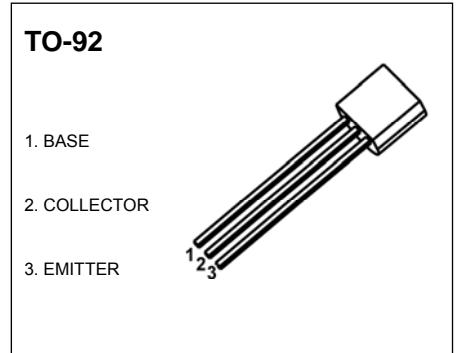


## TO-92 Plastic-Encapsulate Transistors

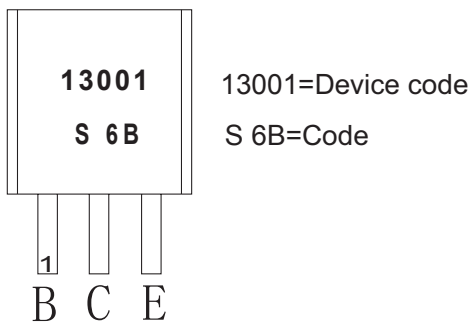
### 3DD13001B TRANSISTOR (NPN)

#### FEATURE

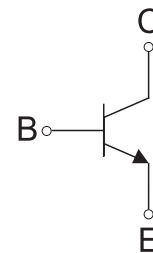
- power switching applications



#### MARKING



#### Equivalent Circuit



#### ORDERING INFORMATION

Part Number	Package	Packing Method	Pack Quantity
3DD13001B	TO-92	Bulk	1000pcs/Bag
3DD13001B-TA	TO-92	Tape	2000pcs/Box

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

Symbol	Parameter	Value	Unit
V <sub>CB0</sub>	Collector -Base Voltage	600	V
V <sub>CE0</sub>	Collector-Emitter Voltage	400	V
V <sub>EB0</sub>	Emitter-Base Voltage	7	V
I <sub>c</sub>	Collector Current -Continuous	0.2	A
P <sub>c</sub>	Collector Power Dissipation	0.75	W
T <sub>J</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage Temperature	-55 ~150	°C

## ELECTRICAL CHARACTERISTICS

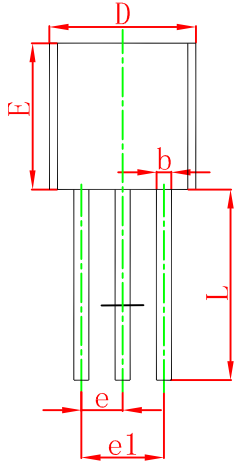
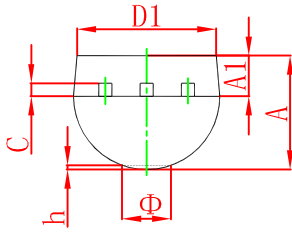
$T_a=25^\circ\text{C}$  unless otherwise specified

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=100\mu\text{A}$ , $I_E=0$	600			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=1\text{mA}$ , $I_B=0$	400			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=100\mu\text{A}$ , $I_C=0$	7			V
Collector cut-off current	$I_{CBO}$	$V_{CB}=600\text{V}$ , $I_E=0$			100	$\mu\text{A}$
Collector cut-off current	$I_{CEO}$	$V_{CE}=400\text{V}$ , $I_B=0$			200	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB}=7\text{V}$ , $I_C=0$			100	$\mu\text{A}$
DC current gain	$h_{FE(1)}$	$V_{CE}=20\text{V}$ , $I_C=20\text{mA}$	14		29	
	$h_{FE(2)}$	$V_{CE}=10\text{V}$ , $I_C=0.25\text{mA}$	5			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=50\text{mA}$ , $I_B=10\text{mA}$			0.5	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=50\text{mA}$ , $I_B=10\text{mA}$			1.2	V
Transition frequency	$f_T$	$V_{CE}=20\text{V}$ , $I_C=20\text{mA}$ $f=1\text{MHz}$	8			MHz
Fall time	$t_f$	$I_C=50\text{mA}$ , $I_{B1}=-I_{B2}=5\text{mA}$ , $V_{CC}=45\text{V}$			0.3	$\mu\text{s}$
Storage time	$t_s$				1.5	$\mu\text{s}$

