

# Type T491 Solid Tantalum Chip Capacitors

## Solid Tantalum Chip Capacitors for Surface Mount Applications



The T491 Series' physical outline and dimensions conform to the global standard for tantalum capacitor chips, and the T491 exceeds the requirements of EIA standard 535BAAC. T491 chips are specifically for automated surface mount processes and equipment. The terminations are 100% Matte-Tin. Reliability and thermal stability are assured by lead-frame attachments to the tantalum pellet made by micro-processor-controlled welding and a high temperature silver epoxy adhesive. Standard packaging is compatible with all tape-fed placement units and with EIA RS-481-1 tape and reel specification.

### Highlights

- ◆ Low DF and DC Leakage
- ◆ Temperature Stable
- ◆ 260 °C for 10 Seconds Soldering
- ◆ Meets IECQ Standard QC300801/US0001
- ◆ Meets EIA Standard 535BAAC

### Specifications

**Capacitance Range:** 0.10  $\mu$ F to 330  $\mu$ F

**Voltage Range:** 4 Vdc to 50 VDC

**Tolerance:**  $\pm$ 10% standard,  $\pm$ 20% available

**Operating Temperature:** -55 °C to +125 °C (with proper derating)

**Cap Change From Initial Limit:** -10% @ -55 °C; +10% @ +85 °C; +12% @ +125 °C

**DC Leakage:** At 25 °C — See Ratings  
At 85 °C — 10 x 25 °C limit  
At 125 °C — 12 x 25 °C limit

**Dissipation Factor:** 0.1  $\mu$ F to 1.0  $\mu$ F — 4%  
1.5  $\mu$ F to 68  $\mu$ F — 6%  
100  $\mu$ F to 330  $\mu$ F — 8%

**Standard Packaging Tape and Reel:** EIA RS-481-1

Case Code	EIA IECQ	Qty per 7" Reel	Tape	
			Width	Pitch
S	3216L	2,500	8mm	4mm
T	3528L	2,500	8mm	4mm
A	3216	2,000	8mm	4mm
B	3528	2,000	8mm	4mm
C	6032	500	12mm	8mm
D	7343	500	12mm	8mm
X	7343H	500	12mm	8mm

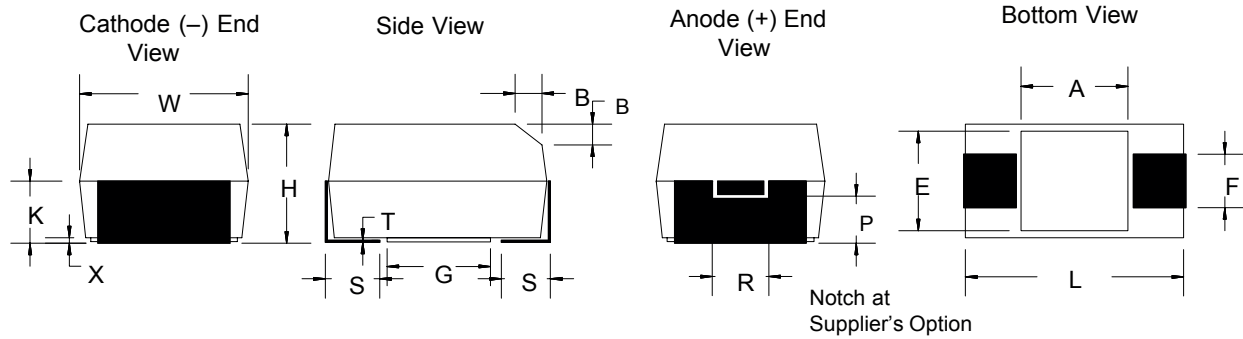
13" Reels Available on Special Order



Complies with the EU Directive 2002/95/EC requirement restricting the use of Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent chromium (Cr(VI)), PolyBrominated Biphenyls (PBB) and PolyBrominated Diphenyl Ethers (PBDE).

