



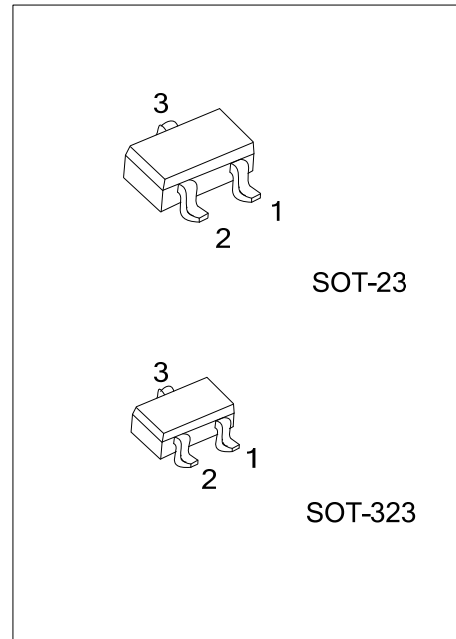
## MMBT2907A

## PNP SILICON TRANSISTOR

### PNP GENERAL PURPOSE AMPLIFIER

#### DESCRIPTION

This UTC **MMBT2907A** is designed for use as a general purpose amplifier and switch requiring collector currents to 500 mA.



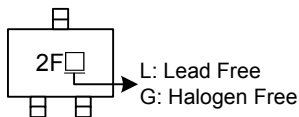
Lead-free: MMBT2907AL  
Halogen-free: MMBT2907AG

#### ORDERING INFORMATION

Ordering Number			Package	Pin Assignment			Packing
Normal	Lead Free	Halogen Free		1	2	3	
MMBT2907A-AE3-R	MMBT2907AL-AE3-R	MMBT2907AG-AE3-R	SOT-23	E	B	C	Tape Reel
MMBT2907A-AL3-R	MMBT2907AL-AL3-R	MMBT2907AG-AL3-R	SOT-323	E	B	C	Tape Reel

<p>MMBT2907AL-AE3-R</p> <p>(1) Packing Type (2) Package Type (3) Lead Plating</p>	<p>(1) R: Tape Reel (2) AE3: SOT-23, AL3: SOT-323 (3) G: Halogen Free, L: Lead Free, Blank: Pb/Sn</p>
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#### MARKING



■ ABSOLUTE MAXIMUM RATING (Ta=25°C unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage	V <sub>CEO</sub>	-60	V
Collector-Base Voltage	V <sub>CBO</sub>	-60	V
Emitter-Base Voltage	V <sub>EBO</sub>	-5	V
Collector Current Continuous	I <sub>C</sub>	-800	mA
Power Dissipation	SOT-23	P <sub>D</sub>	350
	SOT-323		275
Junction Temperature	T <sub>J</sub>	+150	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Case	SOT-23	θ <sub>JA</sub>	357
	SOT-323		455

■ ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Collector-Emitter Breakdown Voltage (Note)	BV <sub>CEO</sub>	I <sub>C</sub> =-10mA, I <sub>B</sub> =0	-60			V
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	I <sub>C</sub> =-10μA, I <sub>E</sub> =0	-60			V
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	I <sub>E</sub> =-10μA, I <sub>C</sub> =0	-5			V
Base Cutoff Current	I <sub>B</sub>	V <sub>CB</sub> =-30V, V <sub>EB</sub> =-0.5V			-50	nA
Collector Cutoff Current	I <sub>CEX</sub>	V <sub>CE</sub> =-30V, V <sub>BE</sub> =-0.5V			-50	nA
Collector Cutoff Current	I <sub>CBO</sub>	V <sub>CB</sub> =-50V, I <sub>E</sub> =0			-0.02	μA
		V <sub>CB</sub> =-50V, I <sub>E</sub> =0, T <sub>A</sub> =150°C			-20	μA
<b>ON CHARACTERISTICS</b>						
DC Current Gain	h <sub>FE</sub>	I <sub>C</sub> =-0.1mA, V <sub>CE</sub> =-10V	75			
		I <sub>C</sub> =-1.0 mA, V <sub>CE</sub> =-10V	100			
		I <sub>C</sub> =-10 mA, V <sub>CE</sub> =-10V	100			
		I <sub>C</sub> =-150 mA, V <sub>CE</sub> =-10V (Note)	100		300	
		I <sub>C</sub> =-500 mA, V <sub>CE</sub> =-10V (Note)	50			
Collector-Emitter Saturation Voltage (Note)	V <sub>CE(SAT)</sub>	I <sub>C</sub> =-150 mA, I <sub>B</sub> =-15mA			-0.4	V
		I <sub>C</sub> =-500 mA, I <sub>B</sub> =-50mA			-1.6	V
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	I <sub>C</sub> =-150 mA, I <sub>B</sub> =-15mA (Note)			-1.3	V
		I <sub>C</sub> =-500 mA, I <sub>B</sub> =-50mA			-2.6	V
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Current Gain – Bandwidth Product	f <sub>T</sub>	I <sub>C</sub> =-50mA, V <sub>CE</sub> =-20V, f=100MHz	200			MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =-10V, I <sub>E</sub> =0, f=100kHz			8	pF
Input Capacitance	C <sub>ib</sub>	V <sub>EB</sub> =-2V, I <sub>C</sub> =0, f=100kHz			30	pF
<b>SWITCHING CHARACTERISTICS</b>						
Turn-on Time	t <sub>ON</sub>	V <sub>CC</sub> =30V, I <sub>C</sub> =-150mA, I <sub>B1</sub> =-15mA			45	ns
Delay Time	t <sub>DLY</sub>				10	ns
Rise Time	t <sub>R</sub>				40	ns
Turn-off Time	t <sub>OFF</sub>	V <sub>CC</sub> =6V, I <sub>C</sub> =-150mA, I <sub>B1</sub> = I <sub>B2</sub> =-15mA			100	ns
Storage Time	t <sub>S</sub>				80	ns
Fall Time	t <sub>F</sub>				30	ns

