

EMC components

Miniaturized common-mode chokes for automotive Ethernet

- Compliant with standards of the OPEN Alliance for automotive Ethernet 1000BASE-T1
- Dimensions of only 3.2 x 2.5 x 2.4 mm
- Wide temperature range from -40 °C to +125 °C
- Qualified in accordance with AEC-Q200

May 19, 2020

TDK Corporation presents the ACT1210G-800-2P, a new type of common-mode choke that conforms to the standards of the OPEN Alliance (One-Pair Ether-Net) for 1000BASE-T1. Thanks to the high values of the S-parameters, a high amplitude ratio is created between differential and common-mode levels – a decisive factor for signal integrity in the automotive Ethernet. The common mode inductance at 100 kHz is 80 µH, and the maximum permissible current is 70 mA. Volume production began in May 2020.

Thanks to a metal frame for the connecting electrodes, the choke offers excellent thermal behavior, enabling it to be used within a wide temperature range from -40 °C to +125 °C. The new component is manufactured in a highly automated and extremely precise winding process which achieves high reliability and minimal scatter of the electrical parameters.

One particular feature is the compact size, with measurements of just 3.2 x 2.5 x 2.4 mm, significantly less than those of CAN-Bus or FlexRay chokes. This means that the new choke can be used, for example, in automotive camera systems featuring an ever-increasing packing density of components.

TDK will extend the permissible temperature range of its common-mode chokes and expand the product portfolio, including the products for high-speed communication so that it can serve even more automotive applications.

Main applications

- Automotive Ethernet based on 1000BASE-T1

Main features and benefits

- Compliant with standards of the OPEN Alliance for automotive Ethernet 1000BASE-T1
- Wide temperature range from -40 °C to +125 °C thanks to a metal frame for the connecting electrodes
- High reliability and minimal scatter of the electrical parameters due to a highly automated and extremely precise winding process
- Qualified in accordance with AEC-Q200

Key data

Type	Common-mode inductance at 100 kHz [μ H]	DC impedance [Ω]	Insulation resistance [$M\Omega$]	Rated current [mA]	Rated voltage [V]
ACT1210G-800-2P	80 (+50/-30%)	2.4 max.	10 min.	70 max.	80 max.

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 2020, TDK posted total sales of USD 12.5 billion and employed about 107,000 people worldwide.

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