

MPM2581

Digital Output Pressure Sensor



Features

- Pressure range: 0 Psi to 5 Psi...500 Psi
- Gauge or Absolute
- Φ 16mm OEM Pressure Sensor
- Stainless Steel 316L wetted parts

Application

- Gas or liquid pressure measurement
- Manifold pressure measurement
- Submersible depth monitoring
- Leak detection equipment

Introduction

The MPM2581 is a compact 16mm digital pressure and temperature sensing element. The pressure sensor has a 14-bit resolution (temperature is 11-bit) with part number configurable I2C or SPI digital interface. The sensor is manufactured from 316L stainless steel and supplied with an EPDM o'ring as standard.

Standard pressure ranges 0 to 5 PSI (350mbar) to 500 psi (35 bar) with gauge or absolute pressure references. Having an optional 3.3 or 5 VDC supply lends itself to battery powered devices with a low power consumption.

Sensor can be fully customized to suit the application demands. Can be used as a drop-in replacement to other 16mm digital output sensors.

- Range: 0 to 5 Psi...500 Psi
- Pressure Reference: Gauge / Absolute
- Power Supply: 3.3V $\pm$ 0.1V DC (default); 5.0 $\pm$ 0.1V DC
- Output: 14-Bit (max 16383) Pressure and 11-bit (max 2047) Temperature
- Start Time to Data Ready: 10ms
- Output Signal: 10%-90% (standard), 5%-95%
- Communication Interface: I2C / SPI
- Accuracy: $\pm$ 0.25%FS
- Total Error Band: $\pm$ 1%FS
- Temperature Error: $\pm$ 1.5°C
- Resolution-Temperature: 0.1°C
- Power Consumption: 5uA (standby mode) @25°C
- Insulation Resistance: 100M Ω @50V DC
- Compensation Temp. Range: 0°C-50°C
@FS $\leq$ 0.35bar, -20°C-85°C@FS $\geq$ 0.7bar
- Working Temp. Range: -20°C-105°C
- Storage Temp. Range: -20°C-105°C
- Shock: 10g, 20Hz-2000Hz
- Impact: 100g, 11ms
- Overpressure: 2 x FS
- Burst Pressure: 3 x FS

Notes :

1. Refers to the fastest time from start time to data preparation.
2. Calculated according to the least square method in the appendix of GB T 15478-2015.
3. Including calibration errors, measurement errors and temperature effects.

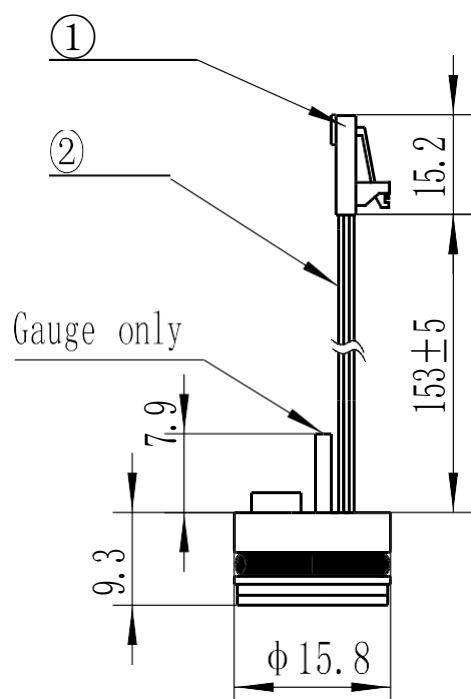
Basic Condition

- Media temperature: $(25 \pm 1) ^\circ\text{C}$
- Environment temperature: $(25 \pm 1) ^\circ\text{C}$
- Humidity: $\leq 80\% \text{ RH}$
- Local air pressure: 86-106 kPa
- Power supply: 3.3V DC

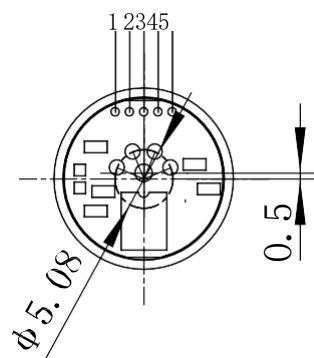
Construction Performance

- Diaphragm: Stainless steel 316L
- Housing: Stainless steel 316L
- Pressure lead tube: Stainless steel 304
- PCB: FR-4
- O-ring: EPDM

Outline Construction (Unit: mm)



