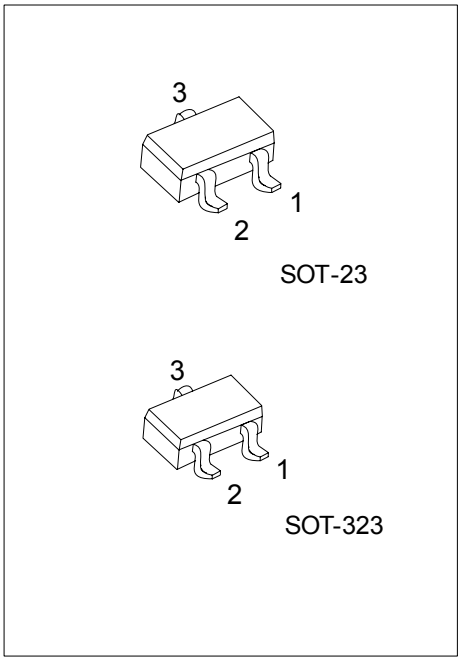
MMBT2907A

PNP PLANAR TRANSISTOR

PNP GENERAL PURPOSE AMPLIFIER



*Pb-free plating product number: MMBT2907AL

■ FEATURES

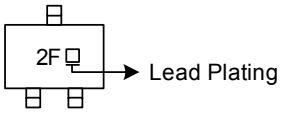
This UTC **MMBT2907A** is designed for use as a general purpose amplifier and switch requiring collector currents to 500 mA.

■ ORDERING INFORMATION

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

MMBT2907L-AE3-R (1)Packing Type (2)Package Type (3)Lead Plating	(1) R: Tape Reel (2) AE3: SOT-23, AL3: SOT-323 (3) L: Lead Free Plating, Blank: Pb/Sn

■ MARKING



■ ABSOLUTE MAXIMUM RATING (NOET 1) (Ta=25°C unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage	V_{CEO}	-60	V
Collector-Base Voltage	V_{CBO}	-60	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current-Continuous	I_C	-800	mA
Operating Junction and Storage Temperature	T_J, T_{STG}	-55 ~ +150	°C

Note 1. These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

3. 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
Thermal Resistance Junction-Case	SOT-23	θ_{JA}	357	°C/W
	SOT-323		455	°C/W

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

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Collector-Emitter Breakdown Voltage*	BV_{CEO}	I_C=-10mA, I_B=0		-60			V
Collector-Base Breakdown Voltage	BV_{CBO}	I_C=-10μA, I_E=0		-60			V
Emitter-Base Breakdown Voltage	BV_{EBO}	I_E=-10μA , I_C=0		-5			V
Base Cutoff Current	I_B	V_{CB}=-30V, V_{EB}=-0.5V				-50	nA
Collector Cutoff Current	I_{CEX}	V_{CE}=-30V, V_{BE}=-0.5V				-50	nA
Collector Cutoff Current	I_{CBO}	V_{CB}=-50V, I_E=0				-0.02	μA
		V_{CB}=-50V, I_E=0, T_A=150°C				-20	μA
ON CHARACTERISTICS							
DC Current Gain	h_{FE}	I_C=-0.1mA, V_{CE}=-10V		75			
		I_C=-1.0 mA, V_{CE}=-10V		100			
		I_C=-10 mA, V_{CE}=-10V		100			
		I_C=-150 mA, V_{CE}=-10V*		100		300	
		I_C=-500 mA, V_{CE}=-10V*		50			
Collector-Emitter Saturation Voltage*	$V_{CE(SAT)}$	I_C=-150 mA, I_B=-15mA				-0.4	V
		I_C=-500 mA, I_B=-50mA				-1.6	V
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	I_C=-150 mA, I_B=-15mA*				-1.3	V
		I_C=-500 mA, I_B=-50mA				-2.6	V
SMALL SIGNAL CHARACTERISTICS							
Current Gain – Bandwidth Product	f_T	I_C=-50mA, V_{CE}=-20V, f=100MHz		200			MHz
Output Capacitance	Cobo	V_{CB}=-10V, I_E=0, f=100kHz				8	pF
Input Capacitance	Cibo	V_{EB}=-2V, I_C=0, f=100kHz				30	pF
SWITCHING CHARACTERISTICS							
Turn-on Time	t_{ON}	V_{CC}=30V, I_C=-150mA, I_{B1}=-15mA				45	ns
Delay Time	td					10	ns
Rise Time	tr					40	ns
Turn-off Time	t_{off}	V_{CC}=6V, I_C=-150mA, I_{B1}= I_{B2}=-15mA				100	ns
Storage Time	ts					80	ns
Fall Time	tf					30	ns
THERMAL CHARACTERISTICS							
Total Device Dissipation	P_D		SOT-23			350	mW
			SOT-323			275	mW

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

Note: Device mounted on FR-4 PCB 1.6" x 1.6" x 0.06."

