Low Current Consumption, High Sensitivity CMOS Hall IC

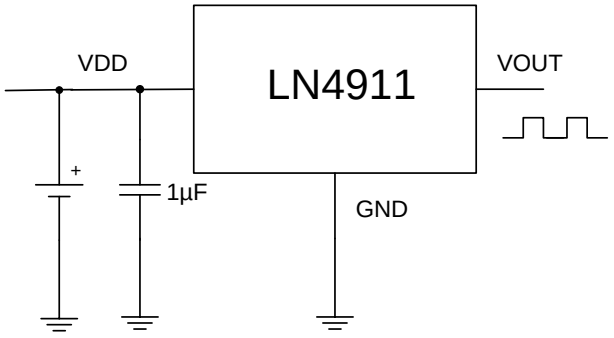
■ General Description

LN4911 is a Hall IC (a magnetic sensor) which has 2 times or more sensitivity and a low current consumption of about one fifties compared with our conventional one. Precise magnetic switching points and high temperature stability are achieved through the unique design of the internal circuit.

An onboard clock scheme is used to reduce the average operating current of the IC. During the operate phase the IC compares the actual magnetic field detected with the internally compensated switching points. The output Q is switched at the end of each operating phase. If the magnetic field perpendicular to enter the chip and the N-level magnetic field strength reaches a certain value of the CMOS output changes from high to low, and have been known to maintain a low state of the magnetic field perpendicular to enter the S-class chips, then the output again from low to high, the formation of cross-sensitive magnetic field detection effect.

LN4911 use of ultra-small package, can be widely applied N, S-level change detection in interactive environments, such as mobile phones trackball detection occasions.

■ Typical Application Circuit



■ Applications

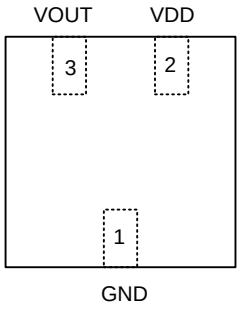
- Function key operation
- Low-speed rotary detector
- Mouse

■ Features

- Micro power design
- 2.4 V to 5.5 V battery operation
- High sensitivity and high stability of the magnetic switching points
- High resistance to mechanical stress
- Digital output signal
- interactive model of the magnetic field induction

