

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		WVDC			WVDC		WVDC		WVDC		WVDC	
		200	100	200	100	50	100	50	100	50	100	50	100	50
1.0* ↓ 9.1*	SA102A1R0DAR ↓ SA102A9R1DAR													
10 12 15	SA102A100JAR SA102A120JAR SA102A150JAR													
18 22 27	SA102A180JAR SA102A220JAR SA102A270JAR													
33 39 47	SA102A330JAR SA102A390JAR SA102A470JAR													
56 68 82	SA102A560JAR SA102A680JAR SA102A820JAR													
100 120 150	SA102A101JAR SA102A121JAR SA101A151JAR													
180 220 270	SA101A181JAR SA101A221JAR SA101A271JAR													
330 390 470	SA101A331JAR SA101A391JAR SA101A471JAR													
560 680 820	SA101A561JAR SA101A681JAR SA101A821JAR													
1000 1200 1500	SA105A102JAR SA201A122JAR SA201A152JAR													
1800 2200 2700	SA205A182JAR SA301A222JAR SA301A272JAR													
3300 3900 4700	SA301A332JAR SA301A392JAR SA305A472JAR													
5600 6800 8200	SA401A562JAR SA401A682JAR SA405A822JAR													
10,000 12,000	SA405A103JAR SA405A123JAR													

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	
Length (L)		3.00 (.118")			4.32 (.170")			4.32 (.170")		6.60 (.260")		7.37 (.290")		10.16 (.400")	
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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			WVDC			WVDC		WVDC		WVDC		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														
1,000,000	SA305C105KAR														

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

= Industry preferred values

Axial Leads/SpinGuard®



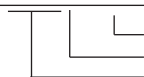
Z5U Dielectric

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
10,000 15,000 22,000	SA105E103ZAR SA105E153ZAR SA105E223ZAR					
33,000 47,000 68,000	SA105E333ZAR SA105E473ZAR SA105E683ZAR					
*100,000 150,000 220,000	SA105E104ZAR SA105E154ZAR SA105E224ZAR					
330,000 470,000 680,000	SA115E334ZAR SA305E474ZAR SA305E684ZAR					
820,000 1,000,000	SA305E824ZAR 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 μ F	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

Axial Leads/SpinGuard®/AA Series



Automotive

GENERAL DESCRIPTION

AVX AA Series

Electrical Characteristics: AA101C103K4R

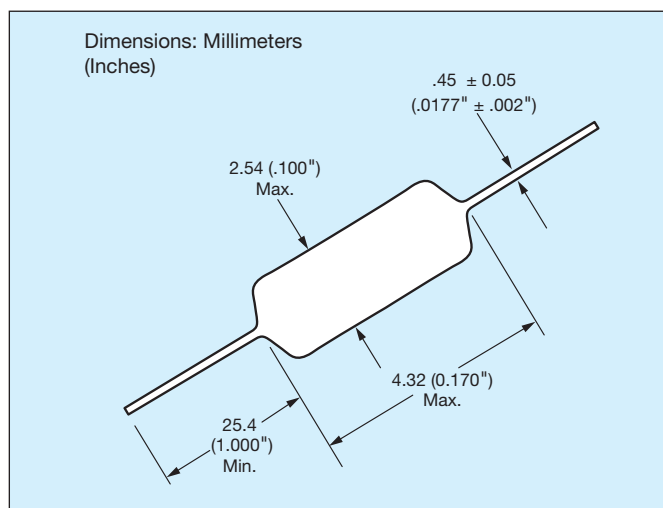
Capacitance @ 25°C, 1kHz, 1Vrms	0.0100μF
Capacitance Tolerance	±10 %
Dissipation Factor @ 25°C	2.5% Max
Rated Voltage	100Vdc
Dielectric Withstand Voltage	250Vdc
Insulation Resistance @ 25°C @ Rated Voltage	100000 Mohms

Temperature Characteristics:

X7R (-55 to + 125°C ± 15% @ 0Vdc)

Lead Material:

RoHS Compliant 100% Tin



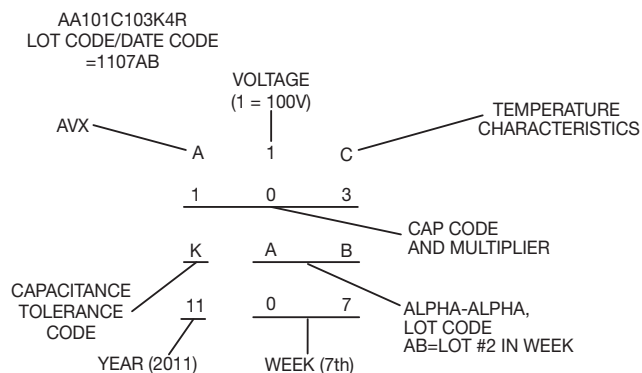
HOW TO ORDER

AA10	1	C	103	K	4	R
Component Size	Voltage Rating	Temperature Characteristic Code	Capacitance Code	Capacitance Tolerance Code	Failure Rate 4 = Automotive	RoHS Compliant



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.



PACKAGING REQUIREMENTS

Tape and Reel Ø 14": 7500 pieces

Axial Leads/SpinGuard®/AA Series

Automotive — C0G (NP0) Dielectric



SIZE AND CAPACITANCE SPECIFICATIONS

Dimensions: Millimeters (Inches)



AVX Style		AA10			AA30	
Length (L)		4.32 (.170")			7.37 (.290")	
Diameter (D)		2.54 (.100")			3.81 (.150")	
Lead Diameter		.445 (.0175")			.445 (.0175")	
Lead Length		25.4 (1.00")			25.4 (1.00")	
Cap. in * pF	Typical AVX Part Nos.	200	WVDC 100	50	100	WVDC 50
100	AA__A101K4R					
120	AA__A121K4R					
150	AA__A151K4R					
180	AA__A181K4R					
220	AA__A221K4R					
270	AA__A271K4R					
330	AA__A331K4R					
390	AA__A391K4R					
470	AA__A471K4R					
560	AA__A561K4R					
680	AA__A681K4R					
820	AA__A821K4R					
1,000	AA__A102K4R					
1,200	AA__A122K4R					
1,500	AA__A152K4R					
1,800	AA__A182K4R					
2,200	AA__A222K4R					
2,700	AA__A272K4R					
3,300	AA__A332K4R					
3,900	AA__A392K4R					
4,700	AA__A472K4R					
5,600	AA__A562K4R					
6,800	AA__A682K4R					
8,200	AA__A822K4R					
10,000	AA__A103K4R					

For other voltage and tolerances contact factory.
 *Other capacitance values available upon special request.



Axial Leads/SpinGuard®/AA Series



Automotive — X7R Dielectric

SIZE AND CAPACITANCE SPECIFICATIONS

Dimensions: Millimeters (Inches)



AVX Style		AA10		AA30	
Length (L)		4.32 (.170")		7.37 (.290")	
Diameter (D)		2.54 (.100")		3.81 (.150")	
Lead Diameter		.445 (.0175")		.445 (.0175")	
Lead Length		25.4 (1.00")		25.4 (1.00")	
Cap. in * pF	Typical AVX Part Nos.	WVDC		WVDC	
		100	50	100	50
220	AA_C221KAR				
270	AA_C271KAR				
330	AA_C331KAR				
390	AA_C391KAR				
470	AA_C471KAR				
560	AA_C561KAR				
680	AA_C681KAR				
820	AA_C821KAR				
1,000	AA_C102KAR				
1,200	AA_C122KAR				
1,500	AA_C152KAR				
1,800	AA_C182KAR				
2,200	AA_C222KAR				
2,700	AA_C272KAR				
3,300	AA_C332KAR				
3,900	AA_C392KAR				
4,700	AA_C472KAR				
5,600	AA_C562KAR				
6,800	AA_C682KAR				
8,200	AA_C822KAR				
10,000	AA_C103KAR				
12,000	AA_C123KAR				
15,000	AA_C153KAR				
18,000	AA_C183KAR				
22,000	AA_C223KAR				
27,000	AA_C273KAR				
33,000	AA_C333KAR				
39,000	AA_C393KAR				
47,000	AA_C473KAR				
56,000	AA_C563KAR				
68,000	AA_C683KAR				
82,000	AA_C823KAR				
100,000	AA_C104KAR				

For other voltage and tolerances contact factory.

*Other capacitance values available upon special request.

