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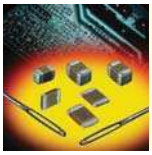
Product Line

CERAMIC CAPACITORS



Surface Mount Multilayer Ceramic Capacitors

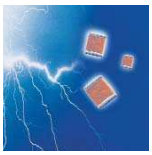
Automotive	HiCV
MIL/COTS-Plus/Space	High Temperature
CDR/High Reliability	Array
Flexiterm®	Tip and Ring
Flexisafe™	Low Distortion
Ultrathin	Gold Terminated
Tin/Lead	Tin/Lead w Flexiterm®

Switch Mode Power Supply Capacitors (SMPS)

MIL/Space	High Temp
Leaded	High Voltage
TurboCap™	

Leaded Multilayer Ceramic Capacitors

Axial	High Voltage
Radial	MIL/Space/High Reliability
2-Pin Dip	

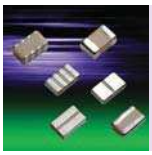


High Voltage

Surface Mount	Flexiterm®
Leaded	MIL

Glass Capacitor

LOW INDUCTANCE / SIGNAL INTEGRITY



Reverse Geometry

Interdigitated

Ultra Low Inductance

CoreCap® Hybrid Niobium Oxide - MLCC

Low Inductance Array

TANTALUM CAPACITORS

Surface Mount Tantalum Capacitors

Low ESR	High Temp (THJ)
CWR	Established Reliability
Polymer	TACmicrochip®
Fused	Tin/Lead

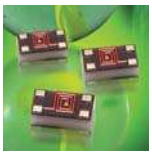
Leaded Tantalum Capacitors

Wet Tantalum
Radial Leaded

Niobium Oxide / OxiCap®

Low ESR
COTS-Plus
Multianode

RF PRODUCTS



Inductors – Thin-Film

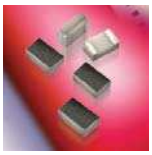
Filters

Band Pass	Custom
Low Pass	EMI

Passive Miniaturized Components

Couplers

3dB	3dB 90°
High Directivity	Splitter/Combiner



Capacitors

Microwave	Medium Power
Single Layer	Tight Tolerance/Thin-Film
High Power	RF Capacitors
Broadband	DC Block

ENERGY HARVESTING

Film Capacitors

Surface Mount Film Capacitors
Medium Power Film
High Power Film

Ceramic Capacitors

Molded Ceramic
Stacked Ceramic

Tantalum Capacitors

Multi-Anode (low ESR)
Stacked Capacitors

Pulse Power Supercap

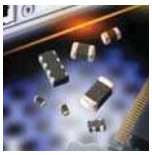
BestCap®

Product Line

CIRCUIT PROTECTION

MLV Transient Voltage Suppressors

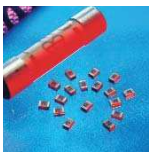
Varistors
Multi-element Varistors
Feedthru Varistors
Application Specific Varistors



- AntennaGuard
- USB Series
- CAN Series
- StaticGuard
- Automotive Series
- High Temperature
- Sub pF
- Low Leakage
- Maxcap
- Capguard
- Medium Power Varistors

Thermistors

Negative Temperature Compensation
- Leaded
- Surface Mount



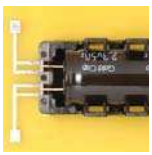
Fuses – Thin-Film

CONNECTORS

LED/Solid State Lighting

Wire to Board
Board to Board
End Cap

Board to Board



DIN 41612 2-Piece
Compression Low Profile 1-Piece
Microleaf/Fine Pitch 2-Piece

FFC/FPC

ZIF/LIF

Automotive

Custom connectors/modules
Pressfit
Insulation Displacement

Portable Devices

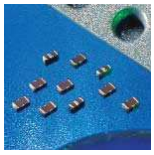
Battery
SIM
Memory Products
Speaker/Microphone
I/O

FILTERS

EMI Filters

- Surface Mount
- High Current
- Bulkhead
- MIL/Space

Noise Filters



Low Pass Filters

Ceramic Filters

SAW Filters

Filtered Arrays

Optical Low Pass

PIEZOELECTRIC DEVICES

Telephone Ringer/External Drive

External Drive/Self-Oscillating

Shock Sensor

Actuator

TIMING PRODUCTS

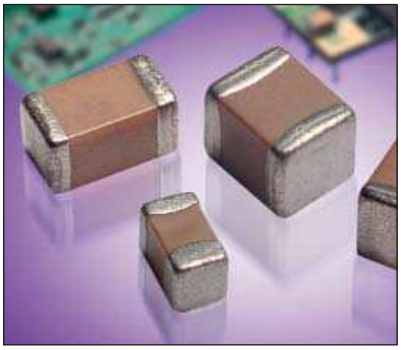
Oscillators

Crystals

Resonators

Standard NP0 (C0G) MLCC

Standard NP0 Dielectric



C0G (NP0) is the most popular formulation of the "temperature-compensating," EIA Class I ceramic materials. Modern C0G (NP0) formulations contain neodymium, samarium and other rare earth oxides.

C0G (NP0) ceramics offer one of the most stable capacitor dielectrics available. Capacitance change with temperature is 0 ±30ppm/°C which is less than ±0.3% ΔC from -55°C to +125°C. Capacitance drift or hysteresis for C0G (NP0) ceramics is negligible at less than ±0.05% versus up to ±2% for films. Typical capacitance change with life is less than ±0.1% for C0G (NP0), one-fifth that shown by most other dielectrics. C0G (NP0) formulations show no aging characteristics.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/ccog.pdf

HOW TO ORDER

0805	5	A	101	J	A	T	2	A
Size (L" x W")	**Voltage** Y = 16V 3 = 25V 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Dielectric** C0G (NP0) = A	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** B = ±.10 pF (<10pF) C = ±.25 pF (<10pF) D = ±.50 pF (<10pF) F = ±1% (≥ 10 pF) G = ±2% (≥ 10 pF) J = ±5% K = ±10%	**Failure Rate** A = Not Applicable	**Terminations** T = Plated Ni and Sn 7 = Gold Plated **Contact Factory For 1 = Pd/Ag Term**	**Packaging** 2 = 7" Reel 4 = 13" Reel 7 = Bulk Cass. 9 = Bulk **Contact Factory For Multiples**	**Special Code** A = Std. Product

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

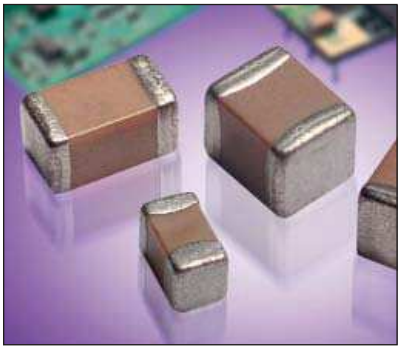
SIZE		0201		0402			0603				0805					1206						1210					1812					1825			2220			2225		
	WVDC	25	50	16	25	50	16	25	50	100	16	25	50	100	200	16	25	50	100	200	500	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200	50	100	200
Cap (pF)	0.5	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	1.0	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	1.2	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	1.5	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	1.8	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	2.2	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	2.7	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	3.3	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	3.9	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	4.7	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	5.6	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	6.8	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	8.2	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	10	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	12	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	15	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	18	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	22	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	27	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	33	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	39	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	47	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	56	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	68	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	82	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	100	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	120			C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	150			C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	180			C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	220			C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	M					J													
	270			C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M					J													
	330			C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M					J													
	390			C	C	C	G	G	G		J	J	J	J	M	J	J	J	J	J	M					M													
	470						G	G	G		J	J	J	J	M	J	J	J	J	J	M					M													
	560						G	G	G		J	J	J	J	M	J	J	J	J	J	M	J	J	J	J	M													
	680						G	G	G		J	J	J	J	P	J	J	J	J	J	P	J	J	J	J	M													
	820						G	G	G		J	J	J	J		J	J	J	J	M		J	J	J	J	M													
	1000						G	G	G		J	J	J	J		J	J	J	J	Q		J	J	J	J	M	K	K	K	K	M	M	M	M				M	M	P
	1200										J	J	J			J	J	J	J	Q		J	J	J	M	M	K	K	K	K	M	M	M	M				M	M	P
	1500										J	J	J			J	J	J	M	Q		J	J	J	M	M	K	K	K	K	M	M	M	M				M	M	P
	1800										J	J	J			J	J	M	M			J	J	J	M		K	K	K	K	M	M	M	M				M	M	P
	2200										J	J	N			J	J	M	P			J	J	J	Q		K	K	K	P	Q	M	M	M				M	M	P
	2700										J	J	N			J	J	M	P			J	J	J	Q		K	K	K	P	Q	M	M	M				M	M	P
	3300										J	J				J	J	M	P			J	J	J			K	K	K	P	Q	M	M	M		X	X	M	M	P
	3900										J	J				J	J	M	P			J	J	M			K	K	K	P	Q	M	M	M	X	X	X	M	M	P
	4700										J	J				J	J	M	P			J	J	M			K	K	K	P	Q	M	M	M	X	X	X	M	M	P
	5600															J	J	M				J	J				K	K	M	P	X	M	M	M	X	X	X	M	M	P
	6800															M	M					J	J				K	K	M	M		M	M	M	X	X	X	M	M	P
	8200															M	M					J	J				K	M	M			M	M		X	X	X	M	M	P
Cap (µF)	0.010															M	M					J	J				K	M	M	M		M	M	M	X	X	X	M	M	P
	0.012																										K	M	M			M	M		X	X	X	M	M	P
	0.015																										K	M	M			M	M		X	X	X	M	M	Y
	0.018																										M	M				P	M		X	X	X	M	M	Y
	0.022																										M	M				P			X	X	X	M	Y	Y
	0.027																										M	M				P			X	X		M	Y	Y
	0.033																										M	M				P			X	X		P		
	0.039																										M	M				P			Y			P		
	0.047																										M	M				P						P		
	0.068																										M	M										P		
	0.082																																					Q		
	0.1																																					Q		
	WVDC	25	50	16	25	50	16	25	50	100	16	25	50	100	200	16	25	50	100	200	500	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200	50	100	200
SIZE		0201		0402			0603				0805					1206						1210					1812					1825			2220			2225		

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

RoHS COMPLIANT

Standard X7R MLCC

Standard X7R Dielectric



X7R formulations are classified as "temperature stable" ceramics and fall into EIA Class II materials. X7R is the most popular of these intermediate dielectric constant materials. Its temperature variation of capacitance is within ±15% from -55°C to +125°C. This capacitance change is non-linear.

Capacitance for X7R varies under the influence of electrical operating conditions such as voltage and frequency.

X7R dielectric chip usage covers the broad spectrum of industrial applications where known changes in capacitance due to applied voltages are acceptable.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cx7r.pdf

HOW TO ORDER

0805	5	C	103	M	A	T	2	A
Size (L" x W")	**Voltage** 6 = 6.3V Z = 10V Y = 16V 3 = 25V 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Dielectric** X7R = C	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** J = ± 5%* K = ±10% M = ± 20% *≤1µF only	**Failure Rate** A = Not Applicable	**Terminations** T = Plated Ni and Sn 7 = Gold Plated* Z = FLEXITERM®** *Optional termination **See FLEXITERM® X7R section	**Packaging** 2 = 7" Reel 4 = 13" Reel 7 = Bulk Cass. 9 = Bulk **Contact Factory For Multiples**	**Special Code** A = Std. Product

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

SIZE		0201			0402			0603							0805							1206								1210							1812				1825		2220				2225	
	WVDC	10	16	25	16	25	50	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	500	10	16	25	50	100	200	500	50	100	200	500	50	100	25	50	100	200	50	100
Cap (pF)	100	A	A	A			C					G	G	G		J	J	J	J	J	J							K						M													
	150	A	A	A			C					G	G	G		J	J	J	J	J	J							K						M													
	220	A	A	A			C					G	G	G		J	J	J	J	J	J							K						M													
	330	A	A	A			C					G	G	G		J	J	J	J	J	J							K						M													
	470	A	A				C					G	G	G		J	J	J	J	J	J							K						M													
	680	A	A				C					G	G	G		J	J	J	J	J	J							K						M													
	1000	A	A				C					G	G	G		J	J	J	J	J	J							K						M													
	1500	A					C					G	G			J	J	J	J	J	J		J	J	J	J	J	M		J	J	J	J	J	J	M											
	2200	A					C					G	G			J	J	J	J	J	J		J	J	J	J	J	M		J	J	J	J	J	J	M											
	3300	A				C	C					G	G			J	J	J	J	J	J		J	J	J	J	J	M		J	J	J	J	J	J	M											
	4700	A				C	C					G	G			J	J	J	J	J	J		J	J	J	J	J	M		J	J	J	J	J	J	M											
	6800	A			C	C						G	G			J	J	J	J	J	J		J	J	J	J	J	M		J	J	J	J	J	J	M											
Cap (µF	0.010	A			C	C						G	G	G		J	J	J	J	J	J		J	J	J	J	J	M		J	J	J	J	J	J	M	K	K	K	K	M	M		X	X	X	M	P
	0.015				C						G	G				J	J	J	J	J	M		J	J	J	J	J	P		J	J	J	J	J	J	Q	K	K	K	P	M	M		X	X	X	M	P
	0.022				C						G	G				J	J	J	J	J	M		J	J	J	J	J	Q		J	J	J	J	J	J		K	K	K	P	M	M		X	X	X	M	P
	0.033										G	G				J	J	J	J	N			J	J	J	J	J	M		J	J	J	J	J	J	Q	K	K	K	X	M	M		X	X	X	M	P
	0.047									G	G	G				J	J	J	J	N			J	J	J	J	J	M		J	J	J	J	J	J		K	K	K	Z	M	M		X	X	X	M	P
	0.068									G	G	G				J	J	J	J	N			J	J	J	J	J	P		J	J	J	J	J	M		K	K	K	Z	M	M		X	X	X	M	P
	0.10					C			G	G	G	G				J	J	J	J	N			J	J	J	J	J	P		J	J	J	J	J	M		K	K	K	Z	M	M		X	X	X	M	P
	0.15							G	G			J*				J	J	J	J	N			J	J	J	J	M	Q		J	J	J	J	M	Z		K	K	P		M	M		X	X	X	M	P
	0.22							G	G							J	J	J	J	N			J	J	J	J	P	Q		J	J	J	J	P			K	K	P		M	M		X	X	X	M	P
	0.33											J*				N	N	N	N	N			J	J	M	P	Q	Q		J	J	M	Q	X			K	M	X		M	M		X	X	X	M	P
	0.47															N	N	N	N	N			M	M	Q	Q	Q	Q		M	M	P	X				K	P			M	M		X	X		M	P
	0.68															N	N	N	N				M	M	Q	Q	Q	Q		M	M	P	X				M	Q			M	P		X	X		M	P
	1.0									J*	J*					N	N	N					M	M	Q	Q	Q			N	N	P	Z				M	X			M	P		X	X		M	P
	1.5																						P	Q	Q	Q				N	N	Z	Z				Z	Z			M			X	X		M	X
	2.2							J*											P*				Q	Q	Q					X	X	Z	Z				Z							X	X		M	
	3.3															P*	P*						Q*	Q*	Q*					X	X	Z	Z				Z							X	Z			
	4.7																						Q*	Q*						Z	X	Z					Z							X	Z			
	10														P*															Z*	Z	Z*																	
	22																					Q*								Z*	Z*													Z					
	47																																																
	100																																																
	WVDC	10	16	25	16	25	50	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	500	10	16	25	50	100	200	500	50	100	200	500	50	100	25	50	100	200	50	100
SIZE		0201			0402			0603							0805							1206								1210							1812				1825		2220				2225	

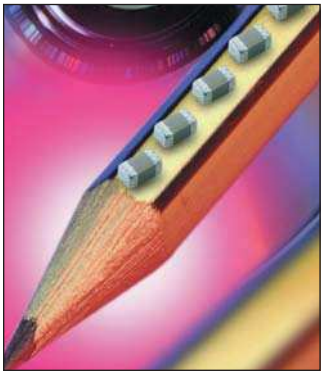
Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

*Optional Specifications – Contact factory

RoHS COMPLIANT

FLEXITERM® MLCC

X7R FLEXITERM® for Board Flexure Applications



With increased requirements from the automotive industry for additional component robustness, AVX recognized the need to produce a MLCC with enhanced mechanical strength. It was noted that many components may be subject to severe flexing and vibration when used in various under the hood automotive and other harsh environment applications.

To satisfy the requirement for enhanced mechanical strength, AVX had to find a way of ensuring electrical integrity is maintained whilst external forces are being applied to the component. It was found that the structure of the termination needed to be flexible and after much research and development, AVX launched FLEXITERM®. FLEXITERM® is designed to enhance the mechanical flexure and temperature cycling performance of a standard ceramic capacitor with an X7R dielectric. **The industry standard for flexure is 2mm minimum. Using FLEXITERM®, AVX provides up to 5mm of flexure without internal cracks. Beyond 5mm, the capacitor will generally fail "open".**

As well as for automotive applications FLEXITERM® will provide Design Engineers with a satisfactory solution when designing PCB's which may be subject to high levels of board flexure.

APPLICATIONS

- **High Flexure Stress Circuit Boards**
- **Variable Temperature Applications**
- **Automotive Applications**

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/softterm.pdf

HOW TO ORDER

0805	5	C	104	K	A	Z	2	A
Style	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
0603	Z = 10V	C = X7R	2 Sig Digits +	J = ± 5%*	A=Commercial	Z = FLEXITERM®	2 = 7" reel	A = Std. Product
0805	Y = 16V		Number of Zeros	K = ±10%	4 = Automotive	For FLEXITERM®	4 = 13" reel	
1206	3 = 25V		e.g., 104 = 100nF	M = ± 20%		with Tin/Lead		
1210	5 = 50V					termination see		
1812	1 = 100V			*≤1µF only		AVX LD Series		
2220	2 = 200V							

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.

RoHS COMPLIANT

Please select correct termination style.

	0603					0805						1206					1210				1812				2220		
	16V	25V	50V	100V	200V	10V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	16V	25V	50V	100V	25V	50V	100V
101																											
121																											
151																											
181																											
221																											
271	J	J	J	J	J	J																					
331	J	J	J	J	J	J	J	J	J	J	J																
391	J	J	J	J	J	J	J	J	J	J	J																
471	J	J	J	J	J	J	J	J	J	J	J																
561	J	J	J	J	J	J	J	J	J	J	J																
681	J	J	J	J	J	J	J	J	J	J	J																
821	J	J	J	J	J	J	J	J	J	J	J																
102	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J											
122	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
152	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
182	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
222	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
272	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
332	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
392	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
472	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
562	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
682	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
822	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
103	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
123	J	J	J			J	J	J	J	J	M	J	J	J	J	J											
153	J	J	J			J	J	J	J	J	M	J	J	J	J	J											
183	J	J	J			J	J	J	J	J	M	J	J	J	J	J											
223	J	J	J			J	J	J	J	J	M	J	J	J	J	J				K							
273	J	J	J			J	J	J	J	J	M	J	J	J	J	J				K							
333	J	J	J			J	J	J	J	J	M	J	J	J	J	J				K							
393	J	J	J			J	J	J	J	J	M	J	J	J	M	J				K							
473	J	J	J			J	J	J	J	J	M	J	J	J	M	J				K							
563	J	J	J			J	J	J	J	J	N	J	J	J	M	J	K	K	K	M	K	K	K	K			
683	J	J	J			J	J	J	J	J	N	J	J	J	M	J	K	K	K	M	K	K	K	K			
823	J	J	J			J	J	J	J	J	N	J	J	J	P	J	K	K	K	M	K	K	K	K			
104	J	J	J			J	J	J	J	J	N	J	J	J	Q	J	K	K	K	P	K	K	K	K	X	X	X
124						J	J	J	N	N		J	J	P	Q		K	K	K	Q	K	K	K	K			
154						M	M	N	N	N		J	J	P	Q		K	K	K	Q	K	K	K	M	X	X	X
184						M	M	N	N	N		J	M	P	Q		M	M	M	Q	K	K	K	M			
224						M	M	N	N	N		J	M	P	Q		M	M	M	Q	M	M	M	X	X	X	X
274						N	N	N	N	N		J	M	P	Q		P	P	P	Q	M	M	M	X			
334						N	N	N	N	N		J	M	P	Q		P	P	P	Q	M	M	M	X	X	X	X
394						N	N	N	N	N		M	M	P	Q		P	P	P	Q	X	X	X	X			
474						N	N	N	N	N		M	M	P	Q		P	P	P	Q	X	X	X	X	X	X	X
564						N	N	N				M	Q	Q	Q		P	Q	Q	Q	X	X	X	Z			
684						N	N	N				M	Q	Q	Q		P	X	X	X	X	X	X	Z	X	X	X
824						N	N	N				M	Q	Q	Q		P	Z	Z	Z	X	X	X	Z			
105						N	N	N				M	Q	Q	Q		P	Z	Z	Z	X	X	X	Z	X	X	X
155												Q	Q				P	Z	Z	Z			Z	Z	X	X	X
185												Q	Q				Z	Z	Z	Z			Z	Z			
225												Q	Q				Z	Z	Z	Z			Z	Z	X	X	X
335																	Z	Z	Z				Z				Z
475																	Z	Z	Z				Z				Z
106																									Z	Z	
226																									Z		
	16V	25V	50V	100V	200V	10V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	16V	25V	50V	100V	25V	50V	100V
	0603					0805						1206					1210				1812				2220		

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

*Optional Specifications – Contact factory

Standard X7S MLCC

X7S Dielectric

X7S formulations are classified as “temperature stable” ceramics and fall into EIA Class II materials. Its temperature variation of capacitance is within ±22% from –55°C to +125°C. This capacitance change is non-linear.

Capacitance for X7S varies under the influence of electrical operating conditions such as voltage and frequency.

X7S dielectric chip usage covers the broad spectrum of industrial applications where known changes in capacitance due to applied voltages are acceptable.

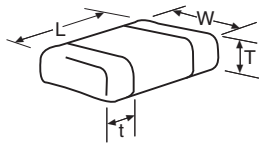
Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cx7s.pdf

HOW TO ORDER

1206	Z	Z	105	M	A	T	2	A
Size (L" x W")	**Voltage** 4 = 4V 6 = 6.3V Z = 10V 3 = 25V	**Dielectric** Z = X7S	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** K = ±10% M = ± 20%	**Failure Rate** A = N/A	**Terminations** T = Plated Ni and Sn	**Packaging** 2 = 7" Reel 4 = 13" Reel 7 = Bulk Cass.	**Special Code** A = Std. Product

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.

SIZE		0402	0603		0805	1206		1210
WVDC		6.3	6.3	25	4	6.3	10	6.3
Cap (pF)	100							
	150							
	220							
	330							
	470							
	680							
	1000							
	1500							
	2200							
	3300							
	4700							
	6800							
Cap (µF	0.010							
	0.015							
	0.022							
	0.033	C						
	0.047	C						
	0.068	C						
	0.10	C						
	0.15							
	0.22			G				
	0.33		G					
	0.47		G					
	0.68		G					
	1.0		G					
	1.5				N	Q		
	2.2				N	Q		
	3.3				N	Q		
	4.7				N	Q	Q	
	10							
	22							Z
	47							
	100							
WVDC		6.3	6.3	25	4	6.3	10	6.3
SIZE		0402	0603		0805	1206		1210

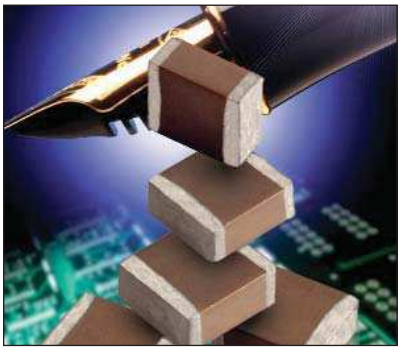


RoHS COMPLIANT

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

Standard X5R MLCC

X5R Dielectric



- General Purpose Dielectric for Ceramic Capacitors
- EIA Class II Dielectric
- Temperature variation of capacitance is within ±15% from -55°C to +85°C
- Well suited for decoupling and filtering applications
- Available in High Capacitance values (up to 100µF)

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cx5r.pdf

HOW TO ORDER

1206	4	D	107	M	A	T	2	A
Size (L" x W")	**Voltage** 4 = 4V, 6 = 6.3V, Z = 10V, Y = 16V, 3 = 25V, D = 35V, 5 = 50V	**Dielectric** D = X5R	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** K = ±10%, M = ± 20%	**Failure Rate** A = N/A	**Terminations** T = Plated Ni and Sn	**Packaging** 2 = 7" Reel, 4 = 13" Reel, 7 = Bulk Cass., 9 = Bulk	**Special Code** A = Std.

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

SIZE		0201					0402						0603							0805							1206							1210							1812			
	WVDC	4	6.3	10	16	25	4	6.3	10	16	25	50	4	6.3	10	16	25	35	50	6.3	10	16	25	35	50	6.3	10	16	25	35	50	4	6.3	10	16	25	35	50	6.3	10	25	50
Cap (pF)	100					A																																				
	150					A																																				
	220					A						C																														
	330					A						C																														
	470					A						C																														
	680					A						C																														
	1000				A	A						C																														
	1500				A							C																														
	2200			A	A							C																														
	3300			A								C																														
	4700			A							C								G																							
	6800			A							C								G																							
Cap (µF)	0.010			A							C								G																							
	0.015										C						G	G	G																							
	0.022		A*							C	C						G	G	G						N																	
	0.033									C							G	G	G						N																	
	0.047		A*							C	C						G	G	G						N																	
	0.068									C							G	G	G						N																	
	0.10		A*						C	C	C						G		G				N		N																	
	0.15																G						N	N																	
	0.22	A*	A					C*								G	G						N	N						Q											
	0.33															G	G						N																	
	0.47						C*	C*								G							N						Q	Q											
	0.68															G							N																	
	1.0	A					C*	C*	C*					G	G	G	J*					N	N		P*				Q	Q				X	X	X					
	1.5																																									
	2.2						C*	C*					G*	G*	J*	J*					N	N	N					Q	Q				Z	X							
	3.3												J*	J*	J*	J*				N	N				Q	Q																
	4.7						C*						J*	J*						N	N	N*	N*		Q	Q	Q	Q					Q	Z							
	10												K	J*						N*	N*	N*	*		Q	Q	Q	Q*				X	Z	Z*			Z				
	22																			N*	*				Q*	Q*	Q*					Z	Z	Z	Z*						
	47																			*					Q*							Z									
	100																															Z*	Z*									
	WVDC	4	6.3	10	16	25	4	6.3	10	16	25	50	4	6.3	10	16	25	35	50	6.3	10	16	25	35	50	6.3	10	16	25	35	50	4	6.3	10	16	25	35	50	6.3	10	25	50
SIZE		0201					0402						0603							0805							1206							1210							1812			

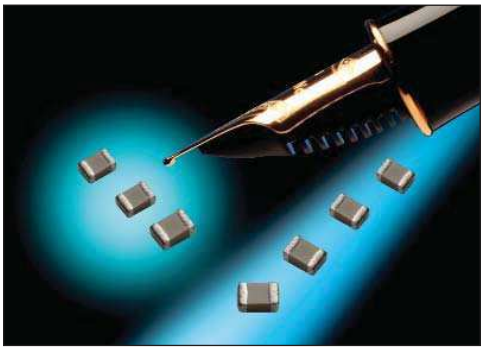
Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

= Under development
= *Optional Specifications Contact factory

*Optional Specifications – Contact factory

RoHS COMPLIANT

MLCC Low Profile
General Specifications



AVX introduces the LT series comprising a range of low profile products in our X5R and X7R dielectric. X5R is a Class II dielectric with temperature varation of capacitance within ±15% from –55°C to +85°C. Offerings include 0201, 0402, 0603, 0805 1206, and 1210 packages in compact, low profile designs. The LT series is ideal for decoupling and filtering applications where height clearance is limited.

AVX is also expanding the low profile products in our X7R dielectric. X7R is a Class II dielectric with temperature variation of capacitance within ±15% from -55ºC to +125ºC. Please contact the factory for availability of any additional values not listed.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/lt02-06.pdf

HOW TO ORDER

LT05	Z	D	475	M	A	T	2	S
Size LT01 - 0201 LT02 - 0402 LT03 - 0603 LT05 - 0805 LT06 - 1206 LT10 - 1210	**Voltage** 4 = 4V 6 = 6.3V Z = 10V Y = 16V 3 = 25V	**Dielectric** X5R = D X7R = C	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** K = ±10% M = ±20%	**Failure Rate** A = Not Applicable	**Terminations** T = Plated Ni and Sn	**Packaging** 2 = 7" Reel 4 = 13" Reel 7 = Bulk Cass. 9 = Bulk **Contact Factory For Multiples**	**Special Code** See table below

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.

SIZE			LT01	LT02				LT03				LT05				LT06			LT10	
		WVDC	4	4	6.3	10	16	4	6.3	16	25	6.3	10	16	25	10	16	25	16	25
Cap	104	0.10	Z		Q		S													
(µF)		0.22									X									
		0.47									X							X		
	105	1.0		C		S				S	X			X	X					
		1.5																		
		2.2		S					S	X				X						
		4.7						S	X				S	X			W	W	W	
	106	10						X/W				X	X				W		W	
		22																		
		47																		
		WVDC	4	4	6.3	10	16	4	6.3	16	25	6.3	10	16	25	10	16	25	16	25
SIZE			LT01	LT02				LT03				LT05				LT06			LT10	

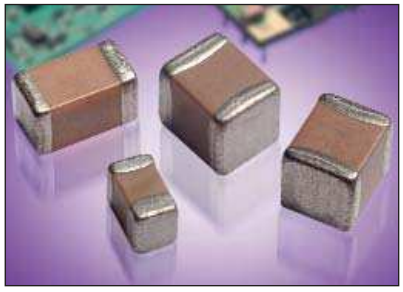
= X7R

Letter	J	Z	Q	C	S	X	W
Max. Thickness	0.15 (0.006)	0.22 (0.009)	0.25 (0.010)	0.36 (0.014)	0.56 (0.022)	0.95 (0.038)	1.02 (0.040)
	PAPER						EMBOSSED

RoHS COMPLIANT

Standard Y5V MLCC

Y5V Dielectric



Y5V formulations are for general-purpose use in a limited temperature range. They have a wide temperature characteristic of +22% –82% capacitance change over the operating temperature range of –30°C to +85°C.

These characteristics make Y5V ideal for decoupling applications within limited temperature range.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cy5v.pdf

HOW TO ORDER

0805	3	G	104	Z	A	T	2	A
Size (L" x W")	**Voltage** 6 = 6.3V Z = 10V Y = 16V 3 = 25V 5 = 50V	**Dielectric** Y5V = G	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** Z = +80 –20%	**Failure Rate** A = Not Applicable	**Terminations** T = Plated Ni and Sn	**Packaging** 2 = 7" Reel 4 = 13" Reel	**Special Code** A = Std. Product

SIZE		0201		0402					0603				0805				1206				1210			
	WVDC	6.3	10	6	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50
Cap (pF)	820		A																					
	1000		A																					
	2200																							
	4700		A																					
Cap (µF)	0.010	A	A																					
	0.022	A																						
	0.047	A				C																		
	0.10				C	C					G	G				K								
	0.22									G														
	0.33									G														
	0.47					C				G	G													
	1.0			C	C				G	G				N	N	N		M	M	M				N
	2.2				C									N										
	4.7												N					P				N	N	
	10.0												N				Q	Q			X	Q	Q	
	22.0																Q				X			
	47.0																							
	WVDC	6.3	10	6	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50
SIZE		0201		0402					0603				0805				1206				1210			

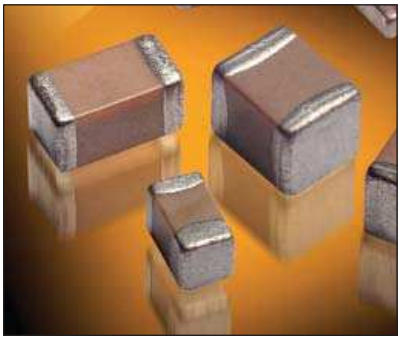
Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

High Voltage MLCC (RoHS)

Applications from 600V to 5000V



High value, low leakage and small size are difficult parameters to obtain in capacitors for high voltage systems. AVX special high voltage MLC chip capacitors meet these performance characteristics and are designed for applications such as snubbers in high frequency power converters, resonators in SMPS, and high voltage coupling/dc blocking. These high voltage chip designs exhibit low ESRs at high frequencies.

Larger physical sizes than normally encountered chips are used to make high voltage MLC chip products. Special precautions must be taken in applying these chips in surface mount assemblies. The temperature gradient during heating or cooling cycles should not exceed 4ºC per second. The preheat temperature must be within 50ºC of the peak temperature reached by the ceramic bodies through the soldering process. Chip sizes 1210 and larger should be reflow soldered only. Capacitors may require protective surface coating to prevent external arcing.

For 1825, 2225 and 3640 sizes, AVX offers leaded version in either thru-hole or SMT configurations (for details see section on high voltage leaded MLC chips).

NEW 630V RANGE

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/aphvc.pdf

HOW TO ORDER

1808	A	A	271	K	A	1	1	A
AVX Style	**Voltage**	**Temperature Coefficient**	**Capacitance Code**	**Capacitance Tolerance**	**Test Level**	**Termination***	**Packaging**	**Special Code**
0805	C = 600V/630V	C0G = A	(2 significant digits	C0G:	A = Standard	1 = Pd/Ag	1 = 7" Reel	A = Standard
1206	A = 1000V	X7R = C	+ no. of zeros)	J = ±5%		T = NiGuard	3 = 13" Reel	
1210	S = 1500V		Examples:	K = ±10%		Nickel	9 = Bulk	
1808	G = 2000V		10 pF = 100	M = ±20%		Barrier		
1812	W = 2500V		100 pF = 101	X7R:		Solderable		
1825	H = 3000V		1,000 pF = 102	K = ±10%		Plate		
2220	J = 4000V		22,000 pF = 223	M = ±20%				
2225	K = 5000V		220,000 pF = 224	Z = +80%,				
3640			1 µF = 105	-20%				
***								

***Note:** Terminations with 5% minimum lead (Pb) is available for LD style. Leaded terminations are also available.

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.
*** AVX offers nonstandard chip sizes. Contact factory for details.

HIGH VOLTAGE C0G CAPACITANCE VALUES

VOLTAGE		0805	1206	1210	1808	1812	1825	2220	2225	3640
600/630	min.	10pF	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF
	max.	330pF	1200 pF	2700 pF	3300 pF	5600 pF	0.012 µF	0.012 µF	0.018 µF	0.047 µF
1000	min.	10pF	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
	max.	180pF	560 pF	1500 pF	2200 pF	3300 pF	8200 pF	0.010 µF	0.010 µF	0.022 µF
1500	min.	—	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF	100 pF
	max.	—	270 pF	680 pF	820 pF	1800 pF	4700 pF	4700 pF	5600 pF	0.010 µF
2000	min.	—	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF	100 pF
	max.	—	120 pF	270 pF	330 pF	1000 pF	1800 pF	2200 pF	2700 pF	6800 pF
2500	min.	—	—	—	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF
	max.	—	—	—	180 pF	470 pF	1200 pF	1500 pF	1800 pF	3900 pF
3000	min.	—	—	—	10 pF	10 pF	10 pF	10 pF	10 pF	100 pF
	max.	—	—	—	120 pF	330 pF	820 pF	1000 pF	1200 pF	2700 pF
4000	min.	—	—	—	10 pF	10 pF	10 pF	10 pF	10 pF	100 pF
	max.	—	—	—	47 pF	150 pF	330 pF	470 pF	560 pF	1200 pF
5000	min.	—	—	—	—	—	—	10 pF	10 pF	10 pF
	max.	—	—	—	—	—	—	220 pF	270 pF	820 pF

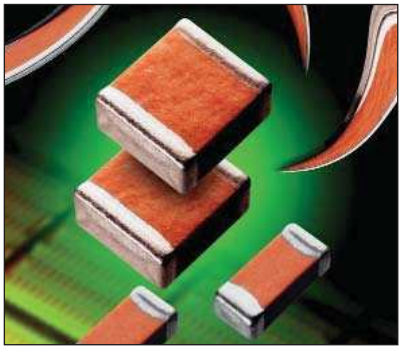
HIGH VOLTAGE X7R CAPACITANCE VALUES

VOLTAGE		0805	1206	1210	1808	1812	1825	2220	2225	3640
600/630	min.	100pF	1000 pF	1000 pF	1000 pF	1000 pF	0.010 µF	0.010 µF	0.010 µF	0.010 µF
	max.	6800pF	0.022 µF	0.056 µF	0.068 µF	0.120 µF	0.270 µF	0.270 µF	0.330 µF	0.560 µF
1000	min.	100pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF	0.010 µF
	max.	1500pF	6800 pF	0.015 µF	0.018 µF	0.039 µF	0.100 µF	0.120 µF	0.150 µF	0.220 µF
1500	min.	—	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF
	max.	—	2700 pF	5600 pF	6800 pF	0.015 µF	0.056 µF	0.056 µF	0.068 µF	0.100 µF
2000	min.	—	10 pF	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
	max.	—	1500 pF	3300 pF	3300 pF	8200 pF	0.022 µF	0.027 µF	0.033 µF	0.027 µF
2500	min.	—	—	—	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF
	max.	—	—	—	2200 pF	5600 pF	0.015 µF	0.018 µF	0.022 µF	0.022 µF
3000	min.	—	—	—	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF
	max.	—	—	—	1800 pF	3900 pF	0.010 µF	0.012 µF	0.015 µF	0.018 µF
4000	min.	—	—	—	—	—	—	—	—	100 pF
	max.	—	—	—	—	—	—	—	—	6800 pF
5000	min.	—	—	—	—	—	—	—	—	100 pF
	max.	—	—	—	—	—	—	—	—	3300 pF

RoHS COMPLIANT

High Voltage FLEXITERM®

For 600V to 3000V Applications



High value, low leakage and small size are difficult parameters to obtain in capacitors for high voltage systems. AVX special high voltage MLC chip capacitors meet these performance characteristics and are designed for applications such as snubbers in high frequency power converters, resonators in SMPS, and high voltage coupling/DC blocking. These high voltage chip designs exhibit low ESRs at high frequencies.

To make high voltage chips, larger physical sizes than are normally encountered are necessary. These larger sizes require that special precautions be taken in applying these chips in surface mount assemblies. In response to this, and to follow from the success of the FLEXITERM® range of low voltage parts, AVX is delighted to offer a FLEXITERM® high voltage range of capacitors, FLEXITERM®.

The FLEXITERM® layer is designed to enhance the mechanical flexure and temperature cycling performance of a standard ceramic capacitor, giving customers a solution where board flexure or temperature cycle damage are concerns.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/flexitermhv.pdf

HOW TO ORDER

1808	A	C	272	K	A	Z	1	A
AVX Style	**Voltage**	**Temperature Coefficient**	**Capacitance Code**	**Capacitance Tolerance**	**Test Level**	**Termination***	**Packaging**	**Special Code**
0805	C = 600V/630V	C0G = A	(2 significant digits	C0G:		Z = FLEXITERM®	1 = 7" Reel	A = Standard
1206	A = 1000V	X7R = C	+ no. of zeros)	J = ±5%		100% Tin	3 = 13" Reel	
1210	S = 1500V		Examples:	K = ±10%		(RoHS Compliant)	9 = Bulk	
1808	G = 2000V		10 pF = 100	M = ±20%				
1812	W = 2500V		100 pF = 101	X7R:				
1825	H = 3000V		1,000 pF = 102	K = ±10%				
2220			22,000 pF = 223	M = ±20%				
2225			220,000 pF = 224	Z = +80%, -20%				
***			1 µF = 105					

Notes: Capacitors with X7R dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.
Contact factory for availability of Termination and Tolerance options for Specific Part Numbers.

*** AVX offers nonstandard chip sizes. Contact factory for details.

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

HIGH VOLTAGE C0G CAPACITANCE VALUES

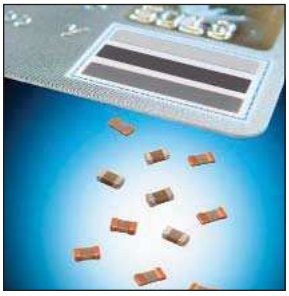
VOLTAGE		0805	1206	1210	1808	1812	1825	2220	2225
600/630	min.	10pF	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
	max.	330pF	1200 pF	2700 pF	3300 pF	5600 pF	0.012 µF	0.012 µF	0.018 µF
1000	min.	10pF	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF
	max.	180pF	560 pF	1500 pF	2200 pF	3300 pF	8200 pF	0.010 µF	0.010 µF
1500	min.	—	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF
	max.	—	270 pF	680 pF	820 pF	1800 pF	4700 pF	4700 pF	5600 pF
2000	min.	—	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF
	max.	—	120 pF	270 pF	330 pF	1000 pF	1800 pF	2200 pF	2700 pF
2500	min.	—	—	—	10 pF	10 pF	10 pF	100 pF	100 pF
	max.	—	—	—	180 pF	470 pF	1200 pF	1500 pF	1800 pF
3000	min.	—	—	—	10 pF	10 pF	10 pF	10 pF	10 pF
	max.	—	—	—	120 pF	330 pF	820 pF	1000 pF	1200 pF

HIGH VOLTAGE X7R CAPACITANCE VALUES

VOLTAGE		0805	1206	1210	1808	1812	1825	2220	2225
600/630	min.	100pF	1000 pF	1000 pF	1000 pF	1000 pF	0.010 µF	0.010 µF	0.010 µF
	max.	6800pF	0.022 µF	0.056 µF	0.068 µF	0.120 µF	0.270 µF	0.270 µF	0.330 µF
1000	min.	100pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF
	max.	1500pF	6800 pF	0.015 µF	0.018 µF	0.039 µF	0.100 µF	0.120 µF	0.150 µF
1500	min.	—	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
	max.	—	2700 pF	5600 pF	6800 pF	0.015 µF	0.056 µF	0.056 µF	0.068 µF
2000	min.	—	10 pF	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF
	max.	—	1500 pF	3300 pF	2300 pF	8200 pF	0.022 µF	0.027 µF	0.033 µF
2500	min.	—	—	—	10 pF	10 pF	100 pF	100 pF	100 pF
	max.	—	—	—	2200 pF	5600 pF	0.015 µF	0.018 µF	0.022 µF
3000	min.	—	—	—	10 pF	10 pF	100 pF	100 pF	100 pF
	max.	—	—	—	1800 pF	2200 pF	0.010 pF	0.012 µF	0.015 µF

UltraThin Ceramic Capacitors

UT023D103MAT2C



The Ultrathin (UT) series of ceramic capacitors is a new product offering from AVX. The UT series was designed to meet the stringent thickness requirements of our customers. AVX developed a new termination process (FCT - Fine Copper Termination) that provides unbeatable flatness and repeatability. The series includes products < 0.35mm in height and is targeted for applications such as Smart cards, Memory modules, High Density SIM cards, Mobile phones, MP3 players, and embedded solutions.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/ut.pdf

HOW TO ORDER

UT	02	3	D	103	M	A	T	2	C
Style Ultra Thin	**Case Size 0402**	**Rated Voltage 25V**	**Temperature Characteristic X5R**	**Coded Cap 0.01µF**	**Cap Tolerance ± 20%**	**Termination Style** Commercial	**Termination** 100% Sn	**Packaging** 7" Reel = 15,000 pcs 13" Reel = 50,000 pcs	**Thickness** 0.30mm max

PART DIMENSIONS

mm (inches)

L	W	T	BL
1.00 ± 0.10 (0.039±0.004)	0.50 ± 0.10 (0.020 ± 0.004)	0.25 ± 0.05 (0.010 ± 0.002)	0.25 ± 0.10 (0.010 ± 0.004)

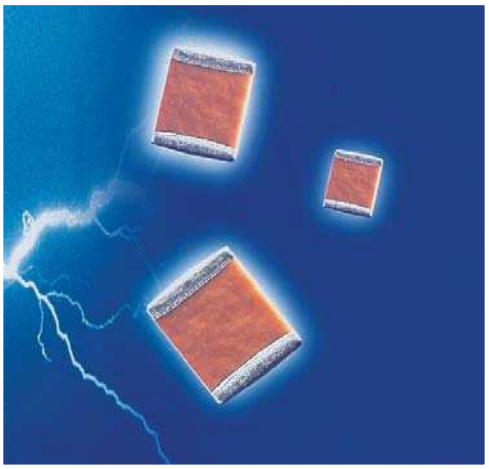
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

PERFORMANCE CHARACTERISTICS

Capacitance Value	0.01µF
Capacitance Tolerance	±20%
Dissipation Factor Range	3.0%
Operating Temperature	-55°C to +85°C
Temperature Coefficient	±15%
Rated Voltage	25V
Insulation Resistance at 25ºC and Rated Voltage	100,000 Mohms
Test Frequency	1 Vrms @ 1 KHz

Tip & Ring
Multilayer Ceramic Chip Capacitors



AVX "Tip & Ring" or "ring detector" Multilayer Ceramic Chip Capacitors are designed as a standard telecom filter to block -48 Volts DC telephone line voltage and pass subscriber's AC signal pulse (16 to 25Hz, 70 to 90Vrms). The ringer capacitors replace large leaded film capacitors and are ideal for telecom/modem applications. Using AVX "Tip & Ring" capacitors not only saves valuable real estate on the board and reduces the weight of overall product, but also features standard surface mounting capabilities so critical to new and compact designs.

The AVX "Tip & Ring" capacitors are offered in standard EIA sizes and standard values. They offer excellent high frequency performance, low ESR and improved temperature performance over film capacitors.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/apt&r.pdf

HOW TO ORDER

1812	P	C	104	K	A	T	1	A
AVX Style 0805 1206 1210 1808 1812 1825 2220 2225	**Voltage** 250 VDC Telco Rating	**Temperature Coefficient** X7R	**Capacitance Code** (2 significant digits + no. of zeros) Examples: 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105	**Capacitance Tolerance** K = ±10% M = ±20%	**Test Level** A = Standard	**Termination** T = Plated Ni and Sn (RoHS Compliant) Z = FLEXITERM® 100% Tin (RoHS Compliant)	**Packaging** 2 = 7" Reel 4 = 13" Reel 6 = Bulk	**Special Code** A = Standard

Contact factory for availability of Termination and Tolerance options for Specific Part Numbers.

RoHS COMPLIANT

PERFORMANCE CHARACTERISTICS

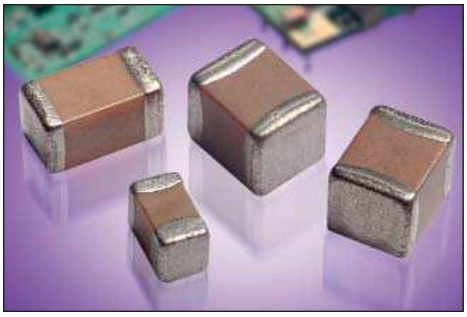
Capacitance Range	1000 pF to 1.2 µF (25°C, 1.0 ±0.2 Vrms at 1kHz)
Capacitance Tolerances	±10%, ±20%
Dissipation Factor	2.5% max. (25°C, 1.0 ±0.2 Vrms at 1kHz)
Operating Temperature Range	-55°C to +125°C
Temperature Characteristic	X7R ±15% (0 VDC)
Voltage Rating	250 VDC Telco rating
Insulation Resistance	1000 megohm-microfarad min.
Dielectric Strength	Minimum 200% rated voltage for 5 seconds at 50 mA max. current

CAPACITANCE RANGE (µF)

Size	0805	1206	1210	1808	1812	1825	2220	2225
min.	0.0010	0.0010	0.0010	0.010	0.10	0.33	0.47	0.47
max.	0.027	0.082	0.22	0.27	0.47	1.0	1.0	1.2

Tin/Lead Termination MLCC

LD Series NP0 Dielectric, Tin/Lead



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination "B" products.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tinterm.pdf

HOW TO ORDER

LD05	5	A	101	J	A	B	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
LD02 - 0402	Y = 16V	C0G (NP0) = A	2 Sig. Digits +	B = ±.10 pF (<10pF)	A = Not	B = 5% min	2 = 7" Reel	A = Std. Product
LD03 - 0603	3 = 25V		Number of Zeros	C = ±.25 pF (<10pF)	Applicable	lead	4 = 13" Reel	
LD04 - 0504*	5 = 50V			D = ±.50 pF (<10pF)			7 = Bulk Cass.	
LD05 - 0805	1 = 100V			F = ±1% (≥ 10 pF)			9 = Bulk	
LD06 - 1206	2 = 200V			G = ±2% (≥ 10 pF)				
LD10 - 1210	7 = 500V			J = ±5%			**Contact Factory For Multiples**	
LD12 - 1812				K = ±10%				
LD13 - 1825				M = ±20%				
LD14 - 2225								

*LD04 has the same CV ranges as LD03.

