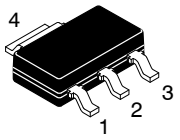
NPN Low Saturation Transistor

NZT902

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



1:Base
2:Collector
3:Emitter

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Features

- This is a Pb−Free Device

ABSOLUTE MAXIMUM RATINGS (Notes 1, 2)

(T_A = 25°C unless otherwise noted.)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector−Emitter Voltage	90	V
V_{CBO}	Collector−Base Voltage	120	V
V_{EBO}	Emitter−Base Voltage	5	V
I_C	Collector Current − Continuous	3	A
T_J	Junction Temperature	150	°C
T_{STG}	Storage 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 state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

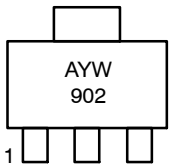
THERMAL CHARACTERISTICS (Note 3)

(T_A = 25°C unless otherwise noted.)

Symbol	Characteristics	Value	Unit
P_D	Total Device Dissipation	1	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	125	°C/W

3. Device mounted on FR−4 PCB 36 mm × 18 mm × 1.5 mm.

MARKING DIAGRAM



A	= Assembly Location
Y	= Year
W	= Work Week
902	= Specific Device Code

ORDERING INFORMATION

Device	Package	Shipping†
NZT902	SOT−223 (Pb−Free)	4000 / 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 (Note 4)
(T_A = 25°C unless otherwise noted.)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
BV_{CEO}	Collector−Emitter Breakdown Voltage	I_C = 10 mA	90			V
BV_{CBO}	Collector−Base Breakdown Voltage	I_C = 100 μA	120			V
BV_{EBO}	Emitter−Base Breakdown Voltage	I_E = 100 μA	5			V
I_{CBO}	Collector−Base Cut−Off Current	V_{CB} = 100 V			100	nA
		V_{CB} = 100 V, T_A = 100°C			10	μA
I_{EBO}	Emitter−Base Cut−Off Current	V_{EB} = 4 V			100	nA
h_{FE}	DC Current Gain	I_C = 0.1 A, V_{CE} = 2 V	80			
		I_C = 1 A, V_{CE} = 2 V	80			
		I_C = 2 A, V_{CE} = 2 V	25			
V_{CE}(sat)	Collector−Emitter Saturation Voltage	I_C = 0.1 A, I_B = 5.0 mA			50	mV
		I_C = 1.0 A, I_B = 100 mA			250	
		I_C = 3.0 A, I_B = 300 mA			600	
V_{BE}(sat)	Base−Emitter Saturation Voltage	I_C = 1.0 A, I_B = 100 mA			1.25	V
C_{obo}	Output Capacitance	V_{CB} = 10 V, I_E = 0, f = 1 MHz			35	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 PERFORMANCE CHARACTERISTICS

