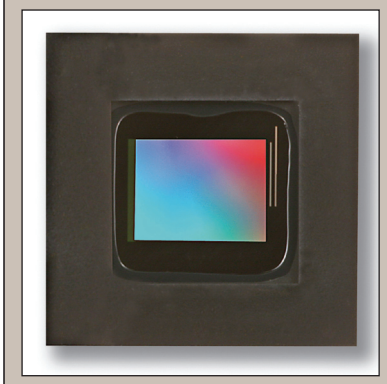
CMOS IMAGE SENSOR

A NEW IMAGE sensor, the MT9V125, from Micron Technology Inc. is designed to promote safer, smarter driving. As technically advanced automobiles continue to hit the roadways, imaging technology is a key feature that provides drivers with an intuitive look at the drive ahead or the view behind. With this sensor, automotive manufacturers can design in-camera functionality for side-view mirror replacement and assistance, or provide a reversing camera so the driver can clearly see what might be next to the car and behind it.



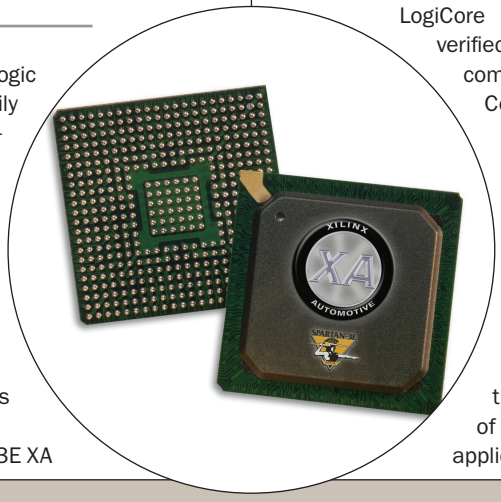
The sensor complements Micron's portfolio of automotive CMOS image sensors. It offers a complete camera system on a chip and meets the requirements of Automotive Electronics Council (AEC) Q-100. Designed to fit a one-quarter-inch lens aperture, the sensor provides a higher-level of integration, reducing camera cost and size. It is also equipped with Micron's proprietary low-noise, high-sensitivity DigitalClarity technology. The sensor's dual electronic rolling shutters capture 30 frames per second (fps) at 27 MHz, 60 Hz field rate for NTSC video systems, or 25 fps at 27 MHz, 50 Hz field rate for PAL video systems with a maximum integration time of 33 ms for NTSC and 40 ms for PAL providing excellent video quality, especially in low light and bright light conditions. In addition, the sensor features flexible signal paths that allow a designer to choose one scene view sensor across a range of vehicle models, whether for a basic reversing camera in a low-end model, or a high-end system where content is statically or dynamically overlaid onto a car's video signal display. To provide reliable operation under severe conditions, the sensor provides an extended operating temperature range of –40 °C to +105 °C.

With a 640 x 480 pixel format, the sensor comes in a 52-ball BGA and consumes about 350 mW at 2.8 Vdc supply. In sleep mode it consumes about 100 µW. It is available for customer sampling, with mass production expected in the first quarter of 2006. In 10k units, the MT9V125 is priced at $12.00 each.

Micron Technology Inc. • (208) 368-4000
www.micron.com/products/imaging/applications/auto.html

XILINX EXPANDS AUTOMOTIVE FPGA OFFERINGS

Xilinx Inc. has expanded its XA family of programmable logic devices (PLDs) to include its line of low-cost Spartan-3E family and its high-performance Virtex-4 platform FPGA device. Automotive designers can choose between the 90 nm Spartan-3E family or the high-performance features of its 90 nm Virtex-4 FX12 XA device. The devices meet the requirements of the ISO TS16949 certification, AEC-Q100 qualification flow, and PPAP documentation process. Implementing the low-cost Spartan-3E XA devices with MicroBlaze 32-bit soft processor solutions, or the high-performance Virtex-4 FX12 devices with embedded Power PCs, DSP multipliers and Ethernet MAC blocks allows automotive engineers to meet their design goals with confidence in component quality.



