

Digital transistors (built-in resistors)

DTD113ZK / DTD113ZU / DTD113ZS

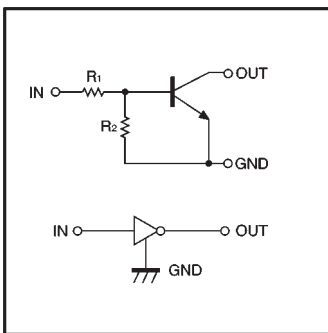
●Features

- 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 with complete isolation to allow 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 device design easy.

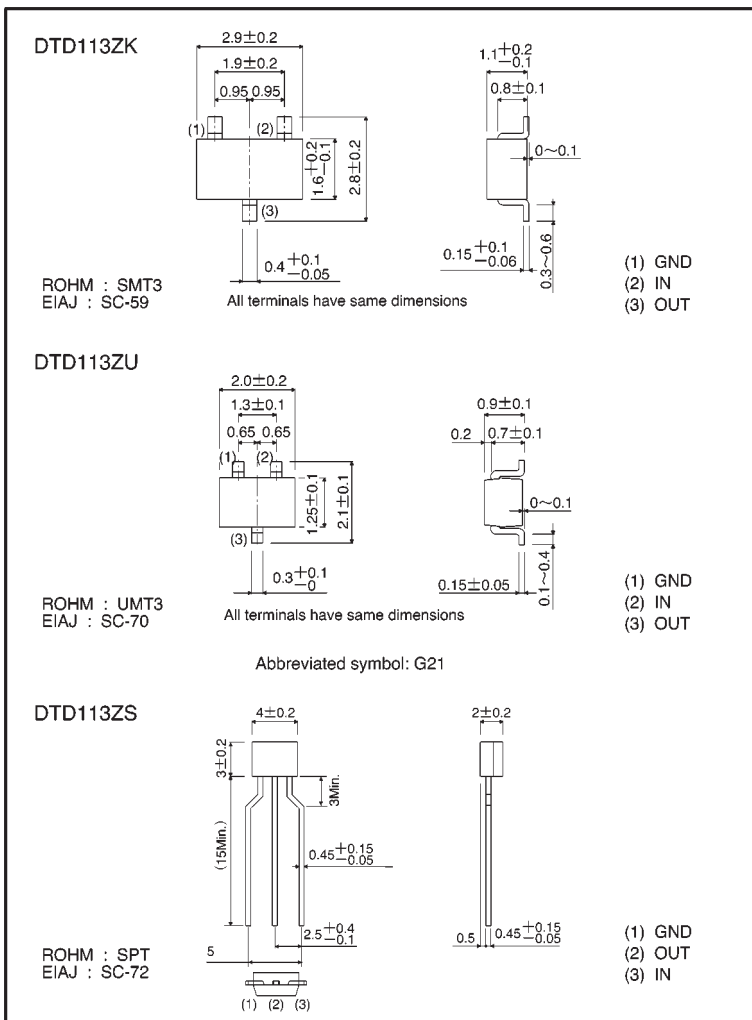
●Structure

NPN digital transistor
(Built-in resistor type)

●Equivalent circuit



●External dimensions (Units: mm)



●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits(DTD113Z□)			Unit
		U	K	S	
Supply voltage	V _{CC}	50			V
Input voltage	V _{IN}	-5~+10			V
Output current	I _o	500			mA
Power dissipation	P _d	200	300		mW
Junction temperature	T _j	150			°C
Storage temperature	T _{stg}	-55~+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 =100 μA
	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	kΩ	—
Resistance ratio	R ₂ /R ₁	8	10	12	—	—
Transition frequency	f _r	—	200	—	MHz	V _{CE} =10V, I _E =-5mA, f=100MHz *

* Transition frequency of the device

●Packaging specifications

Part No.	Package	SMT3	UMT3	SPT
	Package type	Taping	Taping	Taping
	Code	T146	T106	TP
	Basic ordering unit (pieces)	3000	3000	5000
DTD113ZK		○	—	—
DTD113ZU		—	○	—
DTD113ZS		—	—	○

●Electrical characteristic curves

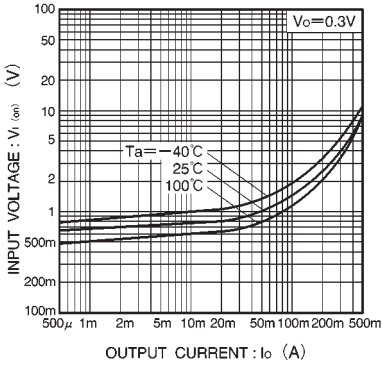


Fig.1 Input voltage vs. output current (ON characteristics)

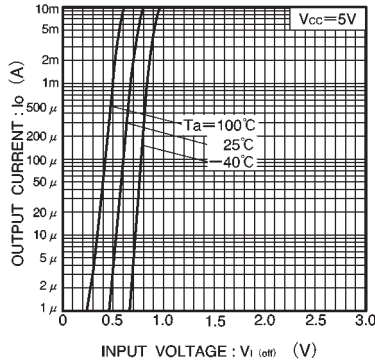


Fig.2 Output current vs. input voltage (OFF characteristics)

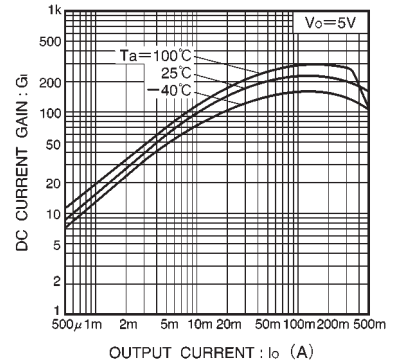


Fig. 3 DC current gain vs. output current

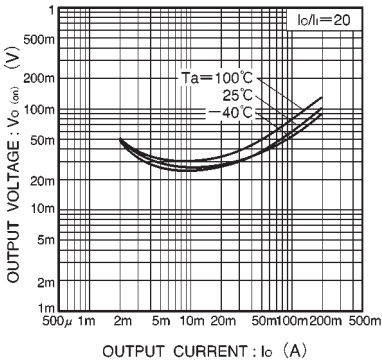


Fig.4 Output voltage vs. output current