



We make
IoT work
infineon.io



Unleashing the power of the IoT

One stop product portfolio and made to measure services
for a faster time-to-market

www.infineon.io



Linking the real and the digital world

Digitalization is one of the most significant trends of our time. It is transforming all areas of life, providing us with the tools to tackle the major challenges of our time: Growing world population, demographic change, urbanization, CO₂ emissions, climate change, and scarce resources.

With the Internet of Things (IoT) as part of the digitalization we face a revolution that has gained speed for many years and is now reaching its breakthrough point, with technologies that are working ever more seamlessly.

The IoT's magic: It links the real and the digital world by connecting billions of devices and machines worldwide – each of them equipped with powerful electronics including

sensors, wireless connectivity, and software. What used to require a multitude of human efforts and industrial machinery can now be achieved by the smallest devices, which autonomously process information, make decisions, and set chains of action in motion.

In the longer term, a new class of IoT-based possibilities will radically transform businesses, with new competitive opportunities and threats and disrupting industry boundaries as competition shifts from specific products to increasingly comprehensive systems that encompass a whole range of related products and services.

No innovation without microchips

Digital transformation and innovation without microchips is unimaginable. As the “raw material”, they are an elementary component of the IoT: Sensors, actuators, micro-controllers, communication solutions, and security

components underpin every IoT device. They connect the real with the digital world. Microchips make devices and machines smart, secure and energy-efficient.

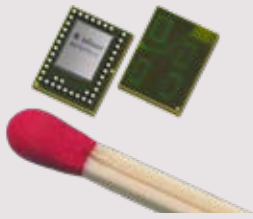
Sensors capture environmental information and convert it into digital data



Ubiquitous sensors make IoT devices smarter, enabling the “things” involved to “see”, “hear”, “feel”, “smell”, and therefore understand their surroundings. They mark the “point of beginning” of each IoT system, picking up data from the environment surrounding a connected device. Infineon’s broad portfolio of XENSIV™ sensors is meeting today’s sensing challenges reliability, accuracy, and application fit. It covers a wide offering for automotive, industrial, and consumer sensor solutions including pressure and magnetic sensors, acoustic sensors, 3D image sensors, radar sensors, and CO₂ sensors to name just a few examples.

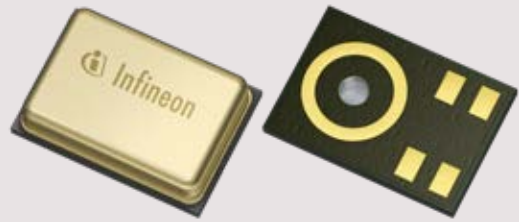
Building on the company’s in-depth system understanding, we provide perfect-fit sensor types, giving customers the widest selection of ready-to-use solutions offering fast time-to-market. Additionally Infineon boasts an excellent selection of ready-to-use solutions with a short time-to-market. Evaluation and demo boards and online simulation tools empower you to easily create IoT solutions that make a difference. What is more, Infineon collaborates with its ecosystem partners to develop innovative use cases that grant customers a clear market advantage in sectors such as robotics, autonomous driving, and building automation.

Sensors from Infineon – Product and solution examples:



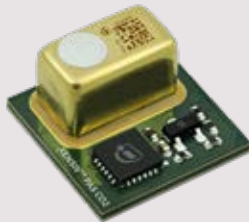
Giving things eyes with radar sensors

XENSIV™ 60 GHz radar sensors give devices greater contextual awareness plus the ability to “see” their surroundings so they can offer users a more convenient and natural experience than they ever thought possible.



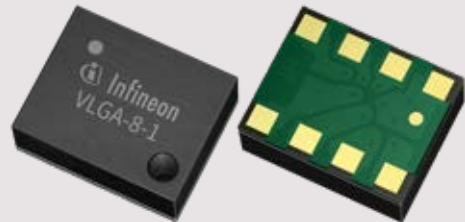
Giving things ears with MEMS microphones

Our MEMS microphones bring best-in-class performance – with the lowest possible self-noise (high SNR) and lowest distortion – to more and more IoT applications.



Giving things a nose with PAS CO2 sensors

Leveraging photoacoustic spectroscopy (PAS), Infineon has developed an exceptionally small CO₂ sensor that overcomes existing size, cost, and performance challenges.

