



PNP Silicon General Purpose Transistor

Features

- Pb-Free Package May be Available. The G-Suffix Denotes a Pb-Free Lead Finish

Maximum Ratings

Rating	Symbol	2907A	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

Thermal Characteristics

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	225 1.8	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction–to–Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate, $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	300 2.4	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction–to–Ambient	$R_{\theta JA}$	417	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

Device Marking

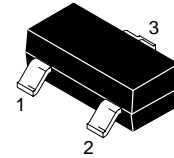
MMBT2907ALTG = 2F

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

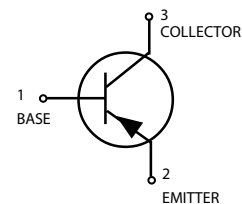
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Breakdown Voltage (Note 3) ($I_C = -10 \text{ mAdc}, I_B = 0$)	$V_{(BR)CEO}$	-60	-	Vdc
Collector–Base Breakdown Voltage ($I_C = -10 \mu\text{Adc}, I_E = 0$)	$V_{(BR)CBO}$	-60	-	Vdc
Emitter–Base Breakdown Voltage ($I_E = -10 \mu\text{Adc}, I_C = 0$)	$V_{(BR)EBO}$	-5.0	-	Vdc
Collector Cutoff Current ($V_{CE} = -30 \text{ Vdc}, V_{EB(off)} = -0.5 \text{ Vdc}$)	I_{CEX}	-	-50	nAdc
Collector Cutoff Current ($V_{CB} = -50 \text{ Vdc}, I_E = 0$) ($V_{CB} = -50 \text{ Vdc}, I_E = 0, T_A = 125^\circ\text{C}$)	I_{CBO}	- -	-0.010 -10	μAdc
Base Cutoff Current ($V_{CE} = -30 \text{ Vdc}, V_{EB(off)} = -0.5 \text{ Vdc}$)	I_{BL}	-	-50	nAdc

- FR-5 = 1.0 x 0.75 x 0.062 in.
- Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.
- Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

Package outline



SOT-23



Electrical Characteristics (T_A = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit	
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}) (I _C = -500 mA _{dc} , V _{CE} = -10 V _{dc}) (Note 3)	h _{FE}	75 100 100 100 50	- - - 300 -	-	
Collector-Emitter Saturation Voltage (Note 3) (I _C = -150 mA _{dc} , I _B = -15 mA _{dc}) (Note 3) (I _C = -500 mA _{dc} , I _B = -50 mA _{dc})	V _{CE(sat)}	- -	-0.4 -1.6	V _{dc}	
Base-Emitter Saturation Voltage (Note 3) (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 3, 4) (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		
SWITCHING CHARACTERISTICS					
Turn-On Time	(V _{CC} = -30 V _{dc} , I _C = -150 mA _{dc} , I _{B1} = -15 mA _{dc})	t _{on}	-	45	ns
Delay Time		t _d	-	10	
Rise Time		t _r	-	40	
Turn-Off Time	(V _{CC} = -6.0 V _{dc} , I _C = -150 mA _{dc} , I _{B1} = I _{B2} = -15 mA _{dc})	t _{off}	-	100	
Storage Time		t _s	-	80	
Fall Time		t _f	-	30	

3. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
 4. f_T is defined as the frequency at which |h_{fe}| extrapolates to unity.

