



**THE DATASHEET OF  
PZT2907AT1G**



# PZT2907A

## PNP Silicon Epitaxial Transistor

This PNP Silicon Epitaxial transistor is designed for use in linear and switching applications. The device is housed in the SOT-223 package which is designed for medium power surface mount applications.

### Features

- NPN Complement is PZT2222AT1
- The SOT-223 Package can be Soldered Using Wave or Reflow
- SOT-223 Package Ensures Level Mounting, Resulting in Improved Thermal Conduction, and Allows Visual Inspection of Soldered Joints. The Formed Leads Absorb Thermal Stress during Soldering Eliminating the Possibility of Damage to the Die
- S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant\*

### MAXIMUM RATINGS

| Rating                         | Symbol    | Value | Unit |
|--------------------------------|-----------|-------|------|
| Collector - Emitter Voltage    | $V_{CEO}$ | -60   | Vdc  |
| Collector - Base Voltage       | $V_{CBO}$ | -60   | Vdc  |
| Emitter - Base Voltage         | $V_{EBO}$ | -5.0  | Vdc  |
| Collector Current - Continuous | $I_C$     | -600  | mAdc |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

### THERMAL CHARACTERISTICS

| Characteristic  | Symbol          | Max            | Unit                      |
|---|-----------------|----------------|---------------------------|
| Total Device Dissipation (Note 1)<br>$T_A = 25^\circ\text{C}$               | $P_D$           | 1.5<br>12      | W<br>mW/ $^\circ\text{C}$ |
| Thermal Resistance Junction-to-Ambient<br>(Note 1)                          | $R_{\theta JA}$ | 83.3           | $^\circ\text{C}/\text{W}$ |
| Lead Temperature for Soldering,<br>0.0625" from case<br>Time in Solder Bath | $T_L$           | 260<br>10      | $^\circ\text{C}$<br>Sec   |
| Operating and Storage Temperature Range                                     | $T_J, T_{stg}$  | -65 to<br>+150 | $^\circ\text{C}$          |

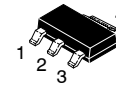
1. FR-4 with 1 oz and 713 mm<sup>2</sup> of copper area.

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

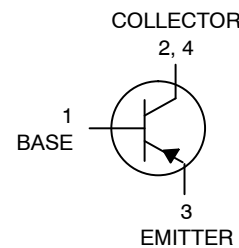


**ON Semiconductor®**

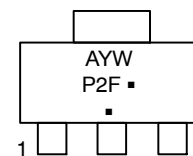
<http://onsemi.com>



**SOT-223  
CASE 318E  
STYLE 1**



### MARKING DIAGRAM



P2F = Specific Device Code  
 A = Assembly Location  
 Y = Year  
 W = Work Week  
 ■ = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

| Device       | Package              | Shipping†           |
|--------------|----------------------|---------------------|
| PZT2907AT1G  | SOT-223<br>(Pb-Free) | 1,000 / Tape & Reel |
| SPZT2907AT1G | SOT-223<br>(Pb-Free) | 1,000 / Tape & Reel |
| PZT2907AT3G  | SOT-223<br>(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 Specifications Brochure, BRD8011/D.

# PZT2907A

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

### OFF CHARACTERISTICS

|   |               |      |   |     |      |
|---|---------------|------|---|-----|------|
| Collector-Base Breakdown Voltage<br>( $I_C = -10 \mu\text{Adc}$ , $I_E = 0$ )                   | $V_{(BR)CBO}$ | -60  | - | -   | Vdc  |
| Collector-Emitter Breakdown Voltage<br>( $I_C = 10 \text{ mAdc}$ , $I_B = 0$ )                  | $V_{(BR)CEO}$ | -60  | - | -   | Vdc  |
| Emitter-Base Breakdown Voltage<br>( $I_E = -10 \mu\text{Adc}$ , $I_C = 0$ )                     | $V_{(BR)EBO}$ | -5.0 | - | -   | Vdc  |
| Collector-Base Cutoff Current<br>( $V_{CB} = -50 \text{ Vdc}$ , $I_E = 0$ )                     | $I_{CBO}$     | -    | - | -10 | nAdc |
| Collector-Emitter Cutoff Current<br>( $V_{CE} = -30 \text{ Vdc}$ , $V_{BE} = 0.5 \text{ Vdc}$ ) | $I_{CEX}$     | -    | - | -50 | nAdc |
| Base-Emitter Cutoff Current<br>( $V_{CE} = -30 \text{ Vdc}$ , $V_{BE} = -0.5 \text{ Vdc}$ )     | $I_{BEX}$     | -    | - | -50 | nAdc |

