



Application brief

Wrist-worn wearable devices

Overcome design challenges with Infineon's excellent RF, sensor, connectivity, power, memory and security solutions

A **smartwatch** is a wrist-worn wearable device that provides a two-way connection via Bluetooth®, cellular baseband or Wi-Fi to a smartphone. It receives electronic communications like texts or voice calls, also showing the time and other alerts on its glanceable display. In addition, these convenient lifestyle devices support health, fitness and activity tracking. They can include a smartwatch from all generations/versions.

A **sports watch** is a highly functional, robust and usually water-resistant device. It is typically used by leisure and professional athletes to monitor health metrics, fitness and sleep patterns. Sports watches have fewer features than smartwatches, with the main design focus on sports tracking.

A **wristband** or **fitness tracker** is a wrist-worn device tailored to activity-tracking and health-monitoring functions. Designs can vary from a simple pedometer for step counting to more sophisticated use cases such as sleep monitoring, location tracking and access control.




















A **medical wrist-worn** device measures physical activity and general health stats such as heart rate and blood pressure. They can even tell if the wearer has fallen. By supporting connected health, they enable elderly people in particular to live independently and safely.

With its broad product portfolio, Infineon helps wearable manufacturers to overcome design challenges across all device categories. These include the need for robust device and data security to protect personal and sensitive information, accurate sensor readings for precise location tracking and to differentiate between everyday movements and a fall event for instance, longer battery lifetimes and small form factors for elegant, unobtrusive designs. Infineon's widely-deployed Wi-Fi and Bluetooth® combo ICs offer the industry's best interoperability and RF performance. Infineon also helps customers to differentiate their offerings with highly efficient, secured and innovative solutions supporting the integration of additional use cases such as smart payment and ticketing, notifications and voice calls, bluetooth audio streaming, smart access or different ways of charging (wireless, NFC, USB).

Highlights wearable offering

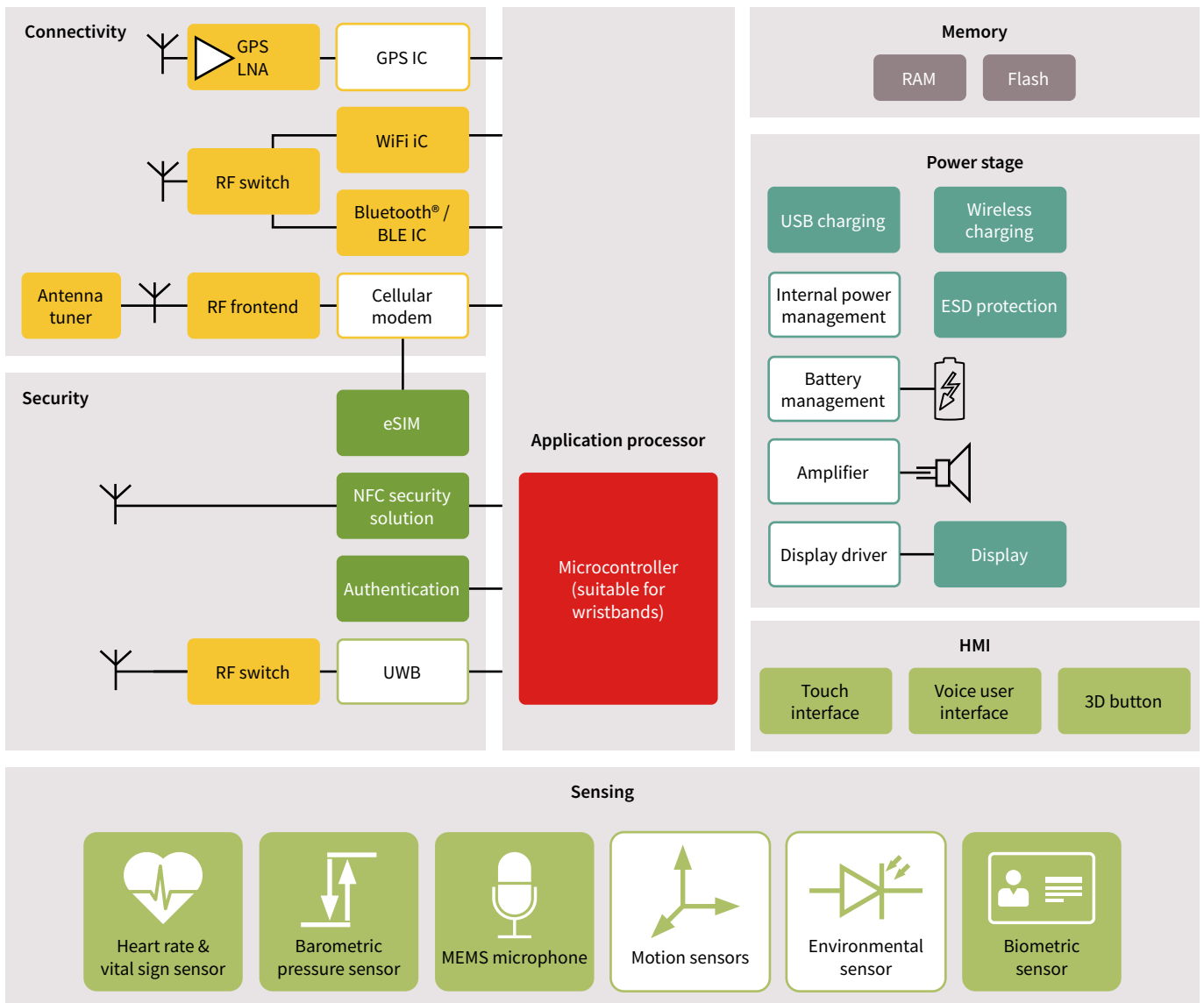
- > Increased battery lifetime
- > Enhanced productivity for the device
- > Easy-to-integrate turnkey security solutions
- > Robust, secured battery authentication
- > Reduced system size and cost
- > Quality and technology leadership
- > One-stop-shop
- > Fast time-to-market with best-in-class support