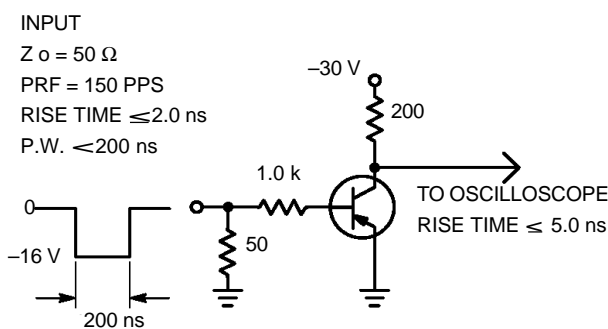


Figure 1. Delay and Rise Time Test Circuit

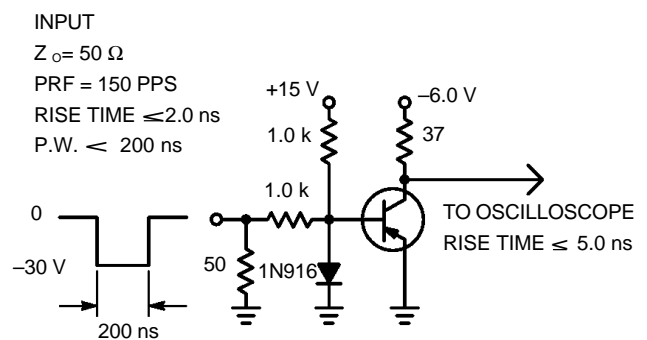
