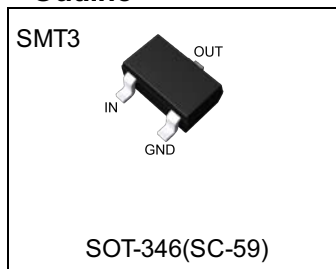


| Parameter     | Value        |
|---------------|--------------|
| $V_{CC}$      | -50V         |
| $I_{C(MAX.)}$ | -100mA       |
| $R_1$         | 47k $\Omega$ |
| $R_2$         | 10k $\Omega$ |

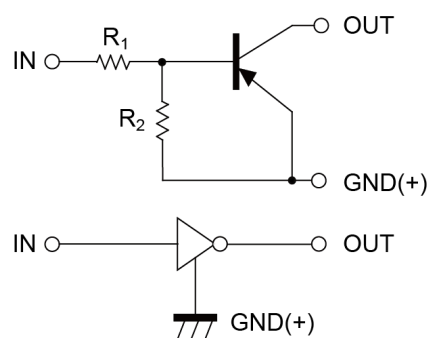
## ●Outline



## ●Features

- 1) Built-In Biasing Resistors
- 2) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner circuit) .
- 3) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of completely eliminating parasitic effects.
- 4) Only the on/off conditions need to be set for operation, making the circuit design easy.
- 5) Complementary NPN Type: DTC144VKA
- 6) Lead Free/RoHS Compliant.

## ●Inner circuit



## ●Application

Switching circuit, Inverter circuit, Interface circuit,  
Driver circuit

## ●Packaging specifications

| Part No.  | Package | Package size | Taping code | Reel size (mm) | Tape width (mm) | Basic ordering unit.(pcs) | Marking |
|-----------|---------|--------------|-------------|----------------|-----------------|---------------------------|---------|
| DTA144VKA | SMT3    | 2928         | T146        | 180            | 8               | 3000                      | E56     |

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

| Parameter                    | Symbol            | Values      | Unit             |
|------------------------------|-------------------|-------------|------------------|
| Supply voltage               | $V_{CC}$          | -50         | V                |
| Input voltage                | $V_{IN}$          | -40 to 15   | V                |
| Output current               | $I_O$             | -30         | mA               |
| Collector current            | $I_{C(MAX)}^{*1}$ | -100        | mA               |
| Power dissipation            | $P_D^{*2}$        | 200         | mW/Total         |
| 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        | $V_{I(off)}$ | $V_{CC} = -5V, I_O = -100\mu\text{A}$                | -      | -    | -1    | V             |
|                      | $V_{I(on)}$  | $V_O = -0.3V, I_O = -2\text{mA}$                     | -6     | -    | -     |               |
| Output voltage       | $V_{O(on)}$  | $I_O / I_I = -10\text{mA} / -0.5\text{mA}$           | -      | -0.1 | -0.3  | V             |
| Input current        | $I_I$        | $V_I = -5V$                                          | -      | -    | -0.16 | mA            |
| Output current       | $I_{O(off)}$ | $V_{CC} = -50V, V_I = 0V$                            | -      | -    | -0.5  | $\mu\text{A}$ |
| DC current gain      | $G_I$        | $V_O = -5V, I_O = -5\text{mA}$                       | 33     | -    | -     | -             |
| Input resistance     | $R_1$        | -                                                    | 32.9   | 47   | 61.1  | k $\Omega$    |
| Resistance ratio     | $R_2/R_1$    | -                                                    | 0.17   | 0.21 | 0.26  | -             |
| Transition frequency | $f_T^{*1}$   | $V_{CE} = -10V, I_E = 5\text{mA}, f = 100\text{MHz}$ | -      | 250  | -     | MHz           |

\*1 Characteristics of built-in transistor

\*2 Each terminal mounted on a reference footprint

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

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

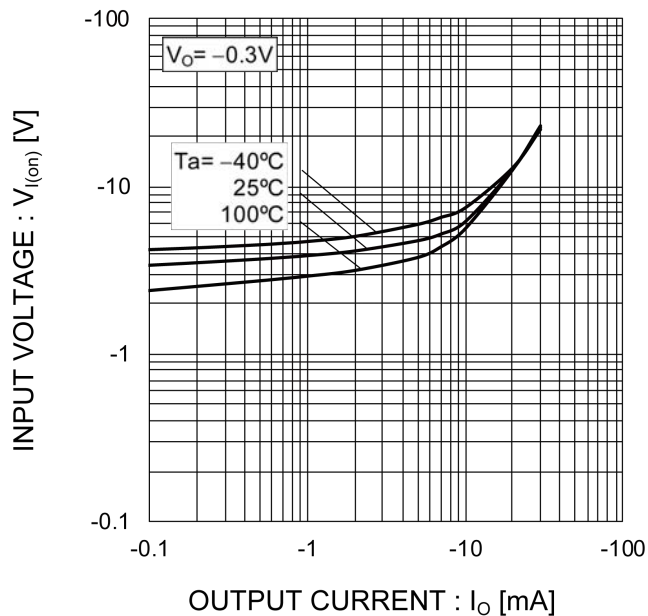


Fig.2 Output current vs. input voltage  
(OFF characteristics)

