



**THE DATASHEET OF
MA402C223KAA**



GENERAL DESCRIPTION

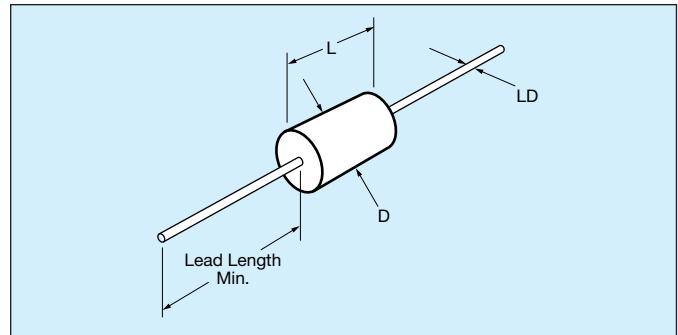
AVX MA Series

Molded Axial Leaded MLC

Temperature Coefficient: COG (NP0), X7R, Z5U
50V, 100V and 200V

Case Material: Molded Epoxy

Lead Material: Solderable



HOW TO ORDER

MA10

Molded Axial Size

MA10
MA20
MA30
MA40
MA50
MA60

5

Voltage

5 = 50V
1 = 100V
2 = 200V

E

Dielectric

A = COG (NP0)
C = X7R
E = Z5U

104

Capacitance

First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)

Z

Capacitance Tolerance

COG (NP0):
F = ±1%
J = ±5%
K = ±10%
M = ±20%
D = ±0.5pF
<10pF only

X7R:
J = ±5%
K = ±10%
M = ±20%

Z5U:
M = ±20%
Z = +80%
-20%

A

Failure Rate
A = Not Applicable

A

Leads
A = Standard

Not RoHS Compliant

‡ C tolerance available COG (NP0) from 1.0 to 9.1 pF only. Minimum tolerance for values 10 pF - 100 pF is D or F whichever is greater.

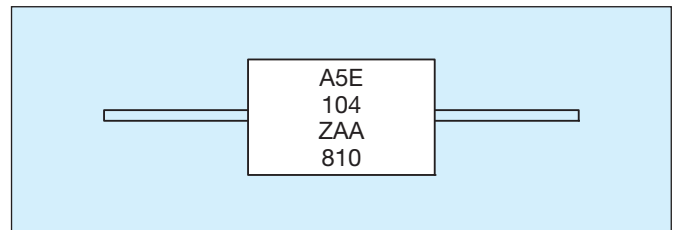
MARKING (EXAMPLE)

Line 1, A (for AVX), 5 = 50 Volts (V is optional),
E = TC Line 2, 104Z = Capacitance Code

Line 3, Tolerance, 2 digit Lot Code

Date Code: 8 = 2008
10 = Week

Four Digit Date Code Optional



MILITARY CROSS REFERENCE AND DIMENSIONS GUIDE

AVX Style	Per MIL-Spec			Case Size		
	MIL-C-11015	MIL-PRF-39014	MIL-PRF-20	Length (L)	Diameter (D)	Lead Diameter (LD)
MA10	CK12	CKR11	CCR75/CC75	4.07 ± .25 (.160" ± .010")	2.29 ± .25 (.090" ± .010")	.48 ± .05 (.019" ± .002")
MA20	CK13	CKR12	CCR76/CC76	6.35 ± .25 (.250" ± .010")	2.29 ± .25 (.090" ± .010")	.48 ± .05 (.019" ± .002")
MA40	CK14	CKR14	CCR77/CC77	9.91 ± .25 (.390" ± .010")	3.56 ± .25 (.140" ± .010")	.63 ± .05 (.025" ± .002")
MA50	CK15	CKR15	CCR78/CC78	12.7 ± .51 (.500" ± .020")	6.35 ± .38 (.250" ± .015")	.63 ± .05 (.025" ± .002")
MA60	CK16	CKR16	CCR79/CC79	17.53 ± .51 (.690" ± .020")	8.89 ± .51 (.350" ± .015")	.63 ± .05 (.025" ± .002")

For Military/Established Reliability Molded/Axial Lead see MIL-C-11015, MIL-PRF-39014, MIL-PRF-20 Section.

