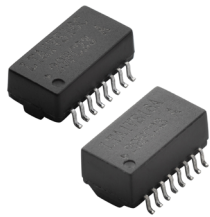


Use case

Eaton automotive LAN transformer module LTA1V



Eaton automotive LAN transformer modules enhance ADAS capability using Ethernet 10/100BASE-T protocols

Advanced driver assistance systems (ADAS) in modern vehicles represent a significant stride in the evolution of automotive technology, equipping vehicles with features that enhance safety, improve driveability, and elevate driver and passenger comfort. From lane departure warning to adaptive cruise control and autonomous parking, ADAS rely on a plethora of internal electronics, sensors, and real-time data to function correctly.

With bandwidths ranging from 100 Mbps to 10 Gbps and beyond, Ethernet has emerged as the standard of choice to handle the vast streams of data from high-resolution cameras, LIDAR, and other sensors. Automotive Ethernet also supports advanced features

such as quality of service (QoS) and time-sensitive networking, crucial for the deterministic behavior required in vehicles.

The transition of vehicle communication systems to advanced Ethernet-based networks, such as 1000BASE-T1, emphasizes the need for components that can ensure reliable data transmission, given the bandwidth and speed requirements of ADAS. A significant challenge is the presence of noise (EMI) in communication lines, which can impair data transmission quality and reliability. In ADAS, noise causes data corruption by altering the bits transmitted over the Ethernet, leading to corrupted data packets. Retransmissions and error checks due to noise can

introduce delays, which can be hazardous for safety-critical functions. In extreme cases, noise can lead to system malfunctions or shutdowns. Using passive electronic components such as inductors and chokes, unwanted frequencies can be filtered out from the desired signal.

Eaton, a renowned leader in power management solutions, offers the LTA1V family ensuring noise-free, fast, and reliable data transmission in ADAS systems. Eaton's LTA1V is a comprehensive solution that combines a LAN transformer and a common mode choke into a single module. LTA1V provides signal decoupling from power lines and provides common-mode noise filtering for unshielded

transmit (Tx) and receive (Rx) lines. This product is AEC-Q200 tested and offers reliable interfacing between the PHY (physical layer) and connector in automotive 10/100BASE-T Ethernet applications. Eaton's LTA1V comes in a standard SMT size of 13 mm x 7 mm, fitting seamlessly into most LAN transformer PCB layouts. It is compliant with IEEE 802.3 standards for 10/100BASE-T fast data protocols. Eaton's LTA1V operates reliably in a temperature range of -40 °C to +125 °C, suitable for most automotive applications under the hood.

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