



Toshiba releases power MOSFETs with high-speed body diode that help to improve efficiency of power supplies

New additions to the latest generation DT MOS VI series with super junction structure

Düsseldorf, Germany, 9th April 2024 – Toshiba Electronics Europe GmbH (“Toshiba”) has launched a new range of 650V N-channel power MOSFETs. The TK042N65Z5 and TK095N65Z5 in TO-247 package are the first high-speed diode (HSD) type products in the latest generation DT MOS VI series. This generation has a super junction structure suitable for switching power supplies in demanding applications including data centres and power conditioners for photovoltaic (PV) generators.

The two new power MOSFETs use intrinsic high-speed diodes to improve the important reverse recovery characteristics to enhance bridge and inverter circuit applications.. Compared to the standard DT MOS VI products, the TK042N65Z5 and TK095N65Z5 achieve a 65% reduction in reverse recovery time (t_{rr}) with values of 160ns and 115ns respectively. Compared with Toshiba standard MOSFETs, the new products reduce the reverse recovery charge (Q_{rr}) by 88% and drain cut-off current at high temperatures by up to 90% (TK042N65Z5). Additionally, the key figure of merit (FoM) of “drain-source On-resistance \times gate-drain charge” ($R_{DS(ON)} * Q_{gd}$) has been reduced by approximately 72% compared with Toshiba’s existing TK62N60W5. These significant improvements reduce power losses of equipment, which helps efficiency. For example, in a 1.5kW LLC circuit the TK042N65Z5 shows around 0.4% improvement in power supply efficiency over the previous TK62N60W5.

The new TK042N65Z5 and TK095N65Z5 have $R_{DS(ON)}$ values of 42m Ω and 95m Ω , respectively. They are capable of delivering drain currents (I_D) up to 55A and 29A. Both devices are housed in a small TO-247 package.

A new reference design for an upgraded [1.6kW server power supply](#) is now available based upon the new TK095N65Z5 device. Toshiba also offers tools that support circuit design for switching power supplies. Alongside the G0 SPICE model, which verifies circuit function in a short time, highly accurate G2 SPICE models, which accurately reproduce transient characteristics, are now available.

In addition to the already released 650V and 600V DTMOS VI products, Toshiba will continue to expand its lineup of DTMOS VI with high-speed diodes to enhance switching power supply efficiency, contributing to energy conservation.

Read more about the new 650V N-channel power MOSFETs on Toshiba's website:

<https://toshiba.semicon-storage.com/eu/semiconductor/product/mosfets/400v-900v-mosfets/detail.TK042N65Z5.html>

<https://toshiba.semicon-storage.com/eu/semiconductor/product/mosfets/400v-900v-mosfets/detail.TK095N65Z5.html>

Shipments of both new devices start today.

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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 Toshiba's 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.

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

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