

Digital transistors (built-in resistors)

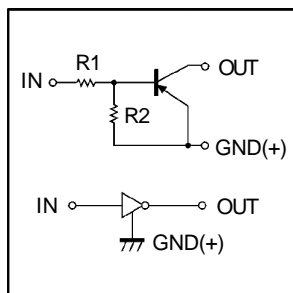
- Features

- 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.

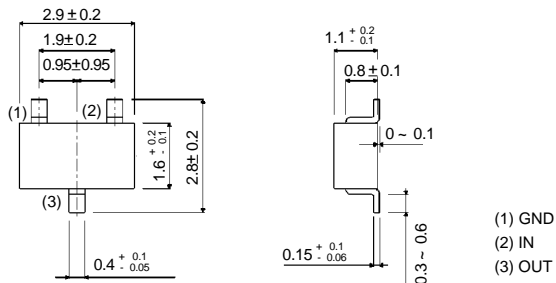
- Structure

PNP digital transistor (with built-in resistors)

- Equivalent circuit



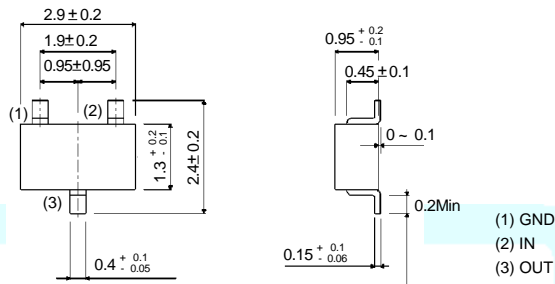
DTA143EKA
DTA143ECA



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	$^\circ\text{C}$

DTA143EKA DTA143ECA

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

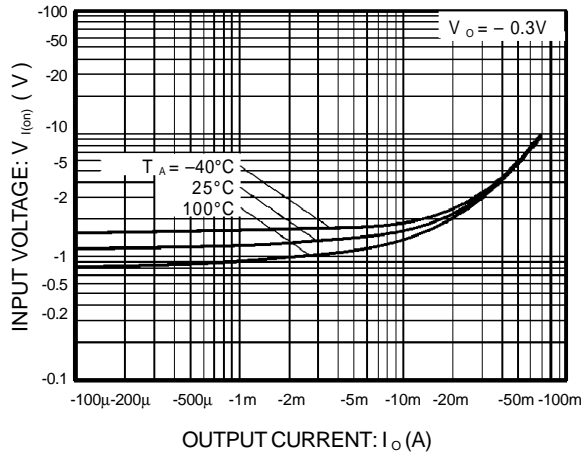
Parameter	symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	—	—	-0.5	V	$V_{CC} = -5V, I_O = -100\mu A$
	$V_{I(on)}$	-3	—	—		$V_O = -0.3V, I_O = -20mA$
Output Voltage	$V_{O(on)}$	—	-0.1	-0.3	V	$I_O / I_I = -10mA / -0.5mA$
Input current	I_I	—	—	-1.8	mA	$V_I = -5V$
Output current	$I_{O(off)}$	—	—	-0.5	μA	$V_{CC} = -50V, V_I = 0V$
DC current gain	G_I	20	—	—	—	$V_O = -5V, I_O = -10mA$
Input resistance	R_I	3.29	4.7	6.11	$K\Omega$	—
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

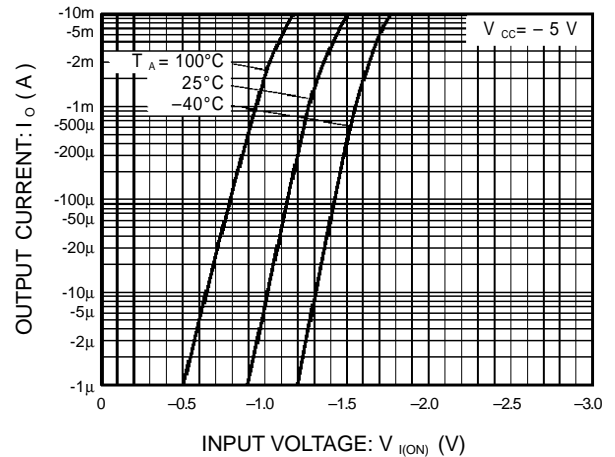
● Packaging specifications

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

ELECTRICAL CHARACTERISTIC CURVES



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



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

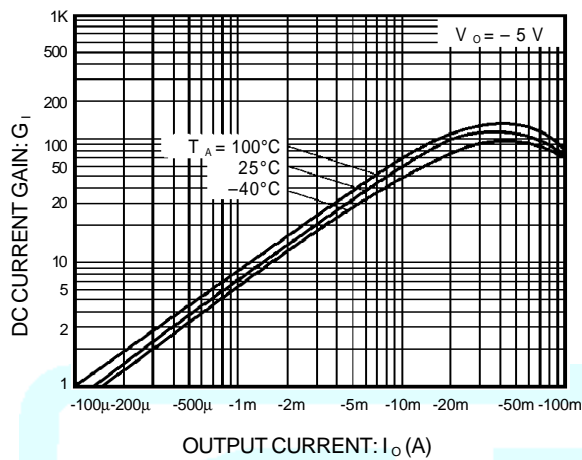


Figure 3. DC current gain vs. output current

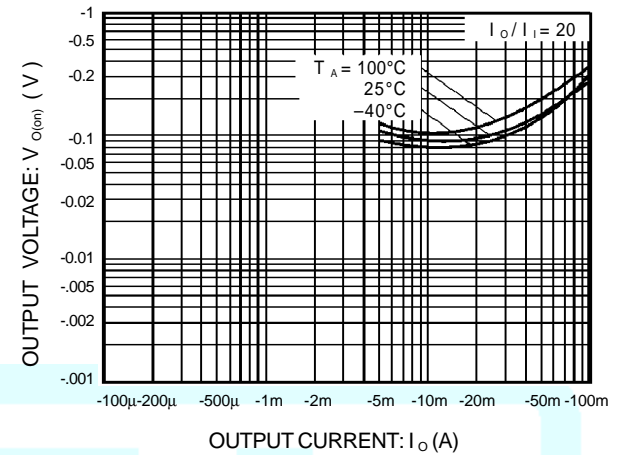


Figure 4. Output voltage vs. output current