

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

DTC044TM / DTC044TEB / DTC044TUB

●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.

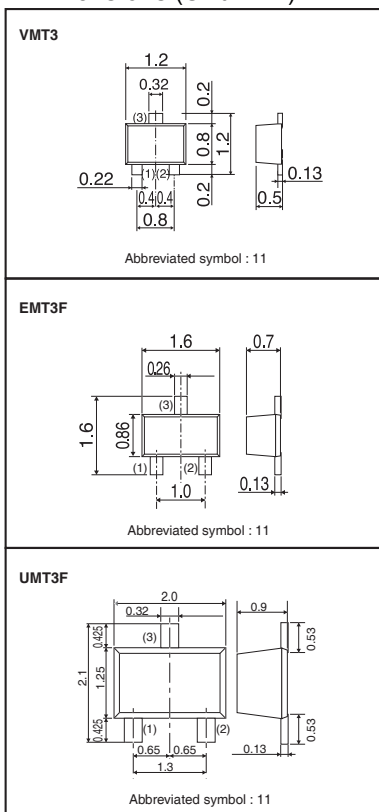
●Structure

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

●Applications

Inverter, Interface, Driver

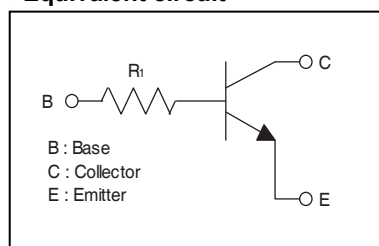
●Dimensions (Unit : mm)



●Packaging specifications

Type	Package	VMT3	EMT3F	UMT3F
	Packaging Type	Taping	Taping	Taping
	Code	T2L	TL	TL
	Basic ordering unit (pieces)	8000	3000	3000
DTC044TM		○	-	-
DTC044TEB		-	○	-
DTC044TUB		-	-	○

●Equivalent circuit



$R_1 = 47k\Omega$

●Absolute maximum (Ta=25°C)

Parameter	Symbol	Limits(DTC044T□)			Unit
		M	EB	UB	
Collector-base voltage	V_{CBO}	50			V
Collector-emitter voltage	V_{CEO}	50			V
Emitter-base voltage	V_{EBO}	5			V
Collector current	I_C	60			mA
Power dissipation *	P_D	150		200	mW
Junction temperature	T_j	150			°C
Range of storage temperature	T_{stg}	-55 to +150			°C

* Each terminal mounted on a reference land

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Collector-Base breakdown voltage	BV_{CBO}	50	-	-	V	$I_C=50\mu A$
Collector-Emitter breakdown voltage	BV_{CEO}	50	-	-	V	$I_C=1mA$
Emitter-Base breakdown voltage	BV_{EBO}	5	-	-	V	$I_E=50\mu A$
Collector cut-off current	I_{CBO}	-	-	500	nA	$V_{CB}=50V$
Emitter cut-off current	I_{EBO}	-	-	500	nA	$V_{EB}=4V$
Collector-Emitter saturation voltage	$V_{CE(sat)}$	-	0.05	0.15	V	$I_C=5mA / I_B=0.5mA$
DC current gain	h_{FE}	100	-	600	-	$V_{CE}=10V / I_C=5mA$
Transition frequency *	f_T	-	250	-	MHz	$V_{CE}=10V / I_E=5mA$ $f=100MHz$
Input resistance	R_1	32.9	47	61.1	$k\Omega$	

* Characteristics of built-in transistor

●Electrical characteristics curves

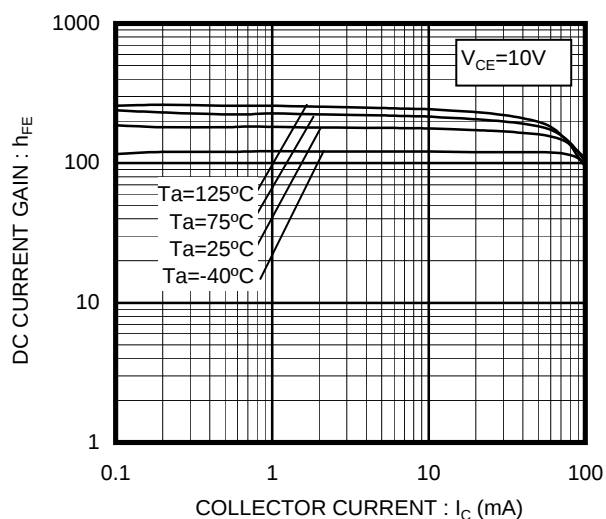


Fig.1 DC Current Gain vs. Collector Current

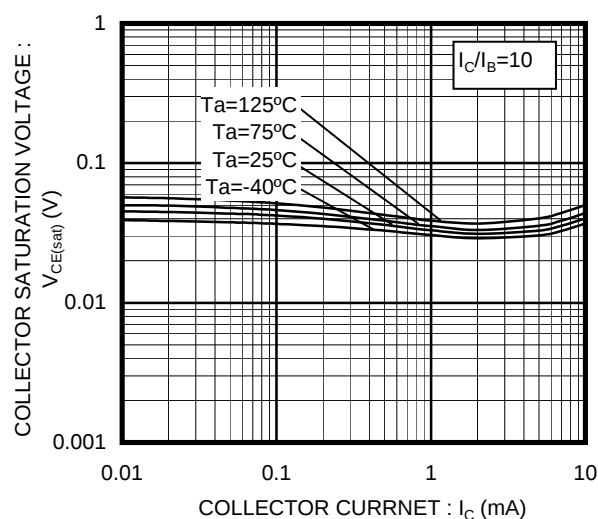


Fig.2 Collector Saturation Voltage vs. Collector Current

Notes

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