

TOSHIBA GTR Module Silicon N Channel IGBT

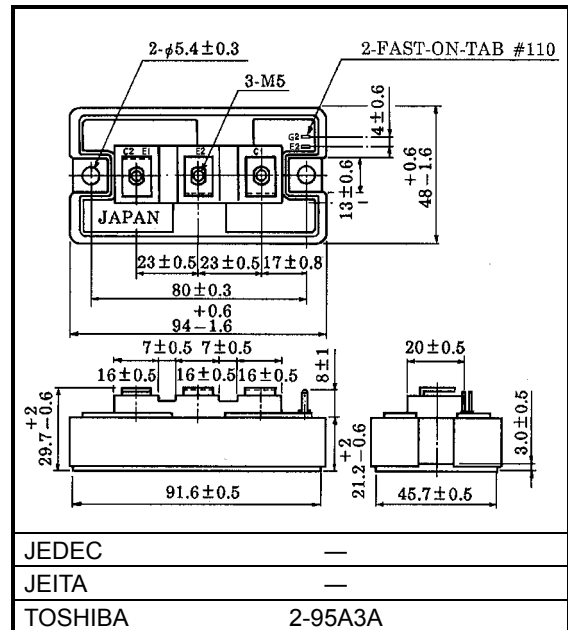
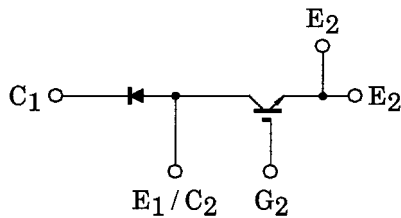
MG150J1ZS50

High Power Switching Applications
 Motor Control Applications

Unit: 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) ($I_C = 150A$)
 $t_{rr} = 0.15\mu s$ (max) ($I_F = 150A$)
- Low saturation voltage
 : $V_{CE(sat)} = 2.70V$ (max) ($I_C = 150A$)

Equivalent Circuit



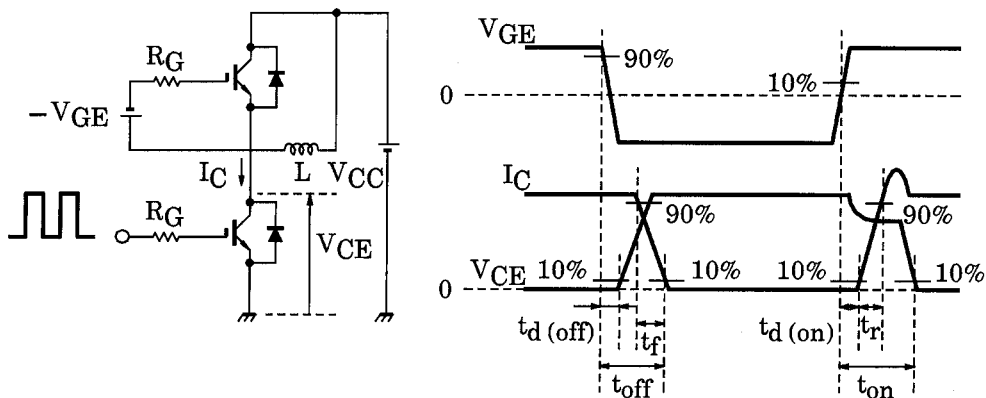
Maximum Ratings (Ta = 25°C)

| Characteristics | | Symbol | Rating | Unit |
|--|-----|------------|---------------------|------|
| Collector-emitter voltage | | V_{CES} | 600 | V |
| Gate-emitter voltage | | V_{GES} | ±20 | V |
| Reverse voltage | | V_R | 600 | V |
| Collector current | DC | I_C | 150 | A |
| | 1ms | I_{CP} | 300 | |
| Forward current | DC | I_F | 150 | A |
| | 1ms | I_{FM} | 300 | |
| Collector power dissipation ($T_c = 25^\circ C$) | | P_C | 780 | W |
| Junction temperature | | T_j | 150 | °C |
| Storage temperature range | | T_{stg} | -40 ~ 125 | °C |
| Isolation voltage | | V_{isol} | 2500 (AC 1 min.) | V |
| Screw torque (Terminal / mounting) | | — | 3 / 3 | N·m |

