TOSHIBA GTR MODULE SILICON N-CHANNEL IGBT

# MG1200V1US51

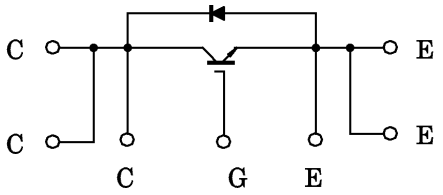
HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

FEATURES

- High Input Impedance
- Enhancement Mode
- Electrodes are isolated from case.

EQUIVALENT CIRCUIT




MAXIMUM RATINGS (Ta = 25°C)

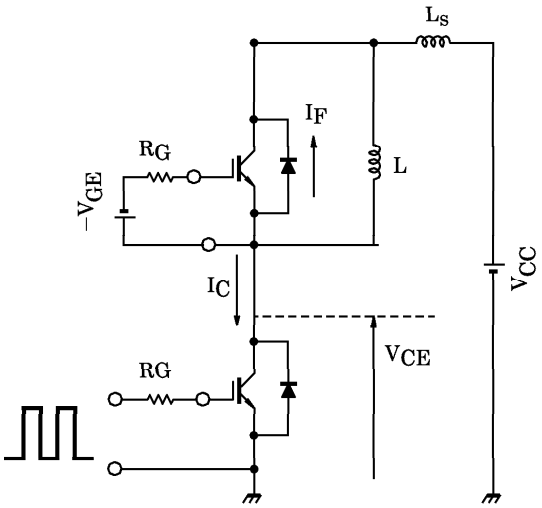
| CHARACTERISTICS | | SYMBOL | RATING | UNIT |
|---|---|---|---|---|
| Collector-Emitter Voltage | | $V_{CES}$ | 1700 | V |
| Gate-Emitter Voltage | | $V_{GES}$ | 20 | V |
| Collector Current | DC | $I_C$ | 1200 | A |
| | 1ms | $I_{CP}$ | 2400 | |
| Forward Current | DC | $I_F$ | 1200 | A |
| | 1ms | $I_{FM}$ | 2400 | |
| Collector Power Dissipation (Tc = 25°C) | | $P_C$ | 5560 | W |
| Junction Temperature | | $T_j$ | −20~125 | °C |
| Storage Temperature Range | | $T_{stg}$ | −40~125 | °C |
| Isolation Voltage | | $V_{Isol}$ | 5400 (AC 1min.) | V |
| Screw Torque | Terminal : M4 / M8 | — | 2 / 7 | N·m |
| | Mounting | | 4 | |

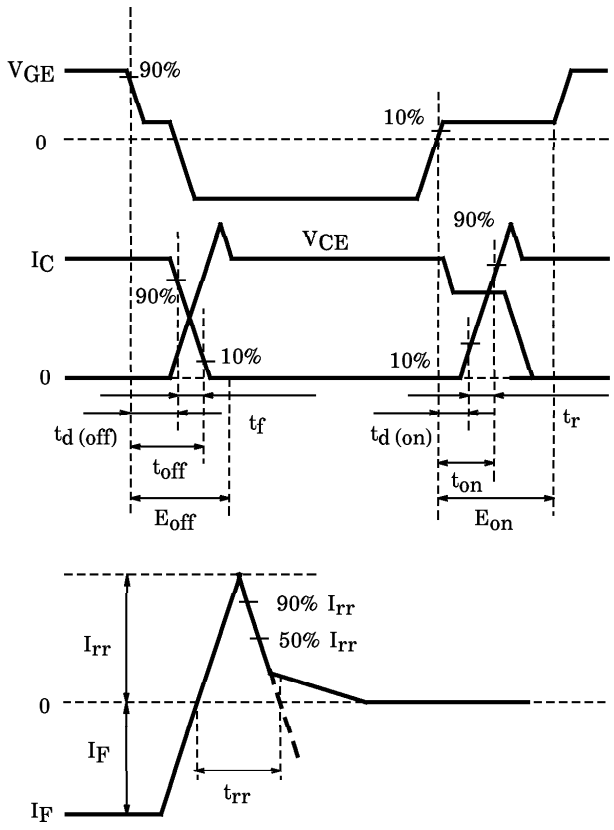
961001EAA1

ELECTRICAL CHARACTERISTICS (Tc = 125°C : except thermal resistance)

