# 100mA / 50V Digital transistors (with built-in resistors) DTC113ZUA / DTC113ZKA / DTC113ZSA

#### Applications

Inverter, Interface, Driver

#### Features

- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
- Each bias resistor is a thin-film resistor. Since they are completely insulated, the input can be negatively biased. The insulation also eliminates most of the parasitic effects.
- 3) Only the on / off conditions need to be set for operation, making the device design easy.

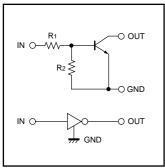
#### Structure

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

## Packaging specifications

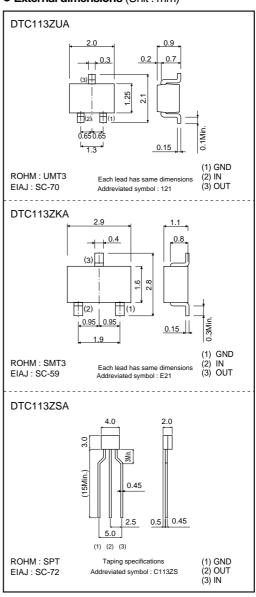
	Package	UMT3	SMT3	SPT
	Packaging type	Taping	Taping	Taping
	Code	T106	T146	TP
Part No.	Basic ordering unit (pieces)	3000	3000	5000
DTC113ZUA		0	-	_
DTC113ZKA		_	0	-
DTC113ZSA		-	1	0

## ●Equivalent circuit



R<sub>1</sub>=1.0kΩ, R<sub>2</sub>=10kΩ

#### • External dimensions (Unit: mm)



# ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits			Unit
raiametei		DTC113ZUA DTC113ZKA DTC113ZSA			
Supply voltage	Vcc	50			V
Input voltage	Vin	−5 to +10			V
Output ourrent	lo	100		mA	
Output current	IC(Max.)	100			
Power dissipation	Po	20	200 300		mW
Junction temperature	Tj	150		°C	
Storage temperature	Tstg	-55 to +150		°C	

# ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
lanut valtara	VI(off)	-	-	0.3	.,	Vcc=5V, Io=100μA
Input voltage	V <sub>I(on)</sub>	3	_	-	V	Vo=0.3V, Io=20mA
Output voltage	VO(on)	-	0.1	0.3	V	lo/l⊫10mA/0.5mA
Input current	lı .	-	_	7.2	mA	Vi=5V
Output current	IO(off)	-	-	0.5	μА	Vcc=50V, Vi=0V
DC current gain	Gı	33	-	-	-	Vo=5V, Io=5mA
Input resistance	R <sub>1</sub>	0.7	1	1.3	kΩ	_
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>	8	10	12	-	_
Transition frequency	f⊤ *	_	250	_	MHz	Vce=10V, Ie= -5mA, f=100MHz

<sup>\*</sup> Characteristics of built-in transistor

#### •Electrical characteristic curves

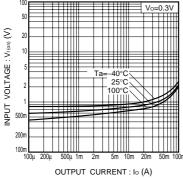


Fig.1 Input voltage vs. output current (ON characteristics)

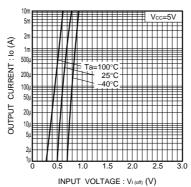


Fig.2 Output current vs. input voltage (OFF characteristics)

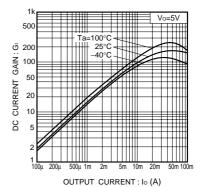


Fig.3 DC current gain vs. output current

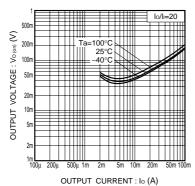


Fig.4 Output voltage vs. output current

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