

TOSHIBA INTEGRATED IGBT MODULE SILICON N CHANNEL IGBT

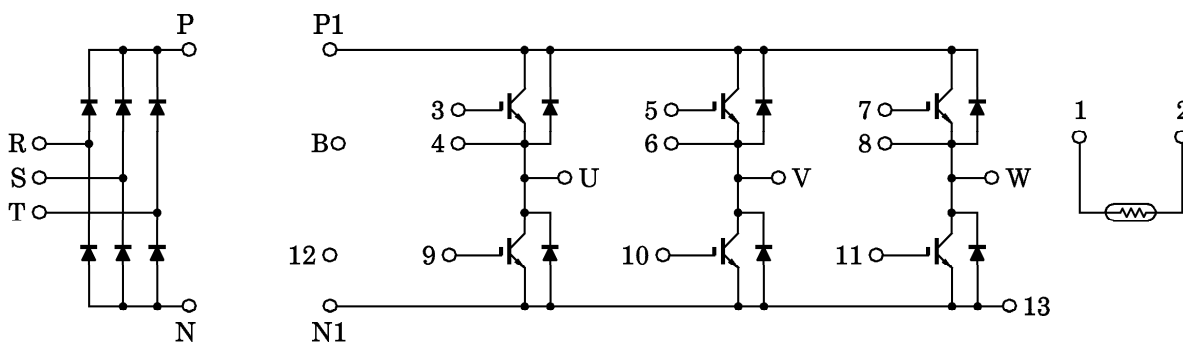
MIG25Q806H, MIG25Q806HA

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

- Integrates Inverter, Converter Power Circuits and Thermistor in One Package.
- Output (Inverter Stage) : 3 ϕ 25 A / 1200 V IGBT
- Input (Converter Stage) : 3 ϕ 20 A / 1600 V Silicon Rectifier
- The Electrodes are Isolated from Case.
- Outline
 - MIG25Q806H : 2-108E5A
 - MIG25Q806HA : 2-108E6A
- Weight : 190 g

