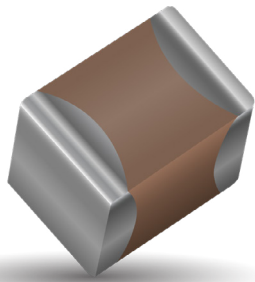


High Voltage MLC Chips, KGM Series

For 600V to 5000V Applications



High value, low leakage and small size are difficult parameters to obtain in capacitors for high voltage systems. KYOCERA AVX special high voltage MLC chip capacitors meet these performance characteristics and are designed for applications such as snubbers in high frequency power converters, resonators in SMPS, and high voltage coupling/dc blocking. These high voltage chip designs exhibit low ESRs at high frequencies.

Larger physical sizes than normally encountered chips are used to make high voltage MLC chip products. 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)

NEW 630V RANGE

HOW TO ORDER

KGM	05	A	CG	1E	101	M	U
Series	Size	Thickness	Dielectric	Voltage	Capacitance Code Code (in pF)	Capacitance Tolerance	Packaging
General Purpose	21 = 0805	See Cap Chart	C0G = CG	2J = 630V	2 Significant Digits	B = ± 0.1pF(<10pF)*	
Tin/Nickel Finish	31 = 1206		X7R = R7	3A = 1000V	+Number of zeros	C = ± 0.25pF(<10pF)*	
	32 = 1210			3N = 1500V	eg. 10µF = 106	D = ± 0.5pF(<10pF)*	
	42 = 1808			3D = 2000V	10nF = 103	G = ±2%*	
	43 = 1812				47pF = 470	F = ±1%*	
						J = ±5%*	
						K = ±10%	
						M = ±20%	
							See Table Below

PACKAGING CODES

Code	EIA (inch)	IEC(mm)	7" Paper	7" Embossed	13" Paper	13" Embossed
21	0805	2012		U		L
31	1206	3216		U		L
32	1210	3225		U		L
42	1808	4520		Y		K
43	1812	4532		V		S
44	1825	4564		V		S
55	2220	5750		V		S
56	2225	5763		V		S
91	3640	9110		N/A		N/A

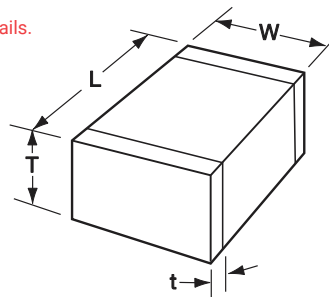
* COG ONLY

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.
- *Terminations with 5% minimum lead (Pb) is available, see pages 100 and 101 for LD style. Leaded terminations are available, see pages 102-106.

**The 3640 Style is not available on Reels.

*** KYOCERA AVX offers nonstandard chip sizes. Contact factory for details.



DIMENSIONS: millimeters (inches)

SIZE	0805	1206	1210*	1808*	1812*	1825*	2220*	2225*	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) terminal min. 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



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.kyocera-avx.com/disclaimer/ by reference and should be reviewed in full before placing any order.

High Voltage MLC Chips, KGM Series

For 630V to 5000V Applications

NPO (C0G) DIELECTRIC – PERFORMANCE CHARACTERISTICS

Capacitance Range	10 pF to 0.100 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

