

TOSHIBA TRANSISTOR SILICON NPN TRIPLE DIFFUSED TYPE

# 2SD1411A

HIGH CURRENT SWITCHING APPLICATIONS

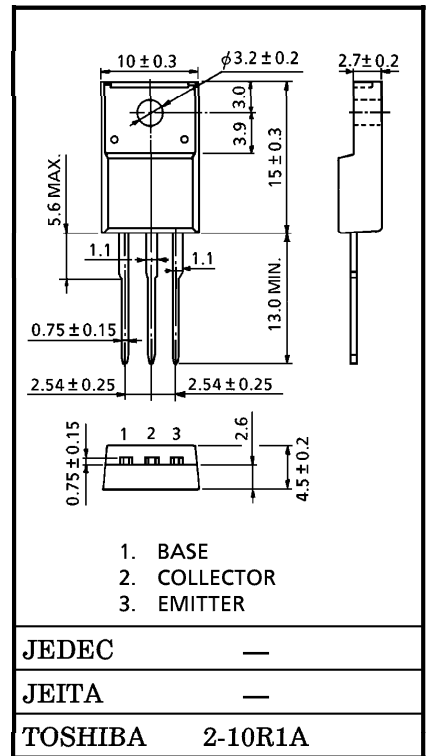
POWER AMPLIFIER APPLICATIONS

- Low Saturation Voltage :  $V_{CE(sat)} = 0.5V$  (Max.) at  $I_C = 4A$
- Complementary to 2SB1018A

MAXIMUM RATINGS ( $T_c = 25^\circ C$ )

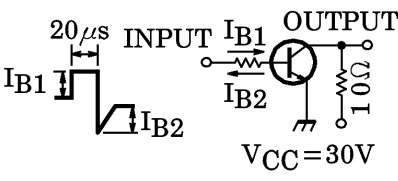
| CHARACTERISTIC              |                    | SYMBOL    | RATING  | UNIT       |
|-----------------------------|--------------------|-----------|---------|------------|
| Collector-Base Voltage      |                    | $V_{CBO}$ | 100     | V          |
| Collector-Emitter Voltage   |                    | $V_{CEO}$ | 80      | V          |
| Emitter-Base Voltage        |                    | $V_{EBO}$ | 5       | V          |
| Collector Current           |                    | $I_C$     | 7       | A          |
| Base Current                |                    | $I_B$     | 1       | A          |
| Collector Power Dissipation | $T_a = 25^\circ C$ | $P_C$     | 2.0     | W          |
|                             | $T_c = 25^\circ C$ |           | 30      |            |
| Junction Temperature        |                    | $T_j$     | 150     | $^\circ C$ |
| Storage Temperature Range   |                    | $T_{stg}$ | -55~150 | $^\circ C$ |

