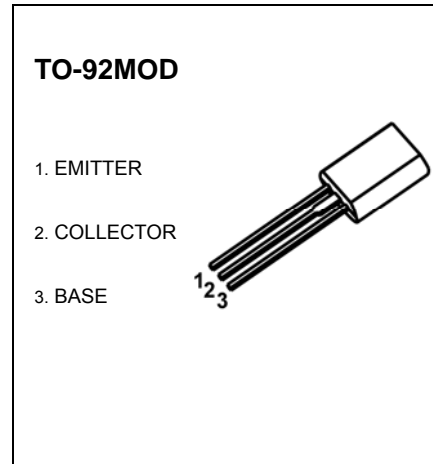


TO-92MOD Plastic-Encapsulate Transistors

2SA1013 TRANSISTOR (PNP)

FEATURE

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

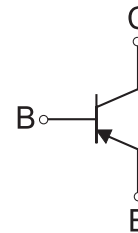


MARKING



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-92MOD	Bulk	500pcs/Bag
2SA1013-TA	TO-92MOD	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

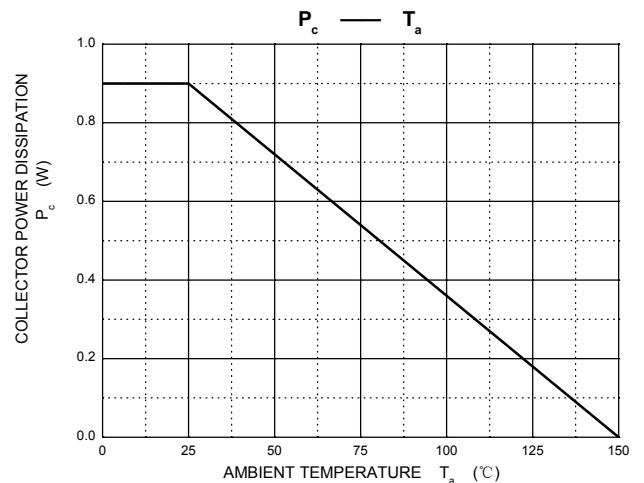
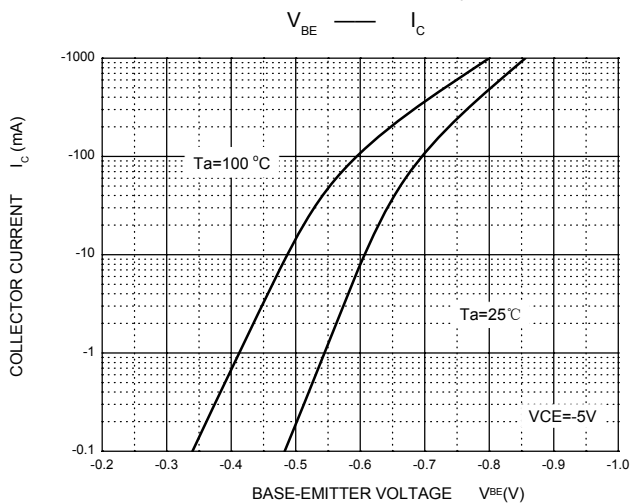
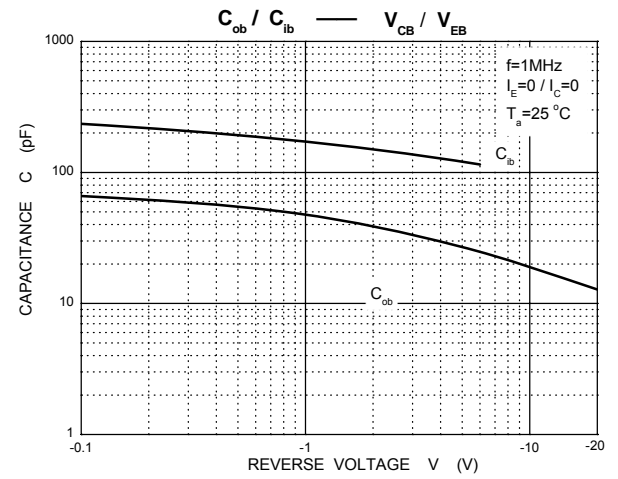
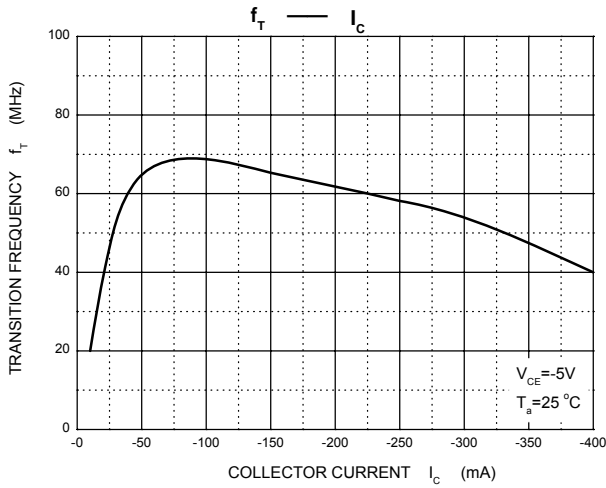
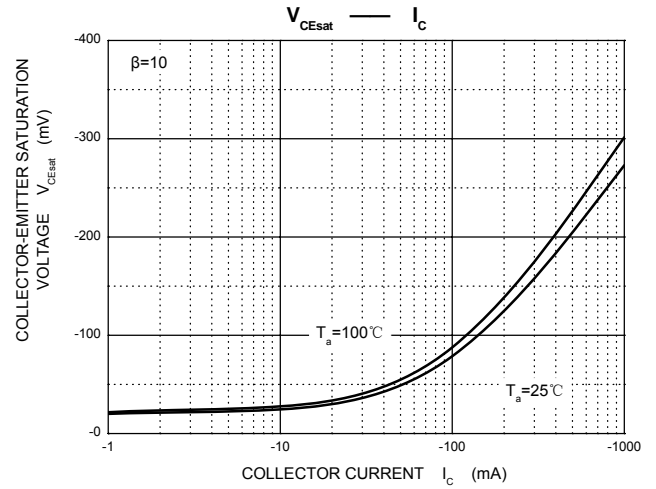
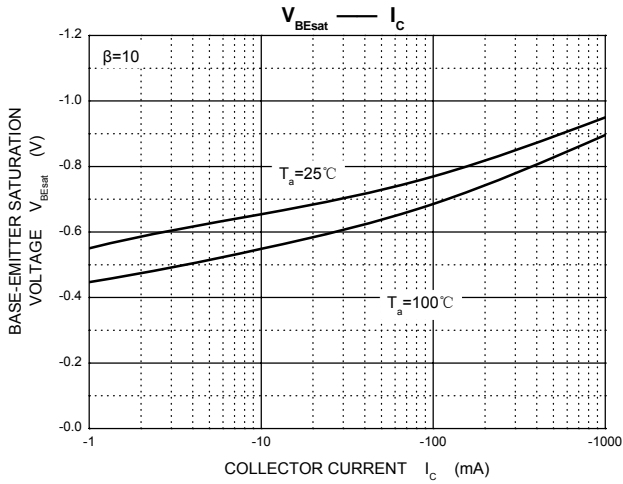
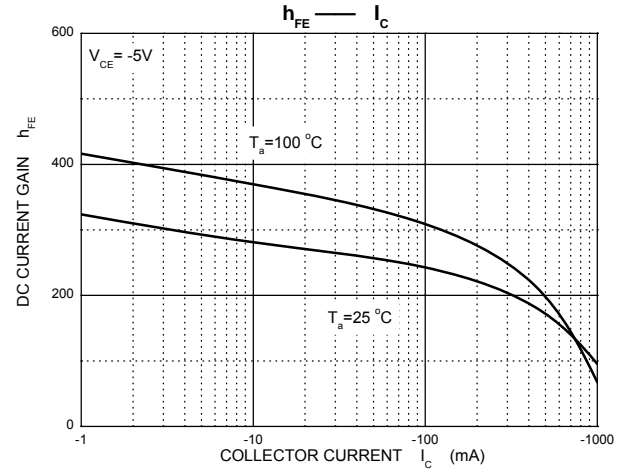
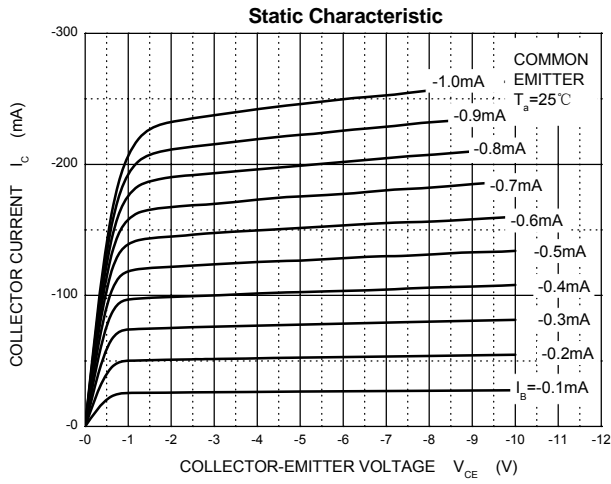
$T_a=25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	$V(\text{BR})_{\text{CBO}}$	$I_{\text{C}}=-100\mu\text{A}, I_{\text{E}}=0$	-160		V
