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Version 1.5

The Latest CV Tables from the Leader  
in Capacitor Technology

This booklet is a quick reference guide which provides the very latest capacitor capability charts for a broad range of dielectrics available from AVX Corporation.

As a market leader in capacitor technology, AVX Corporation continues to develop new materials and process technology to expand our product portfolio. This document is intended to assist engineers in achieving the best possible design solution. Selection of the most appropriate capacitor technology, case size and other parametric options can help maximize system performance and cost-effectiveness.

We welcome any feedback and ideas you may have to improve this document and making it more useful to you. Please send any e-mail suggestions to: [avx@avxus.com](mailto:avx@avxus.com)

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MLC Chips

MLC  
Automotive

MLC  
High Voltage

MLC Low  
Inductance

Tantalum

Tantalum  
Automotive

OxiCap™  
Niobium Oxide

Film

RF/Microwave

Supercapacitors  
BestCap®

# MLCC with FLEXITERM™



## General Specifications



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

## HOW TO ORDER

**0805**



### Style

0603  
0805  
1206  
1210  
1812

**5**



### Voltage

6 = 6.3V  
Z = 10V  
Y = 16V  
3 = 25V  
5 = 50V  
1 = 100V  
2 = 200V

**C**



### Dielectric

C = X7R

**104**



### Capacitance Code (In pF)

2 Sig Digits +  
Number of Zeros  
e.g., 104 = 100nF

**K**



### Capacitance Tolerance

J = ±5%  
K = ±10%  
M = ±20%

**A**



### Failure Rate

A=Commercial  
4 = Automotive

**Z**



### Terminations

Z = FLEXITERM™

**2**



### Packaging

2 = 7" reel  
4 = 13" reel

**A**



### Special Code

A = Std. Product



Check for up-to-date CV Tables at

[http://www.avxcorp.com/prodinfo\\_catlist.asp?ParentID=185](http://www.avxcorp.com/prodinfo_catlist.asp?ParentID=185)

	0603					0805						1206					1210				1812			
	16V	25V	50V	100V	200V	10V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	16V	25V	50V	100V
101																								
121																								
151																								
181																								
221	J	J	J	J	J	J																		
271	J	J	J	J	J	J	J	J	J	J	J													
331	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J								
391	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J								
471	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J								
561	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J								
681	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J								
821	J	J	J	J	J	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	J								
152	J	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	J								
222	J	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	J								
332	J	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	J								
472	J	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	J								
682	J	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	J								
103	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J								
123	J	J	J	J	J	J	J	J	J	M														
153	J	J	J	J	J	J	J	J	J	M														
183	J	J	J	J	J	J	J	J	J	M														
223	J	J	J	J	J	J	J	J	J	M														
273	J	J	J	J	J	J	J	J	J	M														
333	J	J	J	J	J	J	J	J	J	M														
393	J	J	J	J	J	J	J	J	J	M														
473	J	J	J	J	J	J	J	J	J	M														
563	J	J	J	J	J	J	J	J	N															
683	J	J	J	J	J	J	J	J	N															
823	J	J	J	J	J	J	J	J	N															
104	J	J	J	J	J	J	J	J	N															
124						J	J	J	N															
154						M	M	N	N															
184						M	M	N	N															
224						M	M	N	N															
274						N	N	N	N															
334						N	N	N	N															
394						N	N	N	N															
474						N	N	N	N															
564						N	N	N	N															
684						N	N	N	N															
824						N	N	N	N															
105						N	N	N	N															
155						O	O	O	O															
185						O	O	O	O															
225						O	O	O	O															
335																								
475																								

  = Under development

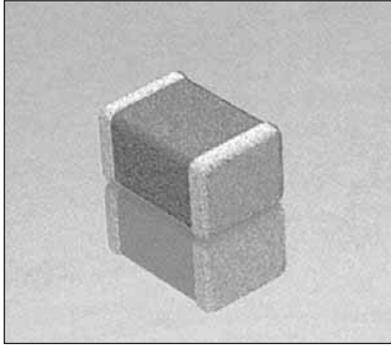
Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max.	0.33	0.56	0.71	0.86	0.94	1.02	1.27	1.40	1.52	1.78	2.29	2.54	2.79
Thickness	(0.013)	(0.022)	(0.028)	(0.034)	(0.037)	(0.040)	(0.050)	(0.055)	(0.060)	(0.070)	(0.090)	(0.100)	(0.110)
	PAPER						EMBOSSED						

**MLC Chips**



# COG (NP0) Dielectric

## General Specifications



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

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

The COG (NP0) formulation usually has a “Q” in excess of 1000 and shows little capacitance or “Q” changes with frequency. Their dielectric absorption is typically less than 0.6% which is similar to mica and most films.



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

## HOW TO ORDER

**0805**

**Size**  
(L" x W")

**5**

**Voltage**  
6.3V = 6  
10V = Z  
16V = Y  
25V = 3  
50V = 5  
100V = 1  
200V = 2  
500V = 7

**A**

**Dielectric**  
COG (NP0) = A

**101**

**Capacitance Code (In pF)**  
2 Sig. Digits +  
Number of  
Zeros

**J**

**Capacitance Tolerance**  
B =  $\pm 10 \text{ pF}$  ( $< 10 \text{ pF}$ )  
C =  $\pm 25 \text{ pF}$  ( $< 10 \text{ pF}$ )  
D =  $\pm 50 \text{ pF}$  ( $< 10 \text{ pF}$ )  
F =  $\pm 1\%$  ( $\geq 10 \text{ pF}$ )  
G =  $\pm 2\%$  ( $\geq 10 \text{ pF}$ )  
J =  $\pm 5\%$   
K =  $\pm 10\%$

**A**

**Failure Rate**  
A = Not  
Applicable

**T**

**Terminations**  
T = Plated Ni  
and Sn  
7 = Gold Plated

**Contact  
Factory For**  
1 = Pd/Ag Term

**2**

**Packaging**  
2 = 7" Reel  
4 = 13" Reel  
7 = Bulk Cass.  
9 = Bulk

**Contact  
Factory For  
Multiples**

**A**

**Special Code**  
A = Std. Product



# X8R Dielectric

## General Specifications



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

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**

**Size**  
0603  
0805  
1206

**5**

**Voltage**  
25V = 3  
50V = 5

**F**

**Dielectric**  
X8R = F

**104**

**Capacitance Code (in pF)**  
2 Sig. Digits +  
Number of Zeros  
e.g. 10 $\mu$ F = 106

**K**

**Capacitance Tolerance**  
J =  $\pm 5\%$   
K =  $\pm 10\%$   
M =  $\pm 20\%$

**4**

**Failure Rate**  
4 = Automotive  
A = Not Applicable

**T**

**Terminations**  
T = Plated Ni and Sn  
Z = FLEXITERM™  
U = Conductive Epoxy for Hybrid apps

**2**

**Packaging**  
2 = 7" Reel  
4 = 13" Reel

**A**

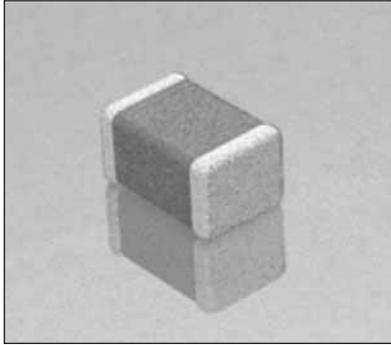
**Special Code**  
A = Std. Product

SIZE		0603		0805		1206	
	WVDC	25	50	25	50	25	50
Cap (pF)	270						
	330						
	470						
	680						
	1000						
	1500						
	1800						
	2200						
	2700						
	3300						
	3900						
	4700						
	5600						
	6800						
	8200						
Cap ( $\mu$ F)	0.01						
	0.012						
	0.015						
	0.018						
	0.022						
	0.027						
	0.033						
	0.039						
	0.047						
	0.056						
	0.068						
	0.082						
	0.1						
	0.12						
	0.15						
	0.18						
	0.22						
	0.27						
	0.33						
	0.39						
	0.47						
	WVDC	25	50	25	50	25	50
<b>SIZE</b>		<b>0603</b>		<b>0805</b>		<b>1206</b>	



# X7R Dielectric

## General Specifications



X7R formulations are called "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  $\pm 15\%$  from  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ . 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**

**Size**  
(L" x W")

**5**

**Voltage**  
 4V = 4  
 6.3V = 6  
 10V = Z  
 16V = Y  
 25V = 3  
 50V = 5  
 100V = 1  
 200V = 2  
 500V = 7

**C**

**Dielectric**  
X7R = C

**103**

**Capacitance Code (In pF)**  
 2 Sig. Digits +  
 Number of Zeros

**M**

**Capacitance Tolerance**  
 J =  $\pm 5\%$   
 K =  $\pm 10\%$   
 M =  $\pm 20\%$

**A**

**Failure Rate**  
 A = Not  
 Applicable

**T**

**Terminations**  
 T = Plated Ni  
 and Sn  
 7 = Gold  
 Plated

**2**

**Packaging**  
 2 = 7" Reel  
 4 = 13" Reel  
 7 = Bulk Cass.  
 9 = Bulk

**A**

**Special Code**  
 A = Std. Product

**Contact  
 Factory For  
 Multiples**

SIZE	0201				0402				0603				0805				1206				1210				1812				1825				2220				2225									
WDC	16	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	6.3	50	100	200	50	100	
Cap (pF)	A											J	J	J	J	J	J	J																												
100	A											J	J	J	J	J	J	J																												
150	A											J	J	J	J	J	J	J																												
220	A											J	J	J	J	J	J	J																												
330	A											J	J	J	J	J	J	J																												
470	A											J	J	J	J	J	J	J																												
680	A											J	J	J	J	J	J	J																												
1000	A											J	J	J	J	J	J	J																												
1500												J	J	J	J	J	J	J																												
2200												J	J	J	J	J	J	J																												
3300												J	J	J	J	J	J	J																												
4700												J	J	J	J	J	J	J																												
6800												J	J	J	J	J	J	J																												
Cap (µF)												J	J	J	J	J	J	J																												
0.010												J	J	J	J	J	J	J																												
0.015												J	J	J	J	J	J	J																												
0.022												J	J	J	J	J	J	J																												
0.033												J	J	J	J	J	J	J																												
0.047												J	J	J	J	J	J	J																												
0.068												J	J	J	J	J	J	J																												
0.10												J	J	J	J	J	J	J																												
0.15												J	J	J	J	J	J	J																												
0.22												J	J	J	J	J	J	J																												
0.33												J	J	J	J	J	J	J																												
0.47												J	J	J	J	J	J	J																												
0.68												J	J	J	J	J	J	J																												
1.0												J	J	J	J	J	J	J																												
1.5												J	J	J	J	J	J	J																												
2.2												J	J	J	J	J	J	J																												
3.3												J	J	J	J	J	J	J																												
4.7												J	J	J	J	J	J	J																												
10												J	J	J	J	J	J	J																												
22												J	J	J	J	J	J	J																												
47												J	J	J	J	J	J	J																												
100												J	J	J	J	J	J	J																												
WDC	16	16	25	50	6.3	10	16	25	50 <td>100<td>200</td> <td>6.3</td><td>10</td><td>16</td><td>25</td> <td>50<td>100<td>200</td> <td>6.3</td><td>10</td><td>16</td><td>25</td> <td>50<td>100<td>200</td><td>500</td> <td>10</td><td>16</td><td>25</td><td>50</td> <td>100<td>200</td><td>500</td> <td>50</td><td>100</td><td>200</td><td>500</td> <td>50</td><td>100</td><td>6.3</td><td>50</td> <td>100</td><td>200</td><td>50</td><td>100</td> </td></td></td></td></td></td>	100 <td>200</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>50<td>100<td>200</td> <td>6.3</td><td>10</td><td>16</td><td>25</td> <td>50<td>100<td>200</td><td>500</td> <td>10</td><td>16</td><td>25</td><td>50</td> <td>100<td>200</td><td>500</td> <td>50</td><td>100</td><td>200</td><td>500</td> <td>50</td><td>100</td><td>6.3</td><td>50</td> <td>100</td><td>200</td><td>50</td><td>100</td> </td></td></td></td></td>	200	6.3	10	16	25	50 <td>100<td>200</td> <td>6.3</td><td>10</td><td>16</td><td>25</td> <td>50<td>100<td>200</td><td>500</td> <td>10</td><td>16</td><td>25</td><td>50</td> <td>100<td>200</td><td>500</td> <td>50</td><td>100</td><td>200</td><td>500</td> <td>50</td><td>100</td><td>6.3</td><td>50</td> <td>100</td><td>200</td><td>50</td><td>100</td> </td></td></td></td>	100 <td>200</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>50<td>100<td>200</td><td>500</td> <td>10</td><td>16</td><td>25</td><td>50</td> <td>100<td>200</td><td>500</td> <td>50</td><td>100</td><td>200</td><td>500</td> <td>50</td><td>100</td><td>6.3</td><td>50</td> <td>100</td><td>200</td><td>50</td><td>100</td> </td></td></td>	200	6.3	10	16	25	50 <td>100<td>200</td><td>500</td> <td>10</td><td>16</td><td>25</td><td>50</td> <td>100<td>200</td><td>500</td> <td>50</td><td>100</td><td>200</td><td>500</td> <td>50</td><td>100</td><td>6.3</td><td>50</td> <td>100</td><td>200</td><td>50</td><td>100</td> </td></td>	100 <td>200</td> <td>500</td> <td>10</td> <td>16</td> <td>25</td> <td>50</td> <td>100<td>200</td><td>500</td> <td>50</td><td>100</td><td>200</td><td>500</td> <td>50</td><td>100</td><td>6.3</td><td>50</td> <td>100</td><td>200</td><td>50</td><td>100</td> </td>	200	500	10	16	25	50	100 <td>200</td> <td>500</td> <td>50</td> <td>100</td> <td>200</td> <td>500</td> <td>50</td> <td>100</td> <td>6.3</td> <td>50</td> <td>100</td> <td>200</td> <td>50</td> <td>100</td>	200	500	50	100	200	500	50	100	6.3	50	100	200	50	100	

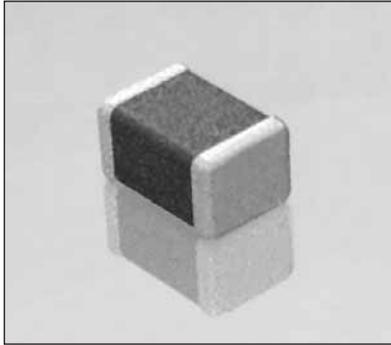
= Under development

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)	0.86 (0.034)	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							



# X5R Dielectric

## General Specifications



### GENERAL DESCRIPTION

- General Purpose Dielectric for Ceramic Capacitors
- EIA Class II Dielectric
- Temperature variation of capacitance is within  $\pm 15\%$  from  $-55^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Well suited for decoupling and filtering applications
- Available in High Capacitance values (up to  $100\mu\text{F}$ )



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

### HOW TO ORDER

**1210**

Size  
(L" x W")

**6**

Voltage  
4 = 4V  
6 = 6.3V  
Z = 10V  
Y = 16V  
3 = 25V  
D = 35V  
5 = 50V

**D**

Dielectric  
D = X5R

**107**

Capacitance  
Code (In pF)  
2 Sig. Digits +  
Number of Zeros

**M**

Capacitance  
Tolerance  
K =  $\pm 10\%$   
M =  $\pm 20\%$

**A**

Failure  
Rate  
A = N/A

**T**

Terminations  
T = Plated Ni  
and Sn

**2**

Packaging  
2 = 7" Reel  
4 = 13" Reel  
7 = Bulk Cass.  
9 = Bulk

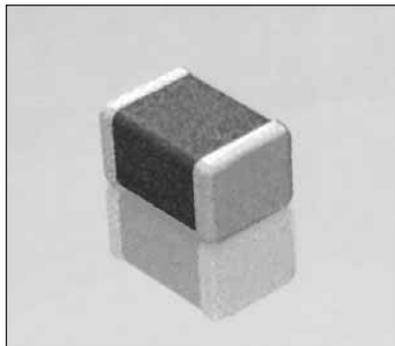
**A**

Special  
Code  
A = Std.



