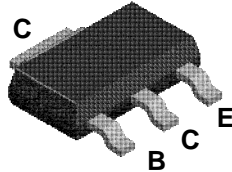


## NZT560 / NZT560A



SOT-223

### NPN Low Saturation Transistor

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

#### Absolute Maximum Ratings\* T<sub>A</sub> = 25°C unless otherwise noted

| Symbol                            | Parameter  | NZT560/NZT560A | Units |
|-----------------------------------|--|----------------|-------|
| V <sub>CEO</sub>                  | Collector-Emitter Voltage                        | 60             | V     |
| V <sub>CB0</sub>                  | Collector-Base Voltage                           | 80             | V     |
| V <sub>EB0</sub>                  | Emitter-Base Voltage                             | 5              | V     |
| I <sub>C</sub>                    | Collector Current - Continuous                   | 3              | A     |
| T <sub>J</sub> , T <sub>stg</sub> | Operating and Storage Junction Temperature Range | -55 to +150    | °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°C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

#### Thermal Characteristics T<sub>A</sub> = 25°C unless otherwise noted

| Symbol           | Characteristic                          | Max            | Units |
|------------------|---|----------------|-------|
|                  |   | NZT560/NZT560A |       |
| P <sub>D</sub>   | Total Device Dissipation                | 2              | W     |
| R <sub>θJA</sub> | Thermal Resistance, Junction to Ambient | 62.5           | °C/W  |

**NPN Low Saturation Transistor**

(continued)

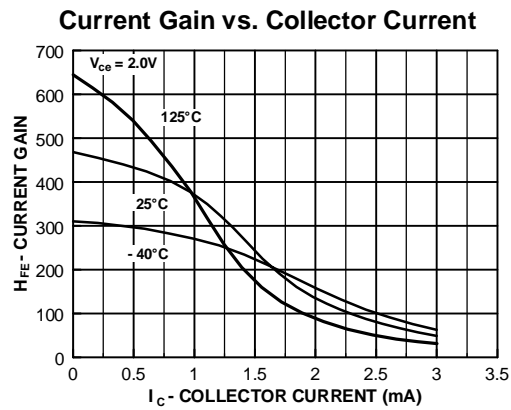
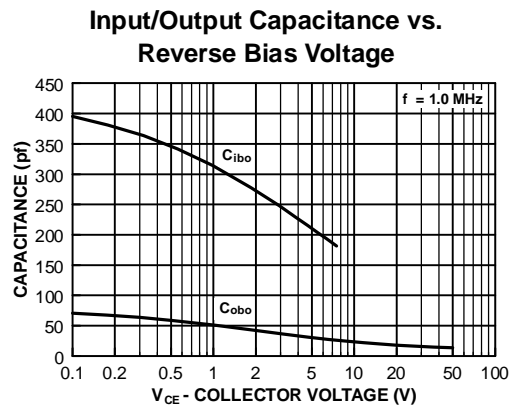
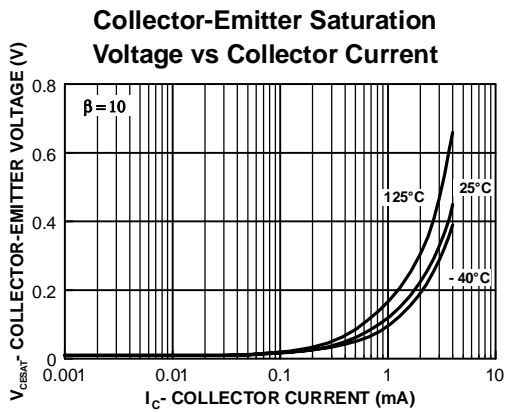
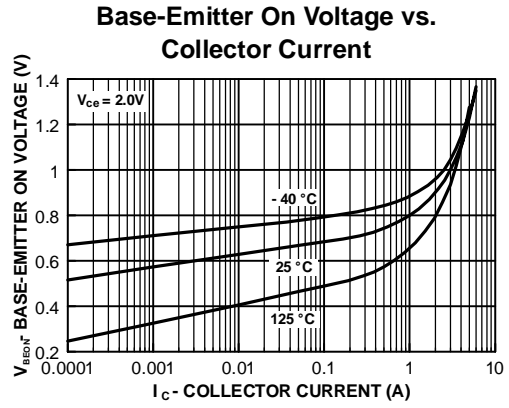
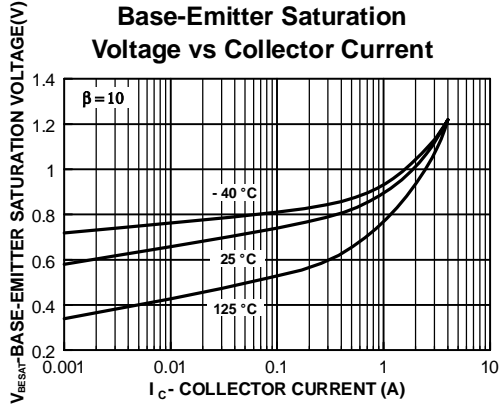
**Electrical Characteristics**

