

Features and Benefits

- **Bipolar Technology**
- **Magnetic Type: Latch**
- **Wide Operating Voltage Range:**
Supply Voltage 4.0~60V
- **Specified Operating Temperature Range:**
From -40°C~150°C
- **Magnetic Sensitivity**
 $B_{OP}=40\text{Gauss}$, $B_{RP}=-40\text{Gauss}$ (typical)
- **Lead-free Package**
Flat TO-92
- **Open Collector Output**
- **RoHS Compliant**
2011/65/EU

Applications

- BLDC commutation for E-Bike
- BLDC commutation for E-Motorcycle

Family Members

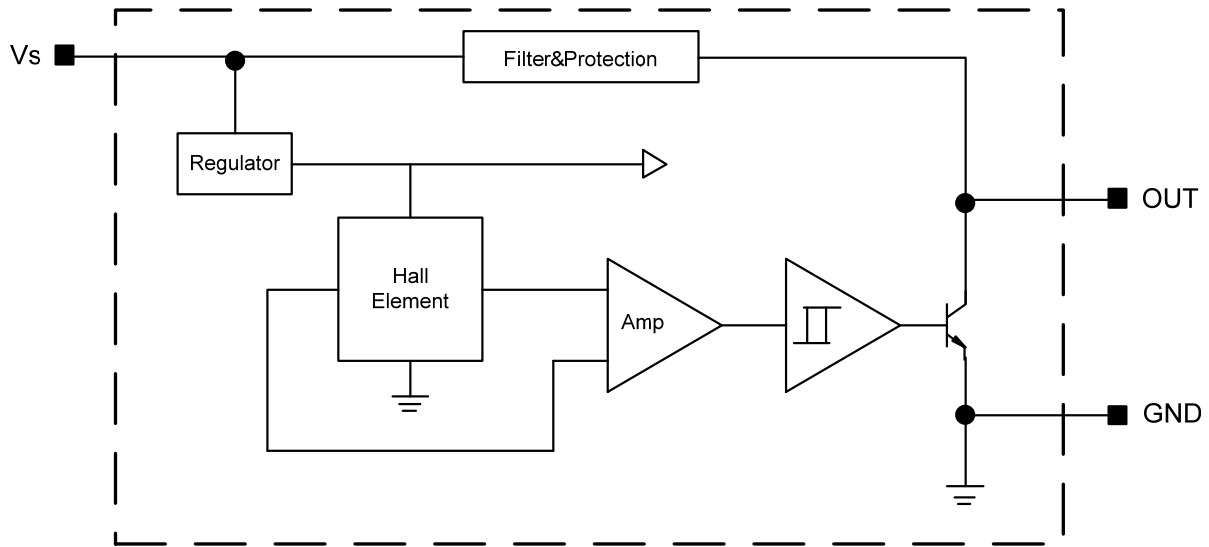
Part number	Description
MT4601A	Flat TO-92 package, bulk packaging (1000pcs/bag)
MT4601LA	Flat TO-92 package, bulk packaging (1000pcs/bag)
MT4601HA	Flat TO-92 package, bulk packaging (1000pcs/bag)

General Description

The MT4601 Series sensors are small, versatile digital Hall-effect devices that are operated by the magnetic field from a permanent magnet or an electromagnet, designed to respond to alternating North and South poles. These bipolar sensors have suitable sensitivity which reduces the peak-voltage noise to meet the brush-less DC motor requirement and enhance the reliability. The internal filter and protection block can keep the output voltage at safety level and avoid the damage of the sensors.

The integrated circuits are designed to provide predictable performance over the full temperature range of -40 to +150°C.

The MT4601 family provides one package to customers: flat TO-92 for through-hole mount. This package is RoHS compliant.



Functional Block Diagram

Function Description

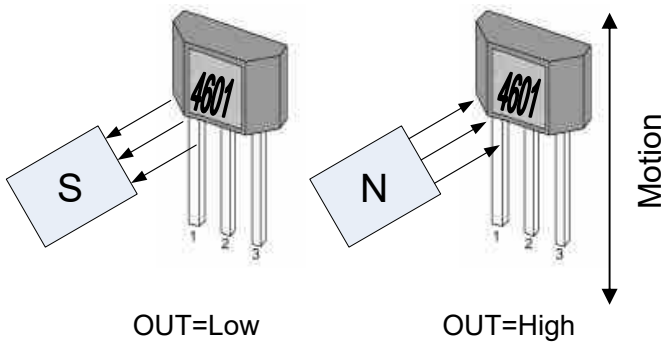
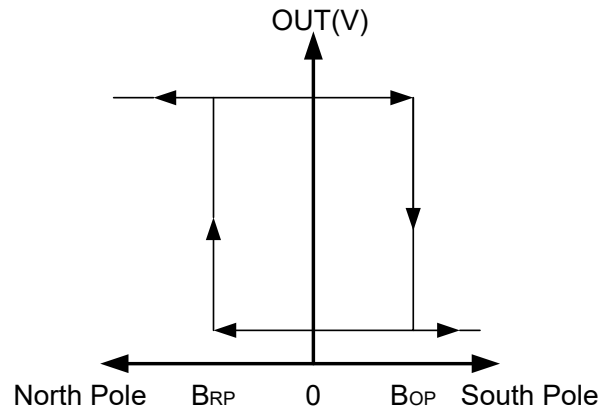
Definition of Magnetic Parameters