Collector-emitter breakdown voltage	$V(\text{BR})_{\text{CEO}}$	$I_{\text{C}}=-1\text{mA}, I_{\text{B}}=0$	-160		V
Emitter-base breakdown voltage	$V(\text{BR})_{\text{EBO}}$	$I_{\text{E}}=-10\mu\text{A}, I_{\text{C}}=0$	-6		V
Collector cut-off current	I_{CBO}	$V_{\text{CB}}=-150\text{V}, I_{\text{E}}=0$		-1	μA
Emitter cut-off current	I_{EBO}	$V_{\text{EB}}=-6\text{V}, I_{\text{C}}=0$		-1	μA
DC current gain	h_{FE}	$V_{\text{CE}}=-5\text{V}, I_{\text{C}}=-200\text{mA}$	60	320	
Collector-emitter saturation voltage	$V_{\text{CE(sat)}}$	$I_{\text{C}}=-500\text{mA}, I_{\text{B}}=-50\text{mA}$		-1.5	V
Base-emitter voltage	V_{BE}	$I_{\text{C}}=-5\text{mA}, V_{\text{CE}}=-5\text{V}$	-0.45	-0.75	V
Transition frequency	f_{T}	$V_{\text{CE}}=-5\text{V}, I_{\text{C}}=-200\text{mA}$	15		MHz
Collector Output capacitance	C_{ob}	$V_{\text{CB}}=-10\text{V}, I_{\text{E}}=0, f=1\text{MHz}$		35	pF

