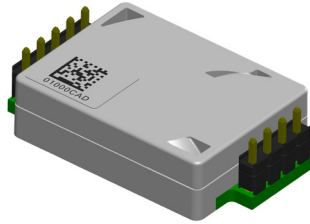


[Preliminary]

# LP8

Miniature CO<sub>2</sub> sensor module for battery-powered applications.



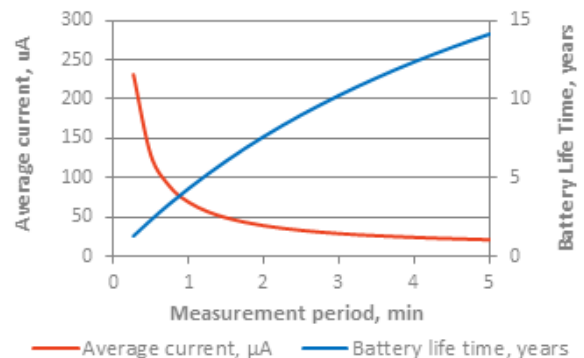
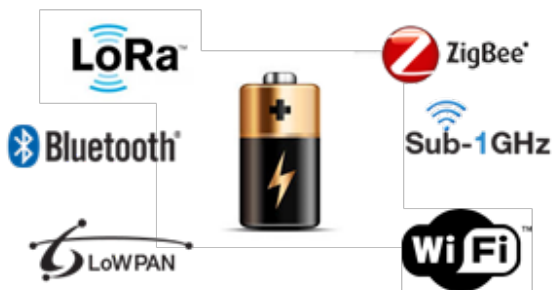
## Key Benefits:

- 3.6 mC power usage per measurement (11.9mJ@3.3V)
- Miniature size (SenseAir® S8 format)
- A wide supply voltage range enables a variety of battery options
- Adjustable measurement period by host
- Adjustable ABC period by host

LP8 is a miniature sensor module which targets battery-powered applications. It gives full control on sensor integration into a host system and flexibility in changing the CO<sub>2</sub> measurement period and consequently also the power consumption. One measurement requires only 3.6 mC of charge (or energy 11.9 mJ having 3.3V on the battery).

A wide supply voltage range (2.9-5.5V) enables a variety of battery options for powering the sensor. For example three alkaline 1.5V batteries, or a single 3.6V Li-SOCI2 battery for a more compact alternative.

LP8 provides a relatively simple communication protocol which allows customer to change measurement period on the fly and control ABC (Automatic Background Calibration) period. Background and zero-gas calibrations are also implemented in a simple manner.



Integrate our LP8 sensor into your wireless battery-powered solution.

Estimated 2600 mAh battery life-time (super-cap 8 $\mu\text{A}$  leakage, w/o battery voltage monitor option).

## Average current calculation:

$$I_{avg} = \frac{Q_{meas}}{T_{meas}} + I_{SHDN} + I_{C\_leak}$$

Where:

$I_{avg}$  = Average current consumption

$T_{meas}$  = Measurement period set by host

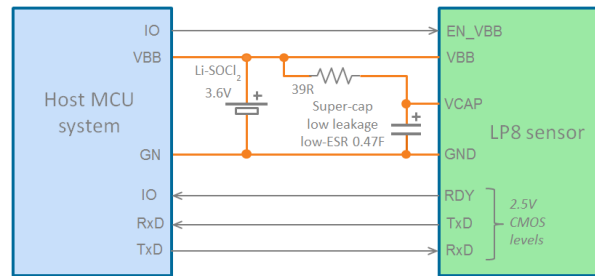
$Q_{meas}$  = Charge per measurement

$I_{SHDN}$  = Shutdown current of sensor (option of measurement battery voltage by 400k resistor network connected to ADC adds 12µA)

$I_{C\_leak}$  = Leakage current of optional super-capacitor on host site

Example: Host system sets measurement period to 1 minute. Eaton Bussman PM-5R0H474-R (0.47F 5V) external super-capacitor is used (8µA leakage) to limit peak current to 2 mA.

$$I_{avg} = \frac{3600 \mu C}{60 s} + 1 \mu A + 8 \mu A = 69 \mu A$$



## Standard Configuration:

Measured Gas	Carbon dioxide (CO <sub>2</sub> )
Operating principle	Non-dispersive infrared (NDIR)
Measurement range	0 to 10 000 ppm
Accuracy CO <sub>2</sub>	±50ppm ±3% of reading <sup>1,4</sup>
RMS noise CO <sub>2</sub>	14 ppm @ 400 ppm at 25°C 25 ppm @ 1000 ppm at 25°C
Accuracy temperature	±0.7°C
Power supply	2.9 – 5.5V
Peak current	125 mA
Shutdown current	1 µA <sup>2,3</sup>
Charge per measurement	3.6 mC
Energy per measurement	11.9 mJ @ 3.3V
Average current having	
- 16 second measuring period	225 µA <sup>2,3</sup>
- 60 second measuring period	61 µA <sup>2,3</sup>
- 120 second measuring period	31 µA <sup>2,3</sup>
CO <sub>2</sub> measurement period	≥16 s.
Dimensions (H x W x D)	8 mm x 33 mm x 20 mm
Life expectancy	>15 years
Operation temperature range	0-50°C, 0-95% RH, non condensing
Communication	UART (host-slave protocol)

Note 1: 15 – 35°C, 20 – 60 % RH after minimum 3 weeks of continuous operation with ABC enabled

Note 2: Option of measuring battery voltage adds 12 µA

Note 3: External super-capacitor leakage is not considered

Note 4: Spec is ref. to uncertainty of calibration gas mixtures +-1%