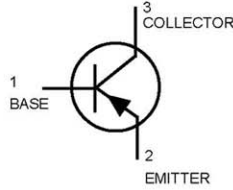


PNP Silicon



● MAXIMUM RATINGS

Rating	Symbol	Value		Unit
		2907	2907A	
Collector–Emitter Voltage	V_{CE0}	-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	$^\circ\text{C}$

● DEVICE MARKING

MMBT2907LT1 = M2B, MMBT2907ALT1 = 2F

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Breakdown Voltage(3) ($I_C = -10\text{ mAdc}, I_E = 0$)	$V_{(BR)CEO}$	-40	—	Vdc
	MMBT2907	-40	—	
	MMBT2907A	-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}	—	-0.020	μAdc
	MMBT2907	—	-0.020	
	MMBT2907A	—	-0.010	
($V_{CB} = -50\text{Vdc}, I_E = 0, T_A = 125^\circ\text{C}$)	MMBT2907	—	-20	
	MMBT2907A	—	-10	
Base Current($V_{CE} = -30\text{Vdc}, V_{EB(OFF)} = -0.5\text{Vdc}$)	I_B	—	-50	nAdc

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

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

Characteristic	Symbol	Min	Max	Unit
DC CHARACTERISTICS				
DC Current Gain ($I_C = -0.1\text{mA}$, $V_{CE} = -10\text{Vdc}$)	h_{FE}	35	—	—
	MMBT2907	75	—	
	MMBT2907A	—	—	
($I_C = -1.0\text{mA}$, $V_{CE} = -10\text{Vdc}$)	MMBT2907	50	—	
	MMBT2907A	100	—	
($I_C = -10\text{mA}$, $V_{CE} = -10\text{Vdc}$)	MMBT2907	75	—	
	MMBT2907A	100	—	
($I_C = -150\text{mA}$, $V_{CE} = -10\text{Vdc}$)(3)	MMBT2907	—	—	
	MMBT2907A	100	300	
($I_C = -500\text{mA}$, $V_{CE} = -10\text{Vdc}$)(3)	MMBT2907	30	—	
	MMBT2907A	50	—	
Collector–Emitter Saturation Voltage(3) ($I_C = -150\text{mA}$, $I_B = -15\text{mA}$) ($I_C = -500\text{mA}$, $I_B = -50\text{mA}$)	$V_{CE(sat)}$	—	-0.4 -1.6	Vdc
Base–Emitter Saturation Voltage(3) ($I_C = -150\text{mA}$, $I_B = -15\text{mA}$) ($I_C = -500\text{mA}$, $I_B = -50\text{mA}$)	$V_{BE(sat)}$	—	-1.3 -2.6	Vdc

● SMALL-SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product(3),(4) ($I_C = -50\text{mA}$, $V_{CE} = -20\text{Vdc}$, $f = 100\text{MHz}$)	f_T	200	—	MHz
Output Capacitance ($V_{CB} = -10\text{Vdc}$, $I_E = 0$, $f = 1.0\text{MHz}$)	C_{obo}	—	8.0	pF
Input Capacitance ($V_{EB} = -2.0\text{Vdc}$, $I_C = 0$, $f = 1.0\text{MHz}$)	C_{ibo}	—	30	pF

● SWITCHING CHARACTERISTICS

Turn–On Time ($V_{CC} = -30\text{Vdc}$, $I_C = -150\text{mA}$, $I_{B1} = -15\text{mA}$)	t_{on}	—	45	ns
Delay Time	t^d	—	10	ns
Rise Time	t_r	—	40	ns
Fall Time ($V_{CC} = -6.0\text{Vdc}$, $I_C = -150\text{mA}$, $I_{B1} = I_{B2} = 15\text{mA}$)	t_f	—	30	ns
Storage Time	t_s	—	80	ns
Turn–Off Time	t_{off}	—	100	ns

3. Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

4. f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

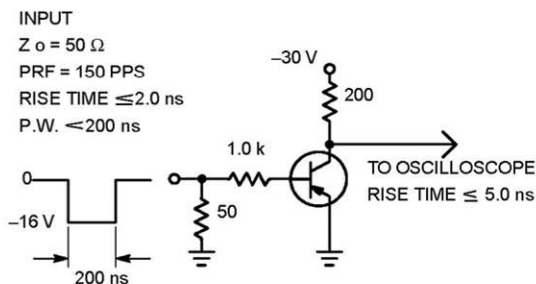


Figure 1. Delay and Rise Time Test Circuit

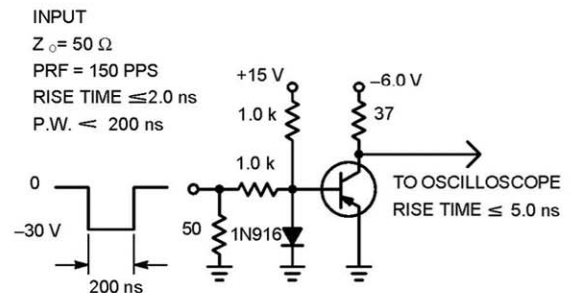


Figure 2. Storage and Fall Time Test Circuit

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TYPICAL CHARACTERISTICS

