MH253 Hall-effect sensor is a temperature stable, stress-resistant 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.

MH253 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.

MH253 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(0.55 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 was verified by third party Lab.

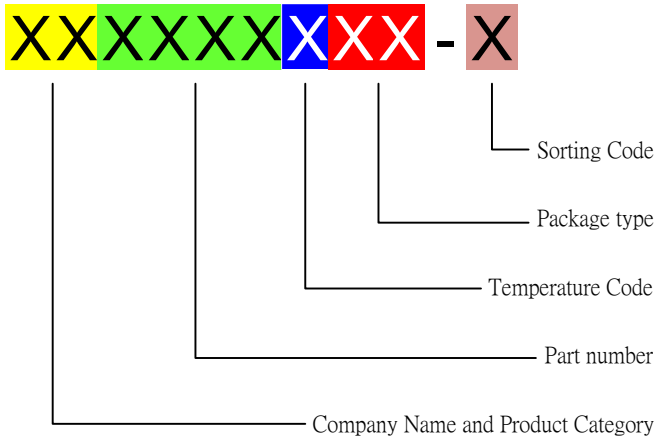
Features and Benefits

- CMOS Hall IC Technology
- Solid-State Reliability much better than reed switch
- Omni polar output switches with absolute value of North or South pole from magnet
- Low power consumption(2.6mA)
- High Sensitivity for reed switch replacement
- 100% tested at 125℃ for K.
- Small Size
- ESD HBM ±4KV Min
- COST competitive

Applications

- Solid state switch
- Lid close sensor for power supply devices
- Magnet proximity sensor for reed switch replacement in high duty cycle applications.
- Safety Key on sporting equipment
- Revolution counter
- Speed sensor
- Position Sensor
- Rotation Sensor
- Safety Key

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,SG:SOT-89(3pin)

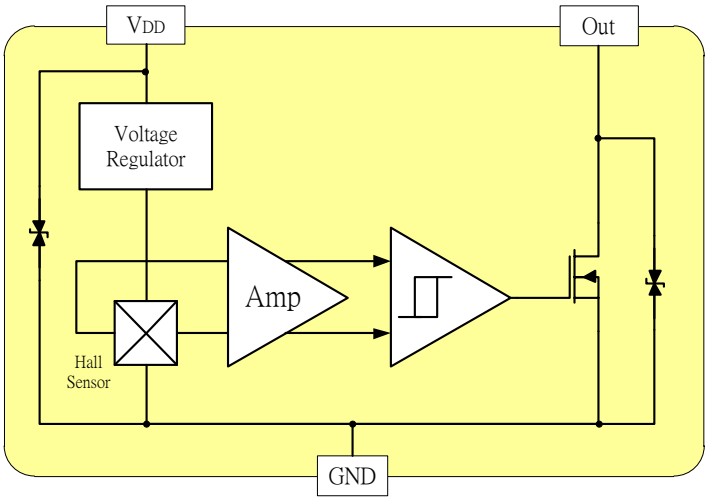
Sorting

α,β,Blank…..

Part No.	Temperature Suffix	Package Type
MH253KUA	K (-40℃ to + 125℃)	UA (TO-92S)
MH253EUA	E (-40℃ to + 85℃)	UA (TO-92S)
MH253ESO	E (-40℃ to + 85℃)	SO (SOT-23)
MH253ESQ	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 100 Ω resistor in series with V_{DD} is recommended.*

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})		25	mA
Operating Temperature Range, (Ta)	"E" version	-40 to +85	℃
	"K" version	-40 to +125	℃
Storage temperature range, (Ts)		-55 to +150	℃
Maximum Junction Temp,(Tj)		150	℃
Thermal Resistance	(θ_{JA}) UA / SO / SQ	206 / 543 / 543	℃/W
	(θ_{JC}) UA / SO / SQ	148 / 410 /410	℃/W
Package Power Dissipation, (P_D) UA / SO / SQ		606 / 230 / 230	mW

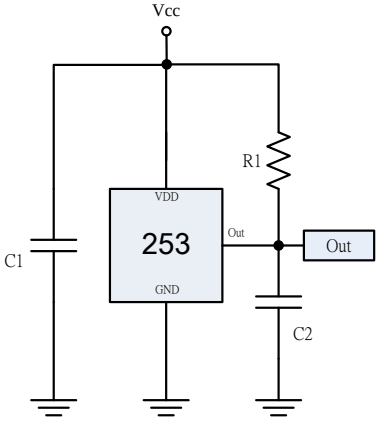
Note: *Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.*

Electrical Specifications

DC Operating Parameters T_A=+25℃, V_{DD}=5.0V

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage,(V_{DD})	Operating	2.5		6	V
Supply Current,(I_{DD})	Average		2.6	6.0	mA
Output Low Voltage,(V_{DSON})	I_{OUT}=10mA			400	mV
Output Leakage Current,(I_{off})	I_{OFF} B<BRP, V_{OUT} = 5V			10	uA
Output Rise Time,(T_R)	R_L=10kΩ, CL =20pF			0.45	uS
Output Fall Time,(T_F)	R_L=10kΩ; CL =20pF			0.45	uS
Electro-Static Discharge	HBM	4			KV
Operate Point, (B_{OPS})	S pole to branded side, B > BOP, Vout On		30	60	Gauss
(B_{OPN})	N pole to branded side, B > BOP, Vout On	-60	-30		
Release Point (B_{RPS})	S pole to branded side, B < BRP, Vout Off	5	25		Gauss
(B_{RPN})	N pole to branded side, B < BRP, Vout Off		-25	-5	
Hysteresis,(B_{HYS})	|BOPx - BRPx|		5		Gauss

