

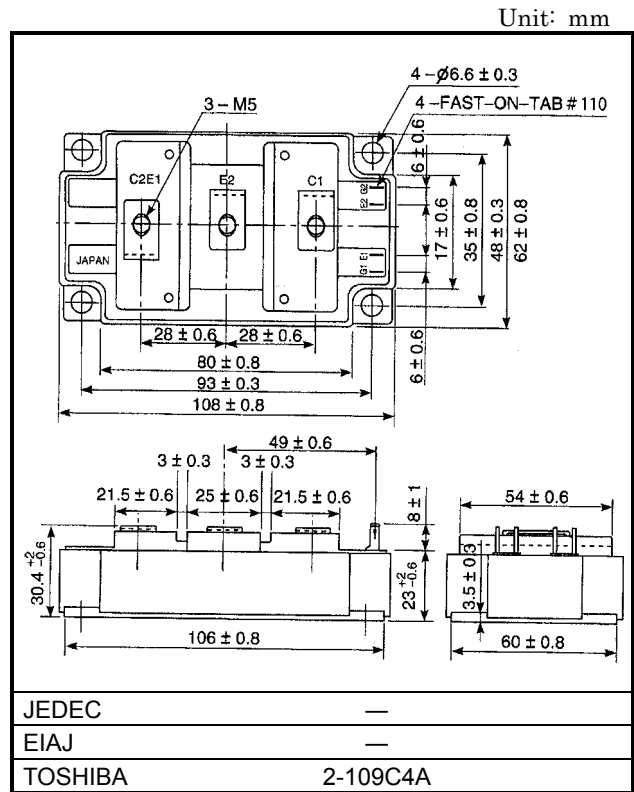
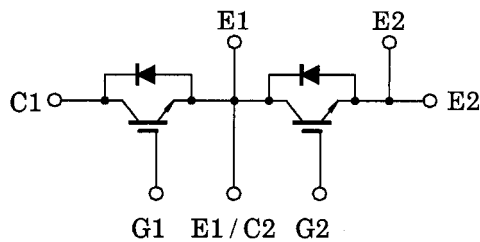
TOSHIBA GTR Module Silicon N Channel IGBT

MG200Q2YS50

High Power Switching Applications
 Motor Control Applications

- High input impedance
- High speed : $t_f = 0.3\mu\text{s}$ (Max.)
 @Inductive Load
- Low saturation voltage
 : $V_{CE(sat)} = 3.6\text{V}$ (Max.)
- Enhancement-mode
- Includes a complete half bridge in one package.
- The electrodes are isolated from case.

Equivalent Circuit



Weight: 430g

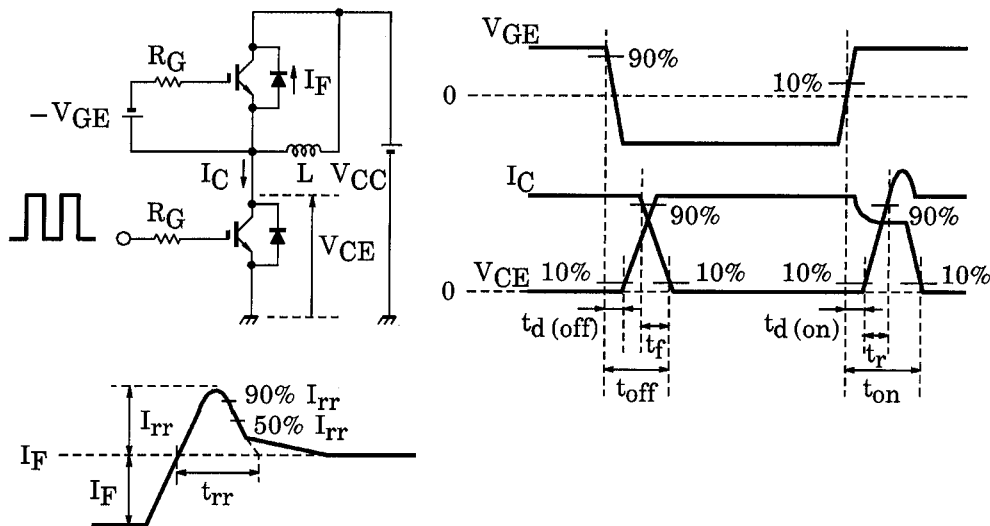
