

TOSHIBA Insulated Gate Bipolar Transistor  
Silicon N Channel IGBT

GT25Q102

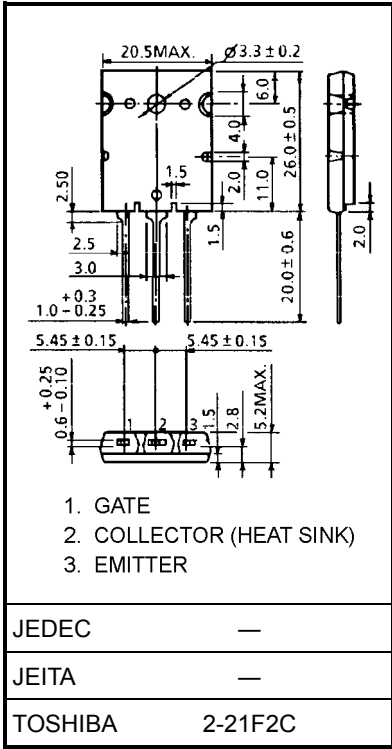
High Power Switching Applications

- The 3rd Generation
- Enhancement-Mode
- High Speed:  $t_f = 0.32 \mu s$  (max)
- Low Saturation Voltage:  $V_{CE(sat)} = 2.7 V$  (max)

Maximum Ratings (Ta = 25°C)

| Characteristic                             |      | Symbol    | Rating   | Unit |
|--------------------------------------------|------|-----------|----------|------|
| Collector-emitter voltage                  |      | $V_{CES}$ | 1200     | V    |
| Gate-emitter voltage                       |      | $V_{GES}$ | $\pm 20$ | V    |
| Collector current                          | DC   | $I_C$     | 25       | A    |
|                                            | 1 ms | $I_{CP}$  | 50       |      |
| Collector power dissipation<br>(Tc = 25°C) |      | $P_C$     | 200      | W    |
| Junction temperature                       |      | $T_j$     | 150      | °C   |
| Storage temperature range                  |      | $T_{stg}$ | -55~150  | °C   |

Unit: mm

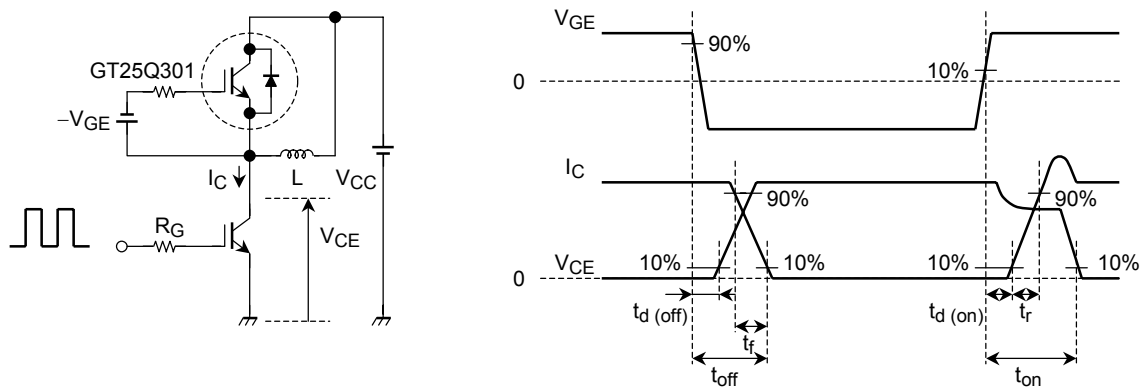


Weight: 9.75 g (typ.)

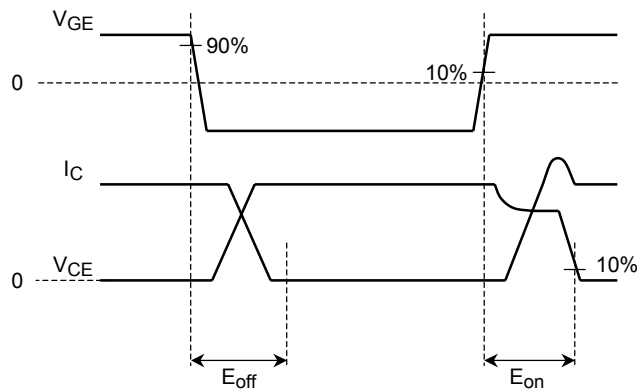
## Electrical Characteristics (Ta = 25°C)

