

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 μ F to 330 μ 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 μ F to 1.0 μ F — 4%
1.5 μ F to 68 μ F — 6%
100 μ F to 330 μ 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 |

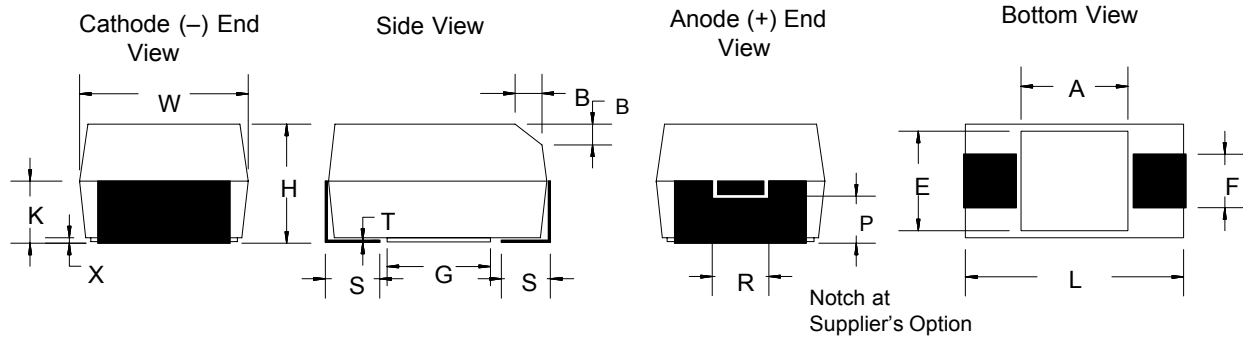
13" Reels Available on Special Order



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) |

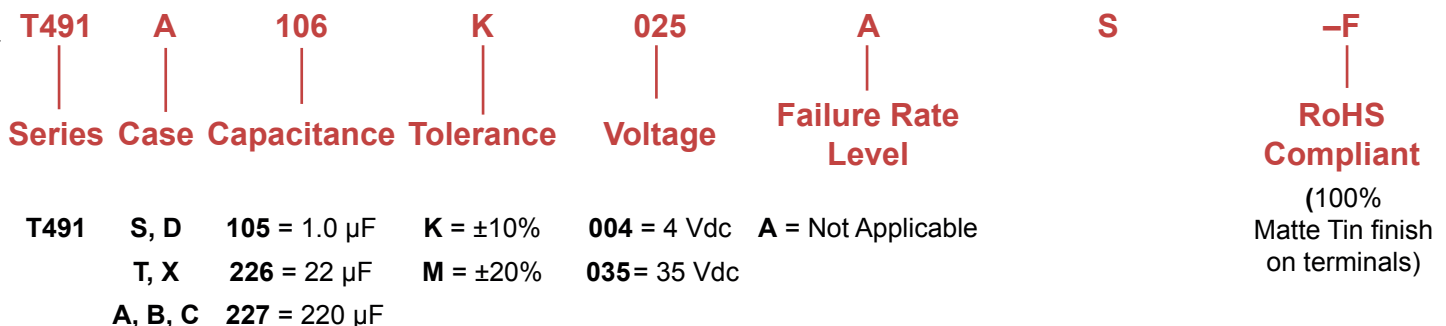
- Notes: 1 Metric dimensions govern
 2 (Ref) - Dimensions provided for reference only
 ** Round Glue Pad 2.9 ± 0.1mm (.114 ± .004) in diameter at Supplier's option

