HIGH RELIABILITY TANTALUM

MILITARY | MEDICAL | AEROSPACE

AVX is the leading supplier of high reliability surface mount tantalum capacitors for military, aerospace, and medical applications. As tantalum technology continues to develop, we are able to offer extended ratings in our products by providing more downsizing opportunities, higher capacitance ratings, new case sizes, and low ESR options.

HIGH RELIABILITY TANTALUM
PRODUCT SELECTION GUIDE

SPACE LEVEL

AVX is the leading supplier of high reliability solid tantalum capacitors for space applications. AVX developed the SRC9000 specification to allow users to select ratings in our TAZ, TBJ, TBM and TBC range with testing appropriate for satellite applications. We offer the widest range of ratings and test options in the industry.

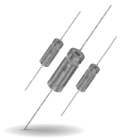
PRODUCT TESTING REFERENCE

TEST	GROUP A TESTING COMPARISON			
	AVX COTS-PLUS	MIL-PRF-55365 QPL		AVX SRC9000 SPACE LEVEL
		MIL WEIBULL B, C, & D	MIL T LEVEL	
100 % Reflow	✓	✓	✓	✓
100% Thermal Shock	✓	✓	✓	✓
100% Weibull	Optional	Mandatory	Mandatory - Grade C min	Mandatory - Grade C min
100% Surge Current	Optional	Optional	Mandatory - C Level	Mandatory - C Level
100% Electrical Testing	Custom Test Limits Available	To Specification Limits Only	+3 Sigma Limits	+3 Sigma Limits or Custom
Visual & Mechanical	Sample	Sample	100% - 20X	100% - 20X
Stimulated Mounting, Rework & Lot Conformance (Sample)	Optional	–	–	✓
Solderability Test* (Sample)	Optional 75% Coverage	Mandatory 95% Coverage	Mandatory 95% Coverage	Mandatory 95% Coverage
100% X-Ray	Optional	–	✓	✓
DPA - 1580 Destructive Physical Analysis	Optional	–	✓	✓
Surge Voltage (Sample)	Optional	–	–	✓
Hot DC Leakage (Sample)	Optional	–	–	✓
Temperature Stability (Sample)	Optional	Mandatory	Mandatory	Mandatory
125°C Life Test 2k Hours	Optional	Sample	✓	Sample

* Only MIL QPL ratings receive the steam age portion of solderability testing unless otherwise specified by the customer
* Medical Grade Group A test procedures, contact AVX

SRW9000 SPACE LEVEL

TWS SERIES

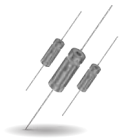


- High Capacitance Values With Additional Mechanical Stability for Increased Vibration Capability
- Enhanced Thermal Shock Testing
- Customized Capacitance and Voltage Packages are Possible

Case: T1-T4
Voltage: Up to 100V
Capacitance: Up to 2,200µF

Style: Hermetically Sealed Axial Leaded

TWC SERIES



- Standard & Extended Range CV
- Capable of Meeting Harsh Shock and Vibration Conditions

Case: T1-T4
Voltage: Contact AVX
Capacitance: Contact AVX

Style: Hermetically Sealed Axial Leaded

SRC9000 SPACE LEVEL

TAZ SRC9000

- Widest Range of Case Sizes
- Most Flexible of Surface Mount Form Factors

Case: 10 Case Sizes **Voltage:** Up to 50V **Capacitance:** Up to 33µF	**Reliability:** Weibull Grading **Style:** Molded SMD

TBJ SRC9000

- Based on EIA/Industrial Standard Sizes
- Enables Commercial Designs/Prototypes to be Upgraded
- Low ESR

Case: 6 Case Sizes **Voltage:** Up to 50V **Capacitance:** Up to 1,500µF	**Reliability:** Weibull Grading **Style:** Molded SMD

TCP SRC9000 MODULE

- These Modules Feature Tacked Assemblies That Offer Ultra-Low ESR
- Customizable Configuration

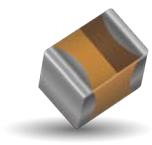
Case: 2H, 4H, & 6H **Voltage:** Up to 50V **Capacitance:** Up to 1,980µF	**Reliability:** Weibull Grading **Style:** Stacked Molded SMD

TBM SRC9000

- Multi-Anode Design Used to Achieve Ultra-Low ESR

Case: 6 Case Sizes **Voltage:** Up to 50V **Capacitance:** Up to 1,500µF	**Reliability:** Weibull Grading **Style:** Molded SMD

