

EM-1781

Shipped in packet-tape reel(5000pcs/Reel)

EM-1781 is ultra-small Hall effect ICs of a single silicon chip composed of Hall element and a signal processing IC.

Omnipolar Hall Effect Switch

Supply Voltage 1.6~5.5V

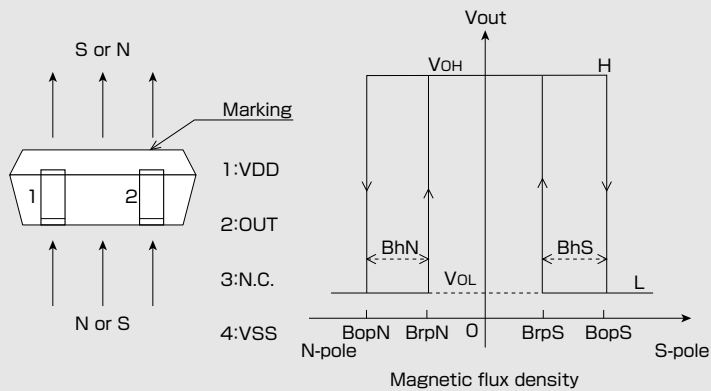
Hall Element Pulse Excitation

High Sensitivity Bop:3mT

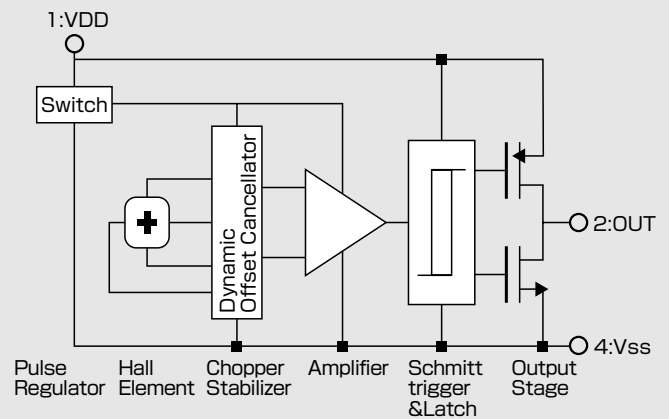
Output CMOS

SMT

Operational Characteristics



Functional Block Diagram



Absolute Maximum Ratings (Ta=25°C)

| Item | Symbol | Limit | Unit |
|-----------------------------|-----------|------------|------|
| Supply Voltage | VDD | -0.1 ~ 6.0 | V |
| Output Current | I_{out} | ± 0.5 | mA |
| Operating Temperature Range | T_{opr} | -30 ~ 85 | °C |
| Storage Temperature Range | T_{stg} | -40 ~ 125 | °C |

Magnetic ① and Electrical Characteristics (Ta=25°C VDD=1.85V)

| Item | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---------------------|--------------------------|----------------|-------------|------|------|---------|
| Supply Voltage | VDD | | 1.6 | | 5.5 | V |
| Operating Point | B_{opS} $ B_{opN} $ | | 1.4* | 3.0 | 4.0 | mT |
| Release Point | B_{rpS} $ B_{rpN} $ | | 1.1 | 2.2 | 3.7* | mT |
| Hysteresis | B_{hS} $ B_{hN} $ | | 0.3* | 0.8 | 1.5* | mT |
| Period | T_p | | | 50 | 100 | ms |
| Output High Voltage | V_{OH} | $I_o = -0.5mA$ | $VDD - 0.4$ | | | V |
| Output Low Voltage | V_{OL} | $I_o = +0.5mA$ | | | 0.4 | V |
| Supply Current | IDD | Average | | 6.5 | 9 | μA |

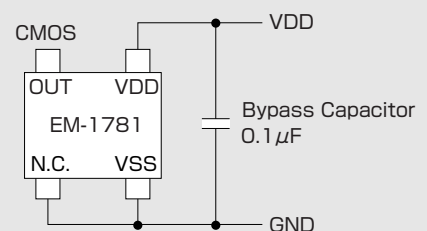
The characteristics with [*] marks are design targets. 1 [mT]=10 [Gauss]

Magnetic Characteristics ② (Ta=-30°C~85°C VDD=1.85V)

| Item | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|-----------------|--------------------------|------------|------|------|------|------|
| Operating Point | B_{opS} $ B_{opN} $ | | 1.2 | 3.0 | 4.4 | mT |
| Release Point | B_{rpS} $ B_{rpN} $ | | 0.9 | 2.2 | 4.1 | mT |
| Hysteresis | B_{hS} $ B_{hN} $ | | 0.1 | 0.8 | 1.7 | mT |

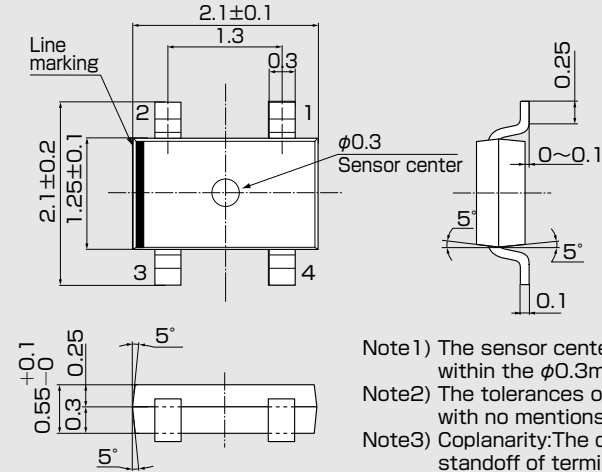
Note) The above specifications are design targets.

