Toshiba starts sampling new automotive SmartMCD with integrated MCU and gate driver for three-phase BLDC motor control

Features sensorless FOC technology for low-speed applications when used with PM-synchronous motors

Düsseldorf, Germany, 16th April 2026 – Toshiba Electronics Europe GmbH ("Toshiba") begins engineering sample shipments of the AEC-Q100 compliant TB9M030FG, a new addition to the SmartMCD™ series that integrates a microcontroller (MCU) and motor driver. The product is suitable for low-speed, sensorless field-oriented control (FOC) of brushless DC (BLDC) motors used in automotive applications, including electric water pumps, oil pumps, fans, and blowers.

In recent years, these automotive systems have been increasingly electrified, and the motors used need to achieve higher efficiency, lower noise, and a more compact form factor. In addition, as the number of installed electronic control units (ECUs) increases, reducing the number of components and minimising board space have become increasingly important. Together, these trends are driving growing demand for highly integrated devices that combine an MCU and a motor control gate driver. Sensorless control of three-phase BLDC motors presents challenges in accurately detecting rotor position at low speeds, creating a strong demand for high-performance sensorless FOC technology capable of delivering stable control from a standstill.

The TB9M030FG integrates a 32-bit MCU with an Arm® Cortex®-M0 core, 64kB flash memory and an additional 12kB of ROM and 4kB of RAM. The gate driver controls and drives the N-channel power MOSFETs for three-phase BLDC motor operation. The product also features a local interconnect network (LIN) transceiver and a power system that can operate at automotive battery levels. This highly integrated part is housed in a small QFP48 package, measuring 9mm × 9mm (typ.), enabling engineers to realise more compact system designs and reduce component count.

The product also incorporates Toshiba's vector engine co-processor, which supports short FOC cycle times, reduces CPU workload, and software program size in motor control applications. In addition, Toshiba's innovative sensorless control technology enables position FOC control from zero speed through the low-speed range when used with optimised PM-Synchronous motors, i.e. three-phase BLDC motors with magnetic anisotropy in the rotor (Ld ≠ Lq), allowing the generation of reluctance torque due to differences in magnetic reluctance within the motor. Compared with the conventional high-frequency injection method, in which the voltage (or current) signal is superimposed and injected into the motor to detect rotor position, this approach eliminates noise caused by harmonic injection and also leads to quieter motor operation. This enables more advanced and sophisticated motor control, making the product suitable for a wide range of automotive motor applications.

Toshiba will continue to expand the lineup of its SmartMCD™ series by incorporating the functions required for automotive systems, contributing to the miniaturisation of automotive systems and reducing component count.

For further information about the new TB9M030FG in the SmartMCD™ series, visit: https://toshiba.semicon-storage.com/eu/semiconductor/product/automotive-devices/detail.TB9M030FG.html

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Notes to editor:
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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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