# Type T491 Solid Tantalum Chip Capacitors

## Capacitor Outline Drawing



## Dimensions ————— Millimeters (Inches)

	EIA/ CDE IECQ	L	W	H	K	F	S	B (Ref)	X (Ref)	P (Ref)	R (Ref)	T (Ref)	A (Min)	G (Ref)	E (Ref)
A	3216-18	3.2 ± 0.2 (.126 ± .008)	1.6 ± 0.2 (.063 ± .008)	1.6 ± 0.2 (.063 ± .008)	0.9 ± 0.2 (.035 ± .008)	1.2 ± 0.1 (.047 ± .004)	0.8 ± 0.3 (.031 ± .012)	0.4 ± 0.15 (.016 ± .006)	0.10 ± 0.10 (.004 ± .004)	0.4 (0.016)	0.4 (0.016)	0.13 (0.005)	0.8 (0.031)	1.1 (0.043)	1.3 (0.051)
B	3528-21	3.5 ± 0.2 (.138 ± .008)	2.8 ± 0.2 (.110 ± .008)	1.9 ± 0.2 (.075 ± .008)	1.1 ± 0.2 (.043 ± .008)	2.2 ± 0.1 (.087 ± .004)	0.8 ± 0.3 (.031 ± .012)	0.4 ± 0.15 (.016 ± .006)	0.10 ± 0.10 (.004 ± .004)	0.5 (0.02)	1 (0.039)	0.13 (0.005)	1.1 (0.043)	1.8 (0.071)	2.2 (0.087)
C	6032-28	6.0 ± 0.3 (.236 ± .012)	3.2 ± 0.3 (.126 ± .012)	2.5 ± 0.3 (.098 ± .012)	1.4 ± 0.2 (.055 ± .008)	2.2 ± 0.1 (.087 ± .004)	1.3 ± 0.3 (.051 ± .012)	0.5 ± 0.15 (.020 ± .006)	0.10 ± 0.10 (.004 ± .004)	0.9 (0.035)	1 (0.039)	0.13 (0.005)	2.5 (0.098)	2.8 (0.11)	2.9 (0.114)
D	7343-31	7.3 ± 0.3 (.287 ± .012)	4.3 ± 0.3 (.169 ± .012)	2.8 ± 0.3 (.110 ± .012)	1.5 ± 0.2 (.059 ± .008)	2.4 ± 0.1 (.094 ± .004)	1.3 ± 0.3 (.051 ± .012)	0.5 ± 0.15 (.020 ± .006)	0.10 ± 0.10 (.004 ± .004)	0.9 (0.035)	1 (0.039)	0.13 (0.005)	3.8 (0.15)	3.5 (0.138)	3.5 (0.138)
X	7343-43	7.3 ± 0.3 (.287 ± .012)	4.3 ± 0.3 (.169 ± .012)	4.0 ± 0.3 (.157 ± .012)	2.3 ± 0.2 (.091 ± .008)	2.4 ± 0.1 (.094 ± .004)	1.3 ± 0.3 (.051 ± .012)	0.5 ± 0.15 (.020 ± .006)	0.10 ± 0.10 (.004 ± .004)	1.7 (0.067)	1 (0.039)	0.13 (0.005)	3.8 (0.15)	3.5** (0.138)	3.5** (0.138)

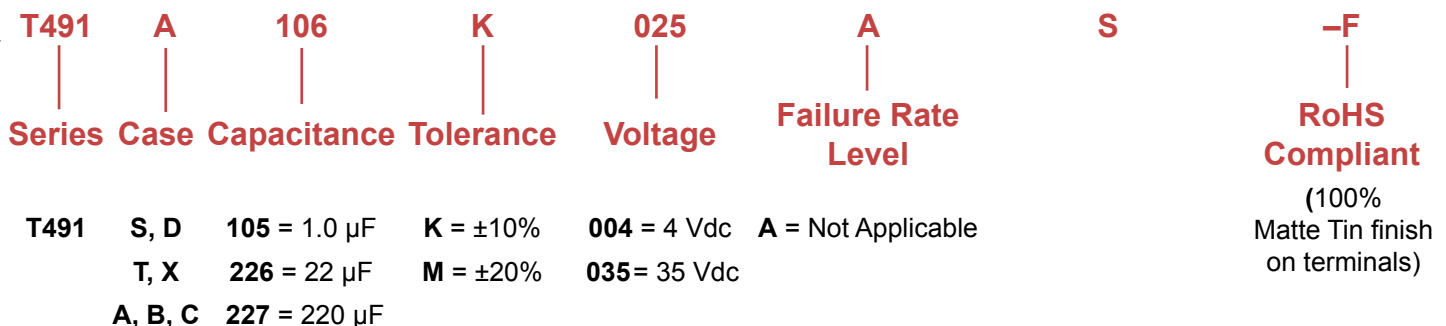
- Notes: 1 Metric dimensions govern  
 2 (Ref) - Dimensions provided for reference only  
 \*\* Round Glue Pad 2.9 ± 0.1mm (.114 ± .004) in diameter at Supplier's option

