

TOSHIBA Transistor Silicon NPN Epitaxial Type

2SC5712

High-Speed Switching Applications
 DC-DC Converter Applications
 DC-AC Converter Applications

- High DC current gain: $h_{FE} = 400$ to 1000 ($I_C = 0.3$ A)
- Low collector-emitter saturation voltage: $V_{CE(sat)} = 0.14$ V (max)
- High-speed switching: $t_f = 120$ ns (typ.)

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

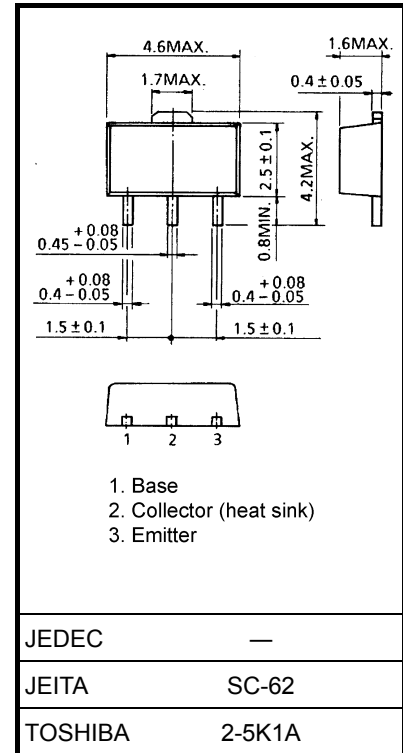
| Characteristics | Symbol | Rating | Unit |
|-----------------------------|------------|------------|------------------|
| Collector-base voltage | V_{CBO} | 100 | V |
| Collector-emitter voltage | V_{CEX} | 80 | V |
| | V_{CEO} | 50 | |
| Emitter-base voltage | V_{EBO} | 7 | V |
| Collector current | DC | I_C | A |
| | Pulse | I_{CP} | |
| Base current | I_B | 0.3 | A |
| Collector power dissipation | DC | P_C | W |
| | $t = 10$ s | (Note 1) | |
| Junction temperature | T_j | 150 | $^\circ\text{C}$ |
| Storage temperature range | T_{stg} | -55 to 150 | $^\circ\text{C}$ |

Note 1: Mounted on an FR4 board (glass epoxy, 1.6 mm thick, Cu area: 645 mm²)

Note 2: 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).

Unit: mm



Weight: 0.05 g (typ.)

Electrical Characteristics (Ta = 25°C)

| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit | |
|--------------------------------------|----------------|---|--|------|------|------|----|
| Collector cut-off current | I_{CBO} | $V_{CB} = 100\text{ V}, I_E = 0$ | — | — | 100 | nA | |
| Emitter cut-off current | I_{EBO} | $V_{EB} = 7\text{ V}, I_C = 0$ | — | — | 100 | nA | |
| Collector-emitter breakdown voltage | $V_{(BR) CEO}$ | $I_C = 10\text{ mA}, I_B = 0$ | 50 | — | — | V | |
| DC current gain | $h_{FE} (1)$ | $V_{CE} = 2\text{ V}, I_C = 0.3\text{ A}$ | 400 | — | 1000 | | |
| | $h_{FE} (2)$ | $V_{CE} = 2\text{ V}, I_C = 1\text{ A}$ | 200 | — | — | | |
| Collector-emitter saturation voltage | $V_{CE (sat)}$ | $I_C = 1\text{ A}, I_B = 20\text{ mA}$ | — | — | 0.14 | V | |
| Base-emitter saturation voltage | $V_{BE (sat)}$ | $I_C = 1\text{ A}, I_B = 20\text{ mA}$ | — | — | 1.10 | V | |
| Collector output capacitance | C_{ob} | $V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$ | — | 13 | — | pF | |
| Switching time | Rise time | t_r | See Figure 1 circuit diagram. | | — | 40 | ns |
| | Storage time | t_{stg} | $V_{CC} \approx 30\text{ V}, R_L = 30\ \Omega$ | | — | 500 | |
| | Fall time | t_f | $I_{B1} = -I_{B2} = 33.3\text{ mA}$ | | — | 120 | |

