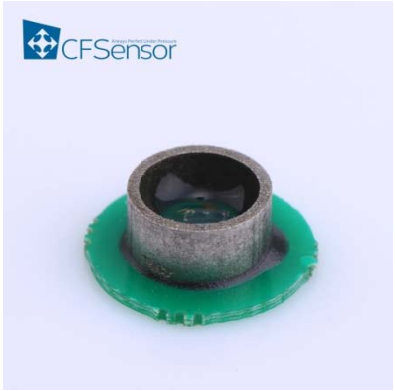
XGZP1501 Pressure Sensor

Features

- Ranges: 0～10kPa…1000kPa(0～1.45psi…150psi)
- MEMS Technology
- Absolute, Gage
- PCB package
- For non-corrosive gas or liquid
- Small size, cost effective



Applications

- For Home appliance field, such as air-conditioner, washing machine, refrigerators etc.
- For Automotive electronics field, such as tire pressure gauge, MAP sensor, engine oil pressure test etc.
- For Water pump,fire controlling,diving and underwater etc.
- For Other fields, such as altimeter, environment monitoring, liquid level measurement etc.

Introduction

XGZP1501 is a surface mounting pressure sensor based on CFSensor silicon based piezoresistive pressure sensor die(XGZP2009).The sensor die is bonded on a substrate with a plastic cap and packaged in a PC Board. The pressure sensing die is composed of a springy diaphragm and four resistors integrated in the diaphragm. Four piezo-resistors build up a Wheatstone bridge structure. When the springy diaphragm is pressured,Wheatstone bridge produces a linear voltage signal(mV) that is proportional to input pressure.

With PCB package, XGZP1501 is easy for users to install by surface mounting or welding.

With good repeatability, linearity, stability and sensibility, XGZP1501 is also easy for users to calibrate output by using operational amplifier or integrated circuit.

It's non-temperature compensated .

Silicone glue in the circular ring provide mild protection against humidity and dust(No recommend for liquids to work a long time). It is recommended to pressurize from circular ring—pressure side.

For gage type, it also can be pressurized from back side (PCB—reference side).This shall be noted clearly on the order.

Electric Performance

- Power Supply: ≤10VDC or ≤3.0mADC
- Input Impedance: 4kΩ～6kΩ
- Output Impedance: 4kΩ～6kΩ
- Insulation Resistance：100MΩ,100VDC
- Over Pressure On Front : 0～10kPa....1000kPa: 2X Rated Pressure
- Over Pressure On Back : 0～100kPa....350kPa 2X Rated Pressure
  0～500kPa 1.5X Rated Pressure

Construction

- Sensing Die: Silicon
- Die Mounting Glue: Silicone Glue
- Potting Glue: Silicon Glue
- Leading Wire: Gold Wire
- Package Housing
  PCB: FR4/5
  Circular Ring: Nickel Plated Iron
- Net Weight: Approx. 3g

Environment condition

- Orientation: Deviate 90° from any direction, zero change ≤ 0.05%FS
- Shock: No change at 10gRMS, (20～2000)Hz condition
- Impact: 100g, 11ms
- Medium Compatibility:
  Pressure Side: gas or liquid compatible with nickel or silicone glue
  Reference Side: gas liquid compatible with silicon, silicone glue or FR4/5

Basic Condition

- Medium:Gas(Clean,dry air and Non-corrosive gases),Purified water and non-corrosive liquid.
- Medium Temp: (25±1)℃/(77±1.8)℉
- Environment Temp.: (25±1)℃/(77±1.8)℉
- Shock: 0.1g (1m/s2) Max
- Humidity: (50%±10%) RH

