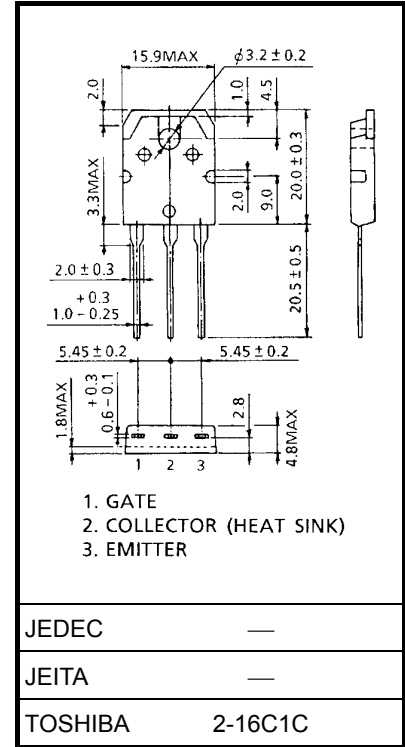


GT50N322A

Voltage Resonance Inverter Switching Application Fifth Generation IGBT

Unit: mm

- FRD included between emitter and collector
- Enhancement mode type
- High speed IGBT : $t_f = 0.10 \mu s$ (typ.) ($I_C = 60 A$)
FRD : $t_{rr} = 0.8 \mu s$ (typ.) ($di/dt = -20 A/\mu s$)
- Low saturation voltage: $V_{CE(sat)} = 2.2 V$ (typ.) ($I_C = 60 A$)



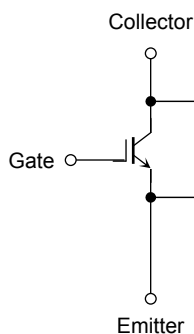
Weight: 4.6 g (typ.)

Absolute Maximum Ratings ($T_a = 25^\circ C$)

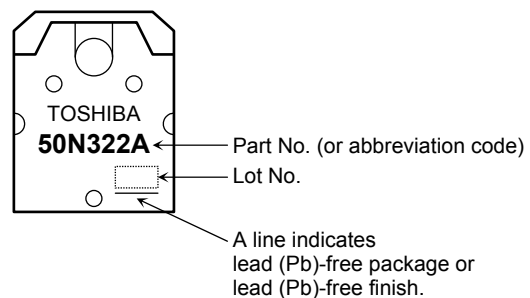
| Characteristics | | Symbol | Rating | Unit |
|----------------------------------------------------|-----|-----------|------------|------------|
| Collector-emitter voltage | | V_{CES} | 1000 | V |
| Gate-emitter voltage | | V_{GES} | ± 25 | V |
| Collector current | DC | I_C | 50 | A |
| | 1ms | I_{CP} | 120 | |
| Diode forward current | DC | I_F | 15 | A |
| | 1ms | I_{FP} | 120 | |
| Collector power dissipation ($T_c = 25^\circ C$) | | P_C | 156 | W |
| Junction temperature | | T_j | 150 | $^\circ C$ |
| Storage temperature | | T_{stg} | -55 to 150 | $^\circ C$ |

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings. Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Equivalent Circuit



