

MH481 a linear Hall-effect sensor, is composed of Hall sensor, linear amplifier and Totem-Pole output stage. It features low noise output, which makes it unnecessary to use external filtering. It also can provide increased temperature stability and accuracy. The linear Hall sensor has a wide operating temperature range of -40°C to $+105^{\circ}\text{C}$, appropriate for commercial, consumer, and industrial environments.

The high sensitivity of Hall-effect sensor accurately tracks extremely weak changes in magnetic flux density. The linear sourcing output voltage is set by the supply voltage and in proportion ofvary of the magnetic flux density. Typical operation current is 2.5mA and operating voltage range is 3.0 volts to 6.5 volts.

MH481 is rated for operation between the ambient temperatures -40°C and $+105^{\circ}\text{C}$ for the I temperature range. The four package styles available provide magnetically optimized solutions for most applications. Package types SQ is a DFN2020-3(0.5 mm nominal height), SD is a DFN2020-6(0.6mm nominal height), ST is a Tsot-23 (0.7 mm nominal height) miniature low-profile surface-mount package, while package UA is a three-lead ultra-mini SIP for through-hole mounting.

Features and Benefits

- Operating Voltage Range: 3.0V~6.5V
- Power consumption of 2.5 mA at 5 V_{DC} for energy efficiency
- Low-Noise Operation
- Linear output for circuit design flexibility
- Totem-Pole for a stable and accurate output
- Responds to either positive or negative gauss
- Small package for SMD
- Magnetically Optimized Package for SIP
- Cost competitive
- Robust ESD performance
- RoHS compliant 2011/65/EU and Halogen Free

Applications

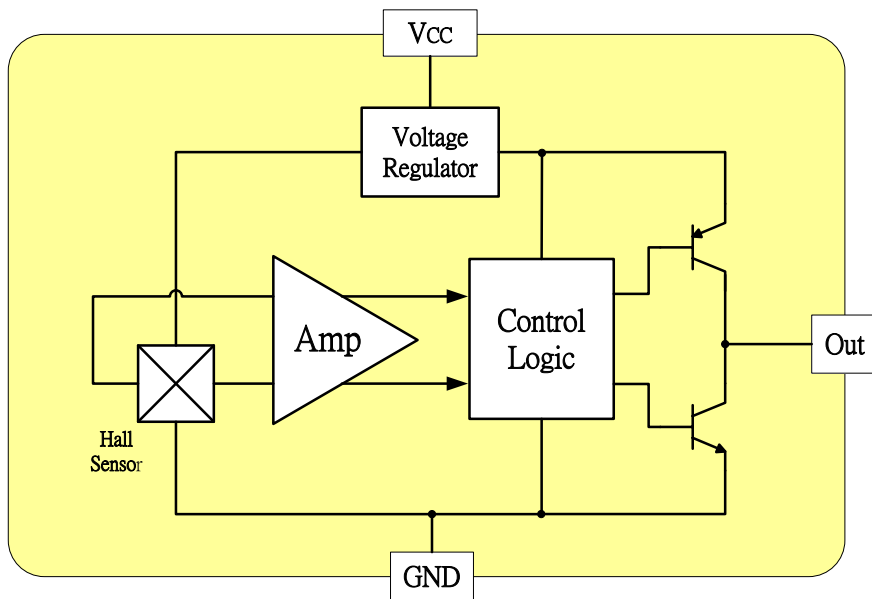
- Current sensing
- Motor control
- Position sensing
- Magnetic code reading
- Rotary encoder
- Ferrous metal detector
- Vibration sensing
- Liquid level sensing
- Weight sensing

