

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

2SC3328

Power Amplifier Applications
Power Switching Applications

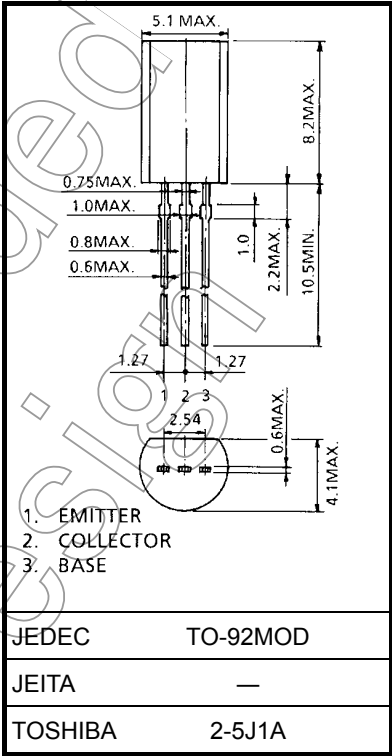
- Low saturation voltage: $V_{CE(sat)} = 0.5\text{ V (max)}$ ($I_C = 1\text{ A}$)
- High-speed switching: $t_{stg} = 1.0\text{ }\mu\text{s (typ.)}$
- Complementary to 2SA1315

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

| Characteristics | Symbol | Rating | Unit |
|-----------------------------|-----------|------------|------------------|
| Collector-base voltage | V_{CBO} | 80 | V |
| Collector-emitter voltage | V_{CEO} | 80 | V |
| Emitter-base voltage | V_{EBO} | 5 | V |
| Collector current | I_C | 2 | A |
| Base current | I_B | 1 | A |
| Collector power dissipation | P_C | 900 | mW |
| Junction temperature | T_j | 150 | $^\circ\text{C}$ |
| Storage temperature range | T_{stg} | -55 to 150 | $^\circ\text{C}$ |

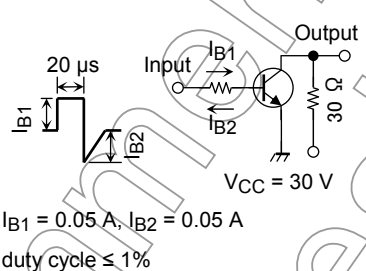
Note1: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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



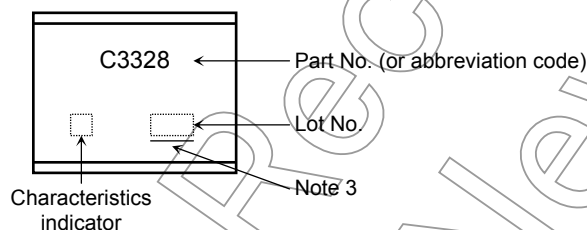
Weight: 0.36 g (typ.)

Electrical Characteristics (Ta = 25°C)

| Characteristics | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|--------------------------------------|--------------------------|----------------|--|-----|------|-----|---------------|
| Collector cut-off current | | I_{CBO} | $V_{CB} = 80 \text{ V}, I_E = 0$ | — | — | 1.0 | μA |
| Emitter cut-off current | | I_{EBO} | $V_{EB} = 5 \text{ V}, I_C = 0$ | — | — | 1.0 | μA |
| Collector-emitter breakdown voltage | | $V_{(BR) CEO}$ | $I_C = 10 \text{ mA}, I_B = 0$ | 80 | — | — | V |
| DC current gain | $h_{FE} (1)$ (Note 2) | | $V_{CE} = 2 \text{ V}, I_C = 0.5 \text{ A}$ | 70 | — | 240 | |
| | $h_{FE} (2)$ | | $V_{CE} = 2 \text{ V}, I_C = 1.5 \text{ A}$ | 40 | — | — | |
| Collector-emitter saturation voltage | | $V_{CE(sat)}$ | $I_C = 1 \text{ A}, I_B = 0.05 \text{ A}$ | — | 0.15 | 0.5 | V |
| Base-emitter saturation voltage | | $V_{BE(sat)}$ | $I_C = 1 \text{ A}, I_B = 0.05 \text{ A}$ | — | 0.9 | 1.2 | V |
| Transition frequency | | f_T | $V_{CE} = 2 \text{ V}, I_C = 0.5 \text{ A}$ | — | 100 | — | MHz |
| Collector output capacitance | | C_{ob} | $V_{CB} = 10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$ | — | 30 | — | pF |
| Switching time | Turn-on time | t_{on} |  <p>$I_{B1} = 0.05 \text{ A}, I_{B2} = 0.05 \text{ A}$ duty cycle $\leq 1\%$</p> | — | 0.2 | — | μs |
| | Storage time | t_{stg} | | — | 1.0 | — | |
| | Fall time | t_f | | — | 0.2 | — | |

