

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

DTC114TM / DTC114TE / DTC114TUA / DTC114TKA / DTC114TSA

●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)

DTC114TM ROHM : VMT3 Abbreviated symbol : 04 (1) Base (2) Emitter (3) Collector	DTC114TE ROHM : EMT3 Abbreviated symbol : 04 (1) Emitter (2) Base (3) Collector
DTC114TUA ROHM : UMT3 EIAJ : SC-70 Abbreviated symbol : 04 (1) Emitter (2) Base (3) Collector Each lead has same dimensions	DTC114TKA ROHM : SMT3 EIAJ : SC-59 Abbreviated symbol : 04 (1) Emitter (2) Base (3) Collector Each lead has same dimensions
DTC114TSA ROHM : SPT EIAJ : SC-72 Abbreviated symbol : C114TS (1) Emitter (2) Collector (3) Base	

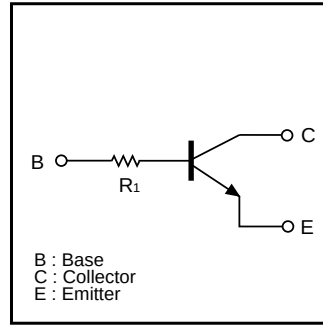
DTC114TM / DTC114TE / DTC114TUA DTC114TKA / DTC114TSA

Transistors

●Packaging specifications

	Package	VMT3	EMT3	UMT3	SMT3	SPT
	Package type	Taping	Taping	Taping	Taping	Taping
	Code	T2L	TL	T106	T146	TP
Part No.	Basic ordering unit (pieces)	8000	3000	3000	3000	5000
DTC114TM		○	—	—	—	—
DTC114TE		—	○	—	—	—
DTC114TUA		—	—	○	—	—
DTC114TKA		—	—	—	○	—
DTC114TSA		—	—	—	—	○

●Equivalent circuit



R1=10kΩ

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits					Unit
		DTA114TM	DTA114TE	DTA114TUA	DTA114TKA	DTA114TSA	
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		300	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 _{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 =10mA/1mA
DC current transfer ratio	h _{FE}	100	250	600	—	V _{CE} =5V, I _C =1mA
Input resistance	R _i	7	10	13	kΩ	—
Transition frequency	f _T *	—	250	—	MHz	V _{CE} =10V, I _E =-5mA, f=100MHz

* Characteristics of built-in transistor

Transistors

●Electrical characteristic curves

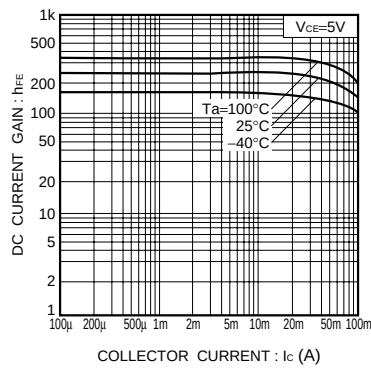


Fig.1 DC current gain vs. collector current

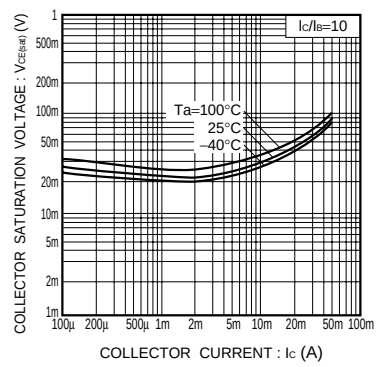


Fig.2 Collector-emitter saturation voltage vs. collector current

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