DIGITIMES

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Virtual reality becoming more of a reality

Michael McManus, DIGITIMES

A number of announcements and technology demos were made and seen at Computex Taipei this year that are sure to help virtual reality (VR) technology become more accessible and exciting for consumers moving forward. And while industry giants like Intel and Microsoft may have made the big splashes at the show, an announcement from some lesser-known but still key industry players may also have an impact as the market matures.

During Intel's keynote on the first day of the show, Gregory M. Bryant, senior vice president and general manager of the Client Computing Group at Intel, announced that VR was going wireless, with Intel partnering with HTC to create a VR accessory that utilizes WiGig technology to allows HTC Vive customers to get quality VR experiences without the wires.

Then there was Microsoft, which followed up on its push last year at Computex to merge physical and virtual realities through mixed reality solutions by showing off designs its partners have been working on over the past year. Microsoft's goal with the platform is to enable a single and consistent user interface, standardized inputs, and a universal app platform for developers. The company indicated that headsets from Acer, Asustek, Dell, Hewlett Packard (HP), and Lenovo are expected to be available by the holiday season at the end of the year.

Microsoft noted that Asustek will be launching a futuristic head-mount device that features six degrees of freedom (DOF) in a tracked motion controller, Dell is partnering with Microsoft to deliver an affordable consumer headset to bring mixed reality experiences to a broad audience, and Lenovo will deliver a mixed reality headset – which will feature built-in sensors to enable inside-out tracking and simplified set-up – to the market by the end of the year. In addition, at Microsoft's Build conference prior to the show, the company announced that Windows Mixed Reality developer kits from Acer and HP are available for pre-order.

Perhaps lost in the VR buzz shuffle was an announcement of the founding of a group called ICVR, based on a partnership between LG Electronics, Analogix Semiconductor, Tencent, and Dell. The group has developed, and will continue to develop what it calls an Interface for Connected VR (ICVR) standard, which defines how virtual reality source (VRS) devices, such as smartphones, PCs and other consumer electronics, connect and interoperate with head-mounted displays (HMDs).

The open industry standard for VR, AR and MR headset connectivity is based on DisplayPort over USB-C and features multi-channel audio, high-definition video, and the head-tracking measurement data required to render the virtual environment between the VRS and the HMD. Industry-standard content protection technology is also available.

One of the key goals of ICVR is to separate the VR source device from the head-mounted display and allow interoperability between devices from different manufacturers of VR solutions. This means consumers can have confidence that a VR headsets will work with any ICVR compliant smartphone or PC.

Ramchan Woo, vice president, new product development at LG Electronics observed that an industry standard can drive an increased level of investment in VR products by hardware manufacturers, developers, and content creators, bringing more applications and an improved VR user experience to consumers.

According to Analogix CTO Ning Zhu, VR solutions available in the market today are all proprietary so they do not interoperate with each other. Connectivity based on USB Type-C is something that would eliminate the proprietary protocols and connectors, which is beneficial to the entire VR ecosystem, ICVR stated.

The ICVR specification will be available for adopters in the third quarter of 2017, the organization stated.

One of the founders of the group, IC design house Analogix is probably best known for its SlimPort display solutions but the company is now looking to make a name for itself in the fast-growing VR industry. Early this year, the company launched its ANX7580 mobile receiver solution, a chip that supports 8 MIPI lanes and is applicable to headsets that use a single panel shared between both eyes. It supports panel resolutions up to a total of 2560x1600.

Continued on page 2...

▲ Automotive solutions are hot at Computex this year

▲ Stealing the hearts of Computex visitors, one checkmate at a time

...Continued from page 1

Commenting on the number of HMDs featured by vendors at the Computex show, Matt Ready, VP of sales at Analogix, pointed out that the ANX7580 would feature in most if there was a teardown of those products.

Ready explained that previous generations of VR HMDs had issues with frame rates not being fast enough and this is an issue the 7580 addresses through bandwidth, and the market is always asking for a fatter pipe.

Ready added that Analogix has developed its VR solutions by leveraging its history of products proven on many generations of silicon.

The company's IP when it comes to low-power, high-speed Serializer/Deserializer (SERDES), is ideal for converting DisplayPort input to MIPI-DSI output. In terms of specs, the DisplayPort 1.4 input supports link frequencies up to 6.75Gbps while MIPI-DSI 1.2 output supports link frequencies up to 1.5Gbps, with either 4-lanes or 8-lanes per eye. HDCP 2.2 and 1.4 high-bandwidth digital content protection is also supported.

According to Ready, there are currently four types of flavors that appear in the VR market. On the entry level there is Google Cardboard where you simply wear a handset on your face. Then there is PC VR which is sort of on the high-end of the market and features high-performance GPUs for products like Oculus. All-in-one is another type of solution for VR where you have everything inside the headset. Analogix calls the fourth kind of solution tethered VR, whereby an HMD is connected to any number of different devices, such as a handset, PC, tablet or media player. The company believes the biggest volume of shipments will come from this area of the market, once connectivity standards are set. And Analogix believes the future is USB type C when it comes to connectivity.

Analogix calls its development in the VR area a bottom-up approach. Companies like Steam and OSVR are taking a top down approach while Analogix is simply making sure that things work at the interconnect level. Miguel Rodriguez, senior marketing manager at Analogix, said it is their job to make sure that when a user connects two ICVR compliant devices that there is a guaranteed level of performance.

The 7530 will be in mass production in July, and Rodriguez predicts that 90% of the HMDs for PCs launched in the next year will likely have an Analogix solution inside.

Moreover, while the 7530 targets the HMD market, Analogix is also working on the computing side of the market. Previously the company was a major player in the handset industry for enabling video-out on smartphones by providing a MIPO-to-DisplayPort converter chip for implementation into the device. However, Qualcomm has begun integrating video-out into its mobile processors. Analogix though, does not see this as something that will constrain its business since it will now become that much easier for smartphones to be able to connect to HMDs, since video-out will become a standard feature supported on the devices.

Moreover, the requirements for VR continue to increase, meaning handsets need even more bandwidth. In line with this, DisplayPort connectors are roadmapped to have one, two, or four differential data pairs (lanes) in a Main Link. The high bit rate (HBR) for two lanes (HBR2) supports 5.4 Gbit/lane while the roadmap to HBR3 calls for support of 8.1Gbit/lane. Higher speeds call for additional challenges, Rodriguez indicated.

Mobile and IoT technologies integrated with AI features to enable data driven solutions

Staff, DIGITIMES, Taipei

Computex Taipei has long been one of the most important tradeshows worldwide for engineers and executrives in ICT industries. On May 31, 2017, Digitimes hosted Computex 2017 Mobile and IoT technology forum, featuring speakers from various sectors to share their views of the future of IoT technology leveraging artificial intelligence (AI) capability.

IBM leveraging IIoT technologies for cognitive manufacturing

Internet of Things combining and converging sensor technologies and robotics is driving profound transformations of the industrial system. As more factories and equipment are equipped with IoT devices, data volume will double by 2020 and computing must become more cognitive to properly process, analyze and optimize the information. This is a key focal point of of the talk by Mike Chang, IBM Cloud Adoption leader. He talked about the concept of " cognitive manufacturing," which involves a set of smart manufacturing solutions with cognitive IoT technology via IBM Watson cognitive computing technologies.

Integrated with IoT and AI, according to Chang, cognition involves three key elements: understanding, reasoning and learning. Through cognitive computing technologies, the concept of mass production will be replaced by smart automated production, which will help Taiwan manufacturers handle orders that come in small volumes and big varieties.

There are four layers of cognitive manufacturing solutions: the data, predict, prescription and cognitive layers. IBM's approaches start with optimizing existing equipment. This will include many intra-factory activities. Then through B2B connectivity, it will have the chance to refine the value chains across the ecosystems. The next step is integrate with IoT technology in order to add values to the data collected from sensors. IBM is a leader in transforming technologies with Industrie 4.0, bringing together things that are instrumented, interconnected, inclusive and intelligent in order to generate insights from collected data and transform manufacturing.

Qualcomm broadens IoT portfolio

Qualcomm has been broadening its capabilities in IoT to meet the demands of an increasingly connected IoT world. ST Liew, VP and president of Qualcomm Taiwan, talked about semiconductor solutions accelerating IoT development. Qualcomm is moving from discrete ICs to integrated platforms. The company has over 25 different IoT reference platforms to help OEM and ODM partners shorten the development cycle and reduce time to market. The new applications range from drones, wearables, immersive VR/AR devices, smart home, smart cities, Industrial IoT, LTE for IoT and 5G New Radio. By the year 2020, Qualcomm semiconductor solutions will have migrated IoT to higher-speed connection to accommodate various fast-growing connected devices.

Part of Qualcomm's strategy to accelerate its growth in IoT has been to support Google's Android Things on its Snapdragon 210 processor. This is the 4G LTE-powered SoC capable of supporting Android Things and it also has a powerful quad-core processor and GPU in the market. The OEMs and developers start to utilize the Snapdragon 210 and see more and more affordable LTE-connected devices. This will help IoT devices are no longer limited to Bluetooth and Wi-Fi connectivity for communications.

In the smart home sector, Liew highlighted Qualcomm's new tri-mode dual-core SoC named the QCA4020 supporting Bluetooth Low Energy 5, dual-band Wi-Fi and 802.15.4 technologies including ZigBee and OpenThread. Considering how prevalent these three connectivity standards are in the home, it is the most logical combination of the three most commonly used communication protocols in the home. These chips also come with features from Qualcomm's recently announced Network IoT Connectivity Platform which includes pre-integrated support for HomeKit and OCF as well as cloud services using AWS IoT SDK or Microsoft Azure SDKs.

Qualcomm has also made announcements concerning IoT and 5G as well as upgrading its existing line of LTE chips scaling LTE to connect IoT devices and satisfy the huge demands for data today. When it comes to 5G, Qualcomm has been focused on supporting the 5G New Radio standard to build seamless connection.

