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

DTC144WE / DTC144WUA / DTC144WKA / DTC144WSA

Applications

Inverter, Interface, Driver

Features

- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors.
- 2) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input, and parasitic effects are almost completely eliminated.
- 3) Only the on / off conditions need to be set for operation, making the device design easy.
- 4) Higher mounting densities can be achieved.

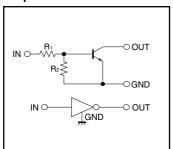
Structure

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

Packaging specifications

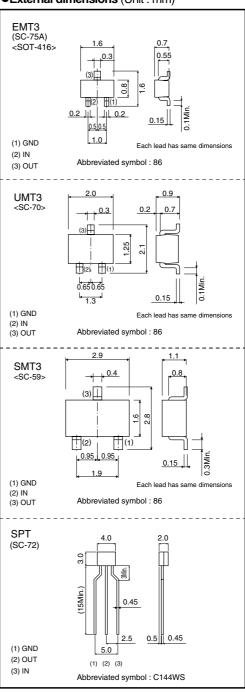
	Package	EMT3	UMT3	SMT3	SPT
	Packaging type	Taping	Taping	Taping	Taping
	Code	TL	T106	T146	TP
Part No.	Basic ordering unit (pieces)	3000	3000	3000	5000
DTC144WE		0	_	-	_
DTC144WUA		_	0	_	_
DTC144WKA		_	_	0	_
DTC144WSA		_	- -		0

●Equivalent circuit



 $R_1{=}47k\Omega,\,R_2{=}22k\Omega$

●External dimensions (Unit : mm)



DTC144WE / DTC144WUA / DTC144WKA / DTC144WSA

Transistors

● Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit	
Supply voltage		Vcc	50	V	
Input voltage		Vı	-10 to +40	V	
Output current		lo	30	- mA	
		IC(Max.)	100		
Power dissipation	DTC144WE		150	mW	
	DTC144WUA / DTC144WKA	Po	200		
	DTC144WSA		300		
Junction temperature		Tj	150	°C	
Storage temperature		Tstg	-55 to +150	°C	

●External characteristics (Unit: mm)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
long the decision of the second	VI(off)	_	_	0.8	٧	Vcc=5V, lo=100μA
Input voltage	VI(on)	4	-	_		Vo=0.3V, Io=2mA
Output voltage	Vo(on)	_	0.1	0.3	V	Io=10mA, I⊫0.5mA
Input current	lı	_	_	0.16	mA	V⊫5V
Output current	IO(off)	_	_	0.5	μΑ	Vcc=50V, V⊫0V
DC current gain	Gı	56	_	_	_	Io=5mA, Vo=5V
Input resistance	R ₁	32.9	47	61.1	kΩ	_
Resistance ratio	R2/R1	0.37	0.47	0.57	_	_
Transition frequency	f⊤ *	_	250	_	MHz	VcE=10V, IE= -5mA, f=100MHz

^{*} Characteristics of built-in transistor

•Electrical characteristics curves

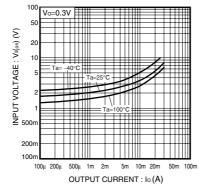


Fig.1 Input voltage vs. Output current (ON characteristics)

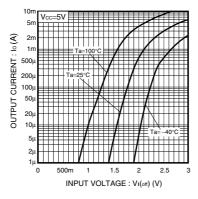


Fig.2 Output current vs. Input voltage (OFF characteristics)

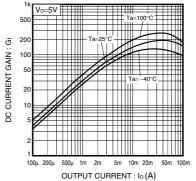


Fig.3 DC current gain vs. Output current

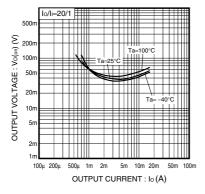


Fig.4 Output voltage vs. Output current

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