# X7S Dielectric

## General Specifications



### GENERAL DESCRIPTION

X7S formulations are called “temperature stable” ceramics and fall into EIA Class II materials. X7S is the most popular of these intermediate dielectric constant materials. Its temperature variation of capacitance is within  $\pm 22\%$  from  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ . 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.avxcorp.com/docs/Catalogs/cx7s.pdf>

### HOW TO ORDER

**1206**

Size  
(L" x W")

**Z**

Voltage  
4 = 4V  
6 = 6.3V  
Z = 10V  
Y = 16V  
3 = 25V  
5 = 50V  
1 = 100V  
2 = 200V

**Z**

Dielectric  
Z = X7S

**105**

Capacitance  
Code (In pF)  
2 Sig. Digits +  
Number of Zeros

**M**

Capacitance  
Tolerance  
K =  $\pm 10\%$   
M =  $\pm 20\%$

**A**

Failure  
Rate  
A = N/A

**T**

Terminations  
T = Plated Ni  
and Sn

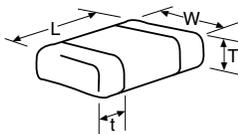
**2**

Packaging  
2 = 7" Reel  
4 = 13" Reel  
7 = Bulk Cass.

**A**

Special  
Code  
A = Std.  
Product

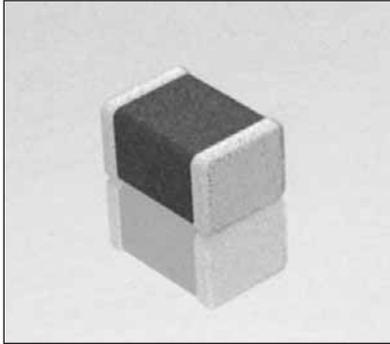
SIZE	0402		0603		0805		1206		1210	
WDC	6.3		6.3	25	4		6.3	10		6.3
Cap (pF)	100									
	150									
	220									
	330									
	470									
	680									
	1000									
	1500									
	2200									
	3300									
	4700									
	6800									
Cap (μF)	0.010									
	0.015									
	0.022									
	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									
WDC	6.3		6.3	25	4		6.3	10		6.3
SIZE	0402		0603		0805		1206			1210



Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max.	0.33	0.56	0.71	0.86	0.94	1.02	1.27	1.40	1.52	1.78	2.29	2.54	2.79
Thickness	(0.013)	(0.022)	(0.028)	(0.034)	(0.037)	(0.040)	(0.050)	(0.055)	(0.060)	(0.070)	(0.090)	(0.100)	(0.110)
	PAPER					EMBOSSED							

# Y5V Dielectric

## General Specifications



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**

**Size**  
(L" x W")

**3**

**Voltage**  
6.3V = 6  
10V = Z  
16V = Y  
25V = 3  
50V = 5

**G**

**Dielectric**  
Y5V = G

**104**

**Capacitance Code (in pF)**  
2 Sig. Digits +  
Number of Zeros

**Z**

**Capacitance Tolerance**  
Z = +80 -20%

**A**

**Failure Rate**  
A = Not  
Applicable

**T**

**Terminations**  
T = Plated Ni  
and Sn

**2**

**Packaging**  
2 = 7" Reel  
4 = 13" Reel

**A**

**Special Code**  
A = Std. Product

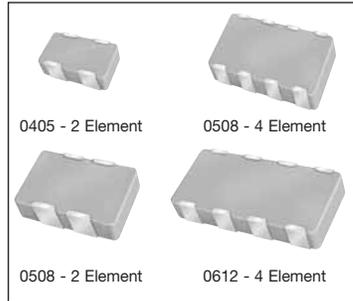
SIZE	0201		0402			0603				0805				1206				1210				
WDC	6.3	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	
Cap (pF)	820																					
	1000		A																			
	2200		A																			
Cap (μF)	4700		A																			
	0.010	A	A																			
	0.022	A		C	C	C																
	0.047	A		C																		
	0.10			C																		
	0.22																					
	0.47																					
	1.0																					
	2.2																					
	4.7																					
	10.0																					
	22.0																					
	47.0																					
WDC	6.3	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	

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)	0.86 (0.034)	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							



# Capacitor Array

## Capacitor Array (IPC)



### GENERAL DESCRIPTION

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 (COG) 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.

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/array.pdf>

### HOW TO ORDER (Capacitor Array - IPC)

<b>W</b>	<b>2</b>	<b>A</b>	<b>4</b>	<b>3</b>	<b>C</b>	<b>103</b>	<b>M</b>	<b>A</b>	<b>T</b>	<b>2A</b>
<b>Style</b>	<b>Case Size</b>	<b>Array</b>	<b>Number of Caps</b>	<b>Voltage</b>	<b>Dielectric</b>	<b>Capacitance Code (In pF)</b>	<b>Capacitance Tolerance</b>	<b>Failure Rate</b>	<b>Termination Code</b>	<b>Packaging &amp; Quantity Code</b>
	1 = 0405 2 = 0508 3 = 0612			Z = 10V Y = 16V 3 = 25V 5 = 50V 1 = 100V	A = NP0 C = X7R D = X5R	2 Sig. Digits + No. of Zeros	J = ±5% K = ±10% M = ±20%	A=Commercial 4=Automotive	T=Ni Barrier	2A = 7" Reel (4000) 4A = 13" Reel (10000) 2F = 7" Reel (1000)

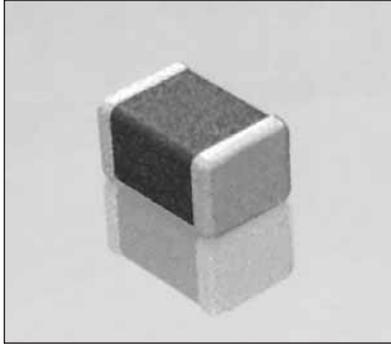
### HOW TO ORDER (Multi-Value Capacitor Array - IPC)

<b>W</b>	<b>2</b>	<b>A</b>	<b>2</b>	<b>Y</b>	<b>C</b>	<b>102M</b>	<b>104M</b>	<b>A</b>	<b>T</b>	<b>2A</b>
<b>Style</b>	<b>Case Size</b>	<b>Array</b>	<b>Number of Caps</b>	<b>Voltage</b>	<b>Dielectric</b>	<b>Capacitance Code (In pF)</b>	<b>Capacitance Tolerance</b>	<b>Failure Rate</b>	<b>Termination Code</b>	<b>Packaging &amp; Quantity Code</b>
	1 = 0405 2 = 0508 3 = 0612			Z = 10V Y = 16V 3 = 25V 5 = 50V 1 = 100V	A = NP0 C = X7R D = X5R	2 Sig. Digits + No. of Zeros	K = ±10% M = ±20%		T = Ni Barrier	2A = 7" Reel (4000) 4A = 13" Reel (10000) 2F = 7" Reel (1000)



# MLCC Tin/Lead Termination “B”

## General Specifications



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 currently offering in this special “B” termination. 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.avxcorp.com/docs/Catalogs/tinterm.pdf>

## HOW TO ORDER

<b>LD05</b>	<b>5</b>	<b>A</b>	<b>101</b>	<b>J</b>	<b>A</b>	<b>B</b>	<b>2</b>	<b>A</b>
<b>Size</b>	<b>Voltage</b>	<b>Dielectric</b>	<b>Capacitance Code (In pF)</b>	<b>Capacitance Tolerance</b>	<b>Failure Rate</b>	<b>Terminations</b>	<b>Packaging</b>	<b>Special Code</b>
LD02 - 0402 LD03 - 0603 LD04 - 0504 LD05 - 0805 LD06 - 1206 LD10 - 1210 LD12 - 1812 LD13 - 1825 LD14 - 2225	6.3V = 6 10V = Z 16V = Y 25V = 3 50V = 5 100V = 1 200V = 2 500V = 7	COG (NP0) = A X7R = C X5R = D	2 Sig. Digits + Number of Zeros	B = ±.10 pF (<10pF) C = ±.25 pF (<10pF) D = ±.50 pF (<10pF) F = ±1% (≥ 10 pF) G = ±2% (≥ 10 pF) J = ±5% K = ±10% M = ±20%	A = Not Applicable	B = 5% min lead	2 = 7" Reel 4 = 13" Reel 7 = Bulk Cass. 9 = Bulk	A = Std. Product
							<b>Contact Factory For Multiples</b>	

1) LICC Tin/Lead Termination “B” are listed under Low Inductance Capacitor section.  
 2) High Voltage Tin/Lead Termination “B” are listed under High Voltage MLC Chips section.







# Automotive MLCC

## Automotive



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 AECQ200 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**

**Size**  
0603  
0805  
1206  
1210  
1812

**5**

**Voltage**  
10V = Z  
16V = Y  
25V = 3  
50V = 5  
100V = 1  
200V = 2

**C**

**Dielectric**  
NP0 = A  
X7R = C

**104**

**Capacitance Code (In pF)**  
2 Significant Digits +  
Number of Zeros  
e.g. 10 $\mu$ F = 106

**K**

**Capacitance Tolerance**  
J =  $\pm 5\%$   
K =  $\pm 10\%$   
M =  $\pm 20\%$

**4**

**Failure Rate**  
4 = **Automotive**

**T**

**Terminations**  
T = Plated Ni and Sn  
Z = FLEXITERM™  
U = Conductive Epoxy

**2**

**Packaging**  
2 = 7" Reel  
4 = 13" Reel

**A**

**Special Code**  
A = Std. Product

# AUTOMOTIVE MLCC – NPO

	0603			0805			1206					1210				1812	
	25V	50V	100V	25V	50V	100V	25V	50V	100V	200V	500V	25V	50V	100V	200V	50V	100V
R47																	
R51																	
R56																	
R62																	
R68																	
R70																	
R82																	
R91																	
R90																	
1R2																	
1R5																	
1R8																	
2R3																	
2R5																	
2R4																	
2R7																	
3R0																	
3R3																	
3R6																	
4R9																	
4R7																	
5R1																	
5R6																	
6R2																	
6R8																	
7R5																	
8R2																	
9R1																	
100																	
120																	
150																	
180																	
220																	
270																	
330																	
390																	
470																	
510																	
560																	
680																	
820																	
101																	
121																	
151																	
181																	
221																	
271																	
331																	
381																	
471																	
561																	
681																	
821																	
102																	
122																	
152																	
182																	
222																	
272																	
332																	
382																	
472																	
562																	
682																	
822																	
103																	
	25V	50V	100V	25V	50V	100V	25V	50V	100V	200V	500V	25V	50V	100V	200V	50V	100V
	0603			0805			1206					1210				1812	

 = Paper Tape  
 = Plastic Tape



**MLC**  
Automotive

# 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	500V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	50V
101																												
121																												
151																												
181																												
221																												
271	G	G	G	G		J	J	J	J																			
331	G	G	G	G		J	J	J	J	J	J																	
391	G	G	G	G		J	J	J	J	J	J																	
471	G	G	G	G		J	J	J	J	J	J																	
561	G	G	G	G		J	J	J	J	J	J																	
681	G	G	G	G		J	J	J	J	J	J																	
821	G	G	G	G		J	J	J	J	J	J																	
102	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	K	K	K	K							
122	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J		K	K	K	K							
152	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J		K	K	K	K							
182	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J		K	K	K	K							
222	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J		K	K	K	K							
272	G	G	G	G		J	J	J	J	J		J	J	J	J	J		K	K	K	K							
332	G	G	G	G		J	J	J	J	J		J	J	J	J	J		K	K	K	K							
392	G	G	G	G		J	J	J	J	J		J	J	J	J	J		K	K	K	K							
472	G	G	G	G		J	J	J	J	J		J	J	J	J	J		K	K	K	K							
562	G	G	G	G		J	J	J	J	J		J	J	J	J		K	K	K	K								
682	G	G	G	G		J	J	J	J	J		J	J	J	J		K	K	K	K								
822	G	G	G	G		J	J	J	J	J		J	J	J	J		K	K	K	K								
103	G	G	G	G		J	J	J	J	J		J	J	J	J		K	K	K	K		K	K	K	K			
	16V	25V	50V	100V	200V	10V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	500V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	50V
	<b>0603</b>					<b>0805</b>					<b>1206</b>					<b>1210</b>					<b>1812</b>					<b>2220</b>		

  = Under development



# 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	500V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	50V	
123	G	G	G			J	J	J	J	M		J	J	J	J			K	K	K	K		K	K	K	K			
153	G	G	G			J	J	J	J	M		J	J	J	J			K	K	K	K		K	K	K	K			
183	G	G	G			J	J	J	J	M		J	J	J	J			K	K	K	K		K	K	K	K			
223	G	G	G			J	J	J	J	M		J	J	J	J			K	K	K	K		K	K	K	K			
273	G	G	G			J	J	J	J	M		J	J	J	J			K	K	K	K		K	K	K	K			
333	G	G	G			J	J	J	J	M		J	J	J	J			K	K	K	K		K	K	K	K			
393	G	G				J	J	J	J	M		J	J	J	M			K	K	K	K		K	K	K	K			
473	G	G				J	J	J	J	M		J	J	J	M			K	K	K	K		K	K	K	K			
563	G					J	J	J	J	N		J	J	J	M			K	K	K	M		K	K	K	K			
683	G					J	J	J	J	N		J	J	J	M			K	K	K	M		K	K	K	K			
823	G					J	J	J	J	N		J	J	J	M			K	K	K	M		K	K	K	K			
104	G					J	J	J	J	N		J	J	J	M			K	K	K	M		K	K	K	K			
124						J	J	J	N			J	J	M	M			K	K	K	P		K	K	K	K			
154						M	M	N	N			J	J	M				K	K	K	Q		K	K	K	M			
184						M	M	N	N			J	M	M				M	M	M	Q		K	K	K	M			
224						M	M	N	N			J	M	M				M	M	M	Q		M	M	M	M			
274						N	N	N	N			J	M					P	P	P	Q		M	M	M	M			
334						N	N	N	N			J	M					P	P	P	Q		X	X	X	X			
394						N	N	N	N			M	M					P	P	P	Q		X	X	X	X			
474						N	N	N	N			M	M					P	P	P	Q		X	X	X	X			
564						N	N	N				M	Q					P	Q	Q	Q		X	X	X				
684						N	N	N				M	Q					P	X	X	X		X	X	X				
824						N	N	N				M	Q					P	Z	Z	Z		X	X	X				
105						N	N	N				M	Q					P	Z	Z	Z		X	X	X				
155												Q	Q					P	Z	Z			Z	Z	Z				
225												Q	Q					Z	Z	Z			Z	Z	Z				
335																		Z	Z	Z			Z	Z	Z				
475																		Z	Z	Z			Z	Z	Z				
106																													
	16V	25V	50V	100V	200V	10V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	500V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	50V	
	0603					0805					1206					1210					1812					2220			

  = Under development

# Automotive Plus Series / APS



## Automotive



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.