VIA provides complete solutions for USB 3.1 Gen 1/ Gen2, USB Type-C

David Hsu, VIA Labs associate VP of product marketing, presented VIA's full line of chipsets for USB 3.1 and USB Type-C covering applications including hub, multi-functional docking, video dongle, cable, power bank, car charger and wall charger. VIA sees USB Type-C specification as a connector standard of the future. The emerging USB Type-C applications are phone docking stations and USB Type-C power charger of mobile peripherals.

For the battery pack solutions, VIA's products offer several unique features including switchable charging sequence to extend the battery life for mobile gaming console. VIA also provides silicon solutions for simple USB Type-C video dongle devices with support of bi-directional operation. The chipset lineups provide several turnkey solutions including " Multi-Function Dock," " Charging-thru Multi-Function Dock" for standalone hub or docking stations, " USB Type-C Mini-Dock/Dongle" for USB external drives, " DP-ALT mode" for video dongle or multimedia docking station. These turnkey solutions cover almost 85% design-in projects for USB Type-C electronics devices in the market.

Hsu noted that the adoption of USB Type-C trend will have more use cases than before. VIA is introducing more solutions to target different market segments. He concluded that the USB Type-C market relies on the right product in the right time with ease of use. And the most important thing is select a solid technology partner. VIA will help OEM and ODM vendors boost the USB Type-C demands.

Xperi enabling IoT experience with product licensing and semiconductor IPs

Xperi has four major brands including DTS, Fotonation, Invensas and Tessera. For these four brands, 50% of their revenues from product licensing businesses including premium audio systems and advanced imaging solutions. And the other 50% come from semiconductor packaging technologies and silicon interconnect technology. Xperi is expanding the ability to address new opportunities in IoT and AR/VR development through high-definition audio and image recognition technology. Vincent Ting, Xperi APAC sales director, indicated the current technology portfolios are ideally suited to deliver the next generation of audio and imaging solutions to mobile, consumer electronics, and automotive markets. The newly developed products range from DTS Virtual:X technology, HD Radio, DTS Play-Fi (streaming the music wirelessly in WiFi networks), DTS Headphone:X (providing users with heightened awareness headphones on VR headsets).

FotoNation researches and develops embedded image processing solutions for computer vision and computational imaging applications. Its video and image enhancement technologies can be found at the core of more than 25% of the all smartphones on the market, and other consumer imaging products.

Xperi integrated DTS' audio and digital radio technology solutions with Fotonation imaging solutions, which enable immersive experience through various devices to satisfy the future development of IoT technology.

Dialog pushing low power connectivity solutions for smart home

Wei Tong, product marketing manager of Dialog Semiconductor, talked about the explosive growth for smart home applications. Dialog is a proven chipset supplier in the RF world for over 20 years, especially in short-range 1.9GHz and 2.4GHz RF IC product matrix. Dialog SmartBond family chips use Bluetooth stack proven in millions of products all over the world. The low power performance is a result of Dialog's design expertise in mixed-signal power management & RF connectivity IC. Today, there have been over one billion units in Dialog RF IC shipments and the failure rates are below 10ppm.

In the smart home sector, Dialog silicon solutions are aiming for energy, security, control and convenience purposes. For the energy management, Dialog's chipsets manage heating and cooling machines through room sensors. And in the security sector, the chipsets for smart door locks will focus on reliability, security, low power consumption, small form factor and quick response. The same applications will also apply to other products such as window sensors and camera-based motion sensors.

Dialog is part of the Apple HomeKit ecosystem. Dialog's HomeKit Solution is the first HomeKit Accessory Protocol (HAP) BLE 2.0 certified solution on the market. All the actions can be grouped and triggered using Siri or Apple HomeKit enabled apps. Dialog will continue to maintain the strength to support leading smart home ecosystems including Apple HomeKit, Nest and other proprietary standards.

Macronix on smart connected devices for IoT

Grandy Hsueh, Macronix segment marketing deputy director, presented a talk on smart devices including home appliances and many others.

There are several challenges and expectations in the IoT market. People are concerned about the welfare of elderly people in agging societies, security issues and energy savings, and smart home devices must be easy to control and work efficiently. Developers of smart home solutions still need to learn from mistakes, as the systems are mostly not flexible enough to make things easy in response to human needs, lifestyles and habits.

Smart home assistant will be a new solution to provide a good answer for users. He is very optimistic about seeing widespread usage in the modern home in the future.

All the smart devices require memory components. Macronix has full memory product lineups covering different kind of NVMs (non-volatile memory) with broad range of product portfolios.

Peraso upbeat about WiGig

Brad Lynch, senior VP, Product Development, Peraso, talked about WiGig (802.11ad), which is Gigabit WiFi standard working in the 60 GHz band and delivers up to 8Gbit per second data transmission. He highlighted WiGig is the next WiFi standard. The recent focus of development in 802.11ad is promoting Wi-Fi Certified WiGig certification, which was launched in Oct 2016. The major players include Dell, Intel, Peraso, Qualcomm and Socionext. Peraso is one of the top 3 WiGig chipset suppliers. Lynch presented applications focusing on WigGig networking, wireless VR/AR development and 5G fixed wireless broadband.

WigGig networking application is mainly for multi-gigabit Wi-Fi connectivity. It is a highly efficient, cost effective solution to provide gigabit Ethernet network in the office, home and public spaces including airports, malls and cafes. The data transfer rate is only seven seconds for transmitting a 1.45GB file at average transfer speed of 219 MBytes/s (or 1750 Mbits/s). The speed is two times faster than Ethernet Gigabit technology.

WiGig Direct is another attractive multi-gigabit wireless application featuring wireless 4K display, high speed media sync and wireless docking. Peraso chipsets provide the support for scalable USB network adaptors. For enhancing smartphone usability, Peraso chipsets also provide benefits for smartphone 4K screen casting, cloud data sync and on-the-go backup.

In the booming VR/AR segments, wireless data throughput increases user experience of VR headsets.The Peraso WigGig chipset offers a low cost, low power HMD solution with simple USB adapters on a VR source platform leveraging highly customizable antenna and software architecture.

Ayla IoT platform powers creativity through end-to-end services

Michel Maeso, Ayla Networks's VP of Global Sales & Service, talked about Ayla's end-to-end agile IoT platform as a service (PaaS) architecture. Ayla provides enterprise-class secure connectivity and cloud data services for Owlet to introduce innovative Smart Sock, which is the wearable baby monitor for consumers that transmits information like heart rates, sleep quality, blood oxygen levels and skin temperatures to a parent's smartphone or other smart devices. Data and alerts are securely transmitted to parents or caregivers via Ayla's end-to-end platform.

Maeso said consumers care more about values than prices. Ayla's platforms provide proactive services and increase customer loyalty. This is how IoT business is developing. Ayla is a company that meets customer's strict criteria for data management, security, cloud-based back-end infrastructure and services and robust wireless connectivity through strategic relationships with leading wireless chip and module vendors.

Digitimes Research: LPWAN fulfilling IoT needs

Benson Wu, a Digitimes Research analyst, said that after reviewing the world's top LTE service providers, he found that 4G services are seeing shirnking profits. And most telecoms have started to look at the benefits of connected devices enabling IoT services. The Low Power Wide Area Networks (LPWAN) is a solution for increasing business opportunities. LPWAN has rapidly gone from " not needed" to an important part of communications for the IoT industry. The building of the LPWAN infrastructure is just beginning. LPWAN is a low-cost, high-volume business. A couple of mobile operators will trial Narrow Band IoT technology alongside their launch preparation of a LoRa network. Also the coming of 5G technology will be a big boost for LPWAN solutions.

China's Tsinghua Unigroup chairman calls out Qualcomm

Claire Sung, Shanghai; Jessie Shen, DIGITIMES

Tsinghua Unigroup chairman Zhao Weiguo has criticized Qualcomm's intention of forming a joint venture with fabless chip firm Leadcore Technology and two local investment firms in China, describing it as a "low-class" tactic aiming to weaken Spreadtrum Communications' competitiveness.

At a Global Semiconductor Alliance (GSA) event in Shanghai on June 1, Zhao expressed his strong displeasure saying "there are always some people who want to curb the development of China's local high-tech industries."

China's local chipmakers are looking to participate in the world's semiconductor industry, and agree with a division of work between companies at different tiers of the supply chain, Zhao indicated. China's chipmaking sector expects to grow with the world together, Zhao said.

However, Qualcomm's intention of teaming up with Leadcore is really upsetting, Zhao noted. Zhao believes that the JV will pose a threat to China's local chipmakers specializing in entry-level and mid-range smartphone solutions, such as Tsinghua Unigroup's unit Spreadtrum.

As the organizer of the event, GSA has responded to Zhao's remarks saying "the criticism of a competitor although not normally done in our forums is nothing unusual. China has a huge market opportunity for our industry and there will be a big fight for market share. We have no doubt that Unigroup will continue to make progress in pushing China forward and taking a global approach. And Qualcomm is of course an icon of our industry... setting the pace of innovation for our industry and setting a high bar for leadership."

Qualcomm recently announced a deal with Leadcore Technology, Jianguang Asset Management and Wise Road Capital to form a JV - JLQ Technology - which will focus on the design, packaging, testing, customer support and sales related to chipsets for mass-tier smartphones designed and sold into China.

JLQ will combine Qualcomm's technology and product portfolio with Leadcore's accomplished R&D capability as well as deep relationships in China, JAC Capital's wide connections in the Chinese financial circle, and Wise Road Capital's financial and industry eco-system resources home and abroad. The JV will be registered in Gui'an New Area in Guizhou Province. The formation of the JV is subject to the approval by relevant authorities, and the parties currently anticipate that it will be completed later in 2017.

