

## GENERAL DESCRIPTION

**AVX SA Series**

**Conformally Coated Axial Leaded MLC**

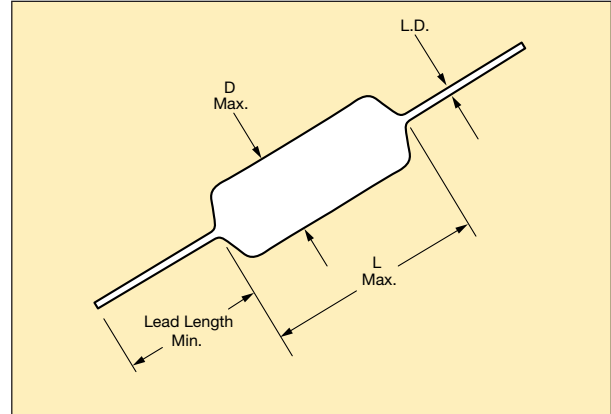
**Temperature Coefficients:** C0G (NP0), X7R, Z5U  
50, 100, 200 Volts

**Case Material:** Epoxy (Flame Retardant to UL Bulletin 492, Par. 280)

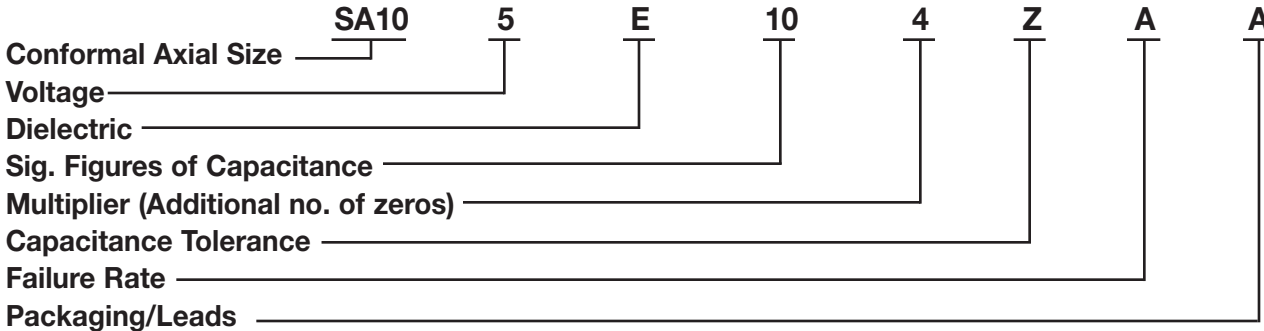
**Lead Material:** Solderable

## HOW TO ORDER

**AVX Styles: SA05, SA10, SA11, SA20, SA30, SA40**



## Part Number Example



## Part Number Codes

**Voltages:** 50V = 5, 100V = 1, 200V = 2

**Dielectric:** C0G (NP0) = A, X7R = C, Z5U = E

**Sig. Figures of Capacitance and Multiplier:** 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 10 pF, use "R" in place of decimal point, e.g., 1R4 = 1.4 pF).

## Capacitance Tolerances:

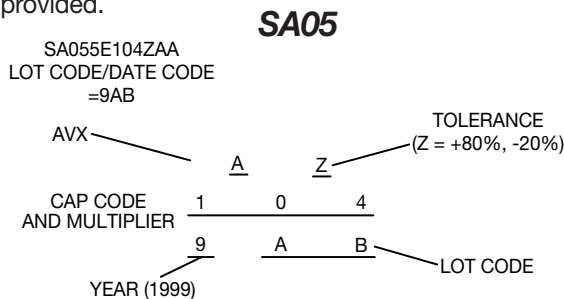
C0G (NP0): C =  $\pm 0.25$  pF, D =  $\pm 0.5$  pF, F =  $\pm 1\%$ ,  
G =  $\pm 2\%$ , J =  $\pm 5\%$ , K =  $\pm 10\%$   
X7R: J =  $\pm 5\%$ , K =  $\pm 10\%$ , M =  $\pm 20\%$   
Z5U: M =  $\pm 20\%$ , Z =  $\pm 80\%$ , -20%