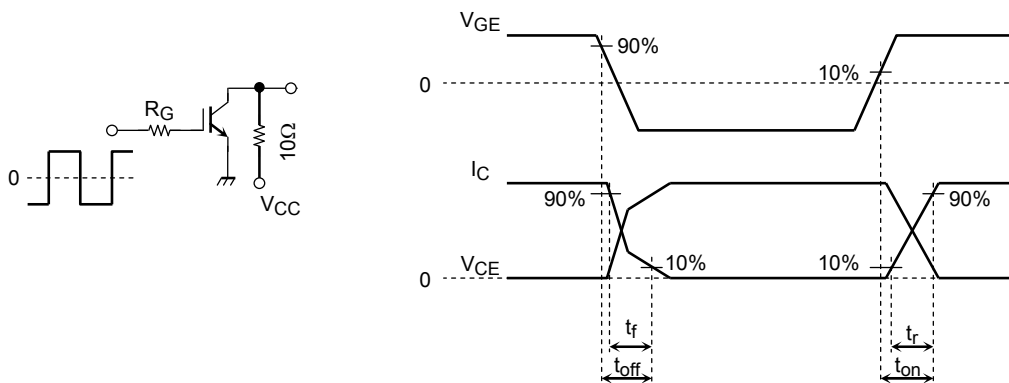
Marking

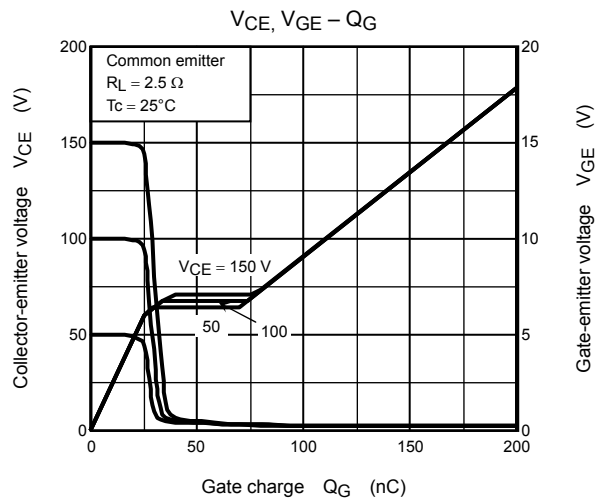
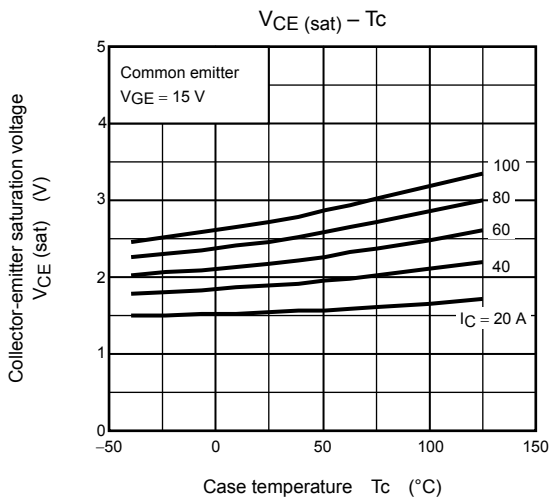
