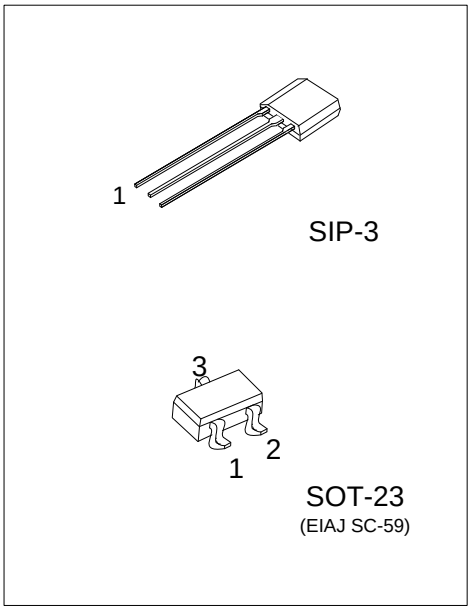
CMOS, OMNI-POLAR, LOW POWER HALL SENSOR



■ DESCRIPTION

UH8106 is a low-power integrated Hall switch designed to sense the applied magnetic flux density and give a digital output, which indicates the present condition of the magnitude sensed.

It mainly designed for battery-powered system and hand-held equipment, such as cellular flip-phones and PDA's, in which power consumption is one major concern.

There are three output types (Internal 100K pull-up resistor, NMOS open-drain and CMOS push-pull) and two ranks of magnetic characters for user to choose.

■ FEATURES

*Omni-polar magnetic type
*2.2V to 5.5V battery operation
*Offset Canceling Technology
*Independent of North or South Pole Magnet,
*Superior temperature stability
*Extremely Low Switch-Point Drift

■ APPLICATIONS

*Micro Switch
*Handheld Wireless Application Wake Up Switch
*Clamp Shell Type Application Switch
*Magnet Switch in Low Duty Cycle Applications

■ ORDERING INFORMATION

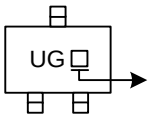
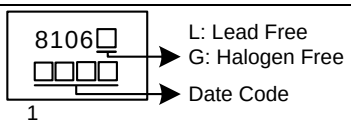
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UH8106XL-AE3-R	UH8106XG-AE3-R	SOT-23	I	O	G	Tape Reel
UH8106XL-G03-B	UH8106XG-G03-B	SIP-3	I	G	O	Tape Box
UH8106XL-G03-K	UH8106XG-G03-K	SIP-3	I	G	O	Bulk

Note: Pin Assignment: I: V_{CC} O: V_{OUT} G: GND

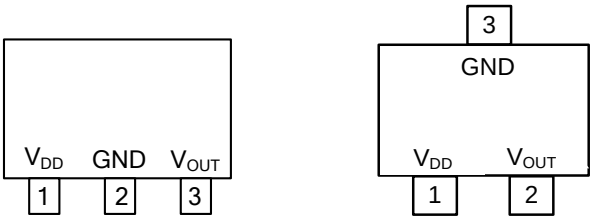
UH8106XG-AE3-R

(1) Packing Type	(1) R: Tape Reel, B: Tape Box, K: Bulk
(2) Package Type	(2) AE3:SOT-23, G03: SIP-3
(3) Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free
(4) Output Type	(4) I: Internal, N: NMOS, C: CMOS

■ MARKING

SOT-23	SIP-3
	

■ PIN CONFIGURATION



SIP-3 SOT-23

■ PIN DESCRIPTION

PIN NAME	TYPE	DESCRIPTION
V_{DD}	P/I	Power Supply Input
V_{OUT}	O	Output
GND	P	Ground

Note: P: power supply, I: input, O: output

■ PRODUCT LIST

Internal pull-up resistor output

PRODUCT NAME	OUTPUT	V_{OUT} (When |B|>|B_{OP}|)	|B_{OP}|
UH8106I-1	Internal pull-up resistor	LOW	1.3~2.3 mT
UH8106I-2	Internal pull-up resistor	LOW	1.0~4.0 mT

