THJ Series

High Temperature Tantalum Chip Capacitor

FEATURES

- Improved reliability – 2x standard
- 175°C @ 0.5V_R continuous operation
- CV range: 0.10-220µF / 6.3-50V
- 5 case sizes available
- Low ESR options on approval
- High temperature automotive and industry applications

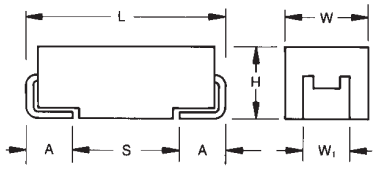
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

SnPb termination option is not RoHS compliant.

APPLICATIONS

- Automotive ECU and ABS control electronics
- Geothermal instrumentation



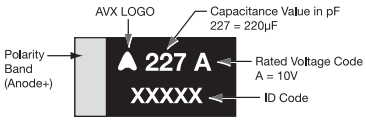
CASE DIMENSIONS: millimeters (inches)

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_1±0.20 (0.008)	A+0.30 (0.012) -0.20 (0.008)	S Min.
A	1206	3216-18	3.20 (0.126)	1.60 (0.063)	1.60 (0.063)	1.20 (0.047)	0.80 (0.031)	1.10 (0.043)
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)
C	2312	6032-28	6.00 (0.236)	3.20 (0.126)	2.60 (0.102)	2.20 (0.087)	1.30 (0.051)	2.90 (0.114)
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)
E	2917	7343-43	7.30 (0.287)	4.30 (0.169)	4.10 (0.162)	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)

W_1 dimension applies to the termination width for A dimensional area only.

MARKING

A, B, C, D, E CASE



HOW TO ORDER

THJ	B	105	*	035	R	JN	–
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** K=±10% M=±20%	**Rated DC Voltage** 006=6.3Vdc 010=10Vdc 016=16Vdc 020=20Vdc 025=25Vdc 035=35Vdc 050=50Vdc	**Packaging** R = Pure Tin 7" Reel S = Pure Tin 13" Reel A = Gold Plating 7" Reel (Contact Manufacturer) B = Gold Plating 13" Reel (Contact Manufacturer) H = Tin Lead 7" Reel (Contact Manufacturer) K = Tin Lead 13" Reel (Contact Manufacturer) H, K = Non RoHS	**Standard Suffix** OR **0100** **Low ESR in mΩ**	**Additional characters may be added for special requirements** V = Dry pack Option

TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C							
Capacitance Range:	0.10 µF to 220 µF							
Capacitance Tolerance:	±10%; ±20%							
Rated Voltage (V_R)	≤ +85°C:	6.3	10	16	20	25	35	50
Category Voltage (V_C)	≤ +125°C:	4	7	10	13	17	23	33
Category Voltage (V_C)	≤ +175°C:	3	5	8	10	12	17	25
Surge Voltage (V_S)	≤ +85°C:	8	13	20	26	32	46	65
Surge Voltage (V_S)	≤ +125°C:	5	8	13	16	20	28	40
Surge Voltage (V_S)	≤ +175°C:	4	6	10	12	15	21	30
Temperature Range:	-55ºC to 175°C voltage derating.							
Reliability:	0.5% per 1000 hours at 85°C, V_R with 0.1Ω/V series impedance, 60% confidence level, 3.5 Fits at 40°C, 0.5V_R							
Termination Finish:	Sn Plating (standard), Gold and SnPb Plating upon request							
	Meets requirements of AEC-Q200							

THJ Series

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CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated voltage (V_R) to 85°C (Voltage Code)						
µF	Code	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
0.10	104						A	
0.15	154						A	
0.22	224						A	
0.33	334						A	
0.47	474					A	B	
0.68	684					A	B	
1.0	105					A	A/B	
1.5	155				A		C	
2.2	225			A, A(1500)		B, B(1500)	C	
3.3	335		A	A	B		C	D
4.7	475	A	A	A/B			C	D
6.8	685	A	A	A/B		C	D	D
10	106	A	A/B	B		C	D	D/E
15	156	B	B	B	C		D	
22	226	B	B	C, C(500)		D	D, D(300)	
33	336	B	C	C	D	D	E, E(150)	
47	476	C	C	C/D				
68	686	C	D	D				
100	107	D	D	E				
150	157	D						
220	227		E					

