

# Digital transistors (built in resistor)

## DTC144TE / DTC144TUA / DTC144TKA DTC144TSA

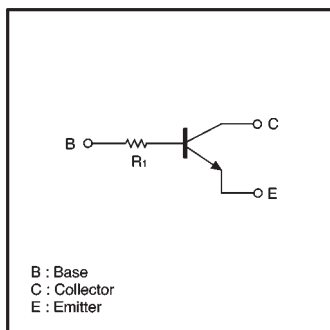
### ●Features

- 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 device design easy.

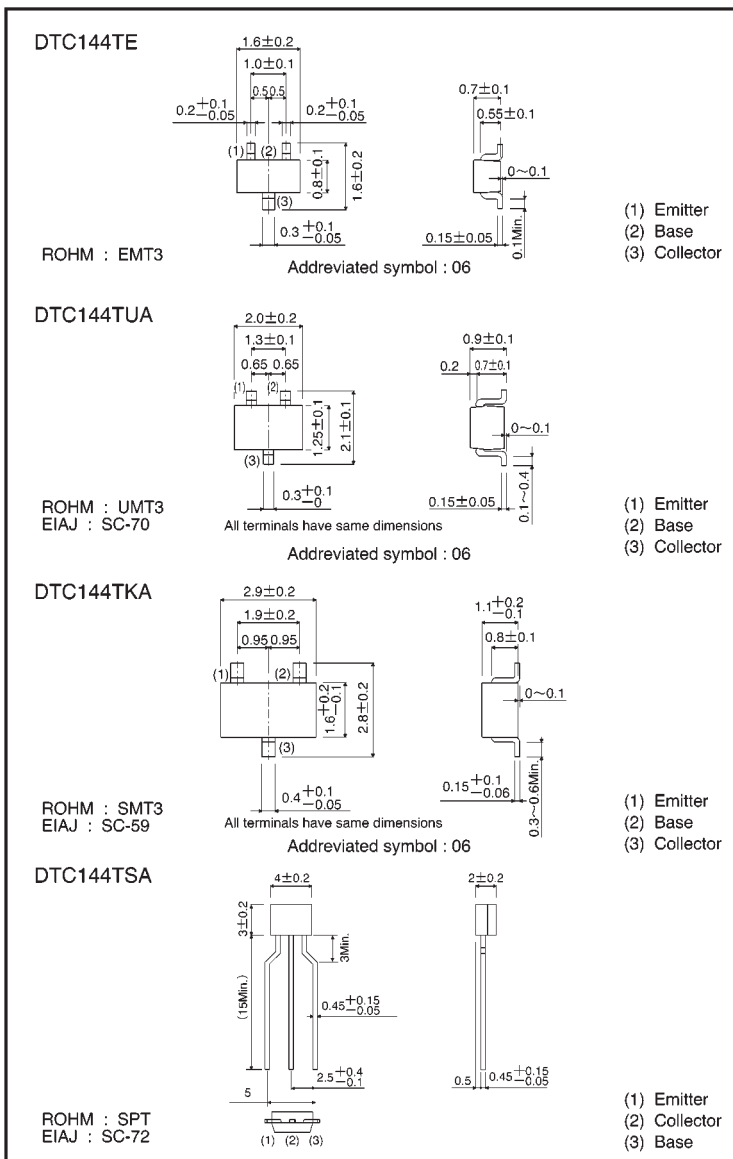
### ●Structure

NPN digital transistor  
(Built-in resistor type)

### ●Equivalent circuit



### ●External dimensions (Units: mm)



●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits(DTC144T□)				Unit
		E	UA	KA	SA	
Collector-base voltage	V <sub>CBO</sub>	50				V
Collector-emitter voltage	V <sub>CEO</sub>	50				V
Emitter-base voltage	V <sub>EBO</sub>	5				V
Collector current	I <sub>C</sub>	100				mA
Collector power dissipation	P <sub>C</sub>	150	200		300	mW
Junction temperature	T <sub>J</sub>	150				°C
Storage temperature	T <sub>stg</sub>	-55~+150				°C

●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> =50 μA
Collector-emitter breakdown voltage	BV <sub>CEO</sub>	50	—	—	V	I <sub>C</sub> =1mA
Emitter-base breakdown voltage	BV <sub>EBO</sub>	5	—	—	V	I <sub>E</sub> =50 μA
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> =5mA/0.5mA
DC current transfer ratio	h <sub>FE</sub>	100	250	600	—	V <sub>CE</sub> =5V, I <sub>C</sub> =1mA
Input resistance	R <sub>i</sub>	32.9	47	61.1	kΩ	—
Transition frequency	f <sub>T</sub>	—	250	—	MHz	V <sub>CE</sub> =10V, I <sub>E</sub> =-5mA, f=100MHz *

\* Transition frequency of the device

●Packaging specifications

Part No.	Package	EMT3	UMT3	SMT3	SPT
	Packaging type	Taping	Taping	Taping	Taping
	Code	TL	T106	T146	TP
	Basic ordering unit (pieces)	3000	3000	3000	5000
DTC144TE		○	—	—	—
DTC144TUA		—	○	—	—
DTC144TKA		—	—	○	—
DTC144TSA		—	—	—	○

● Electrical characteristic curves

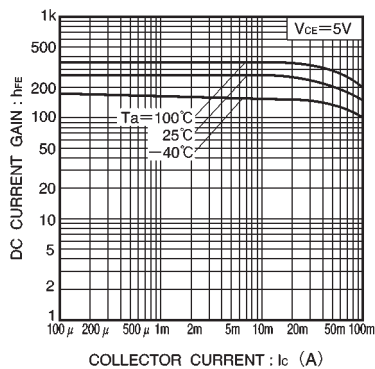


Fig.1 DC current gain vs. collector current

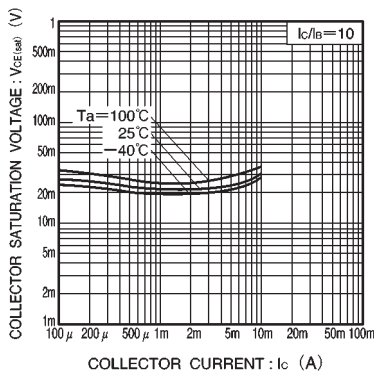


Fig.2 Collector-emitter saturation voltage vs. collector current