

PN2907A

Preferred Device

General Purpose Transistor

PNP Silicon



ON Semiconductor™

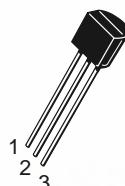
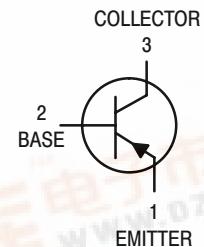
<http://onsemi.com>

MAXIMUM RATINGS

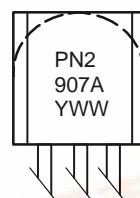
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	-60	Vdc
Collector-Base Voltage	V_{CBO}	-60	Vdc
Emitter-Base Voltage	V_{EBO}	-5.0	Vdc
Collector Current – Continuous	I_C	-600	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	625 5.0	mW mW/°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.5 12	Watts 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

TO-92
CASE 29
STYLE 1

MARKING DIAGRAM

PN2907A = Device Code
Y = Year
WW = Work Week

ORDERING INFORMATION

Device	Package	Shipping
PN2907A	TO-92	5000 Units/Box
PN2907ARLRA	TO-92	2000/Tape & Reel

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

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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 (Note 1.) ($I_C = -10 \text{ mA}_\text{dc}$, $I_B = 0$)	$V_{(\text{BR})\text{CEO}}$	-60	-	Vdc
Collector-Base Breakdown Voltage ($I_C = -10 \mu\text{A}_\text{dc}$, $I_E = 0$)	$V_{(\text{BR})\text{CBO}}$	-60	-	Vdc
Emitter-Base Breakdown Voltage ($I_E = -10 \mu\text{A}_\text{dc}$, $I_C = 0$)	$V_{(\text{BR})\text{EBO}}$	-5.0	-	Vdc
Collector Cutoff Current ($V_{CE} = -30 \text{ Vdc}$, $V_{EB(\text{off})} = -0.5 \text{ Vdc}$)	I_{CEX}	-	-50	nA_dc
Collector Cutoff Current ($V_{CB} = -50 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = -50 \text{ Vdc}$, $I_E = 0$, $T_A = 150^\circ\text{C}$)	I_{CBO}	-	-0.01 -10	μA_dc
Base Current ($V_{CE} = -30 \text{ Vdc}$, $V_{EB(\text{off})} = -0.5 \text{ Vdc}$)	I_B	-	-50	nA_dc

ON CHARACTERISTICS

DC Current Gain ($I_C = -0.1 \text{ mA}_\text{dc}$, $V_{CE} = -10 \text{ Vdc}$) ($I_C = -1.0 \text{ mA}_\text{dc}$, $V_{CE} = -10 \text{ Vdc}$) ($I_C = -10 \text{ mA}_\text{dc}$, $V_{CE} = -10 \text{ Vdc}$) ($I_C = -150 \text{ mA}_\text{dc}$, $V_{CE} = -10 \text{ Vdc}$) (Note 1.) ($I_C = -500 \text{ mA}_\text{dc}$, $V_{CE} = -10 \text{ Vdc}$) (Note 1.)	h_{FE}	75 100 100 100 50	-	-
Collector-Emitter Saturation Voltage (Note 1.) ($I_C = -150 \text{ mA}_\text{dc}$, $I_B = -15 \text{ mA}_\text{dc}$) ($I_C = -500 \text{ mA}_\text{dc}$, $I_B = -50 \text{ mA}_\text{dc}$)	$V_{CE(\text{sat})}$	- -	-0.4 -1.6	Vdc
Base-Emitter Saturation Voltage (Note 1.) ($I_C = -150 \text{ mA}_\text{dc}$, $I_B = -15 \text{ mA}_\text{dc}$) ($I_C = -500 \text{ mA}_\text{dc}$, $I_B = -50 \text{ mA}_\text{dc}$)	$V_{BE(\text{sat})}$	- -	-1.3 -2.6	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current-Gain – Bandwidth Product (Notes 1. and 2.), ($I_C = -50 \text{ mA}_\text{dc}$, $V_{CE} = -20 \text{ Vdc}$, $f = 100 \text{ MHz}$)	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	$(V_{CC} = -30 \text{ Vdc}$, $I_C = -150 \text{ mA}_\text{dc}$, $I_{B1} = -15 \text{ mA}_\text{dc}$) (Figures 1 and 5)	t_{on}	-	45	ns
Delay Time		t_d	-	10	ns
Rise Time		t_r	-	40	ns
Turn-Off Time	$(V_{CC} = -6.0 \text{ Vdc}$, $I_C = -150 \text{ mA}_\text{dc}$, $I_{B1} = I_{B2} = 15 \text{ mA}_\text{dc}$) (Figure 2)	t_{off}	-	100	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 $\leq 2\%$.

