

NST857AMX2, NST857BMX2

Product Preview General Purpose Transistors

PNP Silicon

Features

- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	-45	V
Collector-Base Voltage	V_{CBO}	-50	V
Emitter-Base Voltage	V_{EBO}	-5.0	V
Collector Current – Continuous	I_C	-100	mAdc
Collector Current – Peak	I_C	-200	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board, (Note 1) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	225 1.8	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate, (Note 2) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	300 2.4	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	417	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

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.

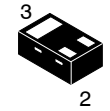
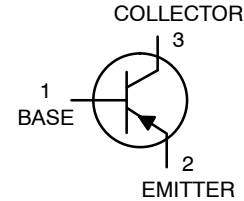
1. FR-5 = 1.0 x 0.75 x 0.062 in.
2. Alumina = 0.4 x 0.3 x 0.024 in 99.5% alumina.

This document contains information on a product under development. ON Semiconductor reserves the right to change or discontinue this product without notice.



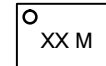
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X2DFN3 (1.0x0.6)
CASE 714AC

MARKING DIAGRAM



XX = Specific Device Code
M = Date Code

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

NST857AMX2, NST857BMX2

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}	-5.0	-	-	V
Collector Cutoff Current (V _{CB} = -30 V) (V _{CB} = -30 V, T _A = 150°C)	I _{CBO}	-	-	-15 -4.0	nA μA

ON CHARACTERISTICS

DC Current Gain (I _C = -10 μA, V _{CE} = -5.0 V)	NST857A NST857B	h _{FE}	-	90 150	-	-
(I _C = -2.0 mA, V _{CE} = -5.0 V)	NST857A NST857B		125 220	180 290	250 475	
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)}	-	-	-0.3 -0.65	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 On Voltage (I _C = -2.0 mA, V _{CE} = -5.0 V) (I _C = -10 mA, V _{CE} = -5.0 V)		V _{BE(on)}	-0.6 -	-	-0.75 -0.82	V

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 _{ob}	-	-	4.5	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)	NST857A NST857B	NF	-	-	10 4.0	dB

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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NST857

