MH251 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.

MH251 is special made for low operation voltage, 1.65V, 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, CMOS output driver. 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.

The package type is in a Halogen Free version has been verified by third party Lab.

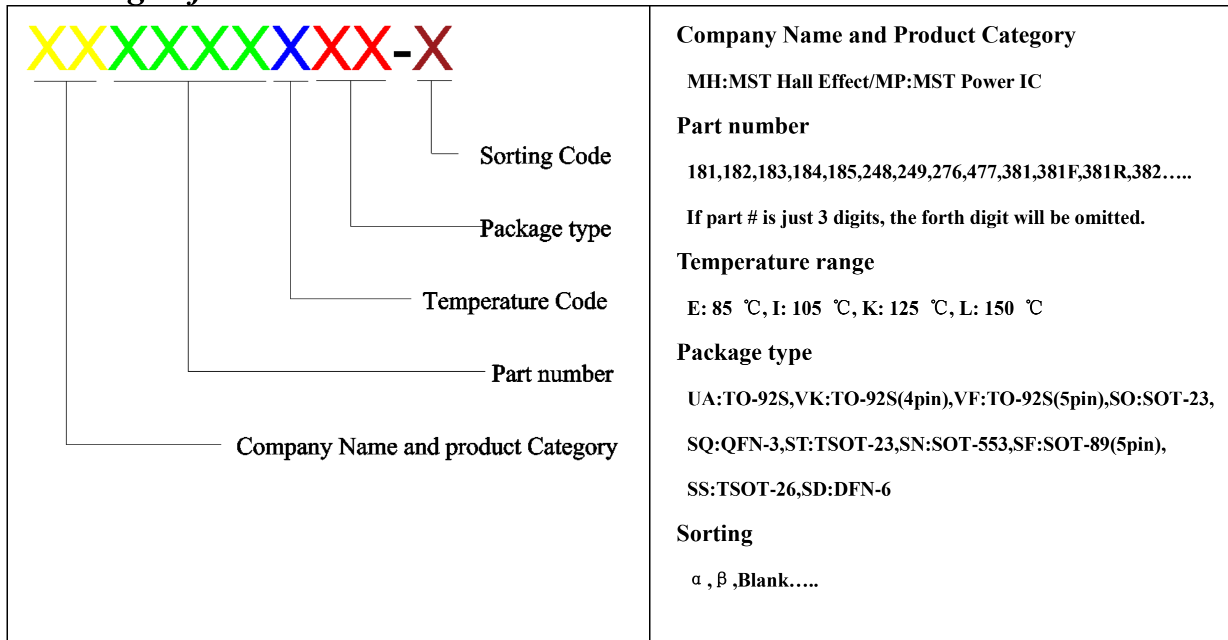
Features and Benefits

- CMOS Hall IC Technology
- Strong RF noise protection
- 1.65 to 3.5V for battery-powered applications
- Omni polar, output switches with absolute value of North or South pole from magnet
- Operation down to 1.65V, Micro power consumption
- High Sensitivity for reed switch replacement applications
- Multi Small Size option
- Low sensitivity drift in crossing of Temp. range
- Ultra Low power consumption at 5uA (Avg)
- High ESD Protection, HMB > ±4KV(min)
- Totem-pole output
- 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
- Water Meter
- Floating Meter
- PDVD
- NB

