

Digital Transistors (Built-in Resistors)

DIGITAL TRANSISTOR (NPN)

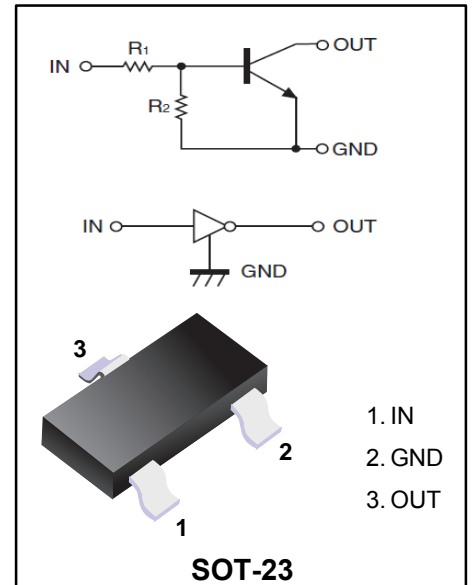
FEATURE

- ◆ Built-in bias resistors 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 positive biasing of the input.They also have the advantage of almost completely eliminating parasitic effects
- ◆ Only the on/off conditions need to be set for operation,marking Device design easy
- ◆ Moisture Sensitivity Level 3

MECHANICAL DATA

- ◆ Case: SOT-23
- ◆ Epoxy UL:94V-0
- ◆ Mounting Position:Any
- ◆ $R_1=2.2k\Omega$, $R_2=10k\Omega$

Equivalent Circuit



Marking Code	
DTD123YCA	F62

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

Parameters	Symbols	Limits	Units
Supply Voltage	V_{CC}	50	V
Input Voltage	V_{IN}	-5~+12	V
Output Current	I_O	500	mA
Power Dissipation	P_D	200	mW
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55~+150	°C

Electrical Characteristics(Ta=25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Input on voltage	$V_O=0.3V, I_O=20mA$	$V_{I(on)}$			2	V
Input off voltage	$V_{CC}=5V, I_O=0.1mA$	$V_{I(off)}$	0.3			V
Output voltage	$I_O/I_I=50mA/2.5mA$	$V_{O(on)}$		0.1	0.3	V
Input current	$V_I=5V$	I_I			3.6	mA
Output current	$V_{CC}=50V, V_I=0$	$I_{O(off)}$			0.5	uA
DC current gain	$V_O=5V, I_O=50mA$	G_I	56			
Input resistor	-	R_1	1.54	2.2	2.86	kΩ
Resistor ratio	-	R_2/R_1	3.6	4.5	5.5	
Transition frequency*	$V_{CE}=10V, I_E=-50mA, f=100MHz$	f_T		200		MHz

*Transition frequency of the device

Typical characteristics

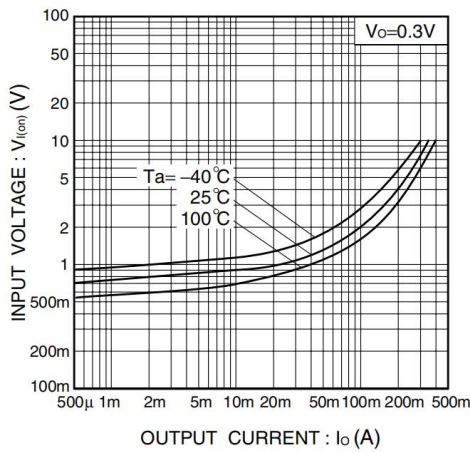


Fig.1 Input voltage vs. output current (ON characteristics)

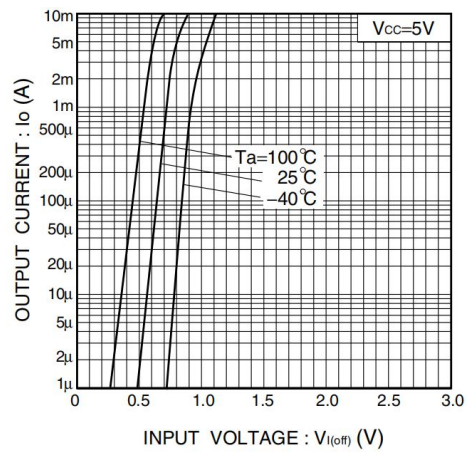


Fig.2 Output current vs. input voltage (OFF characteristics)

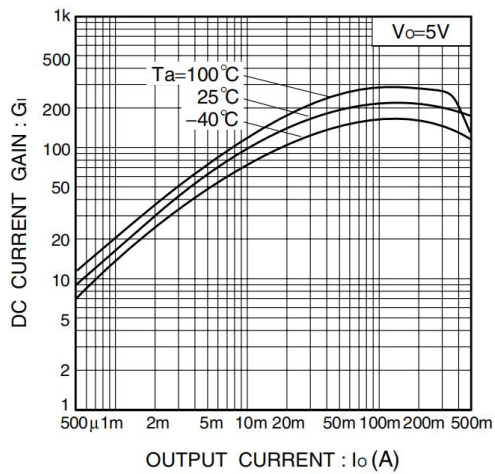


Fig.3 DC current gain vs. output current

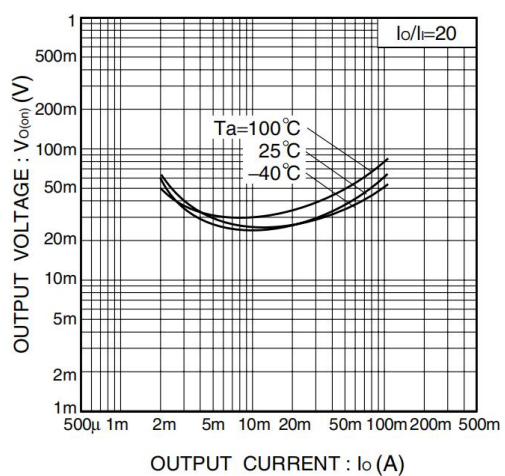


Fig.4 Output voltage vs. output current

Ordering information

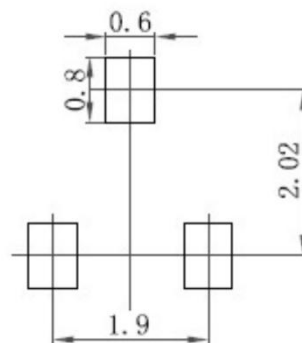
Package	Packing Description	Base Quantity	Packing Quantity
SOT-23	Tape/Reel,7"reel	3000pcs/Reel	24000PCS/Box 120000PCS/Carton

Package Dimensions

SOT-23

Dim.	Millimeter (mm)		mil	
	Min.	Max.	Min.	Max.
A	0.9	1.15	35	45
A1	0.1		3.9	
bp	0.38	0.48	15	19
C	0.09	0.15	3.54	5.9
D	2.8	3.0	110	118
E	1.2	1.4	47	55
e	1.9		75	
e1	0.95		37	
HE	2.1	2.55	83	100
Lp	0.15	0.45	5.9	18
Q	0.45	0.55	18	22
v	0.2		7.9	
W	0.1		4	

The recommended mounting pad size



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