

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

## DTC114WE/DTC114WUA/DTC114WKA/DTC114WSA

### ●Applications

Inverter, Interface, Driver

### ●Features

- 1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors.
- 2) 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.

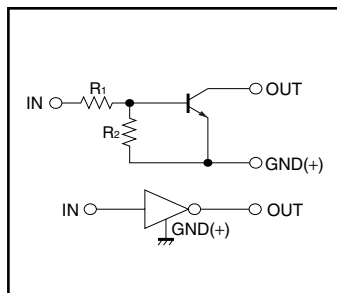
### ●Structure

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

### ●Packaging specifications

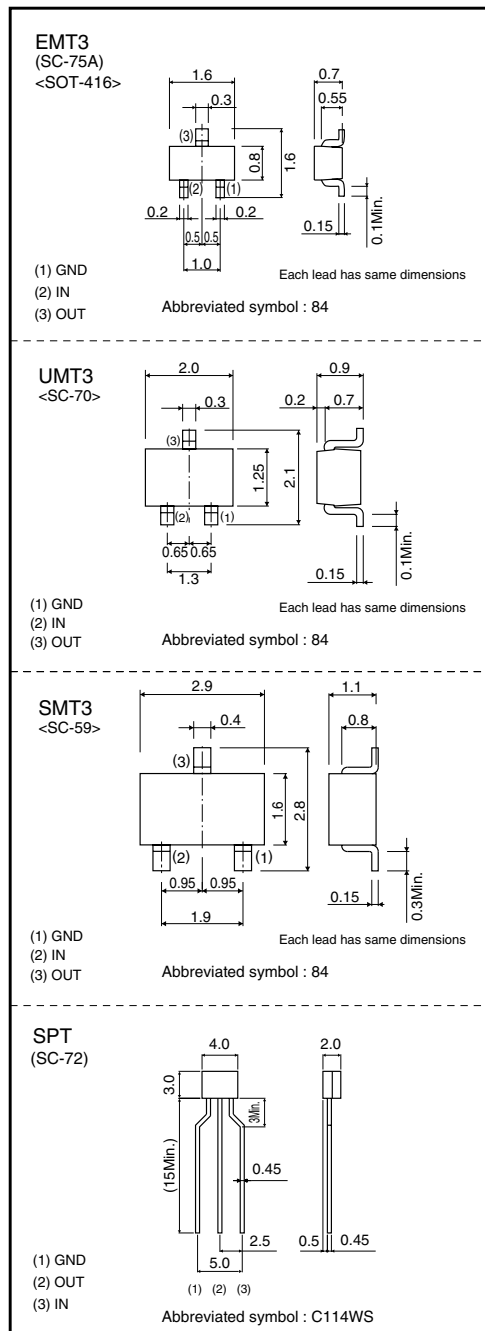
Part No.	Package	EMT3	UMT3	SMT3	SPT
		EMT3 (SC-75A) <SOT-416>	UMT3 <SC-70>	SMT3 <SC-59>	SPT (SC-72)
	Package	EMT3	UMT3	SMT3	SPT
	Packaging type	Taping	Taping	Taping	Taping
	Code	TL	T106	T146	TP
	Basic ordering unit (pieces)	3000	3000	3000	5000
DTC114WE		○	—	—	—
DTC114WUA		—	○	—	—
DTC114WKA		—	—	○	—
DTC114WSA		—	—	—	○

### ●Equivalent circuit



R<sub>1</sub>=10kΩ / R<sub>2</sub>=4.7kΩ

### ●External dimensions (Unit : mm)



# DTC114WE / DTC114WUA / DTC114WKA / DTC114WSA

## Transistors

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

Parameter		Symbol	Limits	Unit
Supply voltage		V <sub>CC</sub>	50	V
Input voltage		V <sub>I</sub>	-10 to +30	V
Output current		I <sub>O</sub>	100	mA
		I <sub>C(Max.)</sub>	100	
Power dissipation	DTC114WE	P <sub>D</sub>	150*	mW
	DTC114WUA / DTC114WKA		200*	
	DTC114WSA		300*	
Junction temperature		T <sub>j</sub>	150	°C
Storage temperature		T <sub>stg</sub>	-55 to +150	°C

\* When mounted on the recommended land

### ●External characteristics (Unit: mm)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	V <sub>I(off)</sub>	-	-	0.8	V	V <sub>CC</sub> =5V, I <sub>O</sub> =100μA
	V <sub>I(on)</sub>	3	-	-		V <sub>O</sub> =0.3V, I <sub>O</sub> =2mA
Output voltage	V <sub>O(on)</sub>	-	0.1	0.3	V	I <sub>O</sub> =10mA, I <sub>I</sub> =0.5mA
Input current	I <sub>I</sub>	-	-	0.88	mA	V <sub>I</sub> =5V
Output current	I <sub>O(off)</sub>	-	-	0.5	μA	V <sub>CC</sub> =50V, V <sub>I</sub> =0V
DC current gain	G <sub>I</sub>	24	-	-	-	I <sub>O</sub> =10mA, V <sub>O</sub> =5V
Input resistance	R <sub>1</sub>	7	10	13	kΩ	-
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>	0.37	0.47	0.57	-	-
Transition frequency	f <sub>T</sub> *	-	250	-	MHz	V <sub>CE</sub> =10V, I <sub>E</sub> =-5mA, f=100MHz

\* Characteristics of built-in transistor

Transistors

●Electrical characteristics curves

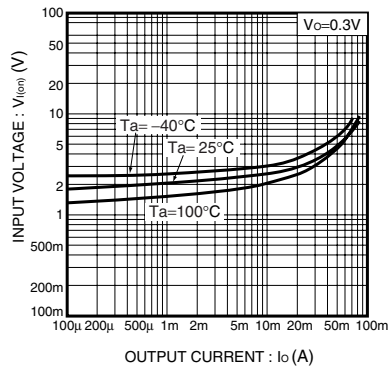


Fig.1 Input voltage vs. Output current (ON characteristics)

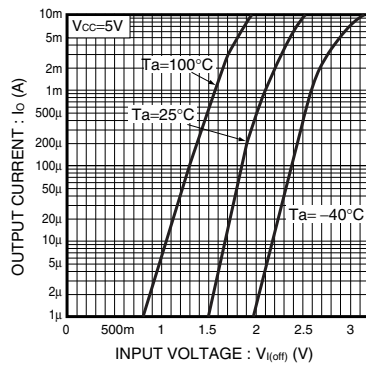


Fig.2 Output current vs. Input voltage (OFF characteristics)

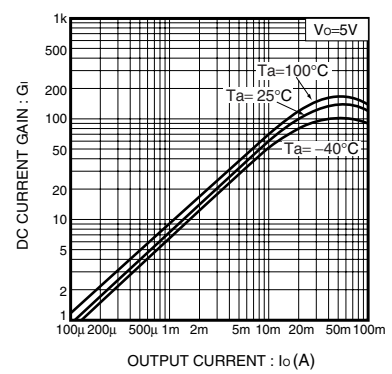


Fig.3 DC current gain vs. Output current

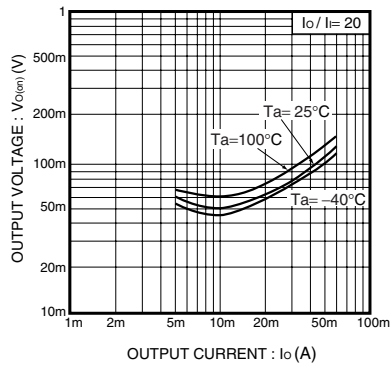


Fig.4 Output voltage vs. Output current

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