深圳市百盛新纪元半导体有限公司
企业QQ：800009921
郑生：　18948314942
邮箱：　bsbdt2@163.com

MH250 Specifications

Low Switch Point Drift &High Sensitivity Micropower Hall Effect Switch

MH250 Hall-effect sensor is a temperature stable, stress-resistant, Low Tolerance of Sensitivity 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.

MH250 is special made for low operation voltage, 1.7V, to active the chip which is 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.

MH250 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), ST is an TSOT-23(0.8 mm nominal height),SQ is an QFN2020-3(0.55 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 Halogen Free version has been verified by third party Lab.

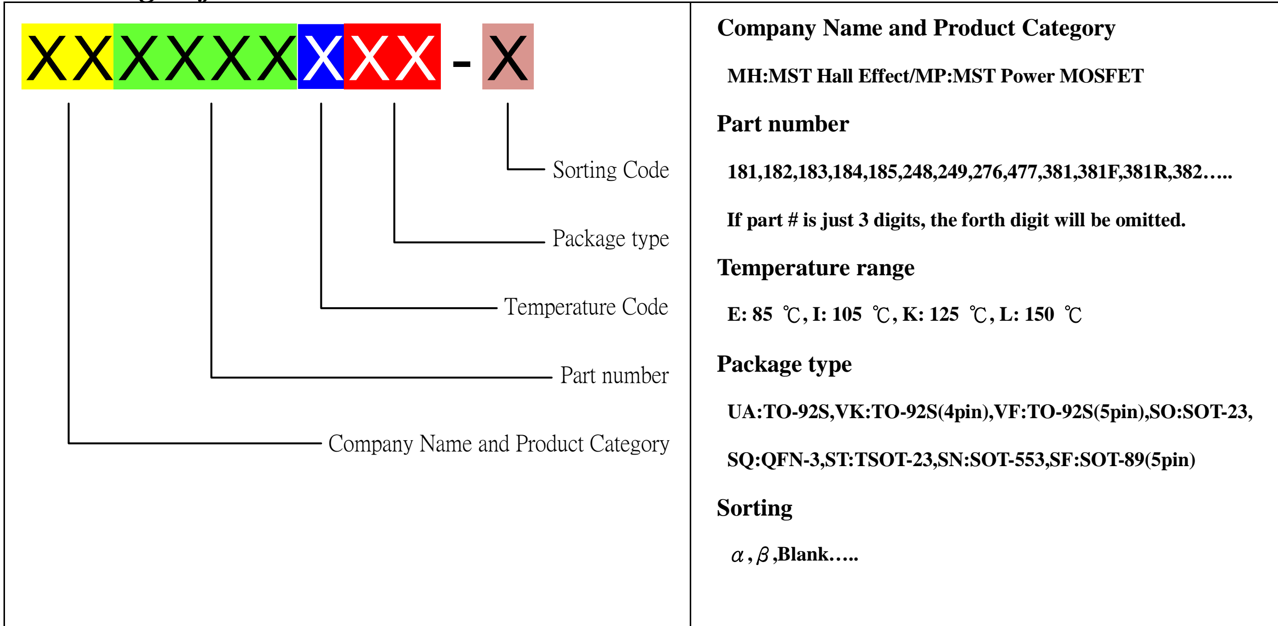
Features and Benefits

- CMOS Hall IC Technology
- MST patented RF noise protection
- 1.7 to 3.5V for battery-powered applications
- Omni polar, output switches with absolute value of North or South pole from magnet
- Operation down to 1.7V, Micro power consumption
- High Sensitivity for direct reed switch replacement applications
- Low sensitivity drift in crossing of Temp. range
- Ultra Low power consumption at 3uA (Avg)
- Green chip is qualified by third party lab.
- High ESD Protection, HBM> ±4KV(min)

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
- Floating Meter
- PDVD
- NB

