Google, Apple and Tesla Too Cool for Old School Detroit

As I have worked on stories about smartphone connectivity, electric and self-driving vehicles, speech recognition or over-the-air software updates, I have tried on many occasions to go through formal media relations channels at Google, Apple and Tesla to find interview partners willing to talk about these subjects. It hasn’t worked. I have never gotten an interview with an executive at Google, Apple or Tesla by going through the front door. It’s not only me. I checked in with a half dozen major writers and analysts who cover automotive technology and learned that every one of them has had a similar experience. These Silicon Valley companies aren’t giving any of us in the automotive technology press the time of day.

“Apple definitely has a cavalier attitude toward the auto industry,” said Strategy Analytics’ Roger Lancot. “If Siri doesn’t work very well in cars, they say tough darts. Would NFC be helpful? They won’t give an opinion. Would it be nice if they stopped changing connectors every couple years? Apple doesn’t seem to care.”

“There’s probably a view out there in Silicon Valley that those auto writers in Michigan are stuck in the last century,” said Lindsay Brooke, senior editor of SAE’s Automotive Engineering International.

By being secretive and unfriendly to the media, Apple, Google and Tesla run the risk that the automotive press will eventually return the unfriendliness. “Google and Apple are notorious for not granting interviews. They won’t talk to the press, period,” said Junko Yoshida, chief correspondent for EE Times. “That makes us skeptical of them. We don’t know what their intentions are. They don’t bother to explain themselves. I’m especially concerned about Google. They are making so much hay out of self-driving cars. But we need to go around [their media representatives] to learn what they are doing to make self-driving cars safe.”

It seems the auto industry is far more curious about Apple and Google than those companies are about the auto industry.

Automotive NFC Applications Just Starting

By the end of 2014, five-hundred million smartphones enabled with Near Field Communication (NFC) technology will be in the field worldwide. That should be enough, say advocates, to finally motivate some carmakers to bring NFC-based features to market. The short-range, high-frequency wireless communications technology, which today lets smartphone users make retail payments with a tap of their phone to a reader-equipped POS (point of sale) terminal, has had a long gestation. The NFC Forum was founded ten years ago by Nokia, Sony and Philips Semiconductors, now NXP Semiconductors, to work on specifications, compliance and promotion.

An outgrowth of RFID technology designed to handle two-way communications, NFC’s primary differentiator from Wi-Fi or Bluetooth is that NFC devices must be in close proximity to communicate with each other, within ten centimeters. “NFC’s short range has inherent security aspects,” noted Diwakar Bansal, manager for safety and security MCUs at Texas Instruments. “You don’t have the problem of interference from hundreds of Bluetooth devices that may be in the vicinity. You can be sure that you are in communication only with the device you intend to talk to.”

The range for Bluetooth devices is typically about 10 meters, but some applications work at 100 meters. Bluetooth allows for up to seven simultaneous connects. As a point-to-point communications link, NFC allows for only one.

The biggest obstacle to the adoption of NFC technology in the car has been its limited adoption by phone manufacturers. Most automotive use cases involve the smartphone. NFC pioneer NXP Semiconductors began promoting NFC to the auto industry in 2005, but it took another year for the first phone with NFC capability to be released, by Nokia. The first Android smartphones equipped with NFC didn’t hit the market until five years later, in 2011.

Since then, the smartphone market has exploded, and NFC penetration is growing along with it. According to IHS Technology, NFC will be included in 64% of the mobile phones shipped in 2018, up from 18.2% in 2013. According to an IHS press release, the majority of smartphone makers are adopting the NFC wireless communications and payment technology in their products as a de facto standard, and consumers and businesses are warming to the idea of mobile payments via NFC. A major barrier to the adoption of NFC by handset manufacturers—the lack of compelling applications and the infrastructure to support them—is falling.

Ninety-three percent of the NFC phones shipped in 2013 were Android phones. Some Blackberry smartphones and Vol. 27, No. 4  hansenreport.com May 2014

Near Field Communications
Definition: The NFC Forum defines near field communications as standards-based short-range wireless technology for exchanging digital content and connecting devices with a touch. Operates at 13.56 MHz in the ISM band.

Bandwidth: 424 kbps. Approval is being sought at NFC Forum for 848 kbps and possibly higher.