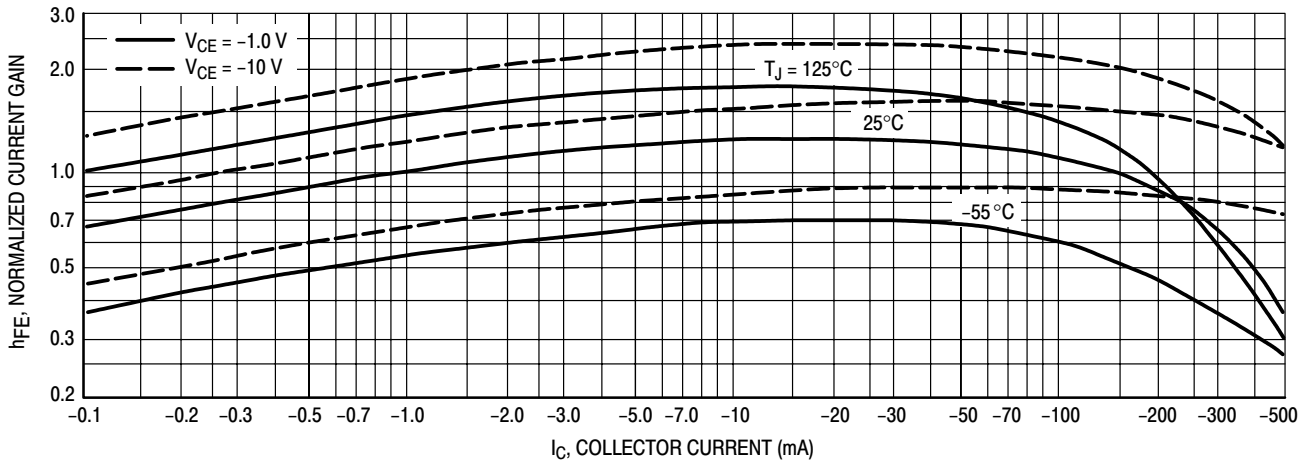
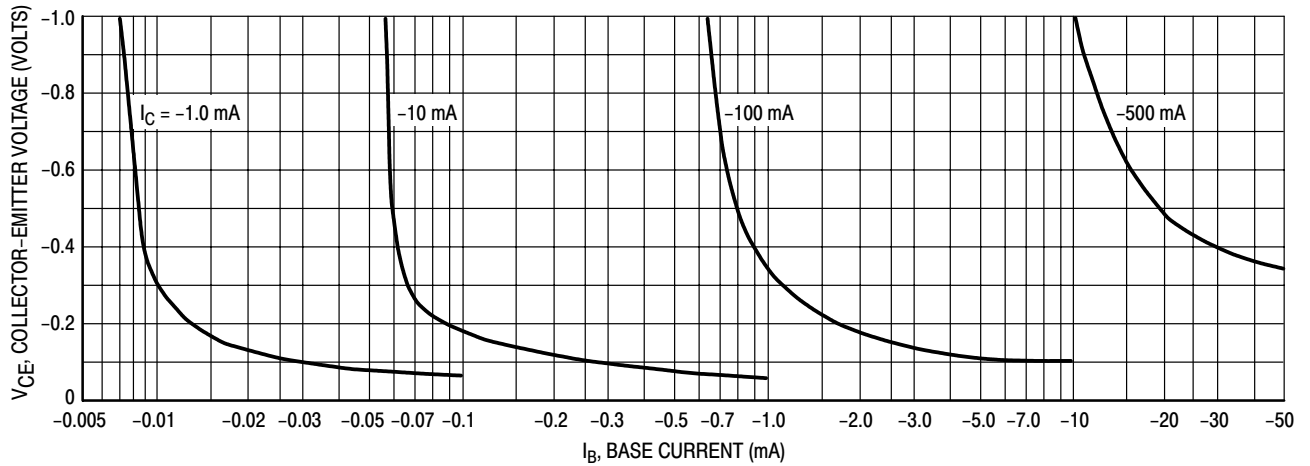
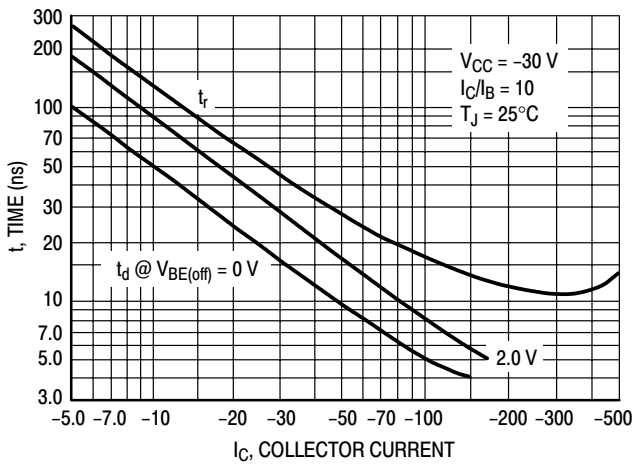
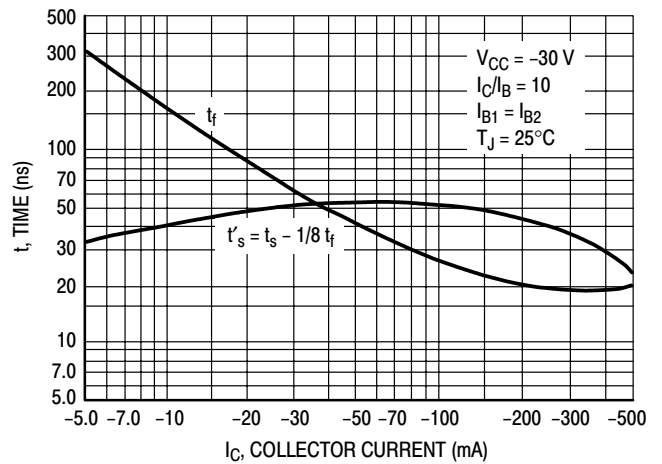


