Elektronische Bauelemente

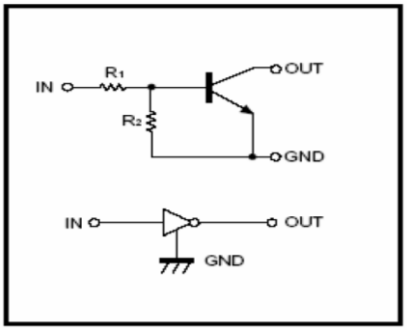
# DTC143XE / DTC143XUA
# DTC143XCA / DTC143XSA / DTC143XM
**NPN Digital Transistors (Built-in Resistors)**

RoHS Compliant Product
A suffix of “-C” specifies halogen & lead-free

## FEATURES

- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
- The bias resistors consist of thin-film resistors with complete isolation to allow positive 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, making device design easy.

## EQUIVALENT CIRCUIT



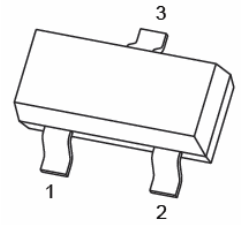

## ORDER INFORMATION

| Part Number | Type |
|---|---|
| DTC143X Series | Lead (Pb)-free |
| DTC143X Series-C | Lead (Pb)-free and Halogen-free |

## PIN CONNENCTIONS AND MARKING

**DTC143XCA**

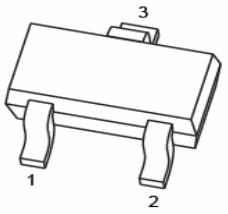
1. IN
2. GND
3. OUT




SOT-23
MARKING: 43

**DTC143XE**

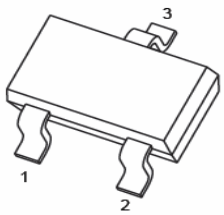
1. IN
2. GND
3. OUT




SOT-523
MARKING: 43

**DTC143XUA**

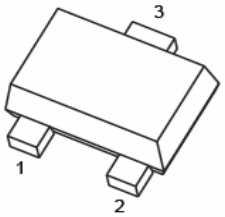
1. IN
2. GND
3. OUT




SOT-323
MARKING: 43

**DTC143XM**

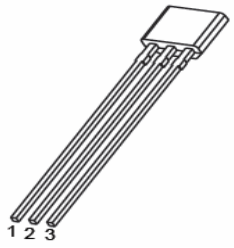
1. IN
2. GND
3. OUT




SOT-723
MARKING: 43

**DTC143XSA**

1. IN
2. GND
3. OUT




TO-92S
MARKING: C143 X□□□ ← □= Production Line Indication

## ABSOLUTE MAXIMUM RATINGS ($T_A$=25°C unless otherwise noted)

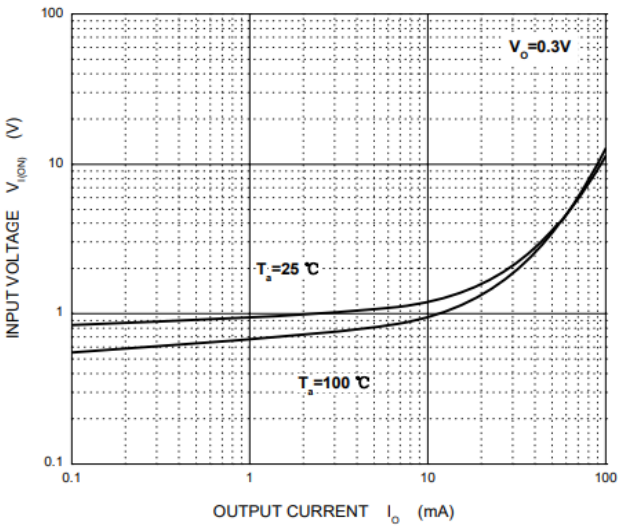
| Parameter | Symbol | Limits (DTC143X□) | | | | | Unit |
|---|---|---|---|---|---|---|---|
| | | M | E | UA | CA | SA | |
| Collector-Base Voltage | $V_{CC}$ | 50 | | | | | V |
| Input Voltage | $V_{IN}$ | -7~20 | | | | | V |
| Output Current | $I_O$ | 100 | | | | | mA |
| Power Dissipation | $P_D$ | 100 | 150 | 200 | | 300 | mW |
| Junction & Storage Temperature | $T_J$, $T_{STG}$ | 150, -55~150 | | | | | °C |

