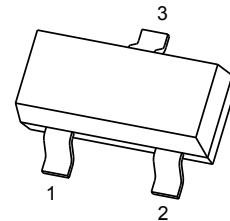


## Digital Transistors (NPN Built-in Resistors)

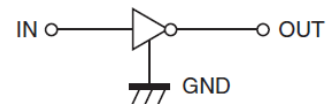
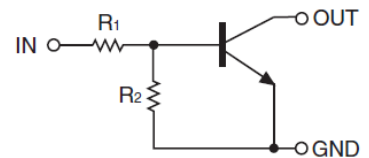
### Feature

- 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.



SOT-23

1. IN  
2. GND  
3. OUT



• Equivalent Circuit

### Absolute Maximum Rating ( $T_A=25^{\circ}\text{C}$ unless otherwise noted )

| Symbol         | Parameter                                        | Limits   | Unit               |
|----------------|--------------------------------------------------|----------|--------------------|
| $V_{CC}$       | Supply Voltage                                   | 50       | V                  |
| $V_{IN}$       | Input Voltage                                    | -10~+30  | V                  |
| $I_O$          | Output Current                                   | 100      | mA                 |
| $P_D$          | Power Dissipation                                | 200      | mW                 |
| $T_J, T_{stg}$ | Operation Junction and Storage Temperature Range | -55~+150 | $^{\circ}\text{C}$ |

### Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter            | Symbol       | Conditions                   | Min  | Typ | Max  | Unit       |
|----------------------|--------------|------------------------------|------|-----|------|------------|
| Input voltage        | $V_{I(off)}$ | $V_{CC}=5V, I_O=100\mu A$    | 0.5  |     |      | V          |
|                      | $V_{I(on)}$  | $V_O=0.3V, I_O=20mA$         |      |     | 3    | V          |
| Output voltage       | $V_{O(on)}$  | $I_O/I_I=10mA/0.5mA$         |      |     | 0.3  | V          |
| Input current        | $I_I$        | $V_I=5V$                     |      |     | 1.8  | mA         |
| Output current       | $I_{O(off)}$ | $V_{CC}=50V, V_I=0$          |      |     | 0.5  | $\mu A$    |
| DC current gain      | $G_I$        | $V_O=5V, I_O=10mA$           | 20   |     |      |            |
| Input resistance     | $R_1$        |                              | 3.29 | 4.7 | 6.11 | k $\Omega$ |
| 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        |