TBC SRC9000



- Volumetrically Efficient
- Extremely Low DC Leakage

Case: 10 Case Sizes **Voltage:** Up to 50V **Capacitance:** Up to 33µF	**Reliability:** Weibull Grading **Style:** Microchip SMD

OTHER SPACE LEVEL OFFERINGS

TAJ SERIES

- ESCC Generic Specification 3012 and Associated Detail Specification 3012/001

Case: 5 Case Sizes **Voltage:** Up to 50V **Capacitance:** Up to 220µF	**Reliability:** Weibull Grading **Style:** Leadless SMD

TES SERIES

- QPL ESCC Approved
- Detailed Specification 3012/004
- Improved Reliability Design

Case: 5 Case Sizes **Voltage:** Up to 50V **Capacitance:** Up to 470µF	**Reliability:** Q-Process™ **Style:** Molded SMD

THH SERIES

- Ideal for High Temperature Applications
- Large Case Sizes Highlight High Capacitance Values

Case: 6 Case Sizes **Voltage:** Up to 63V **Capacitance:** Up to 100µF	**Reliability:** Q-Process™ **Style:** Hermetic

MILITARY

AVX offers the broadest range of military surface mount tantalum capacitors in the industry, meeting military specifications for MIL-PRF-55365.

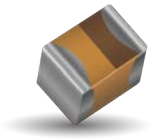
MIL-PRF-55365

CWR09, 19, & 29 SERIES

- Fully Interchangeable with CWR06.
- Also Available in Space Level "T" Spec

Case: A-H **Voltage:** 4V to 50V **Capacitance:** Up to 100µF	**CWR09 (55365/4)** **CWR19 (55365/11):** Extended Range from CWR09 **CWR29 (55365/11):** Low ESR Version of 09 & 19

CWR15 SERIES



- World's Smallest Military Qualified Tantalum Capacitors
- Also Available in Space Level "T" Spec

Case: 0603, 0805, & 1206 **Voltage:** 4V to 20V **Capacitance:** Up to 68µF	**CWR15 (55365/12)**

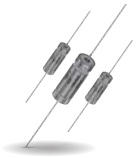
CWR11 SERIES

- Military Version of EIA-535BAAC
- Also Available in Space Level "T" Spec

Case: A, B, C, & D **Voltage:** Up to 50V **Capacitance:** Up to 100µF	**CWR11 (55365/8)**

MIL-PRF-39006, DLA 93026, & DLA 13017

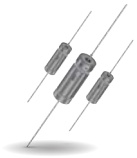
TWA SERIES



- Available with Reliability Level M (1%)

Case: T3-T4 **Voltage:** Up to 75V **Capacitance:** Up to 1,800µF	**M39006/33** **Style:** Hermetically Sealed Axial Leaded

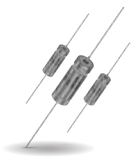
TWS SERIES



- High Capacitance Values with Additional Mechanical Stability for Increased Vibration Capability
- Enhanced Thermal Shock Testing
- Customized Capacitance and Voltage Packages are Possible
- Reverse Voltage Capability

Case: T1-T4 **Voltage:** Up to 100V **Capacitance:** Up to 1,500µF	**DLA 13017** **Style:** Hermetically Sealed Axial Leaded

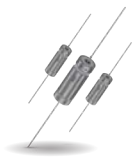
TWC SERIES



- Available with Reliability Levels M (1%), P (0.1%), and R (0.01%)
- Capable of Meeting Harsh Shock and Vibration Conditions

Case: T1-T4 **Voltage:** Up to 100V **Capacitance:** Up to 2,200µF	**M39006/22, /25, /30, & /31** **Style:** Hermetically Sealed Axial Leaded

93026



- New Level of High CV
- Recommend 20% Derating

Case: T1-T4 **Voltage:** Up to 125V **Capacitance:** Up to 2,200µF	**DLA 93026** **Style:** Hermetically Sealed Axial Leaded

TCP SERIES – 09009

- Stacked Assemblies That Offer Ultra-Low ESR

Case: 2H, 4H, & 6H
Voltage: Up to 50V
Capacitance: Up to 1,980µF

Reliability: Weibull Grading
Style: Stacked Molded SMD

TBJ SERIES – 07016 & 95158

- Based on CWR11 Form Factor
- Low ESR Ratings

Case: EIA Standard Sizing
Voltage: Up to 50V
Capacitance: Up to 1,500µF

95156: Original Standard, Limited Ratings
75016: Current Standard, Full Weibull, Extended Range

COTS-PLUS

The AVX COTS-Plus tantalum capacitors offer cost effective solutions based on MIL-PRF-55365 standards. Customer screening options are available from Weibull burn-in to the highest space level testing AVX has to offer, our internal SRC9000 specification.

