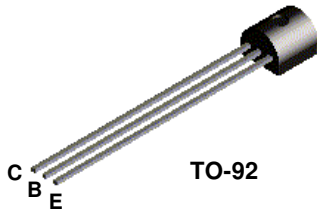


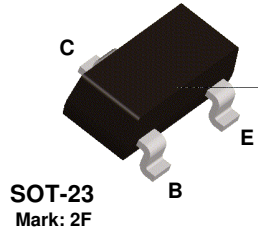
N

Discrete POWER & Signal Technologies

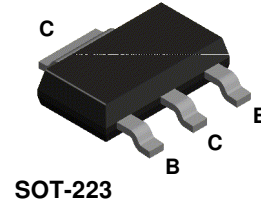
PN2907A



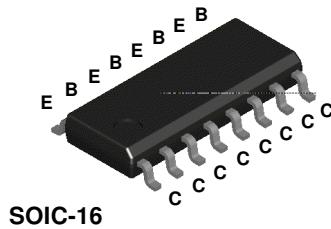
MMBT2907A



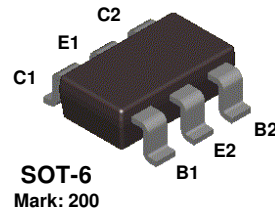
PZT2907A



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 _{CEO}	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	°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
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	$I_C = 10 \text{ } \mu\text{A}, I_E = 0$	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	μA μA

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 NMT2222)

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 NMT2222)

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 $\leq 300 \text{ } \mu\text{s}$, 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 _D	Total Device Dissipation Derate above 25°C	625	1,000	mW
		5.0	8.0	mW/°C
R _{θJC}	Thermal Resistance, Junction to Case	83.3		°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	200	125	°C/W

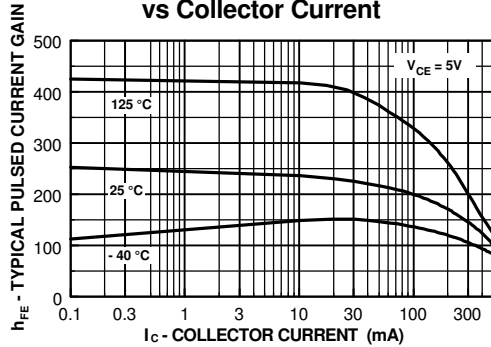
Symbol	Characteristic	Max		Units
		**MMBT2907A	MMPQ2907	
P _D	Total Device Dissipation Derate above 25°C	350	1,000	mW
		2.8	8.0	mW/°C
R _{θJA}	Thermal Resistance, Junction to Ambient Effective 4 Die Each Die	357		°C/W
			125	°C/W
			240	°C/W

* Device mounted on FR-4 PCB 36 mm X 18 mm X 1.5 mm; mounting pad for the collector lead min. 6 \bar{c} m

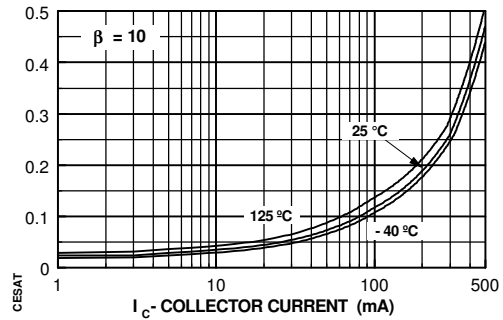
** Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06."