Figure 2. Storage and Fall Time Test Circuit

Typical Characteristics

Figure 3. DC Current Gain

Figure 4. Collector Saturation Region

Figure 5. Turn-On Time

Figure 6. Turn-Off Time

Typical Small-Signal Characteristics

Noise Figure

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

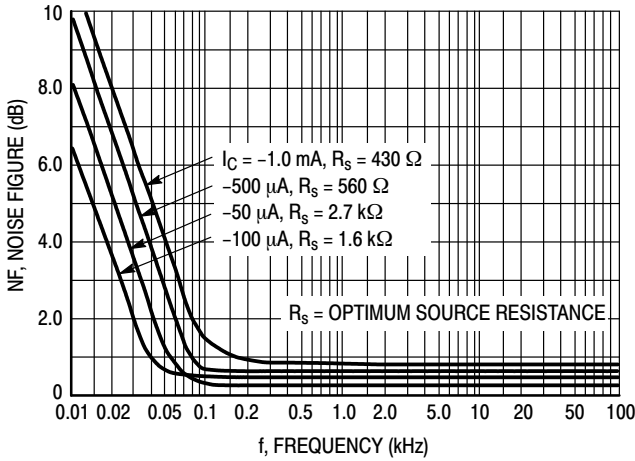


Figure 7. Frequency Effects

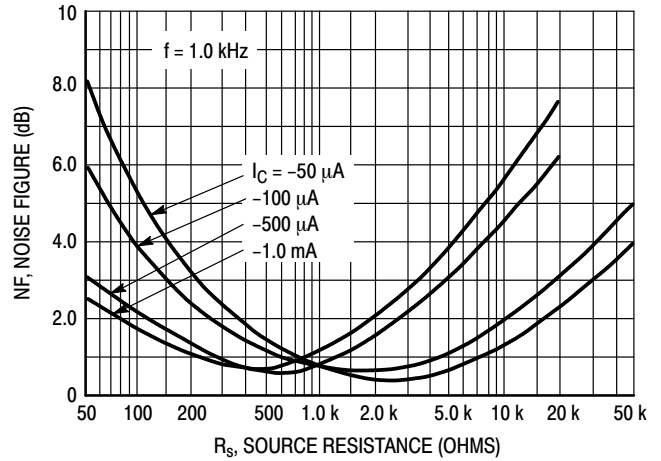


Figure 8. Source Resistance Effects

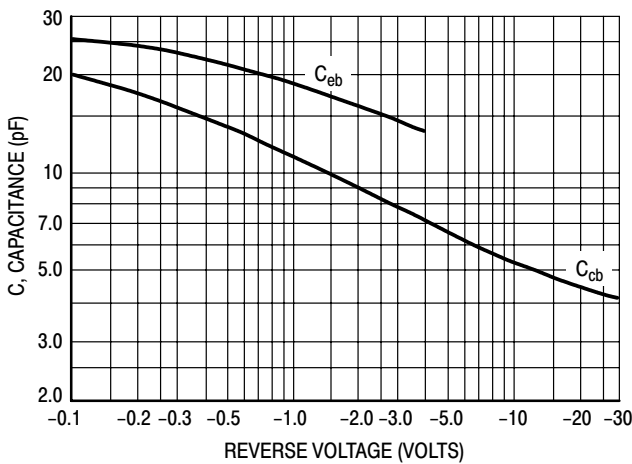


Figure 9. Capacitances

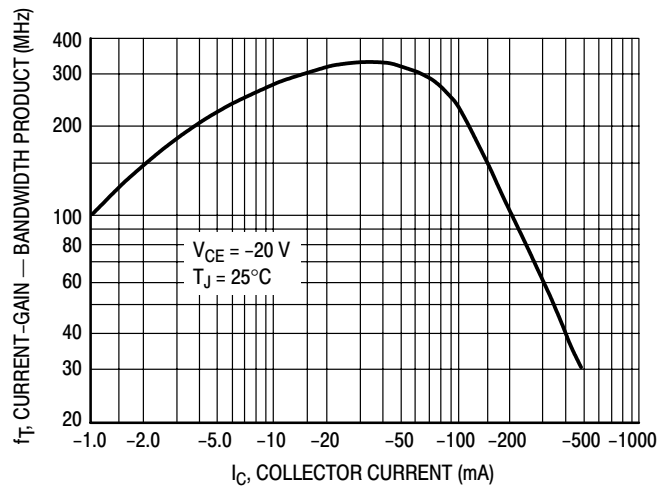


Figure 10. Current-Gain - Bandwidth Product

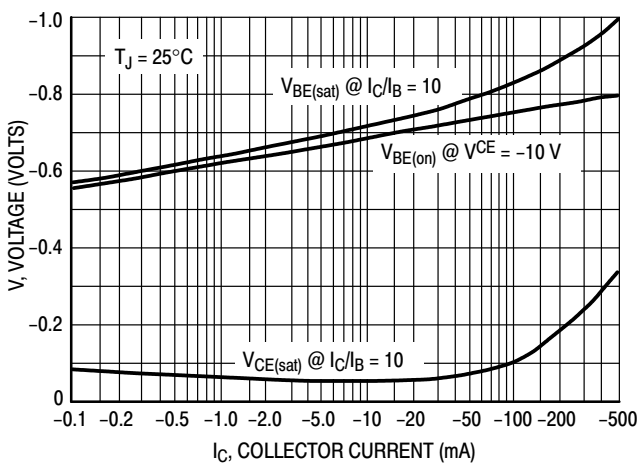


