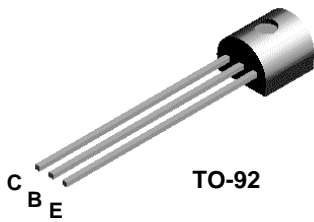
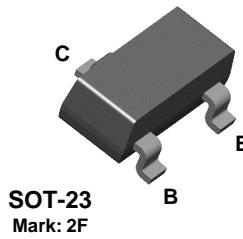


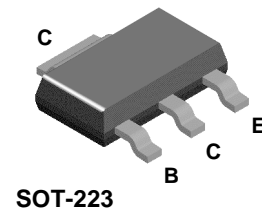
**PN2907A**



**MMBT2907A**



**PZT2907A**



**PNP General Purpose Amplifier**

This device is designed for use as a general purpose amplifier and switch requiring collector currents to 500 mA. Sourced from Process 63.

**Absolute Maximum Ratings\***  $T_A = 25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Value	Units
$V_{CE0}$	Collector-Emitter Voltage	60	V
$V_{CBO}$	Collector-Base Voltage	60	V
$V_{EBO}$	Emitter-Base Voltage	5.0	V
$I_C$	Collector Current - Continuous	800	mA
$T_J, T_{stg}$	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

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

**NOTES:**

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
- 3) All voltages (V) and currents (A) are negative polarity for PNP transistors.

**Thermal Characteristics**  $T_A = 25^\circ\text{C}$  unless otherwise noted

Symbol	Characteristic	Max			Units
		PN2907A	*MMBT2907A	**PZT2907A	
$P_D$	Total Device Dissipation	625	350	1,000	mW
	Derate above 25 $^\circ\text{C}$	5.0	2.8	8.0	mW/ $^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	83.3			$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	200	357	125	$^\circ\text{C}/\text{W}$

\* Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06."

\*\* Device mounted on FR-4 PCB 36 mm X 18 mm X 1.5 mm; mounting pad for the collector lead min. 6 cm<sup>2</sup>.

## PNP General Purpose Amplifier

(continued)

### Electrical Characteristics

$T_A = 25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
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#### OFF CHARACTERISTICS

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	$I_C = 10\text{ mA}, I_B = 0$	60		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10\ \mu\text{A}, I_E = 0$	60		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10\ \mu\text{A}, I_C = 0$	5.0		V
$I_B$	Base Cutoff Current	$V_{CB} = 30\text{ V}, V_{EB} = 0.5\text{ V}$		50	nA
$I_{CEX}$	Collector Cutoff Current	$V_{CE} = 30\text{ V}, V_{BE} = 0.5\text{ V}$		50	nA
$I_{CBO}$	Collector Cutoff Current	$V_{CB} = 50\text{ V}, I_E = 0$ $V_{CB} = 50\text{ V}, I_E = 0, T_A = 150^\circ\text{C}$		0.02 20	$\mu\text{A}$ $\mu\text{A}$

#### ON CHARACTERISTICS

$h_{FE}$	DC Current Gain	$I_C = 0.1\text{ mA}, V_{CE} = 10\text{ V}$ $I_C = 1.0\text{ mA}, V_{CE} = 10\text{ V}$ $I_C = 10\text{ mA}, V_{CE} = 10\text{ V}$ $I_C = 150\text{ mA}, V_{CE} = 10\text{ V}^*$ $I_C = 500\text{ mA}, V_{CE} = 10\text{ V}^*$	75 100 100 100 50	300	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage*	$I_C = 150\text{ mA}, I_B = 15\text{ mA}$ $I_C = 500\text{ mA}, I_B = 50\text{ mA}$		0.4 1.6	V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 150\text{ mA}, I_B = 15\text{ mA}^*$ $I_C = 500\text{ mA}, I_B = 50\text{ mA}$		1.3 2.6	V V

#### SMALL SIGNAL CHARACTERISTICS

$f_T$	Current Gain - Bandwidth Product	$I_C = 50\text{ mA}, V_{CE} = 20\text{ V},$ $f = 100\text{ MHz}$	200		MHz
$C_{obo}$	Output Capacitance	$V_{CB} = 10\text{ V}, I_E = 0,$ $f = 100\text{ kHz}$		8.0	pF
$C_{ibo}$	Input Capacitance	$V_{EB} = 2.0\text{ V}, I_C = 0,$ $f = 100\text{ kHz}$		30	pF

