



# HIGH RELIABILITY TANTALUM

MILITARY | MEDICAL | AEROSPACE



### SPACE LEVEL

KYOCERA AVX is the leading supplier of high reliability solid tantalum capacitors for space applications. KYOCERA 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			
	KYOCERA AVX COTS-PLUS	MIL-PRF-55365 QPL		KYOCERA 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 KYOCERA 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 KYOCERA AVX

**Capacitance:** Contact KYOCERA 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 33 $\mu$ F

**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 1,500 $\mu$ F

**Reliability:** Weibull Grading  
**Style:** Molded SMD

### TCP SRC9000 MODULE

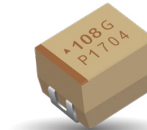


- These Modules Feature Tacked Assemblies That Offer Ultra-Low ESR
- Customizable Configuration

**Case:** 2H, 4H, & 6H  
**Voltage:** Up to 50V  
**Capacitance:** Up to 1,980 $\mu$ F

**Reliability:** Weibull Grading  
**Style:** Stacked Molded SMD

### TBM SRC9000

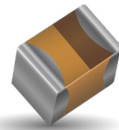


- Multi-Anode Design Used to Achieve Ultra-Low ESR

**Case:** 6 Case Sizes  
**Voltage:** Up to 50V  
**Capacitance:** Up to 1,500 $\mu$ F

**Reliability:** Weibull Grading  
**Style:** Molded SMD

### TBC SRC9000



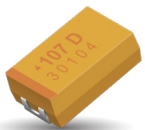
- Volumetrically Efficient
- Extremely Low DC Leakage

**Case:** 10 Case Sizes  
**Voltage:** Up to 50V  
**Capacitance:** Up to 33 $\mu$ F

**Reliability:** Weibull Grading  
**Style:** Microchip SMD

## OTHER SPACE LEVEL OFFERINGS

### TAJ SERIES

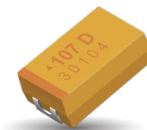


- ESCC Generic Specification 3012 and Associated Detail Specification 3012/001

**Case:** 5 Case Sizes  
**Voltage:** Up to 50V  
**Capacitance:** Up to 220 $\mu$ F

**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 470 $\mu$ F

**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 100 $\mu$ F

**Reliability:** Q-Process™  
**Style:** Hermetic



# MILITARY

KYOCERA 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

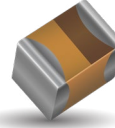


- Fully Interchangeable with CWR06.
- Also Available in Space Level "T" Spec

**Case:** A-H  
**Voltage:** 4V to 50V  
**Capacitance:** Up to 100 $\mu$ F

**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 68 $\mu$ F

**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 100 $\mu$ F

**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 1,800 $\mu$ F

**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 1,500 $\mu$ F

**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 2,200 $\mu$ F

**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 2,200 $\mu$ F

**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 KYOCERA 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 KYOCERA AVX has to offer, our internal SRC9000 specification.



### TAZ SERIES

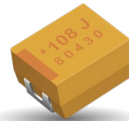


- Widest Range of Case Sizes
- Most Flexible of Surface Mount Form Factors

**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

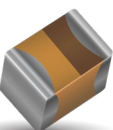


- Multi-Anode Design Used to Achieve Ultra-Low ESR

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

**Reliability:** Weibull Grading  
**Style:** Molded SMD

### TBC SERIES

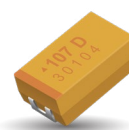


- Volumetrically Efficient
- Extremely Low DC Leakage

**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 478 $\mu$ F

**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 9,000 $\mu$ F

**Style:** Molded Through Hole

### TWC SERIES



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

**Case:** T1-T4  
**Voltage:** Up to 125V  
**Capacitance:** Up to 1,200 $\mu$ F

**Style:** Hermetically Sealed Axial Leaded

## HIGH TEMPERATURE

KYOCERA 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 400 $\mu$ F

**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 3,000 $\mu$ F

**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 560 $\mu$ F

**Style:** Hermetically Sealed Axial Leaded

## MEDICAL

KYOCERA 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. KYOCERA AVX offers two versions of medical grade tantalums: our traditional HRC5000 series uses Weibull grading for batch reliability assessment, and HRC6000 uses the new KYOCERA 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

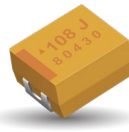


- Short, Consistent Lead Times
- FDA Compliant Design Control
- ISO 13485
- Very Low DC Leakage

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

**Reliability:** Weibull Grading  
**Style:** Molded SMD

## T4J SERIES



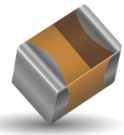
- Based on Standard Commercial Tantalum Products
- FDA Compliant Design Control
- Very Low DC Leakage

**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



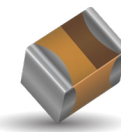
- Stacked Assemblies that Offer Ultra-Low ESR
- Customizable Configurations

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

**Reliability:** Weibull Grading  
**Style:** Stacked Molded SMD

# CRITICAL HRC6000

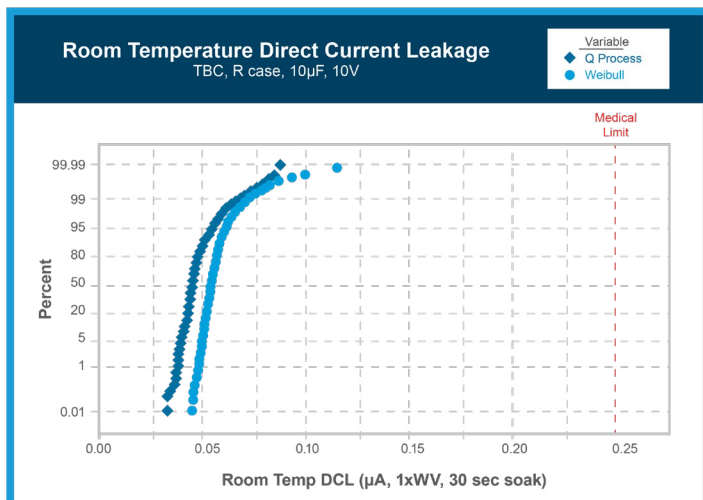
## TBC SERIES



- 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

KYOCERA 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**

## CONTACT US FOR MORE INFORMATION

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