



YAS526C

MS-2

Magnetic field Sensor

Overview

YAS526C is the Triaxial Geomagnetic Sensor IC integrating high sensitivity triaxial Magnetic Sensors, A/D inputs for inclination sensors, temperature sensor for inclination sensor temperature characteristics correction, Buffer Amplifiers, A/D Converters, Clock Generators, and Serial Data Interfaces (supports I²C) on a multi-chip package.

YAS526C allows you to make up a high sensitive, compact and low-power electronic compass in a portable GPS system or a mobile phone.

Features

- A manufacturing process that makes magnetic sensor on Si wafer with high precision realizes integration with peripheral circuits on one chip.
- High sensitive geomagnetic sensor IC is realized by integrating magnetic sensors and low noise amplifiers.
- Three A/D input pins for inclination sensor
- High noise immunity is improved by digitizing output from geomagnetic sensor IC.
- External interface supports I²C bus (100kbps/400kbps, slave mode).
- Geomagnetic sensor with superior high board density and low-power consumption.
- Automatic power-down control mode is available after geomagnetic measurements.
- Temperature sensor for inclination sensor temperature characteristics correction
- Others.

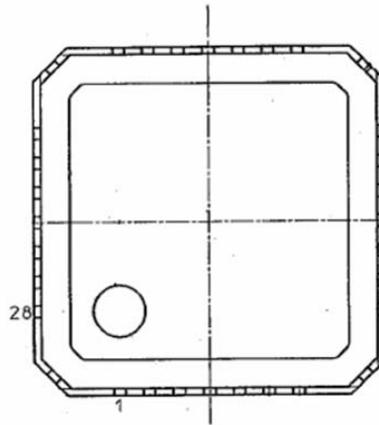
Manufacturing process	CMOS + Magnetic Sensor
Package	Lead-free 28-pin QFN package (YAS526C-QZ)
Supply voltage for Core	2.5 V to 3.6 V
Supply voltage for Interface	1.7 V to VDD
Operating temperature	-20 to +85 °C
Power consumption during operation.	
Magnetic field measurement	27 mW (VDD = 3.0 V)
Inclination sensor A/D conversion	6 mW (VDD = 3.0 V)
Magnetic sensor section	
Measuring magnetic field range	±300 μT
Resolution	≦0.6 μT/count (X,Y), ≦1.2 μT/count (Z)
A/D input section	
Input range	0.5 V to 2.5 V
Resolution	3.0 mV
Measuring time	
Magnetic sensor measurement	within 8 ms (Three axes collective measurement)
Inclination sensor A/D	within 4 ms (per 1 channel)

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YAS526C CATALOG
CATALOG No.: LSI-BAS526C20
2007.6

■ Pin Description

Here is a figure for pin assignment and a table for pin descriptions.



28 Pin QFN Top View

Pin Descriptions

Pin No.	Pin Name	I/O	Function
1	I1	A	A/D input 1
2	I2	A	A/D input 2
3	I3	A	A/D input 3
6	VSS1	-	Ground
7	IOVDD1	-	Power supply for Interface
8	SCL1	I	Serial clock
14	SDA1	I/Od	Serial data
15	VDD1	-	Power supply for Core
16	T1	I	Test mode (connecting with VDD)
18	VSS2	-	Ground
19	T2	I	Test mode (connecting with VDD)
20	IOVDD2	-	Power supply for interface
21	SCL2	I	Serial clock
22	SDA2	I/Od	Serial data
28	VDD2	-	Power supply for Core

Note) Connection of I3(A/D input 3) pin to VDD is recommended when using YAS526C with a biaxial inclination sensor connected.

Connecting I1, I2, and I3 to VSS is recommended when an inclination sensor is not connected.

Pin 16 and pin 19 are used, connecting with VDD.

When used, no connection should be made to the pins (4, 5, 9, 10, 11, 12, 13, 17, 23, 24, 25, 26, 27) except the above.

A : Analog input

I : Digital Input

Od : Open drain output

■ Pin Functions

● Power Supply (VDD1, VDD2, IOVDD1, IOVDD2, VSS1, VSS2)

These pins are for power supply of YAS526C.

