

# THJ Series



## High Temperature Tantalum Chip Capacitor



- Improved reliability – 2x standard
- 175°C @ 0.5V<sub>R</sub> continuous operation
- CV range: 0.10-220μF / 6.3-50V
- 5 case sizes available
- Low ESR options on approval
- High temperature automotive and industry applications



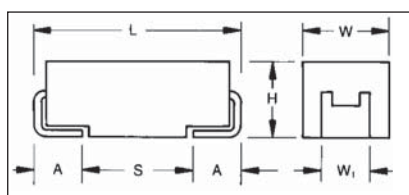
LEAD-FREE  
LEAD-FREE COMPATIBLE  
COMPONENT



RoHS  
COMPLIANT

SnPb termination option is not  
RoHS compliant.

### CASE DIMENSIONS: millimeters (inches)



For part marking see page 157

| Code | EIA Code | EIA Metric | L±0.20 (0.008) | W±0.20 (0.008)<br>-0.10 (0.004) | H±0.20 (0.008)<br>-0.10 (0.004) | W <sub>1</sub> ±0.20 (0.008) | A±0.30 (0.012)<br>-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) |

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

### HOW TO ORDER

| THJ  | B                            | 105                                                                                                                                      | *                             | 035                                                                                                          | R                                                                                                                                                                                                                                           | JN                                             | —                                                                                                        |
|------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Type | Case Size<br>See table above | Capacitance Code<br>pF code: 1st two digits represent significant figures<br>3rd digit represents multiplier (number of zeros to follow) | Tolerance<br>K=±10%<br>M=±20% | Rated DC Voltage<br>006=6.3Vdc<br>010=10Vdc<br>016=16Vdc<br>020=20Vdc<br>025=25Vdc<br>035=35Vdc<br>050=50Vdc | Packaging<br>R = Pure Tin 7" Reel<br>S = Pure Tin 13" Reel<br>A = Gold Plating 7" Reel<br>B = Gold Plating 13" Reel<br>H = Tin Lead 7" Reel<br>(Contact Manufacturer)<br>K = Tin Lead 13" Reel<br>(Contact Manufacturer)<br>H, K = Non RoHS | Standard Suffix<br>OR<br>0100<br>Low ESR in mΩ | Additional characters may be added for special requirements<br>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 μF to 220 μF                                                                                                                   |     |    |    |    |    |    |    |  |
| Capacitance Tolerance:             | ±10%; ±20%                                                                                                                          |     |    |    |    |    |    |    |  |
| Rated Voltage (V <sub>R</sub> )    | ≤ +85°C:                                                                                                                            | 6.3 | 10 | 16 | 20 | 25 | 35 | 50 |  |
| Category Voltage (V <sub>C</sub> ) | ≤ +125°C:                                                                                                                           | 4   | 7  | 10 | 13 | 17 | 23 | 33 |  |
| Category Voltage (V <sub>C</sub> ) | ≤ +175°C:                                                                                                                           | 3   | 5  | 8  | 10 | 12 | 17 | 25 |  |
| Surge Voltage (V <sub>S</sub> )    | ≤ +85°C:                                                                                                                            | 8   | 13 | 20 | 26 | 32 | 46 | 65 |  |
| Surge Voltage (V <sub>S</sub> )    | ≤ +125°C:                                                                                                                           | 5   | 8  | 13 | 16 | 20 | 28 | 40 |  |
| Surge Voltage (V <sub>S</sub> )    | ≤ +175°C:                                                                                                                           | 4   | 6  | 10 | 12 | 15 | 21 | 30 |  |
| Temperature Range:                 | -55°C to 175°C voltage derating.                                                                                                    |     |    |    |    |    |    |    |  |
| Reliability:                       | 0.5% per 1000 hours at 85°C, V <sub>R</sub> with 0.1Ω/V series impedance, 60% confidence level, 3.5 Fits at 40°C, 0.5V <sub>R</sub> |     |    |    |    |    |    |    |  |
| Termination Finish:                | Sn Plating (standard), Gold Plating available on request                                                                            |     |    |    |    |    |    |    |  |
|                                    | Meets requirements of AEC-Q200                                                                                                      |     |    |    |    |    |    |    |  |



