

# 2MBI100SC-120

IGBT Module

1200V / 100A 2 in one-package

## ■ Features

- High speed switching
- Voltage drive
- Low inductance module structure

## ■ 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 (at Tc=25°C unless otherwise specified)

| Item                      |            |                      | Symbol                | Rating          | Unit |
|---------------------------|------------|----------------------|-----------------------|-----------------|------|
| Collector-Emitter voltage |            |                      | V <sub>CE</sub>       | 1200            | V    |
| Gate-Emitter voltage      |            |                      | V <sub>GE</sub>       | ±20             | V    |
| Collector current         | Continuous | T <sub>c</sub> =25°C | I <sub>C</sub>        | 150             | A    |
|                           |            | T <sub>c</sub> =80°C |                       | 100             | A    |
|                           | 1ms        | T <sub>c</sub> =25°C | I <sub>C</sub> pulse  | 300             | A    |
|                           |            | T <sub>c</sub> =80°C |                       | 200             | A    |
|                           |            |                      | -I <sub>C</sub>       | 100             | A    |
|                           | 1ms        |                      | -I <sub>C</sub> pulse | 200             | A    |
| Max. power dissipation    |            |                      | P <sub>C</sub>        | 780             | W    |
| Operating temperature     |            |                      | T <sub>J</sub>        | +150            | °C   |
| Storage temperature       |            |                      | T <sub>stg</sub>      | -40 to +125     | °C   |
| Isolation voltage *1      |            |                      | V <sub>is</sub>       | AC 2500 (1min.) | V    |
| Screw torque              |            |                      | Mounting *2           | 3.5             | N·m  |
|                           |            |                      | Terminals *2          | 3.5             | N·m  |

\*1 : All terminals should be connected together when isolation test will be done

\*2 : Recommendable value : 2.5 to 3.5 N·m(M5)

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

| Item                                 | Symbol               | Characteristics |       |      | Conditions                                         | Unit |
|--------------------------------------|----------------------|-----------------|-------|------|----------------------------------------------------|------|
|                                      |                      | Min.            | Typ.  | Max. |                                                    |      |
| Zero gate voltage collector current  | I <sub>CE</sub>      | —               | —     | 2.0  | V <sub>GE</sub> =0V, V <sub>CE</sub> =1200V        | mA   |
| Gate-Emitter leakage current         | I <sub>GES</sub>     | —               | —     | 0.4  | V <sub>CE</sub> =0V, V <sub>GE</sub> =±20V         | μA   |
| Gate-Emitter threshold voltage       | V <sub>GE(th)</sub>  | 5.5             | 7.2   | 8.5  | V <sub>CE</sub> =20V, I <sub>C</sub> =100mA        | V    |
| Collector-Emitter saturation voltage | V <sub>CE(sat)</sub> | —               | 2.3   | 2.6  | Tc=25°C V <sub>GE</sub> =15V, I <sub>C</sub> =100A | V    |
|                                      |                      | —               | 2.8   | —    | Tc=125°C                                           |      |
| Input capacitance                    | C <sub>ies</sub>     | —               | 12000 | —    | V <sub>GE</sub> =0V                                | pF   |
| Output capacitance                   | C <sub>oes</sub>     | —               | 2500  | —    | V <sub>CE</sub> =10V                               |      |
| Reverse transfer capacitance         | C <sub>res</sub>     | —               | 2200  | —    | f=1MHz                                             |      |
| Turn-on time                         | t <sub>on</sub>      | —               | 0.35  | 1.2  | V <sub>CC</sub> =600V                              | μs   |
|                                      | t <sub>r</sub>       | —               | 0.25  | 0.6  | I <sub>C</sub> =100A                               |      |
|                                      | t <sub>r(i)</sub>    | —               | 0.1   | —    | V <sub>GE</sub> =±15V                              |      |
| Turn-off time                        | t <sub>off</sub>     | —               | 0.45  | 1.0  | R <sub>G</sub> =9.1 ohm                            |      |
|                                      | t <sub>f</sub>       | —               | 0.08  | 0.3  |                                                    |      |
| Forward on voltage                   | V <sub>F</sub>       | —               | 2.3   | 3.0  | Tj=25°C                                            | V    |
|                                      |                      | —               | 2.0   | —    | Tj=125°C                                           |      |
| Reverse recovery time                | t <sub>rr</sub>      | —               | —     | 0.35 | I <sub>F</sub> =100A                               | μs   |

