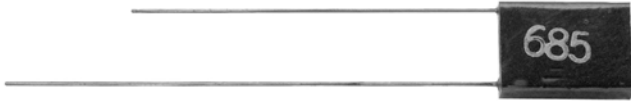


Subminiature, Leaded Solid Tantalum Capacitors Polar or Non-Polar



FEATURES

- Subminiature package size and light weight
- Rectangular case with axial or radial leads
- 2 V_{DC} to 35 V_{DC}
- 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_{DC} bias and 1.0 V_{RMS} 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.

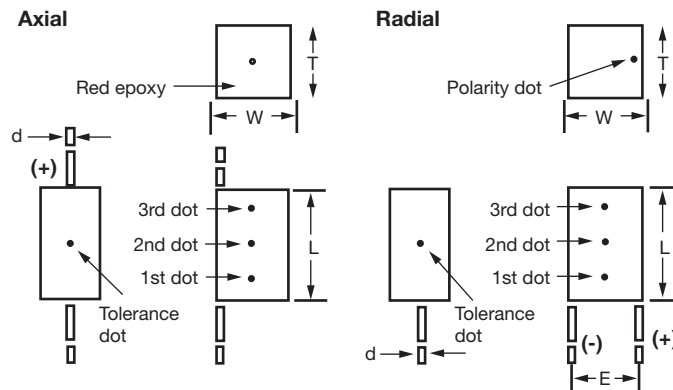
ORDERING INFORMATION

STC	1.0	35	C2	A ⁽¹⁾	M
MODEL	CAPACITANCE (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 %
Example of Part Number Code: STC1.0-35C2AM					

Note

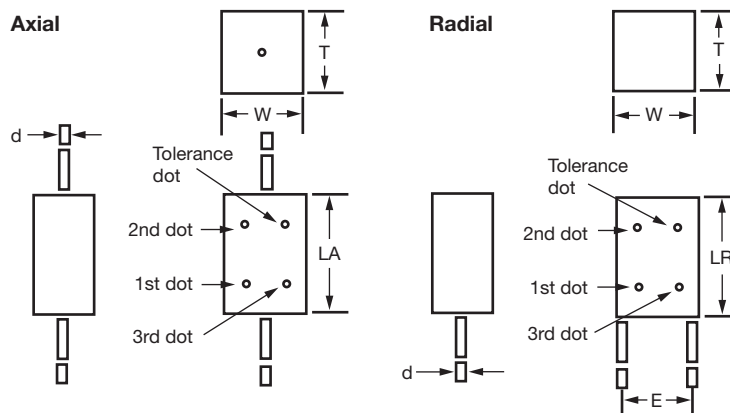
- ⁽¹⁾ To complete part number in rating tables, add A or R.
Change suffix if special capacitance tolerance is required.

DIMENSIONS in inches [millimeters]

Polar Style


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


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]



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

Note

- Part number definition:
(1) Add A for axial, R for radial



STANDARD RATINGS - POLAR CAPACITORS				
CAPACITANCE (μF)	MAX. DF (%)	MAX. DCL AT + 25 °C (μA)	CASE CODE	PART NUMBER
15 V_{DC} AT + 85 °C				
1.0	6	0.5	C1	STC1.0-15C1(1)M
4.7	6	1.0	C2	STC4.7-15C2(1)M
15	6	2.0	C3	STC15-15C3(1)M
22	6	3.0	C4	STC22-15C4(1)M
68	6	6.0	C5	STC68-15C5(1)M
150	10	10.0	C6	STC150-15C6(1)M
20 V_{DC} AT + 85 °C				
0.68	6	0.5	C1	STC.68-20C1(1)M
3.3	6	1.0	C2	STC3.3-20C2(1)M
6.8	6	2.0	C3	STC6.8-20C3(1)M
10	6	2.0	C3	STC10-20C3(1)M
15	6	3.0	C4	STC15-20C4(1)M
47	6	6.0	C5	STC47-20C5(1)M
100	10	10.0	C6	STC100-20C6(1)M
25 V_{DC} AT + 85 °C				
0.47	6	0.5	C1	STC.47-25C1(1)M
2.2	6	1.0	C2	STC2.2-25C2(1)M
3.3	6	2.0	C3	STC3.3-25C3(1)M
4.7	6	2.0	C3	STC4.7-25C3(1)M
10	6	3.0	C4	STC10-25C4(1)M
15	6	6.0	C5	STC15-25C5(1)M
22	6	6.0	C5	STC22-25C6(1)M
33	6	6.0	C5	STC33-25C5(1)M
68	6	10.0	C6	STC68-25C6(1)M
35 V_{DC} AT + 85 °C				
0.33	6	0.5	C1	STC.33-35C1(1)M
0.68	6	1.0	C2	STC.68-35C2(1)M
1.0	6	1.0	C2	STC1.0-35C2(1)M
1.5	6	1.0	C2	STC1.5-35C2(1)M