Maximum Ratings (Ta = 25°C)

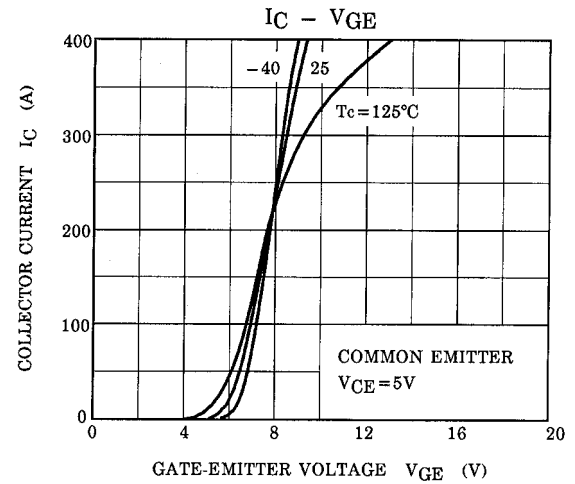
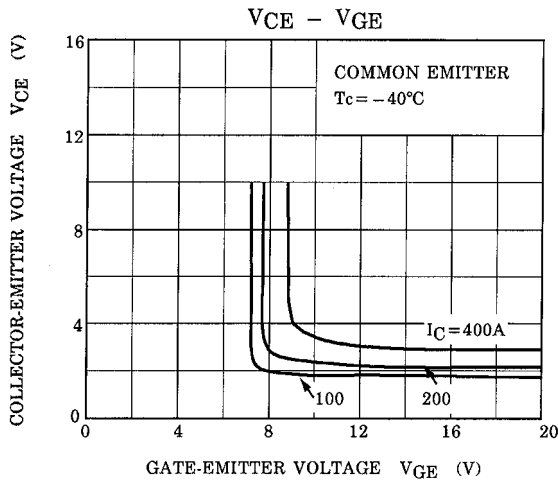
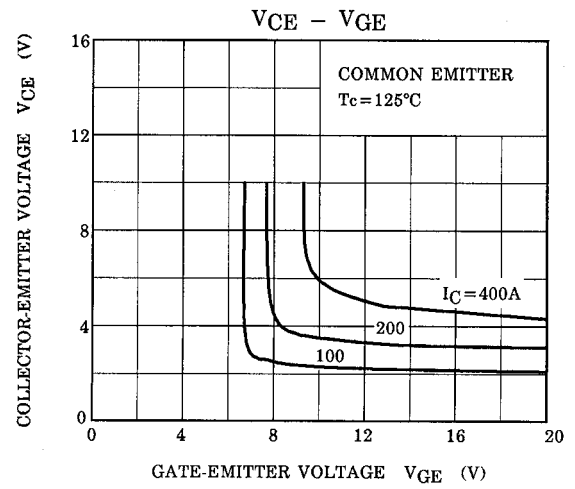
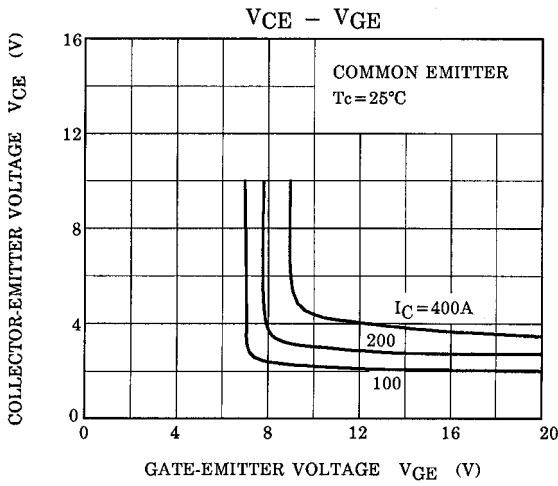
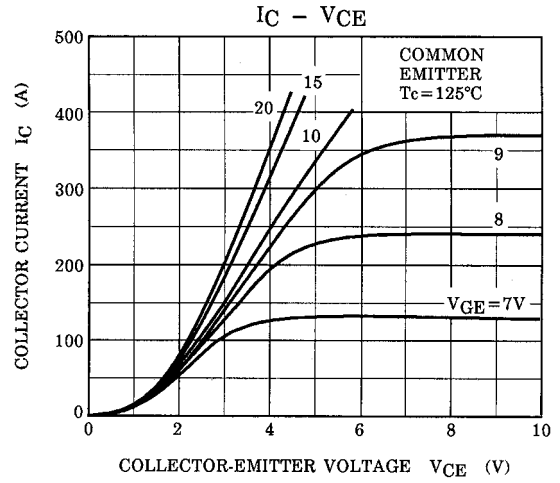
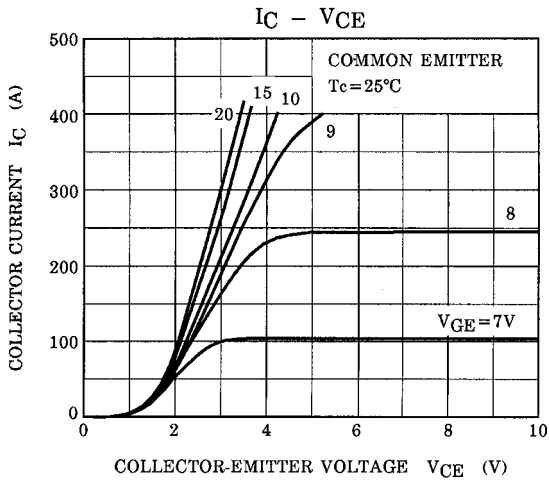
| Characteristic | Symbol | Rating | Unit | |
|--|------------|---------------------------|---------|---|
| Collector-emitter voltage | V_{CES} | 1200 | V | |
| Gate-emitter voltage | V_{GES} | ±20 | V | |
| Collector current | DC | I_C (25°C / 80°C) | 300/200 | A |
