

Sector Update**November 2008****Semiconductors & Systems****CONNECTED HOME, THE NEW WAVE OF SILICON GROWTH****Paul Rutherford**

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Digital and Internet Content Established in Home

Media content is continually moving from a physical product to the digital form. Consumers are moving away from buying CDs and instead download mp3 tracks, storing them on a PC or media centre. In addition, the scalability and reach of the Internet has created a distribution platform for new content categories, such as user generated video and IPTV.

New Home Networking Technologies Required

Such market trends are driving demand for digital home networks that enable multiple devices around the home to access content. However, the high bandwidth, quality of service and reach required of digital home networks means that existing solutions, such as WiFi (802.11g) are insufficient and new networking solutions are required. A range of wired and wireless technologies such as Powerline networking, Multimedia over coaxial, Plastic Optical Fibre, 802.11n Wireless HDMI aim to deliver where existing networks fail and are vying to become the home networking technology of choice.

Wired Backbone Will be Complimented by Wireless

We believe that the bandwidth, reach, and quality of service requirements means that wireline technologies, such as Powerline, Multimedia over Coax, Ethernet and Plastic Optical Fibre will be the backbone of the digital home network. We believe that low installation costs will help early adoption of Powerline and Multimedia over Coax solutions. However, they may fail to meet future bandwidth requirements, especially as Fibre To The Home becomes mass market. In contrast Ethernet and Plastic Over Fibre have the highest installation costs but have sufficient bandwidth to support future requirements and appear best placed to be the wireline technology of choice over the longer term. Wireless technologies do not provide the reach or quality of service to be a standalone home networking solution, in our view. However, WiFi and new standards such as Wireless HDMI bring flexibility and convenience to accessing data and are complimentary to a wireline backbone.

Opportunity for new Chip Technologies

Home networking silicon is likely to be embedded into consumer electronic devices, such as digital TVs and set-top-boxes, in the same way that Wi-Fi silicon is embedded in most laptops. Although the digital home networking silicon market is small today, it offers a strong growth opportunity given the large and diverse unit market that it addresses. In-stat currently forecasts that the addressable unit market will grow from 726 million device shipments in 2007 to nearly 1 billion in 2011. Current penetration rates are negligible meaning that there is a nascent market in which venture backed technology leaders such as Gigle, DS2, SiBEAM and Firecomms are well positioned to benefit.

⁽¹⁾ A GP Bullhound client.

DIGITAL HOME NETWORKING

The shift from physical to digital media and the growth of the Internet as a distribution platform is driving demand for home networks where locally or online stored media content can be easily distributed throughout the home and accessed from multiple devices in multiple rooms:

- Consumers want to watch content distributed over the Internet on a High Definition TV rather than just a laptop
- Media content stored on a laptop or a media centre can be accessed by any device anywhere in the home

Consumers recognise the benefits of a digital home network. However, if digital home networks are to become main-stream then they need to meet consumer performance expectations at a price that ensures mass market adoption including:

- High bandwidth coverage no matter where you are in the home
- Audio and video needs to be delivered perfectly with high quality of service
- Simple for the everyday consumer to install and use
- Low cost / price point

Home Network Bandwidth Needs to Increase

Today's home networks typically consist of Internet access and maybe connectivity to a peripheral such as a printer. In general these are Wi-Fi networks providing data rates of around 54Mbps or in some instances wired Ethernet providing data rates of around 100Mbps.

Such data rates are sufficient for the transfer of data. However, bandwidth improvements are needed in order to provide the high data rates required to support the demands placed on a digital home network (Exhibit 1).

Exhibit 1 – Example bandwidth requirements of a digital home network

| Digital house equipment | Bandwidth required (Mbps) |
|--------------------------------|----------------------------------|
| HDTV + PiP | 40Mbps |
| HDTV to PVR | 20Mbps |
| SDTV | 4Mbps |
| DVD | 10Mbps |
| Advanced surveillance system | 12Mbps x 2 = 24Mbps |
| E-AC-3 Surround sound | 6.1Mbps (today 3Mbps) |
| Broadband internet access | 20Mbps |
| File sharing to projector | 2-3Mbps |
| Total / home | 127Mbps |
| MDU bandwidth sharing | x2 |
| TOTAL | 254Mbps |

Source: Gige Semiconductor 2007.

