

MicroPower, Ultra-sensitive Hall Effect Switch

❖ GENERAL DESCRIPTION

AX8113 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 AX8113, 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.

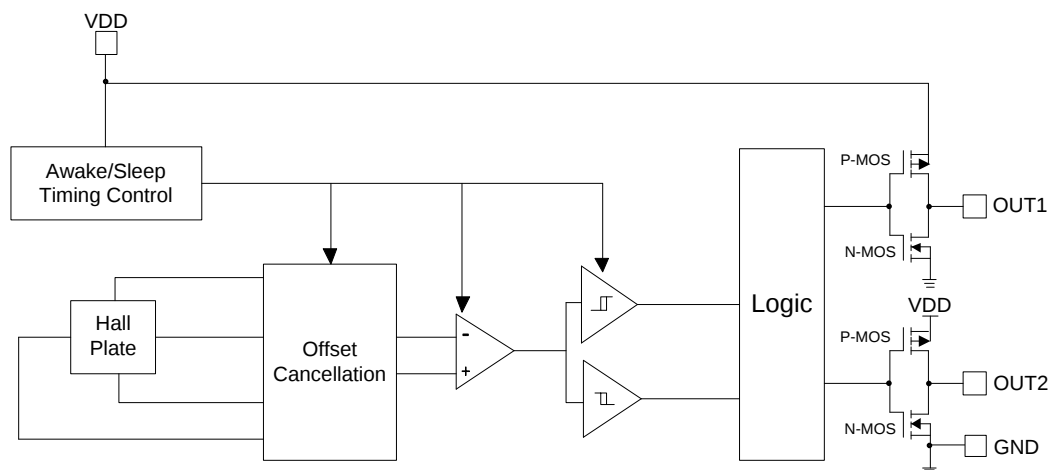
While the magnetic flux density (B) is larger than operate point B_{OPS} (South Pole), the OUT1 will be turned on (low), the OUT1 is held until B is lower than release point B_{RPS} (South Pole), then turned off (high).

While the magnetic flux density (B) is larger than operate point B_{OPN} (North Pole), the OUT2 will be turned on (low), the output is held until B is lower than release point B_{RPN} (North Pole), then turned off (high).

❖ FEATURES

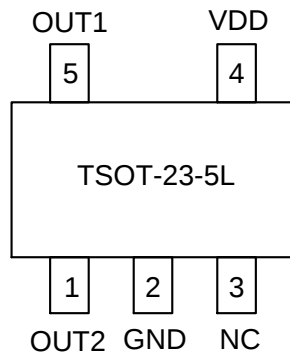
- Micro Power Operation for Battery Applications
- 1.65V to 3.30V battery operation
- Chopper Stabilized Technology
- Operation with South Pole (OUT1) or North Pole (OUT2)
- Good RF noise immunity
- High sensitivity and high stability of the magnetic switching points
- 5-pin Thin TSOT-23 Package

❖ BLOCK DIAGRAM



❖ PIN ASSIGNMET

The packages of AX8113 are TSOT-23-5L; the pin assignment is given by:



Name	Description
VDD	Power Input
GND	Ground
OUT1	Output Pin (active Low in S-Pole)
OUT2	Output Pin (active Low in N-Pole)

❖ ORDER/MARKING INFORMATION

Order Information	Top Marking
AX8113 XX X Package Type: BT:TSOT-23-5L Packing: Blank : Bag, A : Taping	HGY W X ID code: internal WW: 01~26 (A~Z), 27~52 (a~z) Year: A= 2010, 1= 2011 AX8113

❖ ABSOLUTE MAXIMUM RATINGS (at T_A=25°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	°C
Junction Temperature	T _J	+125	°C
Operating Temperature Range	T _{OP}	-40 to +85	°C
Thermal Resistance from Junction to case	θ _{JC}	180	°C/W
Thermal Resistance from Junction to ambient	θ _{JA}	250	°C/W
Power Dissipation[PD=(T _J -T _A) / θ _{JA}]	PD	400	mW

