

# OH9249

## High Sensitivity Micropower Omnipolar Hall-Effect Switch

### Order Information

| Part Number | Package | Temperature Range | Marking ID | Packing Type |
|-------------|---------|-------------------|------------|--------------|
| OH9249-S    | SOT23   | -40 to 85°C       | GJ9        | Tape & Reel  |

**General Description:** The OH9249 is an ultra-sensitive Hall-effect switch with digital latched output, mainly designed for battery-operation, hand-held equipments. Special CMOS process is used for low-voltage and low-power requirement. A chopper stabilized amplifier improves stability of magnetic switch points. A sleep-awake logic controls the IC in sleep time or awake time. This function will reduce the average operating current of the IC. During the awake time, the output is changed with the magnetic flux density. During the sleep time, the output is latched in its previous state and the current consumption will reduce to some  $\mu\text{A}$ . The IC switching behaviour is omnipolar, either north or south pole sufficient strength will turn the output on. If the magnetic flux density is larger than operating point (BOP), the output will be turned on; if it is less than releasing point (BRP), the output will be turned off.



### Features

- Micropower Operation
- 2.5 to 5.5V Power Supply
- Switching for Both Poles of a Magnet (Omnipolar)
- Stabilized Chopper
- Superior Temperature Stability
- Digital Output Signal
- Built-in Pull-up Resistor
- ESD Rating: 4000V (Human Body Model)  
600V (Machine Model)

### Applications

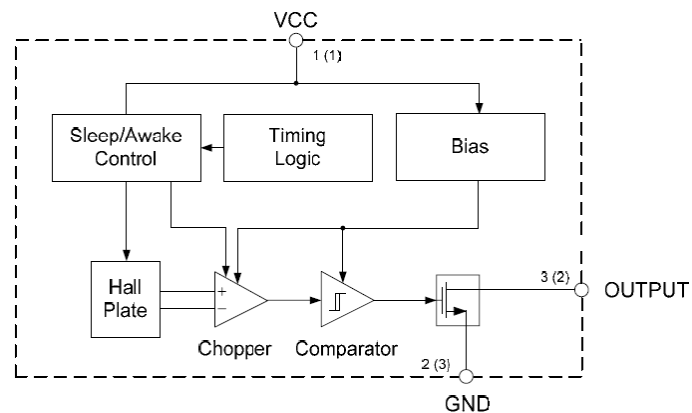
- Cover Switch in Notebook PC/PDA
- Handheld Wireless Application Awake Switch
- Magnet Switch in Low Duty Cycle Applications

### Absolute Maximum Ratings (T<sub>A</sub>=25°C)

|  |               |
|--|---------------|
| Supply Voltage V <sub>CC</sub>         | 7 V           |
| Supply Current (Fault) I <sub>CC</sub> | 6 mA          |
| Output Voltage V <sub>OUT</sub>        | 7 V           |
| Output Current I <sub>OUT</sub>        | 2 mA          |
| Magnetic Flux Density B                | Unlimited     |
| Storage Temperature                    | -55 to 150 °C |
| Junction Temperature                   | 150 °C        |

**NOTE:** Electronic semiconductor products are sensitive to Electro Static Discharge (ESD). Always observe Electro Static Discharge control procedures whenever handling semiconductor products.

### Functional Block Diagram



A (B)  
A for TO-92S-3  
B for SOT-23-3

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### Electrical Characteristics

V<sub>CC</sub> = 3V, T<sub>A</sub> = 25°C, unless otherwise specified

| Parameter              | Symbol            | Conditions               | Value |      |     | Unit |
|------------------------|-------------------|--------------------------|-------|------|-----|------|
|                        |                   |                          | Min   | Typ  | Max |      |
| Supply Voltage         | V <sub>CC</sub>   |                          | 2.5   | 3    | 5.5 | V    |
| Supply Current         | I <sub>AW</sub>   | Awake                    |       | 2    | 4   | mA   |
|                        | I <sub>SL</sub>   | Sleep                    |       | 6    | 10  | μA   |
|                        | I <sub>AVG</sub>  | Average                  |       | 10   | 15  | μA   |
| Output Current         | I <sub>OUT</sub>  |                          |       |      | 1.0 | mA   |
| Output Leakage Current | I <sub>LEAK</sub> | B <   BRP                | -     | <0.1 | 1.0 | μA   |
| Saturation Voltage     | V <sub>SAT</sub>  | I <sub>OUT</sub> = 1.0mA | -     |      | 0.4 | V    |
| Awake Mode Time        | t <sub>AW</sub>   | OPERATING                |       | 150  |     | μs   |
| Sleep Mode Time        | t <sub>SL</sub>   | OPERATING                |       | 90   | 120 | ms   |
| Duty Cycle             | D                 |                          |       | 0.15 |     | %    |
| Chopper Frequency      | f <sub>c</sub>    |                          |       | 15   |     | kHz  |

