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WIMA PROCESS CONTROL SYSTEM

SHIP-TO-STOCK DELIVERIES

Film Capacitors for Electronic Equipment

Edition 2023/2024

Content

04.23

Nominal Capacitance

The nominal capacitance of a capacitor is usually given in pF, nF or µF.

Operating/Rated Voltage

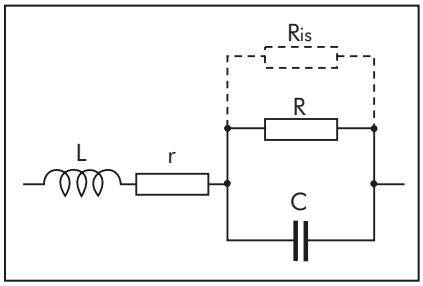
Each capacitor is designed for a specified rated voltage in continuous operation. This is usually only valid for ambient temperatures of T ⩽ + 85° C. In the case of higher temperatures a derating factor must be applied to the rated voltage from 85° C.

Insulation Resistance/Time Constant

The insulation resistance is normally expressed in megohms (MΩ) and is measured at a specified voltage after 1 minute. The time constant defines the time in seconds, in which the voltage across the capacitor self-discharges to 37 % of the fully charged state and it is expressed as $\tau = R_{is} \times C$.
The insulation resistance or time costant value denotes the quality of the dielectric insulation.

Dissipation Factor

The dissipation factor tan δ is the quotient of the resistive and reactive parts of the impedance.
The dielectric losses are illustrated by R in the equivalent circuit diagram.
The insulation resistance R_{is} is in parallel with R, and affects the tan δ only at very low frequencies.
The dissipation factor is also affected by the resistance of both electrodes and of the termination – electrode interface. This is represented by the series resistance r.
L represents the remaining self-inductance.



Capacitance Tolerance

The tolerance is the permissible actual capacitance relative to the nominal capacitance and it is defined in per cent. The tolerance is to be measured at + 25° C and the permissible tolerance is only valid at the time of shipment.
The capacitance may change after long storage or long usage.
The tolerance, with the exception of ± 20 %, is usually marked on the capacitor body in clear digits.

Temperature Coefficient of Capacitance

The temperature coefficient α expresses the change in capacitance with temperature, relative to the capacitance at the reference temperature of + 20° C; it is usually expressed in ppm per °C.

$$C_T = C_{20} \times [1 + \alpha \times (T - 20° C)]$$

C_{20} = capacitance at +20° C
C_T = capacitance at T
α = may be positive or negative.

Pulse Stressing

The ratings on pulse rise time are based on tests in accordance with DIN-IEC 60384 part 1.
The test voltage corresponds to the rated voltage and the test comprises 10 000 pulses with a repetition frequency of 1 Hz.
The catalogue ratings are in accordance with the CECC specifications which specify that the test pulse rise time shall be 10 times the catalogue rating.
It should also be noted that the pulse rise time (F) i.e. V/µsec also provides the maximum current capability, as it can be determined from the following formula.

$$I = F \times C \times 1.6$$

C in µF / I in amps.
The information on the pulse rise time refers to pulses equal to the rated voltage so that, at lower operating voltages, the permissible pulse rise times may be increased.

Warning Notice/Technical Support

AC voltage load at the mains
Anticipating possible interfering pulses, DC voltage capacitors must not be operated at the mains (power line), irrespective of the rated AC voltage. For this purpose, use approved interference suppression capacitors only.

Thermal load in the application
If a plastic film capacitor is overstressed due to inappropriate usage under AC voltage conditions, the temperature inside the component may rise to an impermissibly high level. Thus, the dielectric film may subsequently be damaged leading to a short circuit or formation of smoke and even fire in the capacitor.
This may also happen if the capacitor is overheated by an external heat source.

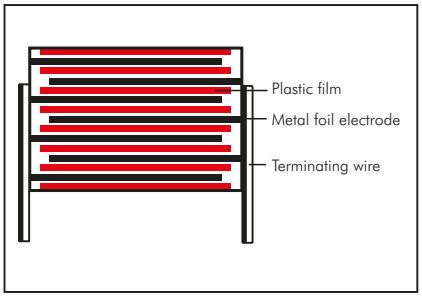
Shock and/or vibration load for larger case sizes
For increased shock and vibration applications involving larger case sizes (i.e., PCM 22.5 mm pin spacing or greater), it is recommended to fix capacitors in an appropriate way; or special pin and plate terminations may be required respectively to minimize lead separation from the capacitor element or the solder joint.

Processing
When processing plastic film capacitors it is mandatory to observe the application recommendations with regard to soldering and/or cleaning and drying processes.

General remarks
All catalogue data, range surveys and application data correspond to the actual state of the art and were elaborated as thoroughly and precisely as possible. They are to be understood as general information, and the right for amendments and construction changes is reserved. Special customized designs which deviate from our catalogue data, irrespective of whether being based on factory standards, specifications or related data, do not release the user from his duty of care with regard to incoming goods inspection and production monitoring. In case of the components being purchased through second or third suppliers we urgently ask to compare the technical details with the data given by the manufacturer. In cases of doubt we recommend use is made of our technical support, since we do not take any responsibility for damages caused by inappropriate use or processing of our capacitors.

Construction Principles of WIMA Capacitors

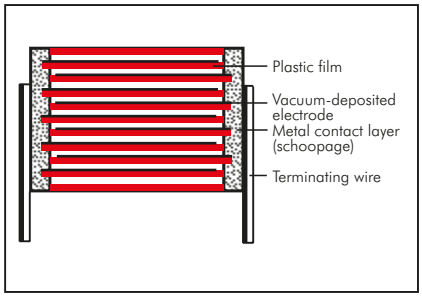
Film and Foil Construction



WIMA Types:

FKP 02 | FKS 2 | FKP 2
FKS 3 | FKP 3

Metallized Construction



WIMA Types:

SMD-PET | SMD-PEN | SMD-PPS
MKS 4 | MKP 4 | MKP-X2

Advantages of Film/Foil Construction:
- High pulse and current rating
- High insulation resistance
- Close tolerances up to ± 1%

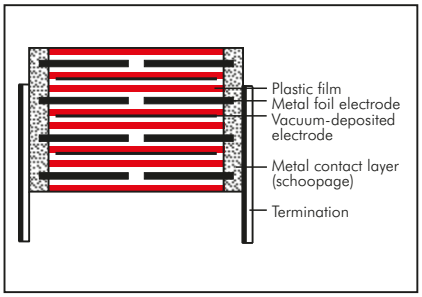
Disadvantages: short circuit at end of life

Advantages of Metallized Construction:
- High capacitances in small box sizes
- Excellent self-healing ability
- Very good price/performance ratio

Disadvantage: low pulse resistance

MKS 02 | MKS 2 | MKP 2
DC-LINK MKP 4 | DC-LINK MKP 6 | DC-LINK HC

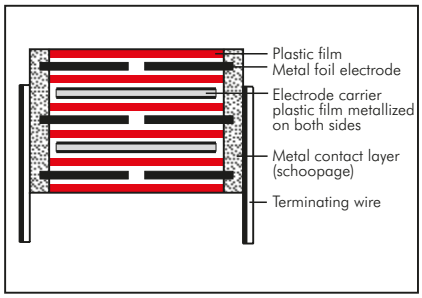
Film and Foil Construction with Internal Series Connection and Self-Healing, Metallized Plastic Film



WIMA Types:

FKP 4 | Snubber FKP

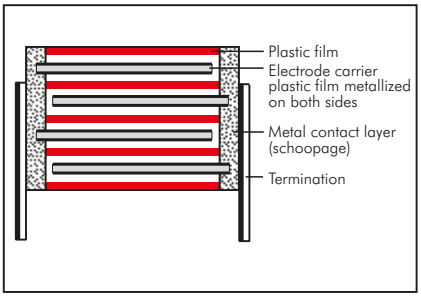
Film and Foil Construction with Internal Series Connection and Self-Healing Plastic Film Metallized on Both Sides



WIMA Types:

FKP 1

Pulse Duty Construction with Self-Healing Plastic Film Metallized on Both Sides

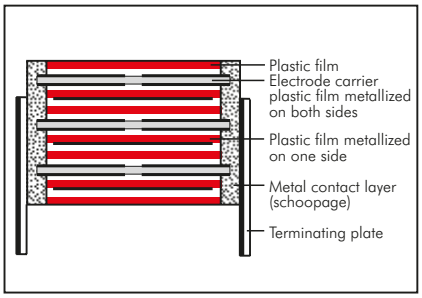


WIMA Types:

MKP 10* | GTO MKP*

*up to 250 VAC *up to 250 VAC

Pulse Duty Construction with Internal Series Connection and Self-Healing Plastic Film Metallized on Both Sides



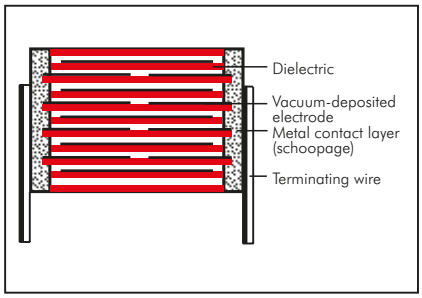
WIMA Types:

MKP 10* | Snubber MKP | GTO MKP*

*400 to 700 VAC

*from 400 VAC

Metallized Construction with Internal Series Connection



WIMA Types:

MKS 4* | MKP 4* | MKP 4F

*400 VAC *400 VAC

MKP-X1 R | MKP-Y2

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Typical Characteristics and Graphs of the Polyester (PET) Film

Polyester Film and Foil Types

FKS 2 | FKS 3

Metallized Polyester Types

SMD-PET | MKS 02 | MKS 2 | MKS 4

Typical Applications

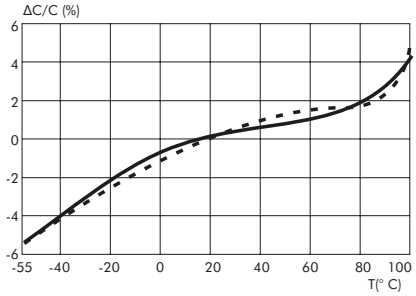
For general DC-applications e.g.

- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**

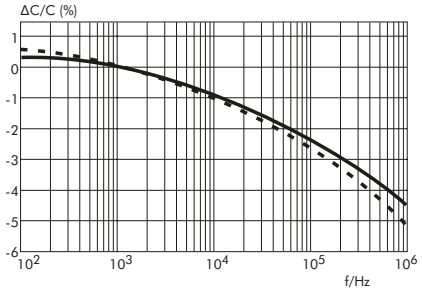
Film Properties

Dielectric constant
at 1 kHz and +23° C:
3.3 positive as temperature rise
Specific volume resistance
in Ω cm at +23° C:
10^{18}
Dielectric strength (DC voltage)
in V/µm at +23° C:
580
Preferred temperature range
in ° C:
-55 to +105 (125)
Dielectric absorption
in % at + 23° C:
0.20 to 0.25

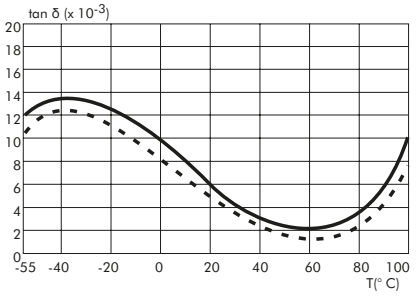
Typical Graphs



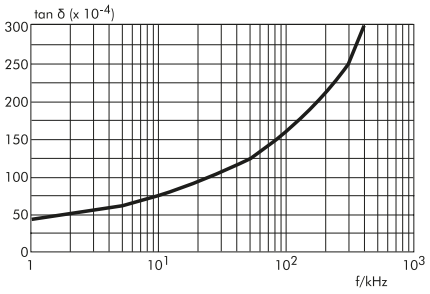
Capacitance change versus temperature (f = 1 kHz) (general guide)



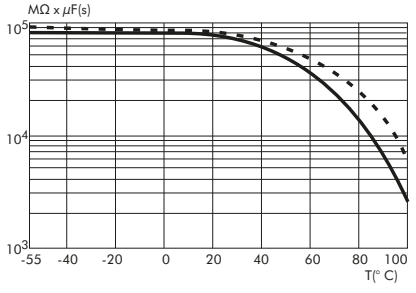
Capacitance change versus frequency (general guide)



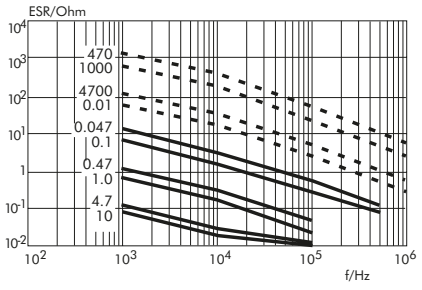
Dissipation factor change versus temperature (f = 1 kHz) (general guide)



Dissipation factor change versus frequency. Example: MKS 4, 0.1 µF/400 VDC (general guide)



Insulation resistance change versus temperature (general guide)



ESR change versus frequency (general guide)

The broken lines show the film and foil types.

The full lines characterize the metallized versions.

Typical Characteristics and Graphs of the Polypropylene (PP) Film

Polypropylene Film and Foil Types

FKP 02 | FKP 2 | FKP 3 | FKP 4 | FKP 1 | Snubber FKP

Metallized Polypropylene Types

MKP 2 | MKP 4 | MKP 10 | MKP-X2 | MKP-X1 R | MKP-Y2
MKP 4F | Snubber MKP | GTO MKP | DC-LINK MKP 4 | DC-LINK MKP 6 | DC-LINK HC

Typical Applications

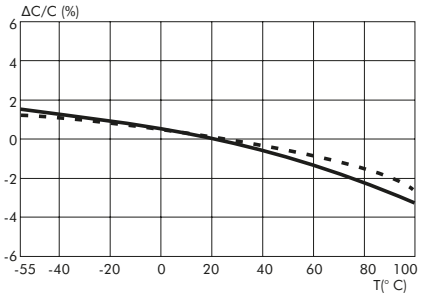
For high frequency and high pulse applications e.g.

- **Sample and hold**
- **Timing**
- **LC-Filtering**
- **Oscillating circuits**
- **Audio equipment**
- **High frequency coupling and decoupling**
- **TV and monitor sets**
- **Lighting**
- **Power electronics**

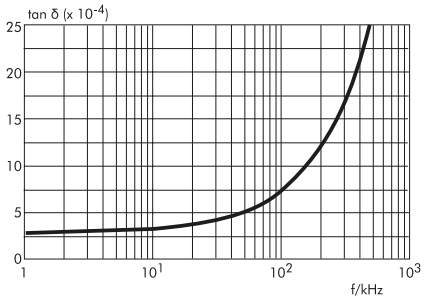
Film Properties

Dielectric constant
at 1 kHz and +23° C:
2.2 negative as temperature rise
Specific volume resistance
in Ω cm at +23° C:
6×10^{18}
Dielectric strength (DC voltage)
in V/µm at +23° C:
650
Preferred temperature range
in ° C:
-55 to +100 (105)
Dielectric absorption
in % at + 23° C:
0.05 to 0.10

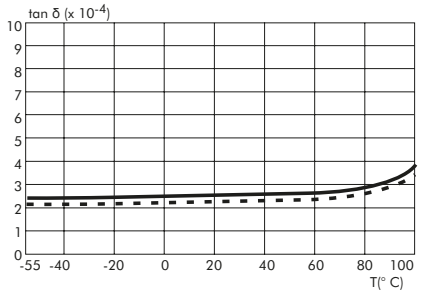
Typical Graphs



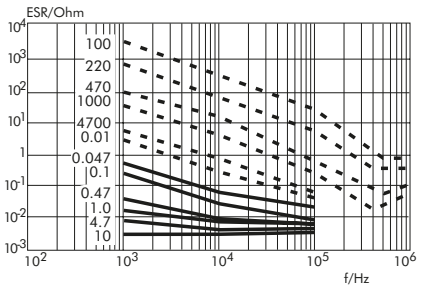
Capacitance change versus temperature (f = 1 kHz) (general guide)



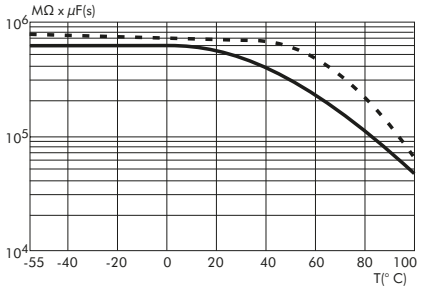
Dissipation factor change versus frequency. Example: MKP 10, 0.01 µF/400 VDC (general guide)



Dissipation factor change versus temperature (f = 1 kHz) (general guide)



ESR change versus frequency (general guide)



Insulation resistance change versus temperature (general guide)

The broken lines show the film and foil types.

The full lines characterize the metallized versions.

Typical Characteristics and Graphs of the Polyethylene-Naphthalate (PEN) Film

Metallized Polyethylene-Naphthalate Type

SMD-PEN

Typical Applications

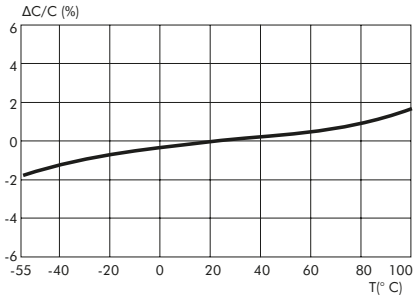
For general DC-applications e.g.

- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**

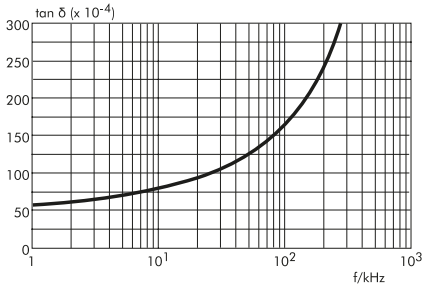
Film Properties

Dielectric constant
at 1 kHz and +23° C:
3.0 positive as temperature rise
Specific volume resistance
in Ω cm at +23° C:
10^{18}
Dielectric strength (DC voltage)
in V/µm at +23° C:
580
Preferred temperature range
in ° C:
-55 to +125
Dielectric absorption
in % at + 23° C:
1.0

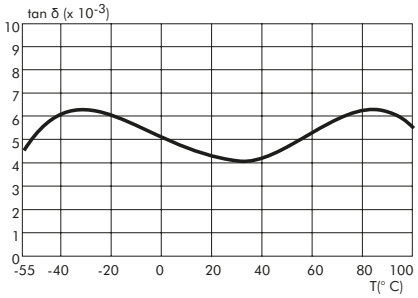
Typical Graphs



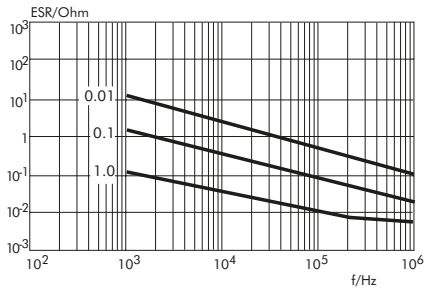
Capacitance change versus temperature (f = 1 kHz) (general guide)



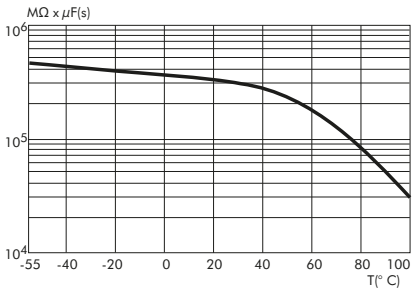
Dissipation factor change versus frequency. Example: SMD-PEN, 0.1 µF/250 VDC (general guide)



Dissipation factor change versus temperature (f = 1 kHz) (general guide)



ESR change versus frequency (general guide)



Insulation resistance change versus temperature (general guide)

Typical Characteristics and Graphs of the Polyphenylene-Sulphide (PPS) Film

Metallized Polyphenylene-Sulphide Type

SMD-PPS

Typical Applications

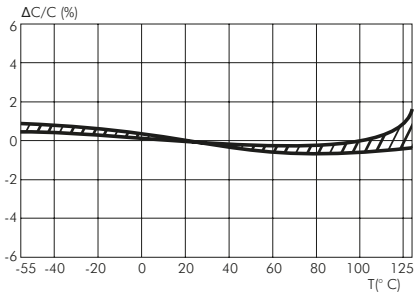
For general applications in high frequency and high temperature circuits e.g.

- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**
- **Filtering**
- **Oscillating circuits**
- **TV and monitor sets**
- **Lighting**
- **Automotive electronics**

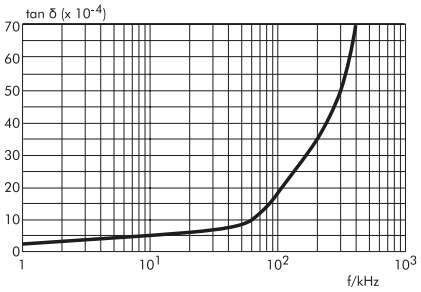
Film Properties

Dielectric constant
at 1 kHz and +23° C:
3.0 very constant versus temperature
Specific volume resistance
in Ω cm at +23° C:
5×10^{17}
Dielectric strength (DC voltage)
in V/µm at +23° C:
470
Preferred temperature range
in ° C:
-55 to +140
Dielectric absorption
in % at + 23° C:
0.05 to 0.10

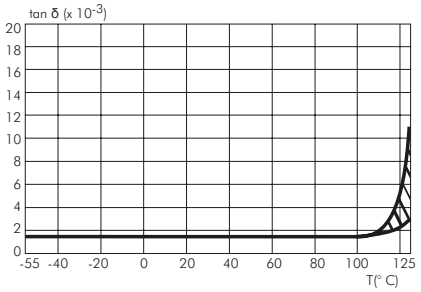
Typical Graphs



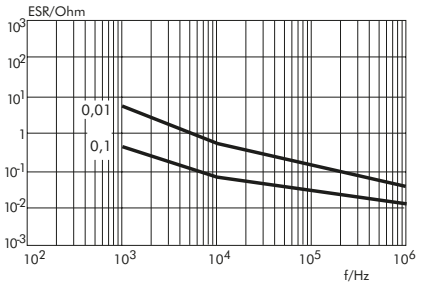
Capacitance change versus temperature (f = 1 kHz) (general guide)



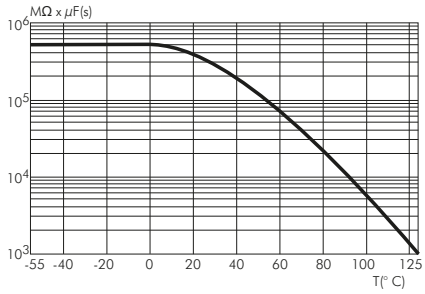
Dissipation factor change versus frequency. Example: SMD-PPS, 0.1 µF/63 VDC (general guide)



Dissipation factor change versus temperature (f = 1 kHz) (general guide)



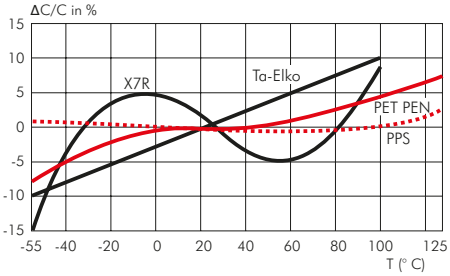
ESR change versus frequency (general guide)



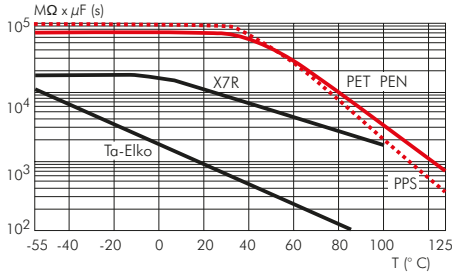
Insulation resistance change versus temperature (general guide)

Characteristics of Metallized Film Capacitors in Comparison with Other Dielectrics

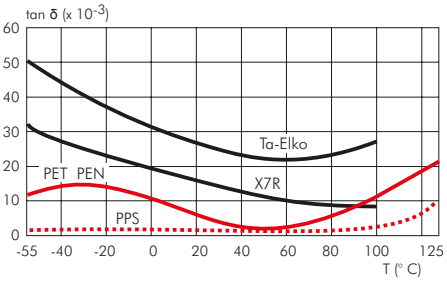
	PET	PP	PEN	PPS	NPO	X7R	Tantalum
Dielectric constant 1 kHz/23° C	3.3 positve as temperature rise	2.2 negative as temperature rise	3.0 positve as temperature rise	3.0 very constant versus temperature	12 ... 40	700...2000	26
Operating temp. (° C)	-55...+105 (125)	-55...+100 (105)	-55...+125	-55...+140	-55...+125	-55...+125	-55...+125
Dielectric absorption (%)	0.2 ... 0.25	0.05 ... 0.10	1.0	0.05	0.6	2.5	n. a.
ΔC/C versus temperature (%)	± 5	± 2.5	± 5	± 1.5	± 0.3	± 15	± 10
ΔC/C versus voltage (%)	negligible	negligible	negligible	negligible	negligible	-20	negligible
ΔC aging rate (%/h decreasing)	negligible	negligible	negligible	negligible	negligible	2	n. a.
Dissipation factor (%) 1 kHz 10 kHz 100 kHz	 0.8 1.5 3.0	 0.05 0.08 0.25	 0.8 1.5 3.0	 0.2 0.25 0.5	 0.10 0.10 0.10	2.5	8
ESR	low	very low	low	very low	low	moderate	high
Ris (MΩ x µF) 25° C 85° C	 10 000 1 000	 100 000 10 000	 10 000 1 000	 10 000 1 000	 10 000 1 000	 1 000 500	 100 10
Capacitance range from pF to µF	1 000 ... 680	27 ... 400	10 000 ... 1.0	10 000 ... 2.2	1... 0.1	100 ... 2.2	100 000 ... 1 000
Capacitance tolerance (± %)	5/10/20	1/2.5/5/10/20	5/10/20	2.5/5/10/20	5/10	10/20	10/20
Self-healing	yes	yes	yes	yes	no	no	no
Typical failure mode at end of life	open	open	open	open	short	short	short
Reliability	high	high	high	high	high	moderate	low
Piezoelectric effect	no	no	no	no	no	yes	yes
Resistance to thermal and mechanical shock	high	high	high	high	moderate to low	moderate to low	high
Polarity	no	no	no	no	no	no	yes



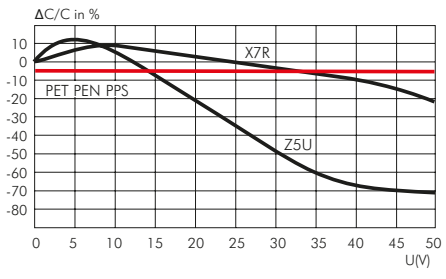
Capacitance change versus temperature (f = 1 kHz) (general guide)



Insulation resistance change versus temperature (general guide)



Dissipation factor change versus temperature (f = 1 kHz) (general guide)



Capacitance change versus voltage (general guide)

Reliability

The failure rate in fit (10^{-9}/h) for plastic film capacitors is shown in the formula:

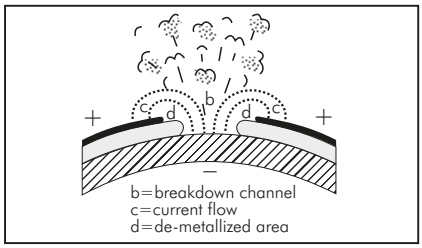
$$\lambda = \lambda_0 \times \pi_T \times \pi_V$$

λ_0 = expected value
π_T = temperature factor
π_V = voltage factor

The expected value has been determined for each component on the basis of life tests. If such a test is carried out at e.g. T=85° C, this corresponds to an operating time of approx. 150 000 - 200 000 h in an equipment with ⩽ 40° C ambient temperature. Nowadays the best values are achieved by our metallized Polyester film capacitors with an expected value of 2 fit and a failure rate of λ=10 fit.

Self-Healing

The self-healing process in metallized plastic film capacitors is started by an electric breakdown, which takes about 10^{-8} sec. Temperatures of approximately 6000 K occur and evaporate the metallization around the failure spot. Insulated areas are formed and the capacitor continues to function properly.



Inductance and Self-Resonance

Depending on the construction, an alternating current in the capacitor winding creates a more or less distinctive magnetic field which can be measured as inductance L. Nowadays, modern plastic film capacitors are contacted over the whole end surface of the winding element. In this way the self-inductance of the winding element is short-circuited and is reduced to the PCM (0.8 nH/mm) and the remaining length of the terminating wires (in case of SMD capacitors the distance between the soldering plates).
L and C form a series oscillating circuit; at a frequency of

Old type with high self-inductance
The tape length of the winding element determines the value of the self-inductance

Modern WIMA type with low self-inductance
WIMA MKS 02/PCM 2.5 mm
Self-inductance L < 8 nH

WIMA SMD/Size Code 1812
Self-inductance L < 6 nH

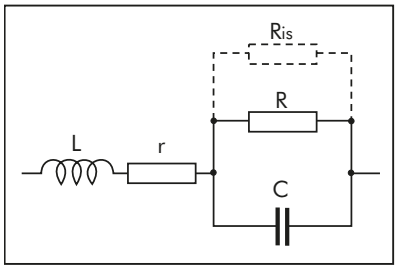
Average value for practical applications: inductance related to length= 0.8 nH/mm
Example: length of the terminating wires = 2 x 3 mm + PCM.

$$f_0 = \frac{1}{2\pi \times \sqrt{L \times C}}$$

the capacitor is in self-resonance and has the lowest impedance, which only consists of r (ESR).

Dissipation Factor and ESR

The dissipation factor tan δ is the quotient of the active and reactive components of the impedance. The losses occur mainly in the dielectric and are represented by R in the equivalent circuit diagram. Parallel to R is the insulation resistance Ris, which, in fact, only affects tan δ at very low frequencies. Further dissipation is caused by the finite conductivity of the electrodes and the transfer resistance between the electrodes and the terminating wires. This is represented in the equivalent circuit diagram by the series resistance r.
L represents the remaining self-inductance.



The dissipation factor is, for example, of importance for AC capacitors, which are subjected to strong currents: too high a tan δ can lead to excessive heating brought about by the incoming active power and thus to a shorter life time of the capacitor.

Values of ESR are not directly stated in the data sheets of plastic film capacitors. The ESR for an individual capacitance value C can be calculated by the formula:

$$ESR = \tan\delta \times (2 \times \pi \times f \times C)^{-1}$$

tan δ: see data sheet of the respective WIMA type
f: frequency of the AC voltage share in the application.
ESR values for certain capacitances see characteristics of film dielectrics page 5.

Box Encapsulation

All WIMA series are produced with the proven box technology, showing the following advantages in comparison with non-encapsulated or dipped versions

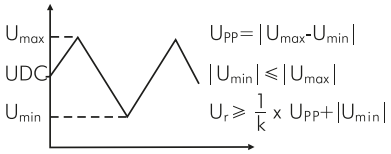
- Safe protection of the capacitor element against mechanical stresses during processing and operation
- No danger of internal cracks, delamination or tearing away of the contacts due to construction elasticity
- Excellent self-healing properties of metallized capacitors due to pressure free layers in the winding element
- Solvent-resistant and flame-retardant plastic case in accordance with UL 94 V-0
- Clearly defined dimensions allows for close placement and exact setting of parts on PC-boards. Even larger parts are easily robotically insertable.

Stress Computation for WIMA Capacitors

The maximum permissible AC voltage that can be applied to capacitors in **sinusoidal** waveform applications, can be determined from the graphs in this catalogue. However, where **pulse conditions** exist, the following procedure is to be observed to ensure that the correct capacitor rating is selected for a particular duty:

1. **Rated Voltage (U_r):** The rated voltage of a capacitor against a zero potential reference point shall take into consideration that the dielectric strength of the capacitor film diminishes with rising frequency. The calculation of the required rated voltage of a capacitor must therefore allow for the correction factor k; where k = dielectric strength of the film at the frequency f in % is shown in graph 1.

   The calculation of the required die lectric strength is shown in the following example (U_{min}, U_{max} have the same polarity).



   Furthermore the rms voltage derived from the peak to peak voltage shall not be greater than the nominal AC voltage rating of the capacitor to avoid the ionization inception level:
   $U_{rms} \leq$ UAC rated.

2. **Maximum current:** The voltage gradient or rise time of the pulse is taken as the reference point when calculating the maximum current rating of the end contacts. The maximum permissible current load on the end contacts is calculated by means of the voltage rise of the pulses (pulse rise time F).
   $I_{max} = F \times C \times 1.6$
   The data of the rated pulse rise time F_r for pulses equal to the rated voltage figure in the technical data of the different types.
   With low voltage rise in operation (U_{PP}) the permissible current load is calculated as follows:

$$F_{max} = \frac{U_r}{U_{PP}} \times F_r$$

   for example
   U_r = 63 V, U_{PP} = 12 V, F_r = 50 V/µsec.

   hence $F_{max} = \frac{63}{12} \times 50 = 262.5$ V/µsec.

   When using maximum current ratings, self-heating must be taken into account at higher frequencies, and must not exceed 10 K.

3. **Dissipation (heat losses):** The heat dissipated by a capacitor when stres sed by non-sinusoidal voltages or when under pulse conditions can be approximately determined from the following formula:

   P_d = $U_{rms}^2 \times \omega C \times \tan\delta$ where
   P_d = dissipation in Watts (see table 1 for the max. W per K).
   U_{rms} = root mean square value of the AC voltage share.
   ω = $2\pi \times f$, where f is the repetition frequency of the pulse waveform (C = capacitance in Farad)
   $\tan\delta$ = dissipation factor corresponding to the frequency of the steepest part of the pulse.

   $$\text{pulse frequency} = \frac{1}{\text{pulse width}}$$

   The temperature rise is as follows:
   Temperature rise in K = $\frac{\text{calculated dissipation}}{\text{specific dissipation}}$ (see table 1)

   In applications where reliability is critical, it is recommended to measure the surface temperature of the capacitor and to take into account that the temperature within the capacitor will be approximately 5 K above the case temperature.

4. **Determining the permissible AC voltage and AC current at given frequencies:**
   To determine the permissible AC voltage (sinusoidal) for applications in a higher frequency spectrum, graphs showing AC voltage derating with frequency are available for the respective WIMA series. The diagrams refer to a permissible self-heating of:
   $\Delta\vartheta \leq 10$ K

   For the WIMA MKP 10/0.01 µF/630 VDC/400 VAC, for example, this shows – when f = 50 kHz – a permissible AC voltage of
   U_{rms} = 280 V (graph 2)
   The AC voltage given in the diagrams can also be used to determine the maximum effective current.

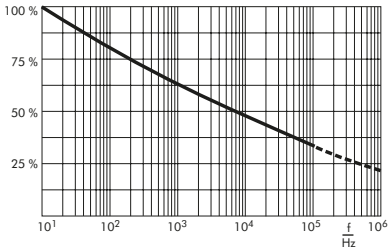
$$Xc = \frac{1}{\omega \times C} = \frac{1}{2\pi \times 50\text{ kHz} \times 0.01\ \mu\text{F}}$$

   Xc = 318 Ω

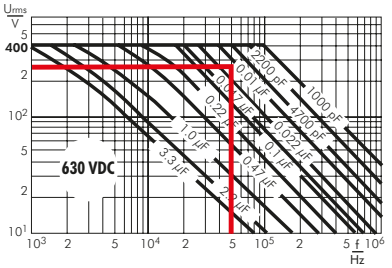
$$Ic = \frac{Uc}{Xc} = \frac{280\text{ V}}{318\ \Omega}$$

   Ic = 0.88 A

   The calculated maximum value of the effective current
   $I_P = Ic \times \sqrt{2} = 0.88\text{ A} \times \sqrt{2}$
   I_P = 1.24 A
   must not exceed the maximum current rating specified in the maximum pulse rise time calculation (cf. F_{max} on left). In this case, the operating AC voltage is to be reduced accordingly.



Graph 1: Dielectric strength of Polypropylene film as a factor of frequency (general guide).



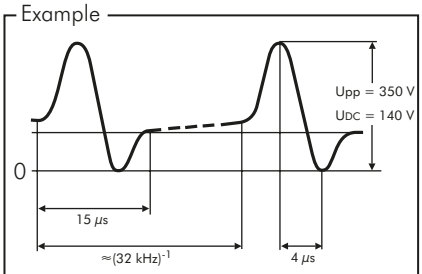
Graph 2: Permissible AC voltage in relation to frequency at 15° C internal temperature rise (general guide).

Printed circuit module PCM (in mm)	Specific dissipation in Watts per K above the ambient temperature
2.5	0.0025
5	0.004
7.5	0.006
10	0.0075
15	0.012
22.5	0.015
27.5	0.025
37.5	0.03

Table 1: The data is for ordinary assembly and ventilation conditions avoiding radiant heat within the chassis of the equipment

The Selection of Capacitors for Pulse Applications

Example



Capacitor: WIMA FKP 1/0.1 µF

Determination of nominal voltage

Calculation is based on an operating temperature < +65° C unless other data is given by the user.
$U_r \geqslant 350$ V
U_{rms} 85 V (referring to AC voltage share)
Selected nominal voltage:
400 VDC/250 VAC pin spacing 27.5 mm

Permissible voltage gradient

The voltage rise time is:

$$\frac{350\ V}{4\ \mu sec.} \approx 87.5\ V/\mu sec$$

Value from table "pulse rise time WIMA FKP 1", page 81: 7000 V/µsec.

The calculated voltage gradient is lower than the permissible value shown in the catalogue for this capacitor.

Dissipation

Given: $U_{rms} = 85$ V
$f = 32$ kHz
$C = 0.1$ µF

The frequency determined from the steepest part of the pulse is:
Pulse width = 15 µsec. = 1 cycle

Hence pulse frequency =

$$\frac{1}{15 \times 10^{-6}} \approx 66\ kHz$$

The tan δ of WIMA FKP 1 at 66 kHz $\approx 10 \times 10^{-4}$ (graph 4).

$P_d = 85^2 \times 2\ \pi \times 32 \times 10^3 \times 0.1 \times 10^{-6} \times 10 \times 10^{-4} \approx 0.145$ Watts

The selected capacitor has a pin spacing of 27.5 mm (table 1, page 11 specific dissipation = 0.025 Watts/K) and the temperature rise due to self-heating is:

$$\text{Temperature rise} = \frac{0.145\ \text{Watts}}{0.025\ \text{Watts/K}} \approx +6\ K$$

The temperature rise plus the max. ambient temperature ⩽ max. permissible operating temperature (taking into account the voltage derating factor as detailed in the Technical Data). If the permissible temperature is exceeded, please select a capacitor with a higher voltage rating.

Optionally a recommendation can be offered by our engineers upon receipt of voltage and current oscillogrammes.

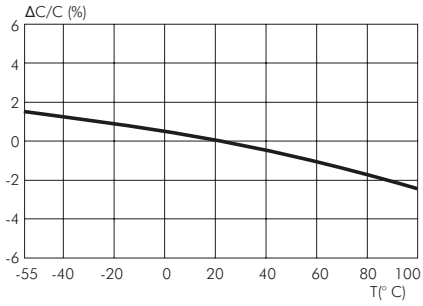
Questionnaire available on demand.

WIMA FKP 1 Pulse Capacitors for Very High Current Ratings

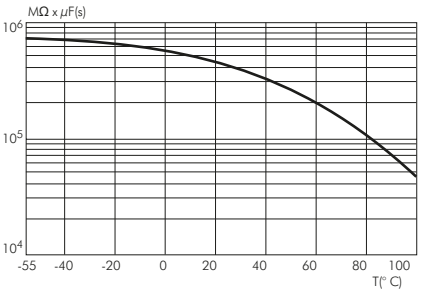
The WIMA FKP1 series was developed for extremely high pulse loads. It has an internal series connection, the metal foil electrodes being combined with a floating electrode metallized on both sides. The metal foil electrodes are safely contacted on both sides of the end surfaces and allow for high current and pulse loading capabilities. At the same time the capacitor is fully self-healing due to the floating electrode metallized on both sides.

As regards pulse loading capability, WIMA FKP 1 represent the high-end of capacitor technology.

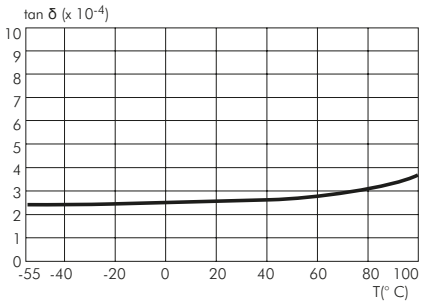
More information see page 81.



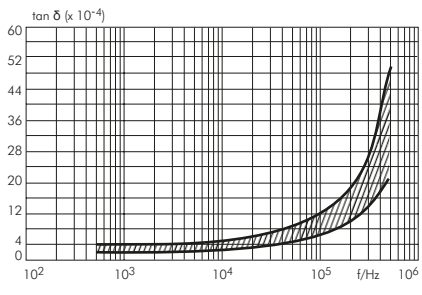
Capacitance change versus temperature (f = 1 kHz) (general guide).



Insulation resistance change versus temperature (general guide).



Dissipation factor change versus temperature (f = 1 kHz) (general guide).



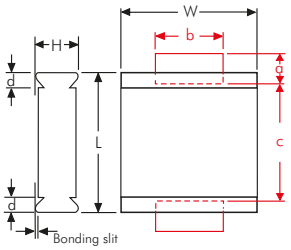
Dissipation factor change versus frequency (general guide).

Recommendation for Processing and Application of SMD Capacitors

Layout Form

The components can generally be positioned on the carrier material as desired. In order to prevent soldering shadows or ensure regular temperature distribution, extreme concentration of the components should be avoided. In practice, it has proven best to keep a minimum distance of the soldering surfaces between two WIMA SMDs of twice the height of the components.

Solder Pad Recommendation



Size code	L ± 0.3	W ± 0.3	d	a min.	b min.	c max.
1812	4.8	3.3	0.5	1.2	3.5	3.5
2220	5.7	5.1	0.5	1.2	4	4.5
2824	7.2	6.1	0.5	1.2	4	6.5
4030	10.2	7.6	0.5	2.5	6	9
5040	12.7	10.2	0.7	2.5	6	11.5
6054	15.3	13.7	0.7	2.5	6	14

The solder pad size recommendations given for each individual series are to be understood as minimum dimensions which can at any time be adjusted to the layout form.

Processing

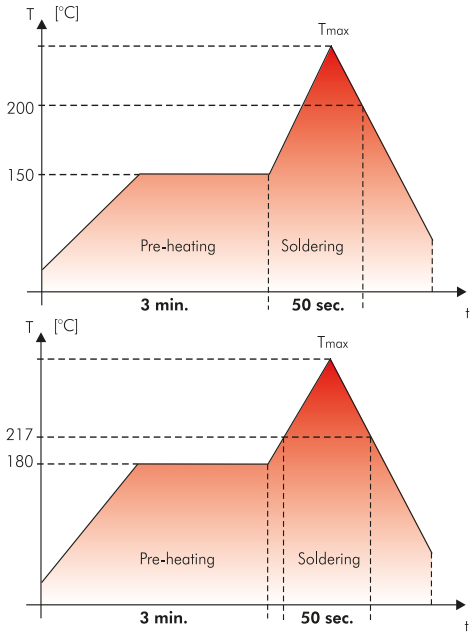
The processing of SMD components

– assembling
– soldering
– electrical final inspection/calibrating

must be regarded as a complete process. The soldering of the printed circuit board, for example, can constitute considerable stress on all the electronic components. The manufacturer's instructions on the processing of the components are mandatory.

Soldering Process

Re-flow soldering



SMD-PET	
Size code	Tmax.
1812	220° C
2220	230° C
2824	230° C
4030	230° C
5040	240° C
6054	250° C

SMD-PEN	
Size code	Tmax.
1812	220° C
2220	230° C
2824	230° C

SMD-PPS	
Size code	Tmax.
1812	250° C
2220	250° C
2824	250° C
4030	250° C
5040	250° C
6054	250° C

Temperature/time graph for the permissible processing temperature of the WIMA SMD film capacitor for typical convection soldering processes.

Due to versatile procedures exact processing parameters for re-flow soldering processes cannot be specified. The graph depicted is to be understood as a recommendation to help establishing a suitable soldering profile fulfilling the requirements in practice at the user. During processing a max. temperature of T = 210° C inside the component should not be exceeded. Due to the differing heat absorption the length of the soldering process should be kept as short as possible for smaller size codes.

SMD Handsoldering

WIMA SMD capacitors with plastic film dielectric are generally suitable for hand-soldering, e. g. for lab purposes, with a soldering iron where, however, similar to automated soldering processes, a certain duration and temperature should not be exceeded. These parameters are dependent on the physical size of the components and the relevant heat absorption involved.

The below data are to be regarded as guideline values and should serve to avoid damage to the dielectric caused by excessive heat during the soldering process. The soldering quality depends on the tool used and on the skill and experience of the person with the soldering iron in hand.

Size code	Temperature °C / °F	Time duration
1812	250/482	2 sec plate 1 / 5 sec off / 2 sec plate 2
2220	250/482	3 sec plate 1 / 5 sec off / 3 sec plate 2
2824	260/500	3 sec plate 1 / 5 sec off / 3 sec plate 2
4030	260/500	5 sec plate 1 / 5 sec off / 5 sec plate 2
5040	260/500	5 sec plate 1 / 5 sec off / 5 sec plate 2
6054	260/500	5 sec plate 1 / 5 sec off / 5 sec plate 2

Recommendation for Processing and Application of SMD Capacitors (Continuation)

Solder Paste

To achieve reliable soldering results one of the following solder alloys have from case to case proven being workable:

Lead free solder paste
Sn - Bi
Sn - Zn (Bi)
Sn - Ag - Cu (suitable for SMD-PET 5040/6054, SMD-PEN and SMD-PPS)

Solder paste with lead
Sn - Pb - Ag (Sn60-Pb40-A, Sn63-Pb37-A)

Washing

WIMA SMD components with plastic encapsulation - like all other components of similar construction irrespective of the make - cannot be regarded as hermetically sealed. Due to today's common washing substances, e. g. on aqueous basis instead of the formerly used halogenated hydrocarbons, with enhanced washing efficiency it became obvious that assembled SMD capacitors may show an impermissibly high deviation of the electrical parameters after a corresponding washing process. Hence it is recommended to refrain from applying industrial washing processes for WIMA SMD capacitors in order to avoid possible damages.

Initial Operation/Calibration

Due to the stress which the components are subjected to during processing, reversible parameter changes occur in almost all electronic components. The capacitance recovery accuracy to be expected with careful processing is within a scope of

$|\Delta C/C| \leqslant 5\ \%$.

For the initial operation of the device a minimum storage time of

$t \geqslant 24$ hours

is to be taken into account. With calibrated devices or when the application is largely dependent on capacitance it is advisable to prolong the storage time to

$t \geqslant 10$ days

In this way ageing effects of the capacitor structure can be anticipated. Parameter changes due to processing are not to be expected after this period of time

Humidity Protection Bags

Taped WIMA SMD capacitors are shipped in humidity protection bags according to JEDEC standard (ESD/EMI-shield/water-vapour proof).
Under controlled conditions the components can be stored two years and more in the originally sealed bag. Opened packing units should immediately be used up for processing. If storage is necessary the opened packing units should be stored air-tight in the original plastic bag.

Reliability

Taking account of the manufacturer's guidelines and compatible processing, the WIMA SMD stand out for the same high quality and reliability as the analogous through-hole WIMA series. The technology of metallized film capacitors used e.g. in WIMA SMD-PET achieves the best values for all fields of application. The expected value is about:

$\lambda_0 \leqslant 2$ fit

Furthermore the production of all WIMA components is subject to the regulations laid down by ISO 9001:2015 as well as the guidelines for component specifications set out by IEC quality assessment system (IECQ) for electronic components.

Electrical Characteristics and Fields of Application

Basically the WIMA SMD series have the same electrical characteristics as the analogous through-hole WIMA capacitors. Compared to ceramic or tantalum dielectrics WIMA SMD capacitors have a number of other outstanding qualities:

- **favourable pulse rise time**
- **low ESR**
- **low dielectric absorption**
- **available in high voltage series**
- **large capacitance spectrum**
- **stand up to high mechanical stress**
- **good long-term stability**

As regards technical performance as well as quality and reliability, the WIMA SMD series offer the possibility to cover nearly all applications of conventionally through-hole film capacitors with SMD components. Furthermore, the WIMA SMD series can now be used for all the demanding capacitor applications for which, in the past, the use of through-hole components was mandatory:

- **measuring techniques**
- **oscillator circuits**
- **differentiating and integrating circuits**
- **A/D or D/A transformers**
- **sample and hold circuits**
- **automotive electronics**

With the WIMA SMD programme available today, the major part of all plastic film capacitors can be replaced by WIMA SMD components. The field of application ranges from standard coupling capacitors to use in switch-mode power supplies as filter or charging capacitors with high voltage and capacitance values, as well as in telecommunications e.g. the well-known telephone capacitor 1µF/250VDC.

Recommendation for Processing and Application of Through-Hole Capacitors

Soldering Process

Internal temperature of the capacitor must be kept as follows:

Polyester: preheating: $T_{max.} \leqslant 125°$ C
soldering: $T_{max.} \leqslant 135°$ C

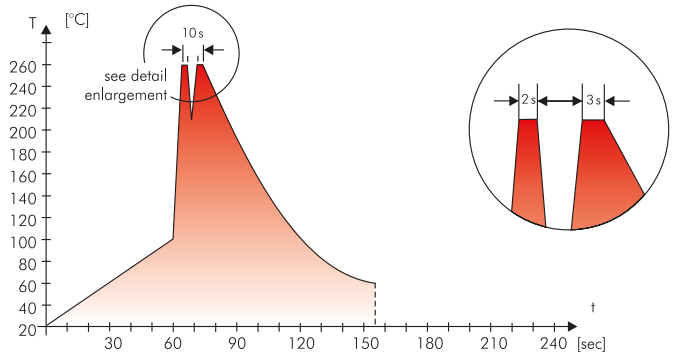
Polypropylene: preheating: $T_{max.} \leqslant 100°$ C
soldering: $T_{max.} \leqslant 110°$ C

Single wave soldering
Soldering bath temperature: T < 260° C
Dwell time: t < 5 sec

Double wave soldering
Soldering bath temperature: T < 260° C
Dwell time: ∑t < 5 sec

Due to different soldering processes and heat requirements the graphs are to be regarded as a recommendation only.

Wave soldering



Typical temperature/time graph for double wave soldering

WIMA Quality and Environmental Philosophy

ISO 9001:2015 Certification

ISO 9001:2015 is an international basic standard of quality assurance systems for all branches of industry. The approval according to ISO 9001:2015 of our factories certifies that organisation, equipment and monitoring of quality assurance in our factories correspond to internationally recognized standards.

WIMA WPCS

The WIMA Process Control System (WPCS) is a quality surveillance and optimization system developed by WIMA. WPCS is a major part of the quality-oriented WIMA production. Points of application during production process:

- **incoming material inspection**
- **metallization**
- **film inspection**
- **schoopage**
- **pre-healing**
- **pin attachment**
- **cast resin preparation/encapsulation**
- **100% final inspection**
- **Testing as per customer requirements**

WIMA Environmental Policy

All WIMA capacitors, irrespective of whether through-hole devices or SMD, are made of environmentally friendly materials. Neither during manufacture nor in the product itself any toxic substances are used, e.g.

- **Lead**
- **PCB**
- **CFC**
- **Hydrocarbon chloride**
- **Chromium 6+**
- **PBB/PBDE**
- **Arsenic**
- **Cadmium**
- **Mercury**
- **etc.**

We merely use pure, recyclable materials for packing our components, such as:

- **carton**
- **cardboard**
- **adhesive tape made of paper**
- **polystyrene**

We almost completely refrain from using packing materials such as:

- **adhesive tapes made of plastic**
- **metal clips**

RoHS Compliance

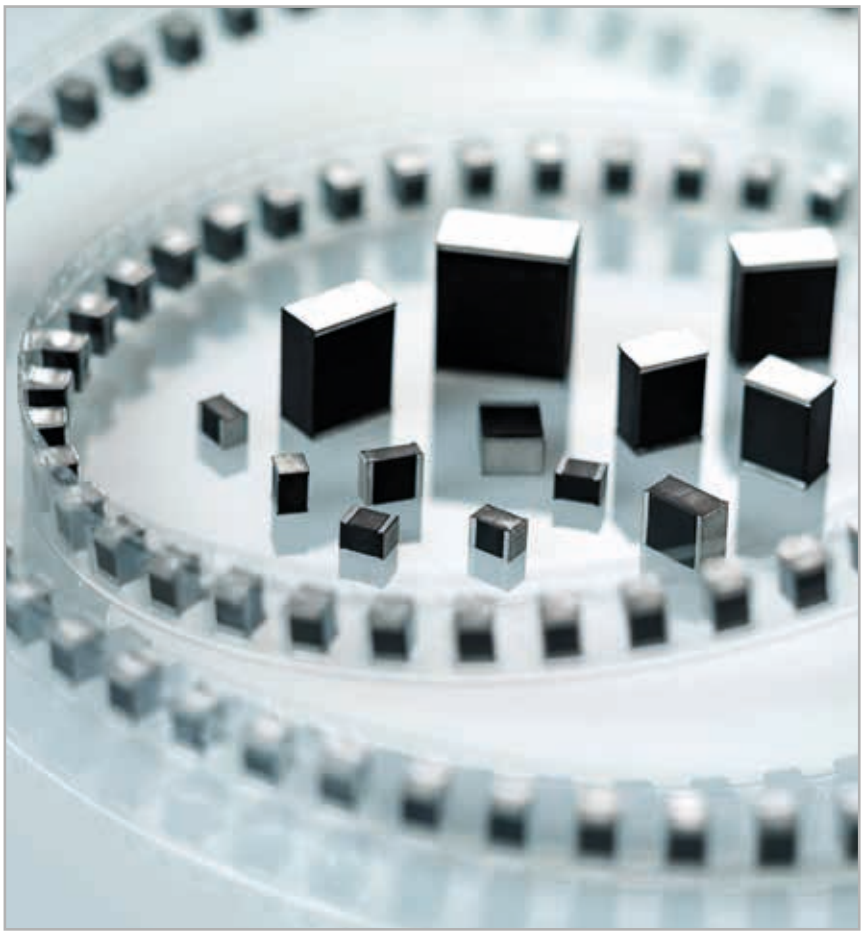
According to the RoHS Directive 2015/863/EU as amended from time to time certain hazardous substances like e.g. lead, cadmium, mercury must not be used any longer in electronic equipment as of July 1st, 2006. For the sake of the environment WIMA has re-fraind from using such substances since years already.

Tape for lead-free WIMA capacitors

DIN EN ISO 14001:2004

WIMA's environmental management has been established in accordance with the guidelines of DIN EN ISO 14001:2004 to optimize the production processes with regard to energy and resources.

WIMA SMD Capacitors in Accordance with RoHS 2015/863/EU



WIMA SMD-PET
WIMA SMD-PEN
WIMA SMD-PPS

WIMA SMD capacitors in size codes 1812, 2220, 2824, 4030, 5040 and 6054, capacitance values from 0.01 µF through 6.8 µF and voltage ranges of 63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC and 1000 VDC cover nearly the entire application range of conventional through-hole plastic film capacitors.

The WIMA SMD-PET is designed for general DC-applications e.g. coupling and decoupling, blocking, by-passing or timing and corresponds to the RoHS 2015/863/EU guidelines (Restriction of Hazardous Substances) of the EU.

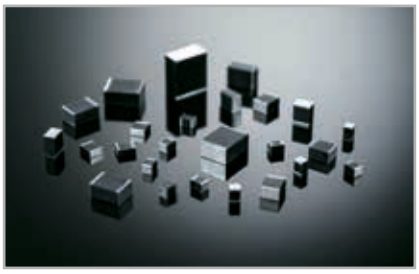
The WIMA SMD-PEN is applicable for operating temperatures up to +125° C and thus suitable for lead-free solder processes in accordance with RoHS.

The WIMA SMD-PPS has an operating temperature range up to +140° C and stands out for its stable capacitance and frequency behaviour versus temperature. Capacitors of this range are environmentally compatible with the RoHS 2015/863/EU guidelines.

All WIMA SMD series are produced with the proven box technology, showing the following advantages in comparison with non-encapsulated or moulded SMD capacitor versions:

- Safe protection of the capacitor element against mechanical and thermal stresses during processing and operation. When using more temperature resistant dielectrics like PEN or PPS an even larger safety margin than with non- encapsulated parts is obtained.
- No danger of internal cracks or tearing away of the contacts due to construction elasticity.
- No danger of delamination due to solder plates covering the capacitor's entire end surfaces.
- Solvent-resistant, flame-retardant plastic case in accordance with UL 94 V-0.

These features and the wide capacitance range enable WIMA SMDs to substitute other capacitor technologies and become standard components in electronic developments.



WIMA SMD-PET

**Metallized Polyester (PET) SMD Film Capacitors with Box Encapsulation.
Capacitances from 0.01 µF to 6.8 µF. Rated Voltages from 63 VDC to 1000 VDC.
Size Codes from 1812 to 6054.**

Special Features

- **Size codes 1812, 2220, 2824, 4030, 5040 and 6054 with PET and encapsulated**
- **Operating temperature up to 125° C**
- **Self-healing**
- **Suitable for lead-free soldering**
- **According to RoHS 2015/863/EU**

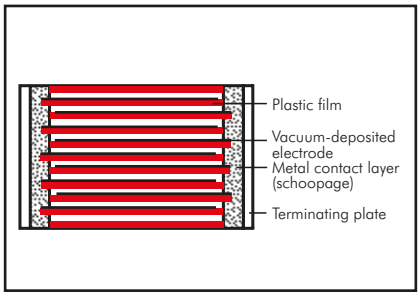
Typical Applications

For general DC-applications e.g.

- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**

Construction

Dielectric:
Polyethylene-terephthalate (PET) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case, UL 94 V-0
Terminations:
Tinned plates.
Marking:
Box colour: Black.

Electrical Data

Capacitance range:
0.01 µF to 6.8 µF
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 1000 VDC
Capacitance tolerances:
±20%, ±10% (±5% available subject to special enquiry)
Operating temperature range:
–55° C to +125° C
Climatic test category:
55/100/21 according to IEC for size codes 1812 to 2824
55/100/56 according to IEC for size codes 4030 to 6054
Insulation resistance at +20° C:

U_r	U_{test}	C ⩽ 0.33 µF	0.33 µF < C ⩽ 6.8 µF
63 VDC 100 VDC	50 V 100 V	⩾ 3.75 x 10^3 MΩ	⩾ 1250 sec (MΩ x µF)
⩾ 250 VDC	100 V	⩾ 1 x 10^4 MΩ	⩾ 3000 sec (MΩ x µF)

Measuring time: 1 min.
Dissipation factors at +20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 8 x 10^{-3}	⩽ 8 x 10^{-3}	⩽ 10 x 10^{-3}
10 kHz	⩽ 15 x 10^{-3}	⩽ 15 x 10^{-3}	–
100 kHz	⩽ 30 x 10^{-3}	–	–

Maximum pulse rise time:

Capacitance µF	max. pulse rise time V/µsec					
	63 VDC	100 VDC	250 VDC	400 VDC	630 VDC	1000 VDC
0.01 ... 0.022	30	35	40	35	40	50
0.033... 0.068	20	20	40	21	25	32
0.1 ... 0.22	10	10	12	14	17	–
0.33 ... 0.68	8	6	9	10	–	–
1.0 ... 2.2	3.5	4	7	–	–	–
3.3 ... 6.8	3	3	–	–	–	–

Test voltage: 1.6 U_r, 2 sec.
Voltage derating:
A voltage derating factor of 1.25 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages
Reliability:
Operational life > 300 000 hours (+125° C permitted for 1000 hours max. distributed over the entire operating life)
Failure rate < 2 fit (0.5 x U_r and 40° C)

Dip Solder Test/Processing

Resistance to soldering heat:
Test Tb in accordance with DIN IEC 60068-2-58/DIN EN 60384-19.
Soldering bath temperature max. 260° C.
Soldering duration max. 5 sec.
Change in capacitance ΔC/C < 5 %.
Soldering process:
Re-flow soldering (see temperature/time graphs page 13).

Packing

Available taped and reeled in blister pack.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	63 VDC/40 VAC*			100 VDC/63 VAC*			250 VDC/160 VAC*		
	Size code	H ± 0.3	Part number	Size code	H ± 0.3	Part number	Size code	H ± 0.3	Part number
0.01 µF	1812	3.0	SMDTC02100KA00____	1812	3.0	SMDTD02100KA00____	2220	3.5	SMDTF02100QA00____
	2220	3.5	SMDTC02100QA00____	2220	3.5	SMDTD02100QA00____	2824	3.0	SMDTF02100TA00____
	2824	3.0	SMDTC02100TA00____	2824	3.0	SMDTD02100TA00____			
0.015 „	1812	3.0	SMDTC02150KA00____	1812	3.0	SMDTD02150KA00____	2220	3.5	SMDTF02150QA00____
	2220	3.5	SMDTC02150QA00____	2220	3.5	SMDTD02150QA00____	2824	3.0	SMDTF02150TA00____
	2824	3.0	SMDTC02150TA00____	2824	3.0	SMDTD02150TA00____			
0.022 „	1812	3.0	SMDTC02220KA00____	1812	3.0	SMDTD02220KA00____	2220	3.5	SMDTF02220QA00____
	2220	3.5	SMDTC02220QA00____	2220	3.5	SMDTD02220QA00____	2824	3.0	SMDTF02220TA00____
	2824	3.0	SMDTC02220TA00____	2824	3.0	SMDTD02220TA00____			
0.033 „	1812	3.0	SMDTC02330KA00____	1812	3.0	SMDTD02330KA00____	2220	3.5	SMDTF02330QA00____
	2220	3.5	SMDTC02330QA00____	2220	3.5	SMDTD02330QA00____	2824	3.0	SMDTF02330TA00____
	2824	3.0	SMDTC02330TA00____	2824	3.0	SMDTD02330TA00____	4030	5.0	SMDTF02330VA00____
0.047 „	1812	3.0	SMDTC02470KA00____	1812	3.0	SMDTD02470KA00____	2220	3.5	SMDTF02470QA00____
	2220	3.5	SMDTC02470QA00____	2220	3.5	SMDTD02470QA00____	2824	3.0	SMDTF02470TA00____
	2824	3.0	SMDTC02470TA00____	2824	3.0	SMDTD02470TA00____	4030	5.0	SMDTF02470VA00____
0.068 „	1812	3.0	SMDTC02680KA00____	1812	3.0	SMDTD02680KA00____	2220	4.5	SMDTF02680QB00____
	2220	3.5	SMDTC02680QA00____	2220	3.5	SMDTD02680QA00____	2824	3.0	SMDTF02680TA00____
	2824	3.0	SMDTC02680TA00____	2824	3.0	SMDTD02680TA00____	4030	5.0	SMDTF02680VA00____
0.1 µF	1812	4.0	SMDTC03100KB00____	1812	4.0	SMDTD03100KB00____	2220	4.5*	SMDTF03100QB00____
	2220	3.5	SMDTC03100QA00____	2220	3.5	SMDTD03100QA00____	2824	5.0	SMDTF03100TB00____
	2824	3.0	SMDTC03100TA00____	2824	3.0	SMDTD03100TA00____	4030	5.0	SMDTF03100VA00____
0.15 „	1812	4.0	SMDTC03150KB00____	1812	4.0	SMDTD03150KB00____	2824	5.0	SMDTF03150TB00____
	2220	3.5	SMDTC03150QA00____	2220	3.5	SMDTD03150QA00____	4030	5.0	SMDTF03150VA00____
	2824	3.0	SMDTC03150TA00____	2824	3.0	SMDTD03150TA00____			
0.22 „	1812	4.0	SMDTC03220KB00____	1812	4.0	SMDTD03220KB00____	2824	5.0	SMDTF03220TB00____
	2220	3.5	SMDTC03220QA00____	2220	3.5	SMDTD03220QA00____	4030	5.0	SMDTF03220VA00____
	2824	3.0	SMDTC03220TA00____	2824	3.0	SMDTD03220TA00____			
0.33 „	1812	4.0	SMDTC03330KB00____	2220	4.5	SMDTD03330QB00____	2824	5.0	SMDTF03330TB00____
	2220	4.5	SMDTC03330QB00____	2824	5.0	SMDTD03330TB00____	4030	5.0	SMDTF03330VA00____
	2824	5.0	SMDTC03330TB00____	4030	5.0	SMDTD03330VA00____	5040	6.0	SMDTF03330XA00____
0.47 „	1812	4.0	SMDTC03470KB00____	2220	4.5	SMDTD03470QB00____	4030	5.0	SMDTF03470VA00____
	2220	4.5	SMDTC03470QB00____	2824	5.0	SMDTD03470TB00____	5040	6.0	SMDTF03470XA00____
	2824	5.0	SMDTC03470TB00____	4030	5.0	SMDTD03470VA00____			
0.68 „	2220	4.5	SMDTC03680QB00____	2824	5.0	SMDTD03680TB00____	5040	6.0	SMDTF03680XA00____
	2824	5.0	SMDTC03680TB00____	4030	5.0	SMDTD03680VA00____			
	4030	5.0	SMDTC03680VA00____	5040	6.0	SMDTD03680XA00____			
1.0 µF	2220	4.5	SMDTC04100QB00____	2824	5.0	SMDTD04100TB00____	6054	7.0	SMDTF04100YA00____
	2824	5.0	SMDTC04100TB00____	4030	5.0	SMDTD04100VA00____			
	4030	5.0	SMDTC04100VA00____	5040	6.0	SMDTD04100XA00____			
1.5 „	2824	5.0	SMDTC04150TB00____	4030	5.0	SMDTD04150VA00____			
	4030	5.0	SMDTC04150VA00____	5040	6.0	SMDTD04150XA00____			
2.2 „	2824	5.0	SMDTC04220TB00____	5040	6.0	SMDTD04220XA00____			
	4030	5.0	SMDTC04220VA00____						
3.3 „	4030	5.0	SMDTC04330VA00____	5040	6.0	SMDTD04330XA00____			
4.7 „	5040	6.0	SMDTC04470XA00____	6054	7.0	SMDTD04470YA00____			
6.8 „	6054	7.0	SMDTC04680YA00____						

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	none = 00
Taped version see page 156.	

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims. in mm.

04.23

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Continuation

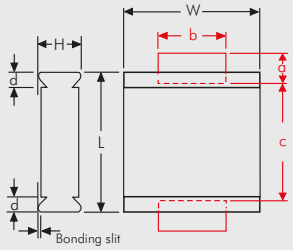
General Data

Capacitance	400 VDC/200 VAC* Size code	H ± 0.3	Part number	630 VDC/300 VAC* Size code	H ± 0.3	Part number	1000 VDC/400 VAC* Size code	H ± 0.3	Part number
0.01 µF	2824 4030	3.0 5.0	SMDTG02100TA00____ SMDTG02100VA00____	4030	5.0	SMDTJ02100VA00____			
0.015 „	2824 4030	3.0 5.0	SMDTG02150TA00____ SMDTG02150VA00____	4030	5.0	SMDTJ02150VA00____	5040	6.0	SMDTO12150XA00____
0.022 „	2824 4030	5.0 5.0	SMDTG02220TB00____ SMDTG02220VA00____	5040	6.0	SMDTJ02220XA00____	5040	6.0	SMDTO12220XA00____
0.033 „	2824 4030	5.0 5.0	SMDTG02330TB00____ SMDTG02330VA00____	5040	6.0	SMDTJ02330XA00____	5040	6.0	SMDTO12330XA00____
0.047 „	2824 4030	5.0 5.0	SMDTG02470TB00____ SMDTG02470VA00____	5040	6.0	SMDTJ02470XA00____	6054	7.0	SMDTO12470YA00____
0.068 „	4030 5040	5.0 6.0	SMDTG02680VA00____ SMDTG02680XA00____	5040	6.0	SMDTJ02680XA00____			
0.1 µF	4030 5040	5.0 6.0	SMDTG03100VA00____ SMDTG03100XA00____	6054	7.0	SMDTJ03100YA00____			
0.15 „	4030 5040	5.0 6.0	SMDTG03150VA00____ SMDTG03150XA00____	6054	7.0	SMDTJ03150YA00____			
0.22 „	5040	6.0	SMDTG03220XA00____	6054	7.0	SMDTJ03220YA00____			
0.33 „	5040	6.0	SMDTG03330XA00____						
0.47 „	6054	7.0	SMDTG03470YA00____						

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims. in mm.

Solder pad recommendation



Size code	L ±0.3	W ±0.3	d	a min.	b min.	c max.
1812	4.8	3.3	0.5	1.2	3.5	3.5
2220	5.7	5.1	0.5	1.2	4	4.5
2824	7.2	6.1	0.5	1.2	4	6.5
4030	10.2	7.6	0.5	2.5	6	9
5040	12.7	10.2	0.7	2.5	6	11.5
6054	15.3	13.7	0.7	2.5	6	14

Part number completion:

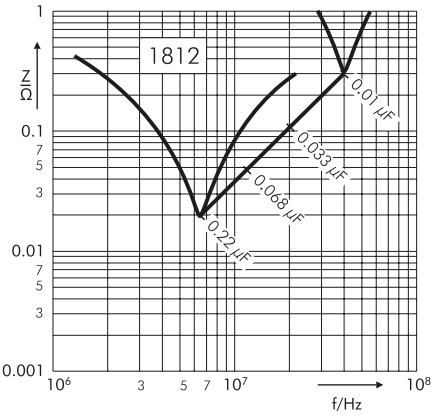
Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: none = 00

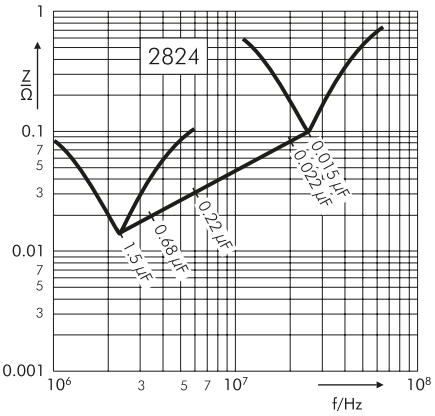
Taped version see page 156.

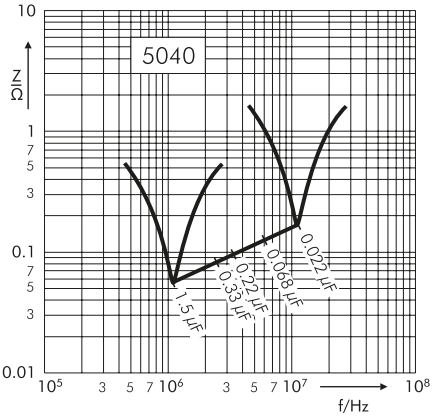
Continuation page 20

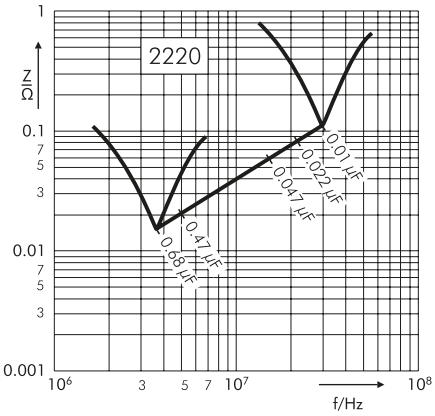
Continuation

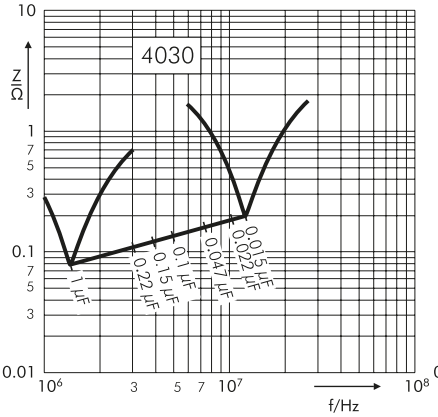
Impedance change with frequency (general guide).

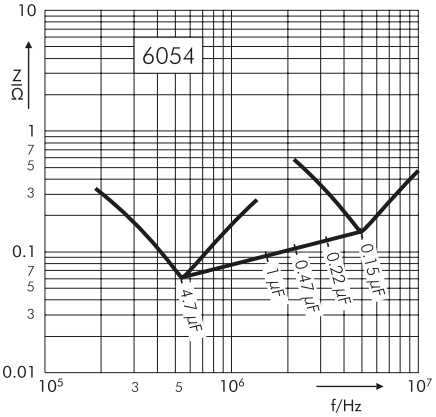




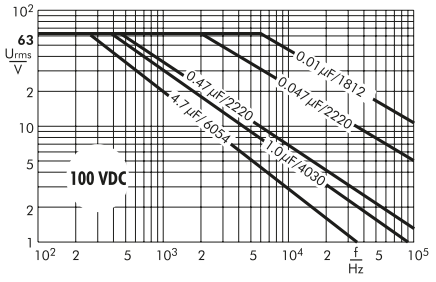


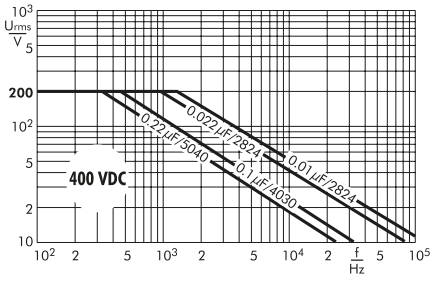


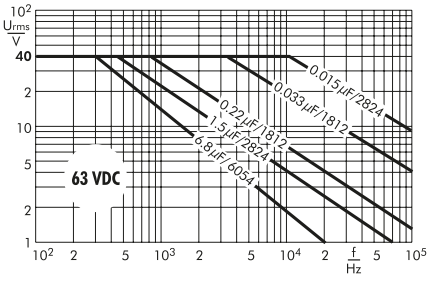


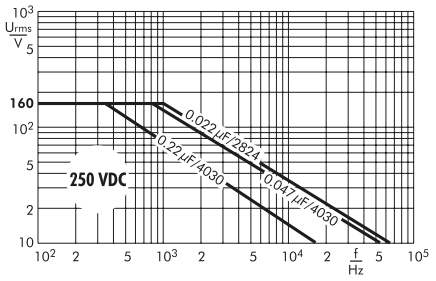


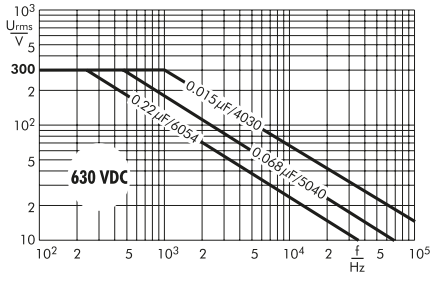
Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).











WIMA SMD-PEN

Metallized Polyethylene-Naphthalate (PEN) SMD Film Capacitors with Box Encapsulation. Capacitances from 0.01 µF to 1.0 µF. Rated Voltages from 63 VDC to 400 VDC. Size Codes from 1812 to 2824.

Special Features

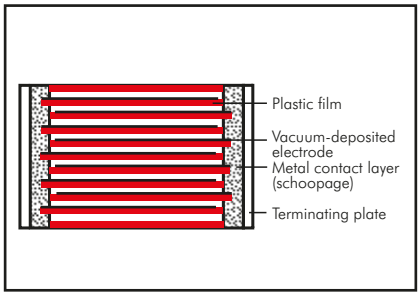
- **Size codes 1812, 2220 and 824, with PEN and encapsulated**
- **Operating temperature up to 125° C**
- **Self-healing**
- **Suitable for lead-free soldering**
- **According to RoHS 2015/863/EU**

Typical Applications

For general DC-applications e.g.
- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**

Construction

Dielectric:
Polyethylene-Naphthalate (PEN) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case, UL 94 V-0
Terminations:
Tinned plates.
Marking:
Colour: Black.

Electrical Data

Capacitance range:
0.01 µF to 1.0 µF
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC
Capacitance tolerances:
±20%, ±10% (±5% available subject to special enquiry)
Operating temperature range:
–55° C to +125° C
Climatic test category:
55/125/21 according to IEC
Insulation resistance at +20° C:

U_r	U_{test}	C ⩽ 0.33 µF	0.33 µF < C ⩽ 1.0 µF
63 VDC 100 VDC	50 V 100 V	⩾ 3.75 x 10^3 MΩ	⩾ 1250 sec (MΩ x µF)
⩾ 250 VDC	100 V	⩾ 1 x 10^4 MΩ	⩾ 3000 sec (MΩ x µF)

Measuring time: 1 min.
Dissipation factors at +20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF
1 kHz	⩽ 8 x 10^{-3}	⩽ 8 x 10^{-3}
10 kHz	⩽ 15 x 10^{-3}	⩽ 15 x 10^{-3}
100 kHz	⩽ 30 x 10^{-3}	–

Maximum pulse rise time:

Capacitance µF	max. pulse rise time V/µsec 63 VDC	100 VDC	250 VDC	400 VDC
0.01 ...0.022	30	35	40	35
0.033...0.068	20	20	40	21
0.1 ...0.22	10	10	12	–
0.33 ...0.68	8	6	–	–
1.0	3.5	4	–	–

Test voltage: 1.6 U_r, 2 sec.
Voltage derating:
A voltage derating factor of 1.25 % per K must be applied from +100° C for DC voltages and from +90° C for AC voltages
Reliability:
Operational life > 300 000 hours
Failure rate < 2 fit (0.5 x U_r and 40° C)

Dip Solder Test/Processing

Resistance to soldering heat:
Test Tb in accordance with DIN IEC 60068-2-58/DIN EN 60384-23.
Soldering bath temperature max. 260° C.
Soldering duration max. 5 sec.
Change in capacitance ΔC/C < 5 %.
Soldering process:
Re-flow soldering (see temperature/time graphs page 13).