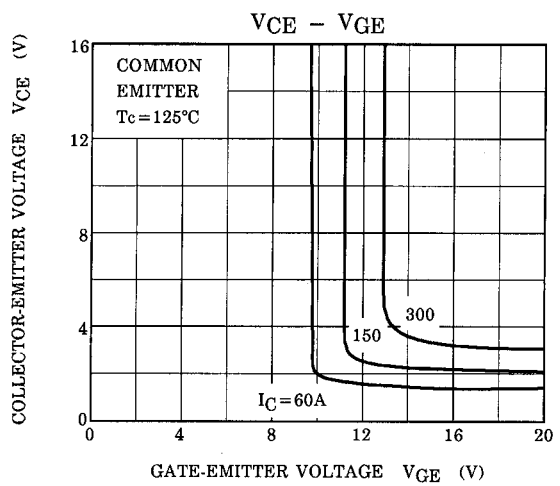
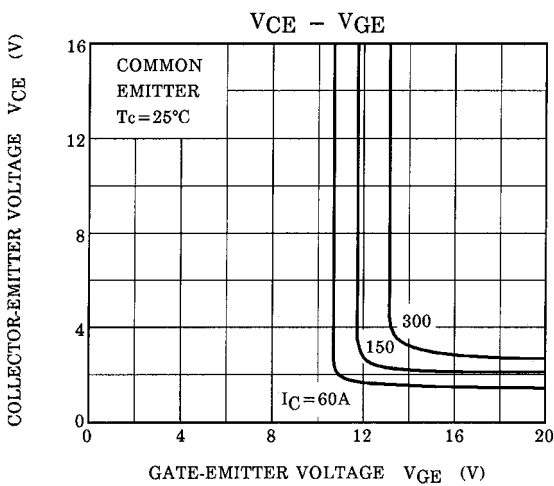
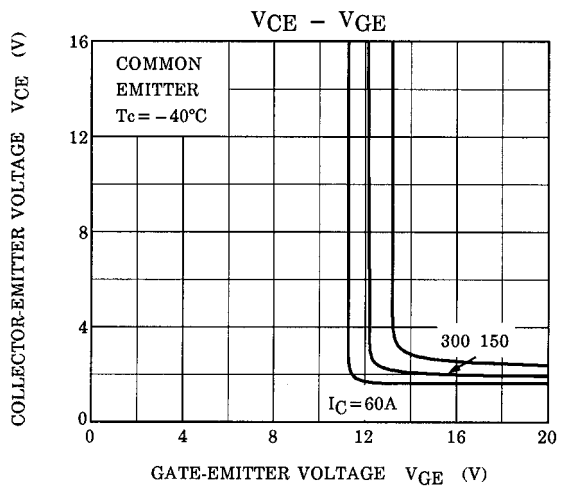
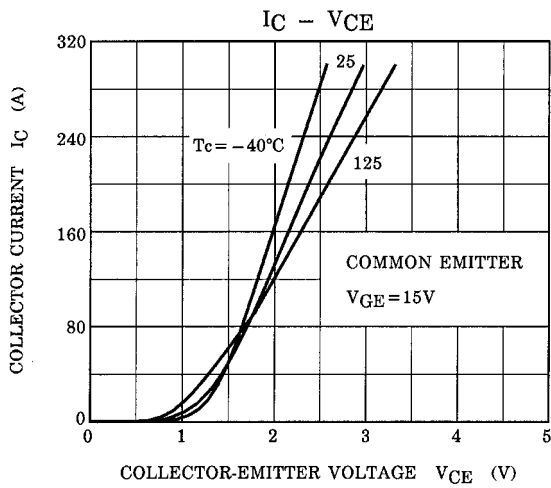
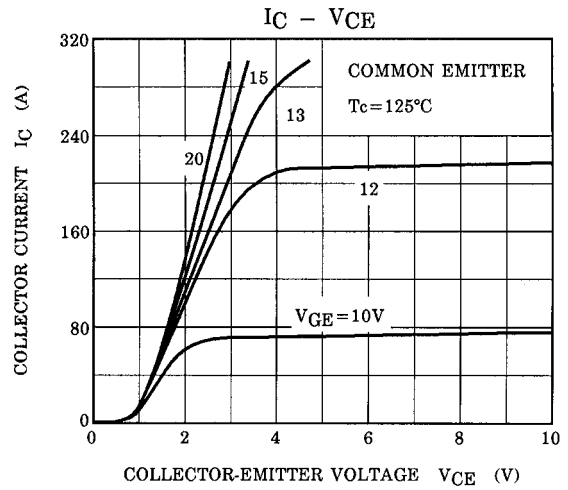
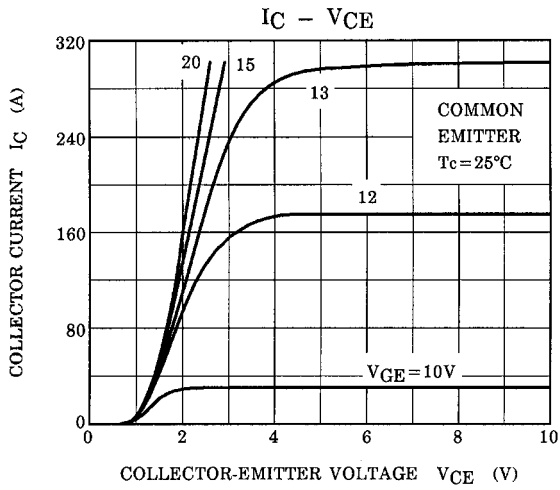
Electrical Characteristics (Ta = 25°C)

