

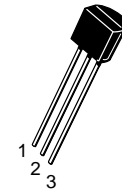
Amplifier Transistor

PNP Silicon

P2N2907A

MAXIMUM RATINGS

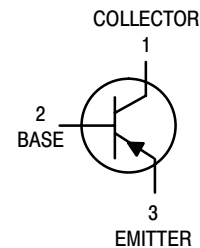
Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	–60	Vdc
Collector–Base Voltage	V_{CBO}	–60	Vdc
Emitter–Base Voltage	V_{EBO}	–5.0	Vdc
Collector Current — Continuous	I_C	–600	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	625 5.0	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.5 12	Watts mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–55 to +150	$^\circ\text{C}$



CASE 29–11, STYLE 17
TO–92 (TO–226AA)

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	200	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	83.3	$^\circ\text{C/W}$



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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage ⁽¹⁾ ($I_C = -10$ mAdc, $I_E = 0$)	$V_{(BR)CEO}$	–60	—	Vdc
Collector–Base Breakdown Voltage ($I_C = -10$ μ Adc, $I_E = 0$)	$V_{(BR)CBO}$	–60	—	Vdc
Emitter–Base Breakdown Voltage ($I_E = -10$ μ Adc, $I_C = 0$)	$V_{(BR)EBO}$	–5.0	—	Vdc
Collector Cutoff Current ($V_{CE} = -30$ Vdc, $V_{EB(off)} = -0.5$ Vdc)	I_{CEX}	—	–50	nAdc
Collector Cutoff Current ($V_{CB} = -50$ Vdc, $I_E = 0$) ($V_{CB} = -50$ Vdc, $I_E = 0$, $T_A = 150^\circ\text{C}$)	I_{CBO}	— —	–0.01 –10	μ Adc
Emitter Cutoff Current ($V_{EB} = -3.0$ Vdc)	I_{EBO}	—	–10	nAdc
Collector Cutoff Current ($V_{CE} = -10$ V)	I_{CEO}	—	–10	nAdc
Base Cutoff Current ($V_{CE} = -30$ Vdc, $V_{EB(off)} = -0.5$ Vdc)	I_{BEX}	—	–50	nAdc

1. Pulse Test: Pulse Width ≤ 300 μ s, Duty Cycle $\leq 2.0\%$.

P2N2907A

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

Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS				
DC Current Gain ($I_C = -0.1 \text{ mAdc}$, $V_{CE} = -10 \text{ Vdc}$) ($I_C = -1.0 \text{ mAdc}$, $V_{CE} = -10 \text{ Vdc}$) ($I_C = -10 \text{ mAdc}$, $V_{CE} = -10 \text{ Vdc}$) ($I_C = -150 \text{ mAdc}$, $V_{CE} = -10 \text{ Vdc}$) ⁽¹⁾ ($I_C = -500 \text{ mAdc}$, $V_{CE} = -10 \text{ Vdc}$) ⁽¹⁾	h_{FE}	75 100 100 100 50	— — — 300 —	—
Collector–Emitter Saturation Voltage ⁽¹⁾ ($I_C = -150 \text{ mAdc}$, $I_B = -15 \text{ mAdc}$) ($I_C = -500 \text{ mAdc}$, $I_B = -50 \text{ mAdc}$)	$V_{CE(sat)}$	— —	-0.4 -1.6	Vdc
Base–Emitter Saturation Voltage ⁽¹⁾ ($I_C = -150 \text{ mAdc}$, $I_B = -15 \text{ mAdc}$) ($I_C = -500 \text{ mAdc}$, $I_B = -50 \text{ mAdc}$)	$V_{BE(sat)}$	— —	-1.3 -2.6	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product ^{(1), (2)} ($I_C = -50 \text{ mAdc}$, $V_{CE} = -20 \text{ Vdc}$, $f = 100 \text{ MHz}$)	f_T	200	—	MHz
Output Capacitance ($V_{CB} = -10 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$)	C_{obo}	—	8.0	pF
Input Capacitance ($V_{EB} = -2.0 \text{ Vdc}$, $I_C = 0$, $f = 1.0 \text{ MHz}$)	C_{ibo}	—	30	pF

