



Digital transistors (built-in resistors)

DTC123JE/DTC123JUA/

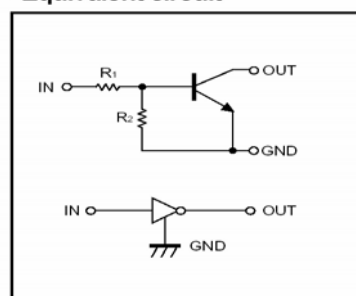
DTC123JKA/DTC123JCA / DTC123JSA

DIGITAL TRANSISTOR (NPN)

Features

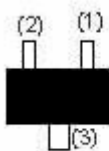
- 1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors(see equivalent circuit).
- 2) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of almost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

●Equivalent circuit



PIN CONNENCTIONS AND MARKING

DTC123JE

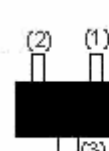


1.IN
2.GND
3.OUT

SOT-523

Abbreviated symbol: E42

DTC123JUA

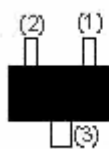


1.IN
2.GND
3.OUT

SOT-323

Abbreviated symbol: E42

DTC123JKA



1.IN
2.GND
3.OUT

SOT-23-3L

Abbreviated symbol: E42

DTC123JCA

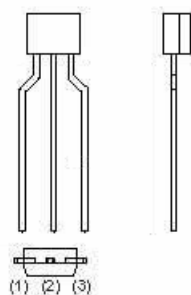


1.IN
2.GND
3.OUT

SOT-23

Abbreviated symbol: E42

DTC123JSA



1.GND
2.OUT
3.IN

TO-92S

Absolute maximum ratings(Ta=25°C)

Parameter	Symbol	Limits (DTC123J□)					Unit
		E	UA	KA	CA	SA	
Supply voltage	V _{CC}	50					V
Input voltage	V _{IN}	-5~12					V
Output current	I _O	100					mA
	I _{C(MAX)}	100					
Power dissipation	Pd	150	200			300	mW
Junction temperature	Tj	150					℃
Storage temperature	Tstg	-55~150					℃

Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$			0.5	V	$V_{CC}=5V, I_O=100\mu A$
	$V_{I(on)}$	1.1				$V_O=0.3V, I_O=5mA$
Output voltage	$V_{O(on)}$		0.1	0.3	V	$I_O/I_I=5mA/0.25mA$
Input current	I_I			3.6	mA	$V_I=5V$
Output current	$I_{O(off)}$			0.5	μA	$V_{CC}=50V, V_I=0$
DC current gain	G_I	80				$V_O=5V, I_O=10mA$
Input resistance	R_I	1.54	2.2	2.86	K Ω	-
Resistance ratio	R_2/R_1	17	21	26		-
Transition frequency	f_T		250		MHz	$V_O=10V, I_O=-5mA, f=100MHz$

Typical Characteristics

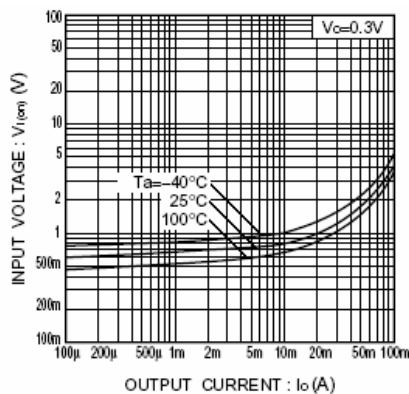


Fig.1 Input voltage vs. output current (ON characteristics)

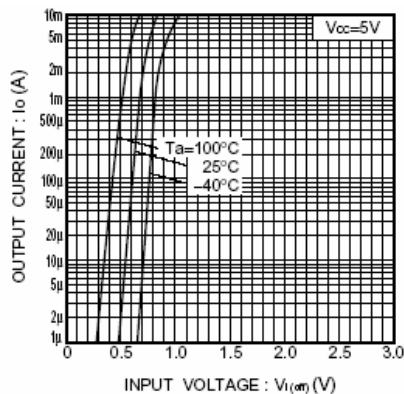


Fig.2 Output current vs. input voltage (OFF characteristics)

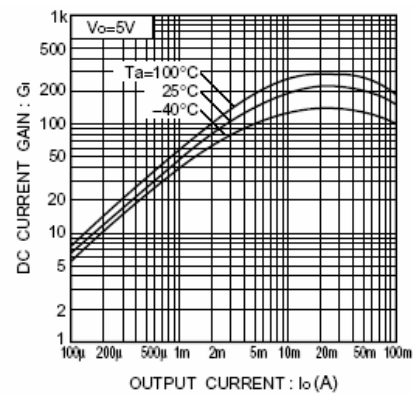


Fig.3 DC current gain vs. output current

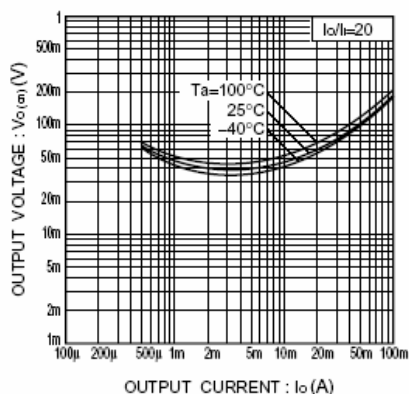


Fig.4 Output voltage vs. output current