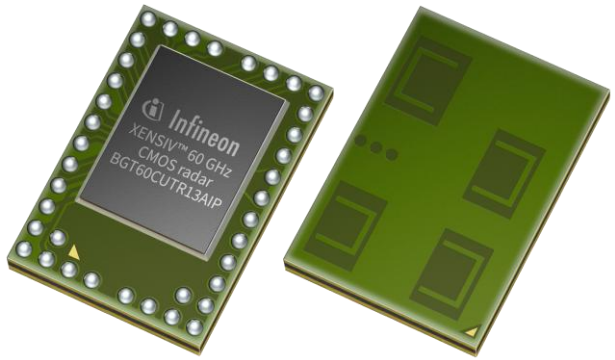


60GHz radar featuring ultra-low-power presence sensing for battery driven IoT devices

Public

XENSIV™ 60GHz CMOS Radar BGT60CUTR13AIP



- Optimized for ultra-low power applications
- 1Tx 3Rx L-shaped Rx antenna with optimized package – enabling azimuth and elevation sensing
- Integrated processing via HW Accelerator including Bootloader for autonomous wake-up
- System level cost optimization

Key Features

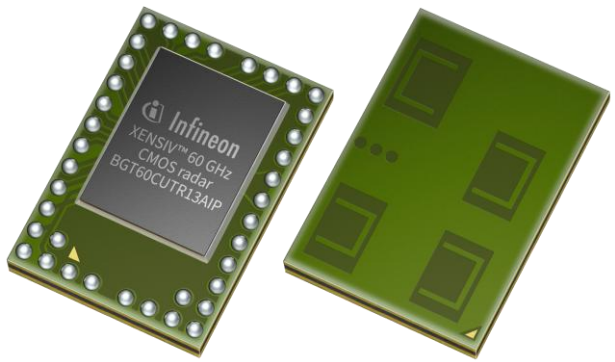
XENSIV™ 60GHz CMOS Radar Family with integrated processing based on Modular Approach



- **Ultra-Low-Power** consumption via embedded Power Management Unit (PMU) with **less than 200µW**
- Up to **7GHz bandwidth** at 60GHz with **11dBm output power** → **Increased Range and Resolution**
- **First type TR13** with **L-shape antenna** pattern enabling both **azimuth** and **elevation** with optimized package size
- **Integrated processing** via HW accelerator: Range, Speed, Azimuth, Elevation Filtering & Magnitude dB (3D FFT, MTI, CFAR, Filtering, ...)
- **Multiple moving targets** and pre-processed data directly available via SPI interface
- Bootloader incl ROM enabling **full autonomous motion detection** mode (incl. self-config after power-up) **to wake up MCU**
- **On-chip chirp averaging** to reduce data rate

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XENSIV™ 60GHz CMOS Radar with fully autonomous, ultra-low-power presece detection to enable new generation of intelligent smart IoT



Improved energy efficiency and increased battery lifetime

Enables **Physical AI** to increase the **intelligence of smart IoT devices** and how they interact with its environment

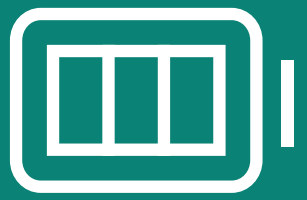
Protect **privacy** of the users

Designed to **support efficient system architecture** with integrated supporting blocks like LDO and high precision crystal oscillators

Allows **cost optimized system design** by adding processing and memory according to the required use case and avoids unused resources

