# 6MBI100S-120



## IGBT MODULE ( S series)
## 1200V / 100A 6 in one-package

### ■ Features
- Compact package
- P.C.board mount
- Low $V_{CE}$(sat)

### ■ Applications
- Inverter for motor drive
- AC and DC servo drive amplifier
- Uninterruptible power supply
- Industrial machines, such as welding machines

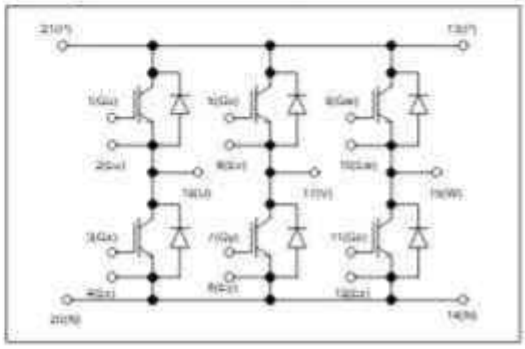
### ■ Maximum ratings and characteristics

● **Absolute maximum ratings (Tc=25°C unless otherwise specified)**

| Item | | | Symbol | Rating | Unit |
|---|---|---|---|---|---|
| Collector-Emitter voltage | | | $V_{CES}$ | 1200 | V |
| Gate-Emitter voltage | | | $V_{GES}$ | ±20 | V |
| Collector current | Continuous | Tc=25°C | $I_C$ | 150 | A |
| | | Tc=80°C | | 100 | |
| | 1ms | Tc=25°C | $I_C$ pulse | 300 | A |
| | | Tc=80°C | | 200 | |
| | | | -$I_C$ | 100 | A |
| | 1ms | | -$I_C$ pulse | 200 | A |
| Max. power dissipation (1 device) | | | $P_C$ | 700 | W |
| Operating temperature | | | $T_j$ | +150 | °C |
| Storage temperature | | | $T_{stg}$ | -40 to +125 | °C |
| Isolation voltage | | | $V_{is}$ | AC 2500 (1min.) | V |
| Screw torque | | | Mounting *1 | 3.5 | N·m |

*1 : Recommendable value : 2.5 to 3.5 N·m (M5)

### ■ Equivalent Circuit Schematic



● **Electrical characteristics (Tj=25°C unless otherwise specified)**

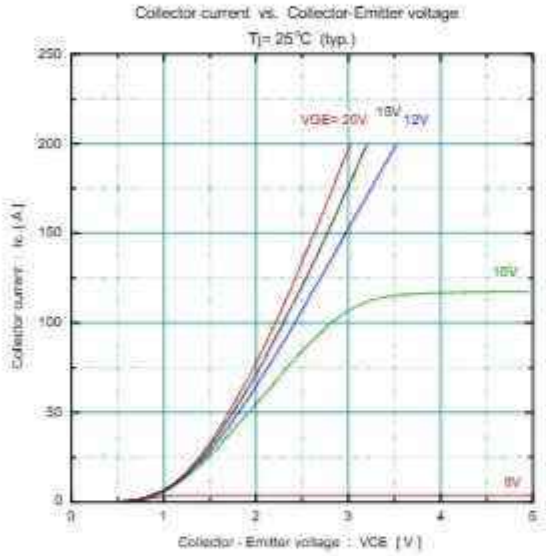
| Item | Symbol | Characteristics | | | Conditions | Unit |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | | |
| Zero gate voltage collector current | $I_{CES}$ | – | – | 1.0 | $V_{GE}$=0V, $V_{CE}$=1200V | mA |
| Gate-Emitter leakage current | $I_{GES}$ | – | – | 0.2 | $V_{CE}$=0V, $V_{GE}$=±20V | μA |
| Gate-Emitter threshold voltage | $V_{GE(th)}$ | 5.5 | 7.2 | 8.5 | $V_{CE}$=20V, $I_C$=100mA | V |
| Collector-Emitter saturation voltage | $V_{CE(sat)}$ | – | 2.3 | 2.6 | Tj=25°C, $V_{GE}$=15V, $I_C$=100A | V |
| | | – | 2.8 | – | Tj=125°C | |
| Input capacitance | $C_{ies}$ | – | 12000 | – | $V_{GE}$=0V | pF |
| Output capacitance | $C_{oes}$ | – | 2500 | – | $V_{CE}$=10V | |
| Reverse transfer capacitance | $C_{res}$ | – | 2200 | – | f=1MHz | |
| Turn-on time | $t_{on}$ | – | 0.35 | 1.2 | $V_{CC}$=600V | μs |
| | $t_r$ | – | 0.25 | 0.6 | $I_C$=100A | |
| | $t_{r(i)}$ | – | 0.1 | – | $V_{GE}$=±15V | |
| Turn-off time | $t_{off}$ | – | 0.45 | 1.0 | $R_G$=12Ω | |
| | $t_f$ | – | 0.08 | 0.3 | | |
| Diode forward on voltage | $V_F$ | – | 2.5 | 3.3 | Tj=25°C, $I_F$=100A, $V_{GE}$=0V | V |
| | | – | 2.0 | – | Tj=125°C | |
| Reverse recovery time | $t_{rr}$ | – | – | 0.35 | $I_F$=100A | μs |