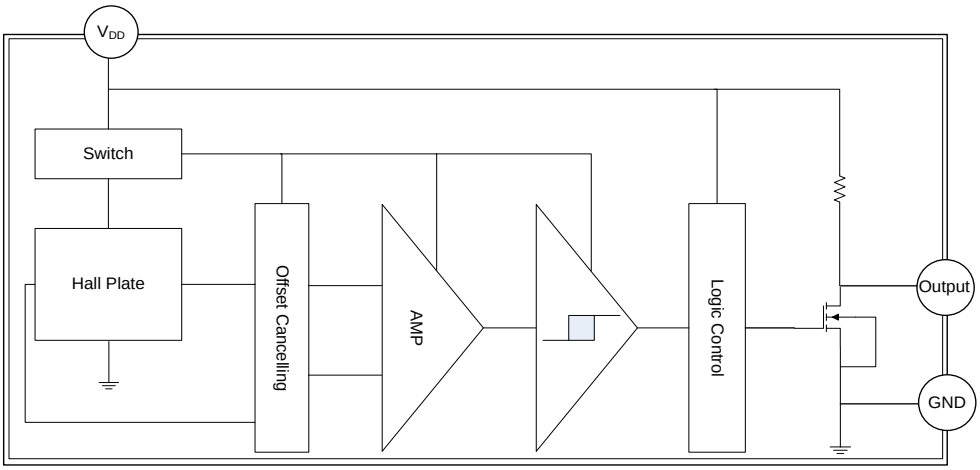
NMOS open-drain output

PRODUCT NAME	OUTPUT	V_{OUT} (When |B|>|B_{OP}|)	|B_{OP}|
UH8106N-1	NMOS open-drain	LOW	1.3~2.3 mT
UH8106N-2	NMOS open-drain	LOW	1.0~4.0 mT

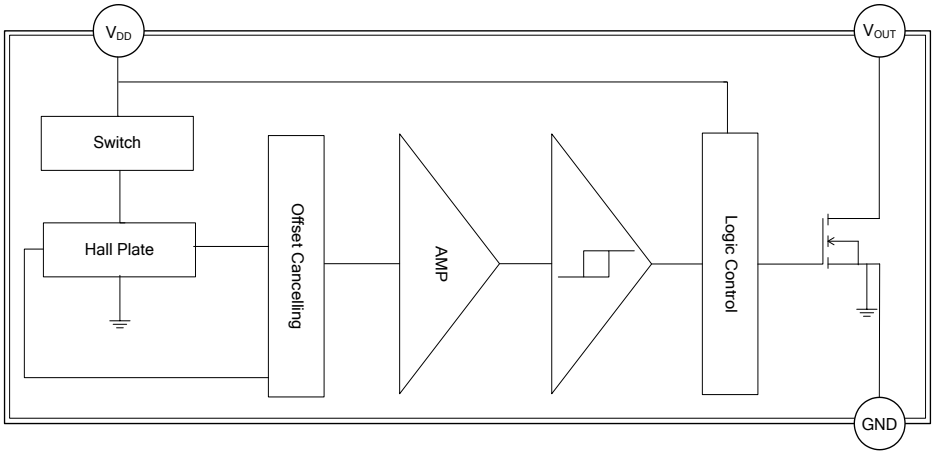
CMOS push-pull output

PRODUCT NAME	OUTPUT	V_{OUT} (When |B|>|B_{OP}|)	|B_{OP}|
UH8106C-1	CMOS push-pull	LOW	1.3~2.3 mT
UH8106C-2	CMOS push-pull	LOW	1.0~4.0 mT

