P2N2907A

Amplifier Transistor

PNP Silicon

Features

- These are Pb-Free Devices*

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°C Derate above 25°C	P_D	625 5.0	mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	1.5 12	W mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

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

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.

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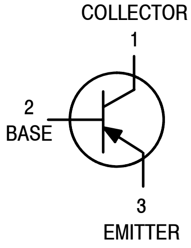
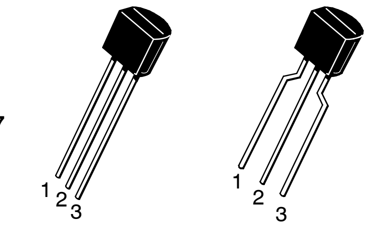


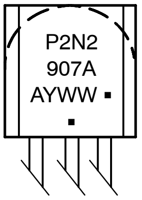
TO-92
CASE 29
STYLE 17



STRAIGHT LEAD
BULK PACK

BENT LEAD
TAPE & REEL
AMMO PACK

MARKING DIAGRAM



A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb-Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
P2N2907AG	TO-92 (Pb-Free)	5000 Units / Bulk
P2N2907ARL1G	TO-92 (Pb-Free)	2000 / 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.

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

April, 2007 - Rev. 6

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (Note 1) (I_C = -10 mAdc, I_B = 0)	$V_{(BR)CEO}$	-60	-	Vdc
Collector-Base Breakdown Voltage (I_C = -10 μAdc, I_E = 0)	$V_{(BR)CBO}$	-60	-	Vdc
Emitter-Base Breakdown Voltage (I_E = -10 μAdc, 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°C)	I_{CBO}	- -	-0.01 -10	μAdc
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
ON CHARACTERISTICS				
DC Current Gain (I_C = -0.1 mAdc, V_{CE} = -10 Vdc) (I_C = -1.0 mAdc, V_{CE} = -10 Vdc) (I_C = -10 mAdc, V_{CE} = -10 Vdc) (I_C = -150 mAdc, V_{CE} = -10 Vdc) (Note 1) (I_C = -500 mAdc, V_{CE} = -10 Vdc) (Note 1)	h_{FE}	75 100 100 100 50	- - - 300 -	-
Collector-Emitter Saturation Voltage (Note 1) (I_C = -150 mAdc, I_B = -15 mAdc) (I_C = -500 mAdc, I_B = -50 mAdc)	$V_{CE(sat)}$	- -	-0.4 -1.6	Vdc
Base-Emitter Saturation Voltage (Note 1) (I_C = -150 mAdc, I_B = -15 mAdc) (I_C = -500 mAdc, I_B = -50 mAdc)	$V_{BE(sat)}$	- -	-1.3 -2.6	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain - Bandwidth Product (Notes 1 and 2) (I_C = -50 mAdc, V_{CE} = -20 Vdc, f = 100 MHz)	f_T	200	-	MHz
Output Capacitance (V_{CB} = -10 Vdc, I_E = 0, f = 1.0 MHz)	C_{obo}	-	8.0	pF
Input Capacitance (V_{EB} = -2.0 Vdc, I_C = 0, f = 1.0 MHz)	C_{ibo}	-	30	pF

SWITCHING CHARACTERISTICS

Turn-On Time	(V_{CC} = -30 Vdc, I_C = -150 mAdc, I_{B1} = -15 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 Vdc, I_C = -150 mAdc, I_{B1} = I_{B2} = -15 mAdc) (Figure 2)	t_{off}	-	110	ns
Storage Time		t_s	-	80	ns
Fall Time		t_f	-	30	ns

