

## ***HX6383 Specifications*** **Micropower CMOS Output Hall Effect Switch**

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HX6383 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.

HX6383 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 omni-polar 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
- Strong RF noise protection
- 1.65 to 3.5V for battery-powered applications
- Omni polar, output switches with absolute value of North or South pole from magnet
- Operation down to 1.65V, Micro power consumption
- High Sensitivity for reed switch replacement applications
- Multi Small Size option
- Low sensitivity drift in crossing of Temp. range
- Ultra Low power consumption at 5uA (Avg)
- High ESD Protection, HMB > ±4KV( min )
- Totem-pole output

### ***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
- Water Meter
- Floating Meter
- PDVD
- NB

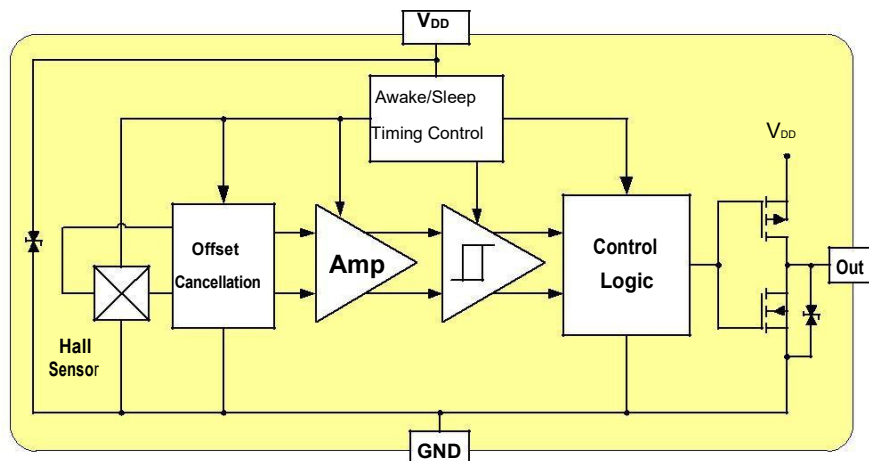
## HX6383 Specifications

### Micropower CMOS Output Hall Effect Switch

Part No.	Temperature Suffix	Package Type
HX6383EST	E (-40°C to + 85°C)	ST (SOT-23)
HX6383ESN	E (-40°C to + 85°C)	SN (SOT-553)
HX6383ESQ	E (-40°C to + 85°C)	SQ (QFN2020-3)
HX6383KUA	E (-40°C to + 125°C)	UA (TO-92S)

Custom sensitivity selection is available by HX sorting technology

### Functional Diagram



**Note:** Static sensitive device; please observe ESD precautions. Reverse V<sub>DD</sub> protection is not included. For reverse voltage protection, a 100Ω resistor in series with V<sub>DD</sub> is recommended.

**HX 6383, HBM > ±4KV which is verified by third party lab.**

## HX6383 Specifications

### Micropower CMOS Output Hall Effect Switch

#### Absolute Maximum Ratings At( $T_a=25^{\circ}\text{C}$ )

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, ( $I_{out}$ )		1	mA
Operating temperature range, ( $T_a$ )		-40 to +85	$^{\circ}\text{C}$
Storage temperature range, ( $T_s$ )		-65 to +150	$^{\circ}\text{C}$
Maximum Junction Temp, ( $T_j$ )		150	$^{\circ}\text{C}$
Thermal Resistance	( $\theta_{JA}$ ) ST / SN / UA / SQ	310 / 540 / 206 / 543	$^{\circ}\text{C}/\text{W}$
	( $\theta_{JC}$ ) ST / SN / UA / SQ	223 / 390 / 148 / 410	$^{\circ}\text{C}/\text{W}$
Package Power Dissipation, ( $P_D$ ) ST / SN / UA / SQ		400 / 230 / 606 / 230	mW

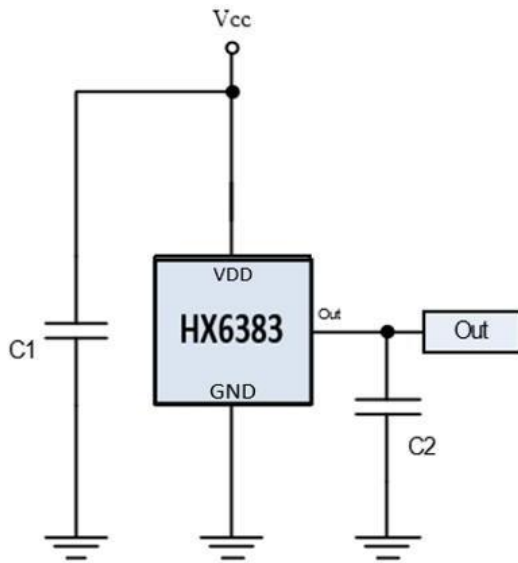
*Note: Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.*

