

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

DTD543XE / DTD543XM

●Applications

Inverter, Interface, Driver

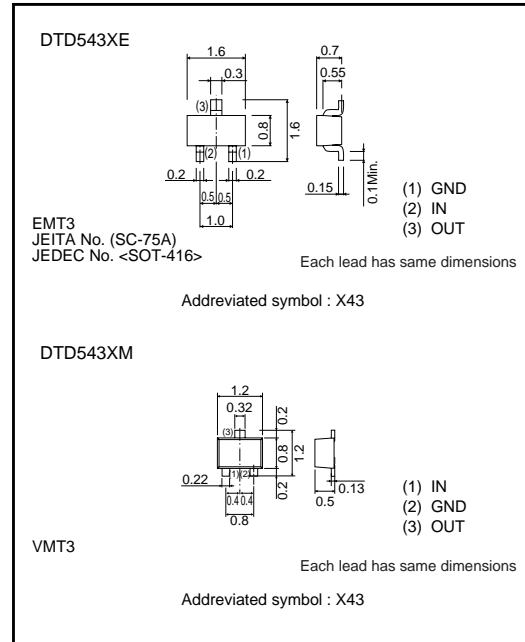
●Feature

- 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 negative 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

NPN 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
		DTD543XE	DTD543XM	
Supply voltage	V_{CC}	12		V
Input voltage	V_{IN}	-7 to +12		V
Collector current *1	$I_C(\text{max})$	500		mA
Power dissipation	P_D	150		mW
Junction temperature *2	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

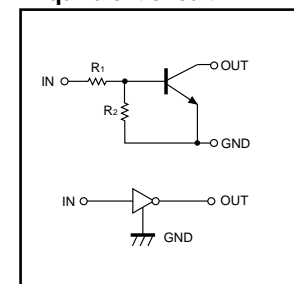
Part No.	Package	EMT3	VMT3
		Package	EMT3
	Packaging type	Taping	Taping
	Code	TL	T2L
	Basic ordering unit (pieces)	3000	8000
DTD543XE		○	-
DTD543XM		-	○

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	-	-	0.3	V	$V_{CC}=5V, I_o=100\mu\text{A}$
	$V_{I(on)}$	2.5	-	-		$V_o=0.3V, I_o=2\text{mA}$
Output voltage	$V_{O(on)}$	-	60	300	mV	$I_o/I_i=100\text{mA} / 5\text{mA}$
Input current	I_i	-	-	1.4	mA	$V_i=5V$
Output current	$I_{O(off)}$	-	-	500	μA	$V_{CC}=12V, V_i=0V$
DC current gain	G_i	140	-	-	-	$V_o=2V, I_o=100\text{mA}$
Transition frequency *	f_T	-	260	-	MHz	$V_{CE}=10V, I_E=-5\text{mA}, f=100\text{MHz}$
Input resistance	R_i	3.29	4.7	6.11	$\text{k}\Omega$	-
Resistance ratio	R_2/R_1	1.7	2.1	2.6	-	-

* Characteristics of built-in transistor.

●Equivalent circuit



$R_1=4.7\text{k}\Omega / R_2=10\text{k}\Omega$

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