F9H Series
High Temperature 150ºC, Improved Reliability J-Lead

FEATURES
• Compliant to the RoHS2 directive 2011/65/EU
• Compliant to AEC-Q200
• Improved reliability - FR=0.5%/1000hrs
• SMD J-Lead

APPLICATIONS
• Automotive electronics (Engine ECU, Transmission ECU, ISG, Head lamp)
• Industrial equipment

CASE DIMENSIONS: millimeters (inches)

<table>
<thead>
<tr>
<th>Code</th>
<th>EIA Code</th>
<th>EIA Metric</th>
<th>L</th>
<th>W1</th>
<th>W2</th>
<th>H</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1206</td>
<td>3216-18</td>
<td>3.20 ± 0.20</td>
<td>1.60 ± 0.20</td>
<td>1.20 ± 0.10</td>
<td>1.60 ± 0.20</td>
<td>0.80 ± 0.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.126 ± 0.008)</td>
<td>(0.063 ± 0.008)</td>
<td>(0.047 ± 0.004)</td>
<td>(0.063 ± 0.008)</td>
<td>(0.031 ± 0.008)</td>
</tr>
<tr>
<td>B</td>
<td>1210</td>
<td>3528-21</td>
<td>3.50 ± 0.20</td>
<td>2.80 ± 0.20</td>
<td>2.20 ± 0.10</td>
<td>1.90 ± 0.20</td>
<td>0.80 ± 0.20</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>(0.138 ± 0.008)</td>
<td>(0.110 ± 0.008)</td>
<td>(0.087 ± 0.004)</td>
<td>(0.075 ± 0.008)</td>
<td>(0.031 ± 0.008)</td>
</tr>
<tr>
<td>C</td>
<td>2312</td>
<td>6032-27</td>
<td>6.00 ± 0.20</td>
<td>3.20 ± 0.20</td>
<td>2.20 ± 0.10</td>
<td>2.50 ± 0.20</td>
<td>1.30 ± 0.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.236 ± 0.008)</td>
<td>(0.126 ± 0.008)</td>
<td>(0.087 ± 0.004)</td>
<td>(0.098 ± 0.008)</td>
<td>(0.051 ± 0.008)</td>
</tr>
</tbody>
</table>

HOW TO ORDER
F9H Type 1C Rated Voltage 106 Capacitance Code M Tolerance A Case Packaging

MARKING
A CASE Capacitance Code
B CASE Capacitance Code
C CASE Capacitance Code

TECHNICAL SPECIFICATIONS
Category Temperature Range: -55 to +150°C
Rated Temperature: +105°C
Capacitance Tolerance: ±20%, ±10% at 120Hz
Dissipation Factor: Refer to next page
ESR 100kHz: Refer to next page
Leakage Current: After 1 minute’s application of rated voltage, leakage current at 20°C is not more than 0.01CV or 0.5μA, whichever is greater.
After 1 minute’s application of rated voltage, leakage current at 105°C is not more than 0.1CV or 5μA, whichever is greater.
After 1 minute’s application of derated voltage, leakage current at 150°C is not more than 0.125CV or 6.3μA, whichever is greater.
Capacitance Change By Temperature +15% Max. at +150°C +10% Max. at +105°C -10% Max. at -55°C
### CAPACITANCE AND RATED VOLTAGE RANGE  
(LETTER DENOTES CASE SIZE)

<table>
<thead>
<tr>
<th>Capacitance</th>
<th>Rated Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>μF</td>
<td>Code</td>
</tr>
<tr>
<td>10</td>
<td>106 A</td>
</tr>
<tr>
<td>15</td>
<td>156 A</td>
</tr>
<tr>
<td>22</td>
<td>226 B</td>
</tr>
<tr>
<td>33</td>
<td>336 C</td>
</tr>
<tr>
<td>47</td>
<td>476 C</td>
</tr>
</tbody>
</table>

### 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>Leakage Current (μA)</th>
<th>ΔF @ 12kHz (%)</th>
<th>ESR @ 10kHz (Ω)</th>
<th>100kHz RMS Current (mA)</th>
<th>*1</th>
<th>MSL</th>
</tr>
</thead>
<tbody>
<tr>
<td>F9HIA156#AA</td>
<td>A</td>
<td>15</td>
<td>10</td>
<td>1.5</td>
<td>10</td>
<td>1.1</td>
<td>316</td>
<td>126</td>
<td>100%</td>
</tr>
<tr>
<td>F9HIC106RAA</td>
<td>A</td>
<td>10</td>
<td>16</td>
<td>1.6</td>
<td>8</td>
<td>3.5</td>
<td>146</td>
<td>126</td>
<td>100%</td>
</tr>
<tr>
<td>F9HIC226#BA</td>
<td>B</td>
<td>22</td>
<td>16</td>
<td>3.5</td>
<td>8</td>
<td>1.9</td>
<td>212</td>
<td>85</td>
<td>100%</td>
</tr>
<tr>
<td>F9HIC476#CC</td>
<td>C</td>
<td>47</td>
<td>16</td>
<td>7.5</td>
<td>10</td>
<td>1.1</td>
<td>316</td>
<td>126</td>
<td>100%</td>
</tr>
</tbody>
</table>