A home network must be able to support peak capacity, which is believed to be around 250Mbps today. Such demands are expected to continually increase as High Definition becomes main-stream and as an increasing amount of content is

distributed over the Internet. Such bandwidth requirements renders today's Ethernet and Wi-Fi networking technologies insufficient and new high bandwidth technologies are required.

New Home Networking Technologies

A significant amount of investment has gone into a number of alternative technologies (Exhibit 2) each of which are positioned to deliver the bandwidth, reach and quality of service required to become the home networking technology of choice.

Exhibit 2 – Home networking technology

| Technology | Physical data rate | Cabling/installation cost | AV-level Coverage | Connection Point Availability | Vulnerability to attacks |
|-----------------------|--------------------|---------------------------|-------------------|-------------------------------|--------------------------|
| 802.11a/g | 54Mbps | 0 | Single room | 0 | High |
| 802.11n | 600Mbps | 0 | Single room | 0 | High |
| Coax/ MoCA | 270Mbps | \$ | Whole home | 4 per home | Low |
| Ethernet | 100Mbps | \$\$ | Whole home | 0 | Low |
| Ethernet (802.3ab-ae) | 1-10Gbps | \$\$\$ | Whole home | 0 | Low |
| HPNA3.0 | 128Mbps | \$ | Whole home | 3 per home | Low |
| Plastic Optical Fiber | 300Mbps | \$\$ | Whole home | 0 | Low |
| Powerline AV | 200Mbps | 0 | Whole home | Several per room | Low |

Source: Gigle Semiconductor, GP Bullhound.

Fixed-Line Network Technologies

Today the only technologies that can deliver the required bandwidth and reach throughout the home are fixed-line technologies, which use a fixed-line cable as a transport medium. While fixed-line offer higher data rates they typically are more costly to install as they require cables and access points to be installed throughout the home.

In addition, fixed-line networks are a less attractive solution as they involve the connection of unwanted wires throughout a home. There are three primary fixed-line technology standards (two of which are open standards) that are capable of delivering a digital home network.

Ethernet

Ethernet is an established networking technology that is standardised under IEEE 802.3.2. While Ethernet benefits from many years of research and large scale deployments.

- Gigabit Ethernet can offer data rates of up to 1Gbps, which is the highest data rate currently offered by wireline alternatives
- Some new homes are built with Ethernet access points in each room. However, this is rare and most homes require Ethernet access points to be installed. This is expensive since cables need to be installed behind walls and transferred across multiple floors. The technology might be cheaper but the labour cost of installation does not leverage any installed base

The cost associated with installing Gigabit Ethernet is a potential barrier to adoption in the short term. However, the scalability of the technology and high data rates that it supports suggests that over the longer term Ethernet will be a dominant home networking technology.

Multimedia Over Coax (MoCA®)

The Multimedia over Coax Alliance (MoCA®) is a non-profit organisation that was established in 2004 to promote the use of coaxial cables for distributing media content as part of a digital home network. MoCA® is also used to establish specifications and ensure interoperability of devices utilising coax as the basis of a digital home network.

MoCA® utilises an underlying OFDM based technology that delivers data rates of up to 270Mbps, which is the highest data rate among fixed-line alternatives.

- MoCA® utilises existing coaxial cable infrastructure meaning that installation costs are low, which combined with its attractive data rate suggests that MoCA® could benefit from strong adoption in the shorter term. However, this will be limited to regions where coaxial cabling in homes is prevalent, such as North America
- We believe that MoCA® will struggle to support continually increasing data rates, which could render the technology redundant over the longer term

Powerline Networking (Homeplug®)

Powerline home networking utilises existing powerlines to distribute multimedia content throughout the home. Powerline brings the advantage of having access points (plug points) in every room and next to devices which will typically be used to view or playback content.

HomePlug® is an open industry alliance that promotes powerline networking technology and ensures interoperability between devices. Homeplug brings together companies from each level of the value chain from silicon to services and content providers to ensure they are creating a positive eco-system enabling the successful introduction of the technology.

- Similar to MoCA®, Powerline utilises existing power cable infrastructure meaning that installation costs are low. Powerline has the added benefit of addressing a global market rather than specific regions, as is the case with MoCA®
- We believe that Powerline has challenges in achieving high data rates due to signal interference within Powerline networks. This could limit the ability of

Powerline to be a dominant technology over the longer term as data rate requirements continue to increase

Plastic Optical Fibre (POF)

As POF uses plastic it is significantly cheaper than traditional glass based optical fibre. Due to its high data rate of 300Mbps and physical characteristics (1mm diameter wires, which are very strong and difficult to bend) POF is well suited for home networking applications.

