# 100mA / 50V Digital transistor (with built-in resistors) DTC144VUA / DTC144VKA

# Applications

Inverter, Interface, Driver

#### Features

- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors.
- The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input, and parasitic effects are almost completely eliminated.
- 3) Only the on / off conditions need to be set for operation, making the device design easy.
- 4) Higher mounting densities can be achieved.

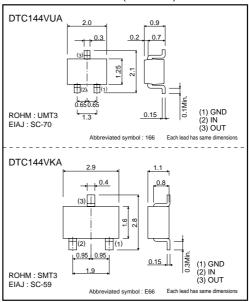
#### Structure

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

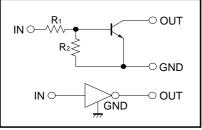
# Packaging specifications

	Package	UMT3	SMT3	
	Packaging type	Taping	Taping	
	Code	T106	T146	
Part No.	Basic ordering unit (pieces)	3000	3000	
DTC144VUA	0	_		
DTC144VKA		_	0	

## ●External dimensions (Unit : mm)



# ●Equivalent circuit



 $R_1=47k\Omega$ ,  $R_2=10k\Omega$ 

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

Parameter	Symbol	Limits	Unit	
Supply voltage	Vcc	50	V	
Input voltage	Vin	-10 to +40	V	
Output curren	lo	30	mA	
Output curren	IC(Max.)	100		
Power dissipation	PD	200	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
Input voltage	VI(off)	_	-	1	V	Vcc=5V , Io=100μA
	VI(on)	6	_	_		Vo=0.3V , Io=2mA
Output voltage	Vo(on)	_	0.1	0.3	V	Io=10mA , I⊫0.5mA
Input current	lı	_	_	0.16	mA	Vi=5V
Output current	IO(off)	_	_	0.5	μΑ	Vcc=50V , V⊫0V
DC current gain	Gı	33	_	_	_	Io=5mA , Vo=5V
Input resistance	R <sub>1</sub>	32.9	47	61.1	kΩ	-
Resistance ratio	R2/R1	0.17	0.21	0.26	_	-
Transition frequency	f⊤*	_	250	_	MHz	Vc=10V , I=-5mA , f=100MHz

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

#### ●Electrical characteristic curves

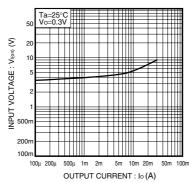


Fig.1 Input voltage vs. Output current (ON characteristics)

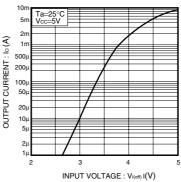


Fig.2 Output current vs. Input voltage (OFF characteristics)

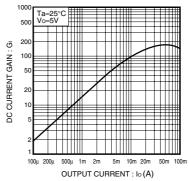


Fig.3 DC current gain vs. Output current

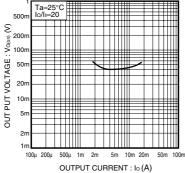


Fig.4 Output voltage vs. Output current

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