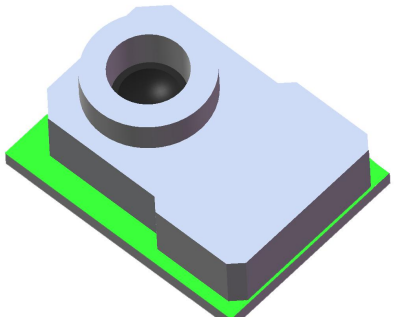
XGZP197 PRESSURE SENSOR

FEATURES

- Range: -50mmHg ~ 300mmHg
- Gauge Pressure Type
- MEMS Technology
- Calibrated and Compensated
- Medical Insulation Silicone Gel
- AAMI-Compliant
- Low Cost for High Volume Application



APPLICATIONS

- Disposable Blood Pressure Meter
- Invasive Sphygmomanometer
- Hemodialysis Instrument
- Infusion Pump

INTRODUCTION

XGZP197 Invasive Pressure Sensor is a sensor designed for use in disposable blood pressure monitoring medical devices, and is designed to meet AAMI's requirements for sphygmomanometers.

The product is based on advanced microelectromechanical principles, with a silicon piezoresistive pressure-sense chip utilizing MEMS technology as the key component. The pressure sensitive chip consists of an elastic membrane and four resistors integrated on the membrane. The four piezoresistors form a Wheatstone bridge structure, which generates a voltage output signal linearly proportional to the applied pressure when pressure is applied to the elastic membrane. The silicon piezoresistive pressure sensitive chip is mounted on a ceramic substrate and the sensor is calibrated and compensated by thick film technology circuitry to produce a highly accurate standard voltage output signal referenced to the supply voltage.

A cap is affixed to the ceramic substrate to protect the internal structure from damage and to facilitate installation in the system. The use of gel on the pressure sensitive chip ensures insulation from the outside. It can be used continuously for 168 hours and should be disposed of properly after use.

PERFORMANCE CHARACTERISTICS

Unless otherwise specified,measurements were taken with Air under a power supply of 6 Vdc at a temperature of 25±1℃ and humidity ranging 50%±10%RH.

Electrical Performance

Parameter	Min.	Typ.	Max.	Unit
Constant Voltage	1	6（Calibrated）	10	V
Input Resistance	1.2		3.2	kΩ
Output Resistance	285		315	Ω
Symmetry	-5		5	%
Breakdown Voltage		10,000		VDC
Leak Current			2	μA
Response Frequency	1200			Hz
Phase Drift			5	Degrees
Offset Drift			1	mmHg/8hrs

Mechanical Characteristics

Parameter	Min.	Typ.	Max.	Unit
Pressure Range	-50		300	mmHg
Offset Output	-25	0	25	mmHg
Sensitivity	4.95	5	5.05	μV/V/mmHg
Calibrated Pressure①	97.5	100	102.5	mmHg
Max.Over Load Pressure	125			PSI

Temperature Characteristic

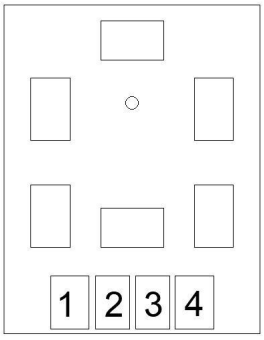
Parameter	Min.	Typ.	Max.	Unit
Working Temperature	15	22	40	℃
Storage Temperature	-25		70	℃
Relative Humidity	10		90	%
Linear Hysteresis②(-50~100 mmHg)			1	mmHg
Linear Hysteresis②(>100~200 mmHg)			1	%Output
Linear Hysteresis②(>200~300 mmHg)			1.5	%Output
Offset Temperature Coefficient	-0.3		0.3	mmHg/℃
FS Temperature Coefficient	-0.1		0.1	%/℃

Note：

①. Applied 100mmHg pressure for calibration;

