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

## DTA114TM / DTA114TE / DTA114TUA DTA114TKA / DTA114TSA

**●Applications**

Inverter, Interface, Driver

**●Features**

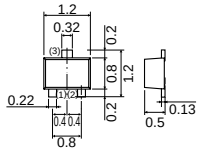
1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
2) The bias resistors consist of thin-film resistors with complete isolation to allow positive biasing of the input. They also have the advantage of almost 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)

**●External dimensions** (Unit : mm)

DTA114TM

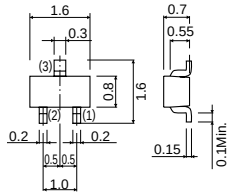



ROHM : VMT3

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

Abbreviated symbol : 94

DTA114TE

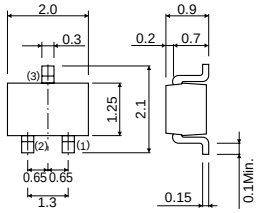



ROHM : EMT3

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

Abbreviated symbol : 94

DTA114TUA



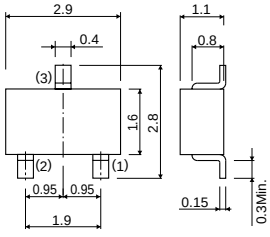

ROHM : UMT3
EIAJ : SC-70

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

Each lead has same dimensions

Abbreviated symbol : 94

DTA114TKA



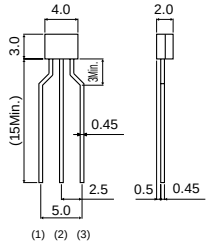

ROHM : SMT3
EIAJ : SC-59

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

Each lead has same dimensions

Abbreviated symbol : 94

DTA114TSA




ROHM : SPT
EIAJ : SC-72

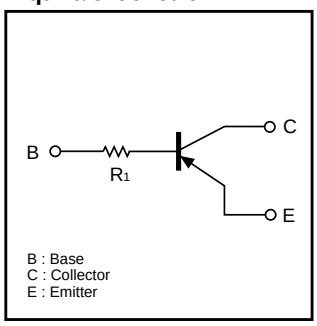
(1) Emitter
(2) Collector
(3) Base

Abbreviated symbol : A114TS

## ●Packaging specifications

| Part No. | Package | VMT3 | EMT3 | UMT3 | SMT3 | SPT |
|---|---|---|---|---|---|---|
| | Package type | Taping | Taping | Taping | Taping | Taping |
| | Code | T2L | TL | T106 | T146 | TP |
| | Basic ordering unit (pieces) | 8000 | 3000 | 3000 | 3000 | 5000 |
| DTA114TM | | ○ | – | – | – | – |
| DTA114TE | | – | ○ | – | – | – |
| DTA114TUA | | – | – | ○ | – | – |
| DTA114TKA | | – | – | – | ○ | – |
| DTA114TSA | | – | – | – | – | ○ |

## ●Equivalent circuit




$R_1$=10kΩ

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

| Parameter | Symbol | Limits | | | | | Unit |
|---|---|---|---|---|---|---|---|
| | | DTA114TM | DTA114TE | DTA114TUA | DTA114TKA | DTA114TSA | |
| 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 |
| Collector power dissipation | $P_C$ | 150 | | 200 | | 300 | mW |
| Junction temperature | Tj | 150 | | | | | °C |
| Storage temperature | Tstg | –55 to +150 | | | | | °C |

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

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

* Characteristics of built-in transistor

## ●Electrical characteristic curves

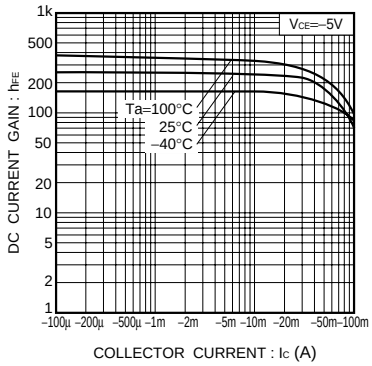



Fig.1 DC current gain vs. collector current

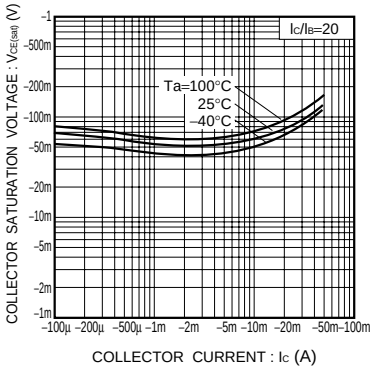



Fig.2 Collector-emitter saturation voltage vs. collector current

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