Note: Pulse Test: Pulse Width ≤ 300ms, Duty Cycle ≤ 2.0%

## ■ TEST CIRCUITS

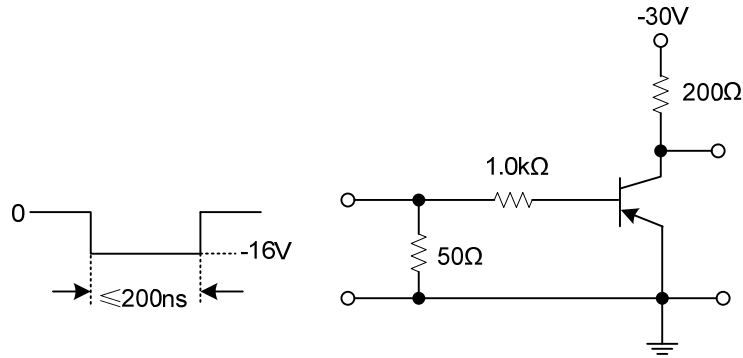


Fig 1. Saturated Turn-On Switching Time Test Circuit

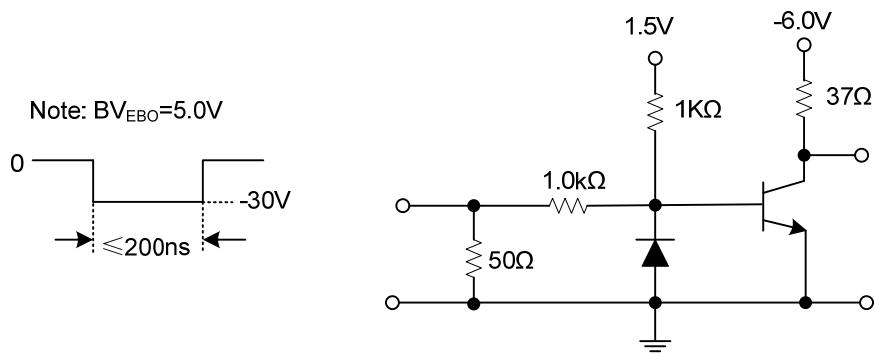
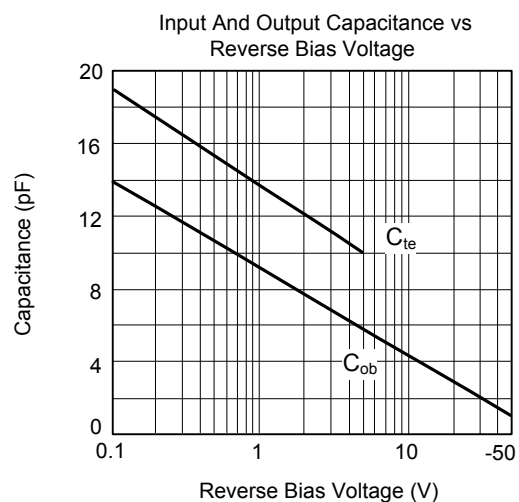
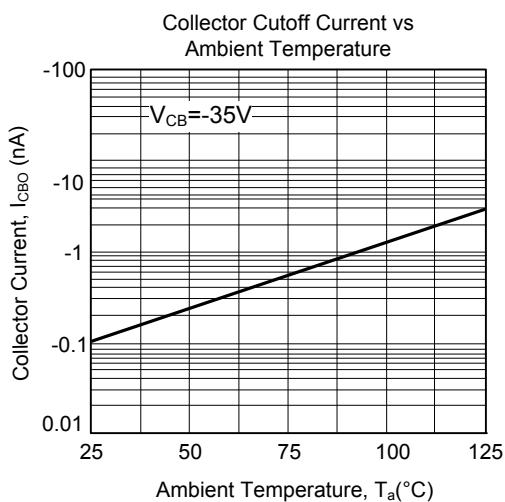