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

Not RoHS Compliant

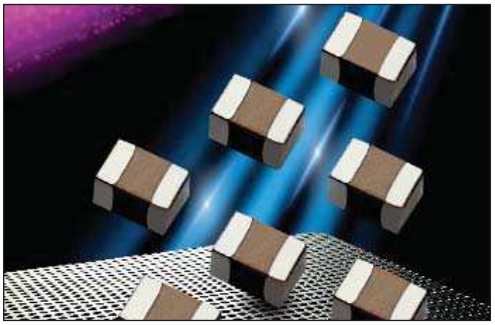
NP0 Dielectric

SIZE		LD02			LD03				LD05					LD06						LD10					LD12					LD13			LD14		
	WVDC	16	25	50	16	25	50	100	16	25	50	100	200	16	25	50	100	200	500	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200
Cap (pF)	0.5	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	1.0	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	1.2	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	1.5	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	1.8	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	2.2	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	2.7	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	3.3	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	3.9	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	4.7	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	5.6	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	6.8	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	8.2	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	10	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	12	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	15	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	18	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	22	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	27	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	33	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	39	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	47	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	56	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	68	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	82	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	100	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	120	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	150	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	180	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	M	J															
	220	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	M	J															
	270	C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M	J															
	330	C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M	J															
	390	C	C	C	G	G	G		J	J	J	J	M	J	J	J	J	J	M	J															
	470	C	C	C	G	G	G		J	J	J	J	M	J	J	J	J	J	M	J															
	560				G	G	G		J	J	J	J	M	J	J	J	J	J	M	J	J	J	J	J	J										
	680				G	G	G		J	J	J	J		J	J	J	J	J	P	J	J	J	J	J	J										
	820				G	G	G		J	J	J	J		J	J	J	J	J	M	J	J	J	J	J	J										
	1000				G	G	G		J	J	J	J		J	J	J	J	J	Q	J	J	J	J	M	M	K	K	K	K	K	M	M	M	M	M	P
	1200								J	J	J			J	J	J	J	J	Q	J	J	J	M	M	K	K	K	K	K	M	M	M	M	M	P
	1500								J	J	J			J	J	J	J	M	Q	J	J	J	M	M	K	K	K	K	K	M	M	M	M	M	P
	1800								J	J	J	N		J	J	M	M	P		J	J	J	J	Q	K	K	K	K	K	P	Q	M	M	M	M	P
	2200								J	J	J	N		J	J	M	M	P		J	J	J	J	Q	K	K	K	K	K	P	Q	M	M	M	M	P
	2700								J	J	J	N		J	J	M	M	P		J	J	J	J	Q	K	K	K	K	K	P	Q	M	M	M	M	P
	3300								J	J				J	J	M	P			J	J	J	J		K	K	K	P	Q	M	M	M	M	M	P
	3900								J	J				J	J	M	P			J	J	J	M		K	K	K	P	Q	M	M	M	M	M	P
	4700								J	J				J	J	M	P			J	J	J	M		K	K	K	P	Q	M	M	M	M	M	P
	5600													J	J	M				J	J				K	K	M	M	X	M	M	M	M	M	P
	6800													M	M					J	J				K	K	M	M		M	M	M	M	M	P
	8200													M	M					J	J				K	K	M	M		M	M	M	M	M	P
Cap (µF)	0.010													M	M					J	J				K	M	M			M	M		M	M	P
	0.012																			J	J				K	M	M			M	M		M	M	P
	0.015																			J	J				K	M	M			M	M		M	M	P
	0.018																								M	M				P	M		M	M	Y
	0.022																								M	M				P			M	Y	Y
	0.027																								M	M				P			P	Y	Y
	0.033																								M	M				P			P		
	0.039																								M	M				P			P		
	0.047																								M	M				P			P		
	0.068																								M	M				P			Q		
	0.082																								M	M				P			Q		
	0.1																																Q		
	WVDC	16	25	50	16	25	50	100	16	25	50	100	200	16	25	50	100	200	500	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200
SIZE		LD02			LD03				LD05					LD06						LD10					LD12					LD13			LD14		

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

Tin/Lead Termination MLCC

LD Series X7R Dielectric, Tin/Lead



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination "B" products.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tinterm.pdf

HOW TO ORDER

LD05	5	C	101	J	A	B	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
LD02 - 0402	6 = 6.3V	X7R = C	2 Sig. Digits +	J = ±5%	A = Not	B = 5% min lead	2 = 7" Reel	A = Std. Product
LD03 - 0603	Z = 10V		Number of Zeros	K = ±10%	Applicable	X = FLEXITERM®	4 = 13" Reel	
LD04 - 0504*	Y = 16V			M = ±20%		with 5% min	7 = Bulk Cass.	
LD05 - 0805	3 = 25V					lead	9 = Bulk	
LD06 - 1206	5 = 50V							
LD10 - 1210	1 = 100V						**Contact Factory For Multiples**	
LD12 - 1812	2 = 200V							
LD13 - 1825	7 = 500V							
LD14 - 2225								
LD20 - 2220								

*LD04 has the same CV ranges as LD03.

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

Not RoHS Compliant

X7R Dielectric

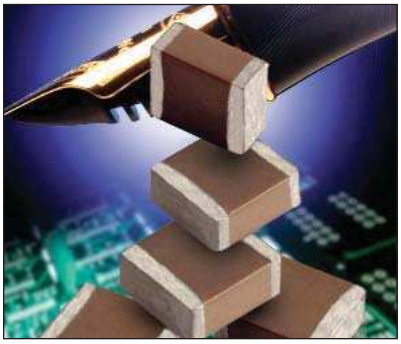
SIZE		LD02			LD03							LD05							LD06								LD10							LD12				LD13		LD20				LD14	
	WVDC	16	25	50	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	500	10	16	25	50	100	200	500	50	100	200	500	50	100	25	50	100	200	50	100
Cap (pF)	100																																												
	150																																												
	220			C																																									
	330			C					G	G	G		J	J	J	J	J	J								K																			
	470			C					G	G	G		J	J	J	J	J	J								K																			
	680			C					G	G	G		J	J	J	J	J	J								K																			
	1000			C					G	G	G		J	J	J	J	J	J								K																			
	1500			C					G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J	M	J	J	J	J	J	J	M											
	2200			C					G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J	M	J	J	J	J	J	J	M											
	3300		C	C					G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J	M	J	J	J	J	J	J	M											
	4700		C	C					G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J	M	J	J	J	J	J	J	M											
	6800	C	C						G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J	M	J	J	J	J	J	J	M											
Cap (µF)	0.010	C							G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J	P	J	J	J	J	J	J	M	K	K	K	K	M	M		X	X	X	M	P
	0.015	C						G	G	G			J	J	J	J	J	J	J	J	J	J	J	J	J	M	J	J	J	J	J	J	P	K	K	K	P	M	M		X	X	X	M	P
	0.022	C						G	G	G			J	J	J	J	J	N	J	J	J	J	J	J	J	M	J	J	J	J	J	J	Q	K	K	K	P	M	M		X	X	X	M	P
	0.033						G	G	G	G			J	J	J	J	J	N	J	J	J	J	J	J	J	M	J	J	J	J	J	J	Q	K	K	K	X	M	M		X	X	X	M	P
	0.047					G	G	G	G	G			J	J	J	J	J	N	J	J	J	J	J	J	J	M	J	J	J	J	J	J		K	K	K	Z	M	M		X	X	X	M	P
	0.068					G	G	G	G	G			J	J	J	J	J	N	J	J	J	J	J	J	J	P	J	J	J	J	J	M		K	K	K	Z	M	M		X	X	X	M	P
	0.10		C*			G	G	G	G	G			J	J	J	J	N	N	J	J	J	J	J	M	Q	P	J	J	J	J	J	M	Z	K	K	K	Z	M	M		X	X	X	M	P
	0.15				G	G							J	J	J	N	N	N	J	J	J	J	J	M	Q		J	J	J	J	M	Z		K	K	P		M	M		X	X	X	M	P
	0.22				G	G							J	J	J	N	N	N	J	J	J	J	J	P	Z		J	J	J	J	P			K	K	P		M	M		X	X	X	M	P
	0.33												N	N	N	N	N	N	J	J	M	P	Q				J	J	J	J	Z			K	M	X		M	M		X	X	X	M	P
	0.47							J*					N	N	N	N	N	N	M	M	M	P	Q				M	M	P	X	Z			K	P			M	M		X	X	X	M	P
	0.68												N	N	N				M	M	Q	Q	Q				M	M		X	Z			M	Q			M	P		X	X		M	P
	1.0					J*	J*						N	N	N*				M	M	Q	Q	Q				N	N	P	X	Z			M	X			M	P		X	X		M	P
	1.5																		P	Q	Q						N	N	Z	Z	Z			Z	Z			M			X	X		M	X
	2.2				J*										P*				Q	Q	Q						X	X	Z	Z	Z			Z				X			X	X			
	3.3												P*	P*					Q*	Q*	Q*						X	X	Z	Z				Z				X	Z		X	Z			
	4.7																		Q*	Q*							X	X	Z	Z								X	Z		X	Z			
	10											P*							Q*	Q*							Z	Z											Z							
	22																		Q*								Z	Z													Z					
	47																																													
	100																																													
	WVDC	16	25	50	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	500	10	16	25	50	100	200	500	50	100	200	500	50	100	25	50	100	200	50	100
SIZE		LD02			LD03							LD05							LD06								LD10							LD12				LD13		LD20				LD14	

= Under development

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

Tin/Lead Termination MLCC

LD Series X5R Dielectric, Tin/Lead



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Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tinterm.pdf

HOW TO ORDER

LD05	5	D	101	J	A	B	2	A
Size LD02 - 0402 LD03 - 0603 LD04 - 0504* LD05 - 0805 LD06 - 1206 LD10 - 1210 LD12 - 1812	**Voltage** 4 = 4V 6 = 6.3V Z = 10V Y = 16V 3 = 25V D = 35V 5 = 50V	**Dielectric** X5R = D	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Failure Rate** A = Not Applicable	**Terminations** B = 5% min lead	**Packaging** 2 = 7" Reel 4 = 13" Reel 7 = Bulk Cass. 9 = Bulk **Contact Factory For Multiples**	**Special Code** A = Std. Product

*LD04 has the same CV ranges as LD03.

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

Not RoHS Compliant

SIZE		LD02						LD03							LD05						LD06						LD10							LD12			
	WVDC	4	6.3	10	16	25	50	4	6.3	10	16	25	35	50	6.3	10	16	25	35	50	6.3	10	16	25	35	50	4	6.3	10	16	25	35	50	6.3	10	25	50
Cap (pF)	100																																				
	150																																				
	220						C																														
	330						C																														
	470						C																														
	680						C																														
	1000						C																														
	1500						C																														
	2200						C																														
	3300						C																														
	4700					C								G																							
	6800					C								G																							
Cap (µF)	0.010					C								G																							
	0.015					C						G	G	G																							
	0.022				C	C						G	G	G						N																	
	0.033				C							G	G	G						N																	
	0.047				C	C						G	G	G						N																	
	0.068				C							G		G						N																	
	0.10			C	C	C						G		G				N		N																	
	0.15											G						N	N																		
	0.22		C*								G	G						N	N						Q												
	0.33										G	G						N																			
	0.47	C*	C*								G							N						Q	Q							X					
	0.68										G							N																			
	1.0	C*	C*	C*					G	G	G	J*					N	N		P*				Q	Q						X	X	X				
	1.5																																				
	2.2	C*	C*					G*	G*	J*	J*					N	N	N						Q	Q						Z	X					
	3.3							J*	J*	J*	J*				N	N					Q	Q															
	4.7	E						J*	J*	J*					N	N	N*	N*			Q	Q		Q	Q					Q	Z						
	10							K*	J*						N*	N*	N*	*			Q	Q		Q	Q*				X	Z	Z					Z		
	22														P*	*					Q*	Q*		Q*				Z	Z	Z	Z						
	47																				Q*							Z*									
	100																										Z*	Z*									
	WVDC	4	6.3	10	16	25	50	4	6.3	10	16	25	35	50	6.3	10	16	25	35	50	6.3	10	16	25	35	50	4	6.3	10	16	25	35	50	6.3	10	25	50
SIZE		LD02						LD03							LD05						LD06						LD10							LD12			

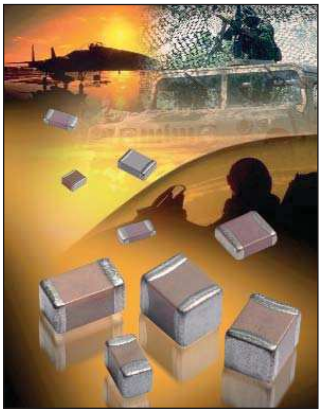
= Under development = *Optional Specifications – Contact factory

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

*Optional Specifications – Contact factory NOTE: Contact factory for non-specified capacitance values

APS for COTS-Plus Applications

APS Series NP0 Dielectric



As part of our continuing support to high reliability customers, AVX has launched an Automotive Plus Series of parts (APS) qualified and manufactured in accordance with automotive AEC-Q200 standard. Each production batch is quality tested to an enhanced requirement and shipped with a certificate of conformance. On a quarterly basis a reliability package is issued to all APS customers.

A detailed qualification package is available on request and contains results on a range of part numbers including:

- X7R dielectric components containing BME electrode and copper terminations with a Ni/Sn plated overcoat.
- X7R dielectric components BME electrode and soft terminations with a Ni/Sn plated overcoat (FLEXITERM®).
- X7R for Hybrid applications.
- NP0 dielectric components containing Pd/Ag electrode and silver termination with a Ni/Sn plated overcoat.

We are also able to support customers who require an AEC-Q200 grade component finished with Tin/Lead.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/aps.pdf

HOW TO ORDER

AP03	5	A	104	K	Q	T	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
AP03=0603	3 = 25V	NP0 = A	2 Significant Digits +	J = ±5%	Q = APS	T = Plated Ni and Sn**	2 = 7" Reel	A = Std. Product
AP05=0805	5 = 50V		Number of Zeros	K = ±10%		B = 5% min lead	4 = 13" Reel	
AP06=1206	1 = 100V		e.g. 10µF = 106	M = ±20%				
AP10=1210	2 = 200V							
AP12=1812	7 = 500V							

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

APS MLCC – NP0

	0603			0805			1206					1210				1812	
	25V	50V	100V	25V	50V	100V	25V	50V	100V	200V	500V	25V	50V	100V	200V	50V	100V
100 10pF	G	G	G	J	J	J	J	J	J	J	J						
120 12	G	G	G	J	J	J	J	J	J	J	J						
150 15	G	G	G	J	J	J	J	J	J	J	J						
180 18	G	G	G	J	J	J	J	J	J	J							
220 22	G	G	G	J	J	J	J	J	J	J							
270 27	G	G	G	J	J	J	J	J	J	J							
330 33	G	G	G	J	J	J	J	J	J	J							
390 39	G	G	G	J	J	J	J	J	J	J							
470 47	G	G	G	J	J	J	J	J	J	J							
510 51	G	G	G	J	J	J	J	J	J	J							
560 56	G	G	G	J	J	J	J	J	J	J							
680 68	G	G	G	J	J	J	J	J	J	J							
820 82	G	G	G	J	J	J	J	J	J	J							
101 100	G	G	G	J	J	J	J	J	J	J							
121 120	G	G	G	J	J	J	J	J	J	J							
151 150	G	G	G	J	J	J	J	J	J	J							
181 180	G	G	G	J	J	J	J	J	J	J							
221 220	G	G	G	J	J	J	J	J	J	J							
271 270	G	G	G	J	J	J	J	J	J	J							
331 330	G	G	G	J	J	J	J	J	J	J							
391 390	G	G		J	J	J	J	J	J	J							
471 470	G	G		J	J	J	J	J	J	J							
561 560				J	J	J	J	J	J	J							
681 680				J	J	J	J	J	J	J							
821 820				J	J	J	J	J	J	J							
102 1000				J	J	J	J	J	J	J		J	J	J	J		
122 1200							J	J	J			J	J	M	M		
152 1500							J	M	M			J	J	M	M		
182 1800							J	M	M			J	J	M	M		
222 2200							J	M	M			J	J	M	M		
272 2700							J	M	Q			J	J	M			
332 3300							J	M	Q			J	J	P		K	K
392 3900												J	J	P		K	K
472 4700												J	J	P		K	K
103 10nF																	
	25V	50V	100V	25V	50V	100V	25V	50V	100V	200V	500V	25V	50V	100V	200V	50V	100V
	0603			0805			1206					1210				1812	

Letter	G	J	K	M	N	P	Q	X
Max. Thickness	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)
	PAPER		PLASTIC TAPE					

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

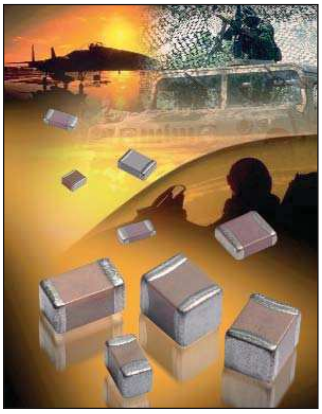
RoHS COMPLIANT

Please select correct termination style.

AEC-Q200 qualified
TS 16949, ISO 9001 certified

APS for COTS-Plus Applications

APS Series X7R Dielectric



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- X7R dielectric components BME electrode and soft terminations with a Ni/Sn plated overcoat (FLEXITERM®).
- X7R for Hybrid applications.
- NP0 dielectric components containing Pd/Ag electrode and silver termination with a Ni/Sn plated overcoat.

We are also able to support customers who require an AEC-Q200 grade component finished with Tin/Lead.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/aps.pdf

HOW TO ORDER

AP03	5	C	104	K	Q	T	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
AP03=0603 AP05=0805 AP06=1206 AP10=1210 AP12=1812 AP20=2220	Y = 16V 3 = 25V 5 = 50V 1 = 100V 2 = 200V 7 = 500V	X7R = C	2 Significant Digits + Number of Zeros e.g. 10µF = 106	J = ±5% K = ±10% M = ±20%	Q = APS	T = Plated Ni and Sn** Z = FLEXITERM®** U = Conductive Epoxy** B = 5% min lead X = FLEXITERM® with 5% min lead	2 = 7" Reel 4 = 13" Reel	A = Std. Product

**RoHS compliant

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

AUTOMOTIVE MLCC – X7R

		0603					0805					1206						1210				1812		2220	
		16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	500V	16V	25V	50V	100V	50V	100V	25V	50V
102	Cap 1	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
182	(nF) 1.8	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
222	2.2	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
332	3.3	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
472	4.7	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
103	10	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
123	12	G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
153	15	G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
183	18	G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
223	22	G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
273	27	G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
333	33	G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
473	47	G	G	G			J	J	J	M		J	J	J	M	J		K	K	K	K	K	K		
563	56	G	G	G			J	J	J	M		J	J	J	M	J		K	K	K	M	K	K		
683	68	G	G	G			J	J	J	M		J	J	J	M	J		K	K	K	M	K	K		
823	82	G	G	G			J	J	J	M		J	J	J	M	J		K	K	K	M	K	K		
104	100	G	G	G			J	J	M	M		J	J	J	M	J		K	K	K	M	K	K		
124	120						J	J	M			J	J	M	M			K	K	K	P	K	K		
154	150						M	N	M			J	J	M	M			K	K	K	P	K	K		
224	220						M	N	M			J	M	M	Q			M	M	M	P	M	M		
334	330						N	N	M			J	M	P	Q			P	P	P	Q	X	X		
474	470						N	N	M			M	M	P	Q			P	P	P	Q	X	X		
684	680						N	N				M	Q	Q	Q			P	P	Q	X	X	X		
105	Cap 1						N	N				M	Q	Q	Q			P	Q	Q	X	X	X		
155	(µF) 1.5											Q	Q					P	Q	Z	Z	X	X		
225	2.2											Q	Q					X	Z	Z	Z	Z	Z		
335	3.3																	X	Z	Z		Z			
475	4.7																	X	Z	Z		Z			
106	10																								Z
226	22																							Z	
		16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	500V	16V	25V	50V	100V	50V	100V	25V	50V
		0603					0805					1206						1210				1812		2220	

= Under development

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

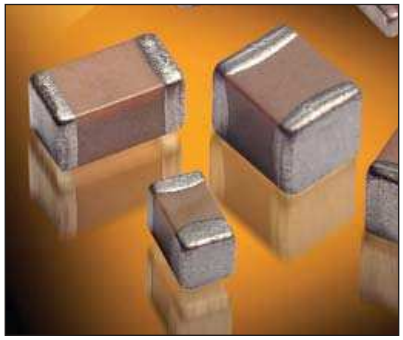
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Please select correct termination style.

High Voltage MLCC (Tin/Lead)

Applications from 600V to 5000V



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. AVX has provided in the following pages, a full range of values that we are offering in this "B" termination.

Larger physical sizes than normally encountered chips are used to make high voltage MLC chip product. Special precautions must be taken in applying these chips in surface mount assemblies. The temperature gradient during heating or cooling cycles should not exceed 4ºC per second. The preheat temperature must be within 50ºC of the peak temperature reached by the ceramic bodies through the soldering process. Chip sizes 1210 and larger should be reflow soldered only. Capacitors may require protective surface coating to prevent external arcing.

For 1825, 2225 and 3640 sizes, AVX offers leaded version in either thru-hole or SMT configurations (for details see section on high voltage leaded MLC chips).

NEW 630V RANGE

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/hvtinterm.pdf

HOW TO ORDER

LD08	A	A	271	K	A	B	1	A
AVX Style	**Voltage**	**Temperature Coefficient**	**Capacitance Code** (2 significant digits + no. of zeros)	**Capacitance Tolerance**	**Test Level**	**Termination**	**Packaging**	**Special Code**
LD05 - 0805	C = 600V/630V	C0G = A	Examples:	C0G:	A = Standard	B = 5% Min Pb	1 = 7" Reel	A = Standard
LD06 - 1206	A = 1000V	X7R = C	10 pF = 100	J = ±5%			3 = 13" Reel	
LD10 - 1210	S = 1500V		100 pF = 101	K = ±10%			9 = Bulk	
LD08 - 1808	G = 2000V		1,000 pF = 102	M = ±20%				
LD12 - 1812	W = 2500V		22,000 pF = 223	X7R:				
LD13 - 1825	H = 3000V		220,000 pF = 224	K = ±10%				
LD20 - 2220	J = 4000V		1 µF = 105	M = ±20%				
LD14 - 2225	K = 5000V			Z = +80%, -20%				
LD40 - 3640 ***								

Notes: Capacitors with X7R dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.
Contact factory for availability of Termination and Tolerance options for Specific Part Numbers.

*** AVX offers nonstandard chip sizes. Contact factory for details.

Not RoHS Compliant

HIGH VOLTAGE C0G CAPACITANCE VALUES

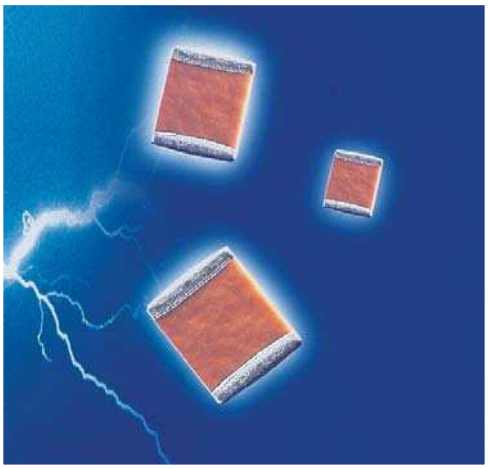
VOLTAGE		0805	1206	1210	1808	1812	1825	2220	2225	3640
600/630	min.	10pF	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF
	max.	330pF	1200 pF	2700 pF	3300 pF	5600 pF	0.012 µF	0.012 µF	0.018 µF	0.047 µF
1000	min.	10pF	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
	max.	180pF	560 pF	1500 pF	2200 pF	3300 pF	8200 pF	0.010 µF	0.010 µF	0.022 µF
1500	min.	—	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF	100 pF
	max.	—	270 pF	680 pF	820 pF	1800 pF	4700 pF	4700 pF	5600 pF	0.010 µF
2000	min.	—	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF	100 pF
	max.	—	120 pF	270 pF	330 pF	1000 pF	1800 pF	2200 pF	2700 pF	6800 pF
2500	min.	—	—	—	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF
	max.	—	—	—	180 pF	470 pF	1200 pF	1500 pF	1800 pF	3900 pF
3000	min.	—	—	—	10 pF	10 pF	10 pF	10 pF	10 pF	100 pF
	max.	—	—	—	120 pF	330 pF	820 pF	1000 pF	1200 pF	2700 pF
4000	min.	—	—	—	10 pF	10 pF	10 pF	10 pF	10 pF	100 pF
	max.	—	—	—	47 pF	150 pF	330 pF	470 pF	560 pF	1200 pF
5000	min.	—	—	—	—	—	—	10 pF	10 pF	10 pF
	max.	—	—	—	—	—	—	220 pF	270 pF	820 pF

HIGH VOLTAGE X7R CAPACITANCE VALUES

VOLTAGE		0805	1206	1210	1808	1812	1825	2220	2225	3640
600/630	min.	100pF	1000 pF	1000 pF	1000 pF	1000 pF	0.010 µF	0.010 µF	0.010 µF	0.010 µF
	max.	6800pF	0.022 µF	0.056 µF	0.068 µF	0.120 µF	0.270 µF	0.270 µF	0.330 µF	0.560 µF
1000	min.	100pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF	0.010 µF
	max.	1500pF	6800 pF	0.015 µF	0.018 µF	0.039 µF	0.100 µF	0.120 µF	0.150 µF	0.220 µF
1500	min.	—	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF
	max.	—	2700 pF	5600 pF	6800 pF	0.015 µF	0.056 µF	0.056 µF	0.068 µF	0.100 µF
2000	min.	—	10 pF	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
	max.	—	1500 pF	3300 pF	3300 pF	8200 pF	0.022 µF	0.027 µF	0.033 µF	0.027 µF
2500	min.	—	—	—	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF
	max.	—	—	—	2200 pF	5600 pF	0.015 µF	0.018 µF	0.022 µF	0.022 µF
3000	min.	—	—	—	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF
	max.	—	—	—	1800 pF	3900 pF	0.010 µF	0.012 µF	0.015 µF	0.018 µF
4000	min.	—	—	—	—	—	—	—	—	100 pF
	max.	—	—	—	—	—	—	—	—	6800 pF
5000	min.	—	—	—	—	—	—	—	—	100 pF
	max.	—	—	—	—	—	—	—	—	3300 pF

Tip & Ring Tin/Lead Termination "B"

Multilayer Ceramic Chip Capacitors



AVX Corporation will support customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers.

AVX "Tip & Ring" or "ring detector" Multilayer Ceramic Chip Capacitors are designed as a standard telecom filter to block -48 Volts DC telephone line voltage and pass subscriber's AC signal pulse (16 to 25Hz, 70 to 90 VRMS). The ringer capacitors replace large leaded film capacitors and are ideal for telecom/modem applications. Using AVX "Tip and Ring" capacitors not only saves valuable real estate on the board and reduces the weight of the overall product, but also features standard surface mounting capabilities, so critical to new and compact designs.

The AVX "Tip & Ring" capacitors are offered in standard EIA sizes and standard values. They offer excellent high frequency performance, low ESR and improved temperature performance over film capacitors.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/apt&rb.pdf

HOW TO ORDER

LD12	P	C	104	K	A	B	1	A
AVX Style LD05 - 0805 LD06 - 1206 LD10 - 1210 LD08 - 1808 LD12 - 1812 LD13 - 1825 LD20 - 2220 LD14 - 2225	**Voltage** 250 VDC Telco Rating	**Temperature Coefficient** X7R	**Capacitance Code** (2 significant digits + no. of zeros) Examples: 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105	**Capacitance Tolerance** K = ±10% M = ±20%	**Test Level** A = Standard	**Termination** B = 5% Min Pb X = FLEXITERM® 5% min. Pb	**Packaging** 1 = 7" Reel 3 = 13" Reel 9 = Bulk	**Special Code** A = Standard

Contact factory for availability of Termination and Tolerance options for Specific Part Numbers.

Not RoHS Compliant

PERFORMANCE CHARACTERISTICS

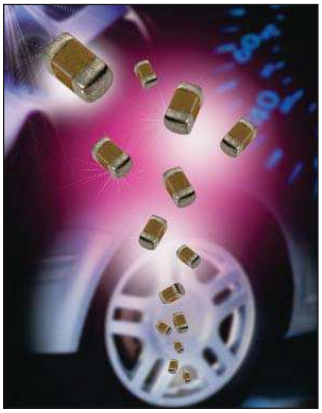
Capacitance Range	1000 pF to 1.2 µF (25°C, 1.0 ±0.2 Vrms at 1kHz)
Capacitance Tolerances	±10%, ±20%
Dissipation Factor	2.5% max. (25°C, 1.0 ±0.2 Vrms at 1kHz)
Operating Temperature Range	-55°C to +125°C
Temperature Characteristic	X7R ±15% (0 VDC)
Voltage Rating	250 VDC Telco rating
Insulation Resistance	1000 megohm-microfarad min.
Dielectric Strength	Minimum 200% rated voltage for 5 seconds at 50 mA max. current

CAPACITANCE RANGE (µF)

STYLE (SIZE)	LD05 (0805)	LD06 (1206)	LD10 (1210)	LD08 (1808)	LD12 (1812)	LD13 (1825)	LD20 (2220)	LD14 (2225)
min.	0.0010	0.0010	0.0010	0.010	0.10	0.33	0.47	0.47
max.	0.027	0.082	0.22	0.27	0.47	1.0	1.0	1.2

Automotive MLCC

NP0 Dielectric



AVX Corporation has supported the Automotive Industry requirements for Multilayer Ceramic Capacitors consistently for more than 10 years. Products have been developed and tested specifically for automotive applications and all manufacturing facilities are QS9000 and VDA 6.4 approved.

As part of our sustained investment in capacity and state of the art technology, we are now transitioning from the established Pd/Ag electrode system to a Base Metal Electrode system (BME).

AVX is using AEC-Q200 as the qualification vehicle for this transition. A detailed qualification package is available on request and contains results on a range of part numbers including:

- Contains BME electrode and copper terminations with a Ni/Sn plated overcoat.
- BME electrode with epoxy finish for conductive glue mounting.
- BME electrode and soft terminations with a Ni/Sn plated overcoat.
- NP0 dielectric components containing Pd/Ag electrode and silver termination with a Ni/Sn plated overcoat.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cauto.pdf

HOW TO ORDER

0805	5	A	104	K	4	T	2	A
Size 0603 0805 1206 1210 1812	**Voltage** 3 = 25V 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Dielectric** NP0 = A	**Capacitance Code (In pF)** 2 Significant Digits + Number of Zeros e.g. 10µF = 106	**Capacitance Tolerance** F = ±1% (≥10pF) G = ±2% (≥10pF) J = ±5% (≤1µF) K = ±10% M = ±20%	**Failure Rate** 4 = Automotive	**Terminations** T = Plated Ni and Sn	**Packaging** 2 = 7" Reel 4 = 13" Reel	**Special Code** A = Std. Product

Contact factory for availability of Tolerance Options for Specific Part Numbers.

AUTOMOTIVE MLCC – NP0

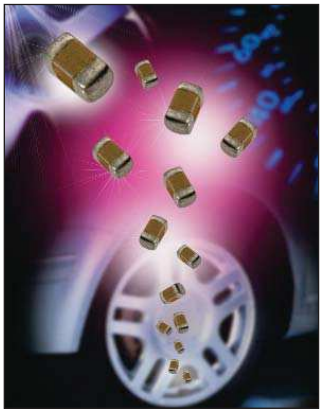
		0603			0805			1206					1210				1812	
		25V	50V	100V	25V	50V	100V	25V	50V	100V	200V	500V	25V	50V	100V	200V	50V	100V
100	10pF	G	G	G	J	J	J	J	J	J	J	J						
120	12	G	G	G	J	J	J	J	J	J	J	J						
150	15	G	G	G	J	J	J	J	J	J	J	J						
180	18	G	G	G	J	J	J	J	J	J	J							
220	22	G	G	G	J	J	J	J	J	J	J							
270	27	G	G	G	J	J	J	J	J	J	J							
330	33	G	G	G	J	J	J	J	J	J	J							
390	39	G	G	G	J	J	J	J	J	J	J							
470	47	G	G	G	J	J	J	J	J	J	J							
510	51	G	G	G	J	J	J	J	J	J	J							
560	56	G	G	G	J	J	J	J	J	J	J							
680	68	G	G	G	J	J	J	J	J	J	J							
820	82	G	G	G	J	J	J	J	J	J	J							
101	100	G	G	G	J	J	J	J	J	J	J							
121	120	G	G	G	J	J	J	J	J	J	J							
151	150	G	G	G	J	J	J	J	J	J	J							
181	180	G	G	G	J	J	J	J	J	J	J							
221	220	G	G	G	J	J	J	J	J	J	J							
271	270	G	G	G	J	J	J	J	J	J	J							
331	330	G	G	G	J	J	J	J	J	J	J							
391	390	G	G		J	J	J	J	J	J	J							
471	470	G	G		J	J	J	J	J	J	J							
561	560				J	J	J	J	J	J	J							
681	680				J	J	J	J	J	J	J							
821	820				J	J	J	J	J	J	J							
102	1000				J	J	J	J	J	J	J		J	J	J	J		
122	1200							J	J	J	J		J	J	M	M		
152	1500							J	M	M	M		J	J	M	M		
182	1800							J	M	M	M		J	J	M	M		
222	2200							J	M	M	M		J	J	M	M		
272	2700							J	M	Q			J	J	M			
332	3300							J	M	Q			J	J	P		K	K
392	3900												J	J	P		K	K
472	4700												J	J	P		K	K
103	10nF																	
		25V	50V	100V	25V	50V	100V	25V	50V	100V	200V	500V	25V	50V	100V	200V	50V	100V
		0603			0805			1206					1210				1812	

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

RoHS COMPLIANT

Automotive MLCC

X7R Dielectric



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As part of our sustained investment in capacity and state of the art technology, we are now transitioning from the established Pd/Ag electrode system to a Base Metal Electrode system (BME).

AVX is using AEC-Q200 as the qualification vehicle for this transition. A detailed qualification package is available on request and contains results on a range of part numbers including:

- X7R dielectric components containing BME electrode and copper terminations with a Ni/Sn plated overcoat.
- X7R dielectric components, BME electrode with epoxy finish for conductive glue mounting.
- X7R dielectric components BME electrode and soft terminations with a Ni/Sn plated overcoat.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cauto.pdf

HOW TO ORDER

0805	5	C	104	K	4	T	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
0402	Y = 16V	X7R = C	2 Significant Digits	J = ±5%	4 = Automotive	T = Plated Ni and Sn		A = Std. Product
0603	3 = 25V		+ Number of Zeros	K = ±10%		Z = FLEXITERM®	2 = 7" Reel	
0805	5 = 50V		e.g. 10µF = 106	M = ±20%		U = Conductive Epoxy	4 = 13" Reel	
1206	1 = 100V							
1210	2 = 200V							
1812	7 = 500V							
2220								

NOTE: Contact factory for non-specified capacitance values. 0402 case size available in T termination only.
Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

AUTOMOTIVE MLCC – X7R

		0402			0603					0805					1206						1210				1812		2220	
		16V	25V	50V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	500V	16V	25V	50V	100V	50V	100V	25V	50V
221	Cap .22	C	C	C																								
271	(nF) .27	C	C	C																								
331	.33	C	C	C																								
391	.39	C	C	C																								
471	.47	C	C	C																								
561	.56	C	C	C																								
681	.68	C	C	C																								
821	.82	C	C	C																								
102	1	C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
182	1.8	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
222	2.2	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
332	3.3	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
472	4.7	C	C		G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
103	10	C			G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
123	12				G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
153	15				G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
183	18				G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
223	22				G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
273	27				G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
333	33				G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
473	47				G	G	G			J	J	J	M		J	J	J	M	J		K	K	K	K	K	K		
563	56				G	G	G			J	J	J	M		J	J	J	M	J		K	K	K	M	K	K		
683	68				G	G	G			J	J	J	M		J	J	J	M	J		K	K	K	M	K	K		
823	82				G	G	G			J	J	J	M		J	J	J	M	J		K	K	K	M	K	K		
104	100				G	G	G			J	J	M	M		J	J	J	M	J		K	K	K	M	K	K		
124	120									J	J	M			J	J	M	M			K	K	K	P	K	K		
154	150									M	N	M			J	J	M	M			K	K	K	P	K	K		
224	220									M	N	M			J	M	M	Q			M	M	M	P	M	M		
334	330									N	N	M			J	M	P	Q			P	P	P	Q	X	X		
474	470									N	N	M			M	M	P	Q			P	P	P	Q	X	X		
684	680									N	N				M	Q	Q	Q			P	P	Q	X	X	X		
105	Cap 1									N	N				M	Q	Q	Q			P	Q	Q	X	X	X		
155	(µF) 1.5														Q	Q					P	Q	Z	Z	X	X		
225	2.2														Q	Q					X	Z	Z	Z	Z	Z		
335	3.3																				X	Z	Z		Z			
475	4.7																				X	Z	Z		Z			
106	10																											Z
226	22																										Z	
		16V	25V	50V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	500V	16V	25V	50V	100V	50V	100V	25V	50V
		0402			0603					0805					1206						1210				1812		2220	

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

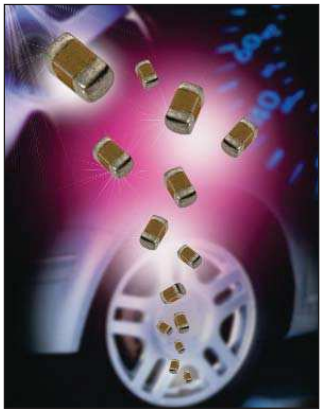
= Under development

AEC-Q200 qualified
TS 16949, ISO 9001 certified

RoHS COMPLIANT

FLEXITERM® MLCC

X7R FLEXITERM® Automotive Series for Board Flexure Applications



AVX Corporation has supported the Automotive Industry requirements for Multilayer Ceramic Capacitors consistently for more than 10 years. Products have been developed and tested specifically for automotive applications and all manufacturing facilities are QS9000 and VDA 6.4 approved.

As part of our sustained investment in capacity and state of the art technology, we are now transitioning from the established Pd/Ag electrode system to a Base Metal Electrode system (BME).

AVX is using AEC-Q200 as the qualification vehicle for this transition. A detailed qualification package is available on request and contains results on a range of part numbers including:

- X7R dielectric components, BME electrode with epoxy finish for conductive glue mounting.
- X7R dielectric components BME electrode and soft terminations with a Ni/Sn plated overcoat.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cauto.pdf

HOW TO ORDER

0805	5	C	104	K	4	Z	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
0603	Z = 10V	X7R = C	2 Significant Digits	J = ±5%*	4 = Automotive	Z = FLEXITERM®	2 = 7" Reel	A = Std. Product
0805	Y = 16V		+ Number of Zeros	K = ±10%		U = Conductive Epoxy	4 = 13" Reel	
1206	3 = 25V		e.g. 10µF = 106	M = ±20%				
1210	5 = 50V							
1812	1 = 100V			*≤ 1µF only				
2220	2 = 200V							

NOTE: Contact factory for non-specified capacitance values.

AUTOMOTIVE MLCC – X7R

	0603					0805						1206					1210				1812				2220		
	16V	25V	50V	100V	200V	10V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	16V	25V	50V	100V	25V	50V	100V
101																											
121																											
151																											
181																											
221																											
271	J	J	J	J	J	J																					
331	J	J	J	J	J	J	J	J	J	J	J																
391	J	J	J	J	J	J	J	J	J	J	J																
471	J	J	J	J	J	J	J	J	J	J	J																
561	J	J	J	J	J	J	J	J	J	J	J																
681	J	J	J	J	J	J	J	J	J	J	J																
821	J	J	J	J	J	J	J	J	J	J	J																
102	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J											
122	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
152	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
182	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
222	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
272	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
332	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
392	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
472	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
562	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
682	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
822	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
103	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
123	J	J	J			J	J	J	J	M		J	J	J	J	J											
153	J	J	J			J	J	J	J	M		J	J	J	J	J											
183	J	J	J			J	J	J	J	M		J	J	J	J	J											
223	J	J	J			J	J	J	J	M		J	J	J	J	J				K							
273	J	J	J			J	J	J	J	M		J	J	J	J	J				K							
333	J	J	J			J	J	J	J	M		J	J	J	J	J				K							
393	J	J	J			J	J	J	J	M		J	J	J	M	J				K							
473	J	J	J			J	J	J	J	M		J	J	J	M	J				K							
563	J	J	J			J	J	J	J	N		J	J	J	M	J	K	K	K	M	K	K	K	K			
683	J	J	J			J	J	J	J	N		J	J	J	M	J	K	K	K	M	K	K	K	K			
823	J	J	J			J	J	J	J	N		J	J	J	P	J	K	K	K	M	K	K	K	K			
104	J	J	J			J	J	J	J	N		J	J	J	Q	J	K	K	K	P	K	K	K	K	X	X	X
124						J	J	J	N			J	J	P	Q		K	K	K	Q	K	K	K	K			
154						M	M	N	N			J	J	P	Q		K	K	K	Q	K	K	K	M	X	X	X
184						M	M	N	N			J	M	P	Q		M	M	M	Q	K	K	K	M			
224						M	M	N	N			J	M	P	Q		M	M	M	Q	M	M	M	X	X	X	X
274						N	N	N	N			J	M	P	Q		P	P	P	Q	M	M	M	X			
334						N	N	N	N			J	M	P	Q		P	P	P	Q	M	M	M	X	X	X	X
394						N	N	N	N			M	M	P	Q		P	P	P	Q	X	X	X	X			
474						N	N	N	N			M	M	P	Q		P	P	P	Q	X	X	X	X	X	X	X
564						N	N	N				M	Q	Q	Q		P	Q	Q	Q	X	X	X	Z			
684						N	N	N				M	Q	Q	Q		P	X	X	X	X	X	X	Z	X	X	X
824						N	N	N				M	Q	Q	Q		P	Z	Z	Z	X	X	X	Z			
105						N	N	N				M	Q	Q	Q		P	Z	Z	Z	X	X	X	Z	X	X	X
155												Q	Q				P	Z	Z	Z			Z	Z	X	X	X
185												Q	Q				Z	Z	Z	Z			Z	Z			
225												Q	Q				Z	Z	Z	Z			Z	Z	X	X	X
335																	Z	Z	Z				Z				
475																	Z	Z	Z				Z				
106																									Z	Z	
226																									Z		
	16V	25V	50V	100V	200V	10V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	16V	25V	50V	100V	25V	50V	100V
	0603					0805						1206					1210				1812				2220		

= Under development

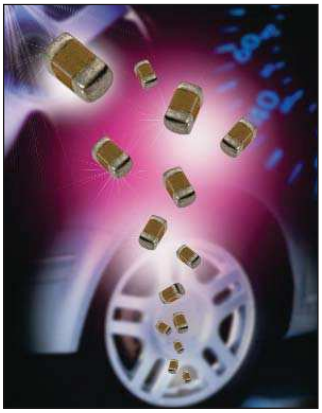
Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

AEC-Q200 qualified
TS 16949, ISO 9001 certified

RoHS COMPLIANT

High Voltage FLEXITERM®

AEC-Q200 X7R For 600V to 5000V Applications



High value, low leakage and small size are difficult parameters to obtain in capacitors for high voltage systems. AVX special high voltage MLC chip capacitors meet these performance characteristics and are designed for applications such as snubbers in high frequency power converters, resonators in SMPS, and high voltage coupling/DC blocking. These high voltage chip designs exhibit low ESRs at high frequencies.

To make high voltage chips, larger physical sizes than are normally encountered are necessary. These larger sizes require that special precautions be taken in applying these chips in surface mount assemblies. In response to this, and to follow from the success of the FLEXITERM® range of low voltage parts, AVX is delighted to offer a FLEXITERM® high voltage range of capacitors, FLEXITERM®.

The FLEXITERM® layer is designed to enhance the mechanical flexure and temperature cycling performance of a standard ceramic capacitor, giving customers a solution where board flexure or temperature cycle damage are concerns.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/flexitermhv.pdf

HOW TO ORDER

1808	A	C	272	K	4	Z	1	A
AVX Style 0805 1206 1210 1808 1812 1825 2220 2225 ***	**Voltage** C = 600V/630V A = 1000V S = 1500V G = 2000V W = 2500V H = 3000V	**Temperature Coefficient** C0G = A X7R = C	**Capacitance Code** (2 significant digits + no. of zeros) Examples: 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105	**Capacitance Tolerance** C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20%	**Test Level**	**Termination*** Z = FLEXITERM® 100% Tin (RoHS Compliant)	**Packaging** 1 = 7" Reel 3 = 13" Reel 9 = Bulk	**Special Code** A = Standard

Notes: Capacitors with X7R dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations. Contact factory for availability of Termination and Tolerance options for Specific Part Numbers.

*** AVX offers nonstandard chip sizes. Contact factory for details.

Size	1206			1210						1812					2220	
	600/630	1000	2000	600/630	1000	1500	2000	2500	3000	600/630	1000	2000	2500	3000	600/630	1500
(pF) 100																
120																
150																
180																
220																
270																
330																
390																
470																
560																
680																
820																
1000																
1200																
1500																
1800																
2200																
2700																
3300																
3900																
4700																
5600																
6800																
8200																
0.01																
0.012																
0.015																
0.018																
0.022																
0.027																
0.033																
0.039																
0.047																
0.056																
0.068																
0.082																
(µF) 0.1																
	600/630	1000	2000	600/630	1000	1500	2000	2500	3000	600/630	1000	2000	2500	3000	600/630	1500
Size	1206			1210						1812					2220	

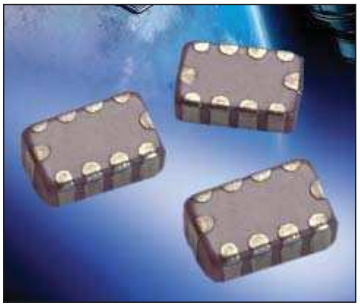
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Please select correct termination style.

Standard Capacitor Arrays

Standard NP0, X7R and X5R Dielectric



AVX is the market leader in the development and manufacture of capacitor arrays. The smallest array option available from AVX, the 0405 2-element device, has been an enormous success in the Telecommunications market. The array family of products also includes the 0612 4-element device as well as 0508 2-element and 4-element series, all of which have received widespread acceptance in the marketplace.

AVX capacitor arrays are available in X5R, X7R and NP0 (C0G) ceramic dielectrics to cover a broad range of capacitance values. Voltage ratings from 6.3 Volts up to 100 Volts are offered. AVX also now offers a range of automotive capacitor arrays qualified to AEC-Q200 (see separate table).

Key markets for capacitor arrays are Mobile and Cordless Phones, Digital Set Top Boxes, Computer Motherboards and Peripherals as well as Automotive applications, RF Modems, Networking Products, etc.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/caparray.pdf

HOW TO ORDER (Capacitor Array - IPC)

W	2	A	4	3	C	103	M	A	T	2A
Style	**Case Size**	**Array**	**Number of Caps**	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging & Quantity Code**
W = RoHS L = Tin/Lead	1 = 0405 2 = 0508 3 = 0612 5 = 0306			6 = 6V Z = 10V Y = 16V 3 = 25V 5 = 50V 1 = 100	A = NP0 C = X7R D = X5R	2 Sig. Digits + No. of Zeros	J = ±5% K = ±10% M = ±20%	A = Commercial	T = Ni Barrier* Z = FLEXITERM®* B = 5% min lead X = FLEXITERM® with 5% min lead	2A = 7" Reel (4000) 4A = 13" Reel (10000) 2F = 7" Reel (1000)

*RoHS compliant

NP0/C0G

SIZE		0405			0508				0508				0612			
# Elements		2			2				4				4			
Soldering		Reflow Only			Reflow/Wave				Reflow/Wave				Reflow/Wave			
Packaging		All Paper			All Paper				Paper/Embossed				Paper/Embossed			
Length	MM	1.00 ± 0.15			1.30 ± 0.15				1.30 ± 0.15				1.60 ± 0.150			
	(in.)	(0.039 ± 0.006)			(0.051 ± 0.006)				(0.051 ± 0.006)				(0.063 ± 0.006)			
Width	MM	1.37 ± 0.15			2.10 ± 0.15				2.10 ± 0.15				3.20 ± 0.20			
	(in.)	(0.054 ± 0.006)			(0.083 ± 0.006)				(0.083 ± 0.006)				(0.126 ± 0.008)			
Max. Thickness	MM	0.66			0.94				0.94				1.35			
	(in.)	(0.026)			(0.037)				(0.037)				(0.053)			
WVDC		16	25	50	16	25	50	100	16	25	50	100	16	25	50	100
1R0	Cap (pF) 1.0															
1R2	1.2															
1R5	1.5															
1R8	1.8															
2R2	2.2															
2R7	2.7															
3R3	3.3															
3R9	3.9															
4R7	4.7															
5R6	5.6															
6R8	6.8															
8R2	8.2															
100	10															
120	12															
150	15															
180	18															
220	22															
270	27															
330	33															
390	39															
470	47															
560	56															
680	68															
820	82															
101	100															
121	120															
151	150															
181	180															
221	220															
271	270															
331	330															
391	390															
471	470															
561	560															
681	680															
821	820															
102	1000															
122	1200															
152	1500															
182	1800															
222	2200															
272	2700															
332	3300															
392	3900															
472	4700															
562	5600															
682	6800															
822	8200															

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Please select correct termination and style.

X7R/X5R

SIZE		0306				0405					0508						0508						0612					
# Elements		4				2					2						4						4					
Soldering		Reflow Only				Reflow Only					Reflow/Wave						Reflow/Wave						Reflow/Wave					
Packaging		All Paper				All Paper					All Paper						Paper/Embossed						Paper/Embossed					
Length	MM	1.60 ± 0.15				1.00 ± 0.15					1.30 ± 0.15						1.30 ± 0.15						1.60 ± 0.150					
	(in.)	(0.063 ± 0.006)				(0.039 ± 0.006)					(0.051 ± 0.006)						(0.051 ± 0.006)						(0.063 ± 0.006)					
Width	MM	0.81 ± 0.15				1.37 ± 0.15					2.10 ± 0.15						2.10 ± 0.15						3.20 ± 0.20					
	(in.)	(0.032 ± 0.006)				(0.054 ± 0.006)					(0.083 ± 0.006)						(0.083 ± 0.006)						(0.126 ± 0.008)					
Max. Thickness	MM	0.50				0.66					0.94						0.94						1.35					
	(in.)	(0.020)				(0.026)					(0.037)						(0.037)						(0.053)					
WVDC		6	10	16	25	6	10	16	25	50	6	10	16	25	50	100	6	10	16	25	50	100	6	10	16	25	50	100
101	Cap (pF) 100																											
121	120																											
151	150																											
181	180																											
221	220																											
271	270																											
331	330																											
391	390																											
471	470																											
561	560																											
681	680																											
821	820																											
102	1000																											
122	1200																											
152	1500																											
182	1800																											
222	2200																											
272	2700																											
332	3300																											
392	3900																											
472	4700																											
562	5600																											
682	6800																											
822	8200																											
103	Cap (µF) 0.010																											
123	0.012																											
153	0.015																											
183	0.018																											
223	0.022																											
273	0.027																											
333	0.033																											
393	0.039																											
473	0.047																											
563	0.056																											
683	0.068																											
823	0.082																											
104	0.10																											
124	0.12																											
154	0.15																											
184	0.18																											
224	0.22																											
274	0.27																											
334	0.33																											
474	0.47																											
564	0.56																											
684	0.68																											
824	0.82																											
105	1.0																											
125	1.2																											
155	1.5																											
185	1.8																											
225	2.2																											
335	3.3																											
475	4.7																											
106	10																											
226	22																											
476	47																											
107	100																											

= Currently available X7R
= Currently available X5R
= Under development X7R, contact factory for advance samples
= Under development X5R, contact factory for advance samples

FLEXISAFE™ MLC Chips

For Ultra Safety Critical Applications

AVX have developed a range of components specifically for safety critical applications.

Utilizing the award-winning FLEXITERM® layer in conjunction with the cascade design previously used for high voltage MLCCs, a range of ceramic capacitors is now available for customers who require components designed with an industry leading set of safety features.

