

## Transistors

# -500mA / -40V Digital transistors (with built-in resistor)

## DTB143TK

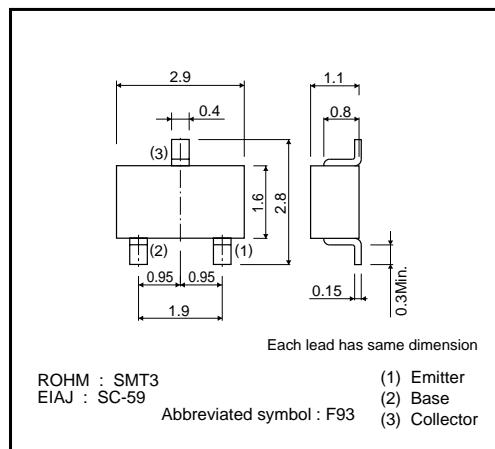
### ●Applications

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.

### ●External dimensions (Unit : mm)



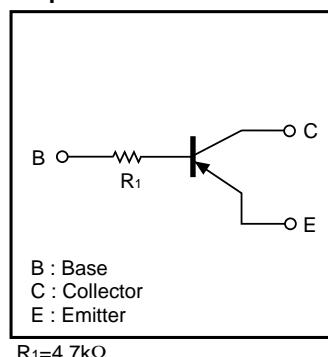
### ●Structure

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

### ●Packaging specifications

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

### ●Equivalent circuit



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

Parameter	Symbol	Limits	Unit
Collector-base voltage	V <sub>CB0</sub>	-50	V
Collector-emitter voltage	V <sub>CBO</sub>	-40	V
Emitter-base voltage	V <sub>EBO</sub>	-5	V
Collector current	I <sub>C</sub>	-500	mA
Collector power dissipation	P <sub>C</sub>	200	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

## Transistors

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$\text{BV}_{\text{CBO}}$	-50	-	-	V	$I_c=-50\mu\text{A}$
Collector-emitter breakdown voltage	$\text{BV}_{\text{CEO}}$	-40	-	-	V	$I_c=-1\text{mA}$
Emitter-base breakdown voltage	$\text{BV}_{\text{EBO}}$	-5	-	-	V	$I_e=-50\mu\text{A}$
Collector cutoff current	$I_{\text{CBO}}$	-	-	-0.5	$\mu\text{A}$	$V_{\text{CB}}=-50\text{V}$
Emitter cutoff current	$I_{\text{EBO}}$	-	-	-0.5	$\mu\text{A}$	$V_{\text{EB}}=-4\text{V}$
Collector-emitter saturation voltage	$V_{\text{CE(sat)}}$	-	-	-0.3	V	$I_c/I_B=-50\text{mA}/-2.5\text{mA}$
DC current transfer ratio	$h_{\text{FE}}$	100	250	600	-	$V_{\text{CE}}=-5\text{V}, I_c=-50\text{mA}$
Input resistance	$R_i$	3.29	4.7	6.11	k $\Omega$	-
Transition frequency	$f_T$ *	-	200	-	MHz	$V_{\text{CE}}=-10\text{V}, I_e=50\text{mA}, f=100\text{MHz}$

\* Characteristics of built-in transistor

## ●Electrical characteristic curves

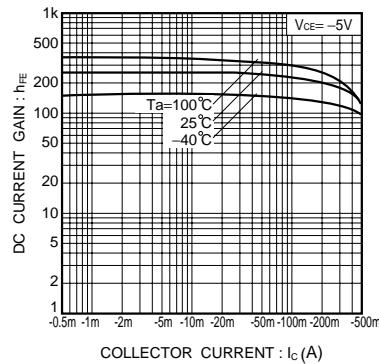


Fig.1 DC current gain vs. collector current

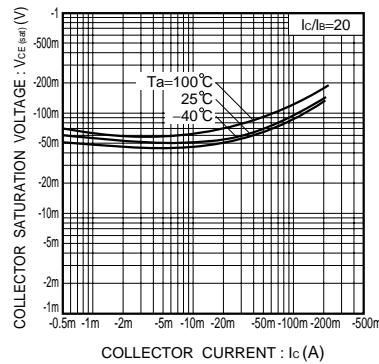


Fig.2 Collector-emitter saturation voltage vs. collector current

## Appendix

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#### Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: [org@eplast1.ru](mailto:org@eplast1.ru)

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.