



AUTOMOTIVE APPLICATIONS

CERAMIC CAPACITORS | TANTALUM CAPACITORS | POLYMER CAPACITORS
NIOBIUM OXIDE | FILM CAPACITORS | CONNECTORS | NTC THERMISTORS
MULTILAYER VARISTORS | ANTENNAS



TANTALUM CAPACITORS



AVX automotive tantalum capacitors offer excellent parameters stability over lifetime, resistance against thermo-mechanical stresses, and high surge robustness.

Capacitors are available in both standard and low ESR options. They are also available in a high temperature series up to +175°C which makes them suitable for a wide range of automotive control circuits in applications such as engine control units, ABS systems, MDPS, electronic gearboxes, TPMS, etc.

Series	Operating Temp	Range
TAJ	+125°C	6.3V – 50V 0.22µF – 680µF
F93-AJ6	+125°C	4V – 35V 1µF – 680µF
TPS	+125°C	6.3V – 50V 0.22µF – 680µF
F91-AJ6	+125°C	6.3V – 16V 10µF – 220µF
TRJ	+125°C	4V – 50V 0.1µF – 680µF
F97	+125°C	6.3V – 35V 0.33µF – 150µF
TRM	+125°C	2.5V – 50V 4.7µF – 1500µF
TMJ	+125°C	6.3V – 50V 0.22µF – 680µF
F98-AJ6	+125°C	6.3V – 16V 4.7µF – 47µF
F97-HT3	+135°C	6.3V – 35V 0.33µF – 100µF
F9H	+150°C	10V – 16V 10µF – 47µF
THJ +175°C	+175°C	6.3V – 50V 0.1µF – 220µF

CONDUCTIVE POLYMER CAPACITORS



Automotive polymer series of low ESR capacitors. Qualified in accordance with AEC-Q200.

Series	Operating Temp	Range
TCQ	+105/125°C	2.5V – 50V 10µF – 470µF
TCO	+150°C	50V 10µF

NIOBIUM OXIDE CAPACITORS



Niobium OxiCap® capacitors offer unique features - high reliability, non-burn and non-smoke technology, more resistance to overvoltage breakdown, lower recommended derating, and high resistance failure mode. OxiCap® capacitors suits application where reliability and safety is of primary focus.

Series	Operating Temp	Range
NOJ	+105°C	1.8V – 10V 4.7µF – 1000µF
NOS	+125°C	1.8V – 8V 10µF – 1000µF
NOM	+125°C	1.8V – 6.3V 220µF – 680µF

FILM CAPACITORS



FILM CHIP CAPACITORS

The self-healing property of film dielectric provides an open failure mode capacitor with excellent reliability. The intrinsic characteristic of film provides a capacitor that exhibits low DC bias, excellent thermal behavior and thermal shock resistance, no piezo effect and low ESR, ESL and dissipation factor.

Series	Operating Temp	Range
PPS	+125°C	16V – 50V 1nF – 180nF
PEN	+125°C	25V – 630V 0.01µF – 4.7µF
PEN-HT	+125°C	63V – 630V 0.01µF – 4.7µF



MEDIUM POWER FILM & DC LINK FILM CAPACITORS

FFV, FFLI and Custom parts are medium power film capacitors for DC filtering, high rms current and high temperature automotive applications. FAV series are high reactive energy tuning capacitors for HEV/EV battery charging applications.

FHC DC link capacitors are designed for use in conjunction with HEV/EV vehicles IGBT modules.

Series	Operating Temp	Range
FFV Series (PET/PPY)	+105°C	300V – 1900V 22µF – 400µF
FFLI (PPY)	+95°C	800V – 1400V 105µF – 3mF
Custom Parts (PPY)	+105°C	75V – 1400V 300µF – 1.5mF
FHC (PPY)	+105°C	410V – 900V 410µF – 900µF

THIN FILM CAPACITORS



Very low-loss (high-Q) SMT capacitors, especially for the wireless communications market at frequencies up to and above 5.8GHz. Accu-P® is unique in its ability to offer very low capacitance values (0.05 pF) and ultra tight capacitance tolerances (±0.01 pF).

