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

## DTC114GUA / DTC114GKA

### ● Applications
Inverter, Interface, Driver

### ● Features
1)The built-in bias resistors consist of thin-film resistors with complete isolation to allow negative 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
NPN epitaxial planar silicon transistor
(Resistor built-in type)

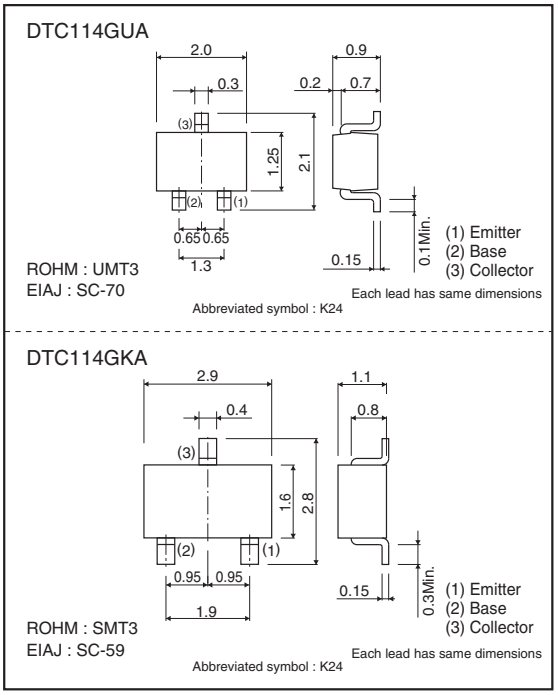
### ● Packaging specifications

| | Package | UMT3 | SMT3 |
|---|---|---|---|
| | Packaging type | Taping | Taping |
| | Code | T106 | T146 |
| Part No. | Basic ordering unit (pieces) | 3000 | 3000 |
| DTC114GUA | | ○ | – |
| DTC114GKA | | – | ○ |

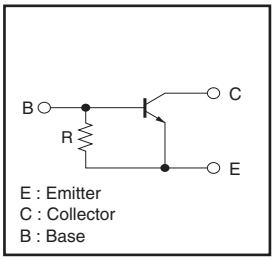
### ● Absolute maximum ratings (Ta=25°C)

| 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 |
| Collector Power dissipation | Pc | 200 | mW |
| Junction temperature | Tj | 150 | °C |
| Storage temperature | Tstg | −55 to +150 | °C |

### ● Dimensions (Unit : mm)




### ● Inner circuit




R=10kΩ

## ● 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 | $I_E$=720μA |
| Collector cutoff current | $I_{CBO}$ | – | – | 0.5 | μA | $V_{CB}$=50V |
| Emitter cutoff current | $I_{EBO}$ | 300 | – | 580 | μA | $V_{EB}$=4V |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | – | – | 0.3 | V | $I_C$=10mA, $I_B$=0.5mA |
| DC current transfer ratio | $h_{FE}$ | 30 | – | – | – | $I_C$=5mA, $V_{CE}$=5V |
| Emitter-base resistance | R | 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

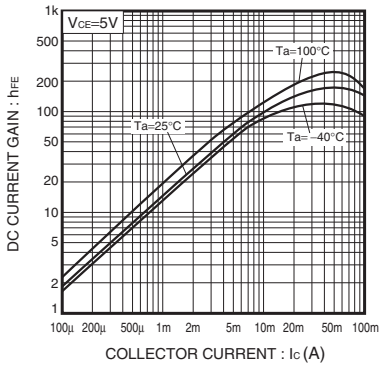



Fig.1 DC current gain vs. Collector current

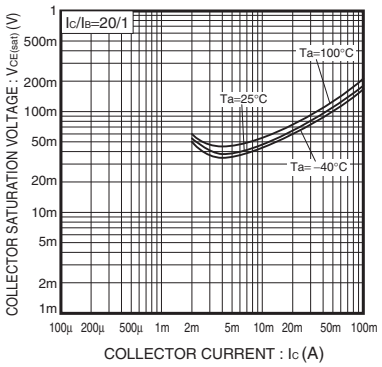



Fig.2 Collector-Emitter saturation voltage vs. Collector current

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