MAGNACHIP SEMICONDUCTOR LLC
Form 10-K
March 31, 2008
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UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

(Mark one)

x Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934
For the fiscal year ended December 31, 2007

or

¨ Transition Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934
For the transition period from to .

Commission file number 333-126019-09

MAGNACHIP SEMICONDUCTOR LLC

(Exact name of Registrant as specified in its charter)

Delaware	83-0406195
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

c/o MagnaChip Semiconductor S.A.

74, rue de Merl, B.P. 709, L-2017

Luxembourg, Grand Duchy of Luxembourg	Not Applicable
(Address of principal executive offices)	(Zip Code)

Registrant s telephone number, including area code: (352) 45-62-62

Securities registered pursuant to Section 12(b) of the Act: None.

Securities registered pursuant to Section 12(g) of the Act: None.

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ¨ No x

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes x No ¨

Note Checking the box above will not relieve any registrant required to file reports pursuant to Section 13 or 15(d) of the Exchange Act from their obligations under those Sections.

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes x No ¨

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant s knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. x

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of accelerated filer, large accelerated filer, accelerated filer and smaller reporting company in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer ¨	Accelerated filer ¨	Non-accelerated filer x (Do not check if a smaller reporting company)	Smaller reporting company ¨

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ¨ No x

State the aggregate market value of the voting and non-voting common equity held by non-affiliates computed by reference to the price at which the common equity was last sold, or the average bid and asked price of such common equity, as of the last business day of the registrant s most recently completed second fiscal quarter. **Not applicable.**

As of December 31, 2007, the registrant had 52,844,222 of the registrant s common units outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

None.

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Supplemental Information to be Furnished With Reports Filed Pursuant to Section 15(d) of the Act by Registrants Which Have Not Registered Securities Pursuant to Section 12 of the Act.

No annual report or proxy statement, form of proxy or other proxy soliciting material with respect to any annual or other meeting of security holders has been sent to security holders.

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MAGNACHIP SEMICONDUCTOR LLC

2007 FORM 10-K ANNUAL REPORT

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PART I

INDUSTRY AND MARKET DATA

In this report, we rely on and refer to information regarding the semiconductor market from iSuppli Corporation, or iSuppli, and Gartner, Inc., or Gartner. Market data attributed to iSuppli is from Application Market Forecast Tool Worldwide Q2 2007 and market data attributed to Gartner is from Gartner Semiconductor Forecast Worldwide: Forecast Database November 28, 2007. Although we believe that this information is reliable, we have not independently verified it. We do not have any obligation to announce or otherwise make publicly available updates or revisions to forecasts contained in these documents. In addition, in many cases, we have made statements in this report regarding our industry and our position in the industry based on our experience in the industry and our own investigation of market conditions.

The Gartner report described herein represents data, research opinion or viewpoints published, as part of a syndicated subscription service available only to clients, by Gartner, Inc., a corporation organized under the laws of the State of Delaware, USA, and its subsidiaries, and is not a representation of fact. The Gartner report does not constitute a specific guide to action. Each Gartner report speaks as of its original publication date (and not as of the date of this report) and the opinions expressed in the Gartner report are subject to change without notice. Although we believe that this report is reliable, we have not independently verified the information contained in it.

In this report, the terms we, us, our and MagnaChip refer to MagnaChip Semiconductor LLC and its consolidated subsidiaries and the term Korea refers to the Republic of Korea or South Korea.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

Information concerning us is subject to risks and uncertainties. Forward-looking statements give our current expectations and projections relating to our financial condition, results of operations, plans, objectives, future performance and business. These statements can be identified by the fact that they do not relate strictly to historical or current facts. These statements may include words such as anticipate, estimate, expect, project, intend, plan, believe and other words and terms of similar meaning in connection with any discussion of the timing or nature of future operating or financial performance or other events. All statements other than statements of historical facts included in this report that address activities, events or developments that we expect, believe or anticipate will or may occur in the future are forward-looking statements.

