

Parameter	Value
$V_{CC}$	50V
$I_{C(MAX.)}$	100mA
$R_1$	1.0k $\Omega$
$R_2$	10k $\Omega$

### ●Features

- 1) Built-In Biasing Resistors,  $R_1 = 1k\Omega$ ,  $R_2 = 10k\Omega$
- 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 PNP Types: DTA013Z series
- 6) Lead Free/RoHS Compliant.

### ●Application

Switching circuit, Inverter circuit, Interface circuit, Driver circuit

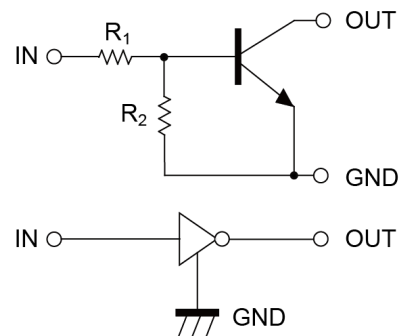
### ●Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
DTC013ZM	VMT3	1212	T2L	180	8	8000	67
DTC013ZEB	EMT3F	1616	TL	180	8	3000	67
DTC013ZUB	UMT3F	2021	TL	180	8	3000	67

### ●Outline

<p>VMT3</p> <p>DTC013ZM (SC-105AA)</p>	<p>EMT3F</p> <p>DTC013ZEB (SC-89)</p>
<p>UMT3F</p> <p>DTC013ZUB (SC-85)</p>	

### ●Inner circuit



● **Absolute maximum ratings** ( $T_a = 25^\circ\text{C}$ )

Parameter		Symbol	Values	Unit
Supply voltage		$V_{CC}$	50	V
Input voltage		$V_{IN}$	10 to -5	V
Output current		$I_O$	100	mA
Collector current		$I_{C(MAX)}^{*1}$	100	mA
Power dissipation	DTC013ZM	$P_D^{*2}$	150	mW
	DTC013ZEB		150	
	DTC013ZUB		200	
Junction temperature		$T_j$	150	$^\circ\text{C}$
Range of storage temperature		$T_{stg}$	-55 to +150	$^\circ\text{C}$

● **Electrical characteristics** ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Input voltage	$V_{I(off)}$	$V_{CC} = 5V, I_O = 100\mu\text{A}$	-	-	0.4	V
	$V_{I(on)}$	$V_O = 0.3V, I_O = 5\text{mA}$	1.0	-	-	
Output voltage	$V_{O(on)}$	$I_O / I_I = 5\text{mA} / 0.5\text{mA}$	-	0.05	0.15	V
Input current	$I_I$	$V_I = 5V$	-	-	7.2	mA
Output current	$I_{O(off)}$	$V_{CC} = 50V, V_I = 0V$	-	-	500	nA
DC current gain	$G_I$	$V_O = 10V, I_O = 5\text{mA}$	30	-	-	-
Input resistance	$R_1$	-	0.7	1.0	1.3	k $\Omega$
Resistance ratio	$R_2/R_1$	-	8	10	12	-
Transition frequency	$f_T^{*1}$	$V_{CE} = 10V, I_E = -5\text{mA},$ $f = 100\text{MHz}$	-	250	-	MHz

\*1 Characteristics of built-in transistor

\*2 Each terminal mounted on a reference footprint

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

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

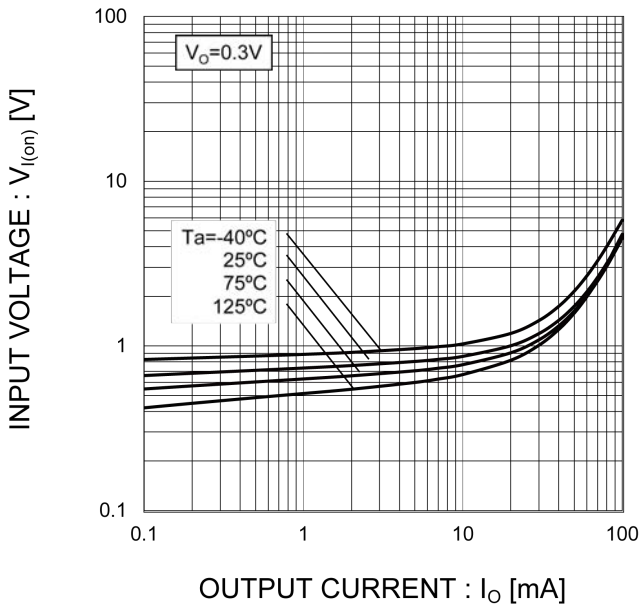


Fig.2 Output current vs. input voltage (OFF characteristics)

