

PN930



NPN General Purpose Amplifier

This device is designed for low noise, high gain, general purpose applications at collector currents from 1 μ to 50 mA. Sourced from Process 07. See 2N5088 for characteristics.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	45	V
V _{CB0}	Collector-Base Voltage	45	V
V _{EBO}	Emitter-Base Voltage	5.0	V
I _C	Collector Current - Continuous	100	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
		PN930	
P _D	Total Device Dissipation Derate above 25°C	625	mW
		5.0	mW/°C
R _{θJC}	Thermal Resistance, Junction to Case	83.3	°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	200	°C/W

NPN General Purpose Amplifier

(continued)

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Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
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OFF CHARACTERISTICS

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	$I_C = 10 \text{ mA}, I_B = 0$	45		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10 \text{ } \mu\text{A}, I_E = 0$	45		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \text{ nA}, I_C = 0$	5.0		V
I_{CEO}	Collector Cutoff Current	$V_{CE} = 5.0 \text{ V}$		2.0	nA
I_{CBO}	Collector Cutoff Current	$V_{CB} = 45 \text{ V}, I_E = 0$		10	nA
I_{CES}	Collector Cutoff Current	$V_{CE} = 45 \text{ V}, I_E = 0$ $V_{CE} = 45 \text{ V}, I_E = 0, T_A = 170 \text{ }^\circ\text{C}$		10 10	nA μA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = 5.0 \text{ V}, I_C = 0$		10	nA

ON CHARACTERISTICS*

h_{FE}	DC Current Gain	$V_{CE} = 5.0 \text{ V}, I_C = 10 \text{ } \mu\text{A}$ $V_{CE} = 5.0 \text{ V}, I_C = 10 \text{ } \mu\text{A},$ $T = -55 \text{ }^\circ\text{C}$ $V_{CE} = 5.0 \text{ V}, I_C = 500 \text{ } \mu\text{A}$ $V_{CE} = 5.0 \text{ V}, I_C = 10 \text{ mA}$	100 20 150	300 600	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$		1.0	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$	0.6	1.0	V

SMALL SIGNAL CHARACTERISTICS

C_{ob}	Output Capacitance	$V_{CB} = 5.0 \text{ V}, f = 1.0 \text{ MHz}$		8.0	pF
h_{fe}	Small-Signal Current Gain	$I_C = 500 \text{ } \mu\text{A}, V_{CE} = 5.0 \text{ V},$ $f = 20 \text{ MHz}$ $I_C = 1.0 \text{ mA}, V_{CE} = 5.0 \text{ V},$ $f = 1.0 \text{ kHz}$	1.5 150	 600	
h_{ib}	Input Impedance	$I_C = 1.0 \text{ mA}, V_{CE} = 5.0 \text{ V},$	25	32	Ω
h_{fb}	Voltage Feedback Ratio	$f = 1.0 \text{ kHz}$		600	$\times 10^{-6}$
h_{ob}	Output Admittance			1.0	μmho
NF	Noise Figure	$V_{CE} = 5.0 \text{ V}, I_C = 10 \text{ } \mu\text{A},$ $R_G = 10 \text{ k}\Omega, B_W = 15.7 \text{ kHz}$		3.0	dB

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