

# TCH Low ESR Hermetic Series



## SMD Low ESR Tantalum Capacitors with Conductive Polymer Electrode in Hermetic Package



### FEATURES

- Aerospace & Hi-Rel applications
- Low ESR conductive polymer electrode
- Endurance up to 10 000 hrs. on selected codes
- Ceramic case hermetic packaging
- Stability under humidity and ambient atmosphere exposure
- Large case sizes including CTC-21D provide high capacitance values
- Developed with ESA to suit aerospace applications
- Ongoing ESA qualification
- Manufacturing and screening utilizing AVX patented Q-Process to effectively remove components that may experience excessive parametric shifts or instability in operation life



### APPLICATIONS

- Aerospace
- Defence
- Power supplies
- Pulse power

### MARKING

#### 9 CASE



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>)

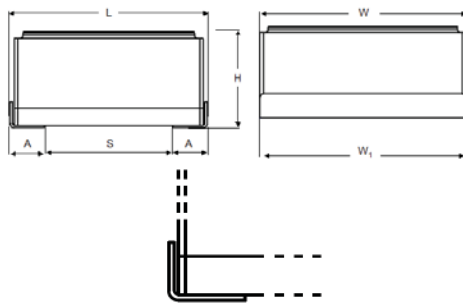
### CASE DIMENSIONS: millimeters (inches)

Code	Type	L±0.20 (0.008)	W±0.20 (0.008)	H Max.	W <sub>1</sub> ±0.20 (0.008)	A±0.20 (0.008)	S Min.
9 (CTC-21D)	J-lead (L-shape)	11.50 ± 0.50 (0.453 ± 0.020)	12.50 ± 0.50 (0.492 ± 0.020)	6.15 (0.242)	12.50 ± 0.50 (0.492 ± 0.020)	1.90 ± 0.50 (0.075 ± 0.020)	7.00 (0.276)
9 (CTC-21D)	Undertab	11.00 (0.433)	12.50 (0.492)	5.95 (0.234)	10.50 (0.413)	1.50 (0.059)	7.80 (0.307)

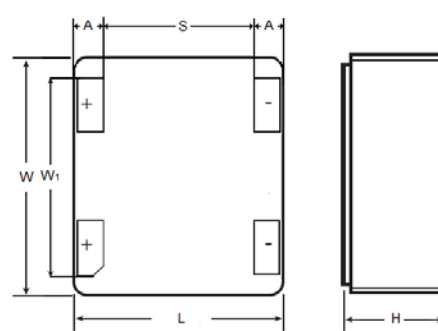
Available ratings

Engineering samples - please contact manufacturer

#### 'J' Lead Termination (L-shape)



#### Undertab Termination



### TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C									
Capacitance Range:	15 µF to 680 µF									
Capacitance Tolerance:	±20%									
Leakage Current DCL:	0.1CV									
Rated Voltage (V <sub>R</sub> )	≤ +85°C	10	16	20	25	35	50	63	75	100
Category Voltage (V <sub>C</sub> )	≤ +125°C	7	11	13.5	17	23.5	33	42	50	66
Temperature Range:	-55°C to +125°C									
Reliability:	1% per 1000 hours at 85°C, V <sub>R</sub> with 0.1Ω/Vseries impedance, 60% confidence level									
Termination Finish:	Gold Plating (Undertab), Sn/Pb (J-lead)									





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### HOW TO ORDER

#### AVX PART NUMBER

<b>TCH</b>   Type	<b>9</b>   Case Size See table above	<b>687</b>   Capacitance Code pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	<b>M</b>   Tolerance M = ±20%	<b>016</b>   Rated DC Voltage 010 = 10Vdc    050 = 50Vdc 016 = 16Vdc    063 = 63Vdc 020 = 20Vdc    075 = 75Vdc 025 = 25Vdc    100 = 100Vdc 035 = 35Vdc	<b>W</b>   Packaging W = Waffle B = Bulk	<b>0040</b>   ESR in mΩ	<b>U</b>   Termination J = 'J' lead (L-shape) U = Undertab	  <small>LEAD-FREE COMPATIBLE COMPONENT</small> <small>For RoHS compliant products, please select correct termination style.</small>
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### CAPACITANCE AND VOLTAGE RANGE (CASE CODE BEFORE THE BRACKETS)

Capacitance		Rated Voltage DC (V <sub>R</sub> ) at 85°C								
μF	Code	10V	16V	20V	25V	35V	50V	63V	75V	100V
15	156									9(150)*
22	226								9(120)*	9(150)
33	336							9(100)*	9(120)	
47	476						9(70)	9(100)*		
68	686						9(70)*			
100	107				9(50)*	9(55)				
150	157			9(45)*	9(50)	9(55)*				
220	227	9(40)*	9(40)	9(45)*	9(50)*					
330	337	9(40)	9(40)*	9(45)*						
470	477	9(40)*	9(40)*							
680	687	9(40)*	9(40)							

Available Ratings: (ESR ratings in mOhms in brackets)  
 Engineering samples - please contact manufacturer  
 \*Codes under development – upon request, please contact manufacturer



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### RATINGS & PART NUMBER REFERENCE

