

EMC components TDK offers industry's first common mode filter for automotive Ethernet 10BASE-T1S

- The industry's first* common mode filter for automotive Ethernet 10BASE-T1S
- Construction designed to reduce line-to-line capacitance
- High reliability achieved by laser welding winding wires to metalizing terminals

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TDK Corporation (TSE: 6762) has announced the introduction of its new ACT1210E Series ($3.2 \times 2.5 \times 2.5 \text{ mm}$ (L x W x H)) of common mode filter for automotive Ethernet 10BASE-T1S. Mass production of this new common mode filter began in February 2023.

This product is the industry's first common mode filter for automotive Ethernet 10BASE-T1S. Adopting TDK's proprietary wire winding structure and optimal materials, this product achieves the industry's best high S-parameters (Scattering parameters) and a maximum line-to-line capacitance of 10 pF. The operating temperature range is from -40 to +125 °C. Laser welding winding wires to the metalizing terminals provides high thermal shock resistance and outstanding reliability.

Amid the recent increase in the attention being paid to the autonomous driving of automobiles, the installation of electronic control units (ECUs) relating to safety functions, including those for advanced driver-assistance systems (ADAS) is increasing. Among the Ethernet telecommunication standards, 10BASE-T1S is unique in its support of multidrop topologies which enables multiple ECUs to be connected. In this respect, it differs from 100BASE-T1 and 1000BASE-T1, which support Peer-to-Peer telecommunication only. More and more customers are now considering shifting from the CAN, CAN FD and Flex-Ray standards, which are currently commonly used because they support multidrop connections, to Ethernet systems to achieve a uniformity of standards. The new product will demonstrate its characteristics are suited to these needs and contribute to improving the quality of telecommunication and suppressing noise.

TDK has an extensive lineup of common mode filters for automotive applications, including not only filters that are compliant with the current mainstream CAN, CAN FD and Flex-Ray protocols but also filters compliant with Ethernet protocols, such as 100BASE-T1 and 1000BASE-T1 for telecommunication speeds of 100 Mbps and 1 Gbps respectively. Moving forward, TDK will continue catering to the needs of customers by providing comprehensive product services for common mode filters for automotive communication.

* As of February 2023, according to TDK

Glossary

- Ethernet: a group of telecommunication protocols for wired local area networks
- ECU: Electronic control unit
- S-parameters (Scattering parameters): Parameters representing the level of reflection and transmission of signal power input to circuits
- Peer to peer: A model of data communication between two ECUs in a one-to-one connection



Main applications

• Automotive Ethernet telecommunication systems (10BASE-T1S)

Main features and benefits

- The industry's first* common mode filter for automotive Ethernet 10BASE-T1S
- Construction designed to reduce line-to-line capacitance
- High reliability achieved by laser welding winding wires to metallizing terminals
- Compliant with AEC-Q200 Rev. D

Key data

Туре	Inductance [μH] at100 KHz, 100 mV	DC resistance [Ω] max.	Insulation resistance [MΩ] min.	Rated current DC [mA] max.	Line-to-line capacitance [pF] max.	Rated voltage DC [V] max.
ACT1210E-241-2P-TL00	240 +50 %/- 20%	4.1	10	70	10	80

About TDK Corporation

TDK Corporation is a world leader in electronic solutions for the smart society based in Tokyo, Japan. Built on a foundation of material sciences mastery, TDK welcomes societal transformation by resolutely remaining at the forefront of technological evolution and deliberately "Attracting Tomorrow." It was established in 1935 to commercialize ferrite, a key material in electronic and magnetic products. TDK's comprehensive, innovation-driven portfolio features passive components such as ceramic, aluminum electrolytic and film capacitors, as well as magnetics, high-frequency, and piezo and protection devices. The product spectrum also includes sensors and sensor systems such as temperature and pressure, magnetic, and MEMS sensors. In addition, TDK provides power supplies and energy devices, magnetic heads and more. These products are marketed under the product brands TDK, EPCOS, InvenSense, Micronas, Tronics and TDK-Lambda. TDK focuses on demanding markets in automotive, industrial and consumer electronics, and information and communication technology. The company has a network of design and manufacturing locations and sales offices in Asia, Europe, and in North and South America. In fiscal 2022, TDK posted total sales of USD 15.6 billion and employed about 117,000 people worldwide.

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