TAZ SERIES

- Widest Range of Case Sizes
- Most Flexible of Surface Mount Form Factors

Case: A-H Plus R & X
Voltage: Up to 50V
Capacitance: Up to 33µF

Reliability: Weibull Grading
Style: Molded SMD

TBJ SERIES

- Based on EIA Standard Case Sizes
- Enables Commercial Designs/Prototypes to be Upgraded
- Lower ESR

Case: EIA Standard Sizing
Voltage: Up to 50V
Capacitance: Up to 1,500µF

Reliability: Weibull grading
Style: Molded SMD

TCP MODULE SERIES

- Stacked Assemblies that Offer Ultra-Low ESR
- Customizable Configurations

Case: 2H, 4H, & 6H
Voltage: Up to 50V
Capacitance: Up to 1,980µF

Reliability: Weibull Grading
Style: Stacked Molded SMD

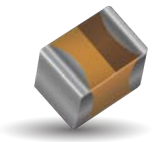
TBM SERIES

- Multi-Anode Design Used to Achieve Ultra-Low ESR

Case: D & E
Voltage: Up to 50V
Capacitance: Up to 1,500µF

Reliability: Weibull Grading
Style: Molded SMD

TBC SERIES



- Volumetrically Efficient
- Extremely Low DC Leakage

Case: 0603, 0805, & 1206
Voltage: Up to 50V
Capacitance: Up to 100µF

Reliability: Weibull Grading
Style: Microchip SMD

TAJ SERIES

- CECC Specification 30801-005 & 30801-011

Case: A, B, C, & D
Voltage: Up to 50V
Capacitance: Up to 33µF

Reliability: Weibull Grading
Style: Molded SMD

COTS-PLUS

WET ELECTROLYTIC TANTALUM

TWA SERIES

- Highest CV
- Traditional MIL-PRF-39006 Case Sizes

Case: 4 Case Sizes **Voltage:** Up to 125V **Capacitance:** Up to 478µF	**Style:** Hermetically Sealed Axial Leaded

TWM SERIES

- Module Connected in Parallel for Extremely High Capacitance
- Constructed of TWA Components

Case: Up to 125V **Capacitance:** Up to 9,000µF	**Style:** Molded Through Hole

TWC SERIES

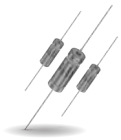
- Standard/Extended Range CV
- Traditional MIL-PRF-39006 Case Sizes
- Capabler of Meeting Harsh Shock and Vibration Conditions

Case: T1-T4 **Voltage:** Up to 125V **Capacitance:** Up to 1,200µF	**Style:** Hermetically Sealed Axial Leaded

HIGH TEMPERATURE

AVX is the world leader in offering high-temperature tantalum solutions (up to 230°C) for the military, aerospace, and medical industries.

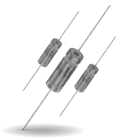
TWA-X SERIES



- Designed for Use at 230°C
- Capable of Up to 500 Hours of Operation at Extreme Temperatures

Case: T4 **Voltage:** Up to 125V **Capacitance:** Up to 400µF	**Style:** Hermetically Sealed Axial Leaded

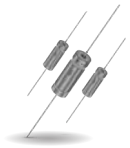
TWA-Y SERIES



- Designed for Operation at 200°C
- Capable of Up to 2000 Hours of Operation at Extreme Temperatures

Case: T1-T4 **Voltage:** Up to 125V **Capacitance:** Up to 3,000µF	**Style:** Hermetically Sealed Axial Leaded

TWC-Y SERIES



- Designed for Operation at 200°C
- Capable of Up to 500 Hours of Operation at Extreme Temperature

Case: T1-T4 **Voltage:** Up to 125V **Capacitance:** Up to 560µF	**Style:** Hermetically Sealed Axial Leaded

MEDICAL

AVX is the leading supplier of tantalum capacitors to the medical device industry. Our capacitors are used in most of the pacemakers, defibrillators, and neuromodulation devices manufactured each year.

Our medical grade capacitors for life support implantable applications are manufactured in the Biddeford Maine facility, which is certified to ISO 13485, and have strict change control procedures to comply with FDA requirements for customer notification and approval of process or raw material changes. Other medical grade tantalum capacitors series offer high reliability and low leakage solutions for other applications within the medical device market. AVX offers two versions of medical grade tantalums: our traditional HRC5000 series uses Weibull grading for batch reliability assessment, and HRC6000 uses the new AVX Q -Process™, which applies an optimized burn in at 125°C and batch conformance test for reliability assurance.

