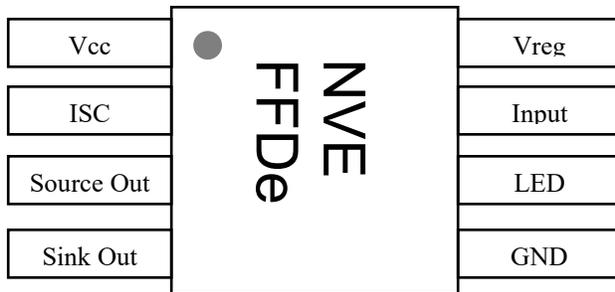
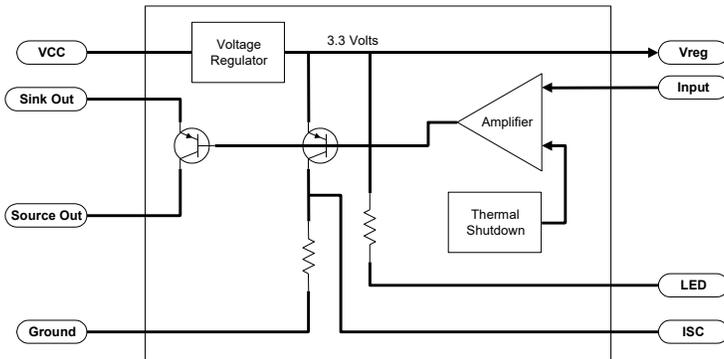


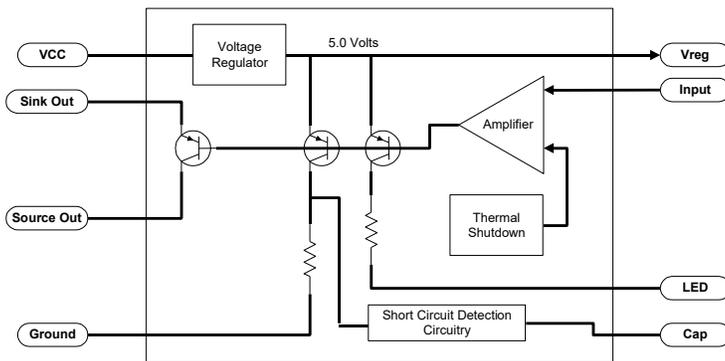
## DB-Series Power Switch ICs

### DB001 Equivalent Circuit and Top-View Pinout

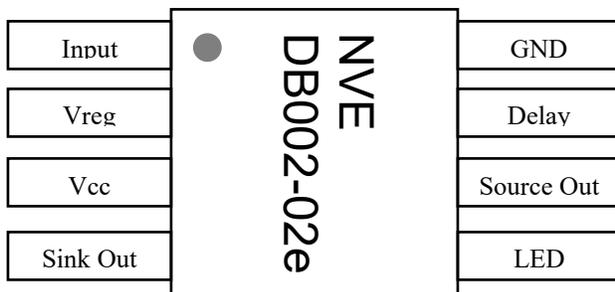


DB001-00E

### DB002 Equivalent Circuit and Top-View Pinout



DB002-02E



### Features

- Designed to work with NVE AD9xx or other magnetic sensors, capacitive sensors, inductive sensors, or photoelectric sensors
- High current output, up to 300 mA continuous
- Short circuit, reverse battery, transient, and thermal protection
- Integrated LED driver
- On-chip voltage regulator
- Up to 50 kHz switching frequency
- Wide voltage and temperature operating ranges
- MSOP8, SOIC8 packages or bare die

### Applications

- Cylinder position sensors
- Solenoid, motor, or relay driver
- Output driver for magnetic, capacitive, inductive, and photoelectric sensor assemblies

### Description

NVE's DB-Series parts are designed to provide the "front-end" signal processing required for robust industrial sensor assemblies. They can sink or source up to 300 mA and feature transient protection to meet rigorous EMC and ESD standards, integrated thermal shutdown, reverse supply protection, a voltage regulator, a driver for a high-efficiency LEDs, and short circuit protection (SCP) for the current-drive output.

The DB001 is designed to work with NVE's AD9xx GMR Switches™. By relying on the SCP embedded in AD9xx sensors, an ultraminiature sensor assembly is possible with just an AD9xx GMR Switch, a DB001-00 signal processor, one or two capacitors, and an LED.

