

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

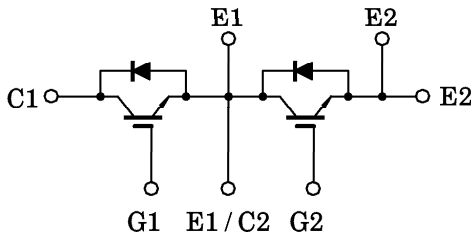
# MG75Q2YS51

HIGH POWER SWITCHING APPLICATIONS

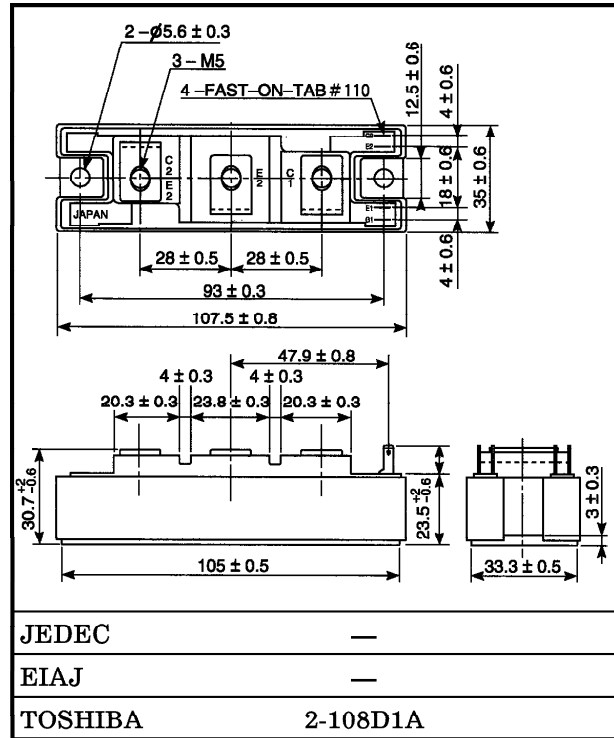
MOTOR CONTROL APPLICATIONS

- High Input Impedance
- High Speed :  $t_f = 0.3 \mu s$  (Max.)  
@Inductive Load
- Low Saturation Voltage  
:  $V_{CE(sat)} = 3.6V$  (Max.)
- Enhancement-Mode
- Includes a Complete Half Bridge in One Package.
- The Electrodes are Isolated from Case.

EQUIVALENT CIRCUIT



Unit in mm



Weight : 240g

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         | $I_C$<br>(25°C / 80°C)    | 100 / 75  |
|  | 1ms        | $I_{CP}$<br>(25°C / 80°C) | 200 / 150 |
| Forward Current                            | DC         | $I_F$                     | 75        |
|  | 1ms        | $I_{FM}$                  | 150       |
| Collector Power Dissipation<br>(Tc = 25°C) | $P_C$      | 600                       | W         |
| Junction Temperature                       | $T_j$      | 150                       | °C        |
| Storage Temperature Range                  | $T_{stg}$  | -40~125                   | °C        |
| Isolation Voltage                          | $V_{Isol}$ | 2500<br>(AC 1 minute)     | V         |
| Screw Torque (Terminal / Mounting)         | —          | 3 / 3                     | N·m       |

