

Unipolar switch Hall position sensor

◆ General Description

SL12xx series unipolar switch Hall position sensor is designed with CMOS technology.

The input control signal is magnetic induction intensity, output is a switch type digital voltage signal, suitable for working with rectangular or cylindrical magnets. When there is no magnetic field control, the output tube of the sensor circuit in this series will be turned off and the output will be at a high level; When the magnetic field strength B is greater than the operating point (BOP), the output switch tube will open and the output will be at a low level; The output state will remain until the magnetic field strength B is lower than the release point (BRP), at which point the output switch will turn off and the output will return to a high level..

◆ Features

- 2.8~ 24V DC Operation Voltage
- CMOS Technology
- Open drain output structure, able to directly interface with logic circuits
- 25mA Output Sink Current
- Operating Temp: -40~ +125°C
- Package: TO-92S/ SOT23-3L/ SOT23
- Lead Free Finish/RoHS Compliant

◆ Applications

- DC brushless motor
- Contactless switch
- Position control
- Isolation testing
- Speed detection

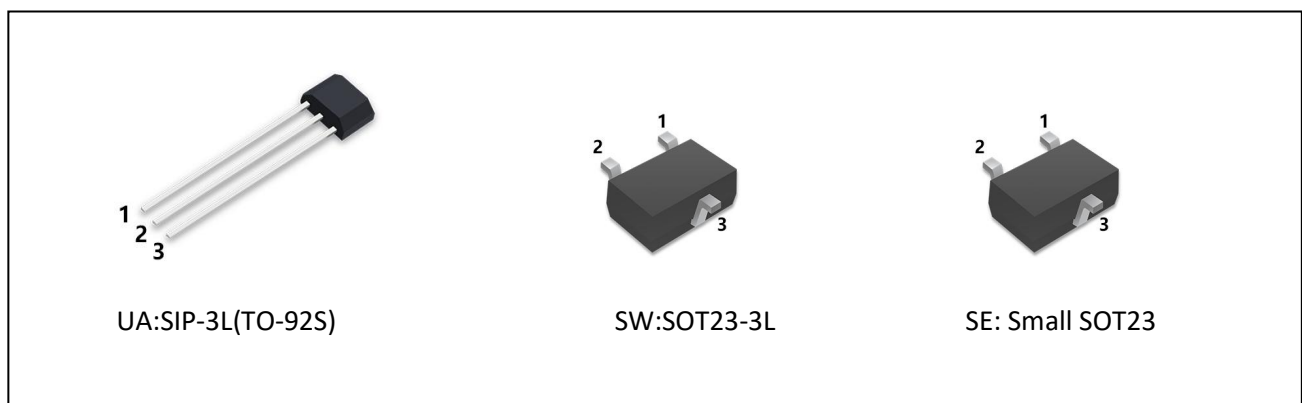


Figure 1. Package Type

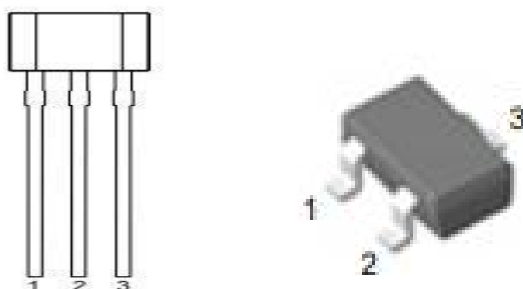
◆ **Ordering information**

Product	Temp	Package	Magnetic	Packing Type	Quantity
SL1210KUA	K	UA	South pole	Pack	1000pic
SL1210KSW	K	SW	North pole	Tape & Reel	3000pic
SL1220KUA	K	UA	South pole	Pack	1000pic
SL1220KSW	K	SW	North pole	Tape & Reel	3000pic
SL1220KSE	K	SE	South pole	Tape & Reel	3000pic
SL1230KUA	K	UA	South pole	Pack	1000pic
SL1230KSW	K	SW	North pole	Tape & Reel	3000pic

Note

- 1) K stands for temp range -40~125°C
- 2) UA represents the packaging form SIP-3L/TO-92S
- 3) SW represents the packaging form SOT23-3L
- 4) SE represents the packaging form as small SOT23

◆ **Pin Configuration**



Pin Number		Pin Name	Function
SIP-3L	SOT23-3L/SOT23		
1	1	VCC	Power supply
2	3	GND	Ground
3	2	VOU	Output