| CHARACTERISTICS | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Gate Laekage Current | | $I_{GES}$ | $V_{GE} = \pm 20V$, $V_{CE} = 0V$ | — | — | ±50 | nA |
| Collector Cut-Off Current | | $I_{CES}$ | $V_{CE} = 1700V$, $V_{GE} = 0V$ | — | — | 100 | mA |
| Gate-Emitter Cut-Off Voltage | | $V_{GE\ (off)}$ | $V_{CE} = 5V$, $I_C = 1.2A$ | 3.0 | | 7.0 | V |
| Collecter-Emitter Saturation Voltage | | $V_{CE\ (sat)}$ | $V_{GE} = 15V$, $I_C = 1200A$ | — | — | 5.0 | V |
| Input Capacitance | | $C_{ies}$ | $V_{CE} = 10V$, $V_{GE} = 0V$, $f = 300kHz$ | — | 130 | — | nF |
| Switching Time (Note 1) | Rise Time | $t_r$ | $V_{CC} = 900V$, $I_C = 1200A$ $V_{GE} = \pm 15V$, $R_G = 1.8\Omega$ (Inductive load : Ls = 150nH) | — | — | 0.7 | μs |
| | Turn-On Time | $t_{on}$ | | — | — | 1.0 | μs |
| | Fall Time | $t_f$ | | — | — | 0.8 | μs |
| | Turn-Off Time | $t_{off}$ | | — | — | 1.5 | μs |
| Forward Voltage | | $V_F$ | $I_F = 1200A$, $V_{GE} = 0V$ | — | — | 3.2 | V |
| Reverse Recovery Time (Note 1) | | $t_{rr}$ | $I_F = 1200A$, $V_{GE} = 15V$ $di/dt = 4000A/\mu s$, $V_{CC} = 900V$ | — | — | 0.8 | μs |
| Switching Dissipation (Note 1) | Turn-On Loss | Eon | $V_{CC} = 900V$, $I_C = 1200A$ $V_{GE} = \pm 15V$, $R_G = 1.8\Omega$ | — | 250 | — | mJ |
| | Turn-Off Loss | Eoff | | — | 500 | — | mJ |
| | Diode Loss | Edsw | $I_F = 1200A$, $V_{GE} = -15V$ $di/dt = 4000A/\mu s$, $V_{CC} = 900V$ | — | 300 | — | mJ |
| Thermal Resistance | | $R_{th\ (j-c)}$ | Transistor (IGBT) Stage | — | — | 0.018 | °C / W |
| | | | Diode Stage | — | — | 0.035 | °C / W |

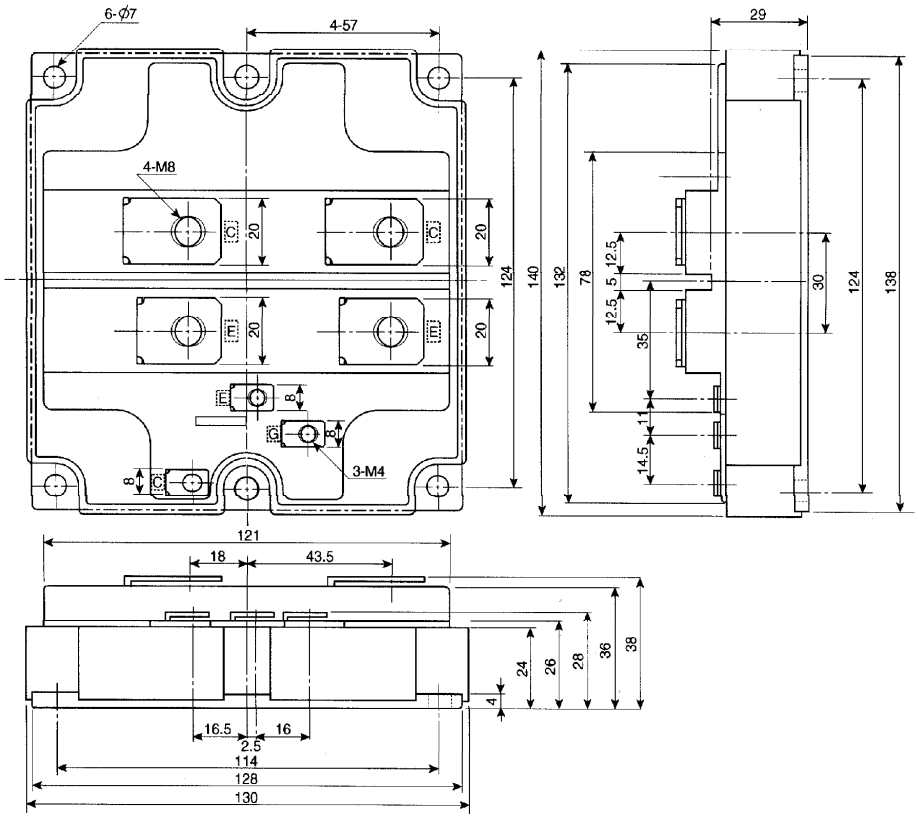
(Note 1) Test circuit and timing chart of switching time, reverse recovery time and switching dissipation.



OUTLINE DRAWING

Unit : mm




Weight : 900g (Typ.)