

## TO-92 Plastic-Encapsulate Transistors

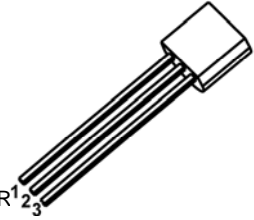
### 2N4402 TRANSISTOR (PNP)

#### FEATURES

- General Purpose Amplifier Transistor

#### TO - 92

1. EMITTER
2. BASE
3. COLLECTOR<sup>1</sup><sub>2</sub><sub>3</sub>



#### MAXIMUM RATINGS (T<sub>a</sub>=25°C unless otherwise noted)

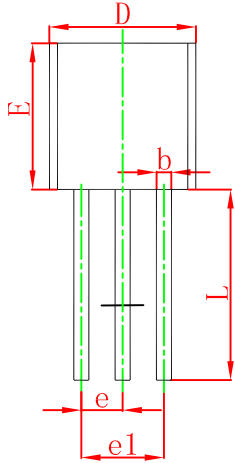
Symbol	Parameter	Value	Unit
V <sub>CBO</sub>	Collector-Base Voltage	-40	V
V <sub>CEO</sub>	Collector-Emitter Voltage	-40	V
V <sub>EBO</sub>	Emitter-Base Voltage	-5	V
I <sub>C</sub>	Collector Current	-0.6	A
P <sub>C</sub>	Collector Power Dissipation	625	mW
R <sub>θJA</sub>	Thermal Resistance From Junction To Ambient	200	°C/W
T <sub>j</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage Temperature	-55~+150	°C

#### ELECTRICAL CHARACTERISTICS (T<sub>a</sub>=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> = -0.1mA, I <sub>E</sub> =0	-40			V
Collector-emitter breakdown voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =-1mA, I <sub>B</sub> =0	-40			V
Emitter-base breakdown voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =-0.1mA, I <sub>C</sub> =0	-5			V
Collector cut-off current	I <sub>CBO</sub>	V <sub>CB</sub> =-40V, I <sub>E</sub> =0			-0.1	μA
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> =-4V, I <sub>C</sub> =0			-0.1	μA
DC current gain	h <sub>FE</sub> *	V <sub>CE</sub> =-1V, I <sub>C</sub> =-1mA	30			
		V <sub>CE</sub> =-1V, I <sub>C</sub> =-10mA	50			
		V <sub>CE</sub> =-2V, I <sub>C</sub> =-150mA	50		150	
		V <sub>CE</sub> =-2V, I <sub>C</sub> =-500mA	20			
Collector-emitter saturation voltage	V <sub>CE(sat)</sub> *	I <sub>C</sub> =-150mA, I <sub>B</sub> =-15mA			-0.4	V
		I <sub>C</sub> =-500mA, I <sub>B</sub> =-50mA			-0.75	V
Base-emitter saturation voltage	V <sub>BE(sat)</sub> *	I <sub>C</sub> =-150mA, I <sub>B</sub> =-15mA	-0.75		-0.95	V
		I <sub>C</sub> =-500mA, I <sub>B</sub> =-50mA			-1.3	V
Collector output capacitance	C <sub>ob</sub>	V <sub>CB</sub> =-10V, I <sub>E</sub> =0, f=1MHz			8.5	pF
Emitter input capacitance	C <sub>ib</sub>	V <sub>EB</sub> =-0.5V, I <sub>C</sub> =0, f=1MHz			30	pF
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =-10V, I <sub>C</sub> =-20mA, f=100MHz	150			MHz

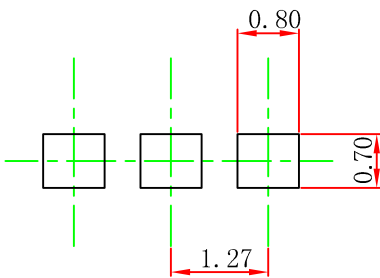
\*Pulse test: pulse width ≤300μs, duty cycles ≤ 2.0%.