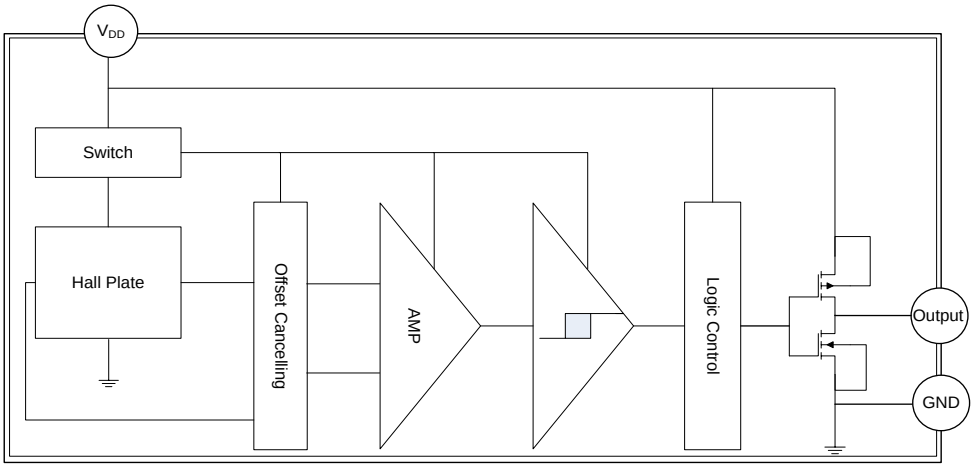
■ BLOCK DIAGRAM



Internal pull-up resistor output



NMOS open-drain output



CMOS push-pull output

■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Magnetic Flux Density		B	Unlimited	mT
Supply Voltage		V_{DD}	7	V
Output Current		I_O	1	mA
Power Dissipation	SIP-3	P_D	400	mW
	SOT-23		200	mW
Maximum Junction Temp		T_J	150	°C
Operation Temperature		T_{OPR}	-40 ~ +85	°C
Storage Temperature		T_{STG}	-65 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ RECOMMENDED OPERATING CONDITIONS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	Conditions	MIN	TYP	MAX	UNIT
Supply Voltage	V_{DD}	Operating	2.2		5.5	V
Ambient Temperature	T_A		-40		85	°C

■ ELECTRICAL CHARACTERISTICS

V_{DD}=2.2V to 5.5V, T_A=25°C, unless otherwise specified

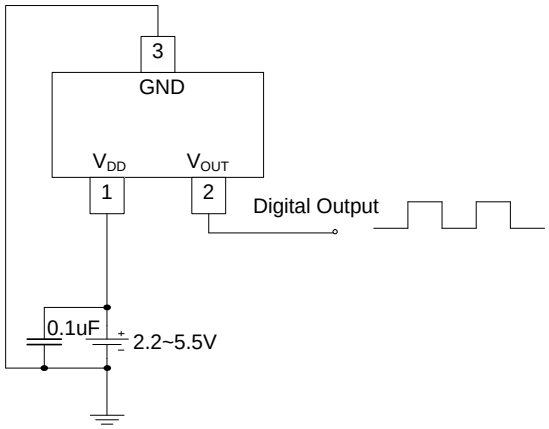
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage Range	V_{DD}	Operating	2.2		5.5	V
Supply Current	I_{DD}	Average (|B|<|Brp|, V_{DD}=3.6V)		4	6	uA
		Awake (|B|<|Brp|, V_{DD}=3.6V)		2	3	mA
		Sleep (|B|<|Brp|, V_{DD}=3.6V)		2	3	uA
Output Leakage Current	I_{OFF}	V_{OUT} = 5V, only for UH8106N			0.1	uA
Output Low Voltage	V_{OL}	I_{SINK} = 1mA, |B|>|Bop|		0.02	0.4	V
Output High Voltage	V_{OH}	I_{SOURCE} = 1mA, |B|<|Brp|, only for UH8106C	V_{DD}-0.4			V
Wake up Time	t_{AWAKE}			50		uS
Period	t_{PERIOD}			35		mS
Duty cycle	d.c.			0.17		%

■ MAGNETIC CHARACTERISTICS

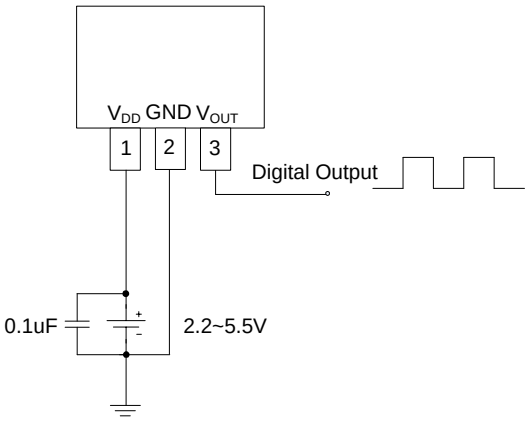
(V_{DD}=2.2V to 5.5V , 1mT=10Gauss, T_A=25°C, unless otherwise specified)

RANK	PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
1	Operation Points	$\|B_{OP}\|$	$\|B\| > \|B_{OP}\|$	13	18	23	Gauss
	Release Points	$\|B_{RP}\|$	$\|B\| < \|B_{RP}\|$	5	10	15	Gauss
	Hysteresis	$\|B_{HYS}\|$	$\|B_{OPX}–B_{RPX}\|$		8		Gauss
2	Operation Points	$\|B_{OP}\|$	$\|B\| > \|B_{OP}\|$	10	18	40	Gauss
	Release Points	$\|B_{RP}\|$	$\|B\| < \|B_{RP}\|$	5	10	35	Gauss
	Hysteresis	$\|B_{HYS}\|$	$\|B_{OPX}–B_{RPX}\|$		8		Gauss

