

TOSHIBA TRANSISTOR SILICON NPN TRIPLE DIFFUSED TYPE

# 2 S C 5 3 5 2

## SWITCHING REGULATOR AND HIGH VOLTAGE SWITCHING

## APPLICATIONS

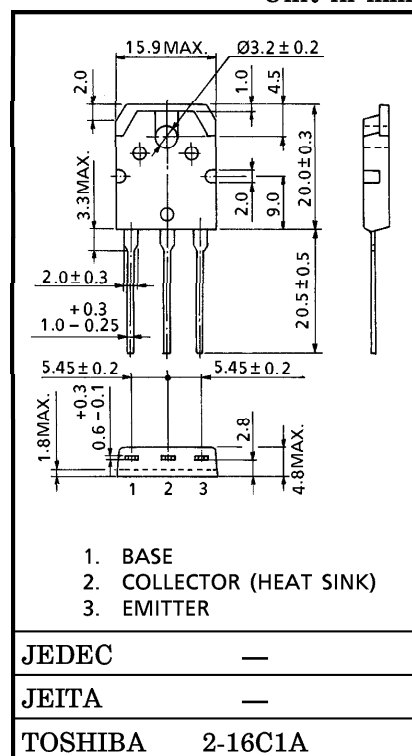
## HIGH SPEED DC-DC CONVERTER APPLICATIONS

- Excellent Switching Times  
:  $t_r = 0.5 \mu s$  (Max.),  $t_f = 0.3 \mu s$  (Max.) ( $I_C = 4 A$ )
- High Collectors Breakdown Voltage :  $V_{CE0} = 400 V$

MAXIMUM RATINGS (T<sub>c</sub> = 25°C)

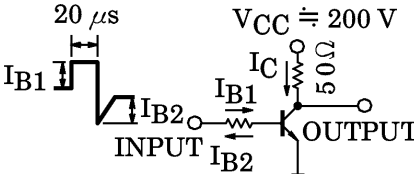
| CHARACTERISTIC                                              |       | SYMBOL    | RATING        | UNIT             |
|-------------------------------------------------------------|-------|-----------|---------------|------------------|
| Collector-Base Voltage                                      |       | $V_{CBO}$ | 600           | V                |
| Collector-Emitter Voltage                                   |       | $V_{CEO}$ | 400           | V                |
| Emitter-Base Voltage                                        |       | $V_{EBO}$ | 7             | V                |
| Collector Current                                           | DC    | $I_C$     | 10            | A                |
|                                                             | Pulse | $I_{CP}$  | 15            |                  |
| Base Current                                                |       | $I_B$     | 5             | A                |
| Collector Power Dissipation<br>( $T_c = 25^\circ\text{C}$ ) |       | $P_C$     | 80            | W                |
| Junction Temperature                                        |       | $T_j$     | 150           | $^\circ\text{C}$ |
| Storage Temperature Range                                   |       | $T_{stg}$ | $-55\sim 150$ | $^\circ\text{C}$ |

