

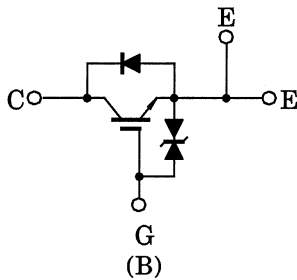
TOSHIBA GTR Module Silicon N Channel IGBT

# MG200Q1US41

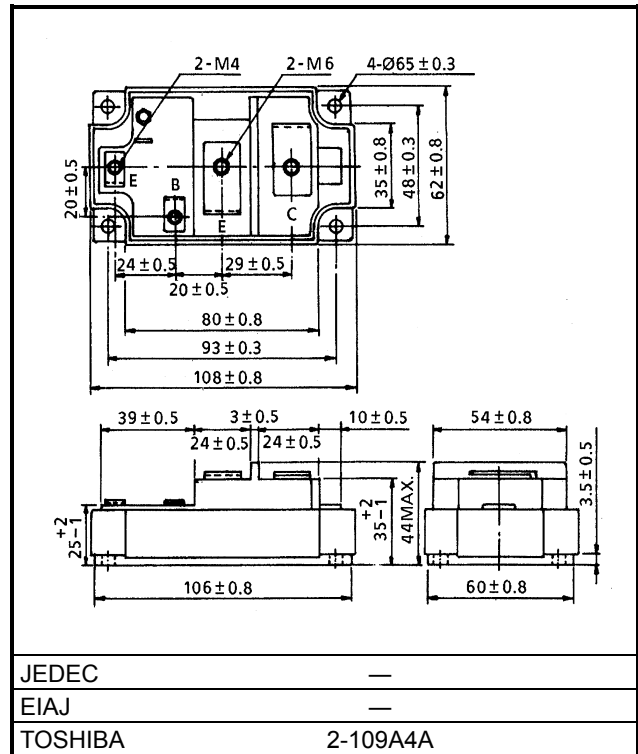
High Power Switching Applications  
 Motor Control Applications