■ Package

- DFN2×2-3L



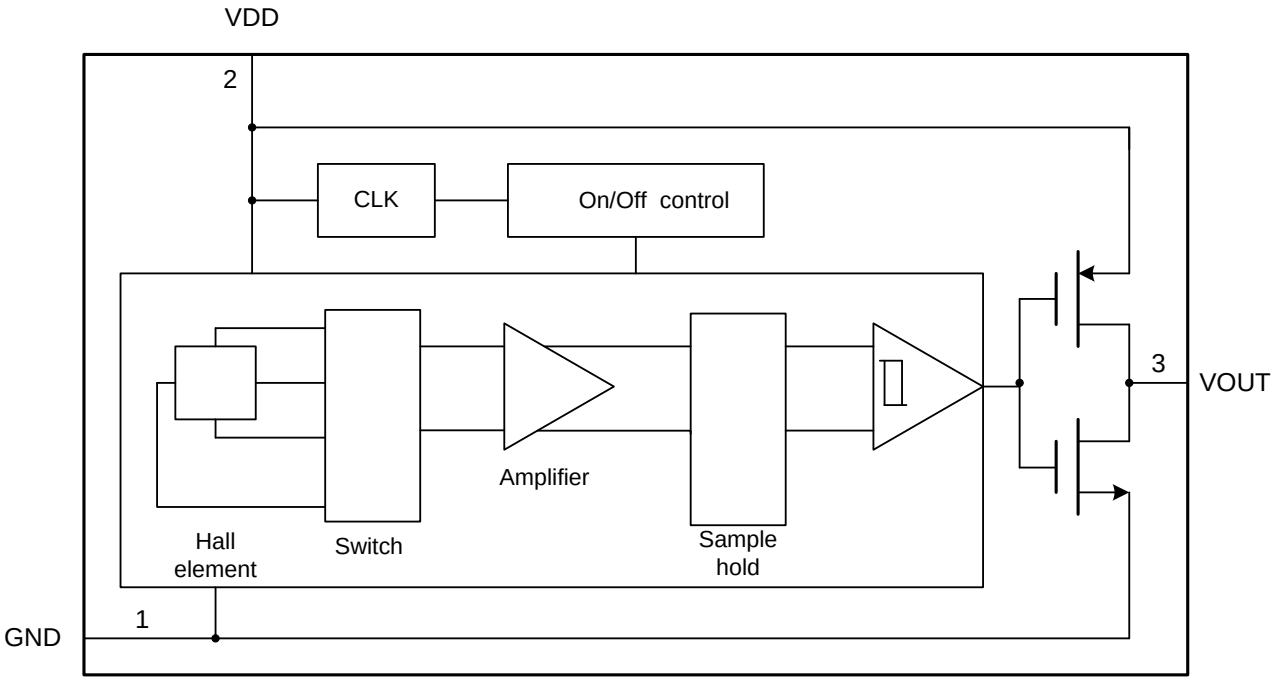
■ Pin Assignment

Pin Number	Symbol	Function Description
1	GND	Ground Pin
2	VDD	Supply Voltage Pin
3	VOUT	Output Pin

■ Ordering Information

Part Number	Package	Lot Number
LN4911LD	DFN2×2-3L	4911

■ Function Block Diagram



■ Absolute Maximum Ratings

Symbol	Characteristics	Values	Unit
Vdd	Supply voltage	-0.3—6.0	V
I_S	Operating current	-1-5.0	mA
V_{OUT}	Output voltage	-0.3-6.0	V
I_{OUT}	Output current	-1-2.0	mA
T_S	Storage temperature range	-40—150	°C
T_J	Maximum junction temperature	150	°C
-	ESD Protection	4000	V

■ Electrical Characteristics

AC/DC Characteristics (T_A=+25℃,V_{DD}=3.0V,Unless otherwise specified)

Symbol	Characteristic	Conditions	Min	Typ	Max	Unit
VDD	Supply voltage	—	2.4	—	6.0	V
I_{SAVG}	Averaged supply current		30	40	60	uA
I_{SOPAVG}	Averaged current during operating time		0.5	2.0	3.5	mA
I_{SOPT}	Peak current during operating time				4.5	mA
I_{SSTB}	Supply current during standby time		1	2.5	8	uA
V_{OUT1}	Output voltage 1	I_{OUT}=2mA, B=6mT		0.1	0.3	V
V_{OUT2}	Output voltage 2	I_{OUT}=-2mA, B=-6mT	2.7	2.9		V
t_{op}	Operating time		18	26	36	us
t_{stb}	Standby time		490	670	850	us
t_{stu}	Start-up time of IC			12	20	us

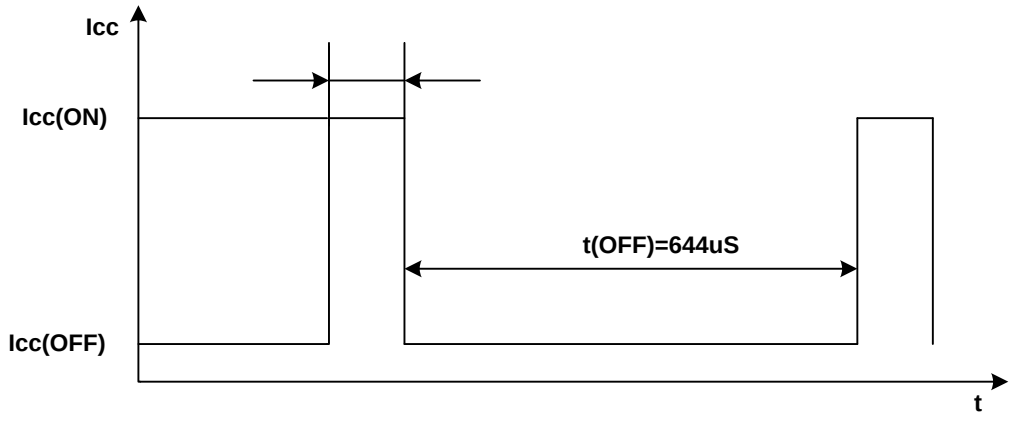
■ Mangentic Characteristics

(T_A=+25℃,V_{DD}=3V, Unless otherwise specified)

