MH248 Hall-effect sensor is a temperature stable, stress-resistant , micro-power switch. Superior high-temperature performance is made possible through a dynamic offset cancellation that utilizes chopper-stabilization. This method reduces the offset voltage normally caused by device over molding, temperature dependencies, and thermal stress.

MH248 includes the following on a single silicon chip: voltage regulator, Hall voltage generator, small-signal amplifier, chopper stabilization, Schmitt trigger, open-drain output. Advanced CMOS wafer fabrication processing is used to take advantage of low-voltage requirements, component matching, very low input-offset errors, and small component geometries.

This device requires the presence of omni-polar magnetic fields for operation.

MH248 is rated for operation between the ambient temperatures –40℃ and + 85℃ for the E temperature range. The four package styles available provide magnetically optimized solutions for most applications. Package types SO is an SOT-23(1.1 mm nominal height),SQ is an QFN2020-3(0.5 mm nominal height),Tsot-23 is an ST(0.7 mm nominal height) ,a miniature low-profile surface-mount package, while package UA is a three-lead ultra-mini SIP for through-hole mounting.

The package type is in a lead Halogen Free version was verified by third party Lab.

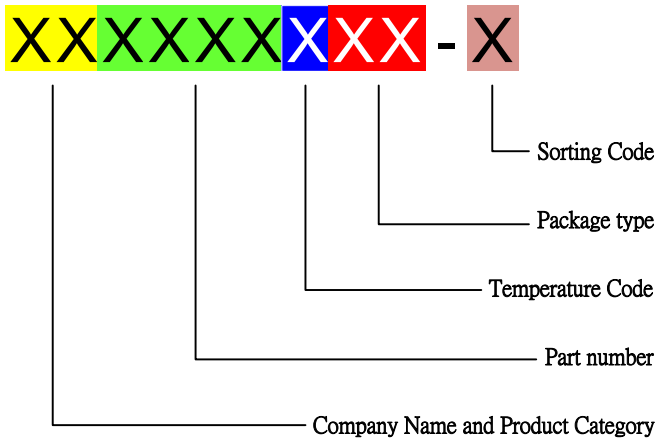
Features and Benefits

- CMOS Hall IC Technology
- Solid-State Reliability
- Micro power consumption for battery-powered applications
- Omni polar, output switches with absolute value of North or South pole from magnet
- Operation down to 2.5 V and Max at 3.5V.
- High Sensitivity for direct reed switch replacement applications
- Multi Small Size option
- Custom sensitivity selection is available in optional package.
- Pb Free/Green chip is qualified by third party lab.

Applications

- Solid state switch
- Handheld Wireless Handset Awake Switch (Flip Cell/PHS Phone/Note Book/Flip Video Set)
- Lid close sensor for battery powered devices
- Magnet proximity sensor for reed switch replacement in low duty cycle applications

Ordering Information



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 3 digits, the forth digit will be omitted.

Temperature range

E: 85 ℃, I: 105 ℃, K: 125 ℃, L: 150 ℃

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

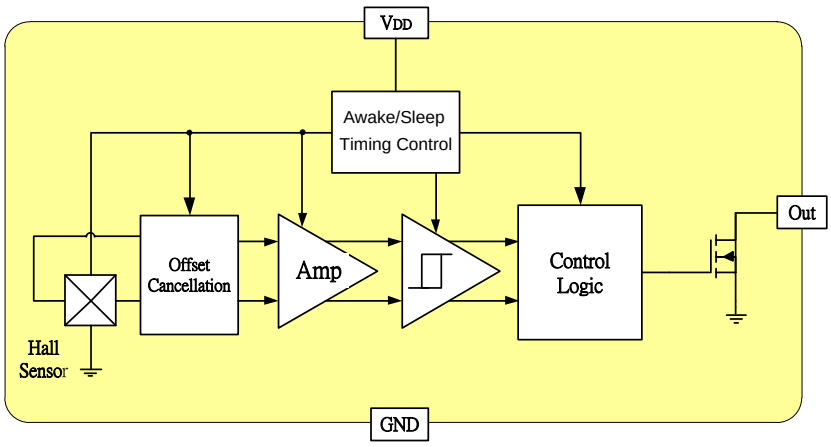
Sorting

α,β,Blank…..

