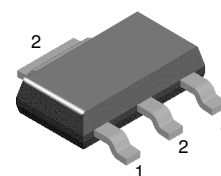


# NZT560/NZT560A

## NPN Low Saturation Transistor

### Features

- These devices are designed with high current gain and low saturation voltage with collector currents up to 3A continuous.



1. Base 2. Collector 3. Emitter

### Absolute Maximum Ratings\* $T_A=25^\circ\text{C}$ unless otherwise noted

| Symbol         | Parameter  | Ratings      | Units            |
|----------------|--|--------------|------------------|
| $V_{CEO}$      | Collector-Emitter Voltage                        | 60           | V                |
| $V_{CBO}$      | Collector-Base Voltage                           | 80           | V                |
| $V_{EBO}$      | Emitter-Base Voltage                             | 5            | V                |
| $I_C$          | Collector Current - Continuous                   | 3            | A                |
| $T_J, T_{STG}$ | Operating and Storage Junction Temperature Range | - 55 to +150 | $^\circ\text{C}$ |

\* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

### NOTES:

- 1) These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

### Thermal Characteristics $T_A=25^\circ\text{C}$ unless otherwise noted

| Symbol          | Parameter                               | Max.   |         | Units                     |
|-----------------|---|--------|---------|---------------------------|
|                 |   | NZT560 | NZT560A |                           |
| $P_D$           | Total Device Dissipation                | 1      |         | W                         |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 125    |         | $^\circ\text{C}/\text{W}$ |

**Electrical Characteristics**  $T_A=25^\circ\text{C}$  unless otherwise noted

| Symbol                              | Parameter                            | Test Conditions  | Min.                         | Max.              | Units               |
|-------------------------------------|--------------------------------------|--|------------------------------|-------------------|---------------------|
| <b>Off Characteristics</b>          |                                      |  |                              |                   |                     |
| $BV_{CEO}$                          | Collector-Emitter Breakdown Voltage  | $I_C = 10\text{mA}$  | 60                           |                   | V                   |
| $BV_{CBO}$                          | Collector-Base Breakdown Voltage     | $I_C = 100\mu\text{A}$   | 80                           |                   | V                   |
| $BV_{EBO}$                          | Emitter-Base Breakdown Voltage       | $I_E = 100\mu\text{A}$   | 5                            |                   | V                   |
| $I_{CBO}$                           | Collector Cutoff Current             | $V_{CB} = 30\text{V}$<br>$V_{CB} = 30\text{V}, T_A = 100^\circ\text{C}$  |                              | 100<br>10         | nA<br>$\mu\text{A}$ |
| $I_{EBO}$                           | Emitter Cutoff Current               | $V_{EB} = 4\text{V}$   |                              | 100               | nA                  |
| <b>On Characteristics *</b>         |                                      |  |                              |                   |                     |
| $h_{FE}$                            | DC Current Gain                      | $I_C = 100\text{mA}, V_{CE} = 2\text{V}$<br>$I_C = 500\text{mA}, V_{CE} = 2\text{V}$<br><br>$I_C = 1\text{A}, V_{CE} = 2\text{V}$<br>$I_C = 3\text{A}, V_{CE} = 2\text{V}$ |                              |                   |                     |
|                                     |                                      | Nzt560<br>Nzt560A  | 70<br>100<br>250<br>80<br>25 | 300<br>550        |                     |
| $V_{CE(sat)}$                       | Collector-Emitter Saturation Voltage | $I_C = 1\text{A}, I_B = 100\text{mA}$<br>$I_C = 3\text{A}, I_B = 300\text{mA}$   |                              | 300<br>450<br>400 | mV<br>mV<br>mV      |
|                                     |                                      | Nzt560<br>Nzt560A  |                              |                   |                     |
| $V_{BE(sat)}$                       | Base-Emitter Saturation Voltage      | $I_C = 1\text{A}, I_B = 100\text{mA}$  |                              | 1.25              | V                   |
| $V_{BE(on)}$                        | Base-Emitter On Voltage              | $I_C = 1\text{A}, V_{CE} = 2\text{V}$  |                              | 1                 | V                   |
| <b>Small Signal Characteristics</b> |                                      |  |                              |                   |                     |
| $C_{obo}$                           | Output Capacitance                   | $V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$  |                              | 30                | pF                  |
| $f_T$                               | Transition Frequency                 | $I_C = 100\text{mA}, V_{CE} = 5\text{V}, f = 100\text{MHz}$  | 75                           |                   | MHz                 |

\* Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

## Typical Performance Characteristics

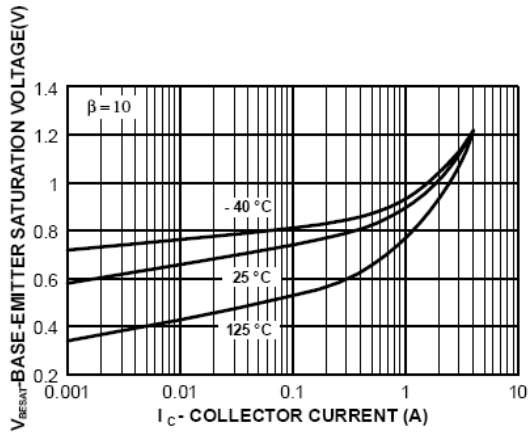


Figure 1. Base-Emitter Saturation Voltage vs Collector Current

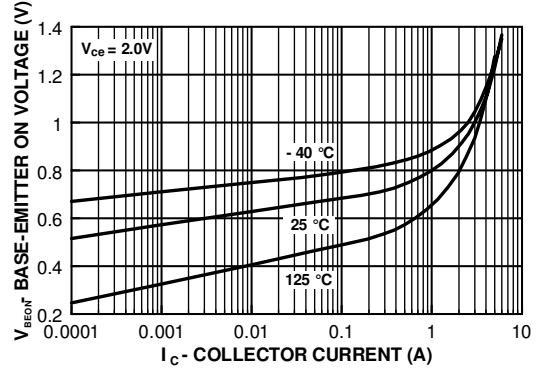


Figure 2. Base-Emitter On Voltage vs Collector Current

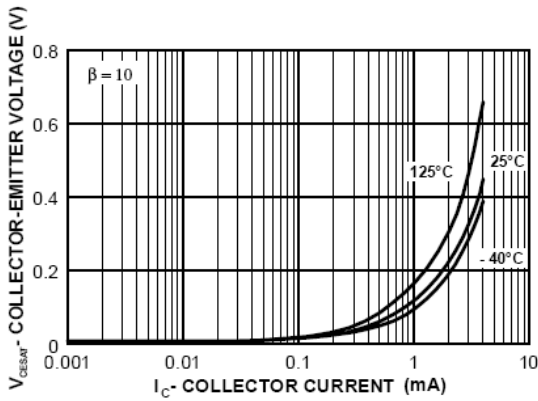


Figure 3. Collector-Emitter Saturation Voltage vs Collector Current

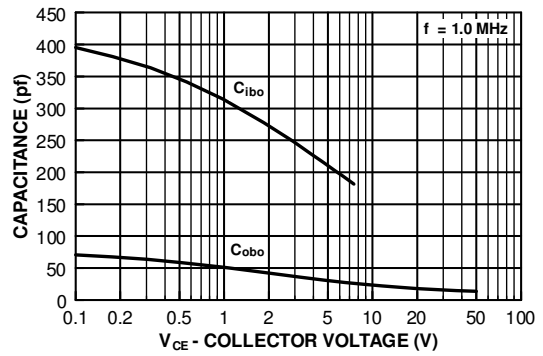


