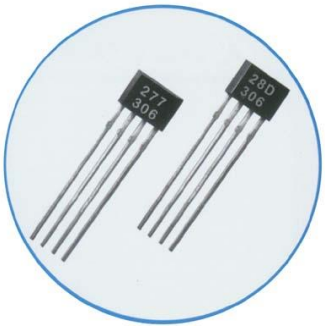
Version 2
Released in May 2016
Dr.-Ing. habil. Jigou Liu

ChenYang
Technologies GmbH & Co. KG

CYD277 Series Hall Effect Switch IC



CYD277 series Hall-effect switch IC is a kind of one-chip semiconductor integrated circuit, which is composed of a reverse voltage protector, a precise voltage regulator, Hall voltage generator, a differential amplifier, Schmitt trigger, a temperature compensator and two open-collector output on a single silicon chip. The main characteristics are wide operating voltage range, high sensitivity to magnetic field, good load-carrying and reverse protection abilities. It is the best component for brushless fan, because its load-carrying ability is up to 400mA with complementary output.

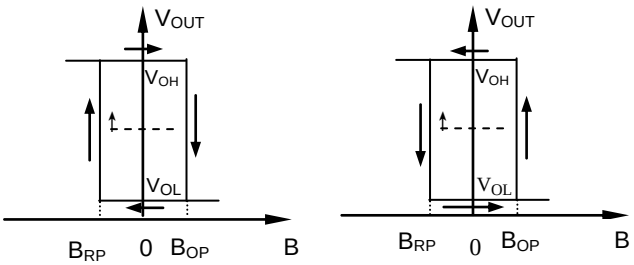
FEATURES

- Smart and Single Chip Integrated
- Temperature Compensation and Wide Operating Temperature Range
- Good Capability of Load
- Reverse Protection
- Open Collector Complementary Outputs
- Low Price , 4 Pin Epoxy Package
- Soldering Temperature can be Lowered Because of Alloy Tin Electroplating
- High Reliability

TYPICAL APPLICATION

- High Sensitive Non-contact Switch
- DC Brushless Motor
- DC Brushless Fan

Magnetic-Electrical Transfer Characteristics



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value		Unit
		Min	Max	
Supply Voltage	V_{CC}	4.5	20	V
Magnetic Flux Density	B	unlimited	unlimited	mT
Output current	Io	-	400	mA
Operating Temperature Range	T_A	-20	85	°C
Storage Temperature Range	T_S	-55	150	°C

ELECTRICAL CHARACTERISTICS (T_A=12°C~+85°C)

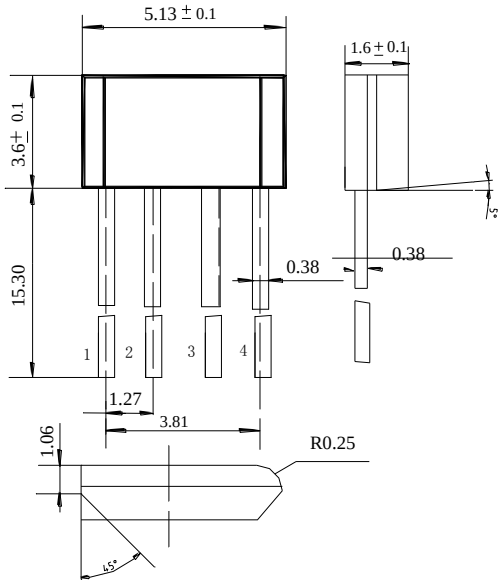
Parameter	Test Conditions	Symbol	Value			Unit
			Min	Typ	Max	
Supply Voltage		V_{CC}	4.5	-	20.0	V
Output Low Voltage	Vcc = 4.5V～20V, B=20mT, Io=300mA	V_{OL}	-	0.2	0.6	V
Output Leakage Current	Vo=Vccmax, Vcc open-collector output	I_{OH}	-	0.1	10.0	μA
Supply Current	Vcc=Vccmax, Vo open-collector output	I_{CC}	-	17.0	30.0	mA
Output Rise time	Vcc=12V, R_L=820Ω, C_L=20pF	t_r	-	0.3	1.5	μS
Output Fall time	Vcc=12V, R_L=820Ω, C_L=20pF	t_f	-	0.3	1.5	μS

Markt Schwabener Str. 8
D-85464 Finsing
Germany

Tel.: +49 (0)8121 – 2574100
Fax: +49 (0)8121– 2574101
Email: info@cy-sensors.com
http://www.cy-sensors.com

ChenYang
Technologies GmbH & Co. KG

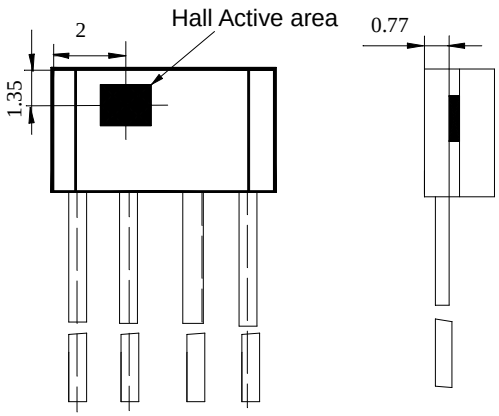
Package (Unit：mm)