Amazon Echo shipments expected to surpass 10 million in 2017

Cage Chao, Taipei; Joseph Tsai, DIGITIMES

Amazon has recently cut the price for its Echo Dot from US$99 originally to US$49 and the reduction is expected to greatly boost the company's smart voice assistance device shipments to surpass 10 million units in 2017. This will not only boost the worldwide smart voice assistance device market's overall demand, many first-tier IT players are also ready to have a share of the market, according to sources from the upstream supply chain.

Google has already announced to release its Essential Home smart voice assistance device and several other IT players including Facebook, China-based Alibaba and Baidu, are also expected to launch their in-house developed smart voice recognition products. Apple is also reportedly considering entering the market with products using Siri.

The sources pointed out that the market's feedbacks on Amazon's voice assistance device are mostly positive and the new Echo Dot has already achieved the company's annual shipment goal planned originally for 2017 in only a couple of months. The popularity of such devices and the first-tier IT vendors' eagerness to enter the enter the market are expected to significantly shore up fast the worldwide smart voice assistance product shipments, which stand a chance of achieving over 100 million units a year in the upcoming few years.

Amazon's original concept for the product line was to have each family own one Echo, but now Amazon is looking to have each family purchasing an Echo and an Amazon Tap for its living room, while every room in the house can be equipped with one Echo Dot. Because of the change of the idea, Amazon has decided to almost halve the pricing for its Echo Dot in order to create even bigger demand from the end device market

Some Amazon's upstream suppliers revealed that their production lines for the smart voice assistance device have been fully running to meet the shipment schedules since the fourth quarter of 2016. Compared to Amazon

Echo's estimated shipments of around three million units in 2016, the suppliers expect related volumes to grow dramatically in 2017 especially since the price-cutting strategy has successfully brought in new demand for the device. Some suppliers even noted that Amazon has already increased its orders to over 10 million units for 2017, more than triple the 2016 volume.

Seeing rising demand, other IT vendors have also begun making their moves recently. Google has announced its Essential Home project for the smart voice assistance market and the sources believe Essential Home-based products will have a good chance to see strong sales if their pricing is able to hit the sweet spot since Google's operating system already has a complete ecosystem for smart voice assistance applications as well as partners for development.

In the best-case scenario, Google's Essential Home-based smart voice assistance product shipments are expected to reach several million units in 2017.

Meanwhile, many first-tier Internet service providers including Facebook, Alibaba and Baidu, have also been aggressively pushing development for smart voice assistance devices and are on the verge of overcoming the last hurdle presented by issues concerning the integration with cloud resources.

Apple is also reportedly looking to enter the market by the end of 2017. Because of the vendors' aggressive moves, demand is expected to be stimulated and in turn create business opportunities from Internet of Things (IoT) and artificial intelligence (AI).

The business opportunities are also growing large in the upstream chip industry and chip suppliers including Texas Instrument (TI) and Marvell have already prepared solutions for the devices. MediaTek has also recently released SoC solutions that have been inquired by several vendors.

Currently, three chips are required to create a smart voice assistance product: CPU/DSP, which is in charge of computing and simulation to convert analog signal to digital; Wi-Fi and Bluetooth communication chips for connection to the cloud system and other home equipment; and RF chip. These chips may not be too complicated to work with when handled individually, but integrating all of them into one SoC is expected to be the direction and a major challenge for chip suppliers.

Colorful iGame Z270 Ymir-X motherboard for pro gamers

Press release

China's leading motherboard brand Colorful Technology will highlight its iGame gaming series at Computex 2017, aiming to deliver the ultimate user experiences to professional e-sports gamers. The product series showcased at Computex this year is an indication of Colorful's rigorous attitude concerning e-sports gamers' needs. Take the motherboard BIOS for example. iGame motherboards have solid firmware performance which continues to improve. This is also the main reason why the iGame mid-to-high end motherboards can establish a firm market position in China while steadily expanding into international markets.

The vendors remaining in the DIY computer market now are mainly very competitive players. Colorful has targeted its iGame motherboards toward a mid-to-high end position and decided to focus on gaming applications three years ago. In recent years, Colorful has been engaging in e-sports events including CGU and OWAPAC and sponsorships of e-sports teams, especially the deal with the RNG team this year. This shows Colorful is placing great importance on the gaming industry.

iGame motherboards not only feature customized ID designs for e-sports competition events and teams but also introduce intricate modifications to the motherboard spec. For example, Colorful uses two chips to provide dual USB I/O ports for gaming while maintaining the quick charging capability. Furthermore, at the time when Intel launched its Optane memory, Colorful immediately worked with Intel to use the new memory technology in its latest generation motherboards. It also selected the Killer series network card chips, which are more favored by gamers. Colorful iGame motherboards are packed with world-class motherboard features and design concepts and therefore present users a highly cost-effective choice that meets all use scenarios of high-end motherboards.

The Colorful team that designed the iGame motherboards decided to upgrade to GamerVoice 2.0, which includes adjustable RGB light and replaceable audio chip. That is, users can choose to replace the audio chip with a more professional chip based on his or her preference.

In addition, the use of professional Japanese Nichicon speaker capacitor, Faraday cage shielding case, audio armor system, audio gold-plating interface, advanced audio circuit segmentation & shielding technology and top-notch materials brings 120dB SNR game audio effect and the capability to drive headphones with 600Ω resistance to catch every detail and deliver perfect audio experiences.

As to the e-sports USB interface, special-purpose chips Fintek F75503 and Fintek F75501 were added near the mouse and the keyboard to optimize the performance of the gaming devices. This optimization enables the e-sports USB ports to provide superior connectivity so the gaming mouse and keyboard can perform at their best.

Users will be able to experience faster and smoother mouse movements during games. Furthermore, iGame Z270 Ymir-X supports on/off charge and quick charge, configurable through BIOS settings, so it can charge mobile devices even when the computer is turned off.

iGame Z270 Ymir-X is equipped with a debug monitor screen that can display hardware temperature, voltage and other working conditions of the motherboard. In addition to achieving a metallic effect on a plastic shell, iGame Z270Ymir X also makes use of wire drawing in its design. The cooler hardware and software is also consistently designed with wire drawing.

Colorful's Computex booth is at M1019A.

▲ Colorful presents the iGame Z270 Ymir-X gaming motherboard.

Shuttle unveils new mini PCs at Computex Taipei 2017

Press release

Shuttle is displaying digital signage and self-service kiosk applications, including multi-display video wall, vending machines, and two Instagram (IG) printing machines, at Computex 2017. In addition, two new mini PCs for VR gaming, cloud-based warehouse tracking and smart long-term care solution will be demonstrated its comprehensive suite of service. Shuttle is at Nangang Exhibition Hall, Booth No. L1217a.

XH270 to install four 2.5-inch HDDs

With a compact 3-liter design, the XH270 supports both Intel Skylak and Kabylake processor platforms to support 4K ultra HD video playback and support up to three independent displays. In response to market demand for storage space, the XH270 has a new mechanism design and can support up to four 2.5-inch hard drive installation.

XC60J with 8 COM ports

Equipped with the latest Intel Apollo Lake SoC 14nm processor, XC60J is the first 3-liter XPC slim with fanless design, powered by Intel Celeron J3355. This compact machine can support up to eight COM ports to power highly interactive Kiosk, vending machine, and POS. Seven RS232 and one RS232/RS422/RS485 ports which support 5V/12V can connect to barcode scanners, receipt printers, and mobile payment devices(such as QR code, Apply pay).

XH110G with PCI-E x16

For storage and high-end graphics card markets, Shuttle debuts our latest 3-liter Slim PC XH110G with support new single-slot design to install multi-display graphics card to power 3x3 video walls. This model also supports both Intel Kabylake and Skylake processors. The XH110G is a 3-liter model with strong graphics support via PCI-E x16 expansion slot for various add-on cards such as graphics card (multi-display), capture card, multi-network card, drawing graphics card, or more. Featuring compact size, excellent cooling technology, low-power consumption, and impressive performance, makes XH110G is very suitable for workstation or surveillance and video wall applications.

DKA1GU with 4 HDMI 2.0 support

The 1-liter slim PC DKA1GU is equipped with the latest Intel Kabylake CPUs and with adding AMD Radeon RX460 Graphics card then users can have better graphics ability in this small form factor. This model is the first 1-liter slim PC which can support up to four independent displays via four HDMI video outputs. The DKA1GU is an impressively versatile and high-performance player made to by easily integrated into a variety of digital signage markets. Its slim metal chassis, including VESA mount capability, versatile connectivity makes the DKA1GU ideal for digital signage, surveillance, kiosk, and other professional applications.

VR ready mini PCs

In addition to the variety of XPC products for vertical applications, Shuttle also launched two mini PCs for VR ready: SZ270R8 and KA1Gh series. The famously compact barebones mini-PCs are only 1/3 the size of traditional tower PCs but without lacking in performance or durability. The SZ270R8 features a 13-liter design with support for Intel Skylake and Kabylake 95W processors, 4xDDR4 2133/2400 MHz (up to 64GB), four 3.5-inch hard drives, and support up to 120mm of height graphics cards.

I-PEX ISH automotive SMT heavy duty connectors

Press release

There are many consumer-related technological trends entering the automotive market in the past few decades: LED lighting, LCD/OLED displays, WiFi, Bluetooth, to name a few. I-PEX Connectors are known for connecting these consumer-based devices. Those devices are much smaller in the consumer market, so are the connectors. To use those small connectors in the automotive market, they have to be converted to Automotive Grade. The I-PEX Automotive Division has been developing its own connectors using its knowledge of the manufacturing process for automotive components.

The I-PEX ISH Connector Series is the first successful SMT connector using a 0.5mm terminal by I-PEX Automotive. This series was designed especially for the automotive market from scratch. I-PEX had heard that automotive device manufactures wanted to use consumer connectors, but they did not meet automotive standards, such as USCAR.

