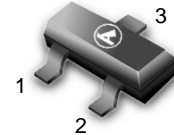


General Purpose Transistor

PNP Silicon

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

LMBT2907LT1
LMBT2907ALT1



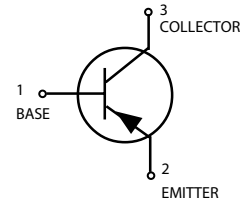
SOT-23

MAXIMUM RATINGS

Rating	Symbol	Value		Unit
		2907	2907A	
Collector-Emitter Voltage	V_{CEO}	-40	-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, (1) $T_A = 25^\circ\text{C}$	P_D	225	mW
Derate above 25°C		1.8	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate, (2) $T_A = 25^\circ\text{C}$	P_D	300	mW
Derate above 25°C		2.4	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	$^\circ\text{C}$



ORDERING INFORMATION

Device	Package	Shipping
LMBT2907LT1	SOT-23	3000/Tape & Reel
LMBT2907LT1G	SOT-23	3000/Tape & Reel
LMBT2907ALT1	SOT-23	3000/Tape & Reel
LMBT2907ALT1G	SOT-23	3000/Tape & Reel

DEVICE MARKING

LMBT2907LT1 = M2B, LMBT2907ALT1 = 2F

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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage(3) ($I_C = -10 \text{ mAdc}, I_E = 0$)	$V_{(BR)CEO}$			Vdc
	LMBT2907	-40	—	
	LMBT2907A	-60	—	
Collector-Emitter 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($V_{CB} = -30\text{Vdc}, I_{BE(OFF)} = -0.5\text{Vdc}$)	I_{CEX}	—	-50	nAdc
Collector Cutoff Current ($V_{CB} = -50\text{Vdc}, I_E = 0$)	I_{CBO}			μAdc
	LMBT2907	—	-0.020	
	LMBT2907A	—	-0.010	
($V_{CB} = -50\text{Vdc}, I_E = 0, T_A = 125^\circ\text{C}$)	LMBT2907	—	-20	
	LMBT2907A	—	-10	
Base Current($V_{CE} = -30\text{Vdc}, V_{EB(OFF)} = -0.5\text{Vdc}$)	I_B	—	-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 $\leq 2.0\%$.

LMBT2907LT1 LMBT2907ALT1

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS				
DC Current Gain (I _C = -0.1mA _{dc} , V _{CE} = -10 V _{dc})	h _{FE}	LMBT2907	35	—
		LMBT2907A	75	—
(I _C = -1.0mA _{dc} , V _{CE} = -10 V _{dc})		LMBT2907	50	—
		LMBT2907A	100	—
(I _C = -10 mA _{dc} , V _{CE} = -10V _{dc})		LMBT2907	75	—
		LMBT2907A	100	—
(I _C = -150mA _{dc} , V _{CE} = -10 V _{dc})(3)		LMBT2907	—	—
		LMBT2907A	100	300
(I _C = -500mA _{dc} , V _{CE} = -10 V _{dc})(3)		LMBT2907	30	—
		LMBT2907A	50	—
Collector-Emitter Saturation Voltage(3) (I _C = -150mA _{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(3) (I _C = -150mA _{dc} , I _B = -15 mA _{dc}) (I _C = -500mA _{dc} , I _B = -50 mA _{dc})	V _{BE(sat)}	—	-1.3 -2.6	V _{dc}

SMALL-SIGNAL CHARACTERISTICS

Current-Gain — Bandwidth Product(3),(4) (I _C = -50mA _{dc} , V _{CE} = -20V _{dc} , f = 100MHz)	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} = -2.0V _{dc} , I _C = 0, f = 1.0 MHz)	C _{ibo}	—	30	pF

SWITCHING CHARACTERISTICS

Turn-On Time Delay Time Rise Time	(V _{CC} = -30 V _{dc} , I _C = -150 mA _{dc} , I _{B1} = -15 mA _{dc})	t _{on} t ^d t _r	— — —	45 10 40	ns
Fall Time Storage Time Turn-Off Time	(V _{CC} = -6.0 V _{dc} , I _C = -150 mA _{dc} , I _{B1} = I _{B2} = 15 mA _{dc})	t _f t _s t _{off}	— — —	30 80 100	ns

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.