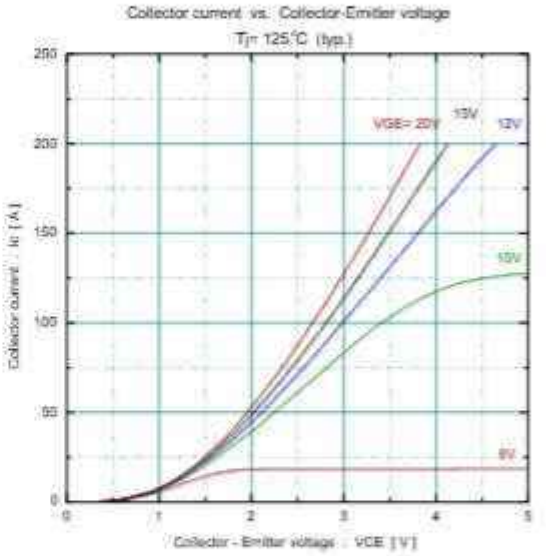
● **Thermal resistance characteristics**

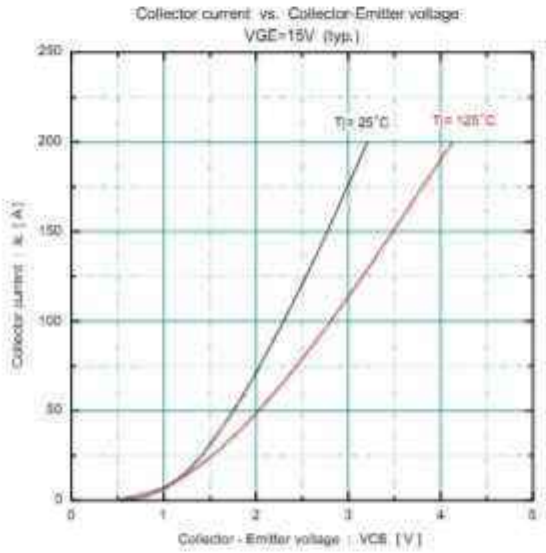
| Item | Symbol | Characteristics | | | Conditions | Unit |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | | |
| Thermal resistance | Rth(j-c) | – | – | 0.18 | IGBT | °C/W |
| | Rth(j-c) | – | – | 0.36 | FWD | °C/W |
| | Rth(c-f)*2 | – | 0.05 | – | the base to cooling fin | °C/W |

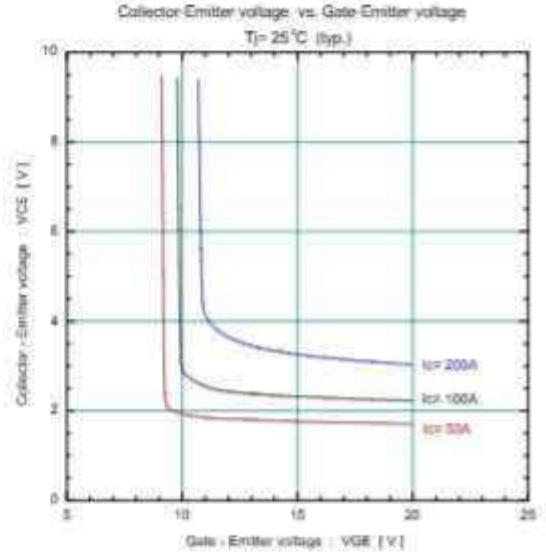
*2 : This is the value which is defined mounting on the additional cooling fin with thermal compound

