FutureHorizons

The Global Semiconductor Industry Analysts

Future Horizons Newsletter

December 2016

Happy Christmas To You All

Thank You for your Continued Support

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Will China Grab ARM Servers?

When Macom bought Applied Micro last week and said it would sell off its X-Gene ARM server unit, the writing was on the wall. Applied has a solid business with big U.S. data centers and in 2017 and beyond they are buying bandwidth in the form of 100-400G Ethernet — not ARM servers.

In the wake of the news I heard multiple reports Broadcom was ending Vulcan, its plan for a beefy ARM server SoC made in a FinFET process with a custom core. The risky product was expected to be cancelled ever since penny-pinching Avago bought the company. (A former Broadcom engineer told me the company also canceled plans for a set-top processor using custom ARM cores.)

ASML Invests $1.9B in Next-Gen EUV

Before the first extreme ultraviolet lithography systems ship, its designer revealed a plan for its much-anticipated follow on. ASML will invest and collaborate with optics specialist Carl Zeiss SMT to deliver a version of EUV systems with a numerical aperture (NA) greater than 0.5, but they won't be ready for volume production until about 2024.

ASML is spending nearly $2 billion as part of the new effort. It will buy a 24.9% stake in the Zeiss subsidiary for about $1.1 billion in cash. In addition, ASML will make a one-time contribution of about $244 million to the joint R&D project and spend another $600 million over six years for capital equipment and other needs.

The deal is another example of how the work of pursuing Moore's law is becoming increasingly costly and complex.

Globalwafers Successfully Consummates Acquisition Of Sunedison Semiconductor

HSINCHU, Taiwan, Dec. 02, 2016 (GLOBE NEWSWIRE) -- GlobalWafers Co., Ltd. (TPEx:6488) ("GlobalWafers") is pleased to announce that the acquisition of SunEdison Semiconductor Limited ("SunEdison Semiconductor") by GlobalWafers has been successfully completed. This follows GlobalWafers' announcement on August 18, 2016 to acquire all outstanding ordinary shares of SunEdison Semiconductor in a transaction valued at USD 683 million, a figure that includes SunEdison Semiconductor's outstanding net debt.

The combined entity will bring together GlobalWafers' unparalleled operating model and market strengths with SunEdison Semiconductor's expansive global footprint and product development capabilities

IQE And Bluglass Sign Strategic Partnership

IQE, a manufacturer of advanced semiconductor wafers, has entered into a formal collaboration agreement with Australian cleantech developer BluGlass.

The 15 month joint R&D agreement is an exclusive arrangement whereby IQE and BluGlass agree to collaborate to develop technology for high quality III-N films deposited by Remote Plasma Chemical Vapour Deposition (RPCVD) on both silicon and cREO-on-silicon templates.

BluGlass' RPCVD technology is a low temperature process targeted at the production of more efficient semiconductor devices at lower cost. IQE's crystalline Rare Earth Oxide (cREO) technology provides a buffer to integrate GaAs, InP, GaN and other compound semiconductors with silicon, allowing the potential of producing compound semiconductor epitaxial layers on lower cost silicon wafers up to 300mm diameter.

Panasonic To Make Gate Drivers For Gallium Nitride

Panasonic announced Monday that it would start manufacturing circuits that switch power transistors made out of gallium nitride, a material that has gained ground on traditional silicon in power electronics.

The new gate driver, AN34092B, opens and closes transistors at extremely high speeds, while simultaneously limiting heat that could permanently damage the chip. The faster switching speeds also makes it harder for electrical current to leak out of the circuits, which lowers efficiency.

The Japanese chipmaker said that it tuned the gate driver specifically for its gallium nitride transistors, which are called X-GaN and can be seen this week at the Electronica trade show in Munich, Germany. X-GaN technology, which is rated to 600 volts, provides higher heat tolerance and better efficiency than regular silicon chips, the company said.

Miniature Multi-Sensor Module From Stmicroelectronics Jumpstarts IoT And Wearable Designs

STMicroelectronics’ 13.5mm x 13.5mm SensorTile is currently the smallest turnkey sensor board of its type, containing a MEMS accelerometer, gyroscope, magnetometer, pressure sensor, and a MEMS microphone. With the on-board low-power STM32L4 microcontroller, it can be used as a sensing and connectivity hub for developing products such as wearables, gaming accessories, and smart-home or Internet-of-Things (IoT) devices. Miniature Multi-Sensor Module from STMicroelectronics Jumpstarts IoT and Wearable Designs

SensorTile has a complete Bluetooth® Low-Energy transceiver including a miniature single-chip balun on-board, as well as a broad set of system interfaces that support use as a sensor-fusion hub or as a platform for firmware development. It can be simply plugged

to a host board, and when powered it immediately starts streaming inertial, audio, and environmental data to ST's BlueMS smartphone app that can be downloaded free of charge from popular app stores.

