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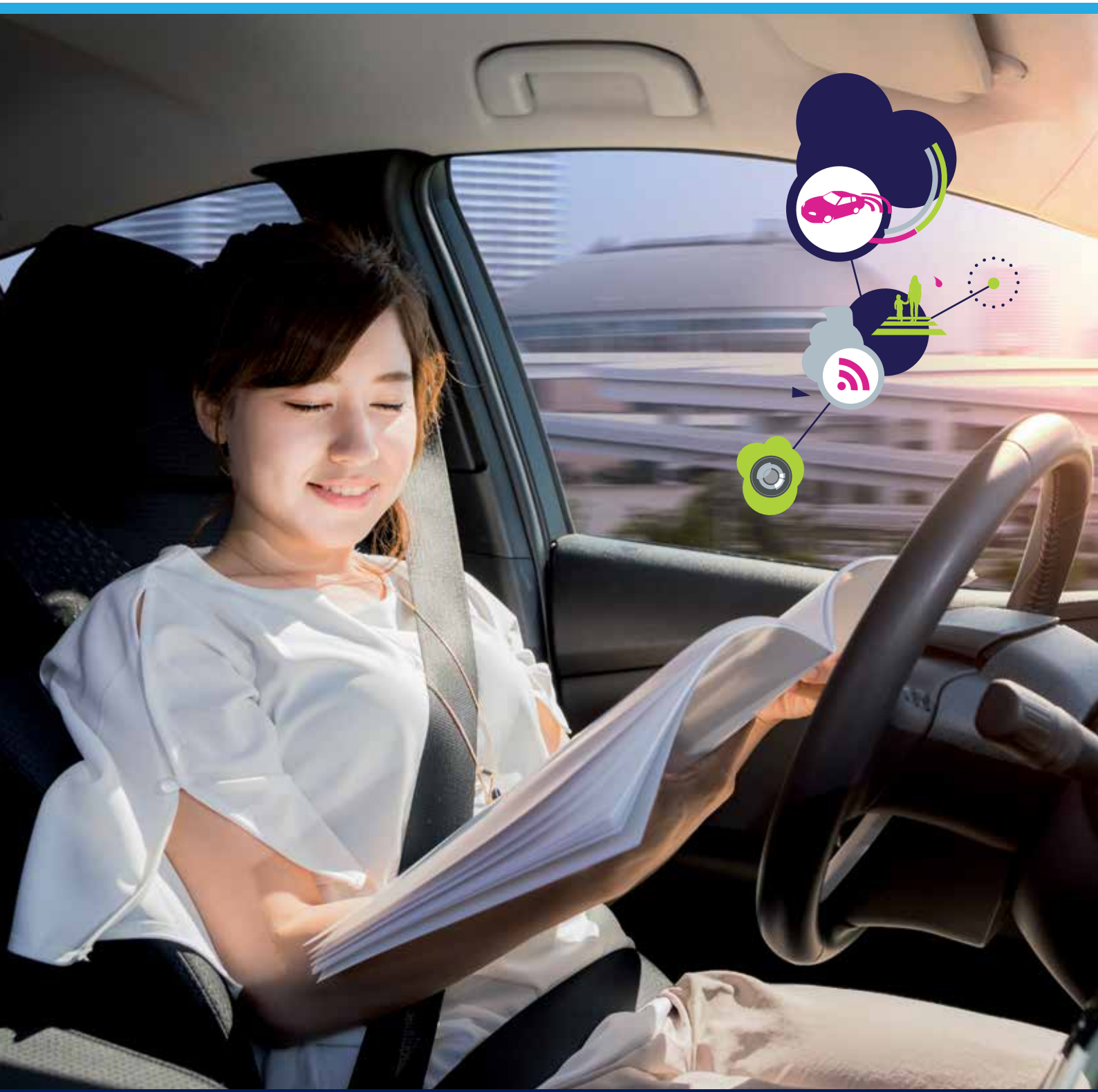
Solutions for Smarter Driving
ADAS



Content

Smart Driving

It is estimated that 80% of all innovations in the automotive industry today are directly or indirectly enabled by electronics. With vehicle functionality improving with every new model this means a continuous increase in the semiconductor content per car. With over 30 years' experience in automotive electronics, ST is a solid, innovative, and reliable partner with whom to build the future of transportation.