AVX Part No.	Case Size	Capacitance (µF)	Rated Voltage (V)	Rated Temperature (°C)	Category Voltage (V)	Category Temperature (°C)	DCL (µA) Max.	DF % Max.	ESR Max. (mΩ) @ 100kHz	MSL	100kHz RMS Current (A)		
											25°C	85°C	125°C
<b>10 Volt @ 85°C</b>													
TCH9227M010W0040#	9	220	10	85	7	125	220	8	40	1	3.16	2.84	1.26
TCH9337M010W0040#	9	330	10	85	7	125	330	8	40	1	3.16	2.84	1.26
TCH9477M010W0040#	9	470	10	85	7	125	470	8	40	1	3.16	2.84	1.26
TCH9687M010W0040#	9	680	10	85	7	125	680	8	40	1	3.16	2.84	1.26
<b>16 Volt @ 85°C</b>													
TCH9227M016W0040#	9	220	16	85	10	125	352	8	40	1	3.16	2.84	1.26
TCH9337M016W0040#	9	330	16	85	10	125	528	8	40	1	3.16	2.84	1.26
TCH9477M016W0040#	9	470	16	85	10	125	752	8	40	1	3.16	2.84	1.26
TCH9687M016W0040#	9	680	16	85	10	125	1088	8	40	1	3.16	2.84	1.26
<b>20 Volt @ 85°C</b>													
TCH9157M020W0045#	9	150	20	85	13	125	300	8	45	1	2.98	2.68	1.19
TCH9227M020W0045#	9	220	20	85	13	125	440	8	45	1	2.98	2.68	1.19
TCH9337M020W0045#	9	330	20	85	13	125	660	8	45	1	2.98	2.68	1.19
<b>25 Volt @ 85°C</b>													
TCH9107M025W0050#	9	100	25	85	17	125	250	8	50	1	2.83	2.55	1.13
TCH9157M025W0050#	9	150	25	85	17	125	357	8	50	1	2.83	2.55	1.13
TCH9227M025W0050#	9	220	25	85	17	125	550	8	50	1	2.83	2.55	1.13
<b>35 Volt @ 85°C</b>													
TCH9107M035W0055#	9	100	35	85	23	125	350	8	55	1	2.69	2.42	1.08
TCH9157M035W0055#	9	150	35	85	23	125	525	8	55	1	2.69	2.42	1.08
<b>50 Volt @ 85°C</b>													
TCH9476M050W0070#	9	47	50	85	33	125	235	8	70	1	2.39	2.15	0.96
TCH9686M050W0070#	9	68	50	85	33	125	340	8	70	1	2.39	2.15	0.96
<b>63 Volt @ 85°C</b>													
TCH9336M063W0100#	9	33	63	85	33	125	215	8	100	1	2.00	1.80	0.80
TCH9476M063W0100#	9	47	63	85	33	125	296	8	100	1	2.00	1.80	0.80
<b>75 Volt @ 85°C</b>													
TCH9226M075W0120#	9	22	75	85	33	125	165	8	120	1	1.82	1.64	0.73
TCH9336M075W0120#	9	33	75	85	33	125	248	8	120	1	1.82	1.64	0.73
<b>100 Volt @ 85°C</b>													
TCH9156M100W0150#	9	15	100	85	33	125	150	8	150	1	1.63	1.47	0.65
TCH9226M100W0150#	9	22	100	85	33	125	220	8	150	1	1.63	1.47	0.65

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

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

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### QUALIFICATION TABLE

TEST	TCH low ESR hermetic series (Temperature range -55°C to +125°C)										
	Condition			Characteristics							
<b>Endurance</b>	Determine after application of rated voltage for 2000 (10000) +48/0 hours at 85±2°C and then leaving min. 2 hours at room temperature. Also determine of 125°C temperature, category voltage for 2000 +48/-0 hours and then leaving min. 2 hours at room temperature. Power supply impedance to be < 3Ω.			Visual examination	no visible damage						
				DCL	1.25 x initial limit						
				ΔC/C	within ±20% 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>Humidity</b>	Determine after storage without applied voltage at 40±2°C and 90±2% relative humidity for 56 days and then recovery min. 2 hours at room temperature.			Visual examination	no visible damage						
				DCL	1.25 x initial limit						
				ΔC/C	within ±10% of initial value						
				DF	initial limit						
				ESR	1.25 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	+22	15	DCL	IL*	n/a	IL*	10 x IL*	12.5 x IL*	IL*	
	2	-55	15		ΔC/C	IL*	+0/-20%	±5%	+20/-0%	+30/-0%	±5%
	3	+22	15	DF		IL*	1.5 x IL*	IL*	1.5 x IL*	2 x IL*	IL*
	4	+85	15		ESR	1.25 x IL*	1.25 x IL*	1.25 x IL*	1.5 x IL*	1.5 x IL*	1.25 x IL*
	5	+125	15								
	6	+22	15								
<b>Surge Voltage</b>	Test temperature: 85°C+3/0°C Surge voltage: 1.3 x rated voltage Series protection resistance: 33Ω Discharge resistance: 33Ω Number of cycles: 1000x Cycle duration: 6 min; 30 sec charge, 5 min 30 sec discharge			Visual examination	no visible damage						
				DCL	initial limit						
				ΔC/C	within ±20% of initial value						
				DF	initial limit						
				ESR	1.25 x initial limit						

\*Initial Limit





## Стандарт Электрон Связь

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