Operating Modes:
• Reader/Writer: Read or write to an NFC tag embedded in a device.
• Peer-to-Peer: Either device can initiate communication, for example smartphone to smartphone, at a much higher data rate than reader/writer mode.
• Card emulation: A transceiver device can be put in a tag state where it can be read by a reader/writer.

Most Promising Automotive Use Cases
• Bluetooth pairing
• Car sharing
• Personalized car settings
• Transfer vehicle diagnostics data

Turn to NFC, page 2
smartphones running Windows are also NFC enabled. “All the non-Apple, high-end smartphones have NFC,” said Mr. Bansal.

The aluminum housing on the iPhone 5 and 5s would block NFC’s RF communications. To incorporate NFC, Apple would have to switch to a plastic case. The Apple iPhone 5c has a plastic housing. While Apple accounted for just 15.5% of global smartphone shipments in Q1 2014, Apple’s rejection of NFC thus far has somewhat hindered automotive adoption of the technology. But, Ward Randall, sales and portfolio manager at Continental Automotive Systems, noted, “The fact that Apple has not introduced NFC does not indicate that they won’t introduce it.” Continental is actively developing automotive NFC solutions.

Most Promising Automotive Use Cases

- **Bluetooth Pairing**
  The first practical NFC use case in automotive today is Bluetooth pairing. With NFC running on the devices to be paired, for example a smartphone and an infotainment system head unit, all that is required to establish the Bluetooth connection is to simply tap the phone to the head unit.
  “A popup shows up on the phone and asks if you want to connect to this infotainment system or this Bluetooth device,” said TI’s Mr. Bansal. “You hit ‘yes’ and eliminate the possibility of connecting to other devices in the vicinity.”

  Without NFC, the person trying to make the Bluetooth connection would have to go to his smartphone settings to select the head unit, assuming it is already in the discoverable mode. Often a complicated process, Bluetooth pairing is necessary because more than one Bluetooth device could be within the ten-meter range of the head unit.
  “Bluetooth pairing via NFC is definitely coming very soon to cars,” said Joerg Becker, director of automotive marketing and business development with NXP Semiconductors. “This secure, simple process is already well established in the consumer domain to pair a mobile device with a speaker system. When you are renting a car the first thing you want to do is pair your Bluetooth phone with the handsfree system. Depending on the car it could be a disaster. With NFC you could do it with just a tap.”

  Lars Reger, manager of strategy and business development for NXP’s automotive business unit, offered additional scenarios. “If I’m in a car with five passengers but want to have a phone conference call using my phone instead of the driver’s, I touch the head unit with my portable device and my phone is routed into the car’s system. Or if I am with my kids, they can touch the rear seat display with their device and stream its content to the larger display.”

  NFC can also be used to enable other wireless links, such as Wi-Fi or Bluetooth Smart, formerly known as Bluetooth Low Energy, or BLE. (See page 3 for more on Bluetooth Smart.)

  Both Continental and NXP expect that as more carmakers incorporate wireless charging in vehicles, NFC-enabled Bluetooth pairing and wireless charging will share the same physical location, whether it is a dock of some sort on the dashboard or in the center stack.

- **Car Sharing**
  Smartphones together with NFC tags in the car can simplify car sharing and car rental experiences, from making the reservation and locating the vehicle, to authenticating a driver’s license, unlocking the doors and starting the engine, and when the car is returned, locking the doors and paying the bill. “Most car sharing services already use RFID technology so the step to NFC is pretty simple,” noted NXP’s Mr. Becker.
  Traffic congestion and lack of parking in cities will encourage more car sharing enterprises. Urban millennials and younger adults, many of whom rely on their smartphones for multiple services and see car sharing as an inexpensive alternative to car owning, will find this “virtual key” concept very practical. They might misplace car keys, but they are far less likely to misplace their phones.

  NFC is not likely to replace conventional passive keyless entry fobs for personal vehicles. There is no apparent reason why consumers would give up the convenience of handsfree unlocking and push button starting in favor of pulling their smartphone out and touching it to their own car every time they use it.

