

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

DTC115EM / DTC115EE DTC115EUA / DTC115EKA

●Applications

Inverter, Interface, Driver

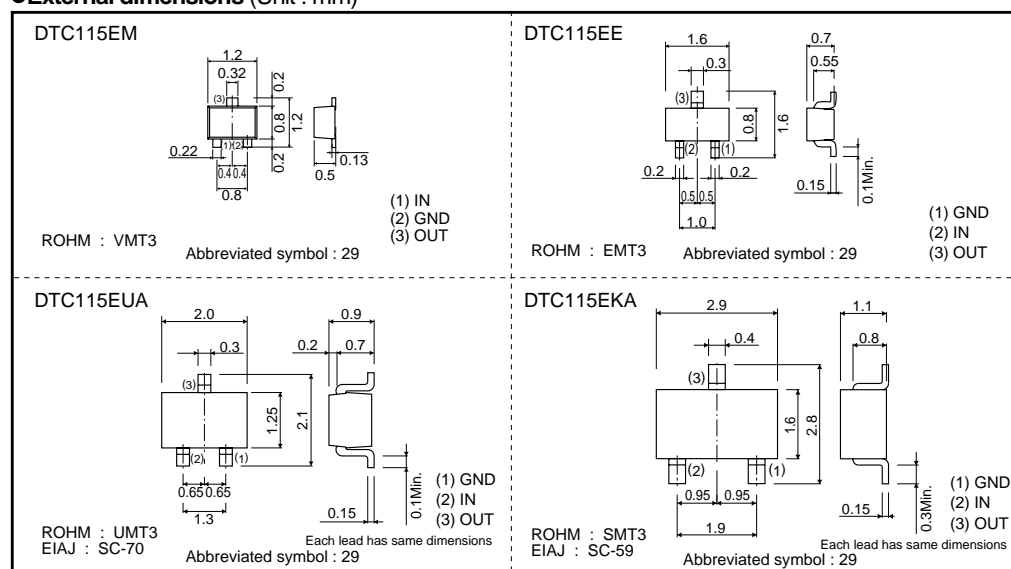
●Features

- 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.

●Structure

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

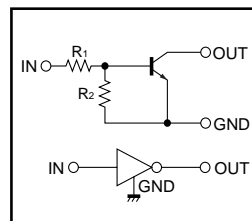
●External dimensions (Unit : mm)



●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		—	—	—	○

●Equivalent circuit

R₁=R₂=100kΩ

●Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Supply voltage		V _{CC}	50	V
Input voltage		V _{IN}	−10 to +40	V
Output current		I _O	20	mA
		I _{C(Max.)}	100	
Power dissipation	DTC115EM / DTC115EE	P _D	150	mW
	DTC115EUA / DTC115EKA		200	
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 =1mA
Output voltage	V _{O(on)}	—	0.1	0.3	V	I _O =5mA, I _I =0.25mA
Input current	I _I	—	—	0.15	mA	V _I =5V
Output current	I _{O(off)}	—	—	0.5	μA	V _{CC} =50V, V _I =0V
DC current gain	G _I	82	—	—	—	I _O =5mA, V _O =5V
Input resistance	R _I	70	100	130	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

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