Fuji Electric
Innovating Energy Technology

7th Generation X Series
PrimePACK™

High Efficiency, Large Capacity IGBT Module Contributing to a Carbon Neutral Society

In recent years, renewable energies such as solar and wind power, are attracting attention as means of preventing global warming. As a result, there is a growing demand for smaller and more efficient power conversion systems and large capacity IGBT modules that can be installed in these renewable energy facilities. In order to meet these demands, we have commercialized the large capacity IGBT modules PrimePACK™ that applies our 7th generation X series low loss and high reliability technologies.

- **Higher efficiency of power conversion systems by lower losses**
  Reduces power loss by approximately 14% compared to conventional products
  * Comparison of conventional product (6th generation V Series PrimePACK™) and this product (7th generation X Series PrimePACK™)
- **Increases inverter output current**
  Continuous operating temperature T_{vjop} is increased from 150°C to 175°C. Inverter output current is increased by about 1.5 times.
- **Ensures high reliability by applying new materials**

Application examples: Motor drives, UPSs, solar power generation, and wind power generation, etc.

RoHS

X series 7G

MTET0-3481a-EN

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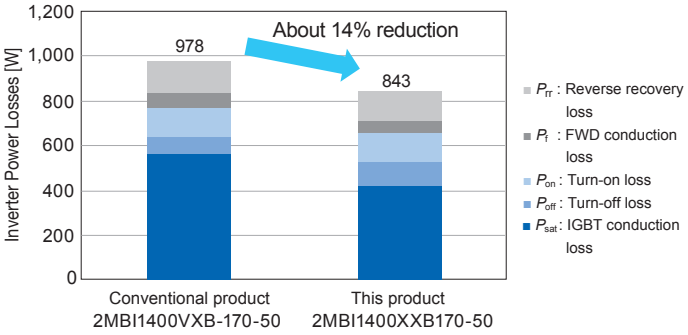
1. Low loss

This product applies X series IGBT technologies which optimized the chip' s surface structure and vertical structure. This result in approximately 14% reduction in loss at a carrier frequency of 1 kHz compared to conventional products. Thus, efficiency of power conversion systems can be improved.

Inverter loss comparison

Conditions: V_{CC}=900V, I_C=700A, f_C=1kHz, f_O=50Hz, R_G=+0.47Ω/-0.56Ω, pf=+0.9, m=1.0

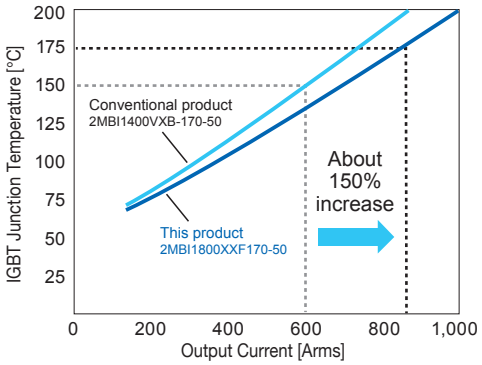


2. Increases output current

By applying the X series packaging technologies, chip temperature rise is suppressed and the continuous operating temperature is increased from 150°C to 175°C. This increases the output current by about 1.5 times when applied to inverter products, compared to conventional products.

Comparison of inverter output current and IGBT junction temperature

Conditions: V_{CC} = 900V, f_O=50Hz, pf = +0.9, m =1.0, T_a = 50°C



3. High reliability

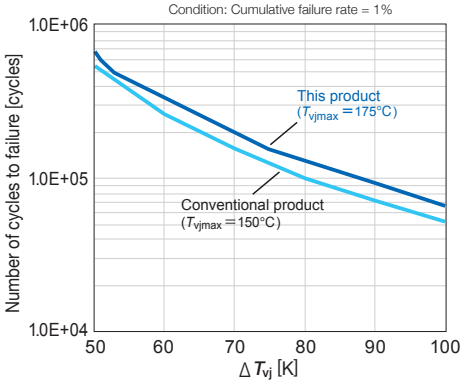
By applying the X series packaging technologies, tolerance to repeated thermal stress (ΔT_{vj} power cycling capability) at T_{vjmax} = 175°C is higher than conventional products at T_{vjmax} = 150°C.

[New materials and applied technologies for X Series packages]

- High thermal conducting AlN (aluminum nitride) insulating substrate
- High heat resistant silicone gel
- New solder material
- New wire bonding technology on semiconductor chips

ΔT_{vj} Power cycling capability comparison

Condition: Cumulative failure rate = 1%



Product series 1200 V/1700 V

Series Type	Package	Size [mm]	I_C					
			650A	900A 1000A	1200A	1400A	1800A	2400A
X Series PrimePACK™	 M271	89×172	1700V	1200V	1700V			
	 M272	89×250		1700V		1200V 1700V		
	 M291	89×250					1200V 1700V	RC-IGBT 1200V *1 *2 RC-IGBT 1700V *1 *2

*1 Under development *2 RC-IGBT (Reverse-Conducting IGBT) chip applied product

Note: PrimePACK™ is a registered trademark of Infineon Technologies.

⚠ Safety Precautions

＊Before using this product, read the "Instruction Manual" and "Specifications" carefully, and consult with the retailer from which you purchased this product as necessary to use this product correctly.

＊The product must be handled by a technician with the appropriate skills.

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URL www.fujielectric.com/products/semiconductor/

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