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

DTC124XM / DTC124XE / DTC124XUA / DTC124XKA / DTC124XSA

Applications

Inverter, Interface, Driver

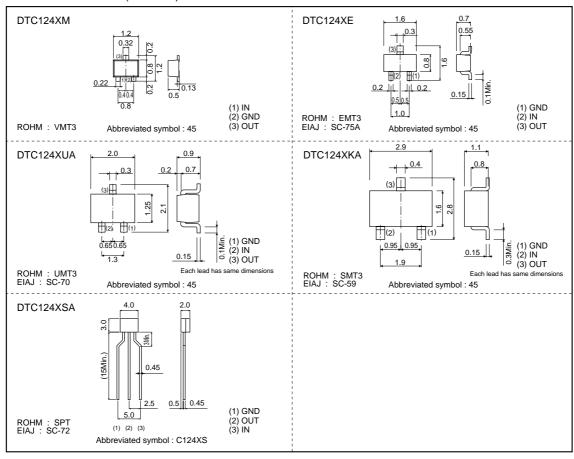
Features

- 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)

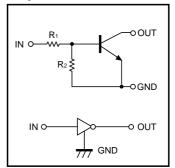
●External dimensions (Unit: mm)



Packaging specifications

	Package	VMT3	EMT3	UMT3	SMT3	SPT
	Packaging type	Taping	Taping	Taping	Taping	Taping
	Code	T2L	TL	T106	T146	TP
Part No.	Basic ordering unit (pieces)	8000	3000	3000	3000	5000
DTC124XM		0	-	-	-	-
DTC124XE			0			-
DTC124XUA			-	0		-
DTC124XKA		-	-	-	0	
DTC124XSA		-	-	-	-	0

●Equivalent circuit



 $R_1=22k\Omega$ $R_2=47k\Omega$

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits					
Parameter		DTC124XM DTC124XE	DTC124XUA	DTC124XKA	DTC124XSA	Unit	
Supply voltage	Vcc	50				V	
Input voltage	Vin	-10 to +40					
Outrut aurent	lo	50				mA	
Output current	IC(Max.)	100					
Power dissipation	Po	150	200		300	mW	
Junction temperature	Tj	150			°C		
Storage temperature	Tstg	−55 to +150				°C	

●Electrical characteristics (Ta=25°C)

	•					
Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
lanut valta sa	VI(off)	-	-	0.4	.,	Vcc=5V, Io=100μA
Input voltage	VI(on)	2.5	-	_	V	Vo=0.3V, Io=2mA
Output voltage	Vo(on)	-	0.1	0.3	٧	lo/l=10mA/0.5mA
Input current	lı	-	-	0.36	mA	Vi=5V
Output current	IO(off)	_	_	0.5	μА	Vcc=50V, Vi=0V
DC current gain	Gı	68	-	_	-	Vo=5V, Io=5mA
Input resistance	R ₁	15.4	22	28.6	kΩ	-
Resistance ratio	R2/R1	1.7	2.1	2.6	-	-
Transition frequency	f⊤ ∗	_	250	_	MHz	Vc=10V, I=-5mA, f=100MHz

^{*} Characteristics of built-in transistor

•Electrical characteristic curves

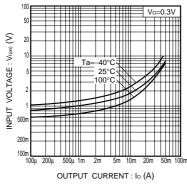


Fig.1 Input voltage vs. output current (ON characteristics)

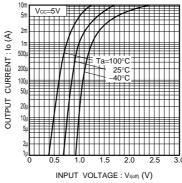


Fig.2 Output current vs. input voltage (OFF characteristics)

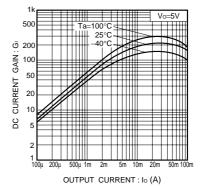


Fig.3 DC current gain vs. output current

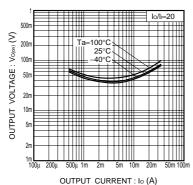


Fig.4 Output voltage vs. output current

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