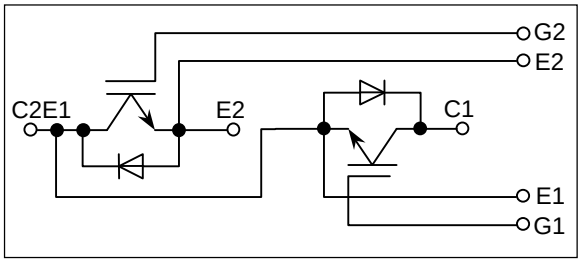
# MBM150GR6

***[Rated 150A/600V, Dual-pack type]***

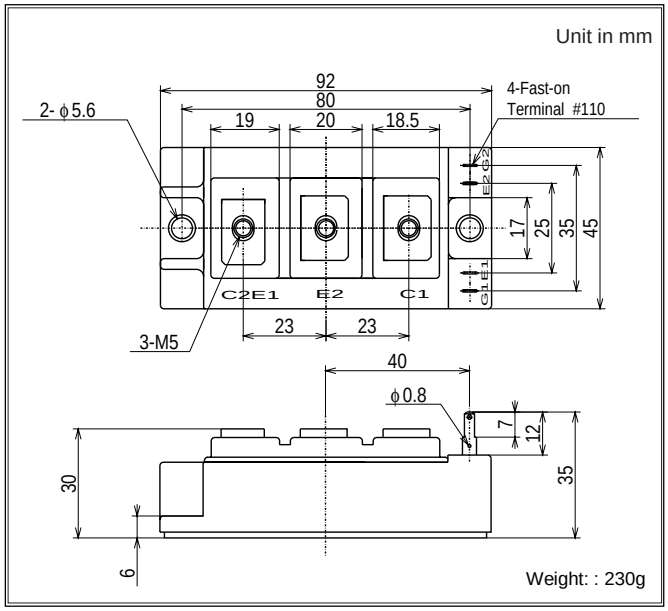
## FEATURES

- Low saturation voltage and high speed.
- Low turn-OFF switching loss.
- Low noise due to build-in free-wheeling diode. (Ultra Soft and Fast recovery Diode (USFD))
- High reliability structure.
- Isolated heat sink (terminals to base).

## CIRCUIT DIAGRAM




## OUTLINE DRAWING




## ABSOLUTE MAXIMUM RATINGS($T_C$=25°C)

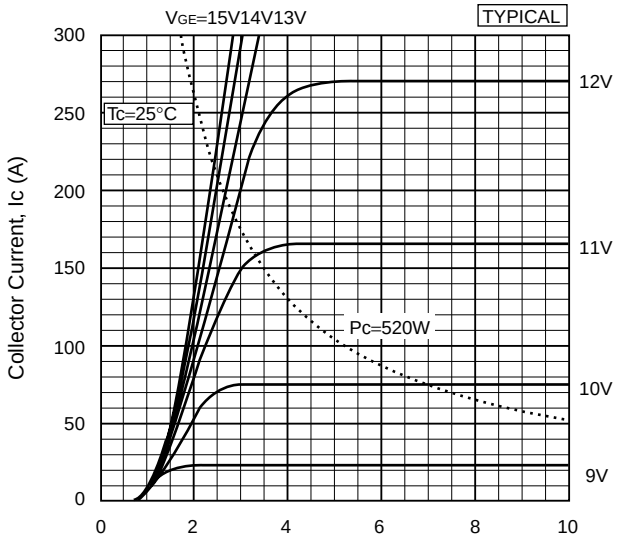
| Item | | Symbol | Unit | Value |
|---|---|---|---|---|
| Collector-Emitter Voltage | | $V_{CES}$ | V | 600 |
| Gate-Emitter Voltage | | $V_{GES}$ | V | ±20 |
| Collector Current | DC | $I_C$ | A | 150 |
| | 1ms | $I_{CP}$ | | 300 |
| Forward Current | DC | $I_F$ | A | 150 *1 |
| | 1ms | $I_{FM}$ | | 300 |
| Collector Power Dissipation | | $P_C$ | W | 520 |
| Junction Temperature | | $T_j$ | °C | -40 ~ +150 |
| Storage Temperature | | $T_{stg}$ | °C | -40 ~ +125 |
| Isolation Voltage | | $V_{iso}$ | $V_{RMS}$ | 2500(AC 1 minute) |
| Screw Torque | Terminals | – | N·m (kgf·cm) | 1.96(20) *2 |
| | Mounting | | | 1.96(20) *3 |

