General Purpose Transistor
PNP Silicon

PZT3906T1G

Features

- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector−Emitter Voltage	V_{CEO}	−40	Vdc
Collector−Base Voltage	V_{CBO}	−40	Vdc
Emitter−Base Voltage	V_{EBO}	−5.0	Vdc
Collector Current − Continuous	I_C	−200	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation (Note 1) T_A = 25°C	P_D	1.5 12	W mW/°C
Thermal Resistance Junction−to−Ambient (Note 1)	$R_{\theta JA}$	83.3	°C/W
Thermal Resistance Junction−to−Lead #4	$R_{\theta JA}$	35	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−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. FR−4 with 1 oz and 713 mm^2 of copper area.

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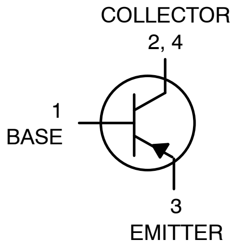
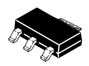
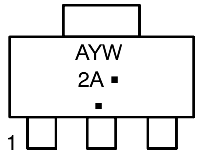




SOT−223
CASE 318E

MARKING DIAGRAM



2A = 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†
PZT3906T1G	SOT−223 (Pb−Free)	1000 / 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.

May, 2020 − Rev. 3

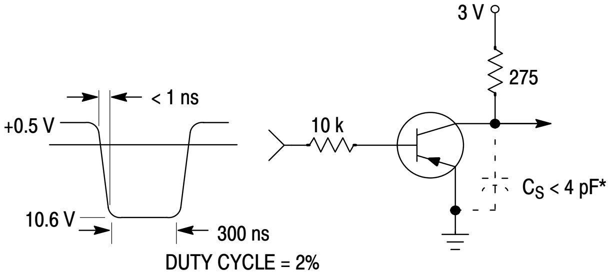
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

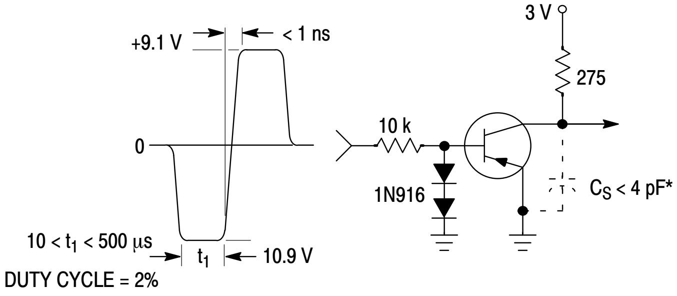
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS (Note 2)				
Collector – Emitter Breakdown Voltage (Note 2) (I_C = –1.0 mAdc, I_B = 0)	$V_{(BR)CEO}$	–40	–	Vdc
Collector – Base Breakdown Voltage (I_C = –10 μAdc, I_E = 0)	$V_{(BR)CBO}$	–40	–	
Emitter – Base Breakdown Voltage (I_E = –10 μAdc, I_C = 0)	$V_{(BR)EBO}$	–5.0	–	
Base Cutoff Current (V_{CE} = –30 Vdc, V_{EB} = –3.0 Vdc)	I_{BL}	–	–50	nAdc
Collector Cutoff Current (V_{CE} = –30 Vdc, V_{EB} = –3.0 Vdc)	I_{CEX}	–	–50	
ON CHARACTERISTICS (Note 2)				
DC Current Gain (I_C = –0.1 mAdc, V_{CE} = –1.0 Vdc) (I_C = –1.0 mAdc, V_{CE} = –1.0 Vdc) (I_C = –10 mAdc, V_{CE} = –1.0 Vdc) (I_C = –50 mAdc, V_{CE} = –1.0 Vdc) (I_C = –100 mAdc, V_{CE} = –1.0 Vdc)	H_{FE}	 60 80 100 60 30	 – – 300 – –	–
Collector – Emitter Saturation Voltage (I_C = –10 mAdc, I_B = –1.0 mAdc) (I_C = –50 mAdc, I_B = –5.0 mAdc)	$V_{CE(sat)}$	 – –	 –0.25 –0.4	Vdc
Base – Emitter Saturation Voltage (I_C = –10 mAdc, I_B = –1.0 mAdc) (I_C = –50 mAdc, I_B = –5.0 mAdc)	$V_{BE(sat)}$	 –0.65 –	 –0.85 –0.95	
SMALL– SIGNAL CHARACTERISTICS				
Current – Gain – Bandwidth Product (I_C = –10 mAdc, V_{CE} = –20 Vdc, f = 100 MHz)	f_T	250	–	MHz
Output Capacitance (V_{CB} = –5.0 Vdc, I_E = 0, f = 1.0 MHz)	C_{obo}	–	4.5	pF
Input Capacitance (V_{EB} = –0.5 Vdc, I_C = 0, f = 1.0 MHz)	C_{ibo}	–	10	
Input Impedance (I_C = –1.0 mAdc, V_{CE} = –10 Vdc, f = 1.0 kHz)	h_{ie}	2.0	12	kΩ
Voltage Feedback Ratio (I_C = –1.0 mAdc, V_{CE} = –10 Vdc, f = 1.0 kHz)	h_{re}	0.1	10	X 10^{-4}
Small – Signal Current Gain (I_C = –1.0 mAdc, V_{CE} = –10 Vdc, f = 1.0 kHz)	h_{fe}	100	400	–
Output Admittance (I_C = –1.0 mAdc, V_{CE} = –10 Vdc, f = 1.0 kHz)	h_{oe}	3.0	60	μmhos
Noise Figure (I_C = –100 μAdc, V_{CE} = –5.0 Vdc, R_S = 1.0 kΩ, f = 1.0 kHz)	NF	–	4.0	dB

