

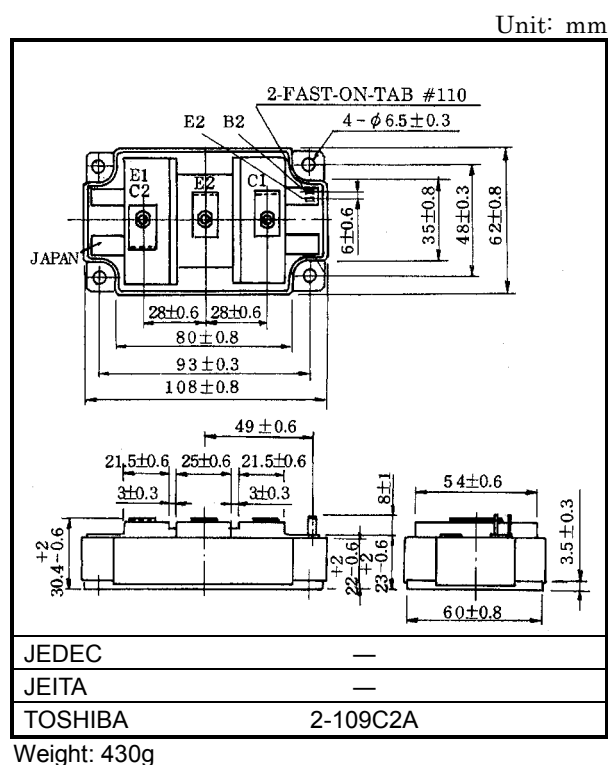
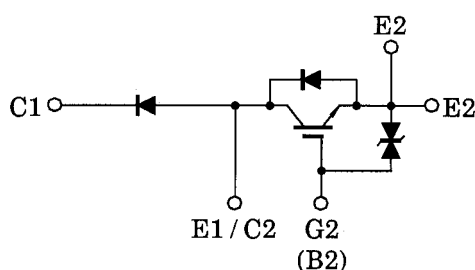
TOSHIBA GTR Module Silicon N Channel IGBT

MG200Q1ZS40

High Power Switching Applications
Motor Control Applications

- High input impedance
- High speed : $t_f = 0.5\mu s$ (max)
 $t_{rr} = 0.5\mu s$ (max)
- Low saturation voltage
: $V_{CE(sat)} = 4.0V$ (max)
- Enhancement-mode
- The electrodes are isolated from case