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

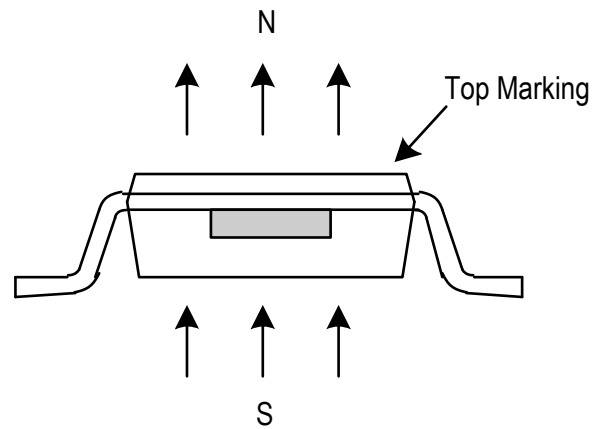
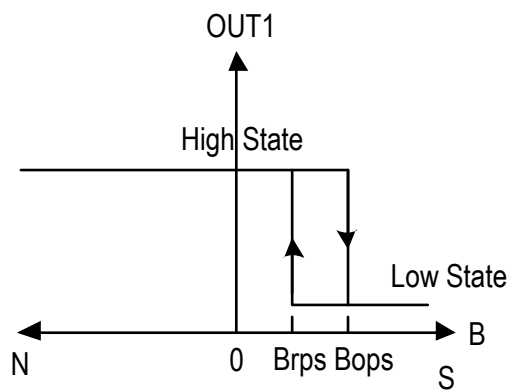
❖ ELECTRICAL CHARACTERISTICS ($V_{DD} = 1.8V$, $T_A = 25^\circ C$, unless otherwise specified)

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	-	%

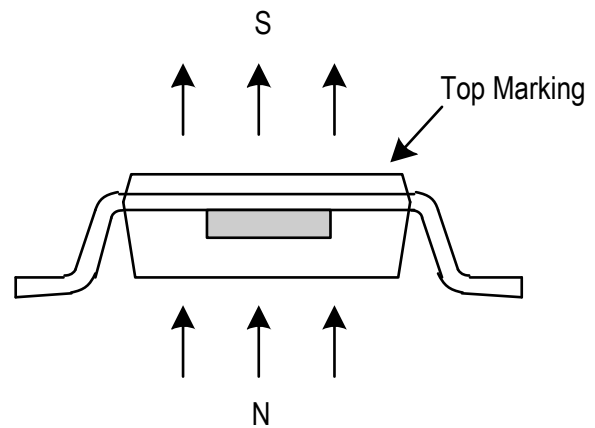
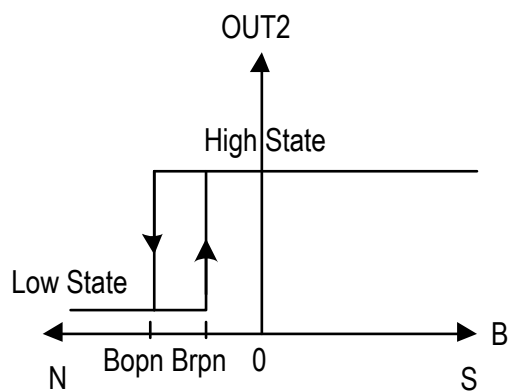
❖ MAGNETIC CHARACTERISTICS ($V_{DD} = 1.8V$, $T_A = 25^\circ C$, unless otherwise specified)

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

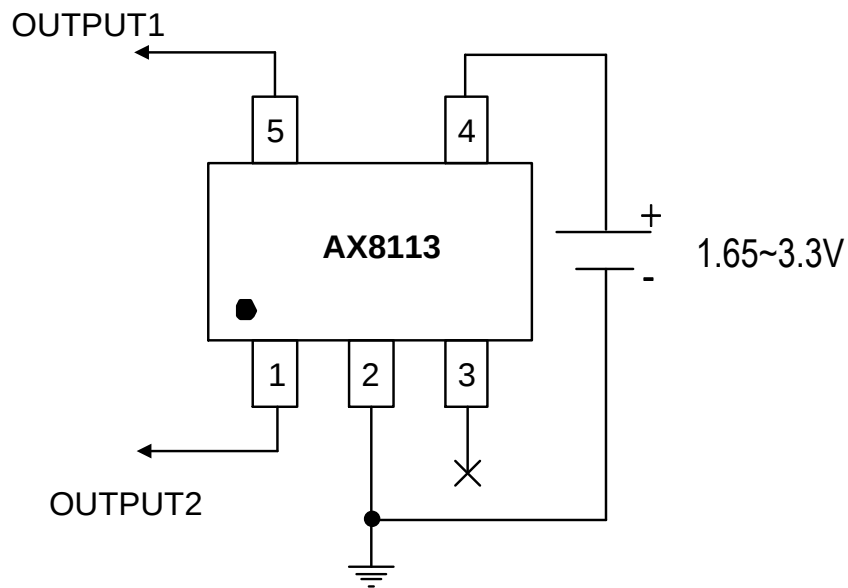
1. OUT1:



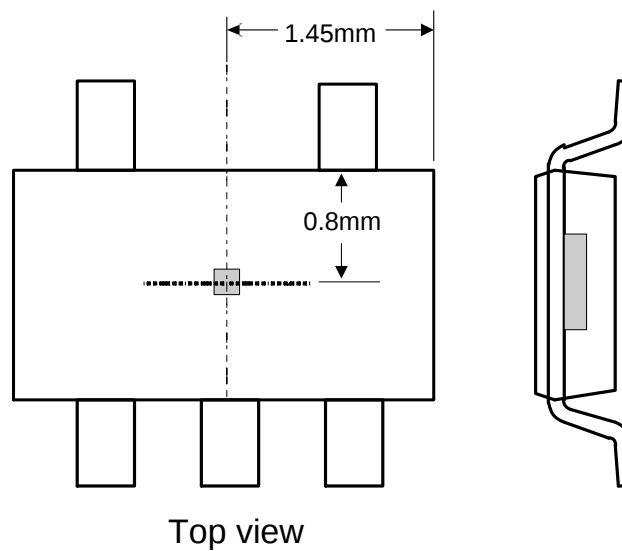
2. OUT2:



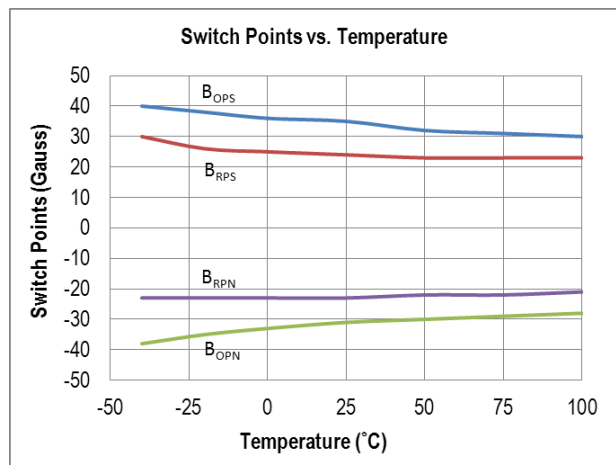
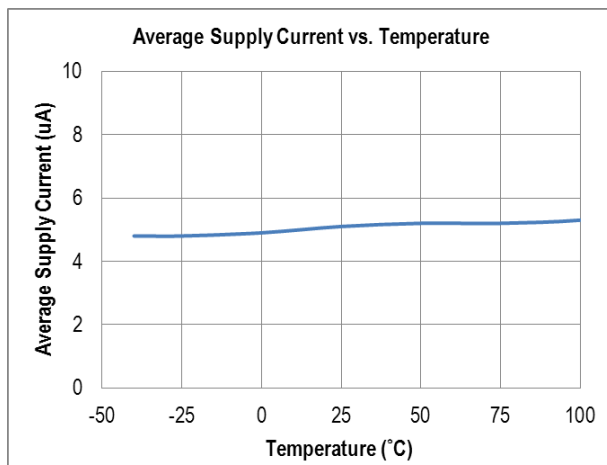
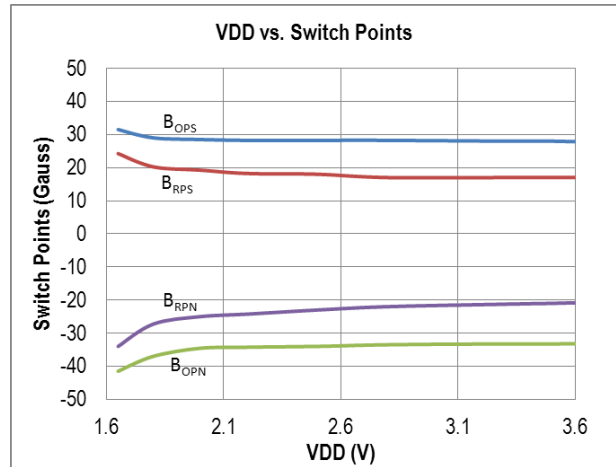
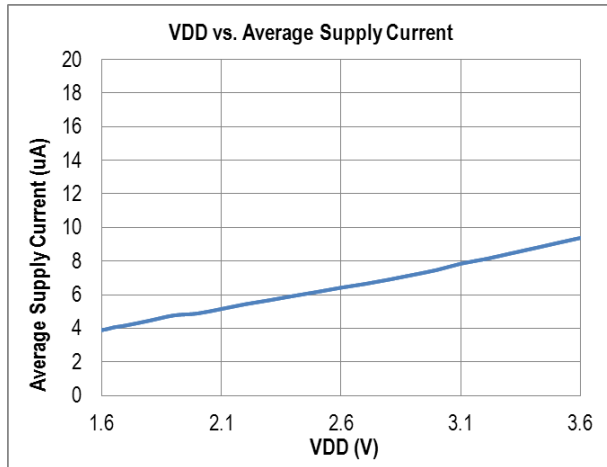
❖ APPLICATION CIRCUIT



