

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

DTC144TM / DTC144TE / DTC144TUA / DTC144TKA

● 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.

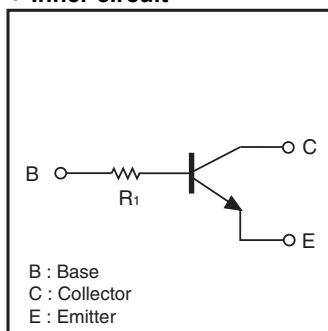
● Structure

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

● Dimensions (Unit : mm)

<p>DTC144TM</p> <p>ROHM : VMT3 Abbreviated symbol : 06</p> <p>(1) Base (2) Emitter (3) Collector</p>	<p>DTC144TE</p> <p>ROHM : EMT3 Abbreviated symbol : 06</p> <p>(1) Emitter (2) Base (3) Collector</p>
<p>DTC144TUA</p> <p>ROHM : UMT3 EIAJ : SC-70 Abbreviated symbol : 06</p> <p>(1) Emitter (2) Base (3) Collector</p> <p>Each lead has same dimensions</p>	<p>DTC144TKA</p> <p>ROHM : SMT3 EIAJ : SC-59 Abbreviated symbol : 06</p> <p>(1) Emitter (2) Base (3) Collector</p> <p>Each lead has same dimensions</p>

● Inner circuit



$R_1=47k\Omega$

● 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
DTC144TM		○	—	—	—
DTC144TE		—	○	—	—
DTC144TUA		—	—	○	—
DTC144TKA		—	—	—	○

● Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits				Unit
		DTC144TM	DTC144TE	DTC144TUA	DTC144TKA	
Collector-base voltage	V _{CB0}	50				V
Collector-emitter voltage	V _{CE0}	50				V
Emitter-base voltage	V _{EBO}	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 _{EBO}	5	—	—	V	I _E =50μA
Collector cutoff current	I _{CB0}	—	—	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/0.5mA
DC current transfer ratio	h _{FE}	100	250	600	—	V _{CE} =5V, I _C =1mA
Input resistance	R ₁	32.9	47	61.1	kΩ	—
Transition frequency	f _T *	—	250	—	MHz	V _{CE} =10V, I _E =-5mA, f=100MHz

* Characteristics of built-in transistor

● Electrical characteristic curves

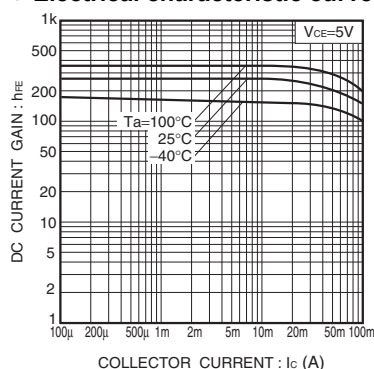


Fig.1 DC current gain vs. collector current

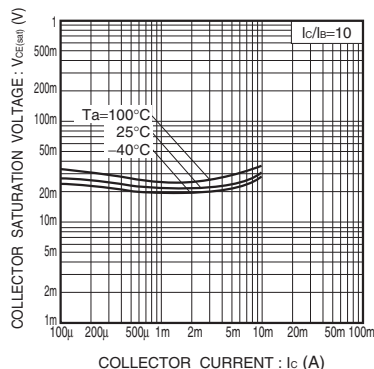


Fig.2 Collector-emitter saturation voltage vs. collector current

Notes

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