

Transistors

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

DTD113ZK / DTD113ZU / DTD113ZS

●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.

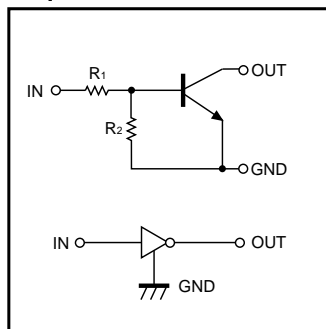
●Structure

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

●Packaging specifications

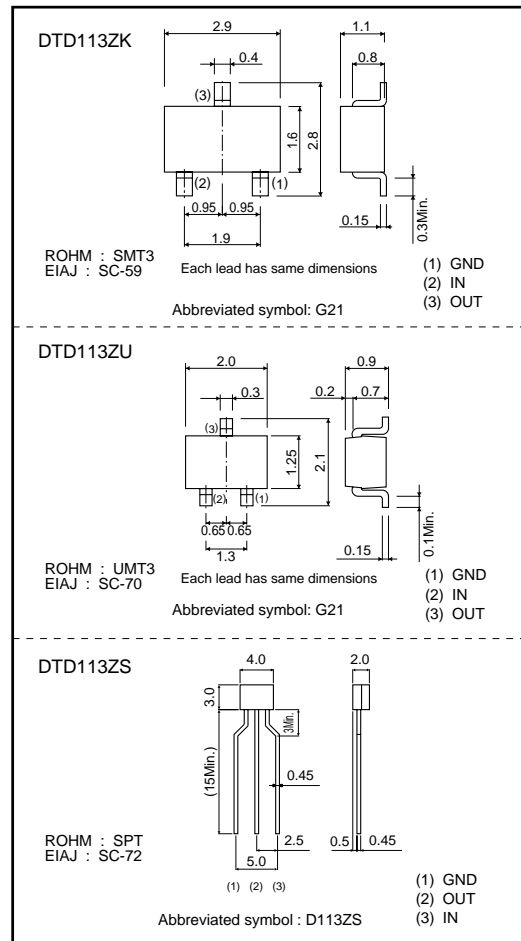
Package	SMT3	UMT3	SPT
Packaging type	Taping	Taping	Taping
Code	T146	T106	TP
Part No.	Basic ordering unit (pieces)		
DTD113ZK	3000	3000	5000
DTD113ZU	—	—	—
DTD113ZS	—	—	—

●Equivalent circuit



R1=1.0kΩ, R2=10kΩ

●External dimensions (Unit : mm)



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Transistors

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits			Unit
		DTD113ZU	DTD113ZK	DTD113ZS	
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		300	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

Transistors

●Electrical characteristic curves

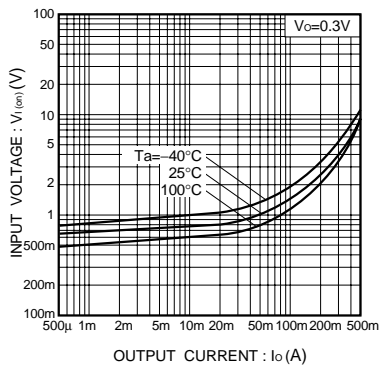


Fig.1 Input voltage vs. output current (ON characteristics)

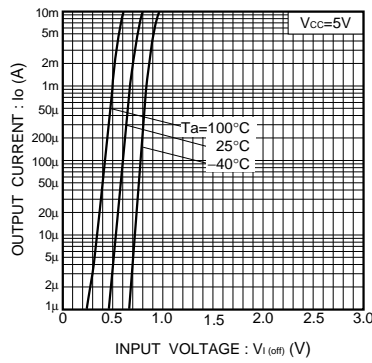


Fig.2 Output current vs. input voltage (OFF characteristics)

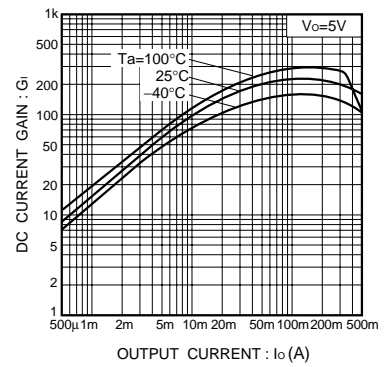


Fig. 3 DC current gain vs. output current

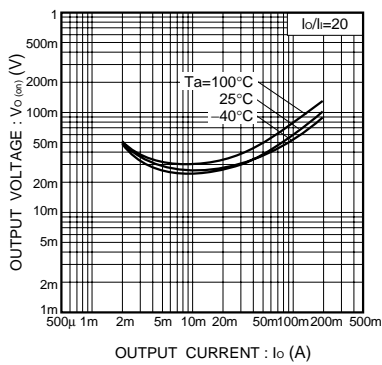


Fig.4 Output voltage vs. output current

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