  **Personalized Settings for the Driver**
  Smart keys for high-end cars today allow two or more drivers to store their personal preferences for the car, for example, seat position, mirror adjustments, radio stations, temperature, etc. NFC advocates see a role for the technology in bringing your personal settings with you on your smartphone to other NFC-equipped vehicles. For example, if you are a frequent user of a local car-sharing service, once you pair your phone with the shared vehicle, you might transfer your preferences for radio stations or the right seat and mirror adjustments.
TI Ready for Bluetooth Smart Applications

Texas Instruments has already received several RFQs from carmakers and tier-one suppliers interested in Bluetooth Smart applications. Bluetooth Smart was previously known as Bluetooth Low Energy or BLE. Compared with classic Bluetooth, Bluetooth Smart features very lower power consumption and quicker connection setup. Bluetooth and Bluetooth Smart both operate in the 2.4 GHz spectrum and have about the same range.

Two types of automotive applications for Bluetooth Smart technology are emerging, according to TI: control of features via smartphones or key fobs, and wireless replacements for cables. With Bluetooth Smart, carmakers can wirelessly connect steering column switches to the infotainment system head unit or wirelessly link door and mirror controls to their actuators.

Since Bluetooth Smart connected components require very little power, they can stay in discoverable mode and therefore be easily seen by smartphones. A smartphone app could be used to control the vehicle’s ambient lighting, for example. Android, Blackberry, Microsoft and iOS phones support Bluetooth Smart. Apple’s iBeacon transmitter is based on Bluetooth Smart. An iOS 7 (or later) device can detect an iBeacon’s signal and estimate its proximity.

“Imagine that you want to use your phone as your access key to the car using Bluetooth Smart,” said Ron Machness, director of business and marketing for automotive connectivity at TI. “Something in the car needs to be constantly in discoverable mode to see if there is a request to open the car, but the current consumption of this Bluetooth Smart receiver needs to be negligible. The main advantage of Bluetooth Smart is the fact that it can be operated from a coin cell battery.” Standby current for Bluetooth Smart is approximately one microamp.

How promising is this? “Automotive applications of TI’s SimpleLink Bluetooth Smart wireless MCU are just now emerging,” said Mr. Machness. “Some OEMs are on the fence, not sure if they will go in this direction or not. Some are working on prototypes. Other OEMs are fully engaged and have specific plans to bring this to production. The most aggressive carmaker is planning a 2015 introduction.” Production orders are expected by year end.

Comparing Classic Bluetooth, Bluetooth Low Energy (Bluetooth Smart) and Near Field Communications

<table>
<thead>
<tr>
<th>Radio frequency</th>
<th>Bluetooth 2.1 + EDR</th>
<th>BLE (Bluetooth Smart)</th>
<th>NFC</th>
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<tr>
<td>2.4 GHz</td>
<td>~10-100 meters</td>
<td>~0.04-0.10 meters</td>
<td>13.56 MHz</td>
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<tr>
<td>Distance/range</td>
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<td>~424 kbps</td>
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<td>Application throughput</td>
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<td>Maximum simultaneous connections</td>
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<td>∞ (20 in practice)</td>
<td>1</td>
</tr>
<tr>
<td>Latency (connection speed)</td>
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<td>~0.03 second</td>
<td>~0.1 second</td>
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<td>Peak use current</td>
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<td>~15 mA</td>
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<tr>
<td>Standby current</td>
<td>~1000 μA</td>
<td>~1 μA</td>
<td>&lt;1 μA</td>
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Source: UL Transaction Security Mobile Competence Center white paper, “Mobile Payment Transactions: BLE and/or NFC?” by Swen van Klaarbergen

NFC...

for the makes and models you frequently select.

Or, “Why not let the key fob and the smartphone talk to each other, just by a tap?” suggested NXP’s Joerg Becker. “We can use the smartphone’s display and its virtual keyboard to communicate with the key. The key then becomes the gateway between the car and the outside world, whether that outside world is a smartphone or any NFC-enabled device.” NFC might also be applied in transferring diagnostic data from the vehicle to a service facility.

According to Mr. Becker, while “all the premium carmakers are working on NFC... the automotive market is embryonic.” NXP’s sales of NFC components to auto industry customers today are zero.

In the next few years, some automotive NFC applications are expected to hit the road. “Carmakers have begun working on NFC designs, so NXP will see business over the next car generation, in three to five years. ... In ten years a car could have as many as three NFC devices,” said Lars Reger.

Ron Machness, director of business and marketing for automotive connectivity at Texas Instruments, having observed the slow progress of NFC over the last several years, noted: “We were expecting NFC to be more common by this time. It is supported by Android, and the application of, for example, simple pairing is there already. But we are not seeing a lot of traction right now. We are seeing less traction than we would think.”

