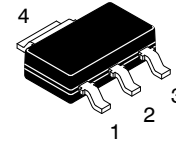


# NPN Darlington Transistor

## PZTA14

This device is designed for applications requiring extremely high current gain at collector currents to 1.0 A. Sourced from Process 05.



1. Base
- 2., 4. Collector
3. Emitter

SOT-223  
CASE 318H

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

Symbol	Parameter	Value	Unit
$V_{CES}$	Collector-Emitter Voltage	30	V
$V_{CBO}$	Collector-Base Voltage	30	V
$V_{EBO}$	Emitter-Base Voltage	10	V
$I_C$	Collector Current – Continuous	1.2	A
$T_J, T_{stg}$	Operating and Storage Junction Temperature Range	-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. These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

### THERMAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Max	Unit
$P_D$	Total Device Dissipation Derate above $25^\circ\text{C}$	1 8.0	W mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	125	$^\circ\text{C}/\text{W}$

NOTE: Device mounted on FR-4 PCB  $36\text{ mm} \times 18\text{ mm} \times 1.5\text{ mm}$ ; mounting pad for the collector lead min.  $6\text{ cm}^2$ .

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	$I_C = 100\text{ }\mu\text{A}, I_B = 0$	30	–	–	V
$I_{CBO}$	Collector-Cutoff Current	$V_{CB} = 30\text{ V}, I_E = 0$	–	–	100	nA
$I_{EBO}$	Emitter-Cutoff Current	$V_{EB} = 10\text{ V}, I_C = 0$	–	–	100	nA

### ON CHARACTERISTICS (Note 3)

$h_{FE}$	DC Current Gain	$I_C = 10\text{ mA}, V_{CE} = 5.0\text{ V}$ $I_C = 100\text{ mA}, V_{CE} = 5.0\text{ V}$	10000 20000	– –	– –	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 100\text{ mA}, I_B = 0.1\text{ mA}$	–	–	1.5	V
$V_{BE(on)}$	Base-Emitter On Voltage	$I_C = 100\text{ mA}, V_{CE} = 5.0\text{ V}$	–	–	2.0	V

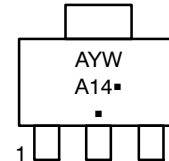
### SMALL SIGNAL CHARACTERISTICS

$f_T$	Current Gain – Bandwidth Product	$I_C = 10\text{ mA}, V_{CE} = 5\text{ V}, f = 100\text{ MHz}$	125	–	–	MHz
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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.

3. Pulse Test: Pulse Width  $\leq 300\text{ }\mu\text{s}$ , Duty cycle  $\leq 2.0\%$ .

### MARKING DIAGRAM



- A = Assembly Site
- YW = Assembly Start Week
- A14 = Specific Device Code
- = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
PZTA14	SOT-223 (Pb-Free)	4000 / Tape & Reel

<sup>†</sup>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](http://www.onsemi.com/BRD8011/D).

