TAIWAN SEMICONDUCTOR

The Smartest Choice

**Small Signal Product**

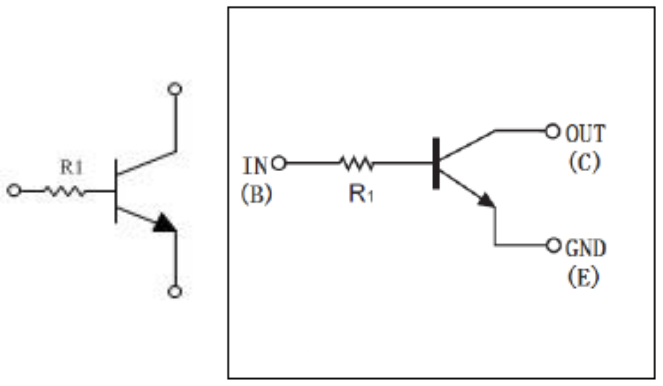
# DTC114 TM/TE/TUA/TCA/TSA

NPN Small Signal Transistor

## Features

- ◇ Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistor (see equivalent circuit).
- ◇ 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.
- ◇ Only the on/off conditions need to be set for operation,marking device design easy.
- ◇ Green compound (Halogen free) with suffix "G" on packing code and prefix "G" on date code.

Equivalent Circuit




Pb-Free

RoHS COMPLIANT

## Ordering Information (example)

| Part No. | Package | Packing | Packing code | Packing code (Green) | Manufacture code | Marking |
|---|---|---|---|---|---|---|
| DTC114 TM | SOT-723 | 8K / 7" Reel | RM | RMG | M0 | 04 |

Note : Detail please see "Ordering Information(detail, example)" below

## Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

**Maximum Ratings**

| Parameter | Symbol | Value | | | | Units |
|---|---|---|---|---|---|---|
| | | TM | TE | EUA / ECA | ESA | |
| Power Dissipation | PD | 100 | 150 | 200 | 300 | mW |
| Collector-Base Voltage | $V_{CBO}$ | 50 | | | | V |
| Collector-Emitter Voltage | $V_{CEO}$ | 50 | | | | V |
| Emitter-Base Voltage | $V_{EBO}$ | 5 | | | | V |
| Collector Current -Continuous | $I_C$ | 100 | | | | mA |
| Junction and Storage Temperature Range | TJ, $T_{STG}$ | -55 to + 150 | | | | °C |

Notes: 1. Valid provided that electrodes are kept at ambient temperature

**Electrical Characteristics**

| Parameter | Symbol | Min | Typ | Max | Condtion | Unit |
|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | 50 | | | Ic=50μA,$I_E$=0 | V |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | 50 | | | Ic=1mA,IB=0 | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | 5 | | | $I_E$=50μA,$I_C$=0 | V |
| Collector cut-off current | $I_{CBO}$ | | | 0.5 | $V_{CB}$=50V,$I_E$=0 | μA |
| Emitter cut-off current | $I_{EBO}$ | | | 0.5 | $V_{EB}$=4V,IC=0 | μA |
| DC Current Gain | $h_{FE}$ | 100 | 300 | 600 | $V_{CE}$=5V,$I_C$=1mA | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | | | 0.3 | $I_C$=10mA,$I_B$=1mA | V |
| Transition frequency | $f_T$ | 250 | | | $V_{CE}$=10V,$I_E$=-5mA, f=100MHz | MHz |
| Imput resistor | $R_1$ | 7 | 10 | 13 | | KΩ |

