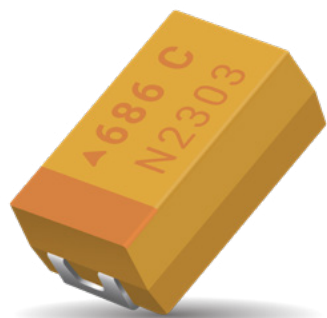


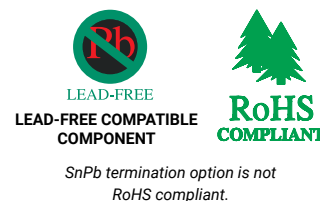
# TRJ Series

## Professional Tantalum Chip Capacitor



### FEATURES

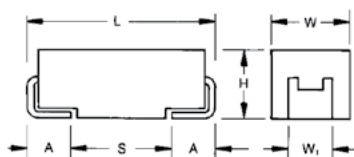
- Improved Reliability – 2x Standard
- DCL Reduced by 25% to 0.0075 CV
- Robust Against Higher Thermo-mechanical Stresses During Assembly Process
- 100% Surge Current Tested
- CV Range: 0.10-680 $\mu$ F / 4-50V
- 6 Case Sizes Available
- 131 Low ESR Parts Released
- Automotive, Industrial and Other Higher End Applications



### APPLICATIONS

- Automotive ECU
- ABS
- Airbag Systems
- Avionics
- Industrial Control Units

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### CASE DIMENSIONS:

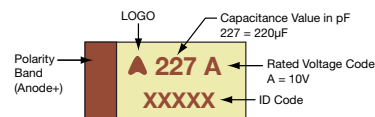
millimeters (inches)

Code	EIA Code	EIA Metric	L $\pm$ 0.20 (0.008)	W $\pm$ 0.20 (0.008) -0.10 (0.004)	H $\pm$ 0.20 (0.008) -0.10 (0.004)	W $\pm$ 0.20 (0.008)	A $\pm$ 0.30 (0.012) -0.20 (0.008)	S Min.
A	1206	3216-18	3.20 (0.126)	1.60 (0.063)	1.60 (0.063)	1.20 (0.047)	0.80 (0.031)	1.10 (0.043)
B	1210	3528-21	3.50 (0.138)	2.80 (0.110)	1.90 (0.075)	2.20 (0.087)	0.80 (0.031)	1.40 (0.055)
C	2312	6032-28	6.00 (0.236)	3.20 (0.126)	2.60 (0.102)	2.20 (0.087)	1.30 (0.051)	2.90 (0.114)
D	2917	7343-31	7.30 (0.287)	4.30 (0.169)	2.90 (0.114)	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)
E	2917	7343-43	7.30 (0.287)	4.30 (0.169)	4.10 (0.162)	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)
U	2924	7361-43	7.30 (0.287)	6.10 (0.240)	4.10 (0.162)	3.10 (0.122)	1.30 (0.051)	4.40 (0.173)

W<sub>1</sub> dimension applies to the termination width for A dimensional area only.

### MARKING

#### A, B, C, D, E, U CASE



### HOW TO ORDER

<b>TRJ</b>	<b>B</b>	<b>105</b>	<b>*</b>	<b>035</b>	<b>R</b>	<b>RJ</b>	<b>-</b>
<b>Type</b>	<b>Case Size</b> See table above	<b>Capacitance Code</b> pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	<b>Tolerance</b> K = $\pm$ 10% M = $\pm$ 20%	<b>Rated DC Voltage</b> 004 = 4V 006 = 6.3V 010 = 10V 016 = 16V 020 = 20V 025 = 25V 035 = 35V 050 = 50V	<b>Packaging</b> R = Pure Tin 7" Reel S = Pure Tin 13" Reel A = Gold Plating 7" Reel B = Gold Plating 13" Reel H = Tin Lead 7" Reel K = Tin Lead 13" Reel H, K = Non RoHS A, B, H, K = Please Contact Manufacturer	<b>Standard Suffix</b> OR <b>0100</b> <b>Low ESR in m<math>\Omega</math></b>	<b>Additional characters may be added for special requirements</b> V = Dry pack Option (selected codes only)

### TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C								
Capacitance Range:	0.10 $\mu$ F to 680 $\mu$ F								
Capacitance Tolerance:	$\pm$ 10%; $\pm$ 20%								
Leakage Current DCL:	0.0075CV or 0.3 $\mu$ A whichever is the greater								
Rated Voltage (V <sub>R</sub> )	$\leq + 85^\circ\text{C}$ :	4	6.3	10	16	20	25	35	50
Category Voltage (V <sub>C</sub> )	$\leq + 125^\circ\text{C}$ :	2.7	4	7	10	13	17	23	33
Surge Voltage (V <sub>S</sub> )	$\leq + 85^\circ\text{C}$ :	5.2	8	13	20	26	32	46	65
Surge Voltage (V <sub>S</sub> )	$\leq + 125^\circ\text{C}$ :	3.4	5	8	13	16	20	28	40
Temperature Range:	-55°C to +125°C								
Reliability:	0.5% per 1000 hours at 85°C, V <sub>R</sub> with 0.1 $\Omega$ /V series impedance, 60% confidence level								
Termination Plating:	Sn Plating (standard), Gold and SnPb Plating upon request								
	Meets requirements of AEC-Q200								

# TRJ Series

## Professional Tantalum Chip Capacitor



### CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage DC (V <sub>R</sub> ) to 85°C							
μF	Code	4V (G)	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
0.10	104							A	
0.15	154							A, A(6000)	
0.22	224							A, A(6000)	A, A(7000)
0.33	334							A, A(6000)	A
0.47	474						A, A(7000)	A, A(4000)	B
0.68	684						A, A(6000)	A, A(6000)	B, B(2000)
1.0	105				A	A, A(3000)	A, A(3000)	A, B A(3000), B(2000)	C, B B(2000)
1.5	155			A		A, A(3000)	A, B, A(3000)	A, B A(2000), B(2500)	C, C(1500)
2.2	225			A	A, A(3500)	A, A(3000)	A, B A(1600), B(1200)	B, B(2000)	C, D C(1000), D(1200)
3.3	335				A, B A(3500)	A, B A(2500), B(1300)	B, B(2000)	B, C, D B(1000), C(800)	C, D C(1000), D(800)
4.7	475			A, A(2000)	A, B A(2000), B(1500)	A, B, A(1800), B(1000)	B, B(1000)	B, C, D B(1500), C(600)	D, D(600)
6.8	685			A, B, A(1800)	A, B, C A(1500), B(1200)	B, C B(1000)	B, C B(1000), C(600)	C, D C(600)	D
10	106		A, B A(1500)	A, B A(1800), B(800)	B, C B(800)	B, C B(1000), C(500)	C, D C(600)	C, D C(600), D(250,400)	E, E(300,400)
15	156	B	A, B A(1500), B(700)	A, B, C A(1000), B(600)	B, B(800)	B, C, D B(500), C(400)	C, D C(500), D(300)	D, D(225)	U
22	226		A, B, C A(900), B(600)	B, B(700)	B, C, D B(600), C(350)	C, D, C(400), D(150,300)	D, D(300)	D, D(200,400)	U
33	336	C	B, C B(600)	B, C, D B(650), C(300)	C, C(300)	C, D C(300), D(250)	D, D(400)	E, E(150,250)	
47	476		B, C B(500), C(250)	C, D C(300)	C, D C(350), D(200)	D, D(200)	D, E D(250), E(150)	U, U(200)	
68	686		C, C(200)	C, C(300)	C, D C(200), D(150)	D, E D(200), E(120,200)	U		
100	107		C, C(300)	C, D, E C(200), D(100,150), E(100)	D, E D(150), E(150)	E, E(150)	U		
150	157		C, D C(300), D(150)	D, E D(150), E(150)	E, E(150)	U, U(250)			
220	227		D, D(150)	D, E, E(150)	U, U(200)				
330	337		D, E, E(150)	E, E(100)	U, U(200)				
470	477		E, E(200)	U, U(200)					
680	687		U, U(250)						

Released ratings, (ESR ratings in mOhms in parentheses)

Note: Voltage ratings are minimum values. KYOCERA AVX reserves the right to supply higher voltage ratings in the same case size, to the same reliability standards.

