

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

## DTC114TUB

### ●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 silicon epitaxial planar transistor type  
(Resistor built-in)

### ●Packaging specifications

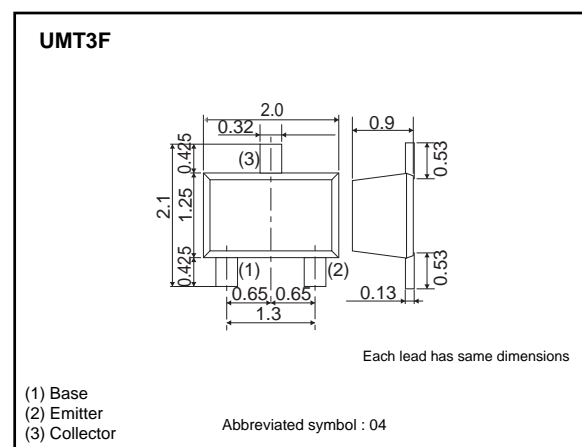
	Package	UMT3F
	Packaging type	Taping
	Code	TL
Part No.	Basic ordering unit (pieces)	3000
DTC114TUB		○

### ●Absolute maximum ratings (T<sub>a</sub>=25°C)

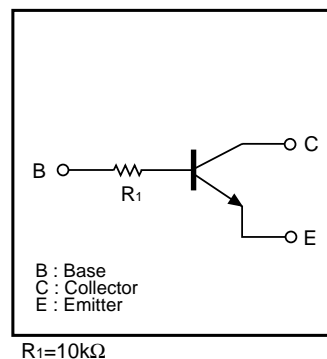
Parameter	Symbol	Limits	Unit
Collector-base voltage	V <sub>CB0</sub>	50	V
Collector-emitter voltage	V <sub>CE0</sub>	50	V
Emitter-base voltage	V <sub>EB0</sub>	5	V
Collector current	I <sub>c</sub>	100	mA
Power dissipation	P <sub>D</sub> <sup>*1</sup>	200	mW
Junction temperature	T <sub>J</sub>	150	°C
Range of storage temperature	T <sub>stg</sub>	-55 to +150	°C

\*1 Each terminal mounted on a recommended land

### ●Dimensions (Unit : mm)



### ●Equivalent circuit



●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-emitter breakdown voltage	$BV_{CE0}$	50	–	–	V	$I_C=1\text{mA}$
Collector-base breakdown voltage	$BV_{CB0}$	50	–	–	V	$I_C=50\mu\text{A}$
Emitter-base breakdown voltage	$BV_{EB0}$	5	–	–	V	$I_E=50\mu\text{A}$
Collector cutoff current	$I_{CBO}$	–	–	500	nA	$V_{CB}=50\text{V}$
Emitter cutoff current	$I_{EBO}$	–	–	500	nA	$V_{EB}=4\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	–	–	0.3	V	$I_C=10\text{mA}, V_C=1\text{mA}$
DC current transfer ratio	$h_{FE}$	100	250	600	–	$V_{CE}=5\text{V}, I_C=1\text{mA}$
Transition frequency	$f_T$ *	–	250	–	MHz	$V_{CE}=10\text{V}, I_E=-5\text{mA}, f=100\text{MHz}$
Input resistance	$R_1$	7	10	13	$k\Omega$	–

\* Characteristics of built-in transistor

●Electrical characteristic curves

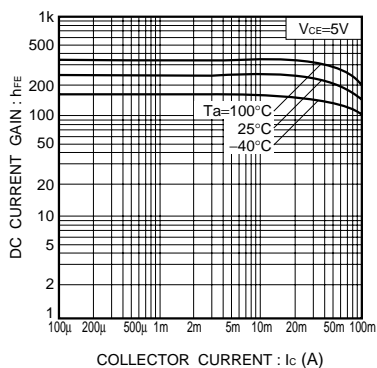


Fig.1 DC current gain vs. collector current

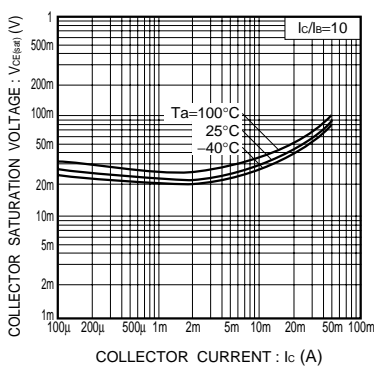


Fig.2 Collector-emitter saturation voltage vs. collector current

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