

# 100mA / 50V Digital transistors

## (with built-in resistors)

#### DTC114EB / DTC114EM / DTC114EE / DTC114EUA / DTC114EKA

#### Applications

Inverter, Interface, Driver

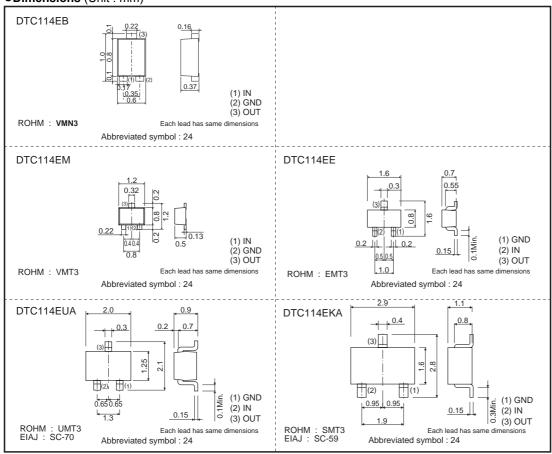
#### Features

- 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 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 the device design easy.

#### Structure

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

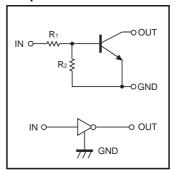
#### ●Dimensions (Unit: mm)



#### Packaging specifications

Package		VMN3 VMT3		EMT3	UMT3	SMT3		
	Packaging type	Taping	Taping	Taping	Taping	Taping		
	Code	T2L	T2L	TL	T106	T146		
Part No.	Basic ordering unit (pieces)	8000	8000	3000	3000	3000		
DTC114EB		0				_		
DTC114EM		_	0	-	-	_		
DTC114EE		_	_	0	_	_		
DTC114EUA		_	_	-	0	_		
DTC114EKA		_	ı	-	_	0		

#### ●Equivalent circuit



 $R_1=R_2=10k\Omega$ 

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

Barrantan	Symbol	Limits					11.2
Parameter		DTC114EB	DTC114EM	DTC114EE	DTC114EUA	DTC114EKA	Unit
Supply voltage	Vcc	50			V		
Input voltage	-10 to +40				V		
Output aumant	lo	50					mA
Output current	IC(Max.)	100					
Power dissipation	Po	150 200		00	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
lanutualtana	VI(off)	-	_	0.5	.,	Vcc=5V, Io=100μA
Input voltage	V <sub>I(on)</sub>	3	_	-	V	Vo=0.3V, Io=10mA
Output voltage	V <sub>O(on)</sub>	-	0.1	0.3	V	Io/I=10mA/0.5mA
Input current	lı .	-	-	0.88	mA	V=5V
Output current	IO(off)	-	-	0.5	μА	Vcc=50V, Vi=0V
DC current gain	Gı	30	-	-	-	Vo=5V, Io=5mA
Input resistance	R <sub>1</sub>	7	10	13	kΩ	_
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>	0.8	1	1.2	-	-
Transition frequency	f⊤ *	-	250	_	MHz	Vce=10V, Ie=-5mA, f=100MHz

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

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#### •Electrical characteristic curves

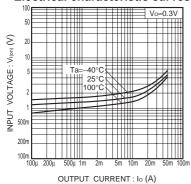


Fig.1 Input voltage vs. output current (ON characteristics)

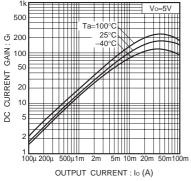


Fig.3 DC current gain vs. output

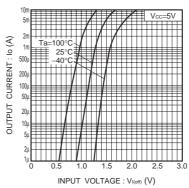


Fig.2 Output current vs. input voltage (OFF characteristics)

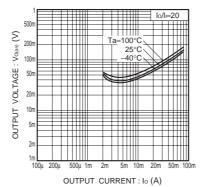


Fig.4 Output voltage vs. output

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