

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

DTC143TM / DTC143TE / DTC143TUA / DTC143TKA

● Applications

Inverter, Interface, Driver

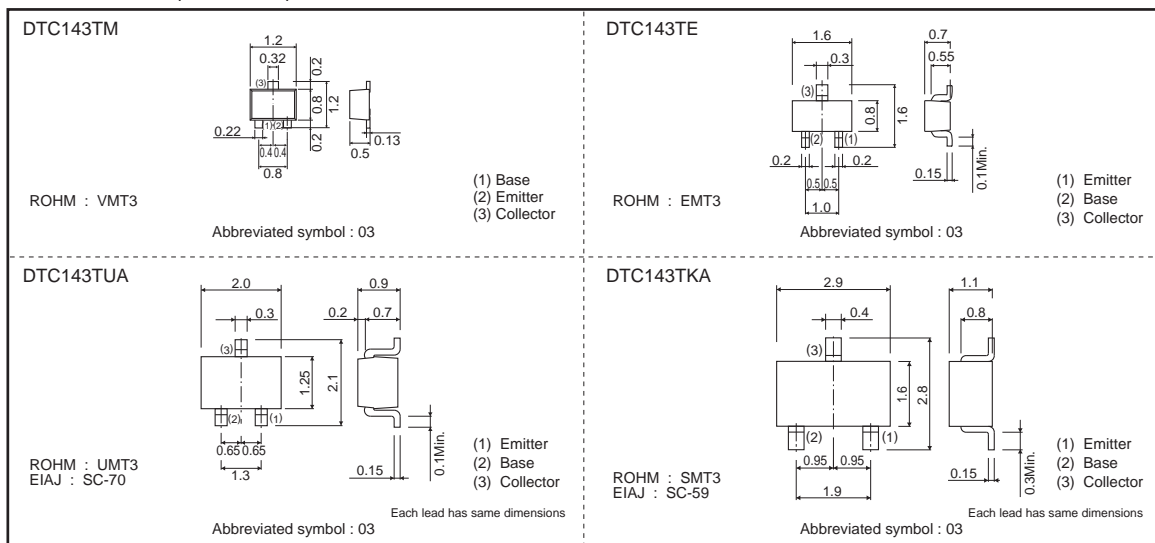
● Features

- 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.

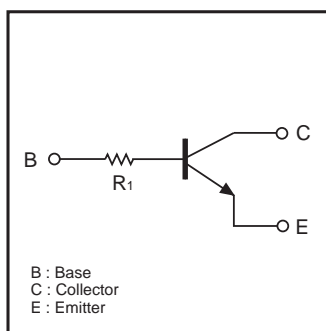
● Structure

NPN 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 _{CB0}	50				V
Collector-emitter voltage	V _{CE0}	50				V
Emitter-base voltage	V _{EB0}	5				V
Collector current	I _c	100				mA
Collector power dissipation	P _c	150		200		mW
Junction temperature	T _J	150				°C
Storage temperature	T _{stg}	-55 to +150				°C

● Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV _{CB0}	50	-	-	V	I _c =50μA
Collector-emitter breakdown voltage	BV _{CE0}	50	-	-	V	I _c =1mA
Emitter-base breakdown voltage	BV _{EB0}	5	-	-	V	I _E =50μA
Collector cutoff current	I _{cBO}	-	-	0.5	μA	V _{CB} =50V
Emitter cutoff current	I _{EBO}	-	-	0.5	μA	V _{EB} =4V
Collector-emitter saturation voltage	V _{CE(sat)}	-	-	0.3	V	I _c /I _B =5mA/0.25mA
DC current transfer ratio	h _{FE}	100	250	600	-	I _c =1mA, V _{CE} =5V
Input resistance	R ₁	3.29	4.7	6.11	kΩ	-
Transition frequency	f _T *	-	250	-	MHz	V _{CE} =10V, I _E =-5mA, f=100MHz

* Characteristics of built-in transistor

● Electrical characteristic curves

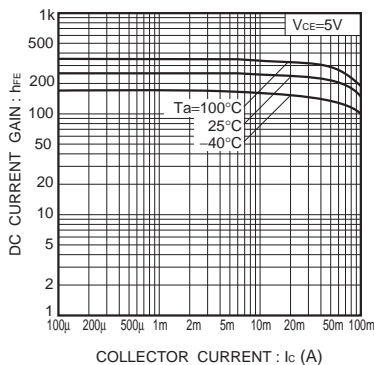


Fig.1 DC current gain vs. collector current

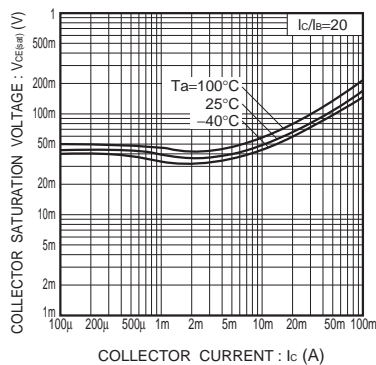


Fig.2 Collector-emitter saturation voltage vs. collector current

Notes

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