

# IGBT Module for Hybrid Electric Vehicle

## High Reliability Pb Free Product

### ■ Features

- 600V/300A Compact Package for 2-pack & 6-pack
- Pb Free package
- 6th Generation IGBT chip with trench-gate FS
- Temperature & Current sensing Functions

### ■ Applications

- Inverter for Electric Propulsion System (10-20kW Motor)

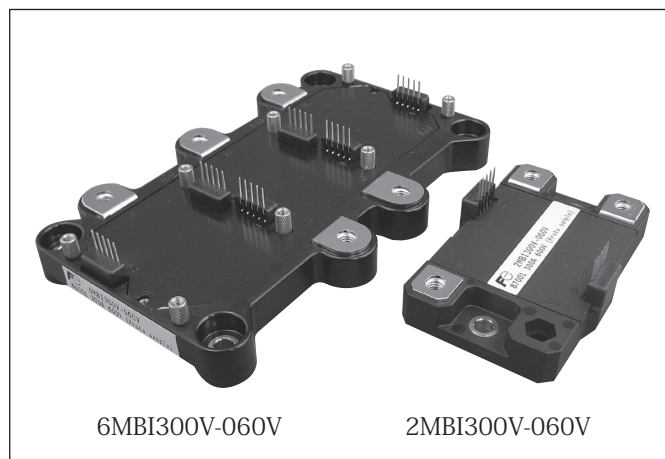
### ■ Specifications

- Absolute Maximum Rating  
(Tc=25°C unless otherwise specified)

| Item                              |                | Symbol           | Rating       | Unit |
|-----------------------------------|----------------|------------------|--------------|------|
| Collector-emitter voltage         |                | V <sub>CES</sub> | 600          | V    |
| Gate emitter voltage              |                | V <sub>GES</sub> | ± 20         | V    |
| Collector current                 | DC             | I <sub>c</sub>   | 300          | A    |
|                                   | DC             | -I <sub>c</sub>  | 300          | A    |
| Max. power dissipation (1 device) |                | P <sub>c</sub>   | tbd          | W    |
| Operating temperature             |                | T <sub>j</sub>   | 150          | °C   |
| Storage temperature               |                | T <sub>stg</sub> | -40 ~ +125   | °C   |
| Isolation voltage                 |                | Viso             | AC2500(1min) | V    |
| Screw torque                      | Mounting (M5)  |                  | 3.5          | Nm   |
|                                   | Terminals (M5) |                  | 3.5          | Nm   |

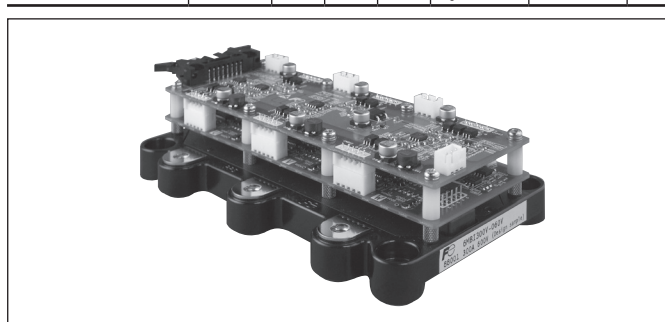
### ■ Evaluation Circuit Board for 6MBI300V-060V

- Optical isolated signal input, alarm output
- Detection of High Temperature
- Detection of Short circuit
- Detection of Low Voltage
- Temperature Output
- Drive-IC : Fuji Electric Products



- Electrical Characteristic  
(T<sub>j</sub>=25°C unless otherwise specified)

| Item                                 | Symbol                        | Value |      |      | Conditions                                   | Unit |
|--------------------------------------|-------------------------------|-------|------|------|--|------|
|                                      |                               | Min.  | Typ. | Max. |  |      |
| Zero gate voltage collector current  | I <sub>CES</sub>              | —     | —    | 2.0  | V <sub>GE</sub> =0V, V <sub>CE</sub> =600V   | mA   |
| Gate-emitter leakage current         | I <sub>GES</sub>              | —     | —    | 0.4  | V <sub>CE</sub> =0V, V <sub>GE</sub> = ± 20V | μ A  |
| Gate-emitter threshold voltage       | V <sub>GE(th)</sub>           | tbd   | 6.2  | tbd  | V <sub>CE</sub> =0V, I <sub>c</sub> =300mA   | V    |
| Collector-emitter saturation voltage | V <sub>CE(sat)</sub> terminal | —     | 2.05 | tbd  | T <sub>j</sub> =25°C                         | V    |
|                                      |                               | —     | 2.6  | —    | T <sub>j</sub> =125°C                        |      |
| Input capacitance                    | C <sub>ies</sub>              | —     | tbd  | —    | V <sub>GE</sub> =0V                          | pF   |
| Forward voltage of diode             | V <sub>F</sub> terminal       | —     | 1.9  | tbd  | T <sub>j</sub> =25°C                         | V    |
|                                      |                               | —     | 1.88 | —    | T <sub>j</sub> =125°C                        |      |



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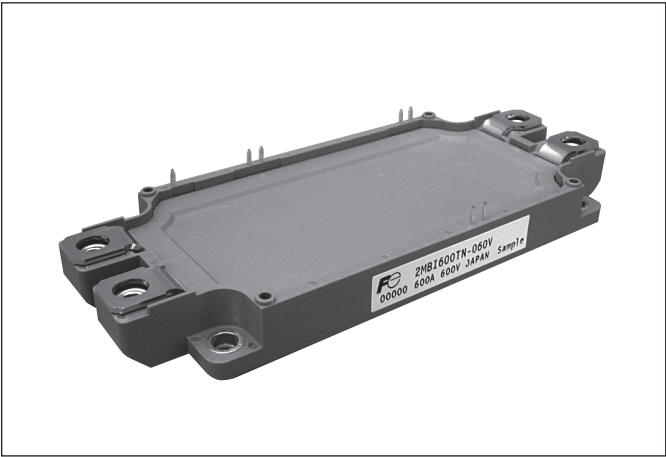
High Reliability Pb Free Product

## Features

- Compatible with the Industrial Package
  - Compact low profile
  - U2-series Planar-NPT technology for 600V
  - U4-series Trench-FS technology for 1200V
- Pb Free Package

## Applications

- Inverter for Electric Propulsion System 30 to 80kW Motor
  - Back Boost Converter



## Characteristics

(Tj=25°C)

| Device Type    | V <sub>CES</sub><br>Volts | V <sub>GE</sub><br>Volts | I <sub>C</sub><br>Continuous<br>Amps. | V <sub>CE(sat)</sub><br>Terminal<br>Typ. Volts | V <sub>F</sub><br>Terminal<br>Typ. Volts | Package |
|----------------|---------------------------|--------------------------|---------------------------------------|--|--|---------|
| 2MBI600TN-060V | 600                       | 20                       | 600                                   | 2.65   | 2.55                                     | M254    |
| 2MBI450UN-120V | 1200                      | 20                       | 450                                   | 2.40   | 2.20                                     | M254    |

## Evaluation Circuit Board

- Optical isolated signal input, alarm output
- Short circuit protection (V<sub>CE</sub> monitoring method)
- Low voltage protection for supplied voltage
- Drive-IC : Fuji Electric Products
- Potential - isolated power supply