These forward-looking statements are largely based on our expectations and beliefs concerning future events, which reflect estimates and assumptions made by our management. These estimates and assumptions reflect our best judgment based on currently known market conditions and other factors relating to our operations and business environment, all of which are difficult to predict and many of which are beyond our control. Although we believe our estimates and assumptions to be reasonable, they are inherently uncertain and involve a number of risks and uncertainties that are beyond our control. In addition, management s assumptions about future events may prove to be inaccurate. Management cautions all readers that the forward-looking statements contained in this report are not guarantees of future performance, and we cannot assure any reader that those statements will be realized or the forward-looking events and circumstances will occur. Actual results may differ materially from those anticipated or implied in the forward-looking statements due to the factors listed in this section, the Risk Factors, Management s Discussion and Analysis of Financial Condition and Results of Operations and Business sections and elsewhere in this report and listed below:

- the cyclical nature of the semiconductor industry may limit our ability to maintain or increase net sales and profit levels during industry downturns;
- customer demand is difficult to accurately forecast;
- our customers may cancel their orders, reduce quantities or delay production;

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a significant portion of our sales comes from a relatively limited number of customers;

our industry is highly competitive;

a decline in average selling prices of our products could decrease our profits;

growth in the consumer electronics and other end markets for our products is an important component in our success;

we depend on successful technological advances for growth;

we may not be able to attract or retain the technical or management employees necessary to remain competitive in our industry;

if we encounter future labor problems, we may fail to deliver our products in a timely manner which could adversely affect our revenues and profitability;

we have a history of losses and may not become profitable in the future;

the improvements and innovations we expect from our research and development efforts may not materialize; and

the costs of our raw materials may increase materially.

All forward-looking statements speak only as of the date of this report. We do not intend to publicly update or revise any forward-looking statements as a result of new information or future events or otherwise, except as required by law. These cautionary statements qualify all forward-looking statements attributable to us or persons acting on our behalf.

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Item 1. Business.

BUSINESS

Recent Events

On November 14, 2007, we filed a registration statement on Form S-1 (file no. 333-147388) with the Securities and Exchange Commission in connection with the initial public offering of shares of common stock of MagnaChip Semiconductor Corporation, which we refer to in this report as the proposed public offering. If the proposed public offering occurs, a corporate reorganization, which we refer to in this report as the proposed corporate reorganization, will occur immediately prior to such offering pursuant to which a wholly owned subsidiary of MagnaChip Semiconductor Corporation will be merged with and into MagnaChip Semiconductor LLC, after which MagnaChip Semiconductor LLC will become a wholly owned subsidiary of MagnaChip Semiconductor Corporation. Pursuant to the proposed corporate reorganization, all of the outstanding common units of MagnaChip Semiconductor LLC will be exchanged for shares of MagnaChip Semiconductor Corporation common stock, all of the outstanding Series B preferred units of MagnaChip Semiconductor LLC will be exchanged at the option of the holder for either shares of MagnaChip Semiconductor Corporation Series B preferred stock or common stock, and all of the outstanding options to purchase common units of MagnaChip Semiconductor LLC will be exchanged into options to purchase shares of MagnaChip Semiconductor Corporation common stock. There can be no assurance that the proposed corporate reorganization or the proposed public offering will occur in the near future, or at all.

Overview

MagnaChip is a Korea-based designer and manufacturer of analog and mixed-signal semiconductor products for high volume consumer applications, such as mobile phones, digital televisions, flat panel displays, notebook computers, mobile multimedia devices and digital cameras. We believe we have one of the broadest and deepest analog and mixed-signal semiconductor technology platforms in the industry, supported by our 28-year operating history, large portfolio of approximately 6,100 novel registered and pending patents and extensive engineering and manufacturing process expertise. Our wide variety of analog and mixed-signal semiconductor products and services combined with our deep technology platform allows us to address multiple high growth end markets and to develop and introduce new products quickly. Our substantial manufacturing operations in Korea and design centers in Korea and Japan provide us with proximity to the global consumer electronics supply chain. We believe this enables us to quickly respond to our customers needs and allows us to better service and capture additional demand from existing and new customers.

We have a long history of supplying and collaborating on product and technology development with leading innovators in the consumer electronics market. Some of our largest customers by revenue include LG.Philips LCD Co., Ltd., Sharp Corporation and members of the Samsung group. We sold over 2,250 distinct products to over 200 customers in the year ended December 31, 2007, with a substantial portion of our revenues nonetheless derived from a concentrated number of customers, including LG.Philips LCD, Sharp and Samsung. Our largest semiconductor manufacturing services customers include some of the fastest growing and leading semiconductor companies that design products for the consumer, computing, wireless and industrial end markets. As a result, we have been able to strengthen our technology platform and focus on products and services that are in high demand by our customers and end consumers.