Ranging from 100 K to 1.6 M system gates, the Spartan-3E XA family delivers low cost per system gate (1000 system gates for three cents). Spartan-3E XA devices also include features tuned for automotive applications, including support for 18 I/O standards including PCI, RSDS and mini-LVDS, as well as interfaces to commodity-priced DDR memories. These built-in platform features reduce the need for other discrete devices, lowering overall system costs and simplifying design.

The Virtex-4 FX12 XA devices include an embedded PowerPC processor, DSP multipliers, and 10/100/1000 Ethernet MAC blocks, all of which are available as part of the Virtex-4 ASMBL architecture. The enhanced PowerPC 32-bit RISC processor can run more than 700 DMIPS at 450 MHz and is suitable for high-performance embedded systems or complex control functions, and the auxiliary processor unit (APU) controller makes it easy to integrate hardware accelerators. The Ethernet MAC blocks in hard IP allows for high-speed uploads of new or updated software into the board, module or system being designed. The 500 MHz Xtreme DSP slices add to the raw processing power of the device, and all of these features offer not only high integration onto a single device, but blistering speed for routing and control functions in areas such as gateways.

Furthermore, Xilinx XA devices feature controller area network (CAN) solutions available in the Xilinx-owned LogiCore library. The fully verified and standards-compliant CAN LogiCore IP offering allows designers to quickly implement CANs in their programmable automotive solutions. This flexible approach allows design optimization for a variety of network-centric applications such as

gateway, infotainment, driver assistance, and comfort and convenience functions. Designers also have access to a full suite of third-party IP support available through the Xilinx Alliance Partners Program that include LIN, CAN, IDB1394, USB and display controllers.

All XA devices are sampling. The XA series Spartan-3 FPGAs with 100 K system gates start at less than $3.00 for 100 K units in the second half of 2006. The XA series Virtex-4 FX12 devices start at less than $40.00 for 100 K units in the second half of 2006.

Xilinx Inc. • (408) 559-7778• www.xilinx.com/automotive

TOOLS ADDRESS DESIGN FLOW

Mentor Graphics Corp. has extended its automotive offerings and is launching a comprehensive set of electrical and electronic (E/E) design solutions for the automotive market. These offerings are the foundation for a tool suite aimed at addressing the complete automotive E/E design process. The company is also now a premium member of AUTOSAR, the standards organization working to create an open standard for automotive engineering architecture.

The company's strength in electrical systems and harness design was extended to in-vehicle network design with the recent acquisition of Volcano Communications Technologies. SystemVision enables the system designer to model systems and components with a virtual prototype and use simulation to perform the critical analyses of electrical, mechanical, thermal and hydraulic subsystems needed to help ensure successful automotive system design. SystemVision is based on a mixed-signal modeling language, VHDL-AMS, which as a vendor- independent standard language enables efficient information exchange between OEMs and suppliers, reducing communication problems with the concept of executable specifications.

SystemVision is fully integrated with Mentor's electrical systems design solution, Capital Harness Systems (CHS), and complements CHS's electrical analysis tool, Capital Analysis. SystemVision is available and priced ranging from the E/E version at $9,000 to the high-end SystemVision Pro Plus Bundle at $38,000.

Mentor Graphics Corp.• www.mentor.com

ULTRACAPACITOR MODULE

Maxwell Technologies is offering a 48 V multicell BOOSTCAP ultracapacitor module consisting of 18 2.7 V BOOSTCAP MC2600 cells. Targeting heavy-duty transportation as well as industrial energy storage and power delivery applications, the BMOD2600-48 is based on a technology that is said to enable cells and multicell modules to store more energy, deliver more power per-unit volume, and last longer than other commercially available ultracapacitor products. According to Maxwell, the module uses proprietary material that reduces manufacturing cost and supports pricing in the $.01/μF range for multimillion-cell quantities.

