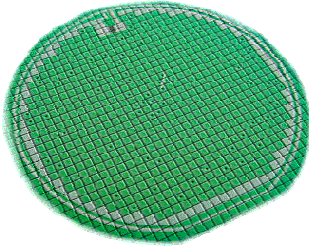


MS7212

PRESSURE SENSOR DIE (0-12 BAR) FOR HARSH ENVIRONMENT



- 0 to 1200 kPa range (12 bar or 174 PSI)
- Absolute pressure sensors
- Hermetic sensor
- RoHS-compatible & Pb-free¹

DESCRIPTION

The MS7212 is an absolute silicon micro-machined pressure sensor for harsh environment. A vacuum reference cavity is sealed on top of the sensitive silicon membrane by the anodic bonding of a Pyrex™ cap. The pressure, applied on the backside, is converted in electrical signal by piezo-resistors implanted in the silicon membrane. To improve the sensor stability, a drilled Pyrex™ is bonded on the backside. As the pressure port consists of Pyrex™ and silicon, both stable in most of the chemicals, the MS7212 is suitable for media-resistive applications.

FEATURES

- Media resistive pressure sensor die
- Output Span 150mV @ 5 V
- Temperature Range -40°...+125°C
- Linearity 0.05% (typical)
- Die Size 1.63 x 1.95 mm²
- Low Cost, High reliability

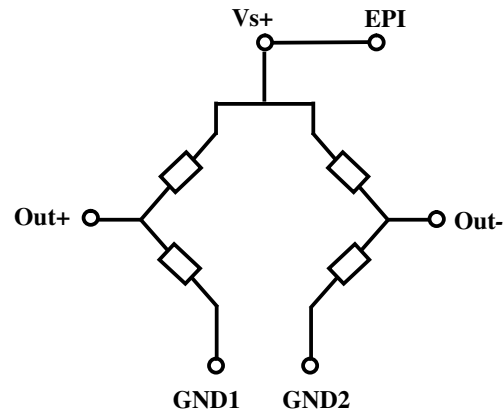
APPLICATION

- Harsh environments
- Absolute pressure sensor systems
- Braking systems
- Tire pressure
- Engine controls
- Diving computers

ELECTRICAL CONNECTIONS

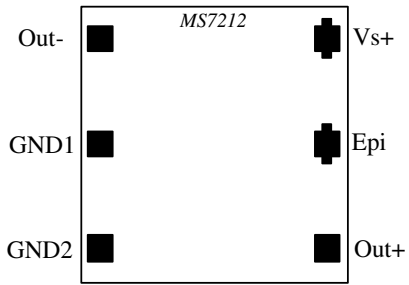
Positive output for pressure applied backside

