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500mA / 50V Digital transistors (with built-in resistors)

DTD122JK

●Applications

Inverter, Interface, Driver

●Features

- 1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors.
- 2) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input, and parasitic effects are almost completely eliminated.
- 3) Only the on / off conditions need to be set for operation, making the device design easy.
- 4) Higher mounting densities can be achieved.

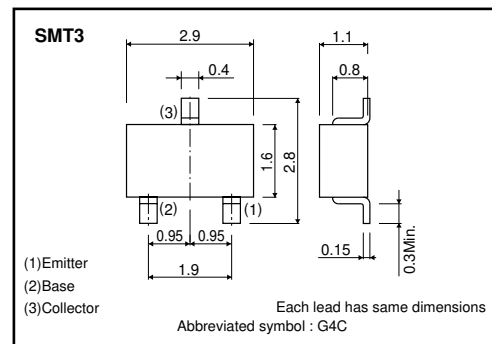
●Structure

NPN epitaxial planar silicon transistor
(Resistor built-in type)

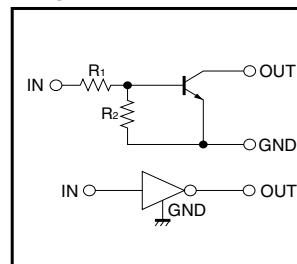
●Packaging specifications

	Package	SMT3
	Packaging type	Taping
	Code	T146
Part No.	Basic ordering unit (pieces)	3000
DTB122JK		○

●External dimensions (Unit : mm)



●Equivalent circuit



$R_1=0.22k\Omega$ $R_2=4.7k\Omega$

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Supply voltage	V _{CC}	50	V
Input voltage	V _{IN}	-5 to +5	V
Output current	I _C	500	mA
Power dissipation	P _D	200	mW
Junction temperature	T _J	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

Transistors

●External 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	–	–		$V_o=0.3V, I_o=30mA$
Output voltage	$V_{O(on)}$	–	0.1	0.3	V	$I_o/I_i=50mA/2.5mA$
Input current	I_i	–	–	45	mA	$V_i=5V$
Output current	$I_{O(off)}$	–	–	0.5	μA	$V_{CC}=50V, V_i=0V$
DC current gain	G_i	47	–	–	–	$I_o=50mA, V_o=5V$
Input resistance	R_1	154	220	286	Ω	–
Resistance ratio	R_2/R_1	17.1	21.3	25.6	–	–
Transition frequency	f_T *	–	200	–	MHz	$V_{CE}=10V, I_E=-50mA, f=100MHz$

* Characteristics of built-in transistor

●Electrical characteristics curves

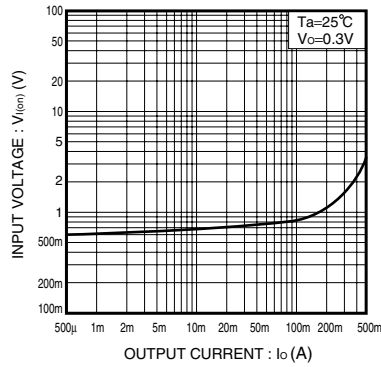


Fig.1 Input voltage vs. Output current (ON characteristics)

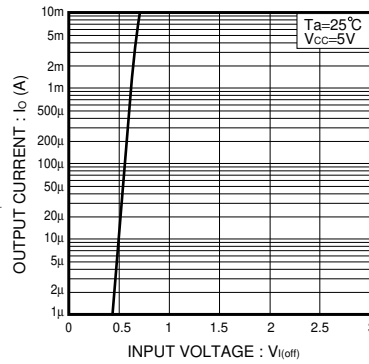


Fig.2 Output current vs. Input voltage (OFF characteristics)

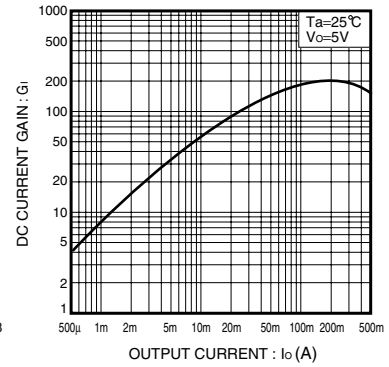


Fig.3 DC current gain vs. Output current

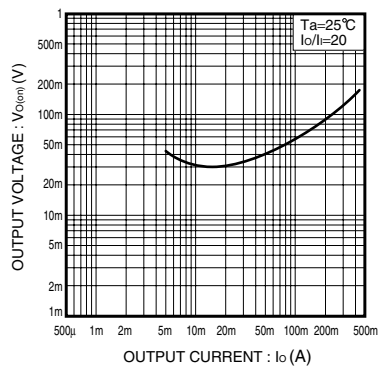


Fig.4 Output voltage vs. Output current

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