THH 230°C HERMETIC SERIES

SMD 230°C High Temperature Tantalum Capacitor in Hermetic Package, COTS-Plus

FEATURES

- High temperature applications
- Operational condition 230°C / 0.5UR / 1000hrs (2000hrs for selected codes) or 200°C / 0.5UR / 10.000hrs
- Ceramic case hermetic packaging
- Large case sizes including CTC-21D provide high capacitance values
- Manufacturing and screening utilizing KYOCERA AVX patented Q-Process to effectively remove components that may experience excessive parametric shifts or instability in operation life

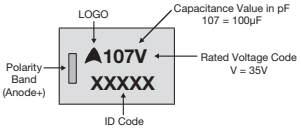
APPLICATIONS

- Oil drilling, and Extreme temperature applications

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

MARKING

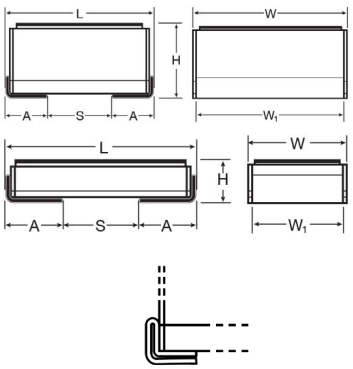
9, I CASE



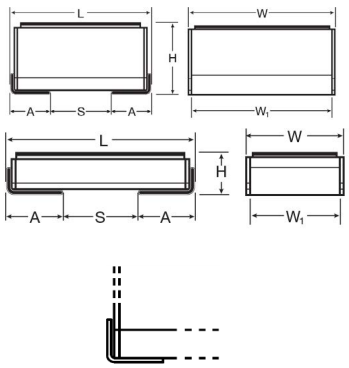
CASE DIMENSIONS: millimeters (inches)

Code	Type	L±0.50 (0.020)	W±0.50 (0.020)	H Max.	W1±0.50 (0.020)	A±0.50 (0.020)	S Min.
9 (CTC-21D)	J-lead (L-shape)	11.50 (0.453)	12.50 (0.492)	6.15 (0.242)	12.50 (0.492)	1.90 (0.075)	7.00 (0.276)
9 (CTC-21D)	J-lead (flex)	12.10 (0.476)	12.50 (0.492)	6.50 (0.256)	12.00 (0.472)	2.00 (0.079)	7.20 (0.283)
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)
I	J-lead (L-shape)	11.50 (0.453)	6.00 (0.236)	2.70 (0.106)	6.00 (0.236)	3.50 (0.138)	4.00 (0.157)
I	J-lead (flex)	11.90 (0.469)	6.00 (0.236)	3.00 (0.118)	5.50 (0.217)	3.60 (0.142)	4.20 (0.165)
I	Undertab	11.00 ± 0.20 (0.433 ± 0.008)	6.00 ± 0.20 (0.236 ± 0.008)	2.50 (0.098)	4.00 ± 0.20 (0.157 ± 0.008)	3.20 ± 0.20 (0.126 ± 0.008)	4.40 (0.173)

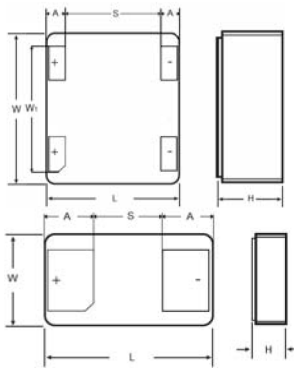
'J' Lead Termination (flex)



'J' Lead Termination (L-shape)



Undertab Termination



TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C				
Capacitance Range:	6.8 µF to 100 µF (for extended range under development, contact manufacturer)				
Capacitance Tolerance:	±20%				
Leakage Current DCL:	0.01CV				
Rated Voltage (V_R)	≤ +85°C:	16	35	50	
Category Voltage (V_C)	≤ +230°C:	8	17	25	
Temperature Range:	-55°C to +230°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), Nickel Plating (J-lead flex)				

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HOW TO ORDER

PART NUMBER

THH	9	107	M	035	W	0250	#
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 016 = 16Vdc 035 = 35Vdc 050 = 50Vdc	Packaging W = Waffle	ESR in mΩ	Termination J = 'J' lead (L-shape) W = 'J' lead (flex) U = Undertab

LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

For RoHS compliant products, please select correct termination style.

