



S4-3DB01

3D Linear Hall-Effect Sensor IC with SFI Capabilities & Wake-Up Function

Description

The S4-3DB01 is a Hall-effect based Sensor measuring all 3 dimensions of the magnetic field. It is assembled in a small TSSOP8L package.

The IC outputs raw data representing the 3 Br field dimensions X, Y and Z and the actual temperature over the I²C interface. Sensitivity and operation modes are user selectable by I²C interface. It features 3 different power modes and 3 different measurement modes with parameters selectable via I²C.

This enables a large variety of possible applications, using an external CPU controlling the device.

Applications

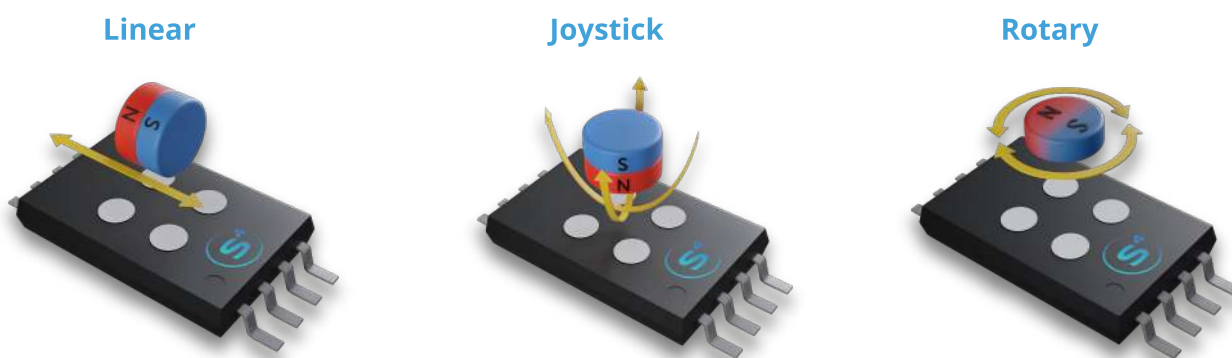
- SFI Joysticks
- HMI Applications, Knobs, Levers, Shifter Position
- Door Handle, Door Lock, Window Position
- Robotics, Automation

Key Features

- Unique Backside Hall Sensor Technology for sensing of all 3 dimensions of magnetic fields from 4 sensor clusters
- User selectable operation modes, sensitivity and conversion rate
- I²C Interface with up to 1 MHz data rate
- 16-bit data output for magnetic field strength and temperature
- Ultra-low power consumption in Sleep Mode
- 9 User selectable Slave Addresses
- Supply Under Voltage detection
- Operating temperature range: -40°C ... +125°C
- Supply voltage range: 2.7V ... 3.6V
- AEC-Q100 qualified

Application example

The S4-3DB01 has 4 set of true 3D Hall Clusters in a small SMD package that can independently do measurements of magnetic flux density in X/Y/Z axes and output 12bits raw data via I²C interface. Therefore, by simple calculation in MCU or CPU, User has ability to do SFI measurement of all kinds of 3D magnet motions.

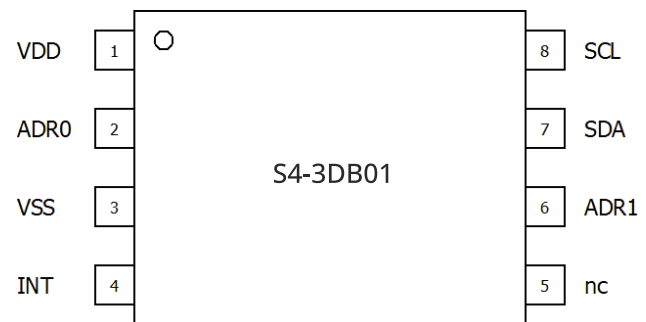


Key Specifications

General	
Supply Voltage Range	2.7V ...3.6V
Supply Current	3.5 mA Measurement mode 6.0µA Inactive mode 10.0nA Sleep mode
Magnetic Field Range	20mT ...200mT
Measure cycle Duration	175µs ...1100µs
Power On Time	500µs typical
Operating temp.Range	-40°C...+125°C

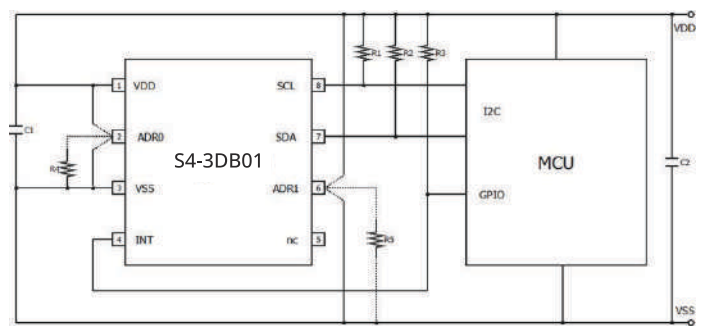
Performance	
Linearity Error	+/- 1,0%
Sensitivity Initial Error	+/- 5.0%
Sensitivity Temp. Drift	+/- 3,0%
Sensitivity mismatch	+/- 5.0%
Sensitivity mismatch Temp. Drift	+/- 3,0%
Zero Field Output	+/- 1,0%
Zero Field Output Temp. plus Supply Drift	+/- 2,0%
Cross-sensitivity	+/- 3,0%
Noise (RMS)	0.125% typical

Pin Assignment



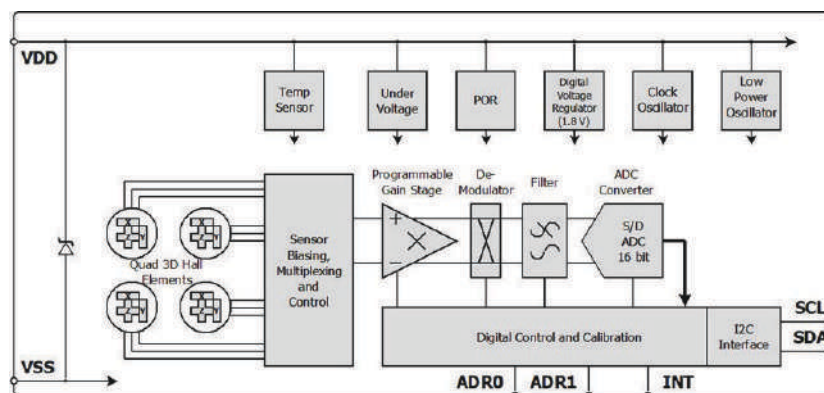
TSSOP-8L Package

Recommended Application Circuit



Recommended component values:
C1, C2: 100 nF; R1, R2, R3: 10 kΩ; R4, R5: ≥ 100kΩ

Block Diagram



Highlights

- Customer programmable Br sensor configurations
- Very high magnetic system design flexibility
- Stray field immunity even for the joystick function
- Wake-up function triggered by external signal or by magnetic & temperature event
- Customer programmable wake-up function relative and absolute threshold value
- Customer programmable pause time
- Small SMD package

