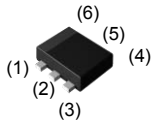
EMB3 / UMB3N / IMB3A

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

Parameter	Tr1 and Tr2
V_{CEO}	−50V
$I_{C(MAX.)}$	−100mA
R_1	4.7kΩ

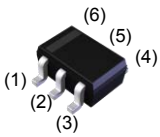
●Outline

EMT6



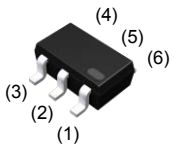
EMB3
(SC-107C)

UMT6



UMB3N
SOT-353 (SC-88)

SMT6



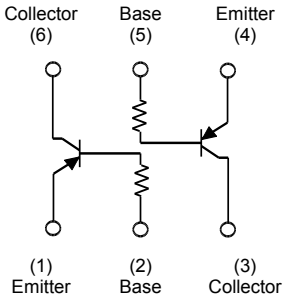
IMB3A
SOT-457 (SC-74)

●Features

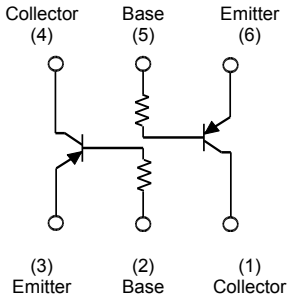
1) Built-In Biasing Resistors.
2) Two DTA143T chips in one package.
3) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner circuit).
4) The bias resistors consist of thin-film resistors with complete isolation to allow negative 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.

●Inner circuit

EMB3 / UMB3N



IMB3A



●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
EMB3	EMT6	1616	T2R	180	8	8,000	B3
UMB3N	UMT6	2021	TR	180	8	3,000	B3
IMB3A	SMT6	2928	T108	180	8	3,000	B3

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●Absolute maximum ratings (Ta = 25°C)

<For Tr1 and Tr2 in common>

Parameter		Symbol	Values	Unit
Collector-base voltage		V_{CBO}	−50	V
Collector-emitter voltage		V_{CEO}	−50	V
Emitter-base voltage		V_{EBO}	−5	V
Collector current		$I_{C(MAX.)}$ *1	−100	mA
Collector Power dissipation	EMB3 / UMB3N	P_D *2	150 (Total) *3	mW
	IMB3A		300 (Total) *4	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
Collector-base breakdown voltage	BV_{CBO}	I_C= −50μA	−50	-	-	V
Collector-emitter breakdown voltage	BV_{CEO}	I_C= −1mA	−50	-	-	V
Emitter-base breakdown voltage	BV_{EBO}	I_E= −50μA	−5	-	-	V
Collector cut-off current	I_{CBO}	V_{CB} = −50V	-	-	−0.5	μA
Emitter cut-off current	I_{EBO}	V_{EB} = −4V	-	-	−0.5	μA
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C / I_B= −5mA / −0.25mA	-	-	−0.3	V
DC current gain	h_{FE}	V_{CE}= −5V , I_C= −1mA ,	100	250	600	-
Input resistance	R_1	-	3.29	4.7	6.11	kΩ
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.

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●Electrical characteristic curves(Ta = 25°C)