**Failure Rate:** Not Applicable

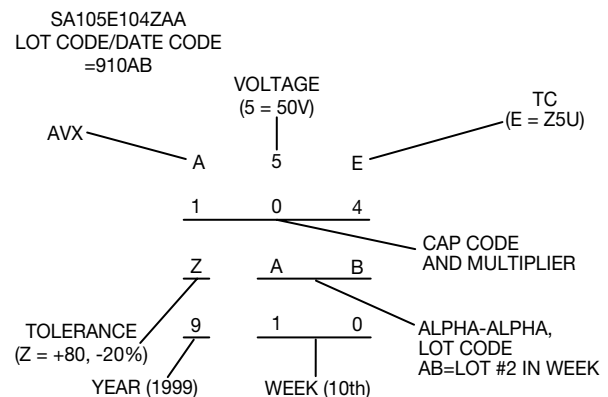
**Leads:** Standard (Solderable)

## MARKING (Example)

SpinGuard marking includes full date code/lot code identification. A first in the industry, this format provides complete traceability to all manufacturing processes involving the basic chip and final assembly. Total Shipment traceability is also provided.



## SA10, 11, 20, 30, 40



## PACKAGING REQUIREMENTS

A = Standard Reels (see Page 38)  
B = 1000 piece reels (distributors only, tight tolerance only)  
C = Ammo Pack (see Page 38)  
D thru J = See Special Lead Configurations (Page 32)

L = Twin Coat Leads (95/5 Flash Tin/Lead)  
M = 26mm tape and reel  
N = 26mm ammo pack

C0G (NP0) Dielectric

## SIZE AND CAPACITANCE SPECIFICATIONS

Dimensions: Millimeters (Inches)



AVX Style	SA05	SA10			SA11		SA20		SA30		SA40								
		Length (L)	Diameter (D)	Lead Diameter	Lead Length	Cap. in pF	Typical AVX Part Nos.	WVDC 200	WVDC 100	WVDC 200	WVDC 100	WVDC 50	WVDC 100	WVDC 50	WVDC 100	WVDC 50	WVDC 100	WVDC 50	
1.0* ↓ 9.1*	SA102A1R0DAA ↓ SA102A9R1DAA																		
10 12 15	SA102A100JAA SA102A120JAA SA102A150JAA																		
18 22 27	SA102A180JAA SA102A220JAA SA102A270JAA																		
33 39 47	SA102A330JAA SA102A390JAA SA102A470JAA																		
56 68 82	SA102A560JAA SA102A680JAA SA102A820JAA																		
100 120 150	SA102A101JAA SA102A121JAA SA101A151JAA																		
180 220 270	SA101A181JAA SA101A221JAA SA101A271JAA																		
330 390 470	SA101A331JAA SA101A391JAA SA101A471JAA																		
560 680 820	SA101A561JAA SA101A681JAA SA101A821JAA																		
1000 1200 1500	SA105A102JAA SA201A122JAA SA201A152JAA																		
1800 2200 2700	SA205A182JAA SA301A222JAA SA301A272JAA																		
3300 3900 4700	SA301A332JAA SA301A392JAA SA305A472JAA																		
5600 6800 8200	SA401A562JAA SA401A682JAA SA405A822JAA																		
10,000 12,000	SA405A103JAA SA405A123JAA																		

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

**■** = Industry preferred values

\*"C&D" Tolerance Only

### SIZE AND CAPACITANCE SPECIFICATIONS

Dimensions: Millimeters (Inches)

