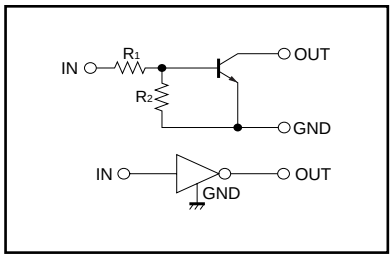
Digital transistors (built-in resistors)

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_{CC}	50	V
Input voltage		V_I	−10 to +40	V
Output current		I_O	30	mA
		$I_{C(Max.)}$	100	
Power dissipation	DTC144WE	Pd	150	mW
	DTC144WUA / DTC144WKA		200	
	DTC144WSA		300	
Junction temperature		Tj	150	℃
Storage temperature		Tstg	−55 to +150	℃

●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

●**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=100μA
	$V_{I(on)}$	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	μA	V_{CC}=50V , V_I=0V
DC current gain	G_I	56	–	–	–	I_O=5mA , V_O=5V
Input resistance	R_1	32.9	47	61.1	kΩ	–
Resistance ratio	R_2/R_1	0.37	0.47	0.57	–	–
Transition frequency	f_T	–	250	–	MHz	V_{CE}=10V , I_E= –5mA , f=100MHz ∗

∗ Transition frequency of the device.

●**Electrical characteristics curves**

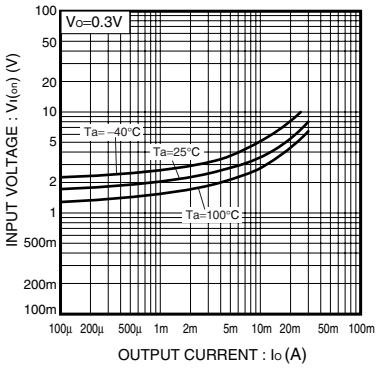


Fig.1 Input voltage vs. Output current (ON characteristics)

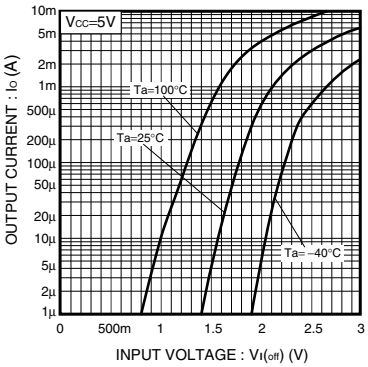


Fig.2 Output current vs. Input voltage (OFF characteristics)

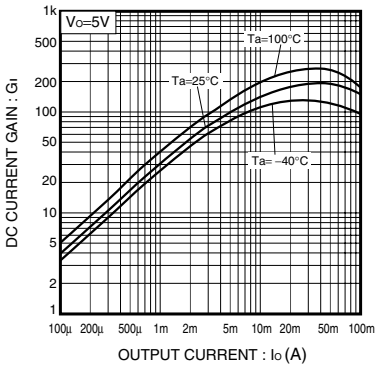


Fig.3 DC current gain vs. Output current

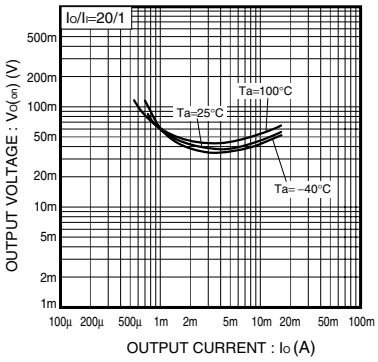


Fig.4 Output voltage vs. Output current