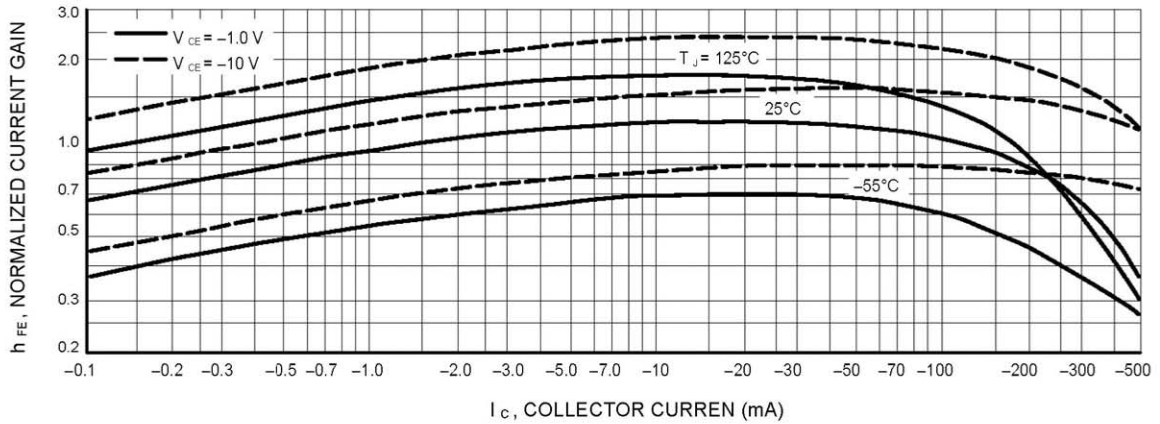


Figure 3. DC Current Gain

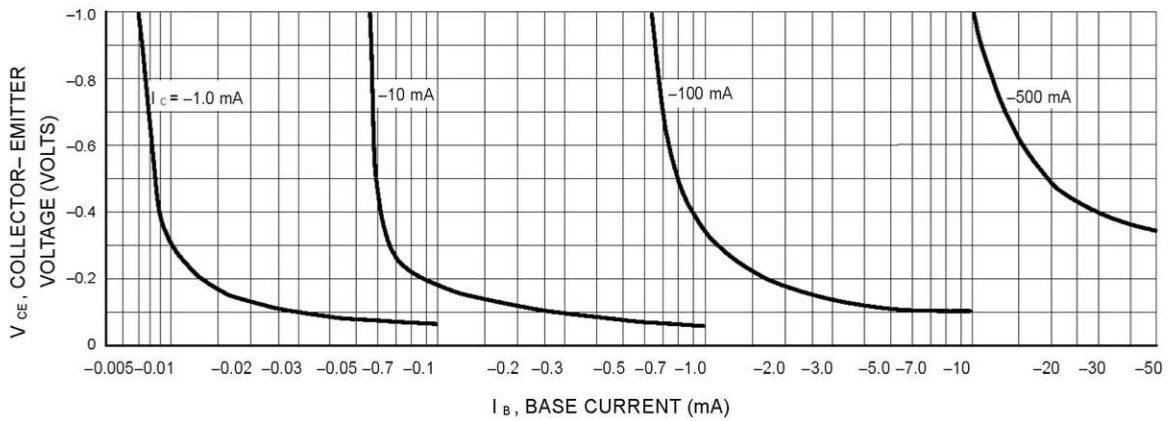


Figure 4. Collector Saturation Region

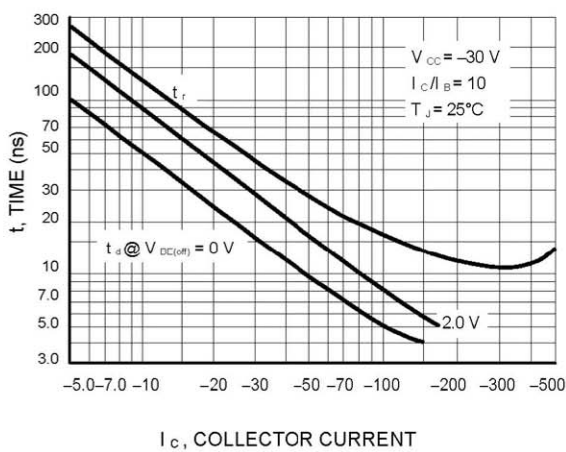


Figure 5. Turn-On Time

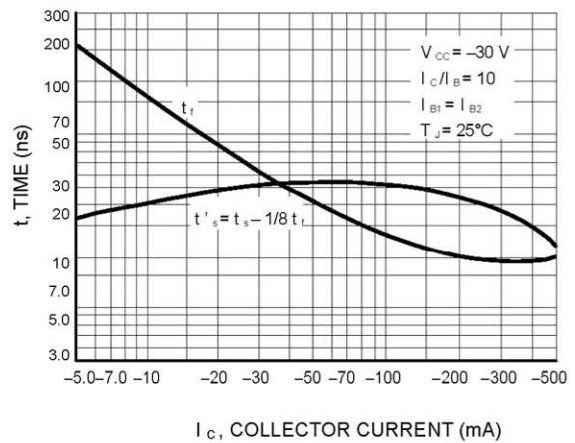


Figure 6. Turn-Off Time

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TYPICAL SMALL-SIGNAL CHARACTERISTICS

