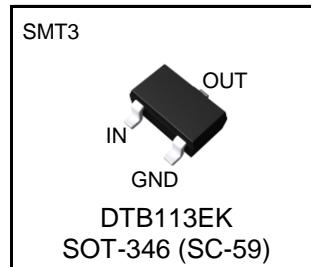


Parameter	Value
$V_{CC}$	-50V
$I_{C(MAX.)}$	-500mA
$R_1$	1k $\Omega$
$R_2$	1k $\Omega$

### ●Outline



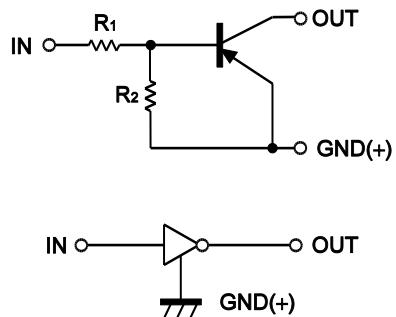
### ●Features

- 1) Built-In Biasing Resistors,  $R_1 = R_2 = 1k\Omega$ .
- 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 NPN Types :DTD113EK
- 6) Lead Free/RoHS Compliant.

### ●Application

Switching circuit, Inverter circuit, Interface circuit, Driver circuit

### ●Inner circuit



### ●Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
DTB113EK	SMT3	2928	T146	180	8	3,000	F11

## ● Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Values	Unit
Supply voltage	V <sub>CC</sub>	-50	V
Input voltage	V <sub>IN</sub>	-10 to +10	V
Collector current	I <sub>C(MAX.)</sub> <sup>*1</sup>	-500	mA
Power dissipation	P <sub>D</sub> <sup>*2</sup>	200	mW
Junction temperature	T <sub>j</sub>	150	°C
Range of storage temperature	T <sub>stg</sub>	-55 to +150	°C

## ● Electrical characteristics(Ta = 25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input voltage	V <sub>I(off)</sub>	V <sub>CC</sub> = -5V, I <sub>O</sub> = -100μA	-	-	-0.5	V
	V <sub>I(on)</sub>	V <sub>O</sub> = -0.3V, I <sub>O</sub> = -20mA	-3.0	-	-	
Output voltage	V <sub>O(on)</sub>	I <sub>O</sub> / I <sub>I</sub> = -50mA / -2.5mA	-	-0.1	-0.3	V
Input current	I <sub>I</sub>	V <sub>I</sub> = -5V	-	-	-7.2	mA
Output current	I <sub>O(off)</sub>	V <sub>CC</sub> = -50V, V <sub>I</sub> = 0V	-	-	-0.5	μA
DC current gain	G <sub>I</sub>	V <sub>O</sub> = -5V, I <sub>O</sub> = -50mA	33	-	-	-
Input resistance	R <sub>1</sub>	-	0.7	1.0	1.3	kΩ
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>	-	0.8	1.0	1.2	-
Transition frequency	f <sub>T</sub> <sup>*1</sup>	V <sub>CE</sub> = -10V, I <sub>E</sub> = 50mA, f = 100MHz	-	200	-	MHz

\*1 Characteristics of built-in transistor

\*2 Each terminal mounted on a reference footprint

● Electrical characteristic curves (Ta = 25°C)