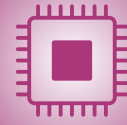


Make things “feel” with pressure sensors

XENSIV™ digital barometric pressure sensors give designers the best choice when it comes to small form factors, highest precision, and accuracy over a wide temperature range, fast read-out speeds and low power consumption.

Microcontrollers – the nerve center of an IoT device

Microcontrollers make products smart by collecting, processing, analyzing, and communicating data



Specifications for microcontrollers in IoT devices are as varied as the IoT applications themselves. Infineon provides the matching solutions for each one of them, offering a broad variety of microcontrollers based on 32-bit Arm® architecture, Infineon’s 32-bit TriCore™ architecture, and others. These include microcontrollers in the XMC™ family and PSoC™ family that were designed for IoT applications – from extremely energysaving to extremely high-performance. The MCUs are backed up by an extensive portfolio of reliable, high-performance memories for embedded systems.

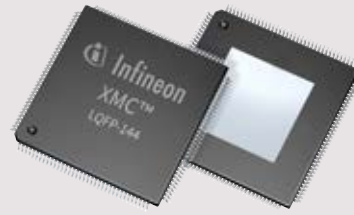
Comprehensive tools and development platforms simplify the development process, such as DAVE™, the development platform for XMC™ microcontrollers, AURIX™ embedded software, or AURIX™ tools. With the PSoC™ line of low-power, high-performance MCUs at our portfolio, we make it even easier for our customers to enter the IoT arena. To evaluate and design with all available PSoC™ 6 MCUs, Infineon offers the ModusToolbox™. PSoC™ Creator is an integrated design environment that enables concurrent hardware and firmware editing, compiling and debugging of PSoC™ and FM0+ systems.

Microcontrollers from Infineon – Product and solution examples:



PSoC™ 6: Purpose-built for the IoT

The PSoC™ 6 family is built on an ultra-low-power architecture to extend battery life for battery powered applications. The PSoC™ 6 MCU also features the latest generation of industry-leading CapSense® capacitive-sensing technology, enabling modern touch, and gesture-based interfaces that are robust and reliable.



XMC™: One platform, countless solutions

The XMC™ microcontroller family is based on Arm® Cortex®-M cores. It is dedicated for a broad range of IoT applications, offering optimal power, performance capabilities, and reduced costs all while providing greater design flexibility. XMC1000 bring together the Arm® Cortex®-M0 core and market-proven and differentiating peripherals in a leading-edge 65 nm manufacturing process. XMC4000 are powered by Arm® Cortex®-M4 with a built-in DSP instruction set.



AURIX™ TriCore™: Safety joins performance

32-bit AURIX™ TriCore™ unites the elements of a RISC processor core, a microcontroller, and a DSP in one single MCU. The AURIX™ microcontroller is automotive qualified and designed to meet the needs of the most demanding embedded control systems applications where the competing issues of price/performance, real-time responsiveness, computational power, data bandwidth, and power consumption are key design elements.



CAPSENSE™ Controllers

Our CAPSENSE™ technology consists of the Capacitive Sigma Delta (CSD) sensing algorithm, which provides capacitive sensing using a switched capacitor technique with a delta-sigma modulator that converts the sensing current to a digital code. CAPSENSE™ offers industry leading low power operation, with an average current consumption of 22 μ A, and the industry's widest voltage ranges (1.71V-5.5V). It also provides the industry's best solution for liquid tolerance to prevent false touches in wet/moist environments

Actuators set things into motion

Actuators convert control signals into actions such as motion, light, and heat



Depending on “smart” decisions, actuators convert the control signals into actions – which is in most cases motion, but also light and heat. This actuation is performed by power semiconductors.

Infineon provides the broadest portfolio of all power technologies in the market – silicon (Si), silicon carbide (SiC), and gallium nitride (GaN). Customers benefit from Infineon’s market leadership in power discretes and modules, providing technology for optimizing power generation, transmission, storage, and consumption.

We deliver solutions from milliwatts to megawatts with superior energy efficiency. We can therefore empower your IoT solution with the best-fit solution for your motor drive, or energy management system. Irrespective of whether you have a design in a microamp, or megawatt range, you can rely on our superior energy efficiency and reliability.

