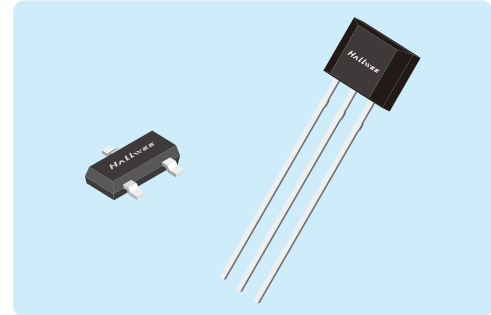


HAL257 Micro power Unipolar Hall Effect Switch

HAL257 Hall-effect sensor is a temperature stable, stress-resistant, Low Tolerance of Sensitivity 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.



HAL257 is special made for low operation voltage, 1.65V, to active the chip which includes the following on a single silicon chip: voltage regulator, Hall voltage generator, small-signal amplifier, chopper stabilization, Schmitt trigger, CMOS output driver. 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 unipolar magnetic fields for operation.

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

Features and Benefits

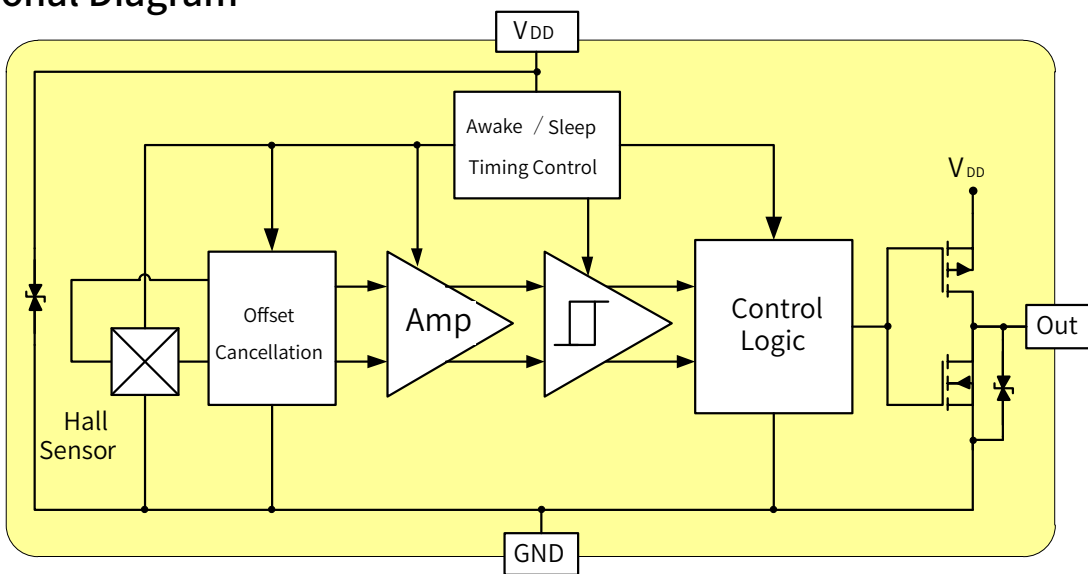
- ◆ CMOS Hall IC Technology
- ◆ 1.70 to 5.5V for battery-powered applications
- ◆ Omni polar, output switches with absolute value of South pole from magnet
- ◆ Operation down to 1.70V, Micro power consumption
- ◆ High Sensitivity for reed switch replacement applications
- ◆ Two Small Size option
- ◆ Low sensitivity drift in crossing of Temp range
- ◆ Low power consumption at 5uA (Avg)
- ◆ High ESD Protection, HBM > ±4KV(min)
- ◆ Totem-pole output
- ◆ RoHS compliant 2011/65/EU and Halogen Free

Applications

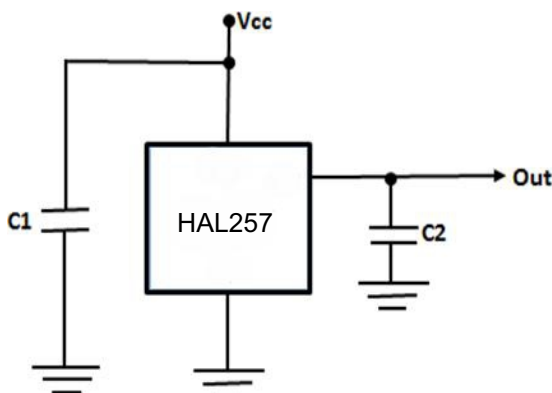
- ◆ Solid state switch
- ◆ Handheld Wireless Handset Awake Switch (Flip Cell/PHS Phone/Note Book/Flip Video Set)
- ◆ Magnet proximity sensor for reed switch replacement in low duty cycle applications
- ◆ Water Meter
- ◆ PDA
- ◆ PDVD
- ◆ NB
- ◆ Pad PC

Order information

Part Number	Package Dimension	MPQ
HAL257S ST	ST (TSOT-23-3L)	3000PCS
HAL257S UA	UA (TO-92S)	1000PCS

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. HAL257, HBM $> \pm 4KV$ which is verified by third party lab.

