DESCRIPTION

The AH8113 is an integrated hall-effect sensor designed specifically to meet the requirements of low-power devices. e.g. as an On/Off switch in Cellular Flip-Phones, with battery operating voltages of 1.65V-5.5V.

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 Voltage is switched at the end of each operating phase. During the Stand-by phase the output stage is latched and the current consumption of the device reduced to some μA.

The IC switching behavior is Omnipolar; it can be switched on with either the North or South pole of a magnet.

The AH8113 is available in TSOT-23 and TO-92S packages.

ORDERING INFORMATION

Package Type	Part Number	
TSOT-23 SPQ: 4,000pcs/Reel	TE3	AH8113TE3R
		AH8113TE3VR
TO-92S SPQ: 1,000pcs/Bag	ZS	AH8113ZSB
		AH8113ZSVB
Note	V: Halogen free Package R: Tape & Reel B: Bulk Packing	
AiT provides all RoHS products		

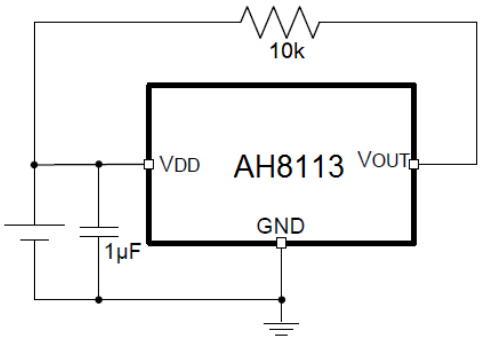
FEATURES

- Micro power design
- 1.65 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
- Switching for both poles of a magnet (omnipolar)
- Not suitable for automotive application
- Available in TSOT-23 and TO-92S packages

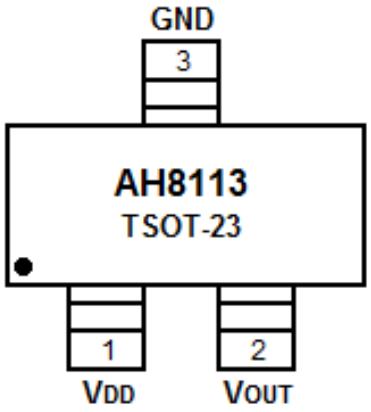
APPLICATION

- Cover switch in clam-shell cellular phones
- Cover switch in Notebook PC/PDA
- Contact-less switch in consumer products

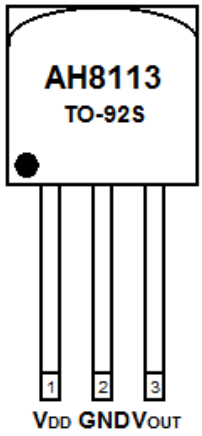
TYPICAL APPLICATION



PIN DESCRIPTION



Top View



Top View

Pin #		Symbol	Function
TSOT-23	TO-92S		
1	1	V_{DD}	Supply Voltage
2	3	V_{OUT}	Output Pin
3	2	GND	Ground

ABSOLUTE MAXIMUM RATINGS

V_{DD}, Supply Voltage	-0.3V ~ 6.0V
I_{DD}, Operating Current	-1mA ~ 4.5mA
V_{OUT}, Output Voltage	-0.3V ~ 6.0V
I_{OUT}, Output Current	-1mA~2.0mA
T_S, Storage Temperature Range	-40°C ~ +150°C
T_J, Maximum Junction Temperature	150°C
ESD Protection	4000V

Stress beyond above listed “Absolute Maximum Ratings” may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

