

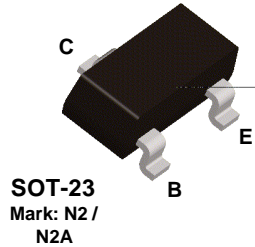
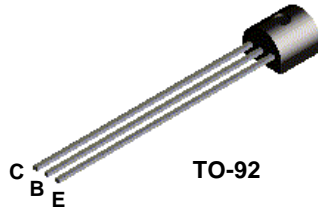
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**Discrete POWER & Signal
Technologies**

PN200 / MMBT200 / PN200A / MMBT200A

**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 _{CEO}	Collector-Emitter Voltage	60	V
V _{CBO}	Collector-Base Voltage	45	V
V _{EBO}	Emitter-Base Voltage	6.0	V
I _C	Collector Current - Continuous	500	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.

Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max		Units
		PN200A	*MMBT200A	
P _D	Total Device Dissipation	625	350	mW
	Derate above 25°C	5.0	2.8	mW/°C
R _{θJC}	Thermal Resistance, Junction to Case	83.3		°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	200	357	°C/W

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

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(continued)

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Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
OFF CHARACTERISTICS					
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

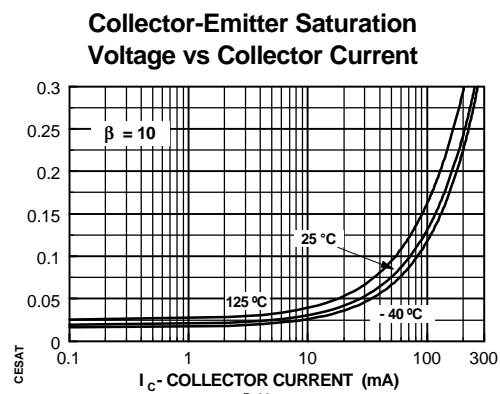
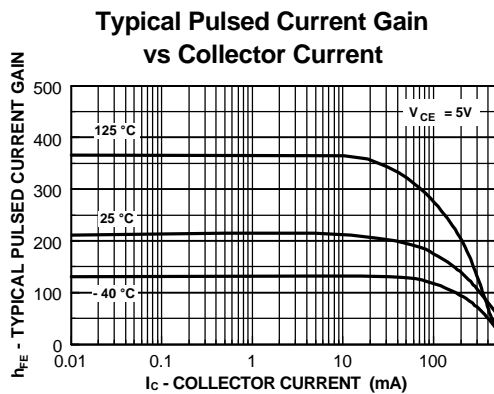
h_{FE}	DC Current Gain	$I_C = 100 \mu A, V_{CE} = 1.0 \text{ V}$	200	80		
			200A	240		
		$I_C = 10 \text{ mA}, V_{CE} = 1.0 \text{ V}$	200	100	450	
			200A	300	600	
		$I_C = 100 \text{ mA}, V_{CE} = 1.0 \text{ V}^*$	200A	100		
		$I_C = 150 \text{ mA}, V_{CE} = 5.0 \text{ V}^*$	200	100	350	
			200A	100		
$V_{CE(sat)}$	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	$I_C = 100 \mu A, V_{CE} = 5.0 \text{ V},$	200	5.0	dB
		$R_G = 2.0 \text{ k}\Omega, f = 1.0 \text{ kHz}$	200A	4.0	dB

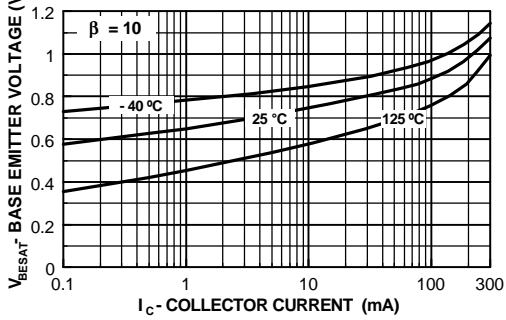
*Pulse Test: Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 2.0\%$

Typical Characteristics

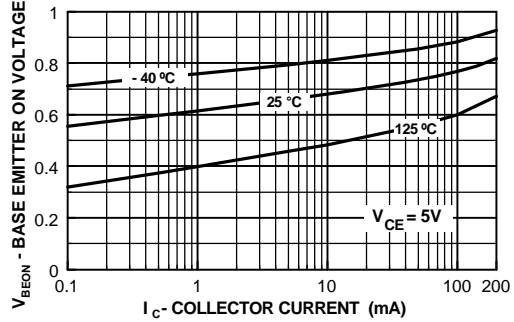


Typical Characteristics (continued)