Ordering Information

<p>The diagram shows a 14-character code: XXXXXX (yellow), XX (green), XX (blue), XX (red), - (black), and X (black). Lines indicate that the first 10 characters represent the Company Name and product Category, the next 3 characters represent the Part number, the next 1 character represents the Temperature Code, the next 1 character represents the Package type, and the final character represents the Sorting Code.</p>	<p>Company Name and Product Category MH:MST Hall Effect/MP:MST Power IC</p> <p>Part number 181,182,183,184,185,248,249,276,477,381,381F,381R,382..... If part # is just 3 digits, the fourth digit will be omitted.</p> <p>Temperature range E: 85 °C, I: 105 °C, K: 125 °C, L: 150 °C</p> <p>Package type UA:TO-92S,VK:TO-92S(4pin),VF:TO-92S(5pin),SO:SOT-23, SQ:QFN-3,ST:TSOT-23,SN:SOT-553,SF:SOT-89(5pin), SS:TSOT-26,SD:DFN-6</p> <p>Sorting <i>α</i>, <i>β</i>, Blank.....</p>
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Part No.	Temperature Suffix	Package Type
MH481IUA	I (-40°C to + 105°C)	UA (TO-92S)
MH481IST	I (-40°C to + 105°C)	ST(TSOT-23)
MH481ISQ	I (-40°C to + 105°C)	SQ (QFN2020-3)
MH481ISD	I (-40°C to + 105°C)	SD (QFN2020-6)

Functional Diagram



Absolute Maximum Ratings At ($T_a = 25^\circ\text{C}$)

Characteristics		Values	Unit
Supply Voltage, (VCC)		8	V
Reverse Voltage, (VCC)		-0.5	V
Magnetic Flux Density		Unlimited	Gauss
Output Current, (IOUT)		10	mA
Operating Temperature Range, (T_a)	"I" version	-40 to +105	$^\circ\text{C}$
Storage temperature range, (T_s)		-65 to +150	$^\circ\text{C}$
Maximum Junction Temp, (T_j)		150	$^\circ\text{C}$
Thermal Resistance	(θ_{ja}) UA / SQ / ST / SD	206 / 543 / 310 / 160	$^\circ\text{C/W}$
	(θ_{jc}) UA / SQ / ST / SD	148 / 410 / 223 / 35	$^\circ\text{C/W}$
Package Power Dissipation, (PD) UA / SQ / ST / SD		606 / 230 / 400 / 780	mW

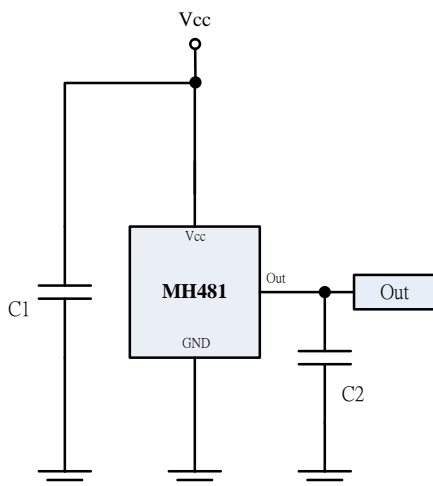
Note: Do not apply reverse voltage to Vcc and Vout Pin, It may be caused for Missfunction or damaged device.

Electrical Specifications

DC Operating Parameters: $T_A = +25^\circ\text{C}$, $V_{CC} = 5.0\text{V}$

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage, (VCC)	Operating	3.0		6.5	V
Supply Current, (ICC)	B=0 Gauss		2.5	5.0	mA
Output Current, (Io)	Vcc > 3V	1.0	1.5		mA
Null Output Voltage, (V_{Null})	B=0 Gauss	2.3	2.5	2.7	V
Output Bandwidth, (Bw)			20		kHz
Output Voltage Span, (V_{os})		2.95	3.2		V
Magnetic Range Gauss		± 500	± 800		Gauss
Linearity	% of Span		0.7		
Response Time			3		μs
Sensitivity		1.9		2.1	mV/G
Electro-Static Discharge	HBM	3			kV

