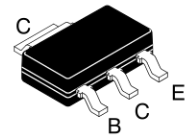
NPN Darlington Transistor

NZT7053

This device is designed for applications requiring extremely high gain at collector currents to 1.0 A and high breakdown voltage. Sourced from Process 06.



SOT−223
CASE 318H

ABSOLUTE MAXIMUM RATINGS (Notes 1, 2)

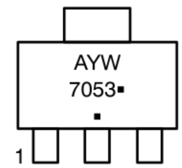
(T_A = 25°C unless otherwise noted.)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector−Emitter Voltage	100	V
V_{CBO}	Collector−Base Voltage	100	V
V_{EBO}	Emitter−Base Voltage	12	V
I_C	Collector Current − Continuous	1.5	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 state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

MARKING DIAGRAM



A = Assembly Location
Y = Year
W = Work Week
7053 = Specific Device Code
▪ = Pb−Free Package

THERMAL CHARACTERISTICS (Note 3)

(T_A = 25°C unless otherwise noted.)

Symbol	Characteristics	Value	Unit
P_D	Total Device Dissipation	1000	mW
	Derate Above 25°C	8.0	mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	125	°C/W

3. Device mounted on FR−4 PCB 36 mm × 18 mm × 1.5 mm; mounting pad for the collector lead min. 6 cm^2.

ORDERING INFORMATION

Device	Package	Shipping†
NZT7053	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 (T_A = 25°C unless otherwise noted.)

Symbol	Parameter	Conditions	Min.	Max.	Unit
OFF CHARACTERISTICS					
$V_{(BR)CEO}$	Collector−Emitter Breakdown Voltage (Note 4)	I_C = 1.0 mA, I_B = 0	100	–	V
$V_{(BR)CBO}$	Collector−Base Breakdown Voltage	I_C = 100 μA, I_E = 0	100	–	V
$V_{(BR)EBO}$	Emitter−Base Breakdown Voltage	I_E = 1.0 mA, I_C = 0	12	–	V
I_{CBO}	Collector−Cutoff Current	V_{CB} = 80 V, I_E = 0	–	0.1	μA
I_{CES}	Emitter−Cutoff Current	V_{CE} = 80 V, I_E = 0	–	0.2	μA
I_{EBO}	Emitter−Cutoff Current	V_{EB} = 7.0 V, I_C = 0	–	0.1	μA
ON CHARACTERISTICS (Note 4)					
h_{FE}	DC Current Gain	I_C = 100 mA, V_{CE} = 5.0 V	10000	–	
		I_C = 1.0 A, V_{CE} = 5.0 V	1000	20000	
$V_{CE(sat)}$	Collector−Emitter Saturation Voltage	I_C = 100 mA, I_B = 0.1 mA	–	1.5	V
$V_{BE(on)}$	Base−Emitter On Voltage	I_C = 100 mA, V_{BE} = 5.0 V	–	2.0	V
SMALL SIGNAL CHARACTERISTICS					
F_T	Transition Frequency	I_C = 100 mA, V_{CE} = 5.0 V	200	–	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%