#### Electrical Specifications

DC Operating Parameters :  $T_a=25^{\circ}\text{C}$ ,  $V_{DD}=1.8\text{V}$

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage, ( $V_{DD}$ )	Operating	1.65		6	V
Supply Current, ( $I_{DD}$ )	Awake State		1.4	3	mA
	Sleep State		3.6	7	$\mu\text{A}$
	Average		5	10	$\mu\text{A}$
Output Leakage Current, ( $I_{off}$ )	Output off			1	$\mu\text{A}$
Output High Voltage, ( $V_{OH}$ )	$I_{OUT}=0.5\text{mA}$ (Source)	$V_{DD}-0.2$			V
Output Low Voltage, ( $V_{OL}$ )	$I_{OUT}=0.5\text{mA}$ (Sink)			0.2	V
Awake mode time, ( $T_{aw}$ )	Operating		40	80	$\mu\text{s}$
Sleep mode time, ( $T_{SL}$ )	Operating		40	80	mS
Duty Cycle, ( $D, C$ )			0.1		%
Electro-Static Discharge	HBM	4			KV
Operate Point, ( $B_{OPS}$ )	S pole to branded side, $B > BOP$ , $V_{out}$ On		30	55	Gauss
	N pole to branded side, $B > BOP$ , $V_{out}$ On	-55	-30		
Release Point, ( $B_{RPS}$ )	S pole to branded side, $B < BRP$ , $V_{out}$ Off	10	20		Gauss
	N pole to branded side, $B < BRP$ , $V_{out}$ Off		-20	-10	
Hysteresis, ( $B_{HYS}$ )	$ BOP_x - BRP_x $		10		Gauss

**Typical Application circuit**



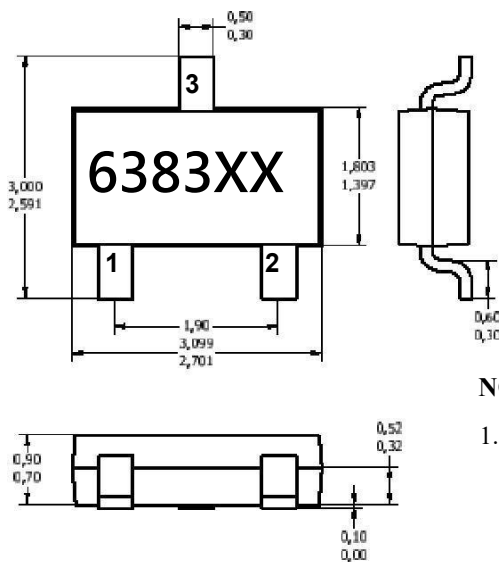
C1 : 10nF

C2 : 100pF

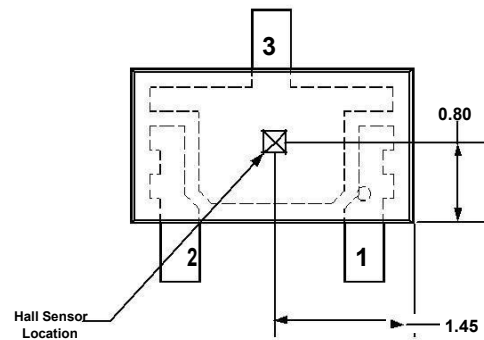
**Sensor Location, package dimension and marking**

