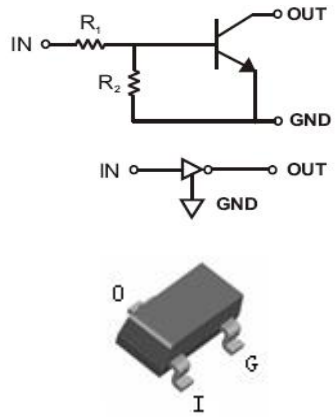
# Digital Transistor

# DTC($R_1$=$R_2$ SERIES)E

## FEATURES

- Epitaxial planar die construction.
- Complementary PNP types available(DTA).
- Built-in biasing resistors,$R_1$=$R_2$.
- Also available in lead free version.

HF




**SOT-523**

## APPLICATIONS

- The NPN style digital transistor.

## ORDERING INFORMATION

| Type No. | Marking | Package Code |
|---|---|---|
| DTC114EE | 24 | SOT-523 |
| DTC124EE | 25 | SOT-523 |
| DTC143EE | 23 | SOT-523 |
| DTC144EE | 26 | SOT-523 |
| DTC115EE | 29 | SOT-523 |

## MAXIMUM RATING @ Ta=25℃ unless otherwise specified

| Symbol | Parameter | | Value | Units |
|---|---|---|---|---|
| $V_{CC}$ | Supply Voltage | | 50 | V |
| $V_{IN}$ | Input Voltage | DTC114EE<br>DTC124EE<br>DTC143EE<br>DTC144EE<br>DTC115EE | -10 to+40<br>-10 to+40<br>-10 to+30<br>-10 to+40<br>-10 to +40 | V |
| $I_O$ | Output Current | DTC114EE<br>DTC124EE<br>DTC143EE<br>DTC144EE<br>DTC115EE | 50<br>30<br>100<br>30<br>100 | mA |
| $I_C$(Max.) | Output current | ALL | 100 | mA |
| $P_D$ | Power Dissipation | | 150 | mW |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient Air *1 | | 306 | ℃/W |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case *1 | | 152 | ℃/W |
| $R_{\theta JL}$ | Thermal Resistance, Junction to Lead *1 | | 61 | ℃/W |
| $T_J$, $T_{STG}$ | Operating and Storage and Temperature Range | | -55 to +150 | ℃ |

# Digital Transistor DTC($R_1$=$R_2$ SERIES)E

## ELECTRICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

| Parameter | | Symbol | Test conditions | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| Input Voltage | | $V_{I(off)}$ | $V_{CC}$=5V,$I_O$=100μA | 0.5 | - | - | V |
| Input Voltage | DTC114EE | $V_{I(on)}$ | $V_O$=0.3V,$I_O$=10mA | - | - | 3 | |
| | DTC124EE | | $V_O$=0.2V,$I_O$=5mA | | | | |
| | DTC143EE | | $V_O$=0.3V,$I_O$=20mA | | | | |
| | DTC144EE | | $V_O$=0.3V,$I_O$=2mA | | | | |
| | DTC115EE | | $V_O$=0.3V,$I_O$=1mA | | | | |
| Output Voltage | DTC114EE | $V_{O(on)}$ | $I_o/I_I$=10mA/0.5mA | - | - | 0.3 | V |
| | DTC124EE | | $I_o/I_I$=10mA/0.5mA | | | | |
| | DTC143EE | | $I_o/I_I$=10mA/0.5mA | | | | |
| | DTC144EE | | $I_o/I_I$=10mA/0.5mA | | | | |
| | DTC115EE | | $I_o/I_I$=5mA/0.25mA | | | | |
| Input Current | DTC114EE | $I_I$ | $V_I$=5V | - | - | 0.88 | mA |
| | DTC124EE | | | | | 0.36 | |
| | DTC143EE | | | | | 1.8 | |
| | DTC144EE | | | | | 0.18 | |
| | DTC115EE | | | | | 0.15 | |
| Output Current | | $I_{O(off)}$ | $V_{CC}$=50V,$V_I$=0V | - | - | 0.5 | μA |
| DC Current Gain | DTC114EE | $G_I$ | $V_O$=5V,$I_O$=5mA | 30 | - | - | - |
| | DTC124EE | | $V_O$=5V,$I_O$=5mA | 56 | | | |
| | DTC143EE | | $V_O$=5V,$I_O$=10mA | 20 | | | |
| | DTC144EE | | $V_O$=5V,$I_O$=5mA | 68 | | | |
| | DTC115EE | | $V_O$=5V,$I_O$=5mA | 82 | | | |
| Input Resistor | DTC114EE | $R_1(R_2)$ | | 7 | 10 | 13 | kΩ |
| | DTC124EE | | | 15.4 | 22 | 28.6 | |
| | DTC143EE | | | 3.29 | 4.7 | 6.11 | |
| | DTC144EE | | | 32.9 | 47 | 61.1 | |
| | DTC115EE | | | 70 | 100 | 130 | |
| Resistance Ratio | | $R_2/R_1$ | - | 0.8 | 1 | 1.2 | |
| Transition frequency | | $f_T$ | $V_O$ =10V,$I_O$=5mA, f=100MHz | - | 250 | - | MHz |

