
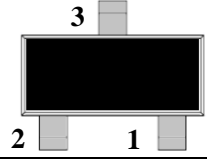


## 1、Features

- Lead(Pb)-Free
- Low Level & Low Noise
- High total power dissipation.(PT=450mW)
- Complimentary to 9015

## 2、Pinning information

PIN	Description	Simplified outline	
1	Emitter(E)		
2	Base(B)		
3	Collector(C)		
		TO-92	SOT-23

## 3、Limiting value

(Ta = 25℃ unless otherwise noted).

SYMBOL	PARAMETER		Limit	UNIT
Vcbo	Collector-Base Voltage		50	V
Vceo	Collector-Emitter Voltage		45	V
Vebo	Emitter-Base Voltage		5	V
Ic	Collector Current		100	mA
Pc	Collector Power Dissipation	TO-92	450	mW
		SOT-23	200	
Tj	Junction Temperature		+150	℃
Tstg	Storage Temperature		-55 to +150	℃

## 4、Electrical Characteristics (Ta = 25℃ unless otherwise noted)

SYMBOL	PARAMETER	CONDITIONS	MIN	Typ	MAX	UNIT
BVcbo	Collector-Base Breakdown Voltage	I <sub>C</sub> = 100μA, I <sub>B</sub> = 0	50			V
Bvceo	Collector-Emitter Breakdown Voltage	I <sub>C</sub> = 1mA, I <sub>E</sub> = 0	45			V
Bvebo	Emitter-Base Breakdown Voltage	I <sub>E</sub> = 100μA, I <sub>C</sub> = 0	5			V
Icbo	Collector Cut-off Current	V <sub>CB</sub> = 45V, I <sub>E</sub> = 0			100	nA
Iebo	Emitter Cut-off Current	V <sub>EB</sub> = 5V, I <sub>C</sub> = 0			100	nA
Vce(sat)	Collector-Emitter Saturation Voltage	I <sub>C</sub> =100mA I <sub>b</sub> =5mA			0.3	V
Vbe(sat)	Base-Emitter Saturation Voltage	I <sub>C</sub> =100mA I <sub>b</sub> =5mA			1.0	V
Vbe(on)	Base-Emitter On Voltage	V <sub>CE</sub> = 5V, I <sub>C</sub> =2mA			0.7	V
h <sub>FE</sub>	DC Current Gain	V <sub>CE</sub> = 5V, I <sub>C</sub> =1mA	60		600	
f <sub>T</sub>	Current Gain Bandwidth Product	V <sub>CE</sub> =5V, I <sub>C</sub> = 10mA	150	270		MHz
Cob	Output Capacitance	V <sub>CB</sub> =10V, f = 1MHz		2.2	3.5	pF