| | 1ms | I_{CP} (25°C / 80°C) | 600/400 | |
| Forward current | DC | I_F | 200 | A |
| | 1ms | I_{FM} | 400 | |
| Collector power dissipation (Tc = 25°C) | P_C | 1400 | W | |
| Junction temperature | T_j | 150 | °C | |
| Storage temperature range | T_{stg} | -40 ~ 125 | °C | |
| Isolation voltage | V_{Isol} | 2500 (AC 1 min.) | V | |
| Screw torque (Terminal / mounting) | — | 3 / 3 | N·m | |

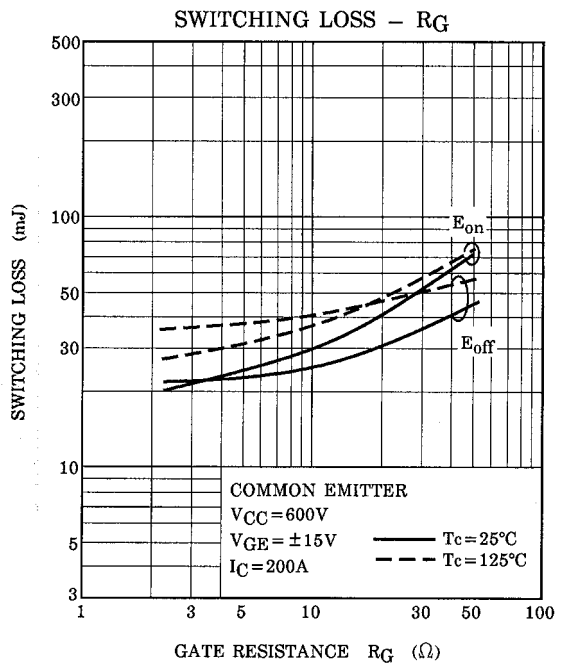
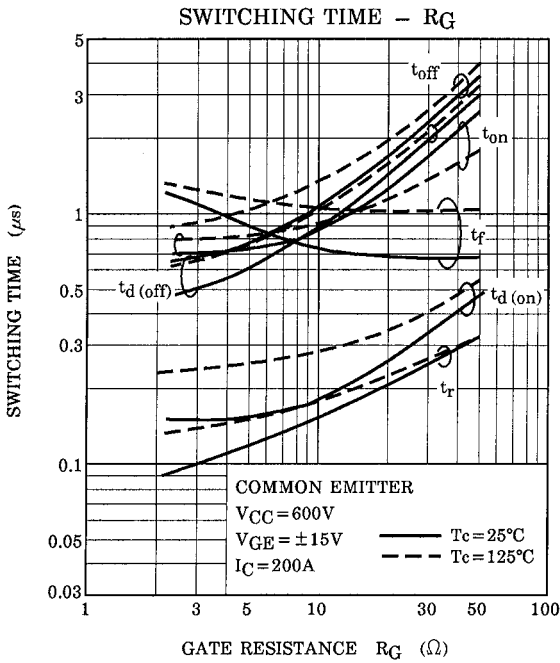
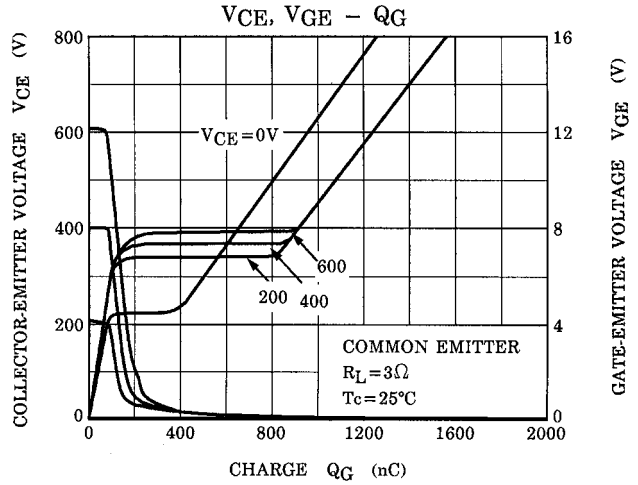
