

Key Features

- Contactless high resolution encoding over a full turn of 360 degrees
- Flexible system due to user programmable incremental output modes:
 - 10, 9, 8 or 7 bit user programmable resolution
 - Quadrature A/B and index output signal
 - Single channel output and direction indication
 - U-V-W commutation signals for brushless DC motors
- Absolute angular position mode:
 - 10-bit resolution providing 1024 absolute positions per 360 degrees (step size ~ 0.35 degrees)
- Synchronous serial interface (SSI) output for absolute position data
- Pulse width modulated (PWM) output, duty cycle proportional to angle
- User programmable zero and index position
- Failure detection mode for magnet placement monitoring
- Rotational speeds up to 10000 rpm (incremental output)
- Push button functionality detects movement of magnet in Z-axis
- Two supply voltages: 3.3V or 5V
- Wide temperature range: -40°C to + 125°C
- SSOP 16 package: 5.3mm x 6.2mm

Benefits

- World's smallest multiple output rotary encoder
- Tolerant to magnetic source misalignment
- Failure detection feature
- Complete system-on-chip:
 - Flexible system solution provides absolute, incremental and PWM digital outputs simultaneously
 - Minimum number of external components needed
- Serial read-out of multiple AS5040 devices using daisy chain mode feature
- Ideal for applications in harsh environments due to contactless position sensing

Applications

- Industrial applications such as:
 - Robotics
 - Motion Control
 - Brushless DC motor commutation
 - Power tools
- Automotive applications:
 - Steering wheel position sensing
 - Transmission box encoder
 - Headlight position control
 - Power seat position sensing
- Replacement of optical encoders
- Front panel rotary switches and potentiometers

General Description

The AS5040 is a system-on-chip, combining integrated Hall elements, analog front end and digital signal processing in a single device. It provides incremental output signals and the absolute angular position of a magnet that is placed above or below the device.

The AS5040 can be configured to specific customer requirements by programming the integrated OTP (one time programmable) register. An internal voltage regulator allows operating the AS5040 device at either 3.3 V or 5 V supplies.

