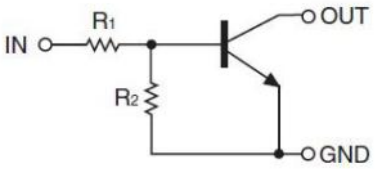
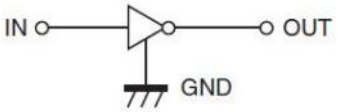
迈拓电子
MAITUO ELECTRONIC

# Digital Transistors (Built-in Resistors)




DIGITAL TRANSISTOR (NPN)

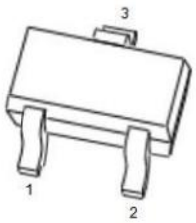



## FEATURES

- 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 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, making device design easy

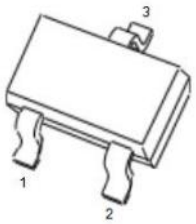
## PIN CONNENCTIONS and MARKING

**DTC124EE** — **SOT-523**



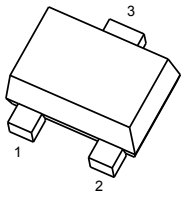

1. IN
2. GND
3. OUT

**DTC124EUA** — **SOT-323**



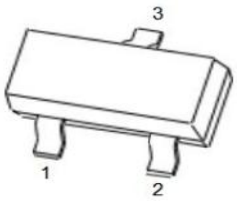

1. IN
2. GND
3. OUT

**DTC124EM** — **SOT-723**




1. IN
2. GND
3. OUT

**DTC124ECA** — **SOT-23**




1.IN
2.GND
3.OUT

## ORDERING INFORMATION

| Part Number | MARKING (1) | Package | Packing Method | Pack Quantity |
|---|---|---|---|---|
| DTC124EE | **25** | SOT-523 | Reel | 3000pcs/Reel |
| DTC124EUA | **25** | SOT-323 | Reel | 3000pcs/Reel |
| DTC124EM | **25** | SOT-723 | Reel | 3000pcs/Reel |
| DTC124ECA | **25** | SOT-23 | Reel | 3000pcs/Reel |

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## MAXIMUM RATINGS(Ta=25℃ unless otherwise noted)

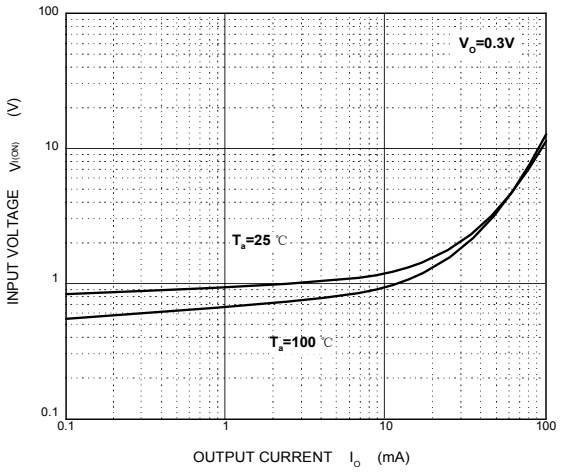
| Symbol | Parameter | Limits(DTC124E□) | | | | | | Unit |
|---|---|---|---|---|---|---|---|---|
| | | M | E | UA | KA | CA | SA | |
| $V_{CC}$ | Supply Voltage | 50 | | | | | | V |
| $V_{IN}$ | Input Voltage | -10～+40 | | | | | | V |
| $I_O$ | Output Current | 30 | | | | | | mA |
| $I_{CM}$ | Peak Collector Current | 100 | | | | | | mA |
| $P_D$ | Power Dissipation | 100 | 150 | 200 | 200 | 200 | 300 | mW |
| $T_J$,$T_{stg}$ | Operation Junction and Storage Temperature Range | -55～+150 | | | | | | ℃ |

## ELECTRICAL CHARACTERISTICS (Ta=25℃ unless otherwise specified)

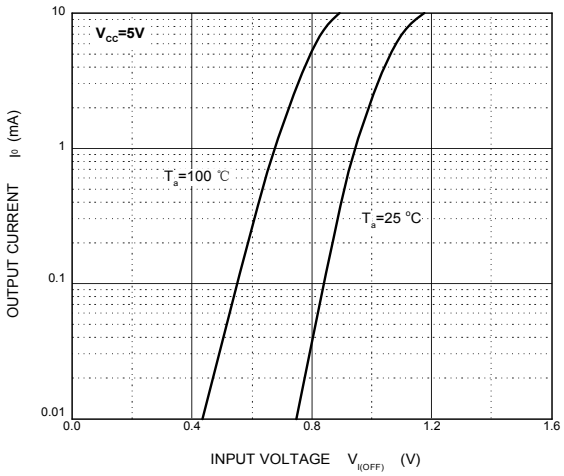
| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Input voltage | $V_{I(off)}$ | $V_{CC}$=5V,$I_O$=100μA | 0.5 | | | V |
| | $V_{I(on)}$ | $V_O$=0.2V,$I_O$=5mA | | | 3 | V |
| Output voltage | $V_{O(on)}$ | $I_O$/$I_I$=10mA/0.5mA | | 0.1 | 0.3 | V |
| Input current | $I_I$ | $V_I$=5V | | | 0.36 | mA |
| Output current | $I_{O(off)}$ | $V_{CC}$=50V,$V_I$=0 | | | 0.5 | μA |
| DC current gain | $G_I$ | $V_O$=5V,$I_O$=5mA | 56 | | | |
| Input resistance | $R_1$ | | 15.4 | 22 | 28.6 | kΩ |
| 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 |

