

MicroPower, Ultra-sensitive Hall Effect Switch

❖ GENERAL DESCRIPTION

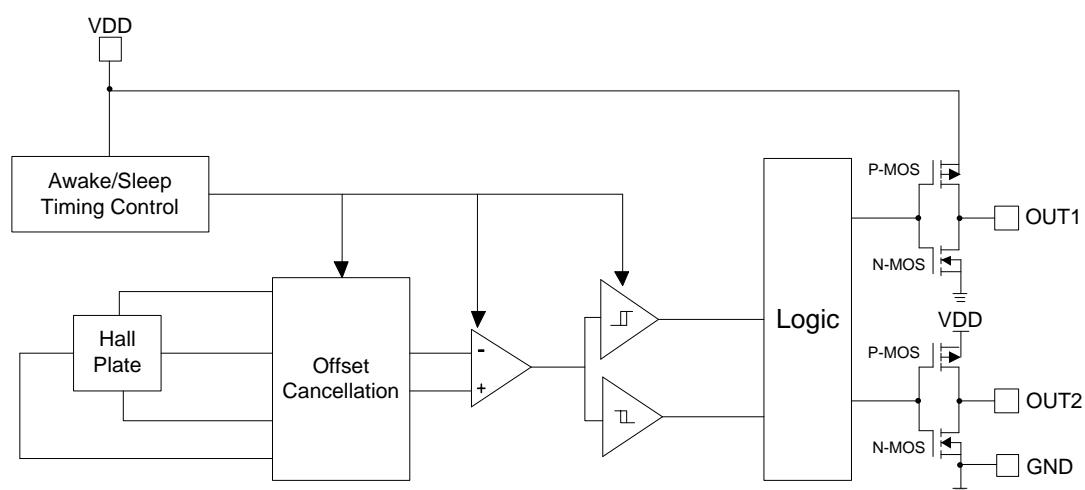
AX8112 is a Hall Effect sensor device with Dual output driver, mainly designed for battery-operation, hand-held equipment (such as Cellular and Cordless Phone, PDA). For AX8112, the total operation power is down to 10uW in the 1.8V supply.

Either north or South Pole of sufficient strength will turn the output on. The output will be turned off under no magnetic field. When the magnetic flux density (B) is larger than operate point (B_{op}) the output is switched on. The output is turned off when B becomes lower than the release point (B_{rp}). The output will remain off when there is no magnetic field. The AX8112 has two outputs, output one pulls low when switched on and output two is inverted.

❖ FEATURES

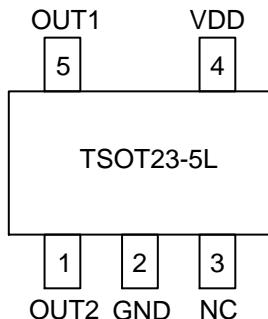
- Micro Power Operation for Battery Applications
- 1.65V to 3.30V battery operation
- Chopper Stabilized Technology
- Operation with North or South Pole
- Good RF noise immunity
- High sensitivity and high stability of the magnetic switching points
- 5-pin Thin TSOT23 Package

❖ BLOCK DIAGRAM



❖ PIN ASSIGNMENT

The packages of AX8112 are TSOT23-5L; the pin assignment is given by:



Name	Description
VDD	Power Input
GND	Ground
OUT1	Output Pin (active Low)
OUT2	Output Pin (active High)

❖ ORDER/MARKING INFORMATION

Order Information	Top Marking
AX8112 XX X Package Type BT:TSOT23-5L Packing Blank : Bag A : Taping	H F Y W X → ID code:internal → WW: 01~26 (A~Z) 27~52 (a~z) → Year: A= 2010 1= 2011 AX8112

❖ ABSOLUTE MAXIMUM RATINGS (at $T_A=25^\circ\text{C}$)

Characteristics	Symbol	Rating	Unit
VDD Pin Voltage	V_{DD}	- 0.3 to 4.5V	V
Output Pin Voltage	V_{OUT}	- 0.3 to 4.5V	V
Output Current	I_{OUT}	± 1	mA
Storage Temperature Range	T_{ST}	-65 to +150	$^\circ\text{C}$
Junction Temperature	T_J	+125	$^\circ\text{C}$
Operating Temperature Range	T_{OP}	-40 to +85	$^\circ\text{C}$
Thermal Resistance from Junction to case	θ_{JC}	180	$^\circ\text{C}/\text{W}$
Thermal Resistance from Junction to ambient	θ_{JA}	250	$^\circ\text{C}/\text{W}$
Power Dissipation [$PD = (T_J - T_A) / \theta_{JA}$]	PD	400	mW

Note : θ_{JA} is measured with the PCB copper area of approximately 1 in²(Multi-layer).

