PRODUCT BRIEF

XENSIV™ BGT60CUTR13AIP

Infineon's 60 GHz CMOS radar sensor for IoT

The XENSIV™ BGT60CUTR13AIP is the lead type of Infineon's new CMOS radar sensors family for consumer and IoT applications.
The sensor is designed for **ultra-low power** and **system cost optimization**. Manufactured in 28 nm RF CMOS technology, the MMIC integrates blocks like LDO and XTAL, as well as a **Hardware Accelerator (HWA)** for processing.

The **integrated Hardware Accelerator** (HWA) allows the device to operate **autonomously** and offload complex tasks from the host MCU by running either radar **pre-processing** or the complete **motion detection on-chip**.
Key highlights of the Hardware Accelerator (HWA) include processing steps such as **2D FFT, filtering, 2D CFAR**, and **Angle of Arrival** estimation. The **motion detector** delivers **up to 8 targets**, including **range**, **velocity**, **azimuth**, **elevation**, and **magnitude**. To **improve robustness** and **reduce false alarms**, users can configure the radar to **mask information** below specific thresholds (e.g., range or velocity) or **exclude up to 112 range-angle zones**. This offers exceptional flexibility for custom detection scenarios.

The XENSIV™ **BGT60CUTR13AIP** achieves exceptional resolution with its ultra-wide 7 GHz bandwidth FMCW operation. It can detect even sub-millimeter movements and the micro-motions of nearly static targets. The **output power of 11 dBm** ensures reliable detection ranges of over **20 m** in boresight and **16 m** across the entire field of view.

The **compact Antenna-in-Package (AIP)** design, featuring **one transmitting (Tx) channel and three receiving (Rx) channels in a L-shaped configuration**, enables both azimuth and elevation angles while maintaining a small form factor of just 4.3 x 6.05 mm^2. This cost-optimized design strikes an excellent balance between performance and affordability.

The integrated hardware sequencer and **Finite State Machine (FSM)** offer users full flexibility in defining configurable chirps and timings, while ensuring cycle-accurate data acquisition. Together with the embedded Hardware Accelerator (HWA) and an integrated bootloader, the MMIC is able to run fully autonomous ultra-low power presence detection to wake the host MCU. Achieving power consumption of less than 1 mW in ultra-low power autonomous mode the XENSIV™ BGT60CUTR13AIP targets low power and battery powered IoT applications.

Target applications include
- **Smart home and building automation**, such as security camera, video doorbell, HVAC systems, and smart thermostat
- **Consumer electronics**, such as smart speakers, smart TVs, and home appliances
- **Healthcare**, such as baby monitors and sleep tracker
- **Robotics**, such as vacuum cleaners and lawn mowers
- **Wearables**, such as headphones, smart glasses and smartwatches

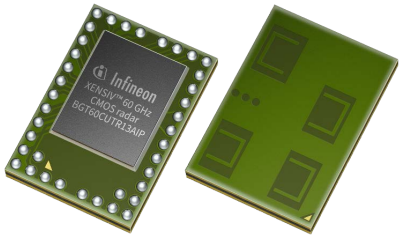
Key features

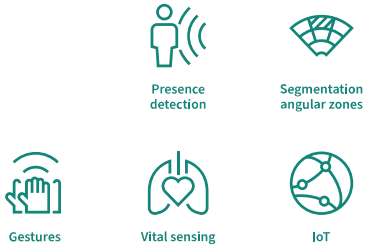
The XENSIV™ **BGT60CUTR13AIP** is a **60 GHz** radar sensor with a detection range of more than **20 m** and power consumption of less than **1 mW**.

Key figures
- 4.30 x 6.05 x 0.9 mm^3 package size
- 1 Tx, 3 Rx Antenna-in-Package (AiP)
- 30 dB Tx-to-Rx isolation
- 11 dBm output power
- 5 dBi antenna gain
- 7 GHz ultra-wide bandwidth
- 700 MHz/µs ramp speed
- 12-bit ADC channel
- 20 MSps ADC sampling
- 50 MHz SPI interface
- –20 to +85°C operating temperature

Key benefits

- Optimized for **ultra-low power** and battery-powered IoT
- **On-chip processing** via Hardware Accelerator (HWA)
- **Integrated bootloader** for autonomous wake-up
- **Small size** (26 mm^2) covering both azimuth and elevation
- **System-level cost optimization** by integration of supporting blocks