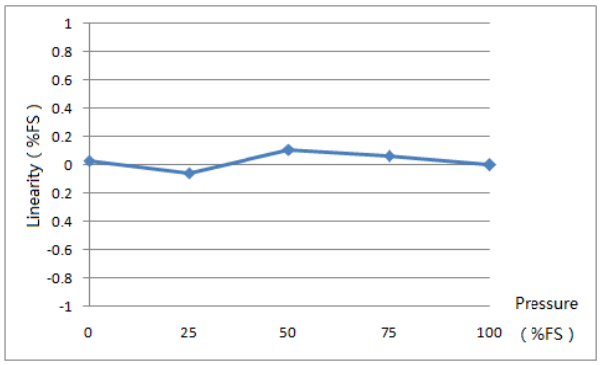
■ Power Supply: (5±0.005) VDC

Specifications

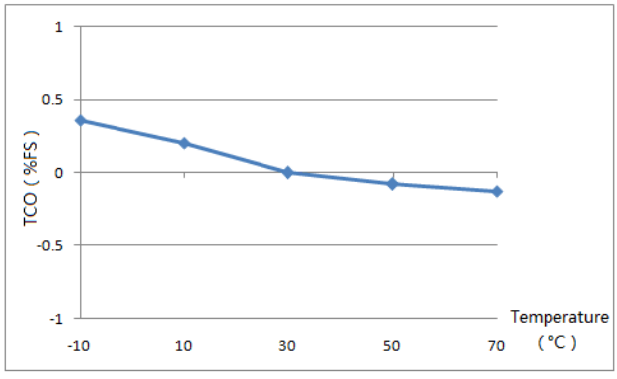
Specifications		Min.	Typ.	Max.	Unit
Pressure Range		10,20,40,100,200,350,500,700,1000			kPa
		1.45,2.9,5.8,15,30,43,75,105,150			PSI
Ambient Temperature		-10/14		+100/257	℃/℉
Storage Temperature		-40/-40		+150/302	℃/℉
Bridge Resistance		4	5	6	kΩ
Zero Output/Offset		-15		+15	mV
FS Output	≤20kPa/2.9PSI	20		60	mV
	40kPa	50	75	100	mV
	≧100kPa/15PSI	60	100	140	mV
Temp. Coefficient of Resistance		2000	2500	3000	ppm/℃
TCO(Temp. Coefficient of Offset)		-0.2		0.2	%FS/℃
TCS(Temp. Coefficient of Span)		-0.25	-0.21	-0.17	%FS/℃
Non-Linearity			0.2	0.3	%FS
Hysteresis		-0.3		0.3	%FS
Repeatability		-0.3		0.3	%FS
Annual Drift		-1.0		1.0	%FS
Note: Unless otherwise specified,measurements were taken on base of above testing condition.					

Reference Data (Base on above test condition)