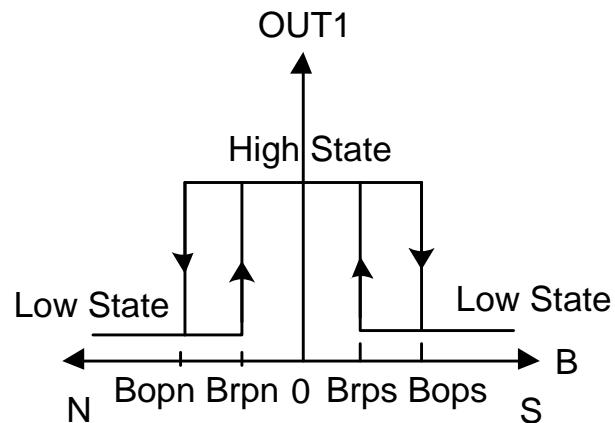
❖ **ELECTRICAL CHARACTERISTICS** ($V_{DD} = 1.8V$, $T_A=25^\circ C$, unless otherwise specified)

Characteristics	Symbol	Conditions	Min	Typ	Max	Units
Supply Voltage	V_{DD}		1.65	1.8	3.3	V
Supply Current	I_{DD}	Awake state	-	1.4	3	mA
		Sleep state	-	3.6	7	uA
		Average	-	5	10	uA
Output High Voltage	V_{OH}	$I_{OUT}=0.5mA$ (Source)	$V_{DD}-0.2$	-	-	V
Output Low Voltage	V_{OL}	$I_{OUT}=0.5mA$ (Sink)	-	-	0.2	V
Output Wake-Up Time	$T_{wake-up}$		-	40	80	us
Period	T_{Period}		-	40	80	ms
Duty Cycle	D.C		-	0.1	-	%

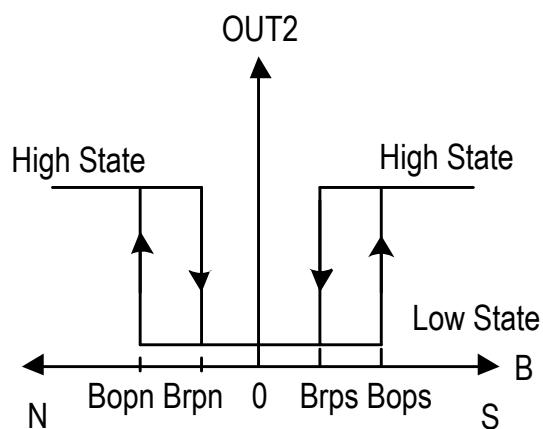
❖ **MAGNETIC CHARACTERISTICS** ($V_{DD} = 1.8V$, $T_A=25^\circ C$, unless otherwise specified)

Characteristics	Symbol	Conditions	Min	Typ	Max	Units
Operating Points	B_{OPS}		-	30	42	Gauss
	B_{OPN}		-42	-30	-	
Release Points	B_{RPS}		10	20	-	Gauss
	B_{RPN}		-	-20	-10	
Hysteresis	B_{Hys}		-	10	-	

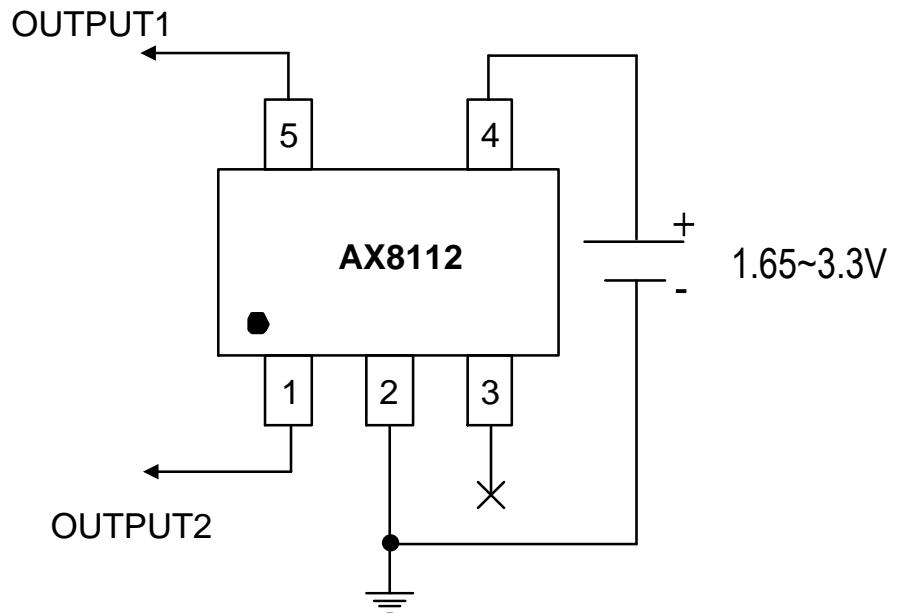
1. OUT1:



