Latch Hall Effect Position Sensor

General Description

The HXJ1821 is an integrated Hall effect High Sensitivity latched sensor designed for electronic commutation of brush-less DC motor applications. The device includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifiers the Hall voltage, and a Schmitt trigger to provide switching hysteresis for noise rejection, and an open-collector output. An internal band-gap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

Features

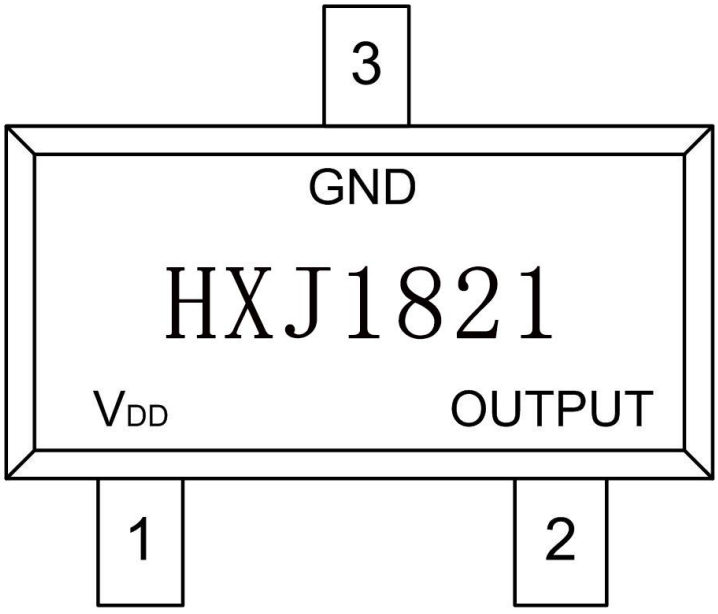
※ Wide operating voltage range: 2.8V~18V
※ Integrated 10KΩpull-up resistance
※ High Sensitivity: BOP(30GS)、BRP(30GS)
※ Operating temperature range: -40°C ~+125°C
※ Supply Reverse polarity protection
※ Package: SOT23-3L

Applications

※ Rotor Position Sensing
※ Speed measurement
※ Brush-less DC Motor
※ Revolution Detection
※ Safe Alarm Device
※ Rotor Position Sensing

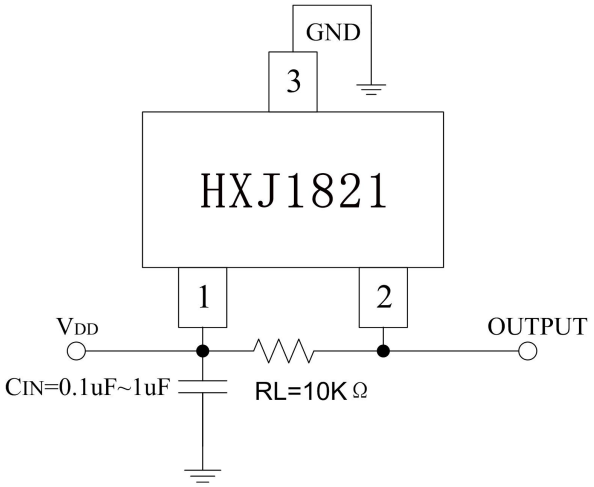
Pin Configuration

(Top View)



Pin Name	Pin Number	HXJ1821 Description	
V_{DD}	1	IC Power Supply	
GND	3	IC Ground	
OUTPUT	2	HXJ1821	It is low state during the S magnetic field
		HXJ1821N	It is low state during the N magnetic field

Application Circuit



Note: C_{IN} is for power stabilization and to strengthen the noise immunity, the recommended capacitance is 0.1~1uF.