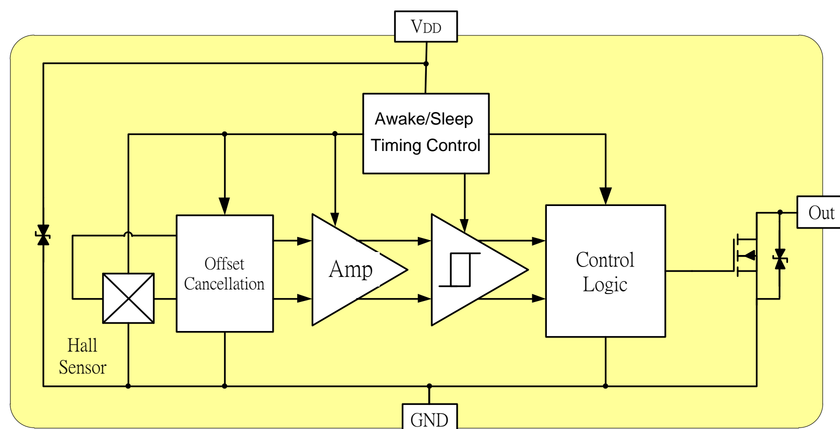
Ordering Information



Part No.	Temperature Suffix	Package Type
MH250EUA	E (-40℃ to + 85℃)	UA (TO-92S)
MH250ESO	E (-40℃ to + 85℃)	SO (SOT-23)
MH250EST	E (-40℃ to + 85℃)	ST (TSOT-23)
MH250ESQ	E (-40℃ to + 85℃)	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.*
MH250, HBM > ±4KV which is verified by third party lab.

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

Characteristics		Values	Unit
Supply voltage,(V_{DD})		7	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})		5	mA
Operating temperature range, (Ta)		-40 to +85	℃
Storage temperature range, (Ts)		-65 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

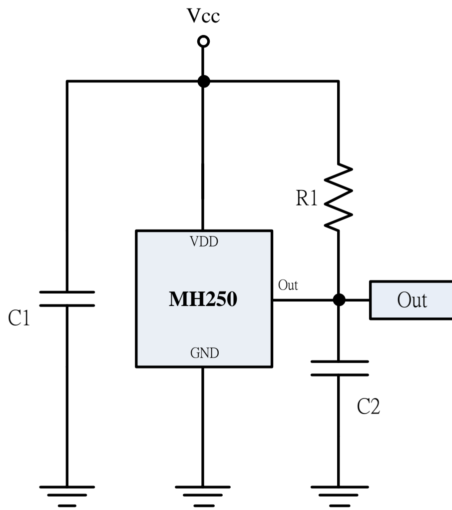
Note: *Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.*

Electrical Specifications

DC Operating Parameters ：Ta=25℃, V_{DD}=1.8V

Parameters		Test Conditions	Min	Typ	Max	Units
Supply Voltage,(V_{DD})		Operating	1.7		3.5	V
Supply Current,(I_{DD})		Awake State		0.9		mA
		Sleep State		1.6		μA
		Average		2.3		μA
Output Leakage Current,(I_{off})		Output off			1	uA
Output Low Voltage,(V_{sat})		I_{OUT}=1mA			0.2	V
Awake mode time,(T_{aw})		Operating		70		uS
Sleep mode time,(T_{SL})		Operating		100		mS
Duty Cycle,(D,C)				0.07		%
Electro-Static Discharge		HBM	4			KV
Operate Point,	(B_{OPS})	S pole to branded side, B > BOP, Vout On		30	40	Gauss
	(B_{OPN})	N pole to branded side, B > BOP, Vout On	-40	-30		
Release Point	(B_{RPS})	S pole to branded side, B < BRP, Vout Off	20	25		Gauss
	(B_{RPN})	N pole to branded side, B < BRP, Vout Off		-25	-20	
Hysteresis,(B_{HYS})		|BOPx - BRPx|		5		Gauss

Typical Application circuit

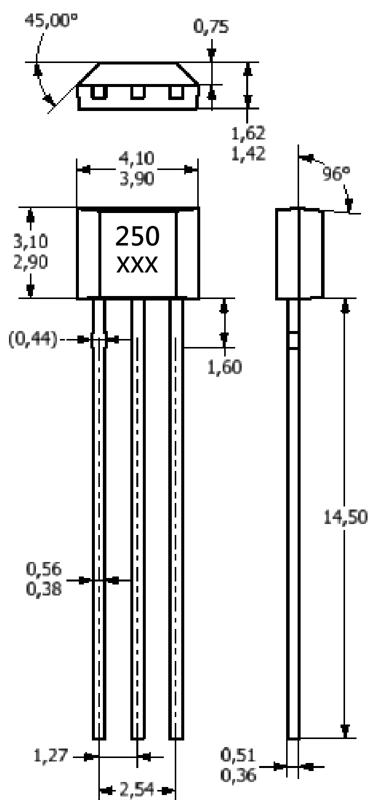


C1：10nF
C2：100pF
R1：100KΩ

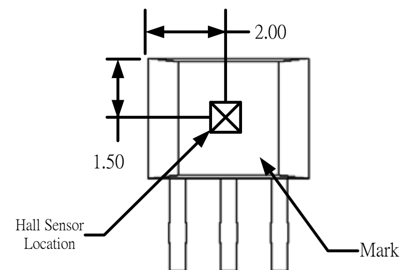
Sensor Location, Package Dimension and Marking

