FutureHorizons

The Global Semiconductor Industry Analysts

Future Horizons Newsletter

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We would like to wish you all a very Happy Christmas and a Peaceful and Prosperous New Year

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Cardiff's Compound Semiconductor Cluster Could Create 5000 Jobs

Semiconductor wafer supplier, IQE and Cardiff University have partnered to create the world's first compound semiconductor (CS) technology cluster with events in Westminster and Cardiff next month.

The cluster, which has the potential to create 5000 jobs, will launch the Compound Semiconductor Centre (CSC) for the development and commercialisation of next generation CS technologies.

Four significant clusters based around silicon technologies already exist in Europe, but CSC – based in Cardiff - will be the first to build upon the potential of CS. These are vital components used in many of today's high-tech applications including communications networks and devices such as smartphones and tablets.

With high performance capabilities, coupled with energy efficiency and photonic properties, CS's are hailed as a key enabling technology for increased productivity and the key economic growth drivers identified in the European Commission's 'Horizon 2020' economic growth strategy, aimed at the reindustrialisation of the EU.

The partnership will see Cardiff-based IQE working closely with Cardiff University's £40million Institute of Compound Semiconductors (ICS).

Infineon Supports Gear S2 Smartwatch For Secured NFC Payment

Munich, Germany – November 17, 2015 – A wave of the arm to pay for a coffee, a simple twist of the bezel to scroll through e-mails: the new Samsung Gear S2 smart watch further improves users' convenience and mobility. Infineon Technologies AG (FSE: IFX / OTCQX: IFNNY) provides the embedded Secure Element (eSE) chip for all Samsung Gear S2 models. The chip safeguards users' sensitive data and supports secured contactless payment transactions based on Near Field Communications (NFC) technology.

"We are pleased to support Samsung, the world's leading smartphone vendor, with our security expertise to protect user credentials," says Dr. Stefan Hofschen, President of the Chip Card & Security Division of Infineon. "Our embedded Secure Element chips are easy to integrate and a perfect match for convenient, secure transactions with wearable devices."

The Gear S2 comes with a unique rotating bezel and works with a variety of phones running Android 4.4 or later. The 3G version adds stand-alone functions and built-in GPS using its own 3G cellular connection.

Intel Set To Launch Next-Gen Atom Processors In 2016

Intel Corporation (NASDAQ:INTC) has unveiled the supply schedule for its next generation Atom processors for mobile devices which will be delivered to partner

vendors across 2016, assert Taiwanese sources. Intel announced the launch of the Atom series earlier this year with numerous variants meant to provide computing power to smartphones and tablets that spread across all price levels and are based on both Windows and Android operating systems.

As per the data compiled by Digitimes, Intel's road map states that it will ship Atom X3 processors with 4G/LTE baseband for entry-level devices in the first quarter of 2016 (1QCY2016). This will be followed by the launch in the second quarter of more advanced Atom X5 and Atom X7 chipsets for mainstream and high-end devices, respectively. The new batch for existing Core m5 and m7 series, powerful enough to operate both deluxe tablets and laptops, will be released near year end in the last quarter of next year.

LG Electronics Develops Its First Mobile Application Processor

LG Electronics is trying to move away from Qualcomm, which the company solely relied on for existing mobile application processors (AP), and is now developing its new mobile AP in cooperation with Intel and TSMC. The company seeks to reduce its dependency on Qualcomm Snapdragon chipset, which will be manufactured at Samsung's chip-making foundries, and develop its own chip from next year.

According to industry sources on Nov. 26, LG Electronics is currently moving to pilot production of ARM-based 64-bit mobile AP called the Nuclun 2 by using Intel's 14-nanometer FinFET technology and TSMC’s 16-nm FinFET technology. The Nuclun 2 will be an octa-core processor with four ARM’s Cortex A72 at 2.1 GHz and four Cortex A53 cores running at 1.5GHz.

With three years of research and development, LG Electronics introduced the Nuclun 1, which was produced with 28-nm FinFET technology, last year and used it on its G3 Screen smartphone. However, its performance fell short of the Samsung Exynos 5420, which was mass produced a year earlier. Even after that, LG Electronics has not abandoned its mobile AP development plan and is now about to complete the development of Nuclun 2, which can be used in its premium smartphones.

Microsemi To Acquire PMC-Sierra

Recently Microsemi Corp. (MSCC) completed its acquisition of Vitesse Semiconductor Corp. (VTSS), which resulted in organic growth and secured record bookings. Microsemi also announced that it entered into another agreement to acquire PMC-Sierra. (PMCS). Last October PMC merged with Skyworks Solutions Inc. (SWKS) to which Skyworks would acquire all of the outstanding shares of PMC common stock for $11.60 per share in an all-cash transaction.

