

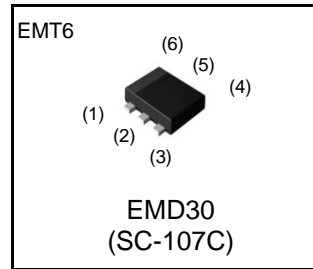
<For DTr1(PNP)>

Parameter	Value
V_{CC}	-30V
$I_{C(MAX.)}$	-200mA
R_1	1k Ω
R_2	10k Ω

<For DTr2(NPN)>

Parameter	Value
V_{CC}	50V
$I_{C(MAX.)}$	100mA
R_1	10k Ω
R_2	10k Ω

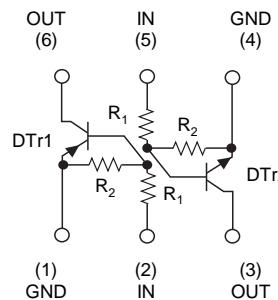
●Outline



●Features

- 1) Both the DTB713Z chip and DTC114E chip in one package.
- 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) Lead Free/RoHS Compliant.

●Inner circuit



●Application

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
EMD30	EMT6	1616	T2R	180	8	8,000	D30

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	DTr1(PNP)	DTr2(NPN)	Unit
Supply voltage	V_{CC}	-30	50	V
Input voltage	V_{IN}	-10 to +5	-10 to +40	V
Output current	I_O	-	50	mA
Collector current	$I_{C(MAX.)}^{*1}$	-200	100	mA
Power dissipation	P_D^{*2}	150 (Total) ^{*3}		mW
Junction temperature	T_j	150		°C
Range of storage temperature	T_{stg}	-55 to +150		°C

●Electrical characteristics (Ta = 25°C) <For DTr1(PNP)>

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input voltage	$V_{I(off)}$	$V_{CC} = -5V, I_O = -100\mu A$	-	-	-0.3	V
	$V_{I(on)}$	$V_O = -0.3V, I_O = -20mA$	-2.5	-	-	
Output voltage	$V_{O(on)}$	$I_O / I_I = -50mA / -2.5mA$	-	-0.07	-0.3	V
Input current	I_I	$V_I = -5V$	-	-	-6.4	mA
Output current	$I_{O(off)}$	$V_{CC} = -30V, V_I = 0V$	-	-	-0.5	μA
DC current gain	G_I	$V_O = -2V, I_O = -100mA$	140	-	-	-
Input resistance	R_1	-	0.7	1	1.3	k Ω
Resistance ratio	R_2/R_1	-	8	10	12	-
Transition frequency	f_T^{*1}	$V_{CE} = -10V, I_E = 5mA$ $f = 100MHz$	-	260	-	MHz

●Electrical characteristics (Ta = 25°C) <For DTr2(NPN)>

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input voltage	$V_{I(off)}$	$V_{CC} = 5V, I_O = 100\mu A$	-	-	0.5	V
	$V_{I(on)}$	$V_O = 0.3V, I_O = 2mA$	3.0	-	-	
Output voltage	$V_{O(on)}$	$I_O / I_I = 10mA / 0.5mA$	-	0.1	0.3	V
Input current	I_I	$V_I = 5V$	-	-	880	μA
Output current	$I_{O(off)}$	$V_{CC} = 50V, V_I = 0V$	-	-	0.5	μA
DC current gain	G_I	$V_O = 5V, I_O = 5mA$	30	-	-	-
Input resistance	R_1	-	7	10	13	k Ω
Resistance ratio	R_2/R_1	-	0.8	1.0	1.2	-
Transition frequency	f_T^{*1}	$V_{CE} = 10V, I_E = -5mA$ $f = 100MHz$	-	250	-	MHz

*1 Characteristics of built-in transistor

*2 Each terminal mounted on a reference footprint

*3 120mW per element must not be exceeded.