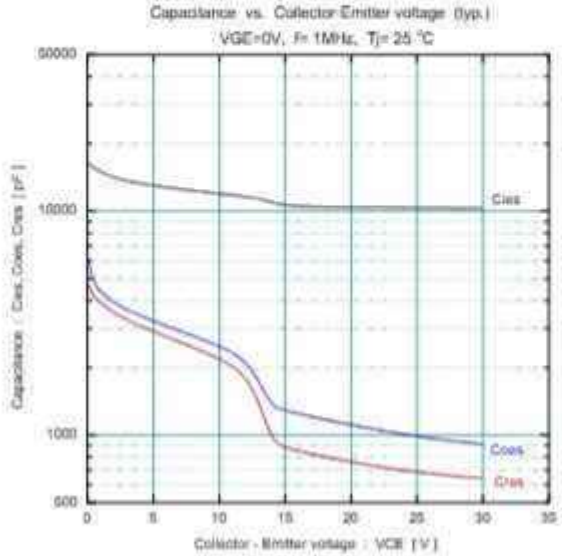
## ■ Characteristics

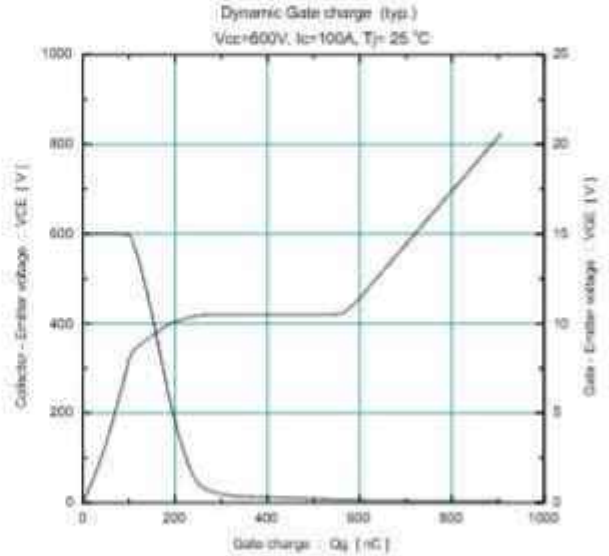


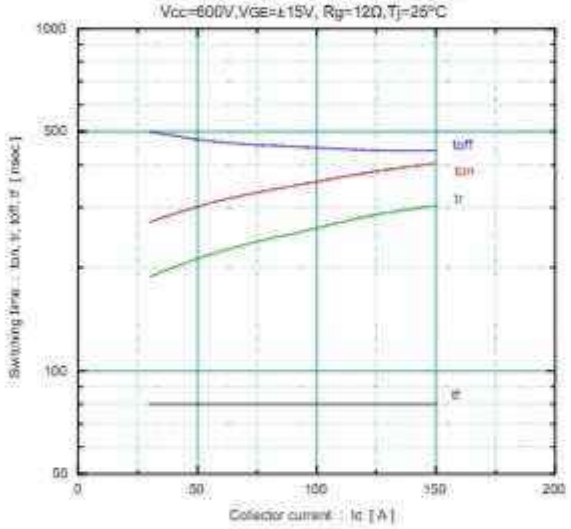



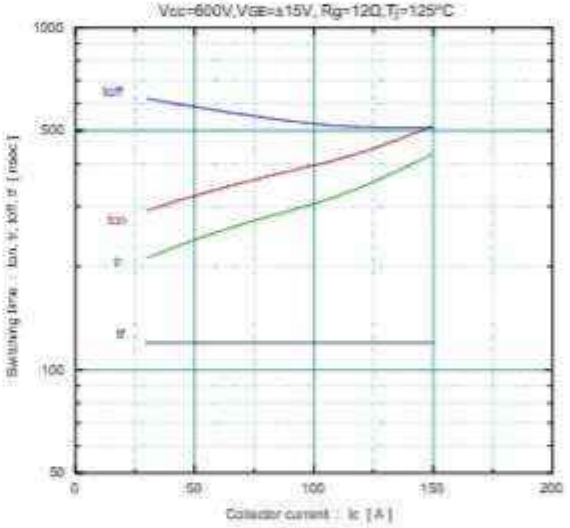



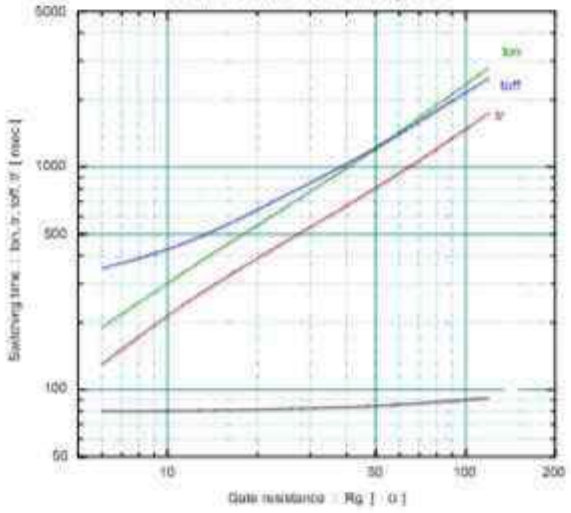
Switching time vs. Collector current (typ.)
Vcc=600V,VGE=±15V, Rg=12Ω,Tj=25°C



