

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

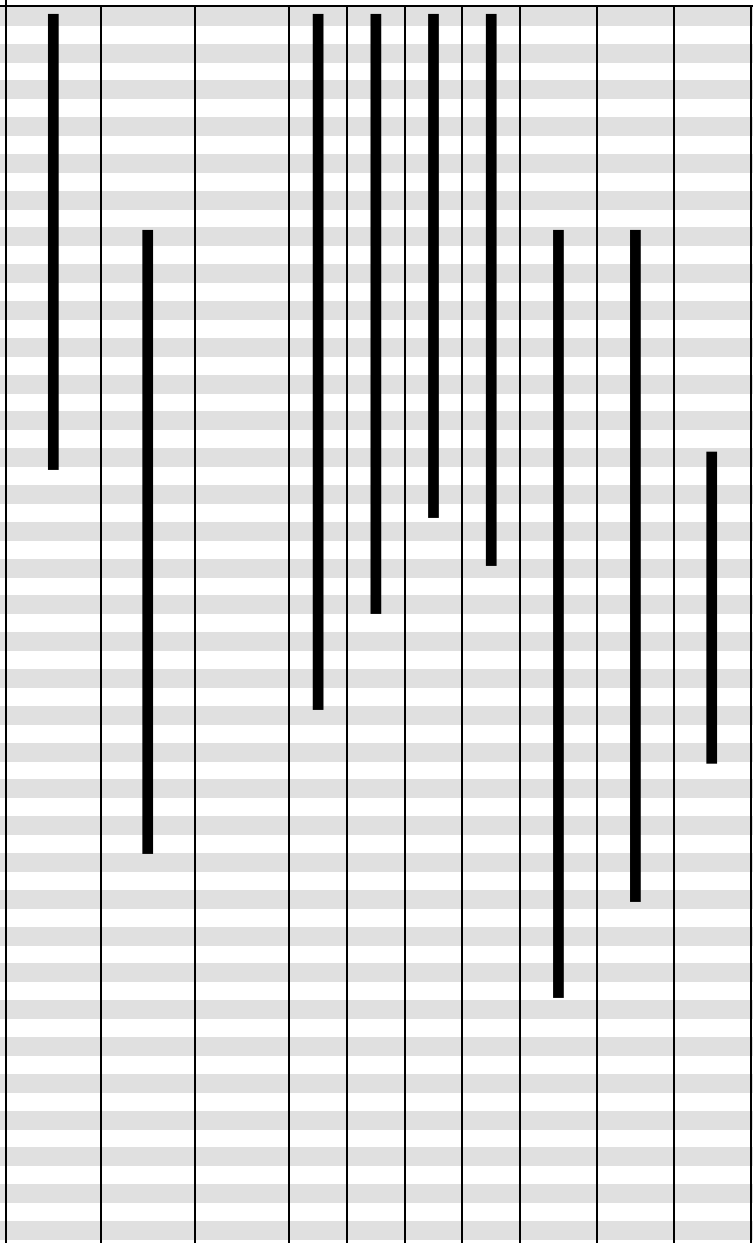
