

# MPS2907A

Preferred Device

## General Purpose Transistors

PNP Silicon



ON Semiconductor™

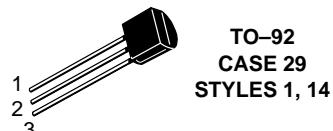
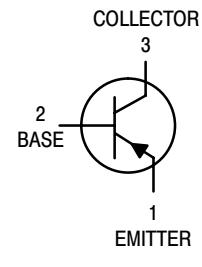
<http://onsemi.com>

### MAXIMUM RATINGS

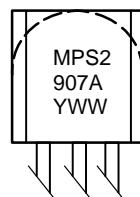
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	-60	Vdc
Collector-Base Voltage	V <sub>CBO</sub>	-60	Vdc
Emitter-Base Voltage	V <sub>EBO</sub>	-5.0	Vdc
Collector Current – Continuous	I <sub>C</sub>	-600	mAdc
Total Device Dissipation @ T <sub>A</sub> = 25°C Derate above 25°C	P <sub>D</sub>	625 5.0	mW mW/°C
Total Device Dissipation @ T <sub>C</sub> = 25°C Derate above 25°C	P <sub>D</sub>	1.5 12	Watts mW/°C
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	°C

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	200	°C/W
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	83.3	°C/W



### MARKING DIAGRAMS



Y = Year  
WW = Work Week

### ORDERING INFORMATION

Device	Package	Shipping
MPS2907A	TO-92	5000 Units/Box
MPS2907ARLRA	TO-92	2000/Tape & Reel
MPS2907ARLRE	TO-92	2000/Ammo Pack
MPS2907ARLRM	TO-92	2000/Ammo Pack
MPS2907ARLRP	TO-92	2000/Ammo Pack

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

# MPS2907A

## ELECTRICAL CHARACTERISTICS (TA = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Breakdown Voltage (Note 1.) (IC = -10 mAdc, IB = 0)	V(BR)CEO	-60	-	Vdc
Collector-Base Breakdown Voltage (IC = -10 µAdc, IE = 0)	V(BR)CBO	-60	-	Vdc
Emitter-Base Breakdown Voltage (IE = -10 µAdc, IC = 0)	V(BR)EBO	-5.0	-	Vdc
Collector Cutoff Current (VCE = -30 Vdc, VEB(off) = -0.5 Vdc)	ICEX	-	-50	nAdc
Collector Cutoff Current (VCB = -50 Vdc, IE = 0) (VCB = -50 Vdc, IE = 0, TA = 150°C)	ICBO	-	-0.01 -10	µAdc
Base Current (VCE = -30 Vdc, VEB(off) = -0.5 Vdc)	IB	-	-50	nAdc

## ON CHARACTERISTICS

DC Current Gain (IC = -0.1 mA, VCE = -10 Vdc) (IC = -1.0 mA, VCE = -10 Vdc) (IC = -10 mA, VCE = -10 Vdc) (IC = -150 mA, VCE = -10 Vdc) (Note 1.) (IC = -500 mA, VCE = -10 Vdc) (Note 1.)	hFE	75 100 100 100 50	-	-
Collector-Emitter Saturation Voltage (Note 1.) (IC = -150 mA, IB = -15 mA) (IC = -500 mA, IB = -50 mA)	VCE(sat)	- -	-0.4 -1.6	Vdc
Base-Emitter Saturation Voltage (Note 1.) (IC = -150 mA, IB = -15 mA) (IC = -500 mA, IB = -50 mA)	VBE(sat)	- -	-1.3 -2.6	Vdc

## SMALL-SIGNAL CHARACTERISTICS

Current-Gain – Bandwidth Product (Notes 1. and 2.), (IC = -50 mA, VCE = -20 Vdc, f = 100 MHz)	fT	200	-	MHz
Output Capacitance (VCB = -10 Vdc, IE = 0, f = 1.0 MHz)	Cobo	-	8.0	pF
Input Capacitance (VEB = -2.0 Vdc, IC = 0, f = 1.0 MHz)	Cibo	-	30	pF

