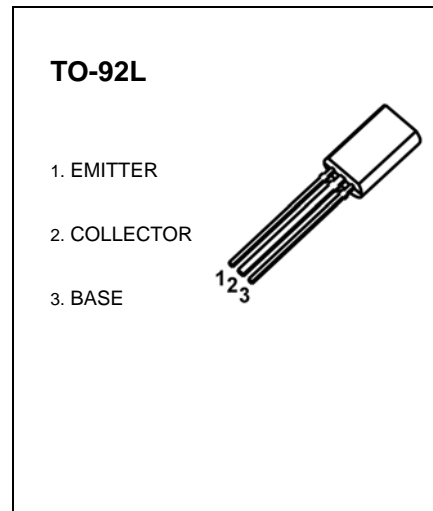


TO-92L Plastic-Encapsulate Transistors

2SA1013 TRANSISTOR (PNP)

FEATURE

- High Voltage: $V_{CEO} = -160V$
- Large Continuous Collector Current Capability
- Complementary to 2SC2383

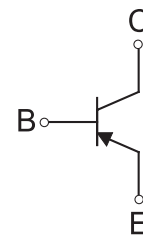


MARKING



A1013=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
2SA1013	TO-92L	Bulk	500pcs/Bag
2SA1013-TA	TO-92L	Tape	2000pcs/Box

MAXIMUM RATINGS ($T_a = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	-160	V
V_{CEO}	Collector-Emitter Voltage	-160	V
V_{EBO}	Emitter-Base Voltage	-6	V
I_C	Collector Current -Continuous	-1	A
P_C	Collector Power Dissipation	0.9	W
T_j	Junction Temperature	150	$^\circ C$
T_{stg}	Storage Temperature	-55 to +150	$^\circ C$

