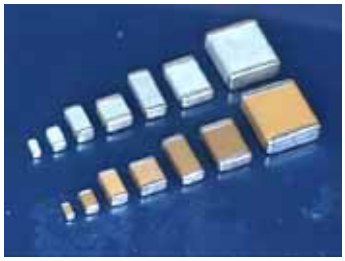
Multilayer Ceramic Chip Capacitors
[High Voltage Capacitor]
HVC Series – Middle Voltage (100V-1KV)



Voltage ratings from 100V to 1KV and sizes from 0603 to 2225.

◆ Features

- ❑ Special internal electrode design offers the highest voltage rating
- ❑ Surface mount suited for wave and reflow soldering
- ❑ High reliability
- ❑ RoHS compliant

◆ Applications

- ❑ Suitable for LAN/WLAN interface, Back-Lighting Inverter ,DC-DC Converters, Ballast, Modems & Power Supplies.

◆ Summary of Specification

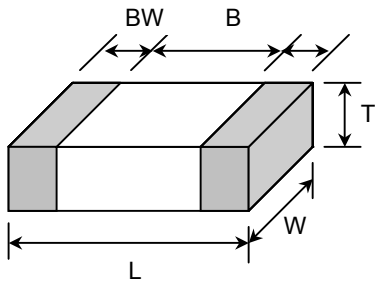
Operation Temperature	-55~+125 °C
Rated Voltage	100Vdc to 1000Vdc
Temperature Coefficient	NPO : ≤ ± 30ppm/ °C , -55~+125 °C (EIA Class Ⅰ)
	X7R : ≤ ± 15% , -55~+125 °C (EIA Class Ⅱ)
Capacitance Range	NPO :2pF to 100nF ; X7R :150pF to 2.2uF
Dissipation Factor :	NPO : Q≧1000 ; X7R : D.F.≦2.5%
Insulation Resistance	10GΩ or 500/C Ω whichever is smaller
Aging	NPO:0% ; X7R: 2.5 % per decade of time
Dielectric Strength	200V ≦ V ＜ 500V : 200% Rated Voltage
	500V ≦ V ＜ 1000V : 150% Rated Voltage
	1000V≦ V : 120% Rated Voltage

◆ How To Order

C	1210	X	103	K	102	T	X

Product Code	Chip Size	Dielectric	Capacitance Unit : pF	Tolerance	Rated Voltage	Packaging	Special Requirement
C: MLCC (Multilayer Ceramic Chip of Capacitor)	Ex.: 1206 : 3.2×1.6mm 1808 : 4.6×2.0mm 1812: 4.6×3.2mm	Ex.: N: NPO X: X7R	Ex.: 2R0:2.0pF 100:10×10^0 471:47×10^1 102:10×10^2	Ex.: C:+/-0.25pF D:+/-0.50pF J :+/- 5% K :+/-10% M:+/-20%	Ex.: 251:250Vdc 631:630Vdc 102:1000Vdc	T: Taping &Reel B: Bulk	Ex.: O: Arc Prevention Coating X: Cushion Termination (Super Term)

◆ Dimension



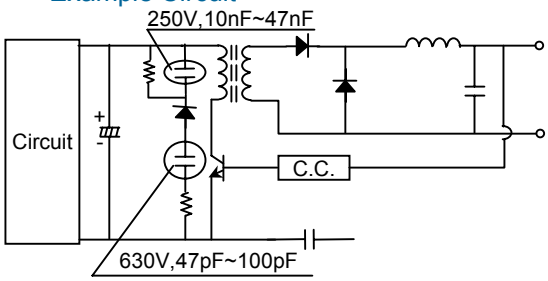
Unit : mm [inches]