EQUIVALENT CIRCUIT

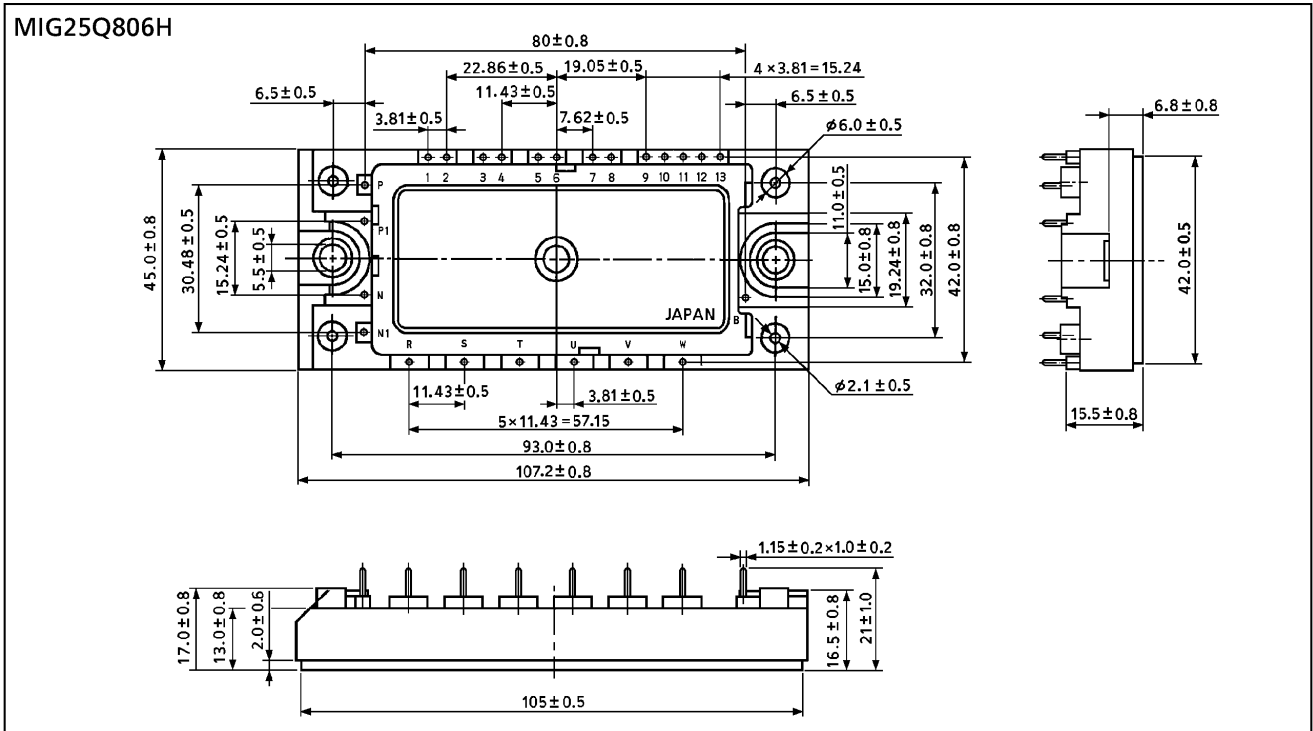


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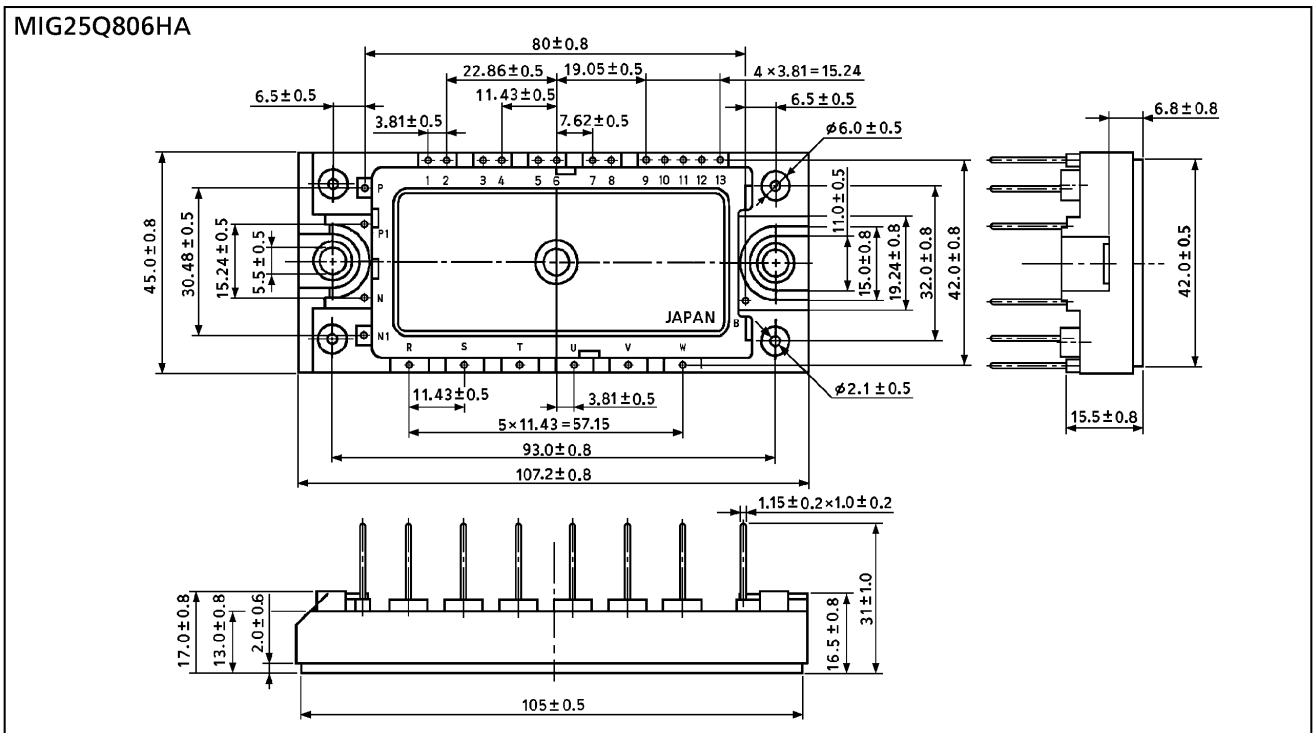
Package Dimension

