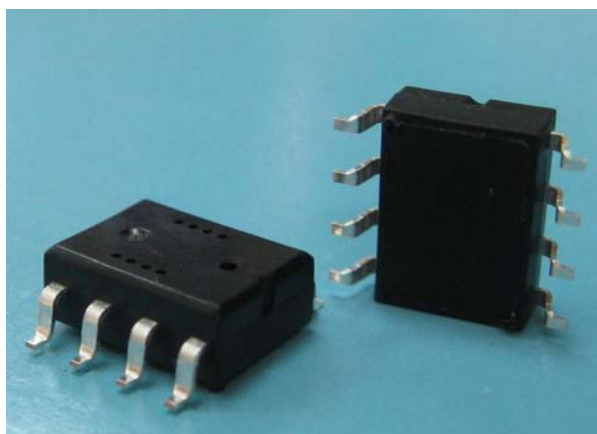


**MIS-3400 series (Preliminary)
Intelligent Pressure Sensor****■ Features**

- Supply Voltage 2.0 to 3.6V
- 300 to 1100 hPa pressure range
- Low standby current: <math><0.1\mu\text{A}</math>
- Factory calibrated and temperature compensated
- SPI digital signal output



The MIS-3400 is an intelligent pressure sensor which consists of a MEMS piezoresistive pressure sensor and a signal conditioning ASIC. The signal conditioning

■ Applications

- Digital barometer
- Weather forecast station

ASIC is a 16-bit AD converter with embedded 512 bits OTP memory. The sensor was calibrated and temperature compensated in factory. The factors for temperature compensation were stored in OTP memory. Users can implement temperature compensation via an external micro processor. The external microprocessor reads the raw output data from MIS-3400 and does simple calculation according to the factors stored in OTP memory. Therefore using MIS-3400 series is easy to get rid of bothersome calibrations and temperature compensations. MIS-3400 provides SPI digital serial output interface to communicate with microprocessors. MIS-3400 series is specially designed for low voltage and low power consumption concerned applications.