Dimensions: Millimeters (Inches)

Axial Leads/Ceralam®



C0G (NP0) Dielectric

SIZE AND CAPACITANCE SPECIFICATIONS



Dimensions: Millimeters (Inches)

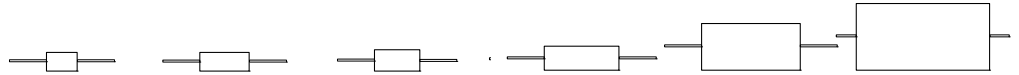
AVX Style	Typical AVX Part Nos.	MA10			MA20			MA30			MA40			MA50			MA60		
		200	100	50	200	100	50	200	100	50	200	100	50	200	100	50	200	100	50
Length		4.07 ± .25 (.160" ± .010")			6.35 ± .25 (.250" ± .010")			6.09 ± .25 (.240" ± .010")			9.91 ± .25 (.390" ± .010")			12.7 ± .51 (.500" ± .020")			17.53 ± .51 (.690" ± .020")		
Diameter		2.29 ± .25 (.090" ± .010")			2.29 ± .25 (.090" ± .010")			3.30 ± .25 (.130" ± .010")			3.56 ± .25 (.140" ± .010")			6.35 ± .38 (.250" ± .015")			8.89 ± .51 (.350" ± .015")		
Lead Diameter		.48 ± .05 (.019" ± .002")			.48 ± .05 (.019" ± .002")			.48 ± .05 (.019" ± .002")			.63 ± .05 (.025" ± .002")			.63 ± .05 (.025" ± .002")			.63 ± .05 (.025" ± .002")		
Lead Length		25.4 (1.00")			25.4 (1.00")			25.4 (1.00")			25.4 (1.00")			25.4 (1.00")			25.4 (1.00")		
Cap. in pF		VVDC			VVDC			VVDC			VVDC			VVDC			VVDC		
1.0 to 9.1	MA.....5A1R0DAA MA.....5A9R1DAA																		
10 to 15	MA.....5A100KAA MA.....5A120KAA MA.....5A150KAA																		
18 to 27	MA.....5A180KAA MA.....5A220KAA MA.....5A270KAA																		
33 to 47	MA.....5A330KAA MA.....5A390KAA MA.....5A470KAA																		
56 to 82	MA.....5A560KAA MA.....5A680KAA MA.....5A820KAA																		
100 to 150	MA.....5A101KAA MA.....5A121KAA MA.....5A151KAA																		
180 to 270	MA.....5A181KAA MA.....5A221KAA MA.....5A271KAA																		
330 to 470	MA.....5A331KAA MA.....5A391KAA MA.....5A471KAA																		
560 to 820	MA.....5A561KAA MA.....5A681KAA MA.....5A821KAA																		
1000 to 1500	MA.....5A102KAA MA.....5A122KAA MA.....5A152KAA																		
1800 to 2700	MA.....5A182KAA MA.....5A222KAA MA.....5A272KAA																		
3300 to 4700	MA.....5A332KAA MA.....5A392KAA MA.....5A472KAA																		
5600 to 8200	MA.....5A562KAA MA.....5A682KAA MA.....5A822KAA																		
10,000 to 15,000	MA.....5A103KAA MA.....5A123KAA MA.....5A153KAA																		
18,000 to 27,000	MA.....5A183KAA MA.....5A223KAA MA.....5A273KAA																		
33,000 to 47,000	MA.....5A333KAA MA.....5A393KAA MA.....5A473KAA																		
56,000 to 82,000	MA.....5A563KAA MA.....5A683KAA MA.....5A823KAA																		
100,000 to 150,000	MA.....5A104KAA MA.....5A124KAA MA.....5A154KAA																		

