ARH248R Hall-effect sensor is a temperature stable, stress-resistant, micro-power switch. Superior high-temperature performance is made possible through a dynamic offset cancellation that utilizes chopper-stabilization. This method reduces the offset voltage normally caused by device over molding, temperature dependencies, and thermal stress.

ARH248R includes the following on a single silicon chip: voltage regulator, Hall voltage generator, small-signal amplifier, chopper stabilization, Schmitt trigger, open-drain output. Advanced CMOS wafer fabrication processing is used to take advantage of low-voltage requirements, component matching, very low input-offset errors, and small component geometries.

This device requires the presence of omni-polar magnetic fields for operation.

ARH248Ris rated for operation between the ambient temperatures –40℃ and + 85℃ for the E temperature range. Package types ST is an SOT-23(0.8 mm nominal height)

The package type is in a lead Halogen Free version has been verified by third party Lab.

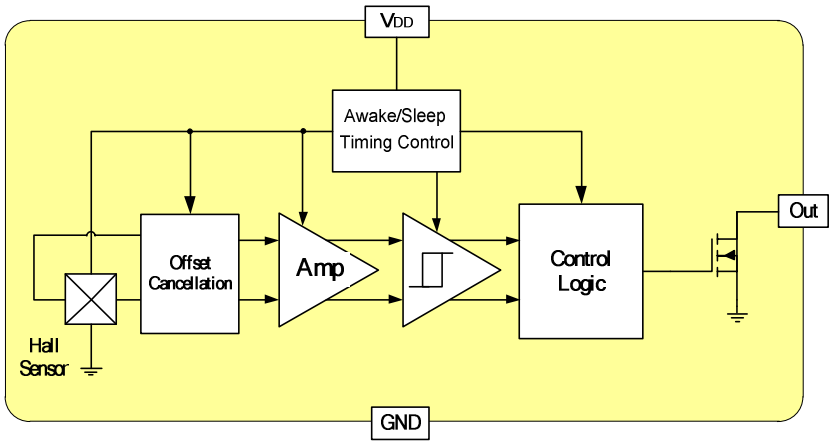
Features and Benefits

- CMOS Hall IC Technology.
- Solid-State Reliability.
- Micro power consumption for battery-powered applications.
- Omni polar, output switches with absolute value of North or South pole from magnet.
- Operation down to 2.5 V and Max at 5.0V.
- Ultra High Sensitivity for direct reed switch replacement applications.
- Narrower operating range(Bop distribution).
- Custom sensitivity selection is availablein optional package.
- Pb Free/Green chip is qualified by third party lab.

Applications

- Solid state switch
- Handheld Wireless Handset Awake Switch (Flip Cell/PHS Phone/Note Book/Flip Video Set)
- Lid close sensor for battery powered devices
- Magnet proximity sensor for reed switch replacement in low duty cycle applications

Functional Diagram



***Note**: Static sensitive device; please observe ESD precautions. Reverse V_{DD} protection is not included. For reverse voltage protection, a 100Ω resistor in series with V_{DD} is recommended.*

Absolute Maximum Ratings *At(Ta=25℃)*

Characteristics		Values	Unit
Supply voltage,(V_{DD})		6	V
Output Voltage,(V_{out})		6	V
Reverse voltage, (V_{DD}) (V_{OUT})		-0.3	V
Magnetic flux density		Unlimited	Gauss
Output current(I_{OUT})		2	mA
Operating temperature range, (Ta)		-40 to +85	℃
Storage temperature range, (Ts)		-55 to +150	℃
Maximum Junction Temp,(Tj)		150	℃
Thermal Resistance	(θ_{JA}) ST	310℃/W	℃ /W
	(θ_{JC}) ST	223℃/W	℃ /W
Package Power Dissipation, (P_D) ST		400	mW

***Note:** Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.*

Electrical Specifications

DC Operating Parameters T_A=+25℃, V_{DD}=3.0V

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage,(V_{DD})	Operating	2.5		5.0	V
Supply Current,(I_{DD})	Awake State		2.5	4.0	mA
	Sleep State		8.0	12	μA
	Average		10	16	μA
Output Leakage Current,(I_{off})	Output off			1	uA
Output Low Voltage,(V_{sat})	I_{OUT}=1mA			0.3	V
Awake mode time,(T_{aw})	Operating		70		uS
Sleep mode time,(T_{SL})	Operating		70		mS
Duty Cycle,(D,C)			0.1		%