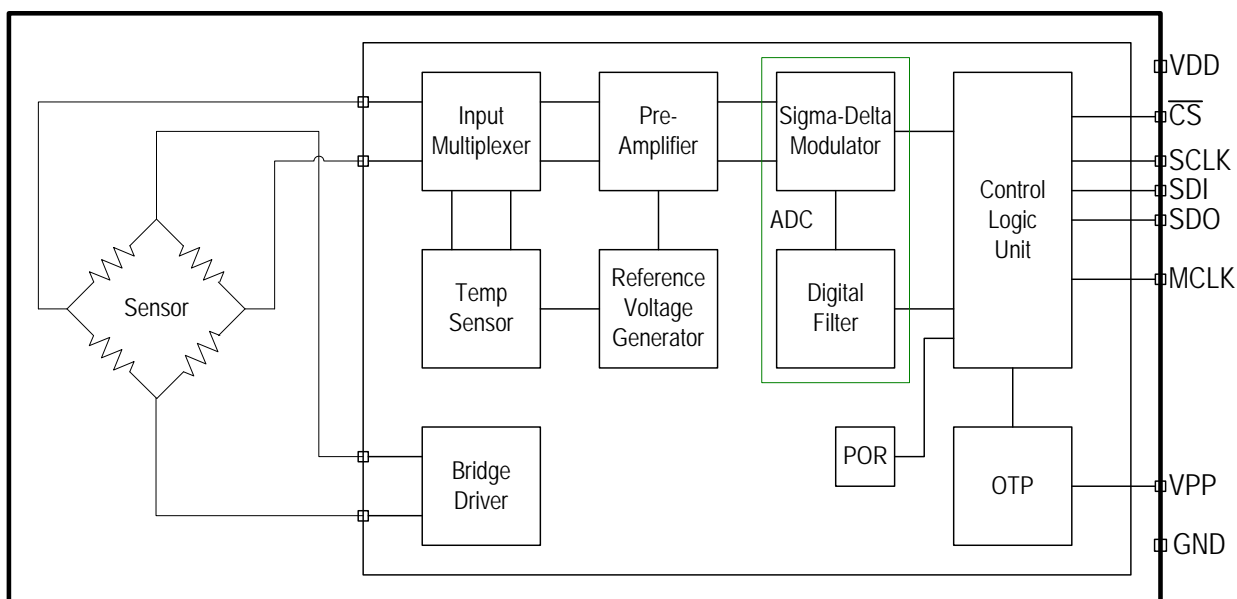


Fig. 1 Functional Block Diagram of MIS-3400

■ Specifications

| Parameter | Symbol | Conditions | Min | Typ | Max | Units | Notes |
|--|------------|-----------------------------------|--------|-------|----------|----------------|-------|
| 1. Absolute Maximum Ratings | | | | | | | |
| Supply Voltage | VDD | | -0.3 | | 4 | V | |
| Inputs voltage to VSS | | | -0.3 | | VDD+0.3 | V | |
| Storage Temperature Range | | | -40 | | 125 | °C | |
| Maximum Overpressure | | | | | 2X | Rated pressure | |
| ESD Rating | | | | | | | |
| HBM | | | 4000 | | | V | |
| MM | | | 400 | | | | |
| 2. Recommended Operating Conditions | | | | | | | |
| Pressure Range | | | 300 | | 1100 | hPa | mbar |
| Operating Temperature Range | | | -40 | | 85 | °C | |
| Humidity | | | 0 | | 95 | %RH | |
| Supply Voltage | VDD | | 2.0 | 3 | 3.6 | V | |
| Supply Current | | | | | | | |
| Peak Current During Conversion | I_{sc} | | | 600 | | μA | |
| Standby | I_{ss} | | | 0.1 | 0.5 | μA | |
| Average | I_{avg} | 1 conversion/s | | 21.6 | 30.5 | μA | |
| Conversion Time | t_{conv} | MCLK=32.768kHz | | 34.5 | | ms | |
| External clock signal | MCLK | | 30000 | 32768 | 35000 | Hz | |
| Duty cycle of MCLK | | | 40 | 50 | 60 | % | |
| Serial data clock | SCLK | | | | 500 | kHz | |
| 3. Electrical Parameters | | | | | | | |
| Analog to Digital Converter | | | | | | | |
| Resolution | | | | 16 | | Bits | |
| Output Code Range | | | 2048 | | 63487 | | |
| Integral Nonlinearity | | | -4 | | +4 | LSB | TBD |
| Differential Nonlinearity | | | -1 | | +1 | LSB | TBD |
| SPI Interface | | | | | | | |
| Digital Inputs | | | | | | | |
| Input High Voltage | V_{IH} | $I_{IH} < 5\mu A$ | 70%VDD | | VDD+0.3V | | |
| Input low Voltage | V_{IL} | $I_{IL} < 5\mu A$ | -0.3V | | 70%VDD | | |
| Rise time | t_r | | | | 200 | nS | |
| Fall time | t_f | | | | 200 | nS | |
| Digital Outputs | | | | | | | |
| Output High Voltage | V_{OH} | $I_{OH} = -1mA$ | 80%VDD | | | | |
| Output low Voltage | V_{OL} | $I_{OL} = 1mA$ | | | 20%VDD | | |
| Rise time | t_r | $C_{load} = 50pf$ | | | 200 | nS | |
| Fall time | t_f | $C_{load} = 50pf$ | | | 200 | nS | |
| Pressure Output Characteristics | | | | | | | |
| Resolution | | | | 0.25 | | hPa | |
| Absolute Pressure Accuracy | | p = 750~1100 hPa Ta = 25°C | -1.5 | | 1.5 | hPa | 2 |
| Relative Pressure Accuracy | | p = 750~1100 hPa Ta = 25°C | -0.5 | | 0.5 | hPa | 3 |
| Relative Pressure Error over Temperature | | p = 750~1100 hPa Ta = -10~70°C | -1.5 | | 1.5 | hPa | 4 |
| Temperature Output Characteristics | | | | | | | |
| Resolution | | | | 0.1 | | °C | |
| Accuracy | | -40 to 85°C | -2 | | 2 | °C | |
| Notes : | | | | | | | |
| 1. Unless otherwise specified, measurements were taken with a supply voltage of 3 Vdc at a temperature of 25±3°C and humidity ranging from 0~95% RH. | | | | | | | |
| 2. Maximum error of pressure reading over the pressure range. | | | | | | | |

3. Maximum error of pressure reading over the pressure range after offset adjustment at one pressure point.
4. With the second-order temperature compensation over -10 to 70°C.

Metrodyne Microsystem Corp. reserves the right to make changes to the product specification in this publication.

■ Pin Configuration and Function Descriptions

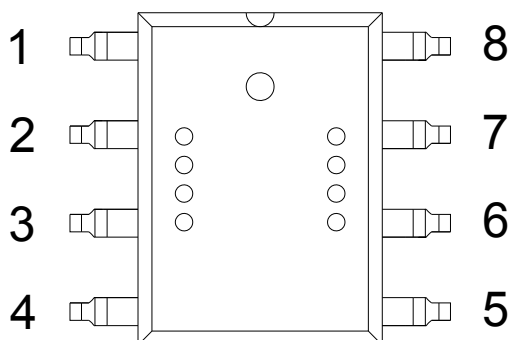
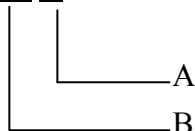