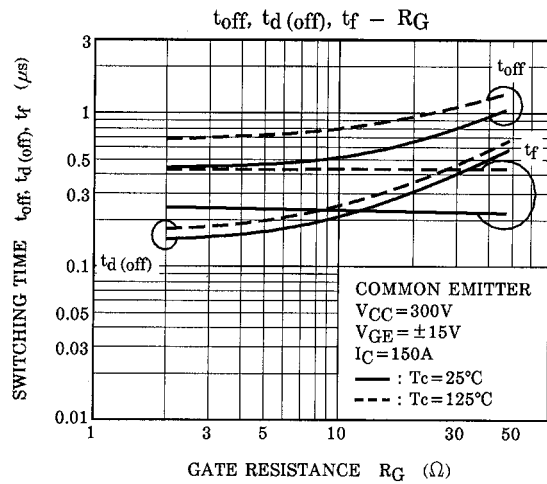
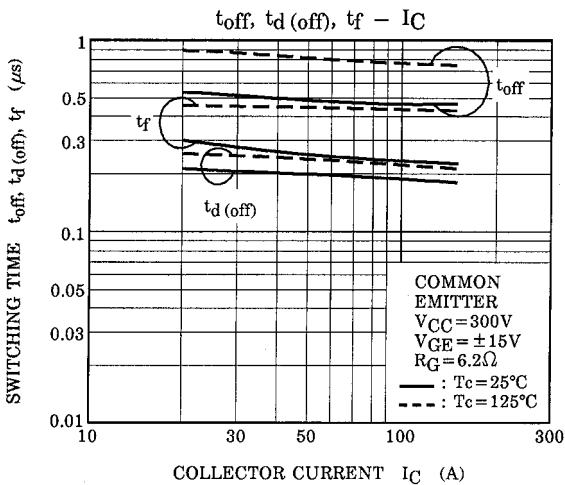
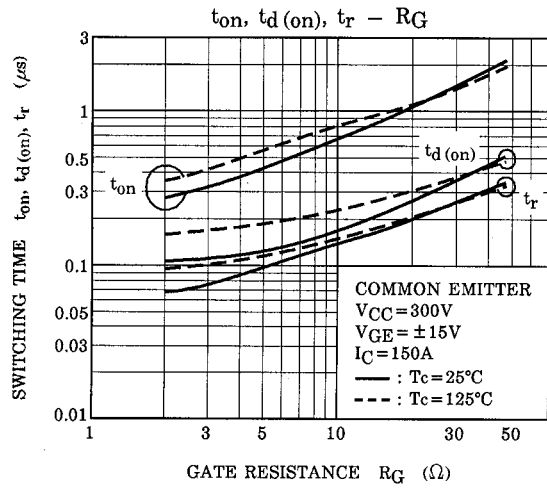
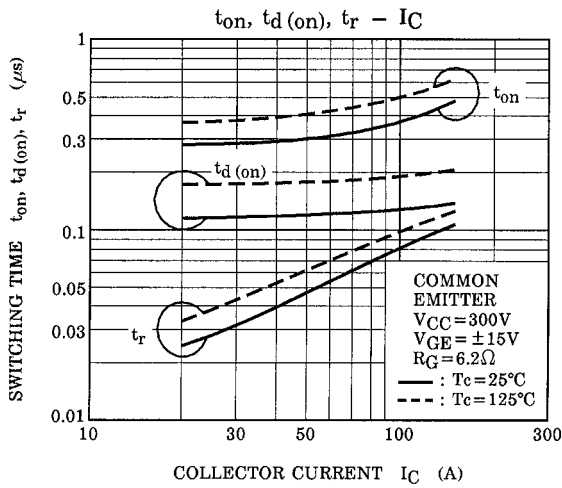
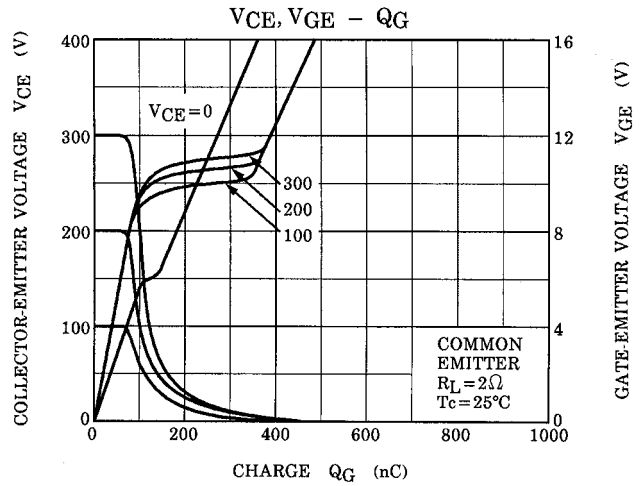
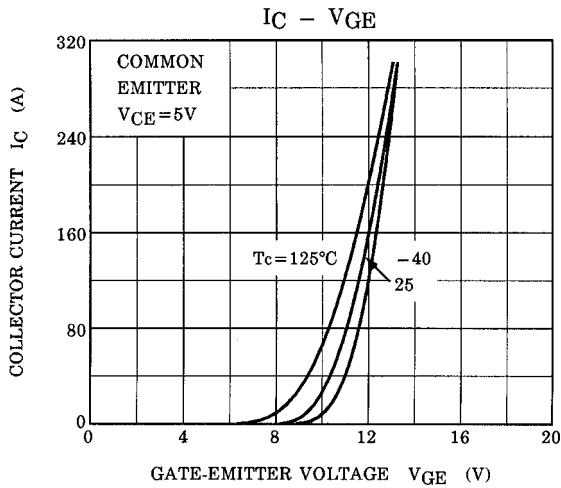
| Characteristics | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|--------------------------------------|---------------------|----------------|---|-----|-------|-----------|-----------------|
| Gate leakage current | | I_{GES} | $V_{GE} = \pm 20V, V_{CE} = 0$ | — | — | ± 500 | nA |
| Collector cut-off current | | I_{CES} | $V_{CE} = 600V, V_{GE} = 0$ | — | — | 2.0 | mA |
| Gate-emitter cut-off voltage | | $V_{GE (off)}$ | $I_C = 15mA, V_{CE} = 5V$ | 5.0 | 7.0 | 8.0 | V |
| Collector-emitter saturation voltage | | $V_{CE (sat)}$ | $I_C = 150A, V_{GE} = 15V$ | — | 2.10 | 2.70 | V |
