



## Product brief

# AK09940

### Ultrahigh precision 3-axis Electronic Magnetometer

#### 1. General Description

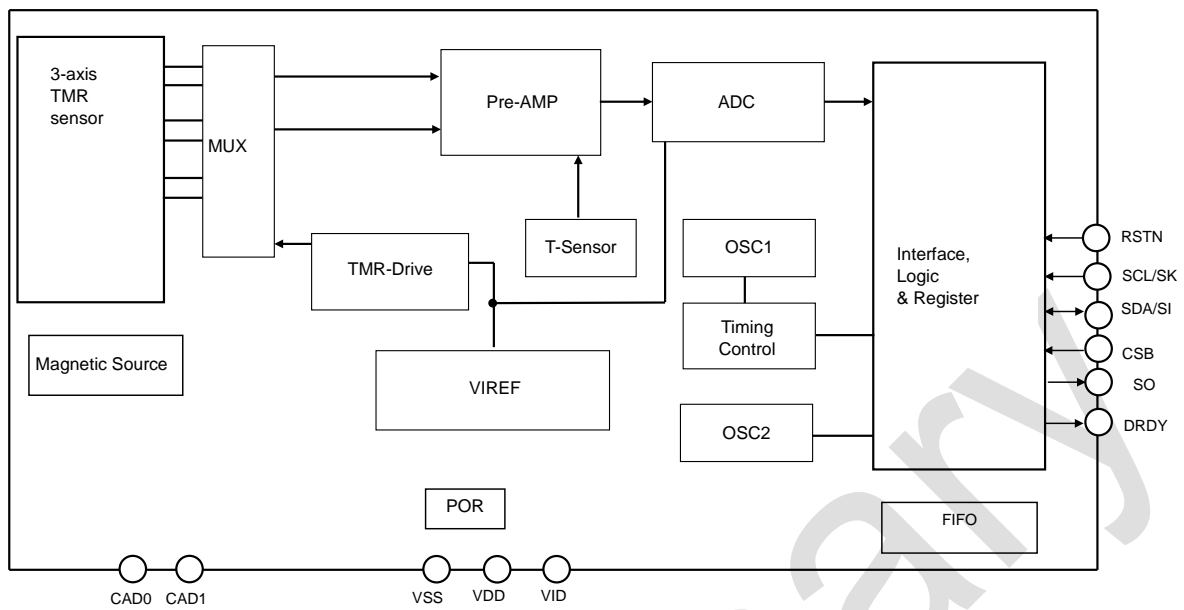
AK09940 is ultrahigh precision 3-axis electronic magnetometer IC with ultrahigh sensitive TMR sensor technology.

Small package of AK09940 incorporates magnetic sensors for detecting magnetic field in the X-axis, Y-axis, and Z-axis, a sensor driving circuit, signal amplifier chain, and an arithmetic circuit for processing the signal from each sensor. Self-test function is also incorporated.

#### 2. Features

- Functions:
  - 3-axis magnetometer device
  - Built-in A to D Converter for magnetometer data out
  - 18-bit data out for each 3-axis magnetic component
    - Sensitivity: 10 nT/LSB (typ.)
    - Range:  $\pm 1200 \mu\text{T}$  (typ.)
  - Serial interface
    - I<sup>2</sup>C bus interface  
Standard and Fast modes compliant with Philips I<sup>2</sup>C specification Ver.2.1
    - 4-wire SPI
  - Operation mode
    - Power-down, Single measurement, Continuous measurement and Self-test
  - DRDY function for measurement data ready
  - Magnetic sensor overflow monitor function
  - Built-in oscillator for internal clock source
  - Power on Reset circuit
  - Self-test function with internal magnetic source
  - Built-in temperature sensor
  - Built-in magnetic sensitivity adjustment circuit
  - 8 FIFO data buffer
  - Selectable sensor drive
    - Low power drive / Low noise drive
- Operating temperatures:
  - -30°C to +85°C
- Operating supply voltage:
  - Analog power supply +1.7V to +1.98V
  - Digital Interface supply +1.65V to analog power supply voltage
- Current consumption:
  - Power-down: 2  $\mu\text{A}$  (typ.)
  - Measurement:
    - Average current consumption at 100 Hz repetition rate
      - ✧ Low power drive 1: 0.04mA (typ.)
      - ✧ Low power drive 2: 0.06mA (typ.)
      - ✧ Low noise drive 1 : 0.11mA (typ.)
      - ✧ Low noise drive 2 : 0.21mA (typ.)
- Package:
  - AK09940 11-pin LGA: 1.6 mm × 1.6 mm × 0.58 mm (typ.)

**3. Block Diagram and Functions**



**4. Evaluation Kit**



Evaluation Kit "ACSP09940"

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