

## 1. Description

The DH246 latching 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. This device requires the presence of both south and north polarity magnetic fields for operation. In the presence of a south polarity field of sufficient strength, the device output latches on, and only switches off when a north polarity field of sufficient strength is present.



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.

## 2. Features

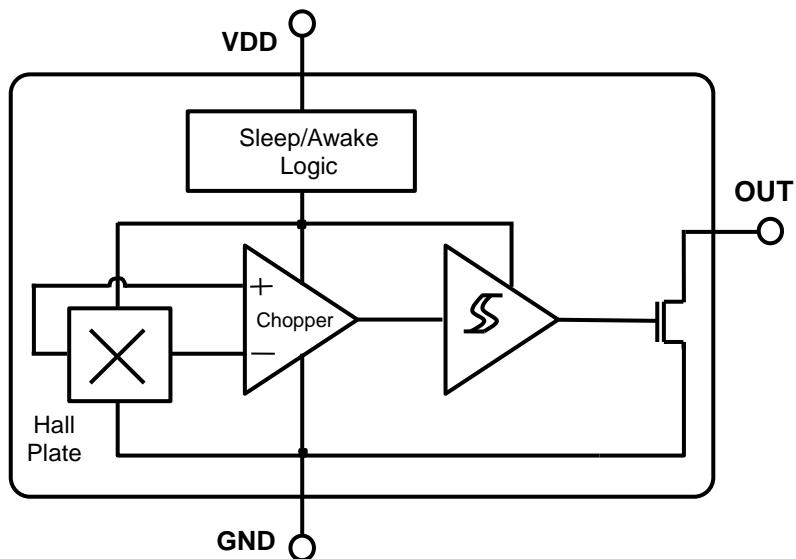
- ◆ Micropower consumption for battery powered applications
- ◆ Latching output
- ◆ Operation down to 2.5V
- ◆ High sensitivity for direct reed switch replacement applications
- ◆ Chopper stabilized amplifier stage

## 3. Applications

- ◆ Solid state switch
- ◆ Handheld Wireless Handset Awake Switch
- ◆ Lid close sensor for battery powered devices

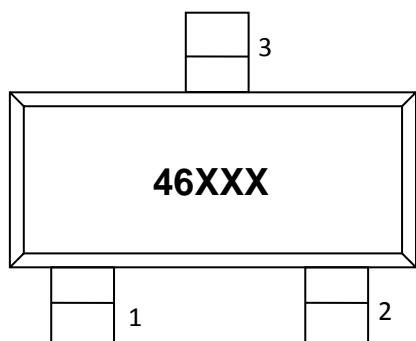


#### 4. Functional Block Diagram



#### 5. Pin Definitions and Descriptions

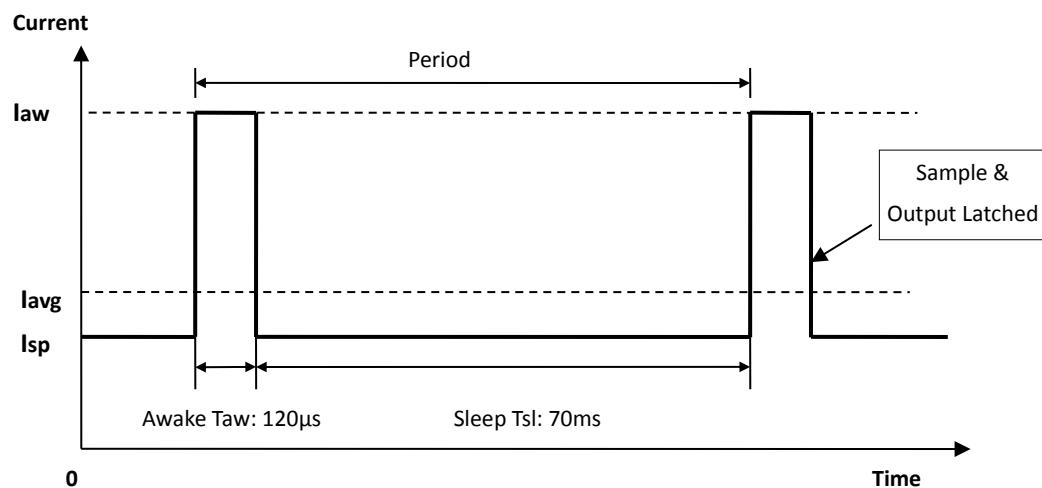
Mark View



Pin Description

Name	No.	Status	Description
V <sub>DD</sub>	1	P	Power Supply
Out	2	O	Output
GND	3	P	IC Ground

