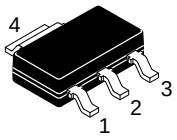
NPN Low-Saturation Transistor

NZT560, NZT560A

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



1. Base
2. & 4. Collector
3. Emitter

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ABSOLUTE MAXIMUM RATINGS

(T_A = 25°C unless otherwise noted.) (Notes 1, 2)

Symbol	Parameter	Value	Unit
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	°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. These ratings are based on a maximum junction temperature of 150°C.
2. These are steady limits. The factory should be consulted on application involving pulsed or low-duty-cycle operations.

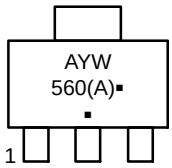
THERMAL CHARACTERISTICS

(T_A = 25°C unless otherwise noted.) (Note 3)

Symbol	Parameter	Max	Unit
P_D	Total Device Dissipation Derate above 25 °C	1 8	W mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	125	°C/W

3. PCB size: FR-4, 76 mm × 114 mm × 1.57 mm (3.0 inch × 4.5 inch × 0.062 inch) with minimum land pattern size.

MARKING DIAGRAM



A = Assembly Location
Y = Year
W = Work Week
560(A) = Specific Device Code
▪ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping
NZT560	SOT-223 (Pb-Free)	4,000 / Tape & Reel
NZT560A	SOT-223 (Pb-Free)	4,000 / 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_C = 25 °C unless otherwise noted.)

Symbol	Parameter	Test Conditions		Min	Max	Unit
BV_{CEO}	Collector-Emitter Breakdown Voltage	I_C = 10 mA, I_B = 0		60	–	V
BV_{CBO}	Collector-Base Breakdown Voltage	I_C = 100 μA, I_E = 0		80	–	V
BV_{EBO}	Emitter-Base Breakdown Voltage	I_E = 100 μA, I_C = 0		5	–	V
I_{CBO}	Collector Cut-Off Current	V_{CB} = 30 V, I_E = 0		–	100	nA
		V_{CB} = 30 V, I_E = 0, T_A = 100°C		–	10	μA
I_{EBO}	Emitter Cut-Off Current	V_{EB} = 4 V, I_C = 0		–	100	nA
h_{FE}	DC Current Gain (Note 4)	I_C = 100 mA, V_{CE} = 2 V		70	–	
		I_C = 500 mA, V_{CE} = 2 V	NZT560	100	300	
			NZT560A	250	550	
		I_C = 1 A, V_{CE} = 2 V		80	–	
		I_C = 3 A, V_{CE} = 2 V		25	–	
V_{CE}(sat)	Collector-Emitter Saturation Voltage (Note 4)	I_C = 1 A, I_B = 100 mA		–	300	mV
		I_C = 3 A, I_B = 300 mA	NZT560	–	450	
			NZT560A	–	400	
V_{BE}(sat)	Base-Emitter Saturation Voltage (Note 4)	I_C = 1 A, I_B = 100 mA		–	1.25	V
V_{BE}(on)	Base-Emitter On Voltage (Note 4)	I_C = 1 A, V_{CE} = 2 V		–	1	V
C_{obo}	Output Capacitance	V_{CB} = 10 V, I_E = 0, f = 1.0 MHz		–	30	pF
f_T	Transition Frequency	I_C = 100 mA, V_{CE} = 5 V, f = 100 MHz		75	–	MHz

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.

