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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.





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

Symbol	Parameter	Units			
V_{CEO}	Collector-Emitter Voltage	45			
V _{CBO}	Collector-Base Voltage	75			
V _{EBO}	Emitter-Base Voltage	6.0			
I _C	Collector current	500			
T _J , T _{stg}	Junction and Storage Temperature				

^{*} These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

- These ratings are based on a maximum junction temperature of 150 degrees C.
 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

		Ma			
Symbol	Parameter	PN100 PN100A	*MMBT100 *MMBT100A	Units	
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."

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

Electrical Characteristics $\rm T_C = 25\,^{\circ}C$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units	
Off Charact	eristics					
BV _{CBO}	Collector-Base Breakdown Voltage $I_C = 10\mu A, I_E = 0$					V
BV _{CEO}	Collector-Emitter Breakdown Voltage *	$I_{C} = 1 \text{mA}, I_{B} = 0$		45		V
BV _{EBO}	Emitter-Base Breakdown Voltage	$I_E = 10 \mu A, I_C = 0$		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 Characte	eristics	•			•	
h _{FE}	DC Current Gain	$I_C = 100\mu A, V_{CE} = 1.0V$ $I_C = 10mA, V_{CE} = 1.0V$ $I_C = 100mA, V_{CE} = 1.0V^*$ $I_C = 150mA, V_{CE} = 5.0V^*$	100 100A 100 100A	80 240 100 300 100 100	450 600 350	
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _C = 10mA, I _B = 1.0mA I _C = 200mA, I _B = 20mA	TOUA	100	0.2 0.4	V V
V _{BE(sat)}	Base-Emitter Saturation Voltage $I_C = 10mA$, $I_B = 1.0mA$ $I_C = 200mA$, $I_B = 20mA$			0.85 1.0	V V	
Small Signa	l 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	$I_C = 100 \mu A, V_{CE} = 5.0 V$ $R_G = 2.0 k\Omega, f = 1.0 KHz$	100 100A		5.0 4.0	dB dB

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

Typical Characteristics

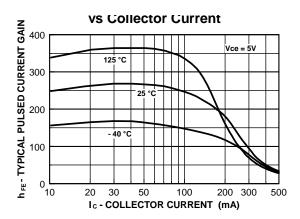


Figure 1. Typical Pulsed Current Gain vs Collector Current

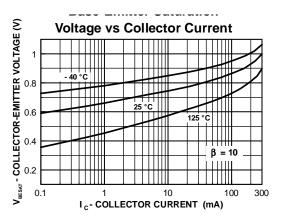


Figure 3. Base-Emitter Saturation Voltage vs Collector Current

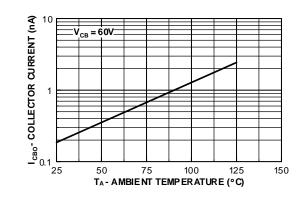


Figure 5. Collector Cutoff Current vs Ambient Temperature

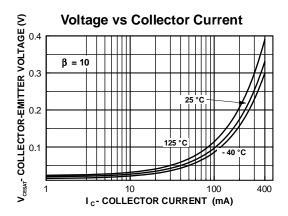


Figure 2. Collector-Emitter Saturation Voltage vs Collector Current

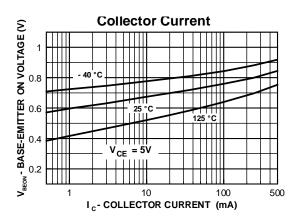


Figure 4. Base-Emitter On Voltage vs Collector Current

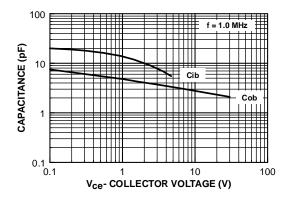


Figure 6. Input and Output Capacitance vs Reverse Voltag

Typical Characteristics (Continued)

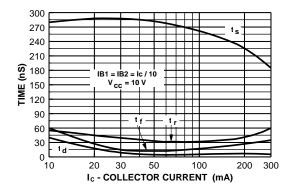


Figure 7. Switching Times vs Collector Current

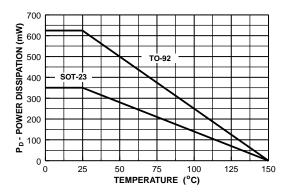
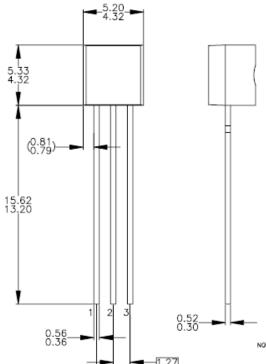


Figure 8. Power Dissipation vs Ambient Temperature

Package Dimension (TO92)



_4.19 3.05 2

2.54

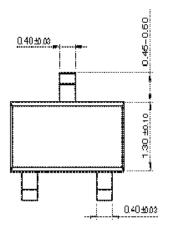
NOTES: UNLESS OTHERWISE SPECIFIED

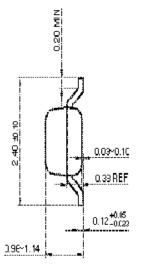
- DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
 B) ALL DIMENSIONS ARE IN MILLIMETERS.
 C) DRAWING CONFORMS TO ASME Y14.5M-1994.
 D) TO-92 (92,94,96,97,98) PIN CONFIGURATION:

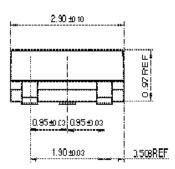
z	92 P F M		94		96		97		98						
•	Р	F	М	Р	F	М	В	F	м	Р	F	М	Р	F	М
1	Ε	S	S	Ε	s	S	В	D	G	С	G	D	C	G	D
2	В	D	G	C	G	D	Ε	S	S	В	D	G	Ε	S	D S
3	C	G	D	В	۵	G	c	G	D	Ε	S	S	В	D	G

- E EMITTER B BASE C COLLECTOR
 - FOR PACKAGE 92, 94, 96, 97 AND 98: PIN CONFIGURATION DRAIN "D" AND SOURCE "S" ARE INTERCHANGEAGLE AT JFET "F" OPTION. DRAWING FILENAME: MKT-ZAO3DREVS.

Package Dimension (SOT23)











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