Magnesensor Technology

MH 177

Single Out Hall Sensor

MH 177, Hall-Effect sensor, designed for electronic commutation of brush-less DC motor applications. The device includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall Voltage, and a Schmitt trigger to provide switching hysteresis for noise rejection, and open collector output. An internal band gap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range. The device is identical except for magnetic switch points.

The device includes on a single silicon chip a voltage regulator, Hall-voltage generator, small-signal amplifier, chopper stabilization, Schmitt trigger, and short-circuit protected open-collector output to sink up to 25mA. A south pole of sufficient strength will turn the output on. The North Pole is necessary to turn the output off. An on-board regulator permits operation with supply voltages of 3.5V to 20 V.

UA and SO is a three-lead ultra-mini-SIP and SOT-23 for through-hole and surface mounting. The package type is also available in a lead (Pb)-free version

Features and Benefits

- Resistant to Physical Stress.
- Temperature compensation.
- Wide operating voltage range.
- High Quality + Low Cost.
- Open-Collector pre-driver.
- Reverse bias protection on power supply pin.
- Small Size.

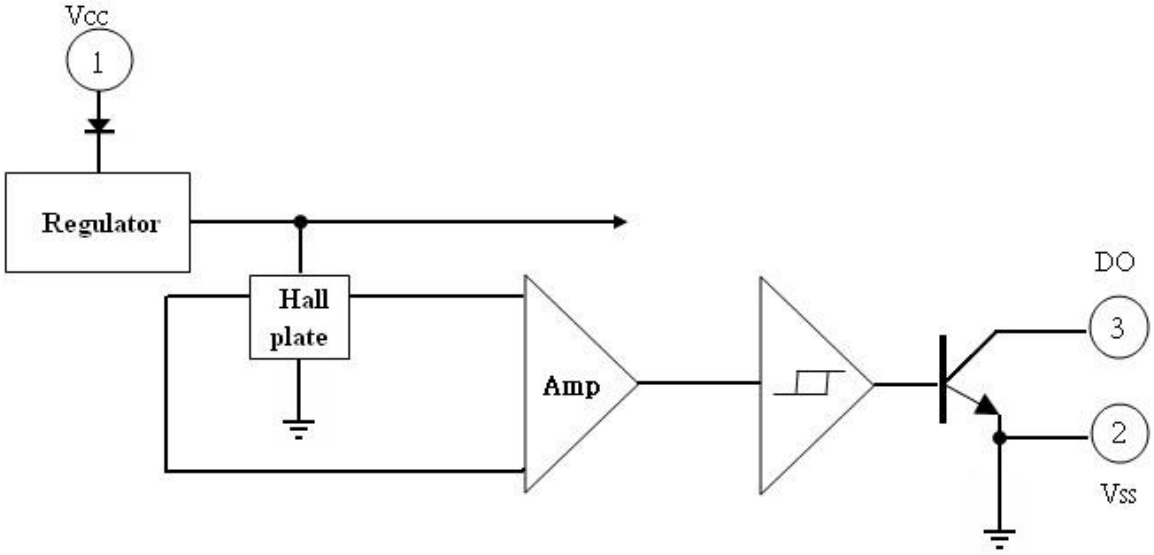
Applications

- Fan motor application
- BLDC motor application
- Speed sensing
- Position sensing
- Current sensing
- Revolution counting

Ordering Information

Part No.	Temperature Suffix	Package Code
177	E (-20℃ to +85℃)	UA (3-pin TO-92S)
		SO (SOT-23)

Functional Diagram



1. Absolute Maximum Ratings

At (Ta=25℃)

Supply Voltage, Vcc	20V
Output	30V
Output Current, Iout	25mA
Operating Temperature Range, T_A "E" version	-20℃ to 85℃
Storage Temperature, Ts	-55℃ to 150℃
Magnetic Flux Density	No limit

2. Electrical Specifications

DC Operating Parameters T_A=+25℃, V_{DD}=12V (Unless otherwise specified)

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage		3.5		20.0	Volts
Supply Current	B<Brp			8.0	mA
Output Saturation Voltage	Iout=10mA			700.0	mV
Output Leakage Current	Vout=12V			10.0	μA
Output Rise Time	R_L=820 ohm; C_L=20pF			1.5	μS
Output Fall Time	R_L=820 ohm; C_L=20pF			1.5	μS