Fig.1 Grounded emitter propagation characteristics

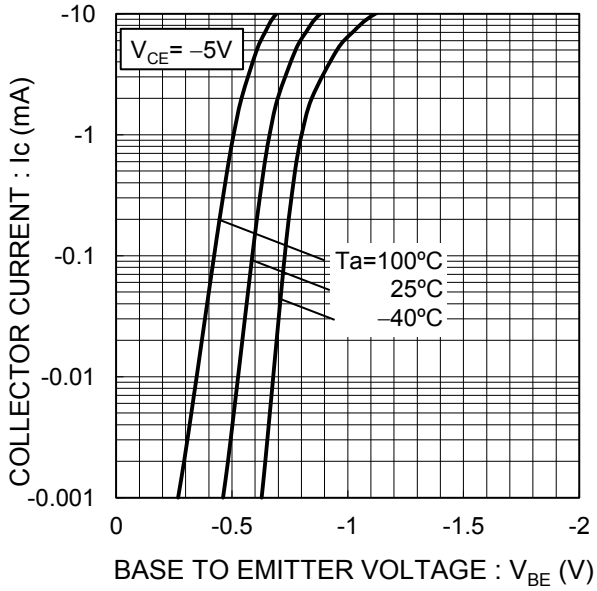


Fig.2 Grounded emitter output characteristics

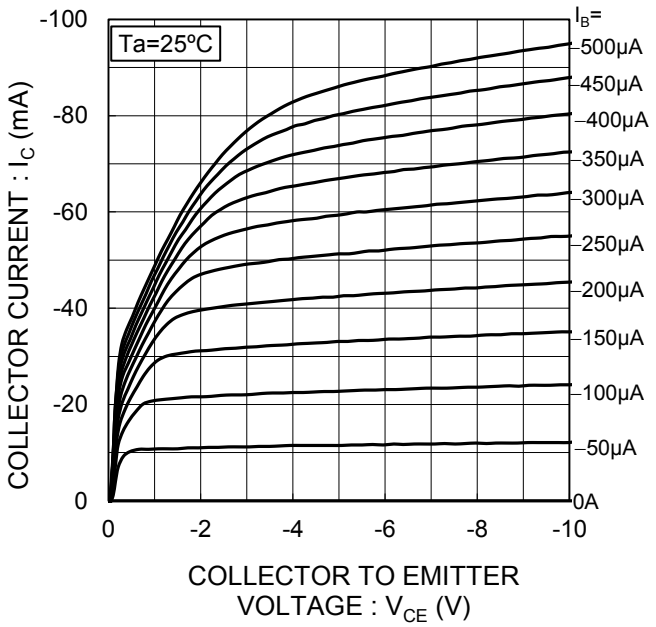


Fig.3 DC Current gain vs. Collector Current

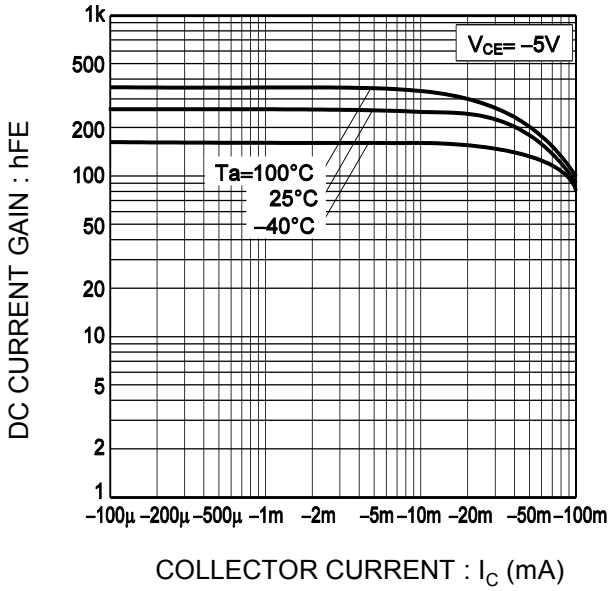
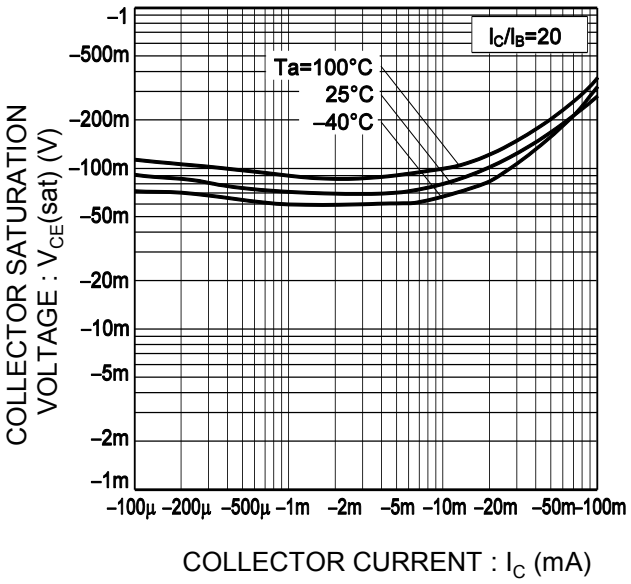