Main use cases for smartwatches, sports watches and wristbands

	 Notifications	 Bluetooth® audio streaming	 Voice recording and assistant	 Gesture control
	 Location tracking	 Contactless payment, access control and ticketing	 Information visualization (maps, news, videos, etc.)	 Physical condition monitoring (cardiac condition, blood pressure, blood glucose monitoring)
	 Health monitoring (heart rate, etc.)	 Sleep monitoring	 Body temperature monitoring	 Smartphone autonomy & broader mobile network accessibility
	 Fitness monitoring	 Speed monitoring	 Cloud authentication for safe data transfer and data privacy	 Car access control

● Use cases today ● Future use cases

Example: smartwatch – block diagram



Key enabling products from Infineon

- > XENSIV™ 3D image sensor REAL3™
- > XENSIV™ 3D magnetic sensor
- > XENSIV™ 60 GHz radar sensor
- > XENSIV™ pressure sensor
- > XENSIV™ MEMS microphones
- > Wireless charging
- > AIROC™ Wi-Fi & Combos
- > AIROC™ Wi-Fi
- > Wi-Fi MCUs
- > Secora™ CONNECT
- > PSoC® 63 microcontrollers
- > PSoC® 4 Bluetooth® Low Energy (Bluetooth® Smart)
- > PSoC® 4 including CapSense® technology
- > RF switches
- > OPTIGA™ Connect consumer eSIM solution
- > OPTIGA™ Authenticate IDoT
- > NOR Flash / F-RAM
- > GPS LNA
- > ESD protection
- > AIROC™ Bluetooth® LE & Bluetooth®
- > AIROC™ Bluetooth® 5.0 SOC for audio
- > Antenna tuners
- > 4G / 5G LTE LNAs



Choose the right partner for the design of your smartwatches, sports watches, wristbands or medical wrist-worn devices



Highest accuracy and fast signal pick-up for location tracking and altitude measurement



Secure cellular network connection



Products with smallest form factors enable high functional integration



Integrated lowest power compute, BLE connectivity and most robust capacitive touch



Bluetooth® audio streaming streaming with BT / BLE combo SoC



Precise detection of single steps, body motions or fall events



USB-C fast charging capability



Lowest power, high reliability data storage



Easy, convenient and secure data transmission by NFC



Device protection to enable high user experience



High reliability and data throughput with Wi-Fi / BT connectivity



Low power consumption to increase battery lifetime

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