## Low Profile Capacitor Dimensions ————— Millimeters (Inches)

	EIA/ CDE IECQ	L	W	H Max.	K Min.	F	S	B (Ref)	X (Ref)	P (Ref)	R (Ref)	T (Ref)	A (Min)	G (Ref)	E (Ref)
S	3216-12	3.2 ± 0.2 (.126 ± .008)	1.6 ± 0.2 (.063 ± .008)	1.2 (0.047)	0.3 (0.012)	1.2 ± 0.1 (.047 ± .004)	0.8 ± 0.3 (.031 ± .012)	Note 3	0.05 (0.002)	Note 3	Note 3	0.13 (0.005)	0.8 (0.031)	1.1 (0.043)	1.3 (0.051)
T	3528-12	3.5 ± 0.2 (.138 ± .008)	2.8 ± 0.2 (.110 ± .008)	1.2 (0.047)	0.3 (0.012)	2.2 ± 0.1 (.087 ± .004)	0.8 ± 0.3 (.031 ± .012)	Note 3	0.05 (0.002)	Note 3	Note 3	0.13 (0.005)	1.1 (0.043)	1.8 (0.071)	2.2 (0.087)

- Notes: 1 Metric dimensions govern  
 2 (Ref) - Dimensions provided for reference only  
 3 No dimensions provided for B, P or R because low profile cases do not have a bevel or notch