■ TEST CIRCUIT

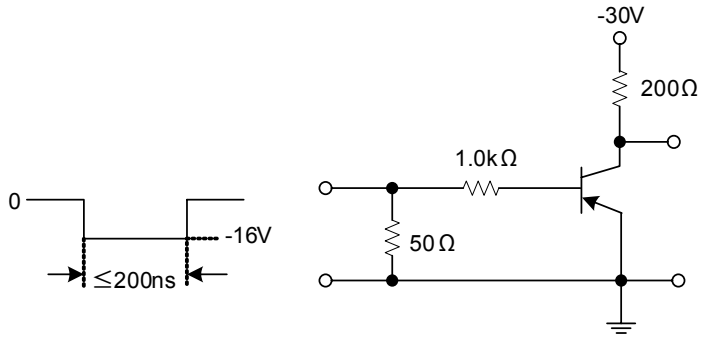


Fig 1. Saturated Turn-On Switching Time Test Circuit

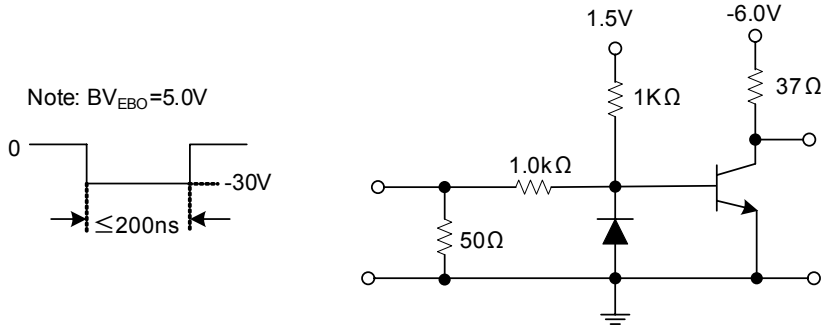
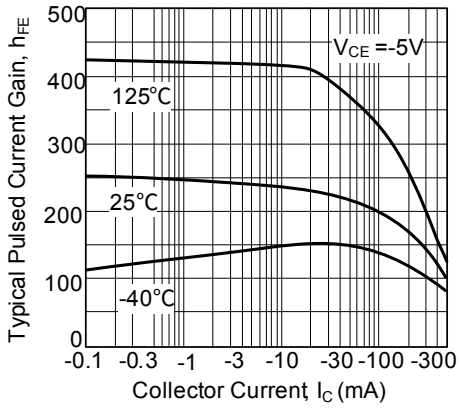


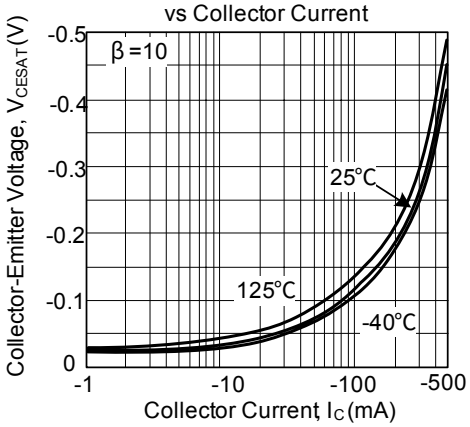
Fig 2. Saturated Turn-Off Switching Time Test Circuit

■ TYPICAL CHARACTERISTICS

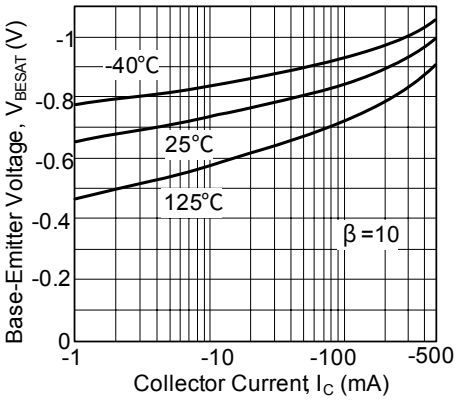
Typical Pulsed Current Gain vs Collector Current