◆ **Functional Block Diagram**

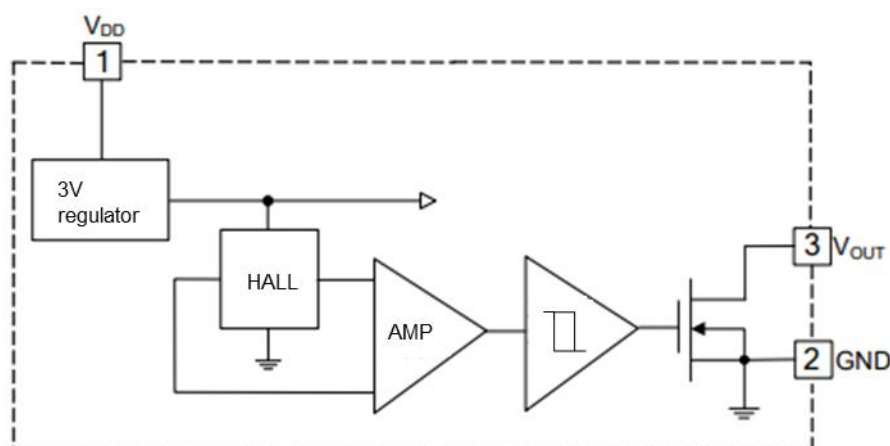


Figure 2. Block Diagram

◆ Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	-0.3~+28	V
Output Off Voltage	V_{OUT}	+32	V
Output Current	I_{OUT}	50	mA
Operation Temperature	T_A	-40~+150	°C
Storage Temperature	T_{ST}	-65~+160	°C
Flux	B	unlimit	Guass

◆ Electrical Characteristics

$V_{DD}=12V$, $T_A=25^{\circ}C$, unless otherwise specified.

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	Operating	2.8	12	24	V
Supply Current	I_{CC}	-	--	2.0	5.0	mA
Output low-level voltage	V_{OUTL}	$I_{OUT}=20mA$, $B>BOP$	--	200	500	mV
Output high-level leakage current	I_{off}	$V_{OUT}=24V$, $B < BRP$	--	<0.1	10	μA
Maximum switching frequency	F_{sw}	$R_L=820\Omega$, $C_L=20pF$	--	10	--	KHz
Output Fall/Up Time	t_f/t_r	$R_L=820\Omega$, $C_L=20pF$	--	0.1	0.5	us

Note:

- 1) If any one of the maximum ratings is exceeded, the device may be damaged.
- 2) The maximum power supply voltage that can work normally must be adjusted according to the constraints of temperature and power consumption.

◆ Magnetic Characteristics

($V_s=12V, T_A=25^{\circ}C$)

SL1210KUA (for South pole)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Operate Point	BOP	$V_{CC}=12V, T_A=25^{\circ}C$	25	45	65	GS
Release Point	BRP	$V_{CC}=12V, T_A=25^{\circ}C$	10	30	50	GS
Hysteresis	BHYS	$V_{CC}=12V, T_A=25^{\circ}C$	5	15	25	GS

SL1210KSW (for North pole)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Operate Point	BOP	$V_{CC}=12V, T_A=25^{\circ}C$	-65	-45	-25	GS
Release Point	BRP	$V_{CC}=12V, T_A=25^{\circ}C$	-50	-30	-10	GS
Hysteresis	BHYS	$V_{CC}=12V, T_A=25^{\circ}C$	5	15	25	GS

SL1220KUA/SL1220KSE (for South pole)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Operate Point	BOP	$V_{CC}=12V, T_A=25^{\circ}C$	100	120	140	GS
Release Point	BRP	$V_{CC}=12V, T_A=25^{\circ}C$	70	90	110	GS
Hysteresis	BHYS	$V_{CC}=12V, T_A=25^{\circ}C$	10	30	50	GS

SL1230KUA (for South pole)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Operate Point	BOP	$V_{CC}=12V, T_A=25^{\circ}C$	15	30	45	GS
Release Point	BRP	$V_{CC}=12V, T_A=25^{\circ}C$	10	20	30	GS
Hysteresis	BHYS	$V_{CC}=12V, T_A=25^{\circ}C$	5	10	15	GS

SL1230KSW (for North pole)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Operate Point	BOP	$V_{CC}=12V, T_A=25^{\circ}C$	-45	-35	-15	GS
Release Point	BRP	$V_{CC}=12V, T_A=25^{\circ}C$	-30	-20	-10	GS
Hysteresis	BHYS	$V_{CC}=12V, T_A=25^{\circ}C$	5	10	15	GS

