# Axial Leads/SpinGuard®

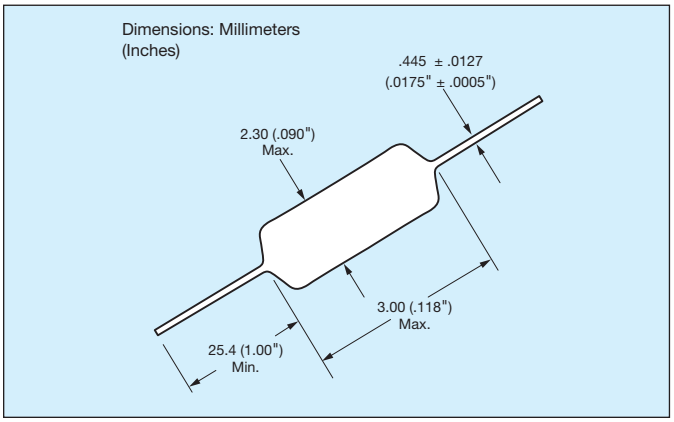
## GENERAL DESCRIPTION

**AVX SA Series**
**Conformally Coated Axial Leaded MLC**

**Temperature Coefficients:** C0G (NP0), X7R, X5R, Z5U
10, 50, 100, 200 Volts

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

**Lead Material:** Solderable



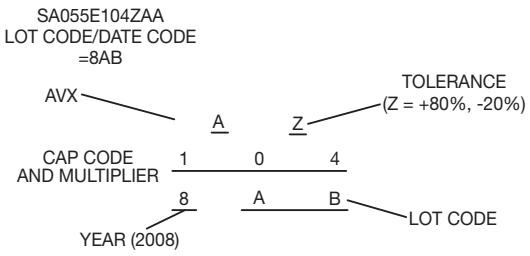

## HOW TO ORDER

| SA10 | 5 | E | 104 | Z | A | R |
|---|---|---|---|---|---|---|
| **Conformal Axial Size** | **Voltage** | **Dielectric** | **Capacitance** | **Capacitance Tolerance** | **Failure Rate** | **Leads** |
| SA05<br>SA10<br>SA11<br>SA20<br>SA30<br>SA40 | Z = 10V<br>5 = 50V<br>1 = 100V<br>2 = 200V | A = C0G (NP0)<br>C = X7R<br>D = X5R<br>E = Z5U | 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.) | C0G (NP0):<br>C = ±.25pF<br>D = ±.5pF<br>F = ±1%<br>G = ±2%<br>J = ±5%<br>K = ±10%<br><br>X7R:<br>J = ±5%<br>K = ±10%<br>M = ±20%<br><br>X5R:<br>K = ±10%<br>M = ±20%<br><br>Z5U:<br>M = ±20%<br>Z = +80%<br>-20% | A = Not Applicable | Standard (Solderable)<br>R = RoHS Compliant<br>A = Standard Solderable |

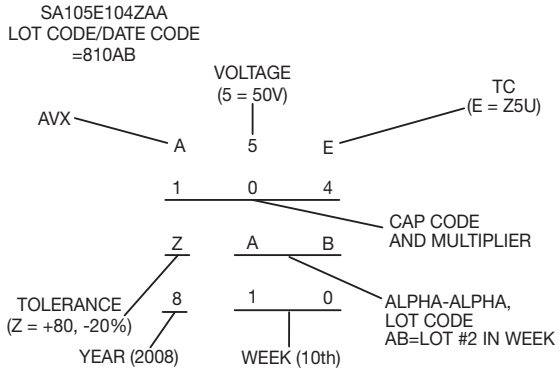
## MARKING (EXAMPLE)

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.

### *SA05*




### *SA10, 11, 20, 30, 40*



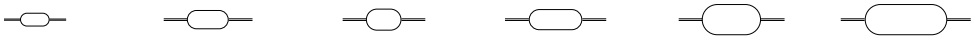

## PACKAGING REQUIREMENTS

A = Standard Reels (see Page 48)
B = 1000 piece reels (distributors only, tight tolerance only)
C = Ammo Pack (see Page 48)
D thru J = See Special Lead Configurations (Page 41)
M = 26mm tape and reel
N = 26mm ammo pack
R = RoHS, Standard reels (See page 48)

