

## **EMC** components

# TDK offers common mode filter for automotive Ethernet 10BASE-T1S

- First in the industry\* to achieve Class IV parasitic capacitance in the OPEN Alliance EMC test specification for common mode chokes
- · High reliability achieved by laser bonding winding wires to metal terminals
- Compliant with AEC-Q200 Rev. D

#### July 9, 2024

TDK Corporation (TSE:6762) announces that it has expanded its lineup of the ACT1210E Series ( $3.2 \times 2.5 \times 2.5 \text{ mm} - L \times W \times T$ ) of common mode filters for automotive Ethernet communication 10BASE-T1S. Mass production of this new common mode filter began this month, July 2024.

The new ACT1210E-131-2P-TL00 filter lowers the line-to-line capacitance by approximately 30% compared to conventional products. In the <u>OPEN Alliance EMC test specification for common mode chokes</u>, the part achieves Class IV status with the lowest parasitic capacitance - an industry first. The common mode inductance at 100 kHz is 130  $\mu$ H, and the rated current is 70 mA.

The communication circuit of 10BASE-T1S has PHY, ESD suppression devices and other electronic components in addition to common mode filters, each of which has its own capacitance. As total capacity increases so does signal wave shape turbulence, which leads to disruptions in normal telecommunications. For this reason, engineers need to select components geared to low capacitance.

To achieve high S-parameters, the new product employs TDK's proprietary design structure and optimized materials to reduce the impact of signal distortions caused by capacitance and effectively dampen common mode noise. Additionally, the original high-precision automatic winding technology ensures stable quality and high reliability.

TDK has an extensive lineup of common mode filters for automotive applications, including not only filters that are compliant with the currently mainstream CAN, CAN FD, and FlexRay protocols but also 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 meeting the demands of customers by providing comprehensive product services for common-mode filters for automotive communication.

\*Source: TDK, as of July 2024

#### Glossary

- OPEN Alliance EMC test specification for common mode chokes: specification stipulating the recommended characteristics of common mode filters for automotive Ethernet
- Ethernet: a group of telecommunication protocols for wired local area networks

#### **Main applications**

Automotive Ethernet telecommunication systems (10BASE-T1S)



#### Main features and benefits

- Class IV parasitic capacitance in the OPEN Alliance EMC test specification for common mode chokes achieve industry first
- High reliability achieved by laser bonding winding wires to metal terminals
- Compliant with AEC-Q200 Rev. D

#### Key data

Туре	Inductance [µH] at 100 kHz, 100 mV	DC resistance [Ω] max.	Insulation resistance [MΩ] min.	Rated current DC [mA] max.	Rated voltage DC [V] max.
ACT1210E-131-2P-TL00	130 + 50 % / -25%	2.9	10	70	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 2024, TDK posted total sales of USD 14.6 billion and employed about 101,000 people worldwide.

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