

PNP -100mA -50V Digital Transistors (Bias Resistor Built-in Transistors)

Parameter	Value
V <sub>CC</sub>	-50V
I <sub>C(MAX.)</sub>	-100mA
R <sub>1</sub>	4.7kΩ
R <sub>2</sub>	4.7kΩ

#### Features

- 1) Built-In Biasing Resistors,  $R_1 = R_2 = 4.7k\Omega$
- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner circuit).
- 3) Only the on/off conditions need to be set for operation, making the circuit design easy.
- 4) Complementary NPN Types: DTC143E series

#### Outline

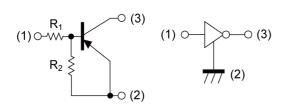
VMT3	EMT3F
DTA143EM	DTA143EEB
(SC-105AA)	(SC-89)
EMT3	UMT3F
DTA143EE	DTA143EUB
SOT-416(SC-75A)	(SC-85)
UMT3 (2) (1)	SMT3 (3)
DTA143EUA	DTA143EKA
SOT-323(SC-70)	SOT-346(SC-59)

# Application

INVERTER, INTERFACE, DRIVER

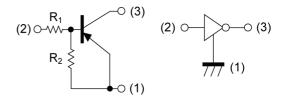
#### Inner circuit

DTA143EM/ DTA143EEB/ DTA143EUB



- (1) IN (BASE)
- (2) GND (+) (EMITTER)
- (3) OUT (COLLECTOR)

### DTA143EE/ DTA143EUA/ DTA143EKA



- (1) GND (+) (EMITTER)
- (2) IN (BASE)
- (3) OUT (COLLECTOR)

### Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
DTA143EM	VMT3	1212	T2L	180	8	8000	13
DTA143EEB	EMT3F	1616	TL	180	8	3000	13
DTA143EE	EMT3	1616	TL	180	8	3000	13
DTA143EUB	UMT3F	2021	TL	180	8	3000	13
DTA143EUA	UMT3	2021	T106	180	8	3000	13
DTA143EKA	SMT3	2928	T146	180	8	3000	13

# ● **Absolute maximum ratings** (T<sub>a</sub> = 25°C)

Para	ameter	Symbol	Values	Unit
Supply voltage			-50	V
Input voltage			-30 to 10	V
Output current			-100	mA
Collector current			-100	mA
	DTA143EM		150	
		150		
Davis a discipation	DTA143EE	P <sub>D</sub> *2	150	mW
Power dissipation	DTA143EUB	P <sub>D</sub> -	200	
	DTA143EUA		200	
	DTA143EKA		200	
Junction temperature		T <sub>j</sub>	150	°C
Range of storage temperatur	re	T <sub>stg</sub>	-55 to +150	°C

# • Electrical characteristics $(T_a = 25^{\circ}C)$

Parameter	Symbol	Conditions	Values			Unit
- Farameter	Symbol	Conditions	Min.	Тур.	Max.	Offic
Input voltage	$V_{I(off)}$	$V_{CC} = -5V, I_{O} = -100 \mu A$	-	-	-0.5	V
Input voltage	V <sub>I(on)</sub>	$V_O = -0.3V$ , $I_O = -20$ mA	-3.0	-	-	V
Output voltage	V <sub>O(on)</sub>	$I_{O}/I_{I} = -10 \text{mA} / -0.5 \text{mA}$	-	-100	-300	mV
Input current	l <sub>l</sub>	V <sub>I</sub> = -5V	-	-	-1.8	mA
Output current	I <sub>O(off)</sub>	V <sub>CC</sub> = -50V, V <sub>I</sub> = 0V	-	-	-500	nA
DC current gain	G <sub>I</sub>	$V_{O} = -5V, I_{O} = -10mA$	30	-	-	-
Input resistance	R <sub>1</sub>	-	3.29	4.7	6.11	kΩ
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>	-	8.0	1.0	1.2	-
Transition frequency	f <sub>T</sub> *1	V <sub>CE</sub> = -10V, I <sub>E</sub> = 5mA, f = 100MHz	-	250	-	MHz

<sup>\*1</sup> Characteristics of built-in transistor.