●Electrical characteristic curves (Ta = 25°C) <For DTr1(NPN)>

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

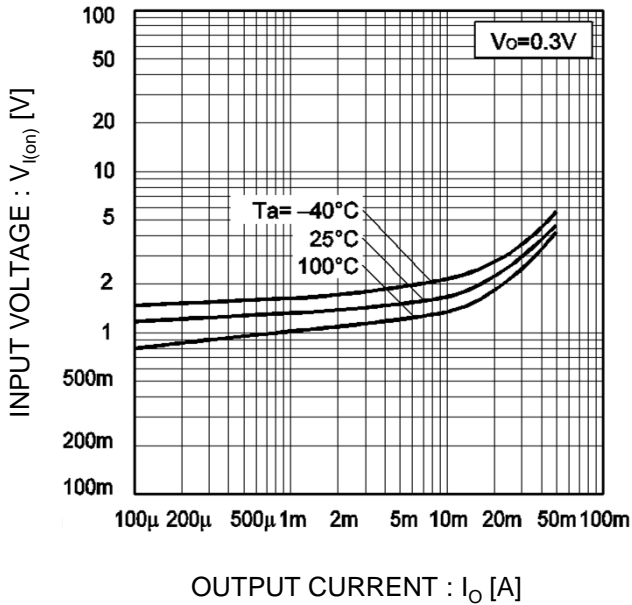


Fig.2 Output current vs. input voltage (OFF characteristics)

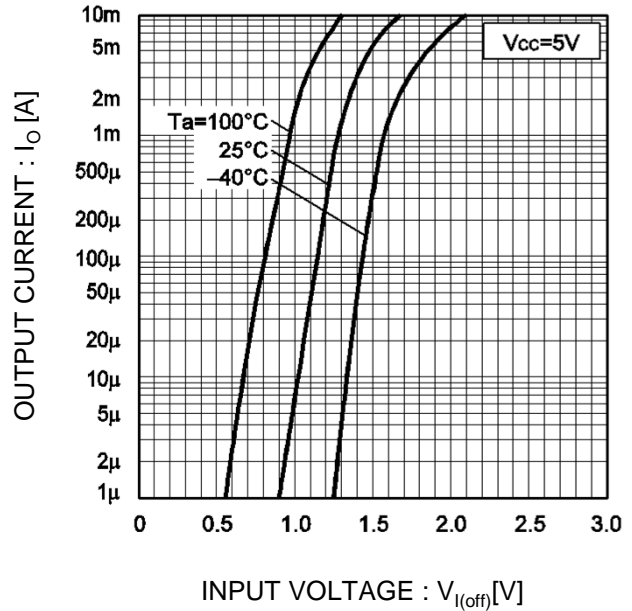


Fig.3 Output current vs. output voltage

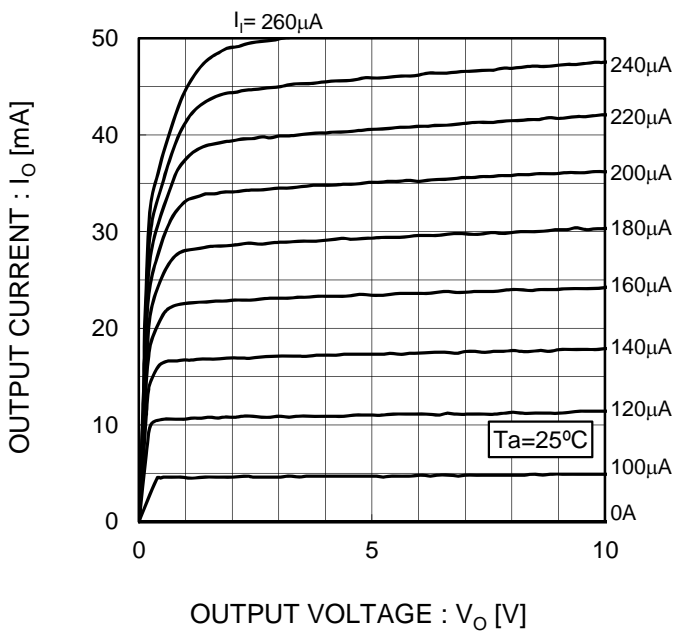
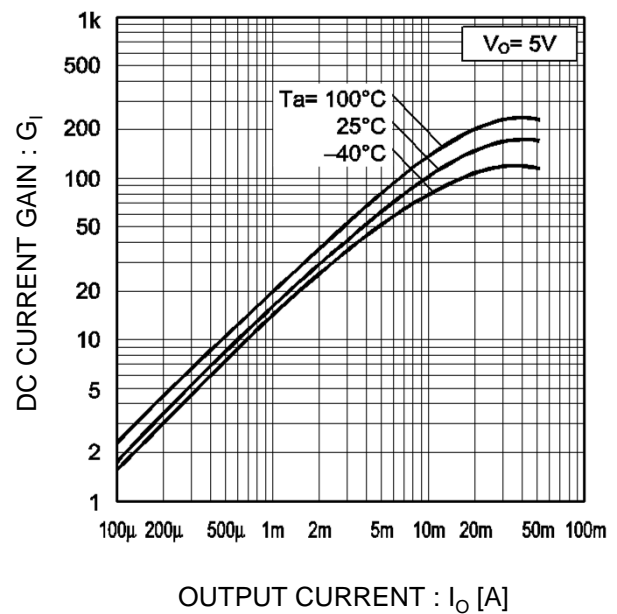
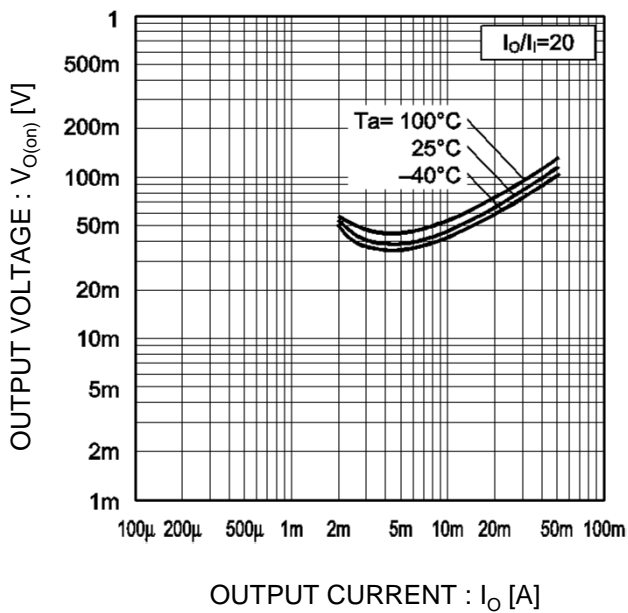