Part No.	**Temperature Suffix**	**Package Type**
MH248EUA	E (-40℃ to + 85℃)	UA (TO-92S)
MH248ESO	E (-40℃ to + 85℃)	SO (SOT-23)
MH248EST	E (-40℃ to + 85℃)	ST (TSOT-23)
MH248ESQ	E (-40℃ to + 85℃)	SQ (QFN2020-3)
MH248ESO-α	E (-40℃ to + 85℃)	SO (SOT-23)
MH248ESO-β	E (-40℃ to + 85℃)	SO (SOT-23)
MH248ESO-γ	E (-40℃ to + 85℃)	SO (SOT-23)

Custom sensitivity selection is available by MST sorting technology

Functional Diagram



***Note**: Static sensitive device; please observe ESD precautions. Reverse V_{DD} protection is not included. For reverse voltage protection, a 100 Ω resistor in series with V_{DD} is recommended.*

Absolute Maximum Ratings *At (Ta=25℃)*

Characteristics		Values	Unit
Supply voltage,(V_{DD})		5	V
Output Voltage,(V_{out})		5	V
Reverse voltage, (V_{DD}) (V_{OUT})		-0.3	V
Magnetic flux density		Unlimited	Gauss
Output current(I_{OUT})		2	mA
Operating temperature range, (Ta)		-40 to +85	℃
Storage temperature range, (Ts)		-55 to +150	℃
Maximum Junction Temp,(Tj)		150	℃
Thermal Resistance	(θ_{JA}) UA / SO / ST / SQ	206 / 543 / 310 / 543	℃/W
	(θ_{JC}) UA / SO / ST /SQ	148 / 410 / 223 / 410	℃/W
Package Power Dissipation, (P_D) UA / SO / ST / SQ		606 / 230 / 400 / 230	mW

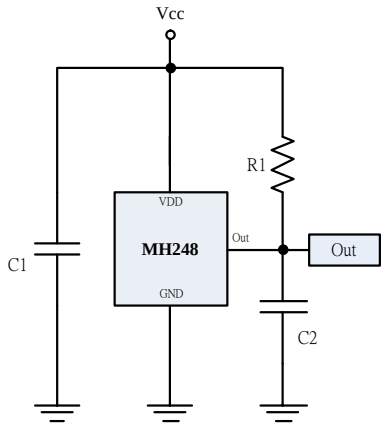
Note: *Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.*

Electrical Specifications

DC Operating Parameters T_A=+25℃, V_{DD}=3.0V

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage,(V_{DD})	Operating	2.5		3.5	V
Supply Current,(I_{DD})	Awake State		2.5	4.0	mA
	Sleep State		8.0	12	μA
	Average		10	16	μA
Output Leakage Current,(I_{off})	Output off			1	uA
Output Low Voltage,(V_{sat})	I_{OUT}=1mA			0.3	V
Awake mode time,(T_{aw})	Operating		70		uS
Sleep mode time,(T_{SL})	Operating		70		mS
Duty Cycle,(D,C)			0.1		%
Operate Point, (B_{OPS})	S pole to branded side, B > BOP, Vout On	6		60	Gauss
(B_{OPN})	N pole to branded side, B > BOP, Vout On	-60		-6	
Release Point (B_{RPS})	S pole to branded side, B < BRP, Vout Off	5		59	Gauss
(B_{RPN})	N pole to branded side, B < BRP, Vout Off	-60		-5	
Hysteresis,(B_{HYS})	|BOPx - BRPx|		7		Gauss

Typical Application circuit

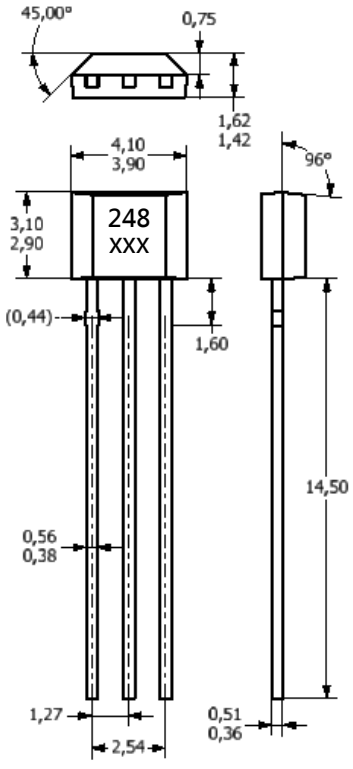


C1：10nF
C2：100pF
R1：100KΩ

Sensor Location, Package Dimension and Marking

MH248 Package

UA Package



NOTES:

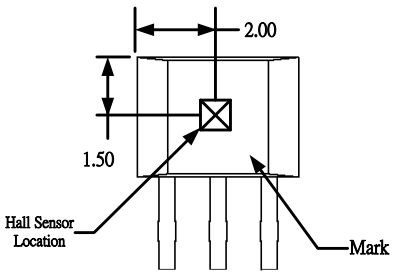
1).Controlling dimension: mm 2).Leads must be free of flash and plating voids

3).Do not bend leads within 1 mm of lead to package interface.

