

# 100mA / 50V Digital transistors (with built-in resistor)

DTC144TM / DTC144TE / DTC144TUA / DTC144TKA

## ● Applications

Inverter, Interface, Driver

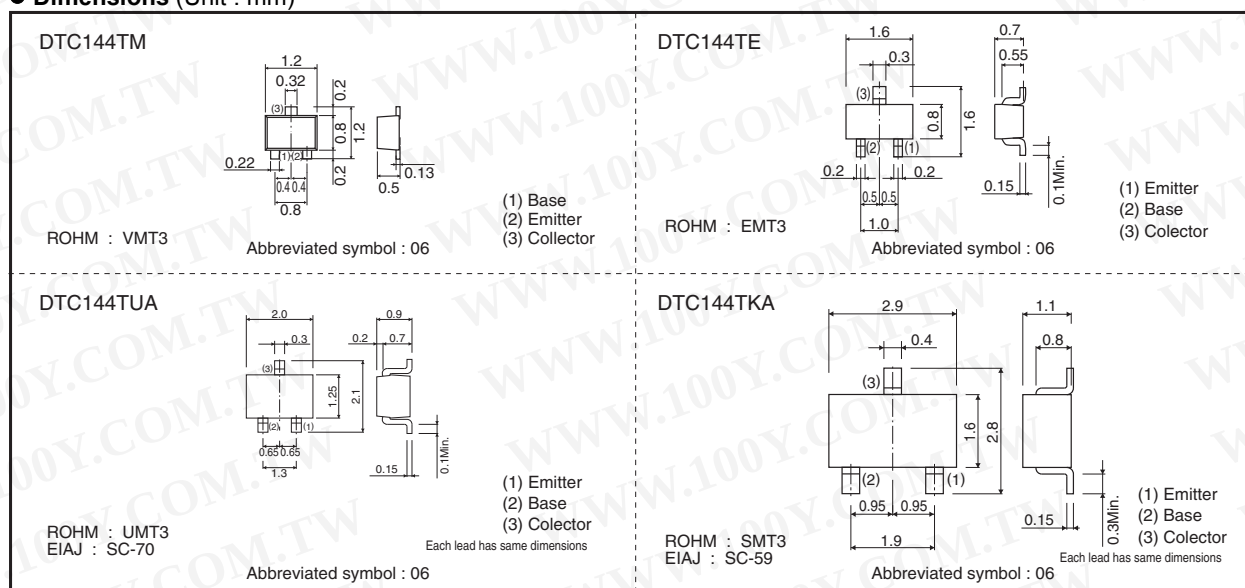
## ● Features

- 1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
- 2) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of almost completely eliminating parasitic effects.
- 3) Only the on/off conditions need to be set for operation, making the device design easy.

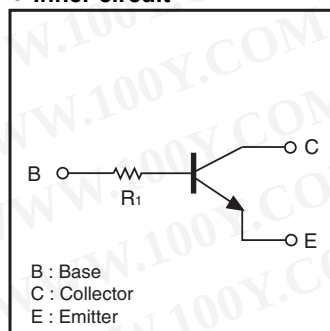
## ● Structure

NPN epitaxial planar silicon transistor (Resistor built-in type)

## ● Dimensions (Unit : mm)



## ● Inner circuit



$R_1 = 47k\Omega$

勝特力材料 886-3-5753170  
 勝特力电子(上海) 86-21-34970699  
 勝特力电子(深圳) 86-755-83298787  
[Http://www.100y.com.tw](http://www.100y.com.tw)

## ● Packaging specifications

| Part No.  | Package                      | VMT3   | EMT3   | UMT3   | SMT3   |
|-----------|------------------------------|--------|--------|--------|--------|
|           | Packaging type               | Taping | Taping | Taping | Taping |
|           | Code                         | T2L    | TL     | T106   | T146   |
|           | Basic ordering unit (pieces) | 8000   | 3000   | 3000   | 3000   |
| DTC144TM  |                              | ○      | —      | —      | —      |
| DTC144TE  |                              | —      | ○      | —      | —      |
| DTC144TUA |                              | —      | —      | ○      | —      |
| DTC144TKA |                              | —      | —      | —      | ○      |