NPO (C0G) CAPACITANCE RANGE

Case Size	0805		1206				1210					1808					1812						
	Reflow/Wave		Reflow/Wave				Reflow Only					Reflow Only					Reflow Only						
(L) Length	2.10 ± 0.20 (0.085 ± 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)						
W) Width	1.25 ± 0.20 (0.049 ± 0.008)		1.60 ± 0.30/-0.10 (0.063 ± 0.012/-0.004)				2.50 ± 0.30 (0.098 ± 0.012)					2.00 ± 0.20 (0.079 ± 0.008)					3.20 ± 0.30 (0.126 ± 0.012)						
(t) Terminal	0.50 ± 0.20 (0.020 ± 0.008)		0.60 ± 0.20 (0.04 ± 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)						
Voltage (V)	630	1000	630	1000	1500	2000	630	1000	1500	2000	3000	630	1000	1500	2000	3000	4000	630	1000	1500	2000	3000	4000
0R5 Cap (pF) 0.50	C	E																					
1R0 1.0	C	E																					
1R2 1.2	C	E																					
1R5 1.5	C	E	B	B	B	B																	
1R8 1.8	C	E	B	B	B	B																	
2R2 2.2	C	E	B	B	B	B						A	A	A	A	A	A						
2R7 2.7	C	E	B	B	B	B						A	A	A	A	A	A						
3R3 3.3	C	E	B	B	B	B						A	A	A	A	A	A						
3R9 3.9	C	E	B	B	B	B						A	A	A	A	A	A						
4R7 4.7	C	E	B	B	B	B						A	A	A	A	A	A						
5R6 5.6	C	E	B	B	B	B						A	A	A	A	A	A						
6R8 6.8	C	E	B	B	B	B						A	A	A	A	A	A						
8R2 8.2	C	E	B	B	B	B						A	A	A	A	A	A						
100 10	C	E	D	D	B	D	R	R	R	E	J	A	A	A	A	B	A	A	B	A	B	B	E
120 12	C	E	D	D	B	D	R	R	R	E	J	A	A	A	A	B	A	A	B	A	B	B	E
150 15	C	E	D	D	B	D	R	R	R	R	J	A	A	A	A	B	A	A	B	A	B	B	E
180 18	C	E	D	D	B	D	R	R	R	R	J	A	A	A	A	B	A	A	B	A	B	B	E
220 22	C	E	D	D	B	D	R	R	R	R	J	A	A	A	A	B	B	A	B	A	B	B	E
270 27	C	E	D	D	B	D	R	R	R	R	J	A	A	A	A	B	B	A	B	A	B	B	E
330 33	C	E	D	D	D	D	E	E	R	E	J	A	A	A	A	B	C	A	B	A	B	B	E
390 39	C	E	D	D	D	D	E	E	R	E	J	A	A	A	A	B	C	A	B	A	B	B	E
470 47	C	E	D	D	D	D	E	E	E	E	J	A	A	A	A	B	C	A	B	A	B	B	E
560 56	C	A	D	D	D	D	E	E	E	E	J	A	A	A	A	B		B	B	A	B	B	F
680 68	C	A	D	D	D	D	E	E	E	E	J	A	A	A	A	B		B	B	A	B	B	F