Packing

Available taped and reeled in blister pack.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	63 VDC/40 VAC*			100 VDC/63 VAC*		
	Size code	H ± 0.3	Part number	Size code	H ± 0.3	Part number
0.01 µF	1812	3.0	SMDNC02100KA00____	1812	3.0	SMDND02100KA00____
	2220	3.5	SMDNC02100QA00____	2220	3.5	SMDND02100QA00____
	2824	3.0	SMDNC02100TA00____	2824	3.0	SMDND02100TA00____
0.015 „	1812	3.0	SMDNC02150KA00____	1812	3.0	SMDND02150KA00____
	2220	3.5	SMDNC02150QA00____	2220	3.5	SMDND02150QA00____
	2824	3.0	SMDNC02150TA00____	2824	3.0	SMDND02150TA00____
0.022 „	1812	3.0	SMDNC02220KA00____	1812	3.0	SMDND02220KA00____
	2220	3.5	SMDNC02220QA00____	2220	3.5	SMDND02220QA00____
	2824	3.0	SMDNC02220TA00____	2824	3.0	SMDND02220TA00____
0.033 „	1812	3.0	SMDNC02330KA00____	1812	3.0	SMDND02330KA00____
	2220	3.5	SMDNC02330QA00____	2220	3.5	SMDND02330QA00____
	2824	3.0	SMDNC02330TA00____	2824	3.0	SMDND02330TA00____
0.047 „	1812	3.0	SMDNC02470KA00____	1812	3.0	SMDND02470KA00____
	2220	3.5	SMDNC02470QA00____	2220	3.5	SMDND02470QA00____
	2824	3.0	SMDNC02470TA00____	2824	3.0	SMDND02470TA00____
0.068 „	1812	3.0	SMDNC02680KA00____	1812	3.0	SMDND02680KA00____
	2220	3.5	SMDNC02680QA00____	2220	3.5	SMDND02680QA00____
	2824	3.0	SMDNC02680TA00____	2824	3.0	SMDND02680TA00____
0.1 µF	1812	4.0	SMDNC03100KB00____	1812	4.0	SMDND03100KB00____
	2220	3.5	SMDNC03100QA00____	2220	3.5	SMDND03100QA00____
	2824	3.0	SMDNC03100TA00____	2824	3.0	SMDND03100TA00____
0.15 „	1812	4.0	SMDNC03150KB00____	1812	4.0	SMDND03150KB00____
	2220	3.5	SMDNC03150QA00____	2220	3.5	SMDND03150QA00____
	2824	3.0	SMDNC03150TA00____	2824	3.0	SMDND03150TA00____
0.22 „	2220	3.5	SMDNC03220QA00____	2220	3.5	SMDND03220QA00____
	2824	3.0	SMDNC03220TA00____	2824	3.0	SMDND03220TA00____
0.33 „	2220	4.5	SMDNC03330QB00____	2220	4.5	SMDND03330QB00____
	2824	5.0	SMDNC03330TB00____	2824	5.0	SMDND03330TB00____
0.47 „	2220	4.5	SMDNC03470QB00____	2220	4.5	SMDND03470QB00____
	2824	5.0	SMDNC03470TB00____	2824	5.0	SMDND03470TB00____
0.68 „	2824	5.0	SMDNC03680TB00____	2824	5.0	SMDND03680TB00____
1.0 µF	2824	5.0	SMDNC04100TB00____	2824	5.0	SMDND04100TB00____

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims in mm.

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	none = 00

Taped version see page 156.

Continuation page 23

Continuation

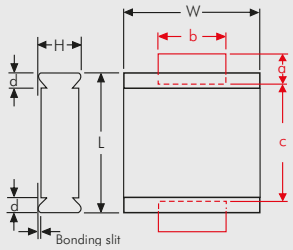
General Data

Capacitance	250 VDC/160 VAC* Size code	H ± 0.3	Part number	400 VDC/200 VAC* Size code	H ± 0.3	Part number
0.01 µF	2220 2824	3.5 3.0	SMDNF02100QA00____ SMDNF02100TA00____	2824	3.0	SMDNG02100TA00____
0.015 „	2220 2824	3.5 3.0	SMDNF02150QA00____ SMDNF02150TA00____	2824	3.0	SMDNG02150TA00____
0.022 „	2220 2824	3.5 3.0	SMDNF02220QA00____ SMDNF02220TA00____	2824	5.0	SMDNG02220TB00____
0.033 „	2220 2824	3.5 3.0	SMDNF02330QA00____ SMDNF02330TA00____	2824	5.0	SMDNG02330TB00____
0.047 „	2220 2824	3.5 3.0	SMDNF02470QA00____ SMDNF02470TA00____	2824	5.0	SMDNG02470TB00____
0.068 „	2220 2824	4.5 3.0	SMDNF02680QB00____ SMDNF02680TA00____			
0.1 µF	2220 2824	4.5 5.0	SMDNF03100QB00____ SMDNF03100TB00____			
0.15 „	2824	5.0	SMDNF03150TB00____			

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims in mm.

Solder pad recommendation



Size code	L ±0.3	W ±0.3	d	a min.	b min.	c max.
1812	4.8	3.3	0.5	1.2	3.5	3.5
2220	5.7	5.1	0.5	1.2	4	4.5
2824	7.2	6.1	0.5	1.2	4	6.5

Part number completion:

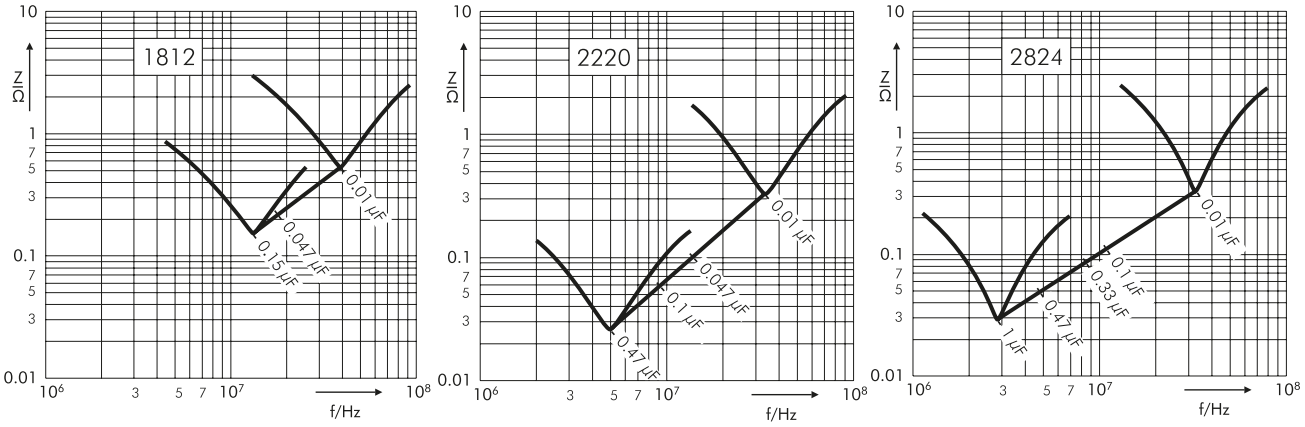
Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: none = 00

Taped version see page 156.

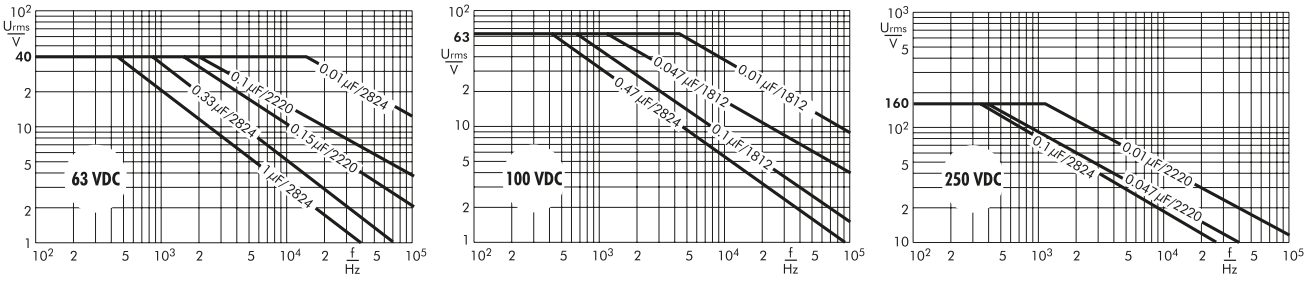
Continuation page 24

Continuation

Impedance change with frequency
(general guide).



Permissible AC voltage in relation to frequency at 10° C internal temperature rise
(general guide).



WIMA SMD-PPS

Metallized Polyphenylene-Sulphide (PPS) SMD Film Capacitors with Box Encapsulation. Capacitances from 0.01 µF to 2.2 µF. Rated Voltages from 63 VDC to 1000 VDC. Size Codes from 1812 to 6054.

Special Features

- **Size codes 1812, 2220, 2824, 4030,5040 and 6054 with PPS and encapsulated**
- **Operating temperature up to 140° C**
- **Self-healing**
- **Suitable for lead-free soldering**
- **Low dissipation factor**
- **Low dielectric absorption**
- **Very constant capacitance value versus temperature**
- **According to RoHS 2015/863/EU**

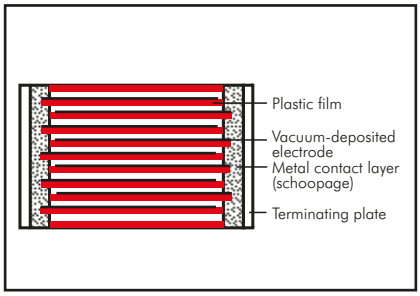
Typical Applications

For general applications in high temperature circuits e.g.

- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**
- **Filtering**
- **Oscillating circuits**

Construction

Dielectric:
Polyphenylene-sulphide (PPS) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case, UL 94 V-0
Terminations:
Tinned plates.
Marking:
Box colour: Black.

Electrical Data

Capacitance range: 0.01 µF to 2.2 µF
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 1000 VDC
Capacitance tolerances:
±20%, ±10% (±5% available subject to special enquiry)
Operating temperature range:
–55° C to +140° C
Climatic test category:
55/140/56 in accordance with IEC
Insulation resistance at +20° C:

U_r	U_{test}	C ⩽ 0.33 µF	0.33 µF < C ⩽ 2.2 µF
63 VDC 100 VDC	50 V 100 V	⩾ 1 x 10^4 MΩ	⩾ 3000 sec (MΩ x µF)
⩾ 250 VDC	100 V	⩾ 3 x 10^4 MΩ	⩾ 6000 sec (MΩ x µF)

Measuring time: 1 min.
Dissipation factors at +20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 15 x 10^{-4}	⩽ 20 x 10^{-4}	⩽ 20 x 10^{-4}
10 kHz	⩽ 25 x 10^{-4}	⩽ 25 x 10^{-4}	–
100 kHz	⩽ 50 x 10^{-4}	–	–

Maximum pulse rise time:

Capacitance µF	max. pulse rise time V/µsec					
	63 VDC	100 VDC	250 VDC	400 VDC	630 VDC	1000 VDC
0.01 ... 0.022	25	25	30	35	40	45
0.033... 0.068	15	15	20	25	28	32
0.1 ... 0.22	10	10	12	15	–	–
0.33 ... 0.68	5	5	6	8	–	–
1.0 ... 2.2	3	3	–	–	–	–

Dip Solder Test/Processing

Resistance to soldering heat:
Test Tb in accordance with DIN IEC 60068-2-58/DIN EN 60384-20.
Soldering bath temperature max. 260° C.
Soldering duration max. 5 sec.
Change in capacitance ΔC/C < 5 %.
Soldering process:
Re-flow soldering (see temperature/time graphs page 13).

Packing

Available taped and reeled in blister pack.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	63 VDC/40 VAC*			100 VDC/63 VAC*			250 VDC/160 VAC*		
	Size code	H ±0.3	Part number	Size code	H ±0.3	Part number	Size code	H ±0.3	Part number
0.01 µF	1812	3.0	SMDIC02100KA00____	1812	3.0	SMDID02100KA00____	2220	3.5	SMDIF02100QA00____
	2220	3.5	SMDIC02100QA00____	2220	3.5	SMDID02100QA00____			
0.015 „	1812	3.0	SMDIC02150KA00____	1812	3.0	SMDID02150KA00____	2220	3.5	SMDIF02150QA00____
	2220	3.5	SMDIC02150QA00____	2220	3.5	SMDID02150QA00____			
0.022 „	1812	3.0	SMDIC02220KA00____	1812	3.0	SMDID02220KA00____	2220	3.5	SMDIF02220QA00____
	2220	3.5	SMDIC02220QA00____	2220	3.5	SMDID02220QA00____	2824	3.0	SMDIF02220TA00____
0.033 „	1812	3.0	SMDIC02330KA00____	1812	3.0	SMDID02330KA00____	2824	3.0	SMDIF02330TA00____
	2220	3.5	SMDIC02330QA00____	2220	3.5	SMDID02330QA00____	4030	5.0	SMDIF02330VA00____
	2824	3.0	SMDIC02330TA00____	2824	3.0	SMDID02330TA00____			
0.047 „	1812	3.0	SMDIC02470KA00____	1812	3.0	SMDID02470KA00____	2824	5.0	SMDIF02470TB00____
	2220	3.5	SMDIC02470QA00____	2220	3.5	SMDID02470QA00____	4030	5.0	SMDIF02470VA00____
	2824	3.0	SMDIC02470TA00____	2824	3.0	SMDID02470TA00____			
0.068 „	1812	3.0	SMDIC02680KA00____	2220	3.5	SMDID02680QA00____	2824	5.0	SMDIF02680TB00____
	2220	3.5	SMDIC02680QA00____	2824	3.0	SMDID02680TA00____	4030	5.0	SMDIF02680VA00____
	2824	3.0	SMDIC02680TA00____						
0.1 µF	1812	3.0	SMDIC03100KA00____	2220	3.5	SMDID03100QA00____	2824	5.0	SMDIF03100TB00____
	2220	3.5	SMDIC03100QA00____	2824	3.0	SMDID03100TA00____	4030	5.0	SMDIF03100VA00____
	2824	3.0	SMDIC03100TA00____				5040	6.0	SMDIF03100XA00____
0.15 „	1812	4.0	SMDIC03150KB00____	2824	3.0	SMDID03150TA00____	4030	5.0	SMDIF03150VA00____
	2220	3.5	SMDIC03150QA00____				5040	6.0	SMDIF03150XA00____
	2824	3.0	SMDIC03150TA00____				6054	7.0	SMDIF03150YA00____
0.22 „	2220	4.5	SMDIC03220QB00____	2220	4.5	SMDID03220QB00____	4030	5.0	SMDIF03220VA00____
	2824	5.0	SMDIC03220TB00____	2824	5.0	SMDID03220TB00____	5040	6.0	SMDIF03220XA00____
							6054	7.0	SMDIF03220YA00____
0.33 „	2220	4.5	SMDIC03330QB00____	2824	5.0	SMDID03330TB00____	5040	6.0	SMDIF03330XA00____
	2824	5.0	SMDIC03330TB00____	4030	5.0	SMDID03330VA00____	6054	7.0	SMDIF03330YA00____
	4030	5.0	SMDIC03330VA00____						
0.47 „	2220	4.5	SMDIC03470QB00____	2824	5.0	SMDID03470TB00____	6054	7.0	SMDIF03470YA00____
	2824	5.0	SMDIC03470TB00____	4030	5.0	SMDID03470VA00____			
	4030	5.0	SMDIC03470VA00____						
0.68 „	2824	5.0	SMDIC03680TB00____	4030	5.0	SMDID03680VA00____			
	4030	5.0	SMDIC03680VA00____						
1.0 µF	2824	5.0	SMDIC04100TB00____	5040	6.0	SMDID04100XA00____			
	4030	5.0	SMDIC04100VA00____						
	5040	6.0	SMDIC04100XA00____						
1.5 „	4030	5.0	SMDIC04150VA00____	6054	7.0	SMDID04150YA00____			
	5040	6.0	SMDIC04150XA00____						
2.2 „	6054	7.0	SMDIC04220YA00____	6054	7.0	SMDID04220YA00____			

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	none = 00

Taped version see page 156.

* AC voltages: f ⩽ 400 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims. in mm.

Continuation page 27

Continuation

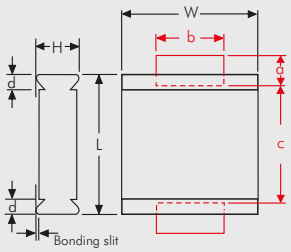
General Data

Capacitance	400 VDC/200 VAC* Size code	H ±0.3	Part number	630 VDC/300 VAC* Size code	H ±0.3	Part number	1000 VDC/400 VAC* Size code	H ±0.3	Part number
0.01 µF				5040	6.0	SMDIJ02100XA00____	5040	6.0	SMDIO12100XA00____
0.015 „				5040	6.0	SMDIJ02150XA00____	5040	6.0	SMDIO12150XA00____
0.022 „	4030 5040	5.0 6.0	SMDIG02220VA00____ SMDIG02220XA00____	5040	6.0	SMDIJ02220XA00____	6054	7.0	SMDIO12220YA00____
0.033 „	4030 5040	5.0 6.0	SMDIG02330VA00____ SMDIG02330XA00____	5040	6.0	SMDIJ02330XA00____	6054	7.0	SMDIO12330YA00____
0.047 „	4030 5040	5.0 6.0	SMDIG02470VA00____ SMDIG02470XA00____	5040	6.0	SMDIJ02470XA00____			
0.068 „	4030 5040	5.0 6.0	SMDIG02680VA00____ SMDIG02680XA00____	6054	7.0	SMDIJ02680YA00____			
0.1 µF	4030 5040 6054	5.0 6.0 7.0	SMDIG03100VA00____ SMDIG03100XA00____ SMDIG03100YA00____						
0.15 „	5040 6054	6.0 7.0	SMDIG03150XA00____ SMDIG03150YA00____						
0.22 „	6054	7.0	SMDIG03220YA00____						
0.33 „	6054	7.0	SMDIG03330YA00____						

* AC voltages: f ⩽ 400 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims. in mm.

Solder pad recommendation



Size code	L ±0.3	W ±0.3	d	a min.	b min.	c max.
1812	4.8	3.3	0.5	1.2	3.5	3.5
2220	5.7	5.1	0.5	1.2	4	4.5
2824	7.2	6.1	0.5	1.2	4	6.5
4030	10.2	7.6	0.5	2.5	6	9
5040	12.7	10.2	0.7	2.5	6	11.5
6054	15.3	13.7	0.7	2.5	6	14

Part number completion:

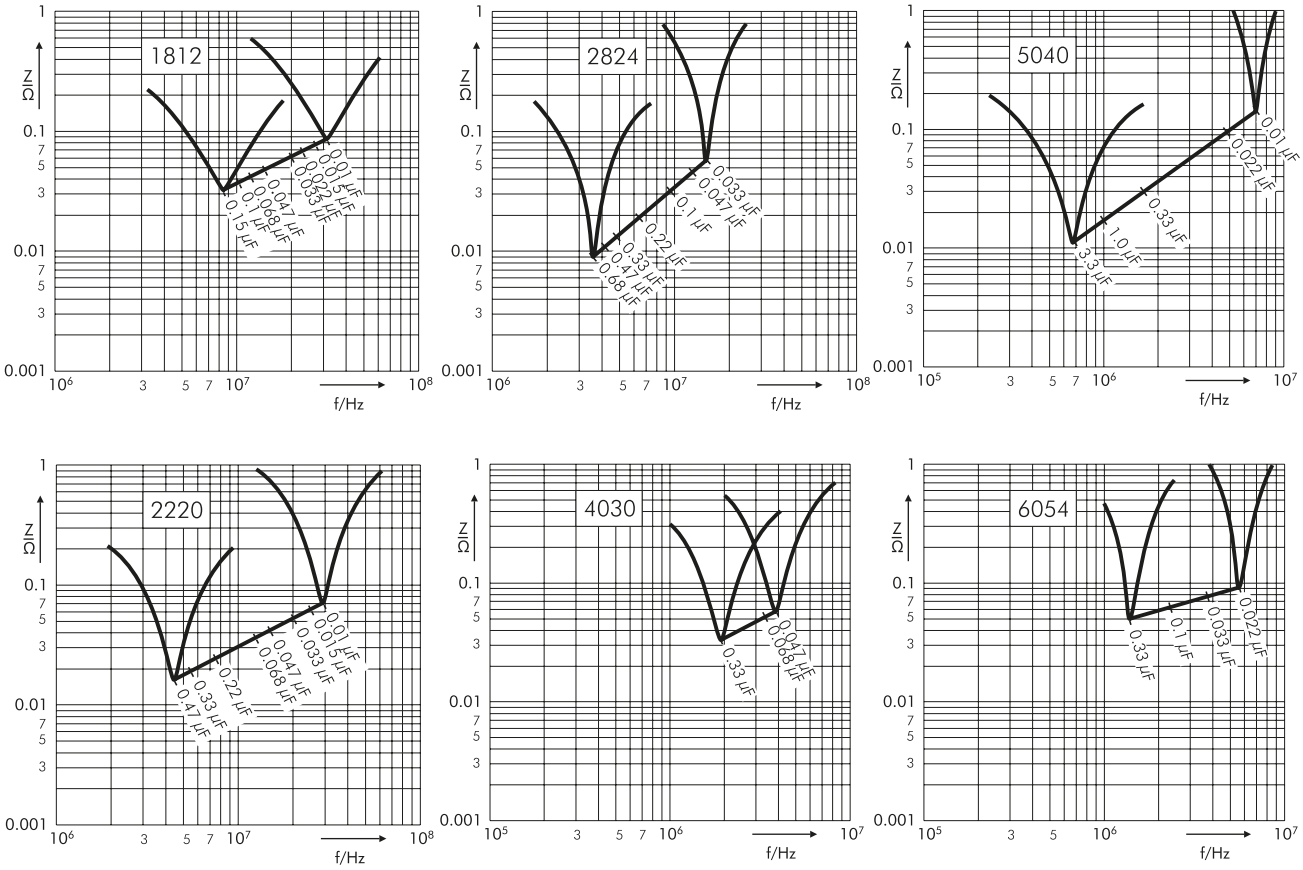
Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: none = 00

Taped version see page 156.

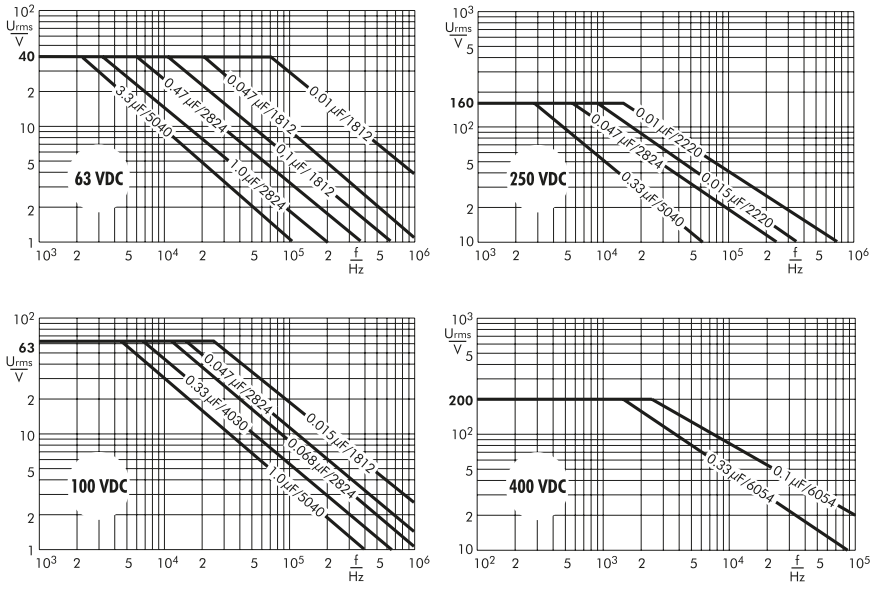
Continuation page 28

Continuation

Impedance change with frequency (general guide).



Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).



WIMA Miniature Capacitors in PCM 2.5 mm

The WIMA series with PCM 2.5 mm are contacted at the end surfaces and have very low self-inductance due to the small pin spacing of the capacitor and its fully contacted electrodes. Furthermore, the pulse and current loading capacities basically increase, the smaller the PCM can be designed, because – provided that the thickness of the film is the same – a longer band length is needed to achieve a particular capacitance value.

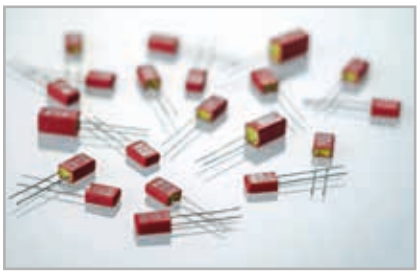
WIMA capacitors are produced with the proven box technology using solvent-resistant, flame-retardant plastic cases according to UL 94 V-0. They are environmetally compatible with the RoHS 2015/863/EU guidelines of the European Union.

WIMA subminiature capacitors in PCM 2.5 mm are outstandingly suitable as reservoir and decoupling capacitors for high-speed digital circuits and for HF decoupling in the field of high frequencies. Due to their excellent electrical properties they can replace ceramic capacitors in applications where quality and reliability are required. Due to their reduced dimensions they open up new possibilities for use in applications with limited space requirements and high package density.

WIMA FKP 02
WIMA MKS 02

WIMA plastic film capacitors in PCM 2.5 mm are available in metallized, self-healing version WIMA MKS 02 or in pulse duty film and foil versions WIMA FKP 02. As a dielectric, Polyester or Polypropylene film is used. The capacitance range includes values of 100 pF through 1.0 µF and voltage ratings of 50 VDC, 63 VDC, 100 VDC, 250 VDC and 400 VDC.

The realization of the smallest plastic film capacitors in the world has been made possible by the use of ultra-thin plastic film in thicknesses of 0.8 mm and below. The film processing with highly sensitive machines requires a high degree of experience and technical know-how.



WIMA FKP 02

Polypropylene (PP) Film/Foil Capacitors for Pulse Applications in PCM 2.5 mm. Capacitances from 100 pF to 0.01 µF. Rated Voltages from 63 VDC to 400 VDC.

Special Features

- **Pulse duty construction**
- **PCM 2.5 mm**
- **Close tolerances up to ±2.5%**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **According to RoHS 2015/863/EU**

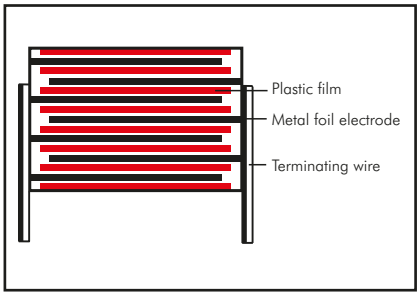
Typical Applications

For high frequency applications e.g.

- **Sample and hold**
- **Timing**
- **LC-Filtering**
- **Oscillating circuits**
- **Audio equipment**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Metal foil
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
100 pF to 0.01 µF (E12-values on request)
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC
Capacitance tolerances:
±20%, ±10%, ±5%, ±2.5%
Operating temperature range:
–55° C to +100° C
Test specifications:
In accordance with IEC 60384-13
Climatic test category:
55/100/21 in accordance with IEC
Insulation resistance at +20° C:
$\geqslant 3 \times 10^5$ MΩ
Measuring voltage:
$U_r =$ 63 V: $U_{test} =$ 50 V/1 min.
$U_r \geqslant$ 100 V: $U_{test} =$ 100 V/1 min.
Test voltage: 2 U_r, 2 sec.
Maximum pulse rise time:
1000 V/µsec.

Dielectric absorption:
0.05%
Temperature coefficient:
$-200 \times 10^{-6}/+$ C (typical)
Dissipation factors at +20° C: tan δ

at f	C ⩽ 0.01 µF
1 kHz	$\leqslant 5 \times 10^{-4}$
10 kHz	$\leqslant 6 \times 10^{-4}$
100 kHz	$\leqslant 8 \times 10^{-4}$

Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300000 hours
Failure rate < 5 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10...2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	63 VDC/40 VAC*					100 VDC/63 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
100 pF	2.5	7	4.6	**2.5**	FKP0C001000B00____	2.5	7	4.6	**2.5**	FKP0D001000B00____
150 „	2.5	7	4.6	**2.5**	FKP0C001500B00____	2.5	7	4.6	**2.5**	FKP0D001500B00____
220 „	2.5	7	4.6	**2.5**	FKP0C002200B00____	2.5	7	4.6	**2.5**	FKP0D002200B00____
330 „	2.5	7	4.6	**2.5**	FKP0C003300B00____	2.5	7	4.6	**2.5**	FKP0D003300B00____
470 „	2.5	7	4.6	**2.5**	FKP0C004700B00____	2.5	7	4.6	**2.5**	FKP0D004700B00____
680 „	2.5	7	4.6	**2.5**	FKP0C006800B00____	2.5	7	4.6	**2.5**	FKP0D006800B00____
1000 pF	2.5	7	4.6	**2.5**	FKP0C011000B00____	2.5	7	4.6	**2.5**	FKP0D011000B00____
1500 „	2.5	7	4.6	**2.5**	FKP0C011500B00____	2.5	7	4.6	**2.5**	FKP0D011500B00____
2200 „	3	7.5	4.6	**2.5**	FKP0C012200C00____	3	7.5	4.6	**2.5**	FKP0D012200C00____
3300 „	3.8	8.5	4.6	**2.5**	FKP0C013300D00____	3.8	8.5	4.6	**2.5**	FKP0D013300D00____
4700 „	4.6	9	4.6	**2.5**	FKP0C014700E00____	4.6	9	4.6	**2.5**	FKP0D014700E00____
6800 „	4.6	9	4.6	**2.5**	FKP0C016800E00____	4.6	9	4.6	**2.5**	FKP0D016800E00____
0.01 µF	5.5	10	4.6	**2.5**	FKP0C021000F00____	5.5	10	4.6	**2.5**	FKP0D021000F00____

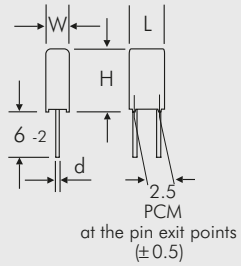
Capacitance	250 VDC/160 VAC*					400 VDC/200 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
100 pF	2.5	7	4.6	**2.5**	FKP0F001000B00____	2.5	7	4.6	**2.5**	FKP0G001000B00____
150 „	2.5	7	4.6	**2.5**	FKP0F001500B00____	2.5	7	4.6	**2.5**	FKP0G001500B00____
220 „	2.5	7	4.6	**2.5**	FKP0F002200B00____	2.5	7	4.6	**2.5**	FKP0G002200B00____
330 „	2.5	7	4.6	**2.5**	FKP0F003300B00____	2.5	7	4.6	**2.5**	FKP0G003300B00____
470 „	2.5	7	4.6	**2.5**	FKP0F004700B00____	2.5	7	4.6	**2.5**	FKP0G004700B00____
680 „	2.5	7	4.6	**2.5**	FKP0F006800B00____	3	7.5	4.6	**2.5**	FKP0G006800C00____
1000 pF	2.5	7	4.6	**2.5**	FKP0F011000B00____	3.8	8.5	4.6	**2.5**	FKP0G011000D00____
1500 „	3	7.5	4.6	**2.5**	FKP0F011500C00____	4.6	9	4.6	**2.5**	FKP0G011500E00____
2200 „	3.8	8.5	4.6	**2.5**	FKP0F012200D00____	4.6	9	4.6	**2.5**	FKP0G012200E00____
3300 „	4.6	9	4.6	**2.5**	FKP0F013300E00____	5.5	10	4.6	**2.5**	FKP0G013300F00____
4700 „	5.5	10	4.6	**2.5**	FKP0F014700F00____					

* AC voltage: f ⩽ 400 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

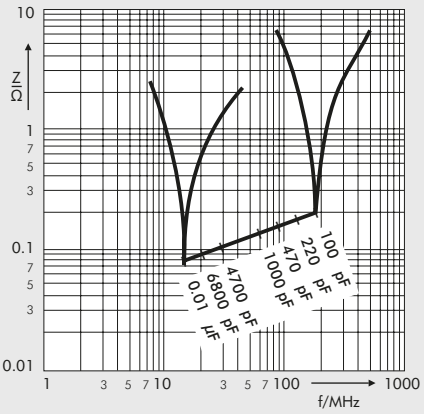
Dims. in mm.

d = 0.4 Ø



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
	2.5 % = H
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 157.



Impedance change with frequency (general guide).

WIMA MKS 02

Metallized Polyester (PET) Capacitors in PCM 2.5 mm. Capacitances from 3300 pF to 1.0 µF. Rated Voltages from 63 VDC to 400 VDC.

Special Features

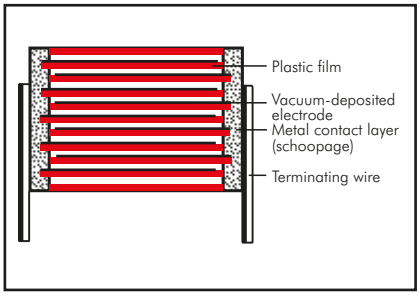
- **High volume/capacitance ratio and reduced base**
- **PCM 2.5 mm**
- **Self-healing**
- **According to RoHS 2015/863/EU**

Typical Applications

For general DC-applications e.g.
- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**

Construction

Dielectric:
Polyethylene-terephthalate (PET) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Silver/Black.

Electrical Data

Capacitance range:
3300 pF to 1.0 µF (E12-values on request)
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC
Capacitance tolerances:
± 20%, ± 10% (±5% available subject to special enquiry)
Operating temperature range:
–55° C to +105° C
Test specifications:
In accordance with IEC 60384-2
Climatic test category:
55/100/21 in accordance with IEC
Insulation resistance at +20° C:0

Dissipation factors at + 20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF
1 kHz	⩽ 8×10^{-3}	⩽ 8×10^{-3}
10 kHz	⩽ 15×10^{-3}	⩽ 15×10^{-3}
100 kHz	⩽ 30×10^{-3}	–

Voltage derating:
A voltage derating factor of 1.25 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300 000 hours
Failure rate < 2 fit (0.5 x U_r and 40° C)

U_r	U_{test}	C ⩽ 0.33 µF	0.33 µF < C ⩽ 1.0 µF)
63 VDC	50 V	⩾ 3.75×10^3 MΩ	⩾ 1250 sec (MΩ x µF)
⩾ 100 VDC	100 V	⩾ 1×10^4 MΩ	–

Measuring time: 1 min.
Test voltage: 1.6 U_r, 2 sec.
Maximum pulse rise time:

Capacitance pF/µF	max. pulse rise time V/µsec
3300 ... 6800	100
0.01 ... 0.022	50
0.033... 0.068	30
0.1 ... 0.33	20
0.47 ... 1.0	15

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

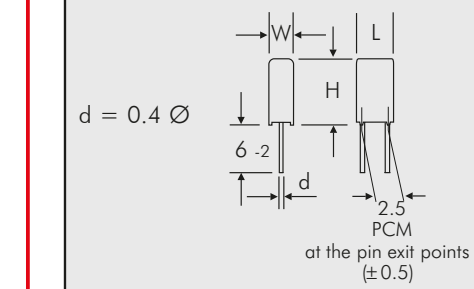
Capacitance	63 VDC/40 VAC* W	H	L	PCM**	Part number	100 VDC/63 VAC* W	H	L	PCM**	Part number
0.01 µF	2.5	7	4.6	**2.5**	MKS0C021000B00____	2.5	7	4.6	**2.5**	MKS0D021000B00____
0.015 „	2.5	7	4.6	**2.5**	MKS0C021500B00____	2.5	7	4.6	**2.5**	MKS0D021500B00____
0.022 „	2.5	7	4.6	**2.5**	MKS0C022200B00____	2.5	7	4.6	**2.5**	MKS0D022200B00____
0.033 „	2.5	7	4.6	**2.5**	MKS0C023300B00____	2.5	7	4.6	**2.5**	MKS0D023300B00____
0.047 „	2.5	7	4.6	**2.5**	MKS0C024700B00____	2.5	7	4.6	**2.5**	MKS0D024700B00____
0.068 „	2.5	7	4.6	**2.5**	MKS0C026800B00____	2.5	7	4.6	**2.5**	MKS0D026800B00____
0.1 µF	3	7.5	4.6	**2.5**	MKS0C031000C00____	3	7.5	4.6	**2.5**	MKS0D031000C00____
0.15 „	3	7.5	4.6	**2.5**	MKS0C031500C00____	3.8	8.5	4.6	**2.5**	MKS0D031500D00____
0.22 „	3	7.5	4.6	**2.5**	MKS0C032200C00____	4.6	9	4.6	**2.5**	MKS0D032200E00____
0.33 „	3.8	8.5	4.6	**2.5**	MKS0C033300D00____	5.5	10	4.6	**2.5**	MKS0D033300F00____
0.47 „	4.6	9	4.6	**2.5**	MKS0C034700E00____					
0.68 „	5.5	10	4.6	**2.5**	MKS0C036800F00____					
1.0 µF	5.5	10	4.6	**2.5**	MKS0C041000F00____					

Capacitance	250 VDC/160 VAC* W	H	L	PCM**	Part number	400 VDC/200 VAC* W	H	L	PCM**	Part number
3300 pF	2.5	7	4.6	**2.5**	MKS0F013300B00____	2.5	7	4.6	**2.5**	MKS0G013300B00____
4700 „	2.5	7	4.6	**2.5**	MKS0F014700B00____	2.5	7	4.6	**2.5**	MKS0G014700B00____
6800 „	2.5	7	4.6	**2.5**	MKS0F016800B00____	2.5	7	4.6	**2.5**	MKS0G016800B00____
0.01 µF	2.5	7	4.6	**2.5**	MKS0F021000B00____	3	7.5	4.6	**2.5**	MKS0G021000C00____
0.015 „	2.5	7	4.6	**2.5**	MKS0F021500B00____	3.8	8.5	4.6	**2.5**	MKS0G021500D00____
0.022 „	2.5	7	4.6	**2.5**	MKS0F022200B00____	4.6	9	4.6	**2.5**	MKS0G022200E00____
0.033 „	3	7.5	4.6	**2.5**	MKS0F023300C00____	5.5	10	4.6	**2.5**	MKS0G023300F00____
0.047 „	3.8	8.5	4.6	**2.5**	MKS0F024700D00____	5.5	10	4.6	**2.5**	MKS0G024700F00____
0.068 „	4.6	9	4.6	**2.5**	MKS0F026800E00____					
0.1 µF	5.5	10	4.6	**2.5**	MKS0F031000F00____					

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

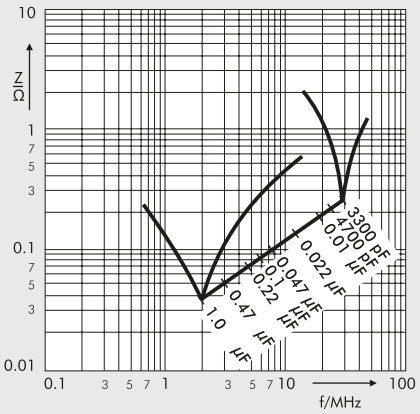
** PCM = Printed circuit module = pin spacing

Dims. in mm.



d = 0.4 Ø

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 157.	



Impedance change with frequency (general guide).

WIMA Capacitors in PCM 5 - 15 mm with Pulse Duty Film/Foil Construction

WIMA FKS 2
WIMA FKP 2
WIMA FKS 3
WIMA FKP 3

In the case of film and foil types, the electrode is not applied as for the metallized capacitors, but is wound with the dielectric as a metal foil. Due to their lower series resistance, the components produced this way have excellent pulse and current carrying capability, as well as a very high insulation resistance.

The film/foil construction is mainly used for capacitors with smaller capacitance value. The advantage of this construction principle is the easy contactability of the metal foil electrodes and the good pulse strength. To avoid breakdowns caused by weak spots in the dielectric, the insulating film chosen is always thicker than theoretically required by the values which are determined from the specific breakdown strength of the material.

WIMA film/foil capacitors in PCM 5 mm, 7.5 mm, 10 mm and 15 mm are available in two dielectric versions.

Capacitors with a Polyester dielectric (PET) are suitable for general applications such as coupling, decoupling and by-passing.

Polypropylene capacitors (PP) are used in the high frequency field. This includes resonant circuits, power supplies, deflection circuits, oscillator circuits and audio equipment.

WIMA capacitors are produced with the proven box technology using solvent-resistant, flame-retardant plastic cases according to UL 94 V-0. They are environmentally compatible with the RoHS 2015/863/EU regulations of the European Union.

WIMA FKS 2

**Polyester (PET) Film/Foil Capacitors for Pulse Applications in PCM 5 mm.
Capacitances from 1000 pF to 0.047 µF. Rated Voltages from 63 VDC to 630 VDC.**

Special Features

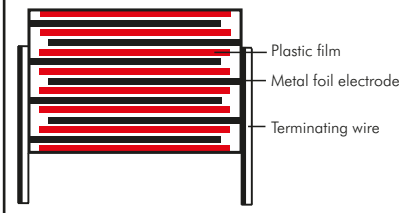
- **Pulse duty construction**
- **According to RoHS 2015/863/EU**

Typical Applications

For general DC-applications e.g.
- **Coupling**
- **Decoupling**

Construction

Dielectric:
Polyethylene-terephthalate (PET) film
Capacitor electrodes:
Metal foil
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Silver/Black.

Electrical Data

Capacitance range:
1000 pF to 0.047 µF
(E12-values on request)
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC
Capacitance tolerances:
± 20%, ±10%, ±5%
Operating temperature range:
–55° C to +105° C
Test specifications:
In accordance with IEC 60384-11
Climatic test category:
55/100/56 in accordance with IEC
Insulation resistance at +20° C:
$\geqslant 1 \times 10^5$ MΩ
Measuring voltage: 100 V/1 min.
Test voltage: 2 U_r, 2 sec.
Maximum pulse rise time:
1000 V/µsec

Dissipation factors at +20° C: tan δ

at f	C ⩽ 0.047 µF
1 kHz	⩽ 7×10^{-3}
10 kHz	⩽ 15×10^{-3}
100 kHz	⩽ 20×10^{-3}

Voltage derating:
A voltage derating factor of 1.25 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300 000 hours
Failure rate < 5 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10…2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	63 VDC/40 VAC*					100 VDC/63 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	2.5	6.5	7.2	**5**	FKS2C011001A00____	2.5	6.5	7.2	**5**	FKS2D011001A00____
1500 „	2.5	6.5	7.2	**5**	FKS2C011501A00____	2.5	6.5	7.2	**5**	FKS2D011501A00____
2200 „	2.5	6.5	7.2	**5**	FKS2C012201A00____	2.5	6.5	7.2	**5**	FKS2D012201A00____
3300 „	2.5	6.5	7.2	**5**	FKS2C013301A00____	2.5	6.5	7.2	**5**	FKS2D013301A00____
4700 „	2.5	6.5	7.2	**5**	FKS2C014701A00____	2.5	6.5	7.2	**5**	FKS2D014701A00____
6800 „	2.5	6.5	7.2	**5**	FKS2C016801A00____	2.5	6.5	7.2	**5**	FKS2D016801A00____
0.01 µF	3	7.5	7.2	**5**	FKS2C021001B00____	3	7.5	7.2	**5**	FKS2D021001B00____
0.015 „	3.5	8.5	7.2	**5**	FKS2C021501C00____	3.5	8.5	7.2	**5**	FKS2D021501C00____
0.022 „	4.5	9.5	7.2	**5**	FKS2C022201E00____	4.5	9.5	7.2	**5**	FKS2D022201E00____
0.033 „	5.5	11.5	7.2	**5**	FKS2C023301H00____	5.5	11.5	7.2	**5**	FKS2D023301H00____
0.047 „	7.2	13	7.2	**5**	FKS2C024701K00____	7.2	13	7.2	**5**	FKS2D024701K00____

Capacitance	250 VDC/160 VAC*					400 VDC/200 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	2.5	6.5	7.2	**5**	FKS2F011001A00____	2.5	6.5	7.2	**5**	FKS2G011001A00____
1500 „	2.5	6.5	7.2	**5**	FKS2F011501A00____	2.5	6.5	7.2	**5**	FKS2G011501A00____
2200 „	2.5	6.5	7.2	**5**	FKS2F012201A00____	2.5	6.5	7.2	**5**	FKS2G012201A00____
3300 „	2.5	6.5	7.2	**5**	FKS2F013301A00____	2.5	6.5	7.2	**5**	FKS2G013301A00____
4700 „	2.5	6.5	7.2	**5**	FKS2F014701A00____	2.5	6.5	7.2	**5**	FKS2G014701A00____
6800 „	2.5	6.5	7.2	**5**	FKS2F016801A00____	3	7.5	7.2	**5**	FKS2G016801B00____
0.01 µF	3	7.5	7.2	**5**	FKS2F021001B00____	3.5	8.5	7.2	**5**	FKS2G021001C00____
0.015 „	3.5	8.5	7.2	**5**	FKS2F021501C00____	4.5	9.5	7.2	**5**	FKS2G021501E00____
0.022 „	4.5	9.5	7.2	**5**	FKS2F022201E00____	5.5	11.5	7.2	**5**	FKS2G022201H00____
0.033 „	5.5	11.5	7.2	**5**	FKS2F023301H00____	7.2	13	7.2	**5**	FKS2G023301K00____
0.047 „	7.2	13	7.2	**5**	FKS2F024701K00____					

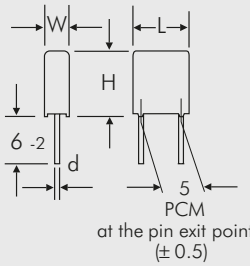
Capacitance	630 VDC/250 VAC*				
	W	H	L	PCM**	Part number
1000 pF	3	7.5	7.2	**5**	FKS2J011001B00____
1500 „	3	7.5	7.2	**5**	FKS2J011501B00____
2200 „	3	7.5	7.2	**5**	FKS2J012201B00____
3300 „	3	7.5	7.2	**5**	FKS2J013301B00____
4700 „	3.5	8.5	7.2	**5**	FKS2J014701C00____
6800 „	4.5	9.5	7.2	**5**	FKS2J016801E00____
0.01 µF	4.5	9.5	7.2	**5**	FKS2J021001E00____
0.015 „	5.5	11.5	7.2	**5**	FKS2J021501H00____
0.022 „	7.2	13	7.2	**5**	FKS2J022201K00____

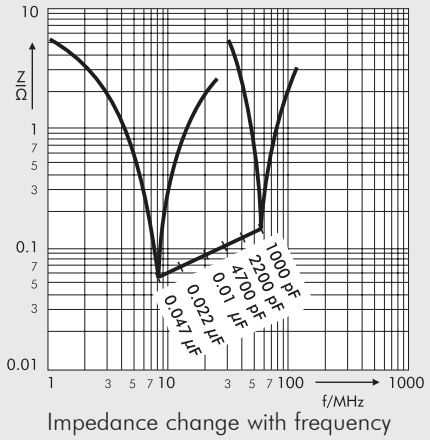
* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

Dims. in mm.

d = 0.5 Ø





Impedance change with frequency (general guide).

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 157.

WIMA FKP 2

Polypropylene (PP) Film/Foil Capacitors for Pulse Applications in PCM 5 mm. Capacitances from 33 pF to 0.033 µF. Rated Voltages from 63 VDC to 1000 VDC.

Special Features

- **Pulse duty construction**
- **Close tolerances up to ±2.5 % (±1 % on request)**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **According to RoHS 2015/863/EU**

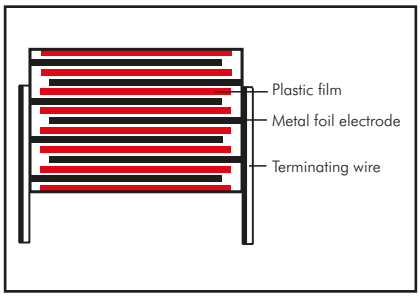
Typical Applications

For high frequency applications e.g.

- **Sample and hold**
- **Timing**
- **LC-Filtering**
- **Oscillating circuits**
- **Audio equipment**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Metal foil
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
33 pF to 0.033 µF (E12-values on request)
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 800 VDC, 1000 VDC
Capacitance tolerances:
±20%, ±10%, ±5%, ±2.5% (±2%, ±1.5% or ±1% available as precision capacitors subject to special enquiry)
Operating temperature range:
–55° C to +100° C
Test specifications:
In accordance with IEC 60384-13
Climatic test category:
55/100/56 in accordance with IEC
Insulation resistance at +20° C:
$\geqslant 3 \times 10^5$ MΩ
Measuring voltage:
$U_r =$ 63 V: $U_{test} =$ 50 V/1 min.
$U_r \geqslant$ 100 V: $U_{test} =$ 100 V/1 min.
Dissipation factors at +20° C: tan δ

at f	C ⩽ 1000 pF	1000 pF < C ⩽ 4700 pF	C > 4700 pF
1 kHz	⩽ 5×10^{-4}	⩽ 5×10^{-4}	⩽ 5×10^{-4}
10 kHz	⩽ 6×10^{-4}	⩽ 6×10^{-4}	⩽ 6×10^{-4}
100 kHz	⩽ 8×10^{-4}	⩽ 8×10^{-4}	–
1 MHz	⩽ 10×10^{-4}	–	–

Test voltage: 2 U_r, 2 sec.
Maximum pulse rise time:
1000 V/µsec
Dielectric absorption:
0.05%
Temperature coefficient:
$-200 \times 10^{-6}/+$ C (typical)
Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages
Reliability:
Operational life > 300 000 hours
Failure rate < 5 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10…2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec² in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	63 VDC/40 VAC* W	H	L	PCM**	Part number	100 VDC/63 VAC* W	H	L	PCM**	Part number
100 pF	4.5	6	7.2	**5**	FKP2C001001D00____	4.5	6	7.2	**5**	FKP2D001001D00____
150 „	4.5	6	7.2	**5**	FKP2C001501D00____	4.5	6	7.2	**5**	FKP2D001501D00____
220 „	4.5	6	7.2	**5**	FKP2C002201D00____	4.5	6	7.2	**5**	FKP2D002201D00____
330 „	4.5	6	7.2	**5**	FKP2C003301D00____	4.5	6	7.2	**5**	FKP2D003301D00____
470 „	4.5	6	7.2	**5**	FKP2C004701D00____	4.5	6	7.2	**5**	FKP2D004701D00____
680 „	4.5	6	7.2	**5**	FKP2C006801D00____	4.5	6	7.2	**5**	FKP2D006801D00____
1000 pF	4.5	6	7.2	**5**	FKP2C011001D00____	4.5	6	7.2	**5**	FKP2D011001D00____
1500 „	4.5	6	7.2	**5**	FKP2C011501D00____	4.5	6	7.2	**5**	FKP2D011501D00____
2200 „	4.5	6	7.2	**5**	FKP2C012201D00____	4.5	6	7.2	**5**	FKP2D012201D00____
3300 „	4.5	6	7.2	**5**	FKP2C013301D00____	5.5	7	7.2	**5**	FKP2D013301G00____
4700 „	4.5	6	7.2	**5**	FKP2C014701D00____	5.5	7	7.2	**5**	FKP2D014701G00____
6800 „	4.5	6	7.2	**5**	FKP2C016801D00____	5.5	7	7.2	**5**	FKP2D016801G00____
0.01 µF	5.5	7	7.2	**5**	FKP2C021001G00____	6.5	8	7.2	**5**	FKP2D021001I00____
0.015 „	6.5	8	7.2	**5**	FKP2C021501I00____	7.2	8.5	7.2	**5**	FKP2D021501J00____
0.022 „	7.2	8.5	7.2	**5**	FKP2C022201J00____	8.5	10	7.2	**5**	FKP2D022201L00____
0.033 „	8.5	10	7.2	**5**	FKP2C023301L00____					

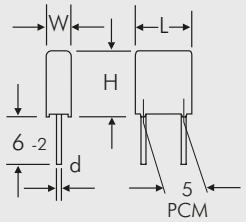
Capacitance	250 VDC/160 VAC* W	H	L	PCM**	Part number	400 VDC/220 VAC* W	H	L	PCM**	Part number
100 pF	4.5	6	7.2	**5**	FKP2F001001D00____	4.5	6	7.2	**5**	FKP2G001001D00____
150 „	4.5	6	7.2	**5**	FKP2F001501D00____	4.5	6	7.2	**5**	FKP2G001501D00____
220 „	4.5	6	7.2	**5**	FKP2F002201D00____	4.5	6	7.2	**5**	FKP2G002201D00____
330 „	4.5	6	7.2	**5**	FKP2F003301D00____	4.5	6	7.2	**5**	FKP2G003301D00____
470 „	4.5	6	7.2	**5**	FKP2F004701D00____	4.5	6	7.2	**5**	FKP2G004701D00____
680 „	4.5	6	7.2	**5**	FKP2F006801D00____	4.5	6	7.2	**5**	FKP2G006801D00____
1000 pF	4.5	6	7.2	**5**	FKP2F011001D00____	4.5	6	7.2	**5**	FKP2G011001D00____
1500 „	4.5	6	7.2	**5**	FKP2F011501D00____	4.5	6	7.2	**5**	FKP2G011501D00____
2200 „	4.5	6	7.2	**5**	FKP2F012201D00____	4.5	6	7.2	**5**	FKP2G012201D00____
3300 „	5.5	7	7.2	**5**	FKP2F013301G00____	5.5	7	7.2	**5**	FKP2G013301G00____
4700 „	6.5	8	7.2	**5**	FKP2F014701I00____	6.5	8	7.2	**5**	FKP2G014701I00____
6800 „	6.5	8	7.2	**5**	FKP2F016801I00____	7.2	8.5	7.2	**5**	FKP2G016801J00____
0.01 µF	7.2	8.5	7.2	**5**	FKP2F021001J00____	8.5	10	7.2	**5**	FKP2G021001L00____
0.015 „	8.5	10	7.2	**5**	FKP2F021501L00____					

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing.

E12 values and individual values available from 27 pF up on request.

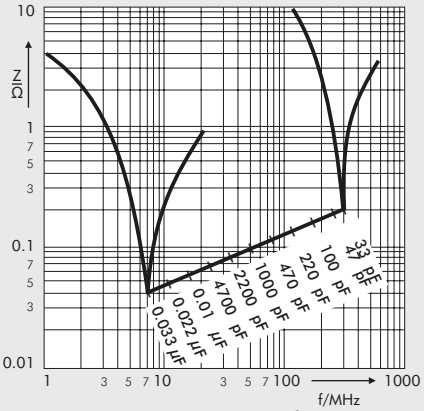
Dims. in mm.



d = 0.5 Ø

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
	2.5 % = H
	2 % = G
	1.5 % = F
	1 % = E
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 157.



Impedance change with frequency (general guide).

Continuation page 39

Continuation

General Data

Capacitance	630 VDC/250 VAC* W	H	L	PCM**	Part number	800 VDC/250 VAC* W	H	L	PCM**	Part number
100 pF	4.5	6	7.2	**5**	FKP2J001001D00____	4.5	6	7.2	**5**	FKP2L001001D00____
150 „	4.5	6	7.2	**5**	FKP2J001501D00____	4.5	6	7.2	**5**	FKP2L001501D00____
220 „	4.5	6	7.2	**5**	FKP2J002201D00____	4.5	6	7.2	**5**	FKP2L002201D00____
330 „	4.5	6	7.2	**5**	FKP2J003301D00____	4.5	6	7.2	**5**	FKP2L003301D00____
470 „	4.5	6	7.2	**5**	FKP2J004701D00____	5.5	7	7.2	**5**	FKP2L004701G00____
680 „	4.5	6	7.2	**5**	FKP2J006801D00____	5.5	7	7.2	**5**	FKP2L006801G00____
1000 pF	4.5	6	7.2	**5**	FKP2J011001D00____	5.5	7	7.2	**5**	FKP2L011001G00____
1500 „	4.5	6	7.2	**5**	FKP2J011501D00____	5.5	7	7.2	**5**	FKP2L011501G00____
2200 „	5.5	7	7.2	**5**	FKP2J012201G00____	6.5	8	7.2	**5**	FKP2L012201I00____
3300 „	6.5	8	7.2	**5**	FKP2J013301I00____	7.2	8.5	7.2	**5**	FKP2L013301J00____
4700 „	6.5	8	7.2	**5**	FKP2J014701I00____	8.5	10	7.2	**5**	FKP2L014701L00____
6800 „	7.2	8.5	7.2	**5**	FKP2J016801J00____					
0.01 µF	8.5	10	7.2	**5**	FKP2J021001L00____					

Capacitance	1000 VDC/250 VAC* W	H	L	PCM**	Part number
33 pF	4.5	6	7.2	**5**	FKP2O100331D00____
47 „	4.5	6	7.2	**5**	FKP2O100471D00____
68 „	4.5	6	7.2	**5**	FKP2O100681D00____
100 pF	4.5	6	7.2	**5**	FKP2O101001D00____
150 „	4.5	6	7.2	**5**	FKP2O101501D00____
220 „	4.5	6	7.2	**5**	FKP2O102201D00____
330 „	4.5	6	7.2	**5**	FKP2O103301D00____
470 „	5.5	7	7.2	**5**	FKP2O104701G00____
680 „	5.5	7	7.2	**5**	FKP2O106801G00____
1000 pF	6.5	8	7.2	**5**	FKP2O111001I00____
1500 „	7.2	8.5	7.2	**5**	FKP2O111501J00____
2200 „	8.5	10	7.2	**5**	FKP2O112201L00____

E12 values and individual values available from 27 pF up on request.

Dims. in mm.

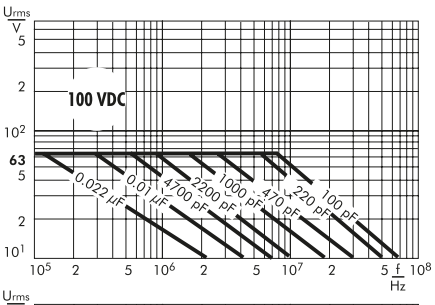
Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
	2.5 % = H
	2 % = G
	1.5 % = F
	1 % = E
Packing:	bulk = S
Pin length:	6-2 = SD

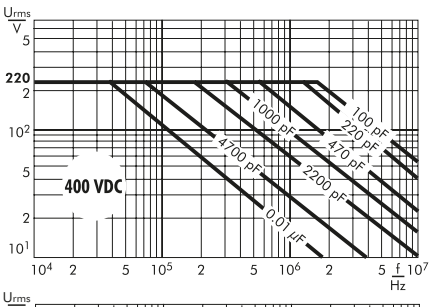
Taped version see page 157.

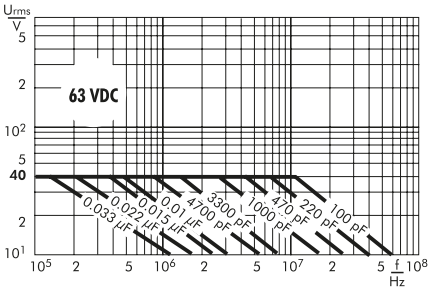
* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

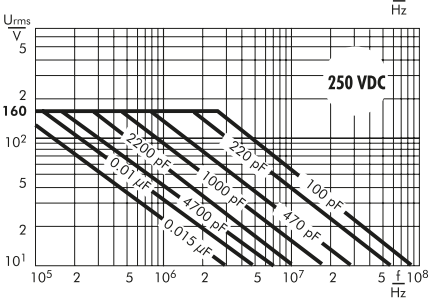
** PCM = Printed circuit module = pin spacing.

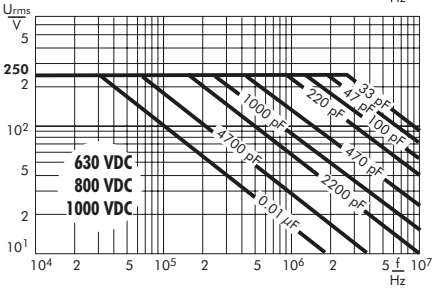
Permissible AC voltage
in relation to frequency
at 10° C internal temperature rise
(general guide).











WIMA FKS 3

Polyester (PET) Film/Foil Capacitors for Pulse Applications in PCM 7.5 mm to 15 mm. Capacitances from 1000 pF to 0.22 µF. Rated Voltages from 100 VDC to 630 VDC.

Special Features

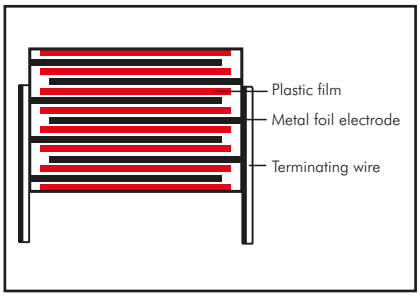
- **Pulse duty construction**
- **According to RoHS 2015/863/EU**

Typical Applications

For general DC-applications e.g.
- **Coupling**
- **Decoupling**

Construction

Dielectric:
Polyethylene-terephthalate (PET) film
Capacitor electrodes:
Metal foil
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
1000 pF to 0.22 µF (E12-values on request)
Rated voltages:
100 VDC, 250 VDC, 400 VDC, 630 VDC
Capacitance tolerances:
± 20%, ±10%, ±5%,
Operating temperature range:
–55° C to +105° C
Test specifications:
In accordance with IEC 60384-11
Climatic test category:
55/100/56 in accordance with IEC
Insulation resistance at +20° C:
$\geqslant 1 \times 10^5$ MΩ
Measuring voltage: 100 V/1 min.
Test voltage: 2 U_r, 2 sec.
Maximum pulse rise time:
1000 V/µsec.

Dissipation factors at +20° C: tan δ

at f	C≤0.22 µF
1 kHz	$\leqslant 7 \times 10^{-3}$
10 kHz	$\leqslant 15 \times 10^{-3}$
100 kHz	$\leqslant 20 \times 10^{-3}$

Voltage derating:
A voltage derating factor of 1.25 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300 000 hours
Failure rate < 5 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

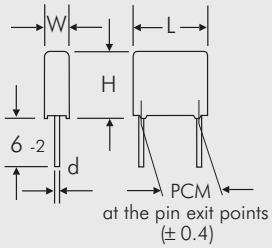
Capacitance	100 VDC/63 VAC* W	H	L	PCM**	Part number	250 VDC/160 VAC* W	H	L	PCM**	Part number
1000 pF	3	8.5	10	7.5	FKS3D011002B00____	3	8.5	10	7.5	FKS3F011002B00____
1500 „	3	8.5	10	7.5	FKS3D011502B00____	3	8.5	10	7.5	FKS3F011502B00____
2200 „	3	8.5	10	7.5	FKS3D012202B00____	3	8.5	10	7.5	FKS3F012202B00____
3300 „	3	8.5	10	7.5	FKS3D013302B00____	3	8.5	10	7.5	FKS3F013302B00____
4700 „	3	8.5	10	7.5	FKS3D014702B00____	3	8.5	10	7.5	FKS3F014702B00____
						3	9	13	10	FKS3F014703A00____
6800 „	3	8.5	10	7.5	FKS3D016802B00____	3	8.5	10	7.5	FKS3F016802B00____
						3	9	13	10	FKS3F016803A00____
0.01 µF	3	8.5	10	7.5	FKS3D021002B00____	3	9	13	10	FKS3F021003A00____
	3	9	13	10	FKS3D021003A00____					
0.015 „	3	8.5	10	7.5	FKS3D021502B00____	4	9.5	13	10	FKS3F021503D00____
	3	9	13	10	FKS3D021503A00____					
0.022 „	3	8.5	10	7.5	FKS3D022202B00____	5	11	13	10	FKS3F022203F00____
	3	9	13	10	FKS3D022203A00____					
0.033 „	4	9.5	13	10	FKS3D023303D00____	6	12	13	10	FKS3F023303G00____
0.047 „	4	9.5	13	10	FKS3D024703D00____	6	12.5	18	15	FKS3F024704C00____
0.068 „	5	11	13	10	FKS3D026803F00____	7	14	18	15	FKS3F026804D00____
0.1 µF	6	12	13	10	FKS3D031003G00____	8	15	18	15	FKS3F031004F00____
0.15 „	7	14	18	15	FKS3D031504D00____	9	16	18	15	FKS3F031504J00____
0.22 „	8	15	18	15	FKS3D032204F00____					

Capacitance	400 VDC/250 VAC* W	H	L	PCM**	Part number	630 VDC/300 VAC* W	H	L	PCM**	Part number
1000 pF	3	9	13	10	FKS3G011003A00____	3	9	13	10	FKS3J011003A00____
1500 „	3	9	13	10	FKS3G011503A00____	3	9	13	10	FKS3J011503A00____
2200 „	3	9	13	10	FKS3G012203A00____	3	9	13	10	FKS3J012203A00____
3300 „	3	9	13	10	FKS3G013303A00____	4	9.5	13	10	FKS3J013303D00____
4700 „	3	9	13	10	FKS3G014703A00____	4	9.5	13	10	FKS3J014703D00____
6800 „	3	9	13	10	FKS3G016803A00____	5	11	13	10	FKS3J016803F00____
0.01 µF	4	9.5	13	10	FKS3G021003D00____	6	12	13	10	FKS3J021003G00____
0.015 „	5	11	13	10	FKS3G021503F00____	6	12.5	18	15	FKS3J021504C00____
0.022 „	6	12	13	10	FKS3G022203G00____	7	14	18	15	FKS3J022204D00____
0.033 „	6	12.5	18	15	FKS3G023304C00____	8	15	18	15	FKS3J023304F00____
0.047 „	7	14	18	15	FKS3G024704D00____					
0.068 „	8	15	18	15	FKS3G026804F00____					
0.1 µF	9	16	18	15	FKS3G031004J00____					

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing.

Dims. in mm.



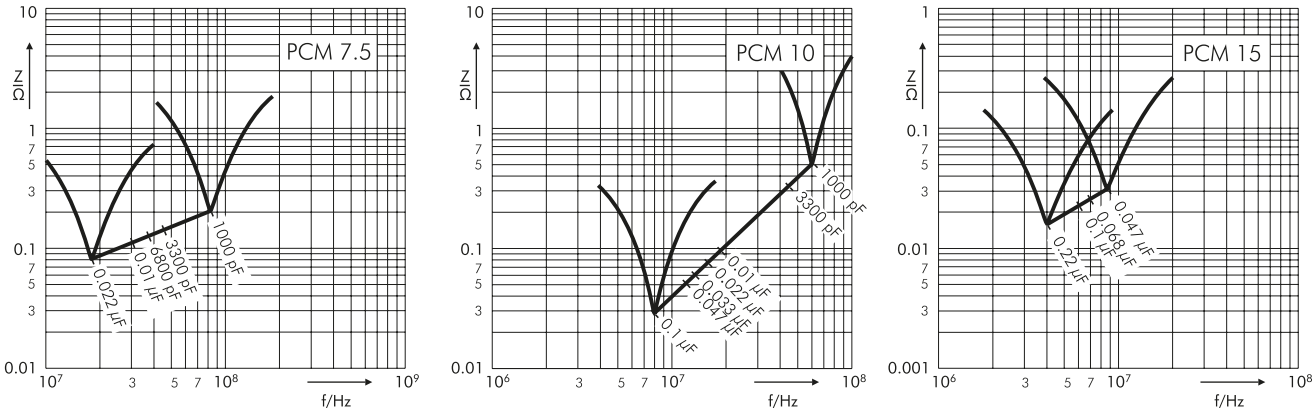
d = 0.5 Ø if W = 3
d = 0.6 Ø if W ⩾ 4 } PCM 7.5 and 10
d = 0.8 Ø if PCM = 15

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 157.	

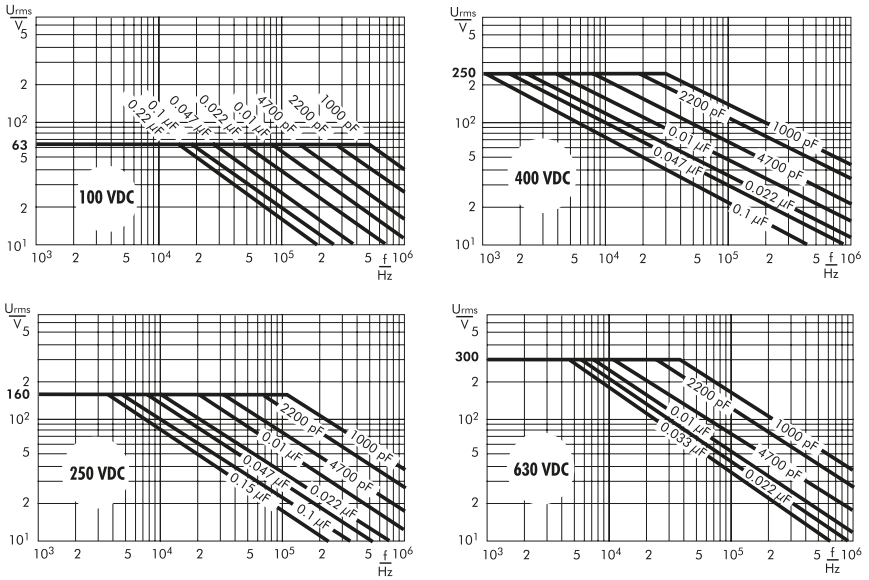
Continuation page 42

Continuation

Impedance change with frequency
(general guide).



Permissible AC voltage
in relation to frequency
at 10° C internal temperature rise
(general guide).



WIMA FKP 3

Polypropylene (PP) Film and Foil Capacitors for Pulse Applications in PCM 7.5 mm to 15 mm. Capacitances from 100 pF to 0.22 µF. Rated Voltages from 63 VDC to 1000 VDC.

Special Features

- **Pulse duty construction**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **According to RoHS 2015/863/EU**

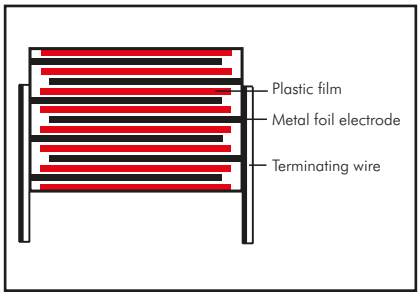
Typical Applications

For high frequency applications e.g.

- **Sample and hold**
- **Timing**
- **LC-Filtering**
- **Oscillating circuits**
- **Audio equipment**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Metal foil
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
100 pF to 0.22 µF (E12-values on request)
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 850 VDC, 1000 VDC
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +105° C
Test specifications:
In accordance with IEC 60384-13
Climatic test category:
55/100/56 in accordance with IEC
Insulation resistance at +20° C:
$\geqslant 3 \times 10^5$ MΩ
Measuring voltage:
$U_r =$ 63 V: $U_{test} =$ 50 V/1 min.
$U_r \geqslant$ 100 V: $U_{test} =$ 100 V/1 min.
Test voltage: 2 U_r, 2 sec.
Maximum pulse rise time:
1000 V/µsec.

Dielectric absorption:
0.05 %
Temperature coefficient:
–200 x 10^{-6}/+ C (general guide)
Dissipation factors at +20° C: tan δ

at f	C≤0.1 µF	0.1 µF < C ≤ 0.22 µF
1 kHz	$\leqslant 5 \times 10^{-4}$	$\leqslant 5 \times 10^{-4}$
10 kHz	$\leqslant 6 \times 10^{-4}$	$\leqslant 6 \times 10^{-4}$
100 kHz	$\leqslant 8 \times 10^{-4}$	–

Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life> 300 000 hours
Failure rate< 5 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10…2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	63 VDC/40 VAC* W	H	L	PCM**	Part number	100 VDC/63 VAC* W	H	L	PCM**	Part number
100 pF						3	8.5	10	7.5	FKP3D001002B00____
150 „						3	8.5	10	7.5	FKP3D001502B00____
220 „						3	8.5	10	7.5	FKP3D002202B00____
330 „						3	8.5	10	7.5	FKP3D003302B00____
470 „						3	8.5	10	7.5	FKP3D004702B00____
680 „						3	8.5	10	7.5	FKP3D006802B00____
1000 pF						3	8.5	10	7.5	FKP3D011002B00____
1500 „						3	8.5	10	7.5	FKP3D011502B00____
2200 „						3	8.5	10	7.5	FKP3D012202B00____
3300 „						3	8.5	10	7.5	FKP3D013302B00____
4700 „						3	8.5	10	7.5	FKP3D014702B00____
6800 „						4	9	10	7.5	FKP3D016802C00____
0.01 µF						4	9	10	7.5	FKP3D021002C00____
0.015 „	4	9	10	7.5	FKP3C021502C00____	4	9.5	13	10	FKP3D021503D00____
0.022 „	4	9.5	13	10	FKP3C022203D00____	5	11	13	10	FKP3D022203F00____
0.033 „	4	9.5	13	10	FKP3C023303D00____	6	12	13	10	FKP3D023303G00____
0.047 „	5	11	13	10	FKP3C024703F00____	5	11	18	15	FKP3D024704B00____
0.068 „	6	12	13	10	FKP3C026803G00____	6	12.5	18	15	FKP3D026804C00____
0.1 µF	6	12.5	18	15	FKP3C031004C00____	7	14	18	15	FKP3D031004D00____
0.15 „	8	15	18	15	FKP3C031504F00____	9	16	18	15	FKP3D031504J00____
0.22 „	9	16	18	15	FKP3C032204J00____					

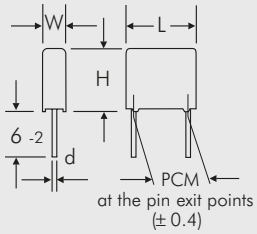
Capacitance	250 VDC/160 VAC* W	H	L	PCM**	Part number	400 VDC/250 VAC* W	H	L	PCM**	Part number
100 pF	3	8.5	10	7.5	FKP3F001002B00____	3	8.5	10	7.5	FKP3G001002B00____
150 „	3	8.5	10	7.5	FKP3F001502B00____	3	8.5	10	7.5	FKP3G001502B00____
220 „	3	8.5	10	7.5	FKP3F002202B00____	3	8.5	10	7.5	FKP3G002202B00____
330 „	3	8.5	10	7.5	FKP3F003302B00____	3	8.5	10	7.5	FKP3G003302B00____
470 „	3	8.5	10	7.5	FKP3F004702B00____	3	8.5	10	7.5	FKP3G004702B00____
680 „	3	8.5	10	7.5	FKP3F006802B00____	3	8.5	10	7.5	FKP3G006802B00____
1000 pF	3	8.5	10	7.5	FKP3F011002B00____	3	8.5	10	7.5	FKP3G011002B00____
1500 „	3	8.5	10	7.5	FKP3F011502B00____	4	9	10	7.5	FKP3G011502C00____
2200 „	4	9	10	7.5	FKP3F012202C00____	4	9	10	7.5	FKP3G012202C00____
						4	9.5	13	10	FKP3G012203D00____
3300 „	3	9	13	10	FKP3F013303A00____	4	9.5	13	10	FKP3G013303D00____
4700 „	4	9.5	13	10	FKP3F014703D00____	5	11	13	10	FKP3G014703F00____
6800 „	5	11	13	10	FKP3F016803F00____	6	12	13	10	FKP3G016803G00____
0.01 µF	5	11	13	10	FKP3F021003F00____	5	11	18	15	FKP3G021004B00____
0.015 „	6	12	13	10	FKP3F021503G00____	6	12.5	18	15	FKP3G021504C00____
	5	11	18	15	FKP3F021504B00____					
0.022 „	6	12.5	18	15	FKP3F022204C00____	7	14	18	15	FKP3G022204D00____
0.033 „	7	14	18	15	FKP3F023304D00____	8	15	18	15	FKP3G023304F00____
0.047 „	8	15	18	15	FKP3F024704F00____	9	16	18	15	FKP3G024704J00____
0.068 „	9	16	18	15	FKP3F026804J00____					

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

Dims. in mm.

d = 0.5 Ø if W = 3
d = 0.6 Ø if W ⩾ 4
} PCM 7.5 and 10
d = 0.8 Ø if PCM = 15



Part number completion:

Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: 6-2 = SD

Taped version see page 157.