Series	Operating Temp	Range
Accu-P®	+125°C	10 – 200V 0.05pF – 68pF

SMT CERAMIC CAPACITORS

	<p>TIN TERMINATION AVX Ceramic Capacitors exhibit low parasitics and excellent EMI filtering capabilities. AVX MLC Capacitors are available in wide range of values, styles, voltage ratings and dielectrics.</p> <p>Ultra Low ESR NP0 - "U" dielectric parts are designed for RF applications requiring ultra-low ESR. NP0 parts are suitable for use in MHz range with very stable characteristics. X7R parts are suitable for use for use in general kHz range. X8R / X8L parts are designed for high temperature applications up to +150°C. (*Contact AVX for +150°C X7R option)</p>	<table border="1"> <thead> <tr> <th>Dielectric</th> <th>Operating Temp</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>NP0 Ultra Low ESR</td> <td>+125°C</td> <td>50V – 200V 0.2pF – 1.0nF</td> </tr> <tr> <td>NP0</td> <td>+125°C</td> <td>25V – 100V 1pF – 4.7nF</td> </tr> <tr> <td>X7R</td> <td>+125°C</td> <td>16V – 500V 220pF – 22µF</td> </tr> <tr> <td>X7R High Voltage</td> <td>+125°C</td> <td>600V – 3000V 100pF – 0.15µF</td> </tr> <tr> <td>X8R / X8L X7R*</td> <td>+150°C</td> <td>25V – 100V 330pF – 4.7µF</td> </tr> </tbody> </table>	Dielectric	Operating Temp	Range	NP0 Ultra Low ESR	+125°C	50V – 200V 0.2pF – 1.0nF	NP0	+125°C	25V – 100V 1pF – 4.7nF	X7R	+125°C	16V – 500V 220pF – 22µF	X7R High Voltage	+125°C	600V – 3000V 100pF – 0.15µF	X8R / X8L X7R*	+150°C	25V – 100V 330pF – 4.7µF
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	<p>FLEXITERM® FLEXITERM® MLC Capacitors equipped with an AVX flexible termination system. They have superior resistance to both mechanical stress (board flexure - 5mm bend test guaranteed) and thermal stress (increased temperature cycling performance, 3000 cycles and beyond).</p> <p>(*Contact AVX for +150°C X7R option)</p>	<table border="1"> <thead> <tr> <th>Dielectric</th> <th>Operating Temp</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>X7R</td> <td>+125°C</td> <td>16V – 200V 270pF – 22µF</td> </tr> <tr> <td>X7R High Voltage</td> <td>+125°C</td> <td>600V – 3000V 100pF – 0.15µF</td> </tr> <tr> <td>X8R / X8L X7R*</td> <td>+150°C</td> <td>25V – 100V 330pF – 4.7µF</td> </tr> </tbody> </table>	Dielectric	Operating Temp	Range	X7R	+125°C	16V – 200V 270pF – 22µF	X7R High Voltage	+125°C	600V – 3000V 100pF – 0.15µF	X8R / X8L X7R*	+150°C	25V – 100V 330pF – 4.7µF						
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	<p>FLEXISAFE Specifically designed with an industry leading set of safety features for safety critical applications. Combines FLEXITERM® layer in conjunction with the cascade design.</p>	<table border="1"> <thead> <tr> <th>Dielectric</th> <th>Operating Temp</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>X7R</td> <td>+125°C</td> <td>16V – 100V 1nF – 470nF</td> </tr> </tbody> </table>	Dielectric	Operating Temp	Range	X7R	+125°C	16V – 100V 1nF – 470nF												
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	<p>IPC ARRAY Integrated Passive Component (IPC) and associates up to four capacitance elements in a single case, and is ideal for use in modern integrated circuits in automotive applications. It offers PCB space saving, increased assembly line output and better electrical performance thanks to small dimensions. Available also with FLEXITERM® for X7R and X8R range.</p>	<table border="1"> <thead> <tr> <th>Dielectric</th> <th>Operating Temp</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>NP0</td> <td>+125°C</td> <td>16V – 100V 1pF – 470pF</td> </tr> <tr> <td>X7R</td> <td>+125°C</td> <td>10V – 100V 220pF – 100nF</td> </tr> <tr> <td>X8R</td> <td>+150°C</td> <td>16V 220pF – 680pF</td> </tr> </tbody> </table>	Dielectric	Operating Temp	Range	NP0	+125°C	16V – 100V 1pF – 470pF	X7R	+125°C	10V – 100V 220pF – 100nF	X8R	+150°C	16V 220pF – 680pF						
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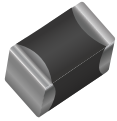
LEADED CERAMIC CAPACITORS

