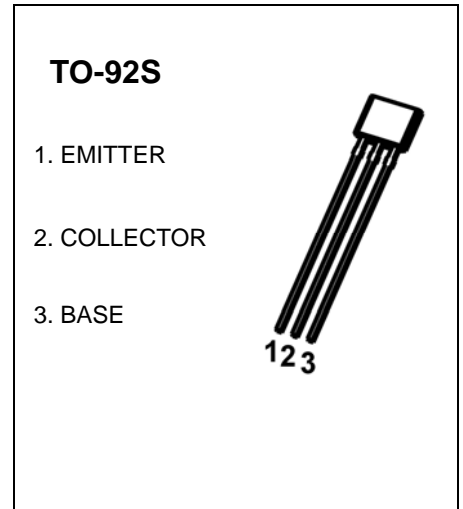


## TO-92S Plastic-Encapsulate Transistors

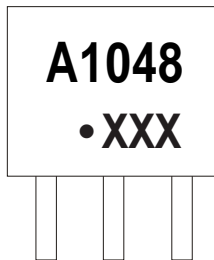
### 2SA1048 TRANSISTOR (PNP)

#### FEATURES

- High voltage
- High  $h_{FE}$
- Low noise
- Complementary to 2SC2458

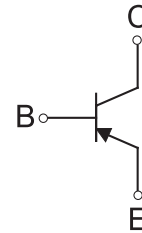


#### MARKING



A1048=Device code  
Solid dot= Green molding compound device,  
if none, the normal device  
XXX=Code

#### Equivalent Circuit



#### ORDERING INFORMATION

Part Number	Package	Packing Method	Pack Quantity
2SA1048	TO-92S	Bulk	1000pcs/Bag
2SA1048-TA	TO-92S	Tape	3000pcs/Box

#### MAXIMUM RATINGS ( $T_a=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector- Base Voltage	-50	V
$V_{CEO}$	Collector-Emitter Voltage	-50	V
$V_{EBO}$	Emitter-Base Voltage	-5	V
$I_c$	Collector Current -Continuous	-0.15	A
$P_C$	Collector Power Dissipation	0.2	W
$T_J, T_{stg}$	Operation Junction and Storage Temperature Range	-55-150	$^{\circ}\text{C}$