## HOW TO ORDER

<b>AP03</b>	<b>5</b>	<b>C</b>	<b>104</b>	<b>K</b>	<b>Q</b>	<b>T</b>	<b>2</b>	<b>A</b>
<b>Size</b>	<b>Voltage</b>	<b>Dielectric</b>	<b>Capacitance Code (In pF)</b>	<b>Capacitance Tolerance</b>	<b>Failure Rate Q = APS</b>	<b>Terminations</b>	<b>Packaging</b>	<b>Special Code</b>
AP03=0603 AP05=0805 AP06=1206 AP10=1210 AP12=1812	16V = Y 25V = 3 50V = 5 100V = 1 200V = 2 500V = 7	NP0 = A X7R = C	2 Significant Digits + Number of Zeros e.g. 10µF = 106	J = ±5% K = ±10% M = ±20%		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

# APS MLCC – NPO

	0603			0805			1206					1210				1812	
	25V	50V	100V	25V	50V	100V	25V	50V	100V	200V	500V	25V	50V	100V	200V	50V	100V
R47																	
R51																	
R56																	
R62																	
R68																	
R70																	
R82																	
R91																	
R90																	
1R2																	
1R5																	
1R8																	
2R3																	
2R5																	
2R4																	
2R7																	
3R0																	
3R3																	
3R6																	
4R3																	
4R7																	
5R1																	
5R6																	
6R2																	
6R8																	
7R5																	
8R0																	
9R1																	
100																	
120																	
150																	
180																	
220																	
270																	
300																	
390																	
470																	
510																	
560																	
680																	
820																	
101																	
121																	
151																	
181																	
221																	
271																	
331																	
381																	
471																	
561																	
681																	
821																	
102																	
122																	
152																	
182																	
222																	
272																	
332																	
382																	
472																	
562																	
682																	
822																	
103																	
	25V	50V	100V	25V	50V	100V	25V	50V	100V	200V	500V	25V	50V	100V	200V	50V	100V
	0603			0805			1206					1210				1812	

AEC-Q200 qualified  
TS 16949, ISO 9001 certified



 = Paper Tape  
 = Plastic Tape

# APS MLCC – X7R

	0603				0805						1206					1210				1812						
	16V	25V	50V	100V	10V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	500V	16V	25V	50V	100V	16V	25V	50V	100V		
101																										
121																										
151																										
181																										
221																										
271	G	G	G	G	J	J	J	J																		
331	G	G	G	G	J	J	J	J	J	J																
391	G	G	G	G	J	J	J	J	J	J																
471	G	G	G	G	J	J	J	J	J	J																
561	G	G	G	G	J	J	J	J	J	J																
681	G	G	G	G	J	J	J	J	J	J																
821	G	G	G	G	J	J	J	J	J	J																
102	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J										
122	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J											
152	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J											
182	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J											
222	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J											
272	G	G	G	G	J	J	J	J	J			J	J	J	J	J										
332	G	G	G	G	J	J	J	J	J			J	J	J	J	J										
392	G	G	G	G	J	J	J	J	J			J	J	J	J	J										
472	G	G	G	G	J	J	J	J	J			J	J	J	J	J										
562	G	G	G	G	J	J	J	J	J			J	J	J	J											
682	G	G	G	G	J	J	J	J	J			J	J	J	J											
822	G	G	G	G	J	J	J	J	J			J	J	J	J											
103	G	G	G	G	J	J	J	J	J			J	J	J	J											K
	16V	25V	50V	100V	10V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	500V	16V	25V	50V	100V	16V	25V	50V	100V		
	<b>0603</b>				<b>0805</b>						<b>1206</b>					<b>1210</b>				<b>1812</b>						

 = Paper Tape  
 = Plastic Tape

AEC-Q200 qualified  
 TS 16949, ISO 9001 certified



# APS MLCC – X7R

	0603				0805						1206					1210				1812				
	16V	25V	50V	100V	10V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	500V	16V	25V	50V	100V	16V	25V	50V	100V
123	G	G	G		J	J	J	J	M		J	J	J	J										K
153	G	G	G		J	J	J	J	M		J	J	J	J										K
183	G	G	G		J	J	J	J	M		J	J	J	J										K
223	G	G	G		J	J	J	J	M		J	J	J	J								K		K
273	G	G	G		J	J	J	J	M		J	J	J	J								K		K
333	G	G	G		J	J	J	J	M		J	J	J	J								K		K
393	G	G			J	J	J	J	M		J	J	J	M								K		K
473	G	G			J	J	J	J	M		J	J	J	M								K		K
563	G				J	J	J	J			J	J	J	M			K	K	K	M	K	K	K	K
683	G				J	J	J	J			J	J	J	M			K	K	K	M	K	K	K	K
823	G				J	J	J	J			J	J	J	M			K	K	K	M	K	K	K	K
104	G				J	J	J	J			J	J	J	M			K	K	K	M	K	K	K	K
124					J	J	J				J	J	M	M			K	K	K	P	K	K	K	K
154					J	M	N				J	J	M				K	K	K		K	K	K	M
184					J	M	N				J	M	M				M	M	M		K	K	K	M
224					J	M	N				J	M	M				M	M	M		M	M	M	M
274					J	N					J	M					P	P	P		M	M	M	M
334					J	N					J	M					P	P	P		X	X	X	X
394					J	N					M	M					P	P	P		X	X	X	X
474					J	N					M	M					P	P	P		X	X	X	X
564					J						M						P				X	X	X	
684					J						M						P				X	X	X	
824					J						M						P				X	X	X	
105					J						M						P				X	X	X	
155																	P							
	16V	25V	50V	100V	10V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	500V	16V	25V	50V	100V	16V	25V	50V	100V
	0603				0805						1206					1210				1812				

 = Paper Tape  
 = Plastic Tape

Letter	G	J	M	N	P	Q	X
Max.	0.86	0.94	1.27	1.40	1.52	1.78	2.29
Thickness	(0.034)	(0.037)	(0.050)	(0.055)	(0.060)	(0.070)	(0.090)

AEC-Q200 qualified  
 TS 16949, ISO 9001 certified

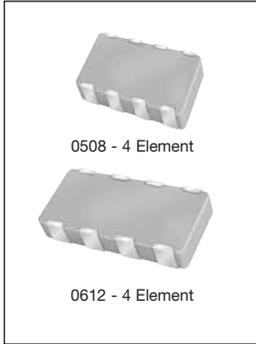


**MLC**  
**Automotive**

# Automotive Capacitor Array (IPC)



## General Specifications



## GENERAL DESCRIPTION

As the market leader in the development and manufacture of capacitor arrays AVX are 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 specification

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/TS16949:2002.



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

## HOW TO ORDER

<b>W</b>	<b>3</b>	<b>A</b>	<b>4</b>	<b>Y</b>	<b>C</b>	<b>104</b>	<b>K</b>	<b>4</b>	<b>T</b>	<b>2A</b>
<b>Style</b>	<b>Case Size</b>	<b>Array</b>	<b>Number of Caps</b>	<b>Voltage</b>	<b>Dielectric</b>	<b>Capacitance Code (In pF)</b>	<b>Capacitance Tolerance</b>	<b>Failure Rate</b>	<b>Termination Code</b>	<b>Packaging &amp; Quantity Code</b>
	2 = 0508 3 = 0612			6 = 6.3V Z = 10V Y = 16V 3 = 25V 5 = 50V 1 = 100V	A = NPO C = X7R	2 Sig. Digits + Number of Zeros e.g. 10 $\mu$ F=106	J = $\pm$ 5% K = $\pm$ 10% M = $\pm$ 20%	4 = Automotive	T = Plated Ni and Sn	2A = 7" Reel (4000) 4A = 13" Reel (10000) 2F = 7" Reel (1000)

## NP0/COG

SIZE	0508 (2 Elements)				0508 (4 Elements)				0612 (4 Elements)				
	WVDC	16	25	50	100	16	25	50	100	16	25	50	100
1R0	Cap 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												

  = Under development

  = NP0/COG

## X7R/X5R

SIZE	0508 (2 Elements)				0508 (4 Elements)				0612 (4 Elements)					
	WVDC	16	25	50	100	16	25	50	100	10	16	25	50	100
101	Cap 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 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													

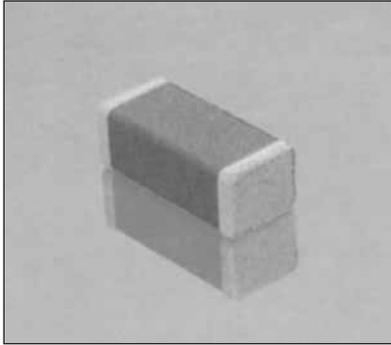
  = Under development

  = X7R/X5R



# High Voltage MLC Chips

For 600V to 5000V Application



High value, low leakage and small size are difficult parameters to obtain in capacitors for high voltage systems. AVX special high voltage MLC chips 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 chips. These larger sizes require that special precautions be taken in applying these chips in surface mount assemblies. This is due to differences in the coefficient of thermal expansion (CTE) between the substrate materials and chip capacitors. Apply heat at less than 4°C per second during the preheat. The preheat temperature must be within 50°C of the peak temperature reached by the ceramic bodies through the soldering process. Chips 1808 and larger to use reflow soldering only.

Capacitors with X7R Dielectrics are not intended for AC line filtering applications. Contact plant for recommendations. Capacitors may require protective surface coating to prevent external arcing.



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

## HOW TO ORDER

<b>1808</b>	<b>A</b>	<b>A</b>	<b>271</b>	<b>K</b>	<b>A</b>	<b>1</b>	<b>1</b>	<b>A</b>
<b>AVX Style</b>	<b>Voltage</b>	<b>Temperature Coefficient</b>	<b>Capacitance Code</b> (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 $\mu$ F = 105	<b>Capacitance Tolerance</b> COG: J = $\pm$ 5% K = $\pm$ 10% M = $\pm$ 20% X7R: K = $\pm$ 10% M = $\pm$ 20% Z = +80%, -20%	<b>Test Level</b> A = Standard	<b>Termination*</b> 1 = Pd/Ag T = NiGuard Nickel Barrier Solderable Plate	<b>Packaging</b> 1 = 7" Reel 3 = 13" Reel 9 = Bulk	<b>Special Code</b> A = Standard
1206 1210 1808 1812 1825 2220 2225 3640	600V = C 1000V = A 1500V = S 2000V = G 2500V = W 3000V = H 4000V = J 5000V = K	COG = A X7R = C						

\*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.

## HIGH VOLTAGE C0G CAPACITANCE VALUES

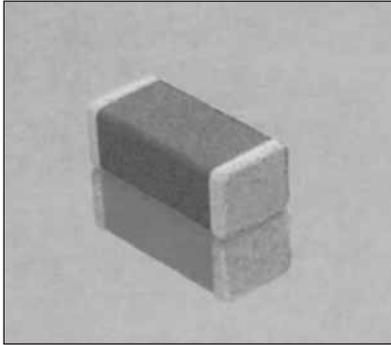
VOLTAGE		1206	1210	1808	1812	1825	2220	2225	3640
600	min.	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF
	max.	680 pF	1500 pF	2700 pF	5600 pF	0.012 $\mu$ F	0.012 $\mu$ F	0.015 $\mu$ F	0.047 $\mu$ F
1000	min.	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
	max.	470 pF	820 pF	1500 pF	2700 pF	6800 pF	0.010 $\mu$ F	0.010 $\mu$ F	0.018 $\mu$ F
1500	min.	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF	100 pF
	max.	150 pF	330 pF	470 pF	1000 pF	2700 pF	2700 pF	3300 pF	8200 pF
2000	min.	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF	100 pF
	max.	68 pF	150 pF	270 pF	680 pF	1800 pF	2200 pF	2200 pF	5600 pF
2500	min.	—	—	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF
	max.	—	—	150 pF	390 pF	1000 pF	1000 pF	1200 pF	3900 pF
3000	min.	—	—	10 pF	10 pF	10 pF	10 pF	10 pF	100 pF
	max.	—	—	100 pF	330 pF	680 pF	680 pF	820 pF	2200 pF
4000	min.	—	—	10 pF	10 pF	10 pF	10 pF	10 pF	100 pF
	max.	—	—	39 pF	100 pF	220 pF	220 pF	330 pF	1000 pF
5000	min.	—	—	—	—	—	—	—	10 pF
	max.	—	—	—	—	—	—	—	680 pF

## HIGH VOLTAGE X7R MAXIMUM CAPACITANCE VALUES

VOLTAGE		1206	1210	1808	1812	1825	2220	2225	3640
600	min.	1000 pF	1000 pF	1000 pF	1000 pF	0.01 $\mu$ F	0.01 $\mu$ F	0.01 $\mu$ F	0.01 $\mu$ F
	max.	0.015 $\mu$ F	0.033 $\mu$ F	0.056 $\mu$ F	0.10 $\mu$ F	0.18 $\mu$ F	0.22 $\mu$ F	0.22 $\mu$ F	0.56 $\mu$ F
1000	min.	100 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF	0.01 $\mu$ F
	max.	5600 pF	0.015 $\mu$ F	0.018 $\mu$ F	0.027 $\mu$ F	0.10 $\mu$ F	0.10 $\mu$ F	0.10 $\mu$ F	0.22 $\mu$ F
1500	min.	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF
	max.	1800 pF	3900 pF	6800 pF	0.012 $\mu$ F	0.033 $\mu$ F	0.039 $\mu$ F	0.047 $\mu$ F	0.068 $\mu$ F
2000	min.	10 pF	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
	max.	1000 pF	2200 pF	2700 pF	4700 pF	0.01 $\mu$ F	0.01 $\mu$ F	0.015 $\mu$ F	0.027 $\mu$ F
2500	min.	—	—	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF
	max.	—	—	1800 pF	3300 pF	6800 pF	8200 pF	0.01 $\mu$ F	0.022 $\mu$ F
3000	min.	—	—	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF
	max.	—	—	1500 pF	2200 pF	4700 pF	4700 pF	6800 pF	0.018 $\mu$ F
4000	min.	—	—	—	—	—	—	—	100 pF
	max.	—	—	—	—	—	—	—	6800 pF
5000	min.	—	—	—	—	—	—	—	100 pF
	max.	—	—	—	—	—	—	—	3300 pF

# High Voltage MLC Chips Tin/Lead Termination “B”

For 600V to 5000V Application



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.

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 4°C per second. The preheat temperature must be within 50°C of the peak temperature reached by the ceramic bodies through the soldering process. Chip sizes 1808 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).