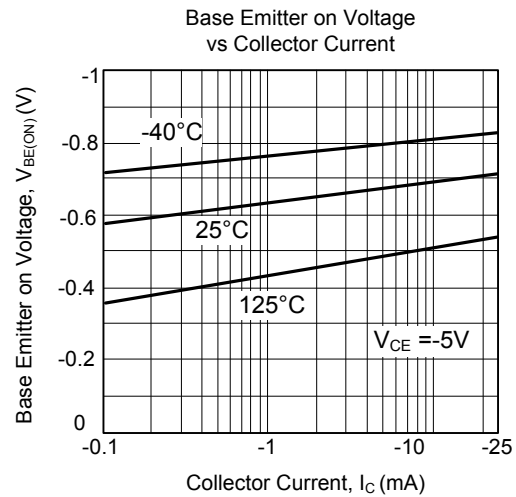
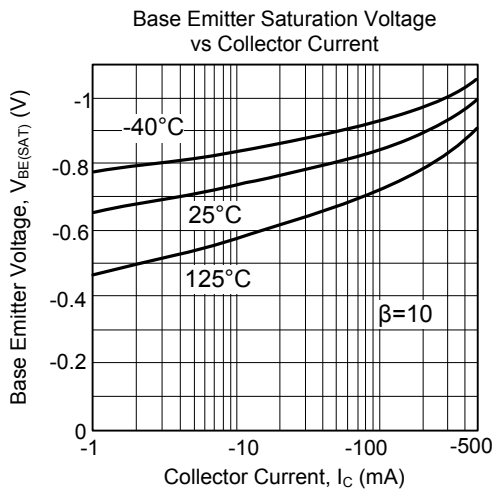
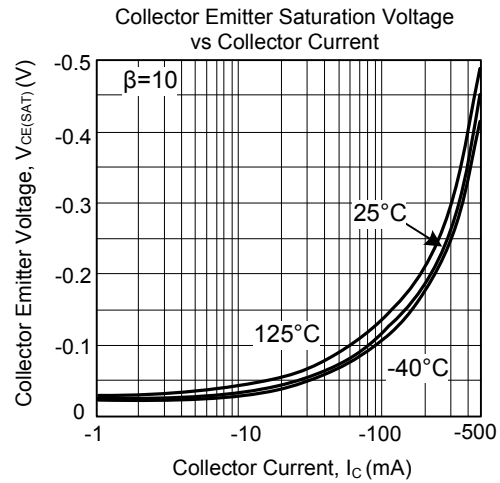
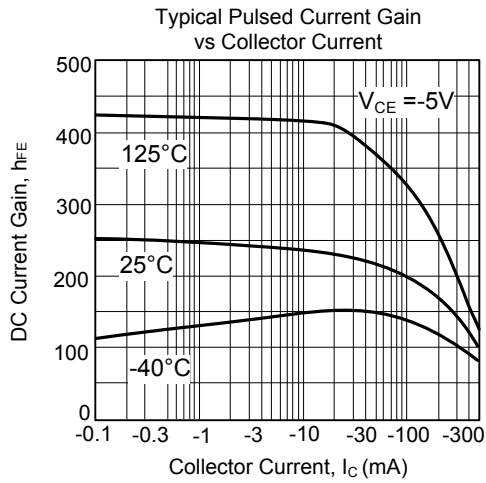
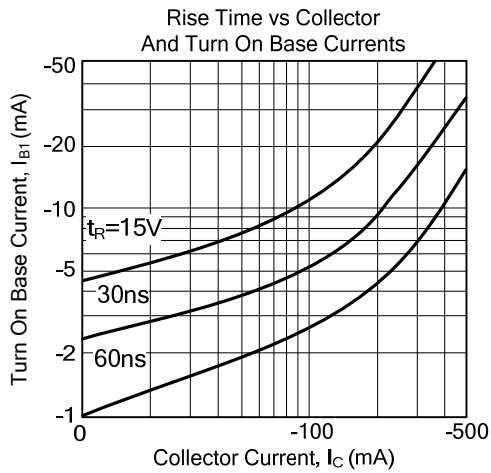
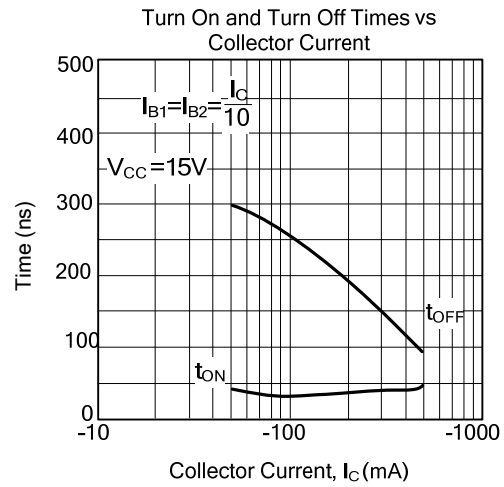
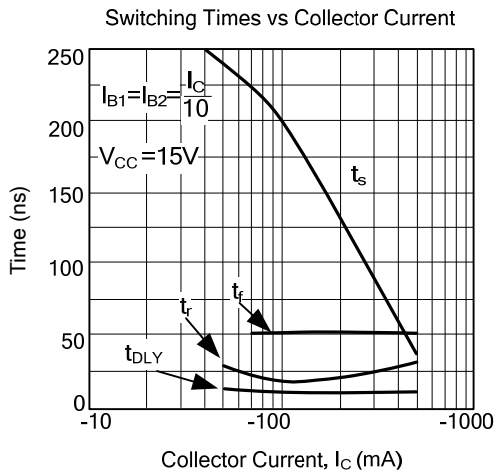


