

# FutureHorizons



The Global Semiconductor Industry Analysts

## **Future Horizons Newsletter**

**June 2021**

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## **Industry News By Company**

### **[ARM Empowers MCU Software Developers To Capitalize On IoT Potential](#)**

The Internet of Things (IoT) is quickly transitioning to a period of rapid growth, driven by increased compute, connectivity and security capabilities, the rapid evolution of machine learning (ML) processing at the endpoint, 5G deployments and evolving IoT platforms from major cloud service providers.

This is a new, more complex world, where the journey to successful IoT implementations requires strong industry collaboration and a robust ecosystem of support and tools. Arm is focused on rapidly empowering the world's largest embedded software ecosystem, and today we're announcing two important steps towards this vision.

Simplifying IoT Workflows and Lifecycle Management: Open-CMSIS-Pack

MCU-based devices form the majority of the 'things' in IoT, as evidenced by the more than 70 billion chips based on the Arm Cortex-M processor family shipped by our partners since its introduction in 2003. However, software compatibility for component re-use has long been a challenge, with the IoT landscape being much more diverse at the hardware level compared to PCs or the data center.

### **[Dialog Semiconductor Extends Partnership with SiFive](#)**

Dialog Semiconductor plc has extended its partnership with RISC-V processor and silicon solutions provider SiFive Inc. Dialog is SiFive's preferred power management partner for its HiFive Unmatched, a PC form-factor RISC-V Linux Development Platform for the SiFive Freedom U740 RISC-V SoC.

The new HiFive Unmatched platform uses Dialog's highly integrated DA9063 system PMIC which incorporates 6 DC-DC Buck Regulators and 11 LDOs. The device enables the SiFive platform to achieve maximum performance by optimally meeting all power supply requirements. In addition, the DA9063 supports Dynamic Voltage Scaling (DVS) which dramatically reduces the power dissipation and thermal footprint of the platform.

### **[GlobalFoundries Partners With Raytheon to Develop New Semiconductor](#)**

Using its plant in Essex Junction, GlobalFoundries will partner with Raytheon Technologies to develop and commercialize new semiconductor technology for mobile and wireless uses.

In a joint statement on Wednesday, the companies said that Raytheon will license its proprietary technology and work with GlobalFoundries to make a new semiconductor "that will enable game-changing radio frequency performance for 5G and 6G mobile and wireless infrastructure applications."

Raytheon makes gallium nitride, a component of high-performance semiconductors that can handle significant heat and power levels, the two companies said.

## **NXP Unveils Two Processors on TSMC 16nm FinFET Technology**

NXP Semiconductors recently announced the release of its S32G2 vehicle network processors and the S32R294 radar processor into volume production on and Taiwan Semiconductor Manufacturing Co. Ltd's (TSMC) advanced 16nm FinFET process technology.

This marks the migration of NXP's S32 family of processors to increasingly advanced process nodes as automobiles continue to evolve into powerful computing platforms. NXP's continued innovation in the S32 family is designed to help carmakers simplify vehicle architecture and deliver the fully connected and configurable car of tomorrow.

The S32G2 vehicle networking processors enable service-oriented gateways for secure cloud connectivity and over-the-air updates that will unlock a multitude of data-driven services such as usage-based insurance and vehicle health management. S32G2 processors also serve as domain and zonal controllers to enable next-generation vehicle architectures and as high-performance ASIL D safety processors in advanced driver assistance and autonomous drive systems. The move to TSMC's 16nm technology has allowed S32G2 to consolidate multiple devices into one, creating a powerful System-on-Chip (SoC) that reduces the processor's footprint.

## **Renesas Launches LTE Cat-M1 Module for Massive IoT**

Renesas Electronics Corp. has introduced the RYZ014A, its first cellular IoT module supporting the LTE Cat-M1 specification, which allows devices to directly connect to the internet without the need for a gateway by relying on the existing communication infrastructure owned by mobile network operators. This makes it economical to connect each device, which is especially beneficial when installing larger networks that require a low cost per unit. The pre-tested, pre-certified RYZ014A enables customers to quickly and cost-effectively implement wireless IoT applications across the globe.