## SWITCHING CHARACTERISTICS

Turn-On Time	(VCC = -30 Vdc, IC = -150 mA, IB1 = -15 mA) (Figures 1 and 5)	t <sub>on</sub>	-	45	ns
Delay Time		t <sub>d</sub>	-	10	ns
Rise Time		t <sub>r</sub>	-	40	ns
Turn-Off Time	(VCC = -6.0 Vdc, IC = -150 mA, IB1 = IB2 = 15 mA) (Figure 2)	t <sub>off</sub>	-	100	ns
Storage Time		t <sub>s</sub>	-	80	ns
Fall Time		t <sub>f</sub>	-	30	ns

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

2. f<sub>T</sub> is defined as the frequency at which |h<sub>fe</sub>| extrapolates to unity.

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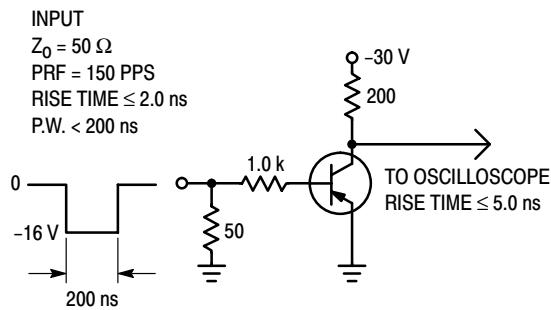


