FOR IMMEDIATE RELEASE

System Plus analyzes the world's smallest microbolometer-based thermal imaging camera core released by FLIR

LYON, France – December 11, 2014: Initially focused on the military market, uncooled thermal camera sales have grown significantly due to substantial cost reduction of microbolometers and growing adoption in commercial markets, including thermography, automotive and surveillance applications. The market research and strategy consulting company, Yole Développement (Yole) confirmed this growth last July: indeed, Yole announced +25% CAGR between 2014 and 2019 in its infrared imaging report, Uncooled Infrared Imaging Technology & Market (Ed. July 2014).

In this report, Yole’s analysts also highlighted the consumer applications: this market has moved to a new phase of growth in 2013-2014. Under this context, FLIR introduced in 2014, two disruptive technologies: the LEPTON® core and FLIR ONE® smartphone plugin. “A high number of pre-release reservations for FLIR ONE® (more than 30K units in July 2014) already confirms the commercial success of this innovation”, says Yole.

System Plus Consulting (System Plus), a sister company of Yole, specialized in technology and electronic components and systems cost analysis, looked into new FLIR’s products and proposes today a complete teardown analysis, entitled FLIR Systems FLIR ONE & LEPTON Consumer Thermal Imager with Microbolometer. System Plus’ report details the bill-of-material (BOM), the manufacturing process flow and related cost analysis, the supply chain evolution and a comparison with FLIR i7 infrared camera and microbolometer sensors.

FLIR is the world’s largest long wave IR (LWIR) camera manufacturer and main microbolometer supplier, and as such it drives the price war in the commercial market. “FLIR’s strategy is to take volume leadership in multiple markets, make economies of scale and further decrease price”, explains Michel Allain, CEO, System Plus, the reverse costing & engineering company. “To achieve this it exploits a vertically-integrated business model and a fabless structure, with manufacturing subcontracted to ON Semiconductor”, he adds.

Yole Développement
Le Quartz – 75 cours Emile Zola – 69100 Lyon-Villeurbanne – France
FLIR also boosted that strategy by acquiring Indigo System’s IR imager business in 2004 and Tessera’s Digital Optics wafer-level optics (WLO) division in 2013.

This year, the company released two innovative solutions: the Lepton® core and FLIR ONE™ smartphone plugin.

Plugged into the back of an iPhone 5 or 5S, the FLIR ONE™ is the first consumer thermal camera featuring LWIR technology. It contains a visible VGA (640x480) camera and a thermal camera which provide images blended using FLIR MSX Technology.

The thermal camera uses FLIR’s new Lepton® core, where costs have been reduced in every element. The most expensive component, the sensor, is an uncooled vanadium-oxide (VOx) microbolometer featuring an 80x60 pixel resolution with 17µm pixel size. VOx provides a high temperature coefficient of resistance (TCR) and low 1/f noise, resulting in excellent thermal sensitivity and stable uniformity. The microbolometer array is grown monolithically on top of a readout integrated circuit (ROIC) to comprise the complete focal plane array (FPA). An anti-reflection (AR) coated window is bonded above the sensor array via a wafer-level packaging (WLP) process, encapsulating the array in a vacuum. The purpose of the vacuum is to provide high thermal resistance between the microbolometer elements and the ROIC substrate, allowing for maximum temperature change in response to incident radiation.

The system electronics that receive and process the signal is a custom application-specific integrated circuit (ASIC) device mounted in flip-chip on the substrate. Digital Optics’ WLO brings an important part of the cost reduction. The silicon lenses are made at the wafer level with
lithography and etching processes. The final cost reduction comes from the core housing, which is a three-dimensional molded interconnected device (3D-MID). Incorporating a conductive circuit pattern inside the housing provides grounding and allows FLIR to integrate a temperature sensor. “Thanks to its strong integration at the core level with innovative WLO, wafer-level packaging (WLP) and custom ASIC use, the FLIR Lepton® is the world's smallest microbolometer-based thermal imaging camera core”, comments Romain Fraux, Project Manager, MEMS Devices, IC’s and Advanced Packaging, System Plus.

More information about Yole and System Plus analysis is available on www.i-micronews.com, reports section.
About FLIR Systems FLIR ONE & LEPTON Consumer Thermal Imager with Microbolometer
- Reverse Engineering report
- Publication date: December 2014

About Uncooled Infrared Imaging Technology & Market Trends report
- Publication date: July 2014
- Technology & Market analysis

Detailed description is available on i-micronews.com, Imaging reports section
For further information, please contact David Jourdan (jourdan@yole.fr).

Across the Enterprise, from marketing to purchasing and R&D, product manufacturing cost is a major factor which has to be measured and then optimized. Since 1993, System Plus Consulting’s mission has been to develop and sell the right tools and services to meet these costing requirements. System Plus Consulting utilizes an engineering approach to cost. Cost models and technology expertise are combined to provide customers with an accurate and objective estimation of manufacturing costs and selling prices.
Headquartered in Nantes, France, System Plus Consulting is specialized in technology and cost analysis of electronic components and systems. During our 20 years in business, we have built and refined detailed cost models as the primary tools for hundreds of analyses. The highly qualified System Plus cost engineers combine broad and deep skills in semiconductor and electronics technologies with years of experience in cost modeling.
We offer:
- Custom reverse costing analyses: technology analysis followed by cost evaluation
- Standard reverse costing reports: regular publications on innovative products (available from our catalogue)
- Costing tools: software tools combining models and data to perform cost analysis
System Plus Consulting analyzes any type of electronic devices and systems, with a special focus on semiconductor technologies. Major fields of technology and cost expertise are: Integrated Circuits - Power Devices and Modules - MEMS & Sensors - Photonics: LED, Image Sensors - Packaging including wafer level - Electronic Boards and Systems
Since 2008, our partnership with YOLE Développement has allowed us to stay at the forefront of technologies and has added a market view to our reports.

About Yole Développement – www.yole.fr / www.i-micronews.com
Founded in 1998, Yole Développement has grown to become a group of companies providing marketing, technology and strategy consulting, media in addition to corporate finance services. With a strong focus on emerging applications using silicon and/or micro manufacturing, 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
• Patent analysis

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

MEDIA & EVENTS
• i-Micronews.com, online disruptive technologies website
• @Micronews, weekly e-newsletter
• Technology Magazines dedicated to MEMS, Advanced Packaging, LED and Power Electronics
• Communication & webcasts services
• Events: Yole Seminars, Market Briefings

FINANCIAL SERVICES
• Mergers & Acquisitions
• Due diligence
• Fundraising
• Coaching of emerging companies
• IP portfolio management & optimization
More information on www.yolefinance.com

CONTACTS
For more information about:
• Consulting Services: Jean-Christophe Eloy (eloy@yole.fr)
• Financial Services: Géraldine Andrieux-Gustin (Andrieux@yole.fr)
• Reports business: David Jourdan (jourdan@yole.fr)
• Press relations: Sandrine Leroy (leroy@yole.fr)

###