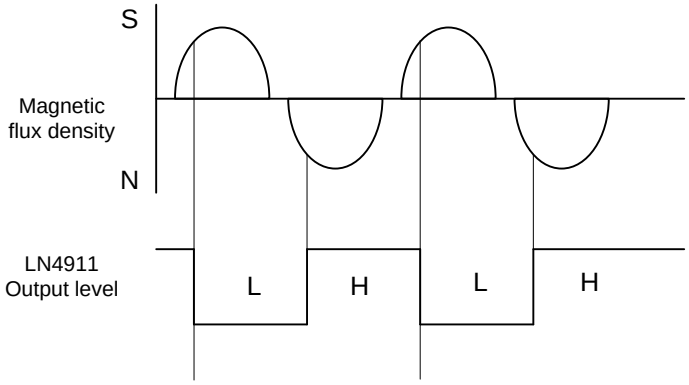
Symbol	Parameter	Min	Typ	Max	Unit
BHL	Forward flip the magnetic field density	0.5		6	mT
BLH	Reverse flip the magnetic field density	-0.5		-6	mT
BW	Magnetic hysteresis bandwidth		7		mT

■ Operating Characteristics

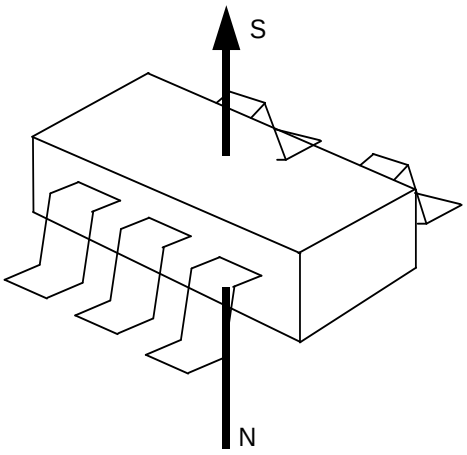
- **Icc vdd t timing diagram**



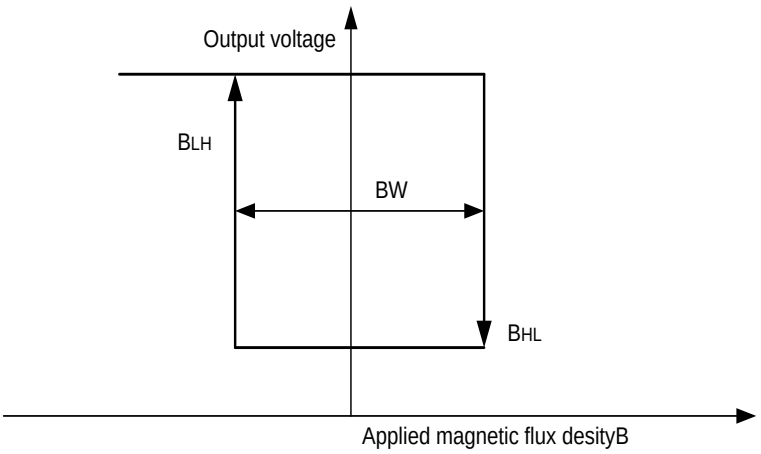
- **Magnetic flux density vdd output level**



