

TO-92 Plastic-Encapsulate Transistors

2N4402 TRANSISTOR (PNP)

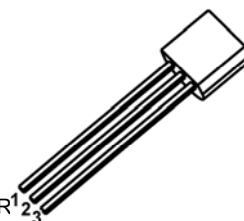
FEATURES

- General Purpose Amplifier Transistor

TO - 92

1. EMITTER

2. BASE

3. COLLECTOR¹₂₃


MAXIMUM RATINGS (T_a=25°C unless otherwise noted)

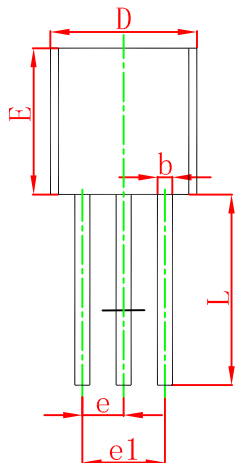
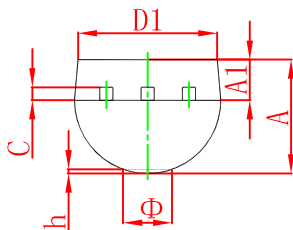
Symbol	Parameter	Value	Unit
V _{CBO}	Collector-Base Voltage	-40	V
V _{CEO}	Collector-Emitter Voltage	-40	V
V _{EBO}	Emitter-Base Voltage	-5	V
I _C	Collector Current	-0.6	A
P _C	Collector Power Dissipation	625	mW
R _{θJA}	Thermal Resistance From Junction To Ambient	200	°C/W
T _j	Junction Temperature	150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

ELECTRICAL CHARACTERISTICS (T_a=25°C unless otherwise specified)

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

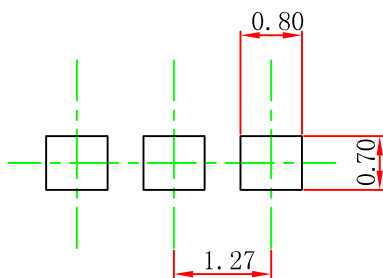
*Pulse test: pulse width ≤300μs, duty cycles 2.0%.

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



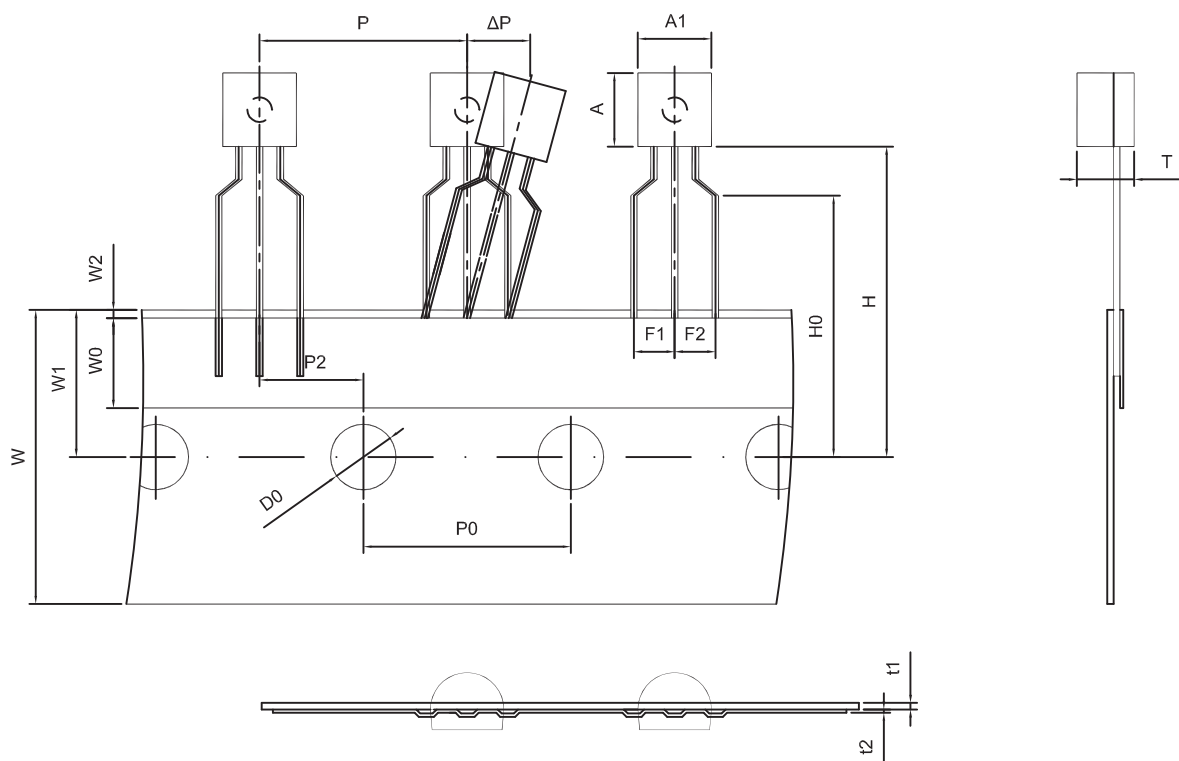
Note:

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

NOTICE

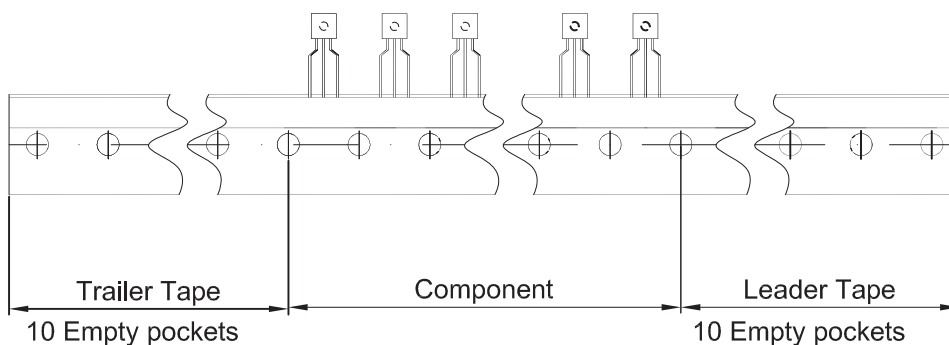
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TO-92 PACKAGE TAPEING DIMENSION



Dimiensions are in millimeter

A1	A	T	P	P0	P2	F1	F2	W
4.5±0.2	4.5±0.2	3.5±0.2	12.7±0.3	12.7±0.2	6.35±0.3	2.5±0.3	2.5±0.3	18.0+1.0/-0.5
W0	W1	W2	H	H0	D0	t1	t2	ΔP
6.0±0.5	9.0±0.5	1.0 MAX.	19.0±1.0	16.0±0.5	4.0±0.2	0.4±0.05	0.2±0.05	0 ± 1.0



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