

-500mA / -50V Digital transistors (with built-in resistors)

DTB113ZK

● Applications

Inverter, Interface, Driver

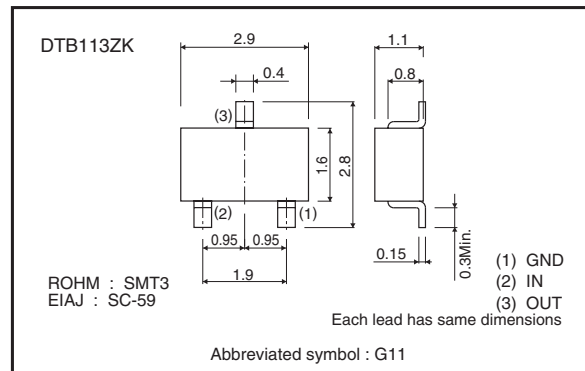
● Feature

- 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.

● Structure

PNP epitaxial planar silicon transistor
 (Resistor built-in type)

● Dimensions (Unit : mm)



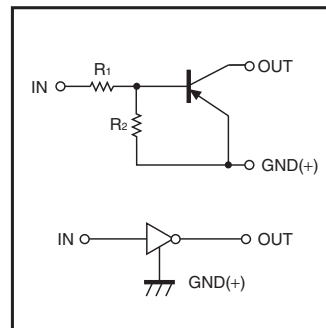
● Packaging specifications

Part No.	Package	SMT3
	Packaging type	Taping
	Code	T146
	Basic ordering unit (pieces)	3000
DTB113ZK		

● Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
		DTB113ZK	
Supply voltage	V_{CC}	-50	V
Input voltage	V_{IN}	-10 to +5	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

● Inner circuit



$R_1=1.0k\Omega$, $R_2=10k\Omega$

● Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	—	—	-0.3	V	$V_{CC} = -5V, I_o = -100\mu A$
	$V_{I(on)}$	-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	—	—	-7.2	mA	$V_i = -5V$
Output current	$I_o(off)$	—	—	-0.5	μA	$V_{CC} = -50V, V_i = 0V$
DC current gain	G_i	56	—	—	—	$V_o = -5V, I_o = -50mA$
Input resistance	R_i	0.7	1	1.3	$k\Omega$	—
Resistance ratio	R_2/R_1	8	10	12	—	—
Transition frequency	f_T *	—	200	—	MHz	$V_{CE} = -10V, I_E = 50mA, f = 100MHz$

* Characteristics of built-in transistor

● Electrical characteristics curves

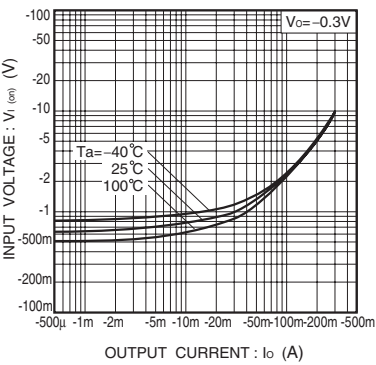


Fig.1 Input voltage vs. output current (ON characteristics)

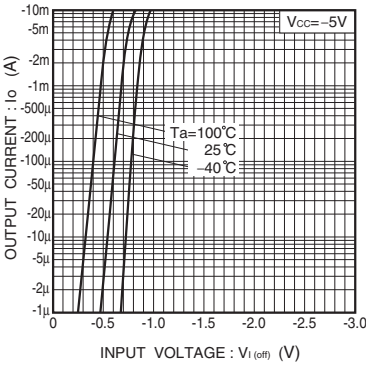


Fig.2 Output current vs. input voltage (OFF characteristics)

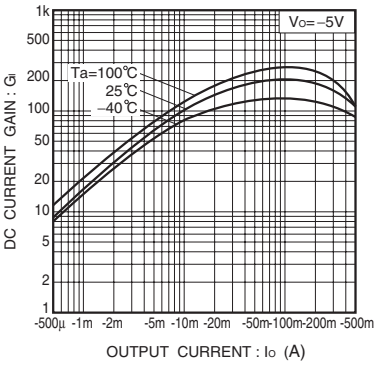


Fig.3 DC current gain vs. output current

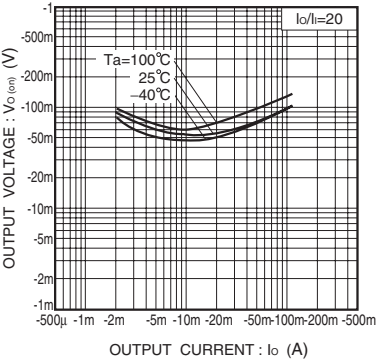


Fig.4 Output voltage vs. output current

Notes

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