Magnetic Specifications

DC Operating Parameters TA=+25 ℃, VDD=3.0V

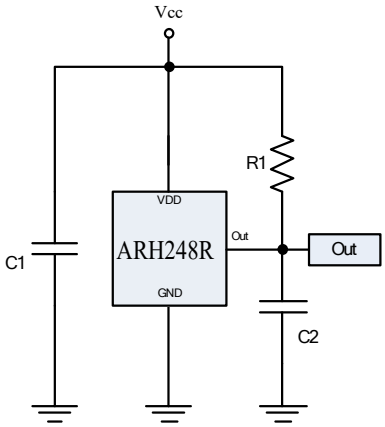
Parameter	*Symbol*	*Test Conditions*	*Min.*	*Typ.*	*Max.*	*Units*
Operating Point	B_{OPS}	N pole to branded side, B > BOP, Vout off	30		60	Gauss
	B_{OPN}	S pole to branded side, B > BOP, Vout off	-60		-30	Gauss
Release Point	B_{RPS}	N pole to branded side, B < BRP, Vout ON	20		50	Gauss
	B_{RPN}	S pole to branded side, B < BRP, Vout ON	-50		-20	Gauss
Hysteresis	B_{HYS}	|BOPx - BRPx|		7		Gauss

Output Behavior versus Magnetic Polar

DC Operating Parameters Ta = -40 to 85 ℃, V_{DD}=2.5Vto 5.0V

Parameter	*Test condition*	*OUT(ST)*
South pole	B<Bop[(-60~(-30)]	High
Null or weak magnetic field	B=0 or B < BRP	Open(Pull-up Voltage)
North pole	B>Bop(30~60)	High

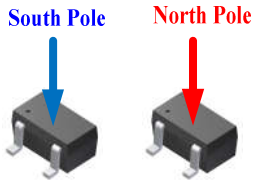
Typical Application circuit



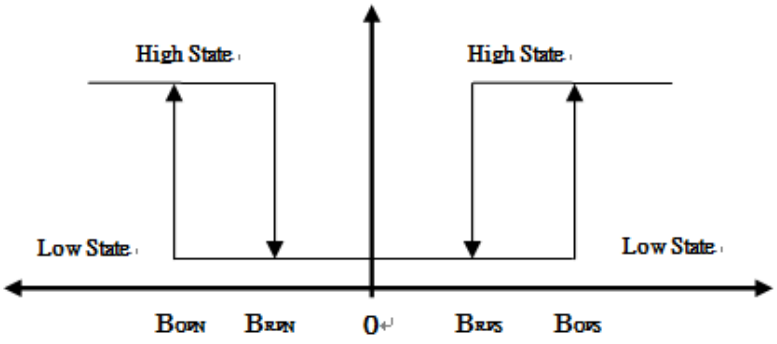
C1 ： 10nF

C2 ： 100pF

R1 ： 100KΩ

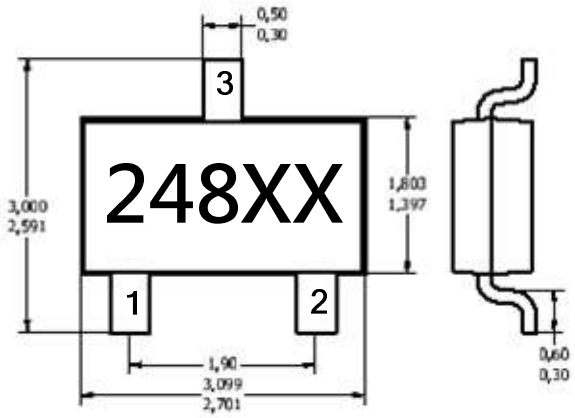


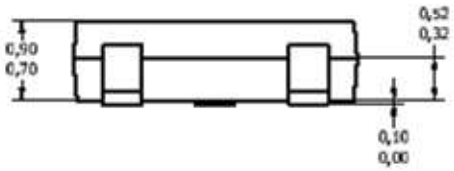
ST package



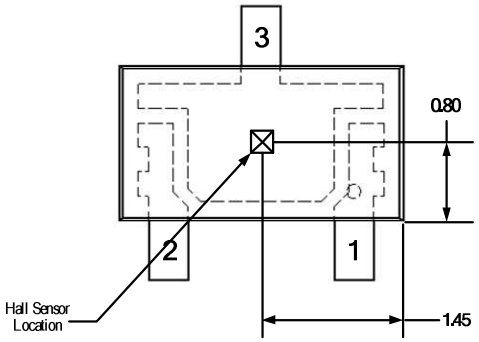
Sensor Location, Package Dimension and Marking

ST Package(TSOT-23)
(Top View)





Hall Plate Chip Location
(Bottom view)



NOTES:

1. PINOUT (See Top View at left:)
   Pin 1 VDD
   Pin 2 Output
   Pin 3 GND
2. Controlling dimension: mm;