
Digital Differential Pressure and Altimeter Sensor Module, ± 1 psi, 14 bit ADC, ± 0.5 %FSS Pressure Accuracy.

Datasheet - In Production



Features

- 5V - 10mA power supply
- ± 1 PSI Pressure range
- Max 350 km/h at sea level
- I²C(400KHz) interfaces

Applications

- UAVs and Drones
- RC aircrafts
- Pneumatic controls
- Medical Instruments

Description

The Siderion **MS4525DSO Airspeed Sensor** is a compact, high-performance and factory-calibrated digital barometric pressure sensor (1PSI) ideal for precise altitude, pressure, and airspeed measurements.

It integrates a piezoresistive barometric sensor, a 14-bit ADC, and a DSP to cover a pressure range of ± 1 PSI.

When used as an airspeed sensor in combination with a Pitot tube, it accurately detects differential pressure for airspeed calculations up to 350km/h at sea level in applications such as drones, aviation, and aerodynamics.

The sensor supports I²C communication interfaces.

The MS4525DSO Airspeed Sensor operates across a temperature range from -25°C to +70°C.

Table 1. Device summary

Order ref code	Temperature [°C]	Product size [mm]	Weight [g]
SID-SENS-MS4525	-25 to +70	33.0 x 26.0 x 14.0	8

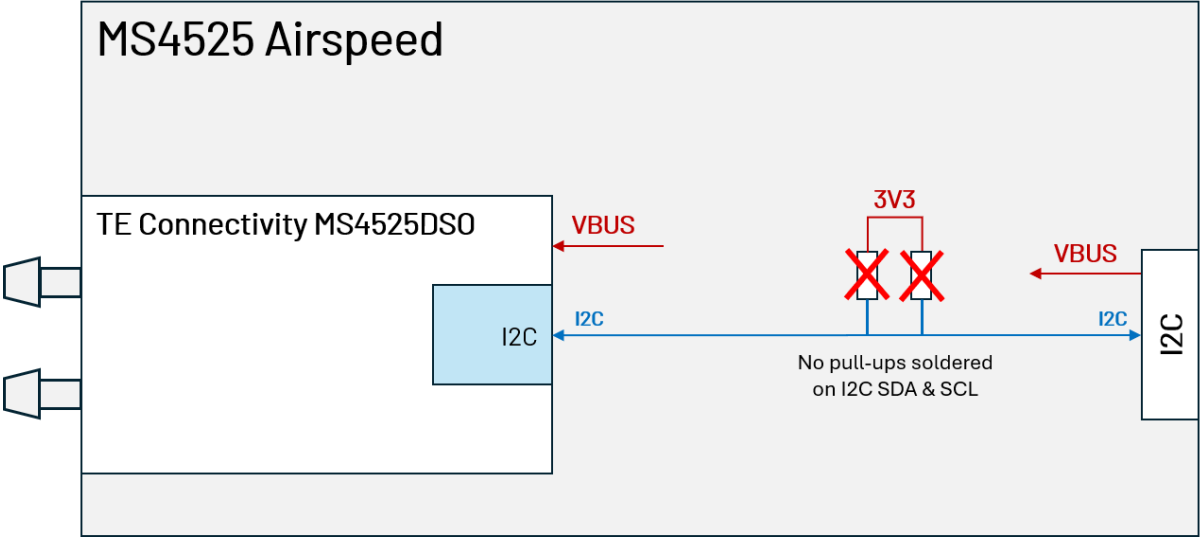
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1. Block diagram and pin description

1.1 Block diagram

Figure 1. MS4525 Airspeed sensor block diagram & connectivity (top view)



1.2 Pin description

Figure 2. MS4525 Airspeed sensor pinout (side views)

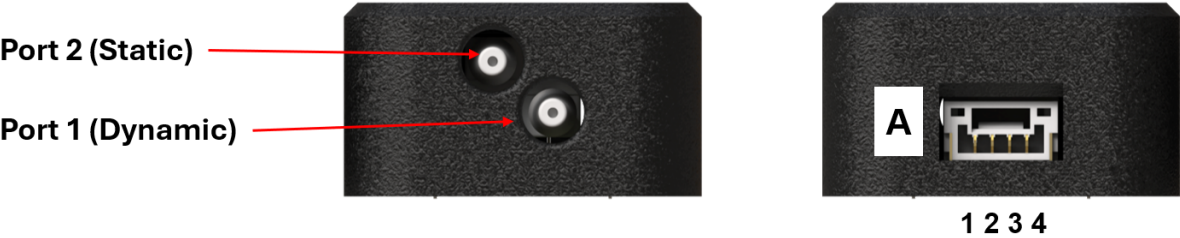


Table 2. Pinout configuration

	Pin	Name	Type	Function
I2C	A1	5V IN	P	5V input
	A2	I2C SCL	I	I2C Serial Clock
	A3	I2C SDA	I/O	I2C Serial Data
	A4	GND	I	Ground reference

P : Power / I : Input / O : Output

2. Absolute maximum ratings

Stresses above those listed as “absolute maximum ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device under these conditions is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability.