## HOW TO ORDER

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

**\*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.

## HIGH VOLTAGE C0G CAPACITANCE VALUES

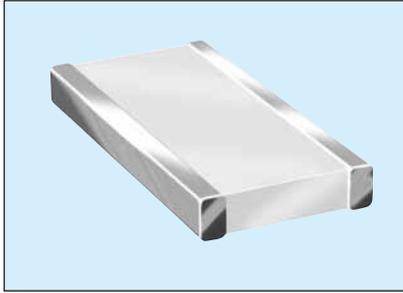
VOLTAGE	LD06 (1206)	LD10 (1210)	LD08 (1808)	LD12 (1812)	LD13 (1825)	LD20 (2220)	LD14 (2225)	LD40 (3640)
600 min.	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF
600 max.	680 pF	1500 pF	2700 pF	5600 pF	0.012 μF	0.012 μF	0.015 μF	0.047 μF
1000 min.	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
1000 max.	470 pF	820 pF	1500 pF	2700 pF	6800 pF	0.010 μF	0.010 μF	0.018 μF
1500 min.	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF	100 pF
1500 max.	150 pF	330 pF	470 pF	1000 pF	2700 pF	2700 pF	3300 pF	8200 pF
2000 min.	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF	100 pF
2000 max.	68 pF	150 pF	270 pF	680 pF	1800 pF	2200 pF	2200 pF	5600 pF
2500 min.	—	—	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF
2500 max.	—	—	150 pF	390 pF	1000 pF	1000 pF	1200 pF	3900 pF
3000 min.	—	—	10 pF	10 pF	10 pF	10 pF	10 pF	100 pF
3000 max.	—	—	100 pF	330 pF	680 pF	680 pF	820 pF	2200 pF
4000 min.	—	—	10 pF	10 pF	10 pF	10 pF	10 pF	100 pF
4000 max.	—	—	39 pF	100 pF	220 pF	220 pF	330 pF	1000 pF
5000 min.	—	—	—	—	—	—	—	10 pF
5000 max.	—	—	—	—	—	—	—	680 pF

## HIGH VOLTAGE X7R MAXIMUM CAPACITANCE VALUES

VOLTAGE	LD06 (1206)	LD10 (1210)	LD08 (1808)	LD12 (1812)	LD13 (1825)	LD20 (2220)	LD14 (2225)	LD40 (3640)
600 min.	1000 pF	1000 pF	1000 pF	1000 pF	0.01 μF	0.01 μF	0.01 μF	0.01 μF
600 max.	0.015 μF	0.033 μF	0.056 μF	0.10 μF	0.18 μF	0.22 μF	0.22 μF	0.56 μF
1000 min.	100 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF	0.01 μF
1000 max.	5600 pF	0.015 μF	0.018 μF	0.027 μF	0.10 μF	0.10 μF	0.10 μF	0.22 μF
1500 min.	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF
1500 max.	1800 pF	3900 pF	6800 pF	0.012 μF	0.033 μF	0.039 μF	0.047 μF	0.068 μF
2000 min.	10 pF	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
2000 max.	1000 pF	2200 pF	2700 pF	4700 pF	0.01 μF	0.01 μF	0.015 μF	0.027 μF
2500 min.	—	—	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF
2500 max.	—	—	1800 pF	3300 pF	6800 pF	8200 pF	0.01 μF	0.022 μF
3000 min.	—	—	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF
3000 max.	—	—	1500 pF	2200 pF	4700 pF	4700 pF	6800 pF	0.018 μF
4000 min.	—	—	—	—	—	—	—	100 pF
4000 max.	—	—	—	—	—	—	—	6800 pF
5000 min.	—	—	—	—	—	—	—	100 pF
5000 max.	—	—	—	—	—	—	—	3300 pF

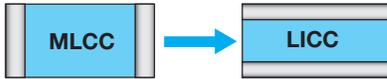
# Low Inductance Capacitors (RoHS)

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



The total inductance of a chip capacitor is determined both by its length to width ratio and by the mutual inductance coupling between its electrodes.

Thus a 1210 chip size has a lower inductance than a 1206 chip. This design improvement is the basis of AVX's Low Inductance Chip Capacitors (LICC), where the electrodes are terminated on the long side of the chip instead of the short side. The 1206 becomes an 0612, in the same manner, an 0805 becomes an 0508, an 0603 becomes an 0306. This results in a reduction in inductance from the 1nH range found in normal chip capacitors to less than 0.2nH for LICCs. Their low profile is also ideal for surface mounting (both on the PCB and on IC package) or inside cavity mounting on the IC itself.



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

### HOW TO ORDER

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

SIZE	0306					0508					0612					
	WDC	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
CAP	0.001															
(uF)	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

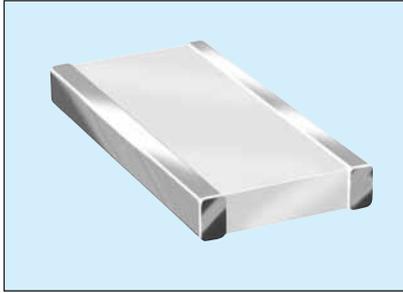
0306	
Code	Thickness
A	0.61 (0.024)

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

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

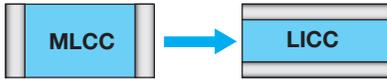
# Low Inductance Capacitors (SnPb)

0612/0508/0306 X7R & X5R Dielectric – Tin Lead Termination “B”



The total inductance of a chip capacitor is determined both by its length to width ratio and by the mutual inductance coupling between its electrodes.

Thus a 1210 chip size has a lower inductance than a 1206 chip. This design improvement is the basis of AVX's Low Inductance Chip Capacitors (LICC), where the electrodes are terminated on the long side of the chip instead of the short side. The 1206 becomes an 0612, in the same manner, an 0805 becomes an 0508, an 0603 becomes an 0306. This results in a reduction in inductance from the 1nH range found in normal chip capacitors to less than 0.2nH for LICCs. Their low profile is also ideal for surface mounting (both on the PCB and on IC package) or inside cavity mounting on the IC itself.



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

## HOW TO ORDER

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

**MLC Low Inductance**

SIZE		LD16					LD17					LD18				
Soldering		Reflow Only					Reflow Only					Reflow/Wave				
Packaging		All Paper					All Paper					Paper/Embossed				
(L) Length	MM (in.)	0.81 ± 0.15 (0.032 ± 0.006)					1.27 ± 0.25 (0.050 ± 0.010)					1.60 ± 0.25 (0.063 ± 0.010)				
(W) Width	MM (in.)	1.60 ± 0.15 (0.063 ± 0.006)					2.00 ± 0.25 (0.080 ± 0.010)					3.20 ± 0.25 (0.126 ± 0.010)				
	WVDC	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	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				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	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
SIZE		0306					0508					0612				

0306	
Code	Thickness
A	0.61 (0.024)

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

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)



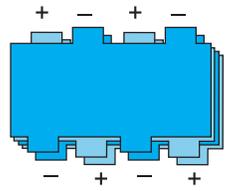
## 0612/0508 IDC (InterDigitated Capacitors)



0612



0508



- Very low equivalent series inductance (ESL), surface mountable, high speed decoupling capacitor in 0612 and 0508 case size.
- Measured inductances of 60 pH (for 0612) and 50 pH (for 0508) are the lowest in the FR4 mountable device family. Now use 10T devices with inductances of 45 pH (for 0612) and 35 pH (for 0508).
- Opposing current flow creates opposing magnetic fields. This causes the fields to cancel, effectively reducing the equivalent series inductance.
- Perfect solution for decoupling high speed microprocessors by allowing the engineers to lower the power delivery inductance of the entire system through the use of eight vias.
- Overall reduction in decoupling components due to very low series inductance and high capacitance.


 Check for up-to-date CV Tables at  
<http://www.avx.com/docs/catalogs/06120508.pdf>

## HOW TO ORDER

<b>W</b>	<b>3</b>	<b>L</b>	<b>1</b>	<b>6</b>	<b>D</b>	<b>225</b>	<b>M</b>	<b>A</b>	<b>T</b>	<b>3</b>	<b>A</b>
<b>Style</b>	<b>Case Size</b>	<b>Low Inductance</b>	<b>Number of Terminals</b>	<b>Voltage</b>	<b>Dielectric</b>	<b>Capacitance Code (In pF)</b>	<b>Capacitance Tolerance</b>	<b>Failure Rate</b>	<b>Termination</b>	<b>Packaging Available</b>	<b>Thickness</b>
	2 = 0508 3 = 0612	ESL = 50pH ESL = 60pH	1 = 8 Terminals	4 = 4V 6 = 6.3V Z = 10V Y = 16V	C = X7R D = X5R	2 Sig. Digits + Number of Zeros	M = ±20%	A = N/A	T = Plated Ni and Sn	1 = 7" Reel 3 = 13" Reel	Max. Thickness mm (in.) A = 0.95 (0.037) S = 0.55 (0.022)

SIZE	Thin 0508				0508				Thin 0612				0612			
WVDC	4	6.3	10	16	4	6.3	10	16	4	6.3	10	16	4	6.3	10	16
CAP (uF) and Thickness																
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

# IDC Low Inductance Capacitors (RoHS)



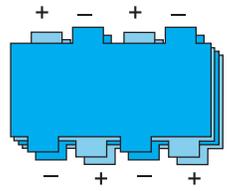
## 0612/0508 IDC (InterDigitated Capacitors)



0612



0508



AVX will support those customers who desire commercial and military type ceramic capacitors with a new series consisting of a termination with a 5% minimum lead content. This new series is AVX's "LD" series incorporating a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products.

- Very low equivalent series inductance (ESL), surface mountable, high speed decoupling capacitor in 0612 and 0508 case size.
- Measured inductances of 60 pH (for 0612) and 50 pH (for 0508) are the lowest in the FR4 mountable device family. Now use 10T devices with inductances of 45 pH (for 0612) and 35 pH (for 0508).
- Opposing current flow creates opposing magnetic fields. This causes the fields to cancel, effectively reducing the equivalent series inductance.
- Perfect solution for decoupling high speed microprocessors by allowing the engineers to lower the power delivery inductance of the entire system through the use of eight vias.
- Overall reduction in decoupling components due to very low series inductance and high capacitance.


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

Need link to website?

## HOW TO ORDER

<b>L</b>	<b>3</b>	<b>L</b>	<b>1</b>	<b>6</b>	<b>D</b>	<b>225</b>	<b>M</b>	<b>A</b>	<b>B</b>	<b>3</b>	<b>A</b>
<b>Style</b>	<b>Case Size</b>	<b>Low Inductance</b>	<b>Number of Terminals</b>	<b>Voltage</b>	<b>Dielectric</b>	<b>Capacitance Code (In pF)</b>	<b>Capacitance Tolerance</b>	<b>Failure Rate</b>	<b>Termination</b>	<b>Packaging Available</b>	<b>Thickness</b>
	2 = 0508 3 = 0612	ESL = 50pH ESL = 60pH	1 = 8 Terminals	4 = 4V 6 = 6.3V Z = 10V Y = 16V	C = X7R D = X5R	2 Sig. Digits + Number of Zeros	M = ±20%	A = N/A	B = 5% min. Lead	1 = 7" Reel 3 = 13" Reel	Max. Thickness mm (in.) A = 0.95 (0.037) S = 0.55 (0.022)

SIZE		Thin 0508				0508				Thin 0612				0612			
Length	MM	2.03 ± 0.20				2.03 ± 0.20				3.20 ± 0.20				3.20 ± 0.20			
	(in.)	(0.080 ± 0.008)				(0.080 ± 0.008)				(0.126 ± 0.008)				(0.126 ± 0.008)			
Width	MM	1.27 ± 0.20				1.27 ± 0.20				1.60 ± 0.20				1.60 ± 0.20			
	(in.)	(0.050 ± 0.008)				(0.050 ± 0.008)				(0.063 ± 0.008)				(0.063 ± 0.008)			
Terminal Pitch	MM	0.508 REF				0.508 REF				0.76 REF				0.76 REF			
	(in.)	0.020 REF				0.020 REF				0.030 REF				0.030 REF			
Thickness	MM	0.55 MAX.				0.95 MAX.				0.55 MAX.				0.95 MAX.			
	(in.)	(0.022) MAX.				(0.037) MAX.				(0.022) MAX.				(0.037) MAX.			
Inductance	(pH)	95				95				120				120			
	WVDC	4	6.3	10	16	4	6.3	10	16	4	6.3	10	16	4	6.3	10	16
CAP (µF) and Thickness																	
0.047																	
0.068																	
0.10																	
0.22																	
0.33																	
0.47																	
0.68																	
1.0																	
1.5																	
2.2																	
3.3																	

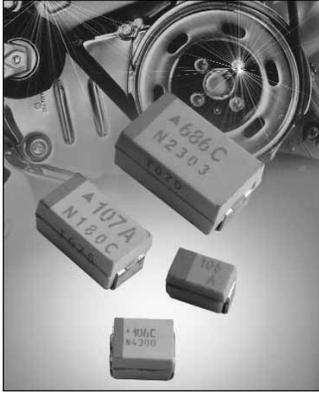
Consult factory for additional requirements

 = X7R

 = X5R

# TAJ Series

## Standard Tantalum



The TAJ standard series encompasses the five key sizes recognized by major OEMs throughout the world. The V case size has been added to the TAJ range to allow high CVs to be offered. The operational temperature is -55°C to +85°C rated voltage and up to +125°C with voltage derating in applications utilizing recommended series resistance.



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

### HOW TO ORDER

**TAJ**

Type

**C**

Case Size

**106**

Capacitance Code

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

**M**

Tolerance

K = ±10%  
 M = ±20%

**035**

Rated DC Voltage

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

**R**

Packaging

R = 7" T/R  
(Lead Free since production date 1/1/04)  
 S = 13" T/R  
(Lead Free since production date 1/1/04)  
 A = Gold Plating  
 7" Reel  
 B = Gold Plating  
 13" Reel

**\*\***

Additional characters may be added for special requirements

Capacitance		Rated voltage DC (V <sub>R</sub> ) 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								A A A	A A/B A/B
0.33 0.47 0.68	334 474 684						<b>A</b>	A A	A A/B A/B	B A/B/C A/B/C
1.0 1.5 2.2	105 155 225			<b>A</b>	<b>A</b> <b>A</b>	<b>A</b> <b>A</b> A/B	A A A/B	A A/B A/B	A/B A/B/C A/B/C	A <sup>(M)</sup> /B/C C/D C/D
3.3 4.7 6.8	335 475 685		<b>A</b> <b>A</b>	<b>A</b> <b>A</b> A/B	<b>A</b> A/B A/B	A/B A/B A/B/C	A/B A/B/C A/B/C	A/B/C A/B/C B/C	B/C B/C/D C/D	C/D D D
10 15 22	106 156 226		<b>A</b> A/B <b>A</b>	A/B A/B A/B/C	A/B/C A/B/C A/B/C	A/B/C A <sup>(M)</sup> /B/C B/C/D	B/C B/C/D B/C/D	C/D C/D C/D	C/D/E C/D D/E	D/E D/E V
33 47 68	336 476 686	A A	A/B A/B A/B/C	A/B/C A/B/C/D B/C/D	A/B/C/D B/C/D B/C/D	B/C/D C/D C/D	C/D C/D/E D/E	D/E D/E E/V	D/E/V E/V V <sup>(M)</sup>	
100 150 220	107 157 227	A/B B B/D	A/B/C B/C B <sup>(M)</sup> /C/D	B/C/D C/D C/D/E	B <sup>(M)</sup> /C/D/E C/D/E D/E	D/E D/E/V D/E/V	D/E/V E/V	V		
330 470 680	337 477 687	D C/D D/E	C/D/E D/E D/E	C/D/E D/E/V E/V	D/E/V E/V V	<b>E/V</b>				
1000 1500 2200	108 158 228	D <sup>(M)</sup> /E D/E/V V	D/E/V E/V <sup>(M)</sup>	V <sup>(M)</sup>						

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

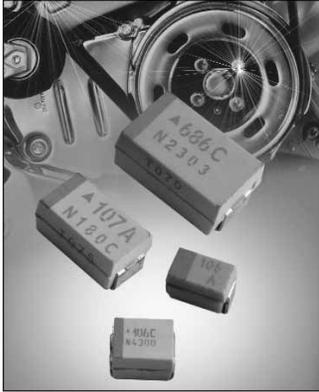
Developmental Ratings - subject to change.