- **Magneto-electro conversion characteristics**



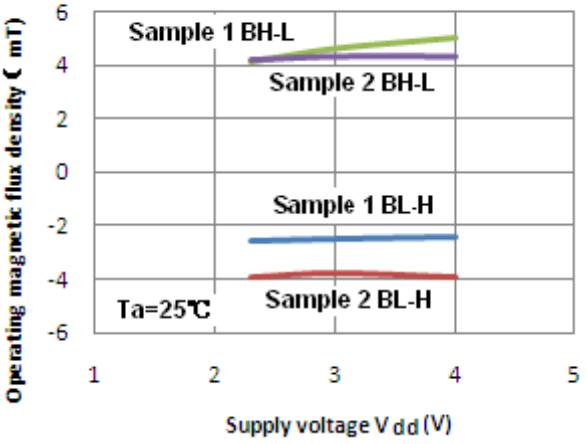
Direction of applied magnetic field



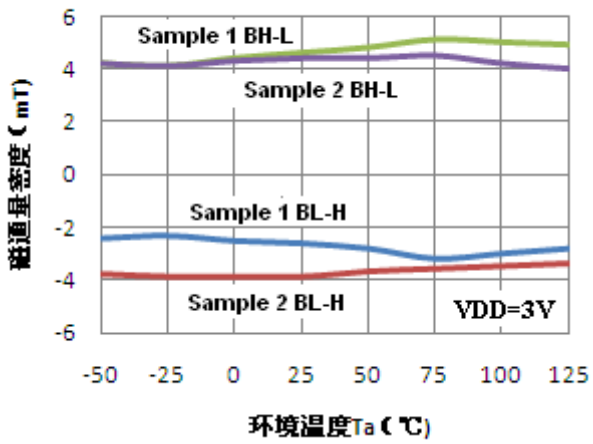
Operating magnetic flux density

■ Typical Operating Characteristics

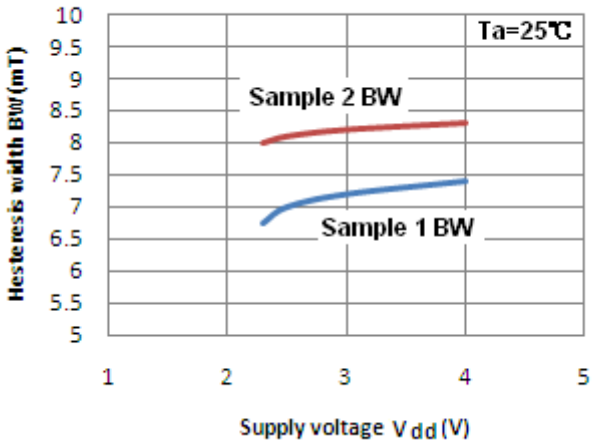
Operating magnetic flux density —Supply voltage