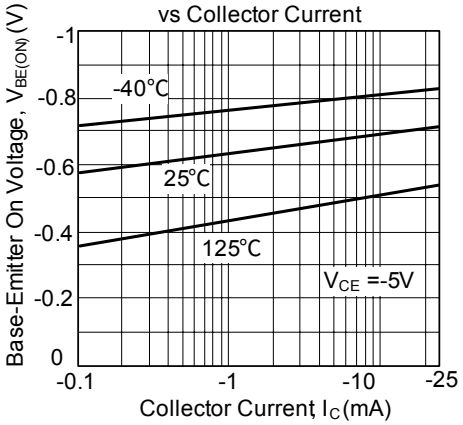
Collector-Emitter Saturation Voltage vs Collector Current



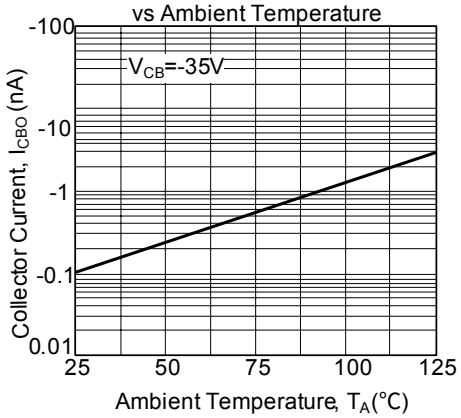
Base-Emitter Saturation Voltage vs Collector Current



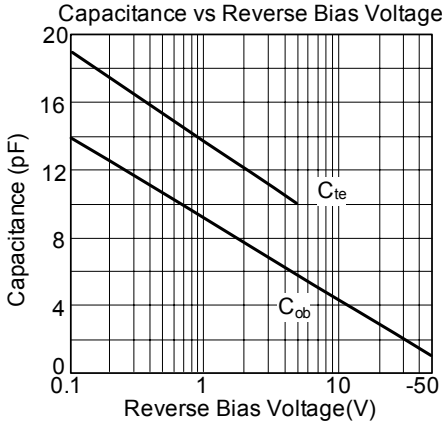
Base-Emitter On Voltage vs Collector Current



Collector-Cutoff Current vs Ambient Temperature

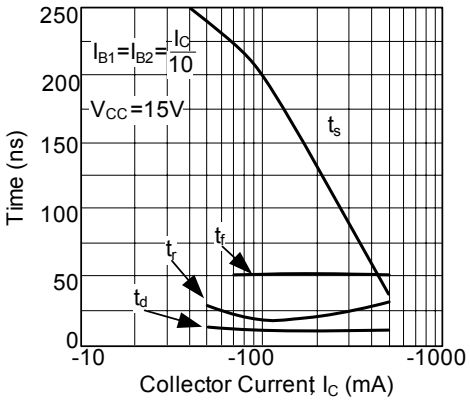


Input And Output Capacitance vs Reverse Bias Voltage

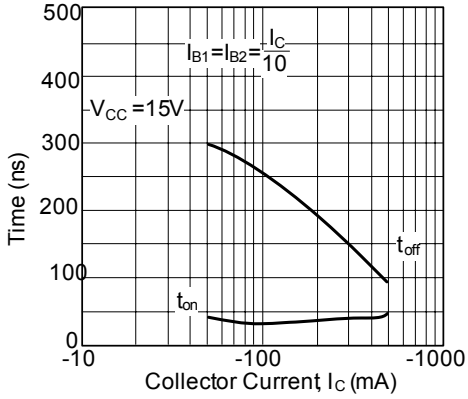


■ TYPICAL CHARACTERISTICS(Cont.)

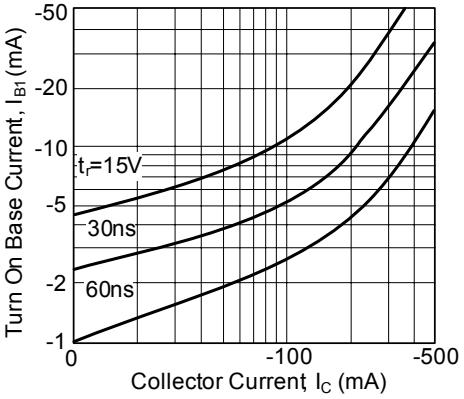
Switching Times vs Collector Current



Turn On and Turn Off Times vs Collector Current



Rise Time vs Collector And Turn On Base Currents



■ TYPICAL COMMON EMITTER CHARACTERISTICS (f=1kHz)