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.

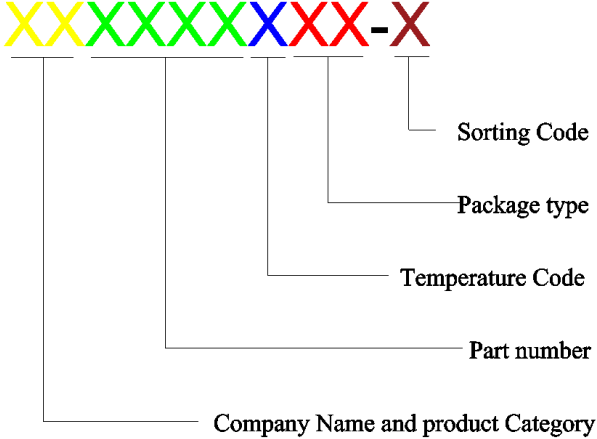The package type is in a lead Halogen Free version was verified by third party Lab.

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 1.8 V and Max at 5.5V.
- High Sensitivity for direct reed switch replacement applications
- Multi Small Size option
- Custom sensitivity selection is available in optional package.
- RoHS compliant 2011/65/EU and Halogen Free

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

XXXXXXXXX-X

- 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 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°C to + 85°C)	UA (TO-92S)
MH248ESO	E (-40°C to + 85°C)	SO (SOT-23)
MH248EST	E (-40°C to + 85°C)	ST (TSOT-23)
MH248ESQ	E (-40°C to + 85°C)	SQ (QFN2020-3)

Custom sensitivity selection is available by MST sorting technology

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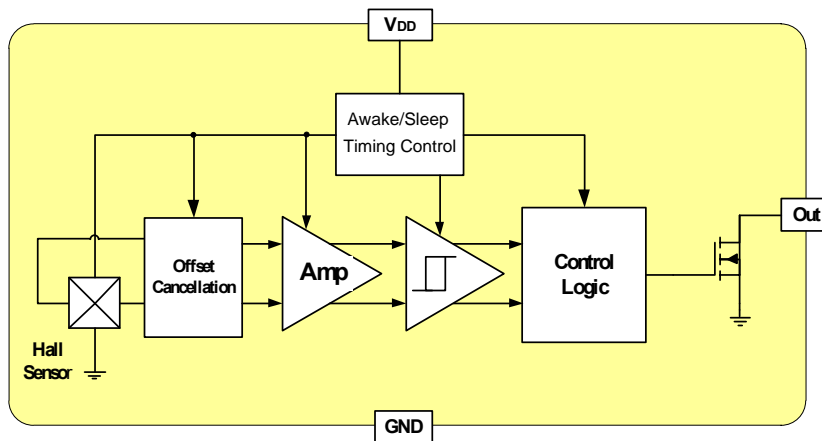
Note: Static sensitive device; please observe ESD precautions. Reverse V_{DD} protection is not included. For reverse voltage protection, a 100Ω resistor in series with V_{DD} is recommended.

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

Characteristics		Values	Unit
Supply voltage, (V_{DD})		6	V
Output Voltage, (V_{OUT})		6	V
Reverse voltage, (V_{DD}) (V_{OUT})		-0.3	V
Magnetic flux density		Unlimited	Gauss
Output current (I_{OUT})		10	mA
Operating temperature range, (Ta)		-40 to +85	°C
Storage temperature range, (Ts)		-55 to +150	°C
Maximum Junction Temp, (Tj)		150	°C
Thermal Resistance	(θ_{JA}) UA / SO / ST / SQ	206 / 543 / 310 / 543	°C/W
	(θ_{JC}) UA / SO / ST /SQ	148 / 410 / 223 / 410	°C/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	1.8		5.5	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,	$B_{OP}S$	S pole to branded side, B > BOP,	6		60	Gauss
	$B_{OP}N$	N pole to branded side, B > BOP,	-60		-6	
Release Point	$B_{RP}S$	S pole to branded side, B < BRP,	5		59	Gauss
	$B_{RP}N$	N pole to branded side, B < BRP,	-60		-5	
Hysteresis,($BHYS$)		|BOPx - BRPx|		7		Gauss

