Inductors

TDK expands multilayer inductors for automotive Power-over-Coax circuits

- Suppresses the deterioration of the impedance when current flows
- Achieves high impedance at high frequencies
- Industry's smallest size* in multilayer inductors for Power-over-Coax circuits

November 19, 2024

TDK Corporation (TSE: 6762) announces expansion the MLJ1005-G series (1.0 x 0.5 x 0.5 mm; L x W x T) of multilayer inductors for automotive Power-over-Coax (PoC) circuits. Mass production of these new components began in November 2024.

Advanced driver assistance systems (ADAS) are designed to enhance vehicle safety by using automotive cameras and sensors that monitor the surrounding 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, streamlining the wiring. This reduction in cables contributes to vehicle weight reduction, which can improve fuel efficiency and lower carbon emissions, promoting a cleaner environment.

The PoC system requires a filter incorporating multiple inductors to effectively separate power from the data signal before processing. TDK's new MLJ1005-G series offers advanced features tailored to meet these demands. By using proprietary materials and structural design innovations, TDK has minimized impedance deterioration, ensuring reliable and high-quality signal filtration. Additionally, the MLJ1005-G series is optimized to support high-frequency performance, responding to recent increases in PoC data transmission speeds. At just 1.0 x 0.5 mm, this series is the smallest multilayer inductor for PoC circuits while supporting up to 480 mA of current.

Looking ahead, TDK is committed to developing advanced inductors for automotive PoC applications to meet evolving market requirements. By refining multilayer, wire-winding, and thin-film technologies, TDK aims to optimize product design, expand its PoC inductor portfolio, and contribute to enhancing PoC signal quality across automotive applications.

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*Source: TDK, as of November 2024

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 cameras

Main features and benefits

- Achieves high-quality filter characteristics by suppressing the deterioration of impedance while current flows
- Achieves high impedance at high frequencies
- Industry's smallest size in multilayer inductors for PoC circuits, contributing to a reduction of the amount of space required in the installation area

Key data

Type	Inductance [µH] ±25%	DC resistance (typ.) [Ω]	DC resistance (max.) [Ω]	Rated current (max.) [mA] at 105 °C	Rated current (max.) [mA] at 125 °C
MLJ1005WGHR27PTD25	0.27	0.53	0.69	480	400
MLJ1005WGHR36PTD25	0.36	0.66	0.86	430	300
MLJ1005WGHR47PTD25	0.47	0.88	1.15	350	250

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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