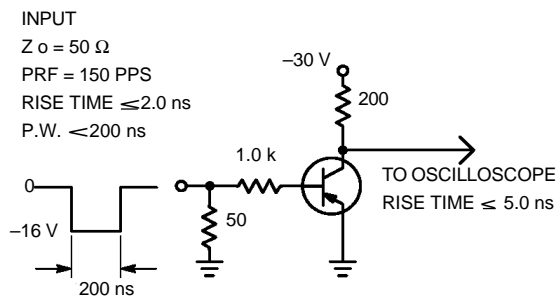


Figure 1. Delay and Rise Time Test Circuit

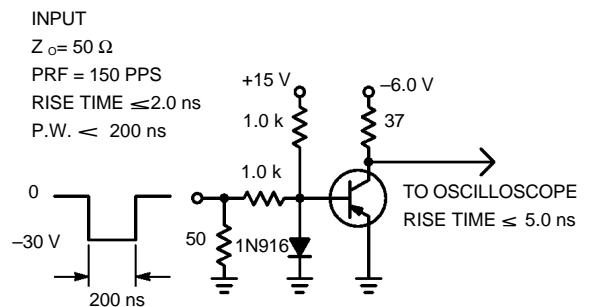


Figure 2. Storage and Fall Time Test Circuit

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TYPICAL CHARACTERISTICS

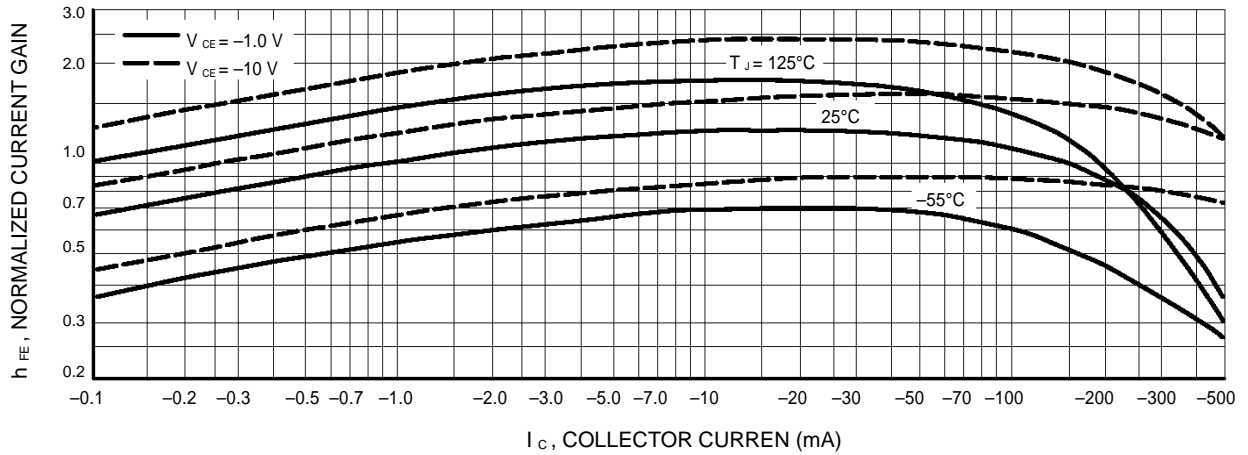


Figure 3. DC Current Gain

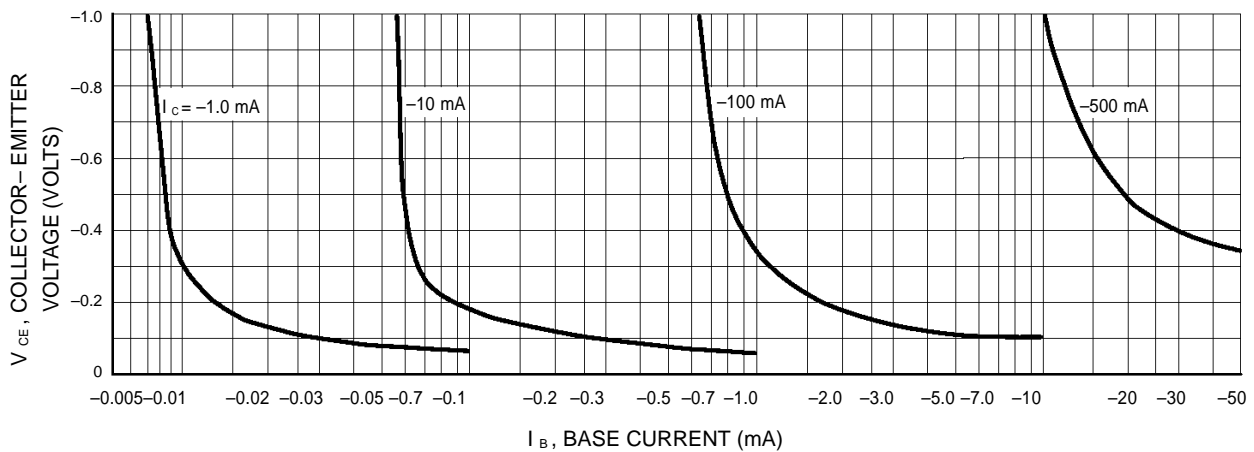


Figure 4. Collector Saturation Region

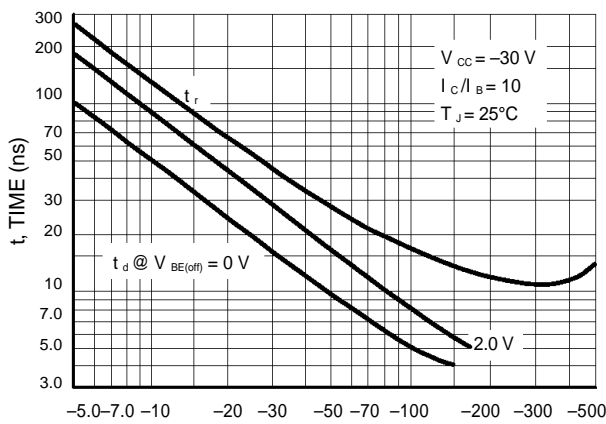


