

# DTA114Y series

PNP -100mA -50V Digital Transistor (Bias Resistor Built-in Transistor)

Datasheet

AEC-Q101 Qualified

Parameter	Value
V <sub>CC</sub>	-50V
I <sub>C(MAX.)</sub>	-100mA
R <sub>1</sub>	10kΩ
R <sub>2</sub>	47kΩ

#### Features

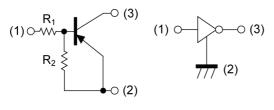
- 1) Built-In Biasing Resistors,  $R_1 = 10k\Omega$ ,  $R_2 = 47k\Omega$
- 2) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner circuit).
- 3) Only the on/off conditions need to be set for operation, making the circuit design easy.
- 4) Complementary NPN Types: DTC114Y series

# Application

INVERTER, INTERFACE, DRIVER

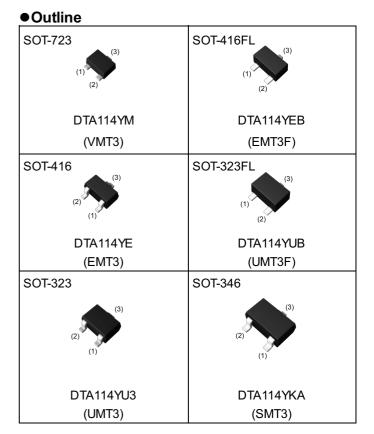
### Inner circuit

DTA114YM/ DTA114YEB/ DTA114YUB

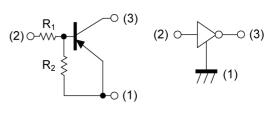


(1) IN (BASE) (2) GND (+) (EMITTER) (3) OUT (COLLECTOR)

# Packaging specifications



# DTA114YE/ DTA114YU3/ DTA114YKA



(1) GND (+) (EMITTER) (2) IN (BASE) (3) OUT (COLLECTOR)

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
DTA114YM	SOT-723	1212	T2L	180	8	3000	54
DTA114YEB	SOT-416FL	1616	TL	180	8	3000	54
DTA114YE	SOT-416	1616	TL	180	8	3000	54
DTA114YUB	SOT-323FL	2021	TL	180	8	3000	54
DTA114YU3	SOT-323	2021	T106	180	8	3000	54
DTA114YKA	SOT-346	2928	T146	180	8	3000	54

# ● Absolute maximum ratings (T<sub>a</sub> = 25°C)

F	Parameter	Symbol	Values	Unit
Supply voltage		V <sub>CC</sub>	-50	V
Input voltage		V <sub>IN</sub>	-40 to 6	V
Output current		Ι <sub>ο</sub>	-70	mA
Collector current		I <sub>C(MAX)</sub> *1	-100	mA
	DTA114YM		150	
	DTA114YEB		150	
Dower discipation	DTA114YE	P <sub>D</sub> <sup>*2</sup>	150	
Power dissipation	DTA114YUB		200	— mW
	DTA114YU3		200	
DTA114YKA Junction temperature			200	
		Tj	150	°C
Range of storage tempera	ature	T <sub>stg</sub>	-55 to +150	°C

# •Electrical characteristics (T<sub>a</sub> = 25°C)

Demonster	O: make al	Qualities	Values			1.1:4	
Parameter	Symbol Conditions –		Min.	Тур.	Max.	Unit	
Innutualtaga	V <sub>I(off)</sub>	V <sub>CC</sub> = -5V, I <sub>O</sub> = -100µA	-	-	-0.3	V	
Input voltage	V <sub>I(on)</sub>	V <sub>O</sub> = -0.3V, I <sub>O</sub> = -1mA	-1.4	-	-	V	
Output voltage	V <sub>O(on)</sub>	I <sub>O</sub> = -5mA, I <sub>I</sub> = -0.25mA	-	-100	-300	mV	
Input current	I <sub>I</sub>	V <sub>I</sub> = -5V	-	-	-880	μA	
Output current	I <sub>O(off)</sub>	V <sub>CC</sub> = -50V, V <sub>I</sub> = 0V	-	-	-500	nA	
DC current gain	G	V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA	68	-	-	-	
Input resistance	R <sub>1</sub>	-	7	10	13	kΩ	
Resistance ratio	$R_2/R_1$	-	3.7	4.7	5.7	-	
Transition frequency	f <sub>T</sub> *1	V <sub>CE</sub> = -10V, I <sub>E</sub> = 5mA, f = 100MHz	-	250	-	MHz	

\*1 Characteristics of built-in transistor

\*2 Each terminal mounted on a reference land.



