MPS2907A

Preferred Device

General Purpose Transistors

PNP Silicon

Features

● Pb−Free Packages are Available*

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

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.
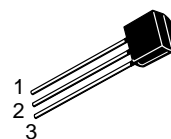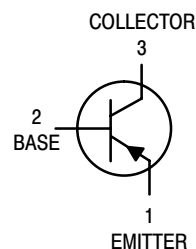
THERMAL CHARACTERISTICS

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

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

ON Semiconductor®

http://onsemi.com

COLLECTOR
3

2
BASE

1
EMITTER

**TO−92
CASE 29
STYLE 1**

MARKING DIAGRAM
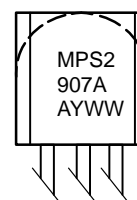
MPS2
907A
AYWW

MPS2	= Device Code
907A	= Specific Device Code
A	Assembly Location
Y	= Year
WW	= Work Week

ORDERING INFORMATION

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
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
Base Current (V_{CE} = –30 Vdc, $V_{EB(off)}$ = –0.5 Vdc)	I_B	–	–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

		Symbol	Min	Max	Unit
Turn–On Time	(V_{CC} = –30 Vdc, I_C = –150 mAdc, I_{B1} = –15 mAdc) (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 Vdc, I_C = –150 mAdc, I_{B1} = I_{B2} = 15 mAdc) (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.
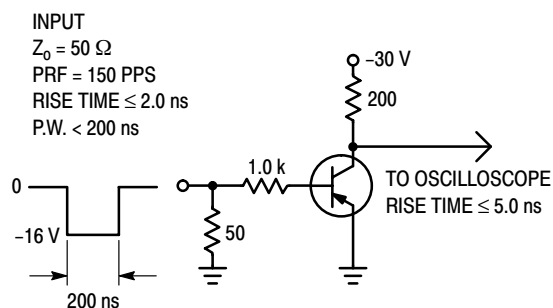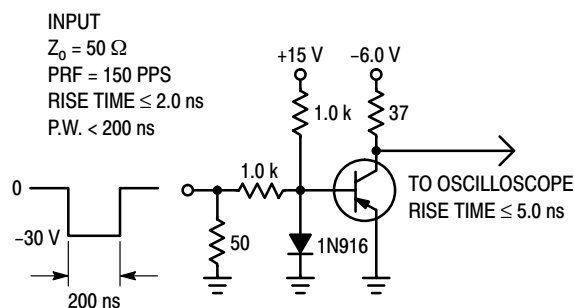

Figure 1. Delay and Rise Time Test Circuit

Figure 2. Storage and Fall Time Test Circuit

MPS2907A

ORDERING INFORMATION

Device	Package	Shipping[†]
MPS2907A	TO–92	5000 Units / Box
MPS2907AG	TO–92 (Pb–Free)	5000 Units / Box
MPS2907ARL	TO–92	2000 / Tape & Reel
MPS2907ARLG	TO–92 (Pb–Free)	2000 / Tape & Reel
MPS2907ARL1G	TO–92	2000 / Tape & Reel
MPS2907ARL1G	TO–92 (Pb–Free)	2000 / Tape & Reel
MPS2907ARLRA	TO–92	2000 / Tape & Reel
MPS2907ARLRAG	TO–92 (Pb–Free)	2000 / Tape & Reel
MPS2907ARLRE	TO–92	2000 / Ammo Pack
MPS2907ARLREG	TO–92 (Pb–Free)	2000 / Ammo Pack
MPS2907ARLRM	TO–92	2000 / Ammo Pack
MPS2907ARLRP	TO–92	2000 / Ammo Pack
MPS2907ARLRPG	TO–92 (Pb–Free)	2000 / Ammo Pack