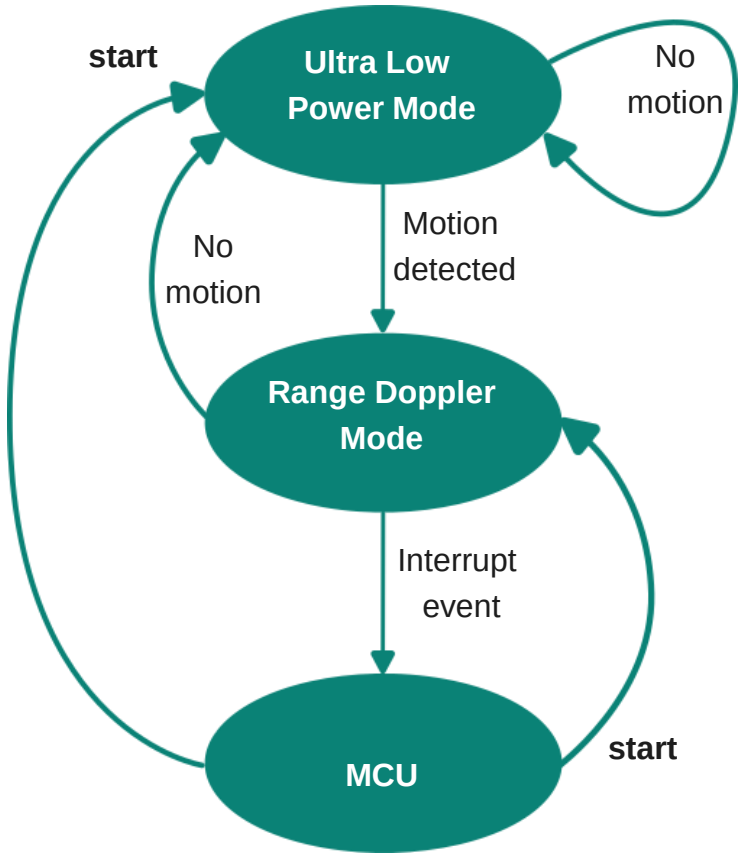
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Ultra-low-power autonomous presence detection to increase energy efficiency and extend the battery lifetime of smart IoT.



BGT60CUTR13AIP - Integrated processing and Presence Detection enables autonomous wake up from Ultra-Low-Power Mode <200µW

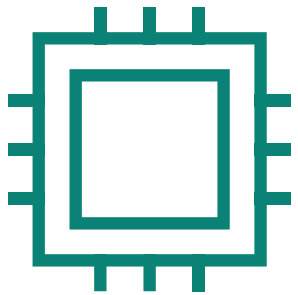
- Integrated HW accelerator incl. ROM enables autonomous mode w/o need to configure the device via ext MCU
- Every motion detection in ULP-Mode will raise an internal event
- Based on config. threshold it will autonomously start the accurate Range Doppler Mode (RD)
- RD then will generate a flag to the host/ ext. MCU to start-up the device
- Different frame configurations, Fps, AVG also possible (w/o AVG ULP well below 1mW, ~160uW)
- Overall power consumption as sum ULP + RD → 9.6mW standard case 75% ULP + 25% RD