Our business was named MagnaChip Semiconductor when it was acquired from Hynix Semiconductor, Inc., or Hynix, in October 2004 by Citigroup Venture Capital Equity Partners, L.P., Francisco Partners L.P., certain investment funds advised by CVC Asia Pacific Limited or its affiliates, certain members of management and other investors. In this report, we refer to these entities as Court Square, Francisco Partners and CVC Asia Pacific and, collectively, as the sponsors and to this acquisition as the Original Acquisition.

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Market Opportunity

The consumer electronics market is large and growing rapidly. This market includes mobile communications and entertainment devices such as digital televisions, mobile phones, flat panel displays, notebook computers, mobile multimedia devices and digital cameras. We believe that we address market segments with a higher growth rate than the overall consumer electronics market. For example, from 2006 to 2011 the worldwide third-generation mobile phone, liquid crystal display, or LCD, television and notebook computer market segments are expected to grow at compound annual unit growth rates of 28%, 27% and 24%, respectively, according to Gartner. We believe this growth will be driven largely by consumers seeking to enjoy greater availability of rich media content, such as digital and high definition audio and video, mobile television, games and digital photography. In order to address and further stimulate consumer demand, electronics manufacturers have been driving rapid advances in technology, functionality, form factor, cost, quality, reliability and power consumption of electronic devices. With these technological advancements, many electronic devices now display high resolution content, capture images, play digital audio and video and use power efficiently.

We believe that consumer electronics manufacturers recognize that the user experience plays a critical role in differentiating their products from competing offerings. This user experience is defined in part by the quality of the display, audio and video processing capabilities and power efficiency of a particular electronic product. Analog and mixed-signal semiconductors enable and enhance these device capabilities. Examples of such analog and mixed-signal semiconductors include display drivers, timing controllers, image sensors, power management voltage regulators, converters, audio coding or decoding devices, or codecs, interface circuits and radio frequency, or RF, components. According to iSuppli Corporation the market opportunity for semiconductors used in consumer electronics, wireless communications and data processing applications is expected to rise to $260 billion in 2010, of which we believe we will have an addressable market opportunity of $63 billion.

Design and manufacture of analog and mixed-signal semiconductors used in consumer electronics are highly complex. In order to grow and succeed in the industry, we believe semiconductor suppliers need to have a broad, advanced intellectual property portfolio, product design expertise, comprehensive product offerings and specialized manufacturing process technologies and capabilities.

Challenges Facing Our Customers

We believe our target customers are looking for suppliers of analog and mixed-signal semiconductor products and services who can help them:

Differentiate products through advanced features and functions. Our target customers seek to differentiate their end products by employing innovative semiconductor products. They seek to closely collaborate with semiconductor suppliers that can provide advanced products, technologies, and manufacturing processes that enable advanced features and functions, such as bright and thin displays, small form factor and energy efficiency.

Accelerate new product introduction. As a result of rapid technological advancements and short product lifecycles, our target customers typically prefer suppliers who have a rich pipeline of new products and can leverage a substantial intellectual property and technology base to accelerate product design and manufacturing when needed.

Ensure speed and stability of supply. Our customers often face rapid product adoption. Inability to meet this demand can dramatically impact their profitability and market share. As a result, they need suppliers who can increase production quickly and meet demand consistently through periods of constrained industry capacity.

Provide environmentally friendly products. Consumers increasingly seek environmentally friendly and energy efficient products. In addition, there is increasing regulatory focus on reducing energy consumption of electronic products. As a result, our customers are seeking analog and mixed-signal semiconductor suppliers that have the technological expertise to deliver solutions that satisfy these ever increasing regulatory and consumer demands.

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Deliver cost competitive solutions. Electronics manufacturers are under constant pressure to deliver cost competitive solutions. To accomplish this objective, they need strategic suppliers that have the ability to provide system-level solutions and more integrated products, a broad product offering at a range of price points and the design and manufacturing infrastructure and logistical support to deliver cost competitive products.

