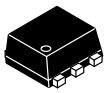
Dual General Purpose Transistor

NST857BDP6T5G

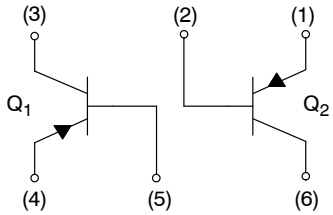


SOT−963
CASE 527AD

The NST857BDP6T5G device is a spin−off of our popular SOT−23/SOT−323/SOT−563 three−leaded device. It is designed for general purpose amplifier applications and is housed in the SOT−963 six−leaded surface mount package. By putting two discrete devices in one package, this device is ideal for low−power surface mount applications where board space is at a premium.

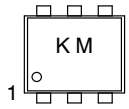
Features

- h_{FE}, 220−475
- Low $V_{CE(sat)}$, ≤ 0.3 V
- Simplifies Circuit Design
- Reduces Board Space
- Reduces Component Count
- This is a Pb−Free Device



NST857BDP6T5G

MARKING DIAGRAM



K = Device Code
M = Date Code

MAXIMUM RATINGS

Symbol	Rating	Value	Unit
V_{CEO}	Collector − Emitter Voltage	−45	Vdc
V_{CBO}	Collector − Base Voltage	−50	Vdc
V_{EBO}	Emitter − Base Voltage	−6.0	Vdc
I_C	Collector Current − Continuous	−100	mAdc
ESD Class	Electrostatic Discharge HBM MM	2 B	

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

Symbol	Characteristic (Single Heated)	Max	Unit
P_D	Total Device Dissipation T_A = 25°C Derate above 25°C (Note 1)	240 1.9	mW mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1)	520	°C/W
P_D	Total Device Dissipation T_A = 25°C Derate above 25°C (Note 2)	280 2.2	mW mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)	446	°C/W
Symbol	**Characteristic (Dual Heated) (Note 3)**	**Max**	**Unit**
P_D	Total Device Dissipation T_A = 25°C Derate above 25°C (Note 1)	350 2.8	mW mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1)	357	°C/W
P_D	Total Device Dissipation T_A = 25°C Derate above 25°C (Note 2)	420 3.4	mW mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)	297	°C/W
T_J, T_{stg}	Junction and Storage Temperature Range	−55 to +150	°C

1. FR−4 @ 100 mm^2, 1 oz. copper traces, still air.
2. FR−4 @ 500 mm^2, 1 oz. copper traces, still air.
3. Dual heated values assume total power is sum of two equally powered channels.

ORDERING INFORMATION

Device	Package	Shipping†
NST857BDP6T5G	SOT−963 (Pb−Free)	8,000/Tape & Reel

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

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

Symbol	Characteristic	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
$V_{(BR)CEO}$	Collector – Emitter Breakdown Voltage (I_C = −10 mA)	−45	–	–	V
$V_{(BR)CES}$	Collector – Emitter Breakdown Voltage (I_C = −10 μA, V_{EB} = 0)	−50	–	–	V
$V_{(BR)CBO}$	Collector – Base Breakdown Voltage (I_C = −10 μA)	−50	–	–	V
$V_{(BR)EBO}$	Emitter – Base Breakdown Voltage (I_E = −1.0 μA)	−5.0	–	–	V
I_{CBO}	Collector Cutoff Current (V_{CB} = −30 V) (V_{CB} = −30 V, T_A = 150°C)	– –	– –	−15 −4.0	nA μA
ON CHARACTERISTICS					
h_{FE}	DC Current Gain (I_C = −10 μA, V_{CE} = −5.0 V) (I_C = −2.0 mA, V_{CE} = −5.0 V)	 – 220	 150 290	 – 475	–
$V_{CE(sat)}$	Collector – Emitter Saturation Voltage (I_C = −10 mA, I_B = −0.5 mA) (I_C = −100 mA, I_B = −5.0 mA)	 – –	 – –	 −0.3 −0.7	V
$V_{BE(sat)}$	Base – Emitter Saturation Voltage (I_C = −10 mA, I_B = −0.5 mA) (I_C = −100 mA, I_B = −5.0 mA)	 – –	 −0.7 −0.9	 – –	V
$V_{BE(on)}$	Base – Emitter On Voltage (I_C = −2.0 mA, V_{CE} = −5.0 V) (I_C = −10 mA, V_{CE} = −5.0 V)	 −0.6 –	 – –	 −0.75 −0.82	V
SMALL−SIGNAL CHARACTERISTICS					
f_T	Current – Gain – Bandwidth Product (I_C = −10 mA, V_{CE} = −5.0 Vdc, f = 100 MHz)	100	–	–	MHz
C_{obo}	Output Capacitance (V_{CB} = −10 V, f = 1.0 MHz)	–	–	4.5	pF
C_{ibo}	Input Capacitance (V_{EB} = −0.5 V, f = 1.0 MHz)	–	–	10	pF
NF	Noise Figure (I_C = −0.2 mA, V_{CE} = −5.0 Vdc, R_S = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz)	–	–	10	dB