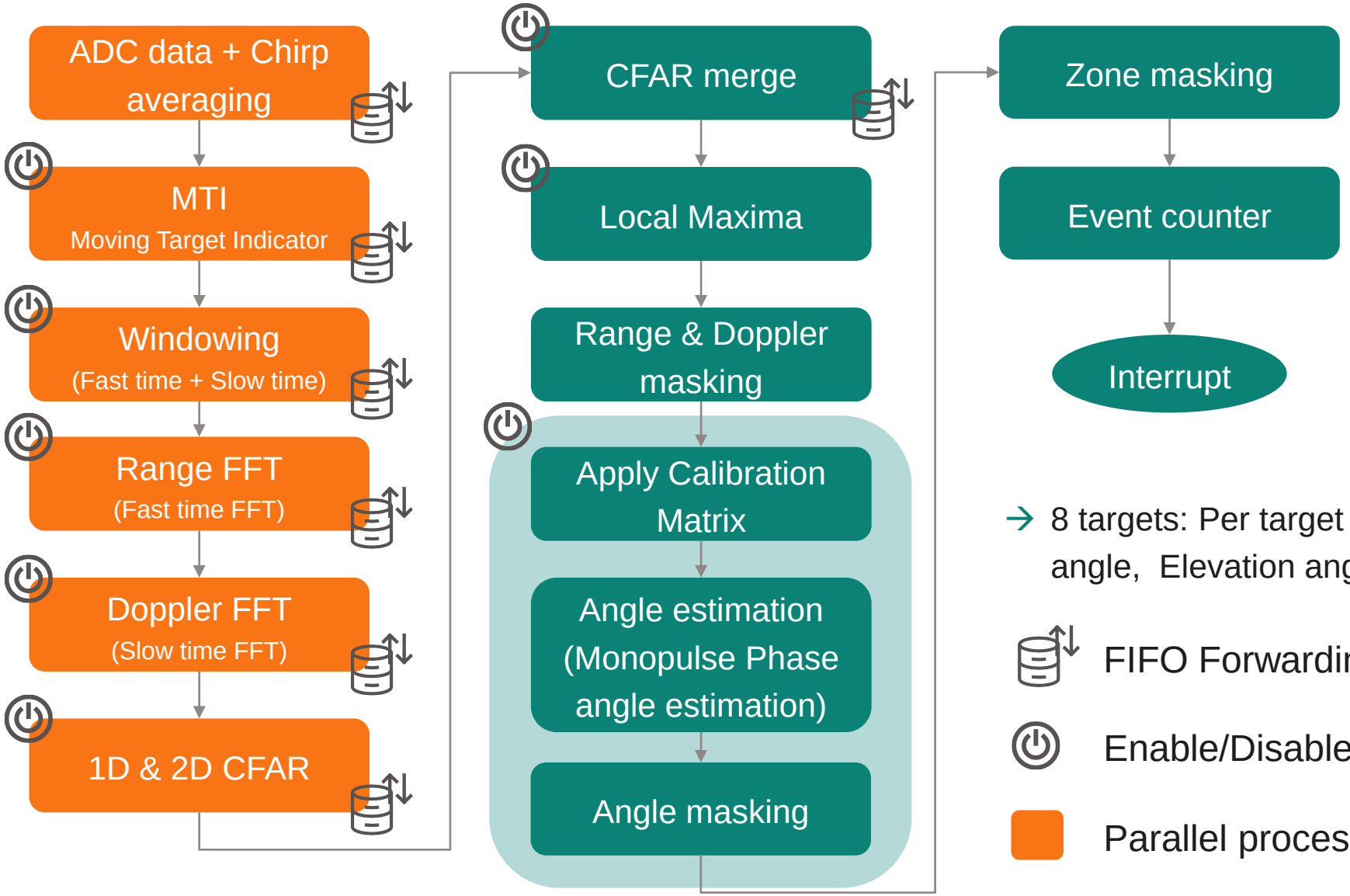
Configuration	Ultra-Low-Power		Range Doppler	Range (RD)
# Chirps	2		16 + 1 (1 for the MTI)	
# Rx	3			
Fps #	4	1	10	
No AVG		< 200 µW	5.5 mW	9m
AVG 4	0.58 mW		9.74 mW	11.5m
AVG16	1.41 mW		26.4 mW	>16m

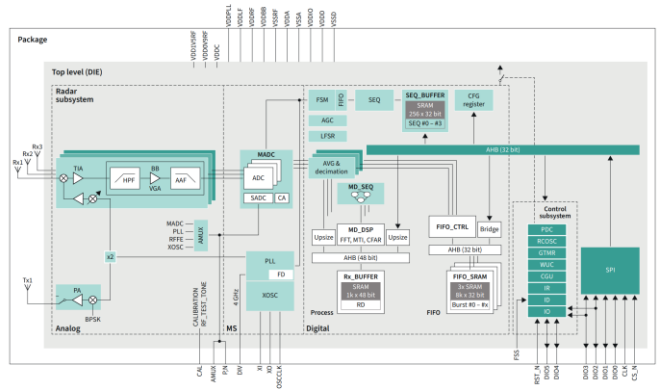
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Embedded processing via hardware accelerator (HWA) to offload host MCU and enable efficient system architectures



