

EMH2 / UMH2N / IMH2A

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	47 kΩ
R ₂	47 kΩ

Features

- 1) Built-In Biasing Resistors, $R_1 = R_2 = 47k\Omega$.
- 2) Two DTC144E chips in one package.
- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner circuit).
- 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 EMT6 UMT6 (6) (6) (5) (5) (4)(1) (3)EMH2 UMH2N (SC-107C) SOT-353 (SC-88) SMT6 (4) (5) (6) IMH2A SOT-457 (SC-74)

Inner circuit



Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
EMH2	EMT6	1616	T2R	180	8	8,000	H2
UMH2N	UMT6	2021	TR	180	8	3,000	H2
IMH2A	SMT6	2928	T108	180	8	3,000	H2

●Absolute maximum ratings (Ta = 25°C)

<For Tr1 and Tr2 in common>

Para	ameter	Symbol	Values	Unit
Supply voltage		V _{CC}	50	V
Input voltage		V _{IN}	-10 to +40	V
Output current		Ι _ο	30	mA
Collector current		^{*1} ا _{C(MAX.)}	100	mA
Power dissipation	EMH2 / UMH2N	– P _D ^{*2}	150 (Total) ^{*3}	mW
	IMH2A		300 (Total) ^{*4}	mW
Junction temperature		Tj	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.	Тур.	Max.	Unit
Input voltage	V _{I(off)}	$V_{CC} = 5V, I_{O} = 100 \mu A$	-	-	0.5	V
Input voltage	V _{I(on)}	$V_0 = 0.3V, I_0 = 2mA$	3.0	-	-	V
Output voltage	V _{O(on)}	I _O / I _I = 10mA / 0.5mA	-	0.1	0.3	V
Input current	I _I	$V_1 = 5V$	-	-	0.18	mA
Output current	I _{O(off)}	$V_{CC} = 50V, \ V_I = 0V$	-	-	0.5	μA
DC current gain	Gı	$V_0 = 5V, I_0 = 5mA$	68	-	-	-
Input resistance	R ₁	-	32.9	47	61.1	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 120mW per element must not be exceeded.

*4 200mW per element must not be exceeded.

•Electrical characteristic curves(Ta = 25°C)



Fig.3 Output current vs. output voltage

Fig.4 DC current gain vs. output current





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•Electrical characteristic curves(Ta = 25°C)



Fig.5 Output voltage vs. output current



•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	
А	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	
x	-	0.10	_	0.004	
У	_	0.10	_	0.004	

DIM	MILIMETERS		INC	HES	
DIM	MIN	MAX	MIN	MAX	
e1	1.25		0.049		
b2	-	- 0.37		0.015	
1	1	0.45	-	0.018	

Dimension in mm/inches

•Dimensions (Unit : mm)

UMT6



Patterm of terminal position areas

DIM	MILIM	ETERS	INC	HES	
DIM	MIN	MAX	MIN	MAX	
А	0.80	1.00	-	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	
Е	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		INC	HES	
DIM	MIN	MAX	MIN	MAX	
e1	1.55		0.06		
b2	-	0.40	-	0.016	
1	-	0.65	-	0.026	

Dimension in mm/inches

•Dimensions (Unit : mm)

SMT6



Patterm of terminal position areas

DIM	MILIM	ETERS	INC	HES	
DIM	MIN	MAX	MIN	MAX	
А	1.00	1.30	0.039	0.051	
A1	0.00	0.10	0	0.004	
A3	0.	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	
Е	1.50	1.80	0.059	0.071	
е	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	
х	_	0.20	-	0.008	
У	_	0.10	-	0.004	

DIM	MILIMETERS		INC	HES	
DIM	MIN MAX		MIN	MAX	
e1	2.10		0.08		
b2		0.60	-	0.024	
1	_	0.90	_	0.035	

Dimension in mm/inches

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