Note 1: The data tested by surface mounted on a 15mm * 15mm * 1mm FR4-epoxy P.C.B

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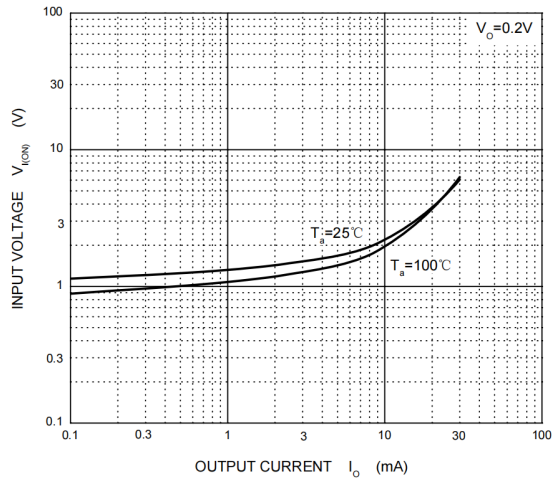
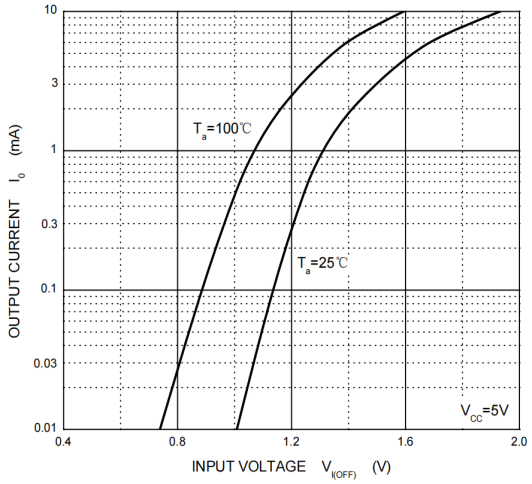
## TYPICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