Continuation page 45

Continuation

General Data

Capacitance	630 VDC/300 VAC*					850 VDC/300 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
100 pF	3	8.5	10	7.5	FKP3J001002B00____	3	8.5	10	7.5	FKP3M001002B00____
150 „	3	8.5	10	7.5	FKP3J001502B00____	3	8.5	10	7.5	FKP3M001502B00____
220 „	3	8.5	10	7.5	FKP3J002202B00____	3	8.5	10	7.5	FKP3M002202B00____
330 „	3	8.5	10	7.5	FKP3J003302B00____	3	8.5	10	7.5	FKP3M003302B00____
470 „	3	8.5	10	7.5	FKP3J004702B00____	3	8.5	10	7.5	FKP3M004702B00____
680 „	3	8.5	10	7.5	FKP3J006802B00____	3	8.5	10	7.5	FKP3M006802B00____
1000 pF	4	9	10	7.5	FKP3J011002C00____	4	9	10	7.5	FKP3M011002C00____
1500 „	4	9.5	13	10	FKP3J011503D00____	4	9.5	13	10	FKP3M011503D00____
2200 „	4	9.5	13	10	FKP3J012203D00____	4	9.5	13	10	FKP3M012203D00____
3300 „	5	11	13	10	FKP3J013303F00____	5	11	13	10	FKP3M013303F00____
4700 „	6	12	13	10	FKP3J014703G00____	6	12	13	10	FKP3M014703G00____
6800 „	5	11	18	15	FKP3J016804B00____	5	11	18	15	FKP3M016804B00____
0.01 µF	6	12.5	18	15	FKP3J021004C00____	6	12.5	18	15	FKP3M021004C00____
0.015 „	8	15	18	15	FKP3J021504F00____	8	15	18	15	FKP3M021504F00____
0.022 „	9	16	18	15	FKP3J022204J00____	9	16	18	15	FKP3M022204J00____
0.033 „	9	16	18	15	FKP3J023304J00____					

Capacitance	1000 VDC300 VAC*				
	W	H	L	PCM**	Part number
100 pF	3	8.5	10	7.5	FKP3O101002B00____
150 „	3	8.5	10	7.5	FKP3O101502B00____
220 „	3	8.5	10	7.5	FKP3O102202B00____
330 „	3	8.5	10	7.5	FKP3O103302B00____
470 „	3	8.5	10	7.5	FKP3O104702B00____
680 „	3	8.5	10	7.5	FKP3O106802B00____
1000 pF	4	9	10	7.5	FKP3O111002C00____
1500 „	4	9.5	13	10	FKP3O111503D00____
2200 „	4	9.5	13	10	FKP3O112203D00____
3300 „	5	11	13	10	FKP3O113303F00____
4700 „	6	12	13	10	FKP3O114703G00____
6800 „	5	11	18	15	FKP3O116804B00____
0.01 µF	6	12.5	18	15	FKP3O121004C00____
0.015 „	8	15	18	15	FKP3O121504F00____
0.022 „	9	16	18	15	FKP3O122204J00____

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

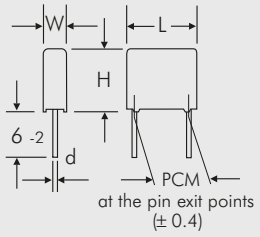
Taped version see page 157.

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

Dims. in mm.

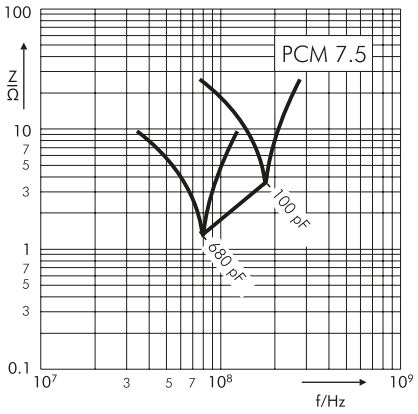
d = 0.5 Ø if W = 3
d = 0.6 Ø if W ⩾ 4
} PCM 7.5 and 10
d = 0.8 Ø if PCM = 15

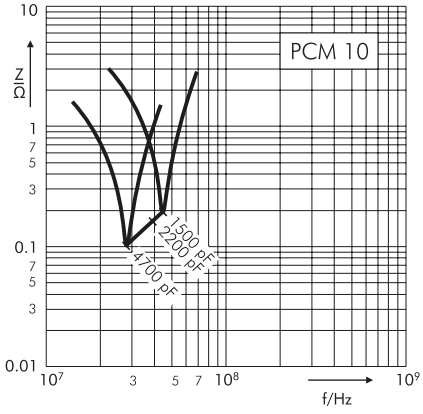


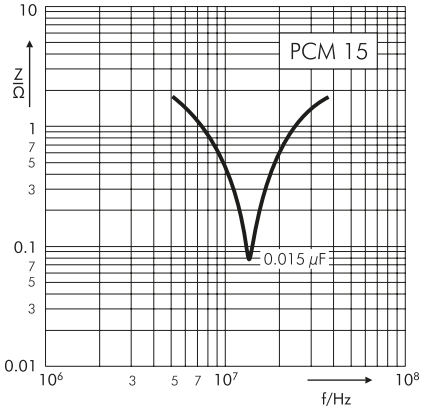
Continuation page 46

Continuation

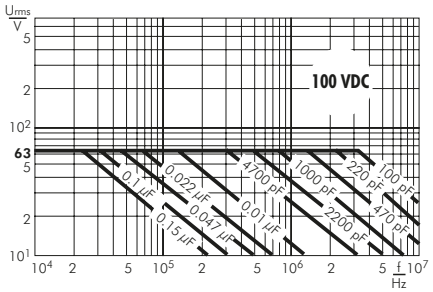
Impedance change with frequency
(general guide).

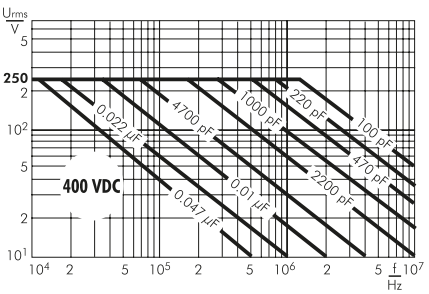


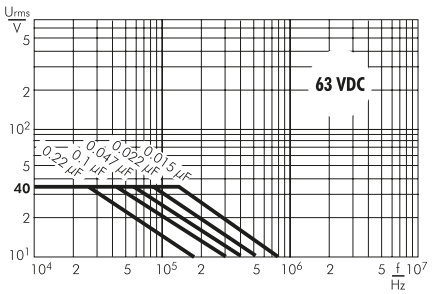


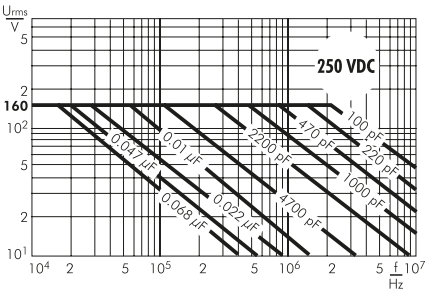


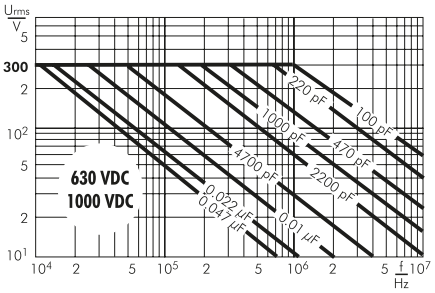
Permissible AC voltage
in relation to frequency
at 10° C internal temperature rise
(general guide).



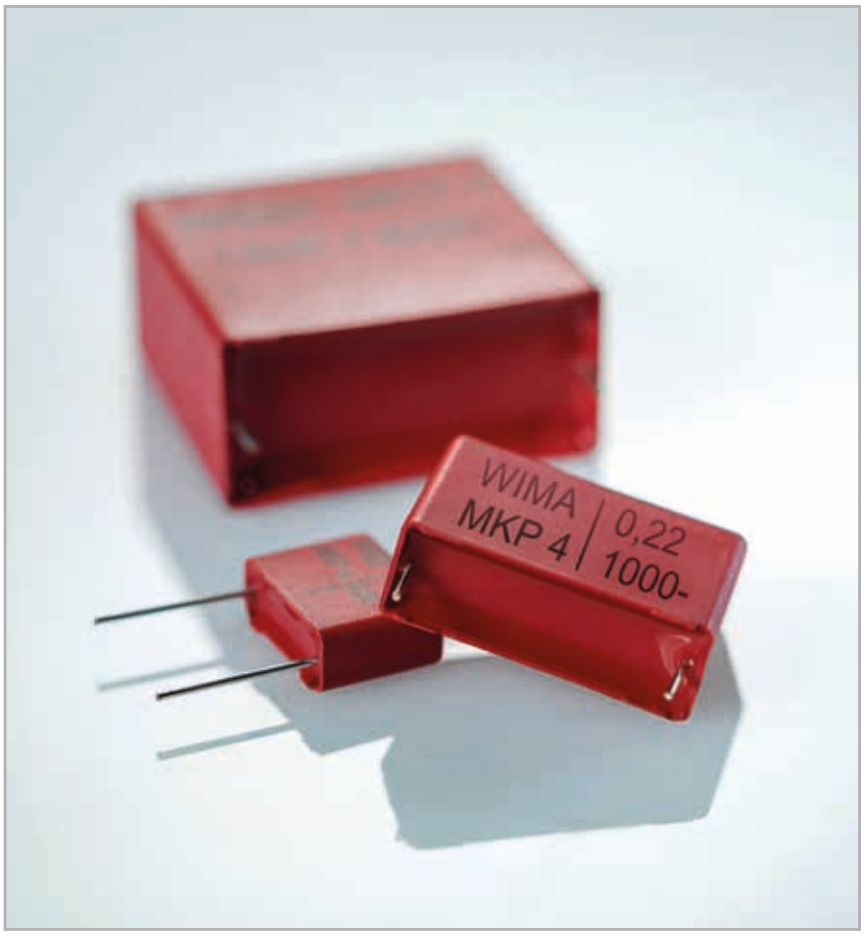








WIMA Capacitors with Metallized, Self-Healing Construction PCM 5 to 52.5 mm



WIMA MKS 2
WIMA MKP 2
WIMA MKS 4
WIMA MKP 4

In the case of metallized capacitors, thin layers of aluminium (approx. 0.03 mm) are vacuum-deposited on the insulating film as conducting electrodes. In the case of a breakdown, the short circuit current causes the thin metal coating to evaporate around the point of failure and an insulating area is formed. The capacitor remains intact (self-healing). Due to their construction principle metallized capacitors stand out for their very favourable capacitance/volume ratio.

Metallized WIMA capacitors in PCM 5 mm – 52.5 mm are available in two dielectric versions.

Capacitors with a Polyester dielectric (PET) are suitable for general applications such as coupling, decoupling and by-passing. By making use of ultra thin film and appropriate manufacturing experience, it has been possible to achieve high capacitance values in very small box sizes. The WIMA MKS 2 for example is available with capacitance values up to 10 µF in PCM 5 mm whereas the MKS 4 is offering capacitances up to 680 µF in PCM 52.5 mm.

Polypropylene capacitors (PP) are used in the high frequency field. This includes resonant circuits, power supplies, deflection circuits, oscillator circuits and audio equipment. WIMA metallized Polypropylene capacitors in PCM 5 - 37.5 mm are available with capacitance values up to 68 µF and voltage ratings up to 1250 VDC.

Upon customer request, larger box sizes can be supplied in 4-pin versions. Types with terminating plates can also be manufactured on request. The advantage of this method of construction, besides the improved mechanical stability of the component on the board, is the excellent electrical contact reliability.

WIMA capacitors are produced with the proven box technology using solvent-resistant, flame-retardant plastic cases according to UL 94 V-0. They are environmentally compatible with the RoHS 2015/863/EU regulations of the European Union.

WIMA MKS 2

Metallized Polyester (PET) Capacitors in PCM 5 mm.
Capacitances from 0.01 µF to 10 µF. Rated Voltages from 50 VDC to 630 VDC.

Special Features

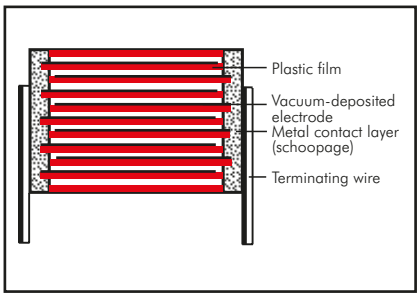
- **High volume/capacitance ratio**
- **Self-healing**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2015/863/EU**

Typical Applications

For general DC-applications e.g.
- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**

Construction

Dielectric:
Polyethylene-terephthalate (PET) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking: Colour: Red.
Marking: Silver/Black/White.

Electrical Data

Capacitance range:
0.01 µF to 10 µF (E12-values on request)
Rated voltages:
50 VDC, 63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
U_r = 50 VDC: –55° C to +105° C
U_r ⩾ 63 VDC: –55° C to +125° C
Climatic test category:
55/100/21 in accordance with IEC
Insulation resistance at +20° C:

U_r	U_{test}	C ⩽ 0.33 µF	0.33 µF < C ⩽ 10 µF
50 VDC	10 V	⩾5 x 10^3 MΩ	⩾1000 sec (MΩ x µF)
63 VDC	50 V	⩾1 x 10^4 MΩ	⩾1250 sec (MΩ x µF)
⩾100 VDC	100 V	⩾1.5 x 10^4 MΩ	⩾3000 sec (MΩ x µF)

Measuring time: 1 min.
Dissipation factors at + 20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 8 x 10^{-3}	⩽ 8 x 10^{-3}	⩽ 10 x 10^{-3}
10 kHz	⩽ 15 x 10^{-3}	⩽ 15 x 10^{-3}	–
100 kHz	⩽ 30 x 10^{-3}	–	–

Maximum pulse rise time:

Capacitance µF	max. pulse rise time V/µsec					
	50 VDC	63 VDC	100 VDC	250 VDC	400 VDC	630 VDC
0.01 ... 0.022	–	35	35	50	80	110
0.033 ... 0.068	–	20	25	50	80	90
0.1 ... 0.47	10	15	20	50	80	–
0.68 ... 1.0	8	12	15	25	–	–
1.5 ... 3.3	8	7.5	10	–	–	–
4.7	5	5	–	–	–	–
6.8	3	3	–	–	–	–
10	2.5	–	–	–	–	–

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Test specifications:
In accordance with IEC 60384-2
Test voltage: 1.6 U_r, 2 sec.
Voltage derating:
A voltage derating factor of 1.25 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages
Reliability:
Operational life > 300 000 hours (+125° C permitted for 1000 hours max. distributed over the entire operating life)
Failure rate < 2 fit (0.5 x U_r and 40° C)

Continuation

General Data

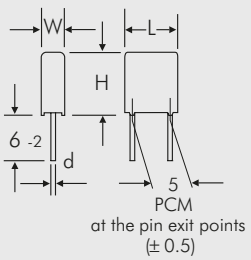
Capacitance	50 VDC/30 VAC* W	H	L	PCM**	Part number	63 VDC/40 VAC* W	H	L	PCM**	Part number
0.01 µF						2.5	6.5	7.2	**5**	MKS2C021001A00____
0.015 „						2.5	6.5	7.2	**5**	MKS2C021501A00____
0.022 „						2.5	6.5	7.2	**5**	MKS2C022201A00____
0.033 „						2.5	6.5	7.2	**5**	MKS2C023301A00____
0.047 „						2.5	6.5	7.2	**5**	MKS2C024701A00____
0.068 „						2.5	6.5	7.2	**5**	MKS2C026801A00____
0.1 µF						2.5	6.5	7.2	**5**	MKS2C031001A00____
0.15 „						2.5	6.5	7.2	**5**	MKS2C031501A00____
0.22 „						3	7.5	7.2	**5**	MKS2C032201B00____
0.33 „	2.5	6.5	7.2	**5**	MKS2B033301A00____	3.5	8.5	7.2	**5**	MKS2C033301C00____
0.47 „	3	7.5	7.2	**5**	MKS2B034701B00____	3.5	8.5	7.2	**5**	MKS2C034701C00____
0.68 „	3.5	8.5	7.2	**5**	MKS2B036801C00____	4.5	9.5	7.2	**5**	MKS2C036801E00____
1.0 µF	3.5	8.5	7.2	**5**	MKS2B041001C00____	5	10	7.2	**5**	MKS2C041001F00____
1.5 „	4.5	9.5	7.2	**5**	MKS2B041501E00____	5.5	11.5	7.2	**5**	MKS2C041501H00____
2.2 „	5	10	7.2	**5**	MKS2B042201F00____	7.2	13	7.2	**5**	MKS2C042201K00____
3.3 „	5.5	11.5	7.2	**5**	MKS2B043301H00____	7.2	13	7.2	**5**	MKS2C043301K00____
4.7 „	7.2	13	7.2	**5**	MKS2B044701K00____	8.5	14	7.2	**5**	MKS2C044701M00____
6.8 „	8.5	14	7.2	**5**	MKS2B046801M00____	11	16	7.2	**5**	MKS2C046801N00____
10 µF	11	16	7.2	**5**	MKS2B051001N00____					

Capacitance	100 VDC/63 VAC* W	H	L	PCM**	Part number	250 VDC/160 VAC* W	H	L	PCM**	Part number
0.01 µF	2.5	6.5	7.2	**5**	MKS2D021001A00____	2.5	6.5	7.2	**5**	MKS2F021001A00____
0.015 „	2.5	6.5	7.2	**5**	MKS2D021501A00____	2.5	6.5	7.2	**5**	MKS2F021501A00____
0.022 „	2.5	6.5	7.2	**5**	MKS2D022201A00____	2.5	6.5	7.2	**5**	MKS2F022201A00____
0.033 „	2.5	6.5	7.2	**5**	MKS2D023301A00____	3.5	8.5	7.2	**5**	MKS2F023301C00____
0.047 „	2.5	6.5	7.2	**5**	MKS2D024701A00____	3.5	8.5	7.2	**5**	MKS2F024701C00____
0.068 „	2.5	6.5	7.2	**5**	MKS2D026801A00____	3.5	8.5	7.2	**5**	MKS2F026801C00____
0.1 µF	2.5	6.5	7.2	**5**	MKS2D031001A00____	4.5	9.5	7.2	**5**	MKS2F031001E00____
0.15 „	3.5	8.5	7.2	**5**	MKS2D031501C00____	5	10	7.2	**5**	MKS2F031501F00____
0.22 „	3.5	8.5	7.2	**5**	MKS2D032201C00____	5.5	11.5	7.2	**5**	MKS2F032201H00____
0.33 „	4.5	9.5	7.2	**5**	MKS2D033301E00____	7.2	13	7.2	**5**	MKS2F033301K00____
0.47 „	4.5	9.5	7.2	**5**	MKS2D034701E00____	8.5	14	7.2	**5**	MKS2F034701M00____
0.68 „	5	10	7.2	**5**	MKS2D036801F00____	11	16	7.2	**5**	MKS2F036801N00____
1.0 µF	7.2	13	7.2	**5**	MKS2D041001K00____					
1.5 „	8.5	14	7.2	**5**	MKS2D041501M00____					
2.2 „	11	16	7.2	**5**	MKS2D042201N00____					

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing.

Dims. in mm.



d = 0.5 Ø

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 157.

Continuation page 50

Continuation

General Data

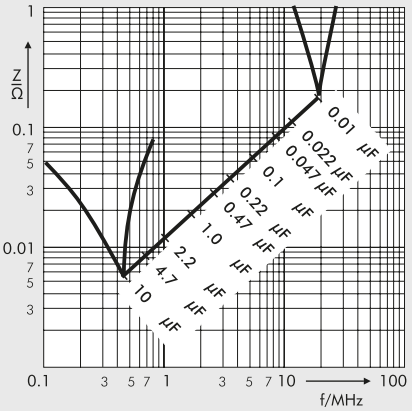
Capacitance	400 VDC/200 VAC* W	H	L	PCM**	Part number	630 VDC/220 VAC* W	H	L	PCM**	Part number
0.01 µF	2.5	6.5	7.2	**5**	MKS2G021001A00____	5.5	11.5	7.2	**5**	MKS2J021001H00____
0.015 „	2.5	6.5	7.2	**5**	MKS2G021501A00____	7.2	13	7.2	**5**	MKS2J021501K00____
0.022 „	3.5	8.5	7.2	**5**	MKS2G022201C00____	7.2	13	7.2	**5**	MKS2J022201K00____
0.033 „	4.5	9.5	7.2	**5**	MKS2G023301E00____	7.2	13	7.2	**5**	MKS2J023301K00____
0.047 „	4.5	9.5	7.2	**5**	MKS2G024701E00____	8.5	14	7.2	**5**	MKS2J024701M00____
0.068 „	5.5	11.5	7.2	**5**	MKS2G026801H00____					
0.1 µF	7.2	13	7.2	**5**	MKS2G031001K00____					
0.15 „	8.5	14	7.2	**5**	MKS2G031501M00____					
0.22 „	11	16	7.2	**5**	MKS2G032201N00____					

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing.

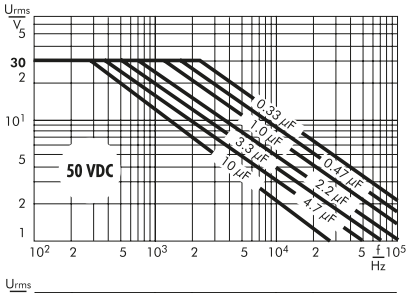
Dims. in mm.

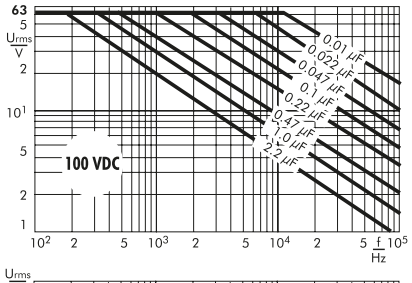
Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 157.	

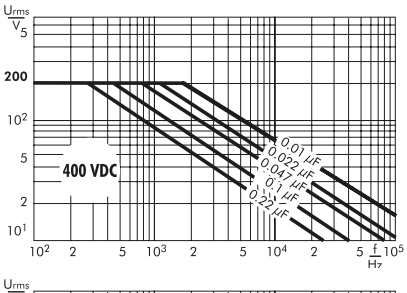


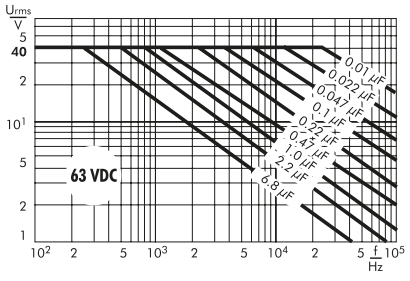
Impedance change with frequency (general guide).

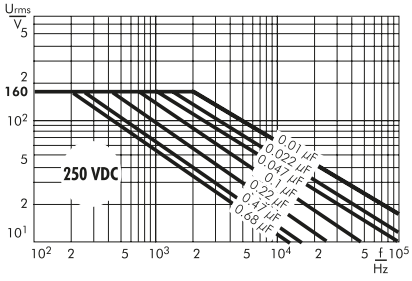
Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).

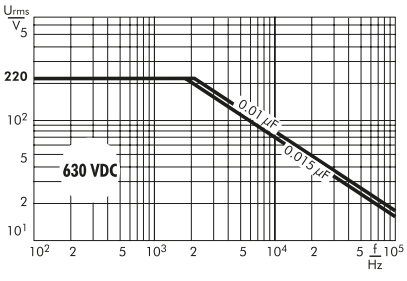












WIMA MKP 2

Metallized Polypropylene (PP) Capacitors in PCM 5 mm. Capacitances from 1000 pF to 1.0 µF. Rated Voltages from 63 VDC to 1000 VDC.

Special Features

- **High volume/capacitance ratio**
- **Self-healing**
- **Increased pulse duty from 250 VDC rated voltage**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2015/863/EU**

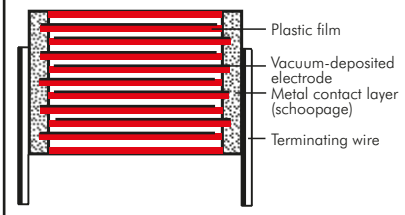
Typical Applications

For high frequency applications e.g.

- **Sample and hold**
- **Timing**
- **Oscillating circuits**
- **High frequency coupling and decoupling**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
1000 pF to 1.0 µF (E12-values on request)
Rated voltages:
63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 800 VDC, 1000 VDC
Capacitance tolerances:
± 20%, ±10%, ±5%
Operating temperature range:
–55° C to +100° C
Test specifications:
In accordance with IEC 60384-16
Climatic test category:
55/100/56 in accordance with IEC
Insulation resistance at +20° C:
$\geqslant 1 \times 10^5$ MΩ
Measuring voltage:
$U_r =$ 63 V: $U_{test} =$ 50 V/1 min.
$U_r \geqslant$ 100 V: $U_{test} =$ 100 V/1 min.
Test voltage:
1.6 U_r, 2 sec.
Maximum pulse rise time:

Capacitance pF/µF	max. pulse rise time V/µsec						
	63 VDC	100 VDC	250 VDC	400 VDC	630 VDC	800 VDC	1000 VDC
1000 ... 2200	–	–	–	300	400	450	500
3300 ... 6800	–	–	–	300	400	450	500
0.01 ... 0.022	100	100	250	300	400	450	500
0.033 ... 0.068	100	100	250	300	400	450	–
0.1 ... 0.22	100	100	250	250	–	–	–
0,33 ... 0.68	100	100	250	–	–	–	–
1.0	70	70	–	–	–	–	–

Dielectric absorption:
0.05 %
Dissipation factors at +20° C: tan δ

at f	C⩽0.1 µF	0.1 µF < C ⩽ 1.0 µF
1 kHz	⩽ 5×10^{-4}	⩽ 5×10^{-4}
10 kHz	⩽ 8×10^{-4}	⩽ 8×10^{-4}
100 kHz	⩽ 25×10^{-4}	–

Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages
Reliability:
Operational life > 300 000 hours
Failure rate < 2 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec² in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	63 VDC/40 VAC*					100 VDC/63 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 µF	3	7.5	7.2	**5**	MKP2C021001B00____	3	7.5	7.2	**5**	MKP2D021001B00____
0.015 „	3	7.5	7.2	**5**	MKP2C021501B00____	3	7.5	7.2	**5**	MKP2D021501B00____
0.022 „	3	7.5	7.2	**5**	MKP2C022201B00____	3	7.5	7.2	**5**	MKP2D022201B00____
0.033 „	3	7.5	7.2	**5**	MKP2C023301B00____	3	7.5	7.2	**5**	MKP2D023301B00____
0.047 „	3.5	8.5	7.2	**5**	MKP2C024701C00____	3.5	8.5	7.2	**5**	MKP2D024701C00____
0.068 „	4.5	9.5	7.2	**5**	MKP2C026801E00____	4.5	9.5	7.2	**5**	MKP2D026801E00____
0.1 µF	5	10	7.2	**5**	MKP2C031001F00____	5	10	7.2	**5**	MKP2D031001F00____
0.15 „	5.5	11.5	7.2	**5**	MKP2C031501H00____	5.5	11.5	7.2	**5**	MKP2D031501H00____
0.22 „	7.2	13	7.2	**5**	MKP2C032201K00____	7.2	13	7.2	**5**	MKP2D032201K00____
0.33 „	8.5	14	7.2	**5**	MKP2C033301M00____	8.5	14	7.2	**5**	MKP2D033301M00____
0.47 „	8.5	14	7.2	**5**	MKP2C034701M00____	8.5	14	7.2	**5**	MKP2D034701M00____
0.68 „	8.5	14	7.2	**5**	MKP2C036801M00____	8.5	14	7.2	**5**	MKP2D036801M00____
1.0 µF	11	16	7.2	**5**	MKP2C041001N00____	11	16	7.2	**5**	MKP2D041001N00____

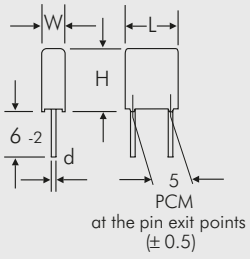
Capacitance	250 VDC/160 VAC*					400 VDC/200 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF						3	7.5	7.2	**5**	MKP2G011001B00____
1500 „						3	7.5	7.2	**5**	MKP2G011501B00____
2200 „						3	7.5	7.2	**5**	MKP2G012201B00____
3300 „						3	7.5	7.2	**5**	MKP2G013301B00____
4700 „						3	7.5	7.2	**5**	MKP2G014701B00____
6800 „						3	7.5	7.2	**5**	MKP2G016801B00____
0.01 µF	3	7.5	7.2	**5**	MKP2F021001B00____	3.5	8.5	7.2	**5**	MKP2G021001C00____
0.015 „	3	7.5	7.2	**5**	MKP2F021501B00____	3.5	8.5	7.2	**5**	MKP2G021501C00____
0.022 „	3	7.5	7.2	**5**	MKP2F022201B00____	4.5	9.5	7.2	**5**	MKP2G022201E00____
0.033 „	3	7.5	7.2	**5**	MKP2F023301B00____	5.5	11.5	7.2	**5**	MKP2G023301H00____
0.047 „	3.5	8.5	7.2	**5**	MKP2F024701C00____	7.2	13	7.2	**5**	MKP2G024701K00____
0.068 „	4.5	9.5	7.2	**5**	MKP2F026801E00____	7.2	13	7.2	**5**	MKP2G026801K00____
0.1 µF	5	10	7.2	**5**	MKP2F031001F00____	8.5	14	7.2	**5**	MKP2G031001M00____
0.15 „	7.2	13	7.2	**5**	MKP2F031501K00____	11	16	7.2	**5**	MKP2G031501N00____
0.22 „	7.2	13	7.2	**5**	MKP2F032201K00____					
0.33 „	8.5	14	7.2	**5**	MKP2F033301M00____					
0.47 „	11	16	7.2	**5**	MKP2F034701N00____					

Capacitance	630 VDC/250 VAC*				
	W	H	L	PCM**	Part number
1000 pF	3	7.5	7.2	**5**	MKP2J011001B00____
1500 „	3	7.5	7.2	**5**	MKP2J011501B00____
2200 „	3	7.5	7.2	**5**	MKP2J012201B00____
3300 „	3	7.5	7.2	**5**	MKP2J013301B00____
4700 „	3	7.5	7.2	**5**	MKP2J014701B00____
6800 „	3.5	8.5	7.2	**5**	MKP2J016801C00____
0.01 µF	4.5	9.5	7.2	**5**	MKP2J021001E00____
0.015 „	5	10	7.2	**5**	MKP2J021501F00____
0.022 „	5.5	11.5	7.2	**5**	MKP2J022201H00____
0.033 „	7.2	13	7.2	**5**	MKP2J023301K00____
0.047 „	8.5	14	7.2	**5**	MKP2J024701M00____
0.068 „	11	16	7.2	**5**	MKP2J026801N00____

* AC voltage: f ⩽ 400 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing.

Dims. in mm.



d = 0.5 Ø

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 157.

Continuation page 53

Continuation

General Data

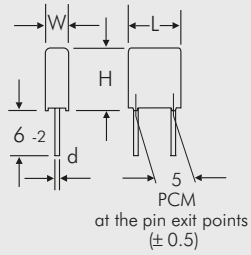
Capacitance	800 VDC/250 VAC* W	H	L	PCM**	Part number	1000 VDC/250 VAC* W	H	L	PCM**	Part number
1000 pF	3	7.5	7.2	**5**	MKP2L011001B00____	3	7.5	7.2	**5**	MKP2O111001B00____
1500 „	3	7.5	7.2	**5**	MKP2L011501B00____	3	7.5	7.2	**5**	MKP2O111501B00____
2200 „	3	7.5	7.2	**5**	MKP2L012201B00____	3	7.5	7.2	**5**	MKP2O112201B00____
3300 „	3	7.5	7.2	**5**	MKP2L013301B00____	3.5	8.5	7.2	**5**	MKP2O113301C00____
4700 „	3.5	8.5	7.2	**5**	MKP2L014701C00____	4.5	9.5	7.2	**5**	MKP2O114701E00____
6800 „	4.5	9.5	7.2	**5**	MKP2L016801E00____	5	10	7.2	**5**	MKP2O116801F00____
0.01 µF	5	10	7.2	**5**	MKP2L021001F00____	7.2	13	7.2	**5**	MKP2O121001K00____
0.015 „	5.5	11.5	7.2	**5**	MKP2L021501H00____	8.5	14	7.2	**5**	MKP2O121501M00____
0.022 „	7.2	13	7.2	**5**	MKP2L022201K00____	11	16	7.2	**5**	MKP2O122201N00____
0.033 „	8.5	14	7.2	**5**	MKP2L023301M00____					
0.047 „	11	16	7.2	**5**	MKP2L024701N00____					

* AC voltage: f ⩽ 400 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

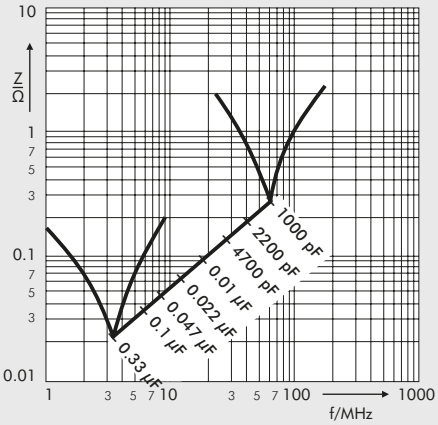
** PCM = printed circuit module = pin spacing.

Dims. in mm.

d = 0.5 Ø

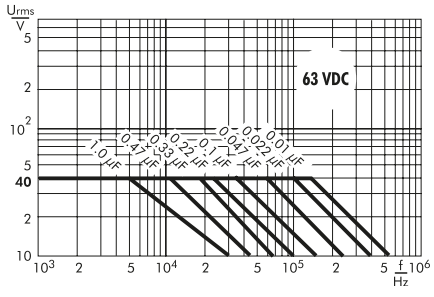


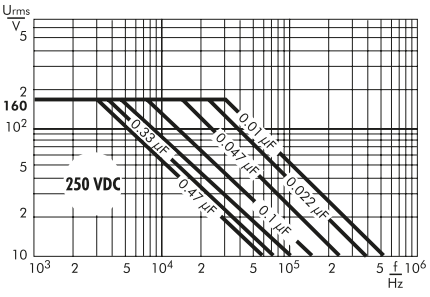
Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 157.	

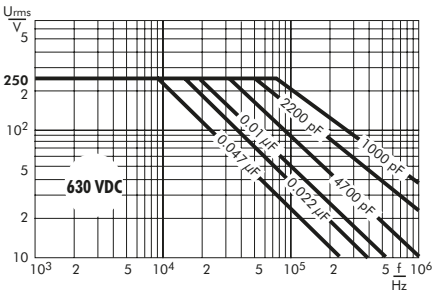


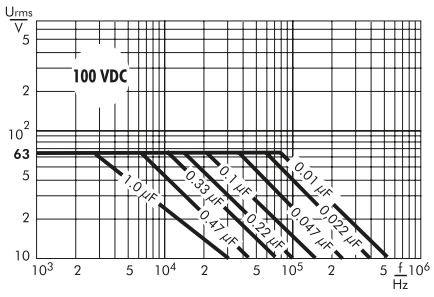
Impedance change with frequency (general guide).

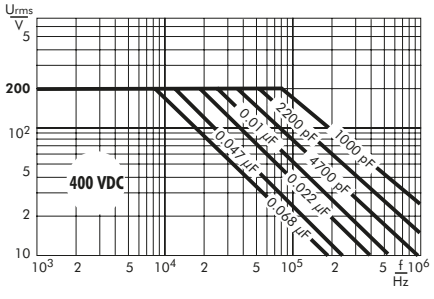
Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).

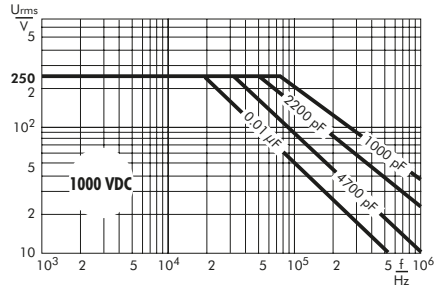












WIMA MKS 4

Metallized Polyester (PET) Capacitors in PCM 7.5 mm to 52.5 mm. Capacitances from 1000 pF to 680 µF. Rated Voltages from 50 VDC to 2000 VDC.

Special Features

- **High volume/capacitance ratio**
- **Self-healing**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2015/863/EU**

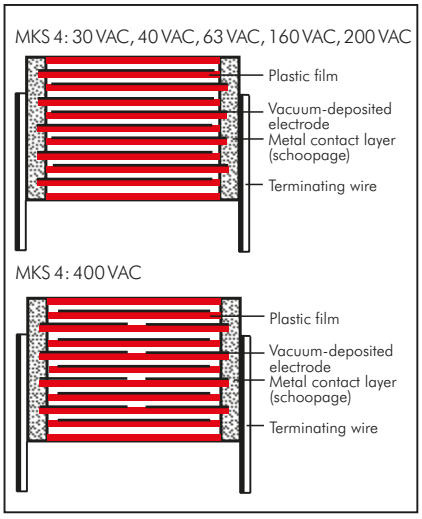
Typical Applications

For general DC-applications e.g.

- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Smoothing**
- **Timing**

Construction

Dielectric:
Polyethylene-terephthalate (PET) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
1000 pF to 680 µF
Rated voltages:
50 VDC, 63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 1000 VDC, 1500 VDC, 2000 VDC
Capacitance tolerances:
± 20%, ± 10% ± 5%
Operating temperature range:
U_r = 50 VDC: –55° C to +105° C
U_r ⩾ 63 VDC: –55° C to +125° C
Climatic test category:
55/100/56 in accordance with IEC
Insulation resistance at +20° C:

U_r	U_{test}	C ⩽ 0.33 µF	0.33 µF < C ⩽ 680 µF
50 VDC	10 V	⩾5 x 10^3 MΩ	⩾1500 sec (MΩ x µF)
63 VDC	50 V	⩾1 x 10^4 MΩ	⩾3000 sec (MΩ x µF)
100 VDC	100 V	⩾1.5 x 10^4 MΩ	⩾5000 sec (MΩ x µF)
⩾250 VDC	100 V	⩾3 x 10^4 MΩ	⩾10 000 sec (MΩ x µF)

Measuring time: 1 min.

Dissipation factors at + 20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 8 x 10^{-3}	⩽ 8 x 10^{-3}	⩽ 10 x 10^{-3}
10 kHz	⩽ 15 x 10^{-3}	⩽ 15 x 10^{-3}	–
100 kHz	⩽ 30 x 10^{-3}	–	–

Maximum pulse rise time:

Capacitance pF/µF	max. pulse rise time V/µsec								
	50VDC	63VDC	100VDC	250VDC	400VDC	630VDC	1000VDC	1500VDC	2000VDC
1000 ...6800	–	–	–	–	–	–	70	90	100
0.01 ...0.022	–	–	30	35	38	40	50	50	60
0.033...0.068	–	–	15	20	25	32	26	35	40
0.1 ...0.22	10	10	12	15	15	17	20	35	40
0.33 ...0.68	9	9	9	10	10	13	20	20	38
1.0 ...2.2	6	6	5	6	9	13	14	15	15
3.3 ...6.8	2.5	3	3	6	6	9	12	12	12
10 ...22	2.5	2.5	2.5	3	6	6	6	–	–
33 ...68	2.5	2.5	2.5	3	3	–	–	–	–
100 ...220	2.5	2.5	2.5	0.9	–	–	–	–	–
330 ...680	0.2	0.2	0.3	–	–	–	–	–	–

Test voltage: 1.6 U_r, 2 sec.
Test specifications:
In accordance with IEC 60384-2
Voltage derating:
A voltage derating factor of 1.25 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300 000 hours (+125° C permitted for 1000 hours max. distributed over the entire operating life)
Failure rate < 2 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
d ⩽ 0.8 Ø: 10 N in direction of pins
d > 0.8 Ø: 20 N in direction of pins
according to IEC 60068-2-21
Vibration: 6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density: 1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test: 4000 bumps at 390 m/sec² in accordance with IEC 60068-2-29

Packing

Available taped and reeled up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	50 VDC/30 VAC*					63 VDC/40 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.1 µF	2.5	7	10	7.5	MKS4B031002A_____	2.5	7	10	7.5	MKS4C031002A_____
						4	9	13	10	MKS4C031003C_____
0.15 „	2.5	7	10	7.5	MKS4B031502A_____	2.5	7	10	7.5	MKS4C031502A_____
						4	9	13	10	MKS4C031503C_____
0.22 „	2.5	7	10	7.5	MKS4B032202A_____	3	8.5	10	7.5	MKS4C032202B_____
						4	9	13	10	MKS4C032203C_____
0.33 „	2.5	7	10	7.5	MKS4B033302A_____	4	9	10	7.5	MKS4C033302C_____
						4	9	13	10	MKS4C033303C_____
0.47 „	3	8.5	10	7.5	MKS4B034702B_____	4	9	10	7.5	MKS4C034702C_____
						4	9	13	10	MKS4C034703C_____
0.68 "	4	9	10	7.5	MKS4B036802C_____	5	10.5	10.3	7.5	MKS4C036802E_____
						4	9	13	10	MKS4C036803C_____
1.0 µF	4	9	10	7.5	MKS4B041002C_____	5	10.5	10.3	7.5	MKS4C041002E_____
						4	9	13	10	MKS4C041003C_____
1.5 „	5	10.5	10.3	7.5	MKS4B041502E_____	5.7	12.5	10.3	7.5	MKS4C041502F_____
						5	11	13	10	MKS4C041503F_____
2.2 „	5.7	12.5	10.3	7.5	MKS4B042202F_____	5	11	13	10	MKS4C042203F_____
						6	12.5	18	15	MKS4C042204C_____
3.3 „	5.7	12.5	10.3	7.5	MKS4B043302F_____	6	12	13	10	MKS4C043303G_____
						7	14	18	15	MKS4C043304D_____
4.7 „	7.2	12.5	10.3	7.5	MKS4B044702G_____	7	14	18	15	MKS4C044704D_____
	6	12	13	10	MKS4B044703G_____	6	15	26.5	22.5	MKS4C044705B_____
6.8 „	7.2	12.5	10.3	7.5	MKS4B046802G_____	8	15	18	15	MKS4C046804F_____
	6	12	13	10	MKS4B046803G_____	7	16.5	26.5	22.5	MKS4C046805D_____
10 µF	9	16	18	15	MKS4B051004J_____	8.5	18.5	26.5	22.5	MKS4C051005F_____
						9	19	31.5	27.5	MKS4C051006A_____
15 „	11	21	26.5	22.5	MKS4B051505I_____	11	21	26.5	22.5	MKS4C051505I_____
						9	19	31.5	27.5	MKS4C051506A_____
18 „	9	19	31.5	27.5	MKS4B051806A_____	9	19	31.5	27.5	MKS4C051806A_____
22 „	11	21	31.5	27.5	MKS4B052206B_____	11	21	31.5	27.5	MKS4C052206B_____
27 „	11	21	31.5	27.5	MKS4B052706B_____	11	21	31.5	27.5	MKS4C052706B_____
33 „	13	24	31.5	27.5	MKS4B053306D_____	13	24	31.5	27.5	MKS4C053306D_____
39 „	15	26	31.5	27.5	MKS4B053906F_____	15	26	31.5	27.5	MKS4C053906F_____
47 „	15	26	31.5	27.5	MKS4B054706F_____	15	26	31.5	27.5	MKS4C054706F_____
						13	24	41.5	37.5	MKS4C054707C_____
56 „	17	29	31.5	27.5	MKS4B055606G_____	17	29	31.5	27.5	MKS4C055606G_____
						15	26	41.5	37.5	MKS4C055607D_____
68 „	20	39.5	31.5	27.5	MKS4B056806J_____	17	34.5	31.5	27.5	MKS4C056806I_____
						15	26	41.5	37.5	MKS4C056807D_____
82 „	17	34.5	31.5	27.5	MKS4B058206I_____	17	34.5	31.5	27.5	MKS4C058206I_____
						17	29	41.5	37.5	MKS4C058207E_____
100 µF	19	32	41.5	37.5	MKS4B061007F_____	20	39.5	31.5	27.5	MKS4C061006J_____
						19	32	41.5	37.5	MKS4C061007F_____
120 „	20	39.5	41.5	37.5	MKS4B061207G_____	20	39.5	41.5	37.5	MKS4C061207G_____
150 „	20	39.5	41.5	37.5	MKS4B061507G_____	20	39.5	41.5	37.5	MKS4C061507G_____
180 „	24	45.5	41.5	37.5	MKS4B061807H_____	24	45.5	41.5	37.5	MKS4C061807H_____
						28	38	41.5	37.5	MKS4C061807L_____
220 „	24	45.5	41.5	37.5	MKS4B062207H_____	31	46	41.5	37.5	MKS4C062207I_____
						25	45	57	52.5	MKS4C062209D_____
270 „	31	46	41.5	37.5	MKS4B062707I_____	31	46	41.5	37.5	MKS4C062707I_____
						25	45	57	52.5	MKS4C062709D_____
330 „	35	50	41.5	37.5	MKS4B063307J_____	35	50	41.5	37.5	MKS4C063307J_____
						30	45	57	52.5	MKS4C063309E_____
390 „	40	55	41.5	37.5	MKS4B063907K_____	40	55	41.5	37.5	MKS4C063907K_____
						30	45	57	52.5	MKS4C063909E_____
470 „	35	50	57	52.5	MKS4B064709F_____	35	50	57	52.5	MKS4C064709F_____
560 „	45	55	57	52.5	MKS4B065609H_____	45	55	57	52.5	MKS4C065609H_____
680 „	45	55	57	52.5	MKS4B066809H_____	45	65	57	52.5	MKS4C066809J_____

* AC voltages: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = printed circuit module = pin spacing

Dims. in mm.

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Continuation

General Data

Capacitance	100 VDC/63 VAC*					250 VDC/160 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 µF	2.5	7	10	7.5	MKS4D021002A_____	3	8.5	10	7.5	MKS4F021002B_____
	4	9	13	10	MKS4D021003C_____	4	9	13	10	MKS4F021003C_____
0.015 „	2.5	7	10	7.5	MKS4D021502A_____	3	8.5	10	7.5	MKS4F021502B_____
	4	9	13	10	MKS4D021503C_____	4	9	13	10	MKS4F021503C_____
0.022 „	2.5	7	10	7.5	MKS4D022202A_____	3	8.5	10	7.5	MKS4F022202B_____
	4	9	13	10	MKS4D022203C_____	4	9	13	10	MKS4F022203C_____
0.033 „	2.5	7	10	7.5	MKS4D023302A_____	3	8.5	10	7.5	MKS4F023302B_____
	4	9	13	10	MKS4D023303C_____	4	9	13	10	MKS4F023303C_____
0.047 „	2.5	7	10	7.5	MKS4D024702A_____	3	8.5	10	7.5	MKS4F024702B_____
	4	9	13	10	MKS4D024703C_____	4	9	13	10	MKS4F024703C_____
0.068 „	2.5	7	10	7.5	MKS4D026802A_____	4	9	10	7.5	MKS4F026802C_____
	4	9	13	10	MKS4D026803C_____	4	9	13	10	MKS4F026803C_____
0.1 µF	2.5	7	10	7.5	MKS4D031002A_____	4	9	10	7.5	MKS4F031002C_____
	4	9	13	10	MKS4D031003C_____	4	9	13	10	MKS4F031003C_____
0.15 „	3	8.5	10	7.5	MKS4D031502B_____	5	10.5	10.3	7.5	MKS4F031502E_____
	4	9	13	10	MKS4D031503C_____	4	9	13	10	MKS4F031503C_____
0.22 „	3	8.5	10	7.5	MKS4D032202B_____	5	10.5	10.3	7.5	MKS4F032202E_____
	4	9	13	10	MKS4D032203C_____	5	11	13	10	MKS4F032203F_____
0.33 „	4	9	10	7.5	MKS4D033302C_____	5.7	12.5	10.3	7.5	MKS4F033302F_____
	4	9	13	10	MKS4D033303C_____	5	11	13	10	MKS4F033303F_____
0.47 „	4.5	9.5	10.3	7.5	MKS4D034702D_____	6	12	13	10	MKS4F034703G_____
	4	9	13	10	MKS4D034703C_____	6	12.5	18	15	MKS4F034704C_____
0.68 "	5	10.5	10.3	7.5	MKS4D036802E_____	7	14	18	15	MKS4F036804D_____
	4	9	13	10	MKS4D036803C_____					
1.0 µF	5.7	12.5	10.3	7.5	MKS4D041002F_____	8	15	18	15	MKS4F041004F_____
	5	11	13	10	MKS4D041003F_____	6	15	26.5	22.5	MKS4F041005B_____
1.5 „	6	12	13	10	MKS4D041503G_____	9	16	18	15	MKS4F041504J_____
	7	14	18	15	MKS4D041504D_____	7	16.5	26.5	22.5	MKS4F041505D_____
2.2 „	8	15	18	15	MKS4D042204F_____	10.5	19	26.5	22.5	MKS4F042205G_____
	6	15	26.5	22.5	MKS4D042205B_____	9	19	31.5	27.5	MKS4F042206A_____
3.3 „	9	16	18	15	MKS4D043304J_____	11	21	26.5	22.5	MKS4F043305I_____
	7	16.5	26.5	22.5	MKS4D043305D_____	11	21	31.5	27.5	MKS4F043306B_____
4.7 „	10.5	19	26.5	22.5	MKS4D044705G_____	11	21	31.5	27.5	MKS4F044706B_____
	9	19	31.5	27.5	MKS4D044706A_____					
6.8 „	10.5	19	26.5	22.5	MKS4D046805G_____	13	24	31.5	27.5	MKS4F046806D_____
	11	21	31.5	27.5	MKS4D046806B_____					
10 µF	9	19	31.5	27.5	MKS4D051006A_____	17	29	31.5	27.5	MKS4F051006G_____
						15	26	41.5	37.5	MKS4F051007D_____
15 „	11	21	31.5	27.5	MKS4D051506B_____	17	34.5	31.5	27.5	MKS4F051506I_____
						17	29	41.5	37.5	MKS4F051507E_____
18 „	11	21	31.5	27.5	MKS4D051806B_____	20	39.5	31.5	27.5	MKS4F051806J_____
						19	32	41.5	37.5	MKS4F051807F_____
22 „	13	24	31.5	27.5	MKS4D052206D_____	20	39.5	41.5	37.5	MKS4F052207G_____
27 „	15	26	31.5	27.5	MKS4D052706F_____	20	39.5	41.5	37.5	MKS4F052707G_____
33 „	15	26	31.5	27.5	MKS4D053306F_____	24	45.5	41.5	37.5	MKS4F053307H_____
	13	24	41.5	37.5	MKS4D053307C_____					
39 „	17	29	31.5	27.5	MKS4D053906G_____	24	45.5	41.5	37.5	MKS4F053907H_____
	15	26	41.5	37.5	MKS4D053907D_____					
47 „	17	34.5	31.5	27.5	MKS4D054706I_____	31	46	41.5	37.5	MKS4F054707I_____
	17	29	41.5	37.5	MKS4D054707E_____					
56 „	20	39.5	31.5	27.5	MKS4D055606J_____	35	50	41.5	37.5	MKS4F055607J_____
	17	29	41.5	37.5	MKS4D055607E_____	25	45	57	52.5	MKS4F055609D_____
68 „	20	39.5	31.5	27.5	MKS4D056806J_____	35	50	41.5	37.5	MKS4F056807J_____
	19	32	41.5	37.5	MKS4D056807F_____	30	45	57	52.5	MKS4F056809E_____
82 „	20	39.5	41.5	37.5	MKS4D058207G_____	40	55	41.5	37.5	MKS4F058207K_____
						35	50	57	52.5	MKS4F058209F_____
100 µF	20	39.5	41.5	37.5	MKS4D061007G_____	45	55	57	52.5	MKS4F061009H_____
120 „	24	45.5	41.5	37.5	MKS4D061207H_____	45	55	57	52.5	MKS4F061209H_____
150 „	31	46	41.5	37.5	MKS4D061507I_____	45	65	57	52.5	MKS4F061509J_____
180 „	31	46	41.5	37.5	MKS4D061807I_____					
	25	45	57	52.5	MKS4D061809H_____					
220 „	35	50	41.5	37.5	MKS4D062207J_____					
	30	45	57	52.5	MKS4D062209E_____					
270 „	40	55	41.5	37.5	MKS4D062707K_____					
	35	50	57	52.5	MKS4D062709F_____					
330 „	45	55	57	52.5	MKS4D063309H_____					
390 „	45	55	57	52.5	MKS4D063909H_____					
470 „	45	65	57	52.5	MKS4D064709J_____					

* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

**PCM = Printed circuit module = pin spacing

Dims. in mm.

04.23

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Continuation

General Data

Capacitance	400 VDC/200 VAC* W	H	L	PCM**	Part number	630 VDC/400 VAC* W	H	L	PCM**	Part number
0.01 µF	3	8.5	10	7.5	MKS4G021002B_____	3	8.5	10	7.5*	MKS4J021002B_____
	4	9	13	10	MKS4G021003C_____	4	9	13	10	MKS4J021003C_____
0.015 „	3	8.5	10	7.5	MKS4G021502B_____	4	9	10	7.5*	MKS4J021502C_____
	4	9	13	10	MKS4G021503C_____	4	9	13	10	MKS4J021503C_____
0.022 „	4	9	10	7.5	MKS4G022202C_____	4.5	9.5	10.3	7.5*	MKS4J022202D_____
	4	9	13	10	MKS4G022203C_____	4	9	13	10	MKS4J022203C_____
0.033 „	4	9	10	7.5	MKS4G023302C_____	5	10.5	10.3	7.5*	MKS4J023302E_____
	4	9	13	10	MKS4G023303C_____	5	11	13	10	MKS4J023303F_____
0.047 „	5	10.5	10.3	7.5	MKS4G024702E_____	5.7	12.5	10.3	7.5*	MKS4J024702F_____
	4	9	13	10	MKS4G024703C_____	6	12	13	10	MKS4J024703G_____
0.068 „	5	10.5	10.3	7.5	MKS4G026802E_____	6	12	13	10	MKS4J026803G_____
	4	9	13	10	MKS4G026803C_____	5	11	18	15	MKS4J026804B_____
0.1 µF	5	10.5	10.3	7.5	MKS4G031002E_____	6	12.5	18	15	MKS4J031004C_____
	5	11	13	10	MKS4G031003F_____	6	15	26.5	22.5	MKS4J031005B_____
0.15 „	5.7	12.5	10.3	7.5	MKS4G031502F_____	7	14	18	15	MKS4J031504D_____
	6	12	13	10	MKS4G031503G_____	6	15	26.5	22.5	MKS4J031505B_____
0.22 „	6	12	13	10	MKS4G032203G_____	8	15	18	15	MKS4J032204F_____
	6	12.5	18	15	MKS4G032204C_____	6	15	26.5	22.5	MKS4J032205B_____
0.33 „	8	15	18	15	MKS4G033304F_____	7	16.5	26.5	22.5	MKS4J033305D_____
						9	19	31.5	27.5	MKS4J033306A_____
0.47 „	8	15	18	15	MKS4G034704F_____	10.5	19	26.5	22.5	MKS4J034705G_____
	6	15	26.5	22.5	MKS4G034705B_____	9	19	31.5	27.5	MKS4J034706A_____
0.68 "	7	16.5	26.5	22.5	MKS4G036805D_____	11	21	26.5	22.5	MKS4J036805I_____
						11	21	31.5	27.5	MKS4J036806B_____
1.0 µF	10.5	19	26.5	22.5	MKS4G041005G_____	11	21	31.5	27.5	MKS4J041006B_____
	11	21	31.5	27.5	MKS4G041006B_____					
1.5 „	11	21	26.5	22.5	MKS4G041505I_____	15	26	31.5	27.5	MKS4J041506F_____
	11	21	31.5	27.5	MKS4G041506B_____					
2.2 „	11	21	31.5	27.5	MKS4G042206B_____	17	34.5	31.5	27.5	MKS4J042206I_____
						15	26	41.5	37.5	MKS4J042207D_____
3.3 „	13	24	31.5	27.5	MKS4G043306D_____	20	39.5	31.5	27.5	MKS4J043306J_____
						19	32	41.5	37.5	MKS4J043307F_____
4.7 „	17	29	31.5	27.5	MKS4G044706G_____	20	39.5	41.5	37.5	MKS4J044707G_____
6.8 „	17	34.5	31.5	27.5	MKS4G046806I_____	24	45.5	41.5	37.5	MKS4J046807H_____
	15	26	41.5	37.5	MKS4G046807D_____					
10 µF	19	32	41.5	37.5	MKS4G051007F_____	35	50	41.5	37.5	MKS4J051007J_____
15 „	20	39.5	41.5	37.5	MKS4G051507G_____	40	55	41.5	37.5	MKS4J051507K_____
18 „	31	46	41.5	37.5	MKS4G051807I_____	45	55	57	52.5	MKS4J051809H_____
22 „	31	46	41.5	37.5	MKS4G052207I_____	45	55	57	52.5	MKS4J052209H_____
27 „	35	50	41.4	37.5	MKS4G052707J_____					
33 „	35	50	41.5	37.5	MKS4G053307J_____					
39 „	35	50	57	52.5	MKS4G053909F_____					
47 „	35	50	57	52.5	MKS4G054709F_____					
56 „	45	65	57	52.5	MKS4G055609J_____					
68 „	45	65	57	52.5	MKS4G056809J_____					

* AC voltages: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

**PCM = printed circuit module = pin spacing

* Admissible AC voltage 250 VAC max.

Dims. in mm.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 157.

Continuation page 58

Continuation

General Data

Capacitance	1000 VDC/400 VAC*					1500 VDC/400 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	3	8.5	10	7.5	MKS4O111002B_____	4	9	13	10	MKS4S011003C_____
	4	9	13	10	MKS4O111003C_____					
1500 „	3	8.5	10	7.5	MKS4O111502B_____	4	9	13	10	MKS4S011503C_____
	4	9	13	10	MKS4O111503C_____					
2200 „	3	8.5	10	7.5	MKS4O112202B_____	4	9	13	10	MKS4S012203C_____
	4	9	13	10	MKS4O112203C_____					
3300 „	4	9	10	7.5	MKS4O113302C_____	4	9	13	10	MKS4S013303C_____
	4	9	13	10	MKS4O113303C_____					
4700 „	4	9	10	7.5	MKS4O114702C_____	4	9	13	10	MKS4S014703C_____
	4	9	13	10	MKS4O114703C_____	5	11	18	15	MKS4S014704B_____
6800 „	4.5	9.5	10.3	7.5	MKS4O116802D_____	5	11	13	10	MKS4S016803F_____
	4	9	13	10	MKS4O116803C_____	5	11	18	15	MKS4S016804B_____
0.01 µF	5	10.5	10.3	7.5	MKS4O121002E_____	6	12	13	10	MKS4S021003G_____
	5	11	13	10	MKS4O121003F_____	5	11	18	15	MKS4S021004B_____
0.015„	5.7	12.5	10.3	7.5	MKS4O121502F_____	6	12.5	18	15	MKS4S021504C_____
	6	12	13	10	MKS4O121503G_____					
0.022„	5	11	18	15	MKS4O122204B_____	7	14	18	15	MKS4S022204D_____
						6	15	26.5	22.5	MKS4S022205B_____
0.033„	6	12.5	18	15	MKS4O123304C_____	8	15	18	15	MKS4S023304F_____
	6	15	26.5	22.5	MKS4O123305B_____	6	15	26.5	22.5	MKS4S023305B_____
0.047„	7	14	18	15	MKS4O124704D_____	7	16.5	26.5	22.5	MKS4S024705D_____
	6	15	26.5	22.5	MKS4O124705B_____					
0.068„	8	15	18	15	MKS4O126804F_____	8.5	18.5	26.5	22.5	MKS4S026805F_____
	6	15	26.5	22.5	MKS4O126805B_____					
0.1 µF	9	16	18	15	MKS4O131004J_____	10.5	19	26.5	22.5	MKS4S031005G_____
	7	16.5	26.5	22.5	MKS4O131005D_____	9	19	31.5	27.5	MKS4S031006A_____
0.15 „	8.5	18.5	26.5	22.5	MKS4O131505F_____	11	21	31.5	27.5	MKS4S031506B_____
0.22 „	10.5	19	26.5	22.5	MKS4O132205G_____	13	24	31.5	27.5	MKS4S032206D_____
0.33 „	11	21	26.5	22.5	MKS4O133305I_____	17	34.5	31.5	27.5	MKS4S033306I_____
	11	21	31.5	27.5	MKS4O133306B_____	17	29	41.5	37.5	MKS4S033307E_____
0.47 „	13	24	31.5	27.5	MKS4O134706D_____	20	39.5	31.5	27.5	MKS4S034706J_____
						17	29	41.5	37.5	MKS4S034707E_____
0.68 „	15	26	31.5	27.5	MKS4O136806F_____	20	39.5	41.5	37.5	MKS4S036807G_____
1.0 µF	17	29	31.5	27.5	MKS4O141006G_____	24	45.5	41.5	37.5	MKS4S041007H_____
	17	29	41.5	37.5	MKS4O141007E_____					
1.5 „	19	32	41.5	37.5	MKS4O141507F_____	31	46	41.5	37.5	MKS4S041507I_____
2.2 „	20	39.5	41.5	37.5	MKS4O142207G_____	35	50	41.5	37.5	MKS4S042207J_____
						35	50	57	52.5	MKS4S042209F_____
3.3 „	24	45.5	41.5	37.5	MKS4O143307H_____	45	55	57	52.5	MKS4S043309H_____
4.7 „	35	50	41.5	37.5	MKS4O144707J_____	45	65	57	52.5	MKS4S044709J_____
6.8 „	40	55	41.5	37.5	MKS4O146807K_____					
	35	50	57	52.5	MKS4O146809F_____					
10 µF	45	55	57	52.5	MKS4O151009H_____					

* AC voltages: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 157.

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Continuation

General Data

Capacitance	2000 VDC/400 VAC* W	H	L	PCM**	Part number
1000 pF	4	9	13	10	MKS4U011003C_____
1500 „	4	9	13	10	MKS4U011503C_____
2200 „	5	11	13	10	MKS4U012203F_____
3300 „	6	12	13	10	MKS4U013303G_____
	5	11	18	15	MKS4U013304B_____
4700 „	5	11	18	15	MKS4U014704B_____
6800 „	6	12.5	18	15	MKS4U016804C_____
0.01 µF	7	14	18	15	MKS4U021004D_____
	6	15	26.5	22.5	MKS4U021005B_____
0.015 „	6	15	26.5	22.5	MKS4U021505B_____
0.022 „	7	16.5	26.5	22.5	MKS4U022205D_____
0.033 „	10.5	19	26.5	22.5	MKS4U023305G_____
0.047 „	11	21	26.5	22.5	MKS4U024705I_____
	11	21	31.5	27.5	MKS4U024706B_____
0.068 „	11	21	31.5	27.5	MKS4U026806B_____
0.1 µF	13	24	31.5	27.5	MKS4U031006D_____
0.15 „	17	29	31.5	27.5	MKS4U031506G_____
	13	24	41.5	37.5	MKS4U031507C_____
0.22 „	17	29	41.5	37.5	MKS4U032207E_____
0.33 „	20	39.5	41.5	37.5	MKS4U033307G_____
0.47 „	24	45.5	41.5	37.5	MKS4U034707H_____
0.68 „	31	46	41.5	37.5	MKS4U036807I_____
1.0 µF	40	55	41.5	37.5	MKS4U041007K_____
	25	45	57	52.5	MKS4U041009D_____
1.5 „	30	45	57	52.5	MKS4U041509E_____
2.2 „	45	55	57	52.5	MKS4U042209H_____
3.3 „	45	65	57	52.5	MKS4U043309J_____

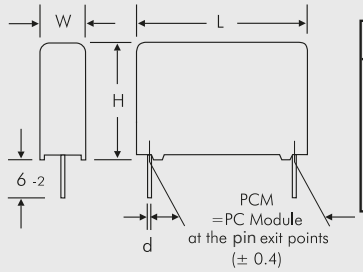
* AC voltage: f = 50 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

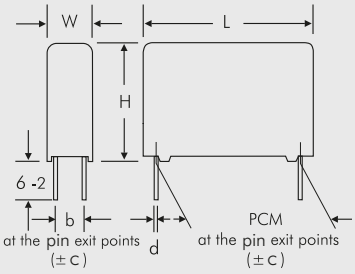
Dims. in mm.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 157.

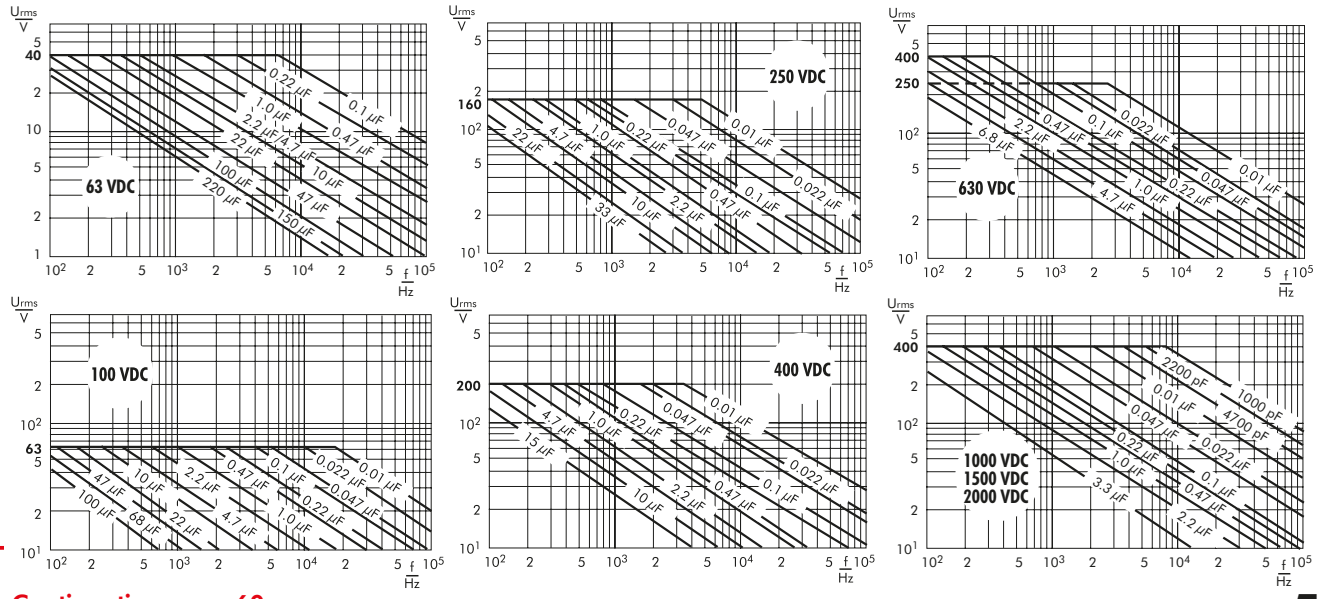


Ø d	PCM	W
0.5	7.5	⩽ 3
0.6	7.5	⩾ 4
0.6	10	
0.8	15 - 27.5	
1.0	37.5	



W	PCM	b	Ød	c
17	37.5	10	1.0	0.4
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
28	37.5	10	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
40	37.5	20	1.0	0.4
25	52.5	12.5	1.2	0.8
30	52.5	20	1.2	0.8
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).



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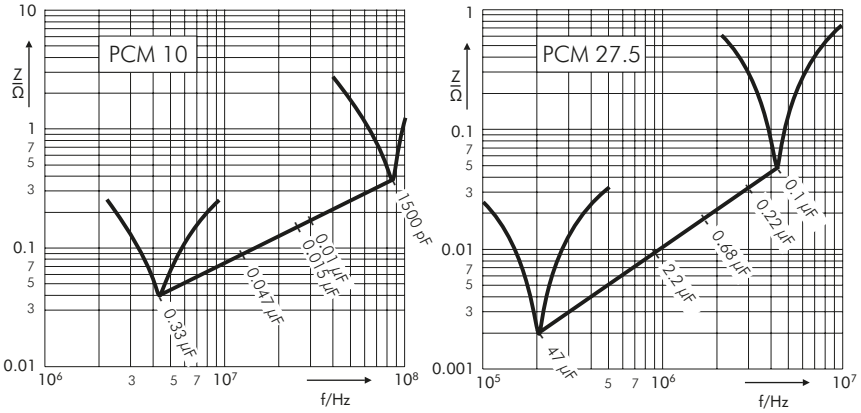
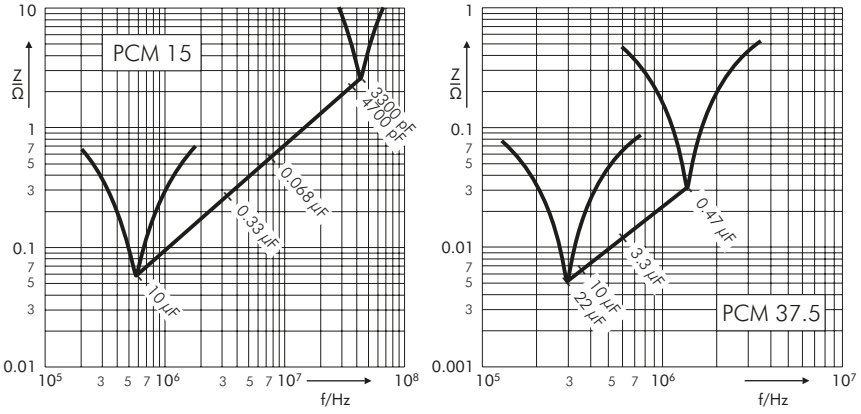
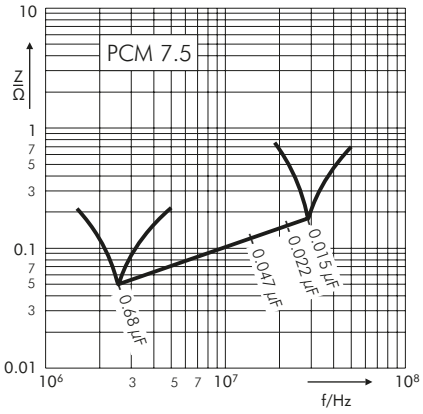
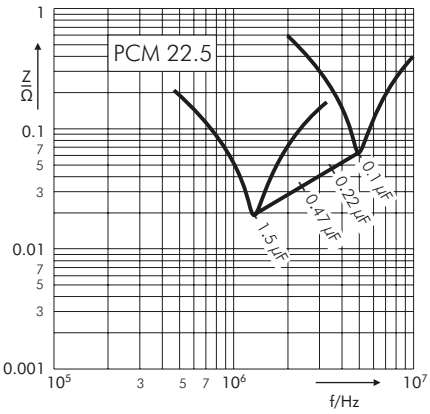
Continuation

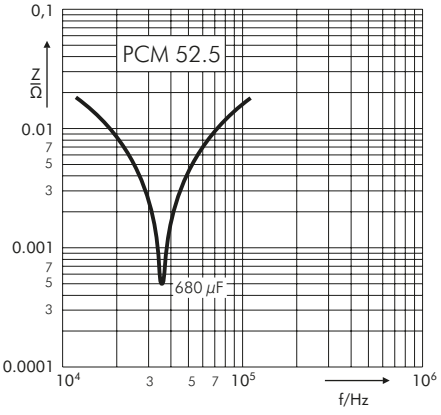
Impedance change with frequency (general guide).











WIMA MKP 4

Metallized Polypropylene (PP) Capacitors in PCM 7.5 mm to 37.5 mm. Capacitances from 0.01 µF to 68 µF. Rated Voltages from 100 VDC to 1250 VDC.

Special Features

- **High volume/capacitance ratio**
- **Self-healing**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2015/863/EU**

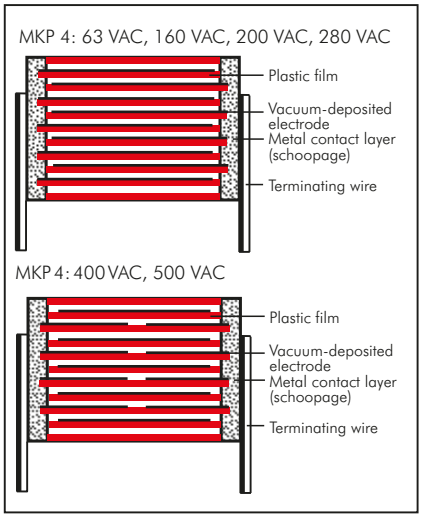
Typical Applications

For high frequency applications e.g.

- **Sample and hold**
- **Timing**
- **Oscillating circuits**
- **High frequency coupling and decoupling**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
0.01 µF to 68 µF
Rated voltages:
100 VDC, 250 VDC, 400 VDC, 630 VDC, 1000 VDC, 1250 VDC
Capacitance tolerances:
± 20%, ± 10%, ± 5%
Operating temperature range:
–55° C to +105° C
Climatic test category:
55/100/56 in accordance with IEC
Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 1 x 10^5 MΩ
C > 0.33 µF: ⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Dissipation factors at + 20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}
10 kHz	⩽ 8 x 10^{-4}	⩽ 8 x 10^{-4}	–
100 kHz	⩽ 25 x 10^{-4}	–	–

Maximum pulse rise time:

Capacitance µF	max. pulse rise time V/µsec at T_A < 40° C					
	100 VDC	250 VDC	400 VDC	630 VDC	1000 VDC	1250 VDC
0.01 ... 0.022	450	450	450	500	550	600
0.033 ... 0.068	250	250	300	350	400	450
0.1 ... 0.22	150	150	200	250	300	350
0.33 ... 0.68	100	100	150	200	200	250
1.0 ... 2.2	75	100	100	150	150	200
3.3 ... 4.7	60	100	100	120	140	160
6.8 ... 10	40	50	60	85	–	–
12 ... 68	20	20	40	50	–	–

Test specifications:
In accordance with IEC 60384-16
Test voltage: 1.6 U_r, 2 sec.
Dielectric absorption:
0.05%
Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300 000 hours
Failure rate < 2 fit (0.5 x U_r and 40° C).

Mechanical Tests

Pull test on pins:
d ⩽ 0.8 Ø: 10 N in direction of pins
d > 0.8 Ø: 20 N in direction of pins
according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2
in accordance with IEC 60068-2-29

Packing

Available taped and reeled up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	100 VDC/63 VAC*					250 VDC/160 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 µF	3	8.5	10	7.5	MKP4D021002B00____	3	8.5	10	7.5	MKP4F021002B00____
0.015 „	3	8.5	10	7.5	MKP4D021502B00____	3	8.5	10	7.5	MKP4F021502B00____
0.022 „	3	8.5	10	7.5	MKP4D022202B00____	3	8.5	10	7.5	MKP4F022202B00____
0.033 „	3	8.5	10	7.5	MKP4D023302B00____	3	8.5	10	7.5	MKP4F023302B00____
	4	9	13	10	MKP4D023303C00____	4	9	13	10	MKP4F023303C00____
0.047 „	4	9	10	7.5	MKP4D024702C00____	4	9	10	7.5	MKP4F024702C00____
	4	9	13	10	MKP4D024703C00____	4	9	13	10	MKP4F024703C00____
0.068 „	4	9	10	7.5	MKP4D026802C00____	4	9	10	7.5	MKP4F026802C00____
	4	9	13	10	MKP4D026803C00____	4	9	13	10	MKP4F026803C00____
0.1 µF	4.5	9.5	10.3	7.5	MKP4D031002D00____	4.5	9.5	10.3	7.5	MKP4F031002D00____
	4	9	13	10	MKP4D031003C00____	4	9	13	10	MKP4F031003C00____
0.15 „	5	10.5	10.3	7.5	MKP4D031502E00____	5	10.5	10.3	7.5	MKP4F031502E00____
	5	11	13	10	MKP4D031503F00____	5	11	13	10	MKP4F031503F00____
0.22 „	6	12	13	10	MKP4D032203G00____	6	12	13	10	MKP4F032203G00____
	5	11	18	15	MKP4D032204B00____	5	11	18	15	MKP4F032204B00____
0.33 „	6	12.5	18	15	MKP4D033304C00____	6	12.5	18	15	MKP4F033304C00____
0.47 „	7	14	18	15	MKP4D034704D00____	7	14	18	15	MKP4F034704D00____
0.68 „	8	15	18	15	MKP4D036804F00____	8	15	18	15	MKP4F036804F00____
	6	15	26.5	22.5	MKP4D036805B00____	6	15	26.5	22.5	MKP4F036805B00____
1.0 µF	7	16.5	26.5	22.5	MKP4D041005D00____	7	16.5	26.5	22.5	MKP4F041005D00____
						9	19	31.5	27.5	MKP4F041006A00____
1.2 „	10.5	19	26.5	22.5	MKP4D041205G00____	10.5	19	26.5	22.5	MKP4F041205G00____
						9	19	31.5	27.5	MKP4F041206A00____
1.5 „	10.5	19	26.5	22.5	MKP4D041505G00____	10.5	19	26.5	22.5	MKP4F041505G00____
						11	21	31.5	27.5	MKP4F041506B00____
1.8 „	11	21	26.5	22.5	MKP4D041805I00____	11	21	26.5	22.5	MKP4F041805I00____
						11	21	31.5	27.5	MKP4F041806B00____
2.2 „	11	21	26.5	22.5	MKP4D042205I00____	11	21	26.5	22.5	MKP4F042205I00____
	9	19	31.5	27.5	MKP4D042206A00____	11	21	31.5	27.5	MKP4F042206B00____
2.7 „	9	19	31.5	27.5	MKP4D042706A00____	11	21	31.5	27.5	MKP4F042706B00____
3.3 „	9	19	31.5	27.5	MKP4D043306A00____	13	24	31.5	27.5	MKP4F043306D00____
3.9 „	11	21	31.5	27.5	MKP4D043906B00____	13	24	31.5	27.5	MKP4F043906D00____
4.7 „	13	24	31.5	27.5	MKP4D044706D00____	15	26	31.5	27.5	MKP4F044706F00____
						13	24	41.5	37.5	MKP4F044707C00____
5.6 „	13	24	31.5	27.5	MKP4D045606D00____	17	29	31.5	27.5	MKP4F045606G00____
						15	26	41.5	37.5	MKP4F045607D00____
6.8 „	15	26	31.5	27.5	MKP4D046806F00____	17	29	31.5	27.5	MKP4F046806G00____
						15	26	41.5	37.5	MKP4F046807D00____
8.2 „	15	26	31.5	27.5	MKP4D048206F00____	17	34.5	31.5	27.5	MKP4F046806I00____
						17	29	41.5	37.5	MKP4F046807E00____
10 µF	17	29	31.5	27.5	MKP4D051006G00____	20	39.5	31.5	27.5	MKP4F051006J00____
	13	24	41.5	37.5	MKP4D051007C00____	19	32	41.5	37.5	MKP4F051007F00____
12 „	17	29	31.5	27.5	MKP4D051206G00____	20	39.5	41.5	37.5	MKP4F051207G00____
	15	26	41.5	37.5	MKP4D051207D00____					
15 „	17	34.5	31.5	27.5	MKP4D051506I00____	20	39.5	41.5	37.5	MKP4F051507G00____
	17	29	41.5	37.5	MKP4D051507E00____					
18 „	20	39.5	31.5	27.5	MKP4D051806J00____	24	45.5	41.5	37.5	MKP4F051807H00____
	19	32	41.5	37.5	MKP4D051807F00____					
22 „	20	39.5	41.5	37.5	MKP4D052207G00____	24	45.5	41.5	37.5	MKP4F052207H00____
						28	38	41.5	37.5	MKP4F052207L00____
27 „	20	39.5	41.5	37.5	MKP4D052707G00____	31	46	41.5	37.5	MKP4F052707I00____
33 „	28	38	41.5	37.5	MKP4D053307L00____	35	50	41.5	37.5	MKP4F053307J00____
	24	45.5	41.5	37.5	MKP4D053307H00____					
39 „	31	46	41.5	37.5	MKP4D053907I00____	40	55	41.5	37.5	MKP4F053907K00____
47 „	35	50	41.5	37.5	MKP4D054707J00____					
56 „	35	50	41.5	37.5	MKP4D055607J00____					
68 „	40	55	41.5	37.5	MKP4D056807K00____					

* AC voltage: $f \leqslant 400$ Hz; $1.4 \times U_{rms} + UDC \leqslant U_r$

Dims. in mm.

