

TOSHIBA Insulated Gate Bipolar Transistor Silicon N Channel IGBT

GT60M322

Voltage Resonance Inverter Switching Application
Current Resonance Inverter Switching Application

- Enhancement mode type
- High speed : $t_f = 0.15 \mu\text{s}$ (typ.) ($I_C = 60 \text{ A}$)
- Low saturation voltage : $V_{CE(sat)} = 2.3 \text{ V}$ (typ.) ($I_C = 60 \text{ A}$)
- FRD included between emitter and collector
- TO-3P(LH) (Toshiba package name)

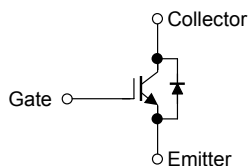
Maximum Ratings ($T_a = 25^\circ\text{C}$)

| Characteristics | | Symbol | Rating | Unit |
|-----------------------------|-----------------------------|-----------|------------|------------------|
| Collector-emitter voltage | | V_{CES} | 950 | V |
| Gate-emitter voltage | | V_{GES} | ± 25 | V |
| Collector current | DC | I_C | 60 | A |
| | 1ms | I_{CP} | 120 | |
| Diode forward current | DC | I_F | 25 | A |
| | Pulsed | I_{FP} | 50 | |
| Collector power dissipation | @ $T_c = 100^\circ\text{C}$ | P_C | 76 | W |
| | @ $T_c = 25^\circ\text{C}$ | | 190 | |
| Junction temperature | | T_j | 150 | $^\circ\text{C}$ |
| Storage temperature range | | T_{stg} | -55 to 150 | $^\circ\text{C}$ |

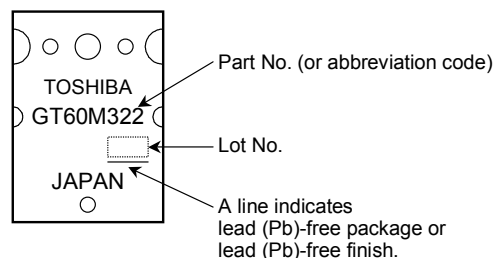
Thermal Characteristics

| Characteristics | Symbol | Max | Unit |
|----------------------------|---------------|------|--------------------|
| Thermal resistance (IGBT) | $R_{th(j-c)}$ | 0.66 | $^\circ\text{C/W}$ |
| Thermal resistance (diode) | $R_{th(j-c)}$ | 1.38 | $^\circ\text{C/W}$ |

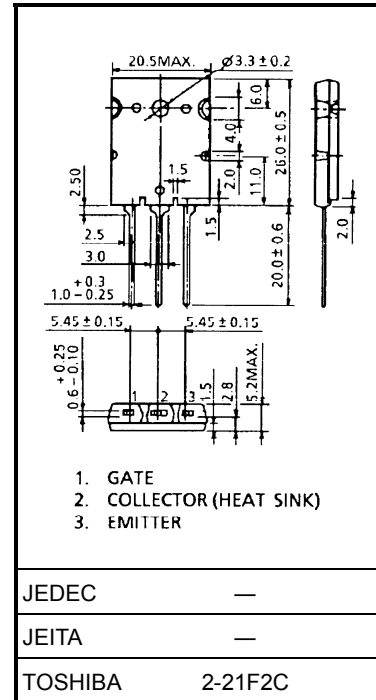
Equivalent Circuit



Marking



Unit: mm



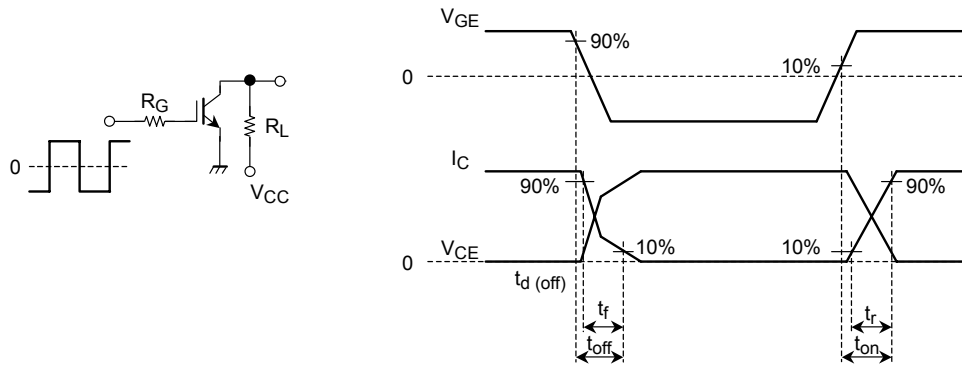
| | |
|---------|---------|
| JEDEC | — |
| JEITA | — |
| TOSHIBA | 2-21F2C |