Note

- Part number definition:
 - (1) Add A for axial, R for radial

STANDARD RATINGS - NON-POLAR CAPACITORS				
CAPACITANCE (μF)	MAX. DF (%)	MAX. DCL AT + 25 °C (μA)	CASE CODE	PART NUMBER
2 V_{DC} AT + 85 °C				
10	10	1.0	N1	STC10-2N1(1)M
3 V_{DC} AT + 85 °C				
33	10	2.0	N2	STC33-3N2(1)M
47	8	3.0	N3	STC47-3N3(1)M
100	10	6.0	N4	STC100-3N4(1)M
4 V_{DC} AT + 85 °C				
6.8	8	1.0	N1	STC6.8-4N1(1)M
22	8	2.0	N2	STC22-4N2(1)M
33	8	3.0	N3	STC33-4N3(1)M
68	8	6.0	N4	STC68-4N4(1)M

Note

- Part number definition:
 - (1) Add A for axial, R for radial



STANDARD RATINGS - NON-POLAR CAPACITORS				
CAPACITANCE (µF)	MAX. DF (%)	MAX. DCL AT + 25 °C (µA)	CASE CODE	PART NUMBER
6 V_{DC} AT + 85 °C				
4.7	6	1.0	N1	STC4.7-6N1(1)M
15	6	2.0	N2	STC15-6N2(1)M
22	6	3.0	N3	STC22-6N3(1)M
47	6	6.0	N4	STC47-6N4(1)M
10 V_{DC} AT + 85 °C				
3.3	6	1.0	N1	STC3.3-10N1(1)M
10	6	2.0	N2	STC10-10N2(1)M
15	6	3.0	N3	STC15-10N3(1)M
33	6	6.0	N4	STC33-10N4(1)M
15 V_{DC} AT + 85 °C				
2.2	6	1.0	N1	STC2.2-15N1(1)M
6.8	6	2.0	N2	STC6.8-15N2(1)M
10	6	3.0	N3	STC10-15N3(1)M
22	6	6.0	N4	STC22-15N4(1)M
20 V_{DC} AT + 85 °C				
1.5	6	1.0	N1	STC1.5-20N1(1)M
4.7	6	2.0	N2	STC4.7-20N2(1)M
6.8	6	3.0	N3	STC6.8-20N3(1)M
15	6	6.0	N4	STC15-20N4(1)M
25 V_{DC} AT + 85 °C				
1.0	6	1.0	N1	STC1.0-25N1(1)M
2.2	6	2.0	N2	STC2.2-25N2(1)M
3.3	6	2.0	N2	STC3.3-25N2(1)M
4.7	6	3.0	N3	STC4.7-25N3(1)M
10	6	6.0	N4	STC10-25N4(1)M
35 V_{DC} AT + 85 °C				
0.68	6	1.0	N1	STC.68-35N1(1)M

Note

- Part number definition:
(1) Add A for axial, R for radial

MARKING				
STC Capacitors case sizes C3 - C6 and N2 - N4 are print marked:		All other case sizes are have color dot marking:		
- Capacitance is in picofarads		Capacitance	Color	Digit
- 1st and 2nd digits are significant figures		In picofarads, indicated by 3 dots.	Black	0
- 3rd digit indicates the number of zeros		1st and 2nd dot give the significant digits.	Brown	1
		3rd dot indicates the number of zeros.	Red	2
		Color dot location is shown on the dimensional sketches.	Orange	3
		Black dot is omitted on black sleeve.	Yellow	4
			Green	5
			Blue	6
			Violet	7
			Grey	8
			White	9
Capacitance Tolerance	Color	Tolerance		
Is indicated by a dot on the side of the case.	Gold	± 5 %		
Black dot is omitted.	Silver	± 10 %		
	None	± 20 %		
	None	+ 40 %/- 20 %		
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 µF	

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 % to 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.