Figure 1. Delay and Rise Time Test Circuit

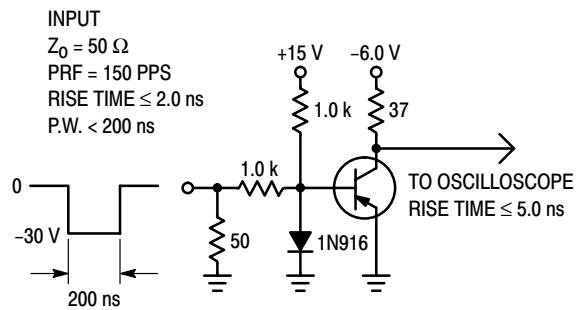


Figure 2. Storage and Fall Time Test Circuit

## TYPICAL CHARACTERISTICS

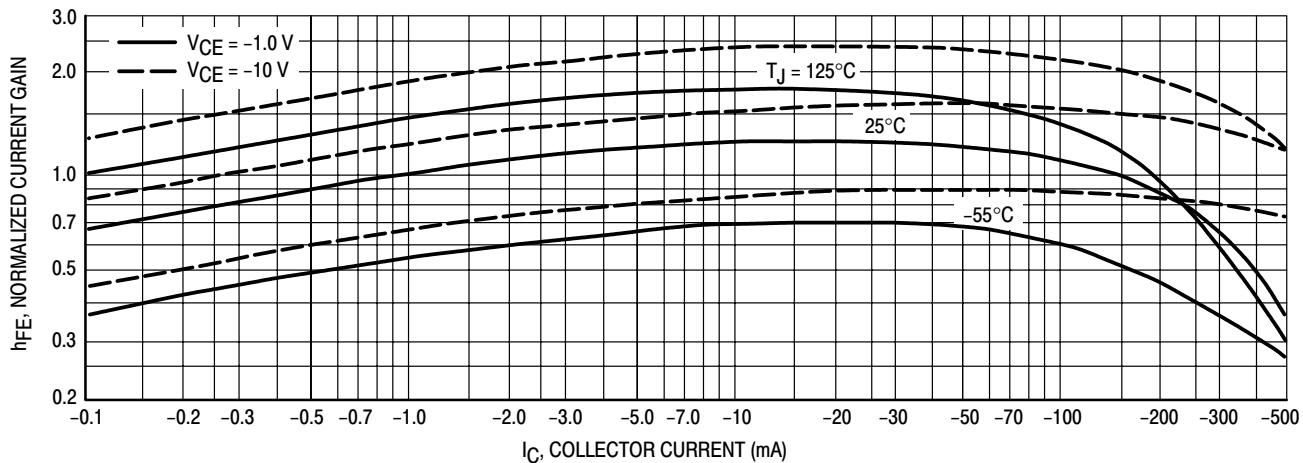


Figure 3. DC Current Gain

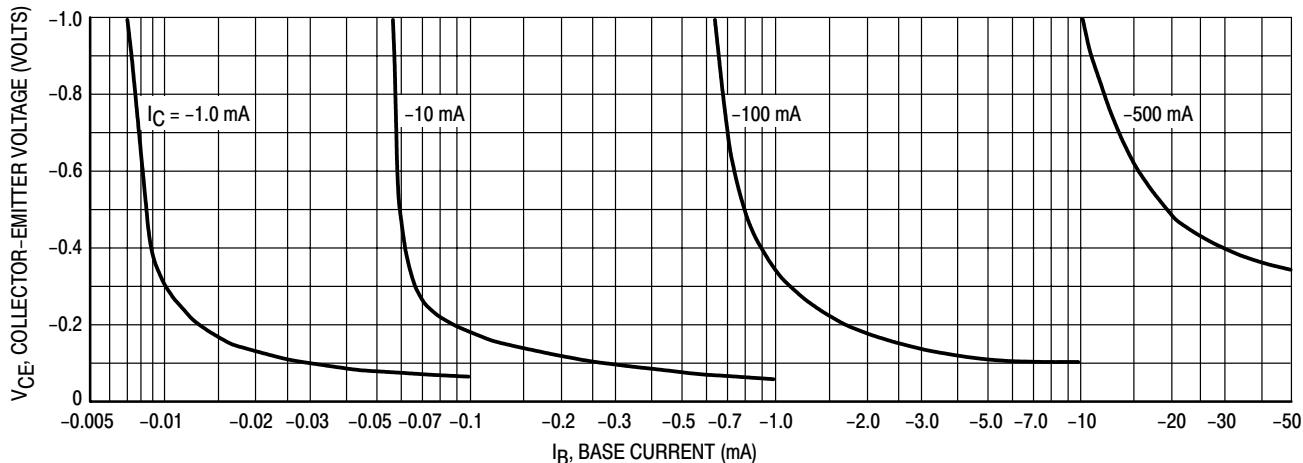
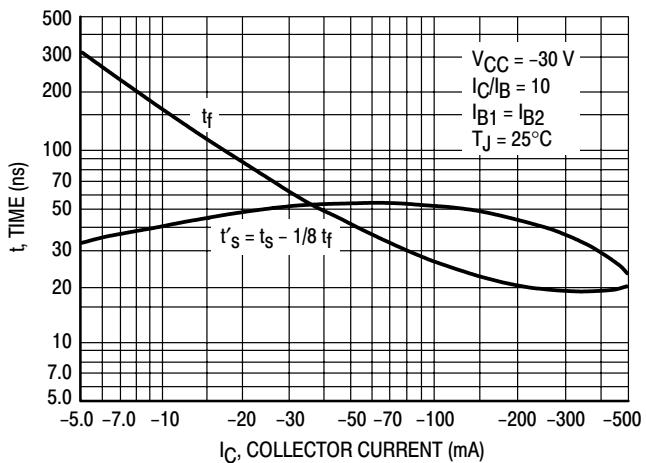
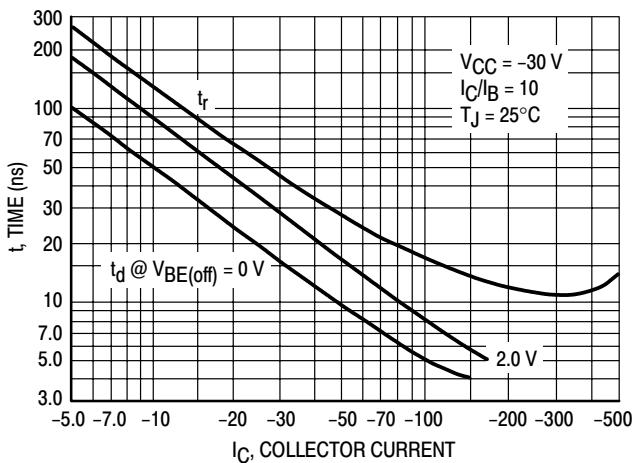