Unit : mm



2-108E5A

Unit : mm



2-108E6A

MAXIMUM RATINGS (Ta = 25°C)

| STAGE | CHARACTERISTIC | SYMBOL | RATING | UNIT | |
|---|--|-------------------|-----------------------|---------|---|
| Inverter | Collector-Emitter Voltage | V _{CE} S | 1200 | V | |
| | Gate-Emitter Voltage | V _{GE} S | ±20 | V | |
| | Collector Current | DC | I _C | 35 / 25 | A |
| | | 1 ms | I _{CP} | 70 / 50 | A |
| | Forward Current | DC | I _F | 25 | A |
| | | 1 ms | I _{FM} | 50 | A |
| Collector Power Dissipation (T _c = 25°C) | | P _C | 200 | W | |
| Converter | Repetitive Peak Reverse Voltage | V _{RRM} | 1600 | V | |
| | Average Output Rectified Current | I _O | 20 | A | |
| | Peak One Cycle Surge Forward Current (50 Hz, Non-Repetitive) | I _{FSM} | 400 | A | |
| Module | Junction Temperature | T _j | 150 | °C | |
| | Storage Temperature Range | T _{stg} | -40~125 | °C | |
| | Isolation Voltage | V _{Isol} | 2500 (AC 1 minute) | V | |
| | Screw Torque | — | 6 | N·m | |

(25°C / 80°C)
(25°C / 80°C)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

a. Inverter stage

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT | |
|--------------------------------------|-----------------------|--|---|------|------|--------|----|
| Gate Leakage Current | I _{GES} | V _{GE} = ±20 V, V _{CE} = 0 | — | — | ±500 | nA | |
| Collector Cut-Off Current | I _{CES} | V _{CE} = 1200 V, V _{GE} = 0 | — | — | 0.5 | mA | |
| Gate-Emitter Cut-Off Voltage | V _{GE} (off) | I _C = 25 mA, V _{CE} = 5 V | — | 6.0 | — | V | |
| Collector-Emitter Saturation Voltage | V _{CE} (sat) | I _C = 25 A | — | 2.8 | 3.2 | V | |
| | | V _{GE} = 15 V | — | 3.1 | 3.7 | | |
| Input Capacitance | C _{ies} | V _{CE} = 10 V, V _{GE} = 0, f = 1 MHz | — | 2600 | — | pF | |
| Switching Time | Rise Time | t _r | V _{CC} = 600 V I _C = 25 A V _{GE} = ±15 V R _G = 51 Ω T _j = 125°C (Note 1) | — | 0.07 | 0.15 | μs |
| | Turn-On Time | t _{on} | | — | 0.15 | 0.30 | |
| | Fall Time | t _f | | — | 0.07 | 0.10 | |
| | Turn-Off Time | t _{off} | | — | 0.60 | 0.90 | |
| Forward Voltage | V _F | I _F = 25 A, V _{GE} = 0 | — | 2.0 | 2.8 | V | |
| Reverse Recovery Time | t _{rr} | I _F = 25 A, V _{GE} = -10 V di / dt = 400 A / μs | — | 0.10 | 0.25 | μs | |
| Thermal Resistance | R _{th} (j-c) | Transistor | — | — | 0.6 | °C / W | |
| | | Diode | — | — | 1.0 | | |

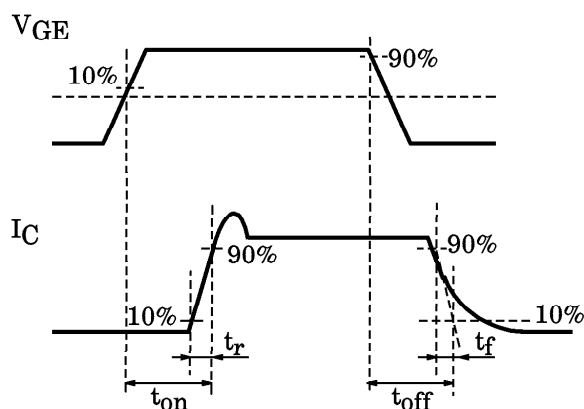
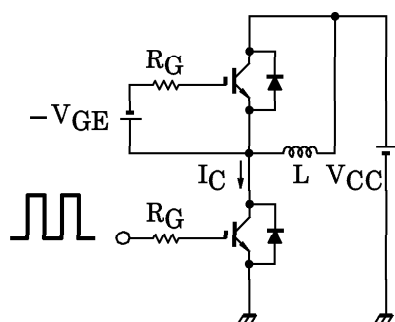
b. Converter stage

