

Parameter	Value
$V_{CC}$	-50V
$I_{C(MAX.)}$	-100mA
$R_1$	2.2k $\Omega$
$R_2$	2.2k $\Omega$

### ●Features

- 1) Built-In Biasing Resistors,  $R_1 = R_2 = 2.2k\Omega$ .
- 2) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent 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 Available.(DTC123E series)
- 6) Lead Free/RoHS Compliant.

### ●Application

Switching circuit, Inverter circuit, Interface circuit, Driver circuit

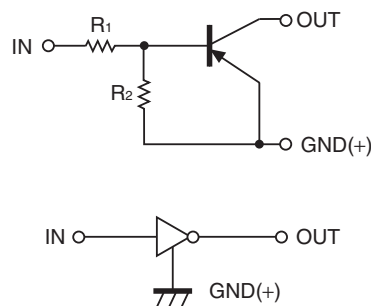
### ●Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
DTA123EM	VMT3	1212	T2L	180	8	8,000	12
DTA123EE	EMT3	1616	TL	180	8	3,000	12
DTA123EUA	UMT3	2021	T106	180	8	3,000	12
DTA123EKA	SMT3	2928	T146	180	8	3,000	12

### ●Outline

<p>VMT3</p> <p>DTA123EM (SC-105AA)</p>	<p>EMT3</p> <p>DTA123EE SOT-416 (SC-75A)</p>
<p>UMT3</p> <p>DTA123EUA SOT-323 (SC-70)</p>	<p>SMT3</p> <p>DTA123EKA SOT-346 (SC-59)</p>

### ●Inner circuit



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

Parameter		Symbol	Values	Unit
Supply voltage		$V_{CC}$	-50	V
Input voltage		$V_{IN}$	-12 to +10	V
Output current		$I_O$	-100	mA
Collector current		$I_{C(MAX.)}^{*1}$	-100	mA
Power dissipation	DTA123EM DTA123EE	$P_D^{*2}$	150	mW
	DTA123EUA DTA123EKA		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	$V_{I(off)}$	$V_{CC} = -5V, I_O = -100\mu A$	-	-	-0.5	V
	$V_{I(on)}$	$V_O = -0.3V, I_O = -10mA$	-3	-	-	
Output voltage	$V_{O(on)}$	$I_O / I_I = -10mA / -0.5mA$	-	-0.1	-0.3	V
Input current	$I_I$	$V_I = -5V$	-	-	-3.8	mA
Output current	$I_{O(off)}$	$V_{CC} = -50V, V_I = 0V$	-	-	-0.5	$\mu A$
DC current gain	$G_I$	$V_O = -5V, I_O = -5mA$	20	-	-	-
Input resistance	$R_1$	-	1.54	2.2	2.86	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

●Electrical characteristic curves(Ta = 25°C)

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

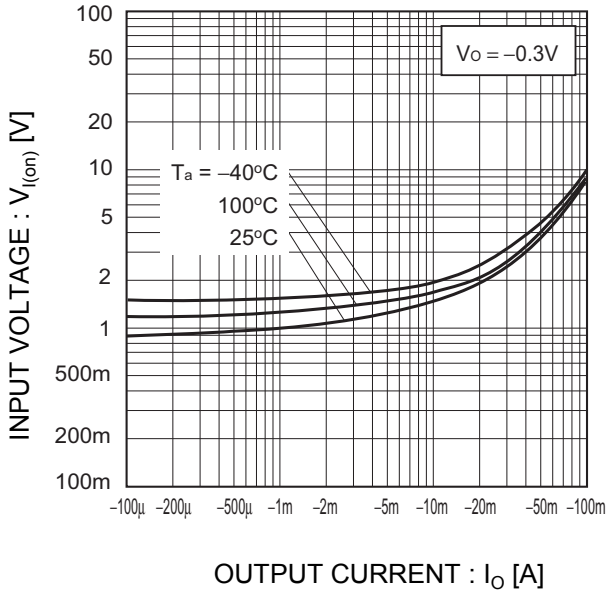


Fig.2 Output current vs. input voltage (OFF characteristics)