GENERAL DESCRIPTION

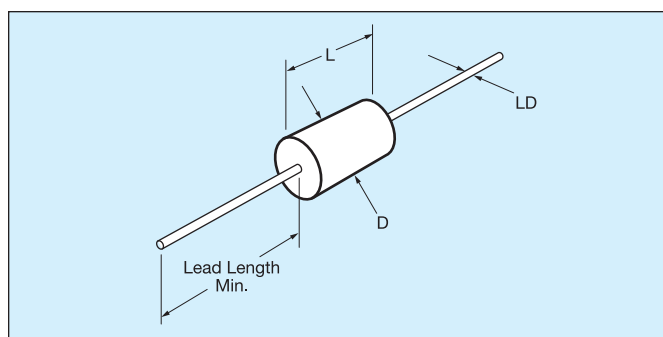
AVX MA Series

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 = ±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

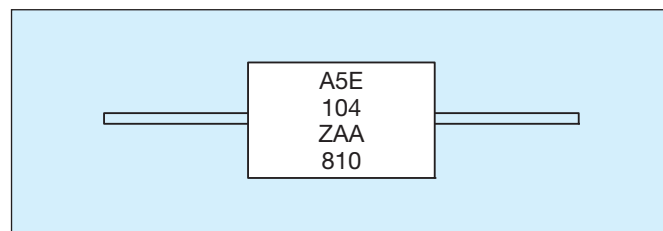
‡ C tolerance available C0G (NP0) from 1.0 to 9.1 pF only. Minimum tolerance for values 10 pF - 100 pF is D or F whichever is greater.

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)

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 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

SIZE AND CAPACITANCE SPECIFICATIONS



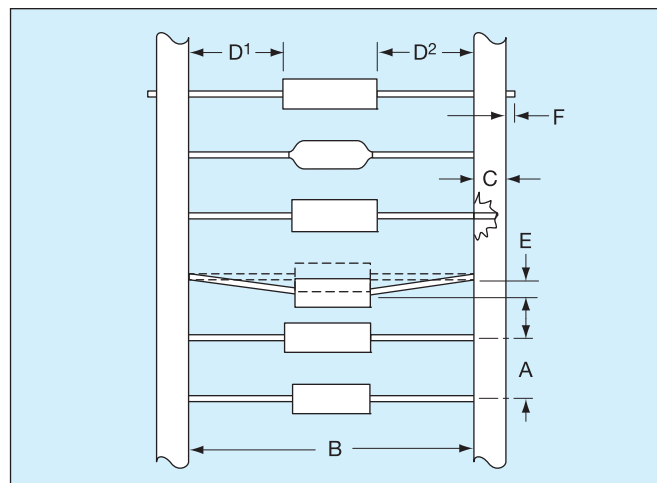
Dimensions: Millimeters (Inches)

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																		
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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

TAPE AND REEL

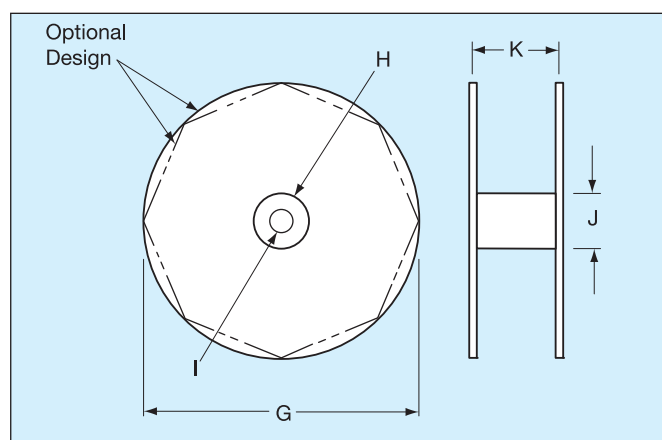
CLASS I / RS-296	
A.	5mm ± 0.5mm (.200" ± 0.020")
B*.	52.4mm ± 1.5mm (2.063" ± 0.059")
C.	6.35mm ± 0.4mm (0.250" ± 0.016")
D ¹ -D ² .	1.4mm (0.055" MAX.)
E.	1.2mm (0.047" MAX.)
F.	1.6mm (0.063" MAX.)
G.	356mm (14.00")
H.	76mm (3.000")
I.	25.4mm (1.000")
J.	84mm (3.300")
K.	70mm (2.750")



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)