BGT60CUTR13AIP Integrated Processing/ HW Accelerator
Pipeline for auto. detection of up to 8 moving targets





→ 8 targets: Per target Range bin, Doppler bin, Azimuth angle, Elevation angle, Magnitude dB

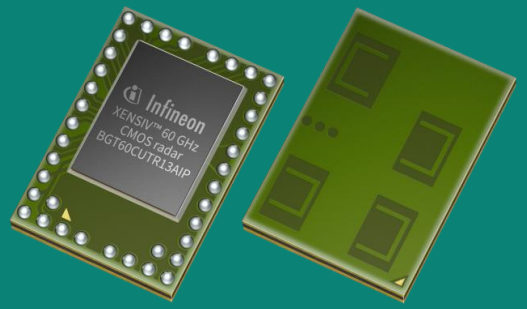
FIFO Forwarding

Enable/Disable option

Parallel processing on each Rx channel

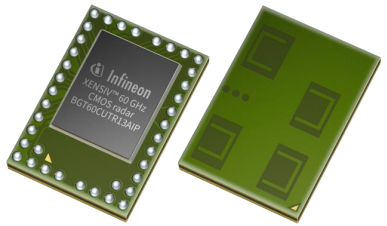
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XENSIV™ BGT60CUTR13AIP
Hardware offering



XENSIV™ 60GHz CMOS Radar Hardware Offering

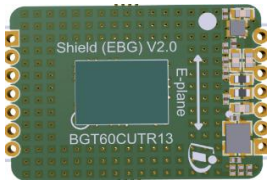
Product

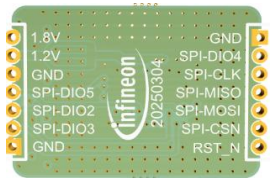


BGT 60CUTR13AIP

- Datasheet
- Product brief
- User Guide
- Product release: Q2 2026

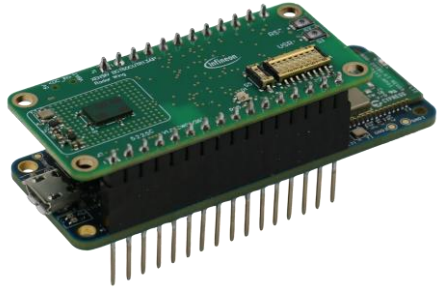
Reference Module





- FCC&CE certified
- Available at Distis for Demo purposes
- Open source design files and various SW package for demo & license available
- Performance benchmark report for each SW package
- User guide, application note and production test tool
- Product release: Q2 2026