## ELECTRICAL CHARACTERISTICS

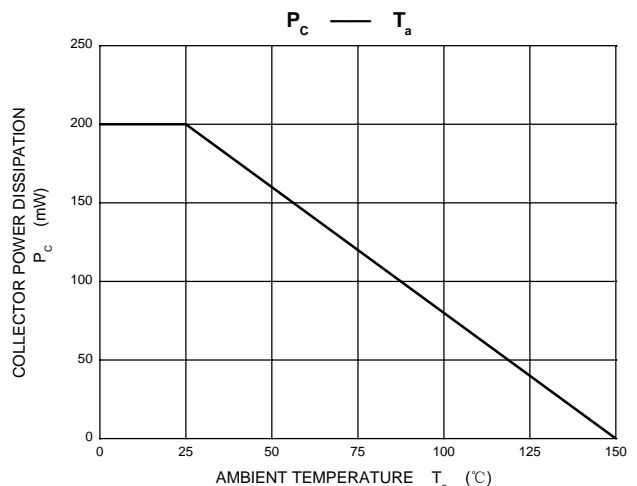
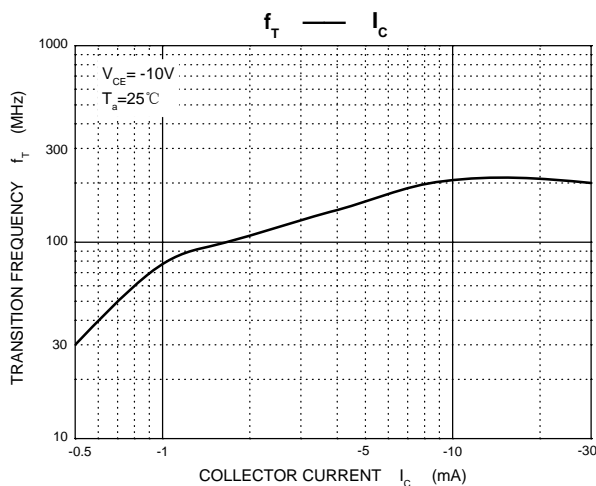
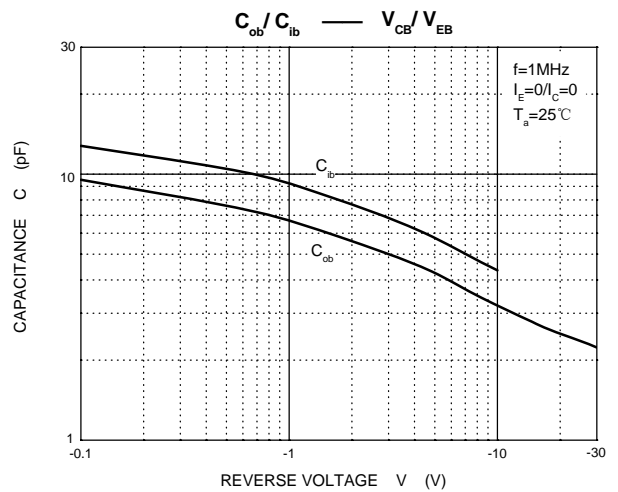
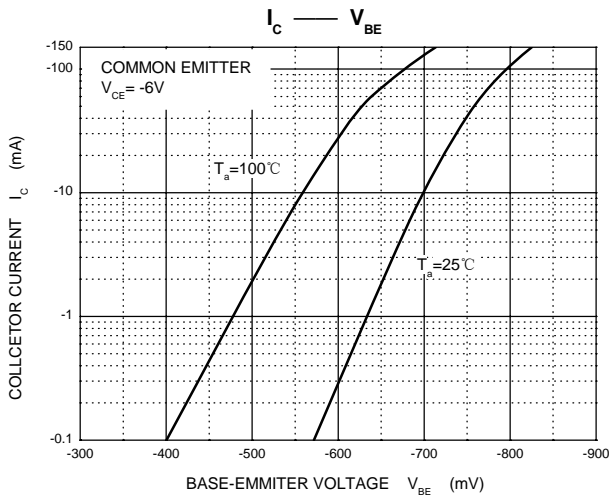
