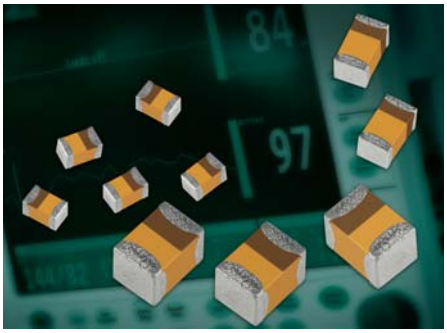
T4C – Microchip Medical Series

HRC4000 Implantable Non Life Support and Non Implantable Life Support



The AVX T4C microchip medical series is designed for use in Implantable - Non-Life support or Non-Implantable - Life support medical applications with space limits. 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.

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

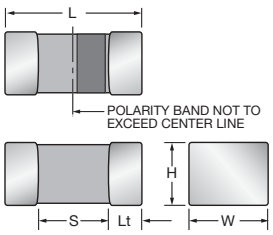
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

For RoHS compliant products, please select correct termination style.

T4C Standard - Standard option DCL and ESR limits including Q-Process screening.

T4C 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



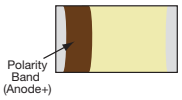
APPLICATIONS

- 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)

MARKING

K, L, R CASE



CASE DIMENSIONS: millimeters (inches)

Code	EIA Code	EIA Metric	L+0.20 (0.008) -0.00 (0.000)	W+0.15 (0.006) -0.00 (0.000)	H+0.15 (0.006) -0.00 (0.000)	Termination Spacing(S)	Minimum Termination Length (Lt)
K	0402	1005-07	1.00 (0.039)	0.50 +0.20 -0.00 (0.020 +0.008 -0.000)	0.50 +0.20 -0.00 (0.020 +0.008 -0.000)	0.40 (0.016) min	0.10 (0.004)
L	0603	1608-10	1.60 (0.063)	0.85 (0.033)	0.85 (0.033)	0.55 (0.022) min	0.15 (0.006)
R	0805	2012-15	2.00 (0.079)	1.35 (0.053)	1.35 (0.053)	0.70 (0.028) min	0.15 (0.006)

CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage DC (V_R) to 85°C (Voltage Code)			
µF	Code	4V (G)	6.3V (J)	10V (A)	16V (C)
0.33	334				
0.47	474			K	
1.0	105	K	K	L	L
2.2	225			L	
3.3	335				
4.7	475	K			
10	106			L(M),R	
15	156				
22	226		R		

Available Ratings (M tolerance only)

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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HOW TO ORDER

T4C	K	105	*	006	C	□	L	Q	4	^	00
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10%	**Voltage Code** 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc 016 = 16Vdc	**Standard or Low ESR Range** C = Std ESR	**Packaging** R, P = 7" Reel X, Q = 4¼" Reel B = Bulk	**Inspection Level** L = Lab Inspection	**Reliability Grade** Q = Q-Proces Screening	**Qualification Level** 4 = HRC4000	**Termination Finish** 7 = 100% Tin 9 = Gold Plated H = SnPb Non RoHS H, 9 = (Contact Manufacturer)	**Suffix** 00 = Standard XX = Custom

TECHNICAL SPECIFICATIONS

Technical Data:		All technical data relate to an ambient temperature of +25°C				
Capacitance Range:		0.47 µF to 22 µF (for extended range contact manufacturer)				
Capacitance Tolerance:		±10%; ±20%				
Leakage Current DCL:		0.01CV or 0.3µA whichever is the greater				
Rated Voltage (V_R)	≤ +85°C:	4	6.3	10	16	
Category Voltage (V_C)	≤ +125°C:	2.7	4	6.7	10	
Surge Voltage (V_S)	≤ +85°C:	5.2	8	13	20	
Surge Voltage (V_S)	≤ +125°C:	3.2	5	8	13	
Temperature Range:		-55°C to +125°C				
Reliability:		0.1% per 1000 hours at 25°C, V_R with 0.1Ω/V series impedance, 90% confidence level				

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
4 Volt @ 85°C													
T4CK105*004C□LQ4^00	K	1	4	85	2.7	125	0.3	6	15	3	32	28	13
T4CK475*004C□LQ4^00	K	4.7	4	85	2.7	125	0.3	20	15	3	32	28	13
6.3 Volt @ 85°C													
T4CK105*006C□LQ4^00	K	1	6.3	85	4	125	0.3	6	15	3	32	28	13
T4CR226*006C□LQ4^00	R	22	6.3	85	4	125	1.4	10	5	3	95	85	38
10 Volt @ 85°C													
T4CK474*010C□LQ4^00	K	0.47	10	85	6.7	125	0.3	6	15	3	32	28	13
T4CL105*010C□LQ4^00	L	1	10	85	6.7	125	0.3	6	7.5	3	58	52	23
T4CL225*010C□LQ4^00	L	2.2	10	85	6.7	125	0.3	6	7.5	3	58	52	23
T4CL106M010C□LQ4^00	L	10	10	85	6.7	125	1	20	7.5	3	58	52	23
T4CR106*010C□LQ4^00	R	10	10	85	6.7	125	1	8	5	3	95	85	38
16 Volt @ 85°C													
T4CL105*016C□LQ4^00	L	1	16	85	10	125	0.3	6	7.5	3	58	52	23

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	T4C HRC4000 (Temperature range -55ºC to +125ºC)		
	Condition		Characteristics
Endurance	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 125ºC 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	125ºC, 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)
	1	+20±2	15
	2	-55+0/-3	15
	3	+20±2	15
	4	+85+3/-0	15
	5	+125+3/-0	15
	6	+20±2	15

	+20ºC	-55ºC	+20ºC	+85ºC	+125ºC	+20ºC
DCL	IL*	n/a	IL*	10 x IL*	12.5 x IL*	IL*
ΔC/C	n/a	+0/-10%	±5%	+10/-0%	+12/-0%	±5%
DF	IL*	1.5 x IL*	IL*	1.5 x IL*	2 x IL*	IL*
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: 85ºC+3/0ºC Test voltage: Rated voltage at 85ºC Surge voltage: 1.3x rated voltage at 85ºC 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

LOT ACCEPTANCE TESTING

TEST	T4C HRC4000 (Temperature range -55ºC to +125ºC)		
	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	

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1210YD106KAT2A TAJC107M006RNJ 06031A330FAT2A 06035C151KAT2A 12101C475K4Z2A F931A226MBA 06035A100KAT2A 069175701601000 1004112-B002 VC080514C300DP 04025A820FAT2A 04025G103ZAT2A 06031A120JAT4A LMXS101DN220LTAS 06035A151FAT2A 109159002101916 SCMR18J604SSBA0 TAJC226K016RNJ 0201ZD103KAT2A 06035F473K4T2A 08055A272JAT2A NJ28MA0302F 009176004722906 08052C331KAT2A ESD55C473K4T2A22 08052C152K4T2A 12061C472KAT2A AEA1010471M025R TLJR476M006R3200 06031C472JAT2A