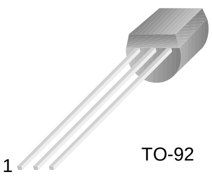
PN100/PN100A/MMBT100/MMBT100A

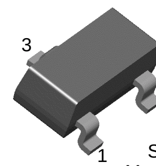
PN100/PN100A/MMBT100/MMBT100A

NPN General Purpose Amplifier

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



1 TO-92
1. Emitter 2. Base 3. Collector



3 2 1 SOT-23
Mark: N1/N1A
1. Base 2. Emitter 3. Collector

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

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

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_B = 0	75		V
BV_{CEO}	Collector-Emitter Breakdown Voltage *	I_C = 1mA, I_E = 0	45		V
BV_{EBO}	Emitter-Base Breakdown Voltage	I_C = 10µA, I_C = 0	6.0		V
I_{CBO}	Emitter Cutoff Current	V_{CB} = 60V		50	nA
I_{CES}	Collector 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 100A I_C = 10mA, V_{CE} = 1.0V 100 100A I_C = 100mA, V_{CE} = 1.0V* I_C = 150mA, V_{CE} = 5.0V * 100 100A	80 240 100 300 100 100 100	 450 600 350 	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 10mA, I_B = 1.0mA I_C = 200mA, I_B = 20mA		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 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 R_G = 2.0kΩ, f = 1.0KHz 100A		5.0 4.0	dB dB

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

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."