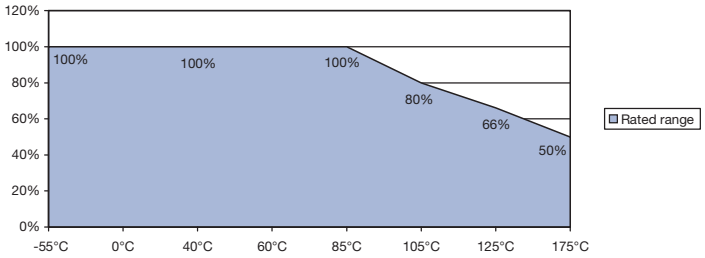
Released ratings (ESR ratings in mOhms in parenthesis)

Engineering samples - please contact AVX

*Ratings under development – subject to change.

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

THJ 175°C Voltage vs Temperature Rating



THJ Series

High Temperature Tantalum Chip Capacitor

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 (Ω)	MSL	100kHz RMS Current (mA)			
											25°C	85°C	125°C	175°C
6.3 Volt @ 85°C														
THJA475*006#JN	A	4.7	6.3	85	3	175	0.5	6	6	1	112	101	45	22
THJA685*006#JN	A	6.8	6.3	85	3	175	0.5	4.5	2.6	1	170	153	68	34
THJA106*006#JN	A	10	6.3	85	3	175	0.6	4.5	2.2	1	185	166	74	37
THJB156*006#JN	B	15	6.3	85	3	175	0.9	6	2.5	1	184	166	74	37
THJB226*006#JN	B	22	6.3	85	3	175	1.4	6	2.5	1	184	166	74	37
THJB336*006#JN	B	33	6.3	85	3	175	1.9	6	2.2	1	197	177	79	39
THJC476*006#JN	C	47	6.3	85	3	175	3.0	6	1.6	1	262	236	105	52
THJC686*006#JN	C	68	6.3	85	3	175	4.3	6	1.5	1	271	244	108	54
THJD107*006#JN	D	100	6.3	85	3	175	6	4.5	0.4	1[1)]	612	551	245	122
THJD157*006#JN	D	150	6.3	85	3	175	9.5	6	0.9	1[1)]	408	367	163	82
10 Volt @ 85°C														
THJA335*010#JN	A	3.3	10	85	5	175	0.5	6	5.5	1	117	105	47	23
THJA475*010#JN	A	4.7	10	85	5	175	0.5	4.5	2.9	1	161	145	64	32
THJA685*010#JN	A	6.8	10	85	5	175	0.7	4.5	2.6	1	170	153	68	34
THJA106*010#JN	A	10	10	85	5	175	1	6	2.7	1	167	150	67	33
THJB106*010#JN	B	10	10	85	5	175	1	4.5	1.8	1	217	196	87	43
THJB156*010#JN	B	15	10	85	5	175	1.5	4.5	1.5	1	238	214	95	48
THJB226*010#JN	B	22	10	85	5	175	2.2	6	2.4	1	188	169	75	38
THJC336*010#JN	C	33	10	85	5	175	3.3	6	1.6	1	262	236	105	52
THJC476*010#JN	C	47	10	85	5	175	4.7	4.5	0.5	1	469	422	188	94
THJD686*010#JN	D	68	10	85	5	175	6.8	4.5	0.4	1[1)]	612	551	245	122
THJD107*010#JN	D	100	10	85	5	175	10	6	0.9	1[1)]	408	367	163	82
THJE227*010#JN	E	220	10	85	5	175	22	10	0.5	1[1)]	574	517	230	115
16 Volt @ 85°C														
THJA225*016#JN	A	2.2	16	85	8	175	0.5	4.5	3	1	158	142	63	32
THJA225*016#1500	A	2.2	16	85	8	175	0.5	4.5	1.5	1	224	201	89	45
THJA335*016#JN	A	3.3	16	85	8	175	0.5	6	5	1	122	110	49	24
THJA475*016#JN	A	4.7	16	85	8	175	0.8	4.5	2.9	1	161	145	64	32
THJB475*016#JN	B	4.7	16	85	8	175	0.8	6	3.5	1	156	140	62	31
THJA685*016#JN	A	6.8	16	85	8	175	1.1	6	3.5	1	146	132	59	29
