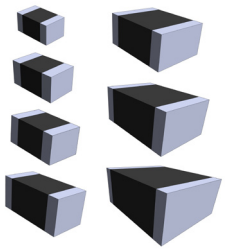
Use case
Eaton AMLV automotive-grade multilayer varistors



Eaton MLVs provide robust circuit protection in automotive applications

Automotive technologies are enhancing safety, drivability, and comfort in today's vehicles. For instance, advanced driver assistance systems (ADAS) utilize a host of electronic sensors, digital signal processors (DSPs), and more to implement real-time safety features, such as lane departure warning, collision avoidance, and adaptive cruise control. These features help reduce road accidents by minimizing human error. Similarly, In-vehicle Infotainment (IVI) and navigation use software and hardware components for in-vehicle and external communications, GPS navigation, and synchronization with mobile phones and multimedia devices.

Advanced features in modern vehicles are increasing the number of components integrated into automotive PCBs. Consequently, circuit protection is more critical than ever to protect electronic components, control, and power units from overcurrent, electrostatic discharge (ESD), lightning strikes, and transient overvoltage. Circuit protection is required throughout the vehicle, including engine control units (ECUs), automotive bus systems (e.g., LIN, CAN, CAN-FD, and FlexRay), ADAS, LED lighting modules, seat motor circuits, and door control modules. Damage to sensor circuits and ICs can disable critical functions, rendering a vehicle undriveable. Automotive-grade AEC-Q101 and AEC-Q200 qualifications for circuit protection components assure the highest levels of safety and reliability.

Varistors are ubiquitous components in modern automobiles as they provide protection from surge voltages. Multilayer varistors (MLVs) are ideal for ESD and transient voltage suppression. They comprise a voltage-variable resistor made up of opposing diode junctions that maintains an extremely high resistance at low voltages but offers an ultra-low resistance at higher voltages. Voltage spikes include electrostatic discharge (ESD), lightning strikes, electromagnetic pulses, motor switching, jump starts, and load dumps. When a large voltage is applied to the MLV, the device rapidly and dramatically reduces resistance and the device enters a high conducting state, allowing current and voltage to flow through and quickly shunting the surge to the ground. This action protects downstream circuits and board-level components from damage.

Eaton's AMLV series of automotive-grade MLV products are transient voltage surge suppression devices designed to suppress a variety of transient events. These products are offered in 0402 and 2220 footprints, are AEC-Q200 qualified, and come in a variety of voltage ranges (5.5 Vdc up to 56 Vdc) to provide high-reliability protection in electronic applications on power supply, control and signal lines. Each product is RoHS-compliant and halogen-free. In addition to Eaton's overvoltage portfolio, TVS Diodes, PolySurg™, and resettable PTC fuses, Eaton's MLVs also protect against a broad range of overvoltage threats and are suited for high-reliability and automotive applications.

Eaton
Electronics Division
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com/electronics

www.eaton.com/fuses

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