## TO-92 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015

## TO-92 Suggested Pad Layout



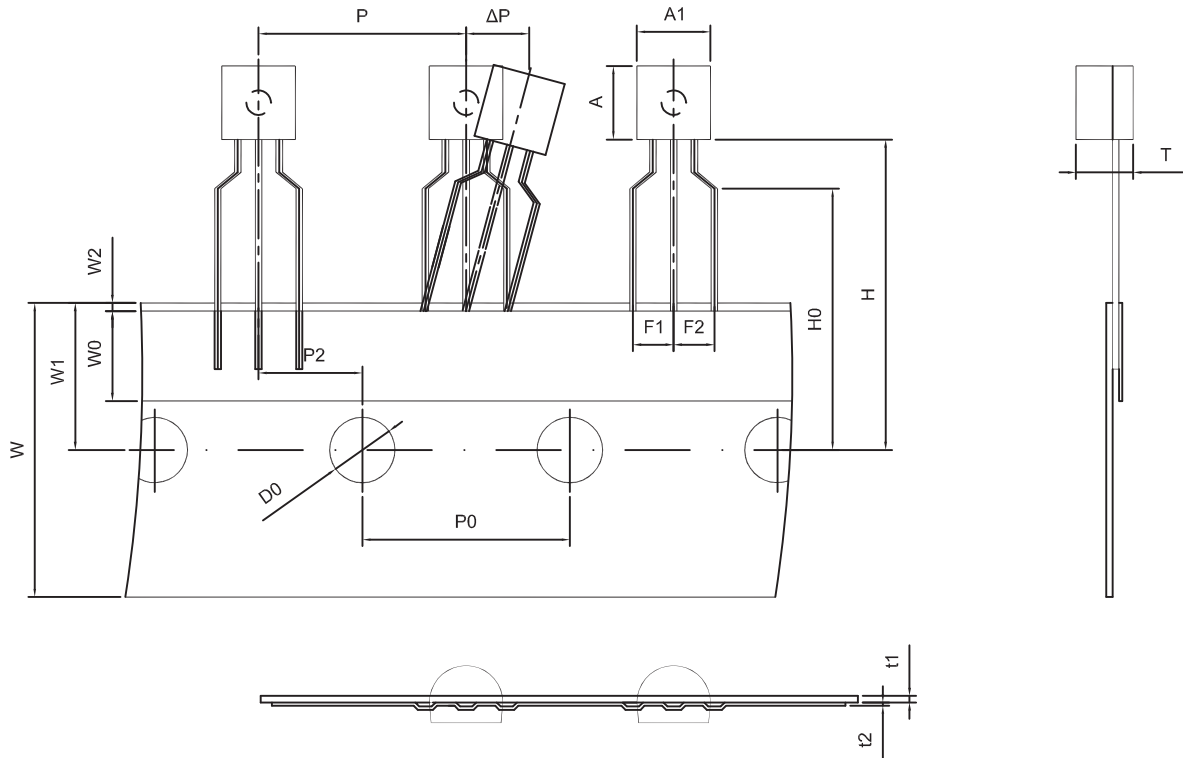
### Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

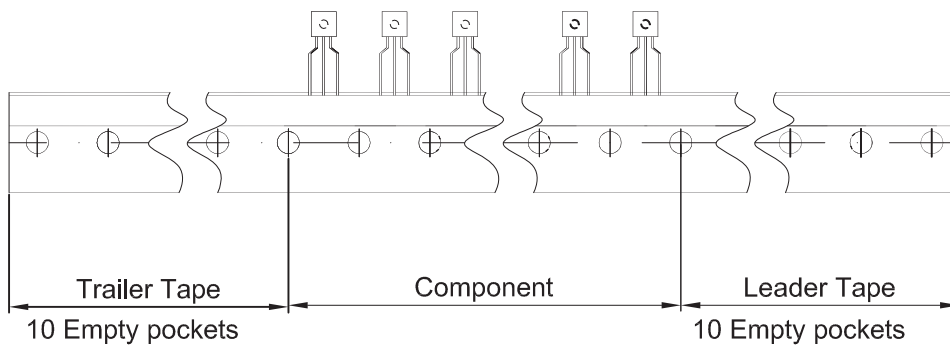
### NOTICE

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TO-92 PACKAGE TAPEING DIMENSION



Dimiensions are in millimeter								
A1	A	T	P	P0	P2	F1	F2	W
4.5	4.5	3.5	12.7	12.7	6.35	2.5	2.5	18.0
W0	W1	W2	H	H0	D0	t1	t2	ΔP
6.0	9.0	1.0 MAX.	19.0	16.0	4.0	0.4	0.2	0



Package	Box	Box Size(mm)	Carton	Carton Size(mm)
TO-92	2000 pcs	333×162×43	20,000 pcs	350×340×250