

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

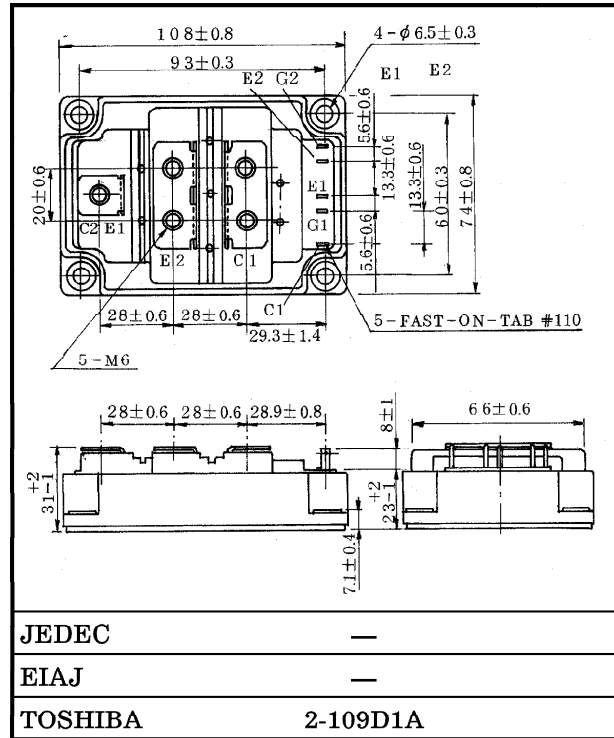
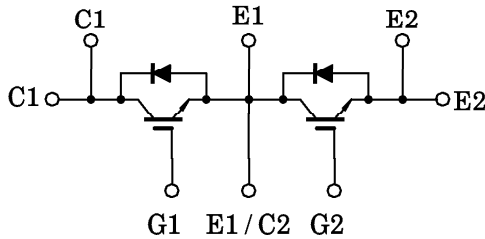
MG400J2YS50

HIGH POWER SWITCHING APPLICATIONS.
MOTOR CONTROL APPLICATIONS.

Unit in mm

- The Electrodes are Isolated from Case.
- High Input Impedance
- Includes a Complete Half Bridge in One Package.
- Enhancement-Mode
- High Speed : $t_f = 0.30 \mu s$ (Max.) ($I_C = 400A$)
 $t_{rr} = 0.15 \mu s$ (Max.) ($I_F = 400A$)
- Low Saturation Voltage
: $V_{CE(sat)} = 2.70V$ (Max.) ($I_C = 400A$)

EQUIVALENT CIRCUIT



Weight : 540g (TYP.)

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|---|------------|-------------------|-------|
| Collector-Emitter Voltage | V_{CES} | 600 | V |
| Gate-Emitter Voltage | V_{GES} | ±20 | V |
| Collector Current | DC | I_C | 400 |
| | 1ms | I_{CP} | 800 |
| Forward Current | DC | I_F | 400 |
| | 1ms | I_{FM} | 800 |
| Collector Power Dissipation (Tc = 25°C) | P_C | 1800 | W |
| Junction Temperature | T_j | 150 | °C |
| Storage Temperature Range | T_{stg} | -40~125 | °C |
| Isolation Voltage | V_{Isol} | 2500 (AC 1minute) | V |
| Screw Torque (Terminal / Mounting) | — | 3 / 3 | N · m |

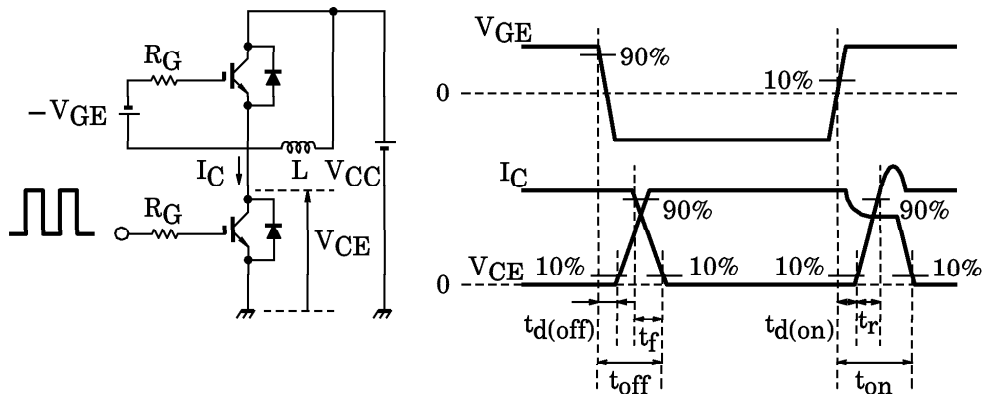
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---------------------------------------|---------------------|---------------|--|------|-------|-----------|---------------|
| Gate Leakage Current | | I_{GES} | $V_{GE} = \pm 20V, V_{CE} = 0$ | — | — | ± 500 | nA |
| Collector Cut-off Current | | I_{CES} | $V_{CE} = 600V, V_{GE} = 0$ | — | — | 3.0 | mA |
| Gate-Emmitter Cut-off Voltage | | $V_{GE(off)}$ | $I_C = 40mA, V_{CE} = 5V$ | 5.0 | 7.0 | 8.0 | V |
| Collector-Emmitter Saturation Voltage | | $V_{CE(sat)}$ | $I_C = 400A, V_{GE} = 15V$ | — | 2.10 | 2.70 | V |
| Input Capacitance | | C_{ies} | $V_{CE} = 10V, V_{GE} = 0$ $f = 1MHz$ | — | 46500 | — | pF |
| Switching Time | Turn-on Delay Time | $t_{d(on)}$ | Inductive Load $V_{CC} = 300V$ $I_C = 400A$ $V_{GE} = \pm 15V$ $R_G = 2.4\Omega$ (Note 1) | — | 0.25 | 0.50 | μs |
| | Rise Time | t_r | | — | 0.12 | 0.24 | |
| | Turn-on Time | t_{on} | | — | 0.40 | 0.80 | |
| | Turn-off Delay Time | $t_{d(off)}$ | | — | 0.30 | 0.60 | |
| | Fall Time | t_f | | — | 0.15 | 0.30 | |
| | Turn-off Time | t_{off} | | — | 0.50 | 1.00 | |
| Forward Voltage | | V_F | $I_F = 400A, V_{GE} = 0$ | — | 2.30 | 3.00 | V |
| Reverse Recovery Time | | t_{rr} | $I_F = 400A, V_{GE} = -10V$ $di/dt = 400A/\mu s$ | — | 0.08 | 0.15 | μs |
| Thermal Resistance | | $R_{th(j-c)}$ | Transistor Stage | — | — | 0.069 | $^{\circ}C/W$ |
| | | | Diode stage | — | — | 0.17 | |
| | | $R_{th(c-f)}$ | Case to Fin (Note 2) | — | — | 0.10 | |

Note 1 Switching Time Test Circuit & Timing Chart



Note 2 Silicone Grease is applied.

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