

Digital transistors (built in resistor)

DTC144TE / DTC144TUA / DTC144TKA

DTC144TSA

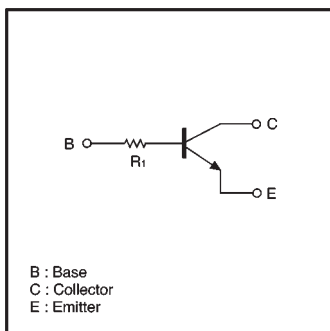
●Features

- 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.

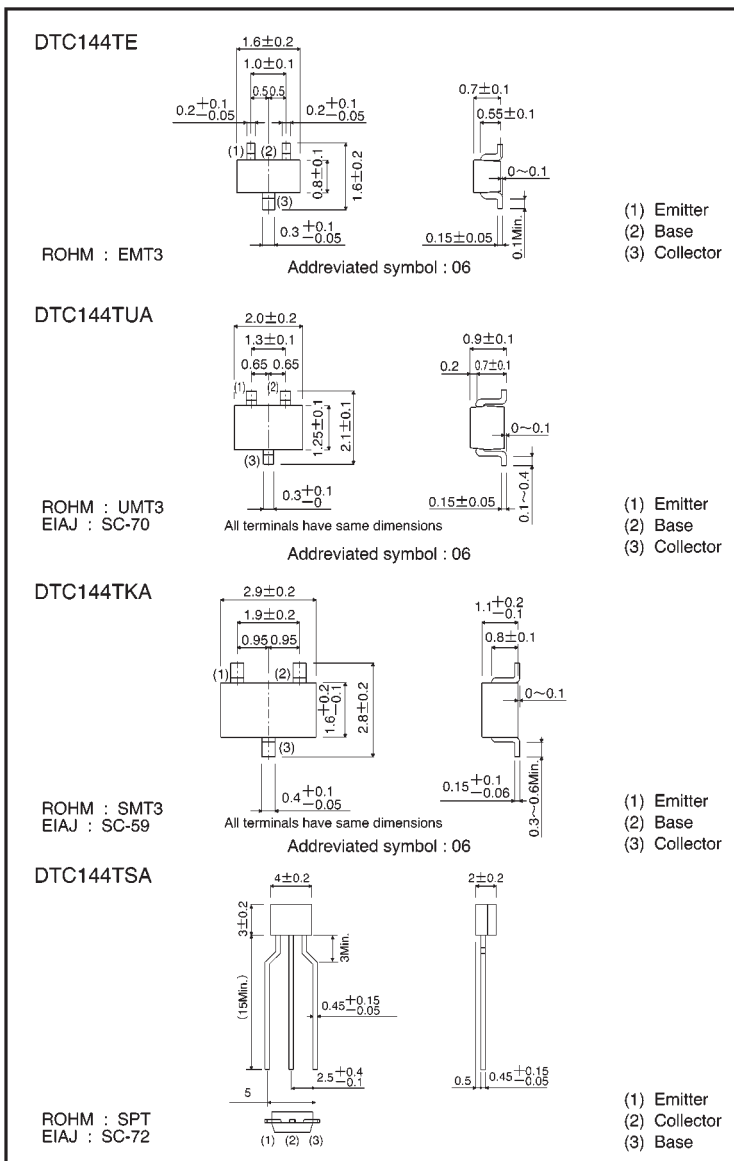
●Structure

NPN digital transistor
(Built-in resistor type)

●Equivalent circuit



●External dimensions (Units: mm)



(96-343-C144T)

● Absolute maximum ratings (Ta = 25°C)

| Parameter | Symbol | Limits(DTC144T□) | | | | Unit |
|-----------------------------|------------------|------------------|-----|----|-----|------|
| | | E | UA | KA | SA | |
| Collector-base voltage | V _{CB0} | 50 | | | | V |
| Collector-emitter voltage | V _{CEO} | 50 | | | | V |
| Emitter-base voltage | V _{EB0} | 5 | | | | V |
| Collector current | I _c | 100 | | | | mA |
| Collector power dissipation | P _c | 150 | 200 | | 300 | mW |
| Junction temperature | T _J | 150 | | | | °C |
| Storage temperature | T _{stg} | -55~+150 | | | | °C |

● Electrical characteristics (Ta = 25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--------------------------------------|----------------------|------|------|------|------|--|
| Collector-base breakdown voltage | BV _{CB0} | 50 | — | — | V | I _c =50 μA |
| Collector-emitter breakdown voltage | BV _{CEO} | 50 | — | — | V | I _c =1mA |
| Emitter-base breakdown voltage | BV _{EB0} | 5 | — | — | V | I _E =50 μA |
| Collector cutoff current | I _{CB0} | — | — | 0.5 | μA | V _{CB} =50V |
| Emitter cutoff current | I _{EB0} | — | — | 0.5 | μA | V _{EB} =4V |
| Collector-emitter saturation voltage | V _{CE(sat)} | — | — | 0.3 | V | I _c /I _B =5mA/0.5mA |
| DC current transfer ratio | h _{FE} | 100 | 250 | 600 | — | V _{CE} =5V, I _c =1mA |
| Input resistance | R ₁ | 32.9 | 47 | 61.1 | kΩ | — |
| Transition frequency | f _T | — | 250 | — | MHz | V _{CE} =10V, I _E =-5mA, f=100MHz * |

* Transition frequency of the device

● Packaging specifications

| Part No. | Package | EMT3 | UMT3 | SMT3 | SPT |
|-----------|------------------------------|--------|--------|--------|--------|
| | Packaging type | Taping | Taping | Taping | Taping |
| | Code | TL | T106 | T146 | TP |
| | Basic ordering unit (pieces) | 3000 | 3000 | 3000 | 5000 |
| DTC144TE | ○ | — | — | — | |
| DTC144TUA | — | ○ | — | — | |
| DTC144TKA | — | — | ○ | — | |
| DTC144TSA | — | — | — | ○ | |

● Electrical characteristic curves

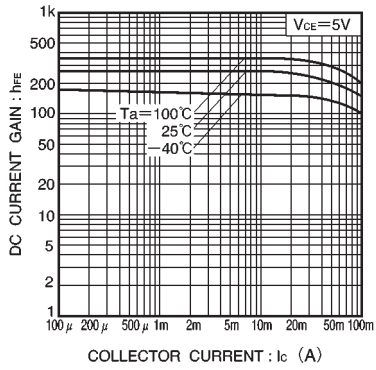


Fig.1 DC current gain vs. collector current

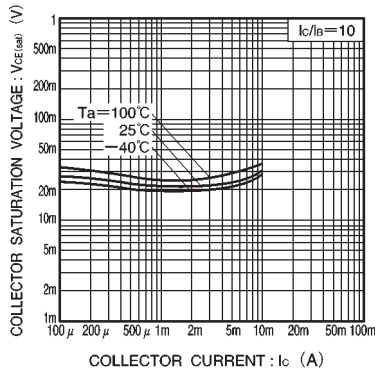


Fig.2 Collector-emitter saturation voltage vs. collector current