The RYZ014A module solves customers' design and certification issues compared to building a wireless IoT solution from scratch. This includes RF regulatory certification, PTCRB/GCF certification and carrier certification for the customer's network operator of choice. The module is built on proven technology both from a hardware and software perspective and is delivered fully tested and calibrated. It has been certified with all major radio frequency regulations in the world as well as with leading network operators in North America, APAC and Europe. Cellular IoT is one of the pillars of Renesas' connectivity strategy that also includes Bluetooth Low Energy, Ultra-wide band (UWB) and Wi-SUN among others.

## **Samsung Launches New Power Management Solutions for DDR5 Modules**

Samsung Electronics Co. Ltd has launched integrated power management ICs (PMICs) S2FPD01, S2FPD02 and S2FPC01, for the fifth-generation double data rate (DDR5) dual in-line memory module (DIMM).

One major design improvement to the newest generation DRAM solution involves integrating the PMIC into the memory module—previous generations placed the PMIC

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on the motherboard—offering increased compatibility and signal integrity, and providing a more reliable and sustained performance.

For improved performance efficiency and load-transient responses, Samsung's new PMICs for DDR5 modules have been equipped with a high-efficiency hybrid gate driver and a proprietary control design (asynchronous-based dual-phase buck control scheme).

### **ST Acquires TinyML IDE Company Cartesiam**

French machine learning startup Cartesiam has been acquired by STMicroelectronics. Cartesiam's integrated development environment, NanoEdge AI Studio, is designed to allow engineers to create and deploy machine learning applications on Arm Cortex-M microcontrollers. Using Cartesiam's specially designed algorithms, applications such as predictive maintenance for industrial machinery can be implemented quickly, with training performed on the microcontroller to tailor the algorithm to the particular piece of machinery.

Cartesiam, based in Toulon, France, was founded in 2016 with seed funding of €500k which allowed a proof of concept, before a funding round raised €2m in 2018. The company has brought together a team of PhD-educated mathematicians, data scientists and machine learning experts.

## **Industry News & Trends**

### **[Chip Giants Are Making More Money Than Ever As The Semiconductor Shortage Rages](#)**

The world's 10 biggest chip manufacturing companies saw their revenues surge to a record high in the first quarter of 2021, according to market research firm TrendForce.

The combined quarterly total revenue of the chipmakers, known as foundries, rose to a record high of \$22.75 billion in the first quarter, according to a TrendForce blog published Monday.

Chips are used in everything from cars and games consoles, to washing machines and toothbrushes. They form part of the life blood of the global economy and are vital to many of the world's biggest industries. But they're also in short supply — and the shortage could last until 2023.

### **[Bandwidth Boosts Could Help Unclog Space Communications](#)**

Data compression algorithms and optical communication links could help unclog bandwidth bottlenecks for transmitting ultra-high-resolution imagery along with big data from the growing number of probes exploring our solar system.

Among the efforts are a NASA project launching this summer that will demonstrate emerging laser communications capabilities. On the receiving end, commercial space startup Metaspectral is advancing AI-based data compression techniques that promise to reduce file sizes to as little as 30 percent of the originals. While shrinking the size of downlinks, the lossless compression technique preserves key image data that can be used later by analysts. Those huge data sets can also be used to advance training of AI models.

### **[Ampere Submits Laudable Progress Report](#)**

Ampere Computing is on a roll. The company's 80-core Altra processor (released in 2020) is racking up customers, several of which Ampere has finally made public. Its 128-core Altra Max is sampling now, and it's just about as fast as Ampere suggested it would be. In an interview with EE Times, CEO Renee James called it "just a screamer." The Altra Max's successor (still unnamed) is on schedule to sample in 2022. Renee James

Ampere was founded in 2018 by James, a former Intel executive, with the ambition of attacking Intel's strength: processors for data centers. In the short time since Ampere was established, a resurgent AMD has begun to gain traction in that same market, some of the biggest data center operators began designing their own chips, and erstwhile Ampere partner Nvidia made clear its intention to also contend for the data center. Not to mention the scores of other startups with artificial intelligence (AI) accelerators designed for data centers.