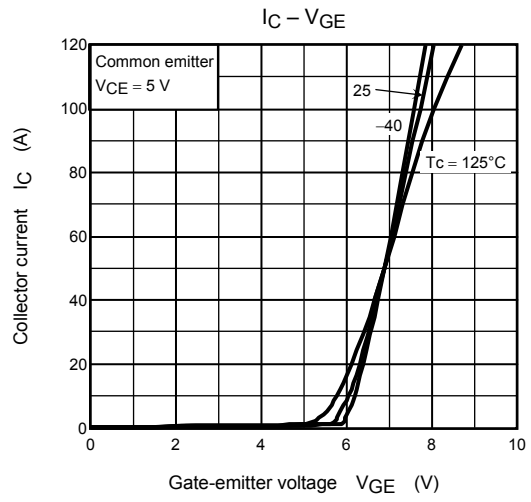
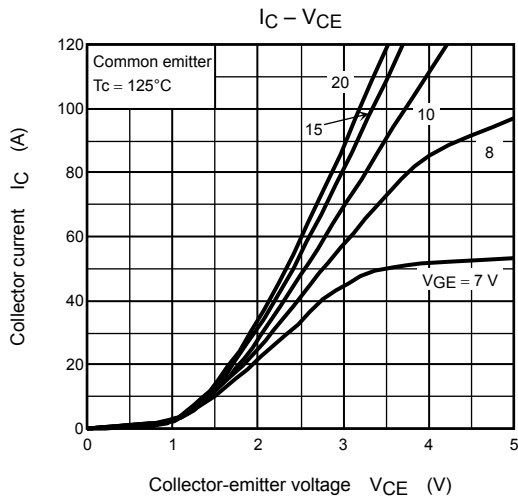
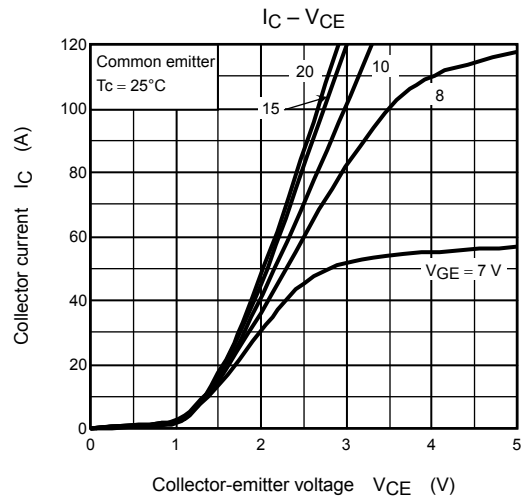
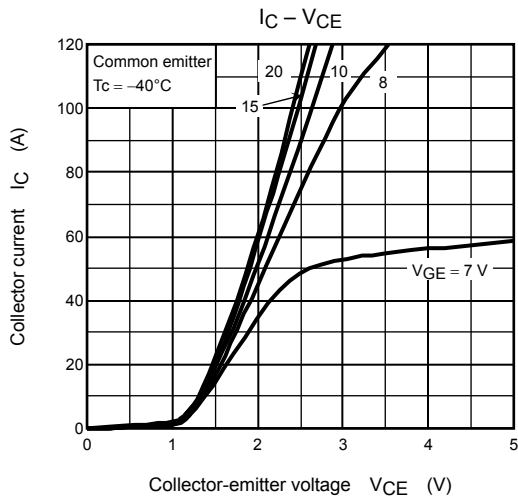


