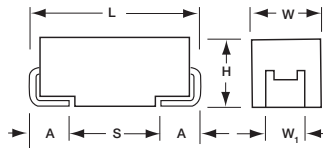


# TCB Series



## COTS-Plus Polymer Capacitor



The TCB series is a COTS-Plus version of the professional grade TCR polymer series.



### FEATURES

- Robust design for long operation lifetime
- AVX Q-process with statistical screening
- 100% Accelerated Ageing
- Surge testing level option
- Improved basic reliability 0.5%/1000hrs
- Humidity 85°C/85%RH, Vr, 500/1000 hours
- - 55 to +125°C operation temperature
- Shock and Vibration by MIL-STD-202
- DCL 0.1 CV
- 3x reflow 260°C compatible
- Benign failure mode under recommended use conditions

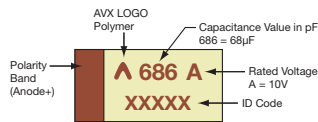
### APPLICATIONS

Long life time DC/DC converter applications in Telecommunications, Industrial, Avionics.

For additional information on Q-process please consult the AVX technical publication "Reaching the Highest Reliability for Tantalum Capacitors" (see the link: <http://www.avx.com/docs/techinfo/Qprocess.pdf>)

### MARKING

#### B, D, Y CASE



### CASE DIMENSIONS: millimeters (inches)

Code	EIA Code	EIA Metric	L±0.20 (0.008)	W+0.20 (0.008) -0.10 (0.004)	H+0.20 (0.008) -0.10 (0.004)	W <sub>1</sub> ±0.20 (0.008)	A+0.30 (0.012) -0.20 (0.008)	S Min.
B	1210	3528-21	3.50 (0.138)	2.80 (0.110)	1.90 (0.075)	2.20 (0.087)	0.80 (0.031)	1.40 (0.055)
D	2917	7343-31	7.30 (0.287)	4.30 (0.169)	2.90 (0.114)	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)
Y	2917	7343-20	7.30 (0.287)	4.30 (0.169)	2.00 (0.079) max	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)

W<sub>1</sub>, dimension applies to the termination width for A dimensional area only.

### CAPACITANCE AND RATED VOLTAGE, V<sub>R</sub> (VOLTAGE CODE) RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage							
µF	Code	4V(G)	6.3V(J)	10V(A)	16V(C)	20V(D)	25V(E)	35V(V)	50V(T)
10	106							D(70)	D(120)
15	156						D(70)		
22	226		B(70)			D(70)			
33	336		B(70)		D(70)				
47	476		B(70)		D(70)				
68	686			D(70)					
100	107			D(70)					
150	157		D(40)						
220	227	D(40), Y(40)							

Available Ratings (ESR ratings in mOhms in brackets)  
Engineering samples – please contact manufacturer

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

# TCB Series



## COTS-Plus Polymer Capacitor

### HOW TO ORDER

#### AVX PART NUMBER:

TCB	D	107	M	010	C	□	S	Z	0	^	00
Type	Case Size See table on previous page	Capacitance Code pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	Tolerance M = ±20%	Rated DC Voltage 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc 016 = 16Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	ESR C = Std ESR L = Low ESR	Packaging R = 7" T&R S = 13" T&R	Inspection Level S = Standard Conformance	Reliability Grade Z = Non-ER	Qualification Level 0 = N/A	Termination Finish 7 = 100% Tin H* = Sn/Pb Non RoHS  *Contact Manufacturer	Surge Test Option 00 = Standard 23 = 10x Cycles, 25°C 24* = 10x Cycles, -55°C & +85°C  *Please contact AVX for Surge option

### TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C
Capacitance Range:	10µF to 220µF
Capacitance Tolerance:	±20%
Leakage Current DCL:	0.1CV
Temperature Range:	-55°C to +125°C
Basic Reliability:	0.5% per 1000 hours at 85°C, Vr with 0.1ΩV series impedance, 60% confidence level
Termination Finish:	Sn Plating or SnPb Plating (Non RoHS)

NOTE: Conductive Polymer Capacitors are designed to operate within the limits of the environmental conditions specified for each series. If operated continuously at their maximum temperature and / or humidity limit, or beyond these limits, capacitors may exhibit a parametric shift in capacitance and increases in ESR. These changes may occur earlier if the specified environmental conditions are exceeded. Similarly, their normal operational time period will be significantly extended if their general duty cycle includes operation below maximum temperature within humidity controlled environments. Careful attention should be paid to maximum temperature with associated high humidity environments as well as voltage derating, ripple current and current surges. Please reference the AVX Conductive Polymer Capacitor Guidelines for more information or contact factory for application assistance.

