Sensirion NDIR CO2 Sensor SCD30

Competitively priced miniature Sensirion carbon dioxide, relative humidity and temperature sensor combo.

SP20513 - MEMS report by Sylvain HALLEREAU
Laboratory Analysis by Youssef El Gmili
January 2020 – Sample
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## Selling Price

## Feedbacks

## Company services
Executive Summary

This full reverse costing study has been conducted to provide insights on technology data, manufacturing cost and selling price of the Sensirion SCD30 CO2 Gas Sensor.

Smart heating, ventilation and air conditioning (HVAC) seeks to reduce air extraction and limit energy consumption. But good extraction is important to limit humidity and CO2 concentration and ensure well-being. With a CO2 gas, humidity and temperature sensor, the SCD30 module gives all the environmental data for HVAC, making it smarter.

Today only a few companies share this market. Sensirion, a leading manufacturer of digital microsensors and systems, recently released a CO2 gas sensor designed for HVAC applications, the SCD30, a Non-Diffractive Infra-Red (NDIR) sensor. With a small package volume under 5.6cm³, this CO2 gas sensor can be integrated into HVAC installations.

Sensirion has developed a thermopile die based on its air flow sensor technology called CMOSens. This technology allows integration of CMOS digital and analog functions with a very thin membrane manufactured in the metal layer. The technology of the CO2 gas sensor is not only in the silicon. The package and the IR filters are very important for the accuracy of the measurement.

The module embedded the SHT31 humidity sensor of Sensirion and an ultra-low power microcontroller from STMicroelectronics control the module and communications.

This report includes a technology and cost analysis of the SCD30 combo. All the main parts of the sensor are studied, including the humidity sensor, the other module parts and the assembly. Pictures and cross-sections for the electronic components and for the module are shown. These analyses provide the technical intelligence necessary to understand this technology.
Sensirion SCD30 – Dimensions
Sensirion CO2 Gas Sensor – Disassembly

Physical Analysis
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  - CO2 Gas Sensor
    - Disassembly
    - IR Filter
    - PCB
    - Module BOM
- Sensor Die
  - Views & Dimensions
  - Sensor Cross-Section
  - Die Process
  - Die Cross-section
- STMicro component
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- SHT31 RH/T Sensor
  - Views & Dimensions
  - Delayering
  - Die Process

Manufacturing Process Flow
Cost Analysis
Selling Price Analysis
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About System Plus

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Thermopile Sensor Die – Top side

- Glop top
- Polymer

Top Side of the sensor Die – Optical View
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- 6x wire bondings
- 10x pads
Thermopile Sensor Die – Thermocouple
Thermopile Sensor Die – Thermocouple
CMOS + 6 Metal Layers Front-End Cost

Overview / Introduction

Company Profile

Physical Analysis

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Cost Analysis
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- Yields Explanation & Hypotheses
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- IR Filters Costs
- SCD30 Gas Sensor
  - BOM
  - Added Value
  - Final Cost

Selling Price Analysis

Feedbacks

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## SCD30 – BOM Cost

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Contact

Headquarters
22 bd Benoni Goullin
44200 Nantes
FRANCE
+33 2 40 18 09 16
sales@systemplus.fr

Europe Sales Office
Lizzie LEVENEZ
Frankfurt am Main
GERMANY
+49 151 23 54 41 82
llevenez@systemplus.fr

America Sales Office
Steve LAFERRIERE
Phoenix, AZ
WESTERN US
T : +1 310 600 8267
lafferiere@yole.fr

Chris YOUMAN
EASTERN US & CANADA
T : +1 919 607 9839
chris.youman@yole.fr

Asia Sales Office
Takashi ONOZAWA
Tokyo
JAPAN
T : +81 804 371 4887
onozawa@yole.fr

Mavis WANG
TAIWAN
T : +886 979 336 809
CN : +8613661566824
wang@yole.fr

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