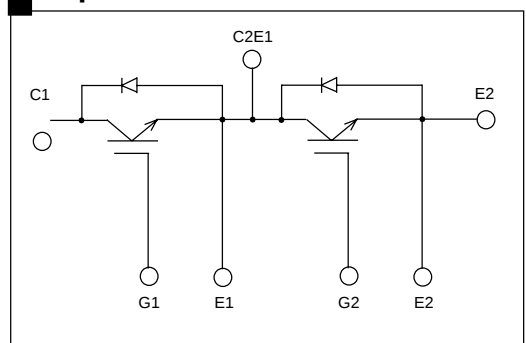
### ● Thermal resistance characteristics

| Item               | Symbol                 | Characteristics |      |      | Conditions              | Unit |
|--------------------|------------------------|-----------------|------|------|-------------------------|------|
|                    |                        | Min.            | Typ. | Max. |                         |      |
| Thermal resistance | R <sub>th(j-c)</sub>   | —               | —    | 0.16 | IGBT                    | °C/W |
|                    | R <sub>th(j-c)</sub>   | —               | —    | 0.33 | Diode                   | °C/W |
|                    | R <sub>th(c-f)*2</sub> | —               | 0.05 | —    | the base to cooling fin | °C/W |

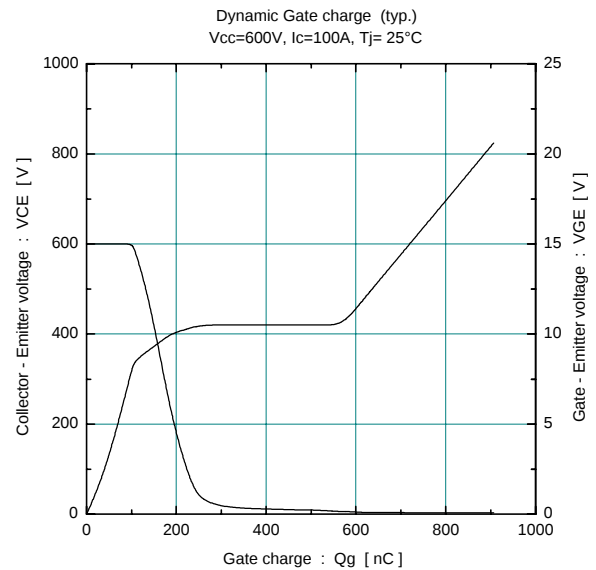
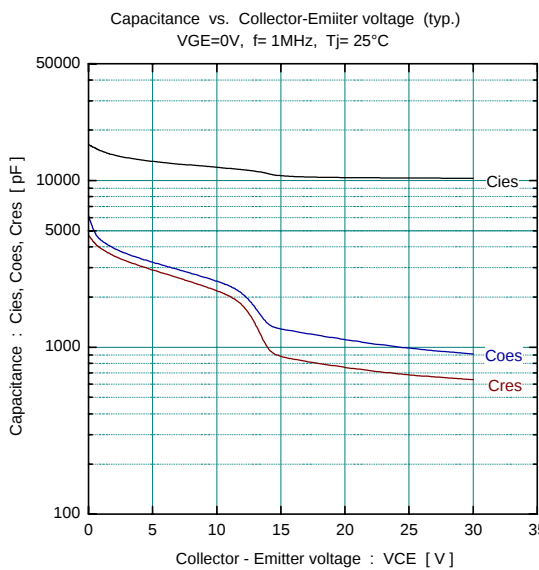
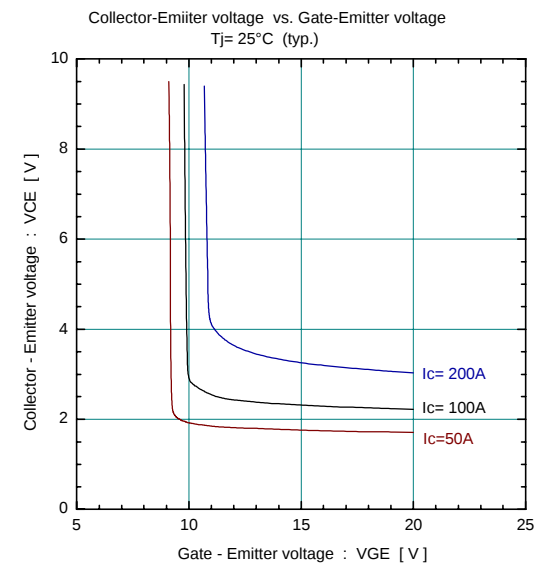
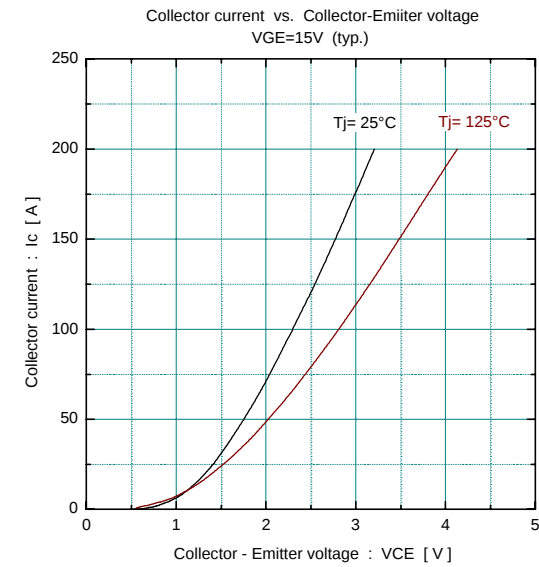
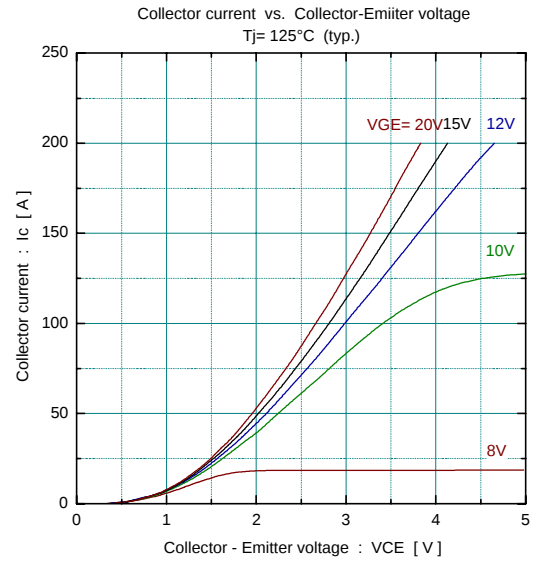
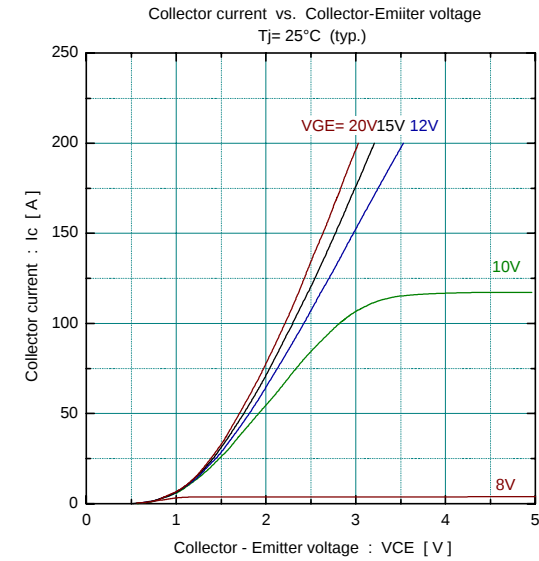
\*2 : This is the value which is defined mounting on the additional cooling fin with thermal compound

