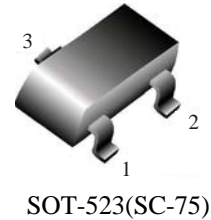


Digital transistors (built-in resistors)

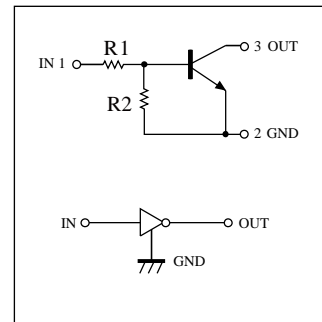
• Features

- 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 negative 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 device design easy.



• Device Marking and Ordering Information

Device	Marking	Shipping
DTC501E	23	3000/Tape&Reel



• Absolute maximum ratings ($T_A = 25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Supply voltage	V_{CC}	50	V
Input voltage	V_{IN}	-10~+30	V
Output current	I_O	100	mA
	$I_{C(Max)}$	100	
Power dissipation	P_d	150	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55~+150	$^\circ\text{C}$

• Electrical characteristics ($T_A = 25^\circ\text{C}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	-	-	0.5	V	$V_{CC} = 5V, I_O = 100\mu A$
	$V_{I(on)}$	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	-	-	1.8	mA	$V_I = 5V$
Output current	$I_{O(off)}$	-	-	0.5	μA	$V_{CC} = 50V, V_I = 0V$
DC current gain	G_I	30	-	-	-	$V_O = 5V, I_O = 10mA$
Input resistance	R_1	3.29	4.7	6.11	k Ω	-
Resistance ratio	R_2/R_1	0.8	1	1.2	-	-
Transition frequency	f_T	-	250	-	MHz	$V_{CE} = 10V, I_E = -5mA, f = 100MHz$ *

* Transition frequency of the device

• Electrical characteristic curves

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

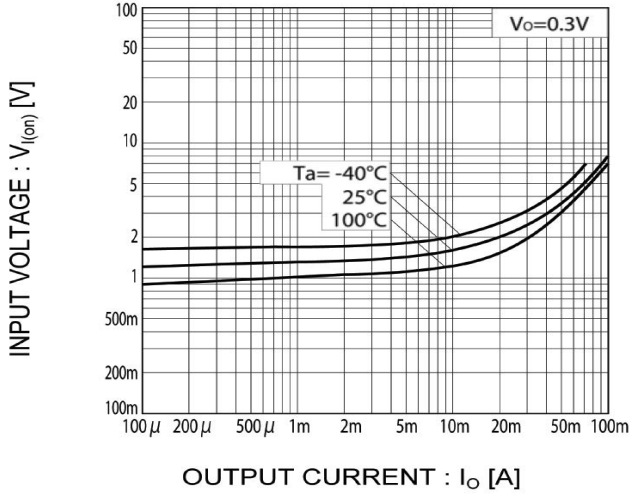


Fig.2 Output current vs. input voltage (OFF characteristics)

