

Parameter	Value
$V_{CC}$	-50V
$I_{C(MAX.)}$	-500mA
$R_1$	1k $\Omega$
$R_2$	10k $\Omega$

### ●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 NPN Types :DTD113ZK/ DTD113ZU
- 6) Lead Free/RoHS Compliant.

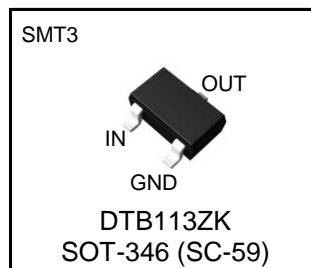
### ●Application

Switching circuit, Inverter circuit, Interface circuit, Driver circuit

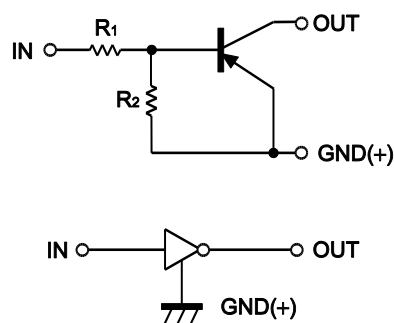
### ●Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
DTB113ZK	SMT3	2928	T146	180	8	3,000	G11

### ●Outline



### ●Inner circuit



●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Values	Unit
Supply voltage	$V_{CC}$	-50	V
Input voltage	$V_{IN}$	-10 to +5	V
Collector current	$I_{C(MAX.)}^{*1}$	-500	mA
Power dissipation	$P_D^{*2}$	200	mW
Junction temperature	$T_j$	150	°C
Range of storage temperature	$T_{stg}$	-55 to +150	°C

●Electrical characteristics(Ta = 25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input voltage	$V_{I(off)}$	$V_{CC} = -5V, I_O = -100\mu A$	-	-	-0.3	V
	$V_{I(on)}$	$V_O = -0.3V, I_O = -20mA$	-3.0	-	-	
Output voltage	$V_{O(on)}$	$I_O / I_I = -50mA / -2.5mA$	-	-0.1	-0.3	V
Input current	$I_I$	$V_I = -5V$	-	-	-7.2	mA
Output current	$I_{O(off)}$	$V_{CC} = -50V, V_I = 0V$	-	-	-0.5	$\mu A$
DC current gain	$G_I$	$V_O = -5V, I_O = -50mA$	56	-	-	-
Input resistance	$R_1$	-	0.7	1.0	1.3	k $\Omega$
Resistance ratio	$R_2/R_1$	-	8	10	12	-
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°C)

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

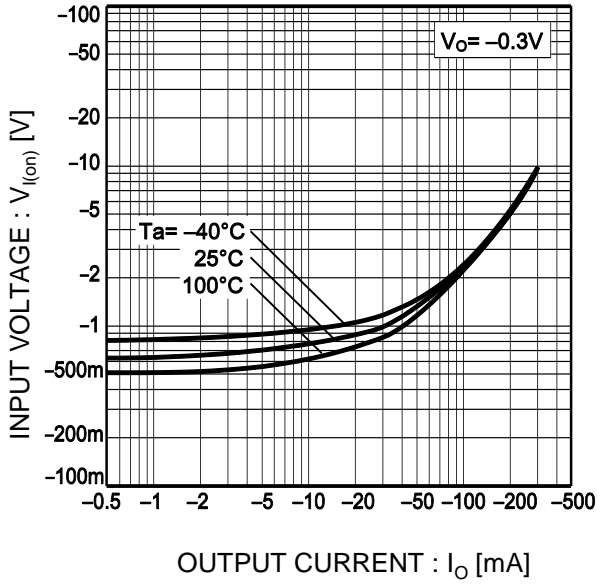


Fig.2 Output current vs. input voltage (OFF characteristics)