## **New Technique to Detect Tropical Cyclones Earlier than Satellites**

Researchers at the Indian Institute of Technology (IIT) Kharagpur have developed a technique that could be useful in the early detection of development or strengthening of tropical cyclones in the atmospheric column prior to satellites over ocean surface in the North Indian Ocean region.

Researchers devise a novel method using Eddy detection technique to investigate the formative stages and advance detection time of tropical cyclogenesis in the North Indian Ocean region. This study has been conducted under the Climate Change Program (CCP) with the support from Department of Science and Technology, Government of India, an official statement said.

Early detection of Tropical cyclones has wide socio-economic implications. So far, remote sensing techniques have detected them the earliest. However, this detection was possible only after system developed as a well-marked low-pressure system over the warm ocean surface. A larger time gap between the detection and the impact of the cyclone could help preparation activities.

## **Toshiba Claims Breakthrough in Quantum Communication**

Engineers at the world-renowned Cambridge Research Laboratory of Toshiba Europe have demonstrated quantum key distribution (QKD) of optical fibers over a distance of 600 km which they claim is a major breakthrough in long-distance quantum communications.

The results hold out the prospect of quantum-secured information being sent between metropolitan areas, and the researchers say the work represents a significant advance towards building a future quantum internet.

Researcher at The Cambridge Research Laboratory of Toshiba Europe

They acknowledge that many technical barriers still remain before such a network of quantum computers connected via long-distance quantum communications becomes a reality, but maintain that their demonstration of how quantum bits can be transmitted over long optical fiber links is a significant step towards such a quantum internet.

## **IBM, GlobalFoundries in Breach-of-Contract Spat**

IBM is suing GlobalFoundries for breach of contract and is asking for \$2.5 billion in damages. IBM made GlobalFoundries aware of the suit, but informed EE Times it hasn't filed it in court yet, and so is not yet prepared to share it publicly. GlobalFoundries has already filed a petition with the New York State Supreme Court to dismiss the pending suit as meritless.

Back in 2014, IBM was trying to get out of the commercial semiconductor production business. It was shopping some of its aging fabs, but failed to find any buyers, and ended up paying GlobalFoundries \$1.5 billion essentially to take them. The two agreed GF would complete the 14 nm IC production process IBM had been working on (which GF did). GlobalFoundries would then supply IBM with 14-nm chips (and so it did), and GF

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would simultaneously work on the next node. The next node was supposed to be 10nm, but given the competitive situation in the IC manufacturing business, GF decided to skip 10nm and go directly to 7nm. GF says IBM agreed with this decision.

### **Finnish Group Readies Non-cellular Technology for IoT**

A small Finnish company focusing on wireless connectivity has developed what it describes as a purpose built, non-cellular 5G technology that it suggests will remove most of the obstacles holding back wider deployment of industrial Internet of Things (IIoT) networks.

Wirepas is using a well-established but updated technology – the European Telecommunications Standards Institute (ETSI)-specified DECT-2020 NR (New Radio) standard. This uses a portion of the unlicensed 1.9 GHz spectrum, assigned to DECT two decades ago for use in applications such as digital cordless handsets.

The new standard was finalised last October and is expected to be included in the upcoming review by the ITU of the IMT-2020 5G specifications. It was devised such that it could be deployed for a broad and diverse range of IoT applications at the physical layer and address numerous frequency bands below 6 GHz, but is likely to be used initially in networks operating at 1.9 GHz.



## **East European News & Trends**

### **[Analysts Predict Rapid Growth In Russia's Cloud Services Market](#)**

The cloud services market in Russia is likely to more than double over the next five years, reaching \$3.2bn in 2025. The prediction came from TMT Consulting based on the key findings of the consultancy's recent study, and was reported by Finmarket.ru.