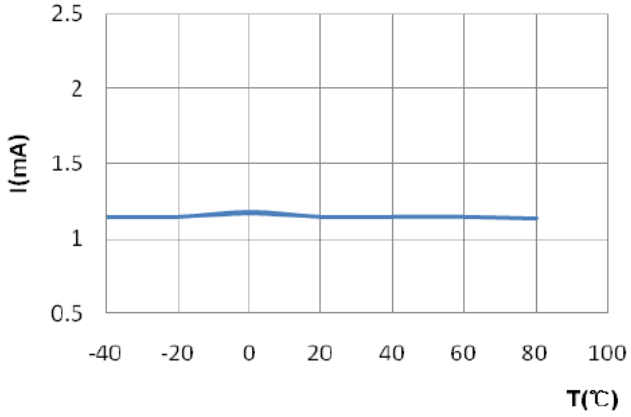
ELECTRICAL CHARACTERISTICS

T_A = +25℃, V_{DD} = 3.0V, unless otherwise specified

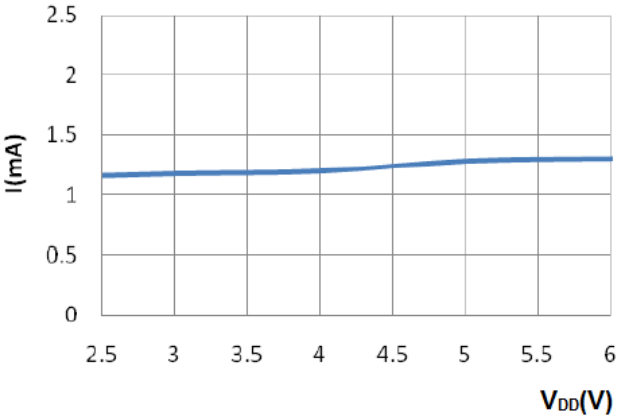
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
AC/DC Characteristics						
Supply Voltage	V_{DD}		1.65	-	6.0	V
Averaged Supply Current	I_{SAVG}		1	3	10	μA
Averaged Current During Operating Time	I_{SOPAVG}		0.5	2.0	3.5	mA
Peak Current During Operating Time	I_{SOPT}		-	-	4.5	mA
Supply Current During Standby Time	I_{SSTB}		1	1.9	8	μA
Output Saturation Voltage	V_{OUTSAT}	I_{OUT}= 1mA	-	0.13	0.4	V
Output on Leakage Current	$I_{OUTLEAK}$		-	0.01	1	μA
Output Rise Time	t_r	R_L=2.7kΩ, C_L=10pF	-	0.5	1	μs
Output Fall Time	t_f	R_L=2.7kΩ, C_L=10pF	-	0.1	1	μs
Operating Time	t_{OP}		25	100	160	μs
Standby Time	t_{STB}		60	140	240	ms
Duty Cycle	t_{OP}/t_{STB}		-	0.071	-	%
Start-up Time of IC	t_{STU}		-	12	20	μs

