

High Voltage Ceramic Chip Capacitors

Introduction

Cal-Chip Electronics, Incorporated operates a policy of continuous development for its ranges of Multilayer Ceramic Capacitors. Our unique construction process ensures excellent volumetric efficiency and stability of capacitance with temperature. High Voltage Chip MLC's have extended values in the 500V series to those previously offered, together with voltage ranges up to 10kV.

Handling

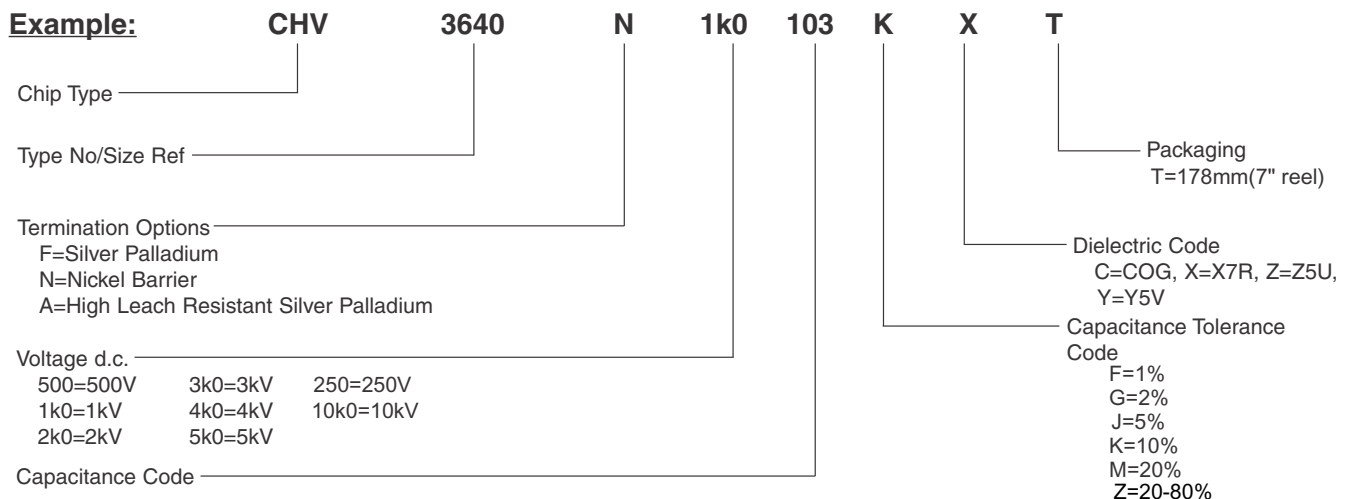
Ceramics are dense, hard, brittle and abrasive materials. They are liable to suffer mechanical damage in the form of chips or cracks, if improperly handled. MLC's should never be handled with metallic instruments.

DIELECTRIC CHARACTERISTICS

	COG / NPO	X7R	Y5V & Z5U
Dielectric classification:	Ultra Stable	Stable	General Purpose
Rated temperature range:	-55°C to +125°C	-55°C to +125°C	+10°C to +85°C
Maximum capacitance change over temperature range	0±30ppm/°C	±15%	+22 to -56%
Tangent of loss angle (tan δ)	Cr>50pF≤0.0015 Cr≤50pF=0.0015 (15+0.7) Cr	≤0.025	≤0.030
Insulation resistance (Ri) Time Constant (Ri X Cr) (whichever is less)	100GΩ or 1000s	100GΩ or 1000s	10GΩ or 100s
Capacitance tolerance	<10pF ±0.25, ±0.5pF ≥10pF ±1, ±2, ±5, ±10%	+5%, ±10%, ±20%	±20%, -20+80%
Proof Voltage 500V ≥1kV	1.5 x rated volts 1.5 x rated volts	1.5 x rated volts 1.25 x rated volts	1.5 x rated volts
Climatic category (IEC)	55/125/56	55/125/56	25/085/56
Aging characteristic (Typ.)	Zero	1% per time decade	6% per time decade

SURFACE MOUNT CHIP CAPACITORS

Ordering Information



High Voltage Ceramic Chip Capacitors- COG, X7R, and Z5U (250V & 500V)