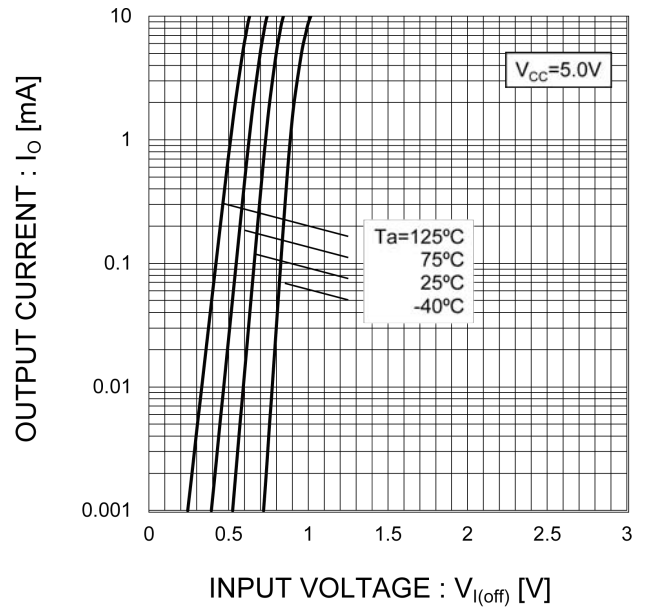


Fig.3 Output current vs. output voltage

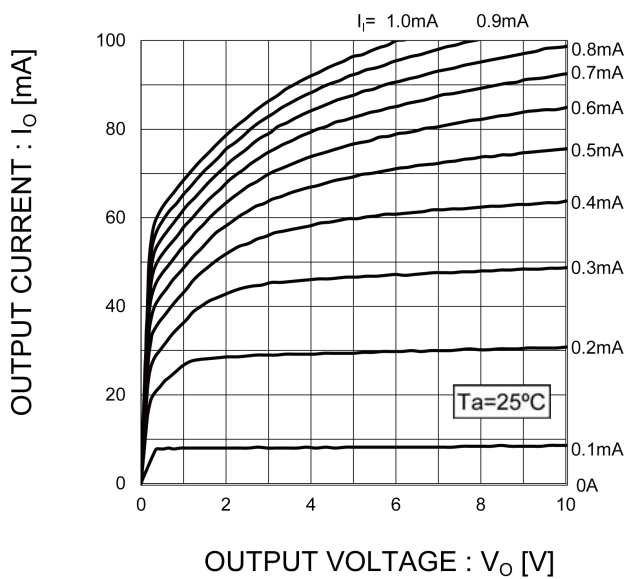
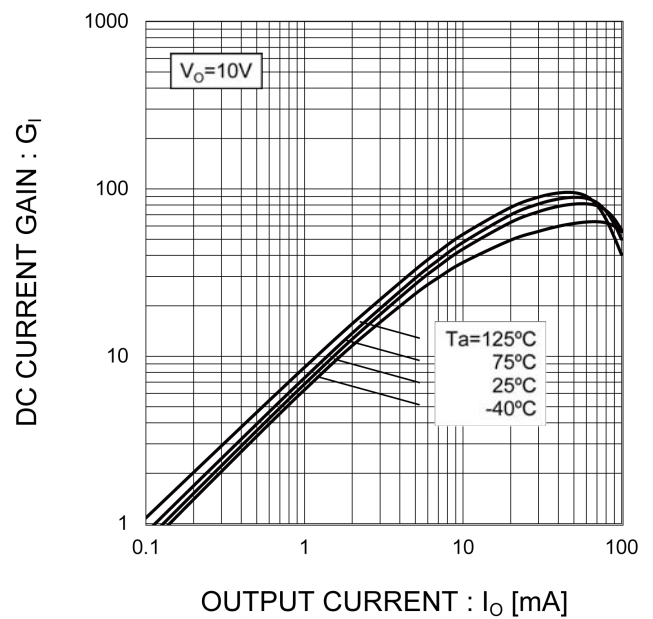
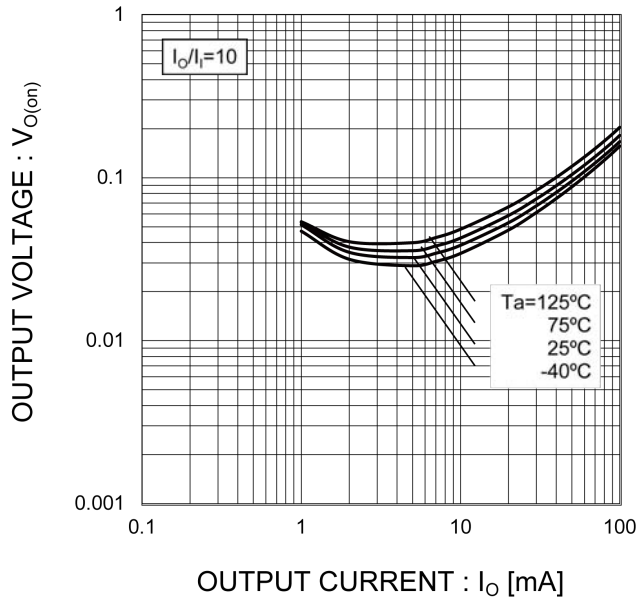


