

# ST products and solutions

We create unique innovations and products that solve real-world problems. Through decades of investment, we have developed leading-edge chip-manufacturing and packaging technologies that help our customers to bring great ideas to life.

Our chips and systems are an essential part of billions of products, from electric cars and industrial robots, through washing machines and solar panels, to smartphones and satellite communications equipment. Our technology helps our customers make all these products more autonomous, more energy-efficient, more connected, safer, and more secure.

Our strategy is based on long-term trends: cloud-connected autonomous things, power and energy, and smart mobility. These trends drive the evolving requirements of our customers and our solutions across the four end markets we address – Automotive; Industrial; Personal Electronics; and Communications Equipment, Computers and Peripherals. [I 2-6 I](#)

## Cloud-connected autonomous things

We envision a world of billions of cloud-connected autonomous things. Processing capabilities supported by embedded artificial intelligence (AI), connectivity, and security, as well as sensing and actuating products and solutions, are vital making this a reality.

### Extending our general-purpose embedded processing offer

We offer general-purpose microcontrollers with a wide variety of device options across our STM32 family. This ensures designers can find the best solution for their application, whether they require ultra-low power consumption, high performance, AI, advanced security, or a high level of wireless and wired connectivity.

During 2023, we announced multiple new products, including a new highly affordable series, a new performance-oriented series with cutting-edge security, and new wireless microcontrollers.



### Making AI more accessible

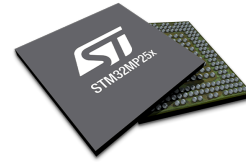
There is a lot of excitement around AI powered by large data centers and large-scale networking. There is also a very different kind of AI running directly at the edge, on a myriad of tiny devices running innumerable applications. This is edge AI, and it is powered by a very different set of chips and software stack to those used in data centers.

We took multiple steps in 2023 to make edge AI more accessible to the developer community. These included launching the world's first microcontroller unit (MCU) Edge-AI Developer Cloud – giving access to an extensive suite of online STM32 development tools, making our NanoEdge AI Studio free for unlimited deployment on any STM32 MCU, and announcing our ST Edge AI Suite – a comprehensive, integrated set of software and tools offering a simpler, more cost-effective way for developers and companies to embed AI-enabled ST products.

## Introducing our next generation of microprocessors

Our STM32 microprocessor (MPU) family addresses demanding industrial and internet-of-things (IoT) applications that require support for large open-source software. Such applications are memory-intensive and often run on operating systems and software packages that require 64-bit architecture.

During 2023, we announced our second generation of Industry 4.0-ready microprocessors. The STM32MP2 series 64-bit microprocessors come with SESIP Level 3 certification, industrial-application-ready interfaces, and dedicated Edge AI acceleration.



## Wireless microcontrollers with advanced security, tailored for IoT devices

Our wireless connectivity solutions include STM32 microcontrollers with embedded wireless, standalone RF transceivers, and network processors for Bluetooth®, Bluetooth Low Energy, Zigbee, Matter, Thread, sub-1GHz long-range networks and Cellular IoT. We work with expert partners to make it easier for our customers to use cloud services thanks to optimized connectivity software.

In 2023, we introduced new devices, modules, development tools, and supporting software. These included the STM32WBA52 microcontrollers that combine Bluetooth connectivity with ultra-low-power modes, advanced security, and a broad selection of peripherals familiar to STM32 developers. They help IoT device developers add wireless, cut power, strengthen cyber-protection, and boost processing in the edge.

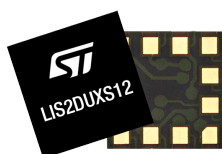
## Simplifying development of secure embedded applications

Security is an increasingly critical function of all connected devices. ST's portfolio covers the full range of secure solutions, including software and hardware embedded in general-purpose microcontrollers and microprocessors. These are supported by the STM32Trust ecosystem, which offers a multi-level strategy to enhance security.



In 2023, in addition to numerous embedded security features in new products, we introduced the market's first out-of-the-box, certified MCU protection for customer embedded developments. The STM32TrusTEE Secure Manager saves developers writing and validating their own code while providing security services developed according to best practices.

We also provide dedicated secure microcontrollers that meet the highest security standards. These can be found in smartcards used for ID, transport, banking, and SIM cards, as well as pay TV applications.



### First AI-enhanced smart accelerometers

STmotion and environmental MEMS and sensors offer accuracy, sensitivity, ultra-low power consumption, and embedded intelligence. Our products power flagship smartphones and accessories and help deliver the best user experience. We are present in many automotive and industrial applications, with products designed to meet the performance and reliability requirements of harsh environments.

We enable the transition to in-sensor processing with a new generation of smart, open, and accurate sensors to help developers exploit their potential while improving overall system efficiency. In 2023, we launched three new accelerometers with advanced processing engines built in to extend sensor autonomy, enabling systems to respond more quickly to external events while lowering power consumption.

### Next-generation multizone time-of-flight sensor

Our patented FlightSense technology, based on the time-of-flight (ToF) principle, ensures a high-accuracy, low-power, all-in-one solution for proximity and ranging sensors. They are used for personal electronics and industrial applications, as well as 3D sensing for smartphones and smart driving (LiDAR) features.