- The advantages of POF are the high data rates available and robust performance, since it is an optical solution the performance is not degraded by electrical interference within the home
- Furthermore, POF is a simple to install technology meaning that consumers can perform self-installation that removes the large labour costs associated with installed more complex cable technologies such as Ethernet. As a result we believe that POF could be an excellent trade off between the high performance of Ethernet and the low cost of Powerline and MoCA® technologies

Wireless Network Technologies

While technologies provide the desired data rates, reach and quality of service but fail to provide the flexibility and freedom on a wireless network. As a result, we believe that most home networks would want to use a combination of high data rate fixed-line with flexible wireless networking.

There are a number of wireless technologies available that can be used as part of a digital home network. Wireless technologies can be split into networking technologies, such as Wi-Fi, and in-room cable replacement technologies, such as WirelessHD.

We believe that quality of service and reach limitations of Wi-Fi render it difficult to use as stand alone home networking solution. Similarly, cable replacement technologies are not networking competitors but are complimentary technologies that can bridge the gap between the wired and wireless home network.

Wi-Fi (802.11x)

Wi-Fi is a general term used to cover a number of standards including 802.11a/b/g and 802.11n and is today's dominant home networking technology.

802.11a/b/g are older standardised wireless technologies that operate at on-air data rates of up to 54 Mbps with a range of up to 35 metres indoors. Therefore while today's Wi-Fi solutions provide consumers with the freedom to connect to the network from anywhere in the home it fails to provide sufficient bandwidth or the reach to provide network coverage to the entire home.

802.11n is the latest Wi-Fi standard that is expected to support a data rate of up to 600 Mbps. It has the additional benefits of being developed by several existing Wi-Fi vendors, along with the established consumer brand recognition associated with Wi-Fi. 802.11n is designed as a network technology. However, the complexity of driver installations and the device matching procedure coupled with

quality of service and reach limitations means that 802.11n faces challenges in operating as a standalone home networking solution.

WirelessHD (60GHz)

WirelessHD is a wireless digital interface designed for the transport of high definition audio and video between consumer electronic devices at a data rate of up to 4Gbps. It allows the wireless transport of an uncompressed 1080p High Definition Audio Visual stream with a range of up to 10 metres using frequencies in the unlicensed 60 GHz band.

We believe that the short range of WirelessHD limits it to an in-room cable replacement technology rather than a networking technology. Furthermore, it is limited to the transmission of HD video rather than a generic networking technology. As such it is complimentary rather than competitive to digital home networking technologies.

Vendors are currently developing solutions using Version 1.0 of the specification, which was released in January 2008. With support from key consumer electronics vendors there exists potential that WirelessHD could be adopted for video streaming in mains connected consumer electronics devices.

Quality of Services Essential to the User Experience

When using an existing wireless gateway connection for surfing the Internet a decline in network quality is marginally acceptable when watching a low quality video on YouTube. However, such a network disruption would not deliver the quality of service required for transferring high quality audio or High Definition TV content throughout the home where only the highest quality of experience is sufficient. Existing networks have not been developed with the quality of service for distributing high quality multimedia content in mind, particularly wireless networks, where signal interference can cause quality issues.

Furthermore, ensuring quality of service can further increase the bandwidth requirements of a network as greater margin for error needs to be built in to the overall networking system.

New networking technologies are required that can deliver the quality of service required to ensure a high quality multimedia experience when distributing content throughout the home.

MARKET SIZING AND OUTLOOK

The home networking silicon market is still in its infancy as viable semiconductor solutions are only recently available. Although the market is small today it offers a tremendous growth opportunity given the large unit market that it addresses.

Home networking silicon is likely to be embedded into consumer electronic devices, such as Digital TVs and set-top-boxes, which would connect as part of a digital home network (Exhibit 3).

