

## Subminiature, Leaded Solid Tantalum Capacitors Polar or Non-Polar



### FEATURES

- Subminiature package size and light weight
- Rectangular case with axial or radial leads
- 2 to 35 V<sub>DC</sub>
- 0.1 μF to 470 μF
- Operating temperature range: - 55 °C to + 125 °C
- High stability and reliability
- Tested in accordance with MIL-PRF-49137
- Unique and comprehensive custom design capability

### ELECTRICAL CHARACTERISTICS

**Operating temperature range:** - 55 °C to + 125 °C

**Capacitance:** Measured at 120 Hz and 25 °C with a maximum of 2.2 V<sub>DC</sub> bias and 1.0 V<sub>rms</sub> signal.

**Capacitance Tolerance:** Standard tolerance is ± 20 % for ratings 0.1 μF and above, and + 40, - 20 % for ratings below 0.1 μF. Special tolerances are also available.

**Dissipation Factor:** When measured simultaneously with capacitance, DF shall not exceed the value shown in the ratings tables.

#### DC Leakage Current (DCL Max.):

When measured with DC voltage applied through a 1000 Ω resistor for 5 min, DC leakage (μA) shall not exceed:

**At 25 °C:** Leakage current shall not exceed the values listed in the Standard Ratings Tables

**At 85 °C:** Leakage current shall not exceed 10 times the values listed in the Standard Ratings Tables

**At 125 °C and 66 % of Rated Voltage:** Leakage current shall not exceed 15 times the values listed in the Standard Ratings Tables

**Operating Voltage:** Full working voltage up to 85 °C. From 85 °C to 125 °C working voltage derates linearly to 66 % of the 85 °C working voltage

### APPLICATIONS

- Hearing aids
- Portable communications
- Space/avionics
- Laptop computers

### MECHANICAL SPECIFICATIONS

Solder coated nickel leads (type N32 per MIL-STD-1276) are standard on all case sizes

Leads are weldable and/or solderable

Special leads are available on request (e.g. bare nickel, gold plated nickel or ribbon leads)

Lead length is 1 1/2" [38.1 mm] minimum on nonpolar parts

On polar parts the negative lead is 1 1/4" [31.8 mm] minimum and the positive lead is 1 1/2" [38.1 mm] minimum

### ORDERING INFORMATION

STC	1.0	35	C2	A (1)	M
MODEL	CAPACITANCE IN μF	DC VOLTAGE RATING AT + 85 °C	CASE CODE	LEAD CONFIGURATION	CAPACITANCE TOLERANCE
			C = Polar N = Non-polar	A = Axial R = Radial	E = + 40, - 20 % M = ± 20 % K = ± 10 % J = ± 5 %
<p><b>Example of Part Number Code: STC1.0-35C2AM</b></p>					

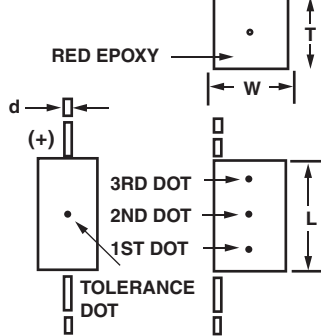
**Note:**

- (1) To complete part number in rating tables, add A or R.  
Change suffix if special capacitance tolerance is required.

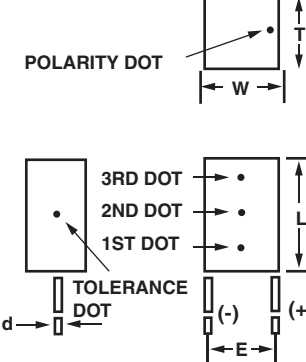
**DIMENSIONS** in inches [millimeters]