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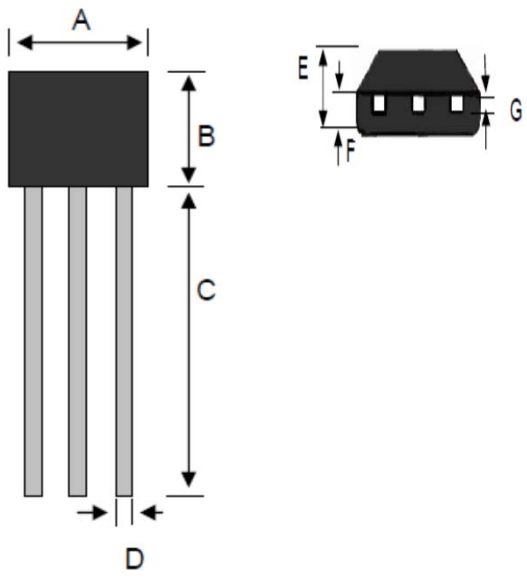
## Ordering information (Detail, example)

| Part No. | Package | Packing | Packing code | Packing code (Green) | Manufacture code (Note) | Marking |
|---|---|---|---|---|---|---|
| DTC114 TM | SOT-723 | 8K / 7" Reel | RM | RMG | | 04 |
| DTC114 TE | SOT-523 | 3K / 7" Reel | RN | RNG | | 04 |
| DTC114 TUA | SOT-323 | 3K / 7" Reel | RV | RVG | | 04 |
| DTC114 TCA | SOT-23 | 3K / 7" Reel | RU | RUG | | 04 |
| DTC114 TSA | TO-92S | 3K / Box(Ammo) | A3 | A3G | | |
| DTC114 TM | SOT-723 | 8K / 7" Reel | RM | RMG | M0 | 04 |
| DTC114 TE | SOT-523 | 3K / 7" Reel | RN | RNG | M0 | 04 |
| DTC114 TUA | SOT-323 | 3K / 7" Reel | RV | RVG | M0 | 04 |
| DTC114 TCA | SOT-23 | 3K / 7" Reel | RU | RUG | M0 | 04 |
| DTC114 TSA | TO-92S | 3K / Box(Ammo) | A3 | A3G | M0 | |

Note : Manufacture special control, if empty means no special control requirement.

### Dimensions

**TO-92S**




| DIM. | Unit(mm) | | Unit(inch) | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 3.85 | 4.15 | 0.15 | 0.16 |
| B | 3.01 | 3.31 | 0.12 | 0.13 |
| C | 15.10 | 15.50 | 0.59 | 0.61 |
| D | 0.38 | 0.55 | 0.01 | 0.02 |
| E | 1.42 | 1.62 | 0.06 | 0.06 |
| F | 0.66 | 0.86 | 0.03 | 0.03 |
| G | 0.36 | 0.51 | 0.01 | 0.02 |

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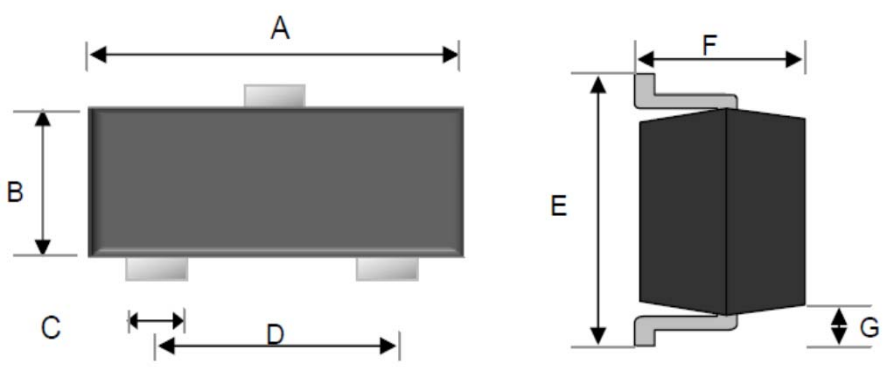
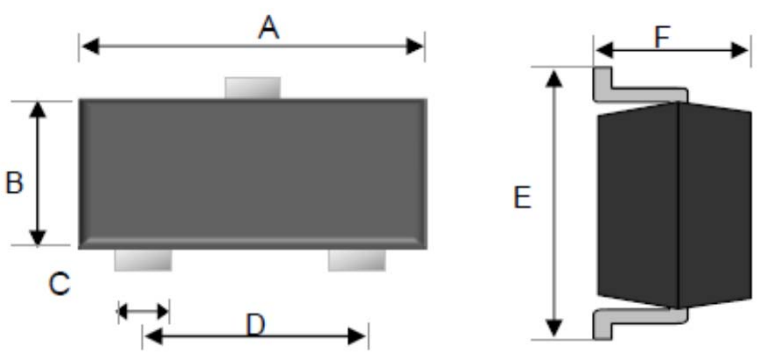
## SOT-23