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|--------------------------------------|---------------|---------------------------|------|------|------|----------------------|
| Repetitive Peak Reverse Current | I_{RRM} | $V_{RRM} = 1600\text{ V}$ | — | — | 50 | μA |
| Peak Forward Voltage | V_{FM} | $I_{FM} = 20\text{ A}$ | — | 1.05 | 1.20 | V |
| Peak One Cycle Surge Forward Current | I_{FSM} | 50 Hz sine-half-wave | 400 | — | — | A |
| Thermal Resistance | $R_{th(j-c)}$ | — | — | — | 1.56 | $^{\circ}\text{C/W}$ |

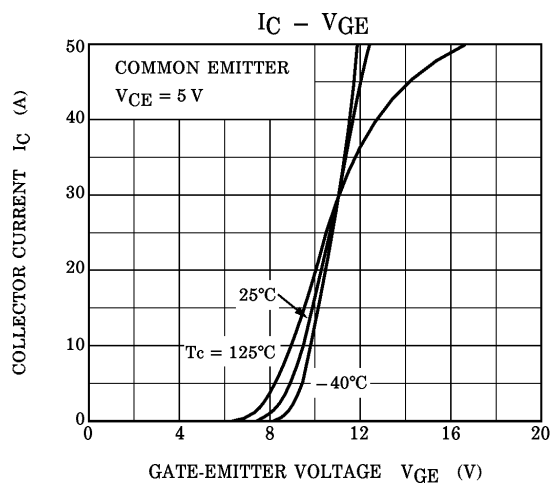
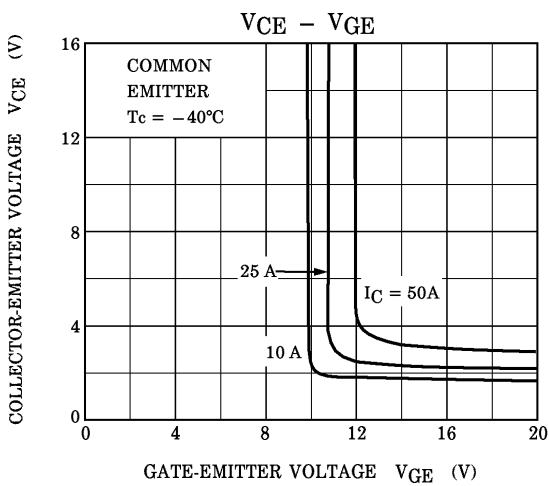
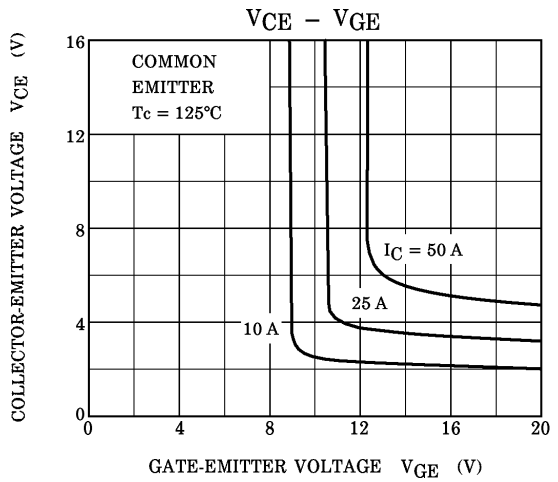
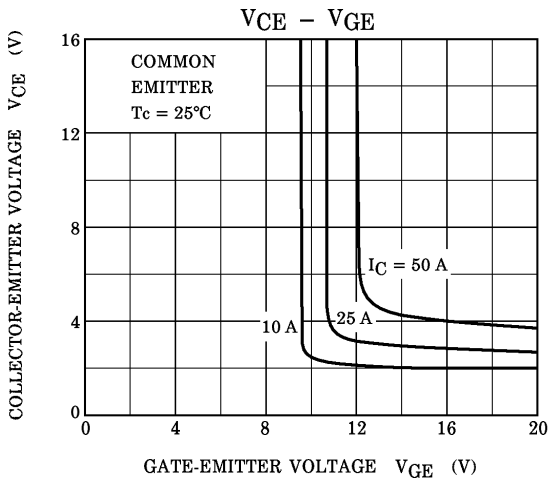
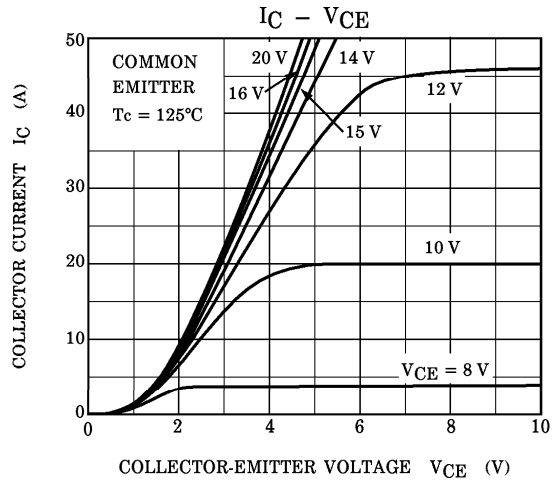
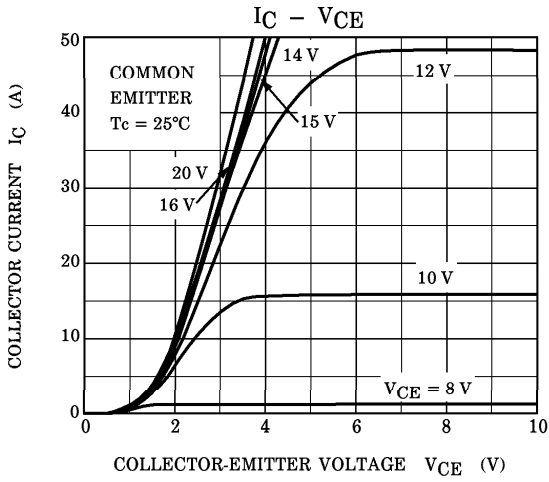
c. Thermistor

