

Digital transistors (built-in resistor)

DTC623TU / DTC623TK

●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.

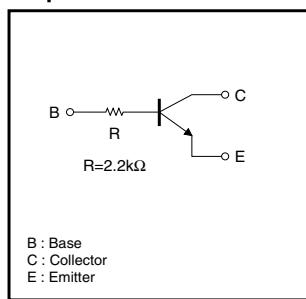
2) These transistors can be used at high current levels, $I_C = 600mA$.

●Structure

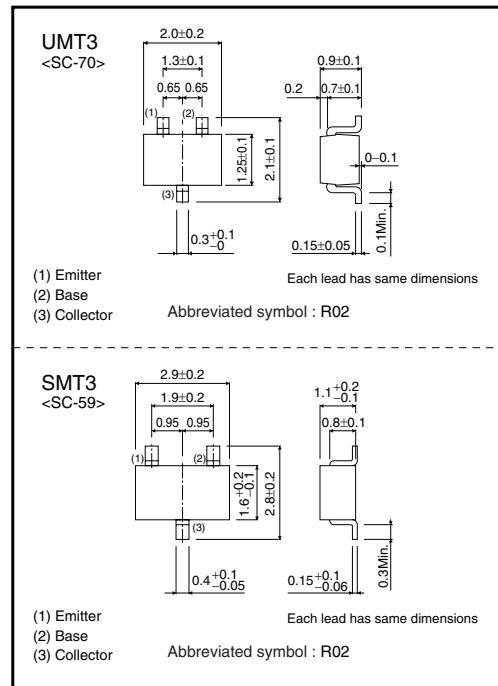
NPN digital transistor

(Built-in resistor type)

●Equivalent circuit



●External dimensions (Unit : mm)



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CBO}	20	V
Collector-emitter voltage	V_{CEO}	20	V
Emitter-base voltage	V_{EBO}	12	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 to +150	°C

Transistors

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV _{CBO}	20	—	—	V	I _c =50μA
Collector-emitter breakdown voltage	BV _{CEO}	20	—	—	V	I _c =1mA
Emitter-base breakdown voltage	BV _{EBO}	12	—	—	V	I _e =50μA
Collector cutoff current	I _{cBO}	—	—	0.5	μA	V _{CB} =20V
Emitter cutoff current	I _{eBO}	—	—	0.5	μA	V _{EB} =12V
Collector-emitter saturation voltage	V _{CE} (sat)	—	40	150	mV	I _c =50mA, I _b =2.5mA
DC current transfer ratio	h _{FE}	820	—	2700	—	V _{CE} =5V, I _c =50mA
Input resistance	R _i	1.54	2.2	2.86	kΩ	—
Transition frequency	f _T	—	150	—	MHz	V _{CE} =10V, I _e =-50mA, f=100MHz *
Output "ON" resistance	R _{on}	—	0.4	—	Ω	V _I =5V, R _L =1kΩ, f=1kHz

*Transition frequency of the device.

●Packaging specifications and h_{FE}

Type	Package	UMT3	SMT3
	Packaging type	Taping	Taping
	Code	T106	T146
	Basic ordering unit (pieces)	3000	3000
DTC623TU	○	—	
DTC623TK	—	○	

●Electrical characteristic curves

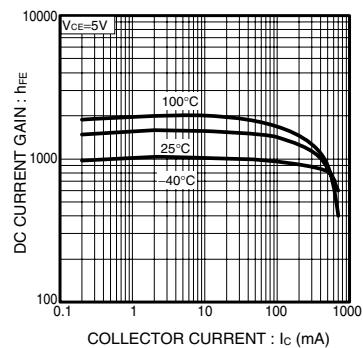


Fig.1 DC Current Gain vs. Collector Current

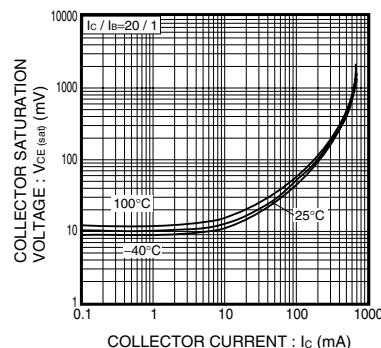


Fig.2 Collector-Emitter Saturation Voltage vs. Collector Current

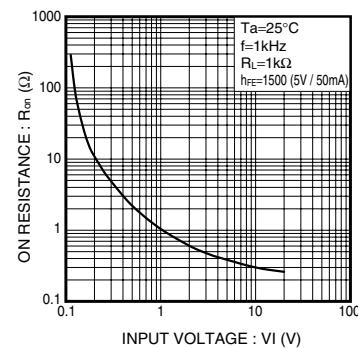


Fig.3 "ON" resistance vs. Input Voltage

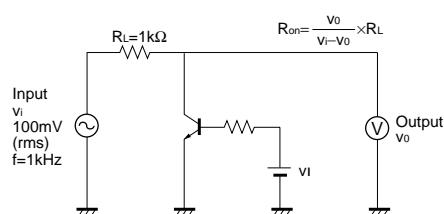
●R_{on} measurement circuit

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

Appendix

Notes

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