

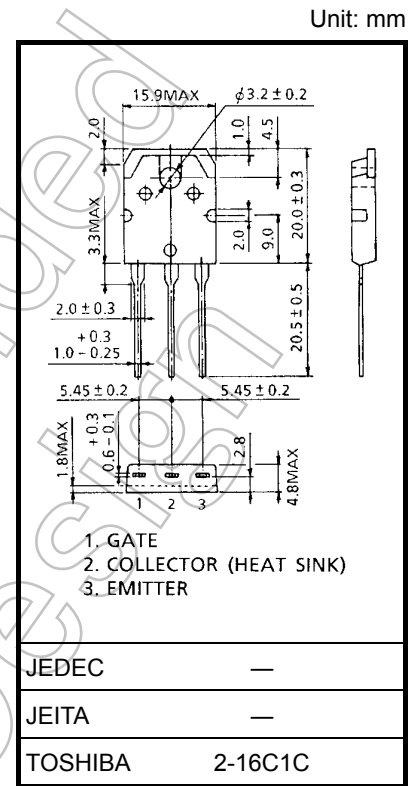
GT30J324

High Power Switching Applications
Fast Switching Applications

- Fourth-generation IGBT
- Enhancement mode type
- Fast switching (FS): Operating frequency up to 50 kHz (reference)
High speed: $t_f = 0.05 \mu s$ (typ.)
Low switching loss: $E_{on} = 1.00 \text{ mJ}$ (typ.)
: $E_{off} = 0.80 \text{ mJ}$ (typ.)
- Low saturation voltage: $V_{CE(sat)} = 2.0 \text{ V}$ (typ.)
- FRD included between emitter and collector

Absolute Maximum Ratings (Ta = 25°C)

| Characteristics | | Symbol | Rating | Unit |
|---|------|-----------|------------|------|
| Collector-emitter voltage | | V_{CES} | 600 | V |
| Gate-emitter voltage | | V_{GES} | ± 20 | V |
| Collector current | DC | I_C | 30 | A |
| | 1 ms | I_{CP} | 60 | |
| Emitter-collector forward current | DC | I_F | 30 | A |
| | 1 ms | I_{FM} | 60 | |
| Collector power dissipation (Tc = 25°C) | | P_C | 170 | W |
| Junction temperature | | T_j | 150 | °C |
| Storage temperature range | | T_{stg} | -55 to 150 | °C |



Weight: 4.6 g (typ.)

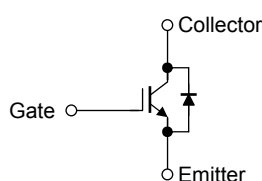
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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.).

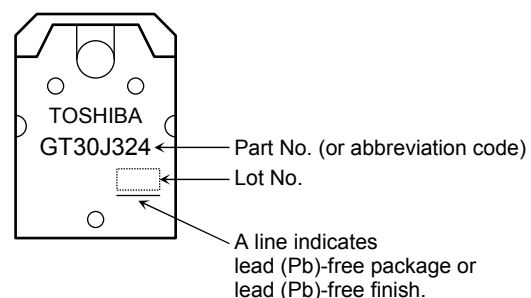
Thermal Characteristics

| Characteristics | Symbol | Max | Unit |
|----------------------------|---------------|-------|------|
| Thermal resistance (IGBT) | $R_{th(j-c)}$ | 0.735 | °C/W |
| Thermal resistance (diode) | $R_{th(j-c)}$ | 1.90 | °C/W |

