



Six new DTMOSVI 600V series N-channel power MOSFETs with 4-pin TO-247-4L(X) package for enhanced efficiency

Innovative package design and optimised gate structure deliver significant performance improvements for critical power applications

Düsseldorf, Germany, 30th October 2025 – Toshiba Electronics Europe GmbH ("Toshiba") launches six new products featuring the DTMOSVI 600V series of N-channel power MOSFET chips, mounted in a 4-pin TO-247-4L(X) package. These advanced TKxxxZ60Z1 devices are designed to significantly reduce switching loss. They are suitable for a range of demanding applications, including servers in data centres, switched-mode power supplies (SMPS) for industrial equipment, and power conditioners for photovoltaic (PV) generators.

The DTMOSVI 600V series, featured in these new products, has been engineered with an optimised gate design and process. This optimisation has resulted in a reduction of the drain-source on-resistance ($R_{DS(ON)}$) per unit area by approximately 13%. Furthermore, the crucial figure of merit (FOM) for MOSFET performance, $R_{DS(ON)} \times$ gate-drain charge (Q_{gd}), has been reduced by approximately 52% compared to Toshiba's previous generation DTMOSIV-H series products with the same 600V drain-source voltage (V_{DS}) ratings. For example, the TK024Z60Z1 has a typical $R_{DS(ON)}$ of 20m Ω and Q_{gd} of 37nC. This translates into a better trade-off between conduction loss and switching loss, directly contributing to the high efficiency of switched-mode power supplies.

The new products incorporate a four-pin TO-247-4L(X) package, which includes a dedicated signal source terminal for the gate drive. This design enhancement significantly reduces the impact of switching due to the inductance of the source wire inside the package, a common issue in conventional three-pin packages. In three-pin packages, the inductance of the source wire generates a counter electromotive voltage that reduces the effective gate drive voltage, thereby slowing down the switching speed of the MOSFET. By contrast, the four-pin package connects the signal source terminal

close to the FET chip, thereby mitigating this effect and allowing the voltage applied between the gate and source to be approximately equal to the gate drive voltage. This enhancement improves the switching speed and enhances high-speed switching performance, contributing to the high efficiency required in applications such as servers, uninterruptible power supplies (UPS), and photovoltaic inverters. However, it is important to note that the TO-247-4L(X) package has a different appearance and dimensions compared to Toshiba's existing four-pin TO-247-4L package, as it features the cavity between the drain and source pins to increase creepage distance.

Toshiba continues to support circuit designers by offering a range of tools, including the G0 SPICE model for quick circuit function verification, and highly accurate G2 SPICE models that precisely reproduce transient characteristics.

Toshiba is committed to expanding its DTMOSVI 600V series lineup further, contributing to the ongoing improvement of power efficiency in electronic equipment.

For more information on the new products, please see the following pages.

[TK125Z60Z1](#)

[TK099Z60Z1](#)

[TK080Z60Z1](#)

[TK063Z60Z1](#)

[TK040Z60Z1](#)

[TK024Z60Z1](#)

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[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 offers SCiB™ battery cells and modules with lithium titanium oxide (LTO) for heavy-duty applications.

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.

Visit Toshiba's websites at www.toshiba.semicon-storage.com and www.scib.jp/en for further company and product information.

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