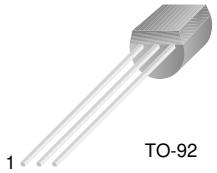
FAIRCHILD SEMICONDUCTOR®

October 2008

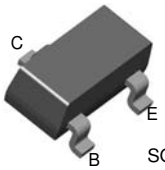
PN100/PN100A/MMBT100/MMBT100A

NPN General Purpose Amplifier

- This device is designed for general purpose amplifier applications at collector currents to 300mA.
- Sourced from process 10.



TO-92



SOT-23

1. Emitter 2. Base 3. Collector
Mark: PN100/PN100A

Absolute Maximum Ratings* T_a = 25°C unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{CEO}	Collector-Emitter Voltage		45
V_{CBO}	Collector-Base Voltage		75
V_{EBO}	Emitter-Base Voltage		6.0
I_C	Collector current	- Continuous	500
T_J, T_{stg}	Junction and Storage Temperature		-55 ~ +150

* 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.

* Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

Thermal Characteristics T_A=25°C unless otherwise noted

Symbol	Parameter	Max.		Units
		PN100 PN100A	*MMBT100 *MMBT100A	
P_D	Total Device Dissipation Derate above 25°C	625 5.0	350 2.8	mW mW/°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	83.3		°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	200	357	°C/W

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

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Electrical Characteristics T_C=25°C unless otherwise noted

Symbol	Parameter	Test Condition		Min.	Max.	Units
Off Characteristics						
BV_{CBO}	Collector-Base Breakdown Voltage	I_C = 10μA, I_E = 0		75		V
BV_{CEO}	Collector-Emitter Breakdown Voltage *	I_C = 1mA, I_B = 0		45		V
BV_{EBO}	Emitter-Base Breakdown Voltage	I_E = 10μA, I_C = 0		6.0		V
I_{CBO}	Collector-Base Cutoff Current	V_{CB} = 60V			50	nA
I_{CES}	Collector-Emiitter Cutoff Current	V_{CE} = 40V			50	nA
I_{EBO}	Emitter Cutoff Current	V_{EB} = 4V			50	nA
On Characteristics						
h_{FE}	DC Current Gain	I_C = 100μA, V_{CE} = 1.0V	100	80		
			100A	240		
		I_C = 10mA, V_{CE} = 1.0V	100	100	450	
			100A	300	600	
		I_C = 100mA, V_{CE} = 1.0V*		100		
		I_C = 150mA, V_{CE} = 5.0V *	100	100	350	
			100A	100		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 10mA, I_B = 1.0mA			0.2	V
		I_C = 200mA, I_B = 20mA			0.4	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	I_C = 10mA, I_B = 1.0mA			0.85	V
		I_C = 200mA, I_B = 20mA			1.0	V
Small Signal Characteristics						
f_T	Current Gain Bandwidth Product	V_{CE} = 20V, I_C = 20mA		250		MHz
C_{obo}	Output Capacitance	V_{CB} = 5.0V, f = 1.0MHz			4.5	pF
NF	Noise Figure	I_C = 100μA, V_{CE} = 5.0V	100		5.0	dB
		R_G = 2.0kΩ, f = 1.0KHz	100A		4.0	dB

* Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2.0%

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Typical Characteristics

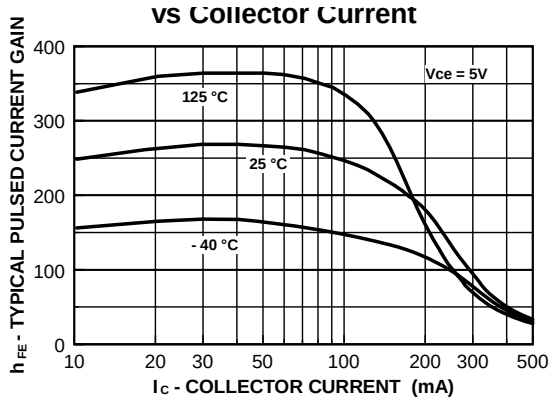


Figure 1. Typical Pulsed Current Gain vs Collector Current

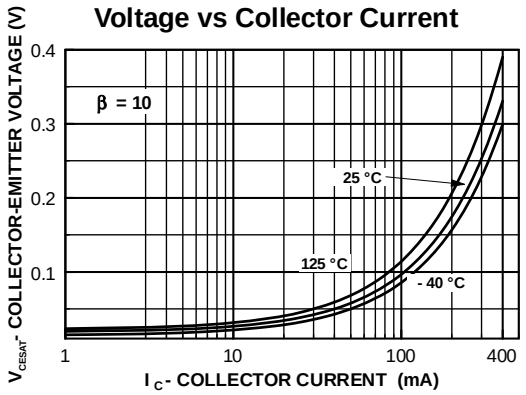


Figure 2. Collector-Emitter Saturation Voltage vs Collector Current

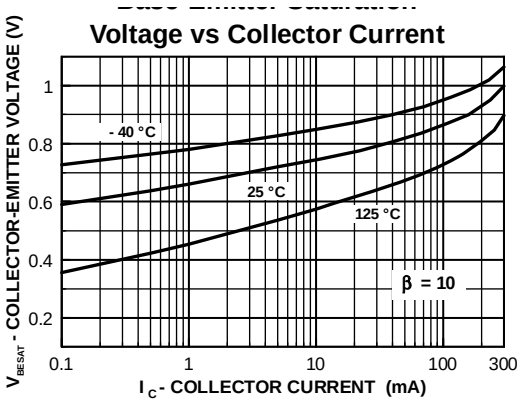


Figure 3. Base-Emitter Saturation Voltage vs Collector Current

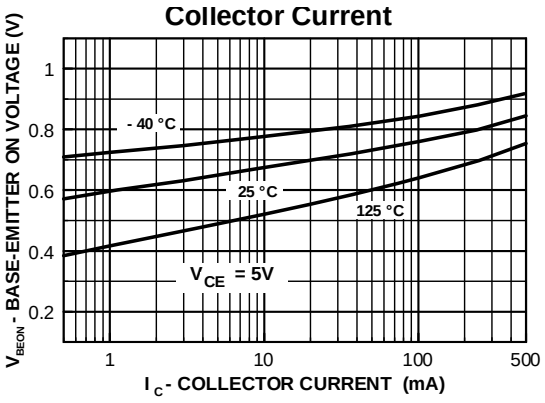


Figure 4. Base-Emitter On Voltage vs Collector Current

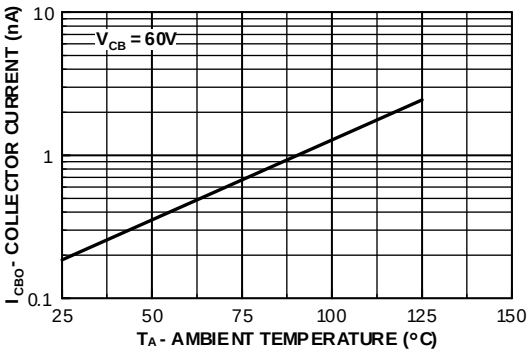


Figure 5. Collector Cutoff Current vs Ambient Temperature

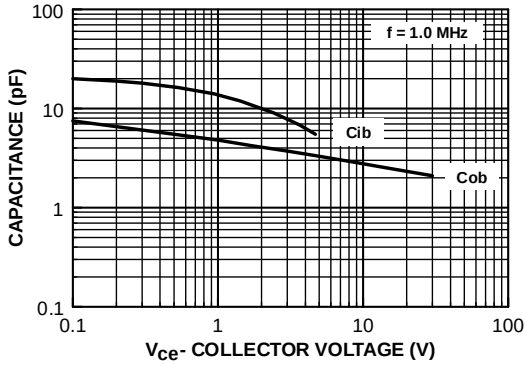


Figure 6. Input and Output Capacitance vs Reverse Voltag

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Typical Characteristics (Continued)