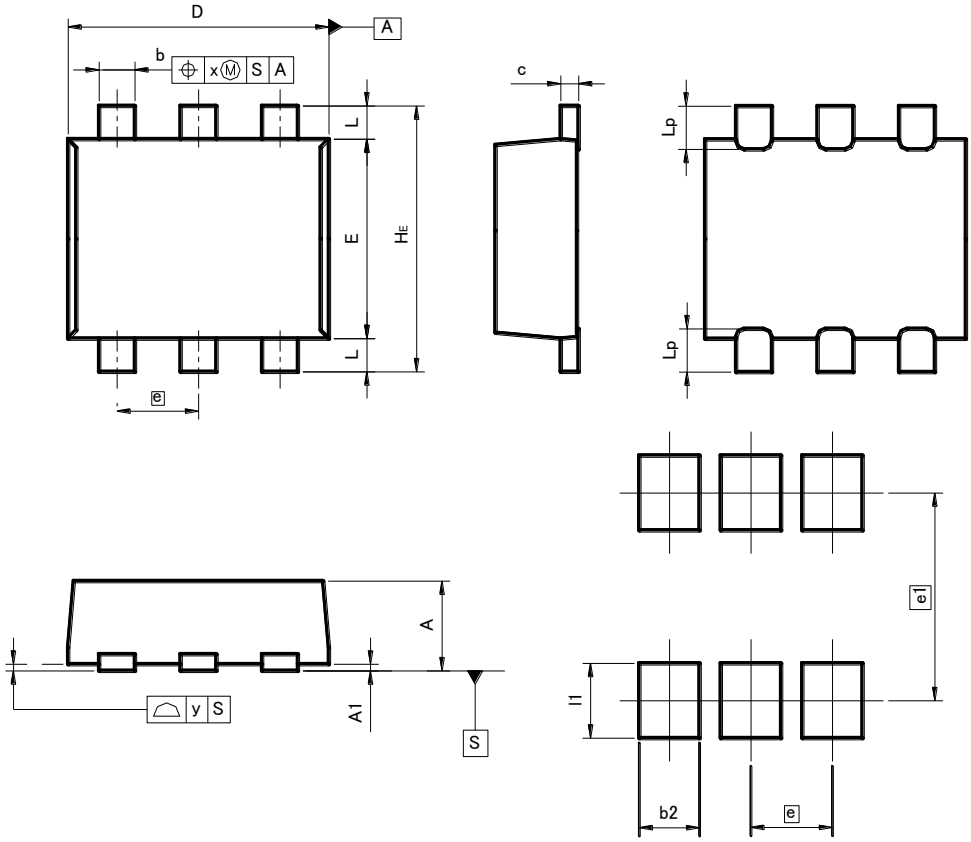
Fig.4 Collector-emitter saturation voltage vs. Collector Current



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●**Dimensions** (Unit : mm)

