# F9H Series

## High Temperature 150°C, Improved Reliability J-Lead


## FEATURES

- Compliant to the RoHS3 directive 2015/863/EU
- Compliant to AEC-Q200
- Improved Reliability - FR=0.5%/1000hrs
- 100% Surge Current Tested
- SMD J-lead

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

## APPLICATIONS

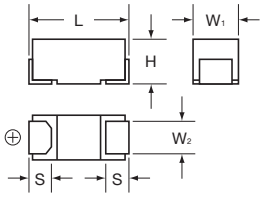
- Automotive Electronics (Engine ECU, Transmission ECU, ISG, Head Lamp)
- Industrial Equipment

## CASE DIMENSIONS:

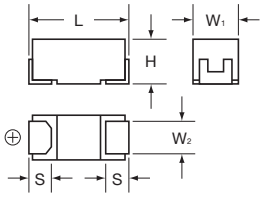
millimeters (inches)

| Code | EIA Code | EIA Metric | L | $W_1$ | $W_2$ | H | S |
|---|---|---|---|---|---|---|---|
| A | 1206 | 3216-18 | 3.20 ± 0.20 (0.126 ± 0.008) | 1.60 ± 0.20 (0.063 ± 0.008) | 1.20 ± 0.10 (0.047 ± 0.004) | 1.60 ± 0.20 (0.063 ± 0.008) | 0.80 ± 0.20 (0.031 ± 0.008) |
| B | 1210 | 3528-21 | 3.50 ± 0.20 (0.138 ± 0.008) | 2.80 ± 0.20 (0.110 ± 0.008) | 2.20 ± 0.10 (0.087 ± 0.004) | 1.90 ± 0.20 (0.075 ± 0.008) | 0.80 ± 0.20 (0.031 ± 0.008) |
| C | 2312 | 6032-27 | 6.00 ± 0.20 (0.236 ± 0.008) | 3.20 ± 0.20 (0.126 ± 0.008) | 2.20 ± 0.10 (0.087 ± 0.004) | 2.50 ± 0.20 (0.098 ± 0.008) | 1.30 ± 0.20 (0.051 ± 0.008) |

### A, B CASE

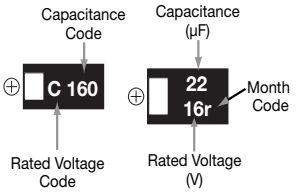



### C CASE

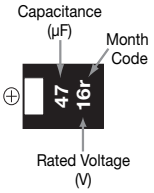



## MARKING

### A CASE B CASE




### C CASE




## HOW TO ORDER

| F9H | 1C | 106 | M | A | □ |
|---|---|---|---|---|---|
| **Type** | **Rated Voltage** | **Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow) | **Tolerance** K = ±10% M = ±20% | **Case Size** See table above | **Packaging** See Tape & Reel Packaging Section |

## 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 |

# F9H Series

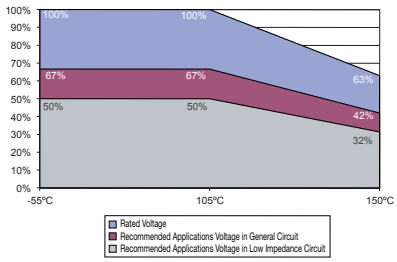
## High Temperature 150°C, Improved Reliability J-Lead

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

| Capacitance | | Rated Voltage | |
|---|---|---|---|
| µF | Code | 10V (1A) | 16V (1C) |
| 10 | 106 | | A |
| 15 | 156 | A | |
| 22 | 226 | | B |
| 33 | 336 | | |
| 47 | 476 | | C |

Released ratings
Please contact to your local AVX sales office when these series are being designed in your application.

Voltage vs Temperature Rating




## RATINGS & PART NUMBER REFERENCE

| AVX Part No. | Case Size | Capacitance (µF) | Rated Voltage (V) | Leakage Current (µA) | DF @ 120Hz (%) | ESR @ 100kHz (Ω) | 100kHz RMS Current (mA) | | | *1 ΔC/C (%) | MSL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 25°C | 105°C | 150°C | | |
| **10 Volt** | | | | | | | | | | | |
| F9H1A156#AA | A | 15 | 10 | 1.5 | 10 | 3.0 | 158 | 142 | 63 | * | 3 |
| **16 Volt** | | | | | | | | | | | |
| F9H1C106#AA | A | 10 | 16 | 1.6 | 8 | 3.5 | 146 | 132 | 59 | * | 3 |
| F9H1C226#BA | B | 22 | 16 | 3.5 | 8 | 1.9 | 212 | 190 | 85 | * | 3 |
| F9H1C476#CC | C | 47 | 16 | 7.5 | 10 | 1.1 | 316 | 285 | 126 | * | 3 |

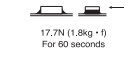
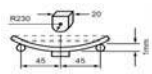
*1: ΔC/C Marked "*"

#: "M" for ±20% tolerance, "K" for ± 10% tolerance.