AVX Style	SA05	SA10	SA11	SA20	SA30	SA40							
<b>Length (L)</b>	3.00 (.118")	4.32 (.170")	4.32 (.170")	6.60 (.260")	7.37 (.290")	10.16 (.400")							
<b>Diameter (D)</b>	2.30 (.090")	2.54 (.100")	3.05 (.120")	2.54 (.100")	3.81 (.150")	3.81 (.150")							
<b>Lead Diameter</b>	.407 (.016")	.483 (.019")	.483 (.019")	.483 (.019")	.483 (.019")	.483 (.019")							
<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		WVDC	
		200	100 50	200	100 50	100	50	100	50	100	50	100	50
220	SA102C221KAA												
270	SA102C271KAA												
330	SA102C331KAA												
390	SA102C391KAA												
470	SA102C471KAA												
560	SA101C561KAA												
680	SA101C681KAA												
820	SA101C821KAA												
1000	SA101C102KAA												
1200	SA101C122KAA												
1500	SA101C152KAA												
1800	SA101C182KAA												
2200	SA101C222KAA												
2700	SA101C272KAA												
3300	SA101C332KAA												
3900	SA101C392KAA												
4700	SA101C472KAA												
5600	SA101C562KAA												
6800	SA101C682KAA												
8200	SA105C822KAA												
<b>10,000</b>	<b>SA105C103KAA</b>												
12,000	SA105C123KAA												
15,000	SA105C153KAA												
18,000	SA105C183KAA												
22,000	SA105C223KAA												
27,000	SA105C273KAA												
33,000	SA105C333KAA												
39,000	SA105C393KAA												
<b>47,000</b>	<b>SA105C473KAA</b>												
56,000	SA115C563KAA												
68,000	SA115C683KAA												
82,000	SA115C823KAA												
<b>100,000</b>	<b>SA115C104KAA</b>												
120,000	SA305C124KAA												
150,000	SA305C154KAA												
180,000	SA305C184KAA												
<b>220,000</b>	<b>SA305C224KAA</b>												
270,000	SA305C274KAA												
330,000	SA305C334KAA												
470,000	SA405C474KAA												

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

= Industry preferred values

## Z5U Dielectric

### SIZE AND CAPACITANCE SPECIFICATIONS

Dimensions: Millimeters (Inches)

AVX Style	SA05	SA10	SA11	SA20	SA30	SA40
<b>Length (L)</b>	3.00 (.118")	4.32 (.170")	4.32 (.170")	6.60 (.260")	7.37 (.290")	10.16 (.400")
<b>Diameter (D)</b>	2.30 (.090")	2.54 (.100")	3.05 (.120")	2.54 (.100")	3.81 (.150")	3.81 (.150")
<b>Lead Diameter</b>	.407 (.016")	.483 (.019")	.483 (.019")	.483 (.019")	.483 (.019")	.483 (.019")
<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")
<b>Cap. in pF</b>	<b>Typical AVX Part Nos.</b>	<b>WVDC</b> 50	<b>WVDC</b> 100    50	<b>WVDC</b> 100    50	<b>WVDC</b> 100    50	<b>WVDC</b> 100    50
10,000 15,000 22,000	SA105E103ZAA SA105E153ZAA SA105E223ZAA					
33,000 47,000 68,000	SA105E333ZAA SA105E473ZAA SA105E683ZAA					
*100,000 150,000 220,000	SA105E104ZAA SA105E154ZAA SA105E224ZAA					
330,000 470,000 680,000	SA115E334ZAA SA305E474ZAA SA305E684ZAA					
820,000 1,000,000	SA305E824ZAA SA305E105ZAA					

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

= Industry preferred values

\*Preferred Industry Decoupling Capacitor — Insertable on .300" centers.  
SA105E104ZAA

