

## TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE (PCT PROCESS)

**2SD2481**

## PULSE MOTOR DRIVE, HAMMER DRIVE APPLICATIONS

## SWITCHING APPLICATIONS

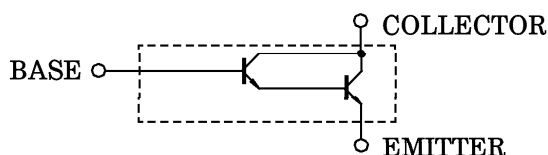
## POWER AMPLIFIER APPLICATIONS

- High DC Current Gain :  $h_{FE}=4000$  (Min.)
- Low Saturation Voltage :  $V_{CE(sat)}=1.5V$  (Max.)

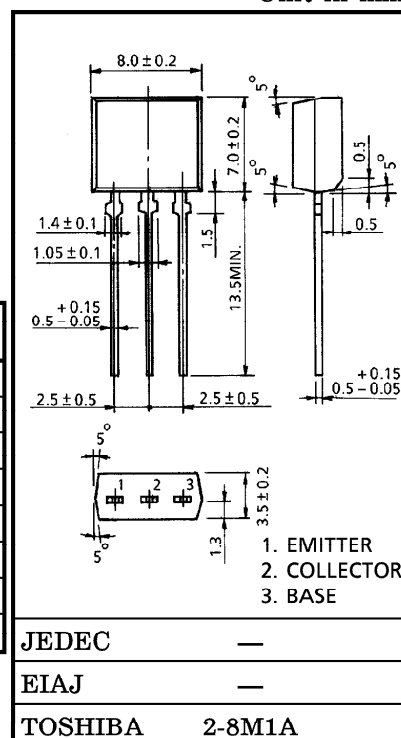
**MAXIMUM RATINGS (T<sub>a</sub> = 25°C)**

| CHARACTERISTIC              | SYMBOL    | RATING  | UNIT |
|-----------------------------|-----------|---------|------|
| Collector-Base Voltage      | $V_{CB0}$ | 30      | V    |
| Collector-Emitter Voltage   | $V_{CEO}$ | 30      | V    |
| Emitter-Base Voltage        | $V_{EB0}$ | 10      | V    |
| Collector Current           | $I_C$     | 1.5     | A    |
| Base Current                | $I_B$     | 0.15    | A    |
| Collector Power Dissipation | $P_C$     | 1.3     | W    |
| Junction Temperature        | $T_j$     | 150     | °C   |
| Storage Temperature Range   | $T_{stg}$ | -55~150 | °C   |

### EQUIVALENT CIRCUIT



Unit in mm



Weight : 0.55g (Typ.)

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

| CHARACTERISTIC                      |                   | SYMBOL        | TEST CONDITION                                                                                                                                                                                       | MIN.                     | TYP. | MAX. | UNIT    |
|-------------------------------------|-------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------|------|---------|
| Collector Cut-off Current           |                   | $I_{CBO}$     | $V_{CB}=30V, I_E=0$                                                                                                                                                                                  | —                        | —    | 10   | $\mu A$ |
| Emitter Cut-off Current             |                   | $I_{EBO}$     | $V_{EB}=10V, I_C=0$                                                                                                                                                                                  | —                        | —    | 10   | $\mu A$ |
| Collector-Emitter Breakdown Voltage |                   | $V_{(BR)CEO}$ | $I_C=10mA, I_B=0$                                                                                                                                                                                    | 30                       | —    | —    | V       |
| DC Current Gain                     |                   | $h_{FE}$      | $V_{CE}=2V, I_C=150mA$                                                                                                                                                                               | 4000                     | —    | —    |         |
| Saturation Voltage                  | Collector-Emitter | $V_{CE(sat)}$ | $I_C=1A, I_B=1mA$                                                                                                                                                                                    | —                        | —    | 1.5  | V       |
|                                     | Base-Emitter      | $V_{BE(sat)}$ | $I_C=1A, I_B=1mA$                                                                                                                                                                                    | —                        | —    | 2.2  |         |
| Switching Time                      | Turn-On Time      | $t_{on}$      | <p>20 <math>\mu s</math></p> <p>INPUT <math>I_{B1}</math> <math>I_{B2}</math></p> <p>OUTPUT</p> <p>15 <math>\Omega</math></p> <p><math>V_{CC}=15V</math></p> <p>DUTY CYCLE <math>\leq 1\%</math></p> | —                        | 0.18 | —    | $\mu s$ |
|                                     | Storage Time      | $t_{stg}$     |                                                                                                                                                                                                      | —                        | 0.6  | —    |         |
|                                     | Fall Time         | $t_f$         |                                                                                                                                                                                                      | $I_{B1} = -I_{B2} = 1mA$ | —    | 0.3  |         |

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