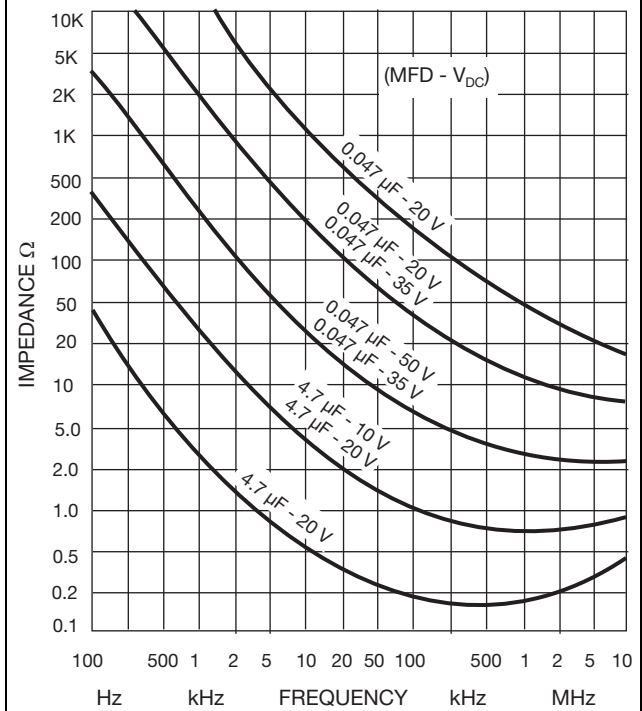
Surge Voltage: (per MIL-PRF-49317) After 1000 cycles at $85\text{ }^\circ\text{C}$ and $1.3 \times V_{DC}$; capacitance shall be within $\pm 10\%$ of initial limit, DF and leakage within initial limits.

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.

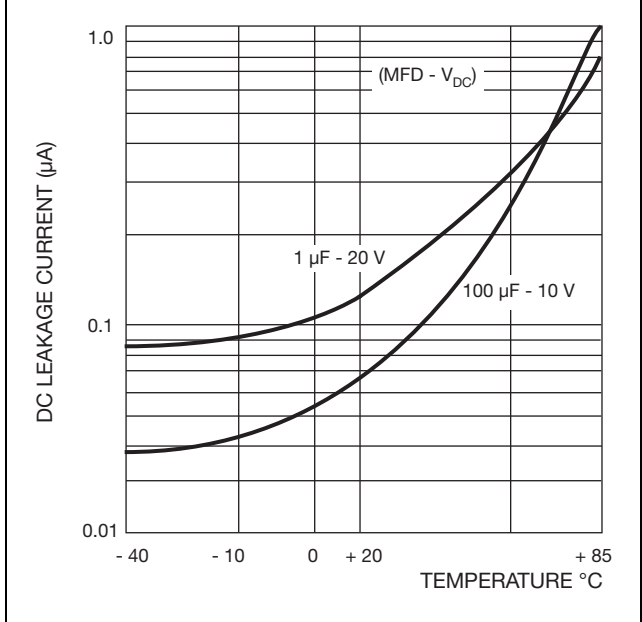
Solderability: (per method 208 of MIL-STD-202) After dipping leads in $235\text{ }^\circ\text{C}$ molten solder to within 0.125" of the body of the unit, the solder shall cover 95 % of the lead surface.

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° to 90° bends with a 1/2 pound applied force.

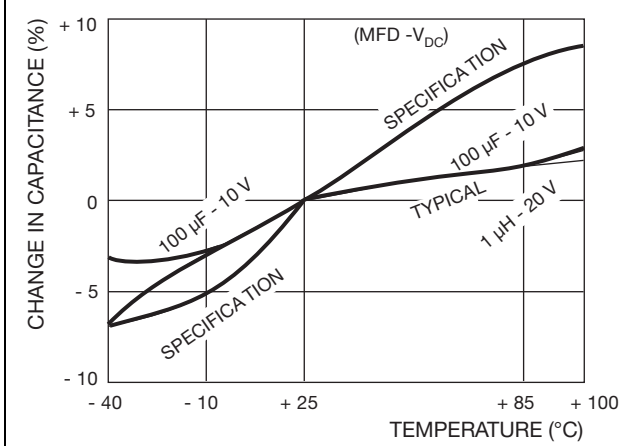
IMPEDANCE VS. FREQUENCY



LEAKAGE CURRENT VS. TEMPERATURE



CAPACITANCE VS. TEMPERATURE





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