

HX258 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.

HX258 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.

HX258 is rated for operation between the ambient temperatures -40°C and $+85^{\circ}\text{C}$ for the E temperature range. The four package styles available provide magnetically optimized solutions for most applications. Package types SO is an SOT-23(1.1 mm nominal height), SP is an PSOT-23(1.1 mm nominal height), ST is an TSOT-23 (0.7 mm nominal height), a miniature low-profile surface-mount package, while package UA is a three-lead ultra-mini SIP for through-hole mounting.

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

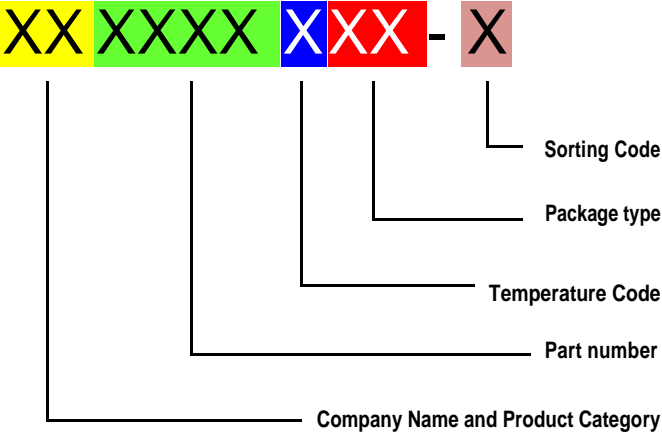
Features and Benefits

- CMOS Hall IC Technology
- Strong RF noise protection
- 1.70 to 5.5V for battery-powered applications
- Omni polar, output switches with absolute value of North or South pole from magnet
- Operation down to 1.70V, 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, HBM $> \pm 4\text{KV}$ (min)
- Open Drain 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

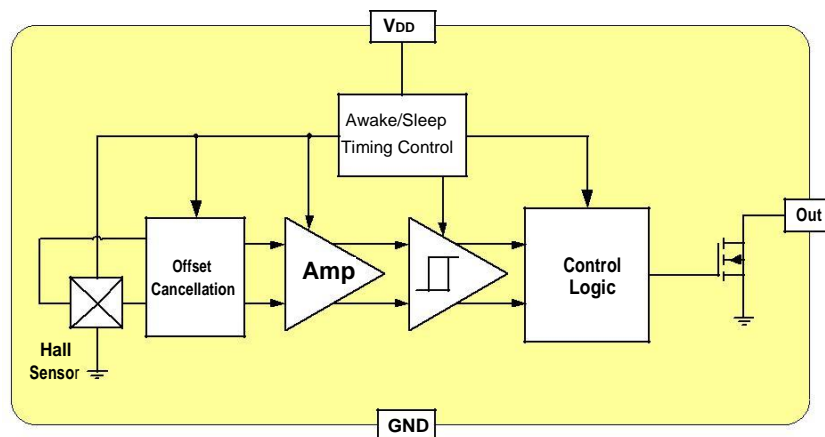
Ordering Information

	<p>Company Name and Product Category HH:HX Hall Effect/HP:HX Power IC</p> <p>Part number 181,182,183,184,185,258,249,276,477,381,381F,381R,382..... If part # is just 3 digits, the fourth digit will be omitted.</p> <p>Temperature range E: 85 °C, I: 105 °C, K: 125 °C, L: 150 °C</p> <p>Package type UA:TO-92S,VK:TO-92S(4pin),VF:TO-92S(5pin),SO:SOT-23, SQ:QFN-3,ST:TSOT-23,SN:SOT-553,SF:SOT-89(5pin), SS:TSOT-26,SD:DFN-6</p> <p>Sorting α,β,Blank.....</p>
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Part No.	Temperature Suffix	Package Type
HX258EUA	E (-40°C to + 85°C)	UA (TO-92S)
HX258ESO	E (-40°C to + 85°C)	SO (SOT-23)
HX258EST	E (-40°C to + 85°C)	ST (TSOT-23)
HX258ESP	E (-40°C to + 85°C)	SP (PSOT-23)

Custom sensitivity selection is available by HX sorting technology

Functional Diagram



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

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

Characteristics		Values	Unit
Supply voltage,(VDD)		6	V
Output Voltage,(Vout)		6	V
Reverse voltage, (VDD) (VOUT)		-0.3	V
Magnetic flux density		Unlimited	Gauss
Output current(IOUT)		10	mA
Operating temperature range, (T_a)		-40 to +85	$^{\circ}\text{C}$
Storage temperature range, (T_s)		-55 to +150	$^{\circ}\text{C}$
Maximum Junction Temp,(T_j)		150	$^{\circ}\text{C}$
Thermal Resistance	(θ_{JA}) UA / SO / ST / SP	206 / 543 / 310 / 625	$^{\circ}\text{C}/\text{W}$
	(θ_{JC}) UA / SO / ST / SP	148 / 410 / 223 / 116	$^{\circ}\text{C}/\text{W}$
Package Power Dissipation, (PD) UA / SO / ST / SP		606 / 230 / 400 / 200	mW

