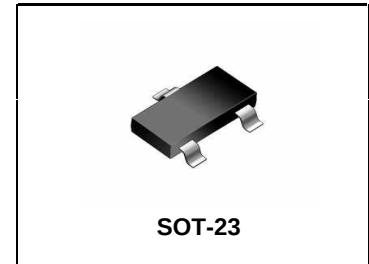
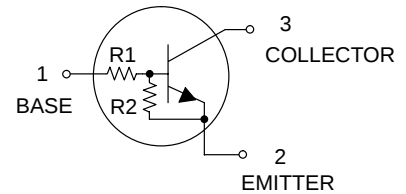


**NPN Digital Transistors (Built-in Resistors)****Applications**

Inverter, Interface, Driver

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 positive 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 the device design easy.

**SOT-23****●Absolute maximum ratings (Ta=25°C)**

Parameter	Symbol	Limits	Unit
Supply voltage	V_{CC}	50	V
Input voltage	V_{IN}	-10 to +12	V
Output current	I_C	500	mA
Power dissipation	P_d	200	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

DEVICE MARKING AND RESISTOR VALUES

Device	Marking	R1 (K)	R2 (K)	Shipping
DTD123E	F22	2.2	2.2	3000/Tape & Reel

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	—	—	0.5	V	$V_{CC}=5V, I_O=100\mu A$
	$V_{I(on)}$	3	—	—		$V_O=0.3V, I_O=20mA$
Output voltage	$V_{O(on)}$	—	0.1	0.3	V	$I_O/I_I=50mA/2.5mA$
Input current	I_I	—	—	3.8	mA	$V_I=5V$
Output current	$I_{O(off)}$	—	—	0.5	μA	$V_{CC}=50V, V_I=0V$
DC current gain	G_I	39	—	—	—	$V_O=5V, I_O=50mA$
Input resistance	R_1	1.54	2.2	2.86	k Ω	—
Resistance ratio	R_2/R_1	0.8	1	1.2	—	—
Transition frequency	f_T *	—	200	—	MHz	$V_{CE}=10V, I_E=-50mA, f=100MHz$

*Characteristics of built-in transistor.

DEVICE CHARACTERISTICS

DTD123E

●Electrical characteristic curves

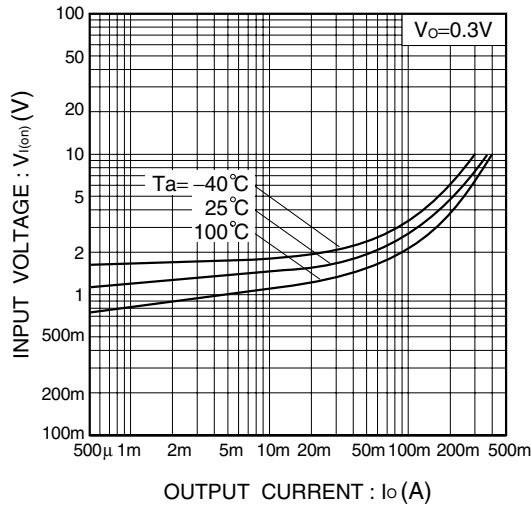


Fig.1 Input voltage vs. output current
(ON characteristics)

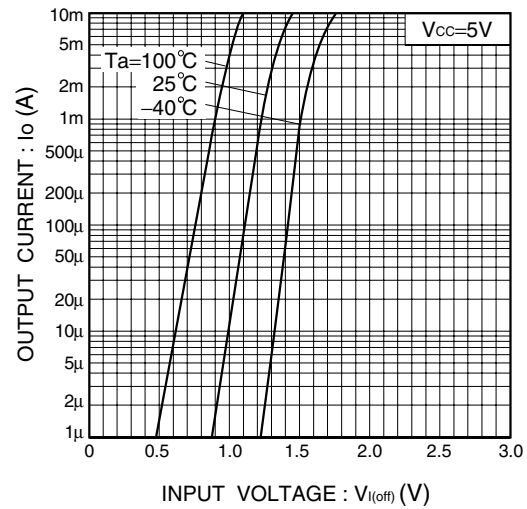


Fig.2 Output current vs. input voltage
(OFF characteristics)

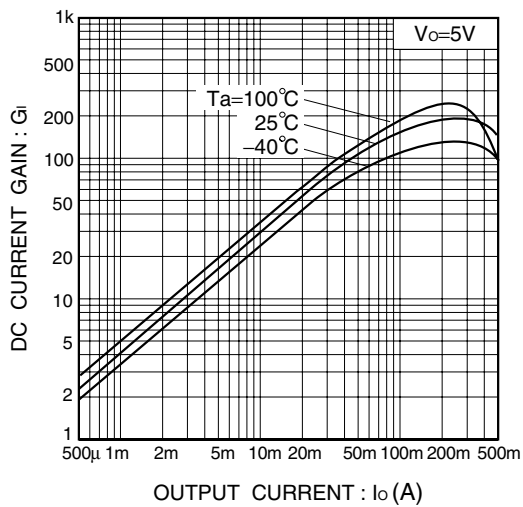


Fig.3 DC current gain
vs. output current

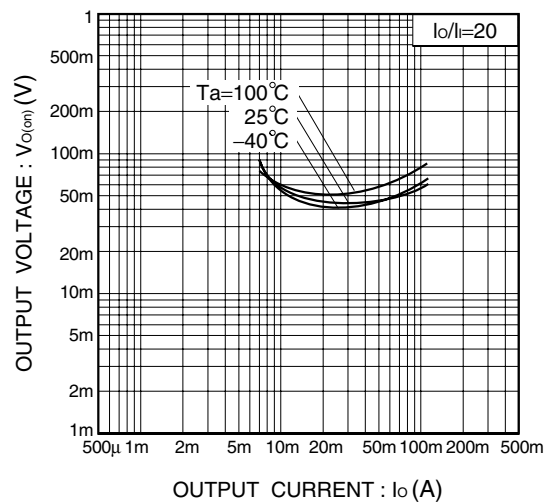


Fig.4 Output voltage vs. output current

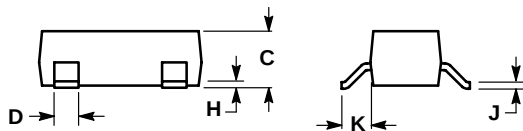
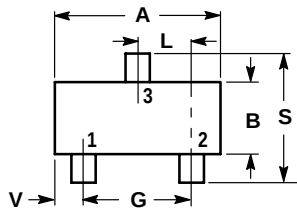
PACKAGE OUTLINE & DIMENSIONS

DTD123E

SOT-23

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M,1982
2. CONTROLLING DIMENSION: INCH.



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