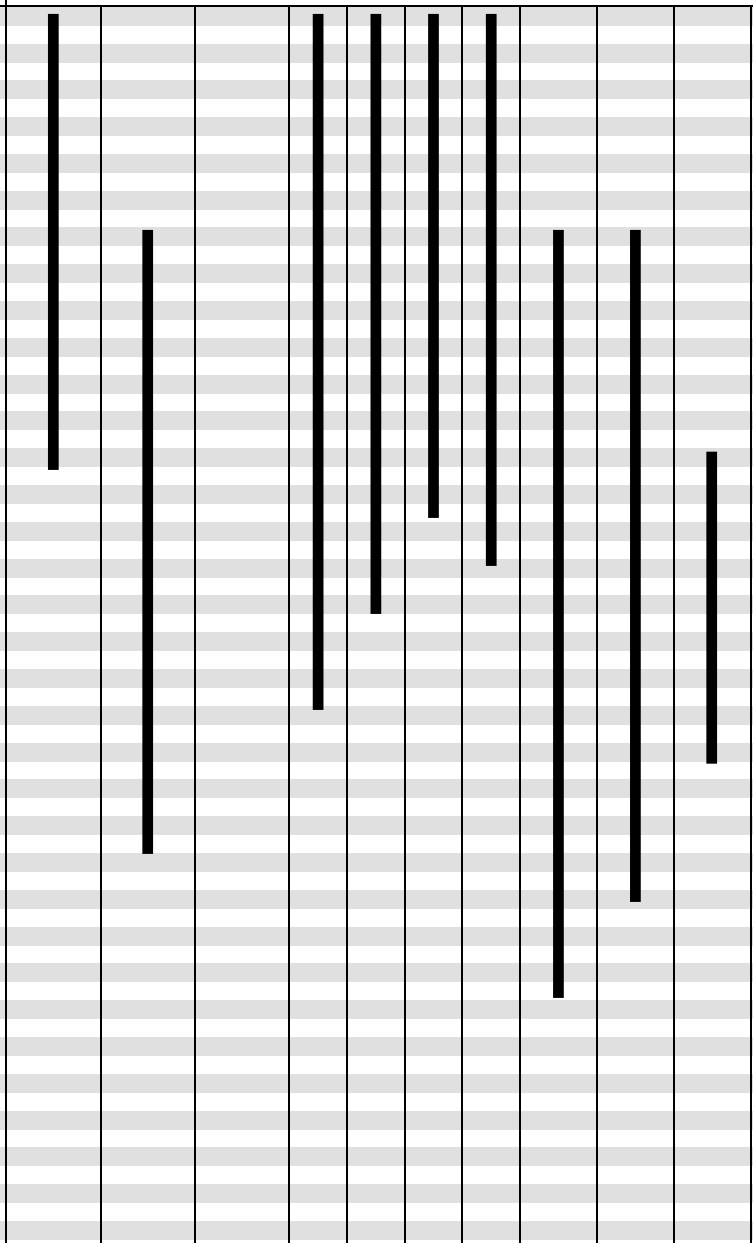
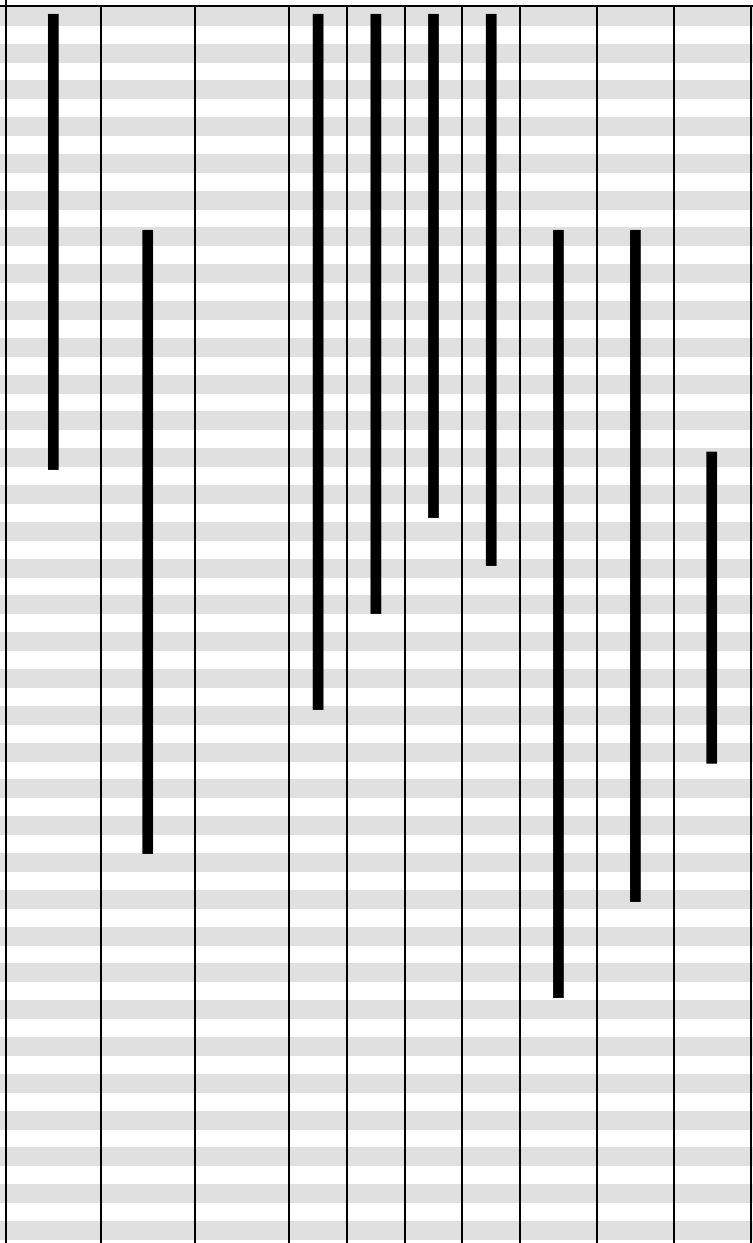
