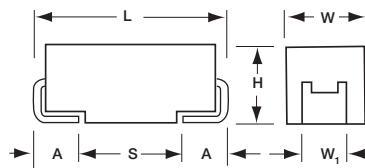


T4J – Medical Series

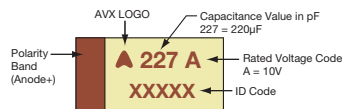


HRC4000 Implantable Non Life Support and Non Implantable Life Support



MARKING

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



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.

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)

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

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			
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						

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.



T4J – Medical Series



HRC4000 Implantable Non Life Support and Non Implantable Life Support

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 680 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								

T4J – Medical Series



HRC4000 Implantable Non Life Support and Non Implantable Life Support

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
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

T4J – Medical Series



HRC4000 Implantable Non Life Support and Non Implantable Life Support

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
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.

T4J – Medical Series



HRC4000 Implantable Non Life Support and Non Implantable Life Support

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												
	3	+20±2	15	ΔC/C	n/a	+0/-10%	±5%	+10/-0%	+12/-0%	±5%					
	4	+85+3/-0	15	DF	IL*	1.5 x IL*	IL*	1.5 x IL*	2 x IL*	IL*					
	5	+125+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*					
	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 • 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	