



MH252 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.

MH252 is special made for low operation voltage, 1.65V, to active the chip which 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
- Direction detection
- Low sensitivity drift in crossing of Temp. range
- Ultra Low power consumption at 5uA (Avg)
- High ESD Protection, HBM > ±4KV(min)
- Operation with South Pole (OUT1) or North Pole (OUT2)
- Totem-pole output

Applications

- Solid state switch
- Handheld Wireless Handset Awake Switch (Flip Cell/PHS Phone/Note Book/Flip Video Set)
- Magnet proximity sensor for reed switch replacement in low duty cycle applications
- Water Meter
- PDA
- PDVD
- NB
- Pab PC

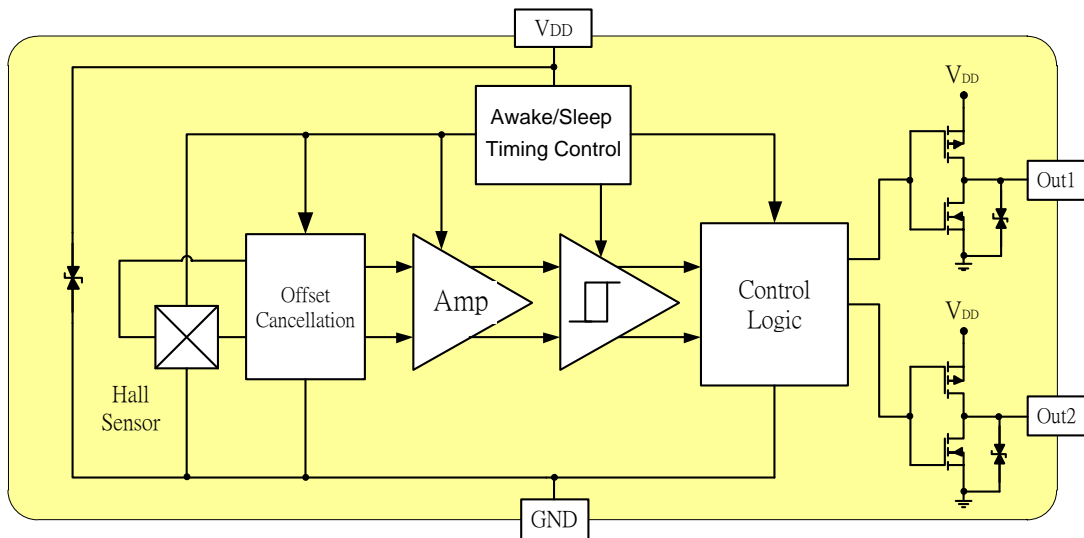
Ordering Information

	<p>Company Name and Product Category MH:MST Hall Effect/MP:MST Power MOSFET</p> <p>Part number 181,182,183,184,185,248,249,276,477,381,381F,381R,382..... If part # is just 3 digits, the fourth digit will be omitted.</p> <p>Temperature range E: 85 °C, I: 105 °C, K: 125 °C, L: 150 °C</p> <p>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)</p> <p>Sorting α, β, Blank.....</p>
<p>Sorting Code</p> <p>Package type</p> <p>Temperature Code</p> <p>Part number</p> <p>Company Name and Product Category</p>	

Part No.	Temperature Suffix	Package Type
MH252EVK	E (-40°C to + 85°C)	VK (4-pin TO-92S)
MH252ESN	E (-40°C to + 85°C)	SN (SOT-553)

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.
MH252, HBM > ±4KV which is verified by third party lab.

Absolute Maximum Ratings At($T_a=25\text{ }^\circ\text{C}$)

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, (T_a)		-40 to +85	$^\circ\text{C}$
Storage temperature range, (T_s)		-65 to +150	$^\circ\text{C}$
Maximum Junction Temp, (T_j)		150	$^\circ\text{C}$
Thermal Resistance	(θ_{JA}) VK / SN	227 / 540	$^\circ\text{C}/\text{W}$
	(θ_{JC}) VK / SN	49 / 390	$^\circ\text{C}/\text{W}$
Package Power Dissipation, (P_D) VK / SN		550 / 230	mW

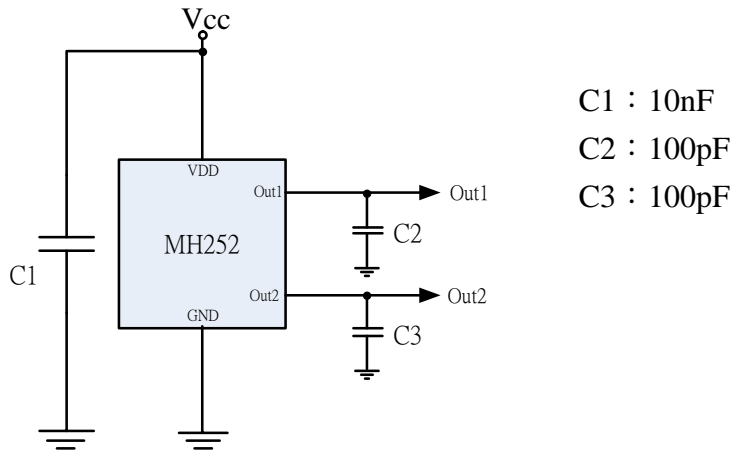
Note: Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.