Ordering Information

Part Number	PackageType	Packing Qty	B_{OP} (Gauss)	B_{RP}(Gauss)	Temperature	Eco Plan	Lead
HXJ1821WAE	SOT23-3L	3000pcs	-30(Typ.)	30(Typ.)	-40~+125℃	ROHS	Cu
HXJ1821NWAE	SOT23-3L	3000pcs	30(Typ.)	-30(Typ.)	-40~+125℃	ROHS	Cu

Block Diagram

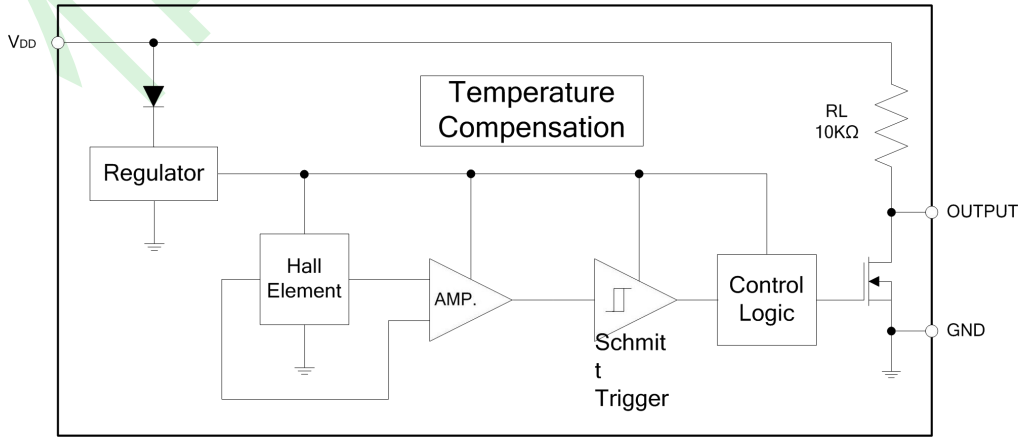


Figure 2, Block Diagram Of HXJ1821

Absolute Maximum Ratings

HXJ1821 Parameter		Value
Supply Voltage		24V
Output "H" Voltage,V_{DS}		24V
Reverse Voltage		24V
Output Maximum Sink Current(AVG)		20mA
Power Dissipation	Ta=25°C	260mW
Thermal Resistance	T_{ja}	0.52°C/mW
	T_{jc}	0.64°C/mW
Operating Temperature Range		-40°C ~+125°C
StorageTemperature Range		-65°C ~+150°C
Junction Temperature		+150°C
Lead Temperature(Soldering,10 sec)		+260°C

Recommended Operating Conditions

HXJ1821Parameter	Symbol	Rating	Unit
V_{DD} Pin Voltage to GND	V_{DD}	2.8 to18	V
Operating Temperature Range	T_{OP}	-40 to +125	℃

DC Electrical Characteristics (V_{CC}=5V,at Ta=25°C,unless otherwise noted)

HXJ1821Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Operating Voltage	V_{DD}	-	2.8	-	18	V
Supply current	I_{DD}	Pin3 is NC V_{CC}:2.8~18V, B=-50GS	0.6	2.37	5	mA
Output Saturation Voltage	V_{SAT}	V_{CC}=5V, B=50GS， Io=10mA	-	0.26	0.4	V
Output Drop Voltage	V_d	V_{CC}=5V, OUT"H" Io=0mA	-	-	15	mV
Pull-up Resistor	RL		6	10	14	KΩ
Output rise time	t_r	-	0.1	-	2.6	μS
Output fall time	t_f	-	0.001	-	1	μS
ESD Voltage (HBM)	V_{ESD}	-	3	-	-	KV

Magnetic Characteristics

Ta=25°C					
HXJ1821Parameter	Symbol	Min.	Typ.	Max.	Unit
Operate point	B_{OP}	5	30	50	G
Release Point	B_{RP}	-50	-30	-5	G
Hysteresis	B_{HY}	20	60	80	G

Output Vs Magnetic Pole

HXJ1821Part Number	Magnetic Pole	Test Conditions	Output
HXJ1821	South Pole	B >B_{OP}	Low
HXJ1821	North Pole	B <B_{RP}	High

