

Thermo Fisher Ion 520 DNA Sequencing Chip

Next generation of silicon/polymer microfluidic technology for fast throughput DNA sequencing from Thermo Fisher Ion Torrent®



Today a main challenge in life science research is to reduce the price of genomic analysis, and the time taken to do it. Back in 2003, the cost of sequencing the human genome was almost \$3B. That decreased to \$10,000 in 2011, and is headed towards \$1,000 in the next few years.

Thermo Fisher, with 8% of the microfluidic product market, is one of the companies most involved in sequencing applications, along with its rival Illumina. However, the two companies have different objectives. Thermo Fisher intends to reduce analysis time with fast throughput and short single-end reads. Illumina has high throughput with short paired reads. To deliver fast reading, Thermo Fisher uses Ion Torrent® technology, which relies on technology similar to an image sensor.

The innovative Ion 520 DNA sequencing chip uses this Ion Torrent technology. It includes a multiwell array, which captures the sphere particles that have DNA attached. The particles react with a solution of nucleotides, which changes the charge in the wells, which in turn is detected by the circuit and allows the DNA sequencing. With several materials involved in the chip manufacturing, 3D silicon design, polymers for microfluidic processing and its special assembly, the component appears to have a very high level of complexity.

Using Ion Torrent technology, Thermo Fisher has managed to provide a powerful and cost-effective sensor chip. The process is entirely CMOS compatible. Surprisingly, it uses well-proven standard packaging with a proprietary flow chamber design.

This report includes a complete analysis of the Ion 520 chip from Thermo Fisher, featuring chip disassembly and die analyses, processes and cross-sections. Finally, it contains a full cost analysis and a selling price estimation of the component.

Title: Thermo Fisher Ion 520 DNA Sequencing Chip
Pages: 130
Date: July 2017
Format: PDF & Excel file
Price: Full report: EUR 3,490

COMPLETE TEARDOWN WITH:

- Detailed photos
- Precise measurements
- Material analysis
- Manufacturing process flow
- Supply chain evaluation
- Manufacturing cost analysis
- Estimated sales price

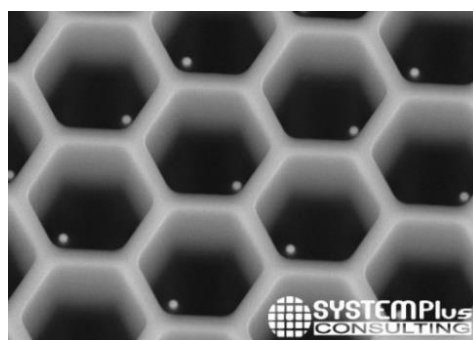
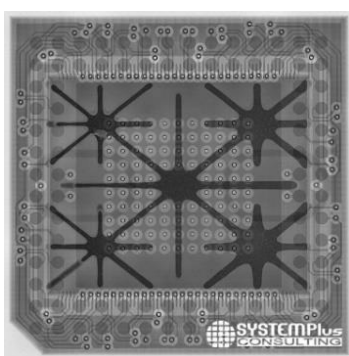


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Stéphane has a deep knowledge of materials characterizations and electronics systems. He holds an Engineering Degree in Electronics and Numerical Technology, and a PhD in Materials for Micro-electronics.



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Yvon has joined System Plus Consulting in 2011 to setup its laboratory. He previously worked for 25 years at Atmel Nantes Technological Analysis Laboratory as fab support in physical analysis, and for three years at Hirex Engineering in Toulouse, in a destructive physical analysis lab.

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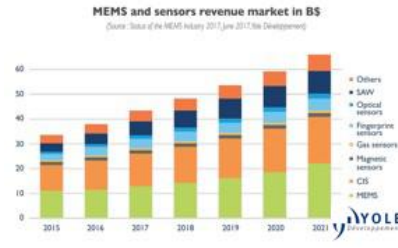
Diagnostics, point-of-care, and pharmaceutical research will drive the rapidly-expanding microfluidic products industry to a potential value of \$23B by 2022.



Pages: 250
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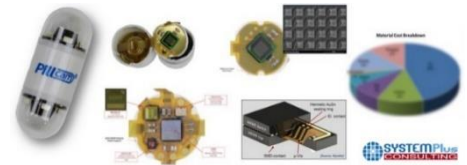
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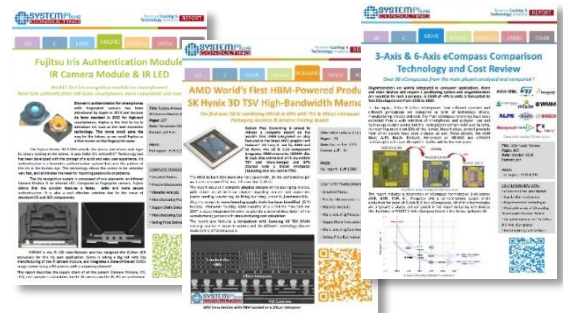
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