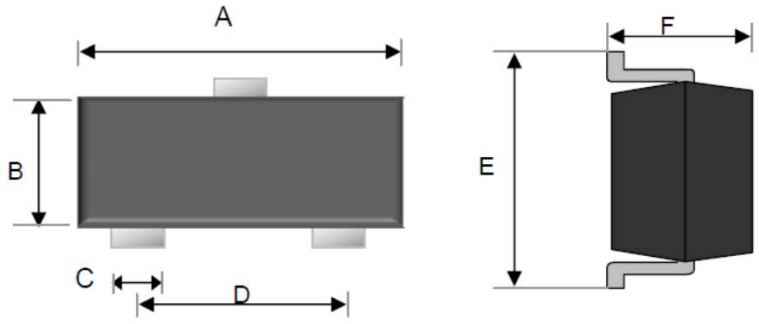

| DIM. | Unit(mm) | | Unit(inch) | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 2.80 | 3.00 | 0.11 | 0.12 |
| B | 1.20 | 1.40 | 0.05 | 0.06 |
| C | 0.30 | 0.50 | 0.01 | 0.02 |
| D | 1.80 | 2.00 | 0.07 | 0.08 |
| E | 2.25 | 2.55 | 0.09 | 0.10 |
| F | 0.90 | 1.20 | 0.04 | 0.04 |
| G | 0.550 REF | | 0.022 REF | |

## SOT-323



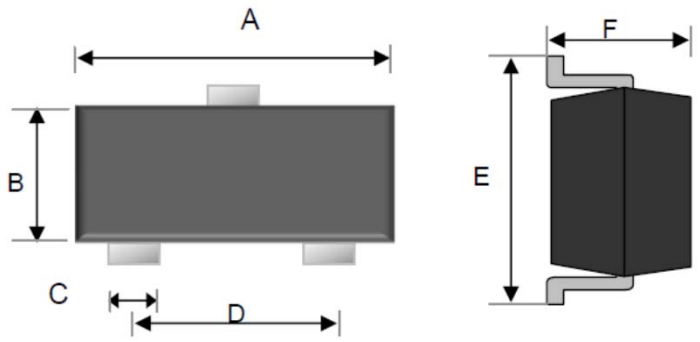

| DIM. | Unit(mm) | | Unit(inch) | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.90 | 2.10 | 0.07 | 0.08 |
| B | 1.15 | 1.35 | 0.05 | 0.05 |
| C | 0.25 | 0.35 | 0.01 | 0.01 |
| D | 1.20 | 1.40 | 0.05 | 0.06 |
| E | 2.00 | 2.20 | 0.08 | 0.09 |
| F | 0.80 | 1.00 | 0.03 | 0.04 |

## SOT-523




| DIM. | Unit(mm) | | Unit(inch) | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.50 | 1.70 | 0.06 | 0.07 |
| B | 0.70 | 0.80 | 0.03 | 0.03 |
| C | 0.25 | 0.35 | 0.01 | 0.01 |
| D | 0.90 | 1.10 | 0.04 | 0.04 |
| E | 1.50 | 1.70 | 0.06 | 0.07 |
| F | 0.70 | 0.90 | 0.03 | 0.04 |

## SOT-723




| DIM. | Unit(mm) | | Unit(inch) | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.15 | 1.25 | 0.05 | 0.05 |
| B | 0.75 | 0.85 | 0.03 | 0.03 |
| C | 0.17 | 0.27 | 0.01 | 0.01 |
| D | 0.8 TYP | | 0.31 TYP | |
| E | 1.15 | 1.25 | 0.05 | 0.05 |
| F | | 0.50 | | 0.02 |