

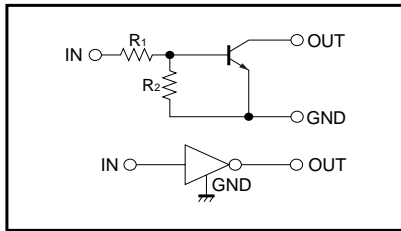
# Digital transistors (Includes resistors)

## DTD133HK / DTD133HS

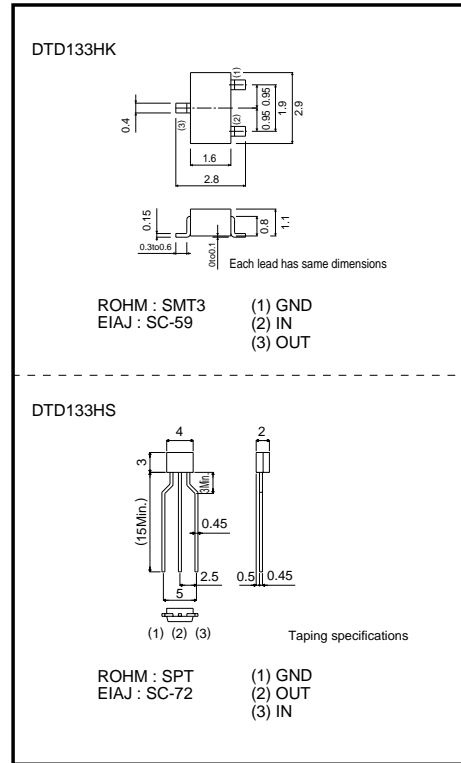
**●Features**

- 1) A built-in bias resistor allows inverter circuit configuration without external resistors for input (see equivalent circuit diagram).
- 2) The bias resistor consists of a thin-film resistor which is completely isolated, providing the capability to negative-bias the input, and avoiding parasitic effects.
- 3) Operation starts by simply setting On/Off conditions, simplifying the design of equipment using the transistors.
- 4) High packing density.

**●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>	-6 to +20	V
Output current	I <sub>c</sub>	500	mA
Power dissipation	DTD133HK	200	mW
	DTD133HS	300	
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.	DTD133HK	DTD133HS
Package	SMT3	SPT
Marking	G08	-
Packaging code	T146	TP
Basic ordering unit (pieces)	3000	5000

Transistors

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	–	–	0.5	V	$V_{CC}=5V, I_o=100\mu A$
	$V_{I(on)}$	2.0	–	–	V	$V_o=0.3V, I_o=20mA$
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	$R_i$	2.31	3.3	4.29	$k\Omega$	–
Resistance ratio	$R_2/R_1$	2.4	3.0	3.7	–	–
Transition frequency	$f_T$	–	200	–	MHz	$V_{CE}=10V, I_E=-50mA, f=100MHz$ *

\*Transition frequency of the device.

●Electrical characteristics curves

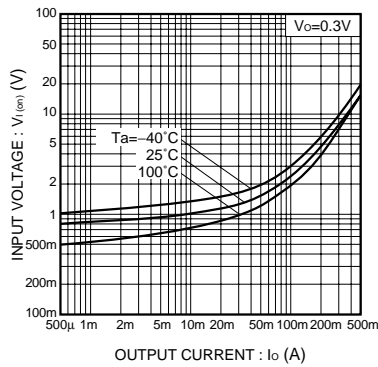


Fig.1 Input voltage vs. output current (ON characteristics)

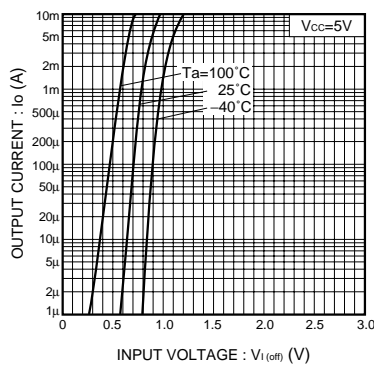


Fig.2 Output current vs. input voltage (OFF characteristics)

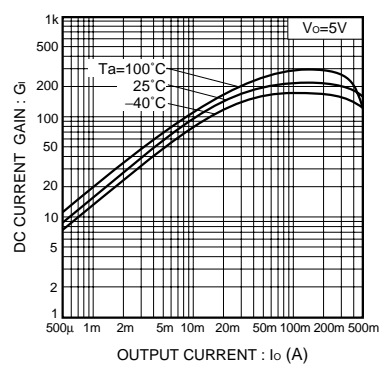


Fig.3 DC current gain vs. output current characteristics

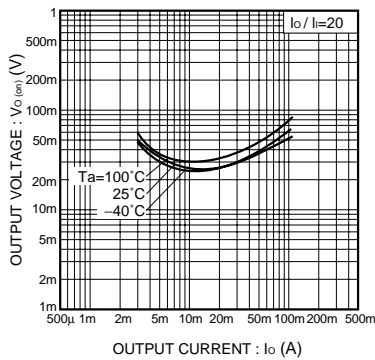


Fig.4 Output voltage vs. output current characteristics

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