The FLEXITERM® layer protects the component from any damage to the ceramic resulting from mechanical stress during PCB assembly or use with end customers. Board flexure type mechanical damage accounts for the majority of MLCC failures. The addition of the cascade structure protects the component from low insulation resistance failure resulting from other common causes for failure; thermal stress damage, repetitive strike ESD damage and placement damage. With the inclusion of the cascade design structure to complement the FLEXITERM® layer, the FLEXISAFE™ range of capacitors has unbeatable safety features.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/flexisafe.pdf

HOW TO ORDER

FS03	5	C	104	K	Q	Z	2	A
Size FS03 = 0603 FS05 = 0805 FS06 = 1206 FS10 = 1210	**Voltage** Y = 16V 3 = 25V 5 = 50V 1 = 100V	**Dielectric** X7R = C	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros e.g. 10µF =106	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Failure Rate** A = Commercial 4 = Automotive Q = APS	**Terminations** Z = FLEXITERM® X = FLEXITERM® with 5% min lead	**Packaging** 2 = 7" Reel 4 = 13" Reel	**Special Code** A = Std. Product

FLEXISAFE™ X7R RANGE

Capacitance		0603				0805			1206			1210		
Code	nF	16	25	50	100	16	25	50	16	25	50	16	25	50
102	1	■	■	■	■	■	■	■	■	■	■			
182	1.8	■	■	■	■	■	■	■	■	■	■			
222	2.2	■	■	■	■	■	■	■	■	■	■			
332	3.3	■	■	■	■	■	■	■	■	■	■			
472	4.7	■	■	■	■	■	■	■	■	■	■			
103	10	■	■	■	■	■	■	■	■	■	■			
123	12	■	■	■		■	■	■	■	■	■			
153	15	■	■	■		■	■	■	■	■	■			
183	18	■	■	■		■	■	■	■	■	■			
223	22	■	■	■		■	■	■	■	■	■			
273	27					■	■	■	■	■	■			
333	33					■	■	■	■	■	■			
473	47					■	■	■	■	■	■			
563	56					■	■	■	■	■	■			
683	68					■	■	■	■	■	■			
823	82					■	■	■	■	■	■			
104	100					■	■	■	■	■	■			
124	120								■	■	■			
154	150								■	■	■	■	■	■
224	220											■	■	■
334	330											■	■	■
474	470											■	■	■

■ Qualified

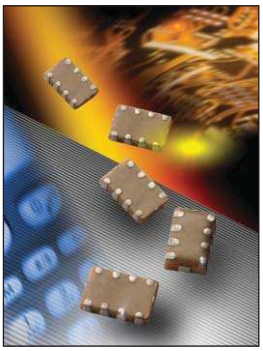
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Please select correct termination style.

Automotive Capacitor Arrays

AEC-Q200 Series NP0/C0G, X7R Dielectric and X8R Dielectric



As the market leader in the development and manufacture of capacitor arrays AVX is pleased to offer a range of AEC-Q200 qualified arrays to compliment our product offering to the Automotive Industry. Both the AVX 0612 and 0508 4-element capacitor array styles are qualified to the AEC-Q200 automotive specifications.

AEC-Q200 is the Automotive Industry qualification standard and a detailed qualification package is available on request.

All AVX automotive capacitor array production facilities are certified to ISO/TS 16949:2002.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/caparray.pdf

HOW TO ORDER

W	3	A	4	Y	C	104	K	4	T	2A
Style W = RoHS L = Tin/Lead	**Case Size** 1 = 0405 2 = 0508 3 = 0612	**Array**	**Number of Caps**	**Voltage** Z = 10V Y = 16V 3 = 25V 5 = 50V 1 = 100V	**Dielectric** A = NP0 C = X7R F = X8R	**Capacitance Code (In pF)** Significant Digits + Number of Zeros e.g. 10µF=106	**Capacitance Tolerance** *J = ±5% *K = ±10% M = ±20%	**Failure Rate** 4 = Automotive	**Terminations** T = Plated Ni and Sn** Z = FLEXITERM®** B = 5% min lead X = FLEXITERM® with 5% min lead	**Packaging & Quantity Code** 2A = 7" Reel (4000) 4A = 13" Reel (10000) 2F = 7" Reel (1000)

**RoHS compliant

*Contact factory for availability by part number for K = ±10% and J = ±5% tolerance.

NP0/C0G

SIZE		0405	0508	0508				0612			
No. of Elements		2	2	4				4			
	WVDC	50	50	16	25	50	100	16	25	50	100
1R0	Cap 1.0										
1R2	(pF) 1.2										
1R5	1.5										
1R8	1.8										
2R2	2.2										
2R7	2.7										
3R3	3.3										
3R9	3.9										
4R7	4.7										
5R6	5.6										
6R8	6.8										
8R2	8.2										
100	10										
120	12										
150	15										
180	18										
220	22										
270	27										
330	33										
390	39										
470	47										
560	56										
680	68										
820	82										
101	100										
121	120										
151	150										
181	180										
221	220										
271	270										
331	330										
391	390										
471	470										
561	560										
681	680										
821	820										
102	1000										
122	1200										
152	1500										
182	1800										
222	2200										
272	2700										
332	3300										
392	3900										
472	4700										
562	5600										
682	6800										
822	8200										

= NP0/C0G

= Under development

X7R / X8R

	SIZE	0508					0508				0612					0405
	No. of Elements	2					4				4					2
	WVDC	10	16	25	50	100	16	25	50	100	10	16	25	50	100	16
101	Cap 100															
121	(pF) 120															
151	150															
181	180															
221	220															
271	270															
331	330															
391	390															
471	470															
561	560															
681	680															
821	820															
102	1000															
122	1200															
152	1500															
182	1800															
222	2200															
272	2700															
332	3300															
392	3900															
472	4700															
562	5600															
682	6800															
822	8200															
103	Cap 0.010															
123	(µF) 0.012															
153	0.015															
183	0.018															
223	0.022															
273	0.027															
333	0.033															
393	0.039															
473	0.047															
563	0.056															
683	0.068															
823	0.082															
104	0.10															
124	0.12															
154	0.15															
224	0.22															

= X7R

= X8R

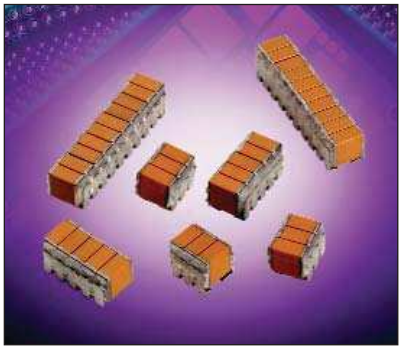
= Under development

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Please select correct termination and style.

TurboCap™
High-CV SMPS Capacitors



The TurboCap™, MLC capacitors from AVX Corporation are characterized with very high capacitance in a small volume. By vertical stacking of the ceramic elements, the footprint required for mounting the capacitors is greatly reduced. TurboCaps™ are ideally suited as filters in the input and output stages of switch mode power supplies (SMPS). With their ultra-low ESR, these capacitors are designed to handle high ripple current at high frequencies and high power levels. The DIP leads in either thru-hole or surface mount configurations offer superior stress relief to the ceramic elements. The leads effectively decouple the parts from the board and minimize thermally or mechanically induced stresses encountered during assembly, temperature cycling or other environmental conditions.

Check for up-to-date CV Tables at
http://www.avx.com/docs/Catalogs/turbocap.pdf

HOW TO ORDER

ST12	5	C	186	M	A	N	03
AVX Style ST12 ST20	**Voltage** 3 = 25V 5 = 50V 1 = 100V	**Temperature Coefficient** X7R = C	**Capacitance Code** (2 significant digits + no. of zeros) 1 pF = 105 10 pF = 106 100 pF = 107	**Capacitance Tolerance** M = ±20%	**Test Level** A = Standard	**Termination** N = Straight Lead J = Leads formed in L = Leads formed out	**Number of Leads Per Side** 03 = 3 05 = 5 10 = 10

Not RoHS Compliant

CAPACITANCE (µF)

	ST12		ST20			
			Voltage			
Cap (µF)	**50V**	**100V**	**25V**	**50V**	**100V**	**500V**
.82						
1.3						
2.7						
8.2		...03				
12		...05				
14					...03	
18	...03					
22		...10			...05	
27	...05			...03		
47				...05	...10	
50	...10					
68			...03			
100			...05	...10		
220			...10			

Development

Numbers inside shaded areas refer to the number of leads per side (the last two digits of the part number.

MH Series

Lead Free Ceramic Capacitor in Molded SM Leadframe

AVX are pleased to introduce the MH range of multi layer ceramic capacitors. The MH components are surface mount molded parts with a multi layer ceramic insert.

MH capacitors combine the ceramic attributes of very low ESR, non polar construction, excellent high frequency behavior, excellent voltage stress capabilities and wide temperature range; with the enhanced mechanical protection of a molded case.

The MH range provides a lead free solution to customers who have previously been unable to use large case ceramic capacitors because of mechanical stressing concerns.

For those applications where a tin termination is not acceptable, a Tin/Lead termination is available.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/mh.pdf

HOW TO ORDER

MH	V	1	1	C	475	M	A	T	2	A
MH Series	**Case Size**	**MLCC Count**	**Voltage** 3 = 25V 5 = 50V 1 = 100V	**Dielectric** C = X7R	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** K = ±10% M = ±20%	**Failure Rate** A = Not Applicable	**Terminations** T = Tin Plated B = Tin/Lead Plated	**Packaging** 2 = 7" Reel 4 = 13" Reel 6 = Waffle Pack	**Special Code** A = Standard

MH X7R RANGE

	Cap µF	25V	50V	100V
225	2.2			
335	3.3			
475	4.7			
685	6.8			
106	10			
156	15			
226	22			

PACKAGING QUANTITY

7" Reels	400
13" Reels	1500
Waffle Pack	108

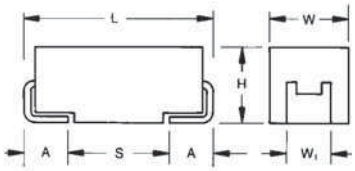
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS
COMPLIANT

TS 16949, ISO 14001
Certified Manufacture

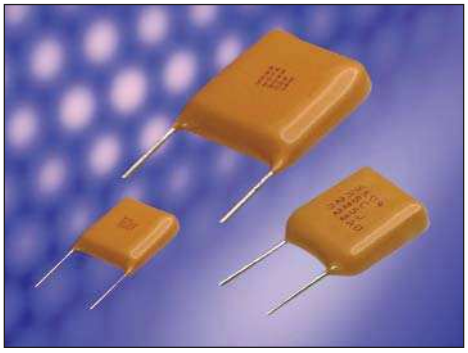
"V" CASE DIMENSIONS: millimeters (inches)

L	7.3±0.2 0 (0.287 ±0.008)
W	6.1 + 0.20 - 0.10
	(0.24 + 0.008 – 0.004)
H	3.45±0.30 (0.136±0.012)
W_1	3.1±0.20 (0.120±0.008)
A	1.4 + 0.30 - 0.20
	(0.055 + 0.012 – 0.008)
S Min	4.40 (0.173)



Leaded SMPS MLCC

SK Series for Output Filtering



AVX SK styles are conformally coated MLC capacitors for input or output filtering in switch mode power supplies. They are specially processed to handle high currents and are low enough in cost for commercial SMPS application.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/sk.pdf

HOW TO ORDER

SK	01	3	E	125	Z	A	A	*
Style	**Size**	**Voltage** 3 = 25V 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Temperature Coefficient** Z5U = E X7R = C C0G = A	**Capacitance Code** (2 significant digits + no. of zeros) 22 nF = 223 220 nF = 224 1 µF = 105 100 µF = 107	**Capacitance Tolerance** C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80, -20% Z5U: M = ±20% Z = +80, -20% P = GMV (+100, -0%)	**Test Level** A = Standard B = Hi-Rel*	**Leads** A = Tin/Lead R = RoHS Compliant	**Packaging** (See Note 1)

Note 1: No suffix signifies bulk packaging, which is AVX standard packaging. SK01, SK*3, SK*4, SK*5, SK*6, SK*9 & SK*0 are available taped and reel per EIA-468. Use suffix "TR1" if tape & reel is required.

Note: Capacitors with X7R and Z5U dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.

*Hi-Rel screening for C0G and X7R only. Screening consists of 100% Group A (B Level), Subgroup 1 per MIL-PRF-49470.

C0G Capacitance Range (µF)

Style	25 WVDC min./max.	50 WVDC min./max.	100 WVDC min./max.	200 WVDC min./max.	500 WVDC min./max.
SK01	.001/0.015	.001/0.012	.001/0.010	.0010/0.0056	.0010/0.0018
SK03/SK53	.01/0.056	.01/0.047	.01/0.039	.001/0.022	.001/0.0068
SK04/SK54	.01/0.12	.01/0.10	.01/0.082	.01/0.047	.001/0.015
SK05/SK55	.01/0.18	.01/0.15	.01/0.12	.01/0.068	.001/0.022
SK06/SK56	.10/0.56	.01/0.47	.01/0.39	.01/0.22	.01/0.068
SK07	.10/0.68	.01/0.56	.01/0.47	.01/0.27	.01/0.082
SK08	.82/1.20	.68/1.10	.56/0.82	.33/0.47	.10/0.15
SK09/SK59	.10/0.27	.01/0.22	.01/0.18	.01/0.10	.001/0.039
SK10/SK60	.10/0.68	.01/0.56	.01/0.47	.01/0.27	.01/0.082

X7R Capacitance Range (µF)

Style	25 WVDC min./max.	50 WVDC min./max.	100 WVDC min./max.	200 WVDC min./max.	500 WVDC min./max.
SK01	.01/0.39	.01/0.33	.01/0.27	.01/0.12	.001/0.047
SK03/SK53	.10/2.2	.10/1.8	.01/1.5	.01/0.56	.01/0.27
SK04/SK54	.10/4.7	.10/3.3	.10/2.7	.01/1.0	.01/0.47
SK05/SK55	.10/6.8	.10/5.6	.10/3.9	.10/1.8	.01/0.68
SK06/SK56	1.0/15	1.0/10	.10/5.6	.10/3.9	.10/1.5
SK07	1.0/18	1.0/14	1.0/8.2	.10/4.7	.10/2.2
SK08	22/33	15/22	10/15	5.6/8.2	2.2/3.9
SK09/SK59	.10/8.2	.10/5.6	.10/3.3	.10/2.2	.10/1.2
SK10/SK60	1.0/18	1.0/12	.10/6.8	.10/4.7	.10/2.2

Z5U Capacitance Range (µF)

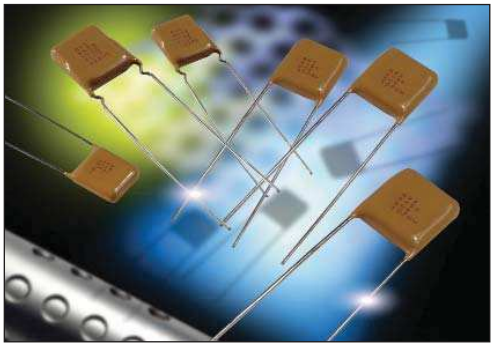
Style	25 WVDC min./max.	50 WVDC min./max.	100 WVDC min./max.	200 WVDC min./max.
SK01	.10/1.2	.10/0.82	.10/0.47	.10/0.33
SK03/SK53	.10/5.6	.10/3.30	.10/2.20	.10/1.50
SK04/SK54	1.0/10.0	1.0/8.20	.10/4.70	.10/3.30
SK05/SK55	1.0/18.0	1.0/10.00	1.0/6.80	.10/4.70
SK06/SK56	1.0/47.0	1.0/39.00	1.0/22.00	1.0/15.00
SK07	1.0/68.0	1.0/47.00	1.0/27.00	1.0/18.00
SK08	82/120.0	56/100.00	33/47.00	22/33.00
SK09/SK59	1.0/27.0	1.0/18.00	1.0/10.00	1.0/6.80
SK10/SK60	1.0/56.0	1.0/39.00	1.0/22.00	1.0/18.00

RoHS COMPLIANT

Please select correct termination style.

Leaded SMPS MLCC

SE Series of Extended Ranges



AVX SE styles offer capacitance extension to popular SK ranges. The CV product for SE-series, X7R capacitors (TCC: ±15% over -55 to +125°C) compares favorably to high CV ranges offered by other suppliers in much less stable Y5U dielectric (TCC: +22/-56% over -30 to +85°C). SE style capacitors are conformally coated and are designed for input and output filtering applications in switch mode power supplies.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/se.pdf

HOW TO ORDER

SE	01	3	C	125	M	A	A	*
Style	**Size**	**Voltage** 3 = 25V 5 = 50V 1 = 100V	**Temperature Coefficient** X7R = C	**Capacitance Code** (2 significant digits + no. of zeros) 22 nF = 223 220 nF = 224 1 µF = 105 100 µF = 107	**Capacitance Tolerance** X7R: K = ±10% M = ±20% Z = +80, -20%	**Test Level** A = Standard B = Hi-Rel*	**Leads** A = Tin/Lead R = RoHS Compliant	**Packaging** (See Note 1)

Note 1: No suffix signifies bulk packaging, which is AVX standard packaging. Parts available tape and reel per EIA-468. Use suffix "TR1" if tape & reel is required.

Note: Capacitors with X7R dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.

*Hi-Rel screening consists of 100% Group A, Subgroup 1 per MIL-PRF-39014.

X7R Capacitance Range (µF)

Style	25 WVDC min./max.	50 WVDC min./max.	100 WVDC min./max.
SE01	0.47/1.5	0.39/1.0	0.33/0.68
SE03/SE53	2.7/6.8	2.2/4.7	1.8/3.3
SE04/SE54	5.6/12	3.9/10	3.3/6.8
SE05/SE55	8.2/18	6.8/12	4.7/10.0
SE06/SE56	18/39	12/27	6.8/15

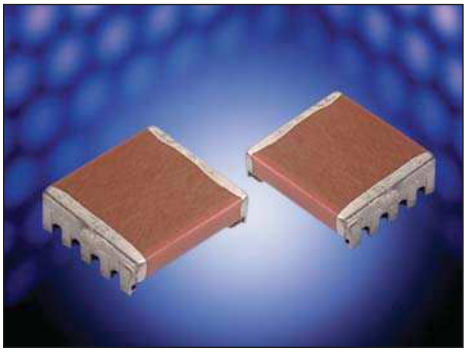
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS
COMPLIANT

Please select correct termination style.

Commercial SMT SMPS Capacitors

RH Series for I/O Filtering in DC-DC Converters



This range of uncoated MLC capacitors are processed for input and output filter capacitors in high frequency DC-DC converter applications above 10 Watts e.g. telecomms and instrumentation, where high volume and low cost is required. These products are available in surface mount 'J' leaded versions and can be supplied in bulk and tape/reel packaging.

- 0.047 µF to 47.0 µF
- 25V to 500 VDC
- -55ºC to +125ºC
- Low ESR/ESL
- X7R Dielectric

RoHS COMPLIANT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/rh.pdf

Please select correct termination style.

HOW TO ORDER

RH	31	5	C	225	M	A	3	0	A	3
Style Code	**Size Code**	**Voltage Code** 3 = 25V 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Dielectric Code** C = X7R	**Capacitance Code** 2 Sig. Digits + Number of Zeros Examples: 105 = 1 µF 104 = 0.1 µF	**Capacitance Tolerance** K = ±10% M = ±20%	**Specification Code** A = Non customized	**Package Code** 3 = Waffle Pack A = Tape & Reel	**Lead Dia. Code** 0 = Standard R = RoHS Compliant	**Lead Space Code** A = Standard	**Lead Style Code** 3 = 'J' Lead

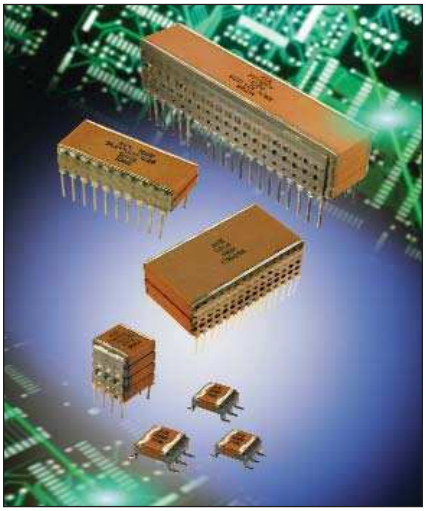
X7R Stable Dielectric

	RH21/RH22 Style					RH31/RH32 Style				RH41/RH42 Style				RH51/RH52 Style				RH61/RH62 Style			
	Voltage DC																				
Cap µF	25	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500
0.047																					
0.056																					
0.068									RH31												
0.082																					
0.1																					
0.12																					
0.15									RH32				RH41								
0.18																					
0.22																					
0.27								RH31													
0.33													RH42								
0.39												RH41					RH51				
0.47																					
0.56								RH32													
0.68																	RH52				RH61
0.78																RH51					
0.82							RH31					RH42									
1																					
1.2																					RH62
1.5						RH31										RH52				RH61	
1.8											RH41										
2.2							RH32														
2.7			RH21							RH41					RH51						
3																				RH62	
3.3		RH21				RH32															
3.9											RH42										
4.4														RH51							
4.7										RH42											
5.6															RH52				RH61		
6.8			RH22																		
8.2														RH52				RH61			
10																					
12																			RH62		
15	RH21	RH22																RH62			
18																					
22																					
27																					
33	RH22																				
39																					
47																					

For availability of further parts in the RH21/RH22 Series, contact manufacturing.

Stacked Leaded MLC Capacitors

SM Series



The SMPS capacitors are designed for high current, high-power and high-temperature applications. These capacitors have very low ESR (Equivalent Series Resistance) and ESL (Equivalent Series Inductance). SMPS Series capacitors offer design and component engineers a proven technology specifically designed for programs requiring high reliability performance in harsh environments.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/rm01-06.pdf

HOW TO ORDER AVX Styles: SM-1, SM-2, SM-3, SM-4, SM-5, SM-6

SM0	1	7	C	106	M	A	N	650
AVX Style Size SM0 = Uncoated SM5 = Epoxy Coated	**Size**	**Voltage** 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Temperature Coefficient** C0G = A X7R = C	**Capacitance Code** (2 significant digits + no. of zeros) 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105 10 µF = 106 100 µF = 107	**Capacitance Tolerance** C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20%	**Test Level** A = Standard	**Termination** N = Straight Lead J = Leads formed in L = Leads formed out P = P Style Leads Z = Z Style Leads	**Height** Max Dimension "A" 120 = 0.120" 240 = 0.240" 360 = 0.360" 480 = 0.480" 650 = 0.650"

Note: Capacitors with X7R and Z5U dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.

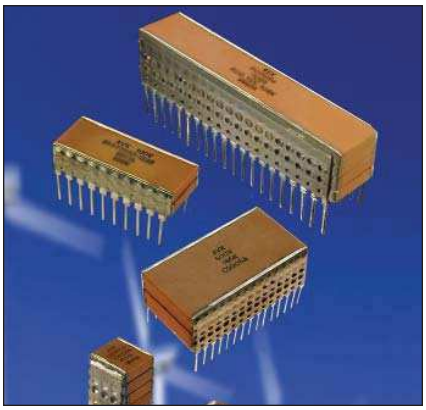
Not RoHS Compliant

Maximum Capacitance Values (µF)													
	Max	Case Code 01		Case Code 02		Case Code 03		Case Code 04		Case Code 05		Case Code 06	
Voltage	Height	X7R	NPO	X7R	NPO	X7R	NPO	X7R	NPO	X7R	NPO	X7R	NPO
50		27.00	1.00	41.00	1.20	18.00	0.47	7.50	0.16	2.80	0.05	80.00	3.20
100	0.12"	12.00	0.70	18.00	1.00	6.00	0.40	1.80	0.13	0.68	0.04	40.00	2.40
200	3.05mm	7.00	0.40	11.00	0.60	3.60	0.20	1.10	0.07	0.40	0.02	24.00	1.30
500		2.60	0.18	4.00	0.26	1.30	0.09	0.40	0.02	0.16	0.01	9.40	0.50
50		54.00	2.00	82.00	2.40	36.00	1.00	15.00	0.32	5.60	0.10	160.00	6.40
100	0.24"	24.00	1.40	36.00	2.00	12.00	0.80	3.60	0.26	1.30	0.08	80.00	4.80
200	6.10mm	14.00	0.80	22.00	1.20	7.20	0.40	2.20	0.12	0.80	0.05	48.00	2.60
500		5.20	0.36	8.00	0.52	2.60	0.18	0.80	0.05	0.32	0.02	18.00	1.00
50		82.00	3.00	120.00	3.60	54.00	1.50	22.00	0.48	8.20	0.15	240.00	9.60
100	0.36"	36.00	2.10	54.00	3.00	18.00	1.20	5.40	0.39	2.00	0.12	120.00	7.20
200	9.14mm	21.00	1.20	33.00	1.80	10.00	0.60	3.30	0.21	1.20	0.07	72.00	3.90
500		7.80	0.54	12.00	0.78	3.90	0.27	1.20	0.07	0.48	0.03	28.00	1.50
50		110.00	4.00	160.00	4.80	72.00	2.00	30.00	0.64	10.00	0.20	320.00	12.00
100	0.48"	48.00	2.80	72.00	4.00	24.00	1.60	7.20	0.52	2.70	0.16	160.00	9.60
200	12.2mm	28.00	1.60	44.00	2.20	14.00	0.80	4.40	0.28	1.60	0.10	96.00	5.20
500		10.00	0.72	16.00	1.00	5.20	0.36	1.60	0.10	0.64	0.04	37.00	2.00
50		130.00	5.00	200.00	6.00	90.00	2.50	36.00	0.80	12.00	0.25	400.00	16.00
100	0.65"	60.00	3.50	90.00	5.00	30.00	2.00	9.00	0.65	3.40	0.20	200.00	12.00
200	16.5mm	35.00	2.00	55.00	3.00	18.00	1.00	5.50	0.35	2.00	0.12	120.00	6.50
500		13.00	0.90	20.00	1.30	6.50	0.47	2.00	0.12	0.80	0.05	47.00	2.50

Note: J, K and M tolerances std. Consult factory for availabilty on other tolerances
Configuration: J, L, N, P and Z leads standard. Consult factory for other variations.

Stacked Leaded MLC Capacitors

RM Series



The SMPS capacitors are designed for high current, high-power and high-temperature applications. These capacitors have very low ESR (Equivalent Series Resistance) and ESL (Equivalent Series Inductance). SMPS Series capacitors offer design and component engineers a proven technology specifically designed for programs requiring high reliability performance in harsh environments.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/rm01-06.pdf

HOW TO ORDER AVX Styles: RM-1, RM-2, RM-3, RM-4, RM-5, RM-6

RM0	1	7	C	106	M	A	N	650
AVX Style Size RM0 = Uncoated RM5 = Epoxy Coated	**Size**	**Voltage** 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Temperature Coefficient** C0G = A X7R = C	**Capacitance Code** (2 significant digits + no. of zeros) 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105 10 µF = 106 100 µF = 107	**Capacitance Tolerance** C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20%	**Test Level** A = Standard	**Termination** N = Straight Lead J = Leads formed in L = Leads formed out P = P Style Leads Z = Z Style Leads	**Height** Max Dimension "A" 120 = 0.120" 240 = 0.240" 360 = 0.360" 480 = 0.480" 650 = 0.650"

Note: Capacitors with X7R and Z5U dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.

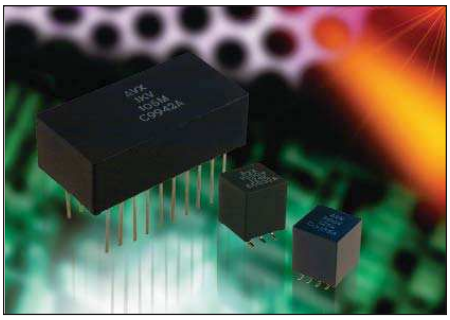
RoHS COMPLIANT

Maximum Capacitance Values (µF)													
	Max	Case Code 01		Case Code 02		Case Code 03		Case Code 04		Case Code 05		Case Code 06	
Voltage	Height	X7R	NPO	X7R	NPO	X7R	NPO	X7R	NPO	X7R	NPO	X7R	NPO
50	0.12" 3.05mm	27.00	1.00	41.00	1.20	18.00	0.47	7.50	0.16	2.80	0.05	80.00	3.20
100		12.00	0.70	18.00	1.00	6.00	0.40	1.80	0.13	0.68	0.04	40.00	2.40
200		7.00	0.40	11.00	0.60	3.60	0.20	1.10	0.07	0.40	0.02	24.00	1.30
500		2.60	0.18	4.00	0.26	1.30	0.09	0.40	0.02	0.16	0.01	9.40	0.50
50	0.24" 6.10mm	54.00	2.00	82.00	2.40	36.00	1.00	15.00	0.32	5.60	0.10	160.00	6.40
100		24.00	1.40	36.00	2.00	12.00	0.80	3.60	0.26	1.30	0.08	80.00	4.80
200		14.00	0.80	22.00	1.20	7.20	0.40	2.20	0.12	0.80	0.05	48.00	2.60
500		5.20	0.36	8.00	0.52	2.60	0.18	0.80	0.05	0.32	0.02	18.00	1.00
50	0.36" 9.14mm	82.00	3.00	120.00	3.60	54.00	1.50	22.00	0.48	8.20	0.15	240.00	9.60
100		36.00	2.10	54.00	3.00	18.00	1.20	5.40	0.39	2.00	0.12	120.00	7.20
200		21.00	1.20	33.00	1.80	10.00	0.60	3.30	0.21	1.20	0.07	72.00	3.90
500		7.80	0.54	12.00	0.78	3.90	0.27	1.20	0.07	0.48	0.03	28.00	1.50
50	0.48" 12.2mm	110.00	4.00	160.00	4.80	72.00	2.00	30.00	0.64	10.00	0.20	320.00	12.00
100		48.00	2.80	72.00	4.00	24.00	1.60	7.20	0.52	2.70	0.16	160.00	9.60
200		28.00	1.60	44.00	2.20	14.00	0.80	4.40	0.28	1.60	0.10	96.00	5.20
500		10.00	0.72	16.00	1.00	5.20	0.36	1.60	0.10	0.64	0.04	37.00	2.00
50	0.65" 16.5mm	130.00	5.00	200.00	6.00	90.00	2.50	36.00	0.80	12.00	0.25	400.00	16.00
100		60.00	3.50	90.00	5.00	30.00	2.00	9.00	0.65	3.40	0.20	200.00	12.00
200		35.00	2.00	55.00	3.00	18.00	1.00	5.50	0.35	2.00	0.12	120.00	6.50
500		13.00	0.90	20.00	1.30	6.50	0.47	2.00	0.12	0.80	0.05	47.00	2.50

Note: J, K and M tolerances std. Consult factory for availabilty on other tolerances
Configuration: J, L, N, P and Z leads standard. Consult factory for other variations.

SMPS Stacked MLC Capacitors

SM9 Style Encapsulated in DAP (Diallyl Phthalate) Case



As the world's leading manufacturer and innovator in application specific multilayer ceramic (ASMLC) capacitors, AVX offers a unique technological and production capability to the field. AVX actively pursues and satisfies the high reliability and custom needs of a variety of governmental and industrial customers. Successful involvement in missile programs, extensive work in ultra-high reliability telecommunications and sophisticated capacitor design applications – all have established AVX as the source for advanced and high reliability ASMLC capacitors. **Advanced Products are ISO9001 certified organizations for design and manufacturing of MLC capacitors.**

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/sm9.pdf

HOW TO ORDER AVX Styles: SM91, SM92, SM93, SM94, SM95, SM96

SM9	1	7	C	106	M	A	N	650
AVX Style SM9 = Plastic Case	**Size**	**Voltage** 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Temperature Coefficient** C0G = A X7R = C Z5U = E	**Capacitance Code** (2 significant digits + number of zeros) 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1µF = 105 10 µF = 106 100 µF = 107	**Capacitance Tolerance** C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20% Z5U: Z = +80%, -20% P = GMV (+100, -0%)	**Test Level** A = Standard B = Hi-Rel*	**Termination** N = Straight Lead J = Leads formed in L = Leads formed out	**Height** Max Dimension "A" 270 = 0.270" 390 = 0.390" 530 = 0.530" 660 = 0.660" 800 = 0.800"

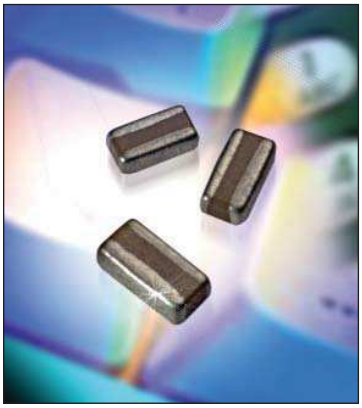
Note: Capacitors with X7R and Z5U dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.

*Hi-Rel screening for C0G and X7R only. Screening consists of 100% Group A (B Level), Subgroup 1 per MIL-PRF-49470.

Not RoHS Compliant

Low Inductance Capacitors (RoHS)

LICC 0612/0508/0306/0204 LICC (Low Inductance Chip Capacitors)



The key physical characteristic determining equivalent series inductance (ESL) of a capacitor is the size of the current loop it creates. The smaller the current loop, the lower the ESL.

A standard surface mount MLCC is rectangular in shape with electrical terminations on its shorter sides. A Low Inductance Chip Capacitor (LICC) sometimes referred to as Reverse Geometry Capacitor (RGC) has its terminations on the longer sides of its rectangular shape. The image on the right shows the termination differences between an MLCC and an LICC.

When the distance between terminations is reduced, the size of the current loop is reduced. Since the size of the current loop is the primary driver of inductance, an 0306 with a smaller current loop has significantly lower ESL then an 0603. The reduction in ESL varies by EIA size, however, ESL is typically reduced 60% or more with an LICC versus a standard MLCC.

AVX LICC products are available with a lead-free finish of plated Nickel/Tin.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/licc.pdf

HOW TO ORDER

0612	Z	D	105	M	A	T	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Thickness**
0204	4 = 4V	C = X7R	2 Sig. Digits +	K = ±10%	A = N/A	T = Plated Ni	Available	Thickness
0306	6 = 6.3V	D = X5R	Number of Zeros	M = ±20%		and Sn	2 = 7" Reel	mm (in)
0508	Z = 10V	W = X6S					4 = 13" Reel	0.35 (0.014)
0612	Y = 16V	Z = X7S						0.56 (0.022)
	3 = 25V							0.61 (0.024)
	5 = 50V							0.76 (0.030)
								1.02 (0.040)
								1.27 (0.050)

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

SIZE	0204				0306						0508					0612				
WVDC	4	6.3	10	16	4	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
CAP 0.001																				
(µF) 0.0022																				
0.0047																				
0.010																				
0.015																				
0.022																				
0.047																				
0.068																				
0.10																				
0.15																				
0.22																				
0.47																				
0.68																				
1.0																				
1.5																				
2.2																				
3.3																				
4.7																				
10																				

Solid = X7R **= X5R**

= X7S **= X6S**

mm (in.)

0204	
Code	Thickness
C	0.35 (0.014)

mm (in.)

0306	
Code	Thickness
A	0.61 (0.024)

mm (in.)

0508	
Code	Thickness
S	0.56 (0.022)
V	0.76 (0.030)
A	1.02 (0.040)

mm (in.)

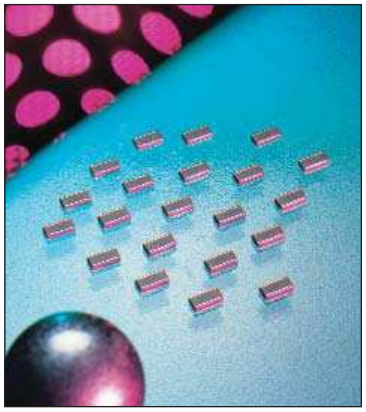
0612	
Code	Thickness
S	0.56 (0.022)
V	0.76 (0.030)
W	1.02 (0.040)
A	1.27 (0.050)

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Low Inductance Capacitors (Tin/Lead)

LICC 0612/0508/0306 Tin/Lead Termination "B"



The key physical characteristic determining equivalent series inductance (ESL) of a capacitor is the size of the current loop it creates. The smaller the current loop, the lower the ESL.

A standard surface mount MLCC is rectangular in shape with electrical terminations on its shorter sides. A Low Inductance Chip Capacitor (LICC) sometimes referred to as Reverse Geometry Capacitor (RGC) has its terminations on the longer sides of its rectangular shape. The image on the right shows the termination differences between an MLCC and an LICC.

When the distance between terminations is reduced, the size of the current loop is reduced. Since the size of the current loop is the primary driver of inductance, an 0306 with a smaller current loop has significantly lower ESL then an 0603. The reduction in ESL varies by EIA size, however, ESL is typically reduced 60% or more with an LICC versus a standard MLCC.

AVX LICC products are available with a lead termination for high reliability military and aerospace applications that must avoid tin whisker reliability issues.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/licc.pdf

HOW TO ORDER

LD18	Z	D	105	M	A	B	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Thickness**
LD15 = 0204	4 = 4V	C = X7R	2 Sig. Digits +	K = ±10%	A = N/A	B = 5% min lead	Available	Thickness
LD16 = 0306	6 = 6.3V	D = X5R	Number of Zeros	M = ±20%			2 = 7" Reel	mm (in)
LD17 = 0508	Z = 10V	W = X6S					4 = 13" Reel	0.35 (0.014)
LD18 = 0612	Y = 16V							0.56 (0.022)
	3 = 25V							0.61 (0.024)
	5 = 50V							0.76 (0.030)
								1.02 (0.040)
								1.27 (0.050)

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

Not RoHS Compliant

SIZE	LD15				LD16						LD17					LD18				
WVDC	4	6.3	10	16	4	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
Cap 1000						A	A	A	A		S	S	S	S	V	S	S	S	S	V
(pF) 2200						A	A	A	A		S	S	S	S	V	S	S	S	S	V
4700						A	A	A	A		S	S	S	S	V	S	S	S	S	V
Cap 0.010						A	A	A	A		S	S	S	S	V	S	S	S	S	V
(µF) 0.015						A	A	A	A		S	S	S	S	V	S	S	S	S	W
0.022						A	A	A	A		S	S	S	S	V	S	S	S	S	W
0.047						A	A	A			S	S	S	V	A	S	S	S	S	W
0.068						A	A	A			S	S	S	A	A	S	S	S	V	W
0.10	C	C				A	A	A			S	S	V	A	A	S	S	S	V	W
0.15						A	A				S	S	V			S	S	S	W	W
0.22						A	A				S	S	A			S	S	V		
0.47											V	V	A			S	S	V		
0.68					A						A	A				V	V	W		
1.0											A	A				V	V	A		
1.5											A					W	W			
2.2																A	A			
3.3																A				
4.7																				
10																				
WVDC	4	6.3	10	16	4	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
SIZE	0204				0306						0508					0612				

Solid = X7R

= X5R

= X7S

= X6S

mm (in.)

0204	
Code	Thickness
C	0.35 (0.014)

mm (in.)

0306	
Code	Thickness
A	0.61 (0.024)

mm (in.)

0508	
Code	Thickness
S	0.56 (0.022)
V	0.76 (0.030)
A	1.02 (0.040)

mm (in.)

0612	
Code	Thickness
S	0.56 (0.022)
V	0.76 (0.030)
W	1.02 (0.040)
A	1.27 (0.050)

IDC Low Inductance Capacitors (RoHS)

0612/0508 Interdigitated Capacitors

Inter-Digitated Capacitors (IDCs) are used for both semiconductor package and board level decoupling. The equivalent series inductance (ESL) of a single capacitor or an array of capacitors in parallel determines the response time of a Power Delivery Network (PDN). A designer can use many standard MLCCs in parallel to reduce ESL or a low ESL Inter-Digitated Capacitor (IDC) device.

IDCs are typically used on packages of semiconductor products with power levels of 15 watts or greater. Inter-Digitated Capacitors are used on CPU, GPU, ASIC, and ASSP devices produced on 0.13µ, 90nm, 65nm, and 45nm processes. IDC devices are used on both ceramic and organic package substrates. These low ESL surface mount capacitors can be placed on the bottom side or the top side of a package substrate.

IDCs are used for board level decoupling of systems with speeds of 300MHz or greater. Low ESL IDCs free up valuable board space by reducing the number of capacitors required versus standard MLCCs. There are additional benefits to reducing the number of capacitors beyond saving board space including higher reliability from a reduction in the number of components and lower placement costs based on the need for fewer capacitors.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/w2lw3l.pdf

HOW TO ORDER

W	3	L	1	6	D	225	M	A	T	3	A
Style	**IDC Case Size** 2 = 0508 3 = 0612	**Low Inductance**	**Number of Terminals** 1 = 8 Terminals	**Voltage** 4 = 4V 6 = 6.3V Z = 10V Y = 16V 3 = 25V	**Dielectric** C = X7R D = X5R Z = X7S	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** M = ±20%	**Failure Rate** A = N/A	**Terminations** T = Plated Ni and Sn	**Packaging** Available 1 = 7" Reel 3 = 13" Reel	**Thickness** Max. Thickness mm (in.) A = 0.95 (0.037) S = 0.55 (0.022)

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

SIZE		Thin 0508					0508					Thin 0612				0612			
Length	MM (in.)	2.03 ± 0.20 (0.080 ± 0.008)					2.03 ± 0.20 (0.080 ± 0.008)					3.20 ± 0.20 (0.126 ± 0.008)				3.20 ± 0.20 (0.126 ± 0.008)			
Width	MM (in.)	1.27 ± 0.20 (0.050 ± 0.008)					1.27 ± 0.20 (0.050 ± 0.008)					1.60 ± 0.20 (0.063 ± 0.008)				1.60 ± 0.20 (0.063 ± 0.008)			
Terminal Pitch	MM (in.)	0.50 ± 0.05 (0.020 ± 0.002)					0.50 ± 0.05 (0.020 ± 0.002)					0.80 ± 0.10 (0.031 ± 0.004)				0.80 ± 0.10 (0.031 ± 0.004)			
Thickness	MM (in.)	0.55 MAX. (0.022) MAX.					0.95 MAX. (0.037) MAX.					0.55 MAX. (0.022) MAX.				0.95 MAX. (0.037) MAX.			
WVDC		4	6.3	10	16	25	4	6.3	10	16	25	4	6.3	10	16	4	6.3	10	16
Cap (µF)	0.01																		
	0.033																		
	0.047																		
	0.068																		
	0.10																		
	0.22																		
	0.33																		
	0.47																		
	0.68																		
	1.0																		
	1.5																		
	2.2																		
	3.3																		

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

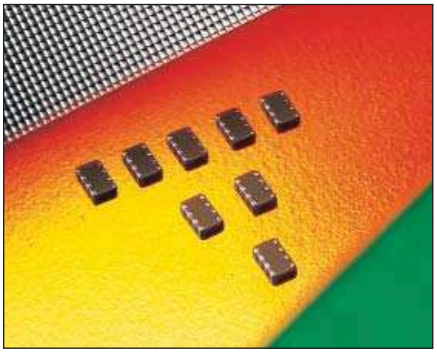
RoHS COMPLIANT

Consult factory for additional requirements

= X7R
= X5R
= X7S

IDC Low Inductance Capacitors (Tin/Lead)

0612/0508 Interdigitated Capacitors



Inter-Digitated Capacitors (IDCs) are used for both semiconductor package and board level decoupling. The equivalent series inductance (ESL) of a single capacitor or an array of capacitors in parallel determines the response time of a Power Delivery Network (PDN). A designer can use many standard MLCCs in parallel to reduce ESL or a low ESL Inter-Digitated Capacitor (IDC) device.

IDCs are typically used on packages of semiconductor products with power levels of 15 watts or greater. Inter-Digitated Capacitors are used on CPU, GPU, ASIC, and ASSP devices produced on 0.13µ, 90nm, 65nm, and 45nm processes. IDC devices are used on both ceramic and organic package substrates. These low ESL surface mount capacitors can be placed on the bottom side or the top side of a package substrate.

IDCs are used for board level decoupling of systems with speeds of 300MHz or greater. Low ESL IDCs free up valuable board space by reducing the number of capacitors required versus standard MLCCs. There are additional benefits to reducing the number of capacitors beyond saving board space including higher reliability from a reduction in the number of components and lower placement costs based on the need for fewer capacitors.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/l2l-l3l.pdf

HOW TO ORDER

L	3	L	1	6	D	225	M	A	B	3	A
Style	**IDC Case Size** 2 = 0508 3 = 0612	**Low Inductance**	**Number of Terminals** 1 = 8 Terminals	**Voltage** 4 = 4V 6 = 6.3V Z = 10V Y = 16V 3 = 25V	**Dielectric** C = X7R D = X5R Z = X7S	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** M = ±20%	**Failure Rate** A = N/A	**Terminations** B = 5% min. Lead	**Packaging** Available 1 = 7" Reel 3 = 13" Reel	**Thickness** Max. Thickness mm (in.) A = 0.95 (0.037) S = 0.55 (0.022)

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

Not RoHS Compliant

SIZE		Thin 0508					0508					Thin 0612				0612			
Length	MM (in.)	2.03 ± 0.20 (0.080 ± 0.008)					2.03 ± 0.20 (0.080 ± 0.008)					3.20 ± 0.20 (0.126 ± 0.008)				3.20 ± 0.20 (0.126 ± 0.008)			
Width	MM (in.)	1.27 ± 0.20 (0.050 ± 0.008)					1.27 ± 0.20 (0.050 ± 0.008)					1.60 ± 0.20 (0.063 ± 0.008)				1.60 ± 0.20 (0.063 ± 0.008)			
Terminal Pitch	MM (in.)	0.50 ± 0.05 (0.020 ± 0.002)					0.50 ± 0.05 (0.020 ± 0.002)					0.80 ± 0.10 (0.031 ± 0.004)				0.80 ± 0.10 (0.031 ± 0.004)			
Thickness	MM (in.)	0.55 MAX. (0.022) MAX.					0.95 MAX. (0.037) MAX.					0.55 MAX. (0.022) MAX.				0.95 MAX. (0.037) MAX.			
WVDC		4	6.3	10	16	25	4	6.3	10	16	25	4	6.3	10	16	4	6.3	10	16
Cap (µF)	0.01																		
	0.033																		
	0.047																		
	0.068																		
	0.10																		
	0.22																		
	0.33																		
	0.47																		
	0.68																		
	1.0																		
	1.5																		
	2.2																		
	3.3																		

Consult factory for additional requirements

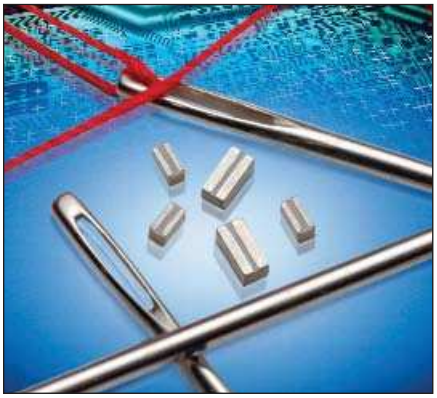
= X7R

= X5R

= X7S

LGA Low Inductance Capacitors

0204/0306/0805 Land Grid Arrays



Land Grid Array (LGA) capacitors are the latest family of low inductance MLCCs from AVX. These new LGA products are the third low inductance family developed by AVX. The innovative LGA technology sets a new standard for low inductance MLCC performance. *Electronic Products* awarded its 2006 Product of the Year Award to the LGA Decoupling capacitor.

Our initial 2 terminal versions of LGA technology deliver the performance of an 8 terminal IDC low inductance MLCC with a number of advantages including:

- Simplified layout of 2 large solder pads compared to 8 small pads for IDCs
- Opportunity to reduce PCB or substrate contribution to system ESL by using multiple parallel vias in solder pads
- Advanced FCT manufacturing process used to create uniformly flat terminations on the capacitor that resist "tombstoning"
- Better solder joint reliability

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/lga2t.pdf

APPLICATIONS

Semiconductor Packages

- **Microprocessors/CPUs**
- **Graphics Processors/GPUs**
- **Chipsets**
- **FPGAs**
- **ASICs**

Board Level Device Decoupling

- **Frequencies of 300 MHz or more**
- **ICs drawing 15W or more**
- **Low voltages**
- **High speed buses**

HOW TO ORDER

LG	1	2	6	Z	104	M	A	T	2	S	1
Style	**Case Size** 1 = 0204 2 = 0306 C = 0805	**Number of Terminals** 2	**Working Voltage** 4 = 4V 6 = 6.3V Z = 10V	**Temperature Characteristic** C = X7R D = X5R Z = X7S W = X6S	**Coded Cap**	**Cap Tolerance** M = 20%	**Termination Style** A = "U" Land	**Termination** 100% Sn* *Contact factory for other termination finishes	**Packaging Tape & Reel** 2 = 7" Reel 4 = 13" Reel	**Thickness** S = 0.55mm max	**Number of Capacitors**

SIZE		LG12 (0204)						LG22 (0306)								LGC2 (0805)							
Length	mm (in.)	0.50 (0.020)						0.76 (0.030)								2.06 (0.081)							
Width	mm (in.)	1.00 (0.039)						1.60 (0.063)								1.32 (0.052)							
Temp. Char.		X5R (D)		X7S (Z)		X6S (W)		X7R (C)		X5R (D)		X7S (Z)		X6S (W)		X7R (C)		X5R (D)		X7S (Z)		X6S (W)	
Working Voltage		6.3 (6)	4 (4)	6.3 (6)	4 (4)	6.3 (6)	4 (4)	10 (Z)	6.3 (6)	4 (4)	6.3 (6)	4 (4)	6.3 (6)	4 (4)	6.3 (6)	4 (4)	6.3 (6)	4 (4)	6.3 (6)	4 (4)	6.3 (6)	4 (4)	6.3 (6)	4 (4)
Cap (µF)	0.010 (103)																						
	0.022 (223)																						
	0.047 (473)																						
	0.100 (104)																						
	0.220 (224)																						
	0.330 (334)																						
	0.470 (474)																						
	1.000 (105)																						
	2.200 (225)																						

Please contact AVX for values

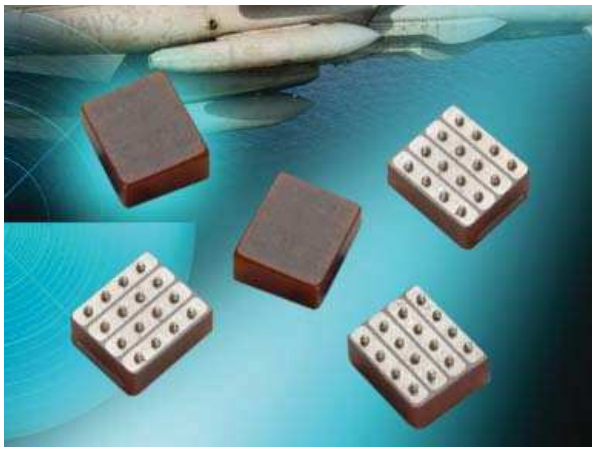
= X7R = X5R = X7S = X6S

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Low Inductance Capacitors

LICA® (Low Inductance Decoupling Capacitor Arrays)



LICA® arrays utilize up to four separate capacitor sections in one ceramic body. These designs exhibit a number of technical advancements:

Low Inductance features–

- Low resistance platinum electrodes in a low aspect ratio pattern
- Double electrode pickup and perpendicular current paths
- C4 "flip-chip" technology for minimal interconnect inductance

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/licc.pdf

HOW TO ORDER

LICA	3	T	102	M	3	F	C	4	A	A
Style & Size	**Voltage** 9 = 5V Z = 10V 3 = 25V	**Dielectric** D = X5R T = T55T S = High K T55T	**Cap/Section (EIA Code)** 102 = 1000 pF 103 = 10 nF 104 = 100 nF	**Capacitance Tolerance** M = ±20% P = GMV	**Height Code** 6 = 0.500mm 3 = 0.650mm 1 = 0.875mm 5 = 1.100mm 7 = 1.600mm	**Termination** F = C4 Solder Balls- 97Pb/3Sn H = C4 Solder Balls Low ESR G = Lead Free SAC R = Cr-Cu-Au N = Cr-Ni-Au V = Eutectic Lead-Tin Bump-37%Pb/63%Sn X = None	**Reel Packaging** M = 7" Reel R = 13" Reel 6 = 2"x2" Waffle Pack 8 = 2"x2" Black Waffle Pack 7 = 2"x2" Waffle Pack w/ termination facing up A = 2"x2" Black Waffle Pack w/ termination facing up C = 4"x4" Waffle Pack w/ clear lid	**# of Caps/Part** 1 = one 2 = two 4 = four	**Inspection Code** A = Standard B = COTS-Plus X = MIL-PRF-123	**Code Face** A = Bar B = No Bar C = Dot, S55S Dielectrics D = Triangle

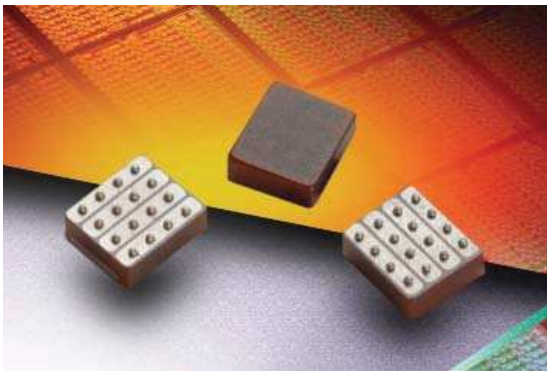
NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

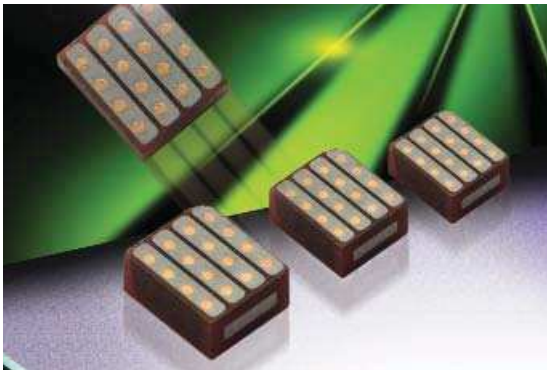
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Please select correct termination style.