Our Competitive Strengths

Our competitive strengths enable us to offer our customers solutions to solve their key challenges. We believe our strengths include:

Leading analog and mixed-signal semiconductor technology platform. We believe we have one of the broadest and deepest analog and mixed-signal semiconductor technology platforms in the industry. Our long operating history, large patent portfolio, extensive engineering and manufacturing process expertise and wide selection of analog and mixed-signal intellectual property libraries allow us to leverage our technology across multiple end markets. This, in turn, allows us to develop and introduce new products quickly as well as to integrate numerous functions into a single product. For example, we were one of the first companies to introduce a commercial active matrix organic light emitting diode, or AMOLED, display driver for mobile phones. Further, we have introduced an integrated image sensor with digital auto focus technology, combining signal processing capabilities with specialized optics to achieve superior system performance in a single chip solution.

Established relationships and close collaboration with leading global electronics companies. We have a long history of supplying and collaborating on product and technology development with leading innovators in the consumer electronics market, such as LG.Philips LCD, Sharp and Samsung. As a result, we have further strengthened our technology platform and focus on those products and services that our customers and end consumers demand. We believe our close contact with customers enhances our visibility into new product opportunities, markets and technology trends.

Comprehensive product and service offerings. We continue to develop a wide variety of analog and mixed-signal semiconductor solutions for multiple high growth consumer end markets. We believe our expanding product and service offerings allow us to provide additional products to new and existing customers and to cross-sell our products and services to our established customers.

Distinctive process technology expertise and manufacturing capabilities. We have developed specialty analog and mixed-signal manufacturing processes such as high voltage complementary metal oxide semiconductor, or CMOS, power and embedded memory. These processes enable us to manufacture highly integrated, high performance analog and mixed-signal semiconductors. As a result of the depth of our process technology, captive manufacturing facilities and customer support capabilities, we believe the majority of our top twenty manufacturing services customers by revenue currently use us as their primary manufacturing source for the products that we manufacture for them.

Longstanding presence in Asia. Our substantial manufacturing operations in Korea and design centers in Korea and Japan provide proximity to many of our largest customers and to the core of the global consumer electronics supply chain. We have active local applications, engineering and product design support as well as senior management and marketing resources in geographic locations close to our customers. This allows us to strengthen our relationship with customers through better service, faster turnaround time and improved product design collaboration. We believe this also helps our customers to deliver products faster than their competitors and to solve problems more efficiently than would be possible with other suppliers.

Highly efficient manufacturing capabilities. Our manufacturing strategy is focused on maintaining the price competitiveness of our products and services through our low cost operating structure. We believe the location of our primary manufacturing and research and development facilities in Asia provides us with a number of cost advantages as compared to operating in other regions in the world.

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We offer specialty analog process technologies that do not require substantial investment in leading edge, smaller geometry process equipment. We are able to utilize our manufacturing base over an extended period of time and thereby minimize our capital expenditure requirements. Our internal manufacturing facilities serve both our solutions products and manufacturing services customers, allowing us to optimize our asset utilization and improve our operational efficiency.

Our Strategy

Our objective is to grow our business and enhance our position as a leading provider of analog and mixed-signal semiconductor products and services for high volume consumer applications. Our business strategy emphasizes the following key elements:

Leverage our leading analog and mixed-signal technology platform. We intend to continue to utilize our extensive patent and technology portfolio and specific end-market applications expertise to deliver products with high levels of performance and integration to customers. We also intend to utilize our systems expertise to extend our product and service offerings within our target end markets. For example, we have utilized our extensive patent portfolio, process technologies and analog and mixed-signal technology platform to develop power management solutions that we expect will expand our market opportunity and address more of our customers needs.

Continue to innovate and deliver new products and services. We intend to leverage our deep knowledge of our customers needs, as well as our analog and mixed-signal design and manufacturing expertise, to design and develop innovative products and offer specialized manufacturing services. We continue to invest in research and development to introduce new technologies such as AMOLED display drivers. We are also currently developing innovative image sensors featuring backside illumination technology that we expect will offer improved light sensitivity performance at high resolutions. In manufacturing services, we are developing cost-effective processes that substantially reduce die size using deep trench isolation.