h<sub>FE</sub> Classification

Rank	A	B	C	D
Range	60-150	100-250	200-350	300-600

## 5、Electrical Characteristics Curve

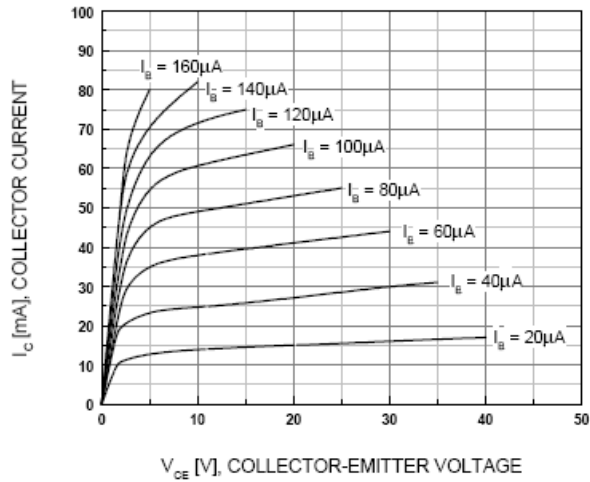


Figure 1. Static Characteristic

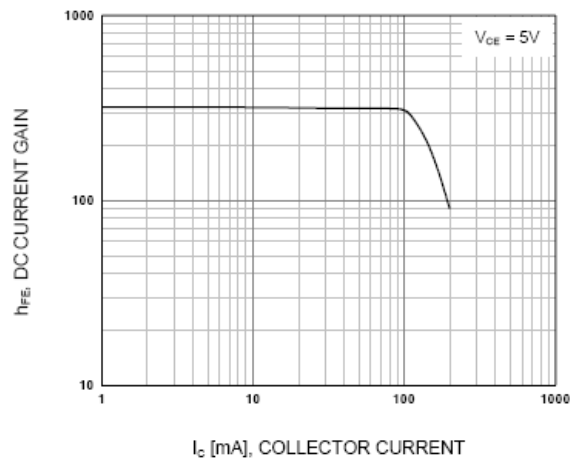


Figure 2. DC current Gain

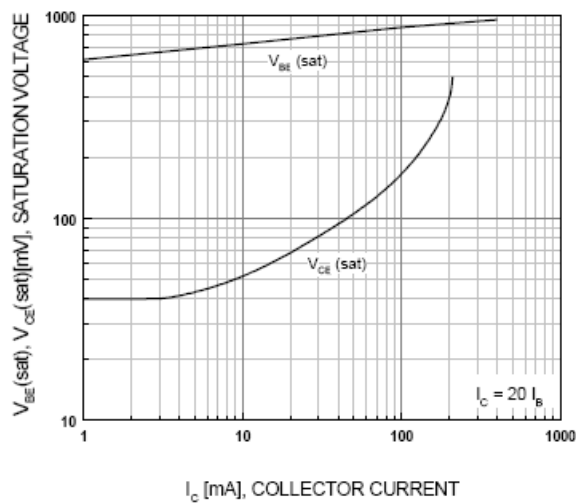


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

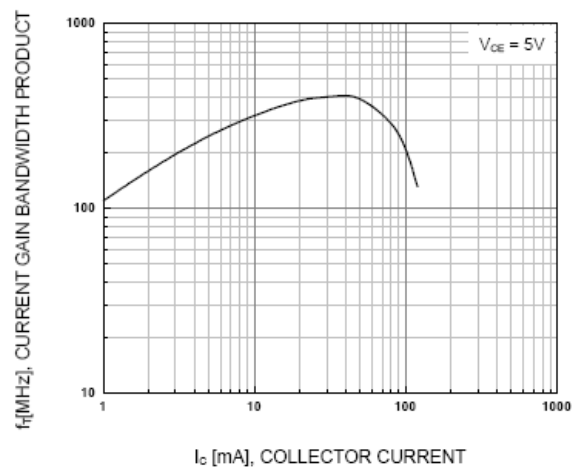
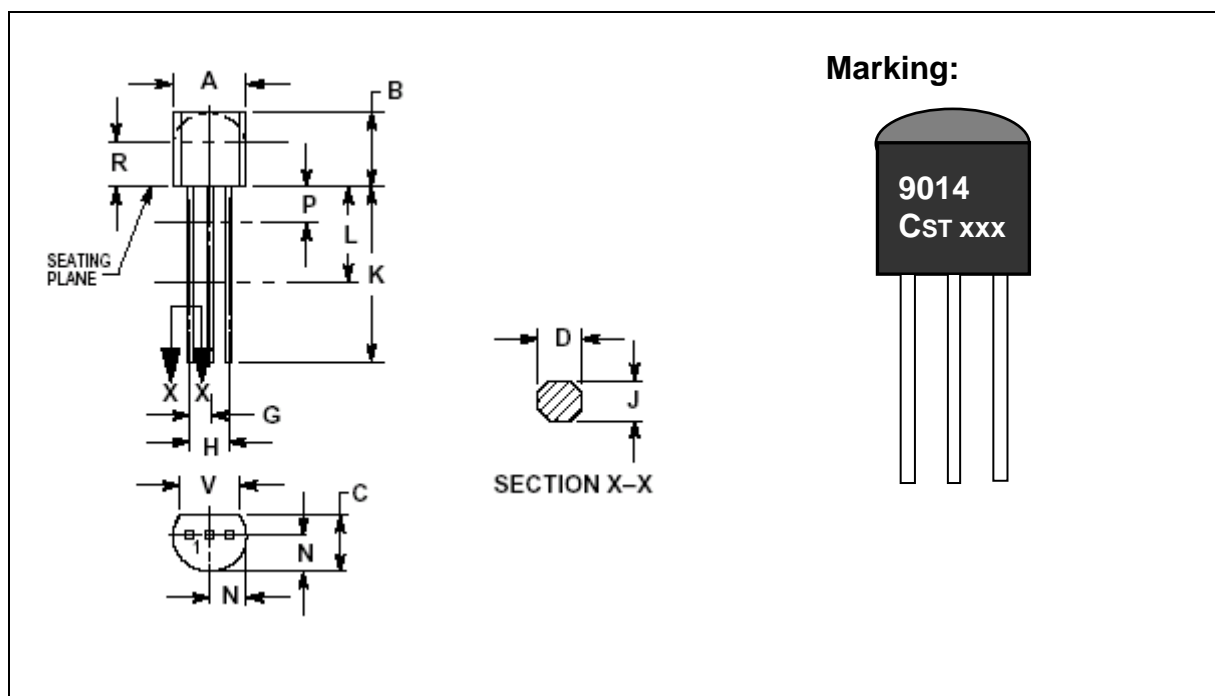


