

# Digital transistors (built-in resistor)

## DTC314TU / DTC314TK

### ●Features

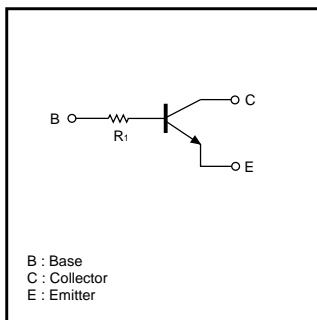
In addition to the features of regular digital transistors,

- 1) Low saturation voltage, typically  $V_{CE(sat)}=40mV$  at  $I_C/I_B=50mA/2.5mA$ , makes these transistors ideal for muting circuits.
- 2) These transistors can be used at high current levels,  $I_C=600mA$ .

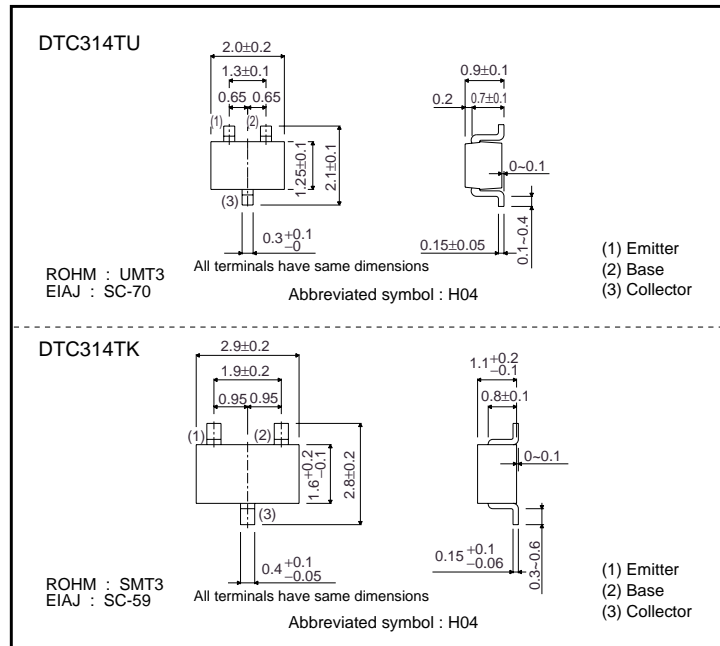
### ●Structure

NPN digital transistor  
(Built-in resistor type)

### ●Equivalent circuit



### ●External dimensions (Units : mm)



### ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits(DTC314T□)		Unit
		U	K	
Collector-base voltage	$V_{CBO}$	30		V
Collector-emitter voltage	$V_{CEO}$	15		V
Emitter-base voltage	$V_{EBO}$	5		V
Collector current	$I_C$	600		mA
Collector power dissipation	$P_C$	200		mW
Junction temperature	$T_j$	150		°C
Storage temperature	$T_{stg}$	-55~+150		°C

Transistors

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV <sub>CBO</sub>	30	–	–	V	I <sub>c</sub> =50μA
Collector-emitter breakdown voltage	BV <sub>CEO</sub>	15	–	–	V	I <sub>c</sub> =1mA
Emitter-base breakdown voltage	BV <sub>EB0</sub>	5	–	–	V	I <sub>E</sub> =50μA
Collector cutoff current	I <sub>CBO</sub>	–	–	0.5	μA	V <sub>CB</sub> =20V
Emitter cutoff current	I <sub>EB0</sub>	–	–	0.5	μA	V <sub>EB</sub> =4V
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	–	40	80	mV	I <sub>c</sub> /I <sub>B</sub> =50mA/2.5mA
DC current transfer ratio	h <sub>FE</sub>	100	250	600	–	V <sub>CE</sub> =5V, I <sub>c</sub> =50mA
Input resistance	R <sub>i</sub>	7	10	13	kΩ	–
Transition frequency	f <sub>T</sub>	–	200	–	MHz	V <sub>CE</sub> =10V, I <sub>E</sub> =–50mA, f=100MHz *
Output "ON" resistance	R <sub>on</sub>	–	1.5	–	Ω	V <sub>i</sub> =7V, R <sub>L</sub> =1kΩ, f=1kHz

\* Transition frequency of the device

●Packaging specifications

Type	Package	UMT3	SMT3
	Packaging type	Taping	Taping
	Code	T106	T146
	Basic ordering unit (pieces)	3000	3000
DTC314TU		○	–
DTC314TK		–	○

●Electrical characteristic curves

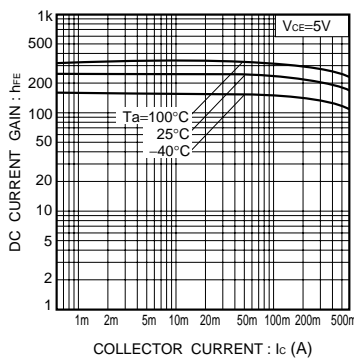


Fig.1 DC current gain vs. collector current

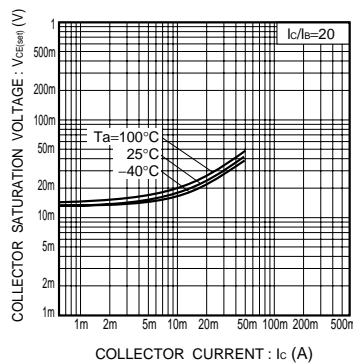


Fig.2 Collector-emitter saturation voltage vs. collector current

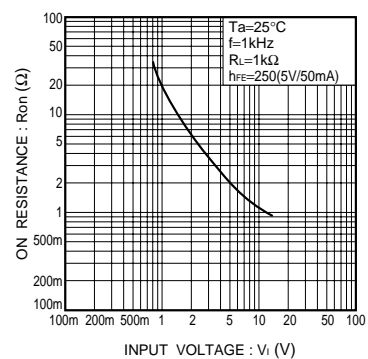


Fig.3 "ON" resistance vs. input voltage

## Transistors

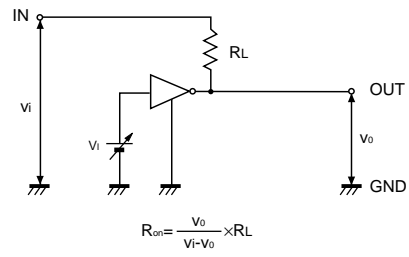
●  $R_{on}$  measurement circuit

Fig.4 Output "ON" resistance ( $R_{on}$ ) measurement circuit