**HX6383 Package**

**ST Package(TSOT-23)  
 (Top View)**



**Hall Plate Chip Location  
 (Bottom view)**



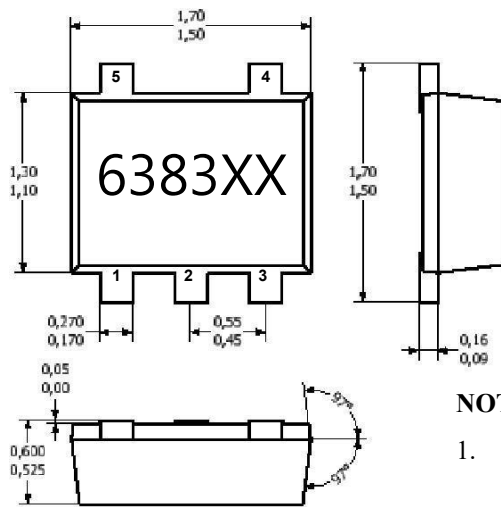
**NOTES:**

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

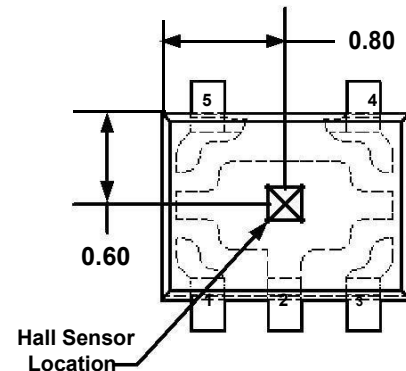
# HX6383 Specifications

## Micropower CMOS Output Hall Effect Switch

### SN Package (SOT-553) (Top View)



### Hall Plate Chip Location (Top View)

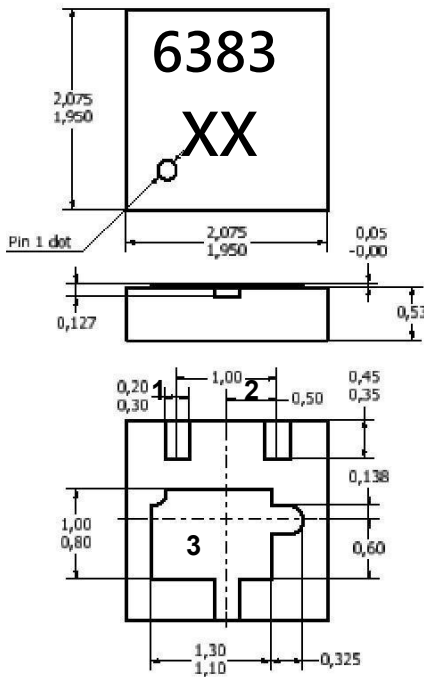


#### NOTES:

- PINOUT (See Top View at left):  
 Pin 1 NC  
 Pin 2 GND  
 Pin 3 NC  
 Pin 4 V<sub>DD</sub>  
 Pin 5 Out
- Controlling dimension: mm;

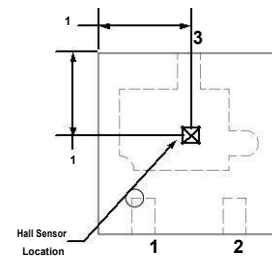
### SQ Package

#### (Top View)



#### (Bottom View)

### Hall Plate Chip Location (Top view)

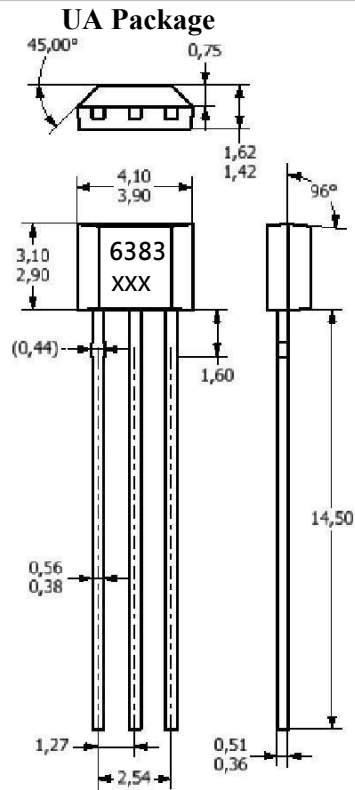


#### NOTES:

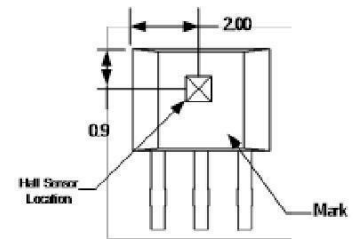
- PINOUT (See Top View at left)  
 Pin 1 V<sub>DD</sub>  
 Pin 2 Output  
 Pin 3 GND
- Controlling dimension: mm;
- Chip rubbing will be 10mil maximum;
- Chip must be in PKG. center.