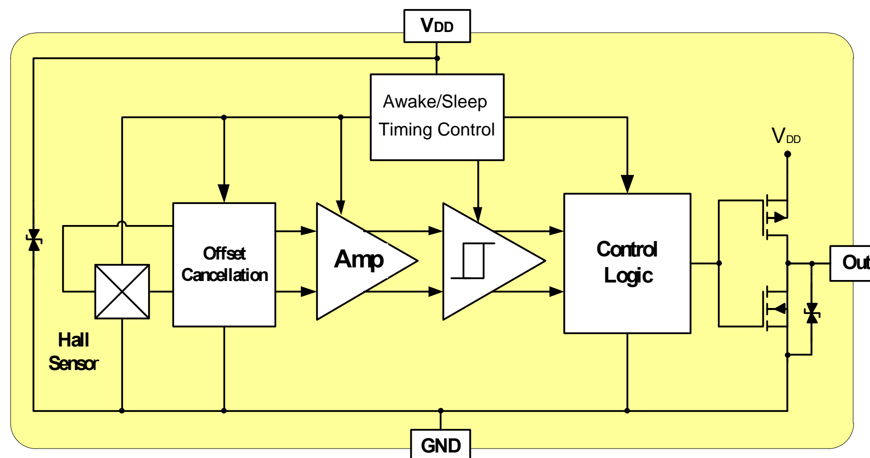
Ordering Information



Part No.	Temperature Suffix	Package Type
MH251EST	E (-40°C to + 85°C)	ST (TSOT-23)
MH251ESO	E (-40°C to + 85°C)	SO (SOT-23)
MH251EUA	E (-40°C to + 85°C)	UA (TO-92S)
MH251ESQ	E (-40°C to + 85°C)	SQ (SQ2020-3)
MH251ESP	E (-40°C to + 85°C)	SP (PSOT-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.*
MH 251, HBM > ±4KV which is verified by third party lab.

Absolute Maximum Ratings *At(Ta=25℃)*

Characteristics		Values	Unit
Supply voltage,(V_{DD})		4.5	V
Output Voltage,(V_{out})		4.5	V
Reverse Voltage , (V_{DD}) (V_{OUT})		-0.3	V
Magnetic flux density		Unlimited	Gauss
Output current,(I_{OUT})		1	mA
Operating temperature range, (Ta)		-40 to +85	℃
Storage temperature range, (Ts)		-65 to +150	℃
Maximum Junction Temp,(Tj)		150	℃
Thermal Resistance	(θ_{JA})ST/SO/UA/SQ/SP	310 /543/ 206 / 543/ 625	℃/W
	(θ_{JC})ST/SO/UA/SQ/ SP	223 /48/ 148 / 410/ 116	℃/W
Package Power Dissipation, (P_D)	ST/UA/SQ/SP	400 / 606 / 230/ 230/200	mW

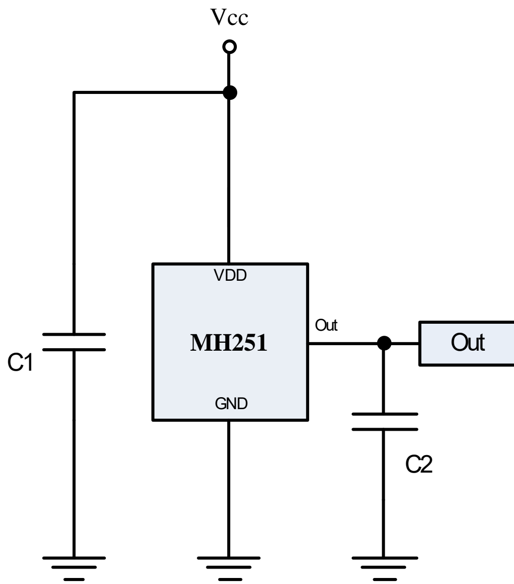
Note: *Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.*