3. Magnetic Specifications

A Grade

DC Operating Parameters T_A=25℃, V_{SUPPLY}=12V

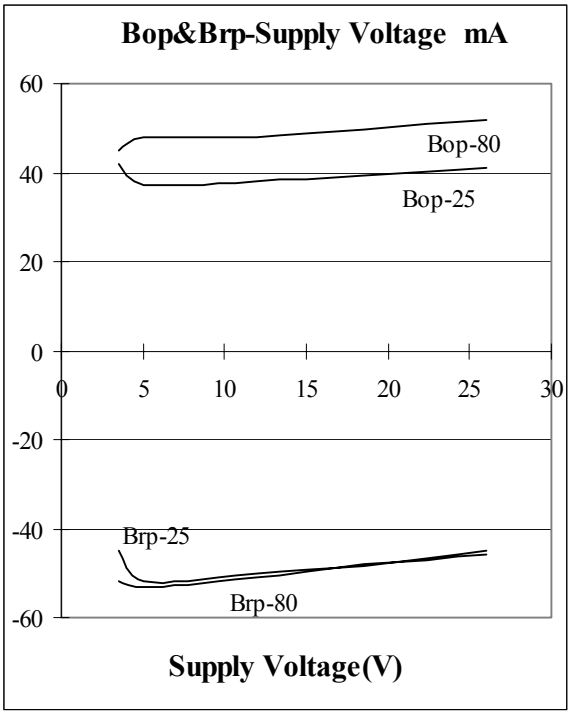
Operate Point	Bop		5		70	Gauss
Release Point	Brp		-70		-5	Gauss
Hysteresis	Hys			100		Gauss

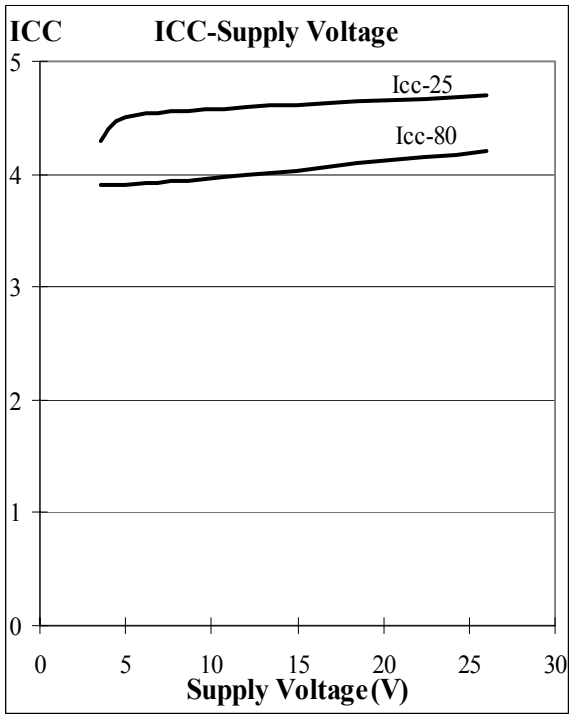
B Grade

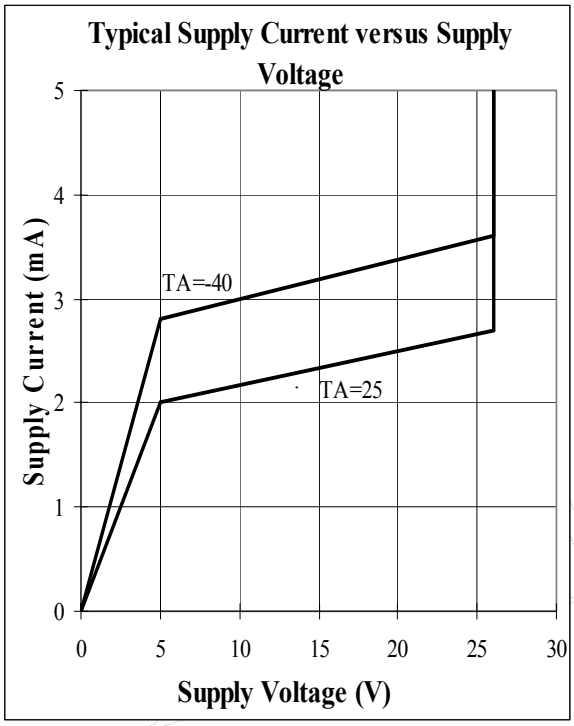
DC Operating Parameters T_A=25℃, V_{SUPPLY}=12V