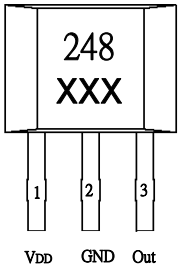
4).PINOUT:

Pin 1	V_{DD}
Pin 2	GND
Pin 3	Output

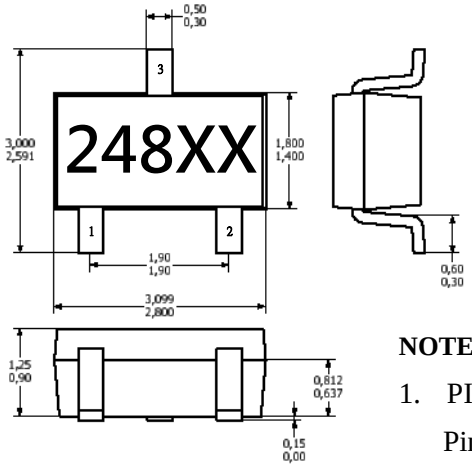
Hall Chip location



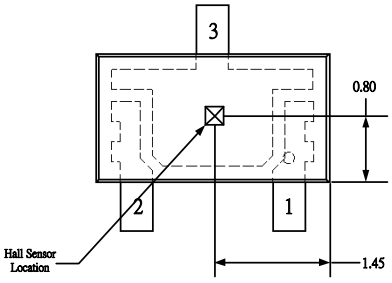
Output Pin Assignment (Top view)



SO Package
(Top View)



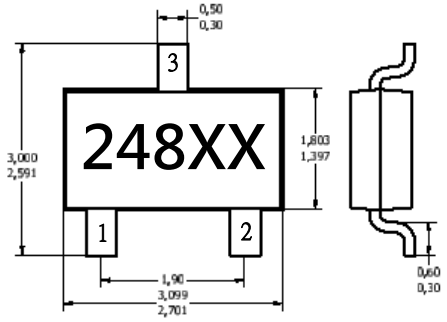
Hall Plate Chip Location
(Bottom view)

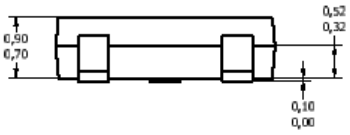


NOTES:

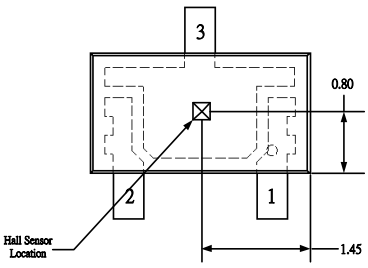
1. PINOUT (See Top View at left :)
   Pin 1 V_{DD}
   Pin 2 Output
   Pin 3 GND
2. Controlling dimension: mm
3. Lead thickness after solder plating will be 0.254mm maximum

ST Package (TSOT-23)
(Top View)





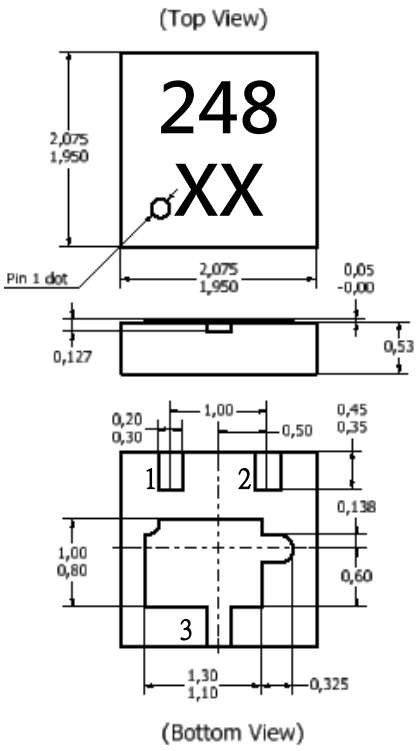
Hall Plate Chip Location
(Bottom view)



NOTES:

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

SQ Package



NOTES:

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

Hall Plate Chip Location

(Top view)