Released codes <sup>(M tolerance only)</sup>

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

# TAJ Series

## Low Profile



Five additional case sizes are available in the TAJ range offering low profile solid tantalum chip capacitors. Designed for applications where maximum height of components above or below board are of prime consideration, this height of 1.2, 1.5 and 2.0mm equates to that of a standard integrated circuit package after mounting. The S&T footprints are identical to the A&B case size parts and the W&Y footprints to C&D case size parts.



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

## HOW TO ORDER

**TAJ**

Type

**Y**

Case Size

**107**

Capacitance Code

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

**M**

Tolerance

K =  $\pm 10\%$   
M =  $\pm 20\%$

**010**

Rated DC Voltage

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

**R**

Packaging

R = 7" T/R  
(Lead Free since production date 1/1/04)  
S = 13" T/R  
(Lead Free since production date 1/1/04)  
A = Gold Plating  
7" Reel  
B = Gold Plating  
13" Reel

**\*\***

Additional characters may be added for special requirements

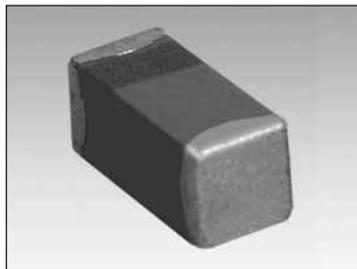
Capacitance		Rated voltage DC (V <sub>R</sub> ) to 85°C								
μF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
0.10	104						R/S		R/S	S
0.15	154						R/S	R	R/S	S
0.22	224						R/S	R	R/S	S
0.33	334						R/S	R	R/S	S/T
0.47	474						R/S	R/S	R/S/T	S/T
0.68	684					R/S	R/S/T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

Released codes (M tolerance only)

**Developmental Ratings - 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.





The world's smallest surface mount Tantalum capacitor, small enough to create space providing room for ideas to grow.

TACmicrochip™ is a major breakthrough in miniaturization without reduction in performance.

It offers you the highest energy store in a small case size down to 0402; enhanced high frequency operation through unique ESR performance with temperature and voltage stability is also offered.



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

## HOW TO ORDER

**TAC**  
 Type  
 TACmicrochip™

**L**  
 Case Code  
 0402 = K  
 0603 = L  
 0805 = R  
 1206 = A

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

**M**  
 Tolerance  
 K = ±10%  
 M = ±20%

**004**  
 Rated DC Voltage  
 002 = 2Vdc  
 003 = 3Vdc  
 004 = 4Vdc  
 005 = 5Vdc  
 006 = 6.3Vdc  
 010 = 10Vdc  
 016 = 16Vdc  
 020 = 20Vdc  
 025 = 25Vdc  
 035 = 35Vdc

**R**  
 Packaging  
 (see table below)

**TA**  
 Additional  
 characters may  
 be added for  
 special  
 requirements

### Packaging Suffix

Reel Size	Standard Tin Termination Plastic Tape	Standard Tin Termination Paper Tape	Gold Termination Plastic Tape
Case	A/R/L	K	A/R/L
7"	RTA	PTA	ATA
4½"	XTA	QTA	FTA

Capacitance		Voltage Rating DC (V <sub>R</sub> ) at 85°C									
µF	Code	2.0V	3.0V	4.0V	5.0V	6.3V	10V	16V	20V	25V	35V
0.33 0.47 0.68	334 474 684						K/L K/L	L L			
1.0 1.5 2.2	105 155 225		K/L	L L		K/L L K/L	K/L L L	L L		R <b>R</b>	
3.3 4.7 6.8	335 475 685	K/L K/L L	K/L K/L L	L L L		L L L/R	L/R L/R L/R		R		
10 15 22	106 156 226	K/L  R	L R L/R	L/R L/R L/R	L	L/R L/R R	L/R R R	R			
33 47 68	336 476 686	R L/R R	R R R	R R A		R A	R/A R <b>A</b>				
100 150 220	107 157 227	A <b>A</b>	<b>R/A</b>	A		<b>A</b>					



**Developmental Ratings - subject to change**

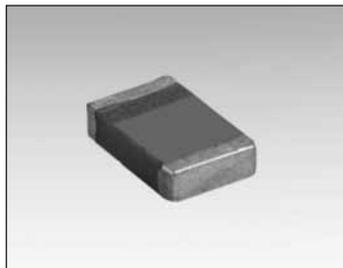
Standard Height Profile: K, L, R, A Case

Low Profile: N, U, H, T, V Case

Custom Low Profile: X Case

# TACmicrochip™

## Low Profile



The flexibility of the TACmicrochip™ product line is once more demonstrated by our ability to produce parts with a profile as low as 0.60mm (maximum) with a maximum CV of 4.7μF at 4V in an 0805 (2012M) footprint.

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

## HOW TO ORDER

**TAC**

Type  
TACmicrochip™

**U**

Case Code  
0402 = N  
0805 = U  
0805 = H  
3528 = T  
1105 = X

**475**

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

**M**

Tolerance  
K = ±10%  
M = ±20%

**004**

Rated DC Voltage  
002 = 2Vdc  
003 = 3Vdc  
004 = 4Vdc  
006 = 6.3Vdc  
010 = 10Vdc  
016 = 16Vdc

**R**

Packaging  
(see table below)

**TA**

Additional  
characters may  
be added for  
special  
requirements

## Packaging Suffix

Reel Size	Standard Tin Termination Plastic Tape	Standard Tin Termination Paper Tape	Gold Termination Plastic Tape
Case	U/H/T	N	U/H/T
7"	RTA	PTA	ATA
4¼"	XTA	QTA	FTA

Capacitance		Voltage Rating DC (V <sub>R</sub> ) at 85°C					
μF	Code	2.0V	3.0V	4.0V	6.3V	10V	16V
0.33 0.47 0.68	334 474 684						
1.0 1.5 2.2	105 155 225				N	U	U
3.3 4.7 6.8	335 475 685			U	U		
10 15 22	106 156 226	U			H V/H	H/V H/V	
33 47 68	336 476 686	V	H X	H	T	T T	
100 150 220	107 157 227		T	T	T		

Developmental Ratings - subject to change



# TLJ Series

## Tantalum Solid Electrolytic Chip Capacitors High CV Consumer Series



The consumer TLJ series of tantalum capacitors offers high capacitance vs. voltage ratio based on stable MnO<sub>2</sub> electrode capacitors. The TLJ series complies with RoHS requirements and it is an environmentally friendly component ready for lead-free assembly systems up to 3x reflow with 260°C peak temperature. The TLJ series is suitable for wide range of consumer electronic applications such as the latest portable handheld electronics, cellular phones, PDAs or other digital equipment and cameras.

- High Volumetric Efficiency
- Environmentally Friendly
- Small & Low Profile Cases
- 3x Reflow 260°C Compatible
- Consumer Applications



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

### HOW TO ORDER

**TLJ**



Type

**W**



Case Size

**157**



**Capacitance Code**

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

**M**



**Tolerance**

M=±20%

**010**



**Rated DC Voltage**

002=2.5Vdc  
004=4Vdc  
006=6.3Vdc  
010=10Vdc  
016=16Vdc

**R**



**Packaging**

R=7" T/R  
S=13" T/R

**0200**



**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)
3.3 4.7 6.8	335 475 685					<b>R</b>
10 15 22	106 156 226			R(3500)	R(3000) R(2000) <b>P</b>	<b>P</b> <b>P/S</b> <b>A/T(1000)</b>
33 47 68	336 476 686	<b>R</b> <b>P</b>	R(3000) <b>P/R(3000)</b> <b>S</b>	P(3000)/R(3000) P(2500)/ <b>S</b> A(500)/T(600)	S(1500) A(600)/T(600) <b>A/T</b>	<b>T</b> <b>B</b> <b>B/W</b>
100 150 220	107 157 227	<b>S</b> <b>A</b> <b>A/T</b>	A(500) <b>A/T(800)</b> <b>T</b>	A(500,800)/T(800) <b>T</b> B(500)/W(200)	H(900)/ <b>T</b> B(500)/W(200)	<b>W</b>
330 470 680	337 477 687	<b>T</b> <b>B*/W*</b>	<b>B*/W(200)</b> <b>B*</b>	<b>B</b>		
1000	108					

**Developmental Ratings - subject to change**

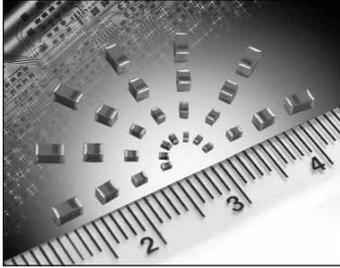
[Please Contact Manufacturer](#)

Available Ratings, (ESR ratings in mOhms in brackets)



# TLC Series

## Tantalum Solid Electrolytic Chip Capacitors Consumer Series



The consumer TLC series of tantalum capacitors offers high capacitance vs. voltage ratio based on stable MnO<sub>2</sub> electrode capacitors. The TLC series complies with RoHS requirements and it is an environmentally friendly component ready for lead-free assembly systems. The TLC series is suitable for wide range of consumer electronic applications such as the latest portable handheld electronics, cellular phones, PDAs or other digital equipment and cameras.

- Super High Volumetric Efficiency
- Environmentally Friendly Component
- Small & Low Profile Case Sizes
- Leadfree Assembly Systems
- Consumer Applications



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

003=3Vdc  
004=4Vdc  
006=6.3Vdc  
010=10Vdc

**R**



Packaging

Capacitance		Voltage Rating DC (V <sub>R</sub> ) to 40°C							
μF	Code	3.0V	4.0V	6.3V	10V	16V	20V	25V	35V
1.0	105							L	
1.5	155								R
2.2	225							R	
4.7	475		K	K					
6.8	685								
10	106	K	K			V			
15	156								
22	226			L					
33	336					T			
47	476	L		R	R/A				
68	686		R						
100	107	R	R		T				
150	157								
220	227	A	T						

Developmental Ratings - subject to change



# TPS Series

## Low ESR



TPS surface mount products have inherently low ESR (equivalent series resistance) and are capable of higher ripple current handling, producing lower ripple voltages, less power and heat dissipation than standard product for the most efficient use of circuit power. TPS has been designed, manufactured, and preconditioned for optimum performance in typical power supply applications. By combining the latest improvements in tantalum powder technology, improved manufacturing processes, and application specific preconditioning tests, AVX is able to provide a technologically superior alternative to the standard range.



Check for up-to-date CV Tables at

<http://www.avx.com/docs/catalogs/tps.pdf>

## HOW TO ORDER

**TPS**

Type

**C**

Case Size

**107**

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

**M**

**Tolerance**  
K =  $\pm 10\%$   
M =  $\pm 20\%$

**010**

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

**R**

**Packaging**  
R = 7" T/R  
(Lead Free since production date 1/1/04)  
S = 13" T/R  
(Lead Free since production date 1/1/04)  
A = Gold Plating  
7" Reel  
B = Gold Plating  
13" Reel

**0100**

**Maximum ESR in Milliohms**  
See note below

**NOTE:** The EIA & CECC standards for low ESR Solid Tantalum Capacitors allow an ESR movement to 1.25 times catalog limit post mounting.

Capacitance		Rated Voltage DC (V <sub>R</sub> ) to 85°C						ESR limits quoted in brackets (milliohms)		
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)	
0.68	684							A(6000)	A(6000)	
1	105				R(9000)		A(3000), R(6000) S(6000), T(2000)		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)	B(800,1500)	A(1800) B(750,1000)	B(700,900,1500)	B(700,1500) C(600)	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)		A(900,1800) P(2000)*, T(1000,2000)	B(500,800), C(500) T(800,1000), W(500,600)	B(500,1000) C(500,700)	C(300,500)	D(125,300) E(200)	E(400,500)
15	156		A(700,1500)		A(1000) B(450,600)	B(500,800)	B(500) C(400,450)	C(220,300) D(100,300)	C(350,450) D(100,300), Y(250)	E(250)
22	226		A(500,900) B(375,600) S(900)		B(400,500,700) C(300) T(800)	C(150,250,300,375) W(500)	B(400,600) C(100,150,400) D(200,300)	D(275,400) E(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) B(250,350,600) C(300)		B(250,350,500,650) C(200,350), D(100) W(125,150,250)	C(110,350) D(80,100,150,200) W(200), Y(250), X(180)	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(250,350,600) C(150,200) W(110,125,250)		B(600), C(80,100,200,300) D(100,150), Y(100,200) W(100,150)	F(200), C(125,200) D(70,100,150) Y(200,250), X(150)	D(70,150,200,300) E(125,150,200)	F(125,200) V(80,95,150,200)	V(150,200)**	
100	107	B(200)	B(200,250,350, 500), W(100)		B(250,400) C(75,150), Y(100), W(100)	B(400)***, C(75,100,150,200) D(50,65,80,100,125,150) E(125), Y(100,150,200) X(85,150,200), W(150)	F(150,200)** D(60,100,125,150) E(55,100,125,150) 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)	F(200), D(50,85,100), E(100) X(100)***, Y(100,150,200)	D(60,85,100,125,150) E(100), V(45,75), Y(200)**	V(80)		
220	227	B(150,200, 600) D(45)	D(40,50,100) Y(40)		F(200), C(70,100,125,250) D(50,100,125) E(100), Y(100,150)	D(50,100,150) E(50,60,70,100,125,150) Y(150,200)	E(100,150) V(50,75,100,150)			
330	337	Y(40)	F(200), C(100) D(35,45,100) X(100)		D(45,50,70,100) E(50,100,125,150) V(100), Y(150)	D(50,65,100,150) E(40,50,60,100) V(40,60,100)				
470	477	F(200) D(35) Y(100)	D(45,100) E(35,45,100)		D(45,60,100,200) E(45,50,60,100,200) V(40,55,100)	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)**	E(60) V(25,35,40,50)		V(40,50)**					
1500	158	D(100), E(50) V(30,40)	E(50,75) V(50,75)**							

For C, D and E case ratings in TPS Series, ESR ratings are printed on capacitor side in the following format: T x x x - where x x x is ESR limit in milliohms i.e. T100 represents max. ESR of 100 milliohms.

Released codes (M tolerance only)



NOTE: The EIA & CECC standards for low ESR Solid Tantalum Capacitors allow an ESR movement to 1.25 times catalog limit post mounting. ESR limits quoted in brackets (milliohms)

Tantalum

# TPM Multianode

## Tantalum Ultra Low ESR Capacitor



Low ESR, high capacitance and high ripple current are the key parameters for processor filtering. Multianode configuration within a standard E case package meets these requirements. Parameters such as ESR 15m $\Omega$ , capacitance 1500 $\mu$ F and ripple current above 4A rms makes TPM series ready to use with the latest processor families.



