

# MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

## DTC143XXX-MS

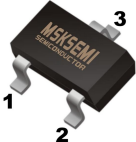

Product specification

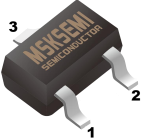

Digital Transistors (Built-in Resistors)

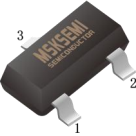

FEATURES

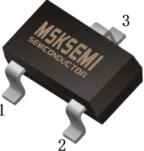

- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors(see equivalent circuit)
- The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input.They also have the advantage of almost completely eliminating parasitic effects
- Only the on/off conditions need to be set for operation, making device design easy

Reference News

| DTC143ZE-MS  | MARKING  |
|--|--|
|  SOT-523 |  |

| DTC143ZUA-MS  | MARKING   |
|---|---|
|  SOT-323 |  |

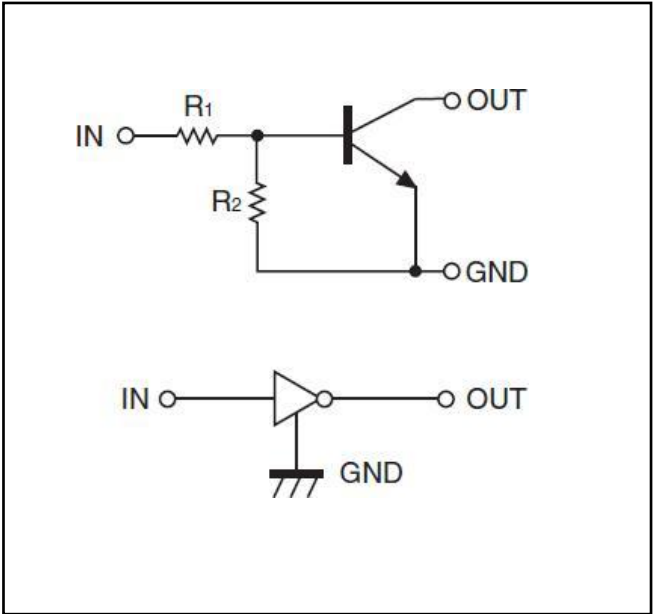
| DTC143ZKA-MS  | MARKING   |
|---|---|
|  SOT-23-3L |  |

| DTC143ZCA-MS   | MARKING   |
|--|---|
|  SOT-23 |  |

PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1   | IN          |
| 2   | GND         |
| 3   | OUT         |

Equivalent Circu



## ORDERING INFORMATION

| Orderable Device | Package   | Packing Option |
|------------------|-----------|----------------|
| DTC143ZE-MS      | SOT-523   | 3000PCS        |
| DTC143ZUA-MS     | SOT-323   | 3000PCS        |
| DTC143ZKA-MS     | SOT-23-3L | 3000PCS        |
| DTC143ZCA-MS     | SOT-23    | 3000PCS        |

