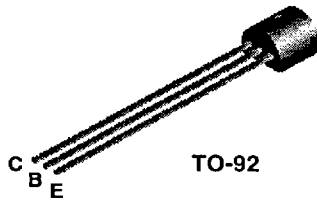


Discrete POWER & Signal
Technologies

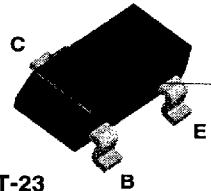
PN2907A

MMBT2907A

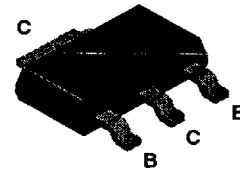
PZT2907A



TO-92



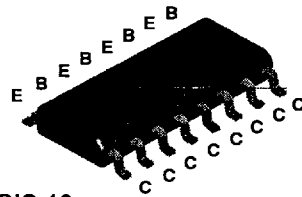
SOT-23
Mark: 2F



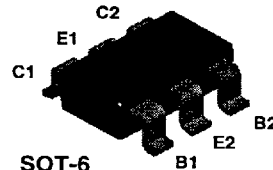
SOT-223

MMPQ2907

NMT2907



SOIC-16



SOT-6
Mark: 200

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

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PNP General Purpose Amplifier

(continued)

Electrical Characteristics

TA = 25°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 mA, I _B = 0	60		V
V _{(BR)CBO}	Collector-Base Breakdown Voltage	I _C = 10 µA, I _E = 0	60		V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage	I _E = 10 µA, I _C = 0	5.0		V
I _B	Base Cutoff Current	V _{CB} = 30 V, V _{EB} = 0.5 V		50	nA
I _{CEX}	Collector Cutoff Current	V _{CE} = 30 V, V _{BE} = 0.5 V		50	nA
I _{CBO}	Collector Cutoff Current	V _{CB} = 50 V, I _E = 0 V _{CB} = 50 V, I _E = 0, T _A = 150°C		0.02 20	µA µA

ON CHARACTERISTICS

h _{FE}	DC Current Gain	I _C = 0.1 mA, V _{CE} = 10 V I _C = 1.0 mA, V _{CE} = 10 V I _C = 10 mA, V _{CE} = 10 V I _C = 150 mA, V _{CE} = 10 V* I _C = 500 mA, V _{CE} = 10 V*	75 100 100 100 50	300	
V _{CE(sat)}	Collector-Emitter Saturation Voltage*	I _C = 150 mA, I _B = 15 mA I _C = 500 mA, I _B = 50 mA		0.4 1.6	V V
V _{BE(sat)}	Base-Emitter Saturation Voltage	I _C = 150 mA, I _B = 15 mA* I _C = 500 mA, I _B = 50 mA		1.3 2.6	V V

SMALL SIGNAL CHARACTERISTICS

(except MMPQ2907 and NMT2222)

f _T	Current Gain - Bandwidth Product	I _C = 50 mA, V _{CE} = 20 V, f = 100 MHz	200		MHz
C _{obo}	Output Capacitance	V _{CB} = 10 V, I _E = 0, f = 100 kHz		8.0	pF
C _{ibo}	Input Capacitance	V _{EB} = 2.0 V, I _C = 0, f = 100 kHz		30	pF

SWITCHING CHARACTERISTICS

(except MMPQ2907 and NMT2222)

t _{on}	Turn-on Time	V _{CC} = 30 V, I _C = 150 mA, I _{B1} = 15 mA		45	ns
t _d	Delay Time			10	ns
t _r	Rise Time			40	ns
t _{off}	Turn-off Time	V _{CC} = 6.0 V, I _C = 150 mA I _{B1} = I _{B2} = 15 mA		100	ns
t _s	Storage Time			80	ns
t _f	Fall Time			30	ns

*Pulse Test: Pulse Width ≤ 300 µs, Duty Cycle ≤ 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)

3469674 0033413 234

PN2907A / MMBT2907A / MMPQ2907 / NMT2907 / PZT2907A

PNP General Purpose Amplifier

(continued)