2. f_T is defined as the frequency at which $|h_{\text{fe}}|$ extrapolates to unity.

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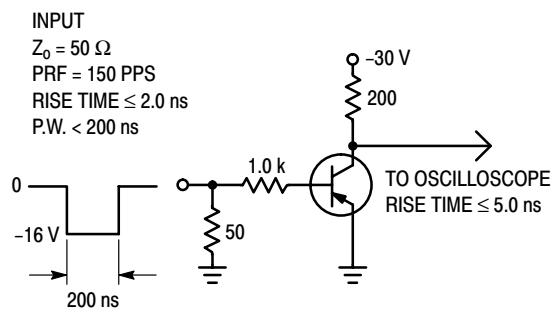


Figure 1. Delay and Rise Time Test Circuit

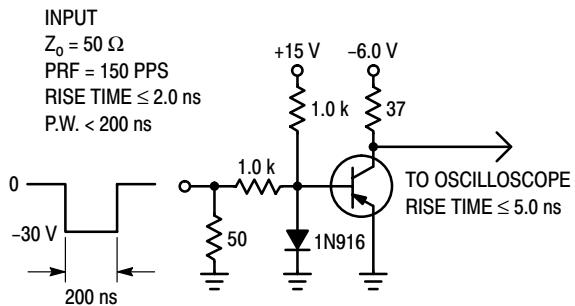


Figure 2. Storage and Fall Time Test Circuit

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TYPICAL CHARACTERISTICS