ELECTRICAL CHARACTERISTICS

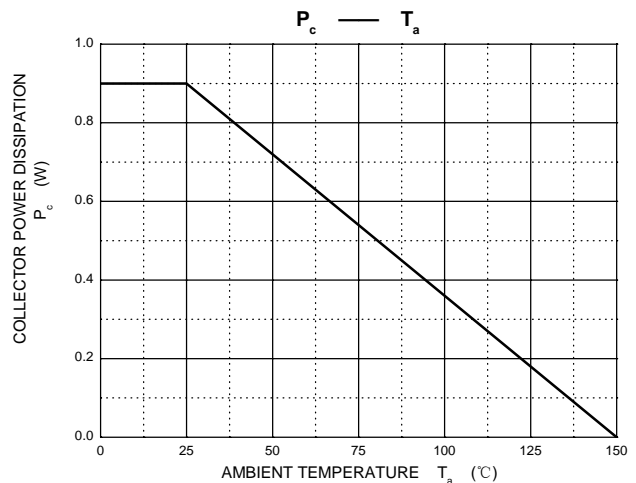
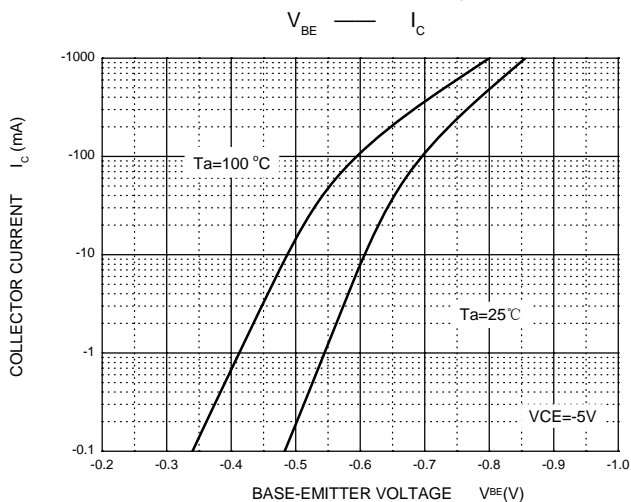
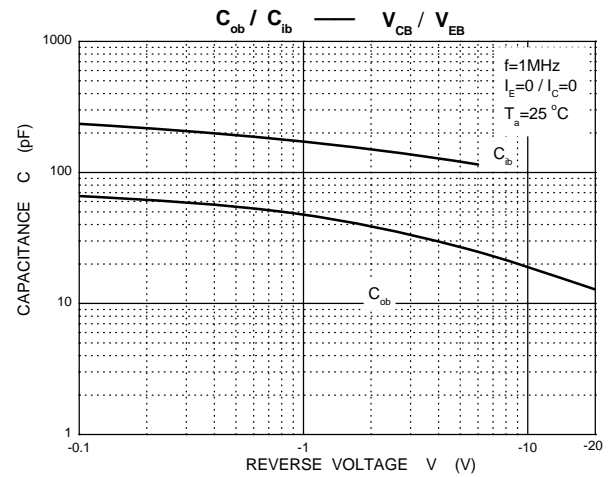
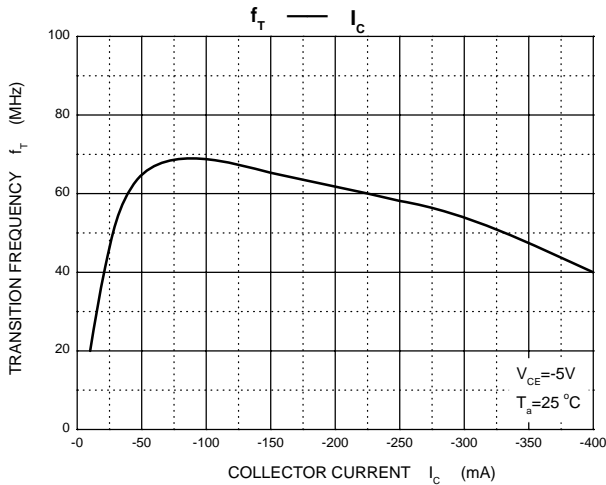
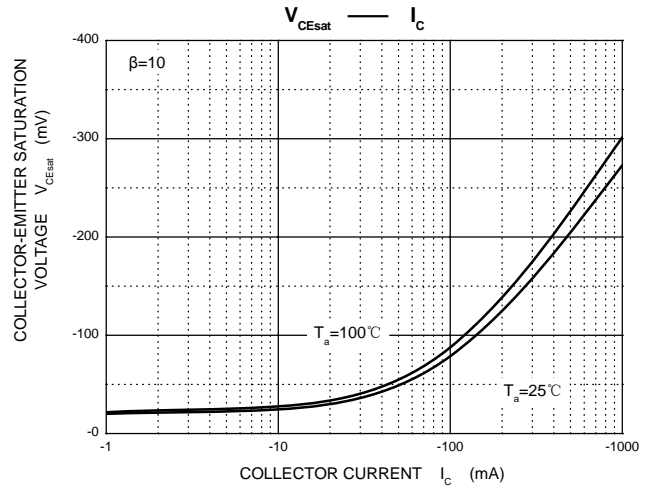
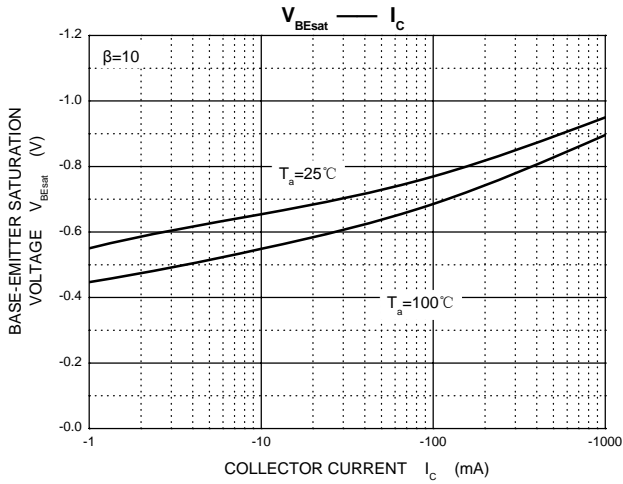
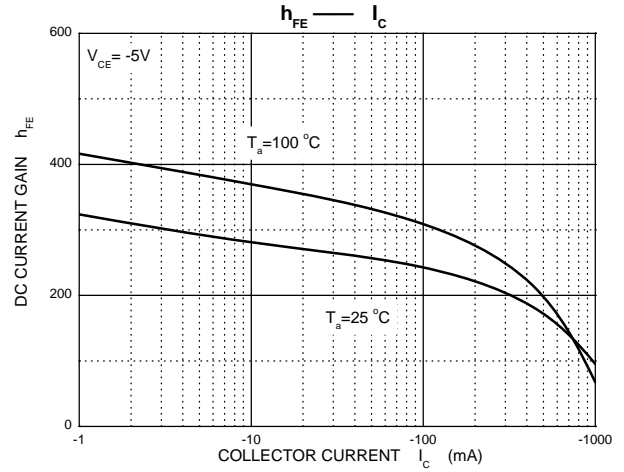
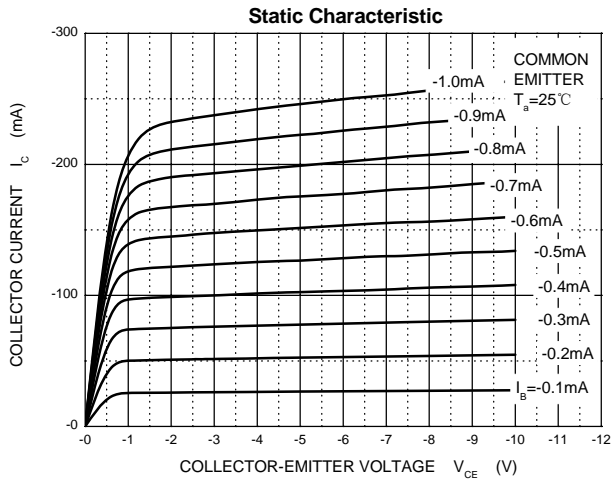
$T_a=25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=-100\mu\text{A}$, $I_E=0$	-160		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=-1\text{mA}$, $I_B=0$	-160		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=-10\mu\text{A}$, $I_C=0$	-6		V
Collector cut-off current	I_{CBO}	$V_{CB}=-150\text{V}$, $I_E=0$		-1	μA
Emitter cut-off current	I_{EBO}	$V_{EB}=-6\text{V}$, $I_C=0$		-1	μA
DC current gain	h_{FE}	$V_{CE}=-5\text{V}$, $I_C=-200\text{mA}$	60	320	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=-500\text{mA}$, $I_B=-50\text{mA}$		-1.5	V
Base-emitter voltage	V_{BE}	$I_C=-5\text{mA}$, $V_{CE}=-5\text{V}$		-0.75	V
Transition frequency	f_T	$V_{CE}=-5\text{V}$, $I_C=-200\text{mA}$	15		MHz
Collector Output capacitance	C_{ob}	$V_{CB}=-10\text{V}$, $I_E=0$, $f=1\text{MHz}$		35	pF