Actuators from Infineon – Product and solution examples:



Gallium Nitride CoolGaN™ HEMTs

Gallium nitride (GaN) is a wide band gap (WBG) material and permits devices to operate at much higher frequencies and temperatures than conventional semiconductor materials like silicon. Infineon's CoolGaN™ gallium nitride solution is based on the most robust and performing concept in the market – the enhancement-mode (e-mode) concept, offering fast turn-on and turn-off speed. CoolGaN™ HEMTs offer the highest quality and reliability well beyond the standards and enable performance improvement in several applications such as server, telecom, wireless charging, adapter and charger, and audio.



Silicon Carbide CoolSiC™ MOSFETs

SiC devices offer a number of attractive characteristics for high voltage power semiconductors when compared to commonly used Silicon (Si). Infineon's CoolSiC™ Schottky diodes ranging from 600V-1200V improve efficiency and solution costs for applications such as Server, Telecom Solar, Lighting, Consumer, PC Power, and AC/DC. The revolutionary CoolSiC™ 1200V SiC JFET family, in combination with the proposed Direct Drive Technology, represents Infineon's leading edge solution to bring actual designs towards new and so far unattainable efficiency levels. Also available: High efficient IGBT power modules with SiC freewheeling diodes.



CIPOS™ Intelligent Power Modules

The CIPOS™ IPMs are families of highly integrated, compact power modules designed to drive motors in applications ranging from home appliances, fans, pumps to general purpose drives. The energy efficient CIPOS™ modules integrate various power and control components to increase reliability, optimize PCB size and reduce system costs. This simplifies the motor drive design, improves reliabilities and lowers component counts while significantly reducing time to market.



iMOTION™ Integrated Motor Control Solutions

iMOTION™ ICs integrate all the control and analog interface functions required for sensor less field oriented control (FOC) of PM motors using DC link, or leg shunt current measurements. In addition they feature Infineon's patented and field proven motor control engine (MCE) that eliminates software coding from the motor control algorithm development process. Assisted by powerful tools like MCEwizard and MCEdesigner it is possible to have the motor up and running in less than an hour.

Seamless connectivity unleashes the IoT's full potential

Connectivity solutions connect the devices with each other and with the cloud



Connectivity is the heartbeat of the Internet of Things, and as the IoT expands further into our daily life connectivity reliability becomes even more critical.

Infineon's portfolio of Wi-Fi® and Bluetooth® products as well as secured cellular connectivity based on eSIM solutions are used extensively in the Internet of Things, including in consumer, commercial, industrial, and automotive applications, and Infineon's expertise in these products continues to deliver market-leading products.

Infineon is also a market leader in USB and USB-C, with more than 1 billion units shipped since 2008. Our continuous innovation drives acceleration of the adoption of communications technologies into new areas.

Connectivity solutions from Infineon – Product and solution examples:



AIROC™ portfolio for reliable and high performance connectivity

Wireless technologies like Wi-Fi® for wireless local area networks (WLAN), Bluetooth® technology for content streaming and Bluetooth Low Energy technology for ultra-low-power connectivity form the backbone of the IoT. AIROC™ wireless connectivity solutions seamlessly integrate all these technologies to provide state-of-the-art, interoperable solutions for consumer, industrial, medical, automotive, and other applications.



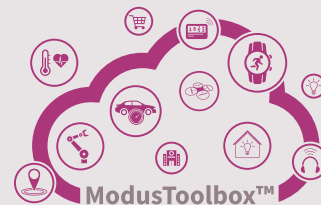
OPTIGA™ Connect family: Turnkey eSIM security solutions

Reaching beyond the typical connectivity, identification, and authentication functionality required of eSIMs, Infineon's turnkey eSIM solutions take performance and ease of deployment to the next level. Combining certified, best-in-class Infineon security hardware with a fast interoperable operating system, Infineon's OPTIGA™ Connect solutions are optimized for the specific requirements of industrial and IoT applications as well as those of consumer devices.



Universal Serial Bus (USB): Plug and play, easy to use, and simple to implement

Infineon provides the industry's most comprehensive "whole product" support, including software, reference designs and driver suites. This provides a one-stop shop for all USB needs and enables our customer to get to market faster, and gain a competitive advantage in the market.