ST's Smart Driving products and solutions are making driving safer, greener and more connected through the combination of several of our technologies.

SAFER

Driving is safer thanks to our Advanced Driver Assistance Systems (ADAS) products – vision processing, radar, imaging and sensors, as well as our adaptive lighting systems, user display and monitoring technologies.

GREENER

Driving is greener with our automotive processors for engine management units engine management systems, high-efficiency smart power electronics at the heart of all automotive sub-systems and Silicon Carbide devices for hybrid and electric vehicle applications.

MORE CONNECTED

And vehicles are more connected using our infotainment-system and telematics processors and sensors, as well as our radio tuners and amplifiers, positioning technologies, and secure car-to-car and car-to-infrastructure (V2X) connectivity solutions.

ST supports a wide range of automotive applications, from Powertrain for ICE, Chassis and Safety, Body and Convenience to Telematics and Infotainment, paving the way to the new era of car electrification, advanced driving systems and secure car connectivity.

ADAS

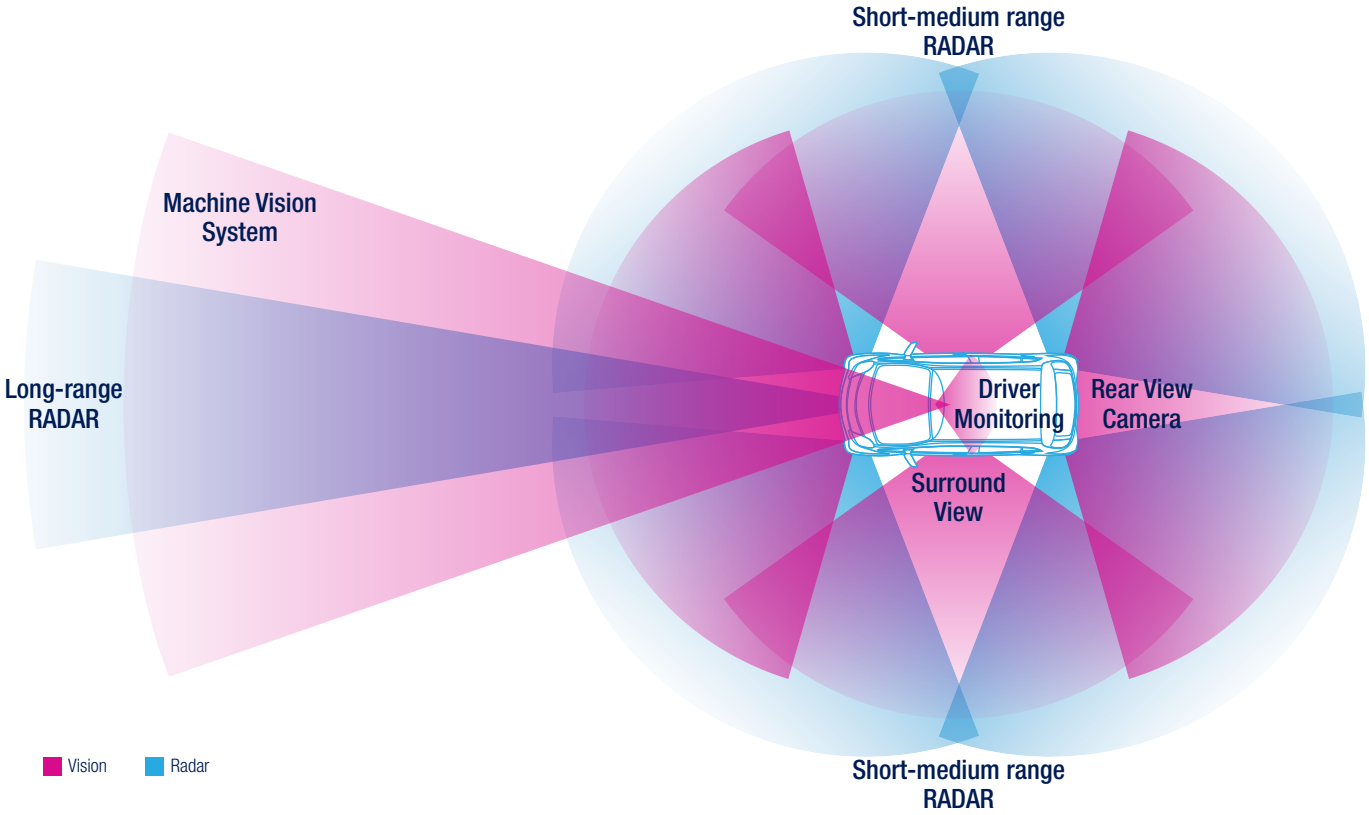
Advanced Driver Assistance Systems (ADAS) aim to drastically reduce road accidents and the associated casualties by helping drivers avoid collisions altogether. These systems react faster than any human, are constantly vigilant, and are already being adopted and deployed across various car segments, from premium to economy models.