# Axial Leads/SpinGuard®

## C0G (NP0) Dielectric

## SIZE AND CAPACITANCE SPECIFICATIONS



Dimensions: Millimeters (Inches)

| | AVX Style | SA05 | | SA10 | | | SA11 | | SA20 | | SA30 | | SA40 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Length (L) | 3.00 (.118") | | 4.32 (.170") | | | 4.32 (.170") | | 6.60 (.260") | | 7.37 (.290") | | 10.16 (.400") | |
| | Diameter (D) | 2.30 (.090") | | 2.54 (.100") | | | 3.05 (.120") | | 2.54 (.100") | | 3.81 (.150") | | 3.81 (.150") | |
| | Lead Diameter | .445 (.0175") | | .445 (.0175") | | | .445 (.0175") | | .445 (.0175") | | .445 (.0175") | | .445 (.0175") | |
| | 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 200 | 100 | 200 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 |
| 1.0* ↓ 9.1* | SA102A1R0DAR ↓ SA102A9R1DAR | | | | | | | | | | | | | |
| 10<br>12<br>15 | SA102A100JAR<br>SA102A120JAR<br>SA102A150JAR | | | | | | | | | | | | | |
| 18<br>22<br>27 | SA102A180JAR<br>SA102A220JAR<br>SA102A270JAR | | | | | | | | | | | | | |
| 33<br>39<br>47 | SA102A330JAR<br>SA102A390JAR<br>SA102A470JAR | | | | | | | | | | | | | |
| 56<br>68<br>82 | SA102A560JAR<br>SA102A680JAR<br>SA102A820JAR | | | | | | | | | | | | | |
| **100**<br>120<br>150 | **SA102A101JAR**<br>SA102A121JAR<br>SA101A151JAR | | | | | | | | | | | | | |
| 180<br>220<br>270 | SA101A181JAR<br>SA101A221JAR<br>SA101A271JAR | | | | | | | | | | | | | |
| 330<br>390<br>470 | SA101A331JAR<br>SA101A391JAR<br>SA101A471JAR | | | | | | | | | | | | | |
| 560<br>680<br>820 | SA101A561JAR<br>SA101A681JAR<br>SA101A821JAR | | | | | | | | | | | | | |
| **1000**<br>1200<br>1500 | **SA105A102JAR**<br>SA201A122JAR<br>SA201A152JAR | | | | | | | | | | | | | |
| 1800<br>**2200**<br>2700 | SA205A182JAR<br>**SA301A222JAR**<br>SA301A272JAR | | | | | | | | | | | | | |
| 3300<br>3900<br>**4700** | SA301A332JAR<br>SA301A392JAR<br>**SA305A472JAR** | | | | | | | | | | | | | |
| 5600<br>6800<br>8200 | SA401A562JAR<br>SA401A682JAR<br>SA405A822JAR | | | | | | | | | | | | | |
| **10,000**<br>12,000 | **SA405A103JAR**<br>SA405A123JAR | | | | | | | | | | | | | |

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

**= Industry preferred values**

*"C&D" Tolerance Only

# Axial Leads/SpinGuard®

## X7R Dielectric

## SIZE AND CAPACITANCE SPECIFICATIONS

Dimensions: Millimeters (Inches)