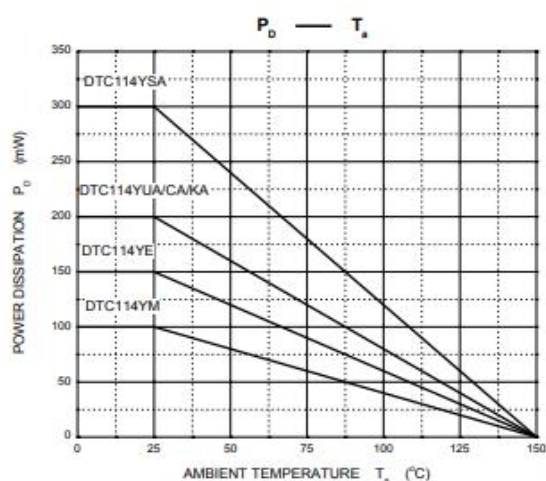
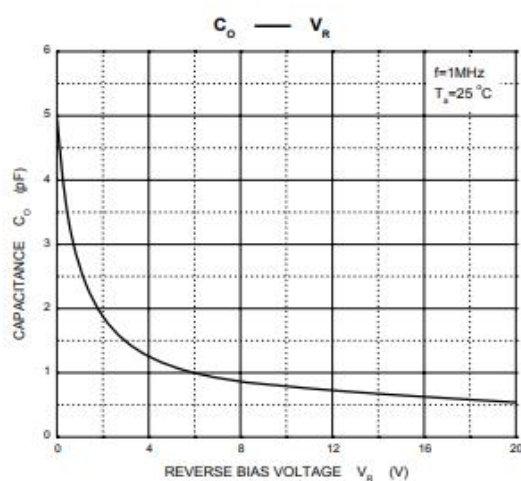
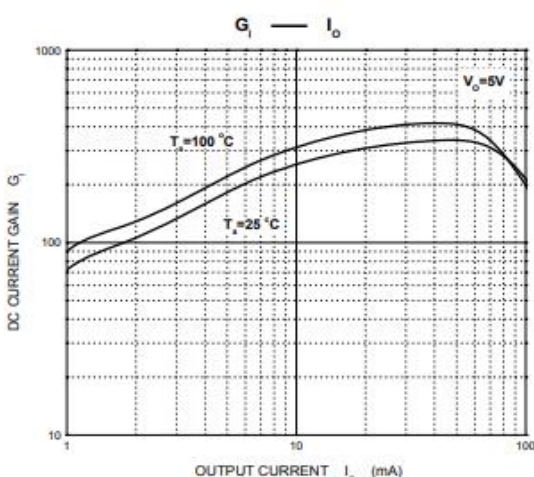
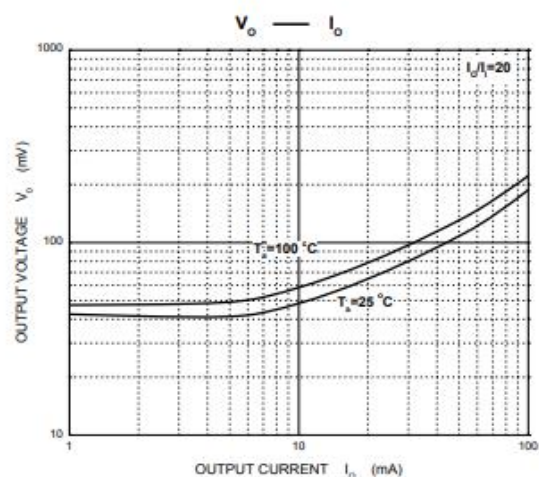
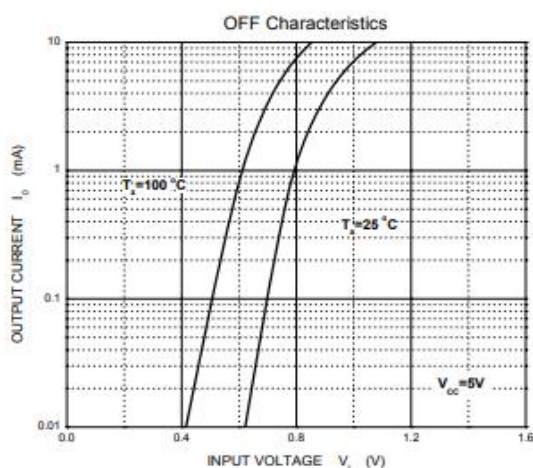
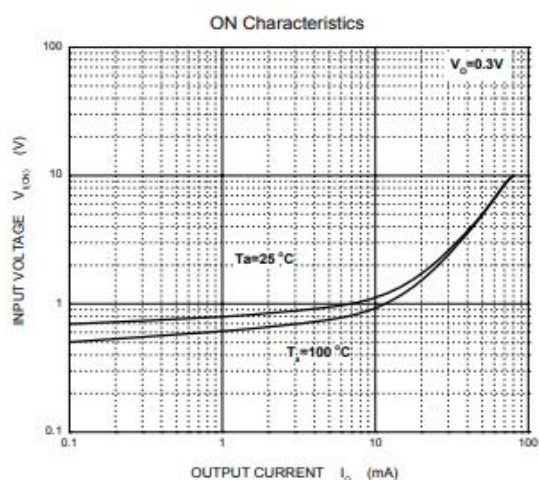
## MAXIMUM RATINGS(Ta=25°C unless otherwise noted)

