NSP1831 Series

MEMS Low Differential Pressure Sensor Die

Datasheet (EN) 1.0

Product Overview

Novosense NSP1831 Series MEMS pressure sensos are high-performance and high-reliability MEMS Low differential pressure sensor dies, based on the principle of mono-crystalline silicon high sensitivity piezoresistive effect, and manufactured by the advanced MEMS technology. The NSP1831 series MEMS Low differential 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~±6kPa and 0~±10kPa, widely used in consumer electronics, medical electronics, industrial controls, automotive electronics etc.

The wafer manufactured platform of NSP1831 series MEMS low differential pressure sensor is verified to fulfill the International Automotive Standard IATF16949:2016. Each wafer is inspected both in backside and frontside 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~±6kPa, ±10kPa
- Operating temperature：-40~125℃
- Die size：2.0mmx2.0mmx0.4mm
- Accuracy and stability better than 1%FS
- IATF16949 certificated manufactured platform
- AEC-Q103 automotive standards qualified
- ROHS & REACH compliant

Applications

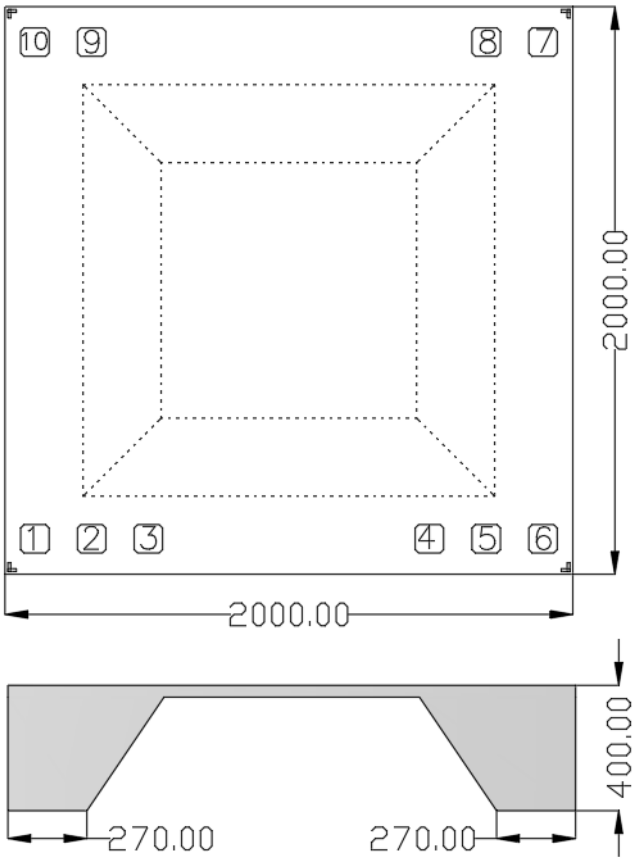
- White household
- Consumer
- Medical
- Industrial Controls

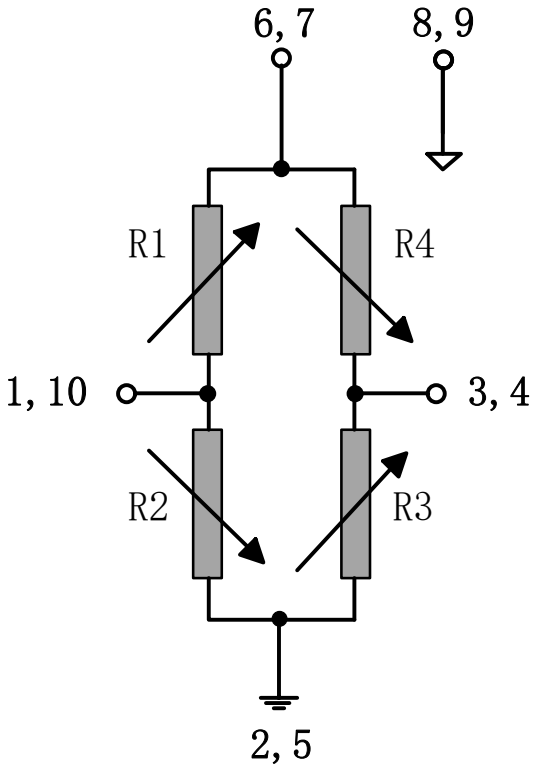
Device Information

Part Number	*Span*	*Die Size*
NSP1831-Bxx006	0~±6kPa	2.0mmx2.0mmx0.4mm
NSP1831-Axx010	0~±10kPa	2.0mmx2.0mmx0.4mm