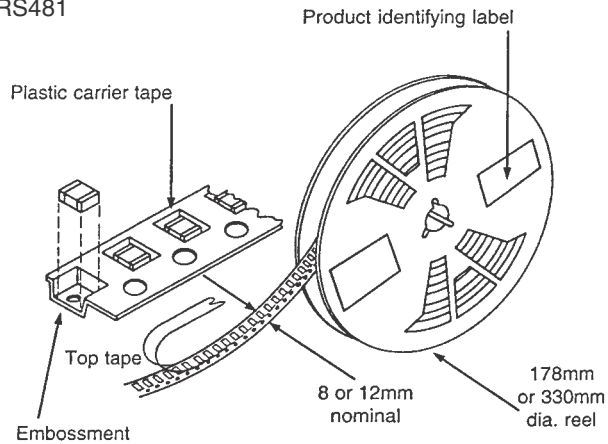
		CHV1206			CHV1210			CHV1812			CHV2220			CHV2225			CHV3640		CHV5550		CHV8060				
Type		1206			1210			1812			2220			2225			3640		5550		8060				
Length	mm	3.2±0.3			3.2±0.3			4.5±0.35			5.7±0.4			5.7±0.4			9.2±0.5		14.0±0.5		20.3±0.5				
	Inches	0.125±0.012			0.125±0.012			0.18±0.014			0.225±0.016			0.225±0.016			0.36±0.02		0.55±0.02		0.80±0.02				
Width	mm	1.6±0.2			2.5±0.3			3.2±0.3			5.0±0.4			6.3±0.4			10.16±0.5		12.7±0.5		15.24±0.5				
	Inches	0.063±0.008			0.10±0.012			0.125±0.012			0.197±0.016			0.25±0.012			0.40±0.02		0.50±0.02		0.60±0.02				
Thickness	mm	1.6			1.8			1.8			1.8			1.8			2.0		2.5		2.5				
	Inches	0.063			0.07			0.07			0.07			0.07			0.08		0.1		0.1				
Termination Band	Min		Max		Min		Max		Min		Max		Min		Max		Min		Max		Min		Max		
	0.25		0.75		0.25		0.75		0.25		0.75		0.25		0.75		0.5		1.5		0.5		1.5		
	Inches		0.01		0.03		0.01		0.03		0.01		0.03		0.01		0.03		0.02		0.06		0.02		0.06
Dielectric		COG	X7R	Z5U	COG	X7R	Z5U	COG	X7R	Z5U	COG	X7R	Z5U	COG	X7R	Z5U	COG	X7R	COG	X7R	COG	X7R	COG	X7R	
Cap. Range	Code																								
1.0pF	1R0																								
1.2	1R2																								
1.5	1R5																								
1.8	1R8																								
2.2	2R2																								
2.7	2R7																								
3.3	3R3																								
3.9	3R9																								
4.7	4R7																								
5.6	5R6																								
6.8	6R8																								
8.2	8R2																								
10	100																								
12	120																								
15	150																								
18	180																								
22	220																								
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33	330																								
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560	561																								
680	681																								
820	821																								
1.0nF	102																								
1.2	122																								
1.5	152																								
1.8	182																								
2.2	222																								
2.7	272																								
3.3	332																								
3.9	392																								
4.7	472																								
5.6	562																								
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10	103																								
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100	104																								
120	124																								
150	154																								
180	184																								
220	224																								
270	274																								
330	334																								
390	394																								
470	474																								
560	564																								
680	684																								
820	824																								
1.0uF	105																								
1.2	125																								
1.5	155																								
1.8	185																								
2.2	225																								
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3.3	335																								
3.9	395																								
4.7	475																								
5.6	565																								
6.8	685																								
8.2	825																								
10	106																								
22	226																								
33	336																								
47	476																								

High Voltage Ceramic Chip Capacitors- COG & X7R (3kV, 4kV and 5kV)