TYPE	L	W	T (max)	B (min)	BW (min)
0603	1.60±0.1 [.063±.004]	0.80±0.1 [.031 ±.004]	0.90 [.039]	0.40 [.016]	0.15 [.006]
0805	2.00±0.20 [.126±.012]	1.25±0.20 [.126±.012]	1.45 [.057]	0.70 [.059]	0.20 [.012]
1206	3.20±0.30 [.126±.012]	1.60±0.20 [.126±.012]	1.80 [.071]	1.50 [.059]	0.30 [.012]
1210	3.20±0.30 [.126±.012]	2.50±0.20 [.126±.012]	2.60 [.102]	1.60 [.059]	0.30 [.012]
1808	4.60±0.30 [.181±.012]	2.00±0.20 [.079±.008]	2.20 [.087]	2.50 [.098]	0.30 [.012]
1812	4.60±0.30 [.181±.012]	3.20±0.30 [.126±.012]	3.00 [.118]	2.50 [.098]	0.30 [.012]
1825	4.6±0.30 [.220±.012]	6.35±0.40 [.250±.016]	3.00 [.118]	2.50 [.098]	0.30 [.012]
2220	5.7±0.40 [.220±.016]	5.00±0.40 [.197±.016]	3.00 [.118]	3.50 [.137]	0.30 [.012]
2225	5.7±0.40 [.220±.016]	6.35±0.40 [.250±.016]	3.00 [.118]	3.50 [.137]	0.30 [.012]

◆ Application

Example Circuit

DC-DC Converter



◆ Capacitance Range

Capacitance Range (pF)

Temperature Characteristic	Size	Rated Voltage	2R0	3R3	3R9	5R0	8R2	100	120	150	180	220	270	330	390	470	560	680	820	101	121	151	181	221	271	331	391	471	561	681	821	102	122	152	182	222	272	332	392	472	562	682	822	103	123	153	183	223	273	333	393	473	563	683	104
NPO	0603	100V				B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B																												
		200V	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B																																		
	0805	100V						B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B																									
		200V	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C																										
		250V	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C																										
		500V	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C																										
	1206	200V	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	D/E	D/E	D/E	D/E	D/E	E	E	E	E	E														
		250V								C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D	D	D/E	D/E	D/E	D/E	D/E	E	E	E	E	E														
		500V								C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D	D	D/E	D/E	D/E	D	D																			
		1KV						D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	E	E	E	E	E	E	E	E	E																									
	1210	200V						B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	D	D	D	D	D	D/E	D/E	E	E	E	E	E	E											
		250V														C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D	E	E	F	D/F	D/F	F	F	F	F	F	F											
		500V														C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D	D	E	E	F	F	F																
	1808	1KV	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	E	E	E	E	E	E	E	E	F	E	E	E	E	F																			
	1812	1KV																D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	F	F	E/F	E/F	E/F	F	F	F	G													
	2220	1KV																		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	F	F	E/F	E/F	E/F	F	F	F	F	G	G								
	1825	250V																		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	F	E/F	E/F	E/F	E/F	F						
		500V																		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	F	E/F	E/F	E/F	E/F	F	F	G	H	H	H	H
		1KV																		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	F	F	E/F	E/F	E/F	E/F	F	F											
	2225	250V																		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	F	E/F	E/F	E/F	E/F	F						
		500V																		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	F	E/F										
		1KV																		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	E	E	F	F	E/F	E/F	F	F										

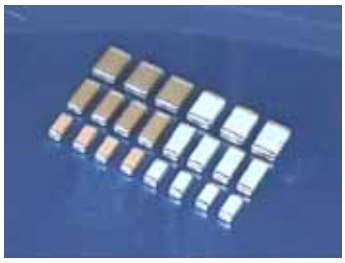
Symbol Code	S	O	A	B	C	D	E	F	G	H
Thickness(mm)	0.3±0.03	0.5±0.05	0.6±0.1	0.8±0.1	1.0±0.1	1.25±0.15	1.6±0.2	2.0±0.2	2.4±0.2	2.8±0.2