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

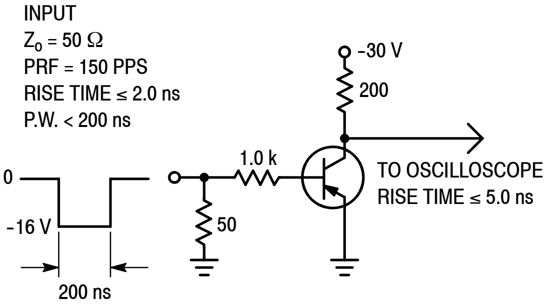


Figure 1. Delay and Rise Time Test Circuit

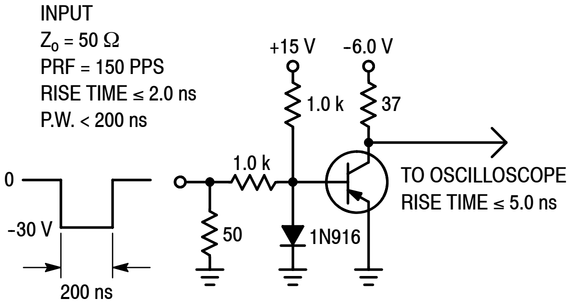


Figure 2. Storage and Fall Time Test Circuit

TYPICAL CHARACTERISTICS

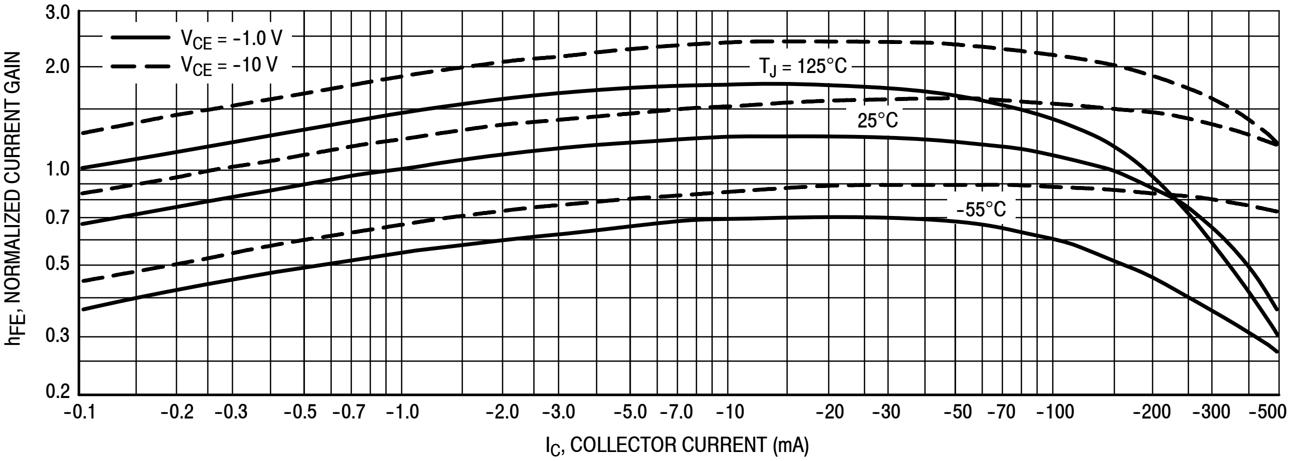


Figure 3. DC Current Gain

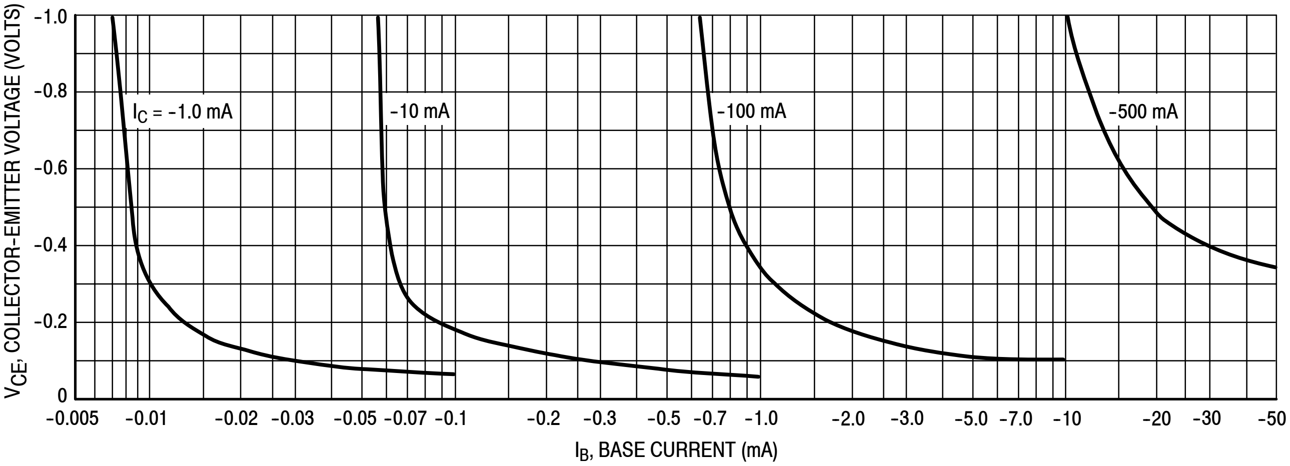


Figure 4. Collector Saturation Region

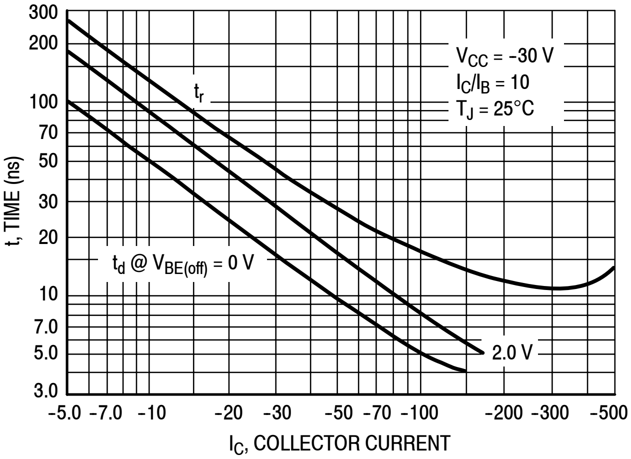


