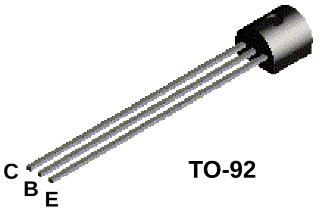
FAIRCHILD
SEMICONDUCTOR ™

Discrete POWER & Signal Technologies

PN930



NPN General Purpose Amplifier

This device is designed for low noise, high gain, general purpose applications at collector currents from 1μ 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_{CBO}	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 5.0	mW mW/°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	83.3	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	200	°C/W

Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units

OFF CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min	Max	Units
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	I_C = 10 mA, I_B = 0	45		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = 10 µA, I_E = 0	45		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = 10 nA, I_C = 0	5.0		V
I_{CEO}	Collector Cutoff Current	V_{CE} = 5.0 V		2.0	nA
I_{CBO}	Collector Cutoff Current	V_{CB} = 45 V, I_E = 0		10	nA
I_{CES}	Collector Cutoff Current	V_{CE} = 45 V, I_E = 0		10	nA
		V_{CE} = 45 V, I_E = 0, T_A = 170 °C		10	µA
I_{EBO}	Emitter Cutoff Current	V_{EB} = 5.0 V, I_C = 0		10	nA

ON CHARACTERISTICS*

Symbol	Parameter	Test Conditions	Min	Max	Units
h_{FE}	DC Current Gain	V_{CE} = 5.0 V, I_C = 10 µA	100	300	
		V_{CE} = 5.0 V, I_C = 10 µA, T = – 55 °C	20		
		V_{CE} = 5.0 V, I_C = 500 µA	150		
		V_{CE} = 5.0 V, I_C = 10 mA		600	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 10 mA, I_B = 0.5 mA		1.0	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	I_C = 10 mA, I_B = 0.5 mA	0.6	1.0	V

SMALL SIGNAL CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min	Max	Units
C_{ob}	Output Capacitance	V_{CB} = 5.0 V, f = 1.0 MHz		8.0	pF
h_{fe}	Small-Signal Current Gain	I_C = 500 µA, V_{CE} = 5.0 V, f = 20 MHz	1.5		
		I_C = 1.0 mA, V_{CE} = 5.0 V, f = 1.0 kHz	150	600	
h_{ib}	Input Impedance	I_C = 1.0 mA, V_{CE} = 5.0 V, f = 1.0 kHz	25	32	Ω
h_{rb}	Voltage Feedback Ratio			600	$x10^{-6}$
h_{ob}	Output Admittance			1.0	µmho
NF	Noise Figure	V_{CE} = 5.0 V, I_C = 10 µA, R_g = 10 kΩ, B_W = 15.7 kHz		3.0	dB

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