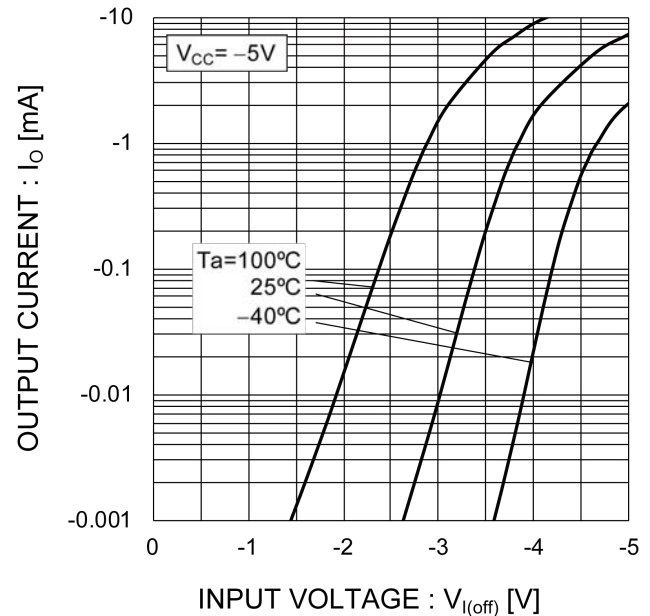


Fig.3 Output current vs. output voltage

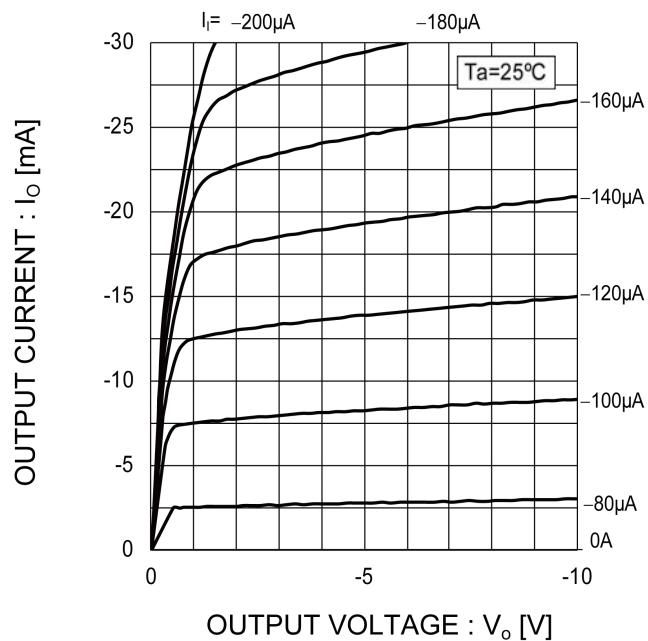
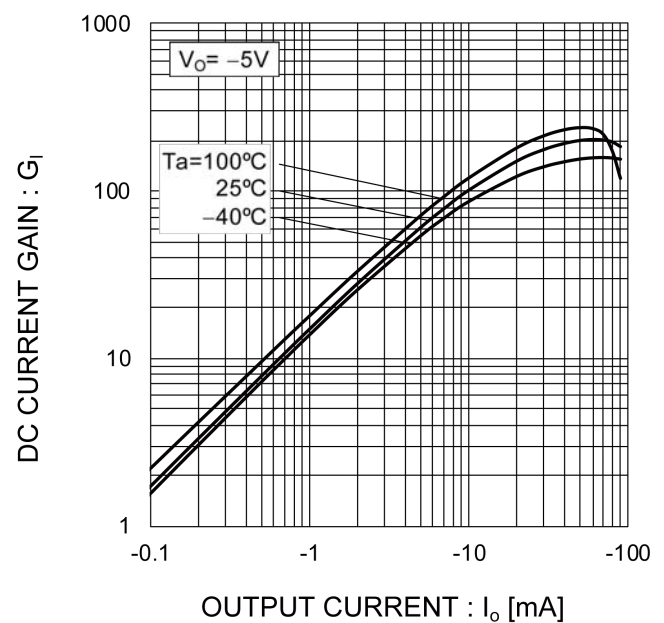
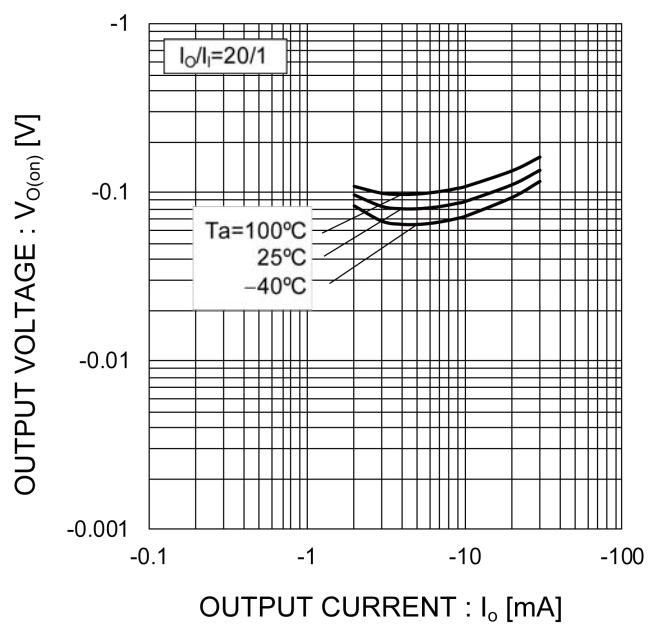


