

MS5201-XD SMD Gage Pressure Sensor



- 1 bar gage pressure range
- Uncompensated
- Piezoresistive silicon micromachined sensor
- Miniature surface mount 7.6 x 7.6 mm
- Low noise, high sensitivity, high linearity

DESCRIPTION

The MS5201-XD is a gage type SMD pressure sensor, suitable for applications which require relative (gage) pressure measurements. The device consists of a silicon micromachined pressure sensor die mounted on a 7.6 x 7.6 mm ceramic carrier protected by a plastic cap with a port to connect plastic tube. The MS5201-XD can be delivered in a highly sensitive version giving a maximal output voltage or in a highly linear version giving a linear output voltage directly proportional to the applied pressure.

Full scale pressure	High Sensitivity Version			High Linearity Version		
	Product code	Full scale span	Linearity	Product code	Full scale span	Linearity
1 bar	MS5201-AD	240 mV	±0.20 % FS	MS5201-BD	150 mV	±0.05 % FS

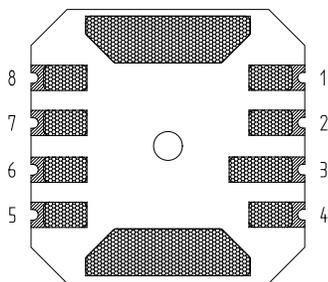
FEATURES

- Low cost SMD ceramic package
- High reliability, low drift
- -40 °C to +125 °C operation range
- Gel protection

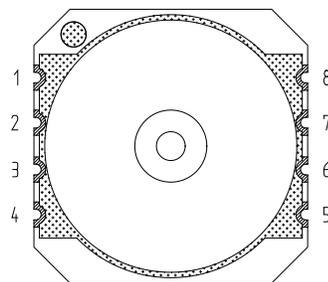
APPLICATIONS

- Medical instrumentation
- Pneumatic controls

PIN CONFIGURATION

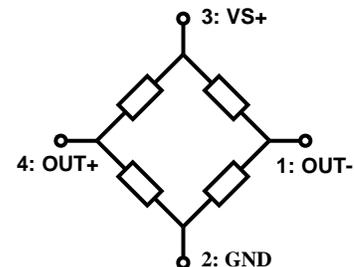


Bottom



Top

(Pressure to be applied from the top)



MS5201-XD SMD Gage Pressure Sensor

PIN DESCRIPTION

Pin Name	Pin No	Function
OUT-	1	Negative output voltage of Wheatstone bridge
GND	2	Ground
VS+	3	Supply voltage of Wheatstone bridge
OUT+	4	Positive output voltage of Wheatstone bridge

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Conditions	Min	Max	Unit
Supply voltage	VS+	Ta = 25 °C	-	20	V
Storage temperature	T _s		-40	+125	°C
Overpressure MS5201-AD MS5201-BD	P	Ta = 25 °C	-	5 10	bar

MS5201-XD SMD Gage Pressure Sensor

ELECTRICAL CHARACTERISTICS

(Vs+ = 5 V; Ta = 25 °C)

	Parameter	Min	Typ	Max	Unit	Notes
MS5201-AD	Operating pressure range	0	-	1	bar	
	Full-scale span (FS)	190	240	290	mV	
High Sensitivity	Sensitivity	190	240	290	mV/bar	
	Linearity	-	±0.15	±0.40	% FS	1, 6
MS5201-BD	Operating pressure range	0	-	1	bar	
	Full-scale span (FS)	120	150	180	mV	
High Linearity	Sensitivity	120	150	180	mV/bar	
	Linearity	-	±0.05	±0.20	% FS	1, 6
All Types	Operating temperature range	-40	-	125	°C	
	Zero pressure offset	-40	0	40	mV	
	Pressure hysteresis	-	±0.05	±0.15	% FS	2, 6
	Temperature hysteresis	-	-	0.3	% FS	3, 6
	Repeatability	-	±0.05	±0.15	% FS	4, 6
	Bridge resistance	3.0	3.4	3.8	kΩ	
	Temperature coefficient of resistance	+2'400	2'900	+3'300	ppm/°C	5, 6
	Temperature coefficient of span	-1'500	-1'900	-2'300	ppm/°C	5, 6
Temperature coefficient of offset	-80	-	+80	μV/°C	5, 6	

NOTES

- 1) Deviation at one half full-scale pressure from the least squares best line fit over pressure range.
- 2) Maximum difference of output voltage after 1 pressure cycle at any pressure within the operating pressure range.
- 3) Maximum difference in offset after one thermal cycle from -40°C to +125°C.
- 4) Same as 2) after 10 pressure cycles.
- 5) Slope of the end-point straight line from 25°C to 60°C.
- 6) Not 100% tested.