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### RATINGS & PART NUMBER REFERENCE

Part Number	Case Size	Capacitance (μF)	Rated Voltage (V)	Rated Temperature (°C)	Category Voltage (V)	Category Temperature (°C)	DCL Max. (μA)	DF Max. (%)	ESR Max. @ 100kHz (mΩ)	100kHz RMS Current (mA)			MSL
										25°C	85°C	125°C	
TRJD225*050#1200	D	2.2	50	85	33	125	0.8	4.5	1200	354	318	141	1 <sup>1)</sup>
TRJC335*050#RJ	C	3.3	50	85	33	125	1.2	6	1400	280	252	112	1
TRJC335*050#1000	C	3.3	50	85	33	125	1.2	6	1000	332	298	133	1
TRJD335*050#RJ	D	3.3	50	85	33	125	1.2	4.5	1100	369	332	148	1 <sup>1)</sup>
TRJD335*050#0800	D	3.3	50	85	33	125	1.2	4.5	800	433	390	173	1 <sup>1)</sup>
TRJD475*050#RJ	D	4.7	50	85	33	125	1.8	4.5	900	408	367	163	1 <sup>1)</sup>
TRJD475*050#0600	D	4.7	50	85	33	125	1.8	4.5	600	500	450	200	1 <sup>1)</sup>
TRJD685*050#RJ	D	6.8	50	85	33	125	2.6	4.5	700	463	417	185	1 <sup>1)</sup>
TRJE106*050#RJ	E	10	50	85	33	125	3.8	4.5	700	486	437	194	1 <sup>1)</sup>
TRJE106*050#0300	E	10	50	85	33	125	3.8	4.5	300	742	667	297	1 <sup>1)</sup>
TRJE106*050#0400	E	10	50	85	33	125	3.8	4.5	400	642	578	257	1 <sup>1)</sup>
TRJU156*050RRJV	U	15	50	85	33	125	5.6	30	500	574	517	230	3
TRJU226*050RRJV	U	22	50	85	33	125	8.2	30	500	574	517	230	3

1<sup>1)</sup> Dry pack option (see How to order) is recommended for reduction of stress during soldering. Dry pack parts should be treated as MSL 3.

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.

For typical weight and composition see page 259.

**NOTE: KYOCERA AVX reserves the right to supply higher voltage ratings or tighter tolerance part in the same case size, to the same reliability standards.**

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### QUALIFICATION TABLE

TEST	TRJ professional series (Temperature range -55°C to +125°C)									
	Condition			Characteristics						
<b>Endurance</b>	Apply rated voltage (Ur) at 85°C and / or category voltage (Uc) at 125°C for 2000 hours through a circuit impedance of $\leq 0.1\Omega/V$ . Stabilize at room temperature for 1-2 hours before measuring.			Visual examination	no visible damage					
				DCL	1.25 x initial limit					
				$\Delta C/C$	within $\pm 10\%$ of initial value					
				DF	initial limit					
				ESR	1.25 x initial limit					
<b>Storage Life</b>	Store at 125°C, no voltage applied, for 2000 hours. Stabilize at room temperature for 1-2 hours before measuring.			Visual examination	no visible damage					
				DCL	1.25 x initial limit					
				$\Delta C/C$	within $\pm 10\%$ of initial value					
				DF	initial limit					
				ESR	1.25 x initial limit					
<b>Humidity</b>	Store at 65°C and 95% relative humidity for 500 hours, with no applied voltage. Stabilize at room temperature and humidity for 1-2 hours before measuring.			Visual examination	no visible damage					
				DCL	1.5 x initial limit					
				$\Delta C/C$	within $\pm 10\%$ of initial value					
				DF	1.2 x initial limit					
				ESR	1.25 x initial limit					
<b>Biased Humidity</b>	Apply rated voltage (Ur) at 85°C, 85% relative humidity for 1000 hours. Stabilize at room temperature and humidity for 1-2 hours before measuring.			Visual examination	no visible damage					
				DCL	2 x initial limit					
				$\Delta C/C$	within $\pm 10\%$ of initial value					
				DF	1.2 x initial limit					
				ESR	1.25 x initial limit					
<b>Temperature Stability</b>	Step	Temperature°C	Duration(min)		+20°C	-55°C	+20°C	+85°C	+125°C	+20°C
	1	+20	15	DCL	IL*	n/a	IL*	10 x IL*	12.5 x IL*	IL*
	2	-55	15	$\Delta C/C$	n/a	+0/-10%	$\pm 5\%$	+10/-0%	+12/-0%	$\pm 5\%$
	3	+20	15	DF	IL*	1.5 x IL*	IL*	1.5 x IL*	2 x IL*	IL*
	4	+85	15	ESR	1.25xIL*	2.5xIL*	1.25xIL*	1.25xIL*	1.25xIL*	1.25xIL*
	5	+125	15							
	6	+20	15							
<b>Surge Voltage</b>	Apply 1.3x category voltage (Uc) at 125°C for 1000 cycles of duration 6 min (30 sec charge, 5 min 30 sec discharge) through a charge / discharge resistance of 1000 $\Omega$			Visual examination	no visible damage					
				DCL	initial limit					
				$\Delta C/C$	within $\pm 5\%$ of initial value					
				DF	initial limit					
				ESR	1.25 x initial limit					
<b>Mechanical Shock</b>	MIL-STD-202, Method 213, Condition F			Visual examination	no visible damage					
				DCL	initial limit					
				$\Delta C/C$	within $\pm 5\%$ of initial value					
				DF	initial limit					
				ESR	1.25 x initial limit					
<b>Vibration</b>	MIL-STD-202, Method 204, Condition D			Visual examination	no visible damage					
				DCL	initial limit					
				$\Delta C/C$	within $\pm 5\%$ of initial value					
				DF	initial limit					
				ESR	1.25 x initial limit					