Notes; *1: RMS current of Diode ≤ 45 Arms
*2, *3 : Recommended value 1.67 N·m (17 kgf·cm)

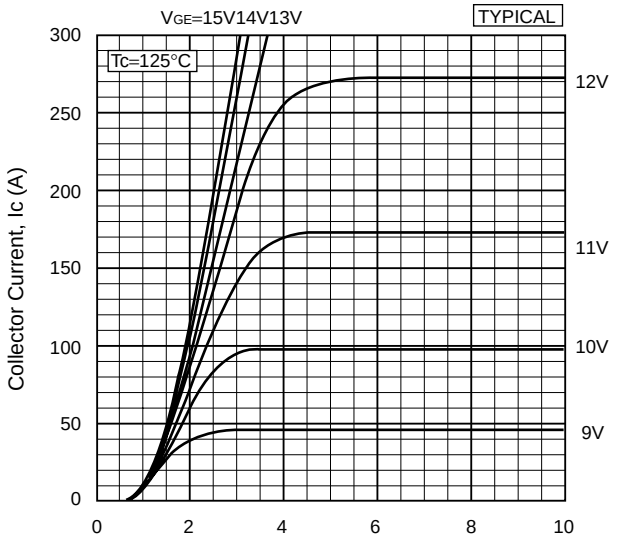
## CHARACTERISTICS ($T_C$=25°C)

| Item | | Symbol | Unit | Min. | Typ. | Max. | Test Conditions |
|---|---|---|---|---|---|---|---|
| Collector-Emitter Cut-Off Current | | $I_{CES}$ | mA | – | – | 1.0 | $V_{CE}$=600V, $V_{GE}$=0V |
| Gate-Emitter Leakage Current | | $I_{GES}$ | nA | – | – | ±500 | $V_{GE}$=±20V, $V_{CE}$=0V |
| Collector-Emitter Saturation Voltage | | $V_{CE(sat)}$ | V | – | 2.1 | 2.6 | $I_C$=150A, $V_{GE}$=15V |
| Gate-Emitter Threshold Voltage | | $V_{GE(TO)}$ | V | – | – | 10 | $V_{CE}$=5V, $I_C$=150mA |
| Input Capacitance | | $C_{ies}$ | pF | – | 7400 | – | $V_{CE}$=10V, $V_{GE}$=0V, f=1MHz |
| Switching Times | Rise Time | $t_r$ | μs | – | 0.2 | 0.5 | $V_{CC}$=300V, $R_L$=2.0Ω, $R_G$=16Ω *4, $V_{GE}$=±15V |
| | Turn-ON Time | $t_{on}$ | | – | 0.3 | 0.7 | |
| | Fall Time | $t_f$ | | – | 0.2 | 0.3 | |
| | Turn-Off Time | $t_{off}$ | | – | 0.55 | 0.8 | |
| Peak Forward Voltage Drop | | $V_{FM}$ | V | – | 1.6 | 2.2 | $I_F$=150A, $V_{GE}$=0V |
| Reverse Recovery Time | | $t_{rr}$ | μs | – | – | 0.3 | $I_F$=150A, $V_{GE}$=-10V, di/dt=200A/μs |
| Thermal Impedance | IGBT | $R_{th(j-c)}$ | °C/W | – | – | 0.238 | Junction to case |
| | FWD | $R_{th(j-c)}$ | | | | 0.51 | |