ADAS systems constantly monitor the vehicle surroundings, alert the driver of hazardous road conditions, and take corrective actions, such as slowing or stopping the vehicle. These systems use inputs from multiple sensors, such as cameras and radars. The fusion of these inputs is processed and the information is delivered to the driver and other parts of the system. The same sensor technologies can be used both in the current ADAS systems and in the upcoming fully autonomous driving systems (level 4 and 5).

Camera-based technologies provide high-reliability and adaptability for a wide-range of driver assistance applications, for example lane keeping, pedestrian detection, traffic sign recognition, rear view camera, driver monitoring, electronic mirror. Radar-based ADAS uses two different carrier frequencies, 24 GHz for narrow band and 77 GHz for wide band applications, to support features such as blind-spot detection, automatic emergency braking and adaptive cruise control.

ST has a leading-edge product portfolio including 24 GHz and 77 GHz Monolithic Microwave Integrated Circuits (MMIC), CMOS High Dynamic Range (HDR) image sensors and advanced Image Signal Processors (ISP) with dedicated HW engines for video analytics and lens correction. ST also has a wide range of Automotive Microcontrollers, Security ICs and Power Management ICs to ensure the reliability of the mission critical ADAS systems.

KEY APPLICATIONS



SOLUTIONS

ST's key products and solutions for ADAS applications include:

Image Signal Processor	Power Management	EOS and ESD Protection	32-bit Automotive Microcontrollers	HW & SW Development Tools – Sample Kits, Evaluation Kits, Product Selectors
Image Sensor	Automotive Radar Transceiver	Ultrafast and Schottky diodes		
HW & SW Development Tools – Sample Kits, Evaluation Kits, Product Selectors				

