

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.

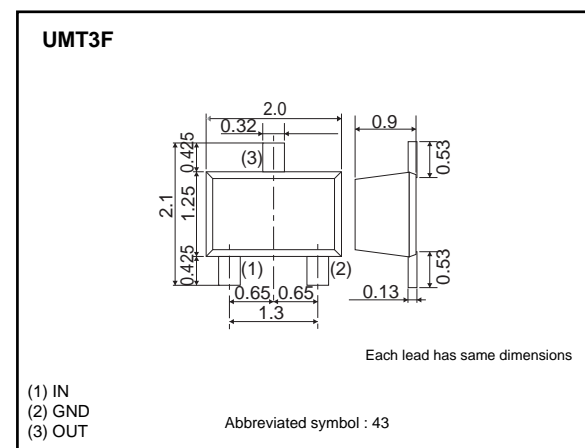
●Structure

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

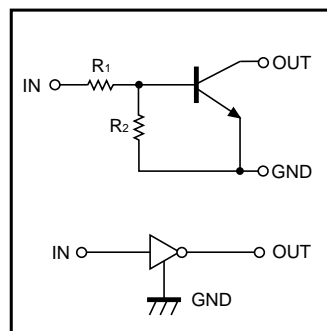
●Packaging specifications

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

●Dimensions (Unit : mm)



●Equivalent circuit



$R_1=4.7k\Omega$, $R_2=10k\Omega$

●Absolute maximum ratings ($T_a=25^\circ\text{C}$)

Parameter	Symbol	Limits	Unit
Supply voltage	V_{CC}	50	V
Input voltage	V_{IN}	-7 to +20	V
Collector current	$I_{C(max)}^{*1}$	100	mA
Output current	I_O	100	mA
Power dissipation	P_D^{*2}	200	mW
Junction temperature	T_J	150	$^\circ\text{C}$
Range of storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

*1 Characteristics of built-in transistor

*2 Each terminal mounted on a recommended land

●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_i	3.29	4.7	6.11	$k\Omega$	—
Resistance ratio	R_2/R_1	1.7	2.1	2.6	—	—

* Characteristics of built-in transistor

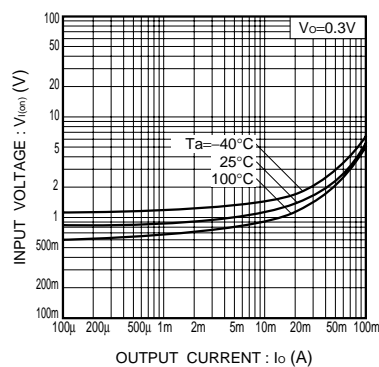
●Electrical characteristic curves


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

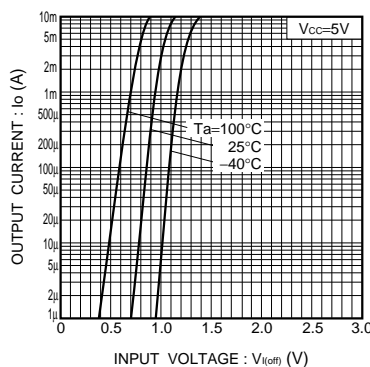


Fig.2 Output current vs. input voltage (OFF characteristics)

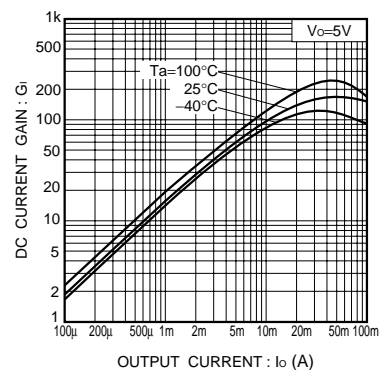


Fig.3 DC current gain vs. output current

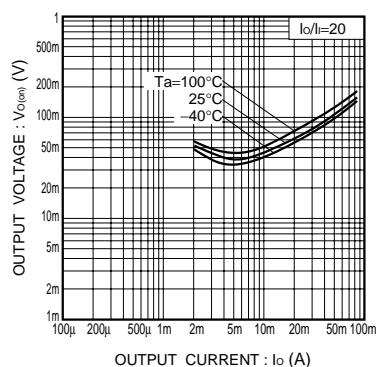


Fig.4 Output voltage vs. output current

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