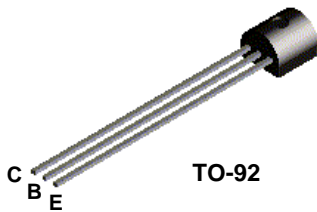
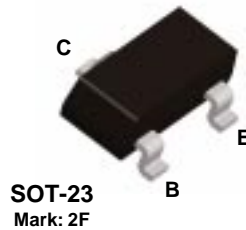


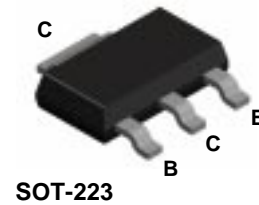
**PN2907A**



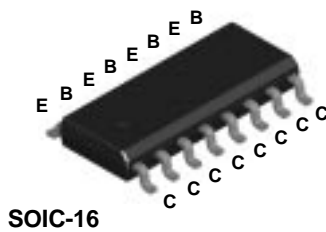
**MMBT2907A**



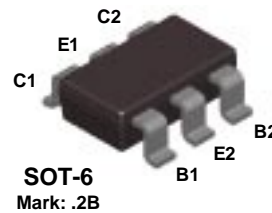
**PZT2907A**



**MMPQ2907**



**NMT2907**



**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\*** TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>CEO</sub>	Collector-Emitter Voltage	60	V
V <sub>CBO</sub>	Collector-Base Voltage	60	V
V <sub>EBO</sub>	Emitter-Base Voltage	5.0	V
I <sub>C</sub>	Collector Current - Continuous	800	mA
T <sub>J</sub> , T <sub>stg</sub>	Operating and Storage Junction Temperature Range	-55 to +150	°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.

PN2907A / MMBT2907A / MMPQ2907 / NMT2907 / PZT2907A

# PNP General Purpose Amplifier

(continued)

## Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
<b>OFF CHARACTERISTICS</b>					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	$I_C = 10 \text{ mA}, I_B = 0$	60		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10 \text{ } \mu\text{A}, I_E = 0$	60		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \text{ } \mu\text{A}, I_C = 0$	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 (except MMPQ2907 and NMT2907)

$f_T$	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 (except MMPQ2907 and NMT2907)

$t_{on}$	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 ms, Duty Cycle  $\leq$  2.0%

## 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 Itf=.65 Vtf=5 Xtf=1.7 Rb=10)

PN2907A / MMBT2907A / MMPQ2907 / NMT2907 / PZT2907A

# PNP General Purpose Amplifier

(continued)

## Thermal Characteristics TA = 25°C unless otherwise noted

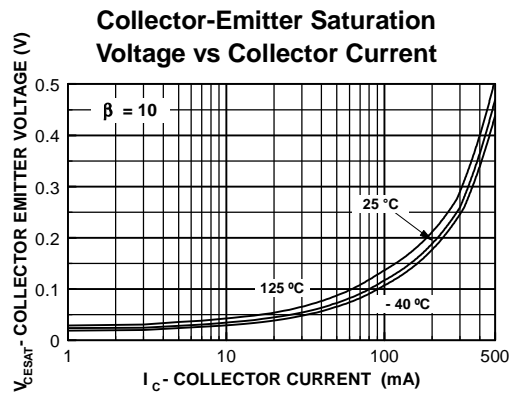
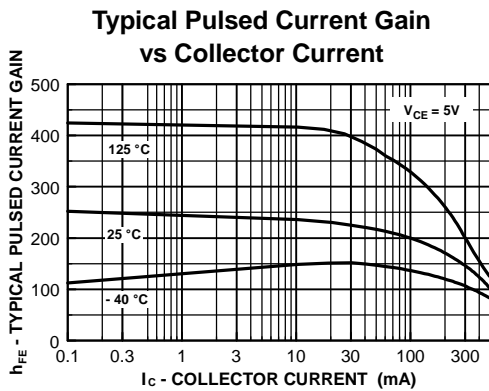
Symbol	Characteristic	Max		Units
		PN2907A	*PZT2907A	
P <sub>D</sub>	Total Device Dissipation Derate above 25°C	625	1,000	mW
		5.0	8.0	mW/°C
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	83.3		°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	200	125	°C/W

Symbol	Characteristic	Max		Units
		**MMBT2907A	MMPQ2907	
P <sub>D</sub>	Total Device Dissipation Derate above 25°C	350	1,000	mW
		2.8	8.0	mW/°C
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient Effective 4 Die Each Die	357		°C/W
			125	°C/W
			240	°C/W

\* 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>.