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

TYPICAL CHARACTERISTICS
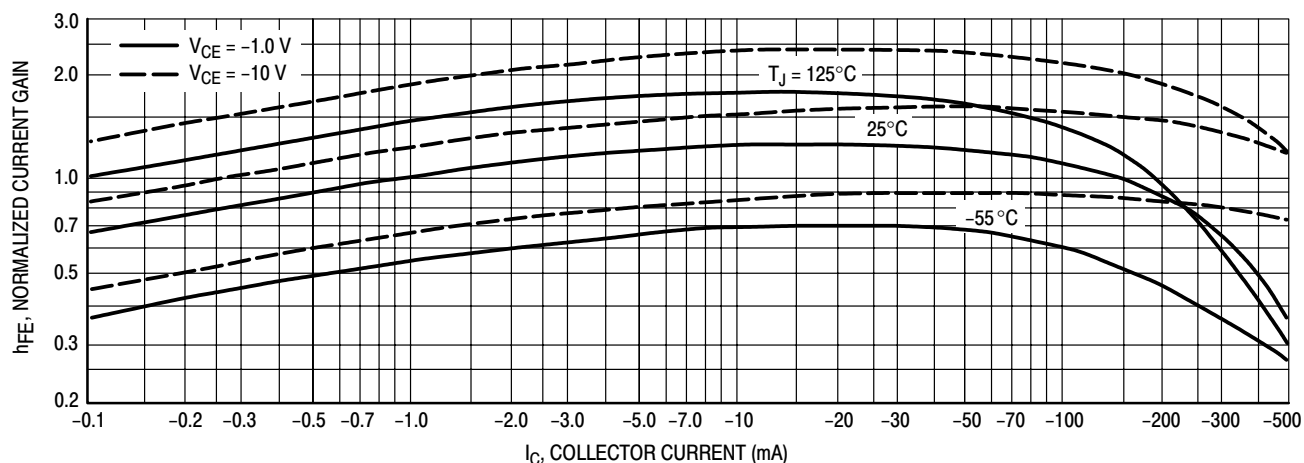
Figure 3. DC Current Gain
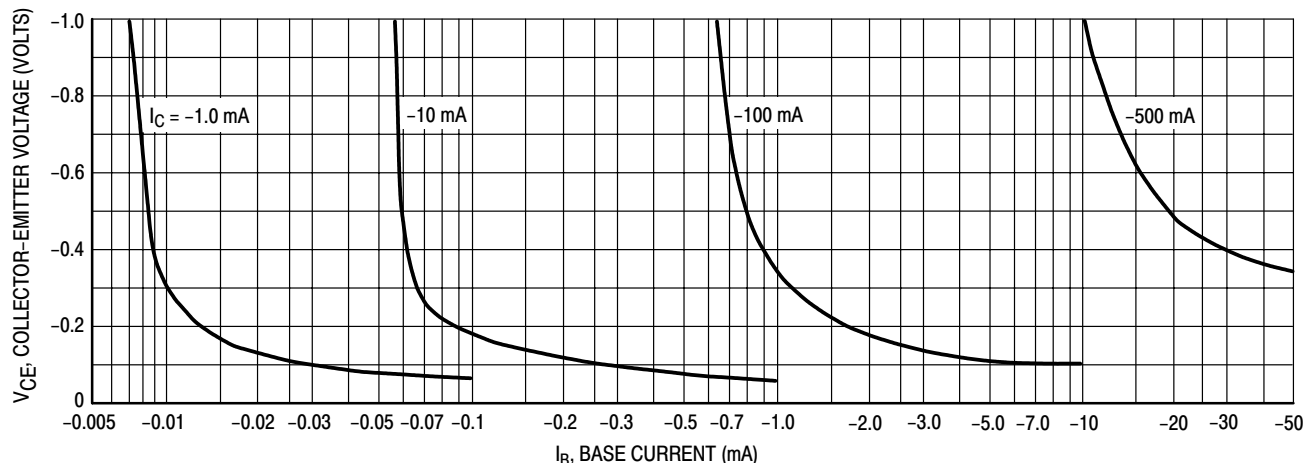
Figure 4. Collector Saturation Region