Typical Application circuit
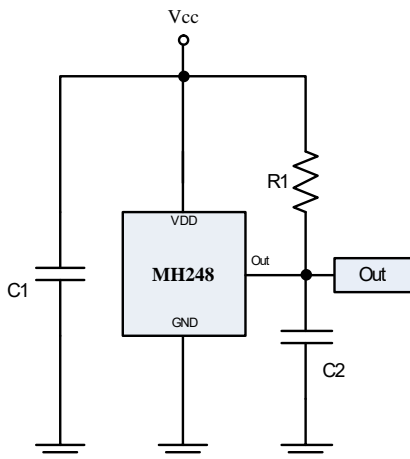
C1：10nF

C2：100pF

Sensor Location, Package Dimension and Marking

UA Package

Hall Chip location
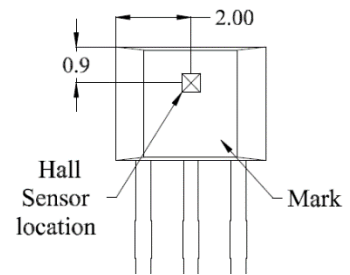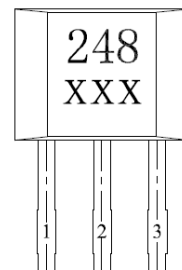

Hall Sensor location

Mark
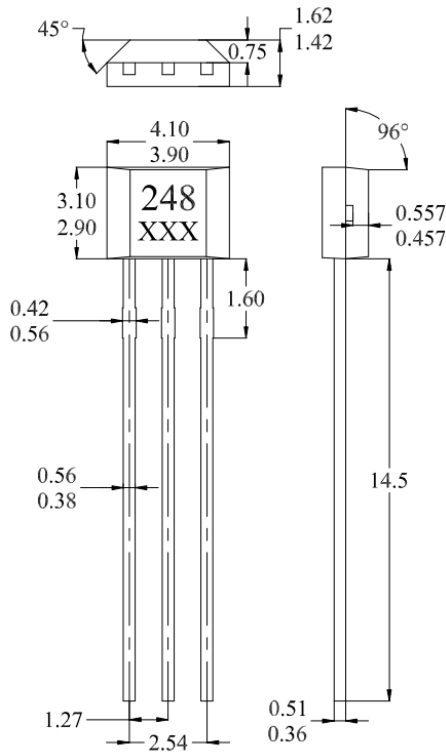
NOTES:

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
5. XXX；1st X=Year；

   2nd and 3rd XX=Week
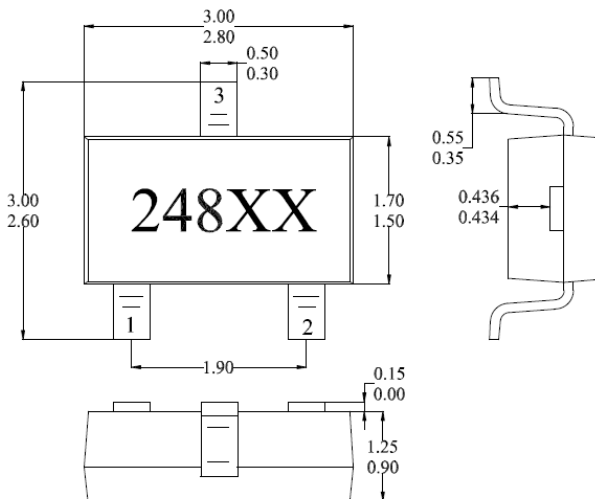
Output Pin Assignment

(Top view)

Package (SOT-23)

(Top View)

Hall Plate Chip Location
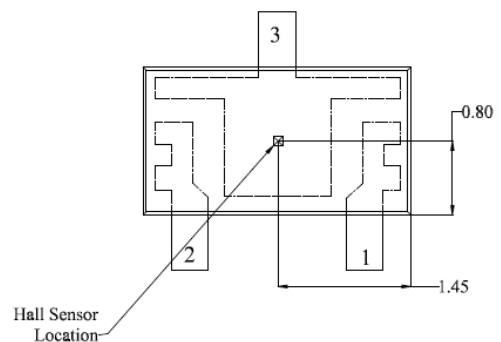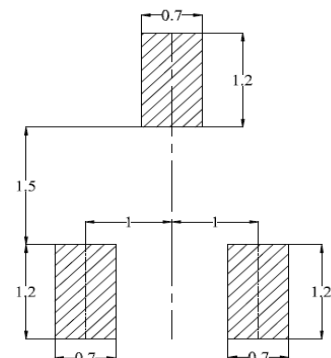
(Bottom view)