Microsemi is a designer, manufacturer and marketer of high-performance analog and mixed-signal semiconductor solutions differentiated by power, security, reliability and

performance. The company's semiconductors manage and control or regulate power, protect against transient voltage spikes and transmit, receive and amplify signals. The company delivered impressive fiscal third quarter results.

Nvidia, Q'comm Drive Nascent Commercial Drone Industry

Nvidia and Qualcomm recently deployed products intended for the development of consumer drones, signifying a sector poised for growth in the near future.

The concept, use and fascination with pilotless aircraft seem unbounded. Probably the most well-known drone is the deadly predator made by General Atomics Aeronautical Systems developed in 1994 and used extensively in Afghanistan, Pakistan, Bosnia, Iraq and elsewhere.

One of the largest and scariest drones is the lethal and long-range Northrop Grumman X-47B, a tail-less, strike fighter-sized unmanned aircraft developed for the Navy. It can refuel successfully in air, so it can go anywhere any time.

Renesas, Nevs Team Up For China's New Energy Vehicle Market

Renesas Electronics Corp. and National Electric Vehicle Sweden (Nevs) have signed a strategic partnership deal. Using Nevs' Phoenix architecture technology for electric vehicles and Renesas' technologies for new energy vehicles, the companies will collaborate on the development of various system solutions aimed at China's new energy vehicle market.

In accordance with this established partnership, Renesas and Nevs will officially launch the research and development (R&D) of electric vehicles.

The signing ceremony was held on October 21, 2015 in Beijing, with Nevs, chair, Kai Johan Jiang, vice chair, Stefan Tilk, board member, Wang Weihang, as well as Shinichi Yoshioka, VP, deputy GM of 1st solution business unit at Renesas Electronics in attendance.

Samsung Begins Mass Production of Industry’s First 128GB DRAM Modules

Based on a three-dimensional through-silicon via (TSV) technology, Samsung Electronics has started mass production of its new DRAM module featuring the world’s largest capacity and the highest performance and energy efficiency that are existing in today's market. The company is planning to strengthen supremacy further in the memory market by bringing TSV technology into high bandwidth memory (HBM), which is considered the next-generation memory.

Samsung Electronics announced on Nov. 26 that it has started mass production of the industry's first 128GB registered, dual inline memory module (RDIMM) in earnest. TSV technology is a high performance technique aimed at creating 3D packages that enable a vertical electrical connection of chips by making tiny holes in chips. After DRAM chips are sliced thinner than half the thickness of paper, they are pierced to contain hundreds of fine holes and vertically connected through electrodes that pass through the holes of the

chips. Compared to the DRAM chip with plane structure, the cutting-edge packaging technology can improve capacity, performance and reduce power consumption.

The new 128GB TSV DRAM module is composed of 144 20-nm 8GB DDR4 DRAM chips, featuring 36 4GB TSV DRAM chips in a four-layer stack assembled with TSV packaging technology.

Sonics Supports ARM P-Channel Interface To Extend Commitment To AMBA Ecosystem

Sonics, Inc., the world's leading supplier of on-chip network (NoC) technologies and services, today announced that it is extending its support for the ARM® AMBA® ecosystem by implementing the P-Channel interface in the Sonics ICE-Grain™ Power Architecture. The strength of the AMBA ecosystem is that it enables companies like Sonics to offer interoperable, value-added technologies for the benefit of customers through open access to interface specifications.

Sonics will reveal more information about its support for ARM's power interface in a presentation on power management for system-on-chip (SoC) design at ARM TechCon. The presentation, entitled "Enabling Autonomous Hardware Based Power Management with AMBA P-Channel Interface," is part of the IoT Track and scheduled for 8:30-9:20 on Wednesday, November 11th, Ballroom E at the annual conference being held in the Santa Clara, CA convention center.

Greg Ehmann, principle engineer from Sonics, will give the presentation, which will cover the benefits of hardware-based power management technology and it's relation to ARM's AMBA P-Channel interface. Ehmann is currently the architect for Sonics' ICE-Grain Power Architecture product development team. His talk will introduce concepts around autonomous power control and contrast the AMBA P-Channel interface with previous AMBA C- and Q-Channel interfaces.

Tower Semiconductor Buys Texas Foundry For $40m

Tower Semiconductor Ltd. (Nasdaq: TSEM; TASE: TSEM), which markets its products as TowerJazz, has signed an agreement with Maxim Integrated Products, Inc. (NASDAQ:MXIM) to purchase Maxim’s 8-inch fabrication facility in San Antonio, Texas for $40 million.