TYPICAL PERFORMANCE CHARACTERISTICS

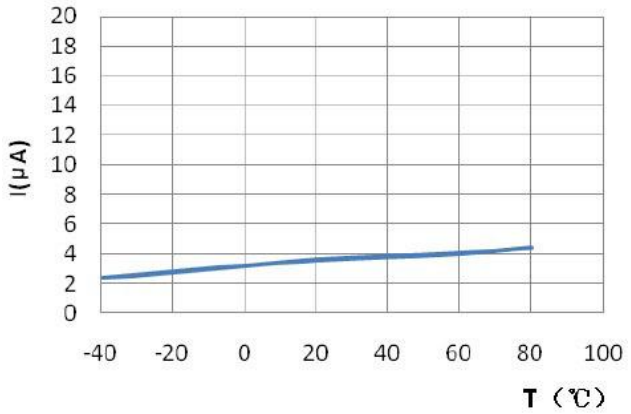
1. V_{DD} = 2.7V, I_{SOPAVG} - T_A



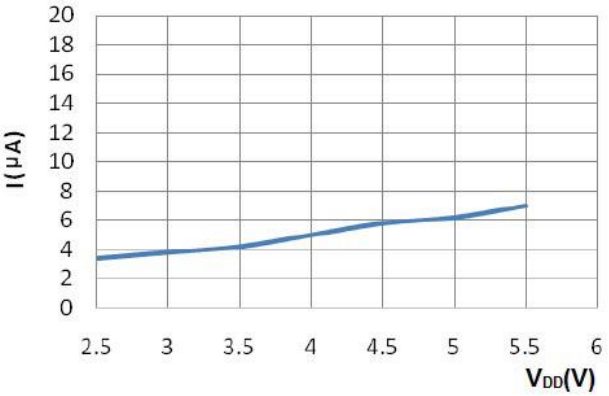
2. T_A = 20℃, I_{SOPAVG} - V_{DD}



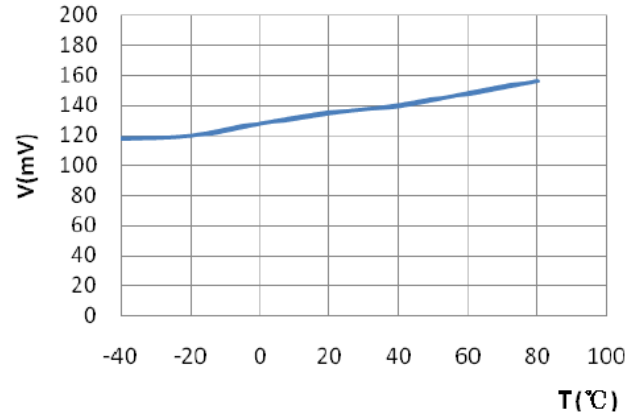
3. V_{DD} = 2.7V, I_{STB} - T_A



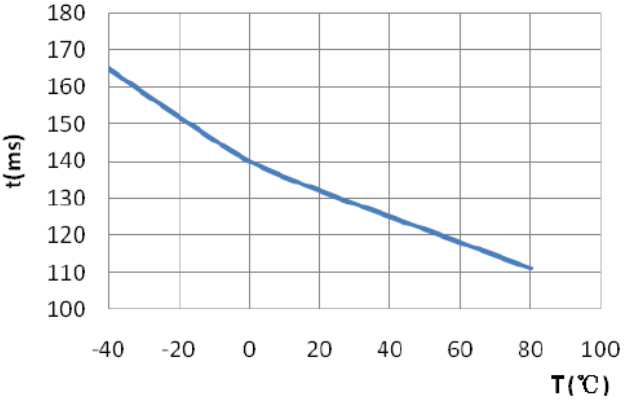