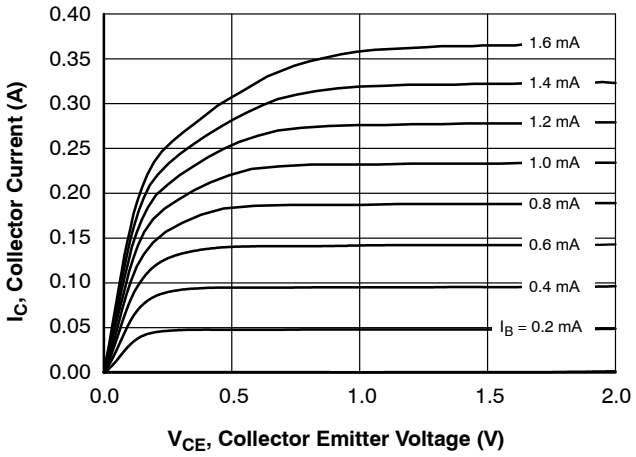


Figure 1. Static Characteristic

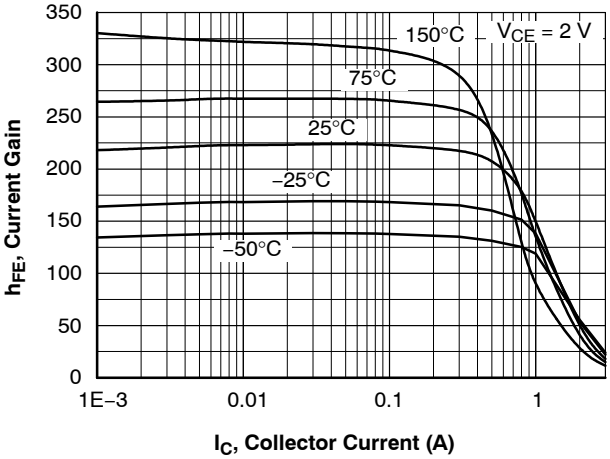


Figure 2. DC Current Gain

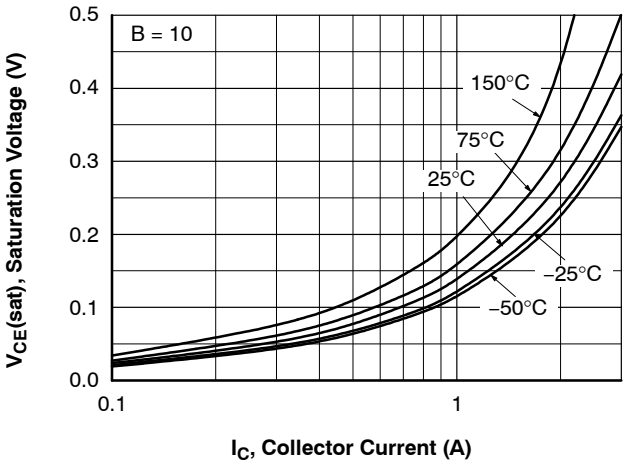


Figure 3. Collector−Emitter Saturation Voltage

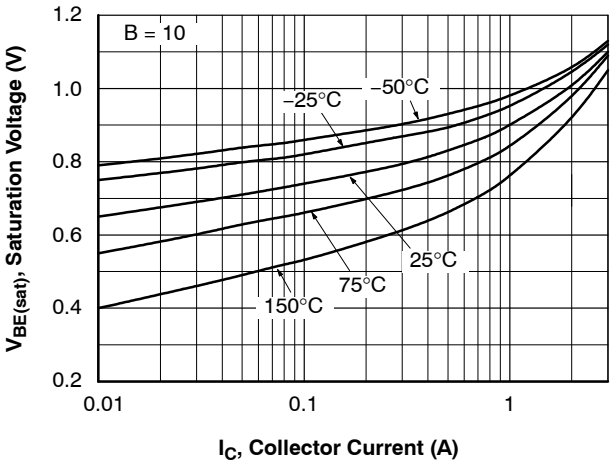


Figure 4. Base−Emitter Saturation Voltage

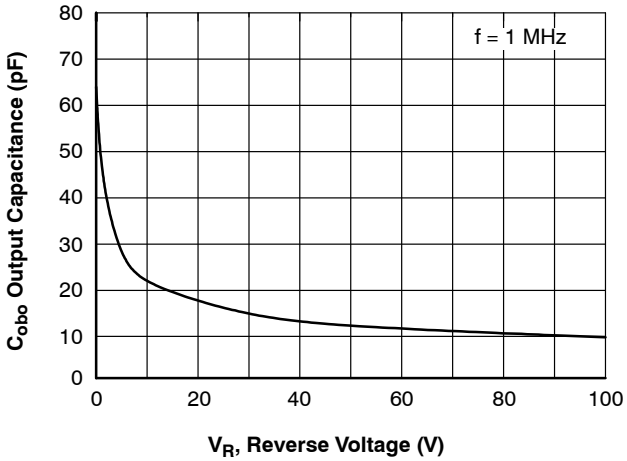


Figure 5. Output Capacitance

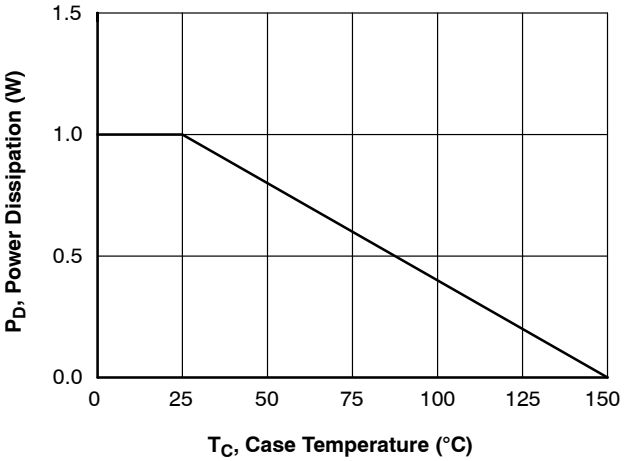


Figure 6. Power Dissipation vs. Ambient Temperature

TYPICAL PERFORMANCE CHARACTERISTICS

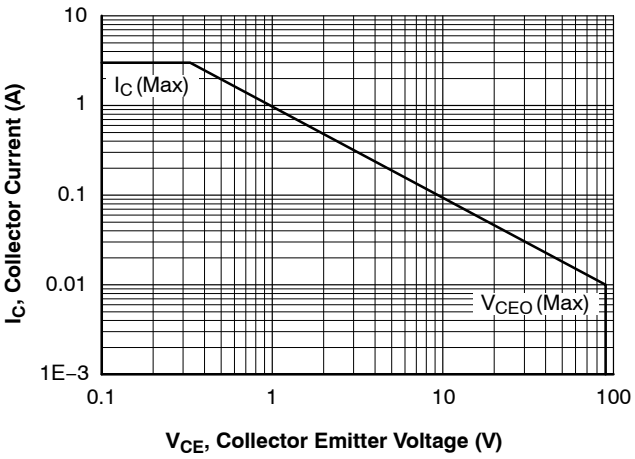
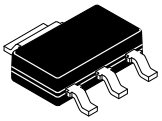


Figure 7. Safe Operating Area



SCALE 2:1

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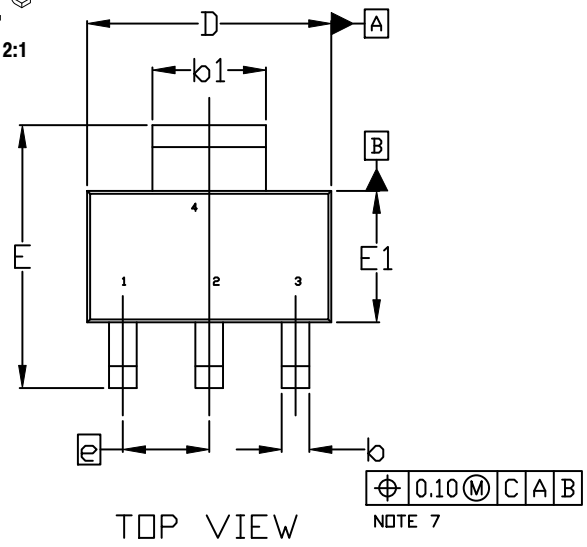
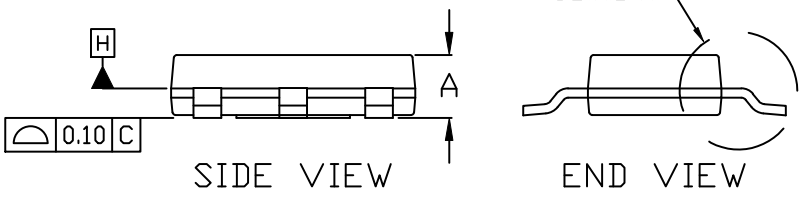