Figure 5. Turn-On Time

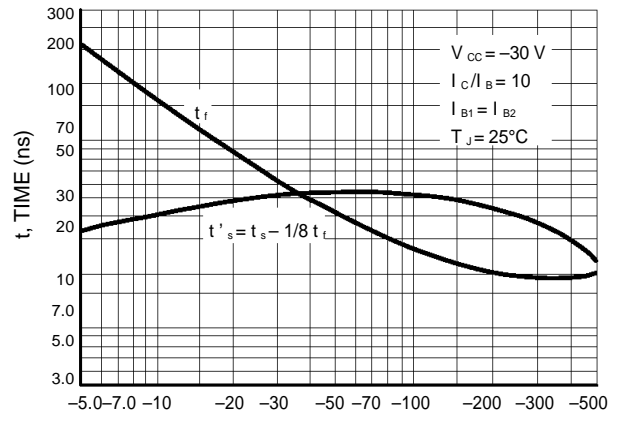


Figure 6. Turn-Off Time

LMBT2907LT1 LMBT2907ALT1

TYPICAL SMALL-SIGNAL CHARACTERISTICS

NOISE FIGURE

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

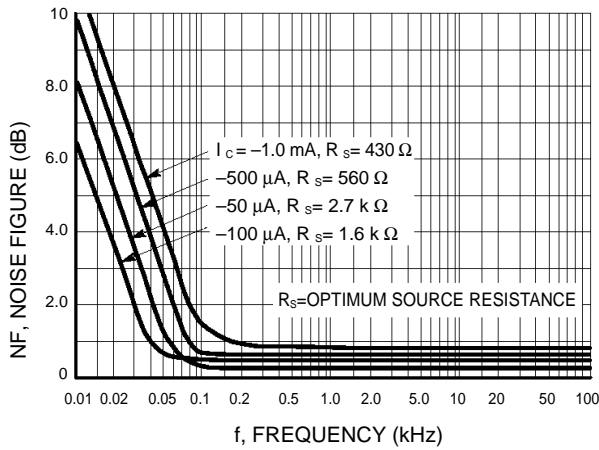


Figure 7. Frequency Effects

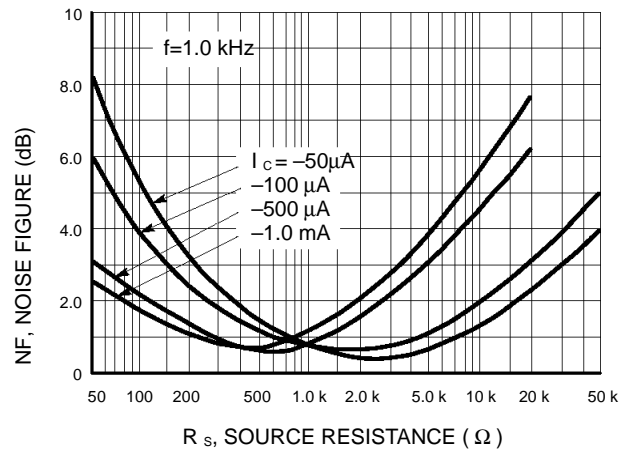


Figure 8. Source Resistance Effects

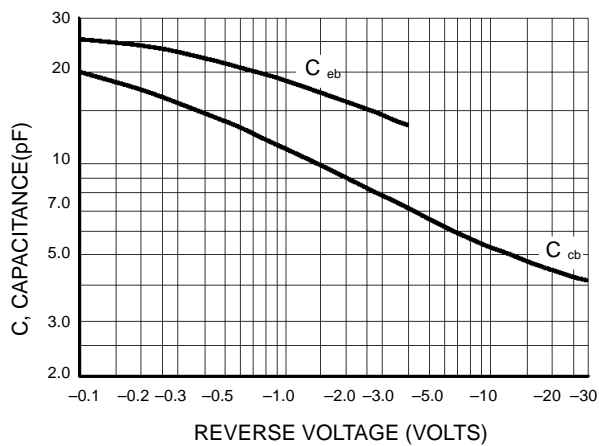


Figure 9. Capacitances