Figure 5. Turn-On Time

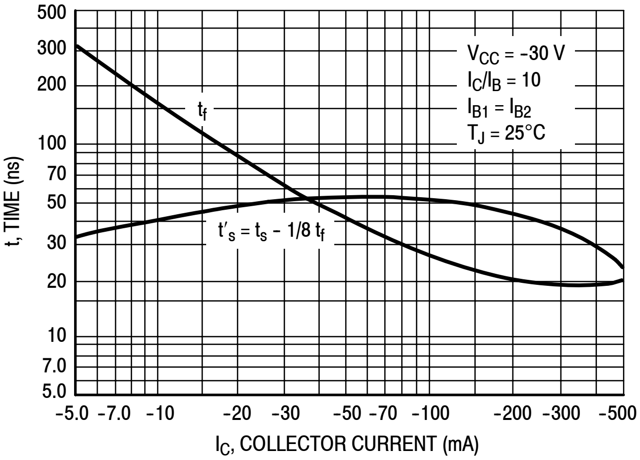


Figure 6. Turn-Off Time

TYPICAL SMALL-SIGNAL CHARACTERISTICS

NOISE FIGURE

V_{CE} = 10 Vdc, T_A = 25°C

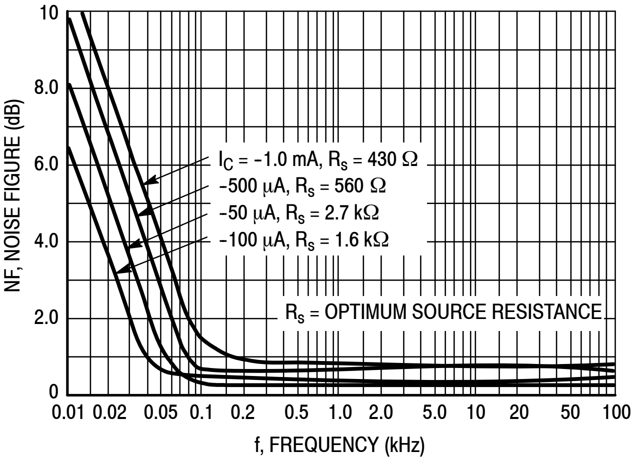


Figure 7. Frequency Effects

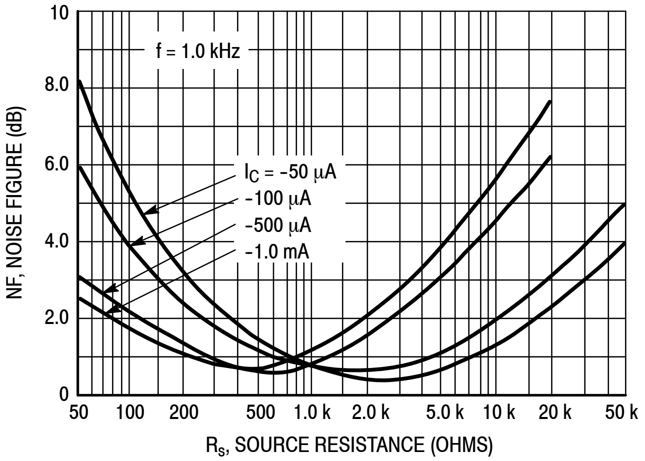


Figure 8. Source Resistance Effects

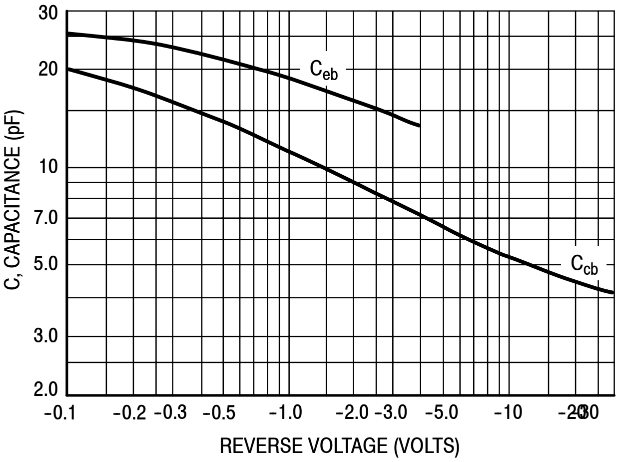


Figure 9. Capacitances

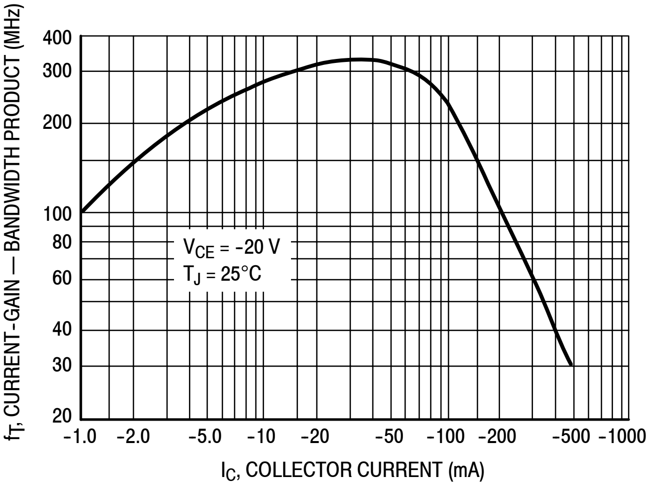


Figure 10. Current-Gain - Bandwidth Product