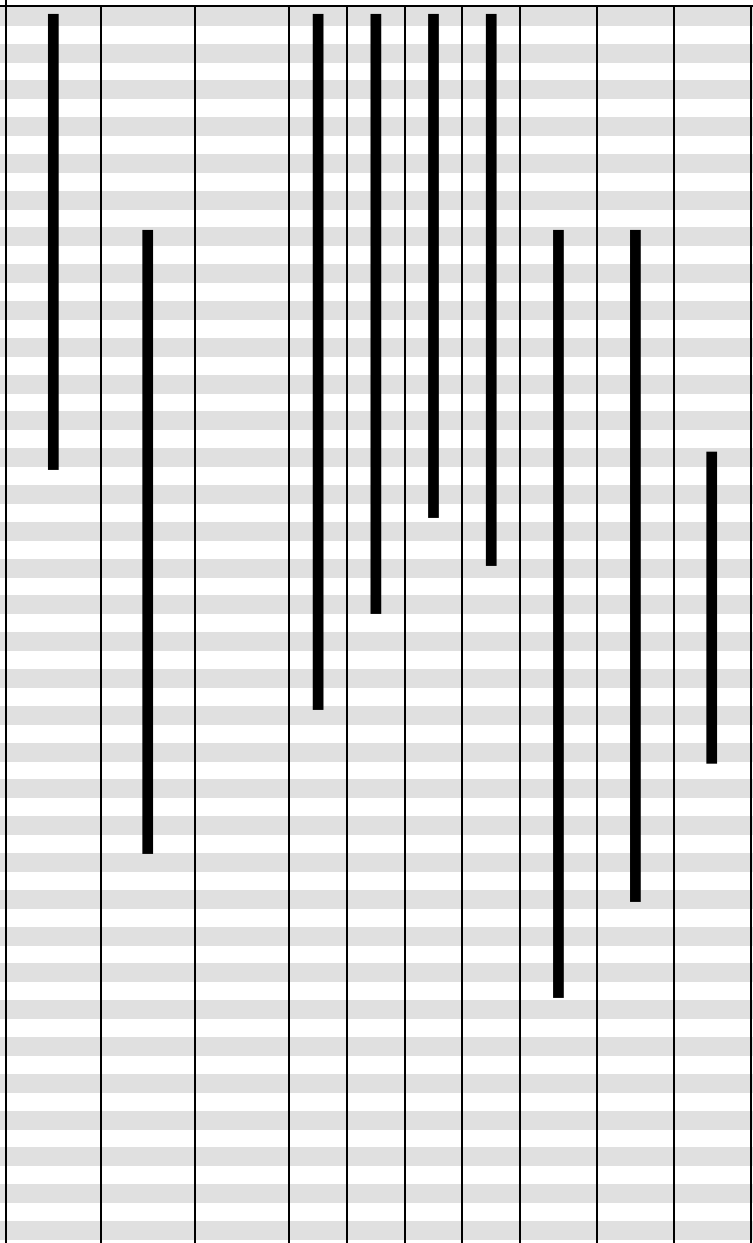
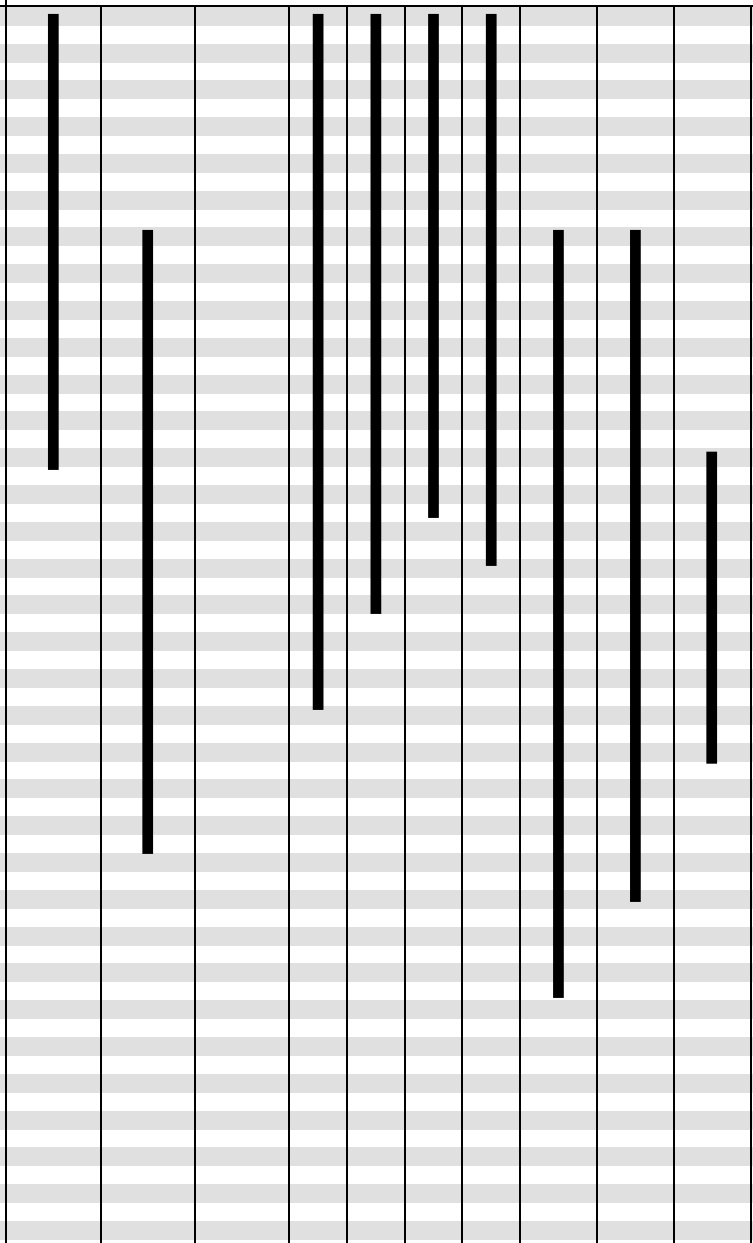