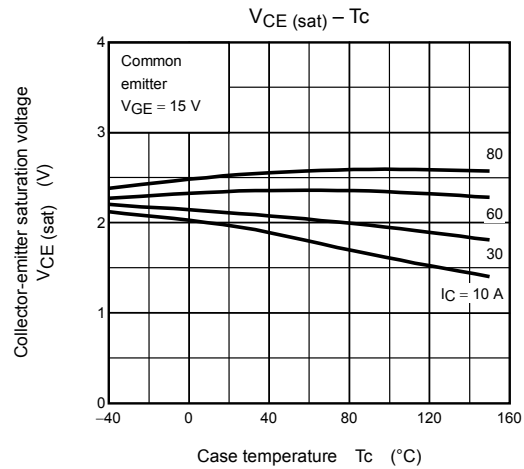
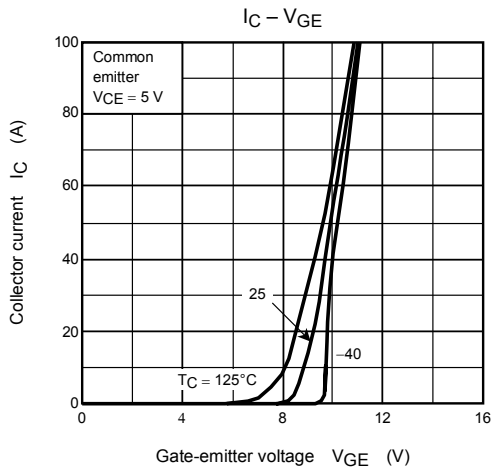
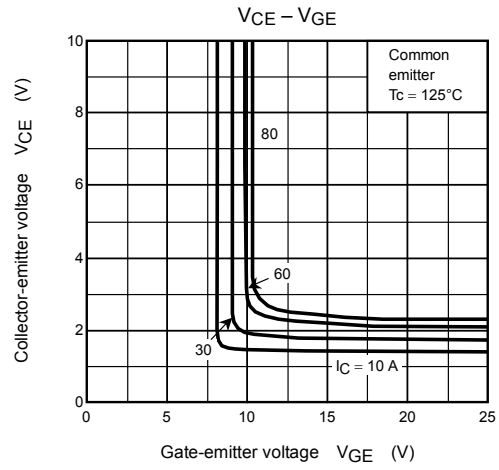
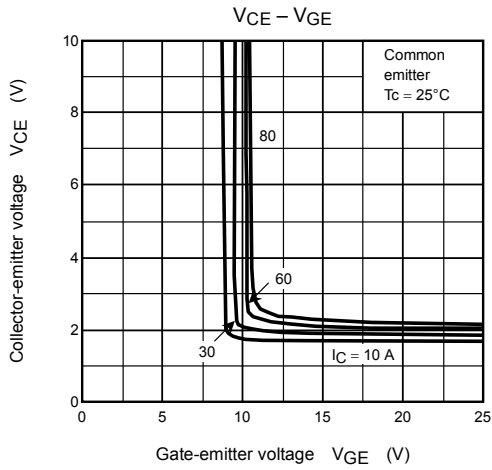
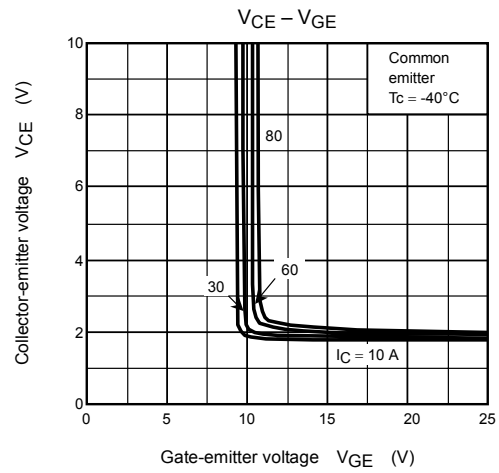
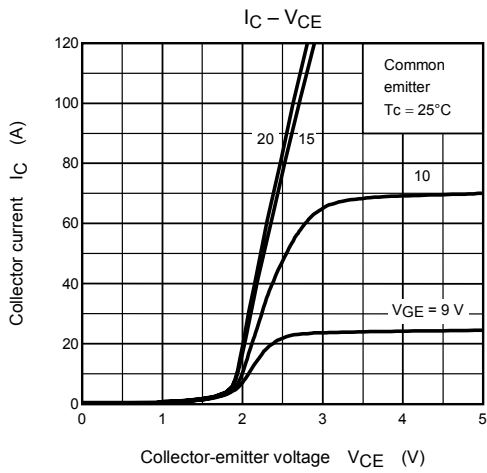
Weight: 9.75 g (typ.)

