Features

- CMOS Hall IC Technology
- Unipolar Output
- Solid-State Reliability much better than reed switch
- Operation down to 2.5V
- CMOS inverter output (no pull-up resistance)
- High sensitivity for direct reed switch replacement applications

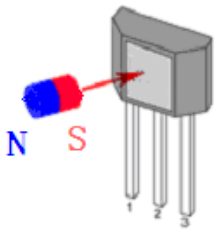
Description

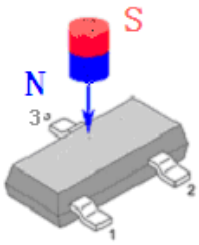
The DH249 Hall effect sensor IC is fabricated from mixed signal CMOS technology. It incorporates advanced chopper-stabilization techniques to provide accurate and stable magnetic switch points.

The circuit design provides an internally controlled clocking mechanism to cycle power to the Hall element and analog signal processing circuits. This serves to place the high current-consuming portions of the circuit into a “Sleep” mode. Periodically the device is “Awakened” by this internal logic and the magnetic flux from the Hall element is evaluated against the predefined thresholds. If the flux density is above or below the Bop/Brp thresholds then the output transistor is driven to change states accordingly. While in the “Sleep” cycle the output transistor is latched in its previous state. The design has been optimized for service in applications requiring extended operating lifetime in battery powered systems.

The output transistor of the DH249 switches low (turns on) when the south pole magnetic field perpendicular to the Hall sensor exceeds the operate point threshold (BOP). After turn-on, the output voltage is VDS. When the magnetic field is reduced below the release point, BRP, the Output transistor turns off (goes high). The difference in the magnetic operate and release points is the hysteresis (BHYS) of the device. This built-in hysteresis prevents output oscillation near the switching point, and allows clean switching of the output even in the presence of external mechanical vibration and electrical noise.

The TSOT-23 device is reversed from the UA package.