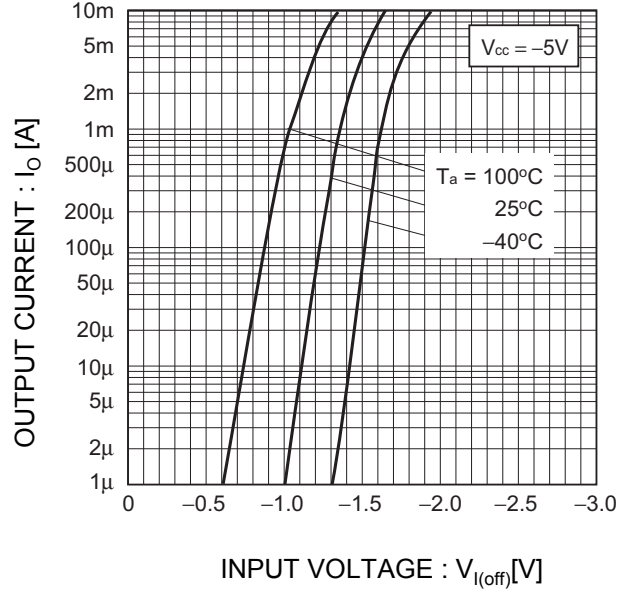


Fig.3 Output current vs. output voltage

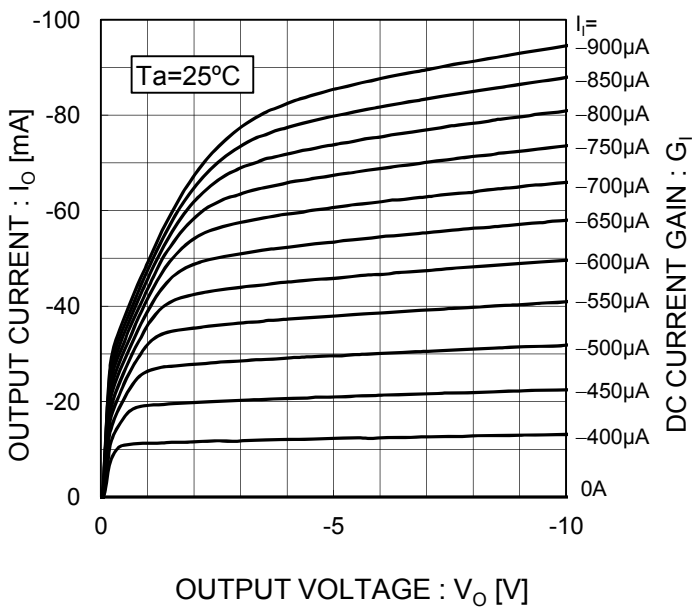
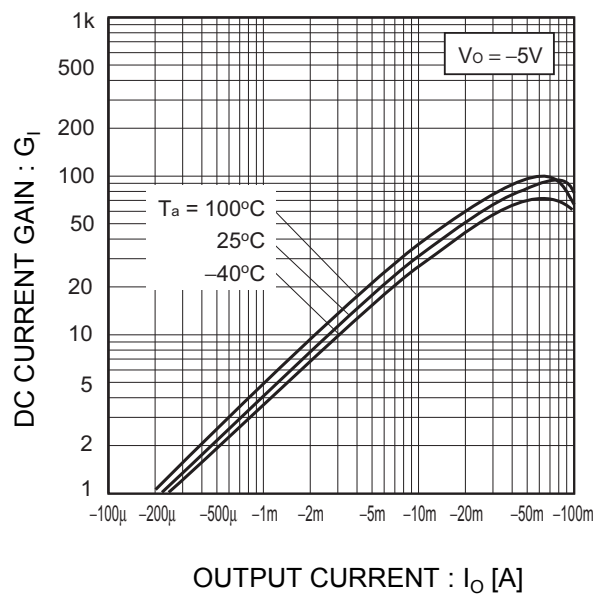
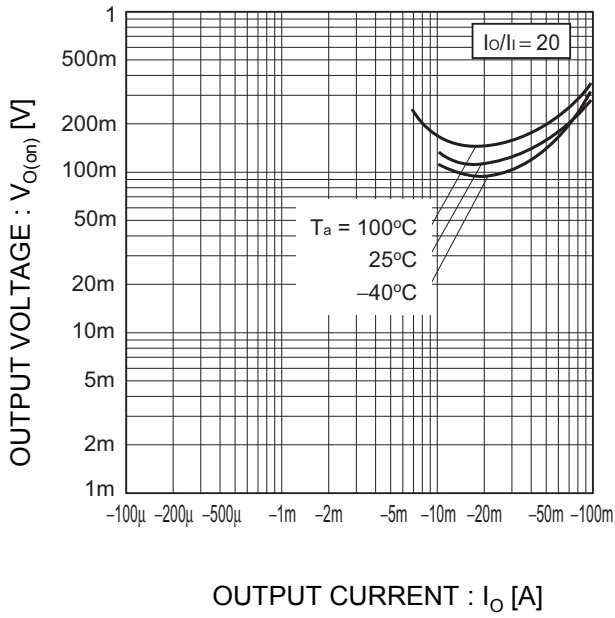


