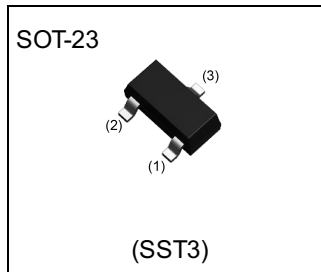


| Parameter     | Value        |
|---------------|--------------|
| $V_{CC}$      | -50V         |
| $I_{C(MAX.)}$ | -500mA       |
| $R_1$         | 1k $\Omega$  |
| $R_2$         | 10k $\Omega$ |

## ●Outline



## ●Features

- 1) Built-In Biasing Resistors,  
 $R_1 = 1.0k\Omega$ ,  $R_2 = 10k\Omega$
- 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 Type: DTD113ZC HZG

## ●Inner circuit



## ●Application

INVERTER, INTERFACE, DRIVER

## ●Packaging specifications

| Part No.     | Package       | Package size | Taping code | Reel size (mm) | Tape width (mm) | Basic ordering unit.(pcs) | Marking |
|--------------|---------------|--------------|-------------|----------------|-----------------|---------------------------|---------|
| DTB113ZC HZG | SOT-23 (SST3) | 2924         | T116        | 180            | 8               | 3000                      | G11     |

● **Absolute maximum ratings** ( $T_a = 25^\circ\text{C}$ )

| Parameter                    | Symbol            | Values      | Unit             |
|------------------------------|-------------------|-------------|------------------|
| Supply voltage               | $V_{CC}$          | -50         | V                |
| Input voltage                | $V_{IN}$          | -10 to 5    | V                |
| Collector current            | $I_{C(MAX)}^{*1}$ | -500        | mA               |
| Power dissipation            | $P_D^{*2}$        | 200         | mW               |
| Junction temperature         | $T_j$             | 150         | $^\circ\text{C}$ |
| Range of storage temperature | $T_{stg}$         | -55 to +150 | $^\circ\text{C}$ |

● **Electrical characteristics** ( $T_a = 25^\circ\text{C}$ )

| Parameter            | Symbol       | Conditions                                   | Values |      |      | Unit       |
|----------------------|--------------|--|--------|------|------|------------|
|                      |              |  | Min.   | Typ. | Max. |            |
| Input voltage        | $V_{I(off)}$ | $V_{CC} = -5V, I_O = -100\mu A$              | -      | -    | -0.3 | V          |
|                      | $V_{I(on)}$  | $V_O = -0.3V, I_O = -20mA$                   | -3.0   | -    | -    |            |
| Output voltage       | $V_{O(on)}$  | $I_O = -50mA, I_I = -2.5mA$                  | -      | -100 | -300 | mV         |
| Input current        | $I_I$        | $V_I = -5V$                                  | -      | -    | -7.2 | mA         |
| Output current       | $I_{O(off)}$ | $V_{CC} = -50V, V_I = 0V$                    | -      | -    | -500 | nA         |
| DC current gain      | $G_I^{*3}$   | $V_O = -5V, I_O = -50mA$                     | 56     | -    | -    | -          |
| Input resistance     | $R_1$        | -  | 0.7    | 1    | 1.3  | k $\Omega$ |
| Resistance ratio     | $R_2/R_1$    | -  | 8      | 10   | 12   | -          |
| Transition frequency | $f_T^{*1}$   | $V_{CE} = -10V, I_E = 50mA,$<br>$f = 100MHz$ | -      | 200  | -    | MHz        |

\*1 Characteristics of built-in transistor

\*2 Each terminal mounted on a reference land.

