

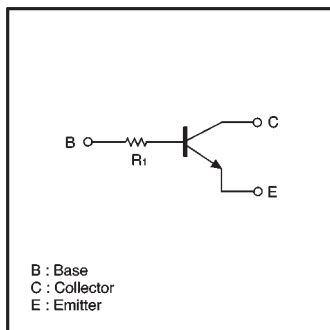
# Digital transistors (built-in resistor)

## DTC124TE / DTC124TUA / DTC124TKA DTC124TSA

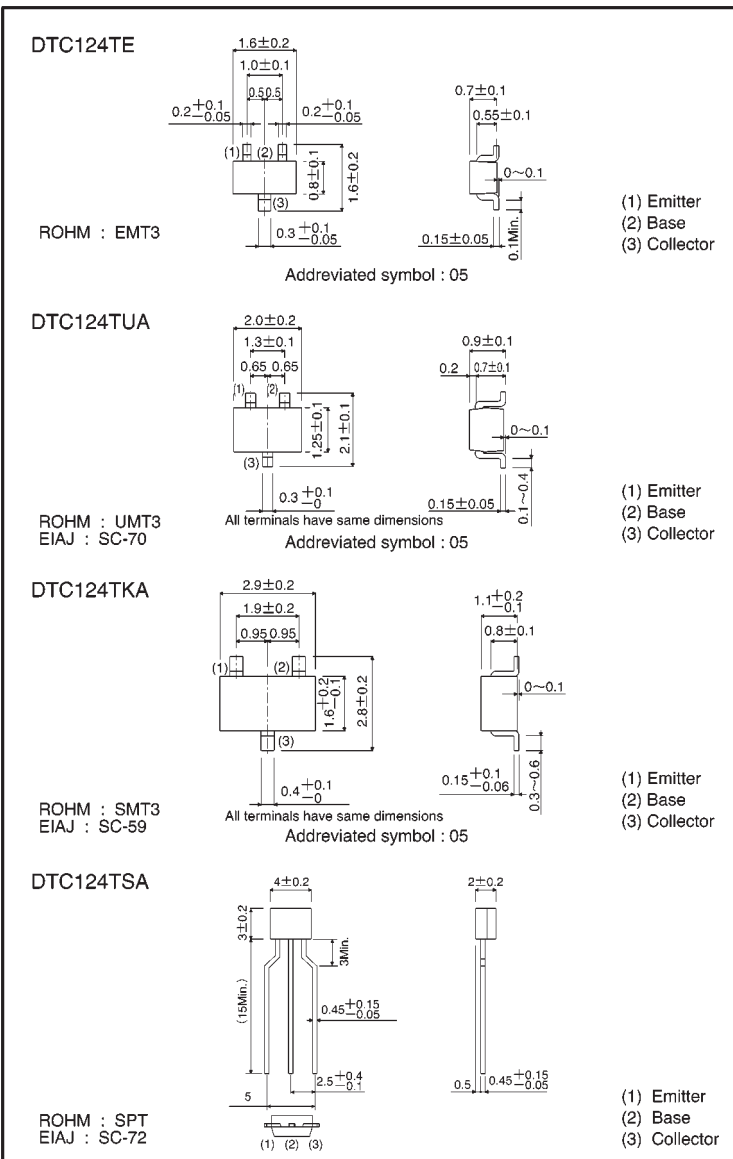
### ●Features

- 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 device design easy.

### ●Equivalent circuit



### ●External dimensions (Units: mm)



●Absolute maximum ratings (Ta = 25°C)

| Parameter                   | Symbol           | Limits(DTC124T□) |     |    |     | Unit |
|-----------------------------|------------------|------------------|-----|----|-----|------|
|                             |                  | E                | UA  | KA | SA  |      |
| 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 |    | 300 | mW   |
| Junction temperature        | T <sub>J</sub>   | 150              |     |    |     | °C   |
| Storage temperature         | T <sub>stg</sub> | -55~+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> =50 μA                                  |
| 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> =50 μA                                  |
| 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>       | 15.4 | 22   | 28.6 | kΩ   | —                                                      |
| Transition frequency                 | f <sub>r</sub>       | —    | 250  | —    | MHz  | V <sub>CE</sub> =10V, I <sub>E</sub> =-5mA, f=100MHz * |

\* Transition frequency of the device

●Packaging specifications

| Part No.  | Package                      | EMT3   | UMT3   | SMT3   | SST3   |
|-----------|------------------------------|--------|--------|--------|--------|
|           | Packaging type               | Taping | Taping | Taping | Taping |
|           | Code                         | TL     | T106   | T146   | TP     |
|           | Basic ordering unit (pieces) | 3000   | 3000   | 3000   | 5000   |
| DTC124TE  |                              | ○      | —      | —      | —      |
| DTC124TUA |                              | —      | ○      | —      | —      |
| DTC124TKA |                              | —      | —      | ○      | —      |
| DTC124TSA |                              | —      | —      | —      | ○      |

● Electrical characteristic curves

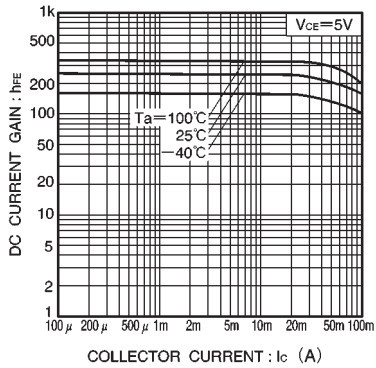


Fig.1 DC current gain vs. collector current

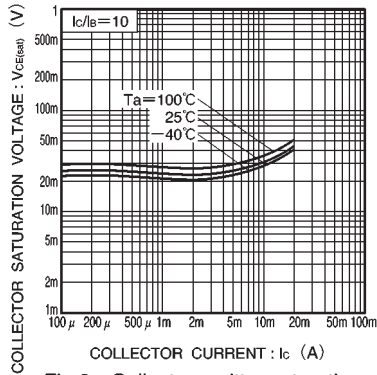


Fig.2 Collector-emitter saturation voltage vs. collector current