PRODUCTS

Surface Mount Multilayer Ceramic Capacitors

ESD Protected X7R & C0G 16 – 250 VDC

Electronic Components
KEMET CHARGED.

Why Choose KEMET

KEMET Electronics Corporation is a leading global supplier of electronic components. We offer our customers the broadest selection of capacitor technologies in the industry, along with an expanding range of electromagnetic compatibility solutions and supercapacitors. Our vision is to be the preferred supplier of electronic component solutions for customers demanding the highest standards of quality, delivery and service.

Features & Benefits

- AEC-Q200 qualification
- ESD qualified per HBM AEC-Q200-002
- Available in EIA case size 0402, 0603, 0805 and 1206
- DC voltage ratings of 16, 25, 50, 63, 100, 200 and 250 V
- Capacitance range from 1 nF to 2.2 μF
- -55°C to +125°C operating temperature range
- Lead (Pb)-Free, RoHS and REACH compliant
- Available capacitance tolerances of ±1%, ±2%, ±5%, ±10% and ±20%
- 100% pure matte tin-plated termination finish allowing for excellent solderability
- Non-polar devices, minimizing installation concerns
- Flexible termination option available

With C0G Dielectric

- No piezoelectric noise
- Extremely low ESR and ESL
- High thermal stability
- High ripple current capability
- Preferred capacitance solution at line frequencies and into the MHz range
- No capacitance changes with respect to applied DC voltage
- Negligible capacitance change with respect to temperature from -55°C to +125°C
- No capacitance decay with time

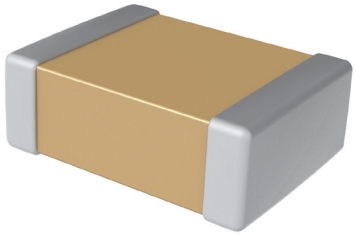
Product Checklist

- What is the end application?
- Is ESD capability a concern?
- Is there a requirement for a design within a given ESD criteria?

For more information, samples and engineering kits, please visit us at www.kemet.com or call 1.877.myKEMET.

Applications

The KEMET electrostatic discharge (ESD) rated commercial and automotive grade surface mount capacitors in X7R and C0G dielectrics are well-suited for a variety of applications, where electrostatic discharge events during assembly or operation could damage the capacitor or the circuit. These capacitors provide the ability to design within a given ESD criteria as per the human body model (HBM) AEC-Q200-002 criteria. Typical applications include electrostatic discharge, integrated circuit (IC) protection, radio frequency (RF) filtering, input and output automotive applications such as controllers, navigation systems, airbags and keyless entry systems.



Electrical/Physical Characteristics

	C0G	X7R
Operating Temperature Range	-55°C to +125°C	-55°C to +125°C
Capacitance Change with Reference to +25°C and 0 VDC Applied (TCC)	±30 ppm/°C	±15%
Aging Rate (Maximum % Capacitance Loss/Decade Hour)	0%	3.0%
Dielectric Withstanding Voltage (DWV)	250% of rated voltage (5 ±1 seconds and charge/discharge not exceeding 50 mA)	250% of rated voltage (5 ±1 seconds and charge/discharge not exceeding 50 mA)
Dissipation Factor (DF) Maximum Limit at 25°C	0.1%	5% (6.3 and 10 V), 3.5% (16 and 25 V) and 2.5% (50 to 250 V)
Insulation Resistance (IR) Minimum Limit at 25°C	100 GΩ (Rated voltage applied for 120 ±5 seconds at 25°C)	See Insulation Resistance Limit Table (Rated voltage applied for 120 ±5 seconds at 25°C)

Ordering Information

C	0603	C	104	J	3	R	E	C	TU
Ceramic	Size (L"x W")	Specification/ Series	Capacitance Code (pF)	Capacitance Tolerance	Voltage (VDC)	Dielectric	Failure Rate	Termination Finish	Packaging/ Grade (C-Spec)
	0402 0603 0805 1206	C = Standard X = Flexible termination	Two significant digits and number of zeros	F = ±1% G = ±2% J = ±5% K = ±10% M = ±20%	4 = 16 3 = 25 5 = 50 M = 63 1 = 100 2 = 200 A = 250	R = X7R G = C0G	E = ESD	C = 100% Matte Sn	See "Packaging C-Spec Ordering Options Table"