Figure 4. Input/Output Capacitance vs Reverse Bias Voltage

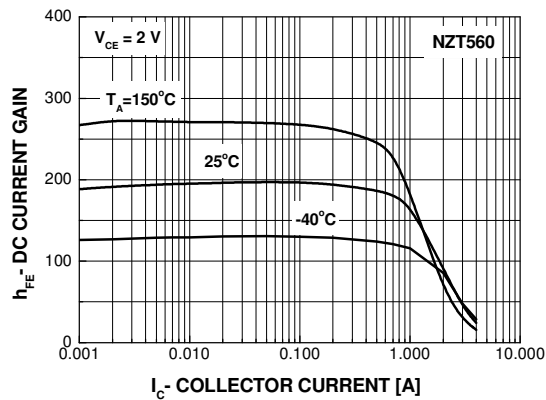


Figure 5. Current Gain vs Collector Current

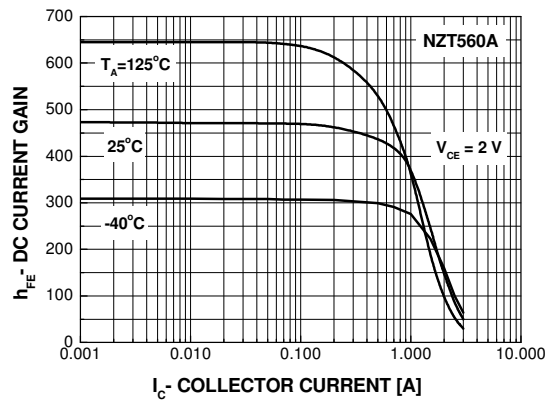
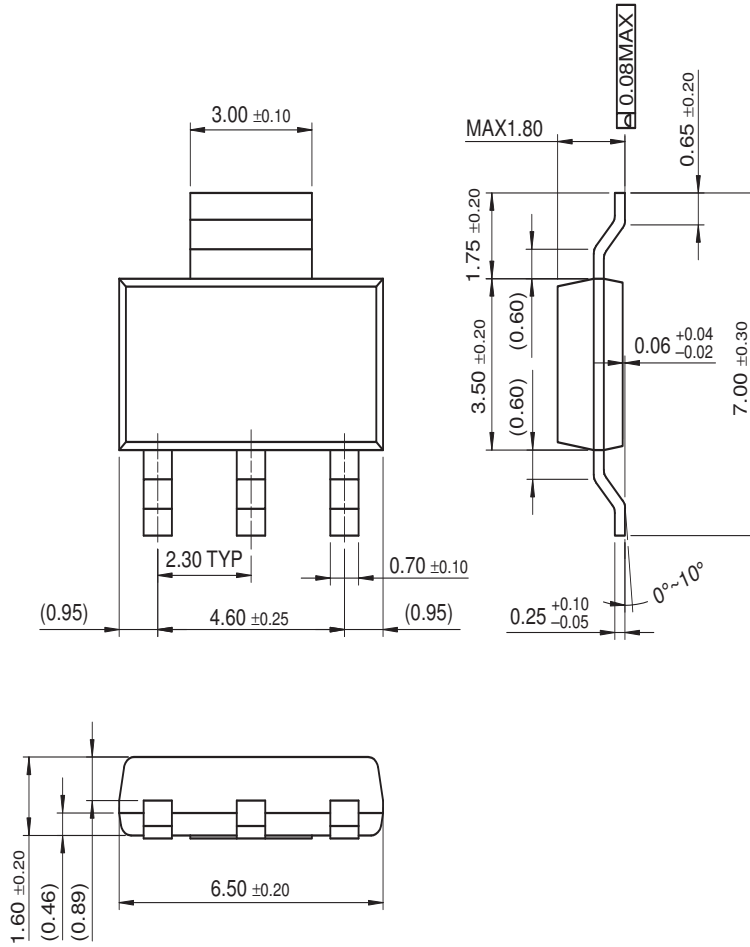


Figure 6. Current Gain vs Collector Current

Physical Dimensions

SOT-223




Dimensions in Millimeters



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Rev. 140



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