For other tolerances see Part No. Codes
 For other voltages see Part No. Codes.
 AVX Style



X7R Dielectric

SIZE AND CAPACITANCE SPECIFICATIONS



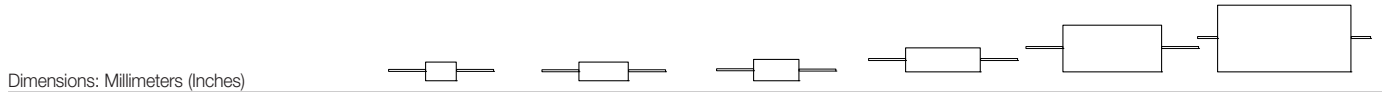
Dimensions: Millimeters (Inches)

AVX Style		MA10			MA20			MA30			MA40			MA50			MA60		
Length		4.07 ± .25 (.160" ± .010")			6.35 ± .25 (.250" ± .010")			6.09 ± .25 (.240" ± .010")			9.91 ± .25 (.390" ± .010")			12.7 ± .51 (.500" ± .020")			17.53 ± .51 (.690" ± .020")		
Diameter		2.29 ± .25 (.090" ± .010")			2.29 ± .25 (.090" ± .010")			3.30 ± .25 (.130" ± .010")			3.56 ± .25 (.140" ± .010")			6.35 ± .38 (.250" ± .015")			8.89 ± .51 (.350" ± .015")		
Lead Diameter		.48 ± .05 (.019" ± .002")			.48 ± .05 (.019" ± .002")			.48 ± .05 (.019" ± .002")			.63 ± .05 (.025" ± .002")			.63 ± .05 (.025" ± .002")			.63 ± .05 (.025" ± .002")		
Lead Length		25.4 (1.00")			25.4 (1.00")			25.4 (1.00")			25.4 (1.00")			25.4 (1.00")			25.4 (1.00")		
Cap. in pF	Typical AVX Part Nos.	WVDC			WVDC			WVDC			WVDC			WVDC			WVDC		
		200	100	50	200	100	50	200	100	50	200	100	50	200	100	50	200	100	50
220	MA.....5C221KAA																		
270	MA.....5C271KAA																		
330	MA.....5C331KAA																		
390	MA.....5C391KAA																		
470	MA.....5C471KAA																		
560	MA.....5C561KAA																		
680	MA.....5C681KAA																		
820	MA.....5C821KAA																		
1000	MA.....5C102KAA																		
1200	MA.....5C122KAA																		
1500	MA.....5C152KAA																		
1800	MA.....5C182KAA																		
2200	MA.....5C222KAA																		
2700	MA.....5C272KAA																		
3300	MA.....5C332KAA																		
3900	MA.....5C392KAA																		
4700	MA.....5C472KAA																		
5600	MA.....5C562KAA																		
6800	MA.....5C682KAA																		
8200	MA.....5C822KAA																		
10,000	MA.....5C103KAA																		
12,000	MA.....5C123KAA																		
15,000	MA.....5C153KAA																		
18,000	MA.....5C183KAA																		
22,000	MA.....5C223KAA																		
27,000	MA.....5C273KAA																		
33,000	MA.....5C333KAA																		
39,000	MA.....5C393KAA																		
47,000	MA.....5C473KAA																		
56,000	MA.....5C563KAA																		
68,000	MA.....5C683KAA																		
82,000	MA.....5C823KAA																		
100,000	MA.....5C104KAA																		
120,000	MA.....5C124KAA																		
150,000	MA.....5C154KAA																		
180,000	MA.....5C184KAA																		
220,000	MA.....5C224KAA																		
270,000	MA.....5C274KAA																		
330,000	MA.....5C334KAA																		
390,000	MA.....5C394KAA																		
470,000	MA.....5C474KAA																		
560,000	MA.....5C564KAA																		
680,000	MA.....5C684KAA																		
820,000	MA.....5C824KAA																		
1.0 µF	MA.....5C105KAA																		
1.2 µF	MA.....5C125KAA																		
1.5 µF	MA.....5C155KAA																		
1.8 µF	MA.....5C185KAA																		
2.2 µF	MA.....5C225KAA																		
2.7 µF	MA.....5C275KAA																		
3.3 µF	MA.....5C335KAA																		
3.9 µF	MA.....5C395KAA																		

