

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

**DTC113ZUA / DTC113ZKA**

● **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) 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)

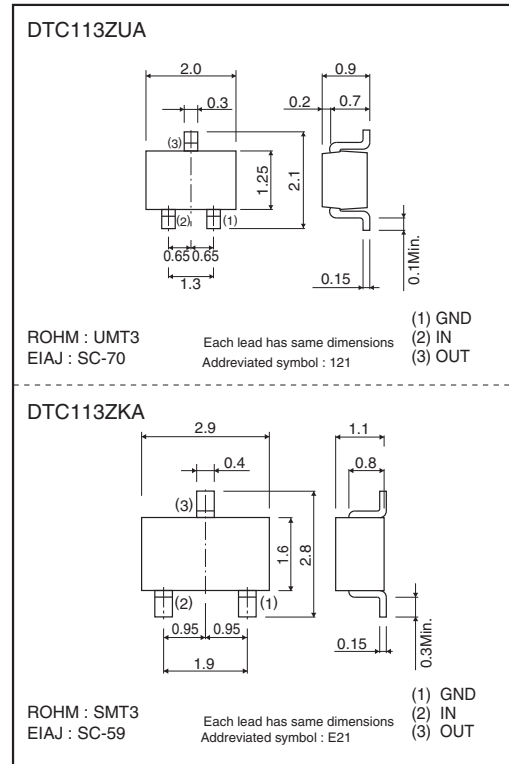
● **Packaging specifications**

Part No.	Package	UMT3	SMT3
	Packaging type	Taping	Taping
	Code	T106	T146
	Basic ordering unit (pieces)	3000	3000
DTC113ZUA		○	-
DTC113ZKA		-	○

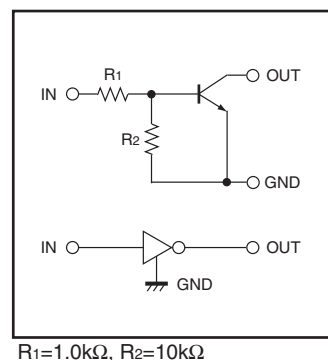
● **Absolute maximum ratings (Ta=25°C)**

Parameter	Symbol	Limits		Unit
		DTC113ZUA	DTC113ZKA	
Supply voltage	V <sub>CC</sub>	50		V
Input voltage	V <sub>IN</sub>	-5 to +10		V
Output current	I <sub>O</sub>	100		mA
	I <sub>C(Max.)</sub>	100		
Power dissipation	P <sub>D</sub>	200		mW
Junction temperature	T <sub>J</sub>	150		°C
Storage temperature	T <sub>stg</sub>	-55 to +150		°C

● **Dimensions (Unit : mm)**



● **Inner circuit**



● Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	-	-	0.3	V	$V_{CC}=5V, I_o=100\mu A$
	$V_{I(on)}$	3	-	-		$V_o=0.3V, I_o=20mA$
Output voltage	$V_{O(on)}$	-	0.1	0.3	V	$I_o/I_i=10mA/0.5mA$
Input current	$I_i$	-	-	7.2	mA	$V_i=5V$
Output current	$I_{O(off)}$	-	-	0.5	$\mu A$	$V_{CC}=50V, V_i=0V$
DC current gain	$G_i$	33	-	-	-	$V_o=5V, I_o=5mA$
Input resistance	$R_i$	0.7	1	1.3	$k\Omega$	-
Resistance ratio	$R_2/R_1$	8	10	12	-	-
Transition frequency	$f_T$ *	-	250	-	MHz	$V_{CE}=10V, I_E=-5mA, f=100MHz$

\* Characteristics of built-in transistor

● Electrical characteristic curves

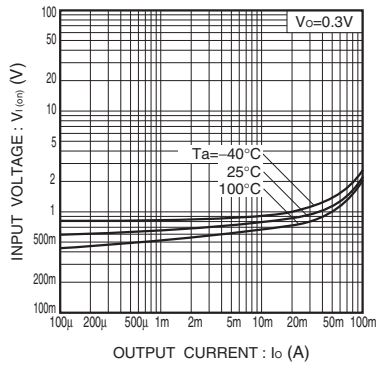


Fig.1 Input voltage vs. output current (ON characteristics)

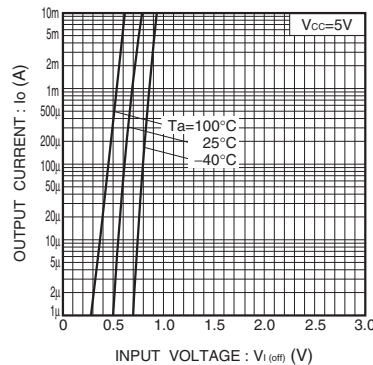


Fig.2 Output current vs. input voltage (OFF characteristics)

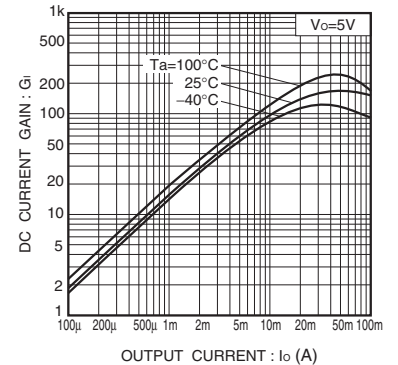


Fig.3 DC current gain vs. output current

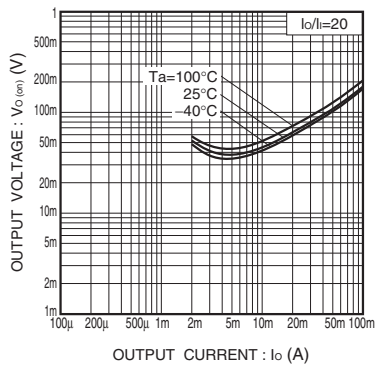


Fig.4 Output voltage vs. output current

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