

| Parameter | Value        |
|-----------|--------------|
| $V_{CEO}$ | -50V         |
| $I_C$     | -100mA       |
| R         | 47k $\Omega$ |

### ●Features

- 1) Built-In Biasing Resistors,  $R_1 = 47k\Omega$
- 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: DTC144T series

### ●Outline

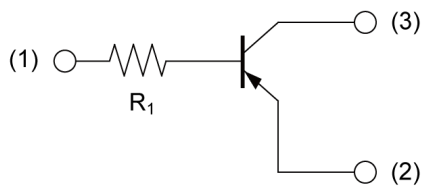
| SOT-723                    | SOT-323                     |
|----------------------------|-----------------------------|
| <p>DTA144TM<br/>(VMT3)</p> | <p>DTA144TUA<br/>(UMT3)</p> |

### ●Application

INVERTER, INTERFACE, DRIVER

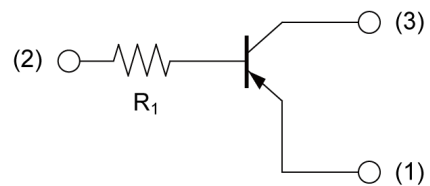
### ●Inner circuit

DTA144TM



(1) BASE  
(2) EMITTER  
(3) COLLECTOR

DTA144TUA



(1) EMITTER  
(2) BASE  
(3) COLLECTOR

### ●Packaging specifications

| Part No.  | Package           | Package size | Taping code | Reel size (mm) | Tape width (mm) | Basic ordering unit.(pcs) | Marking |
|-----------|-------------------|--------------|-------------|----------------|-----------------|---------------------------|---------|
| DTA144TM  | SOT-723<br>(VMT3) | 1212         | T2L         | 180            | 8               | 8000                      | 96      |
| DTA144TUA | SOT-323<br>(UMT3) | 2021         | T106        | 180            | 8               | 3000                      | 96      |

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

| Parameter                    |           | Symbol     | Values      | Unit             |
|------------------------------|-----------|------------|-------------|------------------|
| Collector-base voltage       |           | $V_{CBO}$  | -50         | V                |
| Collector-emitter voltage    |           | $V_{CEO}$  | -50         | V                |
| Emitter-base voltage         |           | $V_{EBO}$  | -5          | V                |
| Collector current            |           | $I_C^{*1}$ | -100        | mA               |
| Power dissipation            | DTA144TM  | $P_D^{*2}$ | 150         | mW               |
|                              | DTA144TUA |            | 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. |            |
| Collector-base breakdown voltage     | $BV_{CBO}$    | $I_C = -50\mu\text{A}$                                      | -50    | -    | -    | V          |
| Collector-emitter breakdown voltage  | $BV_{CEO}$    | $I_C = -1\text{mA}$   | -50    | -    | -    | V          |
| Emitter-base breakdown voltage       | $BV_{EBO}$    | $I_E = -50\mu\text{A}$                                      | -5     | -    | -    | V          |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB} = -50\text{V}$                                      | -      | -    | -500 | nA         |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB} = -4\text{V}$                                       | -      | -    | -500 | nA         |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = -5\text{mA}, I_B = -0.5\text{mA}$                    | -      | -    | -300 | mV         |
| DC current gain                      | $h_{FE}$      | $V_{CE} = -5\text{V}, I_C = -1\text{mA}$                    | 100    | 250  | 600  | -          |
| Input resistance                     | $R_1$         | -   | 32.9   | 47   | 61.1 | k $\Omega$ |
| Transition frequency                 | $f_T^{*1}$    | $V_{CE} = -10\text{V}, I_E = 5\text{mA}, f = 100\text{MHz}$ | -      | 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 Grounded emitter propagation characteristics

