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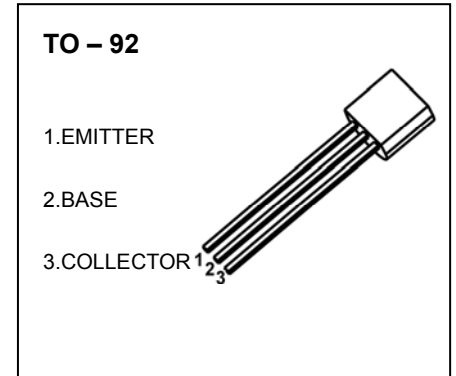
**EN:** This Datasheet is presented by the manufacturer.

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**TO-92 Plastic-Encapsulate Transistors**

**FEATURES**

- High Current Gain Bandwidth Product



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

Symbol	Parameter	Value	Unit
V <sub>CBO</sub>	Collector-Base Voltage	25	V
V <sub>CEO</sub>	Collector-Emitter Voltage	18	V
V <sub>EBO</sub>	Emitter-Base Voltage	4	V
I <sub>C</sub>	Collector Current -Continuous	50	mA
P <sub>C</sub>	Collector Power Dissipation	0.4	W
R <sub>θJA</sub>	Thermal Resistance From Junction To Ambient	312.5	°C/W
T <sub>j</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage Temperature	-55~+150	°C