Fig.4 DC current gain vs. output current

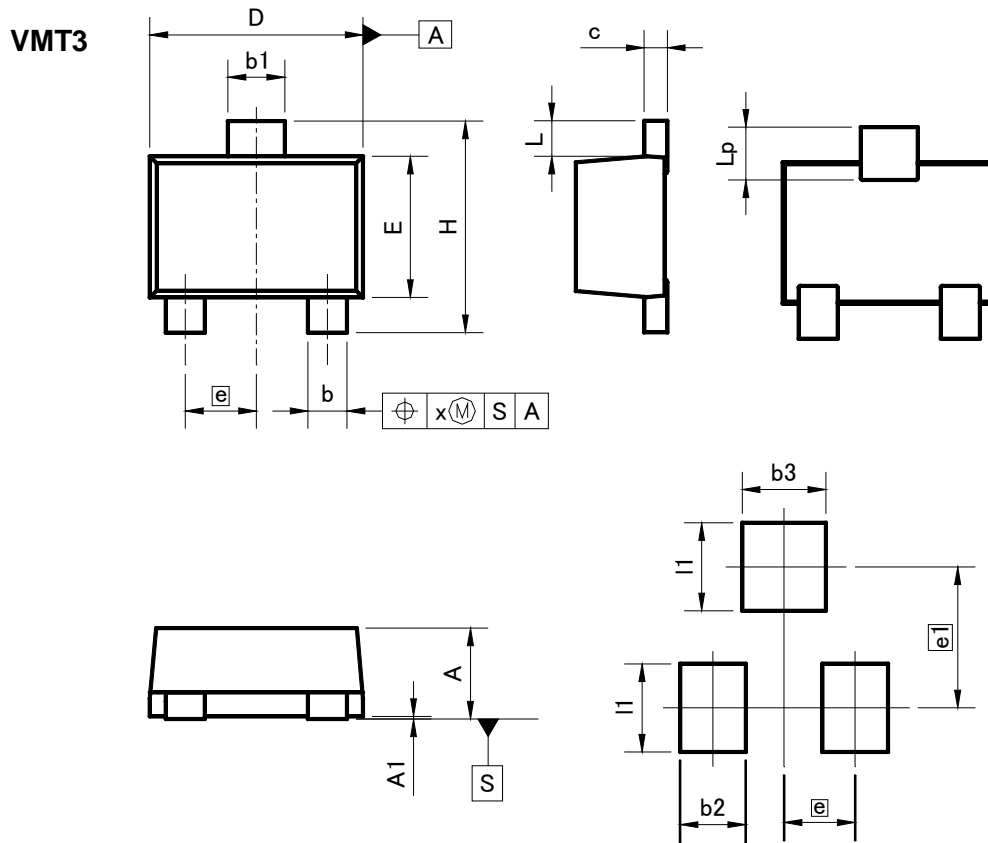


●Electrical characteristic curves(Ta = 25°C)

Fig.5 Output voltage vs. output current



●Dimensions (Unit : mm)



