

**NPN SILICON EPITAXIAL TRANSISTOR (DARLINGTON CONNECTION)  
FOR LOW-FREQUENCY POWER AMPLIFIERS AND LOW-SPEED SWITCHING**

The 2SD560 is a mold power transistor developed for low-frequency power amplifiers and low-speed switching. This transistor is ideal for direct driving from the IC output of devices such as pulse motor drivers and relay drivers, and PC terminals.

**FEATURES**

- C-to-E reverse diode inserted
- Low collector saturation voltage

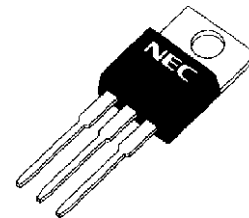
**ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C)**

| Parameter                    | Symbol                | Conditions                      | Ratings     | Unit |
|------------------------------|-----------------------|---------------------------------|-------------|------|
| Collector to base voltage    | V <sub>CB0</sub>      |                                 | 150         | V    |
| Collector to emitter voltage | V <sub>CE0</sub>      |                                 | 100         | V    |
| Emitter to base voltage      | V <sub>EB0</sub>      |                                 | 7.0         | V    |
| Collector current (DC)       | I <sub>C(DC)</sub>    |                                 | ±5.0        | A    |
| Collector current (pulse)    | I <sub>C(pulse)</sub> | PW ≤ 10 ms,<br>duty cycle ≤ 50% | ±8.0        | A    |
| Base current (DC)            | I <sub>B(DC)</sub>    |                                 | 0.5         | A    |
| Total power dissipation      | P <sub>T</sub>        | T <sub>C</sub> = 25°C           | 30          | W    |
|                              |                       | T <sub>A</sub> = 25°C           | 1.5         | W    |
| Junction temperature         | T <sub>j</sub>        |                                 | 150         | °C   |
| Storage temperature          | T <sub>stg</sub>      |                                 | -55 to +150 | °C   |

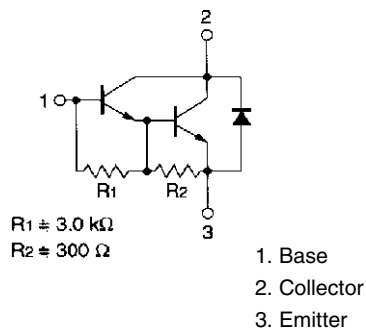
**ORDERING INFORMATION**

| Ordering Name | Package  |
|---------------|----------|
| 2SD560        | TO-220AB |

(TO-220AB)



**INTERNAL EQUIVALENT CIRCUIT**



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**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**

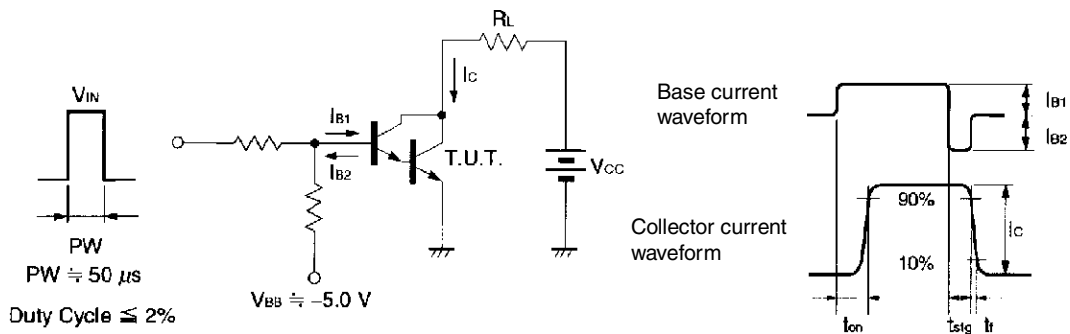
| Parameter                    | Symbol               | Conditions  | MIN.  | TYP.  | MAX.   | Unit |    |
|------------------------------|----------------------|---|-------|-------|--------|------|----|
| Collector cutoff current     | I <sub>CBO</sub>     | V <sub>CB</sub> = 100 V, I <sub>E</sub> = 0 A   |       |       | 1.0    | μA   |    |
| DC current gain              | h <sub>FE1</sub>     | V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 3.0 A <sup>Note</sup>   | 2,000 | 6,000 | 15,000 |      |    |
|                              | h <sub>FE2</sub>     | V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 5.0 A <sup>Note</sup>   | 500   |       |        |      |    |
| Collector saturation voltage | V <sub>CE(sat)</sub> | I <sub>C</sub> = 3.0 A, I <sub>B</sub> = 3.0 mA <sup>Note</sup>   |       | 0.9   | 1.5    | V    |    |
| Base saturation voltage      | V <sub>BE(sat)</sub> | I <sub>C</sub> = 3.0 A, I <sub>B</sub> = 3.0 mA <sup>Note</sup>   |       | 1.6   | 2.0    | V    |    |
| Turn-on time                 | t <sub>on</sub>      | I <sub>C</sub> = 3.0 A, R <sub>L</sub> = 16.7 Ω,<br>I <sub>B1</sub> = -I <sub>B2</sub> = 3.0 mA, V <sub>CC</sub> ≅ 50 V<br>Refer to the test circuit. |       | 1.0   |        | μs   |    |
| Storage time                 | t <sub>stg</sub>     |   |       |       | 3.5    |      | μs |
| Fall time                    | t <sub>f</sub>       |   |       |       | 1.2    |      | μs |

