

NST847BF3T5G

NPN General Purpose Transistor

The NST847BF3T5G device is a spin-off of our popular SOT-23/SOT-323/SOT-563/SOT-963 three-leaded device. It is designed for general purpose amplifier applications and is housed in the SOT-1123 surface mount package. This device is ideal for low-power surface mount applications where board space is at a premium.

Features

- h_{FE} , 200–450
- Low $V_{CE(sat)}$, ≤ 0.25 V
- Reduces Board Space
- This is a Pb-Free Device

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--------------------------------|-----------|-------|------|
| Collector–Emitter Voltage | V_{CEO} | 45 | Vdc |
| Collector–Base Voltage | V_{CBO} | 50 | Vdc |
| Emitter–Base Voltage | V_{EBO} | 6.0 | Vdc |
| Collector Current – Continuous | I_C | 100 | mAdc |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|-----------------------------|----------------|----------------------------|
| Total Device Dissipation, $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D (Note 1) | 290 2.3 | mW mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction–to–Ambient | $R_{\theta JA}$ (Note 1) | 432 | $^\circ\text{C}/\text{W}$ |
| Total Device Dissipation, $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D (Note 2) | 347 2.8 | mW mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction–to–Ambient | $R_{\theta JA}$ (Note 2) | 360 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction–to–Lead 3 | $R_{\theta JL}$ (Note 2) | 143 | $^\circ\text{C}/\text{W}$ |
| Junction and Storage Temperature Range | T_J, T_{stg} | –55 to +150 | $^\circ\text{C}$ |

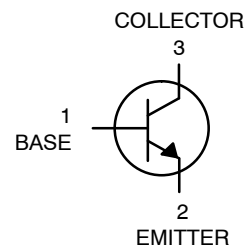
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. 100 mm² 1 oz, copper traces.
2. 500 mm² 1 oz, copper traces.

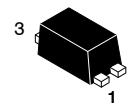


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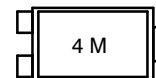


NST847BF3T5G



SOT-1123
CASE 524AA
STYLE 1

MARKING DIAGRAM



4 = Device Code
M = Date Code

ORDERING INFORMATION

| Device | Package | Shipping† |
|--------------|-----------------------|------------------|
| NST847BF3T5G | SOT-1123 (Pb-Free) | 8000/Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|----------------------|-----|-----|-----------|----------|
| OFF CHARACTERISTICS | | | | | |
| Collector–Emitter Breakdown Voltage (I _C = 10 mA) | V _{(BR)CEO} | 45 | – | – | V |
| Collector–Emitter Breakdown Voltage (I _C = 10 μA, V _{EB} = 0) | V _{(BR)CES} | 50 | – | – | V |
| Collector–Base Breakdown Voltage (I _C = 10 μA) | V _{(BR)CBO} | 50 | – | – | V |
| Emitter–Base Breakdown Voltage (I _E = 1.0 μA) | V _{(BR)EBO} | 6.0 | – | – | V |
| Collector Cutoff Current (V _{CB} = 30 V) (V _{CB} = 30 V, T _A = 150°C) | I _{CBO} | – | – | 15 5.0 | nA μA |

ON CHARACTERISTICS

| | | | | | |
|--|----------------------|----------|------------|-------------|----|
| DC Current Gain (I _C = 10 μA, V _{CE} = 5.0 V) (I _C = 2.0 mA, V _{CE} = 5.0 V) | h _{FE} | – 200 | 150 290 | – 450 | – |
| Collector–Emitter Saturation Voltage (I _C = 10 mA, I _B = 0.5 mA) (I _C = 100 mA, I _B = 5.0 mA) | V _{CE(sat)} | – – | – – | 0.25 0.6 | V |
| Base–Emitter Saturation Voltage (I _C = 10 mA, I _B = 0.5 mA) (I _C = 100 mA, I _B = 5.0 mA) | V _{BE(sat)} | – – | 0.7 0.9 | – – | V |
| Base–Emitter Voltage (I _C = 2.0 mA, V _{CE} = 5.0 V) (I _C = 10 mA, V _{CE} = 5.0 V) | V _{BE(on)} | 580 – | 660 – | 700 770 | mV |

SMALL-SIGNAL CHARACTERISTICS

| | | | | | |
|---|------------------|-----|---|-----|-----|
| Current–Gain–Bandwidth Product (I _C = 10 mA, V _{CE} = 5.0 Vdc, f = 100 MHz) | f _T | 100 | – | – | MHz |
| Output Capacitance (V _{CB} = 10 V, f = 1.0 MHz) | C _{obo} | – | – | 4.5 | pF |
| Input Capacitance (V _{EB} = 0.5 V, I _C = 0 mA, f = 1.0 MHz) | C _{ibo} | – | – | 10 | pF |
| Noise Figure (I _C = 0.2 mA, V _{CE} = 5.0 Vdc, R _S = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz) | NF | – | – | 10 | dB |