SWITCHING CHARACTERISTICS

Turn–On Time	$(V_{CC} = -30 \text{ Vdc}$, $I_C = -150 \text{ mAdc}$, $I_{B1} = -15 \text{ mAdc}$) (Figures 1 and 5)	t_{on}	—	50	ns
Delay Time		t_d	—	10	ns
Rise Time		t_r	—	40	ns
Turn–Off Time	$(V_{CC} = -6.0 \text{ Vdc}$, $I_C = -150 \text{ mAdc}$, $I_{B1} = I_{B2} = -15 \text{ mAdc}$) (Figure 2)	t_{off}	—	110	ns
Storage Time		t_s	—	80	ns
Fall Time		t_f	—	30	ns

1. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.
2. f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

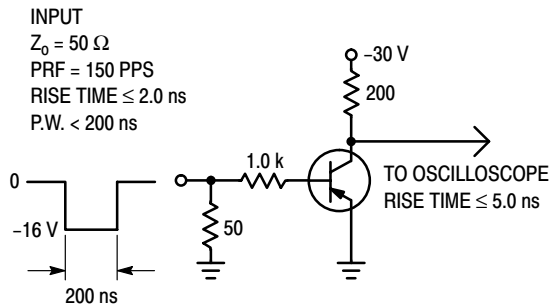


Figure 1. Delay and Rise Time Test Circuit

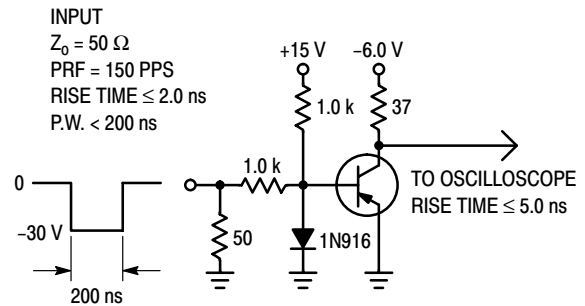


Figure 2. Storage and Fall Time Test Circuit

P2N2907A

TYPICAL CHARACTERISTICS

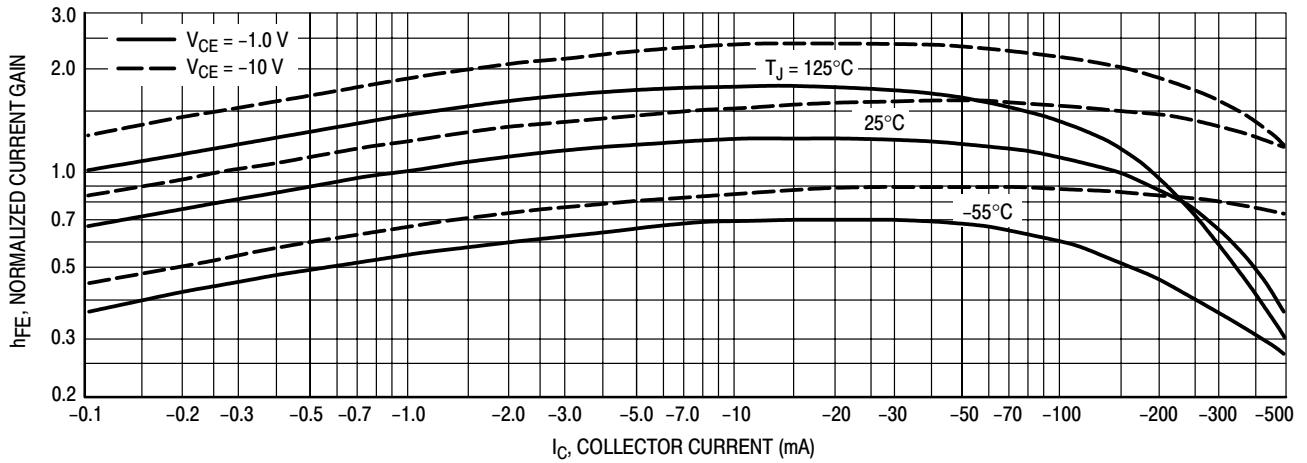


Figure 3. DC Current Gain

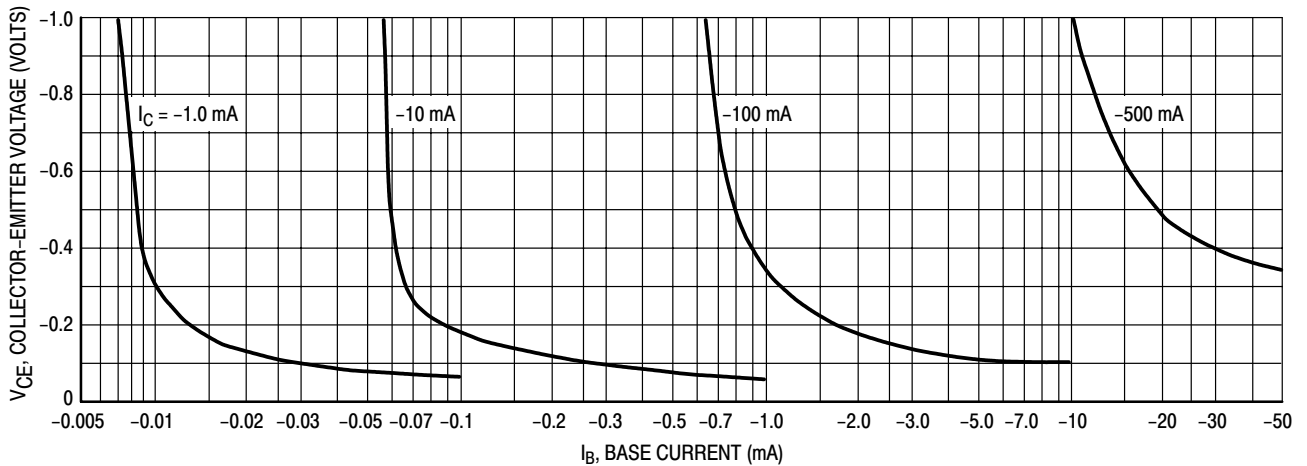


Figure 4. Collector Saturation Region

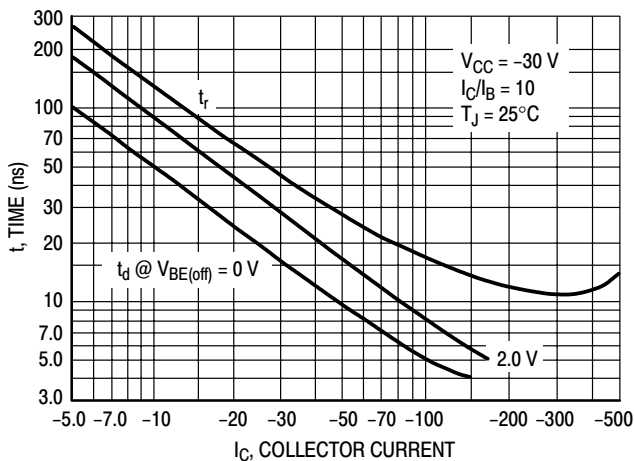


Figure 5. Turn-On Time

