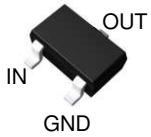
DTD123YK

NPN 500mA 50V Digital Transistors (Bias Resistor Built-in Transistors) Datasheet

Parameter	Value
V_{CC}	50V
$I_{C(MAX.)}$	500mA
R_1	2.2kΩ
R_2	10kΩ

●Outline

SMT3

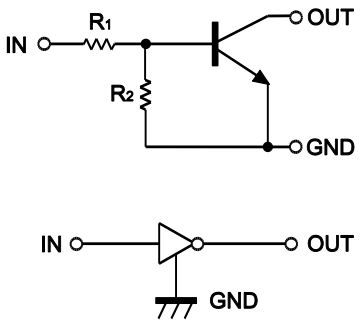


DTD123YK
SOT-346 (SC-59)

●Features

1) Built-In Biasing Resistors
2) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner 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 completely eliminating parasitic effects.
4) Only the on/off conditions need to be set for operation, making the circuit design easy.
5) Complementary PNP Types :DTB123YK
6) Lead Free/RoHS Compliant.

●Inner circuit



●Application

Switching circuit, Inverter circuit, Interface circuit, Driver circuit

●Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
DTD123YK	SMT3	2928	T146	180	8	3,000	F62

●Absolute maximum ratings (Ta = 25℃)

Parameter	Symbol	Values	Unit
Supply voltage	V_{CC}	50	V
Input voltage	V_{IN}	−5 to +12	V
Collector current	I_C *1	500	mA
Power dissipation	P_D *2	200	mW
Junction temperature	T_j	150	℃
Range of storage temperature	T_{stg}	−55 to +150	℃

●Electrical characteristics(Ta = 25℃)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input voltage	$V_{I(off)}$	V_{CC} = 5V, I_O = 100μA	-	-	0.3	V
	$V_{I(on)}$	V_O = 0.3V, I_O = 20mA	2.0	-	-	
Output voltage	$V_{O(on)}$	I_O / I_I = 50mA / 2.5mA	-	0.1	0.3	V
Input current	I_I	V_I = 5V	-	-	3.6	mA
Output current	$I_{O(off)}$	V_{CC} = 50V, V_I = 0V	-	-	0.5	μA
DC current gain	G_I	V_O = 5V, I_O = 50mA	56	-	-	-
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 *1	V_{CE} = 10V, I_E = −50mA, f = 100MHz	-	200	-	MHz

*1 Characteristics of built-in transistor

*2 Each terminal mounted on a reference footprint

●**Electrical characteristic curves**(Ta = 25℃)

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

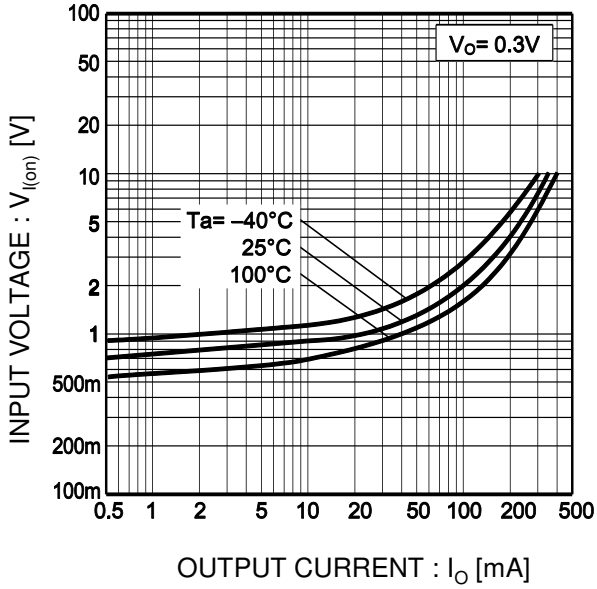


Fig.2 Output current vs. input voltage (OFF characteristics)

