

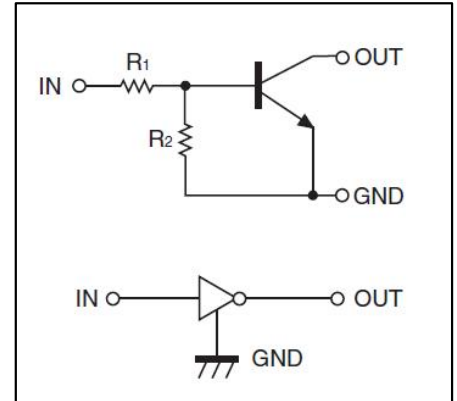
Digital Transistors (Built-in Resistors)

Equivalent Circuit

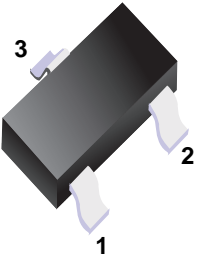
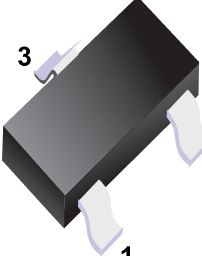
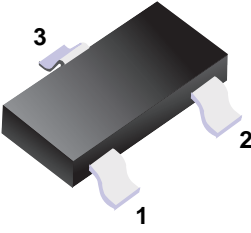
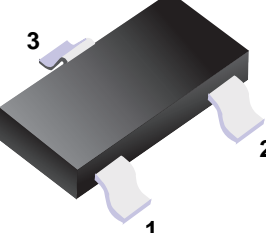
DIGITAL TRANSISTOR (NPN)

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 CONNECTIONS and MARKING

| | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>DTC123YE</p>  <p>SOT-523</p> <p>1. IN 2. GND 3. OUT</p> | <p>DTC123YUA</p>  <p>SOT-323</p> <p>1. IN 2. GND 3. OUT</p> |
| <p>DTC123YCA</p>  <p>SOT-23</p> <p>1. IN 2. GND 3. OUT</p> | <p>DTC123YKA</p>  <p>SOT23-3L</p> <p>1. IN 2. GND 3. OUT</p> |

ORDERING INFORMATION

| Part Number | MARKING ⁽¹⁾ | Package | Packing Method | Pack Quantity |
|-------------|------------------------|----------|----------------|---------------|
| DTC123YE | 62 | SOT-523 | Reel | 3000pcs/Reel |
| DTC123YUA | 62 | SOT-323 | Reel | 3000pcs/Reel |
| DTC123YKA | 62 | SOT23-3L | Reel | 3000pcs/Reel |
| DTC123YCA | 62 | SOT-23 | Reel | 3000pcs/Reel |

Notes: (1). Solid dot= Green molding compound device, if none, the normal device.
(2). XXX=Code

