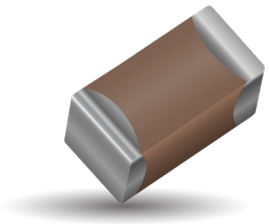
High Voltage MLC Chips

Tin/Lead Termination "B" - 600V to 5000V Applications



NEW 630V RANGE

KYOCERA AVX will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the KYOCERA AVX Catalog Part Number. This fulfills KYOCERA AVX's commitment to providing a full range of products to our customers. KYOCERA AVX has provided in the following pages, a full range of values that we are offering in this "B" termination.

Larger physical sizes than normally encountered chips are used to make high voltage MLC chip product. Special precautions must be taken in applying these chips in surface mount assemblies. The temperature gradient during heating or cooling cycles should not exceed 4°C per second.

The preheat temperature must be within 50°C of the peak temperature reached by the ceramic bodies through the soldering process. Chip sizes 1210 and larger should be reflow soldered only. Capacitors may require protective surface coating to prevent external arcing.

For 1825, 2225 and 3640 sizes, KYOCERA AVX offers leaded version in either thru-hole or SMT configurations (for details see section on high voltage leaded MLC chips).

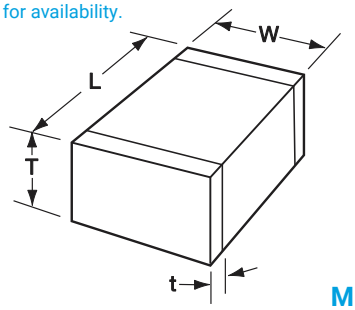
HOW TO ORDER

LD08	A	A	271	K	A	B	2	A
Style	**Voltage**	**Temperature Coefficient**	**Capacitance Code**	**Capacitance Tolerance**	**Test Level**	**Termination***	**Packaging**	**Special Code**
LD05 - 0805	600V/630V = C	C0G = A	(2 significant digits	C0G: J = ±5%	A = Standard	B = 5% Min Pb	2 = 7" Reel**	A = Standard
LD06 - 1206	1000V = A	X7R = C	+ no. of zeros)	K = ±10%	4 = Automotive*	X = FLEXITERM® 5% min. Pb*	4 = 13" Reel**	
LD10 - 1210	1500V = S		Examples:	M = ±20%			6 = Tray (3640 Style)	
LD08 - 1808	2000V = G		10 pF = 100	X7R: K = ±10%				
LD12 - 1812	2500V = W		100 pF = 101	M = ±20%				
LD13 - 1825	3000V = H		1,000 pF = 102	Z = +80%, -20%				
LD20 - 2220	4000V = J		22,000 pF = 223					
LD14 - 2225	5000V = K		220,000 pF = 224					
LD40 - 3640 ***			1 µF =105					

Notes: Capacitors with X7R dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations. Contact factory for availability of Termination and Tolerance options for Specific Part Numbers.

NOT RoHS Compliant

* FLEXITERM is not available in the LD40 Style
** The LD40 Style is not available on Reels.
*** KYOCERA AVX offers nonstandard chip sizes. Contact factory for details..
* Not all values are supported in Automotive grade. Please contact factory for availability.



DIMENSIONS

MILLIMETERS (INCHES)

SIZE	LD05 (0805)	LD06 (1206)	LD10* (1210)	LD08* (1808)	LD12* (1812)	LD13* (1825)	LD20* (2220)	LD14* (2225)	LD40* (3640)
(L) Length	2.10 ± 0.20 (0.083 ± 0.008)	3.30 ± 0.30 (0.130 ± 0.012)	3.30 ± 0.40 (0.130 ± 0.016)	4.60 ± 0.50 (0.181 ± 0.020)	4.60 ± 0.50 (0.181 ± 0.020)	4.60 ± 0.50 (0.181 ± 0.020)	5.70 ± 0.50 (0.224 ± 0.020)	5.70 ± 0.50 (0.224 ± 0.020)	9.14 ± 0.25 (0.360 ± 0.010)
(W) Width	1.25 ± 0.20 (0.049 ± 0.008)	1.60 ± 0.20 (0.063 ± 0.008)	2.50 ± 0.30 (0.098 ± 0.012)	2.00 ± 0.20 (0.079 ± 0.008)	3.20 ± 0.30 (0.126 ± 0.012)	6.30 ± 0.40 (0.248 ± 0.016)	5.00 ± 0.40 (0.197 ± 0.016)	6.30 ± 0.40 (0.248 ± 0.016)	10.2 ± 0.25 (0.400 ± 0.010)
(t) min. terminal max.	0.50 ± 0.20 (0.020 ± 0.008)	0.60 ± 0.20 (0.024 ± 0.008)	0.75 ± 0.35 (0.030 ± 0.014)	0.75 ± 0.35 (0.030 ± 0.014)	0.75 ± 0.35 (0.030 ± 0.014)	0.75 ± 0.35 (0.030 ± 0.014)	0.85 ± 0.35 (0.033 ± 0.014)	0.85 ± 0.35 (0.033 ± 0.014)	0.76 (0.030) 1.52 (0.060)

*Reflow Soldering Only

Performance of ceramic capacitors can be simulated by using the online SpiMLCC software program - http://spicat.avx.com/mlcc
Custom values, ratings and configurations are also available.

