

HX6278 is an unipolar Hall effect sensor IC. It incorporates advanced chopper stabilization technology to provide accurate and stable magnetic switch points. The design, specifications and performance have been optimized for applications of solid state switches.

The output transistor will be switched on (BOP) in the presence of a sufficiently strong South pole magnetic field facing the marked side of the package. Similarly, the output will be switched off (BRP) in the presence of a weaker South field and remain off with “0” field.

The package type is in a Halogen Free version was verified by third party organization. Halogen Free package is available by customer’s option.

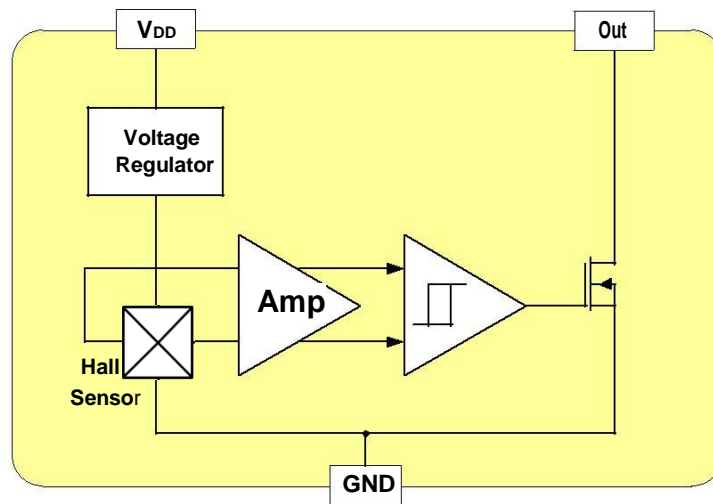
Features and Benefits

- CMOS Hall IC Technology
- Solid-State Reliability
- Chopper stabilized amplifier stage
- Unipolar, output switches with absolute value of South pole from magnet
- Operation down to 3.0V
- High Sensitivity for direct reed switch replacement applications
- 100% tested at 125°C for K Spec.
- Custom sensitivity / Temperature selection are available.

Applications

- Solid state switch
- Limit switch
- Current limit
- Interrupter
- Current sensing
- Magnet proximity sensor for reed switch replacement

Functional Diagram



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

| Characteristics | | Values | Unit |
|--|---------------------------|-------------|---------------------------|
| Supply voltage, (V_{DD}) | | 27 | V |
| Output Voltage, (V_o) | | 27 | V |
| Reverse Voltage , (V_{DD}) (V_{OUT}) | | -0.3 | V |
| Magnetic flux density | | Unlimited | Gauss |
| Output current , (I_{OUT}) | | 50 | mA |
| Operating Temperature Range, (T_a) | “E” version | -40 to +85 | $^\circ\text{C}$ |
| | “K” version | -40 to +125 | $^\circ\text{C}$ |
| 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 | 206 / 543 | $^\circ\text{C}/\text{W}$ |
| | (θ_{jc}) UA / SO | 148 / 410 | $^\circ\text{C}/\text{W}$ |
| Package Power Dissipation, (P_D) UA / SO | | 606 / 230 | mW |

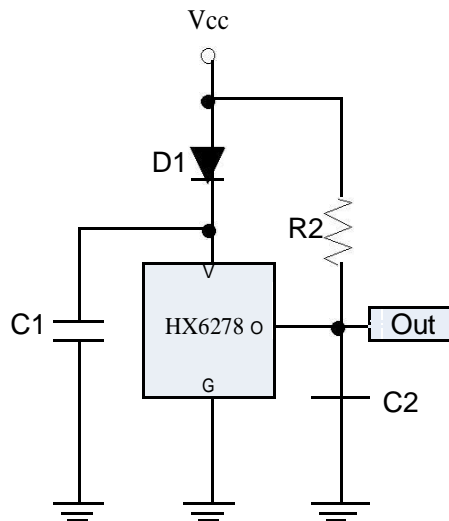
Note: Do not apply reverse voltage to V_{DD} and V_{OUT} Pin, It may be caused for Miss function or damaged device.