TERMINATION OPTIONS





LICA COMMON PART NUMBER LIST

Part Number	Voltage	Thickness (mm)	Capacitors per Package
LICA3T193M3FC4AA	**25**	**0.650**	**4**
LICA3T153P3FC4AA	**25**	**0.650**	**4**
LICA3T134M1FC1AA	**25**	**0.875**	**1**
LICA3T104P1FC1AA	**25**	**0.875**	**1**
LICA3T333M1FC4AA	**25**	**0.875**	**4**
LICA3T263P3FC4AA	**25**	**0.650**	**4**
LICA3T244M5FC1AA	**25**	**1.100**	**1**
LICA3T194P5FC1AA	**25**	**1.100**	**1**
LICA3T394M7FC1AB	**25**	**1.600**	**1**
LICA3T314P7FC1AB	**25**	**1.600**	**1**
Extended Range			
LICAZT623M3FC4AB	**10**	**0.650**	**4**
LICA3T104M3FC1A	**25**	**0.650**	**1**
LICA3T803P3FC1A	**25**	**0.650**	**1**
LICA3T423M3FC2A	**25**	**0.650**	**2**
LICA3T333P3FC2A	**25**	**0.650**	**2**
LICA3S253M3FC4A	**25**	**0.650**	**4**
LICAZD753M3FC4AD	**10**	**0.650**	**4**
LICAZD504M3FC1AB	**10**	**0.650**	**1**
LICAZD604M7FC1AB	**10**	**1.600**	**1**
LICA3D193M3FC4AB	**25**	**0.650**	**4**

TAJ Series
Standard Tantalum Capacitors

- General purpose SMT chip tantalum series
- 6 case sizes available
- Low profile options available
- CV range: 0.10-2200µF / 2.5-50V

RoHS COMPLIANT

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/taj.pdf

HOW TO ORDER

TAJ C 106 M 035 R NJ –

Type
Case Size
Capacitance Code
pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)
Tolerance
K=±10%
M=±20%
Rated DC Voltage
002=2.5Vdc
004=4Vdc
006=6.3Vdc
010=10Vdc
016=16Vdc
020=20Vdc
025=25Vdc
035=35Vdc
050=50Vdc
Packaging
R = Lead Free 7" Reel
S = Lead Free 13" Reel
A = Gold Plating 7" Reel
B = Gold Plating 13" Reel
H = Tin Lead 7" Reel (Contact Manufacturer)
K = Tin Lead 13" Reel (Contact Manufacturer)
H, K = Non RoHS
Specification Suffix
NJ = Standard Suffix
Additional characters may be added for special requirements
V = Dry pack Option (selected codes only)

Capacitance		Rated voltage DC (V_R) to 85°C								
µF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
0.10	104								A	A
0.15	154								A	A/B
0.22	224								A	A/B
0.33	334								A	B
0.47	474							A	A/B	A/B/C
0.68	684						A	A	A/B	A/B/C
1.0	105					A	A	A	A/B	A(M)/B/C
1.5	155				A	A	A	A/B	A/B/C	C/D
2.2	225			A	A	A/B	A/B	A/B	A/B/C	C/D
3.3	335			A	A	A/B	A/B	A/B/C	B/C	C/D
4.7	475		A	A	A/B	A/B	A/B/C	A/B/C	B/C/D	C/D
6.8	685		A	A/B	A/B	A/B/C	A/B/C	B/C	C/D	C/D
10	106		A	A/B	A/B/C	A/B/C	A(M)*/B/C	B/C/D	C/D/E	D/E/V
15	156		A/B	A/B	A/B/C	A(M)/B/C	B/C/D	C/D	C/D	D/E/V
22	226		A	A/B/C	A/B/C	B/C/D	B/C/D	C/D	D/E	V
33	336	A	A/B	A/B/C	A/B/C/D	B/C/D	C/D	D/E	D/E/V	
47	476	A	A/B	A/B/C/D	B/C/D	C/D	C/D/E	D/E	E/V	
68	686	A	A/B/C	B/C/D	B/C/D	C/D	C(M)/D/E	E/V	V(M)	
100	107	A/B	A/B/C	B/C/D	B(M)/C/D/E	C/D/E	D/E/V	E(M)/V		
150	157	B	B/C	B(M)/C/D	C/D/E	D/E/V	E/V	V(M)		
220	227	B/D	B(M)/C/D	C/D/E	C/D/E	E/V				
330	337	D	C/D/E	C/D/E	D/E/V					
470	477	C/D	C/D/E	D/E/V	E/V					
680	687	C/D/E	D/E	E/V						
1000	108	D(M)/E	D/E/V	E(M)/V(M)						
1500	158	D/E/V(M)	E/V(M)							
2200	228	V(M)								

Non preferred Ratings - not recommended for new designs, higher voltage or smaller case size substitution are offered.

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

Released codes (M tolerance only)

Engineering samples - please contact manufacturer

*Codes under development - subject to change

TAJ Low Profile

Low Profile Tantalum Capacitors

- General purpose SMT chip tantalum series
- CV range: 0.10-1000µF / 2.5-50V
- 9 case sizes in low profile option available

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tajlp.pdf

HOW TO ORDER

TAJ	C	107	M	010	R	NJ	–
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** K=±10% M=±20%	**Rated DC Voltage** 002=2.5Vdc 004=4Vdc 006=6.3Vdc 010=10Vdc 016=16Vdc 020=20Vdc 025=25Vdc 035=35Vdc 050=50Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel A = Gold Plating 7" Reel B = Gold Plating 13" Reel	**Specification Suffix** NJ = Standard Suffix	**Additional characters may be added for special requirements** V = Dry pack Option (selected codes only)

Capacitance		Rated voltage DC (V_R) to 85°C								
µF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
0.10 0.15 0.22	104 154 224						R/S R/S R/S	 R R	R/S R/S R/S	S S S
0.33 0.47 0.68	334 474 684					 R/S	R/S R/S R/S/T	R R/S R/S	R/S R/S/T P/S/T	S/T S/T
1.0 1.5 2.2	105 155 225		 R/S	 R/S R/S	R/S R/S R/S	R/S/T R/S R/S/T	R/S/T P/R/S/T P/R/S/T	P/R/S P/S/T T	P/S/T T T	W W
3.3 4.7 6.8	335 475 685	 R R	R/S R/S R/S/T	R/S R/S/T R/S/T	R/S/T R/S/T P/R/S/T	R/S/T K/P/S/T S/T	T T T	T/W T/W W	W W Y	Y Y Y
10 15 22	106 156 226	R/S R P/R	R/S/T R/S/T K/P/R/S/T	P/R/S/T K/P/R/S/T K/P(M)/S/T/W	K/P/R(M)/S/T S/T/W T/W	T/W T(M)/W W	W W W/Y	W Y Y	X/Y Y Y	
33 47 68	336 476 686	K/P/S P(M)/S T	K/P(M)/S/T/W T/W T/W	T/W T/W W	W W/Y W/Y	W/Y W/X/Y F/X/Y	X/Y X/Y Y	Y Y		
100 150 220	107 157 227	T/W T(M)/W W/Y	T(M)/W W/Y W/X/Y	W/Y W/X/Y F/X/Y	W/X/Y F/X(M)/Y Y	F(M)/Y Y(M)				
330 470 680	337 477 687	W(M)/Y F/Y Y	F/X/Y Y Y(M)	Y Y						
1000	108	Y(M)								

Released codes (M tolerance only)

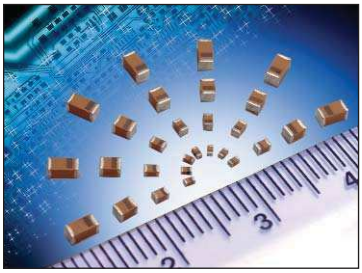
Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TACmicrochip®

Small Case Size Tantalum Capacitors



- The world's smallest surface mount tantalum capacitor
- CV range: 0.47 - 150µF / 2 - 25V
- 5 case sizes available
- Low profile options available
- Industrial and hi-rel medical applications

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tac.pdf

HOW TO ORDER

TAC	L	226	M	004	R	TA

Type
TACmicrochip®

Case Size

Capacitance Code
pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)

Tolerance
K=±10%
M=±20%

Rated DC Voltage
002=2Vdc
003=3Vdc
004=4Vdc
006=6.3Vdc
010=10Vdc
016=16Vdc
020=20Vdc
025=25Vdc
050=50Vdc

Packaging
R, P = 7" Standard Tin Termination Plastic Tape
X, Q = 4¼" Standard Tin Termination Plastic Tape
A = 7" Gold Termination Plastic Tape
F = 4¼" Gold Termination Plastic Tape

Alternative characters may be used for special requirements

Capacitance		Voltage Rating DC (V_R) at 85°C								
µF	Code	2.0V	3.0V	4.0V	6.3V	10V	16V	20V	25V	50V
0.10 0.15 0.22	104 154 224							K*		
0.33 0.47 0.68	334 474 684					K(15)(M)/K(25)(M)/L K(M)/L	L L			
1.0 1.5 2.2	105 155 225		K(M)/L	L L	K/L L K(M)/L	K/L L L	L L		R	A*
3.3 4.7 6.8	335 475 685	K(M)/L K(M)/L K(M)/L	K(M)/L K(M)/L L	L L L	L L L/R	L/R L/R L/R	R*	R(M) R(M)	A*	
10 15 22	106 156 226	K(M)/L R	L R L(M)/R	L/R L(M)/R L(M)/R	L(M)/R L(M)/R R	L/R R R	R			
33 47 68	336 476 686	R R R(M)	R R R(M)	R R A(M)	R A/R(M) A(M)*	A(M)/B*/R(M) B				
100 150 220	107 157 227	A(M)	A(M)/R(M)	A(M)/R(M)	A(M)					

ESR limits quoted in brackets (Ohms)

Released codes (M tolerance only)

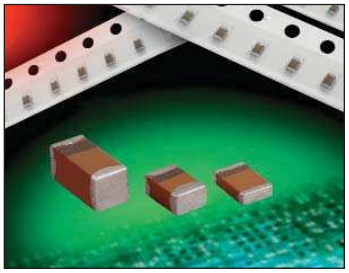
*Codes under development - subject to change.

Standard Height Profile: A, B, K, L, R Case
Low Profile: H, J, T, U, V Case

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TACmicrochip® Low Profile

Low Profile Small Case Size Tantalum Capacitors



- The world's smallest surface mount tantalum capacitor
- CV range: 1.0-220µF / 2-16V
- 5 case sizes available in low profile option
- Industrial and hi-rel medical applications

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/taclp.pdf

HOW TO ORDER

TAC	U	475	M	004	R	TA
Type TACmicrochip®	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** K=±10% M=±20%	**Rated DC Voltage** 002=2Vdc 003=3Vdc 004=4Vdc 006=6.3Vdc 010=10Vdc 016=16Vdc	**Packaging** R = 7" Standard Tin Termination Plastic Tape X = 4¼" Standard Tin Termination Plastic Tape A = 7" Gold Termination Plastic Tape F = 4¼" Gold Termination Plastic Tape	**Alternative characters may be used for special requirements**

Capacitance		Voltage Rating DC (V_R) at 85°C					
µF	Code	2.0V	3.0V	4.0V	6.3V	10V	16V
1.0 1.5 2.2	105 155 225					U(M)	U(M)
3.3 4.7 6.8	335 475 685			U(M)	U(M)		
10 15 22	106 156 226	U(M)		J(M)	H H	H/V V(M)	
33 47 68	336 476 686		H(M)	H	T	T	
100 150 220	107 157 227		T(M)		T(M)		

Released codes (M tolerance only)

Engineering samples - please contact manufacturer

*Codes under development - subject to change

Standard Height Profile: A, B, K, L, R Case
Low Profile: H, J, T, U, V Case

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TLC Series

Consumer Series Small Case Size Tantalum Capacitors

- High capacitance vs. voltage ratio
- Super high volumetric efficiency
- CV range: 0.47-220µF / 2-35V
- 10 case sizes available
- Consumer applications (portable handheld electronics, cellular phones, digital equipments etc.)

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tlc.pdf

HOW TO ORDER

TLC — **Type**

L — **Case Size**

226 — **Capacitance Code**
pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)

M — **Tolerance**
M=±20%

006 — **Rated DC Voltage**
002=2Vdc
003=3Vdc
004=4Vdc
006=6.3Vdc
010=10Vdc
016=16Vdc
020=20Vdc
025=25Vdc
035=35Vdc

R — **Packaging**
R, P = 7" Standard Tin Termination Plastic Tape
X, Q = 4¼" Standard Tin Termination Plastic Tape
A = 7" Gold Termination Plastic Tape
F = 4¼" Gold Termination Plastic Tape

TA — **Standard Suffix**
OR
4000 — **ESR in mΩ**

Capacitance		Voltage Rating DC (V_R) to 40°C								
µF	Code	2.0V	3.0V	4.0V	6.3V	10V	16V	20V	25V	35V
0.33	334						J*		L	
0.47	474					N*	K			
0.68	684									
1.0	105						J*	J*	L	L*/R
1.5	155									
2.2	225					J*/K	J*	H/L*	H/R	
3.3	335						L			
4.7	475			K/N*	K/U	J/K*				R*
6.8	685		K	K		U				
10	106		K	J/K/Z	J/K/Z	J*/U/Z*	V	R		A*
15	156	K	K*	K*/Z*		H/L				
22	226	J	J	J*	L/U*	L*/M			T*	
33	336			L	H/L/L(4000)	H				
47	476	L	L	H/L	H	C*/Q*/R				
68	686			R	R	A*/R*				
100	107		H*	C*/H*/Q*/R	R	R*/T				
150	157			R*	R*					
220	227	R*	S*	A*/R*/T						
330	337									
470	477	A*		A*						
680	687									

Released Codes

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TLJ Series

High CV Consumer Series Tantalum Capacitors

- High Volumetric Efficiency
- 3x reflow 260°C compatible
- 13 case sizes available including low profile codes
- Environmentally friendly
- Consumer applications (e.g. mobiles phones, PDA etc.)
- CV range: 10-680µF / 2.5-20V

RoHS COMPLIANT

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tlj.pdf

HOW TO ORDER

TLJ	W	157	M	010	R	0200
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** M = ±20%	**Rated DC Voltage** 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc 016 = 16Vdc 020 = 20Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel	**ESR in mΩ**

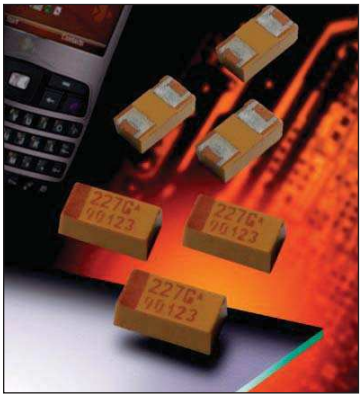
Capacitance		Rated Voltage DC to 40°C / 0.5DC to 85°C / 0.2DC to 125°C						
µF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	16V (C)	20V (D)	35V (V)
6.8	685							
10	106				N(2500) R(2000,3000)	S(2200)	T(1000)	
15	156				R(2000)			
22	226			N(5400)/R(3500)	K(1800)/N(3800) R(3800)	T(1000)		
33	336		N(8000)/R(3000)	K(1700)/N(8000) P(3000)/R(3000)	K(1500)/N(9600) P(3500) R(3500)/S(1500)	T(1000)		
47	476		K(1500)/N(4000) P(3000)/R(3000)	K(1500)/N(8300) P(700,900,1800,2500) R(3200)/S(1500)	A(600)/G(1500) P(3200)/R(3200) S(1500)/T(600)			
68	686		K(1200)/N(8000) P(3000) R(2900)/S(1500)	A(500)/G(800) S(1500)/T(600)	A(1500)			
100	107		A(500)/G(800) N(5200)/P(2700) S(1400)	A(500,800)/G(800) P(5400)/T(800)	A(1400) H(900)/T(900)			
150	157		A(800)/T(800)	A(900)/G(2500) H(900)/T(1200)	B(500) W(150,200)			
220	227	T(1100)	A(1100)/G(3000) H(900)/T(1100)	B(500)/T(2000) W(200)	B(1100)/F(300)			
330	337		T(2700)/W(200)	F(300)				
470	477							
680	687			Y(100,150)				
1000	108							
1500	158							

Available Ratings, (ESR ratings in mOhms in brackets)
Engineering samples - please contact manufacturer
*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TLN Series

Tantalum Solid Electrolytic Chip Capacitors Undertab Series



- Undertab terminations layout:
  - High Volumetric Efficiency
  - High PCB assembly density
  - High capacitance in smaller dimensions
- 3x reflow 260°C compatible
- Consumer applications (e.g. PCMCIA/USB wireless express cards, mobiles, MP3 etc.)
- 6 case sizes available
- CV range 47-220µF / 4-10V

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tlnunder.pdf

HOW TO ORDER

TLN	S	227	M	004	R	3000
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** M = ±20%	**Rated DC Voltage** 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel	**ESR in mΩ**

Capacitance		Rated Voltage DC to 40°C / 0.5DC to 85°C/ 0.2DC to 125°C		
µF	Code	4V (G)	6.3V (J)	10V (A)
33	336			
47	476			K(1500)/N(6000)
68	686	N(3000)*	K(5400)/N(8300)	K(5400)/S(6000)
100	107	N(5200)*	K(5400)/S(5400)	K(2500)/L(7200)* S(2500)
150	157	K(2500)/S(2500)	K(2500)/L(5400)* S(2500)	L(1300)/S(7200)* T(1500)
220	227	L(1300)/S(3000) T(1500)	G(3000)/L(1000) S(8300)*/T(1500)	G(7200)*/H(6000)* T(1300)
330	337	G(4000)*/L(4000)* S(5200)*	G(5400)*/H(3000)* T(5400)	H(7200)*/T(9600)*
470	477	G(5200)*/H(3000)* T(4000)*	H(5400)*/T(8300)*	H(9600)*
680	687	H(4000)*/T(5200)*	H(8300)*	
1000	108	H(5200)*	Y(150)*	

Available Ratings, (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TPS Series

Low ESR Tantalum Capacitors

- Low ESR series of robust MnO_2 solid electrolyte capacitors
- CV range: 0.15-1500µF / 2.5-50V
- 14 case sizes available
- Power supply applications

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Please select correct termination style.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tps.pdf

HOW TO ORDER

TPS	C	107	M	010	R	0100	—
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** K = ±10% M = ±20%	**Rated DC Voltage** 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc 016 = 16Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel A = Gold Plating 7" Reel B = Gold Plating 13" Reel H = Tin Lead 7" Reel (Contact Manufacturer) K = Tin Lead 13" Reel (Contact Manufacturer) H, K = Non RoHS	**ESR in mΩ**	**Additional characters may be added for special requirements** V = Dry pack Option (selected codes only)

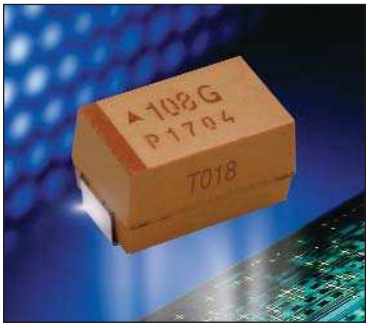
Capacitance		Rated Voltage DC (V_R) to 85°C								
µF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
0.15	154									A(9000)
0.22	224								A(6000)	A(7000)
0.33	334								A(6000)	
0.47	474							A(7000)	A(6000) B(4000)	C(2300)
0.68	684							A(6000)	A(6000)	
1	105				R(9000)		A(3000), R(6000) S(6000), T(2000)	R(2500,4000)	A(3000) B(2000)	C(2500)
1.5	155							A(3000) B(1800)	B(2500)	C(1500,2000)
2.2	225			R(7000)	A(1800)	A(1800,3500) T(2000)	A(3000)	B(900,1200,2500)	A(1500), B(750, 1500,2000), C(1000)	D(1200)
3.3	335				T(1500)	A(3500)	A(2500) B(1300)	A(1000,1500) B(750,1500,2000)	B(1000) C(700)	D(800)
4.7	475			S(4000)	A(1400) R(3000,5000)	A(2000) B(800,1500)	A(1800) B(750,1000)	B(700,900,1500)	B(700,1500) C(600), D(700)	D(300,500,700)
6.8	685			A(1800)	A(1800) T(1800)	A(1500) B(600,1200)	A(1000) B(600,1000) C(700)	B(700) C(500,600,700)	C(350) D(150,400,500)	D(200, 300, 500,600)
10	106		R(3000)	A(1500) R(1000,1500,3000) T(1000)	A(900,1800) P(2000)(M) T(1000,2000)	B(500,800), C(500) T(800,1000) W(500,600)	B(500,1000) C(500,700) W(500)	B(1800) C(300,500)	D(125,300) E(200), Y(250)	E(250,300, 400,500)
15	156			A(700,1500)	A(1000) B(450,600) T(1200)	B(500,800)	B(500) C(400,450)	C(220,300) D(100,300)	C(350,450) D(100,300) Y(250)	E(250) V(250)
22	226			A(500,900) B(375,600) S(900)	A(900) B(400,500,700) C(300), T(800)	B(400,600) C(150,250,300,375) W(500)	B(400,600) C(100,150,400) D(200,300)	C(275,400) D(100,200,300)	D(125,200,300,400) E(125,200,300) Y(200)	
33	336			A(600) B(250,350,450,600) T(800)	A(700) B(250,425,500,650) C(150,375,500) W(350)	B(350,500) C(100,150,225,300) D(200), W(140,175, 250,400,500) Y(300,400)	C(300) D(100,200)	D(100,200,300) E(100,175, 200,300) Y(200)	D(200,300) E(100,250,300) V(200)	
47	476		A(500)	A(800) B(250,350,500) C(300), T(1200)	B(250,350,500,650) C(200,350) D(100) W(125,150,250)	C(110,350) D(80,100,150,200) W(200) X(180), Y(250)	D(75,100,200) E(70,125,150, 200,250)	D(125,150,250) E(80,100,125)	E(200,250) V(150,200)	
68	686			B(250,350,500) C(150,200) W(110,125,250)	B(600) C(80,100,200,300) D(100,150), W(100,150) Y(100,200)	C(125,200) D(70,100,150) F(200), X(150) Y(150,200,250)	D(70,150, 200,300) E(125,150,200)	E(125,200) V(80,95,150,200)	V(150,200)(M)	
100	107	B(200)	B(200,250, 350,500) W(100)	B(250,400) C(75,150) W(100,150) Y(100)	B(400)(M) C(75,100,150,200) D(50,65,80,100,125, 150), E(125) W(150) X(85,150,200) Y(100,150,200)	C(200) D(60,100,125,150) E(55,100,125,150) F(150,200)(M) Y(100,150,200)	D(85,100,150) E(100,150,200) V(60,85,100,200)	V(100)		
150	157	B(150)	B(250) C(70,80)	C(50,90,150,200,250) D(50,125), Y(40,50)	D(50,85,100), E(100) F(200), X(100)(M) Y(100,150,200)	D(60,85,100,125,150) E(100), V(45,75) Y(200)(M)	V(80)			
220	227	B(150, 200,600) D(45)	D(40,50,100) Y(40,50,75)	C(70,100,125,250) D(50,100,125) E(100), F(200) Y(100,150)	D(40,50,100,150) E(50,60,70,100, 125,150) Y(100,150,200)	E(100,150) V(50,75,100,150)				
330	337	Y(40)	C(100) D(35,45,100) F(200) X(100)	C(80,100) D(45,50,70,100) E(50,100,125,150) V(100), Y(100,150)	D(50,65,100,150) E(40,50,60,100) V(40,60,100)					
470	477	D(35) F(200) Y(100)	D(45,100) E(35,45,100)	D(45,60,100,200) E(45,50,60,100,200) V(40,55,100), Y(150)	E(45,50,60,100,200) V(40,60,100)					
680	687	D(35,50) E(35,50) Y(100)	D(45,60,100) E(40,60,100)	E(45,60,100) V(35,40,50)						
1000	108	E(30,40) Y(100)(M)	E(40,60) V(25,35,40,50)	E(100)(M), V(40,50)(M)						
1500	158	D(100) E(50) V(30,40)(M)	E(50,75) V(50,75)(M)							

Released codes (M tolerance only)
Engineering samples - please contact manufacturer
*Codes under development – subject to change
ESR limits quoted in brackets (milliohms)

NOTE: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TPM Multianode

Ultra Low ESR Tantalum Capacitors



- Multi-anode construction
- Super low ESR
- CV range: 10-2200µF / 2.5-50V
- 4 case sizes available
- "Mirror" multi-anode construction used with D case capacitors reduces ESL to half

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Please select correct termination style.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tpm.pdf

HOW TO ORDER

TPM **E** **108** **M** **004** **R** **0018**

Type

Case Size

Capacitance Code
pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)

Tolerance
K=±10%
M=±20%

Rated DC Voltage
002=2.5Vdc
004=4Vdc
006=6.3Vdc
010=10Vdc
016=16Vdc
020=20Vdc
025=25Vdc
035=35Vdc
050=50Vdc

Packaging
R = Lead Free 7" Reel
S = Lead Free 13" Reel
H = Tin Lead 7" Reel (Contact Manufacturer)
K = Tin Lead 13" Reel (Contact Manufacturer)
H, K = Non RoHS

ESR in mΩ

Capacitance		Rated Voltage DC (V_R) to 85°C								
µF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
6.8	685									
10	106									D(140) E(120)
15	156									E(75,100)
22	226								D(70) E(60,100)	E(75,100)
33	336							D(65)	E(50,65)	
47	476						D(55)	D(55)/E(65)	E(55,65)	
68	686					D(50)		E(45,55)		
100	107				Y(45)(M)		E(35,45)			
150	157				Y(45)(M)	E(30,40)	E(35)			
220	227			Y(30)(M)	D(35)	E(25,40)				
330	337		D(25,35)	D(25,35)	D(35) E(23,35)	E(50)				
470	477		D(25,35)	D(30) E(18,23,30)	E(23,30)					
680	687		D(25) E(18,23)	E(18,23), V(23)						
1000	108	D(25)	D(25,45) E(18,23), V(18)	V(20)(M)						
1500	158	E(12,15,18)	E(15,18)							
2200	228	E(18)(M)								

Released codes (M tolerance only)

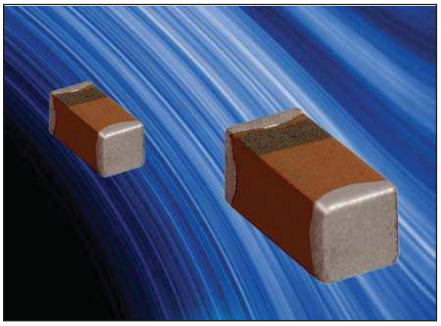
Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TPC Series

Low ESR Small Case Size Tantalum Capacitors



- Low ESR TACmicrochip® capacitor
- Smallest and low profile tantalum
- CV range: 1.0-100µF / 3-25V
- 4 case sizes available
- Power supply applications

RoHS COMPLIANT

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tpc.pdf

HOW TO ORDER

TPC	R	106	M	010	R	1800
Type TACmicrochip®	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** K=±10% M=±20%	**Rated DC Voltage** 003=3Vdc 004=4Vdc 006=6.3Vdc 010=10Vdc 016=16Vdc 020=20Vdc 025=25Vdc	**Packaging** R, P = 7" Standard Tin Termination Plastic Tape X, Q = 4¼" Standard Tin Termination Plastic Tape A, M = 7" Gold Termination Plastic Tape F, N = 4¼" Gold Termination Plastic Tape	**ESR in mΩ**

Capacitance		Voltage Rating DC (V_R) at 85°C						
µF	Code	3.0V	4.0V	6.3V	10V	16V	20V	25V
1.0	105				L(5000)			R(3000)
1.5	155							
2.2	225			K(8000)/L(5000)	L(5000)	L(5000)		
3.3	335				L(5000)			
4.7	475	K(8000)			L(5000)(M)		R(1500)(M)*	
6.8	685							
10	106			L(4000)(M)	H(2500) L(4000)(M),R(1800)	R(1800)		
15	156			R(1800)	R(1500)			
22	226		L(5000)(M)/R(1800)	R(1500)	R(1500)			
33	336	R(1800)	H(1500)(M)/R(1500)		R(1500)(M)			
47	476	R(1500)		R(1800)(M)				
68	686							
100	107		R(1000)(M)					

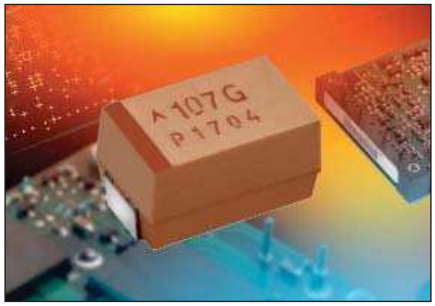
Codes shown are examples of ESR values offered on certain CV and case size.
Other codes and ESR values available upon request.

Released codes (M tolerance only)

*Code under development – subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards

TCJ Series
Polymer Tantalum Capacitors



- Conductive polymer electrode reduces ignition failure mode
- Lower ESR
- 3x reflow 260°C compatible
- CV range: 1.0-220µF / 2.5-50V
- 13 case sizes available


Elektra Award 2010

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tcj.pdf

HOW TO ORDER

TCJ	A	226	M	004	R	0300
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** M=±20%	**Rated DC Voltage** 002=2.5Vdc 004=4Vdc 006=6.3Vdc 010=10Vdc 016=16Vdc 020=20Vdc 025=25Vdc 035=35Vdc 050=50Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel	**ESR in mΩ**

125ºC RATED PARTS

Capacitance		Rated Voltage DC (V_R) to 85°C				
µF	**Code**	**2.5V (e)**	**4V (G)**	**6.3V (J)**	**10V (A)**	**16V (C)**
1.0	105					
4.7	475				K(500), R(500)	
6.8	685					A(200)
10	106			A(300), R(500)	A(300)	A(200), B(200), T(150,200)
15	156		A(300)	A(300)	A(200)	B(150)
22	226		A(300)	A(300), K(400), R(500), S(400), T(150)	B(300), T(150)	B(150)
33	336		A(300)	A(200), B(70,200), T(150)	B(70,200), C(100), T(70,150)	
47	476		A(200), T(80)	A(200), B(70), K(400), P(500), T(80,120)	B(70), C(100)	
68	686	A(250)	A(250), B(70), T(80)	B(55,70), C(100), W(70)		
100	107	A(200), B(70)	A(200), B(70) G(300), T(150)	B(45,69,70)		
150	157	B(70)	B(70)	B(45,69,70), H(200), W(40,70)		
220	227		B(45,70)	B(70,200)		

105ºC RATED PARTS

Capacitance		Rated Voltage DC (V_R) to 85°C				
µF	**Code**	**16V (C)**	**20V (D)**	**25V (E)**	**35V (V)**	**50V (T)**
0.68	684					B(300)
1.0	105			P(500)		B(300)
1.5	155				B(200)	B(300),C(300)
2.2	225				B(200)	C(300)
3.3	335				B(200)	C(200)
4.7	475			B(100)	B(200),C(200)	C(200)
6.8	685			B(100)	C(200)	C(200),D(120)
10	106			B(100)	B(200), C(200),Y(70)	D(120)
15	156			B(100)	C(200),D(70,100)	
22	226		Y(70)	B(100),C(100), D(60,100),Y(70)	D(70,100)	
33	336	Y(70)	Y(70)	D(60,100),Y(100)	D(70,100)	
47	476	Y(70)	Y(70)	D(60,100)		
68	686					

Available Ratings, (ESR ratings in mOhms in brackets)

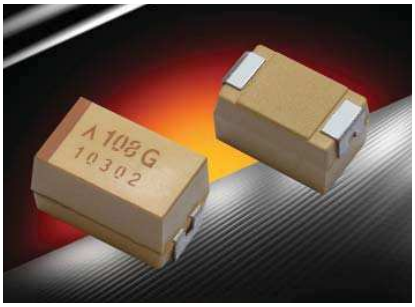
Engineering samples - please contact manufacturer

*Codes under development – subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TCM Series

Tantalum Solid Electrolytic Chip Capacitors
Conductive Polymer Multianode



- Conductive polymer multianode
- Extremely Low ESR
- Reduced ignition failure mode
- 3x reflow 260°C compatible
- Volumetric efficiency
- High frequency capacitance retention

Elektra Award 2010

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tcm.pdf

HOW TO ORDER

TCM	E	108	M	004	R	0010
Type	**Case Size** See table above	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** M=±20%	**Rated DC Voltage** 004=4Vdc 006=6.3Vdc 010=10Vdc 035=35Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel	**ESR in mΩ**

CAPACITANCE AND RATED VOLTAGE, VR (VOLTAGE CODE) RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage DC (V_R) to 85°C			
µF	Code	4V (G)	6.3V (J)	10V (A)	35V (V)
22	226				E(25)
33	336				
47	476				
68	686				
100	107				
150	157				
220	227				
330	337		E*	E(10)	
470	477		E*	E*	
680	687				
1000	108	E(10,12)			
1500	158				

Available Ratings, (ESR ratings in mOhms in brackets)

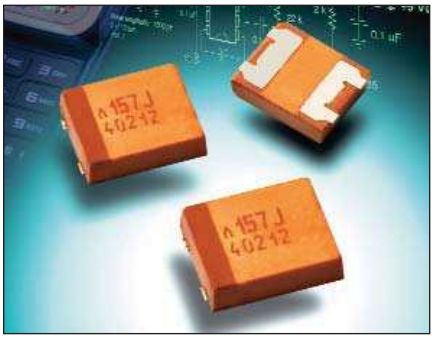
Engineering samples - please contact manufacturer

*Codes under development – subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TCN Series

Tantalum Solid Electrolytic Chip Capacitors Undertab Series with Conductive Polymer Electrode



- Conductive polymer electrode reduces ignition failure mode
- Lower ESR
- Undertab terminations layout:
  - High Volumetric Efficiency
  - High PCB assembly density
  - High capacitance in smaller dimensions
- 3x reflow 260°C compatible
- Consumer applications (e.g. mobiles, MP3 etc.)
- 2 case sizes available

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tcn.pdf

HOW TO ORDER

TCN	L	157	M	006	R	0200
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** M = ±20%	**Rated DC Voltage** 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel	**ESR in mΩ**

Capacitance		Rated Voltage DC to 85°C / 0.66DC to 105°C		
µF	**Code**	**4V (G)**	**6.3V (J)**	**10V (A)**
15	156			N(500)*
22	226			N(500)*
33	336	N(500)*	K(500)*/N(500)*	K(500)*/N(500)*
47	476	N(500)*	K(500)*	K(500)*/S(500)*
68	686	K(500)*/N(500)*	K(500)*/S(500)*	G(150)*/L(150)* S(500)*
100	107	K(500)*/S(500)*	G(200)*/L(200)*	G(150)*/L(150)* S(150)*/T(150)*
150	157	G(200)*/L(200)* S(500)*	K(200)* L(200)/S(200)* T(200)	G(150)*/H(150)* T(150)*
220	227	G(200)*/L(150)* S(200)*/T(150)*	H(200)*/T(200)*	H(150)*
330	337	H(150)*/T(150)*	H(200)*	
470	477	H(150)*		

Available Ratings, (ESR ratings in mOhms in brackets)

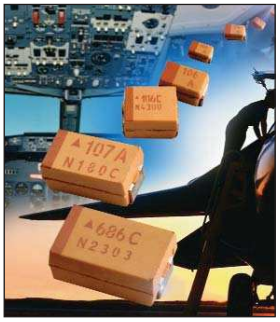
Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TRJ Series

Professional Series Tantalum Capacitors



- Improved reliability – 2x standard
- DCL reduced by 25% to 0.0075 CV
- Robust against higher thermo-mechanical stresses during assembly process
- CV range: 0.10-470µF / 4-50V
- 5 case sizes available
- 119 low ESR parts released
- Automotive, medical, aerospace, military and other high-end applications

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Please select correct termination style.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/trj.pdf

HOW TO ORDER

TRJ B 105 * 035 R RJ –

Type
TRJ

Case Size
B

Capacitance Code
pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)

Tolerance
K=±10%
M=±20%

Rated DC Voltage
004 = 4V
006 = 6.3V
010 = 10V
016 = 16V
020 = 20V
025 = 25V
035 = 35V
050 = 50V

Packaging/ Termination Plating
R = Lead Free 7" Reel
S = Lead Free 13" Reel
A = Gold Plating 7" Reel
B = Gold Plating 13" Reel
H = Tin Lead 7" Reel (Contact Manufacturer)
K = Tin Lead 13" Reel (Contact Manufacturer)
H, K = Non RoHS

Standard Suffix
OR
0100
Low ESR in mΩ

Additional characters may be added for special requirements
V = Dry pack Option (selected codes only)

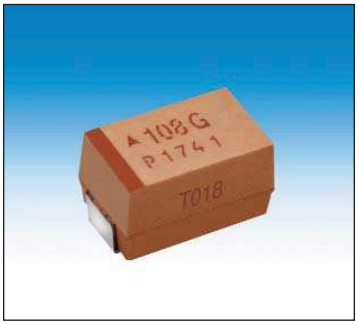
Capacitance		Rated Voltage DC (V_R) to 85°C							
µF	Code	4 (G)	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
0.10	104							A	
0.15	154							A, A(6000)	
0.22	224							A, A(6000)	A, A(7000)
0.33	334							A, A(6000)	A
0.47	474						A, A(7000)	A, A(4000)	B
0.68	684						A, A(6000)	A, A(6000)	B, B(2000)
1.0	105				A	A, A(3000)	A, A(3000)	A, B, A(3000), B(2000)	C, B, B(2000)
1.5	155					A, A(3000)	A, A(3000)	A, B, A(2000), B(2500)	C, C(1500)
2.2	225			A	A, A(3500)	A, A(3000)	A, B, A(1600), B(1200)	B, B(2000)	C, D, C(1000), D(1200)
3.3	335				A, B, A(3500)	A, B, A(2500), B(1300)	B, B(2000)	B, C, D, B(1000), C(800)	C, D, C(1000), D(800)
4.7	475			A, A(2000)	A, B, A(2000), B(1500)	A, B, A(1800), B(1000)	B, B(1000)	B, C, D, B(1500), C(600)	D, D(600)
6.8	685			A, B, A(1800)	A, B, C, A(1500), B(1200)	B, C, B(1000)	B, C, B(1000), C(600)	C, D, C(600)	D
10	106		A, B, A(1500)	A, B, A(1800), B(800)	B, C, B(800)	B, C, B(1000), C(500)	C, D, C(600)	C, D, C(600), D(250,400)	E, E(400)
15	156	B	A, B, A(1500), B(700)	A, B, C, A(1000), B(600)	B, B(800)	B, C, D, B(500), C(400)	C, D, C(500), D(300)	D, D(225, 350)	
22	226		A, B, C, A(900), B(600)	B, B(700)	B, C, D, B(600), C(350)	C, D, C(400), D(300)	D, D(300)	D, D(300, 400)	
33	336		B, C, B(600)	B, C, D, B(650), C(300)	C, C(300)	C, D, C(300), D(250)	D, D(400)	E, E(250)	
47	476		B, C, B(500), C(250)	C, D, C(300)	C, D, C(350), D(200)	D, D(200)	D, E, D(250), E(150)		
68	686		C, C(200)	C, C(300)	D, D(150)	D, E, D(200), E(200)			
100	107		C, C(300)	C, D, C(200), D(150)	D, E, D(150), E(150)	E, E(150)			
150	157		C, D, C(300), D(150)	D, E, D(150), E(150)	E, E(150)				
220	227		D, D(150)	D, E, E(150)					
330	337		E, E(150)	E, E(100)					
470	477		E, E(200)						

Available Ratings, (ESR ratings in mOhms in brackets)
Engineering samples - please contact manufacturer
*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TRM Professional Multianode

Tantalum Ultra Low ESR Capacitor



- Improved reliability – 0.5%/1khrs (twice better than standard)
- DCL reduced by 25% to 0.0075 CV
- Robust against higher thermo-mechanical stresses during assembly process
- Multi-anode construction
- Super low ESR
- CV range 22-1500µF / 2.5-35V
- "Mirror" construction used with D case capacitors reduces ESL to half
- Automotive, medical, aerospace, military and other hi-end application

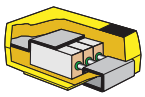
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Please select correct termination style.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/trm.pdf

MULTIANODE CONSTRUCTION



MULTIANODE TRMD LOW SELF INDUCTANCE CONSTRUCTION "MIRROR" DESIGN

HOW TO ORDER

TRM E 108 * 004 R 0023

Type

Case Size
See table above

Capacitance Code
pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)

Tolerance
K=±10%
M=±20%

Rated DC Voltage
002 = 2.5Vdc
004 = 4Vdc
006 = 6.3Vdc
010 = 10Vdc
016 = 16Vdc
020 = 20Vdc
025 = 25Vdc
035 = 35Vdc

Packaging
R = Lead Free 7" Reel
B = Gold Plating 13" Reel
H = Tin Lead 7" Reel (Contact Manufacturer)
K = Tin Lead 13" Reel (Contact Manufacturer)
H, K = Non RoHS

ESR in mΩ

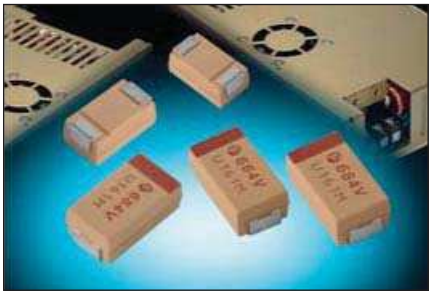
Capacitance		Rated Voltage DC (V_R) to 85°C							
µF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)
6.8	685								
10	106								
15	156								
22	226								D(70)/E(60,100)
33	336							D(65)	E(50,65)
47	476							E(65)	
68	686								
100	107						E(35,45)		
150	157					E(30,40)			
220	227				D(35)				
330	337		D(35)	D(35)	E(35)				
470	477		D(35)	E(30)					
680	687		E(23)						
1000	108	D(25)	E(23)						
1500	158	E(18)							
2200	228								

Available Ratings, (ESR ratings in mOhms in brackets)
Engineering samples - please contact manufacturer
*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TAW Series

Tantalum Solid Electrolytic Fused Capacitors



- Thin film fuse connected in series with capacitor
- Protection from possible damaging from high DC leakage current (short circuit failure)
- CV range: 6.8-100µF / 10-50V
- Application: servers

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/taw.pdf

HOW TO ORDER

TAW	D	476	*	010	R	0500
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** K=±10% M=±20%	**Rated DC Voltage** 010=10Vdc 016=16Vdc 020=20Vdc 025=25Vdc 035=25Vdc 050=50Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel	**ESR in mΩ**

Capacitance		Rated Voltage DC (V_R) to 85°C						
µF	Code	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
1.0	105							
2.2	225							
4.7	475							
6.8	685						D(600)	D(700)
10	106					D(600)	D(600)	D(700)
22	226				D(500)	D(600)		
33	336			D(600)	D(500)			
47	476		D(500)	D(800)				
100	107		D(500)					

Available Ratings (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

*Codes under development – subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

SMPS Stacked MLC Capacitors

SMX Style for High Temperatures Applications up to 200ºC

SMX-style, stacked Switch Mode Power Supply Capacitors (SMPS) utilizing Multilayer Ceramic (MLCC) construction are ideally suited for high temperature applications up to 200ºC. This product is intended for downhole oil exploration, including logging while drilling, geophysical probes, as well as space and aerospace electronics. The high temperature solder utilized in the construction of SMX-style parts assures reliable operation in harsh environments. The wide product offering provides designers a solution for high capacitance value and high voltage capacitors rated at 200ºC. The SMX-style capacitors are ideally suited for applications as DC filters in high power, high frequency motor drives, high pulsed-current circuitry, as well as low power electronics.

SMX-style, SMPS capacitors are characterized with excellent performance in comparison to wet tantalum products. The main benefits of SMX-product over wet tantalum capacitors include:

- Much lower ESR and lower losses
- Excellent capacitance retention with frequency
- Excellent high frequency performance
- Low DC leakage current
- Much higher current handling capabilities

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/smx.pdf

HOW TO ORDER AVX Styles: SMX1, SMX2, SMX3, SMX4, SMX5, SMX6

SMX	1	7	C	106	M	A	N	650
AVX Style SMX = Uncoated	**Size**	**Voltage** 3 = 25V 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Temperature Coefficient** C0G = A X7R/X9U = C	**Capacitance Code** (2 significant digits + number of zeros) 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1µF = 105 10 µF = 106 100 µF = 107	**Capacitance Tolerance** C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20%	**Test Level** A = Standard	**Termination** N = Straight Lead J = Leads formed in L = Leads formed out P = P Style Leads Z = Z Style Leads	**Height** Max Dimension "A" 120 = 0.120" 240 = 0.240" 360 = 0.360" 480 = 0.480" 650 = 0.650"

Note: Capacitors with X7R/X9U dielectric is not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.

Not RoHS Compliant

Max Capacitance (µF) Available Versus Style with Height (A) of 0.120" - 3.05mm

AVX STYLE	SMX1 _ _ _ _ _ _ AN120					SMX2 _ _ _ _ _ _ AN120					SMX3 _ _ _ _ _ _ AN120					SMX4 _ _ _ _ _ _ AN120					SMX5 _ _ _ _ _ _ AN120					SMX6 _ _ _ _ _ _ AN120				
	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V
C0G	1.0	.70	.40	.18	.068	1.2	1.0	.60	.26	.10	.50	.40	.20	.09	.033	.16	.13	.07	.02	.01	.05	.04	.02	.01	.0039	3.2	2.4	1.3	.50	.20
X7R/X9U	22	12	7.0	2.6	1.0	33	18	11	4.0	1.5	11	6.0	3.6	1.3	.50	3.3	1.8	1.1	.40	.15	1.2	.68	.40	.16	.056	68	40	24	9.4	3.3

Max Capacitance (µF) Available Versus Style with Height (A) of 0.240" - 6.10mm

AVX STYLE	SMX1 _ _ _ _ _ _ AN240					SMX2 _ _ _ _ _ _ AN240					SMX3 _ _ _ _ _ _ AN240					SMX4 _ _ _ _ _ _ AN240					SMX5 _ _ _ _ _ _ AN240					SMX6 _ _ _ _ _ _ AN240				
	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V
C0G	2.0	1.4	.80	.36	.13	2.4	2.0	1.2	.52	.20	1.0	.80	.40	.18	.068	.33	.26	.14	.05	.02	.10	.08	.05	.02	.0078	6.4	4.8	2.6	1.0	.40
X7R/X9U	44	24	14	5.2	2.0	66	36	22	8.0	3.0	22	12	7.2	2.6	1.0	6.6	3.6	2.2	.80	.30	2.4	1.3	.80	.32	.110	130	80	48	18	6.6

Max Capacitance (µF) Available Versus Style with Height (A) of 0.360" - 9.14mm

AVX STYLE	SMX1 _ _ _ _ _ _ AN360					SMX2 _ _ _ _ _ _ AN360					SMX3 _ _ _ _ _ _ AN360					SMX4 _ _ _ _ _ _ AN360					SMX5 _ _ _ _ _ _ AN360					SMX6 _ _ _ _ _ _ AN360				
	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V
C0G	3.0	2.1	1.2	.54	.22	3.6	3.0	1.8	.78	.30	1.5	1.2	.60	.27	.10	.48	.39	.21	.07	.03	.15	.12	.07	.03	.011	10	7.2	3.9	1.5	.60
X7R/X9U	68	36	21	7.8	3.0	100	54	33	12	4.5	33	18	10	3.9	1.5	10	5.4	3.3	1.2	.47	3.6	2.0	1.2	.48	.160	200	120	72	28	10

Max Capacitance (µF) Available Versus Style with Height (A) of 0.480" - 12.2mm

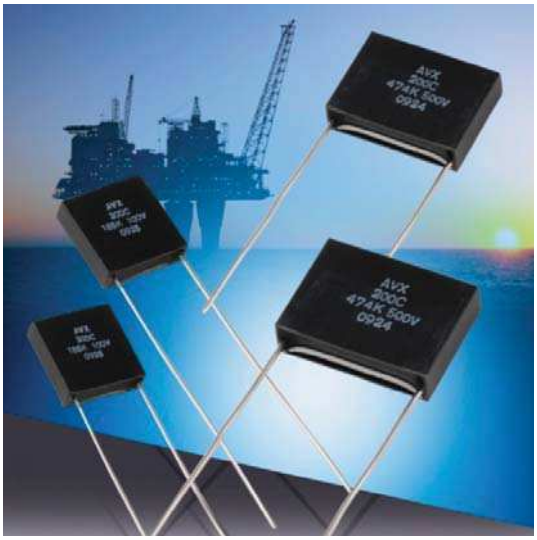
AVX STYLE	SMX1 _ _ _ _ _ _ AN480					SMX2 _ _ _ _ _ _ AN480					SMX3 _ _ _ _ _ _ AN480					SMX4 _ _ _ _ _ _ AN480					SMX5 _ _ _ _ _ _ AN480					SMX6 _ _ _ _ _ _ AN480				
	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V
C0G	4.0	2.8	1.6	.72	.27	4.8	4.0	2.2	1.0	.40	2.0	1.6	.80	.36	.130	.64	.52	.28	.10	.04	.20	.16	.10	.04	.015	13	9.6	5.2	2.0	.80
X7R/X9U	88	48	28	10	4.0	130	72	44	16	6.0	44	24	14	5.2	2.0	13	7.2	4.4	1.6	.60	4.8	2.7	1.6	.64	.22	270	160	96	37	13

Max Capacitance (µF) Available Versus Style with Height (A) of 0.650" - 16.5mm

AVX STYLE	SMX1 _ _ _ _ _ _ AN650					SMX2 _ _ _ _ _ _ AN650					SMX3 _ _ _ _ _ _ AN650					SMX4 _ _ _ _ _ _ AN650					SMX5 _ _ _ _ _ _ AN650					SMX6 _ _ _ _ _ _ AN650				
	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V
C0G	5.0	3.5	2.0	.90	.34	6.0	5.0	3.0	1.3	.50	2.5	2.0	1.0	.45	.160	.82	.65	.35	.12	.05	.25	.20	.12	.05	.019	16	12	6.5	2.5	1.0
X7R/X9U	110	60	35	13	5.0	160	90	55	20	7.5	56	30	18	6.5	2.5	16	9.0	5.5	2.0	.80	6.0	3.4	2.0	.80	.28	340	200	120	47	16

SMPS Molded Radial MLC Capacitors

SXP Sytle for High Temperature Applications up to 200ºC



SXP-style, encapsulated radial leaded MLC capacitors are ideally suited for high temperature applications up to 200ºC. This product is intended for downhole oil exploration, including logging while drilling, geophysical probes, as well as space, aerospace and hybrid automotive applications. This product supplements the SMX family of capacitors and offers mechanical protection to the ceramic element in extreme harsh environments. The high temperature solder utilized in the construction of SXP-style parts assures reliable operation in high temperature and rugged environments. The SXP-style capacitors are ideally suited for applications as DC filters in high power, high frequency motor drives, high pulsed-current circuitry, as well as standard electronic equipment designed for high temperature applications.