## TYPICAL CHARACTERISTICS

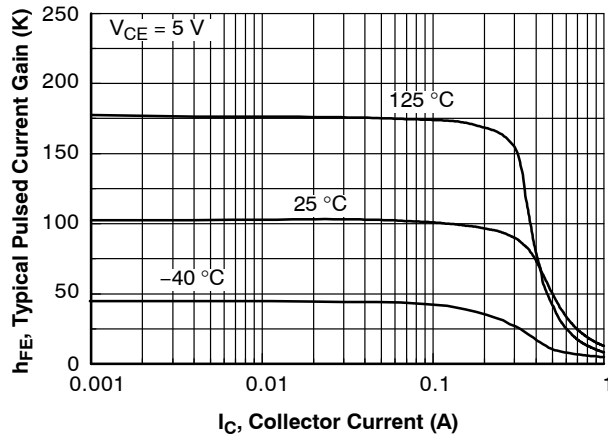


Figure 1. Typical Pulsed Current Gain vs. Collector Current

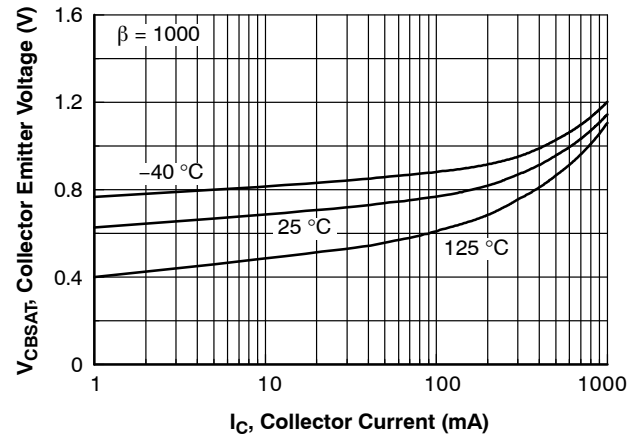


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

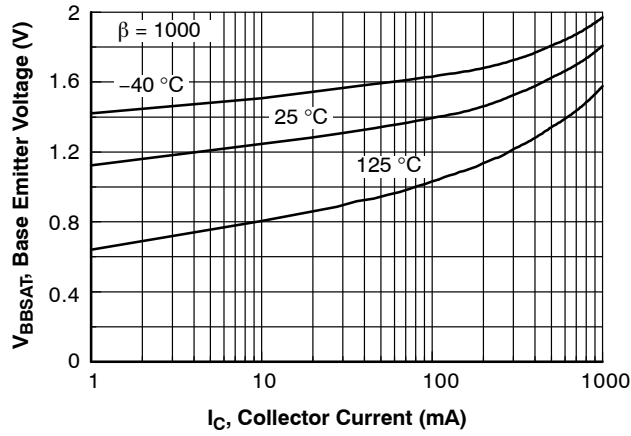


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

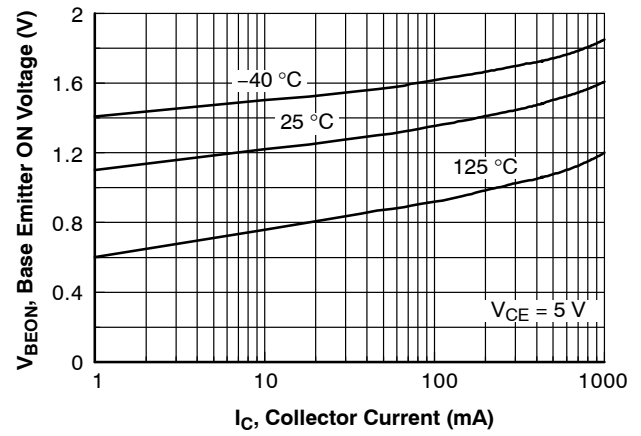


Figure 4. Base-Emitter ON Voltage vs. Collector Current

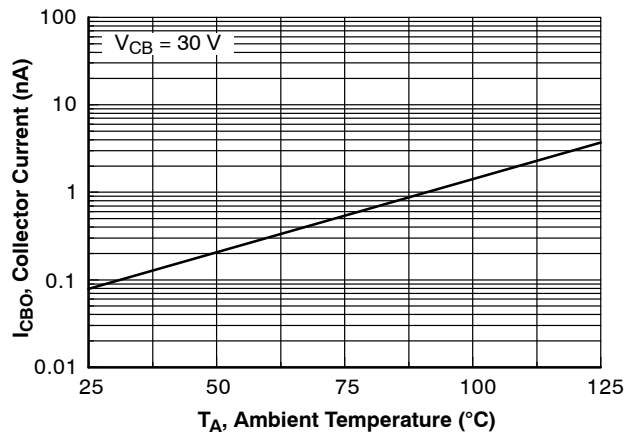


