

100mA / 50V Digital transistors

(with built-in resistors)

DTC114EB / DTC114EM / DTC114EE / DTC114EUA / DTC114EKA

●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)

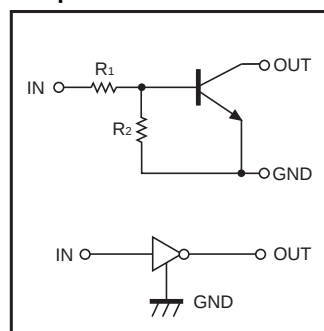
●Dimensions (Unit : mm)

DTC114EB ROHM : VMN3 Each lead has same dimensions Abbreviated symbol : 24	
DTC114EM ROHM : VMT3 Each lead has same dimensions Abbreviated symbol : 24	DTC114EE ROHM : EMT3 Each lead has same dimensions Abbreviated symbol : 24
DTC114EUA ROHM : UMT3 EIAJ : SC-70 Each lead has same dimensions Abbreviated symbol : 24	DTC114EKA ROHM : SMT3 EIAJ : SC-59 Each lead has same dimensions Abbreviated symbol : 24

●Packaging specifications

Part No.	Package	VMN3	VMT3	EMT3	UMT3	SMT3
	Packaging type	Taping	Taping	Taping	Taping	Taping
	Code	T2L	T2L	TL	T106	T146
	Basic ordering unit (pieces)	8000	8000	3000	3000	3000
DTC114EB		○	—	—	—	—
DTC114EM		—	○	—	—	—
DTC114EE		—	—	○	—	—
DTC114EUA		—	—	—	○	—
DTC114EKA		—	—	—	—	○

●Equivalent circuit

R₁=R₂=10kΩ

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits					Unit
		DTC114EB	DTC114EM	DTC114EE	DTC114EUA	DTC114EKA	
Supply voltage	V _{CC}	50					V
Input voltage	V _{IN}	-10 to +40					V
Output current	I _O	50					mA
	I _{C(Max.)}	100					
Power dissipation	P _D	150			200		mW
Junction temperature	T _J	150					°C
Storage temperature	T _{stg}	-55 to +150					°C

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	V _{I(off)}	—	—	0.5	V	V _{CC} =5V, I _O =100μA
	V _{I(on)}	3	—	—		V _O =0.3V, I _O =10mA
Output voltage	V _{O(on)}	—	0.1	0.3	V	I _O /I _I =10mA/0.5mA
Input current	I _I	—	—	0.88	mA	V _I =5V
Output current	I _{O(off)}	—	—	0.5	μA	V _{CC} =50V, V _I =0V
DC current gain	G _I	30	—	—	—	V _O =5V, I _O =5mA
Input resistance	R ₁	7	10	13	kΩ	—
Resistance ratio	R ₂ /R ₁	0.8	1	1.2	—	—
Transition frequency	f _T *	—	250	—	MHz	V _{CE} =10V, I _E =-5mA, f=100MHz

* Characteristics of built-in transistor

●Electrical characteristic curves

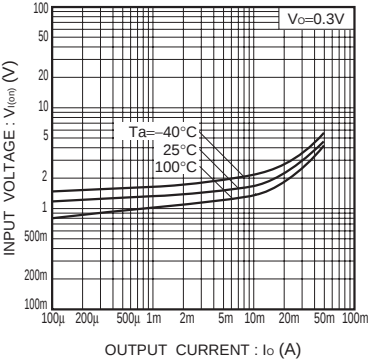


Fig.1 Input voltage vs. output current (ON characteristics)

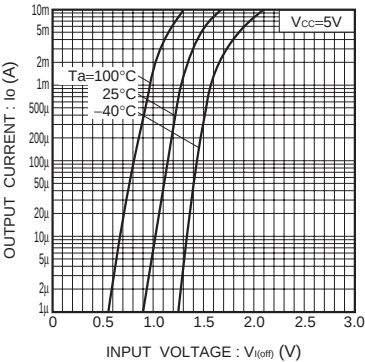


Fig.2 Output current vs. input voltage (OFF characteristics)

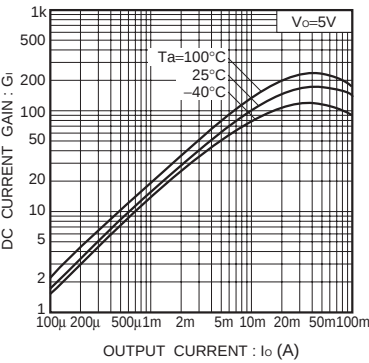


Fig.3 DC current gain vs. output current

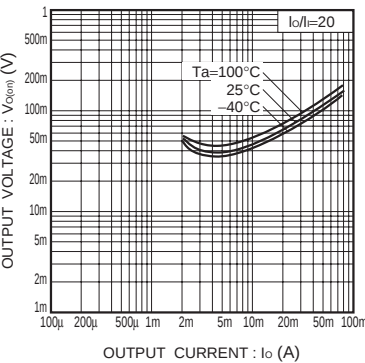


Fig.4 Output voltage vs. output current

Notes

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