Equivalent Circuit



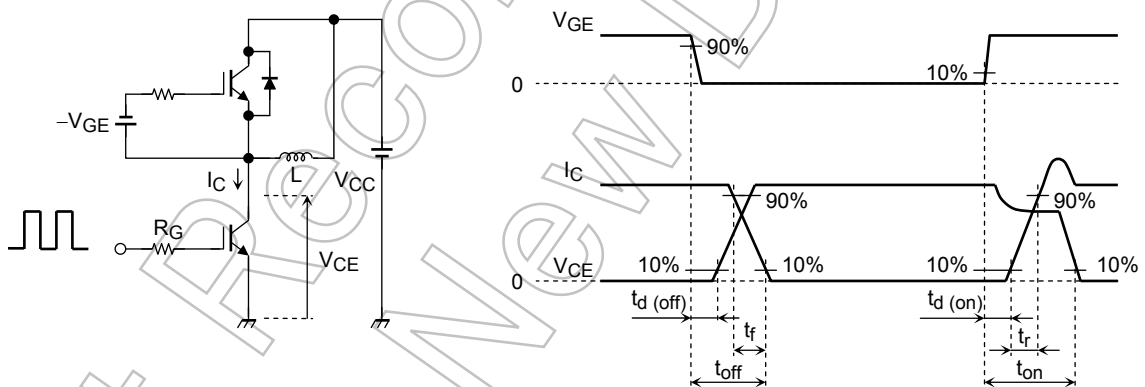
Marking



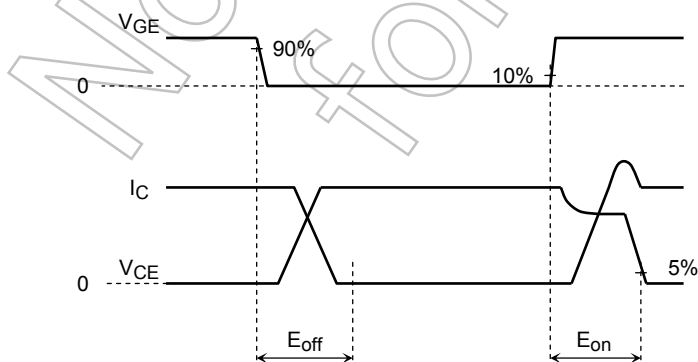
Electrical Characteristics (Ta = 25°C)