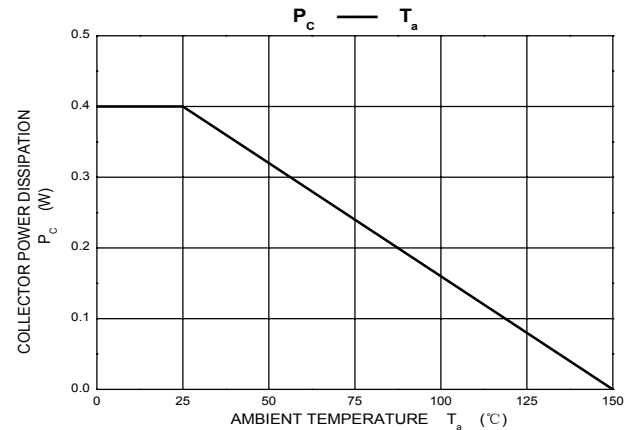
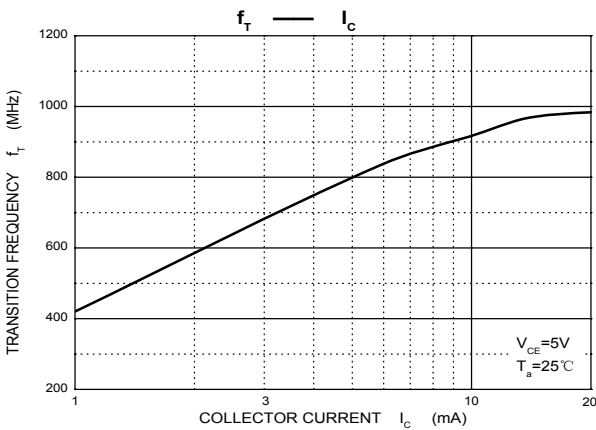
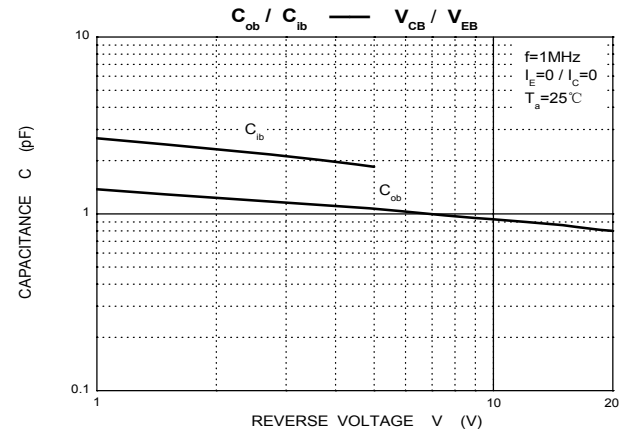
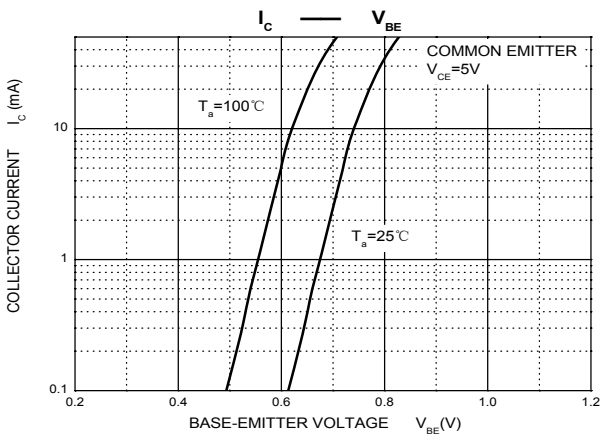
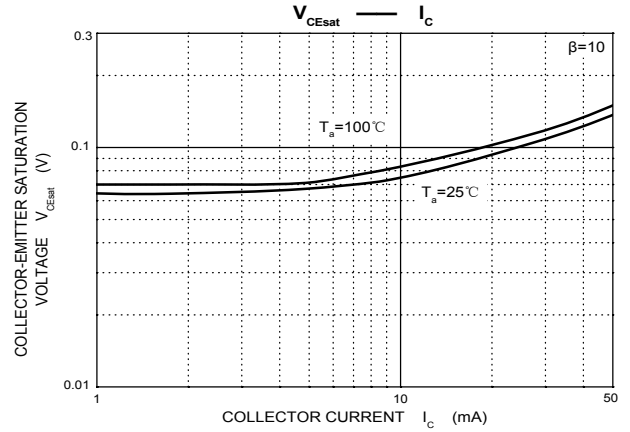
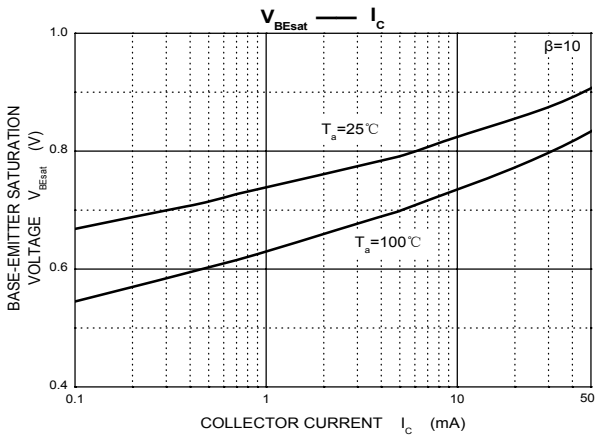
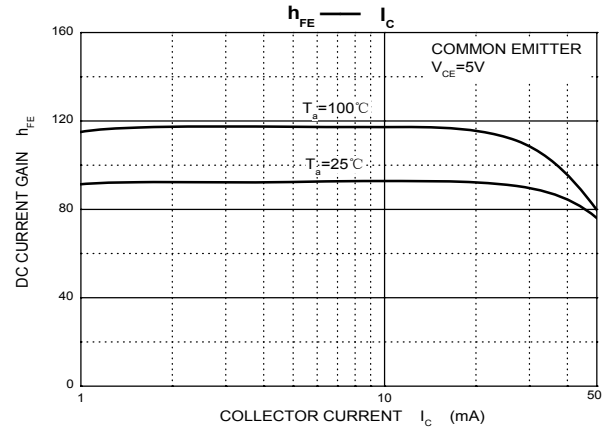
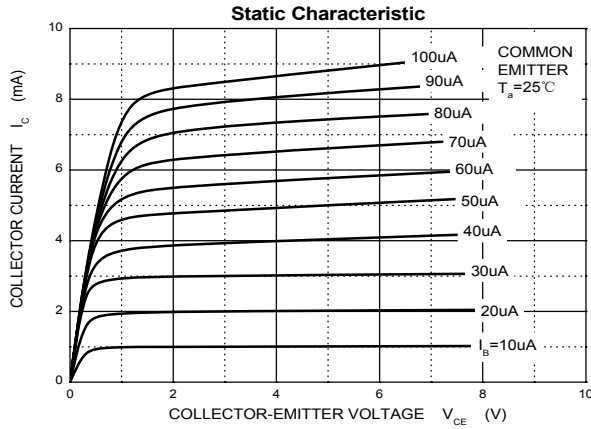
**ELECTRICAL CHARACTERISTICS (T<sub>a</sub>=25°C unless otherwise specified)**

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =100μA, I <sub>E</sub> =0	25			V
Collector-emitter breakdown voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =0.1mA, I <sub>B</sub> =0	18			V
Emitter-base breakdown voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =100μA, I <sub>C</sub> =0	4			V
Collector cut-off current	I <sub>CBO</sub>	V <sub>CB</sub> =20V, I <sub>E</sub> =0			0.1	nA
Collector cut-off current	I <sub>CEO</sub>	V <sub>CE</sub> =15V, I <sub>B</sub> =0			0.1	μA
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> =3V, I <sub>C</sub> =0			0.1	μA
DC current gain	h <sub>FE</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =1mA	28		270	
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =1mA			0.5	V
Base-emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =1mA			1.42	V
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =50mA, f=400MHz		800		MHz

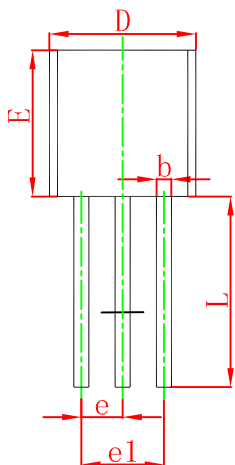
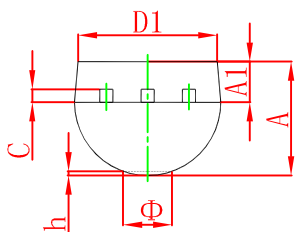
**CLASSIFICATION OF h<sub>FE</sub>**