Typical Characteristics

Typical Pulsed Current Gain vs Collector Current



Collector-Emitter Saturation Voltage vs Collector Current



PN2907A / MMBT2907A / MMPQ2907 / NMT2907 / PZT2907A

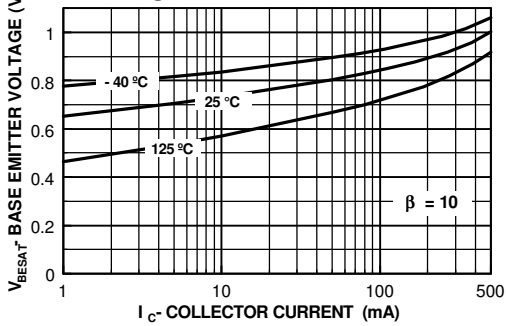
PNP General Purpose Amplifier

(continued)

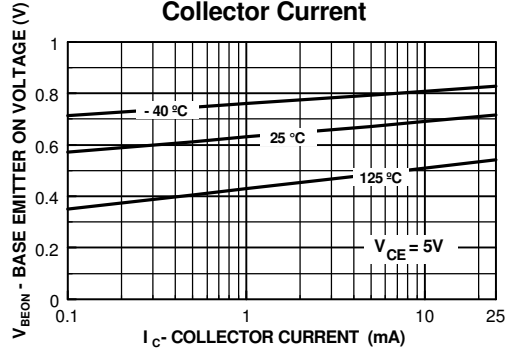
PN2907A / MMBT2907A / MM2907A / NMT2907 / PZT2907A

Typical Characteristics (continued)

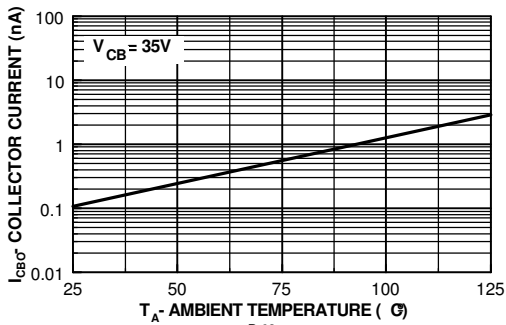
Base-Emitter Saturation Voltage vs Collector Current



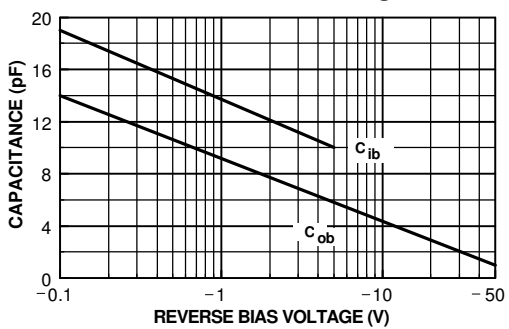
Base Emitter ON Voltage vs Collector Current



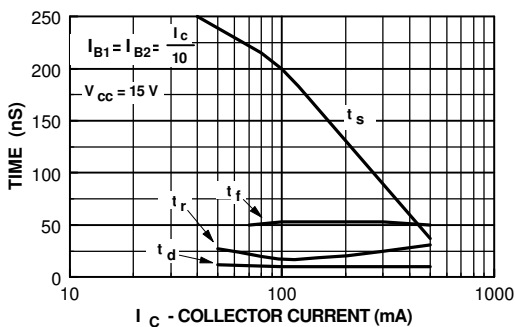
Collector-Cutoff Current vs. Ambient Temperature



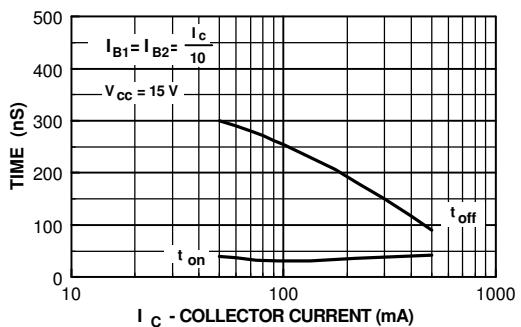
Input and Output Capacitance vs Reverse Bias Voltage