820 82	C	A	D	D	D	D	E	E	E	E	J	A	A	A	A	B		B	B	A	B	B	F
101 100	C	E	D	D	D	D	E	E	E	E	J	A	A	A	A	C		B	B	A	B	B	F
121 120	E	E	D	D	A	A	E	E	E	E	J	A	A	A	A	C		B	B	A	B	B	J
151 150	E	E	D	D	A	A	E	E	H	H	J	A	A	C	C	C		B	B	A	B	B	J
181 180	E	E	D	A	A	A	E	E	H	H	J	A	A	C	C	C		B	B	A	B	F	
221 220	E	E	D	A	A	A	E	H	H	H	J	A	A	C	C	C		B	B	A	B	F	
271 270	E	E	D	A	H	H	E	H	H	J	J	L	C	C	C	C		B	B	F	F	F	
331 330	E	E	D	A	H	H	E	H	H	J	J	L	C	C	C	C		B	B	F	F	F	
391 390	E	E	D	A	H	H	E	H	L	L	L		C	C	C	C		B	B	F	F	F	
471 470	A		D	A	H	H	E	H	L	L	L		C	C	C	C		B	F	F	F	F	
561 560	A		D	A			E	H	L	L	L		C	C	C	C		B	F	F	F	F	
681 680	A		D	A			E	H	L	L	L		C	C	C	C		B	F	F	F	F	
751 750	A		A	A			E	H	L	L	L		C	C	C	C		B	F	F	F	F	J
821 820	A		A	A			E	H	L	L	L		C	C	A	C		B	F	F	F	J	
102 1000	A		A	A			E	H	L	L	L		C	C	B	C		B	F	F	F	J	
122 1200			A				E	H	L	L	L		C	C	B	C		B	F	F	F		
152 1500			A				E	J	L	L	L		C	C		C		B	F	F	F		
182 1800			A				E	L	L	L	L		C	C		C		A	F	F	F		
222 2200			A				E	L					C	C				A	F	F	J		
272 2700			A				E	L					C					A	F	J	J		
332 3300			A				E	L					C					A	F	J	J		
392 3900			A				E	L										A	J				
472 4700			A				E	G										A	J				
562 5600			G				E	G										A	J				
682 6800			G				H	G										A					
822 8200			G				H	G										A					
103 Cap (μF) 0.010			G				J	L										F					
123 0.012							L											E					
153 0.015							L											E					
183 0.018							L											F					
223 0.022							L											F					
273 0.027							L											F					
333 0.033							L																
473 0.047																							
563 0.056																							
683 0.068																							
104 0.100																							
Voltage (V)	630	1000	630	1000	1500	2000	630	1000	1500	2000	3000	630	1000	1500	2000	3000	4000	630	1000	1500	2000	3000	4000
Case Size	0805		1206				1210					1808					1812						