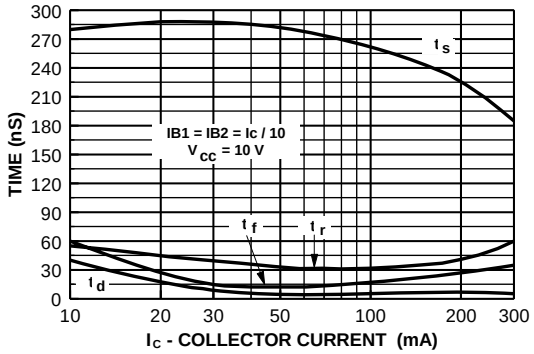


Figure 7. Switching Times vs Collector Current

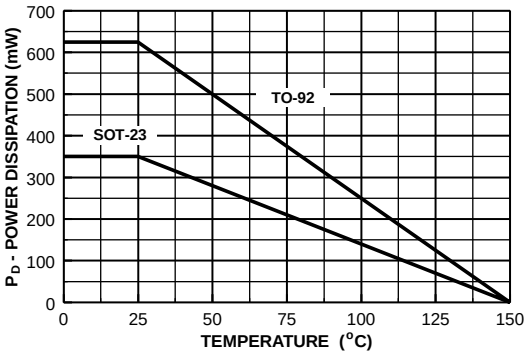
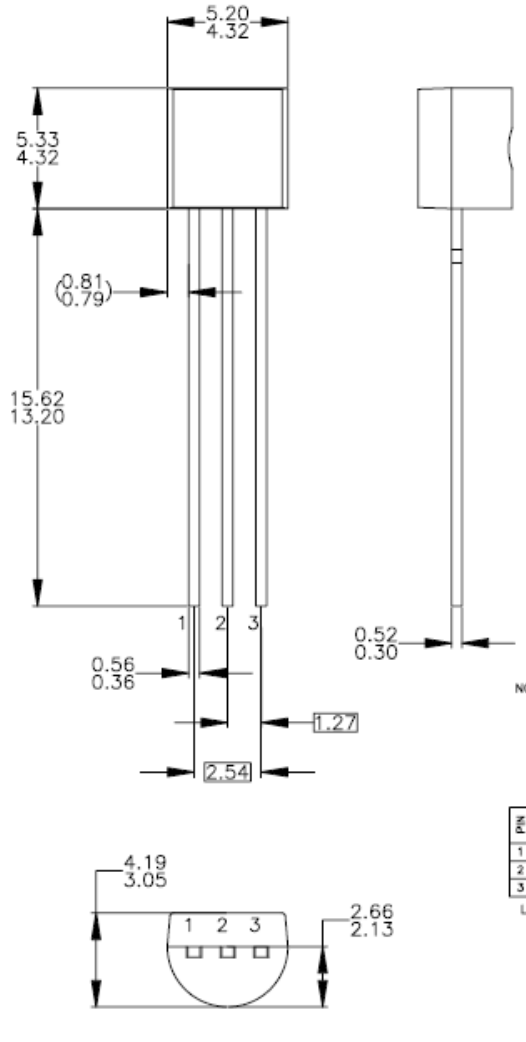


Figure 8. Power Dissipation vs Ambient Temperature

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Package Dimension (TO92)



NOTES: UNLESS OTHERWISE SPECIFIED

A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DRAWING CONFORMS TO ASME Y14.5M-1994.
D) TO-92 (92,94,96,97,98) PIN CONFIGURATION:

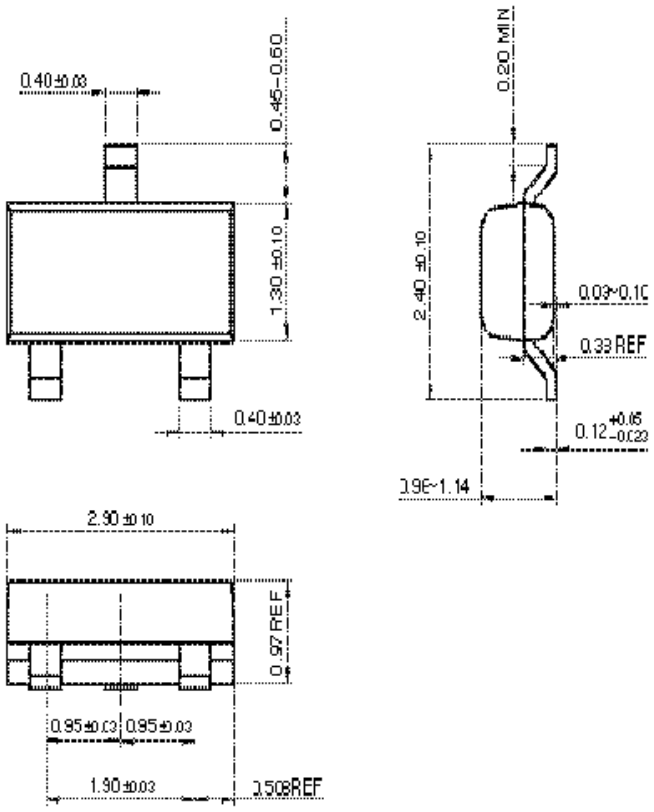
PIN	92			94			96			97			98		
	P	F	M	P	F	M	P	F	M	P	F	M	P	F	M
1	E	S	S	E	S	S	B	D	G	C	G	D	C	G	D
2	B	D	G	C	G	D	E	S	S	B	D	G	E	S	S
3	C	G	D	B	D	G	C	G	D	E	S	S	B	D	G

LEGEND:
P - BIPOLAR
F - JFET
M - DMOS
E - EMITTER
B - BASE
C - COLLECTOR
D - DRAIN
S - SOURCE
G - GATE

E) FOR PACKAGE 92, 94, 96, 97 AND 98: PIN CONFIGURATION DRAIN "D" AND SOURCE "S" ARE INTERCHANGEAGLE AT JFET "F" OPTION.
F) DRAWING FILENAME: MKT-ZA03DREV3.

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Package Dimension (SOT23)



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IntelliMAX™
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OPTOPLANAR®
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PDP-SPM™
Power220®
Power247®
POWEREDGE®
Power-SPM™
PowerTrench®
Programmable Active Droop™
QFET®
QS™
QT Optoelectronics™
Quiet Series™
RapidConfigure™
SMART START™
SPM®
STEALTH™
SuperFET™
SuperSOT™-3
SuperSOT™-6
SuperSOT™-8
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No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
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