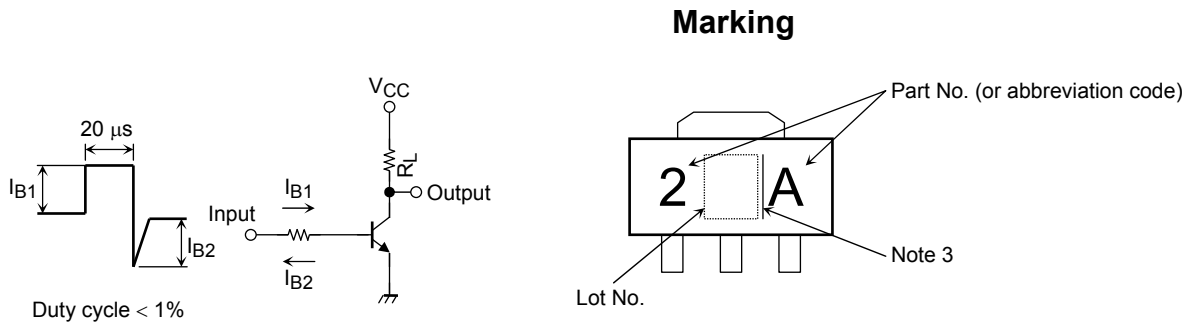


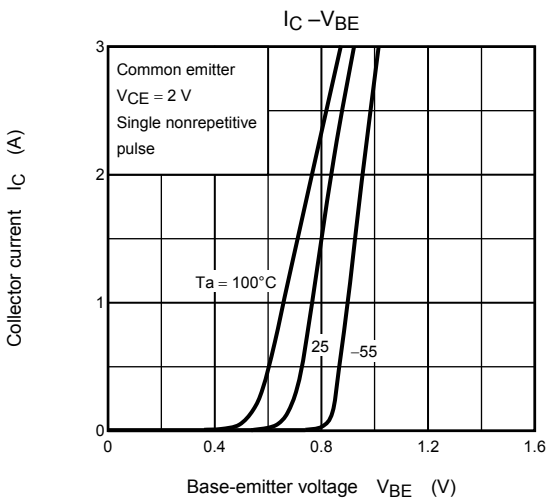
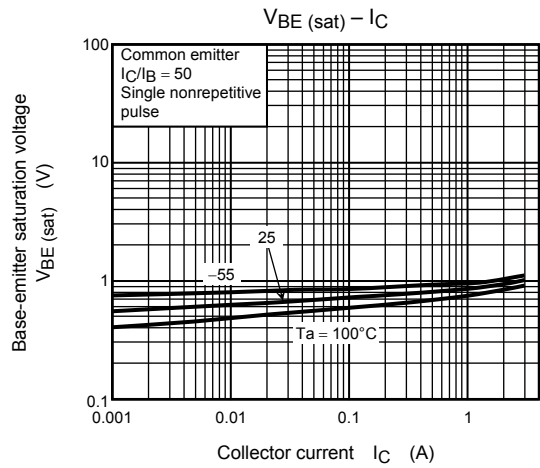
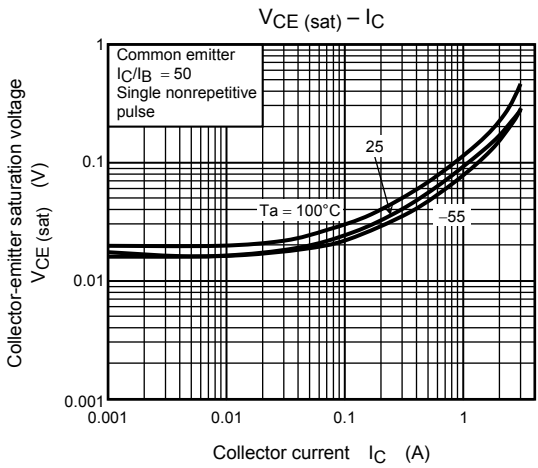
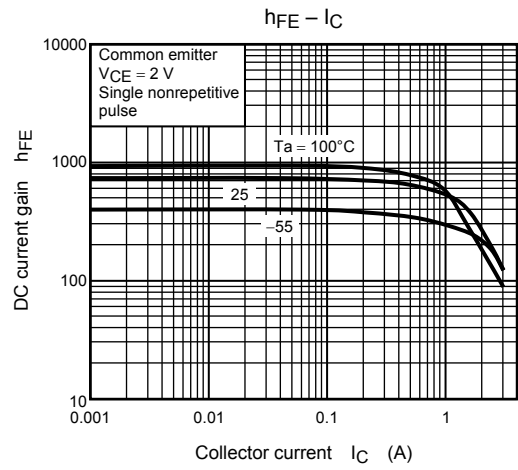
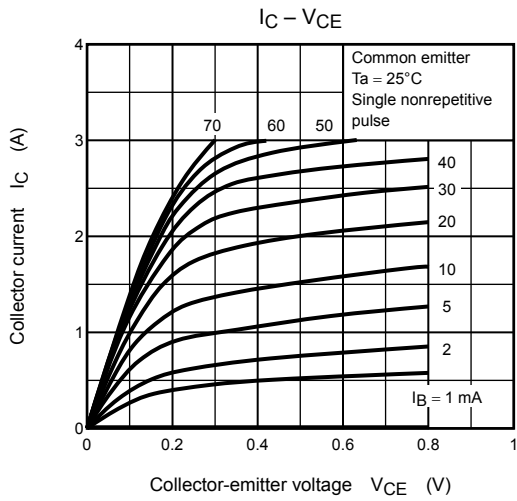
Figure 1 Switching Time Test Circuit & Timing Chart