## High Temperature Tantalum Chip Capacitor

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

| Capacitance          |                   | Rated voltage (V <sub>R</sub> ) to 85°C (Voltage Code) |             |                     |         |         |                     |             |
|----------------------|-------------------|--------------------------------------------------------|-------------|---------------------|---------|---------|---------------------|-------------|
| μF                   | Code              | 6.3V (J)                                               | 10V (A)     | 16V (C)             | 20V (D) | 25V (E) | 35V (V)             | 50V (T)     |
| 0.10<br>0.15<br>0.22 | 104<br>154<br>224 |                                                        |             |                     |         |         | A<br>A<br>A         |             |
| 0.33<br>0.47<br>0.68 | 334<br>474<br>684 |                                                        |             |                     |         | A<br>A  | A<br>B<br>B         |             |
| 1.0<br>1.5<br>2.2    | 105<br>155<br>225 |                                                        |             | A                   | A       | A<br>B  | A/B<br>C<br>C       |             |
| 3.3<br>4.7<br>6.8    | 335<br>475<br>685 | A<br>A                                                 | A<br>A<br>A | A<br>A/B<br>A/B     | B       | C       | C<br>C<br>D         | D<br>D<br>D |
| 10<br>15<br>22       | 106<br>156<br>226 | A<br>B<br>B                                            | B<br>B<br>B | B<br>B<br>C, C(500) | C       | C<br>D  | D<br>D<br>D, D(300) | D/E         |
| 33<br>47<br>68       | 336<br>476<br>686 | B<br>C<br>C                                            | C<br>C<br>D | C<br>C/D<br>D       | D       | D       | E                   |             |
| 100<br>150<br>220    | 107<br>157<br>227 | D<br>D                                                 | D<br>E      | E                   |         |         |                     |             |

