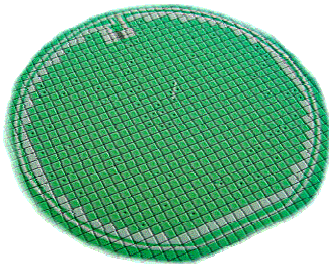


## MS7801

## PRESSURE SENSOR DIE (0-1 BAR)



- 0 to 100 kPa range (1 bar or 14.5PSI)
- Absolute/differential pressure sensors
- RoHS-compatible & Pb-free<sup>1</sup>

### DESCRIPTION

The sensor element of the MS7801 consists of a silicon micro-machined membrane with a Pyrex glass mounted under vacuum. Implanted resistors make use of the piezo-resistive effect. The absolute pressure sensor (MS7801A) carries a sealed vacuum reference cavity underneath the membrane whereas the differential sensor (MS7801D) has a hole in the Pyrex glass at the backside of the sensor.

### FEATURES

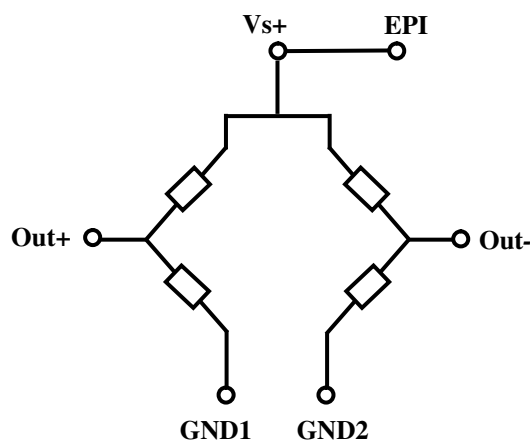
- Uncompensated pressure sensor die
- Output Span 150mV @ 5V
- Temperature Range -40°...+125°C
- Linearity 0.05% (typical)
- Small Die Size 1.98 x 1.84mm
- Low Cost, High reliability

### APPLICATION

- For absolute or differential pressure sensor systems
- Barometers, Altimeters
- Variometers

### ELECTRICAL CONNECTIONS

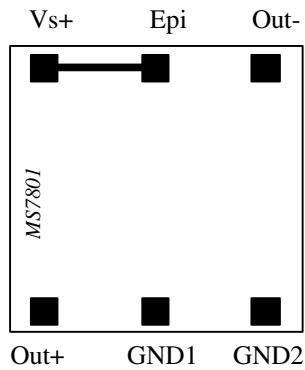
Positive output for pressure applied topside