## Extended Range SpinGuards

### GENERAL SPECIFICATIONS

#### Capacitance Range

220,000 pF, 330,000 pF, 1,000,000 pF

#### Capacitance Tolerances

±20%, [+80 -20]%

#### Operating Temperature Range

Z5U = +10°C to +85°C

#### Temperature Characteristics

E = Z5U

#### Voltage Ratings

50 Vdc

#### Dissipation Factor 25°C

Z5U = 4.0% max. at 1 KHz, .3 VRMS

#### Insulation Resistance 25°C (MIL-STD-202-Method 302)

Z5U = 10 K megohms or 100 megohms - μF minimum, whichever is less

#### Dielectric Strength

Z5U = 200% of rated voltage

#### Moisture Resistance (MIL-STD-202-Method 106)

#### Immersion Cycling (MIL-STD-202-Method 104, condition B)

For current reliability information, consult factory.

### SIZE AND CAPACITANCE SPECIFICATIONS

Dimensions: Millimeters (Inches)

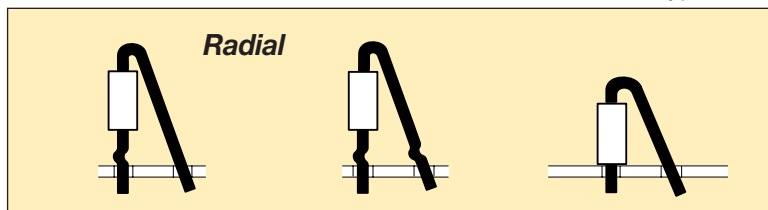
AVX Style	SA11*	SA30
<b>Length (L)</b>	4.32 (.170")	7.37 (.290")
<b>Diameter (D)</b>	3.05 (.120")	3.81 (.150")
<b>0.22 μF SA115E224ZAA</b>		
<b>0.33 μF **SA115E334ZAA</b>		
<b>1.0 μF SA305E105ZAA</b>		

\* Automatically insertable on 0.300" centers (see page 38 for reel packing details)

\*\* RAMGuard: the 0.33 μF value capacitance is recommended for decoupling 256K and 1 Meg Dynamic RAMs.

### Special Lead Configurations

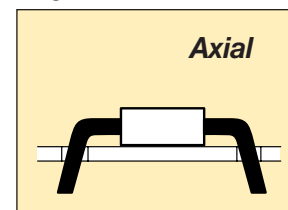
Dimensions — Body dimensions Per Standard SpinGuard Configurations.  
Formed dimensions as shown for types D, E, F, G, H, I, & J configurations.



D  
Single Crimp

E  
Dual Crimp

F  
No Crimp

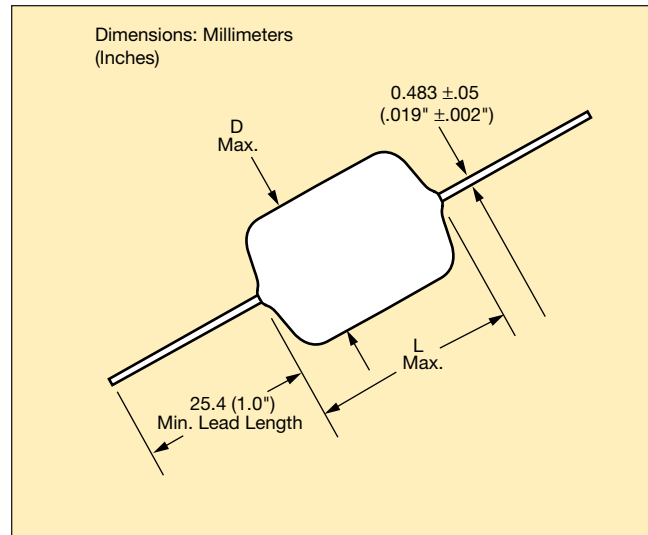


G = .300" L.S. I = .500" L.S.  
H = .400" L.S. J = .600" L.S.