The DB002 contains SCP circuitry and is designed to take a generic digital input from any source, such as inductive or photoelectric sensors. It is ideal for 24 V industrial protocols like EtherNet/IP, PROFINET/PROFIBUS, Modbus TCP/IP or RTU, IO-Link, and DeviceNet.

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Units
Input voltage	$V_{CC}$	0		36	Volts
Vcc reverse voltage	$V_{CC}$	-36		36	Volts
Operating temperature	$T_{min}, T_{max}$	-40		170	°C
Storage temperature		-65		170	°C
ESD (Human Body Model) <sup>1</sup>				2000	Volts
Output current					
DB001	$I_{max}$	-250		250	mA
DB002		-350		250	

Stresses beyond those listed under “Absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “Electrical characteristics” is not implied.

## Operating Specifications (-40 to 125 °C)

Parameter	Symbol	Min.	Typical	Max.	Units
Input voltage					
DB001	$V_{in}$	4.5		30	V
DB002		6.2		30	
Voltage regulator output voltage					
DB001	$V_{reg}$	3.0	3.3	3.6	V
DB002		4.5	5.0	5.5	
Voltage regulator output current	$I_{reg}$			10	mA
Switched output current					
DB001	$I_{max}$			200	mA
DB002				300	
Capacitive load	$C_L$			100	nF
Off State output leakage current	$I_{leak}$			300	μA
Quiescent current (output off)	$I_q$		1.4		mA
LED driver current	$I_{LED}$	0	3		mA
Thermal shutdown temperature	$T_{max}$		200		°C
Sourcing input current or CMOS/TTL drive current req.					
DB001	$I_{in-min}$		100		μA
DB002			5		
Turn-on voltage at input terminal	$V_{on}$			$V_{reg}/2 + 0.5$	V
Turn-off voltage at input terminal	$V_{off}$	$V_{reg}/2 - 0.5$			V
On/Off hysteresis	$V_{hyst}$		0.25		V
Output transistor saturation voltage	$V_{drop}$	0.5	1.1	1.5	V
Short circuit protection turn-on current	$I_{SCP-on}$	400		650	mA
Output short circuit current	$I_{SCP}$	0.5	0.84	1.0	A
Switching frequency bandwidth	$f_{switch}$	DC		50	kHz

## Thermal Specifications

Parameter	Symbol	Min.	Typical	Max.	Units
Junction–ambient thermal resistance					
DB001	$\theta_{ja}$		320		°C/W
DB002			240		
Power dissipation					
DB001	$P_d$		500		mW
DB002			675		

Typical Application Circuits

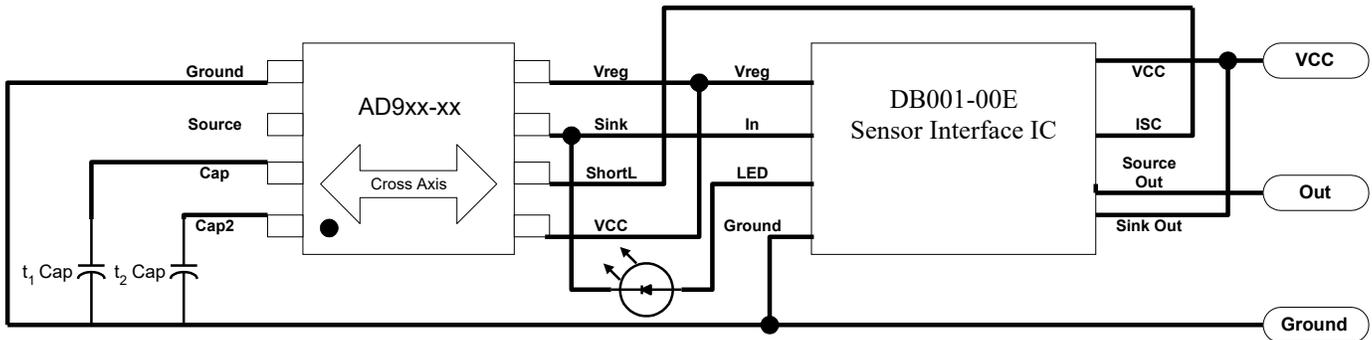


Figure 1: DB001 current-sourcing output configuration. For current-sinking applications, connect Source Out to GND and use Sink Out as the output.