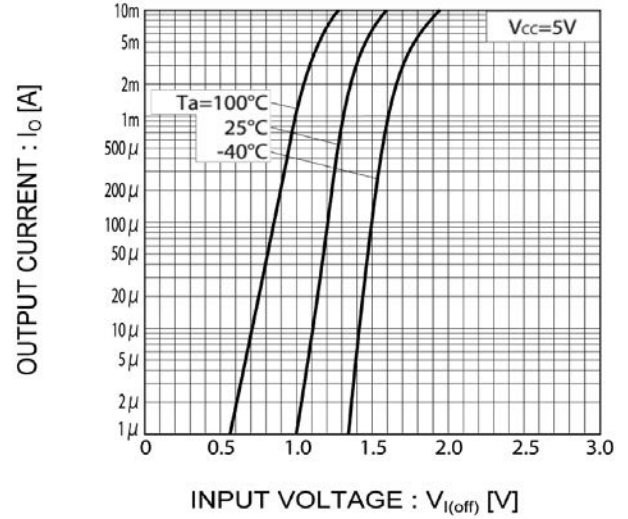


Fig.3 Output current vs. output voltage

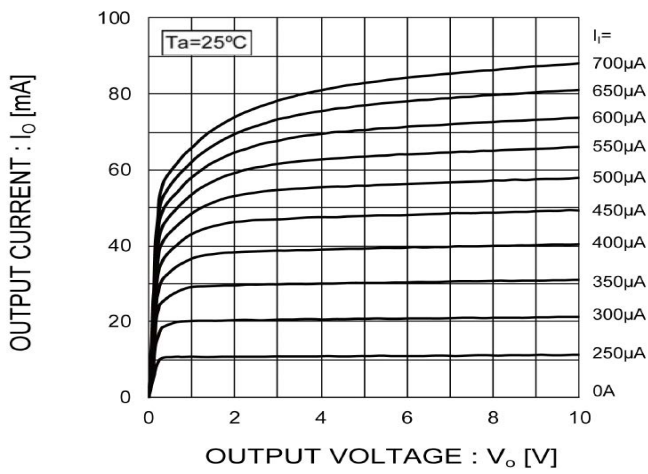


Fig.4 DC current gain vs. output current

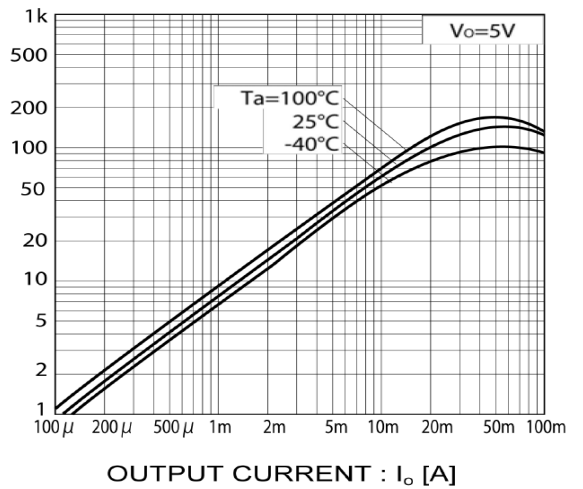
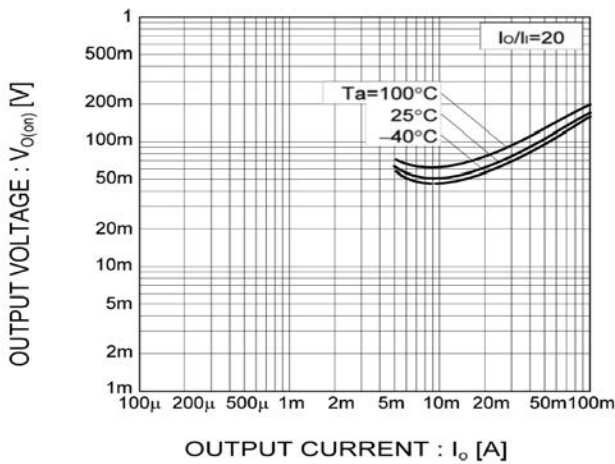
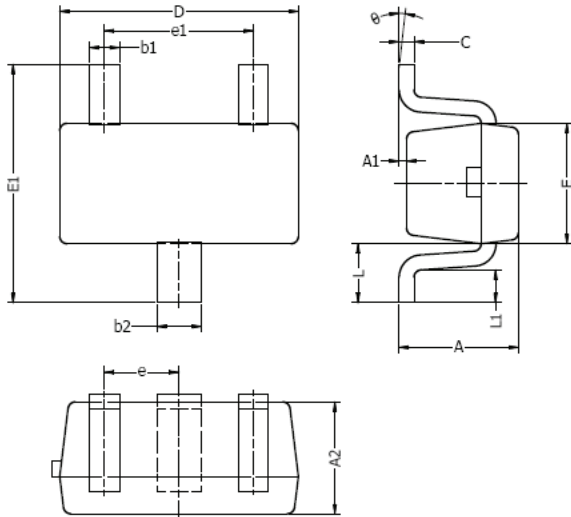


Fig.5 Output voltage vs. output current

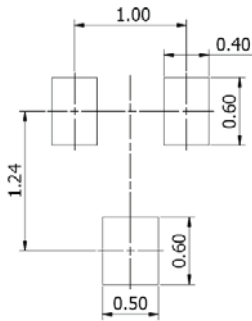


SOT-523(SC-75) OUTLINE AND DIMENSIONS



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.70	0.90	0.028	0.035
A1	0.00	0.10	0.000	0.004
A2	0.70	0.80	0.028	0.031
b1	0.15	0.25	0.006	0.010
b2	0.25	0.35	0.010	0.014
c	0.10	0.20	0.004	0.008
D	1.50	1.70	0.059	0.067
E	0.70	0.90	0.028	0.035
E1	1.45	1.75	0.057	0.069
e	0.50 TYP.		0.020 TYP.	
e1	0.90	1.10	0.035	0.043
L	0.40 REF.		0.016 REF.	
L1	0.10	0.30	0.004	0.012
θ	0°	8°	0°	8°

Typical Soldering Pattern:



NOTES:

- Above package outline conforms to JEITA EAIJ ED-7500A SC-75.
- Dimensions are exclusive of Burrs, Mold Flash & Tie Bar extrusions.