TYPICAL CHARACTERISTICS

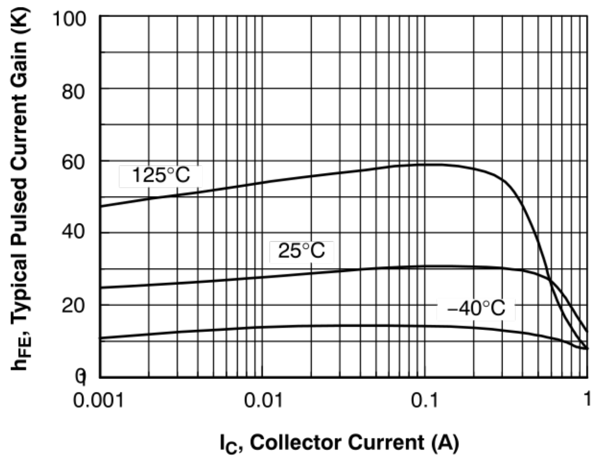


Figure 1. Typical Pulsed Current Gain vs. Collector Current

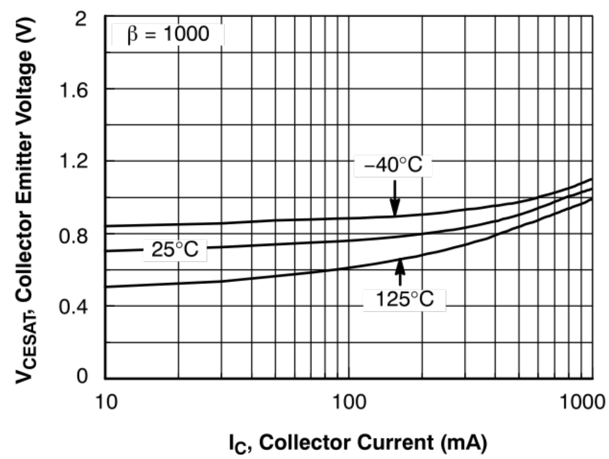


Figure 2. Collector−Emitter Saturation Voltage vs. Collector Current

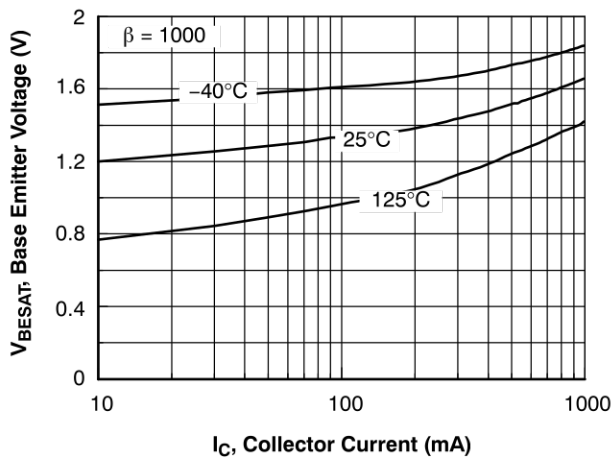


Figure 3. Base−Emitter Saturation Voltage vs. Collector Current

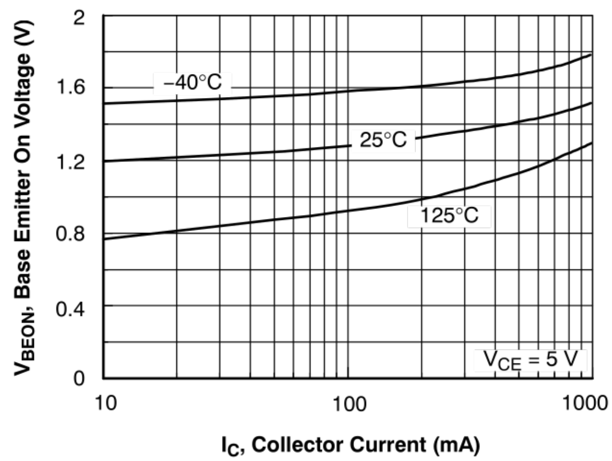


Figure 4. Base Emitter ON Voltage vs. Collector Current

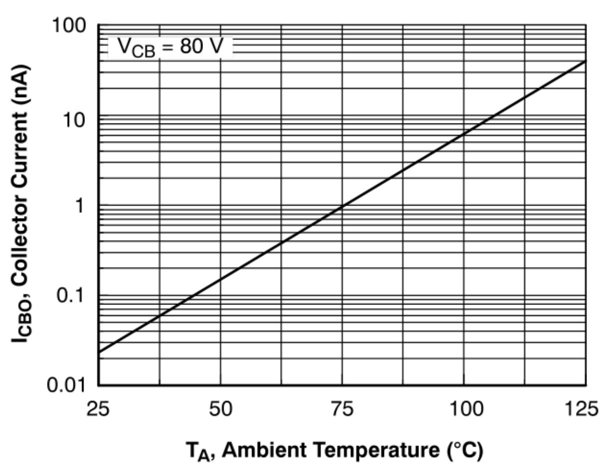


Figure 5. Collector−Cutoff Current vs. Ambient Temperature

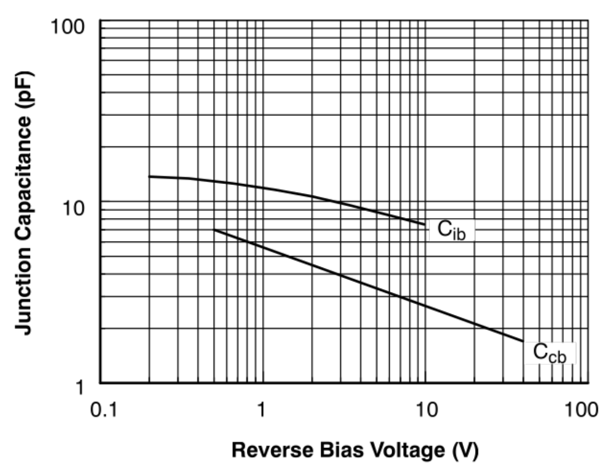


Figure 6. Junction Capacitance vs. Reverse Bias Voltage

TYPICAL CHARACTERISTICS (continued)