\*3 Pulsed

●Electrical characteristic curves ( $T_a = 25^\circ\text{C}$ )

Fig.1 Input Voltage vs. Output Current  
(ON Characteristics)

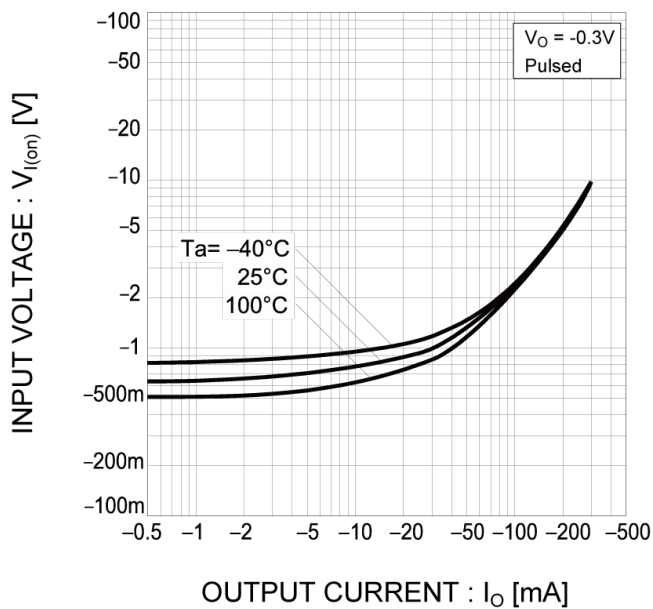


Fig.2 Output Current vs. Input Voltage  
(OFF Characteristics)