# HX6383 Specifications

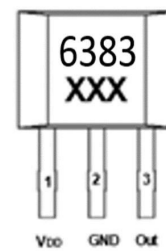
## Micropower CMOS Output Hall Effect Switch



### Hall Chip location



### Output Pin Assignment (Top view)



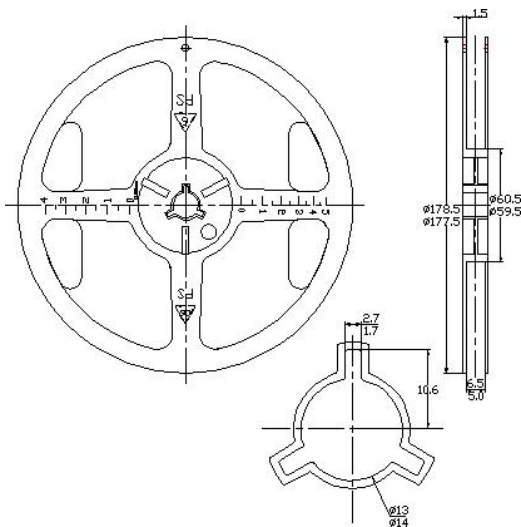
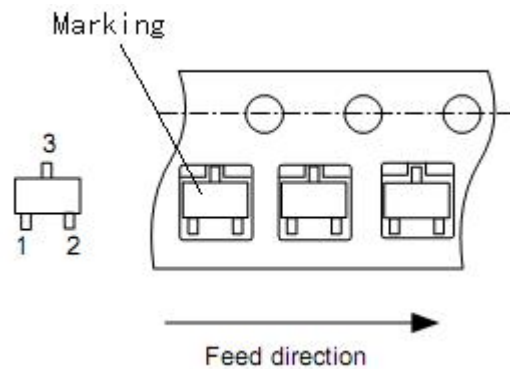
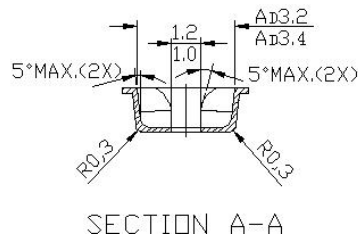
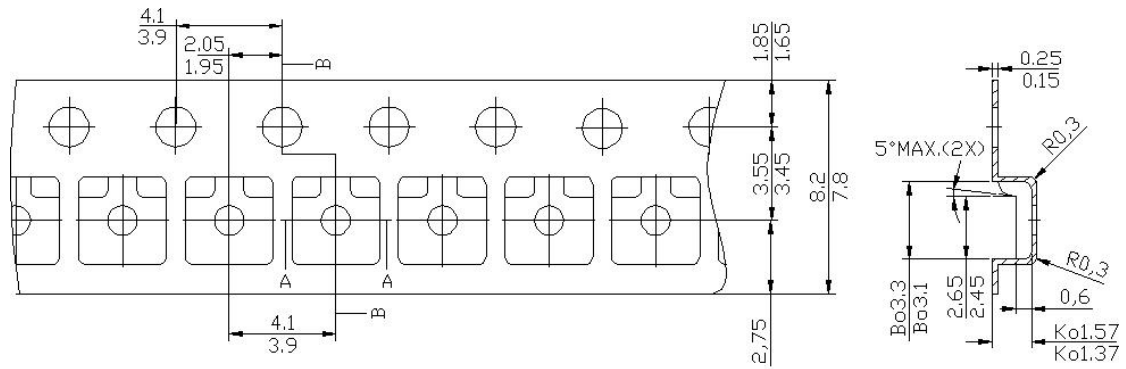
### NOTES:

- 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

# HX6383 Specifications

## Micropower CMOS Output Hall Effect Switch

### TSOT- 23 package Tape On Reel Dimension



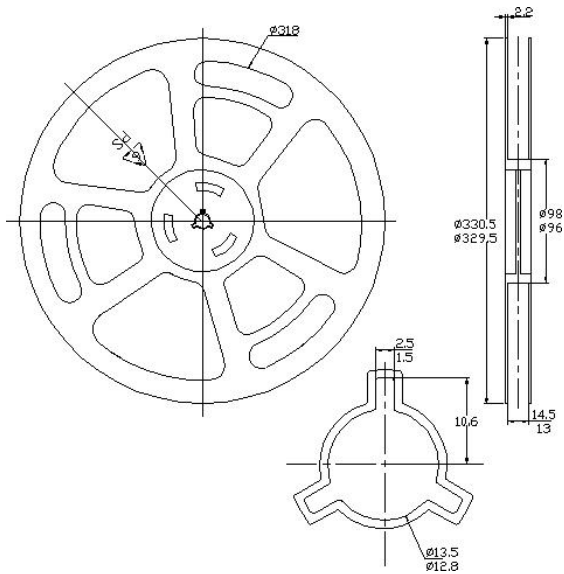
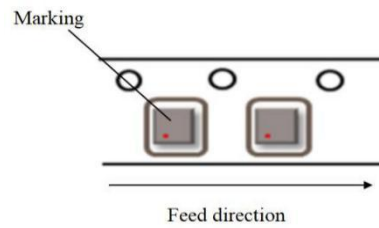
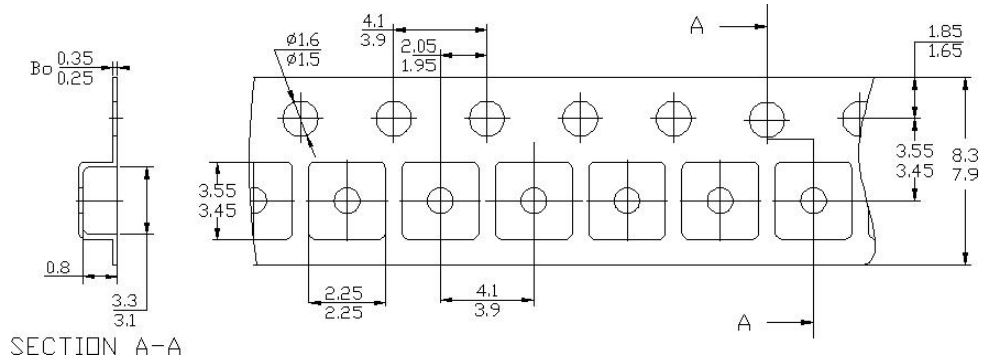
#### NOTES:

- Material: Conductive polystyrene;
- DIM in mm;
- 10 sprocket hole pitch cumulative tolerance  $\pm 0.2$ ;
- Camber not to exceed 1mm in 100mm;
- Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole;
- (S.R. OHM/SQ) Means surface electric resistivity of the carrier tape.