Increase business with existing customers. We have a global customer base consisting of leading consumer electronics original equipment manufacturers, or OEMs, who sell into multiple end markets. We intend to continue strengthening our relationships with our customers by collaborating on critical design and product development in order to improve our success in achieving design wins. We will seek to increase our customer penetration by taking advantage of our broad product portfolio and existing relationships to sell more existing and new products. For example, after initially providing image sensors to one of our key customers, we now also provide mobile and large display driver solutions and plan to provide additional solutions, such as power management, over time.

Broaden our customer base. We expect to continue to expand our global design centers, local application engineering support and sales presence, particularly in China, Hong Kong, Taiwan and Macau, or collectively, Greater China, and other high growth geographies, to penetrate new accounts. In addition, we intend to introduce new products and variations of existing products to address a broader customer base. For example, while we are initially targeting our existing customers with power management solutions, we expect to access a variety of distribution channels to broaden the customer base for these solutions over time.

Drive execution excellence. We have significantly improved our execution through a number of management initiatives implemented since the hiring of our Chief Executive Officer and Chairman, Sang Park, in 2006. As an example, we have introduced new processes for product development, customer service and personnel development. We expect these ongoing initiatives will improve our new product development and customer service as well as lead to a culture of quick action and execution by our workforce. As a result of our focus on execution excellence, we have meaningfully reduced our time from new product definition to development completion, and the proportion of our revenue derived from products introduced in the prior twelve months was approximately 33% greater during the year ended December 31, 2007 than in the comparable period of 2006.

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Optimize asset utilization and return on capital investments. We intend to keep our capital expenditures relatively low by maintaining our focus on specialty process technologies that do not require substantial investment in leading edge manufacturing equipment. By utilizing our manufacturing facilities for both our solutions products and our manufacturing services customers, we will seek to optimize returns on our capital investments.

Our Technology

We continuously strengthen our leading analog and mixed-signal semiconductor technology platform by developing innovative technologies that enhance the functionality of consumer electronics products through brighter displays, enhanced image quality, smaller form factor and longer battery life. We seek to further build our technology platform through proprietary research and development and selective licensing and acquisition of complementary technologies, as well as disciplined process improvements in our manufacturing operations. Our goal is to leverage our experience and development initiatives across multiple end markets and utilize our understanding of system-level issues our customers face to introduce new technologies that enable our customers to develop more advanced, higher performance products.

Our display technology portfolio includes building blocks for display drivers and timing controllers, processor and interface technologies, as well as sophisticated production techniques, such as chip-on-glass, or COG, which enables the manufacture of thinner displays. Our advanced display drivers incorporate low temperature polysilicon, or LTPS, and AMOLED panel technologies that enable the highest resolution displays. Furthermore, we are developing a robust intellectual property portfolio to improve the power efficiency of displays, for example, our smart mobile luminance control, or SMLC, algorithm.

Our image sensor technology portfolio and development are centered on advanced pixel technologies and specialized manufacturing processes that increase light sensitivity and enable more integrated, thinner form factor image sensors. Our technology portfolio includes advanced algorithms, such as extended depth of field, or eDoF, and digital auto focus that enable significant image quality improvements.

We have a long history of specialized process technology development and have a number of distinctive process implementations. We have over 170 process flows we can utilize for our products and offer to our semiconductor manufacturing services customers. Our process technologies include standard CMOS, high voltage complementary metal-oxide semiconductor, or HVCMOS, ultra-low leakage HVCMOS, and bipolar complementary double-diffused metal oxide semiconductor, or BCDMOS. Our manufacturing processes incorporate embedded memory solutions such as static random access memory, or SRAM, one-time programmable, or OTP, memory, electronically erasable programmable read only memory, or EEPROM, and single-transistor random access memory, or 1TRAM. More broadly, we focus extensively on processes that reduce die size across all of the products we manufacture, in order to deliver cost effective solutions to our customers.

Expertise in high voltage and deep trench CMOS process technologies, low power analog and mixed-signal design capabilities and packaging know-how are key requirements in the power management market. We are currently leveraging our capabilities in these areas to enter the power management market with products such as DC-DC converters, linear regulators, including linear low drop out, or LDO, regulators and analog switches, and power metal oxide semiconductor field effect transistors, or MOSFETs. We believe our system level understanding of applications such as LCD TVs and mobile phones will allow us to more quickly develop and customize power management solutions for our customers in these markets.