# •Electrical characteristic curves (T<sub>a</sub> =25°C)

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

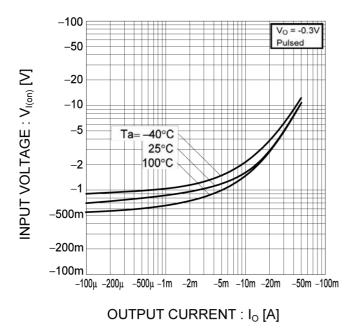


Fig.2 Output current vs. input voltage (OFF characteristics)

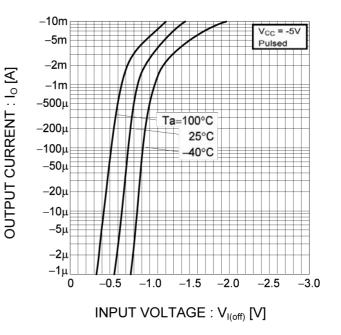


Fig.3 Output current vs. output voltage

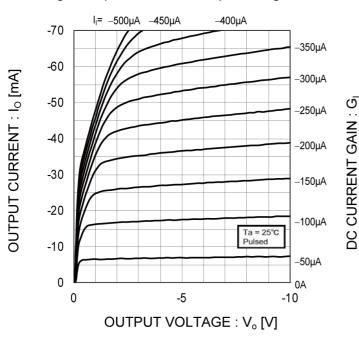
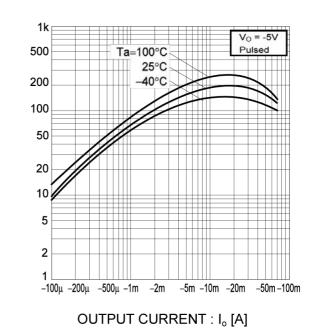
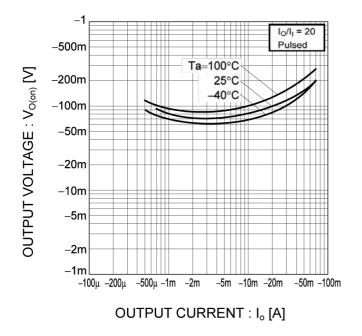


Fig.4 DC current gain vs. output current



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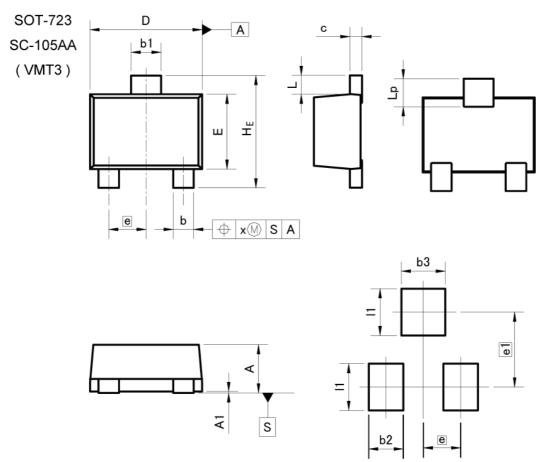
# •Electrical characteristic curves (T<sub>a</sub> =25°C)



### Fig.5 Output voltage vs. output current



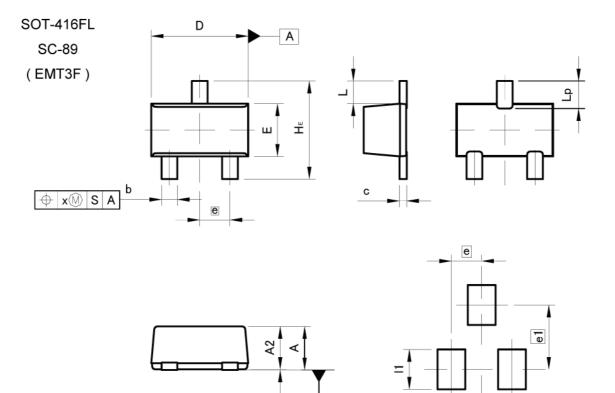




Pattern of terminal position areas [Not a pattern of soldering pads]