Exhibit 3 – Consumer electronic unit shipments: 2007 - 2011

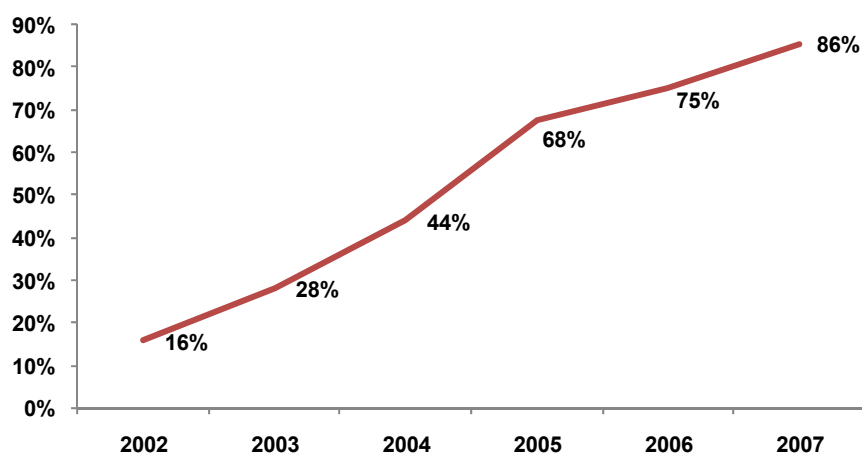
| (k units) | 2007 | 2008 | 2009 | 2010 | 2011 |
|---------------------------|----------------|----------------|----------------|----------------|----------------|
| PC | 254,883 | 285,740 | 312,900 | 354,100 | 399,050 |
| DVD Players | 124,778 | 122,980 | 119,760 | 114,800 | 108,900 |
| Set Top Boxes | 114,007 | 119,811 | 149,865 | 147,181 | 152,015 |
| Digital TV | 64,783 | 84,341 | 102,517 | 116,570 | 129,411 |
| Printers | 60,800 | 60,300 | 58,700 | 57,800 | 57,000 |
| Multifunction peripherals | 47,100 | 51,000 | 54,800 | 57,400 | 59,100 |
| External Hard Drives | 21,700 | 25,000 | 27,400 | 30,400 | 32,700 |
| Scanners | 16,300 | 14,100 | 11,900 | 10,500 | 9,200 |
| DVD Recorders | 16,002 | 18,150 | 20,300 | 22,400 | 24,320 |
| External DVD writers | 5,800 | 6,100 | 6,500 | 6,100 | 5,500 |
| Aggregate | 726,153 | 787,522 | 864,642 | 917,251 | 977,196 |

Source: In-stat, March 2008.

In-stat currently forecasts that the addressable unit market will grow from 726m unit shipments in 2007 to nearly 1bn unit shipments in 2011, representing a unit CAGR of 8% over the period.

Translating the unit opportunity into a dollar market forecasts is dependent upon home networking silicon penetration rates and silicon pricing. While it is difficult to forecast the adoption rate for a new market we can look at the trends experienced with Wi-Fi adoption in the PC market in estimating the potential rate of penetration and resultant market growth (Exhibit 4).

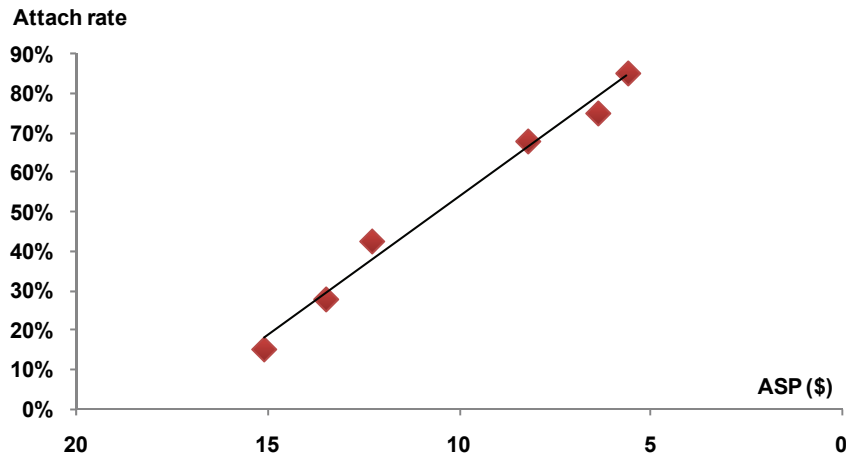
Exhibit 4: Wi-Fi penetration rate of PC market



Source: Gartner.

While penetration rate is a function of consumer pull it is also a function of silicon pricing and Exhibit 5 demonstrates a high correlation between Wi-Fi penetration of the PC (Laptop) market and the average selling price of Wi-Fi silicon.

