

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

**DTC044EM / DTC044EEB / DTC044EUB**

**●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)

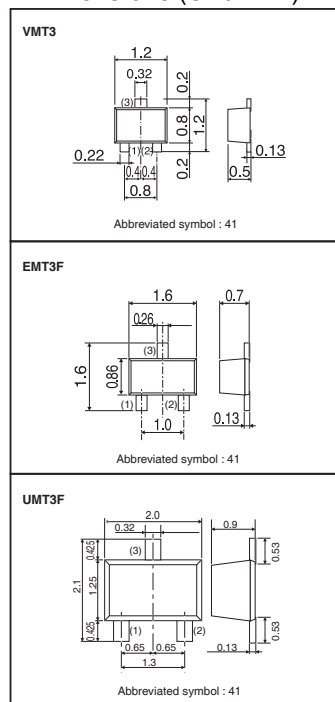
**●Applications**

Inverter, Interface, Driver

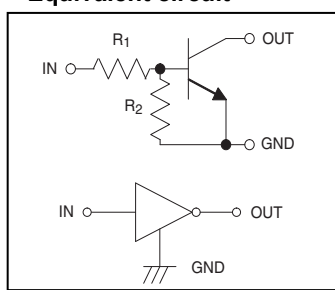
**●Packaging specifications**

Type	Package	VMT3	EMT3F	UMT3F
	Packaging Type	Taping	Taping	Taping
	Code	T2L	TL	TL
	Basic ordering unit (pieces)	8000	3000	3000
DTC044EM		○	-	-
DTC044EEB		-	○	-
DTC044EUB		-	-	○

**●Dimensions (Unit : mm)**



**●Equivalent circuit**



$R_1=R_2=47k\Omega$

**●Absolute maximum (Ta=25°C)**

Parameter	Symbol	Limits(DTC044E□)			Unit
		M	EB	UB	
Supply voltage	$V_{CC}$		50		V
Input voltage	$V_{IN}$		40		V
			-10		V
Collector current *1	$I_{C(max)}$		100		mA
Output current	$I_O$		30		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

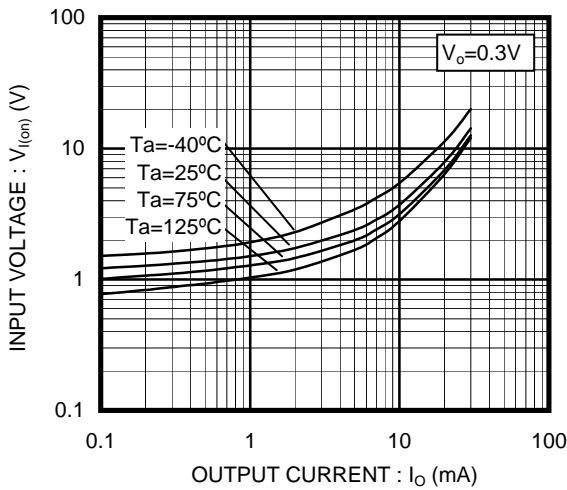
\*2 Each terminal mounted on a reference land

●Electrical characteristics (Ta=25°C)

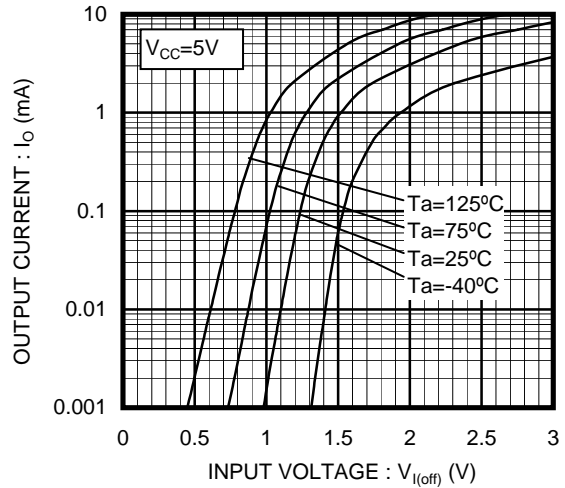
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Input voltage	$V_{I(off)}$	-	-	0.8	V	$V_{CC}=5V / I_O=100\mu A$
	$V_{I(on)}$	3.0	-	-	V	$V_O=0.3V / I_O=2mA$
Output voltage	$V_{O(on)}$	-	0.05	0.15	V	$I_O=5mA / I_I=0.5mA$
Input current	$I_I$	-	-	0.18	mA	$V_I=5V$
Output current	$I_{O(off)}$	-	-	500	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	$R_1$	32.9	47	61.1	kΩ	
Resistance ratio	$R_2/R_1$	0.8	1.0	1.2	-	

\* Characteristics of built-in transistor

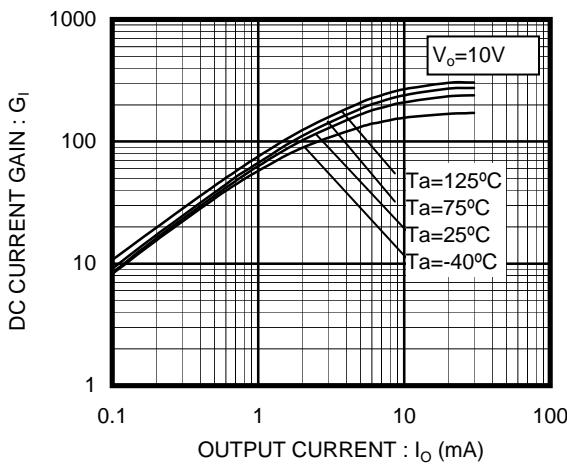
●Electrical characteristics curves



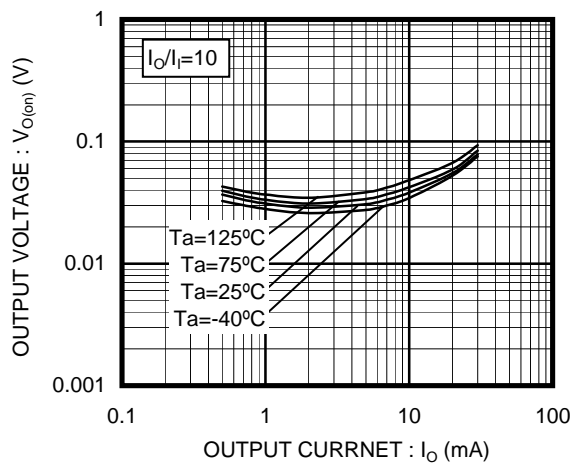
Input Voltage vs. Output Current (ON characteristics)



Input Voltage vs. Output Current (OFF characteristics)



DC Current Gain vs. Output Current



Output Voltage vs. Output Current

## Notes

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