TOSHIBA

1MB/512KB Flash Memory

Toshiba Releases New Microcontrollers with Expanded Code Flash Memory Capacity to Support Firmware Updates

New additions expand Toshiba's M4K and M4M groups of Arm® Cortex®-M4 MCUs for motor control

Düsseldorf, Germany, 26ᵗʰ March 2024 – Toshiba Electronics Europe GmbH ("Toshiba") strengthens the line up of low-power 32-bit microcontrollers in its TXZ+™ Family Advanced Class with the addition of sixteen new products with 1MB/512KB flash memory capacity and four types of packages. The newly released devices feature various interface and control options that contribute to advanced motor control functionality in consumer and industrial equipment.

All devices in Toshiba's M4K and M4M groups, including the newly released devices, feature an Arm® Cortex®-M4 core running up to 160MHz, integrated code flash and 32KB data flash memory with 100K program/erase cycle endurance.

These microcontrollers also offer functional blocks for field oriented control (FOC) of PMSM and BLDC motors such as advance-programmable motor driver (A-PMD), advanced encoder 32-bit (A-ENC32), advanced vector engine plus (A-VE+) and three units of high-speed and high-resolution 12-bit analog/digital converters. The 1MB code flash in the TMPM4KxF10AxxG and TMPM4MxF10AxxG devices is implemented in two separate 512KB areas, allowing instructions to be read from one area, while the updated code is programmed into the other area in parallel. This technique enables firmware rotation with the memory swap method for firmware over-the-air (FOTA) updates.

Devices in the M4K group have UART, TSPI and I²C integrated as general communication interfaces and the M4M group additionally has a CAN communication interface. The self-diagnosis functions incorporated in the devices for flash memory, RAM, ADC and Clock help designers achieve IEC 60730 Class B functional safety certification – a necessity for home appliances, such as washing machines, dishwashers and freezers. Other

applications for these microcontrollers include heat pumps and HVAC due to the possibility of driving up to three motors with a single MCU.

Documentation, sample software with actual usage examples, and driver software that controls the interfaces for each peripheral are available for free download from Toshiba's website. Depending on the communication and functionality integrated into the devices, package options include 87-pin I/O ports for 0.5mm pitch LQFP100 and 0.65mm pitch QFP100, or 51-pin I/O ports in the 10 x 10mm or 14 x 14mm LQFP64. Evaluation boards and development environments are provided in cooperation with various technology partners, including Arm® global ecosystem.

For more information about the M4K and M4M groups in Toshiba's TXZ+™ Family Advanced Class, please visit:
https://toshiba.semicon-storage.com/eu/semiconductor/product/microcontrollers/txz4aplus-series.html#M4K-Group

Notes:
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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 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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