

UNIPOLAR HALL EFFECT SENSOR IC

◆ General Description

SL1104 series high temperature unipolar Hall effect integrated sensor is a magnetic sensing circuit composed of internal voltage stabilizing unit, Hall voltage generator, differential amplifier, temperature compensation unit, Schmitt trigger and open collector output stage. Its input is magnetic induction strength and its output is a digital voltage signal.

It is a magnetic sensing circuit with a single magnetic pole, which is suitable for working under rectangular or cylindrical magnets. SL1104 series can operate at - 20 ℃~85 ℃ or - 40 ℃~150 ℃. The operating range of power supply voltage is 4.5V~24V or 3.8V~30V, and the maximum load current capacity is 50mA. The packages are SIP3L (TO92S), SOT23 - 3L and SOT-89B.

◆ Features

- Wide power supply voltage range and large output current
- Fast switching speed, no instantaneous jitter
- Operating frequency width (0~100KHz)
- Long service life, small size and convenient installation
- Can interface with logic circuit directly

◆ Applications

- DC brushless motor
- Automobile igniter
- Contactless switch
- Current sensor
- Safety alarm device
- Isolation detection
- Position control



UA: SIP-3L(TO-92S)



SW: SOT23-3L



SE: small SOT23-3



SY:SOT-89B

◆ Ordering Information

Product	Temp. Range	Package	Voltage	Packing
SL1104EUA	E(Note1)	UA(Note2)	4.5-24V	1000 PCS/BAG
SL1104LUA	L(Note3)	UA(Note2)	3.8-30V	1000 PCS/BAG
SL1104ESW	E(Note1)	SW(Note4)	4.5-24V	3000 PCS/BAG
SL1104ESE	E(Note1)	SE(Note5)	4.5-24V	3000 PCS/BAG
SL1104ESY	E(Note1)	SY(Note6)	4.5-24V	3000 PCS/BAG

Note:

1.E represents the operating temperature range of -20℃~85℃; 2.UA represents that the packaging form is SIP-3L (TO-92S); 3.L represents the working temperature range of - 40 ℃~150 ℃; 4.SW represents SOT23-3L; 5.SE represents small SOT23; 6.SY represents SOT-89B.

◆ Pin Configuration

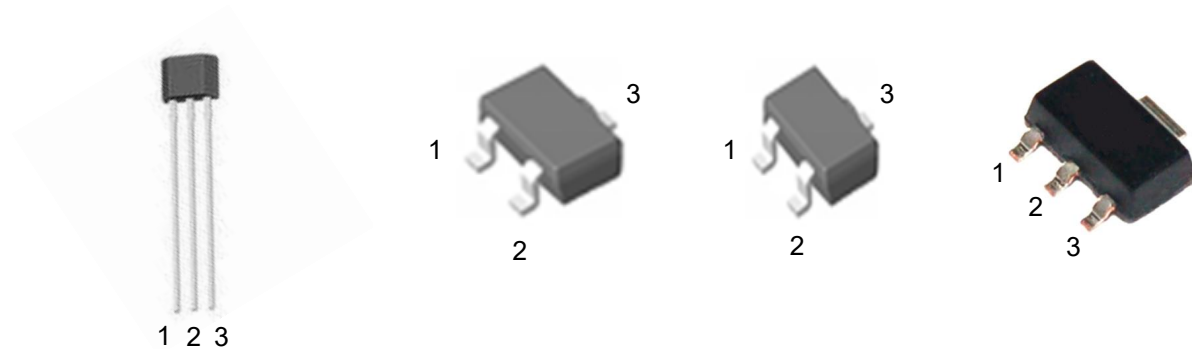


Figure 1. Pin Configuration of SL1104

◆ Pin Description

Pin Number	Pin Name	Function
1	V _{CC}	IC Power Supply voltage
2	GND	IC Ground
3	OUT	Open Collector Output, a pull-up resistor is needed