** PCM = Printed circuit module = pin spacing

Continuation page 63

Continuation

General Data

Capacitance	400 VDC/220 VAC*					630 VDC/280 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 µF	3	8.5	10	7.5	MKP4G021002B00____	3	8.5	10	7.5	MKP4J021002B00____
						4	9	13	10	MKP4J021003C00____
0.015 „	4	9	10	7.5	MKP4G021502C00____	4	9	10	7.5	MKP4J021502C00____
	4	9	13	10	MKP4G021503C00____	4	9	13	10	MKP4J021503C00____
0.022 „	4.5	9.5	10.3	7.5	MKP4G022202D00____	4.5	9.5	10.3	7.5	MKP4J022202D00____
	4	9	13	10	MKP4G022203C00____	4	9	13	10	MKP4J022203C00____
0.033 „	5	10.5	10.3	7.5	MKP4G023302E00____	5	10.5	10.3	7.5	MKP4J023302E00____
	4	9	13	10	MKP4G023303C00____	4	9	13	10	MKP4J023303C00____
0.047 „	5	10.5	10.3	7.5	MKP4G024702E00____	5.7	12.5	10.3	7.5	MKP4J024702F00____
	5	11	13	10	MKP4G024703F00____	5	11	13	10	MKP4J024703F00____
0.068 „	5.7	12.5	10.3	7.5	MKP4G026802F00____	6	12	13	10	MKP4J026803G00____
	5	11	13	10	MKP4G026803F00____	6	12.5	18	15	MKP4J026804C00____
0.1 µF	6	12	13	10	MKP4G031003G00____	7	14	18	15	MKP4J031004D00____
	5	11	18	15	MKP4G031004B00____					
0.15 „	6	12.5	18	15	MKP4G031504C00____	8	15	18	15	MKP4J031504F00____
						6	15	26.5	22.5	MKP4J031505B00____
0.22 „	7	14	18	15	MKP4G032204D00____	9	16	18	15	MKP4J032204J00____
						7	16.5	26.5	22.5	MKP4J032205D00____
0.33 „	8	15	18	15	MKP4G033304F00____	8.5	18.5	26.5	22.5	MKP4J033305F00____
	6	15	26.5	22.5	MKP4G033305B00____					
0.47 „	7	16.5	26.5	22.5	MKP4G034705D00____	10.5	19	26.5	22.5	MKP4J034705G00____
						11	21	31.5	27.5	MKP4J034706B00____
0.68 „	8.5	18.5	26.5	22.5	MKP4G036805F00____	11	21	31.5	27.5	MKP4J036806B00____
1.0 µF	11	21	26.5	22.5	MKP4G041005I00____	13	24	31.5	27.5	MKP4J041006D00____
	11	21	31.5	27.5	MKP4G041006B00____					
1.2 „	11	21	31.5	27.5	MKP4G041206B00____	15	26	31.5	27.5	MKP4J041206F00____
1.5 „	11	21	31.5	27.5	MKP4G041506B00____	15	26	31.5	27.5	MKP4J041506F00____
						13	24	41.5	37.5	MKP4J041507C00____
1.8 „	13	24	31.5	27.5	MKP4G041806D00____	17	29	31.5	27.5	MKP4J041806G00____
						15	26	41.5	37.5	MKP4J041807D00____
2.2 „	15	26	31.5	27.5	MKP4G042206F00____	17	34.5	31.5	27.5	MKP4J042206I00____
	13	24	41.5	37.5	MKP4G042207C00____	17	29	41.5	37.5	MKP4J042207E00____
2.7 „	17	29	31.5	27.5	MKP4G042706G00____	17	29	41.5	37.5	MKP4J042707E00____
3.3 „	17	29	31.5	27.5	MKP4G043306G00____	20	39.5	31.5	27.5	MKP4J043306J00____
	15	26	41.5	37.5	MKP4G043307D00____	19	32	41.5	37.5	MKP4J043307F00____
3.9 „	20	39.5	31.5	27.5	MKP4G043906J00____	20	39.5	41.5	37.5	MKP4J043907G00____
4.7 „	20	39.5	31.5	27.5	MKP4G044706J00____	20	39.5	41.5	37.5	MKP4J044707G00____
	19	32	41.5	37.5	MKP4G044707F00____					
5.6 „	20	39.5	41.5	37.5	MKP4G045607G00____	24	45.5	41.5	37.5	MKP4J045607H00____
						28	38	41.5	37.5	MKP4J045607L00____
6.8 „	20	39.5	41.5	37.5	MKP4G046807G00____	24	45.5	41.5	37.5	MKP4J046807H00____
						28	38	41.5	37.5	MKP4J046807L00____
8.2 „	24	45.5	41.5	37.5	MKP4G048207H00____	31	46	41.5	37.5	MKP4J048207I00____
10 µF	24	45.5	41.5	37.5	MKP4G051007H00____	35	50	41.5	37.5	MKP4J051007J00____
	28	38	41.5	37.5	MKP4G051007L00____					
12 „	31	46	41.5	37.5	MKP4G051207I00____	40	55	41.5	37.5	MKP4J051207K00____
15 „	31	46	41.5	37.5	MKP4G051507I00____					
18 „	35	50	41.5	37.5	MKP4G051807J00____					
22 „	40	55	41.5	37.5	MKP4G052207K00____					

* AC voltages: $f \leqslant 400$ Hz; $1.4 \times U_{rms} + UDC \leqslant U_r$

** PCM = Printed circuit module = pin spacing

Dims. in mm.

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Continuation

General Data

Capacitance	1000 VDC/400 VAC*					1250 VDC/500 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 µF	5.7	12.5	10.3	7.5	MKP4O121002F00____	5	11	18	15	MKP4R021004B00____
	5	11	13	10	MKP4O121003F00____					
0.015 „	5	11	13	10	MKP4O121503F00____	6	12.5	18	15	MKP4R021504C00____
	5	11	18	15	MKP4O121504B00____					
0.022 „	5	11	18	15	MKP4O122204B00____	7	14	18	15	MKP4R022204D00____
0.033 „	6	12.5	18	15	MKP4O123304C00____	8	15	18	15	MKP4R023304F00____
0.047 „	7	14	18	15	MKP4O124704D00____	6	15	26.5	22.5	MKP4R024705B00____
0.068 „	8	15	18	15	MKP4O126804F00____	8.5	18.5	26.5	22.5	MKP4R026805F00____
	6	15	26.5	22.5	MKP4O126805B00____					
0.1 µF	9	16	18	15	MKP4O131004J00____	10.5	19	26.5	22.5	MKP4R031005G00____
	7	16.5	26.5	22.5	MKP4O131005D00____	9	19	31.5	27.5	MKP4R031006A00____
0.15 „	8.5	18.5	26.5	22.5	MKP4O131505F00____	11	21	31.5	27.5	MKP4R031506B00____
0.22 „	11	21	26.5	22.5	MKP4O132205I00____	13	24	31.5	27.5	MKP4R032206D00____
	11	21	31.5	27.5	MKP4O132206B00____					
0.33 „	11	21	31.5	27.5	MKP4O133306B00____	15	26	31.5	27.5	MKP4R033306F00____
						13	24	41.5	37.5	MKP4R033307C00____
0.47 „	13	24	31.5	27.5	MKP4O134706D00____	17	29	31.5	27.5	MKP4R034706G00____
						15	26	41.5	37.5	MKP4R034707D00____
0.68 „	17	29	31.5	27.5	MKP4O136806G00____	20	39.5	31.5	27.5	MKP4R036806J00____
	15	26	41.5	37.5	MKP4O136807D00____	19	32	41.5	37.5	MKP4R036807F00____
1.0 µF	20	39.5	31.5	27.5	MKP4O141006J00____	20	39.5	41.5	37.5	MKP4R041007G00____
	17	29	41.5	37.5	MKP4O141007E00____					
1.2 „	19	32	41.5	37.5	MKP4O141207F00____	20	39.5	41.5	37.5	MKP4R041207G00____
1.5 „	20	39.5	41.5	37.5	MKP4O141507G00____	24	45.5	41.5	37.5	MKP4R041507H00____
1.8 „	20	39.5	41.5	37.5	MKP4O141807G00____	24	45.5	41.5	37.5	MKP4R041807H00____
2.2 „	24	45.5	41.5	37.5	MKP4O142207H00____	31	46	41.5	37.5	MKP4R042207I00____
	28	38	41.5	37.5	MKP4O142207L00____					
2.7 „	31	46	41.5	37.5	MKP4O142707I00____	35	50	41.5	37.5	MKP4R042707J00____
3.3 „	31	46	41.5	37.5	MKP4O143307I00____	40	55	41.5	37.5	MKP4R043307K00____
3.9 „	35	50	41.5	37.5	MKP4O143907J00____					
4.7 „	35	50	41.5	37.5	MKP4O144707J00____					

* AC voltages: f ⩽ 400 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

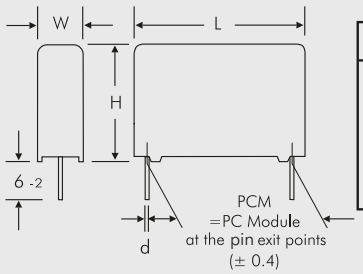
** PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

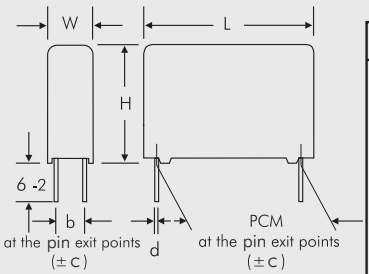
Taped version see page 157.

2-pin version



Ø d	PCM	W
0.5	7.5	= 3
0.6	7.5	⩾ 4
0.6	10	
0.8	15 - 27.5	
1.0	37.5	

4-pin version



W	PCM	b	Ø d	c
17	37.5	10	1.0	0.4
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
28	37.5	10	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
40	37.5	20	1.0	0.4

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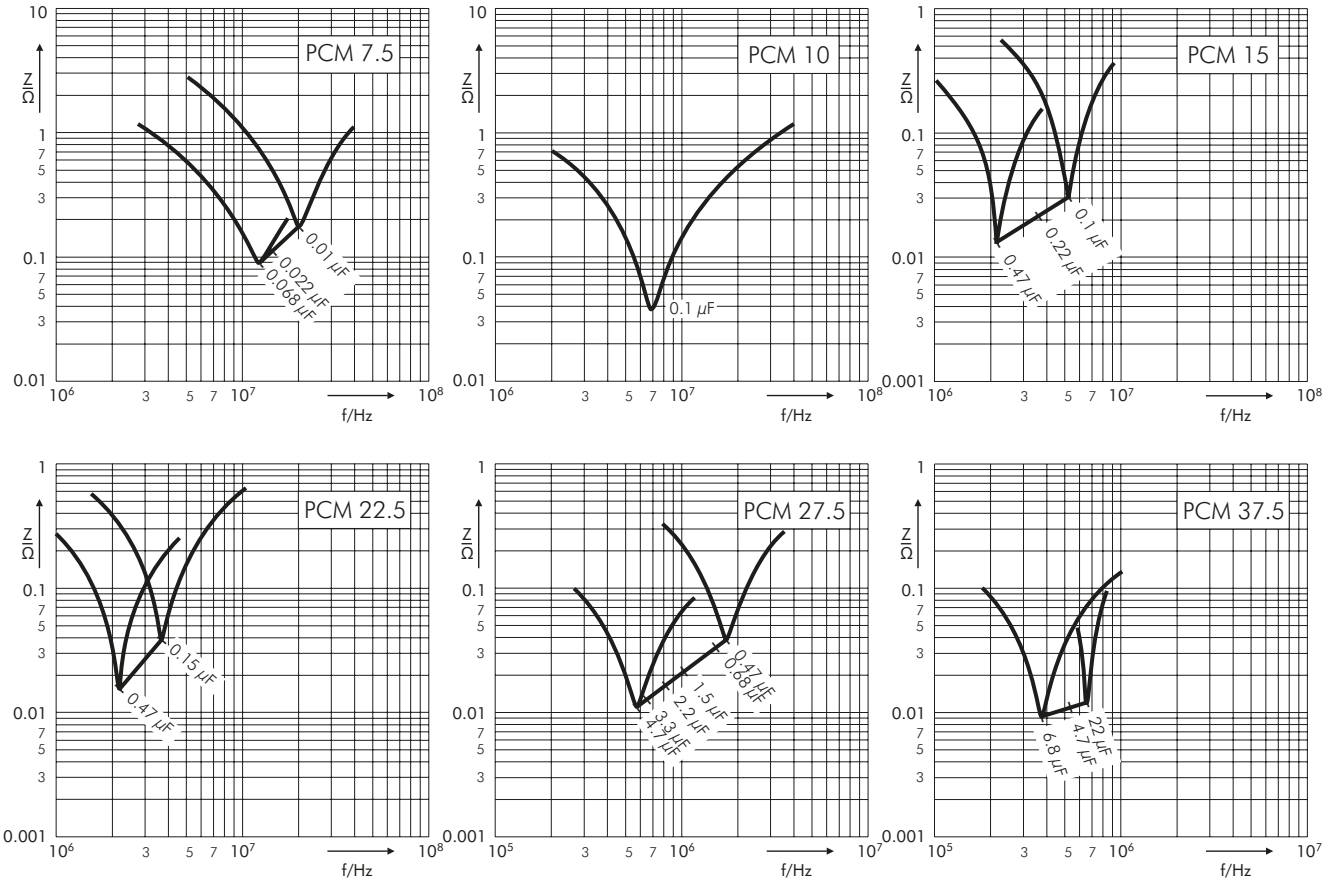
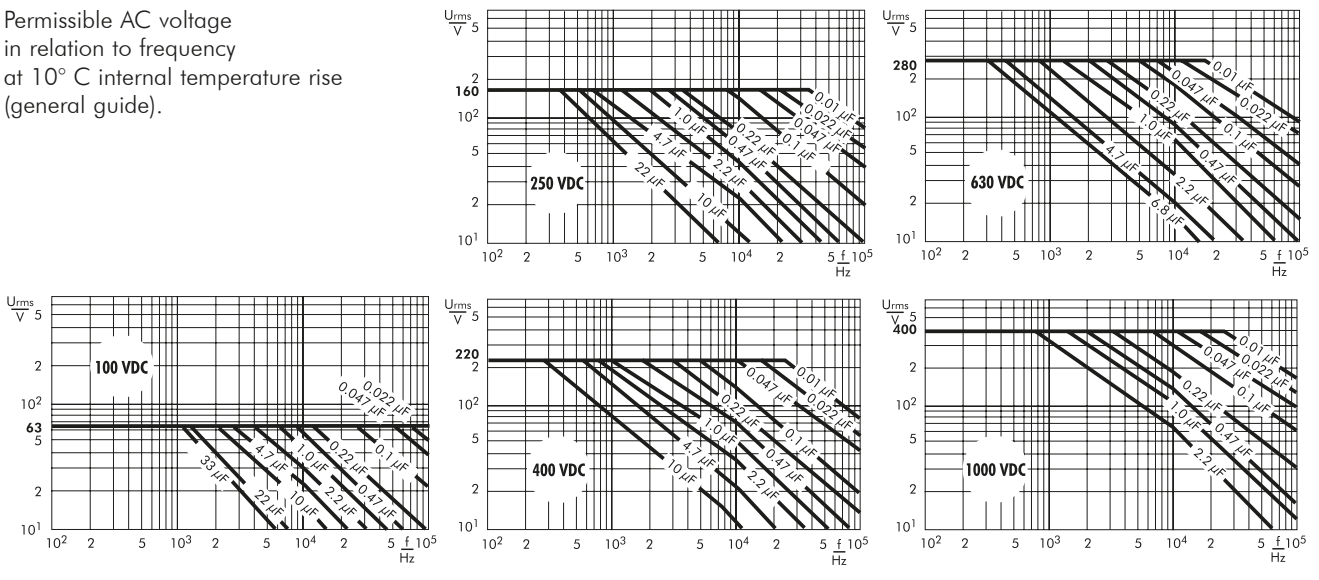
Continuation

Impedance change with frequency
(general guide).



Permissible AC voltage
in relation to frequency
at 10° C internal temperature rise
(general guide).



WIMA Capacitors for Good Contact at High Pulse Ratings

WIMA MKP 10
WIMA FKP 4
WIMA FKP 1

An important construction criterion in the manufacture of reliable, self-healing capacitors for pulse applications is the current-carrying capacity of the contacts, i.e. the connection between the terminating wires and the electrodes.

The construction principle of the WIMA MKP 10 series consists of a non-metallized dielectric film and an carrier film metallized on both sides acting as electrode. Due to the metallization on both sides, the electrical conductivity is considerably improved and the contact surface between the electrodes and the schoopage layer is doubled. This results in better contact and allows high current and pulse loading capability. The properties of metallized capacitors such as excellent self-healing and high capacitances remain unchanged.

The WIMA FKP 4 is a range of self-healing film/foil Polypropylene capacitors made with a single metallized plastic film and metal foil electrodes in series connection. This construction features a high volume capacitance and at the same time high pulse loading capability.

The WIMA FKP 1 series was developed to withstand extremely high pulse loads. It has an internal series connection, the metal foil electrodes being combined with a floating electrode metallized on both sides. The metal foil electrodes are safely contacted on both sides of the end surfaces. At the same time the capacitor is fully self-healing due to the floating electrode metallized on both sides. As regards pulse loading capability, WIMA FKP 1 represents the high-end of capacitor technology.

WIMA pulse capacitors are suitable for high pulse and high frequency applications in e.g. switch mode power supplies, TV and monitor sets, lighting industry, audio/video equipment, convertes in drives and power electronics or in electronic ballasts. They are available with capacitances from 100 pF through 47 µF and with voltage ratings from 100 VDC through 6000 VDC.

WIMA pulse capacitors are produced with the proven box technology using solvent-resistant, flame-retardant plastic cases according to UL 94 V-0. They are environmentally compatible with the RoHS 2015/863/EU regulations.

WIMA MKP 10

Polypropylene (PP) Capacitors for Pulse Applications with Double-Sided Metallized Electrodes in PCM 7.5 mm to 52.5 mm. Capacitances from 1000 pF to 47 µF. Rated Voltages from 100 VDC to 3000 VDC.

Special Features

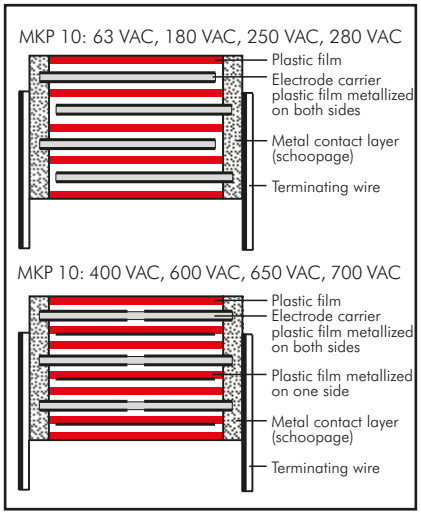
- **Pulse duty construction**
- **Self-healing**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2015/863/EU**

Typical Applications

For pulse applications e.g.
- **Switch mode power supplies**
- **TV and monitor sets**
- **Lighting**
- **Audio/video equipment**

Construction

Dielectric: Polypropylene (PP) film
Capacitor electrodes:
Double-sided metallized plastic film
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations: Tinned wire.
Marking: Colour: Red.
Marking: Black.

Electrical Data

Capacitance range:
1000 pF to 47 µF
Rated voltages: 100 VDC, 250 VDC, 400 VDC, 630 VDC, 850 VDC, 1000 VDC, 1600 VDC, 2000 VDC, 2500 VDC, 3000 VDC
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +105° C
Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 1 x 10^5 MΩ
C > 0.33 µF: ⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Test voltage: 2 sec.

L	⩽ 2000 VDC	2500 VDC	⩾ 3000 VDC
< 41.5	1.6 U_r	1.4 U_r	1.2 U_r
41.5	1.4 U_r	1.4 U_r	1.2 U_r
57	1.2 U_r	1.2 U_r	1.2 U_r

Climatic test category:
55/100/56 in accordance with IEC
Dielectric absorption: 0.05 %
Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300 000 hours
Failure rate < 1 fit (0.5 x U_r and 40° C)
Specific dissipation:

Box size* W x H x L in mm	Specific dissipation in Watts per K above the ambient temperature
35 x 50 x 57	0.132
45 x 55 x 57	0.164
45 x 65 x 57	0.184

* other box sizes see page 11.

Dissipation factors at + 20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}
10 kHz	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}	–
100 kHz	⩽ 15 x 10^{-4}	–	–

Maximum pulse rise time:

Capacitance pF/µF	max. pulse rise time V/µsec at T_A < 40° C									
	100 VDC	250 VDC	400 VDC	630 VDC	850 VDC	1000 VDC	1600 VDC	2000 VDC	2500 VDC	3000 VDC
1000 ... 2200	1250	2300	2300	2300	3500	3500	7000	11500	11500	–
3300 ... 6800	1150	1500	1500	1500	3500	3500	7000	11500	11500	–
0.01 ... 0.022	900	1400	1500	1500	2700	2700	3800	4400	11500	–
0.033 ... 0.068	500	1000	1150	1400	2700	2700	2700	2700	2700	2700
0.1 ... 0.22	250	650	650	1150	1800	1800	1800	1800	1800	1800
0.33 ... 0.68	130	390	500	900	1150	1150	1150	1150	1150	1150
1.0 ... 2.2	90	250	250	500	500	500	650	650	650	500
3.3 ... 4.7	65	100	130	190	230	230	330	–	–	–
6.8 ... 15	45	65	90	160	–	–	–	–	–	–
22 ... 47	30	45	45	–	–	–	–	–	–	–

Mechanical Tests

Pull test on pins:
d ⩽ 0.8 Ø: 10 N in direction of pins
d > 0.8 Ø: 20 N in direction of pins
according to IEC 60068-2-21
Vibration: 6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density: 1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test: 4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	100 VDC/63 VAC W	H	L	PCM**	Part number	250 VDC/180 VAC W	H	L	PCM**	Part number
0.01 µF	4	9	10	7.5	MKP1D021002C_____	4	9	10	7.5	MKP1F021002C_____
						4	9	13	10	MKP1F021003C_____
0.015 „	4	9	10	7.5	MKP1D021502C_____	4	9	10	7.5	MKP1F021502C_____
						4	9	13	10	MKP1F021503C_____
0.022 „	4	9	10	7.5	MKP1D022202C_____	4	9	10	7.5	MKP1F022202C_____
						4	9	13	10	MKP1F022203C_____
0.033 „	5	10.5	10.3	7.5	MKP1D023302E_____	5	10.5	10.3	7.5	MKP1F023302E_____
	4	9	13	10	MKP1D023303C_____	4	9	13	10	MKP1F023303C_____
0.047 „	5	10.5	10.3	7.5	MKP1D024702E_____	5	10.5	10.3	7.5	MKP1F024702E_____
	4	9	13	10	MKP1D024703C_____	4	9	13	10	MKP1F024703C_____
0.068 „	5	11	13	10	MKP1D026803F_____	5	11	13	10	MKP1F026803F_____
						5	11	18	15	MKP1F026804B_____
0.1 µF	6	12	13	10	MKP1D031003G_____	6	12	13	10	MKP1F031003G_____
						5	11	18	15	MKP1F031004B_____
0.12 „	6	12.5	18	15	MKP1D031204C_____	6	12.5	18	15	MKP1F031204C_____
0.15 „	6	12.5	18	15	MKP1D031504C_____	6	12.5	18	15	MKP1F031504C_____
						6	15	26.5	22.5	MKP1F031505B_____
0.18 „	7	14	18	15	MKP1D031804D_____	7	14	18	15	MKP1F031804D_____
0.22 „	7	14	18	15	MKP1D032204D_____	7	14	18	15	MKP1F032204D_____
						6	15	26.5	22.5	MKP1F032205B_____
0.27 „	8	15	18	15	MKP1D032704F_____	8	15	18	15	MKP1F032704F_____
0.33 „	8	15	18	15	MKP1D033304F_____	8	15	18	15	MKP1F033304F_____
						6	15	26.5	22.5	MKP1F033305B_____
0.39 „	9	16	18	15	MKP1D033904J_____	9	16	18	15	MKP1F033904J_____
0.47 „	9	16	18	15	MKP1D034704J_____	9	16	18	15	MKP1F034704J_____
	7	16.5	26.5	22.5	MKP1D034705D_____	7	16.5	26.5	22.5	MKP1F034705D_____
0.56 „	8.5	18.5	26.5	22.5	MKP1D035605F_____	8.5	18.5	26.5	22.5	MKP1F035605F_____
0.68 „	8.5	18.5	26.5	22.5	MKP1D036805F_____	8.5	18.5	26.5	22.5	MKP1F036805F_____
						9	19	31.5	27.5	MKP1F036806A_____
0.82 „	10.5	19	26.5	22.5	MKP1D038205G_____	11	21	26.5	22.5	MKP1F038205I_____
1.0 µF	10.5	19	26.5	22.5	MKP1D041005G_____	11	21	26.5	22.5	MKP1F041005I_____
						11	21	31.5	27.5	MKP1F041006B_____
1.2 „	11	21	31.5	27.5	MKP1D041206B_____	13	24	31.5	27.5	MKP1F041206D_____
1.5 „	11	21	31.5	27.5	MKP1D041506B_____	13	24	31.5	27.5	MKP1F041506D_____
1.8 „	13	24	31.5	27.5	MKP1D041806D_____	15	26	31.5	27.5	MKP1F041806F_____
2.2 „	13	24	31.5	27.5	MKP1D042206D_____	15	26	31.5	27.5	MKP1F042206F_____
						13	24	41.5	37.5	MKP1F042207C_____
2.7 „	17	29	31.5	27.5	MKP1D042706G_____	17	34.5	31.5	27.5	MKP1F042706I_____
3.3 „	17	29	31.5	27.5	MKP1D043306G_____	17	34.5	31.5	27.5	MKP1F043306I_____
						17	29	41.5	37.5	MKP1F043307E_____
3.9 „	20	39.5	31.5	27.5	MKP1D043906J_____	20	39.5	31.5	27.5	MKP1F043906J_____
4.7 „	20	39.5	31.5	27.5	MKP1D044706J_____	20	39.5	31.5	27.5	MKP1F044706J_____
	17	29	41.5	37.5	MKP1D044707E_____	19	32	41.5	37.5	MKP1F044707F_____
5.6 „	19	32	41.5	37.5	MKP1D045607F_____	20	39.5	41.5	37.5	MKP1F045607G_____
6.8 „	19	32	41.5	37.5	MKP1D046807F_____	20	39.5	41.5	37.5	MKP1F046807G_____
8.2 „	20	39.5	41.5	37.5	MKP1D048207G_____	24	45.5	41.5	37.5	MKP1F048207H_____

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 157.

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Continuation

General Data

Capacitance	100 VDC/63 VAC* W	H	L	PCM**	Part number	250 VDC/180 VAC* W	H	L	PCM**	Part number
10 µF	20	39.5	41.5	37.5	MKP1D051007G_____	24	45.5	41.5	37.5	MKP1F051007H_____
						28	38	41.5	37.5	MKP1F051007L_____
12 „	24	45.5	41.5	37.5	MKP1D051207H_____	35	50	41.5	37.5	MKP1F051207J_____
15 „	24	45.5	41.5	37.5	MKP1D051507H_____	35	50	41.5	37.5	MKP1F051507J_____
	28	38	41.5	37.5	MKP1D051507L_____	35	50	57	52.5	MKP1F051509F_____
18 „	35	50	41.5	37.5	MKP1D051807J_____	35	50	57	52.5	MKP1F051809F_____
22 „	35	50	41.5	37.5	MKP1D052207J_____	35	50	57	52.5	MKP1F052209F_____
27 „	40	55	41.5	37.5	MKP1D052707K_____	45	65	57	52.5	MKP1F052709J_____
33 „	40	55	41.5	37.5	MKP1D053307K_____	45	65	57	52.5	MKP1F053309J_____
	35	50	57	52.5	MKP1D053309F_____					
39 „	45	65	57	52.5	MKP1D053909J_____					
47 „	45	65	57	52.5	MKP1D054709J_____					

Capacitance	400 VDC/250 VAC* W	H	L	PCM**	Part number	630 VDC/400 VAC* W	H	L	PCM**	Part number
1000 pF	4	9	10	7.5	MKP1G011002C_____	4	9	10	7.5*	MKP1J011002C_____
1200 „	4	9	10	7.5	MKP1G011202C_____	4	9	10	7.5*	MKP1J011202C_____
1500 „	4	9	10	7.5	MKP1G011502C_____	4	9	10	7.5*	MKP1J011502C_____
1800 „	4	9	10	7.5	MKP1G011802C_____	4	9	10	7.5*	MKP1J011802C_____
2200 „	4	9	10	7.5	MKP1G012202C_____	4	9	10	7.5*	MKP1J012202C_____
2700 „	4	9	10	7.5	MKP1G012702C_____	4	9	10	7.5*	MKP1J012702C_____
3300 „	4	9	10	7.5	MKP1G013302C_____	4	9	10	7.5*	MKP1J013302C_____
3900 „	4	9	10	7.5	MKP1G013902C_____	4	9	10	7.5*	MKP1J013902C_____
4700 „	4	9	10	7.5	MKP1G014702C_____	4	9	10	7.5*	MKP1J014702C_____
5600 „	4	9	10	7.5	MKP1G015602C_____	4	9	10	7.5*	MKP1J015602C_____
6800 „	4	9	10	7.5	MKP1G016802C_____	4	9	10	7.5*	MKP1J016802C_____
						4	9	13	10	MKP1J016803C_____
8200 „	4	9	10	7.5	MKP1G018202C_____	5	10.5	10.3	7.5*	MKP1J018202E_____
0.01 µF	4	9	10	7.5	MKP1G021002C_____	5	10.5	10.3	7.5*	MKP1J021002E_____
	4	9	13	10	MKP1G021003C_____	4	9	13	10	MKP1J021003C_____
0.012 „	5	10.5	10.3	7.5	MKP1G021202E_____	5	11	13	10	MKP1J021203F_____
0.015 „	5	10.5	10.3	7.5	MKP1G021502E_____	5	11	13	10	MKP1J021503F_____
	4	9	13	10	MKP1G021503C_____	5	11	18	15	MKP1J021504B_____
0.018 „	5	10.5	10.3	7.5	MKP1G021802E_____	5	11	13	10	MKP1J021803F_____
0.022 „	5	10.5	10.3	7.5	MKP1G022202E_____	5	11	13	10	MKP1J022203F_____
	4	9	13	10	MKP1G022203C_____	5	11	18	15	MKP1J022204B_____
0.027 „	5.7	12.5	10.3	7.5	MKP1G022702F_____	6	12	13	10	MKP1J022703G_____
0.033 „	5.7	12.5	10.3	7.5	MKP1G023302F_____	6	12	13	10	MKP1J023303G_____
	5	11	13	10	MKP1G023303F_____	5	11	18	15	MKP1J023304B_____
0.039 „	6	12	13	10	MKP1G023903G_____	6	12.5	18	15	MKP1J023904C_____
0.047 „	6	12	13	10	MKP1G024703G_____	6	12.5	18	15	MKP1J024704C_____
	5	11	18	15	MKP1G024704B_____	6	15	26.5	22.5	MKP1J024705B_____
0.056 „	6	12.5	18	15	MKP1G025604C_____	7	14	18	15	MKP1J025604D_____
0.068 „	6	12.5	18	15	MKP1G026804C_____	7	14	18	15	MKP1J026804D_____
	6	15	26.5	22.5	MKP1G026805B_____	6	15	26.5	22.5	MKP1J026805B_____
0.082 „	7	14	18	15	MKP1G028204D_____	9	16	18	15	MKP1J028204J_____

* AC voltage: $f \leqslant 1000$ Hz; $1.4 \times U_{rms} + UDC \leqslant U_r$

** PCM = Printed circuit module = pin spacing

* Admissible AC voltage 280 VAC.

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 157.

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Continuation

General Data

Capacitance	400 VDC/250 VAC*					630 VDC/400 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.1 µF	7	14	18	15	MKP1G031004D_____	9	16	18	15	MKP1J031004J_____
	6	15	26.5	22.5	MKP1G031005B_____	7	16.5	26.5	22.5	MKP1J031005D_____
0.12 „	8	15	18	15	MKP1G031204F_____	8.5	18.5	26.5	22.5	MKP1J031205F_____
0.15 „	8	15	18	15	MKP1G031504F_____	8.5	18.5	26.5	22.5	MKP1J031505F_____
	6	15	26.5	22.5	MKP1G031505B_____	9	19	31.5	27.5	MKP1J031506A_____
0.18 „	9	16	18	15	MKP1G031804J_____	8.5	18.5	26.5	22.5	MKP1J031805F_____
0.22 „	9	16	18	15	MKP1G032204J_____	8.5	18.5	26.5	22.5	MKP1J032205F_____
	7	16.5	26.5	22.5	MKP1G032205D_____	9	19	31.5	27.5	MKP1J032206A_____
0.27 „	8.5	18.5	26.5	22.5	MKP1G032705F_____	11	21	26.5	22.5	MKP1J032705I_____
0.33 „	8.5	18.5	26.5	22.5	MKP1G033305F_____	11	21	26.5	22.5	MKP1J033305I_____
	9	19	31.5	27.5	MKP1G033306A_____	11	21	31.5	27.5	MKP1J033306B_____
0.39 „	10.5	19	26.5	22.5	MKP1G033905G_____	11	21	31.5	27.5	MKP1J033906B_____
0.47 „	10.5	19	26.5	22.5	MKP1G034705G_____	11	21	31.5	27.5	MKP1J034706B_____
	9	19	31.5	27.5	MKP1G034706A_____					
0.56 „	11	21	26.5	22.5	MKP1G035605I_____	15	26	31.5	27.5	MKP1J035606F_____
0.68 „	11	21	26.5	22.5	MKP1G036805I_____	15	26	31.5	27.5	MKP1J036806F_____
	11	21	31.5	27.5	MKP1G036806B_____	13	24	41.5	37.5	MKP1J036807C_____
0.82 „	13	24	31.5	27.5	MKP1G038206D_____	17	29	31.5	27.5	MKP1J038206G_____
1.0 µF	13	24	31.5	27.5	MKP1G041006D_____	17	29	31.5	27.5	MKP1J041006G_____
						15	26	41.5	37.5	MKP1J041007D_____
1.2 „	17	29	31.5	27.5	MKP1G041206G_____	20	39.5	31.5	27.5	MKP1J041206J_____
1.5 „	17	29	31.5	27.5	MKP1G041506G_____	20	39.5	31.5	27.5	MKP1J041506J_____
	13	24	41.5	37.5	MKP1G041507C_____	19	32	41.5	37.5	MKP1J041507F_____
1.8 „	20	39.5	31.5	27.5	MKP1G041806J_____	20	39.5	41.5	37.5	MKP1J041807G_____
2.2 „	20	39.5	31.5	27.5	MKP1G042206J_____	20	39.5	41.5	37.5	MKP1J042207G_____
	17	29	41.5	37.5	MKP1G042207E_____					
2.7 „	20	39.5	41.5	37.5	MKP1G042707G_____	24	45.5	41.5	37.5	MKP1J042707H_____
3.3 „	20	39.5	41.5	37.5	MKP1G043307G_____	24	45.5	41.5	37.5	MKP1J043307H_____
						28	38	41.5	37.5	MKP1J043307L_____
3.9 „	20	39.5	41.5	37.5	MKP1G043907G_____	35	50	41.5	37.5	MKP1J043907J_____
4.7 „	20	39.5	41.5	37.5	MKP1G044707G_____	35	50	41.5	37.5	MKP1J044707J_____
5.6 „	24	45.5	41.5	37.5	MKP1G045607H_____	40	55	41.5	37.5	MKP1J045607K_____
6.8 „	24	45.5	41.5	37.5	MKP1G046807H_____	40	55	41.5	37.5	MKP1J046807K_____
	28	38	41.5	37.5	MKP1G046807L_____	35	50	57	52.5	MKP1J046809F_____
8.2 „	35	50	41.5	37.5	MKP1G048207J_____	45	55	57	52.5	MKP1J048209H_____
10 µF	35	50	41.5	37.5	MKP1G051007J_____	45	55	57	52.5	MKP1J051009H_____
	35	50	57	52.5	MKP1G051009F_____					
12 „	40	55	41.5	37.5	MKP1G051207K_____					
15 „	40	55	41.5	37.5	MKP1G051507K_____					
	35	50	57	52.5	MKP1G051509F_____					
18 „	45	65	57	52.5	MKP1G051809J_____					
22 „	45	65	57	52.5	MKP1G052209J_____					

* AC voltage: $f \leqslant 1000$ Hz; $1.4 \times U_{rms} + UDC \leqslant U_r$

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 157.

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Continuation

General Data

Capacitance	850 VDC/450 VAC*					1000 VDC/600 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	4	9	10	7.5	MKP1M011002C_____	4	9	10	7.5	MKP1O111002C_____
	4	9	13	10	MKP1M011003C_____	4	9	13	10	MKP1O111003C_____
1200 „	4	9	10	7.5	MKP1M011202C_____	4	9	10	7.5	MKP1O111202C_____
1500 „	4	9	10	7.5	MKP1M011502C_____	4	9	10	7.5	MKP1O111502C_____
	4	9	13	10	MKP1M011503C_____	4	9	13	10	MKP1O111503C_____
1800 „	4	9	10	7.5	MKP1M011802C_____	4	9	10	7.5	MKP1O111802C_____
2200 „	4	9	10	7.5	MKP1M012202C_____	4	9	10	7.5	MKP1O112202C_____
	4	9	13	10	MKP1M012203C_____	4	9	13	10	MKP1O112203C_____
2700 „	4	9	10	7.5	MKP1M012702C_____	4	9	10	7.5	MKP1O112702C_____
3300 „	4	9	10	7.5	MKP1M013302C_____	4	9	10	7.5	MKP1O113302C_____
	4	9	13	10	MKP1M013303C_____	4	9	13	10	MKP1O113303C_____
3900 „	4.5	9.5	10.3	7.5	MKP1M013902D_____	4.5	9.5	10.3	7.5	MKP1O113902D_____
4700 „	4.5	9.5	10.3	7.5	MKP1M014702D_____	4.5	9.5	10.3	7.5	MKP1O114702D_____
	4	9	13	10	MKP1M014703C_____	4	9	13	10	MKP1O114703C_____
5600 „	5.7	12.5	10.3	7.5	MKP1M015602F_____	5.7	12.5	10.3	7.5	MKP1O115602F_____
6800 „	5.7	12.5	10.3	7.5	MKP1M016802F_____	5.7	12.5	10.3	7.5	MKP1O116802F_____
	5	11	13	10	MKP1M016803F_____	5	11	13	10	MKP1O116803F_____
8200 „	5	11	13	10	MKP1M018203F_____	5	11	13	10	MKP1O118203F_____
0.01 µF	5	11	13	10	MKP1M021003F_____	5	11	13	10	MKP1O121003F_____
	5	11	18	15	MKP1M021004B_____	5	11	18	15	MKP1O121004B_____
0.012 „	6	12	13	10	MKP1M021203G_____	6	12	13	10	MKP1O121203G_____
0.015 „	6	12	13	10	MKP1M021503G_____	6	12	13	10	MKP1O121503G_____
	5	11	18	15	MKP1M021504B_____	5	11	18	15	MKP1O121504B_____
0.018 „	6	12.5	18	15	MKP1M021804C_____	6	12.5	18	15	MKP1O121804C_____
0.022 „	6	12.5	18	15	MKP1M022204C_____	6	12.5	18	15	MKP1O122204C_____
	6	15	26.5	22.5	MKP1M022205B_____	6	15	26.5	22.5	MKP1O122205B_____
0.027 „	7	14	18	15	MKP1M022704D_____	7	14	18	15	MKP1O122704D_____
0.033 „	7	14	18	15	MKP1M023304D_____	7	14	18	15	MKP1O123304D_____
	6	15	26.5	22.5	MKP1M023305B_____	6	15	26.5	22.5	MKP1O123305B_____
0.039 „	8	15	18	15	MKP1M023904F_____	8	15	18	15	MKP1O123904F_____
0.047 „	8	15	18	15	MKP1M024704F_____	8	15	18	15	MKP1O124704F_____
	6	15	26.5	22.5	MKP1M024705B_____	6	15	26.5	22.5	MKP1O124705B_____
0.056 „	7	16.5	26.5	22.5	MKP1M025605D_____	7	16.5	26.5	22.5	MKP1O125605D_____
0.068 „	7	16.5	26.5	22.5	MKP1M026805D_____	7	16.5	26.5	22.5	MKP1O126805D_____
0.08 „	7	16.5	26.5	22.5	MKP1M028205D_____	8.5	18.5	26.5	22.5	MKP1O128205F_____
0.1 µF	7	16.5	26.5	22.5	MKP1M031005D_____	8.5	18.5	26.5	22.5	MKP1O131005F_____
	11	21	31.5	27.5	MKP1M031006B_____	11	21	31.5	27.5	MKP1O131006B_____
0.12 „	8.5	18.5	26.5	22.5	MKP1M031205F_____	11	21	26.5	22.5	MKP1O131205I_____
0.15 „	8.5	18.5	26.5	22.5	MKP1M031505F_____	11	21	26.5	22.5	MKP1O131505I_____
	11	21	31.5	27.5	MKP1M031506B_____	11	21	31.5	27.5	MKP1O131506B_____
0.18 „	11	21	26.5	22.5	MKP1M031805I_____	11	21	31.5	27.5	MKP1O131806B_____
0.22 „	11	21	26.5	22.5	MKP1M032205I_____	11	21	31.5	27.5	MKP1O132206B_____
	11	21	31.5	27.5	MKP1M032206B_____					
0.27	11	21	31.5	27.5	MKP1M033306B_____	15	26	31.5	27.5	MKP1O132706F_____
0.33 „	15	26	31.5	27.5	MKP1M033306F_____	15	26	31.5	27.5	MKP1O133306F_____
	13	24	41.5	37.5	MKP1M033307C_____	13	24	41.5	37.5	MKP1O133307C_____
0.39 „	17	29	31.5	27.5	MKP1M033906G_____	17	29	31.5	27.5	MKP1O133906G_____
0.47 „	17	29	31.5	27.5	MKP1M034706G_____	17	29	31.5	27.5	MKP1O134706G_____
	13	24	41.5	37.5	MKP1M034707C_____	13	24	41.5	37.5	MKP1O134707C_____
0.56 „	17	29	41.5	37.5	MKP1M035607E_____	20	39.5	31.5	27.5	MKP1O135606J_____
0.68 „	20	39.5	31.5	27.5	MKP1M036806J_____	20	39.5	31.5	27.5	MKP1O136806J_____
	17	29	41.5	37.5	MKP1M036807E_____	17	29	41.5	37.5	MKP1O136807E_____
0.82 „	19	32	41.5	37.5	MKP1M038207F_____	20	39.5	41.5	37.5	MKP1O138207G_____

* AC voltage: $f \leqslant 1000$ Hz; $1.4 \times U_{rms} + UDC \leqslant U_r$

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

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Continuation

General Data

Capacitance	850 VDC/450 VAC* W	H	L	PCM**	Part number	1000 VDC/600 VAC* W	H	L	PCM**	Part number
1.0 µF	19	32	41.5	37.5	MKP1M041007F_____	20	39.5	41.5	37.5	MKP1O141007G_____
1.2 „	20	39.5	41.5	37.5	MKP1M041207G_____	24	45.5	41.5	37.5	MKP1O141207H_____
1.5 „	20	39.5	41.5	37.5	MKP1M041507G_____	24	45.5	41.5	37.5	MKP1O141507H_____
						28	38	41.5	37.5	MKP1O141507L_____
1.8 „	24	45.5	41.5	37.5	MKP1M041807H_____	31	46	41.5	37.5	MKP1O141807I_____
2.2 „	24	45.5	41.5	37.5	MKP1M042207H_____	31	46	41.5	37.5	MKP1O142207I_____
	28	38	41.5	37.5	MKP1M042207L_____					
2.7 „	35	50	41.5	37.5	MKP1M042707J_____	40	55	41.5	37.5	MKP1O142707K_____
3.3 „	35	50	41.5	37.5	MKP1M043307J_____	40	55	41.5	37.5	MKP1O143307K_____
	35	50	57	52.5	MKP1M043309F_____	35	50	57	52.5	MKP1O143309F_____
3.9 „	35	50	57	37.5	MKP1M043909F_____	45	55	57	52.5	MKP1O143909H_____
4.7 „	45	55	57	52.5	MKP1M044709H_____	45	55	57	52.5	MKP1O144709H_____
5.6 „	45	65	57	52.5	MKP1M045609J_____					

Capacitance	1600 VDC/650 VAC* W	H	L	PCM**	Part number	2000 VDC/700 VAC* W	H	L	PCM**	Part number
1000 pF	4	9	13	10	MKP1T011003C_____	4	9	13	10	MKP1U011003C_____
1200 „	4	9	13	10	MKP1T011203C_____	4	9	13	10	MKP1U011203C_____
1500 „	4	9	13	10	MKP1T011503C_____	4	9	13	10	MKP1U011503C_____
1800 „	4	9	13	10	MKP1T011803C_____	5	11	13	10	MKP1U011803F_____
2200 „	4	9	13	10	MKP1T012203C_____	5	11	13	10	MKP1U012203F_____
						5	11	18	15	MKP1U012204B_____
2700 „	4	9	13	10	MKP1T012703C_____	5	11	18	15	MKP1U012704B_____
3300 „	4	9	13	10	MKP1T013303C_____	5	11	18	15	MKP1U013304B_____
3900 „	5	11	13	10	MKP1T013903F_____	5	11	18	15	MKP1U013904B_____
4700 „	5	11	13	10	MKP1T014703F_____	5	11	18	15	MKP1U014704B_____
						6	15	26.5	22.5	MKP1U014705B_____
5600 „	6	12	13	10	MKP1T015603G_____	6	12.5	18	15	MKP1U015604C_____
6800 „	6	12	13	10	MKP1T016803G_____	6	12.5	18	15	MKP1U016804C_____
	5	11	18	15	MKP1T016804B_____	6	15	26.5	22.5	MKP1U016805B_____
6800 „	5	11	18	15	MKP1T018204B_____	7	14	18	15	MKP1U018204D_____
0.01 µF	5	11	18	15	MKP1T021004B_____	7	14	18	15	MKP1U021004D_____
						6	15	26.5	22.5	MKP1U021005B_____
0.012 „	6	12.5	18	15	MKP1T021204C_____	8	15	18	15	MKP1U021204F_____
0.015 „	6	12.5	18	15	MKP1T021504C_____	8	15	18	15	MKP1U021504F_____
	6	15	26.5	22.5	MKP1T021505B_____	6	15	26.5	22.5	MKP1U021505B_____
0.018 „	7	14	18	15	MKP1T022184D_____	9	16	18	15	MKP1U021804J_____
0.022 „	7	14	18	15	MKP1T022204D_____	9	16	18	15	MKP1U022204J_____
	6	15	26.5	22.5	MKP1T022205B_____	7	16.5	26.5	22.5	MKP1U022205D_____
0.027 „	8	15	18	15	MKP1T022704F_____	8.5	18.5	26.5	22.5	MKP1U022705F_____
0.033 „	8	15	18	15	MKP1T023304F_____	8.5	18.5	26.5	22.5	MKP1U023305F_____
	6	15	26.5	22.5	MKP1T023305B_____	9	19	31.5	27.5	MKP1U023306A_____
0.039 „	7	16.5	26.5	22.5	MKP1T023905D_____	10.5	19	26.5	22.5	MKP1U023905G_____
0.047 „	7	16.5	26.5	22.5	MKP1T024705D_____	10.5	19	26.5	22.5	MKP1U024705G_____
	9	19	31.5	27.5	MKP1T024706A_____	11	21	31.5	27.5	MKP1U024706B_____
0.056 „	10.5	19	26.5	22.5	MKP1T025605G_____	11	21	26.5	22.5	MKP1U025605I_____
0.068 „	10.5	19	26.5	22.5	MKP1T026805G_____	11	21	26.5	22.5	MKP1U026805I_____
	9	19	31.5	27.5	MKP1T026806A_____	11	21	31.5	27.5	MKP1U026806B_____
0.082 „	11	21	26.5	22.5	MKP1T028205I_____	13	24	31.5	27.5	MKP1U028206D_____

* AC voltage: $f \leqslant 1000$ Hz; $1.4 \times U_{rms} + UDC \leqslant U_r$

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

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Continuation

General Data

Capacitance	1600 VDC/650 VAC* W	H	L	PCM**	Part number	2000 VDC/700 VAC* W	H	L	PCM**	Part number
0.1 µF	11	21	26.5	22.5	MKP1T031005I_____	13	24	31.5	27.5	MKP1U031006D_____
	11	21	31.5	27.5	MKP1T031006B_____					
0.12 „	13	24	31.5	27.5	MKP1T031206D_____	15	26	31.5	27.5	MKP1U031206F_____
0.15 „	13	24	31.5	27.5	MKP1T031506D_____	15	26	31.5	27.5	MKP1U031506F_____
						13	24	41.5	37.5	MKP1U031507C_____
0.18 „	15	26	31.5	27.5	MKP1T031806F_____	17	34.5	31.5	27.5	MKP1U031806I_____
0.22 „	15	26	31.5	27.5	MKP1T032206F_____	17	34.5	31.5	27.5	MKP1U032206I_____
	13	24	41.5	37.5	MKP1T032207C_____	17	29	41.5	37.5	MKP1U032207E_____
0.27 „	17	34.5	31.5	27.5	MKP1T032706I_____	19	32	41.5	37.5	MKP1U032707F_____
0.33 „	17	34.5	31.5	27.5	MKP1T033306I_____	19	32	41.5	37.5	MKP1U033307F_____
	17	29	41.5	37.5	MKP1T033307E_____					
0.39 „	20	39.5	31.5	27.5	MKP1T033906J_____	20	39.5	41.5	37.5	MKP1U033907G_____
0.47 „	20	39.5	31.5	27.5	MKP1T034706J_____	20	39.5	41.5	37.5	MKP1U034707G_____
	19	32	41.5	37.5	MKP1T034707F_____					
0.56 „	20	39.5	41.5	37.5	MKP1T035607G_____	24	45.5	41.5	37.5	MKP1U035607H_____
0.68 „	20	39.5	41.5	37.5	MKP1T036807G_____	24	45.5	41.5	37.5	MKP1U036807H_____
						28	38	41.5	37.5	MKP1U036807L_____
0.82 „	24	45.5	41.5	37.5	MKP1T038207H_____	35	50	41.5	37.5	MKP1U038207J_____
1.0 µF	24	45.5	41.5	37.5	MKP1T041007H_____	35	50	41.5	37.5	MKP1U041007J_____
	28	38	41.5	37.5	MKP1T041007L_____					
1.2 „	31	46	41.5	37.5	MKP1T041207I_____	40	55	41.5	37.5	MKP1U041207K_____
1.5 „	31	46	41.5	37.5	MKP1T041507I_____	40	55	41.5	37.5	MKP1U041507K_____
						35	50	57	52.5	MKP1U041509F_____
1.8 „	40	55	41.5	37.5	MKP1T041807K_____	45	55	57	52.5	MKP1U041809H_____
2.2 „	40	55	41.5	37.5	MKP1T042207K_____	45	55	57	52.5	MKP1U042209H_____
	35	50	57	52.5	MKP1T042209F_____					
2.7 „	45	65	57	52.5	MKP1T042709J_____					
3.3 „	45	65	57	52.5	MKP1T043309J_____					

Capacitance	2500 VDC/700 VAC* W	H	L	PCM**	Part number
1000 pF	5	11	18	15	MKP1V011004B_____
	6	15	26.5	22.5	MKP1V011005B_____
1200 „	5	11	18	15	MKP1V011204B_____
1500 „	5	11	18	15	MKP1V011504B_____
	6	15	26.5	22.5	MKP1V011505B_____
1800 „	5	11	18	15	MKP1V011804B_____
2200 „	5	11	18	15	MKP1V012204B_____
	6	15	26.5	22.5	MKP1V012205B_____
2700 „	5	11	18	15	MKP1V012704B_____
3300 „	5	11	18	15	MKP1V013304B_____
	6	15	26.5	22.5	MKP1V013305B_____
3900 „	6	12.5	18	15	MKP1V013904C_____
4700 „	6	12.5	18	15	MKP1V014704C_____
	6	15	26.5	22.5	MKP1V014705B_____
5600 „	7	14	18	15	MKP1V015604D_____
6800 „	7	14	18	15	MKP1V016804D_____
	7	16.5	26.5	22.5	MKP1V016805D_____
8200 „	8.5	18.5	26.5	22.5	MKP1V018205F_____

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 157.

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

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Continuation

General Data

Capacitance	2500 VDC/700 VAC* W	H	L	PCM**	Part number	3000 VDC/700 VAC* W	H	L	PCM**	Part number
0.01 µF	8.5	18.5	26.5	22.5	MKP1V021005F_____	8.5	18.5	26.5	22.5	MKP1W021005F_____
0.012 „	10.5	19	26.5	22.5	MKP1V021205G_____	10.5	19	26.5	22.5	MKP1W021205G_____
0.015 „	10.5	19	26.5	22.5	MKP1V021505G_____	10.5	19	26.5	22.5	MKP1W021505G_____
0.018 „	11	21	26.5	22.5	MKP1V021805I_____	11	21	26.5	22.5	MKP1W021805I_____
0.022 „	11	21	26.5	22.5	MKP1V022205I_____	11	21	26.5	22.5	MKP1W022205I_____
0.027 „	11	21	26.5	22.5	MKP1V022705I_____	11	21	26.5	22.5	MKP1W022705I_____
0.033 „	11	21	26.5	22.5	MKP1V023305I_____	11	21	26.5	22.5	MKP1W023305I_____
	9	19	31.5	27.5	MKP1V023306A_____	9	19	31.5	27.5	MKP1W023306A_____
0.039 „	11	21	31.5	27.5	MKP1V023906B_____	11	21	31.5	27.5	MKP1W023906B_____
0.047 „	11	21	31.5	27.5	MKP1V024706B_____	11	21	31.5	27.5	MKP1W024706B_____
0.056 „	13	24	31.5	27.5	MKP1V025606D_____	13	24	31.5	27.5	MKP1W025606D_____
0.068 „	13	24	31.5	27.5	MKP1V026806D_____	13	24	31.5	27.5	MKP1W026806D_____
0.082 „	15	26	31.5	27.5	MKP1V028206F_____	15	26	31.5	27.5	MKP1W028206F_____
0.1 µF	15	26	31.5	27.5	MKP1V031006F_____	15	26	31.5	27.5	MKP1W031006F_____
	13	24	41.5	37.5	MKP1V031007C_____	13	24	41.5	37.5	MKP1W031007C_____
0.12 „	17	34.5	31.5	27.5	MKP1V031206I_____	17	34.5	31.5	27.5	MKP1W031206I_____
0.15 „	17	34.5	31.5	27.5	MKP1V031506I_____	17	34.5	31.5	27.5	MKP1W031506I_____
	15	26	41.5	37.5	MKP1V031507D_____	15	26	41.5	37.5	MKP1W031507D_____
0.18 „	19	32	41.5	37.5	MKP1V031807F_____	19	32	41.5	37.5	MKP1W031807F_____
0.22 „	19	32	41.5	37.5	MKP1V032207F_____	19	32	41.5	37.5	MKP1W032207F_____
0.27 „	24	45.5	41.5	37.5	MKP1V032707H_____	24	45.5	41.5	37.5	MKP1W032707H_____
0.33 „	24	45.5	41.5	37.5	MKP1V033307H_____	24	45.5	41.5	37.5	MKP1W033307H_____
	28	38	41.5	37.5	MKP1V033307L_____	28	38	41.5	37.5	MKP1W033307L_____
0.39 „	31	46	41.5	37.5	MKP1V033907I_____	31	46	41.5	37.5	MKP1W033907I_____
0.47 „	31	46	41.5	37.5	MKP1V034707I_____	31	46	41.5	37.5	MKP1W034707I_____
0.56 „	35	50	41.5	37.5	MKP1V035607J_____	35	50	41.5	37.5	MKP1W035607J_____
0.68 „	35	50	41.5	37.5	MKP1V036807J_____	35	50	41.5	37.5	MKP1W036807J_____
0.82 „	40	55	41.5	37.5	MKP1V038207K_____	40	55	41.5	37.5	MKP1W038207K_____
1.0 µF	40	55	41.5	37.5	MKP1V041007K_____	40	55	41.5	37.5	MKP1W041007K_____
	35	50	57	52.5	MKP1V041009F_____	35	50	57	52.5	MKP1W041009F_____
1.2 „	45	55	57	52.5	MKP1V041209H_____	45	55	57	52.5	MKP1W041209H_____
1.5 „	45	55	57	52.5	MKP1V041509H_____	45	55	57	52.5	MKP1W041509H_____

* AC voltage: $f \leqslant 1000$ Hz; $1.4 \times U_{rms} + UDC \leqslant U_r$

** PCM = Printed circuit module = pin spacing

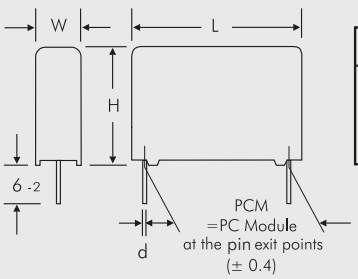
Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

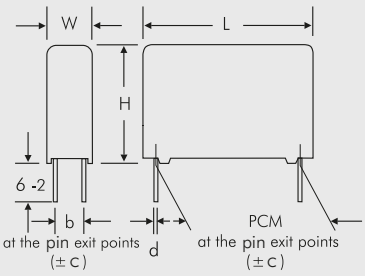
Taped version see page 157.

2-pin version



Ø d	PCM
0.6	7.5 -10
0.8	15 - 27.5
1.0	37.5

4-pin version



W	PCM	b	Ø d	c
17	37.5	10	1.0	0.4
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
28	37.5	10	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
40	37.5	20	1.0	0.4
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

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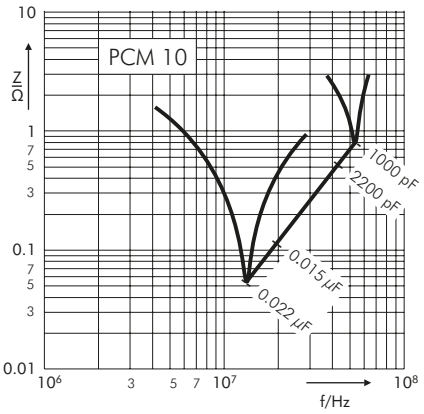
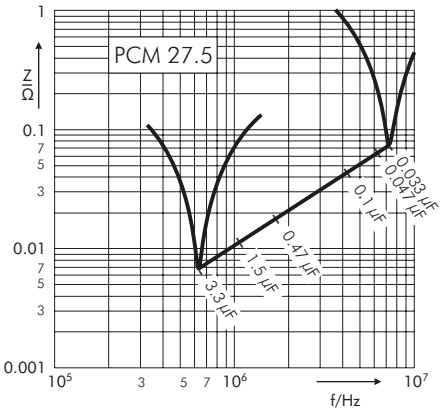
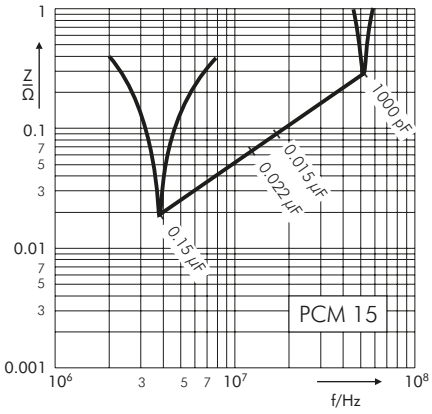
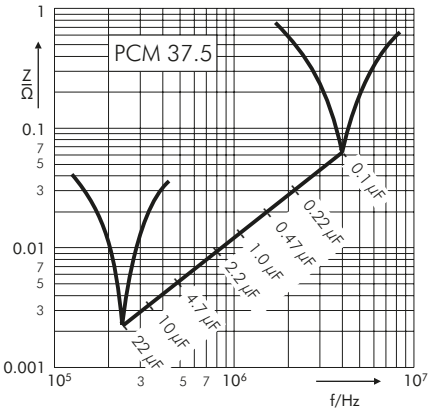
Continuation

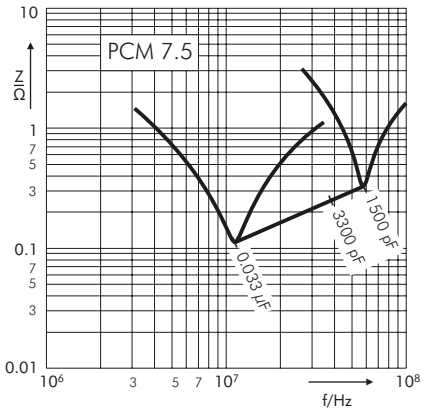
Impedance change with frequency (general guide).

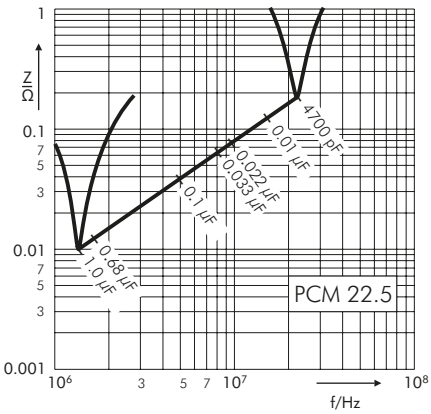


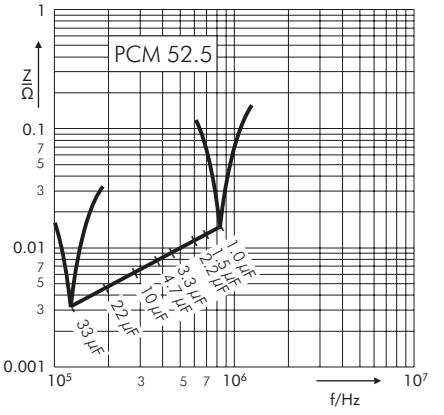












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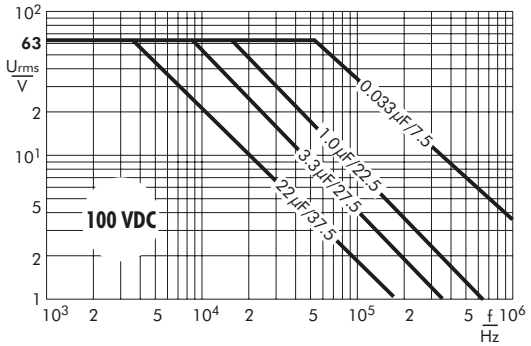
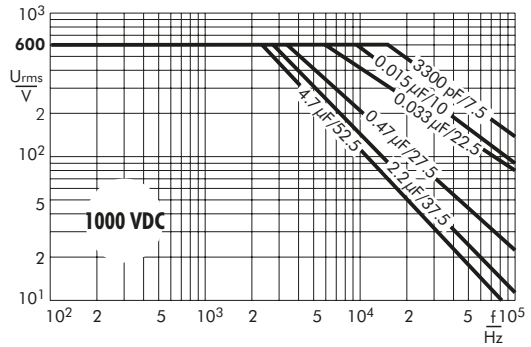
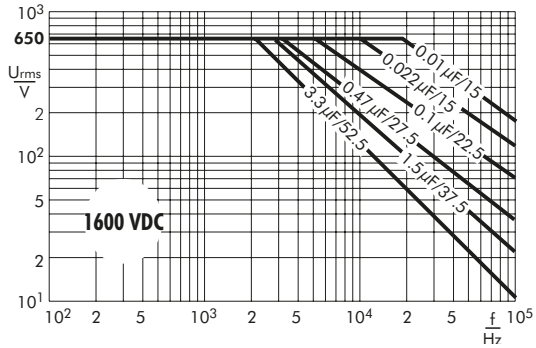
Continuation

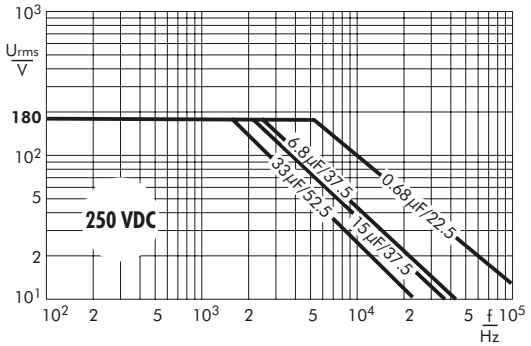
Permissible AC voltage in relation to frequency till 15° C internal temperature rise (general guide).

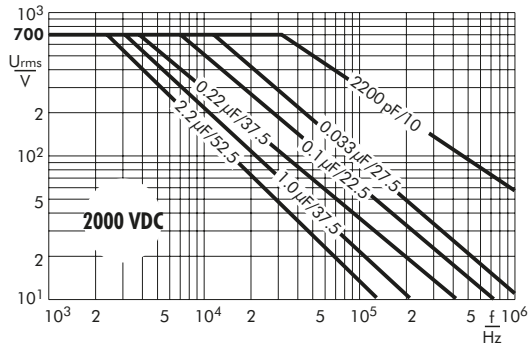
The information behind the cross bar denote the PCM of the measured value.

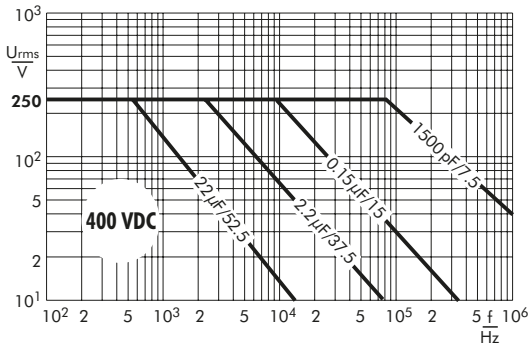


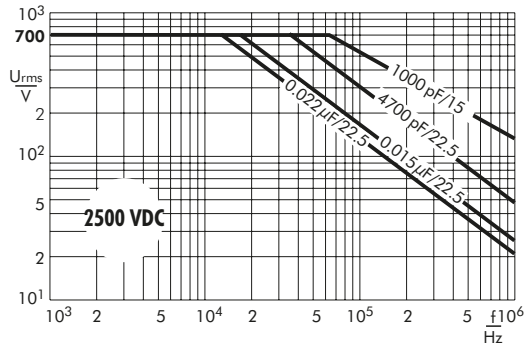


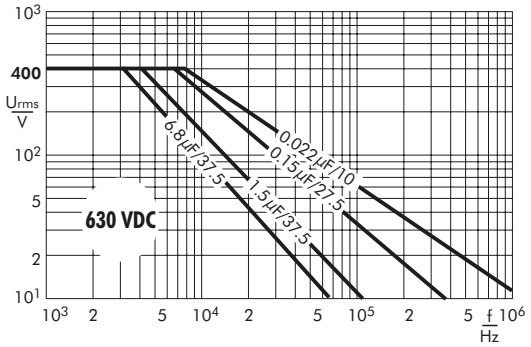


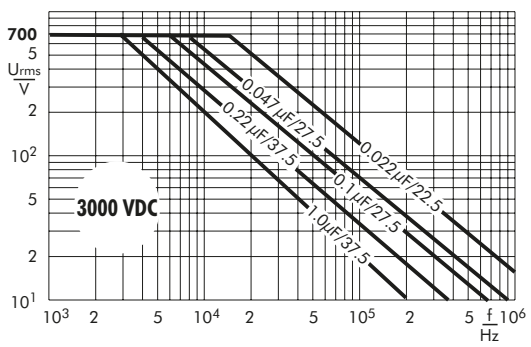












Continuation page 77

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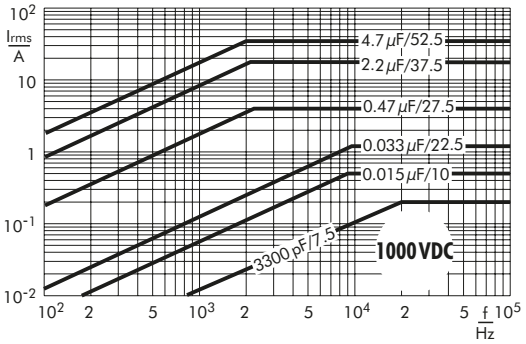
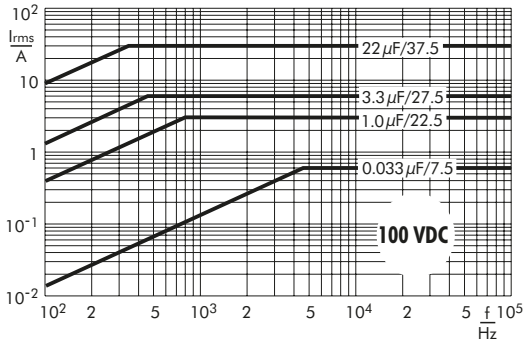
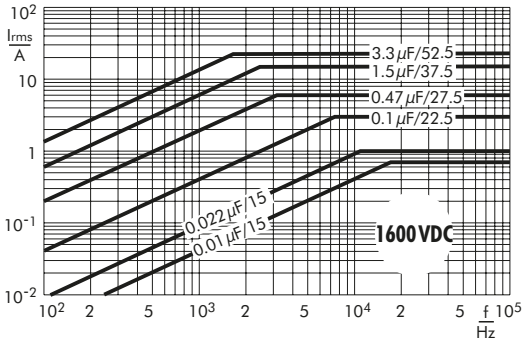
Continuation

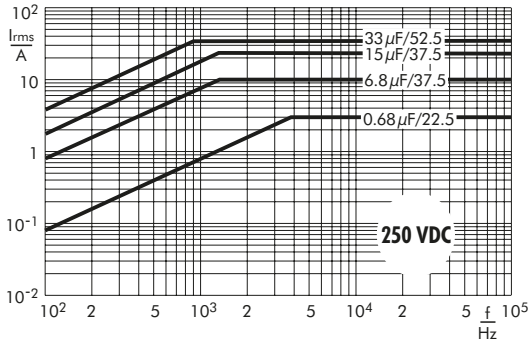
Permissible AC current in relation to frequency till 15° C internal temperature rise (general guide).

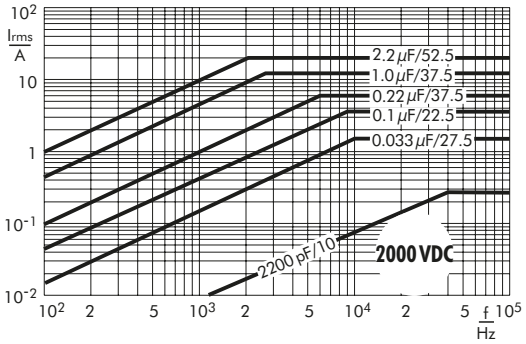
The information behind the cross bar denote the PCM of the measured value.

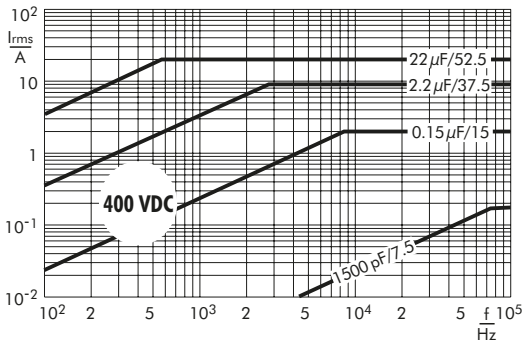


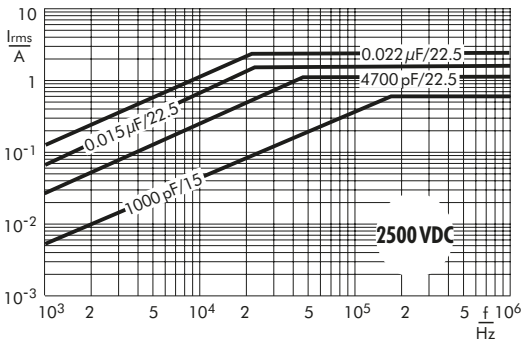


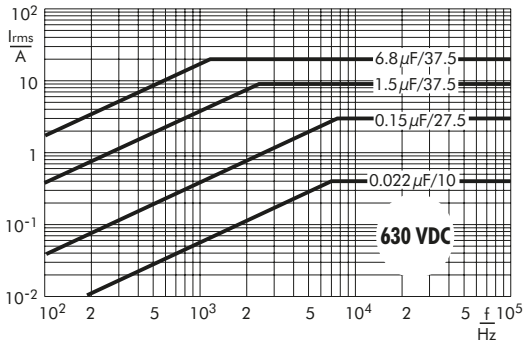


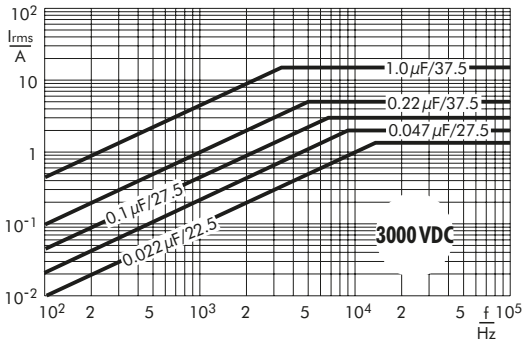












WIMA FKP 4

Polypropylene (PP) Capacitors for High Pulse Applications with Metal Foil Electrodes and Metallized Internal Series Connection in PCM 15 mm to 37.5 mm. Capacitances from 100 pF to 4.7 µF. Rated Voltages from 400 VDC to 2000 VDC.

Special Features

- **High pulse duty**
- **Self-healing**
- **Internal series connection**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **Smaller box sizes than FKP 1**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2015/863/EU**

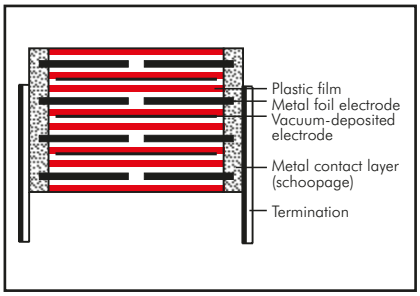
Typical Applications

For high pulse and high frequency applications e.g.

