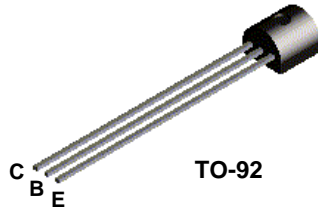
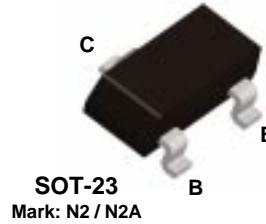


**PN200  
PN200A**



**MMBT200  
MMBT200A**



**PNP General Purpose Amplifier**

This device is designed for general purpose amplifier applications at collector currents to 300 mA. Sourced from Process 68.

**Absolute Maximum Ratings\***

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>CEO</sub>	Collector-Emitter Voltage	45	V
V <sub>CB0</sub>	Collector-Base Voltage	75	V
V <sub>EB0</sub>	Emitter-Base Voltage	6.0	V
I <sub>C</sub>	Collector Current - Continuous	500	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.

**Thermal Characteristics**

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max		Units
		PN200A	*MMBT200A	
P <sub>D</sub>	Total Device Dissipation	625	350	mW
	Derate above 25°C	5.0	2.8	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	357	°C/W

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

# PNP General Purpose Amplifier

(continued)

PN200 / MMBT200 / PN200A / MMBT200A

## Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
<b>OFF CHARACTERISTICS</b>					
$BV_{CBO}$	Collector-Base Breakdown Voltage	$I_C = 10 \mu A, I_B = 0$	60		V
$BV_{CEO}$	Collector-Emitter Breakdown Voltage*	$I_C = 1.0 \text{ mA}, I_E = 0$	45		V
$BV_{EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \mu A, I_C = 0$	6.0		V
$I_{CBO}$	Collector Cutoff Current	$V_{CB} = 50 \text{ V}, I_E = 0$		50	nA
$I_{CES}$	Collector Cutoff Current	$V_{CE} = 40 \text{ V}, I_E = 10$		50	nA
$I_{EBO}$	Emitter Cutoff Current	$V_{EB} = 4.0 \text{ V}, I_C = 0$		50	nA

## ON CHARACTERISTICS

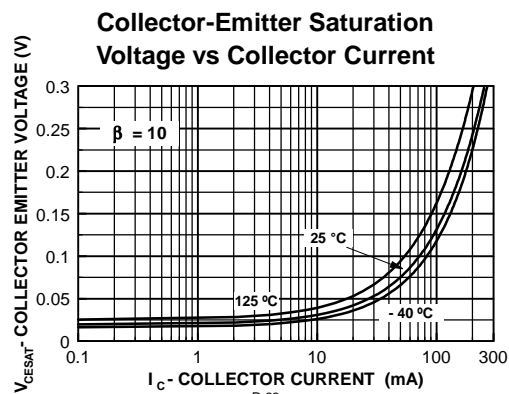
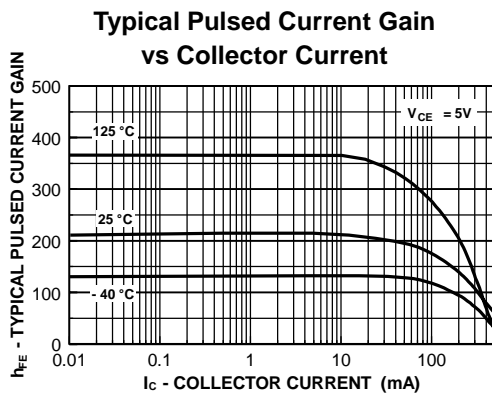
$h_{FE}$	DC Current Gain	$I_C = 100 \mu A, V_{CE} = 1.0 \text{ V}$	<b>200</b>	80		
			<b>200A</b>	240		
		$I_C = 10 \text{ mA}, V_{CE} = 1.0 \text{ V}$	<b>200</b>	100	450	
			<b>200A</b>	300	600	
		$I_C = 100 \text{ mA}, V_{CE} = 1.0 \text{ V}^*$	<b>200A</b>	100		
		$I_C = 150 \text{ mA}, V_{CE} = 5.0 \text{ V}^*$	<b>200</b>	100	350	
			<b>200A</b>	100		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 10 \text{ mA}, I_B = 1.0 \text{ mA}$		0.2	V	
		$I_C = 200 \text{ mA}, I_B = 20 \text{ mA}^*$		0.4	V	
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 10 \text{ mA}, I_B = 1.0 \text{ mA}$		0.85	V	
		$I_C = 200 \text{ mA}, I_B = 20 \text{ mA}^*$		1.0	V	