#### 6. Internal Timing Circuit



## 7. Absolute Maximum Ratings

Parameter	Symbol	Value	Units
Supply Voltage (operating)	V <sub>DD</sub>	6	V
Supply Current	I <sub>DD</sub>	5	mA
Output Voltage	V <sub>OUT</sub>	5	V
Output Current	I <sub>OUT</sub>	5	mA
Operating Temperature Range	T <sub>A</sub>	-40 to 85	°C
Storage Temperature Range	T <sub>S</sub>	-50 to 150	°C
ESD Sensitivity		4000	V

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

## 8. DC Electrical Specifications

DC Operating Parameters: T<sub>A</sub> = 25°C, V<sub>DD</sub> = 2.75V

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Operating voltage	V <sub>DD</sub>	Operating	2.5	3	5.5	V
Supply current	I <sub>DD</sub>	Average		5		µA
Output Current	I <sub>OUT</sub>				1.0	mA
Saturation Voltage	V <sub>SAT</sub>	I <sub>OUT</sub> =1mA			0.4	V
Awake mode time	T <sub>AW</sub>	Operating		175		µS
Sleep mode time	T <sub>SL</sub>	Operating			70	mS

## 9. Magnetic Specifications

Operating Parameters: T<sub>A</sub> = 25°C, V<sub>DD</sub> = 2.75V<sub>DC</sub>

Parameter	Symbol	Min	Typ	Max	Units
Operating Point	B <sub>OP</sub>	10	30	50	Gs
Release Point	B <sub>RP</sub>	-50	-30	-15	Gs
Hysteresis	B <sub>HYS</sub>	-	60	-	Gs

## 10. ESD Protection

Human Body Model (HBM) tests according to: Mil. Std. 883F method 3015.7:

Parameter	Symbol	Limit Values		Unit	Notes
		Min	Max		
Voltage	V <sub>ESD</sub>		±4	kV	

## 11. Unique Features

### ■ CMOS Hall IC Technology

The chopper stabilized amplifier uses switched capacitor techniques to eliminate the amplifier offset voltage, which, in bipolar devices, is a major source of temperature sensitive drift. CMOS makes this advanced technique possible. The CMOS chip is also much smaller than a bipolar chip, allowing very sophisticated circuitry to be placed in less space. The small chip size also contributes to lower physical stress and less power consumption.