Available Ratings, (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

\*Codes under development - subject to change

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

### RATINGS & PART NUMBER REFERENCE

| AVX Part No.                                | Case Size | Cap (μF) | Rated Voltage (V) | DCL (μA) Max. | DF % Max. | ESR Max. (Ω) @100kHz | MSL             |
|---------------------------------------------|-----------|----------|-------------------|---------------|-----------|----------------------|-----------------|
| <b>6.3 Volt @ 85°C (3 Volt @ 175°C) / J</b> |           |          |                   |               |           |                      |                 |
| THJA475*006#JN                              | A         | 4.7      | 6.3               | 0.5           | 6         | 6                    | 1               |
| THJA685*006#JN                              | A         | 6.8      | 6.3               | 0.5           | 4.5       | 2.6                  | 1               |
| THJA106*006#JN                              | A         | 10       | 6.3               | 0.6           | 4.5       | 2.2                  | 1               |
| THJB156*006#JN                              | B         | 15       | 6.3               | 0.9           | 6         | 2.5                  | 1               |
| THJB226*006#JN                              | B         | 22       | 6.3               | 1.4           | 6         | 2.5                  | 1               |
| THJB336*006#JN                              | B         | 33       | 6.3               | 1.9           | 6         | 2.2                  | 1               |
| THJC476*006#JN                              | C         | 47       | 6.3               | 3.0           | 6         | 1.6                  | 1               |
| THJC686*006#JN                              | C         | 68       | 6.3               | 4.3           | 6         | 1.5                  | 1               |
| THJD107*006#JN                              | D         | 100      | 6.3               | 6             | 4.5       | 0.4                  | 1               |
| THJD157*006#JN                              | D         | 150      | 6.3               | 9.5           | 6         | 0.9                  | 1               |
| <b>10 Volt @ 85°C (5 Volt @ 175°C) / A</b>  |           |          |                   |               |           |                      |                 |
| THJA335*010#JN                              | A         | 3.3      | 10                | 0.5           | 6         | 5.5                  | 1               |
| THJA475*010#JN                              | A         | 4.7      | 10                | 0.5           | 4.5       | 2.9                  | 1               |
| THJA685*010#JN                              | A         | 6.8      | 10                | 0.7           | 4.5       | 2.6                  | 1               |
| THJB106*010#JN                              | B         | 10       | 10                | 1             | 4.5       | 1.8                  | 1               |
| THJB156*010#JN                              | B         | 15       | 10                | 1.5           | 4.5       | 1.5                  | 1               |
| THJB226*010#JN                              | B         | 22       | 10                | 2.2           | 6         | 2.4                  | 1               |
| THJC336*010#JN                              | C         | 33       | 10                | 3.3           | 6         | 1.6                  | 1               |
| THJC476*010#JN                              | C         | 47       | 10                | 4.7           | 4.5       | 0.5                  | 1               |
| THJD686*010#JN                              | D         | 68       | 10                | 6.8           | 4.5       | 0.4                  | 1               |
| THJD107*010#JN                              | D         | 100      | 10                | 10            | 6         | 0.9                  | 1               |
| THJE227*010#JN                              | E         | 220      | 10                | 22            | 10        | 0.5                  | 1 <sup>1)</sup> |
| <b>16 Volt @ 85°C (8 Volt @ 175°C) / C</b>  |           |          |                   |               |           |                      |                 |
| THJA225*016#JN                              | A         | 2.2      | 16                | 0.5           | 6         | 6.5                  | 1               |
| THJA335*016#JN                              | A         | 3.3      | 16                | 0.5           | 6         | 5                    | 1               |
| THJA475*016#JN                              | A         | 4.7      | 16                | 0.8           | 4.5       | 2.9                  | 1               |
| THJB475*016#JN                              | B         | 4.7      | 16                | 0.8           | 6         | 3.5                  | 1               |
| THJA685*016#JN                              | A         | 6.8      | 16                | 1.1           | 6         | 3.5                  | 1               |
| THJB685*016#JN                              | B         | 6.8      | 16                | 1.1           | 6         | 2.5                  | 1               |
| THJB106*016#JN                              | B         | 10       | 16                | 1.6           | 6         | 2.8                  | 1               |
| THJB156*016#JN                              | B         | 15       | 16                | 2.4           | 6         | 2                    | 1               |
| THJC226*016#JN                              | C         | 22       | 16                | 3.5           | 6         | 1.6                  | 1               |
| THJC226*016#0500                            | C         | 22       | 16                | 3.5           | 4.5       | 0.5                  | 1               |
| THJC336*016#JN                              | C         | 33       | 16                | 5.3           | 6         | 1.5                  | 1               |
| THJC476*016#JN                              | C         | 47       | 16                | 7.5           | 6         | 0.8                  | 1               |
| THJD476*016#JN                              | D         | 47       | 16                | 7.5           | 6         | 0.9                  | 1               |
| THJD686*016#JN                              | D         | 68       | 16                | 10.9          | 4.5       | 0.9                  | 1               |
| THJE107*016#JN                              | E         | 100      | 16                | 16            | 8         | 0.4                  | 1 <sup>1)</sup> |

