

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°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 of vary 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°C for the I temperature range. The four package styles available provide magnetically optimized solutions for most applications. Package types SP is an PSOT-23(1.1 mm nominal height), SQ is a QFN2020-3(0.5 mm 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.

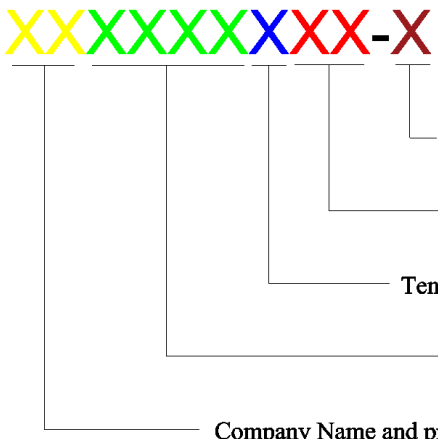
### ***Features and Benefits***

- Operating Voltage Range: 3.0V~6.5V
- Power consumption of 2.5 mA at 5 V<sub>DC</sub> 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***

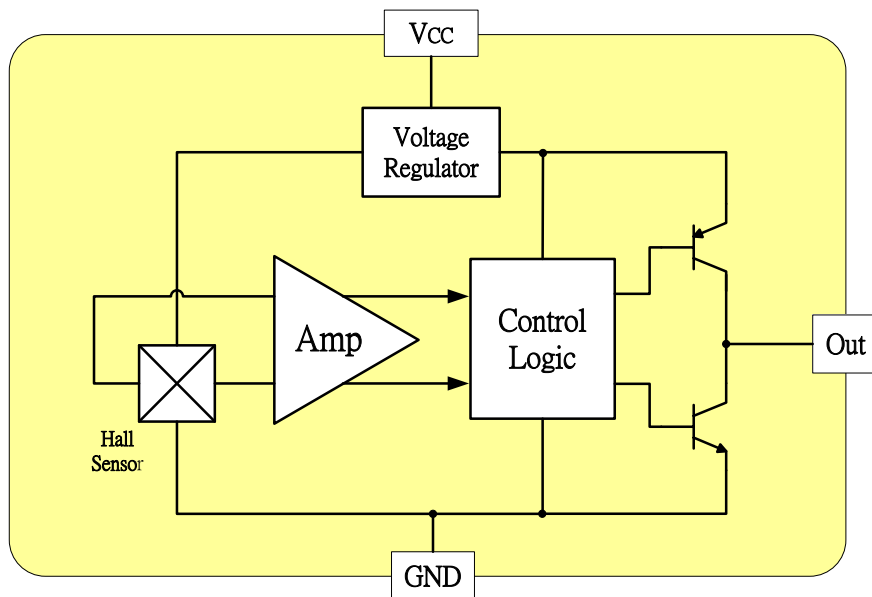
- Current sensing
- Motor control
- Position sensing
- Magnetic code reading
- Rotary encoder
- Ferrous metal detector
- Vibration sensing
- Liquid level sensing
- Weight sensing

### Ordering Information

	<p><b>Company Name and Product Category</b> MH:MST Hall Effect/MP:MST Power IC</p> <p><b>Part number</b> 181,182,183,184,185,248,249,276,477,381,381F,381R,382..... If part # is just 3 digits, the forth digit will be omitted.</p> <p><b>Temperature range</b> E: 85 °C, I: 105 °C, K: 125 °C, L: 150 °C</p> <p><b>Package type</b> 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><b>Sorting</b> <math>\alpha</math>, <math>\beta</math>, Blank.....</p>
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Part No.	Temperature Suffix	Package Type
MH481IUA	I (-40°C to + 105°C)	UA (TO-92S)
MH481ESP	I (-40°C to + 105°C)	SP (PSOT-23)
MH481ISQ	I (-40°C to + 105°C)	SQ (QFN2020-3)
MH481IST	I (-40°C to + 105°C)	ST(TSOT-23)

### 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	( $\theta_{ja}$ ) UA / SQ / ST / SP	206 / 543 / 310 / 625	$^\circ\text{C/W}$
	( $\theta_{jc}$ ) UA / SQ / ST / SP	148 / 410 / 223 / 116	$^\circ\text{C/W}$
Package Power Dissipation, (PD) UA / SQ / ST / SP		606 / 230 / 400 / 200	mW

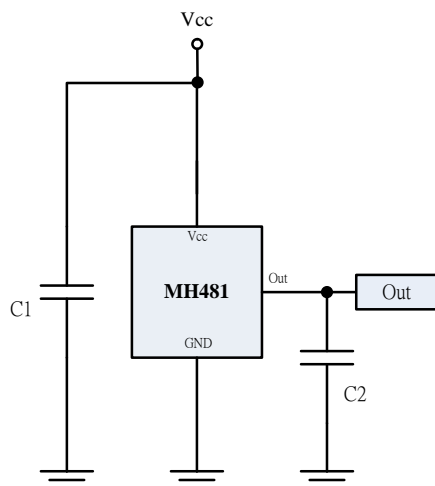
**Note:** Do not apply reverse voltage to Vcc and VOUT Pin, It may be caused for Missfunction or damaged device.