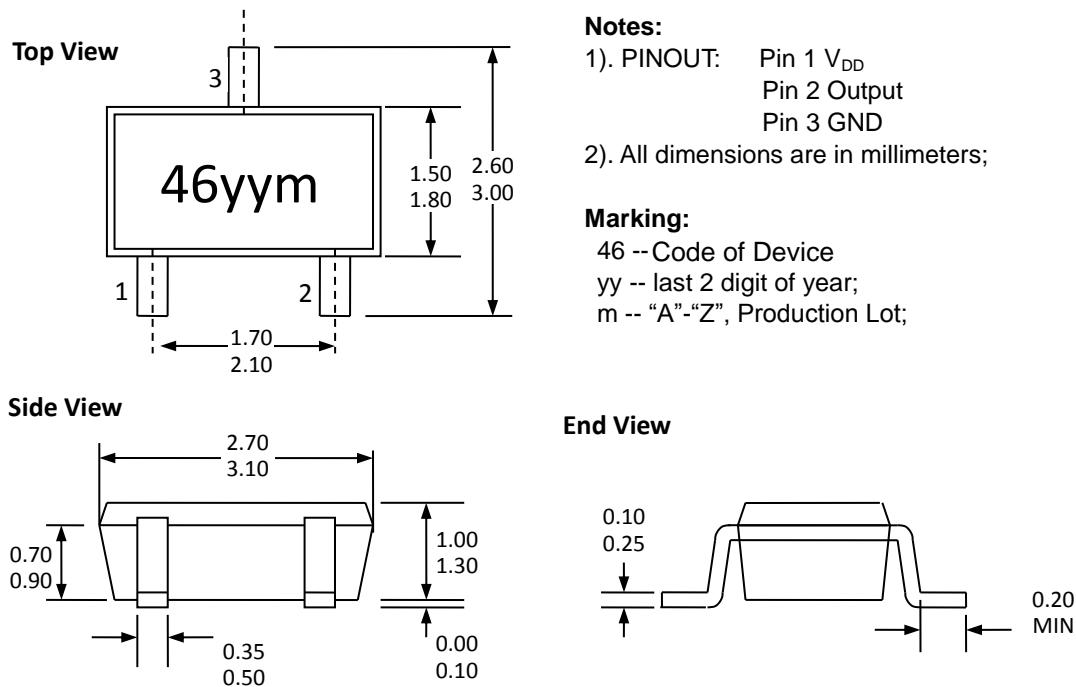
## 12. ESD Precautions

Electronic semiconductor products are sensitive to Electro Static Discharge . Always observe Electro Static Discharge control procedures whenever handling semiconductor products.

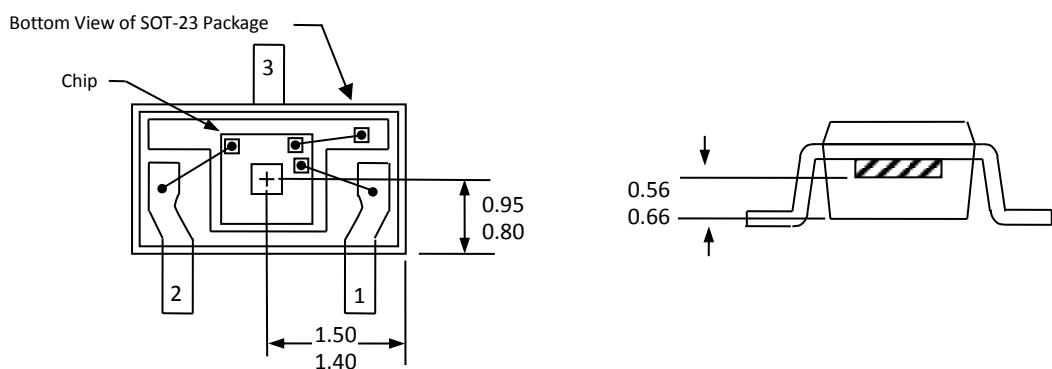


## 13. Package Information

### 13.1 SOT-23 Package Physical Characteristics



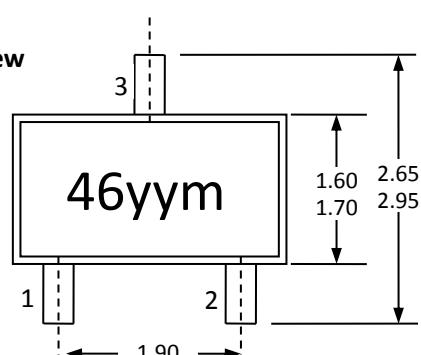
### SOT-23 Package Hall Location





### 13.2 TSOT-23 Package Physical Characteristics

Top View



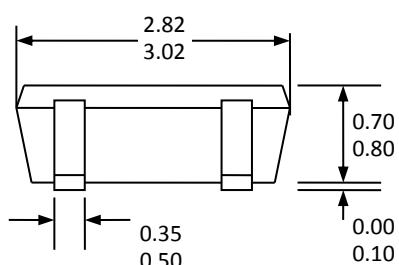
**Notes:**

- 1). PINOUT: Pin 1 V<sub>DD</sub>  
Pin 2 Output  
Pin 3 GND
- 2). All dimensions are in millimeters;

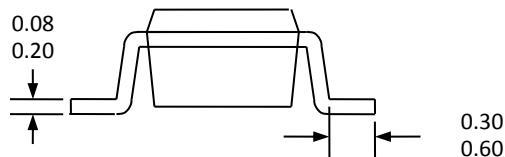
**Marking:**

46-- Code of Device  
yy -- last 2 digit of year;  
m -- "A" - "Z", Production Lot;

