THJ Series with Extension to 200°C

High Temperature Tantalum Chip Capacitor

FEATURES

• SMD 200°C tantalum capacitor
• 200°C @ 0.33VR 1000hrs continuous operation
• Leakage current after 200°C 1000hrs less than 1mA
• 3x reflow 260°C
• Gold plated termination for hybrid assembly
• Oil drilling, aerospace, automotive applications
• CV range: 10-220μF / 10-50V
• 3 case sizes available

APPLICATIONS

• Downhole drilling

CASE DIMENSIONS: millimeters (inches)

<table>
<thead>
<tr>
<th>Code</th>
<th>EIA Code</th>
<th>EIA Metric</th>
<th>L±0.20 (0.008)</th>
<th>W±0.20 (0.008)</th>
<th>H±0.20 (0.008)</th>
<th>W±0.20 (0.008)</th>
<th>A±0.30 (0.012)</th>
<th>S Min.</th>
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<tr>
<td>B</td>
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<td>3.50 (0.138)</td>
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<td>D</td>
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<td>7343-31</td>
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W, dimension applies to the termination width for A dimensional area only.

HOW TO ORDER

THJ Type

E Case Size

107 Capacitance Code

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HOW TO ORDER

THJ Type

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107 Capacitance Code

Tolerance K = ±10%
M = ±20%

Rated DC Voltage 010 = 10Vdc
016 = 16Vdc
035 = 35Vdc
050 = 50Vdc

Packaging A = Gold Plating 7" Reel
B = Gold Plating 13" Reel

Engineering samples

TECHNICAL SPECIFICATIONS

Technical Data: All technical data relate to an ambient temperature of +25°C

Capacitance Range: 10 μF to 220 μF

Capacitance Tolerance: ±10%; ±20%

Leakage Current DCL @ VR 25°C 0.01CV

Leakage Current DCL @ VC 200°C, 1000 hrs 1mA

Rated Voltage (VR)

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Code 1</th>
<th>Code 2</th>
<th>Code 3</th>
<th>Code 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>+85°C</td>
<td>10</td>
<td>16</td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td>+200°C</td>
<td>3.3</td>
<td>5.3</td>
<td>12</td>
<td>17</td>
</tr>
</tbody>
</table>

Surge Voltage (Vs)

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Code 1</th>
<th>Code 2</th>
<th>Code 3</th>
<th>Code 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>+85°C</td>
<td>13</td>
<td>20</td>
<td>44</td>
<td>63</td>
</tr>
<tr>
<td>+200°C</td>
<td>4.3</td>
<td>6.5</td>
<td>14</td>
<td>21</td>
</tr>
</tbody>
</table>

Temperature Range: -55°C up 200°C with voltage derating

Reliability: 0.5% per 1000 hours at 85°C, VR with 0.1Ω/V series impedance, 1000 hrs at 200°C, 0.33VR

Termination Finished: Gold Plating
THJ Series with Extension to 200°C

High Temperature Tantalum Chip Capacitor

CAPACITANCE AND RATED VOLTAGE RANGE
(LETTER DENOTES CASE SIZE)

<table>
<thead>
<tr>
<th>Capacitance (μF)</th>
<th>Rated Voltage (Vr) to 85°C (Voltage Code)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10V (A)</td>
</tr>
<tr>
<td>6.8</td>
<td>685</td>
</tr>
<tr>
<td>10</td>
<td>106</td>
</tr>
<tr>
<td>15</td>
<td>156</td>
</tr>
<tr>
<td>22</td>
<td>226</td>
</tr>
<tr>
<td>33</td>
<td>336</td>
</tr>
<tr>
<td>47</td>
<td>476</td>
</tr>
<tr>
<td>68</td>
<td>686</td>
</tr>
<tr>
<td>100</td>
<td>107</td>
</tr>
<tr>
<td>150</td>
<td>157</td>
</tr>
<tr>
<td>220</td>
<td>227</td>
</tr>
</tbody>
</table>

Released ratings
Engineering samples - please contact AVX
Note: Voltage ratings are minimum values. AVX reserves the right to supply higher voltage ratings in the same case size, to the same reliability standards.

RATINGS & PART NUMBER REFERENCE

<table>
<thead>
<tr>
<th>AVX Part No.</th>
<th>Case Size</th>
<th>Capacitance (μF)</th>
<th>Rated Voltage (V)</th>
<th>Rated Temperature (ºC)</th>
<th>Category Voltage (V)</th>
<th>Category Temperature (ºC)</th>
<th>DCL Max. @ V, 25ºC (μA)</th>
<th>DCL Max. @ V, 200ºC 1000 hrs (mA)</th>
<th>DF Max. (%)</th>
<th>ESR Max. @ 100kHz (Ω)</th>
<th>100kHz RMS Current (mA)</th>
<th>MSL</th>
</tr>
</thead>
<tbody>
<tr>
<td>THJE227*010#JH</td>
<td>E</td>
<td>220</td>
<td>10</td>
<td>85</td>
<td>3.3</td>
<td>200</td>
<td>22</td>
<td>1.0</td>
<td>10</td>
<td>0.25</td>
<td>812</td>
<td>731</td>
</tr>
<tr>
<td>THJE106*016#JH</td>
<td>E</td>
<td>10</td>
<td>16</td>
<td>85</td>
<td>5.3</td>
<td>200</td>
<td>16</td>
<td>1.0</td>
<td>6</td>
<td>2.8</td>
<td>174</td>
<td>157</td>
</tr>
<tr>
<td>THJE336*035#JH</td>
<td>E</td>
<td>33</td>
<td>35</td>
<td>85</td>
<td>12</td>
<td>200</td>
<td>11.6</td>
<td>1.0</td>
<td>6</td>
<td>0.5</td>
<td>574</td>
<td>517</td>
</tr>
<tr>
<td>THJE106*050#JH</td>
<td>E</td>
<td>10</td>
<td>50</td>
<td>85</td>
<td>17</td>
<td>200</td>
<td>5</td>
<td>1.0</td>
<td>6</td>
<td>0.7</td>
<td>486</td>
<td>437</td>
</tr>
</tbody>
</table>