	<p>RADIAL AVX leaded MLCCs offer excellent mechanical shock and vibration resistance in harsh environment applications. With a wide range of dielectric materials, capacitance values, voltage ratings and lead styles, leaded capacitors offer robust mechanical shock and vibration characteristics, exceptional thermal resistance and proven reliability and quality. Both dipped and molded configurations available.</p>	<table border="1"> <thead> <tr> <th>Dielectric</th> <th>Operating Temp</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>NP0</td> <td>+125°C</td> <td>50V – 200V 1pF – 8200pF</td> </tr> <tr> <td>X7R</td> <td>+125°C</td> <td>50V – 100V 470pF – 10µF</td> </tr> <tr> <td>X7R High Voltage</td> <td>+125°C</td> <td>1000V – 3000V 470pF – 10nF</td> </tr> <tr> <td>X8R</td> <td>+150°C</td> <td>50V 1nF – 330nF</td> </tr> </tbody> </table>	Dielectric	Operating Temp	Range	NP0	+125°C	50V – 200V 1pF – 8200pF	X7R	+125°C	50V – 100V 470pF – 10µF	X7R High Voltage	+125°C	1000V – 3000V 470pF – 10nF	X8R	+150°C	50V 1nF – 330nF
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AUTOMOTIVE

PRODUCT SELECTION GUIDE

CIRCUIT PROTECTION



AUTO SERIES MULTILAYER VARISTORS

Reliable bi-directional protection from voltage transients (ESD, inductive switching, automotive transients, etc). Multiple strike capability, high reliability, and EMI/RFI filtering in the off-state. Available in wide range of ratings to suit various application needs from high energy/load dump to low capacitance or ultra-low leakage. AEC-Q200 qualified.

Case Sizes	Operating Temp	Range
0201 – 3220 Radial, Axial	+125/150/175°C	3.3 – 85V 0.8pF – 4.7µF



NTC VARISTORS

Parts are AEC-Q200 qualified and offer fast thermal response, excellent reliability in SMT, leaded and leadless configuration. High accuracy series available with tolerances from ±1%. Customized solutions are available.

Case Sizes	Operating Temp	Range
0603 – 1206 Radial	+150°C	10Ω – 1MΩ B25/85: 3250 – 4840K

CONNECTORS



IDC

Provides reliable “Gas Tight” wire-to-board connections for high temperature, shock and vibration applications. Can also be used with Press-Fit pin technology as 1-piece solution to replace costly 2-piece connector solution.

Range
IDC : AWG 12-28, SMT and PTH IDC Press-Fit : AWG 18-24



CUSTOM AUTO CONNECTORS

Advanced component, process and automation technology provides high pin and component (Mechatronics) count connector and module solutions for emerging automotive systems, engine management, braking, steering, safety, environmental, etc.

Range
Based on customer requirements

ANTENNAS



ON BOARD

SMT antennas using different technologies for easy implementation and fast time to-market. Ceramic, PCB based, stamped metal, patch. PPAP documentation available.

Bands	Frequency
GSM, 3G, LTE /4G, WiFi, BT, V2X, GNSS, UHF, ISM, LPWAN, Satellite, 5G	433, 868 MHz 700 MHz – 2.7 GHz 5.1 – 5.9 GHz; 20 – 67 GHz



EXTERNAL

Roof mounted, shark fin, aftermarket antennas. Waterproof IP67/68. PPAP documentation available.

Bands	Frequency
GSM, 3G, LTE /4G, WiFi, BT, V2X, GNSS, UHF, ISM, LPWAN, Satellite, 5G	433, 868 MHz 700 MHz – 2.7 GHz 5.1 – 5.9 GHz; 20 – 67 GHz



CUSTOMER SPECIFIC

Custom antennas in different manufacturing technologies: LDS, two-shot molding, insert molding. Testing services: simulations and measurements in Automotive Chamber

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