## Part Numbering System



# Type T491 Solid Tantalum Chip Capacitors

## Ratings

Cap ( $\mu$ F)	Case Code		Catalog Part Number	Max. DC Leakage $\mu$ A @ 25 °C	Max. DF % @ 25 °C 120 Hz	Cap ( $\mu$ F)	Case Code		Catalog Part Number	Max. DC Leakage $\mu$ A @ 25 °C	Max. DF % @ 25 °C 120 Hz
	CDE	EIA IECQ					CDE	EIA IECQ			
<b>4 WVdc @ +85 °C (2.7 WVdc @ 125 °C)</b>						<b>16 WVdc @ +85 °C (10 WVdc @ 125 °C)</b>					
15	T	3528L	T491T156K004AS-F	0.6	6	1.0	A	3216	T491A105K016AS-F	0.5	4
33	B	3528	T491B336K004AS-F	1.3	6	2.2	A	3216	T491A225K016AS-F	0.5	6
68	C	6032	T491C686K004AS-F	2.7	6	2.2	S	3216L	T491S225K016AS-F	0.5	6
100	C	6032	T491C107K004AS-F	4	8	3.3	A	3216	T491A335K016AS-F	0.5	6
100	D	7343	T491D107K004AS-F	4	8	3.3	B	3528	T491B335K016AS-F	0.5	6
150	D	7343	T491D157K004AS-F	6	8	4.7	A	3216	T491A475K016AS-F	0.8	6
<b>6 WVdc @ +85 °C (4 WVdc @ 125 °C)</b>						<b>20 WVdc @ +85 °C (13 WVdc @ 125 °C)</b>					
4.7	A	3216	T491A475K006AS-F	0.5	6	4.7	B	3528	T491B475K016AS-F	0.8	6
4.7	S	3216L	T491S475K006AS-F	0.5	6	4.7	T	3528L	T491T475K016AS-F	0.8	6
6.8	A	3216	T491A685K006AS-F	0.5	6	6.8	B	3528	T491B685K016AS-F	1.1	6
6.8	B	3528	T491B685K006AS-F	0.5	6	6.8	C	6032	T491C685K016AS-F	1.1	6
10	A	3216	T491A106K006AS-F	0.6	6	10	B	3528	T491B106K016AS-F	1.6	6
10	B	3528	T491B106K006AS-F	0.6	6	10	C	6032	T491C106K016AS-F	1.6	6
10	T	3528L	T491T106K006AS-F	0.6	6	15	C	6032	T491C156K016AS-F	2.4	6
22	B	3528	T491B226K006AS-F	1.4	6	22	C	6032	T491C226K016AS-F	3.6	6
22	C	6032	T491C226K006AS-F	1.4	6	22	D	7343	T491D226K016AS-F	3.6	6
33	C	6032	T491C336K006AS-F	2	6	33	C	6032	T491C336K016AS-F	5.3	6
47	C	6032	T491C476K006AS-F	2.9	6	33	D	7343	T491D336K016AS-F	5.3	6
47	D	7343	T491D476K006AS-F	2.9	6	47	D	7343	T491D476K016AS-F	7.5	6
68	C	6032	T491C686K006AS-F	4.1	6	68	D	7343	T491D686K016AS-F	10.9	6
100	D	7343	T491D107K006AS-F	6	8	100	X	7343H	T491X107K016AS-F	16	8
150	D	7343	T491D157K006AS-F	9	8	150	X	7343H	T491X157K016AS-F	24	8
220	X	7343H	T491X227K006AS-F	13.2	8	<b>10 WVdc @ +85 °C (7 WVdc @ 125 °C)</b>					
220	D	7343	T491D227K006AS-F	13.2	8	2.2	A	3216	T491A225K010AS-F	0.5	6
330	X	7343H	T491X337K006AS-F	19.8	8	3.3	A	3216	T491A335K010AS-F	0.5	6
<b>10 WVdc @ +85 °C (7 WVdc @ 125 °C)</b>						3.3	S	3216L	T491S335K010AS-F	0.5	6
2.2	A	3216	T491A225K010AS-F	0.5	6	4.7	A	3216	T491A475K010AS-F	0.5	6
3.3	A	3216	T491A335K010AS-F	0.5	6	4.7	B	3528	T491B475K010AS-F	0.5	6
3.3	S	3216L	T491S335K010AS-F	0.5	6	4.7	B	3528	T491B475K010AS-F	0.5	6
4.7	A	3216	T491A475K010AS-F	0.5	6	6.8	A	3216	T491A685K010AS-F	0.7	6
4.7	B	3528	T491B475K010AS-F	0.5	6	6.8	B	3528	T491B685K010AS-F	0.7	6
6.8	A	3216	T491A685K010AS-F	0.7	6	6.8	T	3528L	T491T685K010AS-F	0.7	6
6.8	B	3528	T491B685K010AS-F	0.7	6	10	B	3528	T491B106K010AS-F	1	6
6.8	T	3528L	T491T685K010AS-F	0.7	6	10	C	6032	T491C106K010AS-F	1	6
10	B	3528	T491B106K010AS-F	1	6	15	B	3528	T491B156K010AS-F	1.5	6
10	C	6032	T491C106K010AS-F	1	6	22	C	6032	T491C226K010AS-F	2.2	6
15	B	3528	T491B156K010AS-F	1.5	6	33	C	6032	T491C336K010AS-F	3.3	6
22	C	6032	T491C226K010AS-F	2.2	6	47	C	6032	T491C476K010AS-F	4.7	6
33	C	6032	T491C336K010AS-F	3.3	6	47	D	7343	T491D476K010AS-F	4.7	6
47	C	6032	T491C476K010AS-F	4.7	6	68	D	7343	T491D686K010AS-F	6.8	6
47	D	7343	T491D476K010AS-F	4.7	6	100	D	7343	T491D107K010AS-F	10	8
68	D	7343	T491D686K010AS-F	6.8	6	150	X	7343H	T491X157K010AS-F	15	8
100	D	7343	T491D107K010AS-F	10	8	220	X	7343H	T491X227K010AS-F	22	8
150	X	7343H	T491X157K010AS-F	15	8						
220	X	7343H	T491X227K010AS-F	22	8						

**Note:** CDE reserves the right to offer higher rated voltage substitutes within the same case size. The marking will indicate the higher voltage.