MH250 Package

UA Package



Hall Chip location

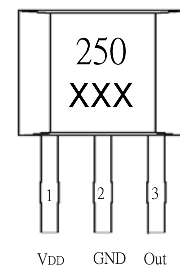


NOTES:

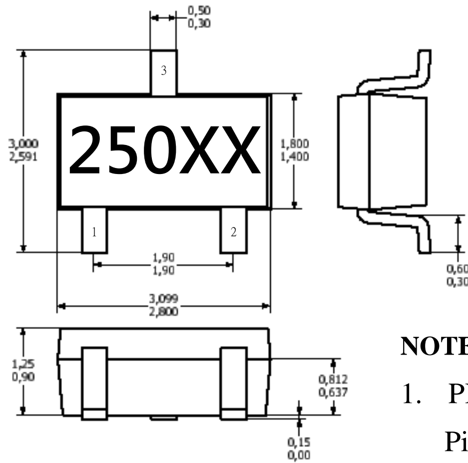
1).Controlling dimension: mm
2).Leads must be free of flash and plating voids
3).Do not bend leads within 1 mm of lead to package interface.
4).PINOUT:

Pin 1	VDD
Pin 2	GND
Pin 3	Output

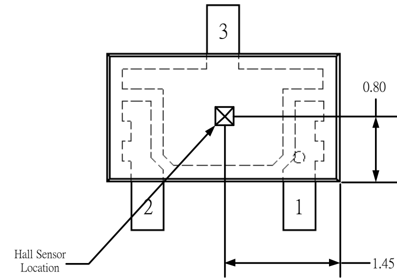
Output Pin Assignment
(Top view)



SO Package (Top View)



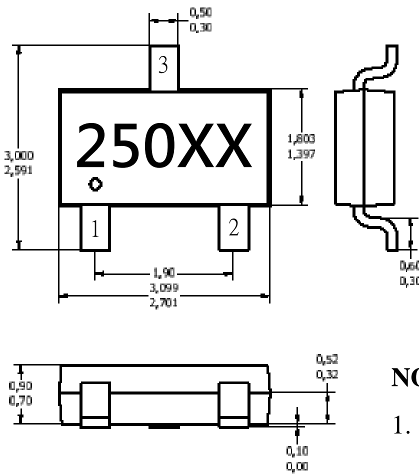
Hall Plate Chip Location (Bottom view)



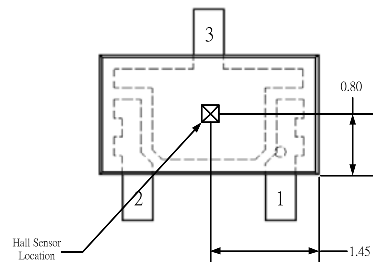
NOTES:

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)



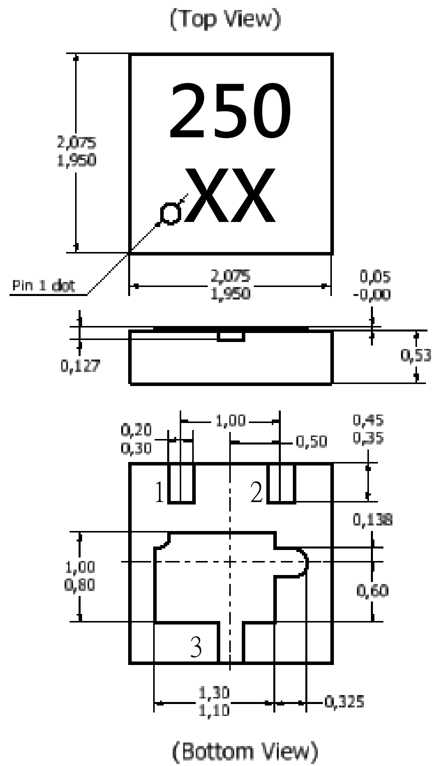
Hall Plate Chip Location (Bottom view)



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 VDD

   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)