

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

DTC114TM / DTC114TE / DTC114TUA / DTC114TKA

## ● Applications

Inverter, Interface, Driver

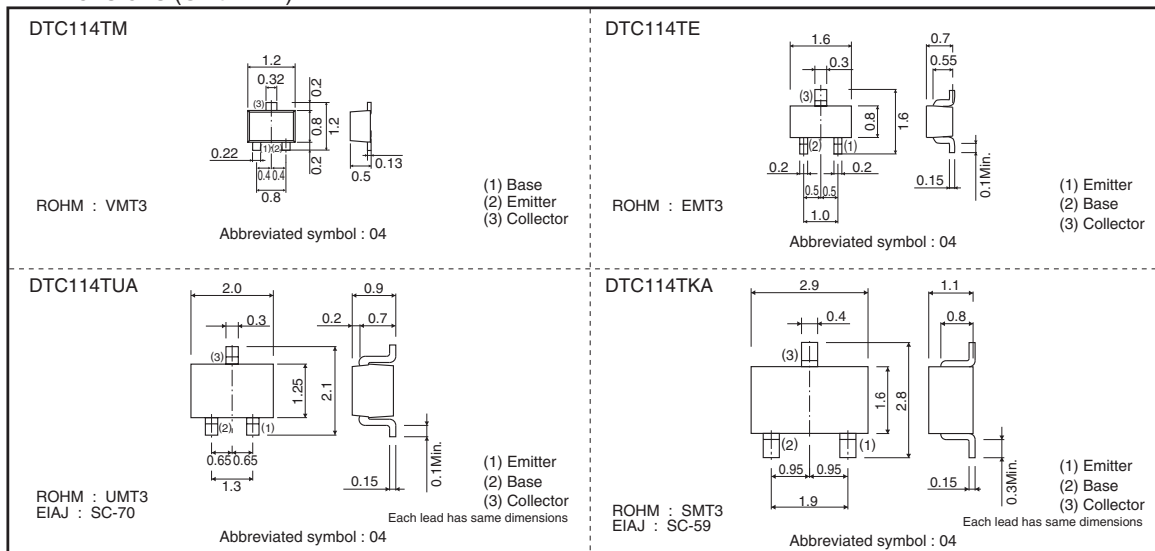
## ● Features

- 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.

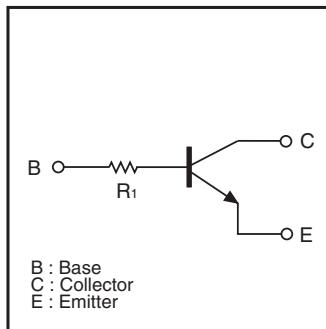
## ● Structure

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

## ● Dimensions (Unit : mm)



## ● Inner circuit



$R_1 = 10k\Omega$

● Packaging specifications

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

● Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits				Unit
		DTA114TM	DTA114TE	DTA114TUA	DTA114TKA	
Collector-base voltage	Vcbo	50				V
Collector-emitter voltage	Vceo	50				V
Emitter-base voltage	Vebo	5				V
Collector current	Ic	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	BVcbo	50	-	-	V	Ic=50μA
Collector-emitter breakdown voltage	BVceo	50	-	-	V	Ic=1mA
Emitter-base breakdown voltage	BVebo	5	-	-	V	Ie=50μA
Collector cutoff current	Icbo	-	-	0.5	μA	Vcb=50V
Emitter cutoff current	Iebo	-	-	0.5	μA	Veb=4V
Collector-emitter saturation voltage	VCE(sat)	-	-	0.3	V	Ic/Ib=10mA/1mA
DC current transfer ratio	hFE	100	250	600	-	VCE=5V, Ic=1mA
Input resistance	Ri	7	10	13	kΩ	-
Transition frequency	fr *	-	250	-	MHz	VCE=10V, Ie=-5mA, f=100MHz

\* Characteristics of built-in transistor

● Electrical characteristic curves

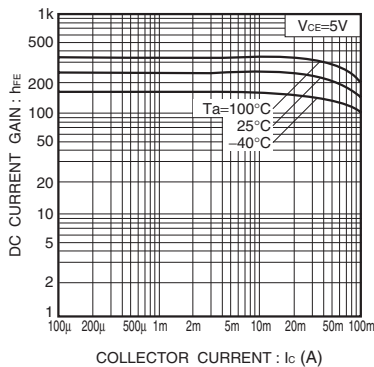


Fig.1 DC current gain vs. collector current

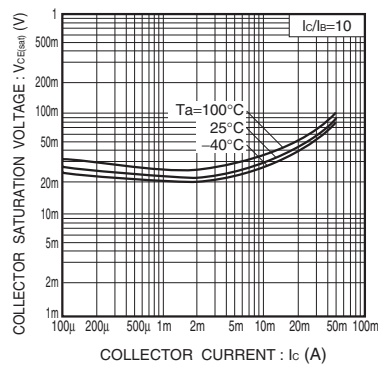


Fig.2 Collector-emitter saturation voltage vs. collector current

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