

DTC663EU / DTC663EK

Transistors

Digital transistors (built-in resistor)

DTC663EU / DTC663EK

●Features

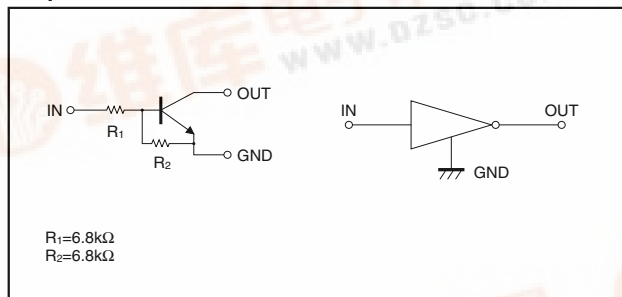
In addition to the features of regular digital transistors.

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

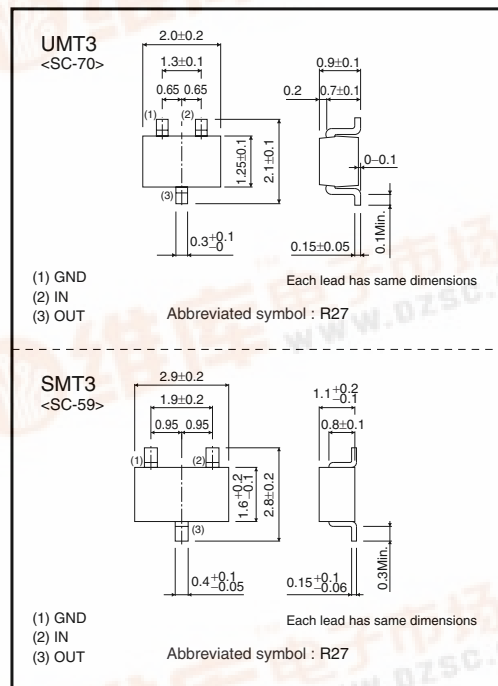
●Structure

NPN digital transistor  
 (Built-in resistor type)

●Equivalent circuit



●External dimensions (Unit : mm)



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Supply voltage	$V_{CC}$	20	V
Input voltage	$V_{IN}$	-20 to 20	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

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●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	-	-	0.5	V	$V_{CC}=5V / I_O=100\mu A$
	$V_{I(on)}$	2.0	-	-	V	$V_O=0.3V / I_O=10mA$
Output voltage	$V_{O(on)}$	-	-	150	mV	$I_O=50mA / I_I=2.5mA$
Input current	$I_I$	-	-	0.9	mA	$V_I=5V$
Output current	$I_{O(off)}$	-	-	0.5	$\mu A$	$V_{CC}=20V / V_I=0V$
DC current transfer ratio	$G_I$	250	-	550	-	$V_O=5V, I_O=50mA$
Input resistance	$R_I$	4.76	6.8	8.84	$k\Omega$	-
Resistance ratio	$R_2/R_1$	0.8	1.0	1.2	-	-
Transition frequency	$f_T$	-	150	-	MHz	$V_{CE}=10V, I_E=-50mA, f=100MHz$ *
Output "ON" resistance	$R_{on}$	-	0.9	-	$\Omega$	$V_I=5V, R_L=1k\Omega, f=1MHz$

\*Transition frequency of the device.

●Packaging specifications and hFE

Type	Package	UMT3	SMT3
	Packaging type	Taping	Taping
	Code	T106	T146
	Basic ordering unit (pieces)	3000	3000
DTC663EU		○	-
DTC663EK		-	○

●Electrical characteristic curves

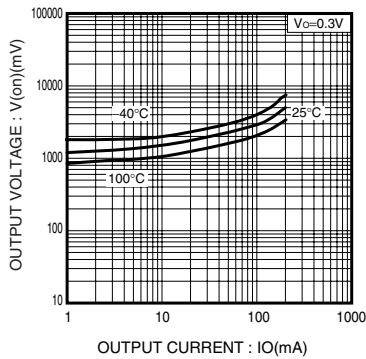


Fig.1 Input Voltage vs. Output Current(On characteristics)

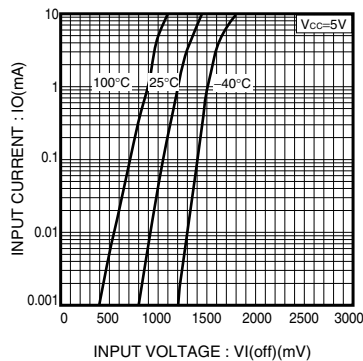


Fig.2 Output Current vs. Input Voltage(Off characteristics)

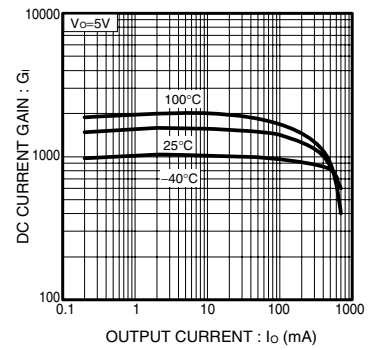


Fig.3 DC Current Gain vs. Output Current

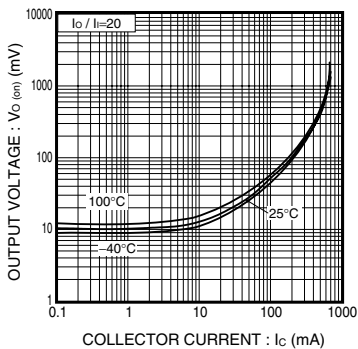


Fig.4 Output Voltage vs. Output Current

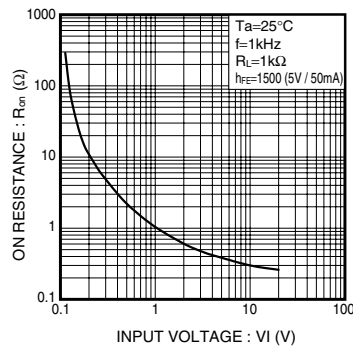
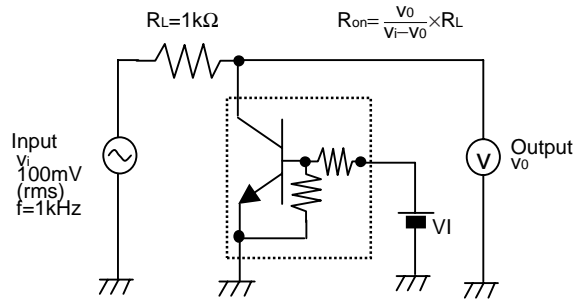


Fig.5 "ON" resistance vs. Input Voltage

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●  $R_{on}$  measurement circuitFig.6 Output "ON" resistance ( $R_{on}$ ) measurement circuit

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