| Input capacitance | | C_{ies} | $V_{CE} = 10V, V_{GE} = 0, f = 1MHz$ | — | 14200 | — | pF |
| Switching time | Turn-on delay time | $t_{d (on)}$ | Inductive load $V_{CC} = 300V$ $I_C = 150A,$ $V_{GE} = \pm 15V$ $R_G = 6.2\Omega$ (Note 1) | — | 0.15 | 0.30 | μs |
| | Rise time | t_r | | — | 0.15 | 0.30 | |
| | Turn-on time | t_{on} | | — | 0.50 | 1.00 | |
| | Turn-off delay time | $t_{d (off)}$ | | — | 0.20 | 0.40 | |
| | Fall time | t_f | | — | 0.15 | 0.30 | |
| | Turn-off time | t_{off} | | — | 0.50 | 1.00 | |
| Reverse current | | I_R | $V_R = 600V$ | — | — | 1.0 | mA |
| Forward voltage | | V_F | $I_F = 150A, V_{GE} = 0$ | — | 2.30 | 3.00 | V |
| Reverse recovery time | | t_{rr} | $I_F = 150A, V_{GE} = -10V$ $di / dt = 200A / \mu s$ | — | 0.08 | 0.15 | μs |
| Thermal resistance | | $R_{th (j-c)}$ | Transistor stage | — | — | 0.16 | $^{\circ}C / W$ |
| | | | Diode stage | — | — | 0.35 | |