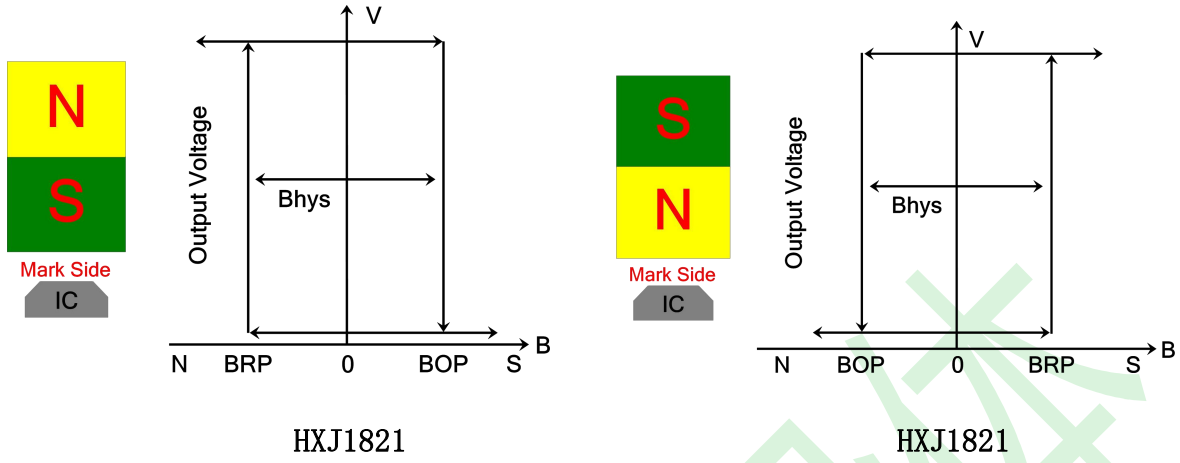


Figure 3, Operational Characteristics

Hall Sensor Location

(TOP View)