Fig. 2 Pin configuration of MIS-3400

| Pin No. | Pin Name | Description |
|--|----------|---|
| 1 | SDO | Serial Data Output. Data is shifted on the RISING edge of DCLK. This output is high impedance when CS_ is HIGH. |
| 2 | SDI | Serial Data Input. If CS_ is LOW, data is latched on RISING edge of DCLK. |
| 3 | MCLK | External Clock Input. This clock runs the A/D conversion process. |
| 4 | VDD | Power Supply. |
| 5 | VPP | OTP Programming Voltage. |
| 6 | CS | Chip Select Input. Control data conversion timing and enables the serial input/output register. |
| 7 | GND | Ground. |
| 8 | SCLK | External Clock Input. This clock synchronizes serial data I/O. |
| Note! Pin5 was used only for calibration by the manufacturer and should not be connected. | | |

■ Ordering information

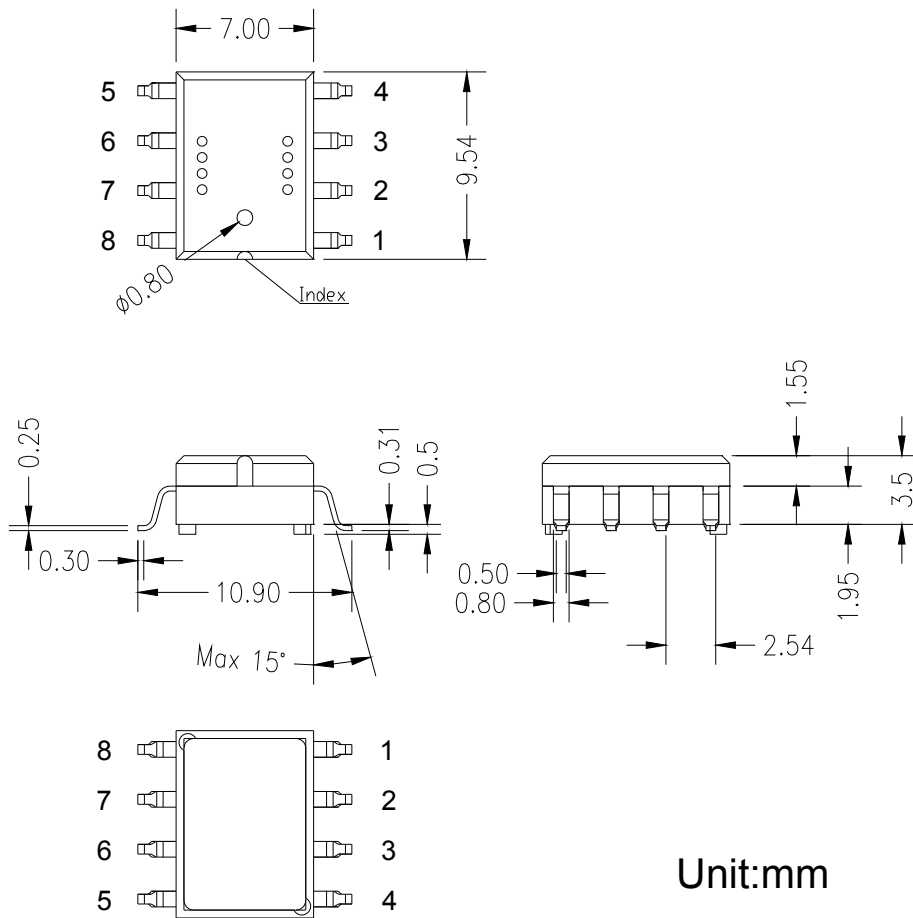
MIS-3 4 0 0-015 A



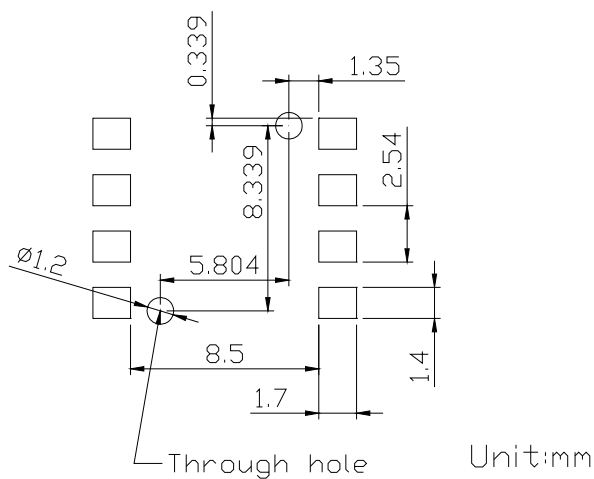
| A | Pressure type | B | Pressure range |
|---|---------------|-----|----------------|
| A | Absolute | 015 | 15 PSI |
| | | | |

| Part No. | Pressure type | Pressure range | Feature | Note |
|---------------|---------------|----------------|---------|------|
| MIS-3400-015A | Absolute | 15 PSI | SPI | |
| | | | | |

■ **Package Outlines**



■ **Recommended Land Pattern**



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