Figure 5. Collector-Cutoff Current vs. Ambient Temperature

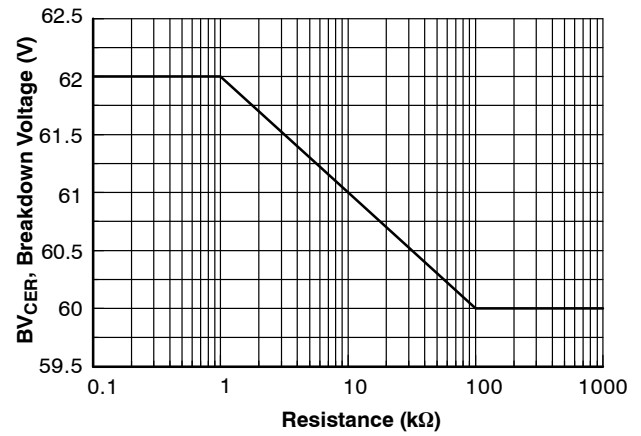


Figure 6. Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base

TYPICAL CHARACTERISTICS (continued)

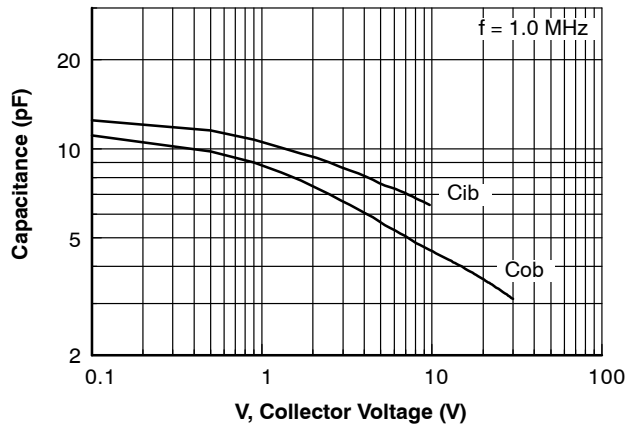


Figure 7. Input and Output Capacitance vs. Reverse Voltage

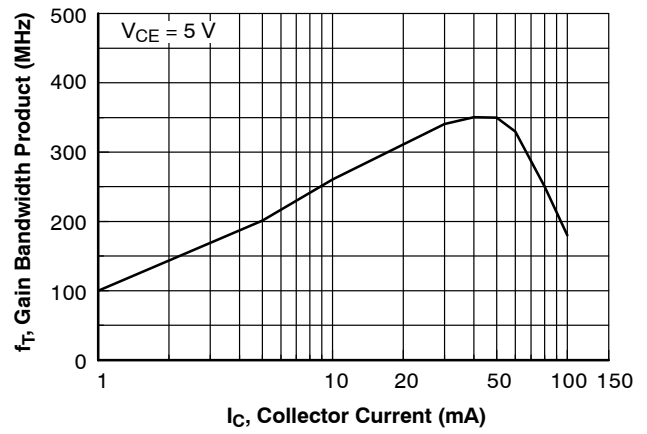


Figure 8. Gain Bandwidth Product vs. Collector Current

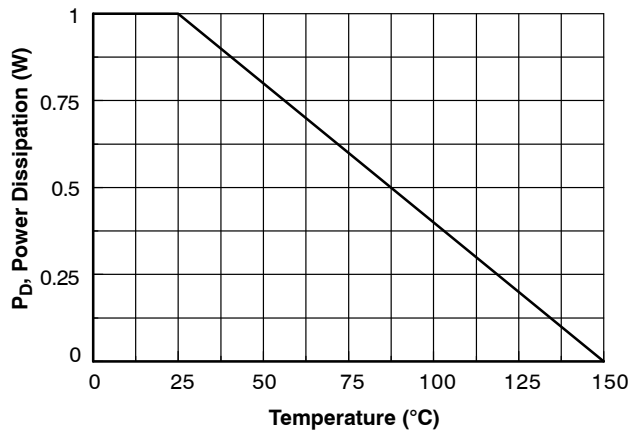
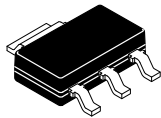


