

ADV-Series Sensors—Bipolar Digital Switches

Features:

- Bipolar operation (south field ON, north field OFF)
- Extremely low operate points for high sensitivity
- Digital switch output
- MSOP8 and TDFN6 packages
- Cannot be damaged by large magnetic fields

Description:

The ADV001-00E is a GMR Digital Switch™ product using a unique bipolar output GMR material. This material allows the sensor to maintain an operate point with the application of a negative (south pole) magnetic field, and a release point with the application of a positive (north pole) magnetic field. The sensor is ideal for magnetic encoders that have alternating north and south poles, or in any other application where one polarity of field is required to turn the part on and the opposite polarity is required to turn it off.

The magnetic operate/release points are extremely low—approximately +4 Gauss for the operate point and -4 Gauss for the release point. Despite the very low values, the operate points are stable over a temperature range of -40°C to +125°C. The high sensitivity to magnetic field and excellent temperature stability give the ADV001-00E better airgap performance and switching precision compared to other products. The output is configured for use as a current-sinking on/off type. The IC is available in an MSOP8 or 2.5 mm x 2.5 mm TDFN6 package.

The following specifications are valid over all operating voltage and temperature ranges:

| Parameter | Min. | Typ. | Max. | Units |
|--|------|------|-------|----------|
| Magnetic Operate Point ¹ | 0 | 4 | 10 | Oersteds |
| Magnetic Release Point ¹ | -10 | -4 | 0 | Oersteds |
| Operate/Release Differential | 2 | | 12 | Oersteds |
| Operating Supply Voltage (V _{CC}) | 4.5 | | 30 | Volts |
| Quiescent Supply Current (V _{CC} = 12 V) | 2.5 | | 4.5 | mA |
| Output Drive Current | 0 | | 20 | mA |
| V _{OL} (V _{CC} ≥ 5 V; 20 mA output sink current ²) | | | 0.400 | Volts |
| Frequency Response | 100 | | | KHz |
| Temperature Range of Operation | -40 | | 125 | °C |

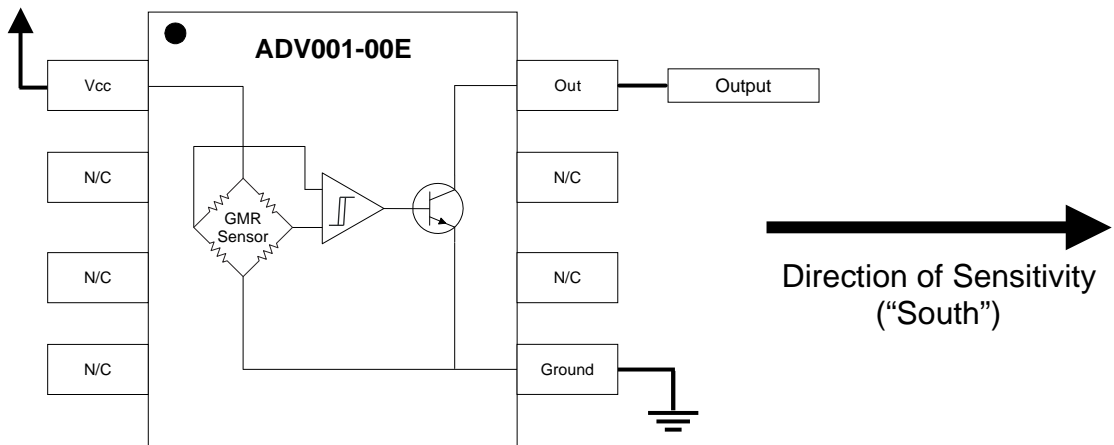
Notes:

1. Other operate and release points are available; contact NVE for details.
2. V_{OL} at V_{CC} = 4.5 V may be higher than 0.400 V.
3. Large magnetic fields WILL NOT damage NVE GMR Sensors.
4. 1 Oe (Oersted) = 1 Gauss in air = 0.1 mT.

