

HIGH RELIABILITY EXTENDED RANGE  
CHIP CAPACITORS FOR SPACE

**NEW  
HIGH CAP  
VALUES**



**100% Screened &  
Inspected to  
MIL-PRF-123 Including  
0201 & 0402  
SIZES**

# HIGH RELIABILITY EXTENDED RANGE CHIP CAPACITORS

## FORMERLY THE PRESIDIO COMPONENTS, INC. “#M123” DRAWING

For space flight applications that require the highest level of reliability, Presidio recommends its high reliability extended range chip capacitors. Tested to the requirements of MIL-PRF-123, Presidio manufactures these chips on the same manufacturing line as its military products. Please note these capacitors are NOT MIL-qualified. Unless noted in the data sheet, the parts do meet the MIL-PRF-123 design requirements for dielectric thickness and electrode composition. All parts are manufactured with **PRECIOUS METAL ELECTRODES**.

**NASA S-311 SPECIFICATION**  
 Most of these chips are qualified to the NASA S-311 drawing. For more information click on the NASA S-311-P-829 link on Presidio's website:  
[www.presidiocomponents.com](http://www.presidiocomponents.com)

### QUALITY ASSURANCE PROVISIONS

Every lot undergoes the following inspection and tests.

**DESTRUCTIVE PHYSICAL ANALYSIS (DPA)** — A representative sample is pulled from each lot and examined per EIA RS469 and to verify adherence to Presidio's design criteria. Sample size is per MIL-PRF-123.

**ULTRASONIC INSPECTION** —

**Code A:** Ultrasonic inspection is performed on 100% of the parts, except for Case Code 0201 where real time X-Ray is used instead.  
**Code B:** No Ultrasonic inspection or real time X-Ray is performed.

**THERMAL SHOCK** — All parts are temperature cycled for 20 cycles to MIL-STD-202 Method 107, Condition A, except that max temperature is 125°C.

**VOLTAGE CONDITIONING** — All parts receive a voltage conditioning at 2X rated voltage and 125°C for a minimum of 168 hours and a maximum of 264 hours. Voltage Conditioning may be terminated at any time between 168 and 264 hour time interval that failures are less than .1% or 1 piece during the last 48 hours of the test. Method follows MIL-PRF-123. Resistors, instead of fuses are acceptable.

**INSULATION RESISTANCE (IR @ 125°C)** — All parts are tested at 125°C and Rated Voltage in accordance with Method 302 of MIL-STD-202. The minimum IR required is 10,000 Megohms or 100 Megohm-Microfarads.

**DIELECTRIC WITHSTANDING VOLTAGE (DWV)** — All parts are tested at 2.5X rated voltage in accordance with Method 301 of MIL-STD-202.

**INSULATION RESISTANCE (IR @ 25°C)** — All parts are tested at 25°C and Rated Voltage in accordance with Method 302 of MIL-STD-202. The minimum IR required is 100,000 Megohms or 1,000 Megohm-Microfarads.

**CAPACITANCE** — All parts are tested at 25°C and 1VACRMS in accordance with Method 305 of MIL-STD-202.

**DISSIPATION FACTOR (DF)** — See following table:

VOLTAGE RATING	NPO	X7R
5/6.3/10	N/A	7.5%
16	0.15%	5%
25	0.15%	4%
50	0.15%	3.5%
100	0.15%	2.5%

\* For 10V high cap values see note 1/ on page 3

**PERCENT DEFECTIVE ALLOWED (PDA)** — The cumulative PDA after Voltage Conditioning is 5%. Pieces rejected as out of tolerance for capacitance or visual screening will be removed from the lot but not counted in the PDA calculation.

**VISUAL** — A 100% inspection is performed IAW MIL-PRF-123 Appendix B.

**MECHANICAL** — Level 1 AQL 1% in accordance with MIL-PRF-123.

**THERMAL SHOCK AND LIFE TEST** — A sample is pulled from each lot. 100 Thermal shock cycles are performed and Life Test is performed for 1000 hours at 2X rated voltage and 125°C. Sample size and method follows MIL-PRF-123.

**HUMIDITY, STEADY STATE, LOW VOLTAGE** — A sample of 12 pieces is pulled from each lot and tested per MIL-PRF-123.

**MARKING (Optional for sizes 0805 and larger only)** — Parts will not be marked unless marking is specified on the PO. If marking is specified, a color letter will be used per Presidio's chip marking system.

### STANDARD PACKAGING

Product will be packaged in individual waffle trays. Tape and reel option is available.

