

Transistors

# 600mA / 15V Digital transistors (with built-in resistors)

## DTC323TU / DTC323TK / DTC323TS

●Applications

Muting, Inverter, Interface

●Features

- In addition to the features of regular digital transistors,
- 1) Low  $V_{CE(sat)}$  makes these transistors ideal for muting circuits. (Typ. 0.04V at  $I_C/I_B=50mA/2.5mA$ )
  - 2) They can be used at high current. ( $I_{CMax.} = 600mA$ )

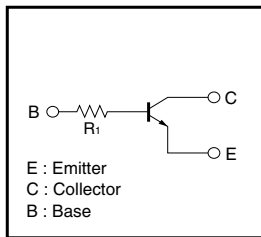
●Structure

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

●Packaging specifications

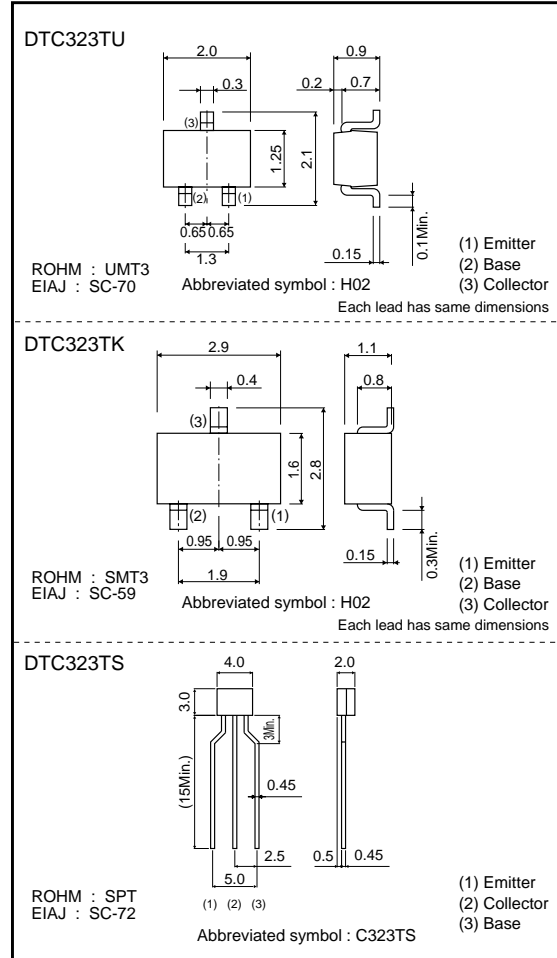
|          | Package                      | UMT3   | SMT3   | SPT    |
|----------|------------------------------|--------|--------|--------|
|          | Packaging type               | Taping | Taping | Taping |
|          | Code                         | T106   | T146   | TP     |
| Part No. | Basic ordering unit (pieces) | 3000   | 3000   | 5000   |
| DTC323TU |                              | ○      | -      | -      |
| DTC323TK |                              | -      | ○      | -      |
| DTC323TS |                              | -      | -      | ○      |

●Equivalent circuit



$R_1=2.2k\Omega$

●External dimensions (Unit : mm)



# DTC323TU / DTC323TK / DTC323TS

## Transistors

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

| Parameter                   | Symbol              | Limits      | Unit |
|-----------------------------|---------------------|-------------|------|
| Collector-base voltage      | V <sub>CB0</sub>    | 30          | V    |
| Collector-emitter voltage   | V <sub>CE0</sub>    | 15          | V    |
| Emitter-base voltage        | V <sub>EB0</sub>    | 5           | V    |
| Collector current           | I <sub>c</sub>      | 600         | mA   |
| Collector power dissipation | DTC323TU / DTC323TK | 200         | mW   |
|                             | DTC323TS            | 300         |      |
| Junction temperature        | T <sub>j</sub>      | 150         | °C   |
| Storage temperature         | T <sub>stg</sub>    | -55 to +150 | °C   |