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

| Parameter                   | Symbol           | Limits      |          |           |           | Unit |
|-----------------------------|------------------|-------------|----------|-----------|-----------|------|
|                             |                  | DTC144TM    | DTC144TE | DTC144TUA | DTC144TKA |      |
| Collector-base voltage      | V <sub>CBO</sub> | 50          |          |           |           | V    |
| Collector-emitter voltage   | V <sub>CEO</sub> | 50          |          |           |           | V    |
| Emitter-base voltage        | V <sub>EBO</sub> | 5           |          |           |           | V    |
| Collector current           | I <sub>C</sub>   | 100         |          |           |           | mA   |
| Collector power dissipation | P <sub>C</sub>   | 150         |          | 200       |           | mW   |
| Junction temperature        | T <sub>J</sub>   | 150         |          |           |           | °C   |
| Storage temperature         | T <sub>stg</sub> | -55 to +150 |          |           |           | °C   |

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

| Parameter                            | Symbol               | Min. | Typ. | Max. | Unit | Conditions                                           |
|--------------------------------------|----------------------|------|------|------|------|------------------------------------------------------|
| Collector-base breakdown voltage     | BV <sub>CBO</sub>    | 50   | —    | —    | V    | I <sub>C</sub> =50μA                                 |
| Collector-emitter breakdown voltage  | BV <sub>CEO</sub>    | 50   | —    | —    | V    | I <sub>C</sub> =1mA                                  |
| Emitter-base breakdown voltage       | BV <sub>EBO</sub>    | 5    | —    | —    | V    | I <sub>E</sub> =50μA                                 |
| Collector cutoff current             | I <sub>CBO</sub>     | —    | —    | 0.5  | μA   | V <sub>CB</sub> =50V                                 |
| Emitter cutoff current               | I <sub>EBO</sub>     | —    | —    | 0.5  | μA   | V <sub>EB</sub> =4V                                  |
| Collector-emitter saturation voltage | V <sub>CE(sat)</sub> | —    | —    | 0.3  | V    | I <sub>C</sub> /I <sub>B</sub> =5mA/0.5mA            |
| DC current transfer ratio            | h <sub>FE</sub>      | 100  | 250  | 600  | —    | V <sub>CE</sub> =5V, I <sub>C</sub> =1mA             |
| Input resistance                     | R <sub>i</sub>       | 32.9 | 47   | 61.1 | kΩ   | —                                                    |
| Transition frequency                 | f <sub>T</sub> *     | —    | 250  | —    | MHz  | V <sub>CE</sub> =10V, I <sub>E</sub> =-5mA, f=100MHz |

\* Characteristics of built-in transistor

## ● Electrical characteristic curves

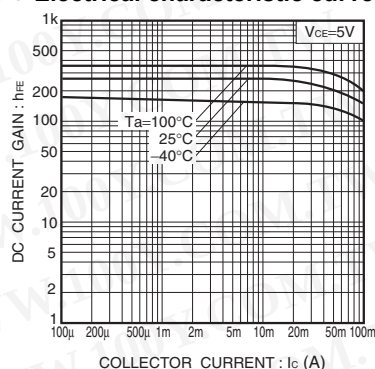


Fig.1 DC current gain vs. collector current

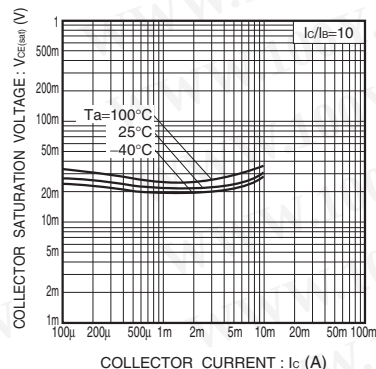


Fig.2 Collector-emitter saturation voltage vs. collector current

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