EMB11 / UMB11N / IMB11A

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

Parameter	Tr1 and Tr2
V _{CC}	-50V
I _{C(MAX.)}	-100mA
R ₁	10kΩ
R_2	10kΩ

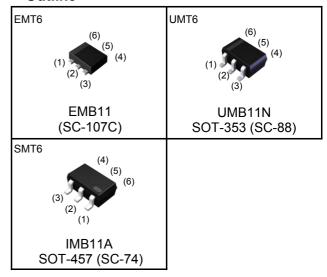
Features

- 1) Built-In Biasing Resistors, $R_1 = R_2 = 10k\Omega$.
- 2) Two DTA114E chips in one package.
- 3) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner circuit).
- 4) 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.
- 5) Only the on/off conditions need to be set for operation, making the circuit design easy.
- 6) Lead Free/RoHS Compliant.

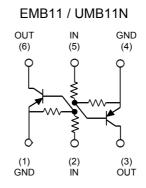
Application

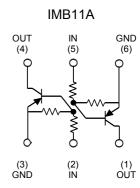
Inverter circuit, Interface circuit, Driver circuit

Outline



●Inner circuit





Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
EMB11	EMT6	1616	T2R	180	8	8,000	B11
UMB11N	UMT6	2021	TR	180	8	3,000	B11
IMB11A	SMT6	2928	T108	180	8	3,000	B11

● Absolute maximum ratings (Ta = 25°C)

<For Tr1 and Tr2 in common>

Parar	neter	Symbol	Values	Unit
Supply voltage		V _{CC}	-50	V
Input voltage		V_{IN}	-40 to +10	V
Output current		Io	-50	mA
Collector current		I _{C(MAX.)} *1	-100	mA
Power dissipation	EMB11 / UMB11N	P _D *2	150 (Total) ^{*3}	mW
IMB11A		P _D	300 (Total) ^{*4}	mW
Junction temperature		T _j	150	°C
Range of storage temperat	ture	T _{stg}	−55 to +150	°C

●Electrical characteristics(Ta = 25°C)

<For Tr1 and Tr2 in common>

Parameter	Symbol	Conditions	Min.	Тур.	Max.	Unit
Input voltage	$V_{I(off)}$	$V_{CC} = -5V, I_{O} = -100 \mu A$	ı	ı	-0.5	V
	$V_{I(on)}$	$V_0 = -0.3V, I_0 = -10mA$	-3.0	-	-	V
Output voltage	$V_{O(on)}$	$I_0 / I_1 = -10 \text{mA} / -0.5 \text{mA}$	-	-0.1	-0.3	V
Input current	I _I	V _I = -5V	-	-	-0.88	mA
Output current	I _{O(off)}	$V_{CC} = -50V, V_1 = 0V$	1	1	-0.5	μΑ
DC current gain	G _I	$V_0 = -5V, I_0 = -5mA$	20	ı	ı	-
Input resistance	R ₁	-	7	10	13	kΩ
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

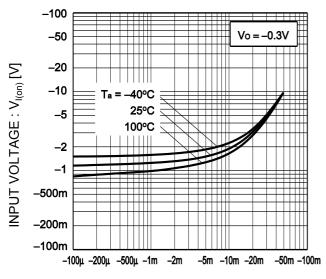
^{*2} Each terminal mounted on a reference footprint

^{*3 120}mW per element must not be exceeded.

^{*4 200}mW per element must not be exceeded.

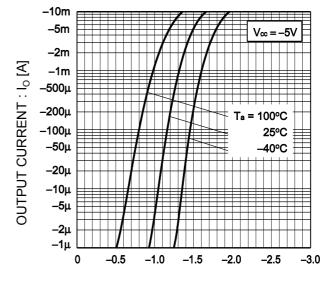
●Electrical characteristic curves(Ta = 25°C)

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



OUTPUT CURRENT : Io [A]

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



INPUT VOLTAGE: V_{I(off)}[V]

Fig.3 Output current vs. output voltage

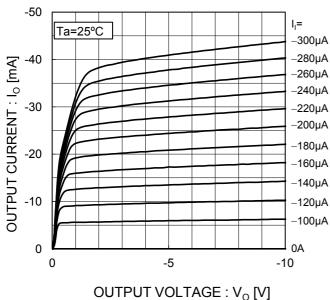
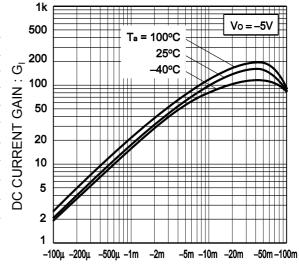


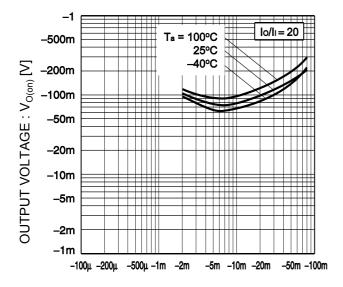
Fig.4 DC current gain vs. output current



OUTPUT CURRENT : Io [A]

