

Digital transistors (built-in resistors)

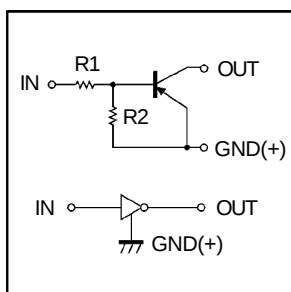
• Features

- 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.

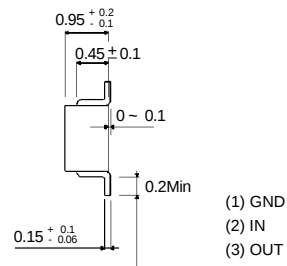
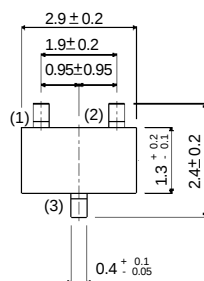
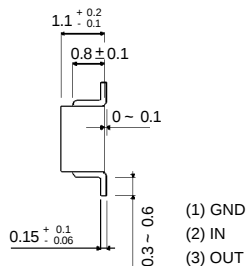
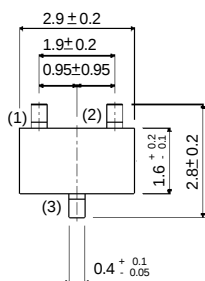
• Structure

PNP digital transistor (Built-in resistors type)

•Equivalent circuit



DTA124EKA
DTA124ECA



All terminals have same dimensions

All terminals have same dimensions

DTA124EKA

DTA124ECA

EIAJ: SC— 59

EIAJ: SOT— 23

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

Parameter	symbol	limits (DTA124EKA DTA124ECA)	unit
Supply voltage	V_{CC}	-50	V
Input voltage	V_{IN}	-40~+10	V
Output current	I_O	-30	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	$^{\circ}\text{C}$

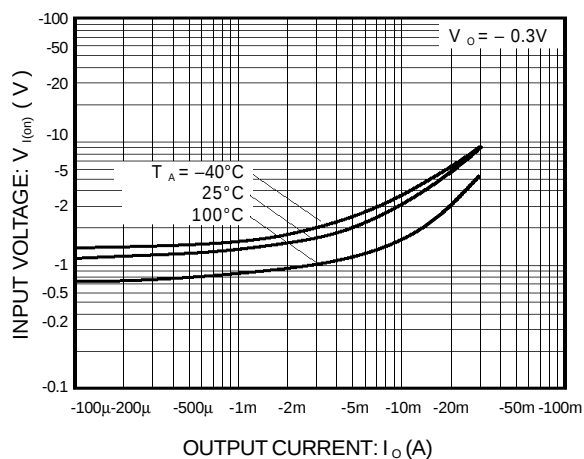
DTA124EKA DTA124ECA

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

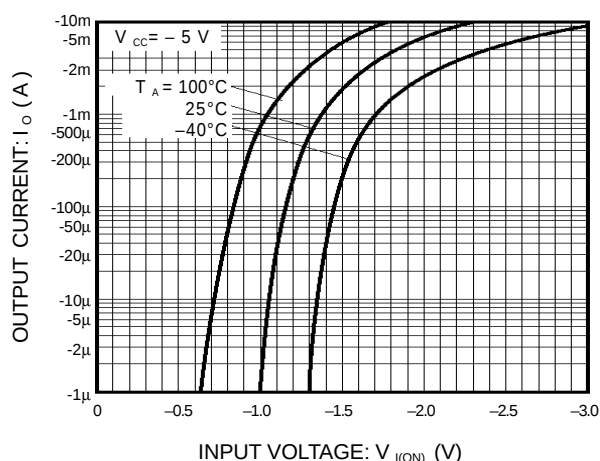
Parameter	symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	—	—	-0.5	V	$V_{CC}=-5\text{V}, I_O=-100\mu\text{A}$
	$V_{I(on)}$	-3	—	—		$V_O=-0.2\text{V}, I_O=-5\text{mA}$
Output Voltage	$V_{O(on)}$	—	-0.1	-0.3	V	$I_O/I_I=-10\text{mA}/-0.5\text{mA}$
Input current	I_I	—	—	-0.36	mA	$V_I=-5\text{V}$
Output current	$I_{O(off)}$	—	—	-0.5	μA	$V_{CC}=-5\text{V}, V_I=0\text{V}$
DC current gain	G_I	56	—	—	—	$V_O=-5\text{V}, I_O=-5\text{mA}$
Input resistance	R_I	15.4	22	28.6	$\text{K}\Omega$	—
Resistance ratio	R_2/R_1	0.8	1	1.2	—	—
Transition frequency	f_T	—	250	—	MHz	$V_{CE}=-10\text{V}, I_E=5\text{mA}, f=100\text{MHz}^*$

*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)**

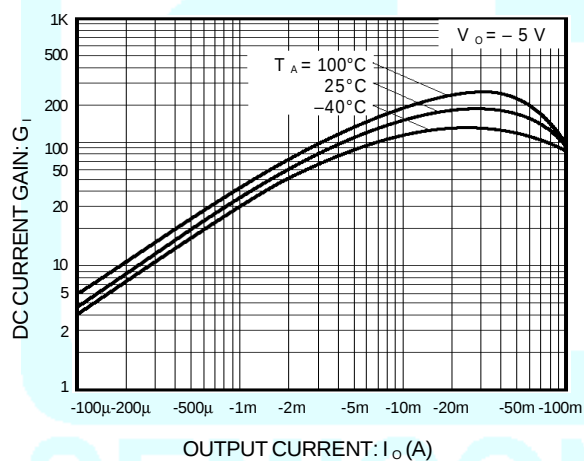


Figure 3. DC current gain vs.output current

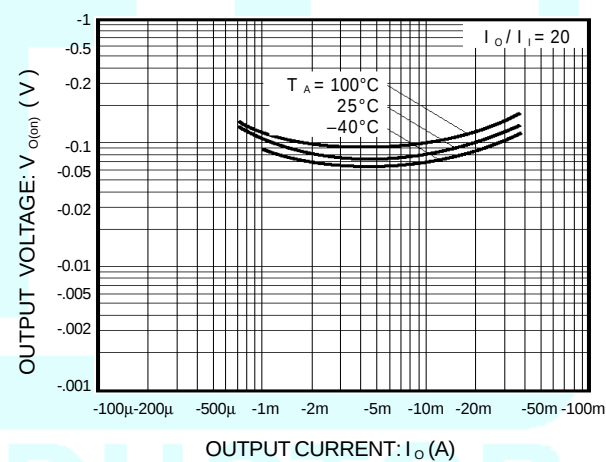


Figure 4. Output voltage vs.output current