### Ordering Information

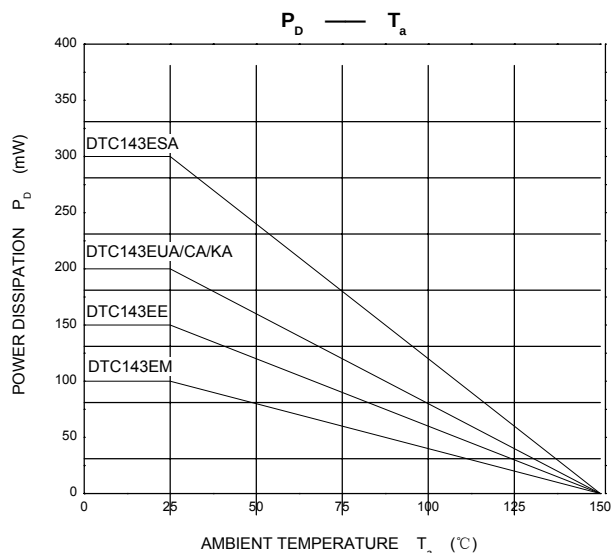
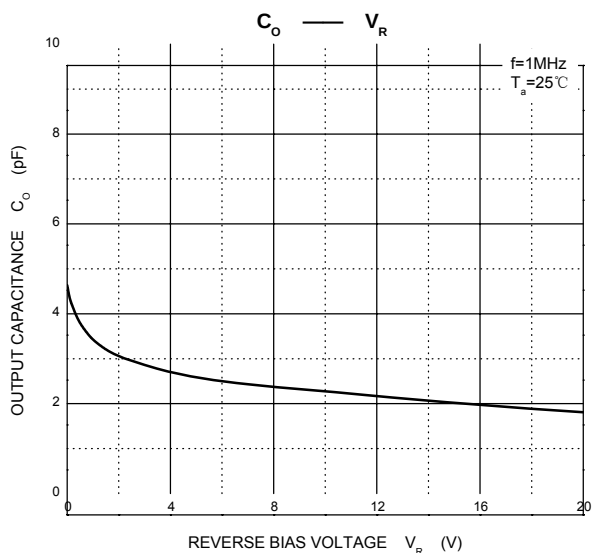
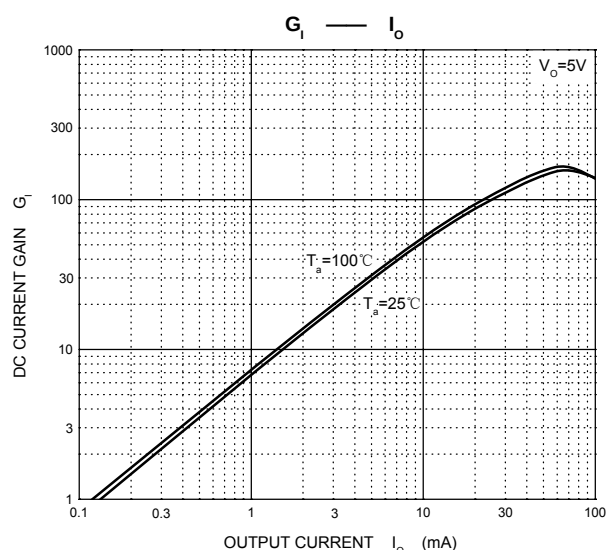
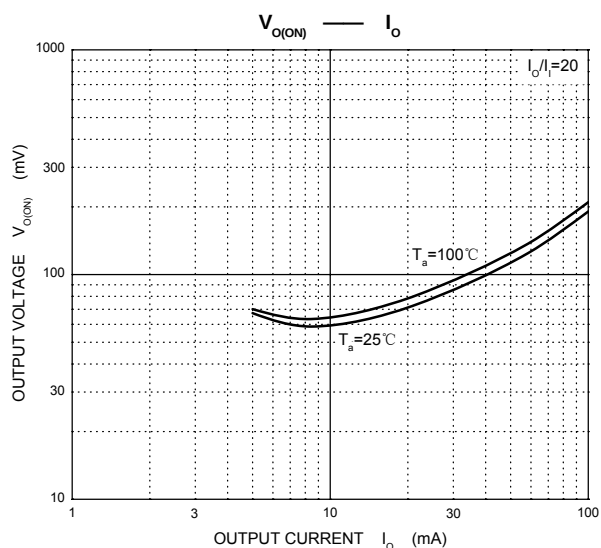
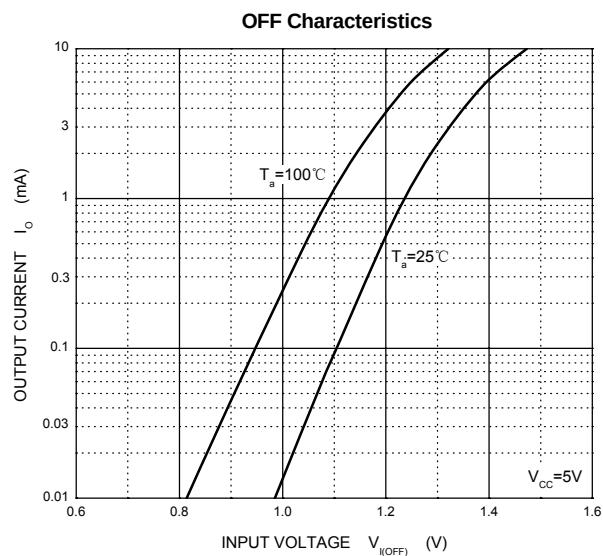
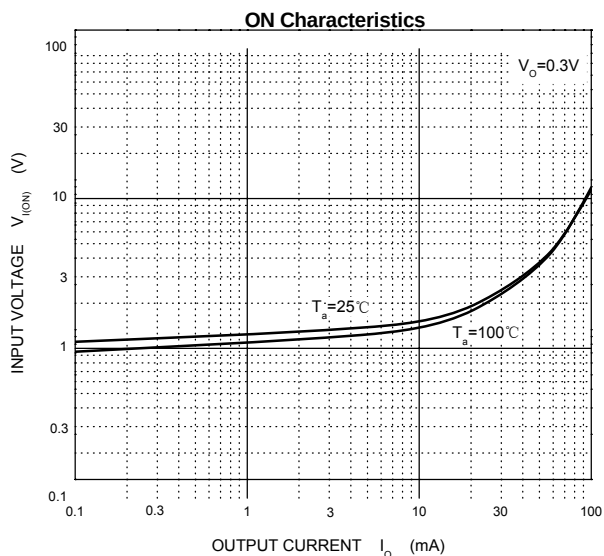
| Part Number | Marking | Package | Packing Method | Pack Quantity |
|-------------|---------|---------|----------------|---------------|
| DTC143ECA   | 23      | SOT-23  | Reel           | 3000pcs/Reel  |

