-100mA / -50V Digital transistors (with built-in resistors)

DTA123YE / DTA123YUA / DTA123YKA / DTA123YSA

●Applications
Inverter, Interface, Driver

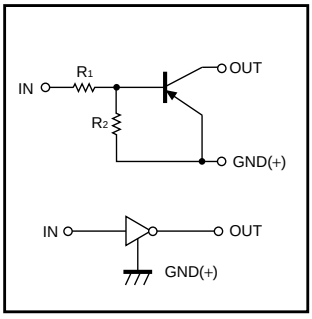
●Features
1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
2) The bias resistors consist of thin-film resistors with complete isolation to allow positive biasing of the input. They also have the advantage of almost completely eliminating parasitic effects.
3) Only the on/off conditions need to be set for operation, making the device design easy.

●Structure
PNP epitaxial planar silicon transistor
(Resistor built-in type)

●Packaging specifications

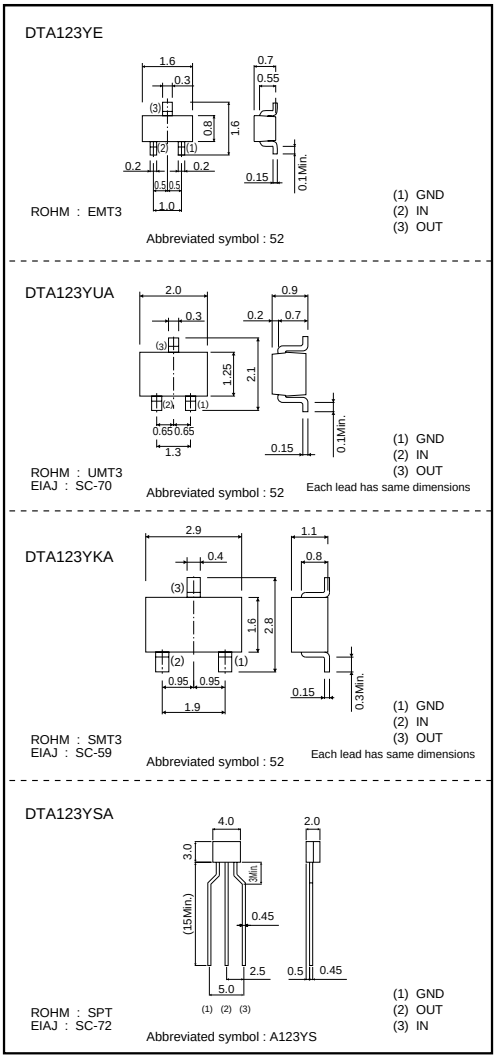
	Package	EMT3	UMT3	SMT3	SPT
	Package type	Taping	Taping	Taping	Taping
	Code	TL	T106	T146	TP
Part No.	Basic ordering unit (pieces)	3000	3000	3000	5000
DTA123YE		○	–	–	–
DTA123YUA		–	○	–	–
DTA123YKA		–	–	○	–
DTA123YSA		–	–	–	○

●Equivalent circuit



R1=2.2kΩ R2=10kΩ

●External dimensions (Unit : mm)



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits				Unit
		DTA123YE	DTA123YUA	DTA123YKA	DTA123YSA	
Supply voltage	V_{CC}	−50				V
Input voltage	V_{IN}	−12 to +5				V
Output current	I_O	−100				mA
	$I_{C(Max.)}$	−100				
Power dissipation	P_D	150	200		300	mW
Junction temperature	Tj	150				°C
Storage temperature	Tstg	−55 to +150				°C

●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
	$V_{I(on)}$	−3	−	−		V_O=−0.3V, I_O=−20mA
Output voltage	$V_{O(on)}$	−	−0.1	−0.3	V	I_O/I_I=−10mA/−0.5mA
Input current	I_I	−	−	−3.8	mA	V_I=−5V
Output current	$I_{O(off)}$	−	−	−0.5	μA	V_{CC}=−50V, V_I=0V
DC current gain	G_I	33	−	−	−	V_O=−5V, I_O=−10mA
Input resistance	R_1	1.54	2.2	2.86	kΩ	−
Resistance ratio	R_2/R_1	3.6	4.5	5.5	−	−
Transition frequency	f_T *	−	250	−	MHz	V_{CE}=−10V, I_E=5mA, f=100MHz

* Characteristics of built-in transistor

●Electrical characteristic curves

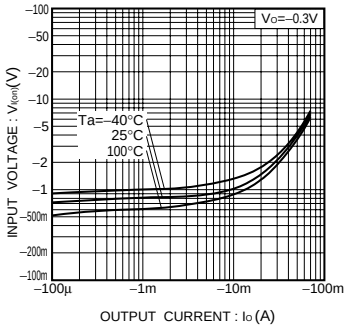


Fig.1 Input voltage vs. output current (ON characteristics)

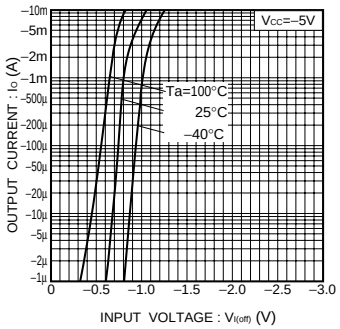


Fig.2 Output current vs. input voltage (OFF characteristics)

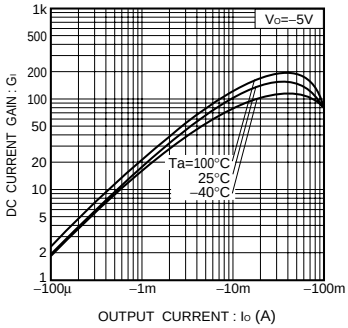


Fig.3 DC current gain vs. output current

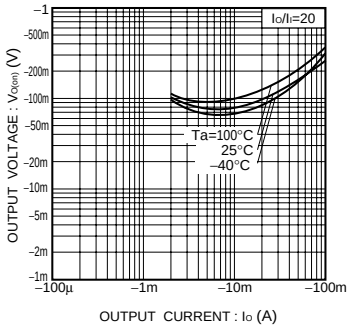


Fig.4 Output voltage vs. output current

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