RANK	D	E	F	G	H	I	J
RANGE	28-45	39-60	54-80	72-108	97-146	132-198	180-270

# Typical Characteristics

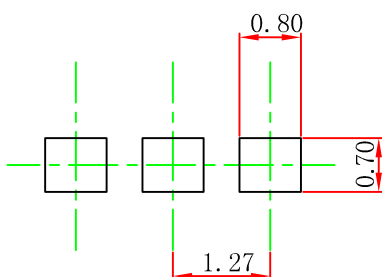


## TO-92 Package Outline Dimensions



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

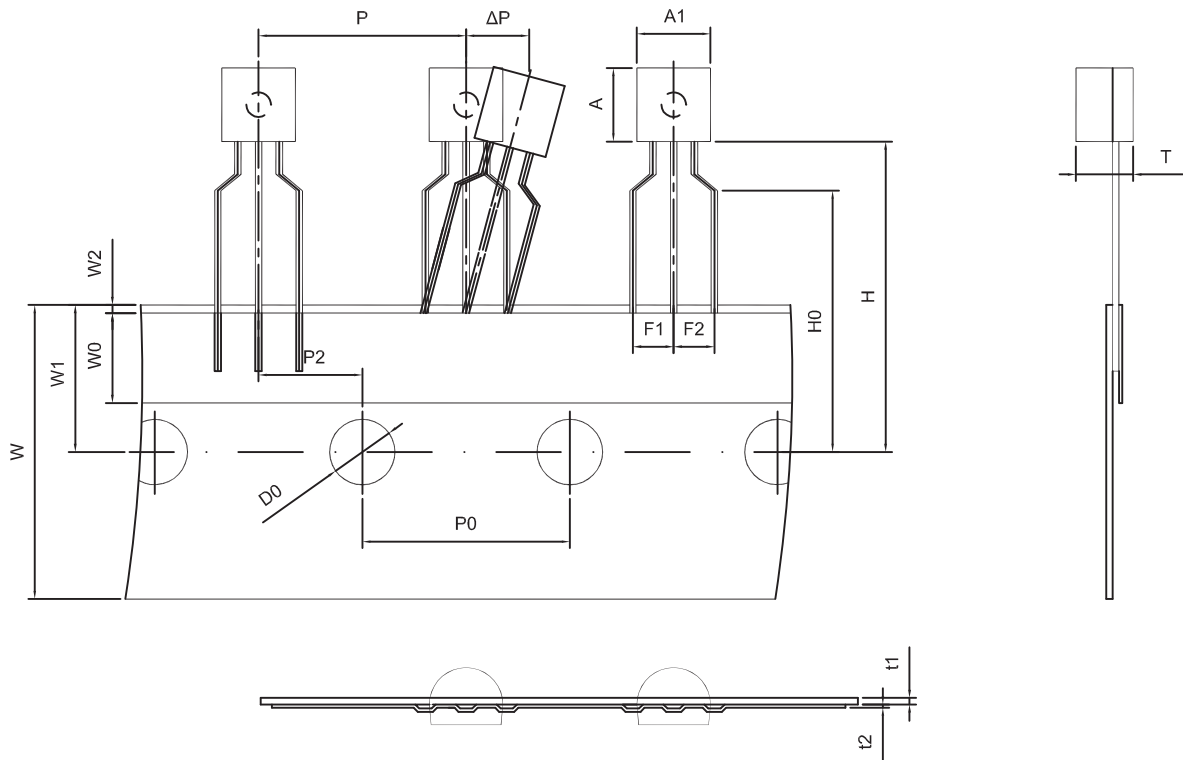
## TO-92 Suggested Pad Layout



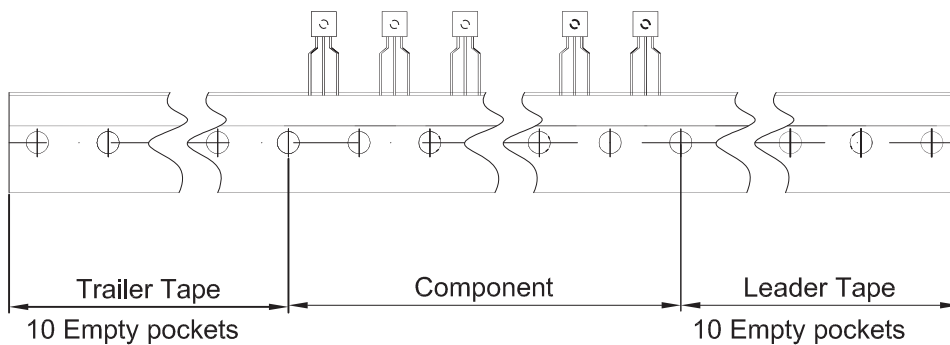
### Note:

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

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