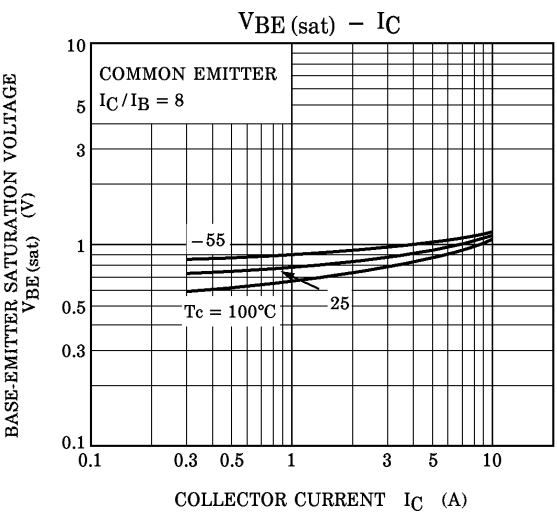
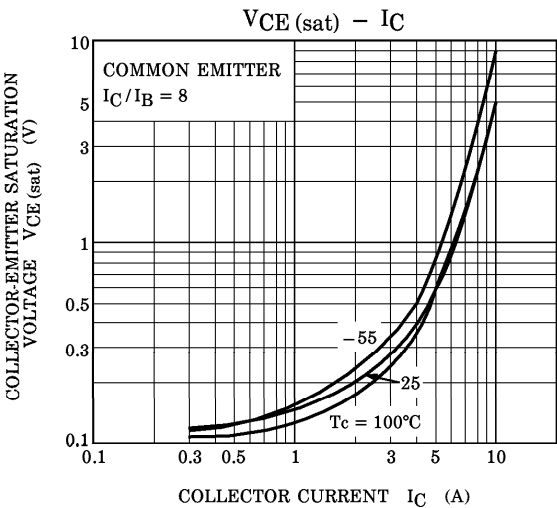
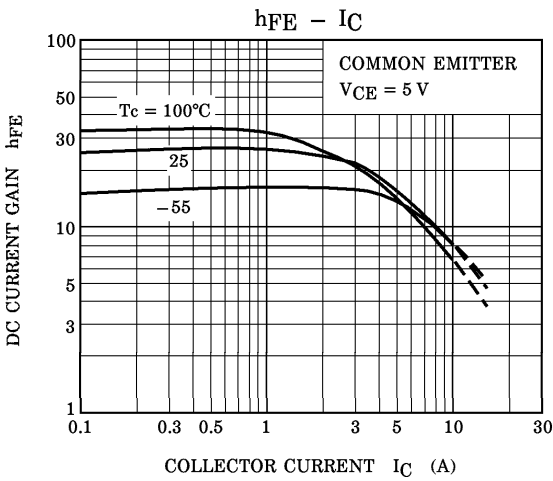
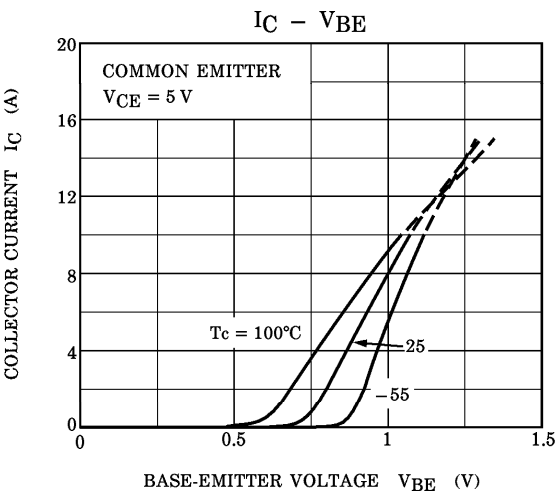
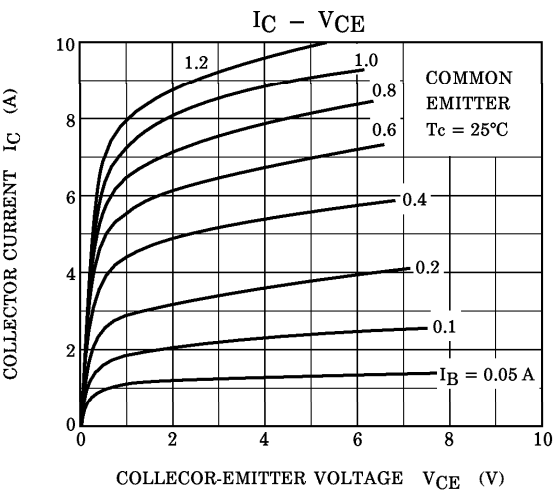
Unit in mm

