

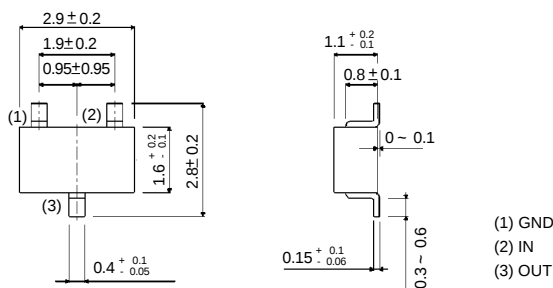
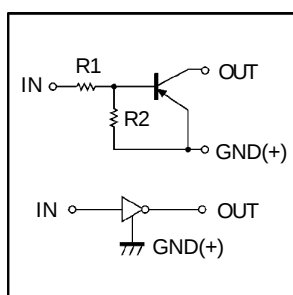
Digital transistors (built-in resistors)

DTA123EKA

• 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

EIAJ: SC—59

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

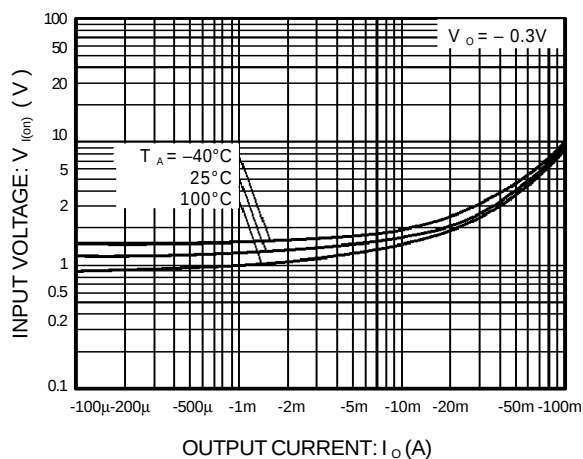
Parameter	symbol	limits	unit
Supply voltage	V_{CC}	-50	V
Input voltage	V_{IN}	-12~+10	V
Output current	I_O	-100	mA
	$I_{C(\text{Max.})}$	-100	
Power dissipation	P_d	200	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55~+150	$^\circ\text{C}$

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

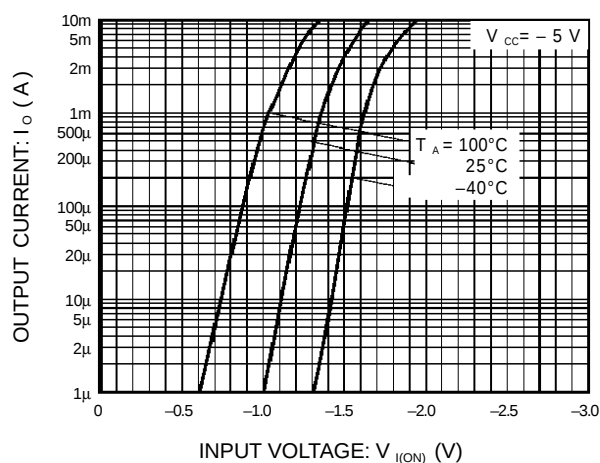
Parameter	symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(\text{off})}$	—	—	-0.5	V	$V_{CC} = -5V, I_O = -100\mu\text{A}$
	$V_{I(\text{on})}$	-3	—	—		$V_O = -0.3V, I_O = -20\text{mA}$
Output Voltage	$V_{O(\text{on})}$	—	-0.1	-0.3	V	$I_O/I_i = -10\text{mA}/-0.5\text{mA}$
Input current	I_i	—	—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

*Transition frequency of the device

ELECTRICAL CHARACTERISTIC CURVES



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



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

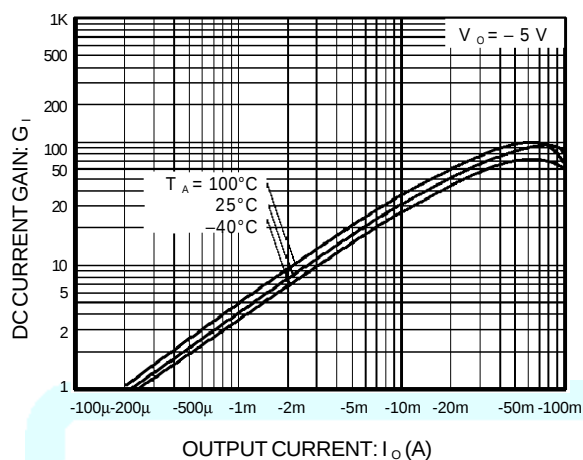


Figure 3. DC current gain vs.output current

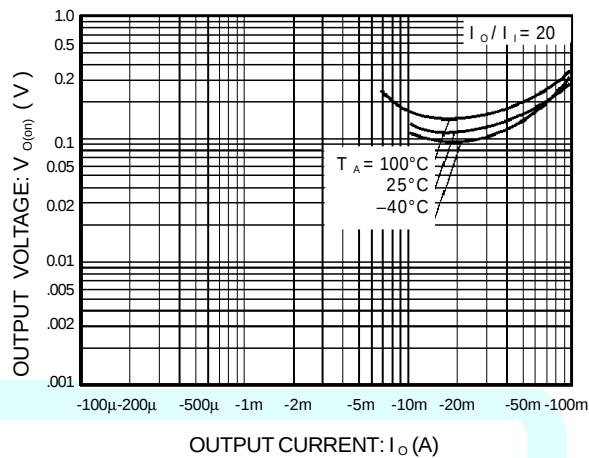


Figure 4. Output voltage vs.output current