

TCH Low ESR Hermetic Series

SMD Low ESR Conductive Polymer Capacitors 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

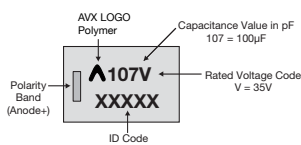


Elektro Award 2015



MARKING

9 CASE



APPLICATIONS

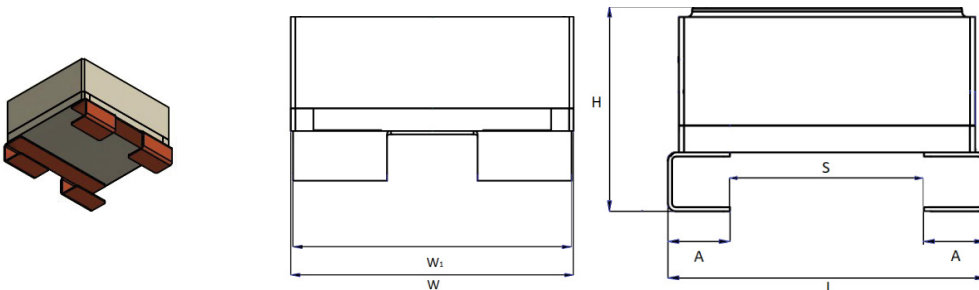
- Aerospace
- Defence
- Power supplies
- Pulse power

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>)

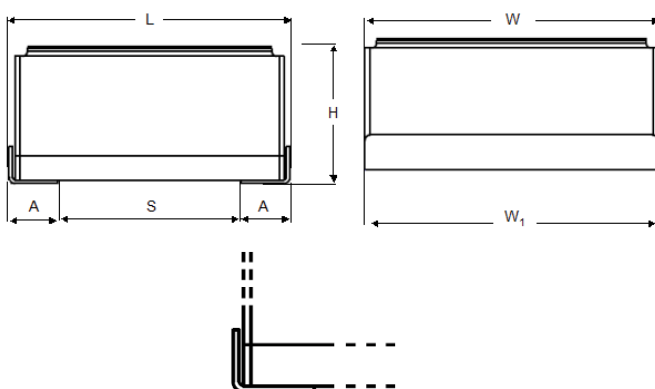
CASE DIMENSIONS: millimeters (inches)

Code	Type	L	W	H Max.	W ₁	A	S Min.
9 (CTC-21D)	J-lead (C-shape)	12.00 ± 0.50 (0.472 ± 0.020)	12.50 ± 0.50 (0.492 ± 0.020)	8.45 (0.333)	12.30 ± 0.50 (0.484 ± 0.020)	2.30 ± 0.50 (0.091 ± 0.020)	6.50 (0.256)
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 ± 0.20 (0.433 ± 0.008)	12.50 ± 0.20 (0.492 ± 0.008)	5.95 (0.234)	10.50 ± 0.20 (0.413 ± 0.008)	1.50 ± 0.20 (0.059 ± 0.008)	7.80 (0.307)

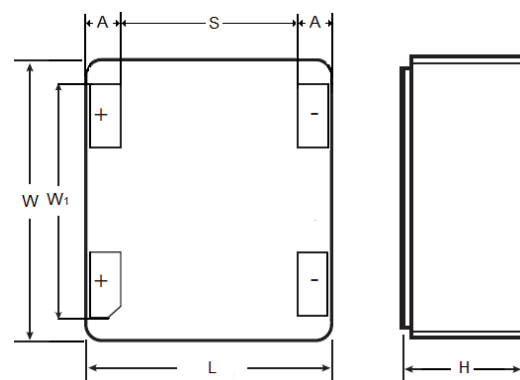
'J' Lead Termination (C-shape)



'J' Lead Termination (L-shape)



Undertab Termination



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TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C							
Capacitance Range:	22 µF to 330 µF (for extended range under development, contact manufacturer)							
Capacitance Tolerance:	±20%							
Leakage Current DCL:	0.1CV							
Rated Voltage (VR)	≤ +85°C:	10	16	25	35	50	75	100
Category Voltage (VC)	≤ +125°C:	7	11	17	23	33	50	66
Temperature Range:	-55°C to +125°C							
Reliability:	1% per 1000 hours at 85°C, Vr with 0.1Ω/V series impedance, 60% confidence level							
Termination Finish:	Gold Plating (Undertab), Gold Plating (J-lead/L-shape), Sn/Pb Plating (J-lead/ C-shape, L-shape)							

