

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

# MG300Q1US41

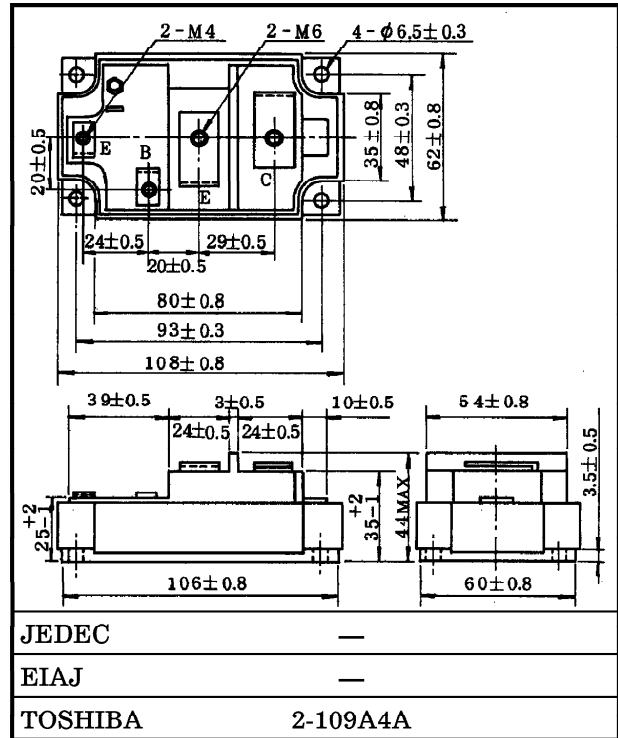
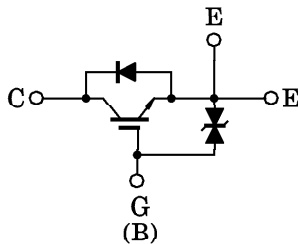
HIGH POWER SWITCHING APPLICATIONS.

Unit : mm

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 :  $V_{CE(sat)} = 4.0 V$  (Max.)
- Enhancement-Mode
- The Electrodes are Isolated from Case.

EQUIVALENT CIRCUIT



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         | $I_C$              | 300  |
|  | 1ms        | $I_{CP}$           | 600  |
| Forward Current                              | DC         | $I_F$              | 300  |
|  | 1ms        | $I_{FM}$           | 600  |
| Collector Power Dissipation (Tc = 25°C)      | $P_C$      | 2000               | W    |
| 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 (Terminal : M4 / M6 / Mounting) | —          | 2 / 3 / 3          | N·m  |

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ELECTRICAL CHARACTERISTIC (Ta = 25°C)

| CHARACTERISTIC                        |               | SYMBOL               | TEST CONDITION   | MIN. | TYP.  | MAX.  | UNIT   |
|---------------------------------------|---------------|----------------------|--|------|-------|-------|--------|
| Gate Leakage Current                  |               | I <sub>GES</sub>     | V <sub>GE</sub> = ±20V, V <sub>CE</sub> = 0                          | —    | —     | ±40   | μA     |
| Collector Cut-off Current             |               | I <sub>CES</sub>     | V <sub>CE</sub> = 1200V, V <sub>GE</sub> = 0                         | —    | —     | 4.0   | mA     |
| Gate-Emmitter Cut-off Voltage         |               | V <sub>GE(OFF)</sub> | I <sub>C</sub> = 300mA, V <sub>CE</sub> = 5V                         | 3.0  | —     | 6.0   | V      |
| Collector-Emmitter Saturation Voltage |               | V <sub>CE(sat)</sub> | I <sub>C</sub> = 300A, V <sub>GE</sub> = 15V                         | —    | 3.0   | 4.0   | V      |
| Input Capacitance                     |               | C <sub>ies</sub>     | V <sub>CE</sub> = 10V, V <sub>GE</sub> = 0, f = 1MHz                 | —    | 36000 | —     | pF     |
| Switching Time                        | Rise Time     | t <sub>r</sub>       |  | —    | 0.3   | 0.6   | μs     |
|                                       | Turn-on Time  | t <sub>on</sub>      |  | —    | 0.4   | 0.8   |        |
|                                       | Fall Time     | t <sub>f</sub>       |  | —    | 0.2   | 0.5   |        |
|                                       | Turn-off Time | t <sub>off</sub>     |  | —    | 0.8   | 1.5   |        |
| Forward Voltage                       |               | V <sub>F</sub>       | I <sub>F</sub> = 300A, V <sub>GE</sub> = 0                           | —    | 2.0   | 3.0   | V      |
| Reverse Recovery Time                 |               | t <sub>rr</sub>      | I <sub>F</sub> = 300A, V <sub>GE</sub> = -10V<br>di / dt = 300A / μs | —    | 0.25  | 0.5   | μs     |
| Thermal Resistance                    |               | R <sub>th(j-c)</sub> | Transistor   | —    | —     | 0.063 | °C / W |
|                                       |               |                      | Diode  | —    | —     | 0.2   |        |

