

Inductors

TDK develops downsized, compact, thin-film power inductors for automotive power circuits

- Compact size: 2.0 mm (L) x 1.25 mm (W) x 1.0 mm (H)
- Supports an operation range between –55 °C and +150 °C
- Increased robustness against mechanical stress due to the resin electrode structure and thermal shocks
- Compliant with AEC-Q200 Rev D

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TDK Corporation (TSE: 6762) has developed a series of thin-film metal power inductors for automotive power circuits. The new TFM201210ALMA inductors feature a mounting area downsized approximately 22 % from TDK's conventional product, TFM201610ALMA (2.0 mm (L) x 1.6 mm (W) x 1.0 mm (H)). Mass production will begin in August 2021.

Demand has recently increased in ECU* mounting for the electrification of various automotive controlling functions, autonomous driving, information communication and other purposes. Downsized inductors for power circuits contribute to space-saving in a mounting substrate, at a time when quick advances in ADAS** performance increase the number of components typically used in system architectures.

In addition to its compact dimension of 2.0 mm (L) x 1.25 mm (W), this series uses the TDK proprietary metallic magnetic material as its core material. The thin-film inductors support a wide range of operating temperatures from -55 °C to +150 °C, the highest level in the industry***. Moreover, it features increased robustness against mechanical stress, such as vibrations and shocks due to the resin electrode structure.

In addition to the new items, TFM series includes a lineup of products with a rated voltage of 40 V, allowing use on an automotive power circuit side directly connected with a 12 V battery.

*** Source: TDK, as of July 2021

Glossary

- *ECU: Electronic Control Unit
- **ADAS: Advanced Driver-Assistance Systems

Main applications

- Automotive camera module
- Communication module for V2X

Main features and benefits

- A compact size of 2.0 mm (L) x 1.25 mm (W) x 1.0 mm (H) to facilitate space saving
- Supporting an operation temperature range between –55 °C and +150 °C (including self-heating)
- Increased robustness against mechanical stress due to the resin electrode structure and thermal shocks

Key data

Type	Inductance [μH]	DC resistance [mΩ] max.	Isat* [A] max.	Itemp** [A] max.	Rated voltage [V]
TFM201210ALMAR56MTAA	0.56 ± 20 %	49	3.0	2.8	20
TFM201210ALMA2R2MTAA	2.2 ± 20 %	282	1.2	1.1	20

* Isat*: Current value based on inductance variation (30 % lower than the initial L value)

* Itemp**: Current value based on temperature increase (Temperature increase of 40 °C by self-heating)

* Rated current: Current value shall be IsatMax or ItempMax, whichever is less

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 2021, TDK posted total sales of USD 13.3 billion and employed about 129,000 people worldwide.

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