

TOSHIBA TRANSISTOR SILICON NPN TRIPLE DIFFUSED MESA TYPE

## 2SC5589

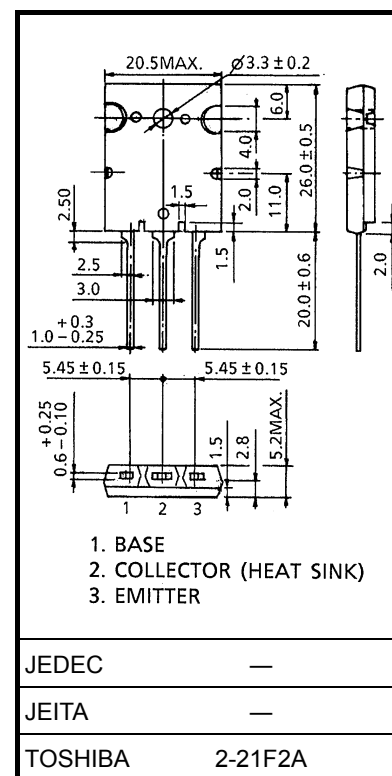
HORIZONTAL DEFLECTION OUTPUT FOR  
HIGH RESOLUTION DISPLAY, COLOR TV  
HIGH SPEED SWITCHING APPLICATIONS

Unit: mm

- High Voltage :  $V_{CBO} = 1500\text{ V}$
- Low Saturation Voltage :  $V_{CE(sat)} = 3\text{ V (Max.)}$
- High Speed :  $t_f(2) = 0.1\text{ }\mu\text{s (Typ.)}$

### ABSOLUTE MAXIMUM RATINGS ( $T_c = 25^\circ\text{C}$ )

| CHARACTERISTIC                           |       | SYMBOL    | RATING  | UNIT             |
|--|-------|-----------|---------|------------------|
| Collector-Base Voltage                   |       | $V_{CBO}$ | 1500    | V                |
| Collector-Emitter Voltage                |       | $V_{CEO}$ | 750     | V                |
| Emitter-Base Voltage                     |       | $V_{EBO}$ | 5       | V                |
| Collector Current                        | DC    | $I_C$     | 18      | A                |
|  | Pulse | $I_{CP}$  | 36      |                  |
| Base Current                             |       | $I_B$     | 9       | A                |
| Collector Power Dissipation <sup>c</sup> |       | $P_C$     | 200     | W                |
| Junction Temperature                     |       | $T_j$     | 150     | $^\circ\text{C}$ |
| Storage Temperature Range                |       | $T_{stg}$ | -55~150 | $^\circ\text{C}$ |



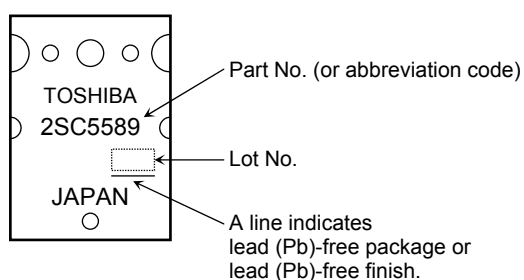
Weight: 9.75 g (typ.)