4. Pulse test: pulse width ≤ 300 μs, duty cycle ≤ 2.0%.

TYPICAL CHARACTERISTICS

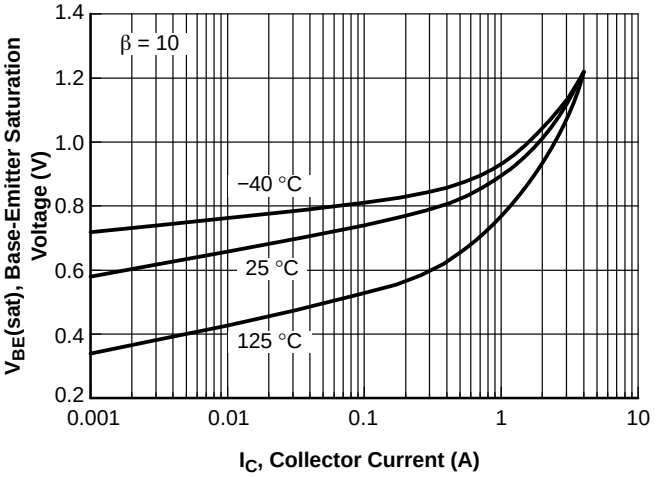


Figure 1. Base-Emitter Saturation Voltage vs. Collector Current

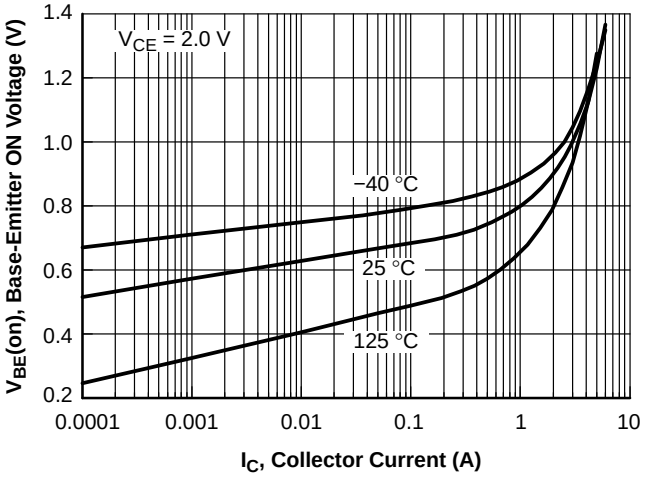


Figure 2. Base-Emitter On Voltage vs. Collector Current

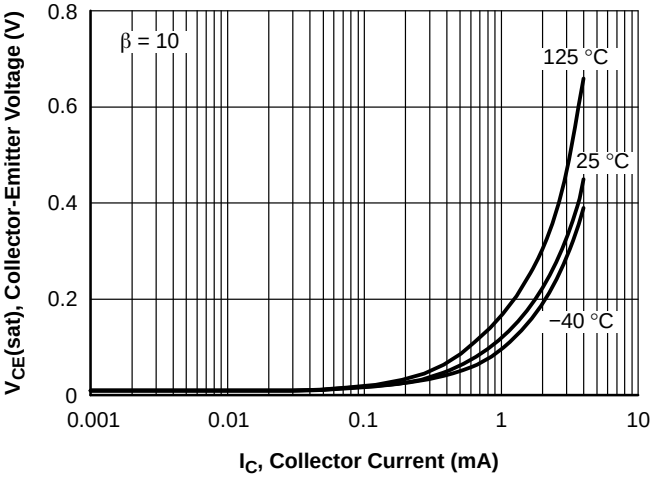


Figure 3. Collector-Emitter Saturation Voltage vs. Collector Current

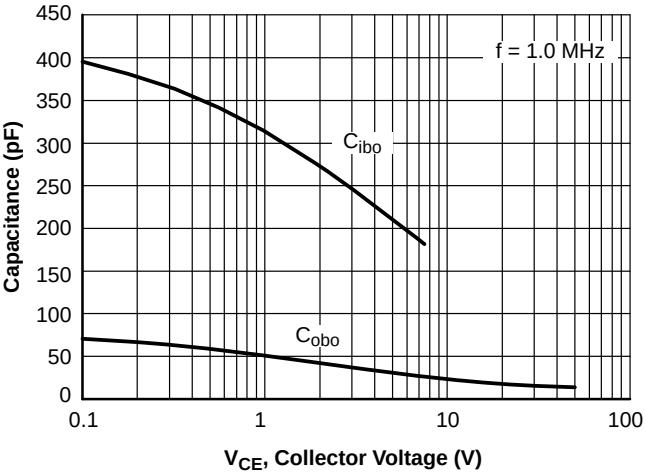


Figure 4. Input/Output Capacitance vs. Reverse Bias Voltage

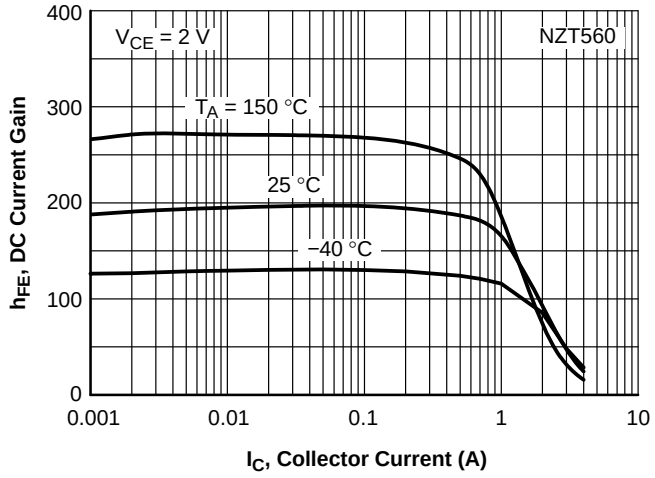


Figure 5. Current Gain vs. Collector Current

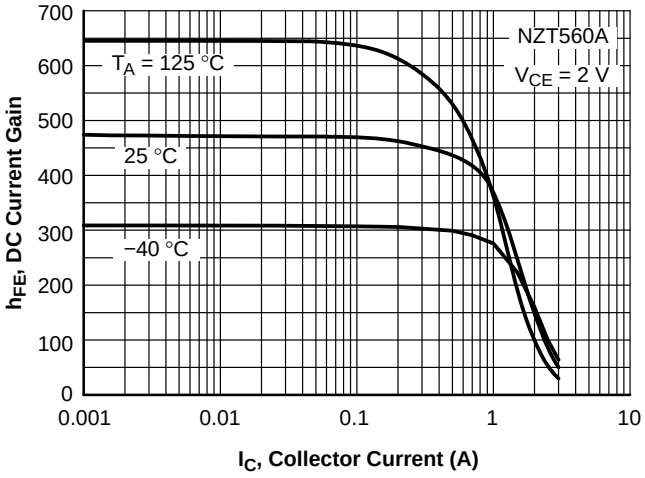
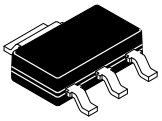


Figure 6. Current Gain vs. Collector Current

REVISION HISTORY

Revision	Description of Changes	Date
2	Converted the Data Sheet to **onsemi** format.	10/1/2025

This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.