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

## HOW TO ORDER

**TPM**

Type

**E**

Case Size

**108**

Capacitance Code

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

**\***

Capacitance Tolerance

K =  $\pm 10\%$   
M =  $\pm 20\%$

**004**

Rated DC Voltage

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

**R**

Packaging

R = 7" T/R  
Lead Free  
S = 13" T/R  
Lead Free

**0018**

Maximun ESR in Milliohms

See note below

**NOTE:** The EIA & CECC standards for low ESR Solid Tantalum Capacitors allow an ESR movement to 1.25 times catalog limit post mounting.

Capacitance		Rated Voltage DC (V <sub>r</sub> ) 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)
10	106									E(120)
15	156									E(75,100)
22	226								E(60,100)	E(75,100)
33	336								E(50,65)	
47	476								E(55,65)	
68	686							E(45,55)	<b>V</b>	
100	107						E(35,45)	<b>E</b>		
150	157					E(30,40)	<b>E</b>			
220	227					E(25,40)				
330	337				E(23,35)	<b>E</b>				
470	477			E(18,23,30)	E(23,30)					
680	687		E(18,23)	E(18,23), V(23)	<b>E</b>					
1000	108		E(18,23), V(18)	<b>E</b>						
1500	158	E(12,15,18)	E(15,18)							
2200	228	<b>E(18,25)</b>								

**Developmental Ratings - subject to change, AVX reserve rights to change ESR specification prior to release.**

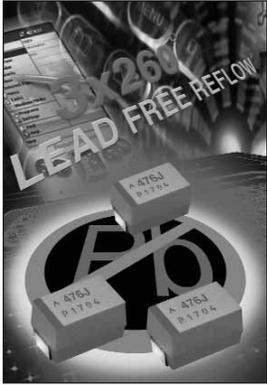
Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.



# TCJ Series



## Tantalum Solid Electrolytic Chip Capacitors with Conductive Polymer Electrode



The TCJ Series of tantalum capacitors with a conductive polymer electrode offers lower ESR, safer non-ignition failure mode and better capacitance retention compared to the conventional MnO<sub>2</sub> electrode capacitors. The TCJ series is suitable for power management systems with operating temperatures up to 125°C. In addition the TCJ series complies with RoHS requirements and it is an environmentally friendly component ready for lead-free assembly systems up to 3x reflow with 260°C peak temperature. Small A and B case sizes are ideal for use with the latest portable handheld electronics such as cellular phones, PDAs or other digital equipment such as cameras.



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

### HOW TO ORDER

**TCJ**

Type

**A**

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%

**004**

**Rated DC Voltage**  
002=2.5Vdc  
004=4Vdc  
006=6.3Vdc  
010=10Vdc  
016=16Vdc

**R**

**Packaging**  
R=7" T/R  
S=13" T/R

**0300**

ESR in mΩ

Capacitance		Rated Voltage DC (V <sub>R</sub> ) to 85°C				
μF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	16V (C)
4.7	475				R (500)	
6.8	685					A (200)
10	106			A (300), R (500)	A (300)	A (200), T (150)
15	156		A (300)	A (300)	A (200)	B (150)
22	226		A (300)	A (300), T (150)	B (300), T (150)	B (150)
33	336		A (300)	A (200), B (200), T (150)	C (100), B (200), T (150)	
47	476		A (200), T (80)	A (200), T (80), B (70)	B (70), C (100)	
68	686	A (250)	A (250), B (70), T (80)	B (70), C (100)		
100	107	A (200), B (70)	A (200), B (70), T (150)	B (70)		
150	157	B (70)	B (70), <b>W (70)</b>	W (70), <b>Y (25)</b>		
220	227		<b>Y (25)</b>	<b>Y (25)</b>		

**Developmental Ratings - subject to change.**

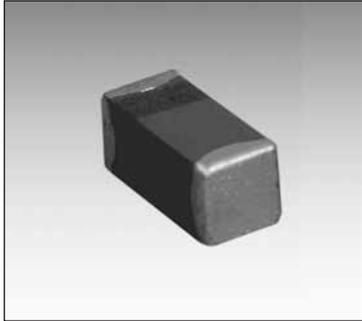
Available Ratings, (ESR ratings in mOhms in brackets)

*The EIA and CECC standards for low ESR solid Tantalum capacitors allow an ESR movement to 1.25 times catalog limit post mounting.*



# TPC Series

## Low ESR TACmicrochip™



The world's smallest surface mount Tantalum capacitor, small enough to create space providing room for ideas to grow.

TACmicrochip™ is a major breakthrough in miniaturization without reduction in performance.

It offers you the highest energy store in an 0603 or 0805 case size; enhanced high frequency operation through unique ESR performance with temperature and voltage stability.



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

## HOW TO ORDER

**TPC**

Type  
TACmicrochip™

**R**

Case Size  
0603=L  
0805=R

**106**

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

**M**

Tolerance  
K=±10%  
M=±20%

**010**

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

**R**

Packaging  
(see table below)

**1800**

Maximum ESR  
in Milliohms  
See note below

**NOTE:** The EIA & CECC standards for low ESR Solid Tantalum Capacitors allow an ESR movement to 1.25 times catalog limit post mounting.

### Packaging Suffix

Reel Size	Standard	Gold Termination
	Tin Termination Plastic Tape	Plastic Tape
Case	R/L	R/L
7"	Rxxxx	Axxxx
4 1/4"	Xxxxx	Fxxxx

**NOTE:** xxxx = ESR Value in Milliohms

Capacitance		Voltage Rating DC ( $V_R$ ) at 85°C							
$\mu\text{F}$	Code	2.0V	3.0V	4.0V	6.3V	10V	16V	20V	25V
0.33 0.47 0.68	334 474 684								
1.0 1.5 2.2	105 155 225								R(3000)
3.3 4.7 6.8	335 475 685					L(5000) L(5000)			
10 15 22	106 156 226			R(1800)	L(4000) R(1800) R(1500)	L(4000),R(1800) R(1500)	R(1800)		
33 47 68	336 476 686		R(1800) R(1500)	R(1500)					
100 150 220	107 157 227								

(ESR in  $\text{m}\Omega$ )



# THJ Series

## High Temperature Tantalum Chip Capacitors



The THJ surface mount series combines high temperature operation and higher basic reliability for optimal performance in high temperature automotive and industry applications. The operational temperature is up to +175°C with derating voltage. The level of reliability of this tantalum product is 0.5% / 1000 hours at rated voltage, rated temperature and 0.1Ω/volt circuit impedance. The capacitors are produced in black encapsulation with white polarity marking. The THJ series encompasses the 4 case sizes with dimensions identical to TAJ standard series. The voltage range available today is 6.3V to 50V.



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

### HOW TO ORDER

**THJ**

Type

**B**

Case Size

**105**

Capacitance Code

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

**\***

Tolerance

K=±10%  
M=±20%

**035**

Rated DC Voltage

006=6.3Vdc  
010=10Vdc  
016=16Vdc  
020=20Vdc  
025=25Vdc  
035=35Vdc  
050=50Vdc

**R**

Packaging

R = 7" T/R  
Lead Free  
S = 13" T/R  
Lead Free  
A = Gold Plating  
7" Reel  
B = Gold Plating  
13" Reel

**JN**

Additional characters may be added for special requirements

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



# TRJ Series

## Professional Tantalum Chip Capacitor (also available as COTS-Plus option)



The TRJ surface mount series employs established Tantalum technology together with new process improvements and advanced manufacturing techniques. This robust series enables extension of the guaranteed 0.5% reliability level to 1000 hours at rated voltage, rated temperature and 0.1Ω/volt circuit impedance. The moisture penetration barrier, thicker external dielectric layer and modified manganising process make the capacitor more robust against higher thermo-mechanical stresses during assembly process (“lead-free” soldering) and also more robust against more severe working conditions in Automotive, Medical, Aerospace, Military and other applications. The temperature range is -55°C to 125°C and voltage range is 6.3V to 35V.

These components do not contain any lead either in the internal structure or in the termination plating. They are compatible with all SnPb and “lead-free” solders and are qualified for higher reflow temperature necessary for new lead-free assembly process.



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

## HOW TO ORDER

**TRJ**

Type

**B**

Case Size

**105**

Capacitor Code

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

**\***

Tolerance

K=±10%  
M=±20%

**035**

Rated DC Voltage

006 = 6.3V  
010 = 10V  
016 = 16V  
020 = 20V  
025 = 25V  
035 = 35V  
050 = 50V

**R**

Packaging/  
Termination Plating

R = 7" T/R  
Lead Free  
S = 13" T/R  
Lead Free  
A = Gold Plating  
7" Reel  
B = Gold Plating  
13" Reel

**RJ**

Additional characters may be added for special requirements

Capacitance		Rated Voltage DC (V <sub>R</sub> ) to 85°C						
μF	Code	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
0.10 0.15 0.22	104 154 224						A A A	
0.33 0.47 0.68	334 474 684					A A	A A A	
1.0 1.5 2.2	105 155 225			A	A A A	A A <b>A/B</b>	A/B <b>A/B</b> B	
3.3 4.7 6.8	335 475 685		A A	A A/B <b>A/B</b>	A/B <b>A/B</b> B	B B <b>B/C</b>	B/C <b>B/C</b> C	D D D
10 15 22	106 156 226	A A/B <b>A/B</b>	A/B <b>A/B</b> B	B B C	B/C <b>B/C</b> C/D	C C/D <b>C/D</b>	C/D <b>C/D</b> D	E
33 47 68	336 476 686	B B/C C	<b>B/C</b> C C	C C/D D	C/D D D/E	D <b>D/E</b>	<b>D/E</b>	
100 150 220	107 157 227	C <b>C/D</b> D	D D/E <b>D/E</b>	D/E <b>E</b>	<b>D/E</b>			
330 470	337 477	E <b>E</b>	<b>E</b>					

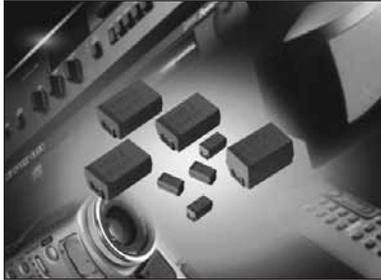
Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same reliability standards.

Developmental Ratings - subject to change



# OxiCap™ NOJ Series

## Niobium Oxide Capacitor



**Cost versus Performance** is a key requirement for consumer electronic products. A new solid electrolyte capacitor **OxiCap™** has been developed by AVX in standard EIA case sizes in order to meet this requirement as a higher performance alternative to aluminum and other SMT capacitor technologies currently on the market. The **OxiCap™ non-burn<sup>1</sup>** technology is based on **NbO niobium oxide ceramic material** as the anodic material processed through the same manufacturing process as tantalum capacitors. Nb<sub>2</sub>O<sub>5</sub> dielectric in combination to self-healing MnO<sub>2</sub> cathode is a basis for a good reliability level **0.5%/1000 hrs.** within a temperature range up to **105°C** and rated voltage **<6V** (rail voltage <5V). Electrical parameters are similar to general tantalum specifications. NbO and MnO<sub>2</sub> are widely available materials. The laser coded **orange molded body** gives total traceability.

- Reduced Voltage Derating
- Failed OxiCap™ will not burn up to category voltage



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

## HOW TO ORDER

**NOJ**

Type

**D**

Case Size

**107**

Capacitance Code

1st two digits  
represent significant  
figures, 3rd digit  
represents multiplier  
in pF

**M**

Capacitance Tolerance

M = ±20%

**006**

Rated DC Voltage

001 = 1.8Vdc  
002 = 2.5Vdc  
004 = 4Vdc  
006 = 6.3Vdc  
010 = 10Vdc

**RWJ**

Packaging

R = Lead Free  
7" Reel  
S = Lead Free  
13" Reel

Capacitance		Rated Voltage DC (V <sub>R</sub> ) 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	B	B
22	226		A	A/B	B	B/C
33	336	<b>A</b>	A/B	B	B/C	C
47	476	<b>A/B</b>	B	B/C	C	C
68	686	B	B/C	B/C	C	<b>D</b>
100	107	B/C	B/C	B/C	C/D	<b>D</b>
150	157	<b>B/C</b>	C	C/D	<b>C/D</b>	<b>E</b>
220	227	C	C	<b>C/D</b>	D/E	<b>V</b>
330	337	C	C/D	D	E	
470	477	<b>C/D</b>	D/E	D/E	V	
680	687	<b>D</b>	E	V	<b>Z</b>	
1000	108	<b>E</b>	V	<b>Z</b>		
1500	158	<b>V</b>	<b>Z</b>			
2200	228	<b>Z</b>				

Developmental Ratings - subject to change

Z case = 4.5mm height V



LEAD-FREE  
LEAD-FREE COMPATIBLE  
COMPONENT



HALOGEN-FREE COMPOUNDS  
ENVIRONMENTAL FRIENDLY  
COMPONENT



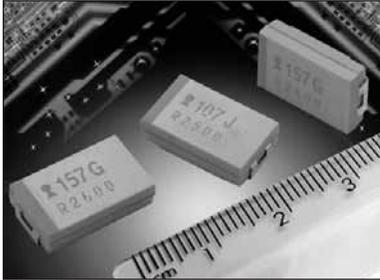
NON-BURN  
NON-SMOKE



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# OxiCap™ NOJ Series

## Low Profile



Five additional case sizes are available in the NOJ range offering low profile solid niobium oxide capacitors. Designed for applications where maximum height of components above or below board are of prime consideration, this height of 1.2, 1.5 and 2.0mm equates to that of a standard integrated circuit package after mounting. The S&T footprints are identical to the A&B case size parts and the W&Y footprints to C&D case size parts.



Check for up-to-date CV Tables at

<http://www.avx.com/docs/catalogs/nojlp.pdf>

## HOW TO ORDER

**NOJ**

Type

**Y**

Case Size

**107**

Capacitance Code  
1st two digits  
represent significant  
figures, 3rd digit  
represents multiplier  
in pF

**M**

Capacitance Tolerance  
M =  $\pm 20\%$

**006**

Rated DC Voltage  
001 = 1.8Vdc  
002 = 2.5Vdc  
004 = 4Vdc  
006 = 6.3Vdc  
010 = 10Vdc

**RWJ**

Packaging  
R = Lead Free  
7" Reel  
S = Lead Free  
13" Reel

Capacitance		Rated Voltage DC (V <sub>R</sub> ) 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					
3.3	335					<b>P/S</b>
4.7	475				P/S	T
6.8	685			P/S	T	T
10	106		P/S	P/S/T	T	T
15	156	<b>P/S</b>	P/S/T	<b>P/T</b>		
22	226	<b>P/S/T</b>	<b>P/T</b>	T		<b>W</b>
33	336	<b>P/T</b>	T		W	
47	476	<b>T</b>		W	<b>W</b>	
68	686	<b>T</b>	W	W	X/Y	<b>Y</b>
100	107	W	W	<b>W/X</b>	Y	
150	157	<b>W</b>	<b>W/X</b>	Y	Y	
220	227	<b>W/X</b>	Y	Y		
330	337	Y	Y			
470	477	Y				

Developmental Ratings - subject to change



**LEAD-FREE**  
**LEAD-FREE COMPATIBLE**  
**COMPONENT**



**HALOGEN-FREE COMPOUNDS**  
**ENVIRONMENTAL FRIENDLY**  
**COMPONENT**



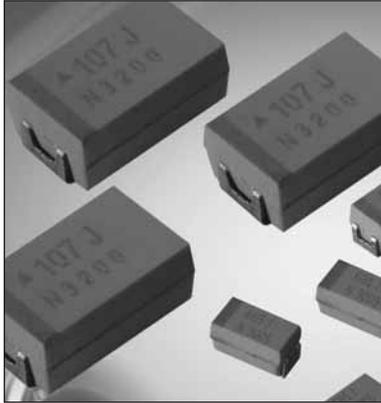
**NON-BURN**  
**NON-SMOKE**



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# OxiCap™ NOS Low ESR Series

## Niobium Oxide Capacitor



**NOS Low ESR** series of **OxiCap™** niobium oxide capacitors have been developed in order to offer significant **Cost versus Performance** value as the key requirement for mass manufactured electronic products. A new solid electrolyte capacitor **OxiCap™** has been developed by AVX in standard EIA SMT case sizes. The **OxiCap™ non-burn** technology is based on **NbO niobium oxide ceramic material** as the anodic material processed through the same manufacturing process as tantalum capacitors. Nb<sub>2</sub>O<sub>5</sub> dielectric in combination to self-healing MnO<sub>2</sub> cathode is a basis for an excellent reliability level **0.2%/1000 hrs.** within a temperature range up to **125°C** and rated voltage **<6V** (rail voltage <5V). Electrical parameters are similar to general low ESR tantalum specifications. NbO and MnO<sub>2</sub> are widely available materials. The laser coded **orange molded body** gives total traceability.

