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

# DTA115EM / DTA115EE / DTA115EUA / DTA115EKA / DTA115ESA

#### Applications

Inverter, Interface, Driver

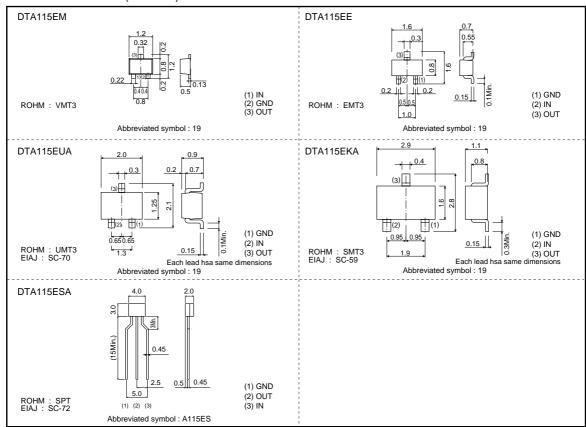
#### Features

- 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)

### ●External dimensions (Unit: mm)

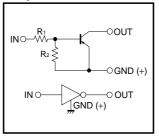


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# Packaging specifications

•	Package	VMT3	EMT3	UMT3	SMT3	SPT
	Packging type	Taping	Taping	Taping	Taping	Taping
	Code	T2L	TL	T106	T146	TP
Part No.	Basic ordering unit (pieces)	8000	3000	3000	3000	5000
DTA115EM		0	-	-	-	-
DTA115EE		_	0	-	-	_
DTA115EUA		_	_	0	_	_
DTA115EKA		-	_	_	0	_
DTA115ESA		_	_	_	_	0

# ●Equivalent circuit



 $R_1=R_2=100k\Omega$ 

# ● Absolute maximum ratings (Ta=25°C)

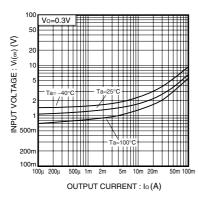
Parameter		Symbol	Limits	Unit	
Supply voltage		Vcc	-50	V	
Input voltage		Vı	-40 to +10	V	
Output current		lo	-20	mA	
		IC(Max.)	-100		
Power dissipation	DTA115EM / DTA115EE		150	mW	
	DTA115EUA / DTA115EKA	Po	200		
	DTA115ESA		300		
Junction temperature		Tj	150	°C	
Storage temperature		Tstg	-55 to +150	°C	

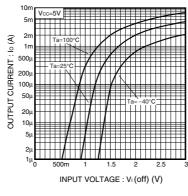
# ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Input voltage	V <sub>I(off)</sub>	_	-	-0.5	V	Vcc= -5V, Io= -100μA
input voitage	VI(on)	-3	_	_	V	Vo= -0.3V, Io= -1mA
Output voltage	Vo(on)	_	-0.1	-0.3	V	Io= −5mA, I:= −0.25mA
Input current	lı	_	-	-0.15	mA	V≔-5V
Output current	IO(off)	_	-	-0.5	μΑ	Vcc= -50V, V⊫0V
DC current gain	Gı	82	-	-	_	Io= -5mA, Vo= -5V
Input resistance	R <sub>1</sub>	70	100	130	kΩ	_
Resistance ratio	R2/R1	0.8	1	1.2	-	-
Transition frequency	f⊤ *	_	250	_	MHz	Vce= -10V, Ie=5mA, f=100MHz

<sup>\*</sup> Characteristics of built-in transistor

### •Electrical characteristics curves





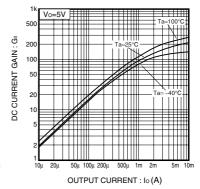


Fig.1 Input voltage vs. Output current (ON characteristics)

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

 $\label{eq:Fig.3DC} \textbf{Current gain vs. Output current}$ 

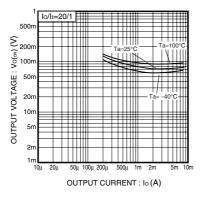


Fig.4 Output voltage vs. Output current

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