

Transistors

-500mA / -12V Low V_{CE} (sat) Digital transistors (with built-in resistors)

DTB543EE / DTB543EM

● Applications

Inverter, Interface, Driver

● Feature

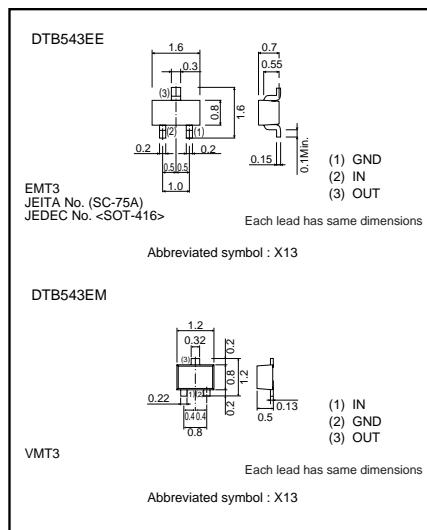
- 1) V_{CE} (sat) is lower than conventional products.
- 2) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
- 3) The bias resistors consist of thin-film resistors with complete isolation to allow positive biasing of the input. They also have the advantage of almost completely eliminating parasitic effects.
- 4) 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)

● Dimensions (Unit : mm)



● Absolute maximum ratings (Ta=25°C)

| Parameter | Symbol | Limits | | Unit |
|----------------------|----------------------|-------------|----------|------|
| | | DTB543EE | DTB543EM | |
| Supply voltage | V _{CC} | — | -12 | V |
| Input voltage | V _{IN} | -12 to +10 | — | V |
| Collector current *1 | I _C (max) | — | -500 | mA |
| Power dissipation *2 | P _D | — | 150 | mW |
| Junction temperature | T _J | — | 150 | °C |
| Storage temperature | T _{STG} | -55 to +150 | — | °C |

*1 Characteristics of built-in transistor.

*2 Each terminal mounted on a recommended land.

● Packaging specifications

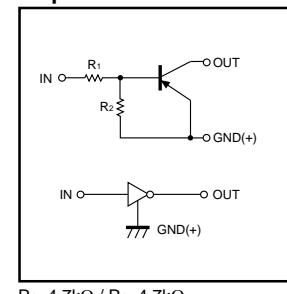
| Part No. | Package | EMT3 | VMT3 |
|------------------------------|----------------|--------|--------|
| | Packaging type | Taping | Taping |
| | Code | TL | T2L |
| Basic ordering unit (pieces) | 3000 | 8000 | |
| DTB543EE | ○ | — | |
| DTB543EM | — | ○ | |

● 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 =-100μA |
| | V _{I(on)} | -2.5 | — | — | | V _O =-0.3V, I _O =-20mA |
| Output voltage | V _{O(on)} | — | -60 | -300 | mV | I _O /I _l =-100mA / -5mA |
| Input current | I _I | — | — | -1.4 | mA | V _I =-5V |
| Output current | I _{O(off)} | — | — | -0.5 | μA | V _{CC} =-12V, V _I =0V |
| DC current gain | G _I | 115 | — | — | | V _O =-2V, I _O =-100mA |
| Transition frequency * | f _T | — | 260 | — | MHz | V _{CE} =-10V, I _E =5mA, f=100MHz |
| Input resistance | R _I | 3.29 | 4.7 | 6.11 | kΩ | — |
| Resistance ratio | R ₂ /R _I | 0.8 | 1.0 | 1.2 | — | — |

* Characteristics of built-in transistor.

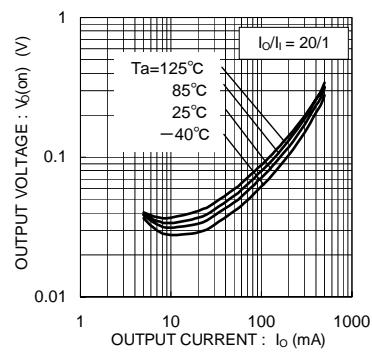
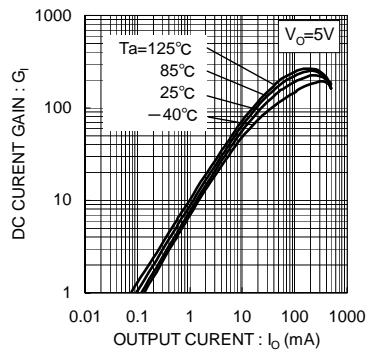
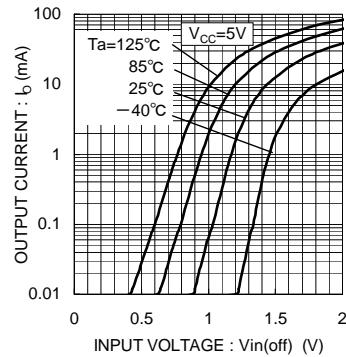
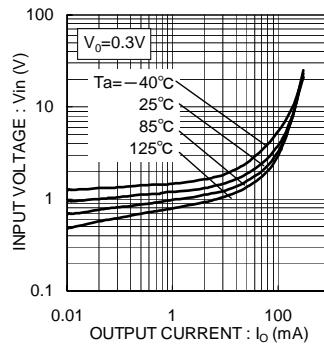
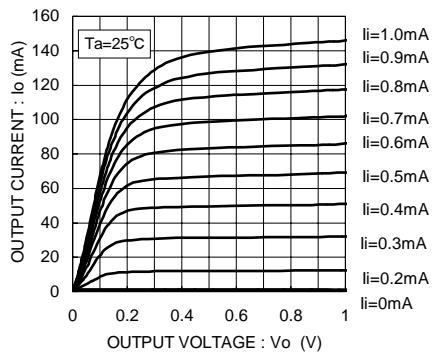
● Equivalent circuit



R₁=4.7kΩ / R₂=4.7kΩ

Transistors

●Electrical characteristics curves



Appendix

Notes

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