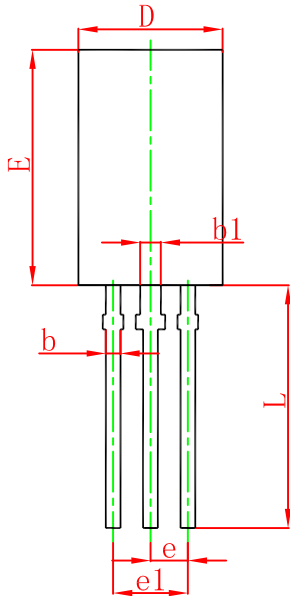
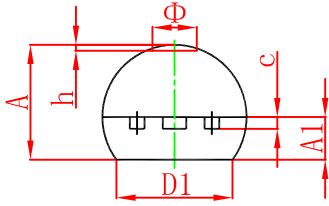
CLASSIFICATION OF h_{FE}

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

Typical Characteristics

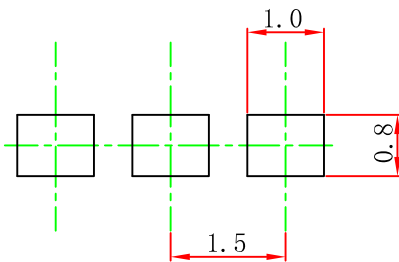


TO-92MOD Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.800	5.000	0.189	0.197
A1	1.730	2.030	0.068	0.080
b	0.440	0.600	0.017	0.024
b1	0.940	1.100	0.037	0.043
c	0.350	0.450	0.014	0.018
D	5.900	6.100	0.232	0.240
D1	4.000		0.157	
E	8.500	8.700	0.335	0.343
e	1.500 TYP.		0.059 TYP.	
e1	2.900	3.100	0.114	0.122
L	13.800	14.200	0.543	0.559
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015

