

100mA / 50V Digital transistors

(with built-in resistors)

DTC123JM / DTC123JE / DTC123JUA / DTC123JKA

Applications

Inverter, Interface, Driver

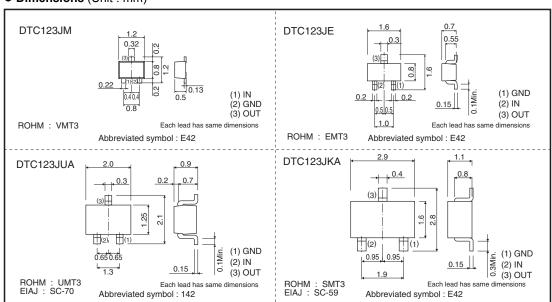
Features

- 1)Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see the 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)

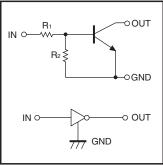
• Dimensions (Unit : mm)



Packaging specifications

	Package	VMT3	EMT3	UMT3	SMT3
	Packaging type	Taping	Taping	Taping	Taping
	Code	T2L	TL	T106	T146
Part No.	Basic ordering unit (pieces)	8000	3000	3000	3000
DTC123JM		0		-	_
DTC123JE		_	0	-	_
DTC123JUA		_	-	0	_
DTC123JKA		_	_	_	

• Inner circuit



R₁=2.2kΩ, R₂=47kΩ

• Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits				Unit
- Farameter		DTC123JM	DTC123JE	DTC123JUA	DTC123JKA	
Supply voltage	Vcc	50			V	
Input voltage	VIN	−5 to +12			V	
Output august	lo	100			mA	
Output current	IC(Max.)	100				
Power dissipation	Pd	150 200		00	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
Innut velte se	V _{I(off)}	-	-	0.5	V	Vcc=5V, Io=100μA
Input voltage	VI(on)	1.1	-	-		Vo=0.3V, Io=5mA
Output voltage	V _{O(on)}	-	0.1	0.3	V	lo/l≔5mA/0.25mA
Input current	lı .	-	-	3.6	mA	Vi=5V
Output current	IO(off)	-	-	0.5	μΑ	Vcc=50V, Vi=0V
DC current gain	Gı	80	-	_	-	Vo=5V, Io=10mA
Input resistance	R ₁	1.54	2.2	2.86	kΩ	_
Resistance ratio	R2/R1	17	21	26	-	-
Transition frequency	f⊤*	-	250	_	MHz	Vc=10V, I=-5mA, f=100MHz

^{*}Characteristics of built-in transistor

• Electrical characteristic curves

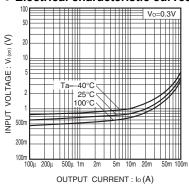


Fig.1 Input voltage vs. output current (ON characteristics)

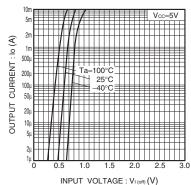


Fig.2 Output current vs. input voltage (OFF characteristics)

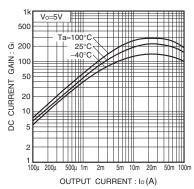


Fig.3 DC current gain vs. output

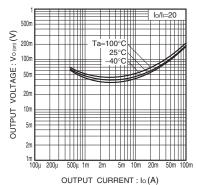


Fig.4 Output voltage vs. output current

Notes

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