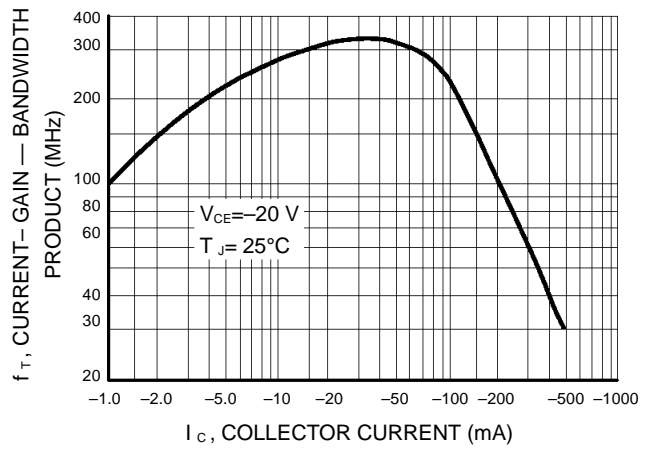


Figure 10. Current-Gain — Bandwidth Product

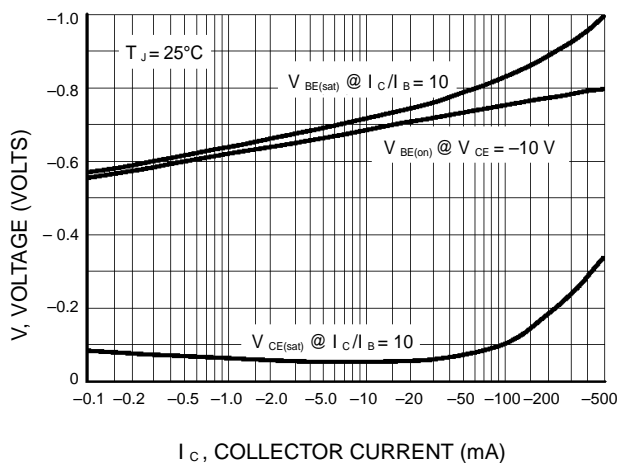


Figure 11. "On" Voltage

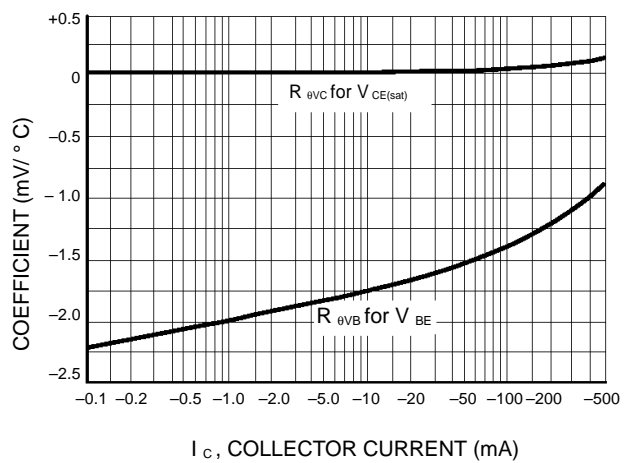
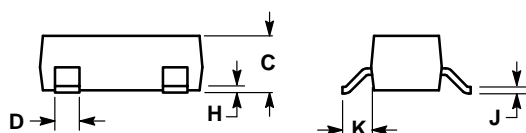
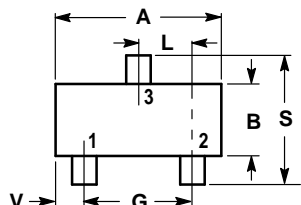


Figure 12. Temperature Coefficients



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NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

- PIN 1. BASE
 2. EMITTER
 3. COLLECTOR