Typical application circuit

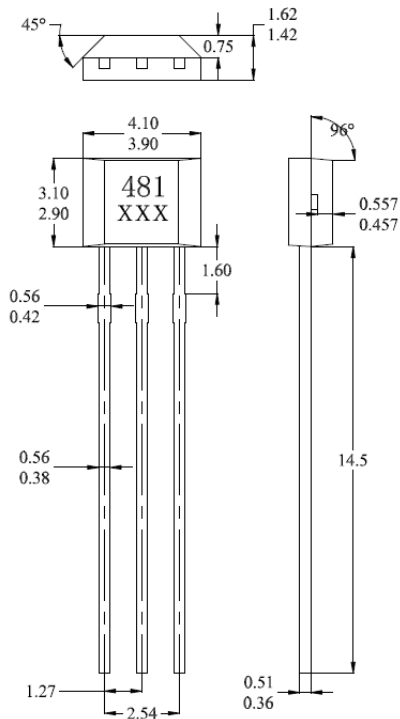


C1 : 1000PF

C2 : 10PF

Sensor Location, package dimension and marking

UA Package

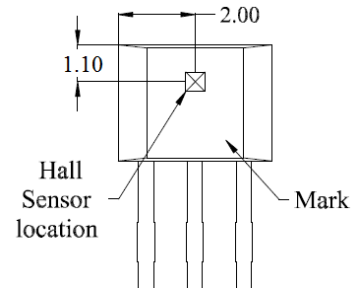


NOTES:

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:

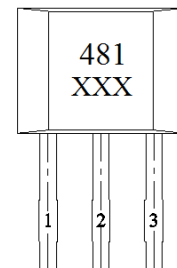
Pin 1	VCC
Pin 2	GND
Pin 3	Output

Hall Chip location



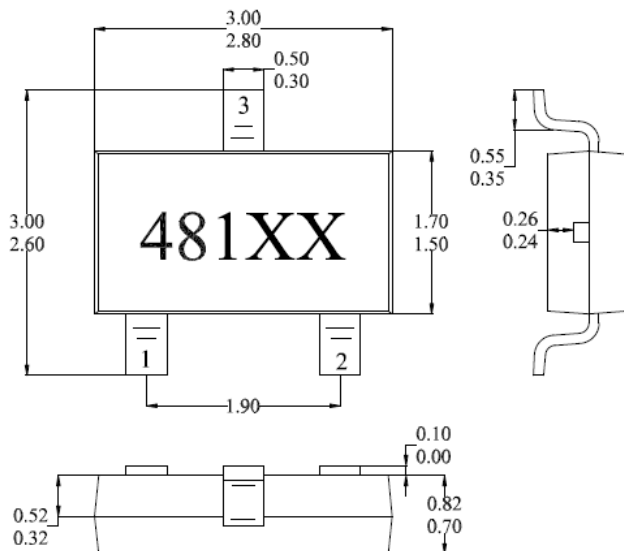
Output Pin Assignment

(Top view)



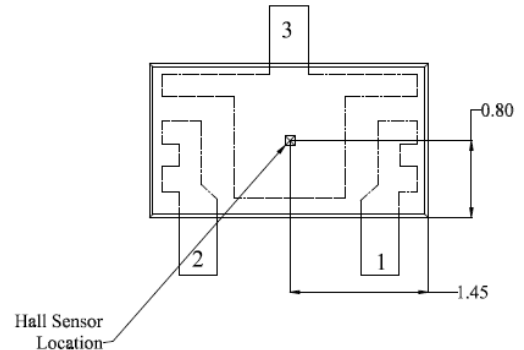
ST Package (TSOT-23)

(Top View)

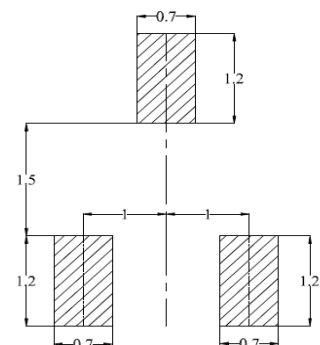


Hall Plate Chip Location

(Bottom view)



