

An inside look at innovative semiconductor start-ups

Given all the negative news, dismal sales, daily restructuring reports, demise of one start-up after another and more unpleasantness, you might think I would have a hard time finding bright spots in the fabless semiconductor arena. I certainly thought that would be the case. After all, there have been more than a few instances where I have failed to find even one exciting start-up in a quarter, even in good times. So I was pleasantly surprised to face the problem of choosing amongst a handful of promising start-ups and emerging technologies.

I started with a list of 30 to 40 companies for the quarter and whittled down to four great companies. Each company was picked individually, based on my analysis of its unique merits. But when I stepped back, a common thread emerged – all four companies focused on various aspects of the video value chain, albeit from very different angles.

This finding was startling, given that I started with a bottom-up, not top-down analysis. If you had asked me about video, I would probably have said something like, “yes, great market...for big boys with big pockets.” This bottom-up analysis validates the age-old adage that tightly focused start-ups can penetrate brutally competitive markets dominated by large incumbents with technologically superior solutions.

So what technologies are the four companies working on? The first has introduced a universal broadband receiver, enabling region-free analog or digital broadcast TV, radio and Global Positioning System (GPS) reception. The benefits are obvious. The second has developed a faster-than-real-time transcoding chip. Anyone who has left their PC on overnight trying to transfer a video from their TiVo to their iPod understands the benefits. Video quality and storage capacity will always be diametrically opposed, and myriad video standards have become the new Tower of Babel. The third company has developed technology that obsoletes the liquid crystal display (LCD) by replacing the grossly inefficient process of light modulation via polarization with a microelectromechanical systems (MEMS) shutter. The benefits, including 75 percent lower power, superior image quality and lower cost, are astounding.

My favorite company for the quarter focuses on a tangential aspect of the video value chain – transmission. The demise of several ultra-wideband (UWB) companies and the anemic uptake of wireless video have captured much attention. Why? Because it is a fascinating problem. After all, who wouldn't want wireless video? But at what cost? And does it work?

But I think this focus on ultra high-bandwidth point-to-point links is meshuga. A more pressing and achievable problem is whole-home Internet Protocol (IP) video distribution, whether it's focused on addressing service provider concerns or consumer requirements.

Quantenna Communications is focused on addressing this market. The company was founded in January 2006 to develop “chipsets for intelligent wireless networking that deliver ultra-reliable, high-speed wireless bandwidth to any home, any time, anywhere.” Quantenna has received \$27 million in two rounds of funding from Sequoia Capital, Venrock Associates, Sigma Partners and Grazia Equity. The company

has more than 35 employees, with a majority having doctorates.

Quantenna argues that today's wireless chipsets offer spotty performance, limited coverage, poor reliability and unpredictable bandwidth. While many 802.11 chipsets are suitable for data transmission, they are not robust enough to support reliable multimedia services.

To address this problem, Quantenna has developed 802.11n chipsets with 4x4 multiple input, multiple output (MIMO) and transmit beamforming that are designed to deliver guaranteed bandwidth for any home, anywhere. The company argues that it delivers 50 percent better performance than other 802.11n solutions. Quantenna's chipsets overcome interference and dead zones, enabling consumers and carriers to reliably deploy video services to any point in the home over a plug-and-play wireless network.

The company holds key patents in MIMO, baseband, mesh networking and integration, and interference mitigation. Quantenna's chipsets offer link speeds of up to 1Gbps and data throughput of up to 600Mbps.

The wireless LAN semiconductor market is expected to reach 1.2 billion units by 2012, generating \$7 billion, according to ABI Research. Competitors include the usual 802.11 suspects, such as Atheros and Broadcom, as well as emerging “carrier-grade” Wi-Fi chipset providers such as Celeno. Quantenna argues that its chipsets are the only solutions that can deliver guaranteed, predictable bandwidth across any size home or office network. In addition to better performance, the devices offer lower cost and smaller footprint than competing solutions. The company believes it has at least a one-year leap on the competition.

I think that's compelling. For Quantenna's target whole-home IP video distribution market, it's a market enabler. If Quantenna executes as planned, its solution is outstanding, even if video distribution isn't a requirement. ■

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