

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

# MG30V2YS40

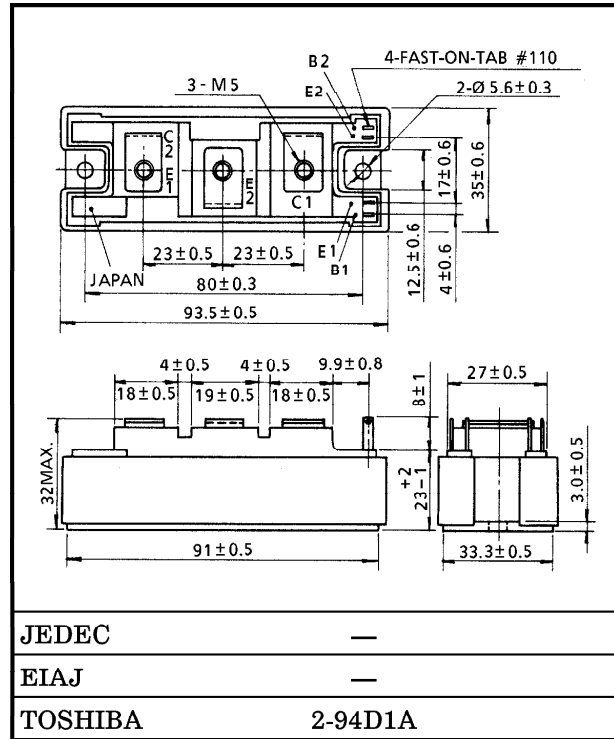
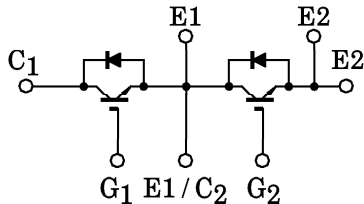
HIGH POWER SWITCHING APPLICATIONS

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.) ( $I_C = 30A$ )  
 $t_{rr} = 0.3 \mu s$  (Max.) ( $I_F = 30A$ )

EQUIVALENT CIRCUIT



Weight : 202g (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         | $I_C$            | 30   |
|   | 1ms        | $I_{CP}$         | 60   |
| Forward Current                         | DC         | $I_F$            | 30   |
|   | 1ms        | $I_{FM}$         | 60   |
| Collector Power Dissipation (Tc = 25°C) | $P_C$      | 500              | 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                 |                     | $I_{GES}$      | $V_{GE} = \pm 20V, V_{CE} = 0$   | —    | —    | $\pm 50$ | nA              |
| Collector Cut-off Current            |                     | $I_{CES}$      | $V_{CE} = 1700V, V_{GE} = 0$   | —    | —    | 0.5      | mA              |
| Gate-Emitter Cut-off Voltage         |                     | $V_{GE} (off)$ | $I_C = 30mA, V_{CE} = 5V$  | 4.0  | —    | 8.0      | V               |
| Collector-Emitter Saturation Voltage |                     | $V_{CE} (sat)$ | $I_C = 30A, V_{GE} = 15V$  | —    | 3.2  | 4.5      | V               |
| Input Capacitance                    |                     | $C_{ies}$      | $V_{CE} = 10V, V_{GE} = 0,$<br>$f = 1MHz$  | —    | 4400 | —        | pF              |
| Switching Time                       | Turn-on Delay Time  | $t_d (on)$     | Inductive Load<br>$V_{CC} = 900V$<br>$I_C = 30A$<br>$V_{GE} = \pm 15V$<br>$R_G = 24\Omega$<br>(Note 1) | —    | 0.1  | —        | $\mu s$         |
|                                      | Rise Time           | $t_r$          |  | —    | 0.1  | —        |                 |
|                                      | Turn-on Time        | $t_{on}$       |  | —    | 0.5  | —        |                 |
|                                      | Turn-off Delay Time | $t_d (off)$    |  | —    | 0.4  | —        |                 |
|                                      | Fall Time           | $t_f$          |  | —    | 0.5  | 1.5      |                 |
|                                      | Turn-off Time       | $t_{off}$      |  | —    | 1.0  | —        |                 |
| Forward Voltage                      |                     | $V_F$          | $I_F = 30A, V_{GE} = 0$  | —    | 3.2  | 4.5      | V               |
| Reverse Recovery Time                |                     | $t_{rr}$       | $I_F = 30A, V_{GE} = -15V$<br>$di / dt = 500A / \mu s$ (Note 1)  | —    | 0.1  | 0.3      | $\mu s$         |
| Thermal Resistance                   |                     | $R_{th (j-c)}$ | Transistor Stage   | —    | —    | 0.25     | $^{\circ}C / W$ |
|                                      |                     |                | Diode Stage  | —    | —    | 1.0      |                 |

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

