

MPS2907A

Preferred Device

General Purpose Transistors

PNP Silicon



ON Semiconductor™

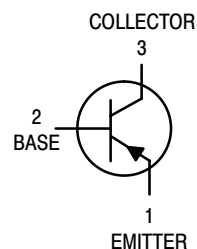
<http://onsemi.com>

MAXIMUM RATINGS

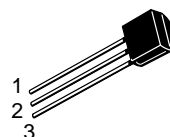
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	-60	Vdc
Collector-Base Voltage	V_{CBO}	-60	Vdc
Emitter-Base Voltage	V_{EBO}	-5.0	Vdc
Collector Current – Continuous	I_C	-600	mA dc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	625 5.0	mW mW/ $^\circ\text{C}$
Total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

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	$^\circ\text{C/W}$

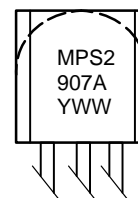


STYLE 1



TO-92
CASE 29
STYLES 1, 14

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 (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage (Note 1.) (I _C = –10 mA _{dc} , I _B = 0)	V _{(BR)CEO}	–60	–	V _{dc}
Collector–Base Breakdown Voltage (I _C = –10 μA _{dc} , I _E = 0)	V _{(BR)CBO}	–60	–	V _{dc}
Emitter–Base Breakdown Voltage (I _E = –10 μA _{dc} , I _C = 0)	V _{(BR)EBO}	–5.0	–	V _{dc}
Collector Cutoff Current (V _{CE} = –30 V _{dc} , V _{EB(off)} = –0.5 V _{dc})	I _{CEX}	–	–50	nA _{dc}
Collector Cutoff Current (V _{CB} = –50 V _{dc} , I _E = 0) (V _{CB} = –50 V _{dc} , I _E = 0, T _A = 150°C)	I _{CBO}	– –	–0.01 –10	μA _{dc}
Base Current (V _{CE} = –30 V _{dc} , V _{EB(off)} = –0.5 V _{dc})	I _B	–	–50	nA _{dc}

ON CHARACTERISTICS

DC Current Gain (I _C = –0.1 mA _{dc} , V _{CE} = –10 V _{dc}) (I _C = –1.0 mA _{dc} , V _{CE} = –10 V _{dc}) (I _C = –10 mA _{dc} , V _{CE} = –10 V _{dc}) (I _C = –150 mA _{dc} , V _{CE} = –10 V _{dc}) (Note 1.) (I _C = –500 mA _{dc} , V _{CE} = –10 V _{dc}) (Note 1.)	h _{FE}	75 100 100 100 50	– – – 300 –	–
Collector–Emitter Saturation Voltage (Note 1.) (I _C = –150 mA _{dc} , I _B = –15 mA _{dc}) (I _C = –500 mA _{dc} , I _B = –50 mA _{dc})	V _{CE(sat)}	– –	–0.4 –1.6	V _{dc}
Base–Emitter Saturation Voltage (Note 1.) (I _C = –150 mA _{dc} , I _B = –15 mA _{dc}) (I _C = –500 mA _{dc} , I _B = –50 mA _{dc})	V _{BE(sat)}	– –	–1.3 –2.6	V _{dc}

SMALL–SIGNAL CHARACTERISTICS

Current–Gain – Bandwidth Product (Notes 1. and 2.), (I _C = –50 mA _{dc} , V _{CE} = –20 V _{dc} , f = 100 MHz)	f _T	200	–	MHz
Output Capacitance (V _{CB} = –10 V _{dc} , I _E = 0, f = 1.0 MHz)	C _{obo}	–	8.0	pF
Input Capacitance (V _{EB} = –2.0 V _{dc} , I _C = 0, f = 1.0 MHz)	C _{ibo}	–	30	pF

SWITCHING CHARACTERISTICS

Turn–On Time	(V _{CC} = –30 V _{dc} , I _C = –150 mA _{dc} , I _{B1} = –15 mA _{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 V _{dc} , I _C = –150 mA _{dc} , I _{B1} = I _{B2} = 15 mA _{dc}) (Figure 2)	t _{off}	–	100	ns
Storage Time		t _s	–	80	ns
Fall Time		t _f	–	30	ns

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

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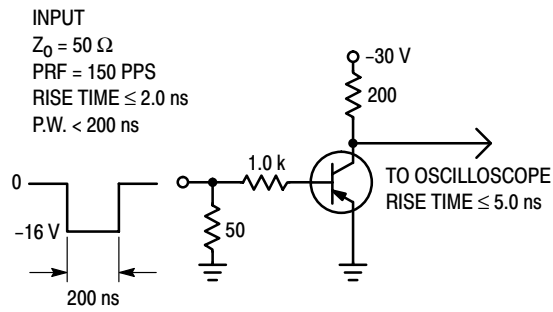