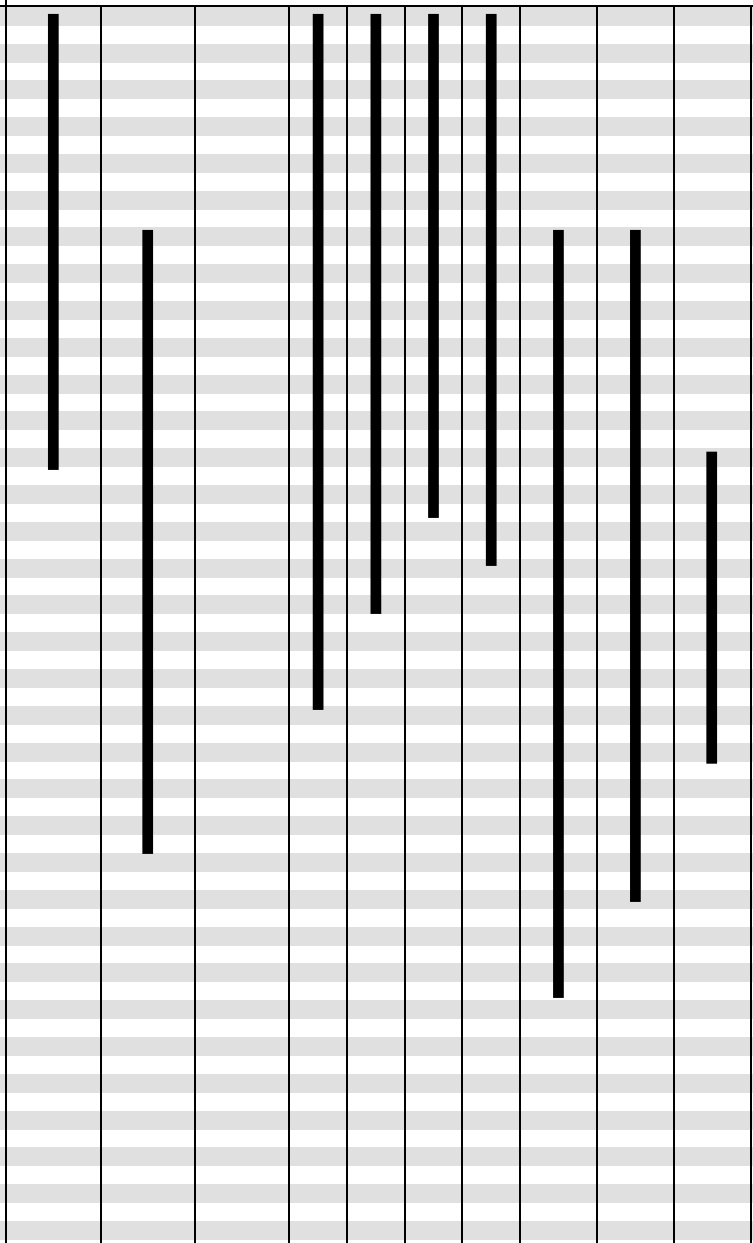
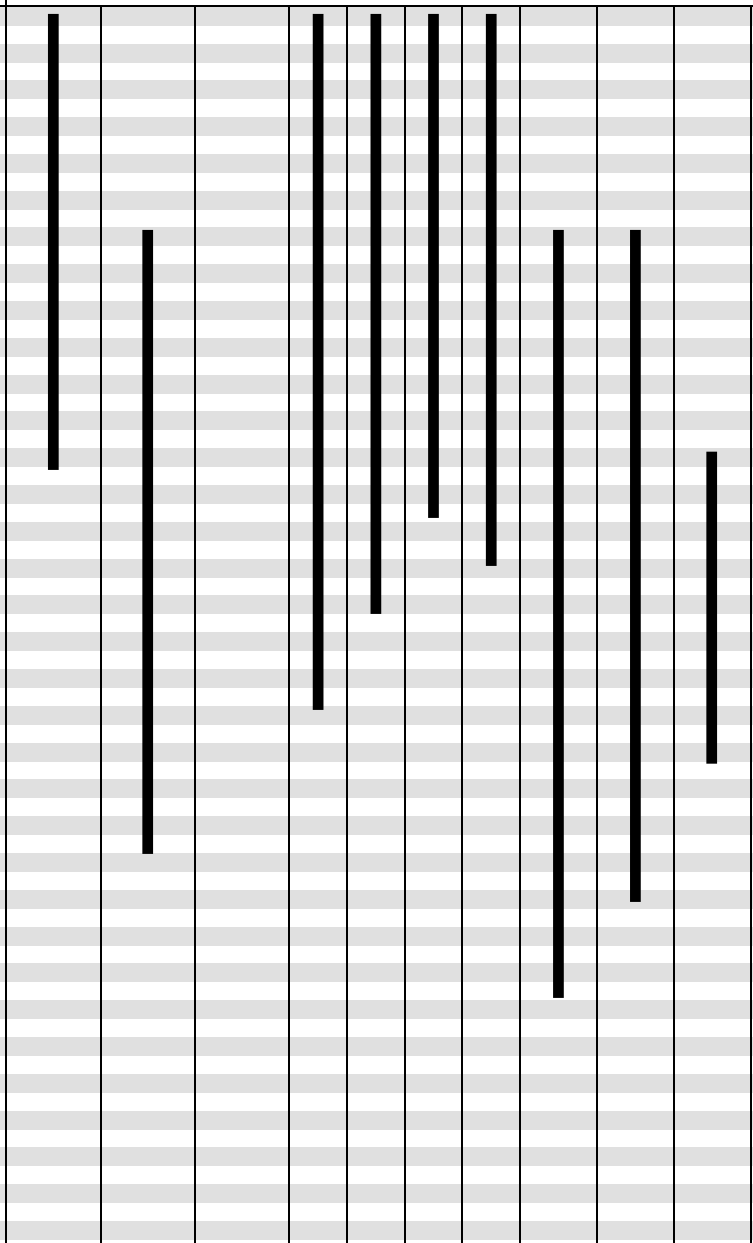
