

## Product Overview

Novosense NSP163x series MEMS pressure sensors are high-performance and high-reliability MEMS absolute pressure sensor dies, based on the principle of monocrystalline silicon high sensitivity piezoresistive effect, and manufactured by the advanced MEMS technology. The NSP163x series MEMS absolute pressure sensors are qualified according to AEC-Q103 and guaranteed the accuracy and stability better than 1% FS in overall lifetime, the typical pressure ranges are 0~100kPa, 0~200kPa and 0~500kPa, widely used in automotive electronics, consumer electronics, industrial controls, etc.

The wafer manufactured platform of NSP163x series MEMS absolute pressure sensors is verified to fulfill the International Automotive Standard IATF16949:2016. Each wafer is inspected both in the process and at the end of process by 100% AOI and the electronic AOI wafer map is provided for each wafer. For additional shipping options, please contact Novosense sales.

## Key Features

- Pressure range: 0~100kPa, 200kPa, 500kPa
- Operating temperature: -40~125°C
- Die size: 1.0mmx1.0mmx0.4mm
- Accuracy and Stability better than 1%FS
- IATF16949 certificated manufactured platform
- AEC-Q103 automotive standards qualified
- ROHS & REACH compliant

## Applications

- Intake Manifold Pressure Sensor
- Vacuum Booster Pressure Sensor
- Electric Vehicle Battery Pack Pressure Sensor
- Barometric Pressure Sensors
- Industrial Controls

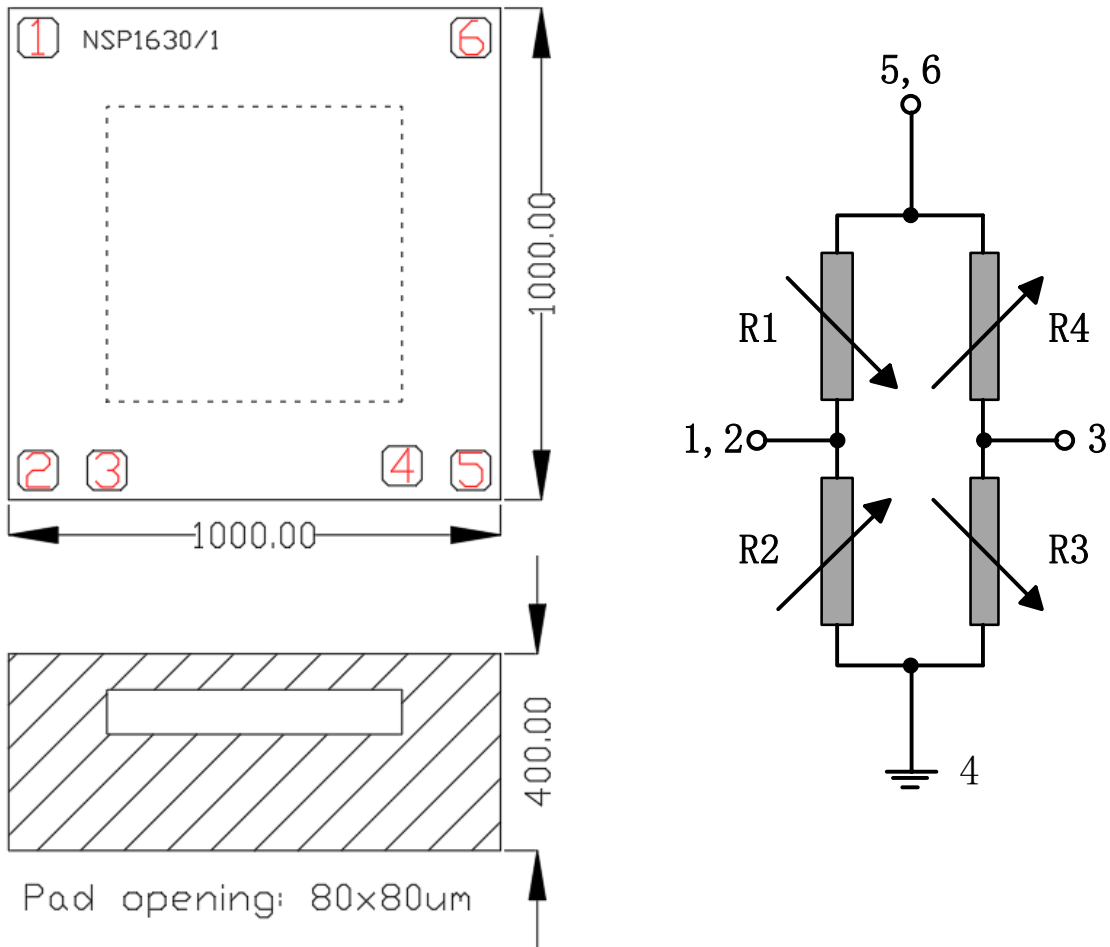
## Device Information

<i>Part Number</i>	<i>Span</i>	<i>Die Size</i>
NSP1630-Cxx200	0~200kPa	1.0mmx1.0mmx0.4mm
NSP1630-Dxx100	0~100kPa	1.0mmx1.0mmx0.4mm
NSP1631-Axx500	0~500kPa	1.0mmx1.0mmx0.4mm