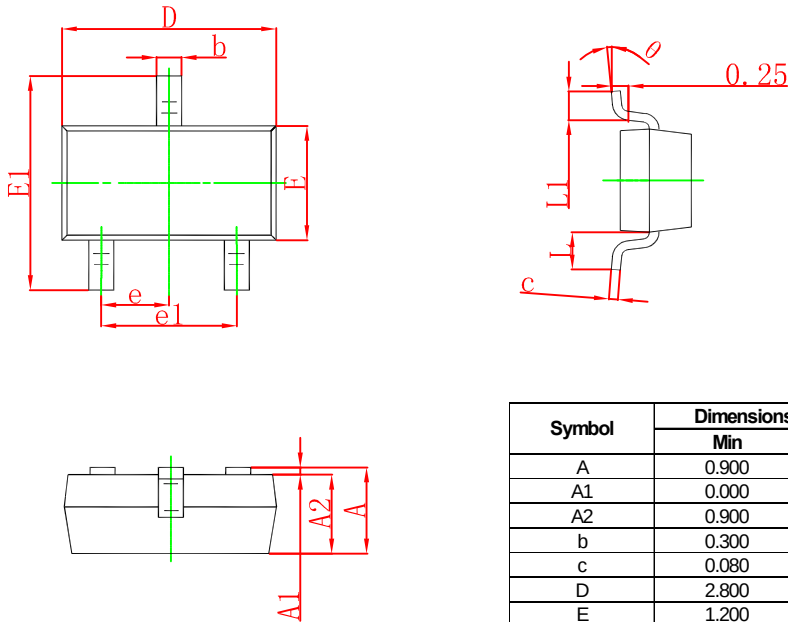
| Part Number | Marking | Package | Packing Method | Pack Quantity |
|-------------|---------|---------|----------------|---------------|
| DTC143ECA   | 23      | SOT-23  | Reel           | 3000pcs/Reel  |



Typical Characteristics

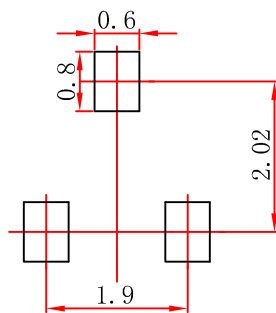


## SOT-23 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.050 | 0.035                | 0.041 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.800                     | 3.000 | 0.110                | 0.118 |
| E      | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1     | 2.250                     | 2.550 | 0.089                | 0.100 |
| e      | 0.950 TYP                 |       | 0.037 TYP            |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.550 REF                 |       | 0.022 REF            |       |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

## SOT-23 Suggested Pad Layout



Note:

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