MPS2907A

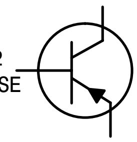
Preferred Device

General Purpose Transistors

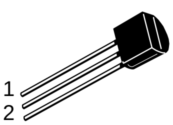
PNP Silicon

ON Semiconductor™

http://onsemi.com

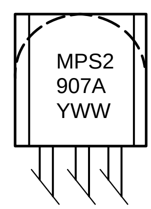


STYLE 1



TO–92
CASE 29
STYLES 1, 14

MARKING DIAGRAMS



Y = Year
WW = Work Week

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	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

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.

October, 2001 – Rev. 0

Publication Order Number:
MPS2907A/D

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					
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.

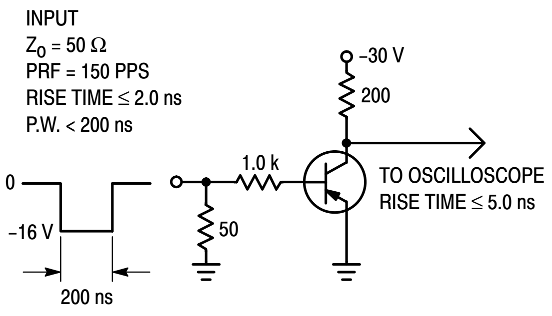


Figure 1. Delay and Rise Time Test Circuit

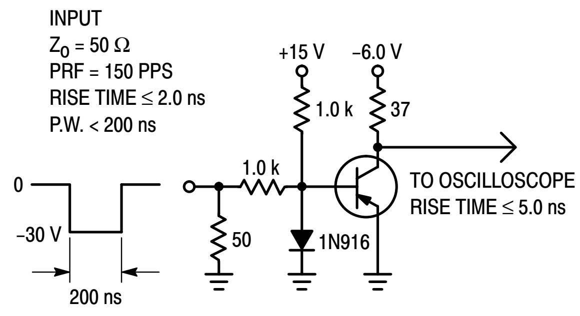


Figure 2. Storage and Fall Time Test Circuit

TYPICAL CHARACTERISTICS

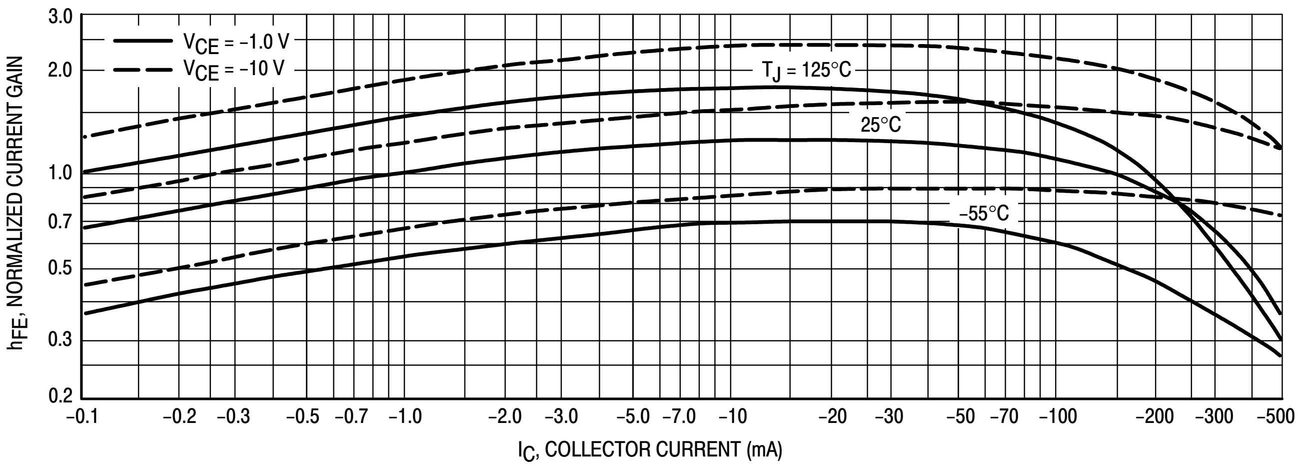


Figure 3. DC Current Gain

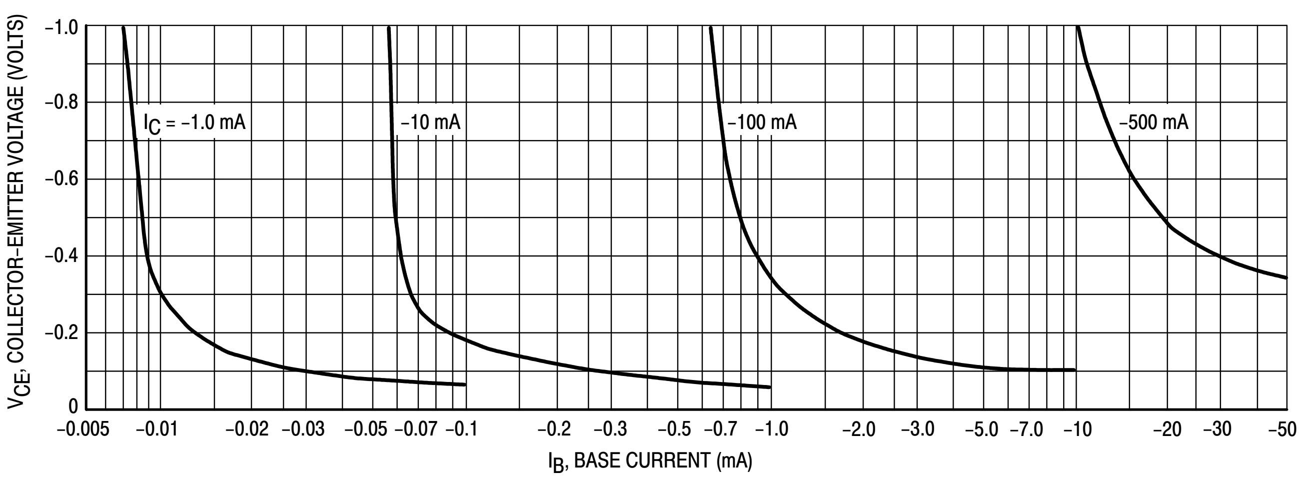


Figure 4. Collector Saturation Region

TYPICAL CHARACTERISTICS

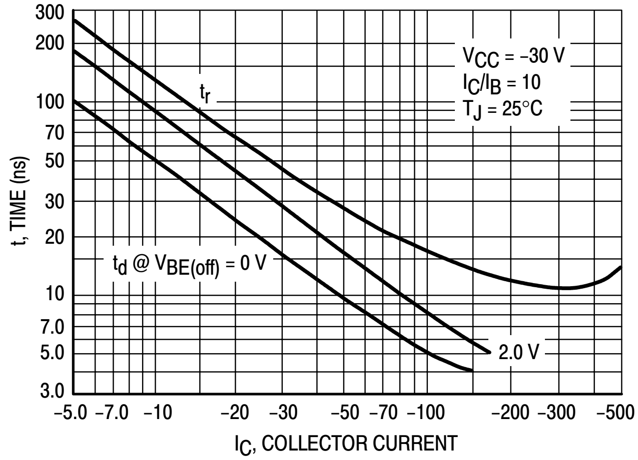


Figure 5. Turn–On Time

