Advisory Report

COMPUTEX TAIPEI 2010 Round-up: Major Mobile Device Silicon Developments and Takeaways

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Issue

The COMPUTEX TAIPEI 2010 conference and exhibition in Taipei, Taiwan during June 1-5, 2010, celebrated its third decade of operation and once again generated significant participation with over 120,000 visitors in total, including 4,498 booths used by 1,715 exhibitors. For the 2010 event, the organizers (TAITRA) touted the arrangement of over 2,014 one-on-one procurement matchmaking meetings during the first two days. These procurement meetings alone generated on-site business worth more the USD 230 million, compared to the relatively modest USD 100 million realized during the previous year's meetings. In itself, this represents another strong indicator that the tech industry, including the mobile sector, is experiencing a robust recovery during 2010 after the dramatic downturn witnessed during most of 2008 and 2009. While the COMPUTEX organizers did not break down the revenues realized from the procurement meetings into distinct categories, mobile silicon played a notable role as evidenced by the wealth of announcements unveiled at the event from mobile silicon vendors alone.

The event clearly generated market buzz around mobile products such as evolving smartphones, e-readers/tablets and notebooks and mobile silicon was naturally a part of this momentum. Mobile silicon sales and marketing themes included the expanding use of Android and Windows as a mobile platform, diversified integration of CE and mobile platforms, dual-CPU innovations, renewed processor architecture competitive differentiation efforts and the diversification of wireless connectivity options. Such themes, while not exhaustive, will drive mobile sales and marketing efforts for the remainder of 2010 and reinforce the industry consensus that the overall mobile silicon market will witness a sustained rebound during H2 2010 and likely beyond.

Current Perspective

The 2010 COMPUTEX TAIPEI event produced a wide array of sales and marketing energy toward rapidly evolving mobile silicon technology themes in areas such as the expanding use of Android and Windows as a mobile platform, diversified integration of CE and mobile platforms, dual-CPU innovations, renewed mobile processor architecture competitive differentiation efforts and the diversification of wireless connectivity options. These themes are inter-related, however major mobile silicon vendors focused on these individual themes to promote their wares at the show.

In the area of expanding support for the Android and Windows (i.e., Windows Embedded Compact

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7) platforms on mobile devices (i.e., tablets, smartphones), the initiatives unveiled at COMPUTEX sustained a clear trend in the industry over the last few quarters in this area. New Android prototype mobile products included MIPS-based System-on-Chip (SoCs) aimed at mobile Internet devices (MIDs) made by Taiwan's Silicon Integrated Systems (SiS) and a variety of Android-based tablets such as Compal's ten-inch tablet as well as tablet offerings from Browan, Digitran and Firston. MIPS itself produced four show-related announcements dedicated primarily to its latest efforts in supporting Android on mobile devices. These included partnering with Myriad to potentially improve the performance of Android applications by up to fivefold on MIPS-based devices, collaborating with SySDSoft in porting LTE protocol stacks to the Android platform, SiS' selection of MIPS processor IP for the development of MID SoCs, and MIPS' decision to support symmetric multiprocessing (SMP) capabilities for Android on MIPS-based multi-core SoCs. The collaboration between MIPS and Myriad leaps out on the radar, since it holds the potential to cause long-term competitive waves within areas such as smartphone silicon due to factors such as MIPS' extensive consumer electronic (CE) customer base (e.g., Cisco, Sony and Motorola). CE/mobile products and technologies are becoming increasingly integrated, and Myriad's vast mobile application presence in areas such as browsers, messaging, Java, social networking, user interfaces and middleware (e.g., Myriad promotes that it has shipped over 3.5 billion software applications in more than 2 billion phones) lends immediate sales and marketing credibility to their joint efforts. Moreover, MIPS and Myriad claim the new Davlik Turbo VM, replacing the standard Android Davlik engine, can improve the performance of Android applications running on MIPS-based devices by up to a fivefold level. This potential capability in itself will help drive more mobile device SoC testing and Android on MIPS participation in MIPS' direction.

