



# TSC114A

## NPN Digital Transistor

**SOT-23**



**SOT-323**



- Pin assignment:
1. Input (Base)
  2. Gnd (Emitter)
  3. Output (Collector)

**V<sub>cc</sub> = 50V**  
**V<sub>in</sub> = - 10V ~ +40V**  
**I<sub>o</sub> = 100mA(max.)**

### Features

- ◇ Build-in bias resistor enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit)
- ◇ The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. The also have the advantage of almost completely eliminating parasitic effects.
- ◇ Only the on/off conditions need to be set for operation, making device design easy.
- ◇ Complements the TSA114A

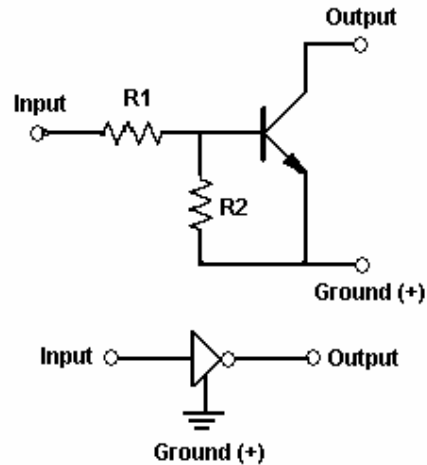
### Ordering Information

Part No.	Packing	Package
TSC114ACX	Tape & Reel	SOT-23
TSC114ACU		SOT-323

Note: **x** is the build-in resistor value type, option as

Code	R1 (KΩ)	R2 (KΩ)	Marking
C	10	10	8A

### Equivalent Circuit



**Input : Base**  
**Output : Collector**  
**Ground : Emitter**

### Absolute Maximum Rating (Ta = 25 °C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Supply Voltage	V <sub>cc</sub>	50	V
Input Voltage	V <sub>in</sub>	- 10 ~ +40	V
Output Current	I <sub>o</sub>	DC	50
		Pulse	100
Power Dissipation	SOT-23	P <sub>D</sub>	250
	SOT-323		200
Operating Junction Temperature	T <sub>J</sub>	+150	°C
Operating Junction and Storage Temperature Range	T <sub>STG</sub>	- 55 to +150	°C

- Note: 1. Single pulse, P<sub>w</sub> = 300uS, Duty <= 2%  
 2. When mounted on an FR-4 PCB

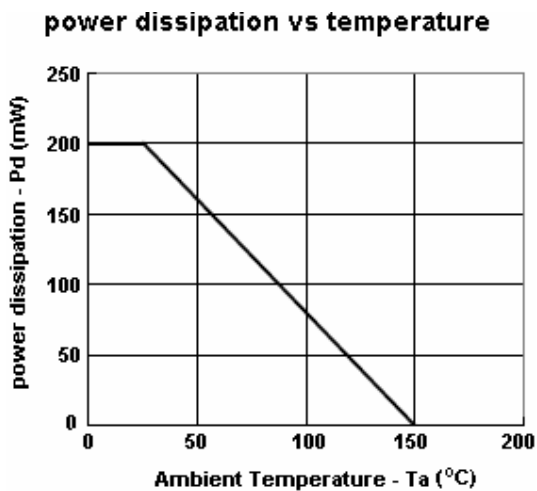
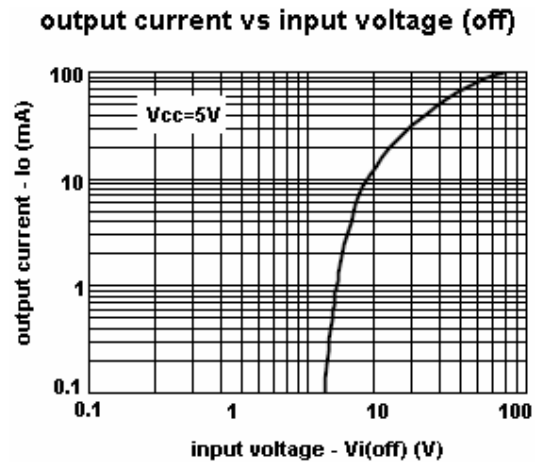
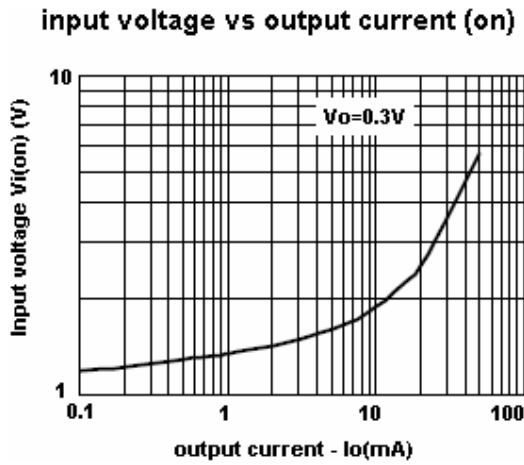
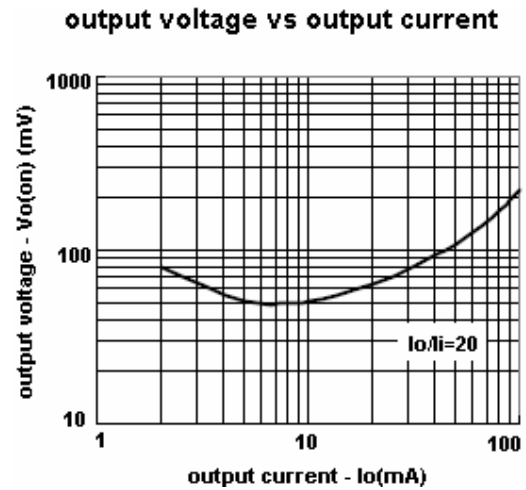
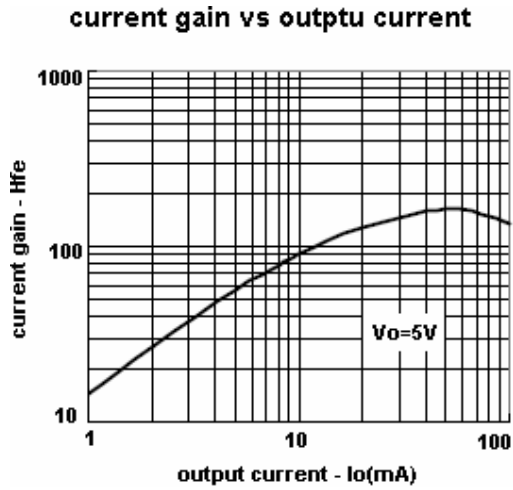


