

NPN Darlington Transistor

PZTA29

Description

This device is designed for applications requiring extremely high current gain at collector currents to 500 mA. Sourced from process 03.

Features

- These are Pb-Free Devices

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted) (Note 1, Note 2)

| Symbol | Parameter | Value | Unit |
|-----------------------------------|--|--------------|------|
| V _{CE} S | Collector–Emitter Voltage | 100 | V |
| V _{CB} O | Collector–Base Voltage | 100 | V |
| V _{EB} O | Emitter–Base Voltage | 12 | V |
| I _C | Collector Current – Continuous | 800 | mA |
| T _J , T _{STG} | Operating and Storage Junction Temperature Range | –55 to + 150 | °C |

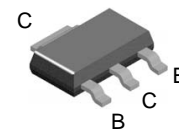
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. These ratings are based on a maximum junction temperature of 150°C.
2. These are steady-state limits. **onsemi** should be consulted on application involving pulsed or low duty cycle operations.

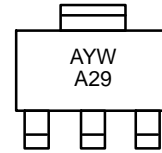
THERMAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

| Symbol | Parameter | Max | Unit |
|------------------|---|------|-------|
| P _D | Total Device Dissipation | 1000 | mW |
| | Derate Above 25°C | 8.0 | mW/°C |
| R _{θJA} | Thermal Resistance, Junction to Ambient | 125 | °C/W |

3. Device mounted on FR–4 PCB 36 mm x 18 mm x 1.5 mm; mounting pad for the collector lead minimum 6cm².



MARKING DIAGRAM



SOT–223
CASE 318H

A = Assembly Location
YW = Date Code
A29 = Specific Device Code

ORDERING INFORMATION

| Device | Package | Shipping† |
|--------|---------|--------------------|
| PZTA29 | SOT–223 | 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.

PZTA29

ELECTRICAL CHARACTERISTICS (Note 4) ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Symbol | Parameter | Test Conditions | Min | Max | Unit |
|--------|-----------|-----------------|-----|-----|------|
|--------|-----------|-----------------|-----|-----|------|

OFF CHARACTERISTICS

| | | | | | |
|---------------|-------------------------------------|---|-----|-----|----|
| $V_{(BR)CES}$ | Collector–Emitter Breakdown Voltage | $I_C = 100\ \mu\text{A}$, $V_{BE} = 0$ | 100 | | V |
| $V_{(BR)CBO}$ | Collector–Base Breakdown Voltage | $I_C = 100\ \mu\text{A}$, $I_E = 0$ | 100 | | V |
| $V_{(BR)EBO}$ | Emitter–Base Breakdown Voltage | $I_E = 10\ \mu\text{A}$, $I_C = 0$ | 12 | | V |
| I_{CBO} | Collector Cut–Off Current | $V_{CB} = 80\ \text{V}$, $I_E = 0$ | | 100 | nA |
| I_{CES} | Collector Cut–Off Current | $V_{CE} = 80\ \text{V}$, $V_{BE} = 0$ | | 500 | nA |
| I_{EBO} | Emitter Cut–Off Current | $V_{EB} = 10\ \text{V}$, $I_C = 0$ | | 100 | nA |

ON CHARACTERISTICS

| | | | | | |
|---------------|--------------------------------------|---|--------|-----|---|
| h_{FE} | DC Current Gain | $I_C = 10\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$ | 10,000 | | |
| | | $I_C = 100\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$ | 10,000 | | |
| $V_{CE(sat)}$ | Collector–Emitter Saturation Voltage | $I_C = 10\ \text{mA}$, $I_B = 0.01\ \text{mA}$ | | 1.2 | V |
| | | $I_C = 100\ \text{mA}$, $I_B = 0.1\ \text{mA}$ | | 1.5 | |
| $V_{BE(on)}$ | 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 | $I_C = 15\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$, $f = 100\ \text{MHz}$ | 125 | | MHz |
| C_{obo} | Output Capacitance | $V_{CB} = 1.0\ \text{V}$, $I_E = 0$, $f = 1.0\ \text{MHz}$ | | 8.0 | pF |

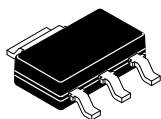
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

4. Pulse test: pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2.0\%$.

MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

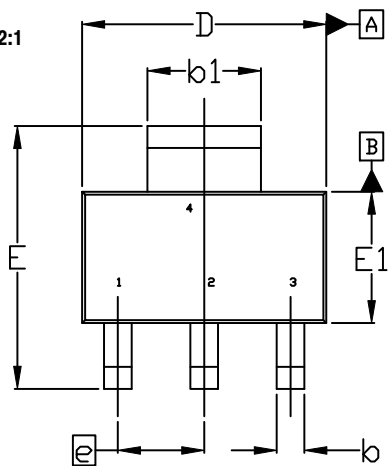
ON Semiconductor®



SOT-223
CASE 318H
ISSUE B

DATE 13 MAY 2020

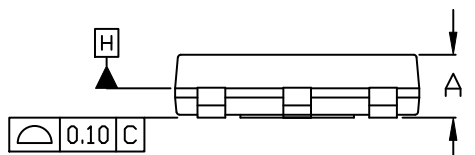
SCALE 2:1



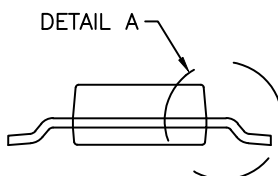
TOP VIEW

$\Phi 0.10 \text{ (M)}$ C A B

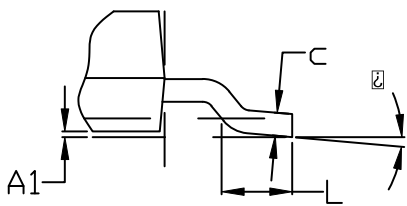
NOTE 7



SIDE VIEW



END VIEW

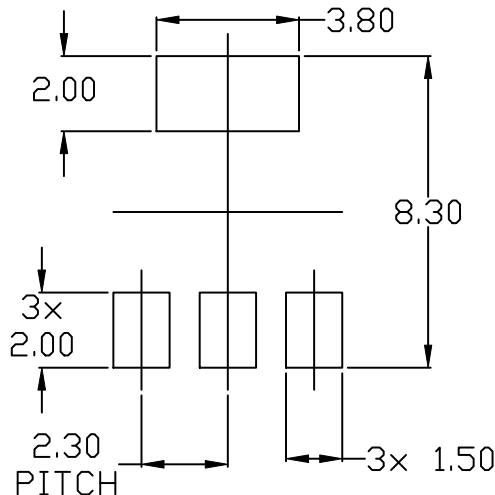


DETAIL A

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.

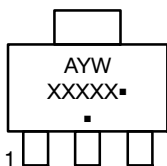
| DIM | MILLIMETERS | | |
|-----------|-------------|------|------|
| | MIN. | NDM. | MAX. |
| A | --- | --- | 1.80 |
| A1 | 0.02 | 0.06 | 0.11 |
| b | 0.60 | 0.74 | 0.88 |
| b1 | 2.90 | 3.00 | 3.10 |
| c | 0.24 | --- | 0.35 |
| D | 6.30 | 6.50 | 6.70 |
| E | 6.70 | 7.00 | 7.30 |
| E1 | 3.30 | 3.50 | 3.70 |
| e | 2.30 BSC | | |
| L | 0.25 | --- | --- |
| \square | 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, SOLDERM/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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