The ISH Connector Series was first adopted by multiple headlight manufacturers. They had high demand for high heat (125 degrees C) and vibration (10G) in order to be able to use on a PCB in ECU in an LED headlight unit.

The connection reliability is ideal for many other automotive devices such as inverters, converters, battery monitoring units, multi-view camera systems, clusters and more. The wide variety of pin options, from 3-pin through 20-pin (40-pin been developed), should cover design needs.

▲ I-PEX ISH Connector Series

DIGITIMES Research: China Smartphone AP Tracker – 1Q 2017

China smartphone AP shipments

Introduction

2Q17 forecast

In terms of the shipments of smartphone application processors (AP) in China, downstream vendors started early inventory preparation in the fourth quarter of 2016 resulting in higher supply chain inventory levels. AP orders dropped significantly after the Chinese New Year, with some handset brand makers even asking to defer AP shipments to a large extent. This caused vendors to become conservative in their AP inventory preparation and as a result, the first quarter of 2017 showed an AP shipment decrease of 31.9% compared to the previous quarter.

In the second quarter of 2017, the China smartphone AP market will likely experience weak growth with downstream vendors adjusting inventory levels in the first quarter and rising costs of components such as display panels and memory modules causing vendors to take a wait-and-see attitude. Orders will probably resume growth momentum no earlier than the end of May. According to Digitimes Research estimates, the AP market will benefit from the promotion of 4G feature phones entering the market in the second quarter and inventory depletion so shipments will likely increase by 10.5% from the level of the first quarter, to reach 129.85 million units, but will drop by 10.8% on year with shipments still unable to return to the level seen in the second quarter of 2016.

In terms of the shipment outlook by individual smartphone AP suppliers in China in the second quarter of 2017, MediaTek's mid-to-high end solution X30 will be impacted by a late launch schedule and price cutting competition causing it to lose customers. Its even more price-sensitive entry-level to mid-range processors are also threatened by price wars. As a result, MediaTek's second quarter shipments will likely edge up by only 5% compared to the first quarter.

Thanks to a number of high-end products of smartphone brands adopting Qualcomm processors entering the market in the second quarter and successful penetration into mid-range smartphone brands in 2016, Qualcomm will begin to reap the benefits in the second quarter of 2017, with AP shipments up by 12.7% on quarter and its market share in the China AP market closing in on MediaTek's totals.

Spreadtrum launched its SC9820 targeting the 4G feature phone markets in China and abroad and the shipments are expected to trend up starting mid/late May. Furthermore, benefiting from a recovering white-box handset market at the end of the second quarter and its own price advantage, Spreadtrum is expected to show 19.5% quarterly growth in smartphone AP shipments in the second quarter of 2017.

Key factors affecting China smartphone AP shipments

shipments

2Q17 forecast

MediaTek has kicked off mass production of Cat.7 and higher spec solutions in the second quarter, which however is later than its competitors. The price cutting competitions with Qualcomm and Spreadtrum are also giving MediaTek great pressure of losing market share.

Qualcomm won back customers including Xiaomi, Oppo and Vivo with its mid-to-high end solutions in 2016. Although there was influence due to customers adjusting inventory in the first quarter of 2017, Qualcomm will gradually see returning orders contributing positively to its numbers starting at the end of the second quarter.

Spreadtrum's SC9860 processors are not ready yet but SC9820 has a price advantage in the 4G feature phone market in China.

HiSilicon's Kirin900 and Kirin600 series account for a growing percentage of the processors used in Huawei's smartphones, which is expected to further trend up. Huawei was one of the three leading domestic smartphone makers in China in 2016.

Shipment breakdown

Smartphone AP shipments in China

2Q17 forecast

In the fourth quarter of 2016 and the first quarter of 2017, the low season effect, inventory adjustment, and rising costs of display panels and memory modules caused handset makers to act conservatively with a wait-and-see attitude on their AP orders.

Excess inventory is expected to be depleted no earlier than late May. Smartphone AP shipments in the second quarter in China will show 10.5% growth on quarter, to reach 129.85 million units.

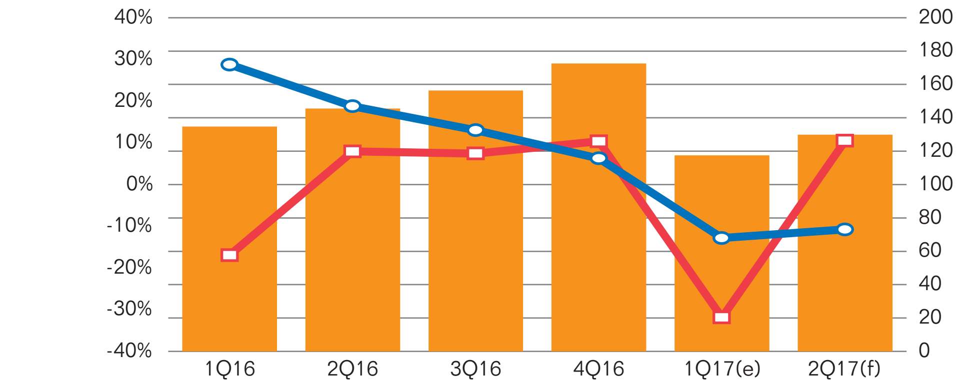
Continued on page 7...

Key factors affecting China smartphone AP shipments in 2Q17

Factor	Item	Analysis	Influence on shipments
Chipmakers	MediaTek	MediaTek's Cat. 7 and higher spec solutions went into mass production later than Qualcomm's. In addition, MediaTek is facing price cutting competition across all high-end, mid-range and entry-level segments. With the smartphone market recovering in the second quarter, MediaTek will encounter more pressure of losing market share.	↓★★★
	Qualcomm	Although brand makers widely adopt the Snapdragon 600 series, Qualcomm will still fall under the influence of the delay in market recovery in 2017.	↑★
	Spreadtrum	SC9820 has a price advantage in China.	↑★★
	HiSilicon	More than half of Huawei's smartphones are powered by HiSilicon's processors and the share is still on the rise.	↑★★★

Note: The more stars, the higher the influence. ↓ indicates negative influence, ↑indicates a positive influence.
Source: Digitimes Research, April 2017

China smartphone AP shipments, 1Q16-2Q17 (m units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Shipments	134.80	145.50	156.30	172.50	117.51	129.85
Q/Q	-16.9%	7.9%	7.4%	10.4%	-31.9%	10.5%
Y/Y	28.7%	18.8%	13.0%	6.3%	-12.8%	-10.8%

Source: Digitimes Research, April 2017

team+ IT security for business communications and collaborations against global outbreak of ransomware

Press release

Global IT security suffered a serious blow in May. Following the phishing attack on Google documents via false App link, the globally epidemic ransomware named WannaCry has caused vast infections to Windows devices. It is reported that over a hundred nations have been hacked. World-renowned enterprises and organizations such as NHS, Renault, and Telephonica were attacked and consequently their operations halted. Taiwan has also become one of the hit areas during this wave of attacks.

IT security is a priority concern for any entrepreneur. Founder and President of team+, Kuo, Cheng-Hsiang indicated that under the architecture of private cloud, servers are installed within the enterprise. Data transmission in a closed-loop system may mitigate leaks of confidentiality. Besides, data and file uploading are centralized for management. Even if an individual PC is inadvertently infected in the ransomware disasters, the enterprise can still mitigate its loss and risk significantly because all of its files have been backed up in team+.

Moreover, the encryption technology of team+ has obtained the "FIPS 140-2," an international certification issued by the United States National Institute of Standards and Technology (NIST), the first real-time communication platform from Taiwan to be recognized by the Public Key Cryptography Standards (PKCS) for meeting the deployment requirements of the US government.

team+ is deeply appreciated by a large number of enterprises. More than 4,000 enterprises are using team+ such as Taiwan High Speed Rail, Taichung Tzu Chi Hospital, China Airlines and Innolux. team+ supports not only the establishment of private cloud for an enterprise to utilize its own security credential without passing any certification of ISP but also multiple mechanisms such as database encryption settings, TLS message encryption, identity verification, anti-assembling mechanisms, remote deleting of App content, access control audit, MDM camera device control, and watermark of file so as to fulfill the needs of IT security, the top concern by any enterprise.

team+ has developed a comprehensive API mechanism for its clients to implement the mobilization of in-house digitized system with ease. The API can be utilized to connect ERP, CRM, POS, and factory production monitoring system. Kuo also indicated that the TDT of team+ offers 100% local service to deal with a particular scenario at every enterprise and come up with flexible and customized services to satisfy individual requirements of smart applications desired by each enterprise for the upgrade of operating performance. On the contrary, most of foreign and domestic active brands of private cloud provide standard specifications only.

team+ is honorably invited by MOEA to exhibit in InnoVEX area where 244 companies from 20 countries will demonstrate their top-notch technologies including cloud computing, IoT, AR/VR, Big Data, and AI. These key technologies are essential for all the industries in their innovation and digital transformation. Under the premise of well-advised considerations of cost, IT security, and high performance, team+ can be your most accountable partner to realize step-by-step digital transformation at your enterprise.

Gigabyte unveils the X299 Aorus Gaming motherboards

Press release

Gigabyte Techonology has unveiled at Computex 2017 their latest motherboard series built on the Intel X299 enthusiast platform. Partnering with WTFast, users can now experience the benefits of having optimized connections while gaming with Aorus Gaming motherboards.

Redesigned Armor and Plating

From its black armor with accents to its black PCB and baseplate, the X299 Aorus motherboards is focused on giving users a strong foundation for their gaming PC. The base plate offers additional structural support to reduce the strain from heavier graphics cards, larger coolers, and even memory modules.

WTFast Gamers Private Network – GPN

Partnered with WTFast, Aorus Gaming motherboards leverage the WTFast Gamers Private Network - GPN, which can optimize and improve connections from a gamer's home PC to the game server and back again. The X299 Aorus Gaming motherboards are known to be high-performance gaming motherboards and with a monthly WTFast subscription, gamers can experience the stable and fast gaming connection possible.