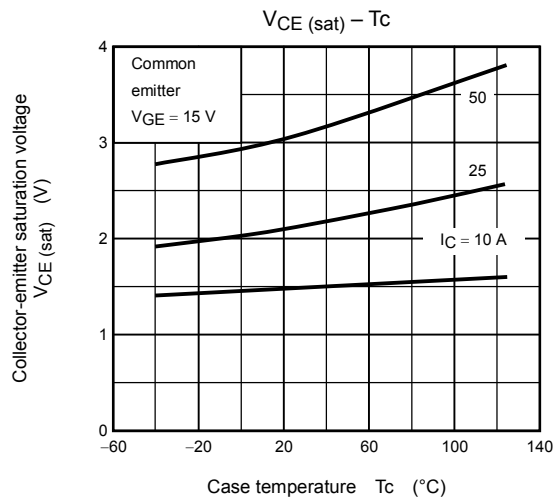
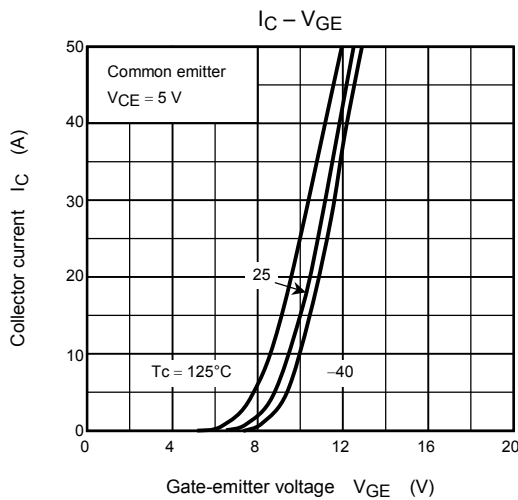
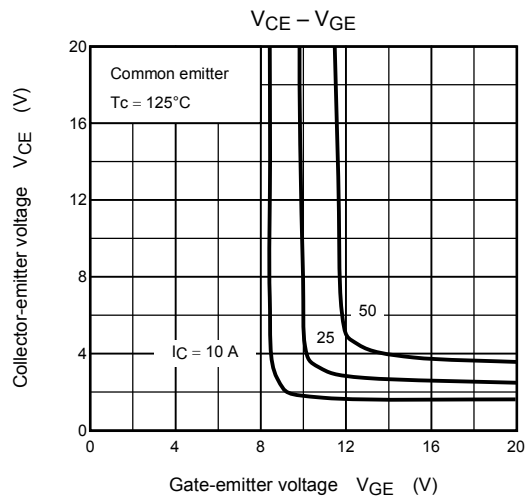
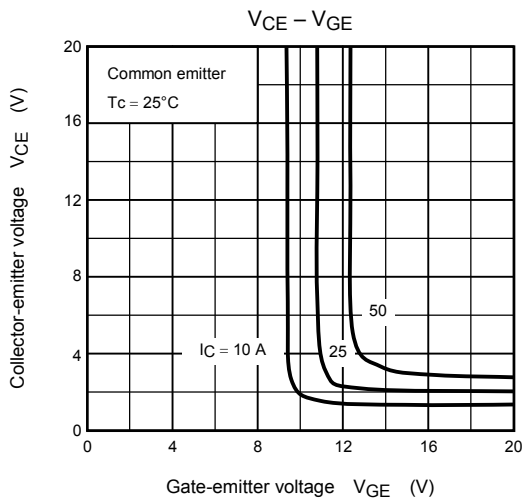
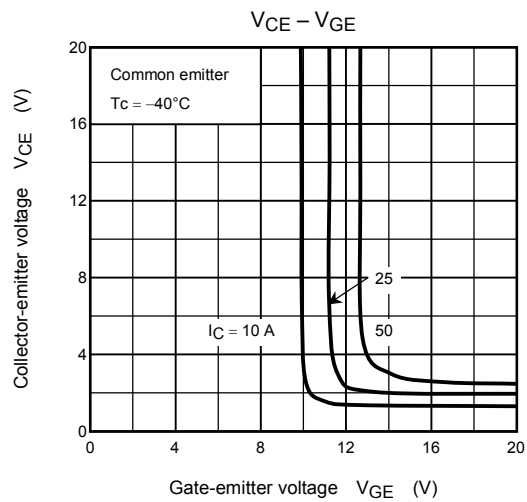
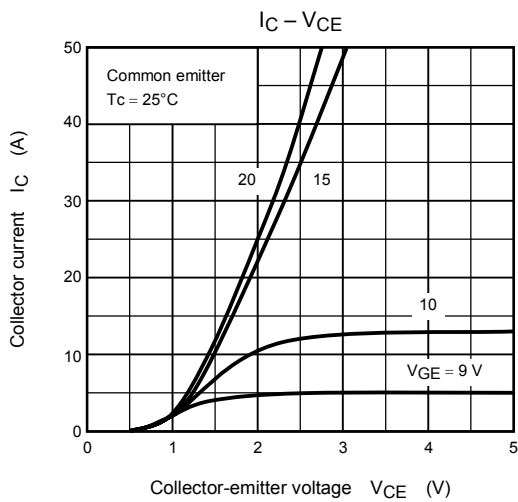
| Characteristic                       |               | Symbol               | Test Condition                                                                                                            | Min | Typ. | Max       | Unit                 |
|--------------------------------------|---------------|----------------------|---------------------------------------------------------------------------------------------------------------------------|-----|------|-----------|----------------------|
| Gate leakage current                 |               | $I_{GES}$            | $V_{GE} = \pm 20 \text{ V}, V_{CE} = 0$                                                                                   | —   | —    | $\pm 500$ | nA                   |
| Collector cut-off current            |               | $I_{CES}$            | $V_{CE} = 1200 \text{ V}, V_{GE} = 0$                                                                                     | —   | —    | 1.0       | mA                   |
| Gate-emitter cut-off voltage         |               | $V_{GE}(\text{OFF})$ | $I_C = 2.5 \text{ mA}, V_{CE} = 5 \text{ V}$                                                                              | 4.0 | —    | 7.0       | V                    |
| Collector-emitter saturation voltage |               | $V_{CE}(\text{sat})$ | $I_C = 25 \text{ A}, V_{GE} = 15 \text{ V}$                                                                               | —   | 2.1  | 2.7       | V                    |
| Input capacitance                    |               | $C_{ies}$            | $V_{CE} = 50 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$                                                                    | —   | 1360 | —         | pF                   |
| Switching time                       | Rise time     | $t_r$                | Inductive Load<br>$V_{CC} = 600 \text{ V}, I_C = 25 \text{ A}$<br>$V_{GG} = \pm 15 \text{ V}, R_G = 43 \Omega$<br>(Note1) | —   | 0.10 | —         | $\mu\text{s}$        |
|                                      | Turn-on time  | $t_{on}$             |                                                                                                                           | —   | 0.30 | —         |                      |
|                                      | Fall time     | $t_f$                |                                                                                                                           | —   | 0.16 | 0.32      |                      |
|                                      | Turn-off time | $t_{off}$            |                                                                                                                           | —   | 0.68 | —         |                      |
| Thermal resistance                   |               | $R_{th(j-c)}$        | —                                                                                                                         | —   | —    | 0.625     | $^{\circ}\text{C/W}$ |

