

## Contributing to noise reduction and energy savings in air conditioners, inverters, and servos

Fuji Electric has developed 3rd generation Small IPM's (Intelligent Power Module)<sup>\*1</sup> suitable for air conditioners, inverters, and servos. By applying and optimizing the 7th generation X series IGBT and FWD chip technology, these products reduce the noise levels generated during FWD reverse recovery operation compared to conventional products, while also reducing inverter losses. The rated voltage is increased from 600V to 650V. These developments contribute to lower noise and higher efficiency in systems equipped with these products.

\*1: IPM is a module which integrates a 3-phase inverter circuit, control circuit, and protection circuits.

- **Achieves low noise and low power loss**

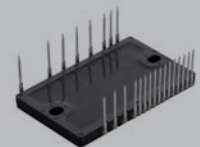
Low noise and low power loss

Reduced inverter loss and improved rated voltage ( $V_{CES} : 600\text{ V} \rightarrow 650\text{ V}$ )

- **Compact package compatible with conventional products**

Utilizes a high heat dissipation aluminum insulated substrate to guarantee high temperature operation ( $T_{vjop}=150^{\circ}\text{C}$ ,  $T_{vjmax}=150^{\circ}\text{C}$ )

Integrates various protection functions in a package with the same dimensions as conventional products



Package: P633C

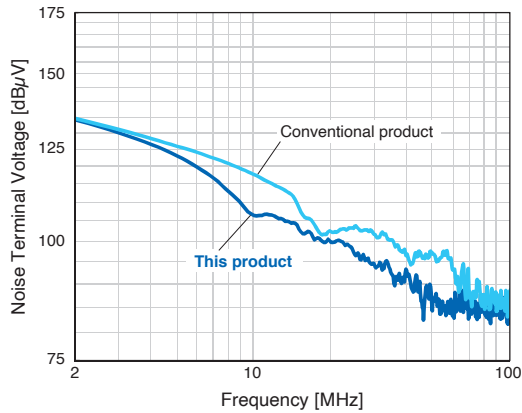
Applications: Air conditioners,  
servo amplifiers,  
industrial inverters, etc.

## 1. Achieves low noise and low power loss

By applying and optimizing the 7th generation X series IGBT and FWD chip technology, these products reduce the noise level generated during FWD reverse recovery operation compared to conventional products, while also reducing inverter losses. The rated voltage is increased from 600V to 650V. These developments contribute to lower noise and higher efficiency in systems equipped with these products.

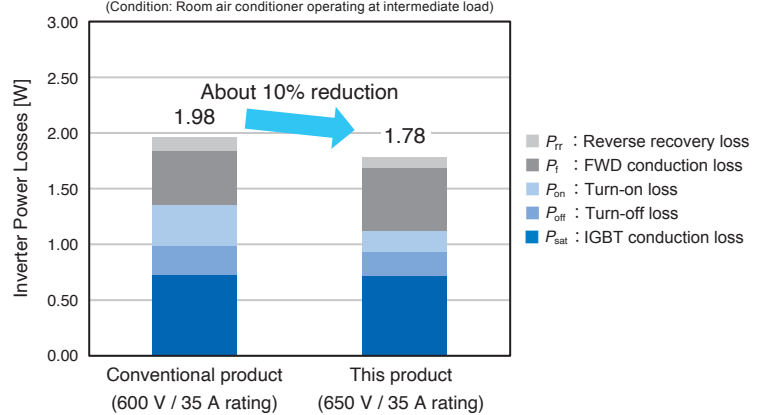
Comparison of noise levels during FWD reverse recovery operation

Conditions:  $V_{DC}=300\text{ V}$ ,  $I_C=0\text{-}90\text{ A}$ ,  $V_{CC}$ ,  $V_B=15\text{ V}$ ,  $T_{vj}=25^\circ\text{C}$



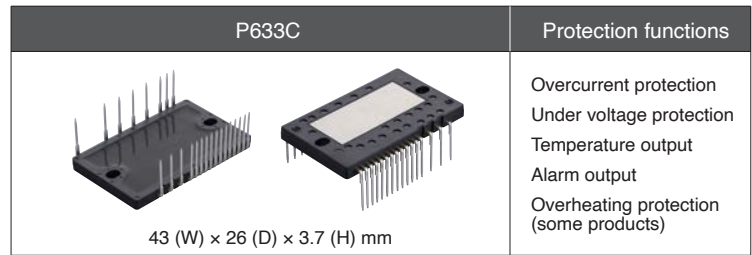
Inverter loss comparison

Conditions:  $V_{DC}=300\text{ V}$ ,  $I_O=3.3\text{ Arms}$ ,  $V_{CC}=15\text{ V}$ ,  $f_c=6\text{ kHz}$ ,  $f_O=50\text{ Hz}$   
(Condition: Room air conditioner operating at intermediate load)



## 2. Compact package compatible with conventional products

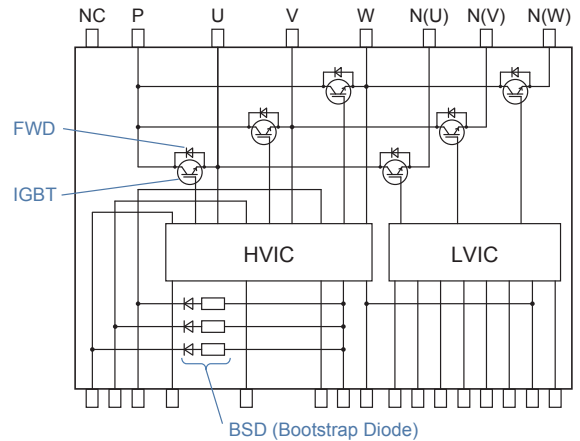
Utilizes a high heat dissipation aluminum insulated substrate to guarantee high temperature operation ( $T_{vjop}=150^\circ\text{C}$ ,  $T_{vjmax}=150^\circ\text{C}$ ). In addition, various protection functions are integrated into a package with the same external dimensions as conventional products to ensure compatibility with the conventional products.



### Product Line-up

Device type	Package	$V_{CES}$ (V)	$I_C$ (A)	Overheating protection function
6MBP15XSJ065-50	P633C	650	15	No
6MBP20XSJ065-50			20	
6MBP30XSJ065-50			30	
6MBP35XSJ065-50			35	
6MBP15XSK065-50			15	Yes
6MBP20XSK065-50			20	
6MBP30XSK065-50			30	
6MBP35XSK065-50			35	

### Internal equivalent circuit : P633C



### ⚠ 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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