



Toshiba introduces a pair of automotive N-channel MOSFETs to expand range

New devices in L-TOGL™ package offer excellent thermal performance

Düsseldorf, Germany, 21st March 2024 – Toshiba Electronics Europe GmbH (“Toshiba”) has launched two automotive N-channel power MOSFET devices to meet the growing demand for 48V batteries and systems within automotive applications including inverters, semiconductor relays, load switches, motor drives and more.

The automotive sector requires power semiconductors that offer high levels of reliability coupled with large drain current (I_D) ratings and excellent heat dissipation. This is especially true for devices used within traction inverters, battery management systems and junction boxes electric vehicles (EVs) and integrated starter generators (ISGs).

The new 80V XPQR8308QB and 100V XPQ1R00AQB are based upon Toshiba’s new U-MOS X-H process. This gives low levels of on-resistance ($R_{DS(ON)}$) with the XPQR8308QB measuring less than 0,83mΩ while the XPQ1R00AQB does not exceed 1,03mΩ. The devices are rated for I_D values of 350A (XPQR8308QB) and 300A (XPQ1R00AQB) continuously with pulsed values (I_{DP}) of 1050A and 900A respectively.

Supporting these low values, the L-TOGL™ package adopts a thick copper (Cu) clip-based leadframe structure that thermally and electrically connects the MOSFET die to the package leads. This reduces the package resistance by approximately 70% and channel-to-case thermal impedance ($Z_{th(ch-c)}$) by 50% compared with the TO-220SM(W) package. Together, the process and clip reduce losses and heat generation while creating a very thermally efficient solution.

Furthermore, the L-TOGL package uses compliant gull-wing leads which reduce mounting stress and improve the reliability of solder joints. It helps to ensure ECU reliability in automotive applications with harsh temperature conditions. Both devices are AEC-Q101 qualified for automotive applications.

MOSFETs are often connected in parallel to increase current capability – especially in automotive applications. To perform effectively, the MOSFET specifications must be closely matched, so Toshiba offers to ship devices grouped to within 0.4V based upon their gate threshold voltage.

Toshiba now offers four MOSFETs housed in the innovative L-TOGL package, including Toshiba's two existing 40V products, XPQ1R004PB and XPQR3004PB along with the products being announced today. Toshiba provides suitable products for automotive applications that increasingly require heavy currents, high power density, and excellent levels of robustness.

Visit Toshiba's website to find out more:

<https://toshiba.semicon-storage.com/eu/semiconductor/product/mosfets/12v-300v-mosfets/detail.XPQR8308QB.html>

<https://toshiba.semicon-storage.com/eu/semiconductor/product/mosfets/12v-300v-mosfets/detail.XPQ1R00AQB.html>

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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.

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) 4181 968098-13

Web: www.publitek.com

E-mail: birgit.schoeniger@publitek.com

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