RGB Fusion with Digital LEDs

The X299 Aorus Gaming 9 and X299 Aorus Gaming 7 motherboards are fashioned with RGB Fusion and onboard digital LEDs. Digital LEDs make new patterns and styles possible using the flexible digital LED strips or digital LEDs onboard, as each LED can now be individually addressed. With the introduction of digital LEDs RGB Fusion will introduce up to eight new patterns for users to enjoy. To ensure that compatibility the digital LED pin headers on the Aorus Gaming motherboards support both 5v and 12v digital LED strips.

Smart Fan 5 with Fan Stop Technology

Enriched with new features in the Smart Fan 5 software suite, the X299 Aorus Gaming series offers Fan Stop Technology and more enhancements for liquid cooling support. Fan Stop Technology reduces unnecessary wear on fans when the system is below a specific temperature, stopping all fans until they are needed.

M.2 Thermal Guard + Intel Optane Support

Intel's X299 platform is the first enthusiast platform that will support Intel's latest Optane Technology. Optane fuels storage performance by acting as a cache drive, giving users a significant boost compared to traditional mechanical drives. Performance users are always troubled with the concern for heat. Gigabyte provides a solution to this problem with its M.2 Thermal Guard. The M.2 Thermal Guard prevents throttling and bottlenecks from M.2 devices as it helps to dissipate and reduce heat before it becomes an issue.

A High-Fidelity Audio Experience

Studio-class audio begins with studio-class components and that is what is included on the latest X299 Aorus Gaming series motherboards. Aorus motherboards are paired with an ESS Sabre DAC, capable of 127dB, which can be found in professional grade equipment. Users can experience unprecedented dynamic range and ultra-low distortion that has yet to be seen on any motherboard.

ShareTech next-gen UTM NU-880 makes management simple

Press release

As a leading network security appliances vendor in Taiwan, ShareTech has been focusing on technology innovation that delivers SMBs real quality and value. NU-880H (next-generation UTM) adopts best-in-class quad-core x86 CPU platform and fiber module to deliver exceptional performance and intelligent network security features. Moreover, it fully integrates firewall, IPS, virus scanning, spam filtering, application control, deep packet inspection (DPI), URL database, dashboard, mail audit and so on. More importantly, next-gen UTM delivers a full range of Layer 2-7 switching which can be a great replacement for a L3 core switch.

NU-880H can be a unified platform to manage deployed wireless access points and authenticate wireless users. Wireless policies can be configured according to business regulations. With a profound understanding of customers' needs, ShareTech provides comprehensive gateway solutions for wired and wireless LAN users. In today's business environment, VPN plays a vital role to establish secure connectivity between branches office locations. NU-880H provides complete VPN Solutions (IPsec, PPTP, L2TP, and SSL VPN) and secure IP tunneling for cloud-based service system. Administrators can deploy, operate, and manage distributed networking appliances in branch offices with ease. By providing firewall features and programmable deployment, ShareTech's next-generation UTM is optimized for internal segmentation, perimeter, and cloud, providing responsive and flexible services to middle and large business. More information at: www.sharetech.com.tw

Gigabyte excites with PC innovation

Press release

Gigabyte Techonology, a leading manufacturer of motherboards and graphics cards, is proud to announce its attendance at Computex 2017. This year Gigabyte shows off its latest X299 AORUS Gaming Series Motherboards with new features that will awe consumers and gamers alike. With a plethora of networking add-ons, software enhancements, system demos, and case mods Gigabyte has pulled out all the stops to show attendees what Computex is all about. Along with components, at their private VIP suite in Taipei 101, new iterations of BRIX are demoed running VR applications on their latest d&i award winning BRIX VR. Other award winning demos will also include the Z270X-Gaming 9 which won the Computex Best Choice Golden Award.

A New King for Enthusiasts – Exceeding Expectations

Perhaps the most exciting release that Gigabyte displayed is the new X299 AORUS Gaming Series Motherboards. Passing the torch from its predecessor, the new X299 has features that many enthusiasts have been yearning for and can only dream of. With support for digital LEDs, triple M.2s, Fan Stop, and the newly released Intel Optane Technology the X299 Aorus Gaming Series will take the role as king of the new enthusiast platform. Sporting the new Aorus branding on this platform users will come to expect nothing but the best from this high-end platform.

A New Era For Networking

Gigabyte is pleased to announce the introduction of Killer xTend networking technology in the GC-Killer xTend PCIe card. Killer xTend, an innovative new solution for home networking, delivers a smart network switch and a Wi-Fi extender to users' high-performance PCs. This PCIe card combines three (3) Killer Ethernet E2500 chips and a Killer™ Wireless-AC 1535 module, which includes Killer's ExtremeRange Technology. Not only does Killer xTend harness the power of the gaming computer to enable four (4) or more other devices to connect through it. In addition, Killer xTend prioritizes important network traffic to ensure that nothing slows down gaming and streaming video on a Killer xTend-enabled PC.

"Gigabyte has a long history of bringing powerful and creative technologies to gamers and performance-minded PC users, and we are excited to partner with them to bring Killer xTend technology to market," said Michael Cubbage, CEO of Rivet Networks. "Integrating a smart network switch and Wi-Fi extender provides significant and valuable new functionality to a Gaming PC. xTend simplifies and improves a gamers' home network, while at the same time prioritizing Killer's important gaming and streaming video traffic above traffic from connected devices."

With network performance in-mind the next generation of network interface cards were also revealed. Gigabyte is pleased to introduce Killer 10 Gb/s Networking Technology. Based on Aquantia's AQC107 10GbE Controller, the GC-AQC107 supports a 10GBASE-T and with Killer's 10 Gb/s Networking software these two complement each other to deliver incredible gaming network performance. With all these networking devices at users disposal Gigabyte is ready for the future of networking technologies.

Next-Gen Video Playback and Video Output

Onsite Gigabyte demoed new software from Cyberlink that is meant to complement its recently launched 200 Series Motherboards. This software allows for UHD Playback for Blu-ray Discs and content in 4K via onboard HDMI2.0a ports on the Z270X-Gaming 9 & Z270X-Gaming 8. This software unleashes the performance capabilities of the onboard Intel GPU for 6th and 7th Generation Core processors.

Ultra HD Blu-ray playback in CyberLink PowerDVD 17 is a world-first, providing viewers the ability to enjoy Blu-ray movies in cinematic 4K resolution at 60Hz with HDR Support, more authentic and vivid color, and with the latest immersive audio formats all on their Windows PC.

"Ultra HD Blu-ray is the latest in a line of nascent technologies that PowerDVD has been the first to support for software playback," said Richard Carriere, CyberLink's Senior Vice-President, Global Marketing. "In PowerDVD 17, our cutting-edge software is built on a foundation of next-generation hardware technology from Gigabyte and Intel, which effectively unlocks this new Blu-ray Disc experience for people to enjoy on their PCs."

Demos, and Casemods

Aside from the cutting-edge hardware and software, visitors saw system demos that highlighted the exclusive features found on Gigabyte and Aorus Motherboards. A liquid cooled system displayed the benefits of having liquid cooling while highlighting features such as support for water flow sensors, water temperature sensors, and high-current hybrid fan pin headers. Other demos included RGB Fusion and control of its many light patterns and colors onboard and through external LED strips. Gigabyte had on display, casemods from artists all over the world including, Brazil, South East Asia, and Greater China, whom utilized Gigabyte Motherboards to create PC masterpieces.

...Continued from page 5

The second quarter will show higher quarterly growth compared to the 7.9% quarterly growth in the corresponding period of 2016 mainly due to the lower base period resulting from the significant shipment decline in the first quarter of 2017. Accumulated shipments in the first half of 2017 still fall short of the level seen in the previous year.

Impacted by deferred orders and slow-moving inventory adjustment, total shipments in the second quarter of 2017 will drop by 10.8% on year compared to the corresponding period of 2016 and the first half will show a yearly decrease of 11.8%.

Of the three leading smartphone AP vendors, Spreadtrum plans to launch SC9820 in May. With SC9820 expected to hold a price advantage in China and Spreadtrum stealing market share from competitors by cutting the price of its entry-level to mid-range smartphone APs, Spreadtrum is likely to deliver 19.5% quarterly growth.

Qualcomm won back customers including Xiaomi, Oppo and Vivo in 2016. It is expected Qualcomm will start to see the benefits in the second quarter, quarterly growth likely to top 12.9% and yearly growth to reach 17.7%. Qualcomm will be the only vendor among the top three showing a yearly shipment increase in the second quarter from the corresponding period of 2016.

MediaTek will begin to see customers increase their orders in the second quarter, quarterly growth likely to edge up by 5%.

Shipments by supplier

2Q17 forecast

MediaTek's shipments in the second quarter of 2017 will show smaller quarterly growth compared to its competitors, causing its share to dip by 1.9 percentage points to 35.3%.

Qualcomm dominates the mid-range to high-end smartphone markets with the exception of Huawei. Furthermore, end markets will start to increase orders at the end of the second quarter. Accordingly, Qualcomm can expect its share to expand by 0.6 percentage point to 31.7% in the second quarter.

With shipments to low-cost markets on the rise and 4G feature phone AP shipments included in this analysis, Spreadtrum's share will likely grow by 1.4 percentage points.

Huawei is one of the three leading domestic smartphone makers in China. Benefiting from Huawei increasing the adoption rate of HiSilicon processors, HiSilicon's share expanded in the first quarter. However, as downstream smartphone vendors will all increase shipments starting from the end of the second quarter, HiSilicon, only supplying processors to Huawei, can expect to see its share slightly dip by 0.1 percentage points.