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

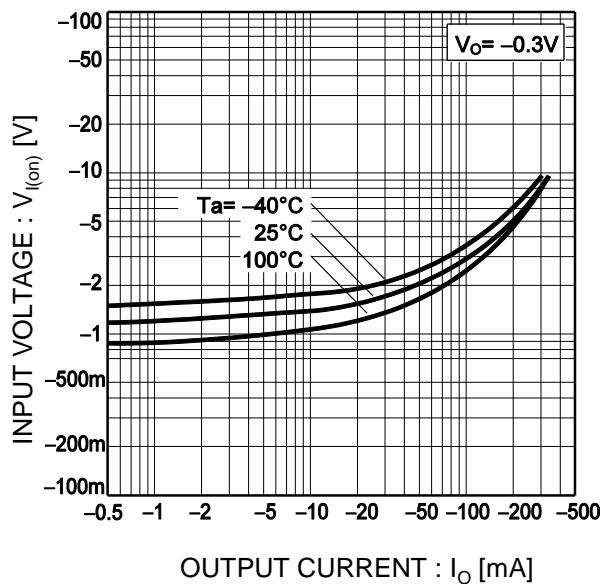


Fig.2 Output current vs. input voltage  
(OFF characteristics)

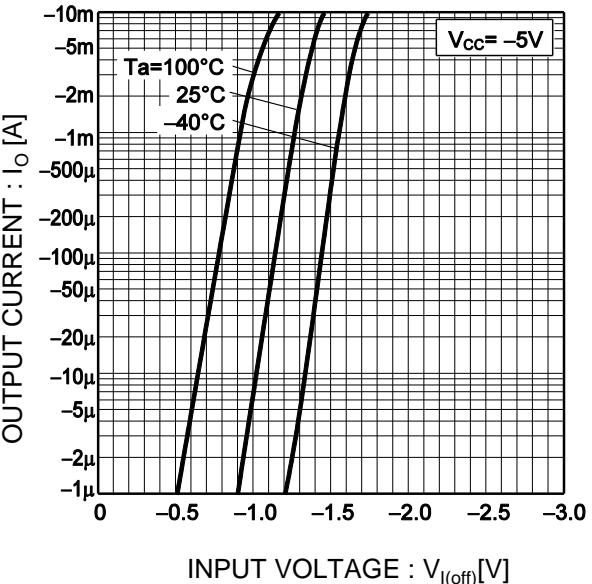


Fig.3 Output current vs. output voltage

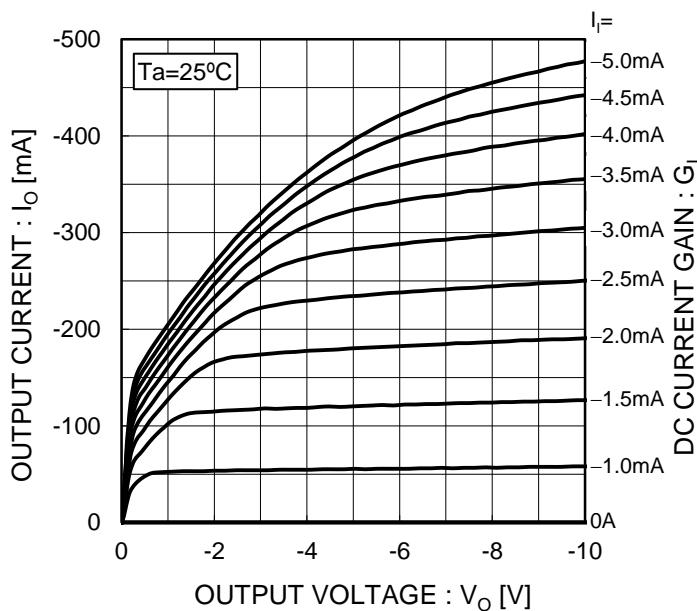
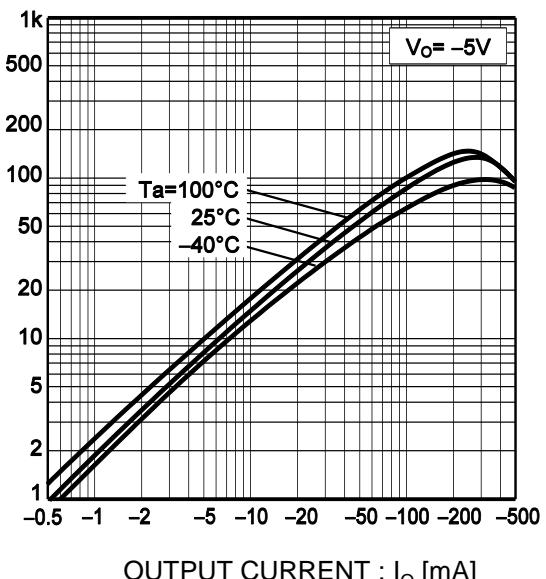
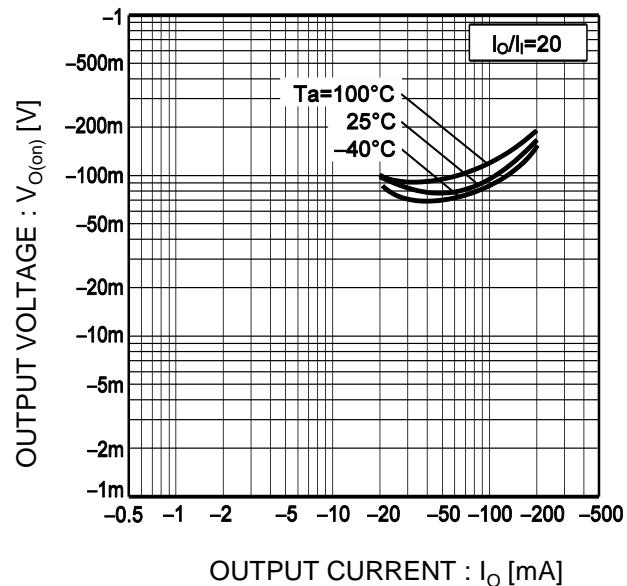