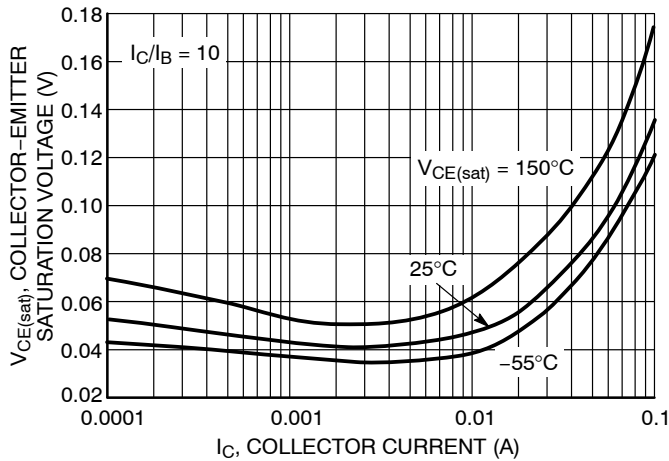


Figure 1. Collector Emitter Saturation Voltage vs. Collector Current

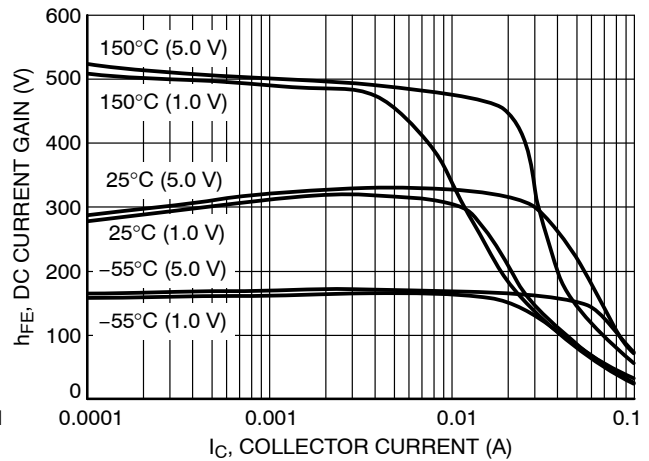


Figure 2. DC Current Gain vs. Collector Current

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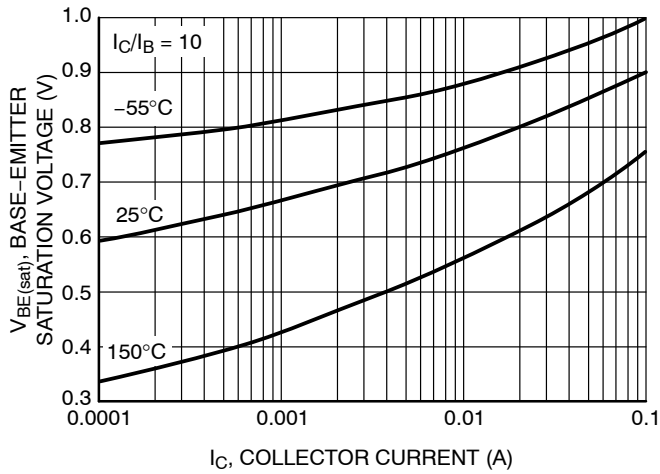


