

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

## DTB743ZE / DTB743ZM

### ●Applications

Inverter, Interface, Driver

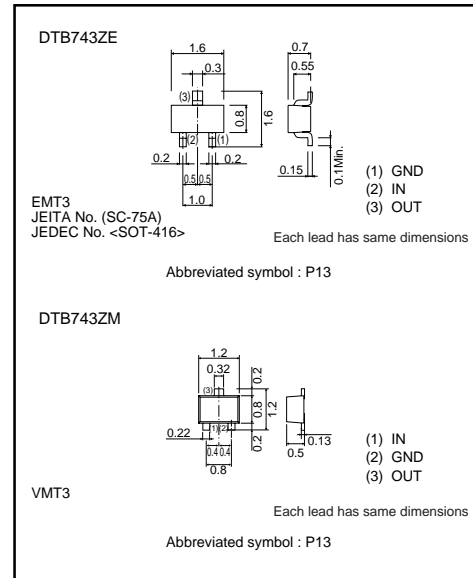
### ●Feature

- 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)

### ●External dimensions (Unit : mm)



### ●Absolute maximum ratings ( $T_a=25^\circ\text{C}$ )

Parameter	Symbol	Limits		Unit
		DTB743ZE	DTB743ZM	
Supply voltage	$V_{CC}$	-30		V
Input voltage	$V_{IN}$	-20 to +5		V
Collector current *1	$I_{C(max)}$	-200		mA
Power dissipation *2	$P_D$	150		mW
Junction temperature	$T_J$	150		$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150		$^\circ\text{C}$

\*1 Characteristics of built-in transistor.

\*2 Each terminal mounted on a recommended land.

### ●Packaging specifications

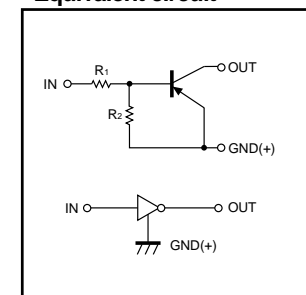
Part No.	Package	EMT3	VMT3
		Packaging type	Taping
	Code	TL	T2L
	Basic ordering unit (pieces)	3000	8000
DTB743ZE		○	—
DTB743ZM		—	○

### ●Electrical characteristics ( $T_a=25^\circ\text{C}$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	—	—	-0.3	V	$V_{CC} = -5V, I_{O} = -100\mu A$
	$V_{I(on)}$	-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	$I_{O(off)}$	—	—	-0.5	$\mu A$	$V_{CC} = -30V, V_I = 0V$
DC current gain	$G_I$	140	—	—	—	$V_O = -2V, I_{O} = -100mA$
Transition frequency *	$f_T$	—	260	—	MHz	$V_{CE} = -10V, I_E = 5mA, f = 100MHz$
Input resistance	$R_1$	3.29	4.7	6.11	k $\Omega$	—
Resistance ratio	$R_2/R_1$	8.0	10	12	—	—

\* Characteristics of built-in transistor.

### ●Equivalent circuit



$R_1 = 4.7k\Omega$  /  $R_2 = 47k\Omega$

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