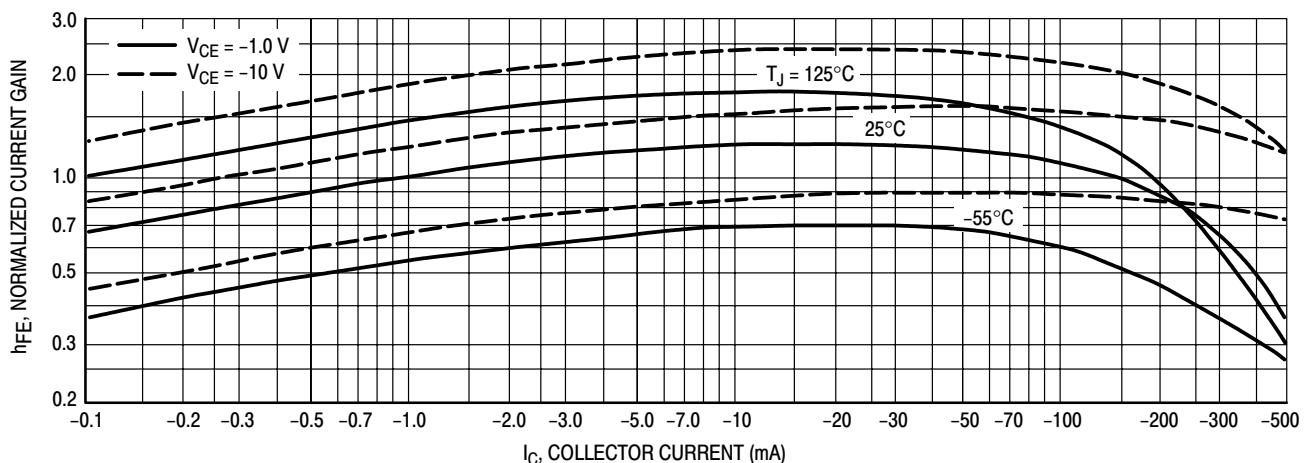


Figure 3. DC Current Gain

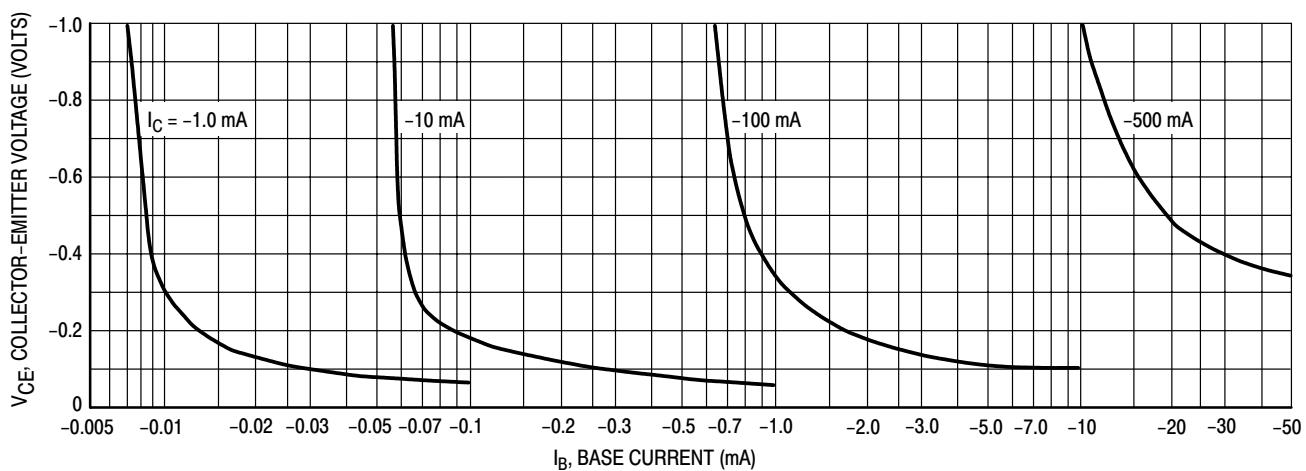


Figure 4. Collector Saturation Region

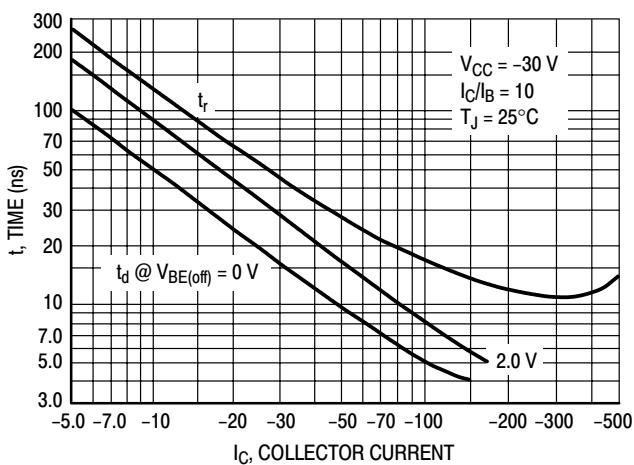


Figure 5. Turn-On Time

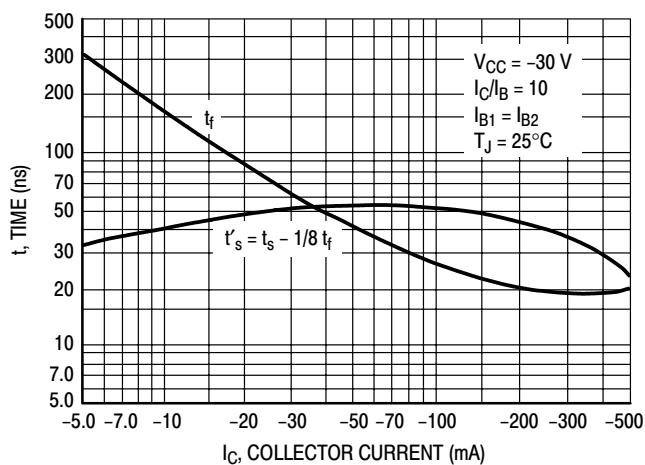


Figure 6. Turn-Off Time

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TYPICAL SMALL-SIGNAL CHARACTERISTICS NOISE FIGURE $V_{CE} = 10$ Vdc, $T_A = 25^\circ\text{C}$