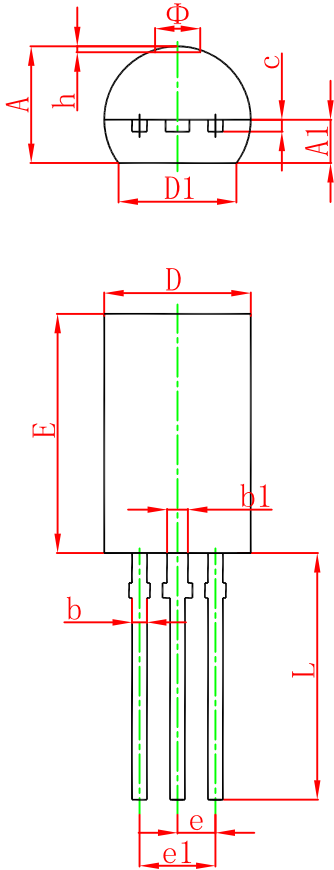
CLASSIFICATION OF h_{FE}

Rank	R	O	Y
Range	60-120	100-200	160-320

Typical Characteristics

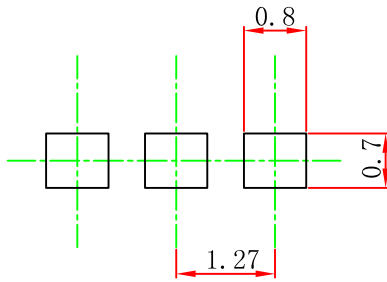


TO-92L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	3.750	4.050	0.148	0.159
A1	1.280	1.580	0.050	0.062
b	0.380	0.550	0.015	0.022
b1	0.620	0.780	0.024	0.031
c	0.350	0.450	0.014	0.018
D	4.750	5.050	0.187	0.199
D1	4.000		0.157	
E	7.850	8.150	0.309	0.321
e	1.270 TYP.		0.050 TYP.	
e1	2.440	2.640	0.096	0.104
L	13.800	14.200	0.543	0.559
Φ		1.600		0.063
h	0.000	0.300	0.000	0.012

