

Parameter	Tr1 and Tr2
$V_{CC}$	50V
$I_{C(MAX.)}$	100mA
$R_1$	47k $\Omega$
$R_2$	47k $\Omega$

### ●Features

- 1) Built-In Biasing Resistors,  $R_1 = R_2 = 47k\Omega$ .
- 2) Two DTC144E chips in one package.
- 3) Emitter(GND)-common type.
- 4) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner circuit).
- 5) 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.
- 6) Only the on/off conditions need to be set for operation, making the circuit design easy.
- 7) Lead Free/RoHS Compliant.

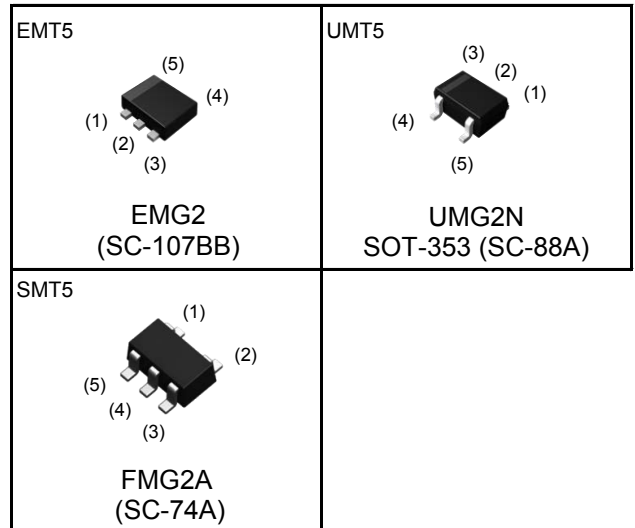
### ●Application

Inverter circuit, Interface circuit, Driver circuit

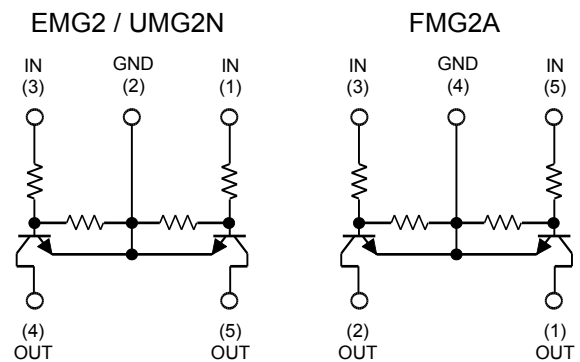
### ●Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
EMG2	EMT5	1616	T2R	180	8	8,000	G2
UMG2N	UMT5	2021	TR	180	8	3,000	G2
FMG2A	SMT5	2928	T148	180	8	3,000	G2

### ●Outline



### ●Inner circuit



●Absolute maximum ratings (Ta = 25°C)

<For Tr1 and Tr2 in common>

Parameter	Symbol	Values	Unit	
Supply voltage	$V_{CC}$	50	V	
Input voltage	$V_{IN}$	-10 to +40	V	
Output current	$I_O$	30	mA	
Collector current	$I_{C(MAX.)}^{*1}$	100	mA	
Power dissipation	EMG2 / UMG2N	$P_D^{*2}$	150 (Total) <sup>*3</sup>	mW
	FMG2A		300 (Total) <sup>*4</sup>	mW
Junction temperature	$T_j$	150	°C	
Range of storage temperature	$T_{stg}$	-55 to +150	°C	

●Electrical characteristics (Ta = 25°C)

<For Tr1 and Tr2 in common>

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	-	-	
Output voltage	$V_{O(on)}$	$I_O / I_I = 10mA / 0.5mA$	-	0.1	0.3	V
Input current	$I_I$	$V_I = 5V$	-	-	0.18	mA
Output current	$I_{O(off)}$	$V_{CC} = 50V, V_I = 0V$	-	-	0.5	$\mu A$
DC current gain	$G_I$	$V_O = 5V, I_O = 5mA$	68	-	-	-
Input resistance	$R_1$	-	32.9	47	61.1	k $\Omega$
Resistance ratio	$R_2/R_1$	-	0.8	1	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.

\*4 200mW per element must not be exceeded.

