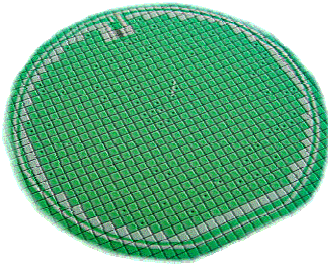


MS7912

PRESSURE SENSOR DIE (0-12 BAR)



- 0 to 1200 kPa range (12 bar or 174 PSI)
- Absolute/differential pressure sensors
- High linearity, small size
- RoHS-compatible & Pb-free¹

DESCRIPTION

The sensor element of the MS7912 consists of a small silicon micro-machined membrane with a Pyrex glass mounted under vacuum. Implanted resistors make use of the piezo-resistive effect. The absolute pressure sensor (MS7912A) carries a sealed vacuum reference cavity underneath the membrane whereas the differential sensor (MS7912D) has a hole in the Pyrex glass at the backside of the sensor.

FEATURES

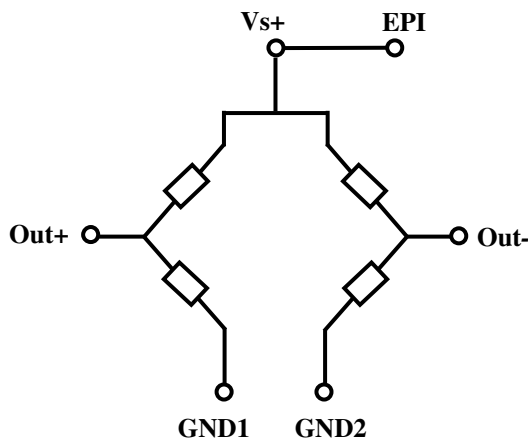
- Uncompensated pressure sensor die
- Output Span 150mV @ 5V
- Temperature Range -40°...+125°C
- Linearity 0.05% (typical)
- Small Die Size 1.72 x 1.58mm
- Low Cost, High reliability

APPLICATION

- For absolute or differential pressure sensor systems
- Engine controls
- Dive computers

ELECTRICAL CONNECTIONS

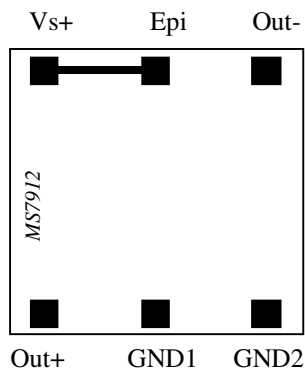
Positive output for pressure applied topside



- Vs+ : Supply voltage of Wheatstone bridge
- Epi : Connection of epitaxial layer (membrane)
- Out- : Negative output
- Out+ : Positive output
- GND1 : Ground
- GND2 : Ground

¹ The European RoHS directive 2002/95/EC (Restriction of the use of certain Hazardous Substances in electrical and electronic equipment) bans the use of lead, mercury, cadmium, hexavalent chromium and polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

PAD OUT

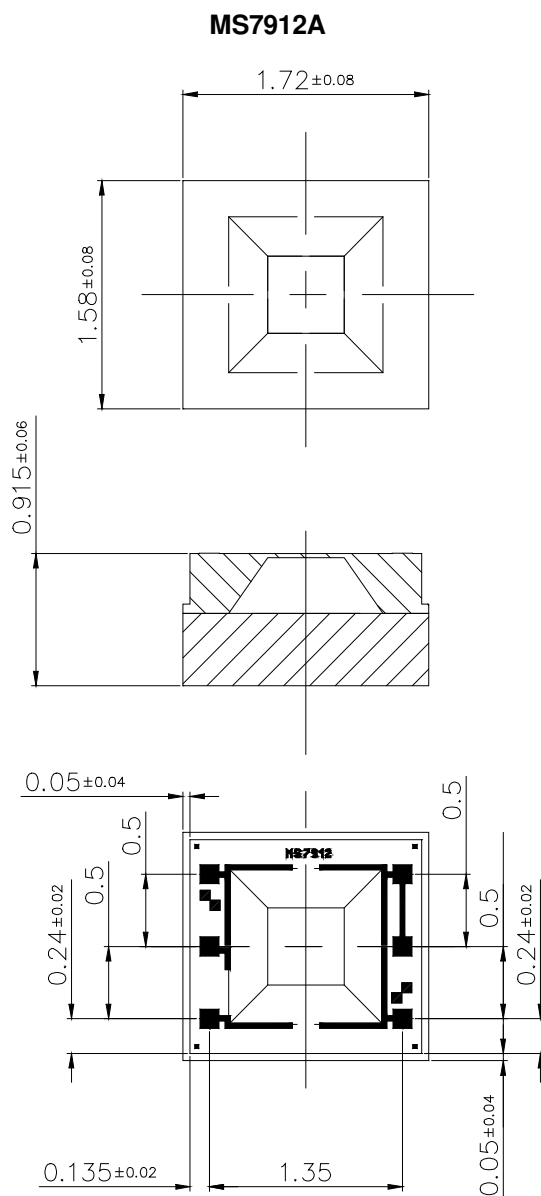


Important remarks:

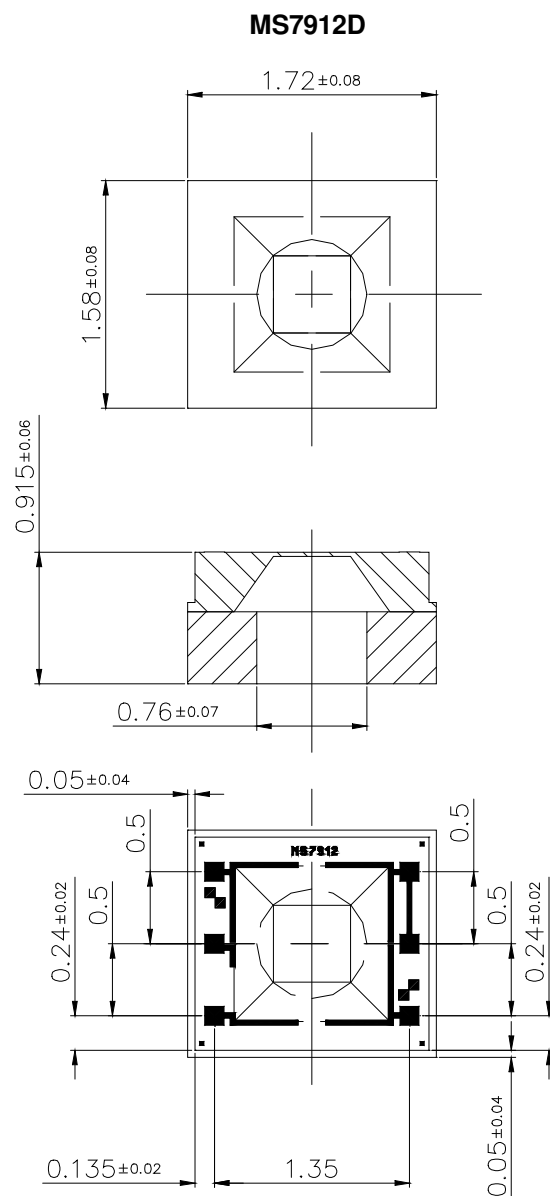
As the sensing elements are diffused resistances, the voltage applied on the ground pads (GND1 and GND2) has to be lower than the voltage applied on supply voltage pad (Vs+).

The epitaxial layer is connected to the Vs+ pin on the die

LAYOUT



Bondable area = 100 x 100 um



Bondable area = 100 x 100 um

FULL SCALE PRESSURE

kPa	bar	mbar	PSI	atm	mm Hg	m H ₂ O	Inches H ₂ O
1200	12	12000	174	11.8	9001	122	4818

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Conditions	Min	Max	Unit
Supply voltage	VS+	Ta = 25 °C		20	V
Storage temperature	T _s		-40	+150	°C
Pressure overload				30	Bar

ELECTRICAL CHARACTERISTICS

(Reference conditions: Supply Voltage VS+ = 5 Vdc; Ambient Temperature Ta = 25 °C)

Parameter	Min	Typ	Max	Unit	Notes
Operating Pressure Range	0		12	Bar	
Operating Temperature Range	-40		125	°C	
Bridge Resistance	3.0	3.4	3.8	kΩ	
Full-scale span (FS)	120	150	180	mV	
Zero Pressure Offset	-40	0	40	mV	
Linearity		± 0.05	± 0.15	% FS	1
Temperature Coefficient of Resistance Span Offset	+ 2400 - 1500 - 80	+ 2800 - 1900	+ 3300 - 2300 + 80	ppm/°C ppm/°C μV/°C	2
Pressure Hysteresis		± 0.05	± 0.15	% FS	3
Repeatability		± 0.1	± 0.2	% FS	4
Temperature Hysteresis			0.3	% FS	5

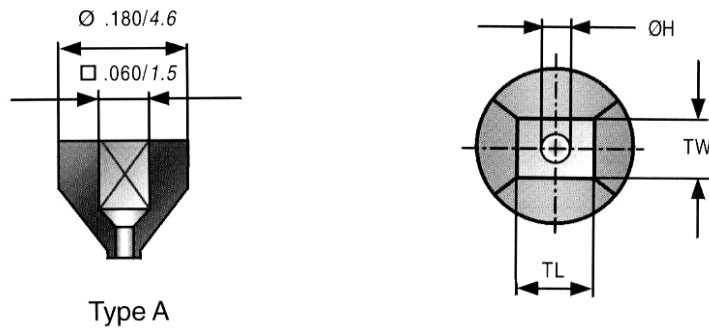
NOTES

- 1) Deviation at one half full-scale pressure from the least squares best line fit over pressure range (0 to 12 bar).
- 2) Slope of the endpoint straight line from 25 °C to 60 °C.
- 3) Output deviation at any pressure within the specified range, when this pressure is cycled to and from the minimum or maximum rated pressure, at 25 °C.
- 4) Same as 3) after 10 pressure cycles.
- 5) Maximum difference in offset after one thermal cycle from -40 °C to +125 °C.

PICKING TOOLS

The MS7912 sensors have a sensitive membrane (0.5 x 0.5 mm) the top surface of the sensor dice has an outer diameter is: 1.62 x 1.48 mm. The pick and place tool has to be of a soft material as rubber (Hardness 78-97 Shore A). Its external size must fit the sensor and the vacuum cavity must be as large as the membrane itself. Successful test were done with some tools of SPT, see SPT drawing and references below).

SPT references	RTR-A1-060x060
External dimension	TL & TW: 0.06 inch / 1.52 mm
Internal dimensions	ØH: 0.035 inch / 0.89 mm



ORDERING INFORMATION

Product Code	Product	Art.-Nr.
MS7912A	1200 kPa Absolute Pressure Sensor	791225021
MS7912D	1200 kPa Differential Pressure Sensor	791225121

The MS7912 dice are supplied sawn on blue foil, mounted on plastic rings

FACTORY CONTACTS

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