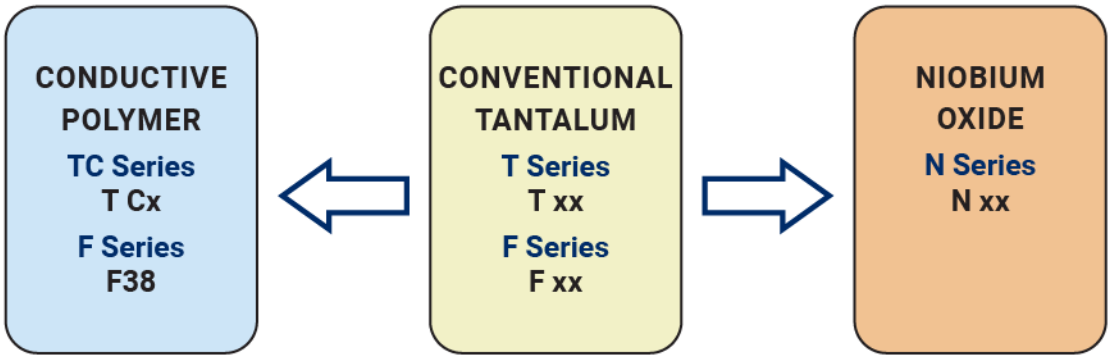
Moisture Sensitivity Level (MSL) is defined according to J-STD-020.

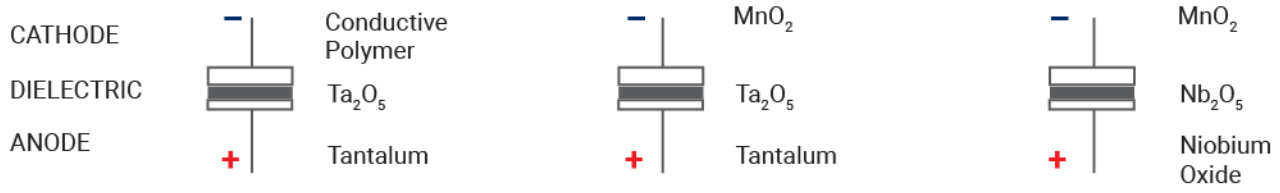
| Item | All Case (%) |
|---|---|
| Damp Heat | ±10 |
| Temperature cycles | ±5 |
| Resistance soldering heat | ±5 |
| Surge | ±5 |
| Endurance | ±10 |
| Load Humidity | ±10 |

## QUALIFICATION TABLE

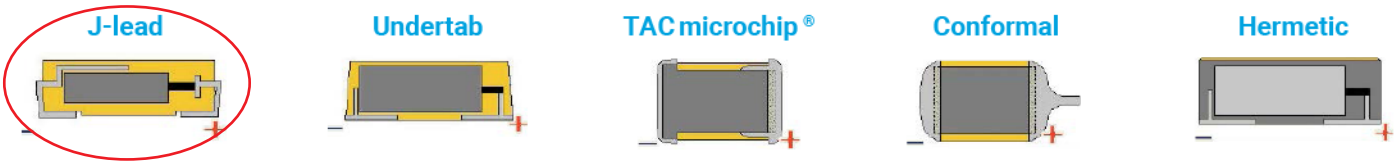
| TEST | F9H series (Temperature range -55°C to +150°C) |
|---|---|
| | Condition |
| **Damp Heat (Steady State)** | At 85°C, 85% R.H., 1000 hours (No voltage applied)<br>Capacitance Change ..... .Refer to page 118 (*1)<br>Dissipation Factor ..... Initial specified value or less<br>Leakage Current ..... 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% R.H., capacitors meet the characteristics requirements table below.<br>Capacitance Change ..... .Refer to page 118 (*1)<br>Dissipation Factor ..... 120% or less than the initial specified value<br>Leakage Current ..... 200% of less than the initial specified value |
| **Temperature Cycles** | At -55°C / +150°C, 30 minutes each, 1000 cycles<br>Capacitance Change ..... .Refer to page 118 (*1)<br>Dissipation Factor ..... Initial specified value or less<br>Leakage Current ..... Initial specified value or less |
| **Resistance to Soldering Heat** | 10 seconds reflow at 260°C, 5 seconds immersion at 260°C.<br>Capacitance Change ..... .Refer to page 118 (*1)<br>Dissipation Factor ..... Initial specified value or less<br>Leakage Current ..... Initial specified value or less |
| **Solderability** | After immersing capacitors completely into a solder pot 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 characteristic requirements in the table above. Capacitance Change Refer to page 118 (*1)<br>Dissipation Factor .....Initial specified value or less<br>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.<br>Capacitance Change ..... . Refer to page 118 (*1)<br>Dissipation Factor ..... Initial specified value or less<br>Leakage Current ..... Initial specified value or less |
| **Shear Test** | After applying the pressure load of 17.7N for 60 seconds horizontally to the center of capacitor side body which has no electrode and has been soldered beforehand on a substrate, there shall be found neither exfoliation nor its sign at the terminal electrode..<br>  |
| **Terminal Strength** | 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 substrate may bend by1mm as illustrated. Then, there shall be found no remarkable abnormality on the capacitor terminals.<br>  |
| **Failure Rate** | 0.5% per 1000 hours at 105°C, $V_R$ with 0.1Ω/V series impedance, 60% confidence level. |