Typical application circuit


C1: 10nF

C2: 100pF

Absolute Maximum Ratings At(Ta=25°C)

Characteristics	Values	Unit	
Supply voltage,(<i>V_{dd}</i>)	6	V	
Output Voltage,(<i>V_{out}</i>)	6	V	
Reverse Voltage , (<i>V_{dd}</i>)(<i>V_{out}</i>)	-0.3	V	
Magnetic flux density	Unlimited	Gauss	
Output current,(<i>I_{out}</i>)	1	mA	
Operating temperature range, (<i>T_a</i>)	-40 to +85	°C	
Storage temperature range, (<i>T_s</i>)	-65 to +150	°C	
Maximum Junction Temp,(<i>T_j</i>)	150	°C	
Thermal Resistance	(θ_{JA}) ST/UA	310/540/206	°C/W
	(θ_{JC})ST/UA	223/390/148	°C/W
Package Power Dissipation, (<i>P_D</i>) ST/UA	400/230 /606	mW	

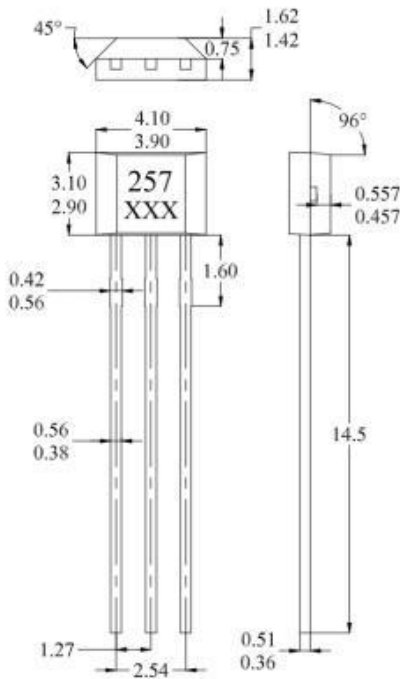
Note: Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum- rated conditions for extended periods may affect device reliability.

Electrical Specifications

DC Operating Parameters: *T_a*=25°C, *V_{DD}* =2.0V

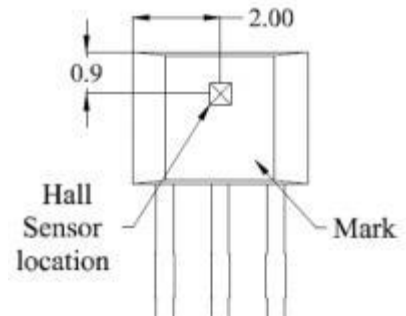
Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage,(<i>V_{DD}</i>)	Operating	1.7		5.5	Volts
Supply Current,(<i>I_{DD}</i>)	Awake State		1.5	3	mA
	Sleep State		3.5	7	μA
	Average		5	10	μA
Output Leakage Current,(<i>I_{off}</i>)	Output off			1	uA
Output High Voltage,(<i>V_{OH}</i>)	I _{OUT} =0.5mA(Source)	V _{DD} -0.2			V
Output Low Voltage,(<i>V_{OL}</i>)	I _{OUT} =0.5mA(Sink)			0.2	V
Awake mode time,(<i>T_{aw}</i>)	Operating		40	80	uS
Sleep mode time,(<i>T_{SL}</i>)	Operating		40	80	mS
Duty Cycle,(<i>D, C</i>)			0.1		%
Electro-Static Discharge	HBM	4			KV
Operating Point	BOP S pole to branded side, B > BOP, Vout On		30	50	Gauss
Release Point	BRP S pole to branded side, B < BRP, Vout Off	10	20		Gauss
Hysteresis	BHY BOPx - BRPx		10		Gauss

Sensor Location, package dimension and marking UA Package(TO-92S)


NOTES:

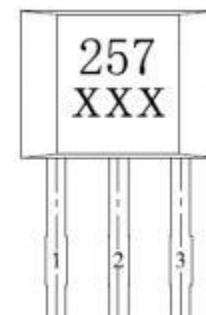
- Controlling dimension: mm
- Leads must be free of flash and plating voids
- Do not bend leads within 1 mm of lead to package interface.
- PINOUT:
Pin 1 VDD
Pin 2 GND
Pin 3 Output
- XXX; 1st X=Year; 2nd and 3rd XX=Week

Hall Chip location

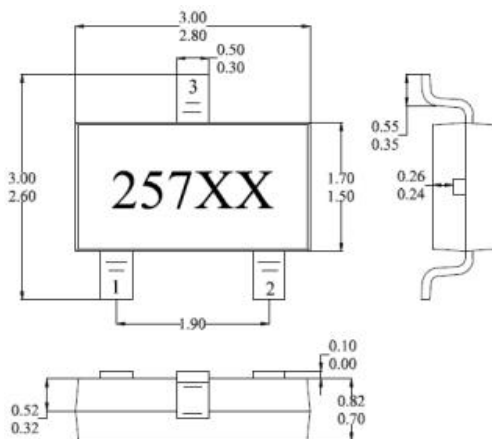


Output Pin Assignment

(Top view)

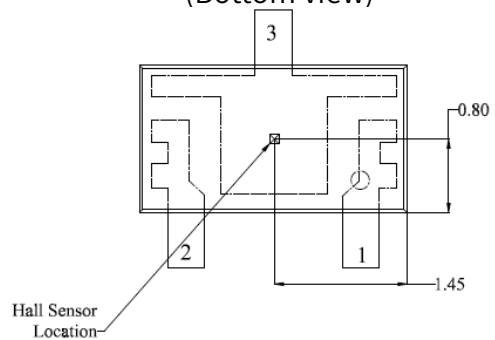


ST Package (TSOT-23) (Top View)



- PINOUT (See Top View at left :)
Pin 1 VDD ; Pin 2 Output; Pin 3 GND
- Controlling dimension: mm
- Lead thickness after solder plating will be 0.254mm maximum
- XX: Date Code, Refer to DC table

Hall Plate Chip Location (Bottom view)



(For reference only) Land Pattern