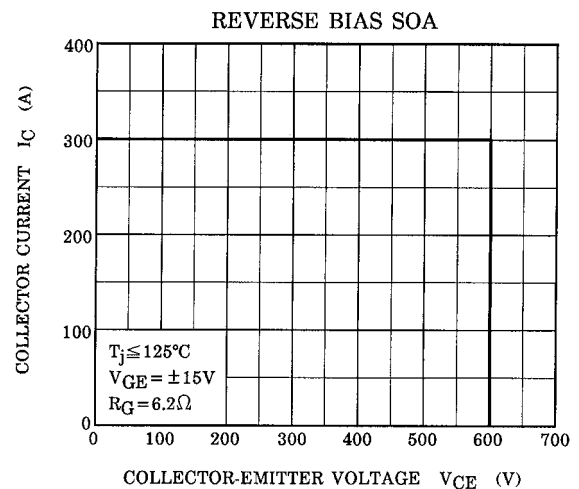
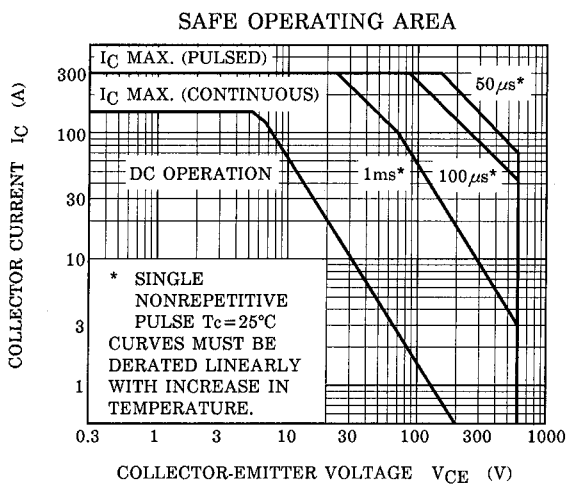
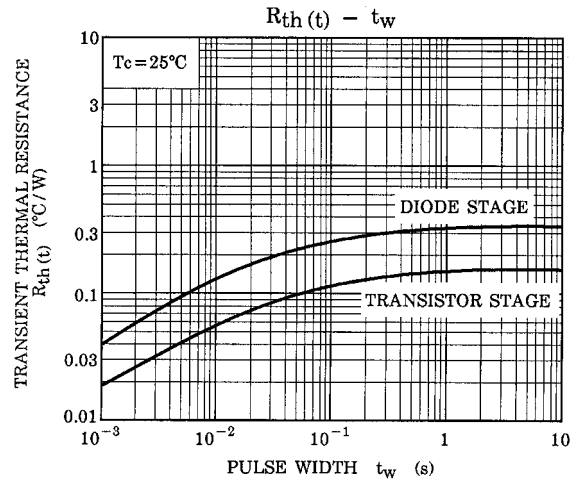
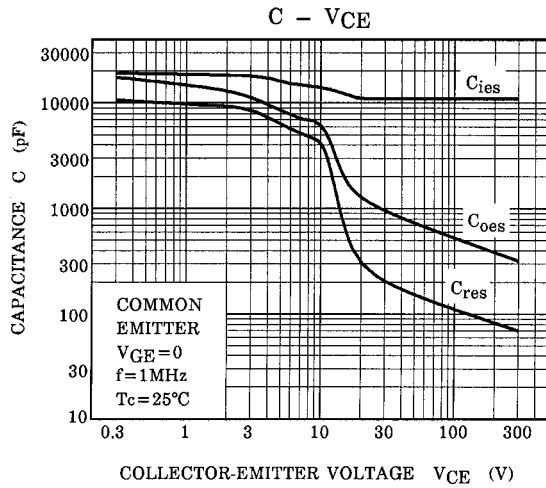
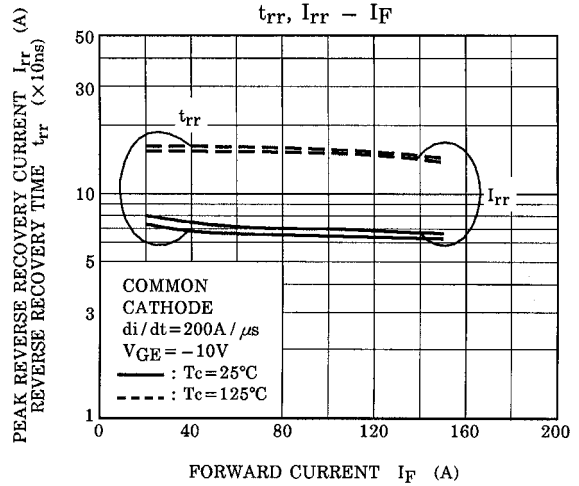
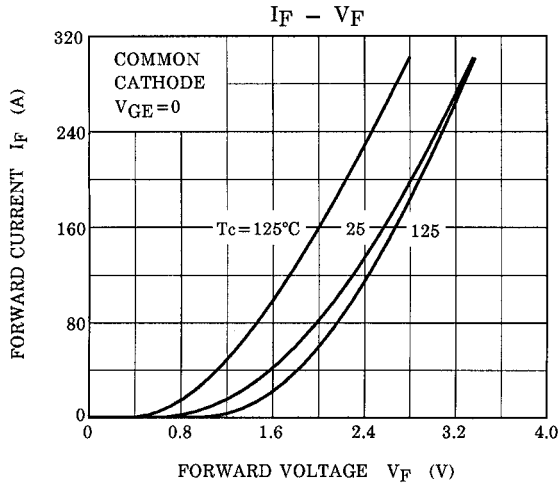
Note 1: Switching time test circuit & timing chart



Note 2: Silicone grease is applied.







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