## SMALL SIGNAL CHARACTERISTICS

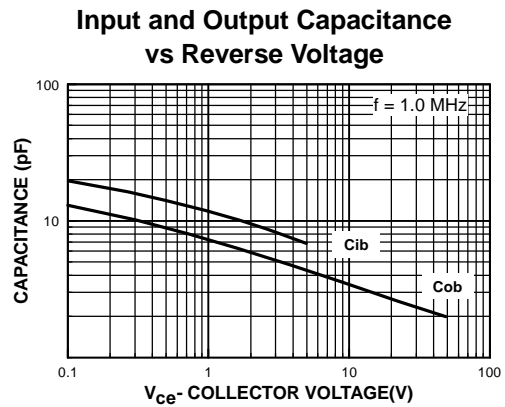
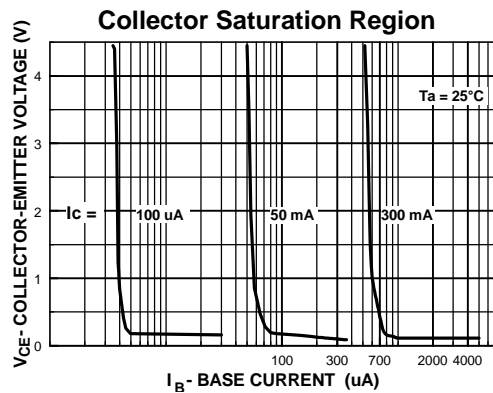
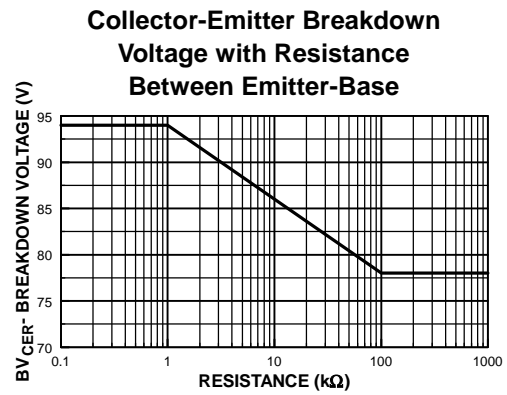
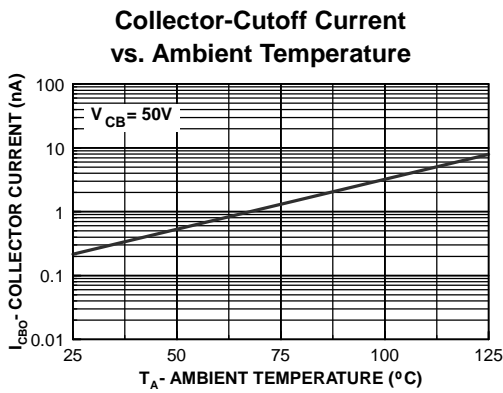
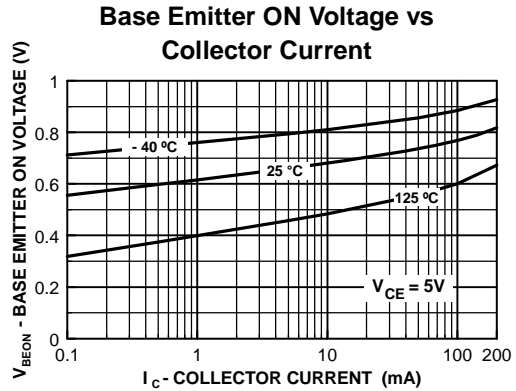
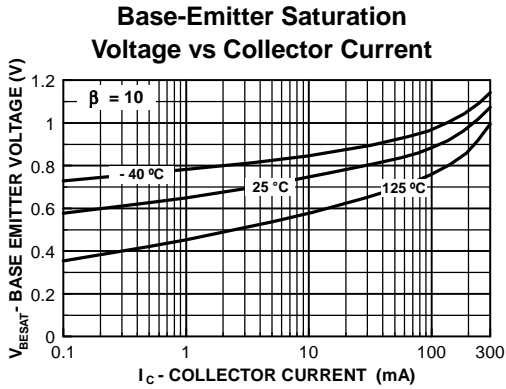
$f_T$	Current Gain - Bandwidth Product	$V_{CE} = 20 \text{ V}, I_C = 20 \text{ mA}$	250		MHz
$C_{obo}$	Output Capacitance	$V_{CB} = 10 \text{ V}, f = 1.0 \text{ MHz}$		6.0	pF
NF	Noise Figure	$I_C = 100 \mu A, V_{CE} = 5.0 \text{ V},$	<b>200</b>	5.0	dB
		$R_G = 2.0 \text{ k}\Omega, f = 1.0 \text{ kHz}$	<b>200A</b>	4.0	dB