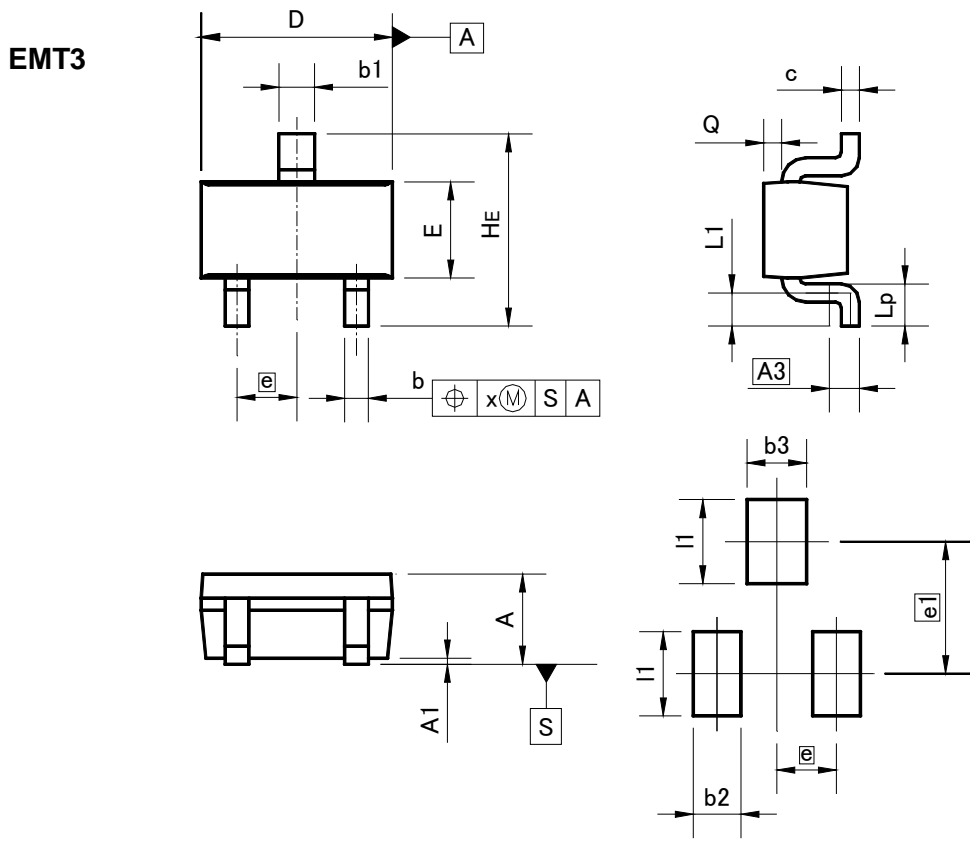
**Pattern of terminal position areas**

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.45	0.55	0.018	0.022
A1	0.00	0.10	0	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	-
Lp	0.20	0.40	0.008	-
x	-	0.10	-	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
e1	0.80		0.03	
b2	-	0.37	-	0.015
b3	-	0.47	-	0.019
l1	-	0.50	-	0.02

Dimension in mm/inches

●Dimensions (Unit : mm)