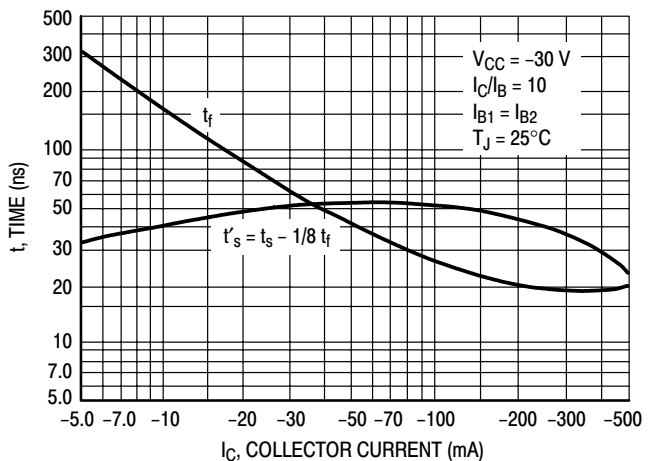


Figure 6. Turn-Off Time

P2N2907A

TYPICAL SMALL-SIGNAL CHARACTERISTICS

NOISE FIGURE

$V_{CE} = 10 \text{ Vdc}$, $T_A = 25^\circ\text{C}$

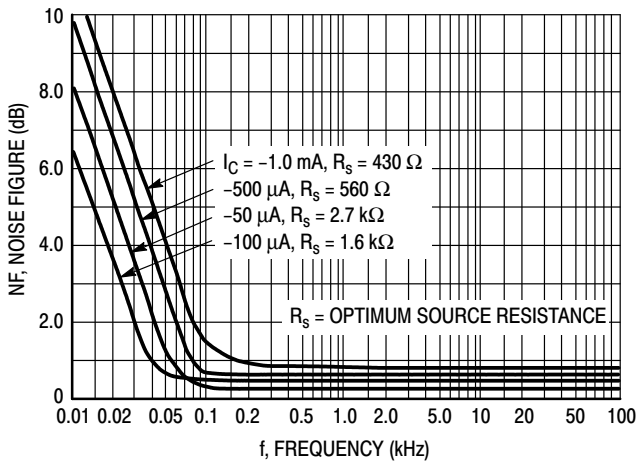


Figure 7. Frequency Effects

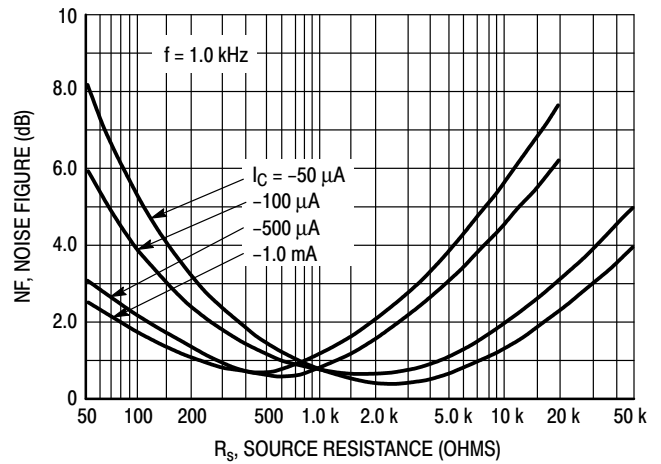


Figure 8. Source Resistance Effects

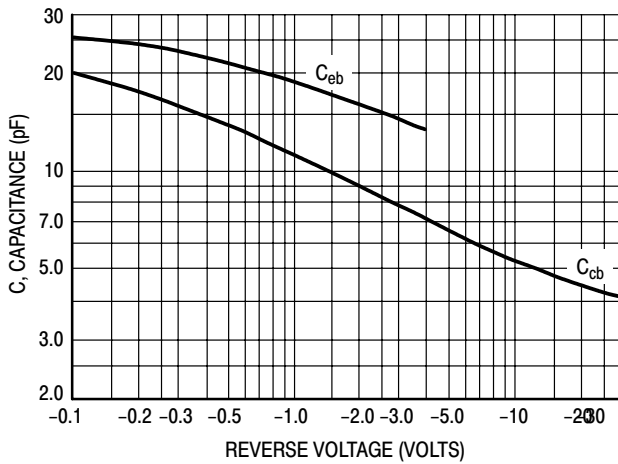


Figure 9. Capacitances

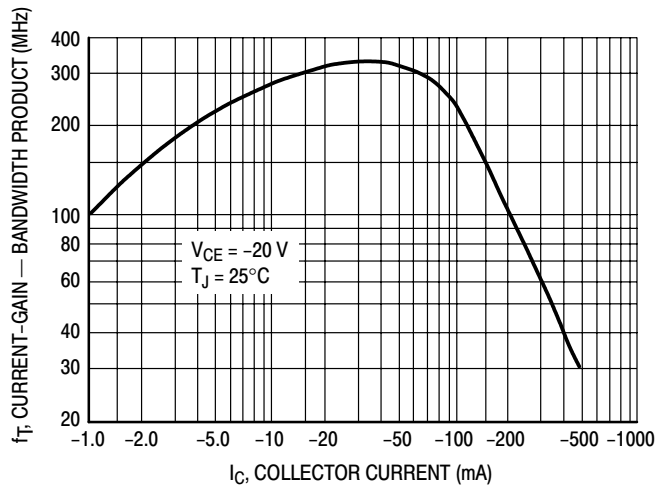


