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

DTC144TM / DTC144TE / DTC144TUA / DTC144TKA / DTC144TSA

●Applications

Inverter, Interface, Driver

●Features

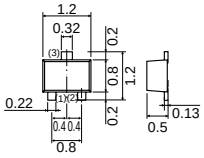
1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
2) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of almost 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)

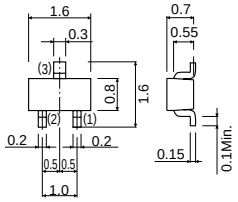
●External dimensions (Unit : mm)

DTC144TM



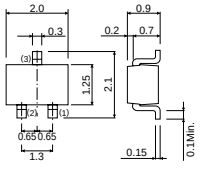
ROHM : VMT3
Abbreviated symbol : 06
(1) Base
(2) Emitter
(3) Collector

DTC144TE



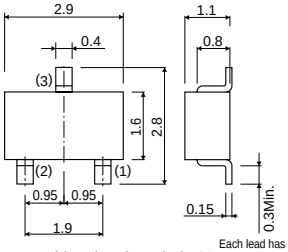
ROHM : EMT3
Abbreviated symbol : 06
(1) Emitter
(2) Base
(3) Colector

DTC144TUA



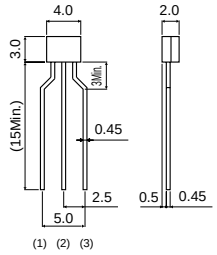
ROHM : UMT3
EIAJ : SC-70
Abbreviated symbol : 06
(1) Emitter
(2) Base
(3) Colector
Each lead has same dimensions

DTC144TKA



ROHM : SMT3
EIAJ : SC-59
Abbreviated symbol : 06
(1) Emitter
(2) Base
(3) Colector
Each lead has same dimensions

DTC144TSA

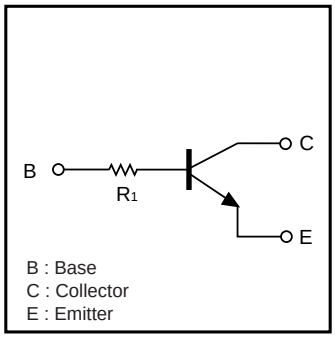


ROHM : SPT
EIAJ : SC-72
Abbreviated symbol : C144TS
(1) Emitter
(2) Collector
(3) Base

●Packaging specifications

Part No.	Package	VMT3	EMT3	UMT3	SMT3	SPT
	Packaging type	Taping	Taping	Taping	Taping	Taping
	Code	T2L	TL	T106	T146	TP
	Basic ordering unit (pieces)	8000	3000	3000	3000	5000
DTC144TM		○	–	–	–	–
DTC144TE		–	○	–	–	–
DTC144TUA		–	–	○	–	–
DTC144TKA		–	–	–	○	–
DTC144TSA		–	–	–	–	○

●Equivalent circuit



R_1=47kΩ

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits					Unit
		DTC144TM	DTC144TE	DTC144TUA	DTC144TKA	DTC144TSA	
Collector-base voltage	V_{CBO}	50					V
Collector-emitter voltage	V_{CEO}	50					V
Emitter-base voltage	V_{EBO}	5					
Collector current	I_C	100					mA
Collector power dissipation	Pc	150		200		300	mW
Junction temperature	Tj	150					°C
Storage temperature	Tstg	–55 to +150					°C

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	50	–	–	V	I_C=50μA
Collector-emitter breakdown voltage	BV_{CEO}	50	–	–	V	I_C=1mA
Emitter-base breakdown voltage	BV_{EBO}	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/0.5mA
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**

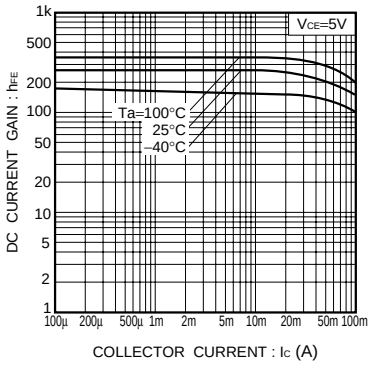


Fig.1 DC current gain vs. collector current

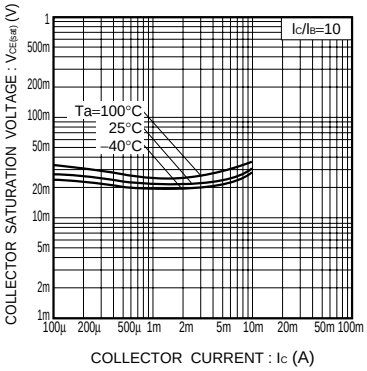


Fig.2 Collector-emitter saturation voltage vs. collector current

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