Thermal Characteristics

TA = 25°C unless otherwise noted

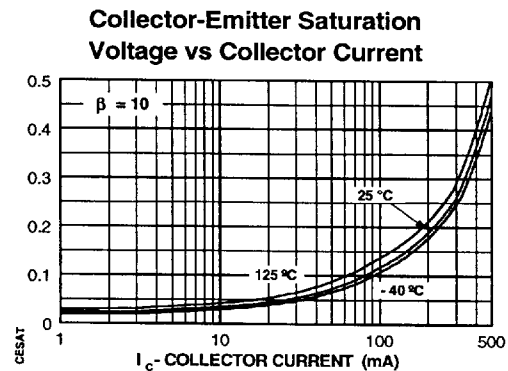
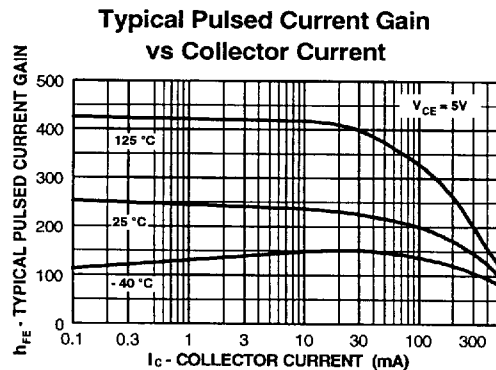
Symbol	Characteristic	Max		Units
		PN2907A	*PZT2907A	
P _D	Total Device Dissipation	625	1,000	mW
	Derate above 25 °C	5.0	8.0	mW/°C
R _{θJC}	Thermal Resistance, Junction to Case	83.3		°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	200	125	°C/W

Symbol	Characteristic	Max		Units
		**MMBT2907A	MMPQ2907	
P _D	Total Device Dissipation	350	1,000	mW
	Derate above 25 °C	2.8	8.0	mW/°C
R _{θJA}	Thermal Resistance, Junction to Ambient	357		°C/W
	Effective 4 Die		125	°C/W
	Each Die		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 cm².

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

Typical Characteristics



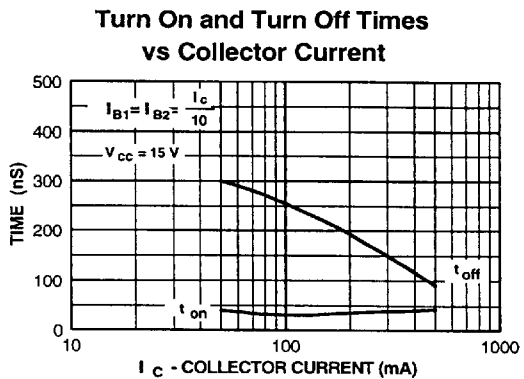
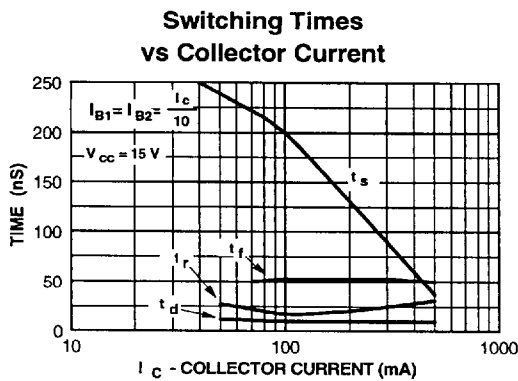
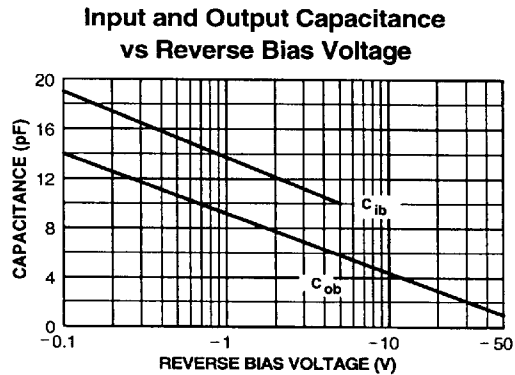
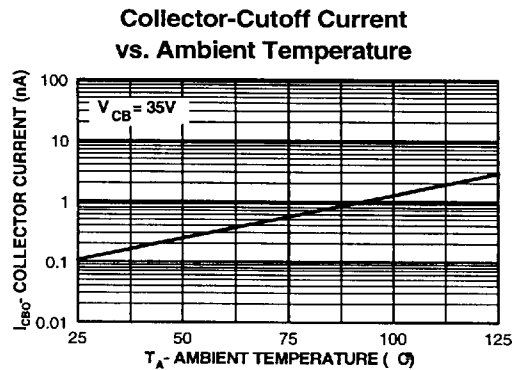
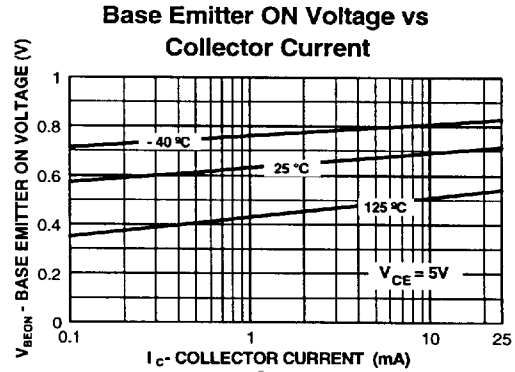
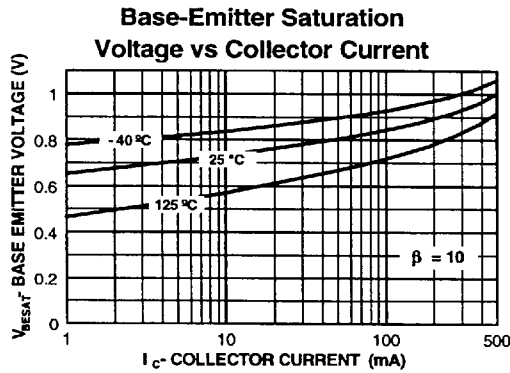
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PN2907A / MMBT2907A / MMPQ2907 / NMT2907 / PZT2907A