Table 3. MS4525 Airspeed sensor absolute maximum ratings

Symbol	Parameter	Maximum value	Units
Vcc	Supply voltage	-0.5 to +5.5	V
Vdd	I/O pins supply voltage	-0.5 to Vcc+0.1	V
Icc	Input current	3	mA
Sair_max	Maximum airspeed	350	Km/h
W	Product weight	8	g
TOP	Operating temperature	-25 to +70	°C
TSTG	Storage temperature	-40 to +80	°C



This device is sensitive to electrostatic discharge (ESD), improper handling can cause permanent damage to the part.

3. Specifications

3.1 TE MS4525DSO specifications

Table 4. MS4525DSO mechanical and electrical specifications

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Units
Vcc	5V Input			5.0		V
Vdd	Supply voltage for I/O			3.3		V
Idd	Current consumption			3		mA
Idd_sb	Current consumption	Stand-By (25°C)		5		μA
Prange	Pressure range	@ 25°C	-1		1	PSI
Pacc	Pressure accuracy	@ 25°C	-0.25		+0.25	%FSS
Pres	Pressure resolution	@ 25°C			0.56	Pa
Tacc	Temperature accuracy	@ 25°C			±1.5	°C
Tres	Temperature resolution	@ 25°C			0.1	°C
Sair	Measurable airspeed	@ sea level			106	m/s
Ctime	Conversion time		0.5		1.0	ms
Vil	IO pin low level input voltage		0		0.8	V
Vih	IO pin high level input voltage		2		Vdd+0.3	V
Vol	IO pin low level output voltage	Iol = 0.6mA	0		20%Vdd	V
Voh	IO pin high level output voltage	Ioh = 0.6mA	80%Vdd		Vdd	V
Top	Operating temperature		-25		+70	°C
I2Cadd	7bit I ² C address	0b0101000 (0x28)				

4. Applications

4.1 Pitot tube configuration

Figure 4. MS4525 Airspeed sensor

4.2 Airspeed computation (Bernouilli's equation)

For UAV and aeronautical use, the **MS4525DO** differential sensor is typically paired with a **pitot tube** to measure dynamic pressure (ΔP). This ΔP is used to compute true airspeed (**TAS**) with the following relation:

$$v = \sqrt{\frac{2 \cdot \Delta P}{\rho}} \quad \text{Equation 1. Bernouilli's equation}$$

Where:

- **v** = airspeed (m/s)
- **ΔP** = differential pressure (Pa) measured by the sensor
- **ρ** = air density (kg/m³), varies with altitude & temperature (**1.225 Kg/m3** at sea level)

With its fast response time and high resolution, the MS4525 enables accurate and real-time airspeed computation, even at low airspeeds (± 1 psi $\approx \pm 6.9$ kPa range), critical for small UAVs and fixed-wing drones.

5. Communication interfaces

The sensor offers an I2C communication interface.

5.1 Slave I2C interface

An I2C compliant interface is available for communication with an external host CPU. The interface can be operated in slave mode only. It is fully compatible with Fast-Mode of the I2C industry standard. Since the maximum SCL clock frequency is 400 KHz (in Fast-Mode), the maximum bit rate is 400 Kbit/s. The interface stretches the clock when slowed down while serving interrupts, therefore the real bit rates may be slightly lower.

The SDA and SCL lines do not have any internal pull-up resistors soldered in place. External pull-up resistors may be required for correct operation (typically 1 kΩ to 4.7 kΩ)