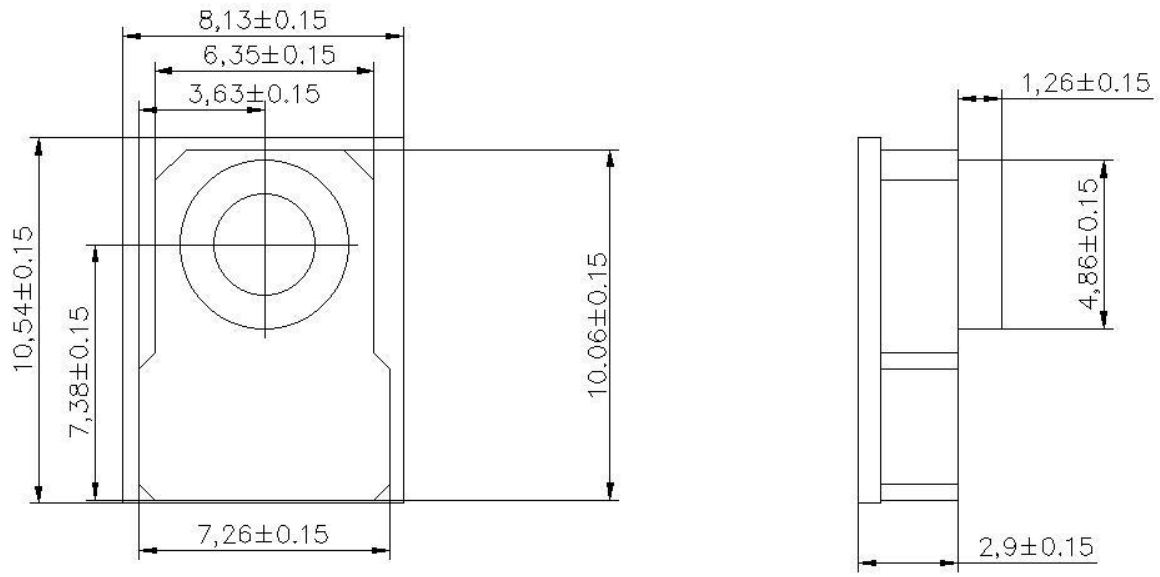
②. For linearity drift from 0 to 100mmHg.

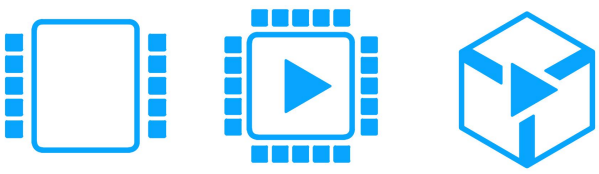
CONNECTION&DEFINITION



Pin	1	2	3	4
Definition	VDD	Vo+	Vo-	GND
Definition	Power +	Output +	Output -	Power -

DIMENSION (Unit:mm)





Symbol FootPrint 3D

Contact CFSensor for above file for design if required.

ORDER GUIDE

XGZP197	Piezo-resistive Pressure Sensor			
	Code	Range	100kPa=0.1mKp=750mmHg=10MH2O≈1bar≈14.5PSI	
	014	-50~300mmHg		
		Code	Pressure Type	
		G	Gauge	
			Code	Packing Type
			F01	Tube Packing
XGZP197	014	G	F01	the whole spec.

PACKING INFORMATION

Tube Packing:

Series	Tube	Outer Box	Note
XGZP197	520x12.3x7mm	530x145x53mm	
	46PCS	3542PCS	Anti-static bag

OVERALL NOTES

Mounting

The following steps is for transmitting the air pressure to sensor after sensor soldering on PCB.

▼ For some sensors that come with inlet tube, select the flexiable pipe to suit the pressure inlet that is firm enough to prevent the pressure leaks.

▼ Atmosphere hole (for Gauge type sensors) and Inlet pipe/hole can't be blocked with gel or glue etc,..

▼ Avoiding excessive external force operation

Soldering

Due to its small size, the thermal capacity of the pressure sensor is low. Therefore, take steps to minimize the effects of external heat. Damage and changes to characteristics may occur due to heat deformation. Use a non-corrosive resin type of flux. Since the pressure sensor is exposed to the atmosphere, do not allow flux to enter inside.

▼ Manual soldering

⊙Raise the temperature of the soldering tip between 260 and 300°C/500 and 572°F (30 W) and solder within 5 seconds.

⊙The sensor output may vary if the load is applied on the terminal during soldering.

⊙Keep the soldering tip clean.

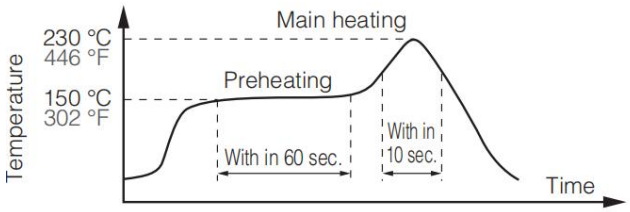
▼DIP soldering (DIP Terminal)

⊙Keep the temperature of the DIP solder tank below 260°C/500 and solder within 5 seconds.

⊙To avoid heat deformation, do not perform DIP soldering when mounting on the PCB which has a small thermal capacity.

▼Reflow soldering (SMD Terminal)

⊙The recommended reflow temperature profile conditions are given below.



⊙Self alignment may not always work as expected, therefore, please carefully note the position of the terminals and pattern.

⊙The temperature of the profile is assumed to be a value measured with the PCB of the terminal neighborhood.

⊙Please evaluate solderbility under the actual mounting conditions since welding and deformation of the pressure inlet port may occur due to heat stress depending on equipments or conditions.