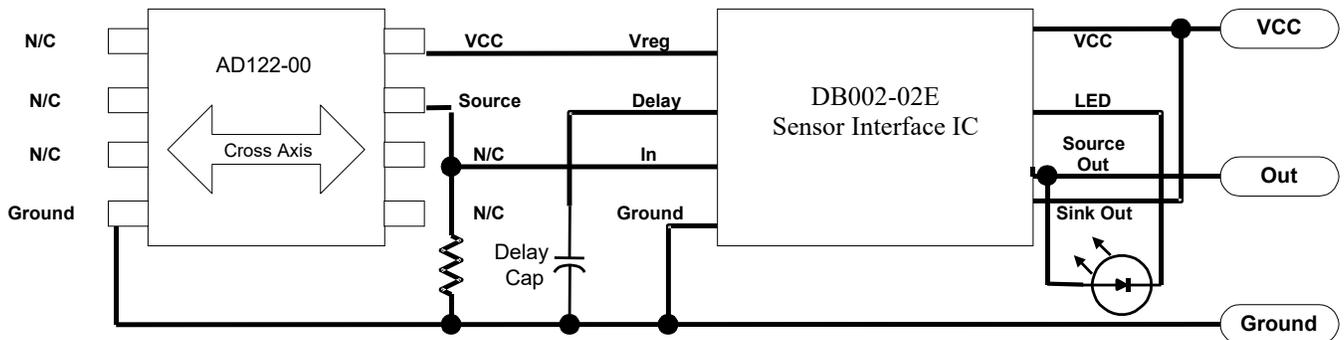


Figure 2: DB002 in current-sourcing output configuration. For current-sinking applications, connect Source Out to GND and use Sink Out pin as output.

## Pinouts

### DB001-00E

Symbol	Description	Pin
$V_{cc}^1$	Input power for DB001 IC	1
ISC	Connect to AD9xx ShortL pin6; leave floating if SCP is not used	2
Source Out	Output PNP transistor collector	3
Sink Out	Output PNP transistor emitter	4
$GND^{1,2}$	Voltage ground	5
LED	Current-limited source for LED	6
Input	Switch input	7
$V_{reg}^2$	Regulated voltage supply	8

### DB002-02E

Symbol	Description	Pin
Input	Switch input	1
$V_{reg}^2$	Regulated voltage supply	2
$V_{cc}^1$	Input power for DB002 IC	3
Sink Out	Output PNP transistor emitter	4
LED	Current-limited source for LED	5
Source Out	Output PNP transistor collector	6
Delay <sup>3</sup>	Capacitor sets timing of SCP onset. Connect a capacitor from here to GND, minimum 1 nF.	7
$GND^{1,2}$	Voltage ground	8

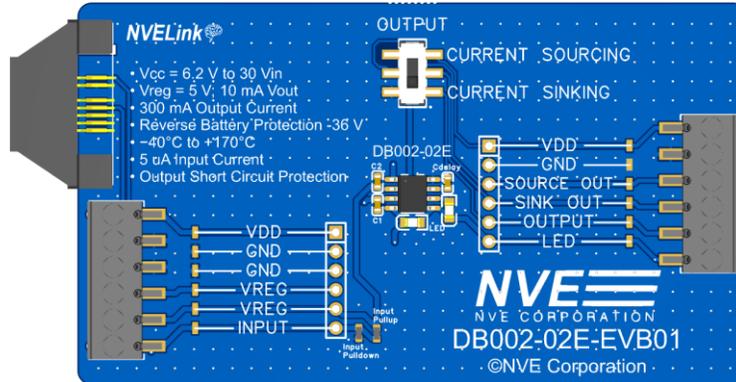
1. Bypass capacitor between VCC and Ground recommended (10 nF or larger).
2. In noisy environments a capacitor may be used on Vreg if necessary, up to 100 nF.
3. (DB002 only) A capacitor of at least 1 nF must be placed between the Delay pin and ground on the IC.