$T_A = 25^\circ\text{C}$  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>uA |
| $I_{EBO}$                           | 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>$I_C = 500\text{ mA}, V_{CE} = 2\text{ V}$ <b>Nzt560</b><br><b>Nzt560A</b><br>$I_C = 1\text{ A}, V_{CE} = 2\text{ V}$<br>$I_C = 3\text{ A}, V_{CE} = 2\text{ V}$ | 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>$I_C = 3\text{ A}, I_B = 300\text{ mA}$ <b>Nzt560</b><br><b>Nzt560A</b>   |                              | 300<br>450<br>400 | mV       |
| $V_{BE(sat)}$                       | 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                           |                   | -        |

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

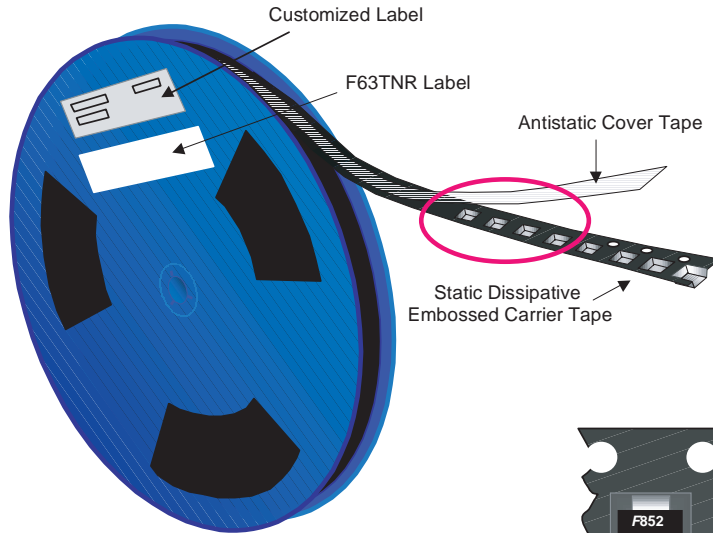
## Typical Characteristics



# SOT-223 Tape and Reel Data and Package Dimensions

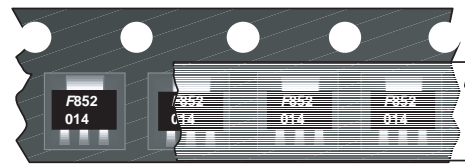


## SOT-223 Packaging Configuration: Figure 1.0

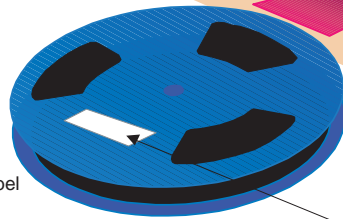
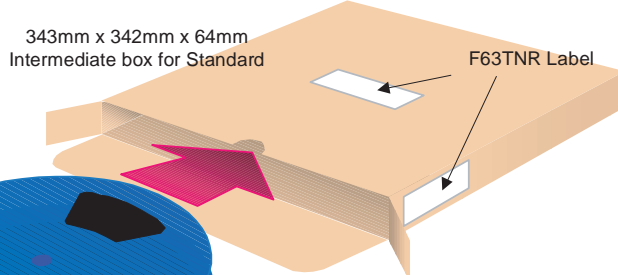