<b>Electrical Characteristics</b>						
Ta = 25 °C unless otherwise noted						
<b>Parameter</b>	<b>Conditions</b>	<b>Symbol</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>	<b>Unit</b>
Input Voltage	Vcc= 5V, Io= 100uA	Vin(off)	--	--	0.5	V
	Vo= 0.3V, Io= 10mA	Vin(on)	3	--	--	V
Output Voltage	Io/Iin= 10mA/ 0.5mA	Vo(on)	--	0.1	0.3	V
Input Current	Vin= 5V	Iin	--	--	0.88	mA
Output Current	Vcc= 50V, Vin= 0V	Io(off)	--	--	0.5	uA
DC Current Gain	Vo= 5V, Io= 5mA	Gi	30	--	--	
Input Resistance		R1	0.7	10	1.3	KΩ
Resistance Ratio		R2/R1	0.8	1	1.2	
Transition Frequency	Vce= 10V, Ie= 5mA, f= 100MHz (note 1)	ft	--	250	--	MHz

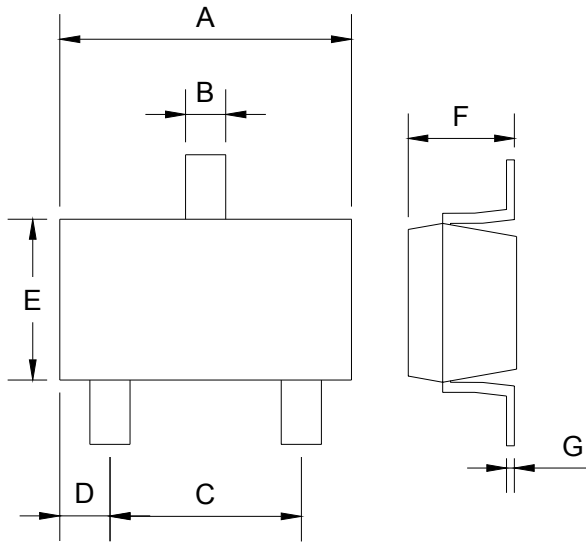
Note : 1. Transition frequency of the device.

2. Pulse test: pulse width  $\leq 380\mu\text{s}$ , duty cycle  $\leq 2\%$

## Electrical Characteristics Curve

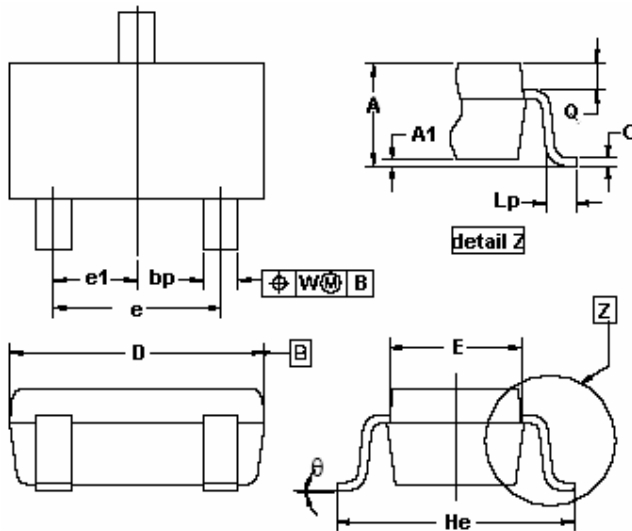


## SOT-23 Mechanical Drawing



SOT-23 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.88	2.91	0.113	0.115
B	0.39	0.42	0.015	0.017
C	1.78	2.03	0.070	0.080
D	0.51	0.61	0.020	0.024
E	1.59	1.66	0.063	0.065
F	1.04	1.08	0.041	0.043
G	0.07	0.09	0.003	0.004

## SOT-323 Mechanical Drawing



SOT-323 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.80	1.10	0.0315	0.0433
A1	--	0.10	--	0.0039
bp	0.30	0.40	0.0118	0.0157
C	0.10	0.25	0.0039	0.0098
D	1.80	2.20	0.0709	0.0866
E	1.15	1.35	0.0453	0.0531
e	1.30	--	0.0512	--
e1	0.65	--	0.0256	--
He	2.00	2.20	0.0787	0.0866
Lp	0.15	0.45	0.0059	0.0177
Q	0.13	0.23	0.0051	0.0091
W	0.20	--	0.0079	--
Theta	10°	--	10°	--