

TOSHIBA GTR MODULE   SILICON N CHANNEL IGBT

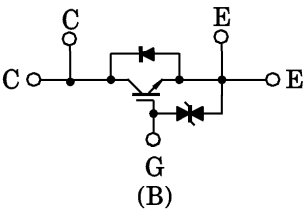
MG600Q1US41

HIGH POWER SWITCHING APPLICATIONS.

MOTOR CONTROL APPLICATIONS.

- High Input Impedance
- High Speed :  $t_f=0.5\mu s$  (Max.)
- Low Saturation Voltage :  $V_{CE(sat)}=4.0V$  (Max.)
- Enhancement-Mode
- Outline : TOSHIBA 2-109E1A  
(See page 3 for the device outline)
- Weight : 590g (TYP.)

EQUIVALENT CIRCUIT



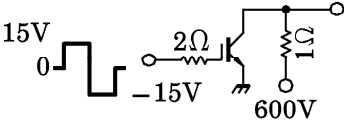
MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC                                  |     | SYMBOL     | RATING             | UNIT |
|-------------------------------------------------|-----|------------|--------------------|------|
| Collector-Emitter Voltage                       |     | $V_{CES}$  | 1200               | V    |
| Gate-Emitter Voltage                            |     | $V_{GES}$  | $\pm 20$           | V    |
| Collector Current                               | DC  | $I_C$      | 600                | A    |
|                                                 | 1ms | $I_{CP}$   | 1200               |      |
| Forward Current                                 | DC  | $I_F$      | 600                | A    |
|                                                 | 1ms | $I_{FM}$   | 1200               |      |
| Collector Power Dissipation<br>(Tc = 25°C)      |     | $P_C$      | 3600               | 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<br>(Terminal : M4 / M6 / Mounting) |     | —          | 2 / 3 / 3          | N·m  |

961001EAA2

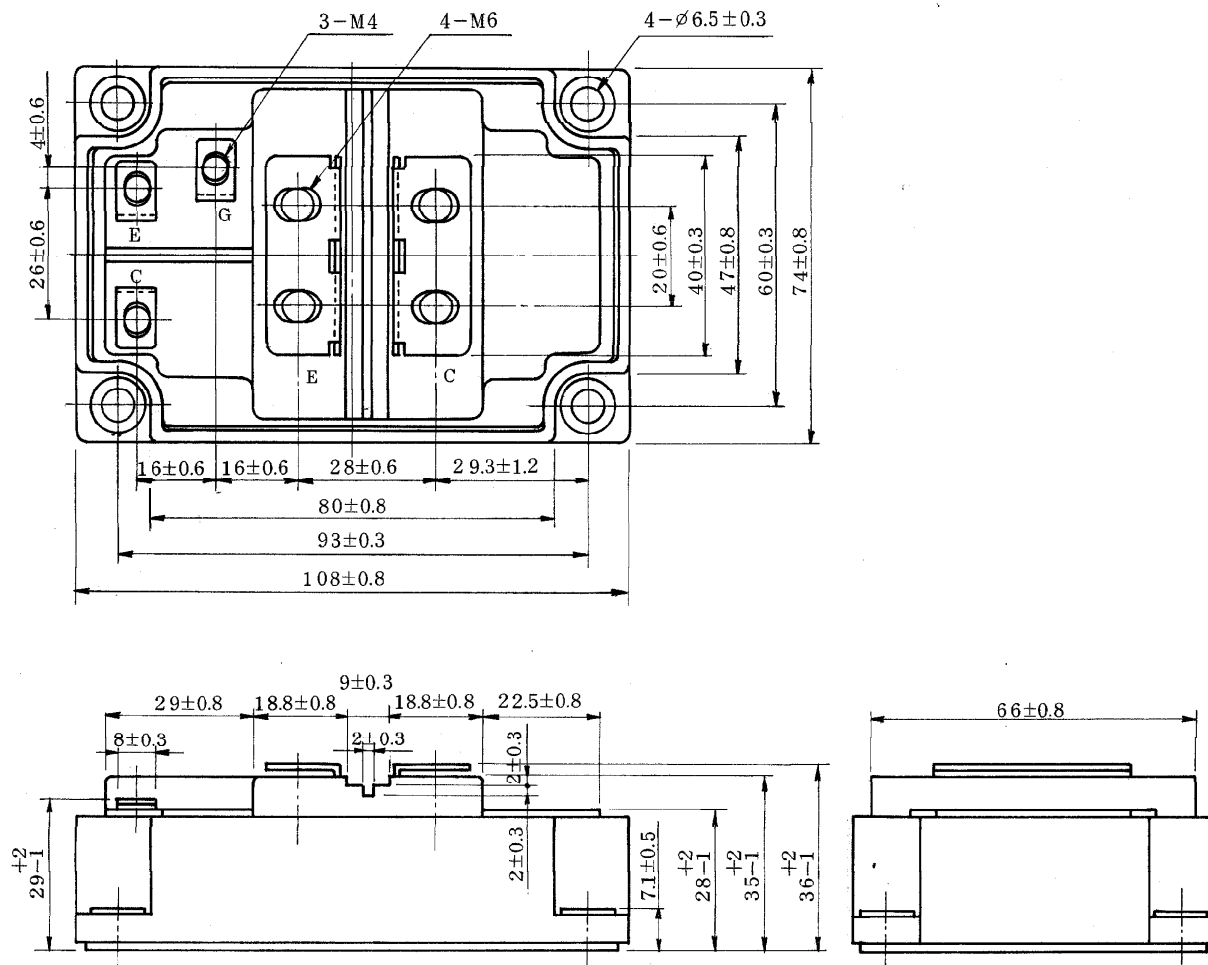
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## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC                       |               | SYMBOL        | TEST CONDITION                                                                     | MIN. | TYP.  | MAX.     | UNIT          |
|--------------------------------------|---------------|---------------|------------------------------------------------------------------------------------|------|-------|----------|---------------|
| Gate Leakage Current                 |               | $I_{GES}$     | $V_{GE} = \pm 20V, V_{CE} = 0$                                                     | —    | —     | $\pm 60$ | $\mu A$       |
| Collector Cut-off Current            |               | $I_{CES}$     | $V_{CE} = 1200V, V_{GE} = 0$                                                       | —    | —     | 6.0      | mA            |
| Gate-Emitter Cut-off Voltage         |               | $V_{GE(OFF)}$ | $I_C = 600mA, V_{CE} = 5V$                                                         | 3.0  | —     | 8.0      | V             |
| Collector-Emitter Saturation Voltage |               | $V_{CE(sat)}$ | $I_C = 600A, V_{GE} = 15V$                                                         | —    | 3.0   | 4.0      | V             |
| Input Capacitance                    |               | $C_{ies}$     | $V_{CE} = 10V, V_{GE} = 0, f = 1MHz$                                               | —    | 72000 | —        | 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                      |               | $V_F$         | $I_F = 600A, V_{GE} = 0$                                                           | —    | 2.3   | 3.2      | V             |
| Reverse Recovery Time                |               | $t_{rr}$      | $I_F = 600A, V_{GE} = -10V$<br>$di/dt = 1000A/\mu s$                               | —    | 0.25  | —        | $\mu s$       |
| Thermal Resistance                   |               | $R_{th(j-c)}$ | Transistor                                                                         | —    | —     | 0.035    | $^{\circ}C/W$ |
|                                      |               |               | Diode                                                                              | —    | —     | 0.125    |               |

OUTLINE : TOSHIBA 2-109E1A

Unit in mm



Weight : 590g (TYP.)