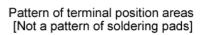
DIM	MILIM	ETERS	INC	HES
DIM	MIN	MAX	MIN	MAX
A	0.45	0.55	0.018	0.022
A1	0.00	0.10	0.000	0.004
b	0.17	0.27	0.007	0.011
b1	0.27	0.37	0.011	0.015
с	0.08	0.18	0.003	0.007
D	1.10	1.30	0.043	0.051
E	0.70	0.90	0.028	0.035
e	0.40		0.02	
HE	1.10	1.30	0.043	0.051
L	0.10	0.30	0.004	0.012
Lp	0.20	0.40	0.008	0.016
х		0.10		0.004
	MILIMETERS		INC	HES
DIM	MIN	MAX	MIN	MAX
b2	<u>111</u> 0	0.37	3 <del>4</del>	0.015
b3	<u>144</u> 5	0.47	1 12	0.019
e1	0.	80	0.0	31
11		0.50	1.27	0.020





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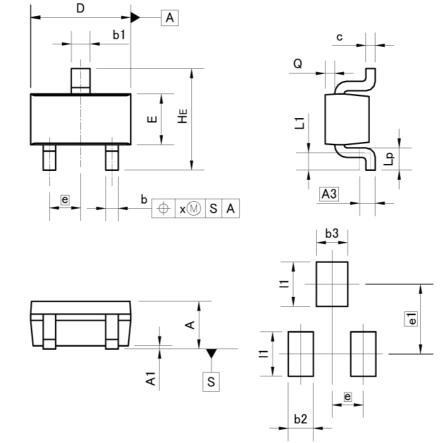
b2

DIM -	MILIM	ETERS	INC	HES
	MIN	MAX	MIN	MAX
A	0.65	0.85	0.026	0.033
A1	0.00	0.10	0.000	0.004
A2	0.60	0.80	0.024	0.031
b	0.21	0.36	0.008	0.014
с	0.08	0.18	0.003	0.007
D	1.50	1.70	0.059	0.067
E	0.76	0.96	0.030	0.038
е	0.50		0.020	
HE	1.50	1.70	0.059	0.067
L	0.	37	0.015	
Lp	0.35	0.55	0.014	0.022
x		0.10		0.004
	MILIMETERS		INC	HES
DIM -	MIN	MAX	MIN	MAX
b2		0.46	-	0.018
e1		1.05	-	0.041
11	-	0.65		0.026





(EMT3)



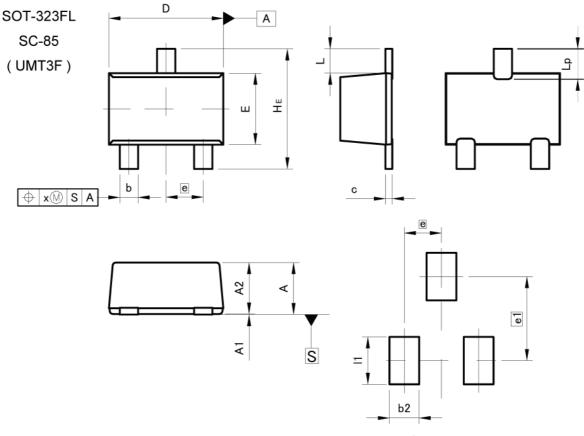
Pattern of terminal position areas [Not a pattern of soldering pads]

dim -	MILIM	ETERS	INCHES	
	MIN	MAX	MIN	MAX
A	0.60	0.80	0.024	0.031
A1	0.00	0.10	0.000	0.004
A3	0.	25	0.0	10
b	0.15	0.30	0.006	0.012
b1	0.25	0.40	0.010	0.016
с	0.10	0.20	0.004	0.008
D	1.50	1.70	0.059	0.067
E	0.70	0.90	0.028	0.035
е	0.	50	0.020	
HE	1.40	1.80	0.055	0.071
L1	0.10	÷3	0.004	0 <del></del>
Lp	0.15		0.006	233
Q	0.05	0.25	0.002	0.010
x	355	0.10	100	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	19 <del>44</del>	0.40	-	0.016
b3	1.000	0.50	-	0.020
e1	1.10		0.0	)43
11	8. <del></del>	0.70	-	0.028

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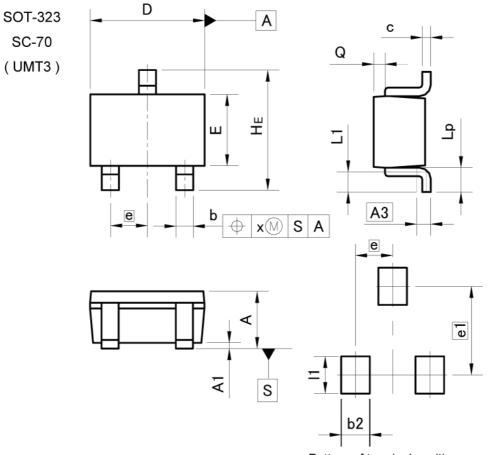