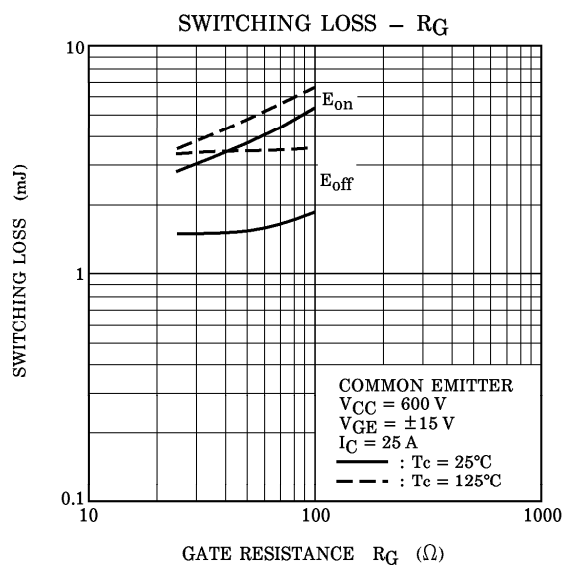
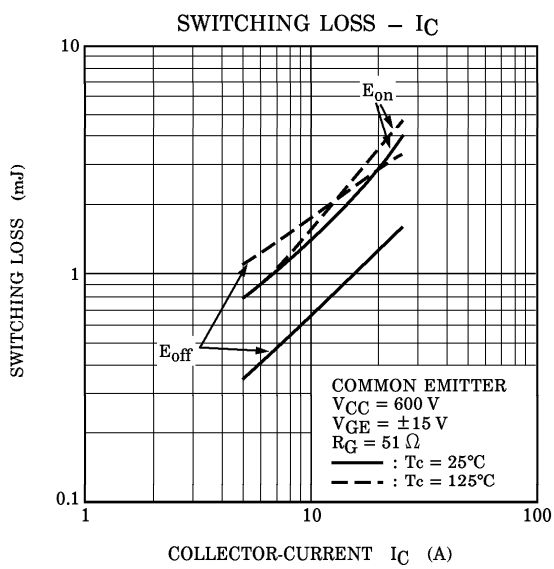
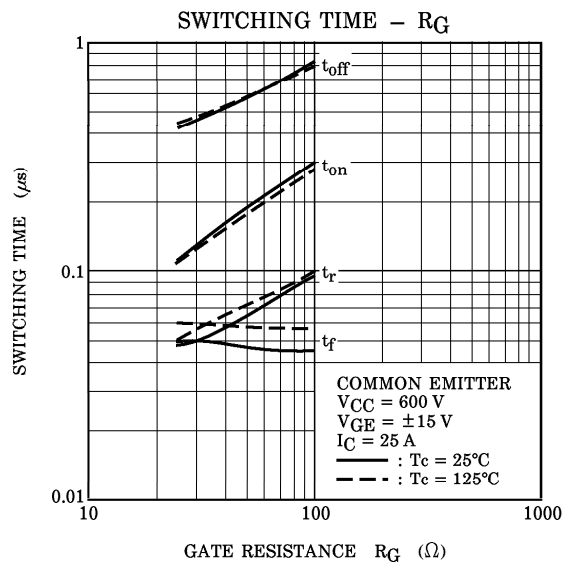
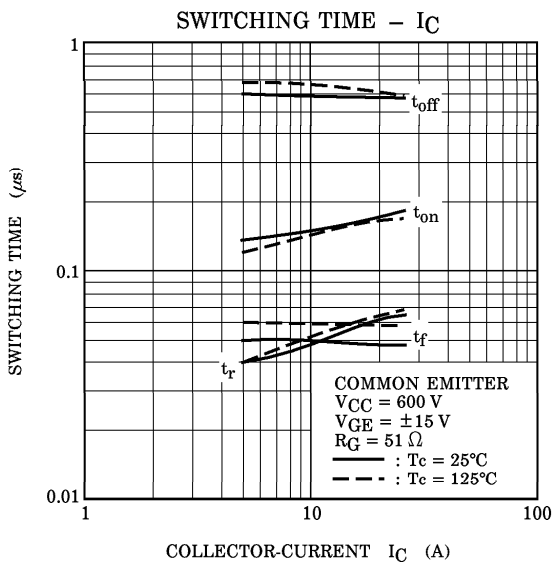
| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-----------------------|-------------|---|-------|------|-------|------------------|
| Zero-power Resistance | R_{25} | $I_{TM} = 0.2\text{ mA}$, $T_c = 25^{\circ}\text{C}$ | 17.31 | 20 | 23.14 | $\text{k}\Omega$ |
| B Value | $B_{25/85}$ | $T_c = 25^{\circ}\text{C} / T_c = 85^{\circ}\text{C}$ | — | 3760 | — | K |