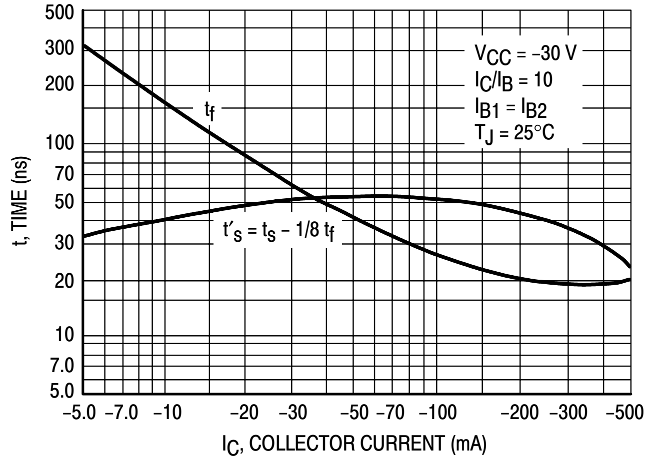


Figure 6. Turn–Off Time

TYPICAL SMALL–SIGNAL CHARACTERISTICS

NOISE FIGURE

V_{CE} = 10 Vdc, T_A = 25°C

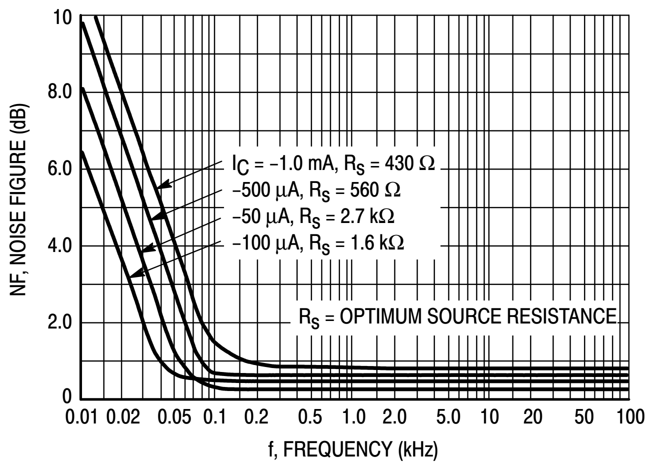


Figure 7. Frequency Effects

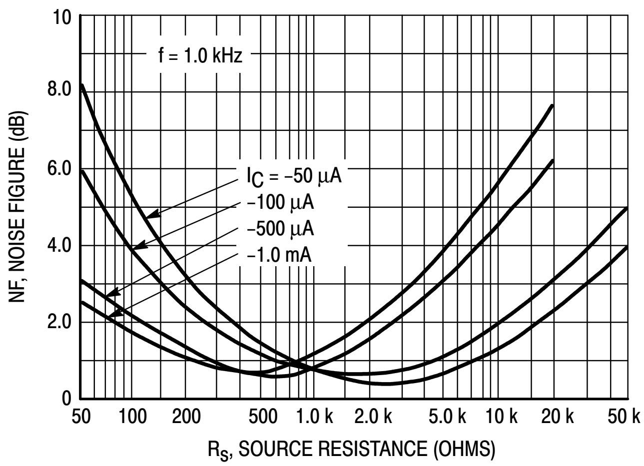


Figure 8. Source Resistance Effects

TYPICAL SMALL–SIGNAL CHARACTERISTICS

NOISE FIGURE

V_{CE} = 10 Vdc, T_A = 25°C

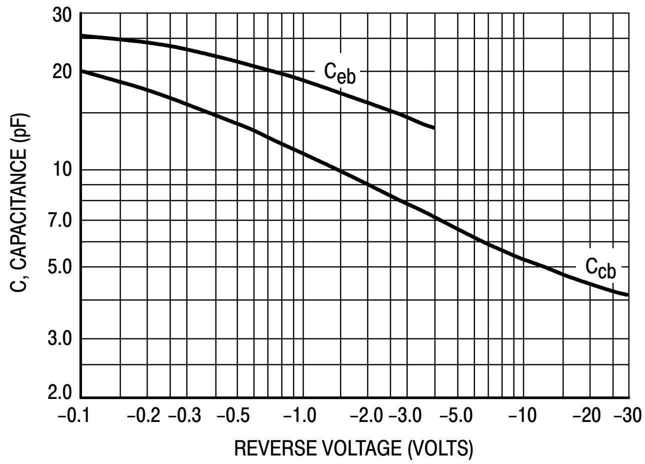


Figure 9. Capacitances

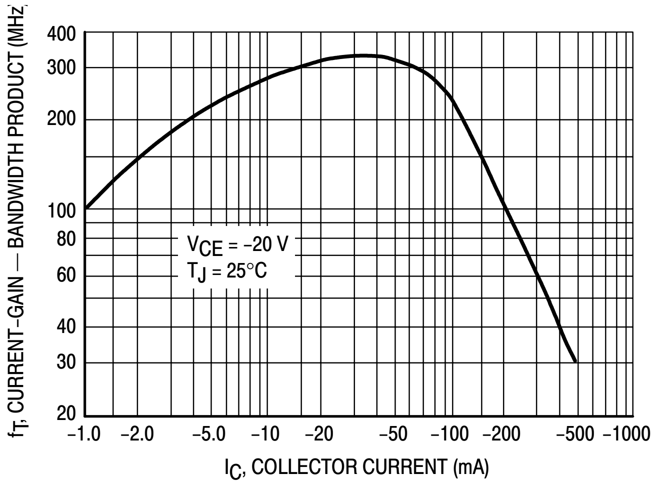


Figure 10. Current–Gain — Bandwidth Product