In 2023, we announced the latest-generation 8x8 multizone ToF ranging sensor which delivers a range of improvements, including greater ambient-light immunity, lower power consumption, and enhanced optics. We also announced a multizone distance sensor with camera-like field of view – the industry's best and 33% larger than the previous generation.

## Power and energy

Our technology and solutions for power and energy management enable customers to increase energy efficiency everywhere and support the use of renewable energy sources.



### Boosting efficiency in industrial applications

We offer power discrete devices and power modules serving applications across our end markets. Our silicon, silicon carbide (SiC), and gallium nitride (GaN) power devices deliver energy efficiency and enhanced performance to applications in all the end markets we serve. Other ST products are first-choice solutions for high-end power conversion, home appliances, power supplies, and motor control.

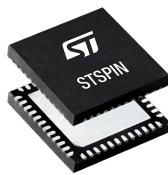
In 2023, we introduced power MOSFETs using an ST proprietary technology that enables very low conduction losses and efficient operation at high switching frequencies, improving a key figure of merit by 40%. We also introduced a number of other new products that improve efficiency in a range of industrial and consumer applications.

### Extending performance and value with new 200W and 500W GaN devices



We address applications that require generic and application-specific solutions for power management. Our solutions enable energy-saving, high-power-density, and lower-standby-power designs. Our offering includes SiC and GaN power discretes, silicon MOSFETs, insulated gate bipolar transistors, customized power modules, AC/DC and DC/DC converters, battery management ICs, wireless power ICs, digital controllers, and gate drivers.

In 2023, we introduced the next generation of integrated GaN bridge devices that simplify power-supply design, leveraging wide-bandgap technology to achieve the latest eco-design targets. The devices integrate features that save designers tackling the complex gate drive requirements of GaN transistors and also enhance reliability, reduce materials costs, and ease circuit layout.



### New high-current motor drive series for increased efficiency and flexibility

We provide an array of motor control solutions that enable motors to run with higher efficiency and greater precision. We cover the requirements of brushed DC motors, stepper motors, and brushless DC motors over an extensive range of voltage and current ratings. We offer highly integrated motor drivers that embed all the functions needed to drive motors efficiently and with the highest accuracy. They include a low-voltage series designed for battery-powered smart devices, and a series embedding an STM32 microcontroller.

In 2023, we introduced a high-current motor drive series targeting high-end industrial, home and professional appliances. The devices integrate control logic and a power stage with system protection and two operational amplifiers for current sensing. This allows greater efficiency, flexibility, and scalability, while streamlining costs.

## Smart mobility

To meet the smart mobility needs of our global customer base, we provide products and solutions that serve the main trends in the automotive market – vehicle digitalization and electrification. We enable customers to create the next generation of vehicles that are safer, greener, and more connected.



### Silicon carbide power modules offering versatile package configurations

We provide high-efficiency smart power solutions and automotive embedded processing solutions to ensure that every device used to power, control, and monitor car subsystems consumes less energy. Our wide-bandgap solutions for electric vehicles (EVs) and charging stations enable our customers to create lower-weight EVs with longer range and faster charging.

We introduced a wide variety of new solutions in 2023, including new silicon power modules targeted at systems such as onboard chargers (OBC), DC/DC converters, fluid pumps, and air conditioning. These modules deliver significant advantages for automotive system developers, including high power density, very compact design, and simplified assembly.

## Powerful automotive MCUs for next-generation cars



Our automotive microcontrollers support the ongoing transformation of the automotive industry, ranging from MCUs for cost-sensitive applications to advanced integration MCUs. New vehicle architectures require open hardware platforms, offering high real-time computing efficiency with easily upgradable devices. These platforms need to handle massive dataflows while observing stringent security guidelines and functional safety requirements.

In 2023, we deployed our new family of automotive microcontrollers, which address the needs of next-generation vehicles through a range of tailored products. These include integration platforms for motion control, gateway and body applications, and products that support car electrification.



## Enabling functional-safety applications with internal sensing units

Working closely with our partners, we provide solutions that make driving safer by reducing traffic-related accidents. These include cutting-edge RF, vision processing systems, vehicle communications, and in-cabin monitoring solutions, as well as automotive-grade sensors.

In 2023, we introduced an automotive-qualified MEMS inertial-sensing module which, with the dedicated software provided, addresses functional-safety applications up to ASIL B1. The module contains a three-axis digital accelerometer and three-axis digital gyroscope to provide accurate measurements for a wide variety of vehicle functions. It also provides ADAS or vehicle-to-everything (V2X) communication to help stabilize sensing systems such as radar, LiDAR and visual cameras, and assist semi-automated driving applications.

## Simplifying automotive power management with integrated solutions



We offer ICs dedicated to body and convenience solutions, including body control modules and car lighting systems, as well as ASIC and ASSP solutions for engine control. Our in-vehicle telematics and infotainment systems cover high-end integrated platforms, digital radio, audio power amplifiers, and satellite navigation receivers.

We introduced a new family of highly integrated automotive power management devices in 2023, with multiple power sources and transceivers integrated on chip. These devices help simplify the design of car-body controllers for sunroofs, seats, tailgates, doors, and lighting modules.