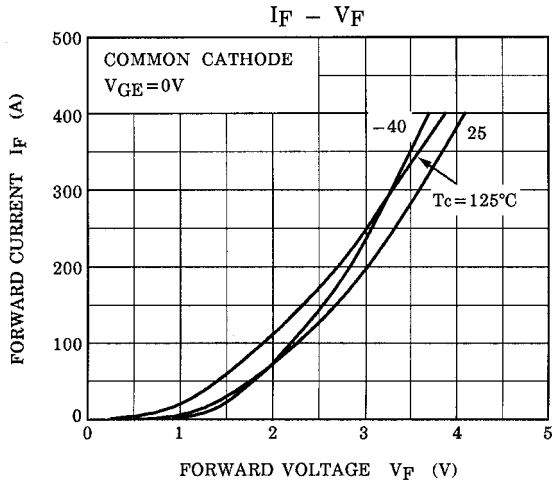
Electrical Characteristics (Ta = 25°C)

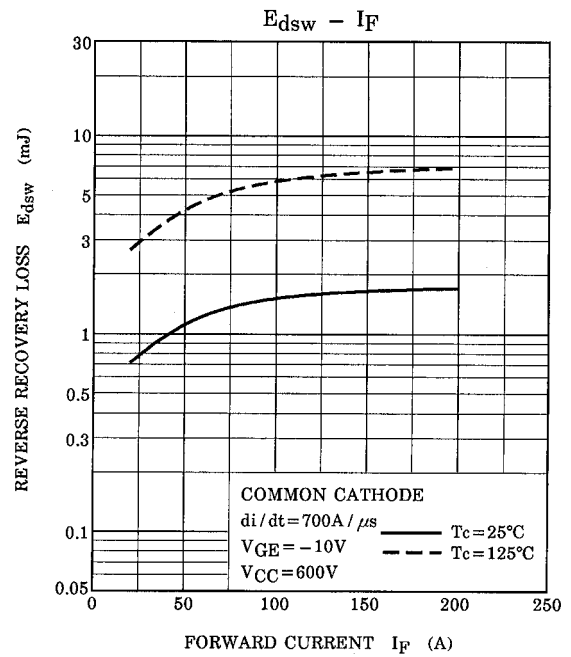
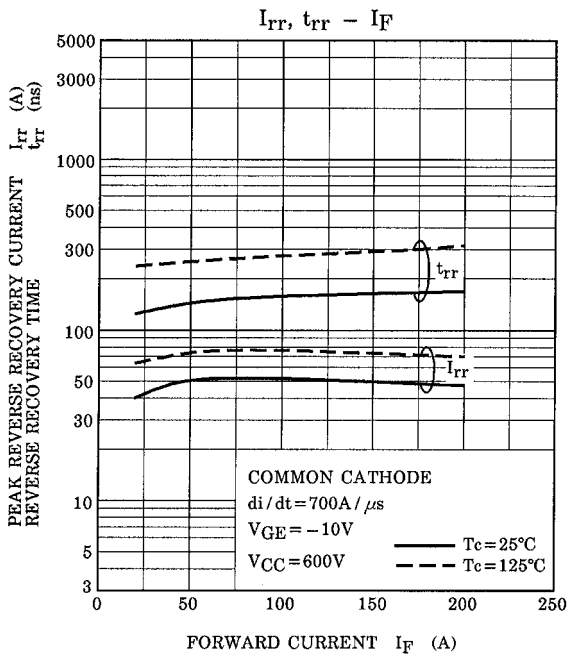
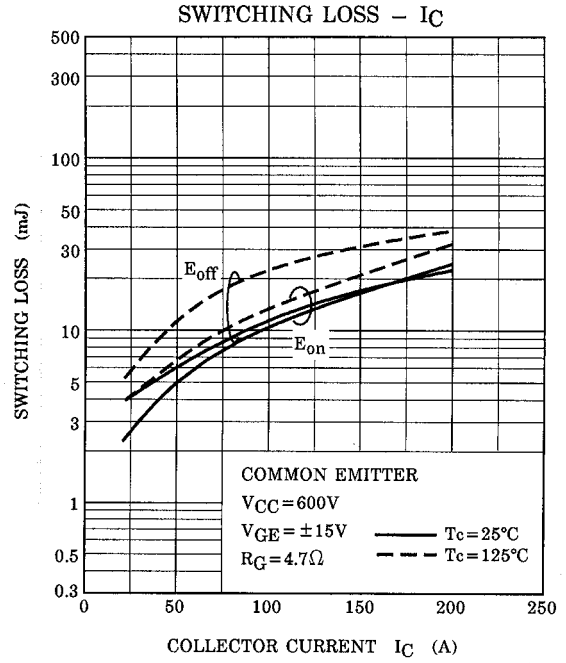
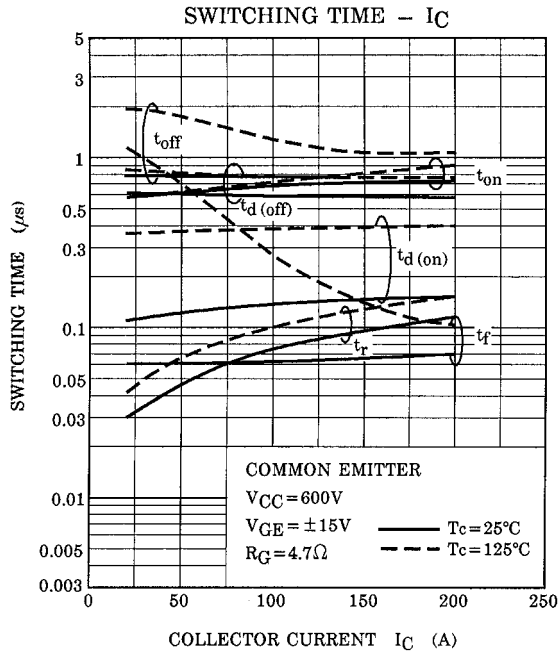
| Characteristic | | Symbol | Test Condition | Min | Typ. | Max | Unit | |
|--------------------------------------|---------------------|----------------|--|---------------------|------|-----------|--------------|---|
| Gate leakage current | | I_{GES} | $V_{GE} = \pm 20V, V_{CE} = 0$ | — | — | ± 500 | nA | |
