

# Digital transistors (built-in resistor)

## DTC623TU / DTC623TK

### ●Features

In addition to the features of regular digital transistors.

1) Low saturation voltage, typically

$V_{CE(sat)} = 40\text{mV}$  at  $I_C / I_B = 50\text{mA} / 2.5\text{mA}$ , makes these transistors ideal for muting circuits.

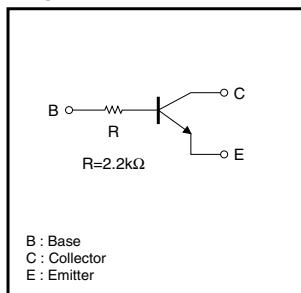
2) These transistors can be used at high current levels,  
 $I_C = 600\text{mA}$ .

### ●Structure

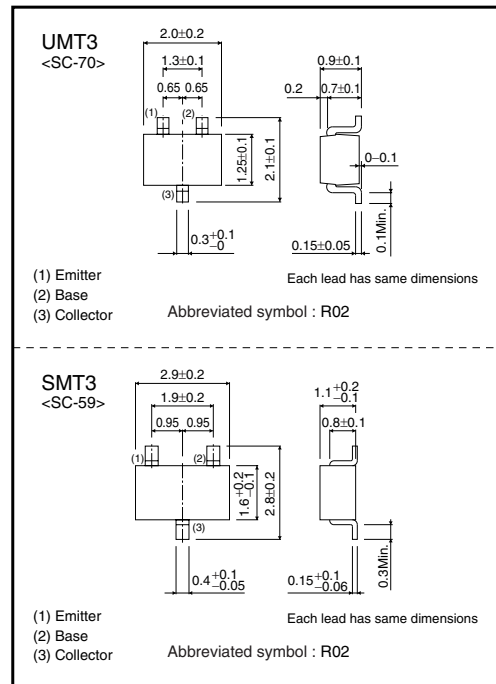
NPN digital transistor

(Built-in resistor type)

### ●Equivalent circuit



### ●External dimensions (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	$I_C=50\mu A$
Collector-emitter breakdown voltage	$BV_{CEO}$	20	—	—	V	$I_C=1mA$
Emitter-base breakdown voltage	$BV_{EBO}$	12	—	—	V	$I_E=50\mu A$
Collector cutoff current	$I_{CBO}$	—	—	0.5	$\mu A$	$V_{CB}=20V$
Emitter cutoff current	$I_{EBO}$	—	—	0.5	$\mu A$	$V_{EB}=12V$
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	$R_1$	1.54	2.2	2.86	$k\Omega$	—
Transition frequency	$f_T$	—	150	—	MHz	$V_{CE}=10V, I_E=-50mA, f=100MHz$ *
Output "ON" resistance	$R_{on}$	—	0.4	—	$\Omega$	$V_I=5V, R_L=1k\Omega, f=1kHz$

\*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

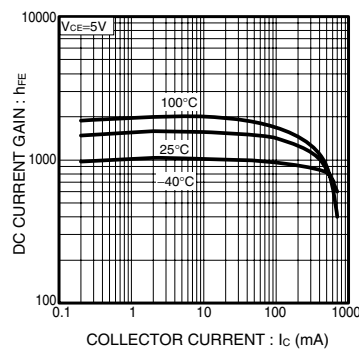


Fig.1 DC Current Gain vs. Collector Current

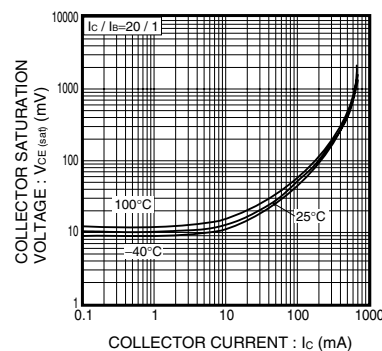


Fig.2 Collector-Emitter Saturation Voltage vs. Collector Current

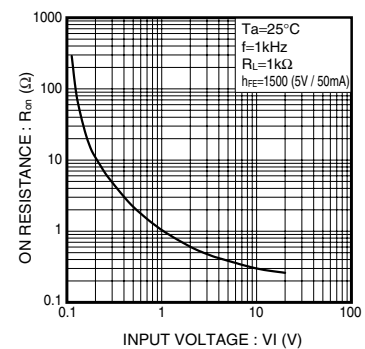
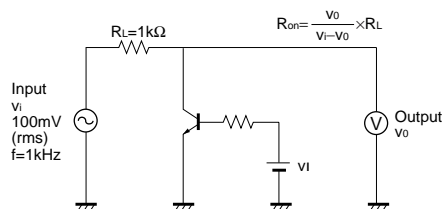


Fig.3 "ON" resistance vs. Input Voltage

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

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