AMS 5105 - AMS 5915 - Product comparison of OEM pressure sensors for PCB mounting

The OEM-pressure sensors from the AMS 5XXX series are well-established measuring devices with different output configurations. They are offered for all pressure types (absolute, gage and (bidirectional) differential). Since the different versions all have a similar construction, it is not obvious right away in which points they differ. This summary shall simplify this matter.
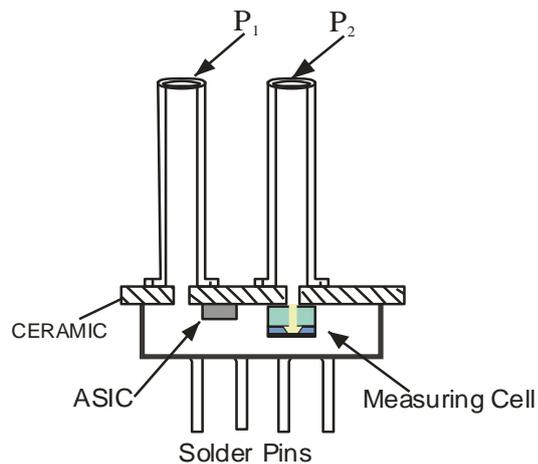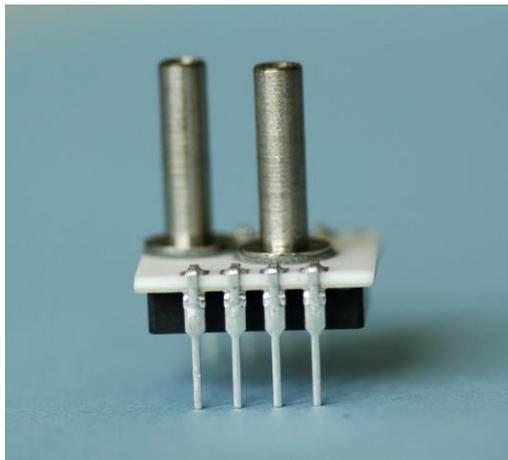

Figure 1: Dual-in-Line Pressure sensors from the AMS 5812, AMS 5612, AMS 5915 and AMS 5105 series, side view and schematic profile (Dimension: ceramic substrate 15.2x15.2mm²)

Description Dual-in-Line Sensors

In case of the Dual-in-Line sensors from the AMS 5XXX series there are four variants with identical dimensions (600mil grid) and configuration in the basic version:

- AMS 5105
- AMS 5612
- AMS 5812
- AMS 5915

The basic versions (see *Figure 1*) consist of different silicon measurement dies and different evaluation ASICs, depending on the pressure range and output signal. But they always consist of similar ceramic substrates, ceramic cap, metallic tubes and solder pins (for through-hole technology).

The OEM-Sensors are individually calibrated to the specific output values during the production process, linearized and temperature compensated. All versions can measure absolute, gage and differential (also bidirectional differential) pressure in a wide range (see table 1).

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AMS 5105 [1]

The AMS 5105 series is a sensor family with two independent, logical switching outputs combined with an analog linear voltage output (0.5 – 4.5 Volt, ratiometric). The sensors are powered with a voltage supply of 5 Volt. The switching function (normally open, normally close, window switch), the switching points, the hysteresis and the switching delay can be adjusted by a programming circuit (USB Starter-KIT AMS 5105) or by the manufacturer. This sensor family is designed for applications which do not have an additional electronic following the sensor and whose switching characteristics will not be changed during operation.

AMS 5612 [2]

The sensors of the AMS 5612 series have a non-amplified, analog output, which is ratiometric to the supply voltage. The sensors are powered with a voltage supply of max. 20 V. They are calibrated and compensated using a resistance network (thick-film resistors) on the ceramic substrate. Since this sensor family is completely analog, the resolution is only restricted by the resistors noise of the silicon measuring bridges. Since no A/D conversion takes place, the sensor is especially suitable for time-critical applications (< 1 msec.) with high resolution.

AMS 5812 [3]

The AMS 5812 family offers a digital output in I²C format and a ratiometric, linear 0.5-4.5 Volt voltage output, which can be used independently from each other. The sensors are powered with a voltage supply of 5 Volt. The address of the sensors is preset but can be adjusted by a programming circuit (USB Starter-KIT AMS 5812) or by the manufacturer according to the customers specifications (e.g. for a sensor network). Additionally, the temperature of the measuring cell is provided as an output signal on the digital interface. Because the cell is in direct contact with the measuring media, the media temperature can be measured nearly failure-free after the temperature has settled.

AMS 5915 [4]

The AMS 5915 series has a digital output in I²C format and is powered using 3 Volt. The sensor's address is preset but can be adjusted by a programming circuit (USB Starter-KIT AMS 5915) or by the manufacturer according to the customers specifications (e.g. for a sensor network). Additionally, the temperature which is measured by the temperature sensor in the ASIC is provided at the output.

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Comparison AMS 5105, AMS 5612, AMS 5812 and AMS 5915:

Sensor type	Differential (Gage) pressure	Bidirectional differential pressure	Absolute pressure	Barometric pressure	Pressure Ranges	Voltage Supply 3V	Voltage Supply 5V	Voltage Supply 20V	Output 0,5 –4,5V	Output I²C	Output binary	Output not amplified	Adressable	Parameterisable
AMS 5105	X	X	X	X	5 mbar - 2 bar		X		X		X		X	X
AMS 5612	X	X	X	X	20mbar - 1bar		X	X				X		
AMS 5812	X	X	X	X	5mbar - 7bar		X		X	X			X	
AMS 5915	X	X	X	X	5mbar - 10bar	X				X			X	

Table1: *Tabular Overview of the AMS 5XX series*

Summary

The OEM pressure sensor series AMS 5XXX covers a wide pressure range and is due to its differ-ent versions suitable for all pressure measuring methods. The pressure sensors can be used for measuring negative pressure and overpressure (bidirectional) particularly.

Beside the offered standard products it is also possible to modify the sensors in various character-istics (e.g. pressure range, pressure ports, without ports) in order to offer an ideal solution for a specific application.

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Further information

[1] Product information AMS 5105: https://www.amsys-sensor.com/products/pressure-sensor/ams5105-pressure-sensor-with-switching-output/

[2] Product information AMS 5612: https://www.amsys-sensor.com/products/pressure-sensor/ams5612-analog-uncompensated-pressure-sensor/

[3] Product information AMS 5812: https://www.amsys-sensor.com/products/pressure-sensor/ams5812-pressure-sensor-with-analog-and-digital-output/

[4] Product information AMS 5915: https://www.amsys-sensor.com/products/pressure-sensor/ams5915-digital-pressure-sensor-5mbar-to-10-bar/

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