TYPICAL CHARACTERISTICS

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
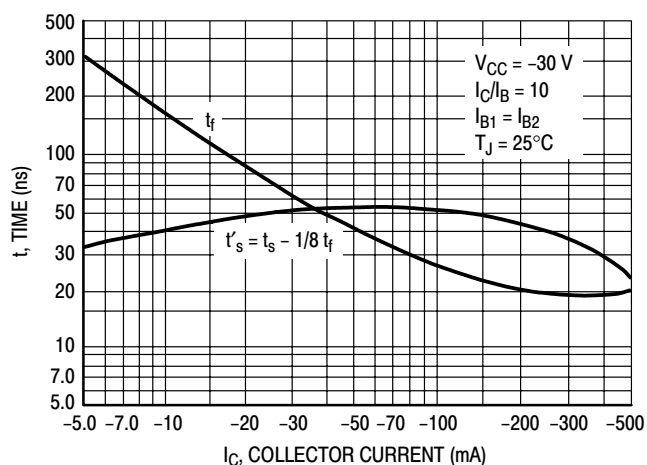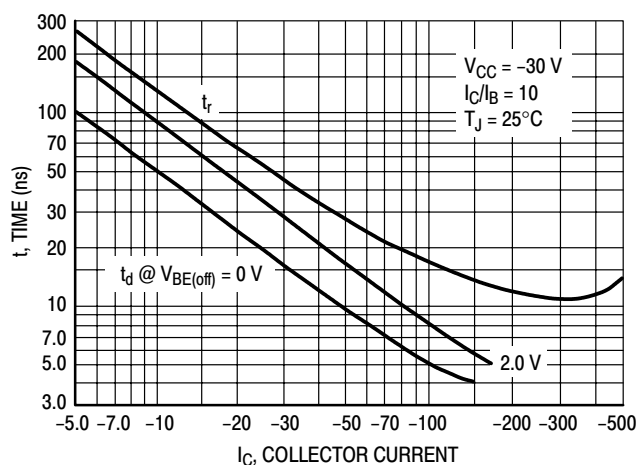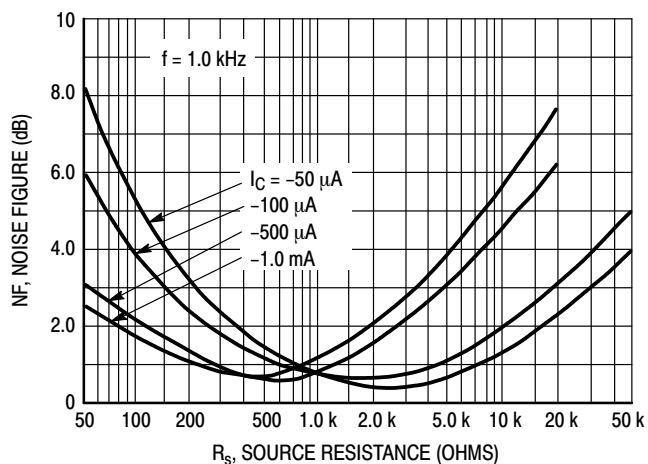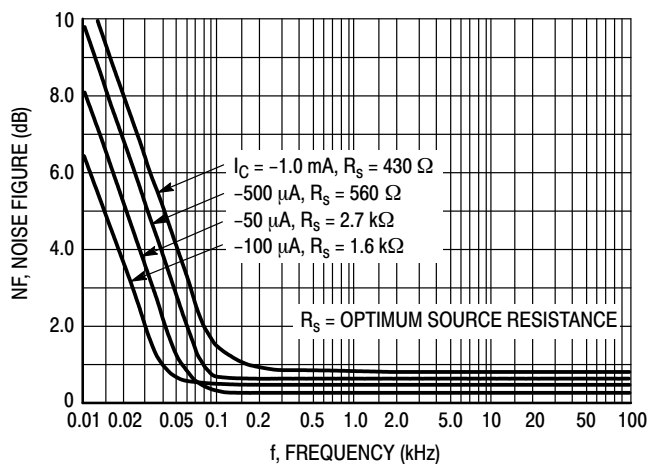
MPS2907A

