

## Transistors

# –500mA / –50V Digital transistors (with built-in resistors)

## DTB114GK

### ●Applications

Inverter, Interface, Driver

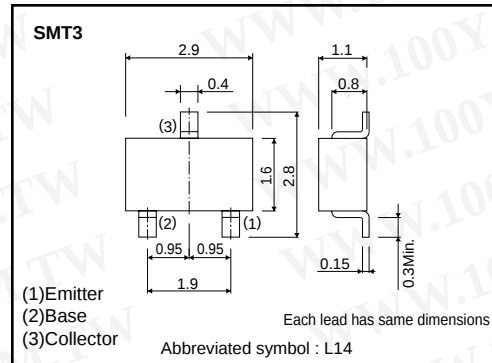
### ●Feature

- 1) The built-in bias resistors consist of thin-film resistors with complete isolation to allow positive biasing of the input, and parasitic effects are almost completely eliminated.
- 2) Only the on / off conditions need to be set for operation, making the device design easy.
- 3) Higher mounting densities can be achieved.

### ●Structure

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

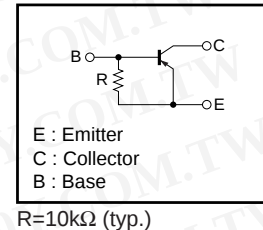
### ●External dimensions (Unit : mm)



### ●Packaging specifications

|                              |          |
|------------------------------|----------|
| Package                      | SMT3     |
| Packaging type               | Taping   |
| Code                         | T146     |
| Basic ordering unit (pieces) | 3000     |
| Part No.                     | DTB114GK |
|                              | ○        |

### ●Equivalent circuit



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

| Parameter                   | Symbol           | Limits      | Unit |
|-----------------------------|------------------|-------------|------|
| Collector-base voltage      | V <sub>CB0</sub> | –50         | V    |
| Collector-emitter voltage   | V <sub>CE0</sub> | –50         | V    |
| Emitter-base voltage        | V <sub>EB0</sub> | –5          | V    |
| Collector current           | I <sub>c</sub>   | –500        | mA   |
| Collector power dissipation | P <sub>d</sub> * | 200         | mW   |
| Junction temperature        | T <sub>j</sub>   | 150         | °C   |
| Storage temperature         | T <sub>stg</sub> | –55 to +150 | °C   |

\* Each pin mounted on the recommended land

## Transistors

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

| Parameter                            | Symbol        | Min. | Typ. | Max. | Unit      | Conditions                              |
|--------------------------------------|---------------|------|------|------|-----------|-----------------------------------------|
| Collector-base breakdown voltage     | $BV_{CBO}$    | -50  | -    | -    | V         | $I_C = -50\mu A$                        |
| Collector-emitter breakdown voltage  | $BV_{CEO}$    | -50  | -    | -    | V         | $I_C = -1mA$                            |
| Emitter-base breakdown voltage       | $BV_{EBO}$    | -5   | -    | -    | V         | $I_E = -720\mu A$                       |
| Collector cutoff current             | $I_{CBO}$     | -    | -    | -0.5 | $\mu A$   | $V_{CB} = -50V$                         |
| Emitter cutoff current               | $I_{EBO}$     | -    | -    | -580 | $\mu A$   | $V_{EB} = -4V$                          |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | -    | -    | -0.3 | V         | $I_C/I_B = -50mA/-2.5mA$                |
| DC current transfer ratio            | $h_{FE}$      | 56   | -    | -    | -         | $I_C = -50mA, V_{CE} = -5V$             |
| Input resistance                     | $R_i$         | 7    | 10   | 13   | $k\Omega$ | -                                       |
| Transition frequency                 | $f_T$ *       | -    | 200  | -    | MHz       | $V_{CE} = -10V, I_E = 50mA, f = 100MHz$ |

\*Characteristics of built-in transistor

### ●Electrical characteristics curves

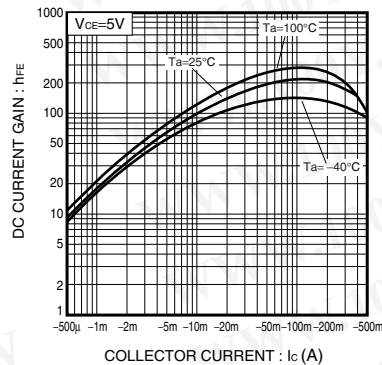


Fig.1 DC current transfer ratio vs. Collector current

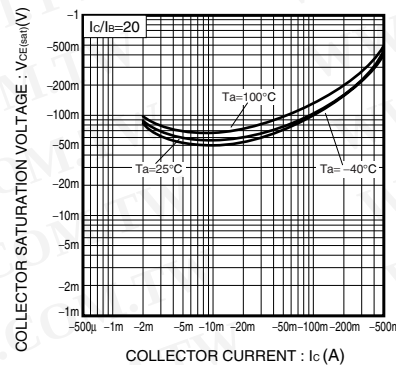


Fig.2 Collector-Emitter saturation voltage vs. Collector current

## Appendix

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