- 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



Unit: mm



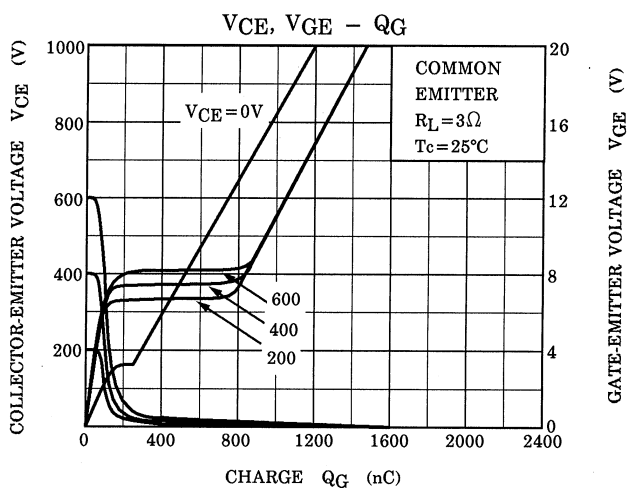
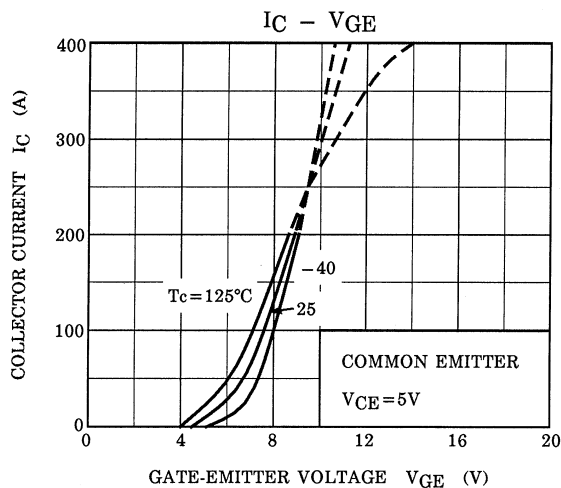
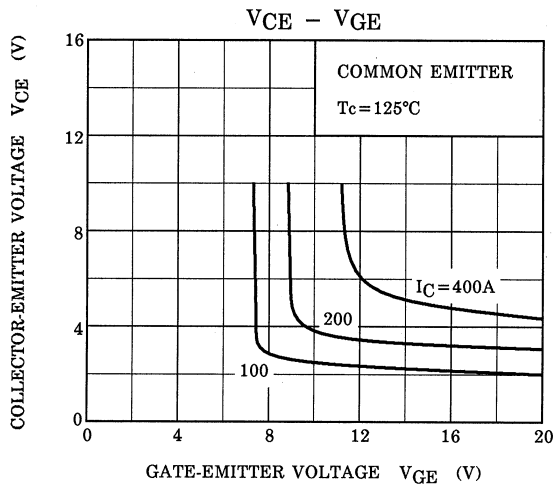
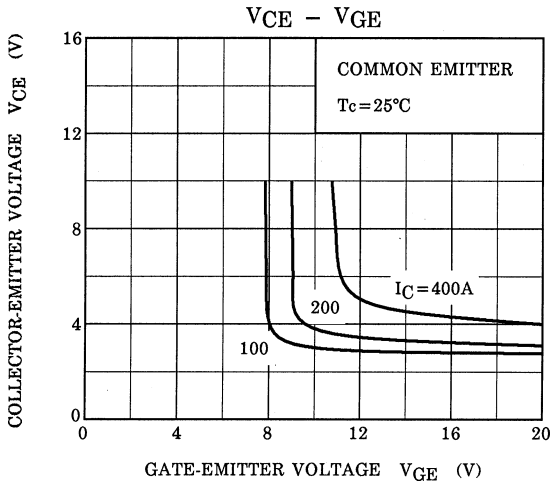
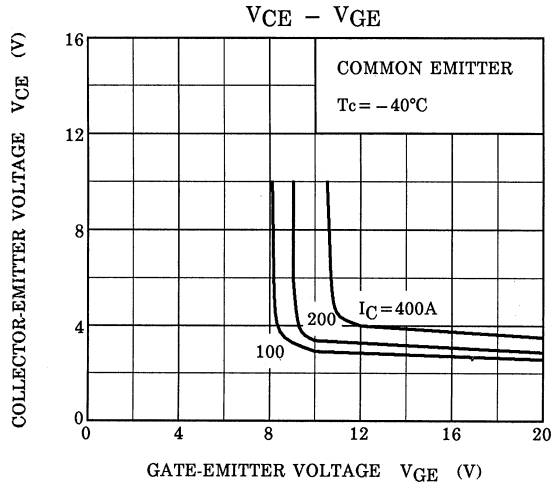
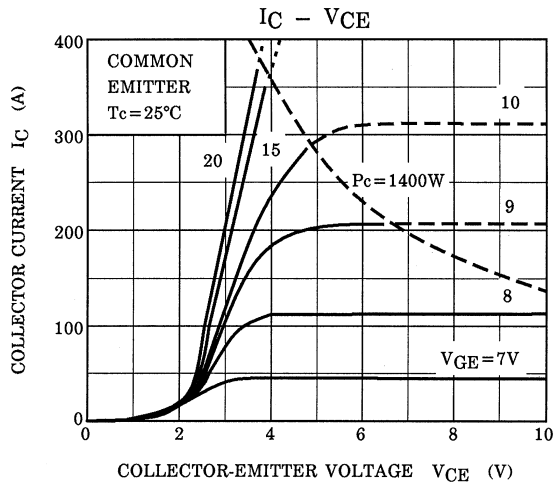
Weight: 465g