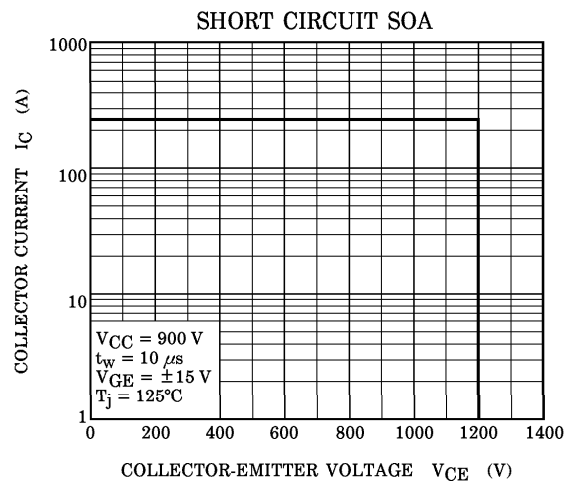
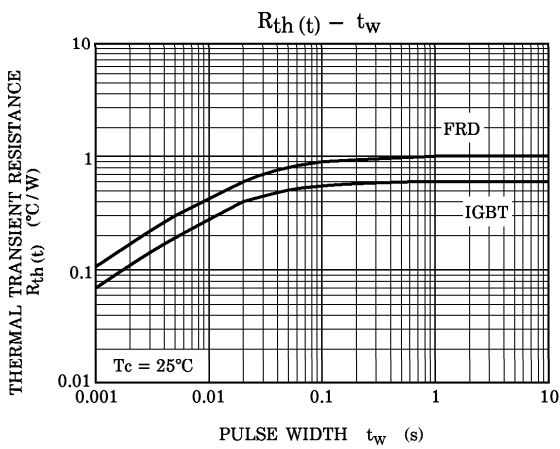
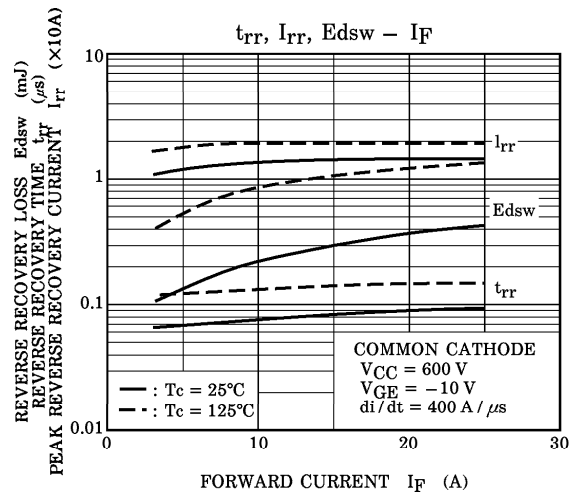
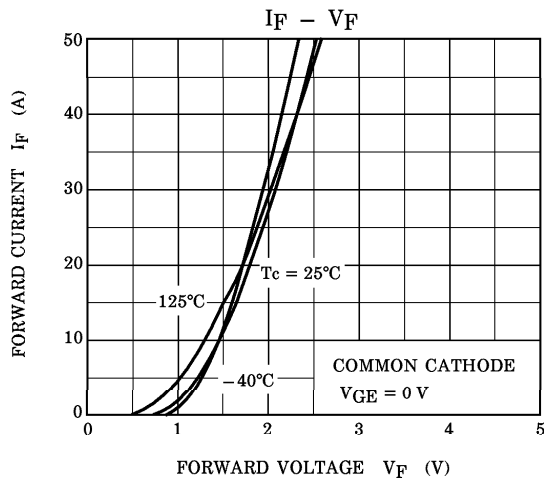
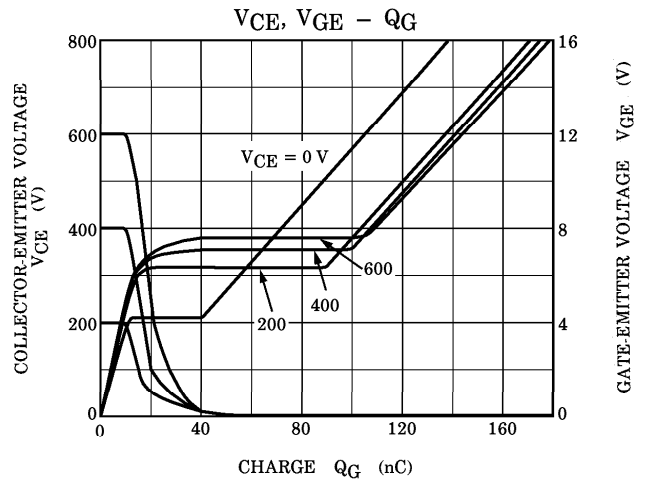