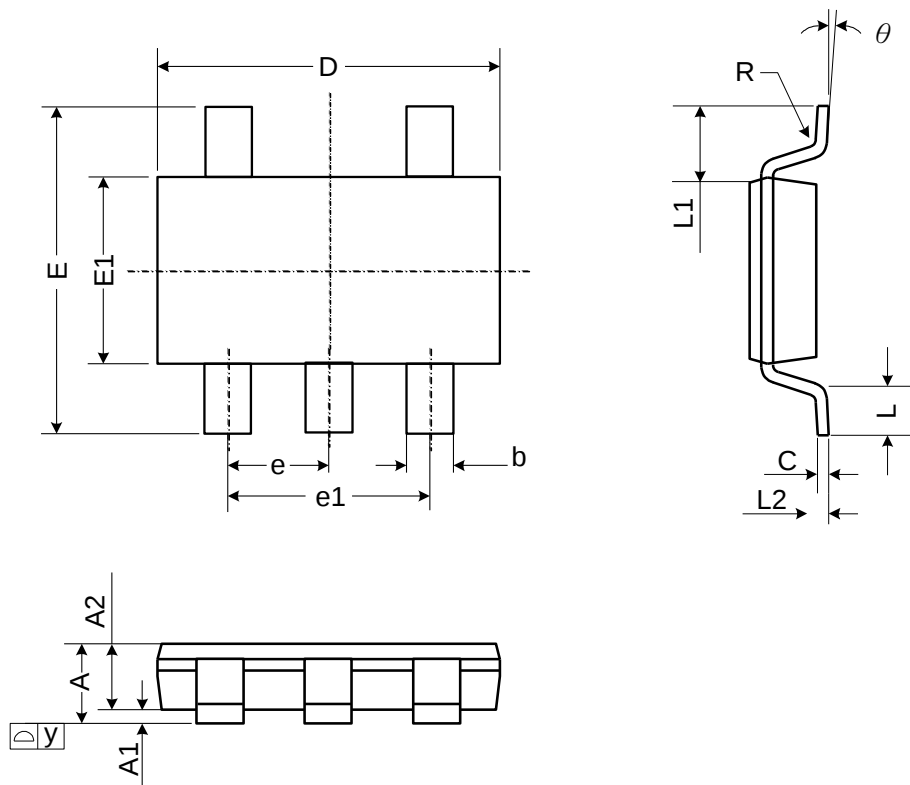
❖ SENSOR LOCATION



❖ 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