TYPICAL SMALL–SIGNAL CHARACTERISTICS
NOISE FIGURE
V_{CE} = 10 Vdc, T_A = 25°C
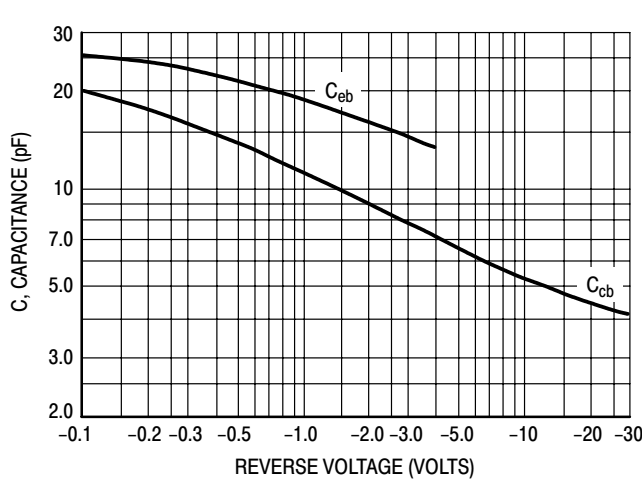
Figure 9. Capacitances
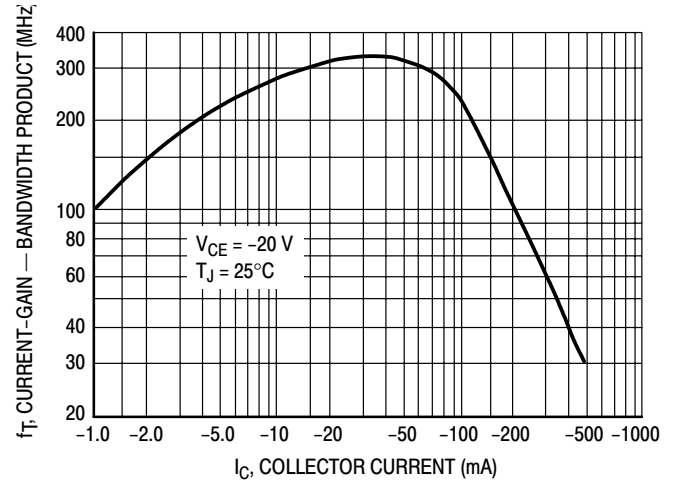
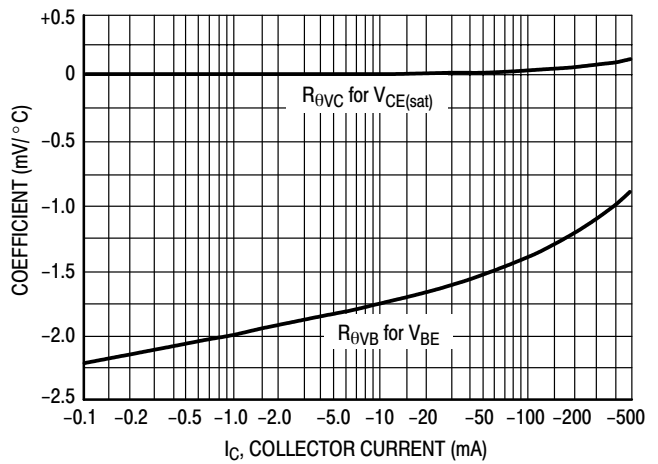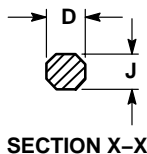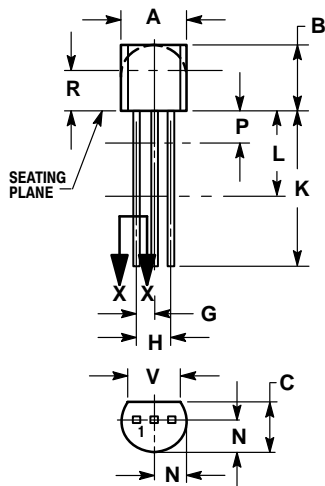**Figure 10. Current–Gain — Bandwidth Product**
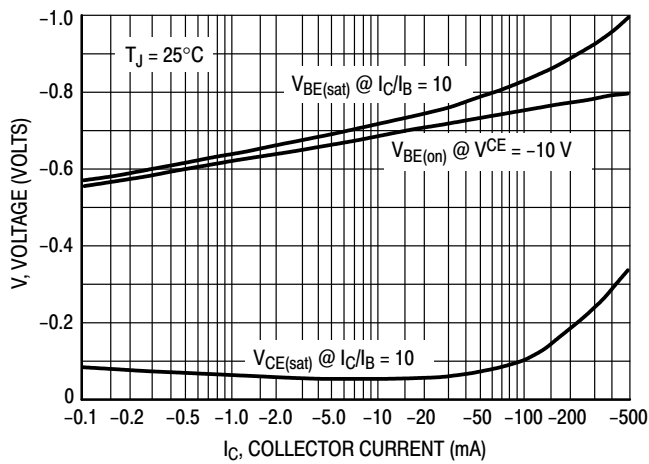
Figure 11. "On" Voltage

Figure 12. Temperature Coefficients

MPS2907A

PACKAGE DIMENSIONS

TO−92
TO−226AA
CASE 29−11
ISSUE AL

SEATING PLANE

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.

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