Electrical Connection



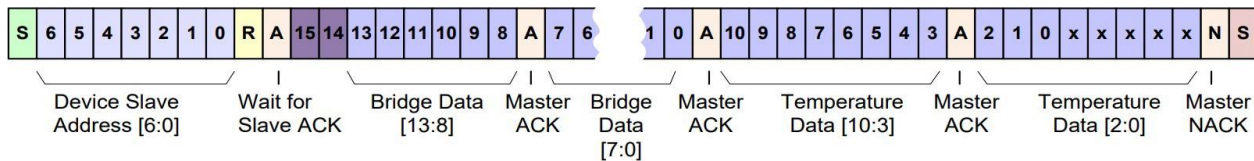
Number	Definition
1	VDD
2	GND
3	SCL / SCLK
4	SDA / MISO
5	INT / SS

① : PIN: MOLEX P/N 16-02-0082; HOUSING: MOLEX P/N 50-57-9405.

② : RIBBON CABLE, 26AWG

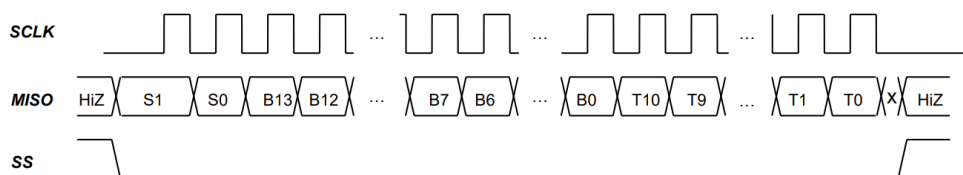
I2C Read Operations

For read operations, the I²C master command starts with the 7bit slave address (default addr. 0x28H) with the 8th bit = 1 (READ). Sensor as the slave sends an acknowledge (ACK) indicating success. Then 2-byte pressure data and 2-byte temperature data (T[10 : 3] and T[2 : 0]xxxxx) are returned from slave to master.



SPI Read Operations

The entire output packet is 4 bytes (32 bits). The high bridge data byte comes first, followed by the low bridge data byte. The first 2 bits of 1st byte S(1:0) means standby status, no need for use, may discard directly. The last 6 bits of 1st byte is the upper 6 bits of pressure data B(13:8); The 2nd byte is the lower 8 bits of pressure data B(7:0); the 3rd byte is the upper 8 bits of temperature data (10:3). The first 3 bits of 4th byte is the lower 3 bits of temperature data T(2:0). The last 5 bits of the 4th byte are undetermined and should be masked off in the application. If the user only requires the pressure data, the read can be terminated after the 2nd byte. If the temperature data is also required but only at an 8-bit resolution, the read can be terminated after the 3rd byte is read.



Packet :

{{ S(1:0), B(13:8)}, { B(7:0)}, { T(10:3)}, { T(2:0), XXXXX}}Where

S(1:0): Status Bits, 00: Normal operation; 01: Command Mode; 10: Stale data; 11: Fault.

B(13:8): Upper 6 bits of pressure data.

B(7:0): Lower 8 bits of pressure data.

T(10:3): Upper 8 bits of temperature data.

T(2:0), xxxxx: Remaining 3 bits of temperature data and 5 bits invalid data.

HiZ: High impedance.

Order Guide

MPM2581		Pressure Sensor													
		Range code		Pressure range		Ref.		Range code		Pressure range		Ref.			
		0A		0-5 psi		G.A		02		0-10 psi		G.A			
		03		0-15 psi		G.A		07		0-30 psi		G.A			
		08		0-50 psi		G.A		09		0-100 psi		G.A			
		10		0-150 psi		G.A		12		0-300 psi		G.A			
		13		0-500 psi		G.A									
				Code	Pressure type										
				G	Gauge										
				A	Absolute										
					Code	Supply voltage									
					3	3.3V DC									
					5	5.0V DC									
						Code	Output type								
						0	10%-90%								
						5	5%-95%								
							Code	Electrical connection							
							1	160mm ribbon cable with Molex connector							
								Code	Communication interface						
								I	I2C						
								S	SPI						
							Code	Power mode							
							Null	N/A							
							L	Low power mode							
MPM2581		-	07	-	G	-	3	-	0	-	1	-	I	-	L

Notes

- Make sure the pressure sensor construction material is compatible with the media being measured.
- Do not depress the sensing face that can cause damage to the diaphragm.
- Make sure no wet and corrosive media can go into the electric connection rear. Keep the breathing tube (only Gauge type sensor) connected to atmosphere.
- If you choose with low power mode, please select the product power supply 3.3V DC. Note the sensor will work on both power modes but the calibration data will differ.
- This product supports customized equipment addresses, if required, please contact us.
- Applied in critical environment or need a special design? please contact us.