◆ Functional Block Diagram

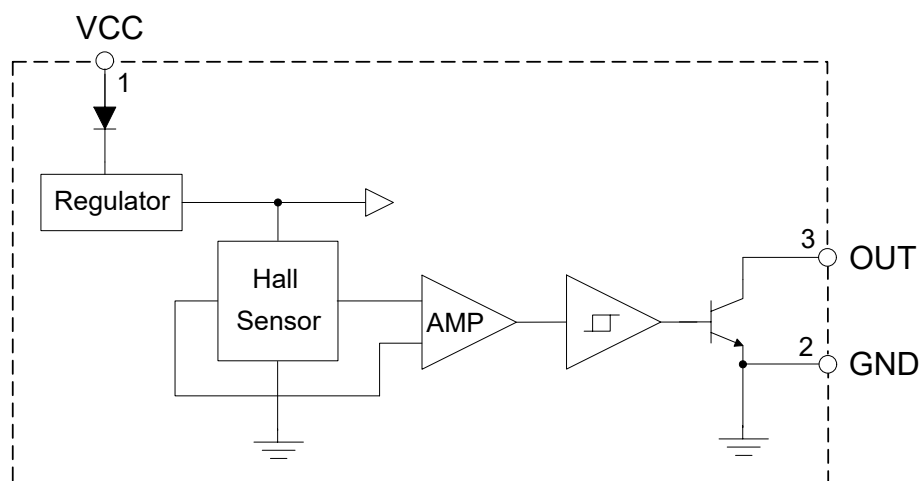


Figure 2. Functional Block Diagram of SL1104

◆ **Absolute Maximum Ratings (Note 7)** ($T_A=25^{\circ}\text{C}$)

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	-30~+40	V
Output Current	I_O	50	mA
Power Dissipation	P_D	450	mW
Operating Temperature	T_A	-20 to 85	$^{\circ}\text{C}$
		-40 to 150	
Junction Temperature	T_J	+150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-65 to 170	$^{\circ}\text{C}$
Magnetic Flux	B	Unlimited	Gauss

Note 7: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

◆ **Electrical Characteristics** ($V_{CC}=12\text{V}$, $T_A=25^{\circ}\text{C}$, unless otherwise specified.)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage	V_{CC}		4.5		24	V
			3.8		30	
Supply Current	I_{CC}	$V_{CC}=3.8\text{V to }30\text{V}$		4	10	mA
Output Leakage Current	I_{OL}	$V_{CE}=30\text{V}, B < B_{rp}$		0.1	10	μA
Output Saturation Voltage	V_{SAT}	$I_{OUT}=25\text{mA}, B > B_{op}$		150	250	mV
		$I_{OUT}=45\text{mA}, B > B_{op}$		350	500	
Rise Time	t_r	$R_L=820\Omega, C_L=20\text{pF}$			1.5	μs
Fall Time	t_f	$R_L=820\Omega, C_L=20\text{pF}$			1.5	μs

◆ **Magnetic Characteristics** ($V_{CC}=12\text{V}$, $T_A=25^{\circ}\text{C}$, unless otherwise specified.)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Point	B_{OP}	70		250	Gauss
Releasing Point	B_{RP}	50		230	Gauss
Hysteresis	B_{HYS}	20	55	80	Gauss

◆ **Output Characteristics**

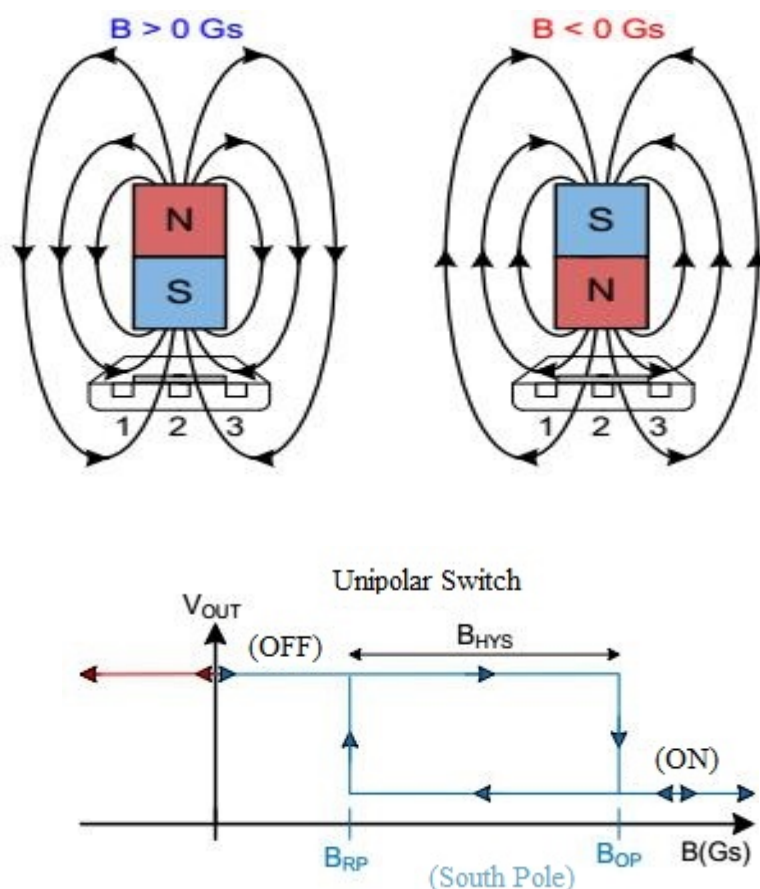
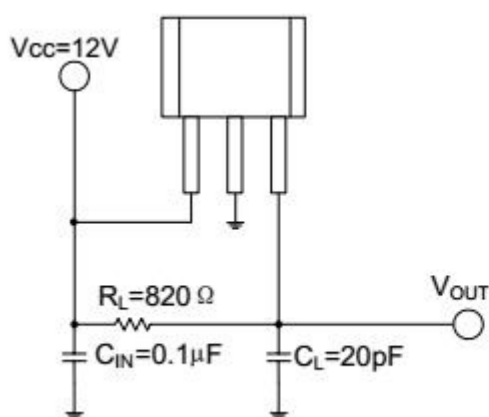