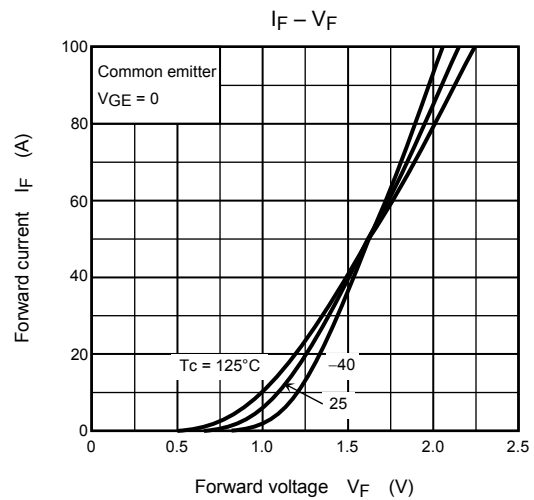
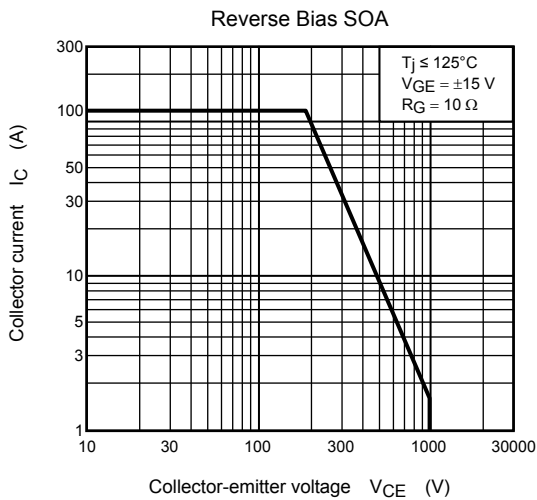
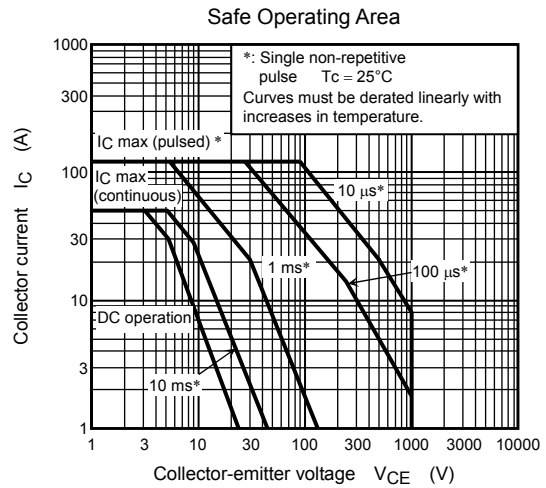
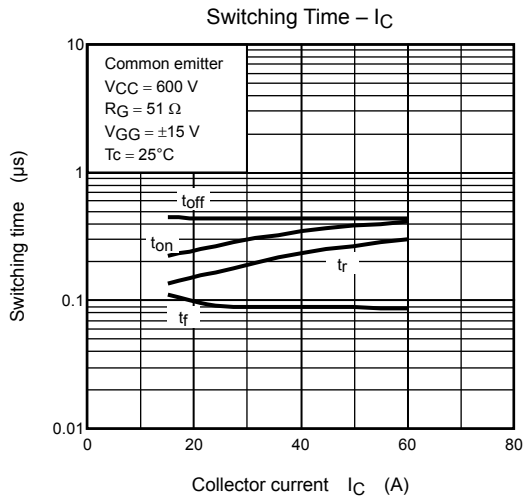
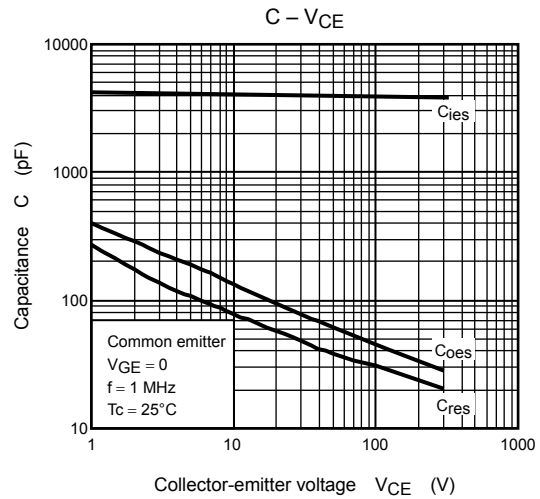
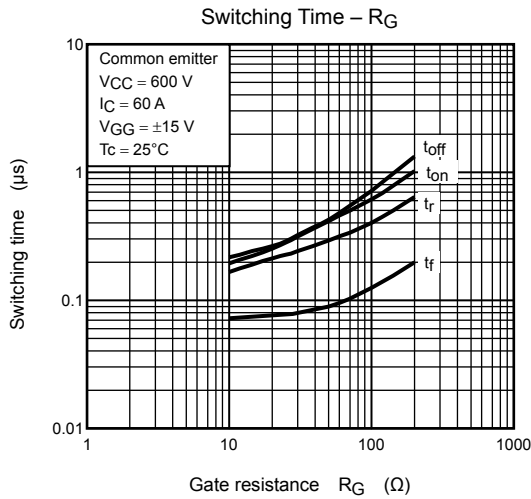
Electrical Characteristics (Ta = 25°C)