SXP-style, switch mode power supply capacitors are characterized with excellent performance. The main benefits of SXP product include:

- Low ESR, low ESL
- Low DC leakage
- Excellent high frequency performance

HOW TO ORDER

SXP	3	1	C	104	M	A	A
AVX Style	**Size**	**Voltage** 5 = 50V 1 = 100V 2 = 200V 7 = 500V A = 1000V	**Temperature Coefficient** C0G = A X7R/X9U = C	**Capacitance Code** (2 significant digits + number of zeros) 100 pF = 101 22,000 pF = 223 1µF = 105	**Capacitance Tolerance** C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20% **Tighter tolerances available upon request**	**Test Level** A = Standard	**Leads** A = Standard Tin/Lead (min. 5% Pb)

CAPACITANCE RANGE

Not RoHS Compliant

C0G

Style		50V	100V	200V	500V	1000V
SXP1	(MIN)	1000pF	1000pF	1000pF	100pF	100pF
	(MAX)	.047µF	.027µF	8200pF	4700pF	2200pF
SXP2	(MIN)	.01µF	1000pF	1000pF	100pF	100pF
	(MAX)	.10µF	.056µF	.018µF	8200pF	4700pF
SXP3	(MIN)	.01µF	1000pF	1000pF	1000pF	1000pF
	(MAX)	.15µF	.068µF	.022µF	.012µF	6800pF
SXP4	(MIN)	.01µF	.01µF	1000pF	1000pF	1000pF
	(MAX)	.39µF	.22µF	.068µF	.033µF	.018µF

X7R

Style		50V	100V	200V	500V	1000V
SXP1	(MIN)	.1µF	.01µF	.01µF	.01µF	.01µF
	(MAX)	1.2µF	.68µF	.27µF	.12µF	.033µF
SXP2	(MIN)	.1µF	.1µF	.01µF	.01µF	.01µF
	(MAX)	2.2µF	1.2µF	.56µF	.22µF	.068µF
SXP3	(MIN)	.01µF	.1µF	.01µF	.01µF	.01µF
	(MAX)	3.3µF	1.8µF	.82µF	.33µF	.10µF
SXP4	(MIN)	1µF	.1µF	.1µF	.01µF	.01µF
	(MAX)	10µF	5.6µF	2.2µF	1.0µF	.27µF

THJ Series

High Temperature Tantalum Capacitors

- Improved reliability – 2x standard
- 175°C @ 0.5V_R continuous operation
- CV range: 0.10-220µF / 6.3-50V
- 5 case sizes available
- Low ESR options on approval
- High temperature automotive and industry applications

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Please select correct termination style.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/thj.pdf

HOW TO ORDER

THJ	B	105	*	035	R	JN	–
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** K=±10% M=±20%	**Rated DC Voltage** 006=6.3Vdc 010=10Vdc 016=16Vdc 020=20Vdc 025=25Vdc 035=35Vdc 050=50Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel A = Gold Plating 7" Reel B = Gold Plating 13" Reel H = Tin Lead 7" Reel (Contact Manufacturer) K = Tin Lead 13" Reel (Contact Manufacturer) H, K = Non RoHS	**Standard Suffix** OR **0100** **Low ESR in mΩ**	**Additional characters may be added for special requirements** V = Dry pack Option (selected codes only)

Capacitance		Rated voltage (V_R) to 85°C (Voltage Code)						
µF	Code	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
0.10	104						A	
0.15	154						A	
0.22	224						A	
0.33	334						A	
0.47	474					A	B	
0.68	684					A	B	
1.0	105					A	A/B	
1.5	155				A		C	
2.2	225			A		B	C	
3.3	335		A	A	B		C	D
4.7	475	A	A	A/B			C	D
6.8	685	A	A	A/B		C	D	D
10	106	A	B	B		C	D	D/E
15	156	B	B	B	C		D	
22	226	B	B	C		D	D, D(300)	
33	336	B	C	C	D	D	E	
47	476	C	C	C/D				
68	686	C	D	D				
100	107	D	D	E				
150	157	D						
220	227		E					

Available Ratings, (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

THJ Series

High Temperature Tantalum Chip Capacitor with Extension to 200ºC

- SMD 200ºC tantalum capacitor
- 200°C @ 0.33VR 1000hrs continuous operation
- Leakage current after 200ºC 1000hrs less than 1mA
- 3x reflow 260°C
- Gold plated termination for hybrid assembly
- Oil drilling, aerospace, automotive applications
- CV range: 100-220µF / 10-16V

RoHS COMPLIANT

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/thj.pdf

HOW TO ORDER

THJ	E	107	*	016	A	JH
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** K=±10% M=±20%	**Rated DC Voltage** 010=10Vdc 016=16Vdc	**Packaging** A = Gold Plating 7" Reel B = Gold Plating 13" Reel	**Standard Suffix**

Capacitance		Rated voltage (V_R) to 85°C (Voltage Code)						
µF	Code	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
33 47 68	336 476 686							
100 150 220	107 157 227		 E	E				
330 470 680	337 477 687							

Available Ratings

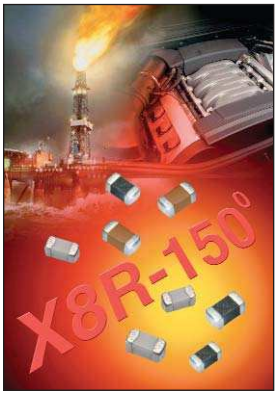
Engineering samples - please contact manufacturer

*Codes under development – subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supplyhigher ratings in the same case size, to the same reliability standards

Standard X8R MLCC

X8R Dielectric



AVX has developed a range of multilayer ceramic capacitors designed for use in applications up to 150ºC. These capacitors are manufactured with an X8R dielectric material which has a capacitance variation of ±15% between -55ºC and +150ºC.

The need for X8R performance has been driven by customer requirements for parts that operate at elevated temperatures. They provide a highly reliable capacitor with low loss and stable capacitance over temperature.

They are ideal for automotive under the hood sensors, measure while drilling and log while drilling. Typical applications include wire line logging tools such as gamma ray receivers, acoustic transceivers and micro-resistivity tools. They can also be used as bulk capacitors for high temperature camera modules.

X8R capacitors are available as standard and Automotive AEC-Q200 qualified parts. Optional termination systems, tin, FLEXITERM® and conductive epoxy for hybrid applications are available. Providing this series with our FLEXITERM® termination system provides further advantage to customers by way of enhanced resistance to both, temperature cycling and mechanical damage.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cx8r.pdf

HOW TO ORDER

0805	5	F	104	K	4	T	2	A
Size 0603 0805 1206	**Voltage** 25V = 3 50V = 5	**Dielectric** X8R = F	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros e.g. 10µF = 106	**Capacitance Tolerance** J = ± 5% K = ±10% M = ± 20%	**Failure Rate** 4 = Automotive A = Not Applicable	**Terminations** T = Plated Ni and Sn Z = FLEXITERM® U = Conductive Epoxy for Hybrid apps	**Packaging** 2 = 7" Reel 4 = 13" Reel	**Special Code** A = Std. Product

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

SIZE		0603		0805		1206	
	WVDC	25V	50V	25V	50V	25V	50V
271	Cap 270	G	G				
331	(pF) 330	G	G	J	J		
471	470	G	G	J	J		
681	680	G	G	J	J		
102	1000	G	G	J	J	J	J
152	1500	G	G	J	J	J	J
182	1800	G	G	J	J	J	J
222	2200	G	G	J	J	J	J
272	2700	G	G	J	J	J	J
332	3300	G	G	J	J	J	J
392	3900	G	G	J	J	J	J
472	4700	G	G	J	J	J	J
562	5600	G	G	J	J	J	J
682	6800	G	G	J	J	J	J
822	8200	G	G	J	J	J	J
103	Cap 0.01	G	G	J	J	J	J
123	(µF) 0.012	G	G	J	J	J	J
153	0.015	G	G	J	J	J	J
183	0.018	G	G	J	J	J	J
223	0.022	G	G	J	J	J	J
273	0.027	G	G	J	J	J	J
333	0.033	G	G	J	J	J	J
393	0.039	G	G	J	J	J	J
473	0.047	G	G	J	J	J	J
563	0.056	G		N	N	M	M
683	0.068	G		N	N	M	M
823	0.082			N	N	M	M
104	0.1			N	N	M	M
124	0.12			N	N	M	M
154	0.15			N	N	M	M
184	0.18			N		M	M
224	0.22			N		M	M
274	0.27					M	M
334	0.33					M	M
394	0.39					M	
474	0.47					M	
684	0.68						
824	0.82						
105	1						
		25V	50V	25V	50V	25V	50V
		0603		0805		1206	

= AEC-Q200 Qualified

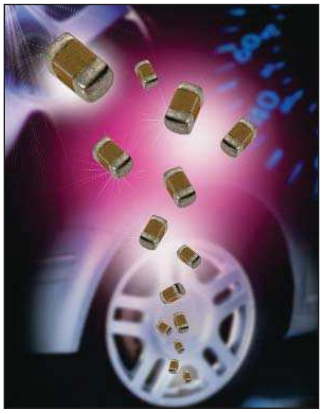
LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

Automotive MLCC
X8R Dielectric



AVX Corporation has supported the Automotive Industry requirements for Multilayer Ceramic Capacitors consistently for more than 10 years. Products have been developed and tested specifically for automotive applications and all manufacturing facilities are QS9000 and VDA 6.4 approved.

As part of our sustained investment in capacity and state of the art technology, we are now transitioning from the established Pd/Ag electrode system to a Base Metal Electrode system (BME).

AVX is using AEC-Q200 as the qualification vehicle for this transition. A detailed qualification package is available on request and contains results on a range of part numbers including:

- X7R dielectric components containing BME electrode and copper terminations with a Ni/Sn plated overcoat.
- X7R dielectric components, BME electrode with epoxy finish for conductive glue mounting.
- X7R dielectric components BME electrode and soft terminations with a Ni/Sn plated overcoat.
- NP0 dielectric components containing Pd/Ag electrode and silver termination with a Ni/Sn plated overcoat.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cauto.pdf

HOW TO ORDER

0805	5	F	104	K	4	T	2	A
Size 0603 0805 1206	**Voltage** 3 = 25V 5 = 50V	**Dielectric** X8R = F	**Capacitance Code (In pF)** 2 Significant Digits + Number of Zeros e.g. 10µF = 106	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Failure Rate** 4 = Automotive	**Terminations** T = Plated Ni and Sn Z = FLEXITERM® U = Conductive Epoxy	**Packaging** 2 = 7" Reel 4 = 13" Reel	**Special Code** A = Std. Product

NOTE: Contact factory for non-specified capacitance values.
Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

AUTOMOTIVE MLCC – X8R

SIZE		0603		0805		1206	
	WVDC	25V	50V	25V	50V	25V	50V
271	Cap 270	G	G				
331	(pF) 330	G	G	J	J		
471	470	G	G	J	J		
681	680	G	G	J	J		
102	1000	G	G	J	J	J	J
152	1500	G	G	J	J	J	J
182	1800	G	G	J	J	J	J
222	2200	G	G	J	J	J	J
272	2700	G	G	J	J	J	J
332	3300	G	G	J	J	J	J
392	3900	G	G	J	J	J	J
472	4700	G	G	J	J	J	J
562	5600	G	G	J	J	J	J
682	6800	G	G	J	J	J	J
822	8200	G	G	J	J	J	J
103	Cap 0.01	G	G	J	J	J	J
123	(µF) 0.012	G	G	J	J	J	J
153	0.015	G	G	J	J	J	J
183	0.018	G	G	J	J	J	J
223	0.022	G	G	J	J	J	J
273	0.027	G	G	J	J	J	J
333	0.033	G	G	J	J	J	J
393	0.039	G	G	J	J	J	J
473	0.047	G	G	J	J	J	J
563	0.056	G		N	N	M	M
683	0.068	G		N	N	M	M
823	0.082			N	N	M	M
104	0.1			N	N	M	M
124	0.12			N	N	M	M
154	0.15			N	N	M	M
184	0.18			N		M	M
224	0.22			N		M	M
274	0.27					M	M
334	0.33					M	M
394	0.39					M	
474	0.47					M	
684	0.68						
824	0.82						
105	1						
	WVDC	25V	50V	25V	50V	25V	50V
SIZE		0603		0805		1206	

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

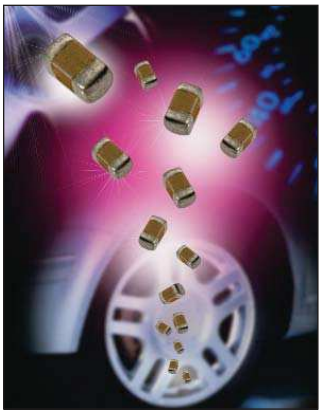
= AEC-Q200 Qualified

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

AEC-Q200 qualified
TS 16949, ISO 9001 certified

FLEXITERM® MLCC

X8R FLEXITERM® Automotive Series



AVX has developed a range of multilayer ceramic capacitors designed for use in applications up to 150ºC. These capacitors are manufactured with an X8R dielectric material which has a capacitance variation of ±15% between -55ºC and +150ºC.

The need for X8R performance has been driven by customer requirements for parts that operate at elevated temperatures. They provide a highly reliable capacitor with low loss and stable capacitance over temperature and are ideal for automotive under the hood sensors.

X8R capacitors are available as Automotive AEC-Q200 qualified parts. Optional termination systems, tin, FLEXITERM® and conductive epoxy for hybrid applications are available. Providing this series with our FLEXITERM® termination system provides further advantage to customers by way of enhanced resistance to both, temperature cycling and mechanical damage.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cx8r.pdf

HOW TO ORDER

0805	5	F	104	K	4	Z	2	A
Size 0603 0805 1206	**Voltage** 3 = 25V 5 = 50V	**Dielectric** X8R = F	**Capacitance Code (In pF)** 2 Significant Digits + Number of Zeros e.g. 10µF = 106	**Capacitance Tolerance** J = ±5%* K = ±10% M = ±20%	**Failure Rate** 4 = Automotive	**Terminations** Z = FLEXITERM® U = Conductive Epoxy	**Packaging** 2 = 7" Reel 4 = 13" Reel	**Special Code** A = Std. Product

*≤ 1µF only

NOTE: Contact factory for non-specified capacitance values.
Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

AUTOMOTIVE MLCC – X8R

SIZE		0603		0805		1206	
	WVDC	25V	50V	25V	50V	25V	50V
271	Cap 270	G	G				
331	(pF) 330	G	G	J	J		
471	470	G	G	J	J		
681	680	G	G	J	J		
102	1000	G	G	J	J	J	J
152	1500	G	G	J	J	J	J
182	1800	G	G	J	J	J	J
222	2200	G	G	J	J	J	J
272	2700	G	G	J	J	J	J
332	3300	G	G	J	J	J	J
392	3900	G	G	J	J	J	J
472	4700	G	G	J	J	J	J
562	5600	G	G	J	J	J	J
682	6800	G	G	J	J	J	J
822	8200	G	G	J	J	J	J
103	Cap 0.01	G	G	J	J	J	J
123	(µF) 0.012	G	G	J	J	J	J
153	0.015	G	G	J	J	J	J
183	0.018	G	G	J	J	J	J
223	0.022	G	G	J	J	J	J
273	0.027	G	G	J	J	J	J
333	0.033	G	G	J	J	J	J
393	0.039	G	G	J	J	J	J
473	0.047	G	G	J	J	J	J
563	0.056	G		N	N	M	M
683	0.068	G		N	N	M	M
823	0.082			N	N	M	M
104	0.1			N	N	M	M
124	0.12			N	N	M	M
154	0.15			N	N	M	M
184	0.18			N		M	M
224	0.22			N		M	M
274	0.27					M	M
334	0.33					M	M
394	0.39					M	
474	0.47					M	
684	0.68						
824	0.82						
105	1						
	WVDC	25V	50V	25V	50V	25V	50V
SIZE		0603		0805		1206	

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

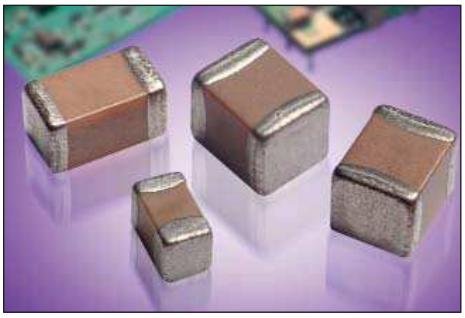
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

AEC-Q200 qualified
TS 16949, ISO 9001 certified

Tin/Lead Termination MLCC

LD Series X8R Dielectric, Tin/Lead



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination "B" products.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tinterm.pdf

HOW TO ORDER

LD05	5	F	101	J	A	B	2	A
Size LD03 - 0603 LD04 - 0504* LD05 - 0805 LD06 - 1206	**Voltage** 3 = 25V 5 = 50V	**Dielectric** X8R = F	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Failure Rate** A = Not Applicable	**Terminations** B = 5% min lead	**Packaging** 2 = 7" Reel 4 = 13" Reel 7 = Bulk Cass. 9 = Bulk **Contact Factory For Multiples**	**Special Code** A = Std. Product

*LD04 has the same CV ranges as LD03.

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

Not RoHS Compliant

X8R Dielectric

SIZE		LD03		LD05		LD06	
	WVDC	25V	50V	25V	50V	25V	50V
271	Cap 270	G	G				
331	(pF) 330	G	G	J	J		
471	470	G	G	J	J		
681	680	G	G	J	J		
102	1000	G	G	J	J	J	J
152	1500	G	G	J	J	J	J
182	1800	G	G	J	J	J	J
222	2200	G	G	J	J	J	J
272	2700	G	G	J	J	J	J
332	3300	G	G	J	J	J	J
392	3900	G	G	J	J	J	J
472	4700	G	G	J	J	J	J
562	5600	G	G	J	J	J	J
682	6800	G	G	J	J	J	J
822	8200	G	G	J	J	J	J
103	Cap 0.01	G	G	J	J	J	J
123	(µF) 0.012	G	G	J	J	J	J
153	0.015	G	G	J	J	J	J
183	0.018	G	G	J	J	J	J
223	0.022	G	G	J	J	J	J
273	0.027	G	G	J	J	J	J
333	0.033	G	G	J	J	J	J
393	0.039	G	G	J	J	J	J
473	0.047	G	G	J	J	J	J
563	0.056	G		N	N	M	M
683	0.068	G		N	N	M	M
823	0.082			N	N	M	M
104	0.1			N	N	M	M
124	0.12			N	N	M	M
154	0.15			N	N	M	M
184	0.18			N		M	M
224	0.22			N		M	M
274	0.27					M	M
334	0.33					M	M
394	0.39					M	
474	0.47					M	
684	0.68						
824	0.82						
105	1						
	WVDC	25V	50V	25V	50V	25V	50V
SIZE		LD03		LD05		LD06	

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
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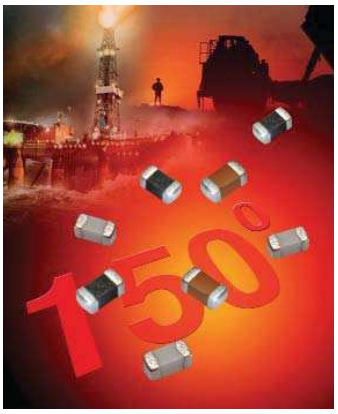
Standard X8L MLCC

X8L Dielectric



AVX has developed a range of multilayer ceramic capacitors designed for use in applications up to 150ºC. These capacitors are manufactured with an X8L dielectric material. The X8L material has capacitance variation of ±15% between -55ºC to 125ºC and +15/-40% from +125ºC to +150ºC.

The need for X8L performance has been driven by customer requirements for parts that operate at elevated temperatures. They provide a highly reliable capacitor with low loss and stable capacitance over temperature.

They are ideal for automotive under the hood sensors, and various industrial applications. Typical industrial application would be drilling monitoring system. They can also be used as bulk capacitors for high temperature camera modules.

The X8L dielectric capacitors are automotive AEC-Q200 qualified. Optional termination systems, tin, FLEXITERM® and conductive epoxy for hybrid applications are available. Providing this series with our FLEXITERM® termination system provides further advantage to customers by way of enhanced resistance to both, temperature cycling and mechanical damage.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cx8r.pdf

HOW TO ORDER

0805	5	L	104	K	4	T	2	A
Size 0603 0805 1206	**Voltage** 16V = Y 25V = 3 50V = 5 100V = 1	**Dielectric** X8L = L	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros e.g. 10µF = 106	**Capacitance Tolerance** J = ± 5% K = ±10% M = ± 20%	**Failure Rate** 4 = Automotive A = Not Applicable	**Terminations** T = Plated Ni and Sn Z = FLEXITERM® U = Conductive Epoxy for Hybrid apps	**Packaging** 2 = 7" Reel 4 = 13" Reel	**Special Code** A = Std. Product

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

X8L

SIZE		0603			0805			1206			
	WVDC	25V	50V	100V	25V	50V	100V	16V	25V	50V	100V
331	Cap 330		G	G		J	J				
471	(pF) 470		G	G		J	J				
681	680		G	G		J	J				
102	1000		G	G		J	J				
152	1500		G	G		J	J			J	J
222	2200		G	G		J	J			J	J
332	3300		G	G		J	J			J	J
472	4700		G	G		J	J			J	J
682	6800		G	G		J	J			J	J
103	Cap 0.01		G	G		J	J			J	J
153	(µF) 0.015	G	G		J	J	J			J	J
223	0.022	G	G		J	J	J			J	J
333	0.033	G	G		J	J	N			J	J
473	0.047	G	G		J	J	N			J	J
683	0.068	G	G		J	J				J	J
104	0.1	G	G		J	J				J	M
154	0.15				J	N		J	J	J	Q
224	0.22				N	N		J	J	J	Q
334	0.33				N			J	M	P	Q
474	0.47				N			M	M	P	
684	0.68							M			
105	1							M			
	WVDC	25V	50V	100V	25V	50V	100V	16V	25V	50V	100V
SIZE		0603			0805			1206			

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

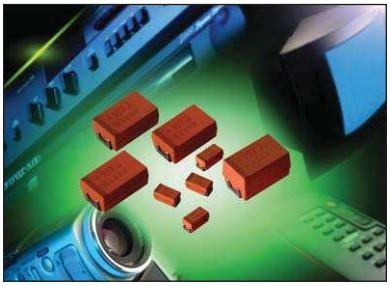
RoHS COMPLIANT

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

= AEC-Q200 Qualified

NOJ Series

Standard OxiCap® Niobium Oxide Capacitors



- Non-burn safe technology
- Reliability level: 0.5%/1000 hrs.
- 6 case sizes available
- Environmentally friendly
- IBM global approval received in 2004
- Electra Award received in 2005
- CV range: 4.7-1000µF / 1.8-10V

Electra Award 2005

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/noj.pdf

HOW TO ORDER

NOJ	D	107	M	006	R	WJ	–
Type	**Case Size**	**Capacitance Code** 1st two digits represent significant figures, 3rd digit represents multiplier in pF	**Tolerance** M=±20%	**Rated DC Voltage** 001 = 1.8Vdc 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel	**Specification Suffix** WJ = Standard Suffix	**Additional characters may be added for special requirements** V = Dry pack Option (selected codes only) with exception of D, E, V cases

Capacitance		Rated Voltage DC (V_R) to 85°C / 0.66 DC to 105°C				
µF	Code	1.8V (x)	2.5V (e)	4V (G)	6.3V (J)	10V (A)
4.7	475				A	A
6.8	685				A	A
10	106				A	A/B
15	156			A	A/B	A/B
22	226		A	A/B	A/B	B/C
33	336		A/B	A/B	B/C	C
47	476	A	A/B	A/B/C	B/C	C
68	686	B	B/C	B/C	B/C	C
100	107	B/C	B/C	B/C	B/C/D	D
150	157	C	C	C/D	C/D	
220	227	C	C	C/D	C/D/E	V
330	337	C	C/D	D	D/E	
470	477		D/E	D/E	E/V	
680	687		E	E/V		
1000	108		V	V		

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

NON-BURN NON-SMOKE

Released codes

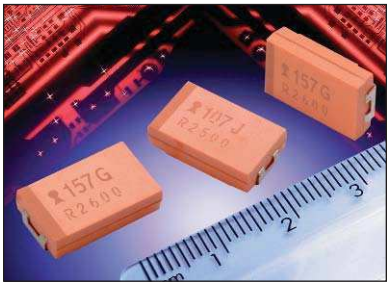
Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

NOJ Low Profile

Low Profile OxiCap® Niobium Oxide Capacitors



- Non-burn safe technology
- Reliability level: 0.5%/1000 hrs.
- CV range: 2.2-470µF / 1.8-10V
- 7 case sizes in low profile available
- IBM global approval received in 2004
- Electra Award received in 2005

Electra Award 2005

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/nojlp.pdf

HOW TO ORDER

NOJ	Y	107	M	006	R	WJ	–
Type	**Case Size**	**Capacitance Code** 1st two digits represent significant figures, 3rd digit represents multiplier in pF	**Tolerance** M=±20%	**Rated DC Voltage** 001 = 1.8Vdc 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel	**Specification Suffix** WJ = Standard Suffix	**Additional characters may be added for special requirements** V = Dry pack Option (selected codes only) with exception of X, Y cases

Capacitance		Rated Voltage DC (V_R) to 85°C / 0.66 DC to 105°C				
µF	Code	1.8V (x)	2.5V (e)	4V (G)	6.3V (J)	10V (A)
1.0	105					
1.5	155					
2.2	225					P
3.3	335					P
4.7	475				P/S	T
6.8	685			P/S	P/S/T	T
10	106		P/S	P/S/T	P/T	T
15	156	P/S	P/S/T	P/T		
22	226	P/S/T	P/T	T	T	
33	336	T	T	T	W	
47	476	T	T	W	W	
68	686		W	W	X/Y	
100	107	W	W	W/X	F/Y	
150	157		X	Y	F/Y	
220	227	X	Y	F/Y	Y	
330	337	Y	Y	Y		
470	477	Y				

Released codes

Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

NON-BURN NON-SMOKE

NLJ Series

Niobium Oxide Capacitors High CV Consumer Series

- High Volumetric efficiency
- Environmentally friendly
- 3x reflow 260°C compatible
- Consumer applications
- OxiCap® non-burn technology
- RoHS compliance
- Lead-free solution
- 10 case sizes available
- CV range: 22-1000µF / 4-10V

Electra Award 2005

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/nlj.pdf

HOW TO ORDER

NLJ	A	476	M	006	R	1600
Type	**Case Size**	**Capacitance Code** 1st two digits represent significant figures, 3rd digit represents multiplier in pF	**Tolerance** M=±20%	**Rated DC Voltage** 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel	**ESR in mΩ**

Capacitance		Rated Voltage DC to 40°C / 0.5DC to 85°C / 0.33DC to 105°C		
µF	Code	4V (G)	6.3V (J)	10V (A)
6.8	685			K(4000)*/P(5000)*
10	106		K(4000)*	K(2200)*/P(6000)*
15	156	K(4000)*/P(4000)*	P(3500)*	L(2800)*/S(2000)*
22	226	P(4000)	L(2500)*/S(1800)	A(3000)*/G(3000)* L(2200)*
33	336	A(3000)*/S(1700)*	G(2200)/L(2500)*	A(1700)/T(1800)*
47	476	A(2600)*/G(2600)* L(1600)*	A(1600)/T(1600)	B(1000)/H(1000)* W(400)
68	686	A(1500)*/T(1500)*	H(900)*	B(1400)*
100	107	H(900)*	B(1700)/W(600)	C(1200)/Y(1200)
150	157	B(1500)/W(400)		
220	227			D(1000)
330	337		C(500)/Y(500)	
470	477	C(500)/Y(500)		
680	687		D(500)	
1000	108	D(500)		

Available Ratings, (ESR ratings in mOhms in brackets)
Engineering samples - please contact manufacturer
*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

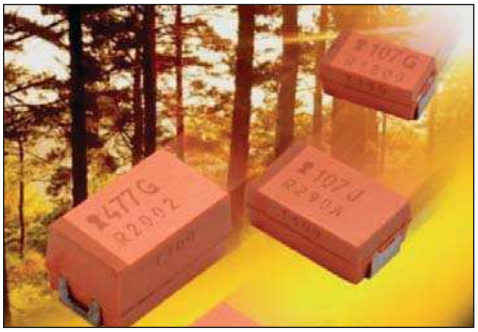
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

NON-BURN NON-SMOKE

NOS Series

Low ESR OxiCap® Niobium Oxide Capacitors



- Low ESR Nb0 capacitors
- Non-burn safe technology
- Reliability level: 0.2%/1000 hrs.
- CV range: 10-1000µF / 1.8-6.3V
- 9 case sizes available
- IBM global approval received in 2004
- Electra Award received in 2005

Electra Award 2005

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/nos.pdf

HOW TO ORDER

NOS	D	107	M	006	R	0100	–
Type	**Case Size**	**Capacitance Code** 1st two digits represent significant figures, 3rd digit represents multiplier in pF	**Tolerance** M=±20%	**Rated DC Voltage** 001 = 1.8Vdc 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel	**ESR in mΩ**	**Additional characters may be added for special requirements** V = Dry pack Option (selected codes only) with exception of D, E, X, Y, V cases

Capacitance		Rated Voltage DC (V_R) to 85°C / 0.66 DC to 105°C / 0.5 DC to 125°C			
µF	Code	1.8V (x)	2.5V (e)	4.0V (G)	6.3V (J)
4.7	475				
6.8	685				
10	106				A(800, 1000, 2000)
15	156			A(1500)	B(600)
22	226		A(900)	B(600)	B(600)
33	336			B(600)	B(600) C(500) W(250)
47	476		B(500)	B(500) C(300) W(150)	B(500) C(300)
68	686		C(200) W(150)	C(200)	C(75,200) X(100) Y(100)
100	107	B(350) W(150)	C(150)	C(70,150) X(100)	C(150) D(80,100) Y(100)
150	157		C(65,150) X(100)	C(90,150) Y(100)	D(50,70,100) Y(100)
220	227	C(125) X(100)	C(80,125) Y(100)	D(40,60,100) Y(100)	D(45,60,100) E(80,100)
330	337	Y(100)	D(35,50,100) Y(100)	D(35,55,100) E(100)/Y(150)	E(80,100)
470	477	Y(100)	D(35,55,100) E(100)	D(100) E(75,100)	V(75)
680	687		E(60)	V(75)	
1000	108		V(50)		

Available Ratings, (ESR ratings in mOhms in brackets)
Engineering samples - please contact manufacturer
*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

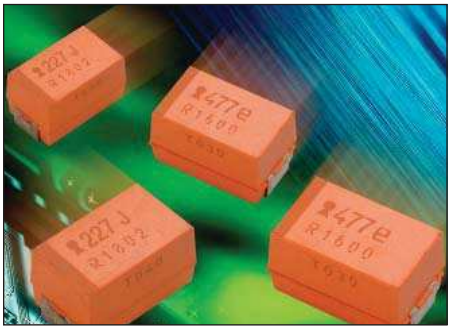
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

NON-BURN NON-SMOKE

NOM Series

Ultra Low ESR OxiCap® Niobium Oxide Capacitors



- Multi-anode construction
- Super low ESR
- Non-burn safe technology
- CV range: 220-680µF / 1.8-6.3V
- IBM global approval received in 2004
- Electra award received in 2005

Electra Award 2005

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/nom.pdf

HOW TO ORDER

NOM	E	227	M	006	R	0040
Type	**Case Size**	**Capacitance Code** 1st two digits represent significant figures, 3rd digit represents multiplier in pF	**Tolerance** M=±20%	**Rated DC Voltage** 001 = 1.8Vdc 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel	**ESR in mΩ**

Capacitance		Rated Voltage DC (V_R) to 85°C / 0.66 DC to 105°C / 0.5 DC to 125°C			
µF	Code	1.8V (x)	2.5V (e)	4.0V (G)	6.3V (J)
220	227				E(40)
330	337			E(35)	E(23,35)
470	477		E(30)	E(23,30)	
680	687	E(23)	E(23)		

Available Ratings, (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

LEAD-FREE

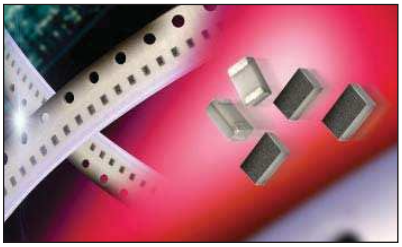
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

NON-BURN NON-SMOKE

Accu-F RF Capacitors

Thin Film Low ESR High Q Capacitors



The use of very low-loss dielectric materials, silicon dioxide and silicon oxynitride, in conjunction with highly conductive electrode metals results in low ESR and high Q. These high-frequency characteristics change at a slower rate with increasing frequency than for ceramic microwave capacitors.

Because of the thin-film technology, the above-mentioned frequency characteristics are obtained without significant compromise of properties required for surface mounting.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/accuf-p.pdf

HOW TO ORDER

0402	3	J	4R7	A	A	W	TR
Size	**Voltage**	**Temperature Coefficient** (1)	**Capacitance**	**Tolerance**	**Specification Code**	**Termination Code**	**Packaging Code**
0603 0805	1 = 100V 5 = 50V 3 = 25V	J = 0±30ppm/°C (-55°C to +125°C) K = 0±60ppm/°C (-55°C to +125°C)	Capacitance expressed in pF. (2 significant digits + number of zeros) **for values <10pF,** letter R denotes decimal point. Example: 68pF = 680, 8.2pF = 8R2	**for C≤2.0pF*** P = ±0.02pF Q = ±0.03pF A = ±0.05pF B = ±0.1pF C = ±0.25pF **for C≤3.0pF** Q = ±0.03pF A = ±0.05pF B = ±0.1pF C = ±0.25pF **for C≤5.6pF** A = ±0.05pF B = ±0.1pF C = ±0.25pF **for 5.6pF<C<10pF** B = ±0.1pF C = ±0.25pF D = ±0.5pF **for C≥10pF** F = ±1% G = ±2% J = ±5%	A = Accu-F® technology	W = Nickel/Solder Coated ***Accu-F***® Sn63, Pb37	TR = Tape & Reel

(1) TC's shown are per EIA/IEC Specifications.

* Tolerances as tight as ±0.01pF are available. Please consult the factory.

TEMP. COEFFICIENT CODE "J" = 0±30ppm/°C (-55°C to +125°C)(2)

Size Code	0603			0805		
Voltage	100	50	25	100	50	25
Cap in pF(1) — Cap code						
0.1 — 0R1 0.2 — 0R2 0.3 — 0R3 0.4 — 0R4 0.5 — 0R5 0.6 — 0R6 0.7 — 0R7 0.8 — 0R8 0.9 — 0R9	■	■	■	■	■	■
1.0 — 1R0 1.2 — 1R2 1.5 — 1R5	■	■	■	■	■	■
1.8 — 1R8 2.2 — 2R2 2.7 — 2R7	■	■	■	■	■	■
3.3 — 3R3 3.9 — 3R9 4.7 — 4R7	■	■	■	■	■	■
5.6 — 5R6 6.8 — 6R8 8.2 — 8R2		■	■	■	■	■
10 — 100 12 — 120 15 — 150		■	■	■	■	■
18 — 180 22 — 220 27 — 270			■		■	■
33 — 330 39 — 390 47 — 470						■
56 — 560 68 — 680 82 — 820						
100 — 101 120 — 121 150 — 151						

TEMP. COEFFICIENT CODE "K" = 0±60ppm/°C (-55°C to +125°)(2)

Size Code	0603			0805		
Voltage	100	50	25	100	50	25
Cap in pF(1) — Cap code						
0.1 — 0R1 0.2 — 0R2 0.3 — 0R3 0.4 — 0R4 0.5 — 0R5 0.6 — 0R6 0.7 — 0R7 0.8 — 0R8 0.9 — 0R9	■	■	■	■	■	■
1.0 — 1R0 1.2 — 1R2 1.5 — 1R5	■	■	■	■	■	■
1.8 — 1R8 2.2 — 2R2 2.7 — 2R7	■	■	■	■	■	■
3.3 — 3R3 3.9 — 3R9 4.7 — 4R7	■	■	■	■	■	■
5.6 — 5R6 6.8 — 6R8 8.2 — 8R2		■	■	■	■	■
10 — 100 12 — 120 15 — 150		■	■	■	■	■
18 — 180 22 — 220 27 — 270			■		■	■
33 — 330 39 — 390 47 — 470						■
56 — 560 68 — 680 82 — 820						■
100 — 101 120 — 121 150 — 151						■

(1) For capacitance values higher than listed in table, please consult factory.
(2) TC shown is per EIA/IEC Specifications.

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

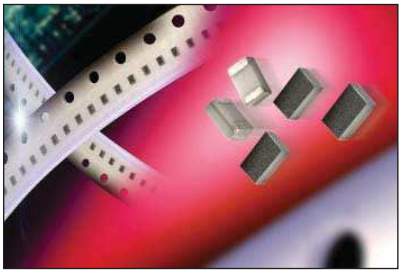
RoHS COMPLIANT

Please select correct termination style.

Intermediate values are available within the indicated range.

Accu-P RF Capacitors

Thin Film Low ESR High Q Capacitors



As in the Accu-F® series the use of very low-loss dielectric materials (silicon dioxide and silicon oxynitride) in conjunction with highly conductive electrode metals results in low ESR and high Q. At high frequency these characteristics change at a slower rate with increasing frequency than conventional ceramic microwave capacitors. Using thin-film technology, the above-mentioned frequency characteristics are obtained without significant compromise of properties required for surface mounting. The use of high thermal conductivity materials results in excellent RF power handling capabilities.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/accuf-p.pdf

HOW TO ORDER

0402 **3** **J** **4R7** **A** **B** **S** **TR**

Size
0201
0402
0603
0805
1210

Voltage
1 = 100V
5 = 50V
3 = 25V
Y = 16V
Z = 10V

Temperature Coefficient (1)
J = 0±30ppm/°C (-55°C to +125°C)
K = 0±60ppm/°C (-55°C to +125°C)

Capacitance
Capacitance expressed in pF. (2 significant digits + number of zeros)
for values <10pF, letter R denotes decimal point.
Example:
68pF = 680
8.2pF = 8R2

Tolerance

for C≤2.0pF*
P = ±0.02pF
Q = ±0.03pF
A = ±0.05pF
B = ±0.1pF
C = ±0.25pF

for C≤3.0pF
Q = ±0.03pF
A = ±0.05pF
B = ±0.1pF
C = ±0.25pF

for C≤5.6pF
A = ±0.05pF
B = ±0.1pF
C = ±0.25pF

for 5.6pF<C<10pF
B = ±0.1pF
C = ±0.25pF
D = ±0.5pF

for C≥10pF
F = ±1%
G = ±2%
J = ±5%

Specification Code
B = Accu-P® technology

Termination Code
W = Nickel/Solder Coated ***Accu-P® 0402*** Sn90, Pb10
T = Nickel/High Temperature Solder Coated ***Accu-P® 0805**, 1210***** Sn96, Ag4
Nickel/Solder Coated ***Accu-P® 0603*** Sn63, Pb37
S = Nickel/Lead Free Solder Coated ***Accu-P® 0201, 0402, 0603* Sn100

**RoHS Compliant

Packaging Code
TR = Tape & Reel

(1) TC's shown are per EIA/IEC Specifications.

* Tolerances as tight as ±0.01pF are available. Please consult the factory.

TEMP. COEFFICIENT CODE:

"J" = 0±30ppm/°C (-55°C to +125°C)(2)

Size Code			0201					0402					0603			0805			1210	
Voltage			100	50	25	16	10	100	50	25	16	10	100	50	25	100	50	25	100	50
Cap in pF(1)		Cap code																		
0.1	–	0R1																		
0.2	–	0R2																		
0.3	–	0R3																		
0.4	–	0R4																		
0.5	–	0R5																		
0.6	–	0R6																		
0.7	–	0R7																		
0.8	–	0R8																		
0.9	–	0R9																		
1.0	–	1R0																		
1.1	–	1R1																		
1.2	–	1R2																		
1.3	–	1R3																		
1.4	–	1R4																		
1.5	–	1R5																		
1.6	–	1R6																		
1.7	–	1R7																		
1.8	–	1R8																		
1.9	–	1R9																		
2.0	–	2R0																		
2.1	–	2R1																		
2.2	–	2R2																		
2.3	–	2R3																		
2.4	–	2R4																		
2.5	–	2R5																		
2.6	–	2R6																		
2.7	–	2R7																		
2.8	–	2R8																		
2.9	–	2R9																		
3.0	–	3R0																		
3.1	–	3R1																		
3.2	–	3R2																		
3.3	–	3R3																		
3.4	–	3R4																		
3.5	–	3R5																		
3.6	–	3R6																		
3.7	–	3R7																		
3.8	–	3R8																		
3.9	–	3R9																		
4.0	–	4R0																		
4.1	–	4R1																		
4.2	–	4R2																		
4.3	–	4R3																		
4.4	–	4R4																		
4.5	–	4R5																		
4.6	–	4R6																		
4.7	–	4R7																		
5.1	–	5R1																		
5.6	–	5R6																		
6.2	–	6R2																		
6.8	–	6R8																		
7.5	–	7R5																		
8.2	–	8R2																		
9.1	–	9R1																		
10.0	–	100																		
11.0	–	110																		
12.0	–	120																		
13.0	–	130																		
14.0	–	140																		
15.0	–	150																		
16.0	–	160																		
17.0	–	170																		
18.0	–	180																		
19.0	–	190																		
20.0	–	200																		
21.0	–	210																		
22.0	–	220																		
24.0	–	240																		
27.0	–	270																		
30.0	–	300																		
33.0	–	330																		
39.0	–	390																		
47.0	–	470																		
56.0	–	560																		
68.0	–	680																		

Intermediate values are available within the indicated range.

"K" = 0±60ppm/°C (-55°C to +125°C)(2)

Size Code			0805			1210	
Voltage			100	50	25	100	50(3)
Cap in pF(1)		Cap code					
0.1	–	0R1					
0.2	–	0R2					
0.3	–	0R3					
0.4	–	0R4					
0.5	–	0R5					
0.6	–	0R6					
0.7	–	0R7					
0.8	–	0R8					
0.9	–	0R9					
1.0	–	1R0					
1.1	–	1R1					
1.2	–	1R2					
1.3	–	1R3					
1.4	–	1R4					
1.5	–	1R5					
1.6	–	1R6					
1.7	–	1R7					
1.8	–	1R8					
1.9	–	1R9					
2.0	–	2R0					
2.1	–	2R1					
2.2	–	2R2					
2.3	–	2R3					
2.4	–	2R4					
2.5	–	2R5					
2.6	–	2R6					
2.7	–	2R7					
2.8	–	2R8					
2.9	–	2R9					
3.0	–	3R0					
3.1	–	3R1					
3.2	–	3R2					
3.3	–	3R3					
3.4	–	3R4					
3.5	–	3R5					
3.6	–	3R6					
3.7	–	3R7					
3.8	–	3R8					
3.9	–	3R9					
4.0	–	4R0					
4.1	–	4R1					
4.2	–	4R2					
4.3	–	4R3					
4.4	–	4R4					
4.5	–	4R5					
4.6	–	4R6					
4.7	–	4R7					
5.1	–	5R1					
5.6	–	5R6					
6.2	–	6R2					
6.8	–	6R8					
7.5	–	7R5					
8.2	–	8R2					
9.1	–	9R1					
10.0	–	100					
11.0	–	110					
12.0	–	120					
13.0	–	130					
14.0	–	140					
15.0	–	150					
16.0	–	160					
17.0	–	170					
18.0	–	180					
19.0	–	190					
20.0	–	200					
21.0	–	210					
22.0	–	220					
24.0	–	240					
27.0	–	270					
30.0	–	300					
33.0	–	330					
39.0	–	390					
47.0	–	470					
56.0	–	560					
68.0	–	680					

(1) For capacitance values higher than listed in table, please consult factory.
(2) TC shown is per EIA/IEC Specifications.
(3) For 50 volt range, please consult factory.
☐ These values are produced with "K" temperature coefficient code only.

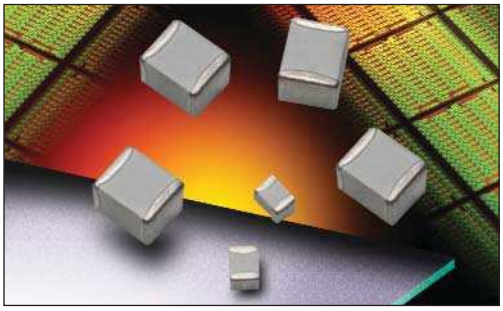
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Please select correct termination style.

SQCA/CB RF Capacitors

Ceramic (0505/1111) Low ESR High Q Capacitors



SQCA (0505) & SQCB (1111) are AVX's Ultra Low ESR microwave capacitors. Suitable for RF Power Amplifiers, they come in non-mag termination for MRI applications. They offer very High Q & resonant frequency and power handling capability.