Fig 2. Saturated Turn-Off Switching Time Test Circuit

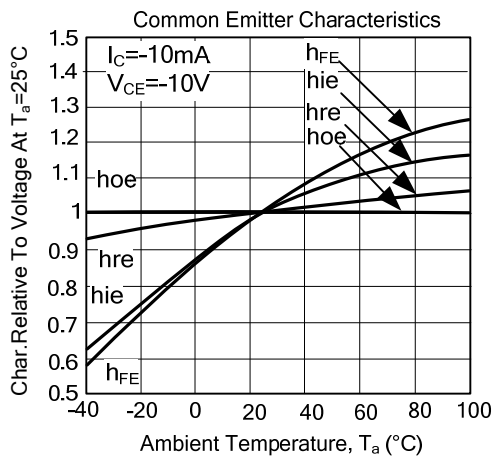
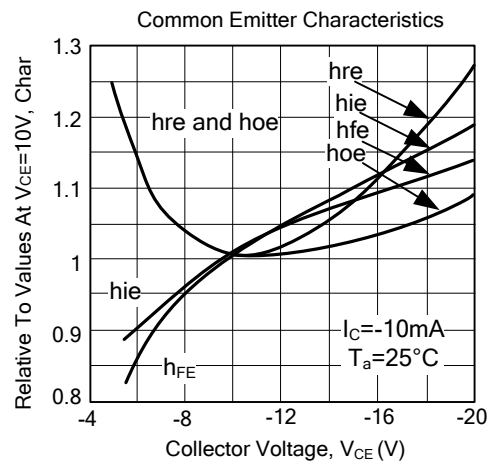
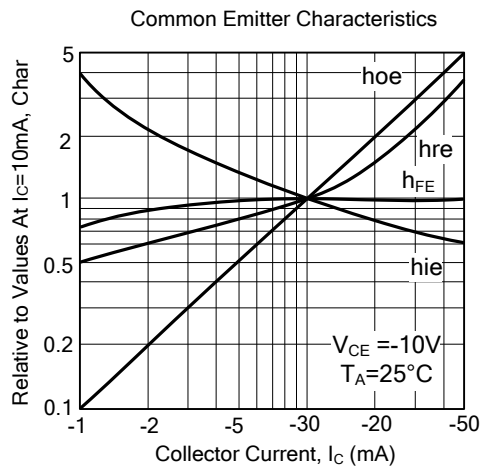
### TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



■ TYPICAL COMMON EMITTER CHARACTERISTICS (f=1kHz)



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