

Product Document

Absolute Digital

www.ams.com/AS5045



AS5045 – Magnetic Rotary Position Sensor

- 12-bit Programmable Magnetic Rotary Position Sensor
- Absolute angle position via SSI readout
- Absolute angle position on PWM output
- Zero position programmable

We provide innovative analog solutions to the most challenging applications in sensor and sensor interfaces, power management, and wireless.

General Description

The AS5045 is a contactless magnetic rotary position sensor for accurate angular measurement over a full turn of 360°. It is a system-on-chip, combining integrated Hall elements, analog front-end and digital signal processing in a single device. To measure the angle, only a simple two-pole magnet, rotating over the center of the chip, is required. The magnet may be placed above or below the IC.

The absolute angle measurement provides instant indication of the magnet's angular position with a resolution of $0.0875^\circ = 4096$ positions per revolution. This digital data is available via SSI readout and as a PWM signal. The PWM pulse width is programmable for 1s/step or 2s/step (244Hz or 122Hz PWM frequency). An internal voltage regulator allows the AS5045 to operate at either 3.3V or 5V supplies.

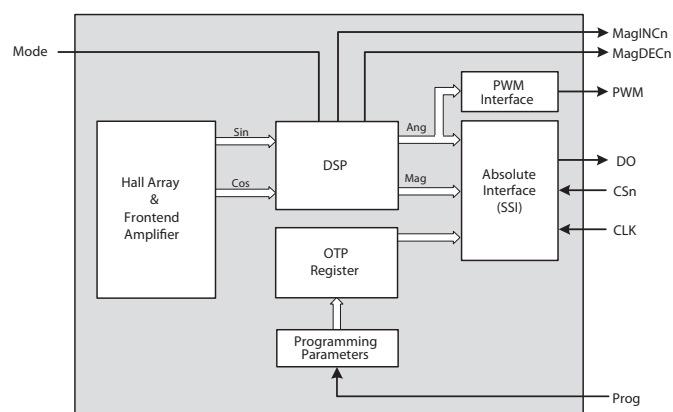
Applications

- Robotics and industrial automation
- Stepper Motor position and motion control
- Digital potentiometer
- R/C Servo

Features

- 360° contactless high resolution angular position sensing
- Two digital 12-bit absolute outputs:
 - SSI interface
 - PWM output
- Failure detection mode for magnet placement monitoring and loss of power supply
- Push button functionality detects movement of magnet in Z-axis
- Mode selection: input for optimizing noise vs. speed
- 3.3V or 5V compliant
- 16-pin SSOP package

AS5045 Block Diagram



Benefits

- Complete system-on-chip
- Absolute angle position via SSI readout and PWM output
- User programmable zero position
- High reliability due to contactless sensing
- Immune to external magnetic stray fields
- Robust to misalignment, airgap variations, temperature variations and external magnetic stray fields

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