Note 2: $h_{FE} (1)$ classification O: 70 to 140, Y: 120 to 240

Marking

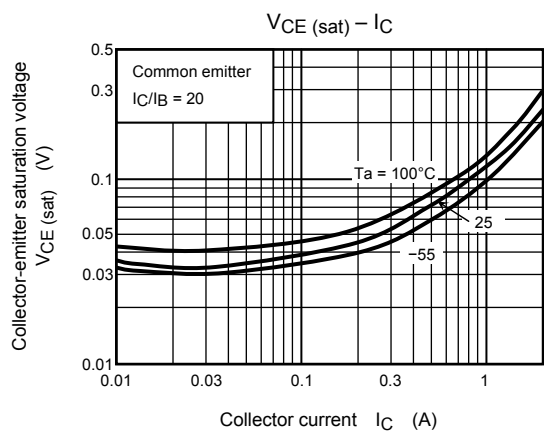
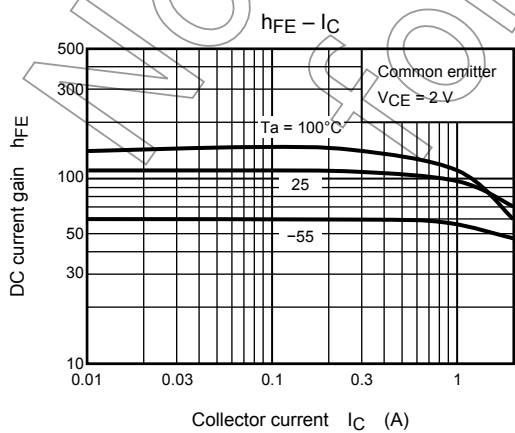
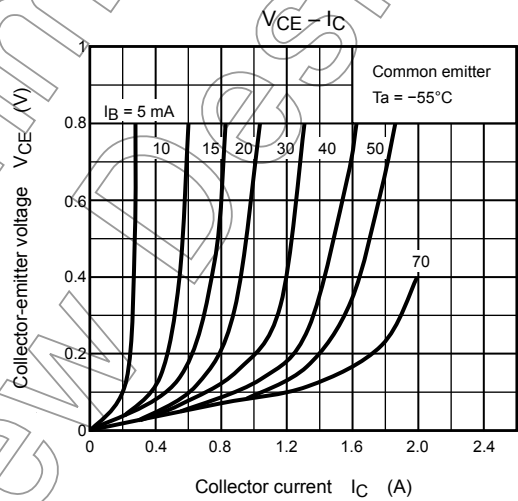
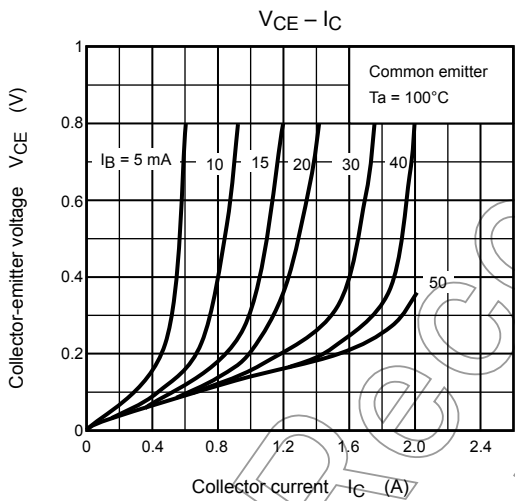
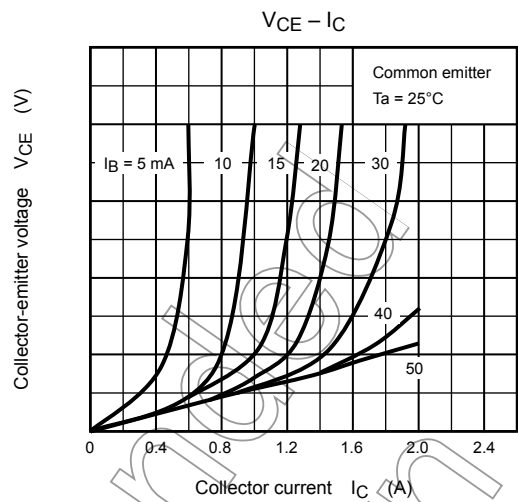
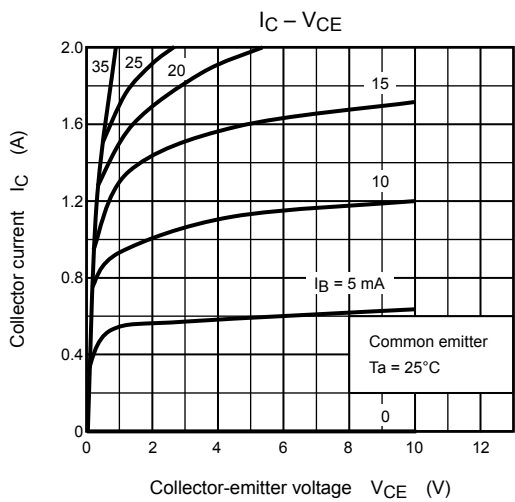


