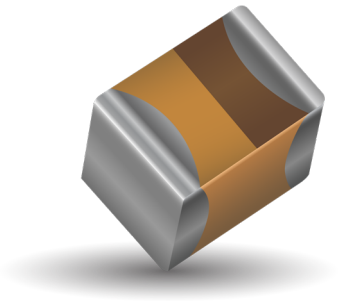
TBC SERIES

T4C 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

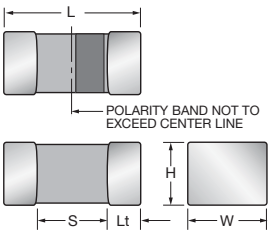
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

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



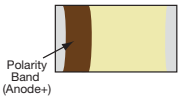
APPLICATIONS

- 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 +0.2 0 -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.

TBC SERIES

T4C HRC4000 Implantable Non Life Support and Non Implantable Life Support

HOW TO ORDER

T4C	R	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.

QUALIFICATION TABLE

TEST	T4C 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)
	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

	+20°C	-55°C	+20°C	+85°C	+125°C	+20°C
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	Condition		Characteristics
	Test temperature: 85°C+3/0°C Test voltage: Rated voltage at 85°C Surge voltage: 1.3x rated voltage at 85°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	T4C 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	