

T4J – Medical Series



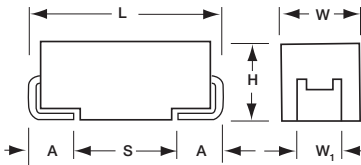
HRC4000 Implantable Non Life Support and Non Implantable Life Support



The AVX T4J series is designed for use in Implantable - Non-Life support or Non-Implantable - Life support medical applications. These components are screened using our newly designed Q-Process to effectively remove components that may experience parametric shifts through customer processing or display instability through life testing.

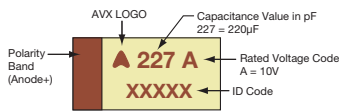


For RoHS compliant products, please select correct termination style.



MARKING

A, B, C, D, E, U, V CASE



FEATURES

- Dedicated to medical applications
- HRC4000 - Implantable, Non-Life support
- Non-Implantable, Life support
- -55 to +125°C operation temperature
- Basic reliability better than 0.1%/1000hours
- Custom DCL / ESR options on selected parts

T4J Standard – Standard option DCL and ESR limits including Q-Process screening.

T4J Custom – A custom option where specific DCL and ESR parameter limits can be agreed based Q-Process statistical screening. DCL down to 0.005CV on selected codes

APPLICATIONS

- Medical, Implantable - Non-Life support and Non-Implantable - Life support

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	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)
U	2924	7361-43	7.30 (0.287)	6.10 (0.240)	4.10 (0.162)	3.10 (0.120)	1.30 (0.051)	4.40 (0.173)
V	2924	7361-38	7.30 (0.287)	6.10 (0.240)	3.55 (0.140)	3.10 (0.120)	1.30 (0.051)	4.40 (0.173)

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

HOW TO ORDER

T4J	E	336	K	035	C	□	L	Q	4	^	00
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%	Rated DC Voltage 006 = 6.3Vdc 010 = 10Vdc 016 = 16Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	Standard or Low ESR Range C = Std ESR L = Low ESR	Packaging R = 7" Reel B = Bulk	Inspection Level L = Lab Inspection	Reliability Grade Q = Q-Process Screening	Qualification Level 4 = HCR4000	Termination 7 = 100% Tin 9 = Gold Plated H = SnPb Non RoHS H,9 = (Contact Manufacturer) Non RoHS	Suffix 00 = Standard XX = Custom

TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C								
Capacitance Range:	1 μF to 1000 μF								
Capacitance Tolerance:	±10%								
Leakage Current DCL:	0.01CV (Custom potential down to 0.005CV available upon request)								
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	
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	
Temperature Range:	-55°C to +125°C								
Reliability:	0.1% / 1000hrs at 25°C, VR with 0.1Ω/V series impedance, 90% confidence level								

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CAPACITANCE AND RATED VOLTAGE, V_R (VOLTAGE CODE) RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage DC (V_R) to 85°C (Voltage Code)						
μF	Code	6.3V (J)	10V (A)	16V (C)	20 (D)	25 (E)	35 (V)	50V (T)
1.0	105						A	C
1.5	155					A	B	C
2.2	225					B	B	C
3.3	335				A*	B	B	C
4.7	475			A*	B	B	C	D
6.8	685		A	B	B	C	C	D
10	106	A	A	B	B/C	C	C	E
15	156	A	B	B	C	C	D	
22	226	B	B	C	C	D	D	
33	336	B	C	C	D	D	E	
47	476	B/C	C	D	D	D		
68	686	B/C	C	D	E		V	
100	107	B/C	D	E	E			
150	157	D	D	E				
220	227	D	E	U				
330	337	E	E					
470	477	E	U					
680	687	U						
1000	108	V						

Available Ratings

Engineering samples - please contact manufacturer

*Codes under development

Please contact the factory for codes not listed in the table.