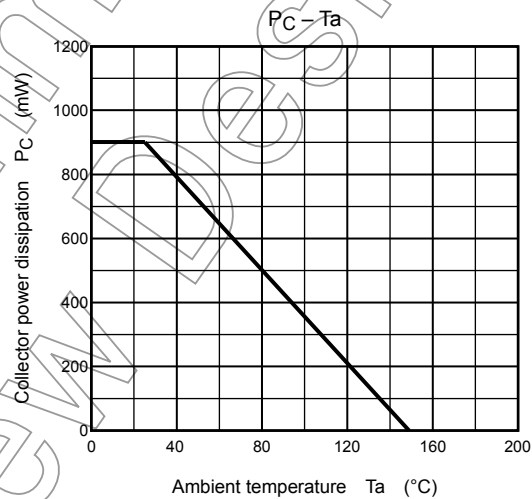
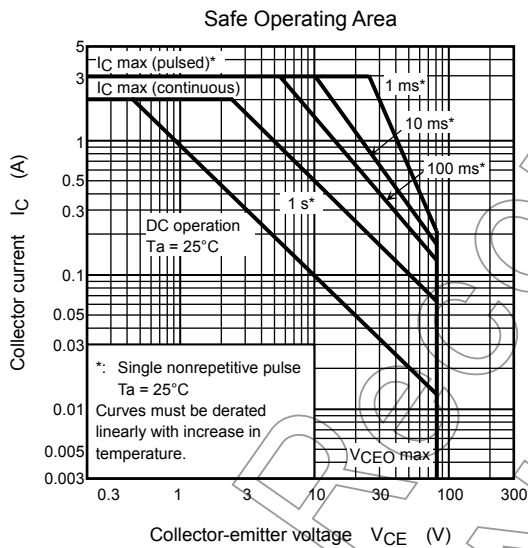
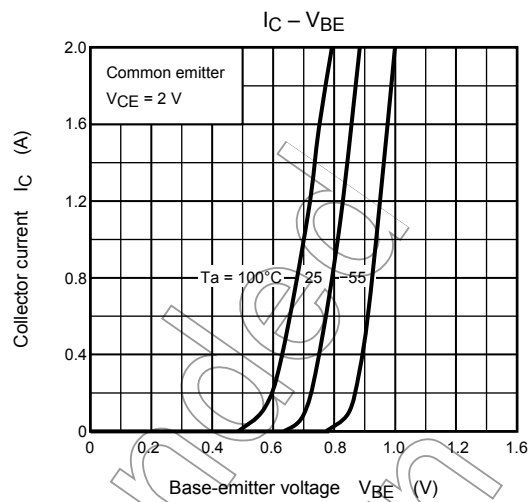
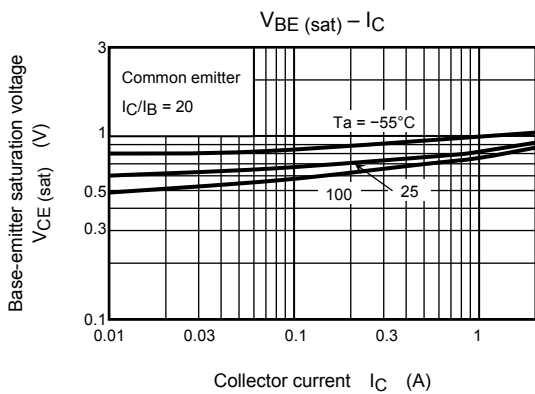
Note 3: A line under a Lot No. identifies the indication of product Labels.

Not underlined: $[[Pb]]/INCLUDES > MCV$

Underlined: $[[G]]/RoHS COMPATIBLE$ or $[[G]]/RoHS [[Pb]]$

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. The RoHS is the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.





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