

Key Features

- Contactless high resolution rotational position encoding over a full turn of 360 degrees
- Two digital 10bit absolute outputs:
 - Serial interface and
 - Pulse width modulated (PWM) output
- Three incremental output modes:
 - Quadrature A/B and Index output signal
 - Step / Direction and Index output signal
 - 3-phase commutation for brushless DC motors
 - 10, 9, 8 or 7 bit user programmable resolution
- User programmable zero / index position
- Failure detection mode for magnet placement monitoring and loss of power supply
- Rotational speeds up to 30,000 rpm
- Push button functionality detects movement of magnet in Z-axis
- Serial read-out of multiple interconnected AS5040 devices using Daisy Chain mode
- Wide temperature range: - 40°C to + 125°C
- Fully automotive qualified to AEC-Q100, grade 1
- Small Pb-free package: SSOP 16 (5.3mm x 6.2mm)

Benefits

- Complete system-on-chip
- Flexible system solution provides absolute, PWM and incremental outputs simultaneously
- Ideal for applications in harsh environments due to contactless position sensing
- Tolerant to magnet misalignment and airgap variations
- No temperature compensation necessary
- No calibration required

Applications

- Industrial applications:
 - Contactless rotary position sensing
 - Robotics
 - Brushless DC motor commutation
 - Power tools
- Automotive applications:
 - Steering wheel position sensing
 - Gas pedal position sensing
 - Transmission gearbox encoder
 - Headlight position control
 - Power seat position indicator
- Office equipment: printers, scanners, copiers
- Replacement of optical encoders
- Front panel rotary switches
- Replacement of potentiometers

General Description

The AS5040 is a contactless magnetic rotary encoder for accurate angular measurement over a full turn of 360°.

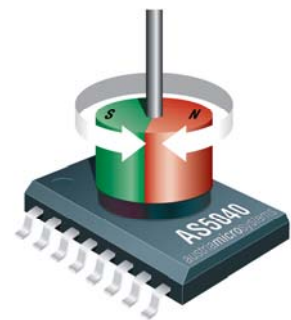
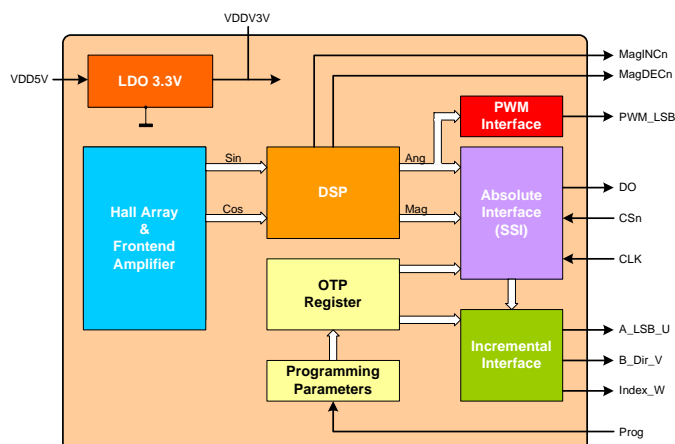
It is a system-on-chip, combining integrated Hall elements, analog front end and digital signal processing in a single device.

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 $0.35^\circ = 1024$ positions per revolution. This digital data is available as a serial bit stream and as a PWM signal.

Furthermore, a user-programmable incremental output is available, making the chip suitable for replacement of various optical encoders.

An internal voltage regulator allows the AS5040 to operate at either 3.3 V or 5 V supplies.



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