THJB685*016#JN	B	6.8	16	85	8	175	1.1	6	2.5	1	184	166	74	37
THJB106*016#JN	B	10	16	85	8	175	1.6	4.5	2.8	1	174	157	70	35
THJB156*016#JN	B	15	16	85	8	175	2.4	6	2	1	206	186	82	41
THJC226*016#JN	C	22	16	85	8	175	3.5	6	1.6	1	262	236	105	52
THJC226*016#0500	C	22	16	85	8	175	3.5	4.5	0.5	1	469	422	188	94
THJC336*016#JN	C	33	16	85	8	175	5.3	6	1.5	1	271	244	108	54
THJC476*016#JN	C	47	16	85	8	175	7.5	6	0.9	1	371	334	148	74
THJD476*016#JN	D	47	16	85	8	175	7.5	6	0.9	1[1)]	408	367	163	82
THJD686*016#JN	D	68	16	85	8	175	10.9	4.5	0.9	1[1)]	408	367	163	82
THJE107*016#JN	E	100	16	85	8	175	16	8	0.4	1[1)]	642	578	257	128
20 Volt @ 85°C														
THJA155*020#JN	A	1.5	20	85	10	175	0.5	6	6.5	1	107	97	43	21
THJB335*020#JN	B	3.3	20	85	10	175	0.7	6	3	1	168	151	67	34
THJC156*020#JN	C	15	20	85	10	175	3.0	6	1.7	1	254	229	102	51
THJD336*020#JN	D	33	20	85	10	175	6.6	6	0.9	1[1)]	408	367	163	82
25 Volt @ 85°C														
THJA474*025#JN	A	0.47	25	85	12	175	0.5	4	14	1	73	66	29	15
THJA684*025#JN	A	0.68	25	85	12	175	0.5	4	10	1	87	78	35	17
THJA105*025#JN	A	1.0	25	85	12	175	0.5	3	5.2	1	120	108	48	24
THJB225*025#JN	B	2.2	25	85	12	175	0.6	6	4.5	1	137	124	55	27
THJB225*025#1500	B	2.2	25	85	12	175	0.6	6	1.5	1	238	214	95	48
THJC685*025#JN	C	6.8	25	85	12	175	1.7	6	2	1	235	211	94	47
THJC106*025#JN	C	10	25	85	12	175	2.5	6	1.8	1	247	222	99	49
THJD226*025#JN	D	22	25	85	12	175	5.5	6	0.9	1[1)]	408	367	163	82
THJD336*025#JN	D	33	25	85	12	175	8.3	6	0.9	1[1)]	408	367	163	82
35 Volt @ 85°C														
THJA104*035#JN	A	0.1	35	85	17	175	0.5	4	24	1	56	50	22	11
THJA154*035#JN	A	0.15	35	85	17	175	0.5	4	21	1	60	54	24	12
THJA224*035#JN	A	0.22	35	85	17	175	0.5	4	18	1	65	58	26	13
THJA334*035#JN	A	0.33	35	85	17	175	0.5	4	15	1	71	64	28	14
THJB474*035#JN	B	0.47	35	85	17	175	0.5	4	10	1	92	83	37	18
THJB684*035#JN	B	0.68	35	85	17	175	0.5	4	8	1	103	93	41	21
THJA105*035#JN	A	1.0	35	85	17	175	0.5	4	7.5	1	100	90	40	20
THJB105*035#JN	B	1.0	35	85	17	175	0.5	4	6.5	1	114	103	46	23
THJC155*035#JN	C	1.5	35	85	17	175	0.5	6	4.5	1	156	141	63	31
THJC225*035#JN	C	2.2	35	85	17	175	0.8	6	3.5	1	177	160	71	35
THJC335*035#JN	C	3.3	35	85	17	175	1.2	6	2.5	1	210	189	84	42
THJC475*035#JN	C	4.7	35	85	17	175	1.6	6	2.2	1	224	201	89	45
THJD685*035#JN	D	6.8	35	85	17	175	2.4	6	1.3	1[1)]	340	306	136	68

