# -100mA / -50V Digital transistors (with built-in resistors)

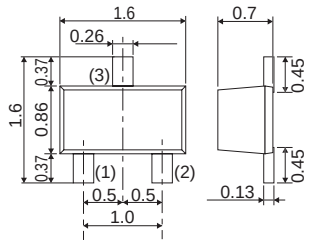
## DTA114TEB

### ●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 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 the device design easy.

### ●Dimensions (Unit : mm)

**EMT3F**



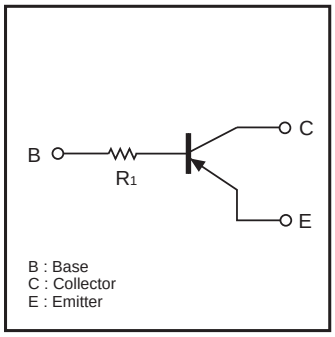

(1) Base
(2) Emitter
(3) Collector

Each lead has same dimensions

Abbreviated symbol : 94

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

### ●Equivalent circuit




B : Base
C : Collector
E : Emitter

$R_1$=10kΩ

### ●Packaging specifications

| | | |
|---|---|---|
| Part No. | Package | EMT3F |
| | Packaging type | Taping |
| | Code | TL |
| | Basic ordering unit (pieces) | 3000 |
| DTA114TEB | | ○ |

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

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Collector-Base voltage | $V_{CBO}$ | –50 | V |
| Collector-Emitter voltage | $V_{CEO}$ | –50 | V |
| Emitter-Base voltage | $V_{EBO}$ | –5 | V |
| Collector current | $I_C$ | –100 | mA |
| Power dissipation | $P_D$ *1 | 150 | mW |
| Junction temperature | Tj | 150 | °C |
| Range of Storage temperature | Tstg | –55 to +150 | °C |

*1 Each terminal mounted on a recommended land

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

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Collector-emitter breakdown voltage | $BV_{CEO}$ | –50 | – | – | V | $I_C$=–1mA |
| Collector-base breakdown voltage | $BV_{CBO}$ | –50 | – | – | V | $I_C$=–50μA |
| Emitter-base breakdown voltage | $BV_{EBO}$ | –5 | – | – | V | $I_E$=–50μA |
| Collector cutoff current | $I_{CBO}$ | – | – | –500 | nA | $V_{CB}$=–50V |
| Emitter cutoff current | $I_{EBO}$ | – | – | –500 | nA | $V_{EB}$=–4V |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | – | – | –0.3 | V | $I_C/I_B$=–10mA/–1mA |
| DC current transfer ratio | $h_{FE}$ | 100 | 250 | 600 | – | $V_{CE}$=–5V, $I_C$=–1mA |
| Transition frequency | $f_T$ * | – | 250 | – | MHz | $V_{CE}$=–10V, $I_E$=5mA, f=100MHz |
| Input resistance | $R_1$ | 7 | 10 | 13 | kΩ | – |

* Characteristics of built-in transistor

## ●Electrical characteristic curves

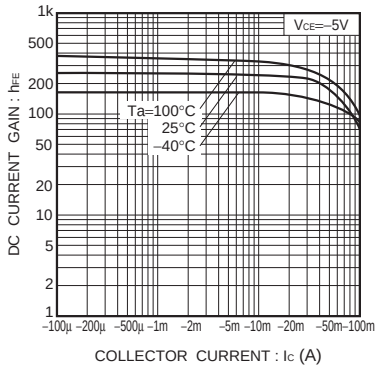



Fig.1 DC current gain vs. collector current

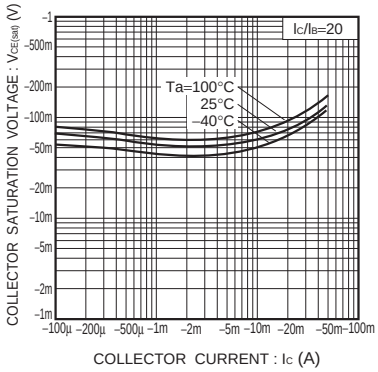



Fig.2 Collector-emitter saturation voltage vs. collector current

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