| Collector cut-off current | | I_{CES} | $V_{CE} = 1200V, V_{GE} = 0$ | — | — | 2.0 | mA | |
| Gate-emitter cut-off voltage | | $V_{GE (off)}$ | $I_C = 200mA, V_{CE} = 5V$ | 3.0 | — | 6.0 | V | |
| Collector-emitter saturation voltage | | $V_{CE (sat)}$ | $I_C = 200A$ $V_{GE} = 15V$ | $T_j = 25^\circ C$ | — | 2.8 | 3.6 | V |
| | | | | $T_j = 125^\circ C$ | — | 3.1 | 4.0 | |
| Input capacitance | | C_{ies} | $V_{CE} = 10V, V_{GE} = 0, f = 1MHz$ | — | 21.0 | — | nF | |
| Switching time | Turn-on delay time | $t_{d(on)}$ | Inductive load $V_{CC} = 600V$ $I_C = 200A$ $V_{GE} = \pm 15V$ $R_G = 4.7\Omega$ (Note 1) | — | 0.05 | — | μs | |
| | Rise time | t_r | | — | 0.05 | — | | |
| | Turn-on time | t_{on} | | — | 0.2 | — | | |
| | Turn-off delay time | $t_{d(off)}$ | | — | 0.5 | — | | |
| | Fall time | t_f | | — | 0.1 | 0.3 | | |
| | Turn-off time | t_{off} | | — | 0.6 | — | | |
| Forward voltage | | V_F | $I_F = 200A, V_{GE} = 0$ | — | 2.4 | 3.5 | V | |
| Reverse recovery time | | t_{rr} | $I_F = 200A, V_{GE} = -10V$ $di/dt = 700A/\mu s$ (Note 1) | — | 0.1 | 0.25 | μs | |