### ON CHARACTERISTICS (Note 2)

|  |               |                               |                       |                         |     |
|--|---------------|-------------------------------|-----------------------|-------------------------|-----|
| DC Current Gain<br>( $I_C = -0.1 \text{ mAdc}$ , $V_{CE} = -10 \text{ Vdc}$ )<br>( $I_C = -1.0 \text{ mAdc}$ , $V_{CE} = -10 \text{ Vdc}$ )<br>( $I_C = -10 \text{ mAdc}$ , $V_{CE} = -10 \text{ Vdc}$ )<br>( $I_C = -150 \text{ mAdc}$ , $V_{CE} = -10 \text{ Vdc}$ )<br>( $I_C = -500 \text{ mAdc}$ , $V_{CE} = -10 \text{ Vdc}$ ) | $h_{FE}$      | 75<br>100<br>100<br>100<br>50 | -<br>-<br>-<br>-<br>- | -<br>-<br>-<br>300<br>- | -   |
| Collector-Emitter Saturation Voltages<br>( $I_C = -150 \text{ mAdc}$ , $I_B = -15 \text{ mAdc}$ )<br>( $I_C = -500 \text{ mAdc}$ , $I_B = -50 \text{ mAdc}$ )  | $V_{CE(sat)}$ | -<br>-                        | -<br>-                | -0.4<br>-1.6            | Vdc |
| Base-Emitter Saturation Voltages<br>( $I_C = -150 \text{ mAdc}$ , $I_B = -15 \text{ mAdc}$ )<br>( $I_C = -500 \text{ mAdc}$ , $I_B = -50 \text{ mAdc}$ )   | $V_{BE(sat)}$ | -<br>-                        | -<br>-                | -1.3<br>-2.6            | Vdc |

### DYNAMIC CHARACTERISTICS

|   |       |     |   |     |     |
|---|-------|-----|---|-----|-----|
| Current-Gain - Bandwidth Product<br>( $I_C = -50 \text{ mAdc}$ , $V_{CE} = -20 \text{ Vdc}$ , $f = 100 \text{ MHz}$ ) | $f_T$ | 200 | - | -   | MHz |
| Output Capacitance<br>( $V_{CB} = -10 \text{ Vdc}$ , $I_E = 0$ , $f = 1.0 \text{ MHz}$ )                              | $C_C$ | -   | - | 8.0 | pF  |
| Input Capacitance<br>( $V_{EB} = -2.0 \text{ Vdc}$ , $I_C = 0$ , $f = 1.0 \text{ MHz}$ )                              | $C_e$ | -   | - | 30  | pF  |

### SWITCHING TIMES

|               |  |           |   |   |     |    |
|---------------|--|-----------|---|---|-----|----|
| Turn-On Time  | $(V_{CC} = -30 \text{ Vdc}$ , $I_C = -150 \text{ mAdc}$ ,<br>$I_{B1} = -15 \text{ mAdc}$ )           | $t_{on}$  | - | - | 45  | ns |
| Delay Time    |  | $t_d$     | - | - | 10  |    |
| Rise Time     |  | $t_r$     | - | - | 40  |    |
| Turn-Off Time | $(V_{CC} = -6.0 \text{ Vdc}$ , $I_C = -150 \text{ mAdc}$ ,<br>$I_{B1} = I_{B2} = -15 \text{ mAdc}$ ) | $t_{off}$ | - | - | 100 | ns |
| Storage Time  |  | $t_s$     | - | - | 80  |    |
| Fall Time     |  | $t_f$     | - | - | 30  |    |