Figure 4. Collector Saturation Region

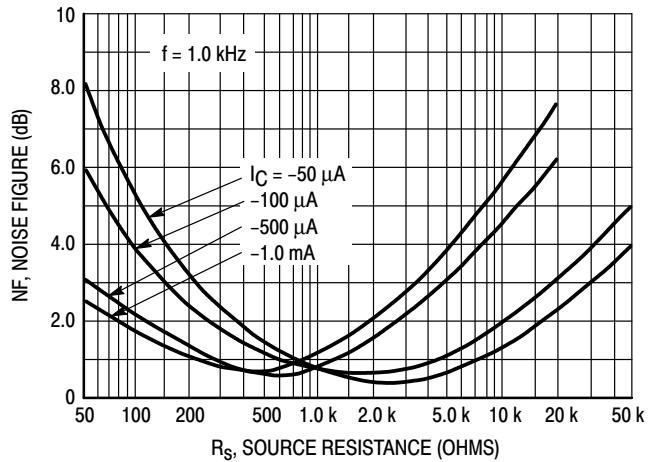
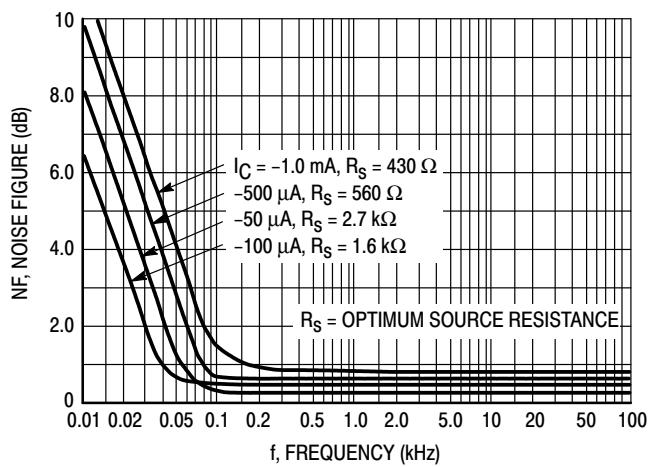
**TYPICAL CHARACTERISTICS**



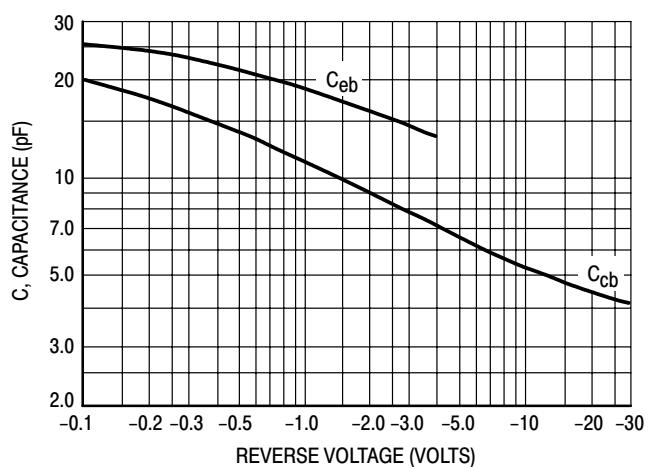
**TYPICAL SMALL-SIGNAL CHARACTERISTICS**

**NOISE FIGURE**

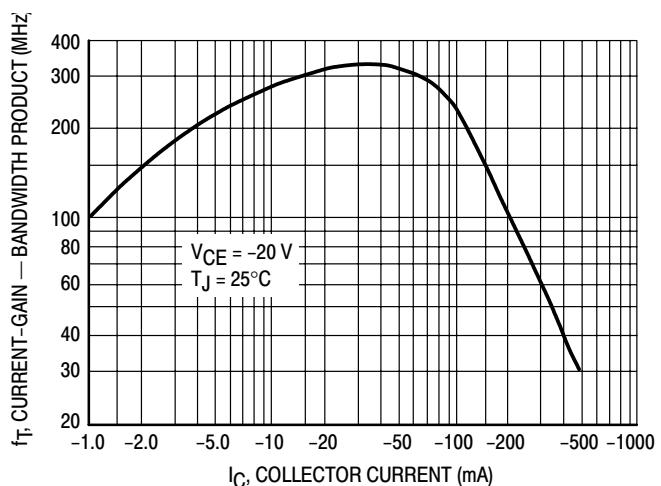
$V_{CE} = 10$  Vdc,  $T_A = 25^\circ\text{C}$



