1. General Description

AK09940A is ultrahigh precision 3-axis electronic magnetometer IC with ultrahigh sensitive TMR sensor technology. Small package of AK09940A 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:**
  - Upward compatible with AK09940.
  - 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: ±1200 µT (max.)
  - Serial interface
    - I²C bus interface
      - Standard and Fast modes compliant with Philips I²C specification Ver.2.1
    - 4-wire SPI
  - Operation mode
    - Power-down, Single measurement, Continuous measurement, External trigger 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: +1.7 V to +1.98 V
  - Digital Interface supply: +1.65 V to +3.6 V

- **Current consumption:**
  - Power-down: 0.5 µA (typ.)
  - Measurement:
    - Average current consumption at 100 Hz repetition rate
      - Low power drive 1: 30 µA (typ.)
      - Low power drive 2: 60 µA (typ.)
      - Low noise drive 1: 100 µA (typ.)
      - Low noise drive 2: 200 µA (typ.)

- **Package:**
  AK09940A 11-pin LGA: 1.6 mm × 1.6 mm × 0.58 mm (typ.)
3. Block Diagram and Functions

3.1. Block Diagram

![Block Diagram]

4. Package

4.1. Marking
Product name: 40
Date code: X1X2X3
- X1 = Year code
- X2 = Month code
- X3 = Lot

![Marking Diagram]

4.2. Pin Assignment

<table>
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<th>X2</th>
<th>X3</th>
</tr>
</thead>
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![Pin Assignment Table]

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