

FutureHorizons
The Global Semiconductor Industry Analysts



Future Horizons Newsletter

January 2015

Happy New Year

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Industry News By Company

[Avago Demonstrates Industry-Leading 56Gbps PAM4 SerDes](#)

Avago Technologies (NASDAQ: AVGO) today announced it has demonstrated the industry's first 56Gbps pulse-amplitude modulation (PAM)4 SerDes across copper backplanes and optical interconnects targeting next-generation switches and routers. Leading OEM customers are presently designing advanced ASIC SoC solutions in 28nm and 16FF+ process technologies utilizing the Avago PAM4 SerDes cores.

PAM4 technology enables future scaling of core/metro router and hyperscale data centers by more than doubling link full-duplex throughput to 56Gbps from 25Gbps per SerDes lane. Rack-level applications will particularly benefit from PAM4 technology realizing advantages in space, power, cost, and simplified cabling.

[Altera Software Cuts Design Time With Arria 10 FPGAs, SoCs](#)

Altera Corp. has introduced its Quartus II software v14.1 that boasts additional support for Arria 10 FPGAs and SoCs, which the company claims as the FPGA industry's only devices with hardened floating point DSP blocks and the industry's only 20nm SoC FPGAs that incorporate ARM processors. The latest software allows users to choose among three unique DSP design entry flows and achieve up to 1.5 TFLOPS of DSP performance. The solution also provides several optimisations that enhance designer productivity by reducing design time of Arria 10 FPGAs and SoCs, added Altera.

[Cadence Platform Offers 10-Fold Increase In SoC Verification](#)

Cadence Design Systems Inc. has introduced the Perspec System Verifier platform for use-case scenario-based software-driven SoC verification. A part of the Cadence System Development Suite, the solution promises to cut complex test development from weeks to days, while also allowing design teams to reproduce, find and fix complex bugs to enhance overall SoC quality, the company indicated.

Using an intuitive graphical specification of system-level verification scenarios and a definition of the SoC topology and actions, the verification solution automates system-level coverage-driven test development using constraint-solving technology, delivering up to 10x productivity improvement in SoC verification versus typical manual test development, stated Cadence.

[Cypress-Spansion Merger Eyes IoT Growth](#)

CEO T.J. Rodgers is the head of the new company formed after the \$4 billion all-stock 50 per cent-split Cypress-Spansion merger. Under the global name Cypress, the company will keep Spansion's world leadership in NOR Flash memory and retain Cypress' huge SRAM memory market.

When asked about possible product line consolidations (both companies offer memory and ARM-based MCUs for the automotive market), Rodgers emphasised the complementarity of the two companies.

[Freescale Semiconductor Announces Super Fast 15-Watt Wireless Charging Solution](#)

In the world of all our electronic devices, wireless power is something that we continually strive for as it would simply make plenty of things more convenient. The closest we have come to that at this point is wireless chargers and the wireless charging capabilities and technology built into our smartphones and tablets. While this is great and it makes for less clutter and less wires hanging around, wireless chargers don't deliver power to the batteries inside our devices as quickly as a traditional A/C charger that plugs into an outlet which is especially time consuming for devices with bigger batteries. Think about the Motorola DROID Turbo using a standard Qi wireless charger, it wouldn't be so Turbo in that regard anymore.

That could change though as a company called Freescale has recently announced the industry first 15-watt wireless charging solution which will end up bringing a much faster experience to the devices we charge wirelessly, and thus making it a lot easier to charge devices with larger batteries fully in a much shorter amount of time. We won't get to see the Freescale wireless charging solution in a final state until sometime in the beginning of next year, but that's a lot sooner than it sounds. Even better still, is that they have reference designs up and running as of now for OEMs to get a head start on manufacturing wireless chargers using this 15-watt solution which gives companies the chance to get them into our hands faster.

[Globalfoundries Eyes Opportunities In China's Semiconductor Industry](#)

Contract chip manufacturer GlobalFoundries is looking to foster deeper ties with the mainland's semiconductor industry, after completing its acquisition of International Business Machines Corp's microelectronics business.