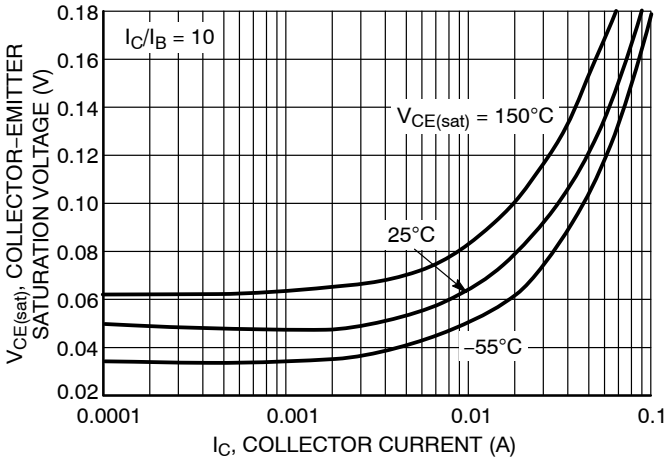


Figure 1. Collector Emitter Saturation Voltage vs. Collector Current

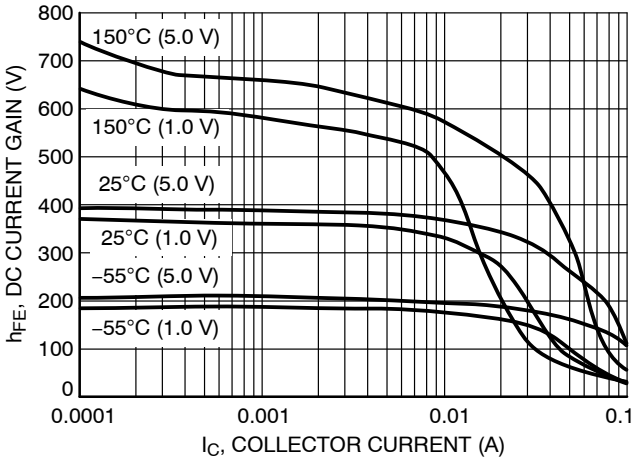


Figure 2. DC Current Gain vs. Collector Current

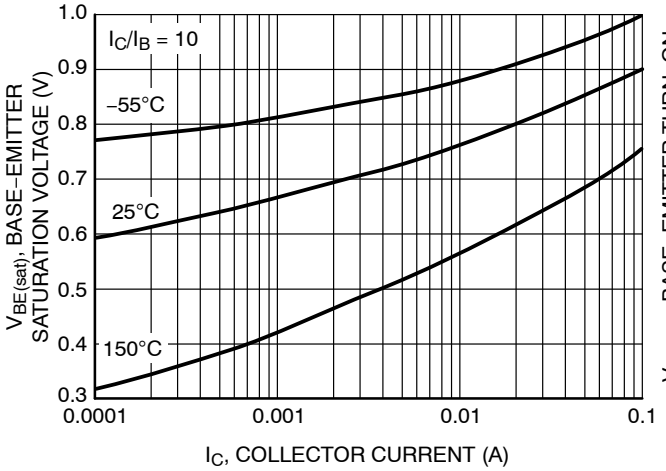


Figure 3. Base Emitter Saturation Voltage vs. Collector Current