CRITICAL APPLICATIONS DEFINED

Implantable life sustaining devices or Implantable non-life sustaining devices with less than one year life

NON-CRITICAL APPLICATIONS DEFINED

Implantable non-life sustaining devices with more than one year life, or non implantable life sustaining devices, or all other high reliability medical devices

NON-CRITICAL HRC4000

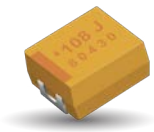
T4Z SERIES

- Short, Consistent Lead Times
- FDA Compliant Design Control
- ISO 13485
- Very Low DC Leakage

Case: Based on CWR09 A-H
Voltage: Up to 50V
Capacitance: Up to 330µF
Reliability: Weibull Grading

Style: Molded SMD

T4J SERIES

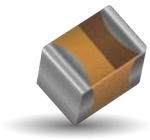


- Based on Standard Commercial Tantalum Products
- FDA Compliant Design Control
- Very Low DC Leakage

Case: EIA Standard Sizing
Voltage: Up to 50V
Capacitance: Up to 1,000µF
Reliability: Q-Process™

Style: Molded SMD

T4C SERIES



- Volumetrically Efficient
- FDA Compliant Design Control
- Extremely Low DC Leakage

Case: 0402, 0603, 0805
Voltage: Max 16V
Capacitance: Max 22µF

Reliability: Q-Process™
Style: Microchip SMD

CRITICAL HRC5000

TAZ SERIES

- Short, Consistent Lead Times
- ISO 13485
- FDA Compliant Design Control
- Very Low DC Leakage

Case: Based on CWR09 A-H
Voltage: Up to 50V
Capacitance: Up to 330µF
Reliability: Weibull Grading

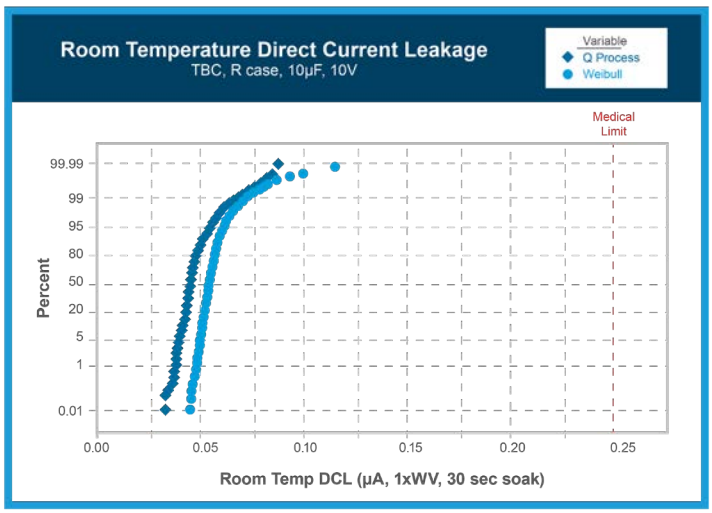
Style: Molded SMD

TCP MODULE SERIES

- Stacked Assemblies that Offer Ultra-Low ESR
- Customizable Configurations

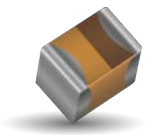
Case: 2H, 4H, & 6H
Voltage: Up to 50V
Capacitance: Up to 1,980µF
Reliability: Weibull Grading

Style: Stacked Molded SMD



CRITICAL HRC6000

TBC SERIES



- Volumetrically Efficient
- FDA Compliant Design Control
- Extremely Low DC Leakage
- ISO 13485

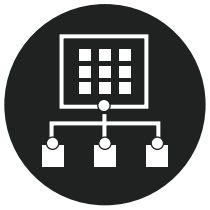
Case: 1206, 1411, 0603, 0805, & 1207
Voltage: Up to 10V
Capacitance: Up to 68µF
Reliability: Q-Process™

Style: Microchip SMD

CUSTOMIZABLE SOLUTIONS

AVX Biddeford has the most extensive test and analysis capability in the tantalum capacitor industry. We support custom solutions for the most demanding applications in medical, military and space applications. We routinely provide real-time X ray, DPA, life test, surge current test, 100% visual inspection and a variety of conformance test options for our customers. Components are regularly screened to statistically derived capability limits as well as customer specified limits to provide improved and consistent parametric performance. We also have a robust design and development process to qualify and deliver product meeting customer specification requirements.

APPLICATION SPECIFIC DEVICES



HIGH RELIABILITY UP-SCREENING

WIDEST TESTING CAPABILITY IN THE INDUSTRY

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