4. T_A = 20℃, I_{STB} - V_{DD}



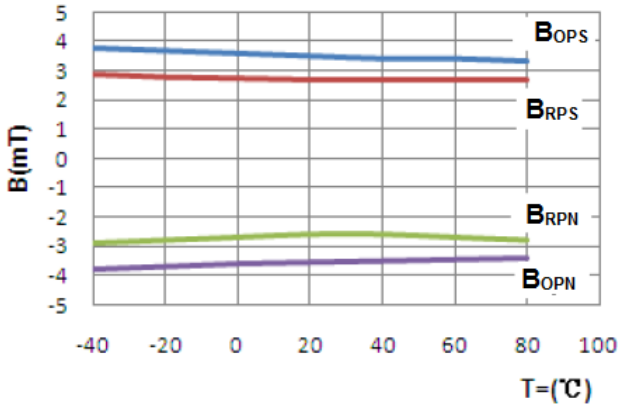
5. I_{OUT} = 1mA, V_{OUTSAT} - T_A



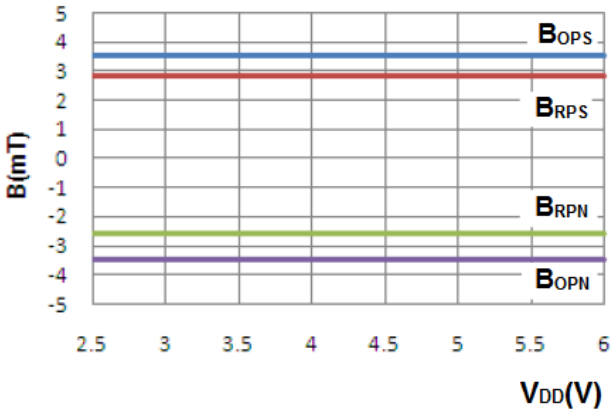
6. V_{DD} = 2.7V, t_{STB} - T_A



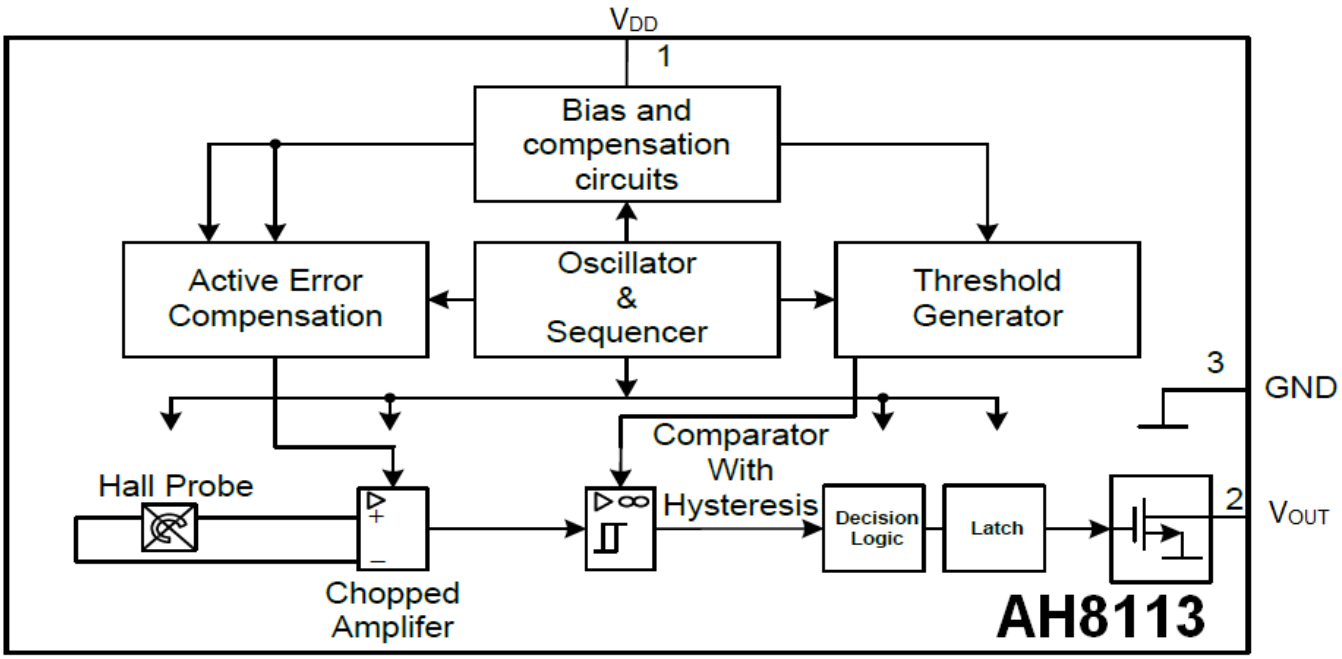
7. V_{DD} = 2.7V, B - T_A



8. T_A = 20℃, B – V_{DD}



