

TOSHIBA Transistor Silicon NPN Triple Diffused Type (PCT Process)

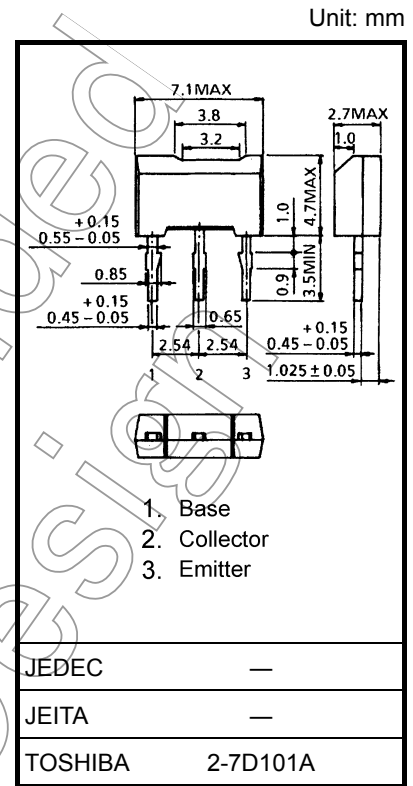
# 2SC5930

High-Speed and High-Voltage Switching Applications  
 Switching Regulator Applications  
 DC-DC Converter Applications

- High-speed switching:  $t_f = 0.3 \mu s$  (max) ( $I_C = 0.3 A$ )

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

| Characteristics             |       | Symbol    | Rating     | Unit       |
|-----------------------------|-------|-----------|------------|------------|
| Collector-base voltage      |       | $V_{CBO}$ | 600        | V          |
| Collector-emitter voltage   |       | $V_{CEX}$ | 600        | V          |
| Collector-emitter voltage   |       | $V_{CEO}$ | 285        | V          |
| Emitter-base voltage        |       | $V_{EBO}$ | 7          | V          |
| Collector current           | DC    | $I_C$     | 1.0        | A          |
|                             | Pulse | $I_{CP}$  | 2.0        |            |
| Base current                |       | $I_B$     | 0.5        | A          |
| Collector power dissipation |       | $P_C$     | 1.0        | W          |
| Junction temperature        |       | $T_j$     | 150        | $^\circ C$ |
| Storage temperature range   |       | $T_{stg}$ | -55 to 150 | $^\circ C$ |



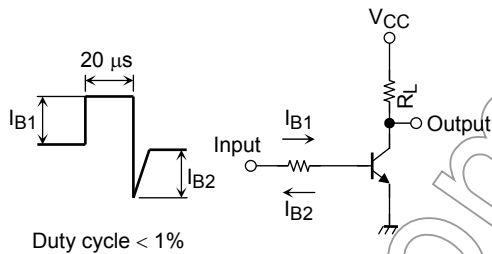
Weight: 0.2 g (typ.)

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).

Not for New

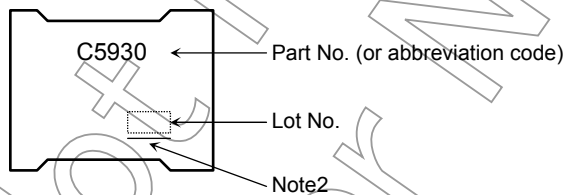
**Electrical Characteristics (Ta = 25°C)**

| Characteristics                      |              | Symbol        | Test Condition  | Min | Typ. | Max | Unit          |
|--------------------------------------|--------------|---------------|---|-----|------|-----|---------------|
| Collector cut-off current            |              | $I_{CBO}$     | $V_{CB} = 600\text{ V}, I_E = 0$  | —   | —    | 100 | $\mu\text{A}$ |
| Emitter cut-off current              |              | $I_{EBO}$     | $V_{EB} = 7\text{ V}, I_C = 0$  | —   | —    | 100 | $\mu\text{A}$ |
| Collector-base breakdown voltage     |              | $V_{(BR)CBO}$ | $I_C = 1\text{ mA}, I_B = 0$  | 600 | —    | —   | V             |
| Collector-emitter breakdown voltage  |              | $V_{(BR)CEO}$ | $I_C = 10\text{ mA}, I_B = 0$   | 285 | —    | —   | V             |
| DC current gain                      | $h_{FE(1)}$  |               | $V_{CE} = 5\text{ V}, I_C = 1\text{ mA}$  | 30  | —    | 100 |               |
|                                      | $h_{FE(2)}$  |               | $V_{CE} = 5\text{ V}, I_C = 0.2\text{ A}$   | 40  | —    | 100 |               |
| Collector-emitter saturation voltage |              | $V_{CE(sat)}$ | $I_C = 0.6\text{ A}, I_B = 0.075\text{ A}$  | —   | —    | 1.0 | V             |
| Base-emitter saturation voltage      |              | $V_{BE(sat)}$ | $I_C = 0.6\text{ A}, I_B = 0.075\text{ A}$  | —   | —    | 1.3 | V             |
| Switching time                       | Rise time    | $t_r$         | See Figure 1.<br>$V_{CC} \approx 200\text{ V}, R_L = 667\ \Omega$<br>$I_{B1} = 20\text{ mA}, I_{B2} = 50\text{ mA}$ | —   | —    | 0.5 | $\mu\text{s}$ |
|                                      | Storage time | $t_{stg}$     |   | —   | —    | 3.0 |               |
|                                      | Fall time    | $t_f$         |   | —   | —    | 0.3 |               |