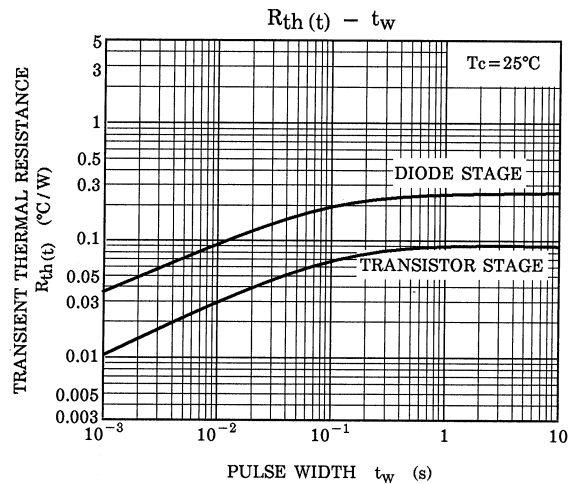
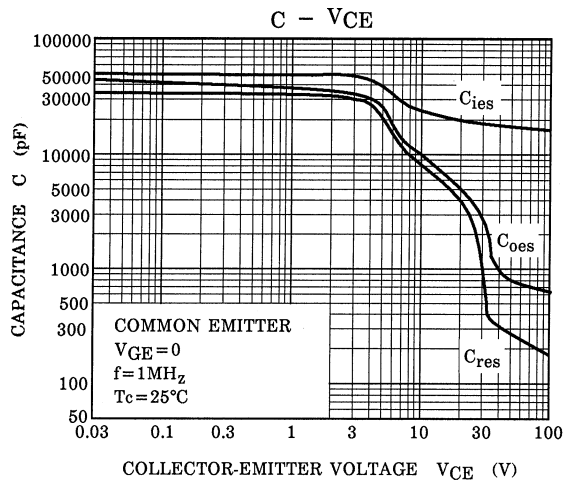
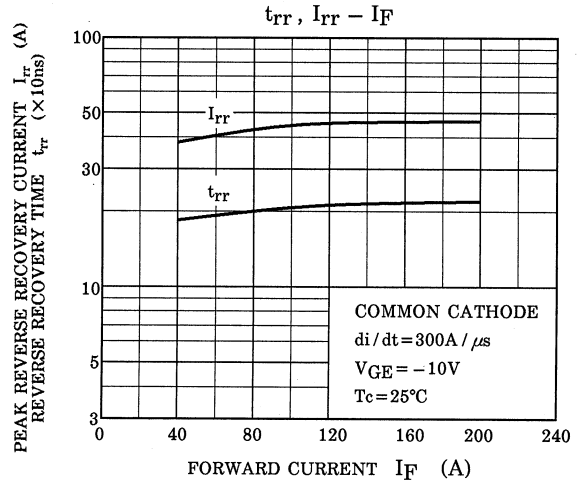
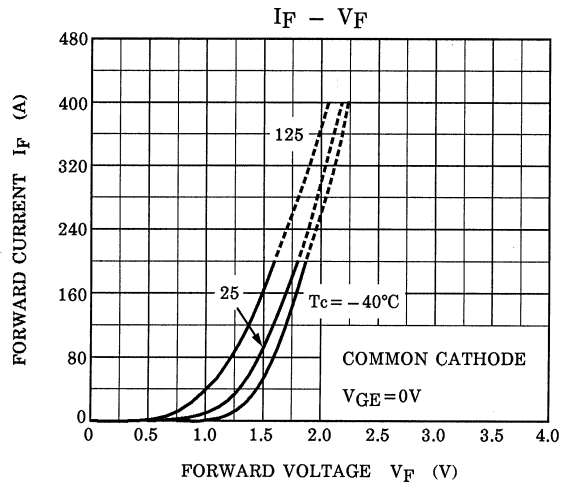
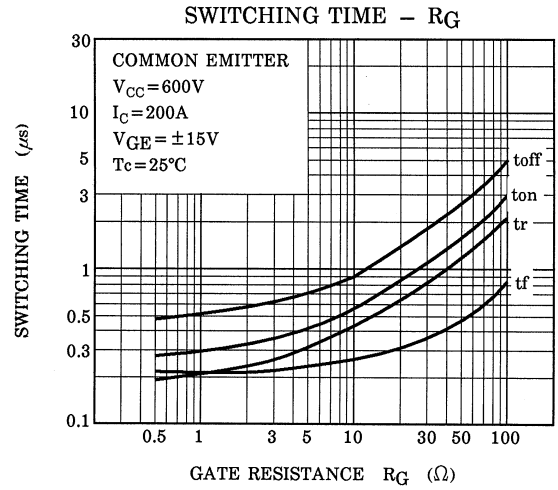
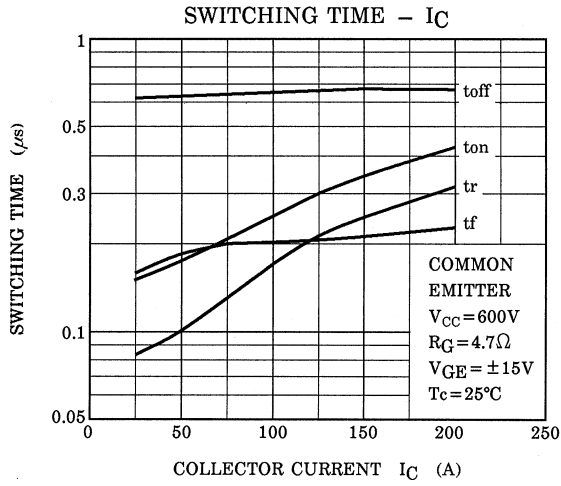
## Maximum Ratings (Ta = 25°C)