GlobalFoundries, which is owned by the Abu Dhabi government's Mubadala Development, agreed in October last year to take over IBM's loss-making semiconductor technology operation for US\$1.5 billion, which IBM will pay the California-based chip manufacturer over three years.

"Our design footprint is tiny right now in China, but we expect to leverage IBM's large presence in China to start building new IP [intellectual property] designs," Chuck Fox, the senior vice-president for worldwide sales at GlobalFoundries, told the South China Morning Post. "I can't be specific, but we are now in active discussions with multiple IP partners [on the mainland] ... The challenge in our industry is about design, so we're making greater investments in IP."

[Murata Boosts RF Expertise With Peregrine Buy](#)

Executives of Murata Electronics North America Inc. in Smyrna, Ga., are boosting their company's expertise in advanced RF and microwave solutions with their acquisition of Peregrine Semiconductor Corp. in San Diego.

Murata Electronics North America, a wholly owned subsidiary of Murata Manufacturing Co. Ltd. in Kyoto, Japan, has acquired all outstanding shares of Peregrine for \$12.50 per

share in cash. Peregrine is founder of RF silicon on insulator (SOI) technology and a pioneer of advanced RF solutions, company officials say.

Peregrine (formerly NASDAQ: PSMI) will continue to market its high-performance, integrated RF solutions under the Peregrine brand, as a wholly owned subsidiary of Murata Electronics North America Inc.

[Infineon And UMC Announce Manufacturing Agreement For Automotive Applications](#)

HSINCHU, Taiwan, Dec. 15, 2014 /PRNewswire/ -- The semiconductor manufacturer Infineon Technologies AG (FSE: IFX / OTCQX: IFNNY) and United Microelectronics Corporation (NYSE: UMC; TWSE: 2303), a leading global semiconductor foundry, today announced the extension of their manufacturing partnership into power semiconductors for automotive applications. Prior to this expanded partnership, the foundry had been producing Infineon's logic chips for more than 15 years. Based on the recently signed agreement, both companies will jointly transfer Infineon's automotive-qualified Smart Power Technology (SPT9) to UMC and extend its production to 300mm wafers. Production start of SPT9 products at UMC's 300mm Fab in Taiwan is planned for early 2018.

SPT9 is a proprietary 130-nanometer (nm) process technology of Infineon that combines microcontroller intelligence and power technology on a single die.

[Intel Unveils New Flagship 'Broadwell' Chips For PCs](#)

Intel took one shot with its latest chip technology in the fall. On Monday, it is unleashing the full salvo.

The Silicon Valley giant announced the fifth generation of its flagship Core microprocessor family at the Consumer Electronics Show on Monday. The new PC chipset will target laptops, desktops and what Intel calls 2-in-1s (products that can switch from clamshell form factor to work like tablets).

An assortment of Intel customers are expected to unveil new hardware based on the chips at CES this week.

Intel's new products, based on a design called Broadwell, are its latest evidence that investing in semiconductor manufacturing technology can pay off. The company is the biggest standard-bearer for Moore's Law, the regular cadence of manufacturers shrinking transistors on chips to increase their performance while reducing their size, cost and power consumption.

Quantenna And Lantig Offer State Of The Art 802.11ac 4x4 System Solution For Ethernet Routers

LAS VEGAS – January 7, 2015 – CES — Quantenna Communications, Inc., the leader in ultra-high performance Wi-Fi and chipset supplier Lantig today announced the availability of a joint system solution to address the Ethernet Retail Router market. The solution combines Quantenna’s QSR1000 4x4 802.11ac with the Lantig’s GRX300 communications processor family and brings ultra-high performance Wi-Fi technology to the mid-range Ethernet Retail Router market. Today’s AC1750 and AC1900 mid-end routers are offering only 3x3 802.11ac. The Lantig /Quantenna AC2000 solution boosts the 5GHz Wi-Fi performance by offering 4x4 11ac including MU MIMO, while optimizing the 802.11n Wi-Fi towards the existing 1x1 and 2x2 clients.

