Inductors

TDK launches wide frequency range wire-wound inductors for automotive power-over-coax applications

- Wide frequency range beyond 1 GHz to enable high impedance characteristics
- Reduced footprint by minimizing the number of power-over-coax (PoC) filter inductors to one component
- Suitable for high temperature environments; supports a wide operation range of -55 °C and +155 °C

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TDK Corporation (TSE: 6762) has expanded its ADL4524VL series (4.5 x 2.4 x 2.6 mm – L x W x H) of wire-wound inductors for automotive power-over-coax (PoC). Mass production of these components began in July 2025.

With automotive PoC technology, a single coaxial cable can simultaneously carry both power and data. PoC is widely used in automotive camera systems as ADAS for safe driving has become more widespread. Using a single coaxial cable for power and signal lowers the vehicle's weight by reducing cabling, which in turn helps to improve fuel and power consumption. Simplified cabling within the vehicle also allows for a more effective use of the space.

The PoC system requires a filter incorporating multiple inductors to separate power from the data signal before processing effectively. This product enables high impedance at a wide frequency range from 10 MHz to 1 GHz with its proprietary materials and structural design innovation. This reduces the number of inductors used to save space. By covering a wide frequency range, this product can handle applications with fewer inductors. For example, where conventional solutions might require three inductors, this solution requires only one. The inductor ensures high reliability with an upper operation temperature range limit of +155 °C.

Looking ahead, TDK is committed to developing inductors for automotive PoC applications by pursuing optimized design by refining multilayer, wire-wound, 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

Main applications

- PoC circuits for automotive cameras

Main features and benefits

- Wide frequency range beyond 1 GHz to enable high impedance characteristics
- Reduced footprint through the use of fewer PoC filter inductors
- Suitable for high temperature environments; supports a wide operation range of -55 °C and +155 °C

Key data

Type	Inductance [µH] @100 kHz	DC resistance [Ω] (max.)	I_{sat} [mA] (typ.) +25 °C	I_{temp} [mA] (typ.) +105°C	I_{temp} [mA] (typ.) +125 °C
ADL4524VL-100M-TL000	10 ± 20%	0.60	660	600	510
ADL4524VL-180M-TL000	18 ± 20%	0.80	510	520	440

I_{sat}: 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 40 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. 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, software 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 2025, TDK posted total sales of USD 14.4 billion and employed about 105,000 people worldwide.

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