Figure 3. Base Emitter Saturation Voltage vs. Collector Current

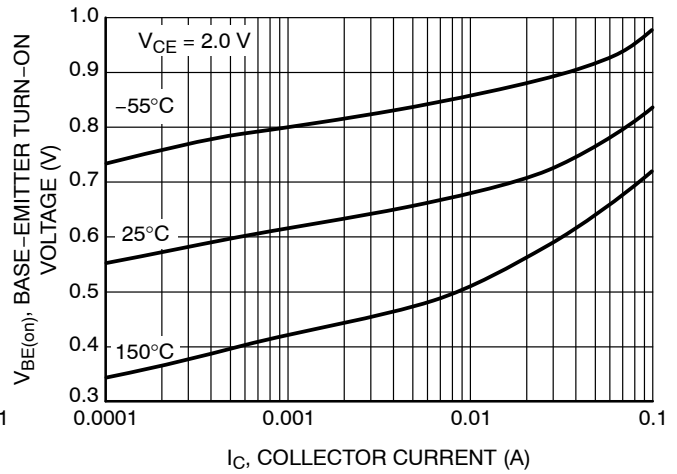


Figure 4. Base Emitter Turn-On Voltage vs. Collector Current

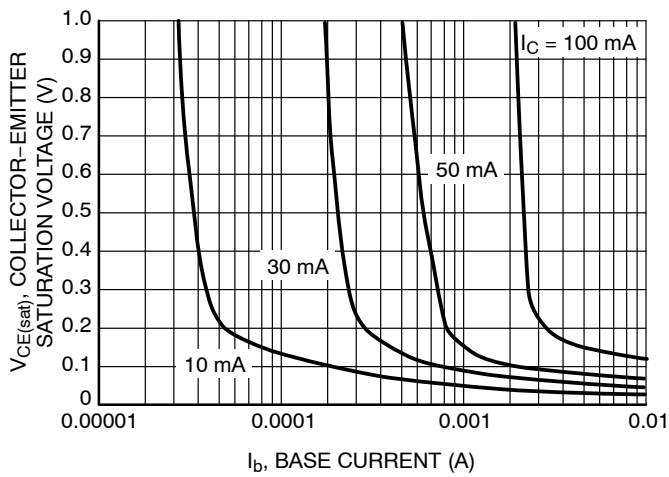


Figure 5. Saturation Region

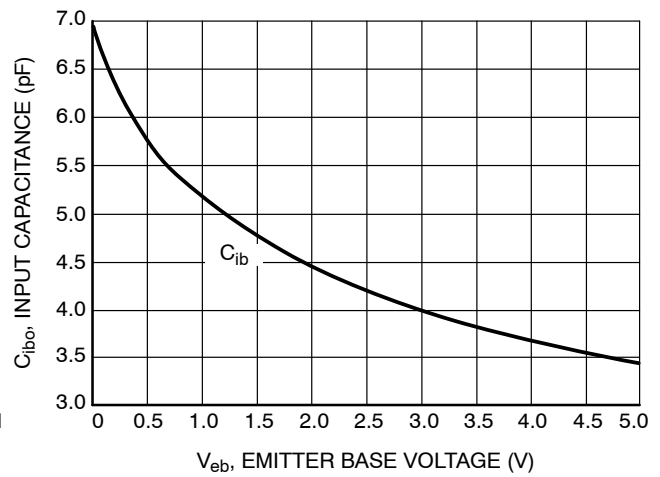


Figure 6. Input Capacitance

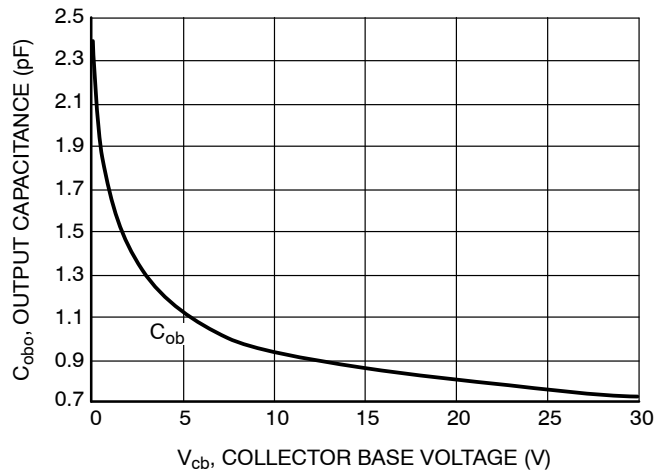
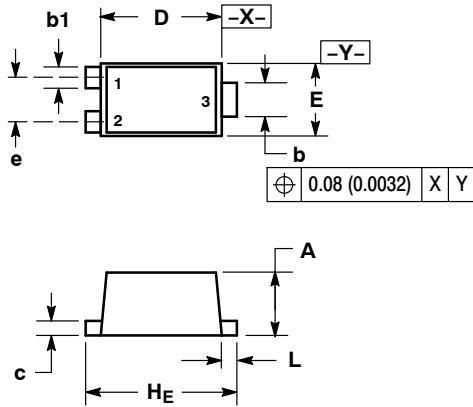


Figure 7. Output Capacitance

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PACKAGE DIMENSIONS

SOT-1123
CASE 524AA-01
ISSUE A



NOTES:

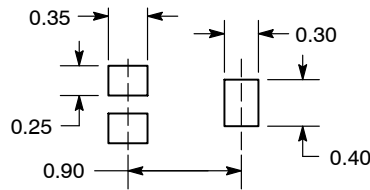
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

| DIM | MILLIMETERS | | | INCHES | | |
|-----|-------------|------|------|--------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.34 | 0.37 | 0.40 | 0.013 | 0.015 | 0.016 |
| b | 0.15 | 0.20 | 0.25 | 0.006 | 0.008 | 0.010 |
| b1 | 0.10 | 0.15 | 0.20 | 0.004 | 0.006 | 0.008 |
| c | 0.07 | 0.12 | 0.17 | 0.003 | 0.005 | 0.007 |
| D | 0.75 | 0.80 | 0.85 | 0.030 | 0.031 | 0.033 |
| E | 0.55 | 0.60 | 0.65 | 0.022 | 0.024 | 0.026 |
| e | 0.35 | | | 0.014 | | |
| HE | 0.95 | 1.00 | 1.05 | 0.037 | 0.039 | 0.041 |
| L | 0.05 | 0.10 | 0.15 | 0.002 | 0.004 | 0.006 |

STYLE 1:

1. BASE
2. EMITTER
3. COLLECTOR

SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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