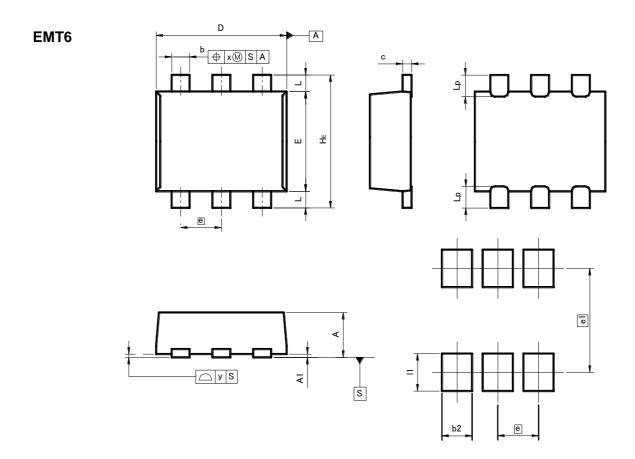
●Electrical characteristic curves(Ta = 25°C)

Fig.5 Output voltage vs. output current



OUTPUT CURRENT : I_O [A]

●Dimensions (Unit : mm)



Patterm of terminal position areas

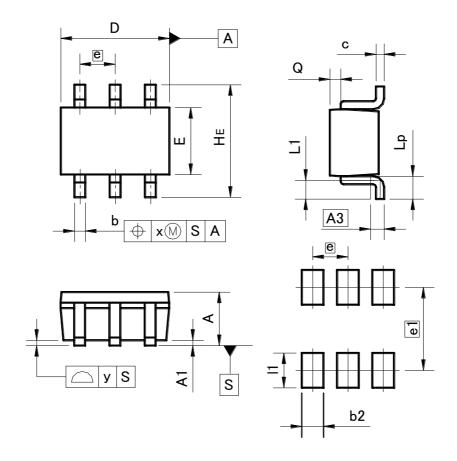
DIM	MILIM	ETERS	INC	HES	
DIM	MIN	MAX	MIN	MAX	
A1	0.00	0.10	0	0.004	
Α	0.45	0.55	0.018	0.022	
b	0.17	0.27	0.007	0.011	
С	0.08	0.18	0.003	0.007	
D	1.50	1.70	0.059	0.067	
E	1.10	1.30	0.043	0.051	
е	0.	50	0.02		
HE	1.50	1.70	0.059	0.067	
L	0.10	0.30	0.004	0.012	
Lp	_	0.35	_	0.014	
х	_	0.10	-	0.004	
У	_	0.10	_	0.004	

DIM	MILIMETERS		INCHES		
MIN		MAX	MIN	MAX	
e1	1.25		0.049		
b2	- 0.37		ı	0.015	
11	_	0.45	_	0.018	

Dimension in mm/inches

●Dimensions (Unit : mm)

UMT6



Patterm of terminal position areas

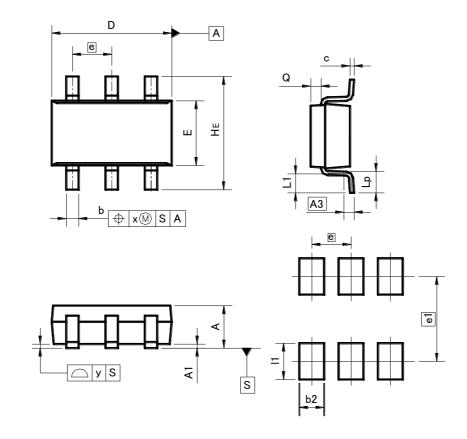
DIM MILIME		ETERS	INC	HES
DIM	MIN	MAX	MIN	MAX
Α	0.80	1.00	ı	0.039
A1	0.00	0.10	0	0.004
A3	0.2	25	0.0	01
b	0.15	0.30	0.006	0.012
С	0.10	0.20	0.004	0.008
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
е	0.0	65	0.03	
HE	2.00	2.20	0.079	0.087
L1	0.20	0.50	0.008	0.02
Lp	0.25	0.55	0.01	0.022
Q	0.10	0.30	0.004	0.012
х	_	0.10	-	0.004
у	_	0.10	_	0.004

DIM	MILIMETERS		INCHES		
	MIN	MAX	MIN	MAX	
e1	1.55		0.06		
b2	_	0.40	_	0.016	
11	- 0.65		ı	0.026	

Dimension in mm/inches

●Dimensions (Unit : mm)

SMT6



Patterm of terminal position areas

DIM	MILIMETERS		INCHES		
DIM	MIN	MAX	MIN	MAX	
Α	1.00	1.30	0.039	0.051	
A1	0.00	0.10	0	0.004	
A3	0.2	25	0.0	01	
b	0.25	0.40	0.01	0.016	
С	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	
е	0.9	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	
х	_	0.20	_	0.008	
У	_	0.10	_	0.004	

DIM	MILIMETERS		INCHES		
DIM	MIN	MAX	MIN	MAX	
e1	2.10		0.08		
b2	0.60		ı	0.024	
11	- 0.90		-	0.035	

Dimension in mm/inches

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