

# MT4409

## Bipolar Latch-type Hall-Effect IC

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### Product Feature

- Ultra high sensitivity with typically Bop 30 Gs
- Low temperature drift of operating points in the temp range of -30°C~120°C
- Wide operating voltage range of 2.3V~ 33 V
- Built-in Pull-up Resistor

### Application Scenario

- Flow-rate sensing
- Position sensing of rotor in BLDC motor
- Angle and Speed sensing
- Stroke sensing

### Function Description

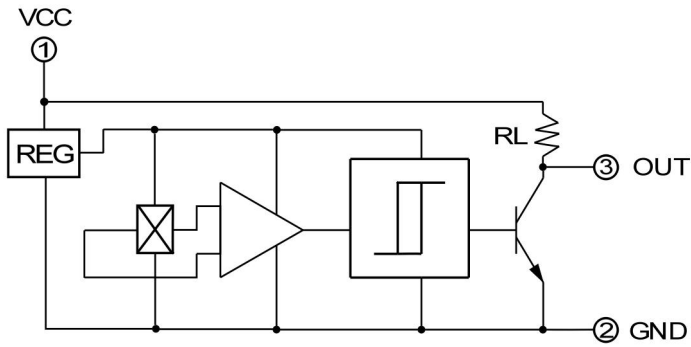
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The MT4409-High sensitivity Latching digital Hall-Effect Sensor IC are small and versatile devices that are operated by the magnetic field from a permanent magnet or an electromagnet . The device are designed to respond to alternating North and South poles. The MT4409 is turned on by a South pole.

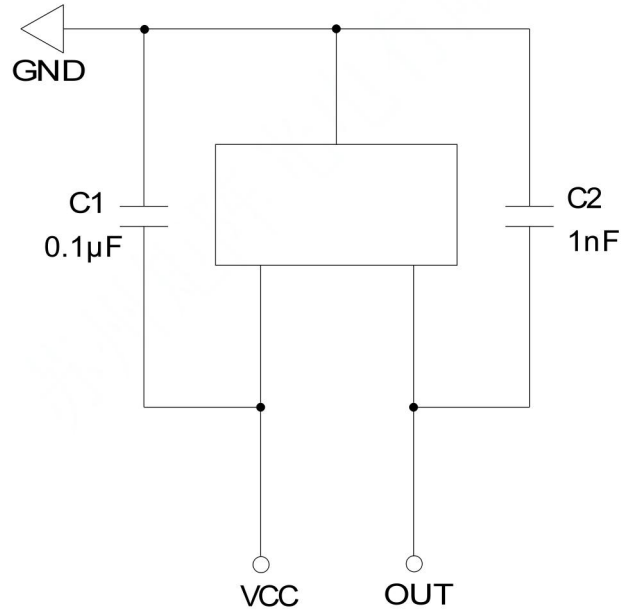
The MT4409 offer reliable switching points with a high magnetic sensitivity of 30 Gs typical . We do not use chopper stabilization on the Hall element, providing a clean output signal and a faster latch response time when compared to competitive high sensitivity Hall-effect latching sensor ICs which do use chopper stabilization.

For BLDC manufacturers who need latching sensors with reliable, consistent performance. The MT4409 can accept any DC supply voltage from 2.3Vdc to 33Vdc. Benefit from the high sensitivity of InSb Hall, MT4409 has excellent switching point symmetry and consistent repeatability while delivering faster response times to a change in magnetic field for better motor efficiency.

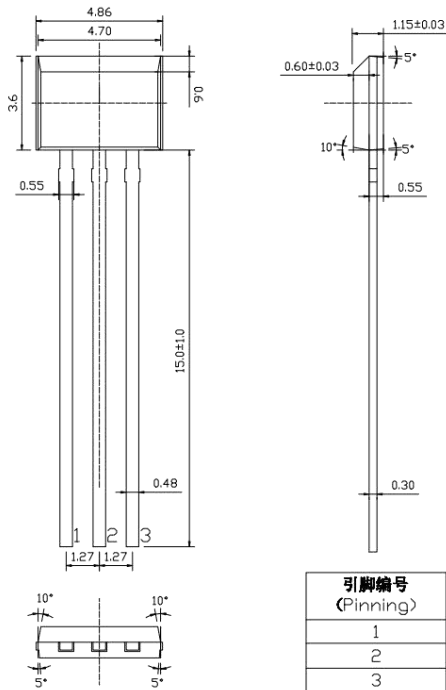
### Functional Block Diagram



### Typical Application Circuit



### Package Outline Drawing(Unit MM)



### Absolute Maximum Rating

Parameter	Symbol	Limit	Unit
Power Supply Voltage	VCC	-0.3~33	V
Operating Temperature	Topr	-40~150	°C
Storage Temperature	Tstg	-40~150	°C