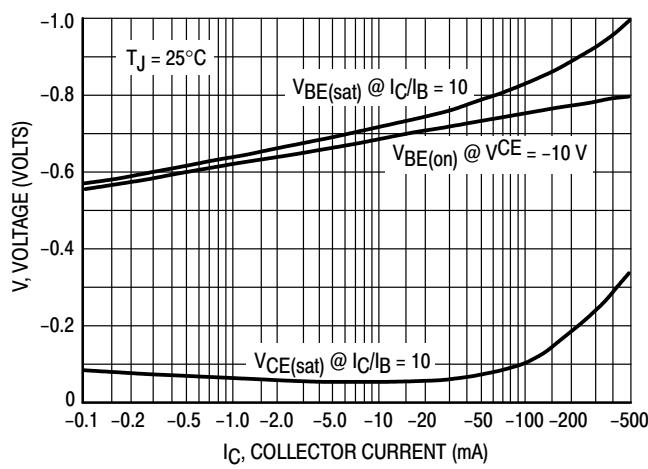
**TYPICAL SMALL-SIGNAL CHARACTERISTICS**  
**NOISE FIGURE**  
 **$V_{CE} = 10$  Vdc,  $T_A = 25^\circ\text{C}$**



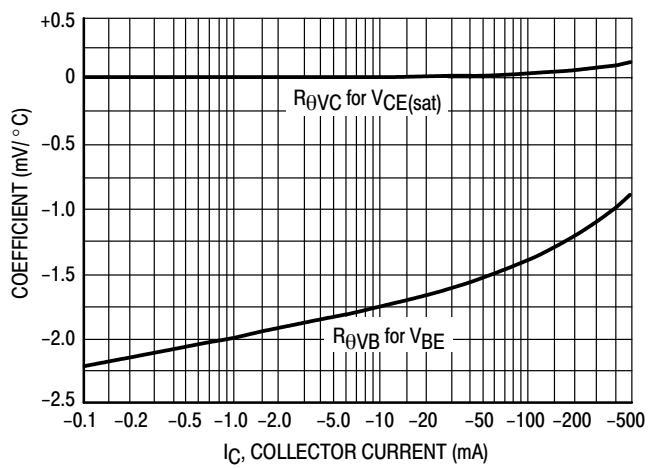
**Figure 9. Capacitances**



**Figure 10. Current-Gain — Bandwidth Product**



**Figure 11. "On" Voltage**

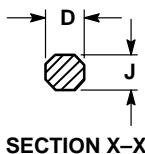
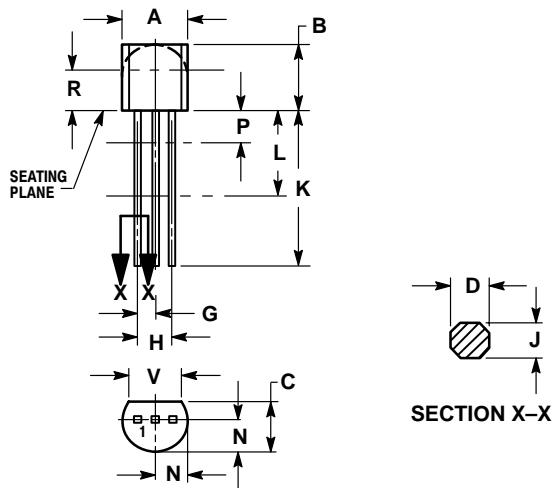


**Figure 12. Temperature Coefficients**

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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

STYLE 14:  
PIN 1. Emitter  
2. Collector  
3. Base

## **Notes**

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