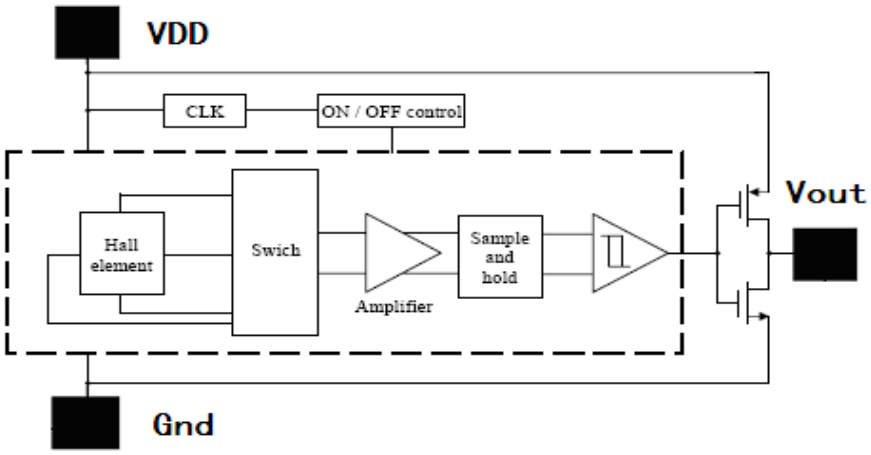




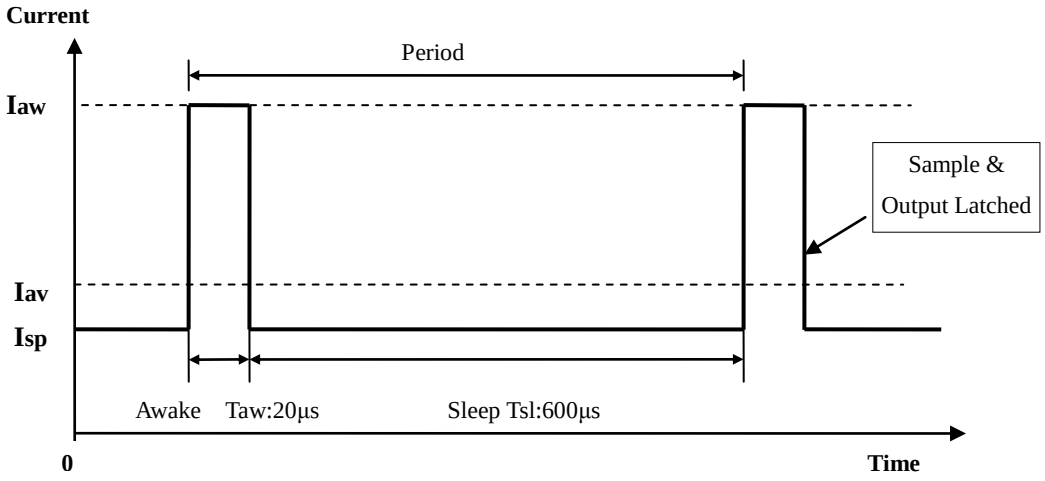
Applications

- Solid state switch
- Magneto-electric conversion switch
- Magnet proximity sensor for reed switch replacement in low duty cycle applications

Functional Block Diagram



Internal Timing Circuit



Absolute Maximum Ratings

Parameter	Symbol	Value	Units
Supply Voltage(operating)	V_{DD}	5.5	V
Supply Current	I_{DD}	70	μA
Output Voltage	V_{OUT}	5.5	V
Output Curent	I_{OUT}	5	mA
Operating Temperature Range	T_A	-40 to 85	°C
Storage Temperature Rang	T_S	-50 to 150	°C
ESD Sensitivity	-	4000	V

DC Electrical Characteristics

DC Operating Parameters: T_A = 25℃, V_{DD}=3V.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Operating voltage	V_{DD}	Operating	2.5	3	5.5	V
Supply current	I_{DD}	Average		45		μA
Output Current	I_{OUT}			1.0		mA
Saturation Voltage	V_{SAT}	I_{OUT}=1mA			0.4	V
Awake mode time	T_{AW}	Operating		20		μS
Sleep mode time	T_{SL}	Operating			600	μS

Magnetic Specifications

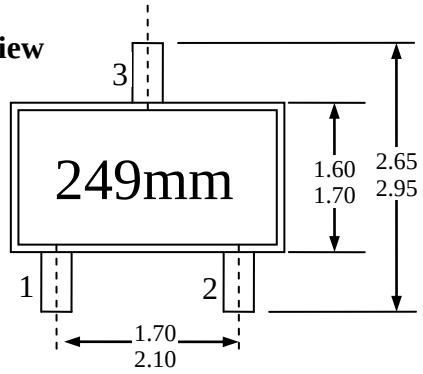
Operating Parameters: T_A = 25℃, V_{DD}=3V_{DC}.

PARAMETER	Symbol	Min	Type	Max	Units
Operating Point	Bop		150	200	Gs
Release Point	Brp	50	90		Gs
Hysteresis	Bhys	-	60	-	Gs

Package Information

TSOT-23 Package Physical Characteristics

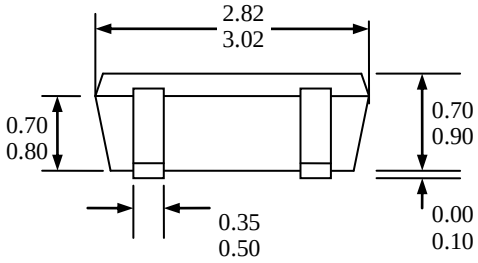
Top View



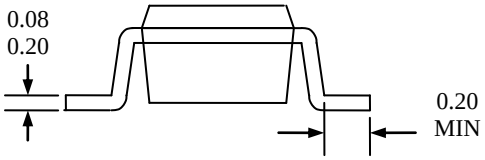
Notes:
1). PINOUT: Pin 1 VDD
Pin 2 Output
Pin 3 GND
2). All dimensions are in millimeters ;