Case Size	0805 (KGM 21)				1206 (KGM31)				1210 (KGM32)					1808 (KGM42)			1812 (KGM43)			
Thickness Letter	C	E	A	B	D	A	H	R	E	H	J	L	A	B	C	A	B	F	J	
Max Thickness (mm)	0.95	1.35	1.45	0.94	1.45	1.80	1.9	1.05	1.45	1.80	2.21	2.80	1.45	1.80	2.21	1.4	1.45	2.21	2.80	
Carrier Tape	PAPER	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	
Packaging Code 7" reel	T	U	U	U	U	U	U	U	U	U	U	U	U	Y	Y	Y	V	V	V	
Packaging Code 13" reel	M	L	L	L	L	L	L	L	L	L	L	L	L	K	K	K	S	S	S	
	Paper												Embossed(EMB)							

High Voltage MLC Chips, KGM Series

For 630V to 5000V Applications

X7R Dielectric

Performance Characteristics

Capacitance Range	10 pF to 0.82 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

X7R CAPACITANCE RANGE

Case Size	0805				1206				1210				1808					1812				
	Reflow/Wave		Reflow/Wave		Reflow/Wave		Reflow/Wave		Reflow Only		Reflow Only		Reflow Only			Reflow Only		Reflow Only				
(L) Length	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		
100	101	B	A	D	A	A	A	H	H	H	H											
120	121	B	A	D	A	A	A	H	H	H	H											
150	151	B	A	D	A	A	A	H	H	H	H											
180	181	B	A	D	A	A	A	H	H	H	H											
220	221	B	A	D	A	A	A	H	H	H	H											
270	271	B	A	D	A	A	A	H	H	H	H							E	E	E	E	
330	331	B	A	D	A	A	A	H	H	H	H	B	B	B	B	C	E	E	E	E		
390	391	B	A	D	A	A	A	H	H	H	H	B	B	B	B	C	E	E	E	E		
470	471	B	A	D	A	A	A	H	H	H	H	B	B	B	B	C	E	E	E	E		
560	561	B	A	D	A	A	A	H	H	H	H	B	B	B	B	C	E	E	E	E		
680	681	B	A	D	A	A	A	H	H	H	H	B	B	B	B	C	E	E	E	E		
750	751	B	A	D	A	A	A	H	H	H	H	B	B	B	B	C	E	E	E	E		
820	821	B	A	D	A	A	A	H	H	H	H	B	B	B	B	C	E	E	E	E		
1000	102	B	A	D	A	A	A	H	H	H	H	B	B	B	B	C	E	E	E	E		
1200	122	B	A	D	A	A	A	H	H	H	H	B	B	B	B	C	F	F	F	F		
1500	152	B	A	D	A	A	A	H	H	H	H	B	B	B	B	C	F	F	F	F		
1800	182	B	A	D	A	A	A	H	H	H	H	B	B	B	B	C	F	F	F	F		
2200	222	B	A	D	A	A	A	H	H	J	J	B	B	C	C		F	F	F	F		
2700	272	A			A	A		H	H	J	L	B	B	C	C		F	F	F	F		
3300	332	A		D	A			H	H	J	L	B	B	C	C		F	F	F	F		
3900	392	A		D	A			H	H	J		B	B	C			F	F	F	F		
4700	472	A		D	A			H	H	J		B	B	C			F	F	F	F		
5600	562	A		D	A			H	H	J		B	B	C			F	F	F	J		
6800	682	A		D	A			H	H			B	B	C			F	F	F	J		
8200	822	A		D	A			H	H			B	B				F	F	F	J		
Cap (μF)	0.010	103	A		D	A		H	H			B	B				F	F	F	J		
0.015	153	A		A	A			H	H			C	C				F	F	J			
0.018	183	A		A				H	H			C	C				F	J				
0.022	223	A		A				H	J			C					F	J				
0.027	273			A				H				C					F	J				
0.033	333			A				H				C					F	J				
0.039	393							H				C					F	J				
0.047	473							H				C					F	J				
0.056	563							J				C					F					
0.068	683							J				C					F					
0.082	823							J									F					
0.100	104							J									F					
0.150	154																J					
0.220	224																J					
0.270	274																					
0.330	334																					
0.390	394																					
0.470	474																					
0.560	564																					
0.680	684																					
0.820	824																					
1.000	105																					
Voltage (V)	630	1000	630	1000	1500	2000	630	1000	1500	2000	630	1000	1500	2000	3000	630	1000	1500	2000	3000		
Case Size	0805		1206				1210				1808					1812						

Case Size	0805 (KGM 21)		1206 (KGM31)		1210 (KGM32)			1808 (KGM42)		1812 (KGM43)		
Thickness Letter	A	B	A	D	H	J	L	B	C	E	F	J
Max Thickness (mm)	1.45	0.94	1.80	1.45	1.80	2.21	2.80	1.80	2.21	1.80	2.21	2.80
Carrier Tape	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB
Packaging Code 7*reel	U	U	U	U	U	U	U	Y	Y	V	V	V
Packaging Code 13*reel	L	L	L	L	L	L	L	K	K	S	S	S

Embossed(EMB)