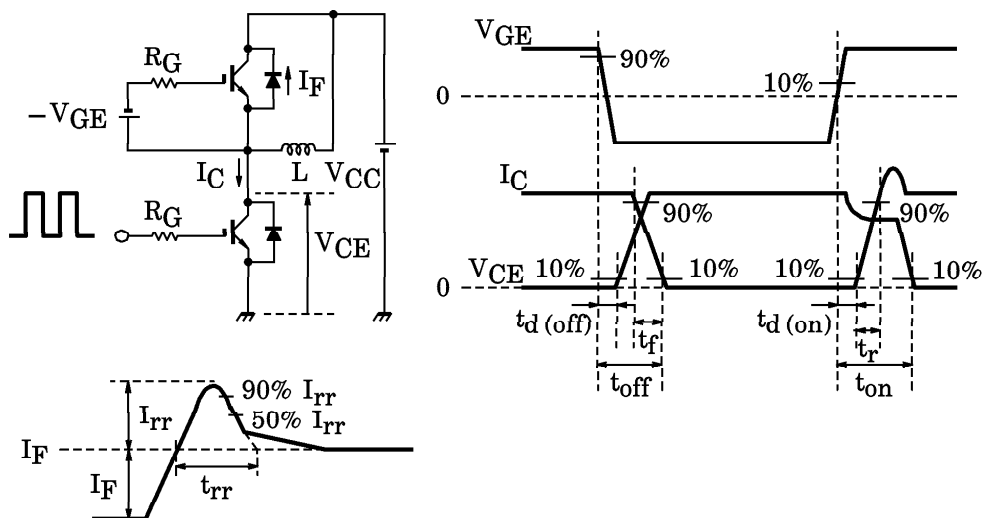
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC                       |                     | SYMBOL         | TEST CONDITION   | MIN.                | TYP. | MAX.      | UNIT         |
|--------------------------------------|---------------------|----------------|--|---------------------|------|-----------|--------------|
| Gate Leakage Current                 |                     | $I_{GES}$      | $V_{GE} = \pm 20V, V_{CE} = 0$   | —                   | —    | $\pm 500$ | nA           |
| Collector Cut-off Current            |                     | $I_{CES}$      | $V_{CE} = 1200V, V_{GE} = 0$   | —                   | —    | 1.0       | mA           |
| Gate-Emitter Cut-off Voltage         |                     | $V_{GE} (off)$ | $I_C = 75mA, V_{CE} = 5V$  | 3.0                 | —    | 6.0       | V            |
| Collector-Emitter Saturation Voltage |                     | $V_{CE} (sat)$ | $I_C = 75A, V_{GE} = 15V$  | $T_j = 25^\circ C$  | —    | 2.8       | 3.6          |
|                                      |                     |                |  | $T_j = 125^\circ C$ | —    | 3.1       | 4.0          |
| Input Capacitance                    |                     | $C_{ies}$      | $V_{CE} = 10V, V_{GE} = 0, f = 1MHz$   | —                   | 8.5  | —         | nF           |
| Switching Time                       | Turn-on Delay Time  | $t_d (on)$     | Inductive Load<br>$V_{CC} = 600V$<br>$I_C = 75A$<br>$V_{GE} = \pm 15V$<br>$R_G = 16\Omega$<br><br>(Note 1) | —                   | 0.05 | —         | $\mu s$      |
|                                      | Rise Time           | $t_r$          |  | —                   | 0.05 | —         |              |
|                                      | Turn-on Time        | $t_{on}$       |  | —                   | 0.2  | —         |              |
|                                      | Turn-off Delay Time | $t_d (off)$    |  | —                   | 0.5  | —         |              |
|                                      | Fall Time           | $t_f$          |  | —                   | 0.1  | 0.3       |              |
|                                      | Turn-off Time       | $t_{off}$      |  | —                   | 0.6  | —         |              |
| Forward Voltage                      |                     | $V_F$          | $I_F = 75A, V_{GE} = 0$  | —                   | 2.4  | 3.5       | V            |
| Reverse Recovery Time                |                     | $t_{rr}$       | $I_F = 75A, V_{GE} = -10V$<br>$di/dt = 700A/\mu s$ (Note 1)  | —                   | 0.1  | 0.25      | $\mu s$      |
| Thermal Resistance                   |                     | $R_{th} (j-c)$ | Transistor Stage   | —                   | —    | 0.2       | $^\circ C/W$ |
|                                      |                     |                | Diode Stage  | —                   | —    | 0.47      |              |

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



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