Electrical Specifications

DC Operating Parameters : $T_a=25\text{ }^\circ\text{C}$, $V_{DD}=1.8\text{V}$

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage, (V_{DD})	Operating	1.65		3.5	Volts
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	μA
Output High Voltage, (V_{OH})	$I_{OUT}=0.5\text{mA}$ (Source)	$V_{DD}-0.2$			V
Output Low Voltage, (V_{OL})	$I_{OUT}=0.5\text{mA}$ (Sink)			0.2	V
Awake mode time, (T_{aw})	Operating		40	80	μS
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}) (B_{OPN})	S pole to branded side, $B > BOP$, OUT1 On		30	50	Gauss
	N pole to branded side, $B < BOP$, OUT2 On	-50	-30		
Release Point (B_{RPS}) (B_{RPN})	S pole to branded side, $B < BRP$, Vout Off	10	20		Gauss
	N pole to branded side, $B > BRP$, Vout Off		-20	-10	
Hysteresis, (B_{HYS})	$ BOP_x - BRP_x $		10		Gauss

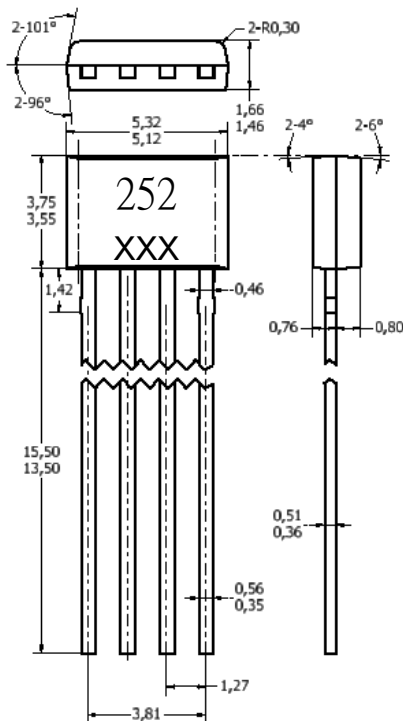
Typical application circuit



Sensor Location, package dimension and marking

MH252 Package

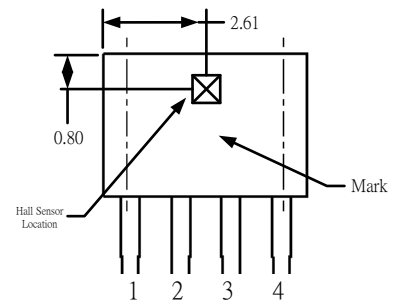
VK Package (4-pin TO-92S)



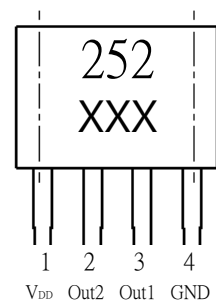
NOTES:

- 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 Out2
 Pin 3 Out1
 Pin 4 GND

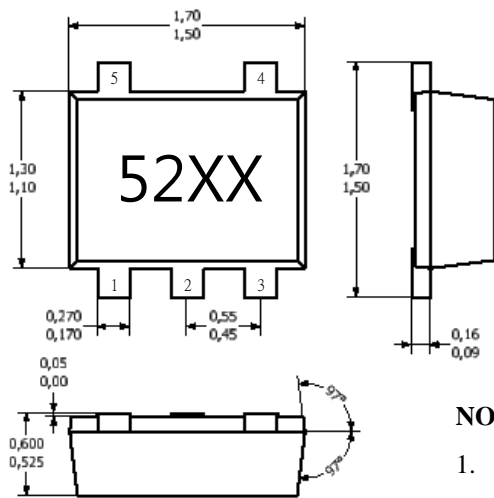
Hall Chip location



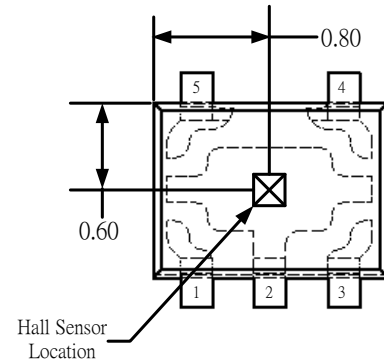
Output Pin Assignment



SN Package (SOT-553)
(Top View)



Hall Plate Chip Location
(Top View)



NOTES:

1. PINOUT (See Top View at left:)
 - Pin 1 Out2
 - Pin 2 GND
 - Pin 3 NC
 - Pin 4 VDD
 - Pin 5 Out1
2. Controlling dimension: mm;