### CLASSIFICATION OF $h_{FE(1)}$

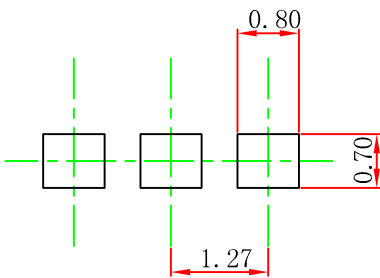
Range	14-17	17-20	20-23	23-26	26-29

## 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



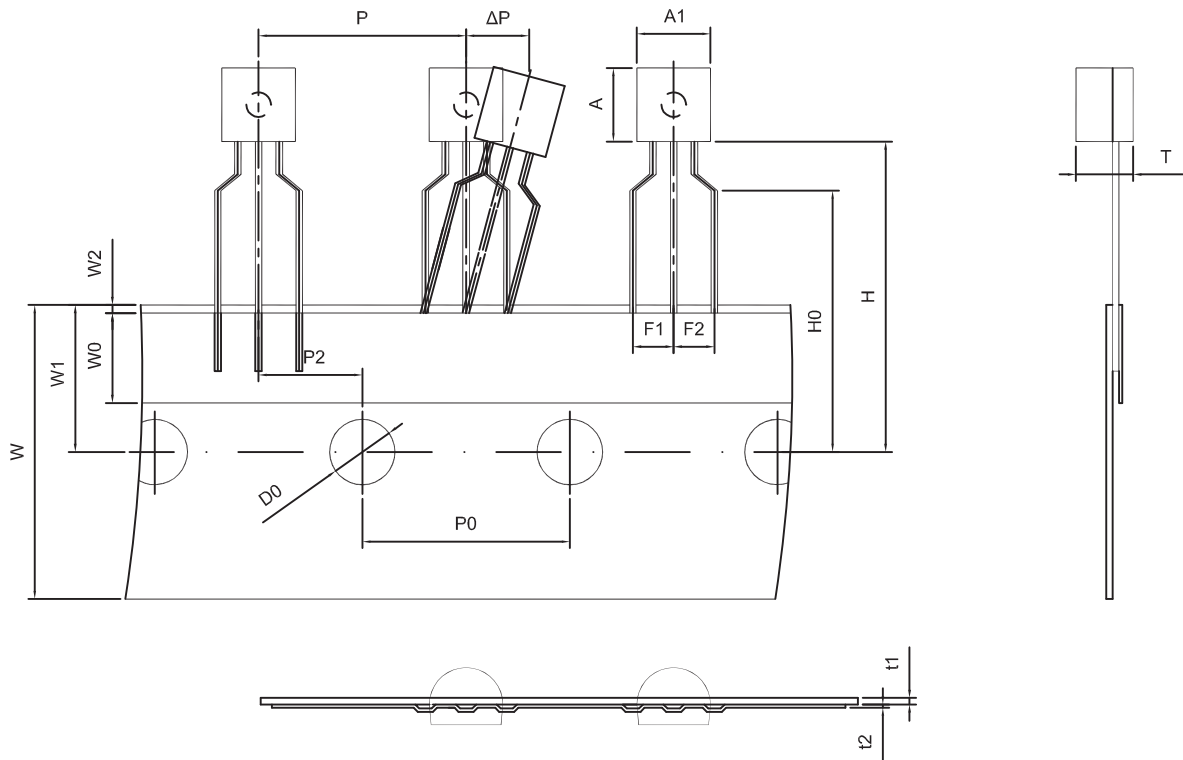
### Note:

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

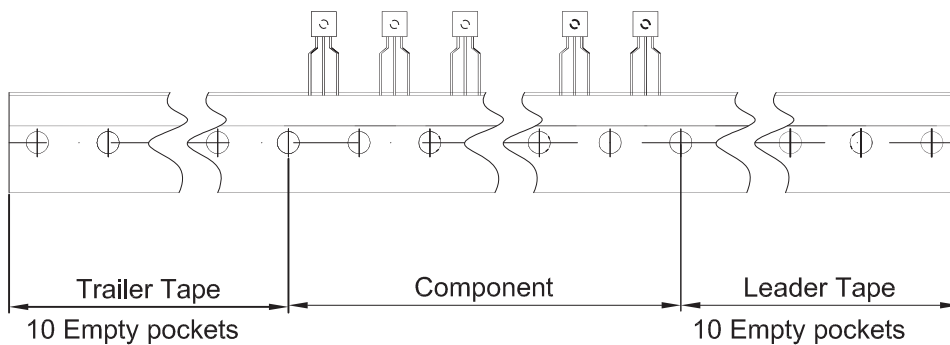
### NOTICE

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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