

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

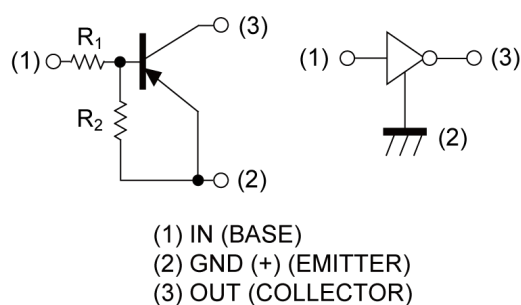
## ●Features

- 1) Built-In Biasing Resistors,  $R_1 = R_2 = 47k\Omega$
- 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: DTC044E series

## ●Outline

|                                               |                                               |
|-----------------------------------------------|-----------------------------------------------|
| <p>SOT-723</p> <p>DTA044EM<br/>(VMT3)</p>     | <p>SOT-416FL</p> <p>DTA044EEB<br/>(EMT3F)</p> |
| <p>SOT-323FL</p> <p>DTA044EUB<br/>(UMT3F)</p> |                                               |

## ●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 |
|-----------|----------------------|--------------|-------------|----------------|-----------------|---------------------------|---------|
| DTA044EM  | SOT-723<br>(VMT3)    | 1212         | T2L         | 180            | 8               | 8000                      | 31      |
| DTA044EEB | SOT-416FL<br>(EMT3F) | 1616         | TL          | 180            | 8               | 3000                      | 31      |
| DTA044EUB | SOT-323FL<br>(UMT3F) | 2021         | TL          | 180            | 8               | 3000                      | 31      |

● **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 10   | V                |
| Output current               |           | $I_O$             | -30         | mA               |
| Collector current            |           | $I_{C(MAX)}^{*1}$ | -100        | mA               |
| Power dissipation            | DTA044EM  | $P_D^{*2}$        | 150         | mW               |
|                              | DTA044EEB |                   | 150         |                  |
|                              | DTA044EUB |                   | 200         |                  |
| 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        | $V_{I(off)}$ | $V_{CC} = -5V, I_O = -100\mu A$             | -      | -    | -0.8 | V          |
|                      | $V_{I(on)}$  | $V_O = -0.3V, I_O = -2mA$                   | -3.0   | -    | -    |            |
| Output voltage       | $V_{O(on)}$  | $I_O = -5mA, I_I = -0.5mA$                  | -      | -70  | -150 | mV         |
| Input current        | $I_I$        | $V_I = -5V$                                 | -      | -    | -180 | $\mu A$    |
| Output current       | $I_{O(off)}$ | $V_{CC} = -50V, V_I = 0V$                   | -      | -    | -500 | nA         |
| DC current gain      | $G_I$        | $V_O = -10V, I_O = -5mA$                    | 80     | -    | -    | -          |
| Input resistance     | $R_1$        | -                                           | 32.9   | 47   | 61.1 | k $\Omega$ |
| Resistance ratio     | $R_2/R_1$    | -                                           | 0.8    | 1.0  | 1.2  | -          |
| Transition frequency | $f_T^{*1}$   | $V_{CE} = -10V, I_E = 5mA,$<br>$f = 100MHz$ | -      | 250  | -    | MHz        |

\*1 Characteristics of built-in transistor

\*2 Each terminal mounted on a reference land.

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

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

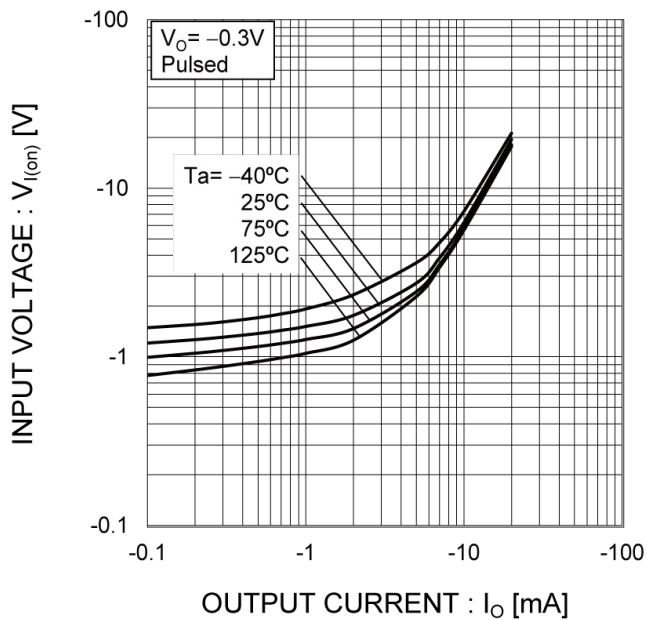


Fig.2 Output current vs. input voltage (OFF characteristics)

