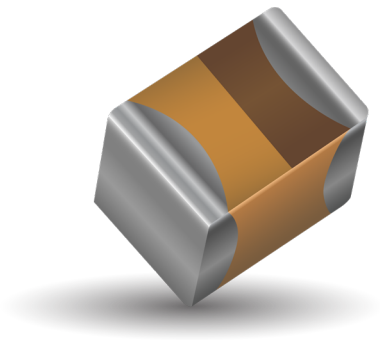
TBC SERIES

HRC6000 Medical Implantable Grade



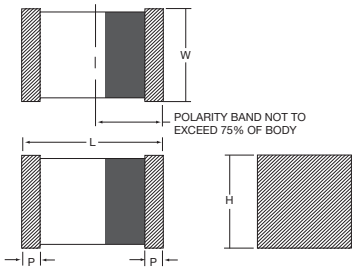
The TBC HRC6000 Medical Grade series is the next generation of our internally qualified medical grade tantalum capacitors. These components are screened using our newly designed Q- Process to effectively remove components that may experience parametric shifts through customer processing or display instability through life testing.

Due to the deficiencies of Weibull grading and its tendency to Burn-In potentially unstable units, this Q-Process utilizes a Product Level Designation system based on a simulated production routine performed on a sample from the population. Once that is completed a calculation is done based on the performance of the sample which can take into account the application conditions of the end customer. This system also allows for derating recommendations to be relaxed as illustrated by the section below.

These components are manufactured and tested in the AVX Biddeford Maine factory which is ISO 13485 certified. For more information on this process or to request a specific rating please contact the factory. In addition, DC leakage testing at application voltage is available upon request.

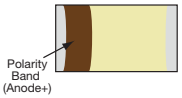
For additional information on Q-process please consult the AVX technical publication "Reaching the Highest Reliability for Tantalum Capacitors" (see the link: http://www.avx.com/docs/techinfo/Qprocess.pdf)

For moisture sensitivity levels please refer to the High Reliability Tantalum MSL section located in the back of the High Reliability Tantalum Catalog.



MARKING

A, B, L, R, S CASE



CASE DIMENSIONS: millimeters (inches)

Case Code	EIA Code	Length (L)		Width (W)		Height (H)		Term. Width (P) min.
L	0603	1.60	+025 -0.15	0.84	+0.20 -0.10	0.84	+0.20 -0.10	0.15 (0.006)
		(0.063	+0.010 -0.006)	(0.033	+0.008 -0.004)	(0.033	+0.008 -0.004)	
R	0805	2.00	+0.25 -0.15	1.35	+0.20 -0.10	1.35	+0. 20 -0.10	0.15 (0.006)
		(0.079	+0.010 -0.006)	(0.053	+0.008 -0 .004)	(0.053	+0.008 -0.004)	
A	1206	3.20 ±0.20 (0.126 ±0.008)		1.60 ±0.20 (0.063 ±0.008)		1.60 ±0.20 (0.063 ±0.008)		0.15 (0.006)
S	1207	3.20 ±0.20 (0.126 ±0.008)		1.80 ±0.20 (0.071 ±0.008)		1.50 max (0.06 max)		0.15 (0.006)
B	1411	3.60 ±0.20 (0.141 ±0.008)		2.90 ±0.15 (0.114 ±0.006)		1.50 max (0.06 max)		0.15 (0.006)

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

Capacitance		Rated Voltage		
µF	Code	4V	6V	10V
0.33	334			L
0.47	474			L
0.68	684			L
1.0	105			L
2.2	225			L
3.3	335		L	
4.7	475		L	
6.8	685			R
10	106	L		R
15	156		R	
22	226		R	
33	336		S	B
47	476		A, S	B
68	686	S	B	

TBC SERIES

HRC6000 Medical Implantable Grade

HOW TO ORDER

TBC	R	106	*	010	C	□	L	Q	6	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Voltage Code** 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc	**ESR** C = Std ESR	**Packaging** B = Bulk R = 7" T&R W = Waffle	**Inspection Level** L = Group A	**Reliability Grade** Product Level Designator: Q = 0.1%/1000 Hours Minimum, 60% conf.	**Qualification Level** 6 = HRC6000	**Termination Finish** 0 = Solder Fused 9 = Gold Plated 7 = 100% Matte Tin	**Custom Option** 00 = Std

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

For RoHS compliant products, please select correct termination style.

*Contact factory for AVX HRC6000 Medical Grade SCD details.