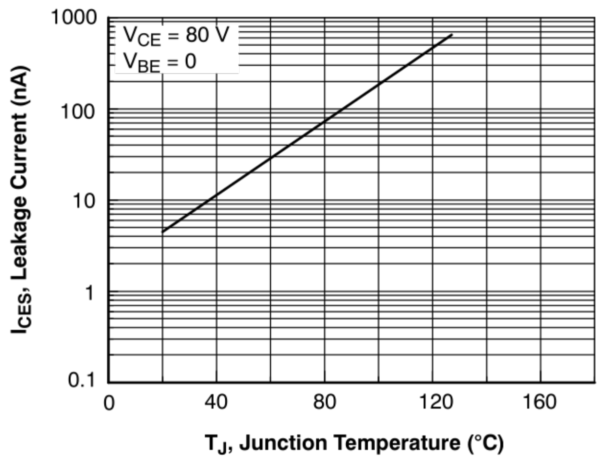


Figure 7. Typical Collector−Emitter Leakage Current vs. Temperature

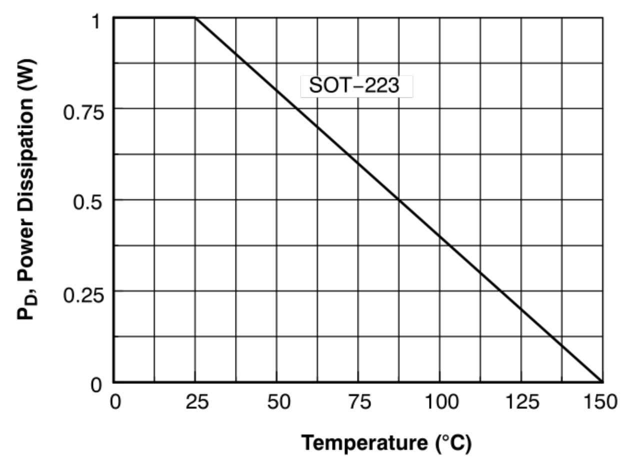
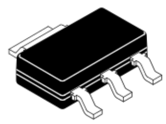


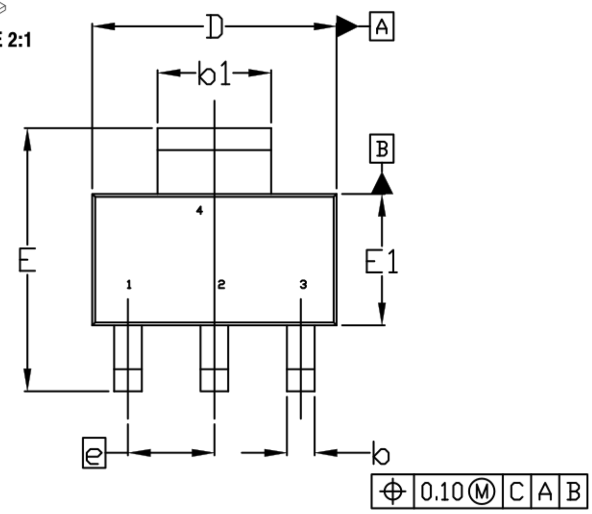
Figure 8. Power Dissipation vs. Ambient Temperature



SCALE 2:1

SOT−223
CASE 318H
ISSUE B

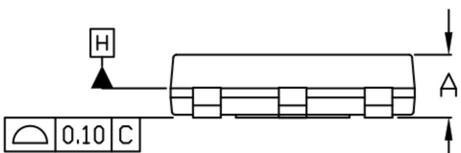
DATE 13 MAY 2020



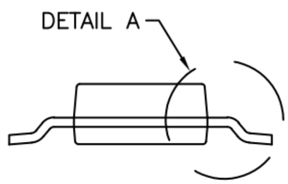
TOP VIEW

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.

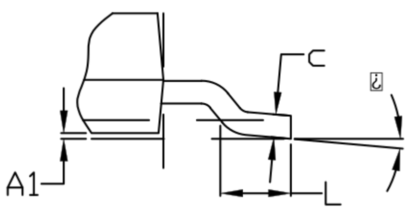
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	---	---	1.80
A1	0.02	0.06	0.11
b	0.60	0.74	0.88
b1	2.90	3.00	3.10
c	0.24	---	0.35
D	6.30	6.50	6.70
E	6.70	7.00	7.30
E1	3.30	3.50	3.70
e	2.30 BSC		
L	0.25	---	---
¿	0°	---	10°



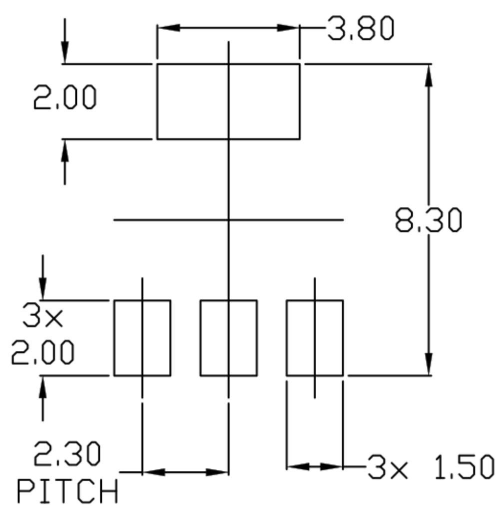
SIDE VIEW



END VIEW



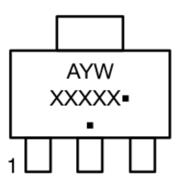
DETAIL A



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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