EMT6



Patterm 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

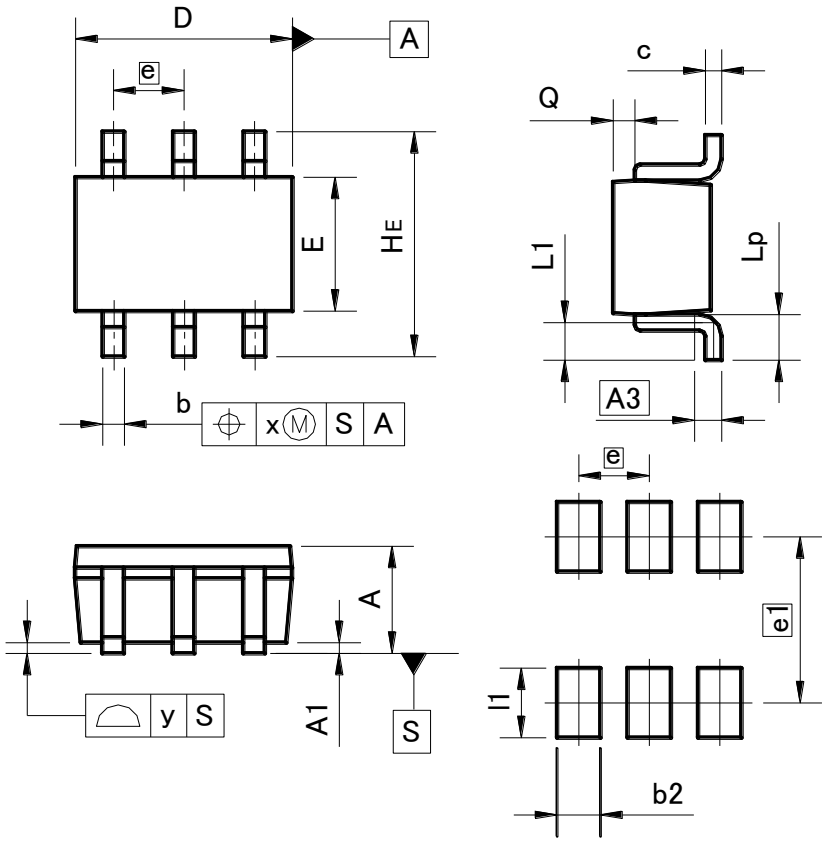
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
e1	1.25		0.049	
b2	−	0.37	−	0.015
l1	−	0.45	−	0.018

Dimension in mm/inches

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●**Dimensions** (Unit : mm)

UMT6



Patterm of terminal position areas

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.80	1.00	−	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

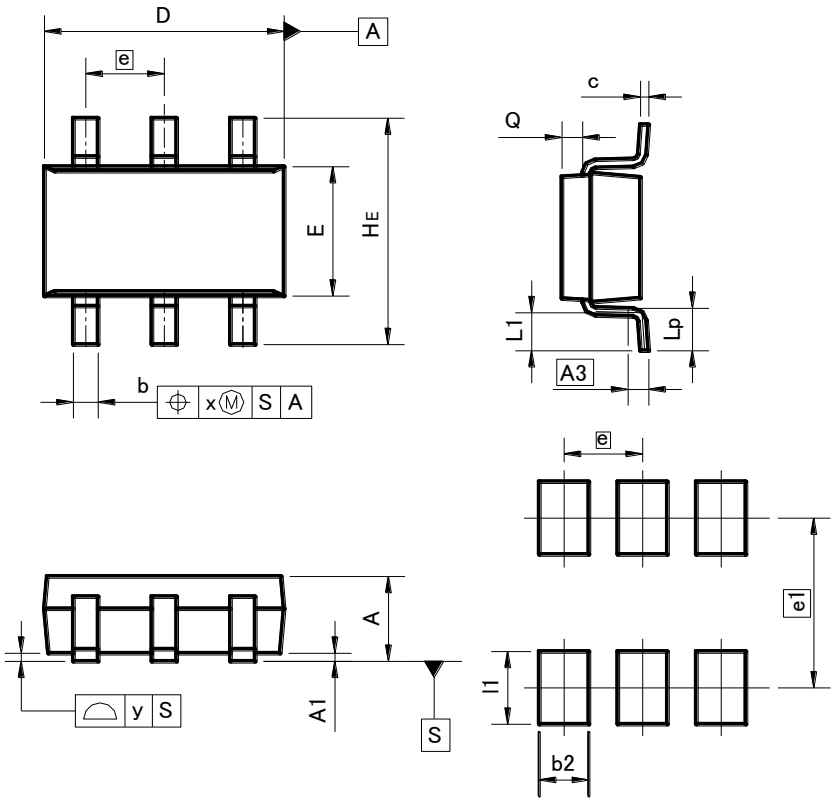
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
e1	1.55		0.06	
b2	−	0.40	−	0.016
l1	−	0.65	−	0.026

Dimension in mm/inches

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●**Dimensions** (Unit : mm)

SMT6



Patterm of terminal position areas

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.00	1.30	0.039	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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