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1. Dimensions And Diagram



NO.	Pad description	Symbol	Value	Coordinate X-Axis ( $\mu\text{m}$ )	Coordinate Y-Axis ( $\mu\text{m}$ )
1	Positive Sensor Output	Vout+	-	60	940
2	Positive Sensor Output	Vout+	-	60	60
3	Negative Sensor Output	Vout-	-	200	60
4	Negative Supply Voltage	GND	0V	800	70
5	Positive Supply Voltage	VDD	+5V	940	60
6	Positive Supply Voltage	VDD	+5V	940	940

Notes:

1. All dimensions are in micron.
2. Bond pad opening size: 80x80um.
3. Bond pad metal: Al, Thickness: 1um.

## 2. Absolute Maximum Ratings

NO.	Parameters	Symbol	Min	Typ	Max	Unit
1	Supply voltage	VDD			12	V
2	Operating temperature <sup>1</sup>	T <sub>OP</sub>	-40		125	°C
3	Storage temperature	T <sub>STG</sub>	-40		150	°C
4	Proof pressure	P <sub>proof</sub>	3x			FS
5	Burst pressure	P <sub>Burst</sub>	5x			FS

### 3. Characteristic

Measured at 5V supply and 25 °C, unless otherwise specified.

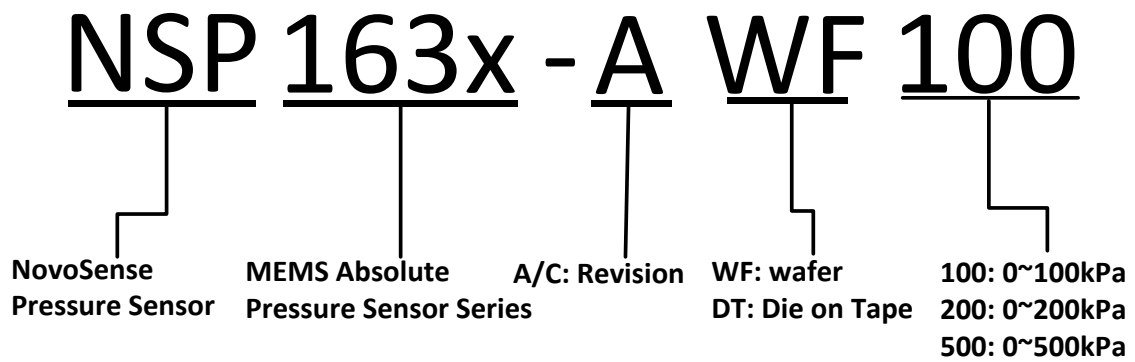
NO.	Parameters	Symbol	Min <sup>3</sup>	Typ <sup>1, 2</sup>	Max <sup>3</sup>	Unit	
1	Pressure range	Span	0	100,200,500	1000	kPa	
2	Full span output	Vout	100kPa	40	70	100	mV
			200kPa	50	80	110	
			500kPa	55	85	115	
3	Offset Voltage <sup>3</sup>	Offset	-30	±10	30	mV	
4	Temperature coefficient of span <sup>4</sup>	TCS	-0.26	-0.21	-0.16	%FS/	
5	Temperature coefficient of offset <sup>4</sup>	TCO	-80	±10	80	μV/°C	
6	Temperature coefficient of bridge resistance <sup>4</sup>	TCR	0.04	0.08	0.12	%FS/	
7	Non-linearity <sup>5</sup>	NL <sub>TS</sub>	-0.3	±0.1	0.3	%FS	
8	Bridge resistance	R <sub>B</sub>	4.3	5.3	6.3	kΩ	
9	Pressure hysteresis <sup>6</sup>	P <sub>HYS</sub>	-0.2	±0.1	0.2	%FS	
10	Temperature hysteresis <sup>5</sup>	T <sub>HYS</sub>	-0.2	±0.1	0.2	%FS	

#### Notes:

1. Measured on a sample basis and based on special MEMS only package. The sensor performance may change depending on the die attach material and the assemble process.
2. Measured at 0~100kPa pressure range and for the other pressure ranges, please contact Novosense sales.
3. Output voltage at zero pressure.
4. Measured from -40°C to 125°C.
5. Defined as the best fit straight line.
6. Dry non-corrosive and pollution-free gas.

**4. Order Information**

NO.	Order NO.	Span	Comment
1	NSP1630-CWF200	0~200kpa	Wafer
2	NSP1630-CDT200	0~200kpa	Die on Tape
3	NSP1630-DWF100	0~100kpa	Wafer
4	NSP1630-DDT100	0~100kpa	Die on Tape
5	NSP1631-AWF500	0~500kpa	Wafer
6	NSP1631-ADT500	0~500kpa	Die on Tape



## 5. Revision History

Revision	Description	Date
0.1	Initial Version.	2021/4/20
1.0	Formal Version	2021/6/6

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