

500mA / 50V Digital transistors

(with built-in resistors)

DTD113ZK / DTD113ZU

● 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 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.

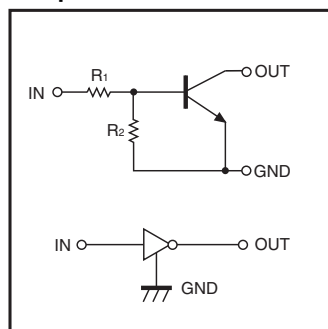
● Structure

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

● Packaging specifications

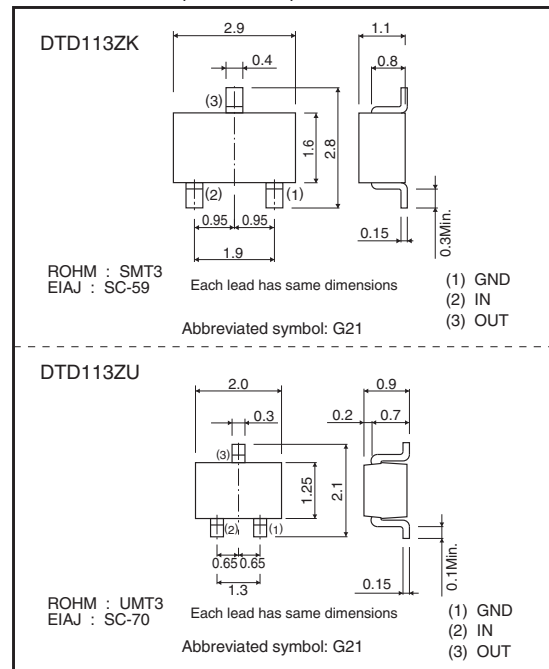
Part No.	Package	SMT3	UMT3
	Packaging type	Taping	Taping
	Code	T146	T106
	Basic ordering unit (pieces)	3000	3000
DTD113ZK		○	—
DTD113ZU		—	○

● Equivalent circuit



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

● 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	T _J	150		°C
Storage temperature	T _{stg}	-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 _I	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

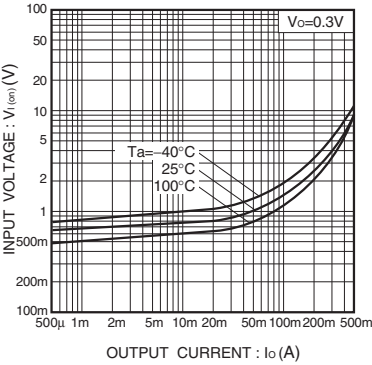


Fig.1 Input voltage vs. output current (ON characteristics)

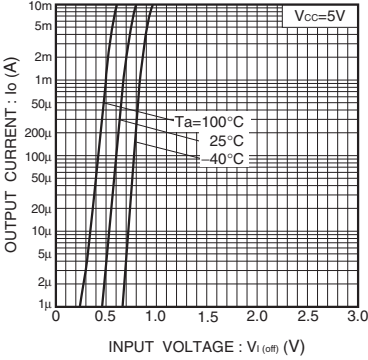


Fig.2 Output current vs. input voltage (OFF characteristics)

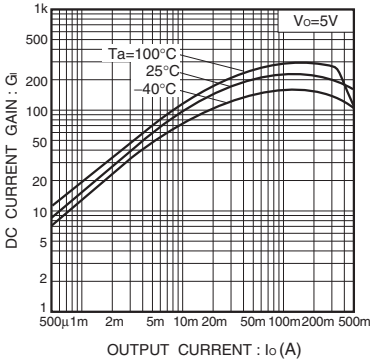


Fig. 3 DC current gain vs. output current

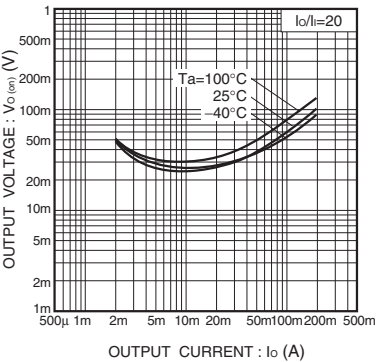


Fig.4 Output voltage vs. output current

Notes

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