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## DTB143EK / DTB143EC / DTB143ES

### Transistors

# -500mA / -50V Digital transistors (with built-in resistors)

## DTB143EK / DTB143EC / DTB143ES

#### ●Applications

Inverter, Interface, Driver

#### ●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 thin-film 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 the device design easy.

#### ●Structure

PNP epitaxial planar silicon transistor  
(Resistor built-in type)

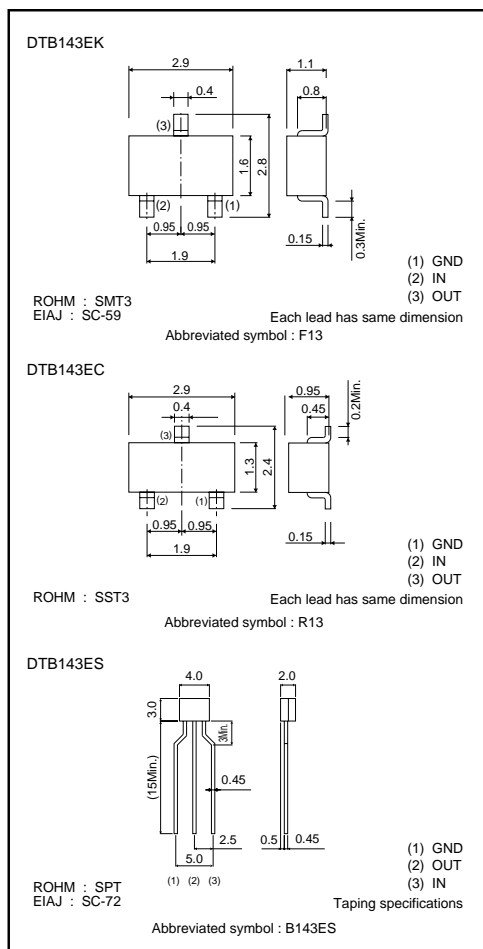
#### ●Packaging specifications

Part No.	Package	SMT3	SST3	SPT
	Package type	Taping	Taping	Taping
	Code	T146	T116	TP
	Basic ordering unit (pieces)	3000	3000	5000
DTB143EK		○	-	-
DTB143EC		-	○	-
DTB143ES		-	-	○

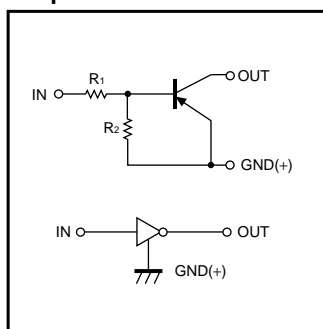
#### ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits			Unit
		DTB143EK	DTB143EC	DTB143ES	
Supply voltage	V <sub>CC</sub>		-50		V
Input voltage	V <sub>IN</sub>		-30 to +10		V
Output current	I <sub>C</sub>		-500		mA
Power dissipation	P <sub>d</sub>		200	300	mW
Junction temperature	T <sub>J</sub>		150		°C
Storage temperature	T <sub>stg</sub>		-55 to +150		°C

#### ●External dimensions (Unit : mm)



#### ●Equivalent circuit



R<sub>1</sub>=R<sub>2</sub>=4.7kΩ

**DTB143EK / DTB143EC / DTB143ES**

**Transistors**

**●Electrical characteristics (Ta=25°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	$I_o/I_i = -50mA/-2.5mA$
Input current	$I_i$	-	-	-1.8	mA	$V_i = -5V$
Output current	$I_{o(off)}$	-	-	-0.5	$\mu A$	$V_{CC} = -50V, V_i = 0V$
DC current gain	$G_i$	47	-	-	-	$V_o = -5V, I_o = -50mA$
Input resistance	$R_i$	3.29	4.7	6.11	$k\Omega$	-
Resistance ratio	$R_z/R_i$	0.8	1	1.2	-	-
Transition frequency	$f_T$ *	-	200	-	MHz	$V_{CE} = -10V, I_E = 50mA, f = 100MHz$

\* Characteristics of built-in transistor

**●Electrical characteristic curves**

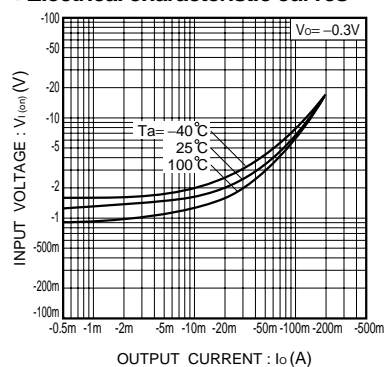


Fig.1 Input voltage vs. output current (ON characteristics)

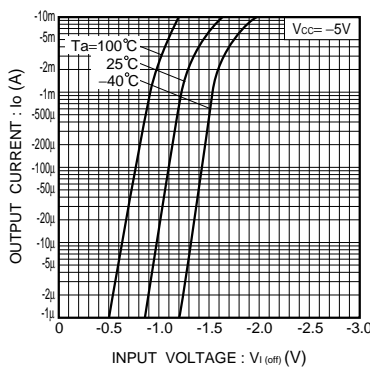


Fig.2 Output current vs. input voltage (OFF characteristics)

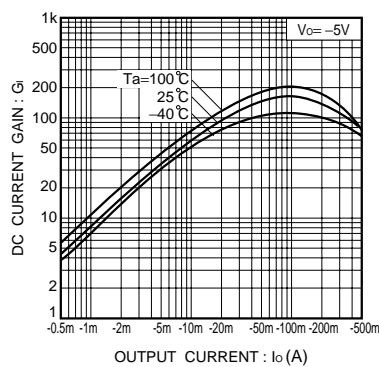


Fig.3 DC current gain vs. output current

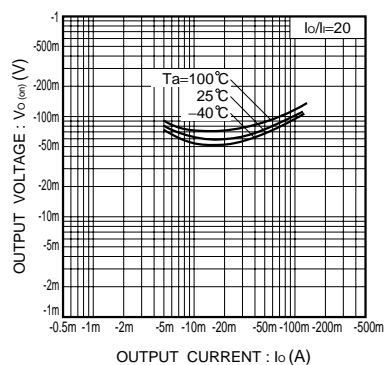


Fig.4 Output voltage vs. output current

## Appendix

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