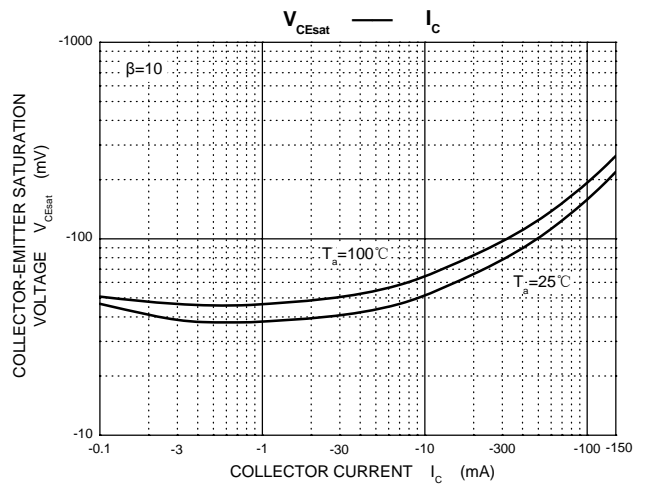
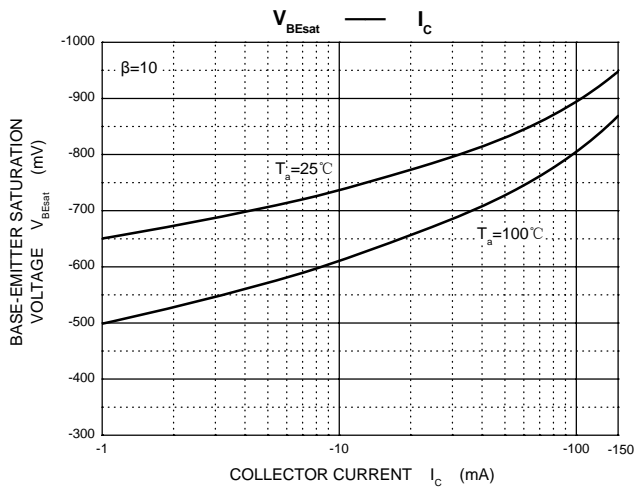
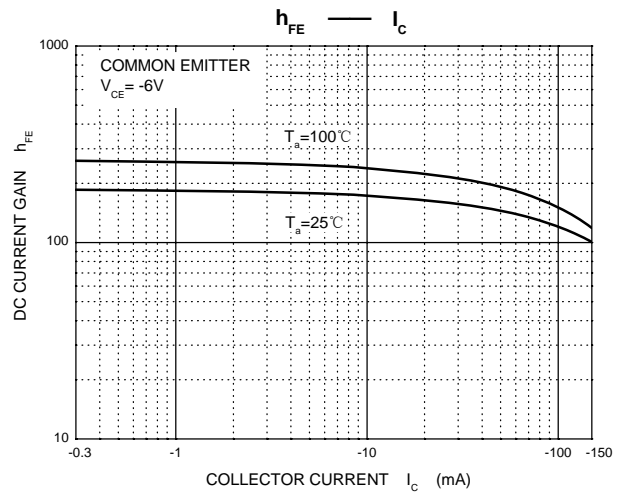
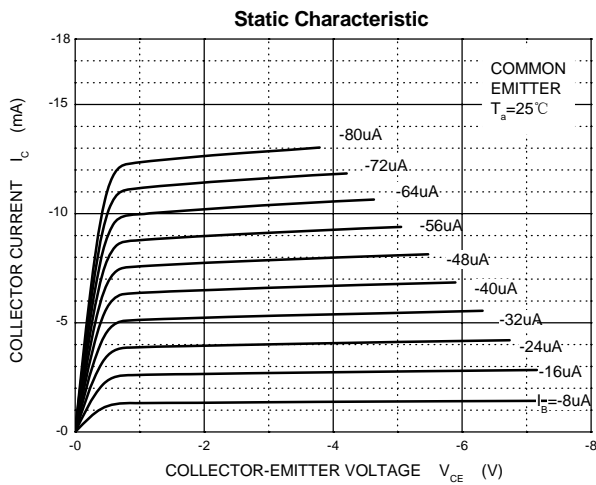
$T_a=25^\circ\text{C}$  unless otherwise specified