Application Circuit



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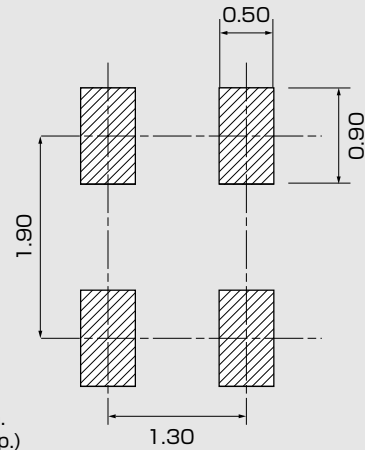
●Package (Unit:mm)



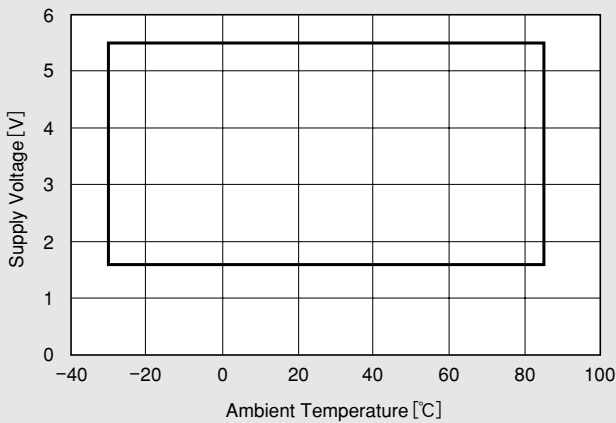
| Pin No. | Pin Name | Function | Comment |
|---------|----------|----------------|--------------|
| 1 | VDD | Supply Voltage | |
| 2 | OUT | Output Voltage | |
| 3 | N.C. | — | Short to GND |
| 4 | VSS | GND | |

- Note1) The sensor center is located within the $\phi 0.3$ mm circle.
- Note2) The tolerances of dimensions with no mentions is ± 0.1 mm.
- Note3) Coplanarity: The differences between standoff of terminals are max.0.1 mm.
- Note4) The sensor part is located 0.4mm(typ.) far from marking surface.

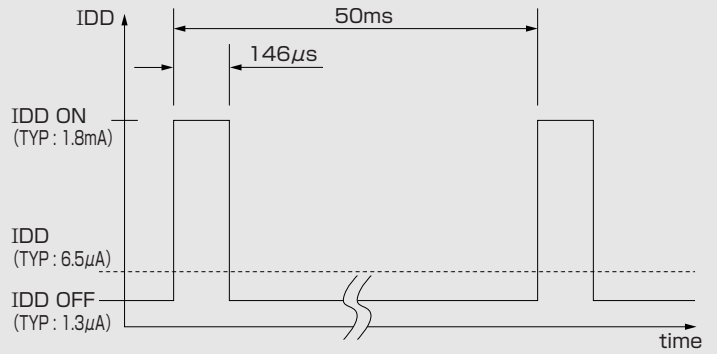
●(For reference only)Land Pattern (Unit:mm)



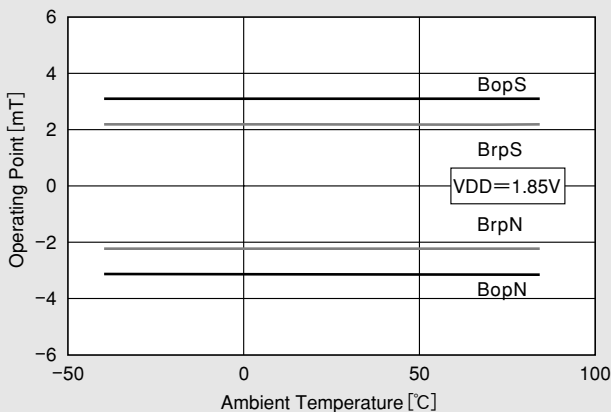
●Supply Voltage



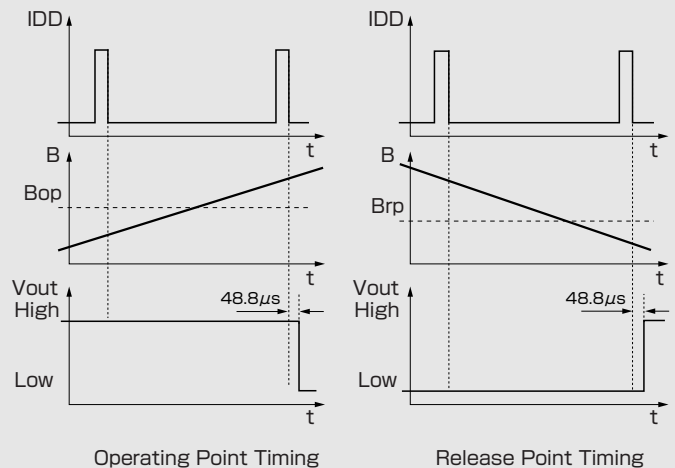
●IDD Pulse Driving (VDD=1.85V)



●Temperature Dependence of Bop, Brp



●Function Timing Chart



This Hall IC's output is held as internal data just before the internal circuit turns OFF (IDD OFF). And after 48.8 μs, the output changes.
 Note) 48.8 μs in figures is typical value

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April 4, 2012