Demo Kit



Connected Sensor Kit (CSK) + CMOS Wing Board

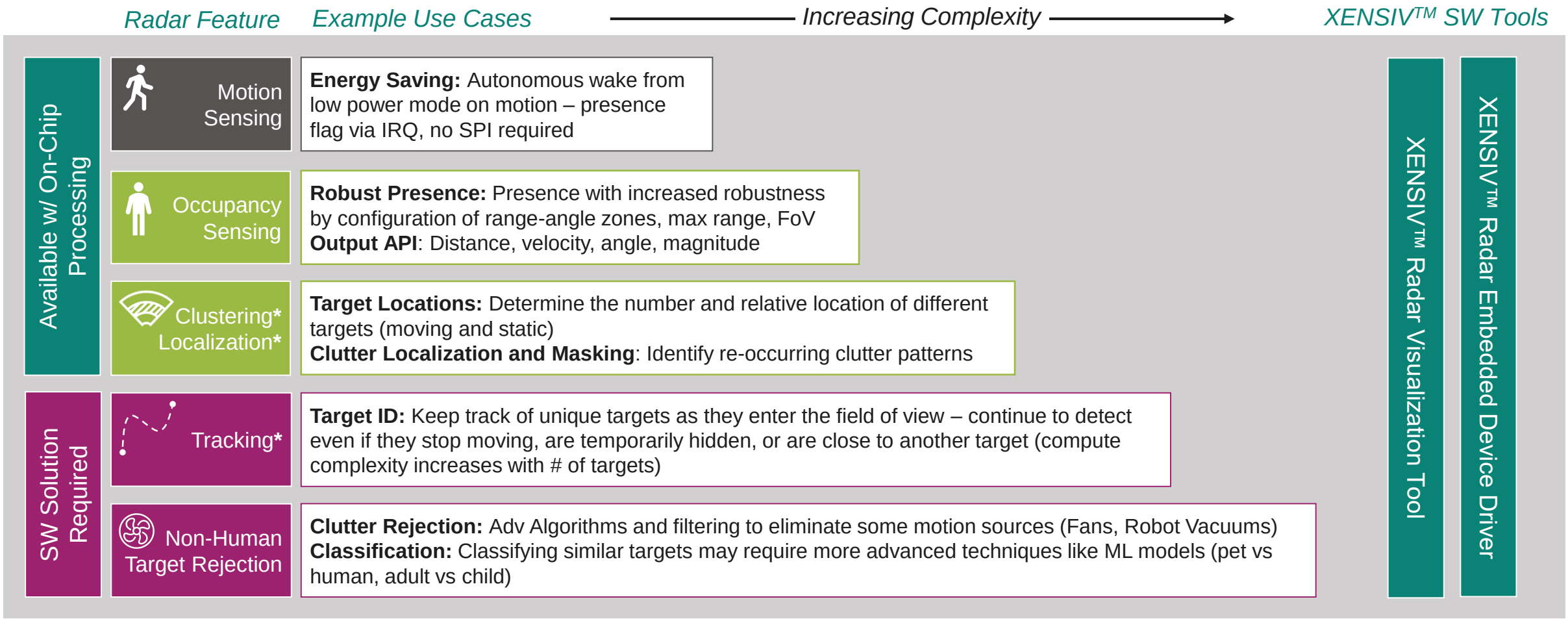
- Connected sensor kit for rapid prototyping → Enabling fast IoT experience
- User Guide & SW Release via ModusToolbox™
- Seamless integration to ModusToolbox™ with application code and drivers → fast G2Market
- Product release: April 2026

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XENSIV™ BGT60CUTR13AIP
Software offering