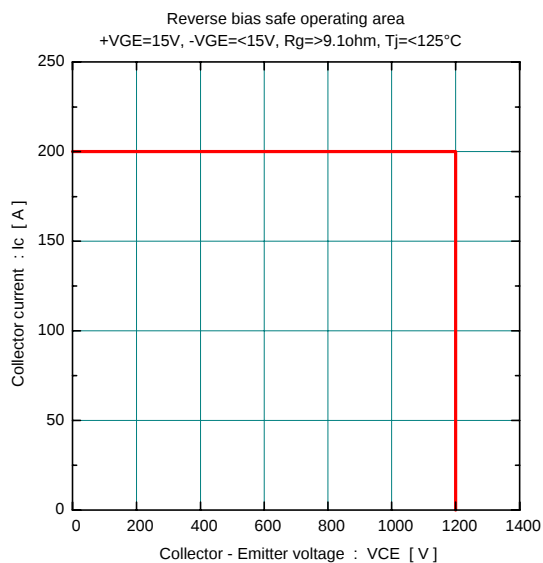
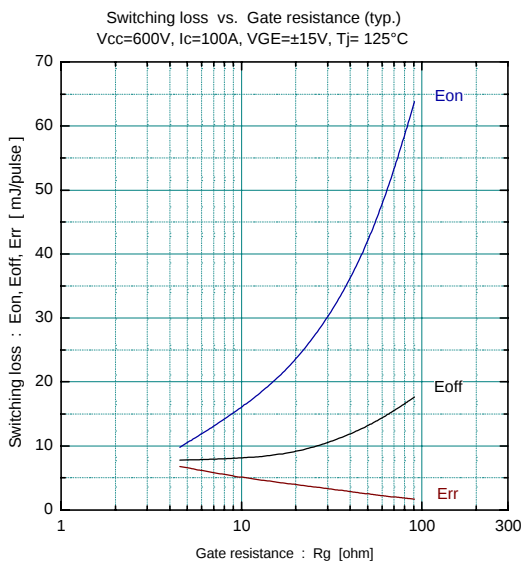
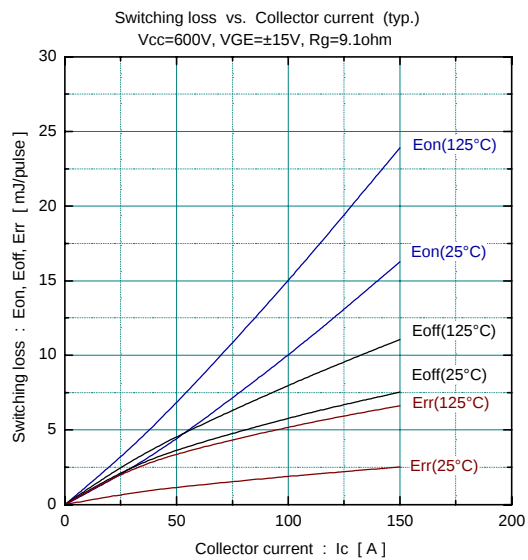
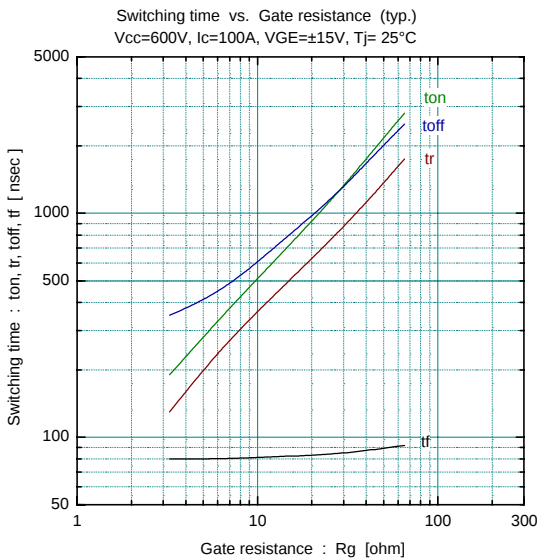
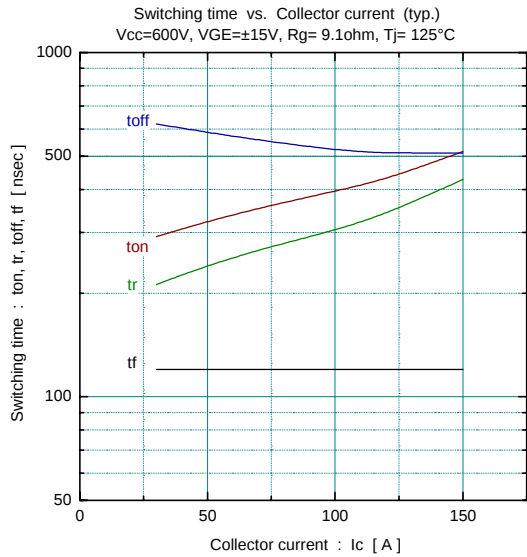
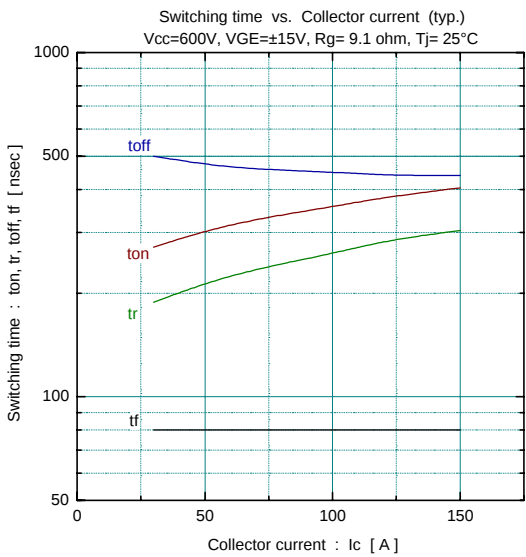


