

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

MG100Q1ZS40

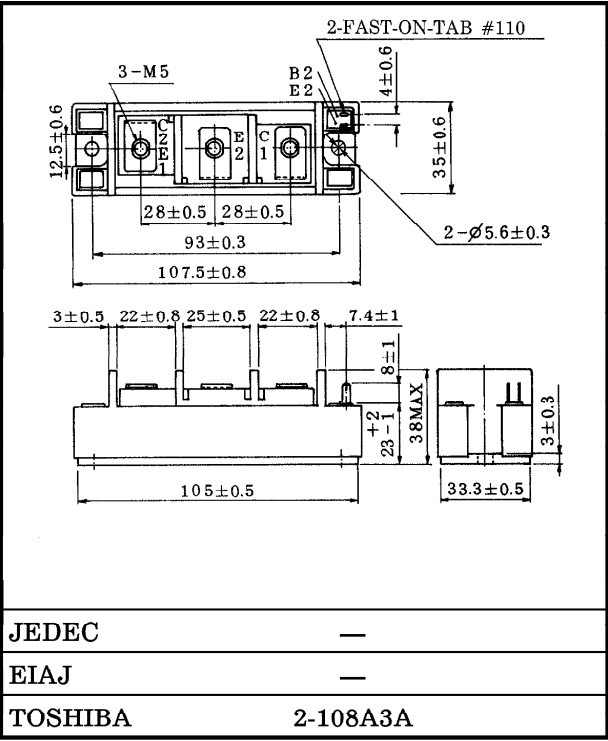
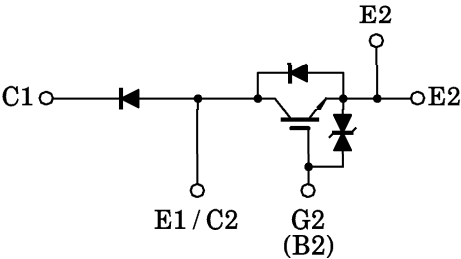
HIGH POWER SWITCHING APPLICATIONS.

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



|         |          |
|---------|----------|
| JEDEC   | —        |
| EIAJ    | —        |
| TOSHIBA | 2-108A3A |

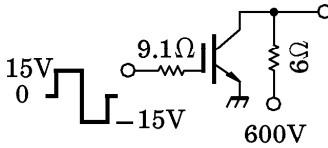
MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC                             |     | SYMBOL     | RATING           | UNIT |
|--------------------------------------------|-----|------------|------------------|------|
| Collector-Emitter Voltage                  |     | $V_{CES}$  | 1200             | V    |
| Gate-Emitter Voltage                       |     | $V_{GES}$  | ±20              | V    |
| Collector Current                          | DC  | $I_C$      | 100              | A    |
|                                            | 1ms | $I_{CP}$   | 200              |      |
| Forward Current                            | DC  | $I_F$      | 100              | A    |
|                                            | 1ms | $I_{FM}$   | 200              |      |
| Collector Power Dissipation<br>(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      |               |