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 (μ F) | Case Code | | Catalog Part Number | Max. DC Leakage μ A @ 25 °C | Max. DF % @ 25 °C 120 Hz | Cap (μ F) | Case Code | | Catalog Part Number | Max. DC Leakage μ A @ 25 °C | Max. DF % @ 25 °C 120 Hz |
|--------------------------------------------|-----------|-------------|------------------------|---------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|------------------------|---------------------------------------|--------------------------------|
| | CDE | EIA IECQ | | | | | CDE | EIA IECQ | | | |
| 4 WVdc @ +85 °C (2.7 WVdc @ 125 °C) | | | | | | 16 WVdc @ +85 °C (10 WVdc @ 125 °C) | | | | | |
| 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 |
| 6 WVdc @ +85 °C (4 WVdc @ 125 °C) | | | | | | 16 WVdc @ +85 °C (10 WVdc @ 125 °C) | | | | | |
| 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 | 20 WVdc @ +85 °C (13 WVdc @ 125 °C) | | | | | |
| 220 | D | 7343 | T491D227K006AS-F | 13.2 | 8 | 1.0 | A | 3216 | T491A105K020AS-F | 0.5 | 4 |
| 330 | X | 7343H | T491X337K006AS-F | 19.8 | 8 | 1.5 | A | 3216 | T491A155K020AS-F | 0.5 | 6 |
| 10 WVdc @ +85 °C (7 WVdc @ 125 °C) | | | | | | 1.5 | S | 3216L | T491S155K020AS-F | 0.5 | 6 |
| 2.2 | A | 3216 | T491A225K010AS-F | 0.5 | 6 | 2.2 | A | 3216 | T491A225K020AS-F | 0.5 | 6 |
| 3.3 | A | 3216 | T491A335K010AS-F | 0.5 | 6 | 2.2 | B | 3528 | T491B225K020AS-F | 0.5 | 6 |
| 3.3 | S | 3216L | T491S335K010AS-F | 0.5 | 6 | 3.3 | A | 3216 | T491A335K020AS-F | 0.7 | 6 |
| 4.7 | A | 3216 | T491A475K010AS-F | 0.5 | 6 | 3.3 | B | 3528 | T491B335K020AS-F | 0.7 | 6 |
| 4.7 | B | 3528 | T491B475K010AS-F | 0.5 | 6 | 3.3 | T | 3528L | T491T335K020AS-F | 0.7 | 6 |
| 6.8 | A | 3216 | T491A685K010AS-F | 0.7 | 6 | 4.7 | B | 3528 | T491B475K020AS-F | 1 | 6 |
| 6.8 | B | 3528 | T491B685K010AS-F | 0.7 | 6 | 4.7 | C | 6032 | T491C475K020AS-F | 1 | 6 |
| 6.8 | T | 3528L | T491T685K010AS-F | 0.7 | 6 | 6.8 | B | 3528 | T491B685K020AS-F | 1.4 | 6 |
| 10 | B | 3528 | T491B106K010AS-F | 1 | 6 | 6.8 | C | 6032 | T491C685K020AS-F | 1.4 | 6 |
| 10 | C | 6032 | T491C106K010AS-F | 1 | 6 | 10 | C | 6032 | T491C106K020AS-F | 2 | 6 |
| 15 | B | 3528 | T491B156K010AS-F | 1.5 | 6 | 15 | C | 6032 | T491C156K020AS-F | 3 | 6 |
| 22 | C | 6032 | T491C226K010AS-F | 2.2 | 6 | 15 | D | 7343 | T491D156K020AS-F | 3 | 6 |
| 33 | C | 6032 | T491C336K010AS-F | 3.3 | 6 | 22 | C | 6032 | T491C226K020AS-F | 4.4 | 6 |
| 47 | C | 6032 | T491C476K010AS-F | 4.7 | 6 | 22 | D | 7343 | T491D226K020AS-F | 4.4 | 6 |
| 47 | D | 7343 | T491D476K010AS-F | 4.7 | 6 | 33 | D | 7343 | T491D336K020AS-F | 6.6 | 6 |
| 68 | D | 7343 | T491D686K010AS-F | 6.8 | 6 | 47 | D | 7343 | T491D476K020AS-F | 9.4 | 6 |
| 100 | D | 7343 | T491D107K010AS-F | 10 | 8 | 68 | X | 7343H | T491X686K020AS-F | 13.6 | 6 |
| 150 | X | 7343H | T491X157K010AS-F | 15 | 8 | 100 | X | 7343H | T491X107K020AS-F | 20 | 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 (μ F) | Case Code | | Catalog Part Number | Max. DC Leakage μ A @ 25 °C | Max. DF % @ 25 °C 120 Hz |
|--------------------------------------------|-----------|-------------|------------------------|---------------------------------------|--------------------------------|
| | CDE | EIA IECQ | | | |
| 25 WVdc @ +85 °C (17 WVdc @ 125 °C) | | | | | |
| 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 |
| 35 WVdc @ +85 °C (23 WVdc @ 125 °C) | | | | | |
| 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 (μ F) | Case Code | | Catalog Part Number | Max. DC Leakage μ A @ 25 °C | Max. DF % @ 25 °C 120 Hz |
|--------------------------------------------|-----------|-------------|------------------------|---------------------------------------|--------------------------------|
| | CDE | EIA IECQ | | | |
| 50 WVdc @ +85 °C (33 WVdc @ 125 °C) | | | | | |
| 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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