

# Digital transistors (built-in resistors)

## DTB143TK

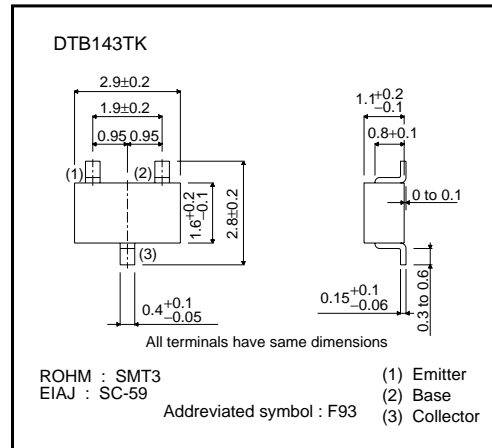
### ●Features

- 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 device design easy.

### ●Structure

PNP digital transistor  
(Built-in resistor type)

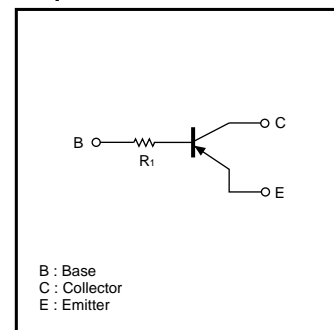
### ●External dimensions (Unit : mm)



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

Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CBO}$	-50	V
Collector-emitter voltage	$V_{CEO}$	-40	V
Emitter-base voltage	$V_{EBO}$	-5	V
Collector current	$I_C$	-500	mA
Collector power dissipation	$P_C$	200	mW
Junction temperature	$T_J$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

### ●Equivalent circuit



## Transistors

## ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV <sub>CBO</sub>	-50	-	-	V	I <sub>c</sub> = -50μA
Collector-emitter breakdown voltage	BV <sub>CEO</sub>	-40	-	-	V	I <sub>c</sub> = -1mA
Emitter-base breakdown voltage	BV <sub>EBO</sub>	-5	-	-	V	I <sub>E</sub> = -50μA
Collector cutoff current	I <sub>CBO</sub>	-	-	-0.5	μA	V <sub>CB</sub> = -50V
Emitter cutoff current	I <sub>EBO</sub>	-	-	-0.5	μA	V <sub>EB</sub> = -4V
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	-	-	-0.3	V	I <sub>c</sub> /I <sub>B</sub> = -50mA/-2.5mA
DC current transfer ratio	h <sub>FE</sub>	100	250	600	-	V <sub>CE</sub> = -5V, I <sub>c</sub> = -50mA
Input resistance	R <sub>1</sub>	3.29	4.7	6.11	kΩ	-
Transition frequency	f <sub>T</sub>	-	200	-	MHz	V <sub>CE</sub> = -10V, I <sub>E</sub> =50mA, f=100MHz *

\* Transition frequency of the device

## ●Packaging specifications

Part No.	Package	SMT3
	Packaging type	Taping
	Code	T146
	Basic ordering unit (pieces)	3000
DTB143TK		○

## ●Electrical characteristic curves

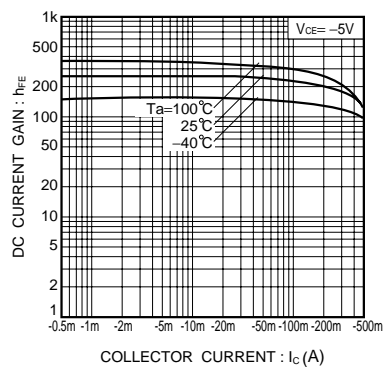


Fig.1 DC current gain vs. collector current

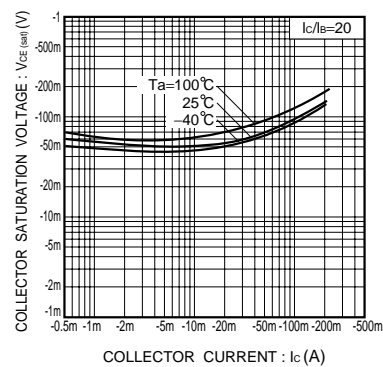


Fig.2 Collector-emitter saturation voltage vs. collector current

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