

Digital transistors (built-in resistor)

DTC314TU / DTC314TK

●Features

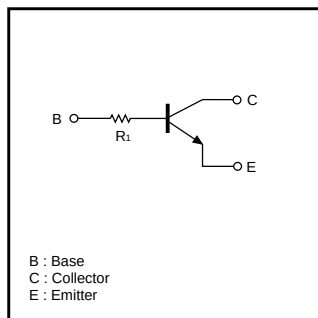
In addition to the features of regular digital transistors,

- 1) Low saturation voltage, typically $V_{CE(sat)}=40\text{mV}$ 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, $I_C=600\text{mA}$.

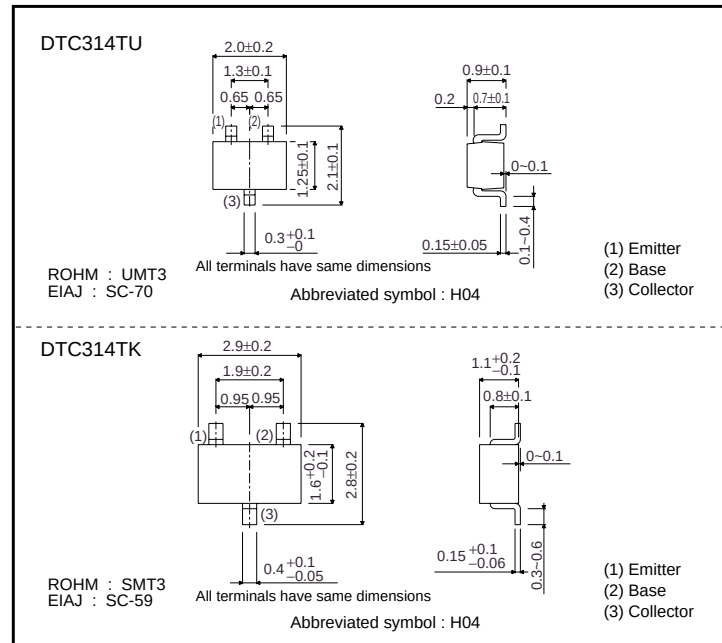
●Structure

NPN digital transistor
(Built-in resistor type)

●Equivalent circuit



●External dimensions (Units : mm)



●Absolute maximum ratings ($T_a=25^\circ\text{C}$)

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		$^\circ\text{C}$
Storage temperature	T_{stg}	-55~+150		$^\circ\text{C}$

Transistors

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	30	—	—	V	$I_C=50\mu A$
Collector-emitter breakdown voltage	BV_{CEO}	15	—	—	V	$I_C=1mA$
Emitter-base breakdown voltage	BV_{EBO}	5	—	—	V	$I_E=50\mu A$
Collector cutoff current	I_{CBO}	—	—	0.5	μA	$V_{CB}=20V$
Emitter cutoff current	I_{EBO}	—	—	0.5	μA	$V_{EB}=4V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	40	80	mV	$I_C/I_B=50mA/2.5mA$
DC current transfer ratio	h_{FE}	100	250	600	—	$V_{CE}=5V, I_C=50mA$
Input resistance	R_1	7	10	13	k Ω	—
Transition frequency	f_T	—	200	—	MHz	$V_{CE}=10V, I_E=-50mA, f=100MHz$ *
Output "ON" resistance	R_{on}	—	1.5	—	Ω	$V_I=7V, R_L=1k\Omega, f=1kHz$

* 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

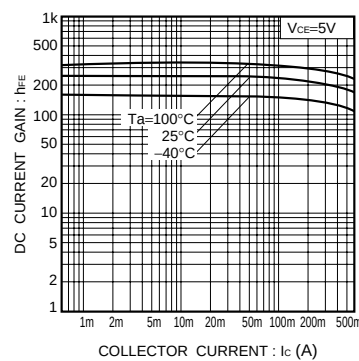


Fig.1 DC current gain vs. collector current

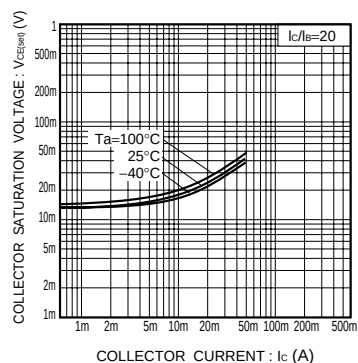


Fig.2 Collector-emitter saturation voltage vs. collector current

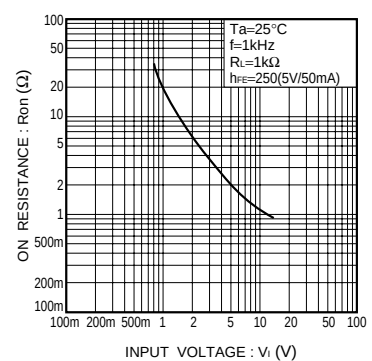


Fig.3 "ON" resistance vs. input voltage

Transistors

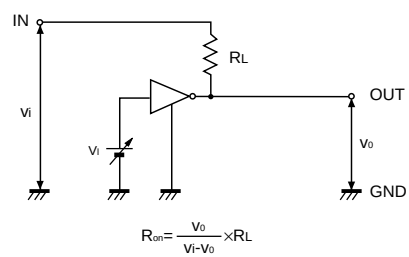
● R_{on} measurement circuit

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