HOW TO ORDER

AVX PART NUMBER

TCH	9	227	M	016	W	0040	#
Type	Case Size See table above	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 010 = 10Vdc 016 = 16Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc 075 = 75Vdc 100 = 100Vdc	Packaging W = Waffle	ESR in mΩ	Termination C = 'J' lead C-shape (Sn/Pb) J = 'J' lead L-shape (Gold) L = 'J' lead L-shape (Sn/Pb) U = Undertab C, L = Non RoHS



CAPACITANCE AND VOLTAGE RANGE (CASE CODE BEFORE THE BRACKETS)

Capacitance		Rated Voltage DC (VR) at 85°C						
µF	Code	10V	16V	25V	35V	50V	75V	100V
22	226							9(150)
33	336						9(120)	
47	476					9(70)		
68	686							
100	107				9(55)			
150	157			9(50)	9(55)			
220	227		9(40)					
330	337	9(40)						

Released ratings, (ESR ratings in mΩ in parentheses)

RATINGS & PART NUMBER REFERENCE

AVX Part No.	Case Size	Capacitance (µF)	Rated Voltage (V)	Rated Temperature (°C)	Category Voltage (V)	Category Temperature (°C)	DCL Max. (µA)	DF Max. (%)	ESR Max. @ 100kHz (mΩ)	100kHz RMS Current (A)			Endurance at 85°C (hrs)
										25°C	85°C	125°C	
10 Volt @ 85°C													
TCH9337M010W0040#	9	330	10	85	7	125	330	8	40	3.16	2.84	1.26	2000
16 Volt @ 85°C													
TCH9227M016W0040#	9	220	16	85	10	125	352	8	40	3.16	2.84	1.26	10000
25 Volt @ 85°C													
TCH9157M025W0050#	9	150	25	85	17	125	375	8	50	2.83	2.55	1.13	10000
35 Volt @ 85°C													
TCH9107M035W0055#	9	100	35	85	23	125	350	8	55	2.69	2.42	1.08	10000
TCH9157M035W0055#	9	150	35	85	23	125	525	8	55	2.69	2.42	1.08	2000

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RATINGS & PART NUMBER REFERENCE (continued)

AVX Part No.	Case Size	Capacitance (μF)	Rated Voltage (V)	Rated Temperature (°C)	Category Voltage (V)	Category Temperature (°C)	DCL Max. (μA)	DF Max. (%)	ESR Max. @ 100kHz (mΩ)	100kHz RMS Current (A)			Endurance at 85°C (hrs)
										25°C	85°C	125°C	
50 Volt @ 85°C													
TCH9476M050W0070#	9	47	50	85	33	125	235	8	70	2.39	2.15	0.96	10000
75 Volt @ 85°C													
TCH9336M075W0120#	9	33	75	85	50	125	248	8	120	1.82	1.64	0.73	2000
100 Volt @ 85°C													
TCH9226M100W0150#	9	22	100	85	66	125	220	8	150	1.63	1.47	0.65	10000

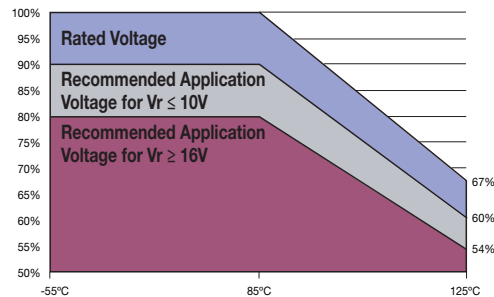
All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5RMS with a maximum DC bias of 2.2V.

DCL is measured at rated voltage after 5 minutes.

Moisture Sensitivity Level (MSL) is defined according to J-STD-020. All TCH products are MSL1.

RECOMMENDED DERATING FACTOR

Voltage and temperature derating as percentage of Vr



QUALIFICATION TABLE

TEST	TCH low ESR hermetic series (Temperature range -55°C to +125°C)									
	Condition			Characteristics						
Endurance	Determine after application of rated voltage for 2000 (10 000) +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					
Storage Life	Store at 125°C, no voltage applied, for 2000 hours. Stabilize at room temperature for 1-2 hours before measuring.			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					
Humidity	Store at 40°C and 90% relative humidity for 56 days, with no applied voltage. Stabilize at room temperature and humidity for min. 2 hours before measuring.			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					
Temperature Stability	Step	Temperature°C	Duration (min)		+20°C	-55°C	+20°C	+85°C	+125°C	+20°C
	1	+20	15	DCL	IL*	n/a	IL*	10 x IL*	12.5 x IL*	IL*
	2	-55	15		ΔC/C	n/a	+0/-20%	±5%	+20/-0%	+30/-0%
	3	+20	15	DF		IL*	1.5 x IL*	IL*	1.5 x IL*	2 x 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*
	5	+125	15							
6	+20	15								