## AVX SOLID ELECTROLYTIC CAPACITOR ROADMAP

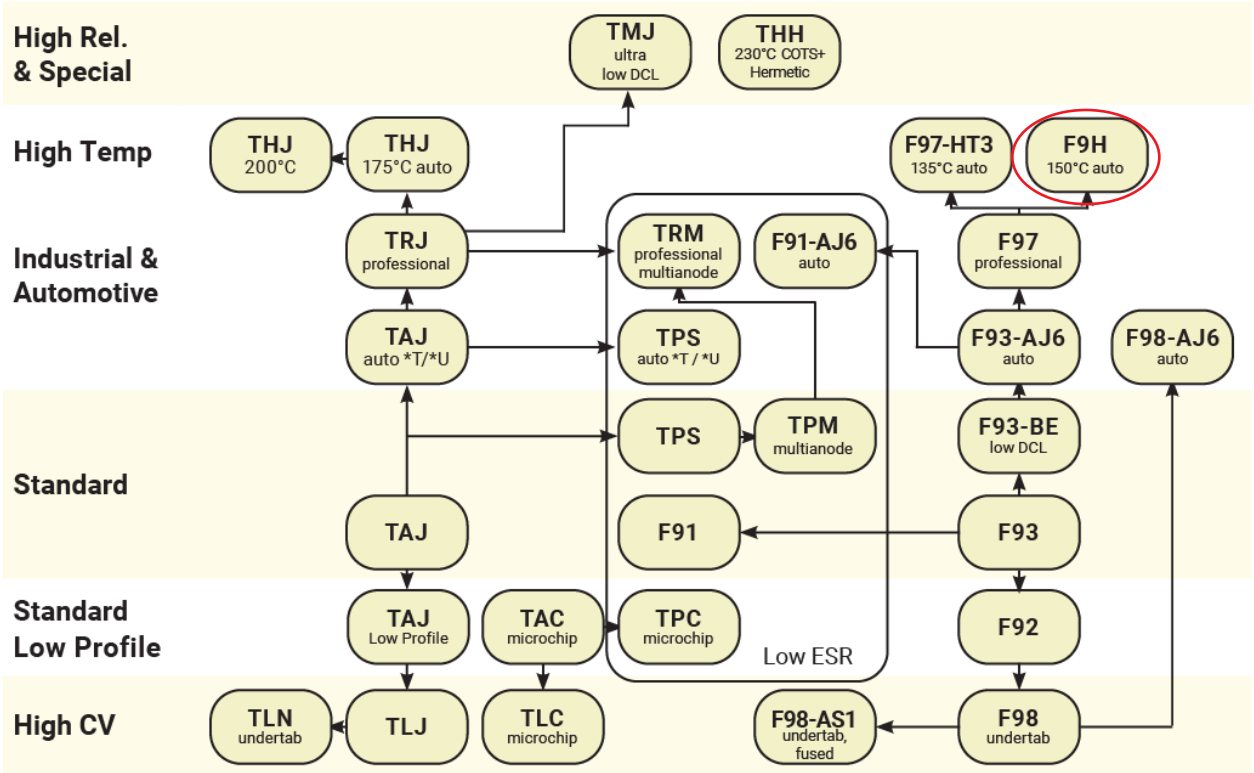



## FIVE CAPACITOR CONSTRUCTION STYLES




## SERIES LINE UP : CONVENTIONAL SMD $MnO_2$



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