The purchase will expand TowerJazz’s worldwide manufacturing capacity, cost-effectively by 28,000 wafers per month. The availability of additional capacity will serve TowerJazz’s forecasted robust customer demand. TowerJazz and Maxim expect to close the transaction in January 2016.

As part of the transaction, the companies have also signed a long-term supply agreement for TowerJazz to manufacture products for Maxim in the San Antonio facility. The transaction is to be paid with TSEM ordinary shares worth about $40 million.

How Thousands Of Jobs Could Come From A High Technology Centre Being Launched Today In Cardiff

Semiconductors are the unsung heroes of our modern world. Unsurprisingly, most people don't realise when accessing the internet on their smartphone that the communications networks and mobile technology they are using would not exist without the complex microchips known as compound semiconductors.

It's even less likely they'll know that much of this technology is developed and manufactured by a global company headquartered in Wales. Regardless of its brand, it's a safe bet the smartphone in your pocket contains technology developed on your doorstep.

It's true to say that the small piece of technology you never knew existed can be credited for having transformed the way we live, work and play. The next generation technologies based on compound semiconductors will play a pivotal role in meeting global societal challenges of the 21st century, and are expected to be the next engine of growth.

GE To Replace Silicon With SiC In Power Products

At a press briefing in London this week on next generation technologies, power electronics company GE discussed imminent plans to replace silicon with SiC technology in all its power electronics products.

SiC will be introduced gradually over this year and next year according to GE Power Conversion's chief engineering officer Vlatko Vlatkovic.

Ambiq Leads Low-Power MCU Race

With so much development for the Internet of Things (IoT) targeting battery-powered operation, it's no wonder that MCU vendors have been engaging in a game of low-power leapfrog with one another, vying for the title of best in low-power performance. But with the announcement of verified EEMBC ULPBench benchmark results for Ambiq Micro's Apollo MCU at ARM TechCon this week, that game may be all but won. The Cortex M4F-based Apollo MCU achieved twice the score of the prior title holder.

ULPBench is an industry-standard means of measuring MCU energy efficiency that mimics typical low-power system behaviour. The benchmark works in conjunction with a standardised hardware device that monitors the MCU's energy consumption. Both the benchmark and monitoring device were developed by the Embedded Microprocessor Benchmark Consortium (EEMBC), which also validates vendor test results. According to EEMBC president Markus Levy, the benchmark calls for the MCU to perform 20k clock cycles of active work once a second and sleep for the remainder of that second, repeating the cycle multiple times to ensure accurate results. The benchmark score is 1,000 divided by the median value for average energy used during each of 10 benchmark cycles. A larger value therefore represents less energy consumed and because the benchmark counts clocks rather than using a fixed time interval, the results compensate for clock speed differences among processors.

ESCATEC Designs Next Generation, Miniaturised TIR Lens For High Brightness Leds

Heerbrugg, Switzerland – 16 November 2015 – ESCATEC, one of Europe's leading providers of contract design and manufacturing services, has designed a next generation, miniaturised TIR (Total Internal Reflection) lens for high brightness LEDs. About a twentieth of the size of current TIR lenses, ESCATEC's next generation TIR lens is mounted directly onto the bare LED and secured in place with special clear optical glue. This secures the two items together with no air gap for optimal optical coupling, ensuring that the light is transferred from the LED to the TIR lens with minimal sideways losses, giving an optical efficiency of up to 95% of light being directed out of the front of the lens.

Current TIR lenses are designed to fit onto packaged LEDs and so cannot achieve the high level of optical coupling of the new design. They typically also have a much greater diameter of 20mm and height of 20mm whereas the next generation TIR lens can be as small as 4mm diameter and 4.5mm high. The new TIR lens can be made from PMMA, silicone or glass depending on how much heat it has to withstand.

3D-Printed Drone On Show In Dubai

The future of aircraft was on display at the Dubai air show, but not on the tarmac. Tucked away in a corner of the exhibition hall was what is thought to be the world's first 3D-printed drone.

The sleek aircraft has a 3m wingspan and is 80 per cent printed, the exceptions being the jet engine, avionics and landing gear. Made of lightweight plastic and a highly heat-resistant printed metal, the aircraft can fly at more than 150 miles per hour for up to seven minutes.

The drone was the brainchild of Stratasys, a 3D printing company, and Aurora Flight Sciences, a manufacturer of unmanned aerial vehicles, and went from concept to flight in the Utah desert in less than a year.

Campus Researchers Publish Findings On Superacid Semiconductor Treatment

A campus research team has discovered a method to dramatically increase the energy efficiency of semiconductors in electronics.

Its research — which began a year ago and was published in Science magazine Friday — focused on decreasing the power consumption of electronic switches and increasing the efficiency of LED optics, according to UC Berkeley doctoral student Matin Amani, a co-author of the study.