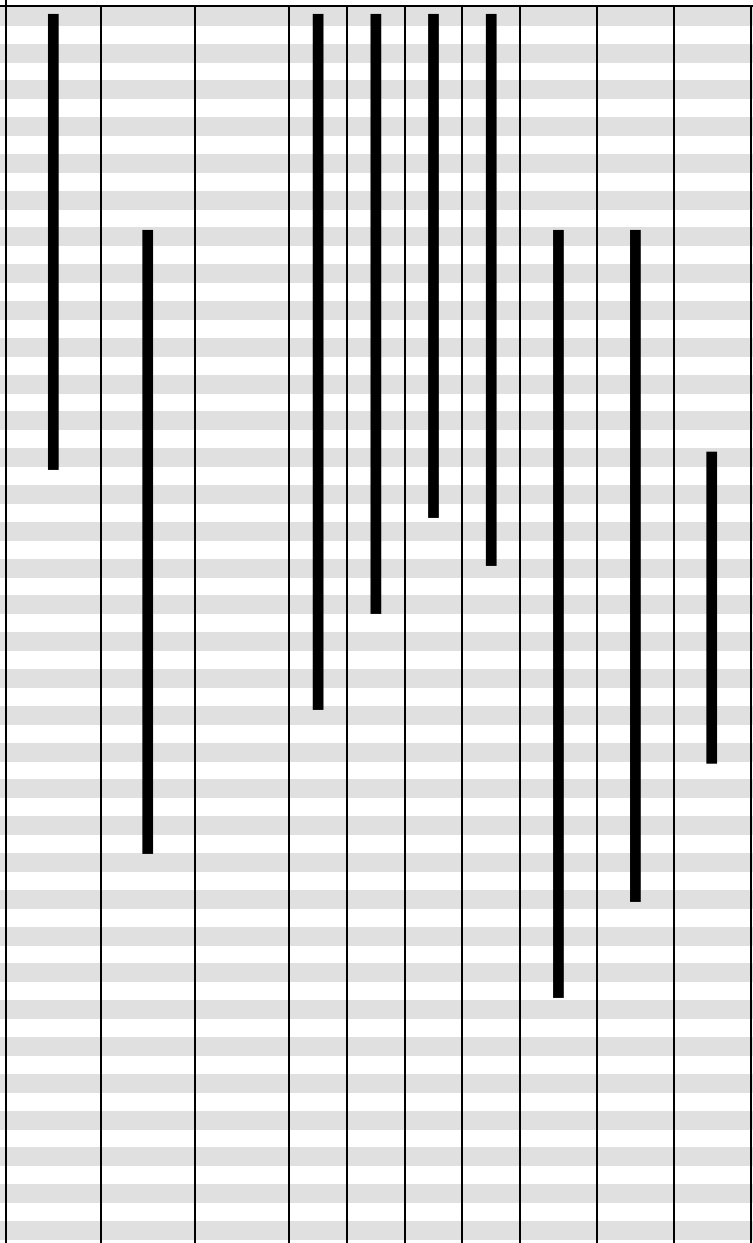
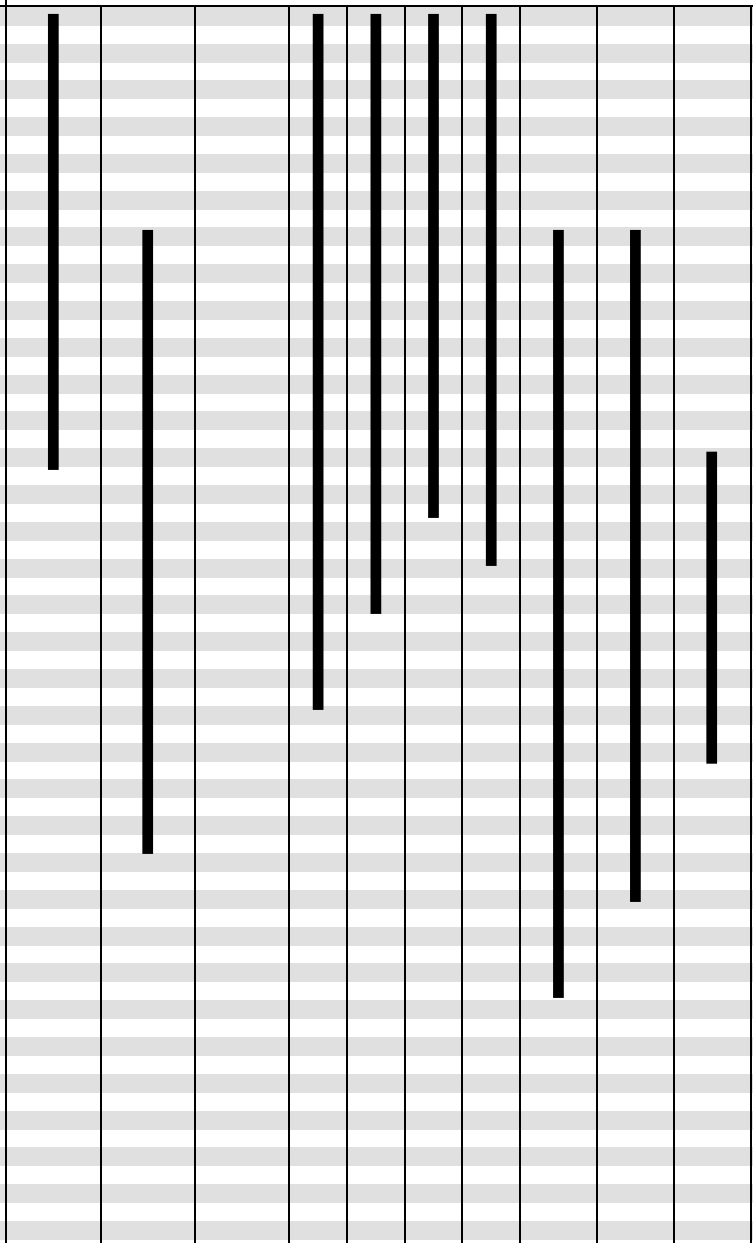