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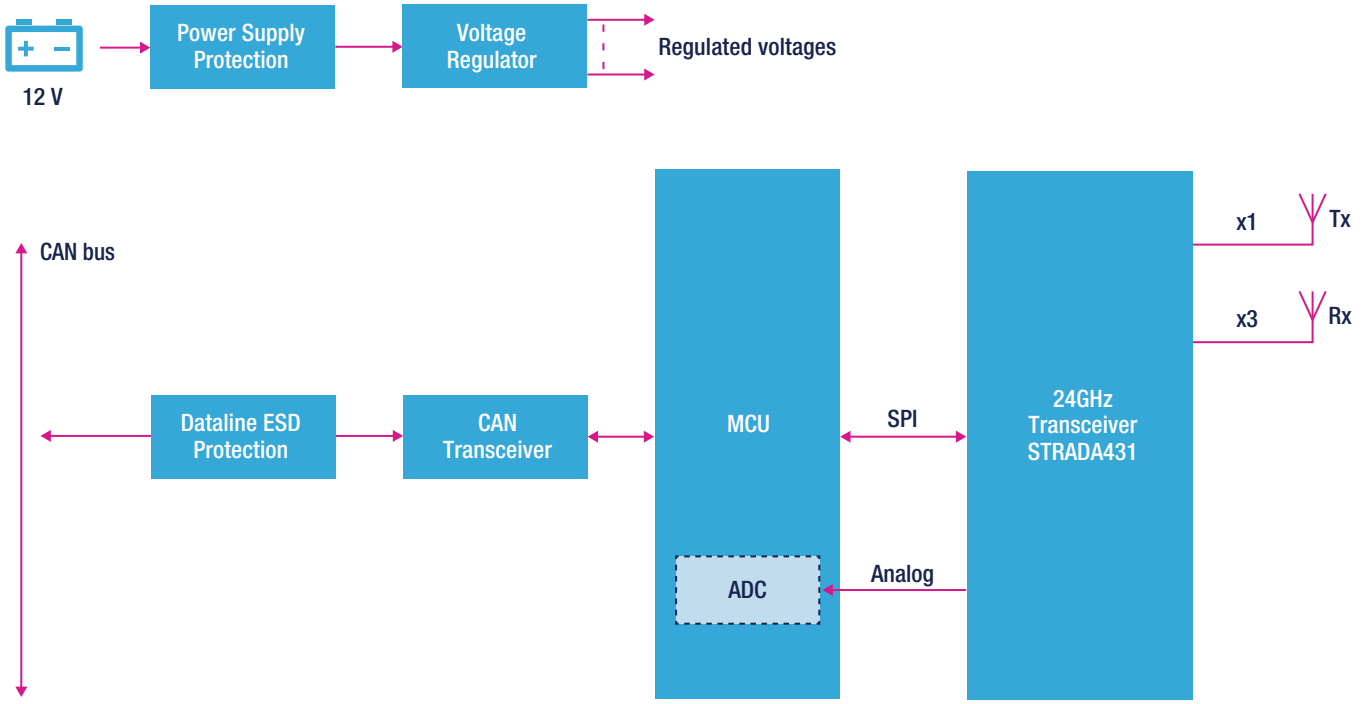
24 GHz RADAR

24 GHz radars are used to sense the environment around the vehicle and offer a proven and cost effective solution. These radar systems are aimed at features such as blind-spot detection, rear cross traffic alerts, collision avoidance and for simpler AEB and ACC systems.

STRADA431 24 GHz transceiver Monolithic Microwave Integrated Circuit (MMIC) includes one transmitter and three receivers and is specifically designed for use in Advanced Driver Assistance Systems (ADAS). It integrates voltage regulators to supply the internal core to simplify system design and is fully configurable via a simple SPI interface.



