

**SOT-23 BIPOLAR TRANSISTORS  
TRANSISTOR(PNP)**


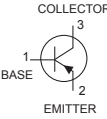
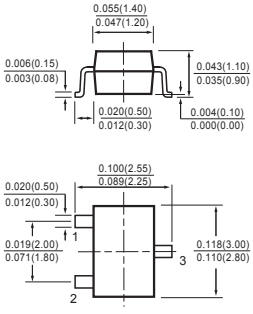
**FEATURES**

- \* Power dissipation  
P<sub>CM</sub> 0.3 W(T<sub>amb</sub>=25°C)
- \* Collector current  
I<sub>CM</sub> -0.6 A
- \* Collector-base voltage  
V<sub>(BR)CBO</sub>: -60 V
- \* Operating and storage junction temperature range  
T<sub>J</sub>, T<sub>stg</sub>: -55°C to +150°C

**MECHANICAL DATA**

- \* Case: Molded plastic
- \* Epoxy: UL 94V-O rate flame retardant
- \* Lead: MIL-STD-202E method 208C guaranteed
- \* Mounting position: Any
- \* Weight: 0.008 gram

**SOT-23**

Dimensions in inches and (millimeters)

**MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS**

Ratings at 25 °C ambient temperature unless otherwise specified.  
Single phase, half wave, 60 Hz, resistive or inductive load.  
For capacitive load, derate current by 20%.

**MAXIMUM RATINGS** ( @ TA = 25°C unless otherwise noted )

RATINGS	SYMBOL	VALUE	UNITS
Max. Steady State Power Dissipation <sup>(1)</sup> @TA=25°C Derate above 25°C	P <sub>D</sub>	300	mW
Max. Operating Temperature Range	T <sub>J</sub>	150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C

**ELECTRICAL CHARACTERISTICS** ( @ TA = 25°C unless otherwise noted )

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS
Thermal Resistance Junction to Ambient	R θ <sub>JA</sub>	-	-	417	°C/W

Notes : 1. Alumina=0.4\*0.3\*0.024in.99.5% alumina  
2. " Fully ROHS Compliant ", "100% Sn plating (Pb-free)".

**ELECTRICAL CHARACTERISTICS** (@TA=25°C unless otherwise noted)

Chatacteristic	Symbol	Min	Max	Unit
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**OFF CHARACTERISTICS**

Collector-Emitter Breakdown Voltage(1) ( $I_C = -10 \text{ mAdc}$ , $I_B = 0$ )	$V_{(BR)CEO}$	-60	-	Vdc
Collector-Base Breakdown Voltage ( $I_C = -10\text{uAdc}$ , $I_E = 0$ )	$V_{(BR)CBO}$	-60	-	Vdc
Emitter-Base Breakdown Voltage ( $I_E = -10\text{uAdc}$ , $I_C = 0$ )	$V_{(BR)EBO}$	-5.0	-	Vdc
Collector Cutoff Current ( $V_{CE} = -30\text{Vdc}$ , $V_{BE(off)} = -5.0\text{Vdc}$ )	$I_{CEX}$	-	-50	nAdc
Collector Cutoff Current ( $V_{CB} = -50\text{Vdc}$ , $I_E = 0$ ) ( $V_{CB} = -50\text{Vdc}$ , $I_E = 0$ , $T_A = 125^\circ\text{C}$ )	$I_{CBO}$	-	-0.02 -20	uAdc
Base Current ( $V_{CE} = -30\text{Vdc}$ , $V_{EB(off)} = -0.5\text{Vdc}$ )	$I_B$	-	-50	nAdc

