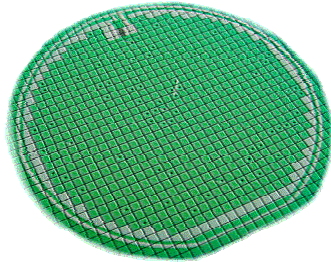


MS7310D LOW PRESSURE SENSOR DIE (0 to 10 kPa)



- 0 to 10 kPa (100 mbar or 1.45 PSI)
- Uncompensated differential pressure sensor die
- Piezoresistive silicon micromachined sensor
- High output signal 110 mV
- Small size
- RoHS-compatible & Pb-free¹

DESCRIPTION

The MS7310D pressure sensor die is designed for low pressure sensor systems with the highest demands on resolution and accuracy. Its sensor element consists of a silicon micro-machined membrane bonded on a Pyrex™ glass support. The sensor signal is proportional to the pressure difference between back and front side of the membrane. The pressure is sensed by four implanted piezoresistors, giving a large output signal.

FEATURES

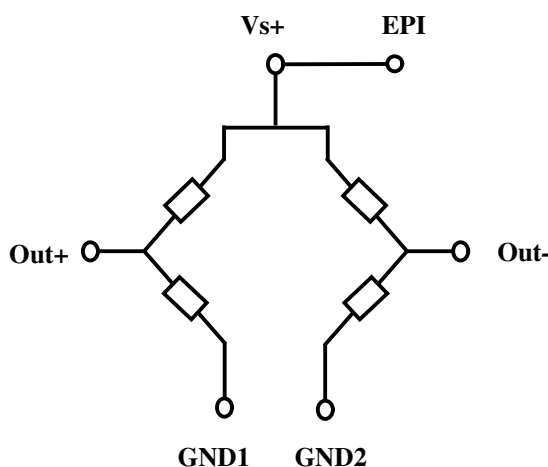
- Uncompensated differential pressure sensor die
- Output span 110 mV @ 5 V
- Temperature range -40 °C to +125 °C
- Typical linearity 0.35% (10kPa) or 0.1% (2kPa)
- Die size 2.45 mm x 2.45 mm
- Low cost, high reliability, low drift
- High pressure burst capability (600 kPa)

APPLICATION

- Washing machines
- Level indicators
- Industrial controls
- Leak detection

ELECTRICAL CONNECTIONS

Positive output for pressure applied topside



Vs+ : Supply voltage of Wheatstone bridge

Epi : Connection of epitaxial layer (membrane)