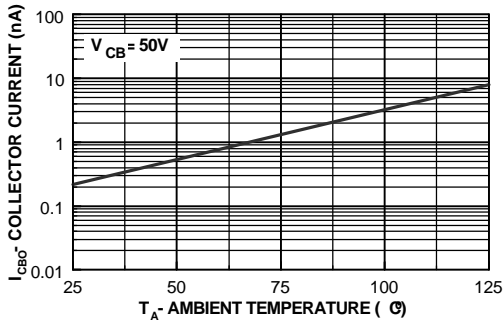
Base-Emitter Saturation Voltage vs Collector Current



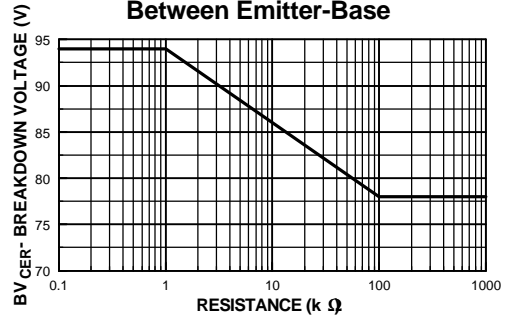
Base Emitter ON Voltage vs Collector Current



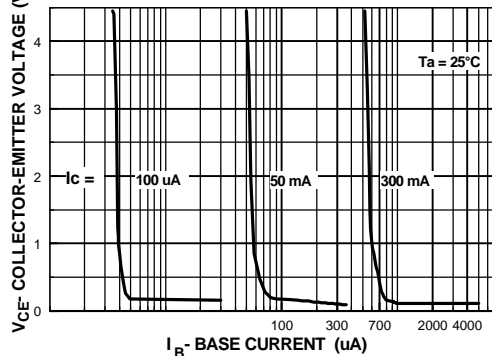
Collector-Cutoff Current vs. Ambient Temperature



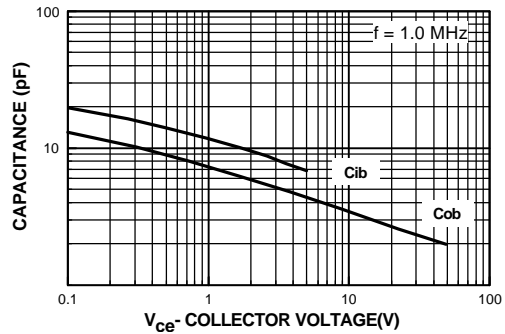
Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base



Collector Saturation Region



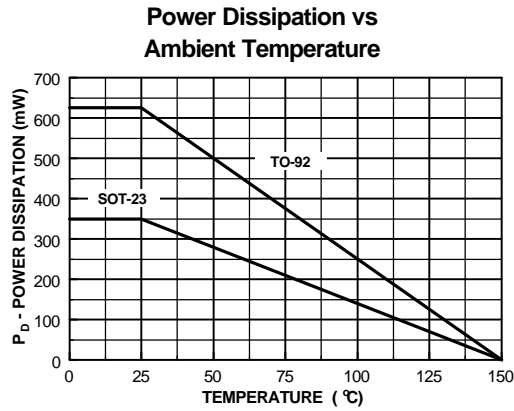
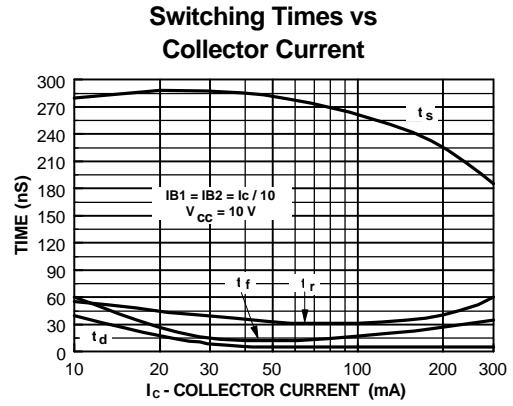
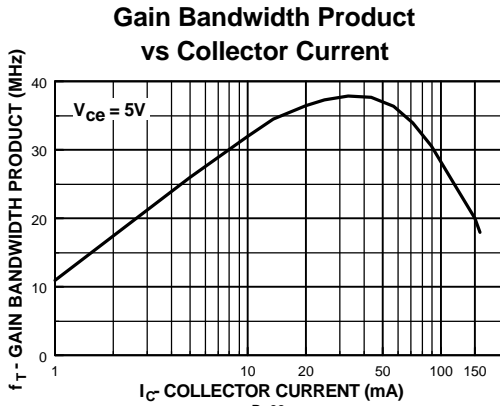
Input and Output Capacitance vs Reverse Voltage



PNP General Purpose Amplifier

(continued)

Typical Characteristics (continued)



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