“We are the leader in ultra-high performance Wi-Fi and are the only company able to offer a 4x4 802.11ac solution for the retail router market. We are excited that, together with Lantig, we could create a new AC2000 Router category and bring our high-end solution with Wi-Fi link rates of 1,700Mbps into the mid-range Ethernet router segment,” said Lionel Bonnot, senior vice president of business development, Quantenna.

Samsung Electronics Starts Mass Production of Industry’s First 8 Gigabit LPDDR4 Mobile DRAM

SEOUL, South Korea--(BUSINESS WIRE)--Samsung Electronics Co., Ltd., the world leader in advanced memory technology, announced today that it has started mass producing the industry’s first 8 gigabit (Gb), low power double data rate 4 (LPDDR4) mobile DRAM based on the company’s leading-edge 20-nanometer (nm) process technology. LPDDR memories are the most widely used “working memory” for mobile devices worldwide.

“By initiating production of 20nm 8Gb LPDDR4, which is even faster than the DRAM for PCs and servers and consumes much less energy, we are contributing to the timely launch of UHD, large-screen flagship mobile devices”

“By initiating production of 20nm 8Gb LPDDR4, which is even faster than the DRAM for PCs and servers and consumes much less energy, we are contributing to the timely launch of UHD, large-screen flagship mobile devices,” said Joo Sun Choi, Executive Vice President of Memory Sales and Marketing at Samsung Electronics. “As this major advancement in mobile memory demonstrates, we will continue to closely collaborate with global mobile device manufacturers to optimize DRAM solutions, making them suitable for next-generation mobile OS environments.”

ST Outs Light, Low-Profile Automotive-Qualified Rectifiers

STMicroelectronics has rolled out its latest automotive-qualified high-voltage ultrafast rectifiers that boast extremely low profile and light weight. According to the company, the devices support space-efficient vehicle electronics by helping reduce the footprint of electronic control modules, power converters and motor drives.

The rectifiers are packaged as SMBFlat devices that weigh only 50mg and, at 1mm-thick, are almost 60 per cent thinner than the nearest competing rectifiers in standard 2.4mm-thick SMB packages, stated ST. This helps designers create lighter and slimmer electronic control units suitable for mounting in small spaces within the vehicle. The two-lead surface-mount SMBFlat package is footprint-compatible with standard SMB devices, which promotes ease of use in existing PCB designs, the company added.

True 3D Monolithic Integration Eliminates TSV Dependence

CEA-Leti has recently unveiled the test results on multi-layer transistors stacking for true 3D monolithic integration during a 3D-VLSI workshop preceding IEDM 2014, in San Francisco. According to the research institute, the technology no longer relies on tall through silicon vias (TSVs) and coarse redistribution layers typically used for wafer-on-wafer die stacking.

Only recently dubbed CoolCube for its future commercialisation, the technology can be essentially described as sequential 3D ICs manufacture, enabling circuit partitioning in 3D at all granularity levels, including at transistor or gate scale through a standard lithographic process.

The key difference with the "traditional" use of TSVs, where two or more processed dies are assembled one on top of another, is the transfer and molecular bonding of a thin Si wafer film, peeled off from a wafer blank after planarisation

Industry News & Trends

[£32M For UK Materials Manufacturing Research](#)

EPSRC to fund projects on GaN, chalcogenides, perovskite photovoltaics, and a new class of photonic chips

Ten new research projects that will advance the UK's manufacturing capability, develop new and exciting functional materials, and accelerate the translation of the science of functional materials through to application have been announced by the Engineering and Physical Sciences Research Council (EPSRC).

The projects will include developing advanced fabrication processes for GaN and related materials; revolutionising the manufacture and use of specialised glass (chalcogenides); exploiting the potential of flexible perovskite photovoltaics; developing the materials needed for the new class of photonic integrated circuits for use in communications, sensors, imaging and lighting; developing thin-film materials and novel manufacturing methods for wearable technology; improving the mass production of carbon nanotube materials; and advanced manufacturing of nanoparticles for healthcare applications.

