

CYD513 HALL EFFECT BIPOLAR SWITCH IC

(ROHS COMPLIANT)

This Hall-effect switch is 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
- Bipolar sensor
- **ROHS compliant**

TYPICAL APPLICATIONS

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

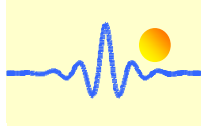
ABSOLUTE MAXIMUM RATING

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	-40~150	°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



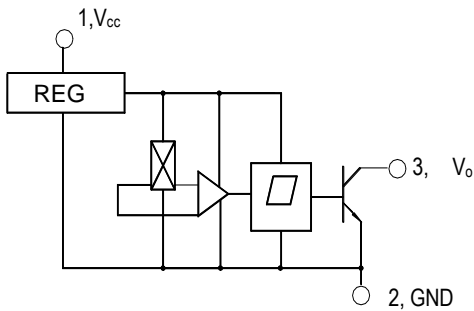
MAGNET CHARACTERISTICS

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

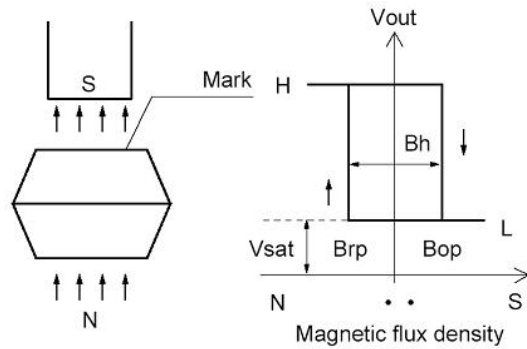
Parameter	Symbol	Type and Value			Unit
		min	typ	max	
Operate point	B_{OP}		4	6	mT
Release point	B_{RP}	-6	-4		mT
Hysteresis	B_H		8	-	mT

NOTE: 1mT=10GS

BLOCK DIAGRAM

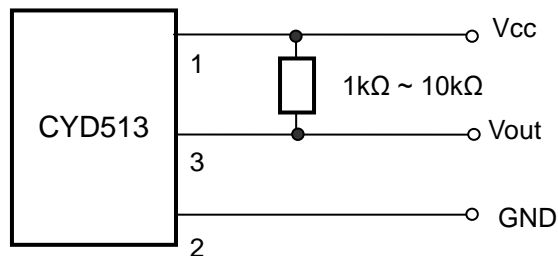


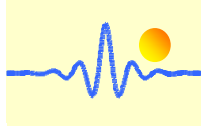
MAGNETIC-ELECTRICAL TRANSFER CHARACTERISTICS



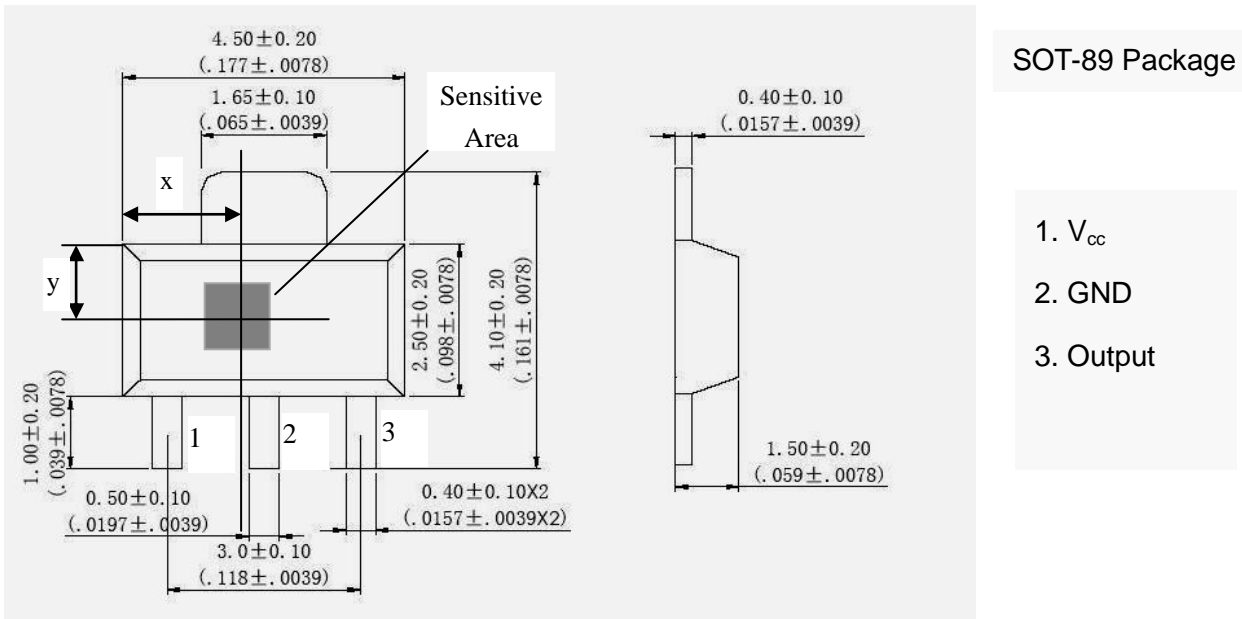
Connection

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





DIMENSIONS (in: mm)



$x = 1.75 \pm 0.25$ mm
 $y = 1.25 \pm 0.25$ mm

Die Size
XW: 1.073mm
YH: 1.184mm

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.