Shipments by architecture

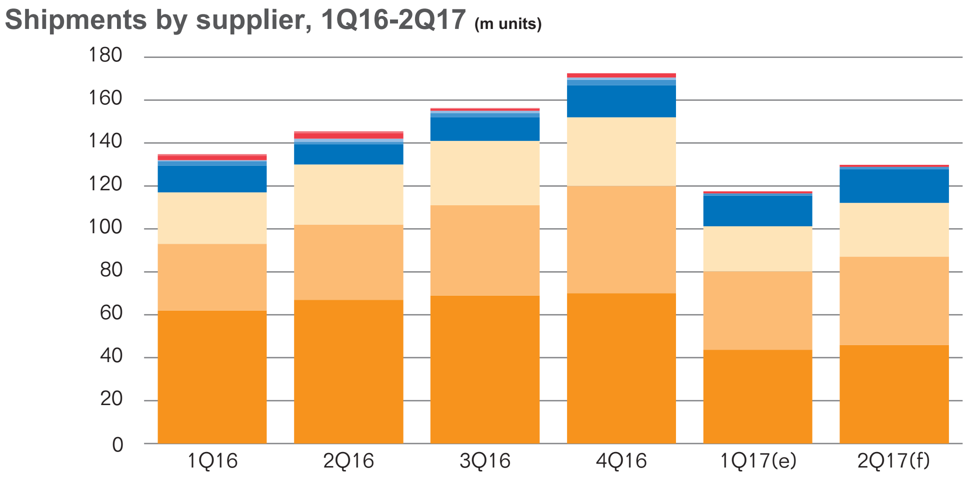
2Q17 forecast

Cortex-A53 will remain the leading architecture in the second quarter of 2017. However, as the trend is shifting toward mid-to-high end processors Cortex-A57/A72/73, the share of Cortex-A53 will drop by 1.9 percentage points.

Shipments of mid-range Cortex-A53 products sustained a major impact by the conservative inventory preparation in the first quarter. Shipments of Cortex-A7 concentrated on entry-level 3G and 4G solutions so the influence on Cortex-A7 was not as strong as that on Cortex-A53. As such, the share of Cortex-A7 processors will still go up by 1.1 percentage points to reach 27.8%.

Driven by shipments of mid-to-high end solutions by Qualcomm, HiSilicon and MediaTek, the share of Cortex-A57/A72/A73 processors will edge up by 0.7 percentage points to reach 8.4% in the second quarter of 2017.

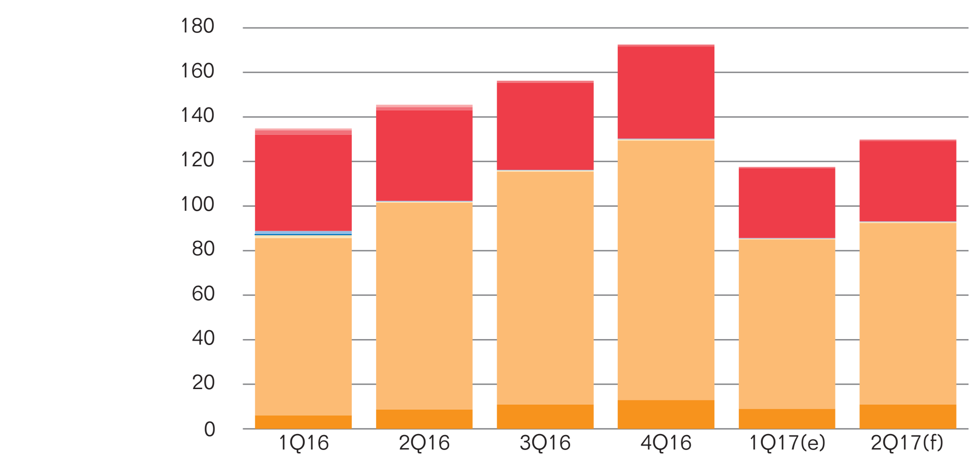
Shipments by supplier, 1Q16-2Q17 (m units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Intel	0.80	1.00	0.30	0.00	0.00	0.00
Samsung	2.00	2.50	1.00	2.00	1.00	1.00
Marvell	0.50	1.50	1.00	1.00	0.00	0.00
Leadcore	2.00	1.00	2.00	2.50	1.00	1.00
Hisilicon	12.50	9.50	11.00	15.00	14.29	15.70
Spreadtrum	24.00	28.00	30.00	32.00	21.00	25.10
Qualcomm	31.00	35.00	42.00	50.00	36.50	41.15
Mediatek	62.00	67.00	69.00	70.00	43.72	45.90

Source: Digitimes Research, April 2017

Shipments by architecture, 1Q16-2Q17 (m units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
x86	0.81	1.02	0.16	0.00	0.00	0.00
Cortex-A5	2.02	1.46	0.78	0.86	0.47	0.65
Cortex-A7	43.14	40.74	39.08	41.40	31.38	36.10
Cortex-A9	1.35	0.29	0.31	0.35	0.24	0.26
Scorpion	0.14	0.00	0.00	0.00	0.00	0.00
Krait	0.40	0.00	0.00	0.00	0.00	0.00
Cortex-A15/A12	1.35	0.44	0.47	0.52	0.35	0.39
Cortex-A53	79.53	92.83	104.57	116.44	76.03	81.55
Cortex-A57/A72/A73	6.07	8.73	10.94	12.94	9.05	10.91

Source: Digitimes Research, April 2017

Supplier analysis

MediaTek

2Q17 forecast

MediaTek's customers will begin to increase their orders in the second quarter, which will help MediaTek's shipments grow by 5% on quarter.

However, MediaTek lacked Cat. 7 and higher spec solutions in 2016, causing it to lose customers, and it launched X30 (Cat. 10) processors rather late in 2017. Impacted by these factors in addition to price cutting competition, MediaTek is expected to deliver 45.9 million units in the second quarter, a sharp yearly decline of 31.5%.

2Q17 forecast

Amid price cutting challenges, MediaTek is losing customers of its 4G LTE solutions in the entry-level to mid-range markets. Its share is likely to further dip by 2 percentage points to 87% in the second quarter.

Continued on below...

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MediaTek's 3G solutions are also struggling in price wars with a price difference of around US$1. However, 4G solutions suffer an even more serious effect from the price cutting competition so the share of 3G processor shipments can still edge up by 2 percentage points to 11.5%.

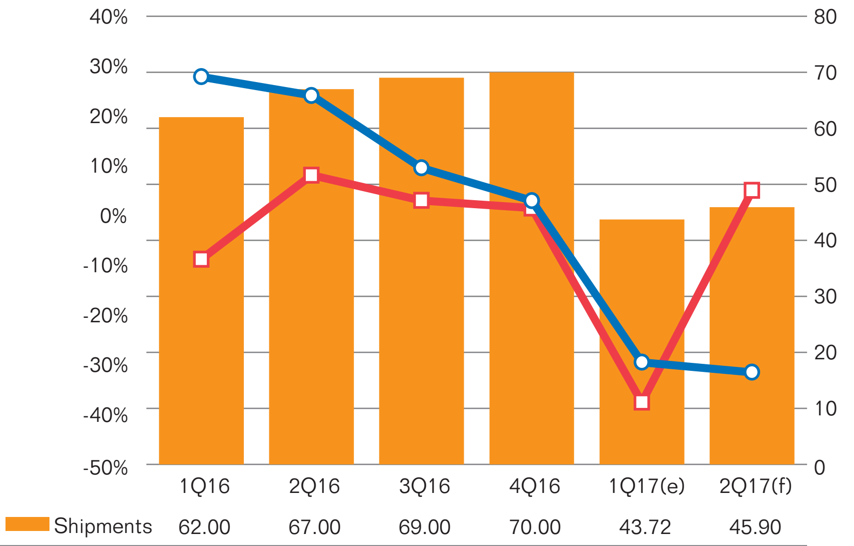
2Q17 forecast

Driven by MediaTek's X30 shipments, the share of Cortex-A57/72/73 architectures is likely to reach 6.8% in the second quarter of 2017.

Losing market share in the mid-range segment, the share of Cortex-A53 will decline by 2.6 percentage points to 83.2% in the second quarter.

Widespread among ultra-low-cost 4G solutions and 3G end products, Cortex-A7 will still account for 9% of the market, slightly down 0.2 percentage point from last quarter.

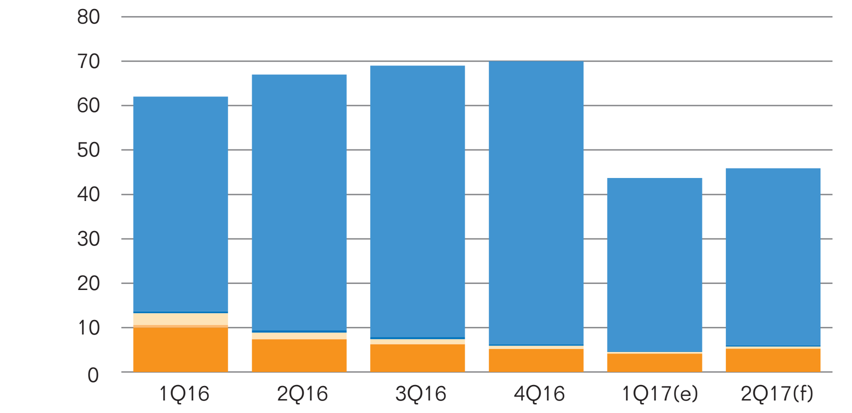
MediaTek smartphone AP shipments, 1Q16-2Q17 (m units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Shipments	62.00	67.00	69.00	70.00	43.72	45.90
Q/Q	-8.8%	8.1%	3.0%	1.4%	-37.5%	5.0%
Y/Y	27.8%	24.1%	9.5%	2.9%	-29.5%	-31.5%