**ON CHARACTERISTICS**

DC Current Gain ( $I_C = -0.1\text{mAdc}$ , $V_{CE} = -10\text{Vdc}$ ) ( $I_C = -1.0\text{mAdc}$ , $V_{CE} = -10\text{Vdc}$ ) ( $I_C = -10\text{mAdc}$ , $V_{CE} = -10\text{Vdc}$ ) ( $I_C = -150\text{mAdc}$ , $V_{CE} = -10\text{Vdc}$ )(1) ( $I_C = -500\text{mAdc}$ , $V_{CE} = -10\text{Vdc}$ )(1)	hFE	75 100 100 100 50	- - - 300 -	-
Collector-Emitter Saturation Voltage (1) ( $I_C = -150\text{mAdc}$ , $I_B = -15\text{mAdc}$ ) ( $I_C = -500\text{mAdc}$ , $I_B = -50\text{mAdc}$ )	$V_{CE(sat)}$	- -	-0.4 -1.6	Vdc
Base-Emitter Saturation Voltage (1) ( $I_C = -150\text{mAdc}$ , $I_B = -15\text{mAdc}$ ) ( $I_C = -500\text{mAdc}$ , $I_B = -50\text{mAdc}$ )	$V_{BE(sat)}$	- -	-1.3 -2.6	Vdc

**SMALL-SIGNAL CHARACTERISTICS**

Current-Gain-Bandwidth Product (1)(2) ( $I_C = -50\text{mAdc}$ , $V_{CE} = -20\text{Vdc}$ , $f = 100\text{MHz}$ )	$f_T$	200	-	MHz
Output Capacitance ( $V_{CB} = -10\text{Vdc}$ , $I_E = 0$ , $f = 1.0\text{MHz}$ )	$C_{obo}$	-	8.0	pF
Input Impedance ( $V_{EB} = -2.0\text{Vdc}$ , $I_C = 0$ , $f = 1.0\text{MHz}$ )	$C_{ibo}$	-	30	pF