- Reduced Voltage Derating
- Failed OxiCap™ will not burn up to category voltage



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

## HOW TO ORDER

**NOS**

Type

**D**

Case Size

**107**

Capacitance Code

1st two digits  
represent significant  
figures, 3rd digit  
represents multiplier  
in pF

**M**

Capacitance  
Tolerance

M = ±20%

**006**

Rated DC Voltage

001 = 1.8Vdc  
002 = 2.5Vdc  
004 = 4Vdc  
006 = 6.3Vdc  
010 = 10Vdc

**R**

Packaging

R = Lead Free  
7" Reel  
S = Lead Free  
13" Reel

**0100**

ESR

ESR value in  
mOhms@100kHz

Capacitance		Rated Voltage DC ( $V_R$ ) to 85°C / 0.66 DC to 105°C / 0.5 DC to 125°C			
$\mu\text{F}$	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>A(900)</b>	<b>B(600)*</b>	B(600)	B(600) C(500) W(250)
47	476	<b>B(500)</b>	B(500)	B(500) C(300) W(150)	C(300)
68	686	<b>B(500)</b>	C(200) W(150)	C(200)	C(75,200) X(100) Y(100)
100	107	B(350) <b>C(200)</b> W(150)	C(150)	C(70,150) X(100)	C(150) D(80,100) Y(100)
150	157	<b>C(150)</b>	C(65,150) X(100)	C(90,150) Y(100)	D(70,100) Y(100)
220	227	C(125) X(100)	C(80,125) Y(100)	D(60,100) Y(100)	D(60,100) E(80,100)
330	337	<b>C(125)</b> Y(100)	D(100) Y(100)	D(100) E(100)	E(80,100)
470	477	<b>D(100)</b> Y(100)	D(55,100) E(100)	D(100) E(75,100)	V(75)
680	687	<b>D(100)</b> <b>E(100)</b>	E(60)	V(75)	
1000	108	<b>E(60)</b>	V(50)		
1500	158	<b>V(50)</b>	<b>Z</b>		
2200	228	<b>Z</b>			

Developmental Ratings - subject to change

Blue - Please Contact Manufacturer



LEAD-FREE  
LEAD-FREE COMPATIBLE  
COMPONENT



HALOGEN-FREE COMPOUNDS  
ENVIRONMENTAL FRIENDLY  
COMPONENT



NON-BURN  
NON-SMOKE



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# OxiCap™ NOM Low ESR Multianodes

## Niobium Oxide Capacitor



Low ESR down to  $30\text{m}\Omega$  and high ripple current are the key parameters of the multianode construction within the E case package available now with niobium oxide anode – OxiCap™ product family. Niobium oxide technology benefits such as high resistance and non-burn together with excellent reliability and reduced derating are maintained within this multianode series.



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

## HOW TO ORDER

**NOM**

Type

**E**

Case Size

**227**

**Capacitance Code**  
1st two digits  
represent significant  
figures, 3rd digit  
represents multiplier  
in pF

**M**

**Capacitance  
Tolerance**  
M =  $\pm 20\%$

**006**

**Rated DC Voltage**  
001 = 1.8Vdc  
002 = 2.5Vdc  
004 = 4Vdc  
006 = 6.3Vdc

**R**

**Packaging**  
R = Lead Free  
7" Reel  
S = Lead Free  
13" Reel

**0040**

**ESR**  
ESR value in  
mOhms@100kHz

Capacitance		Rated Voltage DC ( $V_R$ ) to 85°C / 0.66 DC to 105°C / 0.5 DC to 125°C				
$\mu\text{F}$	Code	1.8V (x)	2.5V (e)	4.0V (G)	6.3V (J)	10V (A)
150	157					E(40)
220	227				E(40)	
330	337			E(35)	E(23,35)	
470	477		E(30)	E(23,30)		
680	687	E(23)	E(23)			
1000	108					

Developmental Ratings - subject to change



LEAD-FREE  
LEAD-FREE COMPATIBLE  
COMPONENT



HALOGEN-FREE COMPOUNDS  
ENVIRONMENTAL FRIENDLY  
COMPONENT



NON-BURN  
NON-SMOKE



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# Film Chip Capacitors

## Film Chip Capacitors



High temperature PET construction. Industry standard sizes from 1206 to 6054, Low DF. Self-healing. Very stable vs. temperature variation  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ .

- 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/filmchp.pdf>

## HOW TO ORDER

**CF**



Type

**04**



Size

01 or **21** = 1206  
02 or **22** = 1210  
03 or **23** = 1812  
04 or **24** = 2220  
05 or **25** = 2824  
16 or **26** = 4030  
17 or **27** = 5040  
18 or **28** = 6054

**2**



Dielectric

2 = PET - HT

**G**



Voltage

25 V = C  
50/63 V = D  
100 V = E  
160 V = F  
250 V = G

**0105**



Capacitance  
EIA Code

\* 1st digit: 0 (zero).  
\* 2nd & 3rd: the 2nd significant figures of the capacitance value.  
\* 4th digit: the number of zeros to be added to the capacitance value.

**K**



Tolerance

5% = J  
10% = K

**--**



Suffix

-- = Bulk  
BA = Tape & reel  
Ø 180mm (7")  
BC = Tape & reel  
Ø 330mm (13")

Standard range  
Extended range

## Voltages (Vdc/Vac)

Capacitance		25 Vdc/16Vac		50 Vdc/40Vac		63 Vdc/40Vac		100 Vdc/63Vac		160 Vdc/100Vac		250 Vdc/160Vac	
		Size Code	H max	Size Code	H max	Size Code	H max	Size Code	H max	Size Code	H max	Size Code	H max
1 nF	0102	1206	1.10	1206	1.10	1812	1.50	1812/1206	1.50/1.10	1812	1.50	1812	1.50
1.5	0152	1206	1.10	1206	1.10	1812	1.50	1812/1206	1.50/1.10	1812	1.50	1812	1.50
2.2	0222	1206	1.10	1206	1.10	1812	1.50	1812/1206	1.50/1.10	1812	1.50	1812	1.50
3.3	0332	1206	1.10	1206	1.10	1812	1.50	1812/1206	1.50/1.10	1812	1.50	1812	1.50
4.7	0472	1206	1.10	1206	1.10	1812	1.50	1812/1206	1.50/1.30	1812	1.50	1812	1.50
6.8	0682	1206	1.10	1206	1.10	1812	1.50	1812/1210/1206	1.50/1.60/1.10	1812	1.50	1812	1.50
10	0103	1206	1.30	1206	1.30	1812	1.50	1812/1210/1206	1.50/1.60/1.30	1812	1.50	1812	1.50
15	0153	1206	1.30	1210/1206	1.80/1.30	1812	1.50	1812/1210/1206	1.50/1.80/1.30	1812	1.50	1812	2.50
22	0223	1206	1.30	1210/1206	2.20/1.30	1812	1.50	1812/1210/1206	1.50/2.20/1.30	1812	2.00	2220/1812	2.00/1.70
33	0333	1210/1206	2.20/1.30	1210/1206	2.20/1.30	1812	1.50	1812/1210	1.50/2.00	1812	2.50	2220/1812	2.00/2.50
47	0473	1210	1.80	1210	1.80	1812	2.00	1812/1210	2.00/2.20	2220	2.10	2220/2220	3.00/2.40
68	0683	1210	2.20	1210	2.20	1812	2.00	1812/1210	3.00/2.30	2220	3.00	2220/2220	4.00/2.40
100	0104	1210	2.20	1210	2.20	1812	2.00	1812/1812	3.00/1.80	2220	3.40	2824/2220	3.60/3.50
150	0154					1812/1812	2.50/2.10	2220/1812	3.00/2.60	2824	5.10	2824/2220	5.10/4.20
220	0224					1812/1812	3.00/2.60	2220/2220	4.50/2.00	2824	5.00	4030/2824	3.80/4.60
330	0334					2220/2220	3.40/2.30	2220/2220	4.50/2.80	4030	3.80	4030/4030	5.80/4.00
470	0474					2220/2220	4.00/2.70	2824/2220	3.50/3.90	5040	3.80	5040/4030	4.60/5.50
680	0684					2220/2220	4.50/4.10	2824/2824	5.10/3.50	5040	4.60	6054/5040	4.40/4.60
1µF	0105					2824/2220	5.00/4.40	4030/2824	4.80/5.10	6054	4.40	6054/5040	5.70/6.60
1.5	0155					5040/2824	4.60/4.80	5040/4030	4.60/4.30	6024	6.20	6054	5.90
2.2	0225					5040/2824	5.50/5.60	5040/4030	5.50/6.00				
3.3	0335					6054/4030	5.70/5.80	6054/5040	5.70/5.40				
4.7	0475					6054/5040	6.00/5.70	6054/6054	7.00/4.80				

Standard range  
 Extended range  
 Development range

# Film Chip Capacitors

## High Voltage



Metallized High Temperature polyethylene terephthalate PET film capacitor, non-inductive self-healing dielectric, uncoated, with tin lead terminations for surface mounting.

- Suitable for IR or vapor phase reflow processes
- The self-healing property of film technology results in safe open circuit failure mode and better overall reliability
- 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/hvcf.pdf>

## HOW TO ORDER

**CF**

Type

**05**

Size

04 = 2220  
05 = 2824  
16 = 4030  
17 = 5040  
18 = 6054

**2**

Dielectric  
2 = PET- HT

**I**

Voltage  
400 V = I  
630 V = K

**0104**

Capacitance  
EIA Code

\* 1st digit: 0 (zero).  
\* 2nd & 3rd: the 2nd significant figures of the capacitance value.  
\* 4th digit: the number of zeros to be added to the capacitance value.

**J**

Tolerance  
5% = J  
10% = K

**--**

Suffix

-- = Bulk  
BC = Tape & Reel

**Voltage 400 V**

Ordering Code	Capacitance nF	Chip Dimensions			Tape Dimensions			Reel Dimensions			Packaging Unit		Reel Packaging Code
		L	W	H max.	W	P <sub>1</sub>	K <sub>0</sub>	A	W <sub>1</sub>	W <sub>2</sub> max.	Bulk	Reel	
CF042I0103+--	10	5.70±0.70 (0.224±0.028)	5.10±0.50 (0.201±0.020)	2.05 (0.081)	12 (0.472)	8 (0.315)	2.10 (0.083)	330 (13.00)	12.4 (0.488)	18.4 (0.724)	1500	4400	BC
CF042I0153+--	15	5.70±0.70 (0.224±0.028)	5.10±0.50 (0.201±0.020)	2.05 (0.081)	12 (0.472)	8 (0.315)	2.10 (0.083)	330 (13.00)	12.4 (0.488)	18.4 (0.724)	1500	4400	BC
CF042I0223+--	22	5.70±0.70 (0.224±0.028)	5.10±0.50 (0.201±0.020)	2.20 (0.087)	12 (0.472)	8 (0.315)	3.45 (0.136)	330 (13.00)	12.4 (0.488)	18.4 (0.724)	1500	2800	BC
CF042I0333+--	33	5.70±0.70 (0.224±0.028)	5.10±0.50 (0.201±0.020)	3.00 (0.118)	12 (0.472)	8 (0.315)	3.45 (0.136)	330 (13.00)	12.4 (0.488)	18.4 (0.724)	1500	2800	BC
CF042I0473+--	47	5.70±0.70 (0.224±0.028)	5.10±0.50 (0.201±0.020)	4.20 (0.165)	16 (0.630)	8 (0.315)	4.60 (0.181)	330 (13.00)	16.4 (0.646)	22.4 (0.882)	1500	1900	BC
CF052I0683+--	68	7.10±0.50 (0.280±0.020)	6.10±0.50 (0.240±0.020)	3.70 (0.146)	16 (0.630)	12 (0.472)	5.23 (0.206)	330 (13.00)	16.4 (0.646)	22.4 (0.882)	1000	1100	BC
CF052I0104+--	100	7.10±0.50 (0.280±0.020)	6.10±0.50 (0.240±0.020)	5.30 (0.209)	16 (0.630)	12 (0.472)	5.90 (0.232)	330 (13.00)	16.4 (0.646)	22.4 (0.882)	1000	900	BC
CF162I0154+--	150	10.2±0.60 (0.402±0.024)	7.60±0.80 (0.299±0.031)	4.80 (0.189)	16 (0.630)	12 (0.472)	4.90 (0.193)	330 (13.00)	16.4 (0.646)	22.4 (0.882)	500	1100	BC
CF172I0224+--	220	12.7±0.60 (0.500±0.024)	10.2±0.80 (0.402±0.031)	3.80 (0.150)	24 (0.945)	16 (0.630)	4.00 (0.157)	330 (13.00)	24.4 (0.961)	30.4 (1.197)	300	1100	BC
CF172I0334+--	330	12.7±0.60 (0.500±0.024)	10.2±0.80 (0.402±0.031)	5.60 (0.220)	24 (0.945)	16 (0.630)	7.00 (0.276)	330 (13.00)	24.4 (0.961)	30.4 (1.197)	300	600	BC
CF182I0474+--	470	15.2±0.60 (0.598±0.024)	13.7±0.80 (0.539±0.031)	4.90 (0.193)	24 (0.945)	24 (0.945)	6.30 (0.248)	330 (13.00)	24.4 (0.961)	30.4 (1.197)	300	400	BC