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

# PZT2907A

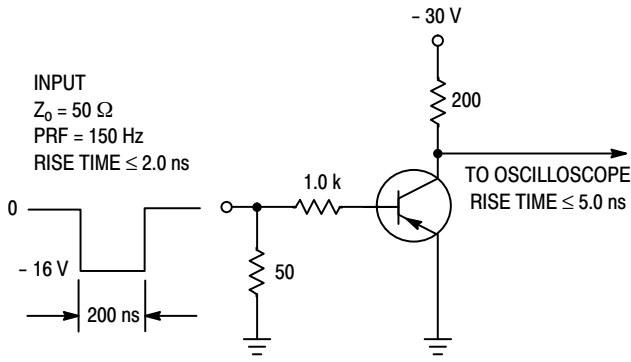


Figure 1. Delay and Rise Time Test Circuit

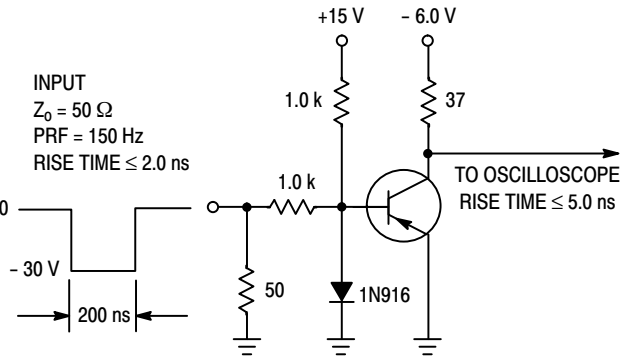


Figure 2. Storage and Fall Time Test Circuit

## TYPICAL ELECTRICAL CHARACTERISTICS

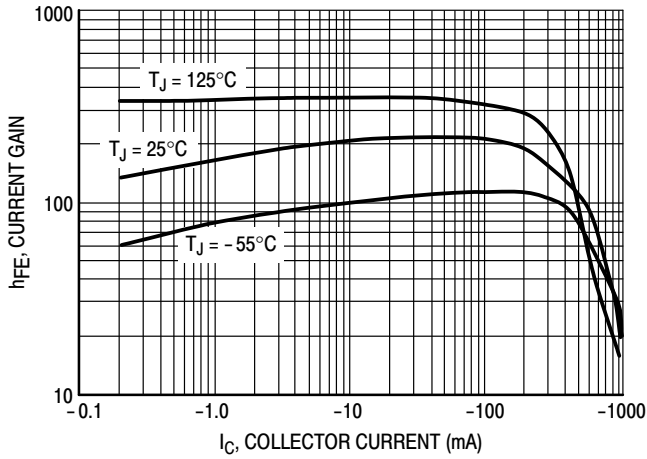


Figure 3. DC Current Gain

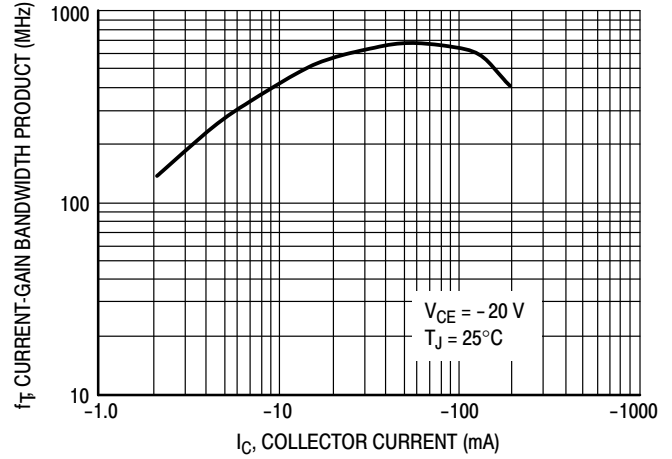


Figure 4. Current Gain Bandwidth Product

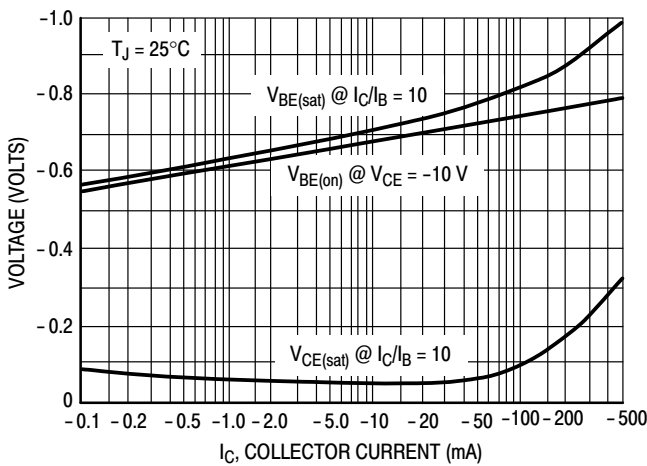


Figure 5. "ON" Voltage

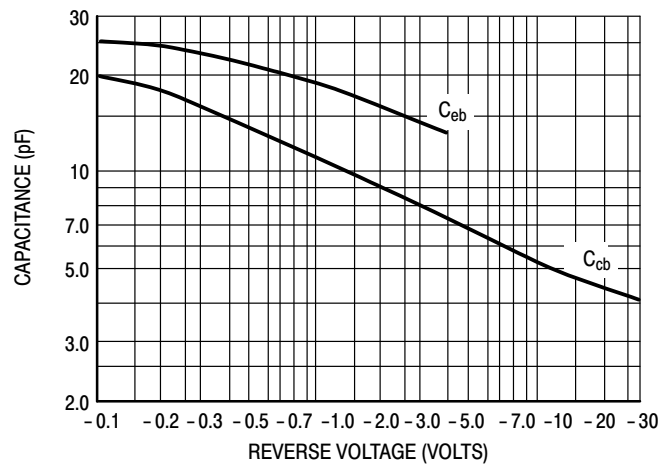
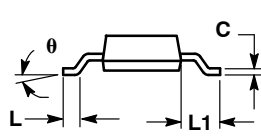
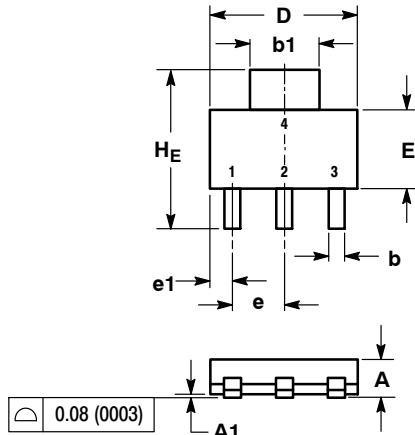


Figure 6. Capacitances

# PZT2907A

## PACKAGE DIMENSIONS

SOT-223 (TO-261)  
CASE 318E-04  
ISSUE N



NOTES:

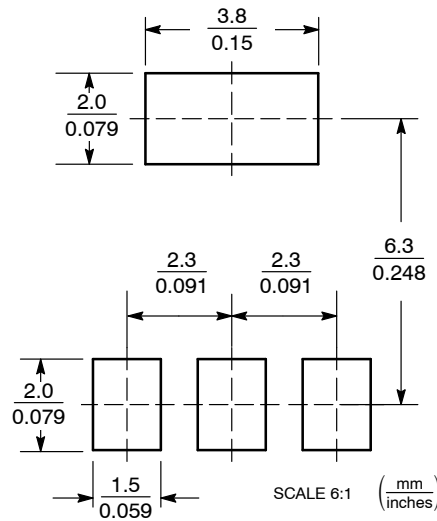
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCH.

| DIM | MILLIMETERS |      |      | INCHES |       |       |
|-----|-------------|------|------|--------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN    | NOM   | MAX   |
| A   | 1.50        | 1.63 | 1.75 | 0.060  | 0.064 | 0.068 |
| A1  | 0.02        | 0.06 | 0.10 | 0.001  | 0.002 | 0.004 |
| b   | 0.60        | 0.75 | 0.89 | 0.024  | 0.030 | 0.035 |
| b1  | 2.90        | 3.06 | 3.20 | 0.115  | 0.121 | 0.126 |
| c   | 0.24        | 0.29 | 0.35 | 0.009  | 0.012 | 0.014 |
| D   | 6.30        | 6.50 | 6.70 | 0.249  | 0.256 | 0.263 |