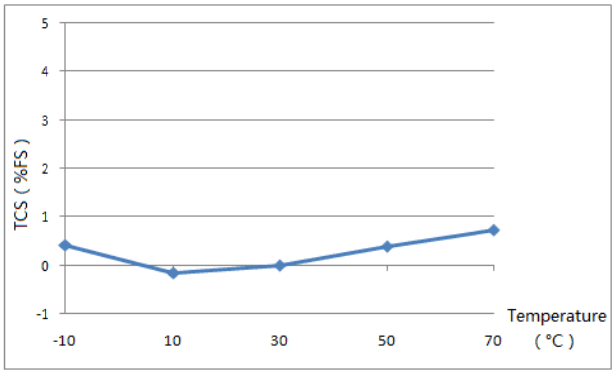
Linearity



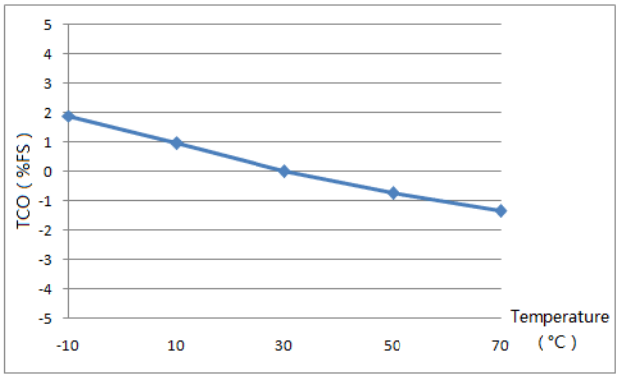
TCO-Constant Current



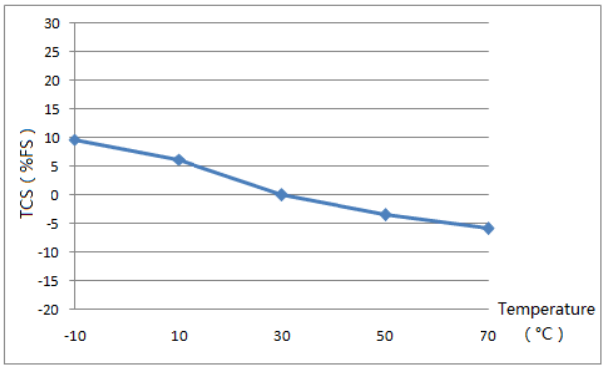
TCS-Constant Current



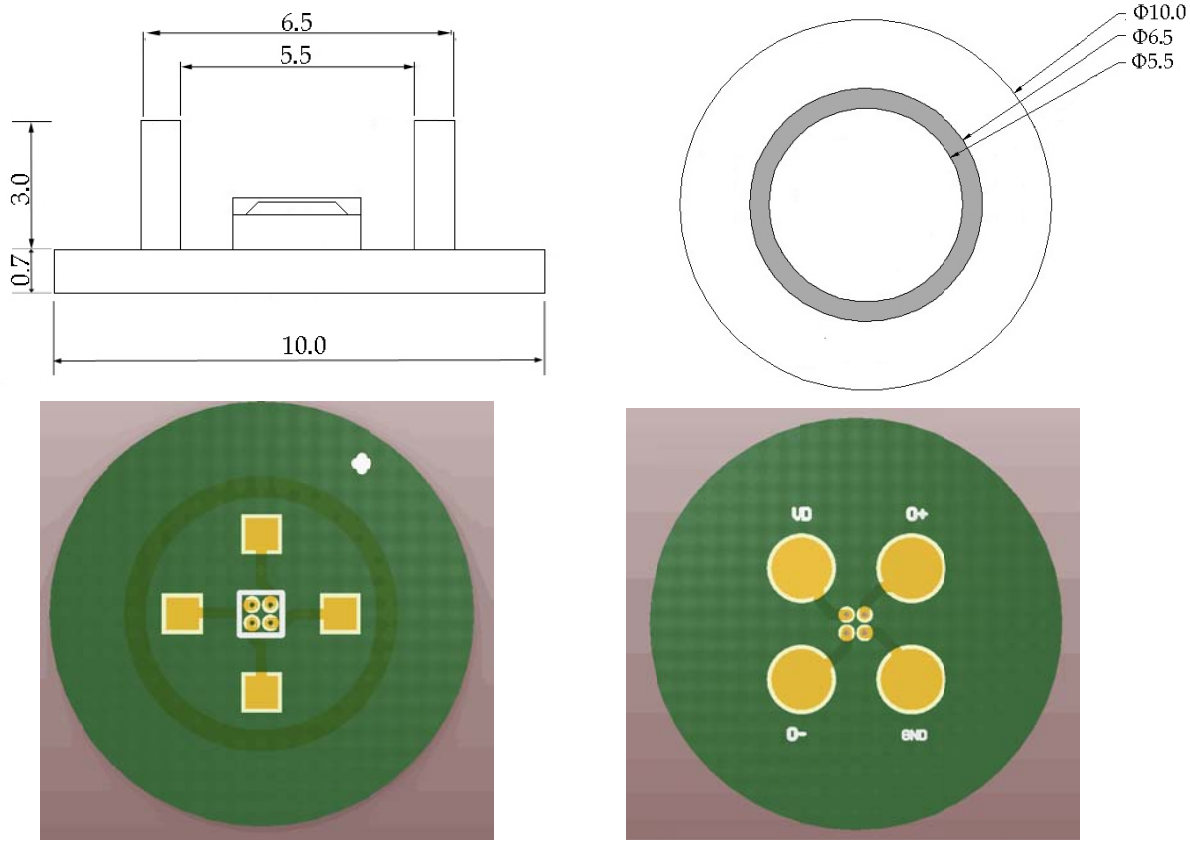
TCO-Constant Voltage



TCS-Constant Voltage



Dimension(Unit:mm/Inch)



