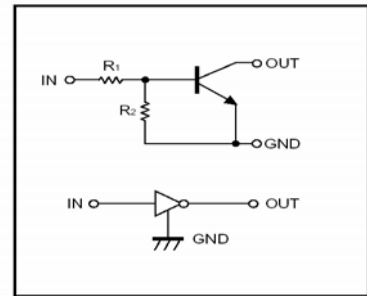


DIGITAL TRANSISTOR (NPN)

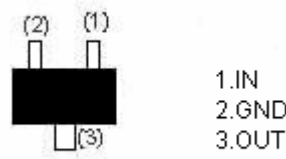
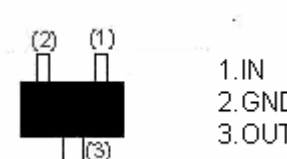
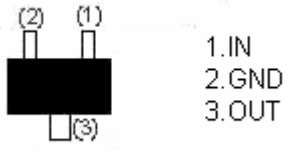
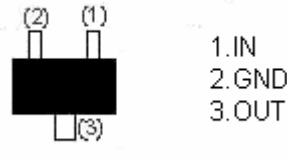
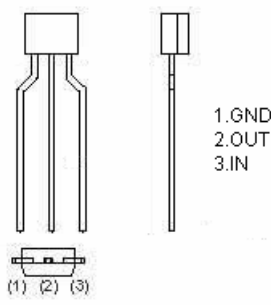
**Features**

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

● **Equivalent circuit**



**PIN CONNECTIONS AND MARKING**

<p>DTC123JE</p>  <p>1.IN 2.GND 3.OUT</p> <p>SOT-523      Abbreviated symbol: E42</p>	<p>DTC123JUA</p>  <p>1.IN 2.GND 3.OUT</p> <p>SOT-323      Abbreviated symbol: E42</p>
<p>DTC123JKA</p>  <p>1.IN 2.GND 3.OUT</p> <p>SOT-23-3L      Abbreviated symbol: E42</p>	<p>DTC123JCA</p>  <p>1.IN 2.GND 3.OUT</p> <p>SOT-23      Abbreviated symbol: E42</p>
<p>DTC123JSA</p>  <p>1.GND 2.OUT 3.IN</p> <p>TO-92S</p>	

**Absolute maximum ratings(Ta=25°C)**

Parameter	Symbol	Limits (DTC123J□ )					Unit
		E	UA	KA	CA	SA	
Supply voltage	V <sub>CC</sub>	50					V
Input voltage	V <sub>IN</sub>	-5~12					V
Output current	I <sub>O</sub>	100					mA
	I <sub>C(MAX)</sub>	100					
Power dissipation	P <sub>d</sub>	150		200		300	mW
Junction temperature	T <sub>j</sub>	150					°C
Storage temperature	T <sub>stg</sub>	-55~150					°C

**Electrical characteristics (Ta=25°C)**

Parameter	Symbol	Min.	Typ	Max.	Unit	Conditions
Input voltage	V <sub>I(off)</sub>			0.5	V	V <sub>CC</sub> =5V, I <sub>O</sub> =100μA
	V <sub>I(on)</sub>	1.1				V <sub>O</sub> =0.3V, I <sub>O</sub> =5 mA
Output voltage	V <sub>O(on)</sub>		0.1	0.3	V	I <sub>O</sub> /I <sub>I</sub> =5mA/0.25mA
Input current	I <sub>I</sub>			3.6	mA	V <sub>I</sub> =5V
Output current	I <sub>O(off)</sub>			0.5	μA	V <sub>CC</sub> =50V, V <sub>I</sub> =0
DC current gain	G <sub>I</sub>	80				V <sub>O</sub> =5V, I <sub>O</sub> =10mA
Input resistance	R <sub>1</sub>	1.54	2.2	2.86	KΩ	-
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>	17	21	26		-
Transition frequency	f <sub>T</sub>		250		MHz	V <sub>O</sub> =10V, I <sub>O</sub> =-5mA, f=100MHz

**Typical Characteristics**

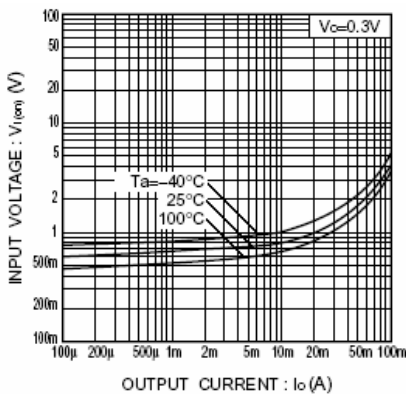


Fig.1 Input voltage vs. output current (ON characteristics)

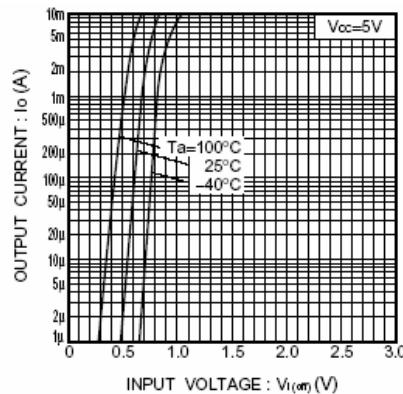


Fig.2 Output current vs. input voltage (OFF characteristics)

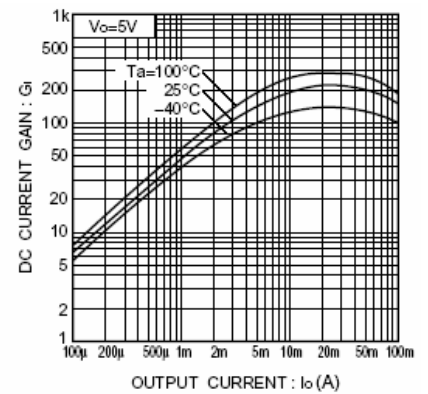


Fig.3 DC current gain vs. output current

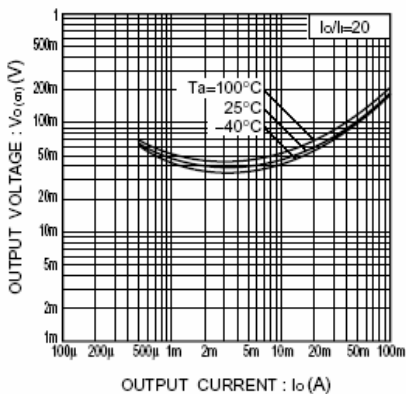


Fig.4 Output voltage vs. output current