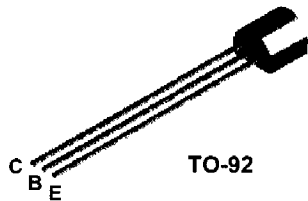


## PN4122



### PNP General Purpose Amplifier

This device is designed for use as general purpose amplifiers and switches requiring collector currents to 100 mA. Sourced from Process 66. See 2N3906 for characteristics.

#### Absolute Maximum Ratings\*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>CEO</sub>	Collector-Emitter Voltage	40	V
V <sub>CB0</sub>	Collector-Base Voltage	40	V
V <sub>EBO</sub>	Emitter-Base Voltage	5.0	V
I <sub>C</sub>	Collector Current - Continuous	200	mA
T <sub>J</sub> , T <sub>stg</sub>	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.

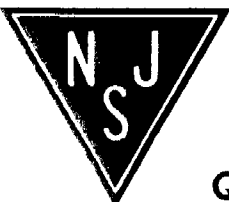
#### NOTES:

- 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
		PN4122	
P <sub>D</sub>	Total Device Dissipation Derate above 25°C	625	mW
		5.0	mW/°C
R <sub>nJC</sub>	Thermal Resistance, Junction to Case	83.3	°C/W
R <sub>nJA</sub>	Thermal Resistance, Junction to Ambient	200	°C/W



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

## PNP General Purpose Amplifier

(continued)

### Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
--------	-----------	-----------------	-----	-----	-------

#### OFF CHARACTERISTICS

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	$I_C = 10 \text{ mA}, I_B = 0$	40		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10 \text{ } \mu\text{A}, I_E = 0$	40		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \text{ } \mu\text{A}, I_C = 0$	5.0		V
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	$I_C = 10 \text{ } \mu\text{A}$	40		nA
$I_B$	Base Cutoff Current	$V_{CE} = 30 \text{ V}$		25	nA
$I_{CES}$	Collector Cutoff Current	$V_{CE} = 30 \text{ V}$ $V_{CE} = 30 \text{ V}, T_A = 65 \text{ }^\circ\text{C}$		25	nA $\mu\text{A}$

#### ON CHARACTERISTICS\*

$\eta_{FE}$	DC Current Gain	$V_{CE} = 1.0 \text{ V}, I_C = 100 \text{ } \mu\text{A}$ $V_{CE} = 1.0 \text{ V}, I_C = 1.0 \text{ mA}$ $V_{CE} = 1.0 \text{ V}, I_C = 10 \text{ mA}$ $V_{CE} = 1.0 \text{ V}, I_C = 50 \text{ mA}$	100 150 150 30	300	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 1.0 \text{ mA}, I_B = 0.1 \text{ mA}$ $I_C = 10 \text{ mA}, I_B = 1.0 \text{ mA}$ $I_C = 50 \text{ mA}, I_B = 5.0 \text{ mA}$		0.13 0.14 0.30	V V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 1.0 \text{ mA}, I_B = 0.1 \text{ mA}$ $I_C = 10 \text{ mA}, I_B = 1.0 \text{ mA}$ $I_C = 50 \text{ mA}, I_B = 5.0 \text{ mA}$	0.70	0.75 0.90 1.10	V V V

#### SMALL SIGNAL CHARACTERISTICS

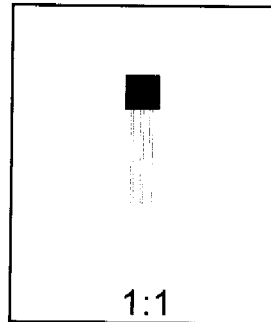
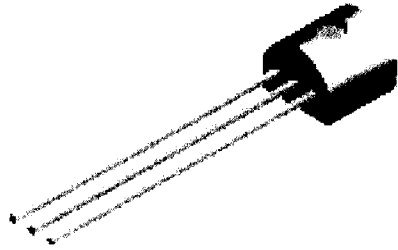
$C_{ob}$	Output Capacitance	$V_{CB} = 10 \text{ V}, f = 1.0 \text{ MHz}$		4.5	pF
$C_{ib}$	Input Capacitance	$V_{EB} = 0.5 \text{ V}, f = 1.0 \text{ MHz}$		8.0	pF
$\eta_{fe}$	Small-Signal Current Gain	$I_C = 10 \text{ mA}, V_{CE} = 20 \text{ V},$ $f = 100 \text{ MHz}$ $I_C = 1.0 \text{ mA}, V_{CE} = 10 \text{ V},$ $f = 1 \text{ kHz}$	4.5 150	450	
$\eta_{ie}$	Input Impedance	$I_C = 1.0 \text{ mA}, V_{CE} = 10 \text{ V},$	4.0	12	k $\Omega$
$\eta_{re}$	Voltage Feedback Ratio	$f = 1.0 \text{ kHz}$		4.0	$\times 10^{-4}$
$\eta_{oe}$	Output Admittance		8.0	40	$\mu\text{mhos}$
$\tau_{b'c}$	Collector-Base Time Constant	$V_{CE} = 20 \text{ V}, I_C = 10 \text{ mA}$ $f = 80 \text{ MHz}$		50	ps
NF	Noise Figure	$V_{CE} = 5.0 \text{ V}, I_C = 1.0 \text{ mA},$ $R_S = 100 \text{ } \Omega, f = 100 \text{ MHz},$ $B_w = 15 \text{ MHz}$ $V_{CE} = 5.0 \text{ V}, I_C = 100 \text{ } \mu\text{A},$ $R_S = 1.0 \text{ k}\Omega, PB_w = 15.7 \text{ kHz}$		6.0 4.0	dB dB

#### SWITCHING CHARACTERISTICS

$t_{on}$	Turn-on Time	$V_{CC} = 30 \text{ V}, I_C = 50 \text{ mA},$		40	ns
$t_d$	Delay Time	$I_{B1} = 5.0 \text{ mA}, V_{BE(off)} = 3.0 \text{ V}$		15	ns
$t_r$	Rise Time			40	ns
$t_{off}$	Turn-off Time	$V_{CC} = 30 \text{ V}, I_C = 50 \text{ mA}$		150	ns
$t_s$	Storage Time	$I_{B1} = I_{B2} = 5.0 \text{ mA}$		140	ns
$t_f$	Fall Time			40	ns

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

# TO-92 (FS PKG Code 92, 94, 96)



Scale 1:1 on letter size paper

Dimensions shown below are in:  
inches [millimeters]

Part Weight per unit (gram): 0.1977

TO-92 (92,94,96)

PIN	92		94		96	
	B	F	B	F	B	F
1	E	D	E	D	B	S
2	B	S	C	G	E	D
3	C	G	B	S	C	G