Exhibit 5 -- Attach rate vs ASP (\$)



Source: In-stat, Gartner.

While the trends experienced in the Wi-Fi / laptop market are a useful proxy we believe that the penetration rate and resultant market growth of the home networking silicon market will differ as a result of the greater variance in the price sensitivity of the target consumer devices for digital home networking silicon.

For example a digital TV having multimedia home networking capability is redundant unless a set-top-box has the same capability. However, the price sensitivity of a set-top-box for adopting new silicon is greater than that of a digital TV. As such we believe that home networking silicon needs to achieve lower price points than its Wi-Fi equivalent in order to drive early penetration. However, once adopted the market should demonstrate a higher growth rate than that experienced in Wi-Fi.

CONCLUSIONS

We believe that the bandwidth, reach, and quality of service requirements for home networking means that wireline technologies, such as Powerline, Multimedia over Coax, Ethernet and Plastic Optical Fibre will be the backbone of the digital home network. We believe that low installation costs will help early adoption of Powerline and Multimedia over Coax solutions. However, they may fail to meet future bandwidth requirements, especially as Fibre To The Home becomes mass market. In contrast Ethernet and Plastic Over Fibre have the highest installation costs but have sufficient bandwidth to support future requirements and appear best placed to be the wireline technology of choice over the longer term. Wireless technologies do not provide the reach or quality of service to be a standalone home networking solution, in our view. However, WiFi and new standards such as Wireless HDMI bring flexibility and convenience to accessing data and are complimentary to a wireline backbone.

We believe that heterogeneous and complimentary environment will emerge where home networks are a combination of wired and wireless alternatives. Furthermore, the choice of which wired or wireless technology to use will come down to specific factors such as home structure, legacy cabling and personal preference.

While the exact structure of the end market remains unclear what is evident is that home networking is an immature market with tremendous growth potential addressing around 1bn end units in 2011. With a number of start-ups tackling the area we believe that one or two market leaders will emerge and are positioned to take significant market share.

SELECTED COMPANY PROFILES



Amimon provides wireless uncompressed high-definition video for universal connectivity consumer electronic video devices. Its WHDI uncompressed Wireless HD Interface allows flat-panel televisions and multimedia projectors to wirelessly interface to all HDTV video sources at a quality equivalent to that achieved with wired interfaces such as component video, DVI and HDMI.

Founded in 2004, Amimon is headquartered in Herzlia, Israel. Its investors include Argonaut Private Equity, Cedar Fund, Evergreen Venture Partners, Motorola Ventures, Stata Venture Partners and Walden Israel.



Celeno Communication develops component and subsystems for high performance wireless home networking entertainment delivery. Its technology enables the distribution of multiple HDTV, SDTV, VoIP and Data "triple play" services over the home network.

Founded in 2005, Celeno Communication is headquartered in Ra'anana, Israel. The company is backed by Cisco Systems Investment Arm, Greylock Partners, Miven Venture Partners and Pitango Venture Capital.



DS2 provides high speed semiconductor solutions for powerline communications, a technology that converts electricity wires into high speed networking media. It offers DSS9 family of ICs enables solutions for a range of market segments, including home media networks, in-building LANs and low to medium voltage PLC access networks.

Founded in 1998, Design of Systems on Silicon is based in Paterna, Spain. The company is backed by Empresa Nacional de Innovación and Endesa Net Factory.



Entropic Communications designs and develops system solutions that enable connected home entertainment over existing coax. The company is a founding member of MoCA, an organization that sets standards for the distribution of multimedia over coax. The company offers home networking, Broadband access, outdoor unit solution and TV tuner.

Founded in 2001, Entropic Communication is headquartered in California, USA. The company is backed by CMEA Ventures, Focus Ventures, Redpoint Ventures and Yas Broadband Ventures.



Firecomms develops high-speed photonic communication products for cars and home networks. It offers lasers and LEDs that enables low-cost, high-speed optical data transmission and data capture using visible light. Product includes VCSEL plastic Optical Fibre Gigabit transceiver and RCLED with speed up to 400 Mbps. The company has a strong R&D expertise and a close relationship with the Tyndall Institute, a European research institute for Information and Communications Technology.

Founded in 2000, Firecomms is headquartered in Cork, Ireland. The company is backed by ACT Venture, Alps Electric, Atlantic Bridge Ventures, Enterprise Ireland and Mentor Capital.