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

## Typical Characteristics



Typical Characteristics (continued)

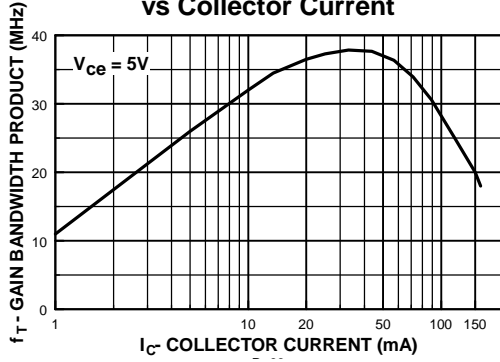


# PNP General Purpose Amplifier

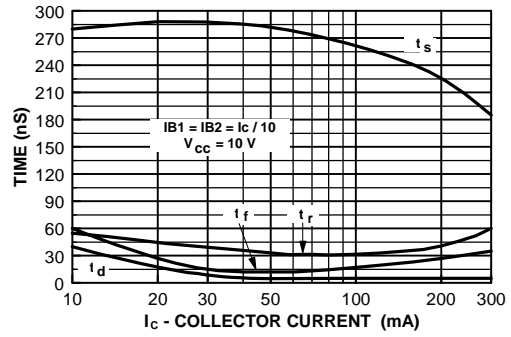
(continued)

## Typical Characteristics (continued)

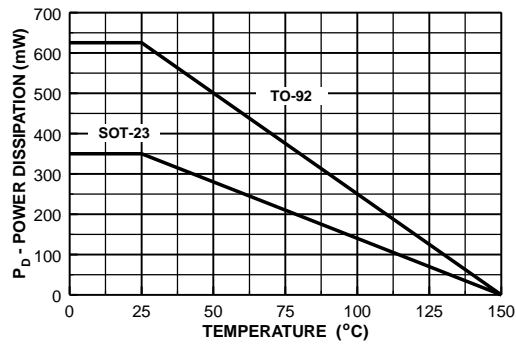
**Gain Bandwidth Product vs Collector Current**



**Switching Times vs Collector Current**



**Power Dissipation vs Ambient Temperature**



PN200 / MMBT200 / PN200A / MMBT200A