PCIM 2023
Nuremberg,
9th - 11th May
Hall 9 Booth 503

Contributing to a sustainable future: Toshiba proves its power credentials at PCIM 2023

SiC-CUBE and robot arm demonstrations among highlights at the company's booth

Düsseldorf, Germany, 20th April 2023 – Toshiba Electronics Europe GmbH ("Toshiba") is fully prepared for this year's PCIM conference and exhibition (Nuremberg 9th – 11th May). The company will use the event to showcase its latest engineering advances in making industrial and automotive power systems more efficient. These will underline the instrumental role it will play in society's progression towards carbon neutrality.

Developed at the High Voltage Lab that Toshiba has established in Dusseldorf, the intention of the SiC-CUBE proof-of-concept is to accelerate power system implementation by leveraging parallelism. This totem-pole power factor correction (PFC) building block supports 22kW 3-phase operation. It is based on the company's latest wide bandgap technology - featuring its third generation SiC MOSFETs, as well as Schottky barrier diodes and smart gate drivers. By having such closely matched constituent components, it has been possible to deliver a fully optimized PFC reference design platform on which highly effective power systems can be developed. Its power switching boards, plus inductor and capacitor boards, are all connected

to a TMPM4K microcontroller board via individual bridge legs. The 3D stacking arrangement means major footprint savings are realized.

Achieving industry-leading power density, the SiC-CUBE has a compact 140mm x 140mm x 210mm form factor (which is then attached to a heatsink). Use of 650V-rated MOSFETs, rather than ones with 1200V ratings, presents a more cost-effective modular way of implementing PFC than competing solutions, with system bill-of-materials costs kept down. Thanks to the 3-level configuration, the voltage swing across each MOSFET can be restricted, so the power losses experienced are minimized. The coupling of DC-DC converter hardware to the PFC will result in creation of off-board EV charging infrastructure, while the addition of inverter hardware will address renewable energy generation requirements.

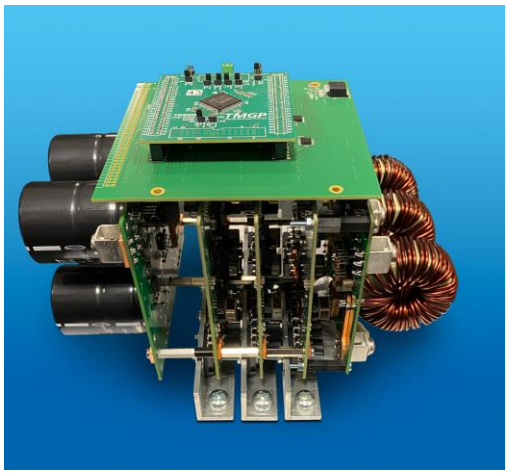

Photo caption:
Among the highlights of the Toshiba booth at will be the SiC-Cube proof-of-concept developed at the Duesseldorf Toshiba High-Voltage Lab. It supports the acceleration of power system design and their implementation.

Alongside SiC-CUBE, there will be a multi-axis robot arm demonstration. This will also rely on one of Toshiba's TMPM4K motor control MCUs (and accompanying software) for smooth, high-precision FOC-based movement, with 3 motors being driven simultaneously. It also utilizes cutting-edge MOSFET, photocoupler and voltage regulator technology.

Toshiba staff will be available to help visitors coming to the booth - discussing their power system applications (from e-mobility, industrial motor drives and robotics, through to solar installations), then recommending the best solutions to the challenges they face. Several of the company's representatives are also due to be participating in the conference program, with a series of in-depth speeches covering a broad variety of power-related topics. These are:

Tuesday 9th - Development of Ag-Free Active Metal Brazing Filler for Manufacturing Copper-Si3N4 Substrates
Tuesday 9th - Current Adjustable Gate Drive IC with Propagation Delay Reduction Technique for High-Speed Power Transistors
Tuesday 9th - Multi-Level SiC Power Design for PFC and DC/DC Conversion
Thursday 11th - Novel 2200V Schottky Barrier Diode-Embedded SiC MOSFET Module

Thursday 11th - Mixed-Signal Gate Driver IC and Control Schemes for Modern Power Semiconductor Devices

More details on these speeches can be found at: https://toshiba.semicon-storage.com/eu/company/exhibition/articles/exhibition_PCIM2023.html

Learn all about SiC-CUBE and Toshiba's other new power innovations by visiting Hall 9 Booth 503 at PCIM 2023.

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About Toshiba Electronics Europe
Devices and Storage Corporation. TEE offers European consumers and businesses a wide variety of innovative 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.

TEE has headquarters in Düsseldorf, Germany, with branch offices in France, Italy, Spain, Sweden and the United Kingdom providing marketing, sales and logistics services. The company president is Mr. Tomoaki Kumagai.

For more company information visit TEE's website at www.toshiba.semicon-storage.com.

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