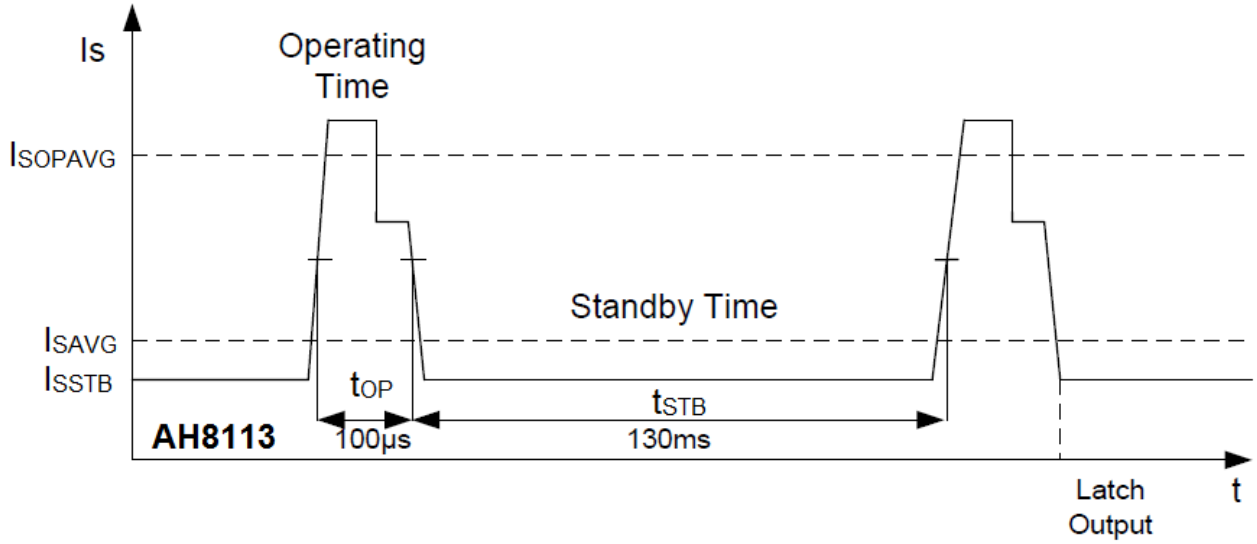
BLOCK DIAGRAM

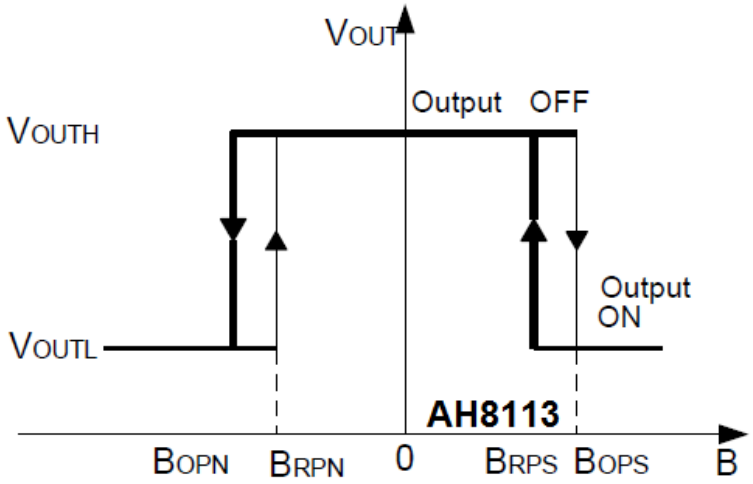


MANGENTIC CHARACTERISTICS

T_A = +25℃, V_{DD} = 2.7V, unless otherwise specified

Symbol	Min	Typ	Max	Unit
B_{OPS}	2	3.5	5	mT
B_{OPN}	-5	-3.5	-2	mT
B_{RPS}	1.2	2.7	4.2	mT
B_{RPN}	-4.2	-2.6	-1.2	mT
B_{HYS}	0.2	0.8	1.6	mT