<sup>\*2</sup> Each terminal mounted on a reference land.

# ● Electrical characteristic curves (T<sub>a</sub> =25°C)

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

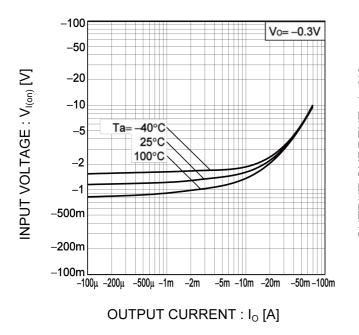


Fig.2 Output current vs. input voltage (OFF characteristics)

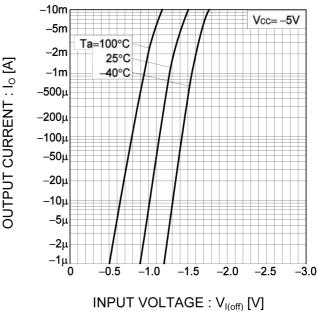


Fig.3 Output current vs. output voltage

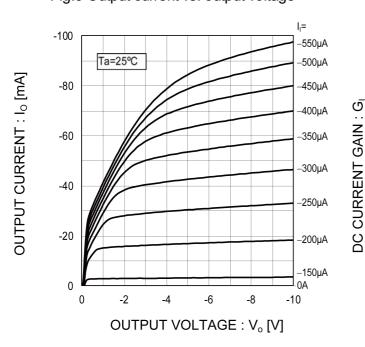
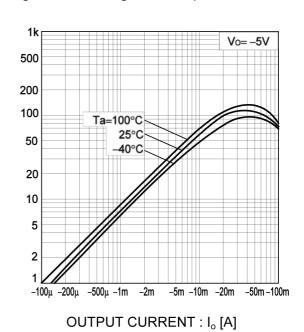
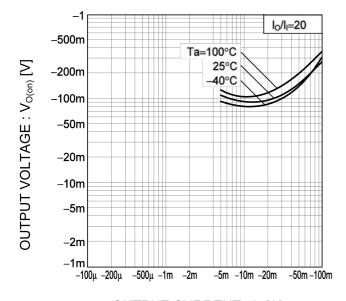


Fig.4 DC current gain vs. output current



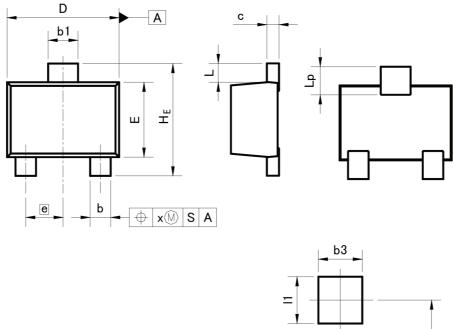
# ●Electrical characteristic curves (T<sub>a</sub> =25°C)

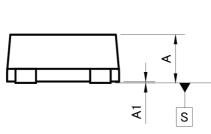
Fig.5 Output voltage vs. output current

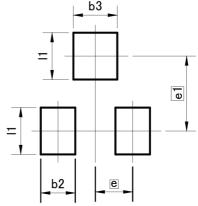


OUTPUT CURRENT :  $I_o$  [A]









