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

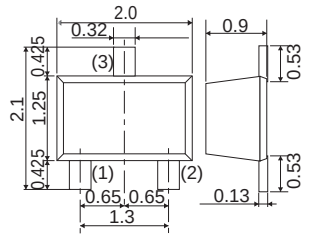
DTC143ZUB

●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.

●Dimensions (Unit : mm)

UMT3F



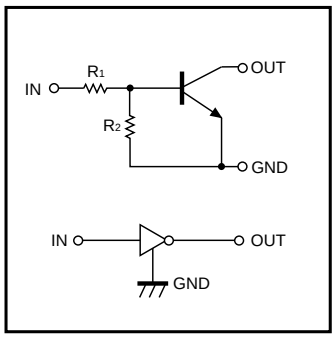
Each lead has same dimensions

(1) IN
(2) GND
(3) OUT

Abbreviated symbol : 123

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

●Equivalent circuit



R1=4.7kΩ, R2=47kΩ

●Packaging specifications

Part No.	Package	UMT3F
	Packaging type	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
DTC143ZUB		○

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Supply voltage	V_{CC}	50	V
Input voltage	V_{IN}	–5 to +30	V
Collector current	Ic(max)*1	100	mA
Output current	Io	100	mA
Power dissipation	P_D*2	200	mW
Junction temperature	Tj	150	°C
Range of storage temperature	Tstg	–55 to +150	°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	$V_{I(off)}$	–	–	0.5	V	V_{CC}=5V, I_O=100μA
	$V_{I(on)}$	1.3	–	–		V_O=0.3V, I_O=5mA
Output voltage	$V_{O(on)}$	–	100	300	mV	I_O=5mA, I_I=0.25mA
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	80	–	–	–	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	8	10	12	–	–

* Characteristics of built-in transistor

●**Electrical characteristic curves**

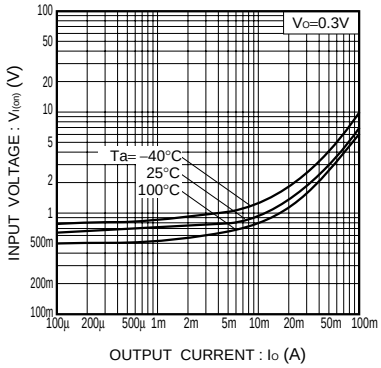


Fig.1 Input voltage vs. output current (ON characteristics)

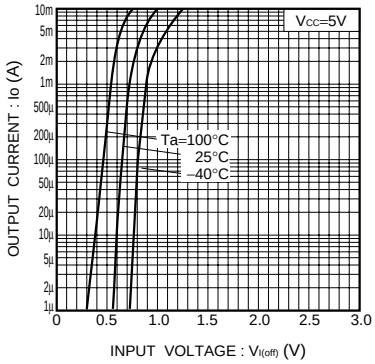


Fig.2 Output current vs. input voltage (OFF characteristics)

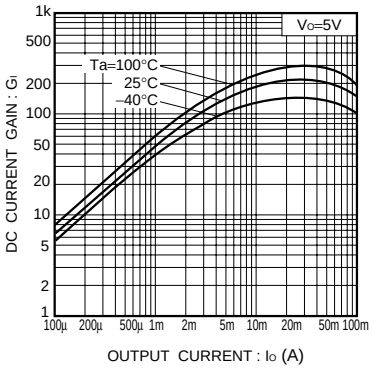


Fig.3 DC current gain vs. output current

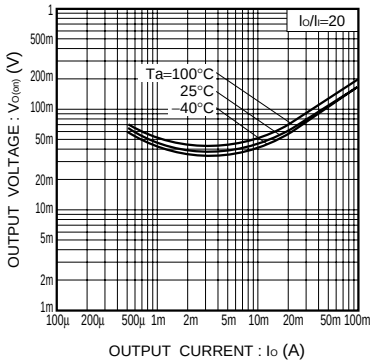


Fig.4 Output voltage vs. output current

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