Unit in mm

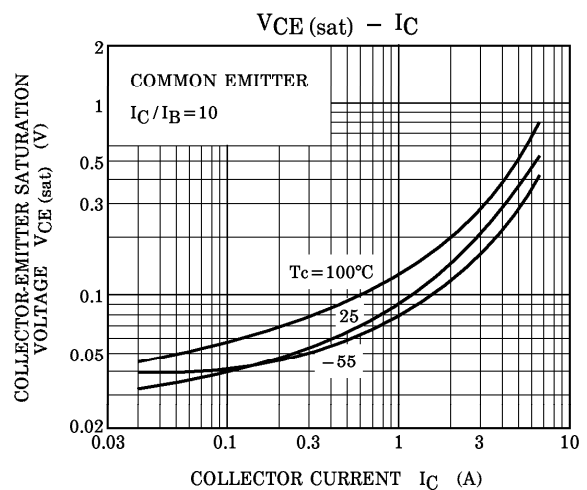
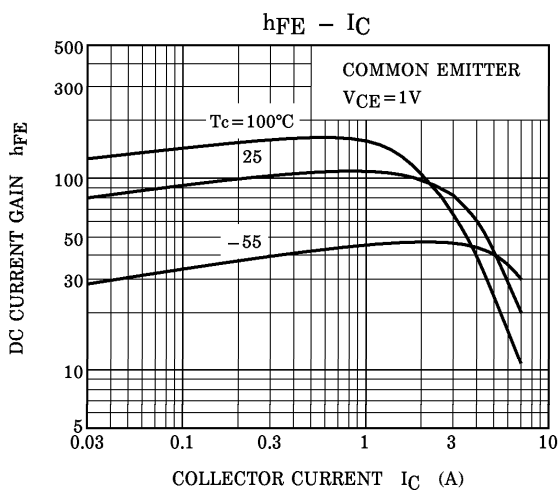
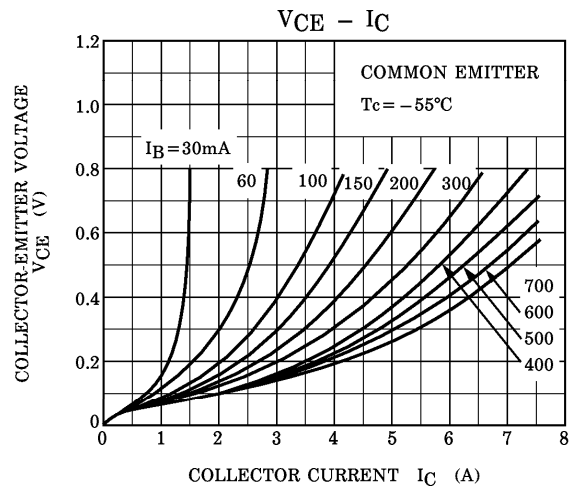
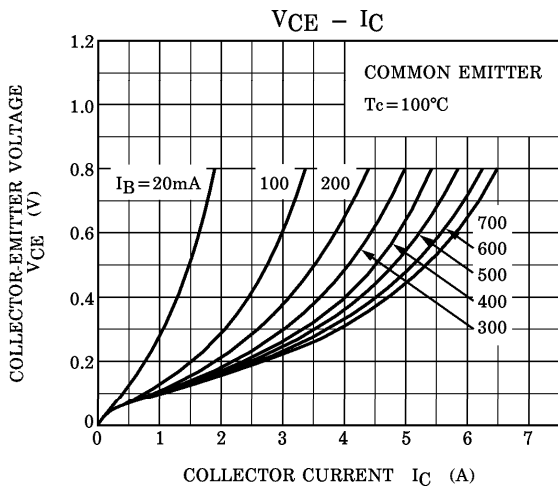
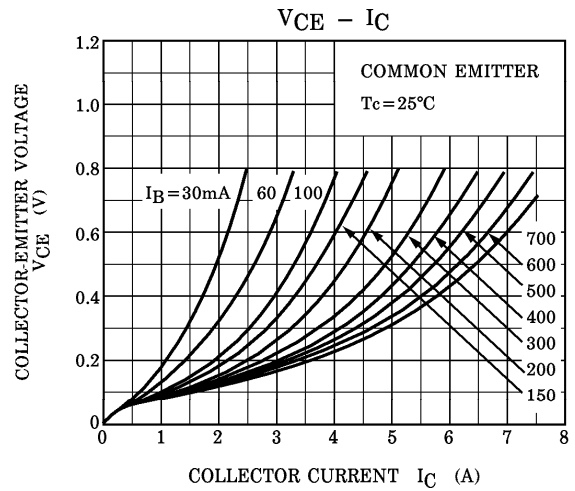
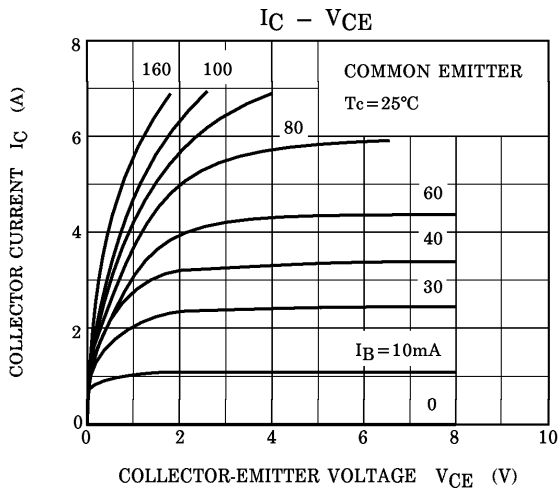