#### SWITCHING CHARACTERISTICS

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

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

**NOTE:** All voltages (V) and currents (A) are negative polarity for PNP transistors.

### Spice Model

PNP (Is=650.6E-18 Xti=3 Eg=1.11 Vaf=115.7 Bf=231.7 Ne=1.829 Ise=54.81f Ikf=1.079 Xtb=1.5 Br=3.563 Nc=2  
Isc=0 Ikr=0 Rc=.715 Cjc=14.76p Mjc=.5383 Vjc=.75 Fc=.5 Cje=19.82p Mje=.3357 Vje=.75 Tr=111.3n Tf=603.7p  
Ilf=.65 Vlf=5 Xtf=1.7 Rb=10)

PN2907A / MMBT2907A / PZT2907A

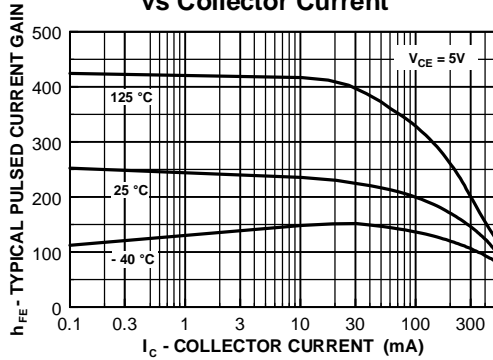
# PNP General Purpose Amplifier

(continued)

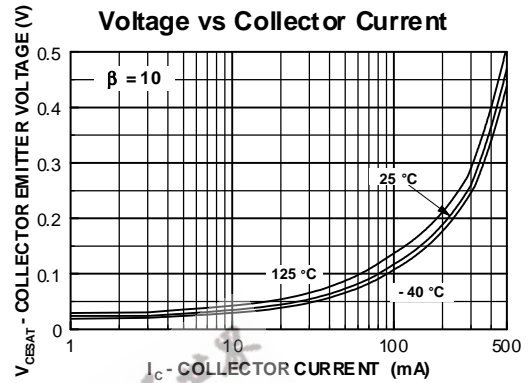
PN2907A / MMBT2907A / PZT2907A

## Typical Characteristics

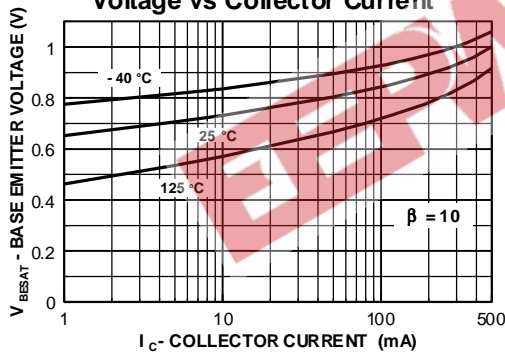
Typical Pulsed Current Gain vs Collector Current



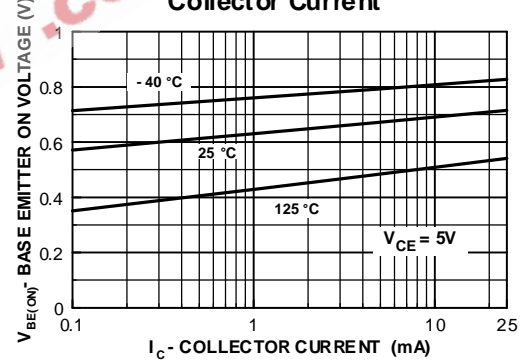
Collector-Emitter Saturation Voltage vs Collector Current



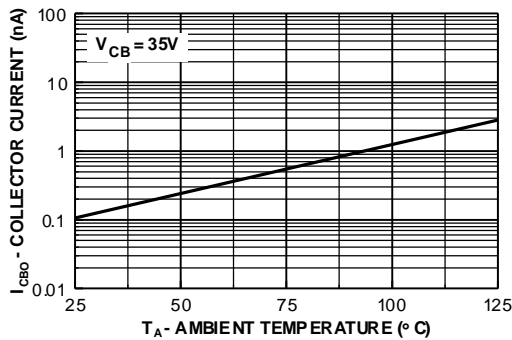
Base-Emitter Saturation Voltage vs Collector Current