Fig.4 DC current gain vs. output current



●Electrical characteristic curves (Ta = 25°C) <For DTr1(PNP)>

Fig.5 Output voltage vs. output current



●Electrical characteristic curves (Ta = 25°C) <For DTr2(PNP)>

Fig.6 Input voltage vs. output current (ON characteristics)

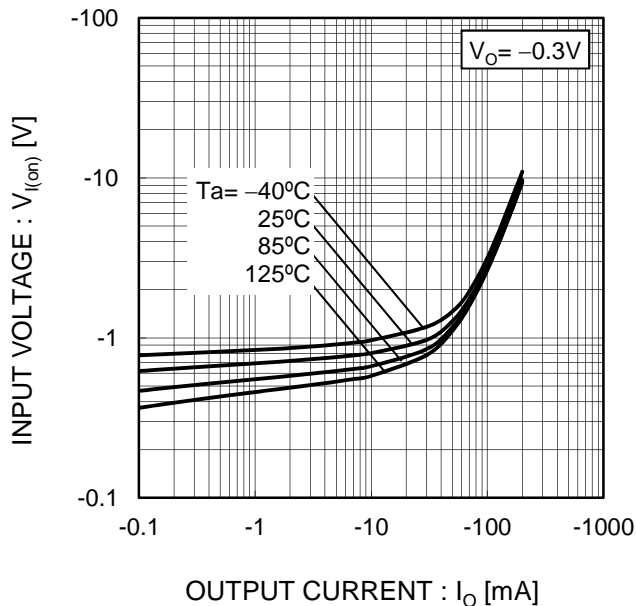
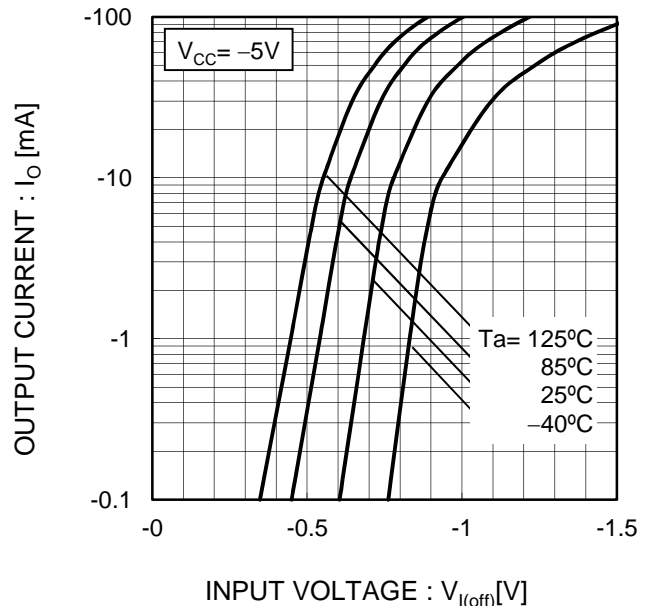


