

Automotive-Grade Tantalum Capacitors Deliver High Capacitance Per Volume

[AVX's](#) F9H series miniature, surface-mount, J-lead tantalum capacitors deliver high reliability and high volumetric efficiency in high-temperature automotive and industrial applications. These resin-molded chip capacitors meet AEC-Q200 requirements, are compliant with the RoHS2 directive 2011/65/EU, and are rated for operating temperatures up to 150°C.

According to the vendor, this series offers the industry's highest CV/cc in a high-temperature 1206 tantalum capacitor: a 10- μ F, 16-V capacitor that delivers 50% more capacitance than the next-highest CV/cc 1206 tantalum capacitor, a 6.8- μ F, 16-V part (see the figure and the table). These devices are also said to deliver higher reliability than standard automotive-grade capacitors, with a failure rate of just 0.5% after 1,000 hours at 105°C and rated voltage with 0.1- Ω /V series impedance and a 60% confidence level.

The F9H series is currently offered with four ratings: 1206 10 μ F and 16 V; 1206 15 μ F and 10 V; 1210 22 μ F and 16 V; and 2312 47 μ F/16 V with an operating temperature of +105°C at rated voltage and a maximum category temperature of 150°C at 50% of rated voltage. They have a conventional MnO₂ cathode, which is characterized by low leakage current, and do not exhibit capacitance loss with applied voltage (voltage coefficient) or capacitance loss over time, as respectively seen in Class II MLCCs and aluminum electrolytic capacitors.

In addition these devices are well suited for use in the secondary power lines of automotive electronics applications including engine and transmission control units, integrated starter generators, headlamps, and brakes, as well as in industrial applications.

"Our new F9H Series J-lead tantalum capacitors provide the highest available capacitance for high-temperature automotive applications in a miniature case size, in addition to reliability performance two times better than standard AEC-Q200-compliant tantalum series," said Allen Mayar, product marketing manager, AVX.

F9H series capacitors are also lead-free compatible and RoHS compliant. Lead time for the series is currently 8 to 10 weeks. For more information about AVX's F9H series capacitors, see the product [page](#).



Figure. The AEC-Q200-qualified F9H series tantalum electrolytic capacitors are said to deliver twice the reliability of standard automotive-grade capacitors and the industry's highest CV/cc in a high-temperature 1206 tantalum capacitor—a 10- μ F capacitance and 16-V rating.

Table. Part numbers and key specifications for members of the F9H series.

AVX Part No.	Case Size	Capacitance (µF)	Rated Voltage (V)	Leakage Current (µA)	DF @ 120Hz (%)	ESR @ 100kHz (Ω)	*1 ΔC/C (%)	MSL
10 Volt								
F9H1A156#AA	A	15	10	1.5	10	3.0	*	3
16 Volt								
F9H1C106#AA	A	10	16	1.6	8	3.5	*	3
F9H1C226#BA	B	22	16	3.5	8	1.9	*	3
F9H1C476#CC	C	47	16	7.5	10	1.1	*	3

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

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