Electric Connection

VD	GND	O+	O-
Power+	Power-	Output+	Output-

Order Guide

XGZP 1501	Piezo-resistive Pressure Sensor					
	Code	Range				
	010	[0～10]kPa	G	Y		
	020	[0～20]kPa	G	Y		
	040	[0～40]kPa	G	Y		
	101	[0～100]kPa	G&A	Y		
	201	[0～200]kPa	G&A	Y		
	351	[0～350]kPa	G&A	Y		
	501	[0～500]kPa	G&A	Y		
	701	[0～700]kPa	G&A	Y		
	102	[0～1000]kPa	G&A	N		
			Code	Pressure type		
			G	Gauge		
			A	Absolute		
				Code	Pressurize	
				Y	Available to pressurize on back	
				N	Unavailable to pressurize on back	
					Code	PCB Size
					10	Dia:10mm
XGZP1501	701		A	Y	10	the whole spec.

Notes

■ Mounting

Adopting land on the PC board for ensuring the sensor is securely fixed.

■ 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

⊙Set the soldering tip from 260 to 300°C (30W), and solder for no more than 5 seconds.

⊙Please note that output may change if the pressure is applied on the terminals when the soldering.

⊙Thoroughly clean the soldering iron.

▼ Soldering

⊙Please keep the solder bath temperature no higher than 260°C/500°F. When soldering, heat should be applied no longer than five seconds.

⊙When mounting onto a PCB of low thermal capacity, please avoid soldering as this may cause

heat deformity.

▼ Solder reworking

⊙Finish reworking in one operation.

⊙For reworking of the solder bridge, use a soldering iron with a flat tip. Please do not add more flux when reworking.

⊙Please use a soldering iron that is below the temperature given in the specifications in order to maintain the correct temperature at the tip of the soldering iron.

⊙Too much force on the terminals will cause deformation and loss in effectiveness of the solder. Therefore, please avoid dropping and careless handling of the product.

⊙Please control warping of the PCB within 0.05 mm of the sensor width.

⊙When cut folding the PCB after mounting the sensor, take measures to prevent stress to the soldered parts.

⊙The sensor terminals are designed to be exposed, so contact of the terminals with metal shards and the like will cause output errors. Therefore, please be careful and prevent things such as metal shards and hands from contacting the terminals.

⊙To prevent degradation of the PCB insulation after soldering, please be careful not to get chemicals on the sensor when coating.

⊙Please consult us regarding the use of lead-free solder.

■ **Cleaning**

▼ Since the pressure sensor chip is exposed to the atmosphere, do not allow cleaning fluid to enter inside.

▼ Avoid ultrasonic cleaning since this may cause breaks or disconnections in the wiring.

■ **Environment**

▼Please avoid using or storing the pressure sensor chip 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 chip does not have a water-proof construction, please do not use the sensor in a location where it may be sprayed with water, etc.

▼Avoid using the pressure sensors chip in an environment where condensation may form. Furthermore, its output may fluctuate if any moisture adhering to it freezes.

▼The pressure sensor chip 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 the pressure sensor chip where it will be susceptible to ultrasonic or other high-frequency vibration.

■ **Quality check under actual loading conditions**

To assure reliability, check the sensor under actual loading conditions. Avoid any situation that may adversely affect its performance.

■ **Other handling precautions**

▼That using the wrong pressure range or mounting method may result in accidents.
▼The only direct pressure medium you can use is dry air. The use of other media, in particular, corrosive gases (organic solvent based gases, sulfurous acid based gases, and hydrogen sulfide based gases, etc.) and media that contains moisture or foreign substances will cause malfunction and damage. Please do not use them.
▼The pressure sensor chip is positioned inside the pressure inlet. Never poke wires or other foreign matter through the pressure inlet since they may damage the chip or block the inlet. Avoid use when the atmospheric pressure inlet 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 chip, bear in mind the following handling precautions.
⊙When storing the pressure sensor chips, use a conductive material to short the pins or wrap the entire chip in aluminum foil. Plastic containers should not be used to store or transport the chips since they readily become charged.
⊙When using the pressure sensor chips, 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 DIP type and to the securing and selection of the inlet tube.