- **Switch mode power supplies**
- **Converter in drives and power electronics**
- **Deflection systems in monitors and TV-sets**
- **Electronic ballasts**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Aluminium foil and single-sided metallized plastic film
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
100 pF to 4.7 µF (E12-values on request)
Rated voltages:
400 VDC, 630 VDC, 1000 VDC, 1250 VDC, 1600 VDC, 2000 VDC
Capacitance tolerances:
±20%, ±10%, ±5% (other tolerances are available subject to special enquiry)
Operating temperature range:
–55° C to +105° C
Climatic test category:
55/100/56 in accordance with IEC
Insulation resistance at +20° C:
C ⩽ 0.1 µF: ⩾ 1 x 10^5 MΩ
C > 0.1 µF: ⩾ 10 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Dissipation factors at +20° C: tan δ

at f	C⩽0.1 µF	0.1 µF < C ⩽ 1.0 µF	C>1.0 µF
1 kHz	⩽ 5x10^{-4}	⩽5x10^{-4}	⩽ 5x10^{-4}
10 kHz	⩽ 6x10^{-4}	⩽6x10^{-4}	–
100 kHz	⩽10x10^{-4}	–	–

Test voltage: 2 U_r, 2 sec.
Dielectric absorption:
0.05 %
Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300 000 hours
Failure rate < 1 fit (0.5 x U_r and 40° C)

Maximum pulse rise time:

Capacitance pF/µF	max. pulse rise time V/µsec at T_A < 40° C					
	400 VDC	630 VDC	1000 VDC	1250 VDC	1600 VDC	2000 VDC
100 ... 220	–	–	–	–	–	39000
330 ... 680	–	–	–	–	–	39000
1000 ... 2200	–	–	–	–	27000	39000
3300 ... 6800	–	–	–	–	17000	21000
0.01 ... 0.022	7000	11000	11000	11000	11000	11000
0.033 ... 0.068	7000	9000	9000	9000	9000	9000
0.1 ... 0.22	6000	9000	9000	9000	9000	9000
0.33 ... 0.68	3000	5000	5000	5000	5000	5000
1.0 ... 4.7	1000	1600	2000	2000	2000	–

Mechanical Tests

Pull test on pins:
d ⩽ 0.8 Ø: 10 N in direction of pins
d > 0.8 Ø: 20 N in direction of pins
according to IEC 60068-2-21
Vibration:
6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2
in accordance with IEC 60068-2-29

Packing

Available taped and reeled up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

04.23

Continuation

General Data

Capacitance	400 VDC/250 VAC* W	H	L	PCM**	Part number	630 VDC/400 VAC* W	H	L	PCM**	Part number
0.01 µF	5	11	18	15	FKP4G021004B00____	5	11	18	15	FKP4J021004B00____
0.015 „	5	11	18	15	FKP4G021504B00____	6	12.5	18	15	FKP4J021504C00____
0.022 „	6	12.5	18	15	FKP4G022204C00____	7	14	18	15	FKP4J022204D00____
0.033 „	7	14	18	15	FKP4G023304D00____	8	15	18	15	FKP4J023304F00____
						6	15	26.5	22.5	FKP4J023305B00____
0.047 „	8	15	18	15	FKP4G024704F00____	9	16	18	15	FKP4J024704J00____
	6	15	26.5	22.5	FKP4G024705B00____	7	16.5	26.5	22.5	FKP4J024705D00____
0.068 „	7	16.5	26.5	22.5	FKP4G026805D00____	8.5	18.5	26.5	22.5	FKP4J026805F00____
0.1 µF	8.5	18.5	26.5	22.5	FKP4G031005F00____	10.5	19	26.5	22.5	FKP4J031005G00____
						11	21	31.5	27.5	FKP4J031006B00____
0.15 „	11	21	26.5	22.5	FKP4G031505I00____	11	21	26.5	22.5	FKP4J031505I00____
	9	19	31.5	27.5	FKP4G031506A00____	11	21	31.5	27.5	FKP4J031506B00____
0.22 „	11	21	31.5	27.5	FKP4G032206B00____	13	24	31.5	27.5	FKP4J032206D00____
0.33 „	13	24	31.5	27.5	FKP4G033306D00____	15	26	31.5	27.5	FKP4J033306F00____
0.47 „	17	29	31.5	27.5	FKP4G034706G00____	17	34.5	31.5	27.5	FKP4J034706I00____
0.68 „	17	34.5	31.5	27.5	FKP4G036806I00____	17	34.5	31.5	27.5	FKP4J036806I00____
						19	32	41.5	37.5	FKP4J036807F00____
1.0 µF	20	39.5	31.5	27.5	FKP4G041006J00____	20	39.5	41.5	37.5	FKP4J041007G00____
1.5 „	20	39.5	41.5	37.5	FKP4G041507G00____	24	45.5	41.5	37.5	FKP4J041507H00____
2.2 „	24	45.5	41.5	37.5	FKP4G042207H00____	31	46	41.5	37.5	FKP4J042207I00____
3.3 „	31	46	41.5	37.5	FKP4G043307I00____	40	55	41.5	37.5	FKP4J043307K00____
4.7 „	40	55	41.5	37.5	FKP4G044707K00____					

Capacitance	1000 VDC/600 VAC* W	H	L	PCM**	Part number	1250 VDC/600 VAC* W	H	L	PCM**	Part number
0.01 µF	6	12.5	18	15	FKP4O121004C00____	9	16	18	15	FKP4R021004J00____
	5	14	26.5	22.5	FKP4O121005A00____	6	15	26.5	22.5	FKP4R021005B00____
0.015 „	7	14	18	15	FKP4O121504D00____	7	16.5	26.5	22.5	FKP4R021505D00____
	6	15	26.5	22.5	FKP4O121505B00____					
0.022 „	8	15	18	15	FKP4O122204F00____	8.5	18.5	26.5	22.5	FKP4R022205F00____
	6	15	26.5	22.5	FKP4O122205B00____					
0.033 „	7	16.5	26.5	22.5	FKP4O123305D00____	10.5	19	26.5	22.5	FKP4R023305G00____
						9	19	31.5	27.5	FKP4R023306A00____
0.047 „	8.5	18.5	26.5	22.5	FKP4O124705F00____	11	21	31.5	27.5	FKP4R024706B00____
	9	19	31.5	27.5	FKP4O124706A00____					
0.068 „	11	21	26.5	22.5	FKP4O126805I00____	13	24	31.5	27.5	FKP4R026806D00____
	9	19	31.5	27.5	FKP4O126806A00____					
0.1 µF	11	21	31.5	27.5	FKP4O131006B00____	15	26	31.5	27.5	FKP4R031006F00____
0.15 „	13	24	31.5	27.5	FKP4O131506D00____	15	26	31.5	27.5	FKP4R031506F00____
0.22 „	15	26	31.5	27.5	FKP4O132206F00____	20	39.5	31.5	27.5	FKP4R032206J00____
						17	29	41.5	37.5	FKP4R032207E00____
0.33 „	17	34.5	31.5	27.5	FKP4O133306I00____	19	32	41.5	37.5	FKP4R033307F00____
	19	32	41.5	37.5	FKP4O133307F00____					
0.47 „	20	39.5	41.5	37.5	FKP4O134707G00____	20	39.5	41.5	37.5	FKP4R034707G00____
0.68 „	24	45.5	41.5	37.5	FKP4O136807H00____	24	45.5	41.5	37.5	FKP4R036807H00____
1.0 µF	31	46	41.5	37.5	FKP4O141007I00____	31	46	41.5	37.5	FKP4R041007I00____
1.5 „	35	50	41.5	37.5	FKP4O141507J00____	35	50	41.5	37.5	FKP4R041507J00____
2.2 „	35	50	41.5	37.5	FKP4O142207J00____					

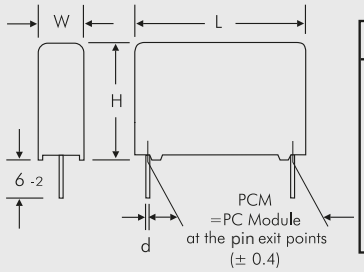
* AC voltage: f = 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module
= pin spacing

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Ø d	PCM
0.8	15 - 27.5
1.0	37.5



Part number completion:

Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 157.

Continuation page 80

Continuation

General Data

Capacitance	1600 VDC/650 VAC* W	H	L	PCM**	Part number	2000 VDC/700 VAC* W	H	L	PCM**	Part number
100 pF						5	11	18	15	FKP4U001004B00____
150 „						5	11	18	15	FKP4U001504B00____
220 „						5	11	18	15	FKP4U002204B00____
330 „						5	11	18	15	FKP4U003304B00____
470 „						5	11	18	15	FKP4U004704B00____
680 „						5	11	18	15	FKP4U006804B00____
1000 pF	5	11	18	15	FKP4T011004B00____	5	11	18	15	FKP4U011004B00____
1500 „	5	11	18	15	FKP4T011504B00____	6	12.5	18	15	FKP4U011504C00____
2200 „	6	12.5	18	15	FKP4T012204C00____	7	14	18	15	FKP4U012204D00____
3300 „	7	14	18	15	FKP4T013304D00____	9	16	18	15	FKP4U013304J00____
						6	15	26.5	22.5	FKP4U013305B00____
4700 „	8	15	18	15	FKP4T014704F00____	7	16.5	26.5	22.5	FKP4U014705D00____
6800 „	9	16	18	15	FKP4T016804J00____	8.5	18.5	26.5	22.5	FKP4U016805F00____
0.01 µF	6	15	26.5	22.5	FKP4T021005B00____	10.5	19	26.5	22.5	FKP4U021005G00____
0.015 „	8.5	18.5	26.5	22.5	FKP4T021505F00____	11	21	26.5	22.5	FKP4U021505I00____
						9	19	31.5	27.5	FKP4U021506A00____
0.022 „	10.5	19	26.5	22.5	FKP4T022205H00____	11	21	31.5	27.5	FKP4U022206B00____
	9	19	31.5	27.5	FKP4T022206A00____	11	22	41.5	37.5	FKP4U022207B00____
0.033 „	11	21	31.5	27.5	FKP4T023306B00____	13	24	31.5	27.5	FKP4U023306D00____
0.047 „	13	24	31.5	27.5	FKP4T024706D00____	15	26	31.5	27.5	FKP4U024706F00____
						15	26	41.5	37.5	FKP4U024707D00____
0.068 „	15	26	31.5	27.5	FKP4T026806F00____	17	34.5	31.5	27.5	FKP4U026806I00____
						17	29	41.5	37.5	FKP4U026807E00____
0.1 µF	17	34.5	31.5	27.5	FKP4T031006I00____	17	29	41.5	37.5	FKP4U031007E00____
0.15 „	20	39.5	31.5	27.5	FKP4T031506J00____	20	39.5	41.5	37.5	FKP4U031507G00____
	19	32	41.5	37.5	FKP4T031507F00____					
0.22 „	20	39.5	41.5	37.5	FKP4T032207G00____	24	45.5	41.5	37.5	FKP4U032207H00____
0.33 „	24	45.5	41.5	37.5	FKP4T033307H00____	31	46	41.5	37.5	FKP4U033307I00____
0.47 „	31	46	41.5	37.5	FKP4T034707I00____	31	46	41.5	37.5	FKP4U034707I00____
0.68 „	35	50	41.5	37.5	FKP4T036807J00____	35	50	41.5	37.5	FKP4U036807J00____
1.0 µF	40	55	41.5	37.5	FKP4T041007K00____					

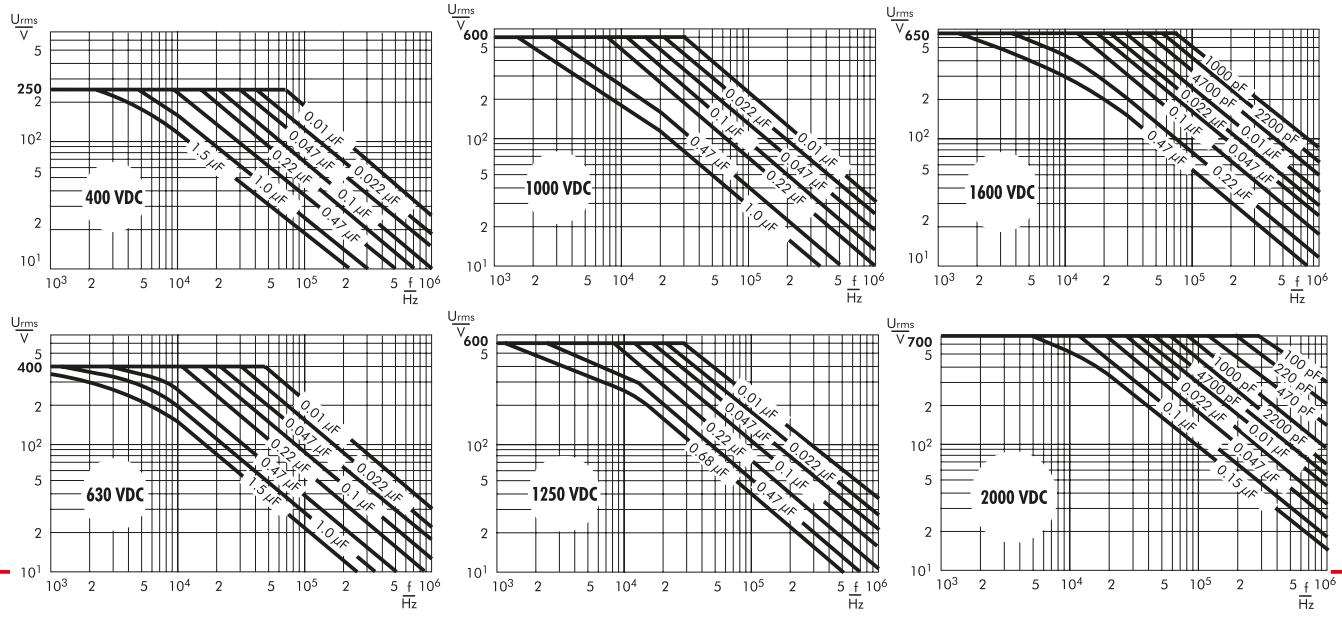
* AC voltage: f = 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Dims. in mm.

Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).



WIMA FKP 1

Polypropylene (PP) Capacitors for Very High Pulse Applications with Metal Foil Electrodes and Metallized Internal Series Connection in PCM 15 mm to 52.5 mm. Capacitances from 100 pF to 4.7 µF. Rated Voltages from 400 VDC to 6000 VDC.

Special Features

- **Extremely high pulse duty**
- **Self-healing**
- **Internal series connection**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2015/863/EU**

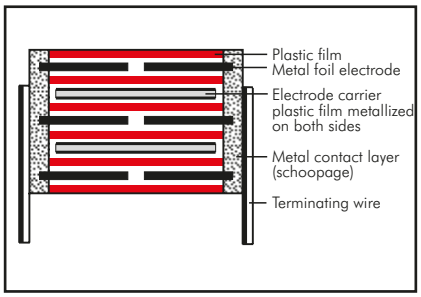
Typical Applications

For high pulse and high frequency applications e.g.

- **Switch mode power supplies**
- **Converters in drives and power electronics**
- **Deflection systems in monitors and TV-sets**
- **Electronic ballasts**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Aluminium foil and double-sided metallized plastic film
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
100 pF to 4.7 µF (E12-values on request)
Rated voltages:
400 VDC, 630 VDC, 1000 VDC, 1250 VDC, 1600 VDC, 2000 VDC, 4000 VDC, 6000 VDC
Capacitance tolerances:
±20%, ±10%, ±5% (other tolerances are available subject to special enquiry)
Operating temperature range:
–55° C to +105° C
Climatic test category:
55/100/56 in accordance with IEC
Test voltage: 2 sec

Dielectric absorption: 0.05 %
Insulation resistance at +20° C:
C ⩽ 0.1 µF: ⩾ 1 x 10^5 MΩ
C > 0.1 µF: ⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages
Reliability:
Operational life > 300 000 hours
Failure rate < 1 fit (0.5 x U_r and 40° C)

PCM	< 4000 VDC	4000 VDC	6000 VDC
< 37.5	2 U_r	2 U_r	1.6 U_r
⩾ 37.5	2 U_r	1.6 U_r	1.2 U_r

Dissipation factors at +20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 5x10^{-4}	⩽ 5x10^{-4}	⩽ 5x10^{-4}
10 kHz	⩽ 6x10^{-4}	⩽ 6x10^{-4}	–
100 kHz	⩽ 10x10^{-4}	–	–

Maximum pulse rise time:

Capacitance pF/µF	max. pulse rise time V/µsec at T_A < 40° C							
	400VDC	630VDC	1000VDC	1250VDC	1600VDC	2000VDC	4000VDC	6000VDC
100 ... 220	–	–	–	–	56000	56000	–	–
330 ... 680	–	–	–	–	51000	56000	56000	56000
1000 ... 2200	29000	29000	29000	29000	46000	51000	51000	51000
3300 ... 6800	9000	14000	27000	29000	29000	29000	29000	29000
0.01 ... 0.022	9000	11000	11000	11000	11000	13000	13000	13000
0.033... 0.068	9000	11000	11000	11000	11000	11000	13000	13000
0.1 ... 0.22	7000	11000	11000	11000	11000	11000	13000	13000
0.33 ... 0.68	6000	10000	11000	11000	11000	11000	–	–
1.0 ... 2.2	5000	6600	8300	9500	11000	–	–	–
3.3 ... 4.7	2500	–	–	–	–	–	–	–

Mechanical Tests

Pull test on pins:
d ⩽ 0.8 Ø: 10 N in direction of pins
d > 0.8 Ø: 20 N in direction of pins
according to IEC 60068-2-21
Vibration:
6 hours at 10...2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2
in accordance with IEC 60068-2-29

Packing

Available taped and reeled up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	400 VDC/250 VAC*					630 VDC/400 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	5	11	18	15	FKP1G011004B_____	5	11	18	15	FKP1J011004B_____
1500 „	5	11	18	15	FKP1G011504B_____	5	11	18	15	FKP1J011504B_____
2200 „	5	11	18	15	FKP1G012204B_____	5	11	18	15	FKP1J012204B_____
3300 „	5	11	18	15	FKP1G013304B_____	5	11	18	15	FKP1J013304B_____
4700 „	5	11	18	15	FKP1G014704B_____	5	11	18	15	FKP1J014704B_____
6800 „	5	11	18	15	FKP1G016804B_____	6	12.5	18	15	FKP1J016804C_____
0.01 µF	5	11	18	15	FKP1G021004B_____	7	14	18	15	FKP1J021004D_____
						5	14	26.5	22.5	FKP1J021005A_____
0.015 „	6	12.5	18	15	FKP1G021504C_____	8	15	18	15	FKP1J021504F_____
						6	15	26.5	22.5	FKP1J021505B_____
0.022 „	7	14	18	15	FKP1G022204D_____	7	16.5	26.5	22.5	FKP1J022205D_____
	5	14	26.5	22.5	FKP1G022205A_____					
0.033 „	8	15	18	15	FKP1G023304F_____	8.5	18.5	26.5	22.5	FKP1J023305F_____
	6	15	26.5	22.5	FKP1G023305B_____					
0.047 „	7	16.5	26.5	22.5	FKP1G024705D_____	10.5	20.5	26.5	22.5	FKP1J024705H_____
						9	19	31.5	27.5	FKP1J024706A_____
0.068 „	8.5	18.5	26.5	22.5	FKP1G026805F_____	11	21	31.5	27.5	FKP1J026806B_____
						9	19	41.5	37.5	FKP1J026807A_____
0.1 µF	10.5	20.5	26.5	22.5	FKP1G031005H_____	13	24	31.5	27.5	FKP1J031006D_____
	9	19	31.5	27.5	FKP1G031006A_____	11	22	41.5	37.5	FKP1J031007B_____
0.15 „	11	21	31.5	27.5	FKP1G031506B_____	13	24	41.5	37.5	FKP1J031507C_____
0.22 „	13	24	31.5	27.5	FKP1G032206D_____	15	26	41.5	37.5	FKP1J032207D_____
	11	22	41.5	37.5	FKP1G032207B_____					
0.33 „	13	24	41.5	37.5	FKP1G033307C_____	19	32	41.5	37.5	FKP1J033307F_____
0.47 „	17	29	41.5	37.5	FKP1G034707E_____	20	39.5	41.5	37.5	FKP1J034707G_____
0.68 „	19	32	41.5	37.5	FKP1G036807F_____	24	45.5	41.5	37.5	FKP1J036807H_____
1.0 µF	20	39.5	41.5	37.5	FKP1G041007G_____	35	50	41.5	37.5	FKP1J041007J_____
1.5 „	31	46	41.5	37.5	FKP1G041507I_____	40	55	41.5	37.5	FKP1J041507K_____
						35	50	57	52.5	FKP1J041509F_____
2.2 „	35	50	41.5	37.5	FKP1G042207J_____	45	55	57	52.5	FKP1J042209H_____
3.3 „	35	50	57	52.5	FKP1G043309F_____					
4.7 „	45	65	57	52.5	FKP1G044709J_____					

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completeion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 157.

Continuation page 83

Continuation

General Data

Capacitance	1000 VDC/600 VAC* W	H	L	PCM**	Part number
1000 pF	5	11	18	15	FKP1O111004B_____
1500 „	5	11	18	15	FKP1O111504B_____
2200 „	5	11	18	15	FKP1O112204B_____
3300 „	5	11	18	15	FKP1O113304B_____
4700 „	6	12.5	18	15	FKP1O114704C_____
6800 „	7	14	18	15	FKP1O116804D_____
0.01 µF	8	15	18	15	FKP1O121004F_____
	6	15	26.5	22.5	FKP1O121005B_____
0.015 „	6	15	26.5	22.5	FKP1O121505B_____
0.022 „	8.5	18.5	26.5	22.5	FKP1O122205F_____
0.033 „	10.5	20.5	26.5	22.5	FKP1O123305H_____
	9	19	31.5	27.5	FKP1O123306A_____
0.047 „	11	21	31.5	27.5	FKP1O124706B_____
0.068 „	13	24	31.5	27.5	FKP1O126806D_____
	11	22	41.5	37.5	FKP1O126807B_____
0.1 µF	13	24	41.5	37.5	FKP1O131007C_____
0.15 „	15	26	41.5	37.5	FKP1O131507D_____
0.22 „	19	32	41.5	37.5	FKP1O132207F_____
0.33 „	20	39.5	41.5	37.5	FKP1O133307G_____
0.47 „	31	46	41.5	37.5	FKP1O134707I_____
0.68 „	35	50	41.5	37.5	FKP1O136807J_____
1.0 µF	40	55	41.5	37.5	FKP1O141007K_____
	35	50	57	52.5	FKP1O141009F_____
1.5 „	45	55	57	52.5	FKP1O141509H_____
2.2 „	45	65	57	52.5	FKP1O142209J_____

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

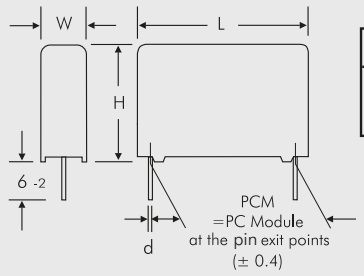
Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

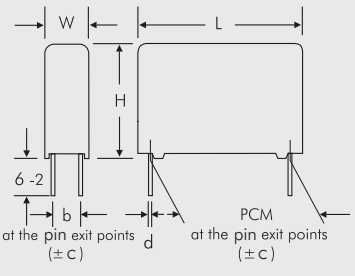
Taped version see page 157.

2-pin version



Ø d	PCM
0.8	15 - 27.5
1.0	37.5

4-pin version



W	PCM	b	Ø d	c
17	37.5	10	1.0	0.4
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
40	37.5	20	1.0	0.4
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Continuation page 84

Continuation

General Data

Capacitance	1250 VDC/600 VAC* W	H	L	PCM**	Part number	1600 VDC/650 VAC* W	H	L	PCM**	Part number
100 pF						5	11	18	15	FKP1T001004B_____
150 „						5	11	18	15	FKP1T001504B_____
220 „						5	11	18	15	FKP1T002204B_____
330 „						5	11	18	15	FKP1T003304B_____
470 „						5	11	18	15	FKP1T004704B_____
680 „						5	11	18	15	FKP1T006804B_____
1000 pF	5	11	18	15	FKP1R011004B_____	6	12.5	18	15	FKP1T011004C_____
						5	14	26.5	22.5	FKP1T011005A_____
1500 „	5	11	18	15	FKP1R011504B_____	7	14	18	15	FKP1T011504D_____
						5	14	26.5	22.5	FKP1T011505A_____
2200 „	5	11	18	15	FKP1R012204B_____	8	15	18	15	FKP1T012204F_____
						5	14	26.5	22.5	FKP1T012205A_____
3300 „	6	12.5	18	15	FKP1R013304C_____	6	15	26.5	22.5	FKP1T013305B_____
4700 „	7	14	18	15	FKP1R014704D_____	7	16.5	26.5	22.5	FKP1T014705D_____
6800 „	8	15	18	15	FKP1R016804F_____	8.5	18.5	26.5	22.5	FKP1T016805F_____
	5	14	26.5	22.5	FKP1R016805A_____					
0.01 µF	7	16.5	26.5	22.5	FKP1R021005D_____	10.5	20.5	26.5	22.5	FKP1T021005H_____
0.015 „	8.5	18.5	26.5	22.5	FKP1R021505F_____	11	21	31.5	27.5	FKP1T021506B_____
0.022 „	10.5	20.5	26.5	22.5	FKP1R022205H_____	11	21	31.5	27.5	FKP1T022206B_____
0.033 „	11	21	31.5	27.5	FKP1R023306B_____	13	24	31.5	27.5	FKP1T023306D_____
	9	19	41.5	37.5	FKP1R023307A_____	13	24	41.5	37.5	FKP1T023307C_____
0.047 „	13	24	31.5	27.5	FKP1R024706D_____	13	24	41.5	37.5	FKP1T024707C_____
	11	22	41.5	37.5	FKP1R024707B_____					
0.068 „	11	22	41.5	37.5	FKP1R026807B_____	15	26	41.5	37.5	FKP1T026807D_____
0.1 µF	15	26	41.5	37.5	FKP1R031007D_____	17	29	41.5	37.5	FKP1T031007E_____
0.15 „	17	29	41.5	37.5	FKP1R031507E_____	20	39.5	41.5	37.5	FKP1T031507G_____
0.22 „	19	32	41.5	37.5	FKP1R032207F_____	24	45.5	41.5	37.5	FKP1T032207H_____
0.33 „	24	45.5	41.5	37.5	FKP1R033307H_____	31	46	41.5	37.5	FKP1T033307I_____
0.47 „	31	46	41.5	37.5	FKP1R034707I_____	40	55	41.5	37.5	FKP1T034707K_____
0.68 „	40	55	41.5	37.5	FKP1R036807K_____	35	50	57	52.5	FKP1T036809F_____
1.0 µF	35	50	57	52.5	FKP1R041009F_____	45	55	57	52.5	FKP1T041009H_____
1.5 „	45	65	57	52.5	FKP1R041509J_____					

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 157.

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Continuation

General Data

Capacitance	2000 VDC/700 VAC* W	H	L	PCM**	Part number	4000 VDC/700 VAC* W	H	L	PCM**	Part number
100 pF	5	11	18	15	FKP1U001004B_____					
150 „	5	11	18	15	FKP1U001504B_____					
220 „	5	11	18	15	FKP1U002204B_____					
330 „	6	12.5	18	15	FKP1U003304C_____					
470 „	6	12.5	18	15	FKP1U004704C_____	5	14	26.5	22.5	FKP1X004705A_____
680 „	6	12.5	18	15	FKP1U006804C_____	5	14	26.5	22.5	FKP1X006805A_____
1000 pF	7	14	18	15	FKP1U011004D_____	5	14	26.5	22.5	FKP1X011005A_____
	5	14	26.5	22.5	FKP1U011005A_____					
1500 „	6	15	26.5	22.5	FKP1U011505B_____	7	16.5	26.5	22.5	FKP1X011505D_____
2200 „	7	16.5	26.5	22.5	FKP1U012205D_____	8.5	18.5	26.5	22.5	FKP1X012205F_____
3300 „	7	16.5	26.5	22.5	FKP1U013305D_____	10.5	20.5	26.5	22.5	FKP1X013305H_____
4700 „	8.5	18.5	26.5	22.5	FKP1U014705F_____	11	21	31.5	27.5	FKP1X014706B_____
6800 „	10.5	20.5	26.5	22.5	FKP1U016805H_____	13	24	31.5	27.5	FKP1X016806D_____
0.01 µF	11	21	31.5	27.5	FKP1U021006B_____	15	26	31.5	27.5	FKP1X021006F_____
0.015 „	13	24	31.5	27.5	FKP1U021506D_____	13	24	41.5	37.5	FKP1X021507C_____
0.022 „	15	26	31.5	27.5	FKP1U022206F_____	17	29	41.5	37.5	FKP1X022207E_____
	13	24	41.5	37.5	FKP1U022207C_____					
0.033 „	13	24	41.5	37.5	FKP1U023307C_____	20	39.5	41.5	37.5	FKP1X023307G_____
0.047 „	17	29	41.5	37.5	FKP1U024707E_____	24	45.5	41.5	37.5	FKP1X024707H_____
0.068 „	19	32	41.5	37.5	FKP1U026807F_____	31	46	41.5	37.5	FKP1X026807I_____
0.1 µF	20	39.5	41.5	37.5	FKP1U031007G_____	35	50	41.5	37.5	FKP1X031007J_____
0.15 „	24	45.5	41.5	37.5	FKP1U031507H_____	40	55	41.5	37.5	FKP1X031507K_____
0.22 „	35	50	41.5	37.5	FKP1U032207J_____	45	55	57	52.5	FKP1X032209H_____
0.33 „	40	55	41.5	37.5	FKP1U033307K_____					
0.47 „	45	55	57	52.5	FKP1U034709H_____					
0.68 „	45	65	57	52.5	FKP1U036809J_____					

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

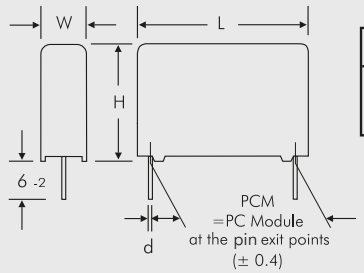
Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

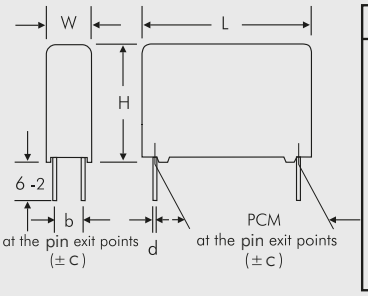
Taped version see page 157.

2-pin version



Ø d	PCM
0.8	15 - 27.5
1.0	37.5

4-pin version



W	PCM	b	Ø d	c
17	37.5	10	1.0	0.4
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
40	37.5	20	1.0	0.4
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

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Continuation

General Data

Capacitance	6000 VDC/700 VAC* W	H	L	PCM**	Part number
470 pF	5	14	26.5	22.5	FKP1Y004705A_____
680 „	5	14	26.5	22.5	FKP1Y006805A_____
1000 pF	5	14	26.5	22.5	FKP1Y011005A_____
1500 „	7	16.5	26.5	22.5	FKP1Y011505D_____
2200 „	10.5	20.5	26.5	22.5	FKP1Y012205H_____
3300 „	10.5	20.5	26.5	22.5	FKP1Y013305H_____
4700 „	11	21	31.5	27.5	FKP1Y014706B_____
6800 „	13	24	31.5	27.5	FKP1Y016806D_____
0.01 µF	15	26	31.5	27.5	FKP1Y021006F_____
0.015 „	13	24	41.5	37.5	FKP1Y021507C_____
0.022 „	17	29	41.5	37.5	FKP1Y022207E_____
0.033 „	20	39.5	41.5	37.5	FKP1Y023307G_____
0.047 „	24	45.5	41.5	37.5	FKP1Y024707H_____
0.068 „	31	46	41.5	37.5	FKP1Y026807I_____
0.1 µF	35	50	41.5	37.5	FKP1Y031007J_____
0.15 „	40	55	41.5	37.5	FKP1Y031507K_____
0.22 „	45	55	57	52.5	FKP1Y032209H_____

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

** PCM = Printed circuit module = pin spacing

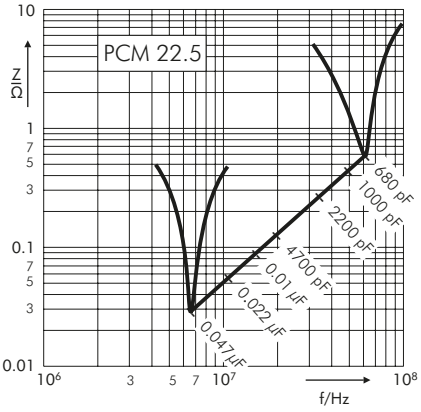
Dims. in mm.

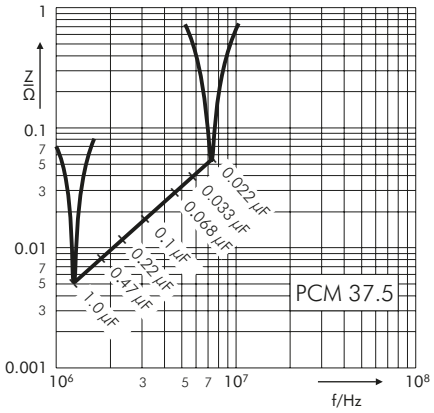
Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

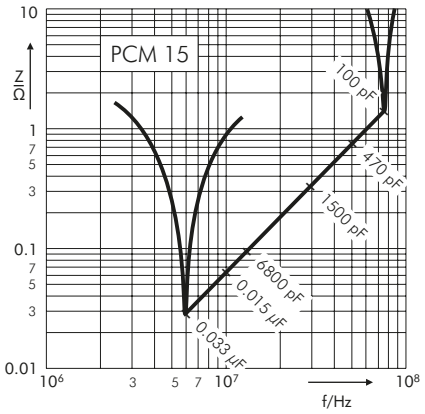
Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

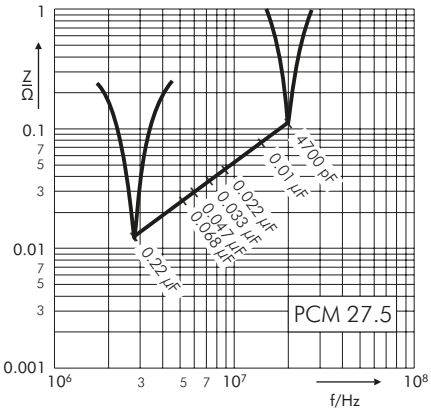
Taped version see page 157.

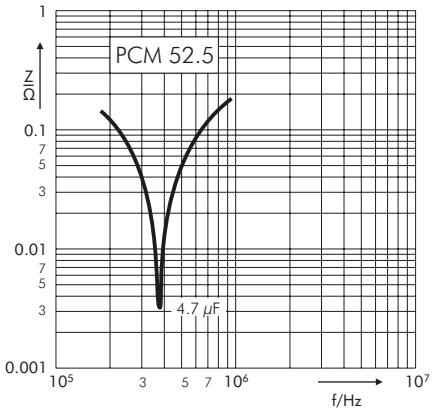
Impedance change with frequency (general guide).











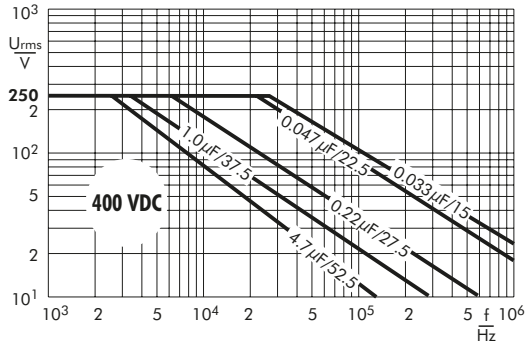
04.23

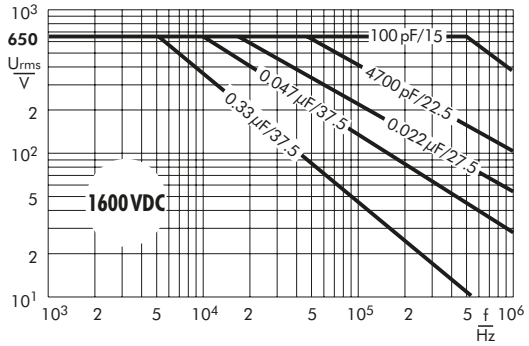
Continuation page 87

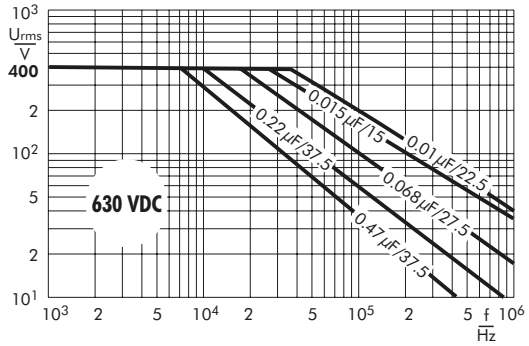
Continuation

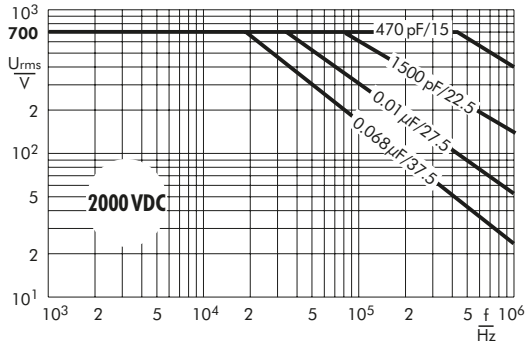
Permissible AC voltage in relation to frequency till 15° C internal temperature rise (general guide).

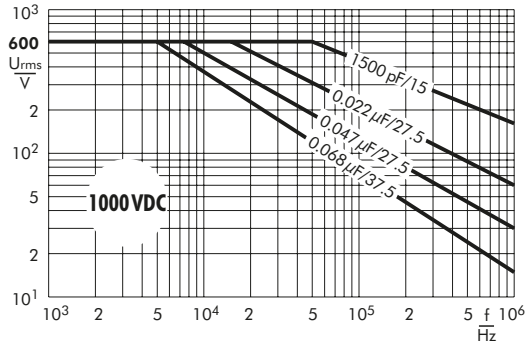
The information behind the cross bar denote the PCM of the measured value.

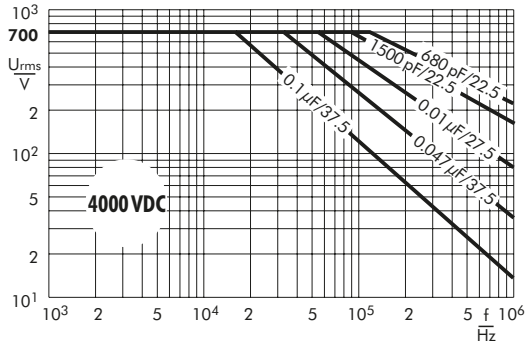


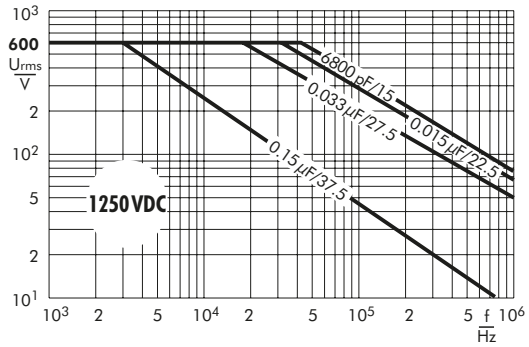


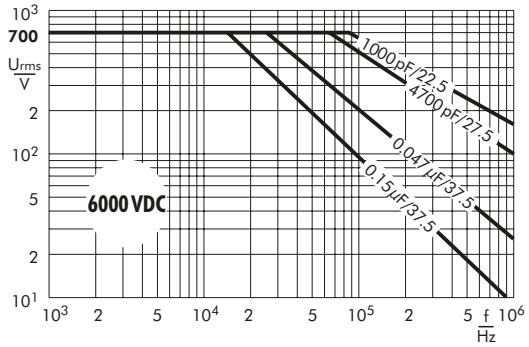










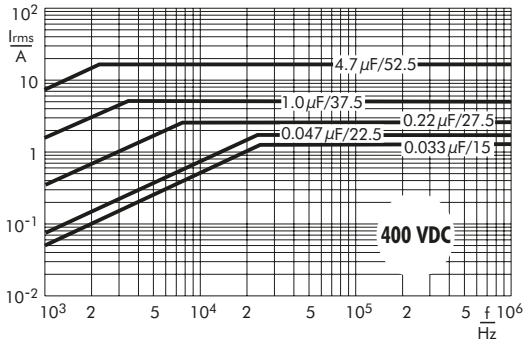


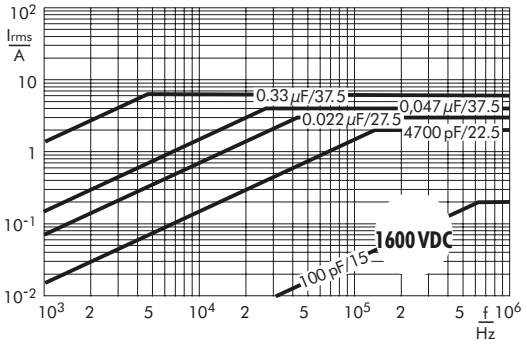
Continuation page 88

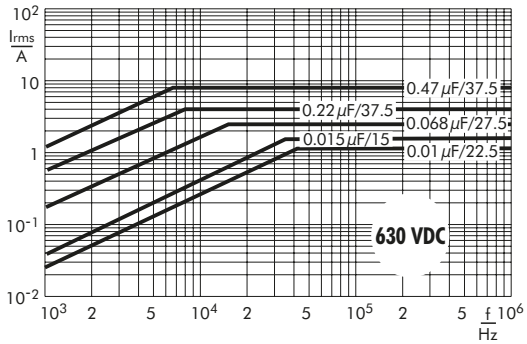
Continuation

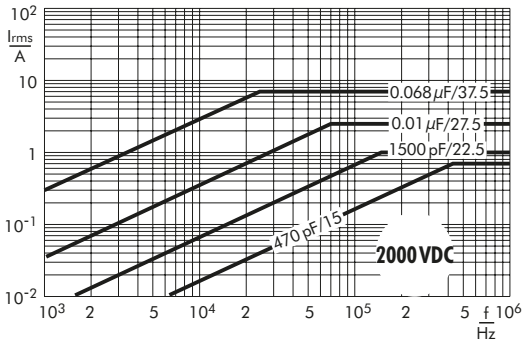
Permissible AC current in relation to frequency till 15° C internal temperature rise (general guide).

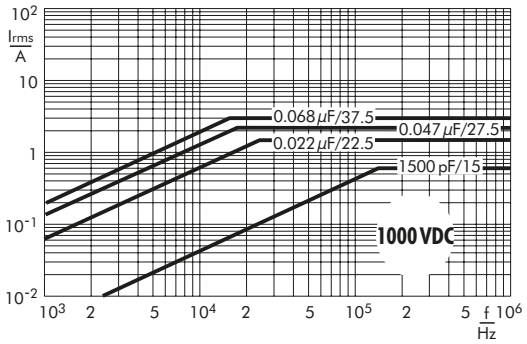
The information behind the cross bar denote the PCM of the measured value.

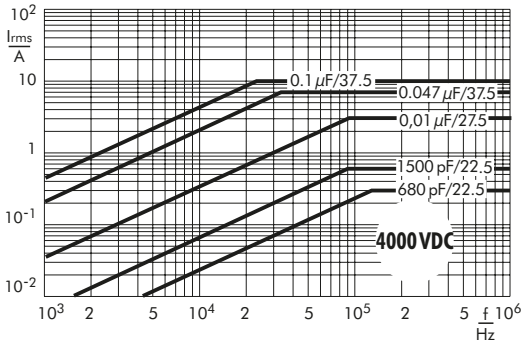


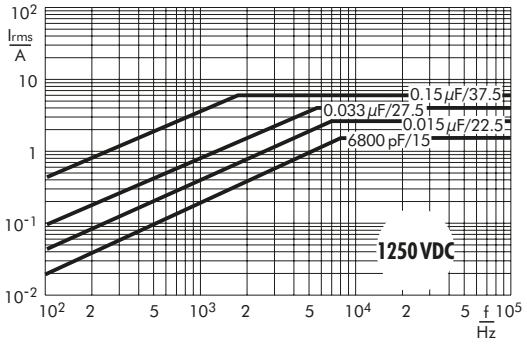


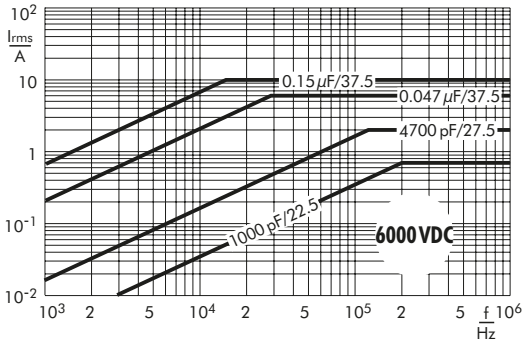












WIMA Radio Interference Suppression Capacitors for Overvoltage Protection

WIMA MKP-X2
WIMA MKP-Y2
WIMA MKP-X1 R

Depending on the application, radio interference suppression capacitors remain on the mains for an uninterrupted period of 10, 20 or more years. They need not only satisfy EMC requirements in suppressing outgoing interference from an application but they also have to protect the application from incoming power surges. Hence careful selection of these components is essential.

The special feature of WIMA Polypropylene RFI capacitors are the high capacitance values at smaller case sizes, being available with capacitances from 1000 pF through 10 µF at AC voltages of 300 VAC, 305 VAC and 440 VAC for class X2, X1 and Y2.

Based on the dielectric used they are highly cost-effective. The low attenuation construction results in a high degree of interference suppression with low ESR.

WIMA metallized RFI film capacitors exhibit a safe regeneration behaviour and reliably heal in case of a beakdown (self-healing).

Class X capacitors are connected between phase and neutral or phase and phase conductors. Class Y capacitors have an increased degree of electrical and mechanical safety and are connected, for example, between phase conductors and earthed casing, and thus by-pass operating insulation.

WIMA RFI capacitors are approved according to IEC 60384-14/4, UL 60384-14 respective CAN/CSA-E60384-14 and CQC11-471115-2016.

The specified rated AC voltage takes into account a rise of the mains voltage of up to 10% above the nominal value, in accordance with IEC 60384-14.

The components are environmentally compatible with the RoHS 2015/863/EU regulations of the European Union.

WIMA MKP-X2

Metallized Polypropylene (PP) RFI-Capacitors Class X2 in PCM 7.5 mm to 37.5 mm. Capacitances from 1000 pF to 10 µF. Rated Voltage 305 VAC.

Special Features

- **Reliable self-healing**
- **High degree of interference suppression due to good attenuation and low ESR**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2015/863/EU**

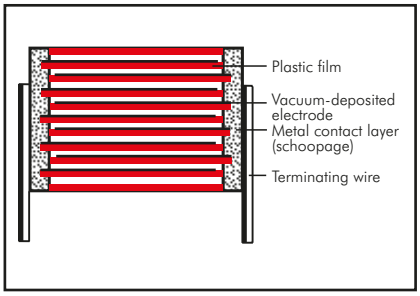
Typical Applications

Class X2 RFI applications to meet EMC regulations

- **Capacitors connected to the mains between phase and neutral or phase conductors**
- **General requirements, pulse peak voltage ⩽ 2.5 kV**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range: 1000 pF to 10 µF
Rated voltage: 305 VAC
Continuous DC voltage* (general guide): ⩽ 560 V
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +105° C
Climatic test category:
55/105/56 in accordance with IEC
Passive flammability class:
B for capacitors with V > 1750 mm³
C for capacitors with V ⩽ 1750 mm³
Test specifications:
In accordance with IEC 60384-14
Dissipation factors at + 20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 18 x 10^{-4}	⩽ 20 x 10^{-4}	⩽ 20 x 10^{-4}
10 kHz	⩽ 20 x 10^{-4}	⩽ 60 x 10^{-4}	–
100 kHz	⩽ 50 x 10^{-4}	–	–

Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 1.5 x 10^4 MΩ
C > 0.33 µF: ⩾ 5000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Maximum pulse rise time:
100 V/µsec for pulses equal to a voltage amplitude with $\sqrt{2}$ x 305 VAC = 432 V according to IEC 60384-14
Test voltage:
C ⩽ 1.0 µF: 2260 VDC, 2 sec.
C > 1.0 µF: 1800 VDC, 2 sec.
Reliability:
Operational life > 300 000 hours
Failure rate < 2 fit (0.5 x U_r and 40° C)

Approvals:

Country	Authority	Specification	Symbol	Approval-No.
Germany	VDE	IEC 60384-14/4		40003472
USA/Canada	UL	UL 60384-14 CAN/CSA-E60384-14		E 134915
China	CQC	CQC11-471115-2016		CQC20001271097

Mechanical Tests

Pull test on pins: 10 N in direction of pins according to IEC 60068-2-21
Vibration: 6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density: 1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test: 4000 bumps at 390 m/sec² in accordance with IEC 60068-2-29

* If safety-approved EMI suppression capacitors are operated with a DC voltage being above the specified AC voltage rating the given approvals are no longer valid (IEC 60384-14).

Furthermore the permissible pulse rise time du/dt ($F_{max.}$) will be subject to a reduction according to

$F_{max.} = F_r \times \sqrt{2} \times UAC/UDC$

if the DC operating voltage UDC is higher than $\sqrt{2}$ x UAC

Packing

Available taped and reeled up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

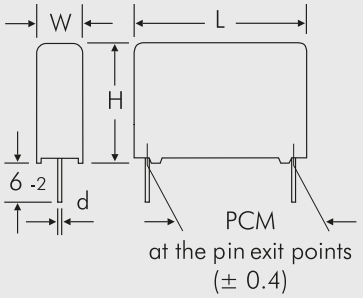
Capacitance	305 VAC* W	H	L	PCM**	Part number
1000 pF	4	9	10	7.5	MKX2AW11002C00____
1200 „	4	9	10	7.5	MKX2AW11202C00____
1500 „	4	9	10	7.5	MKX2AW11502C00____
1800 „	4	9	10	7.5	MKX2AW11802C00____
2200 „	4	9	10	7.5	MKX2AW12202C00____
2700 „	4	9	10	7.5	MKX2AW12702C00____
3300 „	4	9	10	7.5	MKX2AW13302C00____
3900 „	4	9	10	7.5	MKX2AW13902C00____
4700 „	4	9	10	7.5	MKX2AW14702C00____
5600 „	4	9	10	7.5	MKX2AW15602C00____
6800 „	4	9	10	7.5	MKX2AW16802C00____
8200 „	4	9	10	7.5	MKX2AW18202C00____
0.01 µF	4	9	10	7.5	MKX2AW21002C00____
	5	11	13	10	MKX2AW21003F00____
0.012 „	4	9	10	7.5	MKX2AW21202C00____
	5	11	13	10	MKX2AW21203F00____
0.015 „	4	9	10	7.5	MKX2AW21502C00____
	5	11	13	10	MKX2AW21503F00____
0.018 „	4	9	10	7.5	MKX2AW21802C00____
	5	11	13	10	MKX2AW21803F00____
0.022 „	4	9	10	7.5	MKX2AW22202C00____
	5	11	13	10	MKX2AW22203F00____
0.027 „	5	10.5	10.3	7.5	MKX2AW22702E00____
	5	11	13	10	MKX2AW22703F00____
0.033 „	5	10.5	10.3	7.5	MKX2AW23302E00____
	5	11	13	10	MKX2AW23303F00____
0.039 „	5.7	12.5	10.3	7.5	MKX2AW23902F00____
	5	11	13	10	MKX2AW23903F00____
0.047 „	5.7	12.5	10.3	7.5	MKX2AW24702F00____
	6	12.5	13	10	MKX2AW24703H00____
	5	11	18	15	MKX2AW24704B00____
0.056 „	6	12.5	13	10	MKX2AW25603H00____
	5	11	18	15	MKX2AW25604B00____
0.068 „	6	12.5	13	10	MKX2AW26803H00____
	5	11	18	15	MKX2AW26804B00____
0.082 „	6	12.5	13	10	MKX2AW28203H00____
	5	11	18	15	MKX2AW28204B00____

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.

d = 0.6 Ø if PCM < 15
d = 0.8 Ø if PCM ⩾ 15



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 157.

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Continuation

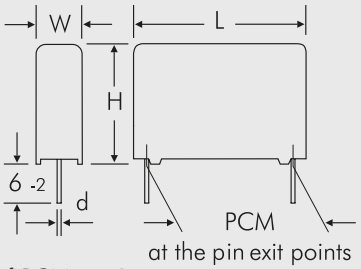
General Data

Capacitance	305 VAC* W	H	L	PCM**	Part number
0.1 µF	8	12	13	10	MKX2AW31003I00____
	5	11	18	15	MKX2AW31004B00____
	6	12.5	18	15	MKX2AW31004C00____
0.12 „	6	12.5	18	15	MKX2AW31204C00____
0.15 „	6	12.5	18	15	MKX2AW31504C00____
	8	15	18	15	MKX2AW31504F00____
	6	15	26.5	22.5	MKX2AW31505B00____
0.18 „	8	15	18	15	MKX2AW31804F00____
	6	15	26.5	22.5	MKX2AW31805B00____
0.22 „	9	14	18	15	MKX2AW32204H00____
	8	15	18	15	MKX2AW32204F00____
	6	15	26.5	22.5	MKX2AW32205B00____
0.27 „	8	15	18	15	MKX2AW32704F00____
	7	16.5	26.5	22.5	MKX2AW32705D00____
0.33 „	11	14	18	15	MKX2AW33304M00____
	9	16	18	15	MKX2AW33304J00____
	7	16.5	26.5	22.5	MKX2AW33305D00____
0.39 „	8.5	18.5	26.5	22.5	MKX2AW33905F00____
0.47 „	8.5	18.5	26.5	22.5	MKX2AW34705F00____
	10.5	19	26.5	22.5	MKX2AW34705G00____
	9	19	31.5	27.5	MKX2AW34706A00____
0.56 „	10.5	19	26.5	22.5	MKX2AW35605G00____
	9	19	31.5	27.5	MKX2AW35606A00____
0.68 „	10.5	19	26.5	22.5	MKX2AW36805G00____
	11	21	26.5	22.5	MKX2AW36805I00____
	9	19	31.5	27.5	MKX2AW36806A00____
0.82 „	11	21	26.5	22.5	MKX2AW38205I00____
	9	19	31.5	27.5	MKX2AW38206A00____

* f = 50/60 Hz

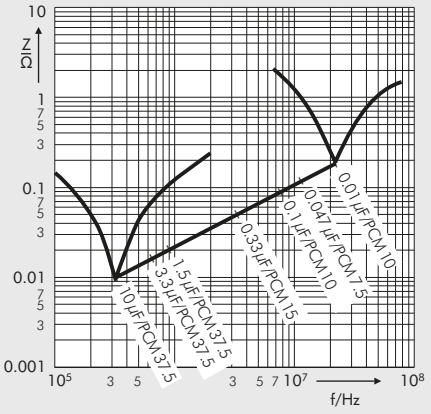
** PCM = Printed circuit module = pin spacing

Dims. in mm.



d = 0.6 Ø if PCM = 10
d = 0.8 Ø if PCM ⩾ 15

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 157.	



Impedance change with frequency (general guide).

Continuation page 93

Continuation

General Data

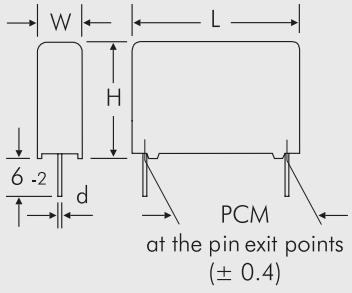
Capacitance	305 VAC* W	H	L	PCM**	Part number
1.0 µF	11	21	26.5	22.5	MKX2AW41005I00____
	11	21	31.5	27.5	MKX2AW41006B00____
	13	24	31.5	27.5	MKX2AW41006D00____
1.2 „	11	21	31.5	27.5	MKX2AW41206B00____
1.5 „	13	24	31.5	27.5	MKX2AW41506D00____
	15	26	31.5	27.5	MKX2AW41506F00____
	13	24	41.5	37.5	MKX2AW41507C00____
1.8 „	13	24	31.5	27.5	MKX2AW41806D00____
	13	24	41.5	37.5	MKX2AW41807C00____
2.2 „	15	26	31.5	27.5	MKX2AW42206F00____
	17	29	31.5	27.5	MKX2AW42206G00____
	13	24	41.5	37.5	MKX2AW42207C00____
	15	26	41.5	37.5	MKX2AW42207D00____
2.7 „	17	29	31.5	27.5	MKX2AW42706G00____
	15	26	41.5	37.5	MKX2AW42707D00____
	17	29	41.5	37.5	MKX2AW42707E00____
3.3 „	17	34.5	31.5	27.5	MKX2AW43306I00____
	20	39.5	31.5	27.5	MKX2AW43306J00____
	15	26	41.5	37.5	MKX2AW43307D00____
	17	29	41.5	37.5	MKX2AW43307E00____
3.9 „	17	34.5	31.5	27.5	MKX2AW43906I00____
	17	29	41.5	37.5	MKX2AW43907E00____
	19	32	41.5	37.5	MKX2AW43907F00____
4.7 „	20	39.5	31.5	27.5	MKX2AW44706J00____
	19	32	41.5	37.5	MKX2AW44707F00____
	20	39.5	41.5	37.5	MKX2AW44707G00____
5.6 „	19	32	41.5	37.5	MKX2AW45607F00____
	20	39.5	41.5	37.5	MKX2AW45607G00____
6.8 „	20	39.5	41.5	37.5	MKX2AW46807G00____
	24	45.5	41.5	37.5	MKX2AW46807H00____
8.2 „	24	45.5	41.5	37.5	MKX2AW48207H00____
	31	46	41.5	37.5	MKX2AW48207I00____
10 µF	24	45.5	41.5	37.5	MKX2AW51007H00____
	31	46	41.5	37.5	MKX2AW51007I00____

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.

d = 0.8 Ø if PCM ⩽ 27.5
d = 1.0 Ø if PCM = 37.5



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

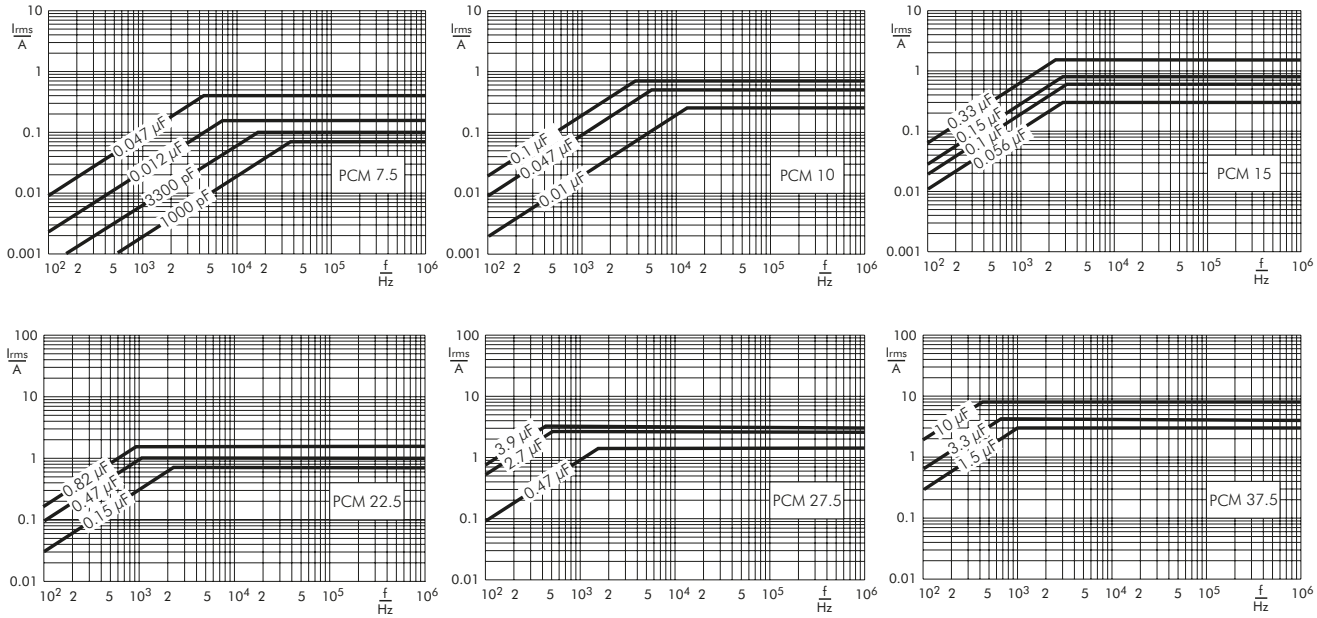
Taped version see page 157.

Continuation page 94

WIMA MKP-X2

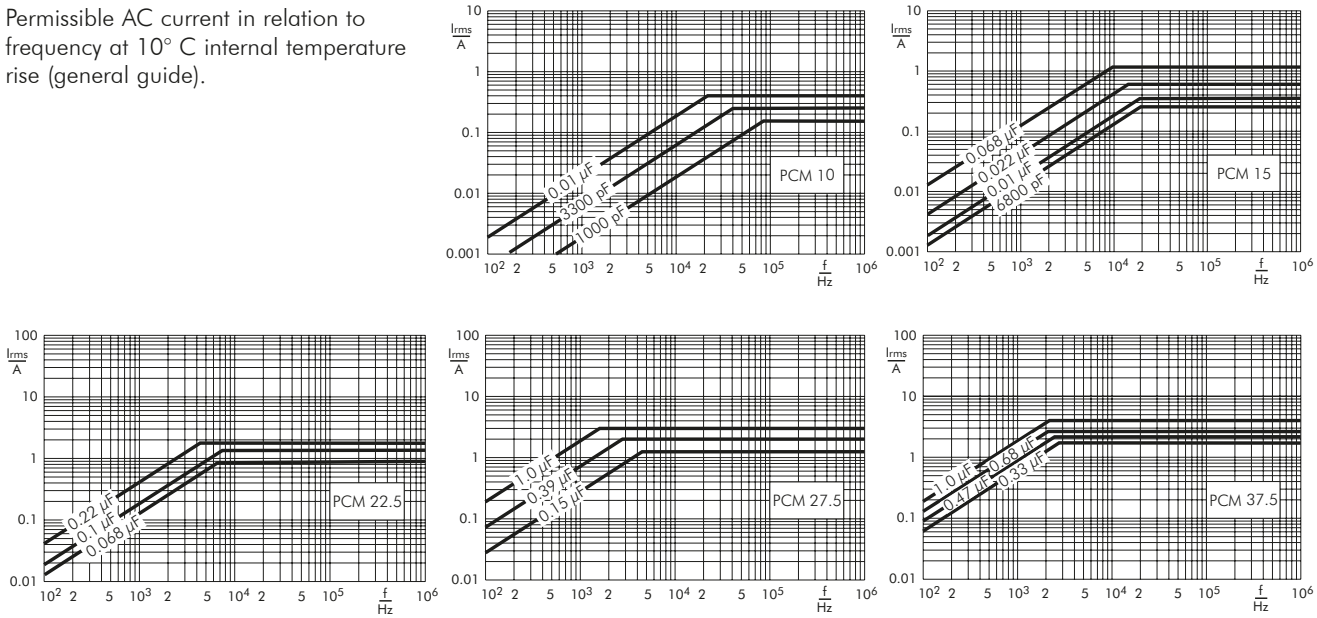
Continuation

Permissible AC current in relation to frequency at 10° C internal temperature rise (general guide).



WIMA MKP-Y2

Permissible AC current in relation to frequency at 10° C internal temperature rise (general guide).



Technical information and general data see page 95

WIMA MKP-Y2

Metallized Polypropylene (PP) RFI-Capacitors Class Y2 in PCM 10 mm to 37.5 mm. Capacitances from 1000 pF to 1.0 µF. Rated Voltage 300 VAC.

Special Features

- **Reliable self-healing**
- **High degree of interference suppression due to good attenuation and low ESR**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2015/863/EU**

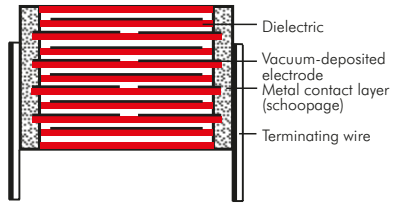
Typical Applications

Class Y2 RFI applications to meet EMC regulations

- **Capacitors connected to the mains between phase or neutral and earthed casing**
- **By-passing of the basic or supplementary insulation, pulse peak voltage ⩽ 5 kV**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



PCM 10: triple series connection

Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range: 1000 pF to 1.0 µF
Rated voltage: 300 VAC
Continuous DC voltage* (general guide): ⩽ 1000 V
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +105° C
Climatic test category:
55/105/56 in accordance with IEC
Passive flammability class:
B for capacitors with V > 1750 mm³
C for capacitors with V ⩽ 1750 mm³
Dissipation factors at + 20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF
1 kHz	⩽ 18 x 10^{-4}	⩽ 20 x 10^{-4}
10 kHz	⩽ 20 x 10^{-4}	⩽ 60 x 10^{-4}
100 kHz	⩽100 x 10^{-4}	–

Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 1.5 x10^4 MΩ
C > 0.33 µF: ⩾ 5000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Test specifications:
In accordance with IEC 60384-14
Maximum pulse rise time:
100 V/µsec for pulses equal to a voltage amplitude with √2 x 300 VAC = 425 V according to IEC 60384-14
Test voltage: 2700 VDC, 2 sec.
Reliability:
Operational life > 300 000 hours
Failure rate < 2 fit (0.5 x U_r and 40° C)

Approvals:

Country	Authority	Specification	Symbol	Approval-No.
Germany	VDE	IEC 60384-14/4		40008997
USA/Canada	UL	UL 60384-14 CAN/CSA-E60384-14		E 134915

Mechanical Tests

Pull test on pins: 10 N in direction of pins according to IEC 60068-2-21
Vibration: 6 hours at 10...2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density: 1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test: 4000 bumps at 390 m/sec² in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

* If safety-approved EMI suppression capacitors are operated with a DC voltage being above the specified AC voltage rating the given approvals are no longer valid (IEC 60384-14).

Furthermore the permissible pulse rise time du/dt ($F_{max.}$) will be subject to a reduction according to

$F_{max.} = F_r \times \sqrt{2} \times UAC/UDC$

if the DC operating voltage UDC is higher than √2 x UAC

For further details and graphs please refer to Technical Information.

WIMA MKP-Y2

Continuation

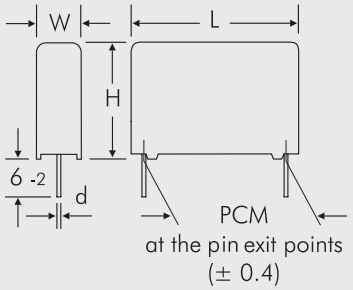
General Data

Capacitance	300 VAC* W	H	L	PCM**	Part number
1000 pF	4	9.5	13	10	MKY22W11003D00____
1200 „	4	9.5	13	10	MKY22W11203D00____
1500 „	4	9.5	13	10	MKY22W11503D00____
1800 „	4	9.5	13	10	MKY22W11803D00____
2200 „	4	9.5	13	10	MKY22W12203D00____
2700 „	4	9.5	13	10	MKY22W12703D00____
3300 „	4	9.5	13	10	MKY22W13303D00____
3900 „	4	9.5	13	10	MKY22W13903D00____
4700 „	5	11	13	10	MKY22W14703F00____
5600 „	5	11	13	10	MKY22W15603F00____
6800 „	6	12.5	13	10	MKY22W16803H00____
	5	11	18	15	MKY22W16804B00____
8200 „	6	12.5	13	10	MKY22W18203H00____
	5	11	18	15	MKY22W18204B00____
0.01 µF	8	12	13	10	MKY22W21003I00____
	5	11	18	15	MKY22W21004B00____
0.012„	5	11	18	15	MKY22W21204B00____
0.015 „	5	11	18	15	MKY22W21504B00____
0.018„	5	11	18	15	MKY22W21804B00____
0.022„	6	12.5	18	15	MKY22W22204C00____
0.027„	6	12.5	18	15	MKY22W22704C00____
0.033„	8	15	18	15	MKY22W23304F00____
0.039„	8	15	18	15	MKY22W23904F00____
0.047„	8	15	18	15	MKY22W24704F00____
0.056„	8	15	18	15	MKY22W25604F00____
0.068„	9	16	18	15	MKY22W26804J00____
	6	15	26.5	22.5	MKY22W26805B00____
0.082„	7	16.5	26.5	22.5	MKY22W28205D00____

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.



d = 0.6 Ø if PCM = 10
d = 0.8 Ø if PCM = 15 - 22.5

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 157.	

Continuation page 97

Continuation

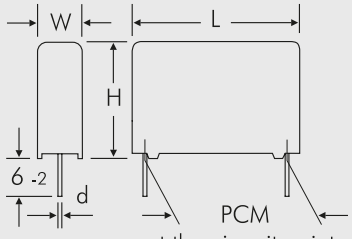
General Data

Capacitance	300 VAC* W	H	L	PCM**	Part number
0.1 µF	7	16.5	26.5	22.5	MKY22W31005D00____
0.12 „	8.5	18.5	26.5	22.5	MKY22W31205F00____
0.15 „	8.5	18.5	26.5	22.5	MKY22W31505F00____
	9	19	31.5	27.5	MKY22W31506A00____
0.18 „	10.5	19	26.5	22.5	MKY22W31805G00____
	9	19	31.5	27.5	MKY22W31806A00____
0.22 „	11	21	26.5	22.5	MKY22W32205I00____
	9	19	31.5	27.5	MKY22W32206A00____
0.27 „	11	21	31.5	27.5	MKY22W32706B00____
0.33 „	11	21	31.5	27.5	MKY22W33306B00____
	13	24	41.5	37.5	MKY22W33307C00____
0.39 „	13	24	31.5	27.5	MKY22W33906D00____
	13	24	41.5	37.5	MKY22W33907C00____
0.47 „	15	26	31.5	27.5	MKY22W34706F00____
	13	24	41.5	37.5	MKY22W34707C00____
0.56 „	15	26	31.5	27.5	MKY22W35606F00____
	13	24	41.5	37.5	MKY22W35607C00____
	15	26	41.5	37.5	MKY22W35607D00____
0.68 „	17	29	31.5	27.5	MKY22W36806G00____
	15	26	41.5	37.5	MKY22W36807D00____
	17	29	41.5	37.5	MKY22W36807E00____
0.82 „	17	34.5	31.5	27.5	MKY22W38206I00____
	17	29	41.5	37.5	MKY22W38207E00____
	19	32	41.5	37.5	MKY22W38207F00____
1.0 µF	20	39.5	31.5	27.5	MKY22W41006J00____
	17	29	41.5	37.5	MKY22W41007E00____
	20	39.5	41.5	37.5	MKY22W41007G00____

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

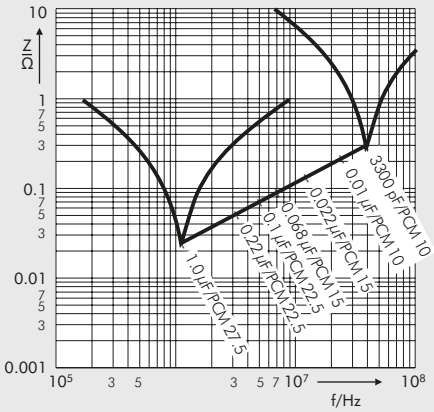
Dims. in mm.



d = 0.8 Ø if PCM ⩽ 27.5
d = 1.0 Ø if PCM = 37.5

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 157.



Impedance change with frequency (general guide).

AC current graphs see page 94

WIMA MKP-X1 R

Metallized Polypropylene (PP) RFI-Capacitors Class X1 with Internal Series Connection in PCM 10 mm to 37.5 mm. Capacitances from 1000 pF to 2.2 µF. Rated Voltage 440 VAC.

Special Features

- **Reliable self-healing**
- **Increased corona inception level due to internal series connection**
- **High degree of interference suppression due to good attenuation and low ESR**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2015/863/EU**

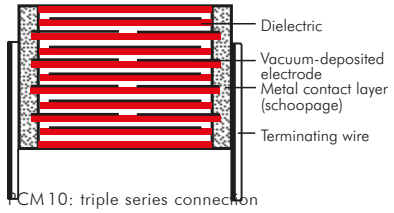
Typical Applications

Class X1 RFI applications to meet EMC regulations

- **Capacitors connected to the mains between phase and neutral or phase and phase conductors**
- **High peak voltage applications, pulse peak voltage ⩽ 4 kV**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



PCM 10: triple series connection

Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V–0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range: 1000 pF to 2.2 µF
Rated voltage: 440 VAC
Continuous DC voltage* (general guide): ⩽ 1000 V
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +105° C
Climatic test category:
55/105/56 in accordance with IEC
Passive flammability class:
B for capacitors with V > 1750 mm³
C for capacitors with V ⩽ 1750 mm³
Test specifications:
In accordance with IEC 60384-14
Dissipation factors at +20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 18 x 10^{-4}	⩽ 20 x 10^{-4}	⩽ 30 x 10^{-4}
10 kHz	⩽ 20 x 10^{-4}	⩽ 60 x 10^{-4}	–
100 kHz	⩽100 x 10^{-4}	–	–

Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 1.5 x10^4 MΩ
C > 0.33 µF: ⩾ 5000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Maximum pulse rise time:
100 V/µsec for pulses equal to a voltage amplitude with $\sqrt{2}$ x 440 VAC = 623 V according to IEC 60384-14
Test voltage:
C ⩽ 1.0 µF: 2260 VDC, 2sec.
C > 1.0 µF: 1900 VDC, 2sec.
Reliability:
Operational life > 300000 hours
Failure rate < 2 fit (0.5 x U_r and 40° C)

Approvals:

Country	Authority	Specification	Symbol	Approval-No.
Germany	VDE	IEC 60384-14/4		40041297
USA/Canada	UL	UL 60384-14 CAN/CSA-E60384-14		E 134915

Mechanical Tests

Pull test on pins: 10 N in direction of pins according to IEC 60068-2-21
Vibration: 6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density: 1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test: 4000 bumps at 390 m/sec² in accordance with IEC 60068-2-29

* If safety-approved EMI suppression capacitors are operated with a DC voltage being above the specified AC voltage rating the given approvals are no longer valid (IEC 60384-14).

Furthermore the permissible pulse rise time du/dt ($F_{max.}$) will be subject to a reduction according to

$F_{max.} = F_r \times \sqrt{2} \times UAC / UDC$

if the DC operating voltage UDC is higher than $\sqrt{2}$ x UAC

Packing

Available taped and reeled up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

04.23

Continuation

General Data

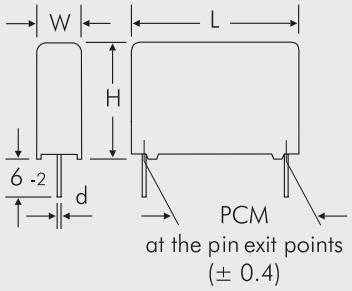
Capacitance	440 VAC* W	H	L	PCM**	Part number
1000 pF	4	9.5	13	10	MKX14W11003D00____
1200 „	4	9.5	13	10	MKX14W11203D00____
1500 „	4	9.5	13	10	MKX14W11503D00____
1800 „	4	9.5	13	10	MKX14W11803D00____
2200 ″	4	9.5	13	10	MKX14W12203D00____
2700 „	4	9.5	13	10	MKX14W12703D00____
3300 ″	4	9.5	13	10	MKX14W13303D00____
3900 „	4	9.5	13	10	MKX14W13903D00____
4700 ″	5	11	13	10	MKX14W14703F00____
5600 „	5	11	13	10	MKX14W15603F00____
6800 „	6	12.5	13	10	MKX14W16803H00____
	5	11	18	15	MKX14W16804B00____
8200 „	6	12.5	13	10	MKX14W18203H00____
	5	11	18	15	MKX14W18204B00____
0.01 µF	8	12	13	10	MKX14W21003I00____
	5	11	18	15	MKX14W21004B00____
0.012„	5	11	18	15	MKX14W21204B00____
0.015 „	5	11	18	15	MKX14W21504B00____
0.018„	5	11	18	15	MKX14W21804B00____
0.022 „	6	12.5	18	15	MKX14W22204C00____
0.027„	6	12.5	18	15	MKX14W22704C00____
0.033„	8	15	18	15	MKX14W23304F00____
0.039„	8	15	18	15	MKX14W23904F00____
0.047„	8	15	18	15	MKX14W24704F00____
0.056„	8	15	18	15	MKX14W25604F00____
0.068„	9	16	18	15	MKX14W26804J00____
	6	15	26.5	22.5	MKX14W26805B00____
0.082„	7	16.5	26.5	22.5	MKX14W28205D00____

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.

d = 0.6 Ø if PCM = 10
d = 0.8 Ø if PCM = 15 - 22.5



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 157.	

Continuation page 100

Continuation

General Data

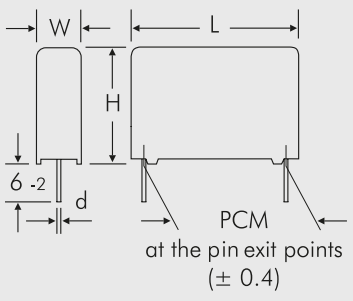
Capacitance	440 VAC* W	H	L	PCM**	Part number
0.1 µF	6	15	26.5	22.5	MKX14W31005B00____
	7	16.5	26.5	22.5	MKX14W31005D00____
0.12 „	7	16.5	26.5	22.5	MKX14W31205D00____
	8.5	18.5	26.5	22.5	MKX14W31205F00____
0.15 „	7	16.5	26.5	22.5	MKX14W31505D00____
	8.5	18.5	26.5	22.5	MKX14W31505F00____
	9	19	31.5	27.5	MKX14W31506A00____
0.18 „	8.5	18.5	26.5	22.5	MKX14W31805F00____
	10.5	19	26.5	22.5	MKX14W31805G00____
	9	19	31.5	27.5	MKX14W31806A00____
0.22 „	8.5	18.5	26.5	22.5	MKX14W32205F00____
	11	21	26.5	22.5	MKX14W32205I00____
	9	19	31.5	27.5	MKX14W32206A00____
0.27 „	10.5	19	26.5	22.5	MKX14W32705G00____
	9	19	31.5	27.5	MKX14W32706A00____
	11	21	31.5	27.5	MKX14W32706B00____
0.33 „	11	21	26.5	22.5	MKX14W33305I00____
	9	19	31.5	27.5	MKX14W33306A00____
	11	21	31.5	27.5	MKX14W33306B00____
	13	24	41.5	37.5	MKX14W33307C00____
0.39 „	11	21	31.5	27.5	MKX14W33906B00____
	13	24	31.5	27.5	MKX14W33906D00____
	13	24	41.5	37.5	MKX14W33907C00____
0.47 „	11	21	31.5	27.5	MKX14W34706B00____
	15	26	31.5	27.5	MKX14W34706F00____
	13	24	41.5	37.5	MKX14W34707C00____
0.56 „	13	24	31.5	27.5	MKX14W35606D00____
	15	26	31.5	27.5	MKX14W35606F00____
	13	24	41.5	37.5	MKX14W35607C00____
	15	26	41.5	37.5	MKX14W35607D00____
0.68 „	15	26	31.5	27.5	MKX14W36806F00____
	17	29	31.5	27.5	MKX14W36806G00____
	13	24	41.5	37.5	MKX14W36807C00____
	15	26	41.5	37.5	MKX14W36807D00____
	17	29	41.5	37.5	MKX14W36807E00____
0.82 „	15	26	31.5	27.5	MKX14W38206F00____
	17	34.5	31.5	27.5	MKX14W38206I00____
	13	24	41.5	37.5	MKX14W38207C00____
	17	29	41.5	37.5	MKX14W38207E00____
	19	32	41.5	37.5	MKX14W38207F00____

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.

d = 0.8 Ø if PCM ⩽ 27.5
d = 1.0 Ø if PCM = 37.5



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD

Taped version see page 157.