Our Products and Services

Our broad portfolio of products and services addresses multiple high growth, consumer-focused end markets. A key component of our product strategy is to supply multiple related product and service offerings to each of the end markets that we serve.

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Display Solutions

Display Driver Characteristics. Display drivers deliver defined analog voltages and currents that activate pixels to exhibit images on displays. The following key characteristics determine display driver performance and end-market application:

Resolution and Number of Channels. Resolution determines the level of detail displayed within an image and is defined by the number of pixels per line multiplied by the number of lines on a display. For large displays, higher resolution typically requires more display drivers for each panel. Display drivers that have a greater number of channels, however, generally require fewer display drivers for each panel and command a higher selling price per unit. Mobile displays, conversely, are typically single chip solutions designed to deliver a specific resolution. We cover resolutions ranging from QQVGA (160RGB x 120) to HVGA (320RGB x 480).

Color Depth. Color depth is the number of colors that can be displayed on a panel. For example, for TFT-LCD panels, 262 thousand colors are supported by 6-bit source drivers; 16 million colors are supported by 8-bit source drivers; and 1 billion colors are supported by 10-bit and 12-bit source drivers.

Operational Voltage. Display drivers are characterized by input and output voltages. Source drivers typically operate at input voltages from 2.0 to 3.6 volts and output voltages between 4.5 and 18 volts. Gate drivers typically operate at input voltages from 2.0 to 3.6 volts and output voltages of up to 40 volts. Lower input voltage results in lower power consumption and electromagnetic interference, or EMI.

Gamma Curve. The relationship between the light passing through a pixel and the voltage applied to the pixel by the source driver is referred to as the gamma curve. The gamma curve of the source driver can correct some imperfections in picture quality in a process generally known as gamma correction. Some advanced display drivers feature up to three independent gamma curves to facilitate this correction.

Driver Interface. Driver interface refers to the connection between the timing controller and the display drivers. Display drivers increasingly require higher bandwidth interface technology to address the larger data transfer rate necessary for higher definition images. The principal types of interface technologies are transistor-to-transistor logic, or TTL, reduced swing differential signaling, or RSDS, low current differential signaling, or LCDS, and mini-low voltage differential signaling, or mLVDS.

Package Type. The assembly of display drivers typically uses chip-on-film, or COF, tape carrier package, or TCP, and COG package types.

Mobile Display Solutions. Our mobile display solutions incorporate the industry s most advanced display technologies, such as LTPS and AMOLED, as well as high volume technologies such as amorphous silicon, a-Si, TFT. Our mobile display products offer specialized capabilities, including high speed serial interfaces, such as mobile display digital interface, or MDDI, and mobile industry processor interface, or MIPI, as well as multi-time programmable, or MTP, memories, using EEPROM and logic-based OTP memory. Further, we are building a distinctive intellectual property portfolio that allows us to provide features that reduce power consumption, such as smart mobile luminance control, or SMLC, ambient light-based brightness control, or LABC, automatic brightness control, or ABC, and automatic current limit, or ACL. This intellectual property portfolio will also support our power management product development initiatives, as we leverage our system level understanding of power efficiency.

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The following table summarizes the features of our products, both in mass production and in development, for mobile displays:

Product	Key Features	Applications
LTPS	Resolutions of QQVGA, QCIF+, QVGA, WQVGA	Mobile phones
	Color depth ranging from 65 thousand to 16 million	PDAs
	Geometries of 0.13μm to 0.18μm	Digital cameras
	MDDI interface	
	MTP (EEPROM and logic-based OTP)	
AMOLED	Resolutions of QVGA, WQVGA	Mobile phones
	Color depth ranging from 262 thousand to 16 million	Portable multimedia players
	Geometries of 0.13μm to 0.15μm	PDAs
	MDDI interface	
	MTP (EEPROM and logic-based OTP)	
	ABC, ACL	
a-Si TFT	Resolutions of QCIF+, QVGA, WQVGA, HVGA	Mobile phones
	Color depth ranging from 262 thousand to 16 million	Game consoles
	Geometries of 0.13μm to 0.35μm	Navigation devices
	MDDI, MIPI Interface	
	1T RAM and MTP (EEPROM and logic-based OTP)	
	ABC, SMLC and LABC	
	Embedded touch screen controller	
	Wide view angle support	
	Separated gamma control	

Large Display Solutions. We provide display solutions for a wide range of large panel display sizes used in digital televisions, including high definition televisions, or HDTVs, LCD monitors and notebook computers.