- 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

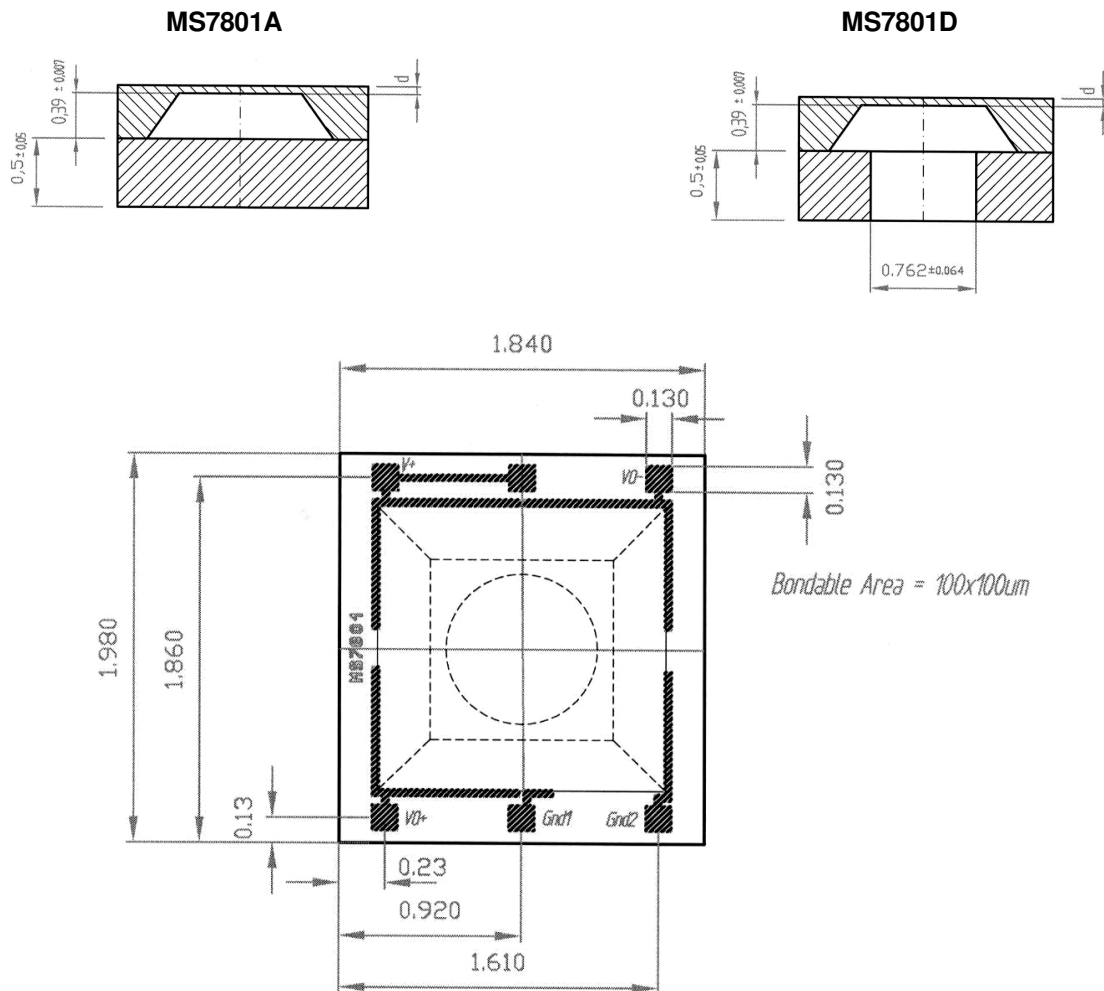


### Important remarks:

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	m H <sub>2</sub> O	Inches H <sub>2</sub> O
100	1	1000	14.5	0.987	750	10.197	401

## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Conditions	Min	Max	Unit
Supply voltage	VS+	Ta = 25 °C		20	V
Storage temperature	T <sub>S</sub>		-40	+150	°C
Pressure overload				5	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		1	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	± 0.2	% 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		± 0.05	± 0.15	% FS	4
Temperature Hysteresis			0.3	% FS	5

## NOTES

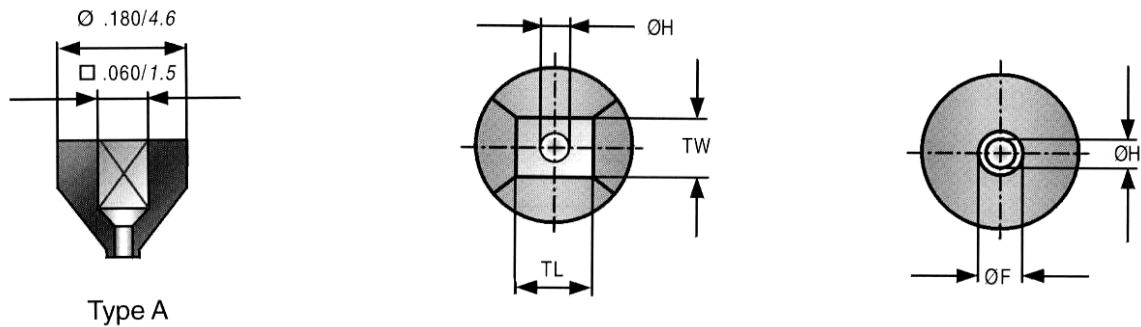
- 1) Deviation at one half full-scale pressure from the least squares best line fit over pressure range (0 to 1 bar).
- 2) Slope of the endpoint straight line from 25 °C to 60 °C.
- 3) Output deviation at any pressure within the specified range, when this pressure is cycled to and from the minimum or 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.

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## PICKING TOOLS

The MS7801 sensors have a sensitive membrane (0.9 x 0.9 mm) the sensor dice outer diameter is: 1.98 x 1.84 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 some tools of SPT , see SPT drawing and references below).

SPT references	RTR-A1-060x060	CTR-A1-080
External dimension	TL & TW: 0.06 inch / 1.52 mm	∅F: 0.08 inch / 2.03 mm
Internal dimensions	∅H: 0.035 inch / 0.89 mm	∅H: 0.035 inch / 0.89 mm



## ORDERING INFORMATION

Product Code	Type	Product	Art.-Nr.
MS7801-A	Absolute	1 bar Pressure Sensors sawn on b/f	780125021
MS7801-A_0.2	Absolute	1 bar Pressure Sensors 0.2 mm Pyrex sawn on b/f	780125022
MS7801-D	Differential	1 bar Pressure Sensors sawn on b/f	780125121

The MS7801 dice are supplied sawn on blue foil, mounted on plastic rings

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