#### 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, ( $B_w$ )			20		kHz
Output Voltage Span, ( $V_{os}$ )		2.95	3.2		V
Magnetic Range Gauss		$\pm 500$	$\pm 800$		Gauss
Linearity	% of Span		0.7		
Response Time			3		$\mu\text{s}$
Sensitivity		1.9		2.1	mV/G
Electro-Static Discharge	HBM	3			kV

#### Typical application circuit

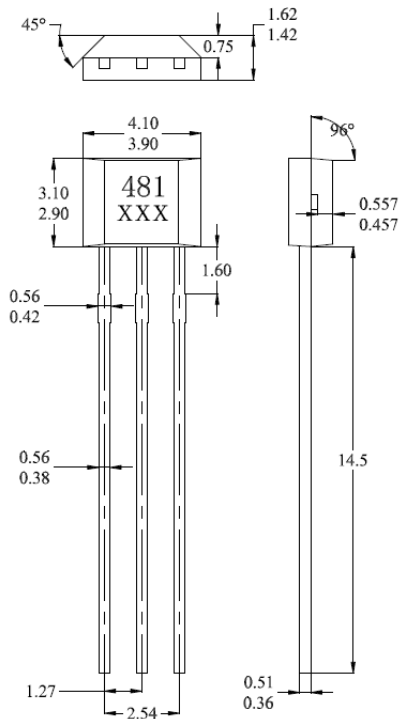


C1 : 1000PF

C2 : 10PF

### Sensor Location, package dimension and marking

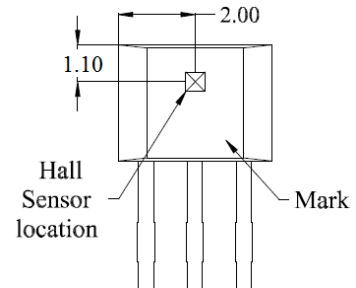
#### UA Package



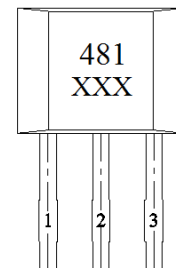
#### NOTES:

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

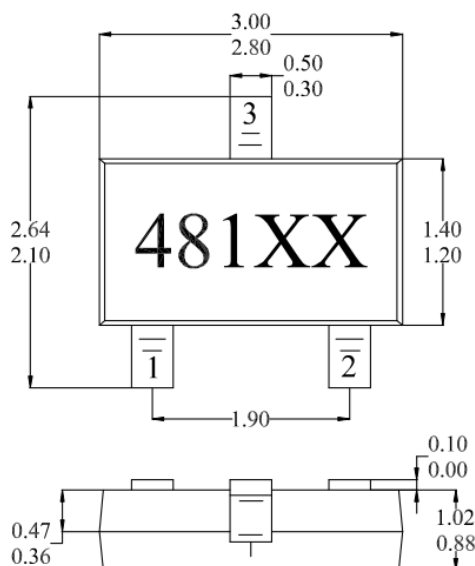
#### Hall Chip location



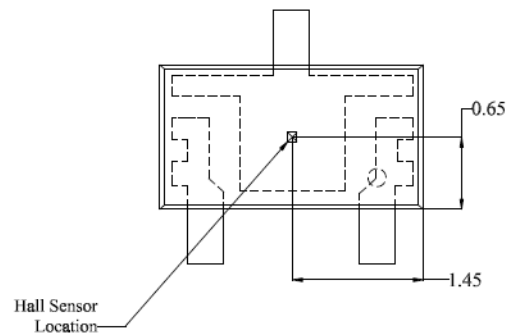
#### Output Pin Assignment (Top view)



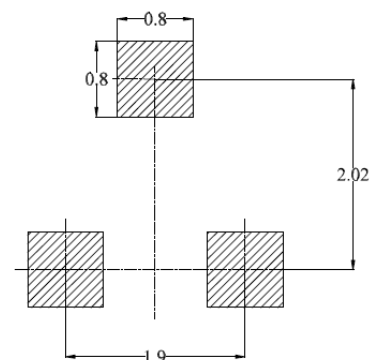
#### SP Package (PSOT-23) (Top View)



#### Hall Plate Chip Location (Bottom view)



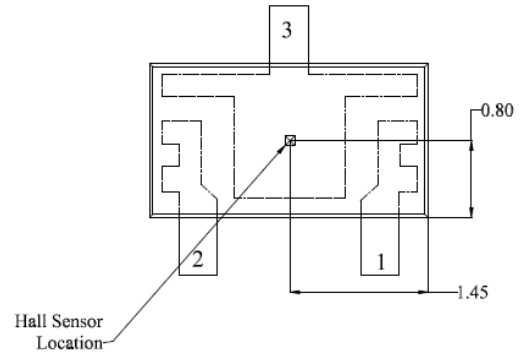
#### (For Reference only) Land pattern



#### NOTES:

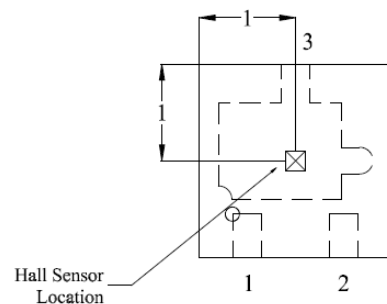
1. PINOUT (See Top View at left):  
Pin 1 VDD; Pin 2 Output; Pin 3 GND.
2. Controlling dimension: mm;

### Hall Plate Chip Location (Bottom view)



1. PINOUT (See Top View at left):  
Pin 1    VDD  
Pin 2    Output  
Pin 3    GND
2. Controlling dimension: mm;

### Hall Plate Chip Location (Top view)



Technical drawing of a mechanical part with the following dimensions:

- Overall width: 1.525
- Overall height: 1.070 (0.70 + 0.60 + 0.20)
- Top flange width: 0.466
- Top flange height: 0.70
- Base height: 0.20
- Base width: 0.465
- Internal width: 0.65
- Internal height: 0.70

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