SWITCHING CHARACTERISTICS

Delay Time	(V_{CC} = –3.0 Vdc, V_{BE} = 0.5 Vdc, I_C = –10 mAdc, I_{B1} = –1.0 mAdc)	t_d	–	35	ns
Rise Time		t_r	–	35	
Storage Time	(V_{CC} = –3.0 Vdc, I_C = –10 mAdc, I_{B1} = I_{B2} = –1.0 mAdc)	t_s	–	225	
Fall Time		t_f	–	75	

2. Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.





* Total shunt capacitance of test jig and connectors

Figure 1. Delay and Rise Time Equivalent Test Circuit

Figure 2. Storage and Fall Time Equivalent Test Circuit

TYPICAL TRANSIENT CHARACTERISTICS

— $T_J = 25°C$
— — $T_J = 125°C$

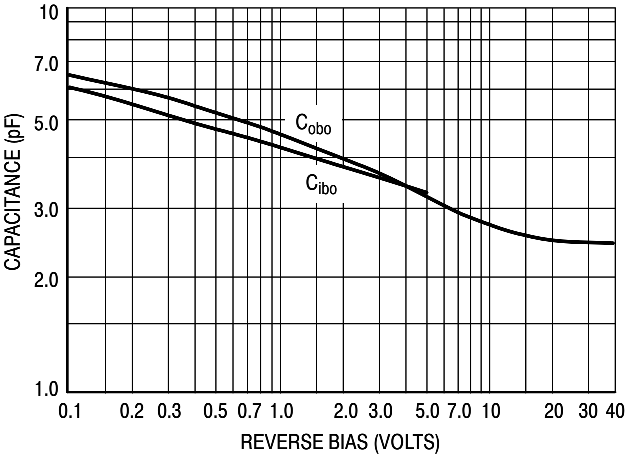


Figure 3. Capacitance

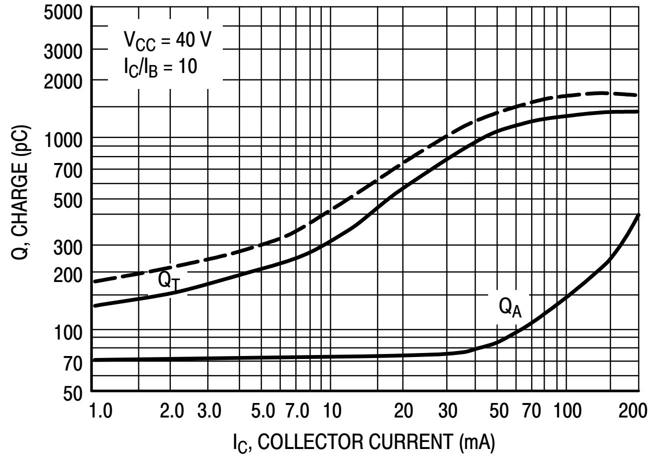


Figure 4. Charge Data

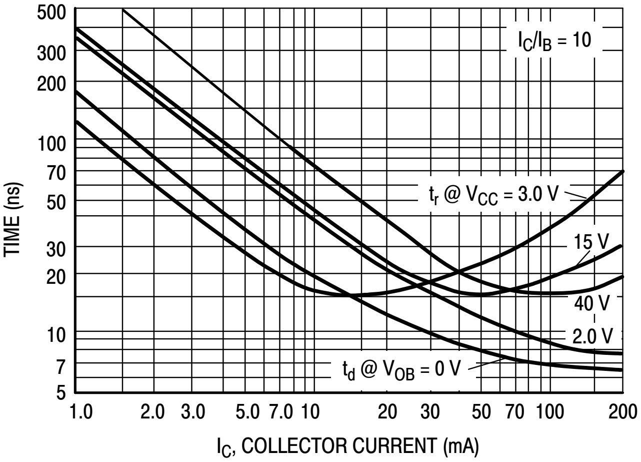


Figure 5. Turn−On Time

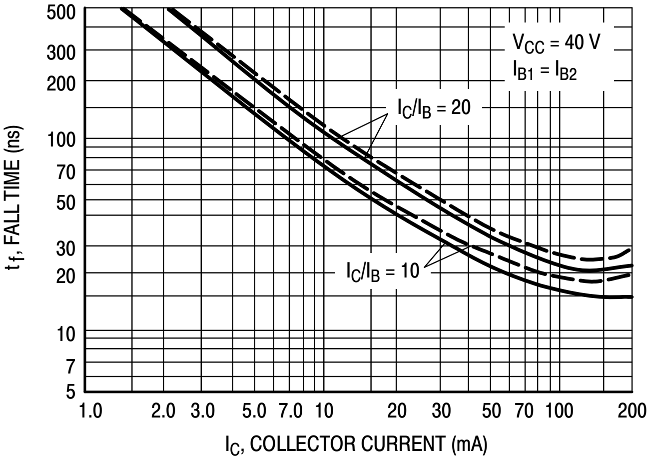


Figure 6. Fall Time

TYPICAL AUDIO SMALL−SIGNAL CHARACTERISTICS NOISE FIGURE VARIATIONS

($V_{CE} = -5.0$ Vdc, $T_A = 25°C$, Bandwidth = 1.0 Hz)

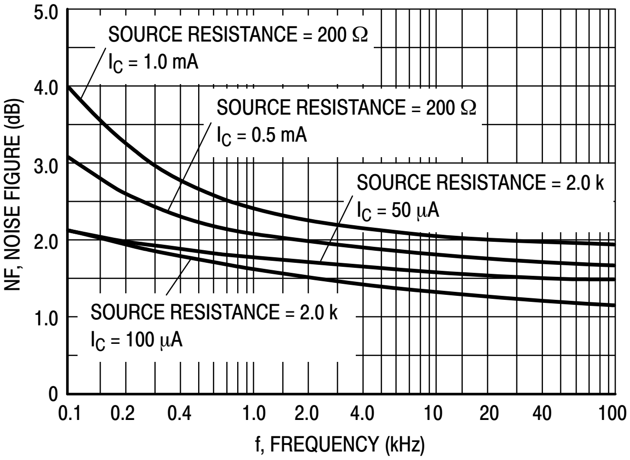


Figure 7.