Continued from page 2
Background

STMicroelectronics N.V. was founded in 1987 when the semiconductor business of SGS Microelettronica of Italy merged with the non-military semiconductor business of Thomson Semiconductors, based in France. The merged companies operated as SGS-Thomson Microelectronics until 1998 when the name was changed to STMicroelectronics. The company went public in 1994.

ST has lost money over the past two years but expects to show a profit in 2014. In 2013, ST and Ericsson ended their four year money-losing joint venture making chips and modems.

ST is organized in two major product segments, Sense and Power and Automotive Products (S&P&A), and the Embedded Processing Solutions Group. This company profile focuses on the Automotive Product Group (APG), one of the three product groups within S&P&A. In 2013, APG accounted for 20.6% of ST’s total sales.

In December 2012, the company announced and implemented a new strategy to focus on the markets and product areas where it already holds a strong position and sees the greatest potential for future growth. ST has targeted five product and application areas for growth: automotive, microcontrollers, digital consumer and ASICs, smart power, and MEMS and other sensors. According to company literature (sourcing Strategy Analytics), with 8.8% annual growth forecast for at least the next two years, automotive is among the fastest growing and healthiest segments of the electronics market. That expected growth will be driven not only by increased vehicle production but also by continued growth in electronics content. Strategy Analytics estimates the global average semiconductor content in new vehicles was approximately $284 in 2013 and will reach $330 in 2019.

“After more than 30 years of investing in the automotive industry, we still love the challenge it brings,” said Giovanni Corrias, APG vice president of business management and mass-market business development. “It’s less predictable than it was in the past, but it is still growing year over year.” ST’s commitment to automotive remains solid. “There is no doubt that if you are in this market it makes sense to stay in. The barriers to entry are still there,” noted Fabio Marchio, APG vice president and microcontroller infotainment division general manager.

In December 2013, Moody’s Investors Service cut STMicroelectronics’ rating to Baa3, outlook stable, the lowest investment grade, citing concerns that the chipmaker’s profitability and cash-flow generation will improve more slowly than previously thought. ST had an operating loss of 5.8% of sales in 2013.

Automotive Product Group

With sales in 2013 of $1,668 million, the Automotive Product Group accounts for roughly 94% of ST’s total sales to automotive accounts. ST serves all the major automotive tier ones. Since our last profile of the Automotive Product Group in the March 2009 Hansen Report, APG has begun to direct some of its marketing efforts toward finding automotive customers outside
its customary list of large automotive accounts.

“When Marco Monti came on board a couple of years ago as general manager of the Automotive Product Group, he made it my responsibility, as business manager for the group, to try to increase our penetration in the mass market and distribution, to become less dependent on the traditional OEM accounts,” said Mr. Corrias. “We closed 2013 with that segment accounting for 34% of our total sales, an increase of 9% over the prior year. Each year we try to increase the number of automotive customers we are approaching by 10%.”

According to market data from IHS, STMicroelectronics was the third largest automotive semiconductor supplier in 2013, behind Renesas and Infineon, second-largest in its served markets. When we last profiled ST, the company asserted its goal was to be the number-one supplier in five years. “That is obviously still our goal, and we have all the ingredients to achieve it,” Mr. Corrias confirmed. “The statement made in 2009 assumed steady-state market conditions, which certainly has not been the case. For instance, 2009 was a disaster for the automotive industry, and in that period Renesas acquired NEC and became a giant. If you take just the Automotive Product Group and the market we serve, we would likely be number one had not Renesas taken over NEC.”

ST’s automotive portfolio covers all the automotive domains: safety, powertrain, body and infotainment.

**Fast Growing Automotive Products/Applications**

- **SPC5x 32-bit MCUs**

  Among all its major automotive products, the company’s line of SPC5x 32-bit embedded flash MCUs is one of its fastest growing. Initially developed jointly with Freescale Semiconductor, starting in 2007, based on a Power Architecture core, and subsequently developed independently, shipments are now ramping up, following design wins totaling $2.5 billion over the last six-plus years. Shipments have been recently growing at more than 25% per year.

  A multipurpose MCU family, the SPC5x family supports a number of automotive applications including chassis and safety, body control and powertrain. SPC56 P was the first product line specifically targeted for safety applications and three-phase motor control. SPC56 L meets ISO 26262 ASIL D requirements for safety applications.