FIND OUT MORE

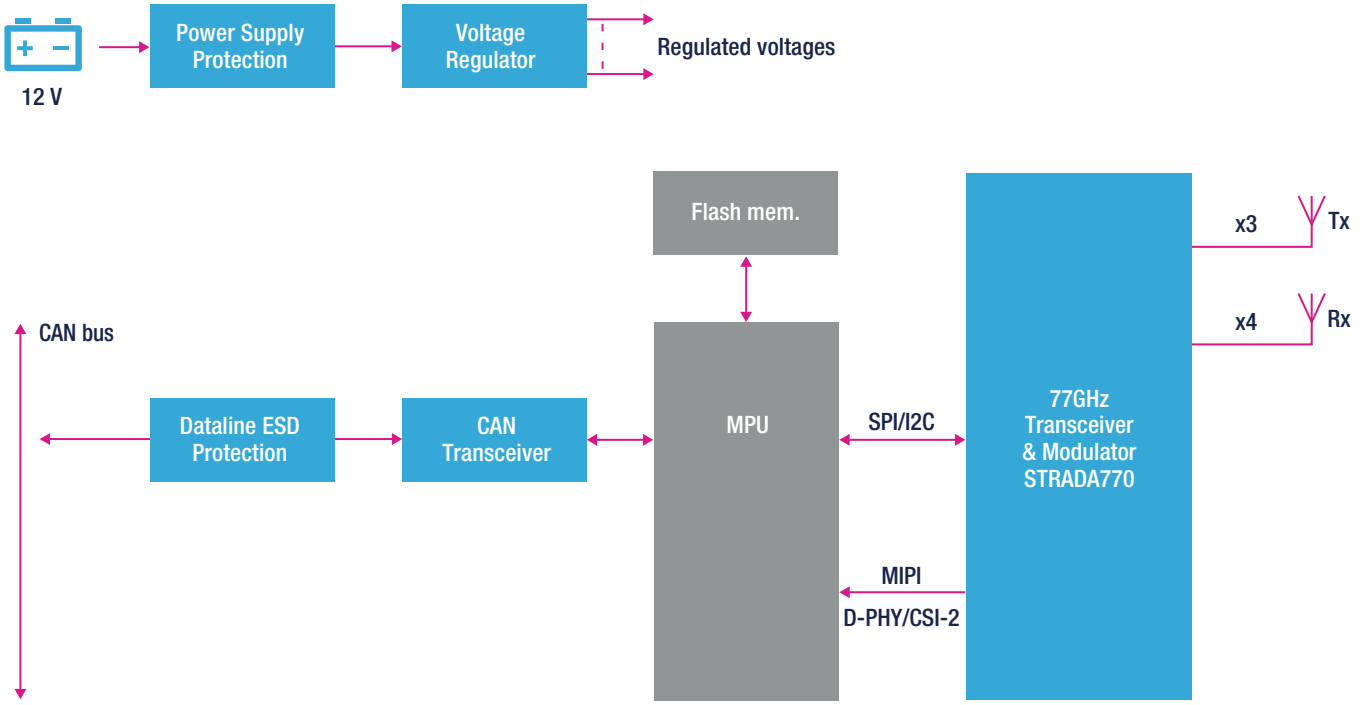
www.st.com/24-ghz-radar

77 GHz RADAR

77 GHz radars enhances automotive safety by enabling vehicles to identify dangerous situations and prevent crashes. They are used to detect different kinds of obstacles such as other vehicles and pedestrians in the 30 to 250 meters range, even in low visibility conditions.
The information provided by the radars is used in ADAS system responsible for multiple applications including autonomous emergency braking and adaptive cruise control.

STRADA770 transceiver, covering the millimeter wave (mmWave) frequency band from 76 to 81 GHz, is designed to provide an optimized solution for high-end ADAS systems. It includes 3 transmitters, 4 receivers and a chirp modulator.

An evaluation kit for developers is available with a STRADA770 evaluation board (EVB-STRADA770) and GUI for programming the IC from a PC using a USB interface.



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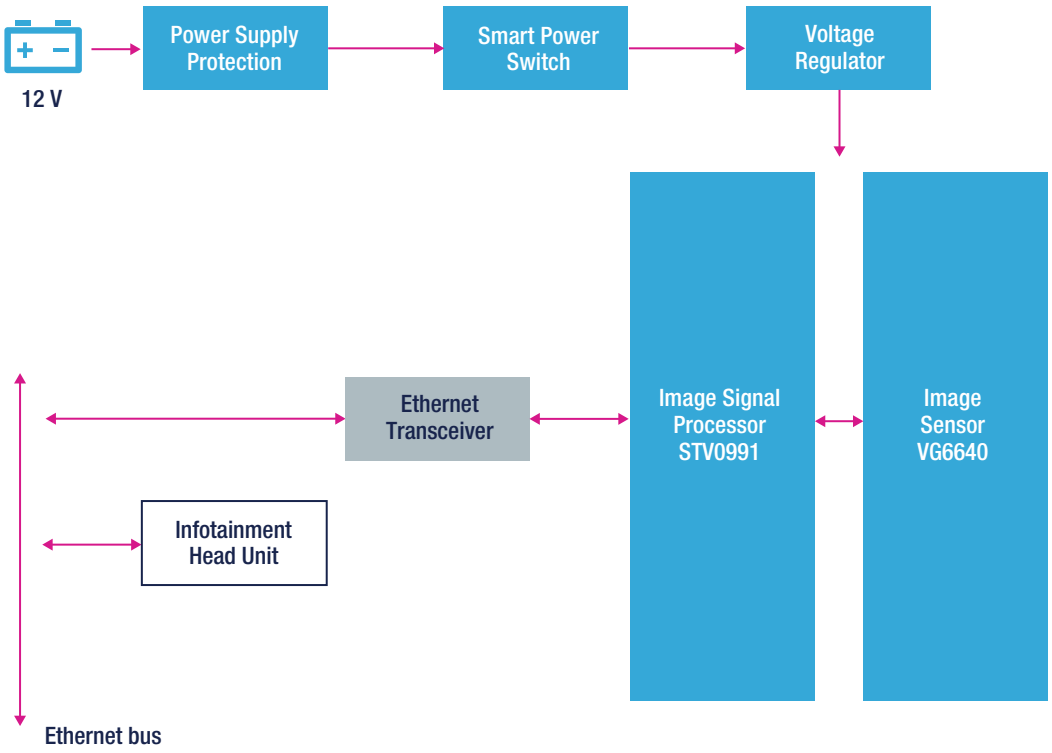
www.st.com/77-ghz-radar