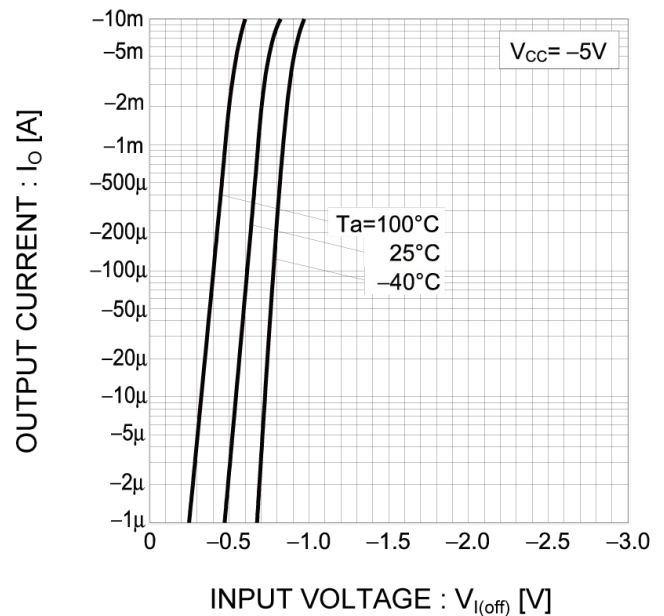


Fig.3 Output Current vs. Output Voltage

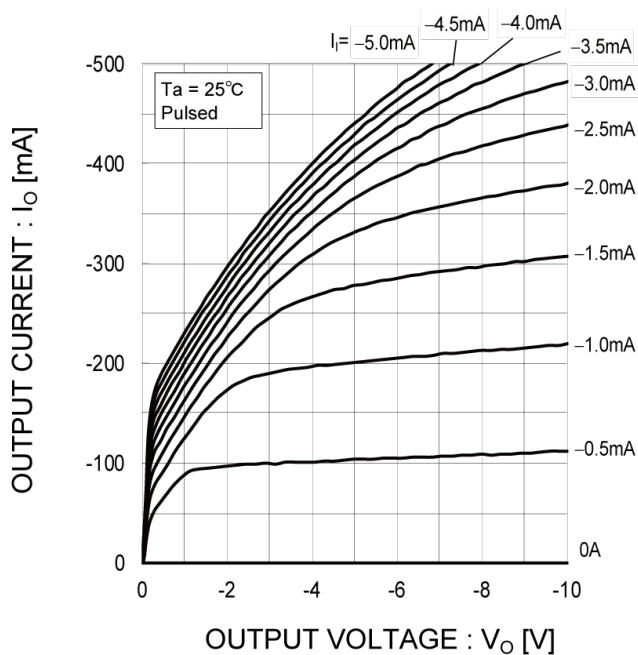
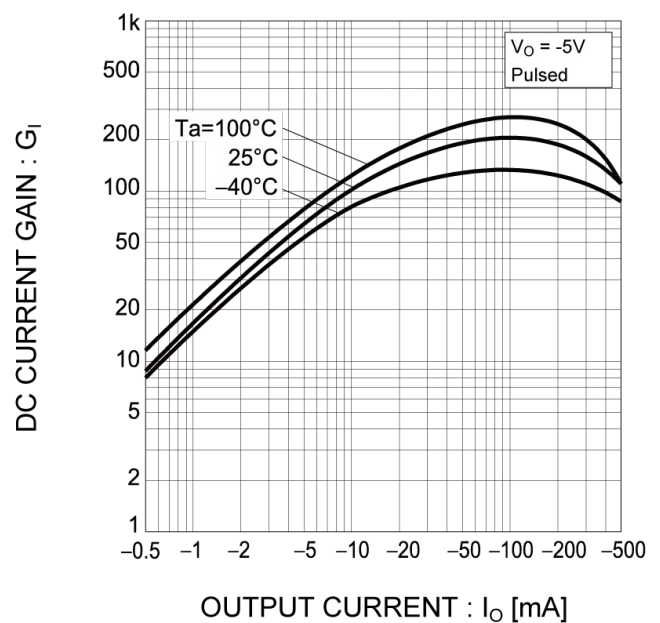
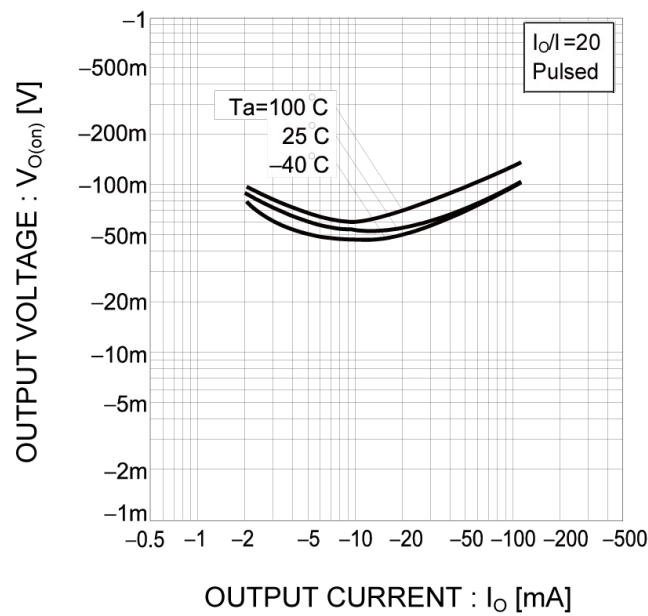