Continuation page 101

Continuation

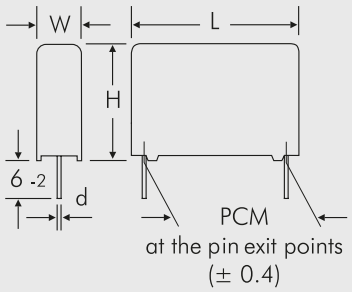
General Data

Capacitance	440 VAC*				
	W	H	L	PCM**	Part number
1.0 µF	17	29	31.5	27.5	MKX14W41006G00____
	20	39.5	31.5	27.5	MKX14W41006J00____
	15	26	41.5	37.5	MKX14W41007D00____
	17	29	41.5	37.5	MKX14W41007E00____
	20	39.5	41.5	37.5	MKX14W41007G00____
1.2 „	17	34.5	31.5	27.5	MKX14W41206I00____
	17	29	41.5	37.5	MKX14W41207E00____
1.5 „	20	39.5	31.5	27.5	MKX14W41506J00____
	19	32	41.5	37.5	MKX14W41507F00____
1.8 „	19	32	41.5	37.5	MKX14W41807F00____
2.2 „	20	39.5	41.5	37.5	MKX14W42207G00____

* f = 50/60 Hz

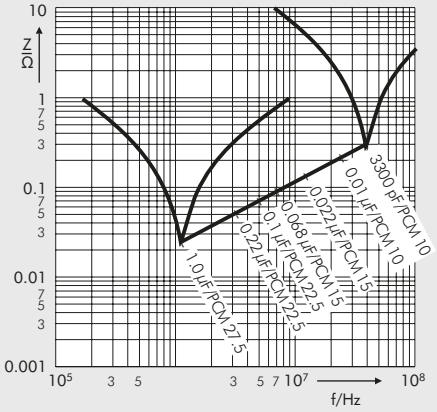
** PCM = Printed circuit module = pin spacing

Dims. in mm.



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 157.	

d = 0.8 Ø if PCM = 27.5
d = 1.0 Ø if PCM = 37.5



Impedance change with frequency (general guide).

WIMA MKP 4F

Due to their typical circuit position AC filter capacitors have to exhibit good high-frequency characteristics and at the same time high AC voltage capabilities. They in general fulfil two requirements:

- Low AC impedance to dissipate high-frequency interference signals
- Attenuation of transient voltage pulses caused e.g. by switching.

WIMA filter capacitors are designed on the basis of low-loss Polypropylene film and exhibit high AC current capability at high frequencies as well as low ESL and ESR values.

They are available with capacitances from 0.68 µF up to 75 µF and rated voltages of 250 VAC, 275 VAC, 305 VAC, 350 VAC and 440 VAC for an operational temperature range of -55° C to +105° C. The 440 VAC range has an internal series connection and stands out for an increased corona discharge inception voltage.

Their metallized construction, i.e. a thin aluminium layer serving as electrode being vapour-deposited onto the insulating film, entails very good self-healing properties of WIMA filter capacitors in case of a dielectric breakdown. The short-circuit current causes the thin metal layer to vaporize around the discharge channel and thus forming an insulating "halo". The capacitor remains fully operative.

Further positive features are the dry construction and thus the waiver of additional impregnating agents, the very favourable capacitance/volume ratio and the long life time at high capacitance long-term stability even under demanding operating conditions.

WIMA capacitors are produced with the proven box technology using solvent-resistant, flame-retardant plastic cases according to UL 94 V-0. They are environmentally compatible with the RoHS 2015/863/EU regulations of the European Union.

WIMA MKP 4F

Metallized Polypropylen (PP) Filter Capacitors in PCM 27.5 mm to 52.5 mm. Capacitances from 0.68 µF to 75 µF. Rate Voltages from 230 VAC to 440 VAC.

Special Features

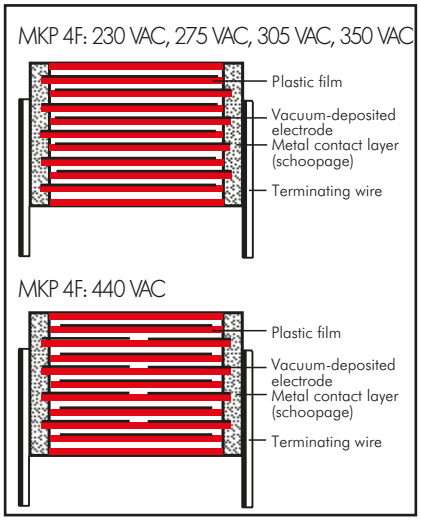
- **High volume/capacitance ratio**
- **High peak current capabilities**
- **Self-healing**
- **Long lifetime**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2015/863/EU**

Typical Applications

For high frequency applications e.g.
- **AC filtering in UPS systems**
- **Harmonic filter**
- **Welding equipment**
- **Renewable energy - grid interface**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range:
0.68 µF to 75 µF
Rated voltages: 230 VAC, 275 VAC, 305 VAC, 350 VAC, 440 VAC
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +105° C
Climatic test category:
55/105/56 in accordance with IEC
Insulation resistance at +20° C:
⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Test voltage:
1.5 $U_{r\,DC}$, 10sec.
Test specifications: In accordance with IEC 61071 and 60068
Dissipation factors at +20° C: tan δ

at f	PCM 27.5	PCM 37.5	PCM 52.5
1 kHz	⩽ 5 x 10^{-4}	⩽ 10 x 10^{-4}	⩽ 15 x 10^{-4}
10 kHz	⩽ 20 x 10^{-4}	⩽ 45 x 10^{-4}	⩽ 90 x 10^{-4}

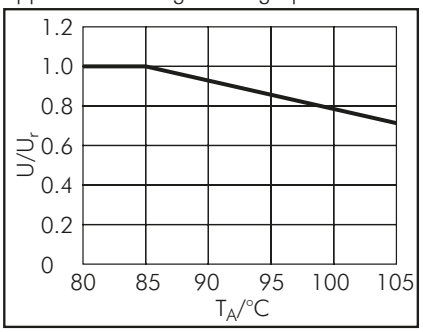
Reference frequency 1 kHz in accordance with IEC 60384-1

Maximum pulse rise time:

PCM	max. pulse rise time V/µsec at T_A < 40° C				
	230 VAC	275 VAC	305 VAC	350 VAC	440 VAC
27.5	45	55	68	100	110
37.5	20	30	35	50	70
52.5	10	13	15	25	40

for pulses equal to the rated voltage ($U_{r\,DC}$)

Voltage derating:
A voltage derating factor must be applied according to the graph:



Reliability:
Operational life > 60 000 hours at U_r
Failure rate < 10 fit (0.5 x U_r and 40° C)

Mechanical Tests

Pull test on pins:
10 N in direction of pins according to IEC 60068-2-21
Vibration:
6 hours at 10…2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
Low air density:
1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test:
4000 bumps at 390 m/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

WIMA MKP 4F

Continuation

General Data

Capacitance	W	H	L	PCM**	Pin	230 VAC*/450 VDC I_S A	I_{rms} (10 kHz) at 85° C A	Part number
1.0 µF	9	19	31.5	27.5	2	45	2.5	MKPF3Y41006A_____
1.5 „	11	21	31.5	27.5	2/4	70	3	MKPF3Y41506B_____
2.2 „	11	21	31.5	27.5	2/4	100	3.5	MKPF3Y42206B_____
3.3 „	13	24	31.5	27.5	2/4	150	5	MKPF3Y43306D_____
4.7 „	15	26	31.5	27.5	2/4	210	7.5	MKPF3Y44706F_____
6.8 „	17	29	31.5	27.5	2/4	300	8.5	MKPF3Y46806G_____
10 µF	20	39.5	31.5	27.5	2/4	450	11.5	MKPF3Y51006J_____
	19	32	41.5	37.5	2/4	200	8	MKPF3Y51007F_____
12 „	19	32	41.5	37.5	2/4	240	10	MKPF3Y51207F_____
15 „	20	39.5	41.5	37.5	2/4	300	12	MKPF3Y51507G_____
20 „	24	45.5	41.5	37.5	2/4	400	14	MKPF3Y52007H_____
22 „	24	45.5	41.5	37.5	2/4	440	15	MKPF3Y52207H_____
25 „	31	46	41.5	37.5	2/4	500	17	MKPF3Y52507I_____
30	31	46	41.5	37.5	2/4	600	19	MKPF3Y53007I_____
	25	45	57	52.5	2/4	300	15	MKPF3Y53009D_____
35 „	35	50	41.5	37.5	2/4	700	20.5	MKPF3Y53507J_____
	25	45	57	52.5	2/4	350	15	MKPF3Y53509D_____
40 „	30	45	57	52.5	2/4	400	17.5	MKPF3Y54009E_____
45 „	30	45	57	52.5	2/4	450	18.5	MKPF3Y54509E_____
50 „	35	50	57	52.5	4	500	21	MKPF3Y55009F_____
55 „	35	50	57	52.5	4	550	22	MKPF3Y55509F_____
60 „	45	55	57	52.5	4	600	23	MKPF3Y56009H_____
65 „	45	55	57	52.5	4	650	25.5	MKPF3Y56509H_____
70 „	45	55	57	52.5	4	700	26	MKPF3Y57009H_____
75 „	45	65	57	52.5	4	750	27	MKPF3Y57509J_____

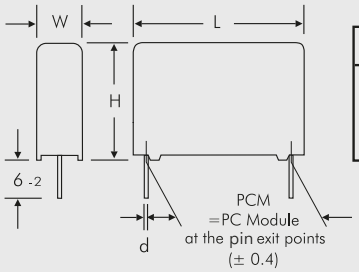
* AC voltages: f ⩽ 100 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.

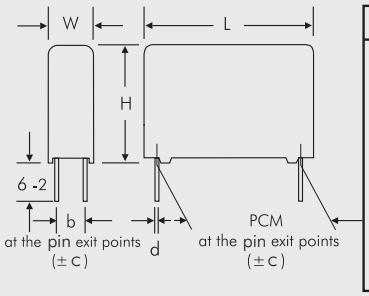
Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD
Taped version see page 157.		

2-pin version



Ø d	PCM
0.8	27.5
1.0	37.5
1.2	52.5

4-pin version



W	PCM	b	Ø d	c
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
25	52.5	12.5	1.2	0.8
30	52.5	20	1.2	0.8
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

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Continuation

General Data

Capacitance	W	H	L	PCM**	Pin	275 VAC*/600 VDC I_S A	275 VAC*/600 VDC I_{rms} (10 kHz) at 85° C A	Part number
1.0 µF	9	19	31.5	27.5	2	55	2.5	MKPF1W41006A_____
1.5 „	11	21	31.5	27.5	2/4	80	3.5	MKPF1W41506B_____
2.2 „	13	24	31.5	27.5	2/4	120	5	MKPF1W42206D_____
3.3 „	15	26	31.5	27.5	2/4	180	5.5	MKPF1W43306F_____
4.7 „	17	34.5	31.5	27.5	2/4	260	8	MKPF1W44706I_____
6.8 „	20	39.5	31.5	27.5	2/4	370	10	MKPF1W46806J_____
10 µF	20	39.5	41.5	37.5	2/4	300	10	MKPF1W51007G_____
12 „	20	39.5	41.5	37.5	2/4	360	12	MKPF1W51207G_____
15 „	24	45.5	41.5	37.5	2/4	450	14	MKPF1W51507H_____
	25	45	57	52.5	2/4	195	11	MKPF1W51509D_____
20 „	31	46	41.5	37.5	2/4	600	16	MKPF1W52007I_____
	25	45	57	52.5	2/4	260	12	MKPF1W52009D_____
22 „	25	45	57	52.5	2/4	286	14	MKPF1W52209D_____
25 „	30	45	57	52.5	2/4	325	16	MKPF1W52509E_____
30	35	50	57	52.5	4	390	17	MKPF1W53009F_____
35 „	35	50	57	52.5	4	455	20	MKPF1W53509F_____
40 „	45	55	57	52.5	4	520	21	MKPF1W54009H_____
45 „	45	55	57	52.5	4	585	23	MKPF1W54509H_____
50 „	45	65	57	52.5	4	650	24	MKPF1W55009J_____

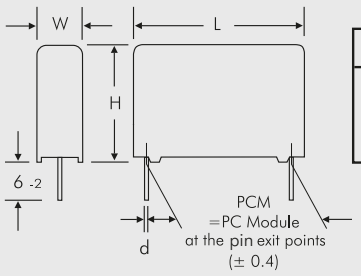
* AC voltages: f ⩽ 100 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.

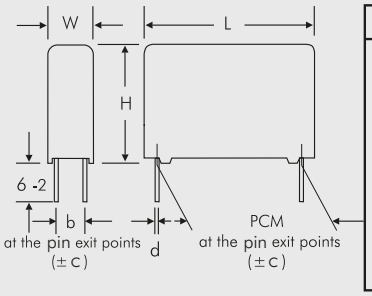
Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD
Taped version see page 157.		

2-pin version



Ø d	PCM
0.8	27.5
1.0	37.5
1.2	52.5

4-pin version



W	PCM	b	Ø d	c
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
25	52.5	12.5	1.2	0.8
30	52.5	20	1.2	0.8
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

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Continuation

General Data

Capacitance	W	H	L	PCM**	Pin	305 VAC*/630 VDC I_S A	305 VAC*/630 VDC I_{rms} (10 kHz) at 85° C A	Part number
0.68 µF	9	19	31.5	27.5	2	50	2	MKPFAW36806A_____
1.0 µF	11	21	31.5	27.5	2/4	68	3	MKPFAW41006B_____
1.5 „	13	24	31.5	27.5	2/4	110	4	MKPFAW41506D_____
2.2 „	15	26	31.5	27.5	2/4	150	5	MKPFAW42206F_____
3.3 „	17	29	31.5	27.5	2/4	220	7	MKPFAW43306G_____
4.7 „	20	39.5	31.5	27.5	2/4	320	9	MKPFAW44706J_____
6.8 „	20	39.5	41.5	37.5	2/4	245	10	MKPFAW46807G_____
10 µF	24	45.5	41.5	37.5	2/4	350	12	MKPFAW51007H_____
	25	45	57	52.5	2/4	150	10	MKPFAW51009D_____
12 „	24	45.5	41.5	37.5	2/4	420	13	MKPFAW51207H_____
15 „	31	46	41.5	37.5	2/4	525	15	MKPFAW51507I_____
	25	45	57	52.5	2/4	225	13	MKPFAW51509D_____
20 „	40	55	41.5	37.5	2/4	700	19	MKPFAW52007K_____
	30	45	57	52.5	2/4	300	14	MKPFAW52009E_____
22 „	35	50	57	52.5	4	330	16	MKPFAW52209F_____
25 „	35	50	57	52.5	4	375	17	MKPFAW52509F_____
30	45	55	57	52.5	4	450	21	MKPFAW53009H_____
35 „	45	65	57	52.5	4	525	22	MKPFAW53509J_____

* AC voltages: f ⩽ 100 Hz

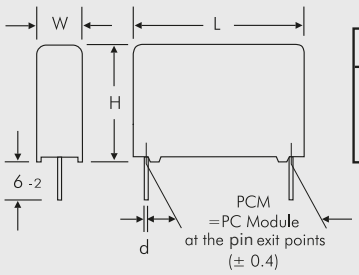
** PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

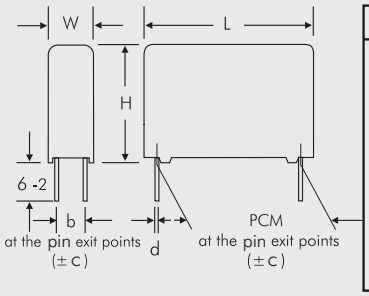
Taped version see page 157.

2-pin version



Ø d	PCM
0.8	27.5
1.0	37.5
1.2	52.5

4-pin version



W	PCM	b	Ø d	c
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
25	52.5	12.5	1.2	0.8
30	52.5	20	1.2	0.8
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

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Continuation

General Data

Capacitance	W	H	L	PCM**	Pin	I_S A	I_{rms} (10 kHz) at 85° C A	Part number
				350 VAC*/700 VDC				
0.68 µF	9	19	31.5	27.5	2	70	1.5	MKPFBW36806A_____
1.0 µF	11	21	31.5	27.5	2/4	100	3	MKPFBW41006B_____
1.5 „	13	24	31.5	27.5	2/4	150	4	MKPFBW41506D_____
2.2 „	15	26	31.5	27.5	2/4	220	5	MKPFBW42206F_____
3.3 „	17	29	31.5	27.5	2/4	330	7	MKPFBW43306G_____
4.7 „	20	39.5	31.5	27.5	2/4	470	11	MKPFBW44706J_____
6.8 „	20	39.5	41.5	37.5	2/4	340	10	MKPFBW46807G_____
10 µF	24	45.5	41.5	37.5	2/4	500	13	MKPFBW51007H_____
	25	45	57	52.5	2/4	250	11	MKPFBW51009D_____
12 „	24	45.5	41.5	37.5	2/4	600	14	MKPFBW51207H_____
15 „	31	46	41.5	37.5	2/4	750	16	MKPFBW51507I_____
	25	45	57	52.5	2/4	375	13	MKPFBW51509D_____
20 „	40	55	41.5	37.5	2/4	1000	18	MKPFBW52007K_____
	30	45	57	52.5	2/4	500	16	MKPFBW52009E_____
22 „	35	50	57	52.5	4	550	18	MKPFBW52209F_____
25 „	35	50	57	52.5	4	625	19	MKPFBW52509F_____
30	45	55	57	52.5	4	750	22	MKPFBW53009H_____
35 „	45	65	57	52.5	4	870	25	MKPFBW53509J_____

Capacitance	W	H	L	PCM**	Pin	I_S A	I_{rms} (10 kHz) at 85° C A	Part number
				440 VAC*/1000 VDC				
0.68 µF	13	24	31.5	27.5	2/4	74.8	3	MKPF4W36806D_____
1.0 µF	13	24	31.5	27.5	2/4	110	4	MKPF4W41006D_____
1.5 „	17	29	31.5	27.5	2/4	165	5	MKPF4W41506G_____
2.2 „	20	39.5	31.5	27.5	2/4	240	6	MKPF4W42206J_____
3.3 „	20	39.5	41.5	37.5	2/4	230	7.5	MKPF4W43307G_____
4.7 „	24	45.5	41.5	37.5	2/4	330	8.5	MKPF4W44707H_____
6.8 „	31	46	41.5	37.5	2/4	480	11.5	MKPF4W46807I_____
10 µF	30	45	57	52.5	2/4	400	16	MKPF4W51009E_____
12 „	35	50	57	52.5	4	480	17	MKPF4W51209F_____

* AC voltages: f ⩽ 100 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.

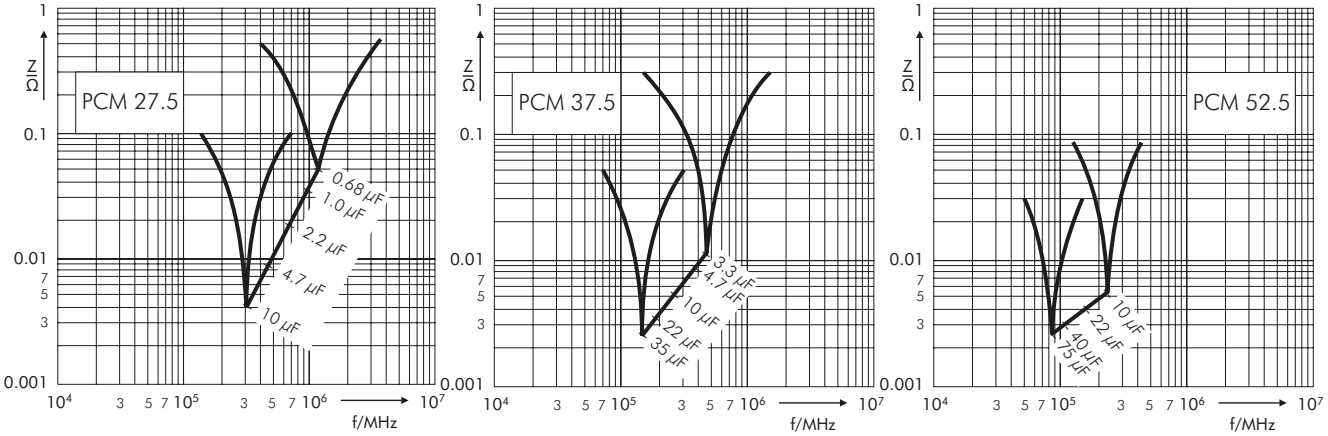
Part number completion:		
Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 157.

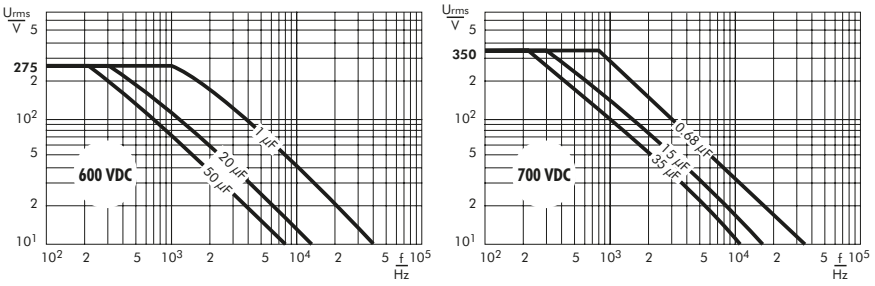
Continuation page 108

Continuation

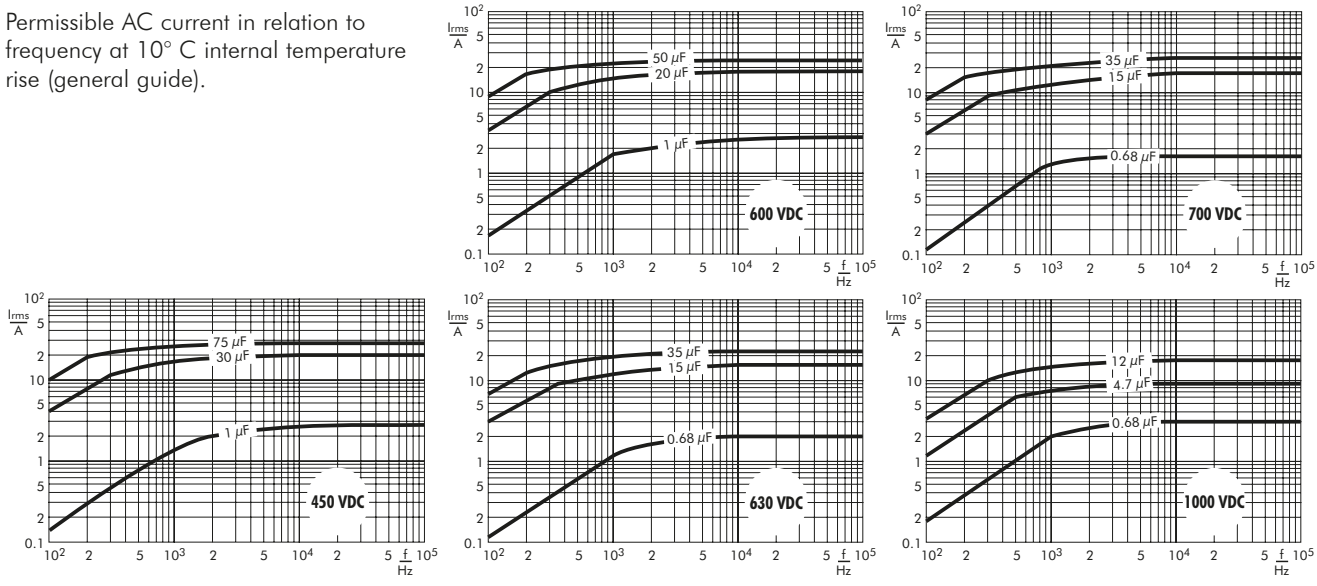
Impedance change with frequency (general guide).



Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).



Permissible AC current in relation to frequency at 10° C internal temperature rise (general guide).



WIMA Snubber Capacitors with Plates or Lead Terminations for Best Contacts

- Low inductance construction achieved by end-surface contacts
- High pulse reliability due to double-sided metallization and/or film/foil construction
- High voltage/overvoltage strength by internal series connection with self-healing metallized floating electrode
- Available in various contact configurations
- Solvent-resistant, flame retardant plastic case in accordance with UL 94 V-0
- Production sites ISO 9001:2015 certified

WIMA Snubber capacitors are manufactured under conditions of large volume production, but are also available in small quantities as individually configurable high-rel. components.

WIMA Snubber capacitors are available with capacitances from 0.01 µF through 8.0 µF and with rated voltages from 630 VDC through 4000 VDC.

All components are environmentally compatible with the RoHS 2015/863/EU regulations of the European Union.

WIMA Snubber MKP
WIMA Snubber FKP

Development of the WIMA Snubber MKP and WIMA Snubber FKP capacitor series for high power conversion is based on decades of experience with Polypropylene film pulse capacitors.

WIMA Snubber capacitors are available both as double-sided metallized pulse version – WIMA Snubber MKP – and for extremly high pulse ratings in self-healing film/foil technology – WIMA Snubber FKP. Their electrical performance as well as the manifold number of available connecting options makes the WIMA Snubber technology unique:

- Plates soldered directly to the schoopage for safe contacts at high rms currents

WIMA Snubber MKP

Snubber MKP Capacitors for Pulse Applications with Double-Sided Metallized Electrodes and Internal Series Connection. Capacitances from 0.047 µF to 8.0 µF. Rated Voltages from 700 VDC to 3000 VDC.

Special Features

- **Pulse duty construction**
- **Self-healing**
- **Particularly reliable contact-configurations: 4-pin versions and screwable plate connections**
- **Internal series connection**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2015/863/EU**

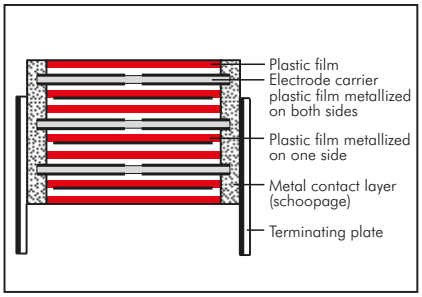
Typical Applications

For high pulse and high frequency applications requiring extremely reliable contacts e.g.

- **IGBT-applications**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Double-sided metallized plastic film
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire or plates.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range: 0.047 µF to 8.0 µF
Rated voltages: 700 VDC, 850 VDC, 1000 VDC, 1250 VDC, 1700 VDC, 2000 VDC, 2500 VDC, 3000 VDC
Capacitance tolerances:
±20%, ±10%, ±5% (other tolerances are available subject to special enquiry)
Operating temperature range:
–55° C to +105° C
Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 1 x 10^5 MΩ
C > 0.33 µF: ⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Test voltage: 2 sec

L	⩽2000 VDC	2500 VDC	⩾3000 VDC
<41.5	1.6 U_r	1.4 U_r	1.2 U_r
41.5	1.4 U_r	1.4 U_r	1.2 U_r
56	1.2 U_r	1.2 U_r	1.2 U_r

Climatic test category:
55/100/56 in accordance with IEC
Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages
Reliability:
Operational life > 300 000 hours
Failure rate < 1 fit (0.5 x U_r and 40° C)
Specific dissipation:

Box size* WxHxL in mm	Specific dissipation in Watts per K above the ambient temperature
19x31x56	0.068
23x34x56	0.079
27x37.5x56	0.092
33x48x56	0.122
37x54x56	0.142

* other box sizes see page 11.

Dissipation factors at + 20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}
10 kHz	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}	–
100 kHz	⩽ 15 x 10^{-4}	–	–

Maximum pulse rise time:

Capacitance µF	max. pulse rise time V/µsec at T_A < 40° C							
	700 VDC	850 VDC	1000 VDC	1250 VDC	1700 VDC	2000 VDC	2500 VDC	3000 VDC
0.047... 0.22	1150	1150	1800	1800	1800	1800	1800	1800
0.33 ... 0.68	900	900	1150	1150	1150	1150	1150	1150
1.0 ... 2.2	500	500	500	500	650	650	650	650
2.5 ... 6.8	190	190	390	390	500	–	–	–
7.0 ... 8.0	90	90	–	–	–	–	–	–

Mounting Recommendation

Excessive mechanical strain, e.g. pressure or shock onto the capacitor body, is to be avoided during mounting and usage of the capacitors. When fixing the plates the screw torque is to be limited to max. 5 Nm.

For further details and graphs please refer to Technical Information.

Packing

Packing units at the end of the catalogue.

Packing quantities may vary depending on the plate version.

Continuation

General Data

Capac-itance	700 VDC/420 VAC* W	H	L	Part number	850 VDC/450 VAC* W	H	L	Part number	1000 VDC/600 VAC* W	H	L	Part number
0.22 µF									11	21	31.5	SNMPO132206B_____
									11	22	41.5	SNMPO132207B_____
0.33 „					15	26	31.5	SNMPM033306F_____	15	26	31.5	SNMPO133306F_____
					13	24	41.5	SNMPM033307C_____	13	24	41.5	SNMPO133307C_____
0.47 „	11	21	31.5	SNMPK034706B_____	17	29	31.5	SNMPM034706G_____	17	29	31.5	SNMPO134706G_____
	11	22	41.5	SNMPK034707B_____	15	26	41.5	SNMPM034707D_____	15	26	41.5	SNMPO134707D_____
0.68 „	15	26	31.5	SNMPK036806F_____	17	29	41.5	SNMPM036807E_____	17	29	41.5	SNMPO136807E_____
	13	24	41.5	SNMPK036807C_____								
1.0 µF	17	29	31.5	SNMPK041006G_____	19	32	41.5	SNMPM041007F_____	20	39.5	41.5	SNMPO141007G_____
	15	26	41.5	SNMPK041007D_____					23	34	56	SNMPO141008E_____
1.5 „	19	32	41.5	SNMPK041507F_____	20	39.5	41.5	SNMPM041507G_____	24	45.5	41.5	SNMPO141507H_____
					23	34	56	SNMPM041508E_____	23	34	56	SNMPO141508E_____
2.0 „	20	39.5	41.5	SNMPK042007G_____	24	45.5	41.5	SNMPM042007H_____	31	46	41.5	SNMPO142007I_____
					23	34	56	SNMPM042008E_____	27	37.5	56	SNMPO142008H_____
2.2 „	20	39.5	41.5	SNMPK042207G_____	24	45.5	41.5	SNMPM042207H_____	31	46	41.5	SNMPO142207I_____
					23	34	56	SNMPM042208E_____	27	37.5	56	SNMPO142208H_____
2.5 „	24	45.5	41.5	SNMPK042507H_____	31	46	41.5	SNMPM042507I_____	35	50	41.5	SNMPO142507J_____
					27	37.5	56	SNMPM042508H_____	33	48	56	SNMPO142508J_____
3.0 „	24	45.5	41.5	SNMPK043007H_____	31	46	41.5	SNMPM043007I_____	40	55	41.5	SNMPO143007K_____
					27	37.5	56	SNMPM043008H_____	33	48	56	SNMPO143008J_____
3.3 „	24	45.5	41.5	SNMPK043307H_____	35	50	41.5	SNMPM043307J_____	40	55	41.5	SNMPO143307K_____
					33	48	56	SNMPM043308J_____	33	48	56	SNMPO143308J_____
4.0 „	31	46	41.5	SNMPK044007I_____	35	50	41.5	SNMPM044007J_____	37	54	56	SNMPO144008L_____
					33	48	56	SNMPM044008J_____				
4.7 „	31	46	41.5	SNMPK044707I_____	33	48	56	SNMPM044708J_____	37	54	56	SNMPO144708L_____
5.0 „	31	46	41.5	SNMPK045007I_____	33	48	56	SNMPM045008J_____	37	54	56	SNMPO145008L_____
6.0 „	35	50	41.5	SNMPK046007J_____	37	54	56	SNMPM046008L_____	37	54	56	SNMPO146008L_____
	33	48	56	SNMPK046008J_____								
7.0 „	40	55	41.5	SNMPK047007K_____	37	54	56	SNMPM047008L_____				
	33	48	56	SNMPK047008J_____								
8.0 „	37	54	56	SNMPK048008L_____								

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Versions and dimensional drawings see page 120.

Part number completion:
Version codes see page 122.
Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: 6-2 = SD
none = 00 (for plate versions)

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Continuation

General Data

Capac-itance	1250 VDC/600 VAC* W	H	L	Part number	1700 VDC/650 VAC* W	H	L	Part number	2000 VDC/700 VAC* W	H	L	Part number
0.068 µF									11	21	31.5	SNMPU026806B_____
									11	22	41.5	SNMPU026807B_____
0.1 µF					11	21	31.5	SNMPTA31006B_____	13	24	31.5	SNMPU031006D_____
					11	22	41.5	SNMPTA31007B_____	11	22	41.5	SNMPU031007B_____
0.15 „					13	24	31.5	SNMPTA31506D_____	15	26	31.5	SNMPU031506F_____
					11	22	41.5	SNMPTA31507B_____	13	24	41.5	SNMPU031507C_____
0.22 „	11	21	31.5	SNMPR032206B_____	15	26	31.5	SNMPTA32206F_____	15	26	41.5	SNMPU032207D_____
	11	22	41.5	SNMPR032207B_____	13	24	41.5	SNMPTA32207C_____				
0.33 „	15	26	31.5	SNMPR033306F_____	17	34.5	31.5	SNMPTA33306I_____	19	32	41.5	SNMPU033307F_____
	13	24	41.5	SNMPR033307C_____	15	26	41.5	SNMPTA33307D_____				
0.47 „	17	29	31.5	SNMPR034706G_____	19	32	41.5	SNMPTA34707F_____	20	39.5	41.5	SNMPU034707G_____
	15	26	41.5	SNMPR034707D_____					23	34	56	SNMPU034708E_____
0.68 „	17	29	41.5	SNMPR036807E_____	20	39.5	41.5	SNMPTA36807G_____	24	45.5	41.5	SNMPU036807H_____
					23	34	56	SNMPTA36808E_____	27	37.5	56	SNMPU036808H_____
1.0 µF	20	39.5	41.5	SNMPR041007G_____	24	45.5	41.5	SNMPTA41007H_____	35	50	41.5	SNMPU041007J_____
	23	34	56	SNMPR041008E_____	27	37.5	56	SNMPTA41008H_____	33	48	56	SNMPU041008J_____
1.5 „	24	45.5	41.5	SNMPR041507H_____	31	46	41.5	SNMPTA41507I_____	40	55	41.5	SNMPU041507K_____
	23	34	56	SNMPR041508E_____	27	37.5	56	SNMPTA41508H_____	33	48	56	SNMPU041508J_____
2.0 „	31	46	41.5	SNMPR042007I_____	40	55	41.5	SNMPTA42007K_____	37	54	56	SNMPU042008L_____
	27	37.5	56	SNMPR042008H_____	33	48	56	SNMPTA42008J_____				
2.2 „	31	46	41.5	SNMPR042207I_____	40	55	41.5	SNMPTA42207K_____	37	54	56	SNMPU042008L_____
	27	37.5	56	SNMPR042208H_____	33	48	56	SNMPTA42208J_____				
2.5 „	35	50	41.5	SNMPR042507J_____	37	54	56	SNMPTA42508L_____				
	33	48	56	SNMPR042508J_____								
3.0 „	40	55	41.5	SNMPR043007K_____	37	54	56	SNMPTA43008L_____				
	33	48	56	SNMPR043008J_____								
3.3 „	40	55	41.5	SNMPR043307K_____								
	33	48	56	SNMPR043308J_____								
4.0 „	37	54	56	SNMPR044008L_____								
4.7 „	37	54	56	SNMPR044708L_____								
5.0 „	37	54	56	SNMPR045008L_____								
6.0 „	37	54	56	SNMPR046008L_____								

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Versions and dimensional drawings see page 120.

Part number completion:
Version codes see page 122. Tolerance: 20 % = M 10 % = K 5 % = J Packing: bulk = S Pin length: 6-2 = SD none = 00 (for plate versions)

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Continuation

General Data

Capacitance	2500 VDC/700 VAC* W	H	L	Part number	3000 VDC/700 VAC* W	H	L	Part number
0.047 µF	11	21	31.5	SNMPV024706B_____	11	21	31.5	SNMPW024706B_____
	11	22	41.5	SNMPV024707B_____	11	22	41.5	SNMPW024707B_____
0.068 „	13	24	31.5	SNMPV026806D_____	13	24	31.5	SNMPW026806D_____
	11	22	41.5	SNMPV026807B_____	11	22	41.5	SNMPW026807B_____
0.1 µF	15	26	31.5	SNMPV031006F_____	15	26	31.5	SNMPW031006F_____
	13	24	41.5	SNMPV031007C_____	13	24	41.5	SNMPW031007C_____
0.15 „	15	26	41.5	SNMPV031507D_____	15	26	41.5	SNMPW031507D_____
0.22 „	19	32	41.5	SNMPV032207F_____	19	32	41.5	SNMPW032207F_____
0.33 „	24	45.5	41.5	SNMPV033307H_____	24	45.5	41.5	SNMPW033307H_____
0.47 „	31	46	41.5	SNMPV034707I_____	31	46	41.5	SNMPW034707I_____
	27	37.5	56	SNMPV034708H_____	27	37.5	56	SNMPW034708H_____
0.68 „	35	50	41.5	SNMPV036807J_____	35	50	41.5	SNMPW036807J_____
	33	48	56	SNMPV036808J_____	33	48	56	SNMPW036808J_____
1.0 µF	40	55	41.5	SNMPV041007K_____	40	55	41.5	SNMPW041007K_____
	33	48	56	SNMPV041008J_____	33	48	56	SNMPW041008J_____
1.5 „	37	54	56	SNMPV041508L_____	37	54	56	SNMPW041508L_____

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

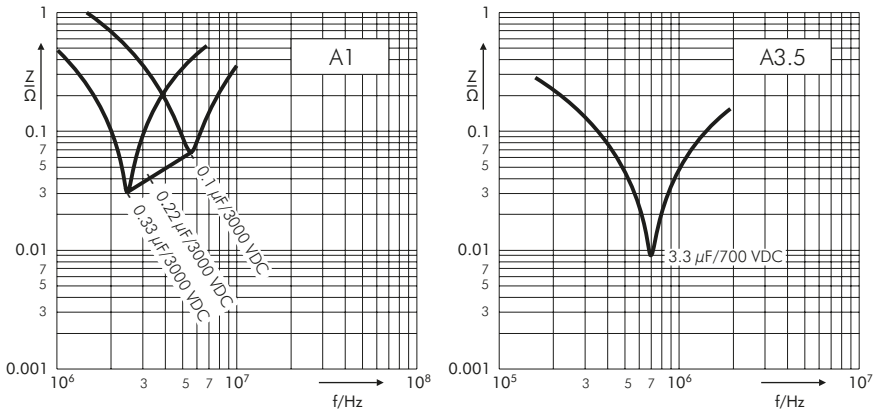
Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Versions and dimensional drawings see page 120.

Part number completion:
Version codes see page 122.
Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: 6-2 = SD
none = 00 (for plate versions)

Impedance change with frequency (general guide) (examples).



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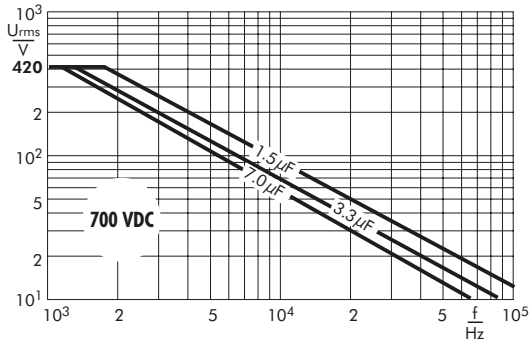
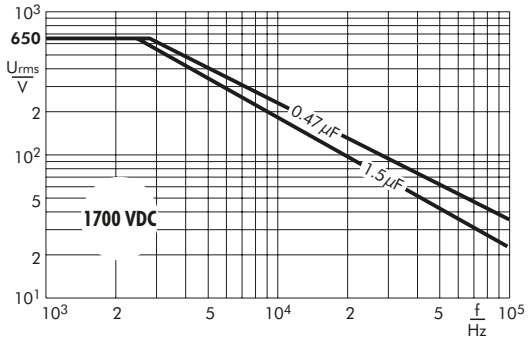
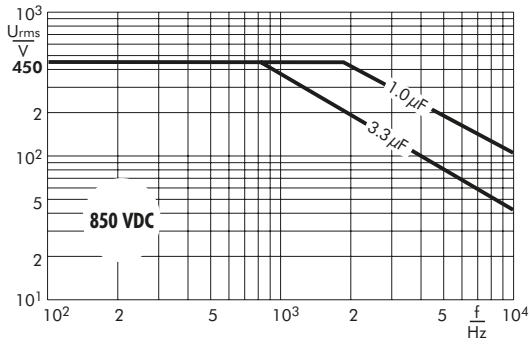
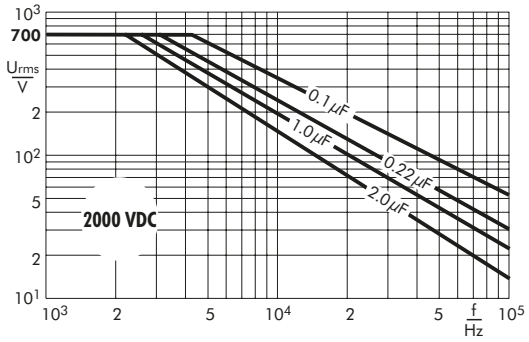
Continuation

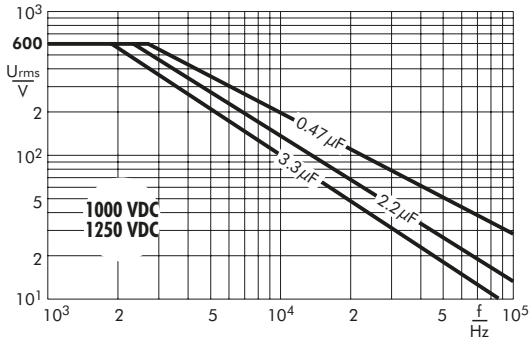
Permissible AC voltage in relation to frequency till 15° C internal temperature rise (general guide).

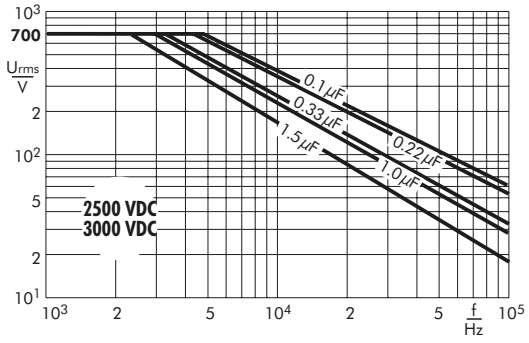












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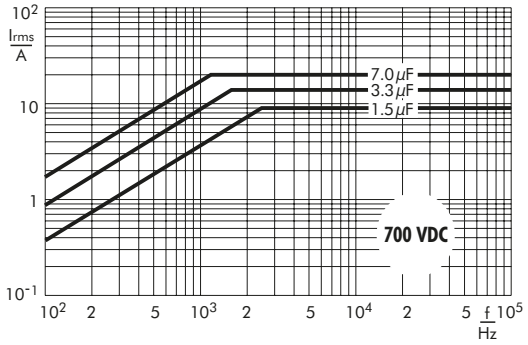
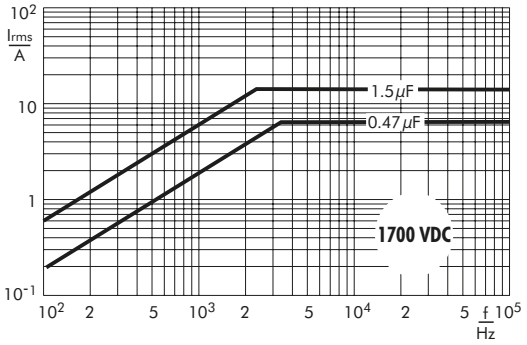
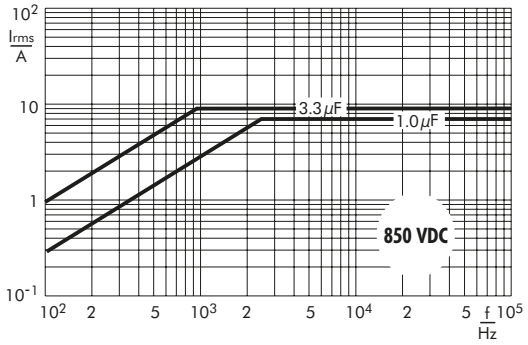
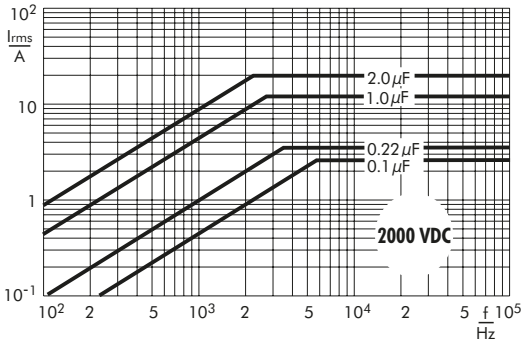
Continuation

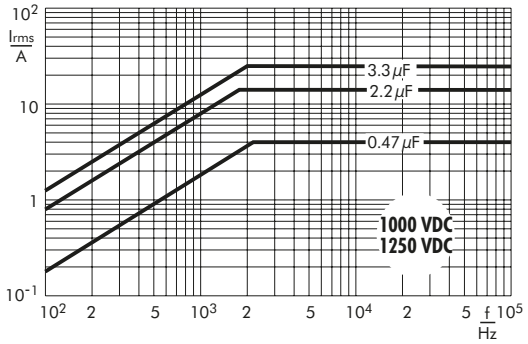
Permissible AC current in relation to frequency till 15° C internal temperature rise (general guide).

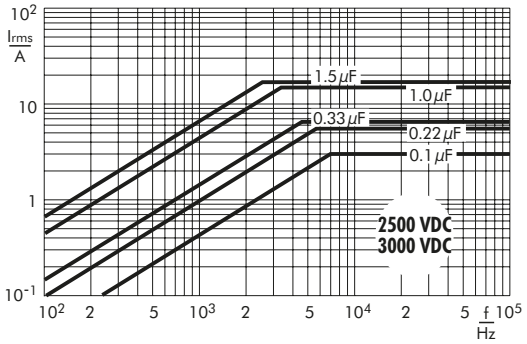












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WIMA Snubber FKP

Snubber FKP Capacitors for High Pulse Applications with Metal Foil Electrodes and Metallized Internal Series Connection. Capacitances from 0.01 µF to 3.3 µF. Rated Voltages from 630 VDC to 4000 VDC.

Special Features

- **High pulse duty**
- **Self-healing**
- **Particularly reliable contact-configurations: 4-pin versions and screwable plate connections**
- **Internal series connection**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2015/863/EU**

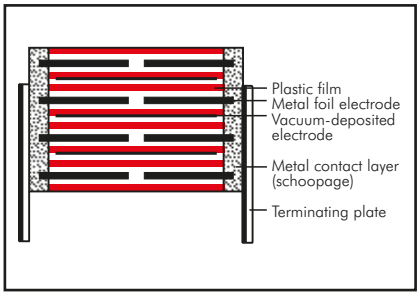
Typical Applications

For high pulse and high frequency applications requiring extremely reliable contacts e.g.

- **IGBT-applications**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Aluminium foil and single-sided metallized plastic film
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire or plates.
Marking:
Colour: Red. Marking: Black.

Electrical Data

Capacitance range: 0.01 µF to 3.3 µF
Rated voltages: 630 VDC, 1000 VDC, 1250 VDC, 1600 VDC, 2000 VDC, 3000 VDC, 4000 VDC
Capacitance tolerances:
±20%, ±10%, ±5% (other tolerances are available subject to special enquiry)
Operating temperature range:
–55° C to +105° C
Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 1 x 10^5 MΩ
C > 0.33 µF: ⩾ 30000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Test voltage: 2 sec

L	⩽ 2000 VDC	⩾ 3000 VDC
< 41.5	1.6 U_r	1.2 U_r
41.5	1.4 U_r	1.2 U_r
56	1.2 U_r	1.2 U_r

Climatic test category:
55/100/56 in accordance with IEC
Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages
Reliability:
Operational life > 300000 hours
Failure rate < 1 fit (0.5 x U_r and 40° C)
Specific dissipation:

Box size* WxHxL in mm	Specific dissipation in Watts per K above the ambient temperature
19x31x56	0.068
23x34x56	0.079
27x37.5x56	0.092
33x48x56	0.122
37x54x56	0.142

* other box sizes see page 11.

Dissipation factors at + 20° C: tan δ

at f	C ⩽ 0.1 µF	0.1 µF < C ⩽ 1.0 µF	C > 1.0 µF
1 kHz	⩽ 5 x 10^{-4}	⩽ 5 x 10^{-4}	⩽ 5 x 10^{-4}
10 kHz	⩽ 6 x 10^{-4}	⩽ 6 x 10^{-4}	–
100 kHz	⩽ 10 x 10^{-4}	–	–

Maximum pulse rise time:

Capacitance µF	max. pulse rise time V/µsec at T_A < 40° C						
	630 VDC	1000 VDC	1250 VDC	1600 VDC	2000 VDC	3000 VDC	4000 VDC
0.01 ... 0.022	–	11000	11000	11000	11000	11000	11000
0.033 ... 0.068	9000	9000	9000	9000	9000	9000	9000
0.1 ... 0.22	9000	9000	9000	9000	9000	9000	9000
0.33 ... 0.68	5000	5000	5000	5000	5000	5000	5000
1.0 ... 3.3	1600	2000	2000	2000	–	–	–

Mounting Recommendation

Excessive mechanical strain, e.g. pressure or shock onto the capacitor body, is to be avoided during mounting and usage of the capacitors. When fixing the plates the screw torque is to be limited to max. 5 Nm.

For further details and graphs please refer to Technical Information.

Packing

Packing units at the end of the catalogue.

Packing quantities may vary depending on the plate version.

Continuation

General Data

Capacitance	630 VDC/400 VAC*				1000 VDC/600 VAC*			
	W	H	L	Part number	W	H	L	Part number
0.022 µF					11	22	41.5	SNFPO122207B_____
0.033 „					11	22	41.5	SNFPO123307B_____
0.047 „	11	22	41.5	SNFPJ024707B_____	11	22	41.5	SNFPO124707B_____
0.068 „	11	22	41.5	SNFPJ026807B_____	11	22	41.5	SNFPO126807B_____
0.1 µF	11	22	41.5	SNFPJ031007B_____	11	22	41.5	SNFPO131007B_____
0.15 „	11	22	41.5	SNFPJ031507B_____	15	26	41.5	SNFPO131507D_____
0.22 „	13	24	41.5	SNFPJ032207C_____	17	29	41.5	SNFPO132207E_____
0.33 „	15	26	41.5	SNFPJ033307D_____	19	32	41.5	SNFPO133307F_____
0.47 „	17	29	41.5	SNFPJ034707E_____	20	39.5	41.5	SNFPO134707G_____
0.68 „	19	32	41.5	SNFPJ036807F_____	24	45.5	41.5	SNFPO136807H_____
					23	34	56	SNFPO136808E_____
1.0 µF	20	39.5	41.5	SNFPJ041007G_____	31	46	41.5	SNFPO141007I_____
					27	37.5	56	SNFPO141008H_____
1.5 „	24	45.5	41.5	SNFPJ041507H_____	35	50	41.5	SNFPO141507J_____
					33	48	56	SNFPO141508J_____
2.2 „	31	46	41.5	SNFPJ042207I_____	37	54	56	SNFPO142208L_____
	27	37.5	56	SNFPJ042208H_____				
2.5 „	35	50	41.5	SNFPJ042507J_____				
	33	48	56	SNFPJ042508J_____				
3.0 „	37	54	56	SNFPJ043008L_____				
3.3 „	37	54	56	SNFPJ043308L_____				

Capacitance	1250 VDC/600 VAC*				1600 VDC/650 VAC*			
	W	H	L	Part number	W	H	L	Part number
0.01 µF					11	22	41.5	SNFPT021007B_____
0.015 „					11	22	41.5	SNFPT021507B_____
0.022 „	11	22	41.5	SNFPR022207B_____	11	22	41.5	SNFPT022207B_____
0.033 „	11	22	41.5	SNFPR023307B_____	11	22	41.5	SNFPT023307B_____
0.047 „	11	22	41.5	SNFPR024707B_____	11	22	41.5	SNFPT024707B_____
0.068 „	11	22	41.5	SNFPR026807B_____	15	26	41.5	SNFPT026807D_____
0.1 µF	11	22	41.5	SNFPR031007B_____	17	29	41.5	SNFPT031007E_____
0.15 „	15	26	41.5	SNFPR031507D_____	19	32	41.5	SNFPT031507F_____
0.22 „	17	29	41.5	SNFPR032207E_____	20	39.5	41.5	SNFPT032207G_____
0.33 „	19	32	41.5	SNFPR033307F_____	24	45.5	41.5	SNFPT033307H_____
0.47 „	20	39.5	41.5	SNFPR034707G_____	31	46	41.5	SNFPT034707I_____
					27	37.5	56	SNFPT034708H_____
0.68 „	24	45.5	41.5	SNFPR036807H_____	35	50	41.5	SNFPT036807J_____
	23	34	56	SNFPR036808E_____	27	37.5	56	SNFPT036808H_____
1.0 µF	31	46	41.5	SNFPR041007I_____	33	48	56	SNFPT041008J_____
	27	37.5	56	SNFPR041008H_____				
1.5 „	33	48	56	SNFPR041508J_____	37	54	56	SNFPT041508L_____
2.2 „	37	54	56	SNFPR042208L_____				

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Versions and dimensional drawings see page 120.

Part number completion:	
Version codes see page 122.	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
	none = 00 (for plate versions)

Continuation page 118

Continuation

General Data

Capac-itance	2000 VDC/700 VAC* W	H	L	Part number	3000 VDC/700 VAC* W	H	L	Part number	4000 VDC/700 VAC* W	H	L	Part number
0.01 µF	11	22	41.5	SNFPU021007B_____	11	22	41.5	SNFPW021007B_____	11	22	41.5	SNFPX021007B_____
0.015 „	11	22	41.5	SNFPU021507B_____	11	22	41.5	SNFPW021507B_____	11	22	41.5	SNFPX021507B_____
0.022 „	11	22	41.5	SNFPU022207B_____	11	22	41.5	SNFPW022207B_____	13	24	41.5	SNFPX022207C_____
0.033 „	13	24	41.5	SNFPU023307C_____	13	24	41.5	SNFPW023307C_____	15	26	41.5	SNFPX023307D_____
0.047 „	15	26	41.5	SNFPU024707D_____	15	26	41.5	SNFPW024707D_____	17	29	41.5	SNFPX024707E_____
0.068 „	17	29	41.5	SNFPU026807E_____	17	29	41.5	SNFPW026807E_____	19	32	41.5	SNFPX026807F_____
0.1 µF	17	29	41.5	SNFPU031007E_____	19	32	41.5	SNFPW031007F_____	20	39.5	41.5	SNFPX031007G_____
0.15 „	20	39.5	41.5	SNFPU031507G_____	20	39.5	41.5	SNFPW031507G_____	24	45.5	41.5	SNFPX031507H_____
0.22 „	24	45.5	41.5	SNFPU032207H_____	24	45.5	41.5	SNFPW032207H_____	31	46	41.5	SNFPX032207I_____
									27	37.5	56	SNFPX032208H_____
0.33 „	31	46	41.5	SNFPU033307I_____	31	46	41.5	SNFPW033307I_____	33	48	56	SNFPX033308J_____
	27	37.5	56	SNFPU033308H_____	27	37.5	56	SNFPW033308H_____				
0.47 „	31	46	41.5	SNFPU034707I_____	33	48	56	SNFPW034708J_____	37	54	56	SNFPX034708L_____
	27	37.5	56	SNFPU034708H_____								
0.68 „	33	48	56	SNFPU036808J_____								

* AC voltages: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Dims. in mm.

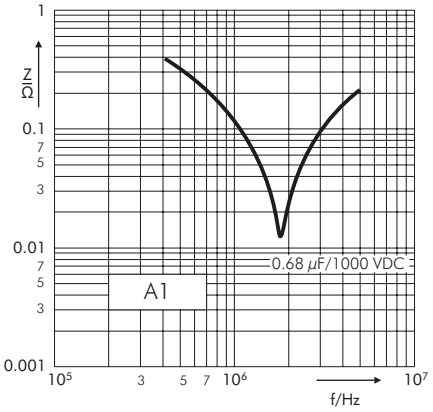
Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

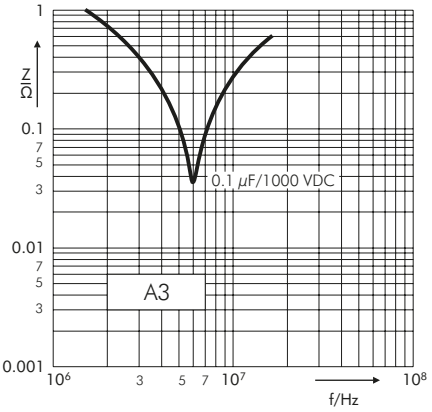
Versions and dimensional drawings see page 120.

Part number completion:

Version codes see page 122.
Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: 6-2 = SD
none = 00 (for plate versions)

Impedance change with frequency (general guide) (examples).





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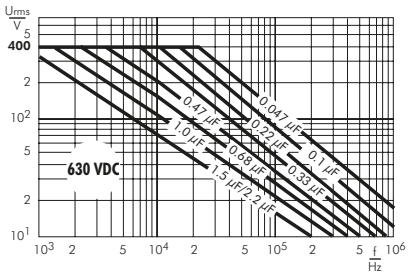
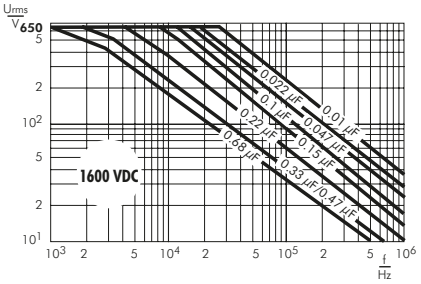
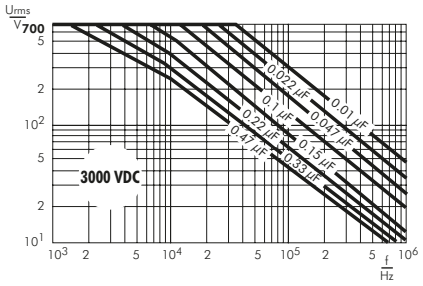
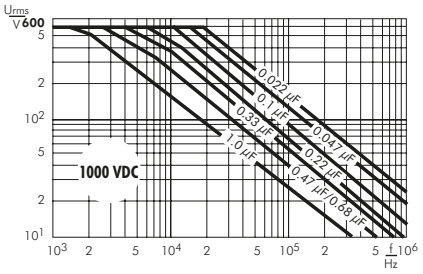
Continuation

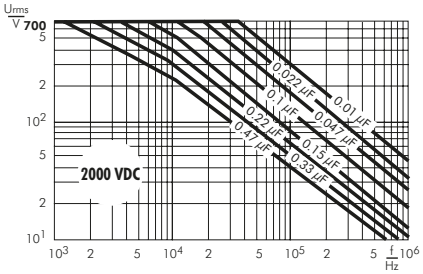
Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).

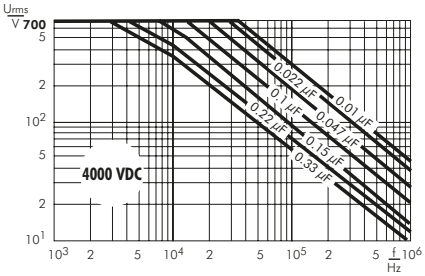












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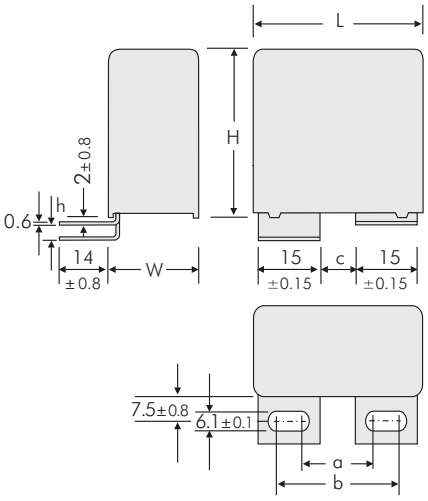
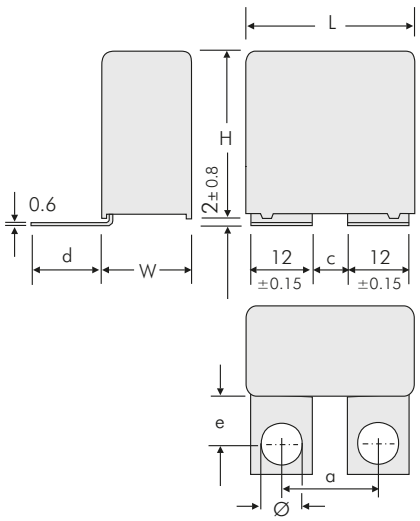
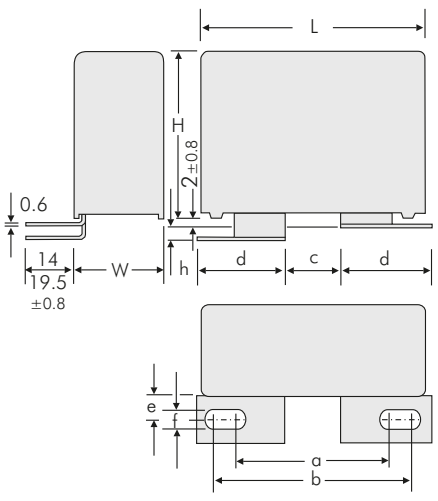
Versions of WIMA Snubber-Capacitors



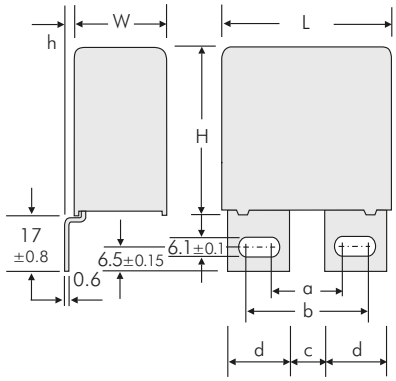
Version	L	a ±0.5	b ±0.5	c ±0.5	h ±0.8
A1	41.5	17.5	28	7.5	0
A1.5	41.5	17.5	28	7.5	3.5
A1	56	20	30	10	0
A1.1.1	56	28	38	18	0
A1.4.1	56	28	38	18	3.5



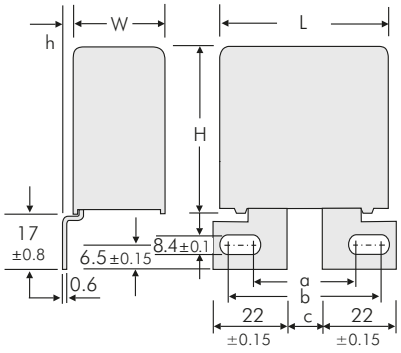
Version	L	a ±0.5	c ±0.5	d ±0.8	e ±0.8	Ø ±0.1
A1.6	41.5	18	6	21.5	16	7
A1.6.1	41.5	22	10	18.5	13	7
A1.6.2	41.5	23	10	18.5	13	8
A1.6	56	29	17	21.5	16	7



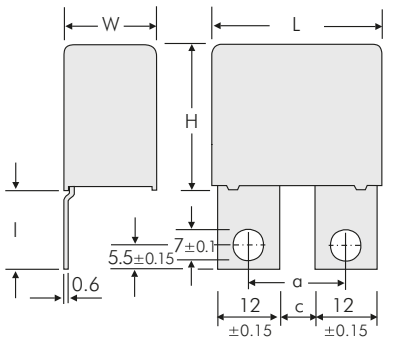
Version	L	a ±0.5	b ±0.5	c ±0.5	d ±0.15	e ±0.8	f ±0.1	h ±0.8
A2	41.5	36	46.5	14.5	22	7.5	8.4	0
A2.4.1	41.5	33.5	39.5	7.5	22	13	8.4	0
A2.6.1	41.5	31.5	41.5	14	18.75	13	6.1	3.5
A2.6.2	41.5	31.5	41.5	14	22	13	6.1	0
A2.8	41.5	36	46.5	14.5	22	7.5	8.4	3.5
A2.1	56	39.5	45.5	13.5	22	7.5	8.4	0
A2.1.2	56	36	45.5	14.5	21.5	7.5	8.4	0



Version	L	a ±0.5	b ±0.5	c ±0.5	d ±0.15	h ±0.8
A3	41.5	17.5	27.5	7.5	15	0
A3.5	41.5	17.5	27.5	7.5	15	3
A3.12	41.5	17.5	30	7.5	16.5	0
A3	56	20	30	10	15	0
A3.1	56	28	38	18	15	0
A3.5	56	20	30	10	15	3
A3.10	56	28	38	18	15	3



Version	L	a ±0.5	b ±0.5	c ±0.5	h ±0.8
A3.9	41.5	36	46.5	14.5	0
A3.11	41.5	36	46.5	14.5	3
A3.2	56	36	46.5	14.5	0
A3.3	56	36	46.5	14.5	3



Version	L	a ±0.5	c ±0.5	l ±0.8
A3.8	41.5 W ⩾ 17	18	6	23
A3.8.1	41.5 W ⩾ 17	22	10	17.5
A3.8.2	41.5 W ⩾ 17	22	10	23

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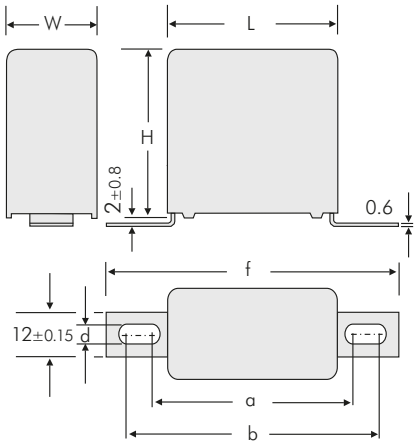
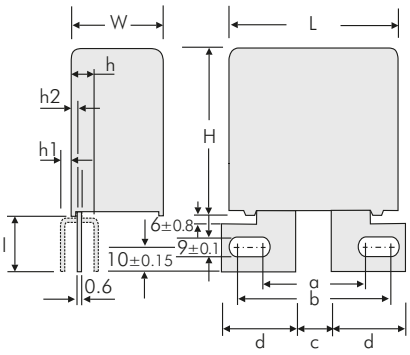
Versions of WIMA Snubber-Capacitors

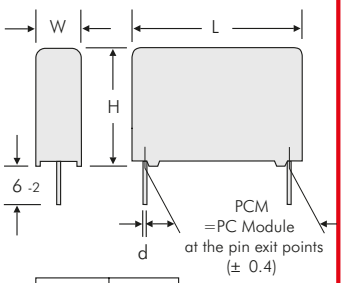


Version	L	a ±0.8	b ±0.8	f ±0.8	d ±0.1
A4.9	31.5 W ⩾ 15	44	47	57	4.5
A4.10	31.5 W ⩾ 15	43	59	69	6.1
A4.2	41.5 W ⩾ 15	54	57	67	4.5
A4	41.5 W ⩾ 15	53	69	79	6.1
A4.7	56	65	68	78	4.5
A4	56	64	80	90	6.1



Version	W	a ±0.5	b ±0.5	c ±0.5	d ±0.15	h ±0.8	h1 ±0.8	h2 ±0.8	l ±0.8
A6	⩾23	41.5	45.5	15.5	24.15	7	-	-	26
A6.3	⩾19	35	39	18	19	-	5	3	25
A6.4	⩾23	42.8	44.8	21	21,5	-	-	6.4	26

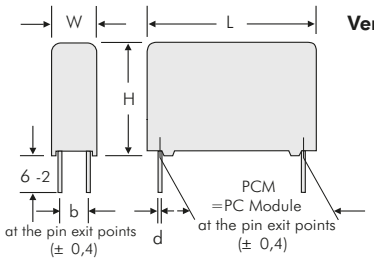
2-pin version



PCM	d
27.5	0.8
38.5	1.2
49.5	1.2

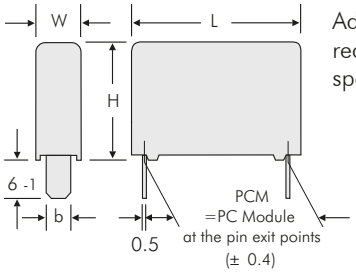
Dims. in mm

4-pin version



W	H	L	PCM	b	d
11	21	31.5	27.5	5	0.8
13	24	31.5	27.5	7.5	0.8
15	26	31.5	27.5	7.5	0.8
17	29	31.5	27.5	10	0.8
19	30	31.5	27.5	10	0.8
17	34.5	31.5	27.5	10	0.8
20	39.5	31.5	27.5	12.5	0.8
22	43.5	31.5	27.5	12.5	0.8
11	22	41.5	37.5	5	1
13	24	41.5	37.5	7.5	1
15	26	41.5	37.5	7.5	1
17	29	41.5	37.5	10	1
19	32	41.5	37.5	10	1
20	39.5	41.5	37.5	12.5	1
24	45.5	41.5	37.5	12.5	1
31	46	41.5	37.5	20	1
35	50	41.5	37.5	20	1
40	55	41.5	37.5	20	1
19	31	56	48.5	12.5	1
23	34	56	48.5	15	1
27	37.5	56	48.5	15	1
33	48	56	48.5	20	1
37	54	56	48.5	20	1

Version B



L	PCM	b ±0.15
31.5	28.5	8
41.5	38.5	8
56	49.5	8

Additional special versions can be realized. Please contact us with your specific needs.

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Versions of WIMA Snubber-Capacitors

Version code		D2	D4	B8	1A	1B	1G	1H	1I	1J	1S	2A	2B	2Q	2F	2J	2K	2M	3A	3C	3D	3E	3G	3K	3L	3M	3N	3O	3P	3Q	4A	4C	4J	4L	4M	6A	6B	6C
W x H x L	Size code	2-pin	4-pin	B8	A1	A1.1.1	A1.4.1	A1.5	A1.6	A1.6.1	A1.6.2	A2	A2.1	A2.1.2	A2.4.1	A2.6.1	A2.6.2	A2.8	A3	A3.1	A3.2	A3.3	A3.5	A3.8	A3.8.1	A3.8.2	A3.9	A3.10	A3.11	A3.12	A4	A4.2	A4.7	A4.9	A4.10	A6	A6.3	A6.4
11 x 21 x 31.5	**6B**	■	■	■																																		
13 x 24 x 31.5	**6D**	■	■	■																																		
15 x 26 x 31.5	**6F**	■	■	■																													■	■			
17 x 29 x 31.5	**6G**	■	■	■																													■	■			
17 x 34.5 x 31.5	**6I**	■	■	■																													■	■			
11 x 22 x 41.5	**7B**	■		■	■			■	■	■	■								■				■						■								
13 x 24 x 41.5	**7C**	■		■	■			■	■	■	■								■				■						■								
15 x 26 x 41.5	**7D**	■		■	■			■	■	■	■								■				■					■	■	■	■						
17 x 29 x 41.5	**7E**	■		■	■			■	■	■	■	■			■	■	■	■	■				■	■	■	■	■		■	■	■	■						
19 x 32 x 41.5	**7F**	■		■	■			■	■	■	■	■			■	■	■	■	■				■	■	■	■	■		■	■	■	■						
20 x 39.5 x 41.5	**7G**	■		■	■			■	■	■	■	■			■	■	■	■	■				■	■	■	■	■		■	■	■	■						
24 x 45.5 x 41.5	**7H**	■		■	■			■	■	■	■	■			■	■	■	■	■				■	■	■	■	■		■	■	■	■						
31 x 46 x 41.5	**7I**	■		■	■			■	■	■	■	■			■	■	■	■	■				■	■	■	■	■		■	■	■	■						
35 x 50 x 41.5	**7J**	■			■			■	■	■	■	■				■	■	■	■				■	■	■	■	■			■								
40 x 55 x 41.5	**7K**	■			■			■	■	■	■	■				■	■	■	■				■	■	■	■	■			■								
19 x 31 x 56	**8D**	■	■	■	■	■	■		■				■	■					■	■	■	■	■					■			■		■			■		
23 x 34 x 56	**8E**	■	■	■	■	■	■		■				■	■					■	■	■	■	■					■			■		■			■	■	■
27 x 37.5 x 56	**8H**	■	■	■	■	■	■		■				■	■					■	■	■	■	■					■			■		■			■	■	■
33 x 48 x 56	**8J**	■	■	■	■	■	■		■				■	■					■	■	■	■	■					■			■		■			■	■	■
37 x 54 x 56	**8L**	■	■	■	■	■	■		■				■	■					■	■	■	■	■					■			■		■			■	■	■

Possible connecting respective plate versions - depending on box size.

■ 4-pin versions on request.

WIMA GTO Capacitors with Screw Connection for High Current Carrying Capability

- High rms current carrying capability
- Very low dissipation factor
- Negative capacitance change versus temperature
- Excellent self-healing properties
- Outstanding mechanical stability
- High shock and vibration resistance
- Solvent-resistant, flame-retardant plastic case in accordance with UL 94 V-0
- Almost unlimited life expectancy

Fields of applications are designs where high current and voltage carrying capabilities are required, e.g. converter equipment in power generation or in traction technology for train drives, hoists, crane drives etc.

WIMA GTO MKP capacitors are available with capacitances from 1.0 µF through 100 µF and with nominal voltages from 400 VDC through 2000 VDC. For mounting purposes M6 and M8 threaded terminations are possible. Customer-specific requirements can be realized on demand.

All components are environmentally compatible with the RoHS 2015/863/EU regulations of the European Union.

WIMA GTO MKP

WIMA GTO MKP capacitors are especially designed to attenuate voltage spikes on GTO (Gate-Turn-Off) Thyristors and IGBT (Insulated Gate Bipolar Transistor). They are manufactured in dry-type technology with double-sided metallized electrodes and encapsulated in a cylindrical plastic case sealed with self-extinguishing polyurethane resin.

Their construction principle combined with the Polypropylene dielectric used creates outstanding features, e.g.:

- Very low self-inductance
- High pulse reliability

WIMA GTO MKP

GTO MKP Capacitors for Pulse Applications with Internal Series Connection. Capacitances from 1.0 µF to 100 µF. Rated Voltages from 400 VDC to 2000 VDC.

Special Features

- **Pulse duty construction**
- **Self-healing**
- **Cylindrical capacitor body with axial screw and thread connec tions size M6 or M8**
- **Internal series connection from 400 VAC**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **According to RoHS 2015/863/EU**

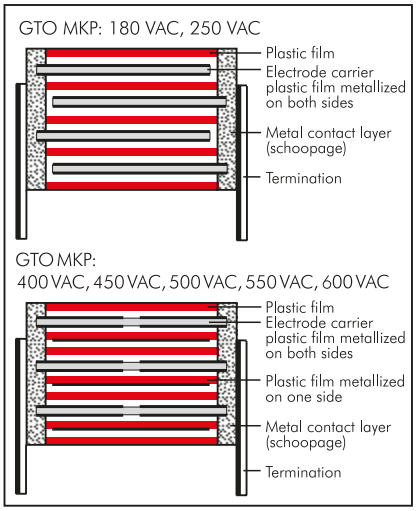
Typical Applications

For high pulse and high frequency applications requiring extremely reliable contacts e.g.

- **Damping of voltage spikes on GTO-Thyristors**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Double-sided metallized plastic film
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with PU seal, UL 94 V-0
Terminations:
Axial screw connection M6 or M8.
Marking:
Colour: Red. Marking: Black on Silver.