Gigle offers solution that enables the delivery of high-definition content and services anywhere in the home over the existing wiring such as powerline, coax and phone lines. The company has three product lines including homeplug (200Mbps), mediastream (1Gbps) and xtendnet (Intelligent networking).

Founded in 2005, Gigle is headquartered in Barcelona, Spain. The company is backed by Accel Partners, Pond Venture Partners and Scottish Equity Partners.



Intellon designs and sells integrated circuits for powerline communications. It provides HomePlug compliant and other powerline ICs for home networking, commercial and Smart Grid applications. The company targets home networking, media and entertainment systems connectivity as well as the convergence of PC and consumer electronics applications.

Founded in 1989, Intellon is headquartered in Orlando, Florida. Its investors include Comcast Interactive Capital, EnerTech Capital, Fidelity Capital, Fidelity Ventures, Goldman Sachs Group, Liberty Associated Partners, Summerhill Venture Partners and TL Ventures.



Miartech offers power line communication chips and energy solutions for industrial control and intelligent home environment. Its main product is the MI200E, a highly integrated powerline network interface controller chip.

Founded in 2004, Miartech is headquartered in Shanghai, China. The company is backed by California Clean Energy Fund, China Seed Ventures, DFJ DragonFund China, DragonVenture, Draper Fisher Jurvetson and Element Venture Partners.



Pulse~LINK provides high data rate wireless and wired solutions. The Cwave product line provides data rates up to a Gigabit per second over coax and wireless networks from the same chipset. It also supports simultaneous operation of 1394, Gigabit Ethernet and HDMI-equivalent connections with high data rate performance and end-to-end Quality of Service.

Founded in 2000, Pulse~LINK is headquartered in California, USA and backed by Commercial Facilities Company, Kuwait And Middle East Financial Investment, Kuwait Financial Centre SAKC, Kuwait Pipes Industries & Oil Services, Kuwait Real Estate Company, Mobile Telecommunications and National Investments Company .



SiBEAM develops RF CMOS semiconductors for the wireless industry. It offers wireless high definition based transmitter and receiver chipsets for various wireless communications platforms and devices, such as DVD players, set-top-boxes, and media center PCs.

Founded in 2004, SiBEAM is based in Sunnyvale, California. The company is backed by Foundation Capital, New Enterprise Associates and U.S. Venture Partners.



Ubicom develops media processor and software platforms that address the demands of real-time interactive applications and multimedia content delivery in the digital home. It serves original equipment manufacturers of wireless networking access products with its main stream engine 7000 processor.

Founded in 2005, Ubicom is headquartered in California, USA. Its investor includes Arcelik, August Capital, Cisco Systems, Gold Hill Capital Management, InveStar Capital, Investcorp Technology Partners, JatoTech Ventures, Kistler Associates, Lake Street Capital, Lantronix, Lehman Brothers Venture Partners, Levensohn Venture Partners, Mayfield Fund, MCP Global...