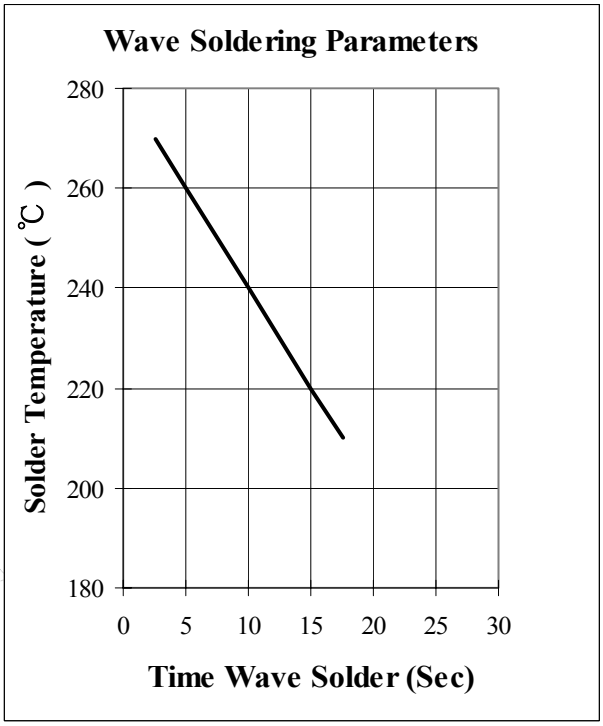
Operate Point	Bop				100	Gauss
Release Point	Brp		-100			Gauss
Hysteresis	Hys			100		Gauss

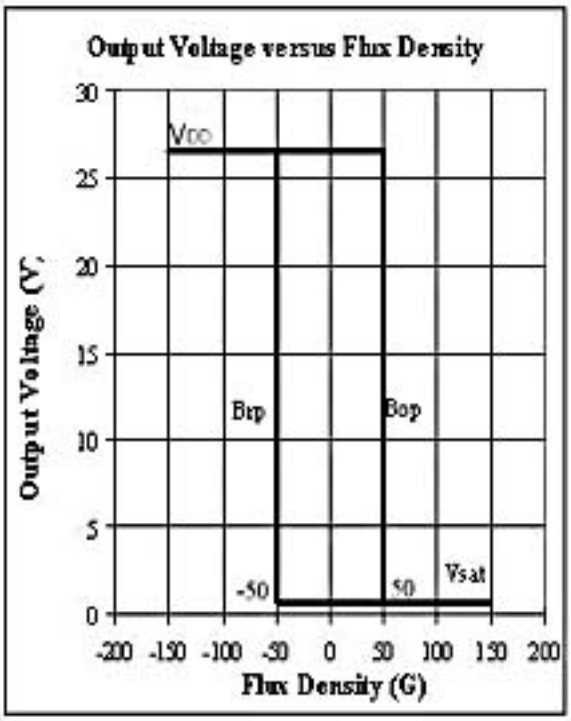
4. Performance Graphs

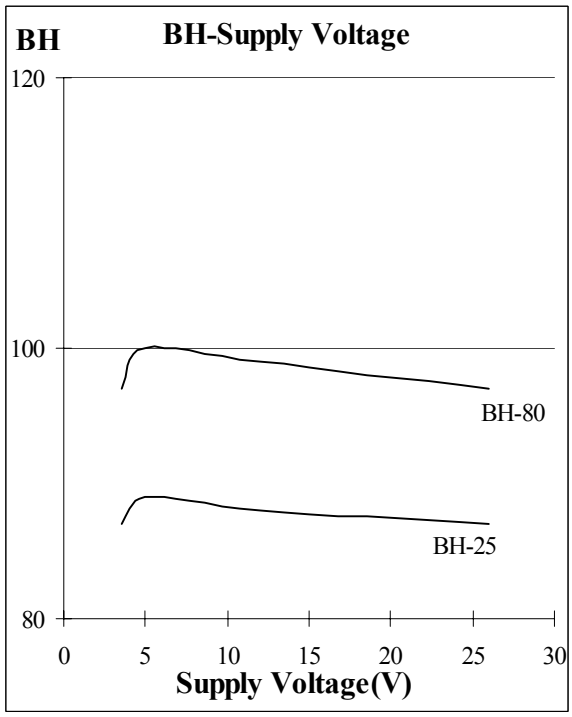


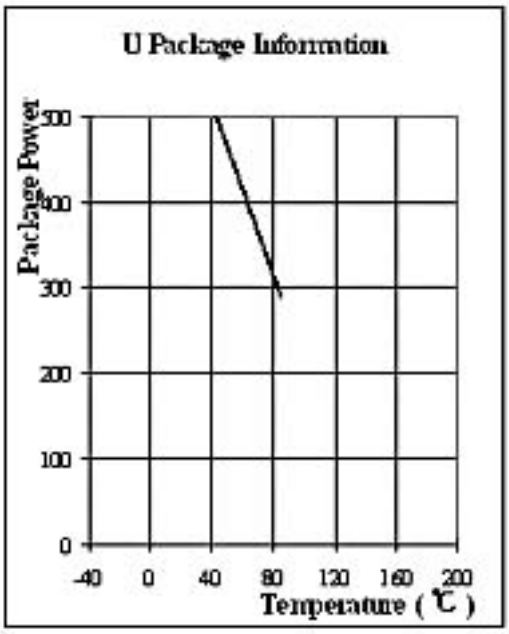



Typical Supply Current versus Supply Voltage
Supply Current (mA)
Supply Voltage (V)
TA=-40
TA=25
0
1
2
3
4
5
0
5
10
15
20
25
30