## Typical Characteristics

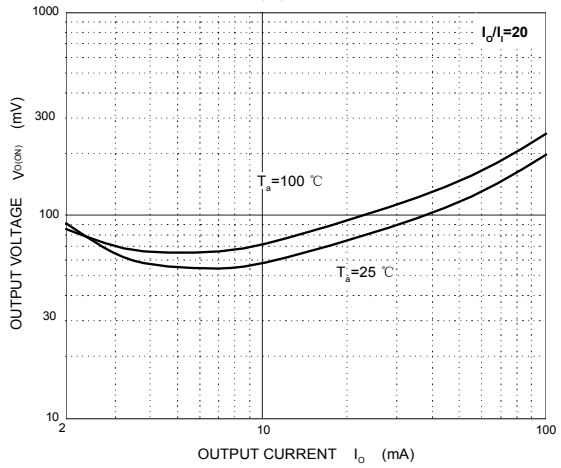
ON Characteristics



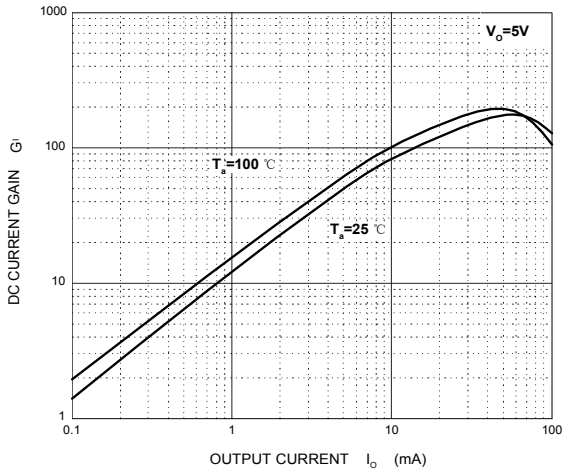

OFF Characteristics



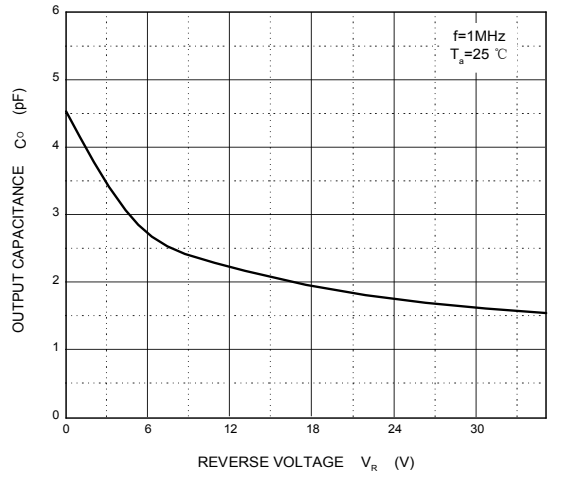

$V_{O(ON)}$ —— $I_O$



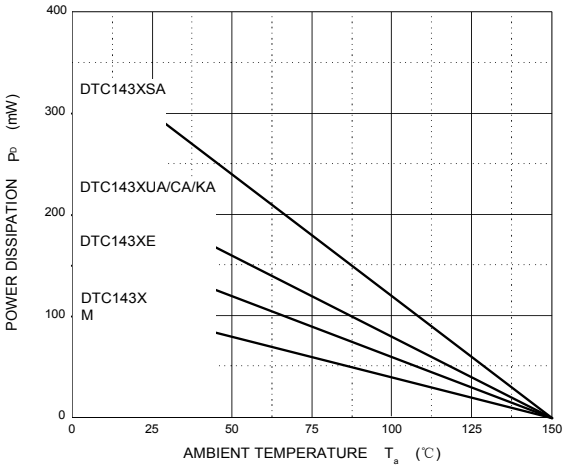

$G_I$ —— $I_O$




$C_O$ —— $V_R$




$P_D$ —— $T_a$



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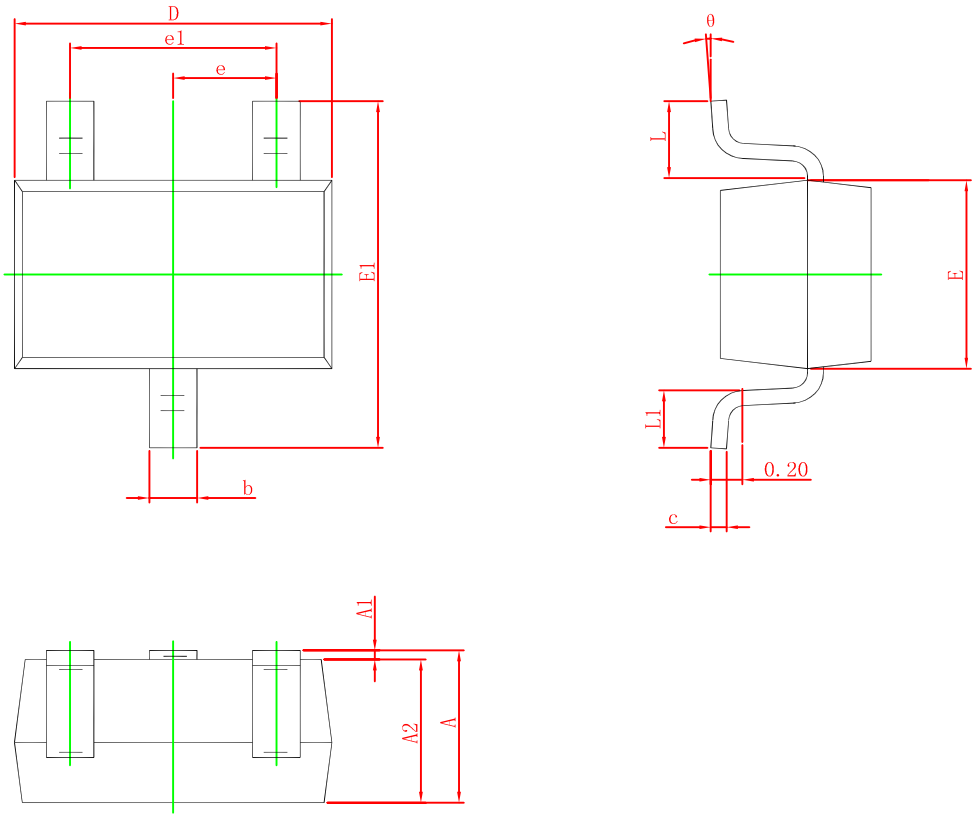
## SOT-323 PACKAGE OUTLINE DIMENSIONS




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 0.900 | 1.100 | 0.035 | 0.043 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.000 | 0.035 | 0.039 |
| b | 0.200 | 0.400 | 0.008 | 0.016 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.000 | 2.200 | 0.079 | 0.087 |
| E | 1.150 | 1.350 | 0.045 | 0.053 |
| E1 | 2.150 | 2.450 | 0.085 | 0.096 |
| e | 0.650 TYP. | | 0.026 TYP. | |
| e1 | 1.200 | 1.400 | 0.047 | 0.055 |
| L | 0.525 REF. | | 0.021 REF. | |
| L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| θ | 0° | 8° | 0° | 8° |