◆ Capacitance Range

Temperature Characteristic	Size	Rated Voltage	Capacitance Range (pF)																																															
			151	181	221	271	331	391	471	561	681	821	102	122	152	182	222	272	332	392	472	562	682	822	103	123	153	183	223	273	333	393	473	563	683	823	104	124	154	184	224	274	334	394	474	564	684	824	105	155	225
X7R	0603	100V	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B																							
	0805	100V							B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C														
		200V							B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	B/C	D	D	D	D																		
		250V							C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D	D	D																		
		500V							C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C																						
	1206	100V		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B/C	B/C	B/C	B/C														
		200V											C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D	D														
		250V		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D	D														
		500V		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D																	
		630V																		D	D	D	D	D	D	D	D	D	D	E	E	E	E																		
		1KV			D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D																										
	1210	100V																												C	C	C	C	C	C	C	C														
		200V																							D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D										
		250V																							D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D										
		500V																											D	D	E	E	E	F	F																
		1KV																							D	D	D	D	D	E	F	F																			
	1808	500V																D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	F																
		1KV																D	D	D	D	E	E	E	F	F	F	F																							
	1812	200V																							D	D	D	D	D	D	D	D	D/E	D/E	D/E	D/E	D/E	D/E	D/E	D/E	D/E	D/E	D/E	D/E	E	E	E	E	E/F		
		250V																							D	D	D	D	D	D	D	D	D/E	D/E	D/E	D/E	D/E	D/E	D/E	D/E	D/E	D/E	D/E	D/E	E	E	E	F	G		
		500V																							D	D	D	D	D	D	D	D	E	E	E	E	E	F	G	H	H										
		1KV			D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	E	E	E	E	F	F	F	F	F	G	G	H	H														
	2220	250V											D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	E	E	E	E	E	E	E	E	E	E	F	F	G
		500V											D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	E	E	E	E	E	F	F	F	F	G	G	H						
		1KV											D	D	D	D	D	D	D	D	D	D	D	D	E	E	E	E	E	E	E	E	F	F	F	F	F	G	G	H	H										
	1825	250V																							D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	E	E	E		
		500V																							D	E	E	E	E	E	E	E	E	E	F	F	F	F	F	F	G										
		1KV																							D	E	E	E	E	E	E	F	F	F	F	F	G														
	2225	250V																							D	D	D	D	D	D	D	D	D	D	D	D	D	E	E	E	E	E	E	E	E	E	E	E	F	F	G
		500V																							D	D	D	D	D	D	E	E	E	E	E	E	E	F	F	F	F	F	F	F	G						
		1KV																							D	E	E	E	E	E	E	E	E	F	F	F	F	F	F	G	H										

Symbol Code	S	O	A	B	C	D	E	F	G	H
Thickness(mm)	0.3±0.03	0.5±0.05	0.6±0.1	0.8±0.1	1.0±0.1	1.25±0.15	1.6±0.2	2.0±0.2	2.4±0.2	2.8±0.2

■ ***Other dimensions, capacitance values and voltages rating are available. Please contact HEC.***



Multilayer Ceramic Chip Capacitors
[High Voltage Capacitor]
HVC Series – High Voltage Capacitors (2KV)

This series is offered in C0G(NPO) and X7R temperature characteristic in sizes from 1206 to 2220.

◆ Features

- ❑ Standard for telecommunication devices (IEEE802.3) in LAN interface.
- ❑ Available with proprietary coating to prevent arcing and pass Hi-Pot test
- ❑ Surface mount suited for wave and reflow soldering
- ❑ Special internal electrode design offers the highest voltage rating
- ❑ RoHS compliant

◆ Applications

- ❑ Suitable for telecommunication devices in LAN interface
- ❑ Ballast capacitor for back light inverter applications

◆ Summary of Specification

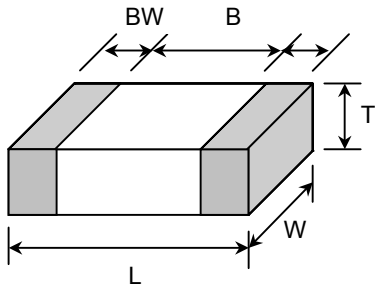
Operation Temperature	-55~+125 °C
Rated Voltage	2KVdc
Temperature Coefficient	NPO : ≤ ± 30ppm/ °C , -55~+125 °C (EIA Class Ⅰ)
	X7R : ≤ ± 15% , -55~+125 °C (EIA Class Ⅱ)
Capacitance Range	NPO :2pF to 470pF ; X7R :150pF to 10nF
Dissipation Factor :	NPO : Q≧1000 ; X7R : D.F.≦2.5%
Insulation Resistance	10GΩ or 500/C Ω whichever is smaller
Aging	NPO:0% ; X7R: 2.5 % per decade of time
Dielectric Strength	120% Rated Voltage