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Please select correct termination style.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/sq.pdf

HOW TO ORDER

SQ	CB	7	M	100	J	A	T	1A
AVX Style	**Case Size**	**Voltage Code**	**Temperature Coefficient Code**	**Capacitance**	**Capacitance Tolerance Code**	**Failure Rate Code**	**Termination Style Code**	**Packaging Code**
SQ	CA = 0505 CB = 1111	5 = 50V E = 150V 2 = 200V V = 250V 9 = 300V 7 = 500V	M = +90±20ppm/°C A = 0±30ppm/°C C = 15% ("J" Termination only)	EIA Capacitance Code in pF. First two digits = significant figures or "R" for decimal place. Third digit = number of zeros or after "R" significant figures.	B = ±.1 pF C = ±.25 pF D = ±.5 pF F = ±1% G = ±2% J = ±5% K = ±10% M = ±20% N = ±30%	A = Not Applicable	*1 = Pd/Ag *7 = Ag/Ni/Au J = Nickel Barrier Tin/Lead (60/40) *T = 100% Tin *RoHS Compliant	1A = 7" Reel Unmarked 6A = Waffle Pack Unmarked ME = 7" Reel Marked WE = Waffle Pack Unmarked *Vertical T&R available *500 piece reels available

Case Size A

TABLE I: TC: M (+90±20PPM/°C)

Cap. pF	Cap. Tol.	WVDC
0.1	B	150, 250
0.2	B	150, 250
0.3	B,C	150, 250
0.4	B,C	150, 250
0.5	B, C, D	150, 250
0.6	B, C, D	150, 250
0.7	B, C, D	150, 250
0.8	B, C, D	150, 250
0.9	B, C, D	150, 250
1.0	B, C, D	150, 250
1.1	B, C, D	150, 250
1.2	B, C, D	150, 250
1.3	B, C, D	150, 250
1.4	B, C, D	150, 250
1.5	B, C, D	150, 250
1.6	B, C, D	150, 250
1.7	B, C, D	150, 250
1.8	B, C, D	150, 250
1.9	B, C, D	150, 250
2.0	B, C, D	150, 250
2.2	B, C, D	150, 250
2.4	B, C, D	150, 250
2.7	B, C, D	150, 250
3.0	B, C, D	150, 250
3.3	B, C, D	150, 250
3.6	B, C, D	150, 250
3.9	B, C, D	150, 250
4.3	B, C, D	150, 250
4.7	B, C, D	150, 250
5.1	B, C, D	150, 250
5.6	B, C, D	150, 250
6.2	B, C, D	150, 250
6.8	B, C, J, K	150, 250
7.5	B, C, J, K	150, 250
8.2	B, C, J, K	150, 250
9.1	B, C, J, K	150, 250
10	F, G, J, K	150, 250
11	F, G, J, K	150, 250
12	F, G, J, K	150, 250
13	F, G, J, K	150, 250
15	F, G, J, K	150, 250
16	F, G, J, K	150, 250
18	F, G, J, K	150, 250
20	F, G, J, K	150, 250
22	F, G, J, K	150, 250
24	F, G, J, K	150, 250
27	F, G, J, K	150, 250
30	F, G, J, K	150, 250
33	F, G, J, K	150, 250
36	F, G, J, K	150, 250
39	F, G, J, K	150, 250
43	F, G, J, K	150, 250
47	F, G, J, K	150, 250
51	F, G, J, K	150, 250
56	F, G, J, K	150, 250
62	F, G, J, K	150, 250
68	F, G, J, K	150, 250
75	F, G, J, K	150, 250
82	F, G, J, K	150, 250
91	F, G, J, K	150, 250
100	F, G, J, K	150, 250

TABLE II: TC: A (0±30PPM/°C)

Cap. pF	Cap. Tol.	WVDC
0.1	B	150
0.2	B	150
0.3	B,C	150
0.4	B,C	150
0.5	B, C, D	150
0.6	B, C, D	150
0.7	B, C, D	150
0.8	B, C, D	150
0.9	B, C, D	150
1.0	B, C, D	150
1.1	B, C, D	150
1.2	B, C, D	150
1.3	B, C, D	150
1.4	B, C, D	150
1.5	B, C, D	150
1.6	B, C, D	150
1.7	B, C, D	150
1.8	B, C, D	150
1.9	B, C, D	150
2.0	B, C, D	150
2.2	B, C, D	150
2.4	B, C, D	150
2.7	B, C, D	150
3.0	B, C, D	150
3.3	B, C, D	150
3.6	B, C, D	150
3.9	B, C, D	150
4.3	B, C, D	150
4.7	B, C, D	150
5.1	B, C, D	150
5.6	B, C, D	150
6.2	B, C, D	150
6.8	B, C, J, K	150
7.5	B, C, J, K	150
8.2	B, C, J, K	150
9.1	B, C, J, K	150
10	F, G, J, K	150
11	F, G, J, K	150
12	F, G, J, K	150
13	F, G, J, K	150
15	F, G, J, K	150
16	F, G, J, K	150
18	F, G, J, K	150
20	F, G, J, K	150
22	F, G, J, K	150
24	F, G, J, K	150
27	F, G, J, K	150
30	F, G, J, K	150
33	F, G, J, K	150
36	F, G, J, K	150
39	F, G, J, K	150
43	F, G, J, K	150
47	F, G, J, K	150
51	F, G, J, K	150
56	F, G, J, K	150
62	F, G, J, K	150
68	F, G, J, K	150
75	F, G, J, K	150
82	F, G, J, K	150
91	F, G, J, K	150
100	F, G, J, K	150
110	F, G, J, K	50
120	F, G, J, K	50
130	F, G, J, K	50
150	F, G, J, K	50
160	F, G, J, K	50
180	F, G, J, K	50
200	F, G, J, K	50
220	F, G, J, K	50
240	F, G, J, K	50
270	F, G, J, K	50
300	F, G, J, K	50
330	F, G, J, K	50
360	F, G, J, K	50
390	F, G, J, K	50
430	F, G, J, K	50
470	F, G, J, K	50
510	F, G, J, K	50
560	F, G, J, K	50
620	F, G, J, K	50
680	F, G, J, K	50
750	F, G, J, K	50
820	F, G, J, K	50
910	F, G, J, K	50
1000	F, G, J, K	50

Case Size A

TABLE III: TC: C (±15%)

Cap. pF	Cap. Tol.	WVDC
1000	K, M, N	50
1200	K, M, N	50
1500	K, M, N	50
1800	K, M, N	50
2000	K, M, N	50
2200	K, M, N	50
2700	K, M, N	50
3300	K, M, N	50
3900	K, M, N	50
4700	K, M, N	50
5100	K, M, N	50
5600	K, M, N	50
6800	K, M, N	50
8200	K, M, N	50
10000	K, M, N	50

Case Size B

TABLE IV: TC: M (+90±20PPM/°C)

Cap. pF	Cap. Tol.	WVDC
0.1	B	500
0.2	B	500
0.3	B,C	500
0.4	B,C	500
0.5	B, C, D	500
0.6	B, C, D	500
0.7	B, C, D	500
0.8	B, C, D	500
0.9	B, C, D	500
1.0	B, C, D	500
1.1	B, C, D	500
1.2	B, C, D	500
1.3	B, C, D	500
1.4	B, C, D	500
1.5	B, C, D	500
1.6	B, C, D	500
1.7	B, C, D	500
1.8	B, C, D	500
1.9	B, C, D	500
2.0	B, C, D	500
2.2	B, C, D	500
2.4	B, C, D	500
2.7	B, C, D	500
3.0	B, C, D	500
3.3	B, C, D	500
3.6	B, C, D	500
3.9	B, C, D	500
4.3	B, C, D	500
4.7	B, C, D	500
5.1	B, C, D	500
5.6	B, C, D	500
6.2	B, C, D	500
6.8	B, C, J, K	500
7.5	B, C, J, K	500
8.2	B, C, J, K	500
9.1	B, C, J, K	500
10	F, G, J, K	500
11	F, G, J, K	500
12	F, G, J, K	500
13	F, G, J, K	500
15	F, G, J, K	500
16	F, G, J, K	500
18	F, G, J, K	500
20	F, G, J, K	500
22	F, G, J, K	500
24	F, G, J, K	500
27	F, G, J, K	500
30	F, G, J, K	500
33	F, G, J, K	500
36	F, G, J, K	500
39	F, G, J, K	500
43	F, G, J, K	500
47	F, G, J, K	500
51	F, G, J, K	500
56	F, G, J, K	500
62	F, G, J, K	500
68	F, G, J, K	500
75	F, G, J, K	500
82	F, G, J, K	500
91	F, G, J, K	500
100	F, G, J, K	500
110	F, G, J, K	300
120	F, G, J, K	300
130	F, G, J, K	300
150	F, G, J, K	300
160	F, G, J, K	300
180	F, G, J, K	300
200	F, G, J, K	300
220	F, G, J, K	200
240	F, G, J, K	200
270	F, G, J, K	200
300	F, G, J, K	200
330	F, G, J, K	200
360	F, G, J, K	200
390	F, G, J, K	200
430	F, G, J, K	200
470	F, G, J, K	200
510	F, G, J, K	150
560	F, G, J, K	150
620	F, G, J, K	150
680	F, G, J, K	150
750	F, G, J, K	150
820	F, G, J, K	150
910	F, G, J, K	150
1000	F, G, J, K	150

TABLE V: TC: A (0±30PPM/°C)

Cap. pF	Cap. Tol.	WVDC
0.1	B	500
0.2	B	500
0.3	B,C	500
0.4	B,C	500
0.5	B, C, D	500
0.6	B, C, D	500
0.7	B, C, D	500
0.8	B, C, D	500
0.9	B, C, D	500
1.0	B, C, D	500
1.1	B, C, D	500
1.2	B, C, D	500
1.3	B, C, D	500
1.4	B, C, D	500
1.5	B, C, D	500
1.6	B, C, D	500
1.7	B, C, D	500
1.8	B, C, D	500
1.9	B, C, D	500
2.0	B, C, D	500
2.2	B, C, D	500
2.4	B, C, D	500
2.7	B, C, D	500
3.0	B, C, D	500
3.3	B, C, D	500
3.6	B, C, D	500
3.9	B, C, D	500
4.3	B, C, D	500
4.7	B, C, D	500
5.1	B, C, D	500
5.6	B, C, D	500
6.2	B, C, D	500
6.8	B, C, J, K	500
7.5	B, C, J, K	500
8.2	B, C, J, K	500
9.1	B, C, J, K	500
10	F, G, J, K	500
11	F, G, J, K	500
12	F, G, J, K	500
13	F, G, J, K	500
15	F, G, J, K	500
16	F, G, J, K	500
18	F, G, J, K	500
20	F, G, J, K	500
22	F, G, J, K	500
24	F, G, J, K	500
27	F, G, J, K	500
30	F, G, J, K	500
33	F, G, J, K	500
36	F, G, J, K	500
39	F, G, J, K	500
43	F, G, J, K	500
47	F, G, J, K	500
51	F, G, J, K	500
56	F, G, J, K	500
62	F, G, J, K	500
68	F, G, J, K	500
75	F, G, J, K	500
82	F, G, J, K	500
91	F, G, J, K	500
100	F, G, J, K	500
110	F, G, J, K	300
120	F, G, J, K	300
130	F, G, J, K	300
150	F, G, J, K	300
160	F, G, J, K	300
180	F, G, J, K	300
200	F, G, J, K	300
220	F, G, J, K	200
240	F, G, J, K	200
270	F, G, J, K	200
300	F, G, J, K	200
330	F, G, J, K	200
360	F, G, J, K	200
390	F, G, J, K	200
430	F, G, J, K	200
470	F, G, J, K	200
510	F, G, J, K	150
560	F, G, J, K	150
620	F, G, J, K	150
680	F, G, J, K	150
750	F, G, J, K	150
820	F, G, J, K	150
910	F, G, J, K	150
1000	F, G, J, K	150
1100	F, G, J, K	50
1200	F, G, J, K	50
1300	F, G, J, K	50
1500	F, G, J, K	50
1600	F, G, J, K	50
1800	F, G, J, K	50
2000	F, G, J, K	50
2200	F, G, J, K	50
2400	F, G, J, K	50
2700	F, G, J, K	50
3000	F, G, J, K	50
3300	F, G, J, K	50
3600	F, G, J, K	50
3900	F, G, J, K	50
4300	F, G, J, K	50
4700	F, G, J, K	50
5000	F, G, J, K	50
5100	F, G, J, K	50

TABLE VI: TC: C (±15%)

Cap. pF	Cap. Tol.	WVDC
5000	K, M, N	50
6800	K, M, N	50
8200	K, M, N	50
10000	K, M, N	50
12000	K, M, N	50
15000	K, M, N	50
18000	K, M, N	50
27000	K, M, N	50
33000	K, M, N	50
39000	K, M, N	50
47000	K, M, N	50
68000	K, M, N	50
82000	K, M, N	50
100000	K, M, N	50

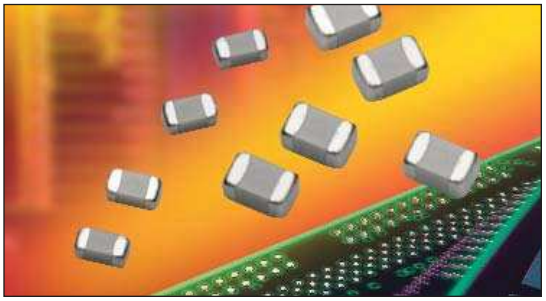
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Please select correct termination style.

SQCS/CF RF Capacitors

Ceramic (0603/0805) Ultra Low ESR High Q Capacitors



SQCS (0603) & SQCF (0805) are AVX's Ultra Low ESR microwave capacitors suitable for Base Station infrastructure applications requiring High Q and power handling capability.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/sq.pdf

HOW TO ORDER

SQ	CS	V	A	100	J	A	T	1A
AVX Style SQ	**Case Size** CS = 0603 CF = 0805	**Voltage Code** V = 250V	**Temperature Coefficient Code** A = 0±30ppm/°C	**Capacitance** EIA Capacitance Code in pF. First two digits = significant figures or "R" for decimal place. Third digit = number of zeros or after "R" significant figures.	**Capacitance Tolerance Code** A = ±.05 pF B = ±.1 pF C = ±.25 pF D = ±.5 pF F = ±1% G = ±2% J = ±5%	**Failure Rate Code** A = Not Applicable	**Termination Style Code** **1 = Pd/Ag **7 = Ag/Ni/Au J = Nickel Barrier Tin/Lead (60/40) **T = 100% Tin (Standard) **RoHS Compliant	**Packaging Code** 1A = 7" Reel Unmarked ME = 7" Reel Marked *Vertical T&R available *500 piece reels available

TABLE I: TC: A (0±30PPM/°C) CASE SIZE S

Cap. pF	Cap. Tol.	WVDC
0.1	A, B	250
0.2	A, B	250
0.3	A, B	250
0.4	A, B	250
0.5	A, B, C	250
0.6	A, B, C	250
0.7	A, B, C	250
0.8	A, B, C	250
0.9	A, B, C	250
1.0	A, B, C	250
1.1	A, B, C	250
1.2	A, B, C	250
1.3	A, B, C	250
1.4	A, B, C	250
1.5	A, B, C	250
1.6	A, B, C	250
1.7	A, B, C	250
1.8	A, B, C	250
1.9	A, B, C	250
2.0	A, B, C	250
2.2	A, B, C	250
2.4	A, B, C	250
2.7	A, B, C	250
3.0	A, B, C	250
3.3	A, B, C	250
3.6	A, B, C	250
3.9	A, B, C	250
4.3	A, B, C	250
4.7	A, B, C	250
5.1	A, B, C	250
5.6	A, B, C	250
6.2	A, B, C	250
6.8	B, C, D	250
7.5	B, C, D	250
8.2	B, C, D	250
9.1	B, C, D	250
10	F, G, J	250
11	F, G, J	250
12	F, G, J	250
13	F, G, J	250
15	F, G, J	250
16	F, G, J	250
18	F, G, J	250
20	F, G, J	250
22	F, G, J	250
24	F, G, J	250
27	F, G, J	250
30	F, G, J	250
33	F, G, J	250
36	F, G, J	250
39	F, G, J	250
43	F, G, J	250
47	F, G, J	250
51	F, G, J	250
56	F, G, J	250
62	F, G, J	250
68	F, G, J	250
75	F, G, J	250
82	F, G, J	250
91	F, G, J	250
100	F, G, J	250

TABLE II: TC: A (0±30PPM/°C) CASE SIZE F

Cap. pF	Cap. Tol.	WVDC
0.1	A, B	250
0.2	A, B	250
0.3	A, B	250
0.4	A, B	250
0.5	A, B, C	250
0.6	A, B, C	250
0.7	A, B, C	250
0.8	A, B, C	250
0.9	A, B, C	250
1.0	A, B, C	250
1.1	A, B, C	250
1.2	A, B, C	250
1.3	A, B, C	250
1.4	A, B, C	250
1.5	A, B, C	250
1.6	A, B, C	250
1.7	A, B, C	250
1.8	A, B, C	250
1.9	A, B, C	250
2.0	A, B, C	250
2.2	A, B, C	250
2.4	A, B, C	250
2.7	A, B, C	250
3.0	A, B, C	250
3.3	A, B, C	250
3.6	A, B, C	250
3.9	A, B, C	250
4.3	A, B, C	250
4.7	A, B, C	250
5.1	A, B, C	250
5.6	A, B, C	250
6.2	A, B, C	250
6.8	B, C, D	250
7.5	B, C, D	250
8.2	B, C, D	250
9.1	B, C, D	250
10	F, G, J	250
11	F, G, J	250
12	F, G, J	250
13	F, G, J	250
15	F, G, J	250
16	F, G, J	250
18	F, G, J	250
20	F, G, J	250
22	F, G, J	250
24	F, G, J	250
27	F, G, J	250
30	F, G, J	250
33	F, G, J	250
36	F, G, J	250
39	F, G, J	250
43	F, G, J	250
47	F, G, J	250
51	F, G, J	250
56	F, G, J	250
62	F, G, J	250
68	F, G, J	250
75	F, G, J	250
82	F, G, J	250
91	F, G, J	250
100	F, G, J	250
110	F, G, J	250
120	F, G, J	250
150	F, G, J	250
180	F, G, J	250
200	F, G, J	250
220	F, G, J	250
240	F, G, J	250

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Please select correct termination style.

U Series RF Capacitors (RoHS)

C0G (NP0) Ceramic Low ESR Capacitors

"U" Series capacitors are C0G (NP0) chip capacitors specially designed for "Ultra" low ESR for applications in the communications market. Max ESR and effective capacitance are met on each value producing lot to lot uniformity. Sizes available are EIA chip sizes 0402, 0603, 0805, and 1210.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/useries.pdf

HOW TO ORDER

0805	1	U	100	J	A	T	2	A
Case Size	**Voltage Code**	**Dielectric = Ultra Low ESR**	**Capacitance**	**Capacitance Tolerance Code**	**Failure Rate Code**	**Termination**	**Packaging Code**	**Special Code**
0402 0603 0805 1210	5 = 50V 1 = 100V 2 = 200V		EIA Capacitance Code in pF. First two digits = significant figures or "R" for decimal place. Third digit = number of zeros or after "R" significant figures.	B = ±0.1pF C = ±0.25pF D = ±0.5pF F = ±1% G = ±2% J = ±5% K = ±10% M = ±20%	A = Not Applicable	T = Plated Ni and Sn	2 = 7" Reel 4 = 13" Reel 9 = Bulk	A = Standard

Cap (pF)	Available Tolerance	Size 0402	0603	0805	1210
0.2	B,C	50V	N/A	N/A	N/A
0.3	↓	↓	↓	↓	↓
0.4	↓	↓	↓	↓	↓
0.5	B,C	↓	↓	↓	↓
0.6	B,C,D	↓	↓	↓	↓
0.7	↓	↓	↓	↓	↓
0.8	↓	↓	↓	↓	↓
0.9	B,C,D	↓	↓	↓	↓

Cap (pF)	Available Tolerance	Size 0402	0603	0805	1210
1.0	B,C,D	50V	200V	200V	200V
1.1	↓	↓	↓	↓	↓
1.2	↓	↓	↓	↓	↓
1.3	↓	↓	↓	↓	↓
1.4	↓	↓	↓	↓	↓
1.5	↓	↓	↓	↓	↓
1.6	↓	↓	↓	↓	↓
1.7	↓	↓	↓	↓	↓
1.8	↓	↓	↓	↓	↓
1.9	↓	↓	↓	↓	↓
2.0	↓	↓	↓	↓	↓
2.1	↓	↓	↓	↓	↓
2.2	↓	↓	↓	↓	↓
2.4	↓	↓	↓	↓	↓
2.7	↓	↓	↓	↓	↓
3.0	↓	↓	↓	↓	↓
3.3	↓	↓	↓	↓	↓
3.6	↓	↓	↓	↓	↓
3.9	↓	↓	↓	↓	↓
4.3	↓	↓	↓	↓	↓
4.7	↓	↓	↓	↓	↓
5.1	↓	↓	↓	↓	↓
5.6	↓	↓	↓	↓	↓
6.2	B,C,D	↓	↓	↓	↓
6.8	B,C,J,K,M	↓	↓	↓	↓

Cap (pF)	Available Tolerance	Size 0402	0603	0805	1210
7.5	B,C,J,K,M	50V	200V	200V	200V
8.2	↓	↓	↓	↓	↓
9.1	B,C,J,K,M	↓	↓	↓	↓
10	F,G,J,K,M	↓	↓	↓	↓
11	↓	↓	↓	↓	↓
12	↓	↓	↓	↓	↓
13	↓	↓	↓	↓	↓
15	↓	↓	↓	↓	↓
18	↓	↓	200V	↓	↓
20	↓	↓	100V	↓	↓
22	↓	↓	↓	↓	↓
24	↓	↓	↓	↓	↓
27	↓	↓	↓	↓	↓
30	↓	50V	↓	↓	↓
33	↓	N/A	↓	↓	↓
36	↓	↓	↓	↓	↓
39	↓	↓	↓	↓	↓
43	↓	↓	↓	↓	↓
47	↓	↓	↓	↓	↓
51	↓	↓	↓	↓	↓
56	↓	↓	↓	↓	↓
68	↓	↓	↓	↓	↓
75	↓	↓	↓	↓	↓
82	↓	↓	↓	↓	↓
91	↓	↓	↓	↓	↓

Cap (pF)	Available Tolerance	Size 0402	0603	0805	1210
100	F,G,J,K,M	N/A	100V	200V	200V
110	↓	↓	50V	↓	↓
120	↓	↓	↓	↓	↓
130	↓	↓	50V	200V	↓
140	↓	↓	N/A	100V	↓
150	↓	↓	↓	↓	↓
160	↓	↓	↓	100V	↓
180	↓	↓	↓	N/A	↓
200	↓	↓	↓	↓	↓
220	↓	↓	↓	↓	↓
270	↓	↓	↓	↓	↓
300	↓	↓	↓	↓	↓
330	↓	↓	↓	↓	↓
360	↓	↓	↓	↓	↓
390	↓	↓	↓	↓	↓
430	↓	↓	↓	↓	200V
470	↓	↓	↓	↓	100V
510	↓	↓	↓	↓	↓
560	↓	↓	↓	↓	↓
620	↓	↓	↓	↓	↓
680	↓	↓	↓	↓	↓
750	↓	↓	↓	↓	↓
820	↓	↓	↓	↓	↓
910	↓	↓	↓	↓	↓
1000	F,G,J,K,M	↓	↓	↓	↓

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Please select correct termination style.

U Series RF Capacitors (Tin/Lead)

C0G (NP0) Ceramic Low ESR Capacitors

"U" Series capacitors are C0G (NP0) chip capacitors specially designed for "Ultra" low ESR for applications in the communications market. Max ESR and effective capacitance are met on each value producing lot to lot uniformity. Sizes available are EIA chip sizes 0402, 0603, 0805, and 1210.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/useries.pdf

HOW TO ORDER

LD05	1	U	100	J	A	B	2	A
Case Size	**Voltage Code**	**Dielectric = Ultra Low ESR**	**Capacitance**	**Capacitance Tolerance Code**	**Failure Rate Code**	**Termination**	**Packaging Code**	**Special Code**
LD02 = 0402 LD03 = 0603 LD05 = 0805 LD10 = 1210	5 = 50V 1 = 100V 2 = 200V		EIA Capacitance Code in pF. First two digits = significant figures or "R" for decimal place. Third digit = number of zeros or after "R" significant figures.	B = ±0.1pF C = ±0.25pF D = ±0.5pF F = ±1% G = ±2% J = ±5% K = ±10% M = ±20%	A = Not Applicable	B = 5% min lead	2 = 7" Reel 4 = 13" Reel 9 = Bulk	A = Standard

Cap (pF)	Available Tolerance	Size LD02	LD03	LD05	LD10
0.2	B,C	50V	N/A	N/A	N/A
0.3	↓	↓	↓	↓	↓
0.4	↓	↓	↓	↓	↓
0.5	B,C	↓	↓	↓	↓
0.6	B,C,D	↓	↓	↓	↓
0.7	↓	↓	↓	↓	↓
0.8	↓	↓	↓	↓	↓
0.9	B,C,D	↓	↓	↓	↓

Cap (pF)	Available Tolerance	Size LD02	LD03	LD05	LD10
1.0	B,C,D	50V	200V	200V	200V
1.1	↓	↓	↓	↓	↓
1.2	↓	↓	↓	↓	↓
1.3	↓	↓	↓	↓	↓
1.4	↓	↓	↓	↓	↓
1.5	↓	↓	↓	↓	↓
1.6	↓	↓	↓	↓	↓
1.7	↓	↓	↓	↓	↓
1.8	↓	↓	↓	↓	↓
1.9	↓	↓	↓	↓	↓
2.0	↓	↓	↓	↓	↓
2.1	↓	↓	↓	↓	↓
2.2	↓	↓	↓	↓	↓
2.4	↓	↓	↓	↓	↓
2.7	↓	↓	↓	↓	↓
3.0	↓	↓	↓	↓	↓
3.3	↓	↓	↓	↓	↓
3.6	↓	↓	↓	↓	↓
3.9	↓	↓	↓	↓	↓
4.3	↓	↓	↓	↓	↓
4.7	↓	↓	↓	↓	↓
5.1	↓	↓	↓	↓	↓
5.6	↓	↓	↓	↓	↓
6.2	B,C,D	↓	↓	↓	↓
6.8	B,C,J,K,M	↓	↓	↓	↓

Cap (pF)	Available Tolerance	Size LD02	LD03	LD05	LD10
7.5	B,C,J,K,M	50V	200V	200V	200V
8.2	↓	↓	↓	↓	↓
9.1	B,C,J,K,M	↓	↓	↓	↓
10	F,G,J,K,M	↓	↓	↓	↓
11	↓	↓	↓	↓	↓
12	↓	↓	↓	↓	↓
13	↓	↓	↓	↓	↓
15	↓	↓	↓	↓	↓
18	↓	↓	200V	↓	↓
20	↓	↓	100V	↓	↓
22	↓	↓	↓	↓	↓
24	↓	↓	↓	↓	↓
27	↓	↓	↓	↓	↓
30	↓	50V	↓	↓	↓
33	↓	N/A	↓	↓	↓
36	↓	↓	↓	↓	↓
39	↓	↓	↓	↓	↓
43	↓	↓	↓	↓	↓
47	↓	↓	↓	↓	↓
51	↓	↓	↓	↓	↓
56	↓	↓	↓	↓	↓
68	↓	↓	↓	↓	↓
75	↓	↓	↓	↓	↓
82	↓	↓	↓	↓	↓
91	↓	↓	↓	↓	↓

Cap (pF)	Available Tolerance	Size LD02	LD03	LD05	LD10
100	F,G,J,K,M	N/A	100V	200V	200V
110	↓	↓	50V	↓	↓
120	↓	↓	50V	↓	↓
130	↓	↓	N/A	200V	↓
140	↓	↓	↓	100V	↓
150	↓	↓	↓	↓	↓
160	↓	↓	↓	100V	↓
180	↓	↓	↓	N/A	↓
200	↓	↓	↓	↓	↓
220	↓	↓	↓	↓	↓
270	↓	↓	↓	↓	↓
300	↓	↓	↓	↓	↓
330	↓	↓	↓	↓	↓
360	↓	↓	↓	↓	↓
390	↓	↓	↓	↓	200V
430	↓	↓	↓	↓	100V
470	↓	↓	↓	↓	↓
510	↓	↓	↓	↓	↓
560	↓	↓	↓	↓	↓
620	↓	↓	↓	↓	↓
680	↓	↓	↓	↓	↓
750	↓	↓	↓	↓	↓
820	↓	↓	↓	↓	↓
910	↓	↓	↓	↓	↓
1000	F,G,J,K,M	↓	↓	↓	↓

Not RoHS Compliant

HQ Series, High Q, High RF Power Chips

For 600V to 7200V Application

Hi-Q®, High RF Power, Surface Mount and Leaded MLC Capacitors from AVX Corporation are characterized with ultra-low ESR and dissipation factor at high frequencies. They are designed to handle high power and high voltage levels for applications in RF power amplifiers, inductive heating, high magnetic field environments (MRI coils), medical and industrial electronics.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/hi-q.pdf

HOW TO ORDER

HQCC	A	A	271	J	A	T	1	A
AVX Style HQCC HQCE	**Voltage** C = 600V A = 1000V S = 1500V G = 2000V W = 2500V H = 3000V J = 4000V K = 5000V M = 7200V	**Temperature Coefficient** C0G = A	**Capacitance Code** (2 significant digits + no. of zeros) Examples: 4.7 pF = 4R7 10 pF = 100 100 pF = 101 1,000 pF = 102	**Capacitance Tolerance** C = ±0.25pF (<13pF) D = ±0.50pF (<25pF) F = ±1% (≥25pF) G = ±2% (≥13pF) J = ±5% K = ±10% M = ±20%	**Test Level** A = Standard	**Termination*** 1 = Pd/Ag T = Plated Ni and Sn (RoHS Compliant) J = 5% Min Pb M = Microstip (non-mag) A = Axial (non-mag)	**Packaging** 1 = 7" Reel 3 = 13" Reel 9 = Bulk	**Special Code** A = Standard

DIELECTRIC PERFORMANCE CHARACTERISTICS

Capacitance Range	3.3pF to 6,800pF (25°C, 1.0 ±0.2 Vrms at 1kHz, for ≤ 1000 pF use 1MHz)
Capacitance Tolerances	±0.25pF, ±0.50pF, ±1%, ±2%, ±5%, ±10%, ±20%
Dissipation Factor 25°C	0.1% Max (+25°C, 1.0 ±0.2 Vrms at 1kHz, for ≤ 1000 pF use 1MHz)
Operating Temperature Range	-55°C to +125°C
Temperature Characteristic	C0G: 0 ± 30 ppm/°C (-55°C to +125°C)
Voltage Ratings	600, 1000, 1500, 2000, 2500, 3000, 4000, 5000, 7200VDC
Insulation Resistance	100K MΩ min. @ +25°C and 500VDC 10K MΩ min. @ +125°C and 500VDC
Dielectric Strength	120% of rated WVDC

HIGH VOLTAGE CAPACITANCE VALUES (pF)

Style	600 WDC min./max.	1000 WVDC min./max.	1500 WVDC min./max.	2000 WVDC min./max.	2500 WVDC min./max.	3000 WVDC min./max.	4000 WVDC min./max.	5000 WVDC min./max.	7200 WVDC min./max.
HQCC	2,200 - 2,700	1,500 - 1,800	820 - 1,200	470 - 680	330 - 390	4.7 - 270	3.3 - 6.8		
HQCE	3.3 - 6,800	3.3 - 4,700	3.3 - 2,700	3.3 - 1,800	3.3 - 1,000	3.3 - 680	3.3 - 390	3.3 - 180	3.3 - 100

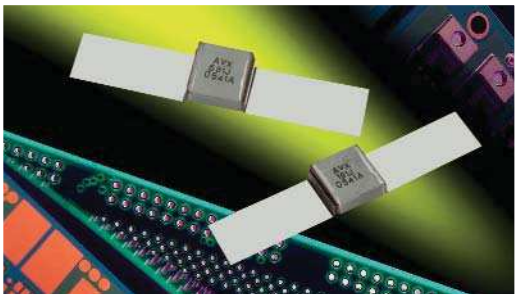
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Please select correct termination style.

HQL Series, High Q, High RF Power

Ribbon Leaded MLC Capacitors



Hi-Q®, High RF Power, Ribbon Leaded MLC Capacitors from AVX Corporation are characterized with ultra-low ESR and dissipation factor at high frequencies. The HQL-style parts are constructed using non-magnetic materials. They are designed to handle high power and high voltage levels for applications in RF power amplifiers, inductive heating, high magnetic field environments (MRI coils), medical and industrial electronics.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/hi-ql.pdf

HOW TO ORDER

HQLC	A	A	271	J	A	A
AVX Style HQLC HQLE	**Voltage** C = 600V/630 A = 1000V S = 1500V G = 2000V W = 2500V H = 3000V J = 4000V K = 5000V M = 7200V	**Temperature Coefficient** C0G = A	**Capacitance Code** (2 significant digits + no. of zeros) Examples: 4.7 pF = 4R7 10 pF = 100 100 pF = 101 1,000 pF = 102	**Capacitance Tolerance** C = ±0.25pF (<13pF) D = ±0.50pF (<25pF) F = ±1% (≥25pF) G = ±2% (≥13pF) J = ±5% K = ±10% M = ±20%	**Test Level** A = Standard	**Lead Style** A = Axial Ribbon M = Microstrip

DIELECTRIC PERFORMANCE CHARACTERISTICS

Capacitance Range	3.3pF to 6,800pF (25°C, 1.0 ±0.2 Vrms at 1kHz, for ≤ 1000 pF use 1MHz)
Capacitance Tolerances	±0.25pF, ±0.50pF, ±1%, ±2%, ±5%, ±10%, ±20%
Dissipation Factor 25°C	0.1% Max (+25°C, 1.0 ±0.2 Vrms at 1kHz, for ≤ 1000 pF use 1MHz)
Operating Temperature Range	-55°C to +125°C
Temperature Characteristic	C0G: 0 ± 30 ppm/°C (-55°C to +125°C)
Voltage Ratings	600, 1000, 1500, 2000, 2500, 3000, 4000, 5000, 7200VDC
Insulation Resistance	100K MΩ min. @ +25°C and 500VDC 10K MΩ min. @ +125°C and 500VDC
Dielectric Strength	120% of rated WVDC

HIGH VOLTAGE CAPACITANCE VALUES (pF)

Style	600 WDC min./max.	1000 WVDC min./max.	1500 WVDC min./max.	2000 WVDC min./max.	2500 WVDC min./max.	3000 WVDC min./max.	4000 WVDC min./max.	5000 WVDC min./max.	7200 WVDC min./max.
HQLC	2,200 - 2,700	1,500 - 1,800	820 - 1,200	470 - 680	330 - 390	4.7 - 270	3.3 - 6.8		
HQLE	3.3 - 6,800	3.3 - 4,700	3.3 - 2,700	3.3 - 1,800	3.3 - 1,000	3.3 - 680	3.3 - 390	3.3 - 180	3.3 - 100

RoHS COMPLIANT

GX Series
Ultra Broad Band Capacitor

ADVANTAGES

- Ultra-Broadband performance
- Ultra-Low Insertion Loss
- X5R & X7S Characteristics
- Low Return Loss

APPLICATIONS

- Semi-Conductor Data Communications Customers
- Receiver Optical Sub-Assemblies
- Transimpedance Amplifier Customers
- Test Equipment Manufactures

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/gx.pdf

The GX Series was developed specifically to address DC Blocking issues from ~16KHz (-3dB roll-off) to 40GHz. Most applications will experience resonance-free insertion loss of <0.5dB thru at least 40GHz. Insertion loss at higher frequencies is in part dependent on installation parameters. Using AVX's patented precision thin film termination process, the part is designed to be completely orientation insensitive with a standard EIA 0402 footprint to minimize board space requirements. Both Ni/Sn and Ni/Au terminations are available to cover a wide range of attachment processes. All GX parts are RoHS compliant.

Au terminated units are wire bondable. Users may, therefore, find these devices equally useful in bypass applications when wire bonding is a necessary part of the manufacturing process.

More information can be obtained by contacting the factory or your local AVX representative.

HOW TO ORDER

GX	02	YD	104	K	A	T	2
Style	**Case Size** 02 = 0402	**Voltage/Dielectric** YD = 16Vdc/X5R ZZ = 10Vdc/X7S	**Capacitance** 104 = 0.1µF EIA Cap Code in pF	**Tolerance** K = ±10% M = ±20%	**Failure Rate** A = Std	**Termination** T = Ni-Sn (Standard) 7 = Ni-Au	**Packaging** 2 = 4000 pcs, 7" T&R 2-500 = 500 pcs, 7" T&R 2-1000 = 1000 pcs, 7" T&R

ELECTRICAL SPECIFICATIONS

Capacitance	0.1 µF ± 10%, 0.1 µF ± 20%
Voltage Rating/Operating Temperature	16 VDC @ 85°C; 10 VDC @ 125°C
Dielectric Withstanding Voltage	250% WVDC
Insulation Resistance	10,000 Meg Ohms @ 25°C; 1,000 Meg Ohms @ 125°C
Temperature Coefficient	16 VDC X5R (± 15%); 10 VDC X7S (± 22%)

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Film Chip Capacitors

CB-PET Series High Temperature PET Dielectric

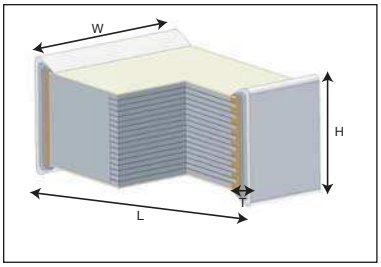
Film chip capacitor using a naked and stacked construction with metallized High Temperature PET (polyethylene terephtalate).

- Use of high temperature dielectric films makes these capacitors suitable for IR or vapor phase reflow processes. This chip is built without specific encapsulation.
- The intrinsic elasticity of the dielectric film allows an excellent compatibility of the capacitor with all types of material for printed circuit boards.
- The self-healing property of film technology results in a safe open failure mode and better overall reliability.
- Excellent thermal shock resistance
- Low dissipation factor, ESR & ESL
- No piezoelectric effect
- Available in tape and reel suitable for automatic placement
- Non-polar construction

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cb-petht.pdf

HOW TO ORDER

CB	04	2	G	0104	K	--
Type	**Size**	**Dielectric**	**Voltage**	**Capacitance EIA Code**	**Tolerance**	**Suffix Packaging**
SMD Lead Free	04 = 2220 05 = 2824 16 = 4030 17 = 5040 18 = 6054	2 = PET-HT	D = 50/63V E = 100V G = 250V I = 400V K = 630V	1st digit: 0 2nd & 3rd digit: the 2nd significant figures of the capacitance value 4th digit: the number of zeros to be added to the capacitance value	K = 10% J = 5%	-- = Bulk BC = tape & reel diameter: 330mm



millimeters (inches)

Size Code	Equivalent Size	Length (L)	Width (W)
04	2220	5.8±0.50 (0.228±0.020)	5.0±0.50 (0.197±0.020)
05	2824	7.2±0.50 (0.283±0.020)	6.1±0.50 (0.240±0.020)
16	4030	10.5±0.60 (0.413±0.024)	7.6±0.80 (0.299±0.031)
17	5040	12.8±0.60 (0.504±0.024)	10.2±0.80 (0.402±0.031)
18	6054	15.3±0.60 (0.602±0.024)	13.7±0.80 (0.539±0.031)

VOLTAGE (Vdc / Vac)											
Capacitance		**63 Vdc / 40 Vac**		**100 Vdc / 63 Vac**		**250 Vdc - 160 Vac**		**400 Vdc / 200 Vac**		**630 Vdc / 250 Vac**	
Value	Cap Code	Size Code	H max	Size Code	H max	Size Code	H max	Size Code	H max	Size Code	H max
0.010µF	0103							2220	2.4	2220	2.8
0.015	0153							2220	2.4	2220	4.0
0.022	0223							2220	3.0	2824	3.4
0.033	0333							2220	4.2	2824	5.0
0.047	0473					2220	3.0	2824	4.5	4030	3.6
0.068	0683					2220	4.1	4030	3.6	4030	5.2
0.100	0104					2220	4.55	4030	4.7	5040	5.0
0.150	0154					2824	4.3	5040	4.6	5040	6.9
0.220	0224			2220	3.3	2824	4.9	6054	4.0	6054	5.8
0.330	0334	2220	3.3	2220	4.0	4030	5.6	6054	5.6		
0.470	0474	2220	3.5	2824	4.4	4030	6.15				
0.680	0684	2220	4.0	2824	5.2	5040	6.5				
1.0µF	0105	2220	4.0	2824	5.7	6054	6.0				
1.5	0155	2824	5.4	4030	6.1	6054	7.0				
2.2	0225	4030	5.7	5040	5.5						
3.3	0335	6054	5.5	6054	5.2						
4.7	0475	6054	4.9	6054	7.1						

For other values : upon request

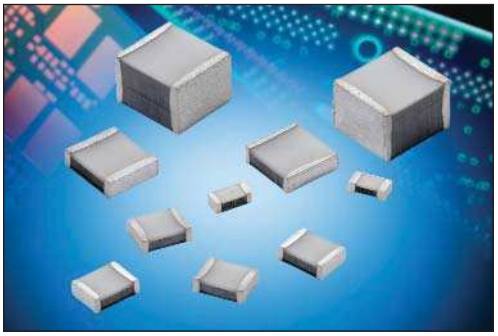
ISO/TS 16949 TS 95138 REGISTERED

LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Film Chip Capacitors

CB-PEN Series PEN Dielectric



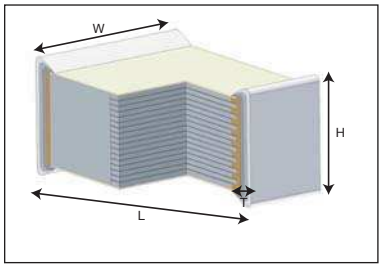
Film chip capacitor using a naked and stacked construction with metallized PEN (polyethylene naphtalate).

- Use of high temperature dielectric films makes these capacitors suitable for IR or vapor phase reflow processes. This chip is built without specific encapsulation.
- The intrinsic elasticity of the dielectric film allows an excellent compatibility of the capacitor with all types of material for printed circuit boards.
- The self-healing property of film technology results in a safe open circuit failure mode and better overall reliability.
- Excellent thermal shock resistance
- Low dissipation factor, ESR & ESL
- No piezoelectric effect
- Available in tape and reel suitable for automatic placement
- Non-polar construction.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cb-pen.pdf

HOW TO ORDER

CB	01	7	D	0103	J	BA
Type	**Size**	**Dielectric**	**Voltage**	**Capacitance EIA Code**	**Tolerance**	**Suffix Packaging**
SMD Lead Free	01 = 1206 02 = 1210 03 = 1812 04 = 2220 05 = 2824 16 = 4030 17 = 5040 18 = 6054	7 = PEN	C = 25V D = 50/63V E = 100V G = 250V I = 400V K = 630V	1st digit: 0 2nd & 3rd digit: the 2nd significant figures of the capacitance value 4th digit: the number of zeros to be added to the capacitance value	K = 10% J = 5%	-- = Bulk BA = tape & reel diameter: 180mm BC = tape & reel diameter: 330mm



millimeters (inches)

Size Code	Equivalent Size	Length (L)	Width (W)
01	1206	3.3±0.30 (0.130±0.012)	1.6±0.30 (0.063±0.012)
02	1210	3.3±0.30 (0.130±0.012)	2.5±0.30 (0.098±0.012)
03	1812	4.7±0.50 (0.185±0.020)	3.2±0.50 (0.126±0.020)
04	2220	5.8±0.50 (0.228±0.020)	5.0±0.50 (0.197±0.020)
05	2824	7.2±0.50 (0.283±0.020)	6.1±0.50 (0.240±0.020)
16	4030	10.5±0.60 (0.413±0.024)	7.6±0.80 (0.299±0.031)
17	5040	12.8±0.60 (0.504±0.024)	10.2±0.80 (0.402±0.031)
18	6054	15.3±0.60 (0.602±0.024)	13.7±0.80 (0.539±0.031)

VOLTAGE (Vdc / Vac)															
Capacitance		25 Vdc / 16 Vac		50-63 Vdc / 40 Vac				100 Vdc - 63 Vac		250 Vdc / 160 Vac		400 Vdc / 200 Vac		630 Vdc / 250 Vac	
Value	Cap Code	Size Code	H max	Size Code		H max		Size Code	H max	Size Code	H max	Size Code	H max	Size Code	H max
0.001µF	0102	1206	1.15	1206	1812	1.15	1.9	1206	1.15	1812	2.0	1812	2.0	1812	2.0
0.0015	0152	1206	1.15	1206	1812	1.15	1.9	1206	1.15	1812	2.0	1812	2.0	1812	2.0
0.0022	0222	1206	1.15	1206	1812	1.15	1.9	1206	1.15	1812	2.0	1812	2.0	1812	2.0
0.0033	0332	1206	1.15	1206	1812	1.15	1.9	1206	1.15	1812	2.0	1812	2.0	1812	2.0
0.0047	0472	1206	1.15	1206	1812	1.15	2.0	1206	1.15	1812	2.0	1812	2.0	1812	2.5
0.0068	0682	1206	1.15	1206	1812	1.15	2.0	1206	1.15	1812	2.0	1812	2.0	2220	2.0
0.010	0103	1206	1.15	1206	1812	1.15	2.0	1206	1.15	1812	2.0	2220	1.9	2220	2.4
0.015	0153	1206	1.15	1206	1812	1.15	2.4	1210	1.8	1812	2.4	2220	2.2	2220	3.4
0.022	0223	1206	1.15	1206	1812	1.15	2.0	1210	1.8	1812	2.9	2220	2.8	2824	3.4
0.033	0333	1210	1.8	1210	1812	1.8	2.0	1812	2.0	2220	2.2	2220	3.9	2824	4.8
0.047	0473	1210	1.8	1210	1812	1.8	2.7	1812	2.6	2220	2.9	2824	3.2	4030	4.0
0.068	0683	1210	1.8	1210	1812	1.8	2.0	1812	2.0	2220	4.0	2824	4.4	4030	5.5
0.100	0104	1210	2.3	1210	1812	2.3	2.8	1812	3.0	2220	4.5	4030	5.3	5040	5.2
0.150	0154			1812		2.0		2220	3.3	2824	4.7	4030	6.0	5040**	6.9
0.220	0224			1812		3.0		2220	4.0	2824	5.7	5040	5.0	6054	6.0
0.330	0334			2220		4.0		2220	4.2	4030	6.1	6054	5.9		
0.470	0474			2220		4.0		2824*	4.5	5040	5.5	6054	6.5		
0.680	0684			2220		3.9		2824*	4.5	6054	4.6				
1	0105			2824*		4.7		4030	6.0	6054	6.4				
1.5	0155			2824*		4.7		5040	5.5						
2.2	0225			4030		6.1		5040	6.9						
3.3	0335			6054		5.3		6054	7.1						
4.7	0475			6054		7.2									

For other values: upon request
*Special length: 7.3 +0.7/-0.3 (0.287 +0.028/-0.012)
**Only available in tolerance 10%

50V
63V

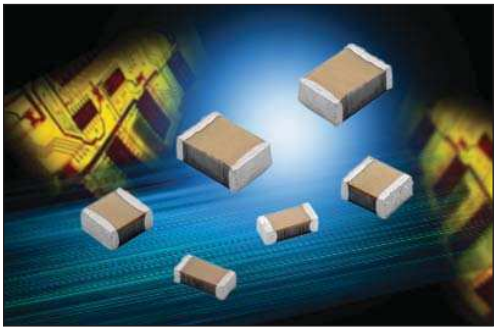
ISO/TS 16949 TS 95138

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Film Chip Capacitors

CB-PPS Series PPS Dielectric



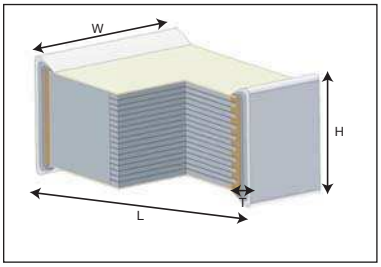
Film chip capacitor using a naked and stacked construction with metallized PPS (polyphenylene sulfide film).

- Applicable for both flow and reflow soldering
- Very constant Capacitance value with temperature
- Low dielectric absorption
- The intrinsic elasticity of the dielectric film provides an excellent compatibility of the capacitor with all types of material for printed circuit boards
- Excellent thermal shock resistance
- Low dissipation factor, ESR and ESL
- No piezoelectric effect
- Available in tape and reel suitable for automatic placement
- Non-polar construction.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cb-pps.pdf

HOW TO ORDER

CB	02	8	B	0104	G	--
Type SMD Lead Free	**Size** 01 = 1206 02 = 1210 03 = 1812	**Dielectric** 8 = PPS	**Voltage** B = 16V D = 50V	**Capacitance EIA Code** 1st digit: 0 2nd & 3rd digit: the 2nd significant figures of the capacitance value 4th digit: the number of zeros to be added to the capacitance value	**Tolerance** G = 2% J = 5% K = 10%	**Suffix Packaging** -- = Bulk BA = tape & reel diameter: 180mm



millimeters (inches)

Size Code	Equivalent Size	Length (L)	Width (W)
01	1206	3.3±0.30 (0.130±0.012)	1.6±0.30 (0.063±0.012)
02	1210	3.3±0.30 (0.130±0.012)	2.5±0.30 (0.098±0.012)
03	1812	4.5±0.50 (0.177±0.020)	3.2±0.50 (0.126±0.020)

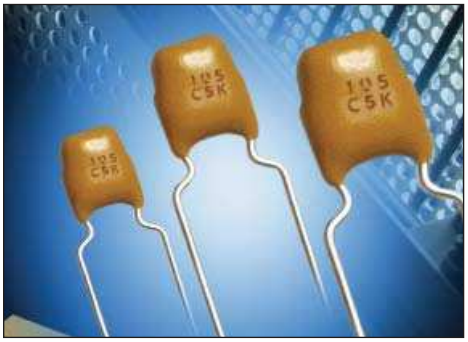
VOLTAGE (Vdc / Vac)					
Capacitance		**16 Vdc / 10 Vac**		**50 Vdc / 40 Vac**	
Value	Cap Code	Size Code	H max	Size Code	H max
0.001µF	0102	1206	1.15	1206	1.15
0.0015	0152	1206	1.15	1206	1.15
0.0022	0222	1206	1.15	1206	1.15
0.0033	0332	1206	1.15	1206	1.15
0.0047	0472	1206	1.15	1206	1.15
0.0068	0682	1206	1.15	1206	1.15
0.010	0103	1206	1.15	1206	1.15
0.015	0153	1206	1.15	1210	1.8
0.022	0223	1206	1.15	1210	1.8
0.033	0333	1206	1.15	1210	2.1
0.047	0473	1210	1.8	1812	2.4
0.068	0683	1210	1.8	1812	2.4
0.100	0104	1210	1.8	1812	2.4
0.150	0154	1812	2.3		
0.180	0184	1812	2.5		

For other values : upon request

LEAD-FREE COMPATIBLE COMPONENT

SR Series

SkyCap® Radial Conformal Coated NP0 Dielectric



AVX SR Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 500V, with lower voltages available as well.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

SR21	5	A	104	F	A	R
AVX Style	**Voltage**	**Temperature Coefficient**	**Capacitance**	**Capacitance Tolerance**	**Failure Rate**	**Leads**
SR15 SR20 SR21 SR22 SR27 SR30 SR40 SR50	5 = 50V 1 = 100V 2 = 200V	A = C0G (NP0)	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.)	C = ±.25pF D = ±.5pF F = ±1% (>50pF only) G = ±2% (>25pF only) J = ±5% K = ±10%	A = Not Applicable	R = RoHS

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

C0G (NP0) Dielectric

AVX Style		SR15			SR20			SR21			SR22			SR27			SR30		SR40		SR50	
AVX "Insertable"		SR07			SR29			SR59			N/A			N/A			SR65		SR75		N/A	
Cap. in.* pF	Industry Preferred Values in Blue	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50
1.0-9.9	SR151A1R0DAR																					
10	SR151A100KAR																					
15	SR_____A150KAR																					
22	SR_____A220KAR																					
33	SR_____A330KAR																					
39	SR_____A390KAR																					
47	SR_____A470KAR																					
68	SR_____A680KAR																					
100	SR151A101KAR																					
150	SR_____A151KAR																					
220	SR_____A221KAR																					
330	SR_____A331KAR																					
390	SR_____A391KAR																					
470	SR_____A471KAR																					
680	SR_____A681KAR																					
1000	SR211A102KAR																					
1500	SR_____A152KAR																					
2200	SR_____A222KAR																					
3900	SR_____A392KAR																					
4700	SR_____A472KAR																					
6800	SR_____A682KAR																					
8200	SR-----A822KAR																					
10,000	SR305A103KAR																					
15,000	SR-----A153KAR																					
22,000	SR_____A223KAR																					
33,000	SR_____A333KAR																					
39,000	SR_____A393KAR																					
47,000	SR_____A473KAR																					
68,000	SR_____A683KAR																					
100,000	SR_____A104KAR																					

For other styles, voltages, tolerances and lead lengths see Part No. Codes or contact factory.