[Germany Startup To Begin Production Of Electric Sports Cars](#)

Germany-based nanoFlowcell AG, a startup car manufacturer, has announced its plan to produce its own electric sports sedan. At next year's Geneva Motor show, the company will present another version of its car besides the Quant E model.

With the purpose of transferring its prototype vehicle into series production, nanoFlowcell has launched a fully-owned subsidiary named nanoProduction GmbH, based in Waldshut (Germany). This company will be responsible for all manufacturing aspects of the vehicles. The first task for the subsidiary is taking all necessary legal measures to enable nanoFlowcell to produce street vehicles in series. In addition, nanoProduction will oversee all negotiations with suppliers and development partners for the entire group and implement all formal and operative measures towards a homologation of the vehicles.

A company spokesperson said that selecting a location in Germany for the launch of nanoProduction does not mean a preliminary decision to manufacture the vehicles in that country. He pointed out that at the present point in time, all options as to the manufacturing model are open. "It is possible to license our technology to an established carmaker, a new market player, or to run it on our own," the spokesperson stated.

[Smart Window Changes Shade, Acts As Battery](#)

A new window developed by scientists from the Nanyang Technological University has the capability to darken or brighten without the need for an external power source. The window's stored energy can be used to light up low-powered electronics like a LED.

The self-tinting window requires zero electricity to operate and is also a rechargeable battery.

Currently, the window solutions in the market are either using permanent tinting which cannot brighten at night or are windows that can change its light transmission properties only with an external power source.

Wearable Technology in Industry Verticals 2014 – 2019

Wearable technology presents the potential for massive transformation in many industries. The more obvious ones include consumer electronics and communications. Early adopter industries include clothing, healthcare, sports and fitness. However, we see many industries adopting wearable technologies as computing and wireless communications integrate wearable into virtually every aspect of products and services.

This marketplace will initially be driven by practical solutions for healthcare, consumer wearables, and military applications. Despite the uncertainty of consumer receptivity, it is estimated that global spending on wearable devices will grow from \$9 billion in 2014 to reach \$218 billion in 2019.

We see several factors converging to facilitate wearable technology integration including expanded wireless capacity due to pervasive wireless (WiFi, WiMAX, and LTE), cellular market saturation and the need for wireless companies to establish new revenue streams, continuously decreasing cost of data, and the significant backing from huge companies including Google, Apple, and others. We also see developments in key technologies such as Augmented Reality, Body Area Networks, Ambient Awareness, and Peer-to-Peer Communications as drivers for evolution in consumer perception of value and willingness to engage in new forms of communications, content, applications, and commerce.

Piezoelectricity In A 2D Semiconductor

Newswise — A door has been opened to low-power off/on switches in micro-electro-mechanical systems (MEMS) and nanoelectronic devices, as well as ultrasensitive biosensors, with the first observation of piezoelectricity in a free standing two-dimensional semiconductor by a team of researchers with the U.S. Department of Energy (DOE)'s Lawrence Berkeley National Laboratory (Berkeley Lab).

Xiang Zhang, director of Berkeley Lab's Materials Sciences Division and an international authority on nanoscale engineering, led a study in which piezoelectricity – the conversion of mechanical energy into electricity or vice versa – was demonstrated in a free standing single layer of molybdenum disulfide, a 2D semiconductor that is a potential successor to silicon for faster electronic devices in the future.

Smart Car Access Is Key To "Cool Car"

We are all living in a dichotomous world. We can't think of a spoon without bringing to mind a fork. Night and day. Left and right. Good and bad. And although not as evident as the examples I indicated, cars go side by side with its teeny-tiny partner. The key.

The car key is seemingly destined to become the most visible object differentiating one car brand from another, thus cementing the bond between carmakers and car owners. At least, that's the expectation of car OEMs, and NXP Semiconductors is banking on it.