Operation

The end user must apply a magnetic field planar with the IC package in the direction of sensitivity of the part (the cross-axis direction). As the applied magnetic field changes intensity and polarity, the digital output will turn on and off. The part is configured for pull down operation when in the “ON” state. An external pull-up resistor is required.

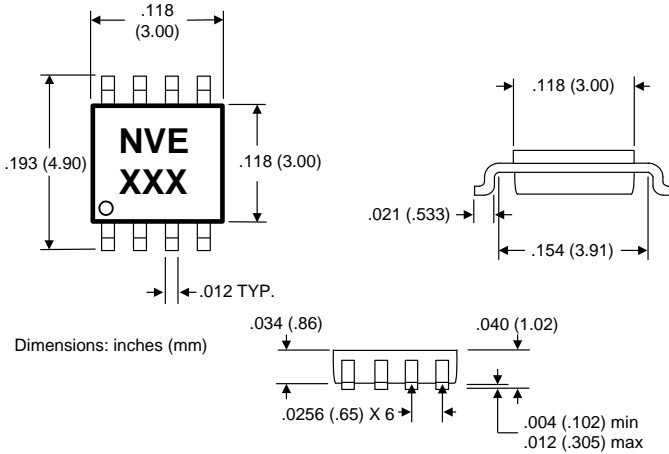
Functional Block Diagram and Pinout



| Pinout | Package | |
|-----------------|-----------------------|-----------------------|
| | MSOP8 (ADV001-00E) | TDFN6 (ADV001-10E) |
| V _{CC} | Pin 1 | Pin 1 |
| Ground | Pin 5 | Pin 4 |
| Out | Pin 8 | Pin 6 |

Package Drawings and Specifications

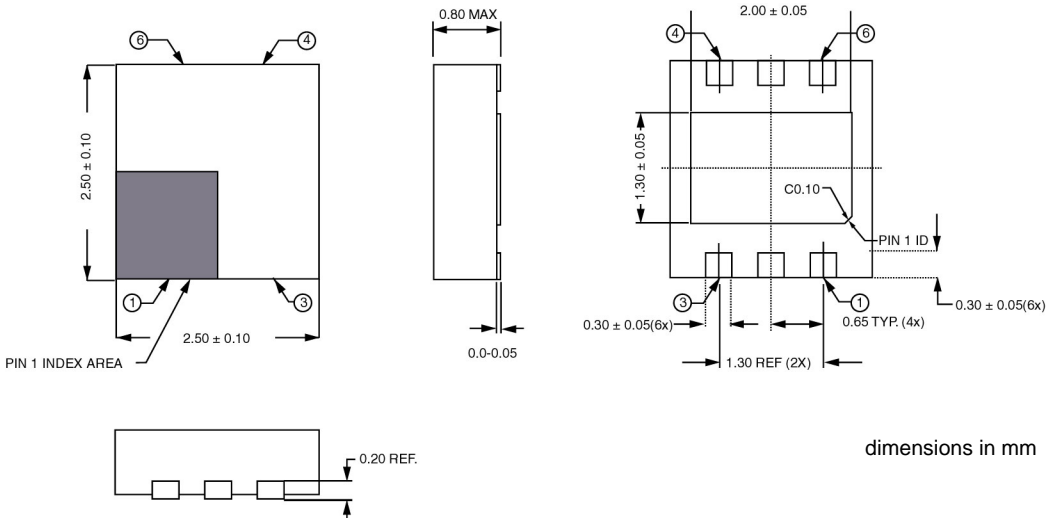
MSOP8 (ADV001-00E)



Notes:

1. The MSOP8 package has thermal power dissipation of 320°C/Watt in free air.
2. Thermal performance is improved when the package is soldered to a circuit board.

2.5 mm x 2.5 mm TDFN6 (ADV001-10E)



Notes:

1. The TDFN6 package has thermal power dissipation of 320°C/Watt in free air.
2. Thermal performance is improved when the package is soldered to a circuit board.