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

DTC144TM / DTC144TE / DTC144TUA / DTC144TKA

● Applications

Inverter, Interface, Driver

● Features

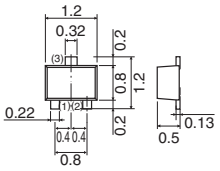
1)Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
2)The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of almost completely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

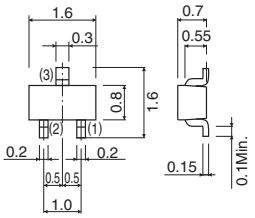
● Dimensions (Unit : mm)

DTC144TM



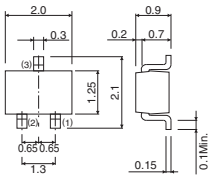
ROHM : VMT3
Abbreviated symbol : 06
(1) Base
(2) Emitter
(3) Collector

DTC144TE



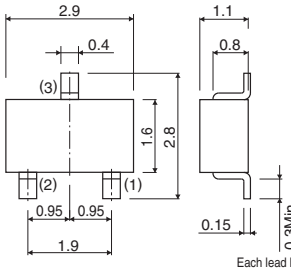
ROHM : EMT3
Abbreviated symbol : 06
(1) Emitter
(2) Base
(3) Colector

DTC144TUA



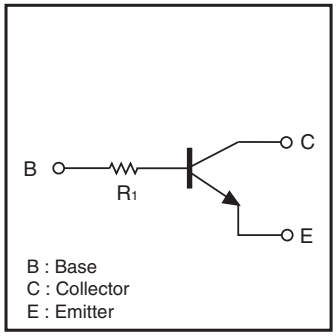
ROHM : UMT3
EIAJ : SC-70
Abbreviated symbol : 06
(1) Emitter
(2) Base
(3) Colector
Each lead has same dimensions

DTC144TKA



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

● Inner circuit



R_1=47kΩ

● Packaging specifications

Part No.		VMT3	EMT3	UMT3	SMT3
	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_{CBO}	50				V
Collector-emitter voltage	V_{CEO}	50				V
Emitter-base voltage	V_{EBO}	5				V
Collector current	I_C	100				mA
Collector power dissipation	Pc	150		200		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

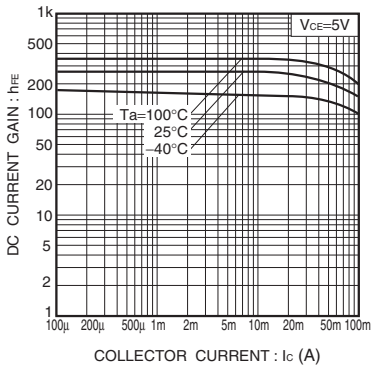


Fig.1 DC current gain vs. collector current

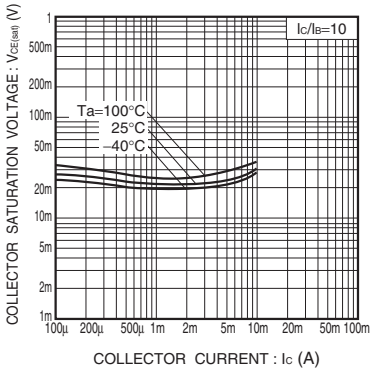


Fig.2 Collector-emitter saturation voltage vs. collector current

Notes

No copying or reproduction of this document, in part or in whole, is permitted without the consent of ROHM Co.,Ltd.

The content specified herein is subject to change for improvement without notice.

The content specified herein is for the purpose of introducing ROHM's products (hereinafter "Products"). If you wish to use any such Product, please be sure to refer to the specifications, which can be obtained from ROHM upon request.

Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

Great care was taken in ensuring the accuracy of the information specified in this document. However, should you incur any damage arising from any inaccuracy or misprint of such information, ROHM shall bear no responsibility for such damage.

The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. ROHM does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by ROHM and other parties. ROHM shall bear no responsibility whatsoever for any dispute arising from the use of such technical information.

The Products specified in this document are intended to be used with general-use electronic equipment or devices (such as audio visual equipment, office-automation equipment, communication devices, electronic appliances and amusement devices).

The Products specified in this document are not designed to be radiation tolerant.

While ROHM always makes efforts to enhance the quality and reliability of its Products, a Product may fail or malfunction for a variety of reasons.

Please be sure to implement in your equipment using the Products safety measures to guard against the possibility of physical injury, fire or any other damage caused in the event of the failure of any Product, such as derating, redundancy, fire control and fail-safe designs. ROHM shall bear no responsibility whatsoever for your use of any Product outside of the prescribed scope or not in accordance with the instruction manual.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). ROHM shall bear no responsibility in any way for use of any of the Products for the above special purposes. If a Product is intended to be used for any such special purpose, please contact a ROHM sales representative before purchasing.

If you intend to export or ship overseas any Product or technology specified herein that may be controlled under the Foreign Exchange and the Foreign Trade Law, you will be required to obtain a license or permit under the Law.

ROHM SEMICONDUCTOR

Thank you for your accessing to ROHM product informations.
More detail product informations and catalogs are available, please contact us.

ROHM Customer Support System

http://www.rohm.com/contact/