VDD1, VDD2	- Power Supply for Core
IOVDD1, IOVDD2	- Power Supply for the Interface
VSS1, VSS2	- Ground

● Serial Data Interface (SCL1, SCL2, SDA1, SDA2)

SCL1, SCL2	- Serial clock input pin. These pins are used with an external pull-up register.
SDA1, SDA2	- Serial data input/output pin. These pins are used with an external pull-up register.

● Analog Input

I1, I2, I3 - A/D input pin

Connection of I3 pin to VDD is recommended when using YAS526C with a biaxial inclination sensor connected.

Connecting I1, I2, and I3 to VSS is recommended when an inclination sensor is not connected.

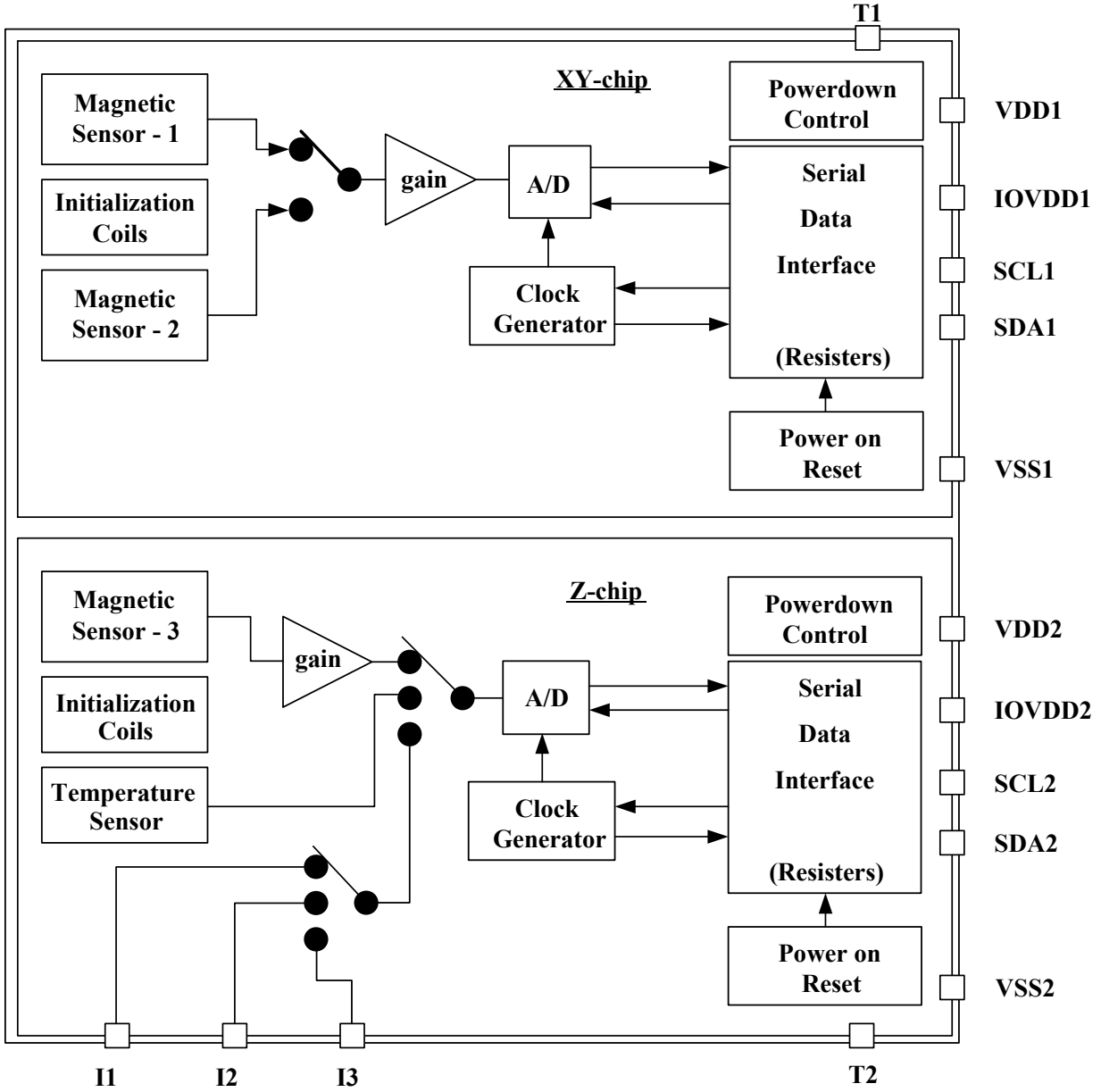
● Others (T1, T2)

T1, T2 - Test mode control pin.

