

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

# MG100Q1ZS40

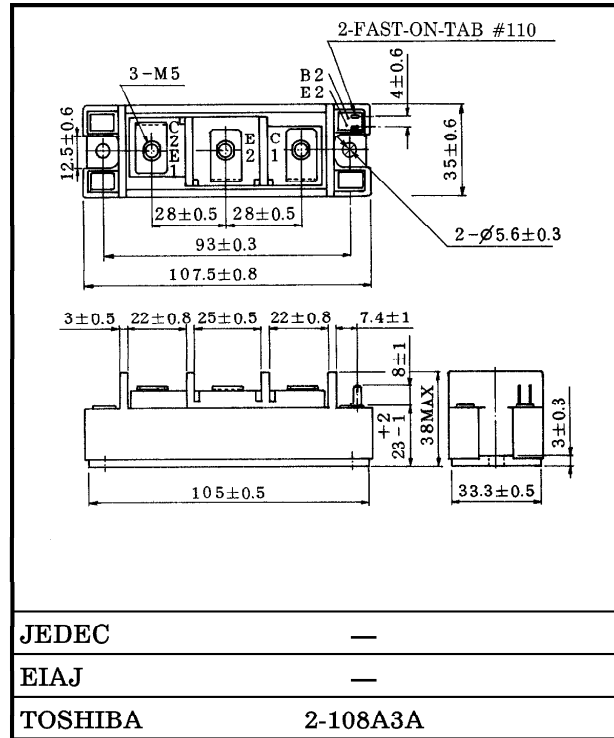
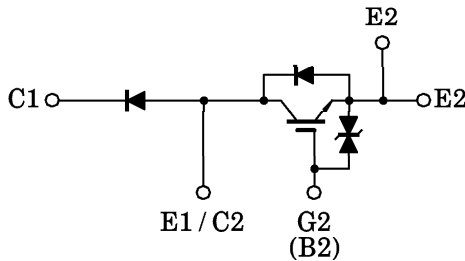
HIGH POWER SWITCHING APPLICATIONS.

Unit in mm

CHOPPER 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)

| CHARACTERISTIC                          | SYMBOL     | RATING           | UNIT |
|---|------------|------------------|------|
| Collector-Emitter Voltage               | $V_{CES}$  | 1200             | V    |
| Gate-Emitter Voltage                    | $V_{GES}$  | ±20              | V    |
| Collector Current                       | DC         | $I_C$            | 100  |
|   | 1ms        | $I_{CP}$         | 200  |
| Forward Current                         | DC         | $I_F$            | 100  |
|   | 1ms        | $I_{FM}$         | 200  |
| Collector Power Dissipation (Tc = 25°C) | $P_C$      | 670              | 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  |

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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC                       |               | SYMBOL         | TEST CONDITION  | MIN. | TYP.  | MAX.     | UNIT            |
|--------------------------------------|---------------|----------------|---|------|-------|----------|-----------------|
| Gate Leakage Current                 |               | $I_{GES}$      | $V_{GE} = \pm 20V, V_{CE} = 0$                          | —    | —     | $\pm 10$ | $\mu A$         |
| Collector Cut-off Current            |               | $I_{CES}$      | $V_{CE} = 1200V, V_{GE} = 0$                            | —    | —     | 1.0      | mA              |
| Collector-Emitter Voltage            |               | $V_{CES}$      | $I_C = 1mA, V_{GE} = 0$                                 | 1200 | —     | —        | V               |
| Gate-Emitter Cut-off Voltage         |               | $V_{GE (off)}$ | $V_{CE} = 5V, I_C = 100mA$                              | 3.0  | —     | 6.0      | V               |
| Collector-Emitter Saturation Voltage |               | $V_{CE (sat)}$ | $I_C = 100A, V_{GE} = 15V$                              | —    | 3.0   | 4.0      | V               |
| Input Capacitance                    |               | $C_{ies}$      | $V_{CE} = 10V, V_{GE} = 0$<br>$f = 1MHz$                | —    | 12000 | —        | 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                      |               | $V_F$          | $I_F = 100A, V_{GE} = 0$                                | —    | 2.0   | 3.0      | V               |
| Reverse Recovery Time                |               | $t_{rr}$       | $I_F = 100A, V_{GE} = -10V$<br>$di / dt = 200A / \mu s$ | —    | 0.25  | 0.5      | $\mu s$         |
| Thermal Resistance                   | Transistor    | $R_{th (j-c)}$ | —   | —    | —     | 0.19     | $^{\circ}C / W$ |
|                                      | Diode         |                |   | —    | —     | 0.5      |                 |