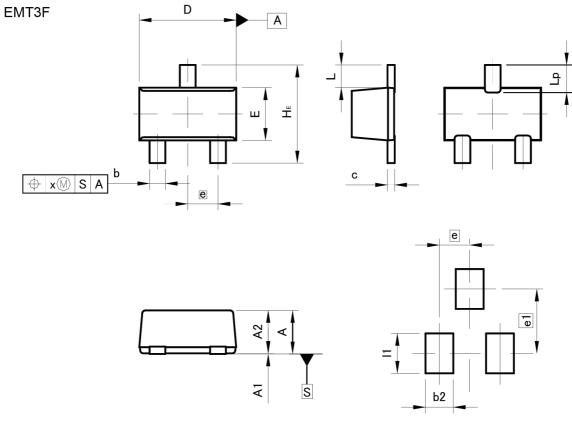
Pattern of terminal position areas [Not a recommended pattern of soldering pads]

DIM -	MILIM	ETERS	INC	HES
DIM	MIN	MAX	MIN	MAX
Α	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
С	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
е	0.4	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
х	=	0.10	-	0.004

DIM -	MILIM	MILIMETERS		HES
DIM	MIN	MAX	MIN	MAX
b2	-	0.37		0.015
b3	. <del></del>	0.47	1	0.019
e1	0.	80	0.0	031
11	-	0.50	-	0.020

Dimension in mm/inches





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

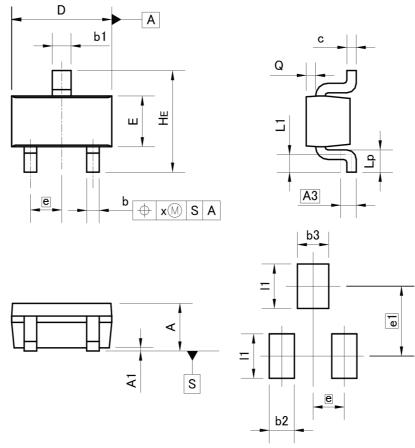
DIM	MILIM	ETERS	INC	HES	
DIM	MIN	MAX	MIN	MAX	
Α	0.65	0.85	0.026	0.033	
A1	0.00	0.10	0.000	0.004	
A2	0.60	0.80	0.024	0.031	
b	0.21	0.36	0.008	0.014	
С	0.08	0.18	0.003	0.007	
D	1.50	1.70	0.059	0.067	
E	0.76	0.96	0.030	0.038	
е	0.9	50	0.0	.020	
HE	1.50	1.70	0.059	0.067	
L	0.0	37	0.0	15	
Lp	0.35	0.55	0.014	0.022	
х	_	0.10		0.004	

DIM	MILIM	ETERS	INC	HES
DIM	MIN	MAX	MIN	MAX
b2		0.46	_	0.018
e1	-	1.05	-	0.041
11	_	0.65	-	0.026

Dimension in mm/inches



EMT3



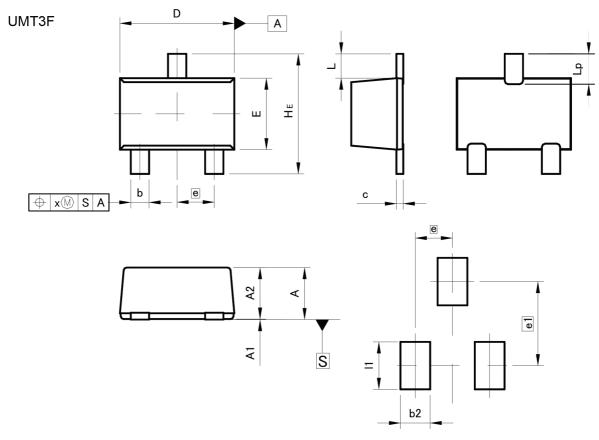
Pattern of terminal position areas [Not a recommended pattern of soldering pads]

DIM -	MILIM	ETERS	INC	HES
DIM	MIN	MAX	MIN	MAX
Α	0.60	0.80	0.024	0.031
A1	0.00	0.10	0.000	0.004
A3	0.	25	0.0	10
b	0.15	0.30	0.006	0.012
b1	0.25	0.40	0.010	0.016
С	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
е	0.	50	0.0	20
HE	1.40	1.80	0.055	0.071
L1	0.10	-	0.004	-
Lp	0.15	-	0.006	<del></del>
Q	0.05	0.25	0.002	0.010
x	_	0.10	_	0.004

