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Diamond Electric Mfg. Co., Ltd.

Diamond Electric Develops Business Card-sized, Thin 1 kW Isolated Bidirectional DCDC Converter

- Smaller, Lighter DCDC Converters Seen Contributing to Spread of EVs, Smart Grids -

OSAKA (Japan) —Diamond Electric Mfg. Co., Ltd. developed a business card-sized, thin isolated bidirectional DCDC converter (IBDC) in December 2017. The technology can substantially downsize and reduce the weight of DCDC converters, which are essential for rechargeable batteries, and is expected to contribute to spreading electric vehicles (EVs) and smart grids.

In recent years, requirements of large-capacity batteries for EVs and smart grids are causing rechargeable batteries to have higher voltage. Therefore, demands are growing for higher-level isolation of DCDC converters to ensure safety and meet safety standards.

In response, Diamond Electric has developed the new IBDC by fully utilizing its unique controlling technology (for which a patent is pending). The IBDC combines both charger and discharger circuits.

By adopting high-frequency switching technology (up to 2MHz), Diamond Electric has developed an ultra-compact IBDC (93.5 mm x 60 mm x 10.5 mm excluding control circuit and heatsink).

Furthermore, the use of gallium nitride (GaN) power semiconductor enabled the achievement of high conversion efficiency (up to 95%) despite the high-frequency switching. By utilizing these technologies, the company expects to downsize the final product to 25% of other existing models.

Expected applications

EVs:

- Onboard chargers
- Onboard AC power supply

Smart grids:

- Battery system for household use
- EV stations (V2H)
- Uninterrupted power supply (UPS) system
- Portable battery system



Product specifications:

	Primary side	Secondary side
Output power	-1,000 to +1,000W (bidirectional)	
Voltage range	270 to 330V	270 to 330V
Current range	-3.7 to +3.7A	-3.7 to +3.7A
Conversion efficiency	Up to 95%	
Switching frequency	Up to 2MHz	
Dimension	93.5 x 60 x 10.5mm (excluding control circuit and heatsink)	

About Diamond Electric Mfg. Co., Ltd.

Listed on the Tokyo Stock Exchange (6895), the company is a leading manufacturer of ignition coils for automobiles, operating for 80 years. It also designs and manufactures a variety of DCDC convertors, such as power conditioners, onboard chargers and onboard DC/DC converters.

For details, please visit: <https://www.diaelec.co.jp/en/>

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