

9097250 TOSHIBA (DISCRETE/OPTO)

56C 07859 D T-33-29

# 2SD1087

SILICON NPN TRIPLE DIFFUSED TYPE  
(DARLINGTON POWER)

### INDUSTRIAL APPLICATIONS

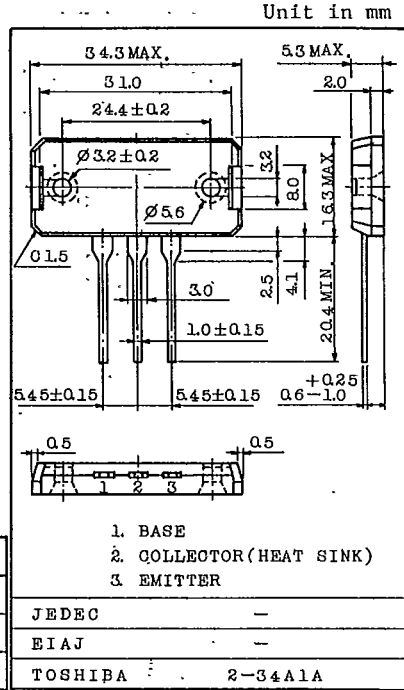
HIGH CURRENT SWITCHING APPLICATIONS.

#### FEATURES

- High DC Current Gain  
:  $h_{FE}=1000(\text{Min.}) (V_{CE}=3V, I_C=15A)$
- Low Collector Saturation Voltage  
:  $V_{CE(\text{sat})}=1.5V(\text{Max.}) (I_C=15A)$
- Monolithic Construction with Built-In Base-Emitter Shunt Resistor.

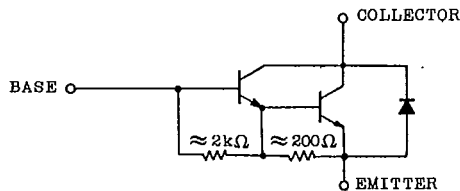
#### MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ )

| CHARACTERISTIC   | SYMBOL           | RATING    | UNIT             |
|--|------------------|-----------|------------------|
| Collector-Base Voltage                                   | $V_{CBO}$        | 100       | V                |
| Collector-Emitter Voltage                                | $V_{CEO}$        | 100       | V                |
| Emitter-Base Voltage                                     | $V_{EBO}$        | 5         | V                |
| Collector Current  | $I_C$            | 15        | A                |
| Base Current   | $I_B$            | 1         | A                |
| Collector Power Disipation<br>( $T_c=25^\circ\text{C}$ ) | $P_C$            | 100       | W                |
| Junction Temperature                                     | $T_j$            | 150       | $^\circ\text{C}$ |
| Storage Temperature Range                                | $T_{\text{stg}}$ | -55 ~ 150 | $^\circ\text{C}$ |



