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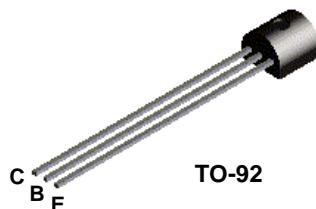


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Jameco Part Number 1944943

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_{CEO}	Collector-Emitter Voltage	40	V
V_{CBO}	Collector-Base Voltage	40	V
V_{EBO}	Emitter-Base Voltage	5.0	V
I_C	Collector Current - Continuous	200	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
		PN4122	
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

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

ON CHARACTERISTICS*

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

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
h_{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	
h_{ie}	Input Impedance	$I_C = 1.0 \text{ mA}, V_{CE} = 10 \text{ V}, f = 1.0 \text{ kHz}$	4.0	12	k Ω
h_{re}	Voltage Feedback Ratio			4.0	$\times 10^{-4}$
h_{oe}	Output Admittance		8.0	40	μmhos
$rb'Cc$	Collector-Base Time Constant	$V_{CE} = 20 \text{ V}, I_C = 10 \text{ mA}, f = 80 \text{ MHz}$		50	ps
NF	Noise Figure	$V_{CE} = 5.0 \text{ V}, I_C = 1.0 \text{ mA}, R_S = 100 \Omega, f = 100 \text{ MHz}, B_W = 15 \text{ MHz}$ $V_{CE} = 5.0 \text{ V}, I_C = 100 \mu\text{A}, R_S = 1.0 \text{ k}\Omega, P_{B_W} = 15.7 \text{ kHz}$		6.0 4.0	dB

SWITCHING CHARACTERISTICS

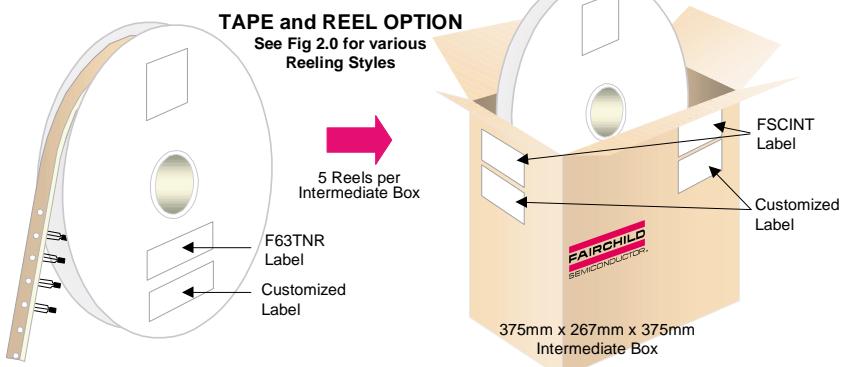
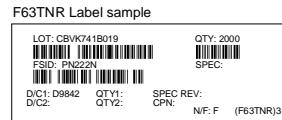
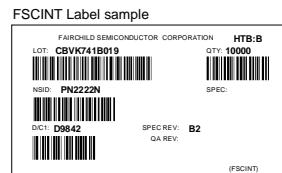
t_{on}	Turn-on Time	$V_{CC} = 30 \text{ V}, I_C = 50 \text{ mA}, I_{B1} = 5.0 \text{ mA}, V_{BE(\text{off})} = 3.0 \text{ V}$		40	ns
t_d	Delay Time			15	ns
t_r	Rise Time			40	ns
t_{off}	Turn-off Time	$V_{CC} = 30 \text{ V}, I_C = 50 \text{ mA}, I_{B1} = I_{B2} = 5.0 \text{ mA}$		150	ns
t_s	Storage Time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