### DATA PACKAGE

Data will be sent with each shipment including:

- CERTIFICATE of COMPLIANCE
- DPA REPORT
- GROUP A & B ATTRIBUTE DATA SHEET
- LIFE TEST AND HUMIDITY VARIABLES DATA SHEET.

Group B required for flight parts. Parts for engineering models may be subject to lesser screening requirements.

**EXAMPLE PART NUMBER**  
**SR0805X7R103K2P5(L)#M123A**  
 PART DESCRIPTION: SR, 0805, X7R, 10nF, ±10%, 50VDC, PdAg Termination, Waffle Pack, Design-In Code (L) for Vermont, Screened per MIL-PRF-123, with 100% Ultrasonic Inspection.

Design-In Codes can be found on our website

### HOW TO ORDER

**EXAMPLE: SR0805X7R103K2P5(L)#M123A**

<b>SR</b>	<b>0805</b>	<b>X7R</b>	<b>103</b>	<b>K</b>	<b>2</b>	<b>P</b>	<b>5</b>	<b>(L)</b>	<b>#M123</b>	<b>A</b>
<b>Prefix</b> SR	<b>Size Code</b> See Page 3 For Sizes Other Sizes Available	<b>Dielectric</b> X7R NPO	<b>Capacitance</b> (in picofarads) Two significant figures followed by the number of zeros. Example: 103 = 10,000pF = .01µF	<b>Tolerance</b> A = ± .05pF < 6.2pF B = ± .10pF < 10pF C = ± .25pF < 10pF D = ± .50pF < 10pF F = ± 1% G = ± 2% J = ± 5%  K = ± 10% L = -10% / +20% M = ± 20%  NPO ONLY  ALL	<b>Voltage Code</b> B = 5 VDC E = 10 VDC F = 12 VDC G = 16 VDC 1 = 25 VDC 2 = 50 VDC 3 = 100 VDC  Other Voltages Available Examples: 63, 75, 150, 250 VDC, etc.	<b>Termination Code</b> P = Palladium Silver NT9 = Ni/Sn/Pb Min 4% Pb NG = Nickel Gold	<b>Packaging Code</b> 1 = Reel, 7", plastic tape, unmarked 2 = Reel, 7", plastic tape, marked 5 = Waffle, unmarked 6 = Waffle, marked	<b>Design-In Code</b> See Website	<b>Special Code</b> #M123	<b>Ultrasonic Inspection</b> A = 100% B = None See Above