◆ How To Order

C	1808	X	102	K	202	T	O

Product Code	Chip Size	Dielectric	Capacitance Unit : pF	Tolerance	Rated Voltage	Packaging	Special Requirement
C: MLCC (Multilayer Ceramic Chip of Capacitor)	Ex.: 1206 : 3.2×1.6mm 1808 : 4.6×2.0mm 1812: 4.6×3.2mm	Ex.: N: NPO X: X7R	Ex.: 2R0:2.0pF 100:10×10^0 471:47×10^1 102:10×10^2	Ex.: C:+/-0.25pF D:+/-0.50pF J :+/- 5% K :+/-10% M:+/-20%	Ex.: 202:2000Vdc	T: Taping &Reel B: Bulk	Ex.: O: Arc Prevention Coating X: Cushion Termination (Super Term)

◆ Dimension



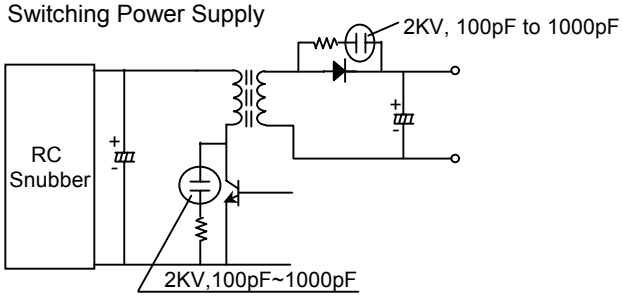
Unit : mm [inches]

TYPE	L	W	T (max)	B (min)	BW (min)
1206	3.20±0.30 [.126±.012]	1.60±0.20 [.126±.012]	1.80 [.071]	1.50 [.059]	0.30 [.012]
1808	4.60±0.30 [.181±.012]	2.00±0.20 [.079±.008]	2.20 [.087]	2.50 [.098]	0.30 [.012]
1812	4.60±0.30 [.181±.012]	3.20±0.30 [.126±.012]	3.00 [.118]	2.50 [.098]	0.30 [.012]
2220	5.7±0.40 [.220±.016]	5.00±0.40 [.197±.016]	3.00 [.118]	3.50 [.137]	0.30 [.012]

◆ Application

Example Circuit

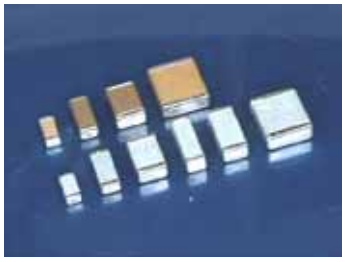
Switching Power Supply



◆ Capacitance Range

| Temperature Characteristic | Size | Rated Voltage | Capacitance Range (pF) | | |

Multilayer Ceramic Chip Capacitors
[High Voltage Capacitor]
HVC Series – Ultra High Voltage (3KV-5KV)



Capacitors with voltage ratings or 3KV to 5KV are ideally suited for LCD back light inverter circuits.

◆ Features

- ❑ Super term termination prevents cracking solution mechanical stress
- ❑ Special internal electrode design offers the highest voltage rating
- ❑ Surface mount suited for wave and reflow soldering
- ❑ High reliability
- ❑ RoHS compliant

◆ Applications

- ❑ Suitable for back-lighting inverter ,DC-DC converters, modems and power supplies

◆ Summary of Specification

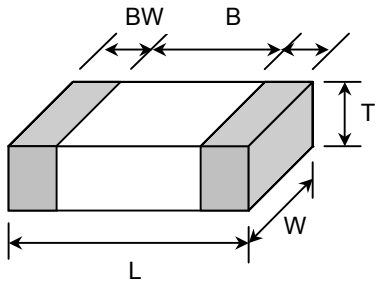
Operation Temperature	-55~+125 °C
Rated Voltage	3KVdc to 5KVdc
Temperature Coefficient	NPO : ≤ ± 30ppm/ °C , -55~+125 °C (EIA Class Ⅰ)
	X7R : ≤ ± 15% , -55~+125 °C (EIA Class Ⅱ)
Capacitance Range	NPO :2pF to 1.0nF ; X7R :150pF to 2.7nF
Dissipation Factor :	NPO : Q≧1000 ; X7R : D.F.≦2.5%
Insulation Resistance	10GΩ or 500/C Ω whichever is smaller
Aging	NPO:0% ; X7R: 2.5 % per decade of time
Dielectric Strength	120% Rated Voltage