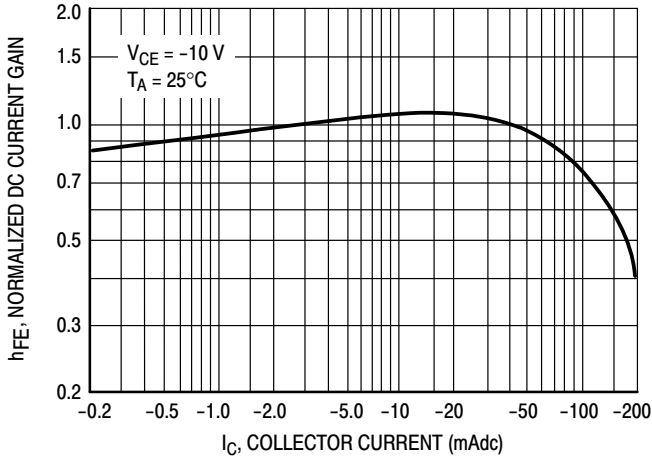


Figure 1. Normalized DC Current Gain

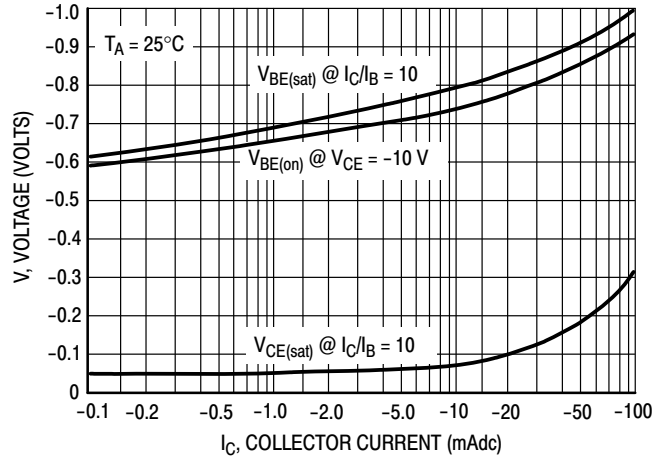


Figure 2. "Saturation" and "On" Voltages

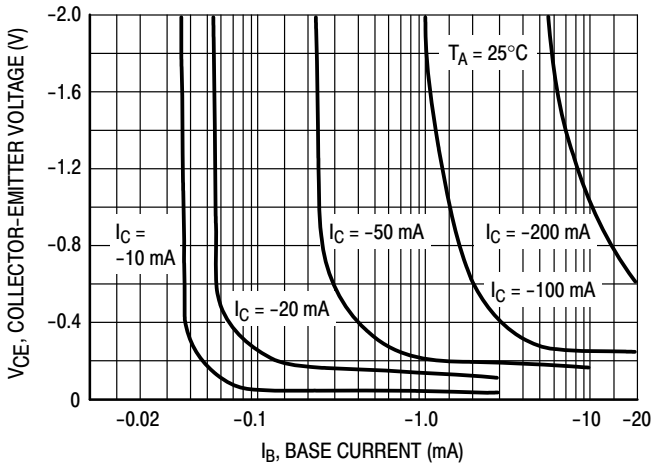


Figure 3. Collector Saturation Region

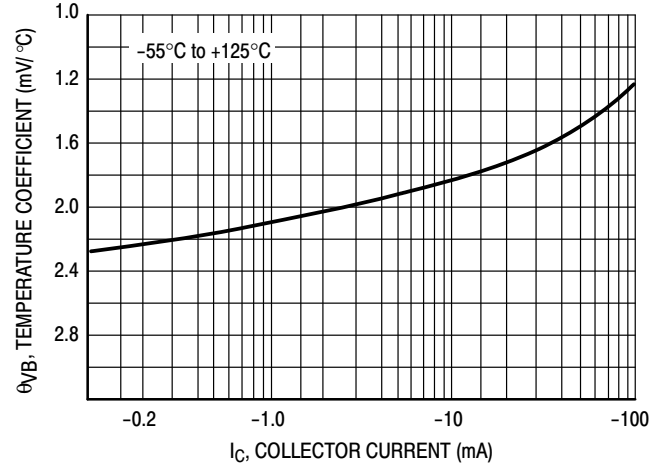


Figure 4. Base-Emitter Temperature Coefficient

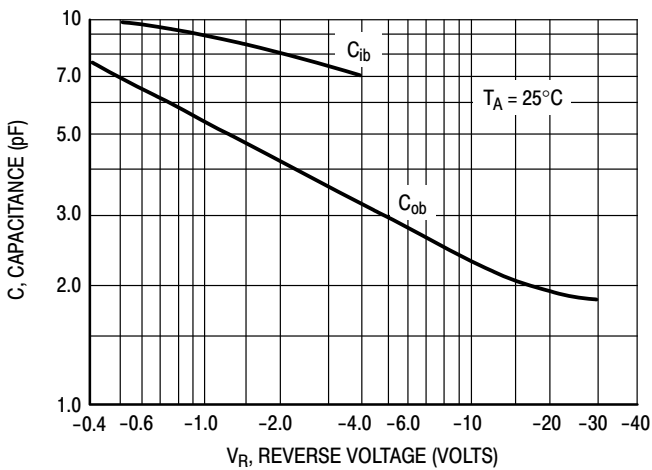


Figure 5. Capacitances

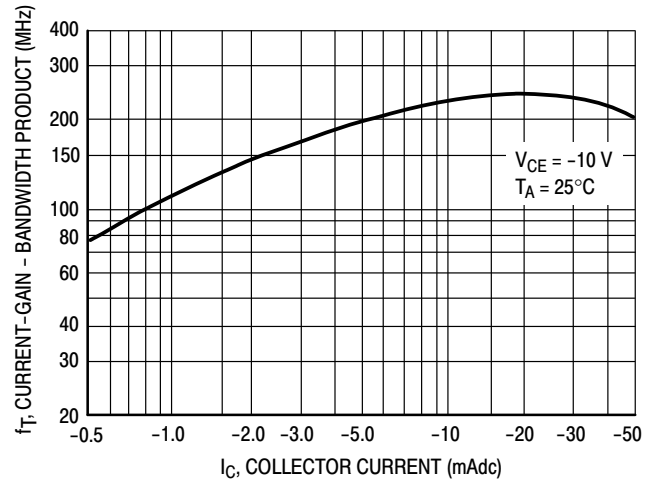