SECTOR VALUATIONS

Private placements

| Date | Company | Investors | Deal Size (\$m) | Business Description |
|------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------|
| 11/10/2008 | Celero Communications | Greylock Partners | na | Develops components for wifi systems and networks that enables wireless home networks to deliver hdtv streams |
| 07/28/2008 | Celero Communications | Greylock Partners, Pitango Venture Capital, Miven Venture Partners, Cisco Systems, Investment Arm | 16.0 | Develops components for wifi systems and networks that enables wireless home networks to deliver hdtv streams |
| 04/07/2008 | SiBEAM | Foundation Capital, New Enterprise Associates, U.S. Venture Partners | 40.0 | Offers wireless high definition based transmitter and receiver chipsets |
| 02/20/2008 | Amimon | Evergreen Venture Partners, Cedar Fund, Walden Israel, Motorola Ventures, Stata Venture Partners, , Argonaut Private Equity | 10.0 | Provides wireless uncompressed high-definition video for universal connectivity consumer electronic video devices |
| 02/19/2008 | Ubicom | August Capital, Mayfield Fund, JatoTech Ventures, Levensohn Venture Partners, Samsung Venture Investment Corporation, Lehman Brothers Venture Partners, Investcorp Technology Partners | 18.0 | Develops communications and media processor for content delivery in the digital home |
| 11/27/2007 | Gigle Semiconductor | Accel Partners, Scottish Equity Partners , Pond Venture Partners . | 20.0 | Develops system-on-chip integrated circuits for multimedia home networkin |
| 03/18/2007 | Celero Communications | Greylock Partners, Pitango Venture Capital | 14.2 | Develops components for wifi systems and networks that enables wireless home networks to deliver hdtv streams |
| 03/13/2007 | Amimon | Motorola Ventures | 2.0 | Provides wireless uncompressed high-definition video for universal connectivity consumer electronic video devices |
| 09/25/2006 | SiConnect | Dow Venture Capital, DFJ Esprit, TTP Venture Managers Limited, Prelude Trust | 5.32 | Provides home powerline communications technology |
| 08/22/2006 | SiBEAM | Foundation Capital, New Enterprise Associates, U.S. Venture Partners | 21.0 | Offers wireless high definition based transmitter and receiver chipsets |
| 08/14/2006 | Amimon | Evergreen Venture Partners, Cedar Fund, Walden Israel, Stata Venture Partners, , Argonaut Private Equity | 14.0 | Provides wireless uncompressed high-definition video for universal connectivity consumer electronic video devices |
| 04/19/2006 | Miartech (Shanghai) | Draper Fisher Jurvetson, DragonVenture, , Element Venture Partners | 6.0 | Develops power line communication chipsets |
| 04/04/2006 | Ubicom | August Capital, Mayfield Fund, JatoTech Ventures, Levensohn Venture Partners, Investcorp Technology Partners | 20.0 | Develops communications and media processor for content delivery in the digital home |
| 03/23/2006 | Gigle Semiconductor | Accel Partners, Pond Venture Partners . | 11.0 | Develops system-on-chip integrated circuits for multimedia home networkin |
| 03/06/2006 | SiConnect | DFJ Esprit, TTP Venture Managers Limited, Dow Chemical Co. (NYSE:DOW), Prelude Trust , Prelude Technology Management Services Limited | 4.9 | Provides home powerline communications technology |
| 11/22/2005 | CopperGate Communication | Tamir Fishman Ventures, Carmel Ventures, Motorola Ventures, Challenge Fund - Etgar L.P., The | 14.5 | Offers chipsets for the home networking and mdu/mtu broadband access markets |
| 06/07/2005 | SiBEAM | Foundation Capital, New Enterprise Associates, U.S. Venture Partners | 15.0 | Offers wireless high definition based transmitter and receiver chipsets |
| 01/16/2005 | Amimon | Evergreen Venture Partners, Cedar Fund, Walden Israel | 7.0 | Provides wireless uncompressed high-definition video for universal connectivity consumer electronic video devices |
| 12/01/2004 | Amimon | Evergreen Venture Partners, Cedar Fund, Walden Israel | 0.6 | Provides wireless uncompressed high-definition video for universal connectivity consumer electronic video devices |
| 06/13/2004 | CopperGate Communication | Tamir Fishman Ventures, Challenge Fund - Etgar L.P., The | 2.0 | Offers chipsets for the home networking and mdu/mtu broadband access markets |
| 04/27/2004 | Pulse-LINK | Mobile Telecommunications , Kuwait Pipes Industries & Oil Services Co. (KWSE:PIPE), Jamson Holdings, National Investments Company (K.S.C.C) (KWSE:NINV), Kuwait Real Estate Company (KWSE:KRE), Kuwait Financial Centre SAKC (KWSE:MARKAZ), Commercial Facilities Company (KWSE:FACL), International Financial Advisors, K.S.C. (KWSE:IFA), Kuwait And Middle East Financial Investment Co. (KWSE:KMEFIC) | 30.0 | Develops silicon with gigabit data rates for wired and wireless hd video distribution |
| 03/31/2004 | Ubicom | August Capital, Mayfield Fund, Vertex Venture Holdings, Walden International, JatoTech Ventures, Levensohn Venture Partners | 21.0 | Develops communications and media processor for content delivery in the digital home |