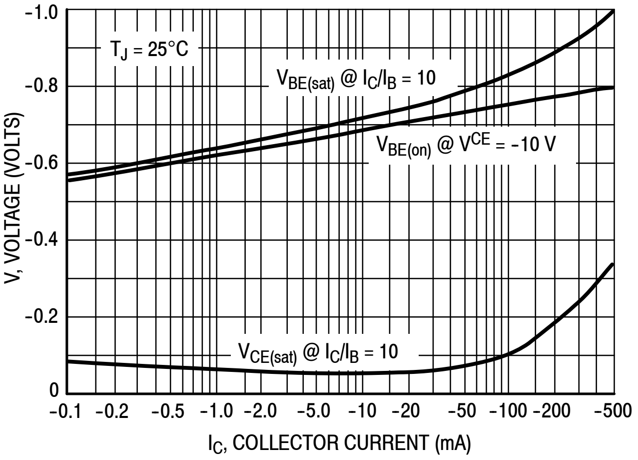


Figure 11. “On” Voltage

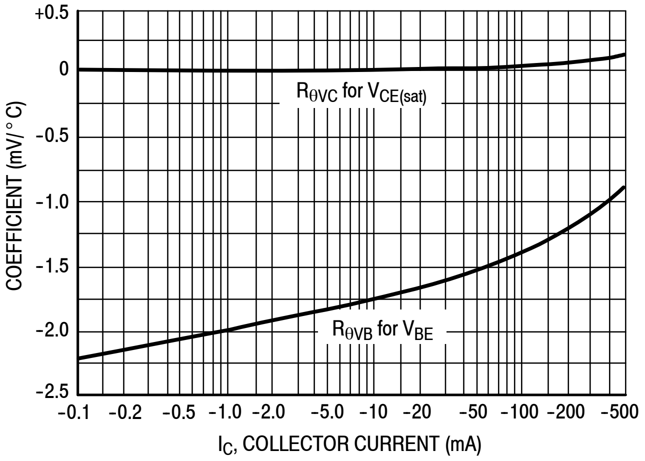
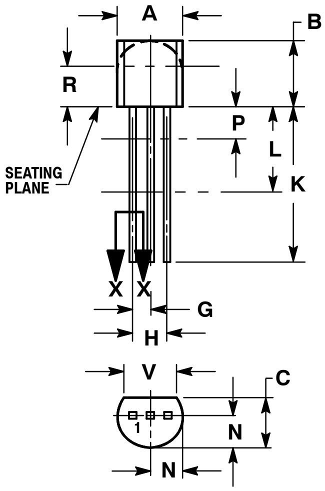


Figure 12. Temperature Coefficients

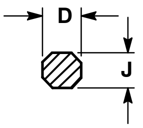
PACKAGE DIMENSIONS

TO-92 (TO-226)

CASE 29-11
ISSUE AM



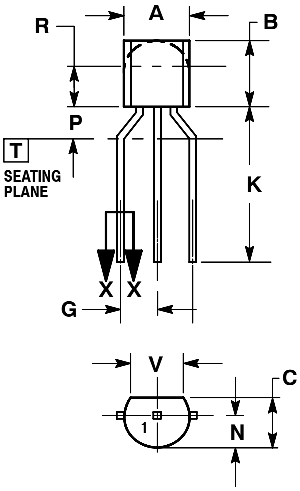
STRAIGHT LEAD
BULK PACK



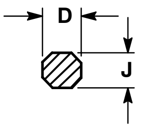
SECTION X-X

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.

	INCHES		MILLIMETERS	
DIM	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	---



BENT LEAD
TAPE & REEL
AMMO PACK



SECTION X-X

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

	MILLIMETERS	
DIM	MIN	MAX
A	4.45	5.20
B	4.32	5.33
C	3.18	4.19
D	0.40	0.54
G	2.40	2.80
J	0.39	0.50
K	12.70	---
N	2.04	2.66
P	1.50	4.00
R	2.93	---
V	3.43	---

STYLE 17:
PIN 1. COLLECTOR
2. BASE
3. EMITTER

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