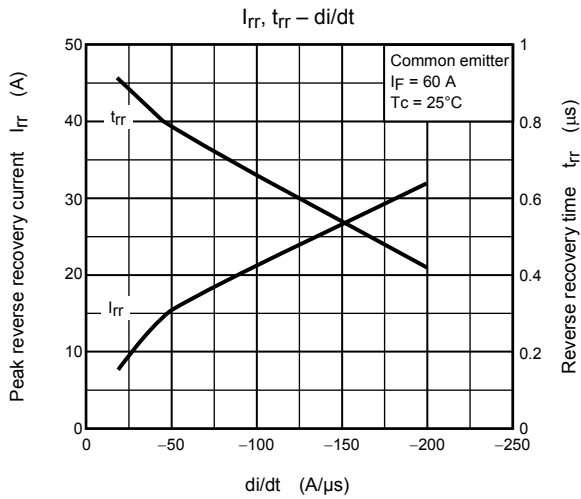
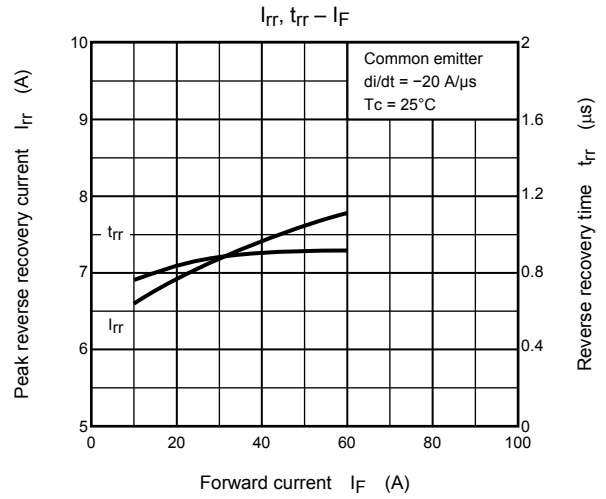
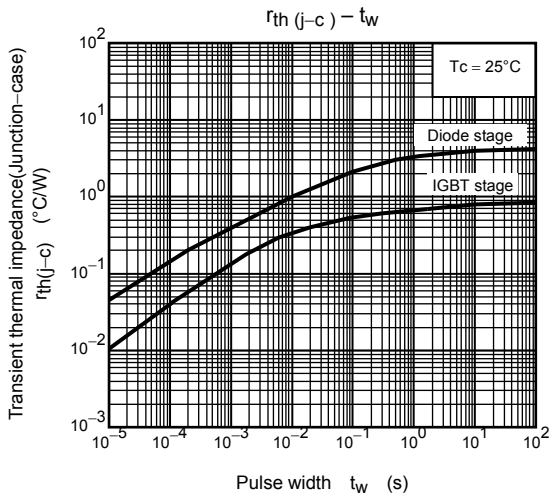
| Characteristics | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|--------------------------------------|---------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------|-----|------|-----------|-----------------------------|
| Gate leakage current | | I_{GES} | $V_{GE} = \pm 25 \text{ V}, V_{CE} = 0$ | — | — | ± 500 | nA |
| Collector cut-off current | | I_{CES} | $V_{CE} = 1000 \text{ V}, V_{GE} = 0$ | — | — | 1.0 | mA |
| Gate-emitter cut-off voltage | | $V_{GE}(\text{OFF})$ | $I_C = 60 \text{ mA}, V_{CE} = 5 \text{ V}$ | 3.0 | — | 6.0 | V |
| Collector-emitter saturation voltage | | $V_{CE}(\text{sat})$ | $I_C = 60 \text{ A}, V_{GE} = 15 \text{ V}$ | — | 2.2 | 2.8 | V |
| Input capacitance | | C_{ies} | $V_{CE} = 10 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$ | — | 4000 | — | pF |
| Switching time | Rise time | t_r | Resistive Load $V_{CC} = 600 \text{ V}, I_C = 60 \text{ A}$ $V_{GG} = \pm 15 \text{ V}, R_G = 51 \Omega$ (Note 1) | — | 0.23 | — | μs |
| | Turn-on time | t_{on} | | — | 0.33 | — | |
| | Fall time | t_f | | — | 0.10 | 0.25 | |
| | Turn-off time | t_{off} | | — | 0.70 | — | |
| Diode forward voltage | | V_F | $I_F = 15 \text{ A}, V_{GE} = 0$ | — | 1.2 | 1.9 | V |
| Reverse recovery time | | t_{rr} | $I_F = 15 \text{ A}, V_{GE} = 0, di/dt = -20 \text{ A}/\mu\text{s}$ | — | 0.8 | — | μs |
| Thermal Resistance | | $R_{th(j-c)}$ | — | — | — | 0.8 | $^{\circ}\text{C}/\text{W}$ |
| Thermal Resistance | | $R_{th(j-c)}$ | — | — | — | 4.0 | $^{\circ}\text{C}/\text{W}$ |

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









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20070701-EN

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