

# Digital transistors (built-in resistor)

## DTC314TU / DTC314TK / DTC314TS

### ●Features

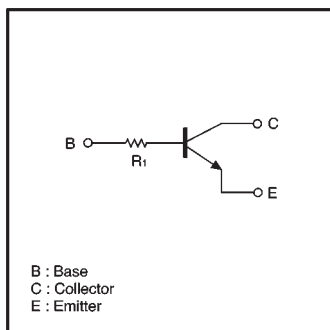
In addition to the features of regular digital transistors,

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

### ●Structure

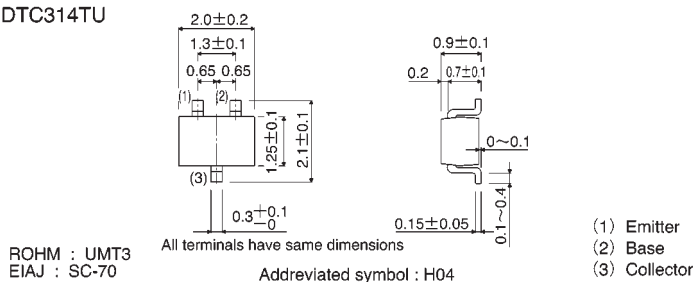
NPN digital transistor  
(Built-in resistor type)

### ●Equivalent circuit

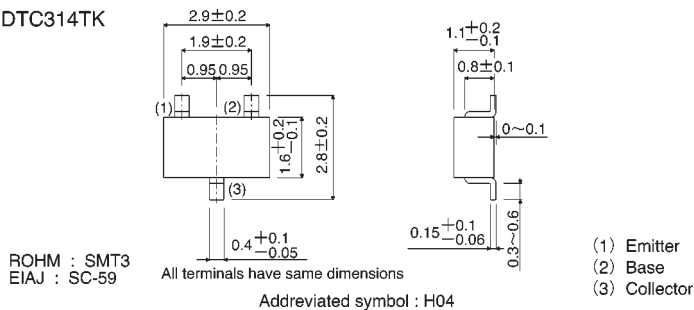


### ●External dimensions (Units: mm)

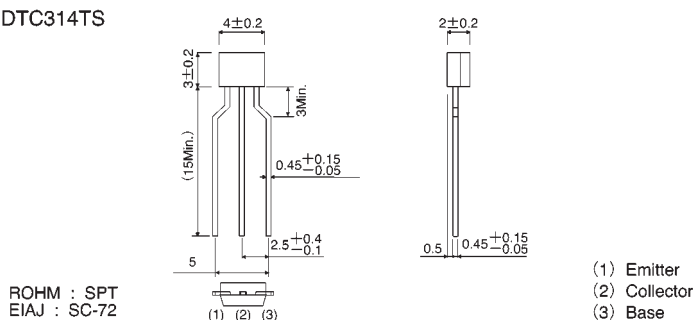
DTC314TU



DTC314TK



DTC314TS



● Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits(DTC314T□)			Unit
		U	K	S	
Collector-base voltage	V <sub>CB0</sub>	30			V
Collector-emitter voltage	V <sub>CEO</sub>	15			V
Emitter-base voltage	V <sub>EBO</sub>	5			V
Collector current	I <sub>c</sub>	600			mA
Collector power dissipation	P <sub>c</sub>	200		300	mW
Junction temperature	T <sub>j</sub>	150			°C
Storage temperature	T <sub>stg</sub>	-55~+150			°C

● Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV <sub>CB0</sub>	30	—	—	V	I <sub>c</sub> =50 μA
Collector-emitter breakdown voltage	BV <sub>CEO</sub>	15	—	—	V	I <sub>c</sub> =1mA
Emitter-base breakdown voltage	BV <sub>EBO</sub>	5	—	—	V	I <sub>E</sub> =50 μA
Collector cutoff current	I <sub>CB0</sub>	—	—	0.5	μA	V <sub>CB</sub> =20V
Emitter cutoff current	I <sub>EBO</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

Part No.	Package	UMT3	SMT3	SPT
	Packaging type	Taping	Taping	Taping
	Code	T106	T146	TP
	Basic ordering unit (pieces)	3000	3000	5000
DTC314TU		○	—	—
DTC314TK		—	○	—
DTC314TS		—	—	○

● R<sub>on</sub> measurement circuit

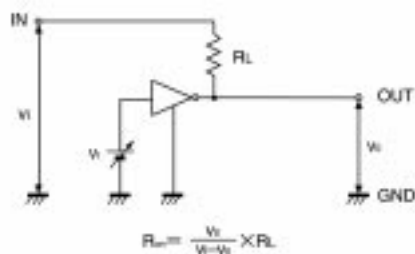


Fig.1 Output "ON" resistance (R<sub>on</sub>) measurement circuit

● Electrical characteristic curves

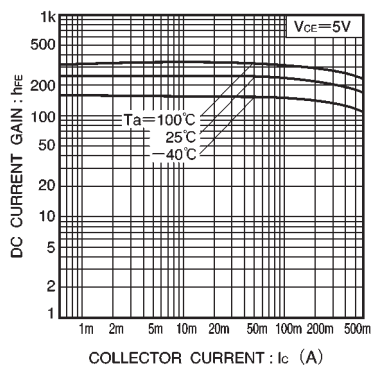


Fig.2 DC current gain vs. collector current

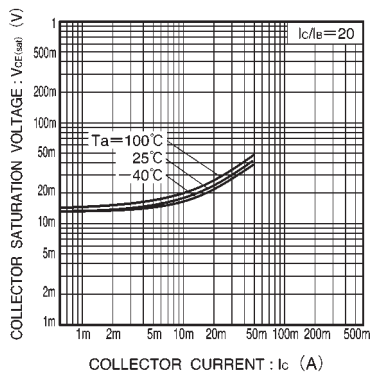


Fig.3 Collector-emitter saturation voltage vs. collector current

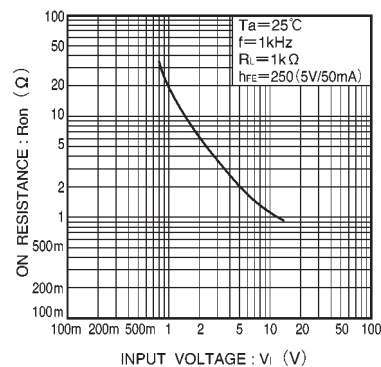


Fig.4 "ON" resistance vs. input voltage