**Figure 1 Switching Time Test Circuit & Timing Chart**

**Marking**

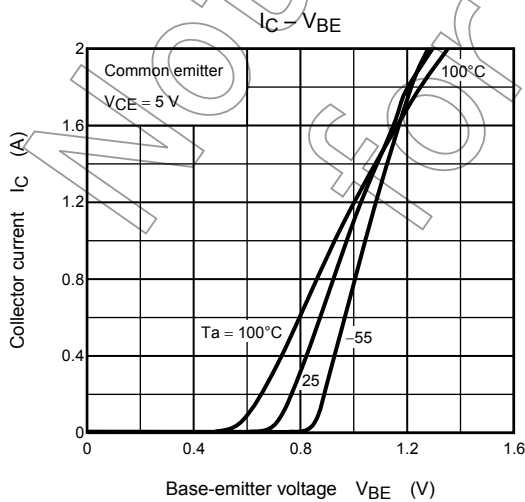
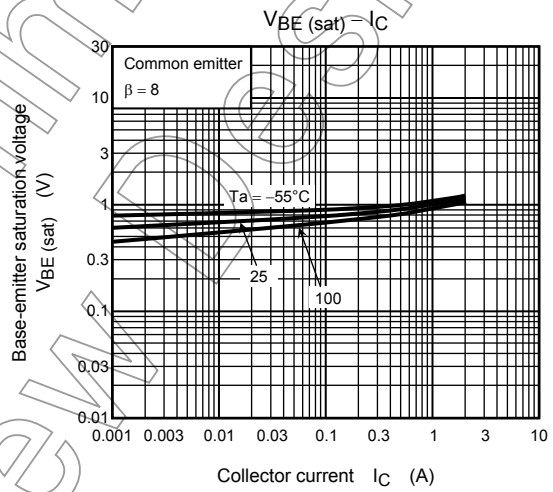
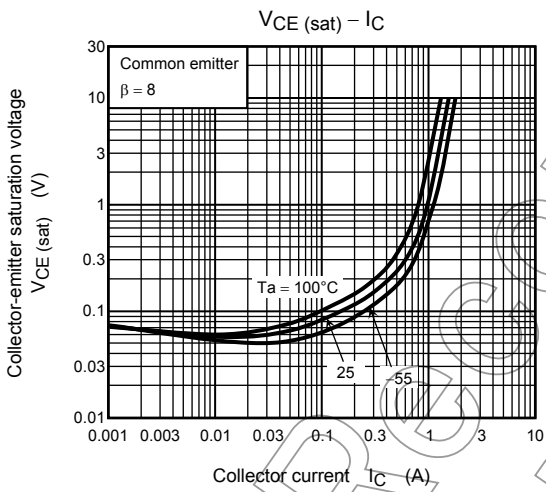
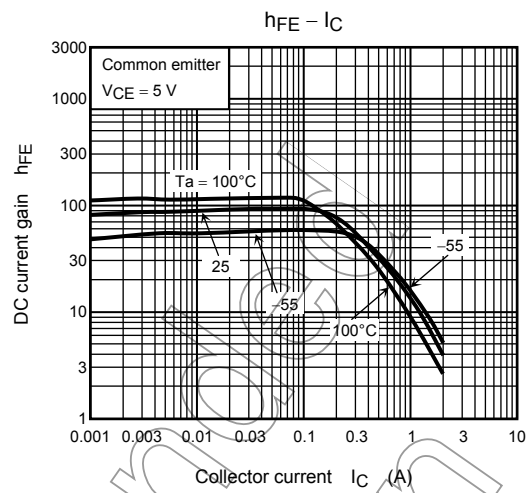
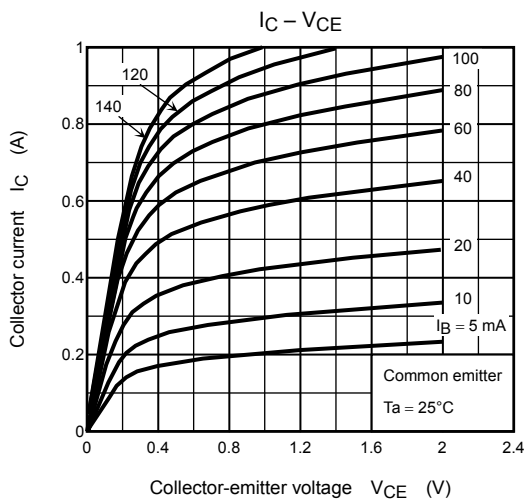


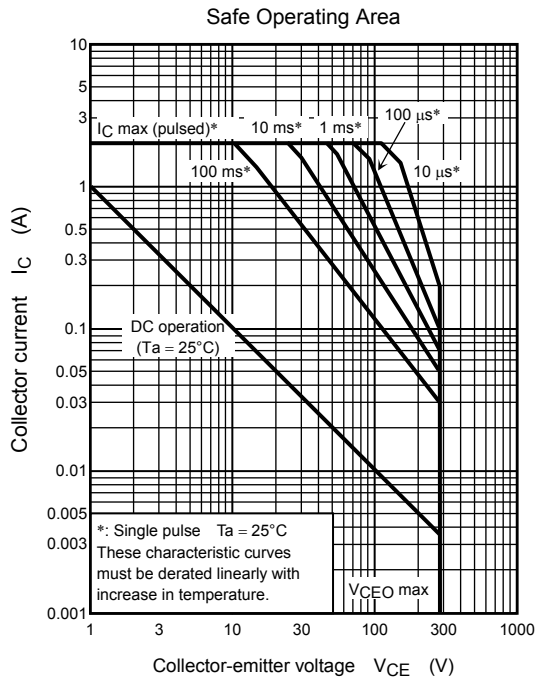
Note2: A line under a Lot No. identifies the indication of product Labels.

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.





Not Recommended for New Design

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