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

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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)	MSL	100kHz RMS Current (mA)		
											25°C	85°C	125°C
6.3 Volt @ 85°C													
T4JA106K006C□□LQ4^00	A	10	6.3	85	4	125	0.6	6	1500	3	224	201	89
T4JA156K006C□□LQ4^00	A	15	6.3	85	4	125	0.9	6	1500	3	224	201	89
T4JB226K006C□□LQ4^00	B	22	6.3	85	4	125	1.4	6	600	3	376	339	151
T4JB336K006C□□LQ4^00	B	33	6.3	85	4	125	2.1	6	600	3	376	339	151
T4JB476K006C□□LQ4^00	B	47	6.3	85	4	125	2.8	8	1500	3	238	214	95
T4JC476K006C□□LQ4^00	C	47	6.3	85	4	125	3.0	6	300	3	606	545	242
T4JB686K006C□□LQ4^00	B	68	6.3	85	4	125	4.0	8	900	3	307	277	123
T4JC686K006C□□LQ4^00	C	68	6.3	85	4	125	4.3	6	300	3	606	545	242
T4JB107K006C□□LQ4^00	B	100	6.3	85	4	125	3.0	10	1400	3	246	222	99
T4JC107K006C□□LQ4^00	C	100	6.3	85	4	125	6.3	6	300	3	606	545	242
T4JD157K006C□□LQ4^00	D	150	6.3	85	4	125	9.5	6	200	3	866	779	346
T4JD227K006C□□LQ4^00	D	220	6.3	85	4	125	13.9	8	200	3	866	779	346
T4JE337K006C□□LQ4^00	E	330	6.3	85	4	125	20.8	8	200	3	908	817	363
T4JE477K006C□□LQ4^00	E	470	6.3	85	4	125	29.6	8	200	3	908	817	363
T4JU687K006C□□LQ4^00	U	680	6.3	85	4	125	42.8	12	250	3	812	731	325
T4JV108K006C□□LQ4^00	V	1000	6.3	85	4	125	60.0	16	200	3	1118	1006	447
10 Volt @ 85°C													
T4JA685K010C□□LQ4^00	A	6.8	10	85	7	125	0.7	6	2000	3	194	174	77
T4JA106K010C□□LQ4^00	A	10	10	85	7	125	1	6	2000	3	194	174	77
T4JB156K010C□□LQ4^00	B	15	10	85	7	125	1.5	6	700	3	348	314	139
T4JB226K010C□□LQ4^00	B	22	10	85	7	125	2.2	6	700	3	348	314	139
T4JC336K010C□□LQ4^00	C	33	10	85	7	125	3.3	6	300	3	606	545	242
T4JC476K010C□□LQ4^00	C	47	10	85	7	125	4.7	6	300	3	606	545	242
T4JC686K010C□□LQ4^00	C	68	10	85	7	125	6.8	6	300	3	606	545	242
T4JD107K010C□□LQ4^00	D	100	10	85	7	125	10.0	6	150	3	1000	900	400
T4JD157K010C□□LQ4^00	D	150	10	85	7	125	15.0	8	150	3	1000	900	400
T4JE227K010C□□LQ4^00	E	220	10	85	7	125	22.0	8	150	3	1049	944	420
T4JE337K010C□□LQ4^00	E	330	10	85	7	125	33.0	8	150	3	1049	944	420
T4JU477K010C□□LQ4^00	U	470	10	85	7	125	47.0	12	200	3	908	817	363
16 Volt @ 85°C													
T4JB685K016C□□LQ4^00	B	6.8	16	85	10	125	1.1	6	1200	3	266	240	106
T4JB106K016C□□LQ4^00	B	10	16	85	10	125	1.6	6	1200	3	266	240	106
T4JB156K016C□□LQ4^00	B	15	16	85	10	125	2.4	6	1200	3	266	240	106
T4JC226K016C□□LQ4^00	C	22	16	85	10	125	3.5	6	350	3	561	505	224
T4JC336K016C□□LQ4^00	C	33	16	85	10	125	5.3	6	350	3	561	505	224
T4JD476K016C□□LQ4^00	D	47	16	85	10	125	7.5	6	200	3	866	779	346
T4JD686K016C□□LQ4^00	D	68	16	85	10	125	10.9	6	200	3	866	779	346
T4JE107K016C□□LQ4^00	E	100	16	85	10	125	16.0	6	150	3	1049	944	420
T4JE157K016C□□LQ4^00	E	150	16	85	10	125	24.0	6	150	3	1049	944	420
T4JU227K016C□□LQ4^00	U	220	16	85	10	125	35.2	12	200	3	908	817	363
20 Volt @ 85°C													
T4JB475K020C□□LQ4^00	B	4.7	20	85	13	125	1.0	6	1000	3	292	262	117
T4JB685K020C□□LQ4^00	B	6.8	20	85	13	125	1.4	6	1000	3	292	262	117
T4JB106K020C□□LQ4^00	B	10	20	85	13	125	1.0	6	1000	3	292	262	117
T4JB106K020L□□LQ4^00	B	10	20	85	13	125	1.0	6	500	3	412	371	165
T4JC106K020C□□LQ4^00	C	10	20	85	13	125	2.0	6	500	3	469	422	188
T4JC156K020C□□LQ4^00	C	15	20	85	13	125	3.0	6	500	3	469	422	188
T4JC226K020C□□LQ4^00	C	22	20	85	13	125	4.4	6	500	3	469	422	188
T4JD336K020C□□LQ4^00	D	33	20	85	13	125	6.6	6	250	3	775	697	310
T4JD476K020C□□LQ4^00	D	47	20	85	13	125	9.4	6	250	3	775	697	310
T4JE686K020C□□LQ4^00	E	68	20	85	13	125	13.6	6	200	3	908	817	363
T4JE107K020C□□LQ4^00	E	100	20	85	13	125	20.0	6	200	3	908	817	363