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

TO-92 Tape and Reel Data



TO-92 Packaging Configuration: Figure 1.0



TO-92 TNR/AMMO PACKING INFORMATION

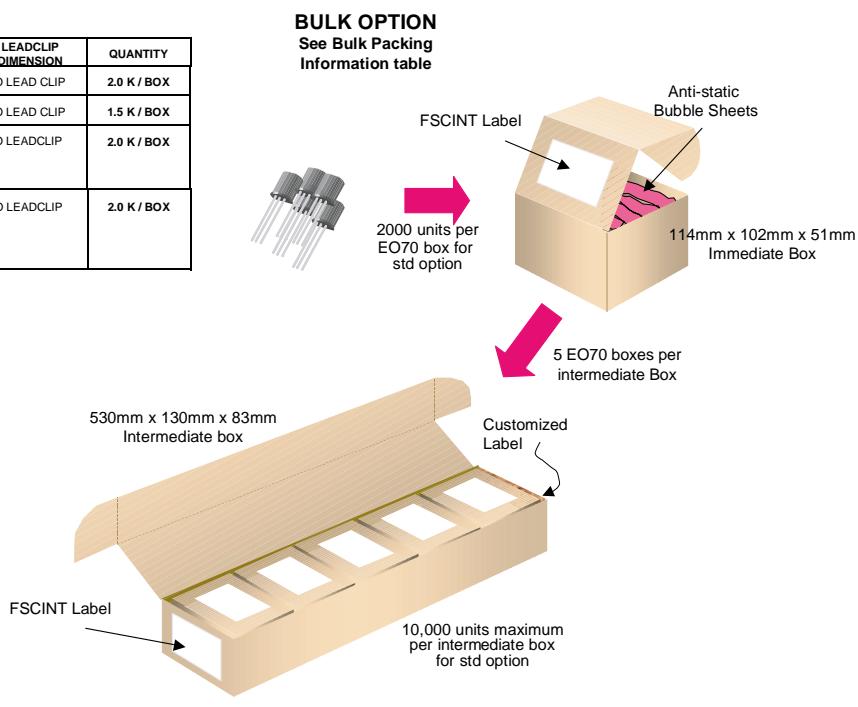
Packing	Style	Quantity	EOL code
Reel	A	2,000	D26Z
	E	2,000	D27Z
Ammo	M	2,000	D74Z
	P	2,000	D75Z

Unit weight = 0.22 gm
Reel weight with components = 1.04 kg
Ammo weight with components = 1.02 kg
Max quantity per intermediate box = 10,000 units



(TO-92) BULK PACKING INFORMATION

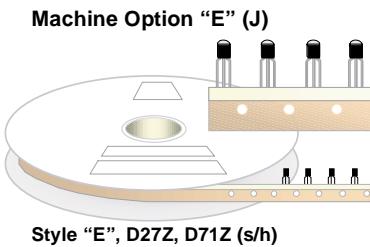
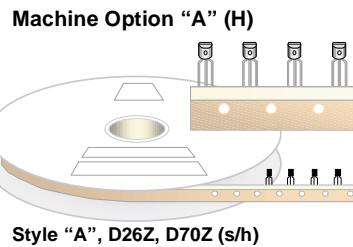
EOL CODE	DESCRIPTION	LEADCLIP DIMENSION	QUANTITY
J18Z	TO-18 OPTION STD	NO LEAD CLIP	2.0 K / BOX
J05Z	TO-5 OPTION STD	NO LEAD CLIP	1.5 K / BOX
NO EOL CODE	TO-92 STANDARD STRAIGHT FOR: PKG 92, 94 (NON PROELECTRON SERIES), 96	NO LEADCLIP	2.0 K / BOX
L34Z	TO-92 STANDARD STRAIGHT FOR: PKG 94 (PROELECTRON SERIES BCXXX, BFXXX, BSXXX), 97, 98	NO LEADCLIP	2.0 K / BOX



TO-92 Tape and Reel Data, continued

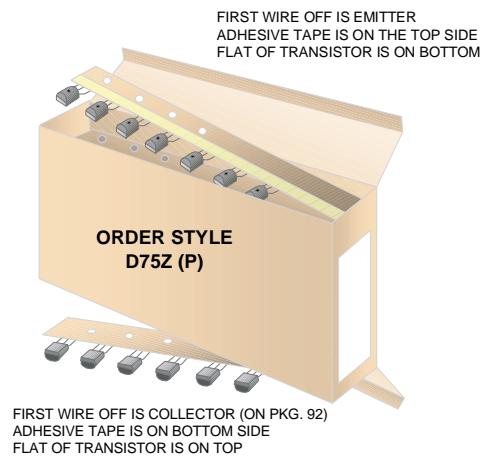
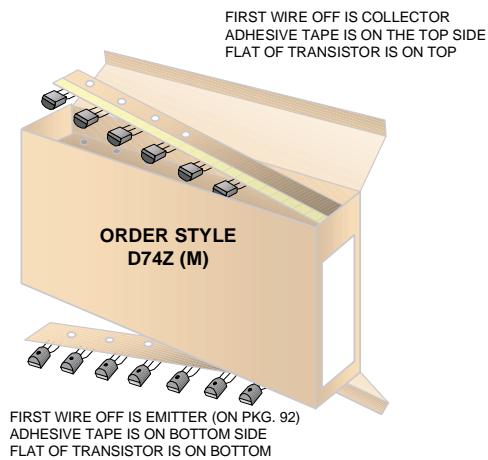
TO-92 Reeling Style