**POLAR STYLE**

**AXIAL**



**RADIAL**

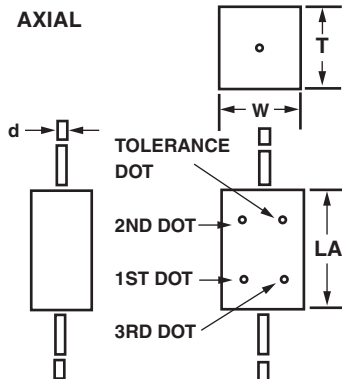


THE 3RD DOT IS ON THE END OF THE CX SIZE

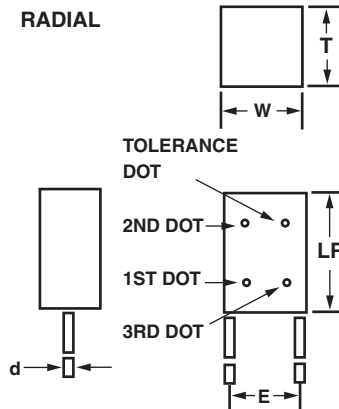
CASE CODE	L MAX.	W MAX.	T MAX.	E	E TOL. ±	d
CX	0.075 [1.91]	0.050 [1.27]	0.040 [1.02]	0.030 [0.76]	0.015 [0.38]	0.007 [0.18]
C0	0.100 [2.54]	0.050 [1.27]	0.040 [1.02]	0.030 [0.76]	0.015 [0.38]	0.007 [0.18]
C1	0.125 [3.18]	0.070 [1.78]	0.040 [1.02]	0.050 [1.27]	0.015 [0.38]	0.010 [0.25]
C2	0.165 [4.19]	0.120 [3.05]	0.070 [1.78]	0.100 [2.54]	0.020 [0.51]	0.010 [0.25]
C3	0.225 [5.72]	0.185 [4.70]	0.075 [1.91]	0.150 [3.81]	0.020 [0.51]	0.010 [0.25]
C4	0.290 [7.37]	0.220 [5.59]	0.110 [2.79]	0.180 [4.57]	0.025 [0.64]	0.016 [0.41]
C5	0.310 [7.87]	0.230 [5.84]	0.130 [3.30]	0.200 [[5.08]	0.025 [0.64]	0.016 [0.41]
C6	0.475 [12.07]	0.375 [9.53]	0.150 [3.81]	0.300 [7.62]	0.025 [0.64]	0.016 [0.41]

**NON POLAR STYLE**

**AXIAL**



**RADIAL**



CASE CODE	LA MAX.	LR MAX.	W MAX.	T MAX.	E MAX.	E TOL. ±	d
N1	0.220 [5.59]	0.180 [4.57]	0.125 [3.18]	0.125 [3.18]	0.100 [2.54]	0.020 [0.51]	0.010 [0.25]
N2	0.280 [7.11]	0.240 [6.10]	0.140 [3.56]	0.180 [4.57]	0.100 [2.54]	0.025 [0.64]	0.010 [0.25]
N3	0.370 [9.40]	0.315 [8.00]	0.180 [4.57]	0.220 [5.59]	0.150 [3.81]	0.025 [0.64]	0.016 [0.41]
N4	0.390 [9.91]	0.335 [8.51]	0.230 [5.84]	0.230 [5.84]	0.180 [4.57]	0.025 [0.64]	0.016 [0.41]