Hall Sensor Location
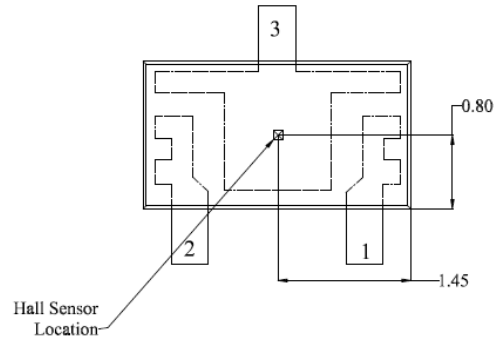
(For reference only)Land Pattern

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
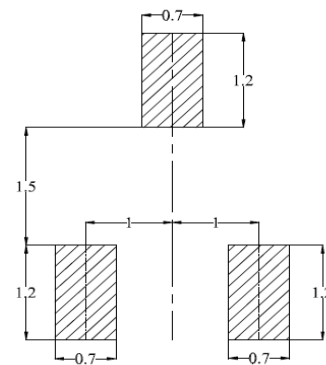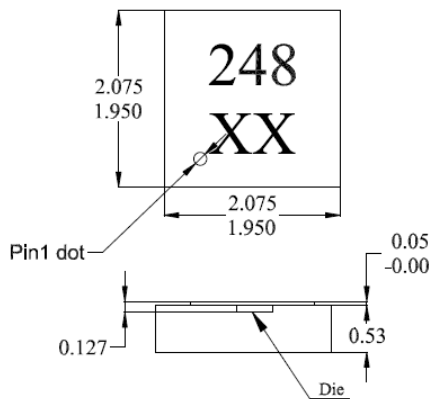4. XX: Date Code, Refer to DC table

Package (TSOT-23)
(Top View)
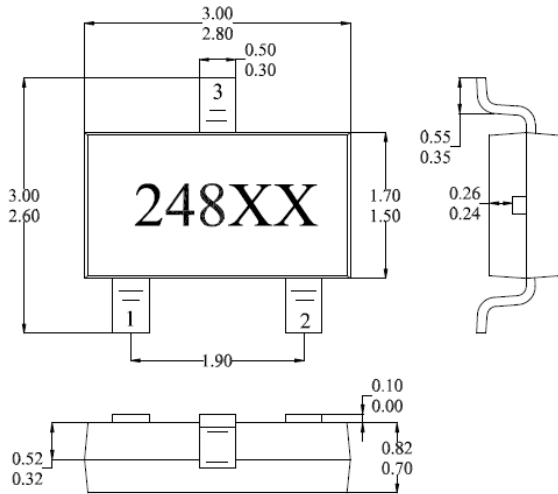
Hall Plate Chip Location
(Bottom view)

Hall Sensor Location
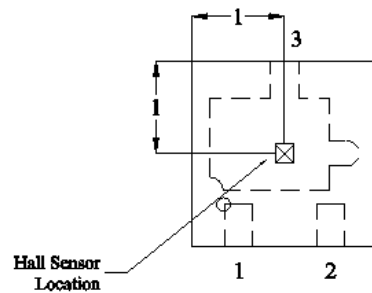
(For reference only)Land Pattern

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
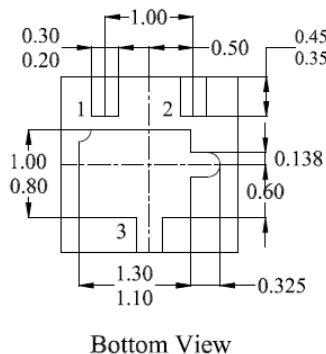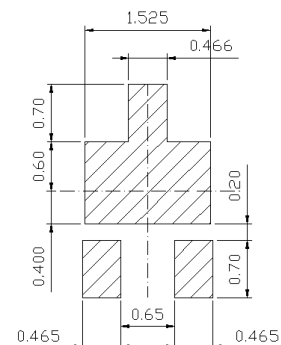4. XX: Date Code, Refer to DC table

SQ Package（QFN2020-3）
（Top View）

Pin1 dot

Die

Bottom View

Hall Plate Chip Location
(Top view)

Hall Sensor Location

(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;
3. Chip rubbing will be 10mil maximum;
4. Chip must be in PKG. center.
5. XX: Date Code, Refer to DC table