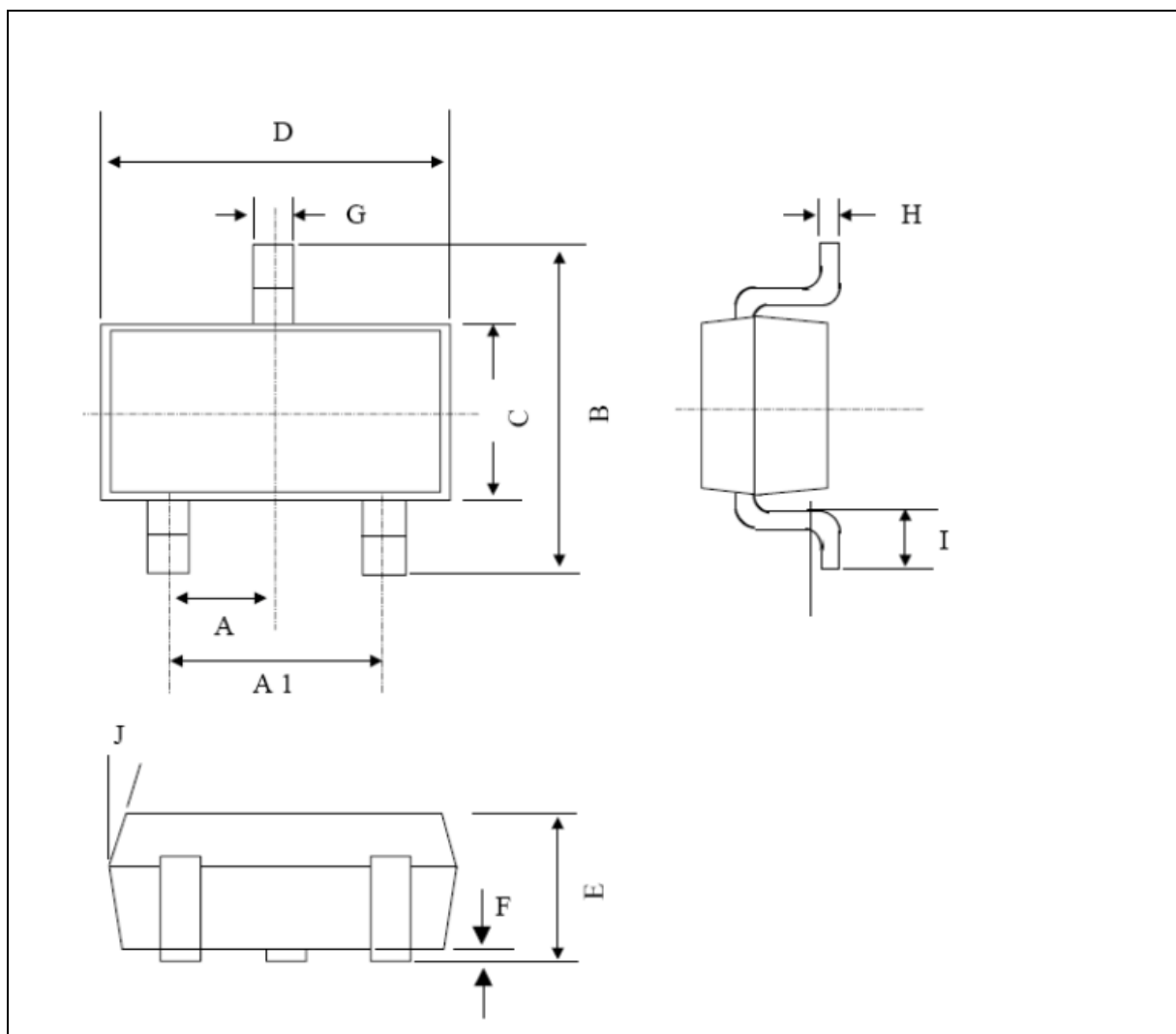
Figure 4. Current Gain Bandwidth Product

## 6、Package outline(TO-92)



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min	Max	Min	Max		Min	Max	Min	Max
A	0.175	0.205	4.45	5.20	K	0.500	-	12.70	-
B	0.170	0.210	4.32	5.33					
C	0.134	0.142	3.40	3.60	N	0.080	0.105	2.04	2.66
D	0.016	0.021	0.407	0.533	P	-	0.100	-	2.54
G	0.045	0.055	1.27	2.41	R	0.079	-	2.00	-
H	0.095	0.105	2.42	2.66	V	0.135	-	3.43	-
J	0.012	0.018	0.30	0.45					

## 7、Package outline(SOT-23)



DIM	Inches		Milimeters		DIM	Inches		Milimeters	
	Min	Max	Min	Max		Min	Max	Min	Max
<b>A</b>	0.037BSC		0.95BSC		<b>F</b>	0.000	0.004	0.00	0.10
<b>A1</b>	0.074BSC		1.90BSC		<b>G</b>	0.012	0.020	0.30	0.50
<b>B</b>	0.089	0.100	2.25	2.55	<b>H</b>	0.003	0.006	0.08	0.15
<b>C</b>	0.047	0.055	1.20	1.40	<b>I</b>	0.012	0.020	0.30	0.50
<b>D</b>	0.114	0.122	2.9	3.10	<b>J</b>	5°	10°	5°	10°
<b>E</b>	0.039	0.045	0.90	1.15					