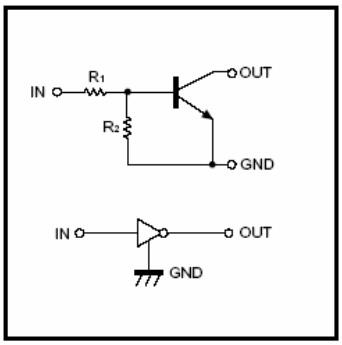
JIANGSU CHANGJIANG ELECTRONICS TECHNOLOGY CO., LTD

# Digital transistors (built-in resistors)

## DTC143EE/DTC143EUA/ DTC143ECA/DTC143EKA/DTC143ESA

●Equivalent circuit



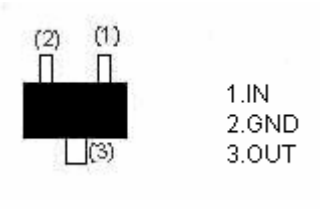

DIGITAL TRANSISTOR (NPN)

**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 negative 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 device design easy.

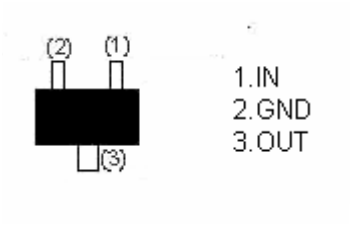
**PIN CONNENCTIONS AND MARKING**

DTC143EE



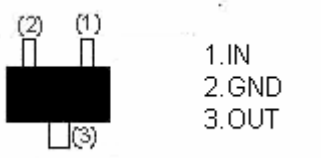

SOT-523 Addreviated symbol: 23

DTC143EUA




SOT-323 Addreviated symbol: 23

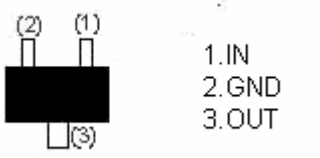
DTC143EKA




SOT-23-3L

Addreviated symbol: 23

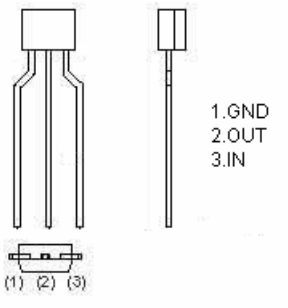
DTC143ECA




SOT-23

Addreviated symbol: 23

DTC143ESA




TO-92S

## Absolute maximum ratings(Ta=25℃)

| Parameter | Symbol | Limits (DTC143E□ ) | | | | | Unit |
|---|---|---|---|---|---|---|---|
| | | E | UA | KA | CA | SA | |
| Supply voltage | $V_{CC}$ | 50 | | | | | V |
| Input voltage | $V_{IN}$ | -10~+30 | | | | | V |
| Output current | $I_O$ | 100 | | | | | mA |
| | $I_{C(MAX)}$ | 100 | | | | | |
| Power dissipation | Pd | 150 | 200 | | | 300 | mW |
| Junction temperature | $T_j$ | 150 | | | | | ℃ |
| Storage temperature | Tstg | -55~150 | | | | | ℃ |

## Electrical characteristics (Ta=25℃)

| Parameter | Symbol | Min. | Typ | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Input voltage | $V_{I(off)}$ | | | 0.5 | V | $V_{CC}$=5V ,$I_O$=100μA |
| | $V_{I(on)}$ | 3 | | | | $V_O$=0.3V ,$I_O$=20 mA |
| Output voltage | $V_{O(on)}$ | | | 0.3 | V | $I_O/I_I$=10mA/0.5mA |
| Input current | $I_I$ | | | 1.8 | mA | $V_I$=5V |
| Output current | $I_{O(off)}$ | | | 0.5 | μA | $V_{CC}$=50V ,$V_I$=0 |
| DC current gain | $G_I$ | 20 | | | | $V_O$=5V ,$I_O$=10mA |
| Input resistance | $R_1$ | 3.29 | 4.7 | 6.11 | KΩ | |
| Resistance ratio | $R_2/R_1$ | 0.8 | 1 | 1.2 | | |
| Transition frequency | $f_T$ | | 250 | | MHz | $V_O$=10V ,$I_O$=5mA,f=100MHz |

# Typical Characteristics

●Electrical characteristic curves

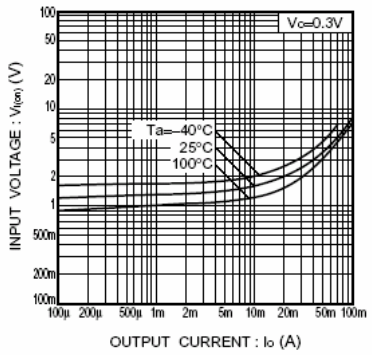



Fig.1 Input voltage vs. output current (ON characteristics)

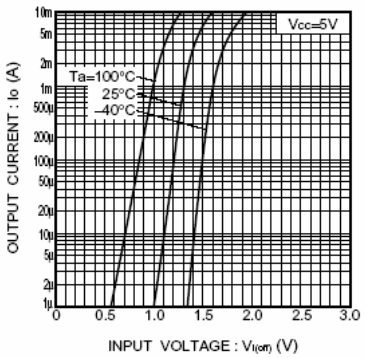



Fig.2 Output current vs. input voltage (OFF characteristics)

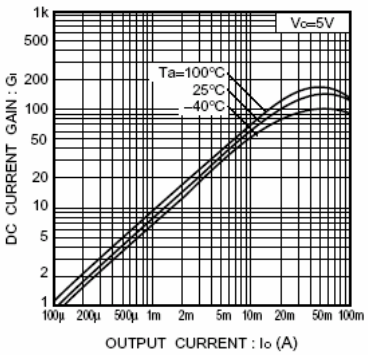



Fig.3 DC current gain vs. output current

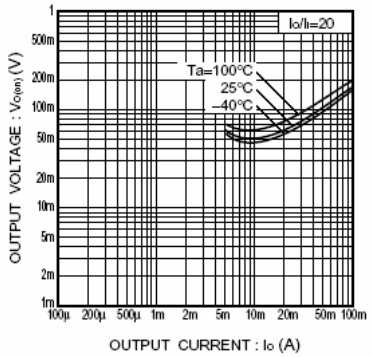



Fig.4 Output voltage vs. output current