Configuration: Figure 2.0



TO-92 Radial Ammo Packaging

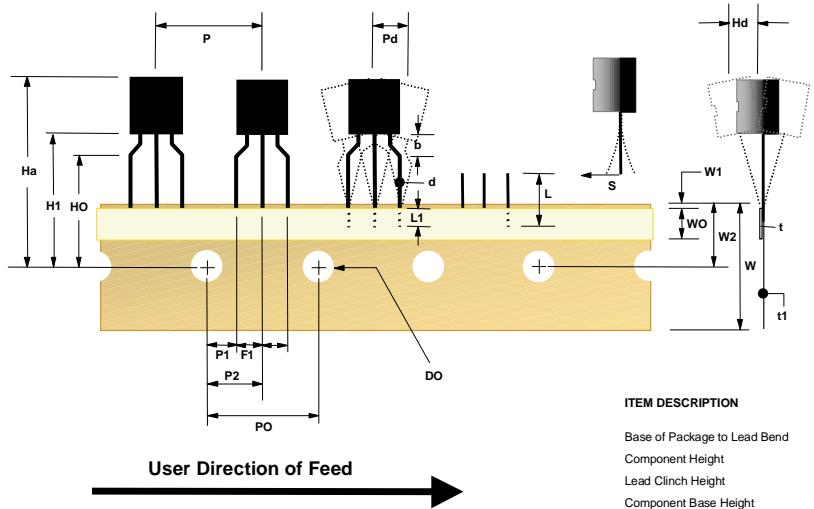
Configuration: Figure 3.0



TO-92 Tape and Reel Data, continued

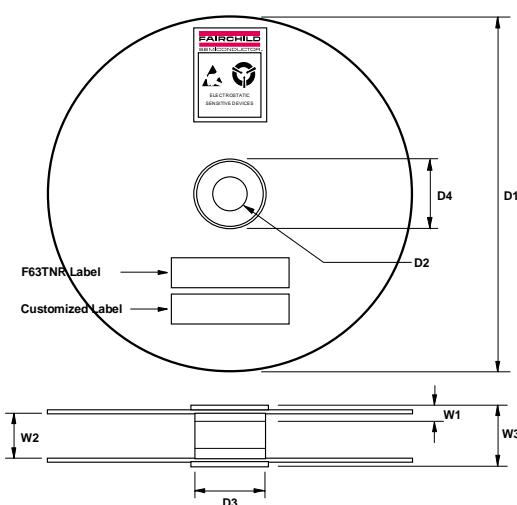
TO-92 Tape and Reel Taping

Dimension Configuration: Figure 4.0



ITEM DESCRIPTION	SYMBOL	DIMENSION
Base of Package to Lead Bend	b	0.098 (max)
Component Height	Ha	0.928 (+/- 0.025)
Lead Clinch Height	HO	0.630 (+/- 0.020)
Component Base Height	H1	0.748 (+/- 0.020)
Component Alignment (side/side)	Pd	0.040 (max)
Component Alignment (front/back)	Hd	0.031 (max)
Component Pitch	P	0.500 (+/- 0.020)
Feed Hole Pitch	PO	0.500 (+/- 0.008)
Hole Center to First Lead	P1	0.150 (+0.009, -0.010)
Hole Center to Component Center	P2	0.247 (+/- 0.007)
Lead Spread	F1/F2	0.104 (+/- 0.010)
Lead Thickness	d	0.018 (+0.002, -0.003)
Cut Lead Length	L	0.429 (max)
Taped Lead Length	L1	0.209 (+0.051, -0.052)
Taped Lead Thickness	t	0.032 (+/- 0.006)
Carrier Tape Thickness	t1	0.021 (+/- 0.006)
Carrier Tape Width	W	0.708 (+0.020, -0.019)
Hold - down Tape Width	WO	0.236 (+/- 0.012)
Hold - down Tape position	W1	0.035 (max)
Feed Hole Position	W2	0.360 (+/- 0.025)
Sprocket Hole Diameter	DO	0.157 (+0.008, -0.007)
Lead Spring Out	S	0.004 (max)