Wave Soldering Parameters
Solder Temperature (℃)
Time Wave Solder (Sec)
180
200
220
240
260
280
0
5
10
15
20
25
30

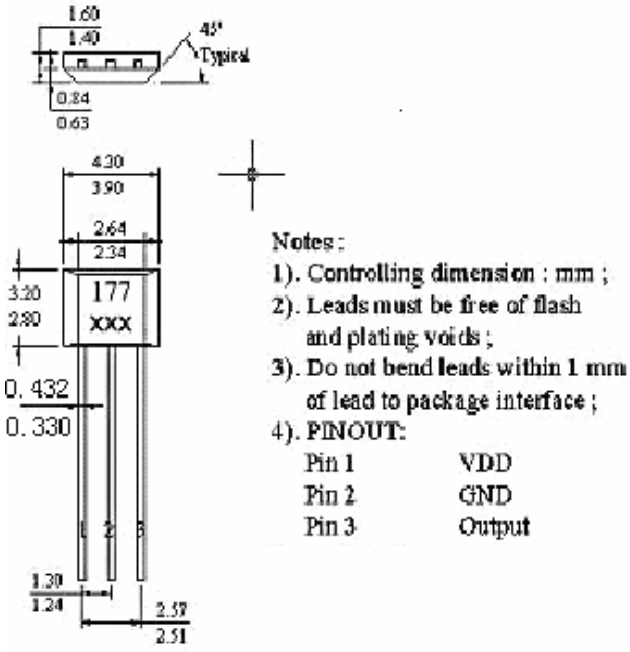

Output Voltage versus Flux Density
Output Voltage (V)
Flux Density (G)
Vcc
Brp
Bop
-50
50
Vsat
0
5
10
15
20
25
30
-200
-150
-100
-50
0
50
100
150
200


BH
BH-Supply Voltage
BH-80
BH-25
80
100
120
0
5
10
15
20
25
30
Supply Voltage(V)



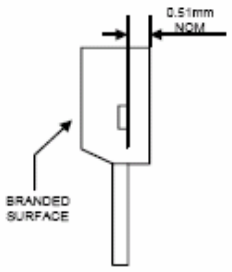
5. Sensor Location and package dimension and marking

UA Package

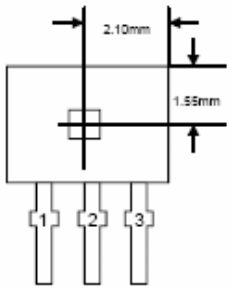


Notes:
1). Controlling dimension : mm ;
2). Leads must be free of flash and plating voids ;
3). Do not bend leads within 1 mm of lead to package interface ;
4). PINOUT:

Pin 1	VDD
Pin 2	GND
Pin 3	Output



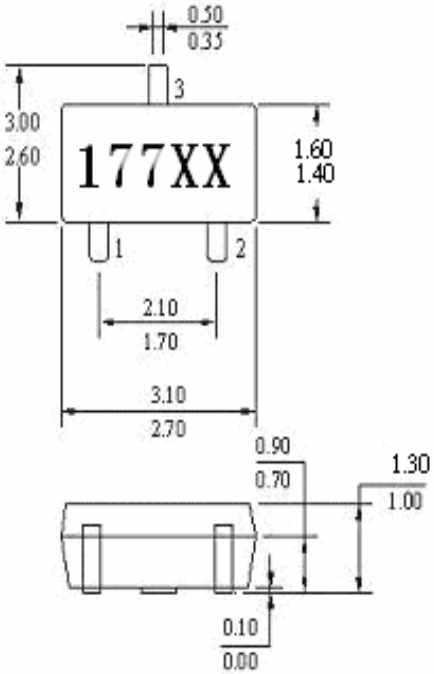
Active Area Depth



Sensor Location

- marking could be either laser marking or ink marking

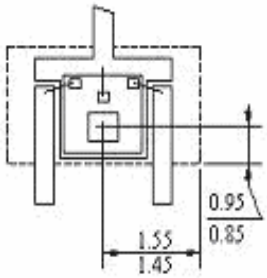
SOT-23 Package Dimensions
(Top View)



NOTES:

1. PINOUT (See Top View at left:
   Pin 1 VDD
   Pin 2 Output
   Pin 3 GND
2. Controlling dimension : mm.
3. Lead thickness after solder plating will be 0.254 mm maximum.

SOT-23 Hall Plate /
Chip Location
(Bottom View)



- marking could be either laser marking or ink marking