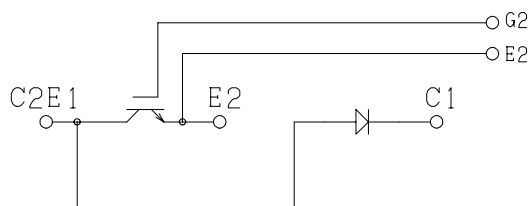


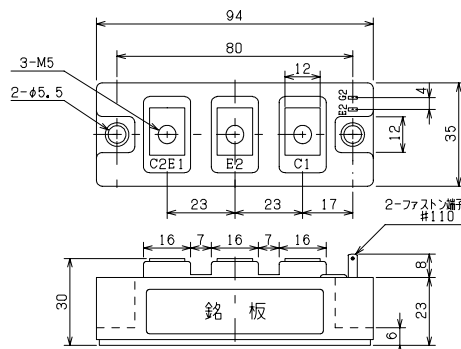
# IGBT MODULE Chopper 50A 600V

## PRHMB50A6

### CIRCUIT



### OUTLINE DRAWING



2- fasten- tab No 110

Dimension(mm)

### MAXMUM RATINGS (T<sub>c</sub>=25°C)

Approximate Weight : 220g

| Item                        | Symbol                       | PRHMB50A6        | 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>   | A    |
|                             | 1 ms                         | I <sub>CP</sub>  |      |
| Collector Power Dissipation | P <sub>C</sub>               | 250              | W    |
| Junction Temperature Range  | T <sub>j</sub>               | -40 to +150      | °C   |
| Storage Temperature Range   | T <sub>stg</sub>             | -40 to +125      | °C   |
| Isolation Voltage           | Terminal to Base AC, 1 min.) | V <sub>ISO</sub> | V    |
| Mounting Torque             | Module Base to Heatsink      | F <sub>TOR</sub> | N•m  |
|                             | Bus Bar to Main Terminals    |                  |      |

### ELECTRICAL CHARACTERISTICS (T<sub>c</sub>=25°C)

| Characteristic                       | Symbol               | Test Condition   | Min. | Typ. | Max. | Unit |
|--------------------------------------|----------------------|--|------|------|------|------|
| Collector-Emitter Cut-Off Current    | I <sub>CES</sub>     | V <sub>CE</sub> =600V, V <sub>GE</sub> =0V   | -    | -    | 1.0  | mA   |
| Gate-Emitter Leakage Current         | I <sub>GES</sub>     | V <sub>GE</sub> =+/- 20V, V <sub>CE</sub> =0V  | -    | -    | 1.0  | μA   |
| Collector-Emitter Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>C</sub> =50A, V <sub>GE</sub> =15V  | -    | 2.0  | 2.5  | V    |
| Gate-Emitter Threshold Voltage       | V <sub>GE(th)</sub>  | V <sub>CE</sub> =5V, I <sub>C</sub> =50mA  | 4.0  | -    | 8.0  | V    |
| Input Capacitance                    | C <sub>ies</sub>     | V <sub>CE</sub> =10V, V <sub>GE</sub> =0V, f=1MHz  | -    | 5000 | -    | pF   |
| Switching Time                       | Rise Time            | V <sub>CC</sub> = 300V<br>R <sub>L</sub> = 6 ohm<br>R <sub>G</sub> = 15.1 ohm<br>V <sub>GE</sub> = +/- 15V | -    | 0.15 | 0.3  | μs   |
|                                      | Turn-on Time         |  | -    | 0.25 | 0.4  |      |
|                                      | Fall Time            |  | -    | 0.2  | 0.35 |      |
|                                      | Turn-off Time        |  | -    | 0.45 | 0.7  |      |