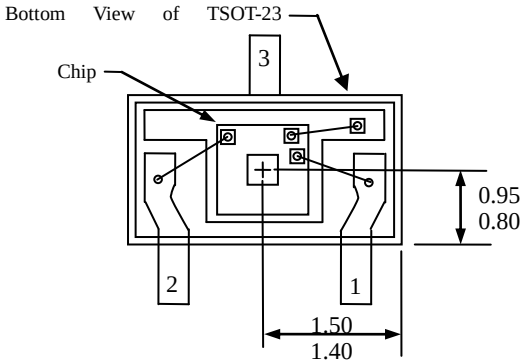
Marking:
249-- Code of Device (DH249) ;
y -- last 1 digit of year ;
mm -- Production Lot ;

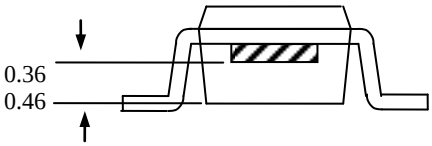
Side View



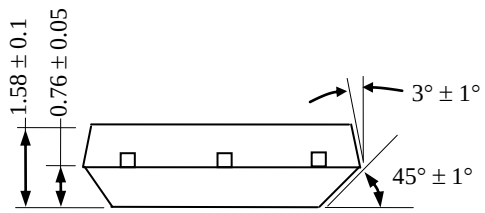
End View

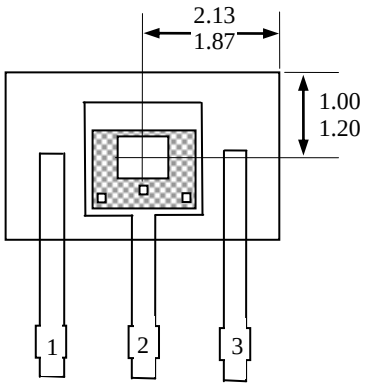




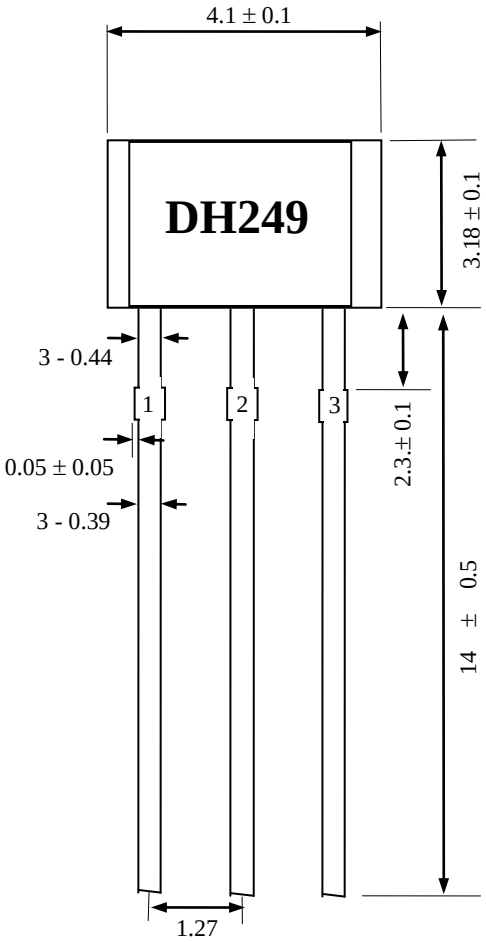


TO-92 Package Physical Characteristics

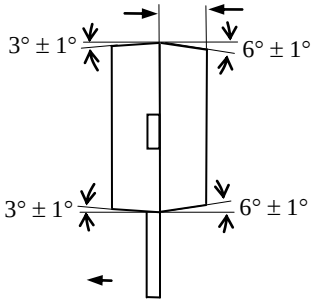




Sensor Location



Active Area Depth: 0.84(Nom)



Notes:

1). Controlling dimension : mm ;

2). Lesds must be free of flash and plating voids ;

3). Do not bend leads within 1 mm of lead to package interface ;

4). PINOUT: Pin 1 VDD
Pin 2 GND
Pin 3 Output