Subminiature, Leaded Solid Tantalum Capacitors  
Polar or Non-Polar

Vishay Sprague

<b>STANDARD RATINGS - POLAR CAPACITORS</b>				
CAPACITANCE ( $\mu$ F)	MAX DF (%)	MAX. DCL AT + 25 °C ( $\mu$ A)	CASE CODE	PART NUMBER
<b>2 WVDC AT + 85 °C</b>				
0.0022	10	0.5	CX	STC.0022-2CX <sup>(1)</sup> E
0.0033	10	0.5	CX	STC.0033-2CX <sup>(1)</sup> E
0.0047	10	0.5	CX	STC.0047-2CX <sup>(1)</sup> E
0.0068	10	0.5	CX	STC.0068-2CX <sup>(1)</sup> E
0.10	10	0.5	CX	STC.10-2CX <sup>(1)</sup> M
0.15	10	0.5	CX	STC.15-2CX <sup>(1)</sup> M
0.22	10	0.5	CX	STC.22-2CX <sup>(1)</sup> M
0.33	10	0.5	CX	STC.33-2CX <sup>(1)</sup> M
0.47	10	0.5	CX	STC.47-2CX <sup>(1)</sup> M
0.68	10	0.5	CX	STC.68-2CX <sup>(1)</sup> M
1.0	10	0.5	CX	STC1.0-2CX <sup>(1)</sup> M
1.5	10	0.5	CX	STC1.5-2CX <sup>(1)</sup> M
2.2	10	0.5	CX	STC2.2-2CX <sup>(1)</sup> M
2.2	10	0.5	C0	STC2.2-2C0 <sup>(1)</sup> M
6.8	10	0.5	C1	STC6.8-2C1 <sup>(1)</sup> M
100	10	2.0	C3	STC100-2C3 <sup>(1)</sup> M
<b>3 WVDC AT + 85 °C</b>				
1.5	10	0.5	C0	STC1.5-3C0 <sup>(1)</sup> M
22	10	1.0	C2	STC22-3C2 <sup>(1)</sup> M
68	10	2.0	C3	STC68-3C3 <sup>(1)</sup> M
100	10	3.0	C4	STC100-3C4 <sup>(1)</sup> M
<b>4 WVDC AT + 85 °C</b>				
1.0	10	0.5	C0	STC1.0-4C0 <sup>(1)</sup> M
4.7	10	0.5	C1	STC4.7-4C1 <sup>(1)</sup> M
10	8	1.0	C2	STC10-4C2 <sup>(1)</sup> M
15	8	1.0	C2	STC15-4C2 <sup>(1)</sup> M
47	8	2.0	C3	STC47-4C3 <sup>(1)</sup> M
68	8	3.0	C4	STC68-4C4 <sup>(1)</sup> M
220	15	9.0	C5	STC220-4C5 <sup>(1)</sup> M
470	15	10.0	C6	STC470-4C6 <sup>(1)</sup> M
<b>6 WVDC AT + 85 °C</b>				
0.68	10	0.5	C0	STC.68-6C0 <sup>(1)</sup> M
3.3	8	0.5	C1	STC3.3-6C1 <sup>(1)</sup> M
33	6	2.0	C3	STC33-6C3 <sup>(1)</sup> M
47	6	3.0	C4	STC47-6C4 <sup>(1)</sup> M
150	10	9.0	C5	STC150-6C5 <sup>(1)</sup> M
330	15	10.0	C6	STC330-6C6 <sup>(1)</sup> M
<b>10 WVDC AT + 85 °C</b>				
0.47	10	0.5	C0	STC.47-10C0 <sup>(1)</sup> M
1.5	6	0.5	C1	STC1.5-10C1 <sup>(1)</sup> M
2.2	6	0.5	C1	STC2.2-10C1 <sup>(1)</sup> M
6.8	6	1.0	C2	STC6.8-10C2 <sup>(1)</sup> M
22	6	2.0	C3	STC22-10C3 <sup>(1)</sup> M
33	6	3.0	C4	STC33-10C4 <sup>(1)</sup> M
100	8	9.0	C5	STC100-10C5 <sup>(1)</sup> M
220	6	0.5	C6	STC220-10C6 <sup>(1)</sup> M
<b>15 WVDC AT + 85 °C</b>				
1.0	6	0.5	C1	STC1.0-15C1 <sup>(1)</sup> M
4.7	6	1.0	C2	STC4.7-15C2 <sup>(1)</sup> M
15	6	2.0	C3	STC15-15C3 <sup>(1)</sup> M
22	6	3.0	C4	STC22-15C4 <sup>(1)</sup> M
68	6	6.0	C5	STC68-15C5 <sup>(1)</sup> M
150	10	10.0	C6	STC150-15C6 <sup>(1)</sup> M

**Note:**

<sup>(1)</sup> Add A for axial, R for radial



<b>STANDARD RATINGS - POLAR CAPACITORS</b>				
CAPACITANCE ( $\mu$ F)	MAX DF (%)	MAX. DCL AT + 25 °C ( $\mu$ A)	CASE CODE	PART NUMBER
<b>20 WVDC AT + 85 °C</b>				
0.68	6	0.5	C1	STC.68-20C1 <sup>(1)</sup> M
3.3	6	1.0	C2	STC3.3-20C2 <sup>(1)</sup> M
6.8	6	2.0	C3	STC6.8-20C3 <sup>(1)</sup> M
10	6	2.0	C3	STC10-20C3 <sup>(1)</sup> M
15	6	3.0	C4	STC15-20C4 <sup>(1)</sup> M
47	6	6.0	C5	STC47-20C5 <sup>(1)</sup> M
100	10	10.0	C6	STC100-20C6 <sup>(1)</sup> M
<b>25 WVDC AT + 85 °C</b>				
0.47	6	0.5	C1	STC.47-25C1 <sup>(1)</sup> M
2.2	6	1.0	C2	STC2.2-25C2 <sup>(1)</sup> M
3.3	6	2.0	C3	STC3.3-25C3 <sup>(1)</sup> M
4.7	6	2.0	C3	STC4.7-25C3 <sup>(1)</sup> M
10	6	3.0	C4	STC10-25C4 <sup>(1)</sup> M
15	6	6.0	C5	STC15-25C5 <sup>(1)</sup> M
22	6	6.0	C5	STC22-25C6 <sup>(1)</sup> M
33	6	6.0	C5	STC33-25C5 <sup>(1)</sup> M
68	6	10.0	C6	STC68-25C6 <sup>(1)</sup> M
<b>35 WVDC AT + 85 °C</b>				
0.33	6	0.5	C1	STC.33-35C1 <sup>(1)</sup> M
0.68	6	1.0	C2	STC.68-35C2 <sup>(1)</sup> M
1.0	6	1.0	C2	STC1.0-35C2 <sup>(1)</sup> M
1.5	6	1.0	C2	STC1.5-35C2 <sup>(1)</sup> M