XENSIV™ 60GHz CMOS Radar Software Offering

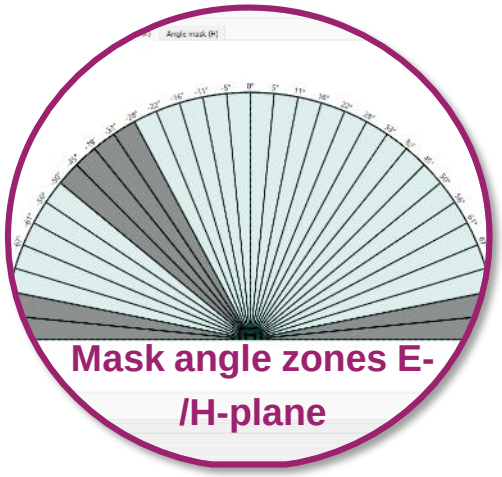


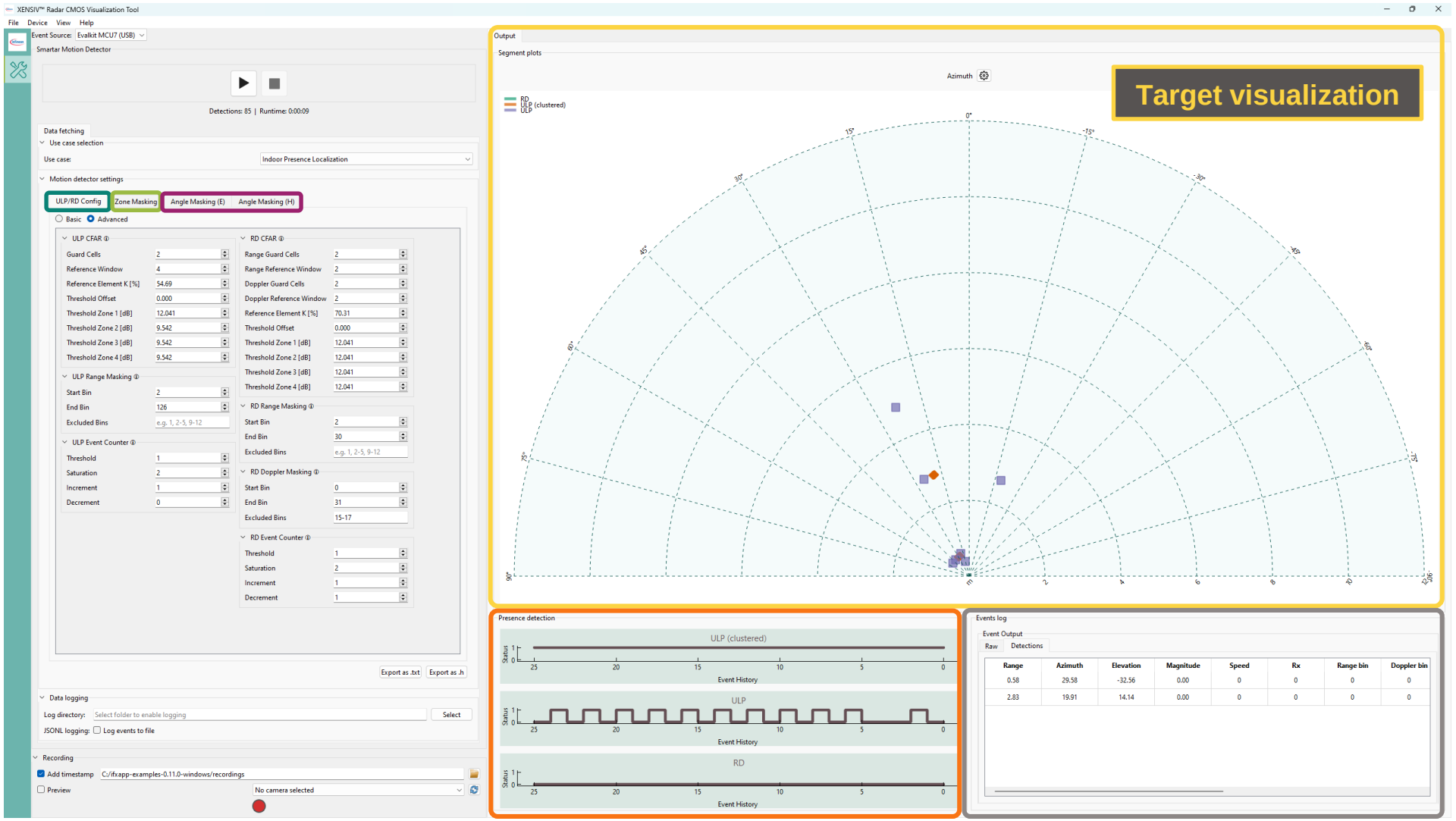
** Infineon offers reference algorithms/ code examples for clutter localization and masking, clustering and tracking (3-4 people), but may require use-case specific modification or custom solutions depending on customer requirements*

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XENSIV™ Radar Visualization Tool
Configure on-chip processing and visualize Radar data