Figure 6. Current-Gain - Bandwidth Product

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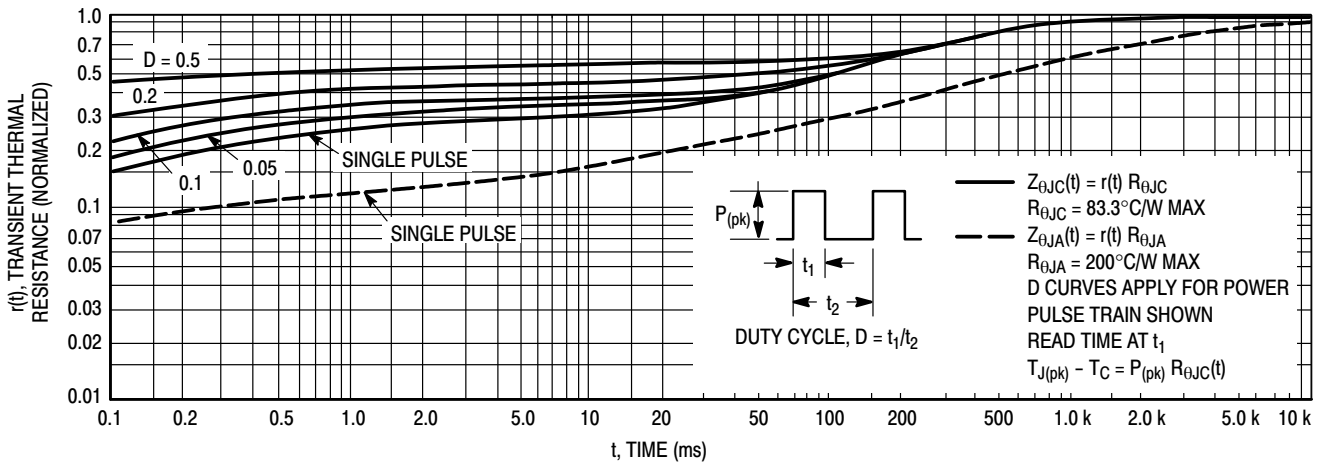


Figure 7. Thermal Response

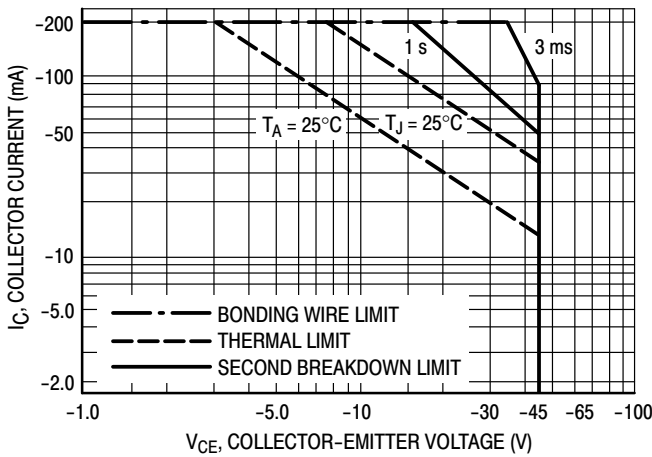


Figure 8. Active Region Safe Operating Area

The safe operating area curves indicate I_C - V_{CE} limits of the transistor that must be observed for reliable operation. Collector load lines for specific circuits must fall below the limits indicated by the applicable curve.

