

Digital transistors (built in resistor)

DTB143TK / DTB143TS

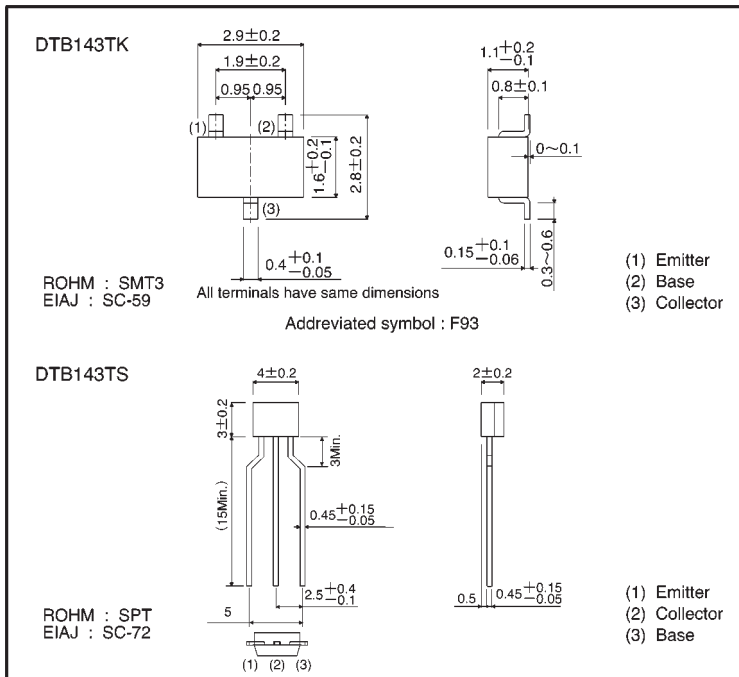
●Features

- 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 positive 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

PNP digital transistor
(Built-in resistor type)

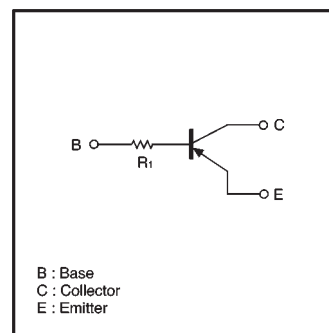
●External dimensions (Units: mm)



●Absolute maximum ratings (Ta = 25°C)

| Parameter | Symbol | Limits(DTB143T□) | | Unit |
|-----------------------------|------------------|------------------|-----|------|
| | | K | S | |
| Collector-base voltage | V _{CB0} | -50 | | V |
| Collector-emitter voltage | V _{CE0} | -40 | | V |
| Emitter-base voltage | V _{EB0} | -5 | | V |
| Collector current | I _c | -500 | | mA |
| Collector power dissipation | P _c | 200 | 300 | mW |
| Junction temperature | T _j | 150 | | °C |
| Storage temperature | T _{stg} | -55~+150 | | °C |

●Equivalent circuit



●Electrical characteristics (Ta = 25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--------------------------------------|----------------------|------|------|------|------|---|
| Collector-base breakdown voltage | BV _{CBO} | -50 | — | — | V | I _C = -50 μA |
| Collector-emitter breakdown voltage | BV _{CEO} | -40 | — | — | V | I _C = -1mA |
| Emitter-base breakdown voltage | BV _{EBO} | -5 | — | — | V | I _E = -50 μA |
| Collector cutoff current | I _{CBO} | — | — | -0.5 | μA | V _{CB} = -50V |
| Emitter cutoff current | I _{EBO} | — | — | -0.5 | μA | V _{EB} = -4V |
| Collector-emitter saturation voltage | V _{CE(sat)} | — | — | -0.3 | V | I _C /I _B = -50mA/-2.5mA |
| DC current transfer ratio | h _{FE} | 100 | 250 | 600 | — | V _{CE} = -5V, I _C = -50mA |
| Input resistance | R _i | 3.29 | 4.7 | 6.11 | kΩ | — |
| Transition frequency | f _t | — | 200 | — | MHz | V _{CE} = -10V, I _E = 50mA, f = 100MHz * |

* Transition frequency of the device

●Packaging specifications

| Part No. | Package | SMT3 | SPT |
|----------|------------------------------|--------|--------|
| | Packaging type | Taping | Taping |
| | Code | T146 | TP |
| | Basic ordering unit (pieces) | 3000 | 5000 |
| DTB143TK | | ○ | — |
| DTB143TS | | — | ○ |

●Electrical characteristic curves

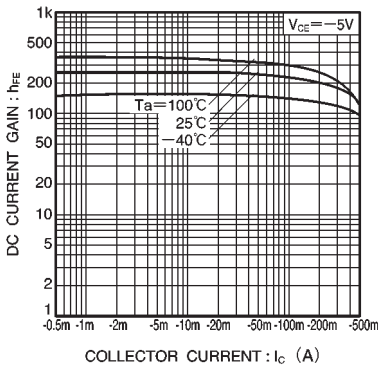


Fig.1 DC current gain vs. collector current

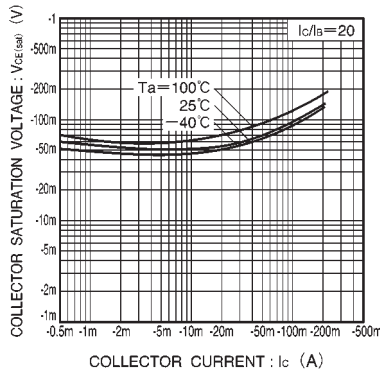


Fig.2 Collector-emitter saturation voltage vs. collector current