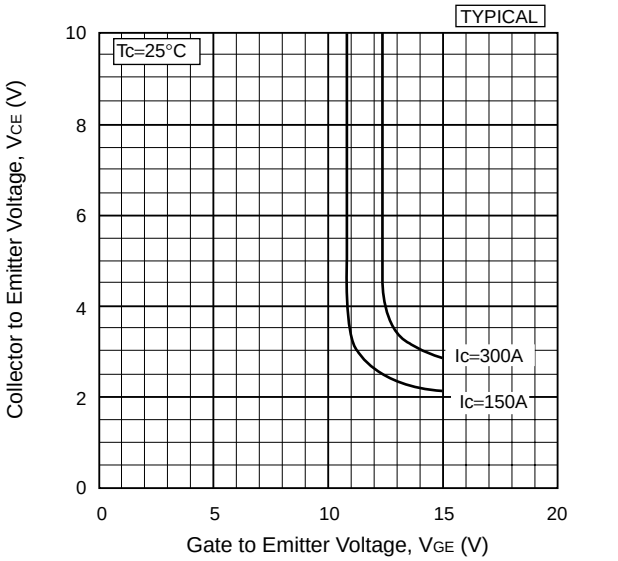
Notes; *4:$R_G$ value is the test condition's value for decision of the switching times, not recommended value, please determine the suitable $R_G$ value after the measurement of switching waveforms (overshoot voltage, etc.) with appliance mounted.
Remark; The specification given herein, is subject to change without prior notice to improve product characteristics.



