



Press Release

**Marelli launches proprietary full SiC power module
for electric and hybrid traction applications in motorsports**

The new technology enables conversion efficiencies of up to 99.5%, with smaller size and weight.

【March 4, 2021】

Leading global automotive supplier, Marelli, has launched the first power module for motorsports electric and hybrid traction applications completely developed in the company's Corbetta facility, fully based on Silicon Carbide (SiC) technology and using a new direct cooling solution. This leading-edge system will be the core building block for even more efficient, compact and lighter inverters.

The new module, called EDI (*Enhanced Direct-cooling Inverter*), was developed by **Marelli Motorsport** with the **Fraunhofer Institute for Reliability and Microintegration IZM** and features an innovative structural design that drastically reduces the thermal resistance between the SiC components themselves and the liquid coolant, thanks to a new baseplate-less solution. The result is an extremely compact power stage, which can exploit the efficiency advantage of Silicon Carbide, allowing vehicle designers more flexibility in packaging, cooling system design and minimized energy storage.

In comparison to a Silicon-based design of the same rating, the new technology enables conversion efficiencies of up to 99.5%, 50% reduction in weight and size and 50% higher heat dissipation into cooling system.

Over the last years, Silicon Carbide has proven to be a technology of choice for high voltage and high temperature power electronics devices such as inverters, being able to grant excellent performance in hybrid and full electric applications. The use of SiC Mosfet enables in fact smaller, lighter and more efficient solutions. These features become even more crucial when it comes to motorsports, where size, weight and efficiency are definitely major design drivers.

Produced in the clean room of Marelli Corbetta facility (Italy), the EDI power module has already successfully undergone a series of reliability qualification tests for motorsports mission profiles, to assess the robustness of the design when subjected to thermal cycles, switching tests, and pressure cycles.



This new significant achievement is a further step forward within Marelli ongoing commitment in the field of electric powertrain, which is focused on developments both for motorsport and road vehicles applications and can rely on the company's combined expertise in electric drives and thermal energy management systems.

“Being at the forefront of motorsports technologies requires a continuous drive for innovation, also based on a constant research for the most efficient materials and solutions” said **Riccardo De Filippi, Senior Vice President and CEO of Marelli Motorsport**. *“As Marelli Motorsport, our mission is to promote technological advancements that can first of all be decisive on racetracks, and at the same time enable next-generation technologies also for the road cars of tomorrow. Specifically, in the electric powertrain field, we can build on our strong experience as pioneers of cutting-edge solutions for F1 and Formula E, as well as early adopters of SiC technologies.”*

About Marelli

MARELLI is one of the world's leading global independent suppliers to the automotive sector. With a strong and established track record in innovation and manufacturing excellence, our mission is to transform the future of mobility through working with customers and partners to create a safer, greener and better-connected world. With around 60,000 employees worldwide, the MARELLI footprint includes 170 facilities and R&D centers across Asia, the Americas, Europe, and Africa, generating revenues of 13.6 Billion Euro (JPY 1,664 billion) in 2019.