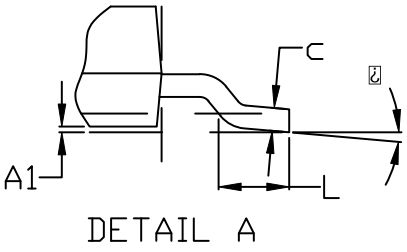
DATE 13 MAY 2020

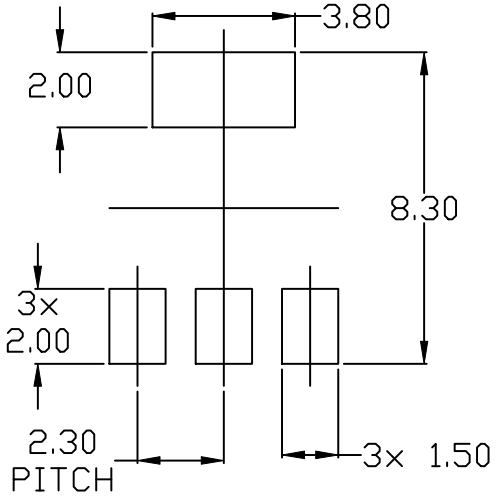






NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSIONS D & E1 ARE DETERMINED AT DATUM H. DIMENSIONS DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. SHALL NOT EXCEED 0.23mm PER SIDE.
4. LEAD DIMENSIONS b AND b1 DO NOT INCLUDE DAMBAR PROTRUSION. 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.

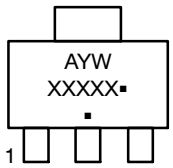
	MILLIMETERS		
DIM	MIN.	NOM.	MAX.
A	---	---	1.80
A1	0.02	0.06	0.11
b	0.60	0.74	0.88
b1	2.90	3.00	3.10
c	0.24	---	0.35
D	6.30	6.50	6.70
E	6.70	7.00	7.30
E1	3.30	3.50	3.70
e	2.30 BSC		
L	0.25	---	---
θ	0°	---	10°



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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