**Note:**

<sup>(1)</sup> Add A for axial, R for radial

<b>STANDARD RATINGS - NON-POLAR CAPACITORS</b>				
CAPACITANCE ( $\mu$ F)	MAX DF (%)	MAX. DCL AT + 25 °C ( $\mu$ A)	CASE CODE	PART NUMBER
<b>2 WVDC AT + 85 °C</b>				
10	10	1.0	N1	STC10-2N1 <sup>(1)</sup> M
<b>3 WVDC AT + 85 °C</b>				
33	10	2.0	N2	STC33-3N2 <sup>(1)</sup> M
47	8	3.0	N3	STC47-3N3 <sup>(1)</sup> M
100	10	6.0	N4	STC100-3N4 <sup>(1)</sup> M
<b>4 WVDC AT + 85 °C</b>				
6.8	8	1.0	N1	STC6.8-4N1 <sup>(1)</sup> M
22	8	2.0	N2	STC22-4N2 <sup>(1)</sup> M
33	8	3.0	N3	STC33-4N3 <sup>(1)</sup> M
68	8	6.0	N4	STC68-4N4 <sup>(1)</sup> M
<b>6 WVDC AT + 85 °C</b>				
4.7	6	1.0	N1	STC4.7-6N1 <sup>(1)</sup> M
15	6	2.0	N2	STC15-6N2 <sup>(1)</sup> M
22	6	3.0	N3	STC22-6N3 <sup>(1)</sup> M
47	6	6.0	N4	STC47-6N4 <sup>(1)</sup> M
<b>10 WVDC AT + 85 °C</b>				
3.3	6	1.0	N1	STC3.3-10N1 <sup>(1)</sup> M
10	6	2.0	N2	STC10-10N2 <sup>(1)</sup> M
15	6	3.0	N3	STC15-10N3 <sup>(1)</sup> M
33	6	6.0	N4	STC33-10N4 <sup>(1)</sup> M

**Note:**

<sup>(1)</sup> Add A for axial, R for radial



<b>STANDARD RATINGS - NON-POLAR CAPACITORS</b>				
CAPACITANCE ( $\mu$ F)	MAX. DF (%)	MAX. DCL AT + 25 °C ( $\mu$ A)	CASE CODE	PART NUMBER
<b>15 WVDC AT + 85 °C</b>				
2.2	6	1.0	N1	STC2.2-15N1 <sup>(1)</sup> M
6.8	6	2.0	N2	STC6.8-15N2 <sup>(1)</sup> M
10	6	3.0	N3	STC10-15N3 <sup>(1)</sup> M
22	6	6.0	N4	STC22-15N4 <sup>(1)</sup> M
<b>20 WVDC AT + 85 °C</b>				
1.5	6	1.0	N1	STC1.5-20N1 <sup>(1)</sup> M
4.7	6	2.0	N2	STC4.7-20N2 <sup>(1)</sup> M
6.8	6	3.0	N3	STC6.8-20N3 <sup>(1)</sup> M
15	6	6.0	N4	STC15-20N4 <sup>(1)</sup> M
<b>25 WVDC AT + 85 °C</b>				
1.0	6	1.0	N1	STC1.0-25N1 <sup>(1)</sup> M
2.2	6	2.0	N2	STC2.2-25N2 <sup>(1)</sup> M
3.3	6	2.0	N2	STC3.3-25N2 <sup>(1)</sup> M
4.7	6	3.0	N3	STC4.7-25N3 <sup>(1)</sup> M
10	6	6.0	N4	STC10-25N4 <sup>(1)</sup> M
<b>35 WVDC AT + 85 °C</b>				
0.68	6	1.0	N1	STC.68-35N1 <sup>(1)</sup> M