Semiconductor-Free Microelectronics Are Now Possible, Thanks To Metamaterials

Engineers at the University of California San Diego have fabricated the first semiconductor-free, optically-controlled microelectronic device. Using metamaterials, engineers were able to build a microscale device that shows a 1,000 percent increase in conductivity when activated by low voltage and a low power laser.

The discovery paves the way for microelectronic devices that are faster and capable of handling more power, and could also lead to more efficient solar panels. The work was published Nov. 4 in Nature Communications.

The capabilities of existing microelectronic devices, such as transistors, are ultimately limited by the properties of their constituent materials, such as their semiconductors, researchers said.

Engineers Have Invented An Ink Made From Pulverized Magnets That Could Self-Repair Torn Fabrics And Broken Devices

Printable electronics, made by depositing electronic ink onto a flexible material like plastic, have allowed manufacturers to mass-produce electronic circuits. Tons of them can now be printed on large sheets or rolls all at once—much like traditional printing methods, such as screen printing and inkjet printing, but with conductive inks. The production is faster and more cost-effective than conventional methods, and resulting electronic components are light-weight, thin, flexible, and inexpensive.

With the technology, you can create flexible solar cells, point-of-care medical diagnostic devices, novel drug delivery devices, smart packaging, and clothing, among other things. However, their flexibility is also their weakness: it makes them more susceptible to mechanical deformation over time, making them prone to damage.

Coating Stops Exploding Batteries

LAKE WALES, Fla. — The exploding battery debacle of Samsung's Note 7 got it recalled, replaced, recalled again and now permanently cancelled. Any remaining units in the field are banned by the FAA from airline flights. But it all could have been avoided, according to Forge Nano (Denver, Colo., formerly PneumatiCoat Technologies), if their nano coating had been used. Forge Nano's nano coatings boost the breakdown temperature of flammable electrolyte Li-Ion batteries, putting it way far into the safe zone for nominal environmental usage. The key, according to Forge Nano (Denver) is nano-pattern atomic layer deposition (ALD).

"The atomic layer coatings are chemically bonded on the surface of active material particles that make up the Li-Ion battery cathode. It works like a protective coating on an M&M. Independent testing and research has shown that ALD coatings can prevent or reduce the formation of these unwanted chemical species within Li-Ion batteries that can lead exothermic reactions [thermal runaway]," Dr. James Trevey, vice president of engineering told EE Times.

Wireless Battery Management Shines At Electronica

It saddened me to have missed Electronica this year. Southern Germany is very much like New England in the fall. The leaves on deciduous trees turn yellow, orange and red, and fall from the trees. The walk from the Ubahn subway stop to my hotel in north eastern Munich is a slosh-slosh-slosh through fallen leaves. The air is cold and damp, and the glow from the Marriott is warm and welcoming, like a Currier and Ives painting.

With 73,000 visitors from 80 countries (2,913 exhibitors), Electronica remains one of the world's largest trade shows, but, occupying the grounds of the old Munich airport, visiting exhibits can be exhausting. Many of the exhibitors serve buffet food for their guests (often sausages and meatballs). In the "olden days," women in domestic's costumes — "cigarette girls" — would walk the trade show aisles selling smokes. Exhibitors would light up in their booths. These days Europe follows America in banning smoking in practically all public places.

Peter Clarke's Electronica summary expressed a different kind of nostalgia: Siemens-Nixdorf and Olivetti are no more, he points out. The computer industry has long since deserted Europe. Former cellphone leaders Nokia and Ericsson are no longer marketing targets for component makers at Electronica. It was free trade agreements and the American elections that seemed to dominate show floor discussions, Peter wrote. But Germany is far from a case study for industrial decline. Rather, the country demonstrates worldwide leadership in automotive electronics (e.g., Audi, BMW and Daimler) — as well as the growing industrial base of small to mid-sized companies.

Korean Team Squeezes Light Into Miniature Devices

Scientists at the Institute for Basic Science (IBS) in Korea have developed optical transistors, optical multiplexers and optical signal detectors using silver nanowires and 2D semiconductors including MoS2.

Published in Nature Communications, the devices used a phenomenon called plasmon-exciton-plasmon interconversion to combine the advantages of photonics and electronics on the same platform.

Surface plasmons are electromagnetic waves that propagate along the surface of s conductive materials like silver, gold, aluminum and copper. They are of growing interest as they allow optical information to be transmitted nearly at the speed of light and in extremely small spaces.

This Battery Charges In Seconds, And Lasts All Week

You can divide the world into two kinds of people. Those who manage to keep their phones charged, and those whose batteries always seem to be in the red—the folks who never remember to charge their phones until five minutes before they have to go out the door. This new battery, which can charge in seconds and last all week, is for those scatterbrained folks.