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

## Typical Characteristics



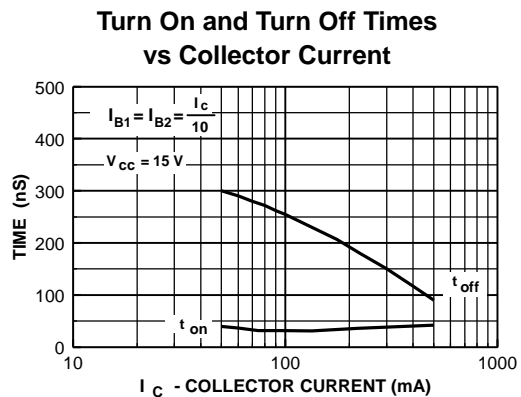
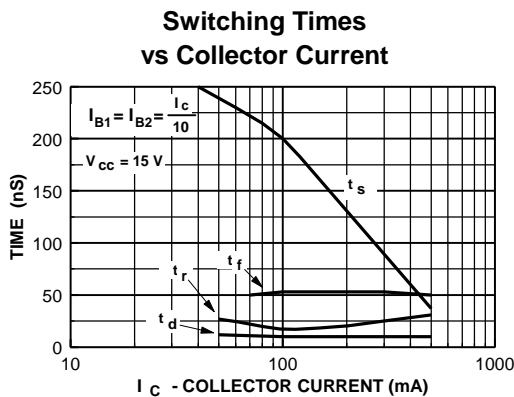
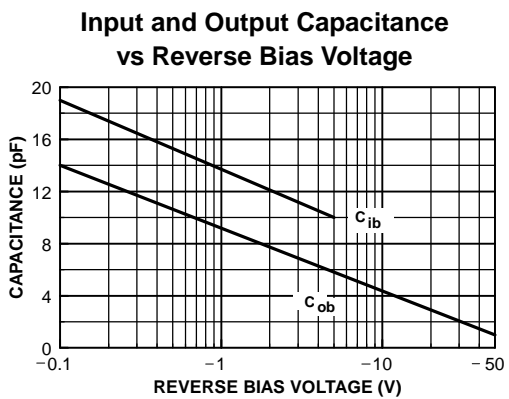
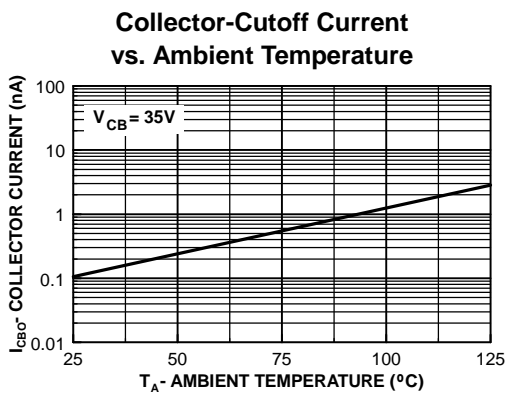
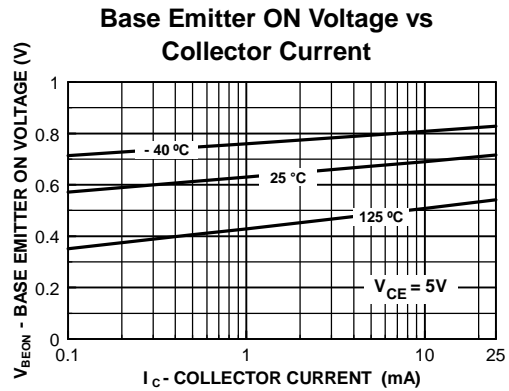
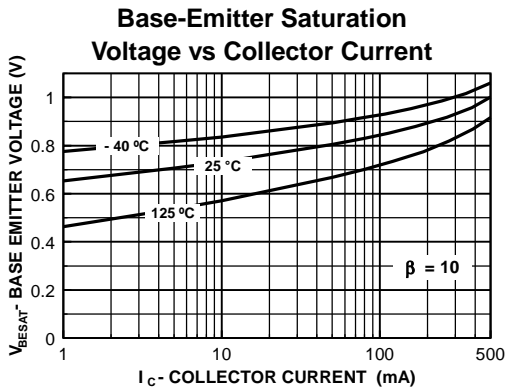
PN2907A / MMBT2907A / MMPQ2907 / NMT2907 / PZT2907A

