

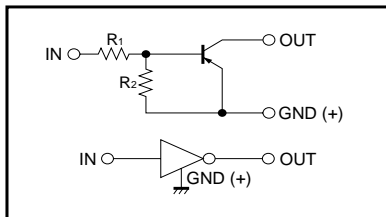
# Digital transistors (built-in resistors)

## DTB133HS

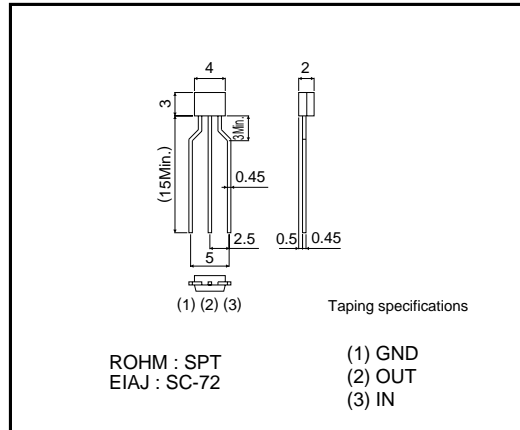
### ●Features

- 1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors.
- 2) The bias resistors consist of thin-film resistors with complete isolation to allow positive biasing of the input, and parasitic effects are almost completely eliminated.
- 3) Only the on/off conditions need to be set for operation, making device design easy.
- 4) Higher mounting densities can be achieved.

### ●Equivalent circuit



### ●External dimensions (Unit : mm)



### ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Supply voltage	V <sub>cc</sub>	-50	V
Input voltage	V <sub>i</sub>	-20	V
		6	
Output current	I <sub>c</sub>	-500	mA
Power dissipation	P <sub>d</sub>	300	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

### ●Package, marking, and packaging specifications

Part No.	DTB133HS
Package	SPT
Marking	-
Packaging code	TP
Basic ordering unit (pieces)	5000

Transistors

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	-	-	-0.3	V	$V_{CC} = -5V, I_o = -100\mu A$
	$V_{I(on)}$	-2	-	-		$V_o = -0.3V, I_o = -20mA$
Output voltage	$V_{O(on)}$	-	-0.1	-0.3	V	$I_o = -50mA, I_i = -2.5mA$
Input current	$I_i$	-	-	-2.4	mA	$V_i = -5V$
Output current	$I_{O(off)}$	-	-	-0.5	$\mu A$	$V_{CC} = -50V, V_i = 0V$
DC current gain	$G_i$	56	-	-	-	$I_o = -50mA, V_o = -5V$
Input resistance	$R_1$	2.31	3.3	4.29	$k\Omega$	-
Resistance ratio	$R_2/R_1$	2.4	3	3.7	-	-
Transition frequency	$f_T$	-	200	-	MHz	$V_{CE} = -10V, I_E = 50mA, f = 100MHz$ *

\*Transition frequency of the device.

●Electrical characteristic curves

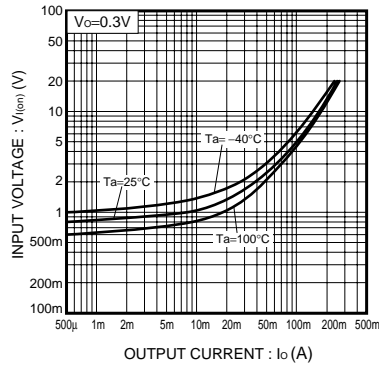


Fig.1 Input voltage vs. Output current (ON characteristics)

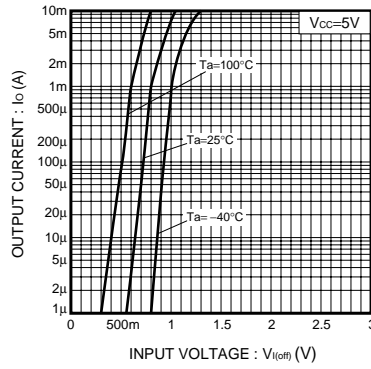


Fig.2 Output current vs. Input voltage (OFF characteristics)

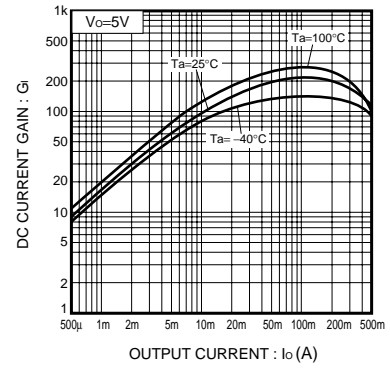


Fig.3 DC current gain vs. Output current

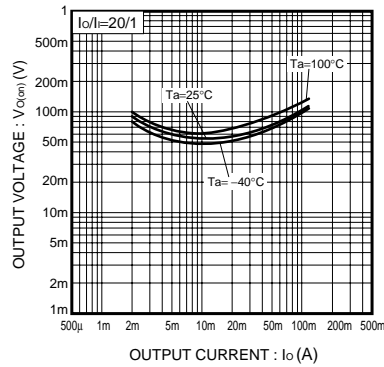


Fig.4 Output voltage vs. Output current

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