

MH254 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.

MH254 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 unipolar 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 6V for battery-powered applications
- Operation down to 1.65V, Unipolar Hall Switch Micro power consumption
- High Sensitivity for reed switch replacement applications
- Low sensitivity drift in crossing of Temp. range
- Ultra Low power consumption at 5uA (Avg)
- High ESD Protection, HBM > ±4KV(min)
- 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
- Pad PC

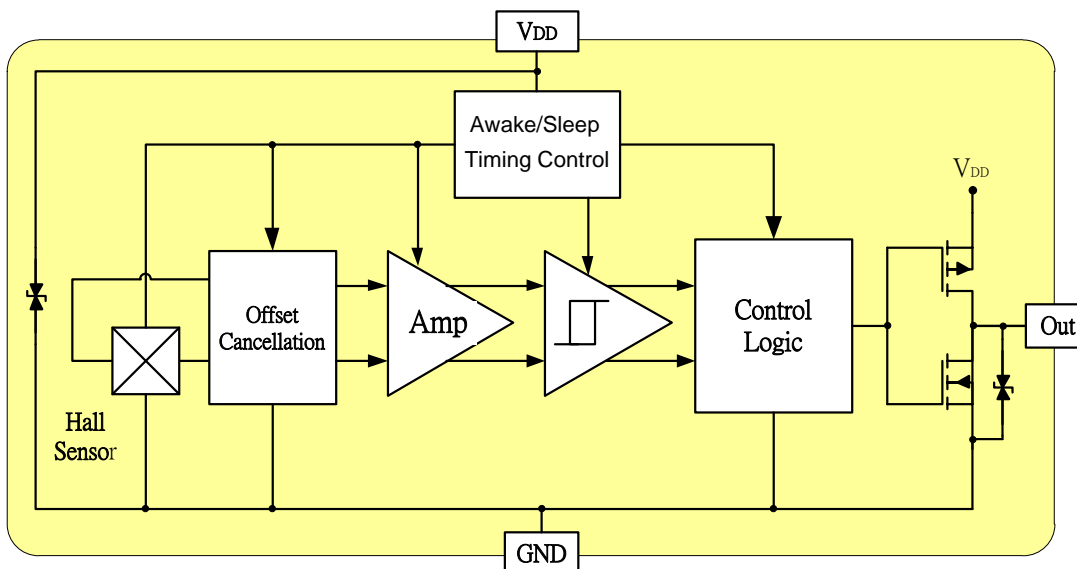
Ordering Information

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

| Part No. | Temperature Suffix | Package Type |
|----------|---------------------|--------------|
| MH254EST | E (-40°C to + 85°C) | ST (TSOT-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.

MH254, HBM > $\pm 4KV$ 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}) | | 7 | V |
| Output Voltage, (V_{out}) | | 7 | 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 |

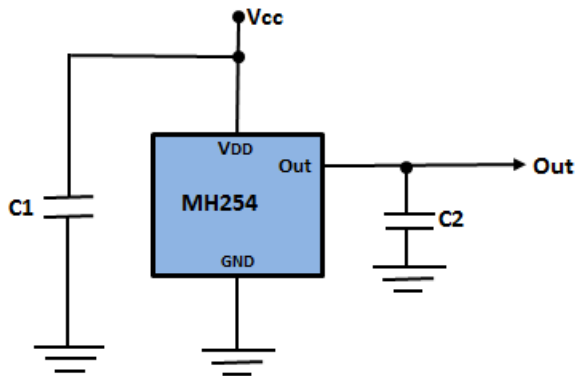
Note: Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.

Electrical Specifications

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

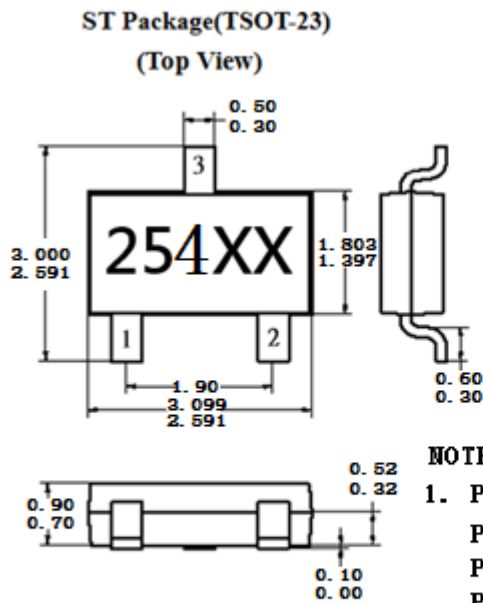
| Parameters | Test Conditions | Min | Typ | Max | Units |
|-----------------------------------|--|--------------|-----|-----|---------------|
| Supply Voltage, (V_{DD}) | Operating | 1.65 | | 6 | Volts |
| Supply Current, (I_{DD}) | Awake State | | 1.4 | 3 | mA |
| | Sleep State | | 3.6 | 7 | μA |
| | 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 |
| Operating Point –(B_{op}) | N pole to branded side, $B > B_{OP}$, Oout On | | 30 | 50 | Gauss |
| Release Point-(B_{rp}) | N pole to branded side, $B < B_{RP}$, Vout Off | 10 | 20 | | Gauss |
| Hysteresis-(B_{HYS}) | $ B_{OPx} - B_{RPx} $ | | 10 | | Gauss |

Typical application circuit



C1 : 10nF
 C2 : 100pF

Sensor Location, package dimension and marking
 MH254 Package



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