Fig.4 DC current gain vs. output current



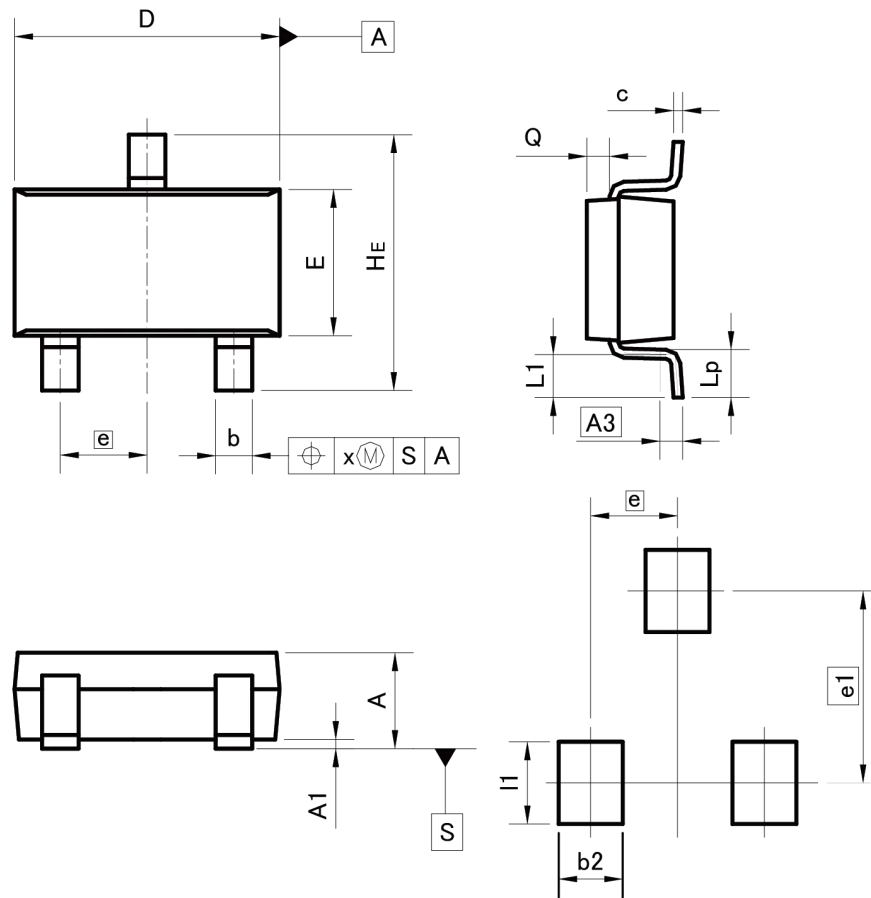
●Electrical characteristic curves ( $T_a = 25^\circ\text{C}$ )

Fig.5 Output voltage vs. output current



## ●Dimensions

SMT3



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

| DIM | MILIMETERS |      | INCHES |       |
|-----|------------|------|--------|-------|
|     | MIN        | MAX  | MIN    | MAX   |
| A   | 1.00       | 1.30 | 0.039  | 0.051 |
| A1  | 0.00       | 0.10 | 0.000  | 0.004 |
| A3  | 0.25       |      | 0.010  |       |
| b   | 0.35       | 0.50 | 0.014  | 0.020 |
| c   | 0.09       | 0.25 | 0.004  | 0.010 |
| D   | 2.80       | 3.00 | 0.110  | 0.118 |
| E   | 1.50       | 1.80 | 0.059  | 0.071 |
| e   | 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 | —      | 0.004 |
| y   | —          | 0.10 | —      | 0.004 |

| DIM | MILIMETERS |      | INCHES |       |
|-----|------------|------|--------|-------|
|     | MIN        | MAX  | MIN    | MAX   |
| b2  | —          | 0.60 | —      | 0.024 |
| e1  | 2.10       |      | 0.083  |       |
| l1  | —          | 0.90 | —      | 0.035 |

Dimension in mm/inches

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