## Available Parts

Part Number	Input	Die Size (mm)	Package	Marking
DB001-00E	Current Sinking from AD9xx-00		MSOP8	FFD
DB001-01	Current Sinking from AD9xx-00	1.48 x 2.25	Die	30284D
DB002-02E	Any Current Sourcing or CMOS/TTL Compatible Digital Output Device		SOIC8	DB002-02
DB002-01	Any Current Sourcing or CMOS/TTL Compatible Digital Output Device	1.89 x 2.85	Die	30304H (Chip ID Number)

**Evaluation Board**

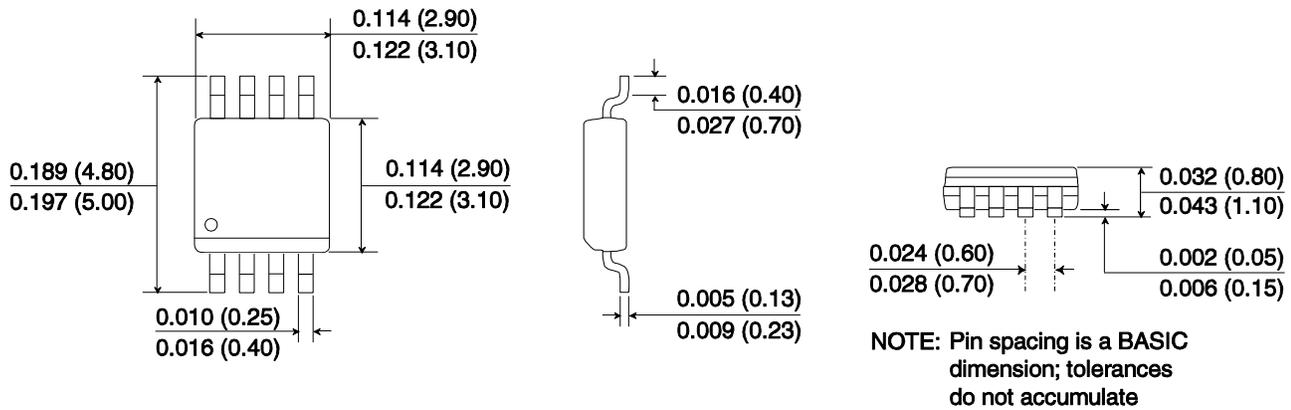
Evaluation boards are available for DB002-02E. The boards include recommended capacitors, an LED to show the output, and switches to select sourcing or sinking output. Connections are available through header pins and screw terminals. An edge connector allows the DB002 Evaluation Board to be connected to an NVELink board, like [ADT501-10E-EVB01](#).



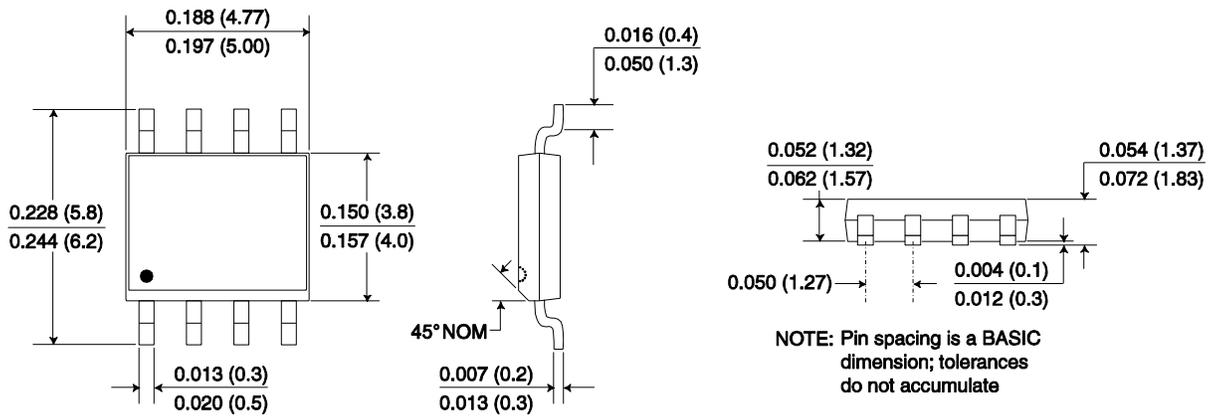
**Part Number DB002-02E-EVB01 Evaluation Board**  
(3.5" x 2" / 89 mm x 51 mm; actual size).

Package Drawings

MSOP8 (-00 suffix)



SOIC8 (-02 suffix)



RoHS  
COMPLIANT

Soldering profiles per JEDEC J-STD-020C, MSL 1.  
Units in inches (mm).

RoHS  
COMPLIANT

## ***Revision History***

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**SB-00-174 – Rev. A**  
March 2026

**Change**

- Initial release.

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March 2026