# TCB Series



## COTS-Plus Polymer Capacitor

### RATINGS & PART NUMBER REFERENCE

AVX Part No.	Case Size	Capacitance (μF)	Rated Voltage (V)	Maximum Operating Temperature (°C)	DCL Max. (μA)	DF Max. (%)	ESR Max. @ 100kHz (mΩ)	MSL	100kHz RMS Current (mA)				Humidity 85°C/ 85%RH, Vr (hrs)	
									45°C	85°C	105°C	125°C		
<b>4 Volt</b>														
TCBD227M004C□SZ0700	D	220	4	125	88	6	40	3	2400	1700	1100	600	1000	
TCBD227M004C□SZ0723	D	220	4	125	88	6	40	3	2400	1700	1100	600	1000	
TCBY227M004C□SZ0700	Y	220	4	125	88	6	40	3	2200	1500	1000	600	500	
TCBY227M004C□SZ0723	Y	220	4	125	88	6	40	3	2200	1500	1000	600	500	
<b>6.3 Volt</b>														
TCBB226M006C□SZ0700	B	22	6.3	125	13	6	70	3	1300	900	600	300	500	
TCBB226M006C□SZ0723	B	22	6.3	125	13	6	70	3	1300	900	600	300	500	
TCBB336M006C□SZ0700	B	33	6.3	125	19	6	70	3	1300	900	600	300	500	
TCBB336M006C□SZ0723	B	33	6.3	125	19	6	70	3	1300	900	600	300	500	
TCBB476M006C□SZ0700	B	47	6.3	125	28	6	70	3	1300	900	600	300	500	
TCBB476M006C□SZ0723	B	47	6.3	125	28	6	70	3	1300	900	600	300	500	
TCBD157M006C□SZ0700	D	150	6.3	125	90	6	40	3	2400	1700	1100	600	1000	
TCBD157M006C□SZ0723	D	150	6.3	125	90	6	40	3	2400	1700	1100	600	1000	
<b>10 Volt</b>														
TCBD686M010C□SZ0700	D	68	10	125	68	6	70	3	1800	1300	800	500	1000	
TCBD686M010C□SZ0723	D	68	10	125	68	6	70	3	1800	1300	800	500	1000	
TCBD107M010C□SZ0700	D	100	10	125	100	6	70	3	1800	1300	800	500	1000	
TCBD107M010C□SZ0723	D	100	10	125	100	6	70	3	1800	1300	800	500	1000	
<b>16 Volt</b>														
TCBD336M016C□SZ0700	D	33	16	125	52	6	70	3	1800	1300	800	500	1000	
TCBD336M016C□SZ0723	D	33	16	125	52	6	70	3	1800	1300	800	500	1000	
TCBD476M016C□SZ0700	D	47	16	125	75	6	70	3	1800	1300	800	500	1000	
TCBD476M016C□SZ0723	D	47	16	125	75	6	70	3	1800	1300	800	500	1000	
<b>20 Volt</b>														
TCBD226M020C□SZ0700	D	22	20	125	44	8	70	3	1800	1300	800	500	1000	
TCBD226M020C□SZ0723	D	22	20	125	44	8	70	3	1800	1300	800	500	1000	
<b>25 Volt</b>														
TCBD156M025C□SZ0700	D	15	25	125	37	8	70	3	1800	1300	800	500	1000	
TCBD156M025C□SZ0723	D	15	25	125	37	8	70	3	1800	1300	800	500	1000	
<b>35 Volt</b>														
TCBD106M035C□SZ0700	D	10	35	125	35	8	70	3	1800	1300	800	500	1000	
TCBD106M035C□SZ0723	D	10	35	125	35	8	70	3	1800	1300	800	500	1000	
<b>50 Volt</b>														
TCBD106M050C□SZ0700	D	10	50	125	50	10	120	3	1400	1000	600	400	500	
TCBD106M050C□SZ0723	D	10	50	125	50	10	120	3	1400	1000	600	400	500	

Moisture Sensitivity Level (MSL) is defined according to J-STD-020.