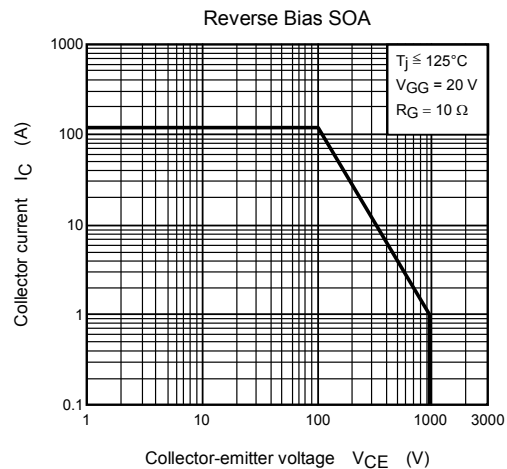
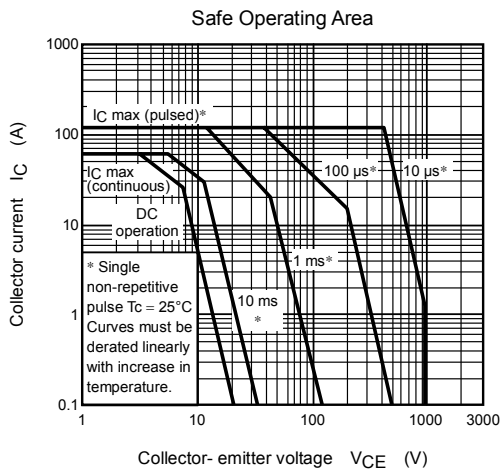
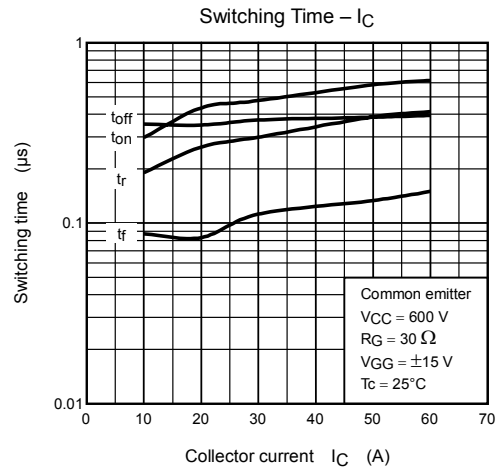
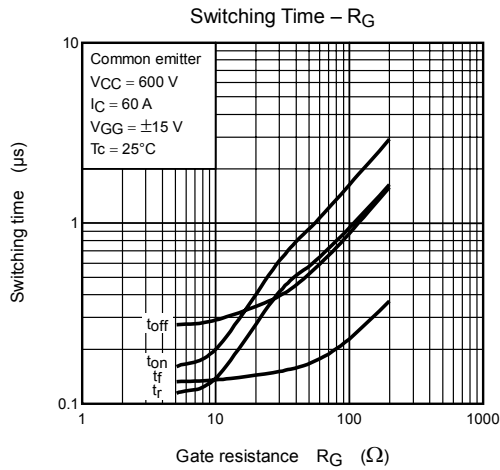
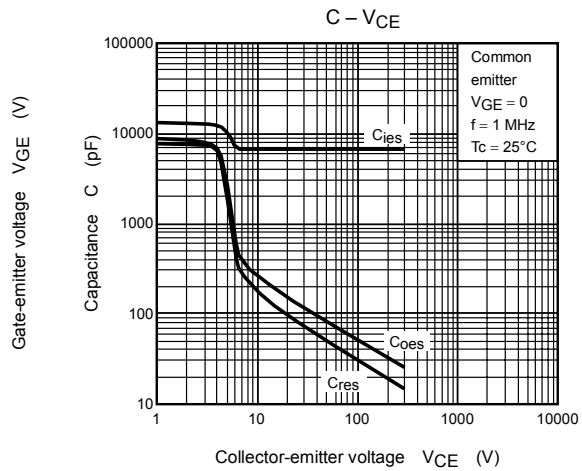
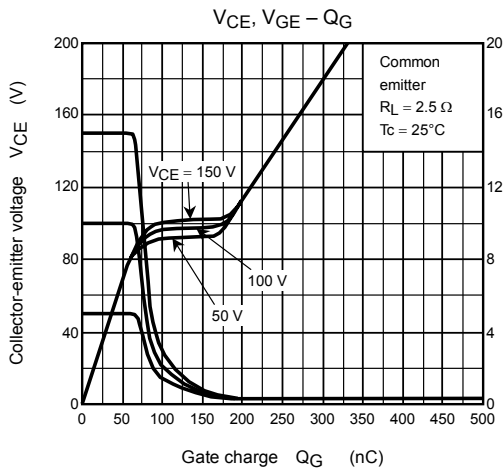
Electrical Characteristics (Ta = 25°C)