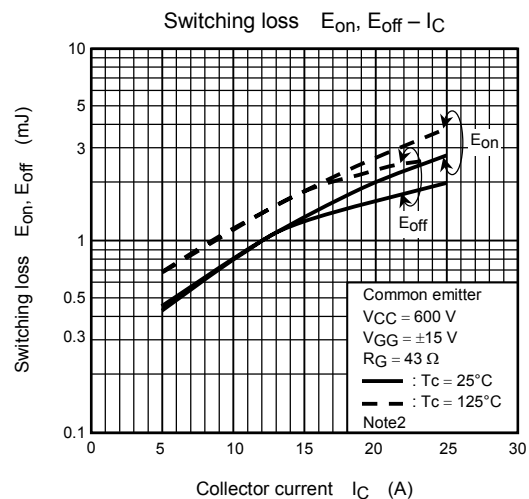
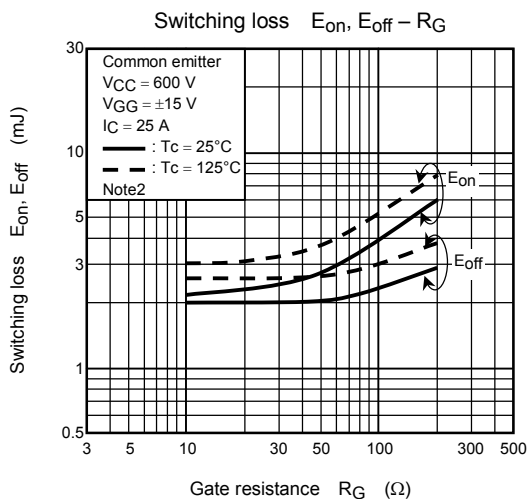
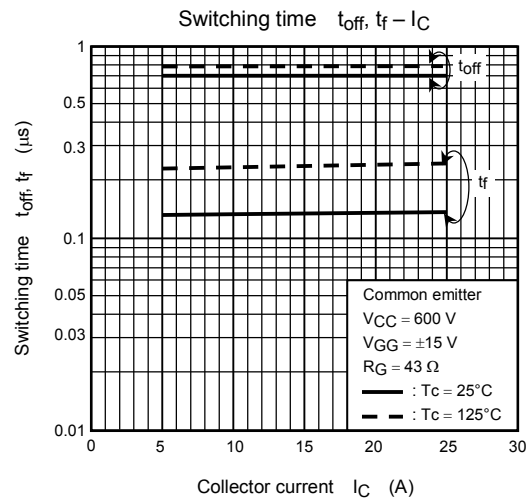
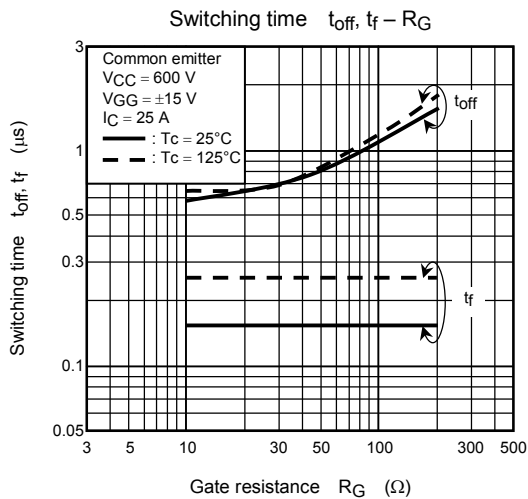
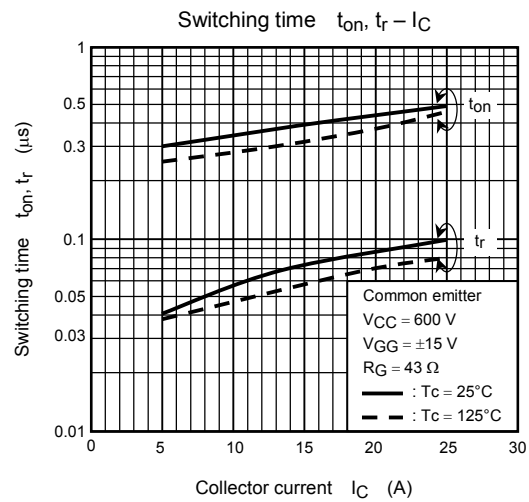
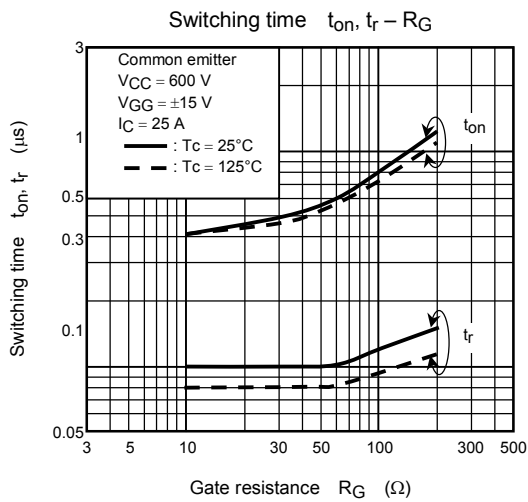
Note1: Switching time measurement circuit and input/output waveforms