**Note:** Stresses beyond the limit listed in “Absolute Maximum Rating” may cause permanent damage to the device.

### Operating Parameters

Parameter	Symbol	Min	Max	Unit
Power Supply Voltage	VCC	2.3	30	V
Operating Temperature	Topr	-30	120	°C

### Magnetic Characteristic

VCC=12V, Topr=25°C, unless otherwise specified. 1mT=10Gs

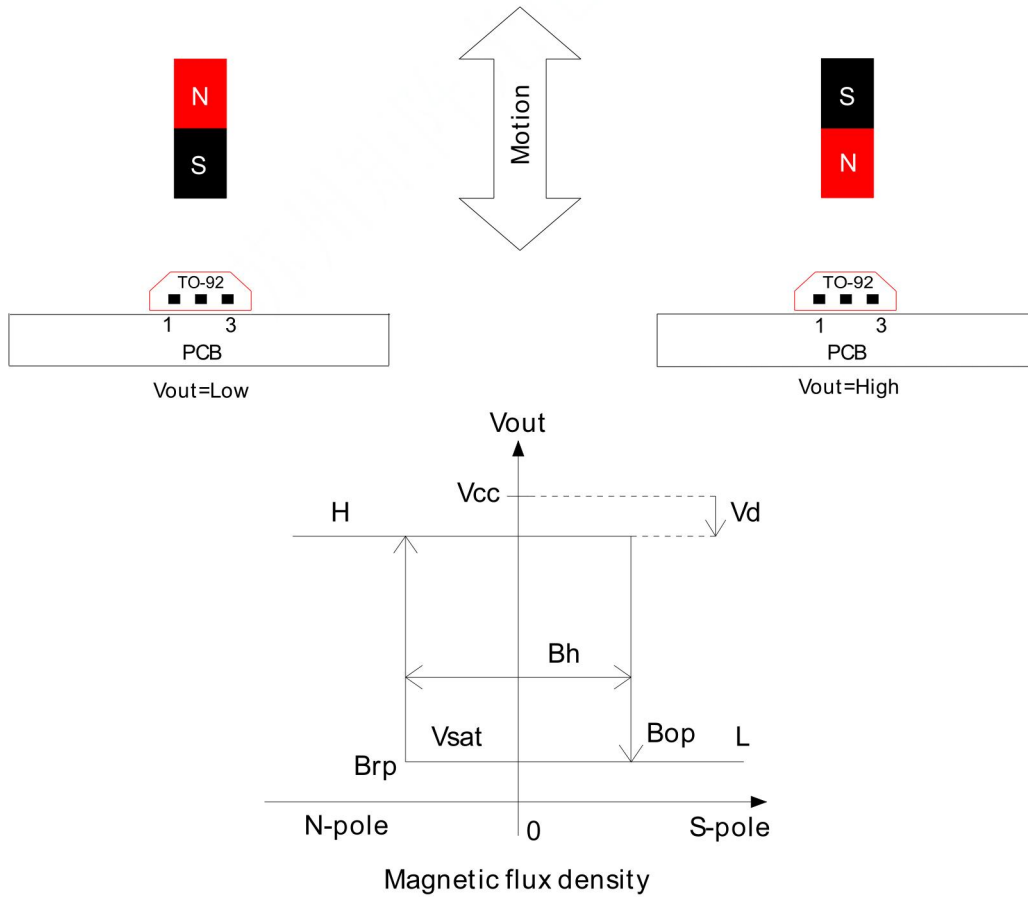
Parameter	Symbol	Min	Type	Max	Unit
B Operating Point	Bop	10	30	60	Gs
B Releasing Point	Brp	-60	-30	-10	Gs
Hysteresis	Bhys	60	-	-	Gs