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X7R ESD Withstanding Capability (kV)

Capacitance	Cap Code	Case Size/Series	C0402C			C0603C						C0805C							C1206C						
		Rated Voltage (VDC)	16	25	50	16	25	50	63	100	200	16	25	50	63	100	200	250	16	25	50	63	100	200	250
		Voltage Code	4	3	5	4	3	5	M	1	2	4	3	5	M	1	2	A	4	3	5	M	1	2	A
		Tolerance	ESD Level per AEC-Q200 (kV)																						
1.0 nF	102		2	2	2	25	25	25	25	25	25	12	12	12	12	12	12	12	4	4	4	4	4	4	4
1.5 nF	152		4	4	4	12	12	12	12	12	12	4	4	4	4	4	4	4	6	6	6	6	6	6	6
2.2 nF	222		6	6	6	25	25	25	25	25	25	4	4	4	4	4	4	4	8	8	8	8	8	8	8
3.3 nF	332		8	8	8	12	12	12	12	12	12	16	16	16	16	16	16	16	16	16	16	16	16	16	16
4.7 nF	472		8	8	8	16	16	16	16	16	16	25	25	25	25	25	25	25	25	25	25	25	25	25	25
6.8 nF	682		4	4	4	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
10 nF	103		6	6	6	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
15 nF	153		6	6	6	16	16	16	16	16		25	25	25	25	25	25	25	25	25	25	25	25	25	25
22 nF	223		8	8	8	16	16	16	16	16		25	25	25	25	25	25	25	25	25	25	25	25	25	25
33 nF	333	J = ±5%	8	8		25	25	25	25	25		25	25	25	25	25	25		25	25	25	25	25	25	25
47 nF	473	K = ±10%	12	12		25	25	25	25	25		25	25	25	25	25	25		25	25	25	25	25	25	25
68 nF	683	M = ±20%	12			25	25	25				25	25	25	25	25			25	25	25	25	25	25	25
100 nF	104		16			25	25	25				25	25	25	25	25			25	25	25	25	25	25	25
150 nF	154					25	25	25				25	25	25	25	25			25	25	25	25	25	25	
220 nF	224					25	25					25	25	25	25	25			25	25	25	25	25		
330 nF	334											25	25	25					25	25	25	25	25		
470 nF	474											25	25	25					25	25	25	25	25		
680 nF	684											25	25	25					25	25	25				
1.0 µF	105											25	25						25	25	25				
1.5 µF	155											25							25	25	25				
2.2 µF	225											25							25	25	25				

C0G ESD Withstanding Capability (kV)

Capacitance	Cap Code	Case Size/Series	C0402C				C0603C					C0805C							C1206C						
		Rated Voltage (VDC)	25	50	63	100	25	50	63	100	200	25	50	63	100	200	250		25	50	63	100	200	250	
		Voltage Code	3	5	M	1	3	5	M	1	2	3	5	M	1	2	A		3	5	M	1	2	A	
		Tolerance	ESD Level per AEC-Q200 (kV)																						
1.0 nF	102		4	4	4	4	6	6	6	6	6	8	8	8	8	8	8		12	12	12	12	12	12	
1.5 nF	152		6	6			8	8	8	8	8	8	8	8	8	8	8		16	16	16	16	16	16	
2.2 nF	222		6				12	12	12	12	12	12	12	12	12	12	12		16	16	16	16	16	16	
3.3 nF	332						16	16	16	16		16	16	16	16	16	16		16	16	16	16	16	16	
4.7 nF	472						16	16	16	16		25	25	25	25	25	25		25	25	25	25	25	25	
6.8 nF	682	F = ±1%					25	25				25	25	25	25	25	25		25	25	25	25	25	25	
10 nF	103	G = ±2%					25					25	25	25	25				25	25	25	25	25	25	
15 nF	153	J = ±5%					25					25	25	25	25				25	25	25	25	25	25	
22 nF	223	K = ±10%										25	25						25	25	25	25	25	25	
33 nF	333	M = ±20%										25							25	25	25	25			
47 nF	473											25							25	25	25	25			
68 nF	683																		25	25					
100 nF	104																		25						
150 nF	154																								
220 nF	224																								