Our large display solutions include source and gate drivers and timing controllers with a variety of interfaces, voltages, frequencies and packages to meet customers needs. These products include advanced technologies such as high channel count, with products under development to provide up to 720 channels. We also offer a distinctive interface technology known as LCDS, which supports thinner displays for notebook computers. Our large display solutions are designed to allow customers to cost effectively meet the increasing demand for high resolution displays. We focus extensively on reducing the die size of our large display drivers and other solutions products and have recently introduced a number of new large display drivers with reduced die size.

The table below sets forth the features of our products, both in mass production and in development, for large-sized displays:

Product	Key Features	Applications
TFT-LCD Source Drivers	384 to 720 output channels	LCD monitors, including widescreens
	6-bit (262 thousand colors), 8-bit (16 million colors), 10-bit and 12-bit (1 billion colors)	Notebook computers
	Output voltage ranging from 4.5V to 18V	Digital televisions, including HDTVs
	Input voltage ranging from standard 2.0V to 3.6V	
	Low power consumption and low EMI	
	Supports COF, TCP and COG package types	
	Supports RSDS, LCDS, and mLVDS interface technologies	
	Geometries of 0.18μm to 0.3μm	

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Product	Key Features	Applications
TFT-LCD Gate Drivers	240 to 540 output channels Output voltage ranging up to 40V Input voltage ranging from standard 2.0V to 3.6V Supports COF and COG package types Geometries of 0.35µm to 0.6µm	LCD monitors, including widescreens Notebook computers Digital televisions, including HDTVs
Timing Controllers	Product portfolio supports a wide range of resolutions Supports TTL, mLVDS, RSDS, LCDS interface technologies Input voltage ranging from 3.6V to 2.3V Geometries of 0.25µm to 0.6µm	LCD monitors Notebook computers

Power Solutions

We have begun marketing a new line of power management solutions. Our initial power management products include MOSFETs, DC-DC converters and linear regulators, such as LDOs and analog switches. We have samples available, including a single LDO regulator, analog switch for USB 2.0, and both a 30 and 40-volt Trench MOSFET.

These initial products are designed for applications such as mobile phones and LCD televisions and allow electronics manufacturers to achieve specific design goals of high efficiency and low standby power consumption. For mobile device applications, our product design is focused on improving battery life, while for LCD televisions, we have focused our product design on controlling and reducing standby power consumption. We believe that our power management solutions will enable customers to increase system stability and reduce heat dissipation and energy use, resulting in cost savings for our customers and consumers, as well as environmental benefits.

Going forward, we expect to expand our power management product portfolio through the addition, for example, of more advanced DC-DC products. Our initial products are designed for production on our eight-inch manufacturing lines, which, in addition to increasing fab utilization, is expected to allow us to offer products at a competitive cost as compared to many currently available products. Further, we have begun building our direct and indirect sales network for our new power solutions to facilitate product distribution and have partnered with specialized packaging providers to deliver optimized, total solutions to our customers.

Imaging Solutions

We provide image sensors for large and rapidly growing camera-equipped applications, such as mobile handsets, PCs, digital cameras, notebook computers and security cameras. Our image sensors are designed to provide brighter, sharper and more colorful image quality for use primarily in applications that require a small form factor, low power consumption and high sensitivity in a variety of light conditions. Our captive manufacturing capabilities enable us to continuously refine our CMOS process and pixel technology to deliver improved image-capture sensitivity and accuracy.

Our CMOS image sensors are characterized by a high level of integration. Many CMOS image sensor systems are made up of at least two integrated circuits, including the CMOS image sensor itself and a separate image signal processor, or ISP. With the continuing demand for ever smaller camera-enabled devices, small size

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without performance degradation has become an increasingly important requirement for manufacturers of camera phones and similar products. Our products meet this demand for smaller form factor by integrating both our proprietary image sensor and an image signal processor, or ISP, onto a single chip, thus occupying approximately half of the space required by conventional multiple chip solutions, while providing equivalent, or even superior, image quality with lower power consumption and a lower overall cost.