The Dutch chip supplier, known for its prominence in the keyless entry and immobilisation IC market, is unveiling a new smart-car access chip integrating passive keyless entry, a RF transmitter for remote control and an immobiliser in one package. The NCF29A1 has been sampled by Tier Ones and car OEMs, said Lars Reger, VP of strategy, new business and R&D for the automotive business unit at NXP. "You'll be able to see cool cars fitted with innovative keys in 2015."

[Eltopia Uses Electronics From STMicroelectronics To Save The Bees](#)

STMicroelectronics (NYSE: STM), a global semiconductor leader serving customers across the spectrum of electronics applications, and Eltopia Communications, whose Innovation Space is dedicated to commercializing devices that address some of the world's most pressing problems, announced that Eltopia's Intelligent Foundation, codenamed MiteNot, uses an STM32F0 microcontroller, multiple sensors, and power-management components from ST to monitor and collect data on environmental conditions and eliminate parasites that contribute to honeybee Colony Collapse Disorder (CCD).

Colony Collapse Disorder is a serious condition in which the worker bees in a hive disappear. As the bees in the estimated 4 million commercial hives are estimated by the US Department of Agriculture to pollinate about 30% of the food consumed by Americans, they also pollinate many of the crops eaten by livestock and have a similar role in global food production, declined bee populations are a serious threat to food sources worldwide. Apiologists—honeybee researchers--attribute CCD to multiple sources, including parasites, viruses, and pesticides. The primary parasitic suspects are mites, which infect and destroy honeybee colonies. Eltopia's Intelligent Foundation is a compostable film that senses the lifecycle of the bees and parasites. The solution then interacts with the colony to apply targeted heat to sterilize the mites without harming the bees, and without pesticides. The low- power STM32F0 microcontroller and a broad range of additional ST sensors were selected by Eltopia engineers based on the components' strong performance.

[Young Industry Developing Drones Resembles Silicon Valley In Early Days Of Personal Computer](#)

DANVERS, Mass. - To see the future of drones, head up the hill at the intersection of Industrial Drive and Electronics Avenue. Inside a bland brick office building, the team at CyPhy is working on tethered machines that can fly nonstop for days and pocket-sized drones for search-and-rescue missions.

It's not a fancy building. There's no giant aerospace or defence company here in Danvers, north of Boston. Just small teams of computer scientists and mechanical engineers working in spaces called "The Playpen," "The Den" and "The Department of Failed Good Intentions."

In many ways, the nascent drone industry looks a lot like the personal computer industry did in its infancy. The money to fuel development is coming largely from entrepreneurs' own checkbooks.

East European News & Trends

FreshOffice For Small Businesses

In the mid-2000s Igor Sugnach, a programmer from St. Petersburg, was working at a large European holding company. He noticed the difference in the operating activities between Russian and European medium-sized businesses. The West already had complete solutions for automating small enterprises, while Russian SMEs were still using Excel.

"The large enterprises used SAP, Oracle, but the niche of programs for small and medium businesses was practically nonexistent," says Sugnach. "There was no advantage for world giants to promote their products to offices with five to 15 employees."

Russians Prefer Mobile Internet Access To Desktops; Even Infants Use Gadgets

Russians are now using the Internet on their mobile devices more frequently than through conventional computers. According to web statistics service LiveInternet, in November some 51% of Russian Internet users (31.1 million) accessed the web on their mobile devices, both phones and tablets, reported East-West Digital News, the first international information company dedicated to Russian digital industries, citing data from Russia's Izvestia. In October, the figure was 49.9% (29.4 million), with the majority still using their computers.

"This trend was first reflected on social networks like VKontakte and Odnoklassniki. These communications services have become the growth drivers. A new medium of interaction is being formed – people are always in touch," says the founder of LiveInternet German Klimenko.