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=-100\ \mu\text{A}$ , $I_E=0$	-50			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=-1\text{mA}$ , $I_B=0$	-50			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=-100\ \mu\text{A}$ , $I_C=0$	-5			V
Collector cut-off current	$I_{CBO}$	$V_{CB}=-50\ \text{V}$ , $I_E=0$			-0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB}=-5\ \text{V}$ , $I_C=0$			-0.1	$\mu\text{A}$
DC current gain	$h_{FE}$	$V_{CE}=-6\ \text{V}$ , $I_C=-2\text{mA}$	70		400	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=-100\text{mA}$ , $I_B=-10\text{mA}$			-0.3	V
Transition frequency	$f_T$	$V_{CE}=-10\ \text{V}$ , $I_C=-1\text{mA}$	80			MHz
Collector output capacitance	$C_{ob}$	$V_{CB}=-10\ \text{V}$ , $I_E=0$ , $f=1\ \text{MHz}$			7	pF
Noise figure	NF	$V_{CE}=-6\ \text{V}$ , $I_C=-0.1\ \text{mA}$ , $f=1\ \text{KHz}$ , $R_g=10\ \text{K}\Omega$			10	dB

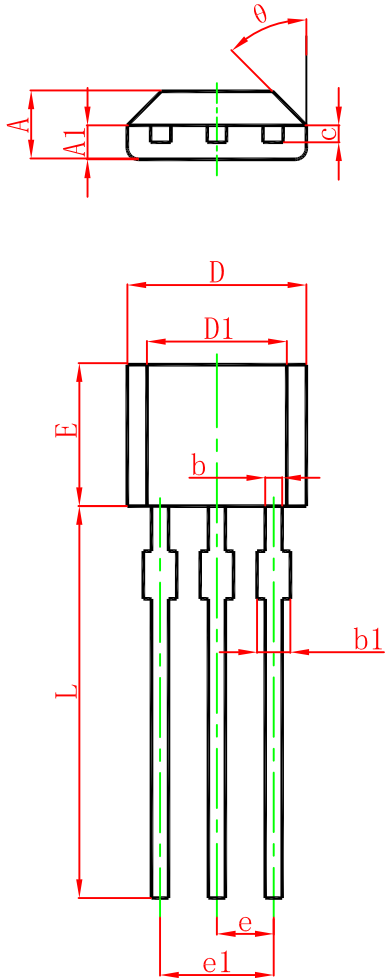
### CLASSIFICATION OF $h_{FE}$

Rank	O	Y	GR
Range	70-140	120-240	200-400

# Typical Characteristics

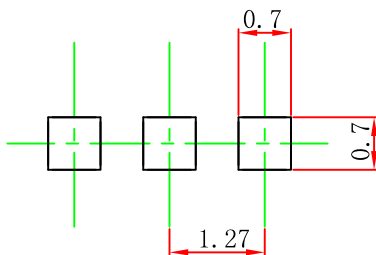


## TO-92S Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.420	1.620	0.056	0.064
A1	0.660	0.860	0.026	0.034
b	0.330	0.480	0.013	0.019
b1	0.400	0.510	0.016	0.020
c	0.330	0.510	0.013	0.020
D	3.900	4.100	0.154	0.161
D1	2.280	2.680	0.090	0.106
E	3.050	3.250	0.120	0.128
e	1.270 TYP.		0.050 TYP.	
e1	2.440	2.640	0.096	0.104
L	15.100	15.500	0.594	0.610
$\theta$	45° TYP.		45° TYP.	