For other tolerances see Part No. Codes
 For other voltages see Part No. Codes.
 AVX Style

Z5U Dielectric

SIZE AND CAPACITANCE SPECIFICATIONS



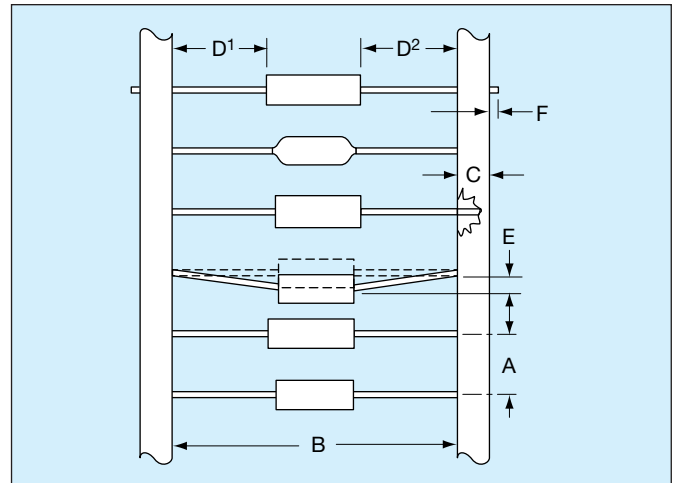
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Diameter	2.29 ± .25 (.090" ± .010")	2.29 ± .25 (.090" ± .010")	3.30 ± .25 (.130" ± .010")	3.56 ± .25 (.140" ± .010")	6.35 ± .38 (.250" ± .015")	8.89 ± .51 (.350" ± .015")										
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Lead Length	25.4 (1.00")	25.4 (1.00")	25.4 (1.00")	25.4 (1.00")	25.4 (1.00")	25.4 (1.00")										
Cap. in pF	Typical AVX Part Nos.	WVDC			WVDC			WVDC			WVDC			WVDC		
		200	100	50	200	100	50	200	100	50	200	100	50	200	100	50
1000	MA...5E102ZAA															
1200	MA...5E122ZAA															
1500	MA...5E152ZAA															
1800	MA...5E182ZAA															
2200	MA...5E222ZAA															
2700	MA...5E272ZAA															
3300	MA...5E332ZAA															
3900	MA...5E392ZAA															
4700	MA...5E472ZAA															
5600	MA...5E562ZAA															
6800	MA...5E682ZAA															
8200	MA...5E822ZAA															
10,000	MA...5E103ZAA															
12,000	MA...5E123ZAA															
15,000	MA...5E153ZAA															
18,000	MA...5E183ZAA															
22,000	MA...5E223ZAA															
27,000	MA...5E273ZAA															
33,000	MA...5E333ZAA															
39,000	MA...5E393ZAA															
47,000	MA...5E473ZAA															
56,000	MA...5E563ZAA															
68,000	MA...5E683ZAA															
82,000	MA...5E823ZAA															
100,000	MA...5E104ZAA															
120,000	MA...5E124ZAA															
150,000	MA...5E154ZAA															
180,000	MA...5E184ZAA															
220,000	MA...5E224ZAA															
270,000	MA...5E274ZAA															
330,000	MA...5E334ZAA															
390,000	MA...5E394ZAA															
470,000	MA...5E474ZAA															
560,000	MA...5E564ZAA															
680,000	MA...5E684ZAA															
820,000	MA...5E824ZAA															
1.0 µF	MA...5E105ZAA															
1.2 µF	MA...5E125ZAA															
1.5 µF	MA...5E155ZAA															
1.8 µF	MA...5E185ZAA															
2.2 µF	MA...5E225ZAA															
2.7 µF	MA...5E275ZAA															
3.3 µF	MA...5E335ZAA															
3.9 µF	MA...5E395ZAA															
4.7 µF	MA...5E475ZAA															
5.6 µF	MA...5E565ZAA															
6.8 µF	MA...5E685ZAA															
8.2 µF	MA...5E825ZAA															