## HX6383 Specifications

### Micropower CMOS Output Hall Effect Switch

#### ***QFN2020-3 Tape On Reel Dimension***



#### **NOTES:**

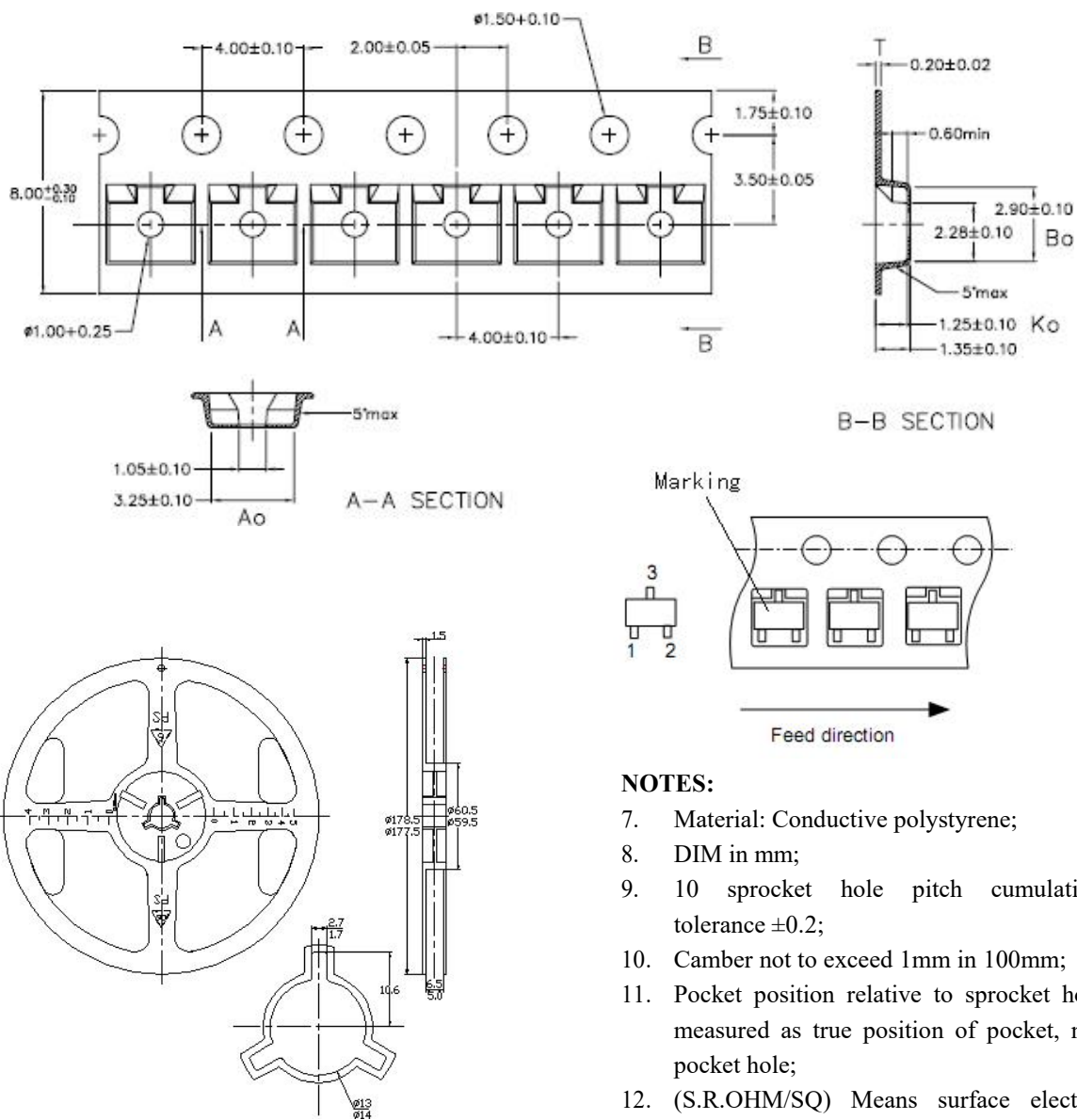
- Material: Conductive polystyrene;
- DIM in mm;
- 10 sprocket hole pitch cumulative tolerance  $\pm 0.2$ ;
- Camber not to exceed 1mm in 100mm;
- Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole;
- (S.R. OHM/SQ) Means surface electric resistivity of the carrier tape.