Typical Characteristics

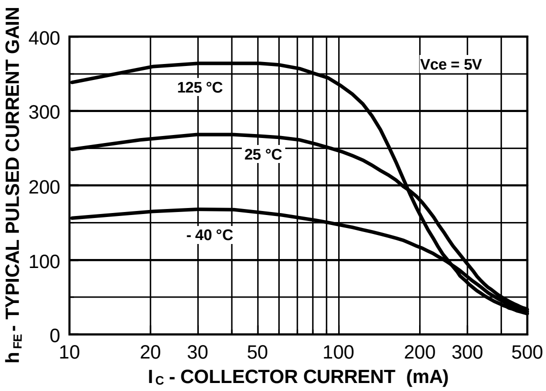


Figure 1. Typical Pulsed Current Gain vs Collector Current

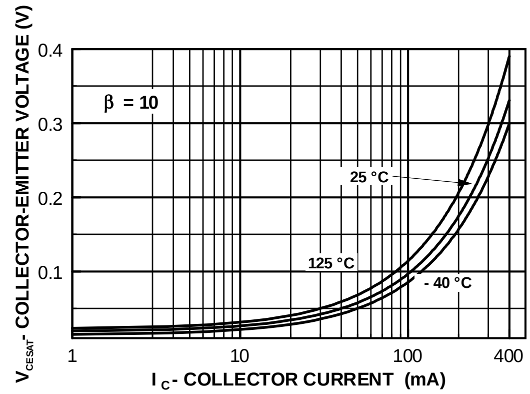


Figure 2. Collector-Emitter Saturation Voltage vs Collector Current

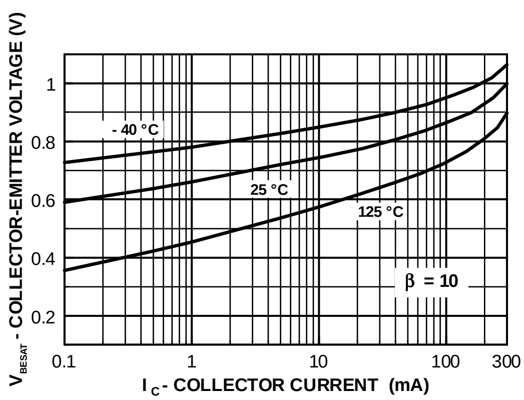


Figure 3. Base-Emitter Saturation Voltage vs Collector Current

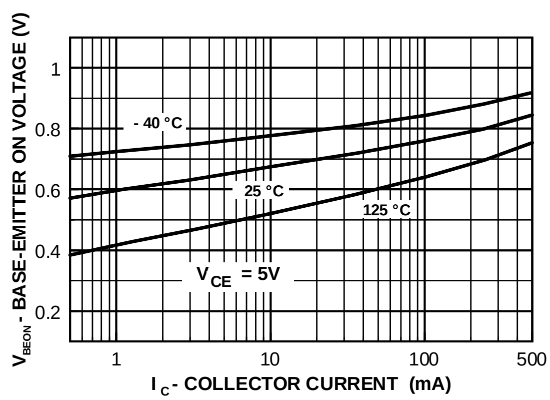


Figure 4. Base-Emitter On Voltage vs Collector Current

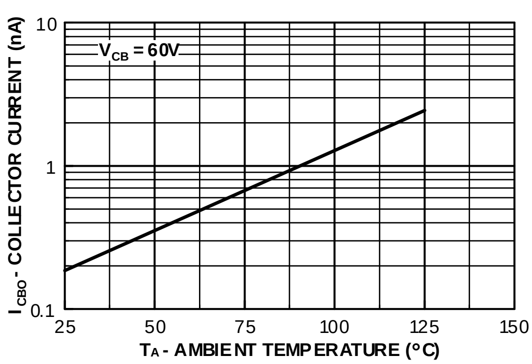


Figure 5. Collector Cutoff Current vs Ambient Temperature

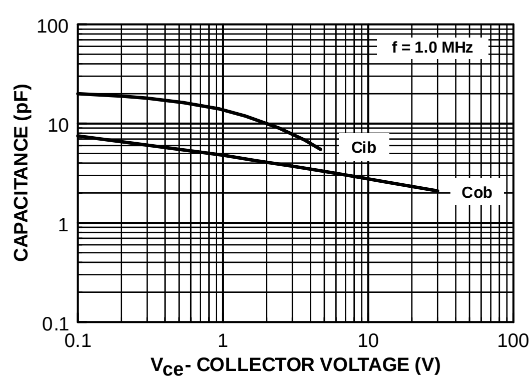


Figure 6. Input and Output Capacitance vs Reverse Voltag

Typical Characteristics (Continued)

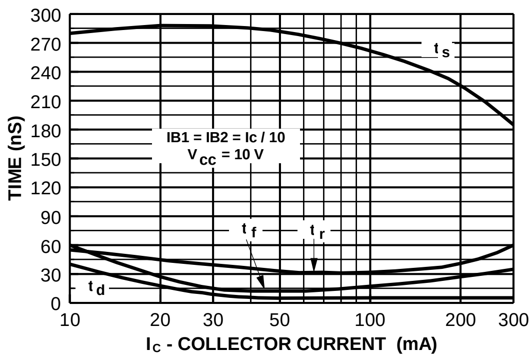


Figure 7. Switching Times vs Collector Current

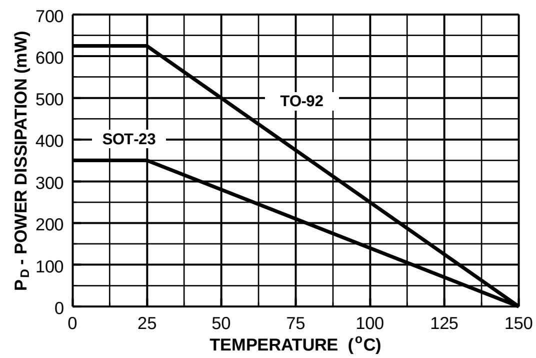
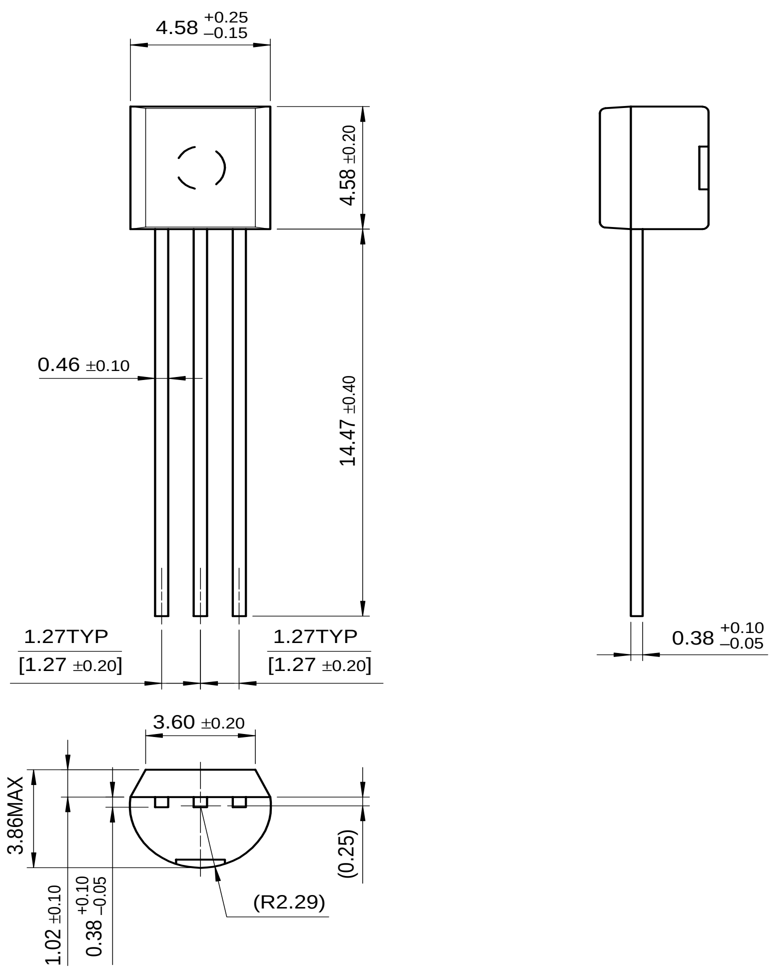