### FREE WHEELING DIODES RATINGS & CHARACTERISTICS (T<sub>c</sub>=25°C)

| Item            | Symbol | Rated Value     | Unit |
|-----------------|--------|-----------------|------|
| Forward Current | DC     | I <sub>F</sub>  | A    |
|                 | 1 ms   | I <sub>FM</sub> |      |

| Characteristic        | Symbol          | Test Condition   | Min. | Typ. | Max. | Unit |
|-----------------------|-----------------|--|------|------|------|------|
| Peak Forward Voltage  | V <sub>F</sub>  | I <sub>F</sub> =50A, V <sub>GE</sub> =0V                 | -    | 1.9  | 2.4  | V    |
| Reverse Recovery Time | t <sub>rr</sub> | I <sub>F</sub> =50A, V <sub>CE</sub> =-10V, di/dt=50A/μs | -    | 0.15 | 0.25 | μs   |

### THERMAL CHARACTERISTICS

| Characteristic    | Symbol | Test Condition   | Min. | Typ. | Max. | Unit |
|-------------------|--------|------------------|------|------|------|------|
| Thermal Impedance | IGBT   | Junction to Case | -    | -    | 0.5  | °C/W |
|                   | DIODE  |                  | -    | -    | 1.0  |      |

## PRHMB50A6

Fig.1- Output Characteristics (Typical)

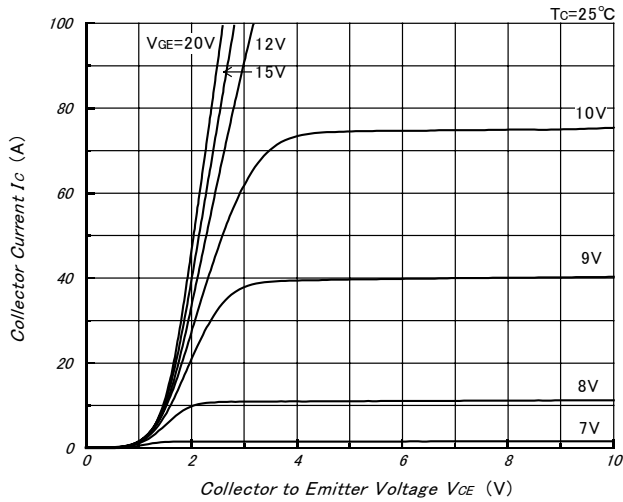


Fig.2- Collector to Emitter On Voltage vs. Gate to Emitter Voltage (Typical)

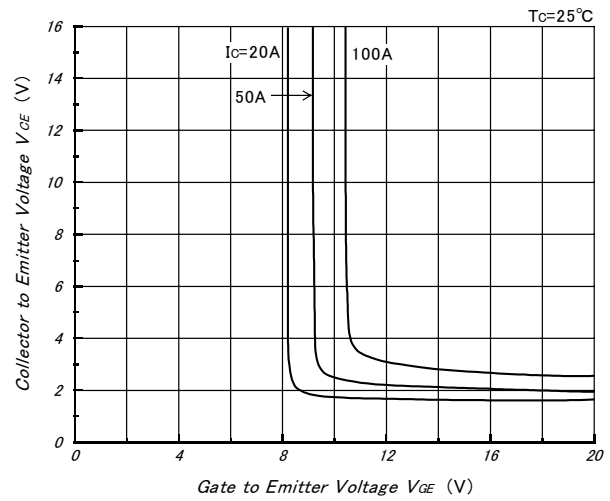


Fig.3- Collector to Emitter On Voltage vs. Gate to Emitter Voltage (Typical)

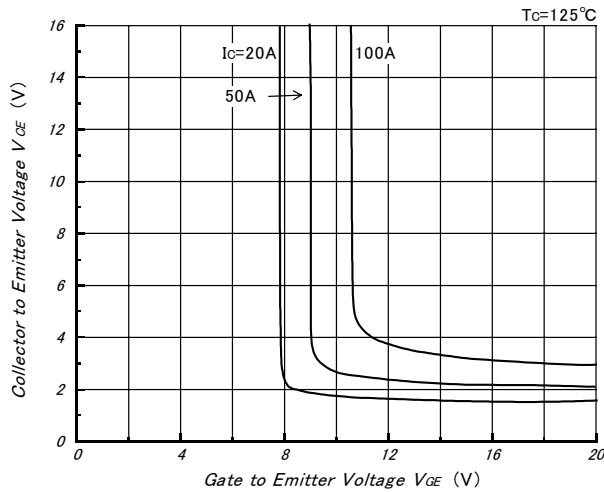


Fig.4- Gate Charge vs. Collector to Emitter Voltage (Typical)