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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)	MSL	100kHz RMS Current (mA)		
											25°C	85°C	125°C
25 Volt @ 85°C													
T4JA155K025C□LQ4^00	A	1.5	25	85	17	125	0.4	6	3000	3	158	142	63
T4JB225K025C□LQ4^00	B	2.2	25	85	17	125	0.6	6	2000	3	206	186	82
T4JB335K025C□LQ4^00	B	3.3	25	85	17	125	0.8	6	2000	3	206	186	82
T4JB475K025C□LQ4^00	B	4.7	25	85	17	125	1.2	6	2000	3	206	186	82
T4JC685K025C□LQ4^00	C	6.8	25	85	17	125	1.7	6	600	3	428	385	171
T4JC106K025C□LQ4^00	C	10	25	85	17	125	2.5	6	600	3	428	385	171
T4JC156K025C□LQ4^00	C	15	25	85	17	125	3.8	6	600	3	428	385	171
T4JD226K025C□LQ4^00	D	22	25	85	17	125	5.5	6	400	3	612	551	245
T4JD336K025C□LQ4^00	D	33	25	85	17	125	8.3	6	400	3	612	551	245
T4JD476K025C□LQ4^00	D	47	25	85	17	125	11.8	6	400	3	612	551	245
35 Volt @ 85°C													
T4JA105K035C□LQ4^00	A	1.0	35	85	23	125	0.4	6	3000	3	158	142	63
T4JA105K035L□LQ4^00	A	1.0	35	85	23	125	0.2	6	1000	3	274	246	110
T4JB155K035C□LQ4^00	B	1.5	35	85	23	125	0.5	6	2500	3	184	166	74
T4JB225K035C□LQ4^00	B	2.2	35	85	23	125	0.8	6	2500	3	184	166	74
T4JB335K035C□LQ4^00	B	3.3	35	85	23	125	1.2	6	2500	3	184	166	74
T4JC475K035C□LQ4^00	C	4.7	35	85	23	125	1.6	6	600	3	428	385	171
T4JC685K035C□LQ4^00	C	6.8	35	85	23	125	2.4	6	600	3	428	385	171
T4JC106K035C□LQ4^00	C	10	35	85	23	125	3.5	6	600	3	428	385	171
T4JD156K035C□LQ4^00	D	15	35	85	23	125	5.3	6	400	3	612	551	245
T4JD226K035C□LQ4^00	D	22	35	85	23	125	7.7	6	400	3	612	551	245
T4JE336K035C□LQ4^00	E	33	35	85	23	125	11.6	6	250	3	812	731	325
T4JV686K035C□LQ4^00	V	68	35	85	23	125	23.8	6	500	3	707	636	283
50 Volt @ 85°C													
T4JC105K050C□LQ4^00	C	1	50	85	33	125	0.5	4	1500	3	271	244	108
T4JC155K050C□LQ4^00	C	1.5	50	85	33	125	0.8	6	1500	3	271	244	108
T4JC225K050C□LQ4^00	C	2.2	50	85	33	125	1.1	6	1500	3	271	244	108
T4JC335K050C□LQ4^00	C	3.3	50	85	33	125	1.7	6	1500	3	271	244	108
T4JD475K050C□LQ4^00	D	4.7	50	85	33	125	2.4	4.5	600	3	500	450	200
T4JD685K050C□LQ4^00	D	6.8	50	85	33	125	3.4	4.5	600	3	500	450	200
T4JE106K050C□LQ4^00	E	10	50	85	33	125	5.0	4.5	400	3	642	578	257

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.

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QUALIFICATION TABLE

TEST	T4J HRC4000 (Temperature range -55°C to +125°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 125°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	125°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						
Temperature Stability	Step	Temperature°C	Duration (min)		+20°C	-55°C	+20°C	+85°C	+125°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%	+12/-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	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*	
	5	+125+3/-0	15								
	6	+20±2	15								
Surge Voltage	Test temperature: 125°C+3/0°C Test voltage: Category voltage at 125°C Surge voltage: 1.3x category voltage at 125°C Series protection resistance 1000±100Ω Discharge resistance: 1000Ω Number of cycles: 1000x Cycle duration: 6min; 30 sec charge, 5min 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

LOT ACCEPTANCE TESTING

TEST	T4J HRC4000 (Temperature range -55°C to +125°C)		
	Condition	Characteristics	
Lot Acceptance Test	25 Pieces from each lot <ul style="list-style-type: none"> • Read and Record Initial Electricals • Bake Out @ 125°C for 2 Hours • Mount using AVX recommended profile • Read and Record Post Mounting Electricals • Life Test: 6 hours, 2/3 R.V., 125°C • Read and Record Post Electricals 	DCL	initial limit
		ΔC/C	within ±5% of initial value
		DF	initial limit
		ESR	1.25 x initial limit
		0 Failures Allowed	