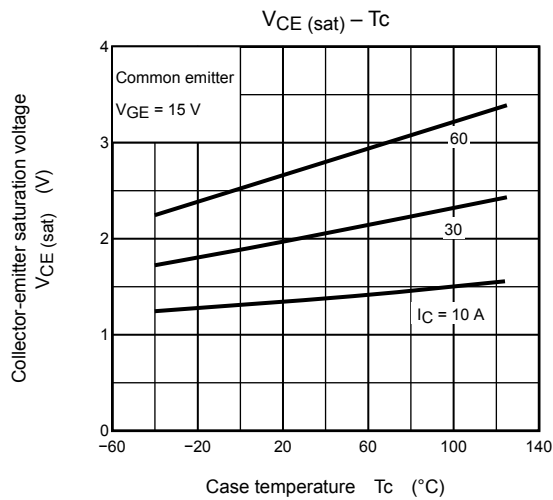
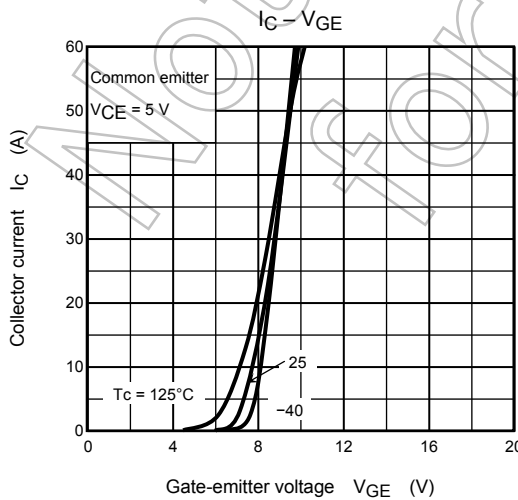
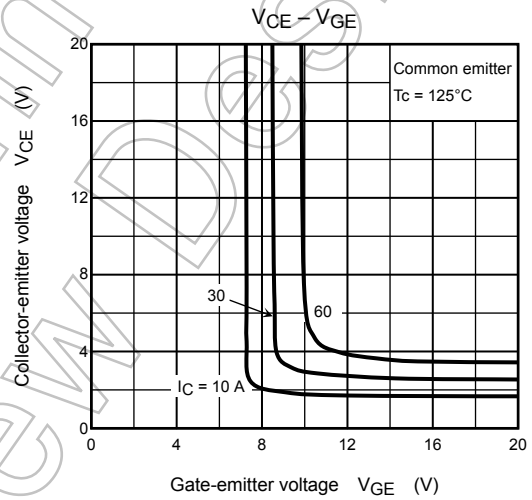
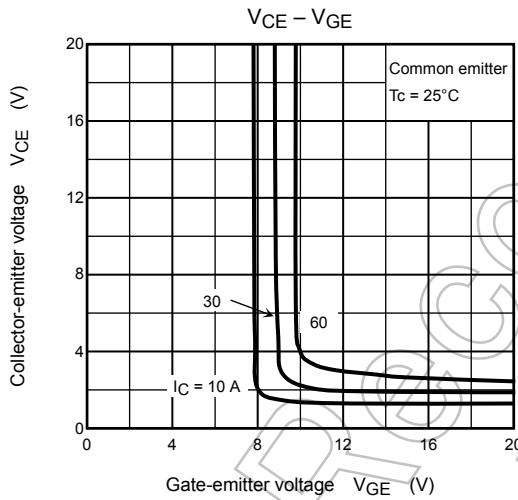
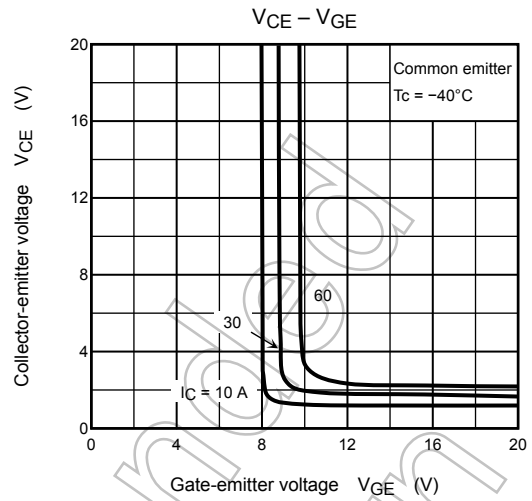
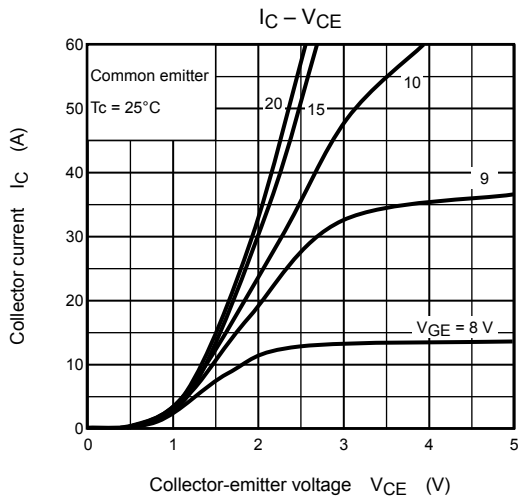
| Characteristics | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|--------------------------------------|-------------------------|-------------------|---|------|------|-----------|---------------|
| Gate leakage current | | I_{GES} | $V_{GE} = \pm 20\text{ V}, V_{CE} = 0$ | — | — | ± 500 | nA |
| Collector cut-off current | | I_{CES} | $V_{CE} = 600\text{ V}, V_{GE} = 0$ | — | — | 1.0 | mA |
| Gate-emitter cut-off voltage | | $V_{GE(OFF)}$ | $I_C = 3\text{ mA}, V_{CE} = 5\text{ V}$ | 3.5 | — | 6.5 | V |
| Collector-emitter saturation voltage | | $V_{CE(sat)}$ | $I_C = 30\text{ A}, V_{GE} = 15\text{ V}$ | — | 2.0 | 2.45 | V |
