

# PZT2907AT1, SPZT2907AT1G

Preferred Device

## 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.
- AEC-Q101 Qualified and PPAP Capable
- S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- Pb-Free Packages are Available\*

### 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

### THERMAL CHARACTERISTICS

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

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.

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.

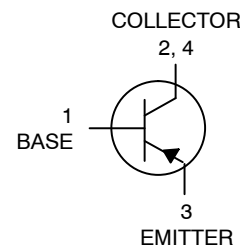


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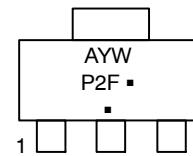
<http://onsemi.com>



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 <sup>†</sup>
PZT2907AT1	SOT-223	1,000 / Tape & Reel
PZT2907AT1G	SOT-223 (Pb-Free)	1,000 / Tape & Reel
SPZT2907AT1G	SOT-223 (Pb-Free)	1,000 / Tape & Reel
PZT2907AT3	SOT-223	4,000 / Tape & Reel
PZT2907AT3G	SOT-223 (Pb-Free)	4,000 / 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.

**Preferred** devices are recommended choices for future use and best overall value.

# PZT2907AT1, SPZT2907AT1G

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector-Base Breakdown Voltage ( $I_C = -10 \mu\text{Adc}$ , $I_E = 0$ )	$V_{(BR)CBO}$	-60	-	-	Vdc
Collector-Emitter Breakdown Voltage ( $I_C = 10 \text{ mAdc}$ , $I_B = 0$ )	$V_{(BR)CEO}$	-60	-	-	Vdc
Emitter-Base Breakdown Voltage ( $I_E = -10 \mu\text{Adc}$ , $I_C = 0$ )	$V_{(BR)EBO}$	-5.0	-	-	Vdc
Collector-Base Cutoff Current ( $V_{CB} = -50 \text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	-	-	-10	nAdc
Collector-Emitter Cutoff Current ( $V_{CE} = -30 \text{ Vdc}$ , $V_{BE} = 0.5 \text{ Vdc}$ )	$I_{CEX}$	-	-	-50	nAdc
Base-Emitter Cutoff Current ( $V_{CE} = -30 \text{ Vdc}$ , $V_{BE} = -0.5 \text{ Vdc}$ )	$I_{BEX}$	-	-	-50	nAdc

## ON CHARACTERISTICS (Note 2)

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

## DYNAMIC CHARACTERISTICS

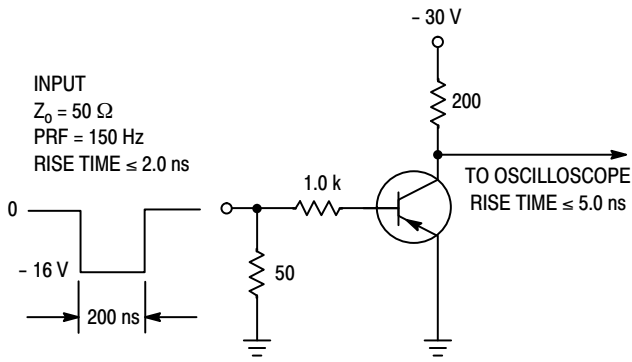
Current-Gain - Bandwidth Product ( $I_C = -50 \text{ mAdc}$ , $V_{CE} = -20 \text{ Vdc}$ , $f = 100 \text{ MHz}$ )	$f_T$	200	-	-	MHz
Output Capacitance ( $V_{CB} = -10 \text{ Vdc}$ , $I_E = 0$ , $f = 1.0 \text{ MHz}$ )	$C_C$	-	-	8.0	pF
Input Capacitance ( $V_{EB} = -2.0 \text{ Vdc}$ , $I_C = 0$ , $f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

## SWITCHING TIMES

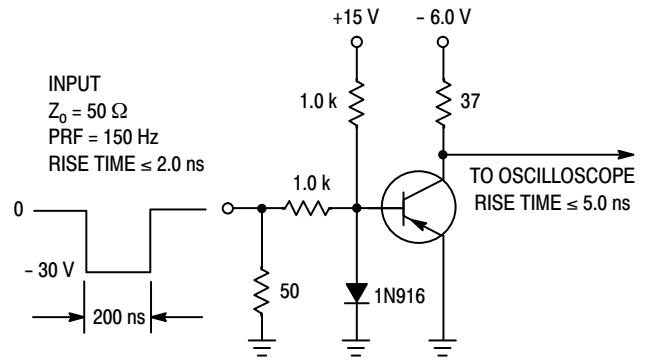
Turn-On Time	$(V_{CC} = -30 \text{ Vdc}$ , $I_C = -150 \text{ mAdc}$ , $I_{B1} = -15 \text{ mAdc}$ )	$t_{on}$	-	-	45	ns
Delay Time		$t_d$	-	-	10	
Rise Time		$t_r$	-	-	40	
Turn-Off Time	$(V_{CC} = -6.0 \text{ Vdc}$ , $I_C = -150 \text{ mAdc}$ , $I_{B1} = I_{B2} = -15 \text{ mAdc}$ )	$t_{off}$	-	-	100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