Electrical Specifications

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

Parameters		Test Conditions	Min	Typ	Max	Units
Supply Voltage,(V_{DD})		Operating	1.65		3.5	V
Supply Current,(I_{DD})		Awake State		1.4	3	mA
		Sleep State		3.6	7	μA
		Average		5	10	μA
Output Leakage		Output off			1	uA
Output High		I_{OUT}=0.5mA(Source)	V_{DD}-0.2			V
Output Low Voltage,(V_{OL})		I_{OUT}=0.5mA(Sink)			0.2	V
Awake mode time,(Taw)		Operating		40	80	uS
Sleep mode time,(T_{SL})		Operating		40	80	mS
Duty Cycle,(D,C)				0.1		%
Electro-Static Discharge		HBM	4			KV
Operate Point,	(B_{OPS})	S pole to branded side, B > BOP,		30	55	Gauss
	(B_{OPN})	N pole to branded side, B > BOP,	-55	-30		
Release Point	(B_{RPS})	S pole to branded side, B < BRP,	10	20		Gauss
	(B_{RPN})	N pole to branded side, B < BRP,		-20	-10	
Hysteresis,(B_{HYS})		|BOPx - BRPx|		10		Gauss

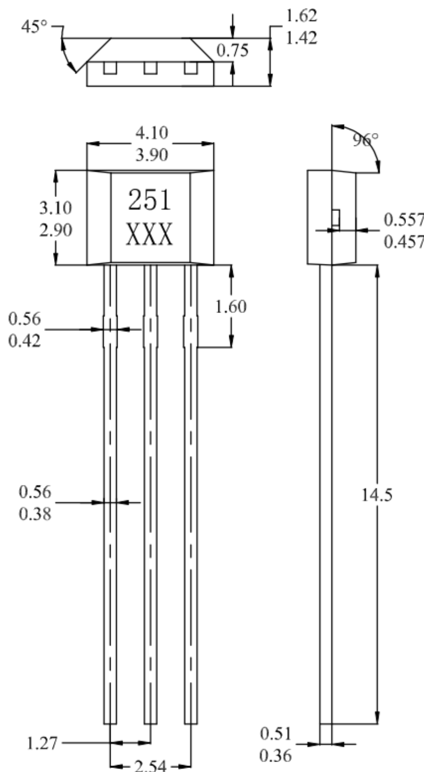
Typical Application circuit



C1：10nF
C2：100pF

Sensor Location, package dimension and marking

UA Package

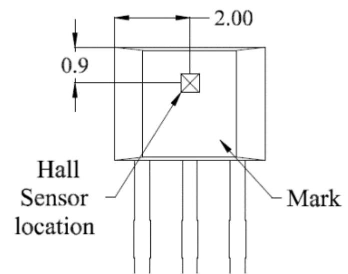


NOTES:

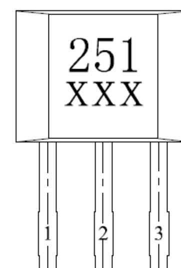
1 Controlling dimension: mm
2.Leads must be free of flash and plating voids
3.Do not bend leads within 1 mm of lead to package interface.
4.PINOUT:

Pin 1	VCC
Pin 2	GND
Pin 3	Output

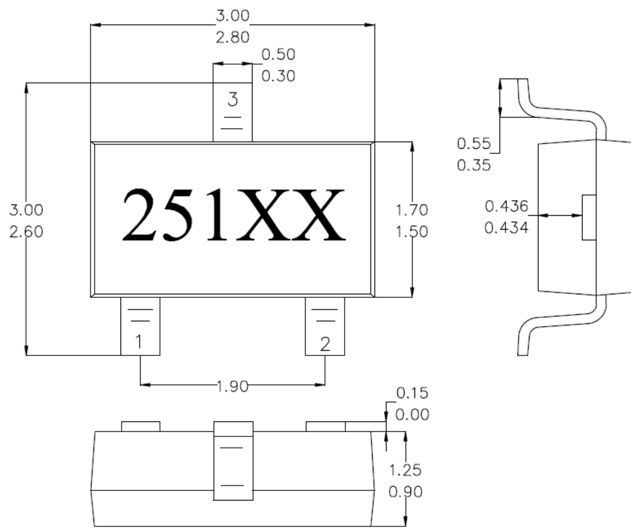
Hall Chip location



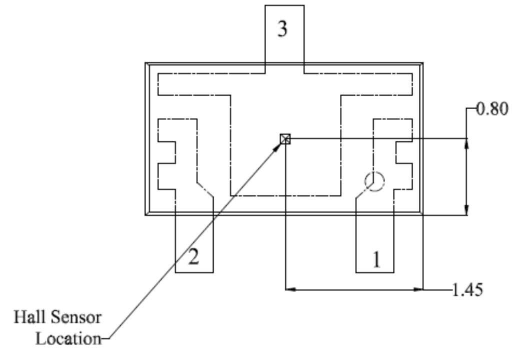
Output Pin Assignment
(Top view)