  “We are currently in the final engineering phase of SPC57, a 55-nanometer embedded flash product, the first generation being SPC56,” explained Fabio Marchio. “This next generation will fuel our growth in the 32-bit arena in the coming years.” Production of SPC57 is expected to start in Q4 2014.

  Tool support for SPC5x includes C compilers, debuggers, emulators, configuration tools and auto-code generators. ST manufactures SPC5x in Rousset and Crolles, France.

  ST will not pursue further 32-bit micro joint development with Freescale beyond the 55-nm generation based on Power architecture. “The cooperation is winding down,” Mr. Marchio noted. “In the beginning Freescale had its own fabs and they were developing product. But I believe that at 40 nm and beyond, the two companies’ different approaches were too great to keep the relationship profitable for both of us.” ST and Freescale will continue supporting customers throughout the lifetime of their jointly developed products.

  ST is currently evaluating next-generation architectures for future 32-bit product families and plans to announce its decision in the near future.

- **ADAS**

  Among all of the applications served by ST’s automotive products, advanced driving assistance systems is the fastest growing. Three ST products have seen particularly
strong growth in this category: 24 GHz and 77 GHz radar sensors, and especially the EyeQ vision processors that ST produces for Mobileye, the world’s number-one supplier of camera-based vision systems. As Mobileye’s exclusive supplier, ST shipped 1.5 million EyeQ processors in 2013.

Developed jointly with Mobileye, the third generation, EyeQ3, SoC (system on chip) is capable of intelligent headlight control, lane keeping, forward collision warning, pedestrian detection and warning, traffic sign recognition, fusion with radar inputs and collision mitigation by braking. EyeQ3 will go into full production later this year. For more on Mobileye and EyeQ, please see the March 2014 issue of the Hansen Report.

EyeQ3 processors are based on ST’s mature FD-SOI (fully depleted silicon on insulator) planar, two-dimensional process technology rather than a 14nm FinFET process technology, which was being considered. ST believes that a major advantage of FD-SOI is that it doesn’t require major changes in process and manufacturing technology. Another advantage is its efficiency in terms of performance versus power.

“Mobileye chips require a power dissipation that is very well controlled, because it is operating in an automotive environment, not a consumer environment. Power consumption and efficiency were constraints,” noted Mr. Marchio. “Our testing proved that 28-nanometer FD-SOI is capable of satisfying those requirements.” EyeQ4, now in development, will dissipate less than 3 watts at full speed and maximum temperature.

ST recently licensed Samsung Electronics to manufacture 28nm FD-SOI products, assuring customers of a second source and high volume supply. Samsung’s 28nm FD-SOI process will be qualified for volume production in 2015.

◆ Audio Amplifiers: Class AB, D

In the global market for class AB audio amplifiers, ST claims a greater than 50% market share and in China an 80% market share. The majority of that business is based on class AB, the type used in most car radios. ST’s class AB portfolio ranges from single-channel devices to powerful quad-channel, single-chip devices. Growth in that segment will be incremental, as OEM customers upgrade to next-generation amplifiers and as global auto production increases.

According to the company, class D amplifier ICs achieve roughly 80% higher energy efficiency than analog class AB, reducing the electrical load on the alternator and allowing extra functions or speaker channels within standard dimensions.

“We basically invented the audio amplifier business more than 40 years ago,” said Mr. Marchio. “Customers tell us ours have the best sound, and our experience and expertise is unmatched in the industry.”

◆ Smart Power ICs

“Thirty years ago, ST basically invented BCD technology, the leading smart power technology, which includes bipolar, CMOS and DMOS on the same die,” noted Mr. Marchio. Today the company is in its ninth-generation BCD and is ready to release a tenth generation. The benefits of combining these technologies on a single chip include improved reliability, reduced EMI and a smaller chip area. ST offers a range of automotive-qualified BCD products, both high voltage and high density.

Automotive smart power ICs are widely applied in powertrain, safety, body and infotainment domains. “We are present in all the different application spaces in varying degrees,” said Mr. Marchio. “For example, in some body applications we are the dominant player. In powertrain we have roughly a 35% market share.”

Smart power ASICs and ASSPs account for 64% of APG sales. ST already had a dominant market share, according to Mr. Corrias, in some traditional growth areas for smart power devices such as engine management, braking, transmission control and electric power steering. In those segments he expects future growth to be driven by next-generation products rather than through increasing market share.

