

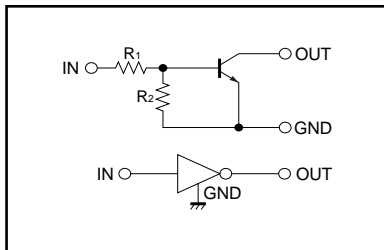
# Digital transistors (built-in resistors)

## DTC144WE/DTC144WUA/DTC144WKA/DTC144WSA

### ●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 device design easy.
- 4) Higher mounting densities can be achieved.

### ●Circuit schematic



### ●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 +40	V
Output current		I <sub>O</sub>	30	mA
		I <sub>C(Max.)</sub>	100	
Power dissipation	DTC144WE	P <sub>d</sub>	150	mW
	DTC144WUA / DTC144WKA		200	
	DTC144WSA		300	
Junction temperature		T <sub>j</sub>	150	°C
Storage temperature		T <sub>stg</sub>	-55 to +150	°C

### ●Package, marking, and packaging specifications

Part No.	DTC144WE	DTC144WUA	DTC144WKA	DTC144WSA
Package	EMT3	UMT3	SMT3	SPT
Marking	86	86	86	-
Packaging code	TL	T106	T146	TP
Basic ordering unit (pieces)	3000	3000	3000	5000

# DTC144WE / DTC144WUA / DTC144WKA / DTC144WSA

## Transistors

### ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	–	–	0.8	V	$V_{CC}=5V, I_o=100\mu A$
	$V_{I(on)}$	4	–	–		$V_o=0.3V, I_o=2mA$
Output voltage	$V_{O(on)}$	–	0.1	0.3	V	$I_o=10mA, I_i=0.5mA$
Input current	$I_i$	–	–	0.16	mA	$V_i=5V$
Output current	$I_{O(off)}$	–	–	0.5	$\mu A$	$V_{CC}=50V, V_i=0V$
DC current gain	$G_i$	56	–	–	–	$I_o=5mA, V_o=5V$
Input resistance	$R_i$	32.9	47	61.1	$k\Omega$	–
Resistance ratio	$R_2/R_1$	0.37	0.47	0.57	–	–
Transition frequency	$f_r$	–	250	–	MHz	$V_{CE}=10V, I_E=-5mA, f=100MHz$ *

\* Transition frequency of the device.

### ●Electrical characteristics curves

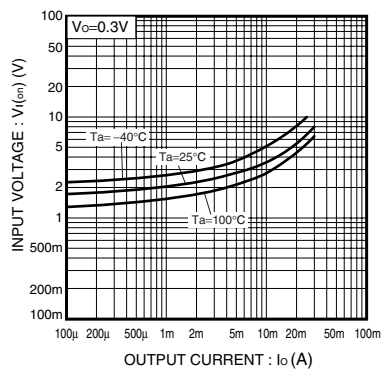


Fig.1 Input voltage vs. Output current (ON characteristics)

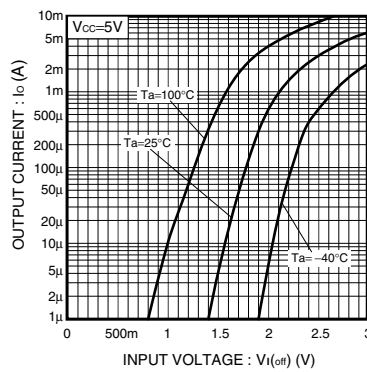


Fig.2 Output current vs. Input voltage (OFF characteristics)

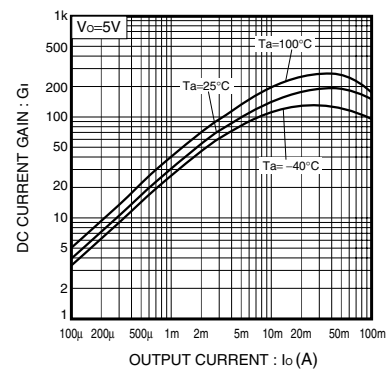


Fig.3 DC current gain vs. Output current

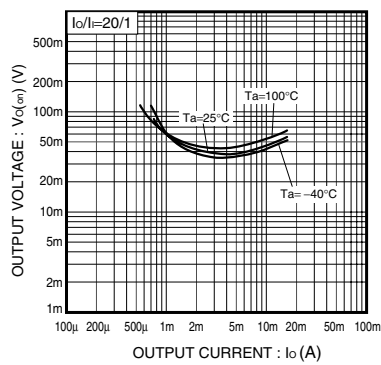


Fig.4 Output voltage vs. Output current

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