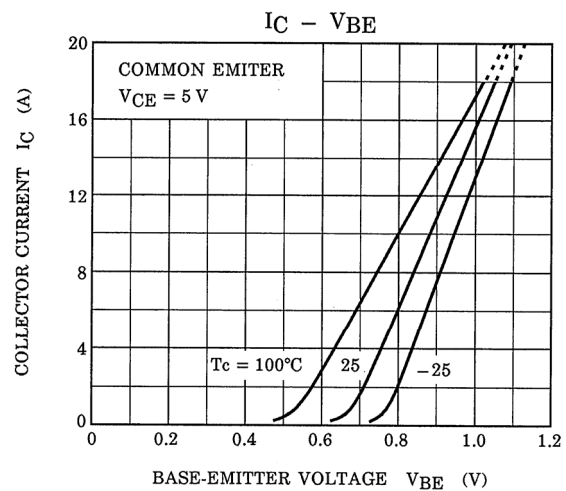
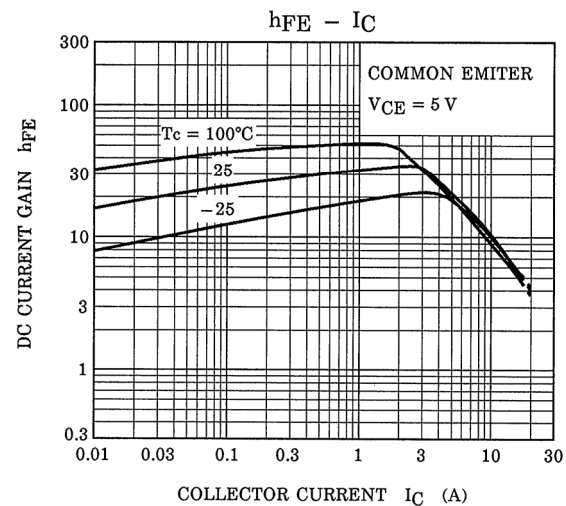
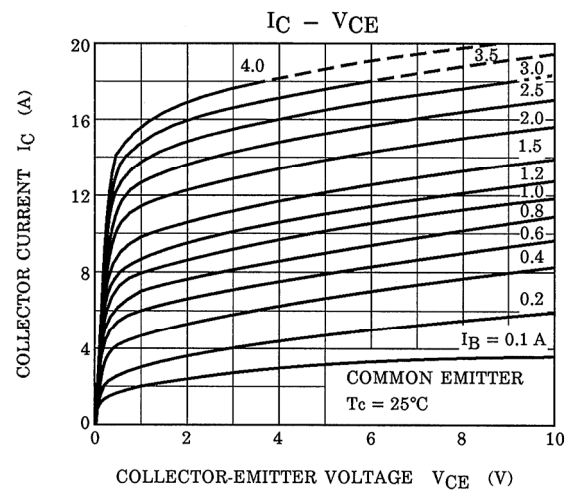
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

