MH259 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.

MH259 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.

MH259 is rated for operation between the ambient temperatures –40°C and +85°C 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), SP is an PSOT-23(0.55 mm nominal height),ST is an SOT-23(0.7mm 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.

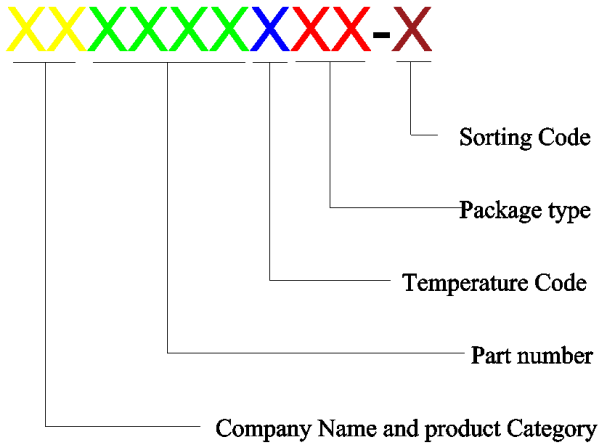
Features and Benefits

- CMOS Hall IC Technology
- Strong RF noise protection
- 2.5 to 6.0V for battery-powered applications
- Omni polar, output switches with absolute value of North or South pole from magnet
- Operation down to 2.5V, 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 350uA (Avg)
- High ESD Protection, HBM > ±4KV(min)
- Open Drain output
- RoHS compliant 2011/65/EU and Halogen Free

Applications

- Solid state switch
- Lid close sensor for battery powered devices
- Magnet proximity sensor for reed switch replacement in low duty cycle applications
- Water Meter
- Floating Meter

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)

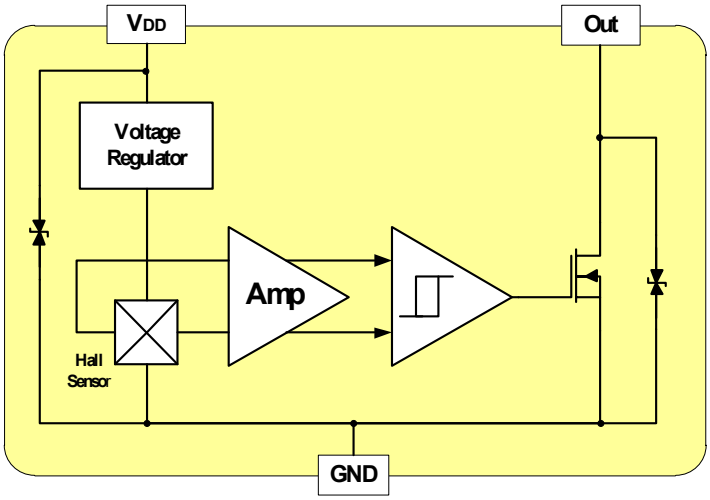
Sorting

α,β,Blank…..

Part No.	Temperature Suffix	Package Type
MH259KUA	K (-40°C to + 125°C)	UA (TO-92S)
MH259EUA	E (-40°C to + 85°C)	UA (TO-92S)
MH259ESO	E (-40°C to + 85°C)	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 100Ω resistor in series with V_{DD} is recommended.*

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

Characteristics		Values	Unit
Supply voltage,(V_{DD})		6.5	V
Output Voltage,(V_{out})		6.5	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)	"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	206 / 543	℃/W
	(θ_{JC}) UA / SO	148 / 410	℃/W
Package Power Dissipation, (P_D) UA / SO		606 / 230	mW

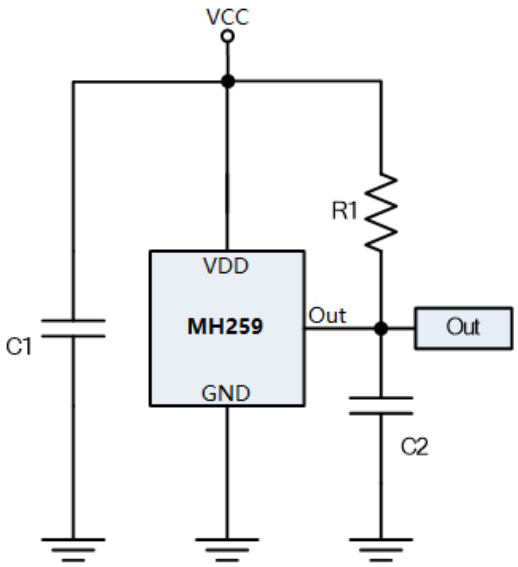
Note: *Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.*