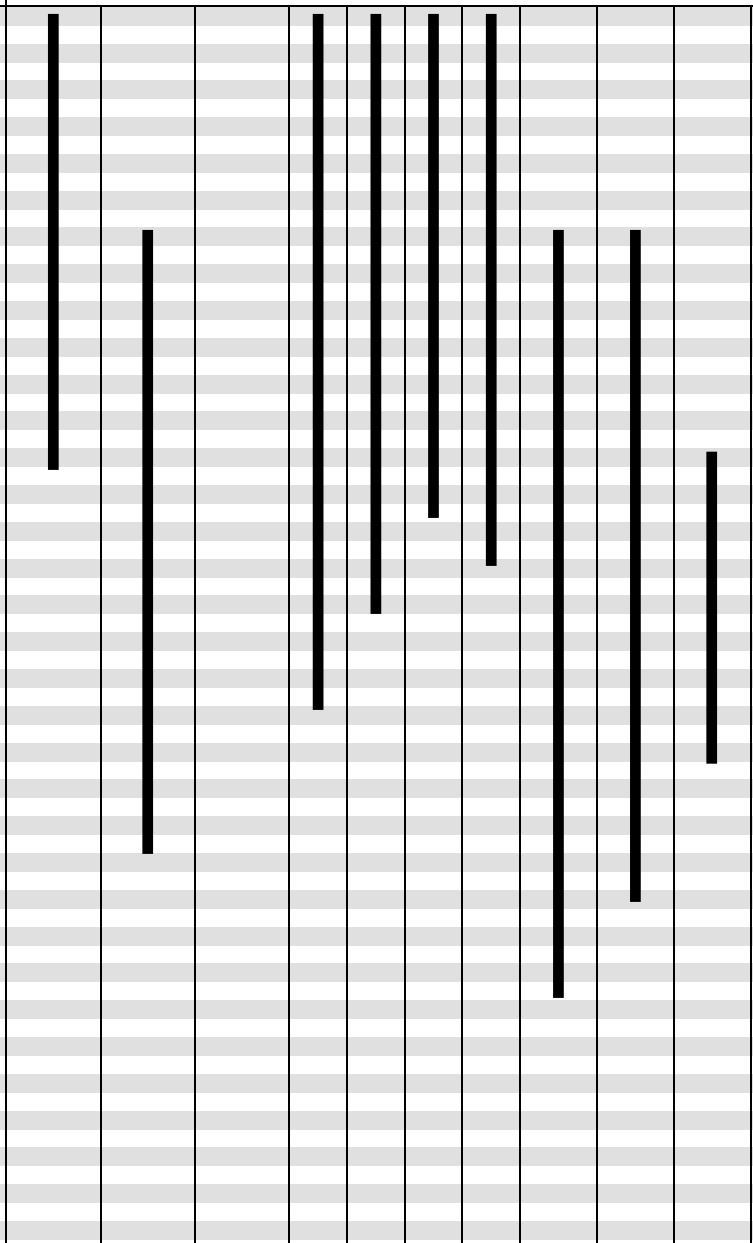
SURFACE MOUNT CHIP CAPACITORS