Weight : 10.8g

#### EQUIVALENT CIRCUIT



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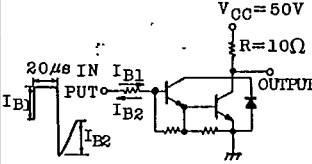
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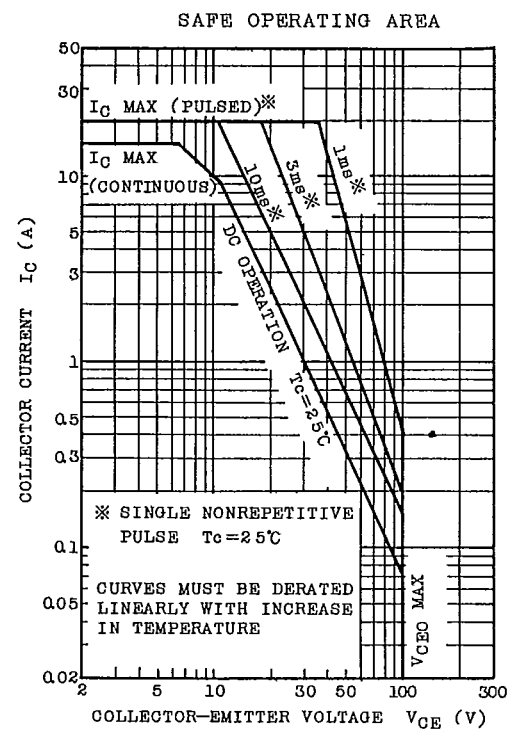
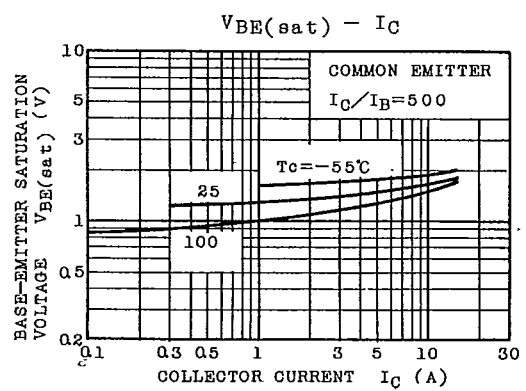
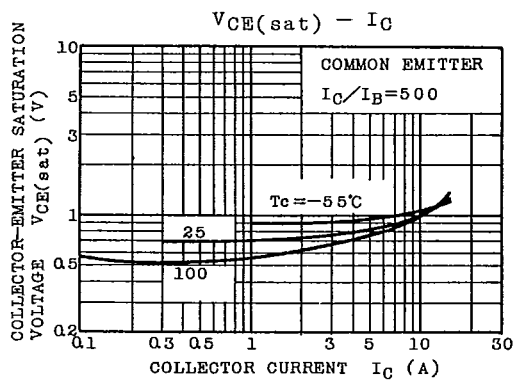
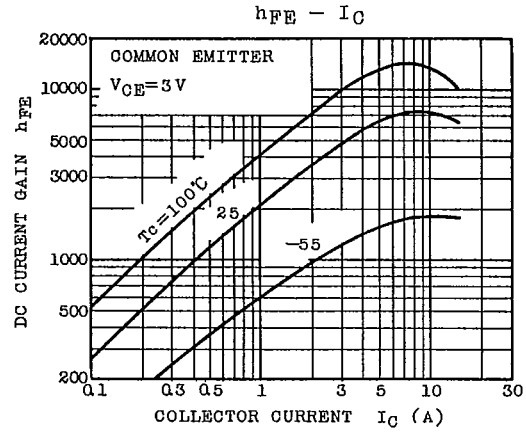
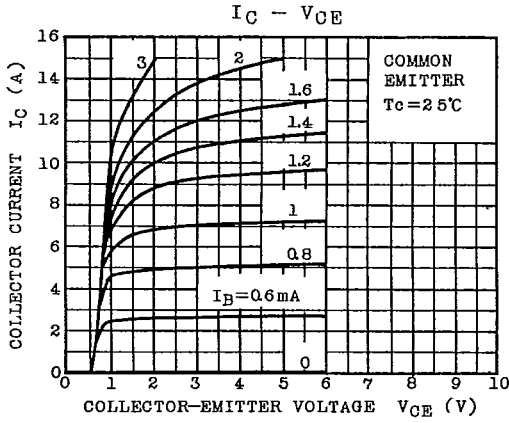
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**2SD1087**

## ELECTRICAL CHARACTERISTICS (Ta=25°C)

| CHARACTERISTIC                       |              | SYMBOL               | TEST CONDITION  | MIN. | TYP. | MAX. | UNIT |
|--------------------------------------|--------------|----------------------|---|------|------|------|------|
| Collector Cut-off Current            |              | ICBO                 | V <sub>CB</sub> =100V, I <sub>E</sub> =0  | -    | -    | 100  | μA   |
| Emitter Cut-off Current              |              | IEBO                 | V <sub>EB</sub> =5V, I <sub>C</sub> =0  | -    | -    | 10   | mA   |
| Collector-Emitter Breakdown Voltage  |              | V(BR)CEO             | I <sub>C</sub> =50mA, I <sub>B</sub> =0   | 100  | -    | -    | V    |
| DC Current Gain                      |              | h <sub>FE</sub>      | V <sub>CE</sub> =3V, I <sub>C</sub> =15A  | 1000 | -    | -    |      |
| Collector-Emitter Saturation Voltage |              | V <sub>CE(sat)</sub> | I <sub>C</sub> =15A, I <sub>B</sub> =0.025A   | -    | -    | 1.5  | V    |
| Base-Emitter Saturation Voltage      |              | V <sub>BE(sat)</sub> |   | -    | -    | 2.2  | V    |
| Emitter-Collector Forward Voltage    |              | V <sub>ECF</sub>     | I <sub>E</sub> =10A, I <sub>B</sub> =0  | -    | -    | 3    | V    |
| Transition Frequency                 |              | f <sub>T</sub>       | V <sub>CE</sub> =5V, I <sub>C</sub> =1A   | -    | 14   | -    | MHz  |
| Collector Output Capacitance         |              | C <sub>ob</sub>      | V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=1MHz   | -    | 280  | -    | pF   |
| Switching Time                       | Turn-on Time | t <sub>on</sub>      |  <p>V<sub>CC</sub>=50V<br/>R=10Ω</p> <p>IB<sub>1</sub> IB<sub>2</sub> I<sub>B</sub> I<sub>E</sub> I<sub>C</sub> I<sub>B</sub> I<sub>E</sub> I<sub>C</sub> I<sub>B</sub> I<sub>E</sub> I<sub>C</sub></p> <p>IB<sub>1</sub> = -IB<sub>2</sub> = 0.01A<br/>DUTY CYCLE ≤ 1%</p> | -    | 0.7  | -    | μs   |
|                                      | Storage Time | t <sub>stg</sub>     |   | -    | 8    | -    |      |
|                                      | Fall Time    | t <sub>f</sub>       |   | -    | 2.5  | -    |      |

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TOSHIBA CORPORATION