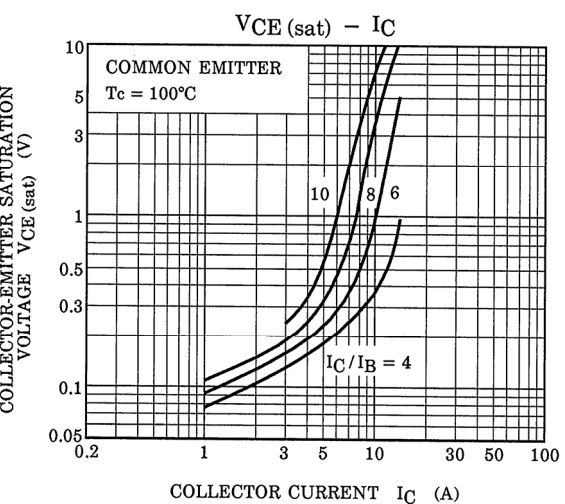
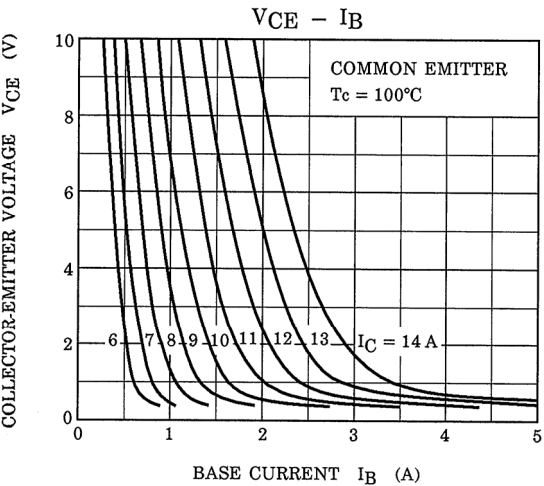
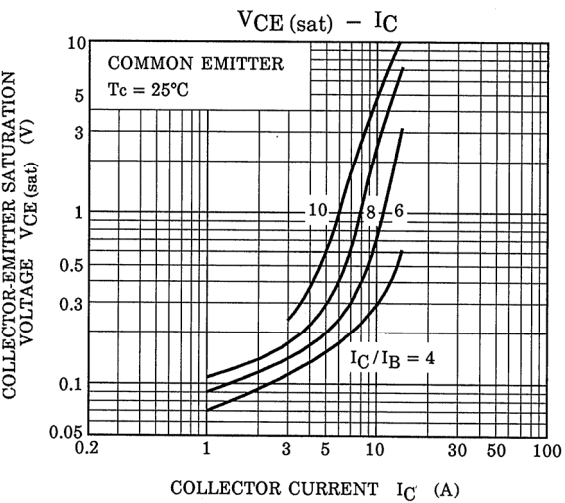
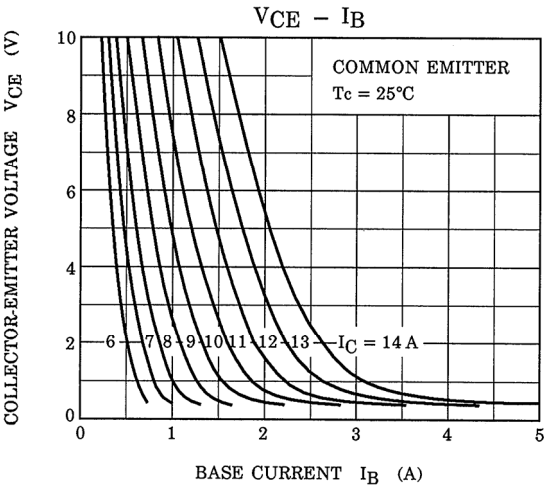
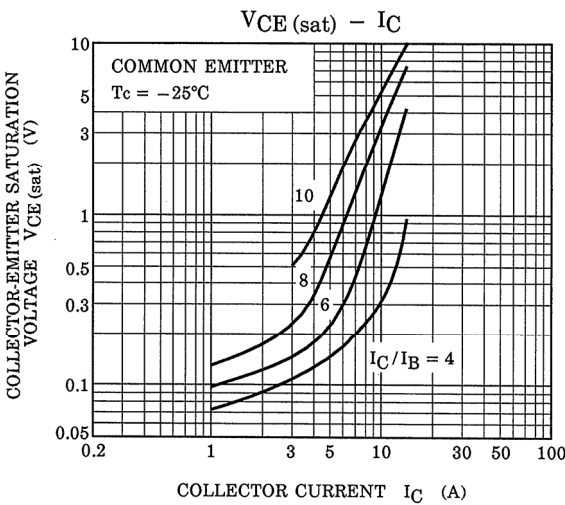
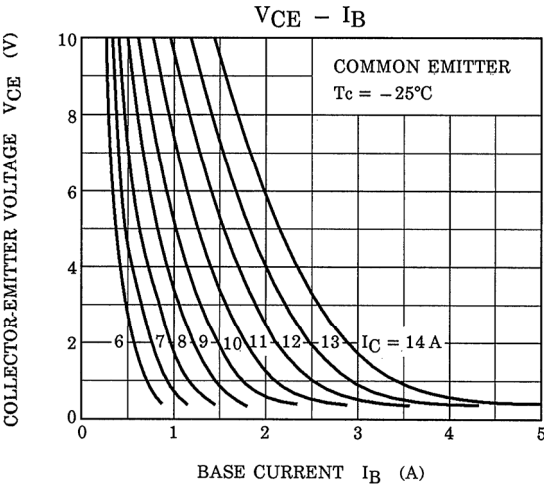
## ELECTRICAL CHARACTERISTICS (T<sub>c</sub> = 25°C)