Source: Digitimes Research, April 2017

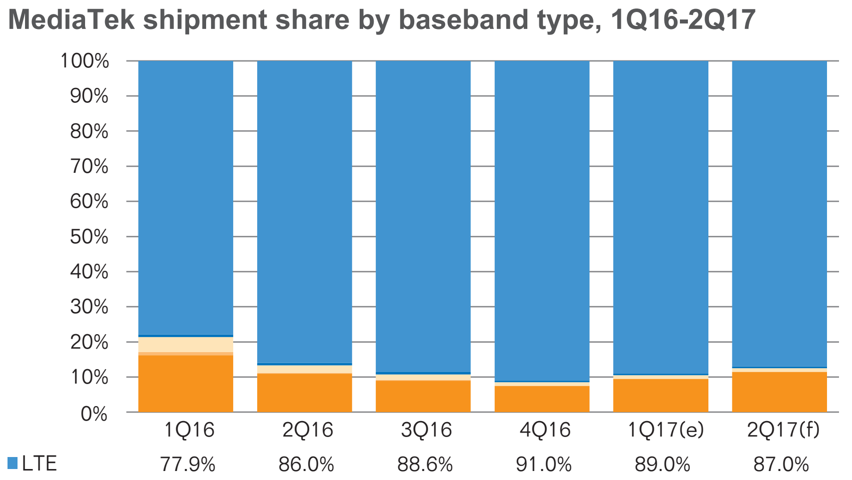
MediaTek shipments by baseband type, 1Q16-2Q17 (m units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
LTE	48.30	57.62	61.13	63.70	38.91	39.93
CDMA	0.43	0.47	0.48	0.35	0.22	0.23
EDGE	2.67	1.41	1.04	0.70	0.44	0.46
TDSCDMA	0.56	0.13	0.14	0.00	0.00	0.00
WCDMA	10.04	7.37	6.21	5.25	4.15	5.28

Source: Digitimes Research, April 2017

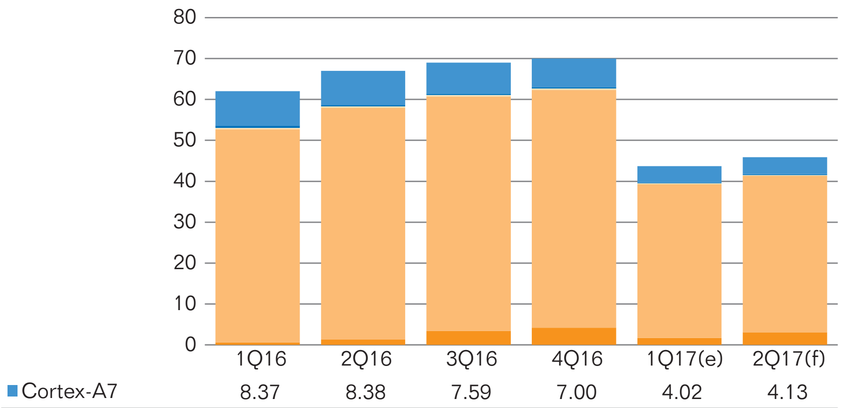
MediaTek shipment share by baseband type, 1Q16-2Q17



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
LTE	77.9%	86.0%	88.6%	91.0%	89.0%	87.0%
CDMA	0.7%	0.7%	0.7%	0.5%	0.5%	0.5%
EDGE	4.3%	2.1%	1.5%	1.0%	1.0%	1.0%
TDSCDMA	0.9%	0.2%	0.2%	0.0%	0.0%	0.0%
WCDMA	16.2%	11.0%	9.0%	7.5%	9.5%	11.5%

Source: Digitimes Research, April 2017

MediaTek shipments by architecture, 1Q16-2Q17 (m units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Cortex-A7	8.37	8.38	7.59	7.00	4.02	4.13
Cortex-A9	0.62	0.34	0.35	0.35	0.22	0.23
Cortex-A15/A17	0.31	0.34	0.35	0.35	0.22	0.23
Cortex-A53	52.08	56.62	57.27	58.10	37.51	38.19
Cortex-A57/A72/A73	0.62	1.34	3.45	4.20	1.75	3.12

Source: Digitimes Research, April 2017

Qualcomm

2Q17 forecast

Qualcomm successfully won back orders for mid-to-high end products from major brand customers such as Xiaomi and Oppo in 2016. With sales of phones made by Huawei, Xiaomi, Oppo and Vivo expected to grow in the second quarter of 2017, Qualcomm will likely ship a total of 41.15 million units in the second quarter. The yearly growth, though slowing down compared to the second half of 2016, can still reach 17.6%.

Quarterly growth in the second quarter is expected to be 12.7% due to the low base period in the first quarter resulting from the low season effect.

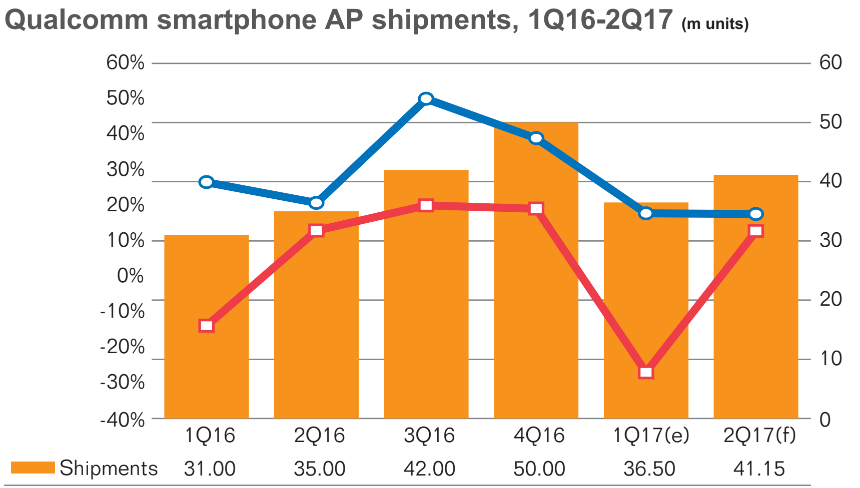
Qualcomm's MSM8905(Snapdragon 205) processors targeting 4G feature phones focus on markets other than China, such as India, and therefore make little contribution to its shipment numbers in China.

2Q17 forecast

LTE solutions account for almost all of Qualcomm's shipments. The share in the second quarter of 2017 will slightly increase by another 0.2 percentage point from last quarter.

Qualcomm no longer holds price advantage in the 3G segment with focus transitioning to LTE solutions.

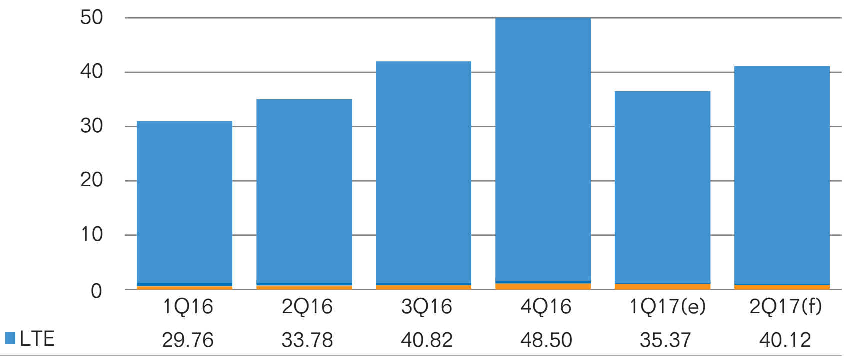
Qualcomm smartphone AP shipments, 1Q16-2Q17 (m units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Shipments	31.00	35.00	42.00	50.00	36.50	41.15
Q/Q	-13.9%	12.9%	20.0%	19.0%	-27.0%	12.7%
Y/Y	26.5%	20.7%	50.0%	38.9%	17.7%	17.6%

Source: Digitimes Research, April 2017

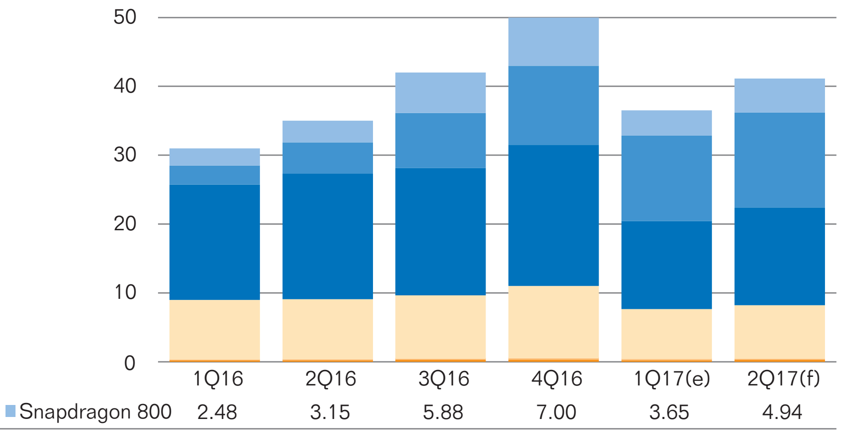
Qualcomm shipments by baseband type, 1Q16-2Q17 (m units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
LTE	29.76	33.78	40.82	48.50	35.37	40.12
CDMA	0.78	0.70	0.63	0.75	0.44	0.41
TDSCDMA	0.06	0.11	0.00	0.00	0.00	0.00
WCDMA	0.40	0.42	0.55	0.75	0.69	0.62

Source: Digitimes Research, April 2017

Qualcomm shipments by architecture, 1Q16-2Q17 (m units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Snapdragon 800	2.48	3.15	5.88	7.00	3.65	4.94
Snapdragon 600	2.79	4.55	7.98	11.50	12.41	13.79
Snapdragon 400	16.74	18.20	18.48	20.50	12.78	14.20
Snapdragon 200	8.68	8.75	9.24	10.50	7.30	7.82
S4	0.16	0.18	0.21	0.25	0.18	0.21
S2	0.16	0.18	0.21	0.25	0.18	0.21

Source: Digitimes Research, April 2017

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2Q17 forecast

Qualcomm has launched and started to ship S835. This is expected to drive the share of S800 series up by 1 percentage point.

