

CYD41 High Sensitive Hall effect Switch IC

CYD41 Series high sensitive Hall Effect switch IC is composed of a reverse protector, voltage regulator, Hall voltage generator, differential amplifier, Schmitt trigger and an open-collector output on a single silicon chip. This IC can convert the changeable magnetic field signal into digital voltage output.



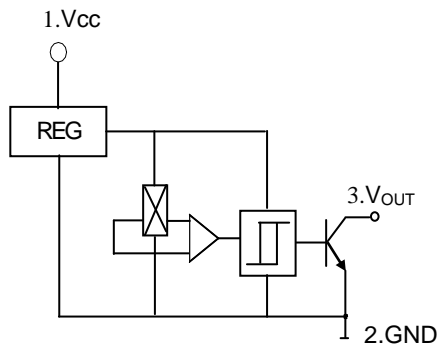
FEATURES

- ◆ High Sensitivity
- ◆ Resistant to Physical Stress
- ◆ Wide Supply Voltage Range
- ◆ Interfacing with All Kinds of Logic Circuits Directly

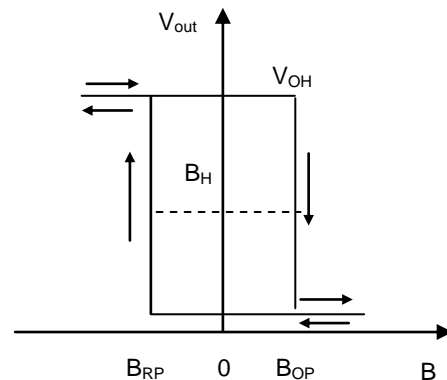
TYPICAL APPLICATION

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

FUNCTIONAL BLOCK DIAGRAM

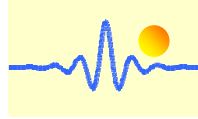


MAGNETIC-ELECTRICAL TRANSFER CHARACTERISTICS



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value		Unit
		Min	Max	
Supply Voltage	Vcc	4.5V ~ 24V		V
Magnetic Flux Density	B	unlimited	unlimited	mT
Output Current	Io	-	25	MA
Operating Temperature Range	T _A	-40	150	°C
Storage Temperature Range	T _S	-55	150	°C



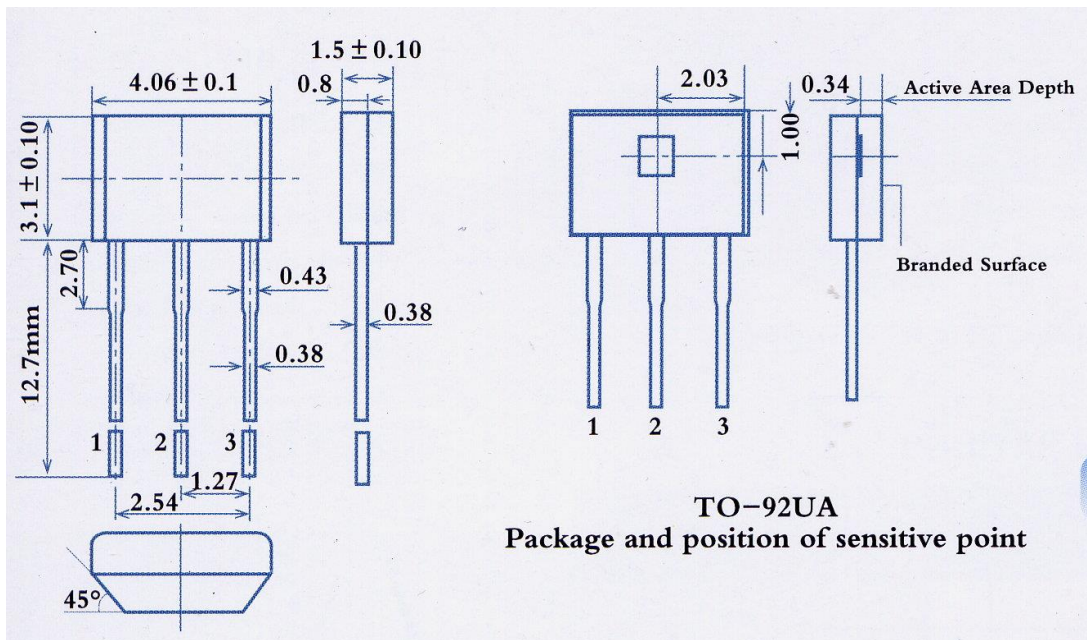
ELECTRICAL CHARACTERISTICS

Parameter	Test Condition	Symbol	Value			Unit
			Min	Typ	Max	
Supply Voltage	$V_{CC}=4.5V\sim 24V$	V_{CC}	4.5	-	24.0	V
Output Low Voltage	$V_{CC}=4.5V, R_L=960\Omega B\geq B_{OP}$	V_{OL}	-	0.2	0.4	V
Output Leakage Current	$V_O=V_{CCmax}, B\leq B_{RP}$	I_{OH}	-	1.0	10.0	μA
Supply Current	$V_{CC}=V_{CCmax}$ open-collector output	I_{CC}	-	4.0	8.0	mA
Output Rise time	$V_{CC}=12V, R_L=820\Omega C_L=20pF$	t_r	-	1.5	-	μs
Output Fall time		t_f	-	1.0	-	μs

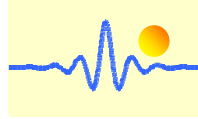
Magnetic Characteristics (Unit: mT)

Parameter	Test condition	Value			Unit
		Min	Typ	Max	
Operate Point (B_{OP})	$-20^\circ C < T_A < +90^\circ C$	1	4	7	mT
Release Point (B_{RP})	$-20^\circ C < T_A < +90^\circ C$	-7	-4	-1	
Hysteresis (B_H)	$-20^\circ C < T_A < +90^\circ C$	4	8		

Package Outline Drawing (Unit: mm)

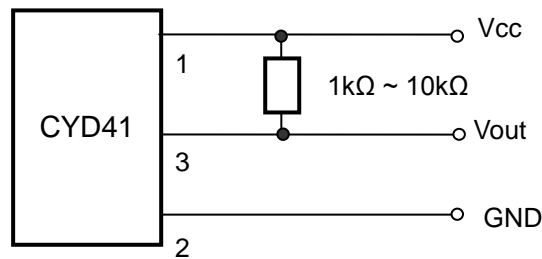


Pin Notes: 1. Power Supply 2. Ground 3. Output



Connection

This sensor has an OC (NPN) output voltage. Therefore it is necessary to connect a pull-up resistor in value from $1\text{k}\Omega$ to $10\text{k}\Omega$ between the power supply V_{cc} and output pins.



Cautions:

- 1) It is possible that outside mechanical stress affects the operating point and the release point of Hall-effect circuit, therefore, mechanical stress should be lessened as far as possible in the process of assembly;
- 2) Pay attention to the soldering temperature ($<260^{\circ}\text{C}$) at the leads; keep it lower in a short time ($<3\text{s}$) to guarantee good soldering quality.