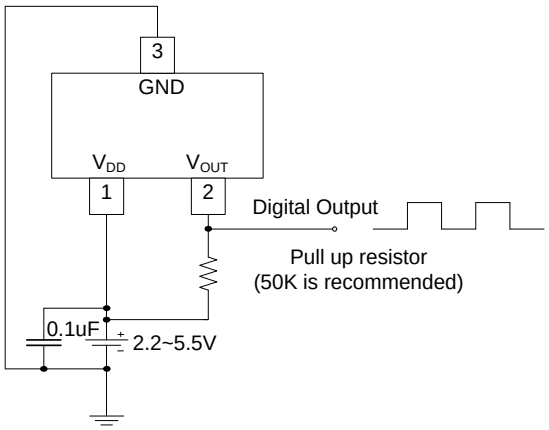
■ TYPICAL CIRCUIT



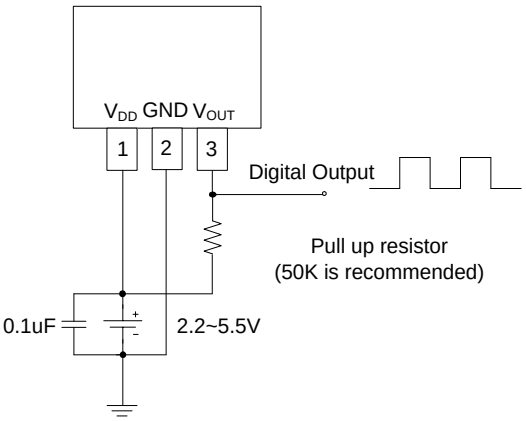
SOT-23 (Internal pull-up resistor output)



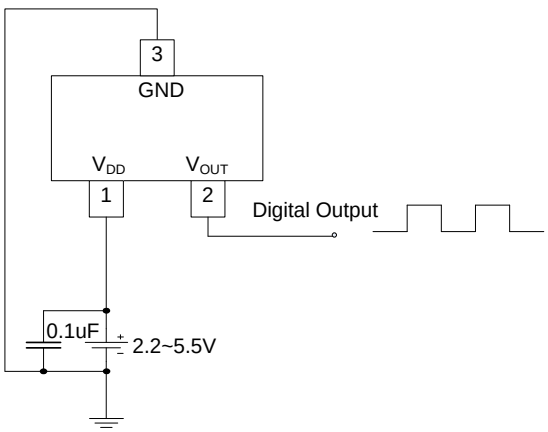
SIP-3 (Internal pull-up resistor output)



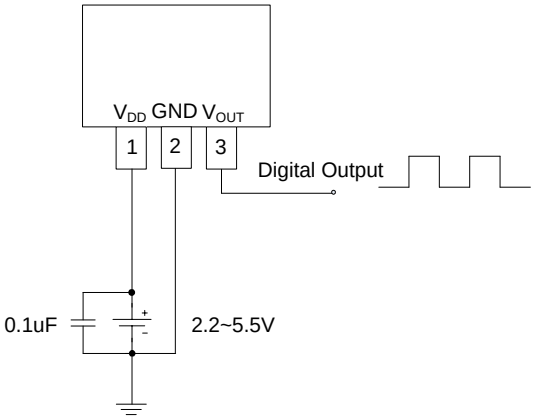
SOT-23 (NMOS open-drain output)



SIP-3 (NMOS open-drain output)

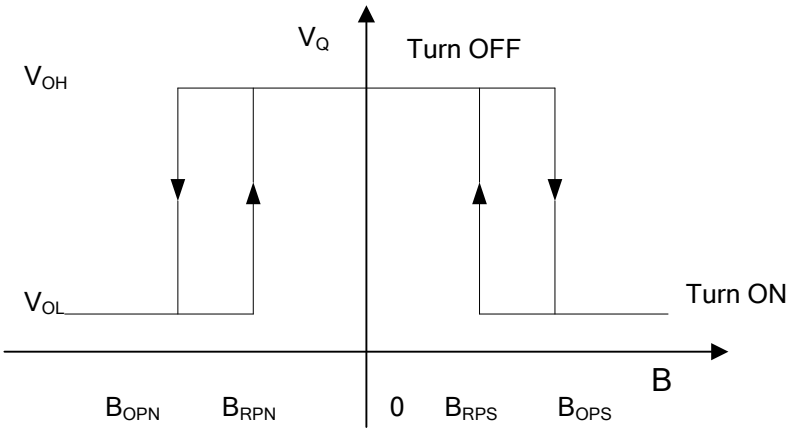


SOT-23 (CMOS push-pull output)



SIP-3 (CMOS push-pull output)

■ MAGNETIC FLUX



SOT-23 / SIP-3