

Inductors TDK launches the industry's smallest thin-film power inductors

- Industry's smallest inductor for power circuits*
- Low-loss magnetic material for highly efficient power supply circuits
- · High-precision internal electrode formation using thin-film technology

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TDK Corporation (TSE:6762) announces the introduction of its new PLE856C Series (0.80 x 0.45 x 0.65 mm; L x W x T) of compact thin-film power inductors for wearable devices. Mass production of these new components began this month, in December 2024.

Increasing functionality and performance of wearable devices, such as wireless earbuds and smartwatches, has led to a higher number of components per system. However, the space in these devices remains limited, driving the demand for smaller electronic components. The PLE856C Series, featuring inductances from 470 nH to $1.5 \,\mu$ H, is the industry's smallest inductor used for power supply circuits in such devices, contributing to space-saving designs and lighter devices. In comparison to the conventional PLEA67B Series ($1.0 \, x \, 0.6 \, x \, 0.8 \, \text{mm}$; L x W x T), the new PLE856C Series boasts a 40% smaller mounted area and a 50% decrease in volume. The saturation currents are specified between 0.40 A and 0.72 A (typ.).

Despite their compact size, these products feature precisely formed coil conductor patterns acting as internal electrodes, achieved using TDK's proprietary thin-film technology. Moreover, the use of low-loss magnetic material helps reduce power losses and increase the efficiency of power supply circuits.

Moving forward, TDK will promote the development of high-performance inductors that are even smaller and better designed for wearable devices, capitalizing on the advantages of the thin-film technology and aiming to expand its power inductors in response to market needs.

* As of December 2024, according to TDK

Main applications

 True wireless stereo (TWS) earbuds, smartwatches, AR/VR devices, small power supply modules, small communication modules

Main features and benefits

- Industry's smallest size inductor for power supply circuits, contributing to space-saving device designs
- Low-loss magnetic material for highly efficient power supply circuits
- High-precision internal electrode formation using thin-film technology



Key data

Туре	Inductance [µH] ±20%	DC resistance (typ.) [mΩ]	DC resistance (max.) [mΩ]	I _{sat} (typ.) [A]	I _{sat} (max.) [A]	l _{temp} (typ.) [A]	I _{temp} (max.) [A]
PLE856CBAR47M-1PT00	0.47	180	210	0.72	0.62	0.90	0.80
PLE856CBA1R0M-1PT00	1.0	350	420	0.52	0.42	0.72	0.62
PLE856CCA1R5M-1PT00	1.5	450	520	0.40	0.33	0.62	0.52

I_{sat}: Current value based on inductance variation (30% lower than the initial inductance value) I_{temp}: Current value based on temperature increase (Temperature increase of 40 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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