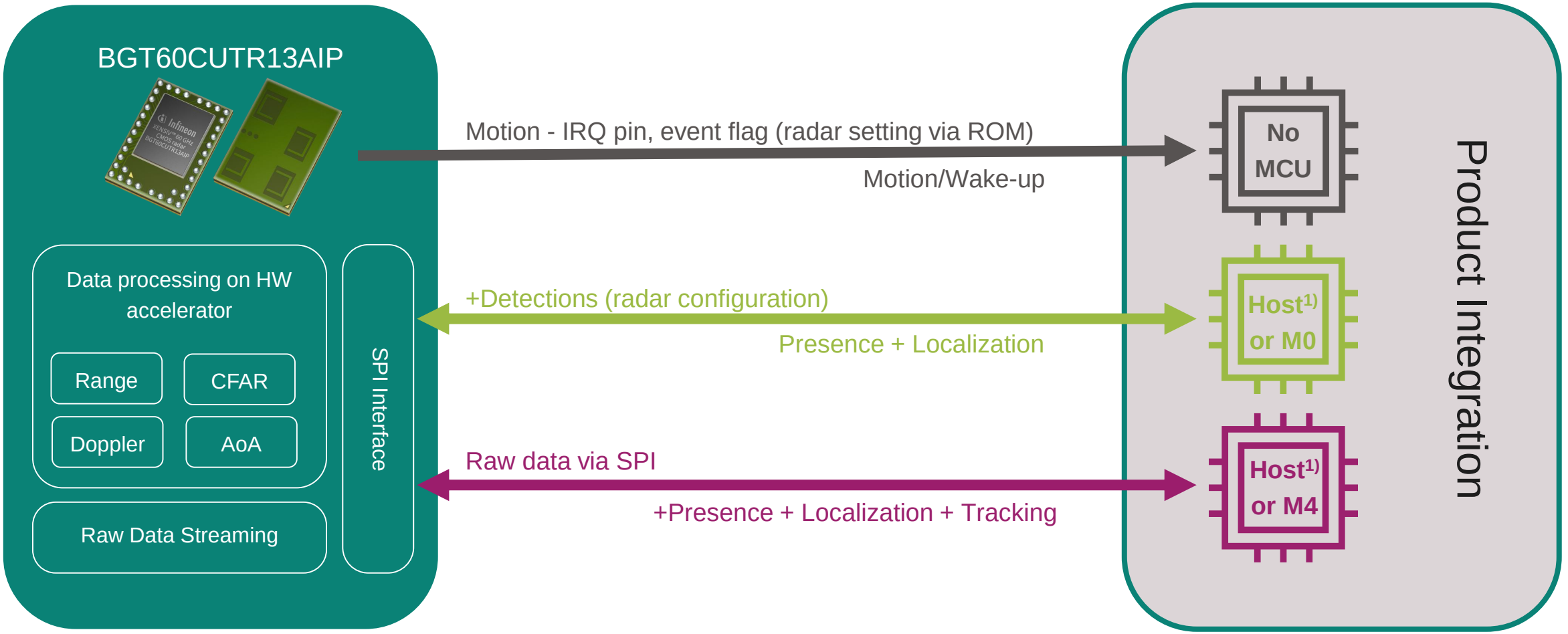


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XENSIV™ BGT60CUTR13AIP System Architecture Options