### QUALIFICATION TABLE

**TEST**

- **Damp Heat** (Steady State)
  - At 85°C, 85% RH, 1000 hours (No voltage applied)
  - Capacitance Change ........ Refer to page 118 (*1)
  - Dissipation Factor ............ Initial specified value or less
  - Leakage Current ............. 125% or less than the initial specified value

- **Load Humidity**
  - After 1000 hour’s application of rated voltage in series with a 33Ω resistor at 85°C, 85% RH, capacitors meet the characteristics requirements table below.
  - Capacitance Change ........ Refer to page 118 (*1)
  - Dissipation Factor ............ Initial specified value or less
  - Leakage Current ............. 200% of less than the initial specified value

- **Temperature Cycles**
  - At -55°C / +150°C, 30 minutes each, 1000 cycles
  - Capacitance Change ........ Refer to page 118 (*1)
  - Dissipation Factor ............ Initial specified value or less
  - Leakage Current ............. Initial specified value or less

- **Resistance to Soldering Heat**
  - 10 seconds reflow at 260°C, 5 seconds immersion at 260°C.
  - Capacitance Change ........ Refer to page 118 (*1)
  - Dissipation Factor ............ Initial specified value or less
  - Leakage Current ............. Initial specified value or less

- **Solderability**
  - After immersing capacitors completely into a solder bath at 245°C for 2 to 3 seconds, more than 3/4 of their electrode area shall remain covered with new solder.

- **Surge**
  - After application of surge voltage in series with a 33Ω resistor at the rate of 30 seconds ON, 30 seconds OFF, for 1000 successive test cycles at 85°C, capacitors shall meet the characteristics requirements in the table above.
  - Capacitance Change ........ Refer to page 118 (*1)
  - Dissipation Factor ............ Initial specified value or less
  - Leakage Current ............. Initial specified value or less

- **Endurance**
  - After 2000 hours application of rated voltage in series with a 3Ω resistor at 105°C, or derated voltage in series with a 3Ω resistor at 150°C, capacitors shall meet the characteristic requirements in the table above.
  - Capacitance Change ........ Refer to page 118 (*1)
  - Dissipation Factor ............ Initial specified value or less
  - Leakage Current ............. Initial specified value or less

- **Shear Test**
  - Keeping a capacitor surface-mounted on a substrate upside down and supporting the substrate at both of the opposite bottom points 45mm apart from the center of capacitor, the pressure strength is applied with a specified jig at the center of the substrate so that the substrate may bend by1mm as illustrated, then, there shall be found no remarkable abnormality on the capacitor terminals.

- **Terminal Strength**
  - 0.5% per 1000 hours at 105°C, Vr with 0.1Ω/V series impedance, 60% confidence level.

- **Failure Rate**
  - 0.5% per 1000 hours at 105°C, Vr with 0.1Ω/V series impedance, 60% confidence level.

*1: ΔC/C Marked “*”

<table>
<thead>
<tr>
<th>Item</th>
<th>All Case (%)</th>
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</thead>
<tbody>
<tr>
<td>Damp Heat</td>
<td>±10</td>
</tr>
<tr>
<td>Temperature cycles</td>
<td>±5</td>
</tr>
<tr>
<td>Resistance soldering</td>
<td>±5</td>
</tr>
<tr>
<td>Surge</td>
<td>±10</td>
</tr>
<tr>
<td>Load Humidity</td>
<td>±10</td>
</tr>
</tbody>
</table>

*: “M” for ±20% tolerance, “K” for ±10% tolerance.

Moisture Sensitivity Level (MSL) is defined according to J-STD-020.
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High Temperature 150°C, Improved Reliability J-Lead

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

**NIOBIUM OXIDE**
N Series
N x x

**CATHODE**
- conductive polymer

**DIELECTRIC**
Tantalum

**ANODE**
+ Tantalum

Five Capacitor Construction Styles

<table>
<thead>
<tr>
<th>J-lead</th>
<th>Undertab</th>
<th>TACmicrochip</th>
<th>Conformal</th>
<th>Hermetic</th>
</tr>
</thead>
</table>

SERIES LINE UP: CONVENTIONAL SMD MnO₂

<table>
<thead>
<tr>
<th>Industrial &amp; Automotive</th>
<th>Standard</th>
<th>Standard Low Profile</th>
<th>High CV</th>
</tr>
</thead>
<tbody>
<tr>
<td>THJ 200°C</td>
<td>TAJ auto (T/U)</td>
<td>TAJ Low profile</td>
<td>TLN undertab</td>
</tr>
<tr>
<td>TMJ professional low DCL</td>
<td>TRJ professional</td>
<td>TAC microchip</td>
<td>TLJ microchip</td>
</tr>
<tr>
<td>THH 230°C Hermetic</td>
<td>TPS auto (T/U)</td>
<td>TPC microchip</td>
<td>TLC microchip</td>
</tr>
<tr>
<td>TRM low DCL multinode</td>
<td>TPM multinode</td>
<td>F91</td>
<td>F98-AS1 undertab,fused</td>
</tr>
<tr>
<td>F97-HT3 135°C auto</td>
<td>TPS</td>
<td>F91</td>
<td>F98 undertab</td>
</tr>
<tr>
<td>F9H 135°C auto</td>
<td>TPS</td>
<td>F93</td>
<td>F92</td>
</tr>
</tbody>
</table>