| E   | 3.30        | 3.50 | 3.70 | 0.130  | 0.138 | 0.145 |
| e   | 2.20        | 2.30 | 2.40 | 0.087  | 0.091 | 0.094 |
| e1  | 0.85        | 0.94 | 1.05 | 0.033  | 0.037 | 0.041 |
| L   | 0.20        | ---  | ---  | 0.008  | ---   | ---   |
| L1  | 1.50        | 1.75 | 2.00 | 0.060  | 0.069 | 0.078 |
| HE  | 6.70        | 7.00 | 7.30 | 0.264  | 0.276 | 0.287 |
| θ   | 0°          | -    | 10°  | 0°     | -     | 10°   |

STYLE 1:

- PIN 1. BASE
- COLLECTOR
- EMITTER
- COLLECTOR

### SOLDERING 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.

ON Semiconductor and are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

### PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor  
P.O. Box 5163, Denver, Colorado 80217 USA  
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
Email: [orderlit@onsemi.com](mailto:orderlit@onsemi.com)

N. American Technical Support: 800-282-9855 Toll Free  
USA/Canada  
Europe, Middle East and Africa Technical Support:  
Phone: 421 33 790 2910  
Japan Customer Focus Center  
Phone: 81-3-5817-1050

ON Semiconductor Website: [www.onsemi.com](http://www.onsemi.com)

Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative

## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

 [View PZT2907AT1G on WIN SOURCE](#)

 [ON Semiconductor](#) Information

## Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management