Fig.7 Output current vs. input voltage (OFF characteristics)



●Electrical characteristic curves (Ta = 25°C) <For DTr2(NPN)>

Fig.8 Output current vs. output voltage

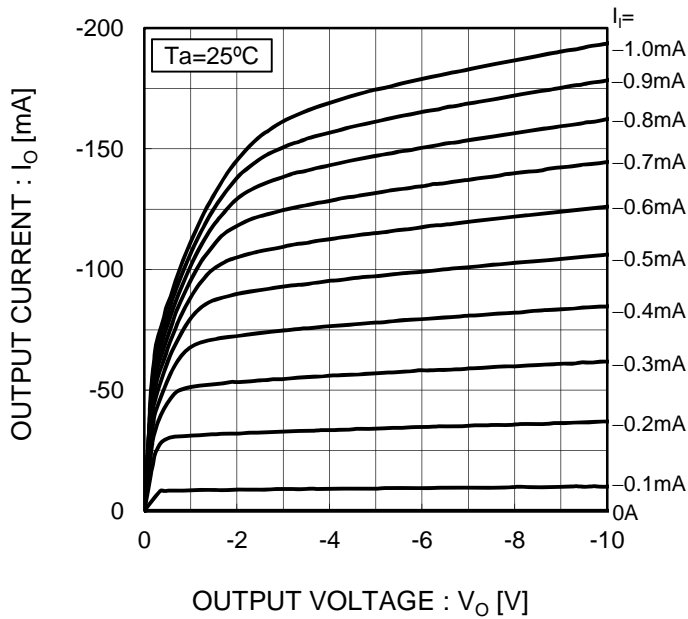


Fig.9 DC current gain vs. output current

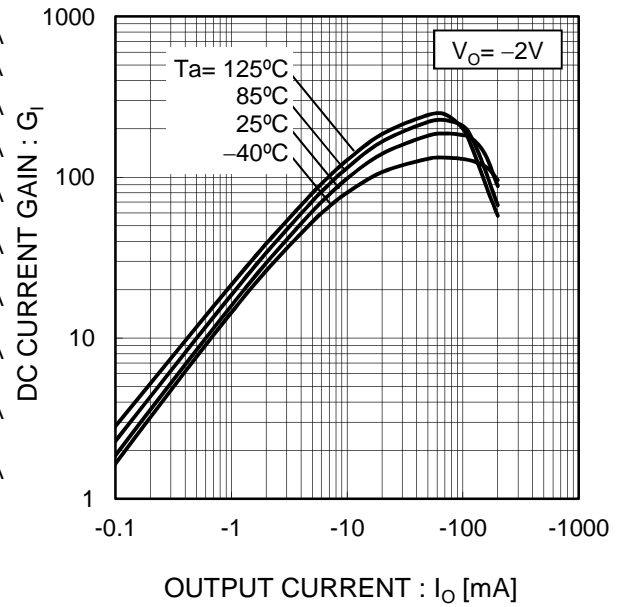
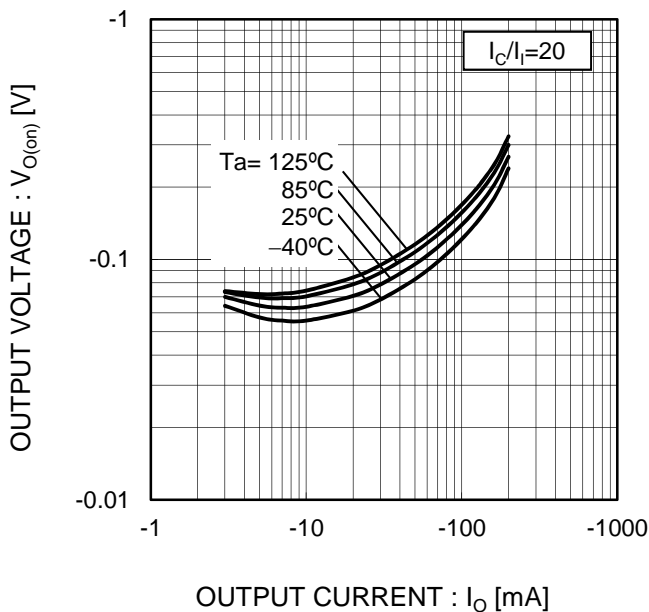
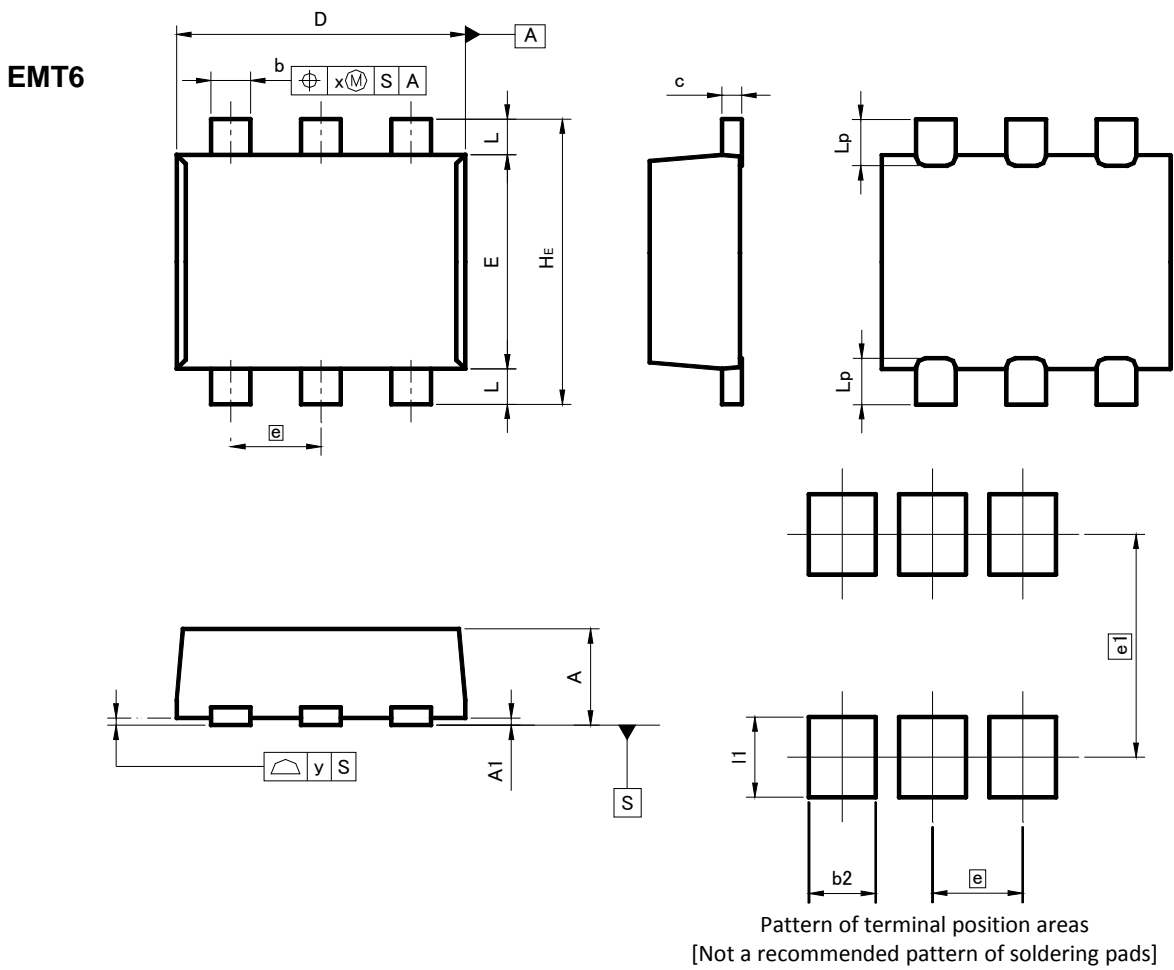


Fig.10 Output voltage vs. output current



●Dimensions (Unit : mm)



DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.45	0.55	0.018	0.022
A1	0.00	0.10	0.000	0.004
b	0.17	0.27	0.007	0.011
c	0.08	0.18	0.003	0.007
D	1.50	1.70	0.059	0.067
E	1.10	1.30	0.043	0.051
e	0.50		0.020	
HE	1.50	1.70	0.059	0.067
L	0.10	0.30	0.004	0.012
Lp	-	0.35	-	0.014
x	-	0.10	-	0.004
y	-	0.10	-	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	-	0.37	-	0.015
e1	1.25		0.049	
l1	-	0.45	-	0.018

Dimension in mm / inches

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