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

DTD113ZK / DTD113ZU

● Applications
Inverter, Interface, Driver

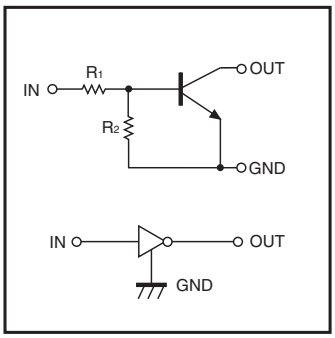
● Features
1) Built-in bias resistors enable theconfiguration of an inverter circuit without connecting external input resistors (see equivalent circuit).
2) The bias resistors consist of thin-film resistors negative biasing of the input. They also have the advantage of almost completely eliminating parasitic effects.
3) Only the on/off conditions need to be set for operation, making the device design easy.

● Structure
NPN epitaxial planar silicon transistor
(Resistor built-in type)

● Packaging specifications

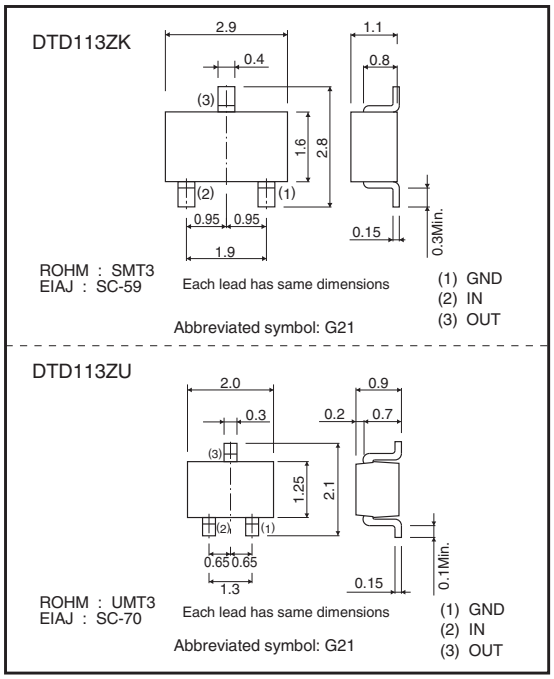
	Package	SMT3	UMT3
	Packaging type	Taping	Taping
	Code	T146	T106
Part No.	Basic ordering unit (pieces)	3000	3000
DTD113ZK		○	–
DTD113ZU		–	○

● Equivalent circuit



R_1=1.0kΩ, R_2=10kΩ

● Dimensions (Unit : mm)



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

Parameter	Symbol	Limits		Unit
		DTD113ZU	DTD113ZK	
Supply voltage	V_{CC}	50		V
Input voltage	V_{IN}	−5 to +10		V
Output current	I_C	500		mA
Power dissipation	P_D	200		mW
Junction temperature	Tj	150		°C
Storage temperature	Tstg	−55 to +150		°C

● **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=100μA
	$V_{I(on)}$	1.5	−	−		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	82	−	−	−	V_O=5V, I_O=50mA
Input resistance	R_1	0.7	1	1.3	kΩ	−
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 characteristic curves

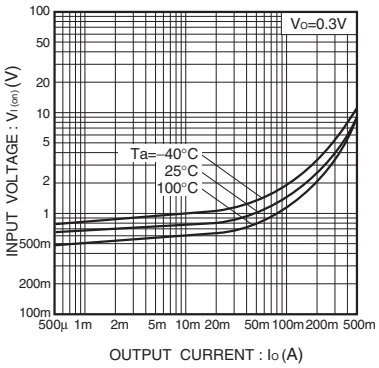


Fig.1 Input voltage vs. output current (ON characteristics)

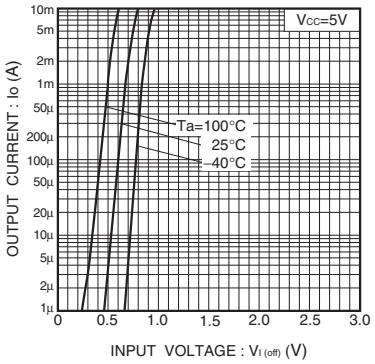


Fig.2 Output current vs. input voltage (OFF characteristics)

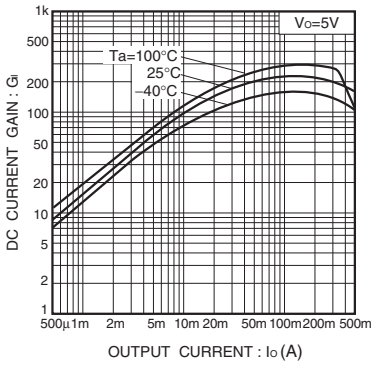


Fig. 3 DC current gain vs. output current

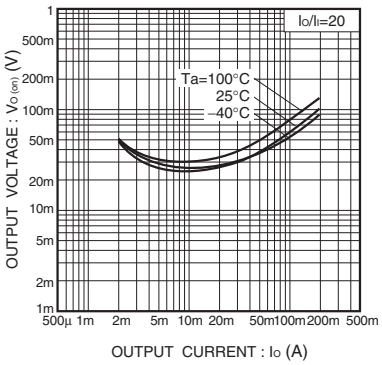


Fig.4 Output voltage vs. output current

Notes

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