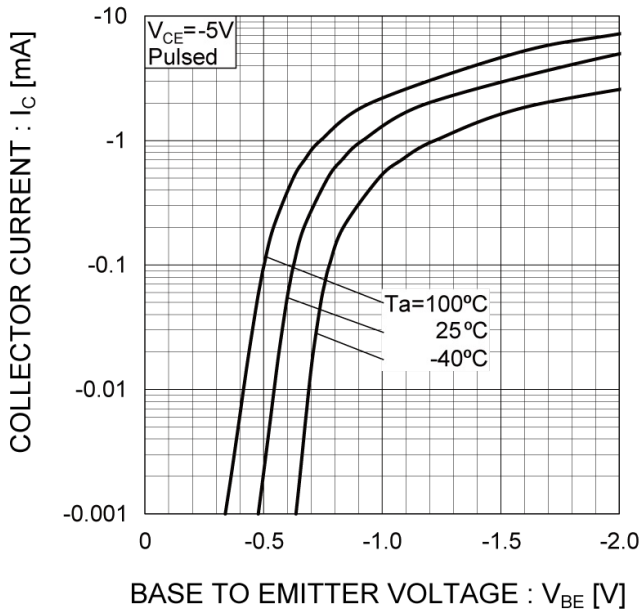


Fig.2 Grounded emitter output characteristics

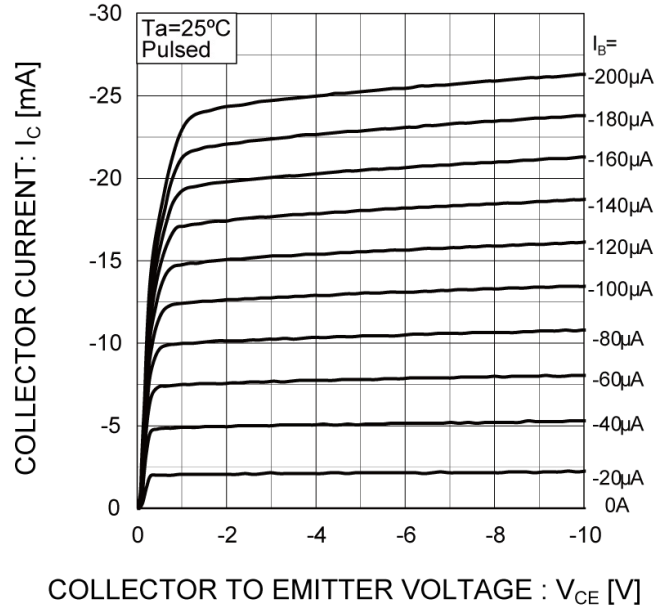


Fig.3 DC Current gain vs. Collector Current

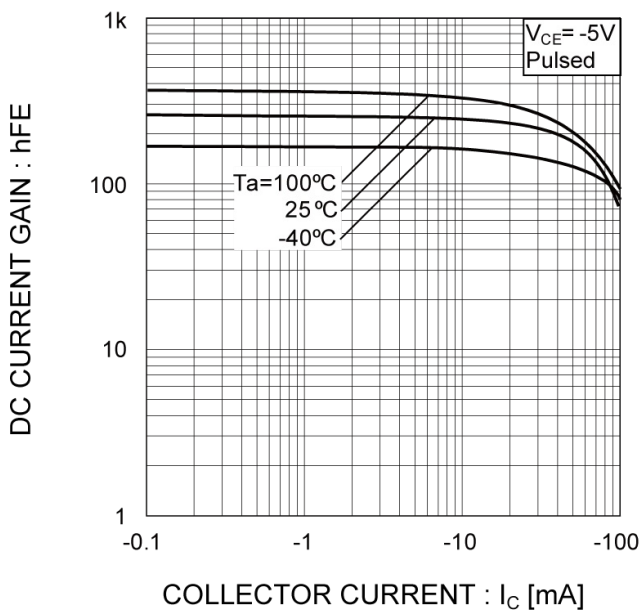
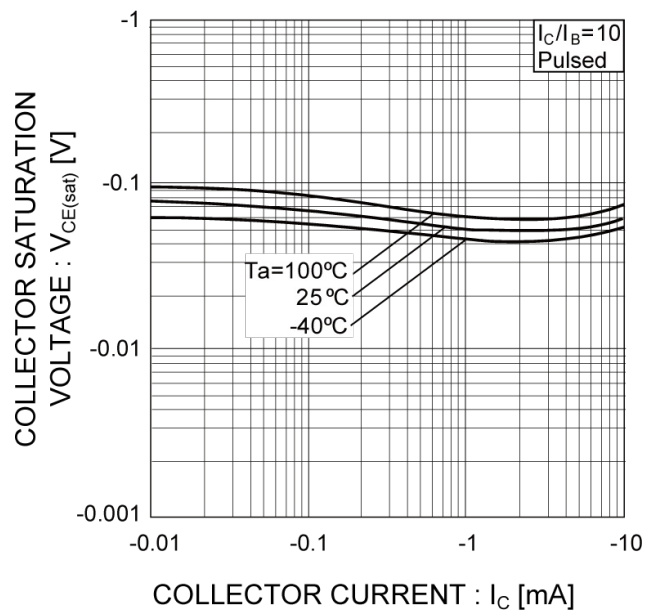


Fig.4 Collector-emitter saturation voltage vs. Collector Current



●Dimensions

SOT-723  
SC-105AA  
(VMT3)