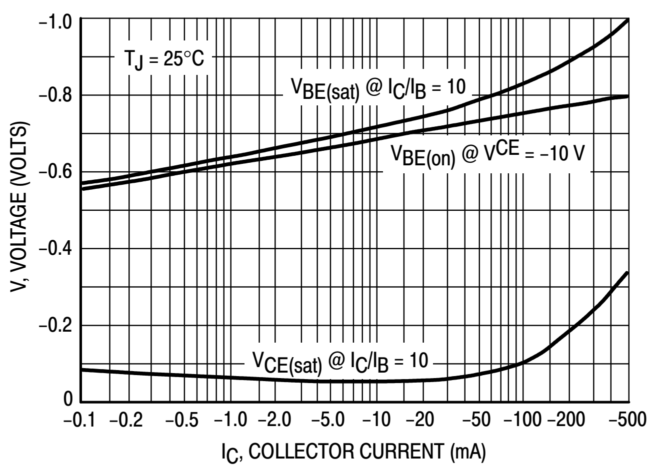


Figure 11. “On” Voltage

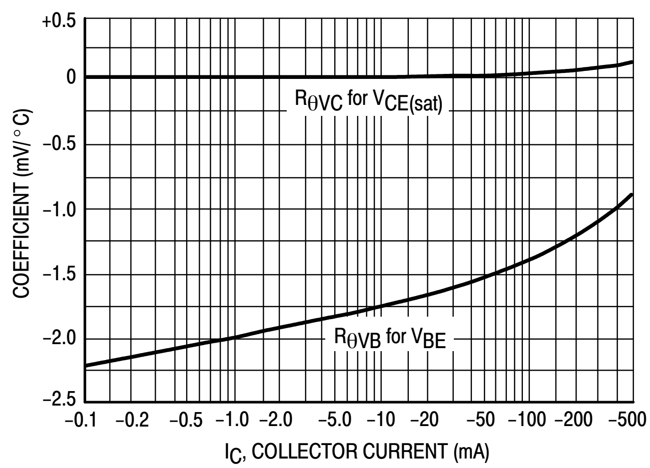
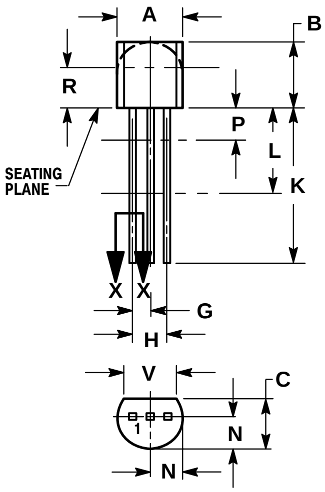
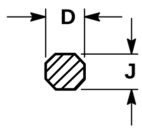


Figure 12. Temperature Coefficients

PACKAGE DIMENSIONS

TO–92
TO–226AA
CASE 29–11
ISSUE AL





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 MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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

PUBLICATION ORDERING INFORMATION

Literature Fulfillment:
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