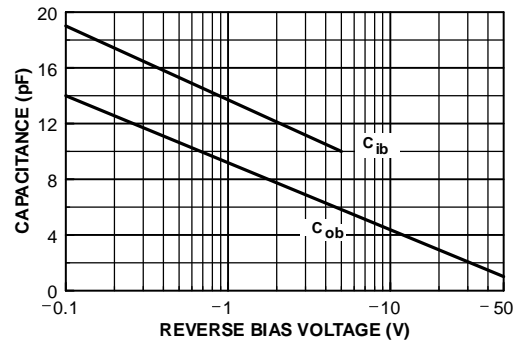
Base Emitter ON Voltage vs Collector Current



Collector-Cutoff Current vs Ambient Temperature



Input and Output Capacitance vs Reverse Bias Voltage

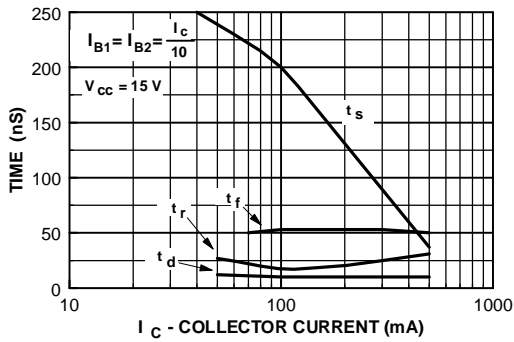


# PNP General Purpose Amplifier (continued)

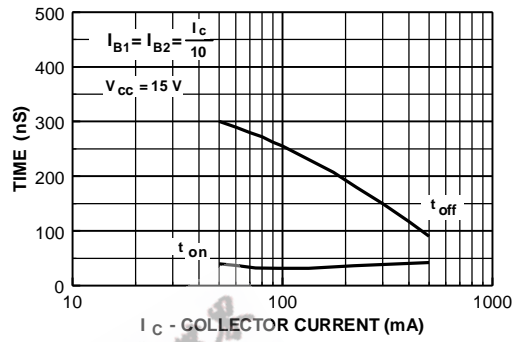
PN2907A / MMBT2907A / PZT2907A

## Typical Characteristics (continued)

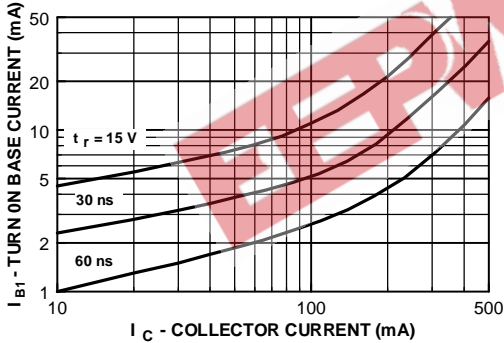
**Switching Times vs Collector Current**



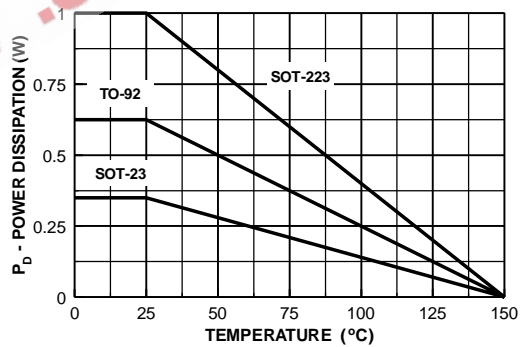
**Turn On and Turn Off Times vs Collector Current**