Qualcomm cut the costs of its S600 series in an attempt to grab market shares. This prompted its existing S200 and S400 customers as well as new entry-level and mid-range customers to transition to S600. As a result, S600 will show the most significant share growth, up 11.5 percentage points to reach 33.5%.

Spreadtrum

2Q17 forecast

Due to the low base period and with the shipments of 4G feature phone solutions included in this analysis, Spreadtrum is expected to show shipment growth of 19.5% in the second quarter of 2017.

It's unlikely for prices of low-cost solutions to go any lower. As such, Spreadtrum will show a yearly decline by 10.4% despite the contribution from SC9820 processors.

In the long run, 4G feature phones will make a limited contribution to AP shipments in China.

2Q17 forecast

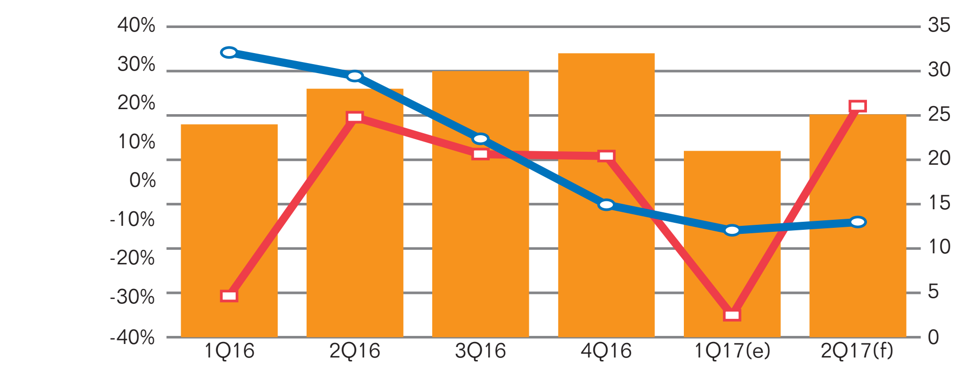
Spreadtrum has kicked off mass production of SC9820, its solution for 4G LTE feature phones, in the second quarter of 2017. As the price is more competitive than that of Qualcomm's solution, SC9820 is expected to contribute significantly to Spreadtrum's share of LTE solution shipments, which will trend up by 7 percentage points compared to last quarter to top 62%.

2Q17 forecast

Cortex-A7 processors will still account for a major portion of Spreadtrum's shipments in the second quarter of 2017. The share is expected to expand to 96.2%, up 0.7 percentage point.

Spreadtrum may still have to improve the software maturity for its 16nm SC9860 solution in the second quarter so the product will make little contribution to the share of Cortex-A53 processors. Spreadtrum's first Cat. 7 solution entering mass production may be SC9861G-IA built with Intel's Airmont architecture.

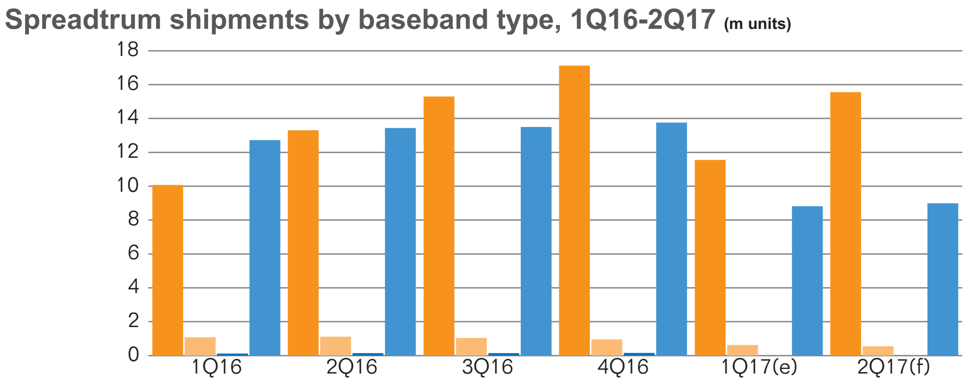
Spreadtrum smartphone AP shipments, 1Q16-2Q17 (m units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Shipments	24.00	28.00	30.00	32.00	21.00	25.10
Q/Q	-29.4%	16.7%	7.1%	6.7%	-34.4%	19.5%
Y/Y	33.3%	27.3%	11.1%	-5.9%	-12.5%	-10.4%

Source: Digitimes Research, April 2017

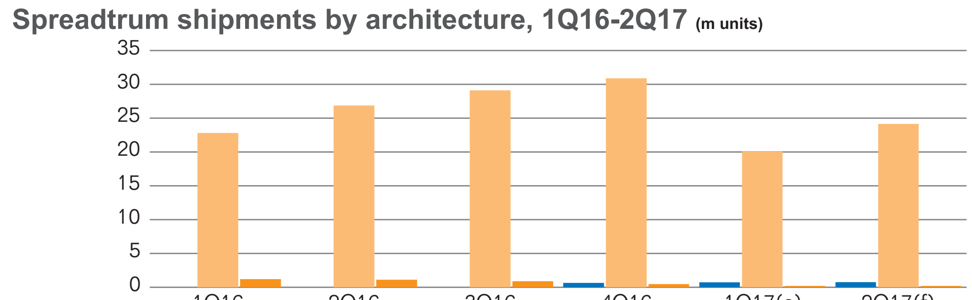
Spreadtrum shipments by baseband type, 1Q16-2Q17 (m units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
WCDMA	12.72	13.44	13.50	13.76	8.82	8.99
TDSCDMA	0.12	0.14	0.15	0.16	0.00	0.00
EDGE	1.08	1.12	1.05	0.96	0.63	0.55
LTE	10.08	13.30	15.30	17.12	11.55	15.56

Source: Digitimes Research, April 2017

Spreadtrum shipments by architecture, 1Q16-2Q17 (m units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Cortex-A5	1.20	1.12	0.90	0.48	0.21	0.20
Cortex-A7	22.80	26.88	29.10	30.88	20.06	24.15
Cortex-A53	0.00	0.00	0.00	0.64	0.73	0.75

Source: Digitimes Research, April 2017

HiSilicon

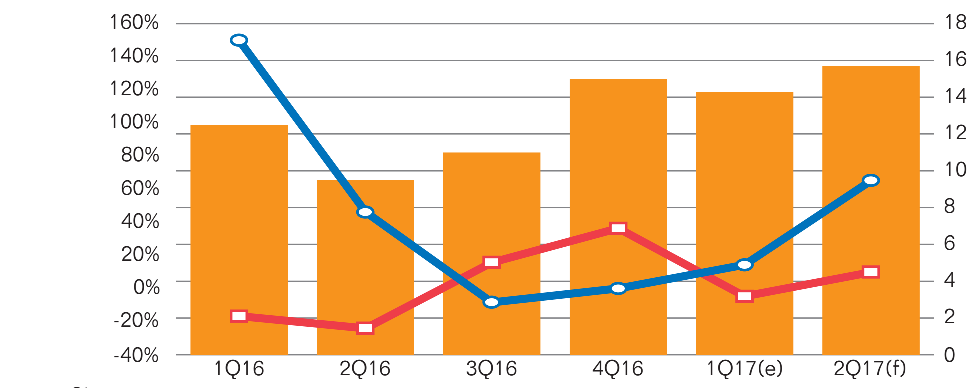
2Q17 forecast

Huawei is shifting focus to mid-to-high end phones which mostly use HiSilicon's Kirin900 and Kirin600 series.

As HiSilicon processors account for an increasing share of Huawei phones, shipments in the second quarter will grow by 9.8% on quarter and 68.3% on year.

Leadcore

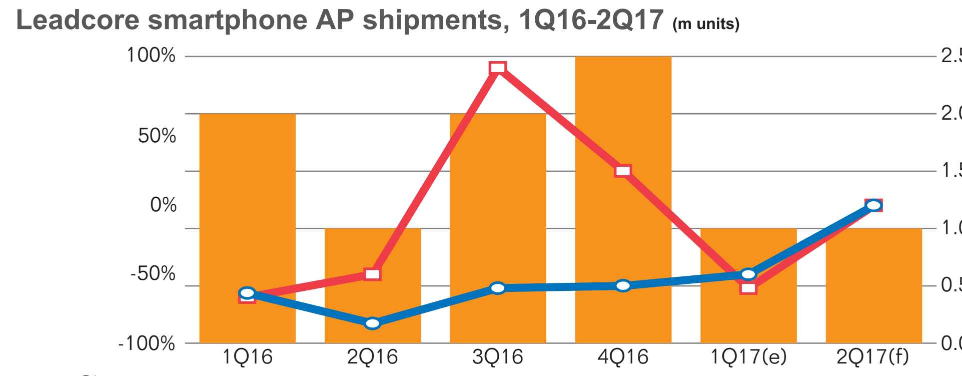
HiSilicon smartphone AP shipments, 1Q16-2Q17 (m units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Shipments	12.50	9.50	11.00	15.00	14.29	15.70
Q/Q	-16.7%	-24.0%	15.8%	36.4%	-4.7%	9.9%
Y/Y	150.0%	46.2%	-8.3%	0.0%	14.3%	65.3%

Source: Digitimes Research, April 2017

Leadcore smartphone AP shipments, 1Q16-2Q17 (m units)



	1Q16	2Q16	3Q16	4Q16	1Q17(e)	2Q17(f)
Shipments	2.00	1.00	2.00	2.50	1.00	1.00
Q/Q	-66.7%	-50.0%	100.0%	25.0%	-60.0%	0.0%
Y/Y	-63.6%	-85.7%	-60.0%	-58.3%	-50.0%	0.0%

Source: Digitimes Research, April 2017