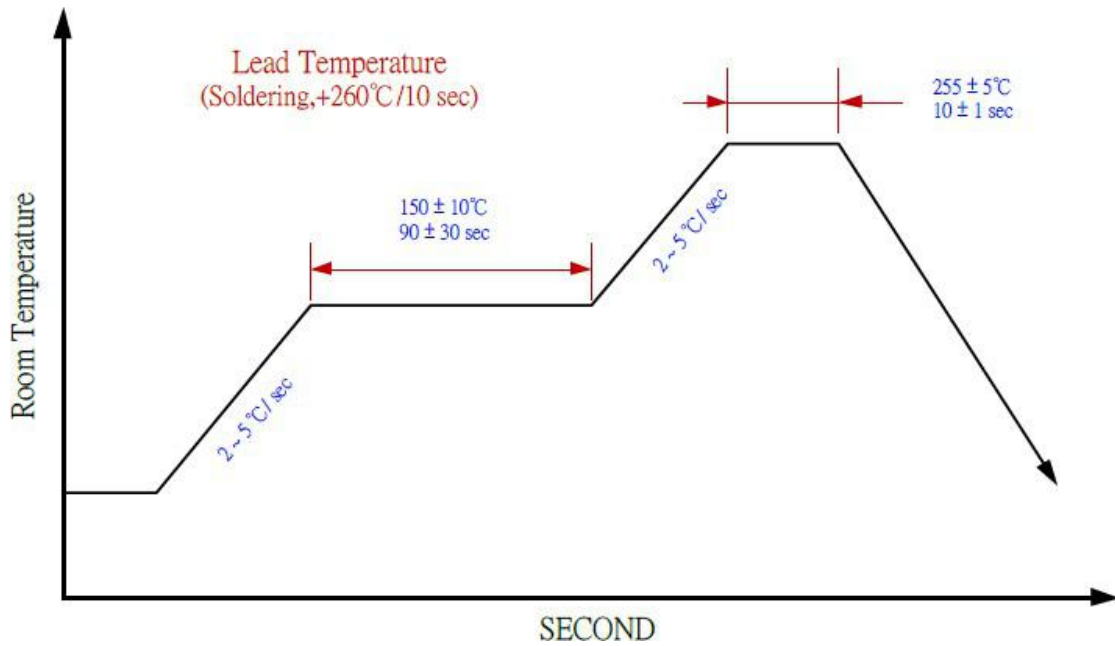
# HX6383 Specifications

## Micropower CMOS Output Hall Effect Switch

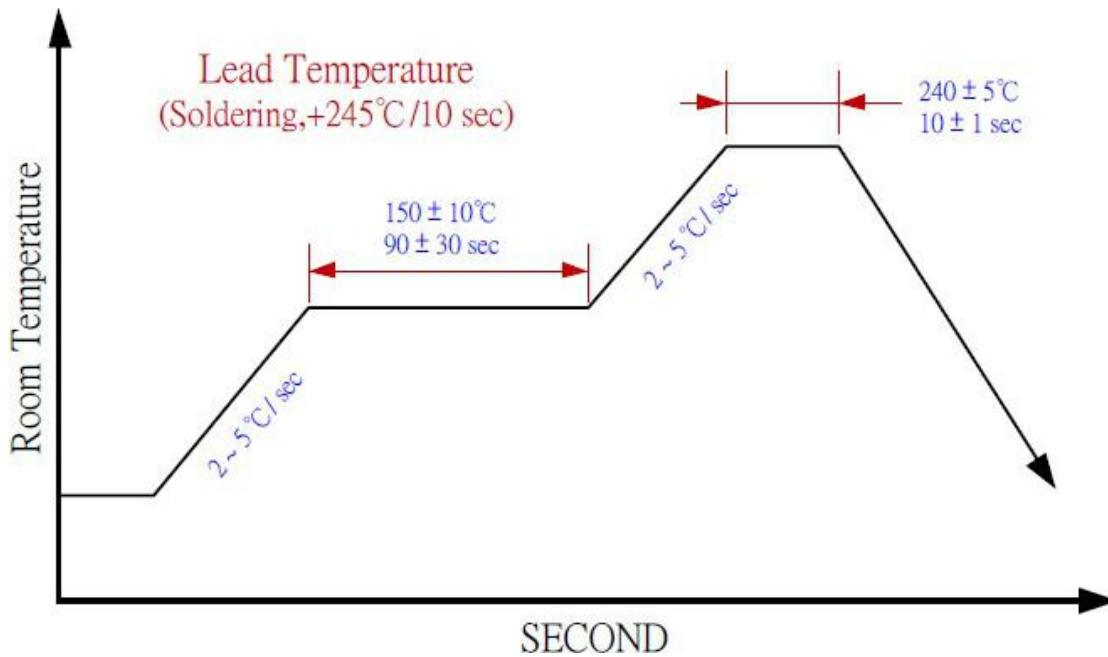
### PSOT-23 package Tape On Reel Dimension



**IR reflow curve**



**ST/SQ/SP Soldering Condition**



**UA Soldering Condition**

## HX6383 Specifications

### Micropower CMOS Output Hall Effect Switch

#### ***Packing specification:***

Package	Bag	Box	Carton	Carton	Carton
TO-92S	1,000pcs/bag	10 bags/box	10 boxes/carton	5 boxes/carton	4 boxes/carton
PSOT-23-3L	3,000pcs/reel	10 reels/box	4 boxes/carton	4boxes/carton	4 boxes/carton
TSOT-23-3L	3,000pcs/reel	5 reels/box	6 boxes/carton	6 boxes/carton	6 boxes/carton
QFN2020-3	3,000pcs/reel	5 reels/box	6 boxes/carton	6 boxes/carton	6 boxes/carton

TO-92S	Weight	PSOT-23-3L	Weight	TSOT-23-3L	Weight	QFN2020-3	Weight
1000pcs/bag	0.11kg	3000pcs/reel	0.13kg	3000pcs/reel	0.12kg	3000pcs/reel	0.10kg
10 bags/box	1.26kg	10 reels/box	1.44kg	5 reels/box	0.72kg	5 reels/box	0.64kg
10 boxes/carton	13.38kg	4 boxes/carton	6.50kg	6 boxes/carton	4.79kg	6 boxes/carton	4.34kg
5 boxes/carton	6.82kg	4 boxes/carton	6.50kg	6 boxes/carton	4.79kg	6 boxes/carton	4.34kg
4 boxes/carton	5.54kg	4 boxes/carton	6.50kg	6 boxes/carton	4.79kg	6 boxes/carton	4.34kg