

Top Mirror
FPI Cavity
Bottom Mirror



Spectral Engines Nirone Sensor X

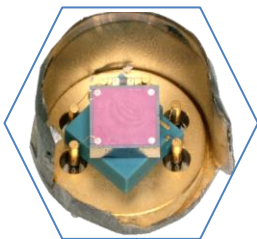
MEMS Fabry-Perot interferometer in a very tiny NIR spectrometer.



The Nirone Sensor X module developed by Spectral Engines, is a Near Infra-Red (NIR) spectrometer, covering wavelengths from 1550 nm to 1950 nm. The Nirone Sensor X module has been developed for applications including pharmaceutical composition analysis, textile, plastic, agriculture and consumer.

A comparison between the Nirone Sensor X and two other spectrometers, the NanoLambda NSP32 and Consumer Physics SciO, is performed in this report.

This reverse costing study provides insights into technological data, manufacturing cost, and selling price of housing, electronic board, FPI MEMS and InGaAs photodiode, for the spectral sensor supplied by Spectral Engines.



In the Nirone Sensor X module, the IR light source is an incandescent lamp. The measurement of the NIR spectrum is performed by an innovative MEMS Fabry-Perot Interferometer (FPI) developed by the VTT Technical Research Centre of Finland. The electrostatically controlled FPI is manufactured with thin-film micromachining technology and is compatible with all semiconductor foundries. Today manufactured on 150mm diameter wafers by VTT MEMSFab, this technology can be manufactured in large volume and for a low cost in 200mm wafer diameter foundry without important investment. An InGaAs standard photodiode measures the NIR light during the measurement to create the spectrum.

The module also integrates a color sensor from ams AG and a microcontroller from STMicroelectronics to manage power and communication.

COMPLETE TEARDOWN WITH

- Detailed photos
- Precise measurements
- Material analysis
- Manufacturing process flow
- Supply-chain evaluation
- Manufacturing cost analysis
- Estimated sales price
- Comparison with Sensor X and Nanolambda NSP32 and the consumer PhysicSciO

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AUTHORS



Sylvain Hallereau has been Project Manager at System Plus Consulting since 2000. He is in charge of costing analyses for Integrated Circuits, Power semiconductors and LEDs. He has significant experience in the modeling of manufacturing costs for electronics components, Sylvain holds a Master degree in Microelectronics from the University of Nantes, France.



Nicolas Radufe is in charge of physical analysis at System Plus Consulting. He has a deep knowledge in chemical and physical analyses. He previously worked in microelectronics R&D for CEA/LETI in Grenoble and for STMicroelectronics in Crolles.

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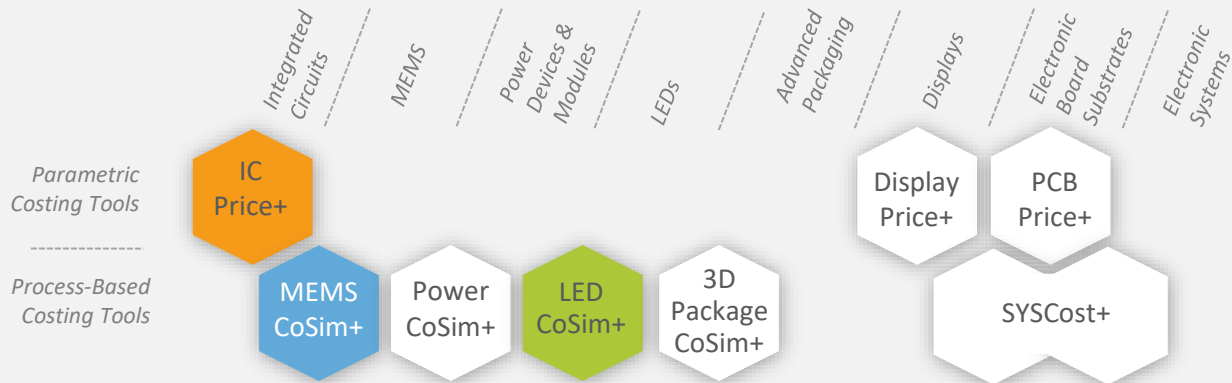


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Our analysis is performed with our costing tools IC Price+, LED Cosim+ and MEMS CoSim+.

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The tool is a process-based costing tool to design and evaluate the cost of any LED process flow.

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WHAT IS A REVERSE COSTING®?

Reverse Costing® is the process of disassembling a device (or a system) in order to identify its technology and calculate its manufacturing cost, using in-house models and tools.



CONTACTS

Headquarters

22, bd Benoni Goullin
Nantes Biotech
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

Steven LAFERRIERE
Western USA & Canada
+1 310-600-8267
laferriere@yole.fr

Chris YOUMAN
Eastern USA & Canada
+1 919-607-9839
chris.youman@yole.fr

Asia Sales Office

Takashi ONOZAWA
Japan & Rest of Asia
+81 80 4371 4887
onozawa@yole.fr

Mavis WANG
Greater China
TW +886 979 336 809
CN +8613661566824
wang@yole.fr

Peter OK
Korea
+82 10 4089 0233
peter.ok@yole.fr

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www.systemplus.fr
sales@systemplus.fr

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