SMART AUTOMOTIVE CAMERAS

ST smart cameras enable ADAS applications like rear or surround view systems and electronic mirrors. Our chip sets include state-of-the-art HDR image sensors and versatile image signal processors that provide excellent flicker-free image quality at HD resolution. Real time processing eliminates the need for costly external memory. Dedicated functions are available for fish-eye correction, detection of moving objects, trajectory and obstacle overlays, H264 or JPEG compression and a variety of interfaces including Ethernet.



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www.st.com/smart-automotive-cameras

Key Technologies

RESEARCH & DEVELOPMENT AND MANUFACTURING

To keep its technology edge, ST maintains a strong commitment to innovation, with approximately 7,400 people working in R&D and product design and spending about 16% of its revenue in R&D. Among the industry's global technology leaders, ST owns and continuously refreshes a substantial patent library (~17,000 patents; ~9,500 patent families and ~500 new patent filings per year).

The Company draws on a rich pool of chip-manufacturing technologies, including advanced FD-SOI (Fully Depleted Silicon-on-Insulator) CMOS (Complementary Metal Oxide Semiconductor), differentiated Imaging technologies, RF-SOI (RF Silicon-On-Insulator), BiCMOS, BCD (Bipolar, CMOS, DMOS), Silicon Carbide, VIPower, and MEMS technologies.

ST believes in the benefits of owning manufacturing facilities and operating them in close proximity and coordination with its R&D operations. ST has a worldwide network of front-end (wafer fabrication) and back-end (assembly and test and packaging) plants. ST's principal wafer fabs are located in Agrate Brianza and Catania (Italy), Crolles, Rousset, and Tours (France), and in Singapore. These are complemented by assembly-and-test facilities located in China, Malaysia, Malta, Morocco, the Philippines, and Singapore.

Development Tools

PRODUCT SELECTORS, SAMPLES, EVALUATION BOARDS

ST provides a set of Smart Selectors tuned to the needs of the Automotive Industry. Once the appropriate products have been selected, a wide range of samples and evaluation boards are available to help you get started and reduce your development times. In addition to boards, ST provides schematics, BOM and Gerber files to facilitate your hardware design and demonstration software packages are available too.

Product Selectors

Rapidly find the most relevant automotive products for your designs.

Evaluation Boards

ST evaluation boards help you evaluate the features and performance of selected products and system solutions that demonstrate optimized and tested solutions for your application design.

SPC5 AUTOMOTIVE MCU EVALUATION TOOLS: EASIER EVALUATION AND FASTER DEVELOPMENT

A complete range of hardware evaluation and emulation tools supports the SPC5 family of automotive microcontrollers. Discovery and Premium development boards are available to support your development from preliminary evaluation through to advanced solution development.

