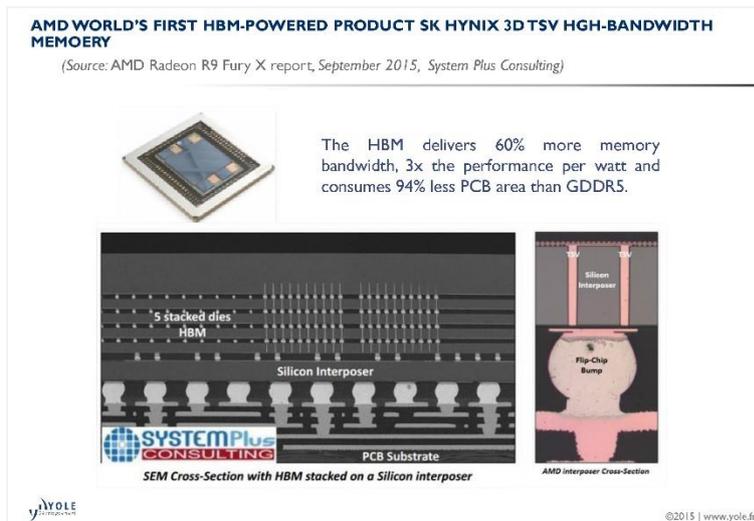


Graphic market is driven by the need of high performance: latest AMD's graphic card, analyzed by System Plus Consulting, confirms the trend

AMD Radeon R9 Fury X report from System Plus Consulting, a sister company of Yole Développement

LYON, France –October 8, 2015 – Last June, [AMD](#) released a new generation of graphic card, Radeon™ R9 Fury X, dedicated to PC gaming applications and including High-Bandwidth Memories (HBM). The “More than Moore” market research and strategy consulting company, [Yole Développement \(Yole\)](#) announces a complete 3D & 2.5D packaging analysis & costing report focused on the HBM integrated on chip led by AMD and its partners SK Hynix. Performed by Yole’s sister

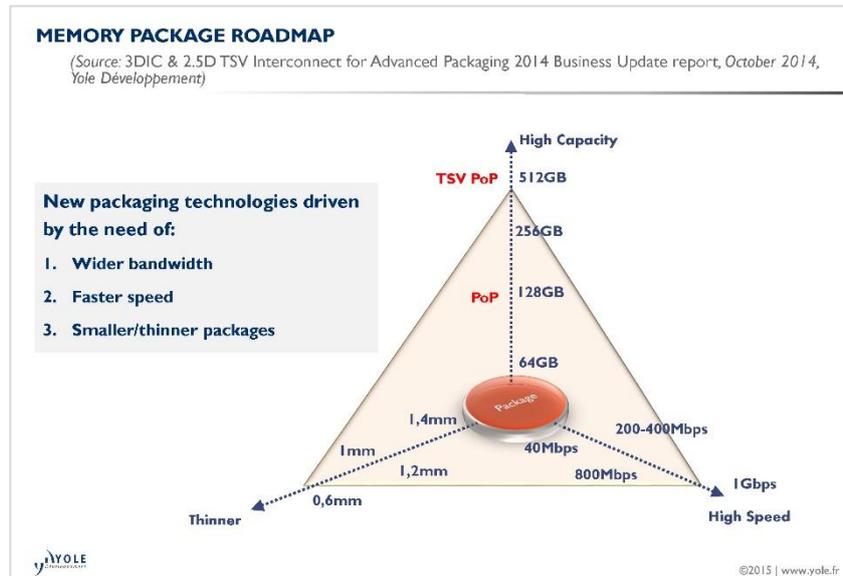
company, [System Plus Consulting \(System Plus\)](#) this full reverse costing study has been conducted to provide insight on technology data, manufacturing cost and selling price. With this new analysis, System Plus Consulting and Yole propose a complete physical overview of the packaging process, with details on all technical choices (wafer bonding, via etching, via filling, bumping, underfill...) and materials.



AMD’s 3D & 2.5D component integrates HBM such as DRAM dies & logic dies connected with via-middle Through-Silicon-Via (TSV) and micro-bumps as well as GPU stacked onto a silicon interposer including also via-middle TSV. According to AMD, this HBM component delivers 60% more memory bandwidth, 3 x the performance per watt and consumes 94% less PCB area than GDDR5.