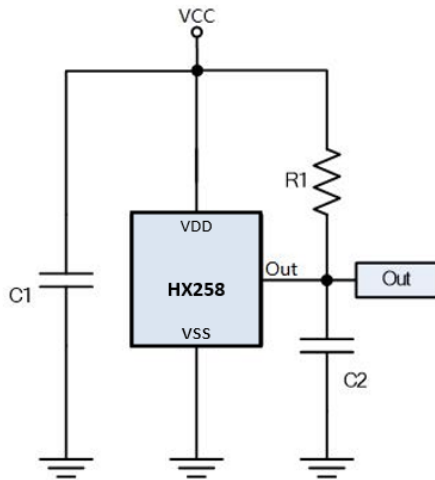
Note: Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.

Electrical Specifications

DC Operating Parameters $T_A=+25^{\circ}\text{C}$, $V_{DD}=3\text{V}$

Parameters		Test Conditions	Min	Typ	Max	Units
Supply Voltage,(VDD)		Operating	1.7		5.5	V
Supply Current,(IDD)	Awake State			1.5	3.0	mA
	Sleep State			3.5	7.0	μA
	Average			5.0	10	μA
Output Leakage Current, (I_{off})		$B < BRP_x$, $V_{OUT} = 5.5\text{V}$			1.0	μA
Output Saturation Voltage, (V_{DSON})		$I_{out}=5\text{mA}$, $B > BOP$			200	mV
Awake mode time,(T_{aw})		Operating		40	80	μS
Sleep mode time,(T_{SL})		Operating		40	80	mS
Duty Cycle,(D, C)				0.1		%
Response Time,(T_{RES})					10	Hz
ESD		HBM	4			KV
Operating Point	BOPS	S pole to branded side, $B > BOP$, V_{out} On	20		55	Gauss
	BOPN	N pole to branded side, $B > BOP$, V_{out} On	-55		-20	Gauss
Release Point	BRPS	S pole to branded side, $B < BRP$, V_{out} Off	10		45	Gauss
	BRPN	N pole to branded side, $B < BRP$, V_{out} Off	-45		-10	Gauss
Hysteresis	BHYS	$ BOP_x - BRP_x $		10		Gauss

Typical Application circuit

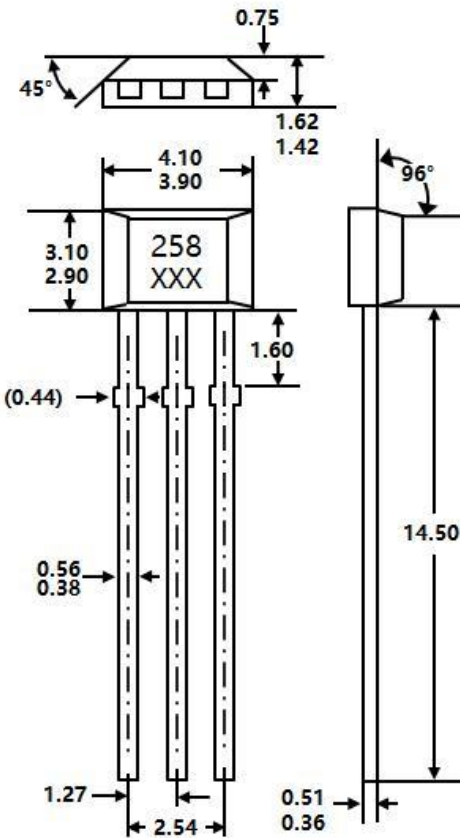


C1 : 10nF
 C2 : 100pF
 R1 : 100KΩ

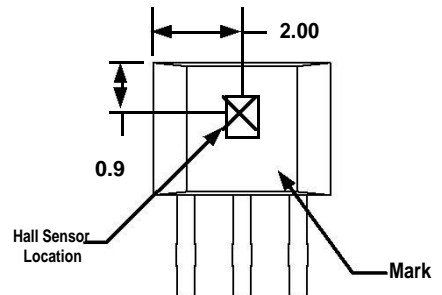
Sensor Location, Package Dimension and Marking

HX258 Package

UA Package

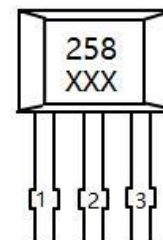


Hall Chip location



Output Pin Assignment

(Top view)

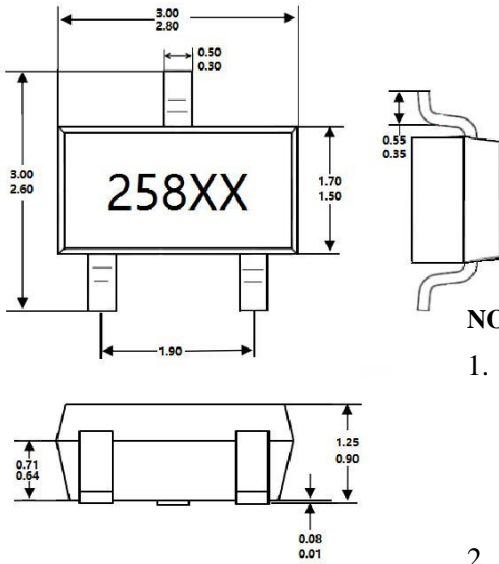


NOTES:

