Sensors

CO sensor specifications

Specifications

- Technology: Electrochemical
- Target gases: Carbon monoxide
- Typical detection range: 0 ~ 5,000ppm
- Baseline offset(*1): <±10ppm equivalent
- Operating temperature: -10˚C ~ +50˚C (continuous) -20˚C ~ +60˚C (intermittent)
- Operating humidity: 10 ~ 95%RH (no condensation)
- Response time (T90): within 60 seconds
- Standard test conditions: 20±2˚C, 40±10%RH

VOC sensor specifications

Parameter	Signal	Values		Comments
Output range	TVOC signal	0 ppb to 60000 ppb		Maximum possible output range. The gas sensing performance is specified for the measurement range as defined
	CO_2eq signal	400 ppm to 60000 ppm		
Resolution	TVOC signal	0 ppb - 2008 ppb	1 ppb	
		2008 ppb – 11110 ppb	6 ppb	
		11110 ppb – 60000 ppb	32 ppb	
Technology	Metal - Oxide			
Sampling rate	TVOC signal	1 Hz		The on-chip baseline compensation algorithm has been optimized for this sampling rate. The sensor shows best performance when used with this sampling rate.

PM sensor specifications

Parameter	Conditions	Value	Units
Mass concentration accuracy[1]	0 to 100 µg/m3	±10	µg/m3
	100 to 1'000 µg/m3	±10	%
Mass concentration range	-	0 to 1'000	µg/m3
Mass concentration resolution	-	1	µg/m3
Mass concentration size range[2]	PM1.0	0.3 to 1.0	µm
	PM2.5	0.3 to 2.5	µm
	PM4	0.3 to 4.0	µm
	PM10	0.3 to 10.0	µm
Number concentration range	-	0 to 3'000	1/cm3
Number concentration size range[2]	PM0.5	0.3 to 0.5	µm
	PM1.0	0.3 to 1.0	µm
	PM2.5	0.3 to 2.5	µm
	PM4	0.3 to 4.0	µm
	PM10	0.3 to 10.0	µm
Sampling interval	-	1	s
Start-up time	-	<8	s
Lifetime[3]	24 h/day operation	>8	years
Acoustic emission level	0.2 m	25	dB(A)
Weight	-	26	g

CO2 sensor specifications

Parameter	Conditions	Value
Technology	-	IR Detection - NDIR
CO_2 measurement range	-	0 – 40’000 ppm
Accuracy	400 ppm – 10’000 ppm	± (30 ppm + 3%MV)
Repeatability	400 ppm – 10’000 ppm	± 10 ppm
Temperature stability	T = 0 … 50°C	± 2.5 ppm / °C
Response time	$\tau_{63\%}$	20 s
Accuracy drift over lifetime	400 ppm – 10’000 ppm ASC field-calibration algorithm activated and SCD30 in environment allowing for ASC, or FRC field-calibration algorithm applied.	± 50 ppm

TEMPERATURE sensor specifications

Parameter	Conditions	Value
Temperature measurement range[9]	-	- 40°C – 70°C
Accuracy	0 – 50°C	± (0.4°C + 0.023 × (T [°C] – 25°C))
Repeatability	-	± 0.1°C
Response time	$\tau_{63\%}$	> 10 s
Accuracy drift	-	< 0.03 °C / year

HUMIDITY sensor specifications

Parameter	Conditions	Value
Humidity measurement range	-	0 %RH – 100 %RH
Accuracy	25°C, 0 – 100 %RH	± 3 %RH
Repeatability	-	± 0.1 %RH
Response time	$\tau_{63\%}$	8 s
Accuracy drift	-	< 0.25 %RH / year

Atmospheric pressure sensor specifications

A miniature 5 x 3 x 1.2 mm LGA package is ideally suited for the space constrained requirements of portable electronic devices. Low current consumptions of
5 µA during Active mode and 1 µA during Shutdown (Sleep) mode are essential when focusing on low-power applications. The wide operating temperature range spans from – 40 °C to +105 °C to fit demanding environment conditions.

The MPL115A1 employs a MEMS pressure sensor with a conditioning IC to provide accurate pressure measurements from 50 to 115 kPa. An integrated ADC converts pressure and temperature sensor readings to digitized outputs via a SPI port. Factory calibration data is stored internally in an on-board ROM. Utilizing the raw sensor output and calibration data, the host microcontroller executes a compensation algorithm to render *Compensated Absolute Pressure* with ±1 kPa accuracy