

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

## DTC143XUB

### ●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 silicon epitaxial planar transistor type  
(Resistor built-in)

### ●Packaging specifications

	Package	UMT3F
	Packaging type	Taping
	Code	TL
Part No.	Basic ordering unit (pieces)	3000
DTC143XUB		○

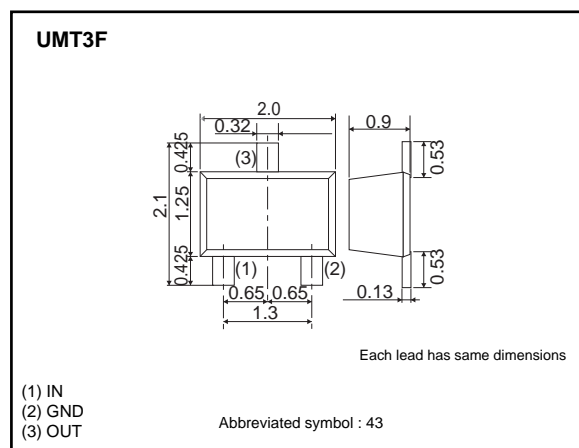
### ●Absolute maximum ratings (T<sub>a</sub>=25°C)

Parameter	Symbol	Limits	Unit
Supply voltage	V <sub>CC</sub>	50	V
Input voltage	V <sub>IN</sub>	-7 to +20	V
Collector current	I <sub>C(max)</sub> <sup>*1</sup>	100	mA
Output current	I <sub>O</sub>	100	mA
Power dissipation	P <sub>D</sub> <sup>*2</sup>	200	mW
Junction temperature	T <sub>J</sub>	150	°C
Range of storage temperature	T <sub>stg</sub>	-55 to +150	°C

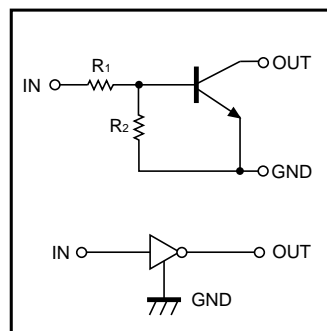
\*1 Characteristics of built-in transistor

\*2 Each terminal mounted on a recommended land

### ●Dimensions (Unit : mm)



### ●Equivalent circuit



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

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	-	-	0.3	V	$V_{CC}=5V, I_o=100\mu A$
	$V_{I(on)}$	2.5	-	-		$V_o=0.3V, I_o=20mA$
Output voltage	$V_{O(on)}$	-	100	300	mV	$I_o=10mA, I_i=0.5mA$
Input current	$I_i$	-	-	1.8	mA	$V_i=5V$
Output current	$I_{O(off)}$	-	-	500	nA	$V_{CC}=50V, V_i=0V$
DC current gain	$G_i$	30	-	-	-	$V_o=5V, I_o=10mA$
Transition frequency	$f_T$ *	-	250	-	MHz	$V_{CE}=10V, I_E=-5mA, f=100MHz$
Input resistance	$R_1$	3.29	4.7	6.11	kΩ	-
Resistance ratio	$R_2/R_1$	1.7	2.1	2.6	-	-

\* Characteristics of built-in transistor

●Electrical characteristic curves

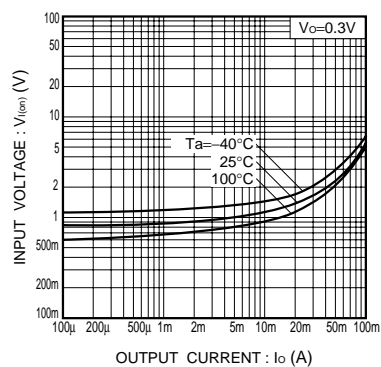


Fig.1 Input voltage vs. output current (ON characteristics)

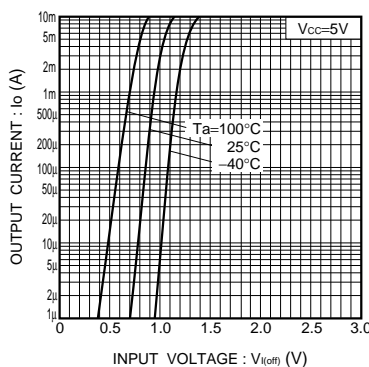


Fig.2 Output current vs. input voltage (OFF characteristics)

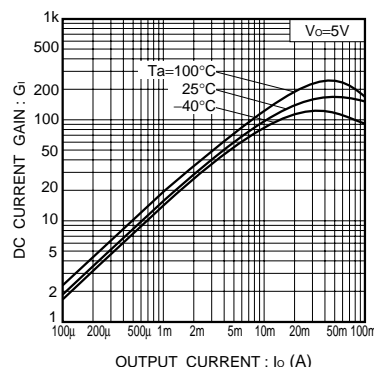


Fig.3 DC current gain vs. output current

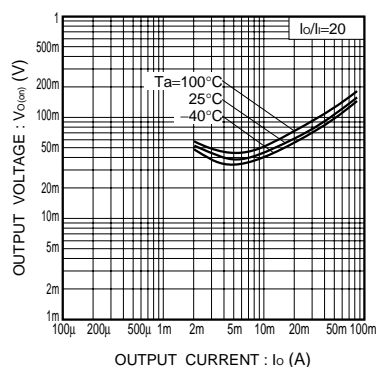


Fig.4 Output voltage vs. output current

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