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



深圳市新世联科技有限公司

PAD OUT

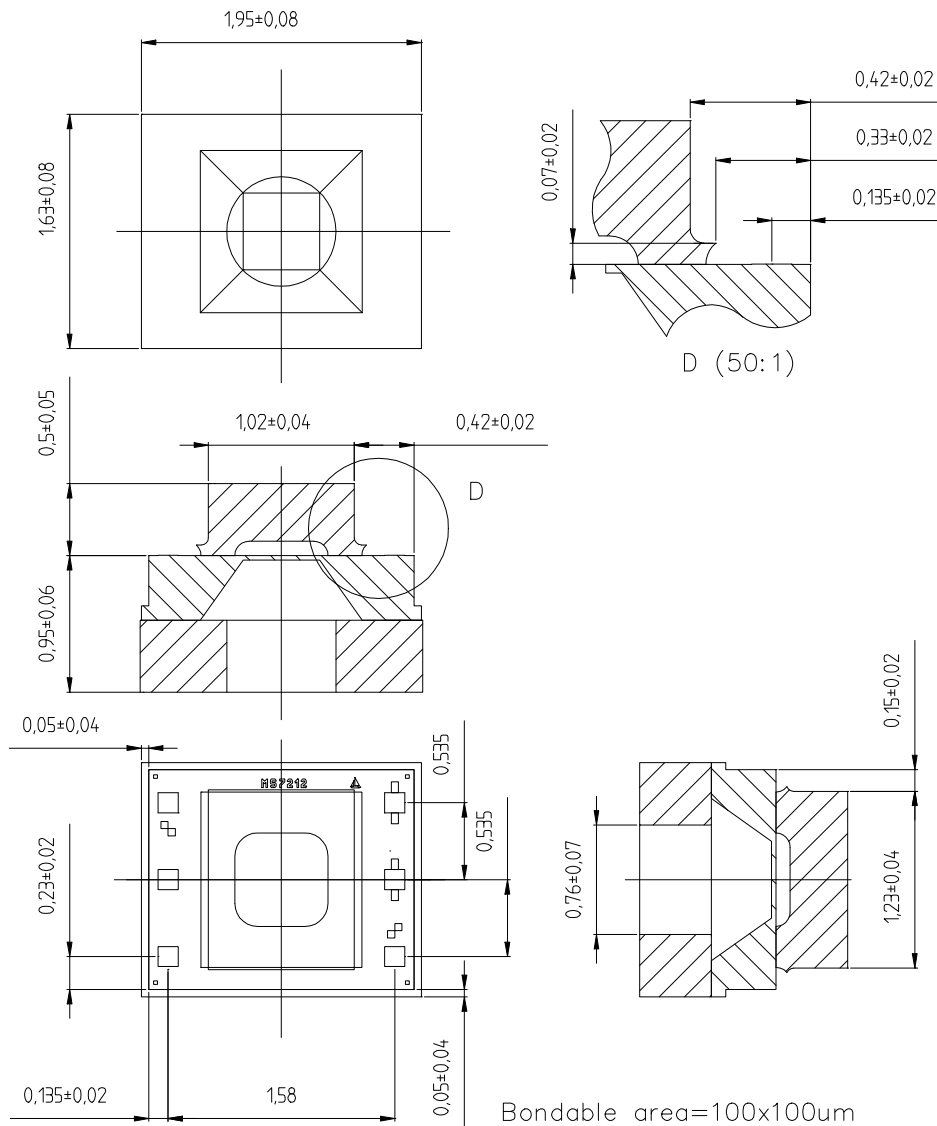


Important remarks:

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



深圳市新世联科技有限公司

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		± 0.05	± 0.15	% FS	4
Temperature Hysteresis			0.3	% FS	5

NOTES

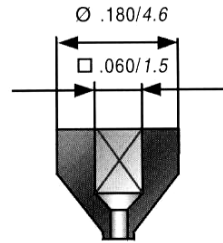
- 1) Deviation at one half full-scale pressure from the least squares best line fit over pressure range (0 to 12 bar).
- 2) Slope of the endpoint straight line from 25 °C to 60 °C.
- 3) Output deviation at any pressure within the specified range, when this pressure is cycled to and from the minimum or 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.

深圳市新世联科技有限公司

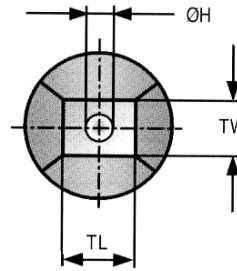
PICKING TOOLS

The MS7212 sensors have a topside Pyrex™ cap (1.23 x 1.02 mm²) and a backside Pyrex™ (1.95 x 1.63 mm²). 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 Pyrex™ cap. Successful tests 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	∅H: 0.035 inch / 0.89 mm



Type A



WIRE BONDING

The bondable area is 100 x 100 μm². The location of the bonding pads is close to the top Pyrex glass edge reducing the possible size and angle of the bonding capillary. Refer to the detail view *D* on the layout for more precision.

ORDERING INFORMATION

Product Code	type	Product	Art.-Nr.
MS7212-A	Absolute	12 bar Pressure Sensors sawn on b/f	721225021

The MS7212 dice are supplied sawn on blue foil, mounted on plastic rings

深圳市新世联科技有限公司