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

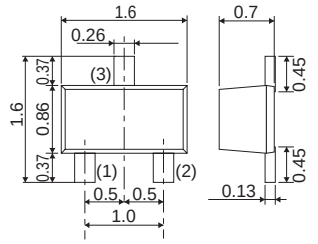
DTC114EEB

●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.

●Dimensions (Unit : mm)

EMT3F



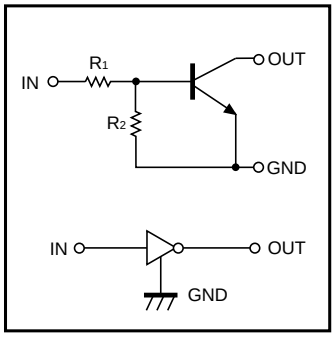
(1) IN
(2) GND
(3) OUT

Each lead has same dimensions

Abbreviated symbol : 24

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

●Equivalent circuit



R_1=R_2=10kΩ

●Packaging specifications

Part No.	Package	EMT3F
	Packaging type	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
DTC114EEB		○

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Supply voltage	V_{CC}	50	V
Input voltage	V_{IN}	−10 to +40	V
Collector current	Ic(max) *1	100	mA
Output current	Io *2	50	mA
Power dissipation	P_D	150	mW
Junction temperature	Tj	150	°C
Range of storage temperature	Tstg	−55 to +150	°C

*1 Characteristics of built-in transistor
*2 Each terminal mounted on a recommended land

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	–	–	500	mV	V_{CC}=5V, I_O=100μA
	$V_{I(on)}$	3	–	–	V	V_O=0.3V, I_O=10mA
Output voltage	$V_{O(on)}$	–	100	300	mV	I_O/I_I=10mA/0.5mA
Input current	I_I	–	–	880	μA	V_I=5V
Output current	$I_{O(off)}$	–	–	500	nA	V_{CC}=50V, V_I=0V
DC current gain	G_I	30	–	–	–	V_O=5V, I_O=5mA
Transition frequency	f_T *	–	250	–	MHz	V_{CE}=10V, I_E=–5mA, f=100MHz
Input resistance	R_1	7	10	13	kΩ	–
Resistance ratio	R_2/R_1	0.8	1	1.2	–	–

* Characteristics of built-in transistor

●Electrical characteristic curves

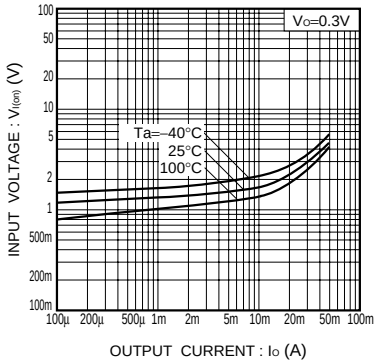


Fig.1 Input voltage vs. output current (ON characteristics)

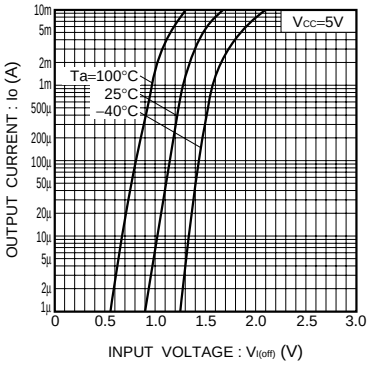


Fig.2 Output current vs. input voltage (OFF characteristics)

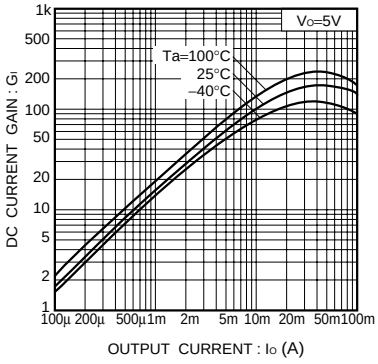


Fig.3 DC current gain vs. output current

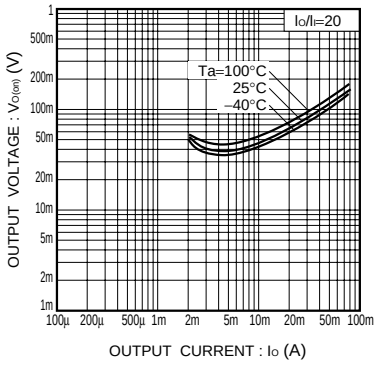


Fig.4 Output voltage vs. output current

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ROHM CO., LTD. 21, Saiin Mizosaki-cho, Ukyo-ku, Kyoto 615-8585, Japan
TEL : +81-75-311-2121
FAX : +81-75-315-0172