Side View

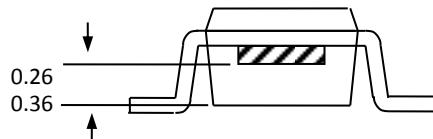
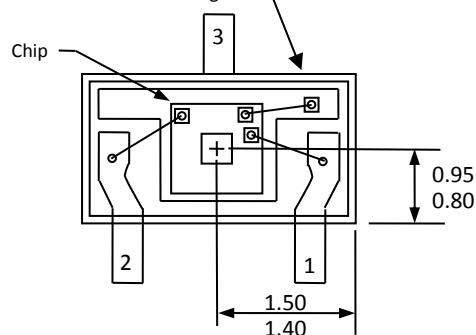


End View



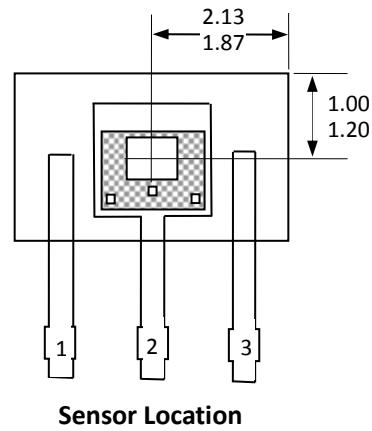
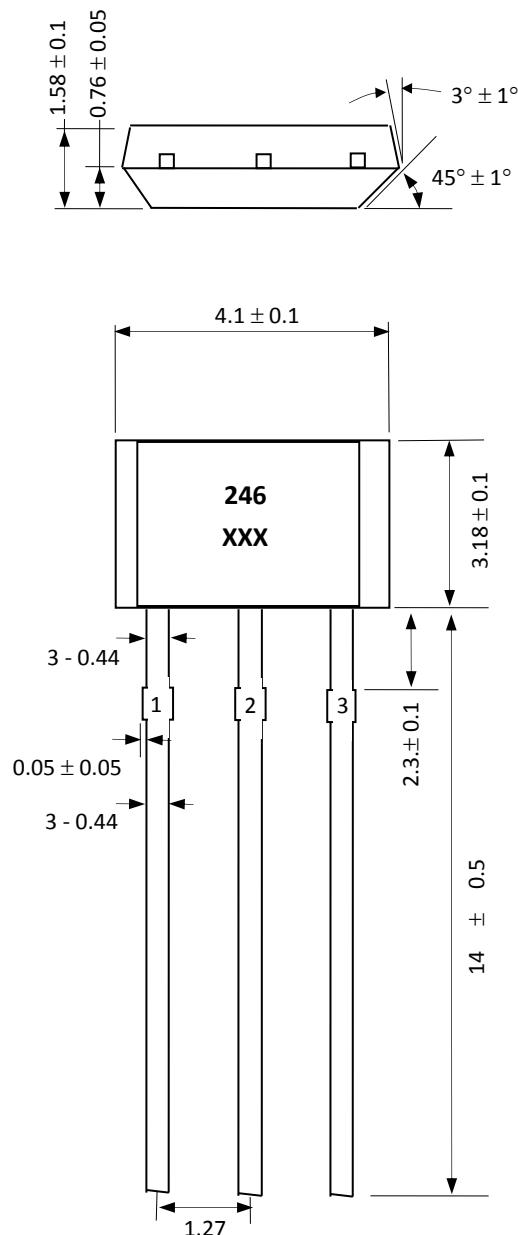
### Hall plate location

Bottom View of TSOT-23 Package

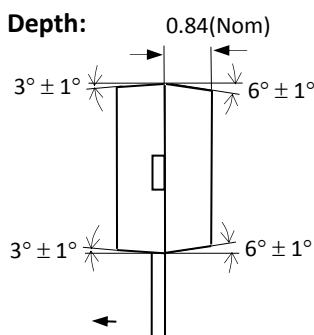




### 13.3 TO-92 Package Physical Characteristics



#### Active Area Depth:



#### Notes:

- 1). Controlling dimension: mm;
- 2). Leads 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  $V_{DD}$
  - Pin 2 GND
  - Pin 3 Output

#### 14. Ordering Information

Part No.	Temperature Suffix	Package Code
DH246	E (-40°C ~ 85°C)	UA (TO-92S)
		SO (SOT-23)
		ST (TSOT-25)