

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

MG90V2YS40

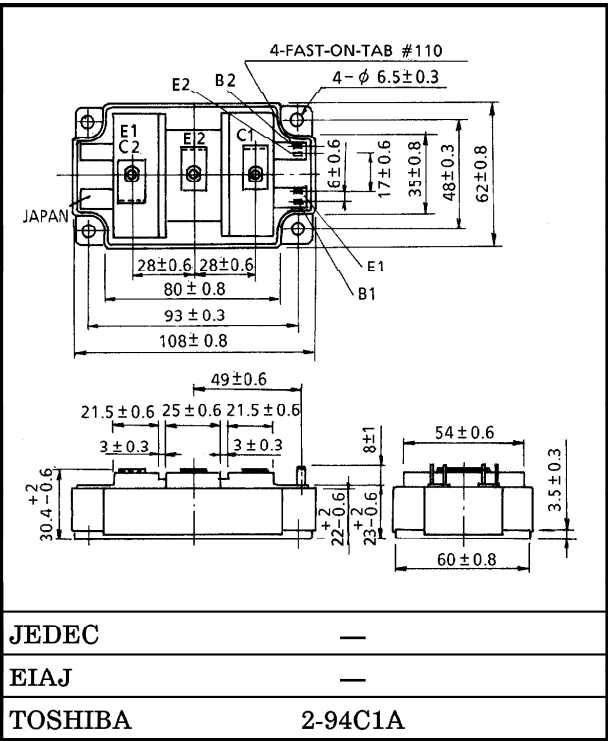
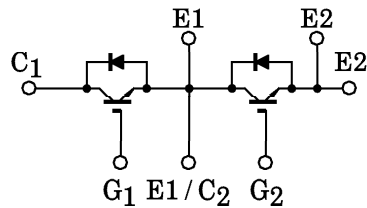
HIGH POWER SWITCHING APPLICATIONS

Unit in mm

MOTOR CONTROL APPLICATIONS

- The Electrodes are Isolated from Case.
- High Input Impedance
- Includes a Complete Half Bridge in One Package.
- Enhancement-Mode
- High Speed :  $t_f=1.5\mu s$  (Max.) ( $I_C=90A$ )  
 $t_{rr}=0.3\mu s$  (Max.) ( $I_F=90A$ )

EQUIVALENT CIRCUIT



Weight : 430g (TYP.)

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC                          |     | SYMBOL     | RATING           | UNIT |
|-----------------------------------------|-----|------------|------------------|------|
| Collector-Emitter Voltage               |     | $V_{CES}$  | 1700             | V    |
| Gate-Emitter Voltage                    |     | $V_{GES}$  | ± 20             | V    |
| Collector Current                       | DC  | $I_C$      | 90               | A    |
|                                         | 1ms | $I_{CP}$   | 180              |      |
| Forward Current                         | DC  | $I_F$      | 90               | A    |
|                                         | 1ms | $I_{FM}$   | 180              |      |
| Collector Power Dissipation (Tc = 25°C) |     | $P_C$      | 1100             | W    |
| Junction Temperature                    |     | $T_j$      | 150              | °C   |
| Storage Temperature Range               |     | $T_{stg}$  | - 40~125         | °C   |
| Isolation Voltage                       |     | $V_{Isol}$ | 4000 (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                 |                     | IGES      | VGE = ±20V, VCE = 0                                                             | —    | —     | ±100  | nA     |
| Collector Cut-off Current            |                     | ICES      | VCE = 1700V, VGE = 0                                                            | —    | —     | 1.0   | mA     |
| Gate-Emitter Cut-off Voltage         |                     | VGE (off) | IC = 90mA, VCE = 5V                                                             | 4.0  | —     | 8.0   | V      |
| Collector-Emitter Saturation Voltage |                     | VCE (sat) | IC = 90A, VGE = 15V                                                             | —    | 3.2   | 4.5   | V      |
| Input Capacitance                    |                     | Cies      | VCE = 10V, VGE = 0, f = 1MHz                                                    | —    | 13000 | —     | pF     |
| Switching Time                       | Turn-on Delay Time  | td (on)   | Inductive Load<br>VCC = 900V<br>IC = 90A<br>VGE = ±15V<br>RG = 5.6Ω<br>(Note 1) | —    | 0.1   | —     | μs     |
|                                      | Rise Time           | tr        |                                                                                 | —    | 0.1   | —     |        |
|                                      | Turn-on Time        | ton       |                                                                                 | —    | 0.5   | —     |        |
|                                      | Turn-off Delay Time | td (off)  |                                                                                 | —    | 0.4   | —     |        |
|                                      | Fall Time           | tf        |                                                                                 | —    | 0.5   | 1.5   |        |
|                                      | Turn-off Time       | toff      |                                                                                 | —    | 1.0   | —     |        |
| Forward Voltage                      |                     | VF        | IF = 90A, VGE = 0                                                               | —    | 3.2   | 4.5   | V      |
| Reverse Recovery Time                |                     | trr       | IF = 90A, VGE = -15V<br>di / dt = 500A / μs (Note 1)                            | —    | 0.2   | 0.4   | μs     |
| Thermal Resistance                   |                     | Rth (j-c) | Transistor Stage                                                                | —    | —     | 0.114 | °C / W |
|                                      |                     |           | Diode Stage                                                                     | —    | —     | 0.4   |        |

Note 1 Switching Time and Reverse Recovery Time Test Circuit & Timing Chart