Fig.4 DC current gain vs. output current



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

Fig.5 Output voltage vs. output current



●Dimensions



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
b1	0.27	0.37	0.011	0.015
c	0.08	0.18	0.003	0.007
D	1.10	1.30	0.043	0.051
E	0.70	0.90	0.028	0.035
e	0.40		0.02	
HE	1.10	1.30	0.043	0.051
L	0.10	0.30	0.004	0.012
Lp	0.20	0.40	0.008	0.016
x	-	0.10	-	0.004

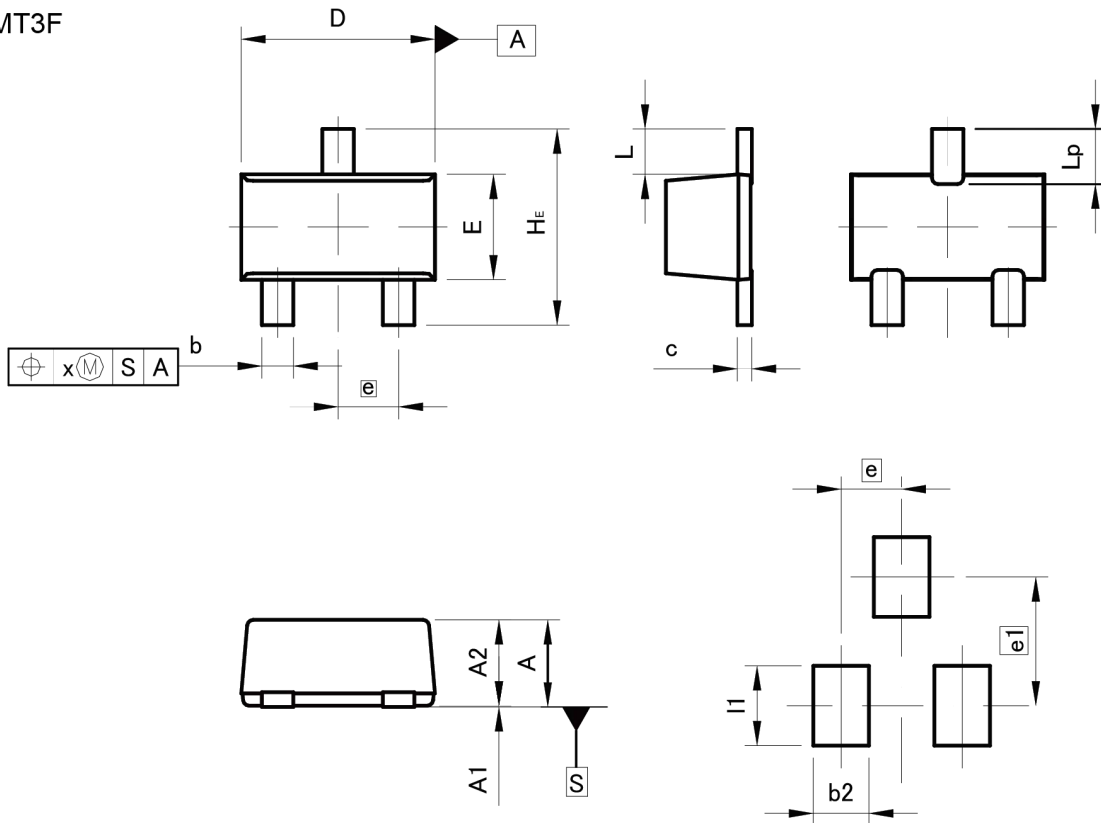
  

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	-	0.37	-	0.015
b3	-	0.47	-	0.019
e1	0.80		0.031	
I1	-	0.50	-	0.020

