

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

DTA115EM / DTA115EE / DTA115EUA / DTA115EKA / DTA115ESA

●Applications

Inverter, Interface, Driver

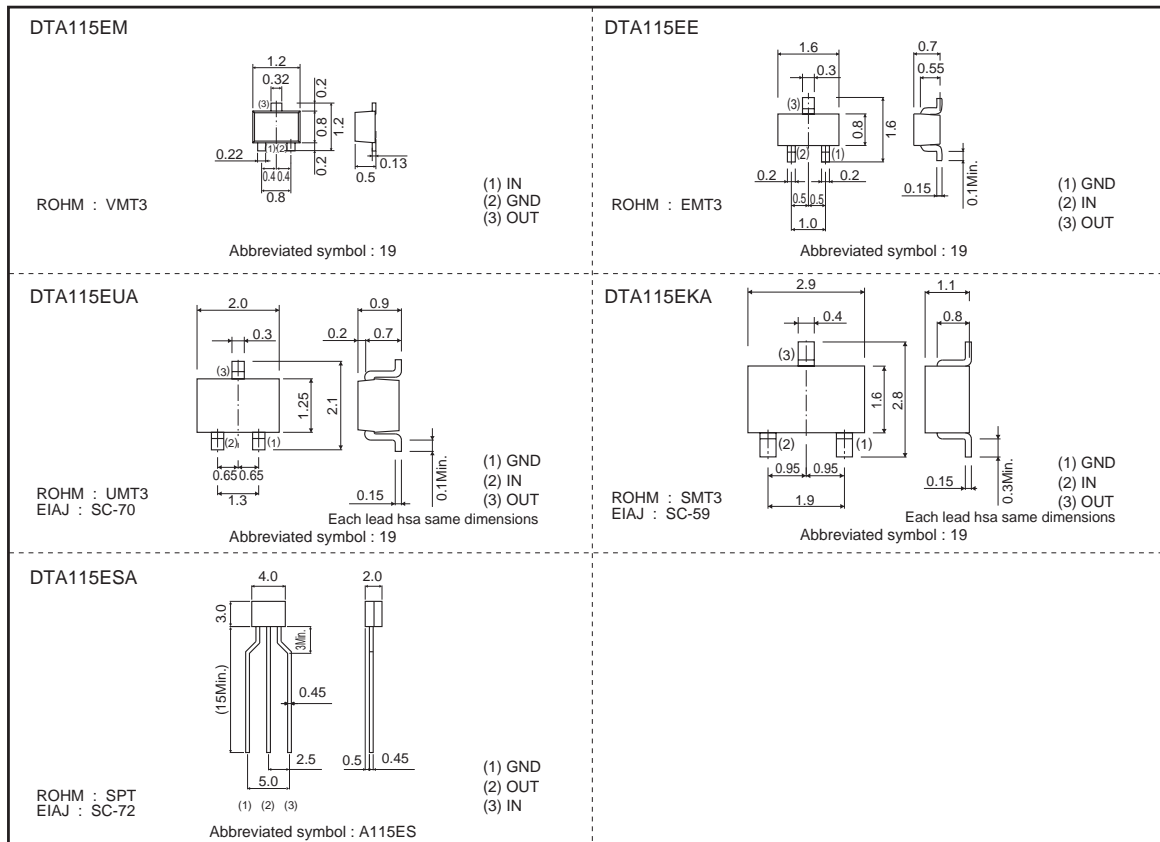
●Features

- 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)



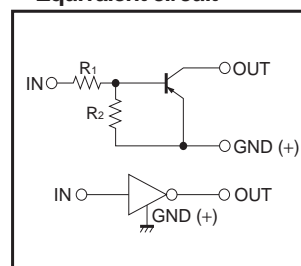
DTA115EM / DTA115EE / DTA115EUA DTA115EKA / DTA115ESA

Transistors

●Packaging specifications

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

●Equivalent 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	
	DTA115ESA		300	
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	$V_{CC} = -5V, I_o = -100\mu A$
	$V_{I(on)}$	-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	$k\Omega$	–
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

Transistors

●Electrical characteristics curves

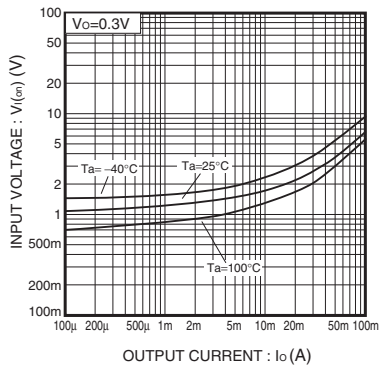


Fig.1 Input voltage vs. Output current (ON characteristics)

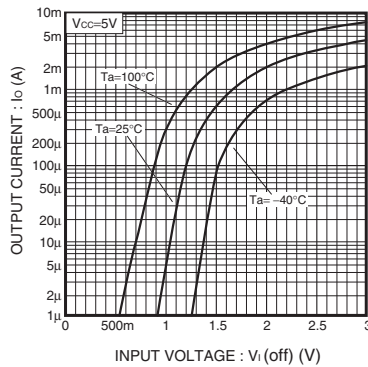


Fig.2 Output current vs. Input voltage (OFF characteristics)

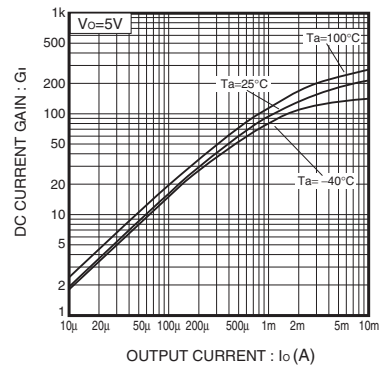


Fig.3 DC current gain vs. Output current

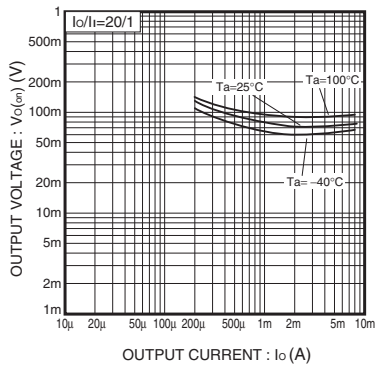


Fig.4 Output voltage vs. Output current

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