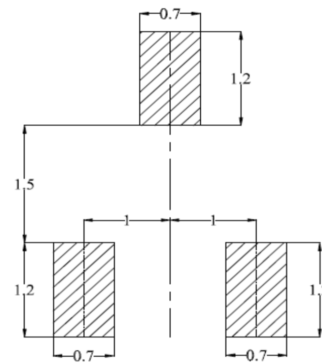
Package (SOT-23)
(Top View)



Hall Plate Chip Location
(Bottom view)

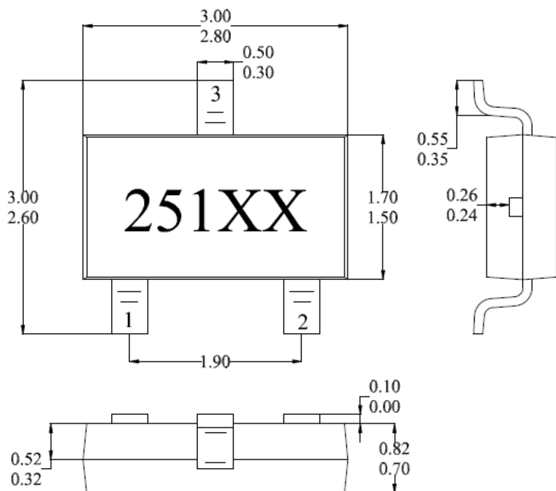


(For reference only)Land Pattern

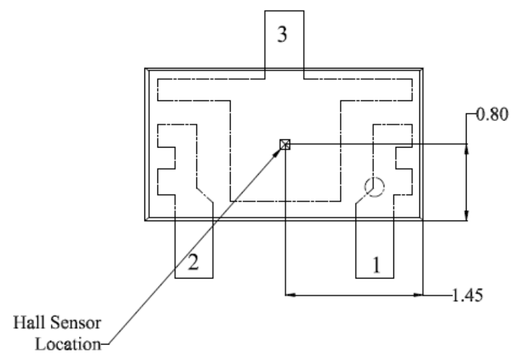


NOTES:
1 PINOUT (See Top View at left :)
Pin 1 V_{DD}; Pin 2 Output; Pin 3 GND
2 Controlling dimension: mm
3 Lead thickness after solder plating will be 0.254mm maximum
4.XX: Date Code, Refer to DC table

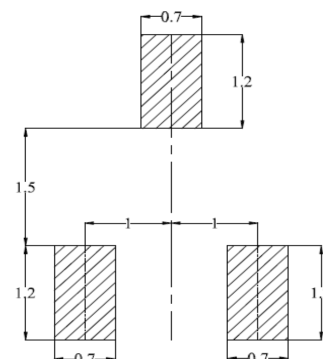
Package (TSOT-23)
(Top View)



Hall Plate Chip Location
(Bottom view)

