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

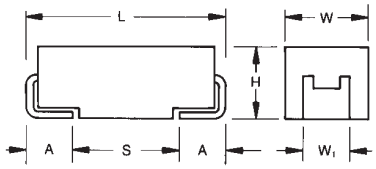
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

SnPb termination option is not RoHS compliant.

APPLICATIONS

- Automotive ECU and ABS control electronics
- Geothermal instrumentation



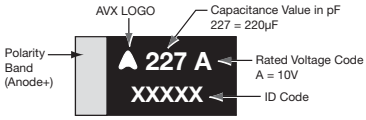
CASE DIMENSIONS: millimeters (inches)

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 B = Gold Plating 13" Reel 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 (selected codes only)

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 Plating available on request							
	Meets requirements of AEC-Q200							

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		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	
47	476	C	C	C/D				
68	686	C	D	D				
100	107	D	D	E				
150	157	D						
220	227		E					

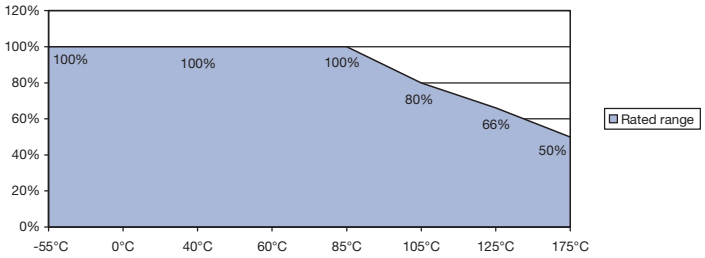
Available Ratings, (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

*Codes 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 (µA) Max.	DF % Max.	ESR Max. (Ω) @ 100kHz	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	612	551	245	122
THJD157*006#JN	D	150	6.3	85	3	175	9.5	6	0.9	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	612	551	245	122
THJD107*010#JN	D	100	10	85	5	175	10	6	0.9	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	6	6.5	1	107	97	43	21
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	6	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	408	367	163	82
THJD686*016#JN	D	68	16	85	8	175	10.9	4.5	0.9	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	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	408	367	163	82
THJD336*025#JN	D	33	25	85	12	175	8.3	6	0.9	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	340	306	136	68
THJD106*035#JN	D	10	35	85	17	175	3.5	6	1	1	387	349	155	77
THJD156*035#JN	D	15	35	85	17	175	5.3	6	0.9	1	408	367	163	82

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 (µA) Max.	DF % Max.	ESR Max. (Ω) @ 100kHz	MSL	100kHz RMS Current (mA)			
											25°C	85°C	125°C	175°C
THJD226*035#JN	D	22	35	85	17	175	7.7	6	0.6	1	500	450	200	100
THJD226*035#0300	D	22	35	85	17	175	7.7	6	0.3	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
50 Volt @ 85°C														
THJD335*050#JN	D	3.3	50	85	25	175	1.7	6	1.1	1	369	332	148	74
THJD475*050#JN	D	4.7	50	85	25	175	2.4	6	0.9	1	463	417	185	93
THJD685*050#JN	D	6.8	50	85	25	175	3.4	6	0.7	1	408	367	163	82
THJD106*050#JN	D	10	50	85	25	175	5	6	0.7	1	463	417	185	93
THJE106*050#JN	E	10	50	85	25	175	5	6	0.7	1[1)]	486	437	194	97

1[1)] Dry pack option (see How to order) recommended for reduction of stress during soldering. Dry pack parts should be treated as MSL 3.

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 ismeasured 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 202.

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="6">THJ series (Temperature range -55°C to +175°C)</th></tr>
<tr><th colspan="3">Condition</th><th colspan="3">Characteristics</th></tr>
<tr><td>Endurance</td><td colspan="3" rowspan="5">Determine after application of rated voltage for 2000 +48/-0 hours at 85±2°C and then leaving 1-2 hours at room temperature. Also determine of 175°C 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 colspan="2">no visible damage</td></tr>
<tr><td></td><td></td><td></td><td>DCL</td><td colspan="2">1.25 x initial limit</td></tr>
<tr><td></td><td></td><td></td><td>ΔC/C</td><td colspan="2">within ±10% of initial value</td></tr>
<tr><td></td><td></td><td></td><td>DF</td><td colspan="2">initial limit</td></tr>
<tr><td></td><td></td><td></td><td>ESR</td><td colspan="2">1.25 x initial limit</td></tr>
<tr><td>Storage Life</td><td colspan="3" rowspan="5">175°C, 0V, 2000h</td><td>Visual examination</td><td colspan="2">no visible damage</td></tr>
<tr><td></td><td></td><td></td><td>DCL</td><td colspan="2">1.25 x initial limit</td></tr>
<tr><td></td><td></td><td></td><td>ΔC/C</td><td colspan="2">within ±10% of initial value</td></tr>
<tr><td></td><td></td><td></td><td>DF</td><td colspan="2">initial limit</td></tr>
<tr><td></td><td></td><td></td><td>ESR</td><td colspan="2">1.25 x initial limit</td></tr>
<tr><td>Biased Humidity</td><td colspan="3" rowspan="5">Determine after leaving for 1000 hours at 85±2°C, 85% relative humidity and rated voltage and then recovery 1-2 hours at room temperature.</td><td>Visual examination</td><td colspan="2">no visible damage</td></tr>
<tr><td></td><td></td><td></td><td>DCL</td><td colspan="2">2 x initial limit</td></tr>
<tr><td></td><td></td><td></td><td>ΔC/C</td><td colspan="2">within ±10% of initial value</td></tr>
<tr><td></td><td></td><td></td><td>DF</td><td colspan="2">1.2 x initial limit</td></tr>
<tr><td></td><td></td><td></td><td>ESR</td><td colspan="2">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>+20°C</td><td>-55°C</td><td>+20°C</td><td>+125°C</td><td>+175°C</td><td>+20°C</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>+85+3/-0</td><td>15</td><td rowspan="2">ESR</td><td rowspan="2">1.25 x IL*</td><td rowspan="2">2.5 x IL*</td><td rowspan="2">1.25 x IL*</td><td rowspan="2">1.25 x IL*</td><td rowspan="2">1.25 x IL*</td><td rowspan="2">1.25 x IL*</td></tr>
<tr><td></td><td>5</td><td>+175+3/-0</td><td>15</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" rowspan="5">Test temperature: 175°C+3/0°C
Test voltage: 1.3 x category voltage at 175°C
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="2">no visible damage</td></tr>
<tr><td></td><td></td><td></td><td>DCL</td><td colspan="2">initial limit</td></tr>
<tr><td></td><td></td><td></td><td>ΔC/C</td><td colspan="2">within ±5% of initial value</td></tr>
<tr><td></td><td></td><td></td><td>DF</td><td colspan="2">initial limit</td></tr>
<tr><td></td><td></td><td></td><td>ESR</td><td colspan="2">1.25 x initial limit</td></tr>
</table>

*Initial Limit