●Electrical characteristic curves(Ta = 25°C)

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

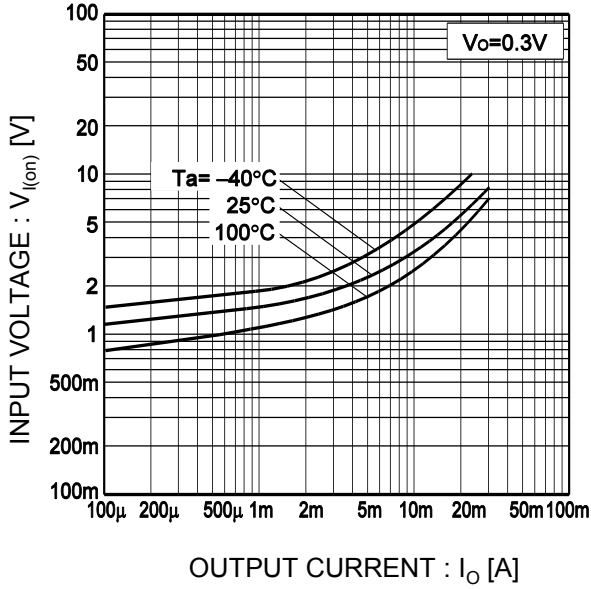


Fig.2 Output current vs. input voltage (OFF characteristics)

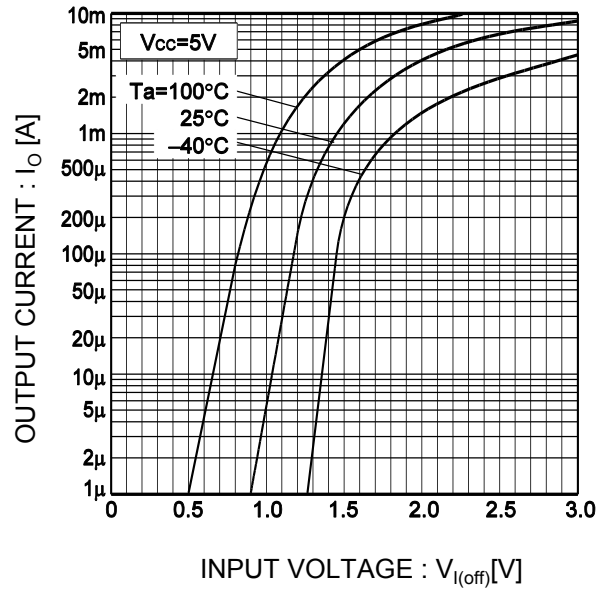


Fig.3 Output current vs. output voltage

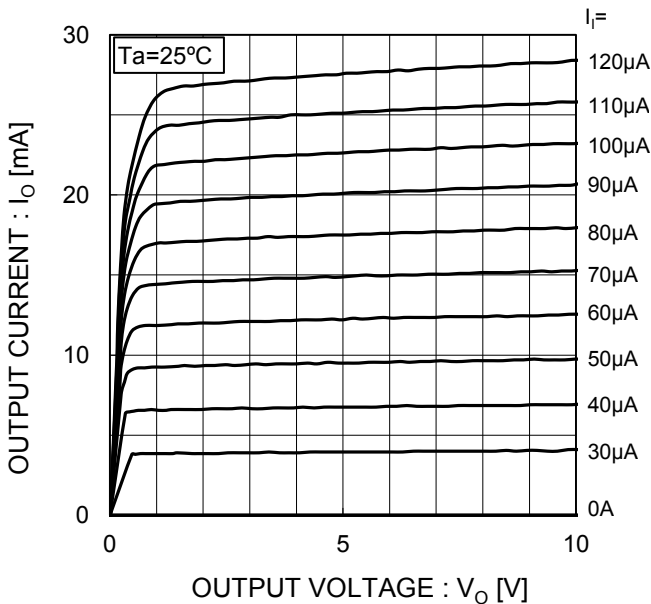
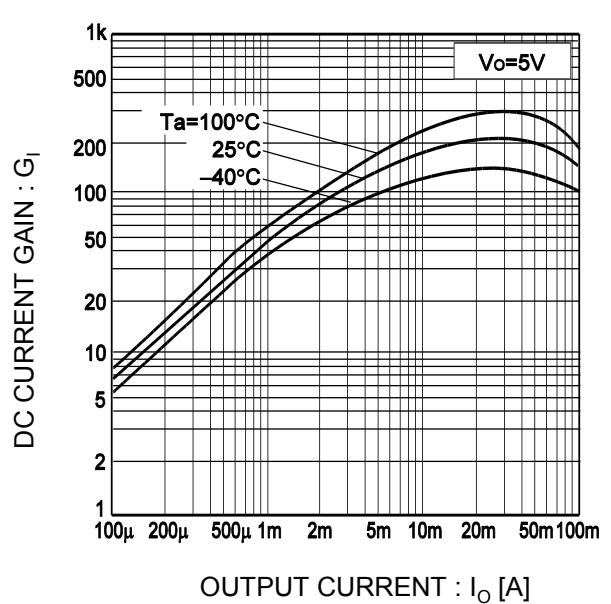
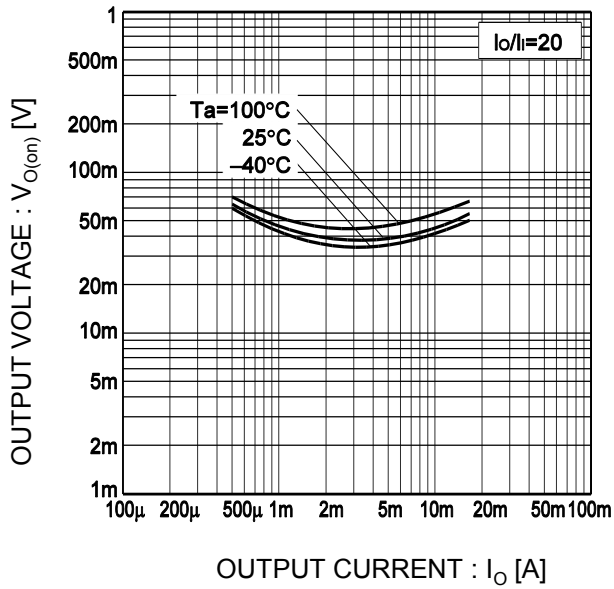