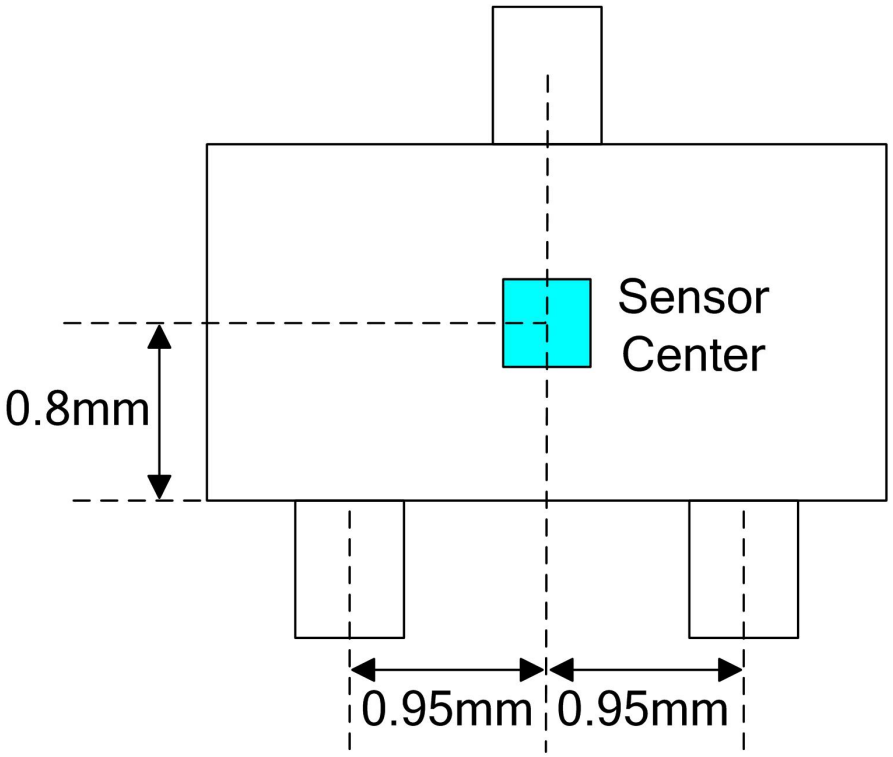
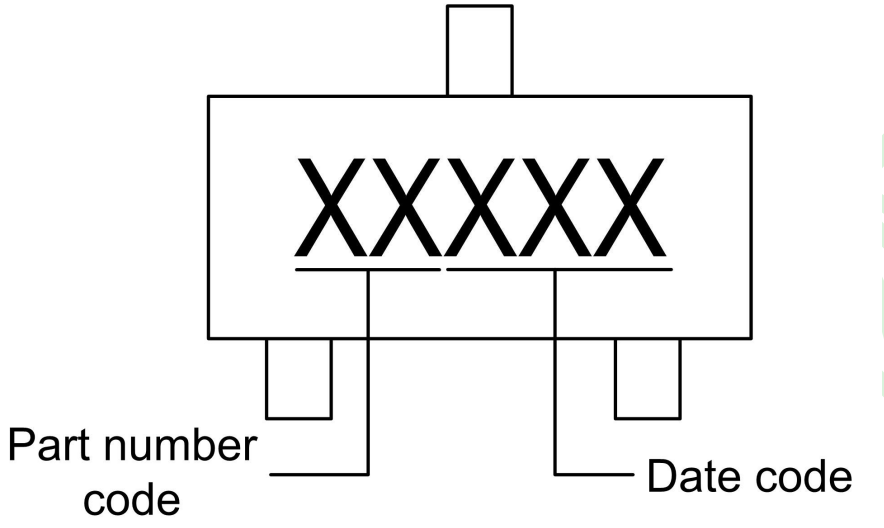
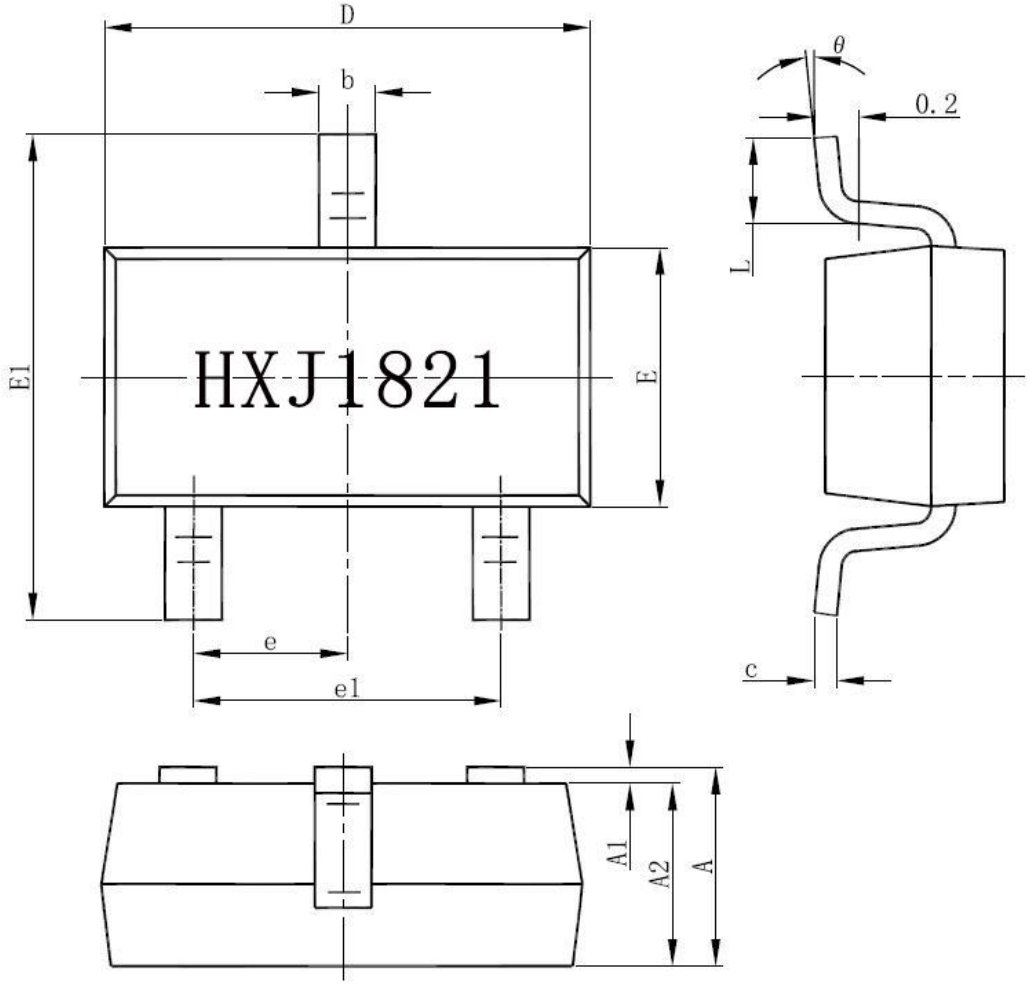