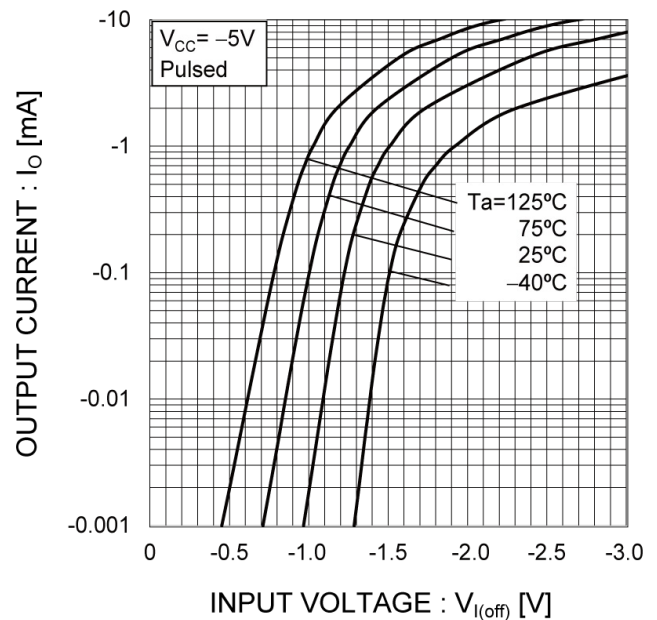


Fig.3 Output current vs. output voltage

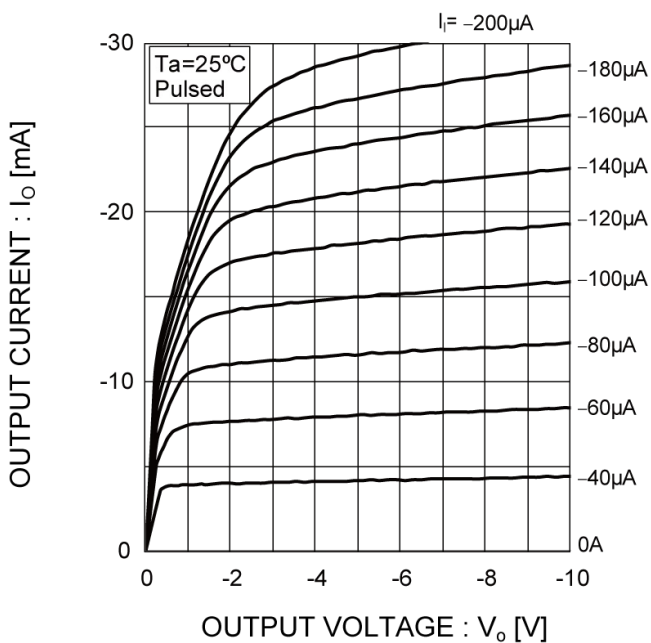
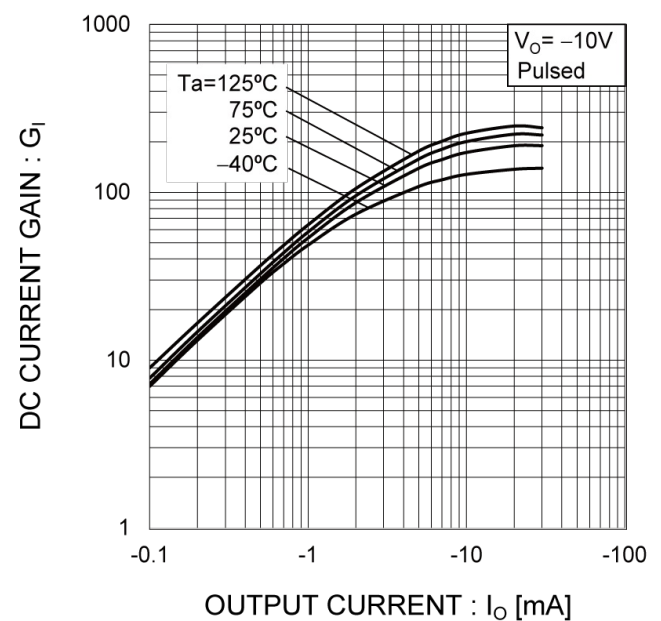
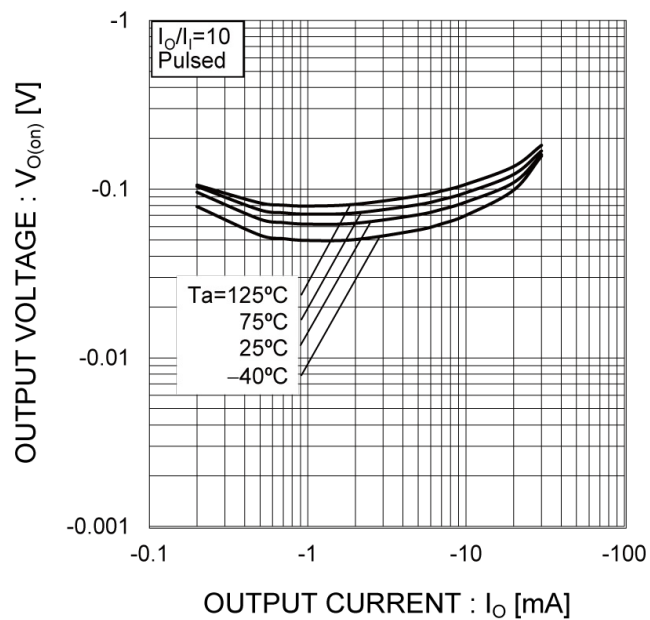


