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

DTD122JK

●Applications
Inverter, Interface, Driver

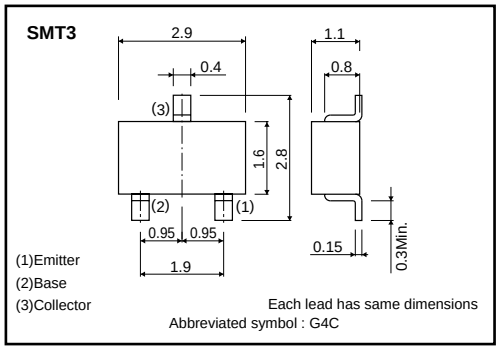
●Features
1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors.
2) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input, and parasitic effects are almost completely eliminated.
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)

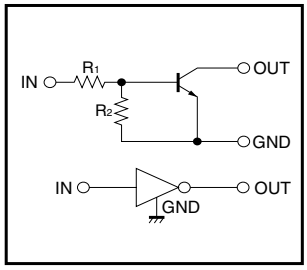
●Packaging specifications

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

●External dimensions (Unit : mm)



● Equivalent circuit



R1=0.22kΩ R2=4.7kΩ

●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	Tj	150	℃
Storage temperature	Tstg	−55 to +150	℃

●**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=100μA
	$V_{I(on)}$	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**

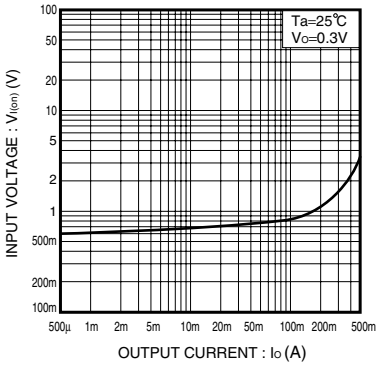


Fig.1 Input voltage vs. Output current (ON characteristics)

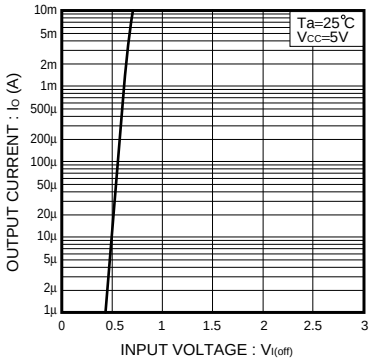


Fig.2 Output current vs. Input voltage (OFF characteristics)

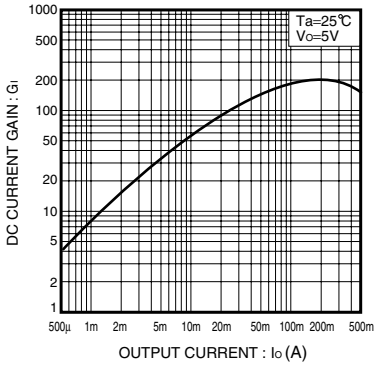


Fig.3 DC current gain vs. Output current

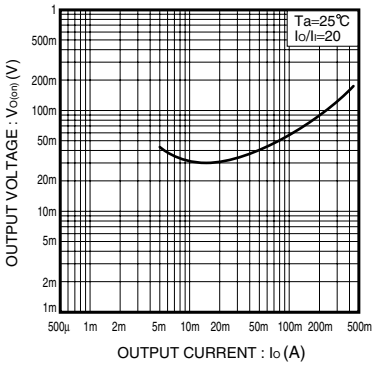


Fig.4 Output voltage vs. Output current

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