

Digital transistors (built-in resistors)

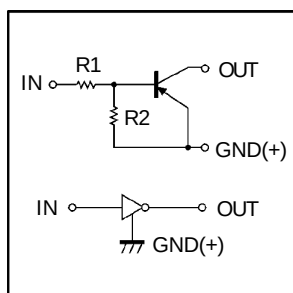
• Features

- 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.

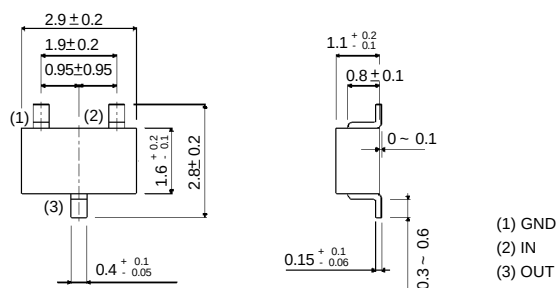
• Structure

PNP digital transistor (with built-in resistors)

• Equivalent circuit



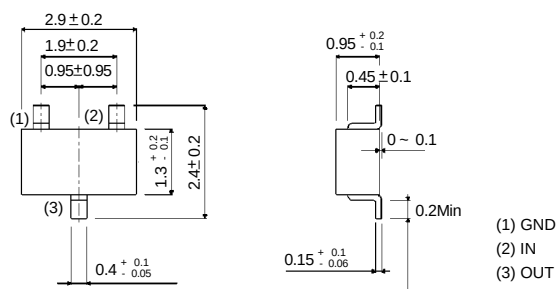
DTA143EKA
DTA143ECA



All terminals have same dimensions

DTA143EKA

EIAJ: SC—59



All terminals have same dimensions

DTA143ECA

EIAJ: SOT—23

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

Parameter	symbol	limits	unit
Supply voltage	V_{cc}	-50	V
Input voltage	V_{IN}	-30~+10	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	$^\circ\text{C}$

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

Parameter	symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(\text{off})}$	—	—	-0.5	V	$V_{CC} = -5\text{V}, I_O = -100\mu\text{A}$
	$V_{I(\text{on})}$	-3	—	—		$V_O = -0.3\text{V}, I_O = -20\text{mA}$
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	—	—	-1.8	mA	$V_I = -5\text{V}$
Output current	$I_{O(\text{off})}$	—	—	-0.5	μA	$V_{CC} = -50\text{V}, V_I = 0\text{V}$
DC current gain	G_I	20	—	—	—	$V_O = -5\text{V}, I_O = -10\text{mA}$
Input resistance	R_I	3.29	4.7	6.11	$\text{K}\Omega$	—
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

● Packaging specifications

Part No.	Package	SC-59	SOT-23
	Package type	Taping	Taping
	Code	T146	T116
	Basic ordering unit(pieces)	3000	3000
DTA143EKA		O	—
DTA143ECA		—	O

DTA143EKA DTA143ECA

ELECTRICAL CHARACTERISTIC CURVES

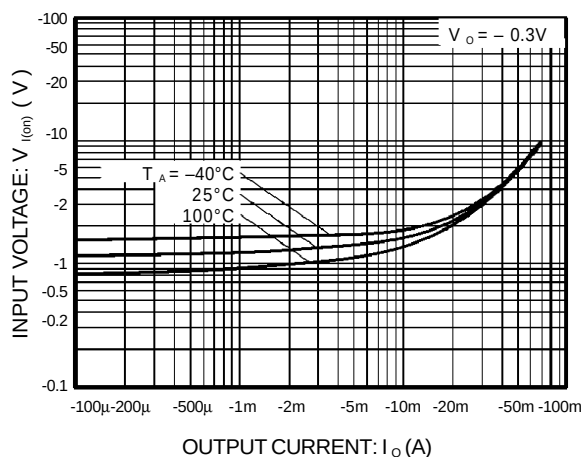


Figure 1. Input voltage vs. output current
(ON characteristics)

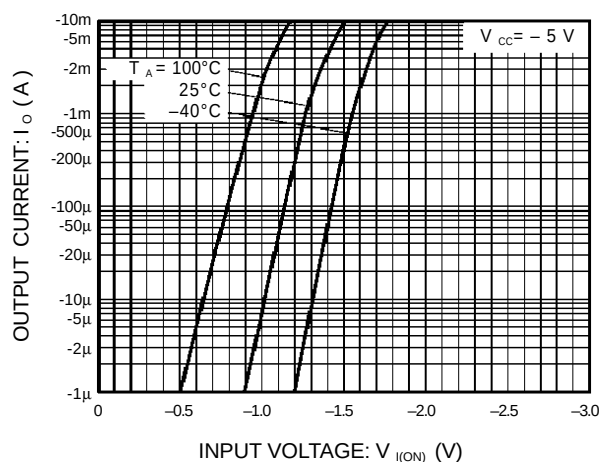


Figure 2. Output current vs. input voltage
(OFF characteristics)

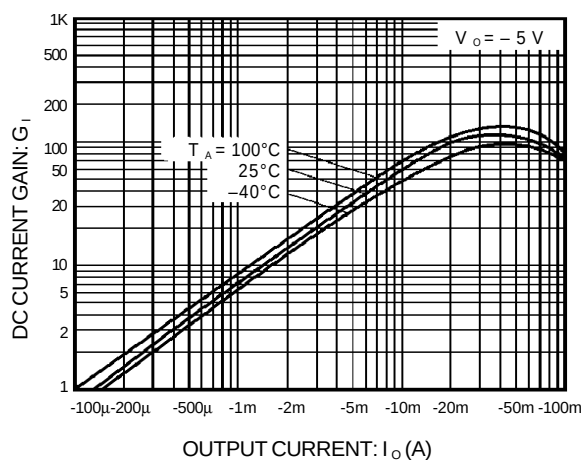


Figure 3. DC current gain vs. output current

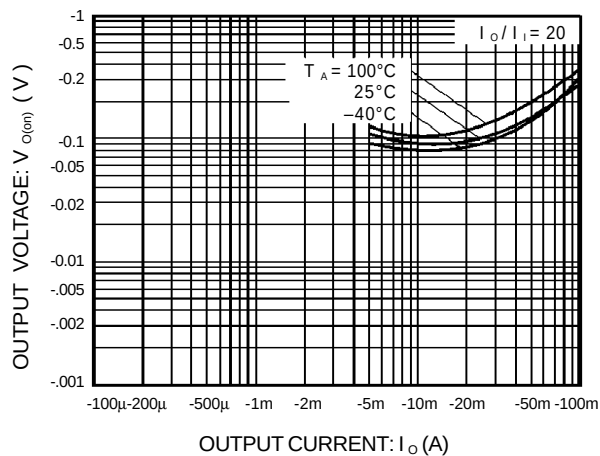


Figure 4. Output voltage vs. output current