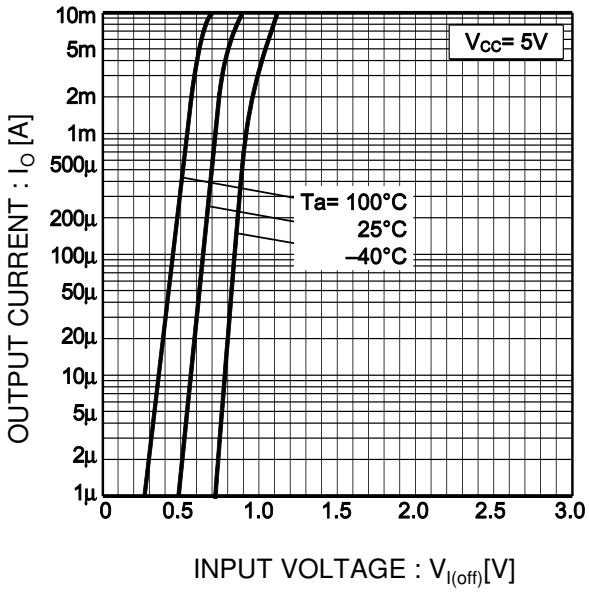


Fig.3 Output current vs. output voltage

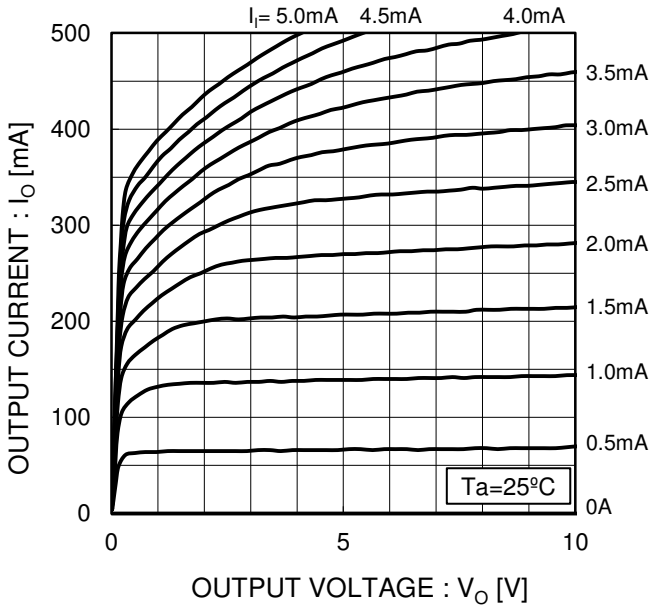
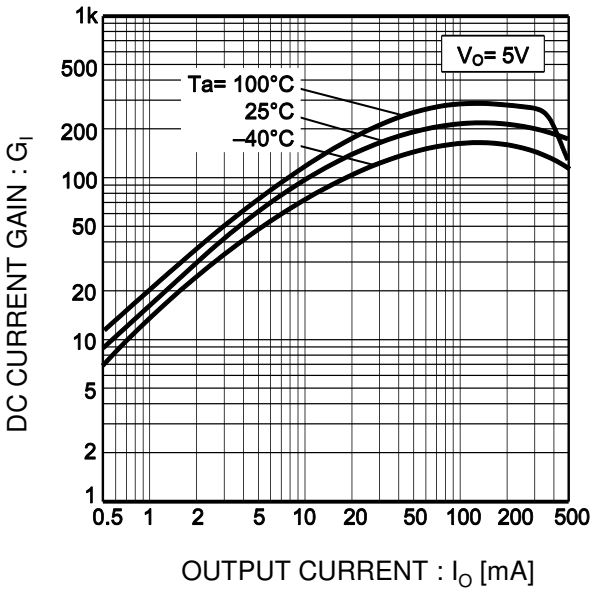
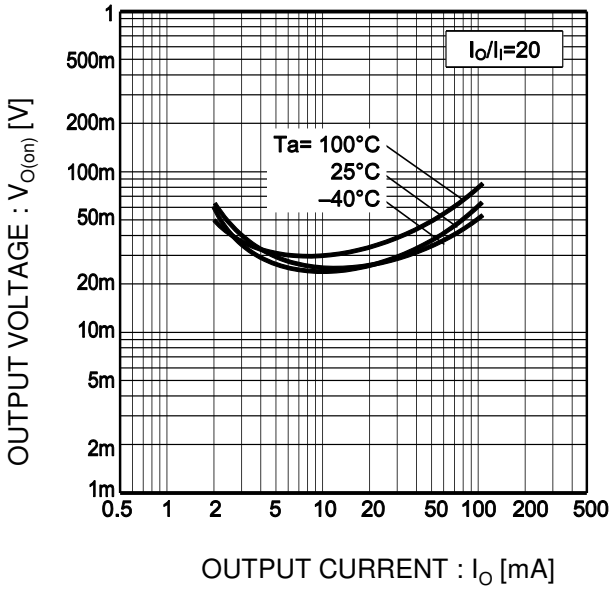