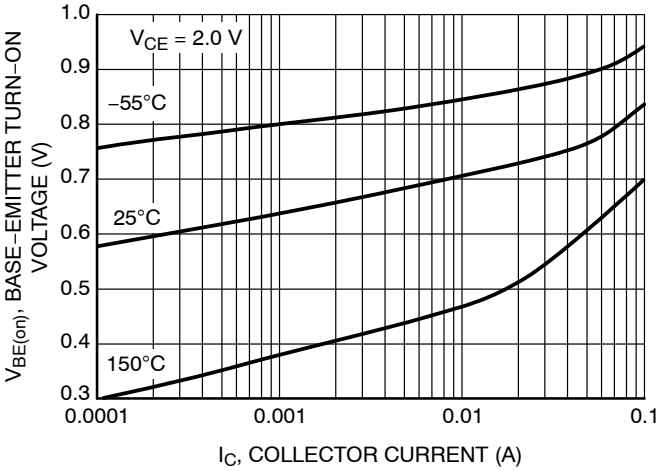


Figure 4. Base Emitter Turn−On Voltage vs. Collector Current

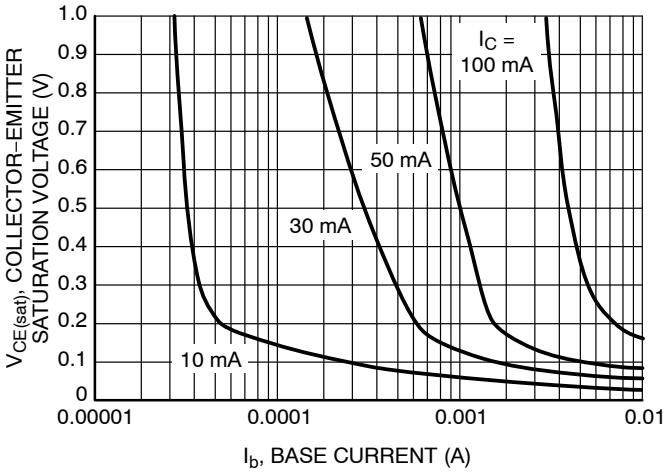


Figure 5. Saturation Region

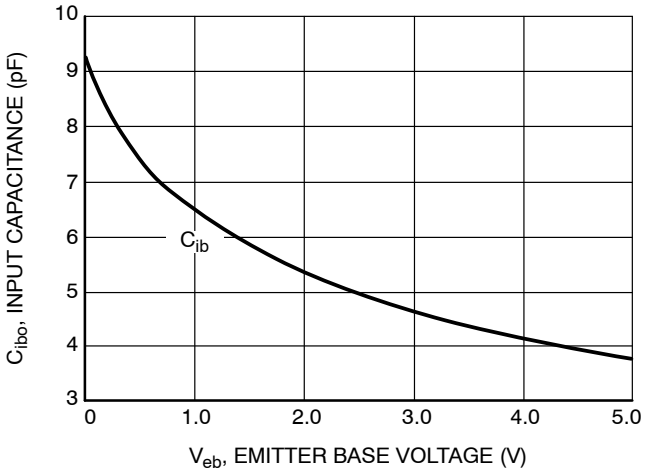


Figure 6. Input Capacitance

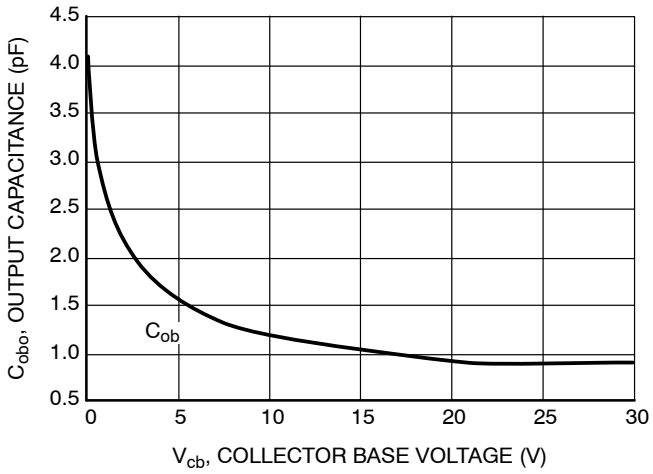
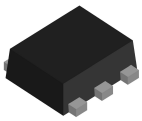