Fig.4 DC current gain vs. output current



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

Fig.5 Output voltage vs. output current



## ●Dimensions

SOT-723  
SC-105AA  
( VMT3 )



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

| DIM | MILIMETERS |      | INCHES |       |
|-----|------------|------|--------|-------|
|     | 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 |
| c   | 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 |
| x   | —          | 0.10 | —      | 0.004 |

| DIM | MILIMETERS |      | INCHES |       |
|-----|------------|------|--------|-------|
|     | MIN        | MAX  | MIN    | MAX   |
| b2  | —          | 0.37 | —      | 0.015 |
| b3  | —          | 0.47 | —      | 0.019 |
| e1  | 0.80       |      | 0.031  |       |
| l1  | —          | 0.50 | —      | 0.020 |

Dimension in mm/inches

## ●Dimensions

SOT-416FL  
SC-89  
( EMT3F )



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

| DIM | MILIMETERS |      | INCHES |       |
|-----|------------|------|--------|-------|
|     | 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 |
| c   | 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 |
| e   | 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 |

| DIM | MILIMETERS |      | INCHES |       |
|-----|------------|------|--------|-------|
|     | MIN        | MAX  | MIN    | MAX   |
| b2  | —          | 0.46 | —      | 0.018 |
| e1  | —          | 1.05 | —      | 0.041 |
| l1  | —          | 0.65 | —      | 0.026 |

Dimension in mm/inches

## ●Dimensions



| DIM | MILIMETERS |      | INCHES |       |
|-----|------------|------|--------|-------|
|     | 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 |
| c   | 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 |
| e   | 0.65       |      | 0.026  |       |
| HE  | 2.00       | 2.20 | 0.079  | 0.087 |
| L   | 0.425      |      | 0.017  |       |
| Lp  | 0.43       | 0.63 | 0.017  | 0.025 |
| x   | —          | 0.10 | —      | 0.004 |

| DIM | MILIMETERS |      | INCHES |       |
|-----|------------|------|--------|-------|
|     | MIN        | MAX  | MIN    | MAX   |
| b2  | —          | 0.52 | —      | 0.020 |
| e1  | 1.47       |      | 0.058  |       |
| l1  | —          | 0.83 | —      | 0.033 |

Dimension in mm/inches

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|-----------|-----------|------------|-----------|
| CLASS III | CLASS III | CLASS II b | CLASS III |
| CLASS IV  |           | CLASS III  |           |

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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.
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8. Confirm that operation temperature is within the specified range described in the product specification.
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  - [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.
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