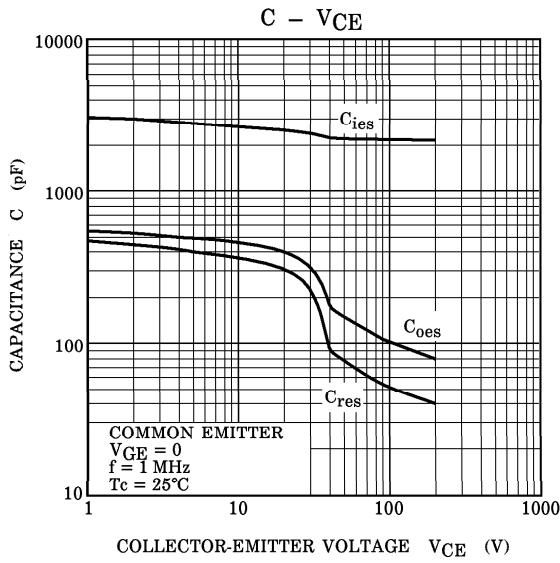
(Note 1) : Switching Time Test Circuit & Timing Chart

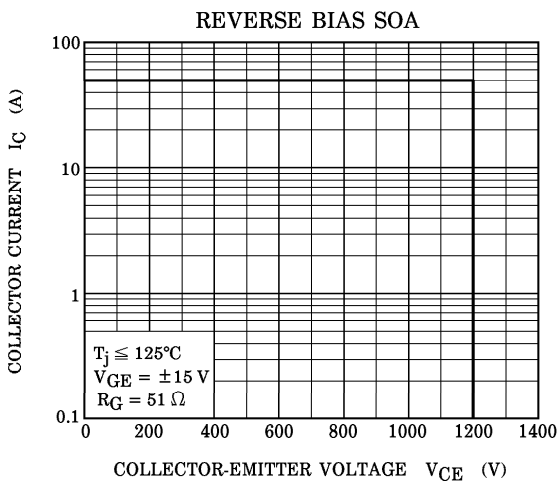


a. Inverter stage









b. Converter stage