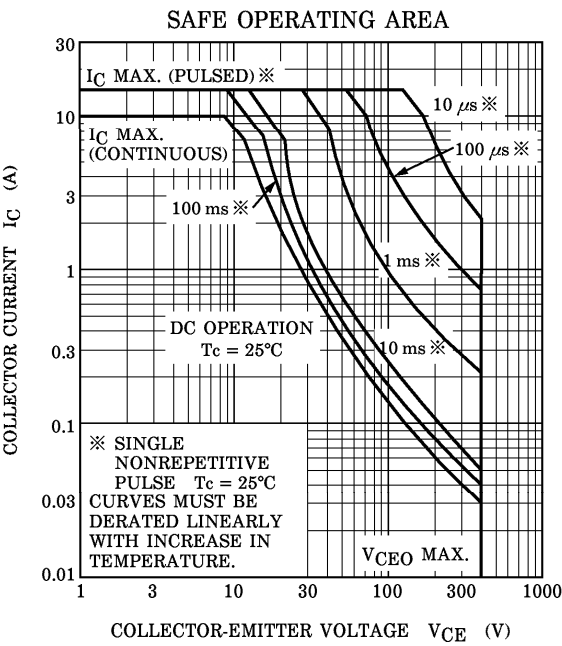


Weight : 4.7 g (Typ.)

### ELECTRICAL CHARACTERISTICS ( $T_c = 25^\circ\text{C}$ )

| CHARACTERISTIC                       |              | SYMBOL                | TEST CONDITION                                                                                                                                                                                                                                               | MIN.                                                               | TYP. | MAX. | UNIT |
|--------------------------------------|--------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------|------|------|
| Collector Cut-off Current            |              | I <sub>CBO</sub>      | V <sub>CB</sub> = 480 V, I <sub>E</sub> = 0                                                                                                                                                                                                                  | —                                                                  | —    | 100  | μA   |
| Emitter Cut-off Current              |              | I <sub>EBO</sub>      | V <sub>EB</sub> = 7 V, I <sub>C</sub> = 0                                                                                                                                                                                                                    | —                                                                  | —    | 1    | mA   |
| Collector-Base Breakdown Voltage     |              | V <sub>(BR)</sub> CBO | I <sub>C</sub> = 1 mA, I <sub>E</sub> = 0                                                                                                                                                                                                                    | 600                                                                | —    | —    | V    |
| Collector-Emitter Breakdown Voltage  |              | V <sub>(BR)</sub> CEO | I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0                                                                                                                                                                                                                   | 400                                                                | —    | —    | V    |
| DC Current Gain                      |              | h <sub>FE</sub>       | V <sub>CE</sub> = 5 V, I <sub>C</sub> = 1 A                                                                                                                                                                                                                  | 20                                                                 | —    | —    |      |
| Collector-Emitter Saturation Voltage |              | V <sub>CE (sat)</sub> | I <sub>C</sub> = 4 A, I <sub>B</sub> = 0.5 A                                                                                                                                                                                                                 | —                                                                  | —    | 1.0  | V    |
| Base-Emitter Saturation Voltage      |              | V <sub>BE (sat)</sub> | I <sub>C</sub> = 4 A, I <sub>B</sub> = 0.5 A                                                                                                                                                                                                                 | —                                                                  | —    | 1.3  | V    |
| Switching Time                       | Rise Time    | t <sub>r</sub>        |  <p>20 μs      V<sub>CC</sub> ≐ 200 V<br/>I<sub>B1</sub>      I<sub>C</sub>      50 Ω<br/>I<sub>B2</sub>      INPUT      OUTPUT<br/>I<sub>B1</sub>      I<sub>B2</sub></p> | —                                                                  | —    | 0.5  | μs   |
|                                      | Storage Time | t <sub>stg</sub>      |                                                                                                                                                                                                                                                              | —                                                                  | —    | 2.0  |      |
|                                      | Fall Time    | t <sub>f</sub>        |                                                                                                                                                                                                                                                              | I <sub>B1</sub> = 0.5 A, I <sub>B2</sub> = -1 A<br>DUTY CYCLE ≤ 1% | —    | —    |      |





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