**Note:**

<sup>(1)</sup> Add A for axial, R for radial

<b>MARKING</b>																																		
STC Capacitors case sizes C3 - C6 and N2 - N4 are print marked: - Capacitance is in picofarads - 1st and 2nd digits are significant figures - 3rd digit indicates the number of zeros.		All other case sizes are have color dot marking:																																
		<table border="1"> <thead> <tr> <th>Capacitance</th> <th>Color</th> <th>Digit</th> </tr> </thead> <tbody> <tr> <td>In picofarads, indicated by 3 dots. 1st and 2nd dot give the significant digits. 3rd dot indicates the number of zeros.</td> <td>Black</td> <td>0</td> </tr> <tr> <td>Color dot location is shown on the dimensional sketches. Black dot is omitted on black sleeve.</td> <td>Brown</td> <td>1</td> </tr> <tr> <td></td> <td>Red</td> <td>2</td> </tr> <tr> <td></td> <td>Orange</td> <td>3</td> </tr> <tr> <td></td> <td>Yellow</td> <td>4</td> </tr> <tr> <td></td> <td>Green</td> <td>5</td> </tr> <tr> <td></td> <td>Blue</td> <td>6</td> </tr> <tr> <td></td> <td>Violet</td> <td>7</td> </tr> <tr> <td></td> <td>Grey</td> <td>8</td> </tr> <tr> <td></td> <td>White</td> <td>9</td> </tr> </tbody> </table>	Capacitance	Color	Digit	In picofarads, indicated by 3 dots. 1st and 2nd dot give the significant digits. 3rd dot indicates the number of zeros.	Black	0	Color dot location is shown on the dimensional sketches. Black dot is omitted on black sleeve.	Brown	1		Red	2		Orange	3		Yellow	4		Green	5		Blue	6		Violet	7		Grey	8		White
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The positive lead is indicated by a color dot of red epoxy on the unit.		e.g. Yellow-Violet-Green = 4 700 000 pf = 4.7 $\mu$ F																																

**PERFORMANCE AND RELIABILITY**

The capacitors are tested in accordance with MIL-PRF-49137, with specific requirements as follows:

**Temperature Stability:** When tested per MIL-PRF-49137/6, capacitance shall be within  $\pm 15\%$  at  $-55\text{ }^\circ\text{C}$  and  $85\text{ }^\circ\text{C}$ , and  $\pm 10\%$  at  $25\text{ }^\circ\text{C}$  after exposure to temperature extremes. DF shall be within 200% of initial limit at  $-55\text{ }^\circ\text{C}$ , 150% of initial limit at  $85\text{ }^\circ\text{C}$ , and meet the initial at  $25\text{ }^\circ\text{C}$ . DCL shall be within 10 x initial limit at  $85\text{ }^\circ\text{C}$ , and meet the initial limit at  $25\text{ }^\circ\text{C}$ .

**Moisture Resistance:** (per Method 106 of MIL-STD-202) After 10 cycles of 24 h at  $25\text{ }^\circ\text{C}$  to  $65\text{ }^\circ\text{C}$  and 80 - 98 % RH; capacitance shall be within  $\pm 15\%$  of initial value, DF within 1.5 x initial limit and leakage within 3 x initial limit.

