

Inductors

TDK launches wire-wound inductors for high-current automotive power-over-coax (PoC) applications

- Compatible with high currents of up to 1650 mA
- Ensures high impedance across a broad frequency range
- Suitable for high temperature environments; supports a wide operation range of -55 °C and +155 °C

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TDK Corporation (TSE: 6762) announces the expansion of the ADL4532VK series (4.5 x 3.2 x 3.2 mm; L x W x T) of wire winding inductors for automotive power-over-coax (PoC). Mass production of these new components began in February 2025.

Advanced driver-assistance systems (ADAS) are designed to enhance vehicle safety by using automotive cameras and sensors that monitor the driving environment. These systems rely on multiple cameras, typically installed at the front, rear, and sides of the vehicle, to capture real-time imagery for safe and secure driving. In standard configurations, automotive cameras require two separate lines for power and signal transmission: a power line connected to the vehicle's battery and a signal line connected to the electronic control unit (ECU). However, with PoC technology, a single coaxial cable can simultaneously carry both power and data, simplifying and reducing cabling. This can reduce the vehicle's weight, which in turn can improve fuel efficiency and lower carbon emissions.

The PoC system requires a filter incorporating multiple inductors to effectively separate power from the data signal before processing. TDK's new ADL4532VK series delivers high impedance across a broad frequency range from tens of megahertz (MHZ) to hundreds of megahertz by using proprietary materials and structural design innovations. This reduces the number of inductors used, saving space. It is compatible with high currents of up to 1650 mA and meets the needs for high functionality, including not only the latest automotive cameras but also the infrared cameras and display. Additionally, the inductor ensures high reliability with an upper operation temperature limit of +155 °C thanks to product design assuming use in high-temperature environments.

Looking ahead, TDK is committed to developing inductors for automotive PoC applications by pursuing optimized design by refining multilayer, wire-winding, and thin-film technologies to address market needs. TDK will expand its lineup of products to improve the quality of PoC transmission signals.

Glossary

- PoC: Transmission technology whereby both data and power are simultaneously transmitted over the same coaxial cable
- ADAS: Advanced driver-assistance systems
- ECU: Electronic control unit

Main applications

PoC circuits for automotive

Main features and benefits

- Compatible with high currents of up to 1650 mA
- Suitable for high temperature environments; supports a wide operation range of -55 °C and +155 °C
- Ensures high impedance across a broad frequency range, helping to reduce the number of inductors used and save space

Type	Inductance @ 100 kHz [μH] ±20%	DC resistance (max.) [Ω]	I _{sat} (typ., 25 °C) [mA]	I _{temp} (typ., 105 °C) [mA]	I _{temp} (typ., 125 °C) [mA]
ADL4532VK-3R0M-TL000	3.0	0.125	2100	1650	1300
ADL4532VK-100M-TL000	10.0	0.235	1250	1200	940
ADL4532VK-160M-TL000	16.0	0.470	950	830	640

I_{sat} (25 °C): Current value based on inductance variation (30% lower than the initial inductance value)

I_{temp} (105 °C): Current value based on temperature increase (temperature increase of 50 K by self-heating)

I_{temp} (125 °C): Current value based on temperature increase (temperature increase of 30 K by self-heating)

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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