# HIGH RELIABILITY EXTENDED RANGE CHIP CAPACITORS

FOR SPACE FLIGHT APPLICATIONS

SIZE	L inches (mm)	W inches (mm)	THICKNESS MAX (T) inches (mm)	METALIZATION BAND (M.B.) inches (mm)	WVDC	DIELECTRIC (MAXIMUM CAPACITANCE)				Available as S-311
						NPO		X7R		
0201	0.024 (0.61) ± 0.003 (0.08)	0.011 (0.28) ± 0.001 (0.03)	0.013 (0.33)	.004 (0.10) min. band .008 (0.20) min. space	10 V	<b>New!</b>		0.01 µF 1/	No	No
					16 V	<b>New!</b>		0.1 µF 1/	No	Yes
0402	0.040 (1.02) ± 0.006 (0.15)	0.020 (0.51) ± 0.004 (0.10)	0.024 (0.61)	.004 (0.10) min. band .015 (0.38) min. space	16 V			0.01 µF	No	Yes
					25 V	120 pF	No	4700 pF	No	Yes
					50 V	100 pF	No	3900 pF	Yes	Yes
					100 V	39 pF	Yes	1200 pF	Yes	Yes
0403	0.040 (1.02) ± 0.010 (0.25)	0.030 (0.76) ± 0.010 (0.25)	0.030 (0.76)	.004 (0.10) min. band .015 (0.38) min. space	16 V			0.022 µF	No	Yes
					25 V	390 pF	No	0.015 µF	No	Yes
					50 V	330 pF	No	0.012 µF	Yes	Yes
					100 V	68 pF	Yes	2200 pF	Yes	Yes
0504	0.050 (1.27) ± 0.010 (0.25)	0.040 (1.02) ± 0.010 (0.25)	0.040 (1.02)	.005 (0.13) min. band .015 (0.38) min. space	16 V			0.082 µF	No	Yes
					25 V	1500 pF	No	0.047 µF	No	Yes
					50 V	1200 pF	No	0.039 µF	Yes	Yes
					100 V	180 pF	Yes	6800 pF	Yes	Yes
Low Inductance 0306	0.032 (0.81) ± 0.006 (0.15)	0.063 (1.60) ± 0.006 (0.15)	0.033 (0.84) See Note 2/	.005 (0.13) min. band .010 (0.25) min. space	5 V			0.10 µF	No	Yes
					16 V			0.10 µF	No	Yes
					25 V			0.022 µF	No	Yes
0603	0.063 (1.60) ± 0.006 (0.15)	0.032 (0.81) ± 0.006 (0.15)	0.035 (0.89)	.005 (0.13) min. band .025 (0.64) min. space	10 V			0.22 µF	No	Yes
					16 V			0.10 µF	No	Yes
					25 V	680 pF	No	0.027 µF	No	Yes
					50 V	560 pF	No	0.022 µF	Yes	Yes
					100 V	100 pF	Yes	3300 pF	Yes	Yes
Low Inductance 0508	0.050 (1.27) ± 0.010 (0.25)	0.080 (2.03) ± 0.010 (0.25)	0.045 (1.14) See Note 3/	.005 (0.13) min. band .020 (0.51) min. space	10 V			0.12 µF	No	Yes
					16 V			0.10 µF	No	Yes
					25 V			0.047 µF	No	Yes
0805	0.080 (2.03) ± 0.010 (0.25)	0.050 (1.27) ± 0.010 (0.25)	0.055 (1.40)	0.020 (0.51) ± 0.010 (0.25)	10 V	<b>New!</b>		1.00 µF 1/	No	Yes
					16 V			0.22 µF	No	Yes
					25 V	2700 pF	No	0.10 µF	No	Yes
					50 V	2200 pF	No	0.10 µF	Yes	Yes
					100 V	560 pF	Yes	0.022 µF	Yes	Yes
Low Inductance 0612	0.063 (1.60) ± 0.010 (0.25)	0.126 (3.20) ± 0.010 (0.25)	0.055 (1.40)	.005 (0.13) min. band .025 (0.64) min. space	16 V			0.27 µF	No	Yes
					25 V			0.22 µF	No	Yes
1206	0.126 (3.20) ± 0.008 (0.20)	0.063 (1.60) ± 0.008 (0.20)	0.060 (1.52)	0.020 (0.51) ± 0.010 (0.25)	10 V	<b>New!</b>		1.8 µF 1/	No	Yes
					16 V			0.39 µF	No	Yes
					25 V	6800 pF	No	0.27 µF	No	Yes
					50 V	5600 pF	No	0.22 µF	Yes	Yes
					100 V	1500 pF	Yes	0.068 µF	Yes	Yes
1209	0.125 (3.18) ± 0.010 (0.25)	0.095 (2.41) ± 0.010 (0.25)	0.065 (1.65)	0.020 (0.51) ± 0.010 (0.25)	10 V	<b>New!</b>		2.7 µF 1/	No	Yes
					16 V			0.68 µF	No	Yes
					25 V	0.010 µF	No	0.47 µF	No	Yes
					50 V	8200 pF	No	0.39 µF	Yes	Yes
					100 V	3900 pF	Yes	0.15 µF	Yes	Yes
Low Inductance 0912	0.095 (2.41) ± 0.010 (0.25)	0.126 (3.20) ± 0.010 (0.25)	0.065 (1.65)	.005 (0.13) min. band .025 (0.64) min. space	16 V			0.68 µF	No	Yes
					25 V			0.47 µF	No	Yes
1712	0.175 (4.45) ± 0.013 (0.33)	0.125 (3.18) ± 0.010 (0.25)	0.065 (1.65)	0.020 (0.51) ± 0.010 (0.25)	16 V			1.2 µF	No	Yes
					25 V	0.022 µF	No	1.0 µF	No	Yes
					50 V	0.015 µF	No	0.68 µF	Yes	Yes
					100 V	6800 pF	Yes	0.27 µF	Yes	Yes
1812	0.180 (4.572) ± 0.015 (0.38)	0.125 (3.18) ± 0.015 (0.38)	0.080 (2.03)	0.020 (0.51) ± 0.010 (0.25)	10 V	<b>New!</b>		4.7 µF 1/	No	Yes
1725	0.180 (4.45) ± 0.013 (0.33)	0.250 (6.35) ± 0.018 (0.46)	0.065 (1.65) *0.080 (2.03) For max cap value	0.020 (0.51) ± 0.010 (0.25)	16 V			3.3 µF	No	Yes
					25 V	0.056 µF	No	2.2 µF	No	Yes
					50 V	0.039 µF	No	2.2 µF	Yes	No
					100 V	0.018 µF	Yes	0.68 µF	Yes	Yes
2225	0.220 (5.59) ± 0.015 (0.38)	0.250 (6.35) ± 0.018 (0.46)	0.080 (2.03)	0.020 (0.51) ± 0.010 (0.25)	16 V			3.9 µF	No	Yes
					25 V	0.068 µF	No	3.3 µF	No	Yes
					50 V	0.056 µF	No	2.2 µF	Yes	Yes
					100 V	0.027 µF	Yes	1.0 µF	Yes	Yes