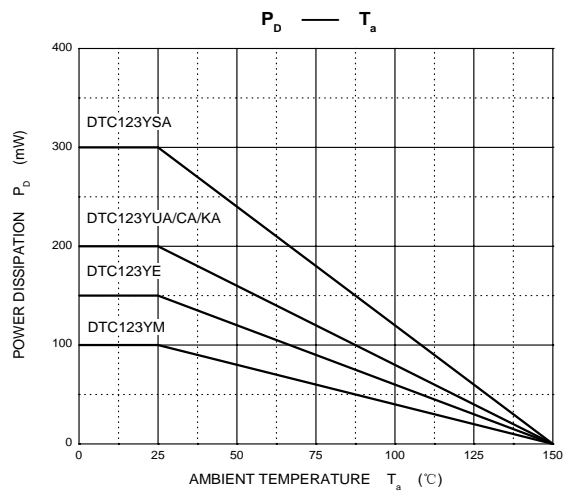
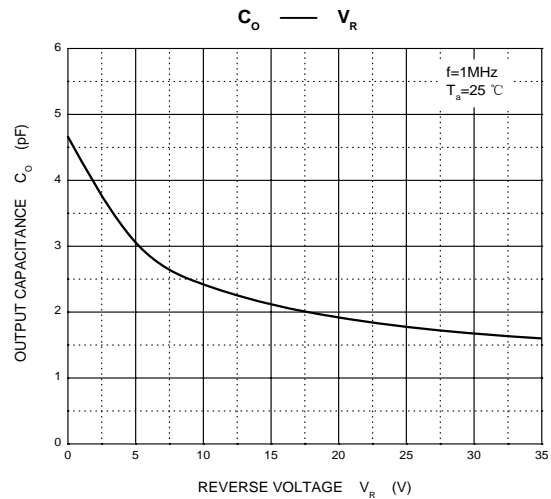
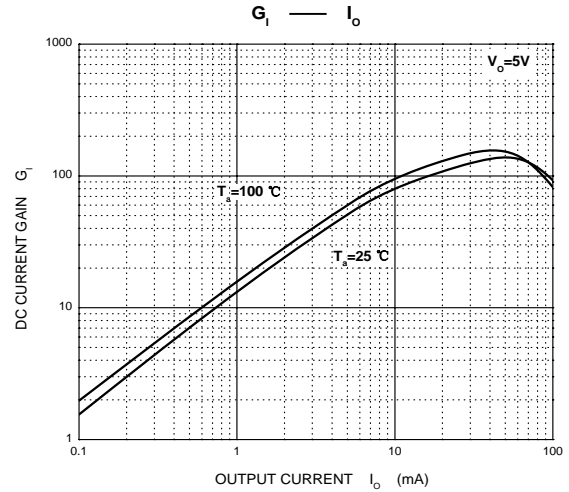
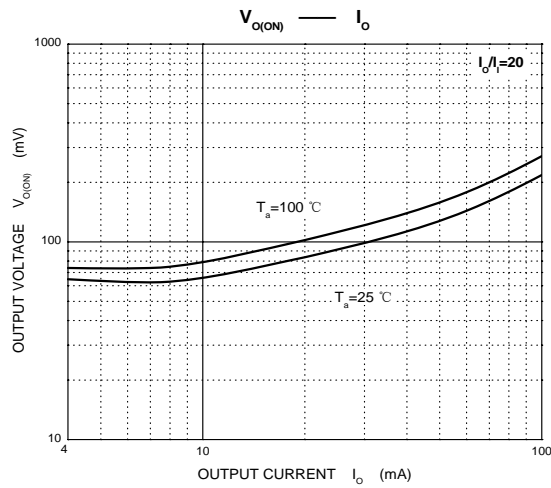
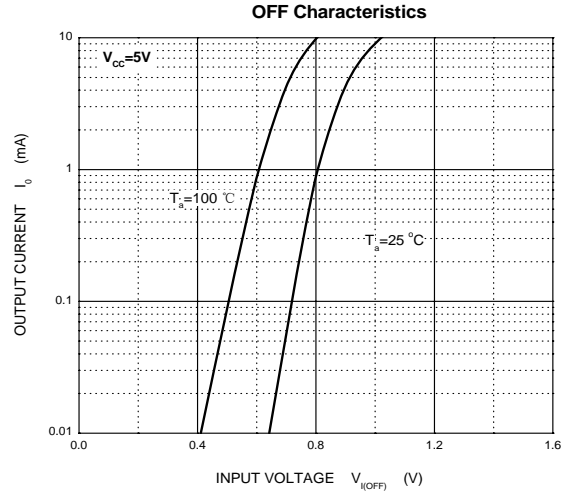
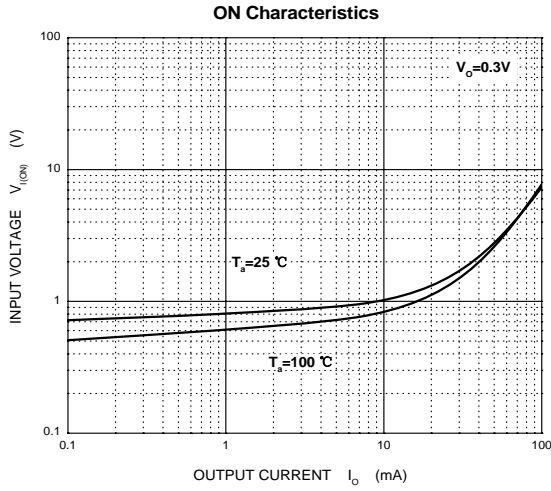
MAXIMUM RATINGS(Ta=25°C unless otherwise noted)

| Symbol | Parameter | Limits(DTC123Y□) | | | | | | Unit |
|-----------------------------------|--------------------------------------------------|------------------|-----|-----|-----|-----|-----|------|
| | | M | E | UA | KA | CA | SA | |
| V _{CC} | Supply Voltage | 50 | | | | | | V |
| V _{IN} | Input Voltage | -5~+12 | | | | | | V |
| I _O | Output 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 | | | | | | °C |