Moisture Sensitivity Level (MSL) is defined according to J-STD-020.
All PNs also available with Dry pack option - MSL 3 (see How to order).
¹ –Dry pack option (see How to order) recommended for reduction of stress during soldering.
Base terminations material is copper for E case size and Nilo42 for B case size.
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.
For typical weight and composition see page 274.

NOTE: AVX reserves the right to supply higher voltage ratings or tighter tolerance part in the same case size, to the same reliability standards.
## THJ Series with Extension to 200ºC
### High Temperature Tantalum Chip Capacitor

#### QUALIFICATION TABLE

<table>
<thead>
<tr>
<th>TEST</th>
<th>Condition</th>
<th>Characteristics</th>
</tr>
</thead>
</table>
| **Endurance** | Apply rated voltage (Ur) at 85ºC and / or category voltage (Uc) at 200ºC for 2000 hours through a circuit impedance of ≤0.1Ω/V. Stabilize at room temperature for 1-2 hours before measuring. | Visual examination no visible damage  
DCL 1.25 x initial limit  
ΔC/C within ±10% of initial value  
DF initial limit  
ESR 1.25 x initial limit |
| **Storage Life** | Store at 200ºC, 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  
ΔC/C within ±10% of initial value  
DF initial limit  
ESR 1.25 x initial limit |
| **Biased Humidity** | Apply rated voltage (Ur) at 85ºC, 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  
ΔC/C within ±10% of initial value  
DF 1.2 x initial limit  
ESR 1.25 x initial limit |
| **Temperature Stability** | | |
| | Step | Temperature°C | Duration(min) | +20ºC | -55ºC | +20ºC | +125ºC | +200ºC | +20ºC |
| | 1 | +20 | 15 | DCL | IL* | n/a | 10 x IL* | 12.5 x IL* | IL* |
| | 2 | -55 | 15 | ΔC/C | n/a | +6/-10% | ±5% | +10/-0% | +18/-0% | ±5% |
| | 3 | +20 | 15 | DF | IL* | 1.5 x IL* | IL* | 1.5 x IL* | 2 x IL* | IL* |
| | 4 | +125 | 15 | ESR | 1.25 x IL* | 2.5 x IL* | 1.25 x IL* | 1.25 x IL* | 1.25 x IL* | 1.25 x IL* |
| | 5 | +200 | 15 | | | | | | |
| | 6 | +20 | 15 | | | | | | |
| **Surge Voltage** | Apply 1.3x category voltage (Uc) at 200ºC for 1000 cycles of duration 6 min (30 sec charge, 5 min 30 sec discharge) through a charge / discharge resistance of 1000Ω | Visual examination no visible damage  
DCL initial limit  
ΔC/C within ±5% of initial value  
DF initial limit  
ESR 1.25 x initial limit |
| **Mechanical Shock** | MIL-STD-202, Method 213, Condition C | Visual examination no visible damage  
DCL initial limit  
ΔC/C within ±5% of initial value  
DF initial limit  
ESR initial limit |
| **Vibration** | MIL-STD-202, Method 204, Condition D | Visual examination no visible damage  
DCL initial limit  
ΔC/C within ±5% of initial value  
DF initial limit  
ESR initial limit |

*Initial Limit

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### THJ 200ºC Voltage vs Temperature Rating

![THJ 200ºC Voltage vs Temperature Rating](chart.png)
THJ Series with Extension to 200°C
High Temperature Tantalum Chip Capacitor

AVX SOLID ELECTROLYTIC CAPACITOR ROADMAP

CONDUCTIVE POLYMER
TC Series
T C x
F Series
F3 x

CONVENTIONAL TANTALUM
T series
T x x
F Series
F x x

NIOBILIUM OXIDE
N Series
N x x

CATHODE
DIELECTRIC
Ta2O5
Tantalum

ANODE
MnO2
Ta2O5

MnO2
Nb2O5
Niobium Oxide

Five Capacitor Construction Styles

J-lead
Undertab
TACmicrochip®
Conformal
Hemetic

SERIES LINE UP: CONVENTIONAL SMD MnO2

Industrial
&
Automotive

THJ 200°C
TMJ professional low DCL
THH 230°C Hemetic
TRM low DCL multinode
F97-HT3 135°C auto
F9H 135°C auto

THJ 175°C auto
TRJ professional
TPS auto "T" / "U"
F91-AJ6 auto
F97 professional

TAJ auto "T" / "U"
TPM multinode
F91
F93

F91-AJ6 auto
F93-BE Low DCL

Standard

TAJ
TPS
F91
F93

Standard
Low Profile

TAJ Low profile
TPC microchip
F92

High CV

TLN undertab
TLJ microchip
F98-AS undertab, fused

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