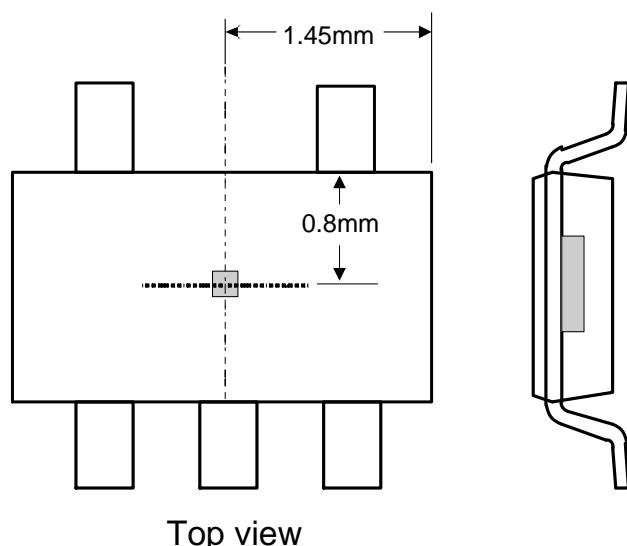
2. OUT2:



❖ APPLICATION CIRCUIT

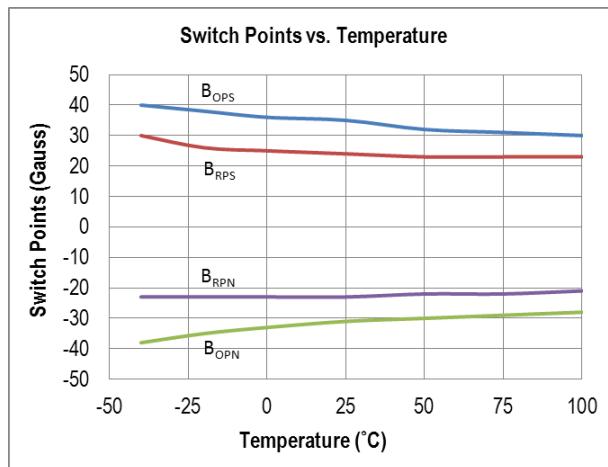
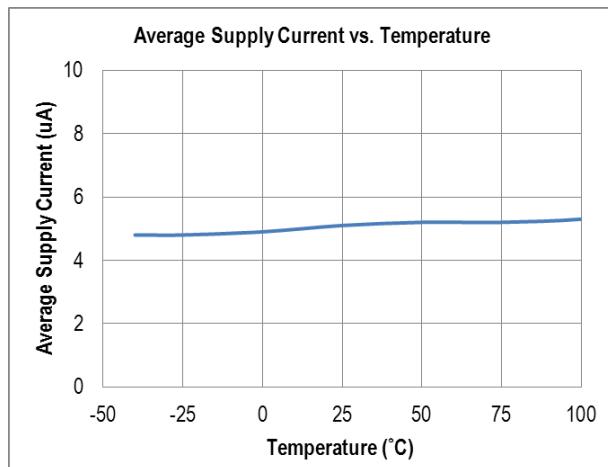
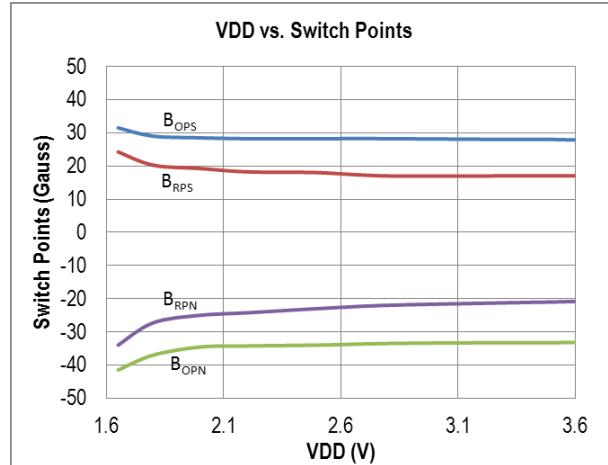
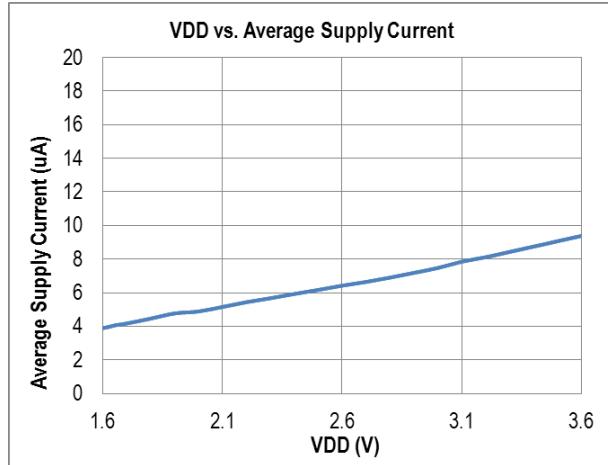