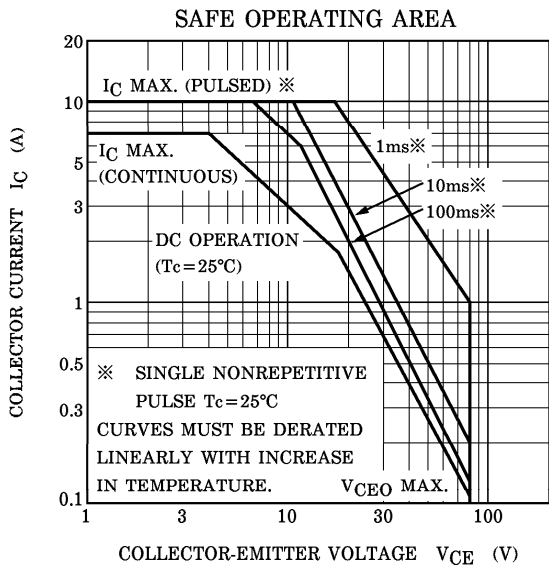
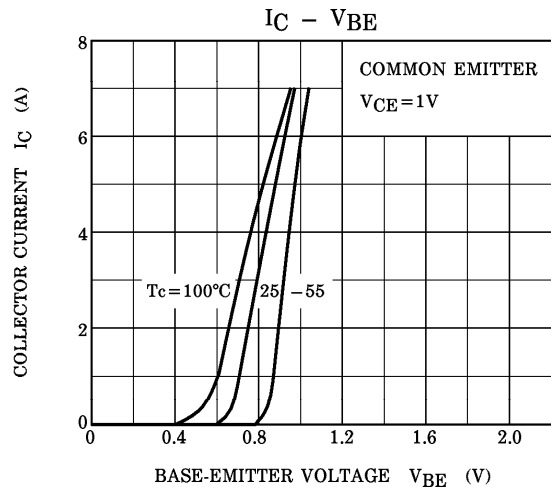
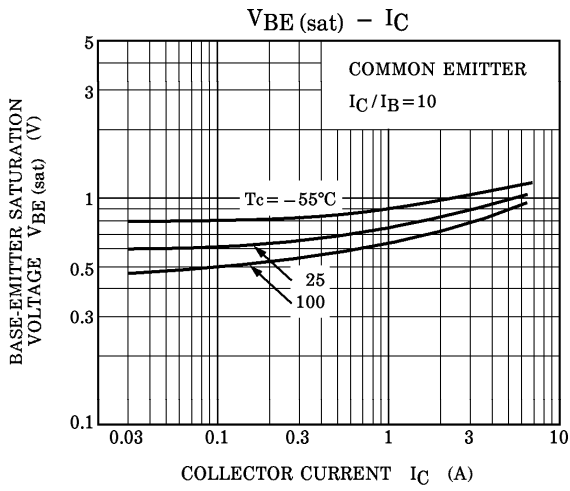
Weight : 1.7 g (Typ.)

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> = 100V, I <sub>E</sub> = 0          | —   | —   | 5    | μA   |    |
| Emitter Cut-off Current              | I <sub>EBO</sub>              | V <sub>EB</sub> = 5V, I <sub>C</sub> = 0            | —   | —   | 5    | μA   |    |
| Collector-Emitter Breakdown Voltage  | V <sub>(BR)CEO</sub>          | I <sub>C</sub> = 50mA, I <sub>B</sub> = 0           | 80  | —   | —    | V    |    |
| DC Current Gain                      | h <sub>FE</sub> (1)<br>(Note) | V <sub>CE</sub> = 1V, I <sub>C</sub> = 1A           | 70  | —   | 240  |      |    |
|                                      | h <sub>FE</sub> (2)           | V <sub>CE</sub> = 1V, I <sub>C</sub> = 4A           | 30  | —   | —    |      |    |
| Collector-Emitter Saturation Voltage | V <sub>CE(sat)</sub>          | I <sub>C</sub> = 4A, I <sub>B</sub> = 0.4A          | —   | 0.25  | 0.5  | V    |    |
| Base-Emitter Saturation Voltage      | V <sub>BE(sat)</sub>          | I <sub>C</sub> = 4A, I <sub>B</sub> = 0.4A          | —   | 0.9   | 1.4  | V    |    |
| Transition Frequency                 | f <sub>T</sub>                | V <sub>CE</sub> = 4V, I <sub>C</sub> = 1A           | —   | 10  | —    | MHz  |    |
| Collector Output Capacitance         | C <sub>ob</sub>               | V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 1MHz | —   | 200   | —    | pF   |    |
| Switching Time                       | Turn-on Time                  | t <sub>on</sub>                                     |  | —   | 0.4  | —    | μs |
|                                      | Storage Time                  | t <sub>stg</sub>                                    |   | —   | 2.5  | —    |    |
|                                      | Fall Time                     | t <sub>f</sub>                                      |   | I <sub>B1</sub> = -I <sub>B2</sub> = 0.3A,<br>DUTY CYCLE ≤ 1% | —    | 0.5  |    |

(Note) : h<sub>FE</sub> (1) Classification    O : 70~140,    Y : 120~240





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