Last year, in its 3D IC report entitled 3DIC & 2.5D TSV Interconnect for Advanced Packaging 2014 Business Update (Yole Développement, October 2014), Yole already announced the starts of high volume production. “3D TSV is finally becoming a reality in the memory industry” comments today, **Thibault Buisson, Technology & Market Analyst, Advanced Packaging at Yole**. Indeed several memory makers announced the volume production this year, to meet the needs of high

performance computing and servers applications. According to Thibault Buisson from Yole, the memory market is driven by the need to increase performance such as higher bandwidth, faster speed and smaller/thinner packages.



Reverse Costing is the process including the component's disassembling, the identification of related manufacturing technologies and the calculation of manufacturing costs. System Plus started its activities in 1993. Its analysts have analyzed hundreds of integrated circuits, modules, electronic boards and systems. Based on their technical expertise and their knowledge of the semiconductor industry, they have developed a dedicated reverse costing methodology.

"In this new report, System Plus identified the complete manufacturing supply chain dedicated to the AMD's HBM chip. This supply chain includes GPU foundry, interposer foundry, HBM foundry, PCB substrate manufacturer and OSAT product integrator", explains **Romain Fraux, System Plus**. And he adds: *"At System Plus, we develop a dedicated "build-in" methodology allowing us to detail the manufacturing process steps with all related manufacturing cost calculation."*

System Plus' report also features a comparison with Samsung 3D TSV DRAM stacking process. This analysis gives an overview and a comprehensive understanding of the different technology choices made by the different companies, all along the supply chain.

A detailed description of AMD Radeon R9 Fury X reverse costing & technical analysis is available on [i-micronews website](#), advanced packaging report section.

About [AMD Radeon R9 Fury X](#):

Samsung 3D TSV stacked DDR4 DRAM: the first memory product with via-middle TSV!

**A complete teardown with:**

Detailed Photos - Precise Measurements - Material Analysis - Manufacturing Process Flow - Supply Chain Evaluation - Manufacturing Cost Analysis - Selling Price Estimation

Full reverse costing report: EUR 3,590 – 2015 Edition

About [3DIC & 2.5D TSV Interconnect for Advanced Packaging 2014 Business Update report](#):

3D TSV is in MEMS, CMOS Image Sensors and High-End Applications. When will it be used for mainstream consumer applications?

Rates: Euros 5,990.00 (Full report - Multi user license). For special offers and the price in dollars, please contact David Jourdan (Phone: +33 472 83 01 90).

About System Plus Consulting

[System Plus Consulting](#) specializes in the cost analysis of electronics, from semiconductor devices to electronic systems, and has developed a complete range of services and costing tools to provide in-depth production cost studies and to estimate the objective selling price of a product.

COSTING SERVICES

- On demand Reverse Costing studies are performed on ICs, ASICs, MEMs, Power Devices, ECUs, electronic boards and full electronic systems.
- Catalogue of available reports includes cost analyses on MEMS, LEDs, modules and electronic systems.

All these analyses are performed using in-house developed, proprietary costing tools and their technological databases.

COSTING TOOLS*«Purchaser» tools*

- IC Price+ to estimate the cost of any integrated circuit
- PCB Price+ for printed circuit boards
- Power Price+ for any power component or module
- SYS.Cost+ for electronic boards and systems

Cost Simulation Tools, process flow based

- MEMS CoSim+
- PowerCoSim+
- LED CoSim+
- 3D Package CoSim+

About Yole Développement

Founded in 1998, [Yole Développement](#) has grown to become a group of companies providing marketing, technology and strategy consulting, media and corporate finance services. With a strong focus on emerging applications using silicon and/or micro manufacturing, the Yole Développement group has expanded to include more than 50 collaborators worldwide covering MEMS, Compound Semiconductors, LED, Image Sensors, Optoelectronics, Microfluidics & Medical, Photovoltaics, Advanced Packaging, Manufacturing, Nanomaterials and Power Electronics. The group supports industrial companies, investors and R&D organizations worldwide to help them understand markets and follow technology trends to develop their business.

CONSULTING

- Market data & research, marketing analysis
- Technology analysis
- Reverse engineering & costing services
- Strategy consulting

REPORTS

- Collection of technology & market reports
- Manufacturing cost simulation tools
- Component reverse engineering & costing analysis
- Patent investigation

- Patent analysis

FINANCIAL SERVICES

- Mergers & Acquisitions
- Due diligence
- Fundraising

More information on www.yolefinance.com

MEDIA & EVENTS

- i-Micronews.com, online disruptive technologies website and its weekly e-newsletter, @Micronews
- Technology Magazines
- Communication & webcasts services
- Events: Yole Seminars, Market Briefings

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