

Product Document

14-bit Resolution

www.ams.com/AS5048



AS5048 – Magnetic Rotary Position Sensor

- High resolution, high accuracy and repeatability
- ISP (in system programmable) zero position
- No external programmer needed
- Wide temperature range (-40°C to +150°C)

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

General Description

The AS5048 is an easy to use 360° angle position sensor with a 14-bit high resolution output. The maximum system accuracy is 0.05° assuming linearization and averaging is done by the external microcontroller. The IC measures the absolute position of the magnet's rotation angle and consists of Hall sensors, analog digital converter and digital signal processing. The zero position can be programmed via SPI or I²C command. Therefore no programmer is needed any more. This simplifies the assembly of the complete system because the zero position of the magnet does not need to be mechanically aligned. This helps developers to shorten their developing time. The sensor tolerates misalignment, air gap variations, temperature variations and as well external

magnetic fields. This robustness and wide temperature range (-40°C up to +150°C) of the AS5048 makes the IC ideal for rotation angle sensing in harsh industrial and medical environments. Several AS5048 ICs can be connected in daisy chain for serial data read out. The absolute position information of the magnet is directly accessible over a PWM output and can be read out over a standard SPI or a high speed I²C interface. Version AS5048A comes with SPI and PWM Interface. Version AS5048B is configured with the I²C interface and has also a PWM output. An internal voltage regulator allows the AS5048 to operate at either 3.3 V or 5 V supplies.

Applications

Robotics

- Motor control and joint position detection

Industry

- Motor position and motion control
- Potentiometer

Medical

- Surgical robots
- Injection pumps
- Fitness equipment

Features

- 360° contactless angle position sensor
- SPI and PWM or I²C and PWM interface
- Simple programmable zero position via SPI or I²C command
- No external programmer needed
- 0.0219°/LSB 14-bit full scale resolution
- Angle accuracy 0.05° after system linearization and averaging
- Daisy chain capability
- Wide magnetic field input range: 30mT – 70mT
- Operating temperature -40°C up to +150°C
- High reliability due to contactless sensing
- Immune to external magnetic stray fields
- 3.3V or 5V compliant
- 14-pin TSSOP package

AS5048 Block Diagram

