

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

DTC115EM / DTC115EE / DTC115EUA / DTC115EKA

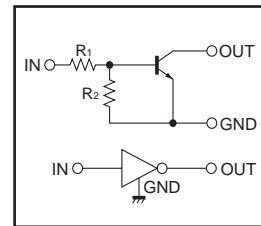
● **Applications**

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, 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.

● **Inner circuit**

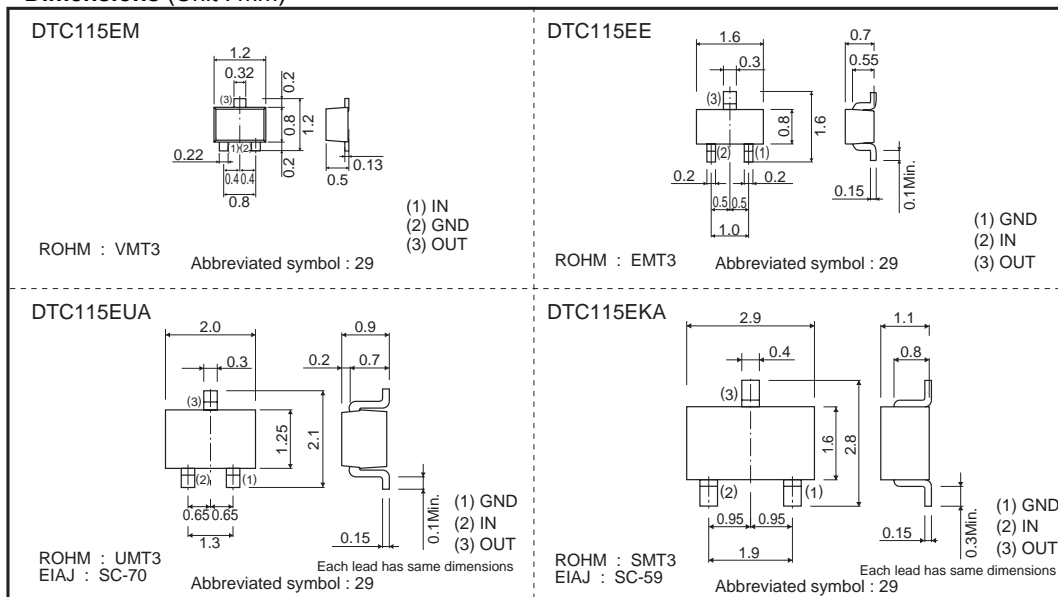


R1=R2=100kΩ

● **Structure**

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

● **Dimensions (Unit : mm)**



● **Packaging specifications**

Part No.	Package	VMT3	EMT3	UMT3	SMT3
	Packaging type	Taping	Taping	Taping	Taping
	Code	T2L	TL	T106	T146
	Basic ordering unit (pieces)	8000	3000	3000	3000
DTC115EM		○	-	-	-
DTC115EE		-	○	-	-
DTC115EUA		-	-	○	-
DTC115EKA		-	-	-	○

●Absolute maximum ratings (Ta=25°C)

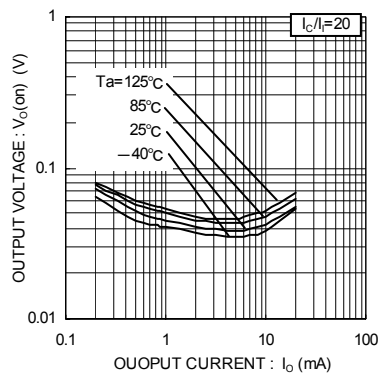
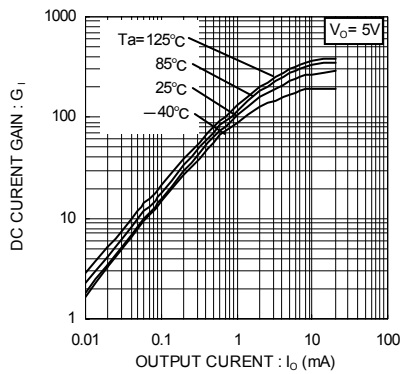
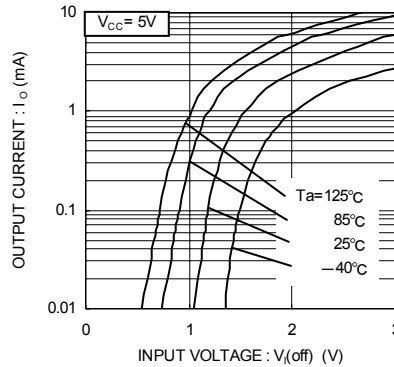
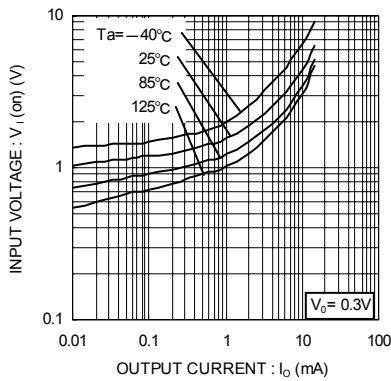
Parameter	Symbol	Limits	Unit
Supply voltage	V <sub>CC</sub>	50	V
Input voltage	V <sub>IN</sub>	-10 to +40	V
Output current	I <sub>o</sub>	20	mA
	I <sub>C(Max.)</sub>	100	
Power dissipation	P <sub>D</sub>	150	mW
		200	
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	V <sub>I(off)</sub>	-	-	0.5	V	V <sub>CC</sub> =5V, I <sub>o</sub> =100μA
	V <sub>I(on)</sub>	3	-	-		V <sub>o</sub> =0.3V, I <sub>o</sub> =1mA
Output voltage	V <sub>O(on)</sub>	-	0.1	0.3	V	I <sub>o</sub> =5mA, I <sub>i</sub> =0.25mA
Input current	I <sub>i</sub>	-	-	0.15	mA	V <sub>i</sub> =5V
Output current	I <sub>O(off)</sub>	-	-	0.5	μA	V <sub>CC</sub> =50V, V <sub>i</sub> =0V
DC current gain	G <sub>i</sub>	82	-	-	-	I <sub>o</sub> =5mA, V <sub>o</sub> =5V
Input resistance	R <sub>1</sub>	70	100	130	kΩ	-
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>	0.8	1	1.2	-	-
Transition frequency	f <sub>T</sub> *	-	250	-	MHz	V <sub>CE</sub> =10V, I <sub>E</sub> =-5mA, f=100MHz

\* Characteristics of built-in transistor

●Electrical characteristics curves



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