Fig.4 DC current gain vs. output current



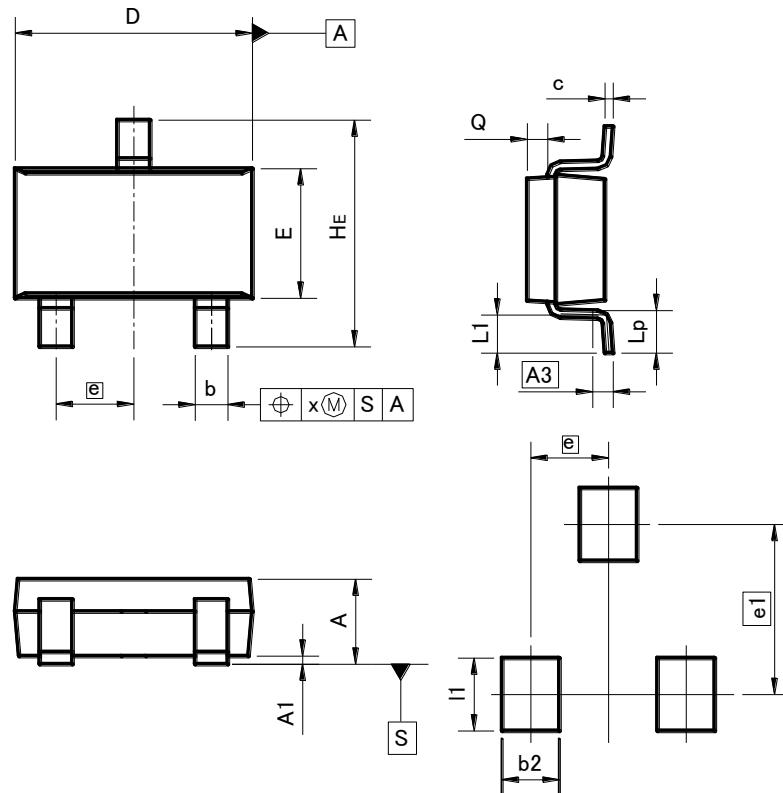
**●Electrical characteristic curves(Ta = 25°C)**

Fig.5 Output voltage vs. output current



## ●Dimensions (Unit : mm)

SMT3



Pattern 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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