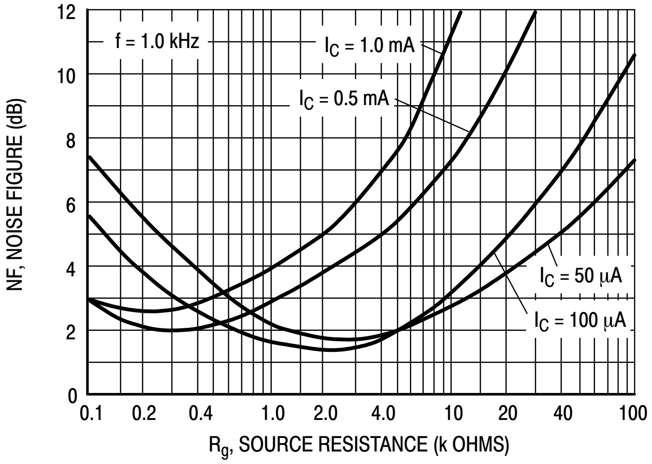


Figure 8.

h PARAMETERS

(V_{CE} = −10 Vdc, f = 1.0 kHz, T_A = 25°C)

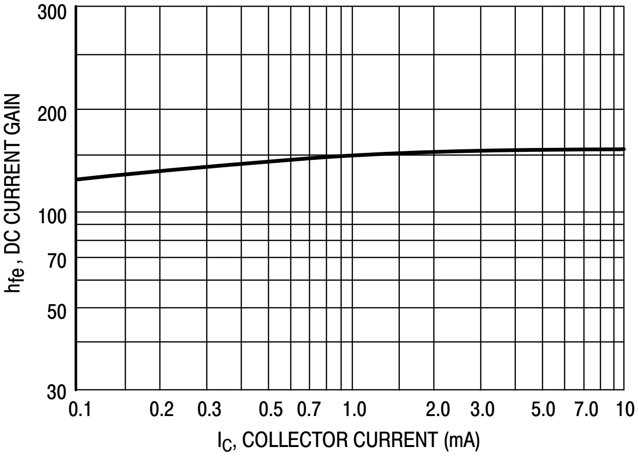


Figure 9. Current Gain

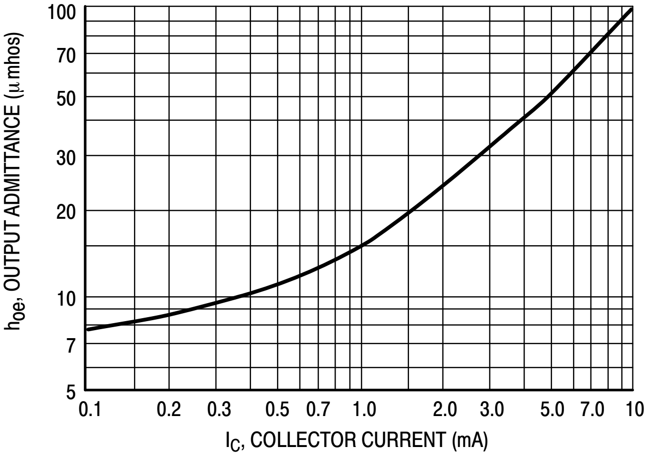


Figure 10. Output Admittance

