Thermistors

TDK offers high-precision NTC chips for embedding into IGBT modules

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TDK Corporation (TSE:6762) presents the new L860 NTC thermistor chip which can be directly embedded into power modules and used within sintering and Al-heavy wire bonding. Its characteristics correspond to the common MELF-R/T curve with R_{100} of 493 Ω. The lead-free chip with ordering code B57860L0522J500 is designed for a wide temperature range of -55 °C to +175 °C, has dimensions of 1.6 x 1.6 x 0.5 mm.

Unlike conventional SMD NTC chips, the leadless NTC chip is mounted horizontally. For electrical bonding, the product is fitted on the bottom with a Ni/Ag thin-film electrode for sintering on the DCB (direct copper bonded) board of power modules, while the upper electrode comprises a Ni/Au thin-film electrode for aluminum wire bonding. Soldering processes are not necessary.

In contrast to other technologies, this solution establishes an outstanding thermal coupling of NTC chips to power modules, which, in turn, causes a very short response time and high-precision temperature measurement and control. The efficiency of power modules is typically highest when operating close to their power limits, however to operate at these limits, a precise temperature control is essential. Typical operating temperatures are in the range of 100 °C, but may slightly increase to 175 °C.

The L860 is suitable for integration into IGBT and IPM modules.

Main fields of application

- IGBT modules
- IPM modules

Main features and benefits

- Wide temperature range from -55 °C to +175 °C
- Low dimensions of just 1.6 x 1.6 x 0.5 mm
- Characteristics according to MELF-R/T curve
- Assembly through sintering and bonding

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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