| Input capacitance | | C_{ies} | $V_{CE} = 10\text{ V}, V_{GE} = 0, f = 1\text{ MHz}$ | — | 4650 | — | pF |
| Switching time | Turn-on delay time | $t_d(\text{on})$ | Inductive Load $V_{CC} = 300\text{ V}, I_C = 30\text{ A}$ $V_{GG} = +15\text{ V}, R_G = 24\ \Omega$ (Note 1) (Note 2) | — | 0.09 | — | μs |
| | Rise time | t_r | | — | 0.07 | — | |
| | Turn-on time | t_{on} | | — | 0.24 | — | |
| | Turn-off delay time | $t_d(\text{off})$ | | — | 0.30 | — | |
| | Fall time | t_f | | — | 0.05 | — | |
| | Turn-off time | t_{off} | | — | 0.43 | — | |
| Switching loss | Turn-on switching loss | E_{on} | — | 1.00 | — | mJ | |
| | Turn-off switching loss | E_{off} | — | 0.80 | — | | |
| Peak forward voltage | | V_F | $I_F = 30\text{ A}, V_{GE} = 0$ | — | — | 3.8 | V |
| Reverse recovery time | | t_{rr} | $I_F = 30\text{ A}, di/dt = -100\text{ A}/\mu\text{s}$ | — | 60 | — | ns |