| | AVX Style | SA05 | | | SA10 | | | SA11 | | SA20 | | SA30 | | SA40 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Length (L) | 3.00 (.118") | | | 4.32 (.170") | | | 4.32 (.170") | | 6.60 (.260") | | 7.37 (.290") | | 10.16 (.400") | |
| | Diameter (D) | 2.30 (.090") | | | 2.54 (.100") | | | 3.05 (.120") | | 2.54 (.100") | | 3.81 (.150") | | 3.81 (.150") | |
| | Lead Diameter | .445 (.0175") | | | .445 (.0175") | | | .445 (.0175") | | .445 (.0175") | | .445 (.0175") | | .445 (.0175") | |
| | 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 200 | 100 | 50 | 200 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 |
| 220 | SA102C221KAR | | | | | | | | | | | | | | |
| 270 | SA102C271KAR | | | | | | | | | | | | | | |
| 330 | SA102C331KAR | | | | | | | | | | | | | | |
| 390 | SA102C391KAR | | | | | | | | | | | | | | |
| 470 | SA102C471KAR | | | | | | | | | | | | | | |
| 560 | SA101C561KAR | | | | | | | | | | | | | | |
| 680 | SA101C681KAR | | | | | | | | | | | | | | |
| 820 | SA101C821KAR | | | | | | | | | | | | | | |
| 1000 | SA101C102KAR | | | | | | | | | | | | | | |
| 1200 | SA101C122KAR | | | | | | | | | | | | | | |
| 1500 | SA101C152KAR | | | | | | | | | | | | | | |
| 1800 | SA101C182KAR | | | | | | | | | | | | | | |
| 2200 | SA101C222KAR | | | | | | | | | | | | | | |
| 2700 | SA101C272KAR | | | | | | | | | | | | | | |
| 3300 | SA101C332KAR | | | | | | | | | | | | | | |
| 3900 | SA101C392KAR | | | | | | | | | | | | | | |
| 4700 | SA101C472KAR | | | | | | | | | | | | | | |
| 5600 | SA101C562KAR | | | | | | | | | | | | | | |
| 6800 | SA101C682KAR | | | | | | | | | | | | | | |
| 8200 | SA105C822KAR | | | | | | | | | | | | | | |
| **10,000** | **SA105C103KAR** | | | | | | | | | | | | | | |
| 12,000 | SA105C123KAR | | | | | | | | | | | | | | |
| 15,000 | SA105C153KAR | | | | | | | | | | | | | | |
| 18,000 | SA105C183KAR | | | | | | | | | | | | | | |
| 22,000 | SA105C223KAR | | | | | | | | | | | | | | |
| 27,000 | SA105C273KAR | | | | | | | | | | | | | | |
| 33,000 | SA105C333KAR | | | | | | | | | | | | | | |
| 39,000 | SA105C393KAR | | | | | | | | | | | | | | |
| **47,000** | **SA105C473KAR** | | | | | | | | | | | | | | |
| 56,000 | SA115C563KAR | | | | | | | | | | | | | | |
| 68,000 | SA115C683KAR | | | | | | | | | | | | | | |
| 82,000 | SA115C823KAR | | | | | | | | | | | | | | |
| **100,000** | **SA115C104KAR** | | | | | | | | | | | | | | |
| 120,000 | SA305C124KAR | | | | | | | | | | | | | | |
| 150,000 | SA305C154KAR | | | | | | | | | | | | | | |
| 180,000 | SA305C184KAR | | | | | | | | | | | | | | |
| **220,000** | **SA305C224KAR** | | | | | | | | | | | | | | |
| 270,000 | SA305C274KAR | | | | | | | | | | | | | | |
| 330,000 | SA305C334KAR | | | | | | | | | | | | | | |
| 470,000 | SA405C474KAR | | | | | | | | | | | | | | |

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

**= Industry preferred values**

# Axial Leads/SpinGuard®

## Z5U Dielectric

## SIZE AND CAPACITANCE SPECIFICATIONS

Dimensions: Millimeters (Inches)

| | AVX Style | SA05 | SA10 | | SA11 | | SA20 | | SA30 | | SA40 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Length (L) | 3.00 (.118") | 4.32 (.170") | | 4.32 (.170") | | 6.60 (.260") | | 7.37 (.290") | | 10.16 (.400") | |
| | Diameter (D) | 2.30 (.090") | 2.54 (.100") | | 3.05 (.120") | | 2.54 (.100") | | 3.81 (.150") | | 3.81 (.150") | |
| | Lead Diameter | .445 (.0175") | .445 (.0175") | | .445 (.0175") | | .445 (.0175") | | .445 (.0175") | | .445 (.0175") | |
| | 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 50 | WVDC 100 | 50 | WVDC 100 | 50 | WVDC 100 | 50 | WVDC 100 | 50 | WVDC 100 | 50 |
| **10,000** | **SA105E103ZAR** | | | | | | | | | | | |
| 15,000 | SA105E153ZAR | | | | | | | | | | | |
| 22,000 | SA105E223ZAR | | | | | | | | | | | |
| 33,000 | SA105E333ZAR | | | | | | | | | | | |
| 47,000 | SA105E473ZAR | | | | | | | | | | | |
| 68,000 | SA105E683ZAR | | | | | | | | | | | |
| ***100,000** | **SA105E104ZAR** | | | | | | | | | | | |
| 150,000 | SA105E154ZAR | | | | | | | | | | | |
| **220,000** | **SA105E224ZAR** | | | | | | | | | | | |
| **330,000** | **SA115E334ZAR** | | | | | | | | | | | |
| **470,000** | **SA305E474ZAR** | | | | | | | | | | | |
| 680,000 | SA305E684ZAR | | | | | | | | | | | |
| 820,000 | SA305E824ZAR | | | | | | | | | | | |
| **1,000,000** | **SA305E105ZAR** | | | | | | | | | | | |