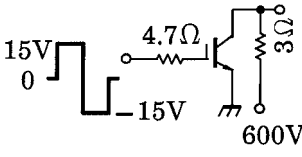
Equivalent Circuit

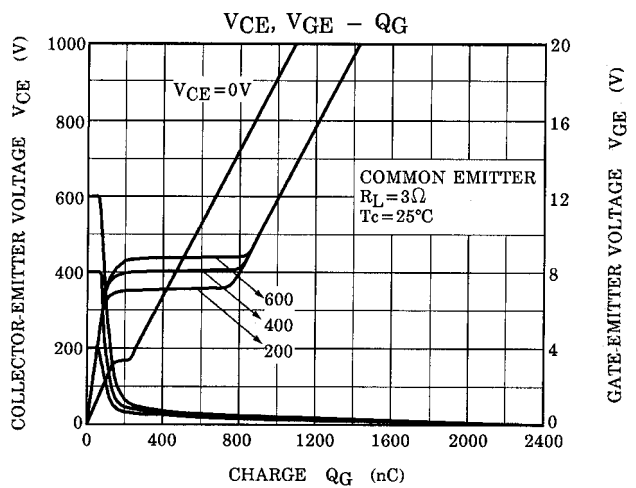
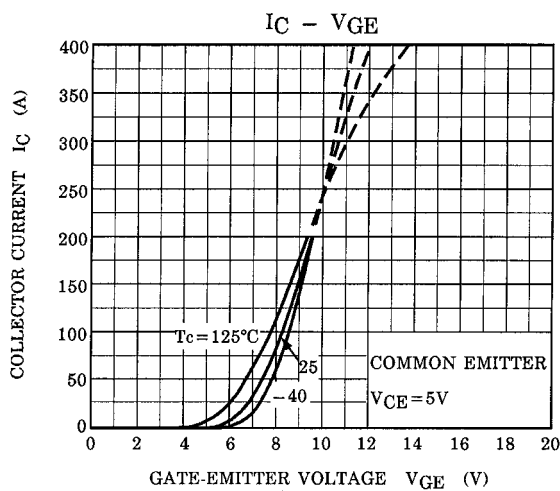
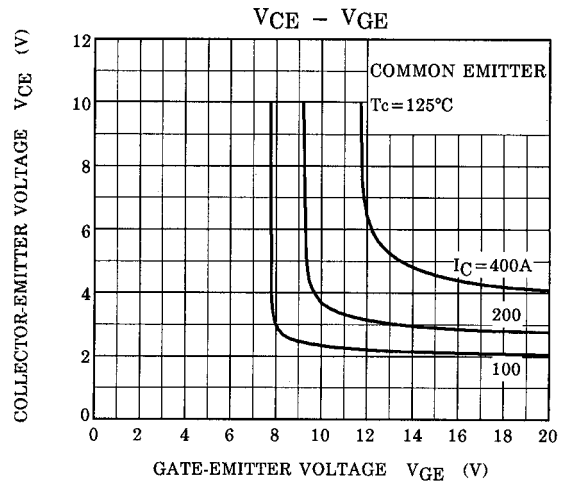
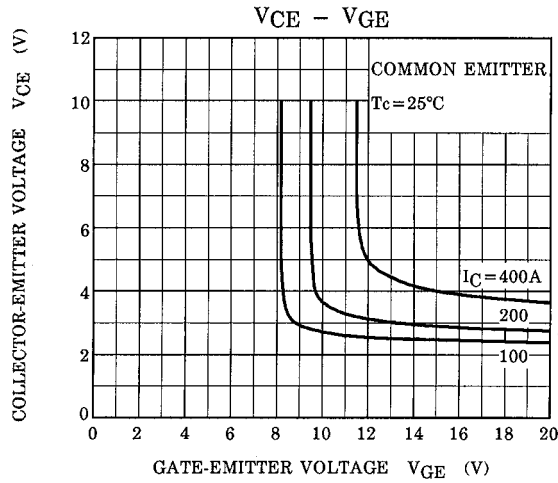
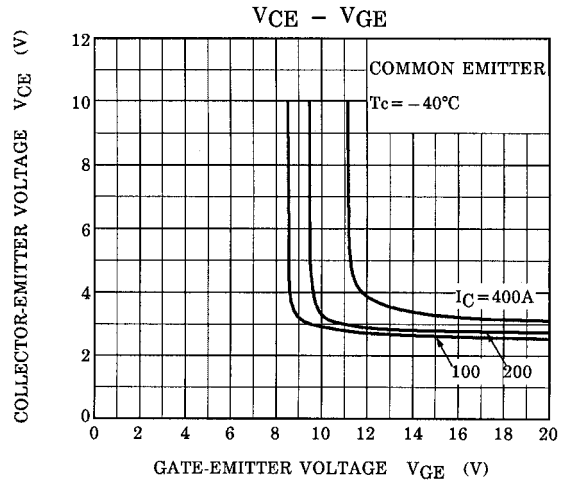
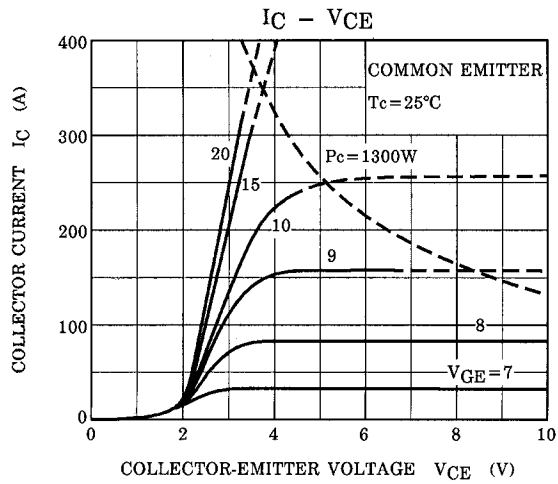