Ordering Information

Example:	CHV	3640	N	1k0	103	K	X	T
Chip Type								
Type No/Size Ref								Packaging T=178mm(7" reel)
Termination Options F=Silver Palladium N=Nickel Barrier A=High Leach Resistant Silver Palladium							Dielectric Code C=COG, X=X7R, Z=Z5U, Y=Y5V	Capacitance Tolerance Code F=1% G=2% J=5% K=10% M=20% Z=20-80%
Voltage d.c. 500=500V 1k0=1kV 2k0=2kV								
Capacitance Code								



High Voltage Ceramic Chip Capacitors- 0603 & 0805 (250V, 500V, 630V and 1KV)

Chip Size				CHV0603				CHV0805							
Length	mm	1.6±0.2				3.2±0.3									
	Inches	0.063±0.008				0.125±0.012									
Width	mm	0.8±0.2				2.5±0.3									
	Inches	0.031±0.008				0.10±0.012									
Thickness	mm	0.8±0.2				1.8									
	Inches	0.031±0.008				0.07									
Termination Band	mm	Min	Max		Min				Max						
	Inches	0.1 0.004	0.4 0.015		0.25 0.01				0.75 0.03						
Dielectric		COG	X7R	Y5V/Z5U	COG				X7R			Y5V/Z5U			
Rated Voltage		250	250	N/A	250	500	630	1kV	250	500	1kV	N/A			
Capacitance	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														
27	270														
33	330														
39	390														
47	470														
56	560														
68	680														
82	820														
100	101														
120	121														
150	151														
180	181														
220	221														
270	271														
330	331														
390	391														
470	471														
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														
6.8	682														
8.2	822														
10	103														
12	123														
15	153														
18	183														
22	223														
27	273														
33	333														
39	393														
47	473														
56	563														
68	683														
82	823														
100	104														
120	124														
150	154														
180	184														
220	224														
330	334														
390	394														
470	474														