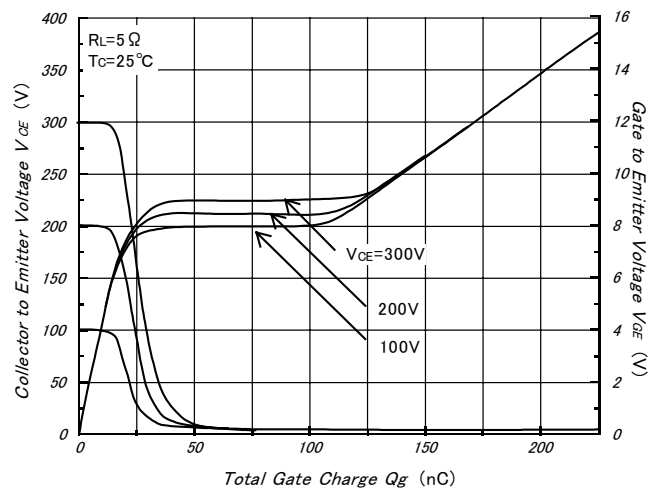


Fig.5- Capacitance vs. Collector to Emitter Voltage (Typical)

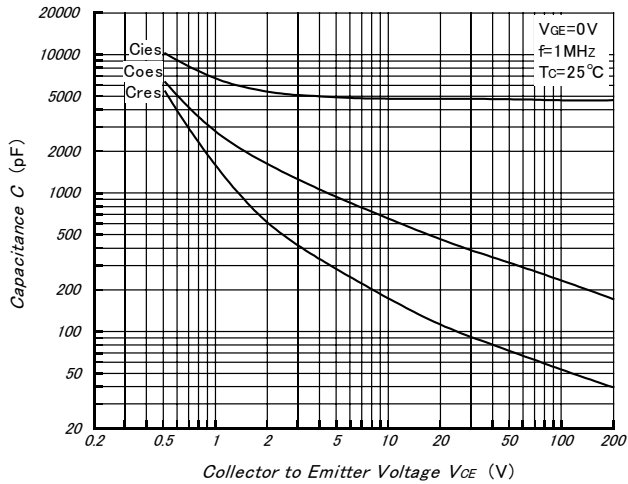
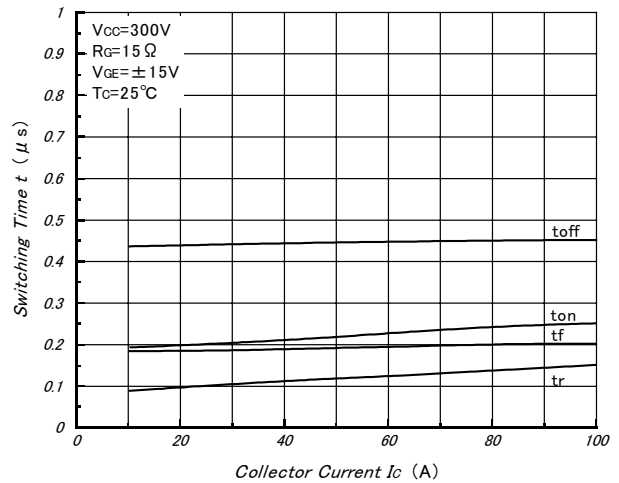


Fig.6- Collector Current vs. Switching Time (Typical)



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Fig.7- Series Gate Impedance vs. Switching Time (Typical)

