

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

**DTC143TM / DTC143TE / DTC143TUA / DTC143TKA**

● **Applications**

Inverter, Interface, Driver

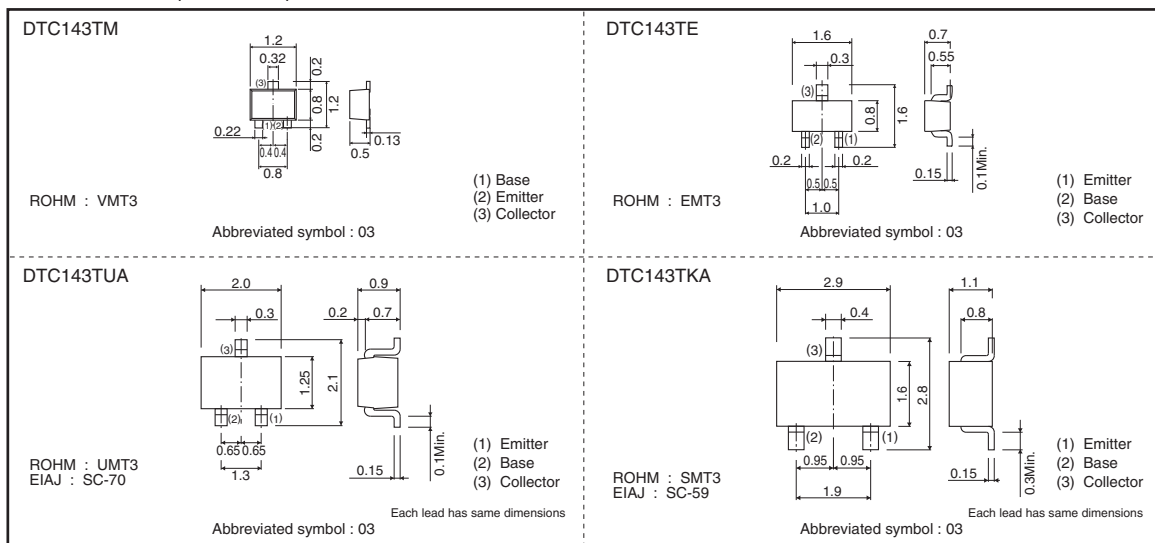
● **Features**

- 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.

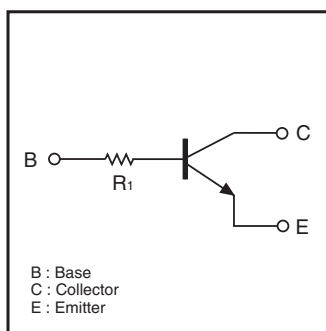
● **Structure**

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

● **Dimensions (Unit : mm)**



● **Inner circuit**



$R_1 = 4.7k\Omega$

● Packaging specifications

Part No.	Package	VMT3	EMT3	UMT3	SMT3
	Packaging type	Taping	Taping	Taping	Taping
	Code	T2L	TL	T106	T146
	Basic ordering unit (pieces)	8000	3000	3000	3000
DTC143TM		○	-	-	-
DTC143TE		-	○	-	-
DTC143TUA		-	-	○	-
DTC143TKA		-	-	-	○

● Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits				Unit
		DTC143TM	DTC143TE	DTC143TUA	DTC143TKA	
Collector-base voltage	V <sub>CB0</sub>	50				V
Collector-emitter voltage	V <sub>CE0</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		mW
Junction temperature	T <sub>J</sub>	150				°C
Storage temperature	T <sub>stg</sub>	-55 to +150				°C

● Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV <sub>CB0</sub>	50	-	-	V	I <sub>c</sub> =50μA
Collector-emitter breakdown voltage	BV <sub>CE0</sub>	50	-	-	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>CB0</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/0.25mA
DC current transfer ratio	h <sub>FE</sub>	100	250	600	-	I <sub>c</sub> =1mA, V <sub>CE</sub> =5V
Input resistance	R <sub>i</sub>	3.29	4.7	6.11	kΩ	-
Transition frequency	f <sub>T</sub> *	-	250	-	MHz	V <sub>CE</sub> =10V, I <sub>E</sub> =-5mA, f=100MHz

\* Characteristics of built-in transistor

● Electrical characteristic curves

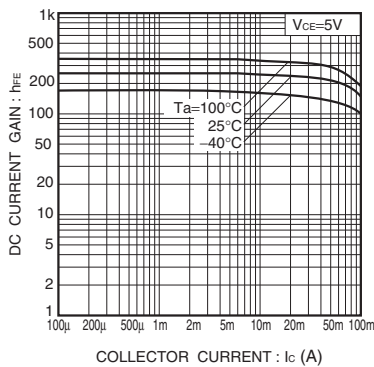


Fig.1 DC current gain vs. collector current

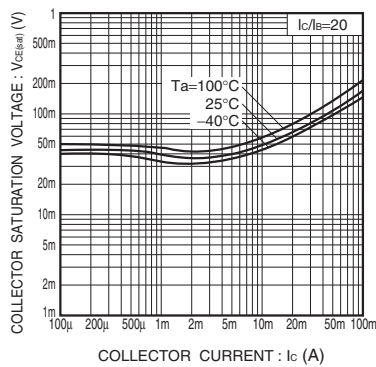


Fig.2 Collector-emitter saturation voltage vs. collector current

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