Figure 9. Power Dissipation vs. Ambient Temperature



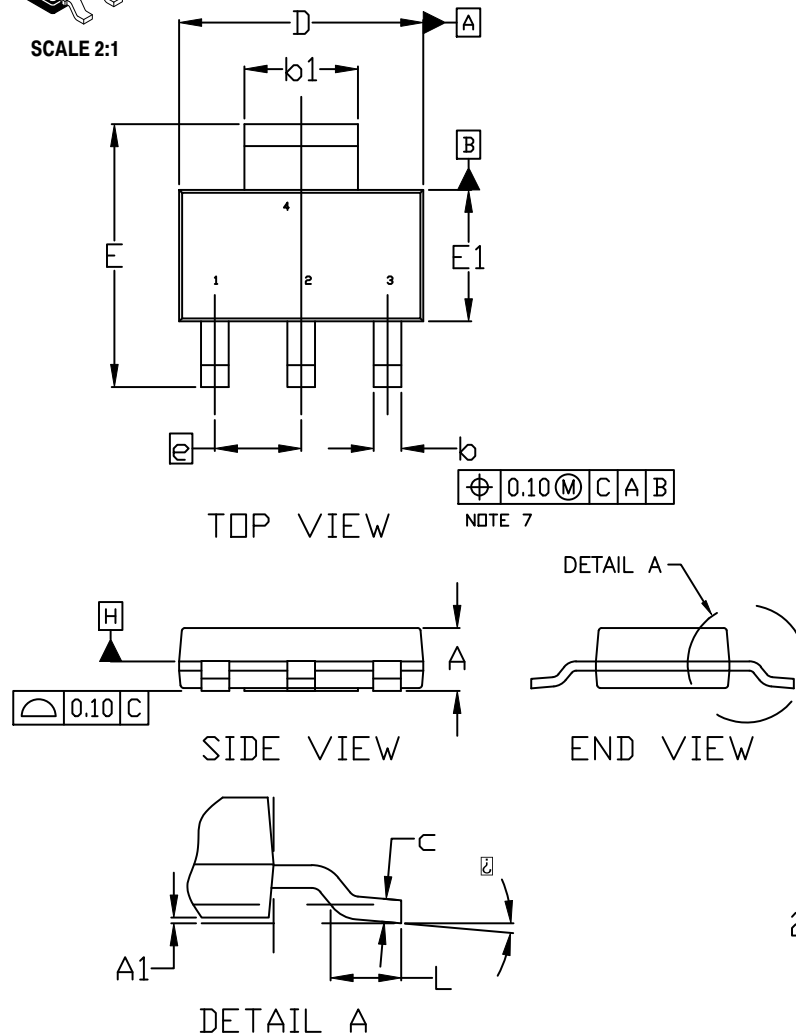
SCALE 2:1

**SOT-223**  
**CASE 318H**  
**ISSUE B**

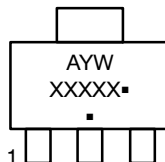
DATE 13 MAY 2020

## 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 DAMBAR 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.



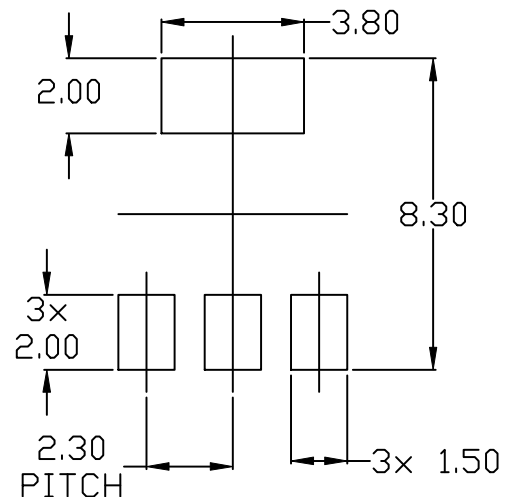
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	---	---	1.80
A1	0.02	0.06	0.11
b	0.60	0.74	0.88
b1	2.90	3.00	3.10
c	0.24	---	0.35
D	6.30	6.50	6.70
E	6.70	7.00	7.30
E1	3.30	3.50	3.70
e	2.30 BSC		
L	0.25	---	---
⌀	0°	---	10°

**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.


**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.

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