The BMOD2600-48 modules are encased in a rugged, splash-proof, aluminum chassis. They weigh 13.5 kg and are 13.4 liters in volume (420 mm L/200 mmT/160 mm W). These durable "smart boxes" include temperature and voltage monitoring and internal cell balancing that give designers "plug and play" solutions, plus module-to-module balancing that makes them versatile building blocks for systems with higher voltage requirements. They are priced at $1900.00 each in low volume and $1077.00 in mid-range volume.

Maxwell Technologies Inc. • (858) 503-3233 • www.maxwell.com

FLASH MICROCONTROLLERS

STMicroelectronics has added a series of eight-bit Flash microcontrollers within the low-cost ST7Lite family, which add new embedded peripherals to the established ST7Lite feature set. Targeting cost-sensitive automotive and other applications, the ST7FLITE3 MCUs feature an enhanced 12-bit auto-reload timer and a master/slave LINSCI asynchronous interface into a 20-pin package, and mark a significant step forward in communication and control functionality for real-time, industrial, consumer and motor control applications.

The 12-bit timer offers four independent PWM output channels with programmable dead time generation, intended for use in half-bridge driving mode in motor control applications where PWM signals must not be allowed to overlap; a 2 kHz to 4 MHz frequency range; programmable duty cycles; polarity control; and programmable output modes.

The embedded hardware LINSCI asynchronous serial interface will enable smooth implementation of LIN bus applications, in the automotive, industrial and appliance sectors. ST's exclusive LINSCI is a hardware-enhanced SCI port designed to simplify software design, and to increase system performance by reducing CPU overhead. LIN is typically used in low-end automotive applications for communication between 12 V intelligent sensors and actuators, but is also increasingly popular in industrial and consumer systems for reducing wiring complexity.

The ST7FLITE3 series is supported by a complete set of hardware and software development tools, both from ST and from third parties Other on-chip functions include a highly accurate internal 1 MHz oscillator, a fast 10-bit ADC with op-amp, and a trimmable reset circuit with low-voltage detection. These simplify system design and reduce manufacturing costs by eliminating the need for external circuitry for these functions. The 8 kbytes of extended Flash memory operates on a single power supply voltage to reduce board complexity and provide fast programming.

The ST7FLITE3 is available in the 20-pin SO20 and DIP20 package. pricing is $1.30 in quantities of 10,000 pieces.

STMicroelectronics • (888) 787-3550 www.st.com

STEP-DOWN DC-DC CONVERTER

Linear Technology has announced an "H" grade version of the LT1936, a

36 V, current mode PWM step-down dc-dc converter with an internal 1.9 A power switch. Packaged in a tiny eight-lead thermally enhanced MSOP package, the "H" grade version operates up to a junction temperature of 150 °C, compared to the E and I grade versions' 125 °C maximum junction temperature. The H grade parts are tested and guaranteed to the maximum junction temperature of 150 °C. They are ideal for automotive and industrial applications, which are subjected to high ambient temperatures.

The LT1936's wide input range of 3.6 V to 36 V makes the LT1936 suitable for regulating power from a variety of sources, including unregulated wall transformers, 24 V industrial supplies and automotive batteries. For automotive applications, the LT1936 can easily operate with sub 4 V inputs, necessary for automotive cold crank requirements. Its 500 kHz operating frequency allows the use of tiny, low-cost inductors and ceramic capacitors, resulting in low, predictable output ripple.

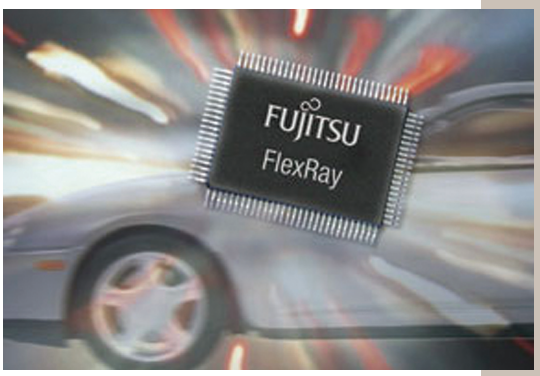
The LT1936HMS8E is available from stock in a thermally enhanced MSOP-10 package. Pricing starts at $3.67 each for 1,000-piece quantities.