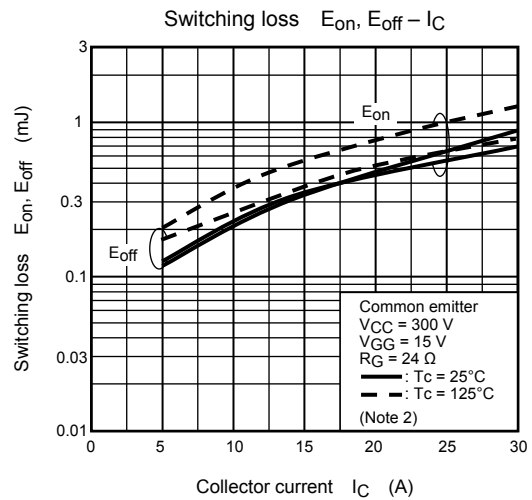
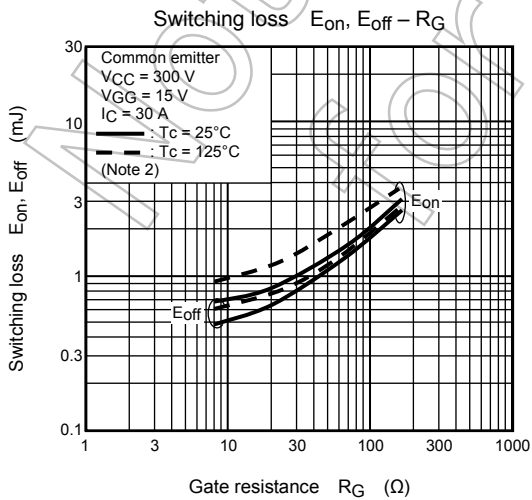
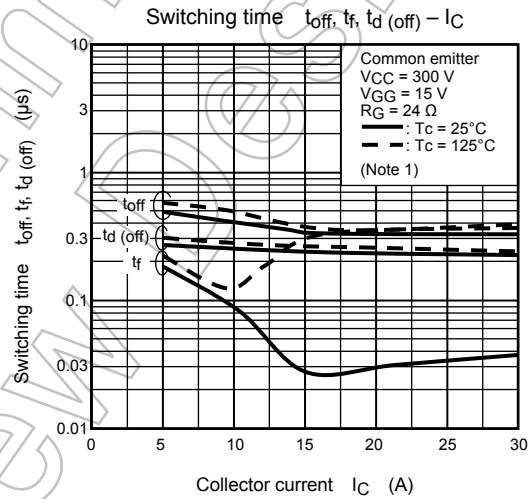
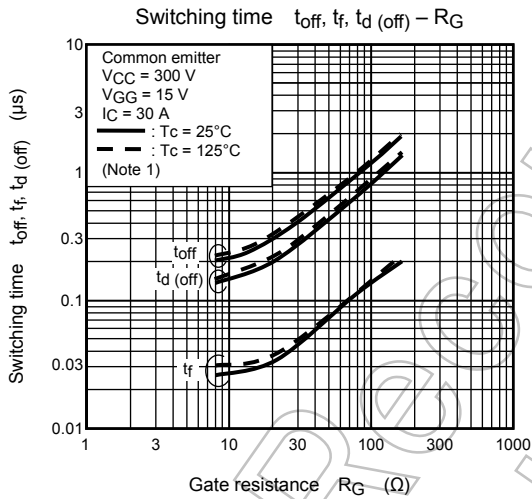
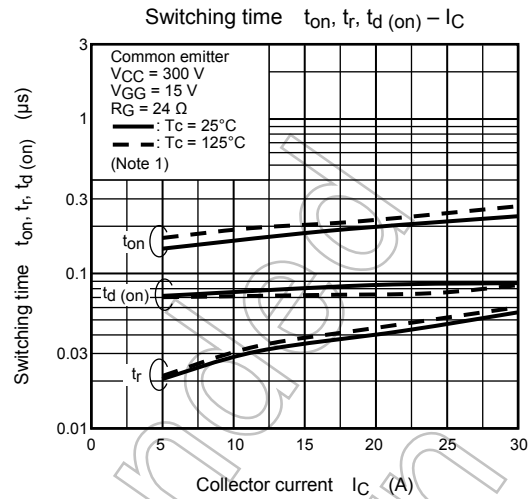
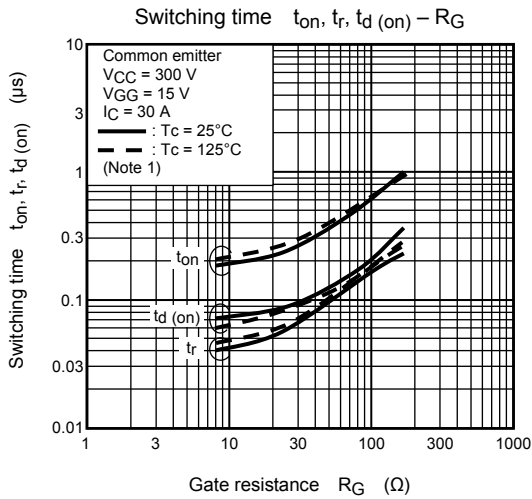
Note 1: Switching time measurement circuit and input/output waveforms