DIM	MILIM	MILIMETERS		HES
DIM	MIN	MAX	MIN	MAX
b2	-	0.40		0.016
b3	-	0.50	-	0.020
e1	1.	10	0.0	043
11	43	0.70		0.028

Dimension in mm/inches





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

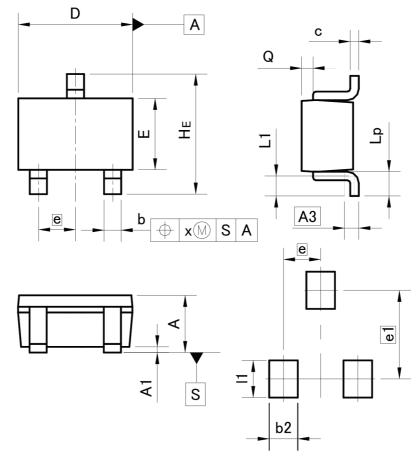
DIM	MILIME	ETERS	INC	HES
DIM	MIN	MAX	MIN	MAX
Α	0.85	1.05	0.033	0.041
A1	0.00	0.10	0.000	0.004
A2	0.80	1.00	0.031	0.039
b	0.27	0.42	0.011	0.017
С	0.08	0.18	0.003	0.007
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
е	0.0	0.65		26
HE	2.00	2.20	0.079	0.087
L	0.4	43	0.0	17
Lp	0.43	0.63	0.017	0.025
х	_	0.10	_	0.004

DIM	MILIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
b2	-	0.52	_	0.020
e1	1.47		0.058	
11	-	0.83		0.033

Dimension in mm/inches



UMT3



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

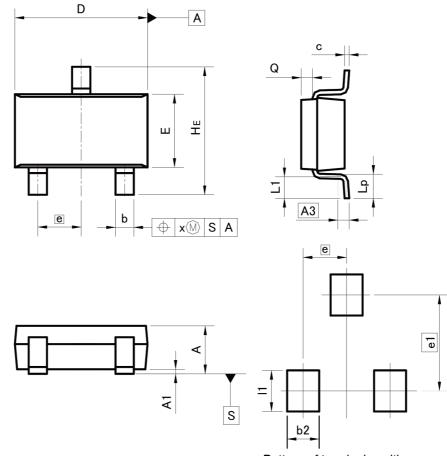
DIM -	MILIMETERS		INCHES		
	MIN	MAX	MIN	MAX	
Α	0.80	1.00	0.031	0.039	
A1	0.00	0.10	0.000	0.004	
A3	0.25		0.010		
b	0.15	0.30	0.006	0.012	
С	0.10	0.20	0.004	0.008	
D	1.90	2.10	0.075	0.083	
E	1.15	1.35	0.045	0.053	
е	0.65		0.026		
HE	2.00	2.20	0.079	0.087	
L1	0.20	0.50	0.008	0.020	
Lp	0.25	0.55	0.010	0.022	
Q	0.10	0.30	0.004	0.012	
x	-	0.10	-	0.004	

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	_	0.50	_	0.020
e1	1.55		0.061	
11	-	0.65	_	0.026

Dimension in mm/inches



SMT3



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

DIM	MILIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
Α	1.00	1.30	0.039	0.051
A1	0.00	0.10	0.000	0.004
A3	0.25		0.010	
b	0.35	0.50	0.014	0.020
С	0.09	0.25	0.004	0.010
D	2.80	3.00	0.110	0.118
Е	1.50	1.80	0.059	0.071
е	0.95		0.037	
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
х		0.10	_	0.004
У		0.10		0.004
				8
DIM	MILIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
b2	<u>=</u> :	0.60	_	0.024
e1	2.10		0.083	
	The second secon			

Dimension in mm/inches

11



0.035

0.90

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