Formed Dimensions:

	LEAD SPACING*	SEATED HEIGHT (Max.)		
	Nom.	D & E	F	G, H, I & J
SA10	.2"	.525"	.300"	.100"
SA20	.2"	.570"	.375"	.100"
SA30	.2"	.580"	.425"	.150"
SA40	.2"	.650"	.460"	.150"

\*Lead spacing can be varied by user to cover .1"- .3" spacing requirements for F, D, and E styles.

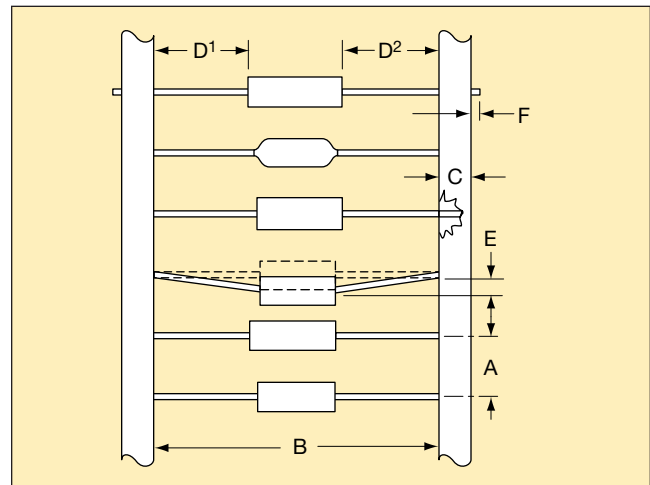


### ELECTRICAL PERFORMANCE CHARACTERISTICS AT TYPICAL 256K DRAM OPERATING CONDITIONS

Parameter	Test Conditions	Mi.	Typ.	Max.	Unit
$V_L$	di/dt = 200 ma/10 ns	—	80	90	mv
Inductance, L		—	4.0	4.5	nh
dv/dt	20 ns after pulse				
Capacitance, C	di/dt = 200 ma/10 ns	—	0.53	—	mv/ns
ESR	Resonance Freq., 4-5 MHz	.24	.33	—	μF
Impedance (Total)	100 MHz (HP- 4192A)	—	.03	.08	Ω
Recovery Time, $t_R$		—	4.4	5.0	Ω
		—	20	—	ns

## TAPE AND REEL

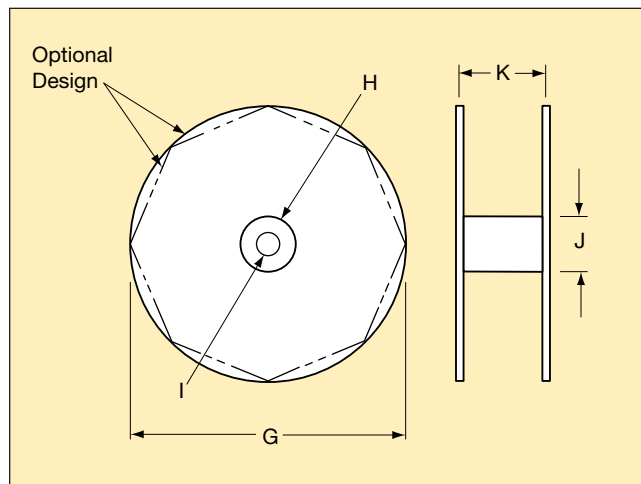
CLASS I / RS-296	
A.	5mm ± 0.5mm (.200" ± 0.020")
B*	52.4mm ± 1.5mm (2.063" ± 0.059")
C.	6.35mm ± 0.4mm (0.250" ± 0.016")
D <sup>1</sup> -D <sup>2</sup> .	1.4mm (0.055" MAX.)
E.	1.2mm (0.047" MAX.)
F.	1.6mm (0.063" MAX.)
G.	356mm (14.00")
H.	76mm (3.000")
I.	25.4mm (1.000")
J.	84mm (3.300")
K.	70mm (2.750")



**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	MA10, SA05, SA10 MA20, SA20	SA11 SA30	MA30 MA40, 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)