

ADV001 Latching Bipolar Digital Switches

Features:

- Latching 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 is a GMR Digital Switch™ product using a unique bipolar output GMR material. This material allows the sensor to maintain a negative (south pole) operate point and a positive (north pole) release point. The sensor is ideal for magnetic encoders with 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 oersteds for the operate point and $+4$ oersteds for the release point. Despite the high sensitivity, the operate points are stable over a temperature range of -40°C to $+125^{\circ}\text{C}$. The high sensitivity and excellent temperature stability give the ADV001 better airgap performance and switching precision than other products. The output is on/off current-sinking. The IC is available in an MSOP8 (part number ADV001-00E) or 2.5 mm x 2.5 mm TDFN6 package (part number ADV001-10E).

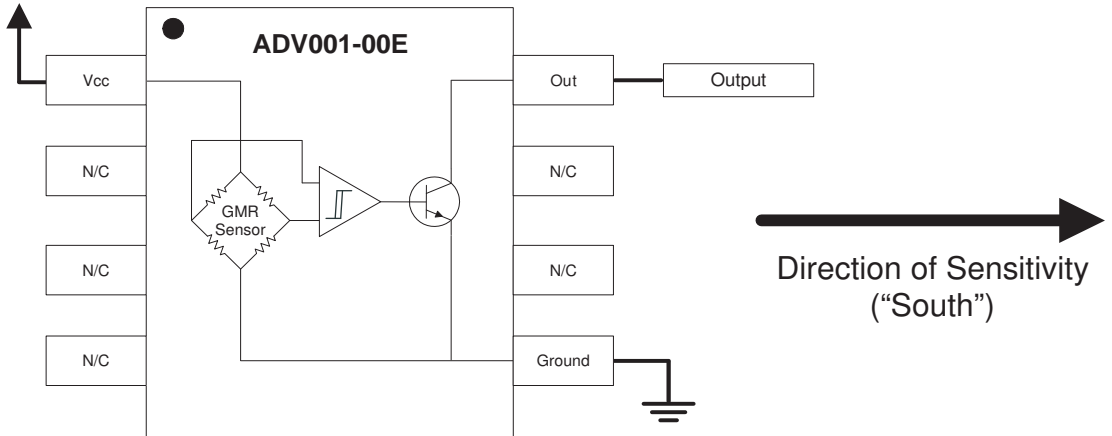
The following specifications are valid over all operating voltage and temperature ranges:

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

Notes:

1. Other operate and release points are available; contact NVE for details.
2. V_{OL} at $V_{CC} = 4.5\text{ V}$ 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.

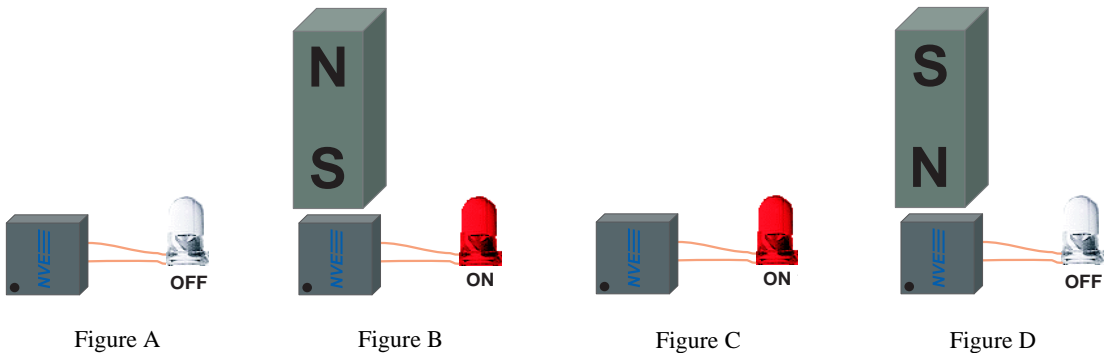
Functional Block Diagram and Pinout



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). The part is configured for pull down operation when in the “ON” state. An external pull-up resistor is required.

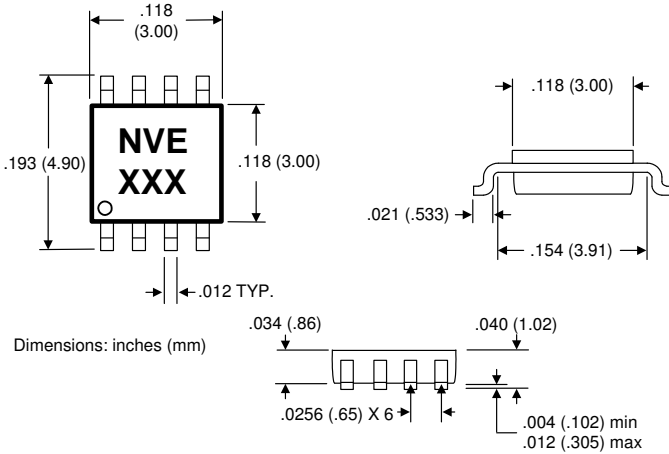
The following figures illustrate the switching operation:



As a south magnetic field is applied to the pin 8 side of the sensor, the digital output will turn on (Figure B). A north magnetic field applied to the pin 1 side will also turn the output on. The output will remain latched on (Figure C) until an opposite field is applied (Figure D).

Package Drawings and Specifications

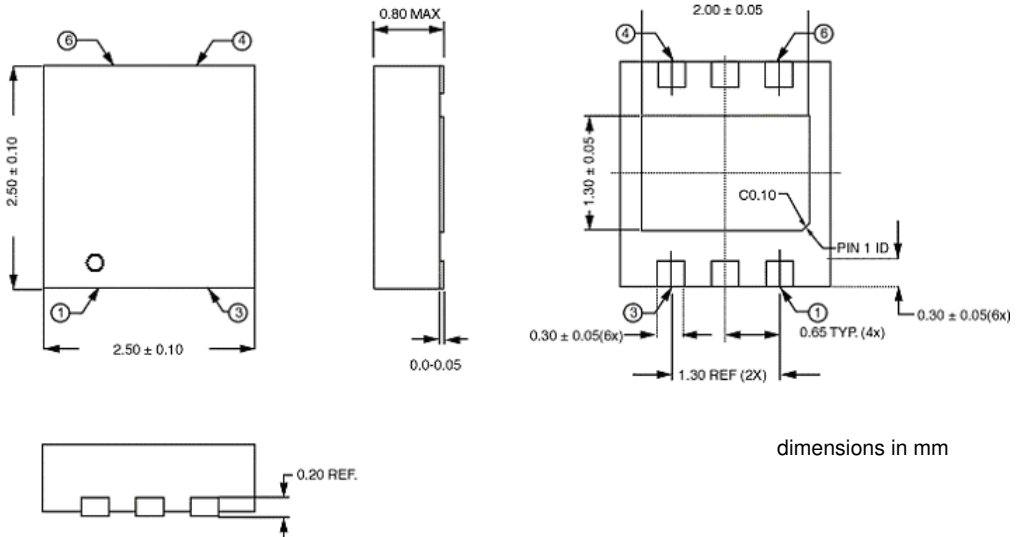
MSOP8 (ADV001-00E)



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.

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

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