NOISE FIGURE

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

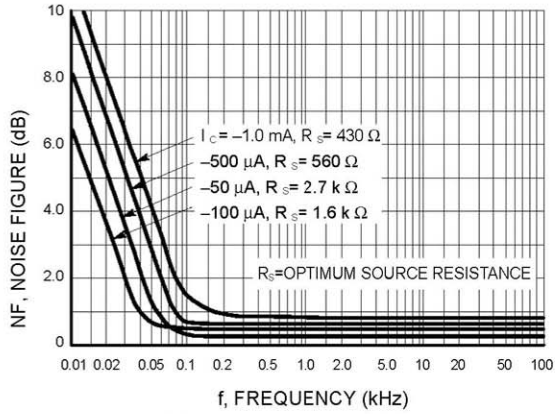


Figure 7. Frequency Effects

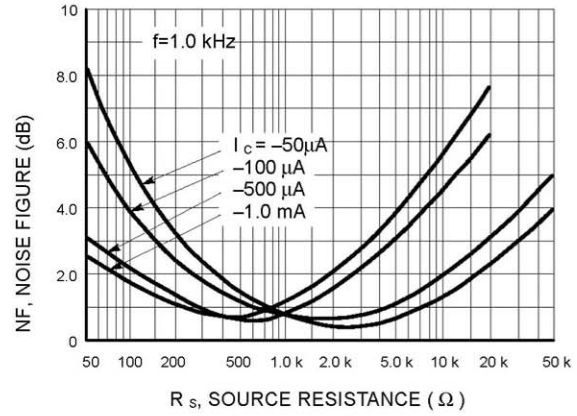


Figure 8. Source Resistance Effects

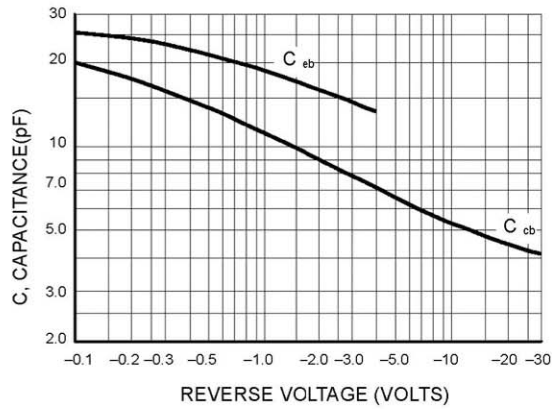


Figure 9. Capacitances

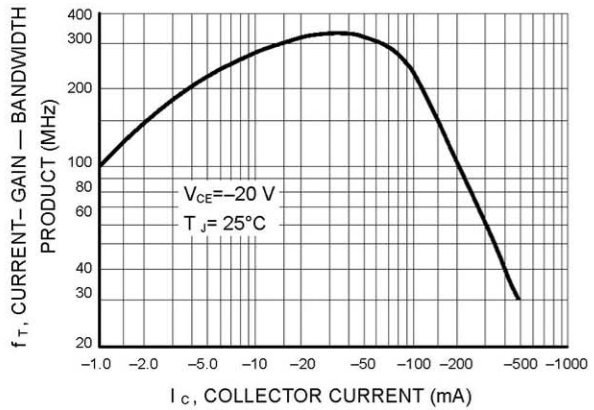


Figure 10. Current-Gain — Bandwidth Product

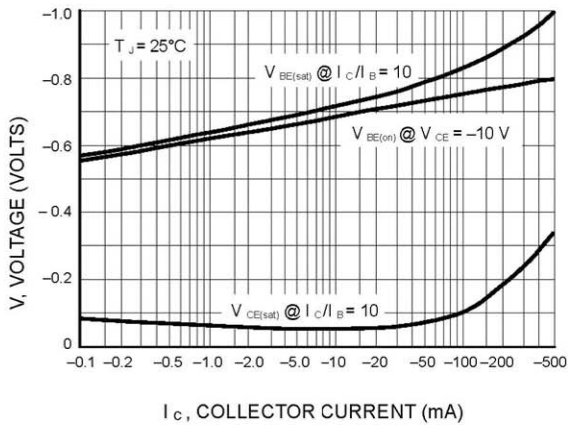


Figure 11. "On" Voltage

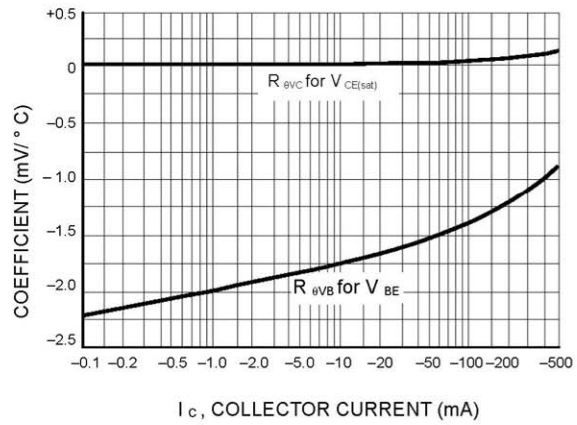


Figure 12. Temperature Coefficients

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