# –200mA / –30V Low $V_{CE}$ (sat) Digital transistors (with built-in resistors)

## DTB743EE / DTB743EM

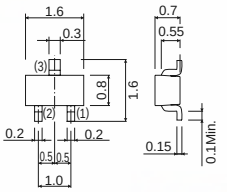
### ●Applications
Inverter, Interface, Driver

### ●Feature
1) $V_{CE\ (sat)}$ is lower than the 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 plannar silicon transistor
(Resistor built-in type)

### ●External dimensions (Unit : mm)

DTB743EE



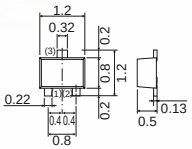

EMT3
JEITA No. (SC-75A)
JEDEC No. <SOT-416>

(1) GND
(2) IN
(3) OUT

Each lead has same dimensions

Abbreviated symbol : M13

DTB743EM




VMT3

(1) IN
(2) GND
(3) OUT

Each lead has same dimensions

Abbreviated symbol : M13

### ●Absolute maximum ratings (Ta=25°C)

| Parameter | Symbol | Limits | | Unit |
|---|---|---|---|---|
| | | DTB743EE | DTB743EM | |
| Supply voltage | $V_{CC}$ | –30 | | V |
| Input voltage | $V_{IN}$ | –20 to +10 | | V |
| Collector current *1 | $I_{C\ (max)}$ | –200 | | mA |
| Power dissipation *2 | $P_D$ | 150 | | mW |
| Junction temperature | Tj | 150 | | ℃ |
| Storage temperature | Tstg | –55 to +150 | | ℃ |

*1 Characteristics of built-in transistor.
*2 Each terminal mounted on a recommended land.

### ●Packaging specifications

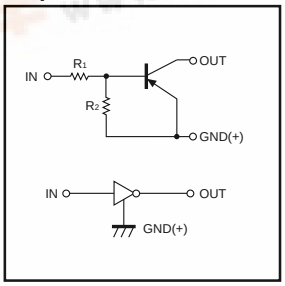
| | Package | EMT3 | VMT3 |
|---|---|---|---|
| | Packaging type | Taping | Taping |
| | Code | TL | T2L |
| Part No. | Basic ordering unit (pieces) | 3000 | 8000 |
| DTB743EE | | ○ | – |
| DTB743EM | | – | ○ |

### ●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 | $V_{O(on)}$ | – | –70 | –300 | mV | $I_O/I_I$= –50mA / –2.5mA |
| Input current | $I_I$ | – | – | –1.4 | mA | $V_I$= –5V |
| Output current | $I_{O(off)}$ | – | – | –500 | nA | $V_{CC}$= –30V, $V_I$=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 | $R_1$ | 3.29 | 4.7 | 6.11 | kΩ | – |
| Resistance ratio | $R_2/R_1$ | 0.8 | 1.0 | 1.2 | – | – |

* Characteristics of built-in transistor.

### ●Equivalent circuit




$R_1$=4.7kΩ / $R_2$=4.7kΩ

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