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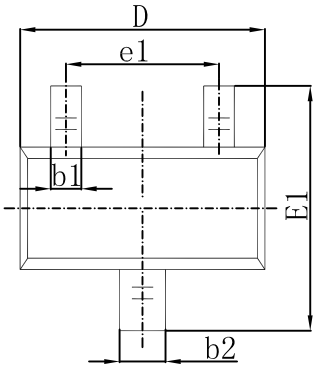
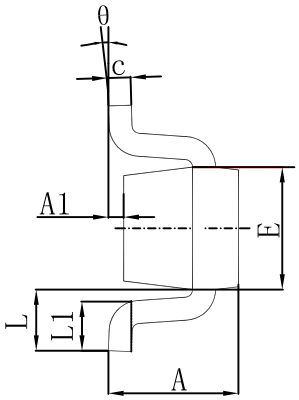
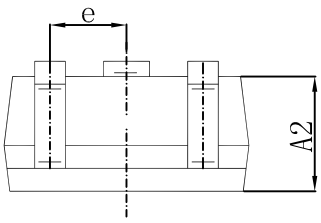
## SOT-523 Package Outline Dimensions

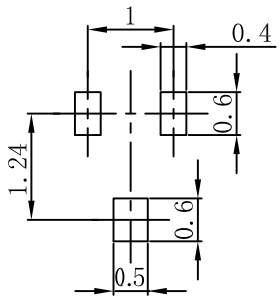



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 0.700 | 0.900 | 0.028 | 0.035 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.700 | 0.800 | 0.028 | 0.031 |
| b1 | 0.150 | 0.250 | 0.006 | 0.010 |
| b2 | 0.250 | 0.350 | 0.010 | 0.014 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 1.500 | 1.700 | 0.059 | 0.067 |
| E | 0.700 | 0.900 | 0.028 | 0.035 |
| E1 | 1.450 | 1.750 | 0.057 | 0.069 |
| e | 0.500 TYP. | | 0.020 TYP. | |
| e1 | 0.900 | 1.100 | 0.035 | 0.043 |
| L | 0.400 REF. | | 0.016 REF. | |
| L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| θ | 0° | 8° | 0° | 8° |

## SOT-523 Suggested Pad Layout




Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.