Note : All dimensions are in inches.



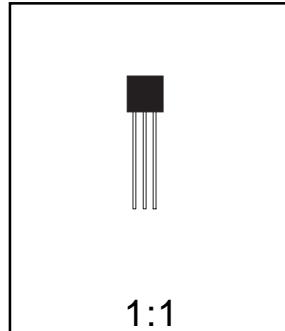
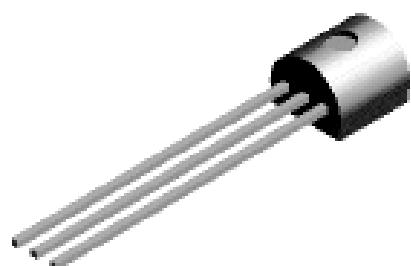
ITEM DESCRIPTION	SYMBOL	MINIMUM	MAXIMUM
Reel Diameter	D1	13.975	14.025
Arbor Hole Diameter (Standard)	D2	1.160	1.200
(Small Hole)	D2	0.650	0.700
Core Diameter	D3	3.100	3.300
Hub Recess Inner Diameter	D4	2.700	3.100
Hub Recess Depth	W1	0.370	0.570
Flange to Flange Inner Width	W2	1.630	1.690
Hub to Hub Center Width	W3		2.090

Note: All dimensions are inches

TO-92 Package Dimensions

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



1:1

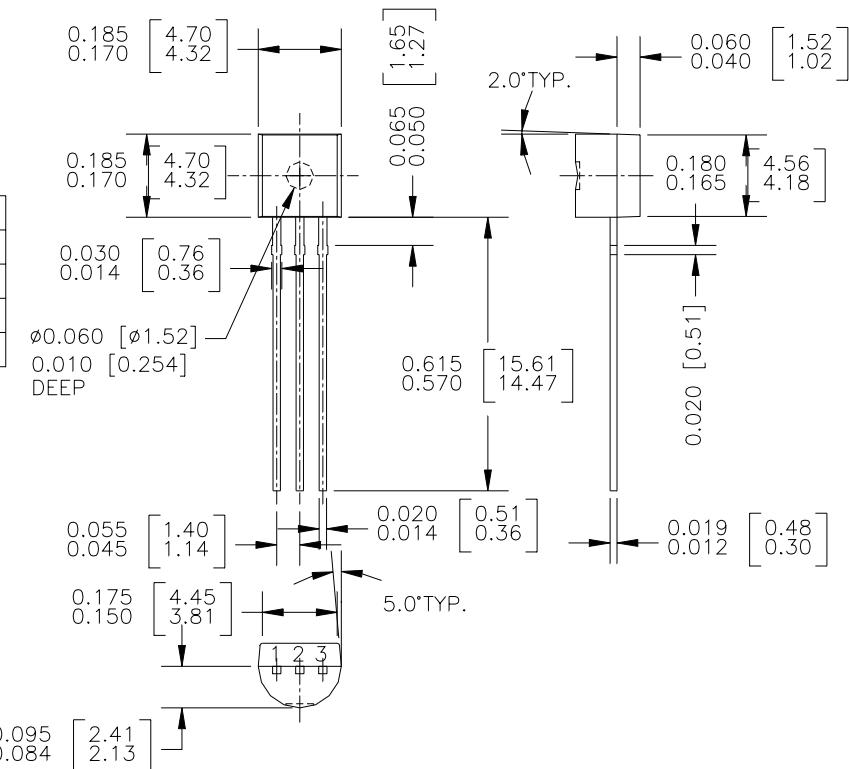
Scale 1:1 on letter size paper

Dimensions shown below are
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



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