Electrical Specifications

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

Parameters		Test Conditions	Min	Typ	Max	Units
Supply Voltage,(*VDD*)		Operating	2.5		6	V
Supply Current,(*IDD*)		Awake State		1.5	3.0	mA
		Sleep State		3.5	7.0	uA
		Average		350	600	uA
Output Saturation Voltage,		Iout=5mA,B>BOP			200	mV
Output Leakage Current,(*Ioff*)		IOFF B<BRP, VOUT = 5.5V			1.0	uA
Awake mode time,(*Taw*)		Operating		40	80	uS
Sleep mode time,(*TSL*)		Operating		160	320	uS
Duty Cycle,(*D,C*)				25		%
Response Time,(*TRES*)					2000	Hz
Electro-Static Discharge		HBM	4			KV
Operating Point	BOPS	S pole to branded side, B > BOP, Vout	20		55	Gauss
	BOPN	N pole to branded side, B > BOP, Vout	-55		-20	Gauss
Release Point	BRPS	S pole to branded side, B < BRP, Vout	10		45	Gauss
	BRPN	N pole to branded side, B < BRP, Vout	-45		-10	Gauss
Hysteresis	BHYS	|BOPx - BRPx|		10		Gauss

Typical Application circuit



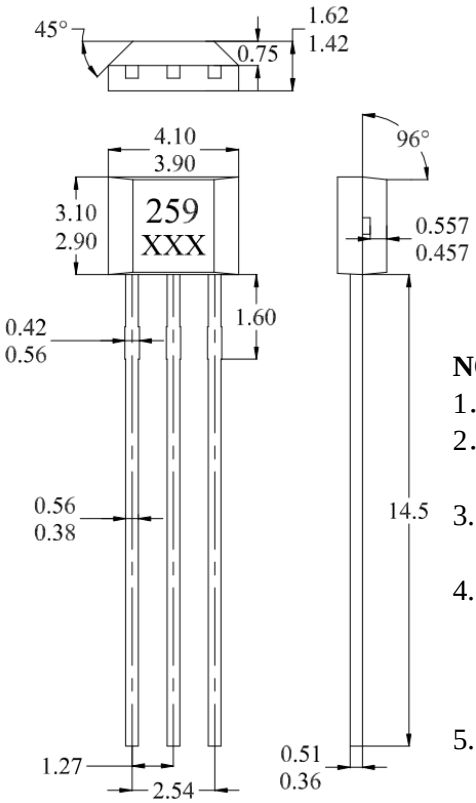
C1：10nF

C2：100pF

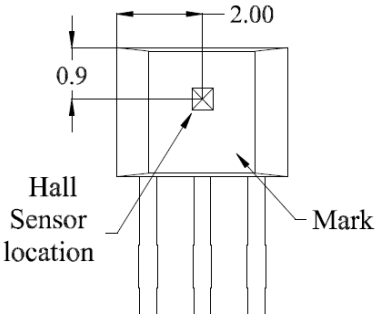
R1：10KΩ

Sensor Location, Package Dimension and Marking

UA Package



Hall Chip location

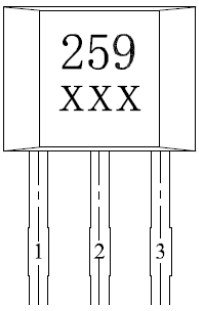


NOTES:

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
5. XXX；1st X=Year；2nd and 3rd XX=Week

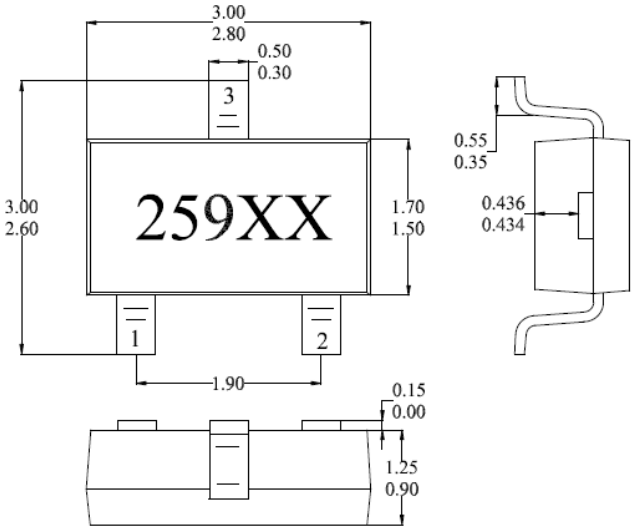
Output Pin Assignment

(Top view)



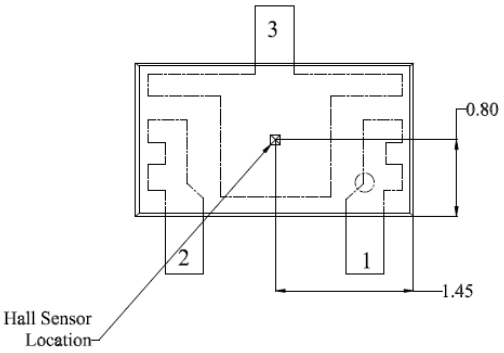
SO Package

(Top View)

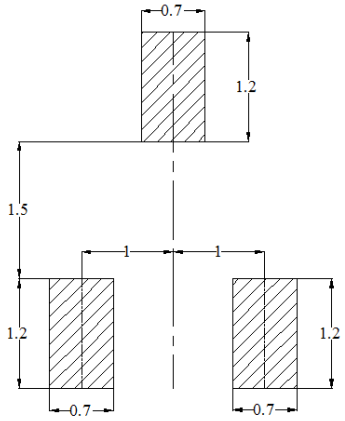


Hall Plate Chip Location

(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