| Thermal resistance | | $R_{th (j-c)}$ | Transistor stage | — | — | 0.085 | $^\circ C/W$ | |
| | | | Diode stage | — | — | 0.24 | | |

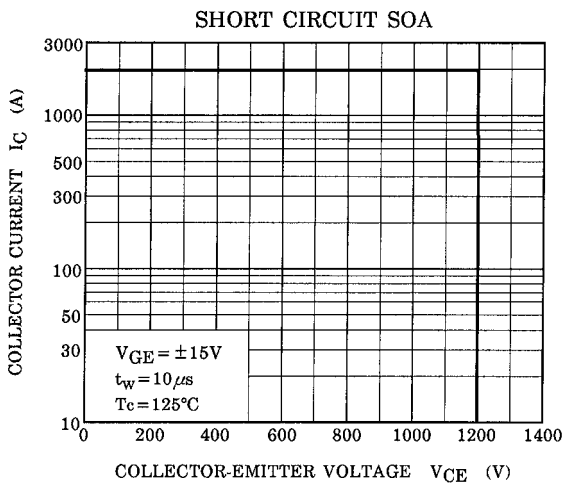
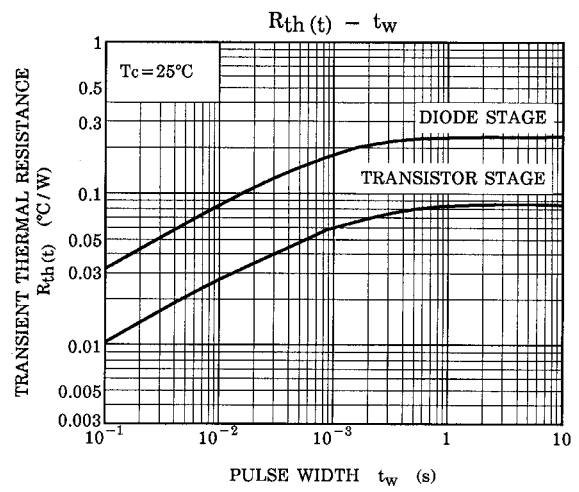
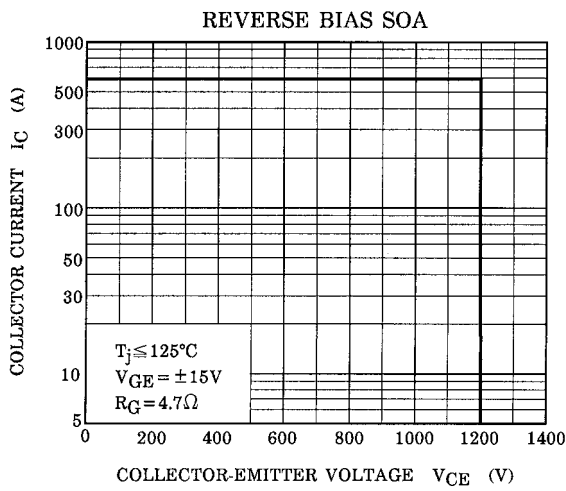
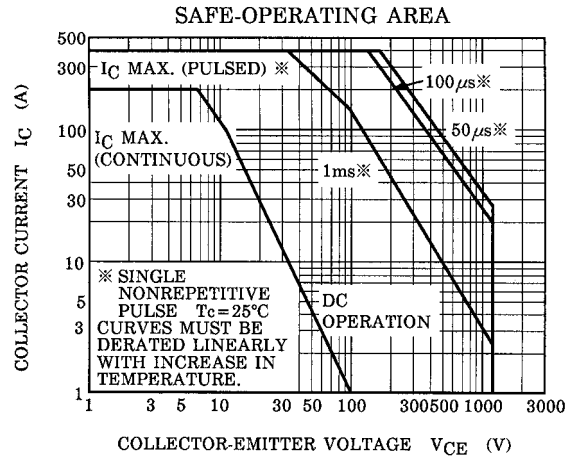
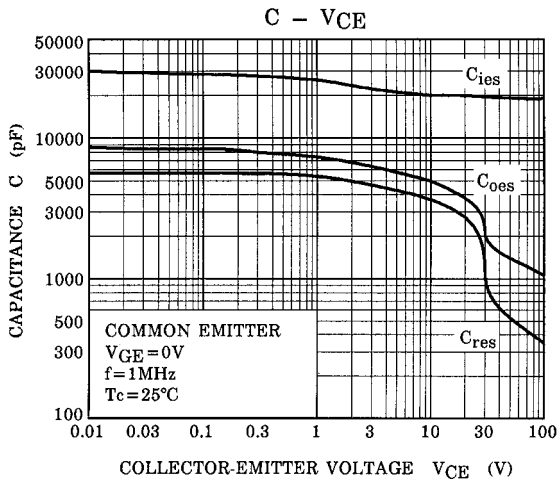
Note 1: Switching time and reverse recovery time test circuit & timing chart











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