-500mA / -50V Digital transistors (with built-in resistors)

DTB113EK / DTB113ES

Applications

Inverter, Interface, Driver

●Feature

- 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 positive 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 the device design easy.

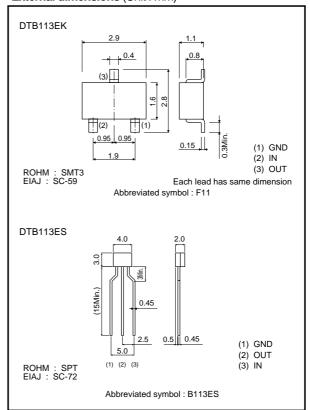
Structure

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

Packaging specifications

| | | Package | SMT3 | SPT | | | | | |
|--|----------|------------------------------|--------|--------|--|--|--|--|--|
| | | Packaging type | Taping | Taping | | | | | |
| | | Code | T146 | TP | | | | | |
| | Part No. | Basic ordering unit (pieces) | 3000 | 5000 | | | | | |
| | DTB113EK | | 0 | _ | | | | | |
| | DTB113ES | | _ | 0 | | | | | |

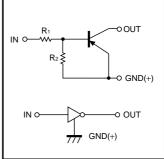
●External dimensions (Unit: mm)



● Absolute maximum ratings (Ta=25°C)

| Parameter | Symbol | Limits | | Unit |
|----------------------|--------|-------------------|--|------|
| raiailletei | Symbol | DTB113EK DTB113ES | | |
| Supply voltage | Vcc | -50 | | V |
| Input voltage | Vin | -10 to +10 | | V |
| Output current | Ic | -500 | | mA |
| Power dissipation | Po | 200 300 | | mW |
| Junction temperature | Tj | 150 | | Ç |
| Storage temperature | Tstg | −55 to +150 | | သိ |

●Equivalent circuit



R1=R2=1.0kΩ

●Electrical characteristics (Ta=25°C)

| Parameter | Symbol | Min. | Тур. | Max. | Unit | Conditions |
|----------------------|--------------------------------|------|------|------|------|----------------------------|
| Input voltage | VI(off) | - | _ | -0.5 | V | Vcc=-5V, Io=-100μA |
| input voltage | VI(on) | -3 | _ | _ | V | Vo=-0.3V, Io=-20mA |
| Output voltage | VO(on) | - | -0.1 | -0.3 | V | Io/I:=-50mA/-2.5mA |
| Input current | lı | - | _ | -7.2 | mA | Vi=-5V |
| Output current | IO(off) | - | - | -0.5 | μΑ | Vcc=-50V, Vi=0V |
| DC current gain | Gı | 33 | _ | - | _ | Vo=-5V, Io=-50mA |
| Input resistance | R ₁ | 0.7 | 1 | 1.3 | kΩ | - |
| Resistance ratio | R ₂ /R ₁ | 0.8 | 1 | 1.2 | - | - |
| Transition frequency | f⊤ * | - | 200 | - | MHz | Vc=-10V, I==50mA, f=100MHz |

^{*} Characteristics of built-in transistor

•Electrical characteristics curves

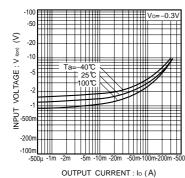


Fig.1 Input voltage vs. output current (ON characteristics)

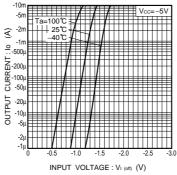


Fig.2 Output current vs. input voltage (OFF characteristics)

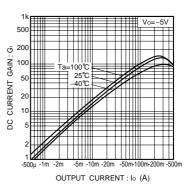


Fig.3 DC current gain vs. output current

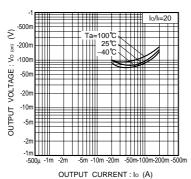


Fig.4 Output voltage vs. output current

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