

# Digital transistors (built-in resistors)

## DTA113ZE / DTA113ZUA / DTA113ZKA / DTA113ZSA

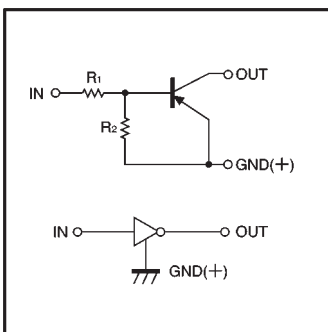
●Features

- 1) The built-in bias resistor allows the configuration of an inverter circuit without connecting any external input resistors (see Equivalent circuit).
- 2) Each bias resistor is a thin-film resistor. Since they are completely insulated, the input can be positively biased. The insulation also eliminates most of the parasitic effects.
- 3) Circuit design is simplified since only the OFF and the ON conditions have to be set.

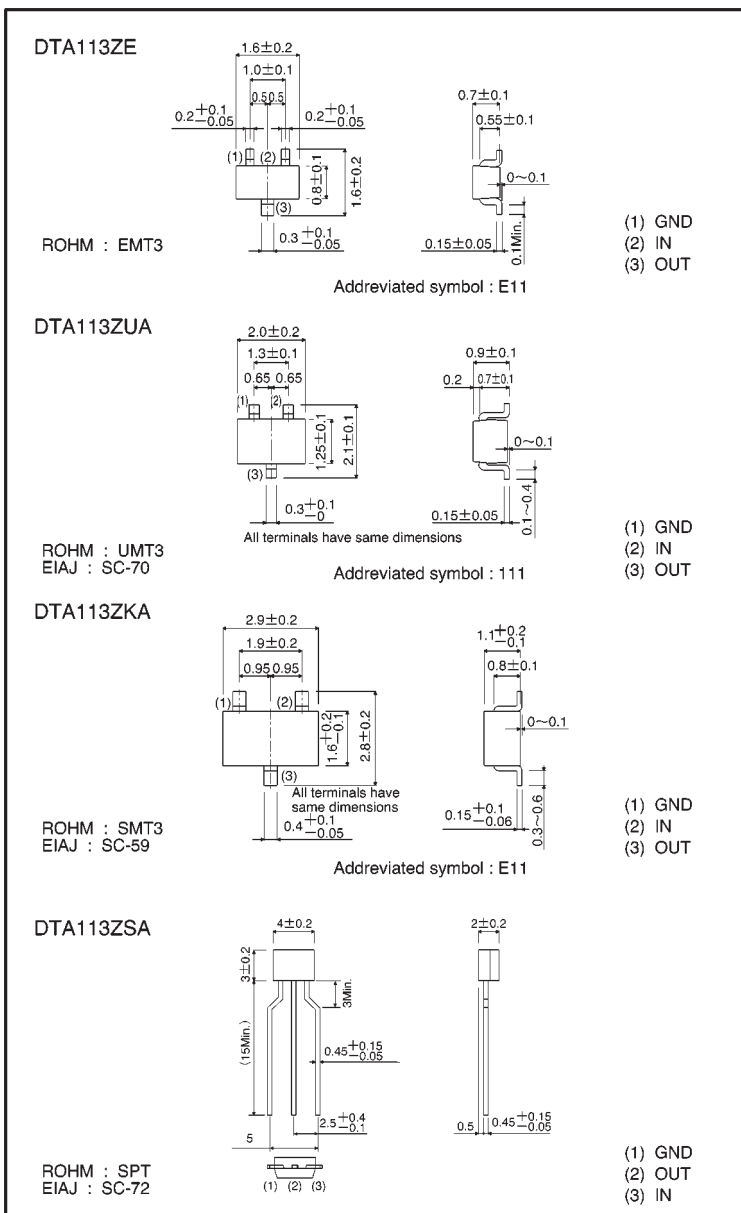
●Structure

PNP digital transistor  
(with built in resistors).

●Equivalent circuit



●External dimensions (Units: mm)



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

| Parameter            | Symbol               | Limits(DTA113Z□) |     |    |     | Unit |
|----------------------|----------------------|------------------|-----|----|-----|------|
|                      |                      | E                | UA  | KA | SA  |      |
| Supply voltage       | V <sub>CC</sub>      | -50              |     |    |     | V    |
| Input voltage        | V <sub>IN</sub>      | -10~+5           |     |    |     | V    |
| Output current       | I <sub>o</sub>       | -100             |     |    |     | mA   |
|                      | I <sub>C(Max.)</sub> | -100             |     |    |     |      |
| Power dissipation    | P <sub>d</sub>       | 150              | 200 |    | 300 | mW   |
| Junction temperature | T <sub>J</sub>       | 150              |     |    |     | °C   |
| Storage temperature  | T <sub>stg</sub>     | -55~+150         |     |    |     | °C   |