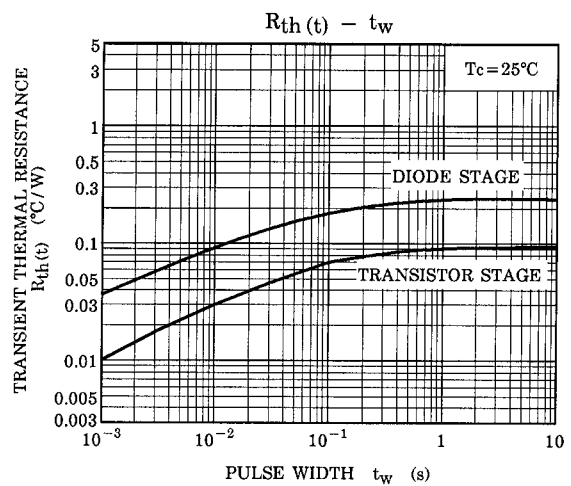
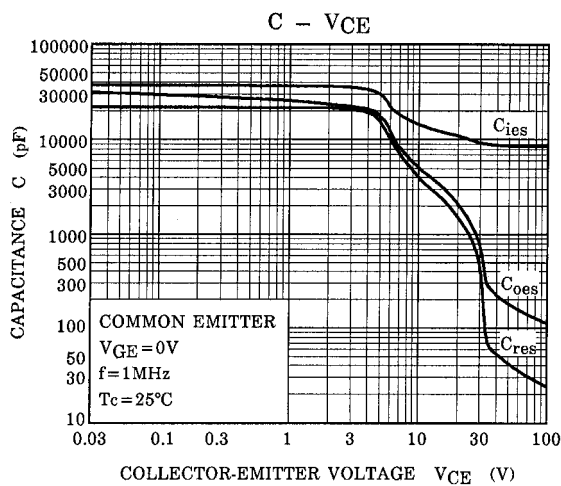
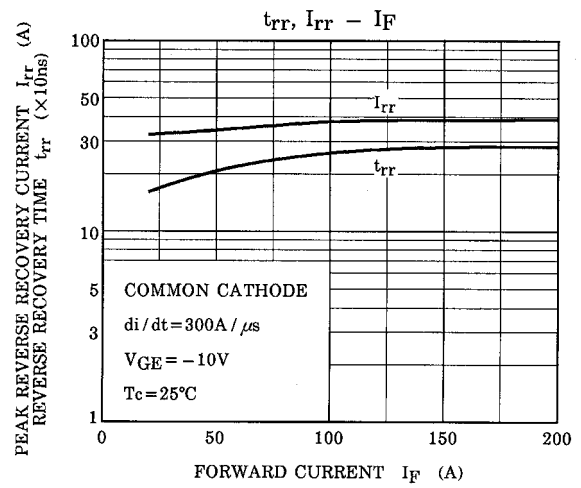
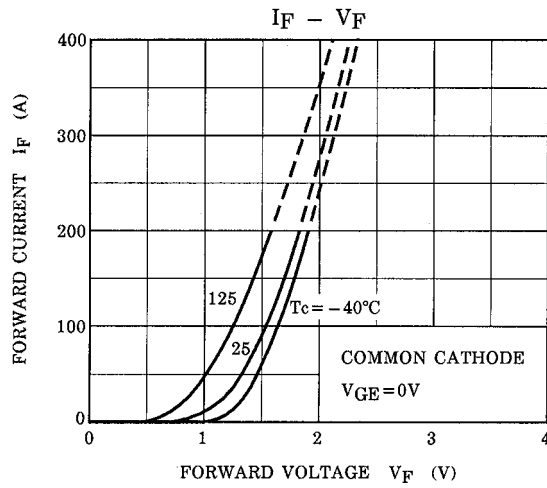
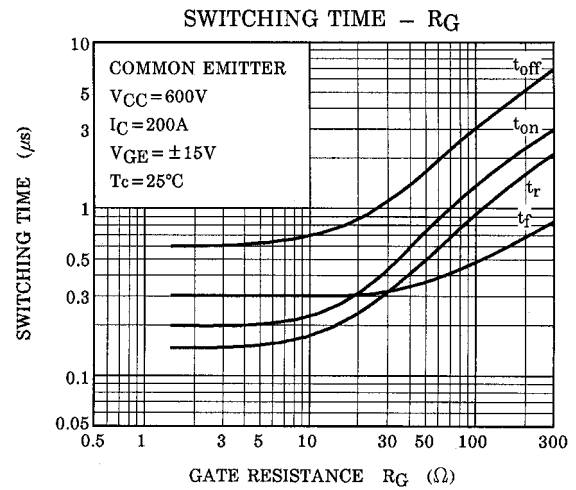
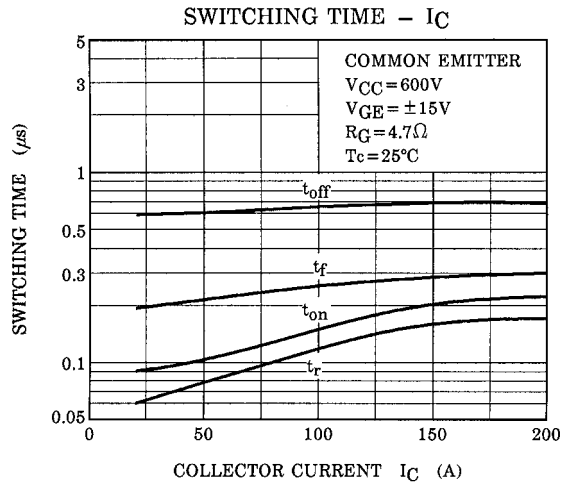
Maximum Ratings (Ta = 25°C)