TO-92L Suggested Pad Layout



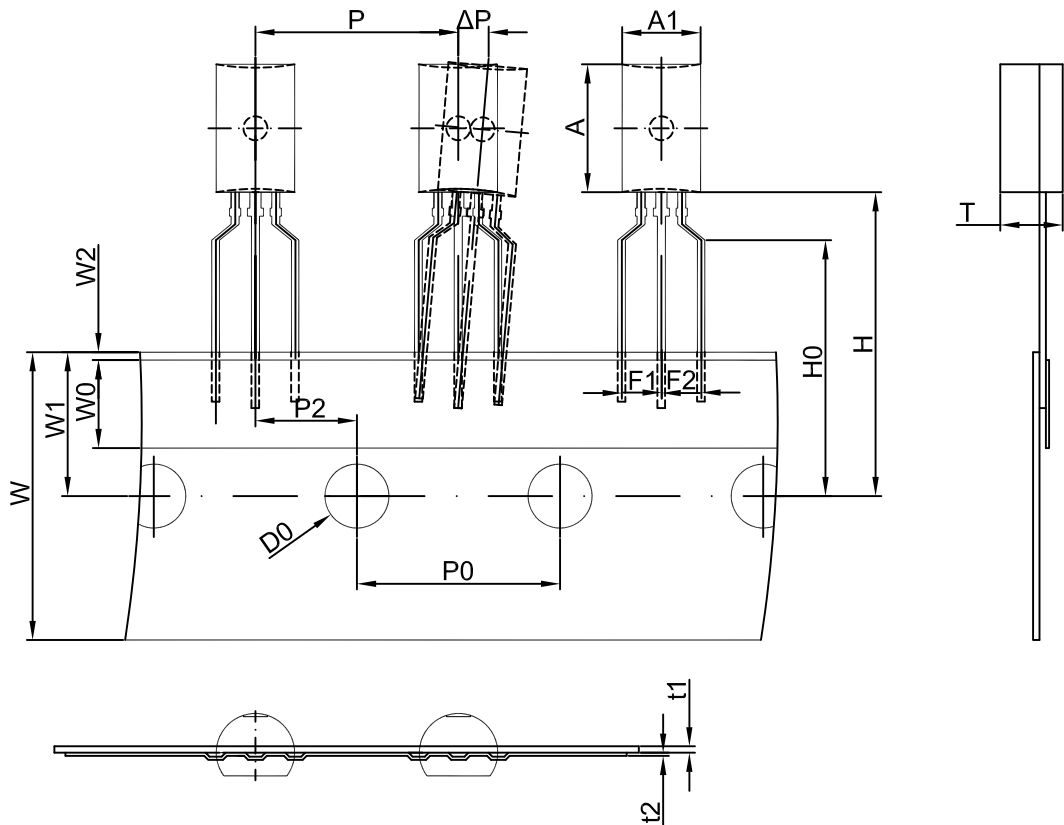
Note:

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

NOTICE

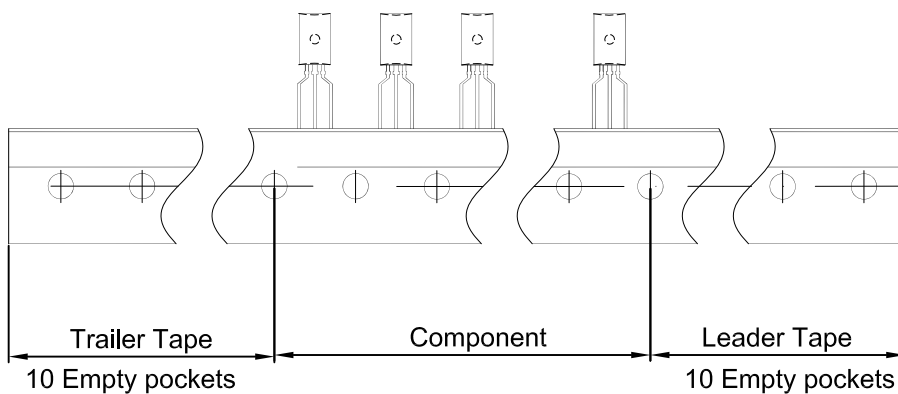
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TO-92L PACKAGE TAPING DIMENSION



Dimensions are in millimeter

A1	A	T	P	P0	P2	F1	F2	W
4.9	8.0	3.9	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-92L	2000 pcs	333×203×42	20,000 pcs	493×400×264