

Digital transistors (built-in resistors)

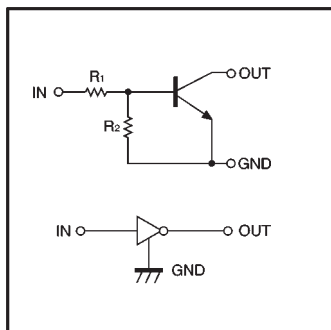
DTC123EE / DTC123EUA / DTC123EKA

DTC123ESA

●Features

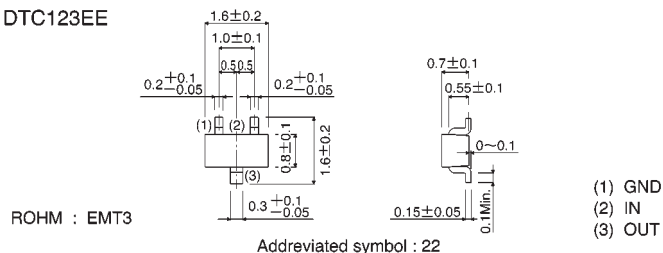
- 1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
- 2) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of almost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

●Equivalent circuit

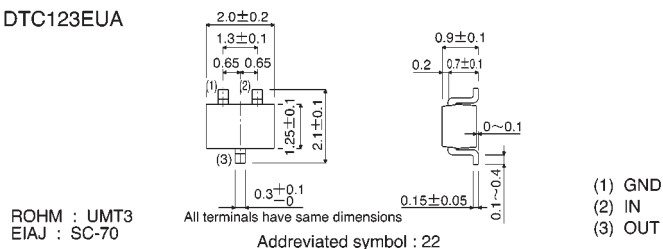


●External dimensions (Units: mm)

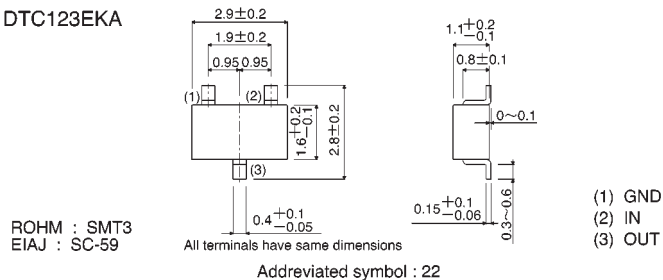
DTC123EE



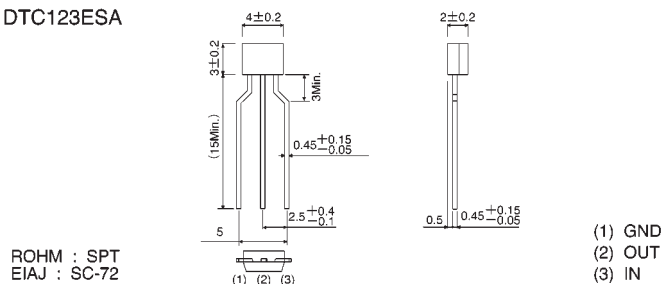
DTC123EUA



DTC123EKA



DTC123ESA



●Absolute maximum ratings (Ta = 25°C)

| Parameter | Symbol | Limits(DTC123E□) | | | | Unit |
|----------------------|----------------------|------------------|-----|----|-----|------|
| | | E | UA | KA | SA | |
| Supply voltage | V _{CC} | 50 | | | | V |
| Input voltage | V _{IN} | -10~+12 | | | | V |
| Output current | I _o | 100 | | | | mA |
| | I _{C(Max.)} | 100 | | | | |
| Power dissipation | P _d | 150 | 200 | | 300 | mW |
| Junction temperature | T _j | 150 | | | | °C |
| Storage temperature | T _{stg} | -55~+150 | | | | °C |

●Electrical characteristics (Ta = 25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|----------------------|--------------------------------|------|------|------|------|--|
| Input voltage | V _{I(off)} | — | — | 0.5 | V | V _{CC} =5V, I _O =100 μA |
| | V _{I(on)} | 3 | — | — | | V _O =0.3V, I _O =20mA |
| Output voltage | V _{O(on)} | — | 0.1 | 0.3 | V | I _O /I _I =10mA/0.5mA |
| Input current | I _I | — | — | 3.8 | mA | V _I =5V |
| Output current | I _{O(off)} | — | — | 0.5 | μA | V _{CC} =50V, V _I =0V |
| DC current gain | G _I | 20 | — | — | — | V _O =5V, I _O =20mA |
| Input resistance | R _I | 1.54 | 2.2 | 2.86 | kΩ | — |
| Resistance ratio | R ₂ /R ₁ | 0.8 | 1 | 1.2 | — | — |
| Transition frequency | f _T | — | 250 | — | MHz | V _{CE} =10V, I _E =-5mA, f=100MHz * |

* Transition frequency of the device

●Packaging specifications

| Part No. | Package | EMT3 | UMT3 | SMT3 | SPT |
|-----------|------------------------------|--------|--------|--------|--------|
| | Packaging type | Taping | Taping | Taping | Taping |
| | Code | TL | T106 | T146 | TP |
| | Basic ordering unit (pieces) | 3000 | 3000 | 3000 | 5000 |
| DTC123EE | | ○ | — | — | — |
| DTC123EUA | | — | ○ | — | — |
| DTC123EKA | | — | — | ○ | — |
| DTC123ESA | | — | — | — | ○ |

●Electrical characteristic curves

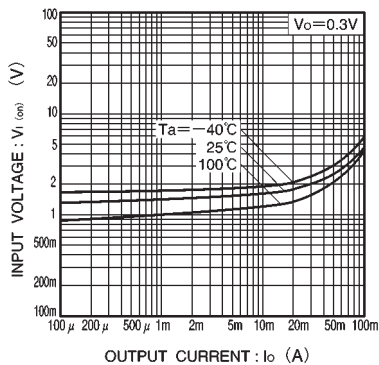


Fig.1 Input voltage vs. output current (ON characteristics)

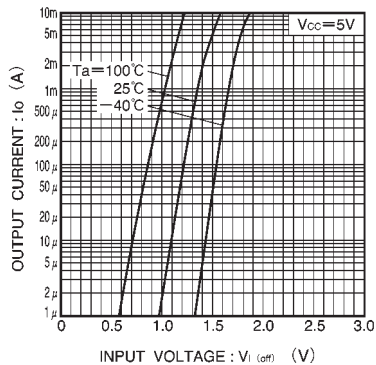


Fig.2 Output current vs. input voltage (OFF characteristics)

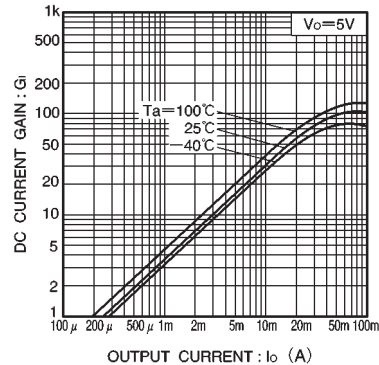


Fig.3 DC current gain vs. output current

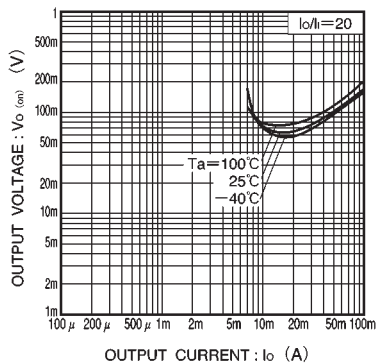


Fig.4 Output voltage vs. output current