▼ Rework soldering

⊙Complete rework at a time.

⊙Use a flattened soldering tip when performing rework on the solder bridge. Do not add the flux.

⊙Keep the soldering tip below the temperature described in the specifications.

▼ Avoid drop and rough handling as excessive force may deform the terminal and damage soldering characteristics.

▼ Keep the circuit board warpage within 0.05 mm of the full width of the sensor.

▼ After soldering, do not apply stress on the soldered part when cutting or bending the circuit board.

▼ Prevent human hands or metal pieces from contacting with the sensor terminal. Such contact may cause anomalous outlets as the terminal is exposed to the atmosphere.
▼ After soldering, prevent chemical agents from adhering to the sensor when applying coating to avoid insulation deterioration of the circuit board.
▼ Consult CFSensor for leadfree soldering.

Connecting

▼ Correctly wire as in the connection diagram. Reverse connection may damage the product and degrade the performance.
▼ Do not use idle terminals(N/C) to prevent damages to the sensor.

Cleaning

▼ Since the pressure sensor is exposed to the atmosphere, do not allow cleaning fluid to enter inside from atmosphere hole (for Gauge type sensors) and inlet pipe.
▼ Avoid ultrasonic cleaning since this may cause breaks or disconnections in the wiring.

Environment

▼Please avoid using or storing the pressure sensor in a place exposed to corrosive gases (such as the gases given off by organic solvents, sulfurous acid gas, hydrogen sulfides, etc.) which will adversely affect the performance of the pressure sensor chip.
▼Since this pressure sensor itself does not have a water-proof construction(even available media can be liquid), please do not use the sensor in a location where it may be sprayed with water, etc.
▼Avoid using the pressure sensors in an environment where condensation may form. Furthermore, its output may fluctuate if any moisture adhering to it freezes.
▼The pressure sensor is constructed in such a way that its output will fluctuate when it is exposed to light. Especially when pressure is to be applied by means of a transparent tube, take steps to prevent the pressure sensor chip from being exposed to light.
▼Avoid using pressure sensor where it will be susceptible to ultrasonic or other high-frequency vibration.
▼Keeping the sensors sealed in static shielding bags with an oxygen-free condition and use the sensor as soon as possible once unfold the package, because the sensors' PINs may be oxidated a bit under atmosphere environment(slight oxidation wouldn't affect soldering and performance)
▼The typical storage period for this sensor is 3 years, please use it during this term.

More Precautions

▼That using the wrong pressure range or mounting method may result in accidents.
▼The only direct pressure medium you can use is non-corrosive gas or air as illuminated above(Note: some sensors are compatible with liquid media). The use of other media, in particular, corrosive gases and liquid (organic solvent based, sulfurous acid based, and hydrogen sulfide based, etc.) or contains foreign substances will cause malfunction and damage. Please do not use them and check with CFSensor.
▼The pressure sensor is positioned inside the pressure inlet. Never poke wires or other foreign matter through the pressure inlet since they may damage the sensor or block the inlet. Avoid use when the atmospheric pressure inlet(only for Gauge type pressure sensor) is blocked.
▼Use an operating pressure which is within the rated pressure range. Using a pressure beyond this range may cause damage.

▼Since static charge can damage the pressure sensor, bear in mind the following handling precautions.
⊙When storing the pressure sensor, use a conductive material to short the pins or wrap the entire sensor in aluminum foil. Common plastic containers should not be used to store or transport the sensor since they readily become charged.
⊙When using the pressure sensor, all the charged articles on the bench surface and the work personnel should be grounded so that any ambient static will be safely discharged.
▼Based on the pressure involved, give due consideration to the securing of the pressure sensor.

【 SAFETY NOTES 】

Using these sensors products may malfunction due to external interference and surges, therefore, please confirm the performance and quality in actual use. Just in case, please make a safety design on the device (fuse, circuit breaker, such as the installation of protection circuits, multiple devices, etc.), so it would not harm life, body, property, etc even a malfunction occurs. To prevent injuries and accidents, please be sure to observe the following items:

●The driving current and voltage should be used below the rated value.
● Please follow the terminal connection diagram for wiring. Especially for the reverse connection of the power supply, it will cause an accident due to circuit damage such as heat, smoke, fire, etc.
●In order to ensure safety, especially for important uses, please be sure to consider double safety circuit configuration.
●Do not apply pressure above the maximum applied pressure. In addition, please be careful not to mix foreign matter into the pressure medium. Otherwise, the sensor will be discarded, or the media will blew out and cause an accident.
●Be careful when fixing the product and connecting the pressure inlet. Otherwise, accidents may occur due to sensor scattering and the blowing out of the media.
●If the sensor come with sharp PIN, please be careful not to hurt your body when using it.

【 WARRANTY 】

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