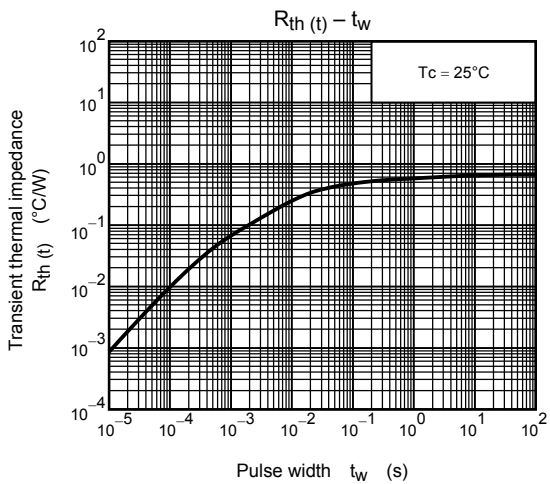
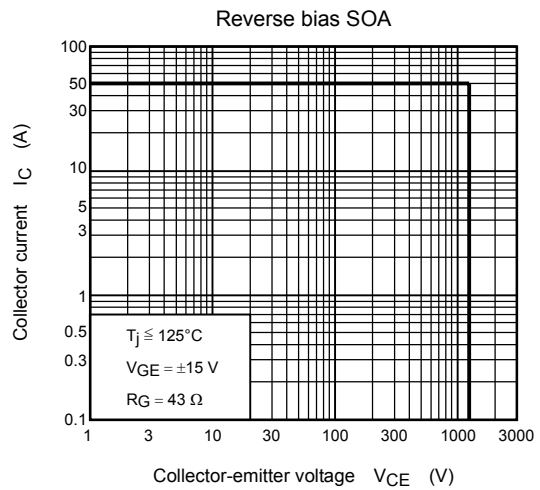
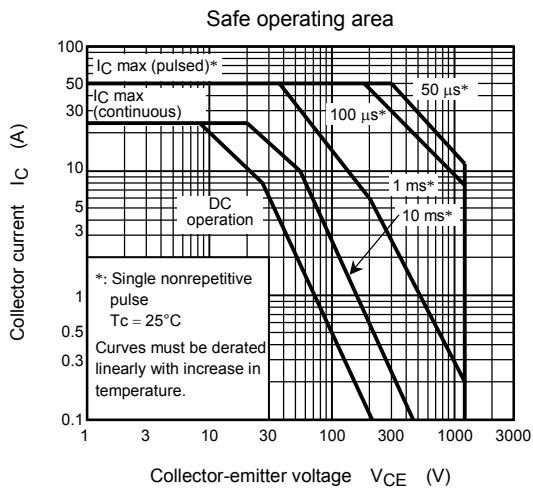
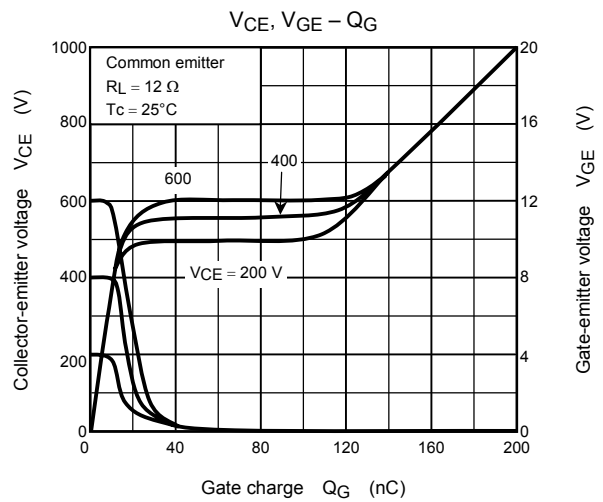
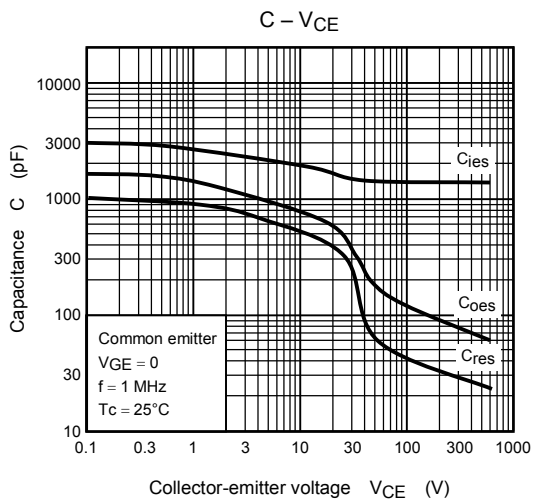


Note2: Switching loss measurement waveforms









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