Fig.4 DC Current Gain vs. Output Current

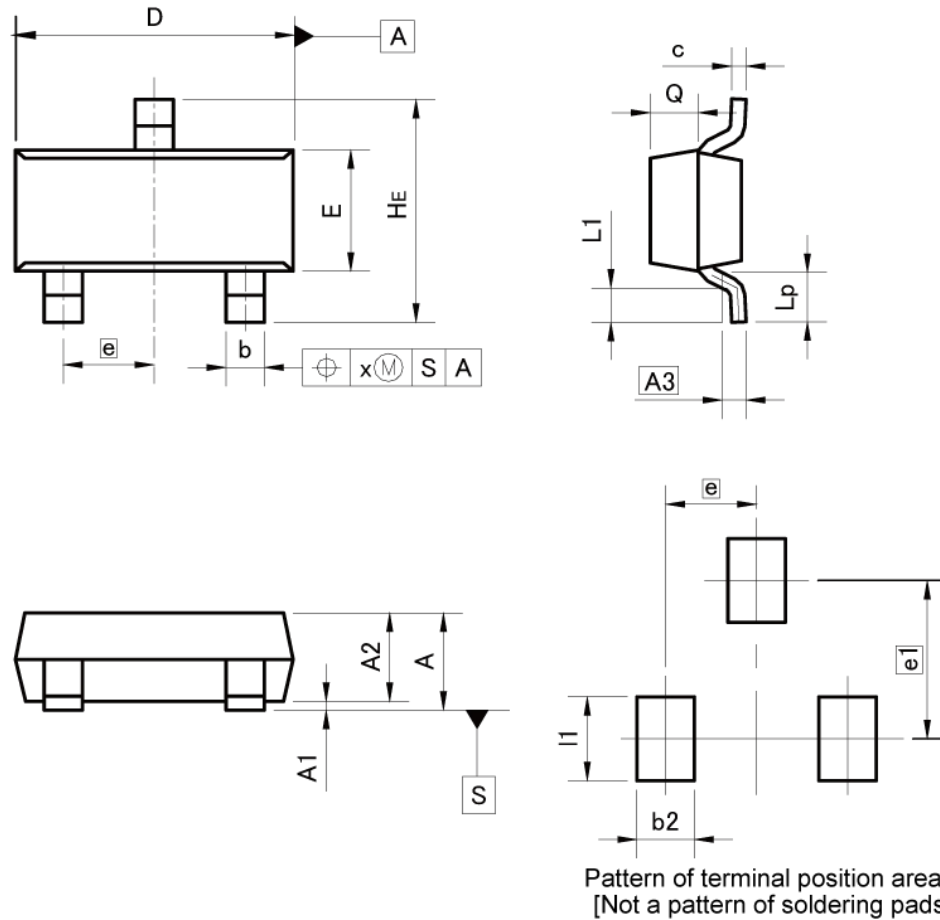


●Electrical characteristic curves (T<sub>a</sub> =25°C)

Fig.5 Output Voltage vs. Output Current



## ●Dimensions

SOT-23  
(SST3)

| DIM | MILIMETERS |      | INCHES |       |
|-----|------------|------|--------|-------|
|     | MIN        | MAX  | MIN    | MAX   |
| A   | 0.90       | 1.20 | 0.035  | 0.047 |
| A1  | 0.00       | 0.10 | 0.000  | 0.004 |
| A2  | 0.85       | 1.15 | 0.033  | 0.045 |
| A3  | 0.25       |      | 0.010  |       |
| b   | 0.35       | 0.50 | 0.014  | 0.020 |
| c   | 0.09       | 0.25 | 0.004  | 0.010 |
| D   | 2.70       | 3.10 | 0.106  | 0.122 |
| E   | 1.20       | 1.50 | 0.047  | 0.059 |
| e   | 0.95       |      | 0.037  |       |
| HE  | 2.20       | 2.60 | 0.087  | 0.102 |
| L1  | 0.20       | —    | 0.008  | —     |
| Lp  | 0.30       | —    | 0.012  | —     |
| Q   | 0.40       | 0.60 | 0.016  | 0.024 |
| x   | —          | 0.10 | —      | 0.004 |

| DIM | MILIMETERS |      | INCHES |       |
|-----|------------|------|--------|-------|
|     | MIN        | MAX  | MIN    | MAX   |
| b2  | —          | 0.60 | —      | 0.024 |
| e1  | 1.70       |      | 0.067  |       |
| l1  | —          | 0.90 | —      | 0.035 |

Dimension in mm/inches

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(Note1) Medical Equipment Classification of the Specific Applications

| JAPAN     | USA       | EU         | CHINA     |
|-----------|-----------|------------|-----------|
| CLASS III | CLASS III | CLASS II b | CLASS III |
| CLASS IV  |           | CLASS III  |           |

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  - [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
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  - [h] Use of the Products in places subject to dew condensation
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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.

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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.
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