◆ How To Order

C	1808	N	270	K	302	T	X

Product Code	Chip Size	Dielectric	Capacitance Unit : pF	Tolerance	Rated Voltage	Packaging	Special Requirement
C: MLCC (Multilayer Ceramic Chip of Capacitor)	Ex.: 1206 : 3.2×1.6mm 1808 : 4.6×2.0mm 1812: 4.6×3.2mm	Ex.: N: NPO X: X7R	Ex.: 2R0:2.0pF 100:10×10^0 471:47×10^1 102:10×10^2	Ex.: C:+/-0.25pF D:+/-0.50pF J :+/- 5% K :+/-10% M:+/-20%	Ex.: 302:3000Vdc 502:5000Vdc	T: Taping &Reel B: Bulk	Ex.: O: Arc Prevention Coating X: Cushion Termination (Super Term)

◆ Dimension



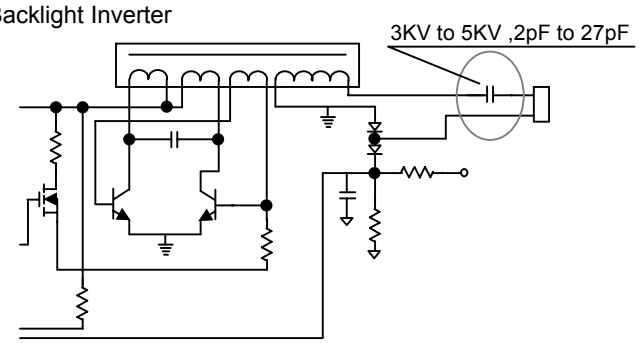
Unit : mm [inches]

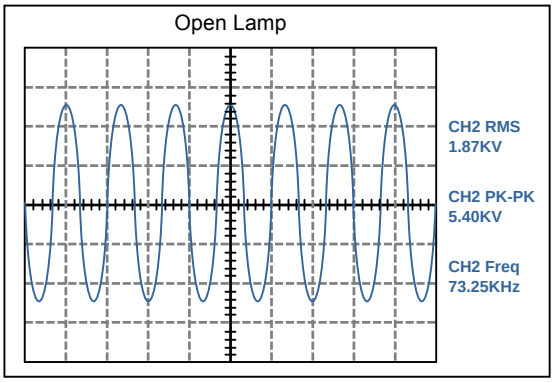
TYPE	L	W	T (max)	B (min)	BW (min)
1206	3.20±0.30 [.126±.012]	1.60±0.20 [.126±.012]	1.80 [.071]	1.50 [.059]	0.30 [.012]
1210	3.20±0.30 [.126±.012]	2.50±0.20 [.126±.012]	2.60 [.102]	1.60 [.059]	0.30 [.012]
1808	4.60±0.30 [.181±.012]	2.00±0.20 [.079±.008]	2.20 [.087]	2.50 [.098]	0.30 [.012]
1812	4.60±0.30 [.181±.012]	3.20±0.30 [.126±.012]	3.00 [.118]	2.50 [.098]	0.30 [.012]
2208	5.7±0.40 [.220±.016]	2.00±0.20 [.079±.008]	2.20 [.087]	3.50 [.137]	0.30 [.012]
2211	5.7±0.40 [.220±.016]	2.80±0.40 [.110±.016]	3.00 [.118]	3.50 [.137]	0.30 [.012]
2220	5.7±0.40 [.220±.016]	5.00±0.40 [.197±.016]	3.00 [.118]	3.50 [.137]	0.30 [.012]

◆ Application

Example Circuit

Backlight Inverter





◆ Capacitance Range

| Temperature Characteristic | Size | Rated Voltage | Capacitance Range (pF) | | |