B_{OP} : Operating Point, magnetic flux density applied on the branded side of the package which turns the output driver ON ($V_{OUT}=Low$)

B_{RP} : Release Point, magnetic flux density applied on the branded side of the package which turns the output driver OFF ($V_{OUT}=High$)

B_{HYST} : Hysteresis Window, $|B_{OP}-B_{RP}|$

Definition of Switching Function



Pin Description

MT4601A(MT4601LA,MT4601HA)

Name	Number	Description
V_s	1	Power
GND	2	Ground
OUT	3	Open-collector Output

Note: Direction of magnetic flux

Electrical and Magnetic Characteristics

Absolute Maximum Ratings

Absolute maximum ratings are limiting values to be applied individually, and beyond which the serviceability of the circuit may be impaired. Functional operability is not necessarily implied. Exposure to absolute maximum rating conditions for an extended period of time may affect device reliability.

Absolute maximum ratings: all voltages listed are referenced to GND.

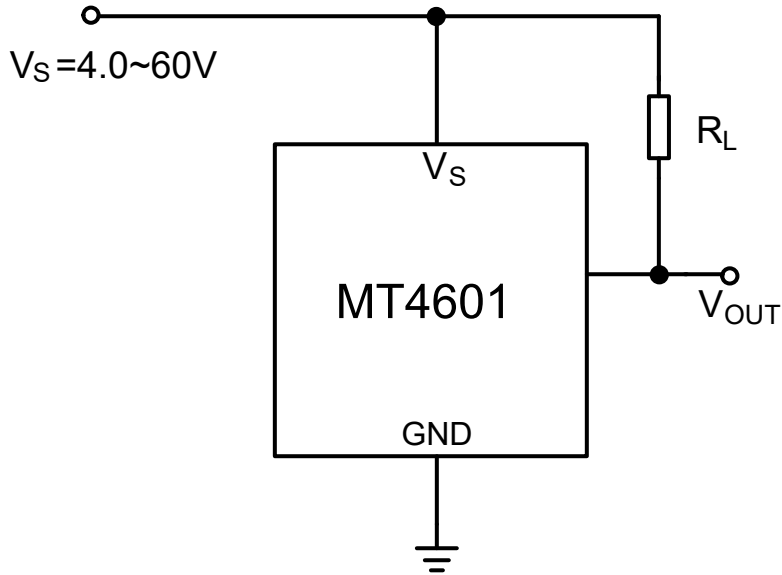
Symbol	Parameters	Min	Max	Units
V _S	Supply Voltage	-	80	V
V _{OUT}	Output Voltage	-	80	V
I _{OUT}	Continuous output current	-	60	mA
T _A	Operating Ambient Temperature	-40	150	°C
T _S	Storage temperature	-50	150	°C
T _J	Junction temperature	-	165	°C
B	Magnetic flux	No Limit		Gauss

MT4601 Series Specifications

At T_A = -40°C to 150°C, V_S = 4.0V to 60V (unless otherwise specified)

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V _S	Supply Voltage	Operating	4.0	-	60	V
I _S	Supply Current	B < B _{RP}	-	4	10	mA
V _{SON}	Output Saturation Voltage	I _{OUT} =20mA, B > B _{OP}	-	-	0.4	V
I _{OFF}	Output Leakage Current	B < B _{RP} , V _{OUT} =60V	-	-	10	µA
T _R	Output Rise Time	R _L =1Kohm, C _L =20pF	-	-	1.5	µs
T _F	Output Fall Time	R _L =1Kohm, C _L =20pF	-	-	1.5	µs
F _{SW}	Maximum Switching Frequency		100	-	-	KHz
R _{TH}	SOT-23 Package Thermal Resistance		-	301	-	°C/W
	TO-92 Package Thermal Resistance		-	230	-	°C/W
	SOT-89B Package Thermal Resistance		-	230	-	°C/W
B _{OP}	Magnetic Operating Point	At T _A =25°C	10	40	100	Gauss
B _{RP}	Magnetic Release Point	At T _A =25°C	-100	-40	-10	Gauss
B _{HYST}	Hysteresis Window	At T _A =25°C, B _{OP} - B _{RP}	40	80	130	Gauss

Typical Application Circuit Note: R_L recommend 1Kohm to 10Kohm



Typical Output Waveform (The TO-92 package as an example)