### Electrical Characteristics

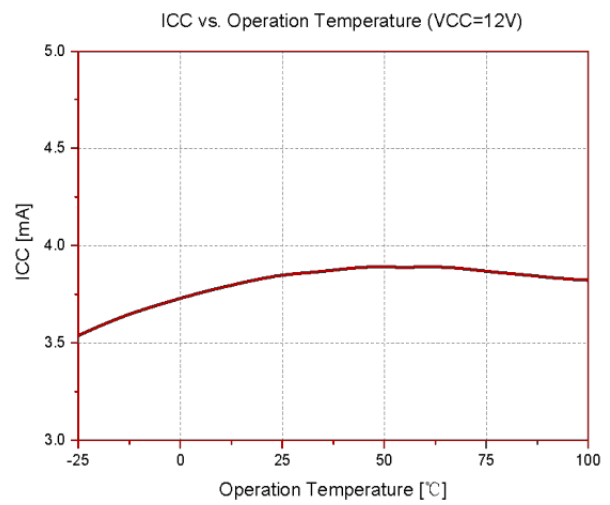
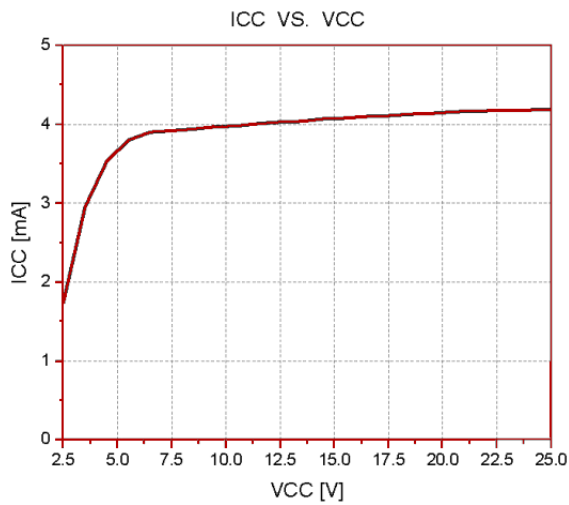
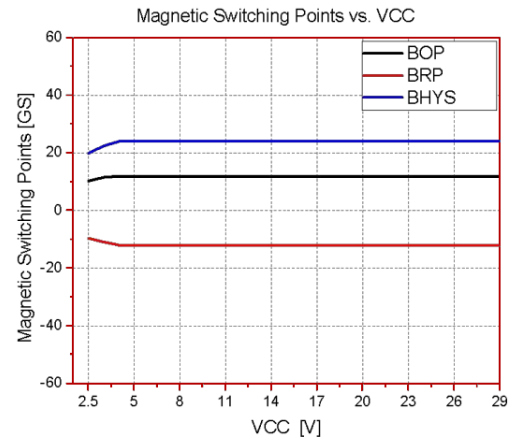
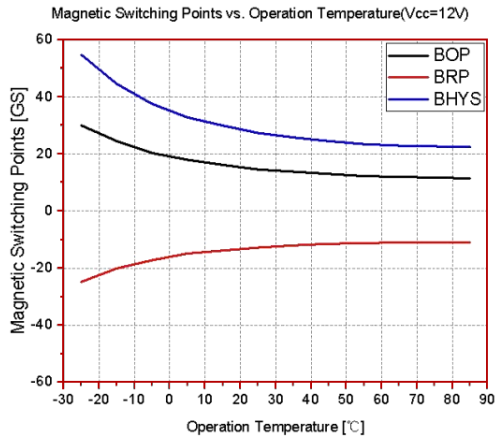
VCC=12V, Topr=25°C, unless otherwise specified. 1mT=10Gs

Parameter	Symbol	Conditions	Min	Type	Max	Unit
Power Supply Voltage	VCC	Operating	2.3	12	33	V
Supply Current	ICC	VCC=12V, Output=High	-	4	8	mA
Output Leakage Current	I <sub>LEAKAGE</sub>	-	-	0.1	10	μA
Output Saturation Voltage	VSAT	VCC=12V, Output=Low	-	-	0.4	V
Built-in Pull-Up Resistance	RL	-	6	-	14	KΩ

### Latch-Type Operating Characteristics



### Precautions for Safety



### Reliability Test Terms

No.	Terms	Conditions	Duration
1	High Temperature Storage	150±5°C	1000hr
2	High Temperature Oxidation	120°C/1V	1000hr
3	Low Temperature Oxidation	-40°C/6mA	1000hr
4	Temperature and Humidity Storage Oxidation	85°C/85%RH/9mA	1000hr
5	Temperature and Humidity Storage	85°C/85%RH	1000hr
6	Pressure Cooker Test	121°C/100%RH/2atm	24hr
7	Temperature Cycling Test	-55°C(30min)~25°C(5min)~150°C(30min)	30cycle

## **Packaging and Storage Methods**

### 1. Packing specification

Product	Package	Marking ID	Packing Type	Quantity
MT4409	TO92S	Wafer ID	Bag	300pcs

### 2. Storage method

2.1 The product should be stored in an appropriate temperature and humidity Environment (5 to 35°C, 40% to 85%RH).

2.2 Even under appropriate conditions, long-term storage may lead to the decrease of solderability and electrical properties of products. For products stored for a long time, the weldability should be checked before use.

2.3 If it is stored for more than 2 years, it is recommended to store it in a nitrogen environment. Oxygen in the atmosphere will oxidize the lead of the product, resulting in poor solderability of the lead.

## **Safety Protection and Precautions**

1. This product is sensitive to ESD (electrostatic discharge). When contacting Hall elements marked with ESD-Caution, the environmental requirements are as follows:

1.1 Electrostatic charges are unlikely to occur in the environment (for example, the relative humidity exceeds 40%RH).

1.2 Wear anti-static clothing and wrist strap when touching products.

1.3 Implement anti-static measures for equipment or containers that are in direct contact with products.

2. Do not turn the product into gas, powder or liquid by burning, crushing or chemical treatment.

3. Please abide by the laws and company regulations when discarding this product.