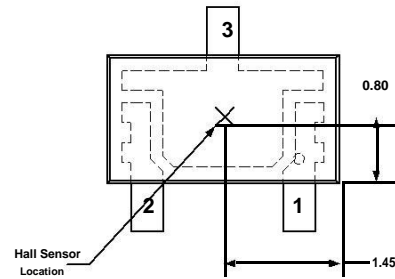
- 1).Controlling dimension: mm
- 2).Leads must be free of flash and plating voids
- 3).Do not bend leads within 1 mm of lead to package interface.
- 4).PINOUT:

Pin 1 V_{DD}
 Pin 2 GND
 Pin 3 Output

SO Package
(Top View)



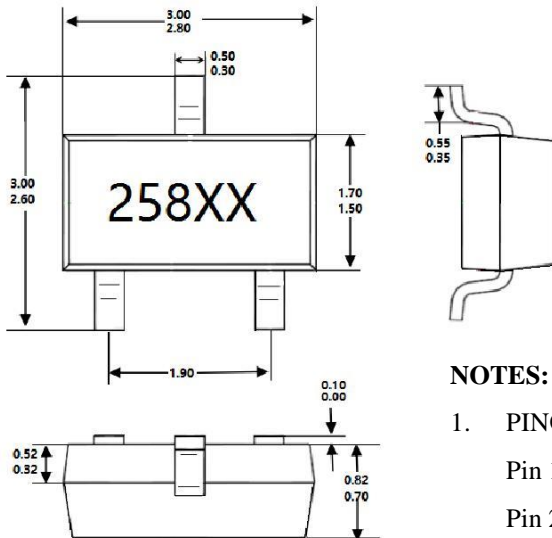
Hall Plate Chip Location
(Bottom view)



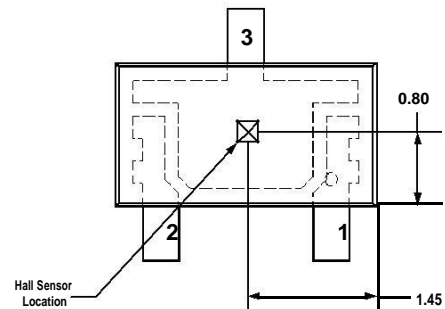
NOTES:

1. PINOUT (See Top View at left :)
Pin 1 V_{DD}
Pin 2 Output
Pin 3 GND
2. Controlling dimension: mm
3. Lead thickness after solder plating will be 0.254mm maximum

ST Package (TSOT-23)
(Top View)



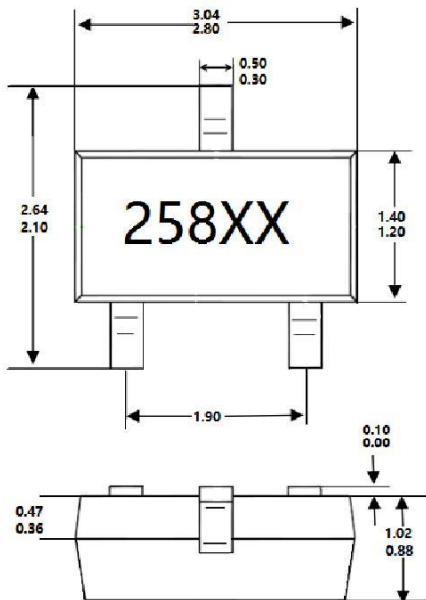
Hall Plate Chip Location
(Bottom view)



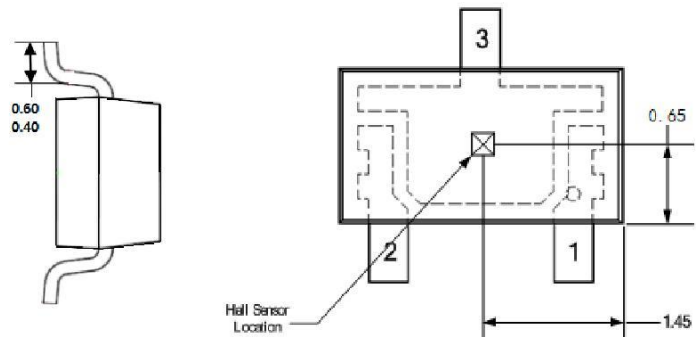
NOTES:

1. PINOUT (See Top View at left:)
Pin 1 V_{DD}
Pin 2 Output
Pin 3 GND
2. Controlling dimension: mm;
3. Lead thickness after solder plating will be 0.254mm maximum

SP Package (PSOT-23)
(Top View)



Hall Plate Chip Location
(Bottom view)



NOTES:

4. PINOUT (See Top View at left:)
 - Pin 1 V_{DD}
 - Pin 2 Output
 - Pin 3 GND
5. Controlling dimension: mm;

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