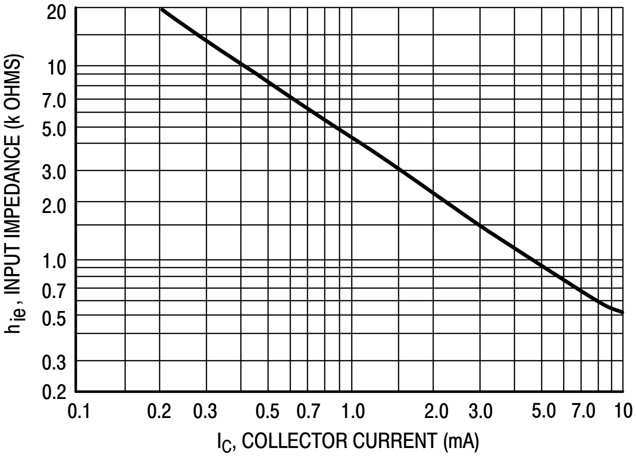


Figure 11. Input Impedance

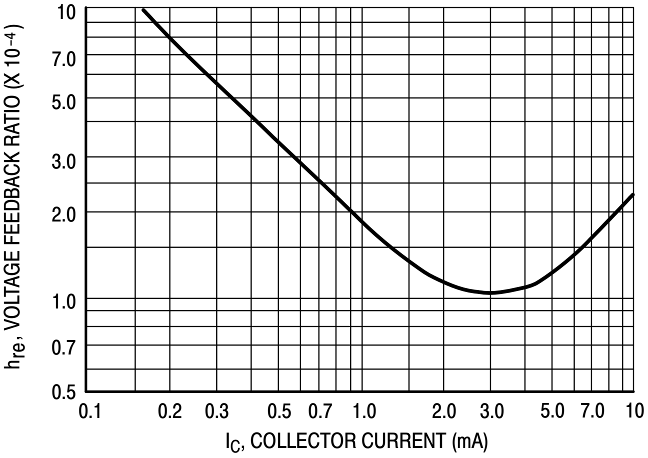


Figure 12. Voltage Feedback Ratio

TYPICAL STATIC CHARACTERISTICS

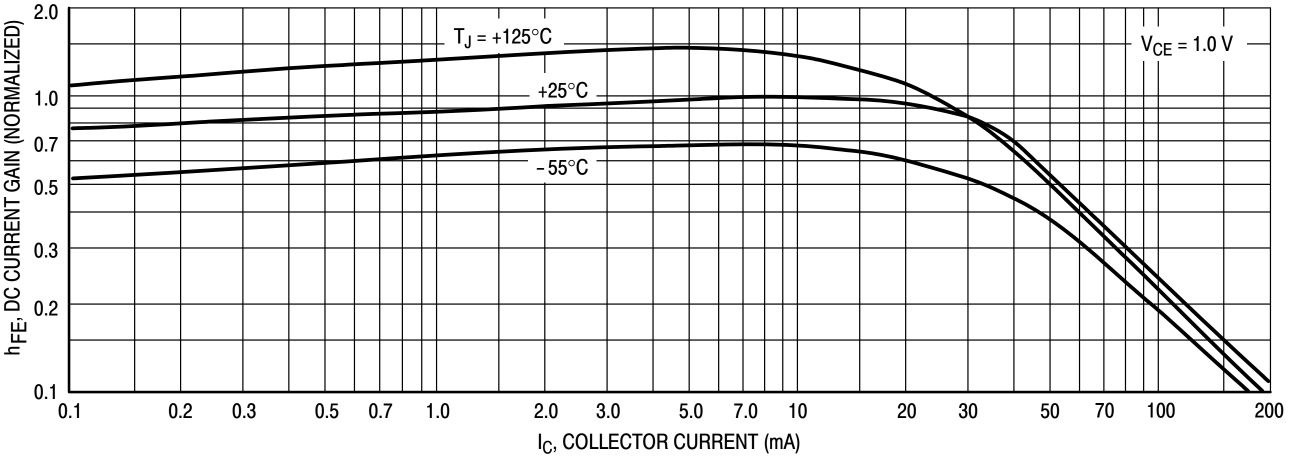


Figure 13. DC Current Gain

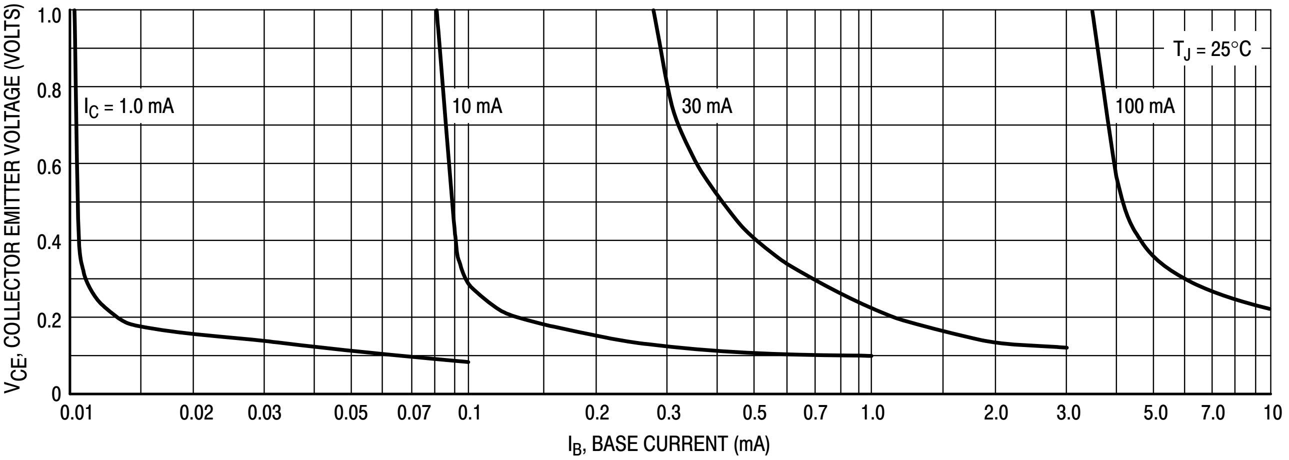