**SWITCHING CHARACTERISTICS**

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

NOTES : 1. Pulse Test: Pulse Width $\leq$ 300ms,Duty Cycle $\leq$ 2.0%

2.  $f_T$  is defined as the frequency at which |hFE| extrapolates to unity

## RATING AND CHARACTERISTICS CURVES ( MMBT2907A )

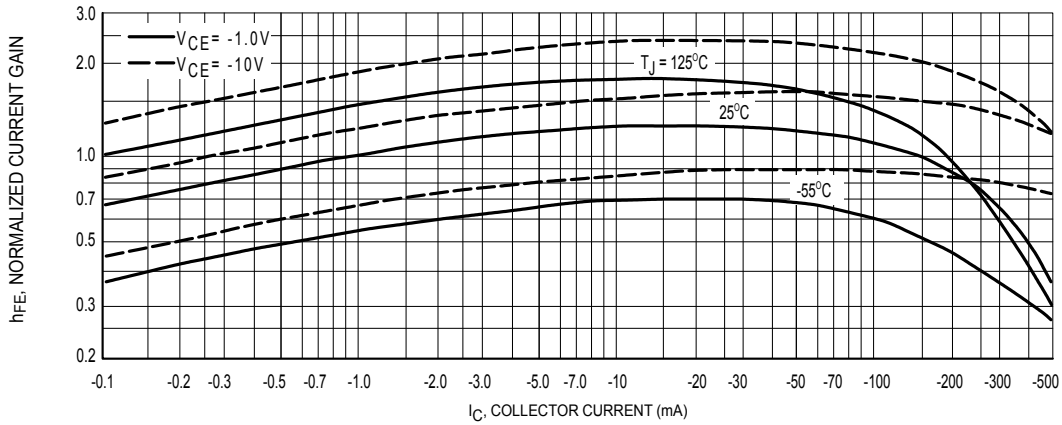


Figure 1. DC Current Gain

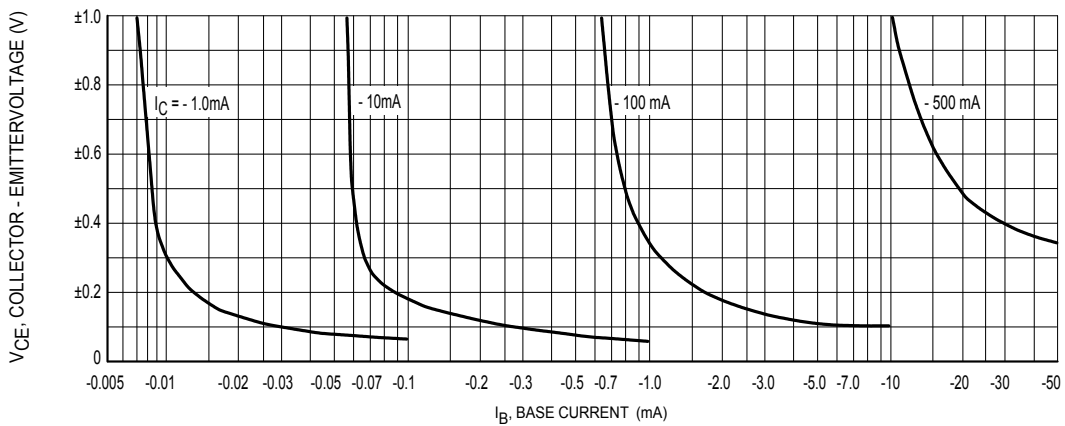


Figure 2. Collector Saturation Region

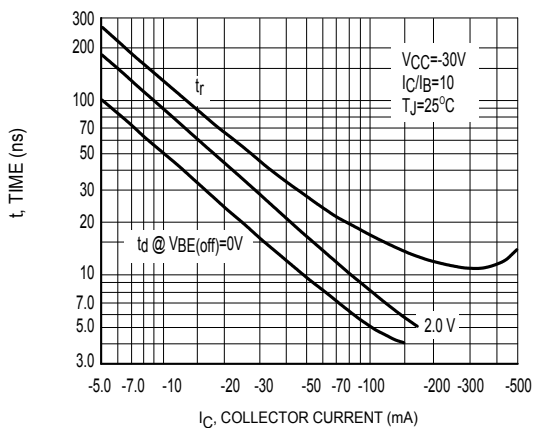


Figure 3. Turn - On Time

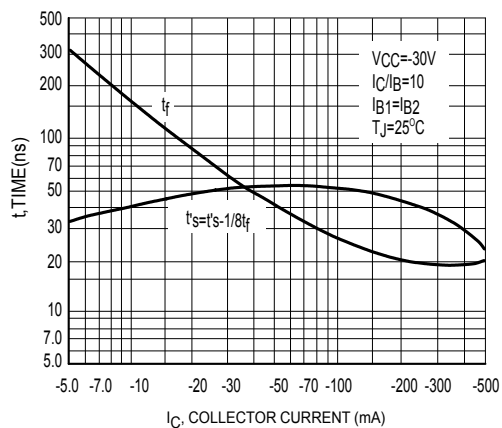


Figure 4. Turn - Off Time

