

CYD543 HALL-EFFECT UNIPOLAR IC SWITCHES

These Hall-effect switches are monolithic integrated circuit consisting of a voltage regulator, Hall-voltage generator, differential amplifier, Schmitt trigger, temperature compensation circuit and open-collector output stage. Its input is a magnetic flux density signal and output is a digital voltage signal.



FEATURES

- Wide supply voltage range
- Fast response time
- Wide frequency and temperature range
- Long operating life
- Small size, convenient installing
- Output compatible with all digital logic families
- Unipolar Sensor
- **ROHS Compliant**

TYPICAL APPLICATIONS

- Contact-less switch
- Position control
- Speed measurement
- Revolution detection
- Isolation measurement
- Brushless dc motor
- Automotive igniters

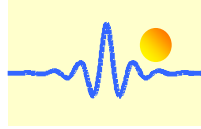
ABSOLUTE MAXIMUM RATING

| Parameter | Symbol | Value | Unit |
|-----------------------------|----------|-----------|------|
| Supply voltage | V_{CC} | 24 | V |
| Magnetic flux density | B | Unlimited | mT |
| Output OFF voltage | V_{ce} | 50 | mV |
| Continuous output current | I_{OL} | 50 | mA |
| Operating temperature range | T_A | -50~150 | °C |
| Storage temperature range | T_S | -55~150 | °C |

ELECTRICAL CHARACTERISTICS

$T_A=25^{\circ}\text{C}$

| Parameter | Symbol | Test conditions | Type and Value | | | Unit |
|---------------------------|----------|-------------------------------------|----------------|------|-----|---------------|
| | | | min | type | max | |
| Supply voltage | V_{CC} | | 4.5 | - | 24 | V |
| Output saturation voltage | V_{OL} | $I_{out}=20\text{mA } B>B_{OP}$ | - | 200 | 400 | mV |
| Output leakage current | I_{OH} | $V_{out}=24\text{V } B<B_{RP}$ | - | 0.1 | 10 | μA |
| Supply current | I_{CC} | $V_{CC}=\text{Output open}$ | - | - | 10 | mA |
| Output rise time | t_r | $R_L=820\ \Omega \ C_L=20\text{PF}$ | - | 0.12 | - | μS |
| Output fall time | t_f | $R_L=820\ \Omega \ C_L=20\text{PF}$ | - | 0.18 | - | μS |



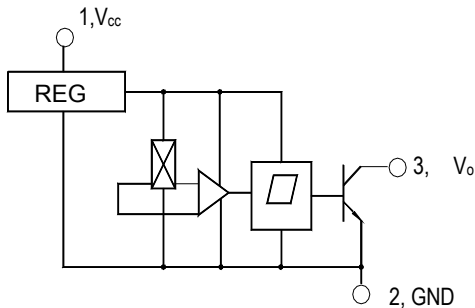
MAGNET CHARACTERISTICS

$V_{CC}=4.5 \sim 24V$

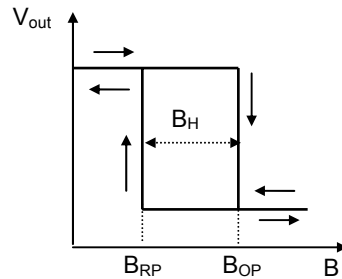
| Parameter | Symbol | Min. | Typical | Max. | Unit |
|---------------|----------|------|---------|------|------|
| Operate point | B_{OP} | | 15 | 20 | mT |
| Release point | B_{RP} | 3 | 10 | | mT |
| Hysteresis | B_H | | 5 | - | mT |

NOTE: 1mT=10GS

BLOCK DIAGRAM

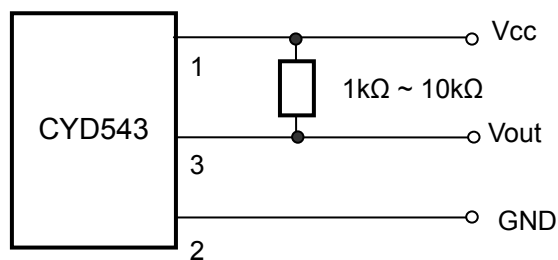


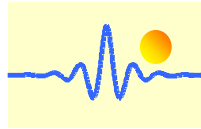
MAGNETIC-ELECTRICAL TRANSFER CHARACTERISTICS



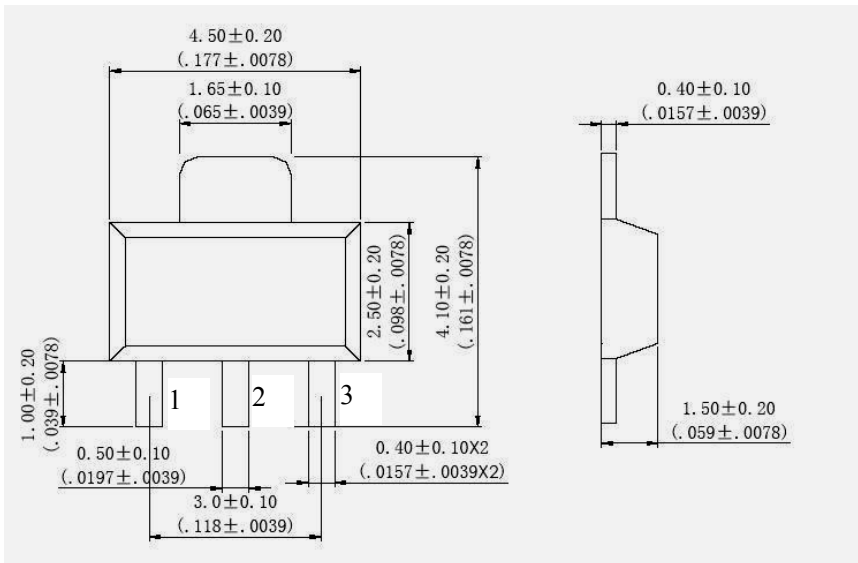
Connection

This sensor has an OC (NPN) output voltage. Therefore it is necessary to connect a pull-up resistor in value from 1kΩ to 10kΩ between the power supply Vcc and output pins.





DIMENSIONS (in mm)



Cautions

1. When install, should as full as possible decrease the mechanical stress acting on the Hall IC, to avoid the influence of the operate point and release point.
2. On the premise of ensuring welding quality, use as possible as low welding temperature an short time.

SOT-89 PACKAGE 1. Supply Voltage 2. GND 3. Output