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts. DCL is measured at rated voltage after 5 minutes.

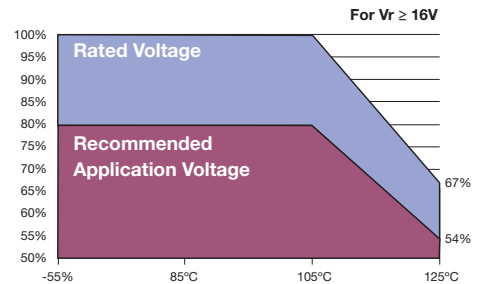
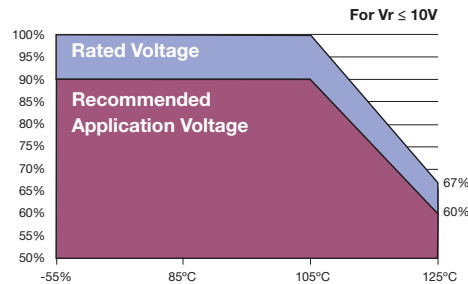
ESR allowed to move up to 1.25 times catalog limit post mounting.

**NOTE: AVX reserves the rights to supply higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.**

### RECOMMENDED DERATING FACTOR

Voltage and temperature derating as percentage of Vr.

Rated voltage	Operating Temperature		
	≤85°C	105°C	125°C
≤10V	90%	90%	60%
≥16V	80%	80%	54%



### QUALIFICATION TABLE

TEST	TCB series (Temperature range -55°C to +125°C)									
	Condition			Characteristics						
<b>Endurance</b>	Determine after application of rated voltage for 2000 +48/-0 hours at 105±2°C. Also determine after application of 125°C temperature, 2/3 rated voltage for 2000 +48/-0 hours. After test leaving 1-2 hours at room temperature. Power supply impedance to be ≤ 0.1Ω/V.			Visual examination	no visible damage					
				DCL	1.25 x initial limit					
				ΔC/C	within +20/-30% of initial value					
				DF	1.5 x initial limit					
				ESR	2 x initial limit					
<b>Storage Life</b>	125°C, 0V, 2000h			Visual examination	no visible damage					
				DCL	2 x initial limit					
				ΔC/C	within ±20% of initial value					
				DF	1.5 x initial limit					
				ESR	2 x initial limit					
<b>Biased Humidity</b>	Determine after leaving for 500 or 1000 hours at 85±2°C, 85% relative humidity and rated voltage and then recovery 1-2 hours at room temperature.			Visual examination	no visible damage					
				DCL	3 x initial limit					
				ΔC/C	within +30/-20% of initial value					
				DF	1.5 x initial limit					
				ESR	2 x initial limit					
<b>Temperature Stability</b>	Step	Temperature°C	Duration(min)		+20°C	-55°C	+20°C	+85°C	+125°C	+20°C
	1	+20±2	15	DCL	IL*	n/a	IL*	10 x IL*	12.5 x IL*	IL*
	2	-55+0/-3	15							
	3	+20±2	15	ΔC/C	n/a	+0/-20%	±5%	+20/-0%	+30/-0%	±5%
	4	+85+3/-0	15							
	5	+125+3/-0	15	DF	IL*	1.5 x IL*	IL*	1.5 x IL*	2 x IL*	IL*
6	+20±2	15								
<b>Surge Voltage</b>	Test temperature: 125°C+3/0°C Surge voltage: 1.3 x 2/3 rated voltage Charge/Discharge resistance: 1000±100Ω Number of cycles: 1000x Cycle duration: 6min; 30sec charge, 5min 30sec discharge			Visual examination	no visible damage					
				DCL	initial limit					
				ΔC/C	within +20/-30% of initial value					
				DF	1.25 x initial limit					
				ESR	1.25 x initial Limit					
<b>Mechanical Shock/Vibration</b>	MIL-STD-202, Method 213, Condition I, 100 G peak MIL-STD-202, Method 204, Condition D, 10 Hz to 2,000 Hz, 20 G peak			Visual examination	no visible damage					
				DCL	initial limit					
				ΔC/C	within ±10% of initial value					
				DF	initial limit					
				ESR	1.25 x initial Limit					

\*Initial Limit

For use outside of recommended conditions and special request, please contact manufacturer.  
Initial measurement max. 1hr after the removal from dry pack or after pretreatment at 85°C for 24 hours.