Electrical Data

Capacitance range:
1.0 µF to 100 µF
Rated voltages:
400 VDC, 600 VDC, 850 VDC, 1000 VDC, 1200 VDC, 1500 VDC, 2000 VDC
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +85° C
Climatic test category:
55/085/56 in accordance with IEC
Insulation resistance at +20° C:
⩾ 10000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Test voltage:
1.2 U_r, 2 sec.
Dielectric absorption:
0.05%
Dissipation factors at + 20° C: tan δ

at f	C ⩽ 20 µF	20 µF < C ⩽ 50 µF	C > 50 µF
1 kHz	⩽ 3 x 10^{-4}	⩽ 5 x 10^{-4}	⩽ 8 x 10^{-4}

Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +65° C for DC voltages and from +60° C for AC voltages.
Reliability:
Operational life > 300000 hours
Failure rate < 1 fit (0.5 x U_r and 40° C)
Specific dissipation:

Box size D x L in mm	Specific dissipation in Watts per K above the ambient temperature
60x49	0.186
70x49	0.231
80x49	0.280
90x49	0.333
90x58	0.364
90x97	0.501

Mounting Recommendation

Excessive mechanical strain, e.g. pressure or shock onto the capacitor body, is to be avoided during mounting and usage of the capacitors. When fixing the capacitor the screw torque is to be limited to max. 5 Nm.

For further details and graphs please refer to Technical Information.

Packing

Transportation-safe packing in cardboard boxes.
Packing units

D	pcs. per packing unit
60	12
70	8
80	6
90	6

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Continuation

General Data

Capacitance	400 VDC/180 VAC* D x L mm	du/dt V/µsec	$I_{max.}$ A	Part number	600 VDC/250 VAC* D x L mm	du/dt V/µsec	$I_{max.}$ A	Part number
3.5 µF					60 x 49	200	770	GTOMI04350GA00____
4 „					60 x 49	200	890	GTOMI04400GA00____
4.5 „					60 x 49	200	990	GTOMI04450GA00____
5 „					60 x 49	180	1090	GTOMI04500GA00____
6 „					60 x 49	180	1310	GTOMI04600GA00____
8 „					60 x 49	80	610	GTOMI04800GA00____
10 µF					60 x 49	80	780	GTOMI05100GA00____
15 „	60 x 49	50	790	GTOMG05150GA00____	60 x 49	80	1150	GTOMI05150GA00____
20 „	60 x 49	50	1050	GTOMG05200GA00____	70 x 49	80	1540	GTOMI05200GB00____
25 „	60 x 49	50	1330	GTOMG05250GA00____	70 x 49	80	1940	GTOMI05250GB00____
30 „	60 x 49	50	1610	GTOMG05300GA00____	80 x 49	80	2340	GTOMI05300GC00____
40 „	70 x 49	50	2090	GTOMG05400GB00____	90 x 49	80	3080	GTOMI05400GD00____
50 „	80 x 49	50	2680	GTOMG05500GC00____	90 x 58	60	3050	GTOMI05500GE00____
60 „	80 x 49	50	3240	GTOMG05600GC00____	90 x 97	35	2140	GTOMI05600GF00____
70 „	90 x 49	50	3630	GTOMG05700GD00____	90 x 97	35	2520	GTOMI05700GF00____
80 „	90 x 49	50	4100	GTOMG05800GD00____	90 x 97	35	2810	GTOMI05800GF00____
90 „	90 x 58	40	3800	GTOMG05900GE00____	90 x 97	35	3200	GTOMI05900GF00____
100 µF	90 x 58	40	4300	GTOMG06100GE00____	90 x 97	35	3550	GTOMI06100GF00____

Capacitance	850 VDC/400 VAC* D x L mm	du/dt V/µsec	$I_{max.}$ A	Part number	1000 VDC/450 VAC* D x L mm	du/dt V/µsec	I_{max} A	Part number
3 µF	60 x 49	200	770	GTOMM04300GA00____	60 x 49	260	790	GTOMO14300GA00____
3.5 „	60 x 49	200	770	GTOMM04350GA00____	60 x 49	260	910	GTOMO14350GA00____
4 „	60 x 49	200	890	GTOMM04400GA00____	60 x 49	260	1050	GTOMO14400GA00____
4.5 „	60 x 49	200	990	GTOMM04450GA00____	60 x 49	260	1170	GTOMO14450GA00____
5 „	60 x 49	200	1090	GTOMM04500GA00____	60 x 49	260	1310	GTOMO14500GA00____
6 „	60 x 49	200	1310	GTOMM04600GA00____	60 x 49	260	1550	GTOMO14600GA00____
8 „	60 x 49	200	1740	GTOMM04800GA00____	70 x 49	260	2080	GTOMO14800GB00____
10 µF	70 x 49	200	2190	GTOMM05100GB00____	70 x 49	260	2600	GTOMO15100GB00____
15 „	70 x 49	200	3230	GTOMM05150GB00____	90 x 49	260	3920	GTOMO15150GD00____
20 „	80 x 49	200	4310	GTOMM05200GC00____	90 x 58	200	4300	GTOMO15200GE00____
25 „	90 x 49	200	5390	GTOMM05250GD00____	90 x 97	120	3050	GTOMO15250GF00____
30 „	90 x 58	160	4800	GTOMM05300GE00____	90 x 97	120	3580	GTOMO15300GF00____
40 „	90 x 97	100	3780	GTOMM05400GF00____	90 x 97	120	4770	GTOMO15400GF00____
50 „	90 x 97	100	4790	GTOMM05500GF00____				
60 „	90 x 97	100	5800	GTOMM05600GF00____				

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	none = 00

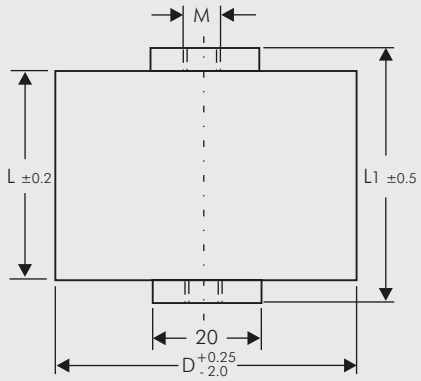
Continuation page 126

Continuation

General Data

Capacitance	1200 VDC/500 VAC* D x L mm	du/dt V/µsec	$I_{max.}$ A	Part number	1500 VDC/550 VAC* D x L mm	du/dt V/µsec	$I_{max.}$ A	Part number
1 µF					60 x 49	400	420	GTOMS04100GA00____
1.5 „					60 x 49	400	590	GTOMS04150GA00____
2 „					60 x 49	400	820	GTOMS04200GA00____
2.5 „	60 x 49	300	770	GTOMQ04250GA00____	60 x 49	400	1010	GTOMS04250GA00____
3 „	60 x 49	300	950	GTOMQ04300GA00____	60 x 49	400	1220	GTOMS04300GA00____
3.5 „	60 x 49	300	1070	GTOMQ04350GA00____	60 x 49	400	1400	GTOMS04350GA00____
4 „	60 x 49	300	1230	GTOMQ04400GA00____	70 x 49	400	1630	GTOMS04400GB00____
4.5 „	60 x 49	300	1380	GTOMQ04450GA00____	70 x 49	400	1800	GTOMS04450GB00____
5 „	60 x 49	300	1570	GTOMQ04500GA00____	70 x 49	400	2010	GTOMS04500GB00____
6 „	70 x 49	300	1840	GTOMQ04600GB00____	80 x 49	400	2390	GTOMS04600GC00____
8 „	70 x 49	300	2470	GTOMQ04800GB00____	90 x 49	400	3210	GTOMS04800GD00____
10 µF	80 x 49	300	3080	GTOMQ05100GC00____	90 x 58	320	3210	GTOMS05100GE00____
15 „	90 x 58	230	3550	GTOMQ05150GE00____	90 x 97	180	2690	GTOMS05150GF00____
20 „	90 x 97	130	2690	GTOMQ05200GF00____	90 x 97	180	3600	GTOMS05200GF00____
25 „	90 x 97	130	3370	GTOMQ05250GF00____				
30 „	90 x 97	130	4110	GTOMQ05300GF00____				

Capacitance	2000 VDC/600 VAC* D x L mm	du/dt V/µsec	$I_{max.}$ A	Part number
1 µF	60 x 49	500	500	GTOMU04100GA00____
1.5 „	60 x 49	500	750	GTOMU04150GA00____
2 „	70 x 49	500	1000	GTOMU04200GB00____
2.5 „	70 x 49	500	1250	GTOMU04250GB00____
3 „	80 x 49	500	1500	GTOMU04300GC00____
3.5 „	80 x 49	500	1750	GTOMU04350GC00____
4 „	90 x 49	500	2000	GTOMU04400GD00____
4.5 „	90 x 49	500	2250	GTOMU04450GD00____
5 „	90 x 58	500	2500	GTOMU04500GE00____
6 „	90 x 58	450	2700	GTOMU04600GE00____
8 „	90 x 97	400	3200	GTOMU04800GF00____
10 µF	90 x 97	300	3000	GTOMU05100GF00____



D	L	L1	M
60	49	55	M6
70	49	55	M6
80	49	55	M8
90	49	55	M8
90	58	64	M8
90	97	103	M8

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

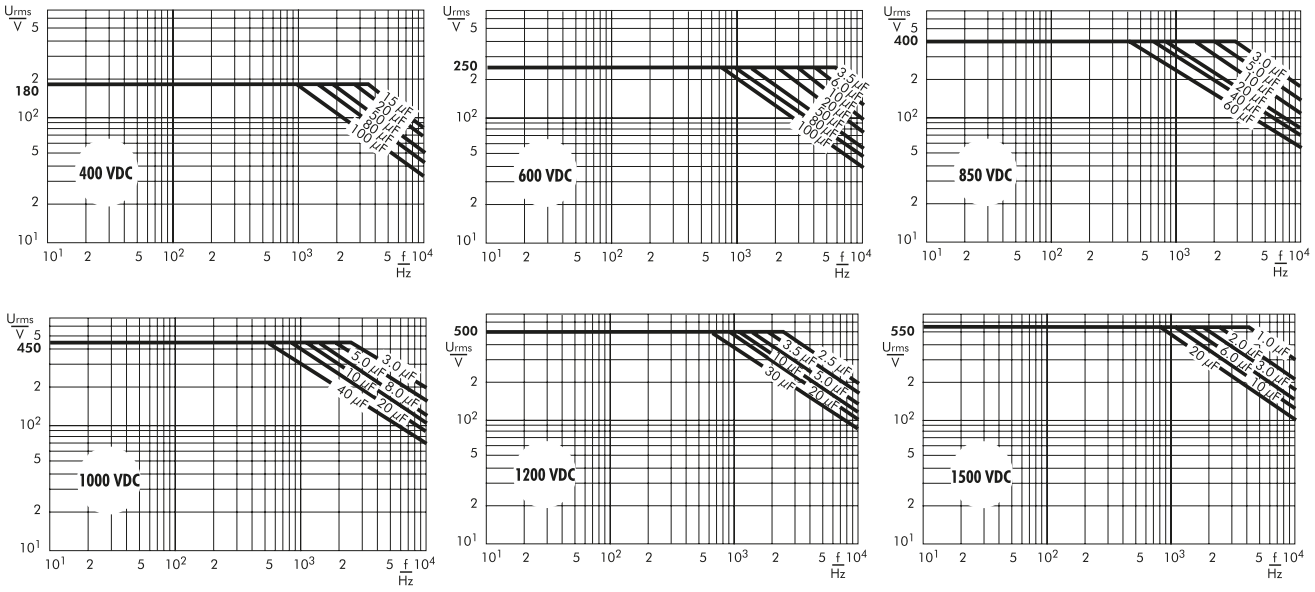
Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	none = 00

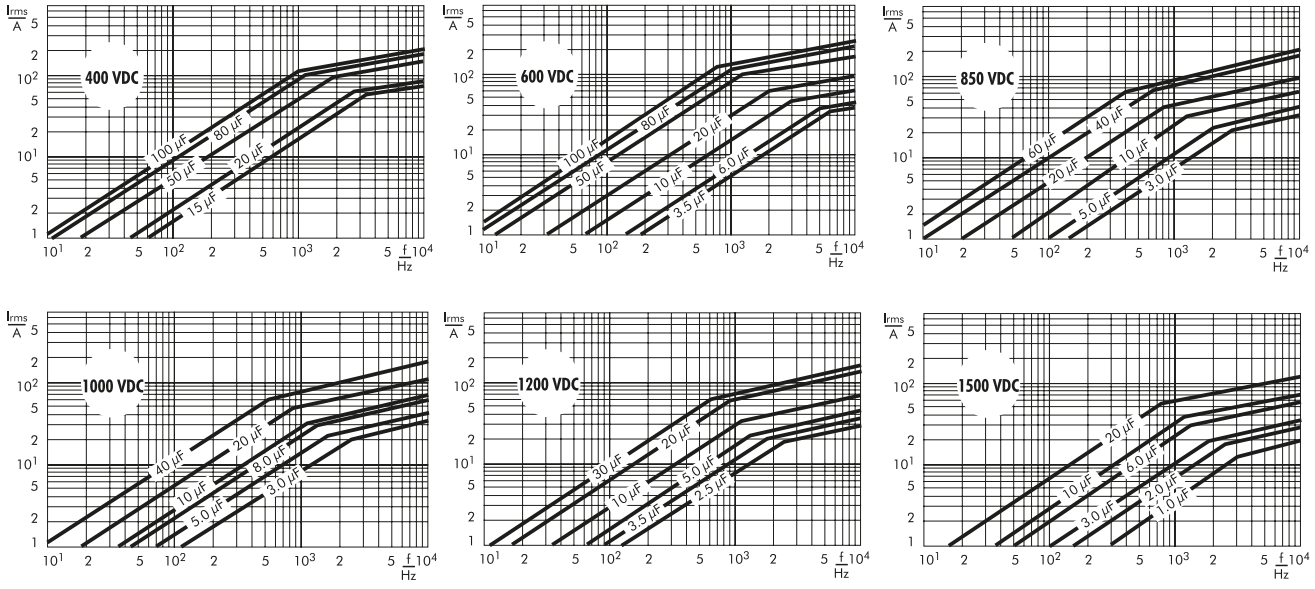
Continuation page 127

Continuation

Permissible AC voltage in relation to frequency
at 20° C internal temperature rise (general guide).



Permissible AC current in relation to frequency
at 20° C internal temperature rise (general guide).



WIMA Intermediate Circuit Capacitors for Applications in High Power Converter Technology

- Particularly reliable contact configuration
- High shock and vibration resistance
- Outstanding mechanical stability

WIMA DC-LINK MKP 4 capacitors with rectangular case are available with capacitance values from 1 µF through 400 µF and with rated voltages from 400 VDC through 1300 VDC. For mounting purposes 2-pin, 4-pin or plate versions are possible.

WIMA DC-LINK MKP 6 capacitors have a cylindrical aluminium case. They are available with capacitances from 75 µF through 4920 µF and with rated voltages from 600 VDC through 1500 VDC. For bus bar mounting they are designed with male or female terminations and screw bolt. The WIMA DC-LINK MKP 6 HP series has been designed for stringent requirements.

Customized solutions can be realized on request with variable connecting configurations.

All components are environmentally compatible with the RoHS 2015/863/EU regulations of the European Union.

WIMA DC-LINK MKP 4
WIMA DC-LINK MKP 6
WIMA DC-LINK HC
CUSTOMIZED

WIMA DC-LINK capacitors are especially designed for applications in high power converter technology where they are more and more substituting electrolytic capacitors due to increasing electrical requirements. Manufactured with a low loss Polypropylene dielectric they show a higher current carrying capability as well as lower dissipation/self-heating at high frequencies compared to electrolytic capacitors. Further outstanding features are, e.g.:

- Very high capacitance/volume ratio
- High voltage rating per component
- Very low dissipation factor (ESR)
- Very high insulation resistance
- Excellent self-healing properties
- Long life expectancy
- Non-polar construction

04.23

WIMA DC-LINK MKP 4

Metallized Polypropylene (PP) - Capacitors for DC-Link Applications. Capacitances from 1.0 µF to 400 µF. Rated Voltages from 400 VDC to 1500 VDC.

Special Features

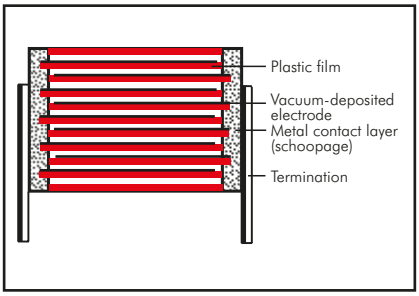
- **Capacitances up to 400 µF**
- **High volume/capacitance ratio**
- **Excellent self-healing properties**
- **Very low dissipation factor**
- **High reliability**
- **2-pin, 4-pin or plate contact configuration**
- **AEC-Q200 qualified** AEC-Q200
- **According to RoHS 2015/863/EU**

Typical Applications

As intermediate circuit capacitor e.g. in high power converter technology, power supplies, solar inverters, e-mobility (battery chargers, motor drives & power train) etc.

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
Terminations:
Tinned wire or plates.
Marking:
Colour: Red. Marking: Black.

Packing

Packing units at the end of the catalogue

Electrical Data

Capacitance range: 1 µF to 400 µF (intermediate values on request)
Rated voltages: 400 VDC, 500 VDC, 600 VDC, 800 VDC, 900 VDC, 1100 VDC, 1300 VDC, 1500 VDC
Capacitance tolerances: ±20%, ±10%, ±5%
Operating temperature range: –55° C to +105° C (hot spot including self-heating)
Climatic test category: 55/085/56 in accordance with IEC
Insulation resistance at +20° C:
⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Dielectric absorption: 0.05 %
Voltage and current derating:
A derating factor of 1.35% per K must be applied from +85° C for DC voltages and from +70° C for AC currents (I_{rms}). Additionally a derating factor of 4.5% per K must be applied from +85° C for AC currents (I_{rms})
Reliability: Operational life > 100 000 hours (U_r and 70° C)
Failure rate λ_0 ($0.5 \times U_r$ and 40° C)

$\Pi = \lvert C_N\ [\mu F] \times U_r\ [V] \rvert$	λ_0
$\Pi \leqslant 10\,000$	< 2 fit
$10\,000 < \Pi \leqslant 25\,000$	< 5 fit
$25\,000 < \Pi \leqslant 50\,000$	< 10 fit
$50\,000 < \Pi \leqslant 100\,000$	< 20 fit
$\Pi > 100\,000$	< 30 fit

Test voltage:
⩽ 500 VDC: 1.5 U_r, 2sec
> 500 VDC: 1.2 U_r, 2sec
Specific dissipation:

Box size WxHxL in mm	Specific dissipation in Watts per K above the ambient temperature
9x19x31.5	0.021
11x21x31.5	0.025
13x24x31.5	0.030
15x26x31.5	0.034
17x29x31.5	0.039
17x34.5x31.5	0.044
20x39.5x31.5	0.053
13x24x41.5	0.037
15x26x41.5	0.042
17x29x41.5	0.048
19x32x41.5	0.054
20x39.5x41.5	0.065
24x45.5x41.5	0.080
28x38x41.5	0.076
31x46x41.5	0.092
35x50x41.5	0.106
40x55x41.5	0.123
25x45x57	0.102
30x45x57	0.113
35x50x57	0.132
45x55x57	0.164
45x65x57	0.184

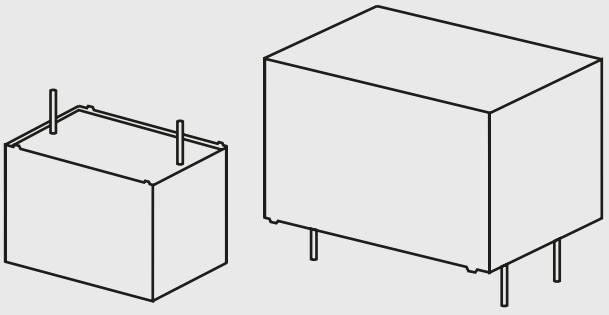
For further details and graphs please refer to Technical Information.

Dissipation factors at +20° C: tan δ x 10^{-4}

PCM	400 VDC		500 VDC		600 VDC		800 VDC		900 VDC		1100 VDC		1300 VDC		1500 VDC	
	1 kHz	10 kHz	1 kHz	10 kHz	1 kHz	10 kHz	1 kHz	10 kHz	1 kHz	10 kHz	1 kHz	10 kHz	1 kHz	10 kHz	1 kHz	10 kHz
27.5	15	160	15	130	12	120	10	90	10	80	10	60	7	50	7	40
37.5	60	350	30	240	21	150	18	170	16	150	14	100	12	90	12	90
52.5	80	550	80	460	40	300	35	250	31	200	30	170	23	150	23	150

Maximum pulse rise time:

PCM	max. pulse rise time V/µsec at T_A < 40° C							
	400 VDC	500 VDC	600 VDC	800 VDC	900 VDC	1100 VDC	1300 VDC	1500 VDC
27.5	11	15	27	29	35	43	50	59
37.5	8	10	19	21	22	29	35	41
52.5	5	7	13	15	18	21	25	29



Continuation

General Data

Capacitance	400 VDC (70° C) / 300 VDC (85° C) / 220 VDC (105° C)								
	W	H	L	PCM**	Pin	I_S A	I_{rms}*(10 kHz)* A	ESR (10 kHz)* mΩ	Part number
1 µF	9	19	31.5	27.5	2	11	1	238.7	DCP4G041006A_____
2 „	9	19	31.5	27.5	2	22	1.5	119.4	DCP4G042006A_____
3 „	9	19	31.5	27.5	2	33	1.5	79.6	DCP4G043006A_____
4 „	9	19	31.5	27.5	2	44	2	59.7	DCP4G044006A_____
5 „	9	19	31.5	27.5	2	55	2	47.7	DCP4G045006A_____
7 „	9	19	31.5	27.5	2	77	2.5	34.1	DCP4G047006A_____
10 µF	11	21	31.5	27.5	2/4	110	3.5	23.9	DCP4G051006B_____
15 „	13	24	31.5	27.5	2/4	165	4.5	15.9	DCP4G051506D_____
20 „	15	26	31.5	27.5	2/4	220	5.5	11.9	DCP4G052006F_____
22 „	17	29	31.5	27.5	2/4	242	6	9.8	DCP4G052206G_____
25 „	17	29	31.5	27.5	2/4	275	7	8.6	DCP4G052506G_____
	15	26	41.5	37.5	2/4	200	6.5	10	DCP4G052507D_____
30 „	17	34.5	31.5	27.5	2/4	330	8	7.2	DCP4G053006I_____
	17	29	41.5	37.5	2/4	240	7.5	8.5	DCP4G053007E_____
40 „	20	39.5	31.5	27.5	2/4	440	10	5.4	DCP4G054006J_____
	19	32	41.5	37.5	2/4	320	9.5	6	DCP4G054007F_____
50 „	20	39.5	41.5	37.5	2/4	400	11	5.4	DCP4G055007G_____
60 „	20	39.5	41.5	37.5	2/4	480	11.5	4.8	DCP4G056007G_____
70 „	24	45.5	41.5	37.5	2/4	560	13	4.7	DCP4G057007H_____
80 „	24	45.5	41.5	37.5	2/4	640	14	4.1	DCP4G058007H_____
90 „	24	45.5	41.5	37.5	2/4	720	15	3.6	DCP4G059007H_____
	28	38	41.5	37.5	2/4	720	15	3.6	DCP4G059007L_____
100 µF	31	46	41.5	37.5	2/4	800	18	2.8	DCP4G061007I_____
120 „	31	46	41.5	37.5	2/4	960	20	2.3	DCP4G061207I_____
140 „	35	50	41.5	37.5	2/4	1120	22.5	2.1	DCP4G061407J_____
150 „	35	50	41.5	37.5	2/4	1200	23	2	DCP4G061507J_____
	25	45	57	52.5	4	750	20	2.6	DCP4G061509D_____
160 „	40	55	41.5	37.5	2/4	1280	24.5	2	DCP4G061607K_____
	25	45	57	52.5	4	800	21	2.3	DCP4G061609D_____
180 „	40	55	41.5	37.5	2/4	1440	26	1.8	DCP4G061807K_____
	30	45	57	52.5	4	900	23.5	2	DCP4G061809E_____
200 „	40	55	41.5	37.5	2/4	1600	27.5	1.6	DCP4G062007K_____
	30	45	57	52.5	4	1000	25	1.8	DCP4G062009E_____
220 „	35	50	57	52.5	4	1100	27	1.8	DCP4G062209F_____
250 „	45	55	57	52.5	4	1250	32	1.6	DCP4G062509H_____
270 „	45	55	57	52.5	4	1350	33.5	1.5	DCP4G062709H_____
300 „	45	55	57	52.5	4	1500	35	1.3	DCP4G063009H_____
330 „	45	65	57	52.5	4	1650	37	1.2	DCP4G063309J_____
350 „	45	65	57	52.5	4	1750	40	1.1	DCP4G063509J_____
370 „	45	65	57	52.5	4	1850	41.5	1.1	DCP4G063709J_____
400 „	45	65	57	52.5	4	2000	43	1	DCP4G064009J_____

* General guide

* Permissible I_{rms} at 10° C internal temperature rise (general guide)

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= D2
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 157.

Continuation page 131

Continuation

General Data

Capacitance	500 VDC (70° C) / 400 VDC (85° C) / 290 VDC (105° C)								
	W	H	L	PCM**	Pin	I_S A	I_{rms}*(10 kHz)* A	ESR (10 kHz)* mΩ	Part number
1 µF	9	19	31.5	27.5	2	15	1	238.7	DCP4H141006A_____
2 „	9	19	31.5	27.5	2	30	1.5	119.4	DCP4H142006A_____
3 „	9	19	31.5	27.5	2	45	1.5	79.6	DCP4H143006A_____
4 „	9	19	31.5	27.5	2	60	1.8	63.7	DCP4H144006A_____
5 „	9	19	31.5	27.5	2	75	2.5	47.7	DCP4H145006A_____
7 „	11	21	31.5	27.5	2/4	105	3	34.1	DCP4H147006B_____
8 „	13	24	31.5	27.5	2/4	120	3	29.8	DCP4H148006D_____
10 µF	13	24	31.5	27.5	2/4	150	4	23.9	DCP4H151006D_____
12 „	15	26	31.5	27.5	2/4	180	4	19.9	DCP4H151206F_____
15 „	17	29	31.5	27.5	2/4	225	5	15.9	DCP4H151506G_____
	15	26	41.5	37.5	2/4	150	4.3	22.3	DCP4H151507D_____
18 „	17	29	31.5	27.5	2/4	270	6	9.5	DCP4H151806G_____
20 „	17	34.5	31.5	27.5	2/4	300	6	11.9	DCP4H152006I_____
	17	29	41.5	37.5	2/4	200	5.4	16.8	DCP4H152007E_____
22 „	20	39.5	31.5	27.5	2/4	330	7	10.9	DCP4H152206J_____
25 „	20	39.5	31.5	27.5	2/4	375	7.5	9.5	DCP4H152506J_____
	19	32	41.5	37.5	2/4	250	6.3	13.4	DCP4H152507F_____
30 „	20	39.5	41.5	37.5	2/4	300	9	7.9	DCP4H153007G_____
35 „	20	39.5	41.5	37.5	2/4	350	8.5	9.1	DCP4H153507G_____
40 „	20	39.5	41.5	37.5	2/4	400	10	5.7	DCP4H154007G_____
50 „	24	45.5	41.5	37.5	2/4	500	13	4.8	DCP4H155007H_____
	28	38	41.5	37.5	2/4	500	13	4.8	DCP4H155007L_____
55 „	24	45.5	41.5	37.5	2/4	550	14	4	DCP4H155507H_____
	28	38	41.5	37.5	2/4	550	14	4	DCP4H155507L_____
60 „	31	46	41.5	37.5	2/4	600	14	4.7	DCP4H156007I_____
70 „	31	46	41.5	37.5	2/4	700	16.5	3.9	DCP4H157007I_____
80 „	31	46	41.5	37.5	2/4	800	17.5	3.4	DCP4H158007I_____
90 „	35	50	41.5	37.5	2/4	900	19	3	DCP4H159007J_____
100 µF	35	50	41.5	37.5	2/4	1000	20	2.7	DCP4H161007J_____
	25	45	57	52.5	4	700	14.3	5	DCP4H161009D_____
120 „	40	55	41.5	37.5	2/4	1200	22.5	2.7	DCP4H161207K_____
	30	45	57	52.5	4	840	16.5	4.2	DCP4H161209E_____
130 „	40	55	41.5	37.5	2/4	1300	23	2.4	DCP4H161307K_____
140 „	35	50	57	52.5	4	980	21.5	2.8	DCP4H161409F_____
150 „	35	50	57	52.5	4	1050	22.5	2.7	DCP4H161509F_____
160 „	45	55	57	52.5	4	1120	25.5	2.5	DCP4H161609H_____
180 „	45	55	57	52.5	4	1260	27	2.2	DCP4H161809H_____
200 „	45	55	57	52.5	4	1400	28.5	2	DCP4H162009H_____
210 „	45	55	57	52.5	4	1470	29.5	1.9	DCP4H162109H_____
220 „	45	65	57	52.5	4	1540	32	1.8	DCP4H162209J_____
240 „	45	65	57	52.5	4	1680	33.5	1.7	DCP4H162409J_____

* General guide

* Permissible I_{rms} at 10° C internal temperature rise (general guide)

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= D2
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 157.

Continuation page 132

Continuation

General Data

Capacitance	600 VDC (70° C) / 450 VDC (85° C) / 320 VDC (105° C) W	H	L	PCM**	Pin	I_S A	I_{rms}*(10 kHz)* A	ESR (10 kHz)* mΩ	Part number
1 µF	9	19	31.5	27.5	2	27	1.5	106.9	DCP4I041006A_____
2 „	9	19	31.5	27.5	2	54	2	56	DCP4I042006A_____
3 „	9	19	31.5	27.5	2	81	2.5	35.6	DCP4I043006A_____
4 „	11	21	31.5	27.5	2/4	108	3	26.7	DCP4I044006B_____
5 „	13	24	31.5	27.5	2/4	135	3.5	22	DCP4I045006D_____
7 „	15	26	31.5	27.5	2/4	189	4.5	16	DCP4I047006F_____
8 „	15	26	31.5	27.5	2/4	216	5	13.4	DCP4I048006F_____
10 µF	17	29	31.5	27.5	2/4	270	6	11	DCP4I051006G_____
	13	24	41.5	37.5	2/4	190	5	17.6	DCP4I051007C_____
12 „	17	29	31.5	27.5	2/4	324	6.5	8.9	DCP4I051206G_____
15 „	17	34.5	31.5	27.5	2/4	405	8	7	DCP4I051506I_____
	17	29	41.5	37.5	2/4	285	6.5	11.8	DCP4I051507E_____
18 „	20	39.5	31.5	27.5	2/2	486	9.5	5.9	DCP4I051806J_____
20 „	20	39.5	31.5	27.5	2/4	540	10	5.3	DCP4I052006J_____
	19	32	41.5	37.5	2/4	380	10.5	4.9	DCP4I052007F_____
22 „	20	39.5	41.5	37.5	2/4	418	11	5.4	DCP4I052207G_____
25 „	20	39.5	41.5	37.5	2/4	475	11.5	5	DCP4I052507G_____
30 „	24	45.5	41.5	37.5	2/4	570	14	4.1	DCP4I053007H_____
35 „	24	45.5	41.5	37.5	2/4	665	14.5	3.8	DCP4I053507H_____
	28	38	41.5	37.5	2/4	665	14.5	3.8	DCP4I053507L_____
40 „	31	46	41.5	37.5	2/4	760	16.5	3.3	DCP4I054007I_____
45 „	31	46	41.5	37.5	2/4	855	17	3.2	DCP4I054507I_____
50 „	35	50	41.5	37.5	2/4	950	19	2.9	DCP4I055007J_____
60 „	35	50	41.5	37.5	2/4	1140	17.5	3.4	DCP4I056007J_____
	25	45	57	52.5	2/4	780	14.5	4.9	DCP4I056009D_____
70 „	40	55	41.5	37.5	2/4	1330	20	3.1	DCP4I057007K_____
	30	45	57	52.5	4	910	16.5	4.2	DCP4I057009E_____
80 „	40	55	41.5	37.5	2/4	1520	22	2.6	DCP4I058007K_____
	30	45	57	52.5	4	1040	17.8	3.6	DCP4I058009E_____
90 „	35	50	57	52.5	4	1170	23.5	1.9	DCP4I059009F_____
100 µF	45	55	57	52.5	4	1300	25	2.6	DCP4I061009H_____
120 „	45	65	57	52.5	4	1560	28	2.3	DCP4I061209J_____
140 „	45	65	57	52.5	4	1820	31	1.9	DCP4I061409J_____
150 „	45	65	57	52.5	4	1950	33	1.7	DCP4I061509J_____

* General guide

* Permissible I_{rms} at 10° C internal temperature rise (general guide)

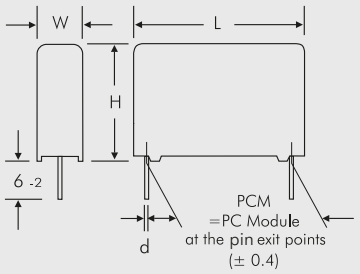
** PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= D2
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

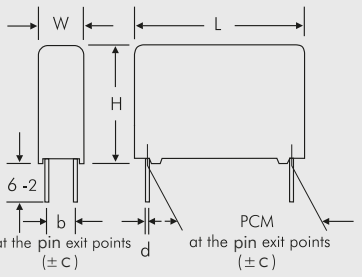
Taped version see page 157.

2-pin version



PCM	Ø d
27.5	0.8
37.5	1

4-pin version



W	PCM	b	Ø d	c
11	27.5	5	0.8	0.4
13	27.5	7.5	0.8	0.4
15	27.5	7.5	0.8	0.4
17	27.5	10	0.8	0.4
20	27.5	12.5	0.8	0.4
19	37.5	10	1	0.4
20	37.5	12.5	1	0.4
24	37.5	12.5	1	0.4
28	37.5	10	1	0.4
31	37.5	20	1	0.4
35	37.5	20	1	0.4
40	37.5	20	1	0.4
25	52.5	12.5	1.2	0.8
30	52.5	20	1.2	0.8
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Continuation

General Data

Capacitance	W	H	L	PCM**	Pin	I_S A	I_{rms}*(10 kHz)* A	ESR (10 kHz)* mΩ	Part number
						800 VDC (70° C) / 700 VDC (85° C) / 510 VDC (105° C)			
1 µF	9	19	31.5	27.5	2	29	1.7	73.2	DCP4L041006A_____
2 „	9	19	31.5	27.5	2	58	2.5	36.6	DCP4L042006A_____
3 „	11	21	31.5	27.5	2/4	87	3	24.4	DCP4L043006B_____
4 „	13	24	31.5	27.5	2/4	116	4	18.3	DCP4L044006D_____
5 „	13	24	31.5	27.5	2/4	145	4.5	14.6	DCP4L045006D_____
7 „	17	29	31.5	27.5	2/4	203	6	10.5	DCP4L047006G_____
8 „	17	29	31.5	27.5	2/4	232	6.5	9.2	DCP4L048006G_____
10 µF	17	34.5	31.5	27.5	2/4	290	8	7.3	DCP4L051006I_____
	17	29	41.5	37.5	2/4	210	7.5	8.5	DCP4L051007E_____
12 „	20	39.5	31.5	27.5	2/4	348	9.5	6.1	DCP4L051206J_____
15 „	20	39.5	31.5	27.5	2/4	435	10.5	4.9	DCP4L051506J_____
	19	32	41.5	37.5	2/4	315	8.5	7.5	DCP4L051507F_____
18 „	20	39.5	41.5	37.5	2/4	378	9.5	7.2	DCP4L051807G_____
20 „	20	39.5	41.5	37.5	2/4	420	10	6.2	DCP4L052007G_____
22 „	20	39.5	41.5	37.5	2/4	462	10.5	5.9	DCP4L052207G_____
25 „	24	45.5	41.5	37.5	2/4	525	12.5	5	DCP4L052507H_____
30 „	24	45.5	41.5	37.5	2/4	630	14	4.1	DCP4L053007H_____
	28	38	41.5	37.5	2/4	630	14	4.1	DCP4L053007L_____
35 „	31	46	41.5	37.5	2/4	735	15.5	3.8	DCP4L053507I_____
40 „	31	46	41.5	37.5	2/4	840	16.5	3.3	DCP4L054007I_____
45 „	35	50	41.5	37.5	2/4	945	17.5	3.4	DCP4L054507J_____
50 „	35	50	41.5	37.5	2/4	1050	19	3	DCP4L055007J_____
	25	45	57	52.5	4	750	18.5	3	DCP4L055009D_____
60 „	40	55	41.5	37.5	2/4	1260	21.5	2.7	DCP4L056007K_____
	30	45	57	52.5	4	900	20.5	2.7	DCP4L056009E_____
65 „	35	50	57	52.5	4	975	22.5	2.2	DCP4L056509F_____
70 „	45	55	57	52.5	4	1050	23.5	3	DCP4L057009H_____
75 „	45	55	57	52.5	4	1125	24	2.9	DCP4L057509H_____
80 „	45	55	57	52.5	4	1200	24.5	3	DCP4L058009H_____
90 „	45	65	57	52.5	4	1350	25.5	2.5	DCP4L059009J_____
100 µF	45	65	57	52.5	4	1500	26.5	2.3	DCP4L061009J_____
115 „	45	65	57	52.5	4	1725	28	2.1	DCP4L061159J_____

* General guide

* Permissible I_{rms} at 10° C internal temperature rise (general guide)

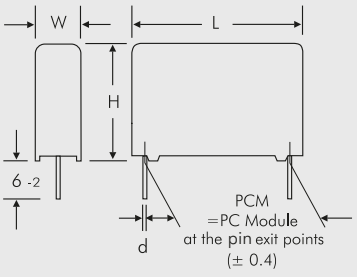
** PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= D2
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

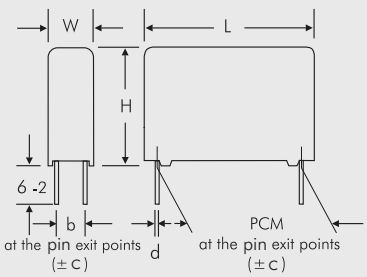
Taped version see page 157.

2-pin version



PCM	Ød
27.5	0.8
37.5	1

4-pin version



W	PCM	b	Ød	c
11	27.5	5	0.8	0.4
13	27.5	7.5	0.8	0.4
15	27.5	7.5	0.8	0.4
17	27.5	10	0.8	0.4
20	27.5	12.5	0.8	0.4
19	37.5	10	1	0.4
20	37.5	12.5	1	0.4
24	37.5	12.5	1	0.4
28	37.5	10	1	0.4
31	37.5	20	1	0.4
35	37.5	20	1	0.4
40	37.5	20	1	0.4
25	52.5	12.5	1.2	0.8
30	52.5	20	1.2	0.8
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Continuation page 134

Continuation

General Data

Capacitance	900 VDC (70° C) / 760 VDC (85° C) / 550 VDC (105° C)								
	W	H	L	PCM**	Pin	I_S A	I_{rms}*(10 kHz)* A	ESR (10 kHz)* mΩ	Part number
1 µF	9	19	31.5	27.5	2	35	2	66.1	DCP4N041006A_____
2 „	11	21	31.5	27.5	2/4	70	2.5	44	DCP4N042006B_____
3 „	13	24	31.5	27.5	2/4	105	4	22	DCP4N043006D_____
4 „	13	24	31.5	27.5	2/4	140	4.5	16.5	DCP4N044006D_____
5 „	17	29	31.5	27.5	2/4	175	4.5	18	DCP4N045006G_____
7 „	17	29	31.5	27.5	2/4	245	6.5	9.4	DCP4N047006G_____
8 „	17	34.5	31.5	27.5	2/4	280	7.5	8.3	DCP4N048006I_____
10 µF	20	39.5	31.5	27.5	2/4	350	10	5.3	DCP4N051006J_____
	19	32	41.5	37.5	2/4	220	9	6.7	DCP4N051007F_____
15 „	20	39.5	41.5	37.5	2/4	330	10.5	5.8	DCP4N051507G_____
20 „	24	45.5	41.5	37.5	2/4	440	13	4.8	DCP4N052007H_____
	28	38	41.5	37.5	2/4	440	13	4.8	DCP4N052007L_____
22 „	24	45.5	41.5	37.5	2/4	484	14	4.1	DCP4N052207H_____
	28	38	41.5	37.5	2/4	484	14	4.1	DCP4N052207L_____
25 „	31	46	41.5	37.5	2/4	550	15.5	3.8	DCP4N052507I_____
30 „	31	46	41.5	37.5	2/4	660	16.5	3.4	DCP4N053007I_____
	25	45	57	52.5	4	540	15	4.5	DCP4N053009D_____
35 „	35	50	41.5	37.5	2/4	770	18	3.2	DCP4N053507J_____
	25	45	57	52.5	4	630	16	4	DCP4N053509D_____
40 „	40	55	41.5	37.5	2/4	880	19.5	3.2	DCP4N054007K_____
	30	45	57	52.5	4	720	18	3.5	DCP4N054009E_____
50 „	35	50	57	52.5	4	900	22	3.3	DCP4N055009F_____
60 „	45	55	57	52.5	4	1080	23	3	DCP4N056009H_____
70 „	45	65	57	52.5	4	1260	24.5	3.3	DCP4N057009J_____
80 „	45	65	57	52.5	4	1440	25.5	2.8	DCP4N058009J_____

* General guide

* Permissible I_{rms} at 10° C internal temperature rise (general guide)

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:		
Version code:	2-pin	= D2
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD

Taped version see page 157.

Continuation page 135

Continuation

General Data

Capacitance	W	H	L	PCM**	Pin	I_S A	I_{rms}*(10 kHz)* A	ESR (10 kHz)* mΩ	Part number
					1100 VDC (70° C) / 920 VDC (85° C) / 670 VDC (105° C)				
1 µF	9	19	31.5	27.5	2	43	2	86	DCP4P041006A_____
2 „	13	24	31.5	27.5	2/4	86	4	19	DCP4P042006D_____
3 „	15	26	31.5	27.5	2/4	129	5	13.6	DCP4P043006F_____
4 „	17	29	31.5	27.5	2/4	172	6	10.8	DCP4P044006G_____
5 „	17	34.5	31.5	27.5	2/4	215	7.5	7.8	DCP4P045006I_____
7 „	20	39.5	31.5	27.5	2/4	301	9	6.5	DCP4P047006J_____
	19	32	41.5	37.5	2/4	203	7.5	10	DCP4P047007F_____
8 „	20	39.5	41.5	37.5	2/4	232	8	10	DCP4P048007G_____
10 µF	20	39.5	41.5	37.5	2/4	290	9.5	7.2	DCP4P051007G_____
12 „	24	45.5	41.5	37.5	2/4	348	11	6.6	DCP4P051207H_____
15 „	24	45.5	41.5	37.5	2/4	435	12	5.6	DCP4P051507H_____
	28	38	41.5	37.5	2/4	435	12	5.6	DCP4P051507L_____
18 „	31	46	41.5	37.5	2/4	522	13.5	5	DCP4P051807I_____
20 „	35	50	41.5	37.5	2/4	580	15	4.7	DCP4P052007J_____
	25	45	57	52.5	4	420	14.5	4.9	DCP4P052009D_____
22 „	35	50	41.5	37.5	2/4	638	15.5	4.4	DCP4P052207J_____
	25	45	57	52.5	4	462	15	4.5	DCP4P052209D_____
25 „	40	55	41.5	37.5	2/4	725	16.5	4.6	DCP4P052507K_____
	30	45	57	52.5	4	525	16	4.4	DCP4P052509E_____
30 „	35	50	57	52.5	4	630	17.5	4.4	DCP4P053009F_____
35 „	35	50	57	52.5	4	735	18	4	DCP4P053509F_____
40 „	35	50	57	52.5	4	840	18	4.3	DCP4P054009F_____
45 „	45	55	57	52.5	4	945	20	4.1	DCP4P054509H_____
50 „	45	65	57	52.5	4	1050	21	4.1	DCP4P055009J_____
60 „	45	65	57	52.5	4	1260	23	3.5	DCP4P056009J_____

Capacitance	W	H	L	PCM**	Pin	I_S A	I_{rms}*(10 kHz)* A	ESR (10 kHz)* MΩ	Part number
					1300 VDC (70° C) / 1100 VDC (85° C) / 800 VDC (105° C)				
1 µF	11	21	31.5	27.5	2/4	50	2.5	40	DCP4R241006B_____
2 „	15	26	31.5	27.5	2/4	100	4.5	16.8	DCP4R242006F_____
3 „	17	29	31.5	27.5	2/4	150	6	10.8	DCP4R243006G_____
4 „	17	34.5	31.5	27.5	2/4	200	6.5	10.4	DCP4R244006I_____
5 „	20	39.5	31.5	27.5	2/4	250	7.5	9.4	DCP4R245006J_____
	19	32	41.5	37.5	2/4	175	7	11	DCP4R245007F_____
7 „	20	39.5	41.5	37.5	2/4	245	8	10	DCP4R247007G_____
8 „	24	45.5	41.5	37.5	2/4	280	9	9.9	DCP4R248007H_____
10 µF	24	45.5	41.5	37.5	2/4	350	10.5	7.2	DCP4R251007H_____
	28	38	41.5	37.5	2/4	350	10.5	7.2	DCP4R251007L_____
15 „	31	46	41.5	37.5	2/4	525	14	4.8	DCP4R251507I_____
	25	45	57	52.5	4	375	13	6	DCP4R251509D_____
18 „	35	50	41.5	37.5	2/4	630	15.5	4.4	DCP4R251807J_____
	25	45	57	52.5	4	450	14.5	4.9	DCP4R251809D_____
20 „	40	55	41.5	37.5	2/4	700	17.5	4	DCP4R252007K_____
	30	45	57	52.5	4	500	16	4.4	DCP4R252009E_____
22 „	40	55	41.5	37.5	2/4	770	18	3.8	DCP4R252207K_____
	35	50	57	52.5	4	550	17.5	4.3	DCP4R252209F_____
25 „	35	50	57	52.5	4	625	19	3.6	DCP4R252509F_____
30 „	45	55	57	52.5	4	750	20	4	DCP4R253009H_____
35 „	45	65	57	52.5	4	875	21	4.1	DCP4R253509J_____
40 „	45	65	57	52.5	4	1000	22	3.7	DCP4R254009J_____

* General guide

** PCM = Printed circuit module = pin spacing

* Permissible I_{rms} at 10° C internal temperature rise (general guide)

Dims. in mm.

Continuation page 136

Continuation

General Data

Capacitance	1500 VDC (70° C) / 1200 VDC (85° C) / 870 VDC (105° C)								
	W	H	L	PCM**	Pin	I_S A	I_{rms}*(10 kHz)* A	ESR (10 kHz)* mΩ	Part number
1 µF	13	24	31.5	27.5	2/4	59	3	33.3	DCP4S041006D_____
2 „	17	29	31.5	27.5	2/4	118	5	15.6	DCP4S042006G_____
3 „	19	32	41.5	37.5	2/4	123	6	15	DCP4S043007F_____
4 „	20	39.5	41.5	37.5	2/4	164	7	13.3	DCP4S044007G_____
5 „	20	39.5	41.5	37.5	2/4	205	8	10.2	DCP4S045007G_____
7 „	24	45.5	41.5	37.5	2/4	287	9.5	8.9	DCP4S047007H_____
	28	38	41.5	37.5	2/4	287	9.5	8.4	DCP4S047007L_____
8 „	31	46	41.5	37.5	2/4	328	11	7.6	DCP4S048007I_____
10 µF	31	46	41.5	37.5	2/4	410	12.5	5.9	DCP4S051007I_____
12 „	35	50	41.5	37.5	2/4	492	14.5	5	DCP4S051207J_____
	25	45	57	52.5	4	348	14	5.2	DCP4S051209D_____
15 „	40	55	41.5	37.5	2/4	615	17	4.3	DCP4S051507K_____
	30	45	57	52.5	4	435	16	4.4	DCP4S051509E_____
18 „	35	50	57	52.5	4	522	17.5	4.3	DCP4S051809F_____
20 „	35	50	57	52.5	4	580	18	4.1	DCP4S052009F_____
22 „	45	55	57	52.5	4	638	20	4.1	DCP4S052209H_____
25 „	45	55	57	52.5	4	725	20.5	3.9	DCP4S052509H_____
30 „	45	65	57	52.5	4	870	21.5	4	DCP4S053009J_____

* General guide

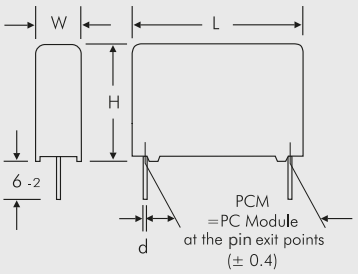
* Permissible I_{rms} at 10° C internal temperature rise (general guide)

** PCM = Printed circuit module = pin spacing

Dims. in mm.

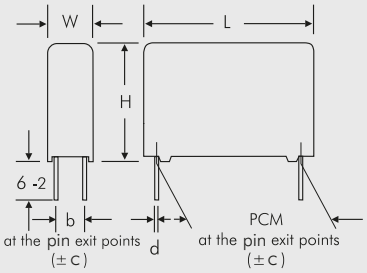
Part number completion:		
Version code:	2-pin	= D2
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD
Taped version see page 157.		

2-pin version



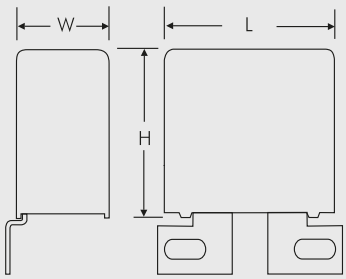
PCM	Ø d
27.5	0.8
37.5	1

4-pin version



W	PCM	b	Ø d	c
11	27.5	5	0.8	0.4
13	27.5	7.5	0.8	0.4
15	27.5	7.5	0.8	0.4
17	27.5	10	0.8	0.4
20	27.5	12.5	0.8	0.4
19	37.5	10	1	0.4
20	37.5	12.5	1	0.4
24	37.5	12.5	1	0.4
28	37.5	10	1	0.4
31	37.5	20	1	0.4
35	37.5	20	1	0.4
40	37.5	20	1	0.4
25	52.5	12.5	1.2	0.8
30	52.5	20	1.2	0.8
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Plate versions page 140



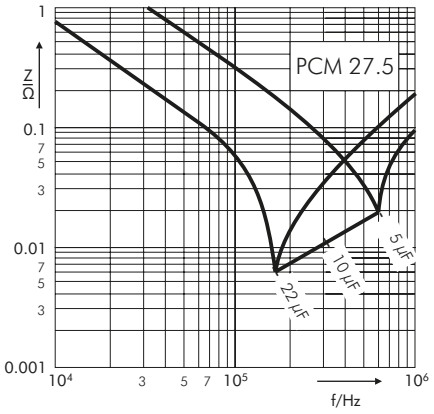
Example

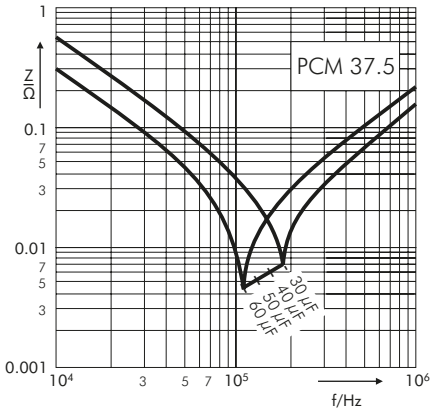
Continuation page 137

Continuation

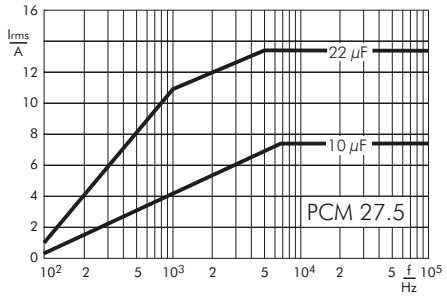
500 VDC

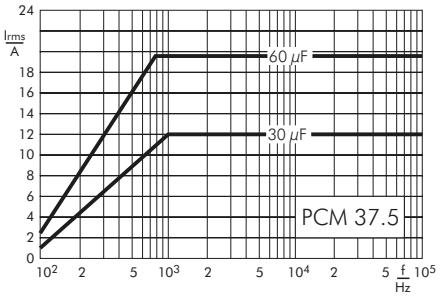
Impedance change with frequency (general guide)

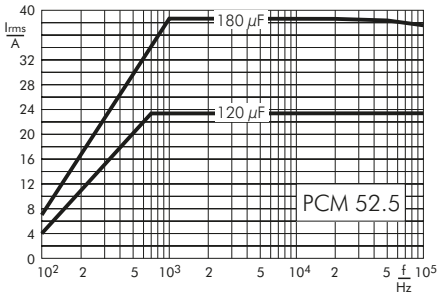




Permissible AC current in relation to frequency at ⩽ 20° C internal temperature rise (general guide)

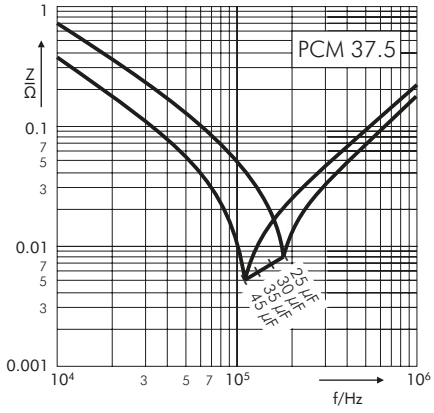


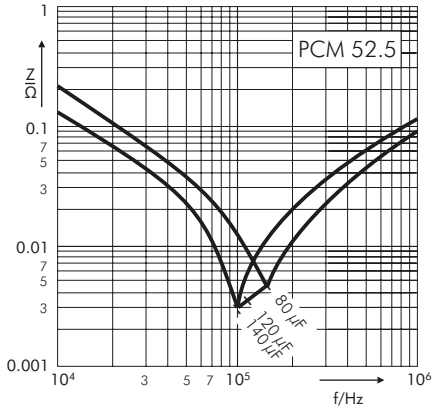




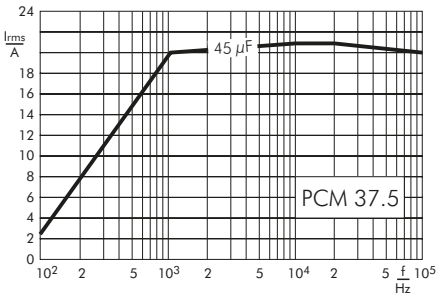
600 VDC

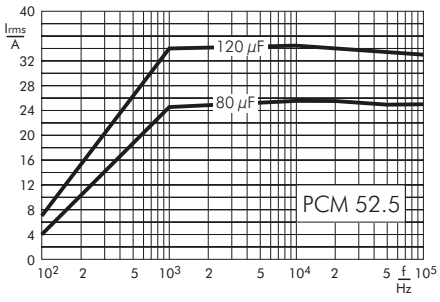
Impedance change with frequency (general guide)





Permissible AC current in relation to frequency at ⩽ 20° C internal temperature rise (general guide)



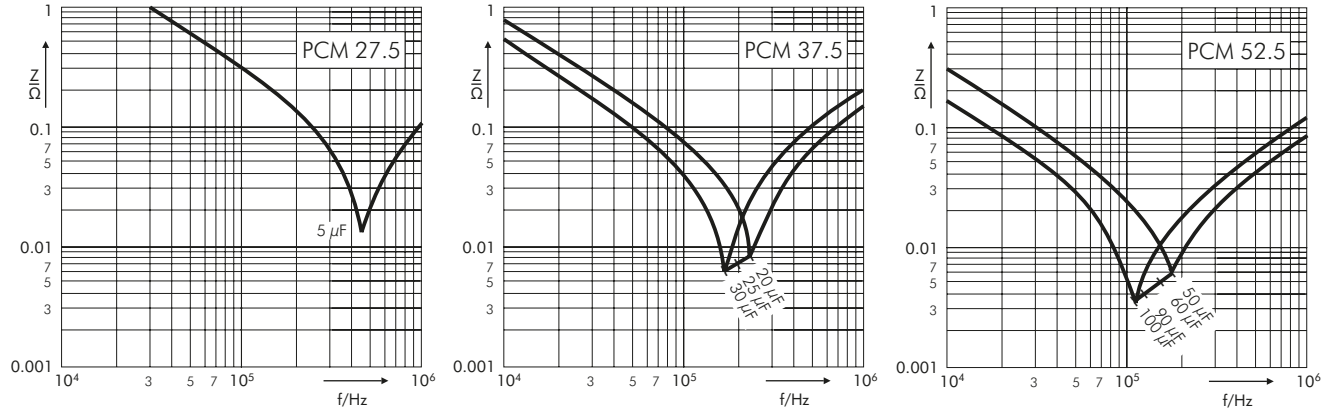


Continuation page 138

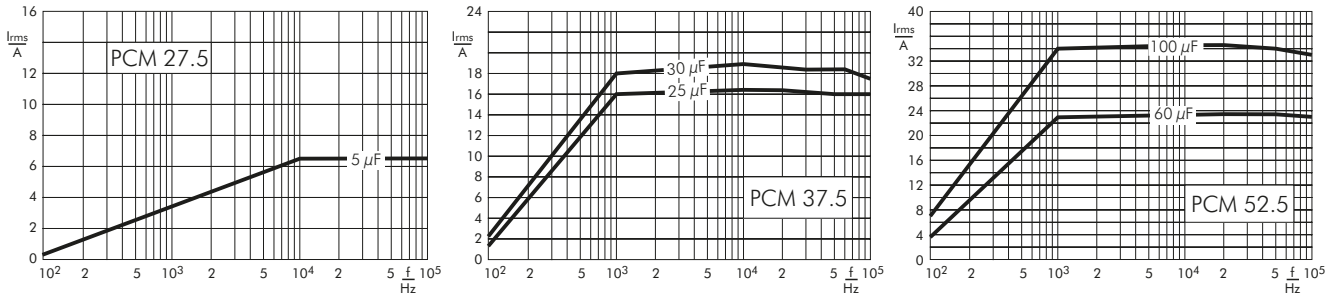
Continuation

800 VDC

Impedance change with frequency (general guide)

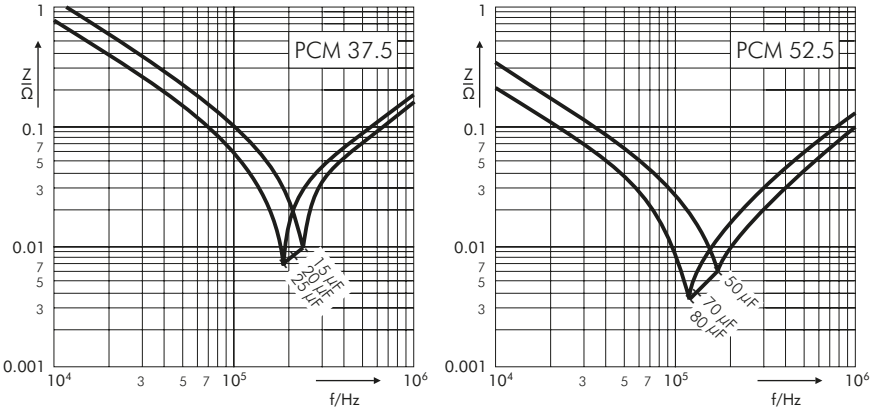


Permissible AC current in relation to frequency at ⩽ 20° C internal temperature rise (general guide)

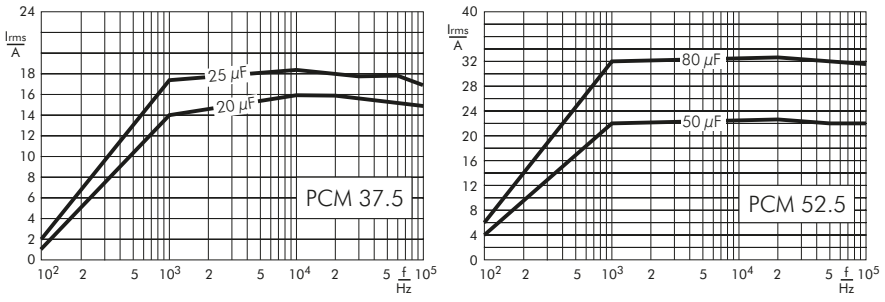


900 VDC

Impedance change with frequency (general guide)



Permissible AC current in relation to frequency at ⩽ 20° C internal temperature rise (general guide)



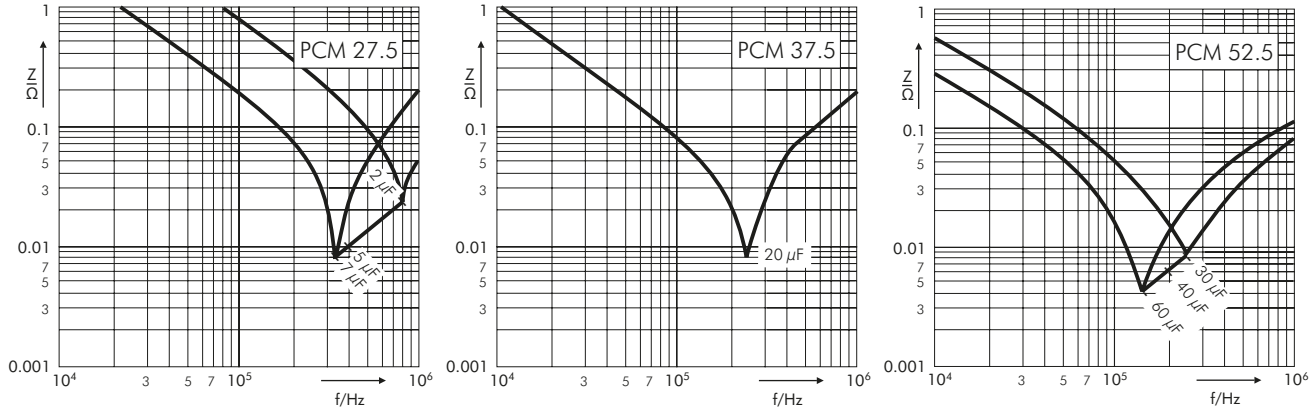
Continuation page 139

04.23

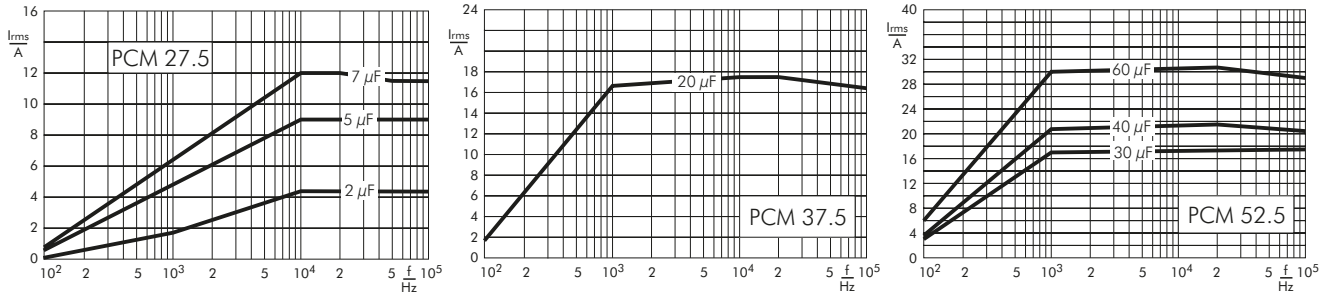
Continuation

1100 VDC

Impedance change with frequency (general guide)

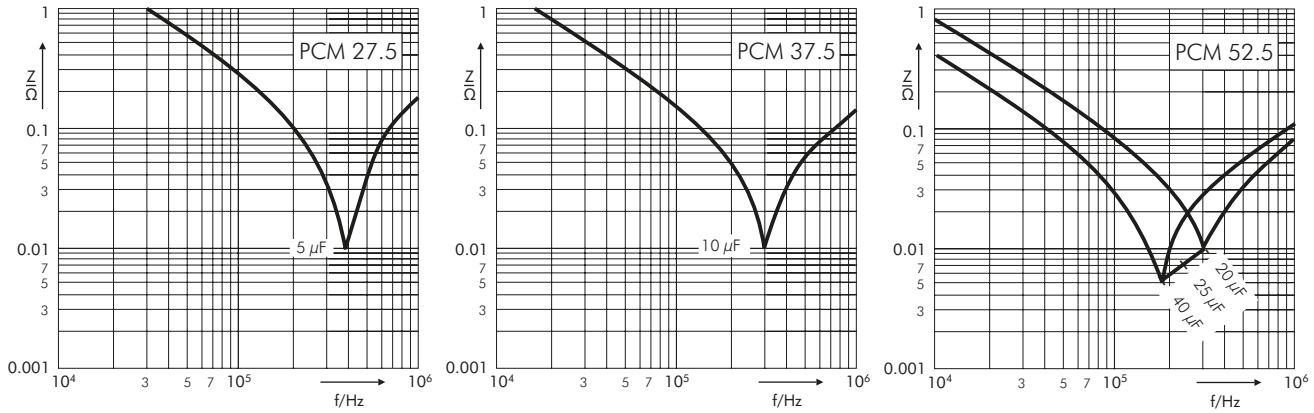


Permissible AC current in relation to frequency at ⩽ 20° C internal temperature rise (general guide)

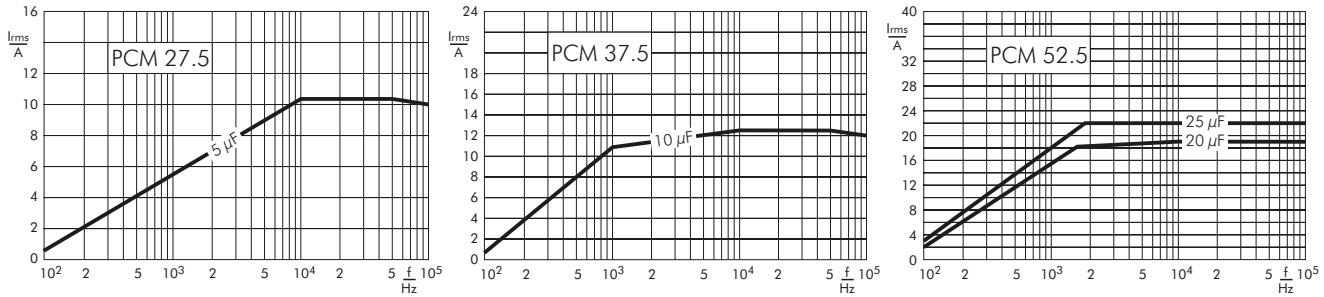


1300 VDC

Impedance change with frequency (general guide)



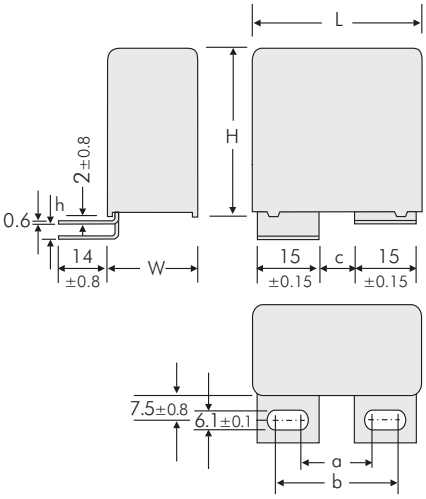
Permissible AC current in relation to frequency at ⩽ 20° C internal temperature rise (general guide)



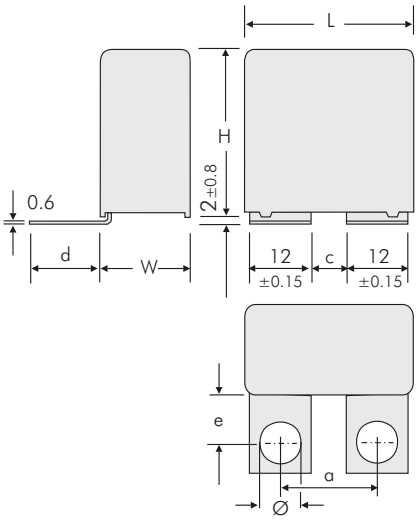
Continuation page 140

Continuation

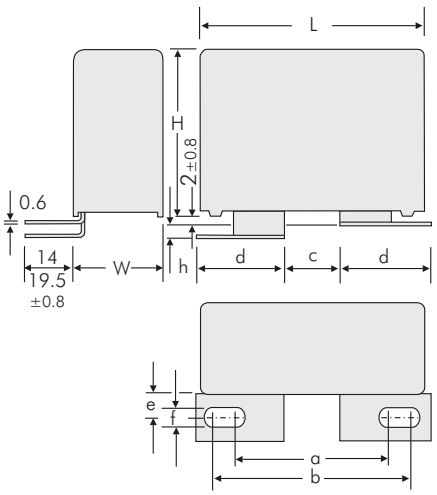
Plate versions



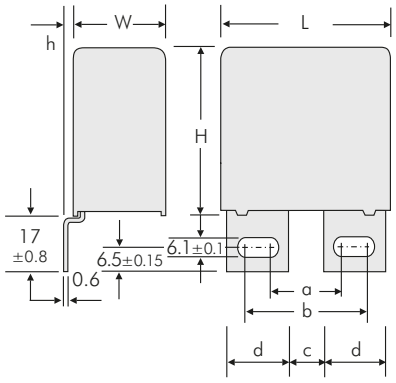
Version	L	a ±0.5	b ±0.5	c ±0.5	h ±0.8
A1	41.5	17.5	28	7.5	0
A1.5	41.5	17.5	28	7.5	3.5



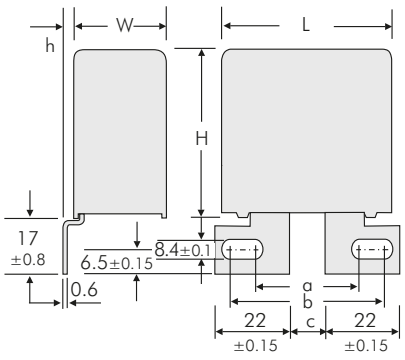
Version	L	a ±0.5	c ±0.5	d ±0.8	e ±0.8	Ø ±0.1
A1.6	41.5	18	6	21.5	16	7
A1.6.1	41.5	22	10	18.5	13	7
A1.6.2	41.5	23	10	18.5	13	8



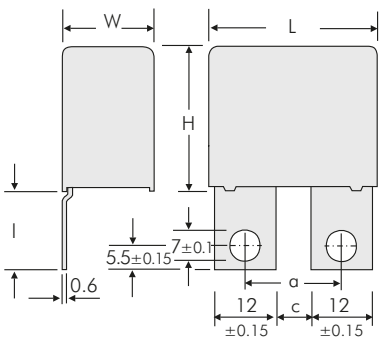
Version	L	a ±0.5	b ±0.5	c ±0.5	d ±0.15	e ±0.8	f ±0.1	h ±0.8
A2	41.5	36	46.5	14.5	22	7.5	8.4	0
A2.4.1	41.5	33.5	39.5	7.5	22	13	8.4	0
A2.6.1	41.5	31.5	41.5	14	18.75	13	6.1	3.5
A2.6.2	41.5	31.5	41.5	14	22	13	6.1	0
A2.8	41.5	36	46.5	14.5	22	7.5	8.4	3.5



Version	L	a ±0.5	b ±0.5	c ±0.5	d ±0.15	h ±0.8
A3	41.5	17.5	27.5	7.5	15	0
A3.5	41.5	17.5	27.5	7.5	15	3
A3.12	41.5	17.5	30	7.5	16.5	0



Version	L	a ±0.5	b ±0.5	c ±0.5	h ±0.8
A3.9	41.5	40.5	46.5	14.5	0
A3.11	41.5	40.5	46.5	14.5	3

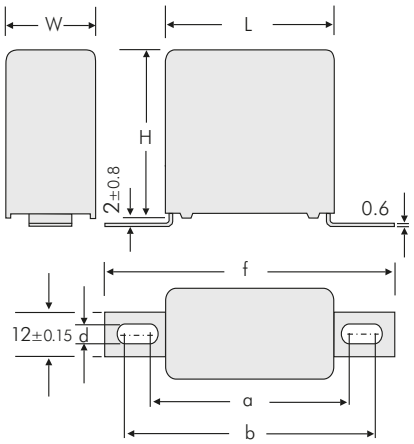


Version	L	a ±0.5	c ±0.5	l ±0.8
A3.8	41.5 W ⩾17	18	6	23
A3.8.1	41.5 W ⩾17	22	10	17.5
A3.8.2	41.5 W ⩾17	22	10	23

Continuation page 141

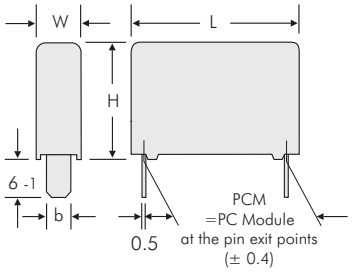
Continuation

Plate versions



Version	L	a ±0.8	b ±0.8	f ±0.8	d ±0.1
A4.9	31.5 W ⩾15	44	47	57	4.5
A4.10	31.5 W ⩾15	43	59	69	6.1
A4.2	41.5 W ⩾15	54	57	67	4.5
A4	41.5 W ⩾15	53	69	79	6.1

Version B



L	PCM	b ±0.15
31.5	28.5	8
41.5	38.5	8

Dims. in mm

Additional special versions can be realized. Please contact us with your specific needs.

Possible connecting respective plate versions - depending on box size

Version code		D2	D4	B8	1A	1H	1I	1J	1S	2A	2F	2J	2K	2M	3A	3G	3K	3L	3M	3N	3P	3Q	4A	4C	4L	4M
W x H x L	Size Code	2-pin	4-pin	B8	A1	A1.5	A1.6	A1.6.1	A1.6.2	A2	A2.4.1	A2.6.1	A2.6.2	A2.8	A3	A3.5	A3.8	A3.8.1	A3.8.2	A3.9	A3.11	A3.12	A4	A4.2	A4.9	A4.10
9 x 19 x 31.5	**6A**	■																								
11 x 21 x 31.5	**6B**	■	■	■																						
13 x 24 x 31.5	**6D**	■	■	■																						
15 x 26 x 31.5	**6F**	■	■	■																					■	■
17 x 29 x 31.5	**6G**	■	■	■																					■	■
17 x 34.5 x 31.5	**6I**	■	■	■																					■	■
20 x 39.5 x 31.5	**6J**	■	■	■																					■	■
13 x 24 x 41.5	**7C**	■	■	■	■	■	■	■	■						■	■						■				
15 x 26 x 41.5	**7D**	■	■	■	■	■	■	■	■						■	■					■	■	■	■		
17 x 29 x 41.5	**7E**	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
19 x 32 x 41.5	**7F**	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
20 x 39.5 x 41.5	**7G**	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
24 x 45.5 x 41.5	**7H**	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
28 x 38 x 41.5	**7L**	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
31 x 46 x 41.5	**7I**	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
35 x 50 x 41.5	**7J**	■	■		■	■	■	■	■	■		■	■	■	■	■	■	■	■	■		■				
40 x 55 x 41.5	**7K**	■	■		■	■	■	■	■	■		■	■	■	■	■	■	■	■	■		■				

WIMA DC-LINK MKP 6

Metallized Polypropylene (PP) - Capacitors in Cylindrical Case. MKP 6 with High Volume/Capacitance Ratio, MKP 6 HP with Higher Current Carrying Capability. Capacitances from 75 µF to 4920 µF. Rated Voltages from 600 VDC to 1500 VDC.

Special Features

- **Very high volume/capacitance ratio**
- **Self-healing properties**
- **With cylindrical aluminium case for bus bar mounting**
- **Dry construction without electrolyte or oil**
- **No internal fuse required**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **According to RoHS 2015/863/EU**
- **Customer-specific capacitances or voltages on request**

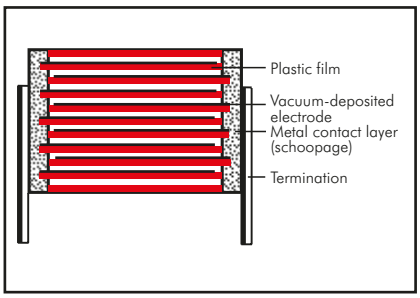
Typical Applications

DC capacitors with high capacitances for applications in power electronics also at non-sinusoidal voltages and currents e.g. in

- **Wind power systems**
- **Inverters**

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Aluminium case with PU-sealing, UL 94 V-0
Terminations:
Screw connection (male or female), screw bolt M12 x 16.
Marking:
Colour: Metallic. Marking: Black on silver label.

Electrical Data

Capacitance range: 75 µF to 4920 µF
Rated voltages: 600 VDC, 700 VDC, 900 VDC,1100 VDC, 1300 VDC, 1500 VDC
Capacitance tolerances: ±20%, ±10% (±5% available subject to special enquiry)
Operating temperature range:
–40° C to +85° C
Insulation resistance at +20° C:
⩾ 5 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.