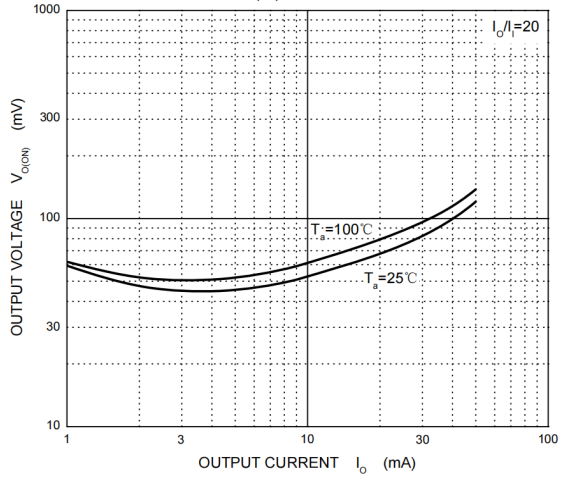
**ON Characteristics**



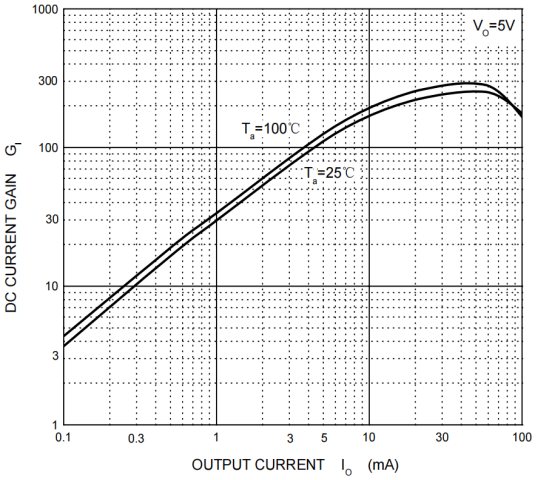

**OFF Characteristics**



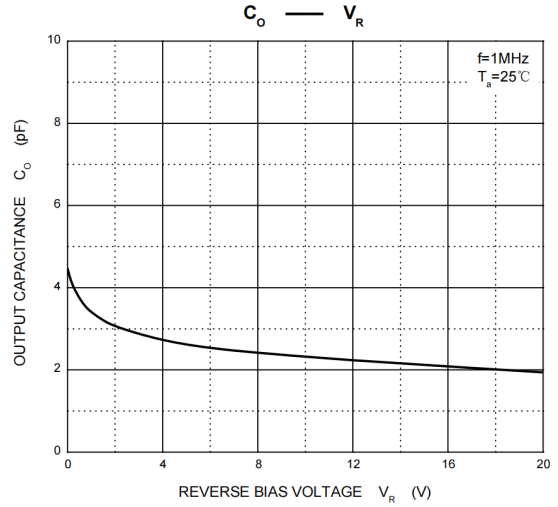

**$V_{O(ON)}$ — $I_O$**



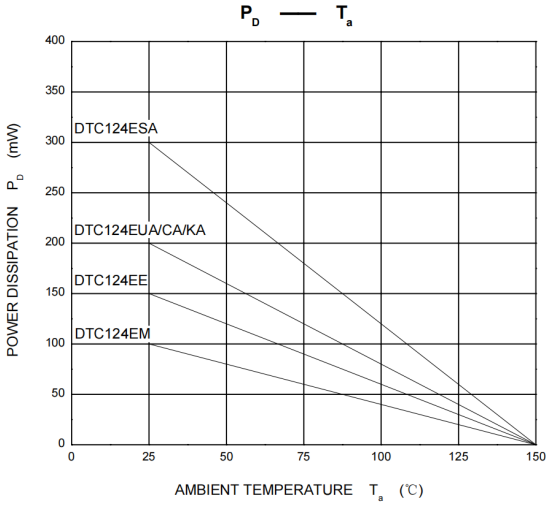

**$G_I$ — $I_O$**




**$C_O$ — $V_R$**




**$P_D$ — $T_a$**



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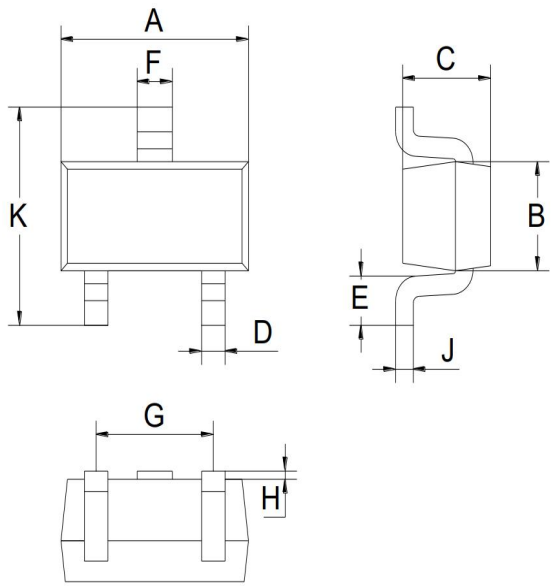
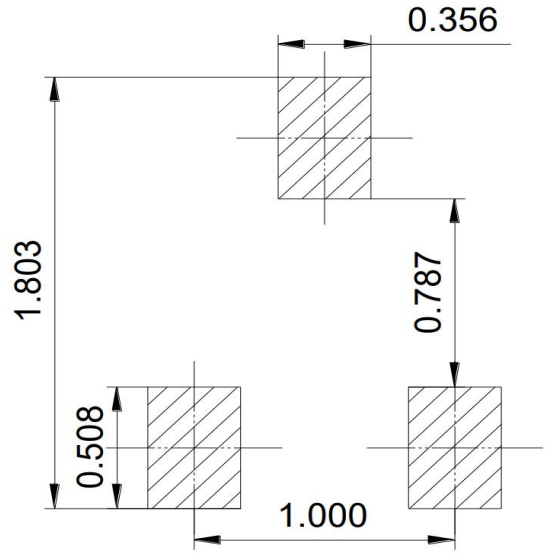
## PACKAGE OUTLINE

Plastic surface mounted package SOT-523




| SOT-523 | | |
|---|---|---|
| Dim | Min | Max |
| A | 1.50 | 1.70 |
| B | 0.75 | 0.85 |
| C | 0.60 | 0.80 |
| D | 0.15 | 0.30 |
| E | 0.30 | 0.40 |
| F | 0.25 | 0.40 |
| G | 0.90 | 1.10 |
| H | 0.02 | 0.10 |
| J | 0.08 | 0.18 |
| K | 1.45 | 1.75 |
| All Dimensions in mm | | |

## SOLDERING FOOTPRINT




Unit: mm

## PACKAGE INFORMATION

| Device | Package | Shipping |
|---|---|---|
| DTC114EE/124EE/143EE/144EE/115EE | SOT-523 | 3000 pcs / Tape & Reel |