Out- : Negative output

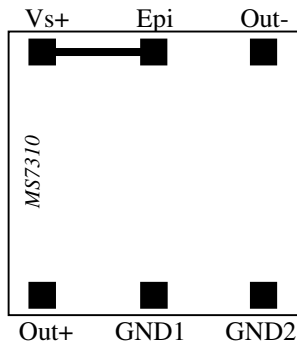
Out+ : Positive output

GND1 : Ground

GND2 : Ground

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PAD OUT

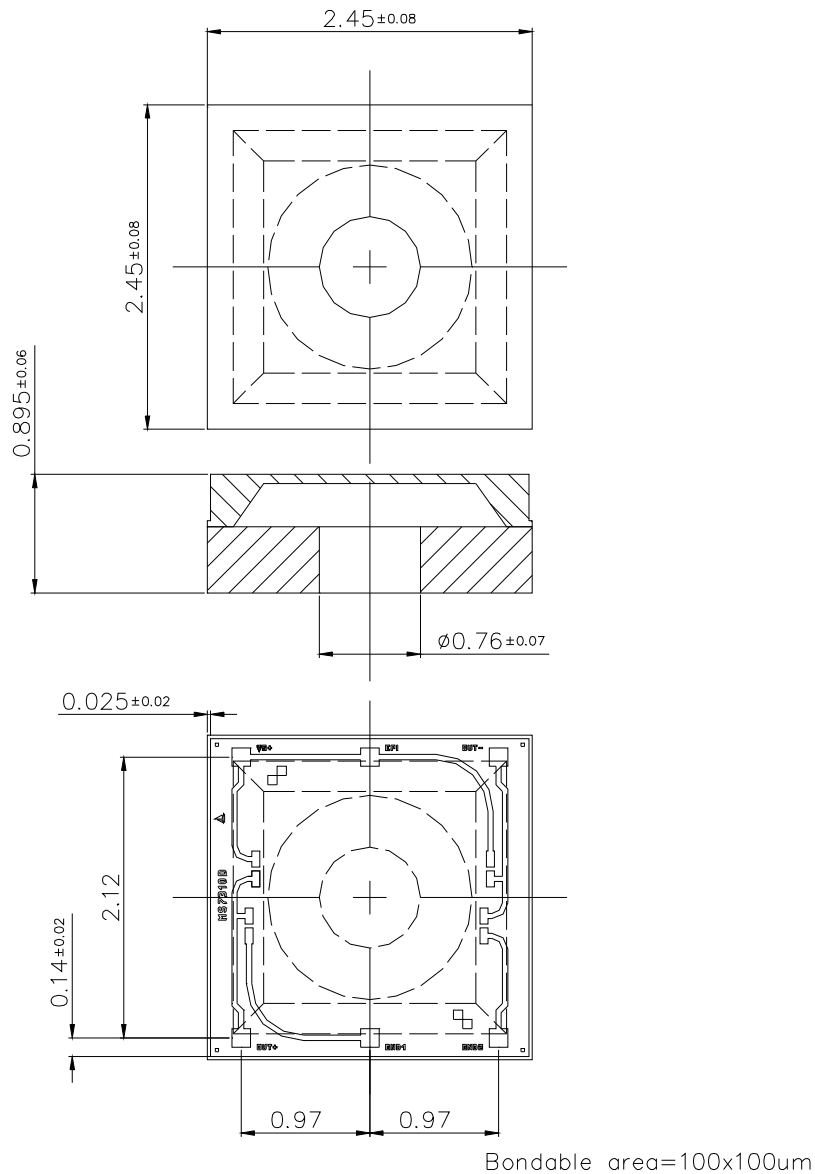


Important remarks:

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



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FULL SCALE PRESSURE

kPa	bar	mbar	PSI	atm	mm Hg	mm H ₂ O	Inches H ₂ O
10	0.1	100	1.45	0.0987	75.01	1019.7	40.1

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Conditions	Min	Max	Unit
Supply voltage	VS+	Ta = 25 °C		12	V
Storage temperature	T _s		-40	+150	°C
Pressure overload				600	kPa

ELECTRICAL CHARACTERISTICS

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

Parameter	Min	Typ	Max	Unit	Notes	
Operating Pressure Range	0	-	10	kPa		
Operating Temperature Range	-40		+125	°C		
Bridge Resistance	3000		3800	Ω		
Zero Pressure Offset	-40	0	40	mV		
Span (Full scale range)	10 kPa	85	110	130	mV	
	5 kPa	43	55	65	mV	
	2 kPa	17	22	26	mV	
Linearity (Full scale range)	10 kPa	±0.35	±0.5	%FS	1	
	5 kPa	±0.25	±0.4	%FS	2	
	2 kPa	±0.1	±0.2	%FS	3	
Temperature Coefficient of Resistance	+ 2500	+ 2900	+ 3400	ppm/°C	4	
	- 1600	- 1900	- 2200	ppm/°C		
	-80	-40	0	μV/°C		
Pressure hysteresis	-0.1		0.1	% FS	5	
Repeatability	-0.1		0.1	% FS	6	
Temperature hysteresis	-0.15		0.15	% FS	7	
Position sensitivity	0		0.15	% FS	8	
Response time		1.0		ms	9	
Warm-up time		1		s	10	

NOTES

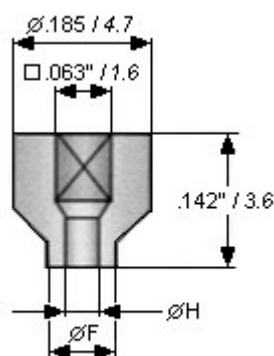
- 1) Deviation at one half full-scale pressure from least squares best line fit over pressure range 0 to 10 kPa.
- 2) Deviation at 2.5 kPa from least squares best line fit over pressure range 0 to 5 kPa.
- 3) Deviation at 1 kPa from least squares best line fit over pressure range 0 to 2 kPa.
- 4) Slope of the endpoint straight line from 25 °C to 60 °C.
- 5) 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.
- 6) Same as 5) after 10 pressure cycles.
- 7) Maximum difference in offset after one thermal cycle from -40 °C to 125 °C.
- 8) Maximum difference in output at any pressure within the specified pressure range between the sensor being in upright position and in upside-down position.
- 9) 10% to 90% signal rise time for a 0 to 10 kPa pressure step change.
- 10) Time to reach an offset accuracy of 0.2% after switching on a supply voltage of 5V.

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PICKING TOOLS

The MS7310D sensors have a sensitive membrane (1.5x1.5 mm) the sensor dice outer diameter is: 2.45x2.45 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 where done with a tool of SPT (see SPT drawing and references below).

SPT reference	PCTR-A-100
External dimension	∅F: 0.1 inch / 2.54 mm
Internal dimension	∅H: 0.08 inch / 2.04 mm



PCTR/FCTR-A

ORDERING INFORMATION

Product Code	Product	Art.-Nr.
MS7310D	10 kPa Differential Low Pressure Sensor	731025121

The MS7310D dice are supplied sawn on blue foil, mounted on plastic rings

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