

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

DTC144TM / DTC144TE / DTC144TUA / DTC144TKA

● Applications

Inverter, Interface, Driver

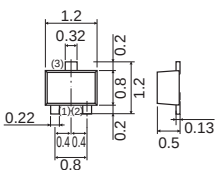
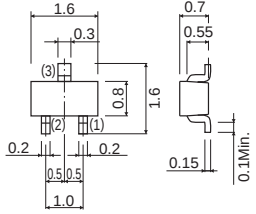
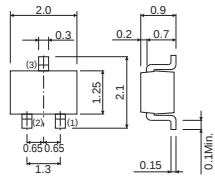
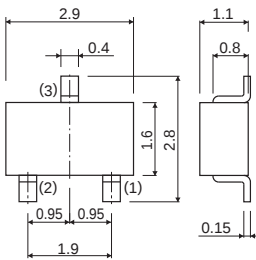
● Features

- 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.

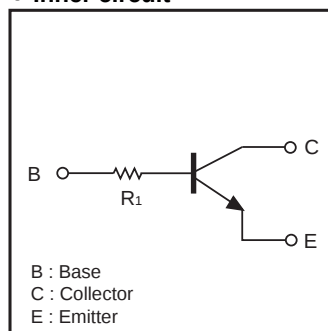
● Structure

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

● Dimensions (Unit : mm)

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

● 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_{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	$I_C=50\mu A$
Collector-emitter breakdown voltage	BV_{CE0}	50	—	—	V	$I_C=1mA$
Emitter-base breakdown voltage	BV_{EB0}	5	—	—	V	$I_E=50\mu A$
Collector cutoff current	I_{CB0}	—	—	0.5	μA	$V_{CB}=50V$
Emitter cutoff current	I_{EB0}	—	—	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	k Ω	—
Transition frequency	f_T *	—	250	—	MHz	$V_{CE}=10V, I_E=-5mA, f=100MHz$

* Characteristics of built-in transistor

● Electrical characteristic curves

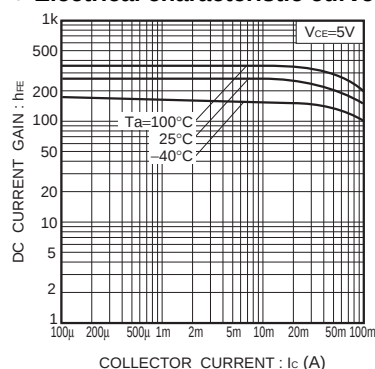


Fig.1 DC current gain vs. collector current

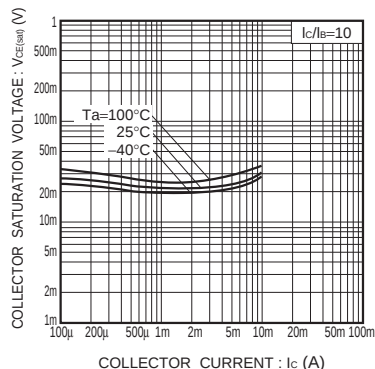


Fig.2 Collector-emitter saturation voltage vs. collector current

Notes

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