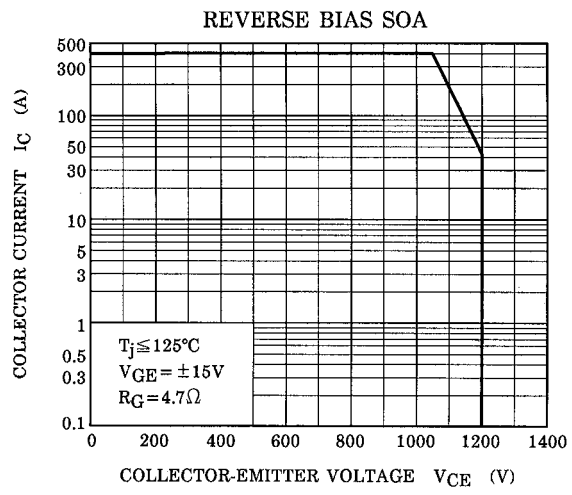
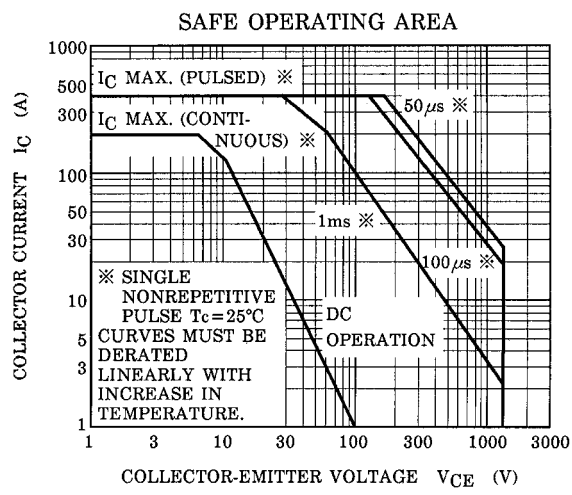
| Characteristics | | Symbol | Rating | Unit |
|---|-----|------------|------------------|------|
| Collector-emitter voltage | | V_{CES} | 1200 | V |
| Gate-emitter voltage | | V_{GES} | ±20 | V |
| Reverse voltage | | V_R | 1200 | V |
| Collector current | DC | I_C | 200 | A |
| | 1ms | I_{CP} | 400 | |
| Forward current | DC | I_F | 200 | A |
| | 1ms | I_{FM} | 400 | |
| Collector power dissipation (Tc = 25°C) | | P_C | 1300 | 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)

| Characteristics | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|--------------------------------------|---------------|----------------|--|-----|-------|----------|-----------------|
| Gate leakage current | | I_{GES} | $V_{GE} = \pm 20V, V_{CE} = 0$ | — | — | ± 20 | μA |
| Collector cut-off current | | I_{CES} | $V_{CE} = 1200V, V_{GE} = 0$ | — | — | 2.0 | mA |
| Gate-emitter cut-off voltage | | $V_{GE (off)}$ | $V_{CE} = 5V, I_C = 200mA$ | 3.0 | — | 6.0 | V |
| Collector-emitter saturation voltage | | $V_{CE (sat)}$ | $I_C = 200A, V_{GE} = 15V$ | — | 3.0 | 4.0 | V |
| Input capacitance | | C_{ies} | $V_{CE} = 10V, V_{GE} = 0, f = 1MHz$ | — | 24000 | — | pF |
| Switching time | Rise time | t_r |  | — | 0.3 | 0.6 | μs |
| | Turn-on time | t_{on} | | — | 0.4 | 0.8 | |
| | Fall time | t_f | | — | 0.2 | 0.5 | |
| | Turn-off Time | t_{off} | | — | 0.8 | 1.5 | |
| Reverse current | | I_R | $V_R = 1200V$ | — | — | 2.0 | mA |
| Forward voltage | | V_F | $I_F = 200A, V_{GE} = 0$ | — | 2.0 | 3.0 | V |
| Reverse recovery time | | t_{rr} | $I_F = 200A, V_{GE} = -10V$ $di / dt = 300A / \mu s$ | — | 0.25 | 0.5 | μs |
| Thermal resistance | Transistor | $R_{th (j-c)}$ | | — | — | 0.096 | $^{\circ}C / W$ |
| | Diode | | | — | — | 0.25 | |







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