MS5201-XD SMD Gage Pressure Sensor

APPLICATION INFORMATION

GENERAL

The MS5201-XD is a miniaturized gage pressure sensor series which has been designed for surface mounting applications. Its main advantages are the high reliability of the semiconductor sensor and a design which makes it suitable for applications requiring small-scale and cost-efficient solutions.

The sensor element of the MS5201-XD consists of a silicon micromachined membrane with a borosilicate glass and a backside vent hole. Implanted resistors make use of the piezo-resistive effect. The sensor is mounted in a special process allowing best-offset stability making the part suitable for direct PCB assembly.

Typical applications for this miniaturized pressure sensor MS5201-XD are blood pressure monitors or vacuum measurement equipment.

CONNECTION TO PCB

The package outline of the module allows the use of a flexible PCB to connect it. This can be important for applications in watches and other special devices, and will also reduce mechanical stress on the device.

For applications subjected to mechanical shock, it is recommended to enhance the mechanical reliability of the solder junctions by covering the rim or the corners of MS5201-XD ceramic substrate with glue or Globtop-like material.

SOLDERING

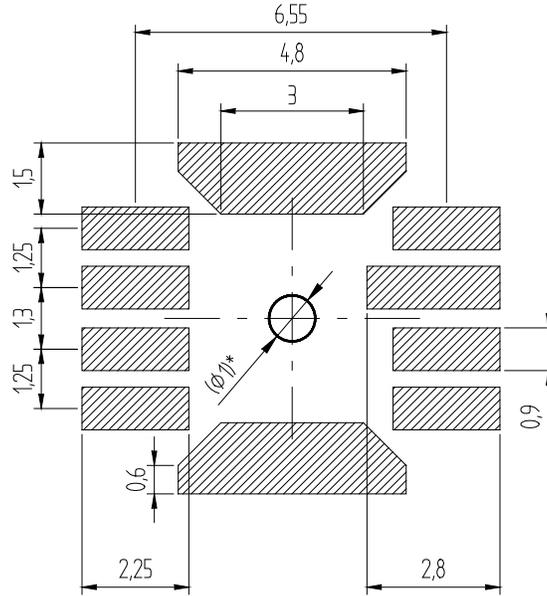
Please refer to the application note AN808 for all soldering issues.

CLEANING

The MS5201-XD has been manufactured under cleanroom conditions. Each device has been inspected for the homogeneity and the cleanness of the silicone gel. It is therefore recommended to assemble the sensor under class 10'000 or better conditions. Should this not be possible, it is recommended to protect the sensor opening during assembly from entering particles and dust. To avoid cleaning of the PCB, solder paste of type "no-clean" shall be used. **Cleaning might damage the sensor.**

MS5201-XD SMD Gage Pressure Sensor

RECOMMENDED PAD LAYOUT



*Recommended vent hole diameter

Recommended pad layout for soldering of the MS5201-XD on a printed circuit board

MS5201-XD SMD Gage Pressure Sensor

ORDERING INFORMATION

Product code	Product	Art. No	Package	Comments
MS5201-AD	Pressure sensor 1 bar, High sensitivity	325201001	SMD hybrid with solder bumps, plastic cap, drop of gel on sensor, no gel protection of the bonding wires	
MS5201-BD	Pressure sensor 1 bar, High linearity	325201003		

FACTORY CONTACT

NORTH AMERICA

Measurement Specialties
45738 Northport Loop West
Fremont, CA 94538

Tel: +1 800 767 1888
Fax: +1 510 498 1578
e-mail: pfg.cs.amerch@meas-spec.com

EUROPE

MEAS Switzerland Sàrl
Ch. Chapons-des-Prés 11
CH-2022 Bevaix

Tel: +41 32 847 9550
Fax: + 41 32 847 9569
e-mail: sales.ch@meas-spec.com

ASIA

北京赛斯维测控技术有限公司
北京市朝阳区望京西路48号
金隅国际D座302

电话 : + 86 010 8477 5646
传真 : + 86 010 5894 9029
邮箱 : sales@sensorway.cn
<http://www.sensorway.cn>

The information in this sheet has been carefully reviewed and is believed to be accurate; however, no responsibility is assumed for inaccuracies. Furthermore, this information does not convey to the purchaser of such devices any license under the patent rights to the manufacturer. Measurement Specialties, Inc. reserves the right to make changes without further notice to any product herein. Measurement Specialties, Inc. makes no warranty, representation or guarantee regarding the suitability of its product for any particular purpose, nor does Measurement Specialties, Inc. assume any liability arising out of the application or use of any product or circuit and specifically disclaims any and all liability, including without limitation consequential or incidental damages. Typical parameters can and do vary in different applications. All operating parameters must be validated for each customer application by customer's technical experts. Measurement Specialties, Inc. does not convey any license under its patent rights nor the rights of others.