TMT also believes that Russia's market for IT cloud services may increase by 25% yoy to \$1.5bn this year after expanding by 24% in 2020.

Growth drivers reportedly include employees' transition to remote work and increased demand for online services during the pandemic. Additionally, substituting less expensive cloud services for enterprise solutions helps companies reduce their spending on IT.

While the use of cloud solutions has increased most rapidly among private companies in the financial and telecommunication sectors, the trend has also been observed among state enterprises, the TMT Consulting report noted.

### **[Moscow Chemists Believe Their Novel Material Promises "Breakthrough In Optoelectronics"](#)**

Chemists and material science specialists at the Moscow Lomonosov State University (MSU) have partnered with colleagues from several Russian research institutes in developing vanadium dioxide films with properties that may be very useful in optoelectronics.

"Today, devices based on terahertz waves control are too large and bulky to find broad practical applications, especially if we take into consideration the growing demand for increasingly miniaturized solutions," Artem Makarevich, PhD, one of the project developers and an MSU chemist, said in a comment on the core focus of his team's effort.

### **[Russia Moves To Further Support Demand For Domestic IT Products](#)**

Russia's Ministry of Digital Development is likely to be appointed the lead supporter of demand for domestic IT products. The information about the Russian Cabinet's draft decree on the move has been published on the Government Portal of Pending Regulations and reported by the business daily Kommersant.

If approved, the decree will make the Ministry fully responsible for developing additional measures to support demand for domestic electronic equipment and software; signing Special Investment Contracts with electronic equipment producers and software developers; and overseeing public procurement of electronic equipment, including foreign companies' access to such procurement.

Additionally, the Digital Ministry would define the criteria electronic equipment and software must meet to be considered "domestic."

## **Printed Magnets May Aid Surgeons And Better EV Technology**

Physicists at the Ural Federal University (UrFU) in Yekaterinburg have unveiled plans to use 3D printers to print out advanced magnets for an array of applications, including medicine and space missions. For example, new magnets may be used to make robots that would assist surgeons in cleaning arteries and veins, or placing a stent inside a blood vessel.

Alexei Volegov, an associate professor at UrFU's magnetism and magnetic nanomaterials chair, was quoted as saying that at this stage, the research team was deciding what kind of magnets to print out first:

## **Novel Packaging Technology That Cares For Environment**

Researchers at the Voronezh State University of Engineering Technologies (VSUET) in Central Russia have come up with what they claim is new compostable synthetic plastic based on polyvinyl alcohol (PVA).

PVA-based compostable synthetic plastics possess properties inherent with aseptic technologies like Tetra Pak and provide a combination of the pluses found in both degradable and non-degradable packaging. Eco-friendly packages based on such plastics can be easily recycled when mixed with organic waste, producing organic fertilizers. In this bioconversion process, polymers decompose down to small fragments that become part of the Big Cycle of substances in Nature.

According to associate professor Lyubov Studenikina who has worked on the project, the team has been working on best possible compositions and studying the properties of the samples the scientists have got.

## **World Economic Round Up**

The global economy is set for the fastest recovery from recession for more than 80 years, but poor nations are at risk of falling further behind wealthy countries amid slow progress with the Covid-19 vaccine, the World Bank has said. In its half-yearly outlook report, the Washington-based institution said the world economy was forecast to grow at 5.6 percent this year, in a sharp upgrade from previous estimates it made in January for growth of 4.1 percent. It said this would mark the fastest post-recession recovery in 80 years, fuelled by growth in a few major economies where rapid progress with the Covid-19 vaccine has enabled a faster return to relative normality. However, developing nations will continue struggling with the virus and its aftermath for longer, worsening divisions between rich and poor nations.

*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 2020

### Future Horizons Events

- [Silicon Chip Industry Training Seminar](#) – London – November 2021
- [Industry Forecast Briefing](#), London – September 2021

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

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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 November 2021**

**AND**

**INDUSTRY FORECAST BRIEFING**

**TUESDAY September 2021**

**BOTH BEING HELD AT**

**HOLIDAY INN KENSINGTON FORUM, LONDON**

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