In parallel to Android, Microsoft fully leveraged the COMPUTEX event to officially unveil the latest version of its Windows Embedded CE, namely the Windows Embedded Compact 7 O/S, which is designed and aimed primarily at mobile-centric and mobile-capable devices such as portable media devices and tablets. Microsoft showcased Windows Embedded Compact 7 prototypes such as the Hanban character recognition device, the Vila tablet and the Sierra Expo slate. In contrast to prior versions of Windows 7 for x86, Windows CE is designed to work with processor architectures such as ARM, MIPS and SH in addition to the x86 architecture. As a result, Microsoft's Embedded Compact 7 O/S will likely gain increased interest as an O/S for mobile devices. For instance, Texas Instruments (TI) touted the use of Windows Embedded Compact 7 for ARM Cortex A8-based devices that include consumer use interfaces, human machine interfaces, and point-of service applications. Such initiatives can logically be applied to mobile technologies as well since TI uses Windows Embedded CE board support packages and ARM Cortex A8 processors for both its OMAP and Sitara platforms. The upshot here is that mobile technologies will increasingly support similar and common consumer user interfaces, human machine interfaces and point-of service applications across both consumer and business settings.

The unveiling of dual-core CPUs continues to gain momentum within the mobile silicon realm. Qualcomm, for example, revealed the sampling of its first dual-CPU Snapdragon chipsets aimed at smartphones. The dual-CPU cores integrate the Mobile Station Modem (MSM) MSM8620 and MSM8660 solutions to achieve up to 1.2 GHz processing power. One reason for the ongoing emergence of the dual core approach in addressing processors for smartphones is the potential to achieve improved power conservation metrics in relation to running a single core at the equivalent processing power. This implementation can create a slight trade-off in optimization of memory caching between dual cores (in relation to a single core), however advancing power conservation metrics continues to prove essential in the evolution of high-end smartphone design priorities.

Intel continues to position its x86 processor-based Atom architecture with the second generation Moorestown line designed and aimed specifically at smartphones and tablets as an alternative to the ARM architecture's pre-dominance in the mobile handset realm. Likewise MIPS issues the same type of challenge to ARM as evidenced by its myriad Android initiatives. Both have their work cut out in winning substantial future business from ARM in the overall mobile device market, although Intel has a solid foundation through its market dominance in the netbook silicon realm (via its first generation Atom processor line) and MIPS through its vast market presence within the CE realm (e.g., set-top boxes, IPTV platforms, etc.). Conversely, Intel and MIPS must also guard against ARM's ongoing attempts to diversify further beyond the mobile device realm into areas such as CE. Where the Intel x86/Atom and MIPS may have a short-term competitive advantage over ARM is in the area of gaming applications. Many of the most popular gaming brands are purpose-designed with the x86 and MIPS processor technologies (e.g., video game consoles such as the Sony PlayStation 2 and PlayStation Portable are MIPS-based) in mind and as a result this segment in itself can help spearhead a beach head within the ARM processor-based mobile device realm.

Mobile silicon vendors continue to devote sales and marketing bandwidth toward advances with wireless (i.e., WiFi, Bluetooth, FM radio and GPS) capabilities that complement the applications processor, RF transceiver, baseband modem and power management initiatives. For instance, Broadcom highlighted the selection of its InConcent combo (e.g., WiFi and Bluetooth) module for netbooks sold by OEMs such as Samsung and ASUS. Managing radio interference remains a key competitive differentiator for wireless connectivity silicon vendors and contributes directly toward the design trend of integrating wireless connectivity options onto a single chip in order to leverage common power management and radio interference management techniques to reduce interference issues.