High Voltage MLC Chips

Tin/Lead Termination "B" - 600V to 5000V Applications

NP0 (C0G) Dielectric

Performance Characteristics

Capacitance Range	10 pF to 0.047 µF (25°C, 1.0 ±0.2 Vrms at 1kHz, for ≤ 1000 pF use 1 MHz)
Capacitance Tolerances	±5%, ±10%, ±20%
Dissipation Factor	0.1% max. (+25°C, 1.0 ±0.2 Vrms, 1kHz, for ≤ 1000 pF use 1 MHz)
Operating Temperature Range	-55°C to +125°C
Temperature Characteristic	0 ±30 ppm/°C (0 VDC)
Voltage Ratings	600, 630, 1000, 1500, 2000, 2500, 3000, 4000 & 5000 VDC (+125°C)
Insulation Resistance (+25°C, at 500 VDC)	100K MΩ min. or 1000 MΩ - µF min., whichever is less
Insulation Resistance (+125°C, at 500 VDC)	10K MΩ min. or 100 MΩ - µF min., whichever is less
Dielectric Strength	Minimum 120% rated voltage for 5 seconds at 50 mA max. current

HIGH VOLTAGE C0G CAPACITANCE VALUES

VOLTAGE		LD05 (0805)	LD06 (1206)	LD10 (1210)	LD08 (1808)	LD12 (1812)	LD13 (1825)	LD20 (2220)	LD14 (2225)	LD40 (3640)
600/630	min.	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF
	max.	330 pF	1200 pF	2700 pF	3300 pF	5600 pF	0.012 µF	0.012 pF	0.018 µF	0.047 µF
1000	min.	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
	max.	180 pF	560 pF	1500 pF	2200 pF	3300 pF	8200 pF	0.010 µF	0.010 µF	0.022 µF
1500	min.	–	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF	100 pF
	max.	–	270 pF	680 pF	820 pF	1800 pF	4700 pF	4700 pF	5600 pF	0.010 µF
2000	min.	–	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF	100 pF
	max.	–	120 pF	270 pF	330 pF	1000 pF	1800 pF	2200 pF	2700 pF	6800 pF
2500	min.	–	–	–	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF
	max.	–	–	–	180 pF	470 pF	1200 pF	1500 pF	1800 pF	3900 pF
3000	min.	–	–	–	10 pF	10 pF	10 pF	10 pF	10 pF	100 pF
	max.	–	–	–	120 pF	330 pF	820 pF	1000 pF	1200 pF	2700 pF
4000	min.	–	–	–	10 pF	10 pF	10 pF	10 pF	10 pF	100 pF
	max.	–	–	–	47 pF	150 pF	330 pF	470 pF	560 pF	1200 pF
5000	min.	–	–	–	–	–	–	10 pF	10 pF	10 pF
	max.	–	–	–	–	–	–	220 pF	270 pF	820 pF

X7R Dielectric

Performance Characteristics

Capacitance Range	10 pF to 0.56 µF (25°C, 1.0 ±0.2 Vrms at 1kHz)
Capacitance Tolerances	±10%; ±20%; +80%, -20%
Dissipation Factor	2.5% max. (+25°C, 1.0 ±0.2 Vrms, 1kHz)
Operating Temperature Range	-55°C to +125°C
Temperature Characteristic	±15% (0 VDC)
Voltage Ratings	600, 630, 1000, 1500, 2000, 2500, 3000, 4000 & 5000 VDC (+125°C)
Insulation Resistance (+25°C, at 500 VDC)	100K MΩ min. or 1000 MΩ - µF min., whichever is less
Insulation Resistance (+125°C, at 500 VDC)	10K MΩ min. or 100 MΩ - µF min., whichever is less
Dielectric Strength	Minimum 120% rated voltage for 5 seconds at 50 mA max. current

HIGH VOLTAGE X7R MAXIMUM CAPACITANCE VALUES

VOLTAGE		0805	1206	1210	1808	1812	1825	2220	2225	3640
600/630	min.	100 pF	1000 pF	1000 pF	1000 pF	1000 pF	0.010 µF	0.010 µF	0.010 µF	0.010 µF
	max.	6800 pF	0.022 µF	0.056 µF	0.068 µF	0.120 µF	0.390 µF	0.270 µF	0.330 µF	0.560 µF
1000	min.	100 pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF	0.010 µF
	max.	1500 pF	6800 pF	0.015 µF	0.018 µF	0.039 µF	0.100 µF	0.120 µF	0.150 µF	0.220 µF
1500	min.	–	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF
	max.	–	2700 pF	5600 pF	6800 pF	0.015 µF	0.056 µF	0.056 pF	0.068 µF	0.100 µF
2000	min.	–	10 pF	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
	max.	–	1500 pF	3300 pF	3300 pF	8200 pF	0.022 µF	0.027 µF	0.033 µF	0.027 µF
2500	min.	–	–	–	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF
	max.	–	–	–	2200 pF	5600 pF	0.015 µF	0.018 µF	0.022 µF	0.022 µF
3000	min.	–	–	–	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF
	max.	–	–	–	1800 pF	3900 pF	0.010 µF	0.012 µF	0.015 µF	0.018 µF
4000	min.	–	–	–	–	–	–	–	–	100 pF
	max.	–	–	–	–	–	–	–	–	6800 pF
5000	min.	–	–	–	–	–	–	–	–	100 pF
	max.	–	–	–	–	–	–	–	–	3300 pF