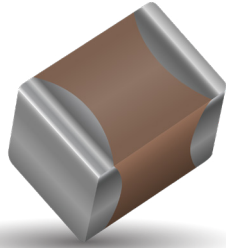


# ESD-SAFE™ MLC Chips

## ESD Withstanding Automotive Ceramic Capacitor



### GENERAL DESCRIPTION

The ESD-Safe™ series is an enhanced MLC capacitor developed and designed specifically for general ESD protection. (ESD = Electro Static Discharge).

ESD-Safe™ capacitors are utilized for ESD protection of I/O gates. ESD capacitors are used on nearly every pin of an automotive module. Their use at that point averages the voltage that the wiring harness can be charged to and the module voltage.

The small footprint makes them ideal for high density electronic devices.

Capacitance selection is a trade off. Large capacitance values provide better ESD protection however a larger could corrupt the data stream.

ESD-Safe™ Capacitors provide (beside ESD protection) RF filtering function.

### GENERAL CHARACTERISTICS

Operating Temperature: -55°C to 125°C

Capacitance Variation: ±15% (X7R)

### FEATURES

- AEC Q200 Qualified
  - ESD Qualified per HBM of AEC Q200-002
  - ISO 10605 (uses both 330pf/2kohm and 150pf/2kohm networks)\*
  - EN61000-4 -2 (uses 150pf/330 Ohm network)\*
- \*Contact factory for ESD performance

### APPLICATIONS

- General ESD protection of I/O gates

### HOW TO ORDER

ESD	3	3	C	104	K	4	Z	2	A	18
<b>Types</b> ESD	<b>Case Size</b>	<b>Voltage</b>	<b>Dielectric</b>	<b>Capacitance Code (In pF)</b>	<b>Capacitance Tolerance</b>	<b>Failure Rate</b>	<b>Terminations</b>	<b>Packaging</b>	<b>Special Code</b>	<b>ESD rating (kV)</b>
Applications	3 = 0603 5 = 0805 6 = 1206	Z = 10V Y = 16V 3 = 25V 5 = 50V 1 = 100V	X7R = C	2 Sig. Digits + Number of Zeros e.g. 1000pF = 102	J = ±5% K = ±10% M = ±20%	4 = Automotive	T = 100% Sn Z = FLEXITERM®	2 = 7" Reel 4 = 13" Reel	A = Std. Product	18 = 18kV 20 = 20kV 22 = 22kV 24 = 24kV 26 = 26kV 28 = 28kV 30 = 30kV

### ESD-SAFE™ X7R RANGE

Capacitance		0603				0805						Q1206					
Code	Value	50V		100V		25V		50V		100V		25V		50V		100V	
472	4.7 (nF)	18kV	G	18kV	G	18kV	N	18kV	N	18kV	N	20kV	Q	20kV	Q	20kV	Q
682	6.8	18kV	G	18kV	G	18kV	N	18kV	N	18kV	N	20kV	Q	20kV	Q	20kV	Q
103	10	18kV	G	18kV	G	18kV	N	18kV	N	18kV	N	20kV	Q	20kV	Q	20kV	Q
153	15	20kV	G			20kV	N	20kV	N	20kV	N	22kV	Q	22kV	Q	22kV	Q
223	22	20kV	G			22kV	N	22kV	N	22kV	N	24kV	Q	24kV	Q	24kV	Q
333	33	20kV	G			22kV	N	22kV	N	22kV	N	24kV	Q	24kV	Q	24kV	Q
473	47	22kV	G			22kV	N	22kV	N	22kV	N	26kV	Q	26kV	Q	26kV	Q
683	68	22kV	G			24kV	N	24kV	N	24kV	N	26kV	Q	26kV	Q	26kV	Q
104	100	24kV	G			24kV	N	24kV	N	24kV	N	26kV	Q	26kV	Q	26kV	Q
154	150					24kV	N	24kV	N	24kV	N	28kV	Q	28kV	Q	28kV	Q
224	220					26kV	N	26kV	N	26kV	N	28kV	Q	28kV	Q	28kV	Q
334	330					26kV	N	26kV	N	26kV	N	28kV	Q	28kV	Q	28kV	Q
474	470					26kV	N	26kV	N	26kV	N	28kV	Q	28kV	Q	28kV	Q
684	680					26kV	N					28kV	Q	28kV	Q	28kV	Q
105	1 (µF)					26kV	N					28kV	Q	28kV	Q	28kV	Q
155	1.5											30kV	Q				
255	2.2											30kV	Q				

Letter		G	N	Q
Max mm		0.740 ~ 0.850	1.127 ~ 1.400	1.430 ~ 1.780
Thickness inch.		0.029 ~ 0.035	0.045 ~ 0.055	0.057 ~ 0.070
		Paper	Embossed	



LEAD-FREE  
LEAD-FREE COMPATIBLE  
COMPONENT

For RoHS compliant products,  
please select correct termination style