MIS-3400 series (Preliminary)

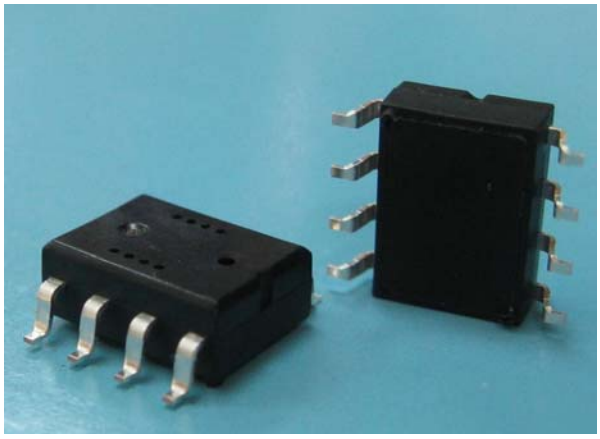
Intelligent Pressure Sensor

■ Features

- □ Supply Voltage 2.0 to 3.6V
- □ 300 to 1100 hPa pressure range
- □ Low standby current: <0.1μA
- □ Factory calibrated and temperature compensated
- □ SPI digital signal output

■ Applications

- □ Digital barometer
- □ Weather forecast station



The MIS-3400 is a intelligent pressure sensor which consist of a MEMS piezoresistive pressure sensor and a signal conditioning ASIC. The signal conditioning ASIC is a 16-bits AD convertor 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 read the raw output data from MIS-3400 and do 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 provide SPI digital serial output interface to communicate with microprocessors. MIS-3400 series is specially designed for low voltage and low power consumption concerned applications.

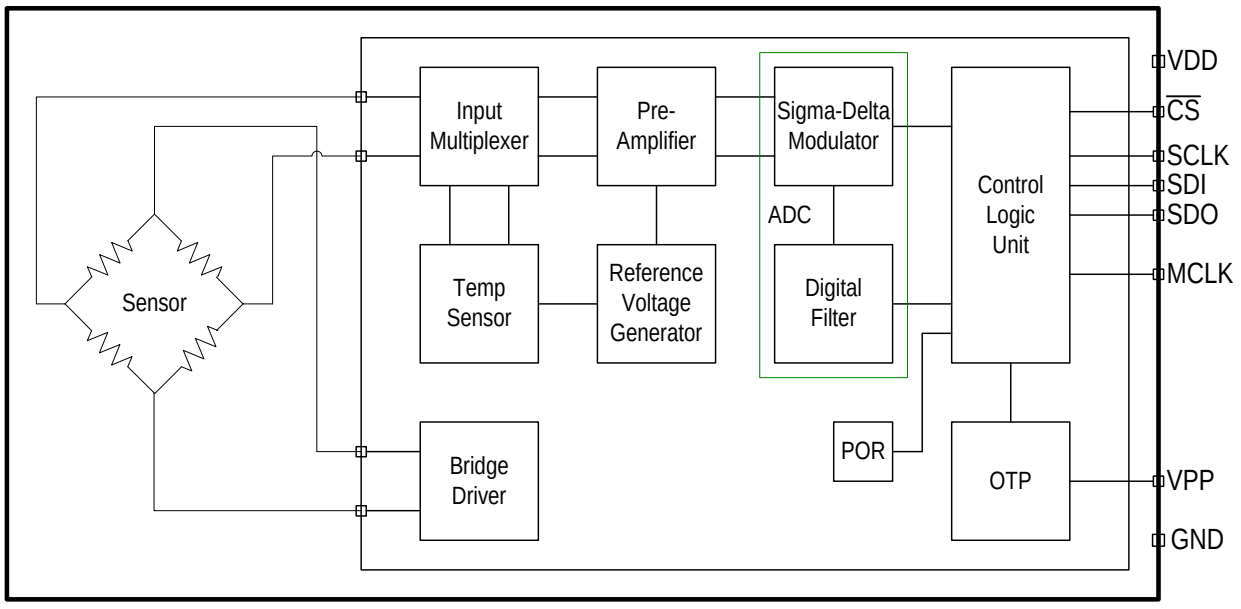


Fig. 1 Functional Block Diagram of MIS-3400

■ 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 MM			 4000 400			 V	
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 Standby Average	 I_{sc} I_{ss} I_{avg}	 1 conversion/s		 600 0.1 21.6	 0.5 30.5	 μA μA 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}< 5μA	70%VDD		VDD+0.3V		
Input low Voltage	V_{IL}	I_{IL}< 5μA	-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℃	-1.5		1.5	hPa	2
Relative Pressure Accuracy		p = 750～1100 hPa Ta = 25℃	-0.5		0.5	hPa	3
Relative Pressure Error over Temperature		p = 750～1100 hPa Ta =-10～70℃	-1.5		1.5	hPa	4
Temperature Output Characteristics							
Resolution				0.1		℃	
Accuracy		-40 to 85℃	-2		2	℃	

Notes：

1. Unless otherwise specified, measurements were taken with a supply voltage of 3 Vdc at a temperature of 25±3℃ 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℃.