**Note** Pulse test PW ≤ 350 μs, duty cycle ≤ 2%

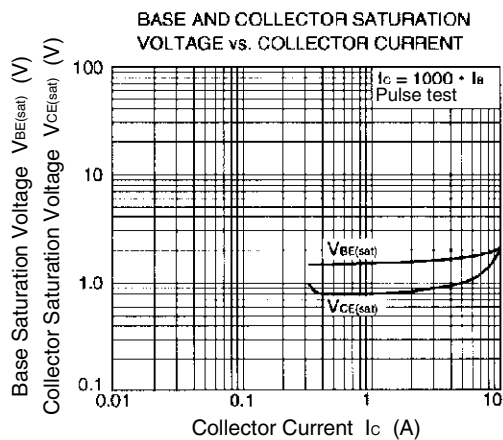
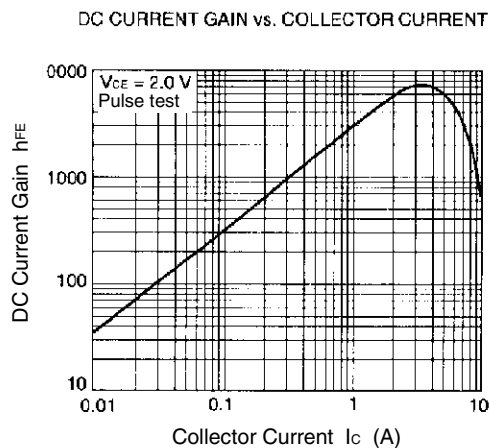
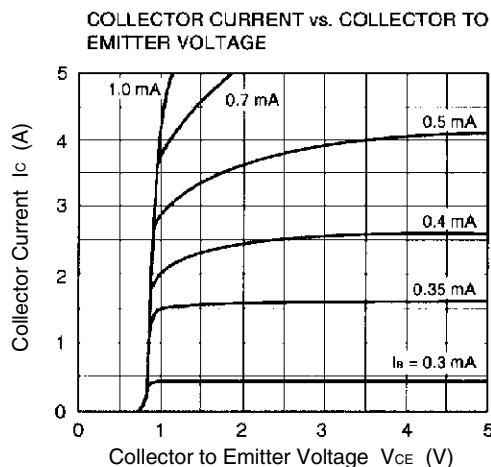
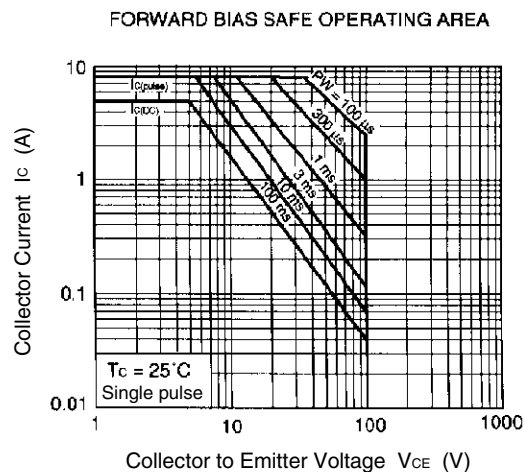
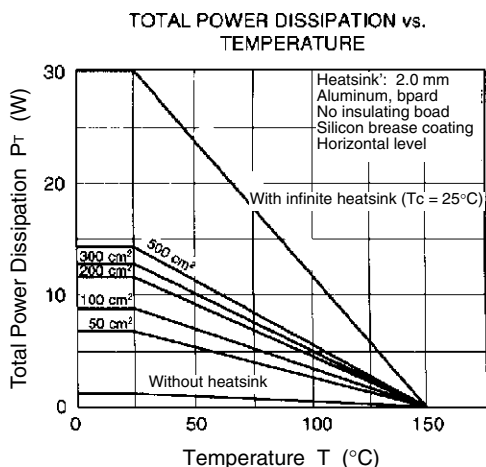
**h<sub>FE</sub> CLASSIFICATION**

| Marking          | MB             | LB             | KB              |
|------------------|----------------|----------------|-----------------|
| h <sub>FE1</sub> | 2,000 to 5,000 | 3,000 to 7,000 | 5,000 to 15,000 |

**SWITCHING TIME (t<sub>on</sub>, t<sub>stg</sub>, t<sub>f</sub>) TEST CIRCUIT**

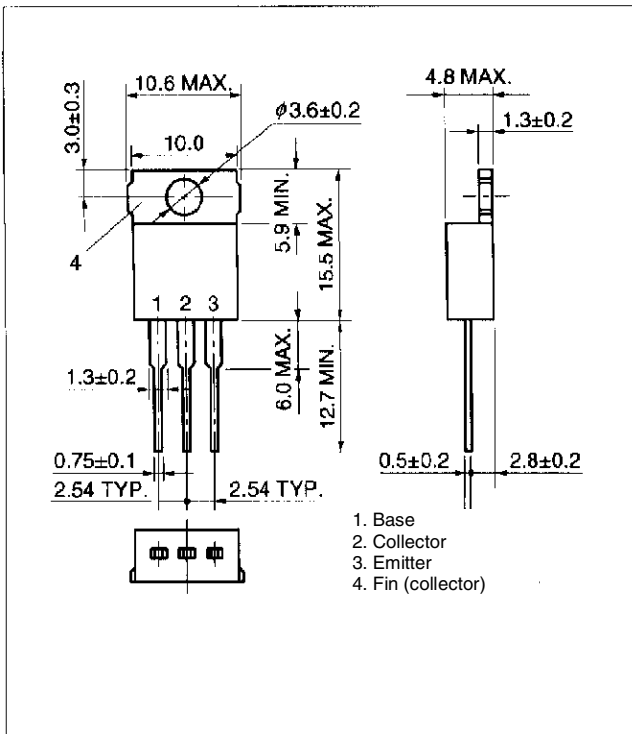


TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)



PACKAGE DRAWING (UNIT: mm)

TO-220AB (MP-25)



[MEMO]

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