

TOSHIBA TRANSISTOR SILICON NPN TRIPLE DIFFUSED TYPE

# 2SD2414(SM)

HIGH CURRENT SWITCHING APPLICATIONS

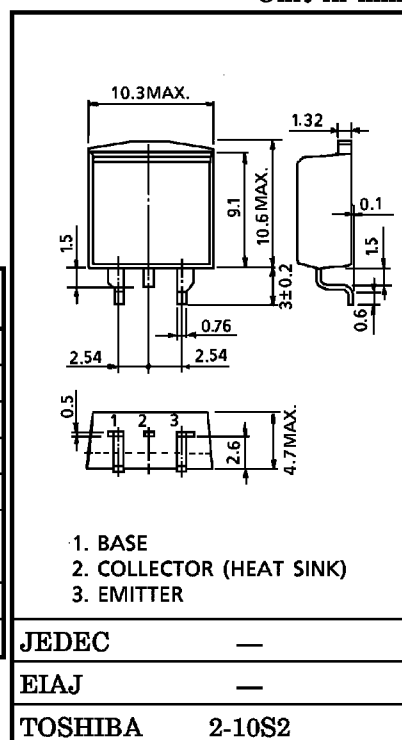
POWER AMPLIFIER APPLICATIONS

Unit in mm

- Low Saturation Voltage

 $V_{CE(sat)} = 0.5 \text{ V (Max.) (at } I_C = 4 \text{ A)}$ 
MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

| 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<br>Dissipation | $P_C$     | $T_a = 25^\circ\text{C}$<br>1.5 | W                |
|                                |           | $T_c = 25^\circ\text{C}$<br>40  |                  |
| Junction Temperature           | $T_j$     | 150                             | $^\circ\text{C}$ |
| Storage Temperature Range      | $T_{stg}$ | $-55 \sim 150$                  | $^\circ\text{C}$ |

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

Weight : 1.4 g

| CHARACTERISTIC                      | SYMBOL                             | TEST CONDITION                                      | MIN. | TYP. | MAX. | UNIT          |
|-------------------------------------|------------------------------------|-----------------------------------------------------|------|------|------|---------------|
| Collector Cut-off Current           | $I_{CBO}$                          | $V_{CB} = 100 \text{ V}, I_E = 0$                   | —    | —    | 5    | $\mu\text{A}$ |
| Emitter Cut-off Current             | $I_{EBO}$                          | $V_{EB} = 5 \text{ V}, I_C = 0$                     | —    | —    | 5    | $\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$                      | $I_C = 50 \text{ mA}, I_B = 0$                      | 80   | —    | —    | V             |
| DC Current Gain                     | $h_{FE(1)}$                        | $V_{CE} = 1 \text{ V}, I_C = 1 \text{ A}$           | 100  | —    | 320  |               |
|                                     | $h_{FE(2)}$                        | $V_{CE} = 1 \text{ V}, I_C = 4 \text{ A}$           | 30   | —    | —    |               |
| Saturation Voltage                  | Collector-Emitter<br>$V_{CE(sat)}$ | $I_C = 4 \text{ A}, I_B = 0.4 \text{ A}$            | —    | 0.25 | 0.5  | V             |
|                                     | Base-Emitter<br>$V_{BE(sat)}$      | $I_C = 4 \text{ A}, I_B = 0.4 \text{ A}$            | —    | 0.9  | 1.4  | V             |
| Transition Frequency                | $f_T$                              | $V_{CE} = 4 \text{ V}, I_C = 1 \text{ A}$           | —    | 10   | —    | MHz           |
| Collector Output Capacitance        | $C_{ob}$                           | $V_{CB} = 10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$ | —    | 200  | —    | pF            |
| Switching Time                      | Turn-on Time<br>$t_{on}$           |                                                     | —    | 0.4  | —    | $\mu\text{s}$ |
|                                     | Storage Time<br>$t_{stg}$          |                                                     | —    | 2.5  | —    |               |
|                                     | Fall Time<br>$t_f$                 |                                                     | —    | 0.5  | —    |               |

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