Semiconductors are the building blocks for electronics, used in computer chips, LED lights and solar panels, among other devices. Semiconducting material alternates from an insulating state to a conducting state, creating electronic switches and storing energy to release as light.

Monolayer semiconductor material is typically 0.7 nanometers thick, compared to the approximate 50,000-nanometer thickness of a single human hair. Any defect can dramatically affect a device's performance, causing heat to be generated instead of light.

Two Russian Supercomputers Join World's Best 100 Supercomputers

The latest edition of the Top 500 list of the world's most powerful supercomputers has been published recently. The publisher updates the list twice a year.

The fastest Russian supercomputer to join the current list is the Lomonosov-2, operating at the Moscow State University (MSU) with a capacity of 1.849 PFLOPS, which puts it on position 35 on the list. Its predecessor, the Lomonosov, is also among the world's best 100 supercomputers, ranking 94th. On the overall Top 500 list, there are seven Russian supercomputing systems.

China's Tianhe-2 tops the global list for the sixth year running. Developed at a major Chinese defense technology think-tank, the supercomputer, whose name is translated into English as "Milky Way-2," reportedly operates with a Linpack test proven capacity of 33.86 PFLOPS (1,000,000,000,000,000 floating point operations per second.

Russia's Skolkovo And Finland's Nokia Extend R&D Cooperation

The Skolkovo Foundation, the manager of Russia's largest innovation hub outside Moscow, and Nokia, a Finnish telecom company, have formally extended till the end of next year its cooperation in R&D, the Foundation's website announced.

Under terms of a new agreement, Nokia will focus on a number of areas, including LTE, Cloud and Virtual RAN, 5G, GSM-R, IoT, navigation technology, intelligent robotics, and self-contained vehicles, the source quoted Markus Borchert, senior vice president at Nokia for Europe, as saying.

Mr. Borchert said that, in addition to these priorities, the Finnish company is looking for new opportunities for collaboration in the field of the Internet of things. According to the executive, Nokia "is very interested to partner with Skolkovo" in this area which, as many reckon, may bring about a real technology revolution in the next ten years.

A Russian-American Startup Shines At Helsinki Tech Fair

Astro Digital, a startup created by Ekaterina Kotenko-Lengold, won second place in the startup competition at Slush, which is a major event in northern Europe for innovators and developers interested in attracting international investors.

"I've always been interested in the space industry and wanted to apply space technology to everyday life," Kotenko-Lengold, a graduate from the Skolkovo Institute of Science and Technology (Skoltech) in Moscow, told RBTH.

Astro Digital is a platform for accessing satellite data that provides easy, quick search and integration of satellite photographs into web and mobile applications. Developers believe there can be a demand for such technology, especially from farmers and forest owners.

Russian Scientists Successfully Implant The First 3D-Printed Thyroid Gland

A Russian company announced a successful experiment implanting 3D-printed thyroid glands into mice, and the results will be published next week, said Dmitri Fadin, development director at 3D Printing Solutions.

"We had some difficulties during the study, but in the end the thyroid gland turned out to be functional," Mr. Fadin told RBTH.

3D Bioprinting Solutions printed the thyroid gland - or to be exact, the gland's organ construct - in March of this year. At that time, scientific laboratories were saying that they will start printing human thyroid glands if the experiment is successful.

World Economic Round Up

Central Europe's tail risks appear low relative to other EMEA EM countries, yet Romania and Hungary face some challenges. Romania's parliamentary election in late 2016 significantly complicates the fiscal outlook. Hungary has made good progress in reducing external vulnerabilities, but still needs to reduce its public debt/GDP ratio and raise potential growth. Oil has slipped close to levels last seen during the financial crisis ahead of Opec's next meeting, with little sign the cartel will reverse its policy of maximising production to squeeze higher-cost rival producers.

The latest economic news by country to include USA, Europe, UK, Japan, China, Asia Pacific and India can be found each month in our Semiconductor Monthly Report.

Industry Events 2015

Future Horizons Events

- Silicon Chip Industry Training Seminar – London 7 March 2016
- Industry Forecast Briefing, London – 19 January 2016

To book your place on any of our events please contact us on:

Telephone: +44 1732 740440
Email: mail@futurehorizons.com

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Industry Events

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MARK YOUR CALENDER FOR THE NEXT

INDUSTRY FORECAST BRIEFING
TUESDAY 19th January 2016

AND

SILICON CHIP INDUSTRY WORKSHOP
MONDAY 7th March 2016

BOTH BEING HELD AT

HOLIDAY INN KENSINGTON FORUM, LONDON

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