

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

DTA115EM / DTA115EE / DTA115EUA / DTA115EKA

● Applications

Inverter, Interface, Driver

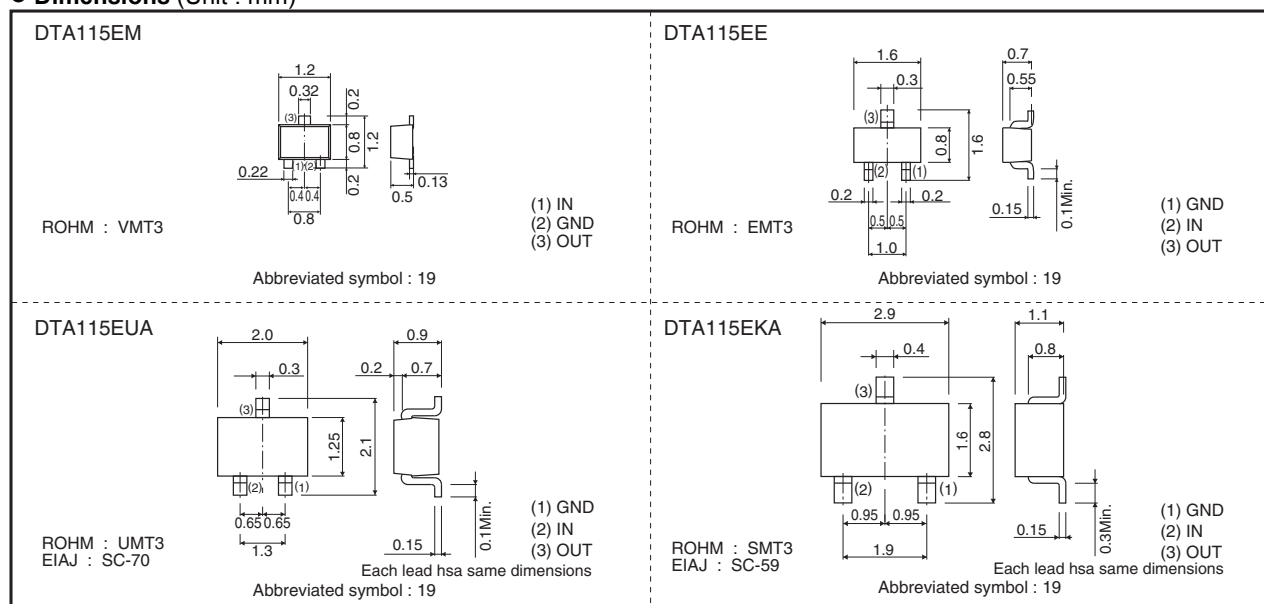
● Features

- 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 positive 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

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

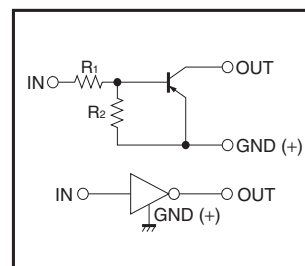
● Dimensions (Unit : mm)



● Packaging specifications

Part No.	Package	VMT3	EMT3	UMT3	SMT3
	Packging type	Taping	Taping	Taping	Taping
	Code	T2L	TL	T106	T146
	Basic ordering unit (pieces)	8000	3000	3000	3000
DTA115EM		○	—	—	—
DTA115EE		—	○	—	—
DTA115EUA		—	—	○	—
DTA115EKA		—	—	—	○

● Inner circuit



$R_1=R_2=100k\Omega$

● Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Supply voltage		V _{CC}	-50	V
Input voltage		V _I	-40 to +10	V
Output current		I _O	-20	mA
		I _{C(Max.)}	-100	
Power dissipation	DTA115EM / DTA115EE	P _D	150	mW
	DTA115EUA / DTA115EKA		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 _E = -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

● Electrical characteristic curves

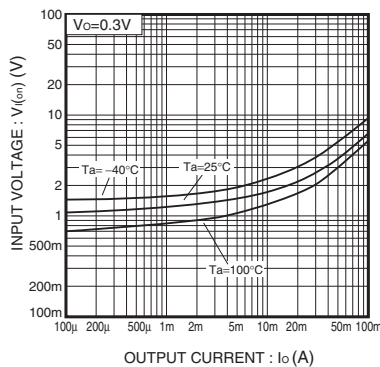


Fig.1 Input voltage vs. Output current (ON characteristics)

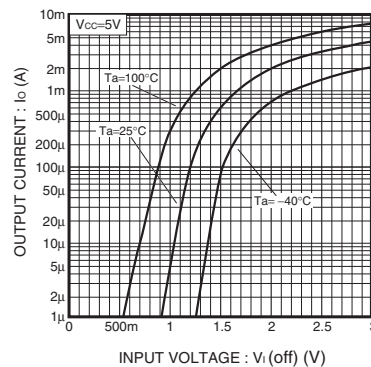


Fig.2 Output current vs. Input voltage (OFF characteristics)

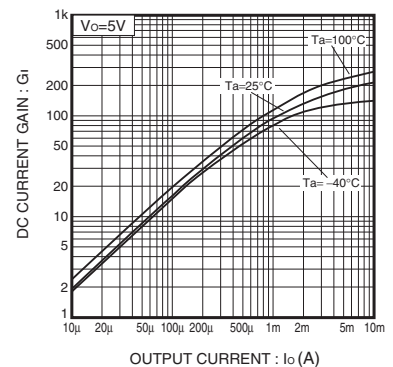


Fig.3 DC current gain vs. Output current

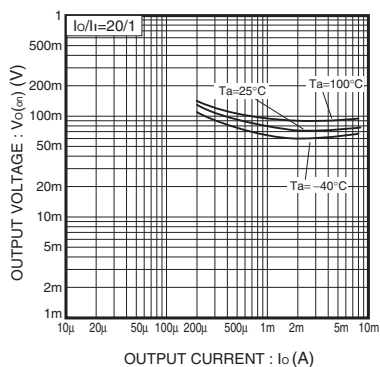


Fig.4 Output voltage vs. Output current

Notes

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