# Type T491 Solid Tantalum Chip Capacitors

Cap ( $\mu$ F)	Case Code		Catalog Part Number	Max. DC Leakage $\mu$ A @ 25 °C	Max. DF % @ 25 °C 120 Hz
	CDE	EIA IECQ			
<b>25 WVdc @ +85 °C (17 WVdc @ 125 °C)</b>					
0.47	A	3216	T491A474K025AS-F	0.5	4
0.68	A	3216	T491A684K025AS-F	0.5	4
1.0	A	3216	T491A105K025AS-F	0.5	4
1.0	B	3528	T491B105K025AS-F	0.5	4
1.5	B	3528	T491B155K025AS-F	0.5	6
2.2	B	3528	T491B225K025AS-F	0.6	6
2.2	C	6032	T491C225K025AS-F	0.6	6
3.3	C	6032	T491C335K025AS-F	0.9	6
4.7	C	6032	T491C475K025AS-F	1.2	6
6.8	C	6032	T491C685K025AS-F	1.7	6
10	C	6032	T491C106K025AS-F	2.5	6
10	D	7343	T491D106K025AS-F	2.5	6
15	D	7343	T491D156K025AS-F	3.8	6
22	D	7343	T491D226K025AS-F	5.5	6
33	X	7343H	T491X336K025AS-F	8.3	6
<b>35 WVdc @ +85 °C (23 WVdc @ 125 °C)</b>					
0.10	A	3216	T491A104K035AS-F	0.5	4
0.15	A	3216	T491A154K035AS-F	0.5	4
0.22	A	3216	T491A224K035AS-F	0.5	4
0.33	A	3216	T491A334K035AS-F	0.5	4
0.47	A	3216	T491A474K035AS-F	0.5	4
0.47	B	3528	T491B474K035AS-F	0.5	4
0.68	B	3528	T491B684K035AS-F	0.5	4
1.0	B	3528	T491B105K035AS-F	0.5	4
1.5	C	6032	T491C155K035AS-F	0.5	6
2.2	C	6032	T491C225K035AS-F	0.8	6
3.3	C	6032	T491C335K035AS-F	1.2	6
4.7	C	6032	T491C475K035AS-F	1.7	6
4.7	D	7343	T491D475K035AS-F	1.7	6
6.8	D	7343	T491D685K035AS-F	2.4	6
10	D	7343	T491D106K035AS-F	3.5	6
15	X	7343H	T491X156K035AS-F	5.3	6
22	X	7343H	T491X226K035AS-F	7.7	6

Cap ( $\mu$ F)	Case Code		Catalog Part Number	Max. DC Leakage $\mu$ A @ 25 °C	Max. DF % @ 25 °C 120 Hz
	CDE	EIA IECQ			
<b>50 WVdc @ +85 °C (33 WVdc @ 125 °C)</b>					
0.10	A	3216	T491A104K050AS-F	0.5	4
0.15	A	3216	T491A154K050AS-F	0.5	4
0.15	B	3528	T491B154K050AS-F	0.5	4
0.22	B	3528	T491B224K050AS-F	0.5	4
0.33	B	3528	T491B334K050AS-F	0.5	4
0.47	B	3528	T491B474K050AS-F	0.5	4
0.47	C	6032	T491C474K050AS-F	0.5	4
0.68	C	6032	T491C684K050AS-F	0.5	4
1.0	C	6032	T491C105K050AS-F	0.5	4
1.5	C	6032	T491C155K050AS-F	0.5	6
1.5	D	7343	T491D155K050AS-F	0.8	6
2.2	D	7343	T491D225K050AS-F	1.1	6
3.3	D	7343	T491D335K050AS-F	1.7	6
4.7	D	7343	T491D475K050AS-F	2.4	6
6.8	X	7343H	T491X685K050AS-F	3.5	6

**Note:** CDE reserves the right to offer higher rated voltage substitutes within the same case size. The marking will indicate the higher voltage.

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