

THJ Series



High Temperature Tantalum Chip Capacitor



FEATURES

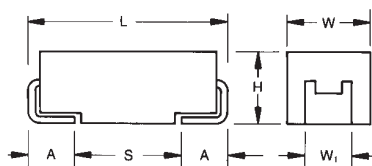
- Improved reliability – 2x standard
- 175°C @ 0.5V_R continuous operation
- CV range: 0.10-220μF / 6.3-50V
- 5 case sizes available
- Low ESR options on approval
- High temperature automotive and industry applications



SnPb termination option is not RoHS compliant.

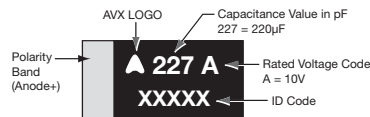
APPLICATIONS

- Automotive ECU and ABS control electronics
- Geothermal instrumentation



MARKING

A, B, C, D, E CASE



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)

W₁ dimension applies to the termination width for A dimensional area only.

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:	-55°C 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



High Temperature Tantalum Chip Capacitor

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 0.15 0.22	104 154 224						A A A	
0.33 0.47 0.68	334 474 684					A A	A B B	
1.0 1.5 2.2	105 155 225			A	A	A B, B(1500)	A/B C C	
3.3 4.7 6.8	335 475 685	A A A	A A A	A A/B A/B	B	C	C C D	D D D
10 15 22	106 156 226	A B B	A/B B B	B B C, C(500)	C	C D	D D D, D(300)	D/E
33 47 68	336 476 686	B C C	C C D	C C/D D	D	D	E	
100 150 220	107 157 227	D D	D E	E				

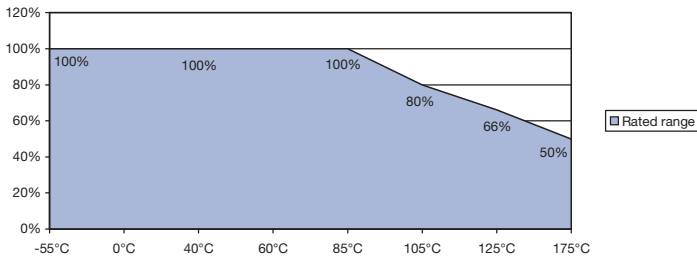
Available Ratings, (ESR ratings in mOhms in brackets)

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



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	

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

1¹⁾ 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 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 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

TEST	THJ series (Temperature range -55°C to +175°C)									
	Condition			Characteristics						
Endurance	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.			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					
Storage Life	175°C, 0V, 2000h			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					
Biased Humidity	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.			Visual examination	no visible damage					
				DCL	2 x initial limit					
				ΔC/C	within ±10% of initial value					
				DF	1.2 x initial limit					
				ESR	1.25 x initial limit					
Temperature Stability	Step	Temperature°C	Duration(min)		+20°C	-55°C	+20°C	+125°C	+175°C	+20°C
	1	+20±2	15	DCL	IL*	n/a	IL*	10 x IL*	12.5 x IL*	IL*
	2	-55+0/-3	15	ΔC/C	n/a	+0/-10%	±5%	+10/-0%	+18/-0%	±5%
	3	+20±2	15	DF	IL*	1.5 x IL*	IL*	1.5 x IL*	2 x IL*	IL*
	4	+85+3/-0	15							
	5	+175+3/-0	15	ESR	1.25 x IL*	2.5 x IL*	1.25 x IL*	1.25 x IL*	1.25 x IL*	1.25 x IL*
Surge Voltage	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			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