New 1800V photorelay powers safer and more efficient high-voltage EV batteries

Device supports the BMS for 800V batteries for extending life and optimising the performance of EVs and ESS

Düsseldorf, Germany, 31st July 2025 – Toshiba Electronics Europe GmbH ("Toshiba") launches the TLX9165T, an automotive photorelay in a 10-pin SO16L-T package, that achieves an output withstand voltage of 1800V (min.). It is designed specifically to support the battery management system (BMS) for high-voltage, 800V electric vehicle (EV) batteries and battery energy storage systems (ESS).

The wider adoption of EVs is significantly dependent on improvements in charging times and an extended cruising range. Both of these factors necessitate more efficient operation of battery systems. Battery management systems (BMS) are integral to achieving this efficiency by monitoring the battery charge status and the insulation between the battery and the vehicle body, which is crucial for the safe use of high-voltage batteries. In BMS that handle high voltages, electrically isolated photorelays are essential. Similarly, energy storage systems (ESS), which are essential for the efficient operation of renewable energy, adopt a comparable BMS configuration.

Photorelays commonly used in these battery systems must withstand a voltage of approximately twice the system voltage; therefore, an output withstand voltage of over 1600V is required for an 800V system. Toshiba's new TLX9165T photorelay meets and exceeds this requirement. Equipped with a newly developed high-voltage MOSFET, it achieves an output withstand voltage of 1800V (min.). This capability makes it highly suitable for 800V systems.

The 10-pin SO16L-T package of the TLX9165T incorporates a resin with a Comparative Tracking Index (CTI) of 600 or higher, belonging to Material Group I of the international

standard IEC 60664-1. Furthermore, its pin configuration ensures a creepage distance of 7.5mm or more on the light receiver side, which allows for an operating voltage of 1500V. The pin pitch and configuration are also identical to Toshiba's existing SO16L-T packages (such as TLX9160T and TLX9152M), enabling the common use of PCB pattern designs.

The TLX9165T is a normally open (1-Form-A) device with an avalanche current rating of I_{AV}=0.6mA and a high isolation voltage of 5000V_{rms} (min.). It is AEC-Q101 qualified and fully compliant with the IEC 60664-1 international standard. Key applications for the TLX9165T include automotive equipment, particularly BMS for monitoring battery voltage, detecting mechanical relay sticking, and ground fault detection, as well as serving as a replacement for mechanical relays.

Please click on the links for more information on the TLX9165T photorelay and Toshiba's range of isolators, solid-state relays, and automotive devices.

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About Toshiba Electronics Europe

Toshiba Electronics Europe GmbH (TEE) offers European consumers and businesses a wide variety of hard disk drive (HDD) products plus semiconductor solutions for automotive, industrial, IoT, motion control, telecoms, networking, consumer, and white goods applications. Next to HDDs, the company's broad portfolio encompasses power semiconductors and other discrete devices ranging from diodes to logic ICs, optical semiconductors as well as microcontrollers and application specific standard products (ASSPs) amongst others.

In addition, TEE also offers SCiB™ battery cells and modules with lithium titanium oxide (LTO) for heavy-duty applications and Silicon Nitride (SiN) ceramic substrates used in power semiconductor modules, inverters, and converters for their heat dissipation characteristics and strength.

TEE has its headquarters in Düsseldorf, Germany, with branch offices in France, Italy, Spain, Sweden and the United Kingdom providing marketing, sales and logistics services.
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