CAPACITANCE AND VOLTAGE RANGE (CODE DENOTES THE CASE SIZE)

Capacitance		Rated Voltage DC (V_R) at 85°C		
µF	Code	16V (C)	35V (V)	50V (T)
6.8	685		I	I
10	106		I	
15	156			
22	226	I		
33	336			
47	476	I		
68	686			
100	107		9	

Released ratings
Engineering samples - please contact KYOCERA AVX

VOLTAGE VS TEMPERATURE RATING

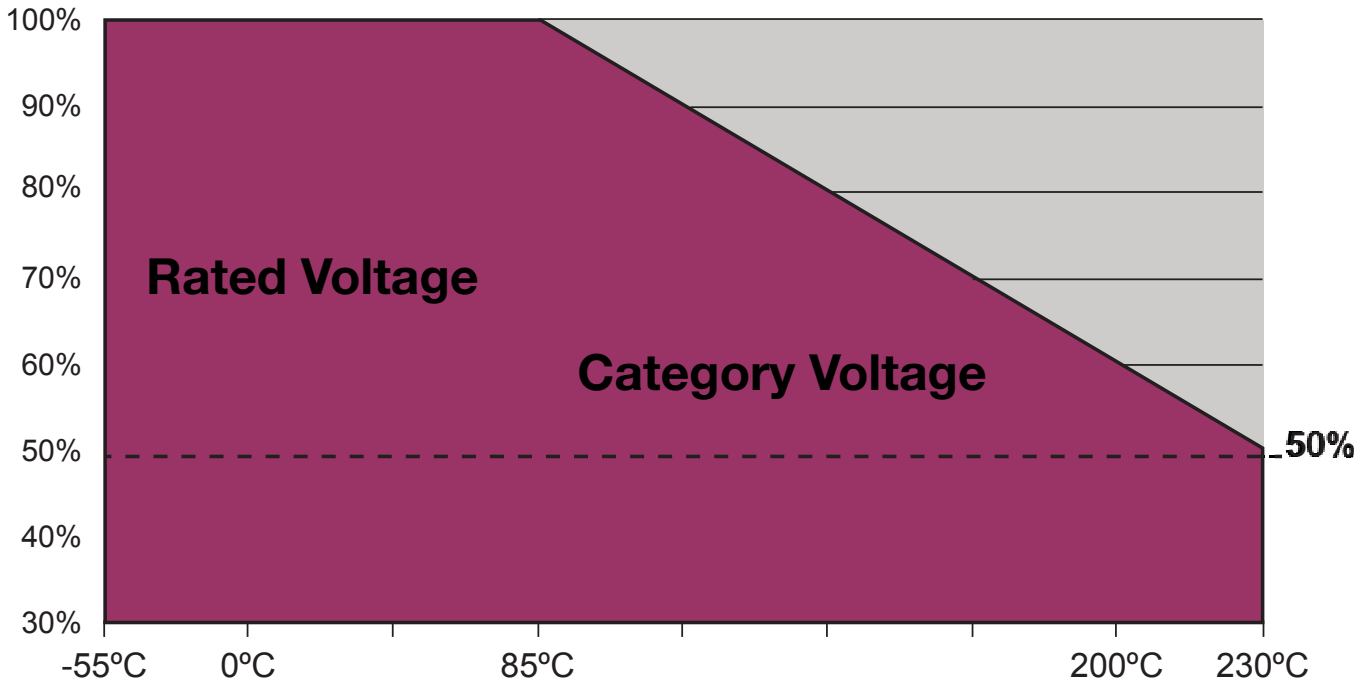
Part No.	Case Size	Capacitance (µF)	Rated Voltage @ 85°C (V)	Category Voltage @ 230°C (V)	DCL Max. (µA)	DF Max. (%)	ESR Max. @100kHz (mΩ)	100kHz RMS Current (A)			Lifetime at 230°C (hrs)	MSL
								25°C	85°C	125°C		
16 Volt												
THHI226M016W0500#	I	22	16	8	3.6	8	500	0.81	0.73	0.73	2,000	1
THHI476M016W0500#	I	47	16	8	7.5	8	500	0.81	0.73	0.73	1,000	1
35 Volt												
THHI685M035W0500#	I	6.8	35	17	2.4	8	500	0.81	0.73	0.73	2,000	1
THHI106M035W0500#	I	10	35	17	3.5	8	500	0.81	0.73	0.73	2,000	1
THH9107M035W0250#	9	100	35	17	35	8	250	1.26	1.13	1.13	2,000	1
50 Volt												
THHI685M050W0500#	I	6.8	50	25	3.4	8	500	0.81	0.73	0.73	1,000	1

