

-500mA / -40V Digital transistors (with built-in resistor)

DTB143TK

●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 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 the device design easy.

●Structure

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

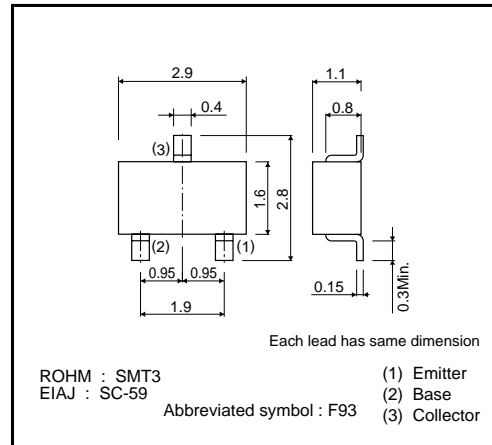
●Packaging specifications

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

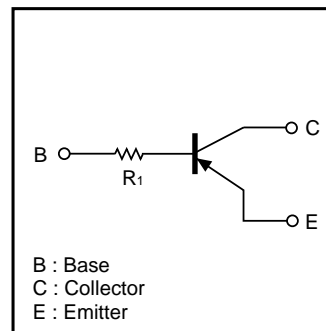
●Absolute maximum ratings (Ta=25°C)

| Parameter | Symbol | Limits | Unit |
|-----------------------------|------------------|-------------|------|
| 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 | mW |
| Junction temperature | T _j | 150 | °C |
| Storage temperature | T _{stg} | -55 to +150 | °C |

●External dimensions (Unit : mm)



●Equivalent circuit



R₁=4.7kΩ

Transistors

●Electrical characteristics (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--------------------------------------|----------------------|------|------|------|------|--|
| Collector-base breakdown voltage | BV _{CB0} | -50 | - | - | V | I _c = -50μA |
| Collector-emitter breakdown voltage | BV _{CEO} | -40 | - | - | V | I _c = -1mA |
| Emitter-base breakdown voltage | BV _{EB0} | -5 | - | - | V | I _E = -50μA |
| 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 ₁ | 3.29 | 4.7 | 6.11 | kΩ | - |
| Transition frequency | f _T * | - | 200 | - | MHz | V _{CE} = -10V, I _E =50mA, f=100MHz |

* Characteristics of built-in transistor

●Electrical characteristic curves

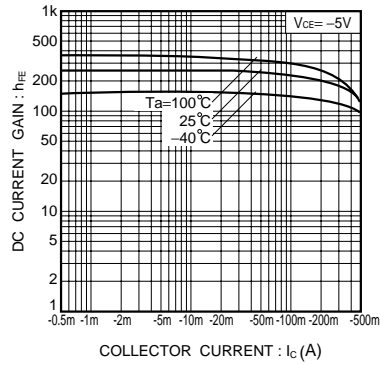


Fig.1 DC current gain vs. collector current

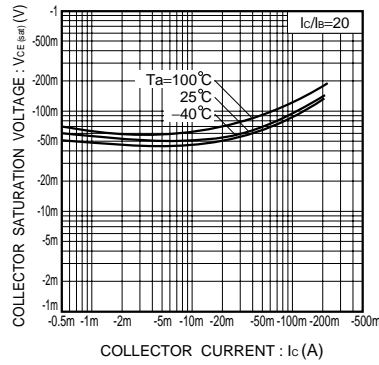


Fig.2 Collector-emitter saturation voltage vs. collector current

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