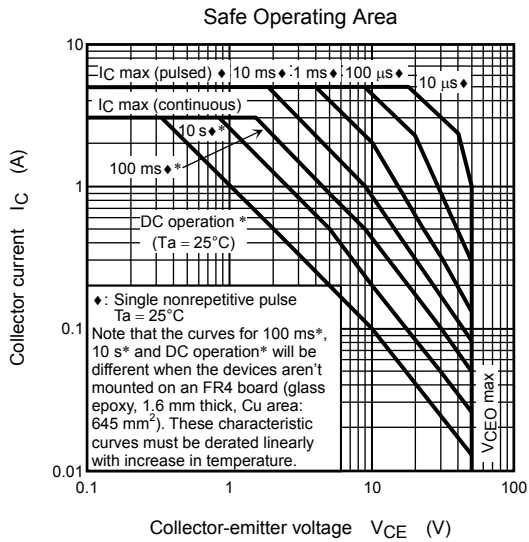
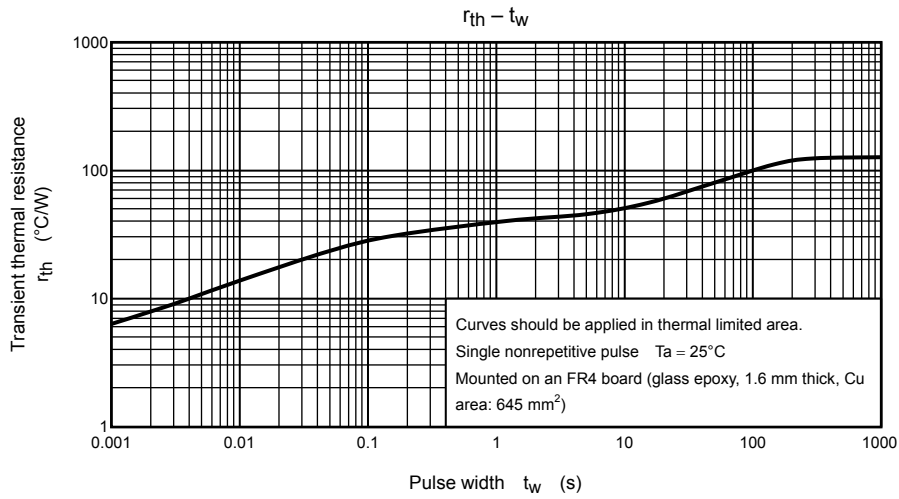
Note 3: A line beside a Lot No. identifies the indication of product Labels.

Without a line: [[Pb]]/INCLUDES > MCV

With a line: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

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