Figure 8. Power Dissipation vs Ambient Temperature

Package Dimensions

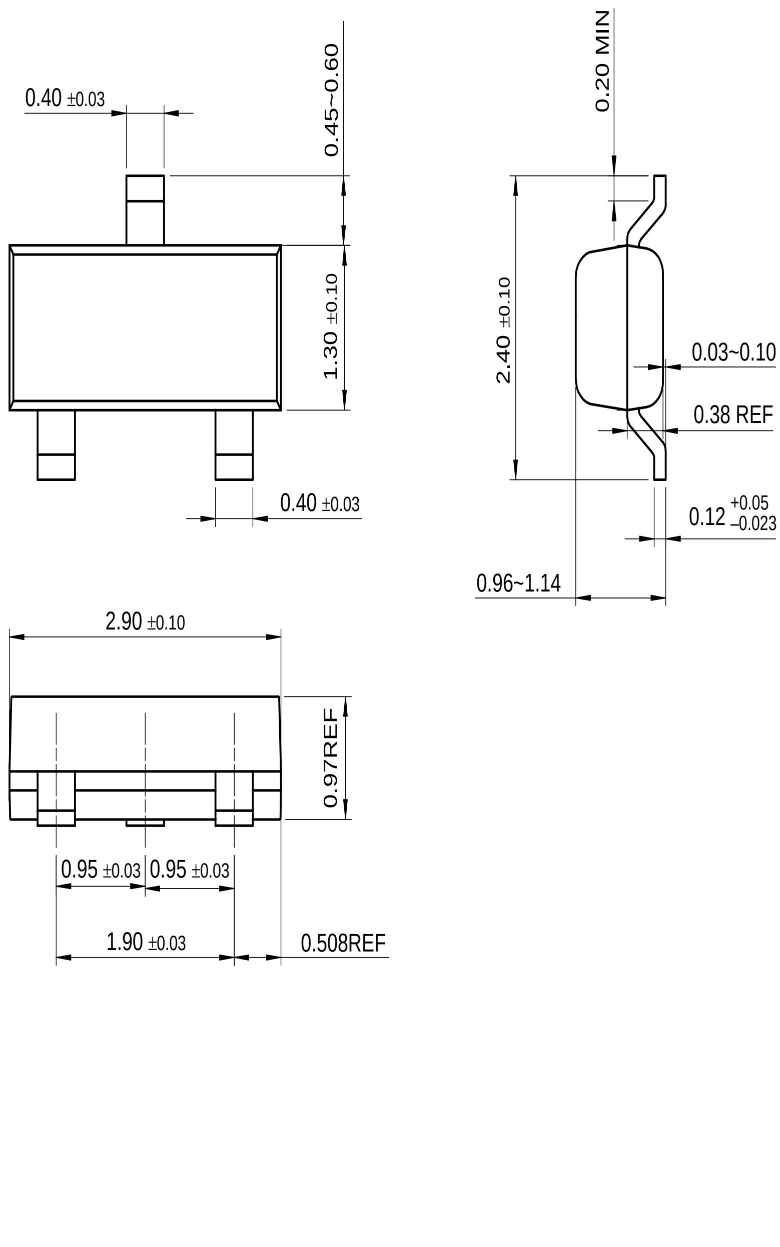
TO-92



Dimensions in Millimeters

Package Dimensions (Continued)

SOT-23



Dimensions in Millimeters

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