Dielectric loss factor tan δ_0: 2 x 10^{-4}
Test voltage between terminals
at +25° C: 1.5 $U_{r\ DC}$, 10sec
Test voltage between terminals and case
at +25° C and 50 Hz: 3 kV_{AC}, 1 min.
Dielectric absorption:
0.05 %
Reliability:
Operational life > 100 000 hours
Failure rate < 50 fit (hot spot ⩽ 70° C)

Mounting Recommendation

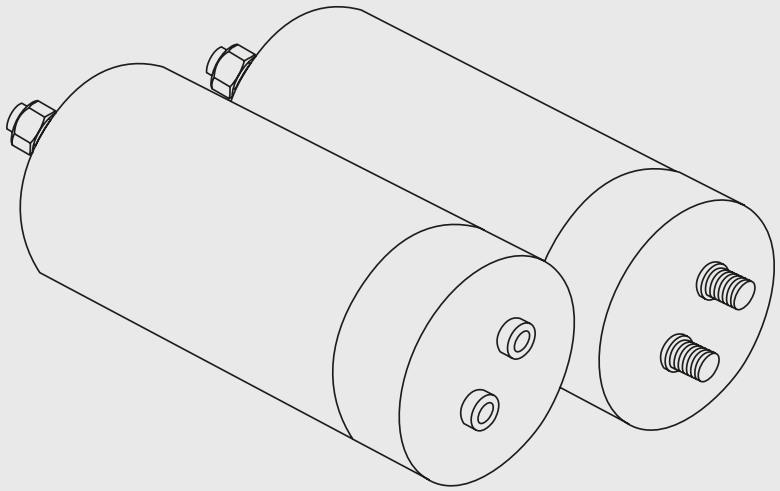
Excessive mechanical strain, e.g. pressure or shock onto the capacitor body, is to be avoided during mounting and usage of the capacitors.

Packing

Transportation-safe packing in cardboard boxes.

For further details and graphs please refer to Technical Information.

The capacitors are non-polarized and are optionally available with „male“ and „female“ terminations. The earth bolt is electrically inactive and serves for fixing and/or earthing of the metal case.



Continuation

General Data

U_R 70° C	U_R 85° C	C_N	D x L mm	I_{rms} (max.)* at 70° C A	ESR (1 kHz)* mΩ	L_e nH	Approx. weight g	Part number
		320 µF	85 x 60	25	2.1	< 40	380	DCP6I06320EB00____
		460 „	85 x 76	25	2.1	< 40	480	DCP6I06460EC00____
		520 „	85 x 85	30	2.0	< 40	540	DCP6I06520ED00____
		620 „	85 x 95	30	1.9	< 40	600	DCP6I06620EE00____
		760 „	85 x 110	30	1.7	< 40	690	DCP6I06760EF00____
		780 „	85 x 120	30	1.7	< 40	700	DCP6I06780E000____
600 VDC	450 VDC	950 „	85 x 132	35	1.8	< 40	850	DCP6I06950E100____
		1030 „	85 x 140	35	1.8	< 40	880	DCP6I07103EG00____
		1220 „	116 x 95	40	1.7	< 40	1200	DCP6I07122EN00____
		1500 „	116 x 110	40	1.7	< 40	1390	DCP6I07150EO00____
		1640 „	116 x 120	40	1.6	< 40	1510	DCP6I07164EP00____
		1890 „	116 x 132	40	1.6	< 40	1660	DCP6I07189EQ00____
		2030 „	116 x 140	40	1.6	< 40	1760	DCP6I07203ER00____
		230 µF	85 x 60	25	1.9	< 40	380	DCP6K06230EB00____
		330 „	85 x 76	25	1.9	< 40	480	DCP6K06330EC00____
		380 „	85 x 85	30	1.7	< 40	540	DCP6K06380ED00____
		450 „	85 x 95	30	1.7	< 40	600	DCP6K06450EE00____
		550 „	85 x 110	30	1.8	< 40	690	DCP6K06550EF00____
		585 „	85 x 120	30	1.8	< 40	700	DCP6K06585E000____
700 VDC	600 VDC	690 „	85 x 132	35	1.8	< 40	850	DCP6K06690E100____
		740 „	85 x 140	35	1.8	< 40	880	DCP6K06740EG00____
		890 „	116 x 95	40	1.7	< 40	1200	DCP6K06890EN00____
		1090 „	116 x 110	40	1.7	< 40	1390	DCP6K07109EO00____
		1190 „	116 x 120	40	1.8	< 40	1510	DCP6K07119EP00____
		1370 „	116 x 132	40	1.8	< 40	1660	DCP6K07137EQ00____
		1470 „	116 x 140	40	1.8	< 40	1760	DCP6K07147ER00____
		190 µF	85 x 60	30	1.9	< 40	380	DCP6N06190EB00____
		270 „	85 x 76	30	1.9	< 40	480	DCP6N06270EC00____
		315 „	85 x 85	30	1.8	< 40	540	DCP6N06315ED00____
		360 „	85 x 95	30	1.7	< 40	600	DCP6N06360EE00____
		450 „	85 x 110	30	1.7	< 40	690	DCP6N06450EF00____
		480 „	85 x 120	35	1.8	< 40	700	DCP6N06480E000____
900 VDC	760 VDC	550 „	85 x 132	35	1.8	< 40	850	DCP6N06550E100____
		620 „	85 x 140	35	1.8	< 40	880	DCP6N06620EG00____
		730 „	116 x 95	40	1.7	< 40	1200	DCP6N06730EN00____
		900 „	116 x 110	40	1.7	< 40	1390	DCP6N06900EO00____
		980 „	116 x 120	40	1.8	< 40	1510	DCP6N06980EP00____
		1130 „	116 x 132	40	1.8	< 40	1660	DCP6N07113EQ00____
		1200 „	116 x 140	40	1.8	< 40	1760	DCP6N07120ER00____
		120 µF	85 x 60	30	2.0	< 40	380	DCP6P06120EB00____
		170 „	85 x 76	30	2.0	< 40	480	DCP6P06170EC00____
		200 „	85 x 85	30	1.9	< 40	540	DCP6P06200ED00____
		230 „	85 x 95	30	1.9	< 40	600	DCP6P06230EE00____
		290 „	85 x 110	30	1.8	< 40	690	DCP6P06290EF00____
		325 „	85 x 120	40	1.8	< 40	700	DCP6P06325E000____
1100 VDC	920 VDC	360 „	85 x 132	40	1.8	< 40	850	DCP6P06360E100____
		390 „	85 x 140	40	2.0	< 40	880	DCP6P06390EG00____
		470 „	116 x 95	40	1.8	< 40	1200	DCP6P06470EN00____
		580 „	116 x 110	40	1.8	< 40	1390	DCP6P06580EO00____
		630 „	116 x 120	40	1.7	< 40	1510	DCP6P06630EP00____
		720 „	116 x 132	40	1.7	< 40	1660	DCP6P06720EQ00____
		780 „	116 x 140	40	1.6	< 40	1760	DCP6P06780ER00____

Contacts can handle: peak currents (repetitive) Î up to 5 kA
surge currents (isolated cases) I_S up to 20 kA

Customer-specific capacitances or voltages on request

* General guide

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Connection:	male = 0M
	female = 0F

Continuation page 144

Continuation

General Data

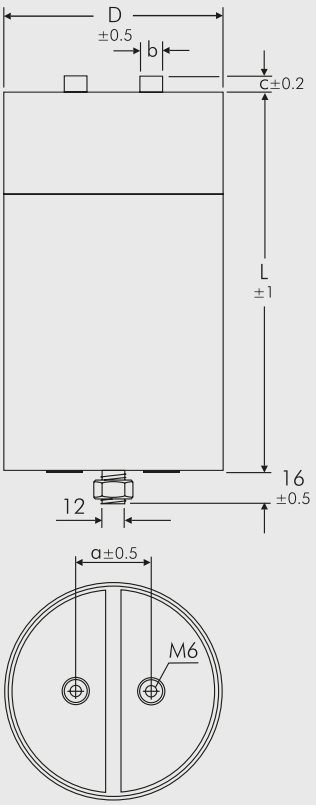
U_R 70° C	U_R 85° C	C_N	D x L mm	I_{rms} (max.)* at 70° C A	ESR (1 kHz)* mΩ	L_e nH	Approx. weight g	Part number
		85 µF	85 x 60	30	2.1	< 40	380	DCP6R25850EB00____
		120 „	85 x 76	30	2.1	< 40	480	DCP6R26120EC00____
		135 „	85 x 85	30	1.9	< 40	540	DCP6R26135ED00____
		160 „	85 x 95	30	1.9	< 40	600	DCP6R26160EE00____
		200 „	85 x 110	30	1.8	< 40	690	DCP6R26200EF00____
		215 „	85 x 120	30	1.8	< 40	700	DCP6R26215E000____
1300 VDC	1100 VDC	250 „	85 x 132	40	2.2	< 40	850	DCP6R26250E100____
		270 „	85 x 140	40	2.2	< 40	880	DCP6R26270EG00____
		320 „	116 x 95	40	1.8	< 40	1200	DCP6R26320EN00____
		390 „	116 x 110	40	1.8	< 40	1390	DCP6R26390EO00____
		430 „	116 x 120	40	1.7	< 40	1510	DCP6R26430EP00____
		490 „	116 x 132	40	1.7	< 40	1660	DCP6R26490EQ00____
		530 „	116 x 140	40	1.6	< 40	1760	DCP6R26530ER00____
		75 µF	85 x 60	25	2.5	< 40	380	DCP6S05750EB00____
		110 „	85 x 76	25	2.5	< 40	480	DCP6S06110EC00____
		120 „	85 x 85	25	2.3	< 40	540	DCP6S06120ED00____
		145 „	85 x 95	30	2.3	< 40	600	DCP6S06145EE00____
		180 „	85 x 110	30	2.3	< 40	690	DCP6S06180EF00____
		195 „	85 x 120	40	2.4	< 40	700	DCP6S06195E000____
1500 VDC	1250 VDC	225 „	85 x 132	40	2.4	< 40	850	DCP6S06225E100____
		240 „	85 x 140	40	2.5	< 40	880	DCP6S06240EG00____
		290 „	116 x 95	40	1.8	< 40	1200	DCP6S06290EN00____
		355 „	116 x 110	40	1.8	< 40	1390	DCP6S06355EO00____
		390 „	116 x 120	40	1.7	< 40	1510	DCP6S06390EP00____
		445 „	116 x 132	40	1.7	< 40	1660	DCP6S06445EQ00____
		480 „	116 x 140	40	1.7	< 40	1760	DCP6S06480ER00____

Contacts can handle: peak currents (repetitive) $\hat{I}$ up to 5 kA
surge currents (isolated cases) I_S up to 20 kA

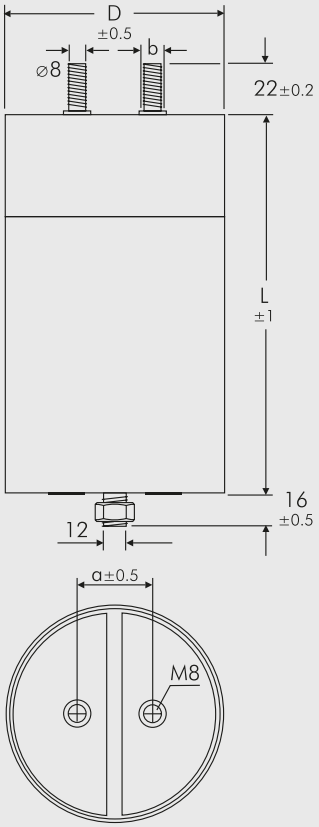
Customer-specific capacitances or voltages on request

* General guide

female



male



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Connection:	male = 0M
	female = 0F

D	L	a	b	c
85	60	32	12	6
85	76	32	12	6
85	85	32	12	6
85	95	32	12	6
85	110	32	12	6
85	120	32	12	6
85	132	32	12	6
85	140	32	12	6
116	95	50	14	5
116	110	50	14	5
116	120	50	14	5
116	132	50	14	5
116	140	50	14	5

Dims. in mm.

Continuation page 145

WIMA DC-LINK MKP 6 HP

Continuation: Versions with increased dimensioning for higher current carrying capability

General Data

U_R 70° C	U_R 85° C	C_N	D x L mm	I_{rms} (max.)* at 70° C A	ESR (1 kHz)* mΩ	L_e nH	Approx. weight g	Part number
600 VDC	450 VDC	640 µF	85 x 110	50	1.3	< 40	690	DCHPI06640EF00____
		920 „	85 x 140	50	1.3	< 40	880	DCHPI06920EG00____
		1040 „	85 x 155	60	1.3	< 40	980	DCHPI07104EH00____
		1240 „	85 x 185	60	1.3	< 60	1165	DCHPI07124EI00____
		1520 „	85 x 210	60	1.2	< 60	1400	DCHPI07152E200____
		1660 „	85 x 235	60	1.2	< 60	1480	DCHPI07166EJ00____
		1900 „	85 x 252	60	1.2	< 60	1590	DCHPI07190EK00____
		2060 „	85 x 260	60	1.2	< 60	1640	DCHPI07206EL00____
		2490 „	85 x 345	70	1.0	< 70	2190	DCHPI07249EM00____
		1260 „	116 x 110	80	1.2	< 40	1385	DCHPI07126EO00____
		1820 „	116 x 140	80	1.2	< 40	1765	DCHPI07182ER00____
		2060 „	116 x 158	80	1.1	< 40	1990	DCHPI07206ES00____
		2440 „	116 x 185	80	1.1	< 60	2330	DCHPI07244ET00____
		3000 „	116 x 215	80	1.0	< 60	2710	DCHPI07300EU00____
		3280 „	116 x 230	90	1.0	< 60	2900	DCHPI07328E700____
		3780 „	116 x 255	90	1.0	< 60	3210	DCHPI07378EV00____
		4060 „	116 x 295	90	1.0	< 70	3720	DCHPI07406EW00____
		4920 „	116 x 342	100	0.7	< 70	4350	DCHPI07492EX00____
700 VDC	600 VDC	460 µF	85 x 110	50	1.3	< 40	690	DCHPK06460EF00____
		660 „	85 x 140	50	1.3	< 40	880	DCHPK06660EG00____
		760 „	85 x 155	60	1.2	< 40	980	DCHPK06760EH00____
		900 „	85 x 185	60	1.2	< 60	1165	DCHPK06900EI00____
		1100 „	85 x 210	60	1.2	< 60	1400	DCHPK07110E200____
		1200 „	85 x 235	60	1.2	< 60	1480	DCHPK07120EJ00____
		1380 „	85 x 252	70	1.1	< 60	1590	DCHPK07138EK00____
		1480 „	85 x 260	70	1.1	< 60	1640	DCHPK07148EL00____
		1800 „	85 x 345	80	1.0	< 70	2190	DCHPK07180EM00____
		920 „	116 x 110	80	1.3	< 40	1385	DCHPK06920EO00____
		1320 „	116 x 140	80	1.3	< 40	1765	DCHPK07132ER00____
		1500 „	116 x 158	80	1.3	< 40	1990	DCHPK07150ES00____
		1780 „	116 x 185	80	1.2	< 60	2330	DCHPK07178ET00____
		2180 „	116 x 215	90	1.2	< 60	2710	DCHPK07218EU00____
		2380 „	116 x 230	90	1.0	< 60	2900	DCHPK07238E700____
		2740 „	116 x 255	90	1.0	< 60	3210	DCHPK07274EV00____
		2940 „	116 x 295	90	1.0	< 70	3720	DCHPK07294EW00____
		3570 „	116 x 342	110	0.7	< 70	4350	DCHPK07357EX00____
900 VDC	760 VDC	380 µF	85 x 110	50	1.4	< 40	690	DCHPN06380EF00____
		540 „	85 x 140	50	1.4	< 40	880	DCHPN06540EG00____
		630 „	85 x 155	60	1.3	< 40	980	DCHPN06630EH00____
		720 „	85 x 185	60	1.3	< 60	1165	DCHPN06720EI00____
		900 „	85 x 210	60	1.1	< 60	1400	DCHPN06900E200____
		1000 „	85 x 235	70	1.0	< 60	1480	DCHPN07100EJ00____
		1140 „	85 x 252	70	0.9	< 60	1590	DCHPN07114EK00____
		1240 „	85 x 260	70	0.9	< 60	1640	DCHPN07124EL00____
		1500 „	85 x 345	80	0.7	< 70	2190	DCHPN07150EM00____

Contacts can handle: peak currents (repetitive) Î up to 10 kA
surge currents (isolated cases) I_S up to 40 kA

Customer-specific capacitances or voltages on request

* General guide

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Connection:	male = 0M
	female = 0F

Continuation page 146

WIMA DC-LINK MKP 6 HP

Continuation

General Data

U_R 70° C	U_R 85° C	C_N	D x L mm	I_{rms} (max.)* at 70° C A	ESR (1 kHz)* mΩ	L_e nH	Approx. weight g	Part number
900 VDC	760 VDC	760 µF	116 x 110	80	1.3	< 40	1385	DCHPN06760EO00____
		1100 „	116 x 140	80	1.3	< 40	1765	DCHPN07110ER00____
		1240 „	116 x 158	80	1,3	< 40	1990	DCHPN07124ES00____
		1460 „	116 x 185	80	1.2	< 60	2330	DCHPN07146ET00____
		1800 „	116 x 215	90	1.2	< 60	2710	DCHPN07180EU00____
		1960 „	116 x 230	90	1.0	< 60	2900	DCHPN07196E700____
		2260 „	116 x 255	90	1.0	< 60	3210	DCHPN07226EV00____
		2400 „	116 x 295	90	1.0	< 70	3720	DCHPN07240EW00____
		2940 „	116 x 342	110	0.7	< 70	4350	DCHPN07294EX00____
1100 VDC	920 VDC	240 µF	85 x 110	50	1.3	< 40	690	DCHPP06240EF00____
		340 „	85 x 140	50	1.2	< 40	880	DCHPP06340EG00____
		400 „	85 x 155	50	1.2	< 40	980	DCHPP06400EH00____
		460 „	85 x 185	50	1.2	< 60	1165	DCHPP06460EI00____
		580 „	85 x 210	60	1.2	< 60	1400	DCHPP06580E200____
		640 „	85 x 235	60	1.1	< 60	1480	DCHPP06640EJ00____
		720 „	85 x 252	60	1.1	< 60	1590	DCHPP06720EK00____
		780 „	85 x 260	60	1.2	< 60	1640	DCHPP06780EL00____
		960 „	85 x 345	80	1.0	< 70	2190	DCHPP06960EM00____
		480 „	116 x 110	80	1.4	< 40	1385	DCHPP06480EO00____
		700 „	116 x 140	80	1.3	< 40	1765	DCHPP06700ER00____
		780 „	116 x 158	80	1.3	< 40	1990	DCHPP06780ES00____
		940 „	116 x 185	80	1.3	< 60	2330	DCHPP06940ET00____
		1160 „	116 x 215	90	1.2	< 60	2710	DCHPP07116EU00____
		1260 „	116 x 230	90	1.2	< 60	2900	DCHPP07126E700____
		1440 „	116 x 255	90	1.1	< 60	3210	DCHPP07144EV00____
		1560 „	116 x 295	90	1.0	< 70	3720	DCHPP07156EW00____
		1890 „	116 x 342	110	0.8	< 70	4350	DCHPP07189EX00____
1300 VDC	1100 VDC	170 µF	85 x 110	50	1.3	< 40	690	DCHPR26170EF00____
		240 „	85 x 140	50	1.3	< 40	880	DCHPR26240EG00____
		270 „	85 x 155	50	1.2	< 40	980	DCHPR26270EH00____
		320 „	85 x 185	60	1.2	< 60	1165	DCHPR26320EI00____
		400 „	85 x 210	60	1.2	< 60	1400	DCHPR26400E200____
		440 „	85 x 235	60	1.1	< 60	1480	DCHPR26440EJ00____
		500 „	85 x 252	60	1.1	< 60	1590	DCHPR26500EK00____
		540 „	85 x 260	60	1.2	< 60	1640	DCHPR26540EL00____
		660 „	85 x 345	80	1.0	< 70	2190	DCHPR26660EM00____
		330 „	116 x 110	80	1.4	< 40	1385	DCHPR26330EO00____
		480 „	116 x 140	80	1.4	< 40	1765	DCHPR26480ER00____
		540 „	116 x 158	80	1.3	< 40	1990	DCHPR26540ES00____
		640 „	116 x 185	80	1.3	< 60	2330	DCHPR26640ET00____
		780 „	116 x 215	90	1.2	< 60	2710	DCHPR26780EU00____
		860 „	116 x 230	90	1.2	< 60	2900	DCHPR26860E700____
		980 „	116 x 255	90	1.1	< 60	3210	DCHPR26980EV00____
		1060 „	116 x 295	90	1.1	< 70	3720	DCHPR27106EW00____
		1290 „	116 x 342	110	0.8	< 70	4350	DCHPR27129EX00____

Contacts can handle: peak currents (repetitive) Î up to 10 kA
surge currents (isolated cases) I_S up to 40 kA

Customer-specific capacitances or voltages on request

* General guide

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Connection:	male = 0M
	female = 0F

Continuation page 147

Continuation

General Data

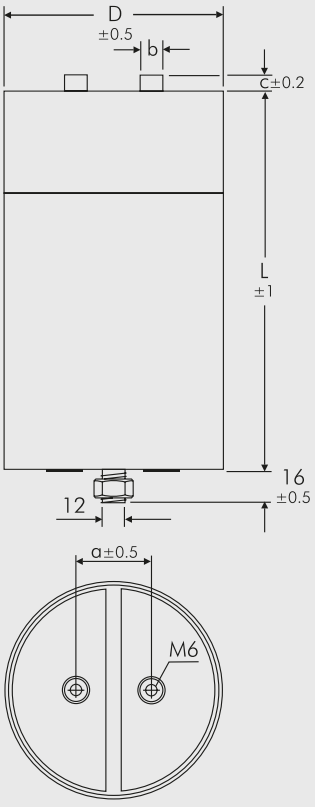
U_R 70° C	U_R 85° C	C_N	D x L mm	I_{rms} (max.)* at 70° C A	ESR (1 kHz)* mΩ	L_e nH	Approx. weight g	Part number
1500 VDC	1250 VDC	150 µF	85 x 110	50	1.3	< 40	690	DCHPS06150EF00____
		220 „	85 x 140	50	1.3	< 40	880	DCHPS06220EG00____
		240 „	85 x 155	50	1.2	< 40	980	DCHPS06240EH00____
		290 „	85 x 185	60	1.2	< 60	1165	DCHPS06290EI00____
		360 „	85 x 210	60	1.2	< 60	1400	DCHPS06360E200____
		390 „	85 x 235	60	1.1	< 60	1480	DCHPS06390EJ00____
		450 „	85 x 252	60	1.1	< 60	1590	DCHPS06450EK00____
		480 „	85 x 260	60	1.1	< 60	1640	DCHPS06480EL00____
		585 „	85 x 345	80	1.0	< 70	2190	DCHPS06585EM00____
		300 „	116 x 110	80	1.5	< 40	1385	DCHPS06300EO00____
		430 „	116 x 140	80	1.4	< 40	1765	DCHPS06430ER00____
		490 „	116 x 158	80	1.4	< 40	1990	DCHPS06490ES00____
		580 „	116 x 185	80	1.4	< 60	2330	DCHPS06580ET00____
		710 „	116 x 215	90	1.3	< 60	2710	DCHPS06710EU00____
		780 „	116 x 230	90	1.2	< 60	2900	DCHPS06780E700____
		890 „	116 x 255	90	1.2	< 60	3210	DCHPS06890EV00____
		960 „	116 x 295	90	1.1	< 70	3720	DCHPS06960EW00____
		1170 „	116 x 342	110	0.8	< 70	4350	DCHPS07117EX00____

Contacts can handle: peak currents (isolated) Î up to 5 kA
surge currents (isolated cases) I_S up to 20 kA

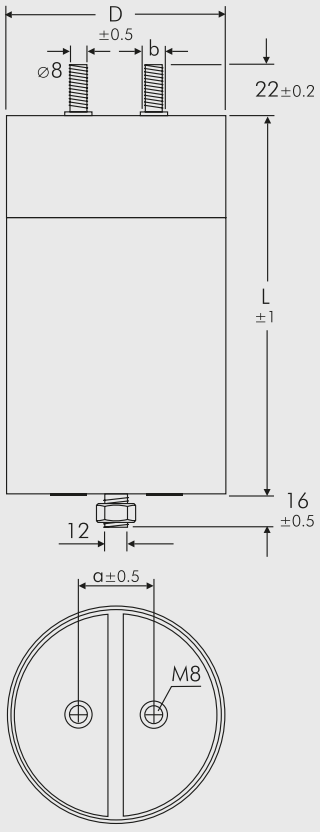
Customer-specific capacitances or voltages on request

* General guide

female



male



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Connection:	male = 0M
	female = 0F

D	L	a	b	c
85	110	32	12	6
85	140	32	12	6
85	155	32	12	6
85	185	32	12	6
85	210	32	12	6
85	235	32	12	6
85	252	32	12	6
85	260	32	12	6
85	345	32	12	6
116	110	50	14	5
116	140	50	14	5
116	158	50	14	5
116	185	50	14	5
116	215	50	14	5
116	230	50	14	5
116	255	50	14	5
116	295	50	14	5
116	342	50	14	5

Dims. in mm.

WIMA DC-LINK HC

Metallized Polypropylene (PP) - Capacitors for DC-Link Applications. Capacitances from 140 µF to 8250 µF. Rated Voltages from 450 VDC to 1500 VDC.

Special Features

- **Very high volume/capacitance ratio**
- **Self-healing, internal safety disconnector**
- **Safe contact configurations by screwable plates**
- **Dry construction without electrolyte or oil**
- **Very low disipation factor**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **According to RoHS 2015/863/EU**
- **Customer-specific tabs, capacitances or voltages on request**
- **105° C version on request**

Typical Applications

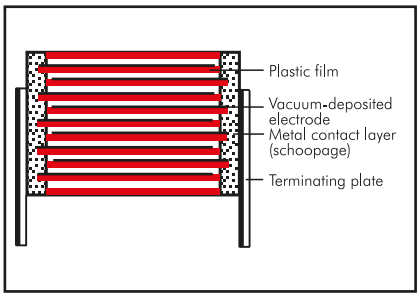
As intermediate circuit capacitor e. g. in high power converter technology

Electrical Data

Capacitance range: 140 µF to 8250 µF
Rated voltages:
450 VDC, 900 VDC, 1500 VDC
Capacitance tolerance: ±10%
Operating temperature:
–55° C to +85° C (+105° C on request)
Insulation resistance at +20° C:
⩾ 30 000 sec (MΩ x µF)
Measuring voltage: 100 V/1 min.
Self-inductance: ⩽ 50 nH depending on tab configuration
ESR at +20° C: See General Data.
Test voltage: 1.5 U_r, 10 sec
Dielectric absorption: 0.05 %
Voltage derating:
A derating factor of 1.35% per K must be applied from +70° C for AC currents (I_{rms})
Reliability:
Operational life > 100 000 hours at 70° C hot spot
Failure rate < 50 fit (hot spot ⩽ 70° C)
Specific dissipation:
See General Data.
Standards: in accordance with IEC 61071

Construction

Dielectric:
Polypropylene (PP) film
Capacitor electrodes:
Vacuum-deposited
Internal construction:



Encapsulation:
Solvent resistant, flame-retardant plastic case with PU seal
Terminations:
Tinned plates, customized plate configurations are possible.
Marking:
Colour: Black. Marking: Gold.

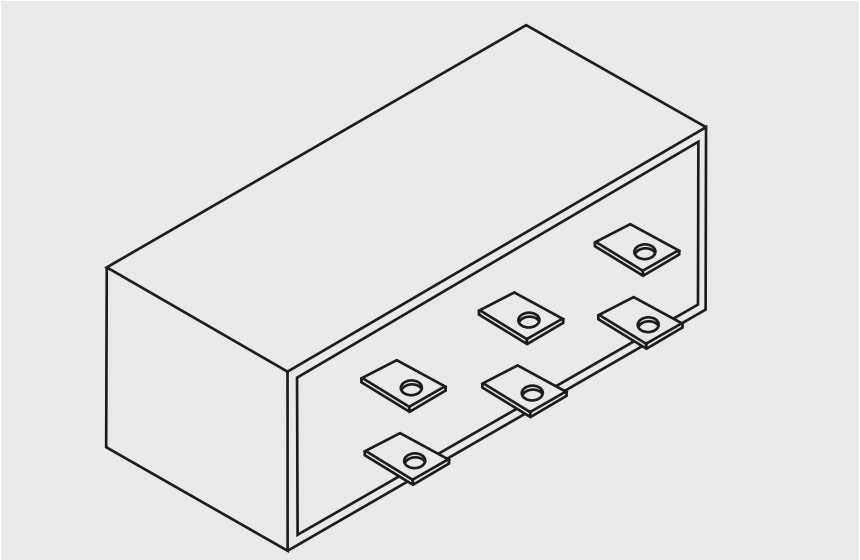
Mounting Recommendation

Excessive mechanical strain, e. g. pressure or shock onto the capacitor body, is to be avoided during mounting and usage of the capacitors. When fixing the capacitor the screw torque is to be limited to max. 5 Nm.

Packing

Transportation-safe packing in cardboard boxes.

For further details and graphs please refer to Technical Information.



Continuation

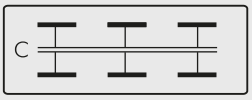
General Data

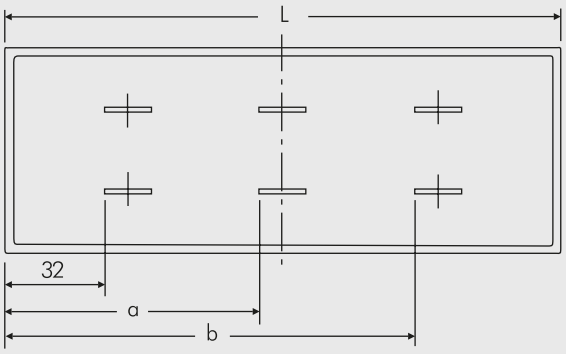
U_R	C_N	E_N / W_S	Size (mm) W	H	L	I_{rms} (max.)* A	$\hat{I}$* kA	I_S* kA	ESR (1 kHz)* mΩ	R_{th}* K/W	Approx. weight g	Part number
450 VDC	1440 µF	146	84	66	179	100	4.6	18.6	0.3	2.8	1220	DCHCH07144JB00KS00
	2400 „	243	84	66	291	170	7.7	30.9	0.2	1.8	1985	DCHCH07240JH00KS00
	3000 „	304	107	91	179	120	6.7	26.7	0.3	2.0	2145	DCHCH07300JC00KS00
	4950 „	501	130	114	179	140	8.7	34.9	0.3	1.5	3265	DCHCH07495JE00KS00
	5000 „	506	107	91	291	190	11.1	44.5	0.2	1.3	3485	DCHCH07500JI00KS00
	8250 „	835	130	114	291	210	14.5	58.1	0.2	1.1	5305	DCHCH07825JJ00KS00
900 VDC	450 µF	182	84	66	179	90	2.2	8.8	0.5	2.8	1220	DCHCN06450JB00KS00
	750 „	304	84	66	291	140	3.7	14.6	0.3	1.8	1985	DCHCN06750JH00KS00
	940 „	381	107	91	179	100	2.9	11.6	0.5	2.0	2145	DCHCN06940JC00KS00
	1500 „	608	130	114	179	110	3.5	14.1	0.5	1.5	3265	DCHCN07150JE00KS00
	1560 „	632	107	91	291	160	4.8	19.3	0.3	1.3	3485	DCHCN07156JI00KS00
	2600 „	1053	130	114	291	180	6.1	24.4	0.3	1.1	5305	DCHCN07260JJ00KS00
1500 VDC	140 µF	158	84	66	179	60	1.2	4.9	0.9	2.8	1220	DCHCS06140JB00KS00
	230 „	259	84	66	291	100	2.0	8.1	0.6	1.8	1985	DCHCS06230JH00KS00
	280 „	315	107	91	179	80	1.5	6.1	0.8	2.0	2145	DCHCS06280JC00KS00
	460 „	518	130	114	179	90	1.8	7.3	0.8	1.5	3265	DCHCS06460JE00KS00
	470 „	529	107	91	291	130	2.5	10.2	0.5	1.3	3485	DCHCS06470JI00KS00
	790 „	889	130	114	291	150	3.1	12.5	0.4	1.1	5305	DCHCS06790JJ00KS00

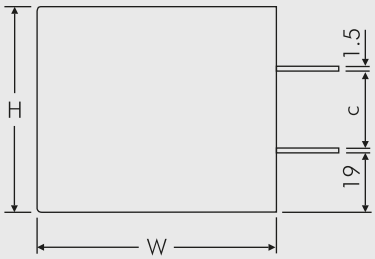
* General guide

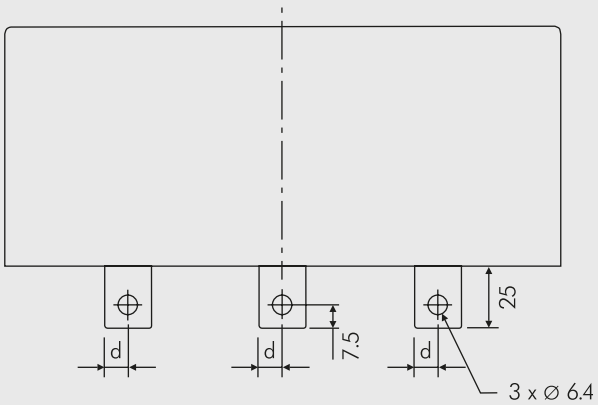
Customer-specific tabs, capacitances or voltages on request

External wiring:







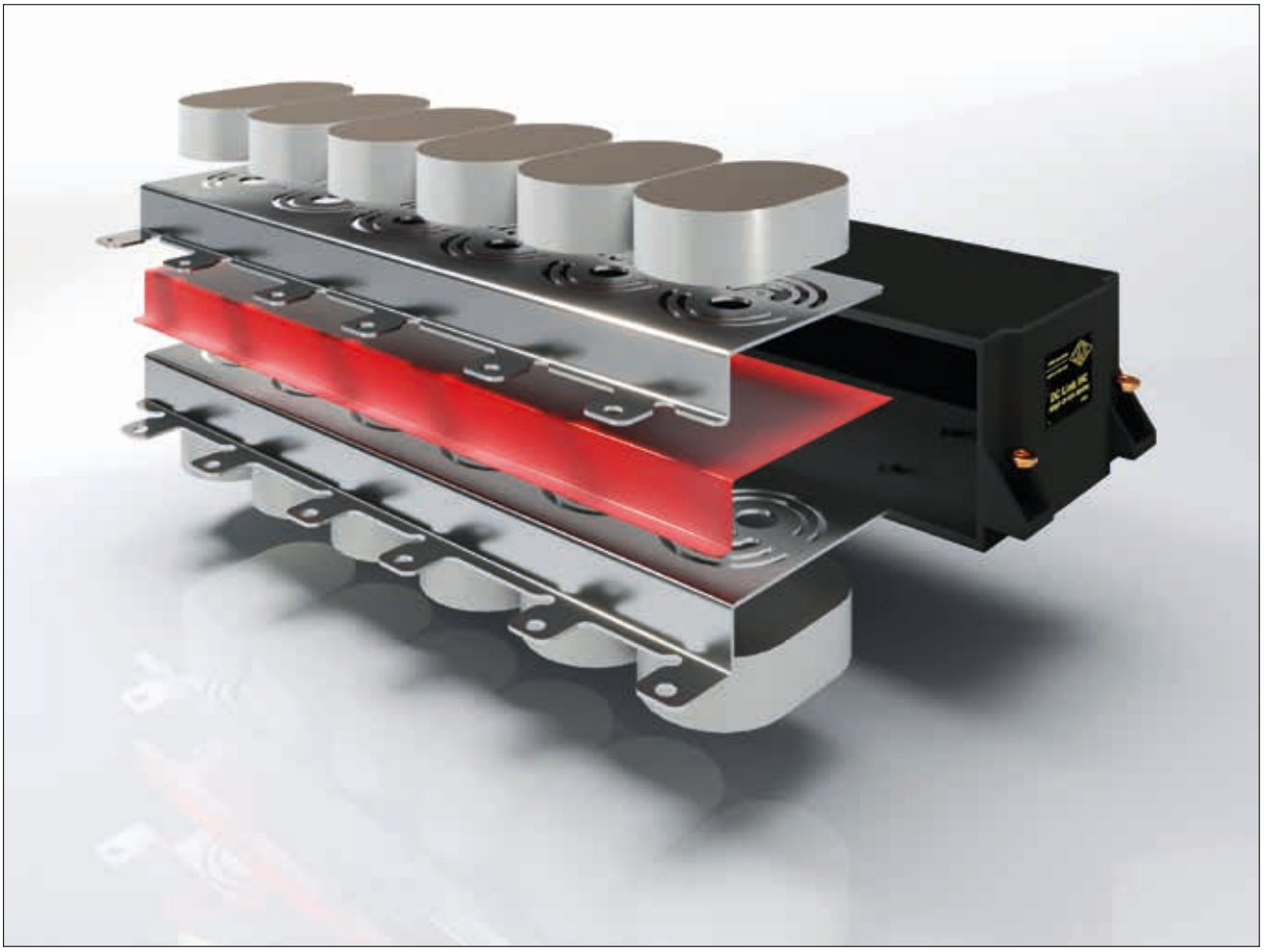


W	H	L	a	b	c	d
84	66	179	82	132	25	7.5
107	91	179	82	132	50	7.5
130	114	179	82	132	73	7.5
84	66	291	135.5	239	25	10
107	91	291	135.5	239	50	10
130	114	291	135.5	239	73	10

Dims. in mm. Case tolerances: general tolerances in accordance with ISO 2768-1 C (approximate)

Customized NEW

DC-LINK Capacitors for SiC-Power Semiconductors



WIMA low-inductance (LI) DC-LINK capacitors are characterized by a flat, space-saving design with particularly low self-inductance. In addition to general applications, they are particularly suitable for applications in combination with silicon-based SiC power semiconductors.

Advantages

- The LI configuration with flat, space-saving design is available for all types and contact configurations
- Existing capacitor designs can easily be substituted with LI capacitors
- The LI design has no restrictions regarding the energy density per volume compared to previous DC-Link configurations
- The WIMA Single Side Cooling (SSC) achieves ideal heat dissipation with one-sided (water) cooling systems
- The LI design is available in 2- and 3-voltage level configurations.

Properties

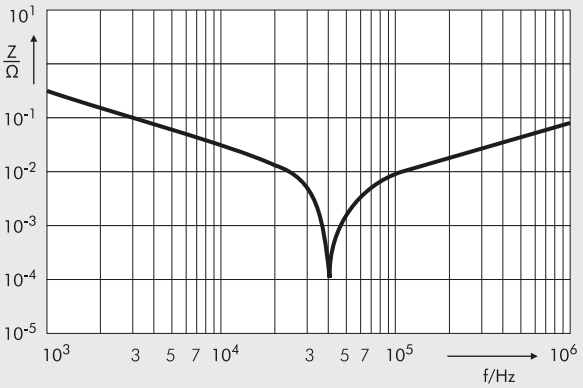
- Low leakage inductance of ⩽ 10 nH in almost any capacitor configuration
- Significant resonance point shift in high frequency ranges compared to conventional designs
- Optional: ESR optimized design and application temperatures up to +125°C on request.

Customized

Continuation

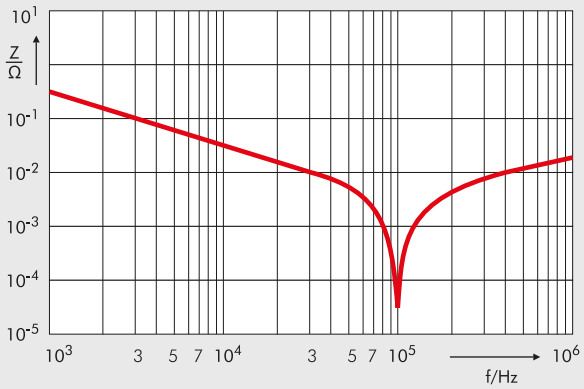
Impedance Change with Frequency

Reference Design



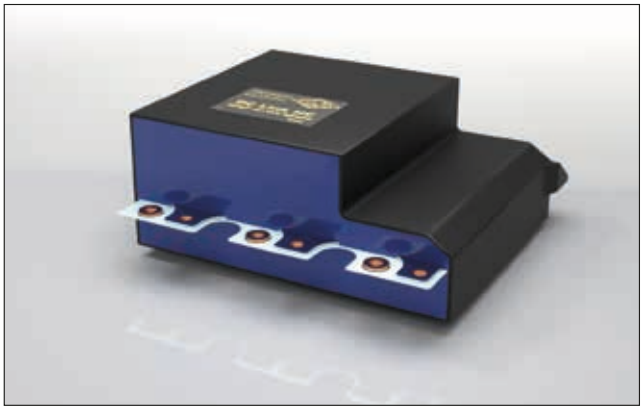
C_r = 500 µF ±10%
ESR = 0.46 mΩ at 1kHz
f_R ≏ 42.5 kHz ⇨ ESL ≏ 30 nH

NEW: LI-Design



C_r = 500 µF ±10%
ESR = 0.4 mΩ at 1kHz
f_R ≏ 100 kHz ⇨ **ESL ≏ 5 nH**

Examples



WIMA PowerBlock

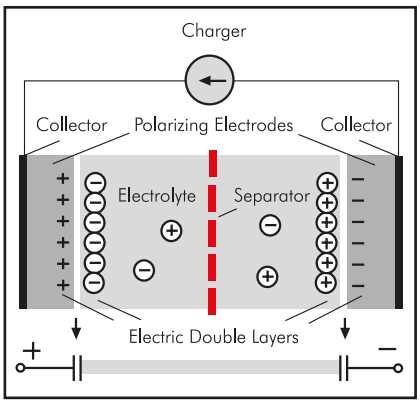
Double-Layer Capacitor (SuperCap) Modules with Very High Capacitances

Special Features

- **Modules with very high capacitance values from 62 F to 500 F and rated voltages from 16 VDC to 125 VDC**
- **Discharge current up to 1900 A**
- **Maintenance-free**
- **Series connected**
- **Actively balanced**
- **According to RoHS 2015/863/EU**

Construction

Encapsulation: Metal case IP65
Terminal tread size: M8 / M10
Marking: Colour: Black. Marking: Gold
Internal construction:



The WIMA PowerBlock range has a modular design. The configurations displayed are representative examples which at any time can be adapted in terms of capacitance, voltage or dimensions. Customized solutions can be realized on request.

Technical Options on Request

- **Temperature monitoring**
- **Overvoltage signal**
- **Voltage monitoring**
- **Industrial connector/CAN-connector**
- **Application-adapted cooling**
- **Application-specific protection classes**

General Data

U_R	C_N	Dimensions W	H	L	Part number
16 V	105 F	157	69	250	MCPBA0B105MC00QV00
	500 F	157	156	250	MCPBA0B500MC00QV00
62.5 V	125 F	283	156	439	MCPBB4B125MC00QV00
125 V	62 F	409	156	575	MCPBDAA620MC00QV00

Application:

WIMA PowerBlock modules stores energy and releases it within short time in e.g.:

- Motor start in construction, agriculture and earth moving machines, trucks, busses, vessels, generators
- Railway technology e.g. locomotives, electric tramway, metro etc.
- Hybrid and heavy transportation in e.g. construction, agricultural and forest machines, city busses, forklifts, cranes etc.
- Automated guided vehicules (AGV) in production facilities, in-plant logistic systems etc.
- Uninterruptible power supply (UPS) in hospitals, telecommunication systems, oil and gas extraction etc.
- Wind power systems e.g. in pitch control.

Advantages:

- Fast supply of several 100 - 1000 A in direct current operation
- Operating temperature range from -40° C to +65° C
- Maintenance-free operation with up to 1 million charge/discharge cycles
- Life expectancy >10 years
- Low weight against batteries or secondary batteries
- Environmentally friendly materials
- No risk of damage do to complete discharge of the component
- Very fast recharge of the PowerBlock.

Conclusion:

The use of PowerBlocks as energy storage increases efficiency and life time of the applications, saves weight and cost for maintenance, and is environmentally friendly.

Continuation

Technical Data

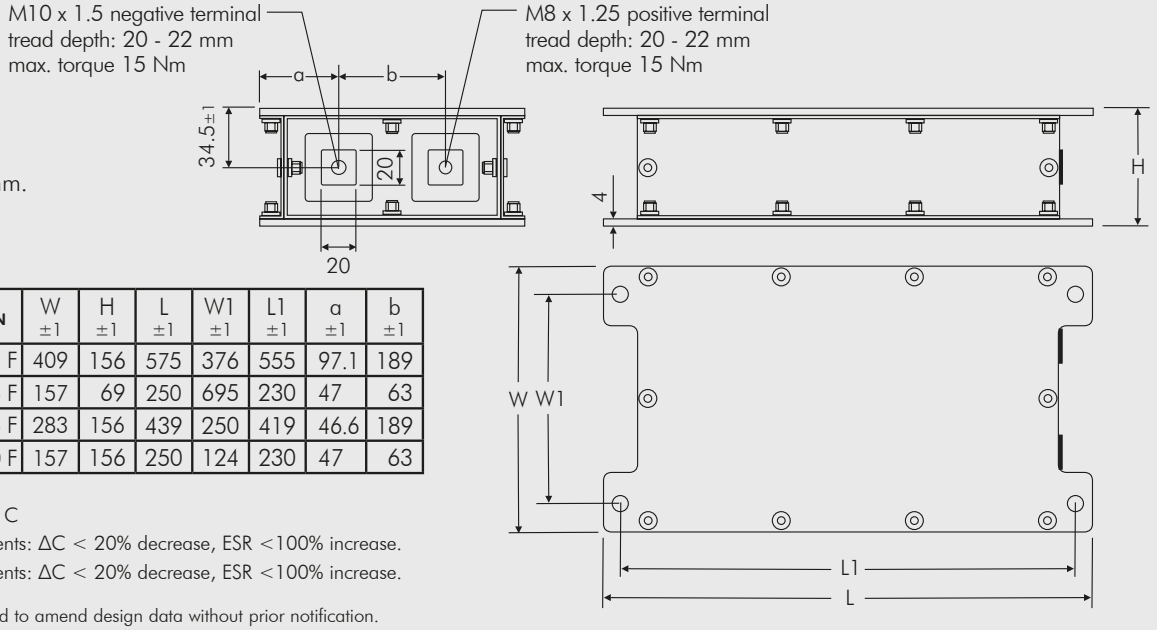
Rated capacitance:	C_N [F]	105	500	125	62
Capacitance tolerance:	[%]	0%/+20%			
Rated voltage:	U_R [V]	16		62.5	125
Max. continuous current[1]:	I_C [A, rms]	54	130	130	130
Current, peak (1 sec):	I_P [A]	up to 680	up to 1900	up to 1900	up to 1900
Max. ESR, initial:	R_{DC} [mΩ]	5.2	2.1	8.3	16.4
Max. stored energy: ±20%	$E_{max.}$ [Wh]	3.7	17.8	67.8	134.5
Operating temperature:	T_{op} [°C]	–45° C ... +65° C			
Storage temperature:	T_{st} [°C]	–45° C ... +75° C			
Weight:	m [kg]	2.3	4.4	16	31.9
Volume:	V [l]	2.7	6.1	19.4	36.7

Additional Data

Case:	–	AlMg3
Lug terminals:	–	M8 / M10

Comparative Data

Lifetime:					
in hours [2]	[h]	90 000, rated voltage, 25° C			
in cycles [3]	cycles	>1 million, rated voltage, 25° C			
Energy density:					
gravimetric	E_d [Wh/kg]	1.62	4.03	4.24	4.21
volumetric	E_V [Wh/l]	1.38	2.9	3.5	3.67



Dims. in mm.

C_N	W ±1	H ±1	L ±1	W1 ±1	L1 ±1	a ±1	b ±1
62 F	409	156	575	376	555	97.1	189
105 F	157	69	250	695	230	47	63
125 F	283	156	439	250	419	46.6	189
500 F	157	156	250	124	230	47	63

1) ΔT = 40° C
2) Requirements: ΔC < 20% decrease, ESR <100% increase.
3) Requirements: ΔC < 20% decrease, ESR <100% increase.

Fields of Application for WIMA PowerBlock Modules

Motor Start

WIMA PowerBlock Modules replace, protect or support converntional batteries to reliably crank big diesel engines in e.g.:

- **Trucks**
- **Construction, agricultural and earth moving machines**
- **Busses and trains**
- **Vessels**
- **Generators**
- **etc.**

During start-up of a big diesel engine the energy requirement is quite high. By using WIMA PowerBlock modules the battery layout can be designed smaller and thus lower in weight which leads to a significant reduction of fuel cost and emission of harmful substances.

Railway Technology

WIMA PowerBlock modules store braking energy and immediately release it for engine starting, acceleration or peak-load levelling in e.g.:

- **Locomotives**
- **Electric tramway**
- **etc.**

The use of PowerBlock modules as energy storage increases efficiency and life time of transportation systems, saves weight and cost for maintenance, and is environmentally friendly.

Hybrid/Heavy Transportation

WIMA PowerBlock modules in hybrid drives support diesel engines with fast and frequent dynamic loads in e.g.:

- **City busses**
- **Construction machines, agricultural machines and forestry equipment**
- **Forklifts, cranes**
- **etc.**

The use of WIMA PowerBlock modules as energy storage leads to significant saving in terms of fuel consumption and considerably reduces exhaust and noise emission.

Automated Guided Vehicles (AGV)

WIMA PowerBlock modules serve as rechargeable or exchangeable energy storage in independent, automated guided vehicles (AGV) in e.g.:

- **Warehouse and distribution environments**
- **Production facilities**
- **In-plant logistic systems**
- **etc.**

The use of PowerBlock modules as energy storage saves weight, reduces cost for maintenance and increases efficiency and life time of the transportation system.

Uninterruptible Power Supply (UPS)

Cascaded WIMA PowerBlock modules are used as emergency power supply in e.g.:

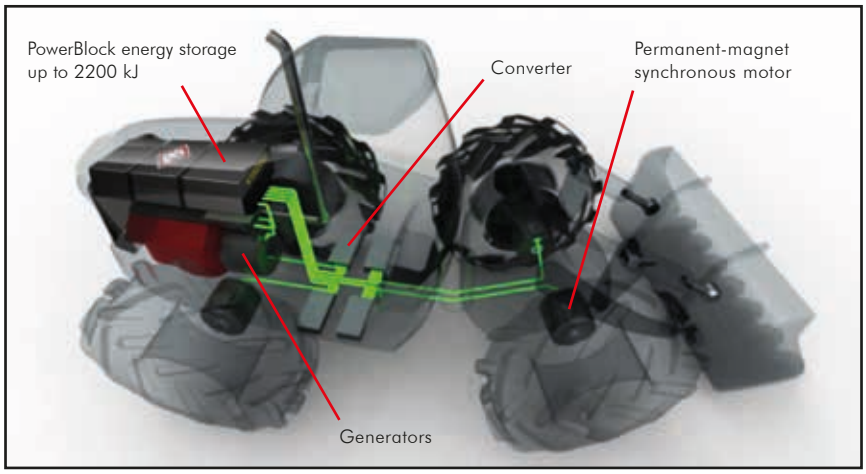
- **Hospitals**
- **Telecommunication systems**
- **Oil production plants**
- **Gas extraction**
- **etc.**

By reliably bridging short-term power outages cost-intensive system crashes can be avoided.

WIMA Competence

WIMA has many years of experience in construction of customized energy storage modules based on double layer capacitors. Design and construction of individual solutions is coordinated with the user. Customer's advantages are:

- High expertise due to many years of manufacturing and field experience
- Individual design related to
  - environment
  - space requirements
  - fixing
  - connecting options
- Flexible capacitance or voltage due to serial or parallel cascading of single cells with 350 F to 3,000 F
- Laser-based, reliable welding of the single cells
- Robust, vibration resistant construction according to IP-25 - IP-69 K on demand
- Various technical options, e.g.:
  - temperature monitoring
  - overvoltage signal
  - voltage monitoring
  - industrial connector/CAN-connector
  - application-adapted cooling
  - custom-specific protection class
- Pulse current, endurance and voltage tests according to IEC 62576 or DIN EN 62391-1
- Prototype and small series production
- Ready for connection supply.



VISEDO electrified wheel-loader using WIMA PowerBlock energy storage modules.

04.23

WIMA Part Number System

A WIMA part number consists of 18 digits and is composed as follows:

Field 1 - 4: Type description
Field 5 - 6: Rated voltage
Field 7 - 10: Capacitance
Field 11 - 12: Size and PCM
Field 13 - 14: Version code (e.g. Snubber versions)
Field 15: Capacitance tolerance
Field 16: Packing
Field 17 - 18: Pin length (untaped)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
M	**K**	**S**	**2**	**C**	**0**	**2**	**1**	**0**	**0**	**1**	**A**	**0**	**0**	**M**	**S**	**S**	**D**
MKS 2				63 VDC		0.01 µF				2.5x6.5x7.2		-		20%	bulk	6 -2	

Type description:

SMD-PET	= SMDT
SMD-PEN	= SMDN
SMD-PPS	= SMDI
FKP 02	= FKP0
MKS 02	= MKS0
FKS 2	= FKS2
FKP 2	= FKP2
FKS 3	= FKS3
FKP 3	= FKP 3
MKS 2	= MKS2
MKP 2	= MKP2
MKS 4	= MKS4
MKP 4	= MKP4
MKP 10	= MKP1
FKP 4	= FKP4
FKP 1	= FKP1
MKP-X2	= MKX2
MKP-X1 R	= MKX1
MKP-Y2	= MKY2
MKP 4F	= MKPF
Snubber MKP	= SNMP
Snubber FKP	= SNFP
GTO MKP	= GTOM
DC-LINK MKP 4	= DCP4
DC-LINK MKP 6	= DCP6
DC-LINK HC	= DCHC

Rated voltage:

50 VDC	= B0
63 VDC	= C0
100 VDC	= D0
250 VDC	= F0
400 VDC	= G0
450 VDC	= H0
520 VDC	= H2
600 VDC	= I0
630 VDC	= J0
700 VDC	= K0
800 VDC	= L0
850 VDC	= M0
900 VDC	= N0
1000 VDC	= O1
1100 VDC	= P0
1200 VDC	= Q0
1250 VDC	= R0
1500 VDC	= S0
1600 VDC	= T0
1700 VDC	= TA
2000 VDC	= U0
2500 VDC	= V0
3000 VDC	= W0
4000 VDC	= X0
6000 VDC	= Y0
230 VAC	= 3Y
275 VAC	= 1W
300 VAC	= 2W
305 VAC	= AW
350 VAC	= BW
440 VAC	= 4W
...	

Capacitance:

22 pF	= 0022
47 pF	= 0047
100 pF	= 0100
150 pF	= 0150
220 pF	= 0220
330 pF	= 0330
470 pF	= 0470
680 pF	= 0680
1000 pF	= 1100
1500 pF	= 1150
2200 pF	= 1220
3300 pF	= 1330
4700 pF	= 1470
6800 pF	= 1680
0.01 µF	= 2100
0.022 µF	= 2220
0.047 µF	= 2470
0.1 µF	= 3100
0.22 µF	= 3220
0.47 µF	= 3470
1 µF	= 4100
2.2 µF	= 4220
4.7 µF	= 4470
10 µF	= 5100
22 µF	= 5220
47 µF	= 5470
100 µF	= 6100
220 µF	= 6220
1000 µF	= 7100
1500 µF	= 7150
...	

Size:

4.8x3.3x3 Size 1812	= KA
4.8x3.3x4 Size 1812	= KB
5.7x5.1x3.5 Size 2220	= QA
5.7x5.1x4.5 Size 2220	= QB
7.2x6.1x3 Size 2824	= TA
7.2x6.1x5 Size 2824	= TB
10.2x7.6x5 Size 4030	= VA
12.7x10.2x6 Size 5040	= XA
15.3x13.7x7 Size 6054	= YA
2.5x7x4.6 PCM 2.5	= 0B
3x7.5x4.6 PCM 2.5	= 0C
2.5x6.5x7.2 PCM 5	= 1A
3x7.5x7.2 PCM 5	= 1B
2.5x7x10 PCM 7.5	= 2A
3x8.5x10 PCM 7.5	= 2B
3x9x13 PCM 10	= 3A
4x9x13 PCM 10	= 3C
5x11x18 PCM 15	= 4B
6x12.5x18 PCM 15	= 4C
5x14x26.5 PCM 22.5	= 5A
6x15x26.5 PCM 22.5	= 5B
9x19x31.5 PCM 27.5	= 6A
11x21x31.5 PCM 27.5	= 6B
9x19x41.5 PCM 37.5	= 7A
11x22x41.5 PCM 37.5	= 7B
19x31x56 PCM 48.5	= 8D
25x45x57 PCM 52.5	= 9D
...	

Version code:

Standard	= 00
Version A1	= 1A
Version A1.1.1	= 1B
Version A2	= 2A
...	

Tolerance:

±20%	= M
±10%	= K
±5%	= J
±2.5%	= H
±1%	= E
...	

Packing:

AMMO H16.5 340x340	= A
AMMO H16.5 490x370	= B
AMMO H18.5 340x340	= C
AMMO H18.5 490x370	= D
REEL H16.5 360	= F
REEL H16.5 500	= H
REEL H18.5 360	= I
REEL H18.5 500	= J
ROLL H16.5	= N
ROLL H18.5	= O
BLISTER W12 180	= P
BLISTER W12 330	= Q
BLISTER W16 330	= R
BLISTER W24 330	= T
Bulk/TPS Standard	= S
...	

Pin length (untaped)

3.5 ±0.5	= C9
6 -2	= SD
16 ±1	= P1
...	

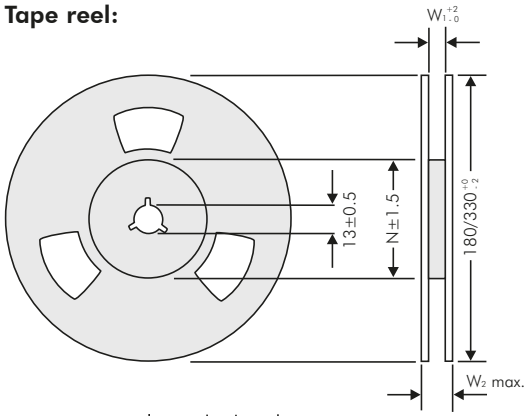
Pin length (taped)

none	= 00

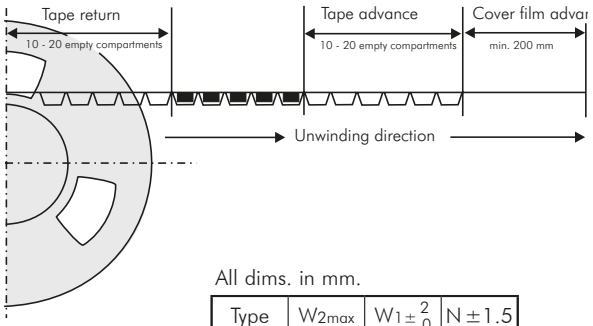
The data on this page is not complete and serves only to explain the part number system. Part number information is listed on the pages of the respective WIMA range.

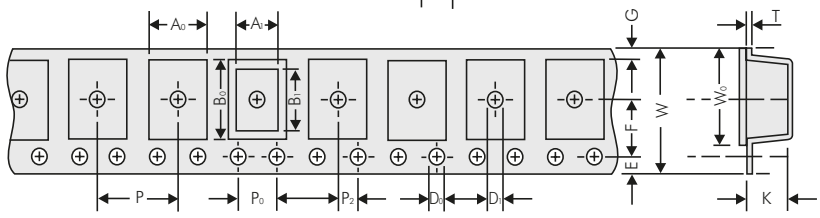
Blister Tape Packaging and Packing Units of the WIMA SMD Capacitors

Tape reel:



Tape advance and return:





All dims. in mm.

Type	W2max	W1 ± 2 0	N ±1.5
1812	19	12.4	62
2220	19	12.4	62
2824	19	12.4	62
4030	22.4	16.4	60
5040	30.4	24.4	90
6054	30.4	24.4	90

Packing units

Size Code 1812		A0 ±0.1	A1	B0 ±0.1	B1	D0 +0.1 -0	D1 +0.1 -0	P ±0.1	P0* ±0.1	P2 ±0.05	E ±0.1	F ±0.05	G	W ±0.3	W0 ±0.2	K ±0.1	T ±0.1
Box size	Code																
4.8x3.3x3	**KA**	3.55	3.3	5.1	4.8	P1.5	P1.5	8	4	2	1.75	5.5	2.2	12	9.5	3.4	0.3
4.8x3.3x4	**KB**	3.55	3.3	5.1	4.8	P1.5	P1.5	8	4	2	1.75	5.5	2.2	12	9.5	4.4	0.3

taped Reel 180 mm Ø	taped Reel 330 mm Ø	bulk Standard
700	2500	3000
500	2000	3000

Size Code 2220		A0 ±0.1	A1	B0 ±0.1	B1	D0 +0.1 -0	D1 +0.1 -0	P ±0.1	P0* ±0.1	P2 ±0.05	E ±0.1	F ±0.05	G	W ±0.3	W0 ±0.2	K ±0.1	T ±0.1
Box size	Code																
5.7x5.1x3.5	**QA**	6.3	5.7	5.6	5.1	P1.5	P1.5	8	4	2	1.75	5.5	1.95	12	9.5	3.7	0.3
5.7x5.1x4.5	**QB**	6.3	5.7	5.6	5.1	P1.5	P1.5	8	4	2	1.75	5.5	1.95	12	9.5	4.7	0.3

taped Reel 180 mm Ø	taped Reel 330 mm Ø	bulk Standard
500	1800	3000
400	1500	3000

Size Code 2824		A0 ±0.1	A1	B0 ±0.1	B1	D0 +0.1 -0	D1 +0.1 -0	P ±0.1	P0* ±0.1	P2 ±0.05	E ±0.1	F ±0.05	G	W ±0.3	W0 ±0.2	K ±0.1	T ±0.1
Box size	Code																
7.2x6.1x3	**TA**	6.6	6.1	7.7	7.2	P1.5	P1.5	12	4	2	1.75	5.5	0.9	12	9.5	3.4	0.3
7.2x6.1x5	**TB**	6.6	6.1	7.7	7.2	P1.5	P1.5	12	4	2	1.75	5.5	0.9	12	9.5	5.4	0.4

taped Reel 330 mm Ø	bulk Standard
1500	2000
750	2000

	Code	A0 ±0.1	A1	B0 ±0.1	B1	D0 +0.1 -0	D1 +0.1 -0	P ±0.1	P0* ±0.1	P2 ±0.05	E ±0.1	F ±0.05	G	W ±0.3	W0 ±0.2	K ±0.1	T ±0.1
Size Code 4030	**VA**	10.7	10.2	8.1	9.1	P1.5	P1.5	16	4	2	1.75	7.5	1.9	16	13.3	5.5	0.3
Size Code 5040	**XA**	13.5	12.7	11	11.5	P1.5	P1.5	16	4	2	1.75	11.5	4.7	24	21.3	6.5	0.3
Size Code 6054	**YA**	17.0	16.5	15.6	15.0	P1.5	P1.5	20	4	2	1.75	11.5	2.95	24	21.3	7.5	0.3

taped Reel 330 mm Ø	bulk Standard
775	2000
600	1000
450	500

* cumulative after 10 steps p 0.2 mm max.
Samples and pre-production needs on request or 1 Reel minimum.

Part number codes for SMD packing

W (Blister)	Ø in mm	Code
12	180	**P**
12	330	**Q**
16	330	**R**
24	330	**T**

Bulk Standard	**S**

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Typical Dimensions for Taping Configuration

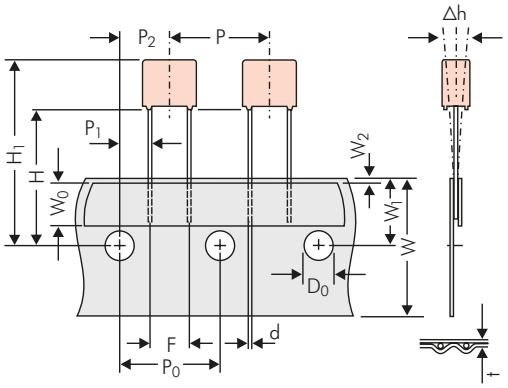


Diagram 1:
PCM 2.5/5/7.5mm

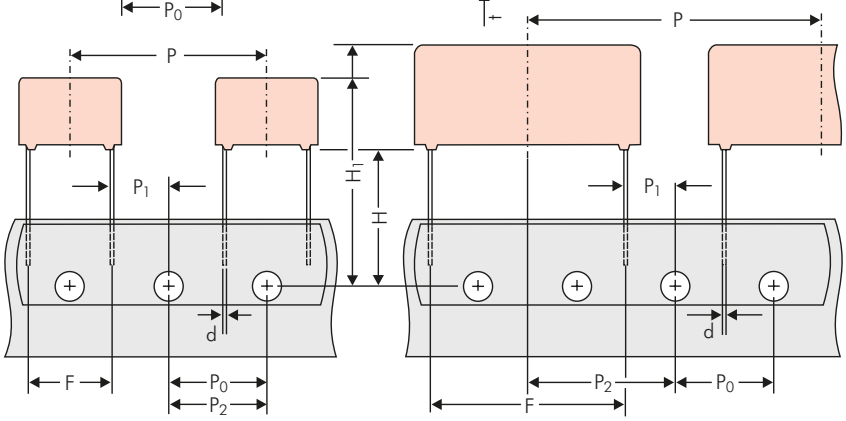


Diagram 2: PCM 10/15 mm

Diagram 3: PCM 22.5 and 27.5*mm
*PCM 27.5 taping possible with two feed holes between components

Designation	Symbol	Dimensions for Radial Taping						
		PCM 2.5 taping	**PCM 5 taping**	**PCM 7.5 taping**	**PCM 10 taping***	**PCM 15 taping***	**PCM 22.5 taping**	**PCM 27.5 taping**
Carrier tape width	W	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5
Hold-down tape width	W_0	6.0 for hot-sealing adhesive tape	6.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape
Hole position	W_1	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5
Hold-down tape position	W_2	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.
Feed hole diameter	D_0	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2
Pitch of component	P	12.7 ±1.0	12.7 ±1.0	12.7 ±1.0	25.4 ±1.0	25.4 ±1.0	38.1 ±1.5	*38.1 ±1.5 or 50.8 ±1.5
Feed hole pitch	P_0	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch
Feed hole centre to pin	P_1	5.1 ±0.5	3.85 ±0.7	2.6 ±0.7	7.7 ±0.7	5.2 ±0.7	7.8 ±0.7	5.3 ±0.7
Hole centre to component centre	P_2	6.35 ±1.3	6.35 ±1.3	6.35 ±1.3	12.7 ±1.3	12.7 ±1.3	19.05 ±1.3	19.05 ±1.3
Feed hole centre to bottom edge of the component	H ▲	16.5 ±0.3	16.5 ±0.3	16.5 ±0.5	16.5 ±0.5	16.5 ±0.5	16.5 ±0.5	16.5 ±0.5
		18.5 ±0.5	18.5 ±0.5	18.5 ±0.5	18.5 ±0.5	18.5 ±0.5	18.5 ±0.5	18.5 ±0.5
Feed hole centre to top edge of the component	H_1	$H+H_{component} < H_1$ 32.25 max.	$H+H_{component} < H_1$ 32.25 max.	$H+H_{component} < H_1$ 24.5 to 31.5	$H+H_{component} < H_1$ 25.0 to 31.5	$H+H_{component} < H_1$ 26.0 to 37.0	$H+H_{component} < H_1$ 30.0 to 43.0	$H+H_{component} < H_1$ 35.0 to 45.0
Pin spacing at upper edge of carrier tape	F	2.5 ±0.5	5.0 $^{+0.8}_{-0.2}$	7.5 ±0.8	10.0 ±0.8	15 ±0.8	22.5 ±0.8	27.5 ±0.8
Pin diameter	d	0.4 ±0.05	0.5 ±0.05	•0.5 ±0.05 or $0.6^{+0.06}_{-0.05}$	•0.5 ±0.05 or $0.6^{+0.06}_{-0.05}$	$0.8^{+0.08}_{-0.05}$	$0.8^{+0.08}_{-0.05}$	$0.8^{+0.08}_{-0.05}$
Component alignment	Δh	± 2.0 max.	± 2.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.
Total tape thickness	t	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2
Package (see also page 158)	▲	ROLL/AMMO		AMMO				
		REEL Ø 360 max. Ø 30 ±1 B 52 ±2 / 58 ±2 depending on comp. dimensions		REEL Ø 360 max. Ø 30 ±1 B 52 ±2 / 58 ±2 / 66 ±2 or REEL Ø 500 max. Ø 25 ±1 B 54 ±2 / 60 ±2 / 68 ±2 depending on PCM and component dimensions				
Unit		see details page 159.						

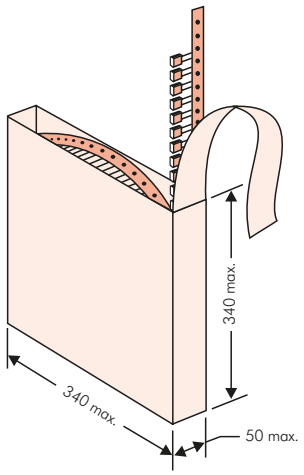
▲ When ordering please specify dimension H and required packaging type.
Dims in mm.

• Diameter of pins see General Data.
Please clarify customer-specific deviations with the manufacturer.

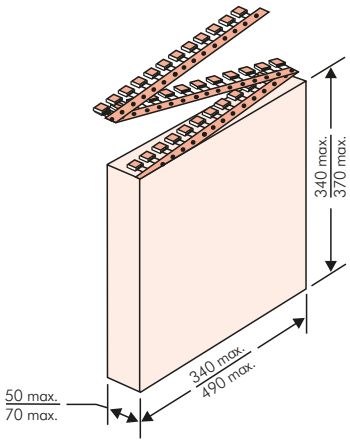
* PCM 10 and PCM 15 can be crimped to PCM 7.5.
Position of components according to PCM 7.5 (sketch 1). P_0 = 12.7 or 15.0 is possible

Types of Tape Packaging of Capacitors for Automatic Radial Insertion

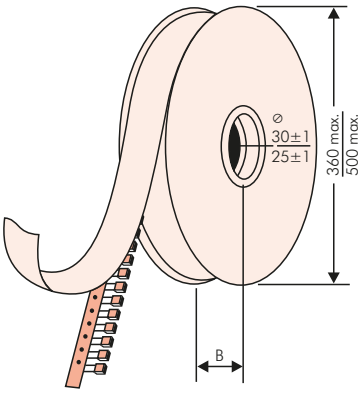
ROLL Packaging



AMMO Packaging



REEL Packaging



BAR CODE (Labelling)

Labelling of package units in plain text and with alphanumerical Bar Code

- WIMA supplier number
- Date code
- Customer's P/O number
- P/O line
- Customer's part number
- WIMA part number
- Quantity
- WIMA confirmation number
- Country of origin
- Customer name
- Handling unit number
- Week of delivery.

In addition part description of

– article
– capacitance value
– rated voltage
– dimensions
– technical note
– capacitance tolerance
– packing
– connecting information

BARCODE PDF417
BARCODE 2D Datamatrix

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Packing Quantities for Capacitors with Radial Pins in PCM 2.5 mm to 27.5 mm

PCM	Size				bulk	pcs. per packing unit									
						ROLL		REEL				AMMO			
								Ø 360		Ø 500		340 x 340		490 x 370	
						H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	H16.5	H18.5
	W	H	L	Codes	S	N	O	F	I	H	J	A	C	B	D
2.5 mm	2.5	7	4.6	**0B**	5000	2200		2500		–		2800		–	
	3	7.5	4.6	**0C**	5000	2000		2300		–		2300		–	
	3.8	8.5	4.6	**0D**	5000	1500		1800		–		1800		–	
	4.6	9	4.6	**0E**	5000	1200		1500		–		1500		–	
	5.5	10	4.6	**0F**	5000	900		1200		–		1200		–	
5 mm	2.5	6.5	7.2	**1A**	5000	2200		2500		–		2800		–	
	3	7.5	7.2	**1B**	5000	2000		2300		–		2300		–	
	3.5	8.5	7.2	**1C**	5000	1600		2000		–		2000		–	
	4.5	6	7.2	**1D**	6000	1300		1500		–		1500		–	
	4.5	9.5	7.2	**1E**	4000	1300		1500		–		1500		–	
	5	10	7.2	**1F**	3500	1100		1400		–		1400		–	
	5.5	7	7.2	**1G**	4000	1000		1200		–		1200		–	
	5.5	11.5	7.2	**1H**	2500	1000		1200		–		1200		–	
	6.5	8	7.2	**1I**	2500	800		1000		–		1000		–	
	7.2	8.5	7.2	**1J**	2500	700		1000		–		1000		–	
	7.2	13	7.2	**1K**	2000	700		950		–		1000		–	
	8.5	10	7.2	**1L**	2000	600		800		–		800		–	
	8.5	14	7.2	**1M**	1500	600		800		–		800		–	
	11	16	7.2	**1N**	1000	500		600		–		640		–	
7.5 mm	2.5	7	10	**2A**	5000	–		2500		4400		2500		–	
	3	8.5	10	**2B**	5000	–		2200		4300		2300		4150	
	4	9	10	**2C**	4000	–		1700		3200		1700		3000	
	4.5	9.5	10.3	**2D**	3500	–		1500		2900		1400		2700	
	5	10.5	10.3	**2E**	3000	–		1300		2500		1300		–	
	5.7	12.5	10.3	**2F**	2000	–		1000		2200		1100		–	
	7.2	12.5	10.3	**2G**	1500	–		900		1800		1000		–	
10 mm	3	9	13	**3A**	3000	–		1100		2200		–		1900	
	4	9	13	**3C**	3000	–		900		1600		–		1450	
	4	9.5	13	**3D**	3000	–		900		1600		–		1400	
	5	11	13	**3F**	3000	–		700		1300		–		1100	
	6	12	13	**3G**	2400	–		550		1100		–		1000	
	6	12.5	13	**3H**	2400	–		550		1100		–		1000	
	8	12	13	**3I**	2000	–		400		800		–		740	
15 mm	5	11	18	**4B**	2400	–		600		1200		–		1150	
	6	12.5	18	**4C**	2000	–		500		1000		–		1000	
	7	14	18	**4D**	1600	–		450		900		–		850	
	8	15	18	**4F**	1200	–		400		800		–		740	
	9	14	18	**4H**	1200	–		350		700		–		650	
	9	16	18	**4J**	900	–		350		700		–		650	
	11	14	18	**4M**	1000	–		300		600		–		540	
22.5 mm	5	14	26.5	**5A**	1200	–		–		800		–		770	
	6	15	26.5	**5B**	1000	–		–		700		–		640	
	7	16.5	26.5	**5D**	760	–		–		600		–		550	
	8.5	18.5	26.5	**5F**	500	–		–		480		–		450	
	10.5	19	26.5	**5G**	594*	–		–		400		–		360	
	10.5	20.5	26.5	**5H**	594*	–		–		400		–		360	
	11	21	26.5	**5I**	561*	–		–		380		–		350	
27.5 mm	9	19	31.5	**6A**	567*	–		–		460/340*		–		–	
	11	21	31.5	**6B**	459*	–		–		380/280*		–		–	
	13	24	31.5	**6D**	378*	–		–		300		–		–	
	15	26	31.5	**6F**	324*	–		–		270		–		–	
	17	29	31.5	**6G**	198*	–		–		–		–		–	
	17	34.5	31.5	**6I**	198*	–		–		–		–		–	
	20	39.5	31.5	**6J**	162*	–		–		–		–		–	

* for 2-inch transport pitches.

* TPS (Tray-Packing-System). Plate versions may have different packing units. Samples and pre-production needs on request.

Packing Quantities for Capacitors with Radial Pins in PCM 37.5 mm to 52.5 mm

PCM	Size				bulk	pcs. per packing unit									
						ROLL		REEL				AMMO			
								∅ 360		∅ 500		340 x 340		490 x 370	
						H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	H16.5	H18.5
	W	H	L	Codes	S	N	O	F	I	H	J	A	C	B	D
37.5 mm**	9	19	41.5	**7A**	441*	–		–		–		–		–	
	11	22	41.5	**7B**	357*	–		–		–		–		–	
	13	24	41.5	**7C**	294*	–		–		–		–		–	
	15	26	41.5	**7D**	252*	–		–		–		–		–	
	17	29	41.5	**7E**	154*	–		–		–		–		–	
	19	32	41.5	**7F**	140*	–		–		–		–		–	
	20	39.5	41.5	**7G**	126*	–		–		–		–		–	
	24	45.5	41.5	**7H**	112*	–		–		–		–		–	
	28	38	41.5	**7L**	84*	–		–		–		–		–	
	31	46	41.5	**7I**	84*	–		–		–		–		–	
	35	50	41.5	**7J**	35*	–		–		–		–		–	
	40	55	41.5	**7K**	28*	–		–		–		–		–	
48.5 mm**	19	31	56	**8D**	120*	–		–		–		–		–	
	23	34	56	**8E**	80*	–		–		–		–		–	
	27	37.5	56	**8H**	84*	–		–		–		–		–	
	33	48	56	**8J**	25*	–		–		–		–		–	
	37	54	56	**8L**	25*	–		–		–		–		–	
52.5 mm	25	45	57	**9D**	70*	–		–		–		–		–	
	30	45	57	**9E**	60*	–		–		–		–		–	
	35	50	57	**9F**	25*	–		–		–		–		–	
	45	55	57	**9H**	20*	–		–		–		–		–	
	45	65	57	**9J**	20*	–		–		–		–		–	

* TPS (Tray-Packing-System). Plate versions may have different packing units.
**For Snubber capacitors in 2-pin version the PCM is changing to 38.5 respective 49.5 mm.
Samples and pre-production needs on request.

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