Linear Technology Corp.
408-432-1900 • www.linear.com

NEXT-GENERATION FLEXRAY CONTROLLER

Fujitsu Microelectronics America Inc.'s FlexRay controller, the MB88121, is an application-specific standard product that supports FlexRay version 2.0. Based on IP developed by Robert Bosch GmbH, the MB88121 delivers 10 Mbps over two channels. It provides fault-tolerant, deterministic data transmission, which is suitable for the engine control, braking and steering subsystems being introduced using the FlexRay protocol.

The MB88121 is designed to complement all of the existing standard automotive buses, including the controller area network (CAN) and local interconnect network (LIN). FlexRay-based technology, which can provide approximately 10 times the throughput of CAN, is expected to gradually replace CAN as automakers and their suppliers adopt x-by-wire solutions in new generations of vehicles.



The MB88121 can be connected directly to existing CPUs, enabling the development of production systems that use a next-generation network, while simultaneously maximizing the performance of equipment already in the vehicle. Internal speeds reach 80 MHz, with a 4 MHz, 5 MHz, 8 MHz, 10 MHz external oscillator, or by external clock. The chip's parallel interface affords a maximum frequency of 33 MHz.

The MB88121 is available in production quantities with prices beginning less than $5 each. It is packaged in an LQFP-64. Fujitsu is planning a 48-pin version for future release.

Fujitsu Microelectronics America Inc. • www.us.fujitsu.com

FULL-DUPLEX RF TRANSCEIVER

Two new full-duplex RF transceiver ICs from Atmel, ATA5824 and ATA5823, are optimized for automotive keyless entry/passive entry go (PEG) and tire pressure monitoring (TPMS) systems. They can also be used for remote control, alarm, telemetering, energy metering and home automation systems to name a few applications. The ATA5824 and the ATA5823 provide full-duplex functionality, which helps to secure RF systems against automotive theft and other unauthorized system access. In addition, the devices enable system cost reduction since in automotive applications only one transceiver will be needed for car access plus TPMS functions instead of one transceiver for each system. The ATA5823 is designed for 313 MHz to 316 MHz, whereas the ATA5824 operates at 433 MHz to 435 MHz and 867 MHz to 870 MHz. Both transceivers are pin and functionally identical. They support data rates of 1 kbaud to 20 kbaud (FSK) and 1 kbaud to 10 kbaud (ASK) in Manchester, bi-phase or other codes in transparent mode.

The ATA5823's and the ATA5824's current consumption is in receive and in transmit mode as low as 10.5 mA (3 V/ Tx with 5 dBm). This enables portable applications to be powered by a single Li-cell for smaller designs with extended lifetime.

The transceivers' system performance demonstrates high sensitivity in ASK (e.g. -116.5 dBm at 2.4 kbaud) and FSK mode (e.g. -109.5 dBm at 2.4 kbaud), a PAE of nearly 40%, adjustable output power of up to +10 dBm for long-distance operation, a high selectivity and a high blocking plus low intermodulation due to the receiver module's low-IF architecture. Due to the transmitter module's closed-loop Fractional-N synthesizer, the transceiver features high PLL bandwidth and excellent isolation between PLL and PA.

Theft of vehicles with current PEG car access systems can be carried out by extending the RF transmission with the help of two repeaters to gain unauthorized system access (known as a relay attack). The additional full-duplex mode of Atmel's transceiver ICs helps to effectively prevent relay attacks, since the system trying to attack the RF car access system needs to receive and transmit signals on the same frequency at the same time. This high-level system integration results in a small number of external components needed in the transceiver module. Samples of the full-duplex RF transceiver ICs ATA5823/ATA5824 in small QFN48 packages are available. Pricing starts at $4.75.

Atmel Corp. • www.atmel.com