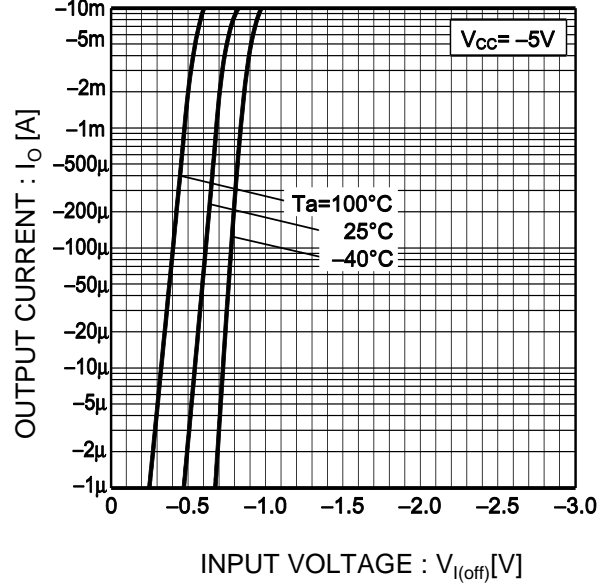


Fig.3 Output current vs. output voltage

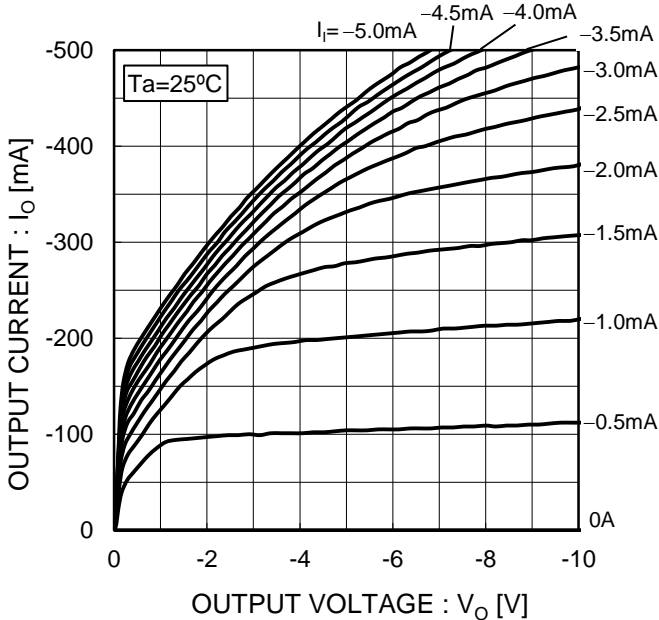
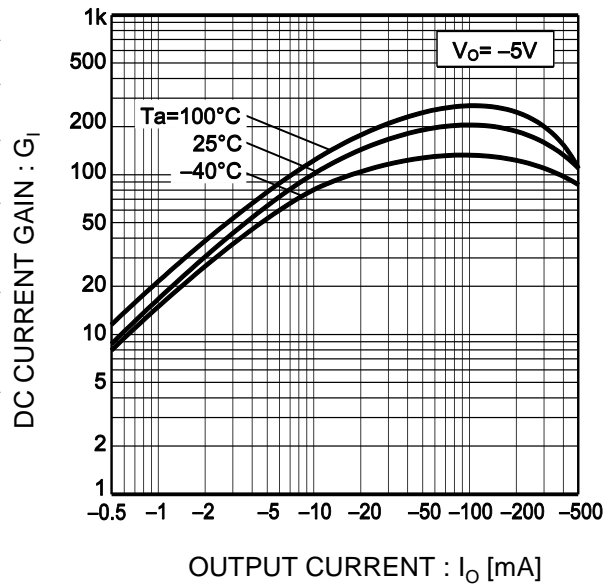
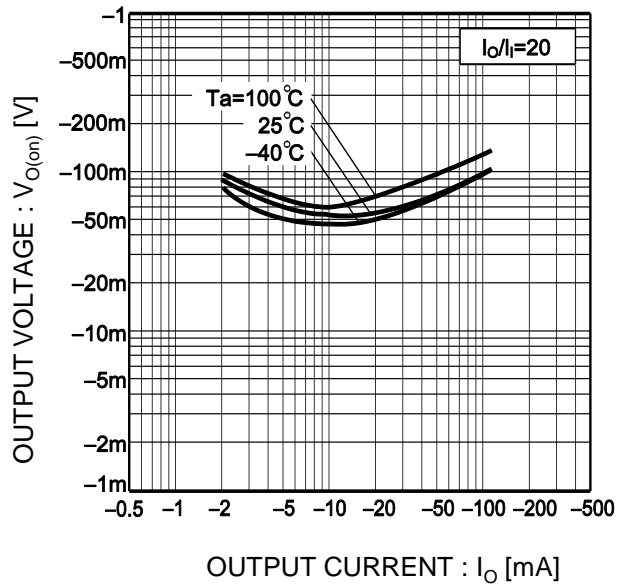


Fig.4 DC current gain vs. output current



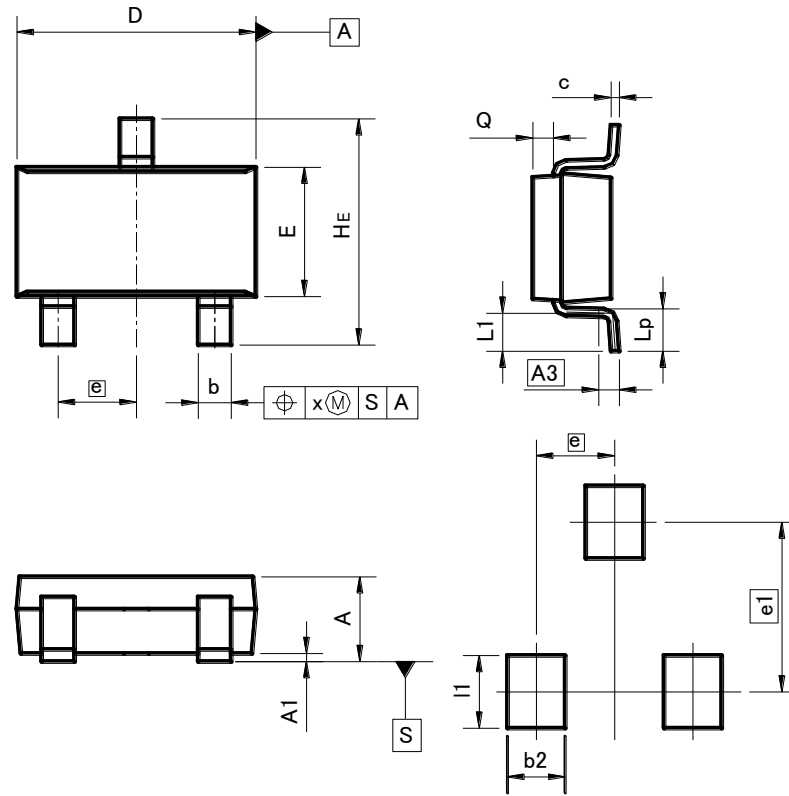
●Electrical characteristic curves( $T_a = 25^\circ\text{C}$ )

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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