Fig.4 DC current gain vs. output current



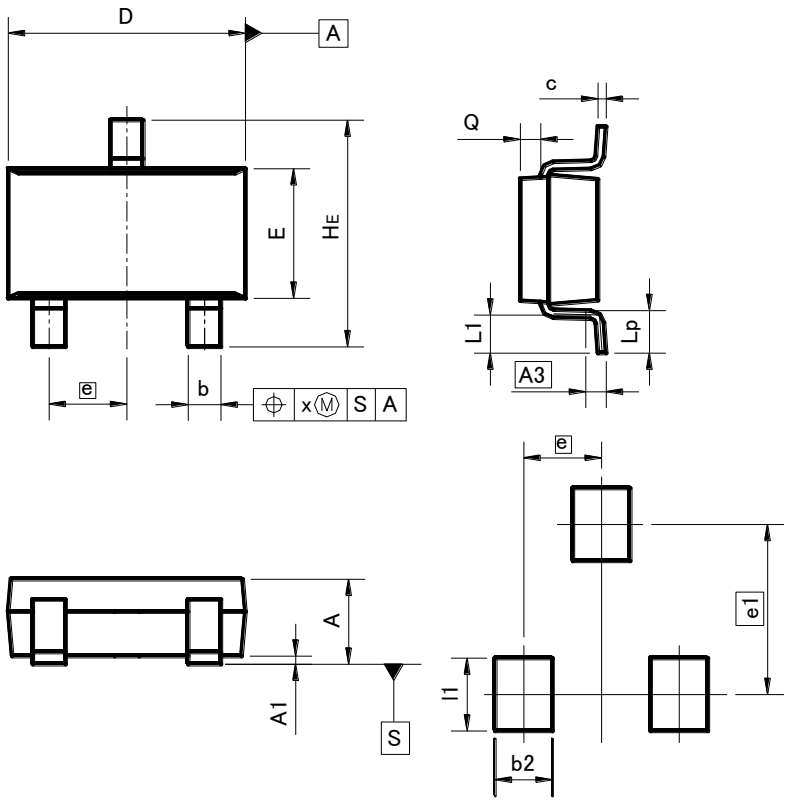
●**Electrical characteristic curves**(Ta = 25℃)

Fig.5 Output voltage vs. output current



●**Dimensions** (Unit : mm)

SMT3



Patterm of terminal position areas

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.00	1.30	–	0.051
A1	0.00	0.10	0	0.004
A3	0.25		0.01	
b	0.35	0.50	0.014	0.02
c	0.09	0.25	0.004	0.01
D	2.80	3.00	0.11	0.118
E	1.50	1.80	0.059	0.071
e	0.95		0.04	
HE	2.60	3.00	0.102	0.118
L1	0.30	0.60	0.012	0.024
Lp	0.40	0.70	0.016	0.028
Q	0.20	0.30	0.008	0.012
x	–	0.10	–	0.004
y	–	0.10	–	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
e1	2.10		0.08	
b2		0.60	–	0.024
l1	–	0.90	–	0.035

Dimension in mm/inches

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