## TO-92S Suggested Pad Layout



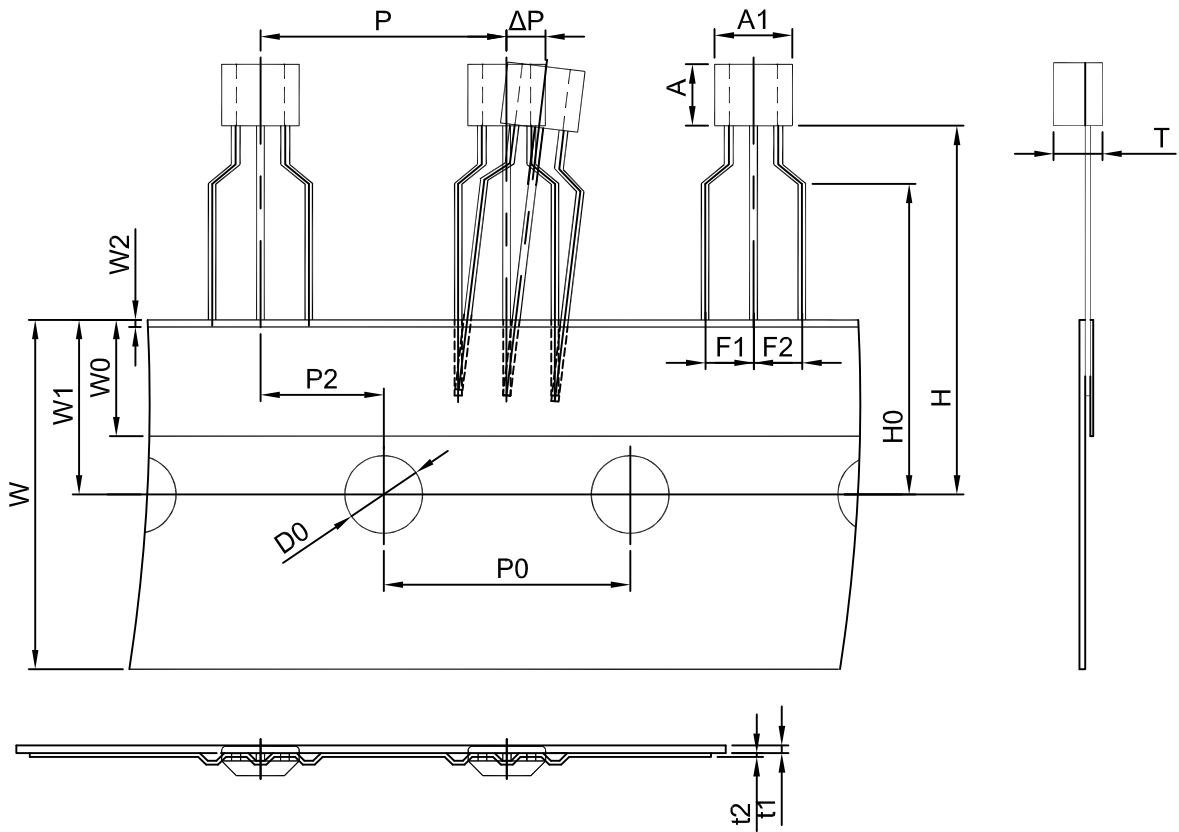
**Note:**

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

**NOTICE**

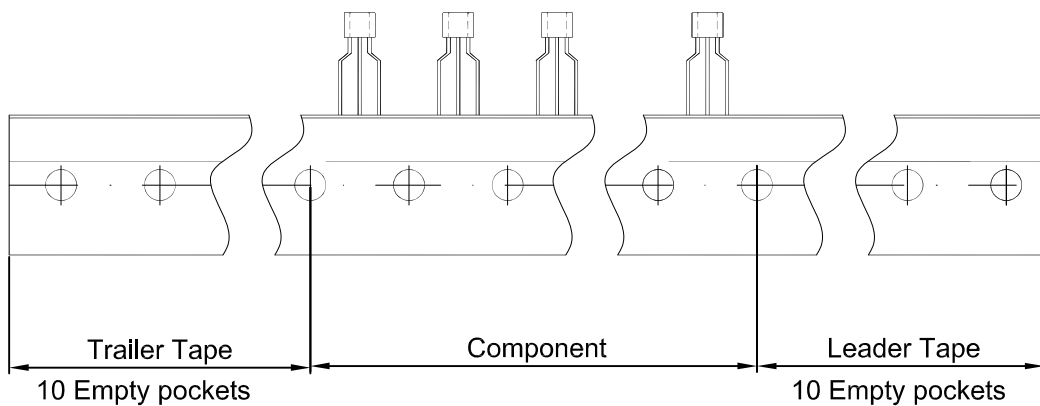
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# TO-92S PACKAGE TAPING DIMENSION



Dimensions are in millimeter

A1	A	T	P	P0	P2	F1	F2	W
4.0	3.15	1.52	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	19.0	16.0	4.0	0.4	0.2	0



Package	Box	Box Size (mm)	Carton	Carton Size (mm)
TO-92S	3,000 pcs	330×184×40	30,000 pcs	505×405×240