Figure 3. I2C chronogram specifications

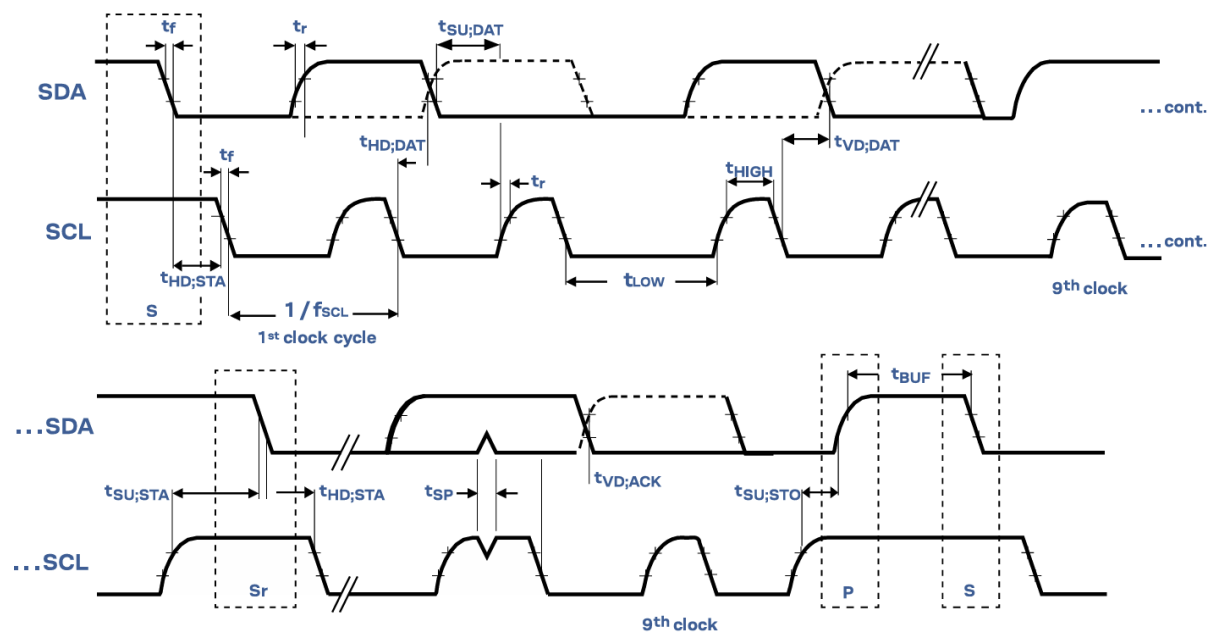
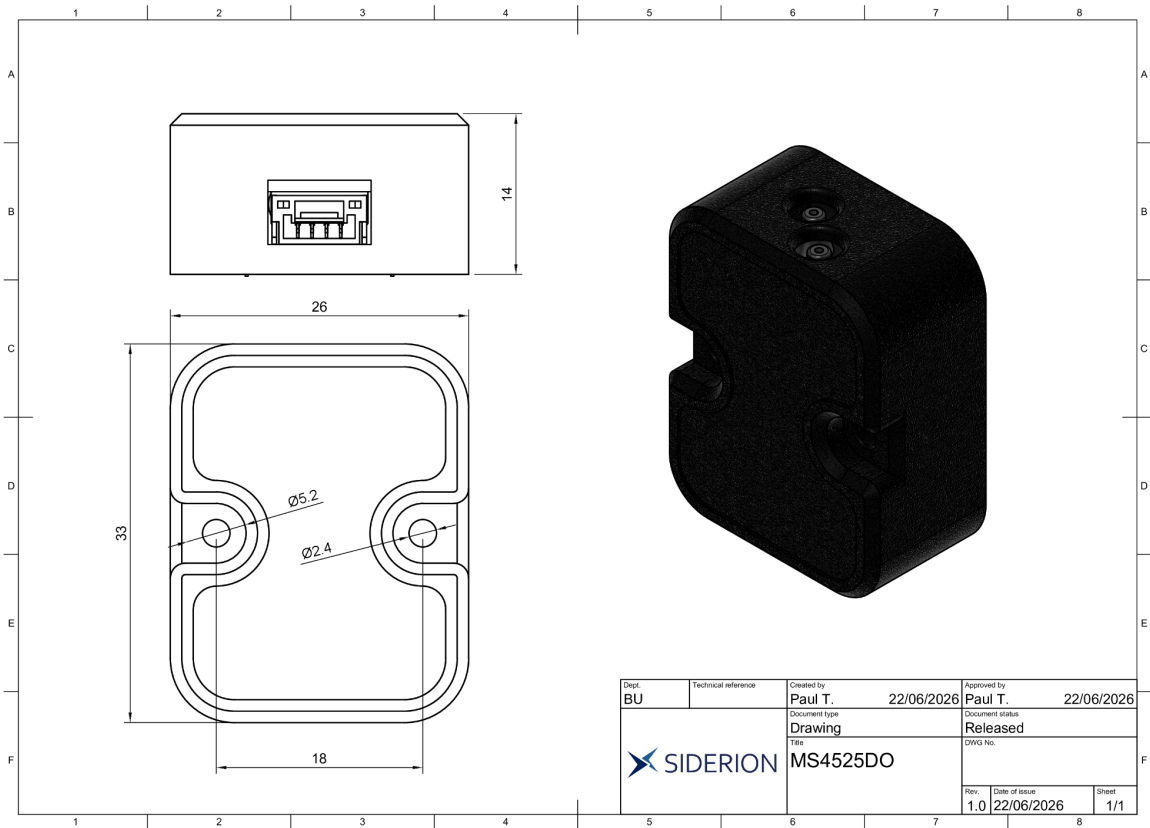


Table 5. MS4525 Airspeed sensor I2C timing specifications

Symbol	Parameter	Min	Max	Units
Vil	LOW-LEVEL input voltage	0	0.2xVdd	V
Vih	HIGH-LEVEL input voltage	0.8xVdd	Vdd	V
Cb	Capacitive load for each bus line	6	6	pF
Fscl	SCL clock frequency	100	400	KHz

6. Mechanical drawings

Figure 4. MS4525 Airspeed Sensor v1.0 mechanical drawings



7. Revision history

Table 6. Document revision history

Date	Revision	Changes
22-June-2026	1.0	SiderionDoc_MS4525 / Initial release

8. Appendix

TE Connectivity MS4525DO datasheet: [MS4525DO](#)

Siderion user's guide:

Siderion tutorials:

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