***Other capacitance values available upon special request.**

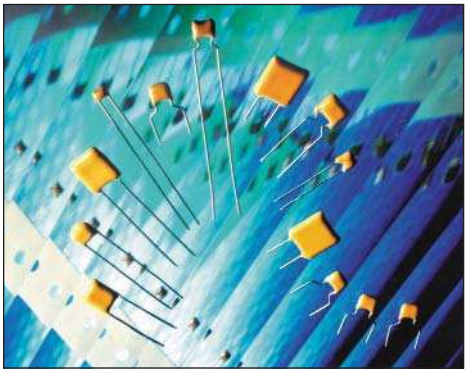
NOTE: Capacitance Ranges available for SR12 same as SR15
SR62 same as SR21
SR64 same as SR30
SR89 same as SR21

= Industry preferred values

= SR20 only

SR Series

SkyCap® Radial Conformal Coated X7R Dielectric



AVX SR Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 500V, with lower voltages available as well.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

SR21	5	C	104	M	A	R

AVX Style
SR15
SR20
SR21
SR22
SR27
SR30
SR40
SR50

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

Temperature Coefficient
C = X7R

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.)

Capacitance Tolerance
J = ±5%
K = ±10%
M = ±20%

Failure Rate
A = Not Applicable

Leads
R = RoHS

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

X7R Dielectric

AVX Style		SR15	SR20	SR21	SR22	SR27	SR30	SR40	SR50
AVX "Insertable"		SR07	SR29	SR59	N/A	N/A	SR65	SR75	N/A
Width (W)		3.81 (.150)	5.08 (.200)	5.08 (.200)	5.08 (.200)	6.604 (.260)	7.62 (.300)	10.16 (.400)	12.70 (.500)
Height (H)		3.81 (.150)	5.08 (.200)	5.08 (.200)	5.08 (.200)	6.35 (.250)	7.62 (.300)	10.16 (.400)	12.70 (.500)
Thickness (T)		2.54 (.100)	3.175 (.125)	3.175 (.125)	3.175 (.125)	4.06 (.160)	3.81 (.150)	3.81 (.150)	5.08 (.200)
Lead Spacing (L.S.)		2.54 (.100)	2.54 (.100)	5.08 (.200)	6.35 (.250)	7.62 (.300)	5.08 (.200)	5.08 (.200)	10.16 (.400)
Lead Diameter (L.D.)		.508 (.020)	.508 (.020)	.508 (.020)	.508 (.020)	.508 (.020)	.508 (.020)	.508 (.020)	.635 (.025)
Cap. in.* pF	Industry Preferred Values in Blue	WVDC 200 100 50	WVDC 200 100 50	WVDC 200 100 50	WVDC 100 50	WVDC 100 50	WVDC 200 100 50	WVDC 200 100 50	WVDC 200 100 50
470	SR_____C471KAR								
1000	SR155C102KAR								
1500	SR_____C152KAR								
2200	SR_____C222KAR								
3300	SR_____C332KAR								
4700	SR_____C472KAR								
6800	SR_____C682KAR								
10,000	SR215C103KAR								
15,000	SR_____C153KAR								
22,000	SR_____C223KAR								
33,000	SR_____C333KAR								
47,000	SR_____C473KAR								
68,000	SR_____C683KAR								
100,000	SR215C104KAR								
150,000	SR_____C154KAR								
220,000	SR215C224KAR								
330,000	SR_____C334KAR								
390,000	SR_____C394KAR								
470,000	SR305C474KAR								
1.0 µF	SR305C105KAR								
2.2 µF	SR405C225KAR								
2.7 µF	SR505C275KAR								
4.7 µF	SR505C475KAR								

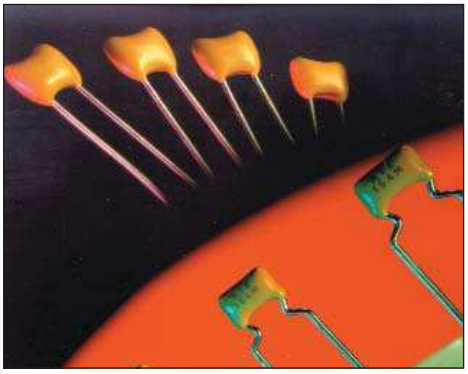
For other styles, voltages, tolerances and lead lengths see Part No. Codes or contact factory. ***Other capacitance values available upon special request.**

= Industry preferred values
= SR20 only
= Extended range
= Extended range, SR20 only
= Extended range with 0.150" thickness maximum

NOTE: Capacitance Ranges available for SR12 same as SR15
SR62 same as SR21
SR64 same as SR30
SR89 same as SR21

SR Series

SkyCap® Radial Conformal Coated Z5U Dielectric



AVX SR Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 500V, with lower voltages available as well.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

SR21	5	E	104	M	A	R
AVX Style	**Voltage**	**Temperature Coefficient**	**Capacitance**	**Capacitance Tolerance**	**Failure Rate**	**Leads**
SR15 SR20 SR21 SR22 SR27 SR30 SR40 SR50	5 = 50V 1 = 100V	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.)	M = ±20% Z = +80% -20%	A = Not Applicable	R = RoHS

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Z5U Dielectric

AVX Style		SR15		SR20		SR21		SR22		SR27		SR30		SR40		SR50	
AVX "Insertable"		SR07		SR29		SR59		N/A		N/A		SR65		SR75		N/A	
Cap. in.* pF	Industry Preferred Values in Blue	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50
10,000 47,000 100,000	SR155E103ZAR SR_____E473ZAR SR215E104ZAR																
150,000 220,000 330,000	SR_____E154ZAR SR215E224ZAR SR215E334ZAR																
470,000 680,000	SR215E474ZAR SR_____E684ZAR																
1.0 µF 1.5 µF 2.2 µF	SR_____105ZAR SR30E155ZAR SR30E225ZAR																
3.3 µF 4.7 µF	SR30E335ZAR SR30E475ZAR																

For other styles, voltages, tolerances and lead lengths see Part No. Codes or contact factory.

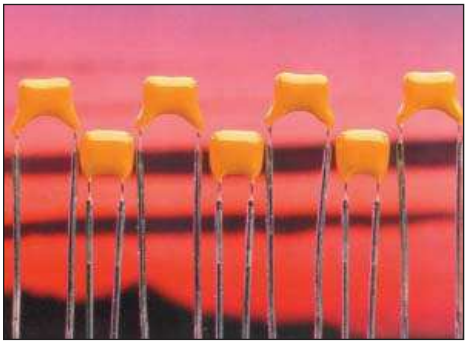
***Other capacitance values available upon special request.**

= Industry preferred values

= SR20 only

SL Series

SkyCap® Radial Conformal Coated NP0 Dielectric



AVX SL Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 500V, with lower voltages available as well.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

SL21	5	A	104	F	A	B
AVX Style	**Voltage**	**Temperature Coefficient**	**Capacitance**	**Capacitance Tolerance**	**Failure Rate**	**Leads**
SL15 SL20 SL21 SL22 SL27 SL30 SL40 SL50	5 = 50V 1 = 100V 2 = 200V	A = C0G (NP0)	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.)	C = ±.25pF D = ±.5pF F = ±1% (>50pF only) G = ±2% (>25pF only) J = ±5% K = ±10%	A = Not Applicable	B = Tin/Lead

Not RoHS Compliant

C0G (NP0) Dielectric

AVX Style		SL15			SL20			SL21			SL22			SL27			SL30		SL40		SL50	
AVX "Insertable"		SL07			SL29			SL59			N/A			N/A			SL65		SL75		N/A	
Cap. in.* pF	Industry Preferred Values in Blue	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50
1.0-9.9	SL151A1R0DAB																					
10	SL151A100KAB																					
15	SL_____A150KAB																					
22	SL_____A220KAB																					
33	SL_____A330KAB																					
39	SL_____A390KAB																					
47	SL_____A470KAB																					
68	SL_____A680KAB																					
100	SL151A101KAB																					
150	SL_____A151KAB																					
220	SL_____A221KAB																					
330	SL_____A331KAB																					
390	SL_____A391KAB																					
470	SL_____A471KAB																					
680	SL_____A681KAB																					
1000	SL211A102KAB																					
1500	SL_____A152KAB																					
2200	SL_____A222KAB																					
3900	SL_____A392KAB																					
4700	SL_____A472KAB																					
6800	SL_____A682KAB																					
8200	SL-----A822KAB																					
10,000	SL305A103KAB																					
15,000	SL-----A153KAB																					
22,000	SL_____A223KAB																					
33,000	SL_____A333KAB																					
39,000	SL_____A393KAB																					
47,000	SL_____A473KAB																					
68,000	SL_____A683KAB																					
100,000	SL_____A104KAB																					

For other styles, voltages, tolerances and lead lengths see Part No. Codes or contact factory.

***Other capacitance values available upon special request.**

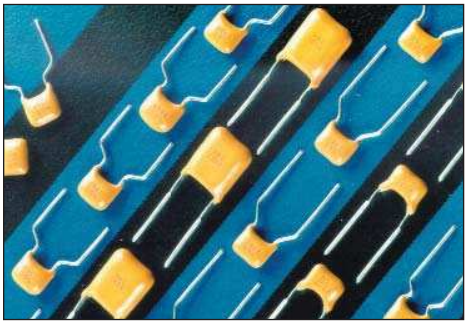
NOTE: Capacitance Ranges available for SL12 same as SL15
SL62 same as SL21
SL64 same as SL30
SL89 same as SL21

= Industry preferred values

= SL20 only

SL Series

SkyCap® Radial Conformal Coated X7R Dielectric



AVX SL Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 500V, with lower voltages available as well.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

SL21	5	C	104	M	A	B
AVX Style	**Voltage**	**Temperature Coefficient**	**Capacitance**	**Capacitance Tolerance**	**Failure Rate**	**Leads**
SL15 SL20 SL21 SL22 SL27 SL30 SL40 SL50	5 = 50V 1 = 100V 2 = 200V	C = X7R	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.)	J = ±5% K = ±10% M = ±20%	A = Not Applicable	B = Tin/Lead

Not RoHS Compliant

X7R Dielectric

AVX Style		SL15			SL20			SL21			SL22		SL27		SL30			SL40			SL50		
AVX "Insertable"		SL07			SL29			SL59			N/A		N/A		SL65			SL75			N/A		
Width (W)		3.81 (.150)			5.08 (.200)			5.08 (.200)			5.08 (.200)		6.604 (.260)		7.62 (.300)			10.16 (.400)			12.70 (.500)		
Height (H)		3.81 (.150)			5.08 (.200)			5.08 (.200)			5.08 (.200)		6.35 (.250)		7.62 (.300)			10.16 (.400)			12.70 (.500)		
Thickness (T)		2.54 (.100)			3.175 (.125)			3.175 (.125)			3.175 (.125)		4.06 (.160)		3.81 (.150)			3.81 (.150)			5.08 (.200)		
Lead Spacing (L.S.)		2.54 (.100)			2.54 (.100)			5.08 (.200)			6.35 (.250)		7.62 (.300)		5.08 (.200)			5.08 (.200)			10.16 (.400)		
Lead Diameter (L.D.)		.508 (.020)			.508 (.020)			.508 (.020)			.508 (.020)		.508 (.020)		.508 (.020)			.508 (.020)			.635 (.025)		
Cap. in.* pF	Industry Preferred Values in Blue	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 100	50	WVDC 100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50
470	SL_____C471KAB																						
1000	SL155C102KAB																						
1500	SL_____C152KAB																						
2200	SL_____C222KAB																						
3300	SL_____C332KAB																						
4700	SL_____C472KAB																						
6800	SL_____C682KAB																						
10,000	SL215C103KAB																						
15,000	SL_____C153KAB																						
22,000	SL_____C223KAB																						
33,000	SL_____C333KAB																						
47,000	SL_____C473KAB																						
68,000	SL_____C683KAB																						
100,000	SL215C104KAB																						
150,000	SL_____C154KAB																						
220,000	SL215C224KAB																						
330,000	SL_____C334KAB																						
390,000	SL_____C394KAB																						
470,000	SL305C474KAB																						
1.0 µF	SL305C105KAB																						
2.2 µF	SL405C225KAB																						
2.7 µF	SL505C275KAB																						
4.7 µF	SL505C475KAB																						

For other styles, voltages, tolerances and lead lengths see Part No. Codes or contact factory.

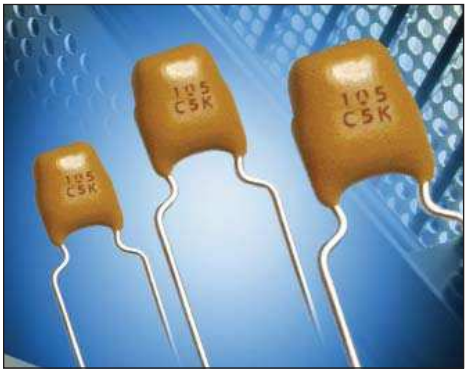
***Other capacitance values available upon special request.**

= Industry preferred values
= SL20 only
= Extended range
= Extended range, SL20 only
= Extended range with 0.150" thickness maximum

NOTE: Capacitance Ranges available for SL12 same as SL15
SL62 same as SL21
SL64 same as SL30
SL89 same as SL21

SL Series

SkyCap® Radial Conformal Coated Z5U Dielectric



AVX SL Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 500V, with lower voltages available as well.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

SL21	5	E	104	M	A	B
AVX Style	**Voltage**	**Temperature Coefficient**	**Capacitance**	**Capacitance Tolerance**	**Failure Rate**	**Leads**
SL15 SL20 SL21 SL22 SL27 SL30 SL40 SL50	5 = 50V 1 = 100V	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.)	M = ±20% Z = +80% -20%	A = Not Applicable	B = Tin/Lead

Not RoHS Compliant

Z5U Dielectric

AVX Style		SL15		SL20		SL21		SL22		SL27		SL30		SL40		SL50	
AVX "Insertable"		SL07		SL29		SL59		N/A		N/A		SL65		SL75		N/A	
Cap. in.* pF	Industry Preferred Values in Blue	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50
10,000 47,000 100,000	SL155E103ZAB SL_____E473ZAB SL215E104ZAB																
150,000 220,000 330,000	SL_____E154ZAB SL215E224ZAB SL215E334ZAB																
470,000 680,000	SL215E474ZAB SL_____E684ZAB																
1.0 µF 1.5 µF 2.2 µF	SL_____105ZAB SL30E155ZAB SL30E225ZAB																
3.3 µF 4.7 µF	SL30E335ZAB SL30E475ZAB																

For other styles, voltages, tolerances and lead lengths see Part No. Codes or contact factory.

***Other capacitance values available upon special request.**

= Industry preferred values

= SL20 only

AR Series (Automotive)

SkyCap® Radial Conformal Coated C0G (NP0) Dielectric

AVX AR Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and X8R dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 200V.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

AR21 — **AVX Style**

5 — **Voltage**
5 = 50V
1 = 100V
2 = 200V

A — **Temperature Coefficient**
A = C0G (NP0)

100 — **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.)

F — **Capacitance Tolerance**
C = ±.25pF
D = ±.5pF
F = ±1% (>50pF only)
G = ±2% (>25pF only)
J = ±5%
K = ±10%

4 — **Failure Rate**
4 = AEC-Q200

R — **Leads**
R = RoHS

C0G (NP0) Dielectric

EIA Characteristic — **Dimensions: Millimeters (Inches)**

AVX Style		AR15			AR20			AR21		
AVX "Insertable"		AR07			AR29			AR59		
Cap in pF	Industry Preferred Values in Blue	WVDC 200	WVDC 100	WVDC 50	WVDC 200	WVDC 100	WVDC 50	WVDC 200	WVDC 100	WVDC 50
1	AR-----A1R0D4R			■	■	■	■	■	■	■
10	AR_____A100K4R			■	■	■	■	■	■	■
15	AR-----A150K4R			■	■	■	■	■	■	■
22	AR-----A220K4R			■	■	■	■	■	■	■
33	AR-----A330K4R			■	■	■	■	■	■	■
39	AR-----A390K4R			■	■	■	■	■	■	■
47	AR-----A470K4R			■	■	■	■	■	■	■
68	AR-----A680K4R			■	■	■	■	■	■	■
100	AR_____A101K4R			■	■	■	■	■	■	■
150	AR-----A151K4R			■	■	■	■	■	■	■
220	AR-----A221K4R			■	■	■	■	■	■	■
330	AR-----A331K4R			■	■	■	■	■	■	■
390	AR-----A391K4R			■	■	■	■	■	■	■
470	AR-----A471K4R			■	■	■	■	■	■	■
680	AR-----A681K4R			■	■	■	■	■	■	■
1,000	AR_____A102K4R			■	■	■	■	■	■	■
1,500	AR-----A152K4R				■	■	■	■	■	■
2,200	AR-----A222K4R				■	■	■		■	■
3,900	AR-----A392K4R					■	■		■	■
4,700	AR_____A472K4R					■	■			■
6800	AR-----A682K4R						■			■
8200	AR-----A822K4R						■			■

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Notes:
"Insertable" make reference to alternative AVX style using the same range of capacitance available on the matrix.
For others Styles, voltages, tolerance and lead lengths see Skycap catalog or contact factory.
Others capacitance values available upon special request.
Others styles available: AR12, AR14, AR62, AR89.

AR Series (Automotive)

SkyCap® Radial Conformal Coated X7R Dielectric

AVX AR Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and X8R dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 200V.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

AR21	5	C	104	M	4	R
AVX Style	**Voltage** 5 = 50V 1 = 100V	**Temperature Coefficient** C = X7R	**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.)	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Failure Rate** 4 = AEC-Q200	**Leads** R = RoHS

X7R Dielectric

EIA Characteristic **Dimensions: Millimeters (Inches)**

	AVX Style	AR15		AR20		AR21		AR30		AR40	
	AVX "Insertable"	AR07		AR29		AR59		AR65		AR75	
Cap in pF	Industry Preferred Values in Blue	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50
470	AR-----C471K4R										
1000	AR-----C102K4R										
1500	AR-----C152K4R										
2200	AR-----C222K4R										
3300	AR-----C332K4R										
4700	AR-----C472K4R										
6800	AR-----C682K4R										
10,000	AR-----C103K4R										
15,000	AR-----C153K4R										
22,000	AR-----C223K4R										
33,000	AR-----C333K4R										
47,000	AR-----C473K4R										
68,000	AR-----C683K4R										
100,000	AR-----C104K4R										
150,000	AR-----C154K4R										
220,000	AR-----C224K4R										
330,000	AR-----C334K4R										
390,000	AR-----C394K4R										
470,000	AR-----C474K4R										
680,000	AR-----C684K4R										
1.0 uF	AR-----C105K4R										
4,700,000	AR-----C475K4R										
6,800,000	AR-----C685K4R										
10.0 uF	AR-----C106K4R										

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

= New extended range

Notes:
"Insertable" make reference to alternative AVX style using the same range of capacitance available on the matrix.
For others Styles, voltages, tolerance and lead lengths see Skycap catalog or contact factory.
Others capacitance values available upon special request.
Others styles available: AR12, AR14, AR62, AR89, AR32, AR38.

AR Series (Automotive)

SkyCap® Radial Conformal Coated X8R Dielectric

AVX AR Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and X8R dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 200V.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

AR21	5	F	104	M	4	R
AVX Style	**Voltage** 5 = 50V 1 = 100V 2 = 200V	**Temperature Coefficient** F = X8R	**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.)	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Failure Rate** 4 = AEC-Q200	**Leads** R = RoHS

X8R Dielectric

EIA Characteristic **Dimensions: Millimeters (Inches)**

AVX Style		AR20			AR21		
AVX "Insertable"		AR29			AR59		
Cap in pF	Industry Preferred Values in Blue	WVDC 200	100	50	WVDC 200	100	50
1,000	AR_____F102K4R						
10,000	AR_____F103K4R						
100,000	AR_____F104K4R						
330,000	AR_____F334K4R						

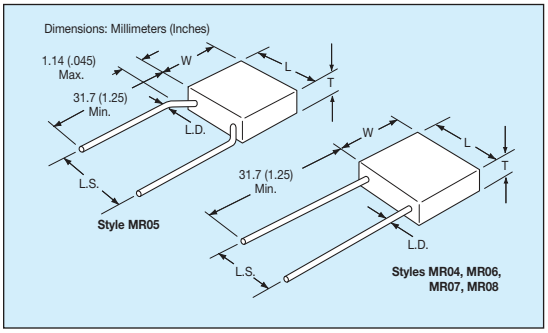
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Notes:
"Insertable" make reference to alternative AVX style using the same range of capacitance available on the matrix.
For others Styles, voltages, tolerance and lead lengths see Skycap catalog or contact factory.
Others capacitance values available upon special request.
Others styles available: AR14, AR62, AR89.

MR Series

Molded Radial MLCC NP0 Dielectric



AVX MR series is a molded radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics. Voltage available are 50, 100, & 200 VDC. AVX also offers military grade molded radials per MIL-PRF-39014, MIL-C-11015, and MIL-PRF-20.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/rceralam.pdf

HOW TO ORDER

MR05	1	A	561	J	A	A
AVX Style	**Voltage**	**Dielectric**	**Capacitance**	**Capacitance Tolerance**	**Failure Rate**	**Leads**
MR04 MR05 MR06 MR07 MR08	5 = 50V 1 = 100V 2 = 200V	A = C0G (NP0)	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.)	D = ±.5pF (>10pF only) F = ±1% (>50pF only) G = ±2% (>25pF only) J = ±5% K = ±10%	A = Not Applicable	A = Standard Solderable T[1] = Trimmed Leads .230" ± .030"

[1] Trimmed lead length for the MR05 style will be measured from the bend in the lead (seating plane).

Not RoHS Compliant

C0G (NP0) Dielectric

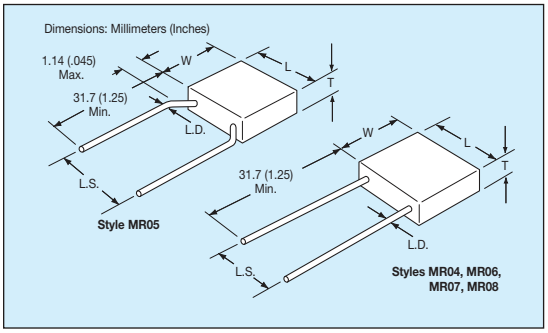
Cap. in pF	AVX Style / Typical AVX Part Nos.	MR04 WVDC			MR05 WVDC			MR06 WVDC			MR07 WVDC			MR08 WVDC		
1.0 to 9.1	MR_____5A1R0DAA MR_____5A9R1DAA															
10 12 15	MR_____5A100KAA MR_____5A120KAA MR_____5A150KAA															
18 22 27	MR_____5A180KAA MR_____5A220KAA MR_____5A270KAA															
33 39 47	MR_____5A330KAA MR_____5A390KAA MR_____5A470KAA															
56 68 82	MR_____5A560KAA MR_____5A680KAA MR_____5A820KAA															
100 120 150	MR_____5A101KAA MR_____5A121KAA MR_____5A151KAA															
180 220 270	MR_____5A181KAA MR_____5A221KAA MR_____5A271KAA															
330 390 470	MR_____5A331KAA MR_____5A391KAA MR_____5A471KAA															
560 680 820	MR_____5A561KAA MR_____5A681KAA MR_____5A821KAA															
1000 1200 1500	MR_____5A102KAA MR_____5A122KAA MR_____5A152KAA															
1800 2200 2700	MR_____5A182KAA MR_____5A222KAA MR_____5A272KAA															
3300 3900 4700	MR_____5A332KAA MR_____5A392KAA MR_____5A472KAA															
5600 6800 8200	MR_____5A562KAA MR_____5A682KAA MR_____5A822KAA															
10,000 12,000 15,000	MR_____5A103KAA MR_____5A123KAA MR_____5A153KAA															
18,000 22,000 27,000	MR_____5A183KAA MR_____5A223KAA MR_____5A273KAA															
33,000 39,000 47,000	MR_____5A333KAA MR_____5A393KAA MR_____5A473KAA															
56,000 68,000 82,000	MR_____5A563KAA MR_____5A683KAA MR_____5A823KAA															
100,000 120,000 150,000	MR_____5A104KAA MR_____5A124KAA MR_____5A154KAA															

= Industry preferred values

For trimmed leads see "How To Order".
For other tolerances see "How To Order".
For other voltages see "How To Order".

MR Series

Molded Radial MLCC X7R Dielectric



AVX MR series is a molded radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics. Voltage available are 50, 100, & 200 VDC. AVX also offers military grade molded radials per MIL-PRF-39014, MIL-C-11015, and MIL-PRF-20.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/rceralam.pdf

HOW TO ORDER

MR05	1	C	561	J	A	A
AVX Style	**Voltage**	**Dielectric**	**Capacitance**	**Capacitance Tolerance**	**Failure Rate**	**Leads**
MR04 MR05 MR06 MR07 MR08	5 = 50V 1 = 100V 2 = 200V	C = X7R	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.)	J = ±5% K = ±10% M = ±20%	A = Not Applicable T = CECC	A = Standard Solderable T[1] = Trimmed Leads .230" ± .030"

[1] Trimmed lead length for the MR05 style will be measured from the bend in the lead (seating plane).

Not RoHS Compliant

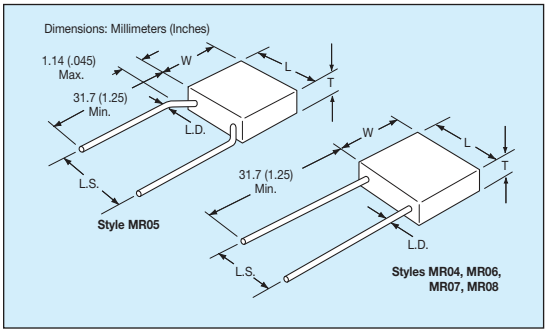
X7R Dielectric

Cap. in pF	AVX Style / Typical AVX Part Nos.	MR04 WVDC			MR05 WVDC			MR06 WVDC			MR07 WVDC			MR08 WVDC		
100 120 150	MR_____5C101KAA MR_____5C121KAA MR_____5C151KAA	■	■	■	■	■	■									
180 220 270	MR_____5C181KAA MR_____5C221KAA MR_____5C271KAA	■	■	■	■	■	■									
330 390 470	MR_____5C331KAA MR_____5C391KAA MR_____5C471KAA	■	■	■	■	■	■									
560 680 820	MR_____5C561KAA MR_____5C681KAA MR_____5C821KAA	■	■	■	■	■	■									
1000 1200 1500	MR_____5C102KAA MR_____5C122KAA MR_____5C152KAA	■	■	■	■	■	■									
1800 2200 2700	MR_____5C182KAA MR_____5C222KAA MR_____5C272KAA	■	■	■	■	■	■									
3300 3900 4700	MR_____5C332KAA MR_____5C392KAA MR_____5C472KAA	■	■	■	■	■	■									
5600 6800 8200	MR_____5C562KAA MR_____5C682KAA MR_____5C822KAA	■	■	■	■	■	■				■	■	■			
10,000 12,000 15,000	MR_____5C103KAA MR_____5C123KAA MR_____5C153KAA	■	■	■	■	■	■	■			■	■	■			
18,000 22,000 27,000	MR_____5C183KAA MR_____5C223KAA MR_____5C273KAA		■	■		■	■	■			■	■	■			
33,000 39,000 47,000	MR_____5C333KAA MR_____5C393KAA MR_____5C473KAA		■	■		■	■	■			■	■	■			
56,000 68,000 82,000	MR_____5C563KAA MR_____5C683KAA MR_____5C823KAA		■	■		■	■		■		■	■	■			
100,000 120,000 150,000	MR_____5C104KAA MR_____5C124KAA MR_____5C154KAA			■			■		■		■	■	■			
180,000 220,000 270,000	MR_____5C184KAA MR_____5C224KAA MR_____5C274KAA								■	■	■	■	■			
330,000 390,000 470,000	MR_____5C334KAA MR_____5C394KAA MR_____5C474KAA								■	■	■	■	■			
560,000 680,000 820,000	MR_____5C564KAA MR_____5C684KAA MR_____5C824KAA								■	■		■	■	■		
1.0 µF 1.2 µF 1.5 µF	MR_____5C105KAA MR_____5C125KAA MR_____5C155KAA									■		■	■	■		
1.8 µF 2.0 µF 2.2 µF	MR_____5C185KAA MR_____5C205KAA MR_____5C225KAA											■	■			
2.7 µF 3.3 µF 3.9 µF	MR_____5C275KAA MR_____5C335KAA MR_____5C395KAA												■		■	■
4.7 µF	MR_____5C475KAA															■

For trimmed leads see "How To Order".
For other tolerances see "How To Order".
For other voltages see "How To Order".

■ = Industry preferred values

MR Series
Molded Radial MLCC Z5U Dielectric



AVX MR series is a molded radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics. Voltage available are 50, 100, & 200 VDC. AVX also offers military grade molded radials per MIL-PRF-39014, MIL-C-11015, and MIL-PRF-20.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/rceralam.pdf

HOW TO ORDER

MR05	1	A	561	Z	A	A
AVX Style	**Voltage**	**Dielectric**	**Capacitance**	**Capacitance Tolerance**	**Failure Rate**	**Leads**
MR04 MR05 MR06 MR07 MR08	5 = 50V 1 = 100V	A = C0G (NP0) C = X7R 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.)	M = ±20% Z = +80% -20%	A = Not Applicable	A = Standard Solderable T[1] = Trimmed Leads .230" ± .030"

[1] Trimmed lead length for the MR05 style will be measured from the bend in the lead (seating plane).

Not RoHS Compliant

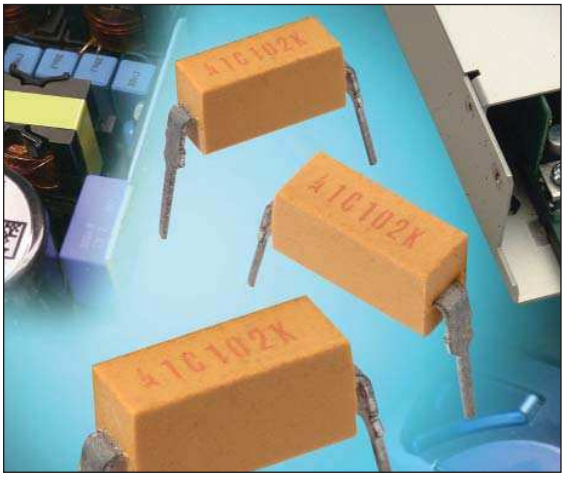
Z5U Dielectric

AVX Style		MR04		MR05		MR06		MR07		MR08	
Cap. in pF	Typical AVX Part Nos.	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50
10,000 12,000 15,000	MR____5E103ZAA MR____5E123ZAA MR____5E153ZAA										
18,000 22,000 27,000	MR____5E183ZAA MR____5E223ZAA MR____5E273ZAA										
33,000 39,000 47,000	MR____5E333ZAA MR____5E393ZAA MR____5E473ZAA										
56,000 68,000 82,000	MR____5E563ZAA MR____5E683ZAA MR____5E823ZAA										
100,000 120,000 150,000	MR____5E104ZAA MR____5E124ZAA MR____5E154ZAA										
180,000 220,000 270,000	MR____5E184ZAA MR____5E224ZAA MR____5E274ZAA										
330,000 390,000 470,000	MR____5E334ZAA MR____5E394ZAA MR____5E474ZAA										
560,000 680,000 820,000	MR____5E564ZAA MR____5E684ZAA MR____5E824ZAA										
1.0 µF 1.2 µF 1.5 µF	MR____5E105ZAA MR____5E125ZAA MR____5E155ZAA										
1.8 µF 2.2 µF 2.7 µF	MR____5E185ZAA MR____5E225ZAA MR____5E275ZAA										
3.3 µF 3.9 µF 4.7 µF	MR____5E335ZAA MR____5E395ZAA MR____5E475ZAA										
5.6 µF 6.8 µF 8.2 µF	MR____5E565ZAA MR____5E685ZAA MR____5E825ZAA										
10.0 µF	MR____5E106ZAA										

= Industry preferred values

For trimmed leads see "How To Order".
For other tolerances see "How To Order".
For other voltages see "How To Order".

MD Series
2 Pin DIP



AVX MD series is a Molded 2 Pin DIP capacitor. We offer NP0, X7R, and Z5U dielectrics. Voltages available are 50 and 100Vdc.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/dipguard.pdf

HOW TO ORDER

MD01	5	E	104	M	A	B

AVX Style
MD01
CKR22*
CKS22**
MD02
CKR23*
CKS23*
MD03
CKR24*
CKS24**

Voltage
5 = 50V
1 = 100V

Temperature Coefficient
A = C0G (NP0)
C = X7R
E = Z5U

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.

Capacitance Tolerance

C0G (NP0):	X7R:	Z5U:
F = ±1%	J = ±5%	M = ±20%
J = ±5%	K = ±10%	Z = +80% -20%
K = ±10%	M = ±20%	

Failure Rate
A = Not Applicable

Assembly Method
A = Hand Assembled
B = Automated Assembly

Not RoHS Compliant

C0G (NP0)

Cap. in pF*	EIA Characteristic	C0G (NP0)	
	AVX Style	MD01	
		WVDC 100	50
10	MD015A100KAB		
15	MD015A150KAB		
22	MD015A220KAB		
33	MD015A330KAB		
47	MD015A470KAB		
68	MD015A680KAB		
100	MD015A101KAB		
150	MD015A151KAB		
220	MD015A221KAB		
330	MD015A331KAB		
470	MD015A471KAB		
680	MD015A681KAB		
1000	MD015A102KAB		
1500	MD015A152KAB		
2200	MD015A222KAB		
3300	MD015A332KAB		
	AVX Style	MD02	
Cap. in pF*		WVDC 100	50
4700	MD025A472KAB		
6800	MD025A682KAB		
10000	MD025A103KAB		

For other voltages and tolerances see Part No. Codes.

X7R

Cap. in pF*	EIA Characteristic	X7R	
	AVX Style	MD01	
		WVDC 100	50
220	MD015C221KAB		
330	MD015C331KAB		
470	MD015C471KAB		
680	MD015C681KAB		
1000	MD015C102KAB		
1500	MD015C152KAB		
2200	MD015C222KAB		
3300	MD015C332KAB		
4700	MD015C472KAB		
6800	MD015C682KAB		
10,000	MD011C103KAB		
15,000	MD015C153KAB		
22,000	MD015C223KAB		
33,000	MD015C333KAB		
47,000	MD015C473KAB		
68,000	MD015C683KAB		
100,000	MD015C104KAB		
	AVX Style	MD02	
Cap. in pF*		WVDC 100	50
150,000	MD025C154KAB		
220,000	MD025C224KAB		
	AVX Style	MD03	
Cap. in pF*		WVDC 100	50
330,000	MD035C334KAA		
470,000	MD035C474KAA		
680,000	MD035C684KAA		
1,000,000	MD035C105KAA		

For other voltages and tolerances see Part No. Codes.

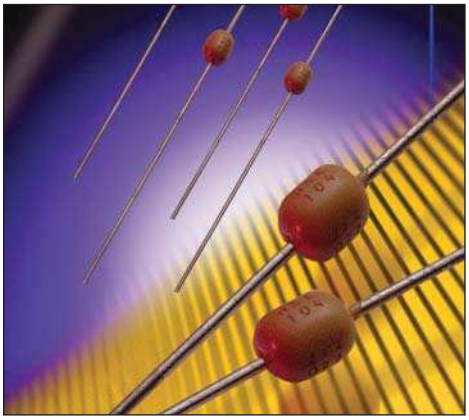
Z5U

Cap. in pF*	EIA Characteristic	Z5U	
	AVX Style	MD01	
		WVDC 100	50
10,000	MD015E103ZAB		
15,000	MD015E153ZAB		
22,000	MD015E223ZAB		
33,000	MD015E333ZAB		
47,000	MD015E473ZAB		
68,000	MD015E683ZAB		
100,000	MD015E104ZAB		
150,000	MD015E154ZAB		
220,000	MD015E224ZAB		
330,000	MD015E334ZAB		
	AVX Style	MD02	
Cap. in pF*		WVDC 100	50
470,000	MD025E474ZAB		
	AVX Style	MD03	
Cap. in pF*		WVDC 100	50
680,000	MD035E684ZAA		
1,000,000	MD035E105ZAA		

For other voltages and tolerances see Part No. Codes.
*Other capacitance values available upon special request.
= Industry preferred values

SA Series

SpinGuard® Axial Conformal Coated NP0 Dielectric



AVX SA series is a conformally coated axial leaded capacitor. We offer NP0, X7R, X5R, and Z5U dielectrics. Voltages available are 10, 50, 100, and 200Vdc. Lower voltages available upon request.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/spingrd.pdf

HOW TO ORDER

SA10	5	A	104	F	A	R

Conformal Axial Size
SA05
SA10
SA11
SA20
SA30
SA40

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

Dielectric
A = C0G (NP0)

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.)

Capacitance Tolerance
C = ±.25pF
D = ±.5pF
F = ±1%
G = ±2%
J = ±5%
K = ±10%

Failure Rate
A = Not Applicable

Leads
Standard (Solderable)
R = RoHS Compliant
A = Standard Solderable

NP0 Dielectric

AVX Style		SA05		SA10			SA11		SA20		SA30		SA40	
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 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

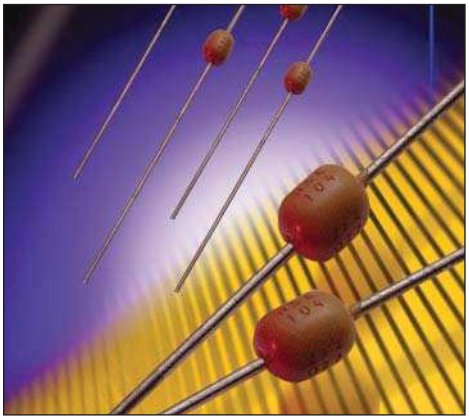
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Please select correct termination style.

SA Series

SpinGuard® Axial Conformal Coated X7R Dielectric



AVX SA series is a conformally coated axial leaded capacitor. We offer NP0, X7R, X5R, and Z5U dielectrics. Voltages available are 10, 50, 100, and 200Vdc. Lower voltages available upon request.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/spingrd.pdf

HOW TO ORDER

SA10	5	C	104	K	A	R
Conformal Axial Size SA05 SA10 SA11 SA20 SA30 SA40	**Voltage** 5 = 50V 1 = 100V 2 = 200V	**Dielectric** C = X7R	**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.)	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Failure Rate** A = Not Applicable	**Leads** Standard (Solderable) R = RoHS Compliant A = Standard Solderable

X7R Dielectric

Cap. in pF	Typical AVX Part Nos.	SA05 WVDC 200	SA05 WVDC 100	SA05 WVDC 50	SA10 WVDC 200	SA10 WVDC 100	SA10 WVDC 50	SA11 WVDC 100	SA11 WVDC 50	SA20 WVDC 100	SA20 WVDC 50	SA30 WVDC 100	SA30 WVDC 50	SA40 WVDC 100	SA40 WVDC 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

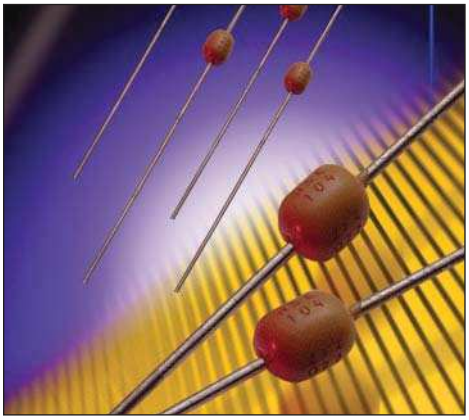
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Please select correct termination style.

SA Series

SpinGuard® Axial Conformal Coated X5R Dielectric



AVX SA series is a conformally coated axial leaded capacitor. We offer NP0, X7R, X5R, and Z5U dielectrics. Voltages available are 10, 50, 100, and 200Vdc. Lower voltages available upon request.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/spingrd.pdf

HOW TO ORDER

SA10	5	D	104	K	A	R
Conformal Axial Size SA10	**Voltage** Z = 10V	**Dielectric** D = X5R	**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.)	**Capacitance Tolerance** K = ±10% M = ±20%	**Failure Rate** A = Not Applicable	**Leads** Standard (Solderable) R = RoHS Compliant A = Standard Solderable

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

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

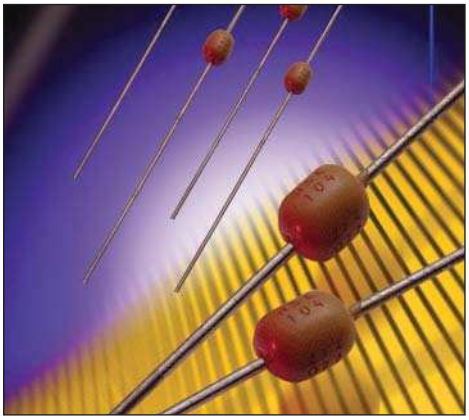
RoHS COMPLIANT

Please select correct termination style.

= Industry preferred values

SA Series

SpinGuard® Axial Conformal Coated Z5U Dielectric



AVX SA series is a conformally coated axial leaded capacitor. We offer NP0, X7R, X5R, and Z5U dielectrics. Voltages available are 10, 50, 100, and 200Vdc. Lower voltages available upon request.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/spingrd.pdf

HOW TO ORDER

SA10	5	E	104	Z	A	R
Conformal Axial Size SA05 SA10 SA11 SA20 SA30 SA40	**Voltage** 5 = 50V 1 = 100V	**Dielectric** E = Z5U	**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.)	**Capacitance Tolerance** M = ±20% Z = +80% -20%	**Failure Rate** A = Not Applicable	**Leads** Standard (Solderable) R = RoHS Compliant A = Standard Solderable

Z5U Dielectric

AVX Style		SA05	SA10		SA11		SA20		SA30		SA40	
Cap. in pF	Typical AVX Part Nos.	WVDC 50	WVDC 100	50	100	50	100	50	100	50	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

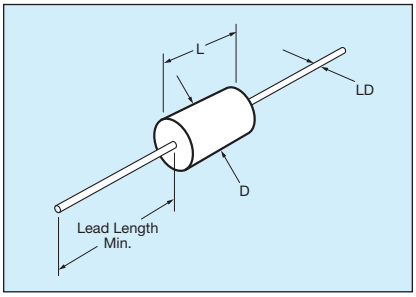
***Preferred Industry Decoupling Capacitor — Insertable on .300" centers.**
SA105E104ZAA

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Please select correct termination style.

MA Series
Molded Axial NP0 Dielectric



AVX MA series is a molded axial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics. Voltages available are 50V, 100V, and 200Vdc. AVX also offers military grade molded axials per MIL-C-11015, MIL-PRF-39014, and MIL-PRF-20.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/aceralam.pdf

HOW TO ORDER

MA10	5	A	104	J	A	A
Molded Axial Size MA10 MA20 MA30 MA40 MA50 MA60	**Voltage** 5 = 50V 1 = 100V 2 = 200V	**Dielectric** A = C0G (NP0)	**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.)	**Capacitance Tolerance** F = ±1% J = ±5% K = ±10% M = ±20% D = ±5.pF <10pF only	**Failure Rate** A = Not Applicable	**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.

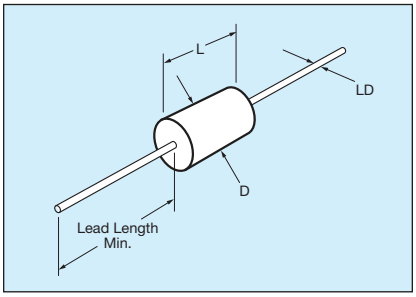
Not RoHS Compliant

NP0 Dielectric

Cap. in pF	AVX Style / Typical AVX Part Nos.	MA10 WVDC 200	MA10 100	MA10 50	MA20 200	MA20 100	MA20 50	MA30 200	MA30 100	MA30 50	MA40 200	MA40 100	MA40 50	MA50 200	MA50 100	MA50 50	MA60 200	MA60 100	MA60 50
1.0 to 9.1	MA_____5A1R0DAA / MA_____5A9R1DAA	■	■	■															
10 12 15	MA_____5A100KAA MA_____5A120KAA MA_____5A150KAA	■	■	■															
18 22 27	MA_____5A180KAA MA_____5A220KAA MA_____5A270KAA	■	■	■															
33 39 47	MA_____5A330KAA MA_____5A390KAA MA_____5A470KAA	■	■	■															
56 68 82	MA_____5A560KAA MA_____5A680KAA MA_____5A820KAA	■	■	■	■	■	■												
100 120 150	MA_____5A101KAA MA_____5A121KAA MA_____5A151KAA	■	■	■	■	■	■	■	■	■									
180 220 270	MA_____5A181KAA MA_____5A221KAA MA_____5A271KAA	■	■	■	■	■	■	■	■	■	■	■	■						
330 390 470	MA_____5A331KAA MA_____5A391KAA MA_____5A471KAA		■	■		■	■	■	■	■	■	■	■						
560 680 820	MA_____5A561KAA MA_____5A681KAA MA_____5A821KAA		■	■		■	■	■	■	■	■	■	■						
1000 1200 1500	MA_____5A102KAA MA_____5A122KAA MA_____5A152KAA			■		■	■	■	■	■	■	■	■	■	■	■			
1800 2200 2700	MA_____5A182KAA MA_____5A222KAA MA_____5A272KAA						■		■	■	■	■	■	■	■	■			
3300 3900 4700	MA_____5A332KAA MA_____5A392KAA MA_____5A472KAA								■	■		■	■	■	■	■	■	■	■
5600 6800 8200	MA_____5A562KAA MA_____5A682KAA MA_____5A822KAA									■		■	■	■	■	■	■	■	■
10,000 12,000 15,000	MA_____5A103KAA MA_____5A123KAA MA_____5A153KAA												■		■	■	■	■	■
18,000 22,000 27,000	MA_____5A183KAA MA_____5A223KAA MA_____5A273KAA														■	■	■	■	■
33,000 39,000 47,000	MA_____5A333KAA MA_____5A393KAA MA_____5A473KAA															■		■	■
56,000 68,000 82,000	MA_____5A563KAA MA_____5A683KAA MA_____5A823KAA																	■	■
100,000 120,000 150,000	MA_____5A104KAA MA_____5A124KAA MA_____5A154KAA																		■

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

MA Series
Molded Axial X7R Dielectric



AVX MA series is a molded axial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics. Voltages available are 50V, 100V, and 200Vdc. AVX also offers military grade molded axials per MIL-C-11015, MIL-PRF-39014, and MIL-PRF-20.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/aceralam.pdf

HOW TO ORDER

MA10	5	C	104	J	A	A
Molded Axial Size MA10 MA20 MA30 MA40 MA50 MA60	**Voltage** 5 = 50V 1 = 100V 2 = 200V	**Dielectric** C = X7R	**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.)	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Failure Rate** A = Not Applicable	**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.

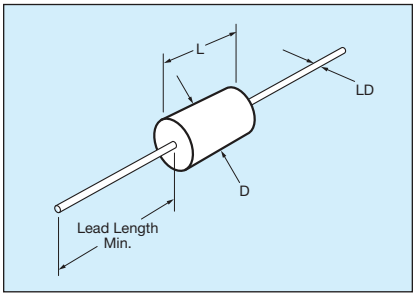
Not RoHS Compliant

X7R Dielectric

Cap. in pF	Typical AVX Part Nos.	MA10 WVDC 200	MA10 100	MA10 50	MA20 200	MA20 100	MA20 50	MA30 200	MA30 100	MA30 50	MA40 200	MA40 100	MA40 50	MA50 200	MA50 100	MA50 50	MA60 200	MA60 100	MA60 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

MA Series
Molded Axial Z5U Dielectric



AVX MA series is a molded axial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics. Voltages available are 50V, 100V, and 200Vdc. AVX also offers military grade molded axials per MIL-C-11015, MIL-PRF-39014, and MIL-PRF-20.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/aceralam.pdf

HOW TO ORDER

MA10	5	E	104	Z	A	A
Molded Axial Size MA10 MA20 MA30 MA40 MA50 MA60	**Voltage** 5 = 50V 1 = 100V 2 = 200V	**Dielectric** E = Z5U	**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.)	**Capacitance Tolerance** M = ±20% Z = +80% -20%	**Failure Rate** A = Not Applicable	**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.

Not RoHS Compliant

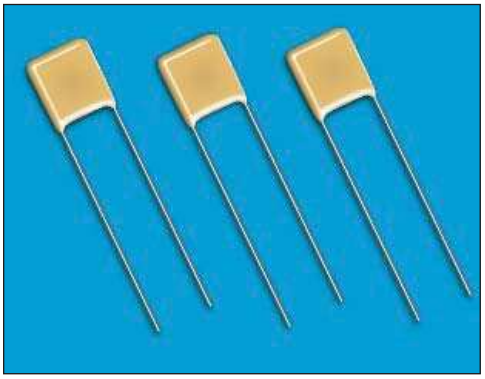
Z5U Dielectric

	AVX Style	MA10			MA20			MA30			MA40			MA50			MA60		
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
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

Leaded High Voltage MLCC

SV Series Radial Capacitors – C0G Dielectric



High value, low leakage and small size are difficult parameters to obtain in capacitors for high voltage systems. AVX special high voltage MLC radial leaded capacitors meet these performance characteristics. The added advantage of these capacitors lies in special internal design minimizing the electric field stresses within the MLC. These special design criteria result in significant reduction of partial discharge activity within the dielectric and having, therefore, a major impact on long-term reliability of the product. The SV high voltage radial capacitors are conformally coated with high insulation resistance, high dielectric strength epoxy eliminating the possibility of arc flashover.

The SV high voltage radial MLC designs exhibit low ESRs at high frequency. The same criteria governing the high voltage design carries the added benefits of extremely low ESR in relatively low capacitance and small packages. These capacitors are designed and are ideally suited for applications such as snubbers in high frequency power converters, resonators in SMPS, and high voltage coupling/DC blocking.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/sv.pdf

HOW TO ORDER

SV01	A	A	102	K	A	A	*
AVX Style	**Voltage** C = 600V/630V A = 1000V S = 1500V G = 2000V W = 2500V H = 3000V J = 4000V K = 5000V	**Temperature Coefficient** C0G = A	**Capacitance Code** (2 significant digits + no. of zeros) Examples: 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Test Level** A = Standard B = Hi-Rel*	**Leads** A = Tin/Lead R = RoHS Compliant	**Packaging** (See Note 1)

Note 1: No suffix signifies bulk packaging which is AVX standard packaging. Use suffix "TR1" if tape and reel is required. Parts are reel packaged per EIA-468.

*Hi-Rel screening consists of 100% Group A, Subgroup 1 per MIL-PRF-49467. (Except partial discharge testing is not performed and DWV is at 120% rated voltage).

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

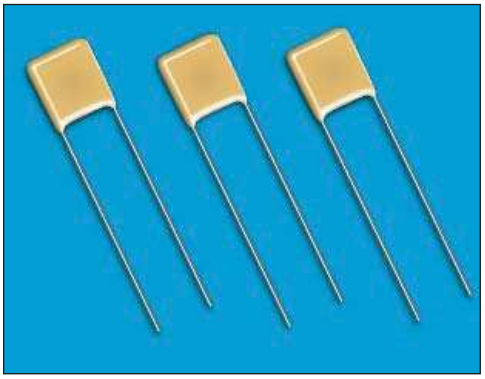
Please select correct termination style.