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

# PZT2907AT1, SPZT2907AT1G

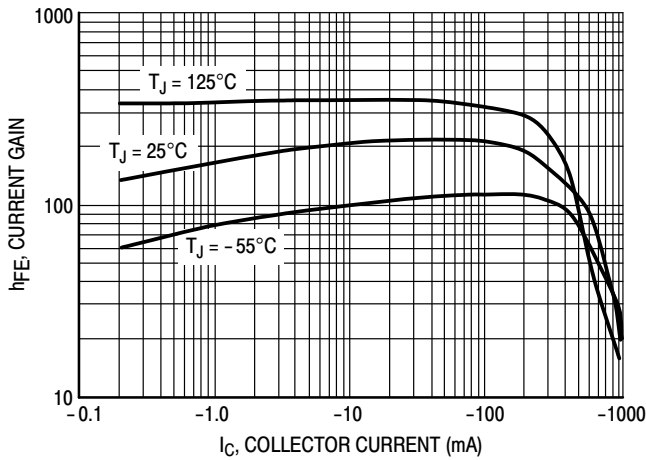


**Figure 1. Delay and Rise Time Test Circuit**

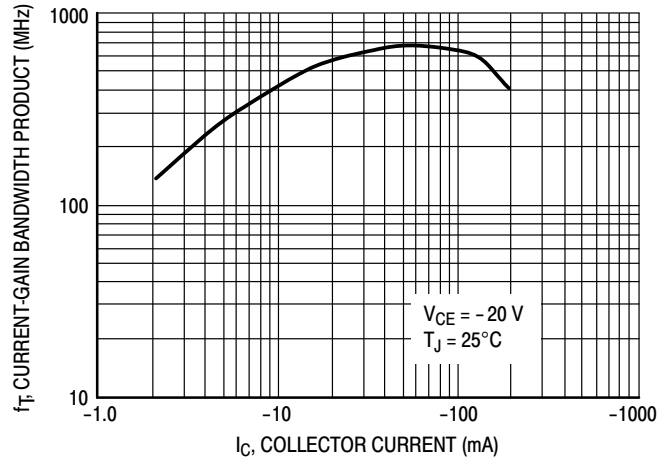


**Figure 2. Storage and Fall Time Test Circuit**

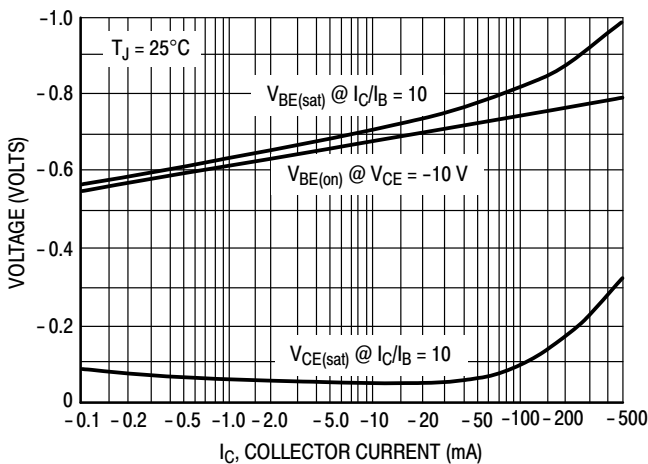
## TYPICAL ELECTRICAL CHARACTERISTICS



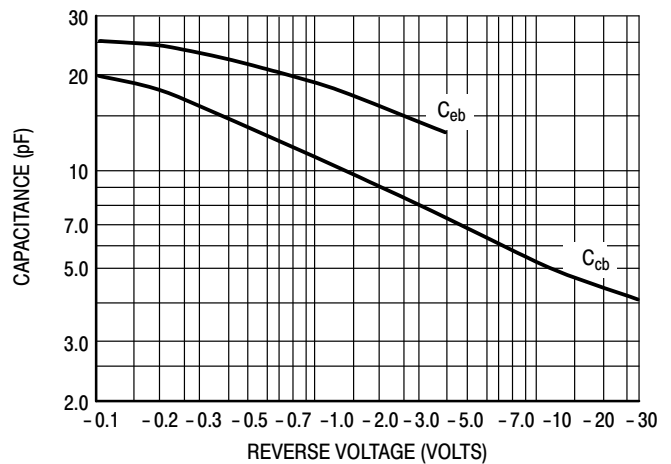
**Figure 3. DC Current Gain**



**Figure 4. Current Gain Bandwidth Product**



**Figure 5. "ON" Voltage**

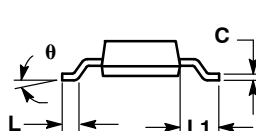
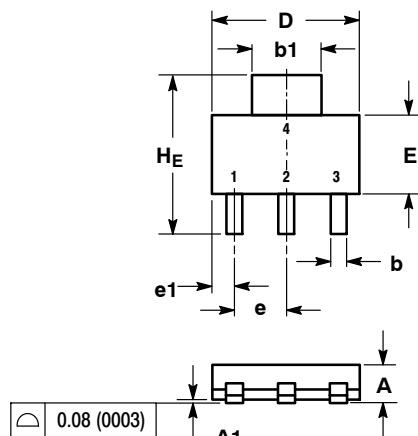


**Figure 6. Capacitances**

# PZT2907AT1, SPZT2907AT1G

## PACKAGE DIMENSIONS

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



NOTES:

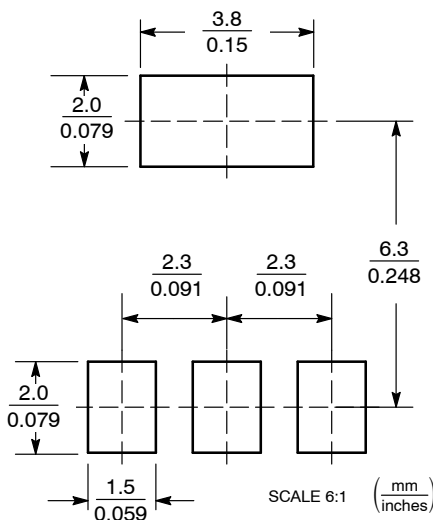
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCH.

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  
2. COLLECTOR  
3. EMITTER  
4. 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.

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