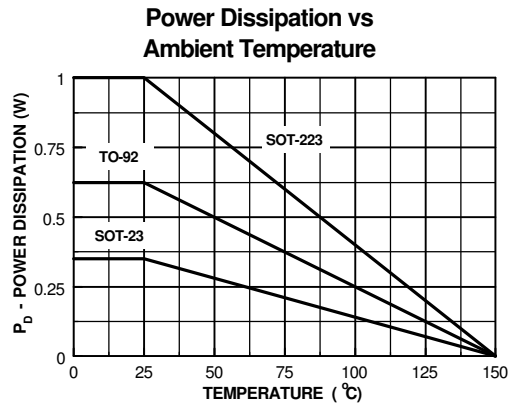
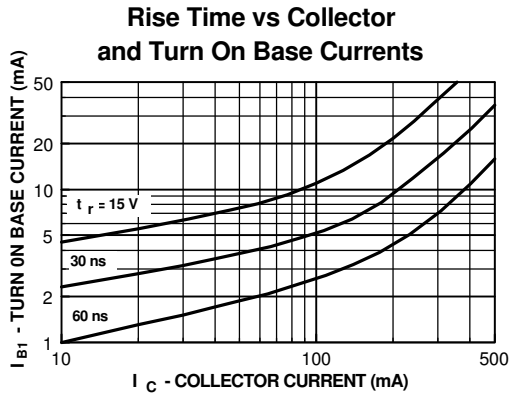
Switching Times vs Collector Current



Turn On and Turn Off Times vs Collector Current



Typical Characteristics (continued)



Test Circuits

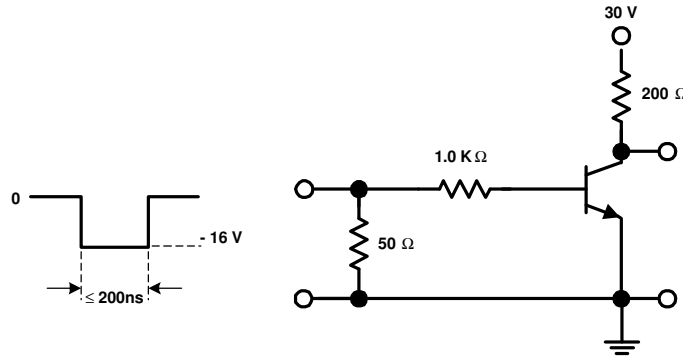


FIGURE 1: Saturated Turn-On Switching Time Test Circuit

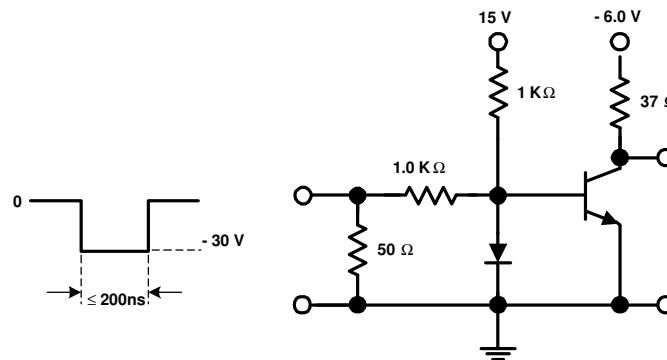


FIGURE 2: Saturated Turn-Off Switching Time Test Circuit

This datasheet has been download from:

www.datasheetcatalog.com

Datasheets for electronics components.

National Semiconductor was acquired by Texas Instruments.

http://www.ti.com/corp/docs/investor_relations/pr_09_23_2011_national_semiconductor.html

This file is the datasheet for the following electronic components:

MMPQ2907 - <http://www.ti.com/product/mmpq2907?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

PN2907A - <http://www.ti.com/product/pn2907a?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

PZT2907A - <http://www.ti.com/product/pzt2907a?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

NMT2907 - <http://www.ti.com/product/nmt2907?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

MMBT2907A - <http://www.ti.com/product/mmbt2907a?HQS=TI-null-null-dscatalog-df-pf-null-wwe>