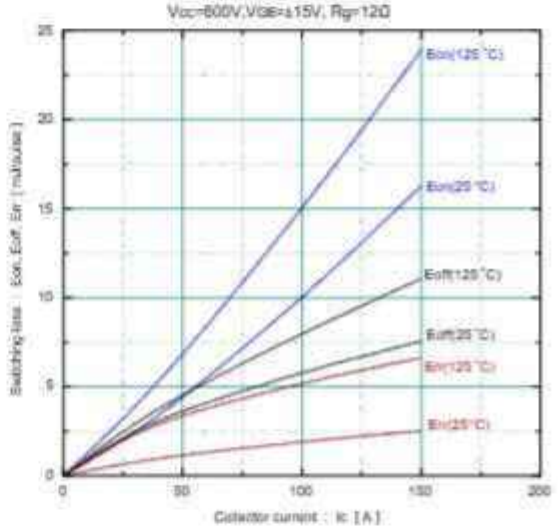

Switching time vs. Collector current (typ.)
Vcc=600V,VGE=±15V, Rg=12Ω,Tj=125°C



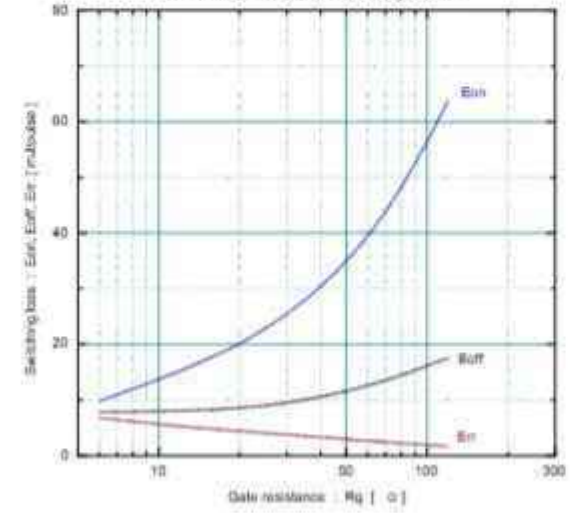

Switching time vs. Gate resistance (typ.)
Vcc=600V,Ic=100A,VGE=±15V,Tj=25°C



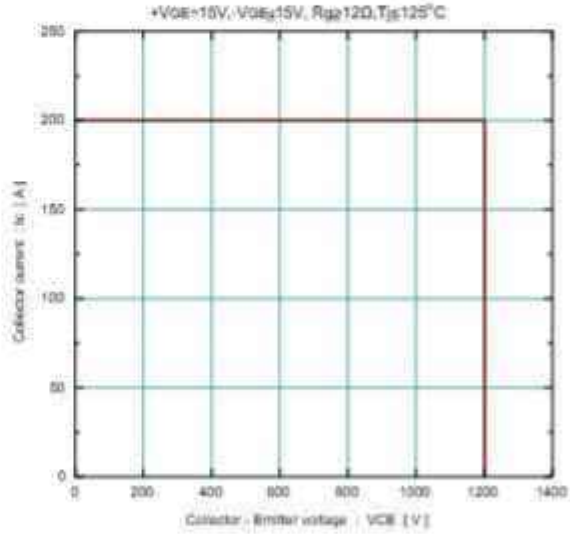

Switching loss vs. Collector current (typ.)