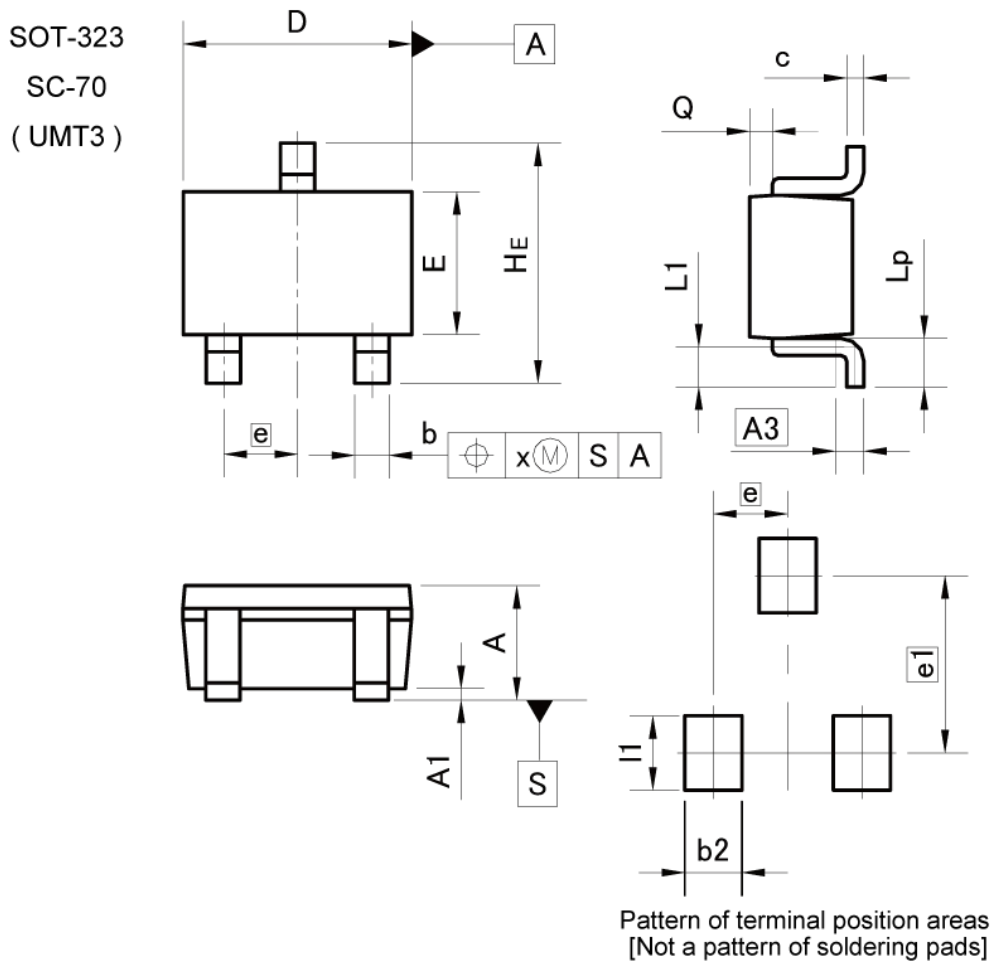
Pattern of terminal position areas  
[Not a pattern of soldering pads]

| 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  |       |
| I1  | -          | 0.50 | -      | 0.020 |

Dimension in mm/inches

●Dimensions



| DIM | MILIMETERS |      | INCHES |       |
|-----|------------|------|--------|-------|
|     | MIN        | MAX  | MIN    | MAX   |
| A   | 0.80       | 1.00 | 0.031  | 0.039 |
| A1  | 0.00       | 0.10 | 0.000  | 0.004 |
| A3  | 0.25       |      | 0.010  |       |
| b   | 0.25       | 0.40 | 0.010  | 0.016 |
| c   | 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 |
| e   | 0.65       |      | 0.026  |       |
| HE  | 2.00       | 2.20 | 0.079  | 0.087 |
| L1  | 0.10       | 0.40 | 0.004  | 0.016 |
| Lp  | 0.25       | 0.55 | 0.010  | 0.022 |
| Q   | 0.10       | 0.30 | 0.004  | 0.012 |
| x   | -          | 0.10 | -      | 0.004 |

| DIM | MILIMETERS |      | INCHES |       |
|-----|------------|------|--------|-------|
|     | MIN        | MAX  | MIN    | MAX   |
| b2  | -          | 0.50 | -      | 0.020 |
| e1  | 1.55       |      | 0.061  |       |
| l1  | -          | 0.65 | -      | 0.026 |

Dimension in mm/inches

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|-----------|-----------|------------|-----------|
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| CLASS IV  |           | CLASS III  |           |

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

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