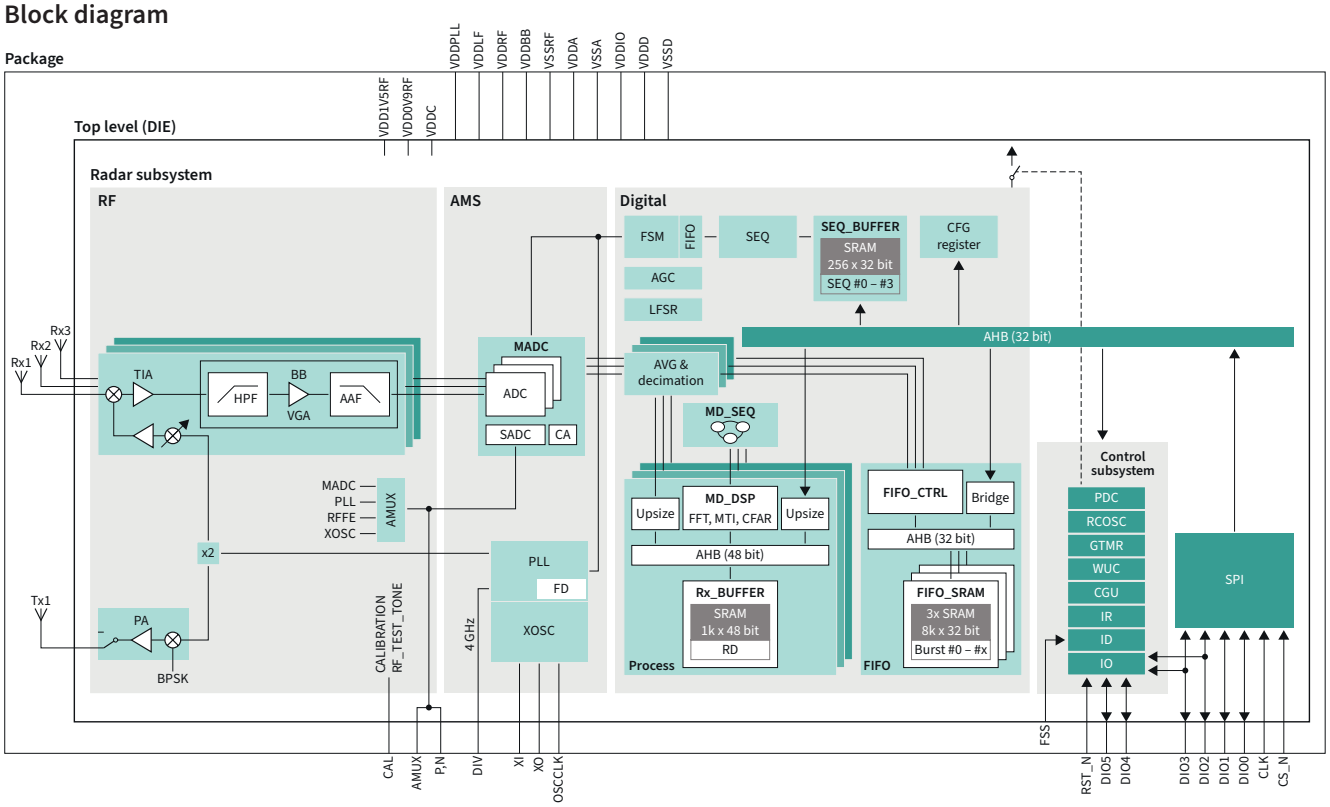


www.infineon.com

The XENSIV™ **BGT60CUTR13AIP** consists of several analog and digital blocks: Radio Frequency (RF) front-end, Analog Base-Band (ABB), Analog-to-Digital Converter (ADC), Phase-Locked Loop (PLL), FIFO (First-In, First-Out) memory, Serial Peripheral Interface (SPI) and antennas. For power efficiency reasons, the BGT60CUTR13AIP has an embedded Hardware Accelerator (HWA) based pre-processing which helps reduce data rates. The sensor is optimized for high power efficiency, achieved through the integration of domain-specific Low Drop-Out voltage regulators (LDOs), the separation of logic into power domains that are dynamically controlled by hardware, and the use of both low-power RC oscillator (RCOSC) and high-precision crystal oscillator (XOSC) on-chip.

The sensor also includes a fully embedded standalone Motion/Presence Detection (MD) processing module that can detect moving targets within its field of view and notify the host via an interrupt.

Block diagram



Product overview

Sales name	SP number	Description	Status
BGT60CUTR13AIP	SP005729332	Radar MMIC	QS available, MP Q1 2026

Published by
Infineon Technologies AG
Am Campeon 1-15, 85579 Neubiberg
Germany

Public

Date: 10/2025

Scan QR code and explore offering
www.infineon.com