Figure 3. Output characteristics of SL1104

◆ **Typical Application**



Note:

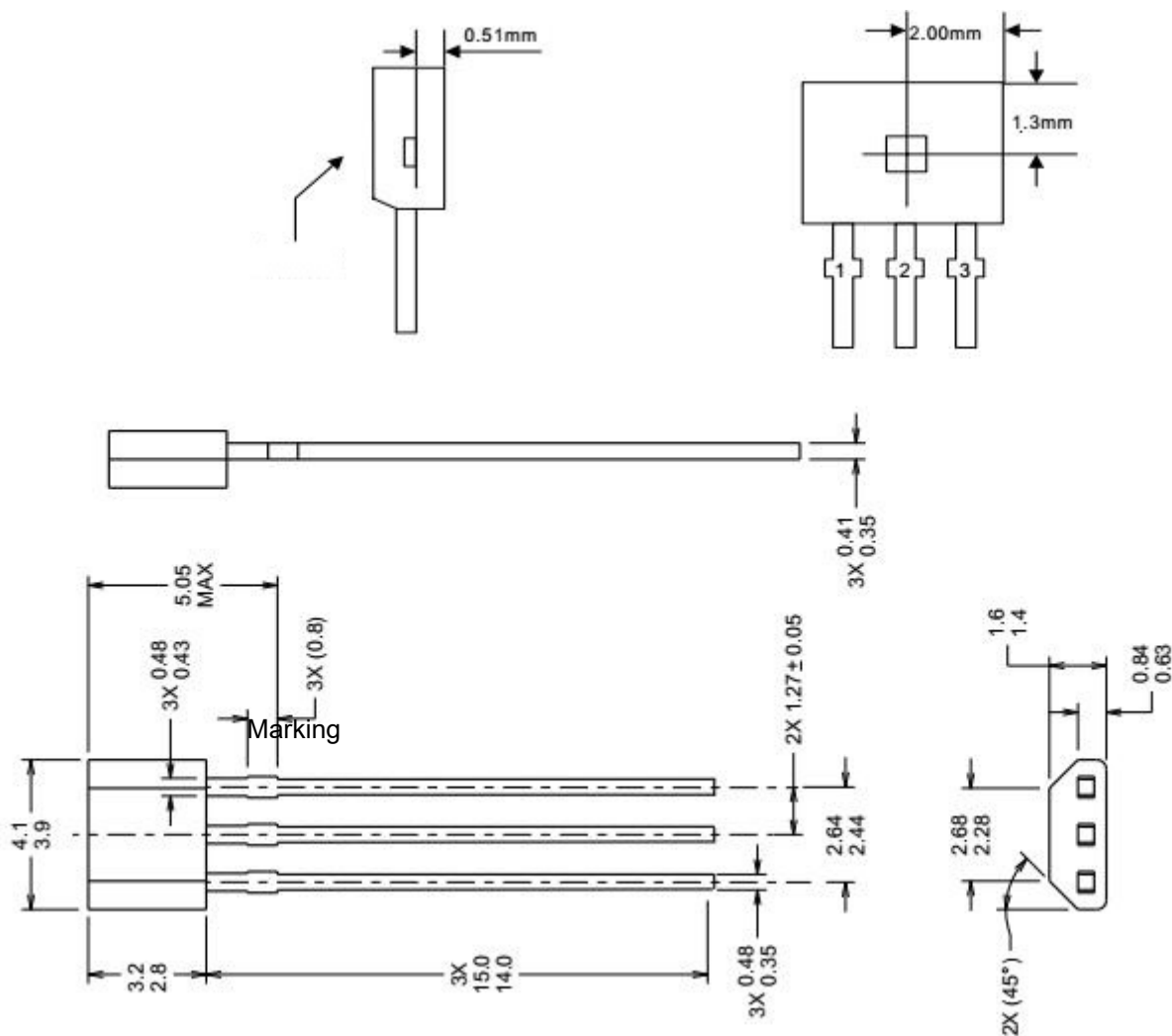
C_{IN} is used to stabilize external power supply; R_L is the pull-up resistance necessary for open collector output, with a value range of $820\ \Omega \sim 100K\ \Omega$, depending on the current capacity required by the back-end input; C_L is used to filter out the output noise. This capacitor will affect the rise time of the waveform.