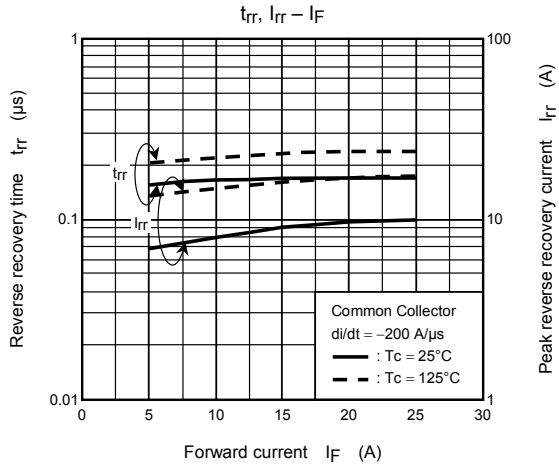
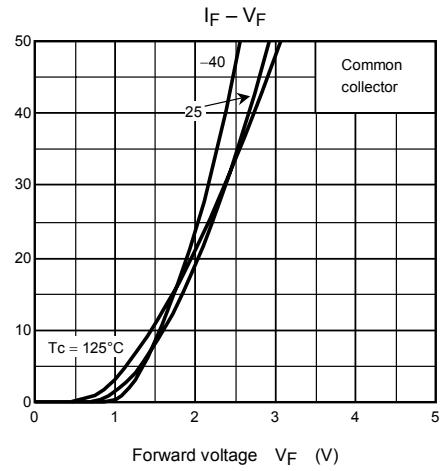
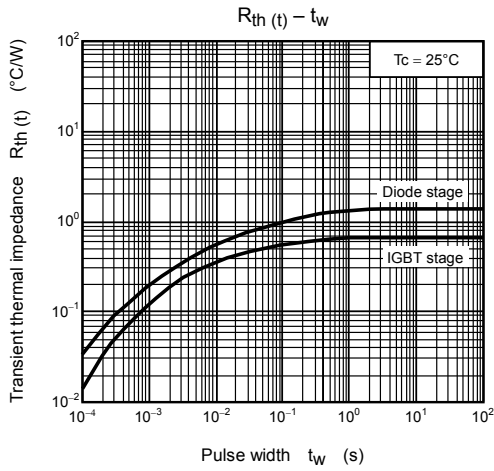
| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|--------------------------------------|---------------|--|-----|------|-----------|---------------|
| Gate leakage current | I_{GES} | $V_{GE} = \pm 25 \text{ V}, V_{CE} = 0$ | — | — | ± 500 | nA |
| Collector cut-off current | I_{CES} | $V_{CE} = 950 \text{ V}, V_{GE} = 0$ | — | — | 1.0 | mA |
| Gate-emitter cut-off voltage | $V_{GE(OFF)}$ | $I_C = 60 \text{ mA}, V_{CE} = 5 \text{ V}$ | 6.0 | — | 9.0 | V |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 60 \text{ A}, V_{GE} = 15 \text{ V}$ | — | 2.3 | 2.7 | V |
| Input capacitance | C_{ies} | $V_{CE} = 10 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$ | — | 6800 | — | pF |
| Switching time | Rise time | Resistive Load $V_{CC} = 600 \text{ V}, I_C = 60 \text{ A}$ $V_{GG} = \pm 15 \text{ V}, R_G = 30 \Omega$ (Note 1) | — | 0.42 | — | μs |
| | Turn-on time | | — | 0.62 | — | |
| | Fall time | | — | 0.15 | 0.21 | |
| | Turn-off time | | — | 0.39 | — | |
| Diode forward voltage | V_F | $I_F = 25 \text{ A}, V_{GE} = 0$ | — | — | 3.0 | V |
| Reverse recovery time | t_{rr} | $I_F = 25 \text{ A}, di/dt = -200 \text{ A}/\mu\text{s}$ | — | — | 0.35 | μs |

Note 1: Switching time measurement circuit and input/output waveforms









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