Electronics for specific applications in the door zone is another fast-growing segment for ST. “We are seeing more and more penetration of electronic solutions for things like window lift, door locks and mirror adjusters in emerging markets,” observed Mr. Marchio.

Key APG Products by Application

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<td>Power MOSFETs and IGBTs</td>
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STMicroelectronics

**Positioning Products**

STMicroelectronics is rolling out new members of its family of positioning receivers called Teseo. Teseo 2 is capable of receiving signals from GPS, Glonass or Galileo satellites concurrently. Teseo 3 can receive from those systems plus the Chinese positioning system Beidou (Compass). “Because the product can receive signals from more than one constellation, the positioning reliability and precision is improved in difficult situations such as urban canyons between tall buildings,” Mr. Marchio explained. It will also help carmakers comply with regional mandates for new vehicles. “For example, in Europe they are mandating that new vehicles have positioning systems that are compatible with Galileo.”

Teseo devices are suitable for both PNDs (portable navigation devices) and embedded navigation systems, as well as telematics systems, eCall, ADAS and machine-to-machine applications.

**Strengths**

According to the company, ST’s automotive customers appreciate its broad technology portfolio and broad product portfolio. They also recognize that ST has been serving the automotive industry for more than 30 years and the company brings a level of experience and automotive-specific expertise that not many of its competitors can match.

Another differentiator for ST is that it has maintained its in-house manufacturing capability while some competitors have gone fabless in favor of using outside contract manufacturing. ST’s major automotive production is centered in France, Italy and Singapore. Sixty-five percent of ST employees are employed in manufacturing.

"In the case of microcontrollers, all of our competitors have declared that long term they would be fabless. That means that the majority of the supply will come from a single company," cautioned Mr. Marchio, referring to Taiwan Semiconductor Manufacturing Company (TSMC), the world’s largest contract manufacturer of semiconductors. He added, “This has implications not only for reasons of supply chain security, but because supply chain robustness and independency can be a crucial decision point for carmakers.”

ST competes most closely with Renesas, Freescale and Infineon in body, powertrain and safety applications. In infotainment, NXP is the toughest competitor, followed by Texas Instruments. Companies coming from consumer electronics such as Qualcomm and Nvidia offer serious competition with their high-end application processors.

**Alliances**

In 2012 ST and Audi formed a semiconductor co-development alliance, broadly targeting applications in CO2 emissions reduction, safety and security, and infotainment and comfort. Audi’s goal in partnering with ST was to accelerate innovation in automotive semiconductors and to ensure product quality and supply while reducing time to market.

Also in 2012, ST established a joint laboratory with China’s FAW Group, at the carmaker’s R&D center, for advanced development of products such as engine control units, transmission control units and electric power steering controls.

Similar to its cooperation with FAW, ST partnered with Great Wall in a joint R&D laboratory in 2013.

The work will focus on gasoline direct injection, body control modules, engine management, safety and infotainment.

In 2013, ST and Hyundai Autron announced they would collaborate on ECUs for powertrain applications, specifically engine management units. Initially Hyundai Autron will use existing, off-the-shelf ASSPs from ST and eventually will move to jointly designed products.

ST also has partnership agreements with Toyota, Mercedes and Changan.
2013 Roundup: Aisin Seiki, Continental, Denso, Mobis

Aisin Seiki Co. Ltd.
FY 2014 Consolidated Sales: ¥2,822.2 billion ($27.6 billion)
Change from FY 2013: up 11.6%
FY 2014 Operating Margin: 6.1%, up slightly from the prior year’s margin of 5.9%
Outlook for FY 2015: No growth in sales is expected. Operating income will increase by less than one percent.

Aisin Seiki attributes its sales growth in FY 2014 to a combination of increased overseas vehicle production and the weak yen. Domestic sales accounted for 64% of the total. Aisin Seiki’s largest customer, Toyota, accounted for 64.4% of sales. The second-largest customer, at roughly 10% of total sales, is Volkswagen/Audi.

Aisin AW Group, the business segment that produces automatic transmissions and navigation systems, increased sales (excluding intersegment sales) by 8.3% even though navigation system production fell by 5% from the prior year. Production of automatic transmissions increased 5% in fiscal 2014. Aisin AW contributed 36% of total Aisin Seiki sales in FY 2014, and posted an 8% profit margin.