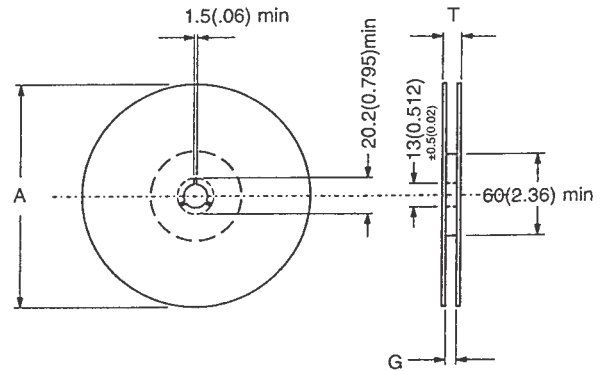
		CHV1812			CHV2220			CHV2225			CHV3640			CHV5550			CHV8060					
Type		1812			2220			2225			3640			5550			8060					
Length	mm	4.5±0.35			5.7±0.4			5.7±0.4			9.2±0.5			14.0±0.5			20.3±0.5					
	Inches	0.18±0.014			0.225±0.016			0.225±0.016			0.36±0.02			0.55±0.02			0.80±0.02					
Width	mm	3.2±0.3			5.0±0.4			6.3±0.4			10.2±0.5			12.7±0.5			15.2±0.5					
	Inches	0.126±0.012			0.197±0.016			0.25±0.016			0.40±0.02			0.50±0.02			0.60±0.02					
Thickness	mm	4.0			4.0			4.0			2.5			2.5			2.5					
	Inches	0.157			0.157			0.157			0.1			0.1			0.1					
Termination Band	mm	Min	0.25		0.25		0.25		0.25		0.5		0.5		0.5		0.5					
		Max	0.75		0.75		0.75		0.75		1.5		1.5		1.5		1.5					
	Inches	0.01		0.03		0.01		0.03		0.01		0.02		0.06		0.02		0.06				
Dielectric	COG		X7R		COG		X7R		COG		X7R		COG		X7R		COG		X7R			
	Voltage		3kV	4kV	3kV	4kV	5kV	3kV	4kV	5kV	3kV	4kV	5kV	3kV	4kV	5kV	3kV	4kV	5kV	3kV	4kV	5kV
Cap Range	Code																					
10pF	100																					
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100	104																					

Surface Mount Chip Capacitors: Tape and Reel packaging information

Tape and reel packing of surface mounting chip capacitors for automatic placement are in accordance with IEC286 part 3 and RS481



Reel dimensions mm (inches)

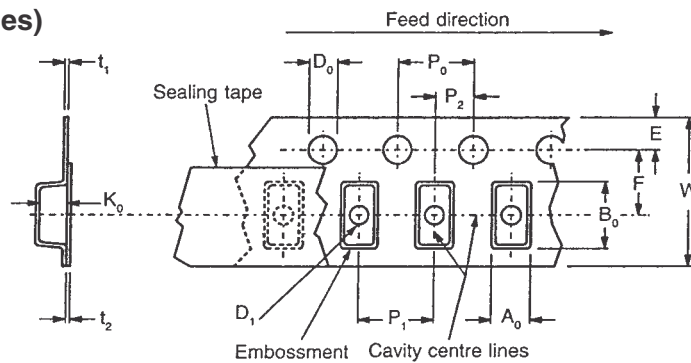


Symbol	Description	178mm reel	330mm reel
A	Reel diameter	178(7) ±2(0.079)	330(13) max
G	Reel inside with	8.4(0.33) ±1.5(0.059)-0	12.4(0.49) ±1.5(0.059)-0
T	Reel outside with	14.4(0.56) max	18.4(0.72) max

Peel force

The peel force of the top sealing tape is between 0.2 and 1.0 Newton at 1800. The breaking force of the carrier and sealing tape in the direction of unreeling is greater than 10 Newtons.

Tape dimensions mm (inches)



Symbol	Description	8mm tape	12mm tape
A ₀	Width of cavity	Dependent on chip size to minimize rotation	
B ₀	Length of cavity		
K ₀	Depth of cavity		
W	Width of tape	8(0.315) ±0.2(0.008)	12(0.472) ±0.2(0.008)
F	Distance between drive hole centres and cavity centres	3.5(0.138) ±0.05(0.002)	5.5(0.213) ±0.05(0.002)
E	Distance between drive hole centres and tape edge	1.75(0.069) ±0.1(0.004)	
P ₁	Distance between cavity centres	4(0.156) ±0.1(0.004)	8(0.315) ±0.1(0.004)
P ₂	Axial distance between drive hole centres and cavity centres	2(0.079) ±0.05(0.002)	
P ₀	Axial distance between drive hole centres	4(0.156) ±0.1(0.004)	
D ₀	Drive hole diameter	1.5(0.059) +0.1(0.004)-0	
D ₁	Diameter of cavity piercing	1(0.039) +0.1(0.004)-0	1.5(0.059) +0.1(0.004)-0
t ₁	Embossed tape thickness	0.3(0.012) ±0.1(0.004)	0.4(0.016) ±0.1(0.004)
t ₂	Top tape thickness	0.1(0.004) max	