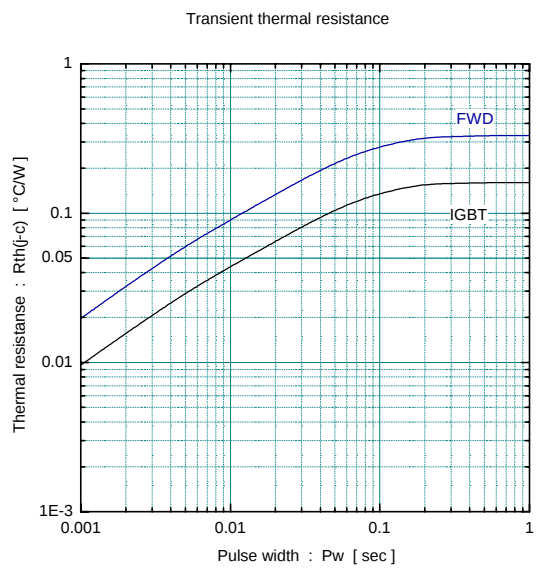
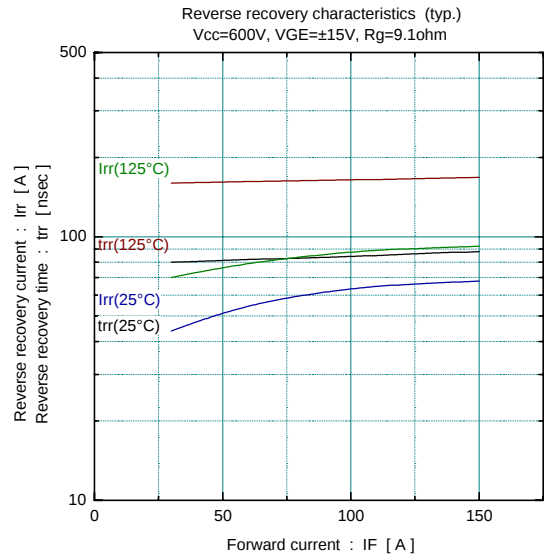
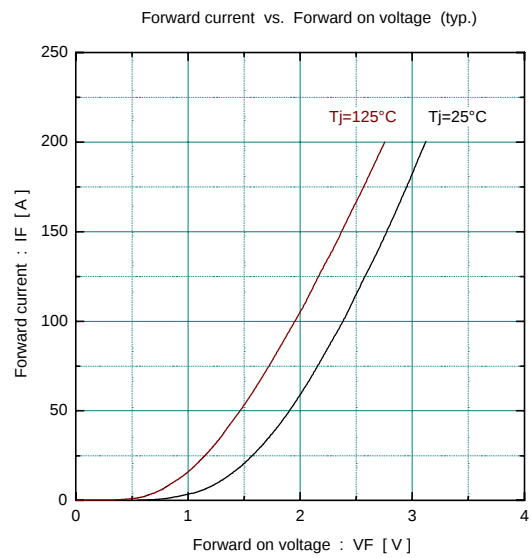
## Equivalent Circuit Schematic



■ Characteristics (Representative)







■ Outline Drawings, mm

