



Digital transistors (built-in resistors)

DTC143XM/DTC143XE/DTC143XUA

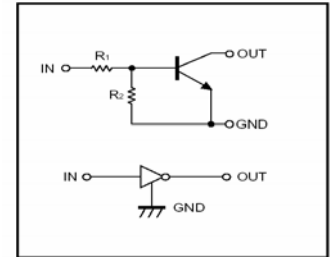
/DTC143XCA/DTC143XKA/DTC143XSA

DIGITAL TRANSISTOR (NPN)

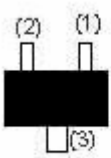
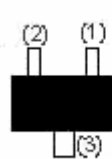
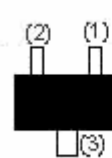
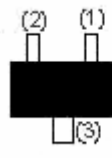
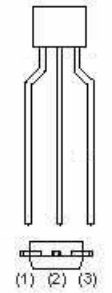
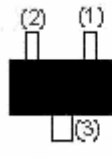
Features

- 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 device design easy.

●Equivalent circuit



PIN CONNENCTIONS AND MARKING

DTC143XE  1.IN 2.GND 3.OUT SOT-523 Abbreviated symbol: 43	DTC143XUA  1.IN 2.GND 3.OUT SOT-323 Abbreviated symbol: 43
DTC143XKA  1.IN 2.GND 3.OUT SOT-23-3L Abbreviated symbol: 43	DTC143XCA  1.IN 2.GND 3.OUT SOT-23 Abbreviated symbol: 43
DTC143XSA  1.GND 2.OUT 3.IN TO-92S	DTC143XM  1.IN 2.GND 3.OUT SOT-723 Abbreviated symbol: 43

Absolute maximum ratings(Ta=25°C)

Parameter	Symbol	Limits (DTC143X)						Unit
		M	E	UA	CA	KA	SA	
Supply voltage	V _{CC}	50						V
Input voltage	V _{IN}	-7~20						V
Output current	I _O	100						mA
	I _{C(MAX)}	100						
Power dissipation	Pd	100	150	200			300	mW
Junction temperature	Tj	150						℃
Storage temperature	Tstg	-55~150						℃

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				$V_O=0.3V, I_O=20\text{ mA}$
Output voltage	$V_{O(on)}$		0.1	0.3	V	$I_O/I_I=10\text{mA}/0.5\text{mA}$
Input current	I_I			1.8	mA	$V_I=5V$
Output current	$I_{O(off)}$			0.5	μA	$V_{CC}=50V, V_I=0$
DC current gain	G_I	30				$V_O=5V, I_O=10\text{mA}$
Input resistance	R_1	3.29	4.7	6.11	K Ω	
Resistance ratio	R_2/R_1	1.7	2.1	2.6		
Transition frequency	f_T		250		MHz	$V_O=10V, I_O=5\text{mA}, f=100\text{MHz}$

Typical Characteristics

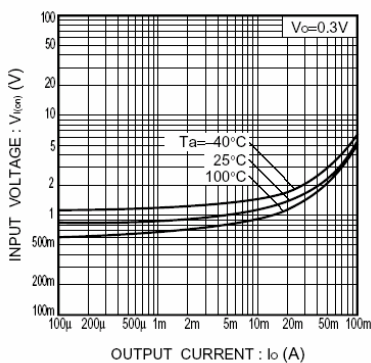


Fig.1 Input voltage vs. output current (ON characteristics)

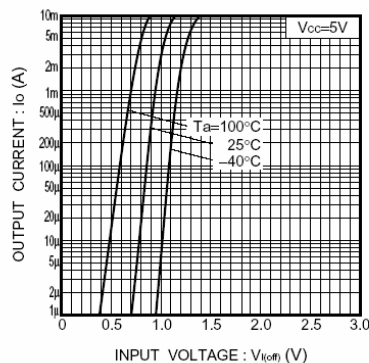


Fig.2 Output current vs. input voltage (OFF characteristics)

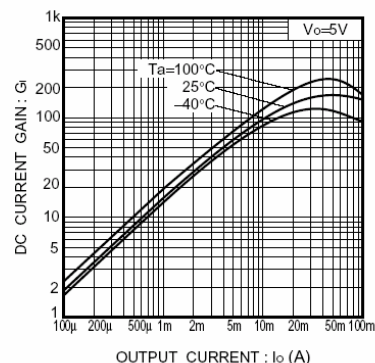


Fig.3 DC current gain vs. output current

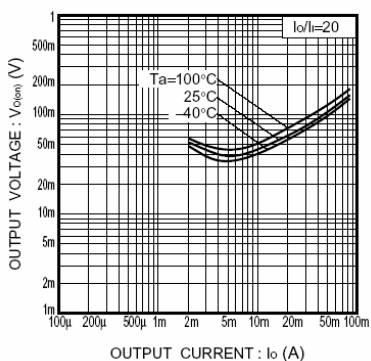


Fig.4 Output voltage vs. output current