Fig.4 DC current gain vs. output current



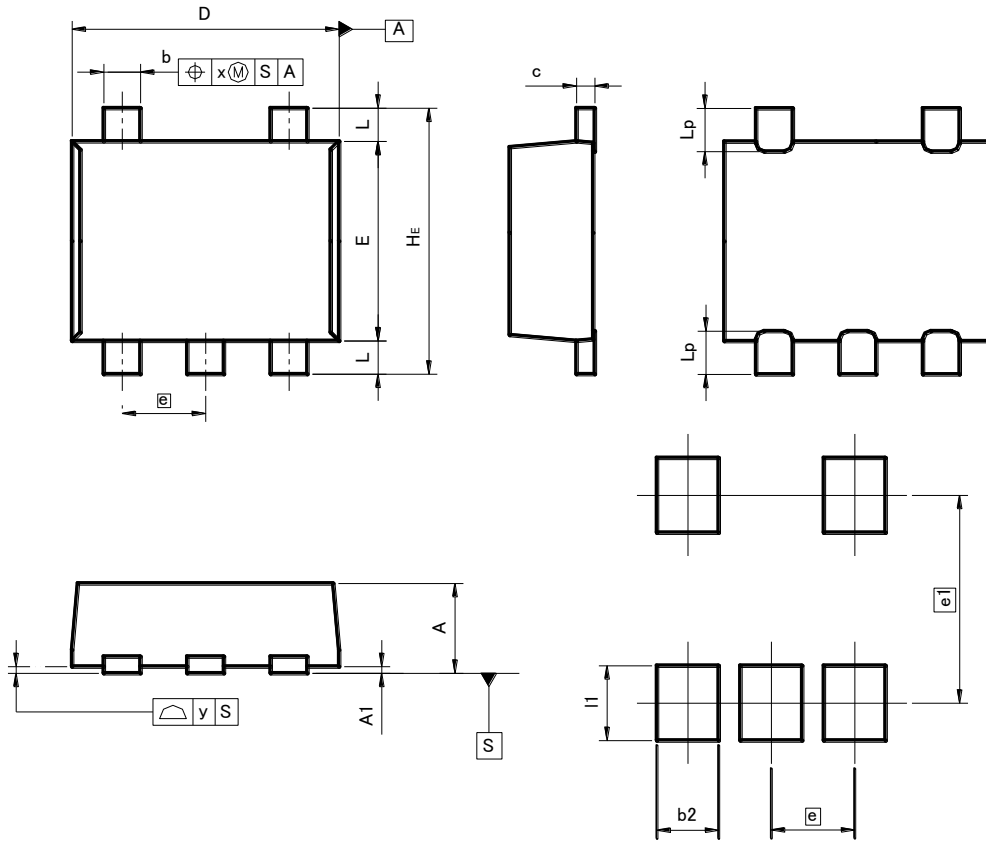
●Electrical characteristic curves(Ta = 25°C)

Fig.5 Output voltage vs. output current



●Dimensions (Unit : mm)