Figure 4, Hall Sensor Location

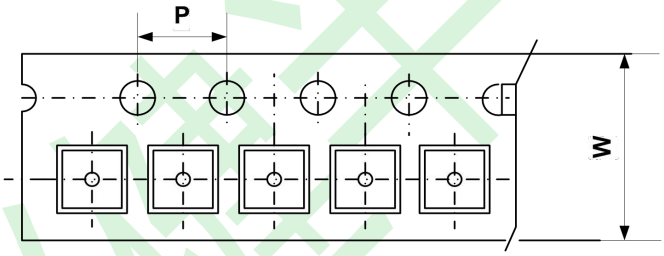
Marking Information

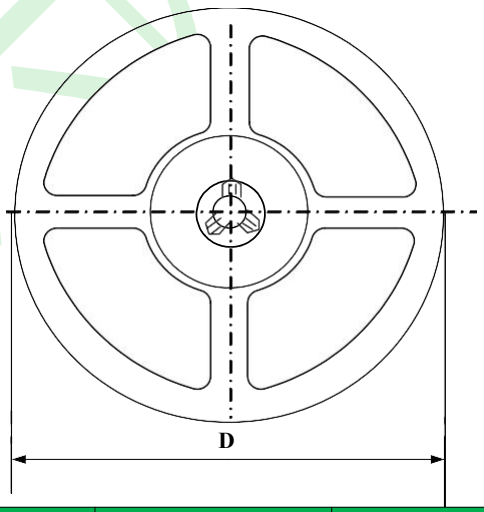
SOT23-3L





Symbol	HXJ1821 Dimensions In Millimeters			HXJ1821 Dimensions In Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.050	1.15	1.250	0.041	0.045	0.049
A1	0.000	0.050	0.100	0.000	0.002	0.004
A2	1.050	1.100	1.150	0.041	0.043	0.045
b	0.300	0.400	0.500	0.012	0.016	0.020
c	0.100	0.150	0.200	0.004	0.006	0.008
D	2.820	2.920	3.020	0.111	0.115	0.119
E	1.500	1.600	1.700	0.059	0.063	0.067
E1	2.650	2.800	2.950	0.104	0.110	0.116
e1	1.800	1.900	2.000	0.071	0.075	0.079
e	0.950 REF			0.037 REF		
L	0.300	0.450	0.600	0.012	0.018	0.024
θ	0°	4°	8°	0°	4°	8°





Package Type	Carrier Width(W)	Pitch(P)	Reel Size(D)	Packing Minimum
SOT23-3L	8.0±0.1 mm	4.0±0.1 mm	180±1 mm	3000pcs

Note: Carrier Tape Dimension, Reel Size and Packing Minimum