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 change post 1000hrs allowed up to 3 times catalog limit.

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

VOLTAGE VS TEMPERATURE RATING

THH 230°C Voltage vs Temperature Rating for 1000 (or 2000) hrs service life



QUALIFICATION TABLE

TEST	THH 230°C hermetic series (Temperature range -55°C to +230°C)	
	Condition	**Characteristics**
Endurance	Determine after application of 230°C temperature, category voltage for 1000+48/-0 hours or 2000+48/-0hrs 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: 3 x initial limit
Endurance	Determine after application of 0.5UR for 10000+48/-0 hours at 200°C temperature 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: 3 x initial limit
Storage Life	230°C, 0V, 1000h + 48/-0 hours	Visual examination: no visible damage DCL: initial limit ΔC/C: within ±5% of initial value DF: initial limit ESR: 1.25 x initial limit
Biased Humidity	Determine after leaving for 1000 hours at 85±2°C, 85% relative humidity and rated voltage and then recovery min. 2 hours at room temperature.	Visual examination: no visible damage DCL: initial limit ΔC/C: within ±10% of initial value DF: initial limit ESR: 1.25 x initial limit
Temperature Stability	Step 1: +20, 15 min Step 2: -55, 15 min Step 3: +20, 15 min Step 4: +85, 15 min Step 5: +125, 15 min Step 6: +175, 15 min Step 7: +200, 15 min Step 8: +230, 15 min Step 9: +20, 15 min	DCL: IL* / n/a / IL* / 10 x IL* / 12.5 x IL* / n/a / n/a / n/a / IL* ΔC/C: n/a / +0/-20% / ±5% / +20/-0% / +30/-0% / +30/-0% / +30/-0% / +30/-0% / ±5% DF: IL* / 1.5 x IL* / IL* / 1.5 x IL* / 2 x IL* / 2 x IL* / 2 x IL* / 2 x IL* / IL* ESR: 1.25 x IL* / 1.25 x IL* / 1.25 x IL* / 1.25 x IL* / 1.25 x IL* / 1.25 x IL* / 1.25 x IL* / 1.25 x IL* / 1.25 x IL*
Surge Voltage	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: 5 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
Mechanical Shock/Vibration	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
Vibration 230°C	Determine after application of 230°C temperature and vibration frequency: 10 ~ 2000 ~ 10Hz in 20 min Full amplitude: 3 mm/20g Vibration directions time X, Y Z directions: 4 hours each direction: total 12 hrs.	Visual examination: no visible damage DCL: initial limit ΔC/C: within ±5% of initial value DF: initial limit ESR: 1.25 x initial limit

*Initial Limit