Figure 14. Collector Saturation Region

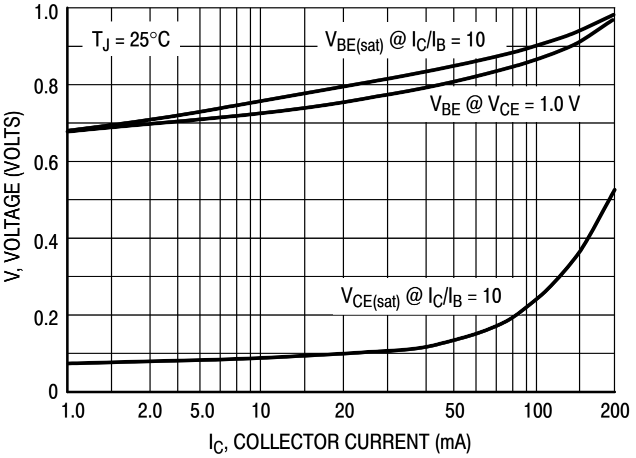


Figure 15. "ON" Voltages

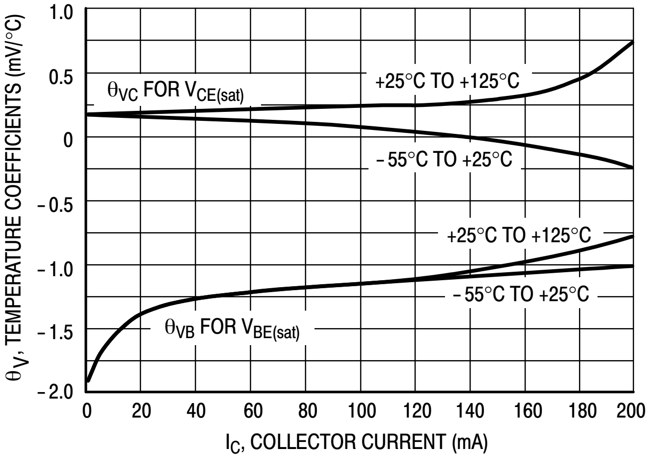


Figure 16. Temperature Coefficients

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