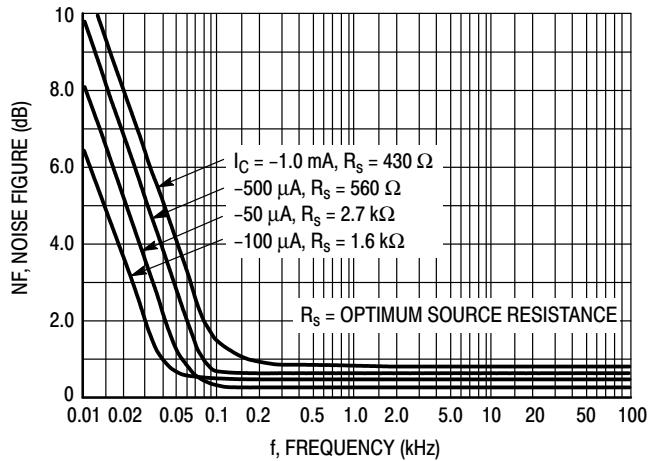


Figure 7. Frequency Effects

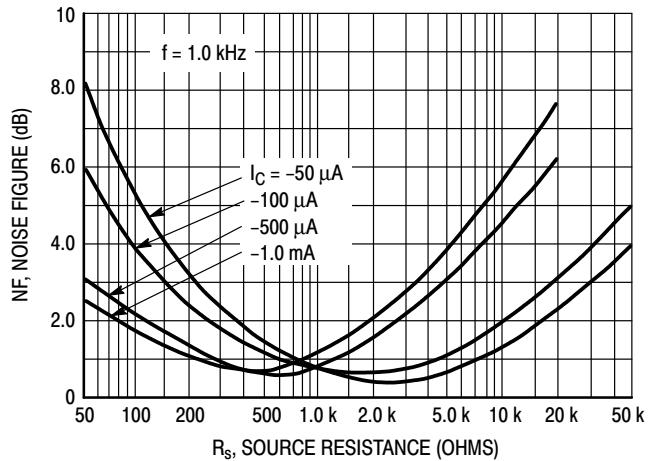


Figure 8. Source Resistance Effects

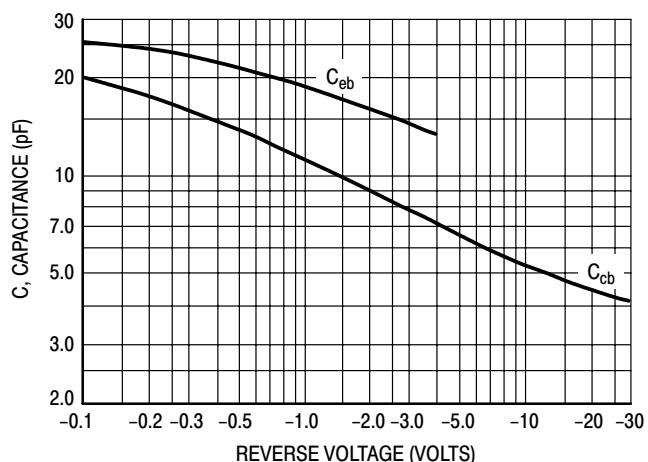


Figure 9. Capacitances

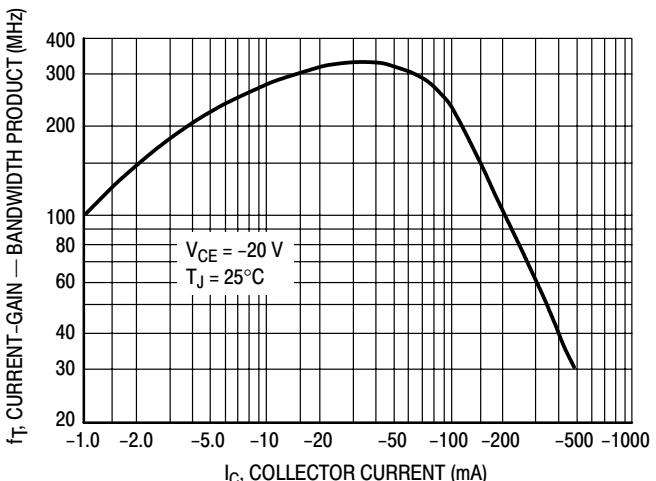


Figure 10. Current-Gain — Bandwidth Product

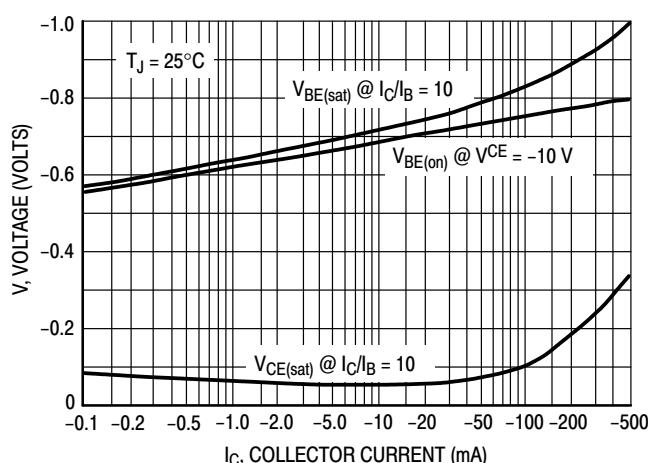


Figure 11. "On" Voltage

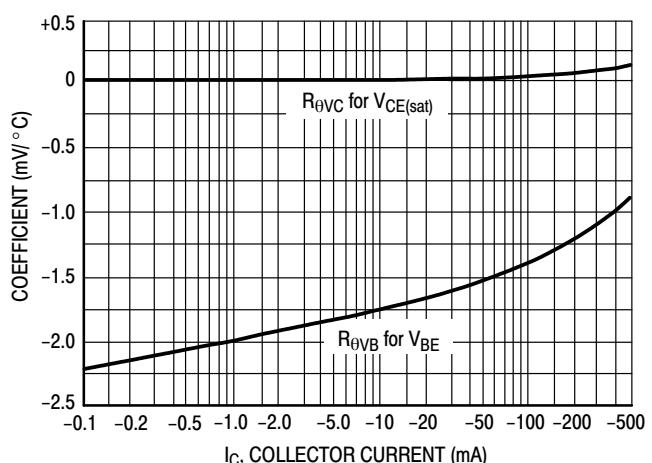
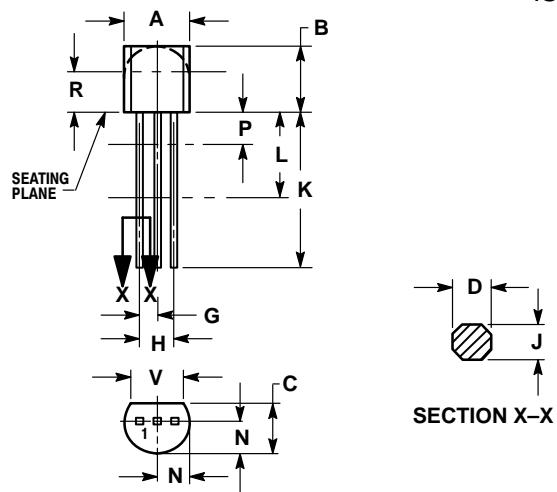


Figure 12. Temperature Coefficients

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PACKAGE DIMENSIONS

TO-92
TO-226AA
CASE 29-11
ISSUE AL



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	---

STYLE 1:
PIN 1. Emitter
2. Base
3. Collector

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Notes

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