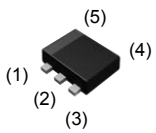
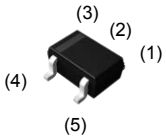
EMG11 / UMG11N

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

Parameter	Tr1 and Tr2
V_{CC}	50V
$I_{C(MAX.)}$	100mA
R_1	2.2kΩ
R_2	47kΩ

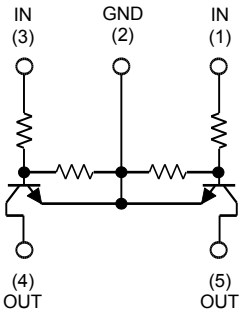
●Outline

EMT5	UMT5
	
EMG11 (SC-107BB)	UMG11N SOT-353 (SC-88A)

●Features

1) Built-In Biasing Resistors.
2) Two DTC123J chips in one package.
3) Emitter(GND)-common type.
4) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner circuit).
5) 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.
6) Only the on/off conditions need to be set for operation, making the circuit design easy.
7) Lead Free/RoHS Compliant.

●Inner circuit



●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
EMG11	EMT5	1616	T2R	180	8	8,000	G11
UMG11N	UMT5	2021	TR	180	8	3,000	G11

●Absolute maximum ratings (Ta = 25°C)

<For Tr1 and Tr2 in common>

Parameter	Symbol	Values	Unit
Supply voltage	V_{CC}	50	V
Input voltage	V_{IN}	−5 to +12	V
Output current	I_O	100	mA
Collector current	$I_{C(MAX.)}$ *1	100	mA
Power dissipation	P_D *2	150 (Total) *3	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
Input voltage	$V_{I(off)}$	V_{CC} = 5V, I_O = 100μA	-	-	0.5	V
	$V_{I(on)}$	V_O = 0.3V, I_O = 5mA	1.1	-	-	
Output voltage	$V_{O(on)}$	I_O / I_I = 5mA / 0.25mA	-	0.1	0.3	V
Input current	I_I	V_I = 5V	-	-	3.6	mA
Output current	$I_{O(off)}$	V_{CC} = 50V, V_I = 0V	-	-	0.5	μA
DC current gain	G_I	V_O = 5V, I_O = 10mA	80	-	-	-
Input resistance	R_1	-	1.54	2.2	2.86	kΩ
Resistance ratio	R_2/R_1	-	17	21	26	-
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.

●**Electrical characteristic curves**(Ta = 25°C)

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

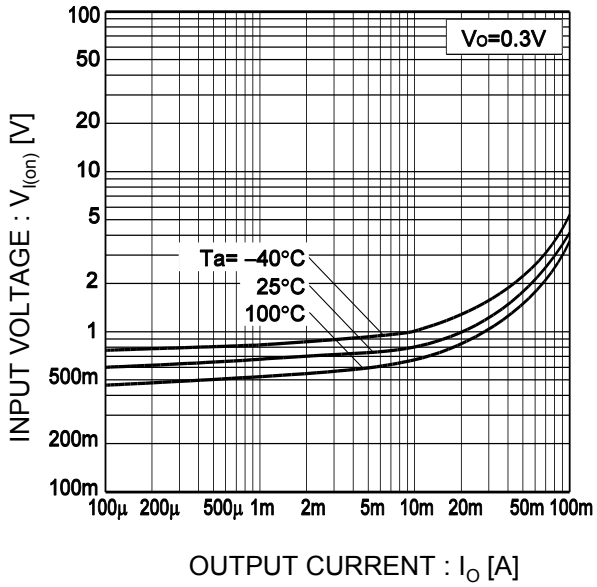


Fig.2 Output current vs. input voltage (OFF characteristics)