THJ Series

High Temperature Tantalum Chip Capacitor

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 (Ω)	MSL	100kHz RMS Current (mA)			
											25°C	85°C	125°C	175°C
THJD106*035#JN	D	10	35	85	17	175	3.5	6	1	1[1)]	387	349	155	77
THJD156*035#JN	D	15	35	85	17	175	5.3	6	0.9	1[1)]	408	367	163	82
THJD226*035#JN	D	22	35	85	17	175	7.7	6	0.6	1[1)]	500	450	200	100
THJD226*035#0300	D	22	35	85	17	175	7.7	6	0.3	1[1)]	707	636	283	141
THJE336*035#JN	E	33	35	85	17	175	11.6	6	0.5	1[1)]	574	517	230	115
THJE336*035#0150	E	33	35	85	17	175	11.6	6	0.15	1[1)]	1049	944	420	210
50 Volt @ 85°C														
THJD335*050#JN	D	3.3	50	85	25	175	1.7	6	1.1	1[1)]	369	332	148	74
THJD475*050#JN	D	4.7	50	85	25	175	2.4	6	0.9	1[1)]	463	417	185	93
THJD685*050#JN	D	6.8	50	85	25	175	3.4	6	0.7	1[1)]	408	367	163	82
THJD106*050#JN	D	10	50	85	25	175	5	6	0.7	1[1)]	463	417	185	93
THJE106*050#JN	E	10	50	85	25	175	5	6	0.7	1[1)]	486	437	194	97

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

All PNs also available with Dry pack option - MSL 3 (see How to order).

[1)] –Dry pack option (see How to order) is recommended for reduction of stress during soldering.

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.

The EIA & CECC standards for low ESR Solid Tantalum Capacitors allow an ESR movement to 1.25 times catalogue limit post mounting.

For typical weight and composition see page 227.