High Voltage MLC Chips, KGM Series

For 630V to 5000V Applications



X7R CAPACITANCE RANGE

SIZE	1825						2220						2225						3640							
Soldering	Reflow Only						Reflow Only						Reflow Only						Reflow Only							
(L) Length	mm		(in.)				mm		(in.)				mm		(in.)				mm		(in.)					
(W) Width	mm		(in.)				mm		(in.)				mm		(in.)				mm		(in.)					
(t) Terminal	mm		(in.)				mm		(in.)				mm		(in.)				mm		(in.)					
Voltage (V)	630	1000	1500	2000	2500	3000	630	1000	1500	2000	2500	3000	630	1000	1500	2000	2500	3000	630	1000	1500	2000	3000	4000	5000	
101	Cap (pF)	100																								
121	120																									
151	150																									
181	180																									
221	220																									
271	270																									
331	330																									
391	390																									
471	470																									
561	560																									
681	680																									
751	750																									
821	820																									
102	1000	C	C	C	C	C	C	Z	Z	Z	Z	Z	C	D	D	D	D	D	D	A	A	A	A	A		
122	1200	C	C	C	C	C	C	Z	Z	Z	Z	Z	C	D	D	D	D	D	D	A	A	A	A	A		
152	1500	C	C	C	C	C	C	Z	Z	Z	Z	Z	C	D	D	D	D	D	D	A	A	A	A	A		
182	1800	C	C	C	C	C	C	Z	Z	Z	Z	Z	C	D	D	D	D	D	D	A	A	A	A	A		
222	2000	C	C	C	C	C	C	Z	Z	Z	Z	Z	C	D	D	D	D	D	D	A	A	A	A	A		
272	2700	C	C	C	C	C	C	Z	Z	Z	Z	Z	C	D	D	D	D	D	D	A	A	A	A	A		
332	3300	C	C	C	C	C	C	Z	Z	Z	Z	Z	C	D	D	D	D	D	D	A	A	A	A	A		
392	3900	C	C	C	C	C	C	Z	Z	Z	Z	Z	C	D	D	D	D	D	D	A	A	A	A	A		
472	4700	C	C	C	C	C	C	Z	Z	Z	Z	Z	C	D	D	D	D	D	D	A	A	A	A	A		
562	5600	C	C	C	C	F	F	Z	Z	Z	Z	Z	C	D	D	D	D	G	G	A	A	A	A	A		
682	6800	C	C	F	F	F	F	Z	Z	Z	Z	Z	C	D	D	D	D	G	G	A	A	A	A	A		
822	8200	C	C	F	F	F	F	Z	Z	C	C	C	C	D	D	D	D	G	G	A	A	A	A	A		
103	Cap (µF)	0.010	C	C	F	F	F	F	Z	Z	C	C	C	C	D	D	D	D	G	G	A	A	A	A		
153	0.015	C	C	F	F	G		Z	Z	C	C	C	C	D	D	D	D	G	G	H	A	A	A	A		
183	0.018	C	C	F	F			Z	Z	C	D	D		D	D	G	G	G		A	A	A	A	A		
223	0.022	C	C	F	F			B	B	C	D	D		D	D	G	G	G		A	A	A	A	A		
273	0.027	C	C	F				B	B	C	D			D	D	G	G			A	A	A	A	A		
333	0.033	C	C	F				B	B	D				D	D	G	G			A	A	A				
393	0.039	C	C	F				B	B	D				D	D	G				A	A	A				
473	0.047	C	C	F				B	B	D				D	D	G				A	A	A				
563	0.056	C	C	F				B	B	D				D	D	H				A	A	A				
683	0.068	C	F					B	C					D	D	H				A	A	A				
823	0.082	C	F					B	C					D	G					A						
104	0.100	C	F					B	C					D	G					A						
154	0.150	C						B	D					D	H					A						
224	0.220	C						Z	D					D						A						
274	0.270	C						Z						D						A						
334	0.330	C						Z						D						A						
394	0.390	C						Z						D						A						
474	0.470	C						Z						D						A						
564	0.560	F						C						D						A						
684	0.680							C						G												
824	0.820													G												
105	1.000													G												
WVDC		630	1000	1500	2000	2500	3000	630	1000	1500	2000	2500	3000	630	1000	1500	2000	2500	3000	630	1000	1500	2000	3000	4000	5000
SIZE		1825						2220						2225						3640						

Case Size	1825 (KGM 44)				2220 (KGM55)				2225 (KGM56)				3640 (KGM91)
Thickness Letter	C	F	G	Z	B	C	D	D	G	H			A
Max Thickness (mm)	2.21	2.80	3.3	2.21	2.54	2.80	3.30	2.21	2.80	3.3			2.80
Carrier Tape	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB			EMB
Packaging Code 7"reel	V	V	V	V	V	V	V	V	V	V			N/A
Packaging Code 13"reel	S	S	S	S	S	S	S	S	S	S			N/A
Embossed(EMB)													