PNP General Purpose Amplifier

(continued)

Typical Characteristics (continued)



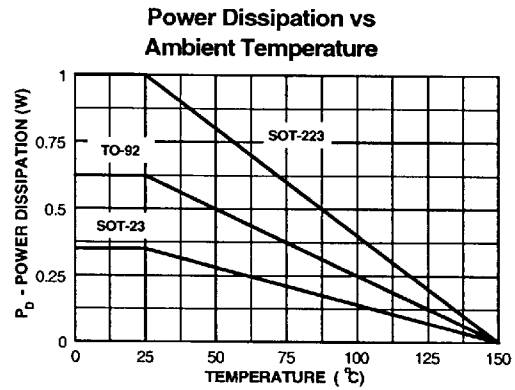
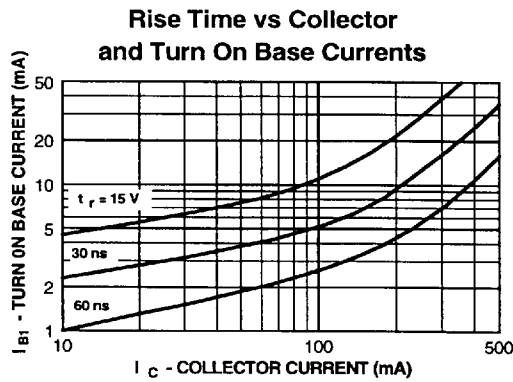
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PN2907A / MMBT2907A / MMPQ2907 / NMT2907 / PZT2907A

PNP General Purpose Amplifier

(continued)

Typical Characteristics (continued)



Test Circuits

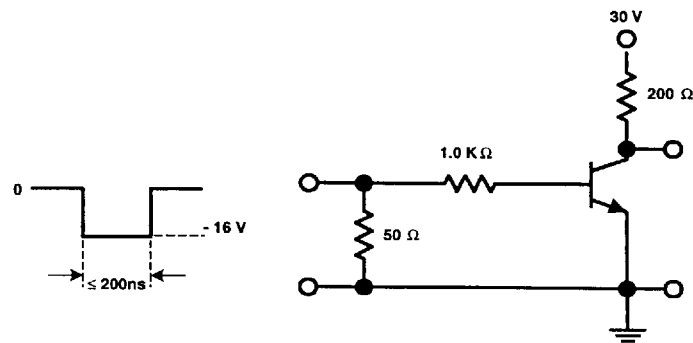


FIGURE 1: Saturated Turn-On Switching Time Test Circuit

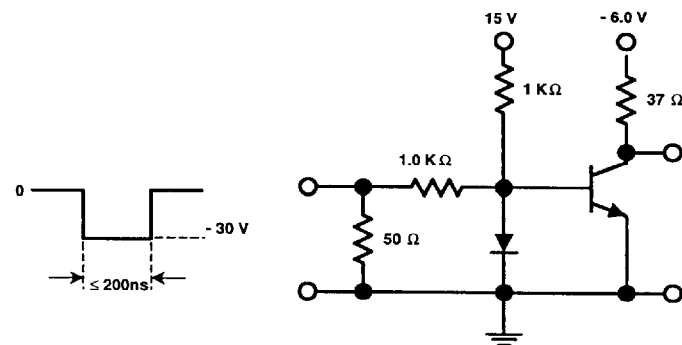


FIGURE 2: Saturated Turn-Off Switching Time Test Circuit