Magnetic Characteristics

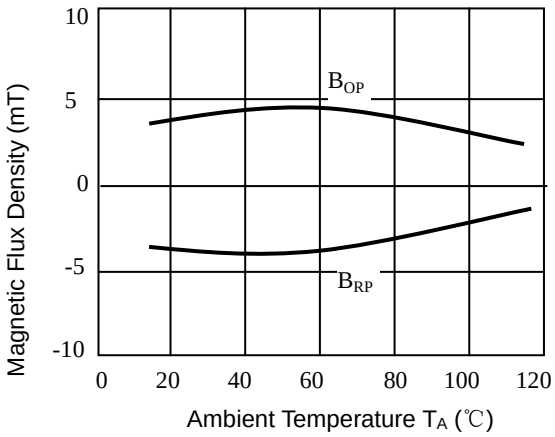
Parameter	Type	Value			Unit
		Min	Typ	Max	
Operate Point (B_{OP})	A	-	-	5	mT
	B	-	-	8	
	C	-	-	12	
Release Point (B_{RP})	A	-5	-	-	
	B	-8	-	-	
	C	-12	-	-	
Hysteresis(B_H)		4	8	-	

Position of Sensitive Area



Characteristics Curves

Temperature Characteristics of B_{op}, B_{RP}



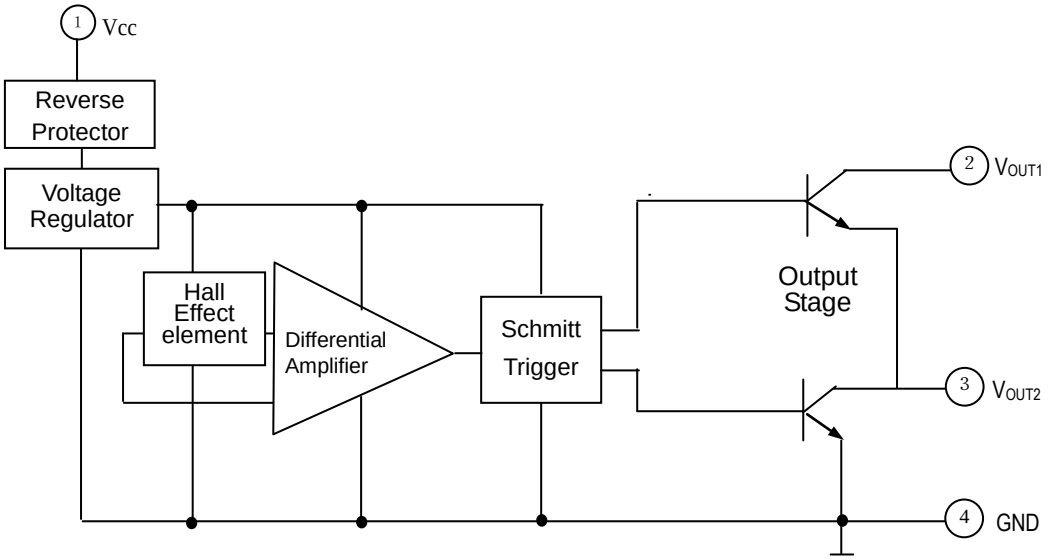
PIN NOTES:

1. Vcc
2. Output 1
3. Output 2
4. GND

Markt Schwabener Str. 8
D-85464 Finsing
Germany

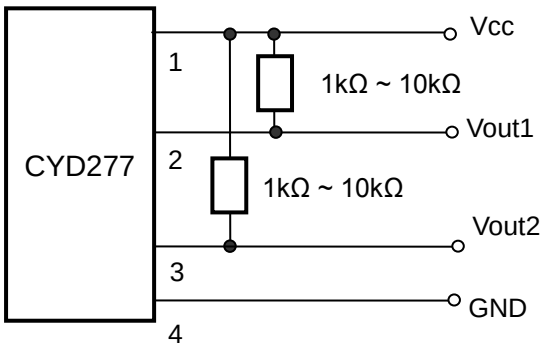
Tel.: +49 (0)8121 – 2574100
Fax: +49 (0)8121– 2574101
Email: info@cy-sensors.com
http://www.cy-sensors.com

Functional Block Diagram



Connection

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



NOTES:

Voltage Regulator： The output is stable when supply voltage varies from 4.5V to 20V.

Reverse Protector： When supply voltage is opposed or interfered by reverse pulse voltage in usage, It protects circuit and protective voltage is up to 30V.

Hall Effect Voltage Generator： It transfers the magnetic signal to the corresponding electric signal.

Differential Amplifier： It can amplify the weak voltage signal from Hall voltage generator output.

Markt Schwabener Str. 8
D-85464 Finsing
Germany

Tel.: +49 (0)8121 – 2574100
Fax: +49 (0)8121– 2574101
Email: info@cy-sensors.com
http://www.cy-sensors.com

Schmitt Trigger：	It transfers analogy signal from differential amplifier output to digital signal.
Temperature Compensator：	It ensures that the Hall-effect ICs over the temperature range of -20°C to +85°C.
Complementary Follower：	Output current can drive two windings of brushless fan directly. Turning on the brushless fan, and the output stage V_{OUT1} & V_{OUT2} will change when the Hall voltage generator is forced by alternating magnetic, the fan can operate because the direction of load current(winding of the fan) is changed.

Markt Schwabener Str. 8
D-85464 Finsing
Germany

Tel.: +49 (0)8121 – 2574100
Fax: +49 (0)8121– 2574101
Email: info@cy-sensors.com
http://www.cy-sensors.com