Vcc=600V,VGE=±15V, Rg=12Ω

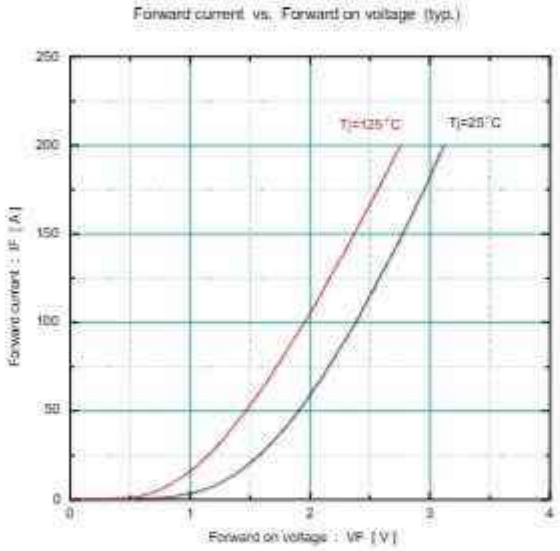


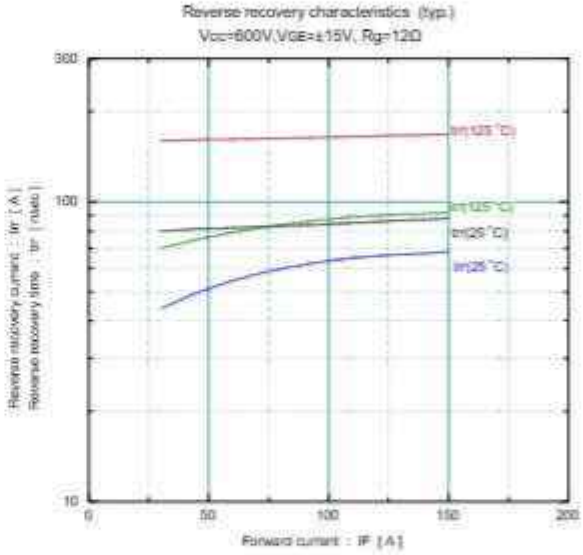

Switching loss vs. Gate resistance (typ.)
Vcc=600V,Ic=100A,VGE=±15V ,Tj=125°C

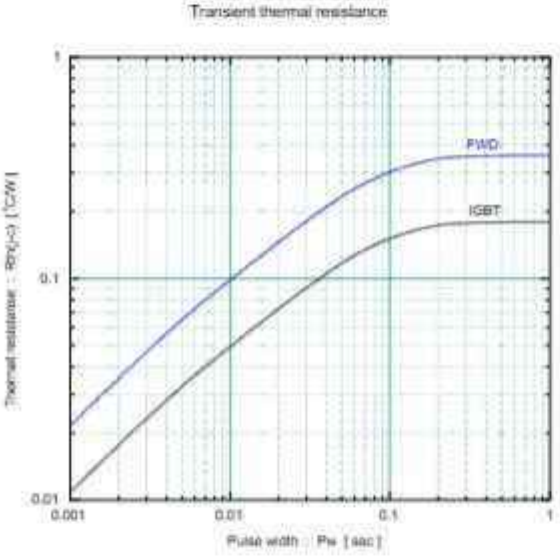



Reverse bias safe operating area
+VGE=15V, -VGE≦15V, Rg≧12Ω,Tj≦125°C






## ■ Outline Drawings, mm