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

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|----------------------|--------------------------------|----------------------------------------------------|------|-----|------|------|
| Input voltage | V _{I(off)} | V _{CC} =5V, I _O =100μA | 0.3 | | | 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 | | 0.1 | 0.3 | V |
| Input current | I _I | V _I =5V | | | 3.8 | 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 =10mA | 33 | | | |
| Input resistance | R ₁ | | 1.54 | 2.2 | 2.86 | kΩ |
| Resistance ratio | R ₂ /R ₁ | | 3.6 | 4.5 | 5.5 | |
| Transition frequency | f _T | V _O =10V, I _O =5mA, f=100MHz | | 250 | | MHz |

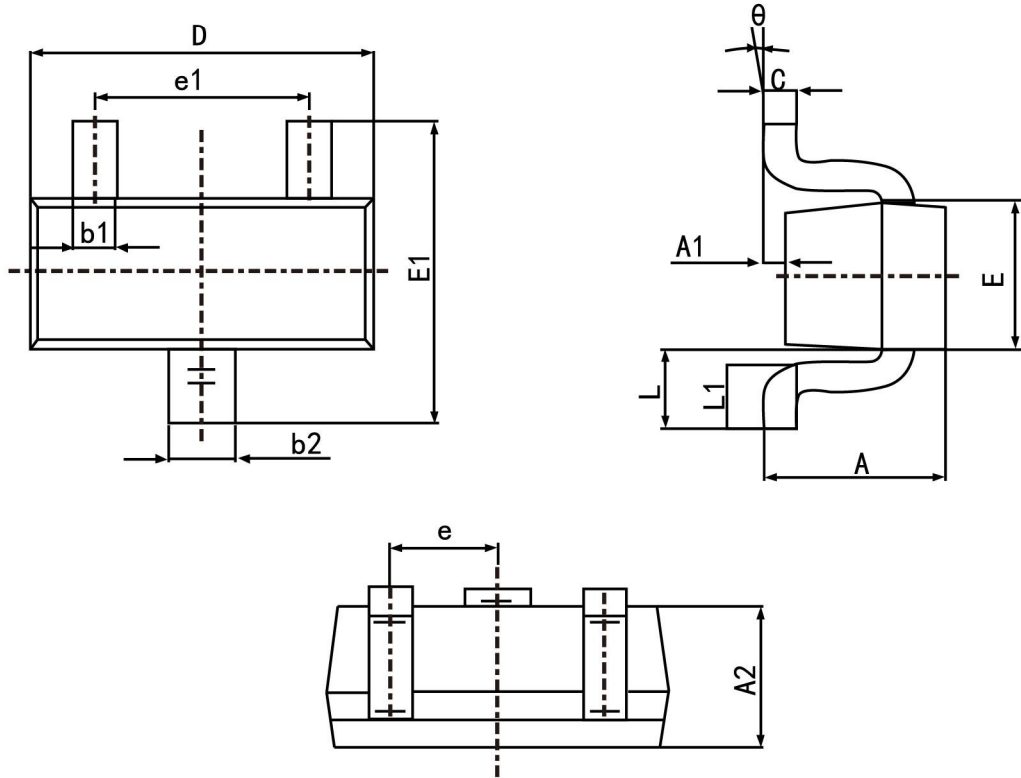
Typical Characteristics



Package Outline

SOT-523

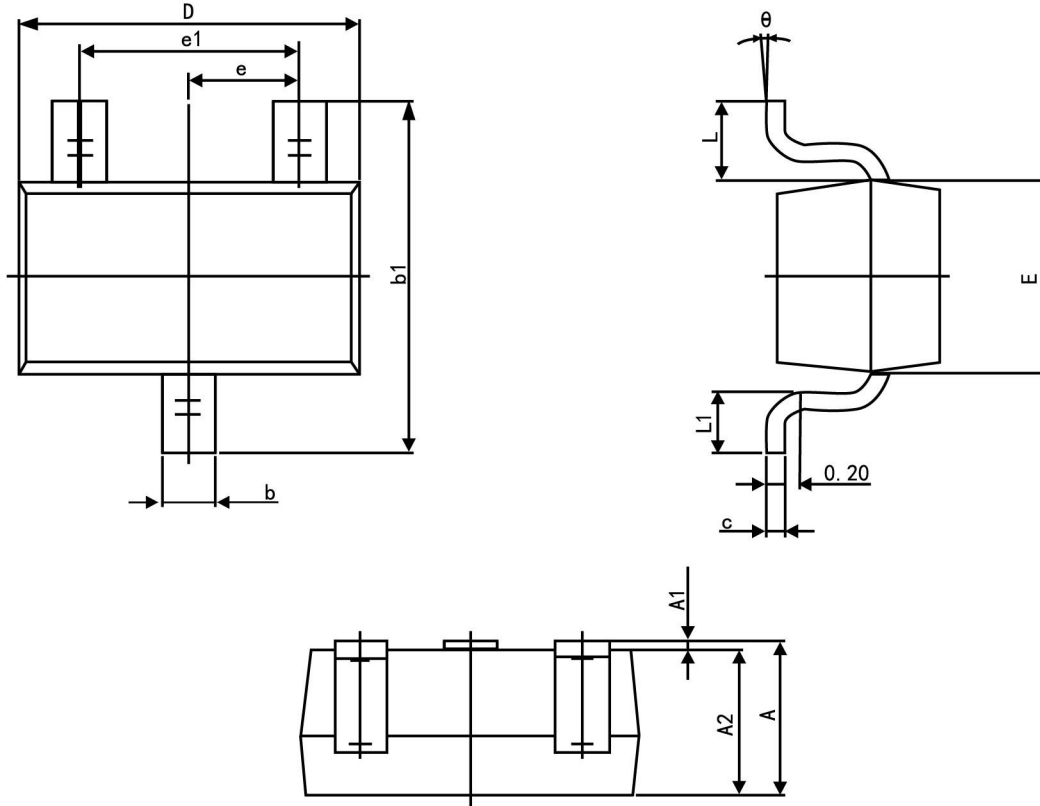
Plastic surface mounted package; 3 leads



| Symbol | Dimension in Millimeters | |
|--------|--------------------------|-------|
| | Min | Max |
| A | 0.700 | 0.900 |
| A1 | 0.000 | 0.100 |
| A2 | 0.700 | 0.800 |
| b1 | 0.150 | 0.250 |
| b2 | 0.250 | 0.350 |
| c | 0.100 | 0.200 |
| D | 1.500 | 1.700 |
| E | 0.700 | 0.900 |
| E1 | 1.450 | 1.750 |
| e | 0.500 | TYP. |
| e1 | 0.900 | 1.100 |
| L | 0.400 REF. | |
| L1 | 0.260 | 0.460 |
| θ | 0° | 8° |