(For reference only) Land Pattern

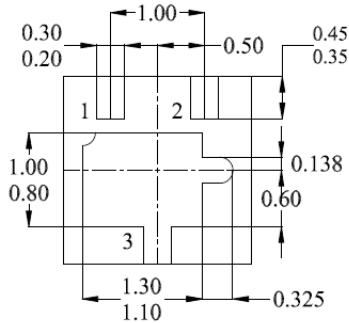
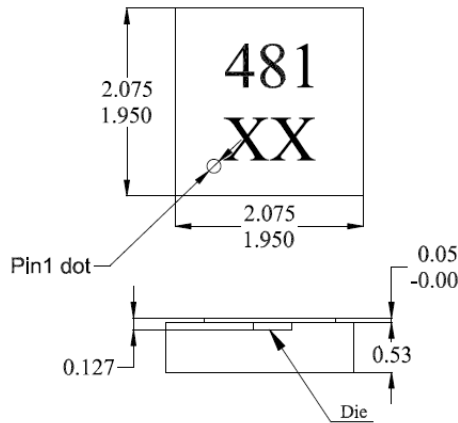


NOTES:

1. PINOUT (See Top View at left):

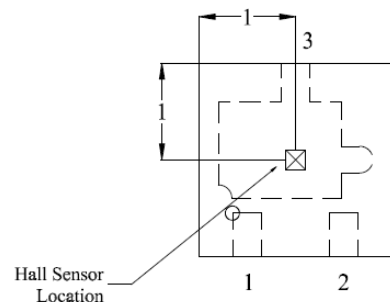
Pin 1	VDD
Pin 2	Output
Pin 3	GND
2. Controlling dimension: mm;

SQ Package (QFN2020-3)
(Top View)

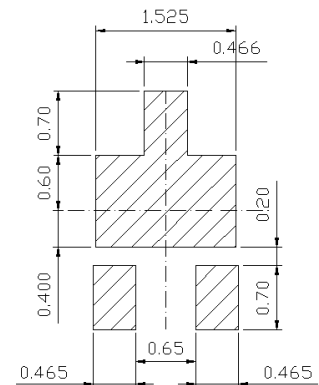


Bottom View

Hall Plate Chip Location
(Top view)



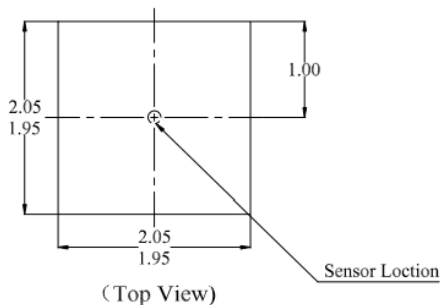
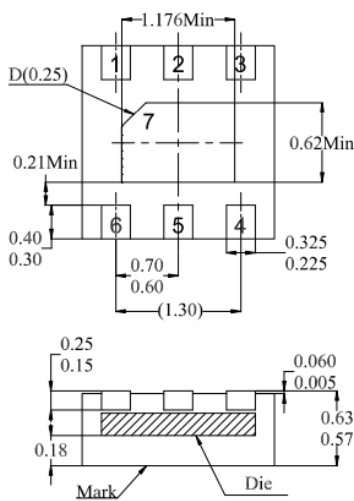
(For reference only) Land Pattern



NOTES:

- PINOUT (See Top View at left)
Pin 1 VCC
Pin 2 Output
Pin 3 GND
- Controlling dimension: mm;
- Chip rubbing will be 10 mil maximum;
- Chip must be in PKG. center.

SD package (DFN2020-6)
(Bottom View)



(Top View)

NOTES:

- Controlling dimension: mm
- Leads must be free of flash and plating voids
- Lead thickness after solder plating will be 0.254mm maximum
- PINOUT:

Pin No.	Pin Name	Function
1	V _{DD}	Power Supply
2	N.C	N.C
3	V _{OUT}	Output
4	N.C	N.C
5	V _{SS}	Ground
6	N.C	N.C
7	V _{SS}	Ground

- (For reference only) Land pattern

