

# TCP SERIES - DLA 09009

## Low ESR Tantalum Modules



TCP Series tantalum modules represent high packing density for applications utilizing multiple components in a parallel configuration, and are available with testing to DLA 09009.

These modules feature stacked assemblies of CWR29 capacitors which provide ultra low ESR and utilize established reliability capacitors (Weibull Grade voltage conditioning) in accordance with MIL-PRF-55365. They can also be supplied with SRC9000 Space Level components.

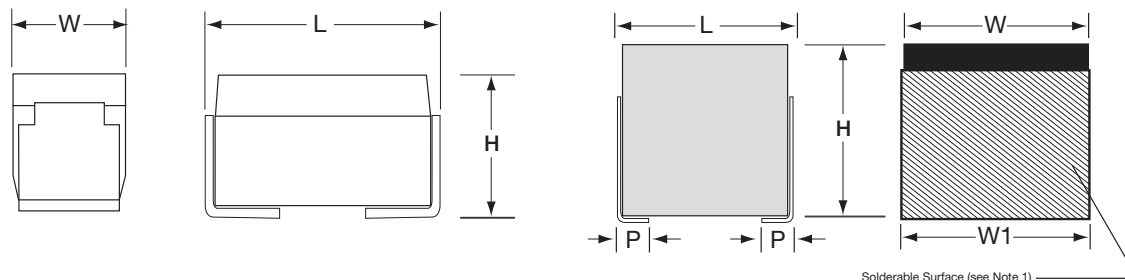
The stacked construction of fully molded capacitors is compatible with a wide range of SMT board assembly processes including reflow solder or conductive epoxy.

There are two termination finishes available: hot solder dipped ("C") and gold plated ("B").

The molding compound has been selected to meet the requirements of UL94V-0 and outgassing requirements of ASTM E-595.

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

### DIMENSIONS: **Note: Additional form factors and ratings are available. Contact plant for details.**



### CASE DIMENSIONS: **millimeters (inches)**

Case Code	Length (L) ±0.38 (0.015)	Width (W) ±0.38 (0.015)	Height (H) ±0.38 (0.015)	Term. Width (W <sub>1</sub> ) ±0.38 (0.015)	Term. Length (P) For Reference Only
2H	7.82 (0.308)	4.06 (0.160)	6.10 (0.240)	4.06 (0.160)	1.52 (0.060)
4H	7.82 (0.308)	8.13 (0.320)	6.10 (0.240)	8.13 (0.320)	1.52 (0.060)
6H	7.82 (0.308)	8.13 (0.320)	9.14 (0.360)	8.13 (0.320)	1.52 (0.060)

Additional form factors and ratings are available – contact plant for details.

### CAPACITANCE AND RATED VOLTAGE CASE SIZE (ESR IN mΩ)

Capacitance		Rated voltage DC (V <sub>R</sub> ) to 85°C						
μF	Code	6V	10V	15V	20V	25V	35V	50V
9.4	945							2H (200)
18.8	196							4H (100)
20	206						2H (200)	
28.2	286							6H (67)
40	406						4H (100)	
60	606						6H (67)	
66	666					2H (85)		
94	946				2H (75)			
132	137					4H (43)		
188	197				4H (38)			
198	207					6H (28)		
200	207			2H (63)				
282	287				6H (25)			
400	407			4H (31)				
440	447		2H (50)					
600	607			6H (21)				
660	667	2H (50)						
880	887		4H (25)					
1,320	138	4H (25)	6H (17)					
1,980	208	6H (17)						

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### HOW TO ORDER

<b>TC</b> Type	<b>2H</b> Case Size	<b>945</b> Capacitance Code pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	<b>*</b> Capacitance Tolerance M = ±20% K = ±10% J = ±5%	<b>050</b> Voltage Code 006 = 6Vdc 010 = 10Vdc 015 = 15Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	<b>L</b> ESR L = Low ESR	<b>□</b> Packaging B = Bulk S = 13" T&R	<b>#</b> Inspection Level S = Std. Conformance L = Group A D = DLA DWG	<b>@</b> Reliability Grade Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf. Z = Non-ER	<b>0</b> Qualification Level 0 = N/A 9 = SRC9000	<b>^</b> Termination Finish 8 = Hot Solder Dipped 9 = Gold Plated  For RoHS compliant products, please select correct termination style.	<b>++</b> Surge Test Option 00 = None 23 = 10 Cycles, +25°C, -55°C & +85°C 24 = 10 Cycles, -55°C & +85°C 45 = 10 cycles, -55°C & +85°C before Weibull
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### DLA DWG P/N:

<b>09009</b> DLA DWG 09009	<b>-01</b> Dash Number See Rating Tables	<b>*</b> Capacitance Tolerance K = ±10% M = ±20%	<b>@</b> Reliability Grade B = B Weibull C = C Weibull D = D Weibull	<b>^</b> Termination Finish B = Gold Plated (10 microinch minimum) C = Hot Solder Dip (60 microinch minimum)  For RoHS compliant products, please select correct termination style.	<b>+</b> Surge Test Option A = 10 cycles, +25°C, -55°C & +85°C B = 10 cycles, -55°C & +85°C before Weibull C = 10 cycles, -55°C & +85°C before Weibull Z = None required Per MIL-PRF-55365
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### SPACE LEVEL SRC9000 P/N\*:

<b>TC</b> Type	<b>2H</b> Case Size	<b>945</b> Capacitance Code pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	<b>*</b> Capacitance Tolerance K = ±10% M = ±20%	<b>050</b> Voltage Code 006 = 6Vdc 010 = 10Vdc 015 = 15Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	<b>L</b> ESR L = Low ESR	<b>□</b> Packaging B = Bulk S = 13" T&R	<b>L</b> Inspection Level L = Group A	<b>C</b> Reliability Grade Weibull: C = 0.01%/1000 hrs. 90% conf.	<b>9</b> Qualification Level 9 = SRC9000	<b>^</b> Termination Finish 8 = Hot Solder Dipped 9 = Gold Plated  For RoHS compliant products, please select correct termination style.	<b>45</b> Surge Test Option 45 = 10 cycles, -55°C & +85°C before Weibull
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\*Contact factory for SRC90000 Space Level details

### TECHNICAL SPECIFICATIONS

Technical Data:	Unless otherwise specified, all technical data relate to an ambient temperature of 25°C								
Capacitance Range:	9.4 µF to 1,980 µF								
Capacitance Tolerance:	±5%; ±10%; ±20%								
Rated Voltage (V <sub>R</sub> )	≤ 85°C:	6	10	15	20	25	35	50	
Category Voltage (V <sub>C</sub> )	≤ 125°C:	4	6.7	10	13.3	16.7	23.3	33.3	
Surge Voltage (V <sub>S</sub> )	≤ 85°C:	8	13.3	20	26.7	33.3	46.7	66.7	
Surge Voltage (V <sub>S</sub> )	≤ 125°C:	5.3	8.7	13.3	17.8	22.2	31.1	44.5	
Temperature Range:	-55°C to +125°C								

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### RATINGS & PART NUMBER REFERENCE

2-STACK				Parametric Specifications by Rating									Typical RMS Ripple Data by Rating					
P/N	DLA P/N	SRC9000 P/N	Case	Cap $\mu$ F	Volt V	ESR @ 100 kHz +25°C m $\Omega$	DC Leakage (max) $\mu$ A			Dissipation Factor (max) %			100kHz Ripple Current Rating			100kHz Ripple Voltage Rating		
							+25°C	+85°C	+125°C	+25°C	+(85/125)°C	-55°C	A	A	A	V	V	V
							+25°C	+85°C	+125°C	+25°C	+(85/125)°C	-55°C	+25°C	+85°C	+125°C	+25°C	+85°C	+125°C
TC2H667*006L□#@0+++	09009-01*@^+	TC2H667*006L□LC9^45	2H	660	6	50	39.6	396	495	10	12	12	2.45	2.20	0.98	0.12	0.11	0.05
TC2H447*010L□#@0+++	09009-02*@^+	TC2H447*010L□LC9^45	2H	440	10	50	44	440	550	10	12	12	2.45	2.20	0.98	0.12	0.11	0.05
TC2H207*015L□#@0+++	09009-03*@^+	TC2H207*015L□LC9^45	2H	200	15	63	30	300	375	10	12	12	2.19	1.97	0.88	0.14	0.12	0.05
TC2H946*020L□#@0+++	09009-04*@^+	TC2H946*020L□LC9^45	2H	94	20	75	18.8	188	235	8	10	10	2.00	1.80	0.80	0.15	0.14	0.06
TC2H666*025L□#@0+++	09009-05*@^+	TC2H666*025L□LC9^45	2H	66	25	85	16.5	165	206	8	10	10	1.88	1.69	0.75	0.16	0.14	0.06
TC2H206*035L□#@0+++	09009-06*@^+	TC2H206*035L□LC9^45	2H	20	35	200	7	70	88	8	10	10	1.22	1.10	0.49	0.24	0.22	0.10
TC2H945*050L□#@0+++	09009-07*@^+	TC2H945*050L□LC9^45	2H	9.4	50	200	4.7	47	59	6	8	8	1.22	1.10	0.49	0.24	0.22	0.10

