

In-Vehicle Semiconductor Market: Key Research Findings in 2009

- The market is expected to start recovering in the second half of 2010, driven by the needs for responding to new safety and environmental regulations. -

Research Outline

Yano Research Institute has conducted a study on the world in-vehicle semiconductor market as described below.

1. Research period: March to July 2009
2. Research targets: Device manufacturers, wafer manufacturers, automobile electronics manufacturers, automakers, etc.
3. Research methodologies:
Face-to-face interviews with relevant personnel, supplemented by interviews via telephone and e-mail, and literature researches.

<What is in-vehicle semiconductor market?>

In this research, the in-vehicle semiconductor is defined to include in-vehicle micro computers, in-vehicle semiconductor sensors, in-vehicle power semiconductors, and others (memories, analog IC, LED, ASSP, etc.)

Key Findings

- ◆ **The in-vehicle semiconductor market in 2009 is expected to be 15.1 billion dollars, reduced by 13.2 percent from the previous year.**

Impacted by a slump in new car sales in the global market continuing since the second half of 2008, the in-vehicle semiconductor market in 2009 has been shrinking continuously, and expected to decrease by 13.2 percent compared to the previous year to be 15.1 billion dollars..

- ◆ **From the second half in 2010, the market will turn into a recovery trend, and grow to 16.3 billion dollars, increased by 7.9 percent compared to the previous year.**

In the first quarter of 2009, the incoming orders for every device manufacturer has been reduced down to the level of 20 to 25 percent of the same period in 2008. From the second quarter of 2009, the inventory adjustment at the automakers has been settled for the time being, and the demand is beginning to recover gradually. As to the future, however, as many people are feeling uncertainty, the full-fledged recovery is estimated to begin in the second half of 2010, preceding the recovery of new car sales in the advanced countries.

- ◆ **In 2011 and after, semiconductor sensors and power semiconductors will drive the market due to the respond to the safety and environmental regulations.**

In 2011 and after, the in-vehicle semiconductor market can be expected to grow by 2-digit due to the demand for responding to the safety and environmental regulations. The demand for power semiconductors will increase as the fuel economy improvement of the gasoline engine vehicles will be progressed and hybrid vehicle/electric vehicle (HEV/EV) will be introduced into the market one after another for complying with the environmental regulations. Also, the installation of safety related devices, such as ESC (electronic stability control) will increase the number of semiconductor sensors used on one automobile.

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➤ Research Summary

1. Market overview

The in-vehicle semiconductor market will continue to be uncertain throughout 2009, and the global market size is expected to decrease by 13.2 percent from the previous year to 15.1 billion US dollars. The incoming orders for the North American market started to decrease in the third quarter of 2008, and the market has shrunk drastically in the fourth quarter of 2008 and the first quarter of 2009 compared to the year before.

Since May 2009, it has been widely considered that the inventory adjustment at the automakers has been settled for the time being, and the factory operating ratio of device manufacturers has been improved to about 80 to 90 percent. In the mean time, as it will take time for the new car sales to recover in Japan, US and European market, the market will not start growing again until 2011 or after. The in-vehicle semiconductor market will start to grow earlier, in the second half of 2010, and recover to 16.3 billion US dollars, by achieving the increase by 7.3 percent from the previous year.

2. Future perspectives: Issues that need to be watched in the future

There may be 3 factors listed below for the in-vehicle semiconductor market to grow in 2011 and after.

The first factor is the growing number of the hybrid and electric vehicles (HEV/EV) on which 2 to 3 times of semiconductor devices will be installed compared to the conventional gasoline engine vehicles. Unlike gasoline engine vehicles, HEV/EV require inverters and converters for the control of motor/generator, and electric power distribution from the battery to various devices and instruments. Thus, the power semiconductor market is expected to grow.

Second factor is the demand of semiconductor devices used for ESC (electronic stability control), a drive safety system, expected to continue until 2015. The ESC is required by NHTSA (National Highway Traffic Safety Administration) to be installed on every automobiles sold in the United States from September 2011. In Europe as well, the installation of ESC is required on every new automobiles from November 2014. The review on the legislation has been initiated in Japan, too. Thus, the demand for micro computers and various semiconductor sensors used in the ESC system is expected to increase.

The third factor is the introduction of various fuel economy improvement technologies mainly on the gasoline engine automobiles for complying with the environmental regulations. The European market is moving in the direction of positively promoting the installation of ISS (idling stop system) for fuel economy improvement. Various "idling-stop" systems have already been announced by various manufacturers, for which performance improvement of DC-DC converter and starter/alternator are indispensable. Thus, the use of power semiconductor on gasoline engine automobile will be enhanced as well. Further, there is a trend centered in North American and European market for enhancing the increase of speed change steps in the transmission and adoption of GDI (gasoline direct injection). The demand for semiconductor sensors in these application fields can be expected as well.

The in-vehicle semiconductor market, although it has been shrunk considerably due to the impacts of the global economic recession, is estimated to show high growth rate from 2011, along with the recovery of new car sales in the advanced countries.

Graph/Table 1: World In-vehicle Semiconductor: Market Size Transition & Forecast



Estimated by Yano Research Institute

(Unit: Million US Dollar)

	2004	2005	2006	2007	2008	2009	2010
Micro computer	3,754	4,250	4,780	5,420	5,150	4,380	4,680
Year/year	—	113.2%	112.5%	113.4%	95.0%	85.0%	106.8%
Semiconductor sensor	1,860	2,012	2,239	2,559	2,352	1,967	2,066
Year/year	—	108.2%	111.3%	114.3%	91.9%	83.6%	105.0%
Power semiconductor	1,320	1,540	1,750	2,180	2,065	1,910	2,170
Year/year	—	116.7%	113.6%	124.6%	94.7%	92.5%	113.6%
Others	8,266	8,598	8,331	8,041	7,833	6,843	7,384
Year/year	—	104.0%	96.9%	96.5%	97.4%	87.4%	107.9%
Total	15,200	16,400	17,100	18,200	17,400	15,100	16,300
Year/year	—	107.9%	104.3%	106.4%	95.6%	86.8%	107.9%

Estimated by Yano Research Institute

Note 1: Actual results for 2004 to 2008, and forecast for 2009 & 2010.

Note 2: Based on the shipment in value from the manufacturers