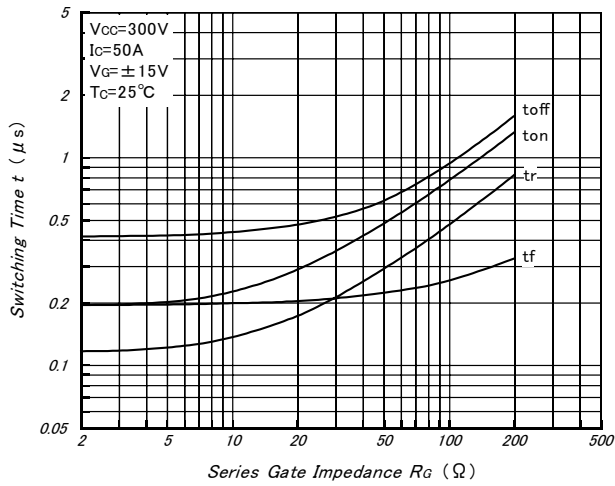


Fig.8- Forward Characteristics of Free Wheeling Diode (Typical)

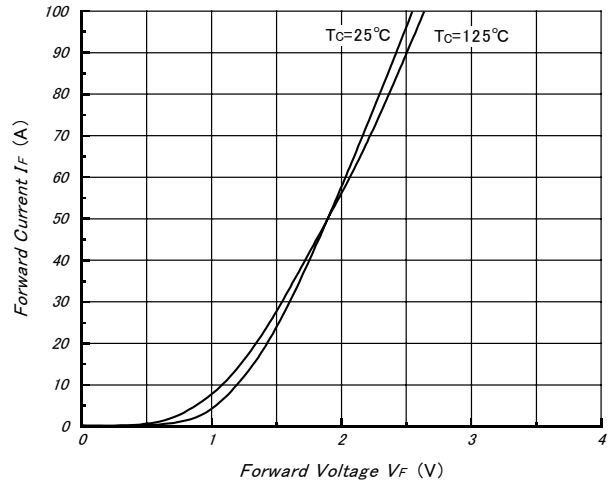


Fig.9- Reverse Recovery Characteristics (Typical)

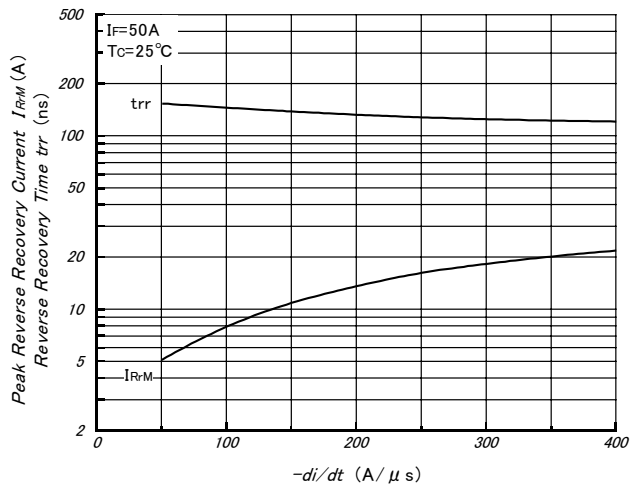


Fig.10- Reverse Bias Safe Operating Area (Typical)

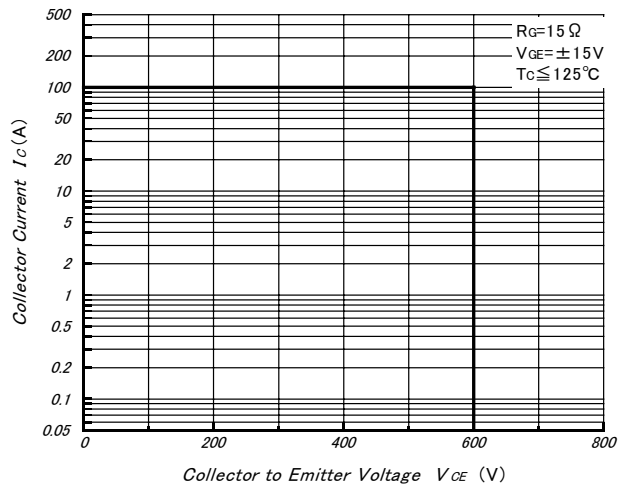


Fig.11- Transient Thermal Impedance