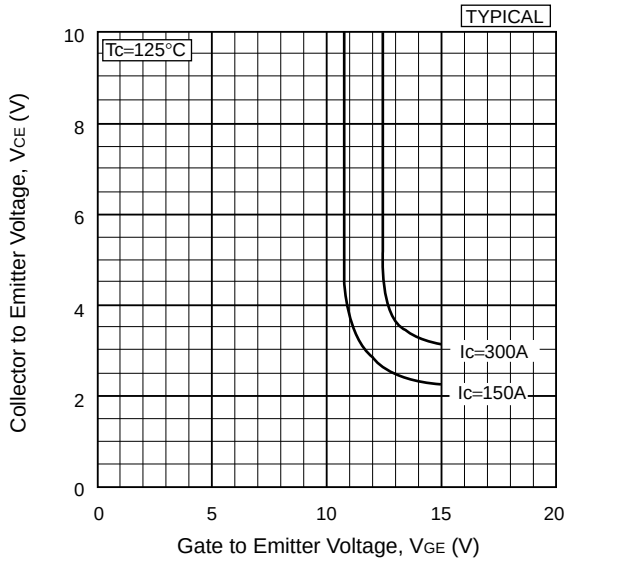

**Collector current vs. Collector to Emitter voltage**



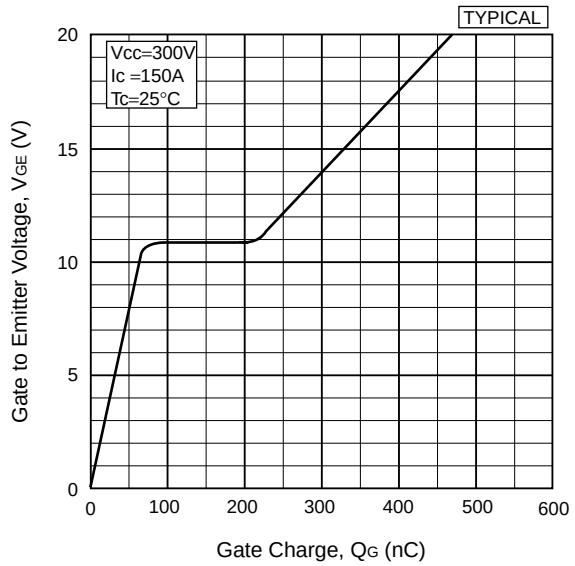

**Collector current vs. Collector to Emitter voltage**



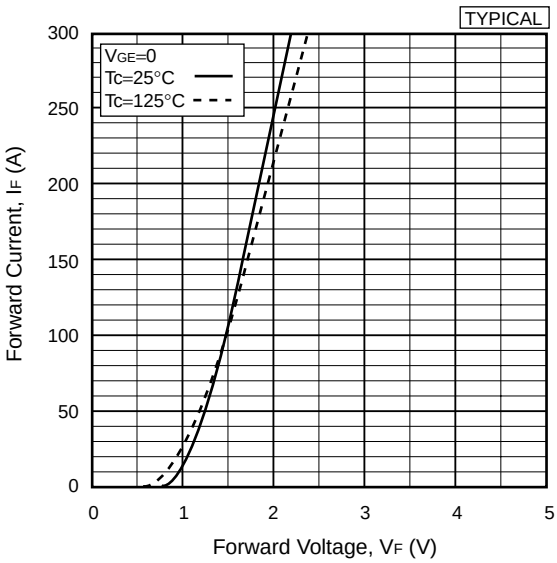

**Collector to Emitter voltage vs. Gate to Emitter voltage**



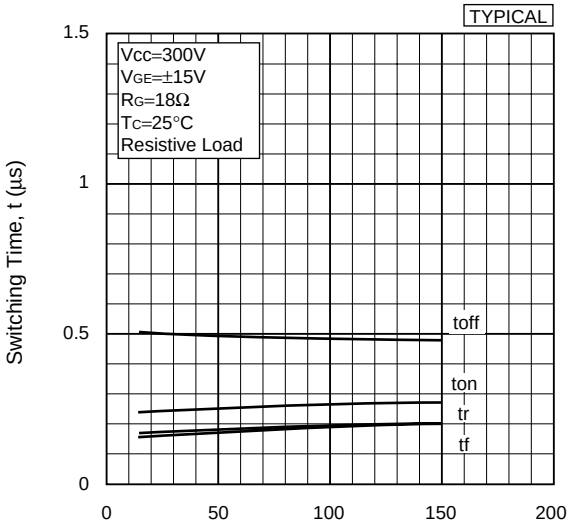

**Collector to Emitter voltage vs. Gate to Emitter voltage**



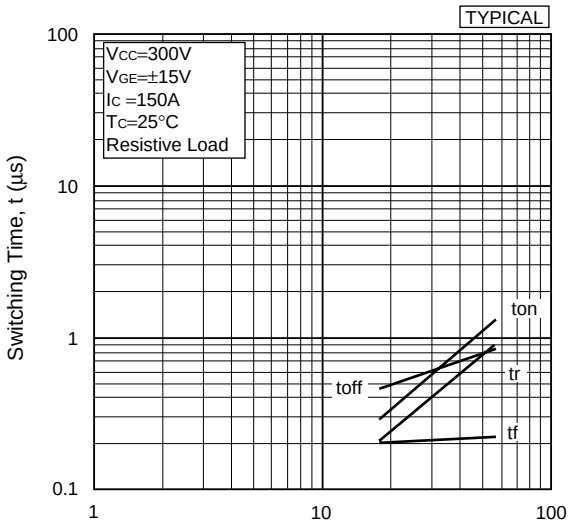

**Gate charge characteristics**



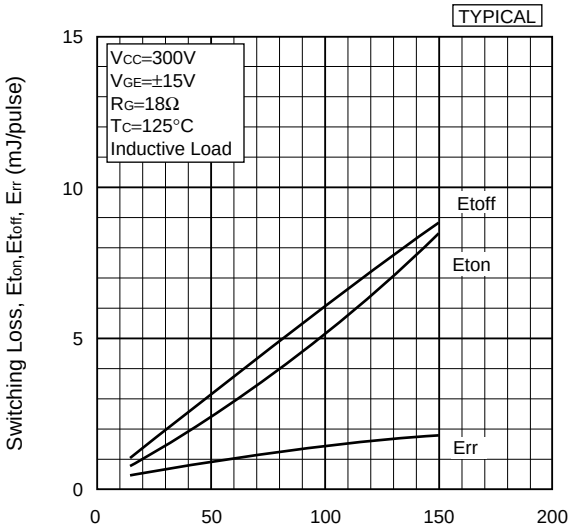