4-STACK				Parametric Specifications by Rating									Typical RMS Ripple Data by Rating					
P/N	DLA P/N	SRC9000 P/N	Case	Cap $\mu$ F	Volt V	ESR @ 100 kHz +25°C m $\Omega$	DC Leakage (max) $\mu$ A			Dissipation Factor (max) %			100kHz Ripple Current Rating			100kHz Ripple Voltage Rating		
							+25°C	+85°C	+125°C	+25°C	+(85/125)°C	-55°C	A	A	A	V	V	V
							+25°C	+85°C	+125°C	+25°C	+(85/125)°C	-55°C	+25°C	+85°C	+125°C	+25°C	+85°C	+125°C
TC4H138*006L□#@0+++	09009-08*@^+	TC4H138*006L□LC9^45	4H	1320	6	25	79.2	792	990	10	12	12	4.90	4.41	1.96	0.12	0.11	0.05
TC4H887*010L□#@0+++	09009-09*@^+	TC4H887*010L□LC9^45	4H	880	10	25	88	880	1100	10	12	12	4.90	4.41	1.96	0.12	0.11	0.05
TC4H407*015L□#@0+++	09009-10*@^+	TC4H407*015L□LC9^45	4H	400	15	31	60	600	750	10	12	12	4.38	3.94	1.75	0.14	0.12	0.05
TC4H197*020L□#@0+++	09009-11*@^+	TC4H197*020L□LC9^45	4H	188	20	38	37.6	376	470	8	10	10	4.00	3.60	1.60	0.15	0.14	0.06
TC4H137*025L□#@0+++	09009-12*@^+	TC4H137*025L□LC9^45	4H	132	25	43	33	330	413	8	10	10	3.74	3.36	1.49	0.16	0.14	0.06
TC4H406*035L□#@0+++	09009-13*@^+	TC4H406*035L□LC9^45	4H	40	35	100	14	140	175	8	10	10	2.45	2.20	0.98	0.24	0.22	0.10
TC4H196*050L□#@0+++	09009-14*@^+	TC4H196*050L□LC9^45	4H	18.8	50	100	9.4	94	118	6	8	8	2.45	2.20	0.98	0.24	0.22	0.10

6-STACK				Parametric Specifications by Rating									Typical RMS Ripple Data by Rating					
P/N	DLA P/N	SRC9000 P/N	Case	Cap $\mu$ F	Volt V	ESR @ 100 kHz +25°C m $\Omega$	DC Leakage (max) $\mu$ A			Dissipation Factor (max) %			100kHz Ripple Current Rating			100kHz Ripple Voltage Rating		
							+25°C	+85°C	+125°C	+25°C	+(85/125)°C	-55°C	A	A	A	V	V	V
							+25°C	+85°C	+125°C	+25°C	+(85/125)°C	-55°C	+25°C	+85°C	+125°C	+25°C	+85°C	+125°C
TC6H208*006L□#@0+++	09009-15*@^+	TC6H208*006L□LC9^45	6H	1980	6	17	118.8	1188	1485	10	12	12	7.35	6.61	2.94	0.12	0.11	0.05
TC6H138*010L□#@0+++	09009-16*@^+	TC6H138*010L□LC9^45	6H	1320	10	17	132	1320	1650	10	12	12	7.35	6.61	2.94	0.12	0.11	0.05
TC6H607*015L□#@0+++	09009-17*@^+	TC6H607*015L□LC9^45	6H	600	15	21	90	900	1125	10	12	12	6.57	5.92	2.63	0.14	0.12	0.05
TC6H287*020L□#@0+++	09009-18*@^+	TC6H287*020L□LC9^45	6H	282	20	25	56.4	564	705	8	10	10	6.00	5.40	2.40	0.15	0.14	0.06
TC6H207*025L□#@0+++	09009-19*@^+	TC6H207*025L□LC9^45	6H	198	25	28	49.5	495	619	8	10	10	5.67	5.10	2.27	0.16	0.14	0.06
TC6H606*035L□#@0+++	09009-20*@^+	TC6H606*035L□LC9^45	6H	60	35	67	21	210	263	8	10	10	3.67	3.31	1.47	0.24	0.22	0.10
TC6H286*050L□#@0+++	09009-21*@^+	TC6H286*050L□LC9^45	6H	28.2	50	67	14.1	141	176	6	8	8	3.67	3.31	1.47	0.24	0.22	0.10

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