

MH50X is a low-voltage, low-power linear Hall effect IC that operates from a 1.7V to 5.5V supply. The output signal level depends on the magnetic field strength applied to the chip surface and varies proportionally with the magnetic field strength. When the chip is in a zero magnetic field environment, its output voltage is half of the supply voltage. Its sensitivity varies proportionally with the supply voltage. At the same time, MH50X has the advantages of low output noise and good temperature stability.

Also, MH50X has been using the MPT which enables the chip to be multiple trims by HVPP pin. It makes the chip can be much more suitable on multiple application filed.

Packages are covered by SIP4 and Sot23-6L which can be trimmed in customer side by programmers, and SIP3 and Sot 23 packages which are trimmed by factory.

All of them are RoHS compliant 2011/65/EU and Halogen Free

Features and Benefits

- Operating voltage range:1.7~5.5 V
- Operating temperature range: -40~125°C
- Low power consumption current: Icc=850µA @ Vcc=1.8V
- Fast responding time:40us (TYP)
- Bandwidth: 9.6KHz
- Low output noise, good stability
- Output behavior on Bipolarity is programmable.
- RoHS compliant 2011/65/EU and Halogen Free

Applications

- Gamepad Joystick
- Proximity detection
- Headphone position detection
- Magnetic Keyboard
- Precious position detection
- Accelerator



Ordering Information	1
Sorting Code Package type Temperature Code Part number Company Name and product Category	Company Name and Product Category MH:MST Hall Effect/MP:MST Power IC Part number 181,182,183,184,185,248,249,276,477,381,381F,381R,382 If part # is just three digits, the fourth digit will be omitted. Temperature range E: 85 °C, I: 105 °C, K: 125 °C, L: 150 °C 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 Sorting a,β,Blank
	N 1 M

Part No.	Temperature Suffix	Package Type
MH50XKSO	K (-40°C to $+ 125$ °C)	SOT23-3L
MH50XKUA	K (-40°C to $+ 125$ °C)	TO-92S
MH50XKVK	K (-40°C to $+ 125$ °C)	TO-94
MH50XKSR	K (-40°C to $+ 125$ °C)	SOT23-6L
MH50XKSM	K (-40°C to $+ 125$ °C)	DFN1.6*1.66L

Functional Diagram





Absolute Maximum Ratings At(Ta=25°C)

Characteristics	Values	Unit
Supply Voltage,(VCC)	6	V
Reverse Voltage, (VCC)	-0.1	V
Magnetic Flux Density	Unlimited	Gauss
Output Voltage, (Vout)	6	V
Operating Temperature Range, (Ta)	-40 to +125	°C
Storage temperature range, (Ts)	-65 to +165	°C
Maximum Junction Temp,(<i>Tj</i>)	165	°C
Package Power Dissipation, (PD)UA/VK/SO/SR/SM	603/550/230/650/500	mW

Note: Do not apply reverse voltage to V_{CC} and V_{OUT} Pin, it may be caused by Miss function or damaged device.

Electrical Specifications

DC Operating Parameters: $T_A = +25$ °C, $V_{CC} = 5.0V$

Parameters		Test Conditions	Min	Тур	Max	Units
Supply Voltage, (VCC)		Operating	1.7	3.3	5.5	V
Supply Current, (ICC)		B=0Gauss		1.3	1.5	mA
Bandwidth, (Bw)		TA=25°C		9.6		kHz
Output impedance, (ROUT)		OUT to GND		5	10	Ω
output load capacitat	nce, (CL)	TA=25°C		1		nF
Power-up time, (T_R)		TA=25°C, CL=1nF			50	us
Response time, (T_{RE})	SP)	TA=25°C		40		us
Linear output low vo	oltage, (VOL)	TA=25°C			0.1	V
Linear output high voltage, (VOH)		TA=25°C	VCC-0.1			V
Linearity Error, (ELIN)		TA=25°C	-1.5		1.5	%
Zero magnetic field	output voltage, (VOQ)	B=0Gauss		0.5*Vcc		V
Zero magnetic field output voltage temperature drift, (<i>Vog_TC</i>)			-2		2	%
Zero magnetic field output voltage error, (VOE)		TA=25°C		0.1*Vcc		V
		MH501P		1.5		mV/G
		MH5002		2.0		mV/G
		MH5003		3.0		mV/G
Sensitivity SO/UA	50/UA	MH5004		4.0		mV/G
		MH5007		7.0		mV/G
		MH5013		13.0		mV/G
	SR/VK/SM	MH50X	Pr	Programmable		mV/G
Magnetic Range Gauss		MH501P	±1600		Gauss	
		MH5002	±1200		Gauss	
		MH5003	± 800		Gauss	
		MH5004	±600		Gauss	
		MH5007	±340		Gauss	
		MH5013		±180		
Sensitivity temperate	ure drift, (SNS_TC)		1000		PPM/°C	



Output noise, (VN)	Vcc=4.0V, TA=25°C, BW=9.6kHz	14		mVpp
Electro-Static Discharge	HBM		4	kV

Typical application circuit



Typical application circuit (Programmable)





UA Package (TO-92S)







Sensor Location, package dimension and marking VK Package (To-94)

Hall Chip location





Pr

SO Package (SOT23-3L)

(Top View)



NOTES:

- 1. PINOUT (See Top View at left :) Pin 1 V_{DD; Pin} 2 Output; Pin 3 GND
- 2. Controlling dimension: mm
- 3. Lead thickness after solder plating will be 0.254mm maximum
- 4. Chip must be in PKG. center.
- Marking info: The first two X=Sens; The last two X=Date code (Refer to DC table)

SR Package (SOT23-6L)

(Top View)



NOTES:

1.PINOUT (See Top View at left :)

Pin 1 V_{DD}; Pin 2 HVPP; Pin 3 Output; Pin 5 GND;

2.Controlling dimension: mm

3.Lead thickness after solder plating will be 0.254mm maximum

4.Chip must be in PKG. center.

5.Marking info: The first two X=Sens; The last two X=Date code (Refer to DC table)

MH50X Specifications Programmable Linear Hall Sensor

Hall Plate Chip Location



(For reference only) Land Pattern



Hall Plate Chip Location



(For reference only) Land Pattern





MH50X Specifications Programmable Linear Hall Sensor

SM Package





NOTES:

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

Pin	Pin Name	Function		
1	OUT	Output/Programming		
2	NC			
3	GND	Ground		
4	HVPP	Programming voltage input		
5	Vcc	Power		
6	NC			

5. Marking info: The 1st line XX =Sens; The 2nd line XX=Date code (Refer to DC table)

(For reference only) Land Pattern