TO-92MOD Suggested Pad Layout



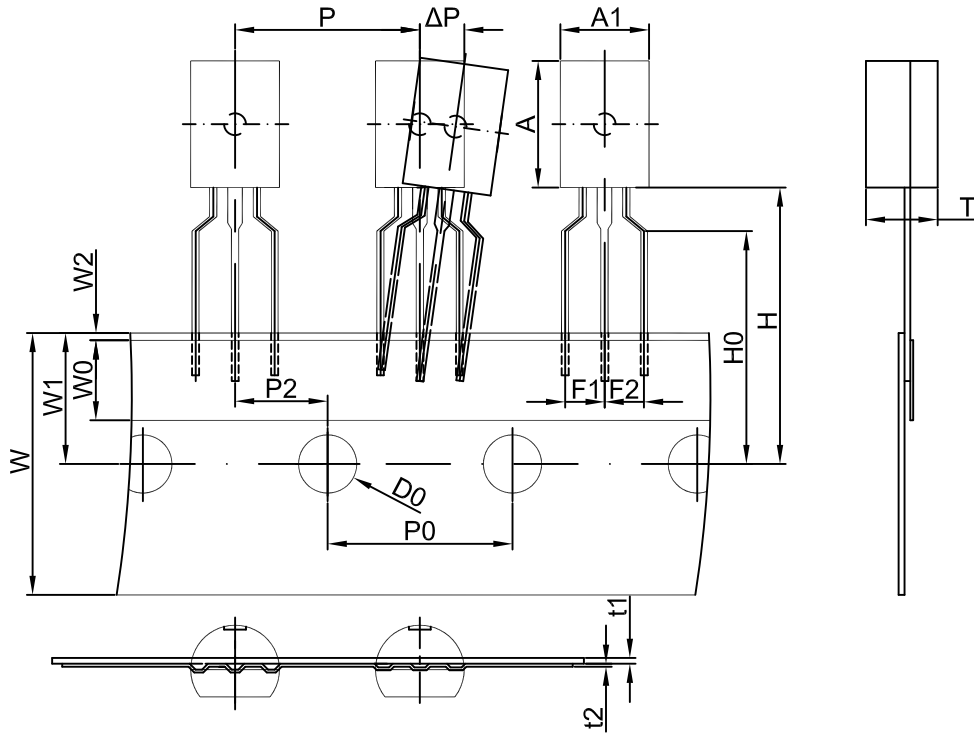
Note:

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

NOTICE

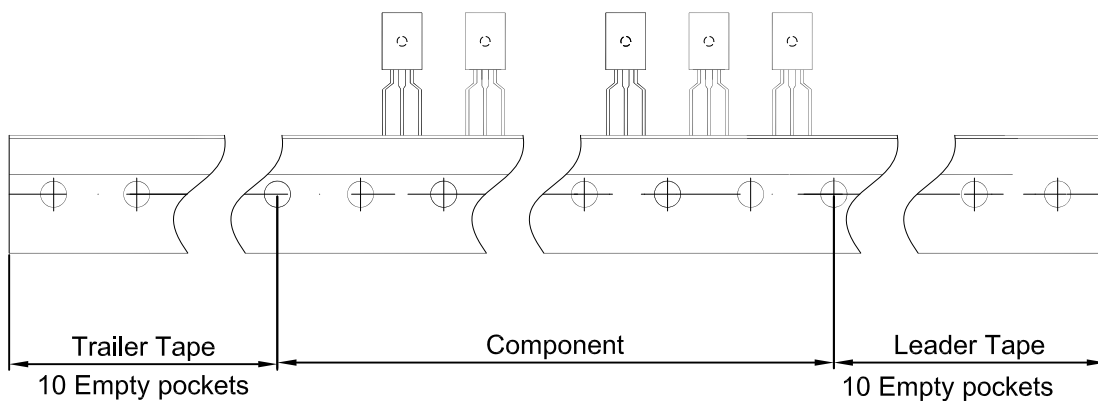
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TO-92MOD PACKAGE TAPING DIMENSION



Dimensions are in millimeter

A1	A	T	P	P0	P2	F1	F2	W
6.0±0.1	8.6±0.1	4.9±0.1	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±2.0/-1	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-92MOD	2000 pcs	333×245×43	20,000 pcs	573×404×266