

# 100mA / 50V Digital transistors (with built-in resistors)

## DTC143TEB

### ●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 negative 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

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

### ●Packaging specifications

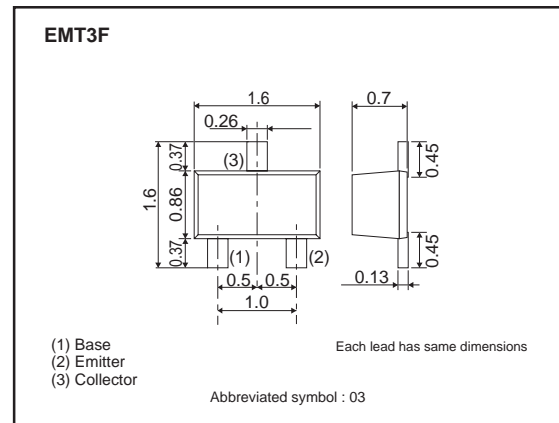
	Package	EMT3F
	Packaging type	Taping
	Code	TL
Part No.	Basic ordering unit (pieces)	3000
DTC143TEB		○

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

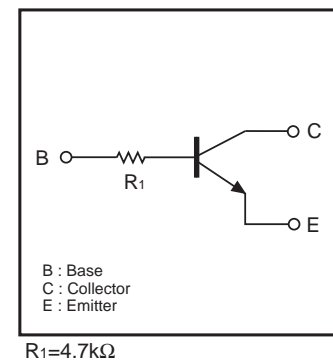
Parameter	Symbol	Limits	Unit
Collector-Base voltage	V <sub>CB0</sub>	50	V
Collector-Emitter voltage	V <sub>CE0</sub>	50	V
Emitter-Base voltage	V <sub>EB0</sub>	5	V
Collector current	I <sub>c</sub>	100	mA
Power dissipation	P <sub>D</sub> *1	150	mW
Junction temperature	T <sub>j</sub>	150	°C
Range of Storage temperature	T <sub>stg</sub>	-55 to +150	°C

\*1 Each terminal mounted on a recommended land

### ●Dimensions (Unit : mm)



### ●Equivalent circuit



●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-emitter breakdown voltage	$BV_{CEO}$	50	–	–	V	$I_C=1mA$
Collector-base breakdown voltage	$BV_{CBO}$	50	–	–	V	$I_C=50\mu A$
Emitter-base breakdown voltage	$BV_{EBO}$	5	–	–	V	$I_E=50\mu A$
Collector cut-off current	$I_{CBO}$	–	–	500	nA	$V_{CB}=50V$
Emitter cut-off current	$I_{EBO}$	–	–	500	nA	$V_{EB}=4V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	–	–	150	mV	$I_C/I_B=5mA/0.25mA$
DC current gain	$h_{FE}$	100	250	600	–	$V_{CE}=5V, I_C=1mA$
Transition frequency	$f_T$ *	–	250	–	MHz	$V_{CE}=10V, I_E=-5mA, f=100MHz$
Input resistance	R	3.5	4.7	5.9	kΩ	–

\* Characteristics of built-in transistor

●Electrical characteristic curves

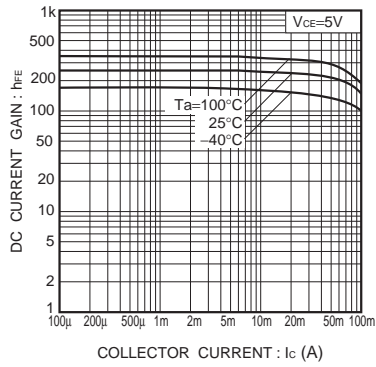


Fig.1 DC current gain vs. collector current

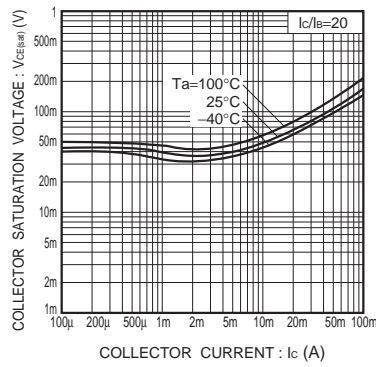


Fig.2 Collector-emitter saturation voltage vs. collector current

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