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**

# Axial Leads/SpinGuard®

## X5R Dielectric

## SIZE AND CAPACITANCE SPECIFICATIONS

Dimensions: Millimeters (Inches)

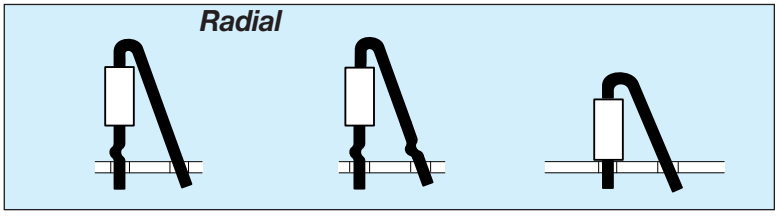
| | AVX Style | SA10 |
|---|---|---|
| | Length (L) | 4.32 (.170") |
| | Diameter (D) | 2.54 (.100") |
| | Lead Diameter | .445 (.0175") |
| | Lead Length | 25.4 (1.00") |
| Cap. in µF | Typical AVX Part Nos. | WVDC 10 |
| 1.8 | SA10ZD185KAR | |
| 2.7 | SA10ZD275KAR | |
| 3.3 | SA10ZD335KAR | |
| 4.7 | SA10ZD475KAR | |

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

= Industry preferred values

## SPECIAL LEAD CONFIGURATIONS

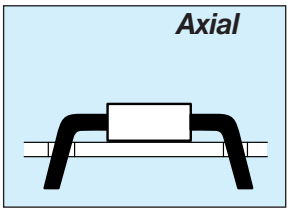
Dimensions — Body dimensions Per Standard SpinGuard Configurations.
Formed dimensions as shown for types D, E, F, G, H, I, & J configurations.




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.

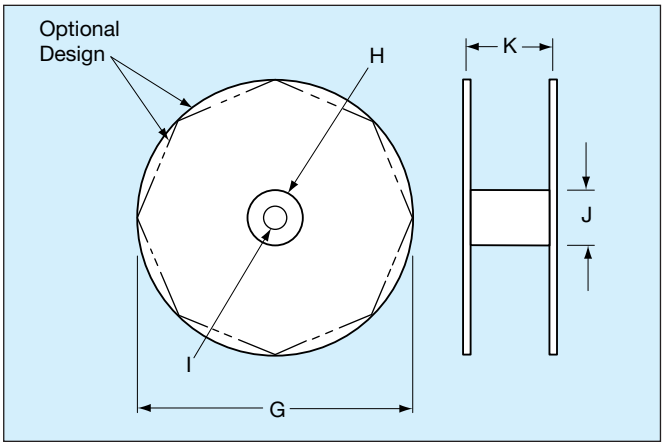
Formed Dimensions:

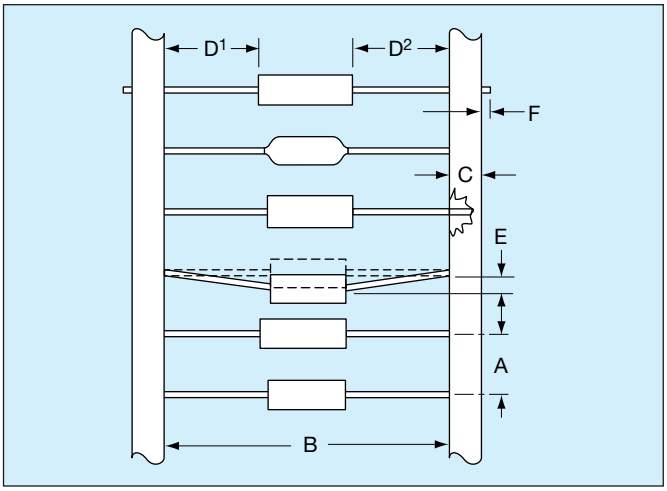
| | LEAD SPACING* | SEATED HEIGHT (Max.) | | |
|---|---|---|---|---|
| | Nom. | D & E | F | G, H, I & J |
| SA10 | .2" | .525" | .300" | .100" |
| SA20 | .2" | .570" | .375" | .100" |
| SA30 | .2" | .580" | .425" | .150" |
| SA40 | .2" | .650" | .460" | .150" |

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

## 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<br>MA20<br>MA30<br>MA40 | 100 pcs. (bag) |
| MA50<br>MA60 | 50 pcs. (bag) |