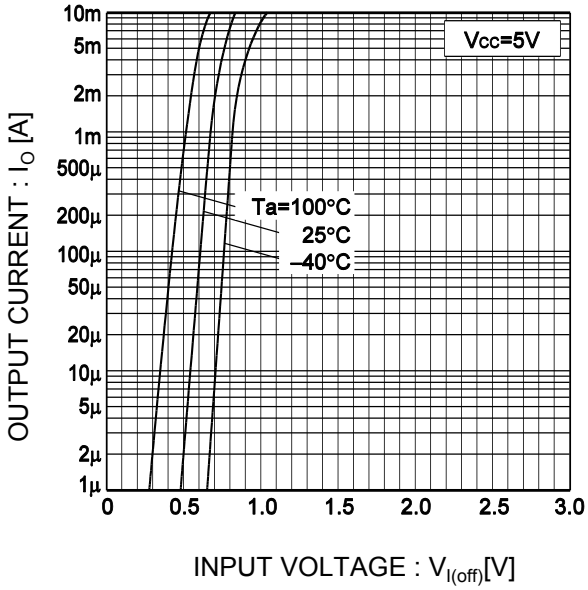


Fig.3 Output current vs. output voltage

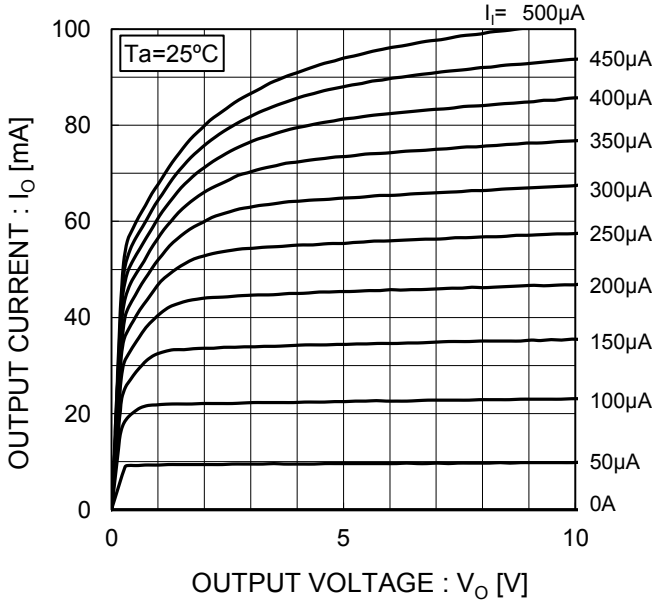
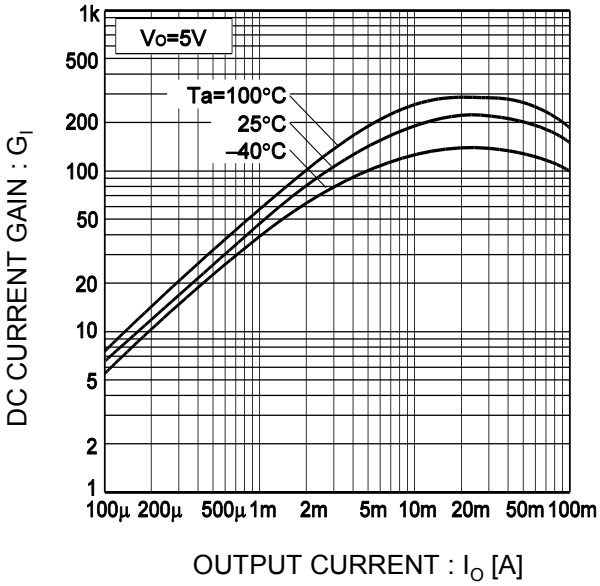
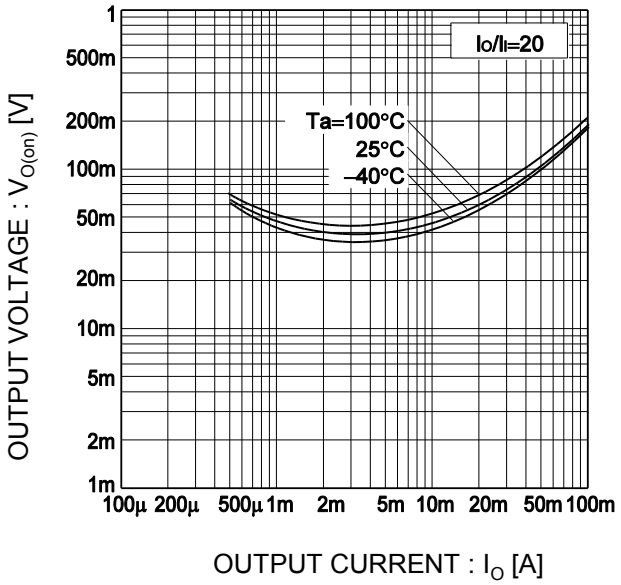