| Symbol                            | Parameter  | Limits(DTC143XXX-MS) |     |     |     | Unit |
|-----------------------------------|--|----------------------|-----|-----|-----|------|
|                                   |  | E                    | UA  | KA  | CA  |      |
| V <sub>CC</sub>                   | Supply Voltage                                   | 50                   |     |     |     | V    |
| V <sub>IN</sub>                   | Input Voltage                                    | -5~+30               |     |     |     | V    |
| I <sub>O</sub>                    | Output Current                                   | 100                  |     |     |     | mA   |
| P <sub>D</sub>                    | Power Dissipation                                | 150                  | 200 | 200 | 200 | mW   |
| T <sub>J</sub> , T <sub>stg</sub> | Operation Junction and Storage Temperature Range | -55~+150             |     |     |     | °C   |

## ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

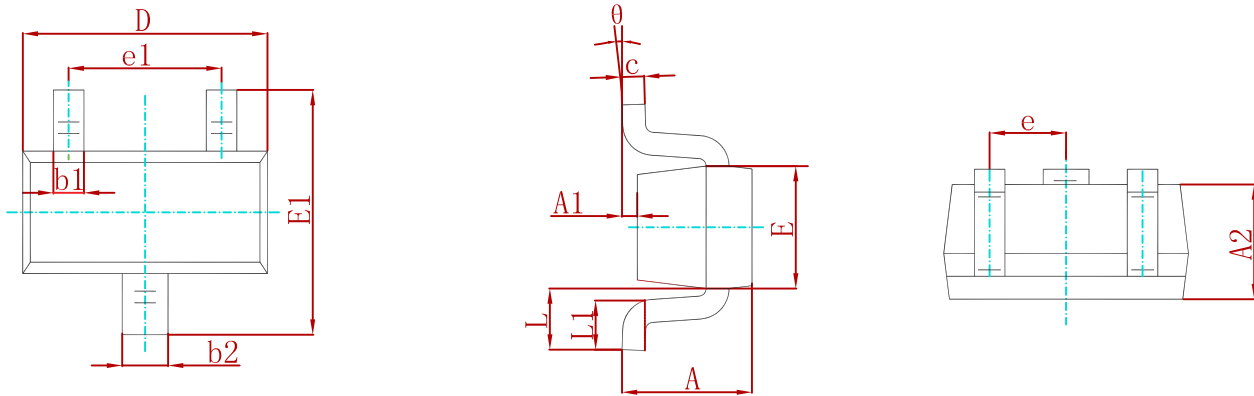
| Parameter            | Symbol                         | Conditions  | Min  | Typ | Max  | Unit |
|----------------------|--------------------------------|---|------|-----|------|------|
| Input voltage        | V <sub>I(off)</sub>            | V <sub>CC</sub> =5V, I <sub>O</sub> = 100μA           | 0.5  |     |      | V    |
|                      | V <sub>I(on)</sub>             | V <sub>O</sub> =0.3V , I <sub>O</sub> =5mA            |      |     | 1.3  | V    |
| Output voltage       | V <sub>O(on)</sub>             | I <sub>O</sub> /I <sub>I</sub> =5mA/0.25mA            |      | 0.1 | 0.3  | V    |
| Input current        | I <sub>I</sub>                 | V <sub>I</sub> =5V                                    |      |     | 1.8  | mA   |
| Output current       | I <sub>O(off)</sub>            | V <sub>CC</sub> =50V, V <sub>I</sub> =0               |      |     | 0.5  | μA   |
| DC current gain      | G <sub>I</sub>                 | V <sub>O</sub> =5V, I <sub>O</sub> = 10mA             | 80   |     |      |      |
| Input resistance     | R <sub>I</sub>                 |   | 3.29 | 4.7 | 6.11 | kΩ   |
| Resistance ratio     | R <sub>2</sub> /R <sub>1</sub> |   | 8    | 10  | 12   |      |
| Transition frequency | f <sub>T</sub>                 | V <sub>O</sub> = 10V , I <sub>O</sub> =5mA, f= 100MHz |      | 250 |      | MHz  |