**Rise Time vs Collector and Turn On Base Currents**



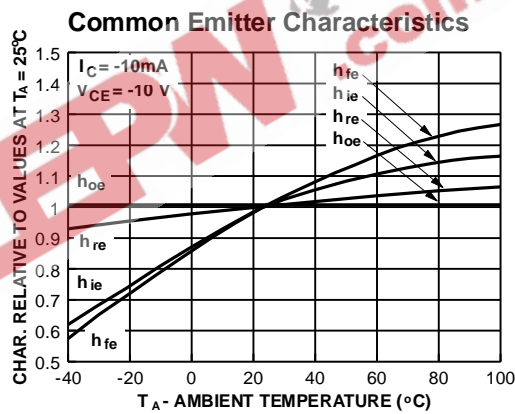
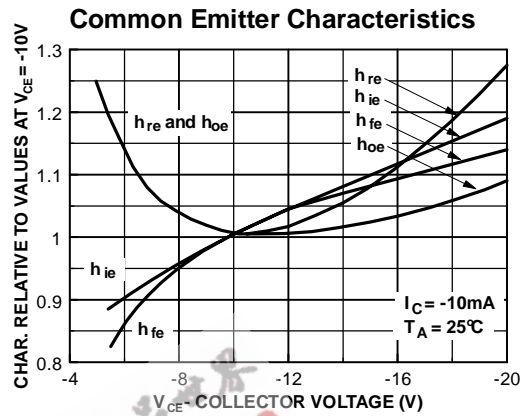
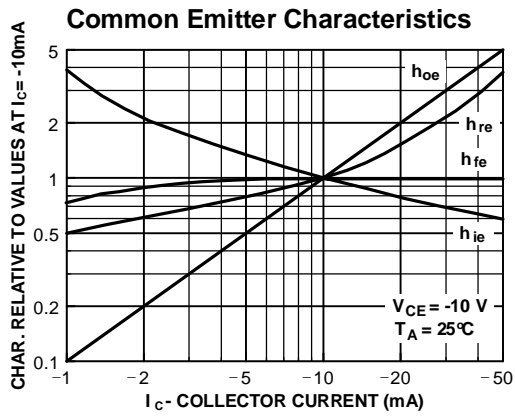
**Power Dissipation vs Ambient Temperature**



**PNP General Purpose Amplifier**  
(continued)

PN2907A / MMBT2907A / PZT2907A

**Typical Common Emitter Characteristics** (f = 1.0kHz)



Test Circuits

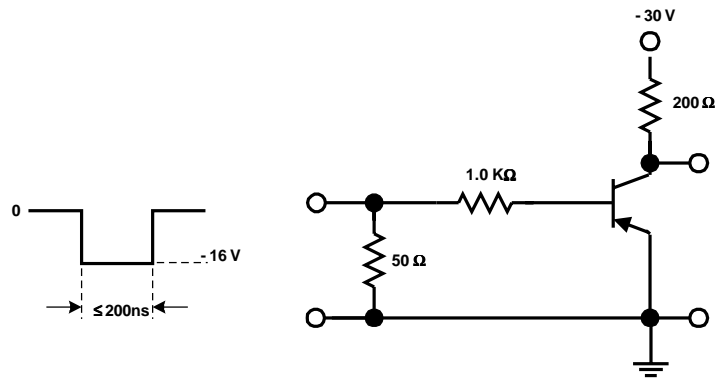


FIGURE 1: Saturated Turn-On Switching Time Test Circuit

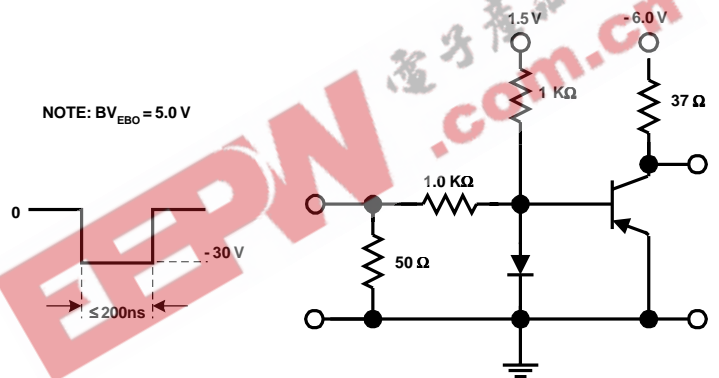


FIGURE 2: Saturated Turn-Off Switching Time Test Circuit

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CROSSVOLT™	HiSeC™	QT Optoelectronics™	VCX™
DOME™	ISOPLANAR™	Quiet Series™	
E <sup>2</sup> CMOS™	MICROWIRE™	SILENT SWITCHER®	
EnSigna™	OPTOLOGIC™	SMART START™	
FACT™	OPTOPLANAR™	SuperSOT™-3	
FACT Quiet Series™	PACMAN™	SuperSOT™-6	
FAST®	POP™	SuperSOT™-8	

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