For other tolerances see Part No. Codes
 For other voltages see Part No. Codes.
 AVX Style

TAPE AND REEL

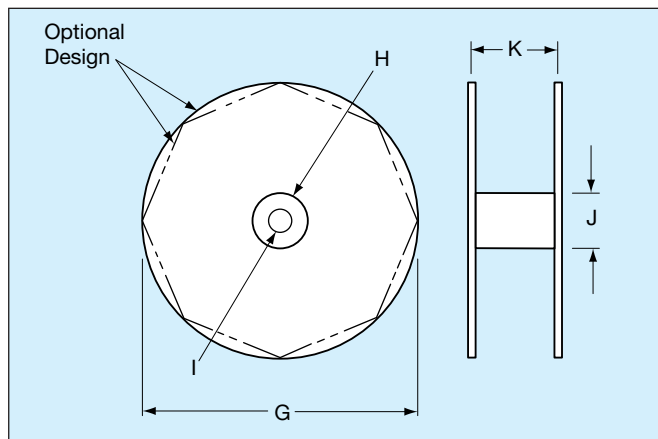
CLASS I / RS-296	
A.	5mm ± 0.5mm (.200" ± 0.020")
B*	52.4mm ± 1.5mm (2.063" ± 0.059")
C.	6.35mm ± 0.4mm (0.250" ± 0.016")
D ¹ -D ² .	1.4mm (0.055" MAX.)
E.	1.2mm (0.047" MAX.)
F.	1.6mm (0.063" MAX.)
G.	356mm (14.00")
H.	76mm (3.000")
I.	25.4mm (1.000")
J.	84mm (3.300")
K.	70mm (2.750")



Leader Tape: 300mm min. (12")

Splicing: Tape Only

Missing Parts: 0.25% of component count max.-
No consecutive missing parts



REEL QUANTITIES (MAX.) ‡

SA05	7,500 pcs.	MA10	5,000 pcs.
SA10	7,500 pcs.	MA20	5,000 pcs.
SA11	5,000 pcs.	MA30	3,000 pcs.
SA20	5,000 pcs.	MA40	3,000 pcs.
SA30	5,000 pcs.	MA50	950 pcs.
SA40	5,000 pcs.	MA60	650 pcs.

‡ 1000 pc. reels available for distribution pack only in ±1% and ±2% tolerance.

* Standard Tape Spacing Shown. Also available in 26.0mm + 1.5mm, - 0mm, (1.023 in. + .059 in. - 0 in.) for SpinGuards only. EIA Class I, II and III tape spacings are available for molded axials. Tape spacing for Class II is 63.5mm ± 1.5mm (2.50 in ± .059 in), and for Class III 73mm ± 1.5mm (2.87 in ± .059 in)

ADDITIONAL PACKAGING AVAILABLE

AMMO PACK

Tape Spacing	SA05, SA10 SA20	SA11 SA30	SA40	BOX SIZES (Nominal)		
				L	W	H
52.4mm ± 1.5mm (2.062" ± .059")	4,000 pcs.	2000	2,000 pcs.	255mm (10.039")	73mm (2.874")	93mm (3.661")
26.0mm + 1.5mm - 0mm (1.023" + .059" - 0")	4,000 pcs.*	2000	2,000 pcs.*	255mm (10.039")	48mm (1.889")	113mm (4.448")

*SpinGuard only

BULK PACK (MOLDED AXIALS ONLY)

MA10 MA20 MA30 MA40	100 pcs. (bag)
MA50 MA60	50 pcs. (bag)

Looking for pricing, stock, or lifecycle information?

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 [AVX Corporation](#) Information

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