Note: $1mT=10Gs$

◆ **Functional Description**

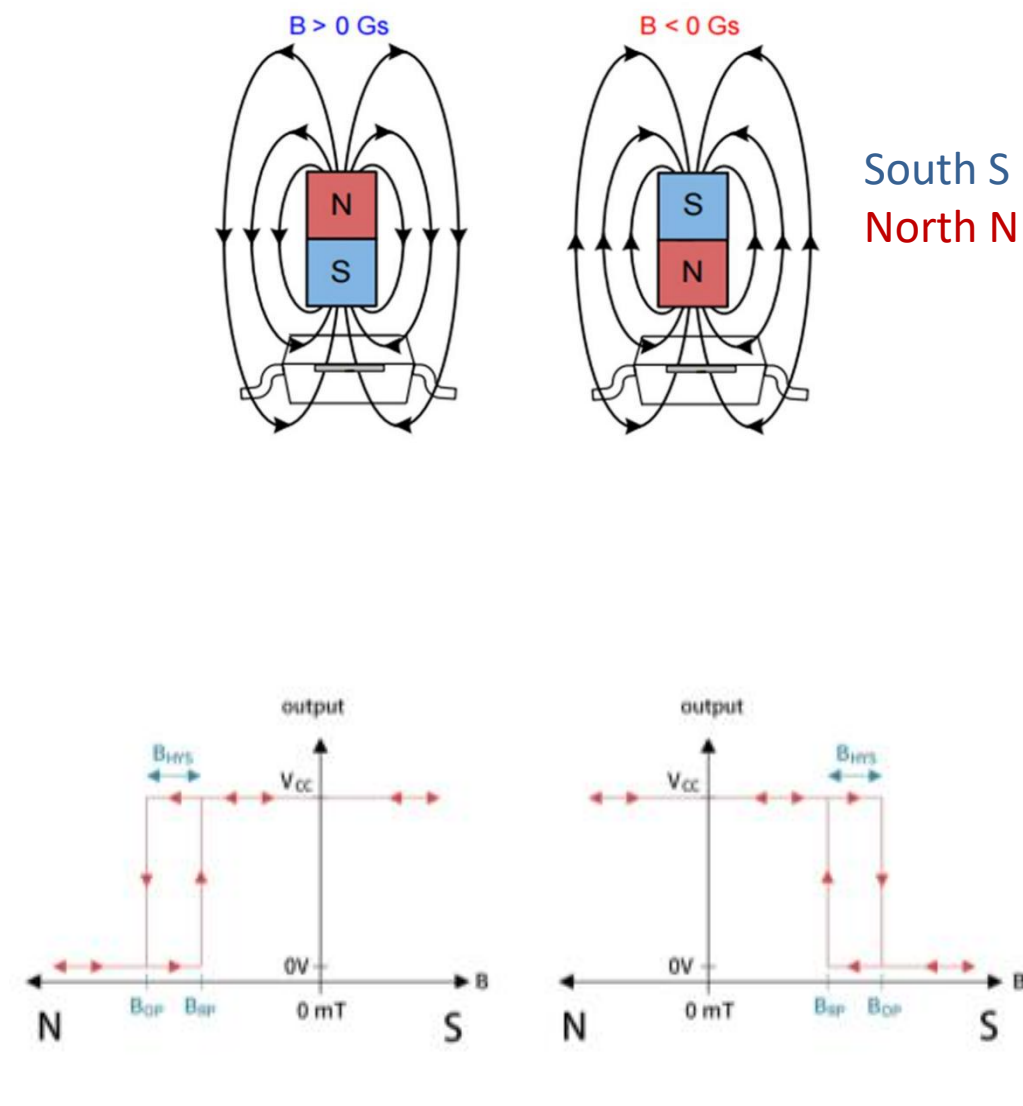


Figure 3. Output characteristics

◆ Typical Application

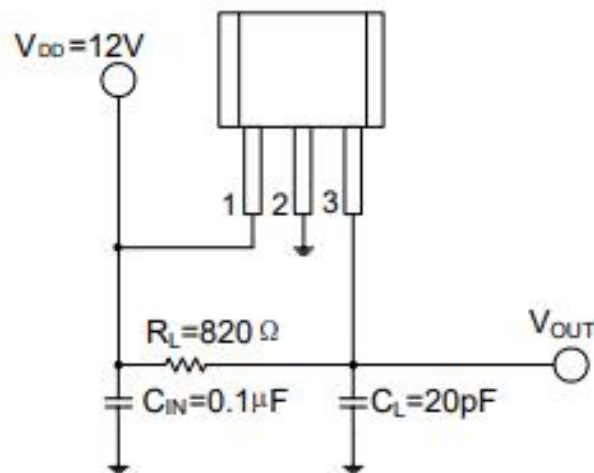


Figure 4. Application

Note:

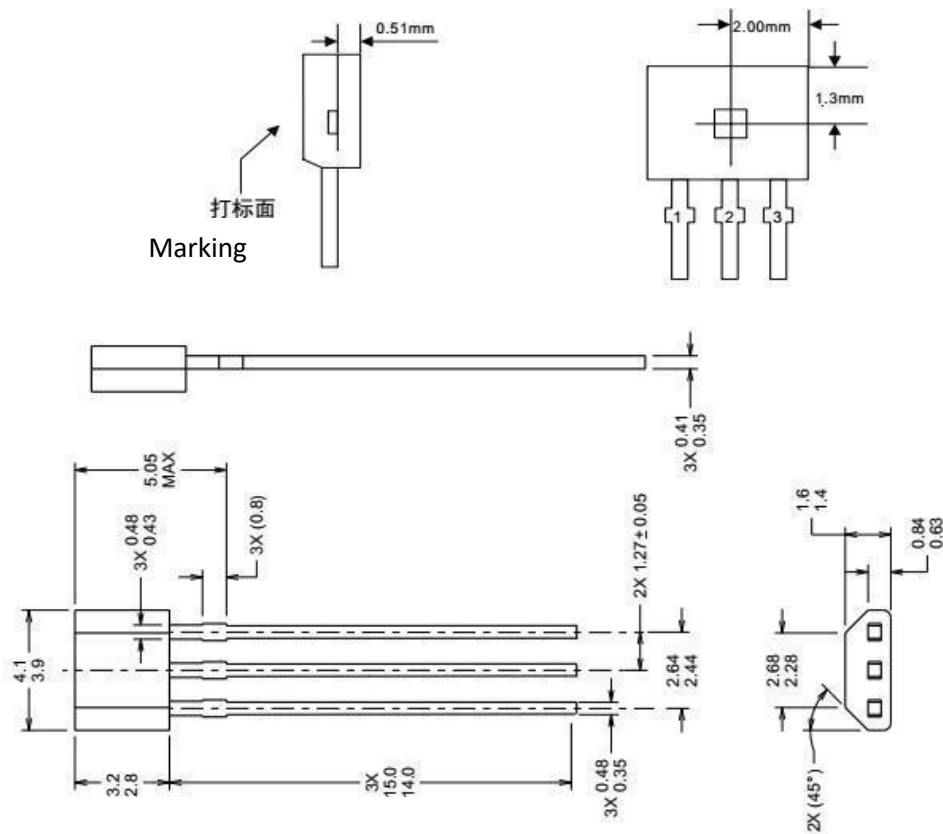
C_{IN} is used to stabilize external power supply;

R_L is the pull-up resistance necessary for open collector output;

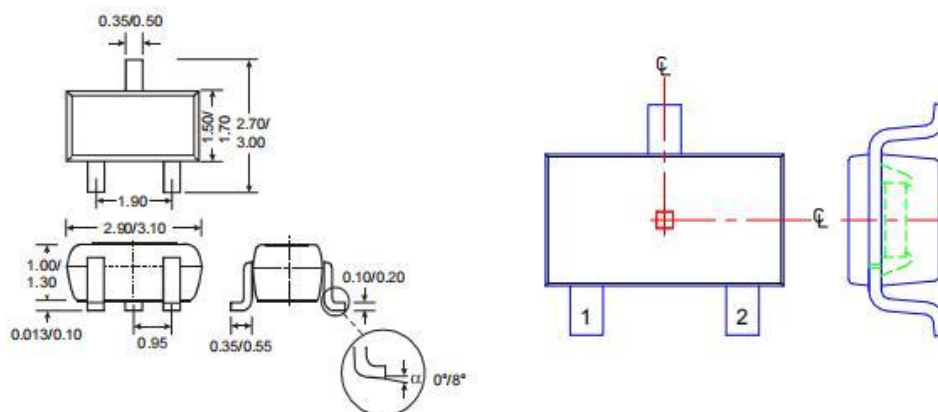
C_L is used for filter out the output noise. This capacitor will affect the rise time of the waveform.

◆ **Package Information**

(1) SIP-3L(TO-92S)



(2) SOT23-3L



(3) SOT23 (Small)