**Packaging Description:**  
 SOT-223 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 2,500 units per 13" or 330cm diameter reel. The reels are dark blue in color and is made of polystyrene plastic (anti-static coated). Other option comes in 500 units per 7" or 177cm diameter reel. This and some other options are further described in the Packaging Information table.  
 These full reels are individually barcode labeled and placed inside a standard intermediate box (illustrated in figure 1.0) made of recyclable corrugated brown paper. One box contains two reels maximum. And these boxes are placed inside a barcode labeled shipping box which comes in different sizes depending on the number of parts shipped.

| SOT-223 Packaging Information |                         |            |
|-------------------------------|-------------------------|------------|
| Packaging Option              | Standard (no flow code) | D84Z       |
| Packaging type                | TNR                     | TNR        |
| Qty per Reel/Tube/Bag         | 2,500                   | 500        |
| Reel Size                     | 13" Dia                 | 7" Dia     |
| Box Dimension (mm)            | 343x64x343              | 184x187x47 |
| Max qty per Box               | 5,000                   | 1,000      |
| Weight per unit (gm)          | 0.1246                  | 0.1246     |
| Weight per Reel (kg)          | 0.7250                  | 0.1532     |
| Note/Comments                 |                         |            |



### SOT-223 Unit Orientation



**F63TNR Label sample**

|                  |           |
|------------------|-----------|
| LOT: CBVK741B019 | QTY: 3000 |
| FSID: PN2222A    | SPEC:     |
|                  |           |
| D/C1: D984Z      | QTY1:     |
| D/C2:            | QTY2:     |
| SPEC REV:        | CPN:      |
|                  | N/F: F    |
|                  | (F63TNR)3 |

## SOT-223 Tape Leader and Trailer Configuration: Figure 2.0



# SOT-223 Tape and Reel Data and Package Dimensions, continued

## SOT-223 Embossed Carrier Tape Configuration: Figure 3.0



Dimensions are in millimeter

| Pkg type          | A0              | B0              | W              | D0              | D1              | E1              | E2           | F               | P1            | P0            | K0              | T                      | Wc              | Tc              |
|-------------------|-----------------|-----------------|----------------|-----------------|-----------------|-----------------|--------------|-----------------|---------------|---------------|-----------------|------------------------|-----------------|-----------------|
| SOT-223<br>(12mm) | 6.83<br>+/-0.10 | 7.42<br>+/-0.10 | 12.0<br>+/-0.3 | 1.55<br>+/-0.05 | 1.50<br>+/-0.10 | 1.75<br>+/-0.10 | 10.25<br>min | 5.50<br>+/-0.05 | 8.0<br>+/-0.1 | 4.0<br>+/-0.1 | 1.88<br>+/-0.10 | 0.292<br>+/-<br>0.0130 | 9.5<br>+/-0.025 | 0.06<br>+/-0.02 |

Notes: A0, B0, and K0 dimensions are determined with respect to the EIA/Jedec RS-481 rotational and lateral movement requirements (see sketches A, B, and C).



## SOT-223 Reel Configuration: Figure 4.0

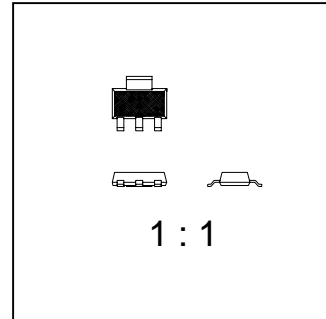
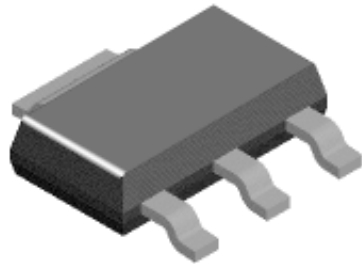


