

Transistors

100mA / 50V Digital transistor (with built-in resistors) DTC144VUA / DTC144VKA

●Applications

Inverter, Interface, Driver

●Features

- 1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors.
- 2) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input, and parasitic effects are almost completely eliminated.
- 3) Only the on / off conditions need to be set for operation, making the device design easy.
- 4) Higher mounting densities can be achieved.

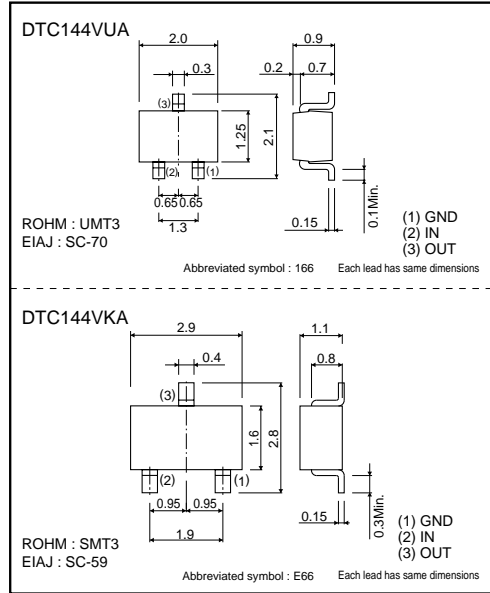
●Structure

NPN epitaxial planar silicon transistor
(Resistor built-in type)

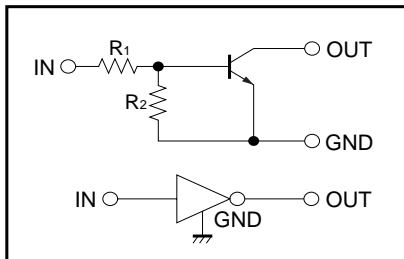
●Packaging specifications

| Part No. | Package | UMT3 | SMT3 |
|-----------|------------------------------|--------|--------|
| | Package type | Taping | Taping |
| | Code | T106 | T146 |
| | Basic ordering unit (pieces) | 3000 | 3000 |
| DTC144VUA | | ○ | — |
| DTC144VKA | | — | ○ |

●External dimensions (Unit : mm)



●Equivalent circuit



R₁=47kΩ, R₂=10kΩ

Transistors

●Absolute maximum ratings (Ta=25°C)

| Parameter | Symbol | Limits | Unit |
|----------------------|----------------------|-------------|------|
| Supply voltage | V _{CC} | 50 | V |
| Input voltage | V _{IN} | -10 to +40 | V |
| Output curren | I _o | 30 | mA |
| | I _{C(Max.)} | 100 | |
| Power dissipation | P _D | 200 | mW |
| Junction temperature | T _j | 150 | °C |
| Storage temperature | T _{stg} | -55 to +150 | °C |

●Electrical characteristics (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|----------------------|--------------------------------|------|------|------|------|--|
| Input voltage | V _{I(off)} | - | - | 1 | V | V _{CC} =5V, I _o =100μA |
| | V _{I(on)} | 6 | - | - | | V _O =0.3V, I _o =2mA |
| Output voltage | V _{O(on)} | - | 0.1 | 0.3 | V | I _o =10mA, I _I =0.5mA |
| Input current | I _I | - | - | 0.16 | mA | V _I =5V |
| Output current | I _{O(off)} | - | - | 0.5 | μA | V _{CC} =50V, V _I =0V |
| DC current gain | G _I | 33 | - | - | - | I _o =5mA, V _O =5V |
| Input resistance | R ₁ | 32.9 | 47 | 61.1 | kΩ | - |
| Resistance ratio | R ₂ /R ₁ | 0.17 | 0.21 | 0.26 | - | - |
| Transition frequency | f _T * | - | 250 | - | MHz | V _{CE} =10V, I _E =-5mA, f=100MHz |

* Characteristics of built-in transistor

●Electrical characteristic curves

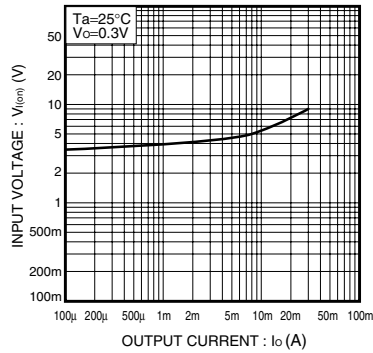


Fig.1 Input voltage vs. Output current (ON characteristics)

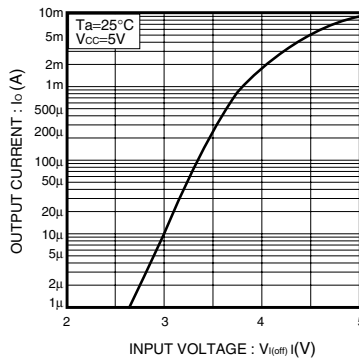


Fig.2 Output current vs. Input voltage (OFF characteristics)

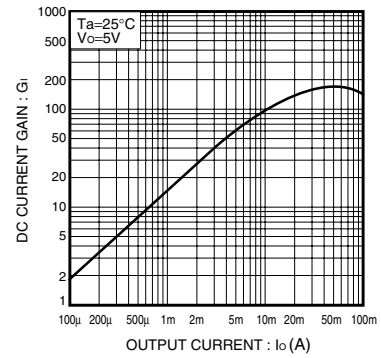


Fig.3 DC current gain vs. Output current

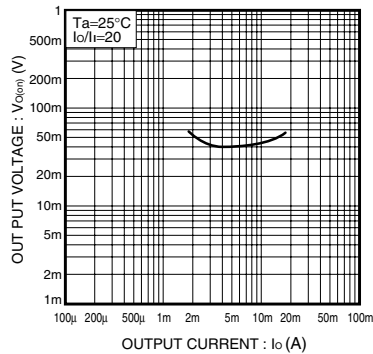


Fig.4 Output voltage vs. Output current

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