Figure 11. "On" Voltage

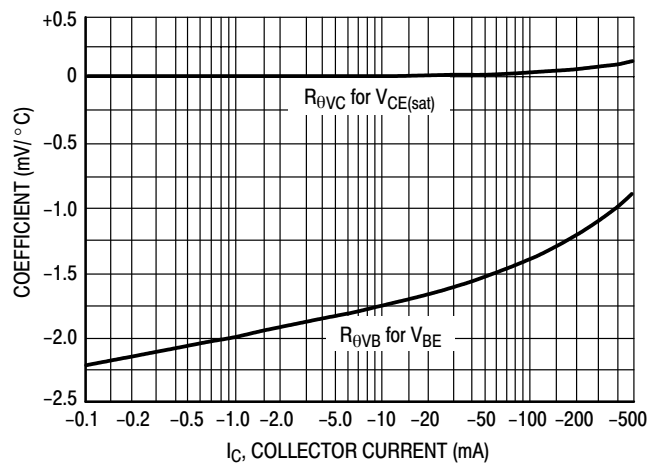
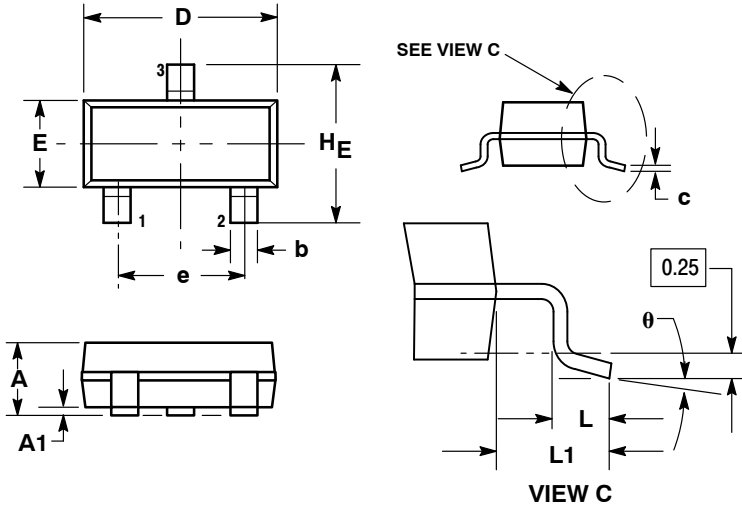


Figure 12. Temperature Coefficients

Package Dimensions

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NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1.00	1.11	0.035	0.040	0.044
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.37	0.44	0.50	0.015	0.018	0.020
c	0.09	0.13	0.18	0.003	0.005	0.007
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.081
L	0.10	0.20	0.30	0.004	0.008	0.012
L1	0.35	0.54	0.69	0.014	0.021	0.029
HE	2.10	2.40	2.64	0.083	0.094	0.104

STYLE 6:

1. BASE
2. EMITTER
3. COLLECTOR

SOLDERING FOOTPRINT*