**Forward voltage of free-wheeling diode**



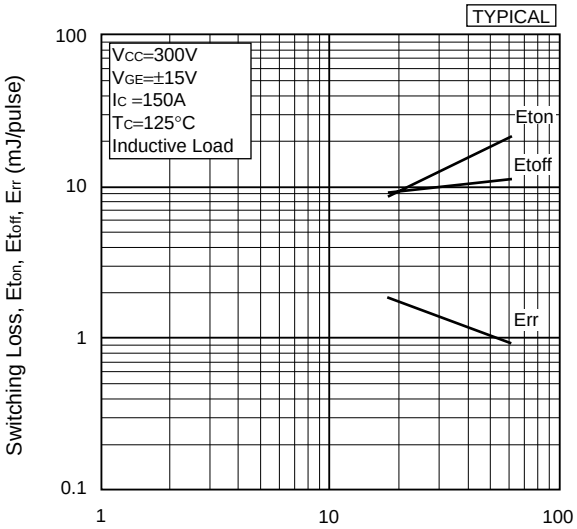

**Switching time vs. Collector current**



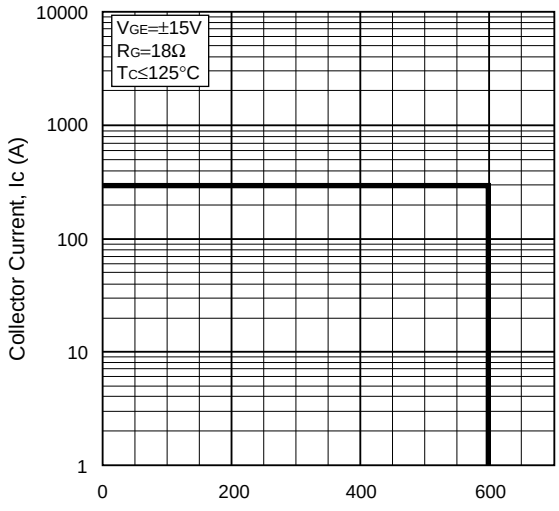

**Switching time vs. Gate resistance**



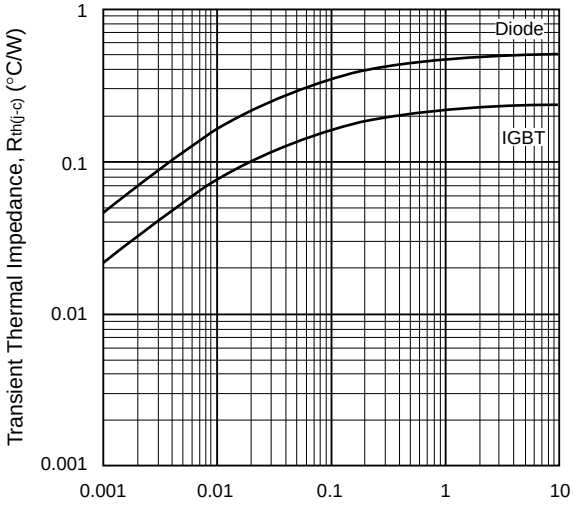

**Switching loss vs. Collector current**




**Switching loss vs. Gate resistance**




**Reverse biased safe operating area**




**Transient thermal impedance**



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# HITACHI POWER SEMICONDUCTORS

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