# Typical Characteristics



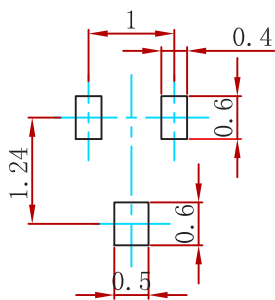
REVERSE VOLTAGE  $V_R$  (V)      AMBIENT TEMPERATURE  $T_a$  ( $^\circ C$ )

## PACKAGE MECHANICAL DATA(SOT-523)



| 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 |
| theta  | 0°                        | 8°    | 0°                   | 8°    |

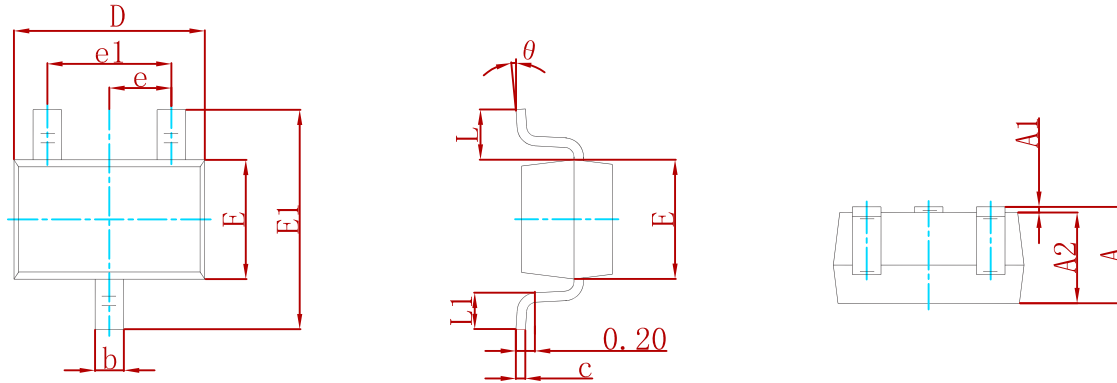
## Suggested Pad Layout



Note:

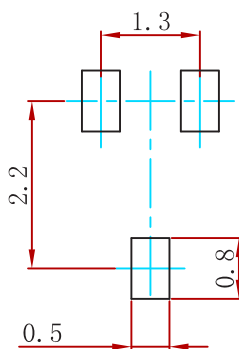
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05$  mm.
3. The pad layout is for reference purposes only.

## PACKAGE MECHANICAL DATA(SOT-323)



| 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°    |

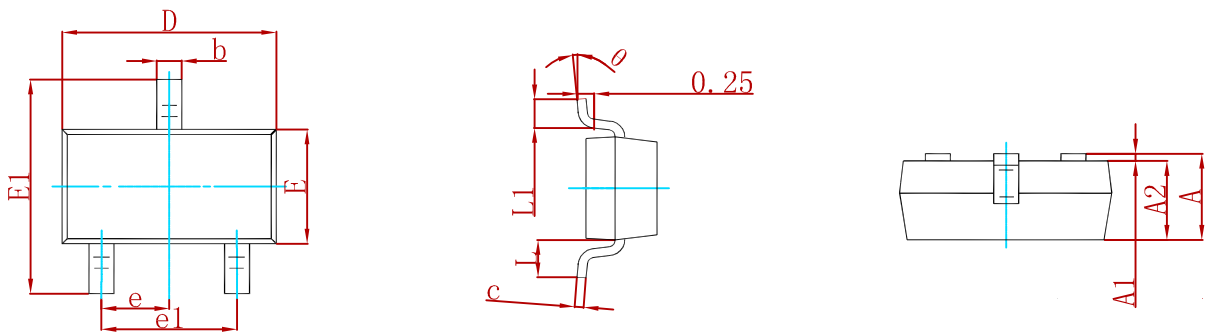
## Suggested Pad Layout



Note:

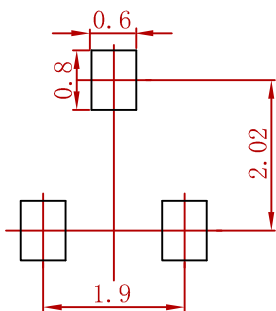
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

**PACKAGE MECHANICAL DATA(SOT-23)**



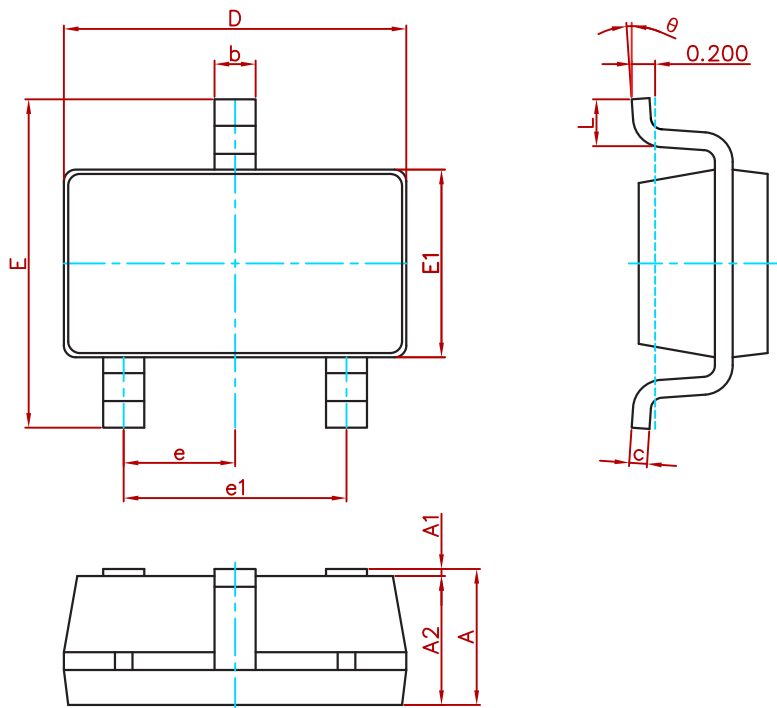
| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.150 | 0.035                | 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°    |

**Suggested Pad Layout**



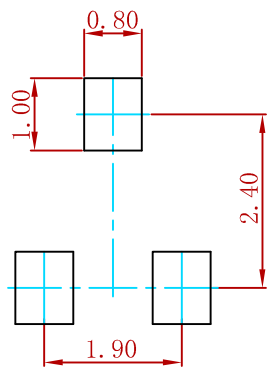
Note:  
1.Controlling dimension:in millimeters.  
2.General tolerance:± 0.05mm.  
3.The pad layout is for reference purposes only.

**PACKAGE MECHANICAL DATA(SOT-23-3L)**



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 1.050                     | 1.150 | 0.041                | 0.045 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.100                     | 0.200 | 0.004                | 0.008 |
| D      | 2.820                     | 3.020 | 0.111                | 0.119 |
| E1     | 1.500                     | 1.700 | 0.059                | 0.067 |
| E      | 2.650                     | 2.950 | 0.104                | 0.116 |
| e      | 0.950(BSC)                |       | 0.037(BSC)           |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.300                     | 0.600 | 0.012                | 0.024 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

**Suggested Pad Layout**



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



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