Once Sidelined, Novosibirsk's Battery Maker Seeks To Reinvent Itself

Liotech, an innovative storage battery developer in Novosibirsk, in Siberia, which had to halt operation earlier this year, is staging a market comeback next year with new small capacity batteries, Delovoi Kvartal reported.

Liotech CEO Andrei Petrov was quoted as saying that, "once small capacity battery production is set up, the company will be able to enter the market for small uninterrupted power supply systems, DC systems, and electric cars."

Ruselectronics And Moscow-Based University Collaborate In High Tech

Ruselectronics, a large-scale Russian electronics maker, announced the signing of an agreement with the Moscow Aviation Institute (MAI) on the joint development of scientific and educational projects and production technologies for use in Russia's high-tech sectors.

Under terms of the agreement, the partners will focus on setting up joint research centers, doing shared R&D, and implementing projects that call for the delivery of high technology goods and the rendering of educational services.

Apple Closes Russian Website

Apple has stopped selling products on its Russian website because of massive fluctuations in the rouble.

The Russian currency has lost 20% of its value against the dollar since the start of the week, smashing records for all-time lows on Monday and Tuesday. As Russians rushed out to spend their roubles before prices went up on imported televisions, washing machines and smartphones – Apple announced it was closing its online store.

“Due to extreme fluctuations in the value of the rouble, our online store in Russia is currently unavailable while we review pricing,” the company said in a statement. Visitors to the site were greeted with the message “we’ll be back” in several languages.

Russian Startup Aims To Boost Internet Speed Significantly

Russian startup MaxTelCom has developed fundamentally new fiber fusion splicers that are qualitatively on par with global competitors and several times cheaper. According to the company’s founders, the majority of internet users around the world are connected via copper networks. Fiber has yet to penetrate apartments and offices due to the high cost of equipment, the inconvenience of installation in buildings and its high levels of energy consumption. The new fiber fusion splicers substantially speed up the process of replacing copper networks with fiber-optic networks. This, in turn, means fiber-optic networks will become more affordable and internet speed and quality will rise dramatically.

MaxTelCom believes that the existing devices used to install fiber-optic cables are inefficient. A qualified specialist is needed to work with those devices, which cost roughly \$12,000 and require expensive maintenance.

State Fund FRII Teams Up With Mobile Operator Yota To Support Start-Ups

Russian mobile operator Yota has become a partner of FRII, the \$200m government-backed fund launched last year to support Russian Internet start-ups. The company will invest in the fund’s start-ups, and may also look at acquiring some projects.

Start-ups will also benefit from the company’s support through assistance with infrastructure and the use of Yota’s resources in the development and testing of their products, reported East-West Digital News, the first international information company dedicated to Russian digital industries.

Yota is primarily interested in start-ups involved in sectors connected with mobile technology: app development, software for reducing roaming costs, financial services, mobile advertising, BigData, M2M, e-commerce, and behavioural analytics.

World Economic Round Up

A spiralling currency crisis, fuelled by the bite of Western sanctions and the plummeting price of oil, spurred Russia's central bank to raise interest rates in December, a drastic move aimed at shoring up the collapsing rouble. The surprise action came at the end of a turbulent day for global financial markets. Currencies and stock markets from several developing nations were buffeted by the deepening oil-price slump and worries about future interest-rate increases in the U.S. The epicentre of the troubles was Russia, where the rouble plunged to a record low in its biggest one-day decline since 1999. Japan slipped into recession during the third quarter,

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

- Industry Forecast Briefing, London – 20th January 2015
- Silicon Chip Industry Training Seminar – London – 17th March 2015

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

Telephone: +44 1732 740440

Email: mail@futurehorizons.com

[Download Future Horizons Full Events Calendar Here](#)

Industry Events

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MARK YOUR CALENDER FOR THE NEXT

INDUSTRY FORECAST BRIEFING

TUESDAY 20th January 2015

AND

SILICON CHIP INDUSTRY WORKSHOP

MONDAY 17th March 2015

BOTH BEING HELD AT

Holiday Inn Kensington Forum, London

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