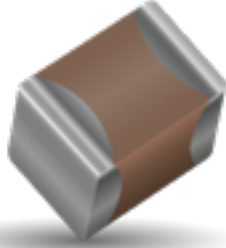


ESD-SAFE™ Automotive MLCC, KAE series

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

KAE	15	A	R7	1H	103	K	T	18	
Series Automotive ESD-SAFE®	Size 15 = 0603 21 = 0805 31 = 1206	Thickness See Cap Chart	Dielectric X7R=R7	Voltage 1E = 25V 1H = 50V 2A = 100V	Capacitance Code Code (in pF) 2 Significant Digits +Number of zeros eg. 10µF = 106 10nF = 103 47pF = 470	Capacitance Tolerance J = ±5% K = ±10% M = ±20%	Packaging See Table Below	ESD Rating 18=18kV 20=20kV 22=22kV 24=24kV 26=26kV 28=28kV 30=30kV	Option 1A=FLEXITERM®

PACKAGING CODES

Code	EIA (inch)	IEC(mm)	7" Paper	7" Embossed	13" Paper	13" Embossed
15	0603	1608	T		M	
21	0805	2012		U		L
31	1206	3216		U		L

ESD-SAFE™ X7R RANGE

SIZE	0603						0805						1206					
	Reflow/Wave						Reflow/Wave						Reflow/Wave					
(L) Length	1.6 ± 0.15						2.01 ± 0.2						3.2 ± 0.2					
	(0.063 ± 0.006)						(0.079 ± 0.008)						(0.126 ± 0.008)					
(W) Width	0.81 ± 0.15						1.25 ± 0.2						1.6 ± 0.2					
	(0.032 ± 0.006)						(0.049 ± 0.008)						(0.063 ± 0.008)					
(t) Terminal	0.35 ± 0.15						0.5 ± 0.25						0.5 ± 0.25					
	(0.014 ± 0.006)						(0.02 ± 0.01)						(0.02 ± 0.01)					
WVDC	50V		100V		25V		50V		100V		25V		50V		100V			
472	4.7 (nF)	18kV	A	18kV	A	18kV	K	18kV	K	18kV	K	20kV	G	20kV	G	20kV	G	
682	6.8	18kV	A	18kV	A	18kV	K	18kV	K	18kV	K	20kV	G	20kV	G	20kV	G	
103	10	18kV	A	18kV	A	18kV	K	18kV	K	18kV	K	20kV	G	20kV	G	20kV	G	
153	15	20kV	A			20kV	K	20kV	K	20kV	K	22kV	G	22kV	G	22kV	G	
223	22	20kV	A			22kV	K	22kV	K	22kV	K	24kV	G	24kV	G	24kV	G	
333	33	20kV	A			22kV	K	22kV	K	22kV	K	24kV	G	24kV	G	24kV	G	
473	47	22kV	A			22kV	K	22kV	K	22kV	K	26kV	G	26kV	G	26kV	G	
683	68	22kV	A			24kV	K	24kV	K	24kV	K	26kV	G	26kV	G	26kV	G	
104	100	24kV	A			24kV	K	24kV	K	24kV	K	26kV	G	26kV	G	26kV	G	
154	150					24kV	K	24kV	K	24kV	K	28kV	G	28kV	G	28kV	G	
224	220					26kV	K	26kV	K	26kV	K	28kV	G	28kV	G	28kV	G	
334	330					26kV	K	26kV	K	26kV	K	28kV	G	28kV	G	28kV	G	
474	470					26kV	K	26kV	K	26kV	K	28kV	G	28kV	G	28kV	G	
684	680					26kV	K					28kV	G	28kV	G	28kV	G	
105	1 (µF)					26kV	K					28kV	G	28kV	G	28kV	G	
155	1.5											30kV	G					
225	2.2											30kV	G					
WVDC	50V		100V		25V		50V		100V		25V		50V		100V			
SIZE	0603						0805						1206					

Case Size	0603(KAE15)	0805(KAE21)	1206(KAE32)
Thickness Letter	A	K	G
Max Thickness (mm)	0.90	1.40	1.78
Carrier Tape	PAPER	EMB	EMB
Packaging Code 7" reel	T	U	U
Packaging Code 13" reel	M	L	L
	PAPER	EMBOSSED(EMB)	



For RoHS compliant products, please select correct termination style



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

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [Multilayer Ceramic Capacitors MLCC - SMD/SMT category:](#)

Click to view products by [Kyocera AVX manufacturer:](#)

Other Similar products are found below :

[M39014/02-1218V](#) [M39014/02-1225V](#) [M39014/02-1301](#) [M39014/22-0631](#) [M39014/22-0808](#) [NIN-FC2R7JTRF](#) [C1608C0G2A221J](#)
[C1608X7R1E334K](#) [C2012C0G2A472J](#) [CL10C0R8BB8ANNC](#) [C1005X5R0G225M](#) [C3216C0G2J272J](#) [726632-1](#) [CGA3E2X8R1H223K](#)
[CDR35BX474AKUR\M500](#) [C1608X8R1H473K](#) [M39014/01-1554](#) [4327 030 36981](#) [CDR06BX474AMSP\M](#) [CDR31BP330BJMS\M](#)
[M39014/220214](#) [CHP1-100-8202-G-LF674A](#) [502R29N330JV3E-](#) [0603B103J500NT](#) [1206B103K501NT](#) [0402N820J101CT](#)
[1206N221J202CT](#) [0805N330J102CT](#) [1206N220J501CT](#) [1206N151J500CT](#) [1206N103J101CT](#) [0603B152K201CT](#) [RF18N5R0B500CT](#)
[0603B472K201CT](#) [0805B272K101CT](#) [0603N1R0C251CT](#) [0805B153K201CT](#) [1210B333K101CT](#) [CC0100JRNPO8BN100](#)
[CC0100JRNPO6BN101](#) [CC0402JRNPO9BN301](#) [CC0805KKX7R0BB105](#) [AC0805KKX7R6BB475](#) [CC0805KKX7R7BB824](#)
[CQ0402DRNPO9BN5R6](#) [AF0100FR-07200KL](#) [CC0603DRNPO9BN5R1](#) [CC0805GKNPO9BN472](#) [CC1206JKX7R9BB474](#)
[CC1206JRX7R8BB474](#)