Normally, these pins are used, connecting with VDD

■ **Block Diagram**

Here is the internal block diagram of YAS526C.



Block Diagram

■ Function Descriptions

● Analog Circuit Section

○ Magnetic Sensor

YAS526C includes three Magnetic Sensors.

Only the sensor of an axis to measure at the time of magnetic field measurement is operated.

○ Buffer Amplifier

The buffer amplifier amplifies a signal output from the bridge of magnetic sensor.

The amplifier operates only when magnetic field measurement is made.

○ Temperature Sensor

The temperature sensor is a sensor using band gap and in Z chip.

The sensor operates only when temperature is measured.

○ A/D Converter (ADC)

The integrating A/D converter (ADC) using switched capacitor is mounted on YAS526C.

XY chip and Z chip has one each.

The ADC of XY chip has Magnetic field Rough Offset Measurement and Magnetic field Normal Measurement modes.

The ADC of Z chip has Temperature Measurement and External Input Measurement modes in addition to Magnetic field Rough Offset Measurement and Magnetic field Normal Measurement modes.

The ADC operates only when measurement is performed.

○ Analog External Input A/D

The A/D measures values from analog external input.

Input range is from 0.5 to 2.5V. One count of A/D converter is about 3.0mV.

○ Clock Generator

The clock generator supplies clocks for ADC and digital circuits.

The generator operates only when the measurements is made.

○ Power-on Reset

The Power-on Reset circuit detects a rising of supply voltage for the core and initializes circuits.

○ Initialization Coil

The coils are used when the magnetic sensor cannot give original characteristics due to receiving high magnetic field.

Generating magnetic field by the initialization coils initializes the magnetic sensor characteristics.

- Digital Circuit Section

- Serial Data Interface

YAS526C serial data interface supports I²C serial interface and operates in the slave mode.

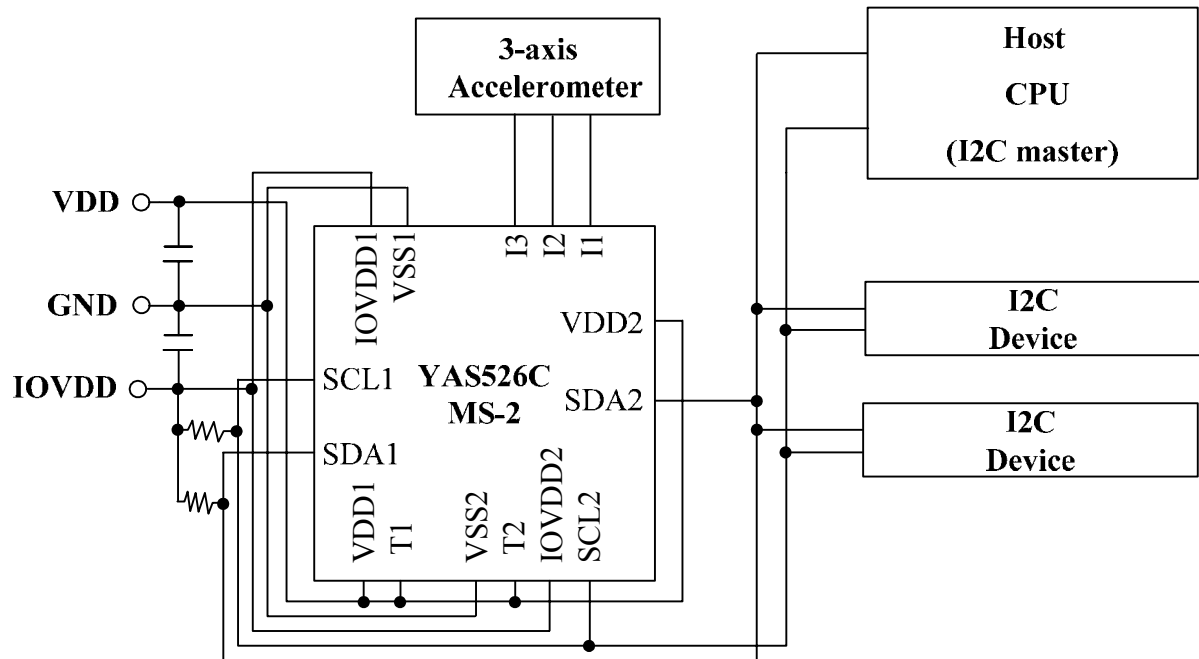
SCL (SCL1, SCL2) : Serial clock input pin