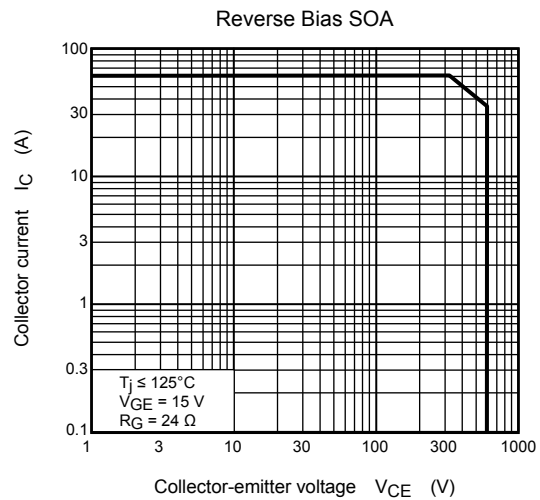
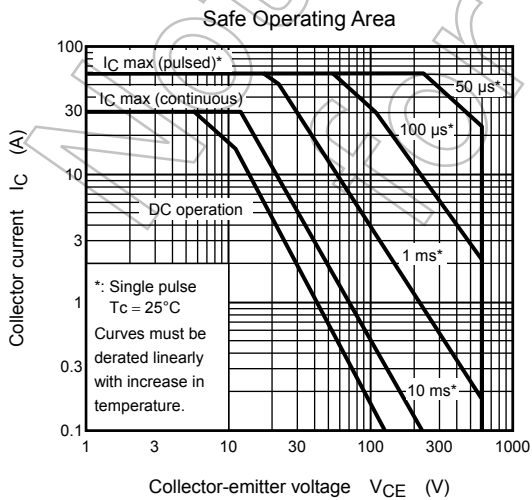
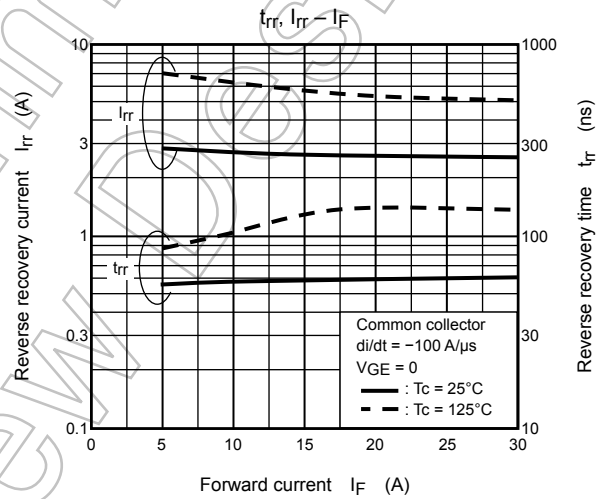
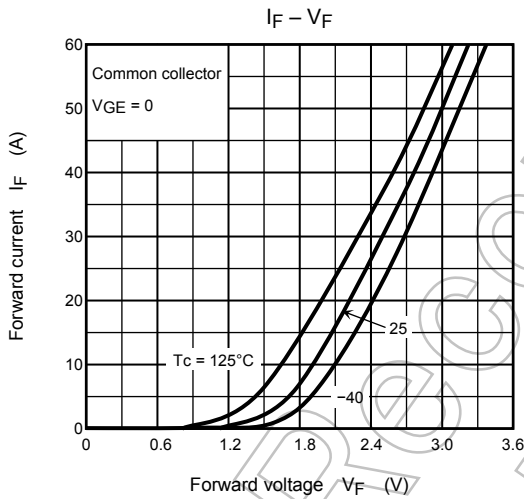
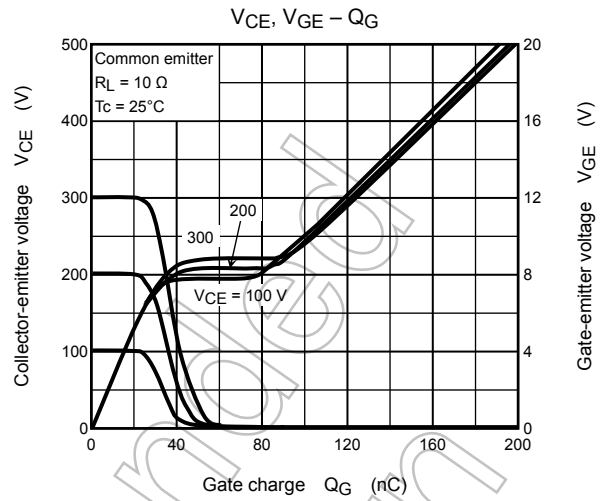
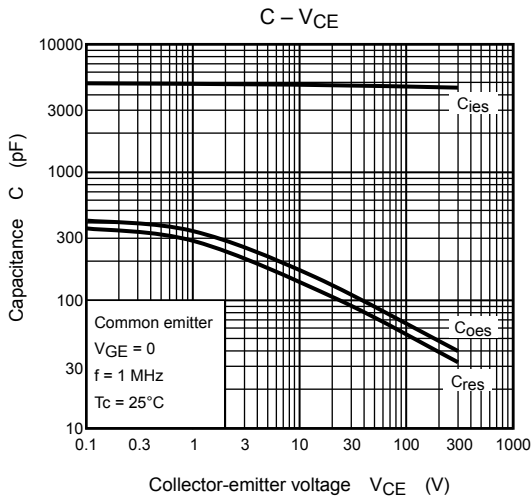


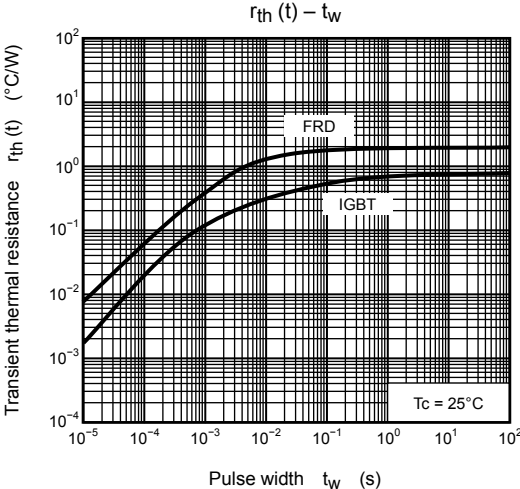
Note 2: Switching loss measurement waveforms











Not Recommended for New Design

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