SCALE 2:1

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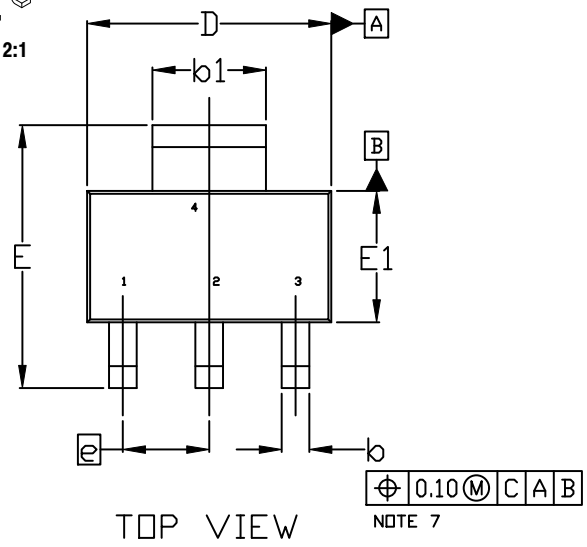
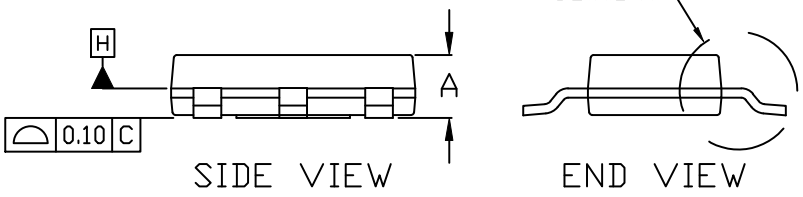
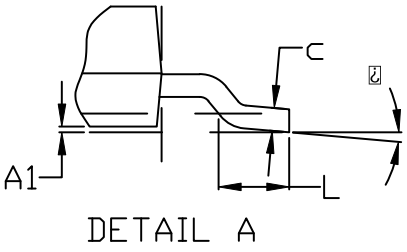
ISSUE B

DATE 13 MAY 2020

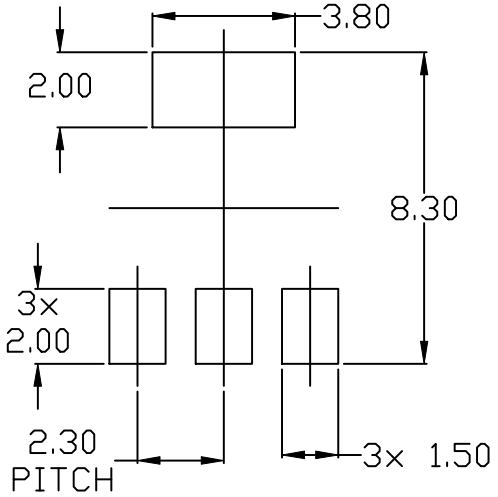






NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSIONS D & E1 ARE DETERMINED AT DATUM H. DIMENSIONS DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. SHALL NOT EXCEED 0.23mm PER SIDE.
4. LEAD DIMENSIONS b AND b1 DO NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBBAR PROTRUSION IS 0.08mm PER SIDE.
5. DATUMS A AND B ARE DETERMINED AT DATUM H.
6. A1 IS DEFINED AS THE VERTICAL DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT OF THE PACKAGE BODY.
7. POSITIONAL TOLERANCE APPLIES TO DIMENSIONS b AND b1.

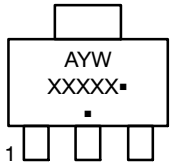
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	---	---	1.80
A1	0.02	0.06	0.11
b	0.60	0.74	0.88
b1	2.90	3.00	3.10
c	0.24	---	0.35
D	6.30	6.50	6.70
E	6.70	7.00	7.30
E1	3.30	3.50	3.70
e	2.30 BSC		
L	0.25	---	---
θ	0°	---	10°



RECOMMENDED MOUNTING FOOTPRINT

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

GENERIC MARKING DIAGRAM*



A = Assembly Location
Y = Year
W = Work Week
XXXXX = Specific Device Code
▪ = Pb−Free Package

(Note: Microdot may be in either location)

*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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DESCRIPTION:	**SOT−223**	**PAGE 1 OF 1**

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