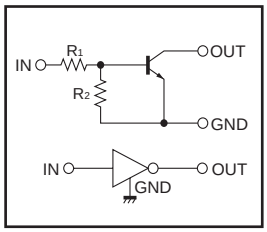
100mA / 50V Digital transistors (with built-in resistors)

DTC115EM / DTC115EE / DTC115EUA / DTC115EKA

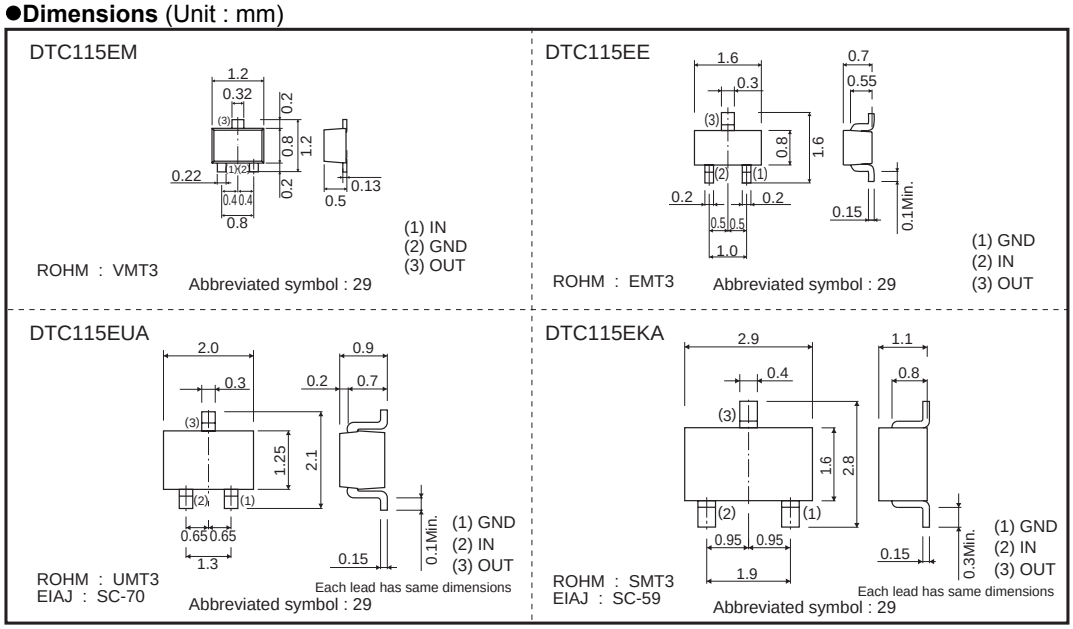
●Applications
Inverter, Interface, Driver

●Inner circuit


R1=R2=100kΩ

●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)

●Dimensions (Unit : mm)


●Packaging specifications

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

●Absolute maximum ratings (Ta=25°C)

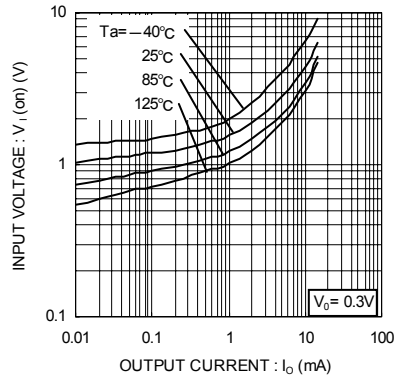
Parameter		Symbol	Limits	Unit
Supply voltage		V_{CC}	50	V
Input voltage		V_{IN}	−10 to +40	V
Output current		I_O	20	mA
		$I_{C(Max.)}$	100	
Power dissipation	DTC115EM / DTC115EE	P_D	150	mW
	DTC115EUA / DTC115EKA		200	
Junction temperature		Tj	150	°C
Storage temperature		Tstg	−55 to +150	°C

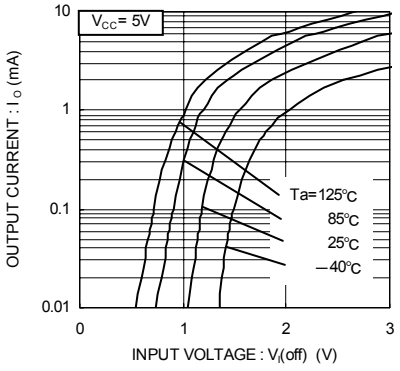
●Electrical characteristics (Ta=25°C)

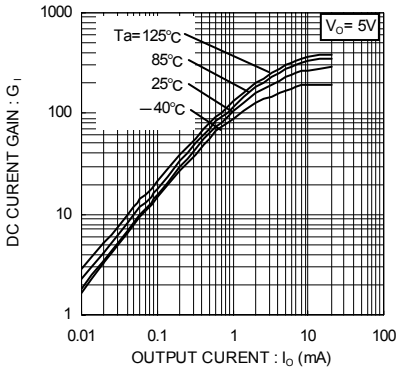
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	–	–	0.5	V	V_{CC}=5V, I_O=100μA
	$V_{I(on)}$	3	–	–		V_O=0.3V, I_O=1mA
Output voltage	$V_{O(on)}$	–	0.1	0.3	V	I_O=5mA, I_I=0.25mA
Input current	I_I	–	–	0.15	mA	V_I=5V
Output current	$I_{O(off)}$	–	–	0.5	μA	V_{CC}=50V, V_I=0V
DC current gain	G_I	82	–	–	–	I_O=5mA, V_O=5V
Input resistance	R_1	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

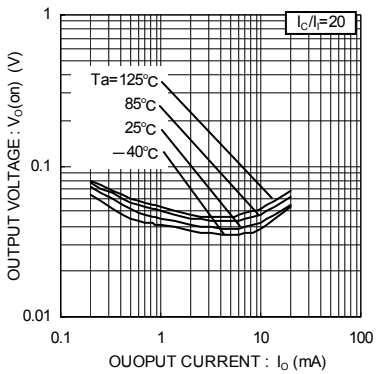
* Characteristics of built-in transistor

●Electrical characteristics curves









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