Figure 1. Delay and Rise Time Test Circuit

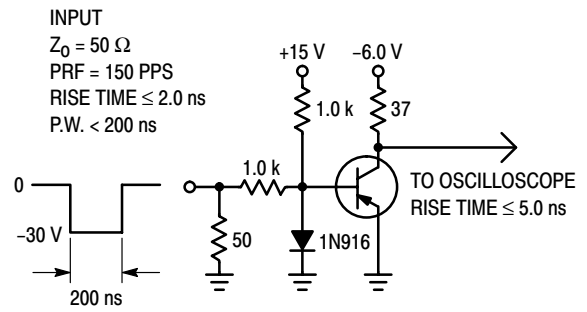


Figure 2. Storage and Fall Time Test Circuit

TYPICAL CHARACTERISTICS

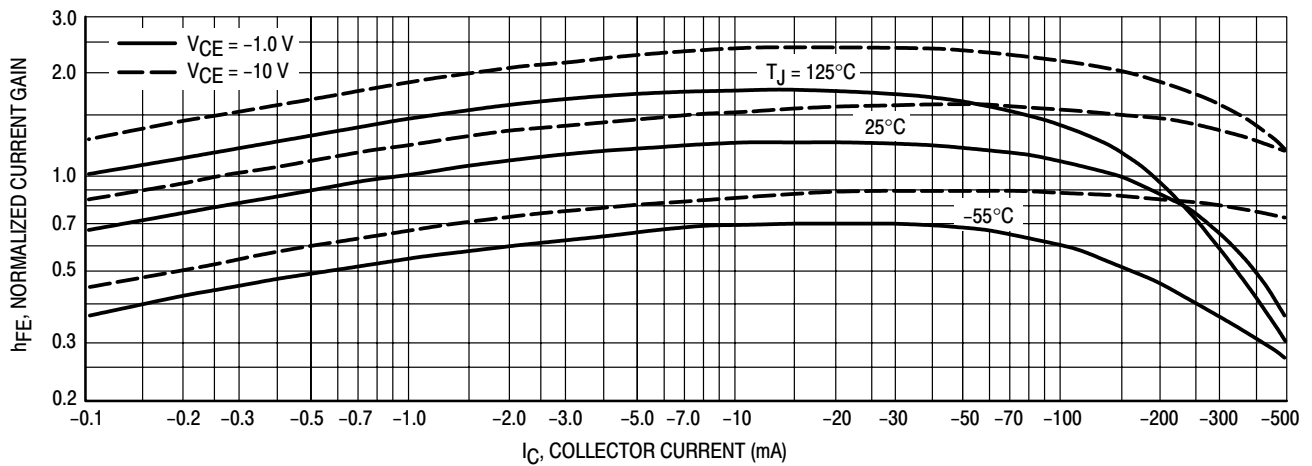


Figure 3. DC Current Gain

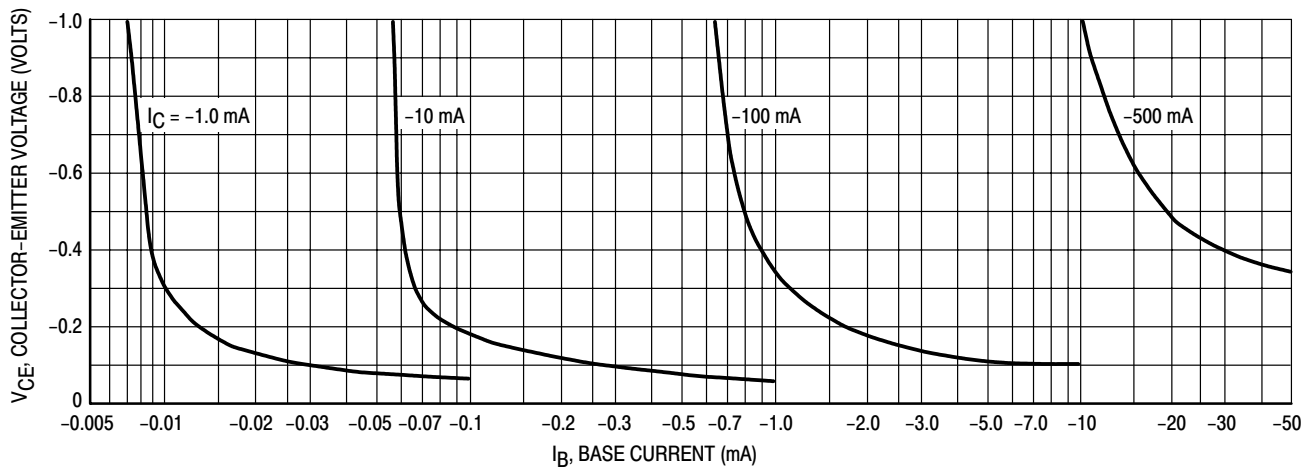
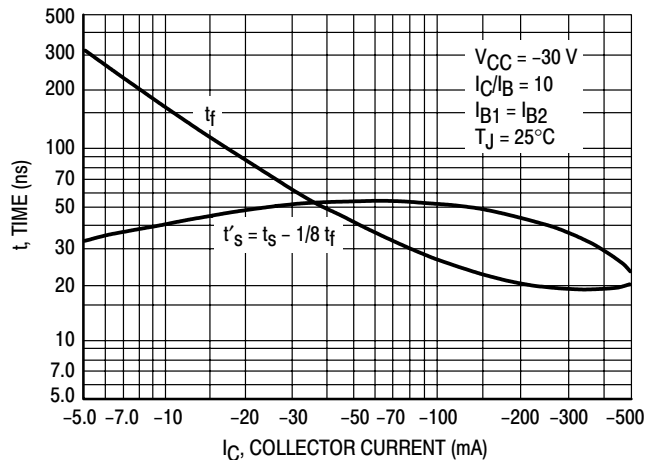
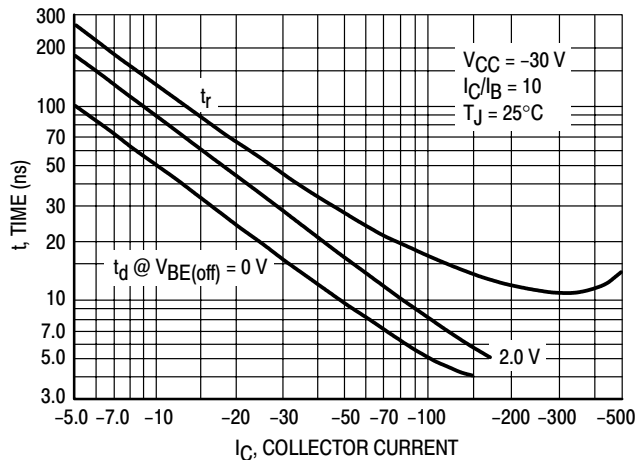


