

## NPN Silicon Surface Mount Transistor

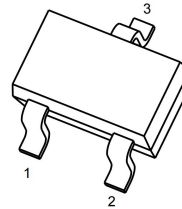
**General description**

SOT-323 Bias Resistor Transistor.  
NPN Silicon Surface Mount Transistor with  
Monolithic Bias Resistor Network.

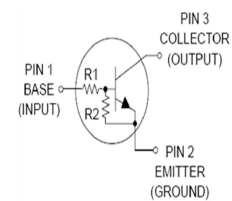
**FEATURES**

- With built-in bias resistors
- Simplifies Circuit Design
- Reduce a quantity of parts
- Manufacturing process

**Marking : 24**

**SOT-323**

1. IN  
2. GND  
3. OUT

**Electrical Symbol:****Absolute Maximum Ratings** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector Emitter Voltage	$V_{CEO}$	50	V
Input Voltage	$V_I$	- 10 to + 40	V
Collector Current	$I_C$	100	mA
Power Dissipation	$P_{tot}$	150	mW
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	- 55 to + 150	$^\circ\text{C}$

**Electrical Characteristics** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
DC Current Gain	$h_{FE}$	$V_{CE} = 5\text{ V}, I_C = 5\text{ mA}$	30	-	-	-
Collector Base Cutoff Current	$I_{CBO}$	$V_{CB} = 50\text{ V}$	-	-	500	nA
Emitter Base Cutoff Current	$I_{EBO}$	$V_{EB} = 5\text{ V}$	-	-	0.88	mA
Collector Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{ mA}, I_B = 0.5\text{ mA}$	-	-	0.3	V
Input on Voltage	$V_{I(on)}$	$V_{CE} = 0.3\text{ V}, I_C = 10\text{ mA}$	-	-	3	V
Input off Voltage	$V_{I(off)}$	$V_{CE} = 5\text{ V}, I_C = 100\text{ }\mu\text{A}$	0.5	-	-	V
Transition frequency	$f_T$	$V_{CE} = 10\text{ V}, -I_E = 5\text{ mA}, f = 100\text{ MHz}$	-	250	-	MHz
Input Resistance	$R_1$		7	10	13	k $\Omega$
Resistance Ratio	$R_2 / R_1$		0.8	1	1.2	-

## Typical Characteristics

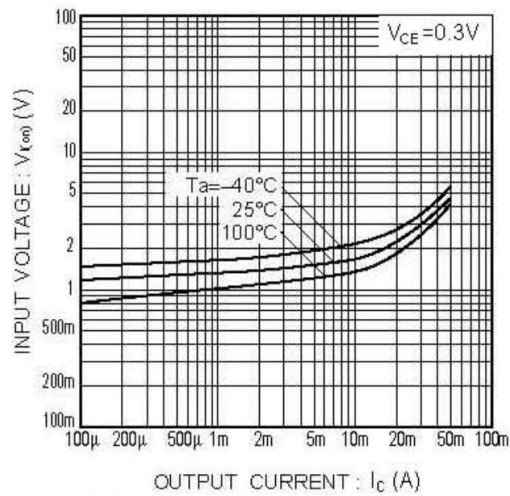


Fig.1 Input voltage vs. output current (ON characteristics)

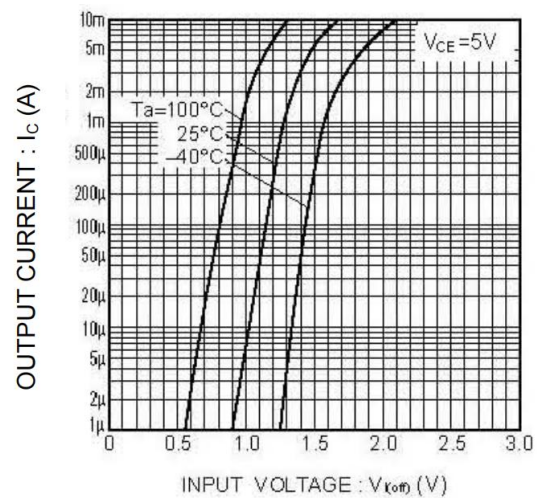


Fig.2 Output current vs. input voltage (OFF characteristics)

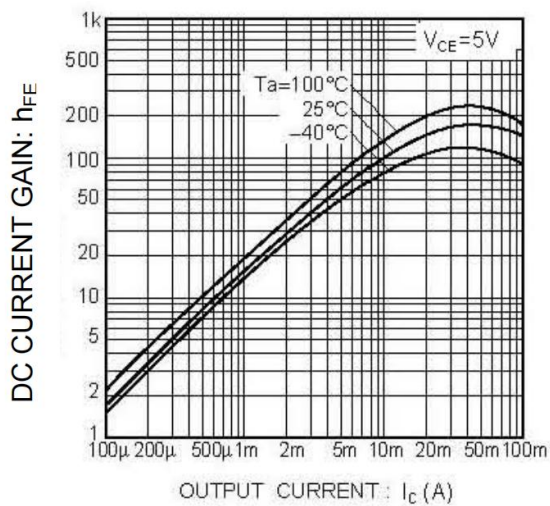


Fig.3 DC current gain vs. output current

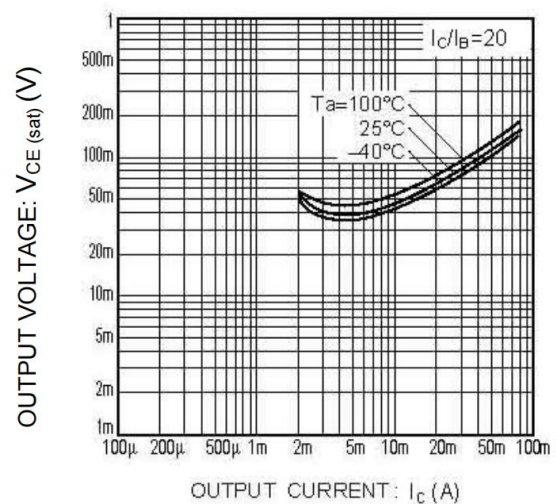
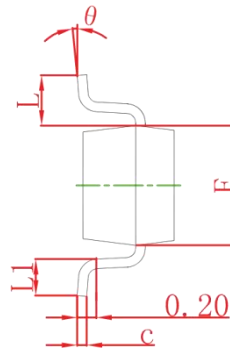
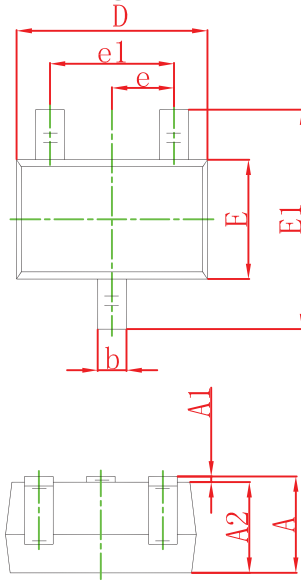


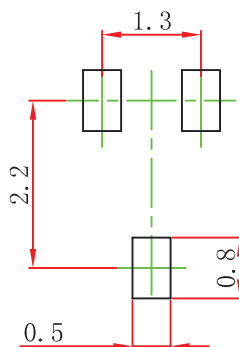
Fig.4 Output voltage vs. output current

## SOT-323 Package Outline



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
	0°	8°	0°	8°

## SOT-23-3L Suggestion layout



Note:

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

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