Dimension in mm/inches

●Dimensions

EMT3F



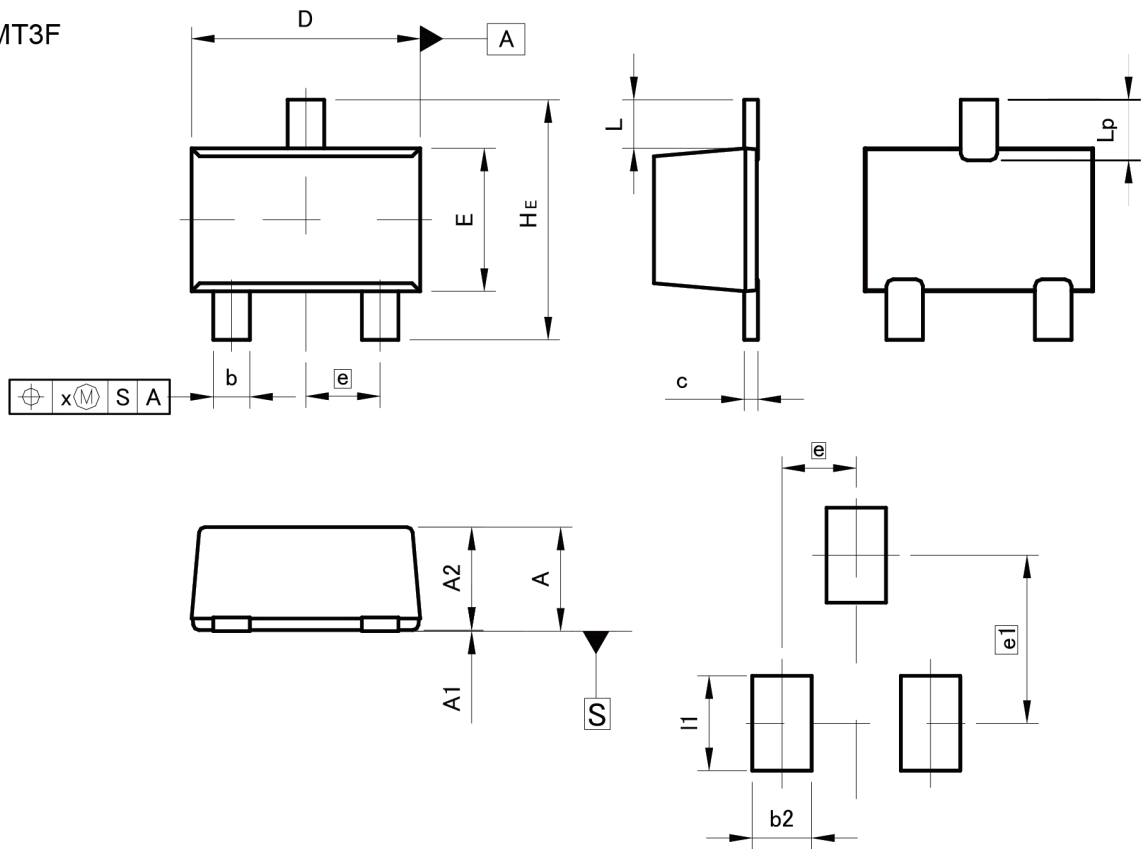
Pattern of terminal position areas  
[Not a recommended pattern of soldering pads]

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.65	0.85	0.026	0.033
A1	0.00	0.10	0.000	0.004
A2	0.60	0.80	0.024	0.031
b	0.21	0.36	0.008	0.014
c	0.08	0.18	0.003	0.007
D	1.50	1.70	0.059	0.067
E	0.76	0.96	0.030	0.038
e	0.50		0.020	
HE	1.50	1.70	0.059	0.067
L	0.37		0.015	
Lp	0.35	0.55	0.014	0.022
x	-	0.10	-	0.004
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	-	0.46	-	0.018
e1	-	1.05	-	0.041
l1	-	0.65	-	0.026

Dimension in mm/inches

●Dimensions

UMT3F



Pattern of terminal position areas  
[Not a recommended pattern of soldering pads]

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.85	1.05	0.033	0.041
A1	0.00	0.10	0.000	0.004
A2	0.80	1.00	0.031	0.039
b	0.27	0.42	0.011	0.017
c	0.08	0.18	0.003	0.007
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
e	0.65		0.026	
HE	2.00	2.20	0.079	0.087
L	0.43		0.017	
Lp	0.43	0.63	0.017	0.025
x	-	0.10	-	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	-	0.52	-	0.020
e1	1.47		0.058	
l1	-	0.83	-	0.033

Dimension in mm/inches

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