■ Pin Configuration and Function Descriptions

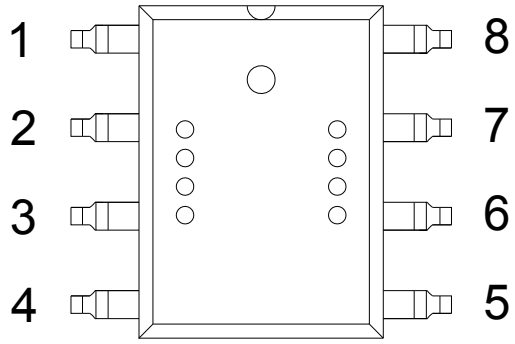


Fig. 2 Pin configuration of MIS-3400

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

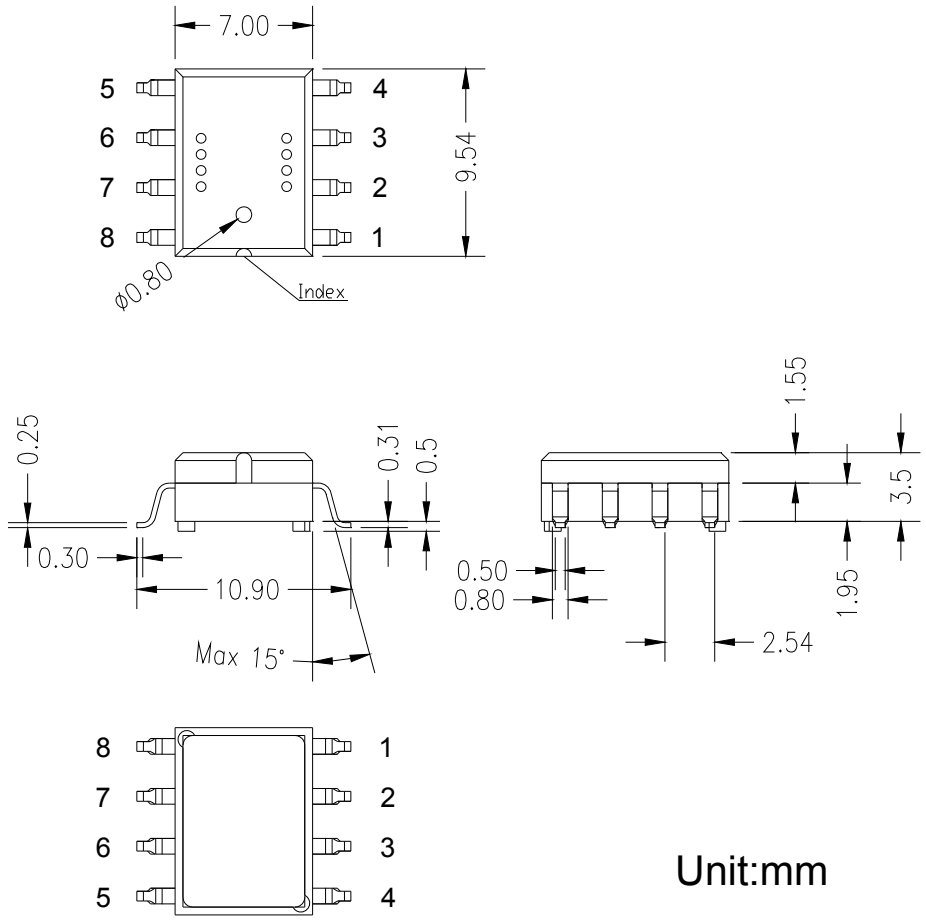
A

B

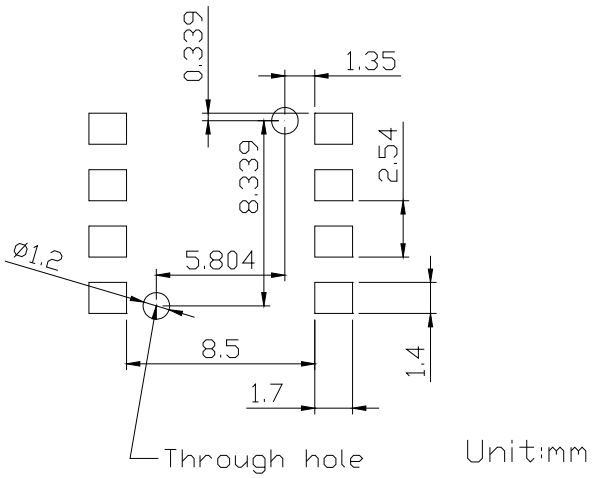
A	Pressure type	B	Pressure range
A	Absolute	015	15 PSI

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

■ Package Outlines



■ Recommended Land Pattern



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