Pattern of terminal position areas [Not a pattern of soldering pads]

DIM	MILIM	ETERS	INC	HES
	MIN	MAX	MIN	MAX
A	0.85	1.05	0.033	0.041
A1	0.00	0.10	0.000	0.004
A2	0.80	1.00	0.031	0.039
b	0.27	0.42	0.011	0.017
с	0.08	0.18	0.003	0.007
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
е	0.65		0.026	
HE	2.00	2.20	0.079	0.087
L	0.	43	0.017	
Lp	0.43	0.63	0.017	0.025
x		0.10		0.004
DIM	MILIMETERS		INC	HES
DIM	MIN	MAX	MIN	MAX
b2	-	0.52	-	0.020
e1	1.47		0.0	58
11	-	0.83	-	0.033





Pattern of terminal position areas [Not a pattern of soldering pads]

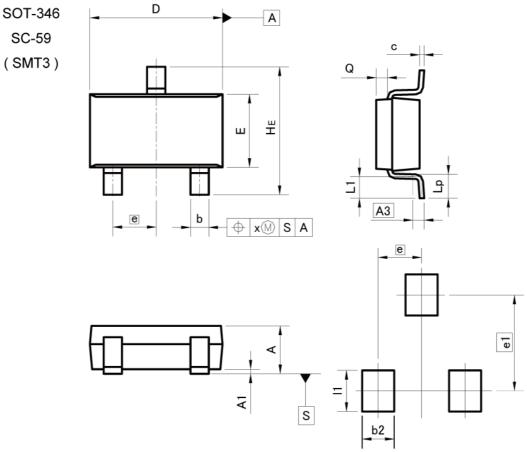
DIM	MILIM	ETERS	INCHES		
DIM	MIN	MAX	MIN	MAX	
A	0.80	1.00	0.031	0.039	
A1	0.00	0.10	0	0.004	
A3	0.2	25	0.0	01	
b	0.25	0.40	0.01	0.016	
с	0.10	0.20	0.004	0.008	
D	1.90	2.10	0.075	0.083	
E	1.15	1.35	0.045	0.053	
е	0.0	65	0.03		
HE	2.00	2.20	0.079	0.087	
L1	0.20	0.50	0.008	0.02	
Lp	0.25	0.55	0.01	0.022	
Q	0.10	0.30	0.004	0.012	
x	_	0.10	-	0.004	

DIM	MILIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
e1	1.55		0.06	
b2		0.50	I	0.02
11	-	0.65	_	0.026



## **DTA114Y** series

### Dimensions



Pattern of terminal position areas [Not a pattern of soldering pads]

DIM	MILIM	ETERS	INC	HES
DIM -	MIN	MAX	MIN	MAX
Α	1.00	1.30	0.039	0.051
A1	0.00	0.10	0.000	0.004
A3	0.	25	0.0	10
b	0.35	0.50	0.014	0.020
С	0.09	0.25	0.004	0.010
D	2.80	3.00	0.110	0.118
E	1.50	1.80	0.059	0.071
е	0.	95	0.037	
HE	2.60	3.00	0.102	0.118
L1	0.30	0.60	0.012	0.024
Lp	0.40	0.70	0.016	0.028
Q	0.20	0.30	0.008	0.012
x		0.10	47	0.004
у	-1	0.10	2 <del></del>	0.004
	MILIMETERS		INCHES	
DIM -	ATAL	MAY	A ATA I	MAY

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	-	0.60	2	0.024
e1	2.10		0.083	
11	-10	0.90	( <b>—</b>	0.035



# Notice

#### **Precaution on using ROHM Products**

1. If you intend to use our Products in devices requiring extremely high reliability (such as medical equipment <sup>(Note 1)</sup>, aircraft/spacecraft, nuclear power controllers, etc.) and whose malfunction or failure may cause loss of human life, bodily injury or serious damage to property ("Specific Applications"), please consult with the ROHM sales representative in advance. Unless otherwise agreed in writing by ROHM in advance, ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties arising from the use of any ROHM's Products for Specific Applications.