ST Discovery boards, available for each product line enable a quick and easy way to evaluate the microcontroller's main features. The expansion connector makes it easy to plug in application and extension modules for rapid prototyping.

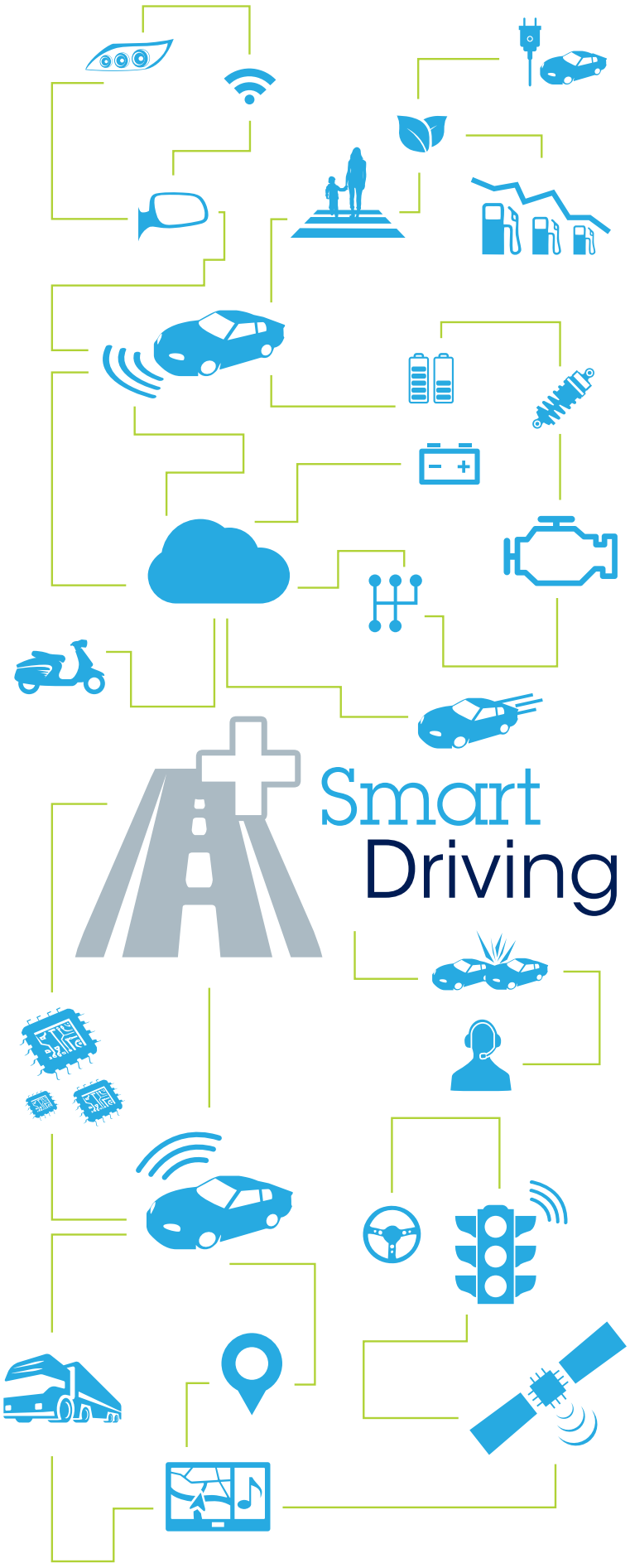
ST Premium boards, available for all lines and packages provide user access to the device's complete feature set and functionalities for advanced development. The SPC5 motherboards, used in combination with adapters, enable full access to all of the MCU's signals and peripherals (such as CAN, SPI, LIN, FlexRAY and Ethernet).

The offer is complemented by a series of emulation solutions for high-speed tracing, monitoring and bypassing.

A full range of state-of-the-art tools and software from major third parties is also available for the SPC5 family of automotive microcontrollers.

FIND OUT MORE

www.st.com/auto-spc5-mcu-evaltools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