Typical Application circuit

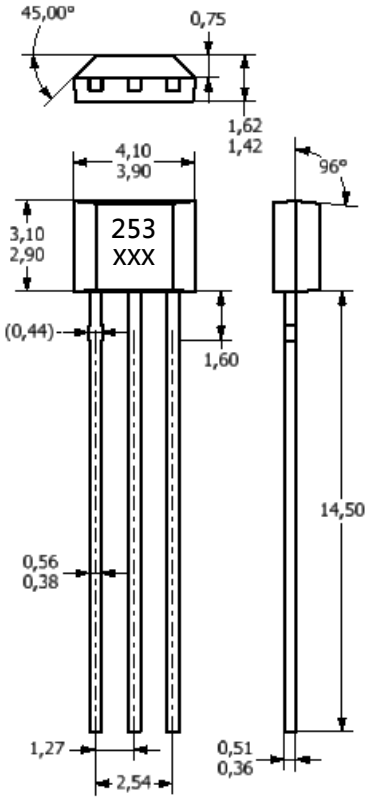


C1：10nF
C2：100pF
R1：10KΩ

Sensor Location, Package Dimension and Marking

MH253 Package

UA Package



NOTES:

1).Controlling dimension: mm

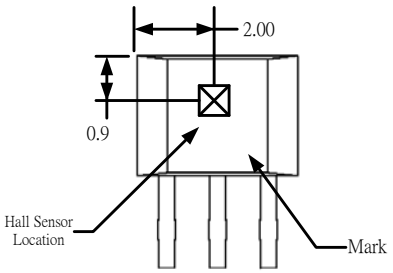
2).Leads must be free of flash and plating voids

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

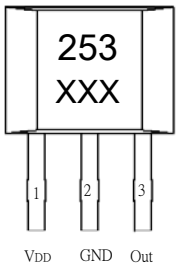
4).PINOUT:

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

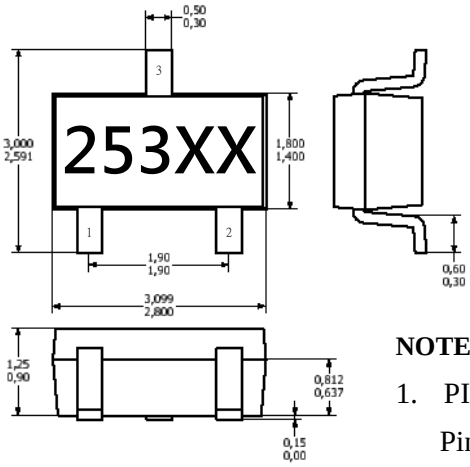
Hall Chip location



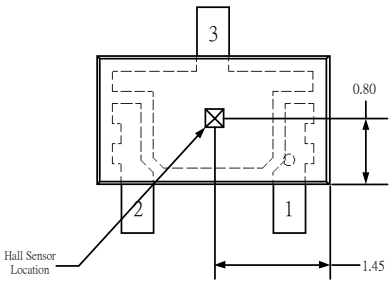
Output Pin Assignment (Top view)



SO Package (Top View)



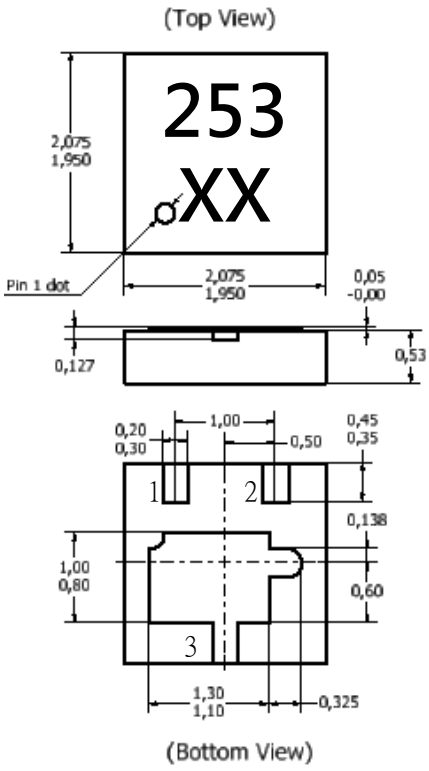
Hall Plate Chip Location (Bottom view)



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

SQ Package

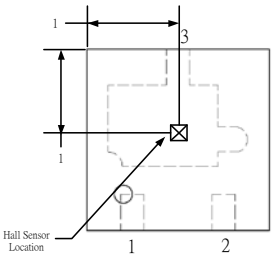


NOTES:

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

Hall Plate Chip Location

(Top view)



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