| AVX Part No.                                | Case Size | Cap (μF) | Rated Voltage (V) | DCL (μA) Max. | DF % Max. | ESR Max. (Ω) @100kHz | MSL             |
|---------------------------------------------|-----------|----------|-------------------|---------------|-----------|----------------------|-----------------|
| <b>20 Volt @ 85°C (10 Volt @ 175°C) / D</b> |           |          |                   |               |           |                      |                 |
| THJA155*020#JN                              | A         | 1.5      | 20                | 0.5           | 6         | 6.5                  | 1               |
| THJB335*020#JN                              | B         | 3.3      | 20                | 0.7           | 6         | 3                    | 1               |
| THJC156*020#JN                              | C         | 15       | 20                | 3.0           | 6         | 1.7                  | 1               |
| THJD336*020#JN                              | D         | 33       | 20                | 6.6           | 6         | 0.9                  | 1               |
| <b>25 Volt @ 85°C (12 Volt @ 175°C) / E</b> |           |          |                   |               |           |                      |                 |
| THJA474*025#JN                              | A         | 0.47     | 25                | 0.5           | 4         | 14                   | 1               |
| THJA684*025#JN                              | A         | 0.68     | 25                | 0.5           | 4         | 10                   | 1               |
| THJA105*025#JN                              | A         | 1.0      | 25                | 0.5           | 3         | 5.2                  | 1               |
| THJB225*025#JN                              | B         | 2.2      | 25                | 0.6           | 6         | 4.5                  | 1               |
| THJC685*025#JN                              | C         | 6.8      | 25                | 1.7           | 6         | 2                    | 1               |
| THJC106*025#JN                              | C         | 10       | 25                | 2.5           | 6         | 1.8                  | 1               |
| THJD226*025#JN                              | D         | 22       | 25                | 5.5           | 6         | 0.9                  | 1               |
| THJD336*025#JN                              | D         | 33       | 25                | 8.3           | 6         | 0.9                  | 1               |
| <b>35 Volt @ 85°C (17 Volt @ 175°C) / V</b> |           |          |                   |               |           |                      |                 |
| THJA104*035#JN                              | A         | 0.1      | 35                | 0.5           | 4         | 24                   | 1               |
| THJA154*035#JN                              | A         | 0.15     | 35                | 0.5           | 4         | 21                   | 1               |
| THJA224*035#JN                              | A         | 0.22     | 35                | 0.5           | 4         | 18                   | 1               |
| THJA334*035#JN                              | A         | 0.33     | 35                | 0.5           | 4         | 15                   | 1               |
| THJB474*035#JN                              | B         | 0.47     | 35                | 0.5           | 4         | 10                   | 1               |
| THJB684*035#JN                              | B         | 0.68     | 35                | 0.5           | 4         | 8                    | 1               |
| THJA105*035#JN                              | A         | 1.0      | 35                | 0.5           | 4         | 7.5                  | 1               |
| THJB105*035#JN                              | B         | 1.0      | 35                | 0.5           | 4         | 6.5                  | 1               |
| THJC155*035#JN                              | C         | 1.5      | 35                | 0.5           | 6         | 4.5                  | 1               |
| THJC225*035#JN                              | C         | 2.2      | 35                | 0.8           | 6         | 3.5                  | 1               |
| THJC335*035#JN                              | C         | 3.3      | 35                | 1.2           | 6         | 2.5                  | 1               |
| THJC475*035#JN                              | C         | 4.7      | 35                | 1.6           | 6         | 2.2                  | 1               |
| THJD685*035#JN                              | D         | 6.8      | 35                | 2.4           | 6         | 1.3                  | 1               |
| THJD106*035#JN                              | D         | 10       | 35                | 3.5           | 6         | 1                    | 1               |
| THJD156*035#JN                              | D         | 15       | 35                | 5.3           | 6         | 0.9                  | 1               |
| THJD226*035#JN                              | D         | 22       | 35                | 7.7           | 6         | 0.6                  | 1               |
| THJD226*035#0300                            | D         | 22       | 35                | 7.7           | 6         | 0.3                  | 1               |
| THJE336*035#JN                              | E         | 33       | 35                | 11.6          | 6         | 0.5                  | 1 <sup>1)</sup> |
| <b>50 Volt @ 85°C (25 Volt @ 175°C) / T</b> |           |          |                   |               |           |                      |                 |
| THJD335*050#JN                              | D         | 3.3      | 50                | 1.7           | 6         | 1.1                  | 1               |
| THJD475*050#JN                              | D         | 4.7      | 50                | 2.4           | 6         | 0.9                  | 1               |
| THJD685*050#JN                              | D         | 6.8      | 50                | 3.4           | 6         | 0.7                  | 1               |
| THJD106*050#JN                              | D         | 10       | 50                | 5             | 6         | 0.7                  | 1               |
| THJE106*050#JN                              | E         | 10       | 50                | 5             | 6         | 0.7                  | 1 <sup>1)</sup> |

<sup>1)</sup> Dry pack option (see How to order) 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 150.

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

THJ 175°C Voltage vs Temperature Rating