Pattern of terminal position areas

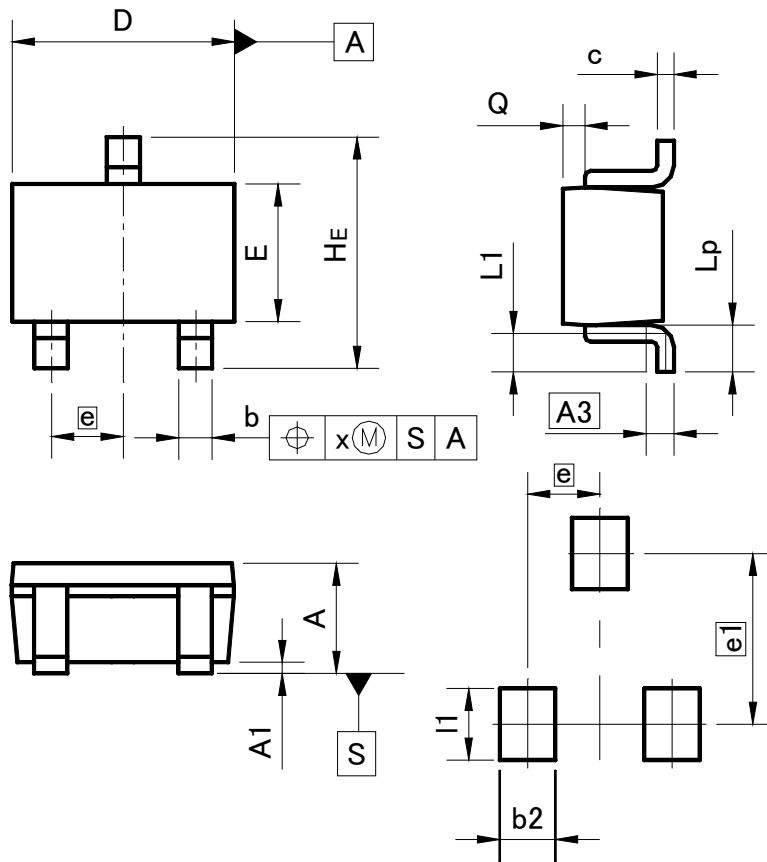
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.60	0.80	0.024	0.031
A1	0.00	0.10	0	0.004
A3	0.25		0.01	
b	0.15	0.30	0.006	0.012
b1	0.25	0.40	0.01	0.016
c	0.10	0.20	0.004	0.008
D	1.50	1.70	0.059	0.067
E	0.70	0.90	0.028	0.035
e	0.50		0.02	
HE	1.40	1.80	0.055	0.071
L1	0.10	-	0.004	-
Lp	0.15	-	0.006	-
Q	0.05	0.25	0.002	0.01
x	-	0.10	-	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
e1	1.10		0.04	
b2	-	0.40	-	0.016
b3	-	0.50	-	0.02
l1	-	0.70	-	0.028

Dimension in mm/inches

●Dimensions (Unit : mm)

UMT3



Pattern of terminal position areas

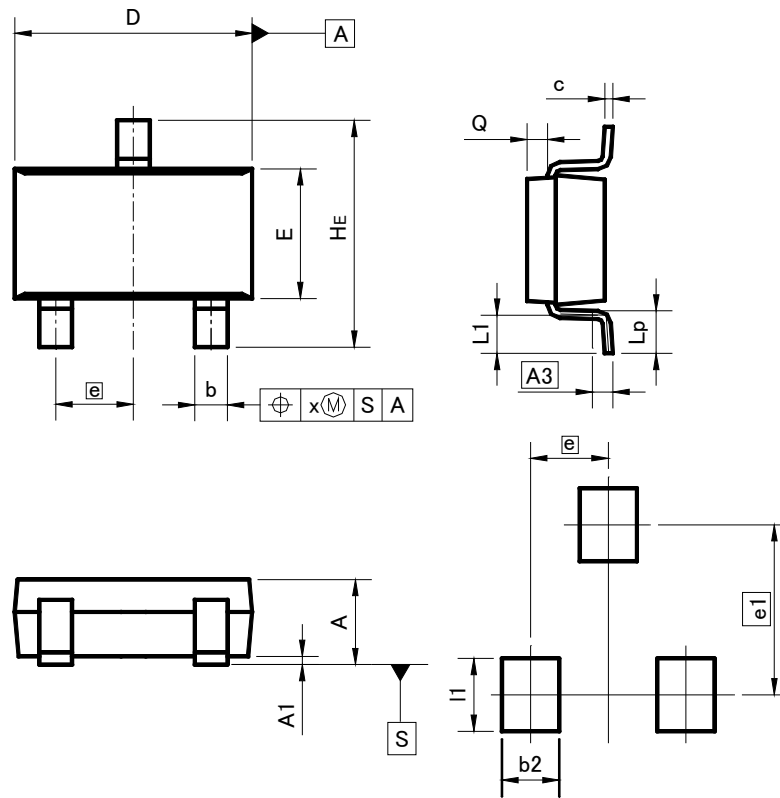
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.80	1.00	0.031	0.039
A1	0.00	0.10	0	0.004
A3	0.25		0.01	
b	0.15	0.30	0.006	0.012
c	0.10	0.20	0.004	0.008
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
e	0.65		0.03	
HE	2.00	2.20	0.079	0.087
L1	0.20	0.50	0.008	0.02
Lp	0.25	0.55	0.01	0.022
Q	0.10	0.30	0.004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

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
e1	1.55		0.06	
b2	-	0.50	-	0.02
l1	-	0.65	-	0.026

Dimension in mm/inches

●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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