Package Outline SOT-323

Plastic surface mounted package; 3 leads

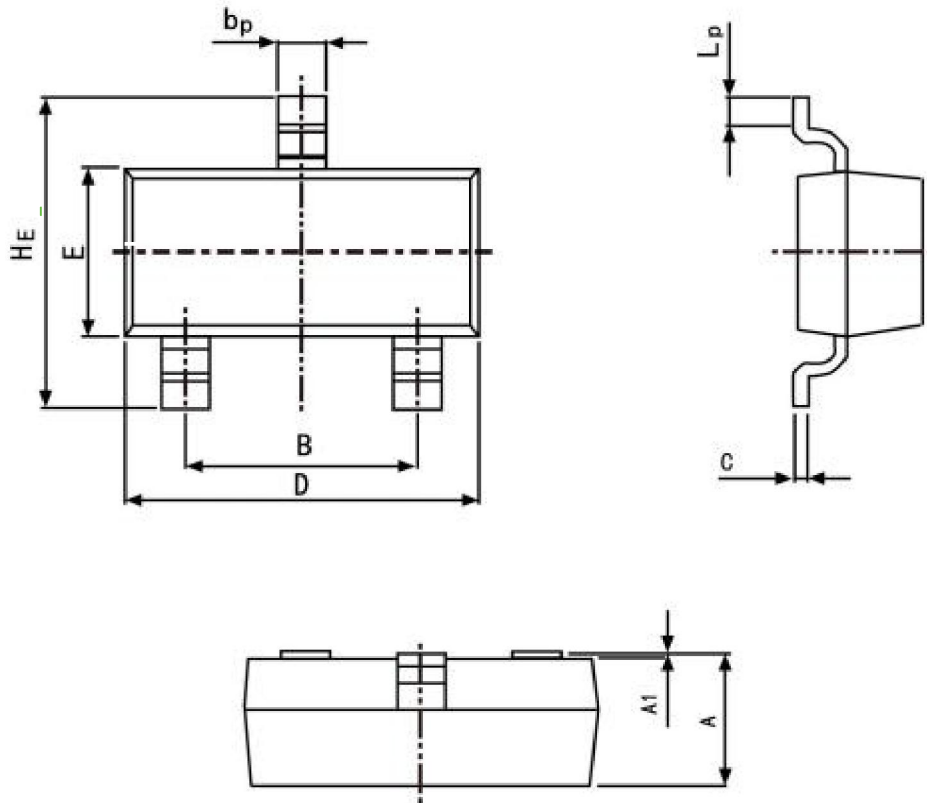


| Symbol | Dimension in Millimeters | |
|----------|--------------------------|-------|
| | Min | Max |
| A | 0.900 | 1.100 |
| A1 | 0.000 | 0.100 |
| A2 | 0.900 | 1.000 |
| b | 0.200 | 0.400 |
| c | 0.080 | 0.150 |
| D | 2.000 | 2.200 |
| E | 1.150 | 1.350 |
| E1 | 2.150 | 2.450 |
| e | 0.650 TYP. | |
| e1 | 1.200 | 1.400 |
| L | 0.525 REF. | |
| L1 | 0.260 | 0.460 |
| θ | 0° | 8° |

Package Outline

SOT-23

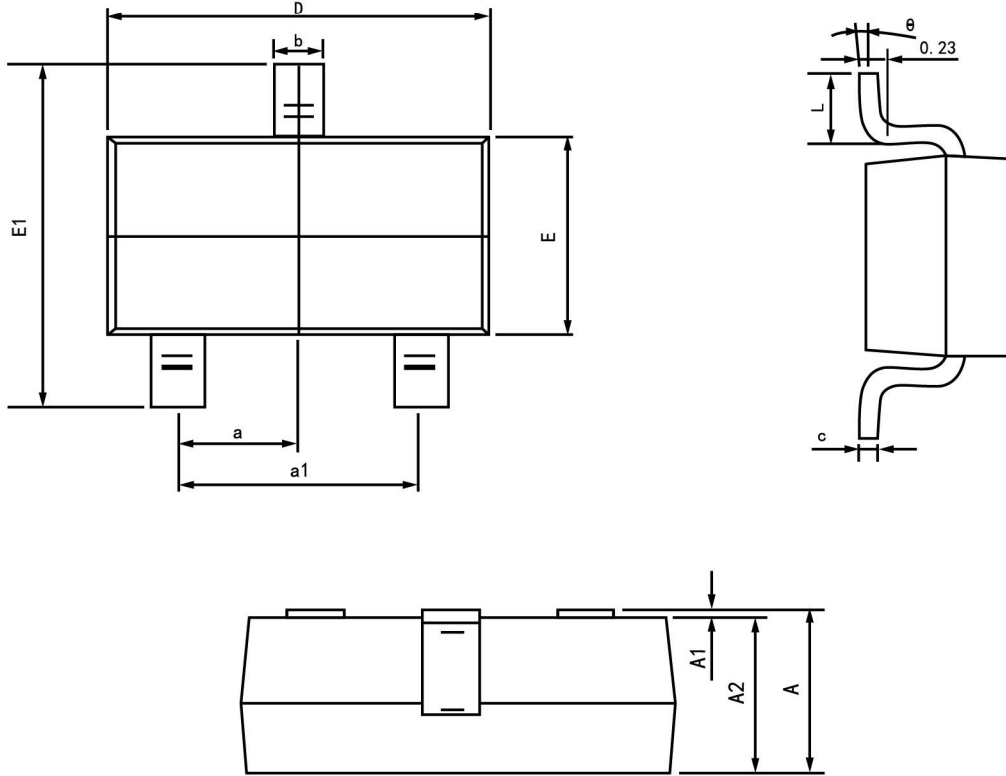
Plastic surface mounted package; 3 leads



| Symbol | Dimension in Millimeters | |
|--------|--------------------------|-------|
| | Min | Max |
| A | 0.95 | 1.40 |
| B | 1.78 | 2.04 |
| b_p | 0.35 | 0.50 |
| C | 0.08 | 0.19 |
| D | 2.70 | 3.10 |
| E | 1.20 | 1.65 |
| HE | 2.20 | 3.00 |
| A_1 | 0.100 | 0.013 |
| L_p | 0.20 | 0.50 |

Package Outline

SOT23-3L



| Symbol | Dimension in Millimeters | |
|--------|--------------------------|-------|
| | Min | Max |
| A | 1.050 | 1.250 |
| A1 | 0.000 | 0.100 |
| A2 | 1.050 | 1.150 |
| b | 0.300 | 0.500 |
| c | 0.100 | 0.200 |
| D | 2.820 | 3.020 |
| E | 1.500 | 1.700 |
| E1 | 2.650 | 2.950 |
| e | 0.950 (Basic) | |
| e1 | 1.800 | 2.000 |
| L | 0.300 | 0.600 |
| θ | 0° | 8° |