Fig.4 DC current gain vs. output current



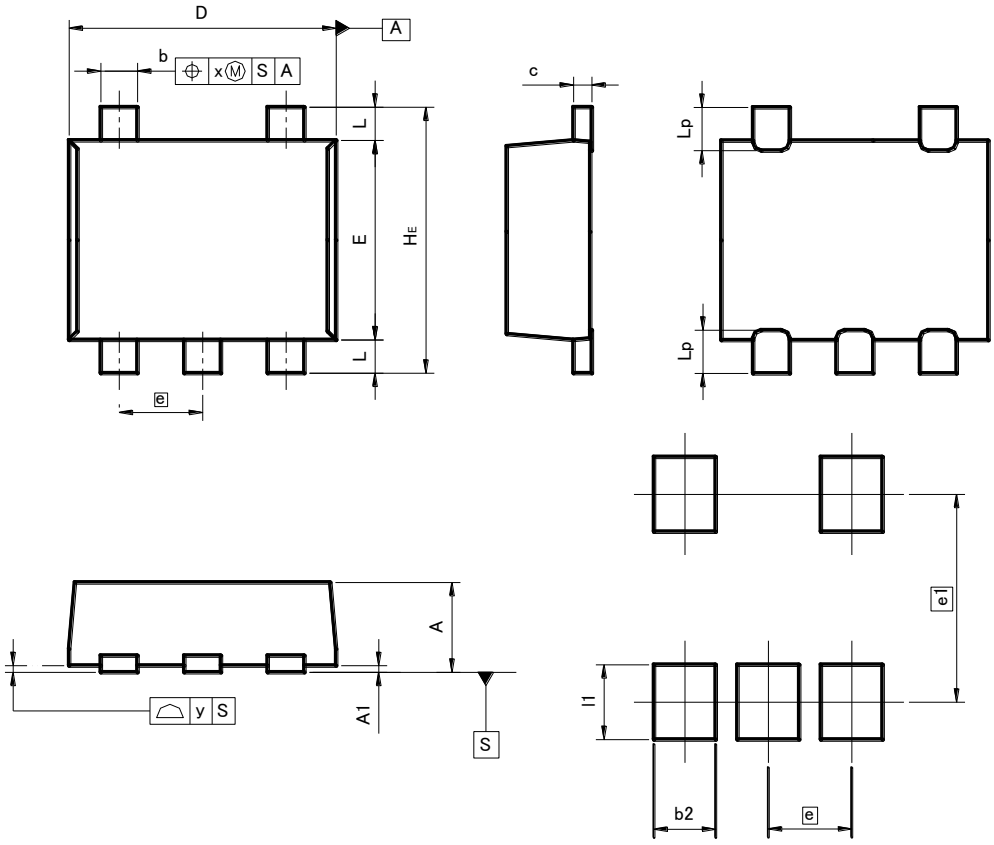
●**Electrical characteristic curves**(Ta = 25°C)

Fig.5 Output voltage vs. output current



●**Dimensions** (Unit : mm)

EMT5



Patterm of terminal position areas

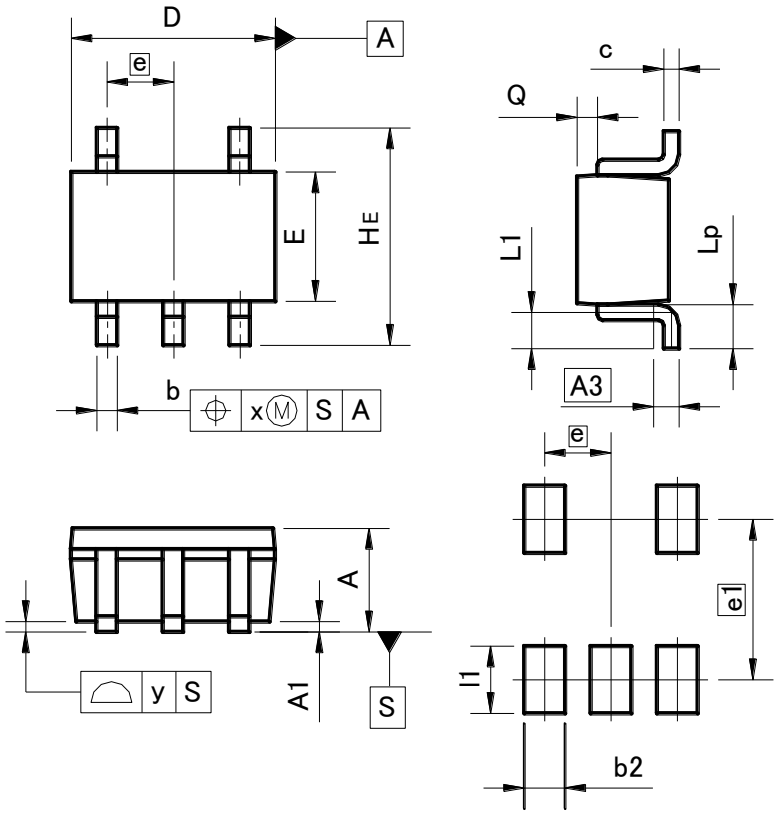
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A1	0.00	0.10	0	0.004
A	0.45	0.55	0.018	0.022
b	0.17	0.27	0.007	0.011
c	0.08	0.18	0.003	0.007
D	1.50	1.70	0.059	0.067
E	1.10	1.30	0.043	0.051
e	0.50		0.02	
HE	1.50	1.70	0.059	0.067
L	0.10	0.30	0.004	0.012
Lp	−	0.35	−	0.014
x	−	0.10	−	0.004
y	−	0.10	−	0.004

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

●**Dimensions** (Unit : mm)

UMT5



Patterm 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
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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