In the e-reader silicon segment, players such as Marvell and Freescale trumpeted their latest partnership efforts. Marvell and Hanwang, the leading e-reader solution provider in China (i.e., based on 66% share in the Chinese e-reader market during Q1 2010), previewed a new generation of e-readers designed to spur mass market adoption via improvements in battery life and price points. Featuring the Marvell ARMADA 166E, a SoC with an integrated e-paper display (EPD) controller, Hanwang's new generation of devices could offer advances over current e-readers in areas such as power consumption due to the ability of the ARMADA 166E SoC to support up to 8,000 pages of content with a single battery charge (at least on Hanwang's new e-reader product). The integrated support of EPD functions enables Marvell to counter Freescale's capabilities in this area directly, and challenge Freescale's ability to claim market share leadership in the global e-reader silicon market due to its Amazon Kindle and Sony Reader business. Freescale announced its ARM Cortex-A8 based i.MX535 processor and new ten-inch tablet business with eReader OEM ASUS/Pegatron to diversify its channels in the China market and promote the development work it is performing in the area of customized Android interfaces.

Overall the COMPUTEX 2010 show did not disappoint in terms of producing significant and breakthrough announcements. One clear market trend impression, at least at the sales and marketing level today, is that Intel x86 and MIPS based processor architectures will increasingly challenge the vast dominance of the ARM processor architecture within the overall mobile device realm. This definitely includes tablets and high-end smartphones as they become increasingly PC-like on the one hand (in terms of sheer processing demands) and increasingly integrated with CE products on the other. Likewise ARM will continue to seek to diversify beyond its mobile device foundation and branch into industrial and business technologies that use point of service functions for instance. The show certainly accented and

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made clear that mobile silicon development efforts will increasingly support the Android and Windows Embedded Compact 7 platforms in conjunction with the proliferation of tablet and smartphone devices that are positioned as alternatives to the Apple iPhone and Apple iPad products. Finally, the industry can expect mobile device products before the end of 2010 that simply offer new and improved capabilities in performance (e.g., dual-CPU processing), power consumption (e.g., virtualized power management) and feature range.

Recommended Vendor Actions

• Mobile device silicon vendors need to continue promoting the ability of their platforms to support mobile O/S's flexibly such as Linux/MeeGo, Android, Windows 7 and iOS as an obligatory checklist item, but also should look creatively to promote how their platforms realize distinct competitive benefits along the lines of MIPS and Myriad asserting that the new Davlik Turbo VM can improve the performance of Android applications running on MIPS-based devices by up to a fivefold level.

• Mobile silicon vendors pursuing dual-core processor designs for advanced smartphone/tablet devices need to differentiate how their platforms are differentiated in areas such as GPU integration support, 1080p video encode/decode performance, 3D/2D acceleration capabilities, resolution display features including touch/touchless gesturing functions and wireless connectivity flexibility.

• Mobile device silicon vendors should also consider addressing how their platforms best benefit mobile devices in areas such as Open GLES 2.0 support for enhanced graphics performance and Adobe Flash 10.1 support for improved Internet browsing experience to meet emerging mobile device OEM expectations in this area.

• Mobile silicon vendors need to provide marketing updates on their roadmaps for supporting wireless connectivity options such as 802.11n WiFi connectivity and Bluetooth 3.0 + HS (High Speed) to ensure competitiveness in this area.

Recommended User Actions

• Mobile device silicon vendors should consider an expanded role for x86 and MIPS processors within next generation 4G smartphone and smart tablet technologies and applications, since these processors can prove better suited for rapidly evolving mobile devices such as smart tablets and high-end smartphones in area such as performance and scaling flexibility. Publicly considering x86 and MIPS platforms could also increase bargaining leverage in relation to ARM licensing arrangements.

• E-reader equipment OEMs should evaluate and investigate the capabilities of e-reader mobile silicon in areas such as content volumes supported with a single battery charge (e.g., including variances for languages, font size, etc.), price points, and a roadmap for e-reader-related SoC integration efforts such as display functions (see COMPUTEX 2010: Marvell Enlists Hanwang in Its ARMADA, June 2, 2010).

• Mobile WiMAX equipment OEMs should consider the competitive virtues of WiMAX/4G mobile silicon offerings in areas such as RF integration (i.e., support of 2.3, 2.5, and 3.5 GHz WiMAX bands), highly efficient packaging metric claims, and performance/power consumption gains - i.e., Mbps of throughput to mW power consumption during fully active mode ratios (see COMPUTEX 2010: Sequans Lands Huawei's Latest WiMAX Endorsement, May 27, 2010).