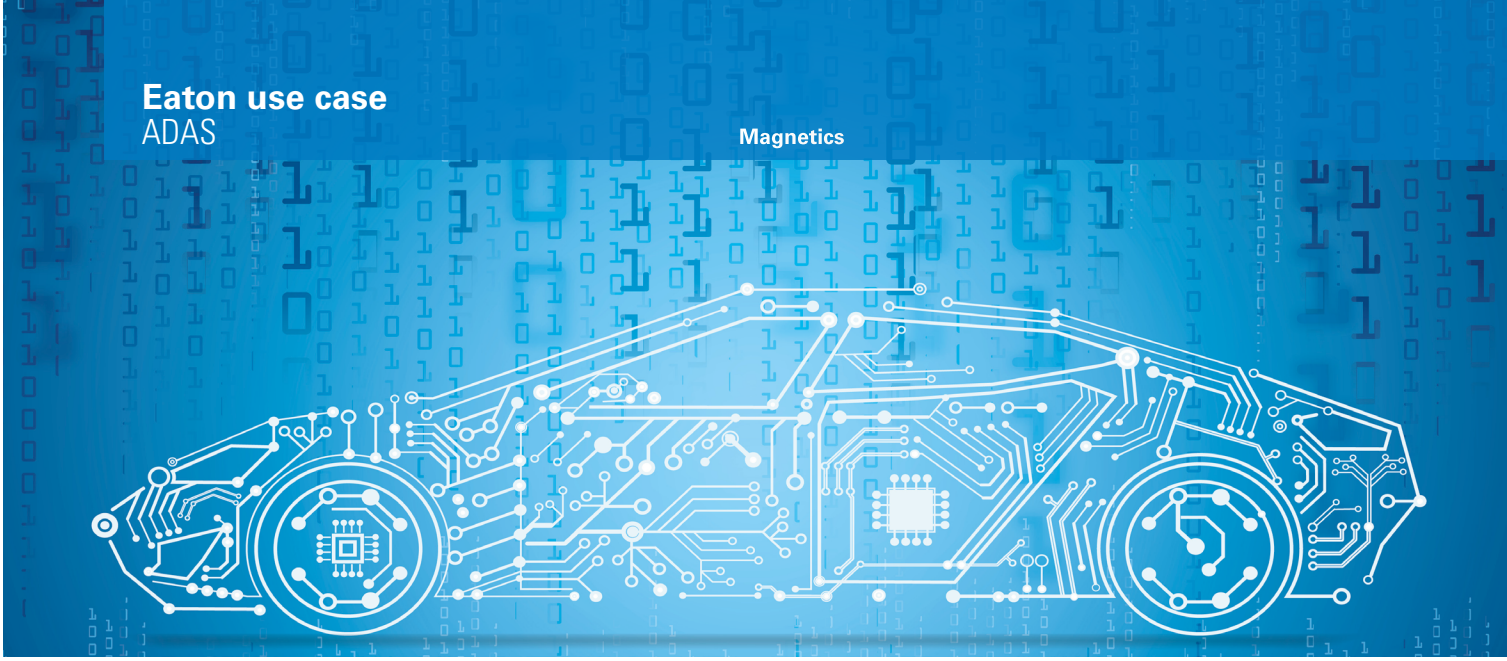
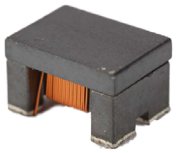
Eaton use case
ADAS

Magnetics



Eaton EMC chokes help vehicles think smarter and faster



Advanced Driver Assistance Systems (ADAS) provide a host of features which improve the safety, reliability, and drivability of modern vehicles. For example, predictive safety features such as lane departure warning systems notify a driver with audio or visual feedback when the car begins trailing off into another lane, and driver drowsiness detection monitors drivers' facial features to detect when they are becoming drowsy, advising them to take a break with audio or visual notifications.

To provide connectivity for these 'smart' vehicles, automakers are integrating Controller Area Networks (CAN)/FlexRay and Ethernet buses. These protocols provide the bandwidth required for high-speed data devices such as sensors, cameras and which is vital for safety and reliability in vehicular automation.

Automotive CAN and FlexRay systems enable in-vehicle connectivity using an array of devices and microcontrollers that communicate with each other in real-time independent of a host computer. They are suited for powertrains and related mechanisms enabling electronic power steering, anti-lock braking, and similar functions. Ethernet is a comparable protocol particularly suited to ADAS due to its higher bandwidth capability (up to 100 Mbps). It is utilized throughout the vehicle to link the various components to electronic control units (ECUs).

With increasing electrification of ancillary systems in autonomous cars, reliable electrical noise immunity is more critical than ever to receive, process and transmit electronic signals and data. New advanced automotive electronics architectures are requiring more ECUs in confined spaces that can communicate faster and reliably anywhere in the vehicle. Extensive wiring networks can induce also crosstalk between components, leading to malfunction and failure. EMI in ECUs of vehicles can cause high attenuation of data signals, compromising transmission, reception and processing of electronic signals and data integrity.

Electrical noise intrusion can be addressed at the design stage by integrating EMI shielding/ filtering to those vehicle systems handling sensitive electronic signals and data. Passive components such as common mode chokes (CMC) can effectively filter unwanted interference or signal attenuation by allowing magnetic flux to create an opposing field, blocking the interference or noise. CAN/Ethernet common mode chokes from Eaton provide automotive EMI shielding in power steering, LED lighting, battery management systems and more.

Eaton ACE1V CAN/Ethernet chokes are available in EIA 0805 (2012 metric), 1210 (3325 metric) and 1812 (4532 metric) industry sizes. The common mode chokes are wire-wound with inductances ranging from 11 uH to 100 uH, while the Ethernet bus choke features a multilayer construction with an inductance of 200 uH. Both products ensure excellent EMI filtering with low parasitic (stray) capacitance in a broad range of automotive applications including CAN/ Ethernet modules, Automotive FlexRay, BroadR-Reach® and Infotainment systems for ADAS. Eaton ACE2V family is ideal for OPEN Allaince applications. The products are AEC-Q200 qualified for superior reliability in automotive applications, RoHS compliant and manufactured with eco-friendly materials.

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