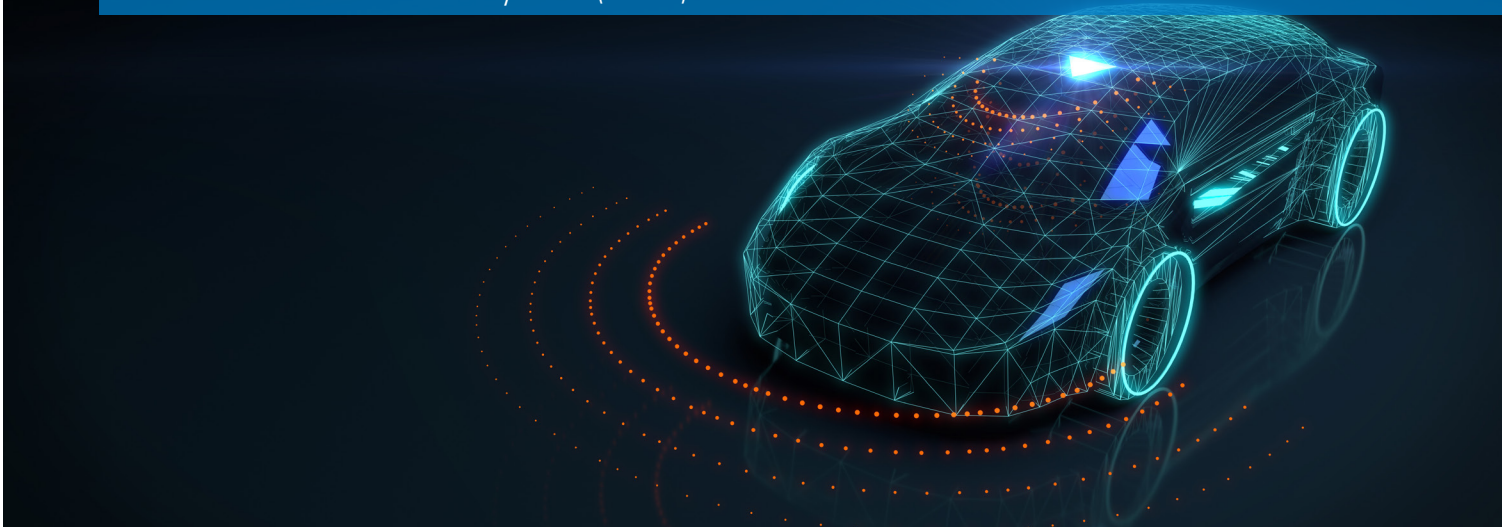
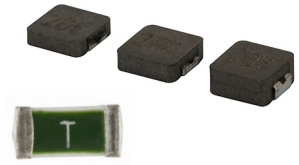
Use case
Advanced driver assistance systems (ADAS)





Smart vehicle autonomy and safety features with ADAS

Advanced driver assistance systems (ADAS), a series of advanced automobile systems that enhance driver safety and vehicle driveability, is incorporated into vehicles to eliminate the human error factor, which is the predominant cause of collisions and road accidents. Each ADAS consists of an array of sensors, ICs, detectors, passive components, and circuit protection devices providing a range of benefits to users.

Reliability is at the core of successful ADAS. As a set of safety systems, ADAS requires sensitive components with a high level of reliability and precision. As automobiles move towards fully automated driving, engineers need to design driving assistance systems offering excellent security for adaptive cruise control, V2X, collision avoidance, adaptive lighting, pedestrian avoidance mitigation systems, lane departure warning systems, and much more.

Engineers face several challenges while incorporating ADAS, including difficulty in sourcing high-sensitivity sensors, expensive components, complicated automotive wire harness design, compliance with automotive regulations, and space constraints. Leading automakers require systems with smaller components to meet size constraints as vehicular construction is consolidated to offer drivers new and improved features. AEC-compliant products are becoming the most desirable choice for ADAS designs across the board.

MPIAV2 inductors are highly reliable passive components compliant with stringent standards for electronic components in automobiles. Eaton's MPIAV2 inductors meet the AEC-Q200 standard by the Automotive Electronics Council for passive electronic parts.

Eaton's MPIAV2 inductors offer higher power density in a compact footprint package measuring 2.7 mm x 2.2 mm with heights of 1.05 mm and 1.25 mm for the MPIA25V2 model. Meanwhile, the MPIA40V2 model has dimensions of 4.75 mm x 4.45 mm with heights of 1.2 mm, 1.5 mm, and 2.0 mm. All models are AEC-Q200 compliant with high-thermal resistance (operating temperature range from -40 °C to +125 °C). The MPIAV2 SMD package is magnetically shielded to ensure low EMI.

Eaton's MPIAV2 inductors can be utilized in a wide range of ADAS applications, including surveillance camera systems (night vision, basic & smart surround, rear and front view), 77-GHz automotive radar systems, facial recognition systems (e.g., driver drowsiness detection), power steering for emergency auto-braking/collision prevention, adaptive cruise control (ACC), automatic parking control, and car black box.

Eaton's CC12H fuses provide overcurrent protection in various sections of automobiles where short-circuits could cause critical part failure, connector damage, or fire hazards.

These low-profile surface mount devices have dimensions of 3.2 mm x 1.6 mm with high inrush withstand capability, high I^2t value, and compatibility with solder reflow and wave soldering techniques. The fuses are AEC-Q200 compliant for suitability with various ADAS, offering overcurrent protection from 750 mA to 30 A.

CC12H SMD fuses can be used in a wide range of ADAS applications, including central body control modules, heating ventilation and air conditioning controllers (HVAC), doors, window lift, and seat control. Other possible features include digital instrument clusters, in-vehicle infotainment (IVI) & navigation systems, powertrain control module (PCM), engine control unit (ECU), transmission control unit (TCU), electric pumps, motor control, and auxiliaries. Designers can truly create their optimal design without sacrificing safety, efficiency, or size.

Eaton passive components offer complete solutions for ADAS at some of the most competitive prices in the industry. Each component features a low-profile design, high power-handling capability, excellent tolerance for temperature variance, and superior reliability.

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