



Digital Transistors (Built-in Resistors)

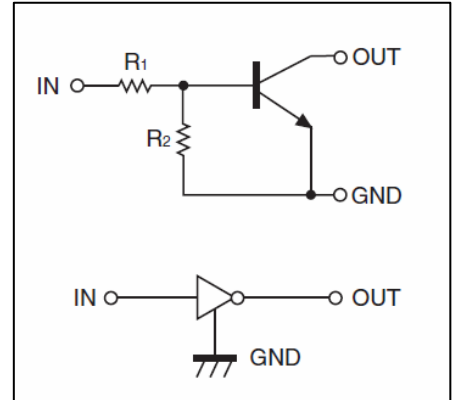
DTC123EM/DTC123EE/DTC123EUA DTC123EKA /DTC123ECA/DTC123ESA

DIGITAL TRANSISTOR (NPN)

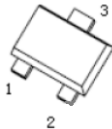
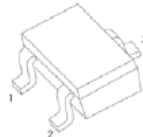
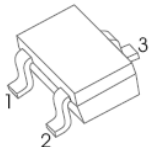
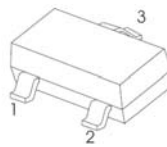
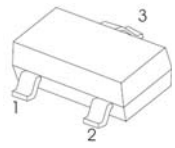

FEATURES

- 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

• Equivalent Circuit



PIN CONNENCTIONS and MARKING

| | |
|--|--|
| <p>DTC123EM</p>  <p>SOT-723</p> <p>1. IN 2. GND 3. OUT</p> <p>MARKING: 22</p> | <p>DTC123EE</p>  <p>SOT-523</p> <p>1. IN 2. GND 3. OUT</p> <p>MARKING: 22</p> |
| <p>DTC123EUA</p>  <p>SOT-323</p> <p>1. IN 2. GND 3. OUT</p> <p>MARKING: 22</p> | <p>DTC123EKA</p>  <p>SOT-23-3L</p> <p>1. IN 2. GND 3. OUT</p> <p>MARKING: 22</p> |
| <p>DTC123ECA</p>  <p>SOT-23</p> <p>1. IN 2. GND 3. OUT</p> <p>MARKING: 22</p> | <p>DTC123ESA</p>  <p>TO-92S</p> <p>1. GND 2. OUT 3. IN</p> |

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

| Symbol | Parameter | Limits(DTC123E□) | | | | | | Unit |
|------------------|----------------------|------------------|-----|-----|-----|-----|-----|------|
| | | M | E | UA | KA | CA | SA | |
| V _{CC} | Supply Voltage | 50 | | | | | | V |
| V _{IN} | Input Voltage | -10~+12 | | | | | | V |
| I _O | Output Current | 100 | | | | | | mA |
| P _D | Power Dissipation | 100 | 150 | 200 | 200 | 200 | 300 | mW |
| T _J | Junction Temperature | 150 | | | | | | °C |
| T _{stg} | Storage Temperature | -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 | 0.5 | | | 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 | | | 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 =20mA | 20 | | | |
| Input resistance | R ₁ | | 1.54 | 2.2 | 2.86 | 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 |