C0G								
Style	**600/630V min./max.**	**1000V min./max.**	**1500V min./max.**	**2000V min./max.**	**2500V min./max.**	**3000V min./max.**	**4000V min./max.**	**5000V min./max.**
SV01	100 pF / 1500 pF	100 pF / 1000 pF	10 pF / 330 pF	10 pF / 220 pF	10 pF / 120 pF	10 pF / 82 pF	–	–
SV02/SV52	100 pF / 6800 pF	100 pF / 4700 pF	100 pF / 1500 pF	10 pF / 1000 pF	10 pF / 680 pF	10 pF / 560 pF	10 pF / 150 pF	10 pF / 100 pF
SV03/SV53	100 pF / 0.012 µF	100 pF / 8200 pF	100 pF / 2700 pF	100 pF / 1800 pF	10 pF / 1000 pF	10 pF / 680 pF	10 pF / 390 pF	10 pF / 220 pF
SV04/SV54	100 pF / 3900 pF	100 pF / 2700 pF	10 pF / 820 pF	10 pF / 560 pF	10 pF / 270 pF	10 pF / 180 pF	10 pF / 100 pF	10 pF / 68 pF
SV05/SV55	1000 pF / 0.027 µF	1000 pF / 0.018 µF	100 pF / 6800 pF	100 pF / 4700 pF	100 pF / 2700 pF	100 pF / 1500 pF	10 pF / 1000 pF	10 pF / 560 pF
SV06/SV56	100 pF / 0.012 µF	100 pF / 0.010 µF	100 pF / 3300 pF	100 pF / 2200 pF	10 pF / 1200 pF	10 pF / 820 pF	10 pF / 470 pF	10 pF / 390 pF
SV07/SV57	1000 pF / 0.056 µF	1000 pF / 0.033 µF	1000 pF / 0.015 µF	100 pF / 0.010 µF	100 pF / 5600 pF	100 pF / 3900 pF	100 pF / 2200 pF	10 pF / 1200 pF
SV08/SV58	1000 pF / 0.082 µF	1000 pF / 0.047 µF	1000 pF / 0.022 µF	1000 pF / 0.015 µF	100 pF / 0.010 µF	100 pF / 6800 pF	100 pF / 3300 pF	100 pF / 2200 pF
SV09/SV59	1000 pF / 0.150 µF	1000 pF / 0.082 µF	1000 pF / 0.039 µF	1000 pF / 0.022 µF	1000 pF / 0.015 µF	100 pF / 8200 pF	100 pF / 4700 pF	100 pF / 3300 pF
SV10	1000 pF / 0.100 µF	1000 pF / 0.056 µF	1000 pF / 0.022 µF	1000 pF / 0.012 µF	100 pF / 8200 pF	100 pF / 5600 pF	100 pF / 3300 pF	100 pF / 2200 pF
SV11	1000 pF / 0.150 µF	1000 pF / 0.082 µF	1000 pF / 0.039 µF	1000 pF / 0.022 µF	1000 pF / 0.015 µF	100 pF / 8200 pF	100 pF / 4700 pF	100 pF / 3300 pF
SV12	0.01 µF / 0.220 µF	0.01 µF / 0.15 µF	1000 pF / 0.056 µF	1000 pF / 0.033 µF	1000 pF / 0.022 µF	1000 pF / 0.015 µF	100 pF / 8200 pF	100 pF / 5600 pF
SV13/SV63	100 pF / 0.018 µF	100 pF / 0.012 µF	100 pF / 4700 pF	100 pF / 2700 pF	100 pF / 1800 pF	100 pF / 1000 pF	10 pF / 470 pF	10 pF / 390 pF
SV14/SV64	1000 pF / 0.039 µF	1000 pF / 0.022 µF	100 pF / 8200 pF	100 pF / 5600 pF	100 pF / 3300 pF	100 pF / 1800 pF	10 pF / 820 pF	10 pF / 680 pF
SV15/SV65	1000 pF / 0.056 µF	1000 pF / 0.033 µF	1000 pF / 0.015 µF	100 pF / 0.01 µF	100 pF / 5600 pF	100 pF / 2700 pF	100 pF / 1800 pF	100 pF / 1200 pF
SV16/SV66	1000 pF / 0.120 µF	1000 pF / 0.082 µF	1000 pF / 0.039 µF	1000 pF / 0.027 µF	1000 pF / 0.015 µF	100 pF / 8200 pF	100 pF / 4700 pF	100 pF / 3300 pF
SV17/SV67	1000 pF / 0.150 µF	1000 pF / 0.10 µF	1000 pF / 0.056 µF	1000 pF / 0.039 µF	1000 pF / 0.022 µF	1000 pF / 0.012 µF	100 pF / 6800 pF	100 pF / 4700 pF

Note: Contact factory for other voltage ratings or values.

Leaded High Voltage MLCC

SV Series Radial Capacitors – X7R Dielectric



High value, low leakage and small size are difficult parameters to obtain in capacitors for high voltage systems. AVX special high voltage MLC radial leaded capacitors meet these performance characteristics. The added advantage of these capacitors lies in special internal design minimizing the electric field stresses within the MLC. These special design criteria result in significant reduction of partial discharge activity within the dielectric and having, therefore, a major impact on long-term reliability of the product. The SV high voltage radial capacitors are conformally coated with high insulation resistance, high dielectric strength epoxy eliminating the possibility of arc flashover.

The SV high voltage radial MLC designs exhibit low ESRs at high frequency. The same criteria governing the high voltage design carries the added benefits of extremely low ESR in relatively low capacitance and small packages. These capacitors are designed and are ideally suited for applications such as snubbers in high frequency power converters, resonators in SMPS, and high voltage coupling/DC blocking.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/sv.pdf

HOW TO ORDER

SV01	A	A	102	K	A	A	*
AVX Style	**Voltage** A = 1000V S = 1500V G = 2000V W = 2500V H = 3000V J = 4000V K = 5000V	**Temperature Coefficient** X7R = C	**Capacitance Code** (2 significant digits + no. of zeros) Examples: 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105	**Capacitance Tolerance** K = ±10% M = ±20% Z = +80 -20%	**Test Level** A = Standard B = Hi-Rel*	**Leads** A = Tin/Lead R = RoHS Compliant	**Packaging** (See Note 1)

Note 1: No suffix signifies bulk packaging which is AVX standard packaging. Use suffix "TR1" if tape and reel is required. Parts are reel packaged per EIA-468.

Note: Capacitors with X7R dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.

*Hi-Rel screening consists of 100% Group A, Subgroup 1 per MIL-PRF-49467. (Except partial discharge testing is not performed and DWV is at 120% rated voltage).

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

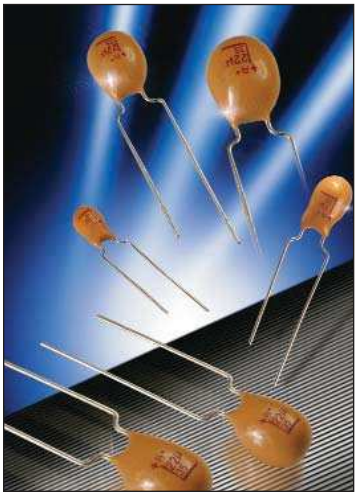
Please select correct termination style.

X7R								
Style	**600/630V min./max.**	**1000V min./max.**	**1500V min./max.**	**2000V min./max.**	**2500V min./max.**	**3000V min./max.**	**4000V min./max.**	**5000V min./max.**
SV01	1000 pF / 0.018 µF	1000 pF / 0.012 µF	100 pF / 5600 pF	100 pF / 3900 pF	–	–	–	–
SV02/SV52	1000 pF / 0.082 µF	1000 pF / 0.047 µF	1000 pF / 0.015 µF	100 pF / 6800 pF	100 pF / 3900 pF	100 pF / 2700 pF	–	–
SV03/SV53	1000 pF / 0.180 µF	1000 pF / 0.082 µF	1000 pF / 0.018 µF	1000 pF / 0.01 µF	100 pF / 6800 pF	100 pF / 4700 pF	100 pF / 1800 pF	–
SV04/SV54	1000 pF / 0.056 µF	1000 pF / 0.033 µF	100 pF / 6800 pF	100 pF / 3900 pF	100 pF / 2200 pF	100 pF / 1800 pF	100 pF / 820 pF	–
SV05/SV55	0.01 µF / 0.470 µF	0.01 µF / 0.22 µF	1000 pF / 0.056 µF	1000 pF / 0.027 µF	1000 pF / 0.018 µF	1000 pF / 0.012 µF	100 pF / 4700 pF	–
SV06/SV56	0.01 µF / 0.180 µF	0.01 µF / 0.10 µF	1000 pF / 0.033 µF	1000 pF / 0.012 µF	100 pF / 8200 pF	100 pF / 6800 pF	100 pF / 2700 pF	100 pF / 1200 pF
SV07/SV57	0.01 µF / 0.820 µF	0.01 µF / 0.39 µF	0.01 µF / 0.10 µF	1000 pF / 0.047 µF	1000 pF / 0.033 µF	1000 pF / 0.027 µF	1000 pF / 0.01 µF	100 pF / 6800 pF
SV08/SV58	0.01 µF / 1.20 µF	0.01 µF / 0.68 µF	0.01 µF / 0.18 µF	1000 pF / 0.082 µF	1000 pF / 0.068 µF	1000 pF / 0.047 µF	1000 pF / 0.018 µF	1000 pF / 0.012 µF
SV09/SV59	0.10 µF / 1.80 µF	0.10 µF / 1.00 µF	0.01 µF / 0.27 µF	0.01 µF / 0.12 µF	0.01 µF / 0.10 µF	1000 pF / 0.068 µF	1000 pF / 0.027 µF	1000 pF / 0.018 µF
SV10	0.01 µF / 1.50 µF	0.01 µF / 0.82 µF	0.01 µF / 0.22 µF	0.01 µF / 0.10 µF	1000 pF / 0.082 µF	1000 pF / 0.056 µF	1000 pF / 0.022 µF	1000 pF / 0.022 µF
SV11	0.10 µF / 2.20 µF	0.10 µF / 1.2 µF	0.01 µF / 0.39 µF	0.01 µF / 0.18 µF	0.01 µF / 0.15 µF	0.01 µF / 0.10 µF	1000 pF / 0.039 µF	1000 pF / 0.027 µF
SV12	0.10 µF / 3.90 µF	0.10 µF / 2.20 µF	0.01 µF / 0.56 µF	0.01 µF / 0.27 µF	0.01 µF / 0.22 µF	0.01 µF / 0.15 µF	1000 pF / 0.056 µF	1000 pF / 0.033 µF
SV13/SV63	0.01 µF / 0.270 µF	0.01 µF / 0.10 µF	1000 pF / 0.033 µF	1000 pF / 0.012 µF	1000 pF / 0.01 µF	100 pF / 6800 pF	100 pF / 2700 pF	–
SV14/SV64	0.01 µF / 0.470 µF	0.01 µF / 0.18 µF	1000 pF / 0.068 µF	1000 pF / 0.022 µF	1000 pF / 0.018 µF	1000 pF / 0.015 µF	100 pF / 5600 pF	–
SV15/SV65	0.01 µF / 0.680 µF	0.01 µF / 0.33 µF	0.01 µF / 0.10 µF	1000 pF / 0.033 µF	1000 pF / 0.027 µF	1000 pF / 0.022 µF	1000 pF / 8200 pF	100 pF / 4700 pF
SV16/SV66	0.01 µF / 1.80 µF	0.01 µF / 1.0 µF	0.01 µF / 0.27 µF	0.01 µF / 0.12 µF	0.01 µF / 0.10 µF	1000 pF / 0.068 µF	1000 pF / 0.027 µF	1000 pF / 0.018 µF
SV17/SV67	0.01 µF / 2.20 µF	0.01 µF / 1.2 µF	0.01 µF / 0.39 µF	0.01 µF / 0.15 µF	0.01 µF / 0.12 µF	1000 pF / 0.082 µF	1000 pF / 0.039 µF	1000 pF / 0.027 µF

Note: Contact factory for other voltage ratings or values.

TAP Series

Dipped Radial Tantalum Capacitors



TAP is a professional grade device manufactured with a flame retardant coating and featuring low leakage current and impedance, very small physical sizes and exceptional temperature stability. It is designed and conditioned to operate to +125°C and is available loose or taped and reeled for auto insertion. The 15 case sizes with wide capacitance and working voltage ranges means the TAP can accommodate almost any application.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tap.pdf

HOW TO ORDER

TAP	475	M	035	SCS
Type	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** K = ±10% M = ±20% (For J = ±5% tolerance, please consult factory)	**Rated DC Voltage**	**Suffix indicating wire form and packaging**

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

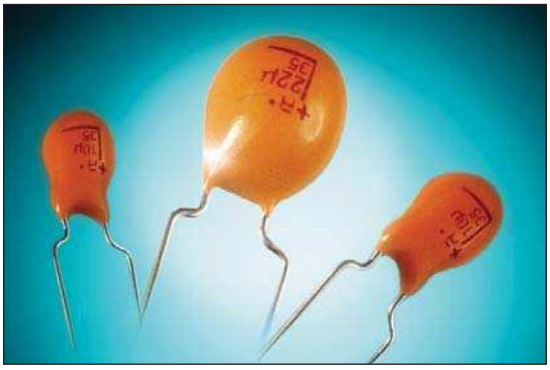
RoHS
COMPLIANT

Capacitance Range (letter denotes case size)								
Capacitance		Rated voltage DC (V_R)						
µF	Code	6.3V	10V	16V	20V	25V	35V	50V
0.1	104						A	A
0.15	154						A	A
0.22	224						A	A
0.33	334						A	A
0.47	474						A	A
0.68	684						A	B
1.0	105				A	A	A	C
1.5	155			A	A	A	A	D
2.2	225		A	A	A	A	B	E
3.3	335	A	A	A	B	B	C	F
4.7	475	A	A	B	C	C	E	G
6.8	685	A	B	C	D	D	F	H
10	106	B	C	D	E	E	F	J
15	156	C	D	E	F	F	H	K
22	226	D	E	F	H	H	K	L
33	336	E	F	F	J	J	M	
47	476	F	G	J	K	M	N	
68	686	G	H	L	N	N		
100	107	H	K	N	N			
150	157	K	N	N				
220	227	M	P	R				
330	337	P	R					

Values outside this standard range may be available on request.
AVX reserves the right to supply capacitors to a higher voltage rating, in the same case size, than that ordered.

TEP Series

Dipped Radial Capacitors – Tin/Lead Finish



TEP is a Tin–Lead finish version of the conformally coated tantalum radial leaded capacitor (TAP), It is a professional grade device manufactured with a flame retardant coating and featuring low leakage current and impedance, very small physical sizes and exceptional temperature stability, available in bulk and T&R packaging for auto insertion. The wide range of Capacitance, working voltages and case sizes enables TEP to accommodate to almost any application.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tep.pdf

HOW TO ORDER

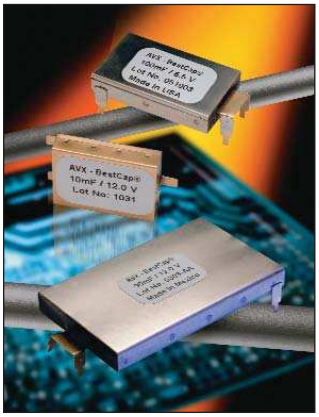
TEP	106	M	016	SCS
Type	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** K = ±10% M = ±20% (For J = ±5% tolerance, please consult factory)	**Rated DC Voltage**	**Suffix indicating wire form and packaging**

Not RoHS Compliant

Capacitance Range (letter denotes case size)								
Capacitance		Rated voltage DC (V_R)						
µF	Code	6.3V	10V	16V	20V	25V	35V	50V
0.1	104						A	A
0.15	154						A	A
0.22	224						A	A
0.33	334						A	A
0.47	474						A	A
0.68	684						A	B
1.0	105				A	A	A	C
1.5	155			A	A	A	A	D
2.2	225		A	A	A	A	B	E
3.3	335	A	A	A	B	B	C	F
4.7	475	A	A	B	C	C	E	G
6.8	685	A	B	C	D	D	F	H
10	106	B	C	D	E	E	F	J
15	156	C	D	E	F	F	H	K
22	226	D	E	F	H	H	K	L
33	336	E	F	F	J	J	M	
47	476	F	G	J	K	M	N	
68	686	G	H	L	N	N		
100	107	H	K	N	N			
150	157	K	N	N				
220	227	M	P	R				
330	337	P	R					

Values outside this standard range may be available on request.
AVX reserves the right to supply capacitors to a higher voltage rating, in the same case size, than that ordered.

BestCap®
Pulse Supercapacitors



AVX's BestCap® technology provides excellent high power pulse characteristics based upon the combination of very high capacitance and ultra-low ESR, together with extremely low leakage current.

Based on a unique patented aqueous chemistry and an innovative design, this series offers high capacitance, even with short pulse applications such as in GSM, GPRS, Edge and PCS based systems.

While BestCap® technology offers more efficient energy savings in battery circuits than conventional supercapacitors, its Low ESR results in a high current handling capability, making this an ideal solution for any portable or wireless device requiring high power availability.

The Low Profile versions are ideally suited to PCMCIA, PDA, DSC and similar applications.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/bestcap.pdf

HOW TO ORDER

BZ	0	1	5	A	503	Z	A	B	XX
BestCap®	**Standard**	**Case Size** 1 = 28mmx17mm 2 = 48mmx30mm 5 = 20mmx15mm 9 = 17mmx15mm	**Rated Voltage** 3 = 3.6V 4 = 4.5V 5 = 5.5V 9 = 9.0V C = 12.0V F = 15.0V	**Series** A = Maximum Capacitance B = Low Profile	**Capacitance Code (Farad Code)**	**Capacitance Tolerance** Z = (-20/+80)%	**Lead Format** A, C, H, L N or S	**Packaging** B = Bulk	**Not Used For Standard Product (Consult Factory For Special Requirements)**

A-SERIES – MAXIMUM CAPACITANCE

Capacitance		Rated Voltage DC at 25°C							
mF	Code	3.6V		5.5V		9.0V		12.0V	
		Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles
10	103							BZ05	C, N, S
22	223							BZ01	A, C, H, S
33	333			BZ05	C, N, S	BZ01	A, C, H, S		
47	473								
50	503			BZ01	A, C, H, S				
68	683			BZ05	S				
70	703	BZ01	A, C, H, S						
90	903							BZ02	A, H, L
100	104			BZ01	A, H, S				
120	124					BZ02	A, H, L		
140	144	BZ01	A, H, S						
150	154								
200	204			BZ02	A, H, L				
280	284	BZ02	A, H, L						
400	404			BZ02	A, H, L				
560	564	BZ02	A, H, L						
1000	105			BZ12	A, H, L				

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS
COMPLIANT

B-SERIES – LOW PROFILE

Capacitance		Rated Voltage DC at 25°C											
mF	Code	3.6V		4.5V		5.5V		9.0V		12.0V		15.0V	
		Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles
6.8	682											BZ05	C, N, S
15	153			BZ09	N, S	BZ05	C, N, S			BZ01	A, H, S		
22	223			BZ05	N, S			BZ01	A, H, S				
30	303					BZ01	C, S						
33	333			BZ01	C, S	BZ05	S						
47	473			BZ15	N, S								
50	503	BZ01	C, S										
60	603					BZ01	A, H, S						
100	104	BZ11	C, S										

TLN PulseCap™ Series

Tantalum Solid Electrolytic Chip Capacitors

- Large case size for maximum capacitance
- 3x reflow 260°C compatible
- Low profile solution
- Consumer applications (e.g. PCMCIA/USB wireless express cards etc.)
- CV range: 1000-3300µF / 4-10V
- 2 case sizes available

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tlnpulse.pdf

HOW TO ORDER

TLN	6	228	M	006	R	0055
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier	**Tolerance** M = ±20%	**Rated DC Voltage** 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc	**Packaging** R = Lead Free 7" Reel	**ESR in mΩ**

Capacitance		Voltage Rating DC (V_R) to 85°C		
µF	Code	4V (G)	6.3V (J)	10V (A)
1000	108			4(100)/6(55)
1500	158		4(100)	6(55)
2200	228		6(55)	
3300	338	6(55)		

Available Codes (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

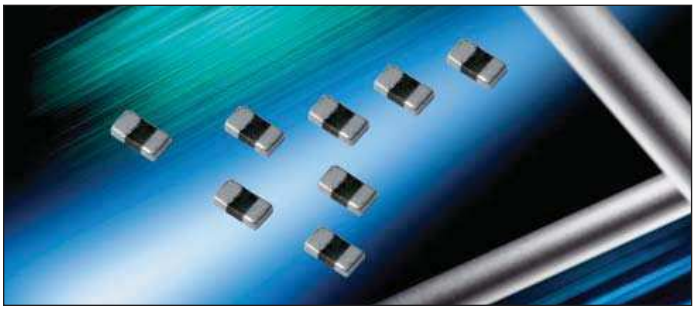
*Codes under development – subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

Sub pF Varistor

AVX Multilayer Ceramic Transient Voltage Suppressors

ESD Protection for any Circuit Sensitive to Capacitance



Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/aguard-sub.pdf

GENERAL DESCRIPTION

AVX offers ultra-low capacitance ESD protection in the Sub 1pF range for use in circuits that are sensitive to capacitance. The Sub pF Varistor (SPV) is available in 0.8pF and 0.4pF capacitance values in a compact 0402 low profile package. SPV devices provide excellent response time to ESD strikes to protect sensitive circuits from over voltage conditions.

The development of new information processing technologies call for ever increasing digital system speeds. Higher speeds necessitate the use of ultra-low capacitance values in order to minimize signal distortion.

FEATURES

- High Reliability
- Capacitance <1pF
- Bi-Directional protection
- Fastest response time to ESD strikes
- Multi-strike capability
- Low insertion loss
- Low profile 0402 case size

APPLICATIONS

- Antennas
- Optics
- HDMI
- RF circuits
- FlexRay
- Portable devices
- Analog sensors
- Any circuit sensitive to capacitance

HOW TO ORDER

VC	H4	AG	10	0R8	M	A	T	W	A
Varistor Chip	**Chip Size** Thin 0402	**Varistor Series** AntennaGuard	**Working Voltage** 10 = 10V 15 = 15V	**Capacitance** 0R8 = 0.8pF 0R4 = 0.47pF	**Tolerance** M = ±20%	**N/A**	**Termination** T = Ni/Sn Alloy	**Reel Size** W = 7"	**Reel Quantity** A = 10k

ANTENNAGUARD CATALOG PART NUMBERS/ELECTRICAL VALUES

AVX Part Number	V_W (DC)	V_B	I_L	Cap	Cap Tolerance	3db Freq (MHz)	Case Size
VCH4AG100R8MA	≤10	125	<10 nA	0.8	±20%	5800	LP 0402
VCH4AG150R8MA	≤15	125	<10 nA	0.96 pF Max	Max	5800	LP 0402
VCH4AG150R4MA	≤15	135	<100 nA	0.47 pF Max	±20%	6700	LP 0402

V_W (DC)	DC Working Voltage (V)
V_B	Typical Breakdown Voltage (V @ 1mA$_{DC}$)
I_L	Typical leakage current at the working voltage
Cap	Typical capacitance (pF) @ frequency specified and 0.5V$_{RMS}$
Freq	Frequency at which capacitance is measured (M = 1MHz)

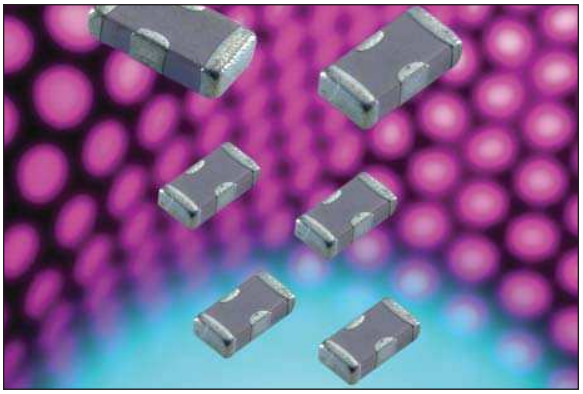
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

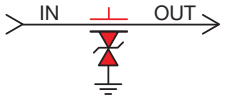
TransFeed, Feedthrough Filter

AVX Multilayer Ceramic Transient Voltage Suppressors

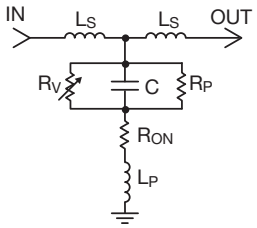
TVS Protection and EMI Attenuation in a Single Chip



Schematic Diagram



Electrical Model



AVX has combined the best electrical characteristics of its TransGuard® Transient Voltage Suppressors (TVS) and its Feedthru Capacitors into a single chip for state-of-the-art overvoltage circuit protection and EMI reduction over a broad range of frequencies. This unique combination of multilayer ceramic construction in a feedthru configuration gives the circuit designer a single 0805 chip that responds to transient events faster than any TVS device on the market today, and provides significant EMI attenuation when in the off-state.

The reduction in parallel inductance, typical of the feedthru chip construction when compared to the construction of standard TVS or ceramic capacitor chips, gives the TransFeed product two very important electrical advantages: (1) faster "turn-on" time. Calculated response times of <200 pSec are not unusual with this device, and measured response times range from 200 – 250 pSec; (2) the second electrical advantage of lower parallel inductance, coupled with optimal series inductance, is the enhanced attenuation characteristics of the TransFeed product. Typical applications include filtering/protection on Microcontroller I/O Lines, Interface I/O Lines, Power Line Conditioning and Power Regulation.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tfeed.pdf

HOW TO ORDER

V	2	F	1	05	A	150	Y	2	E	D	P
Varistor	**Chip Size** 2 = 0805 3 = 0612	**Feedthru Capacitor**	**No. of Elements**	**Voltage** 05 = 5.6VDC 09 = 9.0VDC 14 = 14.0VDC 18 = 18.0VDC	**Energy Rating** X = 0.05J A = 0.1J C = 0.3J	**Varistor Clamping Voltage** 150 = 18V 200 = 22V 300 = 32V 400 = 42V 500 = 50V	**Capacitance Tolerance** Y = +100/-50%	**DC Resistance** 1 = 0.150 Ohms 2 = 0.200 Ohms 3 = 0.250 Ohms	**Feedthru Current** D = 500 mA E = 750 mA F = 1.0 Amp	**Packaging Code Pcs./Reel** D = 1,000 R = 4,000 T = 10,000	**Termination Finish** P = Ni/Sn Alloy (Plated) M = Ni/Sn Pb (Plated)

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS
COMPLIANT

TRANSFEED ELECTRICAL SPECIFICATIONS

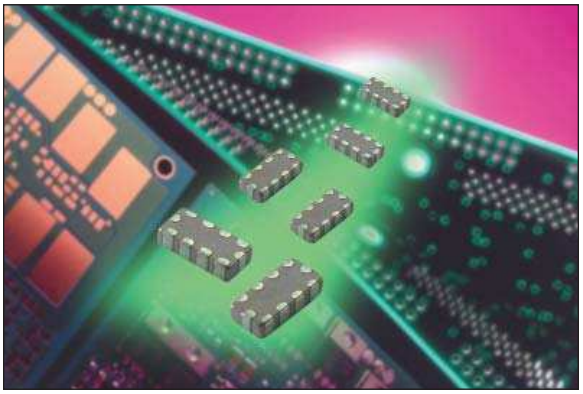
AVX Part Number	Working Voltage (DC)	Working Voltage (AC)	Breakdown Voltage	Clamping Voltage	Maximum Leakage Current	Transient Energy Rating	Peak Current Rating	Typical Cap	DC Resistance	Maximum Feedthru Current
V2F105A150Y2E _ _	5.6	4.0	8.5±20%	18	35	0.10	30	800	0.200	0.75
V2F105C150Y1F _ _	5.6	4.0	8.5±20%	18	35	0.30	120	2500	0.150	1.00
V2F109A200Y2E _ _	9.0	6.4	12.7±15%	22	25	0.10	30	575	0.200	0.75
V2F109C200Y1F _ _	9.0	6.4	12.7±15%	22	25	0.30	120	1800	0.150	1.00
V2F114A300Y2E _ _	14.0	10.0	18.5±12%	32	15	0.10	30	300	0.200	0.75
V2F114C300Y1F _ _	14.0	10.0	18.5±12%	32	15	0.30	120	900	0.150	1.00
V2F118A400Y2E _ _	18.0	13.0	25.5±10%	42	10	0.10	30	200	0.200	0.75
V2F118C400Y1F _ _	18.0	13.0	25.5±10%	42	10	0.30	120	500	0.150	1.00
V2F118X500Y3D _ _	18.0	13.0	25.5±10%	50	10	0.05	20	75	0.250	0.50

Termination Finish Code
Packaging Code

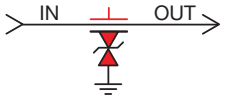
TransFeed Array Filter

AVX Multilayer Ceramic Transient Voltage Suppressors

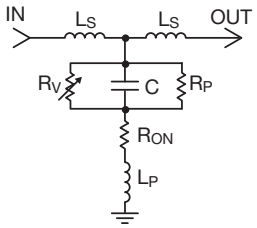
TVS Protection and EMI Attenuation in a Single Chip



Schematic Diagram



Electrical Model



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The reduction in parallel inductance, typical of the feedthru chip construction when compared to the construction of standard TVS or ceramic capacitor chips, gives the TransFeed product two very important electrical advantages: (1) faster "turn-on" time. Calculated response times of <200 pSec are not unusual with this device, and measured response times range from 200 – 250 pSec; (2) the second electrical advantage of lower parallel inductance, coupled with optimal series inductance, is the enhanced attenuation characteristics of the TransFeed product. Typical applications include filtering/protection on Microcontroller I/O Lines, Interface I/O Lines, Power Line Conditioning and Power Regulation.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tfeed.pdf

HOW TO ORDER

V	3	F	4	18	X	500	Y	3	G	D	P
Array	**Chip Size** 2 = 0805 3 = 0612	**Feedthru Capacitor**	**No. of Elements**	**Voltage** 18 = 18.0VDC	**Energy Rating** X = 0.05J A = 0.1J	**Varistor Clamping Voltage** 400 = 42V 500 = 50V	**Capacitance Tolerance** Y = +100/-50%	**DC Resistance** 3 = 0.250 Ohms	**Feedthru Current** G = 200 mA	**Packaging Code Pcs./Reel** D = 1,000 R = 4,000 T = 10,000	**Termination Finish** P = Ni/Sn Alloy (Plated) M = Ni/Sn Pb (Plated)

TRANSFEED ELECTRICAL SPECIFICATIONS

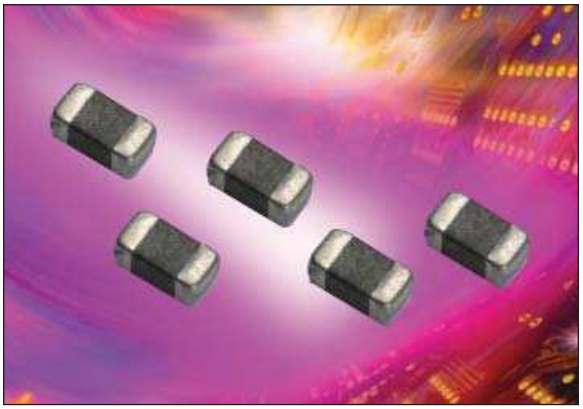
AVX Part Number	Working Voltage (DC)	Working Voltage (AC)	Breakdown Voltage	Clamping Voltage	Maximum Leakage Current	Transient Energy Rating	Peak Current Rating	Typical Cap	DC Resistance	Maximum Feedthru Current
V3F418A400Y3G _ _	18.0	13.0	25.5±10%	42	10	0.10	20	150	0.200	0.30
V3F418X500Y3G _ _	18.0	13.0	25.5±10%	50	10	0.05	15	65	0.250	0.20

Termination Finish Code
Packaging Code

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

TransGuard®
Transient Voltage Suppressors



TransGuard® acts as an EMI filter in the "off state" and a transient voltage suppressor in the "on state". They are bidirectional and therefore act as back to back zener diodes, but offer other advantages, for example, fast turn-on time (sub 1ns) and repetitive strike capability. Package options include EIA case sizes 0402, 0603, 0805, 1206, 1210, 1812 and 2220, as well as axial leaded configuration.

DESC drawing Series AA55562

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tguard.pdf

PART NUMBER IDENTIFICATION

Surface Mount Devices

Important: For part number identification only, not for construction of part numbers.
The information below only defines the numerical value of part number digits, and cannot be used to construct a desired set of electrical limits. Please refer to the TransGuard® part number data for the correct electrical ratings.

V — **Product Designator**
V = Varistor

C — **Case Style**
C = Chip

1206 — **Case Size Designator**

Size	Length	Width
0402	1.00±0.10mm (0.040"±0.004")	0.5±0.10mm (0.020"±0.004")
0603	1.60±0.15mm (0.063"±0.006")	0.8±0.15mm (0.032"±0.006")
0805	2.01±0.2mm (0.079"±0.008")	1.25±0.2mm (0.049"±0.008")
1206	3.20±0.2mm (0.126"±0.008")	1.60±0.2mm (0.063"±0.008")
1210	3.20±0.2mm (0.126"±0.008")	2.49±0.2mm (0.098"±0.008")

05 — **Working Voltage**
03 = 3.3 VDC
05 = 5.6 VDC
09 = 9.0 VDC
12 = 12.0 VDC
14 = 14.0 VDC
18 = 18.0 VDC
26 = 26.0 VDC
30 = 30.0 VDC
48 = 48.0 VDC
60 = 60.0 VDC

D — **Energy**
A = 0.1J
B = 0.2J
C = 0.3J
D = 0.4J
E = 0.5J
F = 0.7J
G = 0.9J
H = 1.2J
J = 1.5J
K = 0.6J
L = 0.8J
M = 1.0J
N = 1.1J
P = 3.0J
Q = 1.3J
R = 1.7J
S = 1.9-2.0J
T = 0.01J
U = 4.0-5.0J
V = 0.02J
W = 6.0J
X = 0.05J
Y = 12.0J
Z = 25.0J

150 — **Clamping* Voltage**
100 = 12V
150 = 18V
200 = 22V
250 = 27V
300 = 32V
390 = 42V
400 = 42V
500 = 50V
560 = 60V
580 = 60V
620 = 67V
650 = 67V
101 = 100V
121 = 120V

R — **Packaging (Pcs/Reel)**

Style	"D"	"R"	"T"	"W"
VC0402	N/A	N/A	N/A	10,000
VC0603	1,000	4,000	10,000	N/A
VC0805	1,000	4,000	10,000	N/A
VC1206	1,000	4,000	10,000	N/A
VC1210	1,000	2,000	10,000	N/A

M — **Termination Finish**
M = Ni/Sn Pb (Plated)

Marking
All standard surface mount TransGuard® chips will **not** be marked.

ELECTRICAL CHARACTERISTICS RANGE

Range	Working Voltage (DC)	Breakdown Voltage	Clamping Voltage	Test Current For V_c	Maximum Leakage Current	Transient Energy Rating	Peak Current Rating	Typical Cap
Lowest Value	3.3	5.0±20%	12	1	100	0.05	20	65
Highest Value	65	82.0±10%	135	10	10	4.80	800	5000

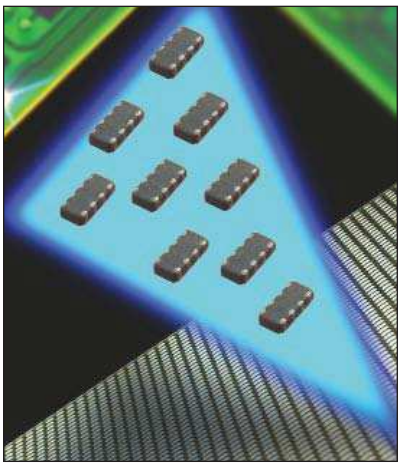
* Please check the AVX website for actual clamping to working voltage available on these devices.

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

MultiGuard TVS Array

AVX Multilayer Ceramic Transient Voltage Suppression Arrays – ESD Protection for CMOS and Bi Polar Systems



AVX's Transient Voltage Suppression (TVS) Arrays address six trends in today's electronic circuits: (1) mandatory ESD protection, (2) mandatory EMI control, (3) signal integrity improvement, (4) PCB downsizing, (5) reduced component placement costs, and (6) protection from induced slow speed transient voltages and currents.

AVX's MultiGuard products offer numerous advantages, which include a faster turn-on-time (<1nS), repetitive strike capability, and space savings. In some cases, MultiGuard consumes less than 75% of the PCB real estate required for the equivalent number of discrete chips. This size advantage, coupled with the savings associated with placing only one chip, makes MultiGuard the TVS component of choice for ESD protection of I/O lines in portable equipment and programming ports in cellular phones. Other applications include differential data line protection, ASIC protection and LCD driver protection for portable computing devices.

Where multiple lines require the ESD protection, the 4-element 0612 or 0508 chip is an ideal solution. While the 2-element 0405 MultiGuard is the smallest TVS array, the 4-element 0508 MultiGuard is the smallest 4-element TVS device available in the market today.

Available with standard working voltage of 5.6V up to 18V with low capacitance in the 3 case sizes, AVX MultiGuard arrays offer a very broad range of integrated TVS solutions to the design community.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tguard.pdf

HOW TO ORDER

MG	04	2	L	14	A	300	T	P
MultiGuard	**Case Size** 04 = 0405 05 = 0508 06 = 0612	**Configuration** 2 = 2 Elements 4 = 4 Elements	**Style** S = Standard Construction L = Low Capacitance	**Working Voltage** 05 = 5.6VDC 09 = 9.0VDC 14 = 14.0VDC 18 = 18.0VDC	**Energy Rating** A = 0.10 Joules V = 0.02 Joules X = 0.05 Joules	**Clamping Voltage** 150 = 18V 200 = 22V 300 = 32V 400 = 42V 500 = 50V	**Packaging** (PCS/REEL) D = 1,000 R = 4,000 T = 10,000	**Termination Finish** P = Ni/Sn Alloy (Plated) M = Ni/Sn Pb (Plated)

ELECTRICAL CHARACTERISTICS PER ELEMENT

	AVX Part Number	Working Voltage (DC)	Working Voltage (AC)	Breakdown Voltage	Clamping Voltage	Test Current For V_c	Maximum Leakage Current	Transient Energy Rating	Peak Current Rating	Typical Cap
2 **Element** 0405 **Chip**	MG042S05X150 _ _	5.6	4.0	8.5±20%	18	1	35	0.05	15	300
	MG042L14V400 _ _	14.0	10.0	18.5±12%	32	1	15	0.02	15	45
	MG042L18V500 _ _	18.0	14.0	N/A	50	1	10	0.02	15	40
2 **Element** 0508 **Chip**	MG052S05A150 _ _	5.6	4.0	8.5±20%	18	1	35	0.10	30	825
	MG052S09A200 _ _	9.0	6.4	12.7±15%	22	1	25	0.10	30	550
	MG052S14A300 _ _	14.0	10.0	19.5±12%	32	1	15	0.10	30	425
	MG052S18A400 _ _	18.0	14.0	25.5±10%	42	1	10	0.10	30	225
	MG052L18X500 _ _	≤18.0	≤14.0	N/A	50	1	10	0.10	20	50
4 **Element** 0508 **Chip**	MG054S05X150 _ _	5.6	4.0	8.5±20%	18	1	35	0.05	15	400
	MG054S09X200 _ _	9.0	6.4	12.7±15%	22	1	25	0.05	15	300
	MG054S14X300 _ _	14.0	10.0	19.5±12%	32	1	15	0.05	15	150
	MG054S18X400 _ _	18.0	14.0	25.5±10%	42	1	10	0.05	15	120
	MG054L18V500 _ _	≤18.0	≤14.0	N/A	50	1	10	0.02	15	50
4 **Element** 0612 **Chip**	MG064S05A150 _ _	5.6	4.0	8.5±20%	18	1	35	0.10	30	825
	MG064S09A200 _ _	9.0	6.4	12.7±15%	22	1	25	0.10	30	550
	MG064S14A300 _ _	14.0	10.0	19.5±12%	32	1	15	0.10	30	425
	MG064S18A400 _ _	18.0	14.0	25.5±10%	42	1	10	0.05	15	120
	MG064L18X500 _ _	≤18.0	≤14.0	N/A	50	1	10	0.10	20	75

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

└ Termination Finish Code
└ Packaging Code

V_W (DC)	DC Working Voltage (V)
V_W (AC)	AC Working Voltage (V)
V_B	Typical Breakdown Voltage (V @ 1mA$_{DC}$)
V_B Tol	V_B Tolerance is ± from Typical Value
V_C	Clamping Voltage (V @ I_{VC})
I_{VC}	Test Current for V_C (A, 8x20µS)
I_L	Maximum Leakage Current at the Working Voltage (µA)
E_T	Transient Energy Rating (J, 10x1000µS)
I_P	Peak Current Rating (A, 8x20µS)
Cap	Typical Capacitance (pF) @ 1MHz and 0.5 V_{RMS}

NB12, Surface Mount Thermistors

NC 12 – NC 20

Chip thermistors are a high quality and low cost device especially developed for surface mounting applications. They are widely used for temperature compensation but can also achieve temperature control of printed circuits. Its silver - palladium - platinum metallization provides a high degree of resistance to dewetting of the terminations during soldering (typically 260°C / 30 s).

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/nb12-20.pdf

HOW TO ORDER

NC 20	K 0	0103	M	BA
Type	**Material Code** K	**Resistance** 10,000 Ω	**Tolerance** M (±20%) J (±5%) K (±10%)	**Suffix: Packaging** – –: Bulk BA: Plastic tape (180mm diam. reel) BE: Plastic tape (1/2 reel) BC: Plastic tape (330mm diam. reel) BB: Cardboard tape (180mm diam. reel) BF: Cardboard tape (1/2 reel) BD: Cardboard tape (330mm diam. reel)

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

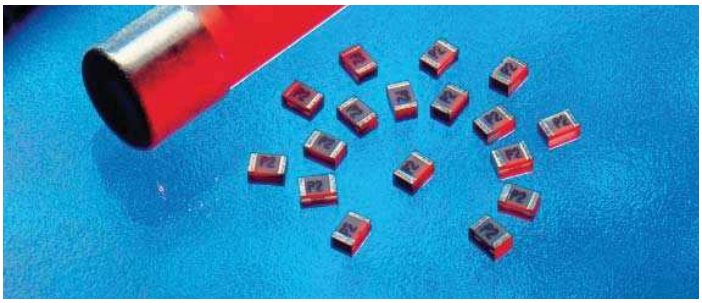
RoHS
COMPLIANT

TABLE OF VALUES (Min/Max)

NC 12 IEC SIZE : 0805				
Types	**Rn at 25°C (Ω)**	**Material Code**	**B (K) ($\Delta B/B$ (1) ± 5% (2) ± 3%)**	**α at 25°C (%/°C)**
NC 12 KC 0 180 NC 12 KC 0 101	18 100	KC	3470 ± 5%	– 3.9
NC 12 MC 0 121 NC 12 MC 0 332	120 3,300	MC	3910 ± 3%	– 4.4
NC 12 J 0 0332 NC 12 J 0 0562	3,300 5,600	J	3480 ± 3%	– 3.9
NC 12 K 0 0682 NC 12 K 0 0123	6,800 12,000	K	3630 ± 3%	– 4.0
NC 12 L 0 0153 NC 12 L 0 0183	15,000 18,000	L	3790 ± 3%	– 4.2
NC 12 M 0 0223 NC 12 M 0 0393	22,000 39,000	M	3950 ± 3%	– 4.4
NC 12 N 0 0473 NC 12 N 0 0563	47,000 56,000	N	4080 ± 3%	– 4.6
NC 12 L 2 0683	68,000	L2	3805 ± 3%	– 4.1
NC 12 N 0 0823	82,000	N	4080 ± 3%	– 4.6
NC 12 P 0 0104 NC 12 P 0 0184	100,000 180,000	P	4220 ± 3%	– 4.7
NC 12 Q 0 0224	220,000	Q	4300 ± 3%	-4.7

NC 20 IEC SIZE : 1206				
Types	**Rn at 25°C (Ω)**	**Material Code**	**B (K) ($\Delta B/B$ (1) ± 5% (2) ± 3%)**	**α at 25°C (%/°C)**
NC 20 KC 0 100 NC 20 KC 0 101	10 100	KC	3470 ± 5%	– 3.9
NC 20 MC 0 121 NC 20 MC 0 152	120 1,500	MC	3910 ± 3%	– 4.4
NC 20 I 0 0182 NC 20 I 0 0332	1,800 3,300	I	3250 ± 5%	– 3.7
NC 20 J 0 0392 NC 20 J 0 0682	3,900 6,800	J	3480 ± 3%	– 3.9
NC 20 K 0 0822 NC 20 K 0 0153	8,200 15,000	K	3630 ± 3%	– 4.0
NC 20 L 0 0183 NC 20 L 0 0223	18,000 22,000	L	3790 ± 3%	– 4.2
NC 20 M 0 0273 NC 20 M 0 0473	27,000 47,000	M	3950 ± 3%	– 4.4
NC 20 N 0 0563 NC 20 N 0 0104	56,000 100,000	N	4080 ± 3%	– 4.6
NC 20 P 0 0124 NC 20 P 0 0224	120,000 220,000	P	4220 ± 3%	– 4.7
NC 20 Q 0 0274 NC 20 Q 0 0474	270,000 470,000	Q	4300 ± 3%	– 4.7
NC 20 R 0 0564 NC 20 R 0 0105	560,000 1,000,000	R	4400 ± 3%	– 4.8

Surface Mount Fuse



Accu-Guard® II is a version of Accu-Guard® fuses for a wider range of current and voltage ratings. Constructed on alumina substrates, Accu-Guard® II fuses display superior electrical, mechanical and environmental properties.Accu-Guard® II dimensions are standard 0402, 0603, 0805, 1206 and 0612 chip sizes.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/fuses.pdf

HOW TO ORDER

F	1206	A	0R20	F	W	TR
Product Fuse	**Size** See table for standard sizes	**Fuse Version** A=Accu-Guard® B=Accu-Guard® II C=Accu-Guard® II 0603 D=Accu-Guard® II 0612 E=Accu-Guard® II 0402, 0603	**Rated Current** Current expressed in Amps. Letter R denotes decimal point. e.g. 0.20A=0R20 1.75A=1R75	**Fuse Speed** F=Fast	**Termination** S=Nickel/Lead Free Solder coated (Sn 100) W=Nickel/solder coated (Sn 63, Pb 37)	**Packaging** TR=Tape and reel

RoHS COMPLIANT

Please select correct termination style.

Type	Part Number	Current Rating A	Resistance 10% x I rated, 25°C Ω (max.)	Voltage Drop @1 x I rated, 25°C mV (max.)	Fusing Current (within 5 sec), 25°C A	Pre-Arc I^2t @ 50A A^2-sec	Rated Voltage V
F0402E	F0402E0R25FSTR	0.25	0.650	220	0.625	0.00005*	32
	F0402E0R50FSTR	0.50	0.250	180	1.25	0.0003	32
	F0402E0R75FSTR	0.75	0.200	180	1.875	0.003	32
	F0402E1R00FSTR	1.00	0.130	160	2.50	0.008	32
	F0402E1R50FSTR	1.50	0.060	140	3.75	0.03	32
	F0402E2R00FSTR	2.00	0.040	120	5.00	0.06	32
F0603E	F0603E0R25FSTR	0.25	0.650	220	0.625	0.00005*	32
	F0603E0R37FSTR	0.375	0.450	220	0.940	0.0001	32
	F0603E0R50FSTR	0.50	0.250	180	1.25	0.0003	32
	F0603E0R75FSTR	0.75	0.200	180	1.875	0.003	32
	F0603E1R00FSTR	1.00	0.130	160	2.50	0.008	32
	F0603E1R25FSTR	1.25	0.090	140	3.125	0.01	32
	F0603E1R50FSTR	1.50	0.060	140	3.75	0.03	32
	F0603E1R75FSTR	1.75	0.050	120	4.375	0.04	32
	F0603E2R00FSTR	2.00	0.040	120	5.00	0.06	32
	F0603E2R50FSTR	2.50	0.035	100	6.25	0.12	32
	F0603E3R00FSTR	3.00	0.030	100	7.50	0.25	32
F0603C	F0603C0R25FWTR	0.25	0.800	280	0.50	0.00003*	32
	F0603C0R37FWTR	0.375	0.500	280	0.75	0.0001	32
	F0603C0R50FWTR	0.50	0.320	280	1.00	0.0002	32
	F0603C0R75FWTR	0.75	0.300	280	1.50	0.0015	32
	F0603C1R00FWTR	1.00	0.200	240	2.00	0.004	32
	F0603C1R25FWTR	1.25	0.170	240	2.50	0.007	32
	F0603C1R50FWTR	1.50	0.110	240	3.00	0.012	32
	F0603C1R75FWTR	1.75	0.090	240	3.50	0.02	24
	F0603C2R00FWTR	2.00	0.075	240	4.00	0.03	24
	F0603C2R50FWTR	2.50	0.055	200	5.00	0.05	16
	F0603C3R00FWTR	3.00	0.045	200	6.00	0.1	16
F0805B	F0805B0R25FWTR	0.25	0.750	280	0.50	0.00003*	63
	F0805B0R50FWTR	0.50	0.350	280	1.00	0.0002	63
	F0805B0R75FWTR	0.75	0.270	280	1.50	0.001	63
	F0805B1R00FWTR	1.00	0.220	280	2.00	0.003	63
	F0805B1R25FWTR	1.25	0.170	280	2.50	0.007	63
	F0805B1R50FWTR	1.50	0.120	240	3.00	0.010	63
	F0805B2R00FWTR	2.00	0.080	220	4.00	0.030	63
	F0805B2R50FWTR	2.50	0.060	220	5.00	0.050	63
	F0805B3R00FWTR	3.00	0.050	220	6.00	0.10	63
F1206B	F1206B0R25FWTR	0.25	0.750	280	0.50	0.00003	63
	F1206B0R50FWTR	0.50	0.350	280	1.00	0.0002	63
	F1206B1R00FWTR	1.00	0.180	240	2.00	0.003	63
	F1206B1R50FWTR	1.50	0.120	240	3.00	0.010	63
	F1206B2R00FWTR	2.00	0.080	220	4.00	0.030	63
	F1206B3R00FWTR	3.00	0.050	220	6.00	0.10	63
F0612D	F0612D4R00FWTR	4.00	0.040	260	10	0.10	32
	F0612D5R00FWTR	5.00	0.025	200	12.5	0.25	32

*Current is limited to less than 50A at 32V due to internal fuse resistance.