The new tech comes from researchers at the University of Central Florida, and uses super-capacitors to do its job. Capacitors are electrical components designed to store and

release electrical charge. They can accept and release the power much faster than a regular battery, but they have—until now—had one big drawback: they're huge. In order to power a phone, you'd need a "battery" bigger than the phone itself.

Unknown Tech Firm That Makes Phones You Can't Break Bullitt Group Is On Course To Sell More Than 1m Phones

It is on course to sell more than one million phones and other electronic devices around the world – yet its name will be unfamiliar to most consumers.

Rather than see its own name in lights, Bullitt Group has instead found a hugely-successful niche designing bespoke phones and electronics for other companies.

For construction company Caterpillar, for example, Bullitt has made phones for workers in rugged environments; one particular model can be dropped from a height of 6 ft and has 23 days of standby battery time.

Legend has it that one of the rugged phones fell from a skydiver's pocket mid-dive – and survived the impact when it hit the ground.

3D Printed Endoprosthesis Production Deal Inked Outside Moscow

Technospark, a nanotech park in Troitsk just outside Moscow, and LVM AT, a Russian tech engineering company, have inked an agreement with Germany's Concept Laser which is paving the way for Russia's pioneering production of 3D printed endoprostheses for joints, interbody fusion cages and implants for intracranial and oral/maxillofacial surgery, announced Rusnano, Russia's largest nanotech company.

Under terms of the agreement, Concept Laser is giving Technospark necessary equipment and transferring production technology, while LVM AT is acting as a technical consultant in putting together and launching additive tech based production. Future markets will not be limited to Russia, Rusnano emphasized; Concept Laser is expected to facilitate contracts with Eastern European customers.

Royal Philips To Open R&D Center In Russia's Skolkovo

Royal Philips, a Dutch company with global presence, is opening a research and development center in Russia's Skolkovo innovation hub outside Moscow with an eye to investigating into advanced IT opportunities in health care, Firrma.ru reported.

The new Center will focus on machine learning, artificial intelligence and big data analysis and processing in the field of health care. The effort is expected to translate into serious R&D support for the firm's global research projects in forecasting analytics for paramedic practice and big data analysis for health care service transformation.

The Skolkovo-based R&D Center will join a network of such centers called Philips Research, operating across Europe, North America, China, India, Brazil, and the African continent.

Can Russia Build A Tech-Based Economy?

Skolkovo Technology Park, one of Russia's largest science parks, is just an hour drive from Moscow's city center. Designed as an alternative to Silicon Valley in the U.S., Skolkovo is a key part of Russia's dream to build an economy based on scientific and technological innovation.

On Oct. 26-28, Skolkovo Technopark hosted the Open Innovations forum, which is the Russian government's flagship tech event. The forum is seen as an opportunity to inspire technological development in the sanctions-hit country.

This year, the event highlighted everything that is wrong with Russia's innovation infrastructure, ranging from low demand for new technology, to the lack of investment for early-stage startups.

Moscow Team Taps UV To Improve Smartphones And Printers

Scientists at MIPT, a leading Moscow-based tech university, partnered with colleagues from Saudi Arabia and China in what appears to be a successful effort to improve the properties of photodetectors, the MIPT website announced. The researchers have

discovered the ability of ultraviolet to change a simple photodetector, widely used in smartphones, printers and an array of other devices, into a broadband one.

The results of the research have been published in English in Advanced Functional Materials.

As a rule, photodetectors react to narrow wavelengths, which creates lots of problems for developers. “Photodetectors that are able to “feel” broadband emission are in strong demand but are also very difficult to put together as materials for them are hard to come by; substances that are transparent for UV are usually nontransparent in the infrared spectrum span, and vice versa. We have found a rapid, economical and efficient way of broadening the photodetector’s sensitivity range,” Vadim Agafonov, the head of MIPT’s Molecular Electronics Center, was quoted as saying.

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World Economic Round Up

The Organization of the Petroleum Exporting Countries (OPEC) representatives reached a landmark deal to reduce oil output, propelling crude prices more than 8 percent after months of wrangling and market uncertainty about the ability of the once-mighty group to strike an agreement. OPEC said that it would cut production by 1.2 million barrels a day from 33.6 million barrels and said it expects producers from outside the group, including Russia, to join with additional cuts totalling 600,000 barrels a day.

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 2017

Future Horizons Events

- Silicon Chip Industry Training Seminar – London – 6th March 2017
- Industry Forecast Briefing, London – 17th January 2017

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

Telephone: +44 1732 740440
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Download Future Horizons Full Events Calendar Here

Industry Events

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MARK YOUR CALENDER FOR THE NEXT

SILICON CHIP INDUSTRY WORKSHOP
MONDAY 6th March 2017
AND
INDUSTRY FORECAST BRIEFING
TUESDAY 17th January 2017

BOTH BEING HELD AT

HOLIDAY INN KENSINGTON FORUM, LONDON

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