EMT5



Pattern of terminal position areas

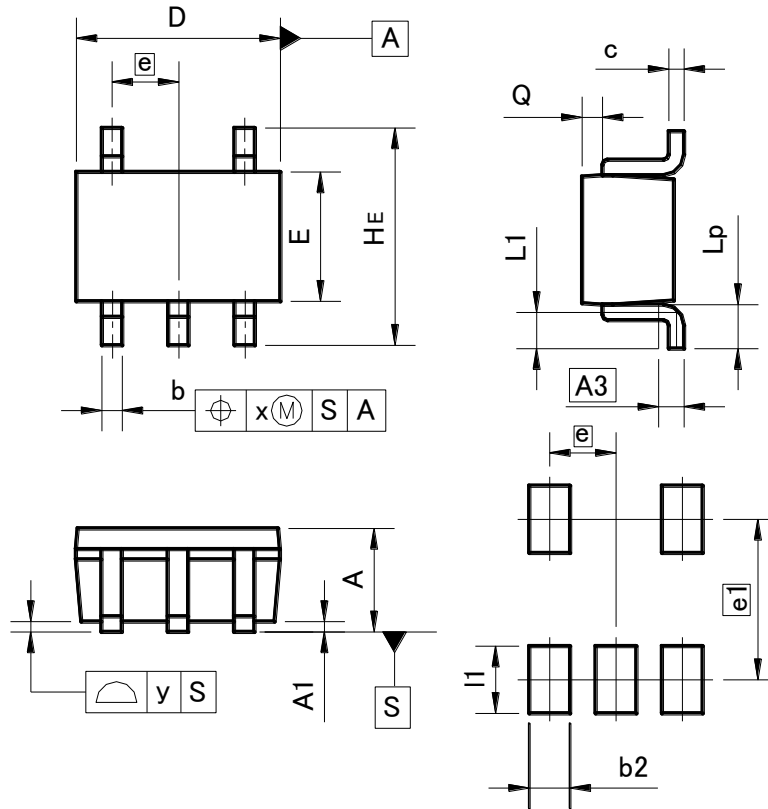
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A1	0.00	0.10	0	0.004
A	0.45	0.55	0.018	0.022
b	0.17	0.27	0.007	0.011
c	0.08	0.18	0.003	0.007
D	1.50	1.70	0.059	0.067
E	1.10	1.30	0.043	0.051
e	0.50		0.02	
HE	1.50	1.70	0.059	0.067
L	0.10	0.30	0.004	0.012
Lp	-	0.35	-	0.014
x	-	0.10	-	0.004
y	-	0.10	-	0.004

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

Dimension in mm/inches

●Dimensions (Unit : mm)

UMT5



Pattern of terminal position areas

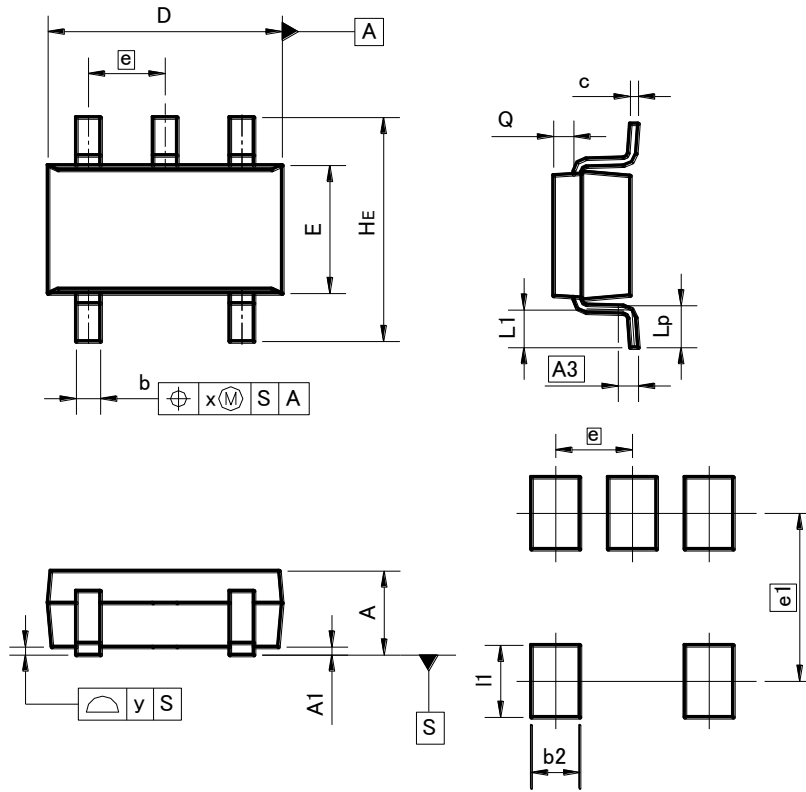
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.80	1.00	0.031	0.039
A1	0.00	0.10	0	0.004
A3	0.25		0.01	
b	0.15	0.30	0.006	0.012
c	0.10	0.20	0.004	0.008
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
e	0.65		0.03	
HE	2.00	2.20	0.079	0.087
L1	0.20	0.50	0.008	0.02
Lp	0.25	0.55	0.01	0.022
Q	0.10	0.30	0.004	0.012
x	-	0.10	-	0.004
y	-	0.10	-	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
e1	1.55		0.06	
b2	-	0.40	-	0.016
l1	-	0.65	-	0.026

Dimension in mm/inches

●Dimensions (Unit : mm)

SMT5



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	0.25	0.40	0.01	0.016
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	-	0.20	-	0.008
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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