

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

DTD523YE / DTD523YM

●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)

●Packaging specifications

Part No.	Package	EMT3	VMT3
	Packaging type	Taping	Taping
	Code	TL	T2L
	Basic ordering unit (pieces)	3000	8000
DTD523YE		○	—
DTD523YM		—	○

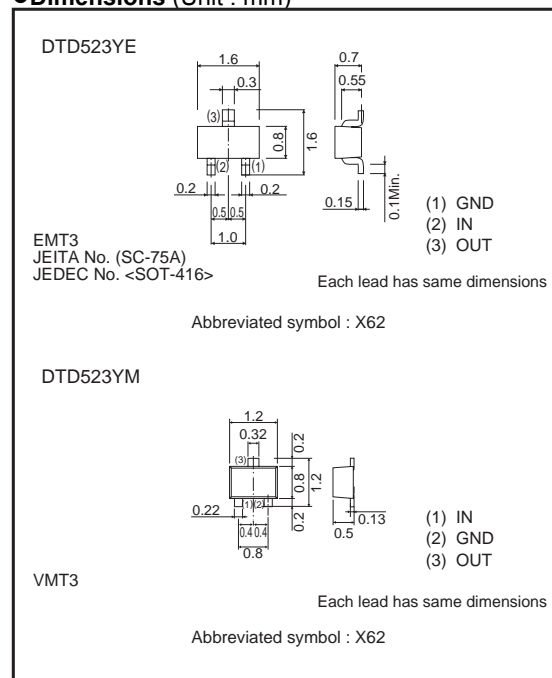
●Absolute maximum ratings ($T_a=25^{\circ}\text{C}$)

Parameter	Symbol	Limits		Unit
		DTD523YE	DTD523YM	
Supply voltage	V_{CC}	12		V
Input voltage	V_{IN}	-5 to +12		V
Collector current *1	$I_C(\text{max})$	500		mA
Power dissipation *2	P_D	150		mW
Junction temperature	T_j	150		$^{\circ}\text{C}$
Storage temperature	T_{stg}	-55 to +150		$^{\circ}\text{C}$

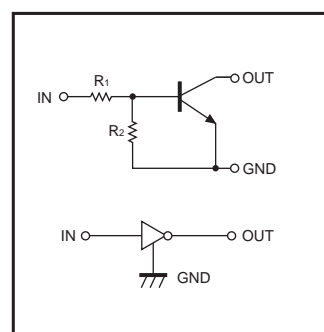
*1 Characteristics of built-in transistor.

*2 Each terminal mounted on a recommended land.

●Dimensions (Unit : mm)



●Inner circuit



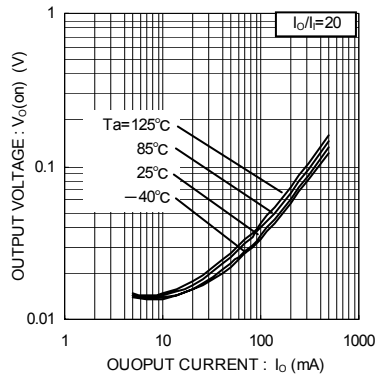
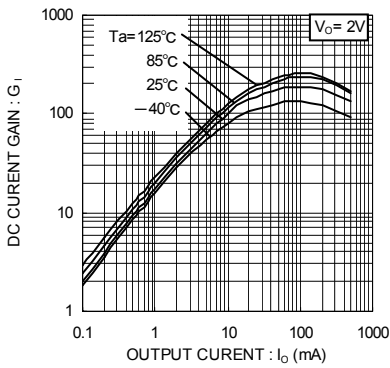
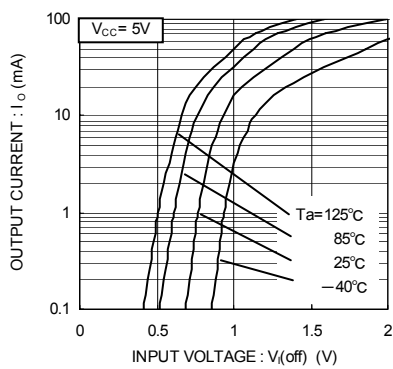
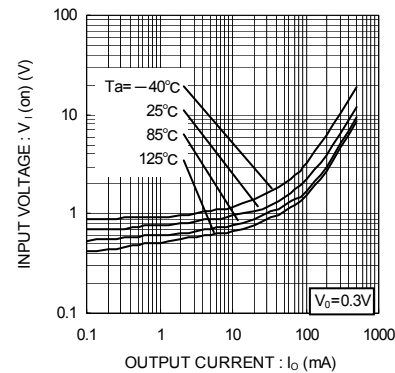
$R_1=2.2\text{k}\Omega$ / $R_2=10\text{k}\Omega$

●Electrical characteristics (Ta=25°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	$V_{O(on)}$	—	60	300	mV	$I_o/I_i=100mA / 5mA$
Input current	I_i	—	—	3.0	mA	$V_i=5V$
Output current	$I_{o(off)}$	—	—	500	nA	$V_{CC}=12V, V_i=0V$
DC current gain	G_i	140	—	—	—	$V_o=2V, I_o=100mA$
Transition frequency *	f_r	—	260	—	MHz	$V_{CE}=10V, I_E=-5mA, f=100MHz$
Input resistance	R_i	1.54	2.2	2.86	k Ω	—
Resistance ratio	R_2/R_1	3.6	4.5	5.5	—	—

* Characteristics of built-in transistor.

●Electrical characteristics curves



Notes

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