High Voltage Ceramic Chip Capacitors- 1808 & 1825 (250V, 500V and 1KV)

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High Voltage Ceramic Chip Capacitors- 1808 & 1825 (2KV, 3KV, 4KV & 5KV)

[illegible]

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		Min	Max	
	mm Inches	0.25 0.01	0.75 0.03		0.25 0.01	0.75 0.03		0.25 0.01	0.75 0.03		0.25 0.01	0.75 0.03		0.25 0.01	0.75 0.03		0.5 0.02	1.5 0.06		0.5 0.02	1.5 0.06	
Dielectric		COG	X7R	Z5U	COG	X7R	Z5U	COG	X7R	Z5U	COG	X7R	Z5U	COG	X7R	Z5U	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																					
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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																					
2.7	275																					
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 (1KV & 2KV)

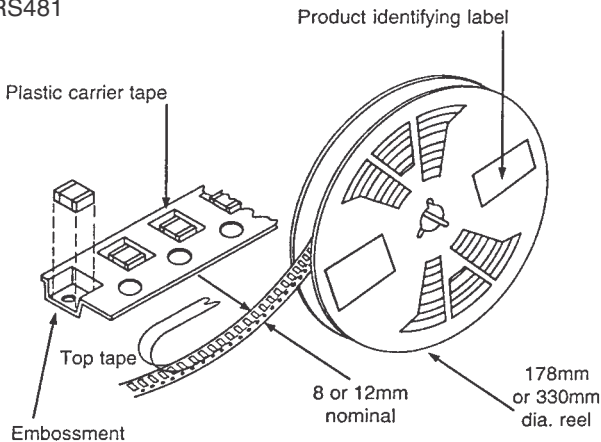
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High Voltage Ceramic Chip Capacitors- COG & X7R (3kV, 4kV and 5kV)

		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	2.5		2.5		2.5		2.5		2.5		2.5													
	Inches	0.1		0.1		0.1		0.1		0.1		0.1													
Termination Band		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max												
	mm Inches	0.25 0.01	0.75 0.03	0.25 0.01	0.75 0.03	0.25 0.01	0.75 0.03	0.5 0.02	1.5 0.06	0.5 0.02	1.5 0.06	0.5 0.02	1.5 0.06												
Dielectric		COG		X7R		COG		X7R		COG		X7R													
Voltage		3kV	4kV	3kV	4kV	3kV	4kV	3kV	4kV	3kV	4kV	3kV	4kV												
Cap Range	Code																								
10pF	100																								
12	120																								
15	150																								
18	180																								
22	220																								
27	270																								
33	330																								
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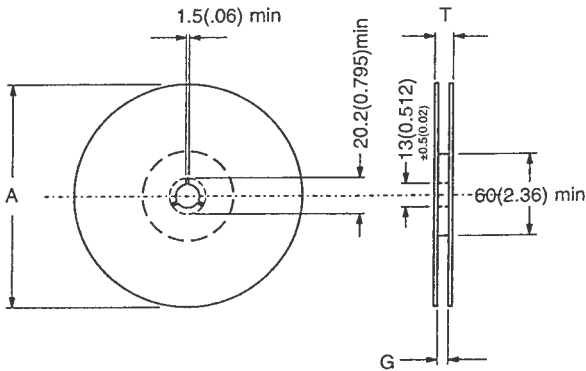
Surface Mount Chip Capacitors: Tape and Reel packaging information

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



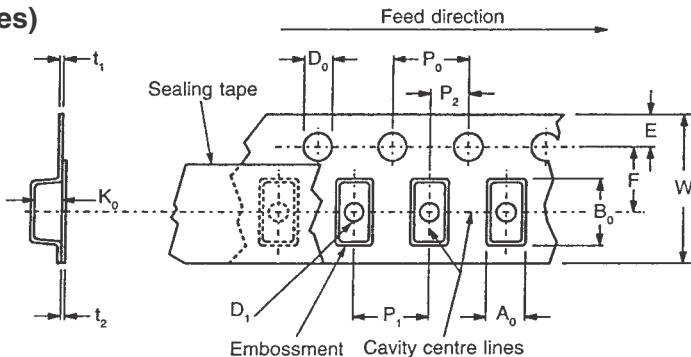
Peel force
The peel force of the top sealing tape is between 0.2 and 1.0 Newton at 1800. The breaking force of the carrier and sealing tape in the direction of unreeling is greater than 10 Newtons.

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

Tape dimensions mm (inches)



Symbol	Description	8mm tape	12mm tape
A ₀ B ₀ K ₀	Width of cavity Length of cavity Depth of cavity	Dependent on chip size to minimize rotation	
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	

