Gate driver photocouplers from Toshiba enhance MOSFETs and IGBTs switching efficiency in industrial equipment

Enhanced optical coupling efficiency and stable propagation delay benefit green energy and factory automation applications in severe thermal environments

Düsseldorf, Germany, 29th July 2025 – Toshiba Electronics Europe GmbH ("Toshiba") extends its lineup to control 1A and 6A class gate drive currents for small- to medium-capacity MOSFET and IGBT gate drives. The TLP579xH series meets the increasing demand for gate drivers that drive high-voltage power devices from the low-voltage control side through isolation, offering more accurate performance over a wide temperature range. The series is suitable for driving SiC MOSFETs and IGBTs in green energy and factory automation applications, including industrial photovoltaic (PV) inverters, uninterruptible power supplies (UPSs), and electric vehicle (EV) charging stations, which operate in harsh thermal environments.

All three devices in the TLP579xH series are designed to drive small to medium capacity power devices as well as IGBTs. The TLP5791H has a performance of -1.0/+1.0A for peak high-level/low-level output current (I_{OLH}/I_{OHL}), with an under voltage lock out (UVLO) threshold voltage (V_{UVLO+}) of 9.5V (max.), a UVLO threshold voltage (V_{UVLO-}) of 7.5V (min.), and a UVLO hysteresis voltage ($V_{UVLOHYS}$) of 0.5V (typ.).

With the TLP5794H, the peak output current spans from -6.0/+4.0A for I_{OLH}/I_{OHL}, with a V_{UVLO+} of 13.5V (max.), a V_{UVLO-} of 9.5V (min.), and $V_{UVLOHYS}$ of 1.5V (typ.).

The TLP5795H is capable of -4.5/+5.3A for peak high-level/low-level output current (I_{OLH}/I_{OHL}), with V_{UVLO+} of 13.5V (max.), a V_{UVLO-} of 11.1V (min.), and $V_{UVLOHYS}$ of 1.0V (typ.).

The propagation delay time exhibits low temperature dependence, enabling stable operation within the practical range defined by factory automation equipment. Additionally, the TLP579xH series is a rail-to-rail output device that enables switching characteristics with less voltage drop from the power supply voltage. This capability is

useful in applications that require circuits to operate at low voltages or to process signals across the entire range of supply voltages.

Furthermore, Toshiba has improved the light output of the input-side infrared light-emitting diode (LED) and optimised the design of the light-receiving element (photodiode array) in the device compared to the current lineup. These enhancements increase the optical coupling efficiency of the product, enabling it to operate within a temperature range of -40°C to +125°C. Toshiba has also standardised the propagation delay time and propagation delay skew within this operating temperature range.

The TLP579xH series is housed in a small SO6L package, contributing to improved flexibility in component placement on the PCB. In addition, the new products feature a minimum creepage distance of 8.0mm and an isolation voltage of 5000V_{RMS}, allowing them to be used in equipment that requires high isolation performance.

More information on the TLP579xH series of gate driver photocouplers can be found on Toshiba's website:
TLP5791H https://toshiba.semicon-storage.com/eu/semiconductor/product/isolators-solid-state-relays/detail.TLP5791H.html
TLP5794H https://toshiba.semicon-storage.com/eu/semiconductor/product/isolators-solid-state-relays/detail.TLP5794H.html
TLP5795H https://toshiba.semicon-storage.com/eu/semiconductor/product/isolators-solid-state-relays/detail.TLP5795H.html

Toshiba will continue to develop and expand its lineup of photocouplers for MOSFET and IGBT gate drive applications in industrial equipment, with further products scheduled for release later in 2025.

For precautions and tips when using a gate negative bias power supply, please refer to the application note "Gate Drive Coupler Notes on using power device gate negative bias power supply".

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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.
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.

Contact details for publication:
Toshiba Electronics Europe GmbH, Hansaallee 181, D-40549 Düsseldorf, Germany
Tel: +49 (0) 211 5296 0
Web: www.toshiba.semicon-storage.com/eu/company/news.html

Contact details for editorial enquiries:
Michelle Shrimpton, Toshiba Electronics Europe GmbH
Tel: +44 (0)7464 493526
E-mail: MShrimpton@teu.toshiba.de

Issued by:
Birgit Schöniger, Publitek
Tel: +49 (0)172 617 8431
Web: www.publitek.com
E-mail: birgit.schoeniger@publitek.com

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