## ELECTRICAL CHARACTERISTICS ($T_A$=25°C unless otherwise noted)

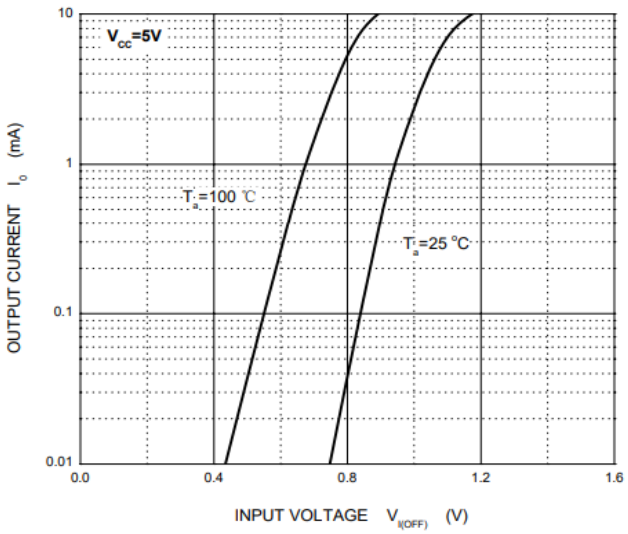
| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Input Voltage | $V_{I(off)}$ | 0.3 | - | - | V | $V_{CC}$=5V, $I_O$=100μA |
| | $V_{I(on)}$ | - | - | 2.5 | | $V_O$=0.3V, $I_O$=20mA |
| Output Voltage | $V_{O(on)}$ | - | 0.1 | 0.3 | V | $I_O/I_I$=10mA/0.5mA |
| 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 | $G_I$ | 30 | - | - | | $V_O$=5V, $I_O$=10mA |
| Input Resistance | $R_1$ | 3.29 | 4.7 | 6.11 | kΩ | |
| Resistance Ratio | $R_2/R_1$ | 1.7 | 2.1 | 2.6 | | |
| Transition Frequency | $f_T$ | - | 250 | - | MHz | $V_O$=10V, $I_O$=5mA, f=100MHz |

## CHARACTERISTIC CURVES

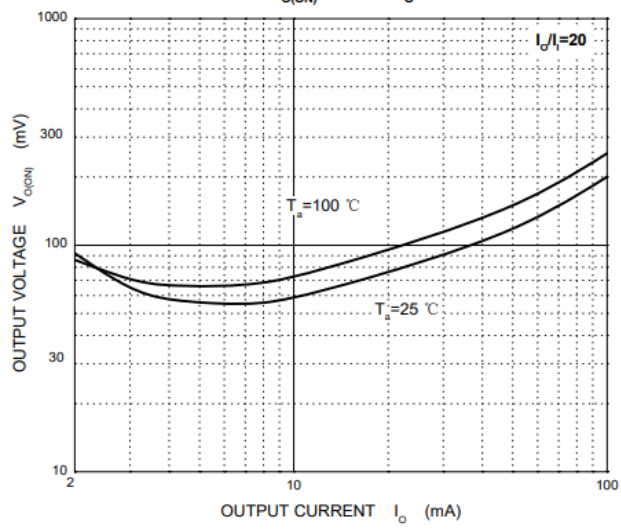
ON Characteristics



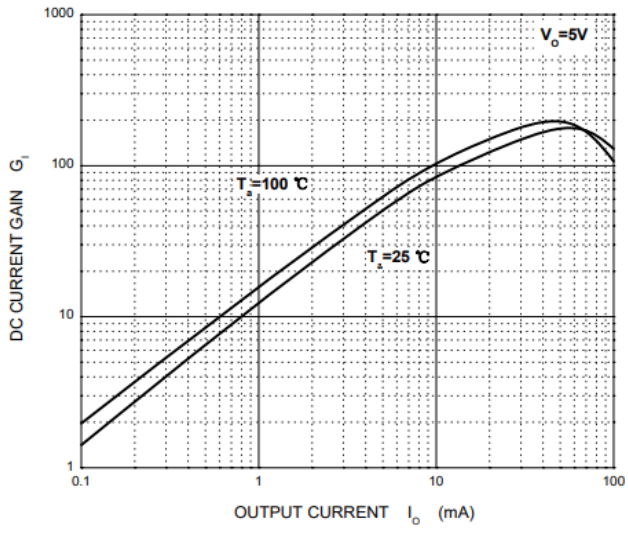

OFF Characteristics



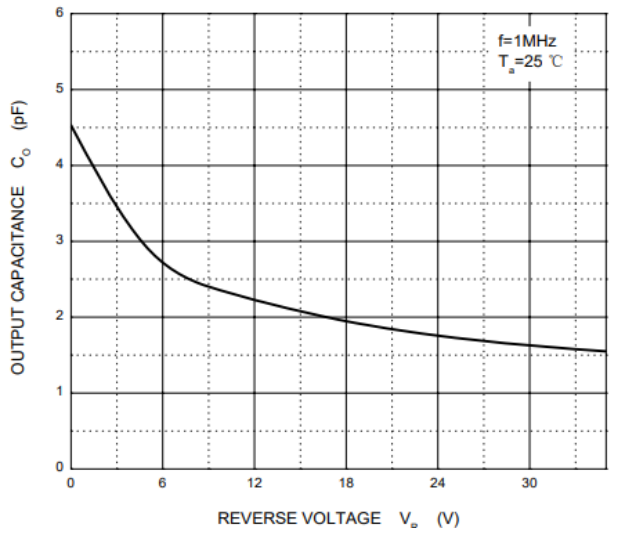

$V_{O(ON)}$ — $I_O$




$G_I$ — $I_O$




$C_O$ — $V_R$




$P_D$ — $T_a$