Dimensions are in inches and millimeters

| Tape Size | Reel Option | Dim A         | Dim B        | Dim C                             | Dim D         | Dim N        | Dim W1                           | Dim W2        | Dim W3 (LSL-USL)             |
|-----------|-------------|---------------|--------------|-----------------------------------|---------------|--------------|----------------------------------|---------------|------------------------------|
| 12mm      | 7" Dia      | 7.00<br>177.8 | 0.059<br>1.5 | 512 +0.020/-0.008<br>13 +0.5/-0.2 | 0.795<br>20.2 | 5.906<br>150 | 0.488 +0.078/-0.000<br>12.4 +2/0 | 0.724<br>18.4 | 0.469 - 0.606<br>11.9 - 15.4 |
| 12mm      | 13" Dia     | 13.00<br>330  | 0.059<br>1.5 | 512 +0.020/-0.008<br>13 +0.5/-0.2 | 0.795<br>20.2 | 7.00<br>178  | 0.488 +0.078/-0.000<br>12.4 +2/0 | 0.724<br>18.4 | 0.469 - 0.606<br>11.9 - 15.4 |

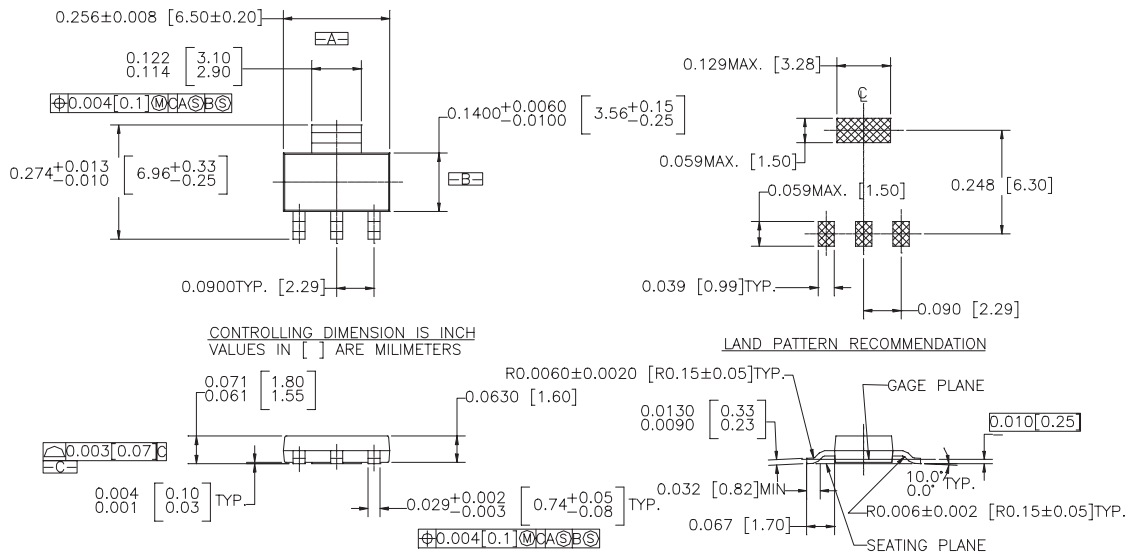
# SOT-223 Tape and Reel Data and Package Dimensions, continued

## SOT-223 (FS PKG Code 47)



Scale 1:1 on letter size paper

Part Weight per unit (gram): 0.1246



- NOTES : UNLESS OTHERWISE SPECIFIED
- STANDARD LEAD FINISH TO BE 150 MICRONS/ 3.81 MICROMETERS MINIMUM TIN/LEAD (SOLDER) ON COPPER.
  - REFERENCE JEDEC REGISTRATION TO-261, VARIATION AA, ISSUE A, DATED JAN 1990

SOT223, 4 LEADS

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| E <sup>2</sup> CMOS™ | PowerTrench™  |      |
| FACT™                | QST™          |      |
| FACT Quiet Series™   | Quiet Series™ |      |
| FAST®                | SuperSOT™-3   |      |
| FASTr™               | SuperSOT™-6   |      |
| GTO™                 | SuperSOT™-8   |      |
| HiSeC™               | TinyLogic™    |      |

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