

## GENERAL DESCRIPTION

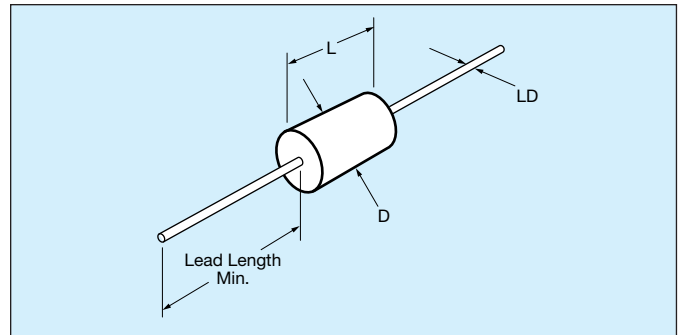
**AVX MA Series**

**Molded Axial Leaded MLC**

**Temperature Coefficient:** C0G (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 = C0G (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**

C0G (NP0):  
F = ±1%  
J = ±5%  
K = ±10%  
M = ±20%  
D = ±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

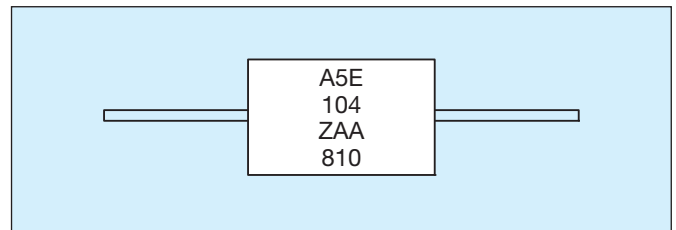
‡ C tolerance available C0G (NP0) from 1.0 to 9.1 pF only. Minimum tolerance for values 10 pF - 100 pF is D or F whichever is greater.

## 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)

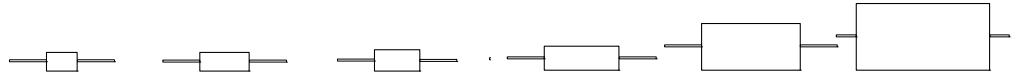
AVX Style		MA10			MA20			MA30			MA40			MA50			MA60			
Length		4.07 ± .25 (.160" ± .010")			6.35 ± .25 (.250" ± .010")			6.09 ± .25 (.240" ± .010")			9.91 ± .25 (.390" ± .010")			12.7 ± .51 (.500" ± .020")			17.53 ± .51 (.690" ± .020")			
Diameter		2.29 ± .25 (.090" ± .010")			2.29 ± .25 (.090" ± .010")			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	
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



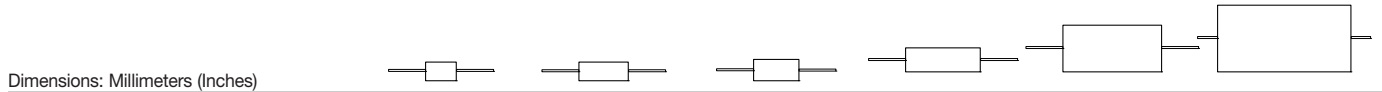
Dimensions: Millimeters (Inches)

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		
		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



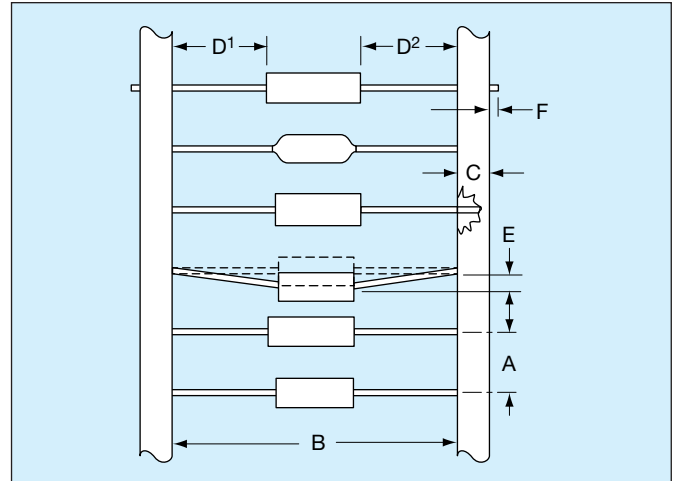
Dimensions: Millimeters (Inches)

AVX Style		MA10	MA20	MA30	MA40	MA50	MA60									
<b>Length</b>		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")									
<b>Diameter</b>		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")									
<b>Lead Diameter</b>		.48 ± .05 (.019" ± .002")	.48 ± .05 (.019" ± .002")	.48 ± .05 (.019" ± .002")	.63 ± .05 (.025" ± .002")	.63 ± .05 (.025" ± .002")	.63 ± .05 (.025" ± .002")									
<b>Lead Length</b>		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

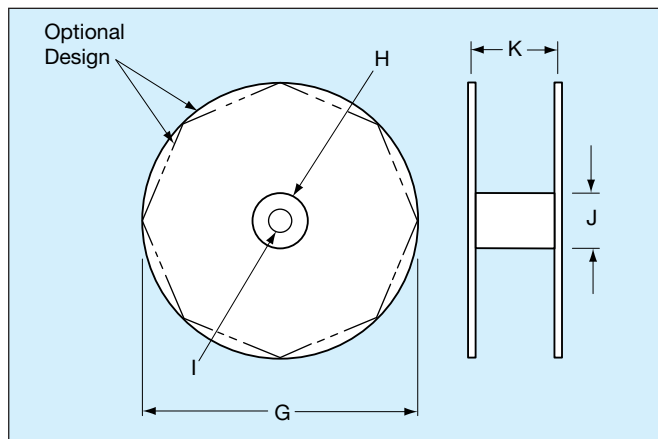
CLASS I / RS-296	
A.	5mm ± 0.5mm (.200" ± 0.020")
B*	52.4mm ± 1.5mm (2.063" ± 0.059")
C.	6.35mm ± 0.4mm (0.250" ± 0.016")
D <sup>1</sup> -D <sup>2</sup> .	1.4mm (0.055" MAX.)
E.	1.2mm (0.047" MAX.)
F.	1.6mm (0.063" MAX.)
G.	356mm (14.00")
H.	76mm (3.000")
I.	25.4mm (1.000")
J.	84mm (3.300")
K.	70mm (2.750")



**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)