\*Initial Limit



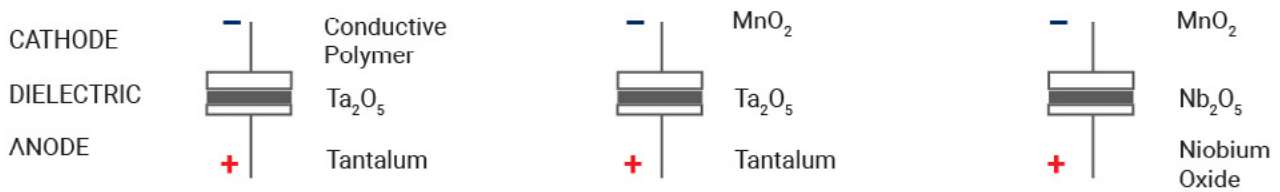
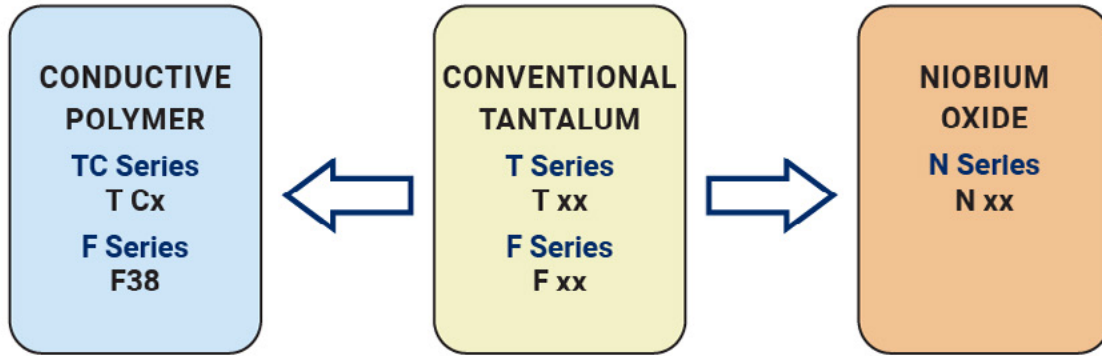
# TRJ Series

## Professional Tantalum Chip Capacitor

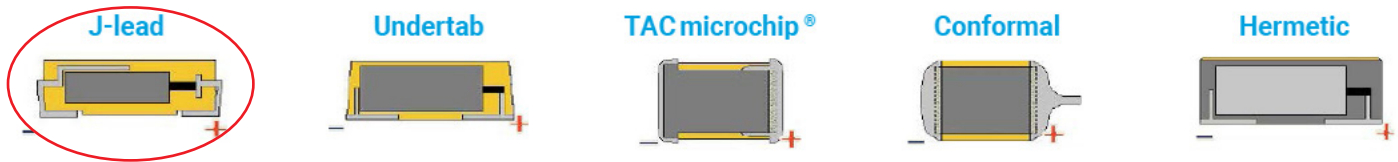
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