❖ SENSOR LOCATION

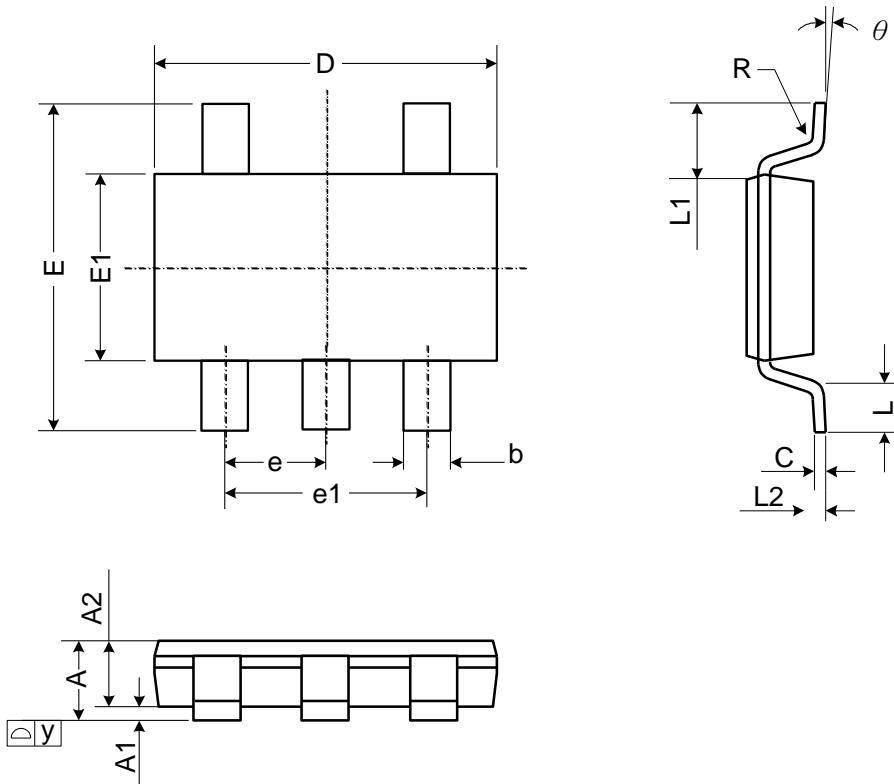


Top view

❖ TYPICAL CHARACTERISTICS



❖ PACKAGE OUTLINES



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	-	-	1.10	-	-	0.043
A1	0.00	-	0.10	0	-	0.004
A2	0.70	0.90	1.00	0.028	0.035	0.039
b	0.30	0.40	0.50	0.012	0.016	0.020
C	0.08	0.14	0.20	0.003	0.006	0.008
D	2.80	2.90	3.00	0.110	0.114	0.118
E	2.60	2.80	3.00	0.102	0.110	0.118
E1	1.50	1.60	1.70	0.059	0.063	0.067
e	0.95 BSC.			0.037 BSC.		
e1	1.90 BSC.			0.075 BSC.		
L	0.30	0.45	0.60	0.012	0.018	0.024
L1	0.60 REF.			0.024 REF.		
L2	0.25 BSC.			0.010 BSC.		
y	-	-	0.10	-	-	0.004
R	0.10	-	-	0.004	-	-
θ	0°	-	8°	0°	-	8°

JECED outline: MO-193 AB