The data of Figure 14 is based upon $T_{J(pk)} = 150^\circ\text{C}$; T_C or T_A is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150^\circ\text{C}$. $T_{J(pk)}$ may be calculated from the data in Figure 13. At high case or ambient temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by the secondary breakdown.

ORDERING INFORMATION

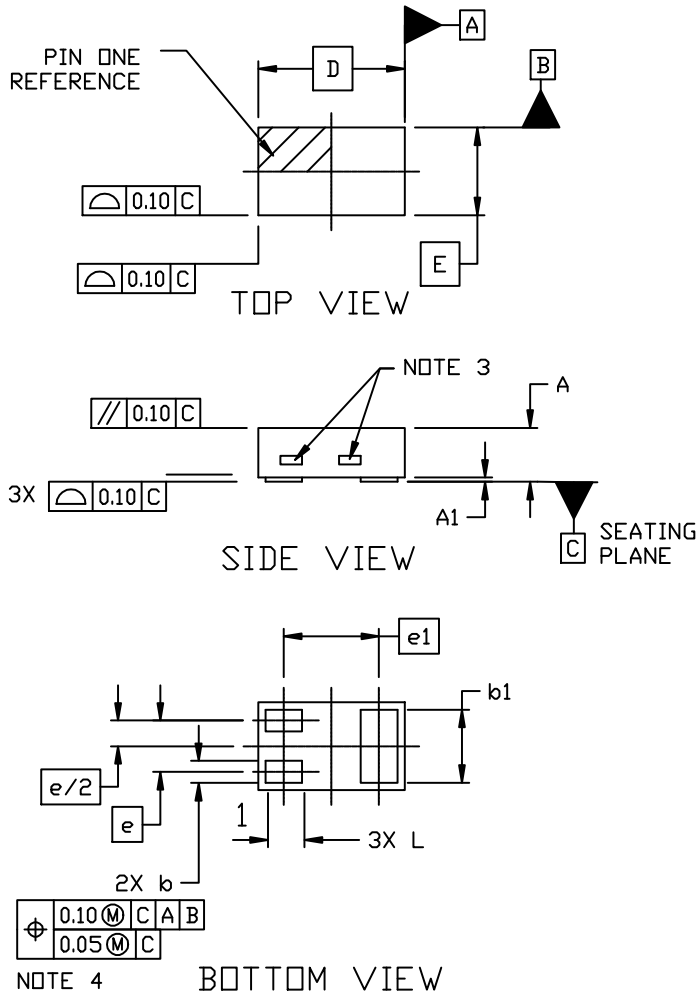
Device	Marking	Package	Shipping†
NST857AMX2T5G	TBD	X2DFN3 (1.0x0.6)	8,000 / Tape & Reel
NST857BMX2T5G	TBD		

†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.

NST857AMX2, NST857BMX2

PACKAGE DIMENSIONS

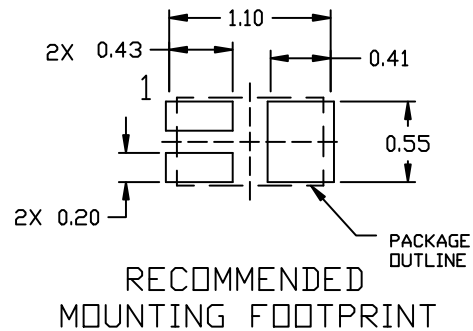
X2DFN3 1.0x0.6, 0.35P
CASE 714AC
ISSUE A



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. EXPOSED COPPER ALLOWED AS SHOWN.
4. ALL PAD LOCATIONS CONTROLLED WITH THIS POSITIONAL TOLERANCE.

DIM	MILLIMETERS		
	MIN.	MAX.	MAX.
A	0.34	0.37	0.40
A1	0.00	---	0.05
b	0.10	0.15	0.20
b1	0.45	0.50	0.55
D	0.95	1.00	1.05
E	0.55	0.60	0.65
e	0.35 BSC		
e1	0.65 BSC		
L	0.20	0.25	0.30



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