Source : Capital IQ

M&A transactions

| Date | Target | Buyers | Deal Size (\$m) | EV / Sales | EV / EBITDA | Business Description |
|------------|------------------------------------------------------------|-------------------------------------------------|-----------------|------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 10/28/2008 | Advanced Micro Devices Digital TV Business | Broadcom Corp (NasdaqGS:BRCM) | 141.5 | na | na | Designs and manufactures silicon and software solutions for integrated digital televisions |
| 10/03/2008 | Kenet | Intersil Corp (NasdaqGS:ISIL) | 35.6 | na | na | Offers solutions that are used in industrial instrumentation and wireless communications |
| 09/17/2008 | SIMTEK Corp | Cypress Semiconductor Corporation (NYSE:CY) | 44.0 | 1.4x | na | Designs high-speed, re-programmable, and nonvolatile memory used in networking and telecommunications equipment |
| 08/08/2008 | Conexant Systems Broadband Media Processing Business | NXP Semiconductors USA | 145.0 | 0.7x | na | Offers digital set top box components and solutions for cable and ip entertainment broadcasting networks |
| 06/30/2008 | Texas Instruments DSL Customer Premises Equipment Business | Infineon Technologies AG (XTRA:IFX) | na | na | na | Dsl business (high speed data communication through a digital subscriber line) |
| 04/03/2008 | Vativ Technologies | Entropic Communications, . (NasdaqGM:ENTR) | 43.8 | 77.0x | na | Provides high-bandwidth digital signal processing solutions for digital television and networking infrastructure |
| 01/24/2008 | Genesis Microchip | STMicroelectronics NV (ENXTPA:STM) | 328.8 | 0.8x | na | Develops integrated circuits that manipulates and processes digital video and graphic image |
| 08/27/2007 | Chipidea Microelectrónica SA | MIPS Technologies (NasdaqGS:MIPS) | 161.9 | 4.9x | na | Offers analog and mixed semiconductor solutions to wireless communications, digital media, and consumer electronics |
| 08/06/2007 | Centrality Communications | SIRF Technology Holdings (NasdaqGS:SIRF) | 286.8 | 13.3x | na | Delivers platform solutions for the navigation/information devices and systems |
| 07/31/2007 | LSI Corporation Consumer Products Business | Magnum Semiconductor, . | na | na | na | Provides digital media processing and silicon solutions which include, dvd recorder, hd set-top box |
| 06/30/2007 | RF Magic | Entropic Communications, . (NasdaqGM:ENTR) | na | na | na | Develops radio frequency systems on chip integrated circuits |
| 05/29/2007 | Octalica | Broadcom Corp. (NasdaqGS:BRCM) | 30.8 | na | na | Provides networking solutions for digital home entertainment market |
| 04/18/2007 | FCI, Inc. | Silicon Motion Technology Corp. (NasdaqNM:SIMO) | 102.0 | na | na | Provides integrated semiconductor solutions for wireless communications. |
| 04/02/2007 | Agere Systems | LSI Corporation (NYSE:LSI) | 4,274.8 | 2.5x | 18.9x | Provides integrated circuit solutions for storage, mobile wireless communications, and enterprise and telecommunications networks applications |
| 01/05/2007 | PortalPlayer | NVIDIA Corporation (NasdaqGS:NVDA) | 361.4 | 0.8x | 5.7x | System-on-chip and software for manufacturers of feature-rich personal media players and notebook computers |
| 12/01/2006 | RF Micro Devices Inc | QUALCOMM Inc. (NasdaqNM:QCOM) | 39.0 | na | na | Bluetooth technology assets of rf micro devices inc |
| 12/13/2005 | Blue7 Communications | Sigma Designs Inc. (NasdaqNM:SIGM) | 14.6 | 29.2x | na | Develops ultra wideband-wireless system-on-a-chip integrated circuits for the consumer electronics |

Source : Capital IQ

Analyst Profiles

GP Bullhound is a research centric investment bank headquartered in London with offices in San Francisco.



Paul Rutherford – Prior to GP Bullhound, Paul worked for ABN AMRO as an equity research analyst focused on the semiconductor and semiconductor equipment sectors. Here he authored in-depth industry and company specific investment reports for a range of institutional clients as well as working on the research side of a number of transactions.



Christian Lagerling – Christian is a co-founder of GP Bullhound. He previously worked in the Corporate Finance department of BZW/Barclays Capital. Prior to Barclays, Christian worked as a research analyst for Connecta, a Scandinavian management consultancy. Christian completed his degree in Economics and Finance at the London School of Economics followed by an MSc Finance at the Stockholm School of Business



Remy Valette – Prior to GP Bullhound, Remy worked as an M&A analyst at Societe Generale covering a number of industrial sectors. He holds a Masters in Corporate Finance from EM Lyon Business School and also a Master in applied Physics from Paris VII University.

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