TECHNICAL SPECIFICATIONS

Technical Data:		Unless otherwise specified, all technical data relate to an ambient temperature of 25°C			
Capacitance Range:		0.33 µF to 68 µF			
Capacitance Tolerance:		±5%; ±10%; ±20%			
Rated Voltage (V_R)	≤ +85°C:	4	6	10	
Category Voltage (V_C)	≤ +125°C:	2.7	4	6.7	
Temperature Range:		-55°C to +125°C			

RATING & PART NUMBER REFERENCE		Parametric Specifications by Rating										Typical RMS Ripple Data by Rating						
		Cap @ 120Hz	DC Rated Voltage	ESR @ 100kHz	DCL max			DF Max			Power Dissipation	25°C Ripple Current	85°C Ripple Current	125°C Ripple Current	25°C Ripple Voltage	85°C Ripple Voltage	125°C Ripple Voltage
					+25°C	+85°C	+125°C	+25°C	+(85/125)°C	-55°C							
AVX HRC6000 P/N	Case	µF @ 25°C	V @ +85°C	Ohms @ +25°C	(µA)	(µA)	(µA)	(%)	(%)	(%)	W	A (100kHz)	A (100kHz)	A (100kHz)	V (100kHz)	V (100kHz)	V (100kHz)
TBCL106*004C□LQ6^++	L	10	4	10	0.100	1.00	1.20	8	16	12	0.025	0.050	0.045	0.020	0.500	0.450	0.200
TBCS686*004C□LQ6^++	S	68	4	4	0.680	6.80	8.16	15	30	23	0.040	0.100	0.090	0.040	0.400	0.360	0.160
TBCL335*006C□LQ6^++	L	3.3	6	10	0.050	0.50	0.60	6	12	9	0.025	0.050	0.045	0.020	0.500	0.450	0.200
TBCL475*006C□LQ6^++	L	4.7	6	10	0.071	0.71	0.852	8	16	12	0.025	0.050	0.045	0.020	0.500	0.450	0.200
TBCR156*006C□LQ6^++	R	15	6	6	0.225	2.25	2.70	8	16	12	0.045	0.087	0.078	0.035	0.520	0.468	0.208
TBCR226*006C□LQ6^++	R	22	6	5	0.330	3.30	3.96	8	20	15	0.045	0.095	0.085	0.038	0.474	0.427	0.190
TBCS336*006C□LQ6^++	S	33	6	6	0.495	4.95	5.94	8	16	12	0.040	0.082	0.073	0.033	0.490	0.441	0.196
TBCA476*006C□LQ6^++	A	47	6	4	0.705	7.05	8.46	15	30	23	0.040	0.100	0.090	0.040	0.400	0.360	0.160
TBCS476*006C□LQ6^++	S	47	6	4	0.705	7.05	8.46	8	16	12	0.040	0.100	0.090	0.040	0.400	0.360	0.160
TBCB686*006C□LQ6^++	B	68	6	1	1.020	10.20	12.24	15	30	22.5	0.040	0.200	0.180	0.080	0.200	0.180	0.080
TBCL334*010C□LQ6^00	L	0.33	10	12	0.050	0.500	0.600	6	12	9	0.025	0.046	0.041	0.018	0.552	0.492	0.216
TBCL474*010C□LQ6^00	L	0.47	10	12	0.050	0.500	0.600	6	12	9	0.025	0.046	0.041	0.018	0.552	0.492	0.216
TBCL684*010C□LQ6^00	L	0.68	10	10	0.050	0.500	0.600	6	12	9	0.025	0.050	0.045	0.020	0.500	0.450	0.200
TBCL105*010C□LQ6^00	L	1	10	10	0.050	0.500	0.600	6	12	9	0.025	0.050	0.045	0.020	0.500	0.450	0.200
TBCL225*010C□LQ6^++	L	2.2	10	10	0.055	0.55	0.66	6	12	9	0.025	0.050	0.045	0.020	0.500	0.450	0.200
TBCR685*010C□LQ6^++	R	6.8	10	6	0.170	1.70	2.04	8	16	12	0.045	0.087	0.078	0.035	0.520	0.468	0.208
TBCR106*010C□LQ6^++	R	10	10	6	0.250	2.50	3.00	8	16	12	0.045	0.087	0.078	0.035	0.520	0.468	0.208
TBCB336*010C□LQ6^++	B	33	10	1	0.825	8.25	9.90	15	30	22.5	0.040	0.200	0.180	0.080	0.200	0.180	0.080
TBCB476*010C□LQ6^++	B	47	10	1	1.175	11.75	14.1	15	30	22.5	0.040	0.200	0.180	0.080	0.200	0.180	0.080

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.

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.

HRC6000 DERATING GUIDELINES

Due to our new Q-Process test procedures the need for a typical 50% derating of the capacitors rated voltage in application can be relaxed. Below is a table outlining some of the common applications where these components are utilized along with appropriate derating recommendations. When determining the appropriate capacitor voltage rating to utilize, the application voltage is determined by the maximum D.C. voltage with the addition of any A.C. ripple voltage that may be present.

Recommended Derating	Application
20%	Filtering
0%	Pacing
0%	Hold-Up
0%	Charging