# PNP General Purpose Amplifier

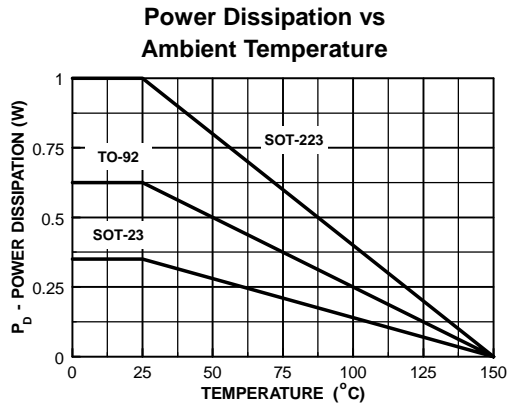
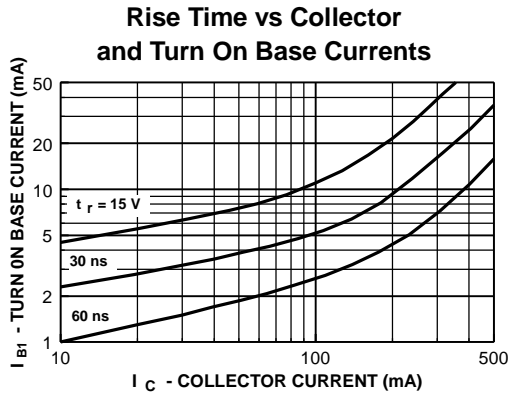
(continued)

PN2907A / MMBT2907A / NMMPQ2907 / NMT2907 / PZT2907A

## Typical Characteristics (continued)



Typical Characteristics (continued)



Test Circuits

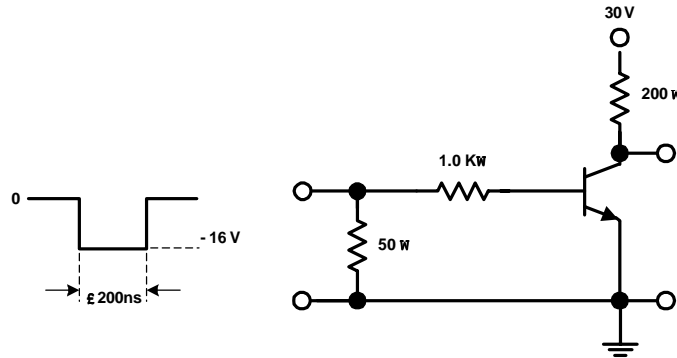


FIGURE 1: Saturated Turn-On Switching Time Test Circuit

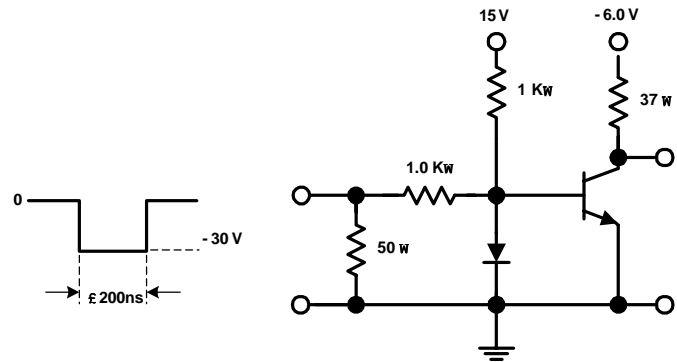


FIGURE 2: Saturated Turn-Off Switching Time Test Circuit

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FACT™	QS™
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