ModusToolbox™: Tools and firmware libraries for quicker software development

Robust software underpins the development of high-quality, secure, and reliable IoT products. That is why Infineon offers the ModusToolbox™, a set of multiplatform development tools and a comprehensive suite of GitHub-hosted firmware libraries. Together, they enable an immersive development experience for customers creating converged MCU and Wireless systems.

Security solutions create trust in the digital world

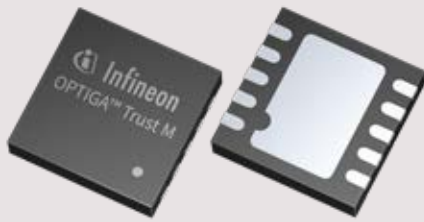
Security solutions protect sensitive data, intellectual property, and personal privacy



Security promotes trust in and between connected IoT devices and is a prerequisite for their mainstream adoption. Security solutions give “things” a trustworthy identity and enable the growth of new business models. They protect sensitive data, intellectual property and personal privacy, and can contribute significantly to public safety. Our security solutions are based on our market-leading competence in the field.

Our products range from basic authentication, to advanced security protection coupled with software for seamless implementation, especially for IoT devices. In our work, we are guided by the belief that security needs to be easy, accessible and intuitive in order to be accepted and successful.

Security solutions from Infineon – Product and solution examples:



OPTIGA™ Trust M: Secured cloud connectivity – the easy way!

The OPTIGA™ Trust M solution is a high-end security controller optimized for connected devices. It provides extremely flexible, high-performance, secured access to any major cloud provider for industrial and building automation, smart home and consumer applications.



OPTIGA™ Authenticate - verifying the authenticity of IoT devices to enable trust.

The OPTIGA™ Authenticate product family gives smart “things” a secured and unique ID (Identity of Things) to verify their authenticity so users can trust them. Reaching beyond batteries, these all-in-one, turnkey device authentication solutions are ideal for all sorts of disposables and spare parts ranging from filters, purifiers and cartridges to complex industrial systems.



OPTIGA™ TPM: Protecting integrity and authenticity of embedded devices

OPTIGA™ TPM (Trusted Platform Module) offers a broad portfolio of standardized security controllers to protect the integrity and authenticity of embedded devices and systems. With a secured key store and support for a variety of encryption algorithms, OPTIGA™ TPM security chips provide robust protection for critical data and processes through their rich functionality.



PSoC® 64 Secure Microcontrollers: The security line

PSoC® 64 Secure MCUs integrate the awardwinning, ultra-low power PSoC 6 architecture with well-structured open-source IoT platform software to deliver a secure solution that “just works”. It comes with validated security firmware to help accelerate your secure design implementation.



SECORA Connect: Empowering smart wearables and IoT devices

Smart things are now also available with functions for making contactless payments – no matter whether the device in question is a fashion accessory, a battery-powered smartwatch, or fitness tracker.

For this purpose, special electronics modules combine a secure element with a system-in-package NFC antenna, making it easy for device manufacturers to integrate and manage payment applications and ticketing and access solutions.

<http://www.infineon.com/cms/en/about-infineon/make-iot-work/secure>

Real, secure, and easy: Infineon makes the IoT work.

We are your link between the real and the digital world.
We make IoT, what it needs to be: Real. Secure. Easy.
We make IoT work.

We make the IoT real. Infineon's capabilities in sensing, computing, actuating, connecting, and securing create the backbone of each IoT system, unlocking new markets and applications. Infineon provides the industry's most comprehensive portfolio for making smart, secure, and energy-efficient IoT solutions possible. This makes us your partner for unleashing the power of the IoT.

We make the IoT secure. Security is embedded in our DNA. We have shaped security and privacy in embedded systems since the beginning, creating trust and confidence in the opportunities of the IoT. We provide security solutions that fit our customers' system requirements. Our solutions ensure the right security for your IoT without compromising on ease of use.

We make the IoT easy. We understand the applications and bring together the essential building blocks of the IoT. A wide variety of reference designs and simulation tools empower you to easily create IoT solutions that make a difference. Pre-integrated solutions backed by a robust software suite help our customers bring their products to market faster by reducing development complexity and cost.

You think about IoT? We help you make IoT work.

We pair our strong heritage and deep application understanding with excellence in product quality and outstanding manufacturing capabilities. This makes us a dependable partner for ensuring broad and sustainable adaptability of IoT technologies across all markets.



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