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

DTB513ZE / DTB513ZM

●Applications

Inverter, Interface, Driver

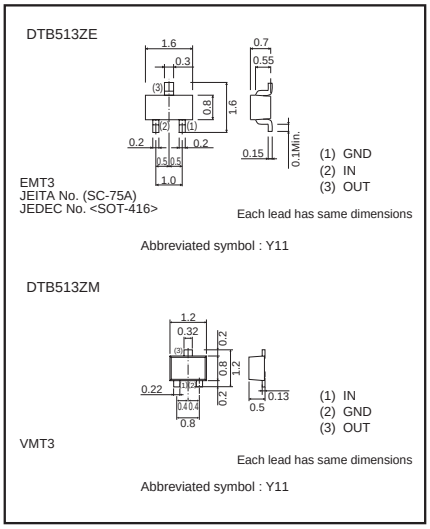
●Feature

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 plannar silicon transistor
(Resistor built-in type)

●Dimensions (Unit : mm)



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits		Unit
		DTB513ZE	DTB513ZM	
Supply voltage	V_{CC}	−12		V
Input voltage	V_{IN}	−10 to +5		V
Collector current ※1	$I_{C\ (max)}$	−500		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

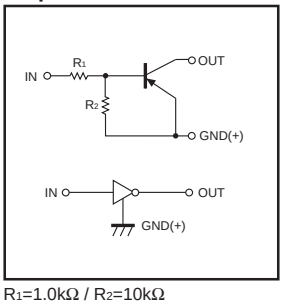
	Package	EMT3	VMT3
	Packaging type	Taping	Taping
	Code	TL	T2L
Part No.	Basic ordering unit (pieces)	3000	8000
DTB513ZE		○	−
DTB513ZM		−	○

●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=−100μA
	$V_{I(on)}$	−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	−	−	−6.4	mA	V_I= −5V
Output current	$I_{O(off)}$	−	−	−0.5	μA	V_{CC}=−12V, 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	0.7	1.0	1.3	kΩ	−
Resistance ratio	R_2/R_1	8.0	10	12	−	−

※ Characteristics of built-in transistor.

●Equivalent circuit



R_1=1.0kΩ / R_2=10kΩ

●**Electrical characteristic curves**

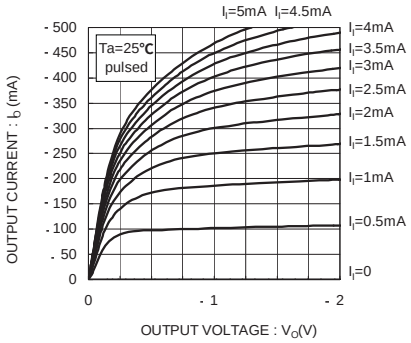


Fig.1 Output Current vs. Output Voltage

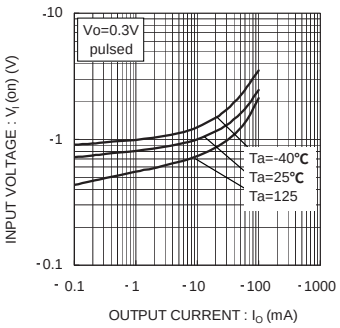


Fig.2 Input Voltage vs. Output Current

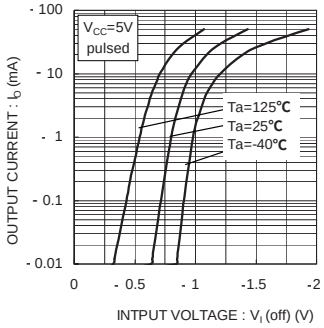


Fig.3 Output Current vs. Input Voltage

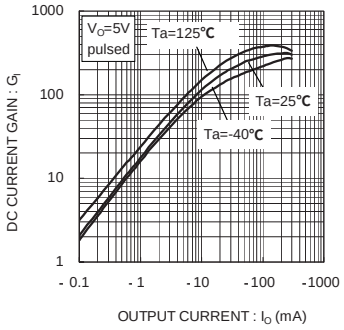


Fig.4 DC Current Gain vs. Output Current

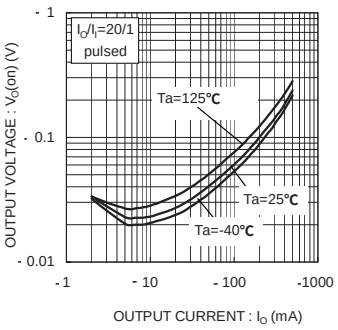


Fig.5 Output Voltage vs. Output Current

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