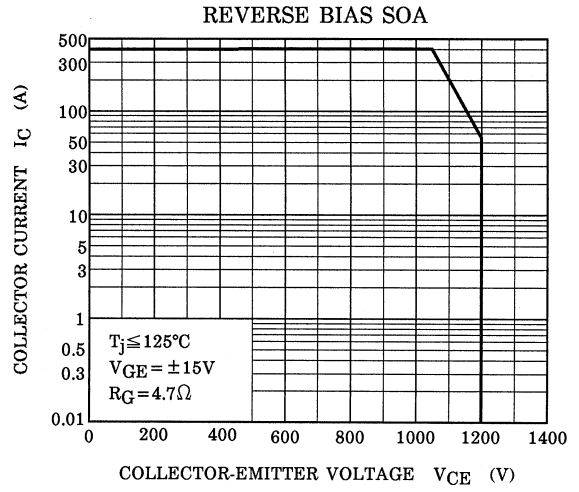
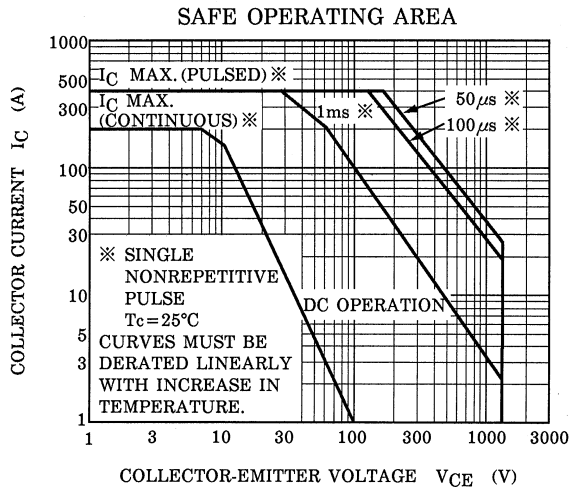
| Characteristic                             | Symbol     | Rating            | Unit |
|--|------------|-------------------|------|
| Collector-emitter voltage                  | $V_{CES}$  | 1200              | V    |
| Gate-emitter voltage                       | $V_{GES}$  | ±20               | V    |
| Collector current                          | DC         | $I_C$             | 200  |
|  | 1ms        | $I_{CP}$          | 400  |
| Forward current                            | DC         | $I_F$             | 200  |
|  | 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 : M4/M6 / mounting) | —          | 2 / 3 / 3         | N·m  |

## Electrical Characteristics (Ta = 25°C)

| Characteristic                       |               | Symbol         | Test Condition  | Min | Typ.  | Max      | Unit            |
|--------------------------------------|---------------|----------------|---|-----|-------|----------|-----------------|
| Gate leakage current                 |               | $I_{GES}$      | $V_{GE} = \pm 20V, V_{CE} = 0$                          | —   | —     | $\pm 40$ | $\mu A$         |
| Collector cut-off current            |               | $I_{CES}$      | $V_{CE} = 1200V, V_{GE} = 0$                            | —   | —     | 4.0      | mA              |
| Gate-emitter cut-off voltage         |               | $V_{GE (OFF)}$ | $I_C = 200mA, V_{CE} = 5V$                              | 3.0 | —     | 6.0      | V               |
| Collector-emitter saturation voltage |               | $V_{CE (sat)}$ | $I_C = 200A, V_{GE} = 15V$                              | —   | 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      | $\mu s$         |
|                                      | 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      |                 |
| Forward voltage                      |               | $V_F$          | $I_F = 200A, V_{GE} = 0$                                | —   | 2.0   | 3.0      | V               |
| Reverse recovery time                |               | $t_{rr}$       | $I_F = 200A, V_{GE} = -10V$<br>$di / dt = 300A / \mu s$ | —   | 0.25  | 0.5      | $\mu s$         |
| Thermal resistance                   |               | $R_{th (j-c)}$ | Transistor  | —   | —     | 0.089    | $^{\circ}C / W$ |
|                                      |               |                | Diode   | —   | —     | 0.25     |                 |







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