Figure 10. Current-Gain — Bandwidth Product

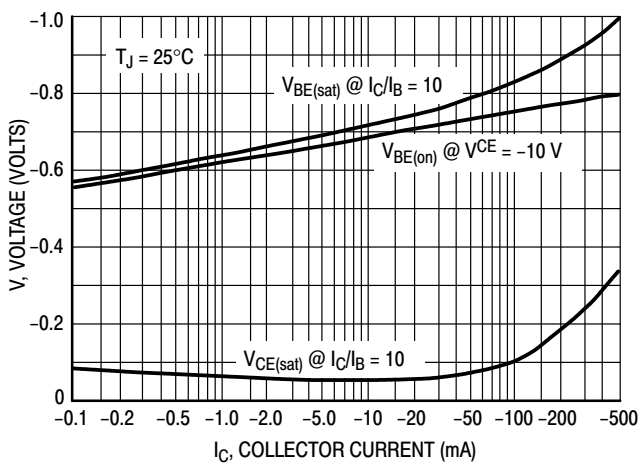


Figure 11. "On" Voltage

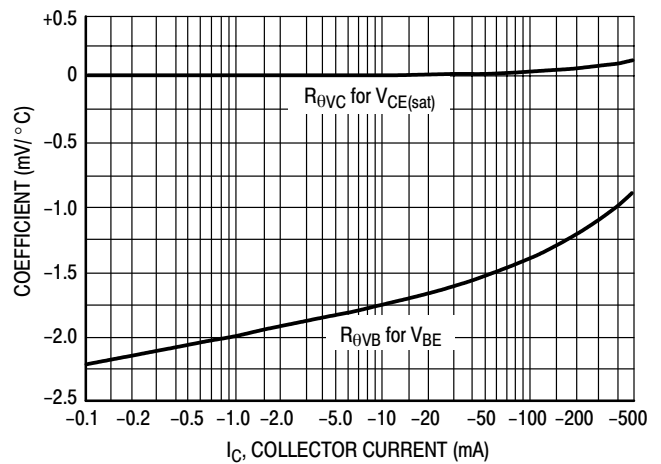
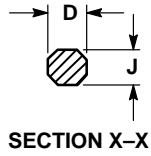
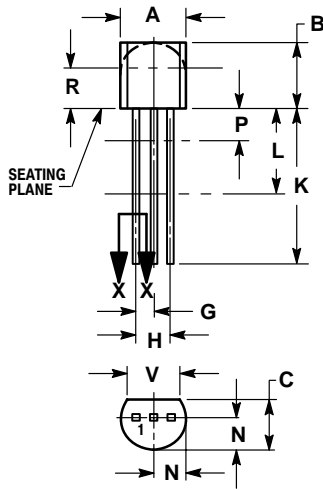


Figure 12. Temperature Coefficients

P2N2907A

PACKAGE DIMENSIONS

TO-92 (TO-226)
CASE 29-11
ISSUE AL



SECTION X-X

STYLE 1:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.115	---	2.93	---
V	0.135	---	3.43	---

Notes



Notes



P2N2907A