### Magnetic Characteristics

V<sub>CC</sub> = 3V, T<sub>A</sub> = 25°C, (1mT = 10 Gauss)

| Parameter     | symbol           | Conditions  | Value |     |     | Unit |
|---------------|------------------|---|-------|-----|-----|------|
|               |                  |   | Min   | Typ | Max |      |
| Operate Point | B <sub>OPS</sub> | South pole to branded side<br>B > B <sub>OPS</sub> , V <sub>OUT</sub> = low (output on)   |       | 30  | 55  | GS   |
|               | B <sub>OPN</sub> | North pole to branded side<br>B > B <sub>OPN</sub> , V <sub>OUT</sub> = low (output on)   | -55   | -30 |     | GS   |
| Release Point | B <sub>RPS</sub> | South pole to branded side<br>B < B <sub>RPS</sub> , V <sub>OUT</sub> = high (output off) | 5     | 20  |     | GS   |
|               | B <sub>RPN</sub> | North pole to branded side<br>B < B <sub>RPN</sub> , V <sub>OUT</sub> = high (output off) |       | -20 | -5  | GS   |
| Hysteresis    | B <sub>H</sub>   | B <sub>OPX</sub> - B <sub>RPX</sub>   | -     | 10  | -   | GS   |

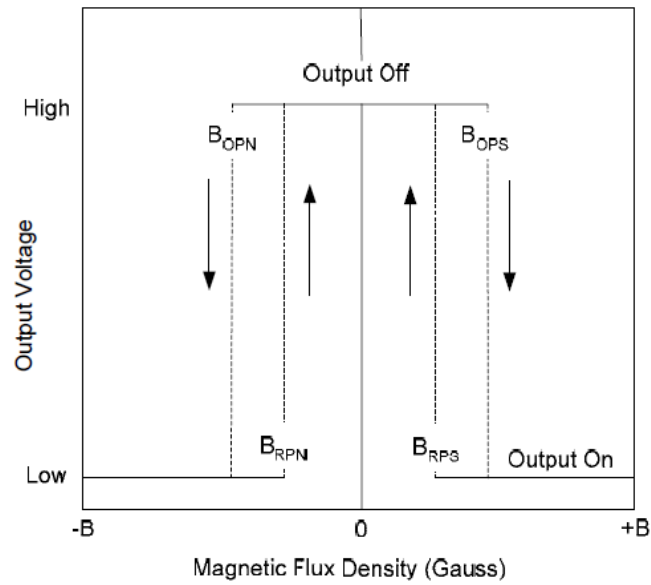
B<sub>OPX</sub> = operating point (output turns on);

B<sub>RPX</sub> = releasing point (output turns off)

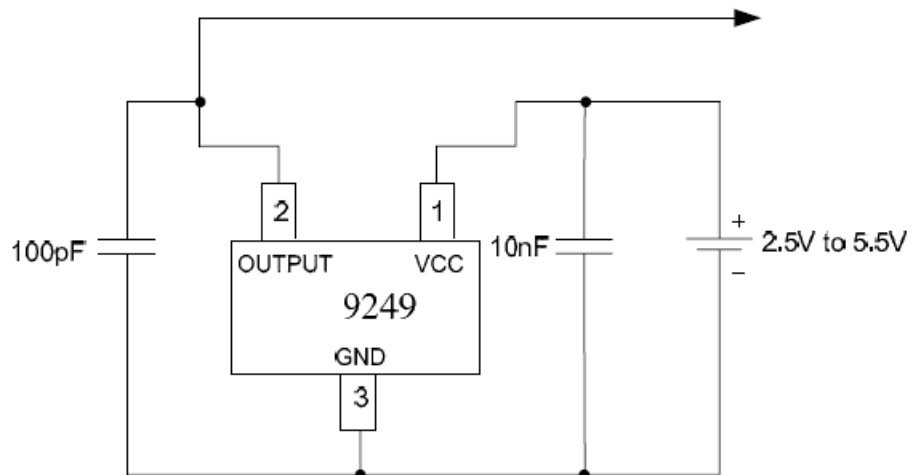
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### Output Voltage vs. Magnetic Flux Density



### Typical Application



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Mechanical Dimension unit:mm(inch)

SOT23