Figure 4. Typical application of SL1104

◆ **Package Information**

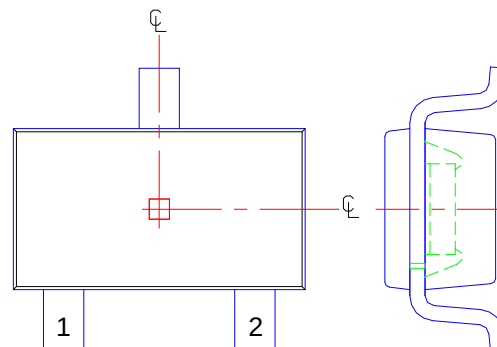
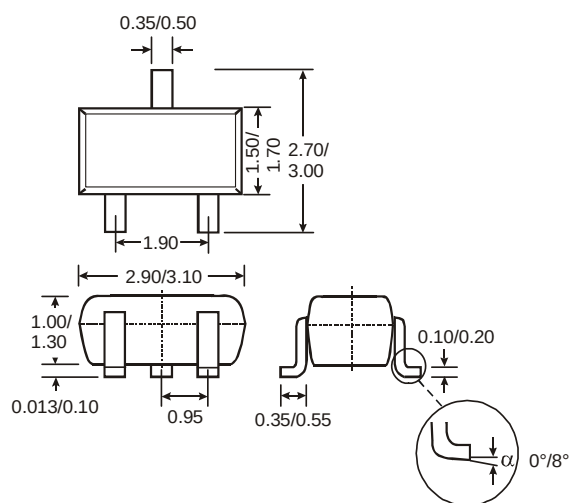
(UA: SOT23-3L)

Unit:mm



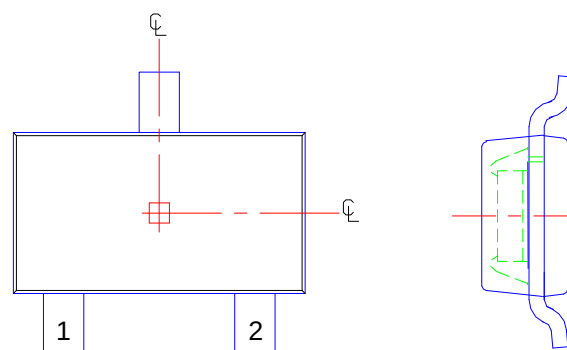
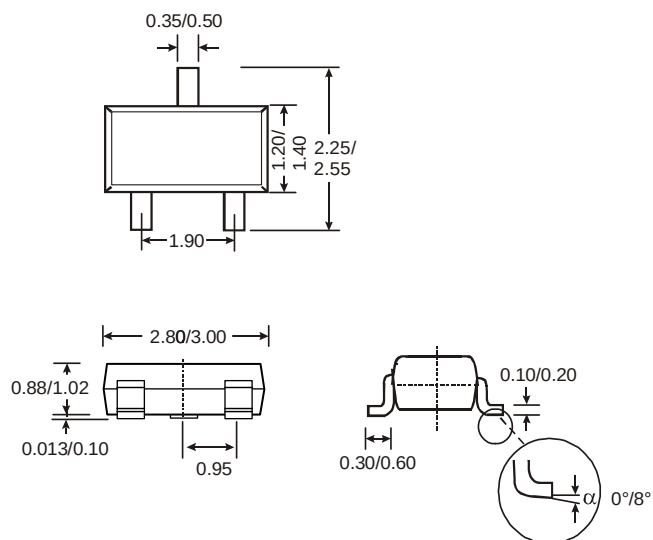
(SW: SOT23-3L)

Unit:mm



(SE: small SOT23-3L)

Unit:mm



(SY: SOT-89)

Unit:mm