## RATING AND CHARACTERISTICS CURVES ( MMBT2907A )

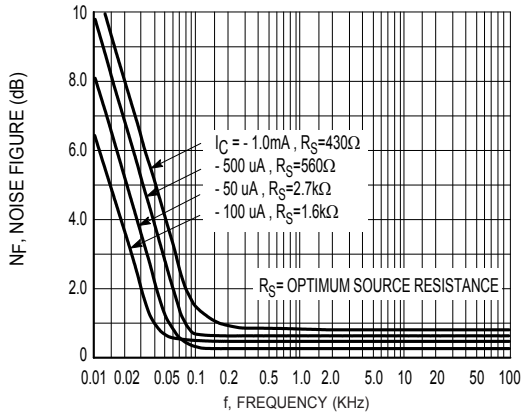


Figure 5. Frequency Effects

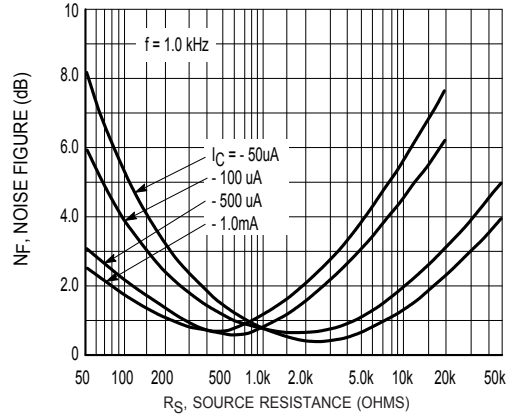


Figure 6. Source Resistance Effects

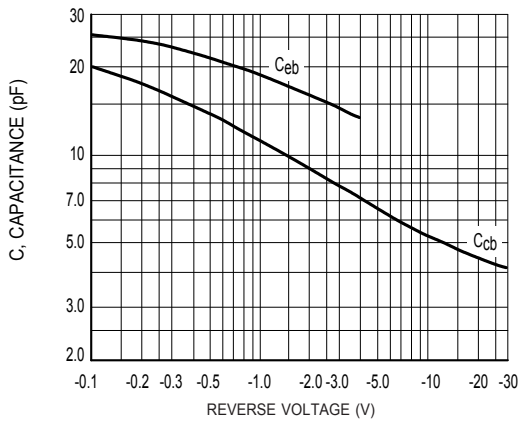


Figure 7. Capacitances

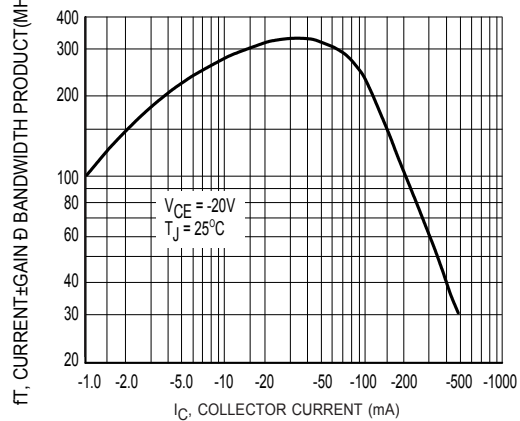


Figure 8. Current-Gain Bandwidth Product

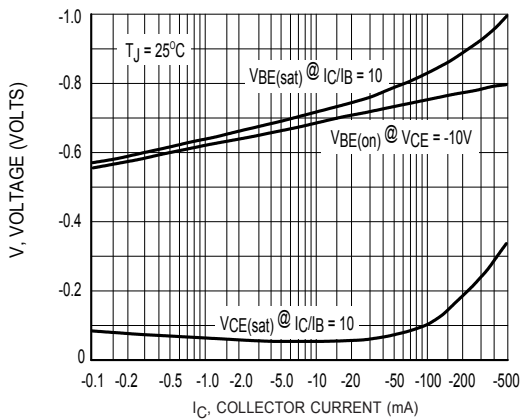


Figure 9. "On" Voltages

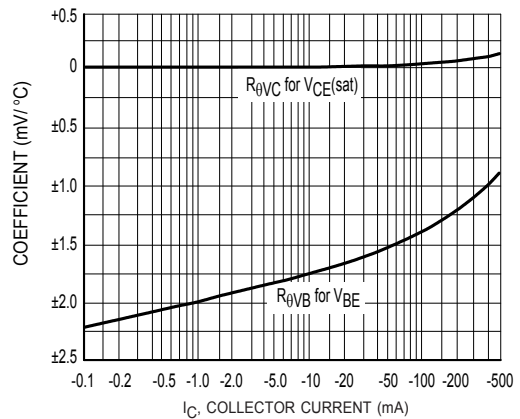


Figure 10. Temperature Coefficients

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