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

| Parameter                            | Symbol               | Min. | Typ. | Max. | Unit | Conditions  |
|--------------------------------------|----------------------|------|------|------|------|---|
| Collector-base breakdown voltage     | BV <sub>CB0</sub>    | 30   | –    | –    | V    | I <sub>c</sub> =50μA                                  |
| Collector-emitter breakdown voltage  | BV <sub>CE0</sub>    | 15   | –    | –    | V    | I <sub>c</sub> =1mA                                   |
| Emitter-base breakdown voltage       | BV <sub>EB0</sub>    | 5    | –    | –    | V    | I <sub>E</sub> =50μA                                  |
| Collector cutoff current             | I <sub>CB0</sub>     | –    | –    | 0.5  | μA   | V <sub>CB</sub> =20V                                  |
| Emitter cutoff current               | I <sub>EB0</sub>     | –    | –    | 0.5  | μA   | V <sub>EB</sub> =4V                                   |
| Collector-emitter saturation voltage | V <sub>CE(sat)</sub> | –    | 40   | 80   | mV   | I <sub>c</sub> /I <sub>B</sub> =50mA/2.5mA            |
| DC current transfer ratio            | h <sub>FE</sub>      | 100  | 250  | 600  | –    | I <sub>c</sub> =50mA, V <sub>CE</sub> =5V             |
| Input resistance                     | R <sub>1</sub>       | 1.54 | 2.2  | 2.86 | kΩ   | –   |
| Transition frequency                 | f <sub>T</sub> *     | –    | 200  | –    | MHz  | V <sub>CE</sub> =10V, I <sub>E</sub> =-50mA, f=100MHz |
| Output on resistance                 | R <sub>on</sub>      | –    | 0.65 | –    | Ω    | V <sub>I</sub> =7V, R <sub>L</sub> =1kΩ, f=1kHz       |

\* Characteristics of built-in transistor

### ●Electrical characteristics curves

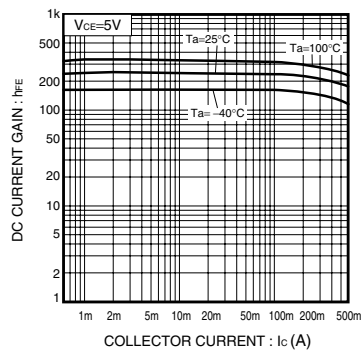


Fig.1 DC current gain vs. Collector current

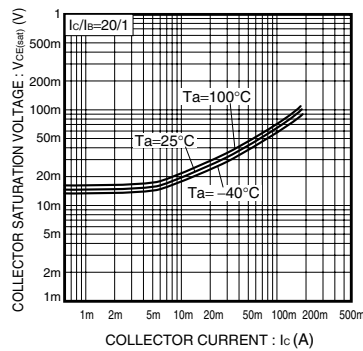


Fig.2 Collector-emitter saturation voltage vs. Collector current

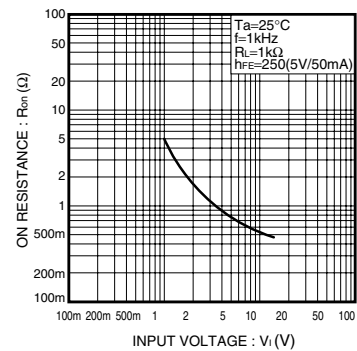


Fig.3 ON resistance vs. Input voltage

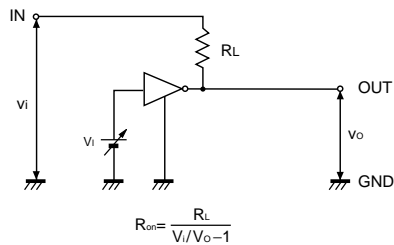


Fig.4 Output "ON" resistance (R<sub>on</sub>) measurement circuit

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