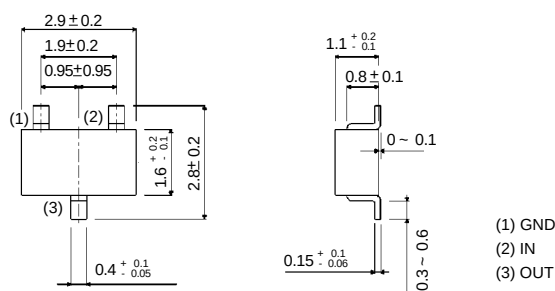
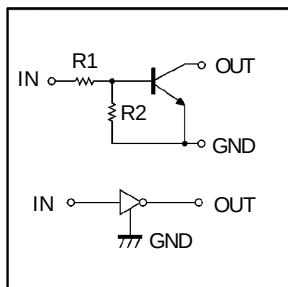


Digital transistors (built-in resistors)

• 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 thinfilm resistors with complete isolation to allow positive 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



All terminals have same dimensions

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

Parameter	symbol	limits	unit
Supply voltage	V_{CC}	-50	V
Input voltage	V_{IN}	-10~+12	V
Output current	I_O	100	mA
	$I_{C(Max)}$	100	
Power dissipation	P_d	200	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55~+150	$^\circ\text{C}$

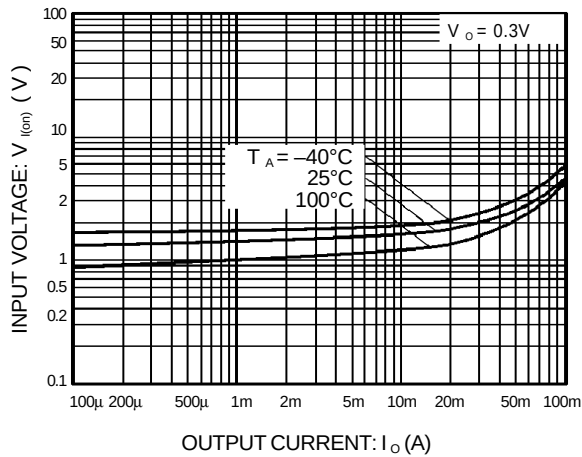
• Electrical characteristics($T_a=25^\circ\text{C}$)

Parameter	symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	—	—	-0.5	V	$V_{CC}=5V, I_O=100\mu A$
	$V_{I(on)}$	3	—	—		$V_O=0.3V, I_O=20mA$
Output Voltage	$V_{O(on)}$	—	0.1	0.3	V	$I_O/I_I=10mA/0.5mA$
Input current	I_I	—	—	3.8	mA	$V_I=5V$
Output current	$I_{O(off)}$	—	—	0.5	μA	$V_{CC}=50V, V_I=0V$
DC current gain	G_I	20	—	—	—	$V_O=5V, I_O=20mA$
Input resistance	R_1	1.54	2.2	2.86	K Ω	—
Resistance ratio	R_2 / R_1	0.8	1	1.2	—	—
Transition frequency	f_T	—	250	—	MHz	$V_{CE}=10V, I_E=-5mA, f=100MHz^*$

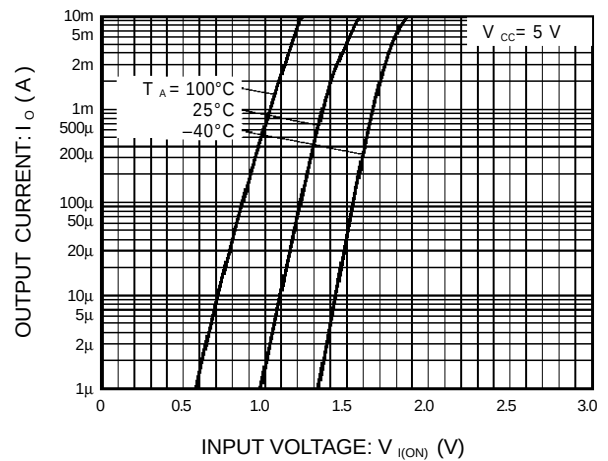
*Transition frequency of the device

DTC123EKA

ELECTRICAL CHARACTERISTIC CURVES



**Figure 1. Input voltage vs.output current
(ON characteristics)**



**Figure 2. Output current vs.input voltage
(OFF characteristics)**

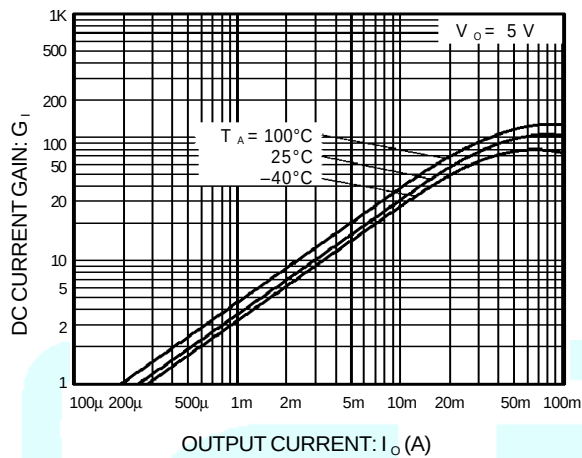


Figure 3. DC current gain vs.output current

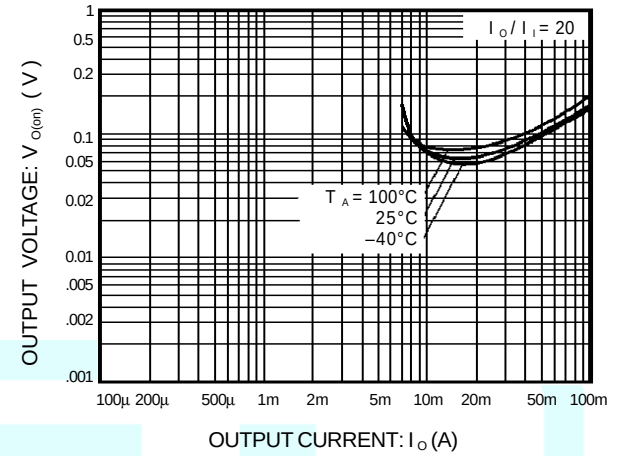


Figure 4. Output voltage vs.output current