## ● Electrical characteristics (Ta = 25°C)

| Parameter            | Symbol                         | Min. | Typ. | Max. | Unit | Conditions   |
|----------------------|--------------------------------|------|------|------|------|--|
| Input voltage        | V <sub>I(off)</sub>            | —    | —    | -0.3 | V    | V <sub>CC</sub> =-5V, I <sub>o</sub> =-100 μA          |
|                      | V <sub>I(on)</sub>             | -3   | —    | —    |      | V <sub>o</sub> =-0.3V, I <sub>o</sub> =-20mA           |
| Output voltage       | V <sub>O(on)</sub>             | —    | —    | -0.3 | V    | I <sub>o</sub> /I <sub>i</sub> =-10mA/-0.5mA           |
| Input current        | I <sub>i</sub>                 | —    | —    | -7.2 | mA   | V <sub>i</sub> =-5V                                    |
| Output current       | I <sub>O(off)</sub>            | —    | —    | -0.5 | μA   | V <sub>CC</sub> =-50V, V <sub>i</sub> =0V              |
| DC current gain      | G <sub>i</sub>                 | 33   | —    | —    | —    | V <sub>o</sub> =-5V, I <sub>o</sub> =-5mA              |
| Input resistance     | R <sub>i</sub>                 | 0.7  | 1    | 1.3  | kΩ   | —  |
| Resistance ratio     | R <sub>2</sub> /R <sub>1</sub> | 8    | 10   | 12   | —    | —  |
| Transition frequency | f <sub>t</sub>                 | —    | 250  | —    | MHz  | V <sub>CE</sub> =-10V, I <sub>E</sub> =5mA, f=100MHz * |

\* Transition frequency of the device

## ● Packaging specifications

| Part No.  | Package                      | EMT3   | UMT3   | SMT3   | SPT    |
|-----------|------------------------------|--------|--------|--------|--------|
|           | Package type                 | Taping | Taping | Taping | Taping |
|           | Code                         | TL     | T106   | T146   | TP     |
|           | Basic ordering unit (pieces) | 3000   | 3000   | 3000   | 5000   |
| DTA113ZE  | ○                            | —      | —      | —      | —      |
| DTA113ZUA | —                            | ○      | —      | —      | —      |
| DTA113ZKA | —                            | —      | ○      | —      | —      |
| DTA113ZSA | —                            | —      | —      | ○      | —      |

●Electrical characteristic curves

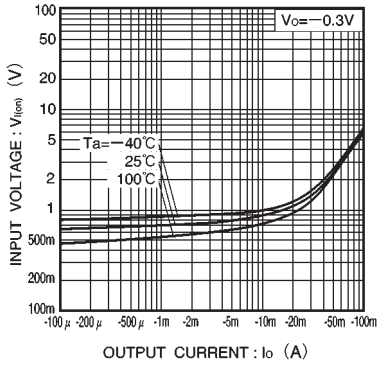


Fig.1 Input voltage vs. output current (ON characteristics)

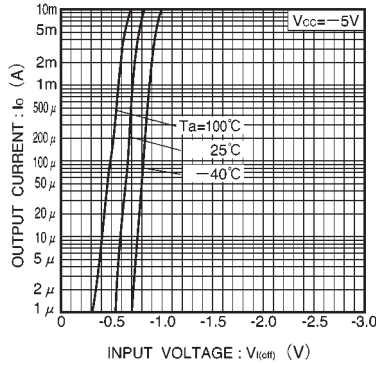


Fig.2 Output current vs. input voltage (OFF characteristics)

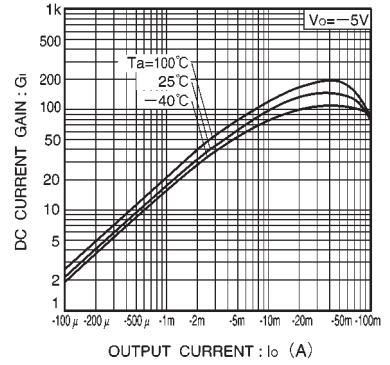


Fig.3 DC current gain vs. output current

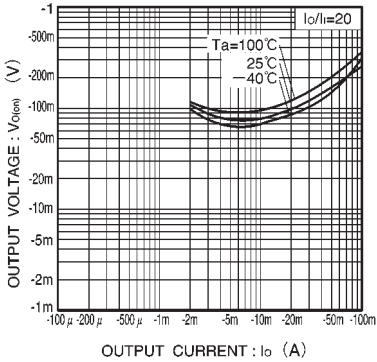


Fig.4 Output voltage vs. output current