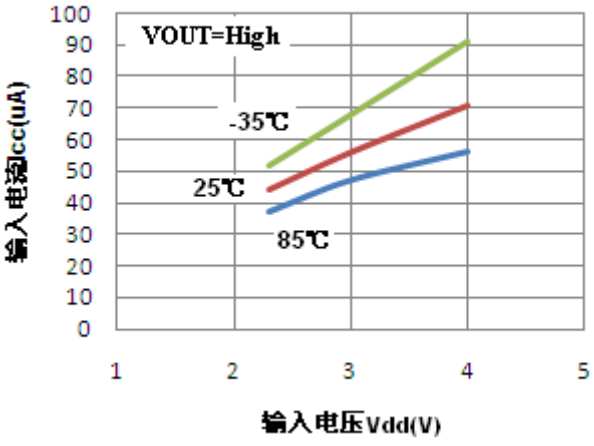
磁通量密度—环境温度



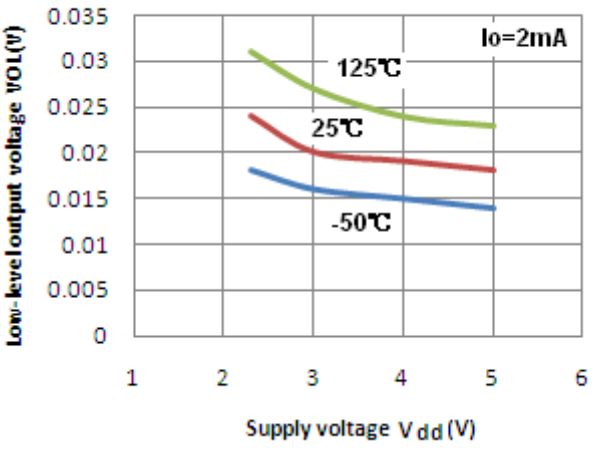
Hysteresis width—Supply voltage



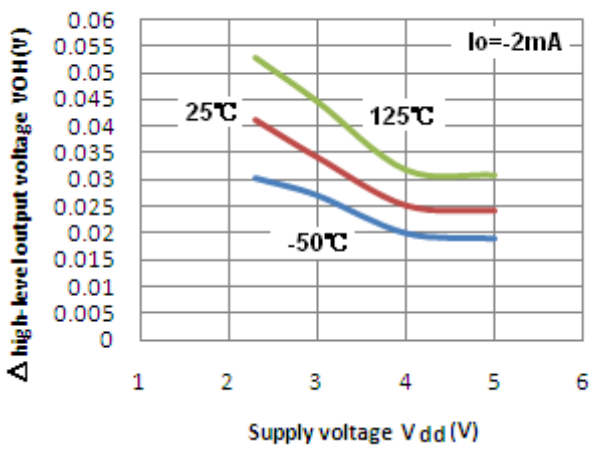
输入电流—输入电压

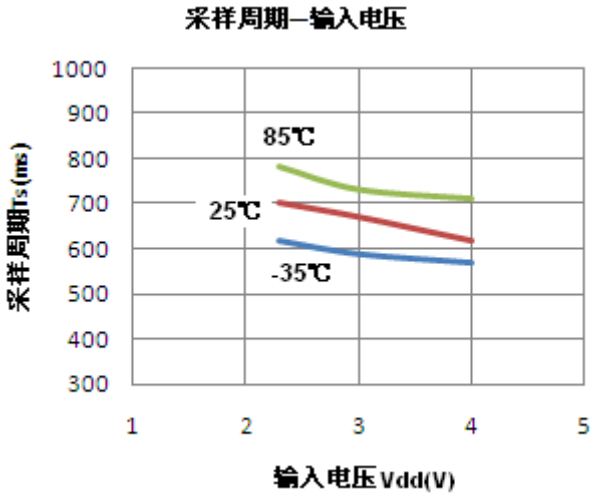


Low-level output voltage—Supply voltage



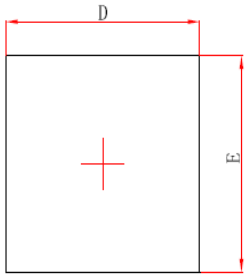
Δhigh-level output voltage—Supply voltage



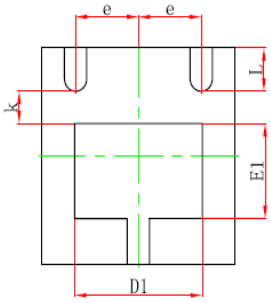


■ Package

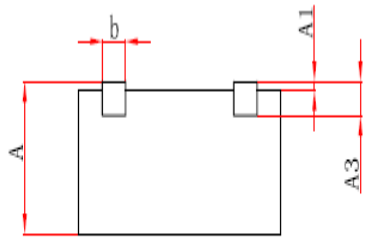
- **DFN2×2-3L**



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700/0.800	0.800/0.900	0.028/0.031	0.031/0.035
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.900	2.100	0.075	0.083
E	1.900	2.100	0.075	0.083
D1	1.220	1.420	0.048	0.056
E1	0.780	0.980	0.031	0.039
k	0.200MIN.		0.008MIN.	
b	0.180	0.300	0.007	0.012
e	0.650TYP.		0.026TYP.	
L	0.300	0.500	0.012	0.020