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CLASSII	CLASSⅢ	CLASS II b	CLASSⅢ
CLASSⅣ	CLASSI	CLASSⅢ	CLASSII

2. ROHM designs and manufactures its Products subject to strict quality control system. However, semiconductor products can fail or malfunction at a certain rate. Please be sure to implement, at your own responsibilities, adequate safety measures including but not limited to fail-safe design against the physical injury, damage to any property, which a failure or malfunction of our Products may cause. The following are examples of safety measures:

[a] Installation of protection circuits or other protective devices to improve system safety

[b] Installation of redundant circuits to reduce the impact of single or multiple circuit failure

- 3. Our Products are not designed under any special or extraordinary environments or conditions, as exemplified below. Accordingly, ROHM shall not be in any way responsible or liable for any damages, expenses or losses arising from the use of any ROHM's Products under any special or extraordinary environments or conditions. If you intend to use our Products under any special or extraordinary environments or conditions (as exemplified below), your independent verification and confirmation of product performance, reliability, etc, prior to use, must be necessary:
  - [a] Use of our Products in any types of liquid, including water, oils, chemicals, and organic solvents
  - [b] Use of our Products outdoors or in places where the Products are exposed to direct sunlight or dust
  - [c] Use of our Products in places where the Products are exposed to sea wind or corrosive gases, including Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, and NO<sub>2</sub>
  - [d] Use of our Products in places where the Products are exposed to static electricity or electromagnetic waves
  - [e] Use of our Products in proximity to heat-producing components, plastic cords, or other flammable items
  - [f] Sealing or coating our Products with resin or other coating materials
  - [g] Use of our Products without cleaning residue of flux (even if you use no-clean type fluxes, cleaning residue of flux is recommended); or Washing our Products by using water or water-soluble cleaning agents for cleaning residue after soldering
  - [h] Use of the Products in places subject to dew condensation
- 4. The Products are not subject to radiation-proof design.
- 5. Please verify and confirm characteristics of the final or mounted products in using the Products.
- 6. In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse. is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.
- 7. De-rate Power Dissipation depending on ambient temperature. When used in sealed area, confirm that it is the use in the range that does not exceed the maximum junction temperature.
- 8. Confirm that operation temperature is within the specified range described in the product specification.
- 9. ROHM shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

#### Precaution for Mounting / Circuit board design

- 1. When a highly active halogenous (chlorine, bromine, etc.) flux is used, the residue of flux may negatively affect product performance and reliability.
- 2. In principle, the reflow soldering method must be used on a surface-mount products, the flow soldering method must be used on a through hole mount products. If the flow soldering method is preferred on a surface-mount products, please consult with the ROHM representative in advance.

For details, please refer to ROHM Mounting specification

#### Precautions Regarding Application Examples and External Circuits

- 1. If change is made to the constant of an external circuit, please allow a sufficient margin considering variations of the characteristics of the Products and external components, including transient characteristics, as well as static characteristics.
- 2. You agree that application notes, reference designs, and associated data and information contained in this document are presented only as guidance for Products use. Therefore, in case you use such information, you are solely responsible for it and you must exercise your own independent verification and judgment in the use of such information contained in this document. ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties arising from the use of such information.

#### **Precaution for Electrostatic**

This Product is electrostatic sensitive product, which may be damaged due to electrostatic discharge. Please take proper caution in your manufacturing process and storage so that voltage exceeding the Products maximum rating will not be applied to Products. Please take special care under dry condition (e.g. Grounding of human body / equipment / solder iron, isolation from charged objects, setting of lonizer, friction prevention and temperature / humidity control).

#### **Precaution for Storage / Transportation**

- 1. Product performance and soldered connections may deteriorate if the Products are stored in the places where:
  - [a] the Products are exposed to sea winds or corrosive gases, including Cl2, H2S, NH3, SO2, and NO2
  - [b] the temperature or humidity exceeds those recommended by ROHM
  - [c] the Products are exposed to direct sunshine or condensation
  - [d] the Products are exposed to high Electrostatic
- 2. Even under ROHM recommended storage condition, solderability of products out of recommended storage time period may be degraded. It is strongly recommended to confirm solderability before using Products of which storage time is exceeding the recommended storage time period.
- 3. Store / transport cartons in the correct direction, which is indicated on a carton with a symbol. Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.
- 4. Use Products within the specified time after opening a humidity barrier bag. Baking is required before using Products of which storage time is exceeding the recommended storage time period.

#### **Precaution for Product Label**

A two-dimensional barcode printed on ROHM Products label is for ROHM's internal use only.

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When disposing Products please dispose them properly using an authorized industry waste company.

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