According to a Bloomberg News report earlier this year, Aisin Seiki is looking to acquire one or more electronics component makers for an investment up to ¥100 billion ($989 million).

Continental Automotive Group
2013 Sales: €20,016.1 million ($27.7 billion)
Change from 2012: up 2.6%
2013 EBIT Margin: 5.8%, the same as 2012.
Outlook for 2014: Continental expects 5% growth in the Automotive Group’s sales, to approximately €21 billion. The forecast assumes growth in global vehicle production of approximately 2%. Sales for all of Continental Corporation are expected to reach €35 billion ($48.5 billion) in 2014.

The Automotive Group accounts for 60% of Continental’s total sales. Included in Automotive are three reporting divisions: Chassis & Safety, Powertrain, and Interior, which in 2013 accounted for 36%, 31% and 33% of sales respectively. All three divisions reported increased sales in 2013, with the most growth, 3.1%, coming from Chassis & Safety, which includes Continental’s advanced driver assistance product line.

Geographically, Continental’s sales are well balanced: Germany accounted for 26%, the rest of Europe contributed 23%, NAFTA accounted for 23% and Asia, 25%.

Schaeffler AG reduced its holdings in Continental to 49.9% in 2013. Schaeffler announced in May 2013 that in the spring of 2014 it would terminate its investment agreement with Continental, which, among other provisions, limits Schaeffler’s stake to 49.9%. No further plans were announced by either company. In March 2014, the two companies presented a jointly developed hybrid concept car based on Continental’s 48-volt Eco Drive System.

Hyundai Mobis
2013 Sales: 34,199 billion KRW ($33.1 billion)
Change from 2012: up 11.1%
2013 Operating Margin: 8.6%, compared with 9.4% operating margin in 2012
Outlook for 2014: None given. Growth in Hyundai-Kia vehicle sales is forecast to slow to 4.1% in 2014, the slowest growth rate for the carmaker since 2006. Hyundai and Kia account for close to 90% of Mobis’ sales. A strengthening Korean won could also dampen Mobis’ sales in 2014.

Mobis’ Modules and Parts Manufacturing division, which makes chassis, cockpit and front-end modules plus a broad line of safety, lighting, infotainment and other E/E-based systems, saw sales increase 12.3% from the prior year to 27,022 billion KRW ($26.2 billion), with operating profits up by 4.5% to 1,712 billion KRW ($1.7 billion), or 6.3% of sales.

Within the division, module assembly accounted for 65% of sales in 2013; core parts manufacturing accounted for 35%. One of the growth drivers in the division was increased sales outside Korea, according to the company. For example, the Modules and Parts Manufacturing division’s sales in China (reported in U.S. dollars) increased 22.7%.

In 2013 Denso acquired 50% ownership in Adasens Automotive GmbH, a Ficosa Group company based in Germany. Adasens develops embedded software for camera-based ADAS. Last year Denso also announced a strategic alliance with Sharp Corporation, including Denso’s purchase of ¥2.5 billion worth of Sharp stock. Denso said it plans to integrate some of Sharp’s consumer electronics technologies into vehicle comfort and convenience features.

Other technology development projects Denso is working on include head-up displays as well as navigation systems, audio equipment and other multimedia products that are “replaceable, installable after purchase of vehicles, or updatable to ensure use of the latest software and connectivity with cutting-edge IT devices.”

FY 2014 Consolidated Sales: ¥4,095.9 billion ($40.1 billion)
Change from FY 2013: up 14.4%
FY 2014 Operating Margin: 9.2%, compared with 7.3% the prior year.
Outlook for FY 2015: Denso forecasts a 1.1% increase in sales, to ¥4,140 billion ($40.5 billion). Operating income is expected to drop to 8.5% of sales. The outlook is based on an assumed decrease in vehicle production volumes in Japan, investment in new product launches and expanding capacity in overseas plants.

Increased vehicle production, primarily in Japan, North America and China, along with the benefit of a weak yen, contributed to Denso’s sales growth in FY 2014. A consumption tax increase in Japan, which went into effect April 1, 2014, is expected to dampen new vehicle sales by up to 16%, according to the Japan Automobile Manufacturers Association.

Toyota Group accounted for 49% of Denso’s sales; Japanese carmakers together accounted for 66% of total sales. Following Toyota, Honda is the second-largest customer, contributing 7% of total sales. No other single customer accounts for more than 3% of sales.