The choice of image sensor products by our customers may involve many factors such as light sensitivity, resolution, size of device, packaging and integration level. Our image sensors are available in multiple package types as well as with various levels of integration, ranging from stand alone image sensors to SoC solutions that integrate ISP and eDoF technologies, so as to service a broad range of customer needs.

Image sensor products are classified by resolution, which determines the visual detail in the image. As the size of the pixel decreases, smaller devices can be produced with higher resolution. Image sensors are comprised of an array of pixels. The pixel size and optical format, which is the size of the image area, determine the size of the pixel array. Smaller optical formats and pixel sizes enable higher resolutions without increasing device size. Our image sensors range from VGA devices at one end of the resolution spectrum up to 3.2 MP at the other.

The table below sets forth the key products and features of our image solutions currently either in mass production or development.

Resolution	Key Features	Applications
VGA (640 x 480)	Pixel size: 5.04μm to 2.2μm	PC cameras
	Optical format: 1/4 to 1/10	Mobile phones
		Notebook computers
		Surveillance devices
1.3 MP (1280 x 1024)	Pixel size: 3.6μm to 2.8μm	Mobile phones
	Optical format: 1/3 to 1/5	Notebook computers
		Digital cameras
		Surveillance devices
2.1 MP (1600 x 1200)	Pixel size: 2.2μm	Mobile phones
	Optical format: 1/4	Notebook computers
3.2 MP (2048 x 1536)	Pixel size: 2.2μm to 1.75μm	Mobile phones
	Optical format: 1/3.2 to 1/4	Digital cameras

Semiconductor Manufacturing Services

We provide semiconductor manufacturing services to analog and mixed-signal semiconductor companies. We have over 170 process flows we offer to our manufacturing services customers. We also often partner with key customers to jointly develop or customize specialized processes that enable our customers to improve their products and allow us to develop unique manufacturing expertise.

Our manufacturing services offering is targeted at customers who require differentiated, specialty analog and mixed-signal process technologies such as high voltage CMOS, embedded memory and power. We refer to our approach of delivering specialized services to our customers as our application-specific technology, or AS Tech, strategy. We differentiate ourselves through the depth of our intellectual property portfolio, ability to customize process technology to meet the customers requirements effectively, long history in this business and reputation for excellence.

Our semiconductor manufacturing services customers typically serve high growth and high volume applications in the consumer, computing, wireless and industrial end markets. We strive to be the primary manufacturing source for our foundry customers.

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Process Technology Overview

Mixed-Signal. Mixed-signal process technology is used in devices that require conversion of light and sound into electrical signals for processing and display. Our mixed-signal processes include advanced technologies such as triple gate, which uses less power at any given performance level.

Power. Power process technology, such as modular BCD, includes high voltage capabilities as well as the ability to integrate functionality such as self-regulation, internal protection, and other intelligent features.

High Voltage CMOS. High voltage CMOS process technology facilitates the use of high voltage levels in conjunction with smaller transistor sizes. This process technology includes several variations, such as bipolar processes, which use transistors with qualities well suited for amplifying and switching applications, mixed mode processes, which incorporate denser, more power efficient FETs and thick metal processes.

Non-Volatile Memory (NVM). Non-volatile memory process technology enables the integration of non-volatile memory cells that allow retention of the stored information even when power is removed from the circuit. This type of memory is typically used for long-term persistent storage.

Microelectromechanical Systems (MEMS). MEMS process technology allows the manufacture of components that use electrical energy to generate a mechanical response. For example, MEMS devices are used in the earpieces of mobile phones.

The table below sets forth the key process technologies in semiconductor manufacturing services currently in mass production or development.

Process	Technology	Device	End Markets
Mixed-signal	0.16-0.8μm	Analog to digital converter	Consumer
	Multipurpose	Digital to analog converter	Industrial
	Triple gate	CODEC	Wireless
		DVD chipset	Computing
Power	0.18-0.6μm	Power management	Consumer
	40V-80V	Power over Ethernet	Wireless
	Analog	LED drivers	Computing
	Modular BCD		
	BCD		
	Deep Trench		
	Trench MOSFET		
High Voltage CMOS	0.13-0.8μm	Display drivers	

	18V-200V
	Multiple options, such as Bipolar, Mixed Mode, Thick Metal