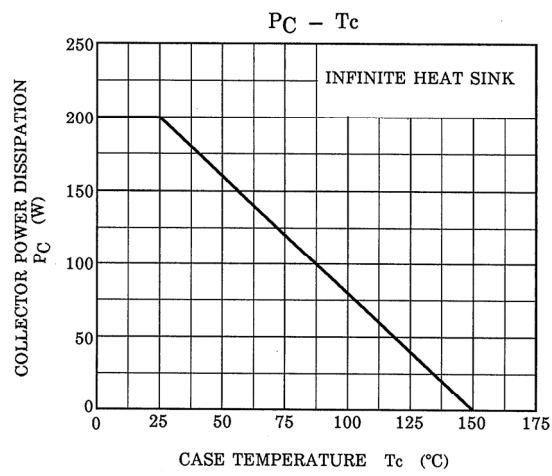
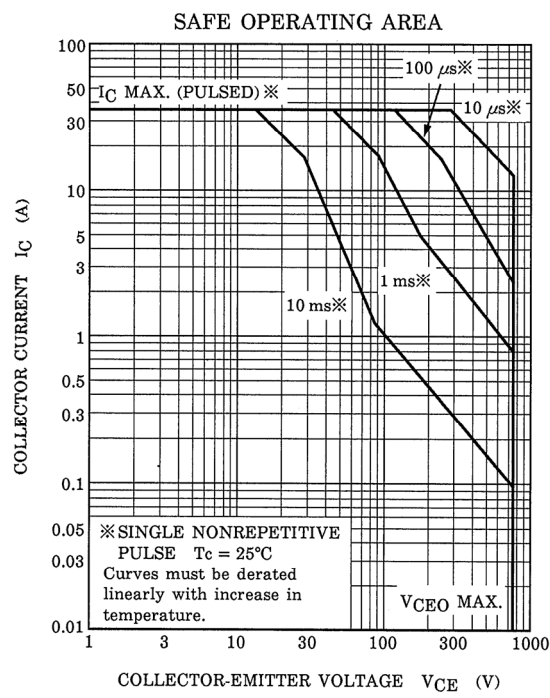
| CHARACTERISTIC                       |              | SYMBOL                | TEST CONDITION   | MIN | TYP. | MAX  | UNIT |
|--------------------------------------|--------------|-----------------------|--|-----|------|------|------|
| Collector Cut-off Current            |              | I <sub>CBO</sub>      | V <sub>CB</sub> = 1500 V, I <sub>E</sub> = 0                                       | —   | —    | 1    | mA   |
| Emitter Cut-off Current              |              | I <sub>EBO</sub>      | V <sub>EB</sub> = 5 V, I <sub>C</sub> = 0  | —   | —    | 100  | μA   |
| Collector-Emitter Breakdown Voltage  |              | V (BR) CEO            | I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0   | 750 | —    | —    | V    |
| DC Current Gain                      |              | h <sub>FE</sub> (1)   | V <sub>CE</sub> = 5 V, I <sub>C</sub> = 2 A  | 22  | —    | 48   | —    |
|                                      |              | h <sub>FE</sub> (2)   | V <sub>CE</sub> = 5 V, I <sub>C</sub> = 7 A  | 9   | —    | 18   |      |
|                                      |              | h <sub>FE</sub> (3)   | V <sub>CE</sub> = 5 V, I <sub>C</sub> = 14 A                                       | 5   | —    | 8    |      |
| Collector-Emitter Saturation Voltage |              | V <sub>CE</sub> (sat) | I <sub>C</sub> = 14 A, I <sub>B</sub> = 3.5 A                                      | —   | —    | 3    | V    |
| Base-Emitter Saturation Voltage      |              | V <sub>BE</sub> (sat) | I <sub>C</sub> = 14 A, I <sub>B</sub> = 3.5 A                                      | —   | 1.0  | 1.5  | V    |
| Transition Frequency                 |              | f <sub>T</sub>        | V <sub>CE</sub> = 10 V, I <sub>C</sub> = 0.1 A                                     | —   | 2    | —    | MHz  |
| Collector Output Capacitance         |              | C <sub>ob</sub>       | V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1 MHz                              | —   | 240  | —    | pF   |
| Switching Time                       | Storage Time | t <sub>stg</sub> (1)  | I <sub>CP</sub> = 9 A, I <sub>B1</sub> (end) = 1.3 A<br>f <sub>H</sub> = 64 kHz    | —   | 2.7  | 3    | μs   |
|                                      | Fall Time    | t <sub>f</sub> (1)    |  | —   | 0.2  | 0.3  |      |
|                                      | Storage Time | t <sub>stg</sub> (2)  | I <sub>CP</sub> = 7.5 A, I <sub>B1</sub> (end) = 1.1 A<br>f <sub>H</sub> = 100 kHz | —   | 1.8  | 2    | μs   |
|                                      | Fall Time    | t <sub>f</sub> (2)    |  | —   | 0.1  | 0.15 |      |

## Marking









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20070701-EN

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