SDA (SDA1, SDA2) : Serial data input/output pin

Communication is performed through the above pins.

■ Example of System Configuration

Here is an example of system configuration.

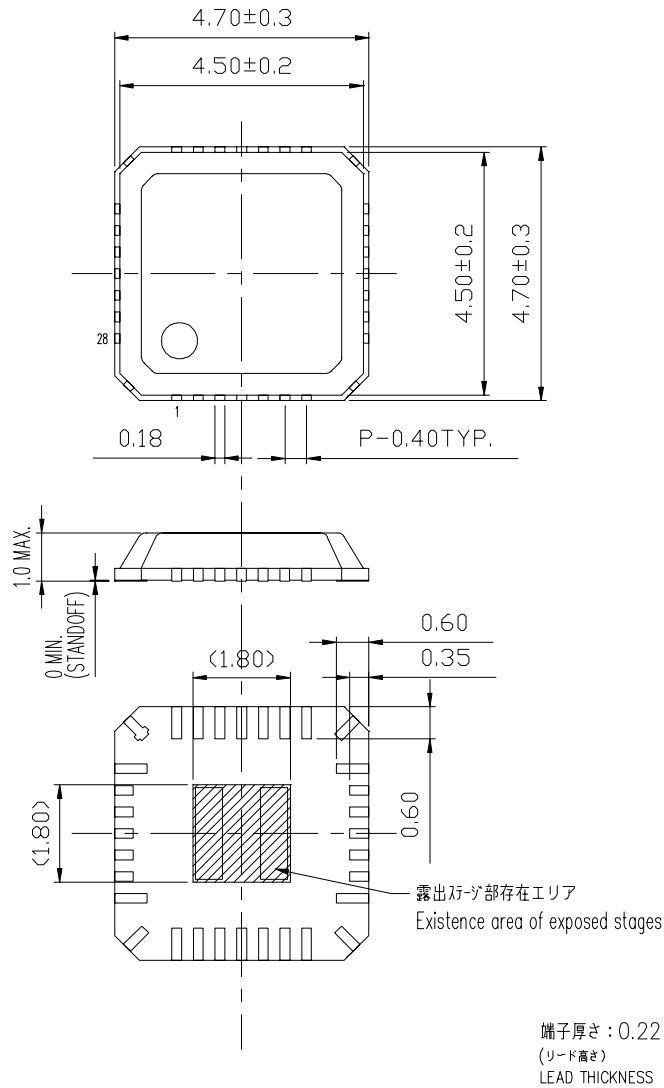


Example of system configuration

■ Package Outline Drawing

Notice : Do not expose wirings of the mount board within a square area (1.8 mm on a side) centering around the center of the chip.
 Since a part of the lead frame is exposed on the package, if the wiring short-circuits to the exposed part, malfunctions may occur.

C-PK28QP-2



モールドコーナー形状は、この図面と若干異なるタイプもあります。
 カッコ内の寸法値は参考値です。
 モールド外形寸法はバリを含みません。
 単位 : mm

The shape of the molded corner may slightly differ from the shape in this diagram.
 The figure in the parentheses () should be used as a reference.
 Plastic body dimensions do not include resin burr.
 UNIT: mm

注) 表面実装LSIは、保管条件、及び半田付けについての特別な配慮が必要です。
 詳しくはヤマハ代理店までお問い合わせください。

Note: The storage and soldering of LSIs for surface mounting need special consideration.
 For detailed information, please contact your local Yamaha agent.

YAS526C



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