Electrical Specifications

DC Operating Parameters : $T_A = +25\text{ }^\circ\text{C}$, $V_{DD} = 12\text{V}$

| Parameters | Test Conditions | Min | Typ | Max | Units |
|--|---|-----|------|-------|-------|
| Supply Voltage, (V_{DD}) | Operating | 3.0 | | 24.0 | V |
| Supply Current, (I_{DD}) | $B < B_{OP}$ | | 2.5 | 5.0 | mA |
| Output Saturation Voltage, (V_{Sat}) | $I_{OUT} = 20\text{ mA}$, $B > B_{OP}$ | | | 500.0 | mV |
| Output Leakage Current, (I_{off}) | I_{OFF} $B < B_{RP}$, $V_{OUT} = 20\text{V}$ | | | 10.0 | uA |
| Output Rise Time, (T_R) | $R_L = 1\text{k}\Omega$, $C_L = 20\text{pF}$ | | 0.04 | | uS |
| Output Fall Time, (T_F) | $R_L = 1\text{k}\Omega$; $C_L = 20\text{pF}$ | | 0.18 | | uS |
| Operate Point, (B_{OP}) | | | 175 | 250 | Gauss |
| Release Point, (B_{RP}) | | 95 | | | Gauss |
| Hysteresis, (B_{HYS}) | | | 45 | | Gauss |

Typical application circuit



D1 : 1N4148 or 100 Ω
 C1 : 1000PF
 C2 : 15PF
 R2 : 10K Ω

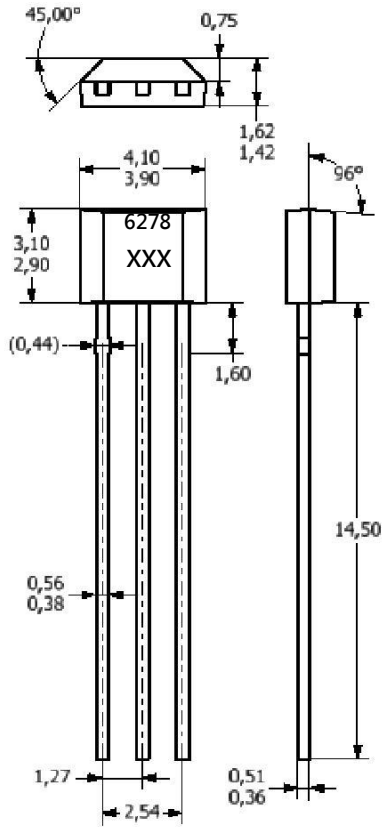
| Part No. | Temperature Suffix | Package Type |
|-----------|---|--------------|
| HX6278KUA | K (-40 $^\circ\text{C}$ to + 125 $^\circ\text{C}$) | UA (TO-92S) |
| HX6278KSO | K (-40 $^\circ\text{C}$ to + 125 $^\circ\text{C}$) | SO (SOT-23) |
| HX6278EUA | E (-40 $^\circ\text{C}$ to + 85 $^\circ\text{C}$) | UA (TO-92S) |
| HX6278ESO | E (-40 $^\circ\text{C}$ to + 85 $^\circ\text{C}$) | SO (SOT-23) |

KUA spec is using in industrial and automotive application. Special Hot Testing is utilized.

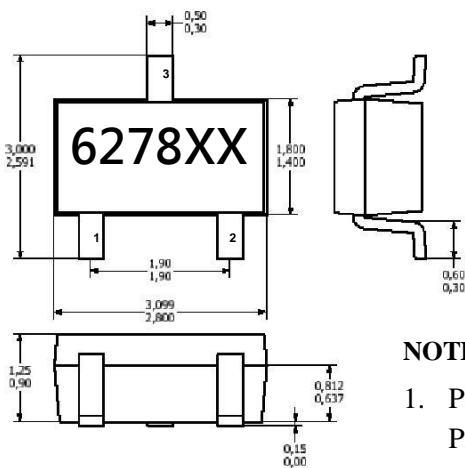
Sensor Location, Package Dimension and Marking

HX6278 Package

UA Package



Package (SOT-23)
(Top View)

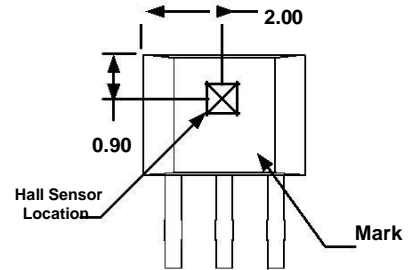


NOTES:

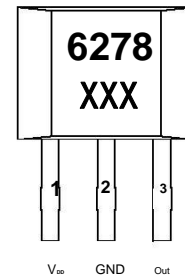
- 1).Controlling dimension: mm
- 2).Leads must be free of flash and plating voids
- 3).Do not bend leads within 1 mm of lead to package interface.
- 4).PINOUT:

| | |
|-------|-----------------|
| Pin 1 | V _{DD} |
| Pin 2 | GND |
| Pin 3 | Output |

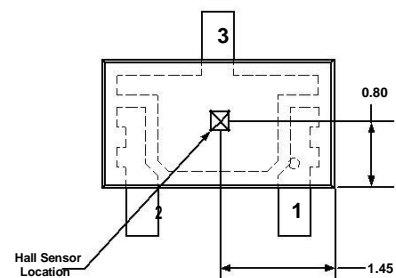
Hall Chip location



Output Pin Assignment
(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