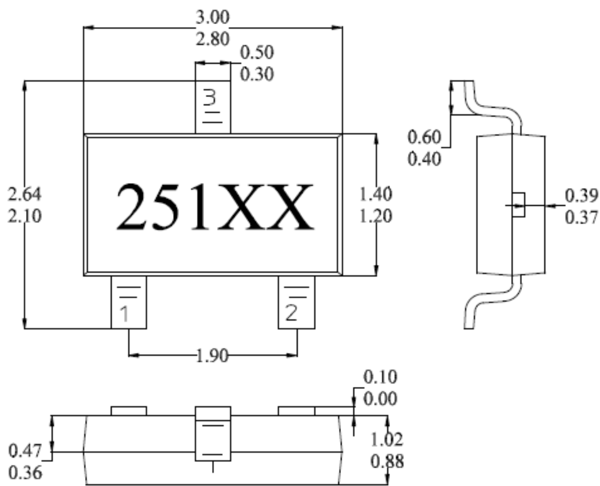


(For reference only)Land Pattern

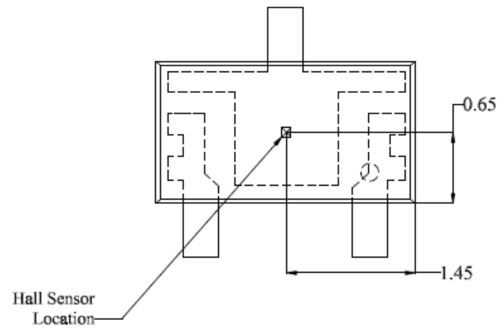


NOTES:
1. PINOUT (See Top View at left :)
   Pin 1 V_{DD}
   Pin 2 Output
   Pin 3 GND
2. Controlling dimension: mm
3. Lead thickness after solder plating will be 0.254mm maximum

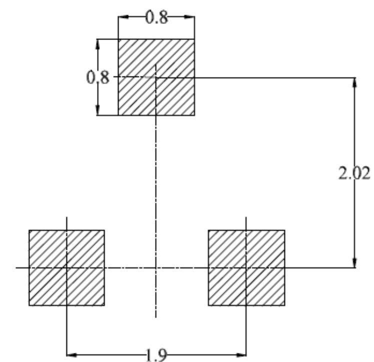
Package (PSOT-23)
(Top View)



Hall Plate Chip Location
(Bottom view)



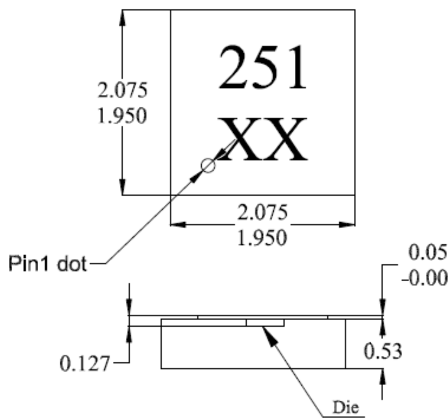
(For reference only)Land Pattern



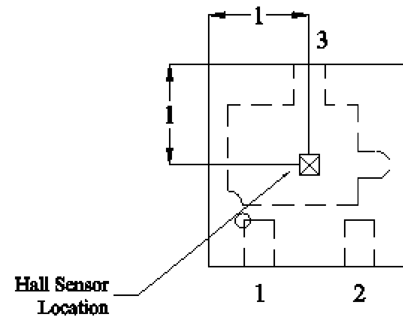
NOTES:

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

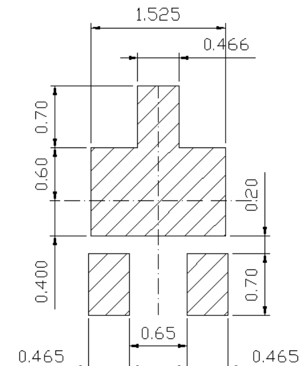
SQ Package
（Top View）

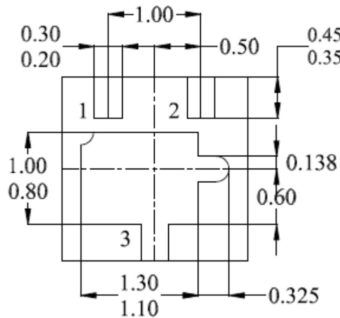


Hall Plate Chip Location
(Top view)



(For reference only)Land Pattern





Bottom View

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.