Figure 4. Collector Saturation Region

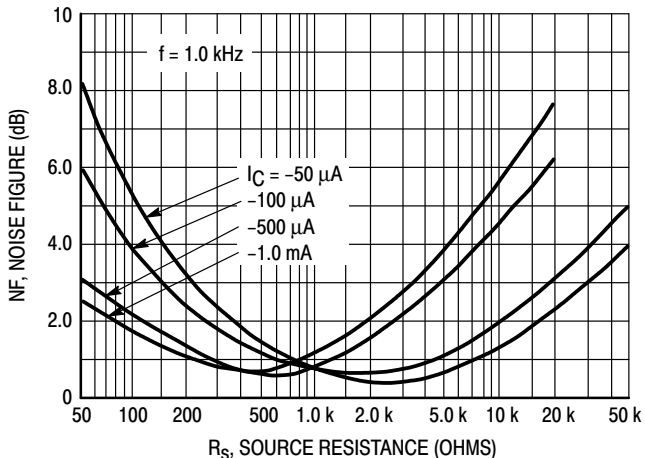
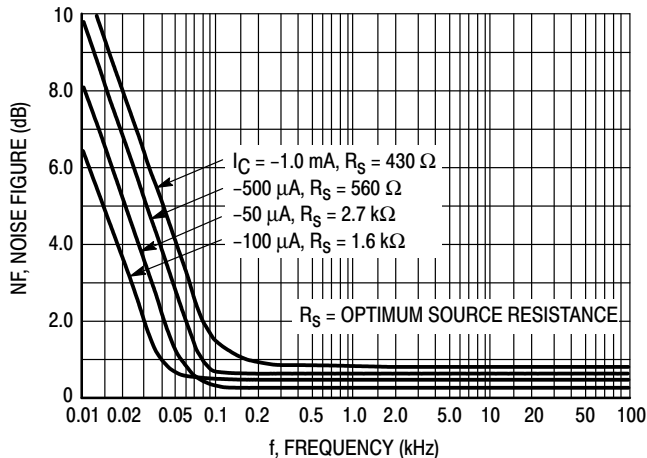
TYPICAL CHARACTERISTICS



TYPICAL SMALL-SIGNAL CHARACTERISTICS

NOISE FIGURE

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



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TYPICAL SMALL-SIGNAL CHARACTERISTICS

