Digital transistors (built-in resistors)

DTB143EK
DTB143EC

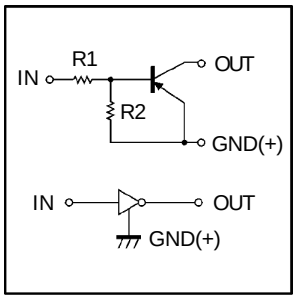
- **Features**

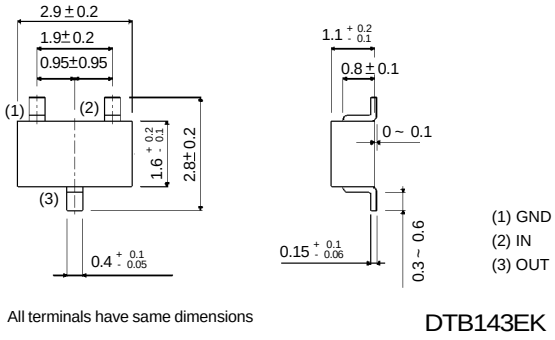
1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
2) The bias resistors consist of thinfilm resistors with complete isolation to allow positive biasing of the input. They also have the advantage of almost completely 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**





All terminals have same dimensions

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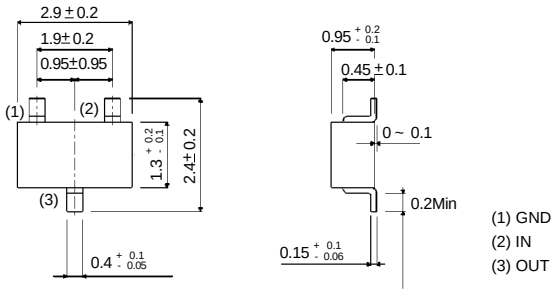

All terminals have same dimensions

DTB143EC

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- Absolute maximum ratings(T_a=25 °C)

Parameter	symbol	limits		unit
Supply voltage	V_{cc}	–50		V
Input voltage	V_{IN}	–30~+10		V
Output current	I_C	–500		mA
Power dissipation	P_d	200	300	mW
Junction temperature	T_j	150		℃
Storage temperature	T_{stg}	–55~+150		℃

DTB143EK DTB143EC

● Elecrical characteristics(T_a=25°C)

Parameter	symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	—	—	–0.5	V	V_{CC}= – 5V, I_O= –100μA
	$V_{I(on)}$	–3	—	—		V_O= – 0.3V, I_O=–20mA
Output Voltage	$V_{O(on)}$	—	—	–0.3	V	I_O/ I_I=–50mA / –2.5mA
Input current	I_I	—	—	–1.8	mA	V_I = – 5V
Output current	$I_{O(off)}$	—	—	–0.5	μA	V_{CC} =– 50V,V_I = 0 V
DC current gain	G_I	47	—	—	—	V_O = – 5V,I_O = – 50mA
Input resistance	R_1	3.29	4.7	6.11	KΩ	—
Resistance ratio	R_2/ R_1	0.8	1	1.2	—	—
Transition frequency	f_T	—	200	—	MHz	V_{CE} = –10V, I_E= 5 mA,f=100MHz*

*Transition frequency of the device

ELECTRICAL CHARACTERISTIC CURVES

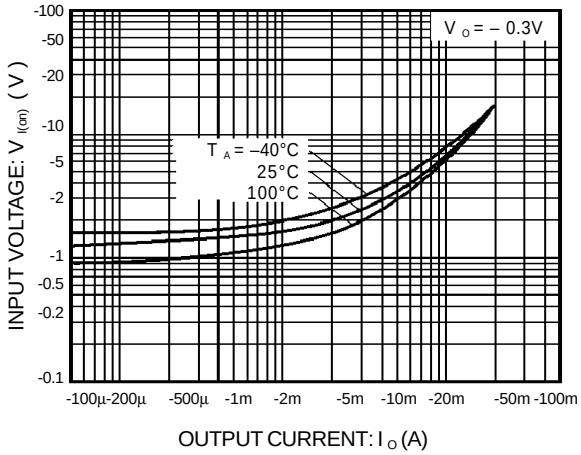

Figure 1. Input voltage vs.output current (ON characteristics)

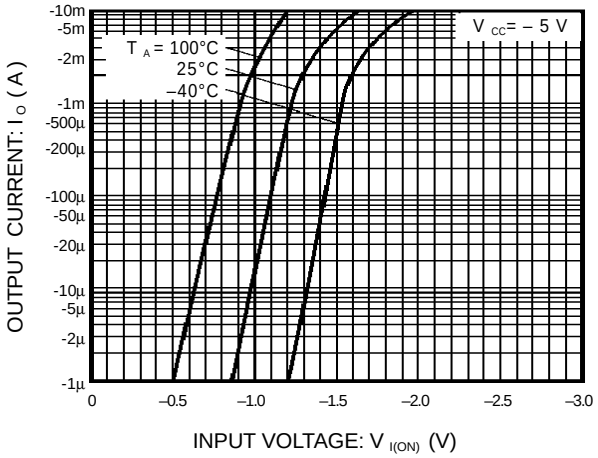

Figure 2. Output current vs.input voltage (OFF characteristics)

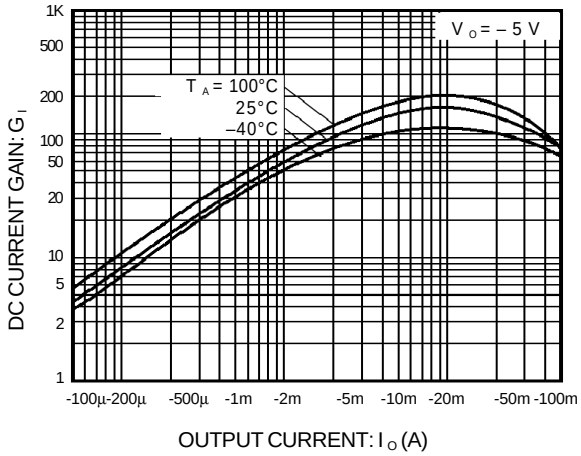

Figure 3. DC current gain vs.output current

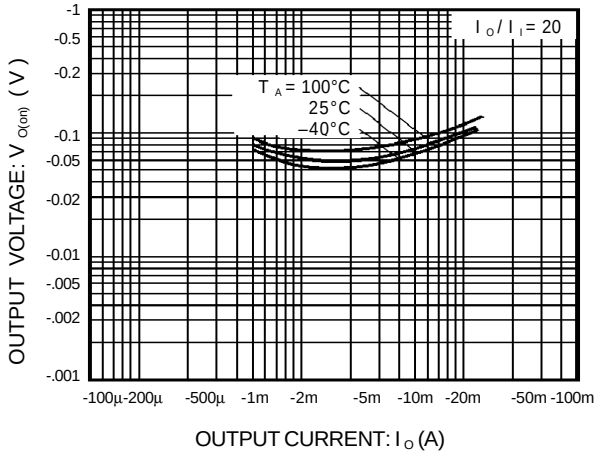

Figure 4. Output voltage vs.output current