MIL-PRF-123 MINIMUM DIELECTRIC THICKNESS COMPLIANT:

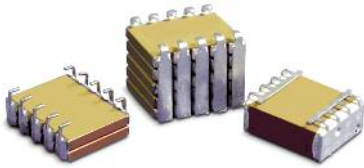
0.8 mils for 50V  
1.0 mils for 100 V

YES/NO

YES/NO

1/ The capacitance values in this category may have DF readings up to 7.5%. 2/ Also available as 0.024 Max Thickness 3/ Also available as 0.020 Max Thickness

# PRESIDIO CUSTOM PRODUCTS



**CUSTOM LEADS**

**PRESIDIO COMPONENTS, INC.** maintains more than 100 million standard commercial and military parts in inventory. If you need a custom product, call our engineering team.

Custom products include non-standard part sizes and voltages such as high voltage, high temperature, high "Q", custom leads, cryogenic ceramics, negative and positive temperature characteristic ceramics, and piezoelectric formulations. European sizes are also available.

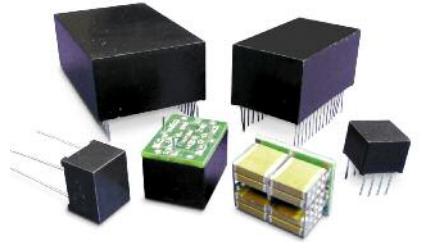
Backed with numerous patents and hundreds of years of combined experience, Presidio's engineering team is ready and able to create the ideal solution for any application.



**'S' LEADS**



**CUSTOM STACKED  
CUSTOM ASSEMBLY**



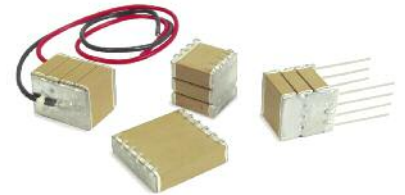
**ENCAPSULATED**



**HIGH TEMP  
DOWNHOLE OIL**

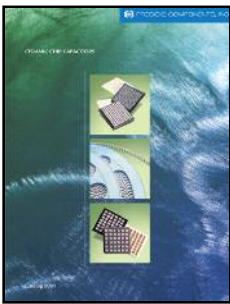


**POWER-STACK™  
CAPACITORS**



**HIGH FREQUENCY  
HIGH POWER**

## MAIN PRODUCT CATALOGS



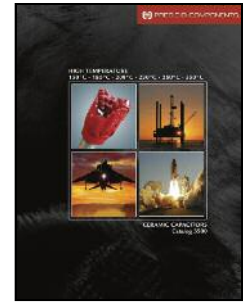
**CERAMIC CHIP  
CAPACITORS**



**HIGH RELIABILITY  
EXTENDED RANGE  
CHIPS FOR SPACE**



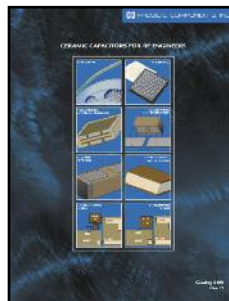
**SMPS STACKED  
CAPACITORS**



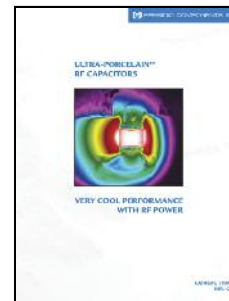
**HIGH TEMPERATURE  
CERAMIC  
CAPACITORS**



**HIGH VOLTAGE &  
RADIAL LEADED PRODUCTS  
MIL-PRF-49467 CAPACITORS**



**CERAMIC CAPACITORS  
FOR RF, MICROWAVE &  
FIBER OPTIC APPLICATIONS**



**ULTRA-PORCELAIN™  
RF CAPACITORS**



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MARCH 2017