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

QUALIFICATION TABLE

<table>
<tr><th rowspan="2">TEST</th><th colspan="4">THJ series (Temperature range -55ºC to +175ºC)</th></tr>
<tr><th colspan="3">Condition</th><th colspan="2">Characteristics</th></tr>
<tr><td>Endurance</td><td colspan="3">Determine after application of rated voltage for 2000 +48/-0 hours at 85±2ºC and then leaving 1-2 hours at room temperature. Also determine of 175ºC temperature, category voltage for 2000 +48/-0 hours and then leaving 1-2 hours at room temperature. Power supply impedance to be ≤0.1Ω/V.</td><td>Visual examination</td><td>no visible damage</td></tr>
<tr><td></td><td></td><td></td><td>DCL</td><td>1.25 x initial limit</td></tr>
<tr><td></td><td></td><td></td><td>ΔC/C</td><td>within ±10% of initial value</td></tr>
<tr><td></td><td></td><td></td><td>DF</td><td>initial limit</td></tr>
<tr><td></td><td></td><td></td><td>ESR</td><td>1.25 x initial limit</td></tr>
<tr><td>Storage Life</td><td colspan="3">175ºC, 0V, 2000h</td><td>Visual examination</td><td>no visible damage</td></tr>
<tr><td></td><td></td><td></td><td></td><td>DCL</td><td>1.25 x initial limit</td></tr>
<tr><td></td><td></td><td></td><td></td><td>ΔC/C</td><td>within ±10% of initial value</td></tr>
<tr><td></td><td></td><td></td><td></td><td>DF</td><td>initial limit</td></tr>
<tr><td></td><td></td><td></td><td></td><td>ESR</td><td>1.25 x initial limit</td></tr>
<tr><td>Biased Humidity</td><td colspan="3">Determine after leaving for 1000 hours at 85±2ºC, 85% relative humidity and rated voltage and then recovery 1-2 hours at room temperature.</td><td>Visual examination</td><td>no visible damage</td></tr>
<tr><td></td><td></td><td></td><td></td><td>DCL</td><td>2 x initial limit</td></tr>
<tr><td></td><td></td><td></td><td></td><td>ΔC/C</td><td>within ±10% of initial value</td></tr>
<tr><td></td><td></td><td></td><td></td><td>DF</td><td>1.2 x initial limit</td></tr>
<tr><td></td><td></td><td></td><td></td><td>ESR</td><td>1.25 x initial limit</td></tr>
<tr><td>Temperature Stability</td><td>Step</td><td>Temperature°C</td><td>Duration(min)</td><td></td><td>+20ºC</td><td>-55ºC</td><td>+20ºC</td><td>+125ºC</td><td>+175ºC</td><td>+20ºC</td></tr>
<tr><td></td><td>1</td><td>+20±2</td><td>15</td><td>DCL</td><td>IL*</td><td>n/a</td><td>IL*</td><td>10 x IL*</td><td>12.5 x IL*</td><td>IL*</td></tr>
<tr><td></td><td>2</td><td>-55+0/-3</td><td>15</td><td>ΔC/C</td><td>n/a</td><td>+0/-10%</td><td>±5%</td><td>+10/-0%</td><td>+18/-0%</td><td>±5%</td></tr>
<tr><td></td><td>3</td><td>+20±2</td><td>15</td><td>DF</td><td>IL*</td><td>1.5 x IL*</td><td>IL*</td><td>1.5 x IL*</td><td>2 x IL*</td><td>IL*</td></tr>
<tr><td></td><td>4</td><td>+125+3/-0</td><td>15</td><td>ESR</td><td>1.25 x IL*</td><td>2.5 x IL*</td><td>1.25 x IL*</td><td>1.25 x IL*</td><td>1.25 x IL*</td><td>1.25 x IL*</td></tr>
<tr><td></td><td>5</td><td>+175+3/-0</td><td>15</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>6</td><td>+20±2</td><td>15</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Surge Voltage</td><td colspan="3">Test temperature: 175ºC+3/0ºC
Test voltage: 1.3 x category voltage at 175ºC
Series protection resistance 1000±100Ω
Discharge resistance: 1000Ω
Number of cycles: 1000x
Cycle duration: 6 min; 30 sec charge,
5 min 30 sec discharge</td><td>Visual examination</td><td colspan="5">no visible damage</td></tr>
<tr><td></td><td></td><td></td><td></td><td>DCL</td><td colspan="5">initial limit</td></tr>
<tr><td></td><td></td><td></td><td></td><td>ΔC/C</td><td colspan="5">within ±5% of initial value</td></tr>
<tr><td></td><td></td><td></td><td></td><td>DF</td><td colspan="5">initial limit</td></tr>
<tr><td></td><td></td><td></td><td></td><td>ESR</td><td colspan="5">1.25 x initial limit</td></tr>
<tr><td>Mechanical Shock</td><td colspan="3">MIL-STD-202, Method 213, Condition F</td><td>Visual examination</td><td colspan="5">no visible damage</td></tr>
<tr><td></td><td></td><td></td><td></td><td>DCL</td><td colspan="5">initial limit</td></tr>
<tr><td></td><td></td><td></td><td></td><td>ΔC/C</td><td colspan="5">within ±10% of initial value</td></tr>
<tr><td></td><td></td><td></td><td></td><td>DF</td><td colspan="5">initial limit</td></tr>
<tr><td></td><td></td><td></td><td></td><td>ESR</td><td colspan="5">1.25 x initial limit</td></tr>
<tr><td>Vibration</td><td colspan="3">MIL-STD-202, Method 204, Condition D</td><td>Visual examination</td><td colspan="5">no visible damage</td></tr>
<tr><td></td><td></td><td></td><td></td><td>DCL</td><td colspan="5">initial limit</td></tr>
<tr><td></td><td></td><td></td><td></td><td>ΔC/C</td><td colspan="5">within ±10% of initial value</td></tr>
<tr><td></td><td></td><td></td><td></td><td>DF</td><td colspan="5">initial limit</td></tr>
<tr><td></td><td></td><td></td><td></td><td>ESR</td><td colspan="5">1.25 x initial limit</td></tr>
</table>

*Initial Limit