INDEX

1. Dimensions And Diagram





NO.	Pad description	Symbol	Value	Coordinate X-Axis (μm)	Coordinate Y-Axis (μm)
1	Negative Sensor Output	Vout-	-	105	125
2	Negative Supply Voltage	GND	0V	305	125
3	Positive Sensor Output	Vout+	-	505	125
4	Positive Sensor Output	Vout+	-	1495	125
5	Negative Supply Voltage	GND	0V	1695	125
6	Positive Supply Voltage	VDD	+5V	1895	125
7	Positive Supply Voltage	VDD	+5V	1895	1875
8	Substrate Supply Voltage	VSUB	+5V	1650	1875
9	Substrate Supply Voltage	VSUB	+5V	305	1875
10	Negative Sensor Output	Vout-	-	105	1875

Notes：

1. All dimensions are in micron.
2. Bond pad opening size: 100x100um.
3. Bond pad metal: Al, Thickness: 1um.
4. The thickness of die is 400um.

2. Absolute Maximum Ratings

NO.	Parameters	Symbol	Min	Typ	Max	Unit
1	Supply voltage	VDD			12	V
2	Operating temperature	T_{OP}	-40		125	℃
3	Storage temperature	T_{STG}	-40		150	℃
4	Proof pressure	P_{proof}	3x			FS
5	Burst pressure	P_{Burst}	5x			FS

3. Characteristic

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

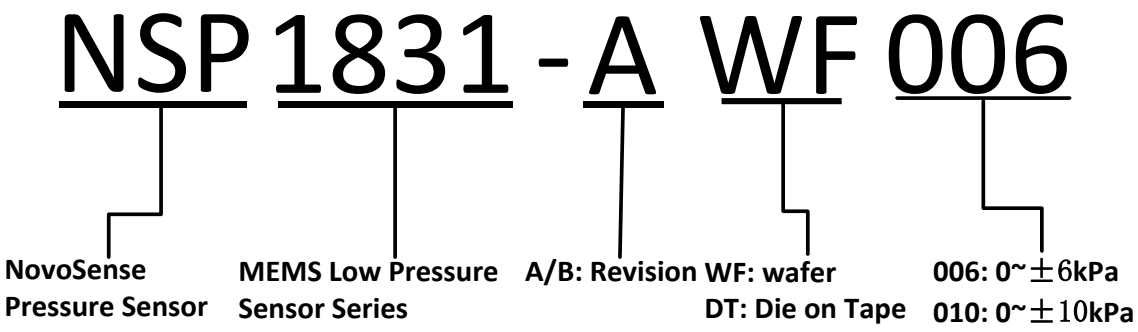
NO.	Parameters		Symbol	Min[3]	Typ[1, 2]	Max[3]	Unit
1	Pressure range[3, 7]		Span	-10	±6, ±10	100	kPa
2	Full span output	±6kPa	Vout	20	50	80	mV
		±10kPa		10	40	70	
3	Offset Voltage[4]		Offset	-30	±15	30	mV
4	Temperature coefficient of span[5]		TCS	-0.28	-0.28	-0.16	%FS/
5	Temperature coefficient of offset[5]		TCO	-80	±15	80	μV/℃
6	Temperature coefficient of bridge resistance[5]		TCR	0.04	0.08	0.12	%FS/
7	Non-linearity[6]	±6kPa	NL	-0.5	±0.2	0.5	%FS
		±10kPa		-0.7	±0.4	0.7	%FS
8	Bridge resistance		R_B	4.3	5.3	6.3	kΩ
9	Pressure hysteresis[7]		P_{HYS}	-0.2	±0.1	0.2	%FS
10	Temperature hysteresis[5]		T_{HYS}	-0.5	±0.2	0.5	%FS

Notes:

1. Measured on a sample basis and based on the special MEMS only package. The sensor performance may change depending on the die attach material and the assembly process.
2. Measured at 0~±6kPa pressure range and for the other pressure ranges, please contact Novosense sales.
3. Referring to atmosphere pressure.
4. Output voltage at zero pressure.
5. Measured from -40℃ to 125℃;
6. Defined as best fit straight line and pressure applied onto the front side of the die.
7. Dry non-corrosive and pollution-free gas.

4. Order Information

NO.	Order NO.	Span	Comment
1	NSP1831-AWF010	0~±10kpa	Wafer
2	NSP1831-ADT010	0~±10kpa	Die on Tape
3	NSP1831-BWF006	0~±6kpa	Wafer
4	NSP1831-BDT006	0~±6kpa	Die on Tape



5. Revision History

Revision	Description	Date
0.1	Initial Version.	2022/5/16
1.0	Formal Version.	2022/6/6

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