Figure 7. Output Capacitance

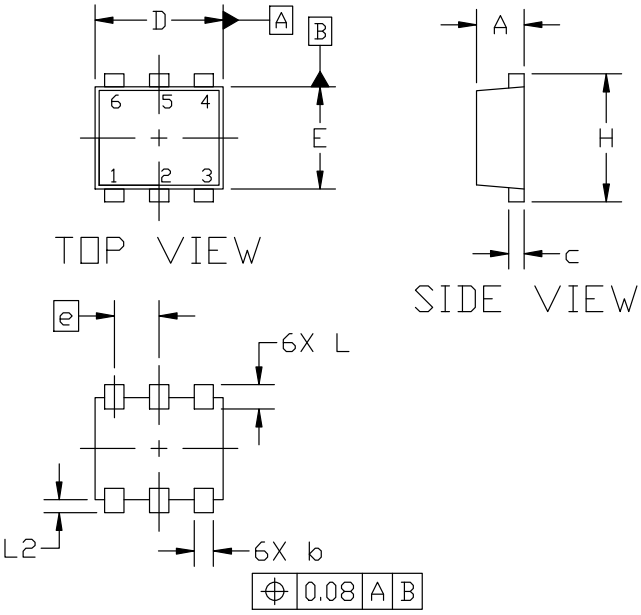


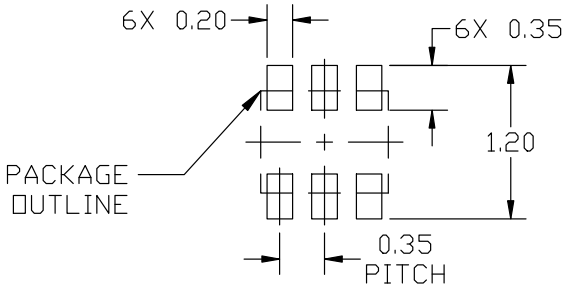
SOT−963 1.00x1.00x0.37, 0.35P
CASE 527AD
ISSUE F

DATE 20 FEB 2024

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.34	0.37	0.40
b	0.10	0.15	0.20
c	0.07	0.12	0.17
D	0.95	1.00	1.05
E	0.75	0.80	0.85
e	0.35 BSC		
H	0.95	1.00	1.05
L	0.19 REF		
L2	0.05	0.10	0.15





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

STYLE 1:
PIN 1. EMITTER 1
2. BASE 1
3. COLLECTOR 2
4. EMITTER 2
5. BASE 2
6. COLLECTOR 1

STYLE 2:
PIN 1. EMITTER 1
2. EMITTER2
3. BASE 2
4. COLLECTOR 2
5. BASE 1
6. COLLECTOR 1

STYLE 3:
PIN 1. CATHODE 1
2. CATHODE 1
3. ANODE/ANODE 2
4. CATHODE 2
5. CATHODE 2
6. ANODE/ANODE 1

STYLE 4:
PIN 1. COLLECTOR
2. COLLECTOR
3. BASE
4. EMITTER
5. COLLECTOR
6. COLLECTOR

STYLE 5:
PIN 1. CATHODE
2. CATHODE
3. ANODE
4. ANODE
5. CATHODE
6. CATHODE

STYLE 6:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. CATHODE
5. CATHODE
6. CATHODE

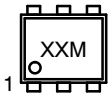
STYLE 7:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. CATHODE
5. ANODE
6. CATHODE

STYLE 8:
PIN 1. DRAIN
2. DRAIN
3. GATE
4. SOURCE
5. DRAIN
6. DRAIN

STYLE 9:
PIN 1. SOURCE 1
2. GATE 1
3. DRAIN 2
4. SOURCE 2
5. GATE 2
6. DRAIN 1

STYLE 10:
PIN 1. CATHODE 1
2. N/C
3. CATHODE 2
4. ANODE 2
5. N/C
6. ANODE 1

GENERIC MARKING DIAGRAM*



XX = Specific Device Code
M = Month Code

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

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