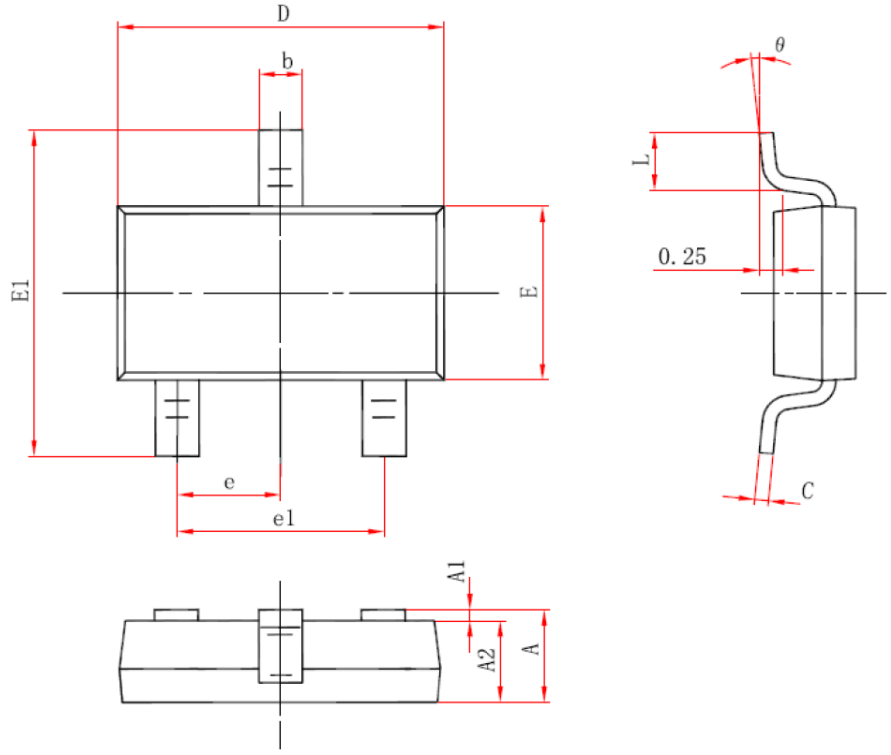




V_{OUT} as function of the applied B-Field

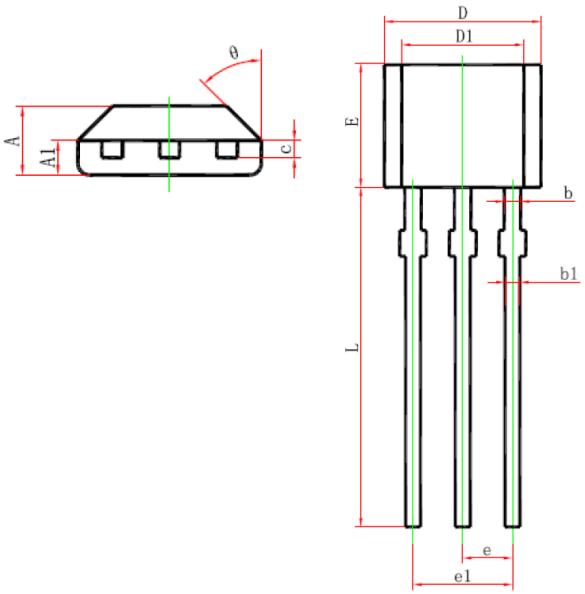
PACKAGE INFORMATION

Dimension in TSOT-23 (Unit: mm)



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b	0.350	0.500	0.014	0.020
c	0.080	0.200	0.003	0.008
D	2.820	3.020	0.111	0.119
E	1.600	1.700	0.063	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Dimension in TO-92S (Unit: mm)



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	1.420	1.620	0.056	0.064
A1	0.660	0.860	0.026	0.034
b	0.420	0.550	0.017	0.022
b1	0.360	0.480	0.014	0.019
c	0.360	0.510	0.014	0.020
D	3.900	4.100	0.154	0.161
D1	2.970	3.270	0.117	0.129
E	3.050	3.250	0.120	0.128
e	1.270TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	15.100	15.500	0.594	0.610
θ	45° TYP		45° TYP	

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