NOISE FIGURE

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

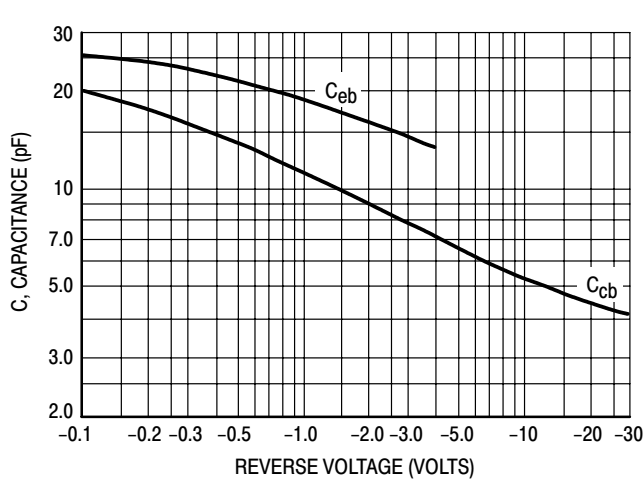


Figure 9. Capacitances

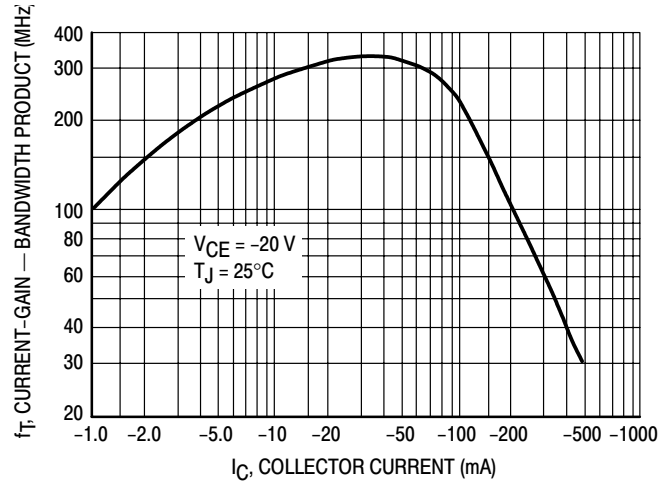


Figure 10. Current-Gain — Bandwidth Product

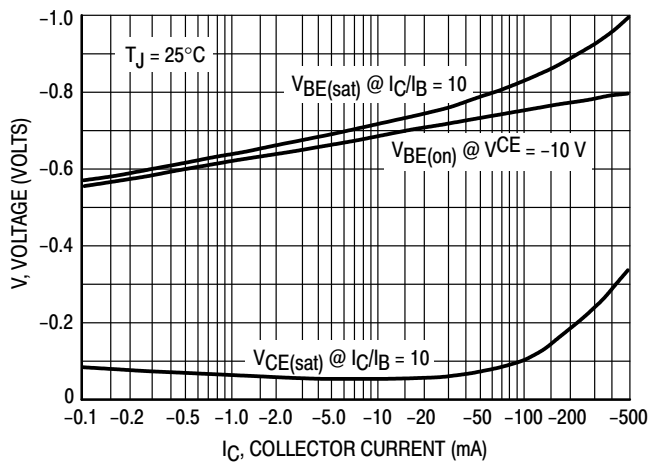


Figure 11. "On" Voltage

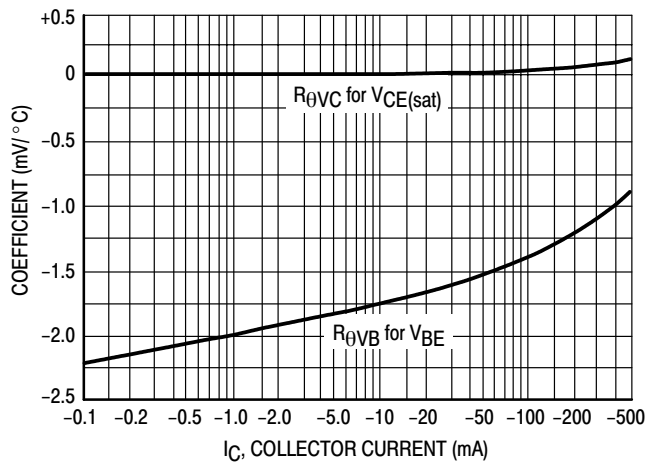
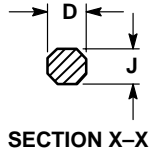
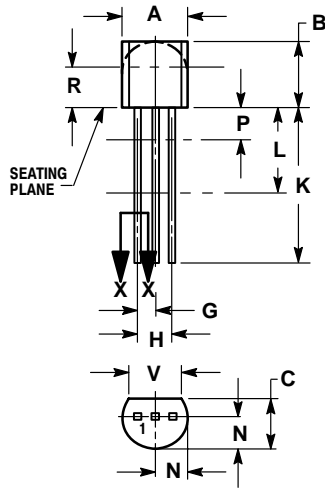


Figure 12. Temperature Coefficients

MPS2907A

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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