**Voltage 630 V**

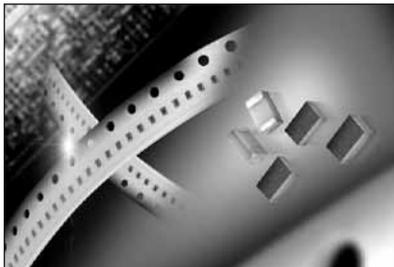
CF042K0103+--	10	5.70±0.70 (0.224±0.028)	5.10±0.50 (0.201±0.020)	2.05 (0.081)	12 (0.472)	8 (0.315)	2.10 (0.083)	330 (13.00)	12.4 (0.488)	18.4 (0.724)	1500	4400	BC
CF042K0153+--	15	5.70±0.70 (0.224±0.028)	5.10±0.50 (0.201±0.020)	2.90 (0.114)	12 (0.472)	8 (0.315)	3.45 (0.136)	330 (13.00)	12.4 (0.488)	18.4 (0.724)	1500	2800	BC
CF042K0223+--	22	5.70±0.70 (0.224±0.028)	5.10±0.50 (0.201±0.020)	4.00 (0.157)	16 (0.630)	8 (0.315)	4.60 (0.181)	330 (13.00)	16.4 (0.646)	22.4 (0.882)	1500	1900	BC
CF052K0333+--	33	7.10±0.50 (0.280±0.020)	6.10±0.50 (0.240±0.020)	3.60 (0.142)	24 (0.945)	12 (0.472)	3.73 (0.147)	330 (13.00)	24.4 (0.961)	30.4 (1.197)	1000	1600	BC
CF052K0473+--	47	7.10±0.50 (0.280±0.020)	6.10±0.50 (0.240±0.020)	5.10 (0.201)	16 (0.630)	12 (0.472)	5.23 (0.206)	330 (13.00)	16.4 (0.646)	22.4 (0.882)	1000	1100	BC
CF162K0683+--	68	10.2±0.60 (0.402±0.024)	7.60±0.80 (0.299±0.031)	3.90 (0.154)	16 (0.630)	12 (0.472)	4.90 (0.193)	330 (13.00)	16.4 (0.646)	22.4 (0.882)	500	1100	BC
CF162K0104+--	100	10.2±0.60 (0.402±0.024)	7.60±0.80 (0.299±0.031)	5.60 (0.220)	24 (0.945)	12 (0.472)	6.19 (0.244)	330 (13.00)	24.4 (0.961)	30.4 (1.197)	500	900	BC
CF172K0154+--	150	12.7±0.60 (0.500±0.024)	10.2±0.80 (0.402±0.031)	4.60 (0.181)	24 (0.945)	16 (0.630)	4.70 (0.185)	330 (13.00)	24.4 (0.961)	30.4 (1.197)	300	900	BC
CF182K0224+--	220	15.2±0.60 (0.598±0.024)	13.7±0.80 (0.539±0.031)	4.10 (0.161)	24 (0.945)	24 (0.945)	4.50 (0.177)	330 (13.00)	24.4 (0.961)	30.4 (1.197)	300	600	BC

Replace the + by the tolerance code: J = 5% or K = 10%  
 Replace the -- by the packaging suffix: -- = bulk  
 BC = tape and reel

\*Please Note: If value not shown other values upon request

# Accu-P®

## Thin-Film Chip Capacitors



As in the Accu-P® 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

**0805**

**Size**  
0201  
0402  
0603  
0805  
1210

**5**

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

**J**

**Temperature Coefficient (1)**  
J =  $0 \pm 30 \text{ppm}/^\circ\text{C}$   
(-55°C to +125°C)  
K =  $0 \pm 60 \text{ppm}/^\circ\text{C}$   
(-55°C to +125°C)

**120**

**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

**G**

**Tolerance**  
**for  $C \leq 2.0 \text{pF}^*$**   
P =  $\pm 0.02 \text{pF}$   
Q =  $\pm 0.03 \text{pF}$   
A =  $\pm 0.05 \text{pF}$   
B =  $\pm 0.1 \text{pF}$   
C =  $\pm 0.25 \text{pF}$   
**for  $C \geq 10 \text{pF}$**   
F =  $\pm 1\%$   
G =  $\pm 2\%$   
J =  $\pm 5\%$   
**for  $C \leq 5.6 \text{pF}$**   
A =  $\pm 0.05 \text{pF}$   
B =  $\pm 0.1 \text{pF}$   
C =  $\pm 0.25 \text{pF}$

**B**

**Specification Code**  
B = Accu-P® technology

**W**

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

**TR**

**Packaging Code**  
TR = Tape and Reel

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

\* Tolerances as tight as  $\pm 0.01 \text{pF}$  are available.  
Please consult the factory.

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

Size Code		0201			0402			0603		0805			1210	
Voltage		25	16	10	25	16	10	50	25	100	50	25	100	50
Cap in pF <sup>(1)</sup>	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			+		+								
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.

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

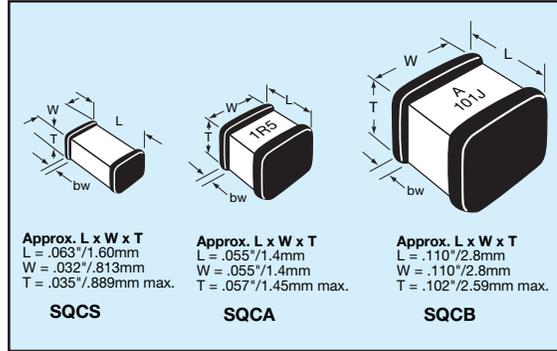
Size Code		0805			1210	
Voltage		100	50	25	100	50 <sup>(3)</sup>
Cap in pF <sup>(1)</sup>	Cap code					
0.1	— 0R1					
0.2	— 0R2					
0.3	— 0R3					
0.4	— 0R4					
0.5	— 0R5					
0.6	— 0R6					
0.7	— 0R7					
0.8	— 0R8					
0.9	— 0R9					
1.0	— 1R0					
1.1	— 1R1					
1.2	— 1R2					
1.3	— 1R3					
1.4	— 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					
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.
- (4) These values are produced with "K" temperature coefficient code only.

# SQ Series

## Microwave MLCs



These porcelain and ceramic dielectric multilayer capacitor (MLC) chips are best suited for RF/Microwave applications typically ranging from 10 MHz to 4.2 GHz. Characteristic is a fine grained, high density, high purity dielectric material impervious to moisture with heavy internal palladium electrodes.

These characteristics lend well to applications requiring:

- 1) high current carrying capabilities;
- 2) high quality factors;
- 3) very low equivalent series resistance;
- 4) very high series resonance;
- 5) excellent stability under stresses of changing voltage, frequency, time and temperature.



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

## HOW TO ORDER

<b>SQ</b>	<b>CB</b>	<b>7</b>	<b>M</b>	<b>100</b>	<b>J</b>	<b>A</b>	<b>1</b>	<b>ME</b>
<b>AVX Style</b>	<b>Case Size</b>	<b>Voltage Code</b>	<b>Temperature Coefficient Code</b>	<b>Capacitance</b>	<b>Capacitance Tolerance Code</b>	<b>Failure Rate Code</b>	<b>Termination Style Code</b>	<b>Packaging Code</b>
SQ	CS = 0603 CA = 0605 CB = 1210	5 = 50V 1 = 100V 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.	A = ±.05 pF 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 Sn/Pb (60/40) T = 100% Tin	ME = 7" Reel RE = 13" Reel WE = Waffle Pack 3A = SQCS 13" 6A = SQCS Waffle Pack 1A = SQCS 7"

**TABLE I: TC: M (+90±20PPM/°C)**

**DIMENSIONS: inches (millimeters)**

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

Case: SQCB			
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,B,C,D	500	
0.7	B,B,C,D	500	
0.8	B,B,C,D	500	
0.9	B,B,C,D	500	
1.0	B,B,C,D	500	
1.1	B,B,C,D	500	
1.2	B,B,C,D	500	
1.3	B,B,C,D	500	
1.4	B,B,C,D	500	
1.5	B,B,C,D	500	
1.6	B,B,C,D	500	
1.7	B,B,C,D	500	
1.8	B,B,C,D	500	
1.9	B,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,B,C,D	500	
3.0	B,C,D	500	
3.3	B,C,D	500	
3.6	B,B,C,D	500	
3.9	B,B,C,D	500	
4.3	B,B,C,D	500	
4.7	B,B,C,D	500	
5.1	B,B,C,D	500	
5.6	B,B,C,D	500	
6.2	B,B,C,D	500	
6.8	B,B,C,J,K,M	500	
7.5	B,B,C,J,K,M	500	
8.2	B,B,C,J,K,M	500	
9.1	B,C,J,K,M	500	
10	F,G,J,K,M	500	
11	F,G,J,K,M	500	
12	F,G,J,K,M	500	
13	F,G,J,K,M	500	
16	F,G,J,K,M	500	
18	F,G,J,K,M	500	
20	F,G,J,K,M	500	
22	F,G,J,K,M	500	
24	F,G,J,K,M	500	
27	F,G,J,K,M	500	
30	F,G,J,K,M	500	
33	F,G,J,K,M	500	
36	F,G,J,K,M	500	
39	F,G,J,K,M	500	
43	F,G,J,K,M	500	
47	F,G,J,K,M	500	
51	F,G,J,K,M	500	
56	F,G,J,K,M	500	
62	F,G,J,K,M	500	
68	F,G,J,K,M	500	
75	F,G,J,K,M	500	
82	F,G,J,K,M	500	
91	F,G,J,K,M	500	

Cap. pF	Cap. Tol.	WVDC
100	F,G,J,K,M	500
110	F,G,J,K,M	300
120	F,G,J,K,M	300
130	F,G,J,K,M	300
150	F,G,J,K,M	300
160	F,G,J,K,M	300
180	F,G,J,K,M	300
200	F,G,J,K,M	300
220	F,G,J,K,M	200
240	F,G,J,K,M	200
270	F,G,J,K,M	200
300	F,G,J,K,M	200
330	F,G,J,K,M	200
360	F,G,J,K,M	200
390	F,G,J,K,M	200
430	F,G,J,K,M	200
470	F,G,J,K,M	200
510	F,G,J,K,M	150
560	F,G,J,K,M	150
620	F,G,J,K,M	150
680	F,G,J,K,M	150
750	F,G,J,K,M	150
820	F,G,J,K,M	150
910	F,G,J,K,M	150
1000	F,G,J,K,M	150



**TABLE II: TC: A (0±30PPM/°C): CASE SIZE 06, 11, 12, 13 & 14**

**DIMENSIONS: inches (millimeters)**

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

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

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



**TABLE III: TC: C ( $\pm 15\%$ )**

**DIMENSIONS:** inches (millimeters)

Case: SQCA									Case: SQCB								
Cap. pF	Cap. Tol.	WVDC	Cap. pF	Cap. Tol.	WVDC	Cap. pF	Cap. Tol.	WVDC	Cap. pF	Cap. Tol.	WVDC	Cap. pF	Cap. Tol.	WVDC	Cap. pF	Cap. Tol.	WVDC
1000	K, M, N	50	2200	K, M, N	50	5100	K, M, N	50	5000	K, M, N	50	15000	K, M, N	50	47000	K, M, N	50
1200	K, M, N	50	2700	K, M, N	50	5600	K, M, N	50	6800	K, M, N	50	18000	K, M, N	50	68000	K, M, N	50
1500	K, M, N	50	3300	K, M, N	50	6800	K, M, N	50	8200	K, M, N	50	27000	K, M, N	50	82000	K, M, N	50
1800	K, M, N	50	3900	K, M, N	50	8200	K, M, N	50	10000	K, M, N	50		33000	K, M, N	50	100000	K, M, N
2000	K, M, N	50	4700	K, M, N	50	10000	K, M, N	50	12000	K, M, N	50	39000	K, M, N	50			



# Ultra Low ESR “U” Series

## RF/Microwave COG (NP0) Chip Capacitors



“U” Series capacitors are COG (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 0603, 0805, and 1210.


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

### HOW TO ORDER

<b>0805</b>	<b>1</b>	<b>U</b>	<b>100</b>	<b>J</b>	<b>A</b>	<b>T</b>	<b>2</b>	<b>A</b>
<b>Case Size</b>	<b>Voltage Code</b>	<b>Dielectric = Ultra Low ESR</b>	<b>Capacitance</b>	<b>Capacitance Tolerance Code</b>	<b>Failure Rate Code</b>	<b>Termination</b>	<b>Packaging Code</b>	<b>Special Code</b>
0402 0603 0805 1210	3 = 25V 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 Tin	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	B,C,D	↓	↓	↓	↓
0.9	↓	↓	↓	↓	↓

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	↓	↓	↓	↓	↓
20	↓	↓	↓	↓	↓
22	↓	↓	↓	↓	↓
24	↓	↓	↓	↓	↓
27	↓	↓	↓	↓	↓
30	↓	↓	↓	↓	↓
33	↓	↓	↓	↓	↓
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	↓	↓	↓	↓	↓
120	↓	↓	↓	↓	↓
130	↓	↓	↓	↓	↓
140	↓	↓	↓	↓	↓
150	↓	↓	↓	↓	↓
160	↓	↓	↓	↓	↓
180	↓	↓	↓	↓	↓
200	↓	↓	↓	↓	↓
220	↓	↓	↓	↓	↓
270	↓	↓	↓	↓	↓
300	↓	↓	↓	↓	↓
330	↓	↓	↓	↓	↓
360	↓	↓	↓	↓	↓
390	↓	↓	↓	↓	↓
430	↓	↓	↓	↓	↓
470	↓	↓	↓	↓	↓
510	↓	↓	↓	↓	↓
560	↓	↓	↓	↓	↓
620	↓	↓	↓	↓	↓
680	↓	↓	↓	↓	↓
750	↓	↓	↓	↓	↓
820	↓	↓	↓	↓	↓
910	↓	↓	↓	↓	↓
1000	F,G,J,K,M	↓	↓	↓	↓



# Supercapacitors BestCap®

## Ultra-low ESR High Power 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.



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## HOW TO ORDER

(See Detailed Electrical Specifications for valid combinations)

<b>BZ</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>A</b>	<b>503</b>	<b>Z</b>	<b>A</b>	<b>B</b>	<b>XX</b>
BestCap®	Standard	Case Size	Rated Voltage	Series	Capacitance Code (Farad Code)	Capacitance Tolerance	Lead Format	Packaging	Not Used For Standard Product (Consult Factory For Special Requirements)
		1 = 28mmx17mm 2 = 48mmx30mm 5 = 20mmx15mm	3 = 3.6V 4 = 4.5V 5 = 5.5V 7 = 7.0V 9 = 9.0V C = 12.0V	A = Maximum Capacitance B = Low Profile		Z = (-20/+80)%	A, H, L or S	B = Bulk	

<b>A-SERIES – MAXIMUM CAPACITANCE</b>											
<b>Capacitance</b>		<b>Rated Voltage DC at 25°C</b>									
mF	Code	3.6V		5.5V		7.0V		9.0V		12.0V	
		Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles
10	103									BZ05	S
22	223									BZ01	A, H, S
33	333			BZ05	S	BZ01	A, H, S	BZ01	A, H, S		
47	473									BZ11	S
50	503			BZ01	A, H, S						
68	683			BZ05	S						
70	703	BZ01	A, 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	BZ11	S	BZ02	A, H, L, S						
560	564	BZ02	A, H, L								
1000	105			BZ12	S						

Available  
 In Development

<b>B-SERIES – LOW PROFILE</b>											
<b>Capacitance</b>		<b>Rated Voltage DC at 25°C</b>									
mF	Code	3.6V		4.5V		5.5V		9.0V		12.0V	
		Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles
15	153					BZ05	S			BZ01	A, H, S
22	223			BZ05	S			BZ01	A, H, S		
30	303					BZ01	S				
33	333			BZ01	S	BZ05	S				
47	473					BZ15	S				
50	503	BZ01	S								
60	603					BZ01	A, H, S				

Available  
 In Development

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