

# 100mA/50V Digital transistors(with built-in resistors)

## DTC043ZM / DTC043ZEB / DTC043ZUB

### ●Features

- 1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors. (See Equivalent circuit)
- 2) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of almost completely eliminating parasitic effects.
- 3) Only the on/off conditions need to be set for operation, making the device design easy.

### ●Structure

NPN epitaxial planar silicon transistor  
(Resistor built-in type)

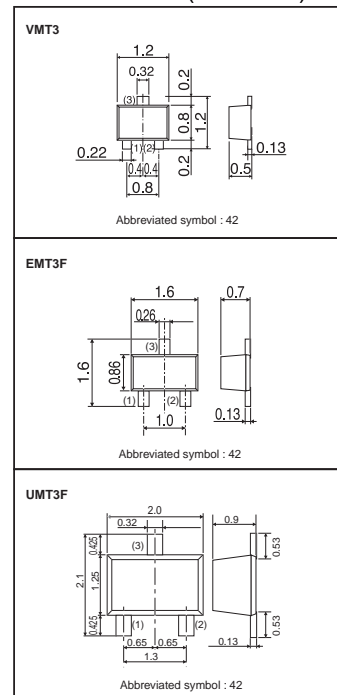
### ●Applications

Inverter, Interface, Driver

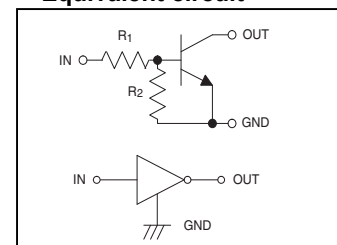
### ●Packaging specifications and $h_{FE}$

Type	Package	VMT3	EMT3F	UMT3F
	Packaging Type	Taping	Taping	Taping
	Code	T2L	TL	TL
	Basic ordering unit (pieces)	8000	3000	3000
DTC043ZM		○	-	-
DTC043ZEB		-	○	-
DTC043ZUB		-	-	○

### ●Dimensions (Unit : mm)



### ●Equivalent circuit



$$R_1=4.7k\Omega, R_2=47k\Omega$$

### ●Absolute maximum (Ta=25°C)

Parameter	Symbol	Limits(DTC043Z□)			Unit
		M	EB	UB	
Supply voltage	$V_{CC}$		50		V
Input voltage	$V_{IN}$		30		V
			-5		V
Collector current *1	$I_{C(max)}$		100		mA
Output current	$I_O$		100		mA
Power dissipation *2	$P_D$	150		200	mW
Junction temperature	$T_j$		150		°C
Range of storage temperature	$T_{stg}$		-55 to +150		°C

\*1 Characteristics of built-in transistor

\*2 Each terminal mounted on a reference land

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Input voltage	$V_{I(off)}$	-	-	0.5	V	$V_{CC}=5V / I_O=100\mu A$
	$V_{I(on)}$	1.1	-	-	V	$V_O=0.3V / I_O=5mA$
Output voltage	$V_{O(on)}$	-	0.05	0.15	V	$I_O=5mA / I_I=0.5mA$
Input current	$I_I$	-	-	1.8	mA	$V_I=5V$
Output current	$I_{O(off)}$	-	-	500	nA	$V_{CC}=50V / V_I=0V$
DC current gain	$G_I$	80	-	-	-	$V_O=10V / I_O=5mA$
Transition frequency *	$f_T$	-	250	-	MHz	$V_{CE}=10V / I_E=-5mA$ $f=100MHz$
Input resistance	$R_I$	3.29	4.7	6.11	kΩ	
Resistance ratio	$R_2/R_1$	8	10	12	-	

\* Characteristics of built-in transistor

●Electrical characteristics curves

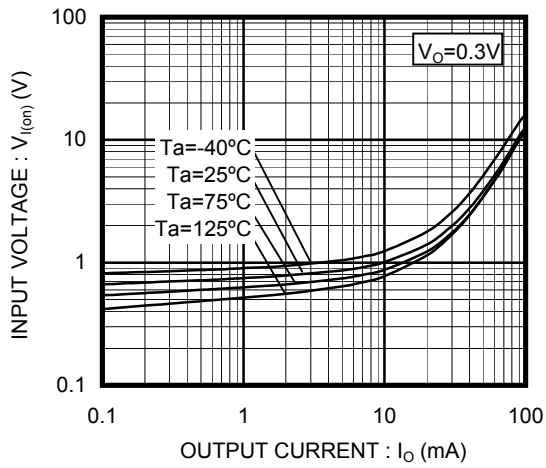


Fig.1 Input Voltage vs. Output Current (ON characteristics)

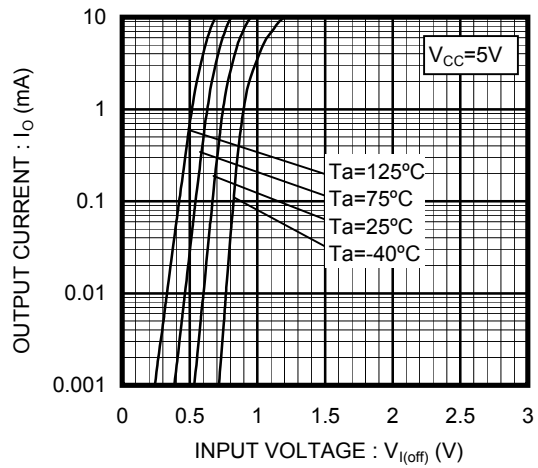


Fig.2 Input Voltage vs. Output Current (OFF characteristics)

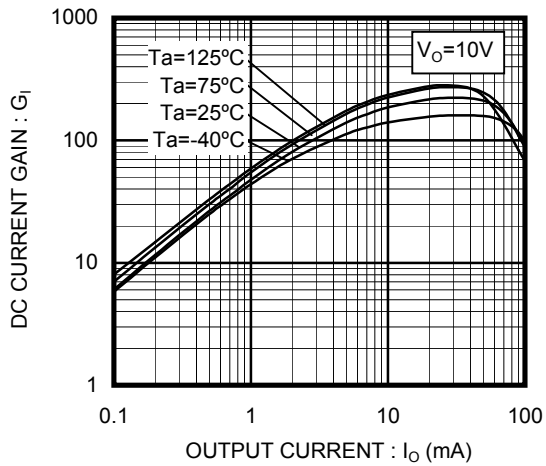


Fig.3 DC Current Gain vs. Output Current

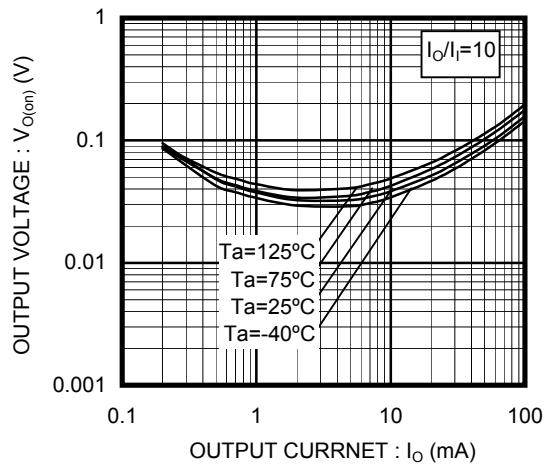


Fig.4 Output Voltage vs. Output Current

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