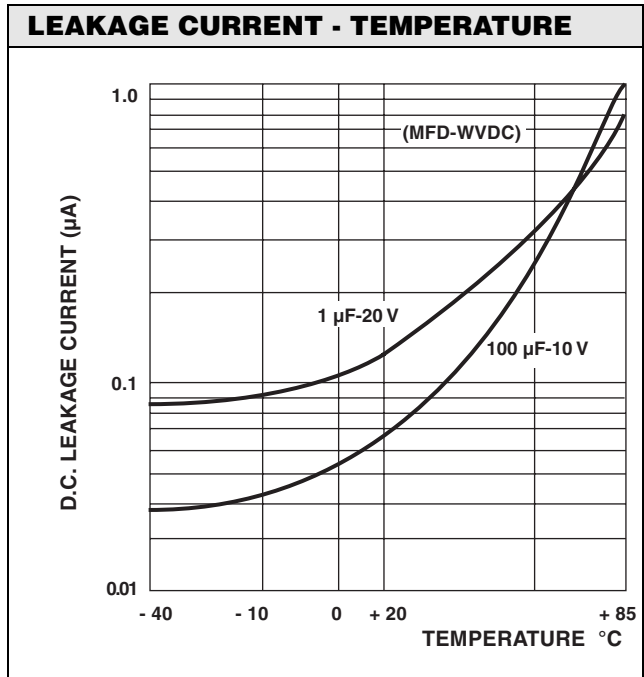
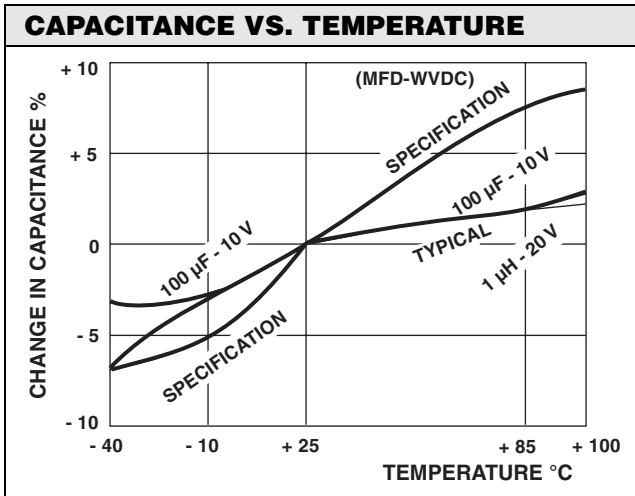
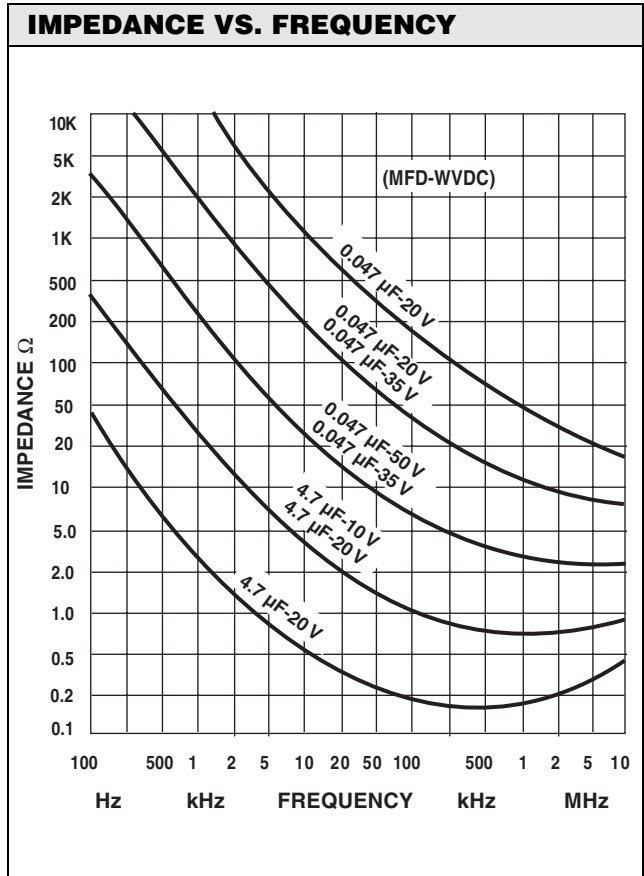
**Life:** (per Method 108 of MIL-STD-202) after 1000 h at  $85\text{ }^\circ\text{C}$  and rated voltage; capacitance shall be within  $\pm 10\%$  of initial limit, DF within initial limits, and leakage within 200% of initial limit.

**Surge Voltage:** (per MIL-PRF-49317) After 1000 cycles at  $85\text{ }^\circ\text{C}$  and 1.3 x WVDC; capacitance shall be within  $\pm 10\%$  of initial limit, DF and leakage within initial limits.

**Resistance to Soldering Heat:** (per Method 210 of MIL-STD-202, Condition B) After immersion in  $260\text{ }^\circ\text{C}$  molten solder to within a 1/4" of the body of the unit, there shall be no evidence of mechanical or electrical degradation.

**Solderability:** (per Method 208 of MIL-STD-202) After dipping leads in  $235\text{ }^\circ\text{C}$  molten solder to within 0.125" of the body of the unit, the solder shall cover 95% of the lead surface.

**Terminal Strength:** (per Method 211 of MIL-STD-202) After the following test there shall be no loosening of the terminals or permanent damage to the terminals. Test Condition A: (Pull Test) 0.010" leads withstand 1 pound, 0.016" leads 2 pounds and 0.007" leads 1/2 pound. Test Condition C: (Bend Test) All leads shall withstand 3 -  $90^\circ$  bends with a 1/2 pound applied force.





## Disclaimer

All product specifications and data are subject to change without notice.

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