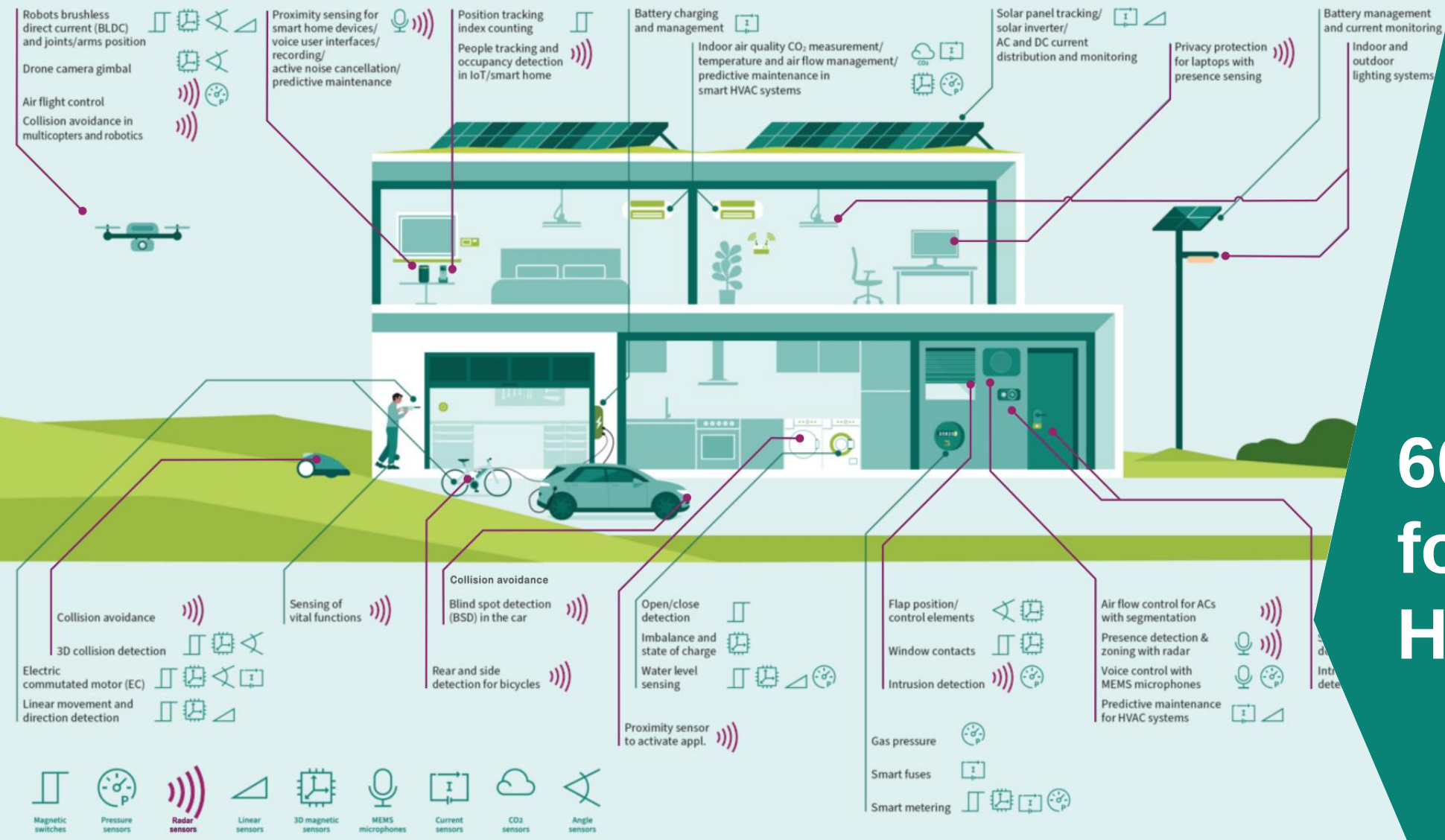


XENSIV™ 60GHz CMOS Radar System Architectures options for various Applications/ Use Cases



1) Host MCU (e.g. Application or WiFi processor)

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60GHz Radar for smart IoT/ Home

Challenges of Smart Home/ Smart IoT Devices



Energy efficiency & power consumption

- Always on
- Reliable wake up on demand

Interaction with the user

- Voice control
- Touch control
- Gesture control
- Remote control

Complexity

- User setup required proper handling
- Increased product complexity by adding more features at smaller size

Privacy

- Continous surveillance/ monitoring
- Video/ Audio recordings

Data streaming/ storage

- Alert/ Notify user every time device turns on
- Stream video data to cloud storage or mobile device

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Application/ Use Case Example
Security Camera & Video Doorbell



Application Use Case: Video Doorbell
Advantage using 60GHz Radar vs. PIR sensors

Increased energy efficiency and battery lifetime due to reduction of False Alarams

Assumptions: $FA_{PIR\ ,\ comb}$ 1.25%, $FA_{RAD,\ comb}$ ~0.05% - ULP 5% , RD 1% |
Power: PIR ~3µA, PIR_{MCU} 5mW, $Radar_{comb}$ ~2mW, Camera + MCU ~75mW

→ Overall power consumption reduced by more than 70%

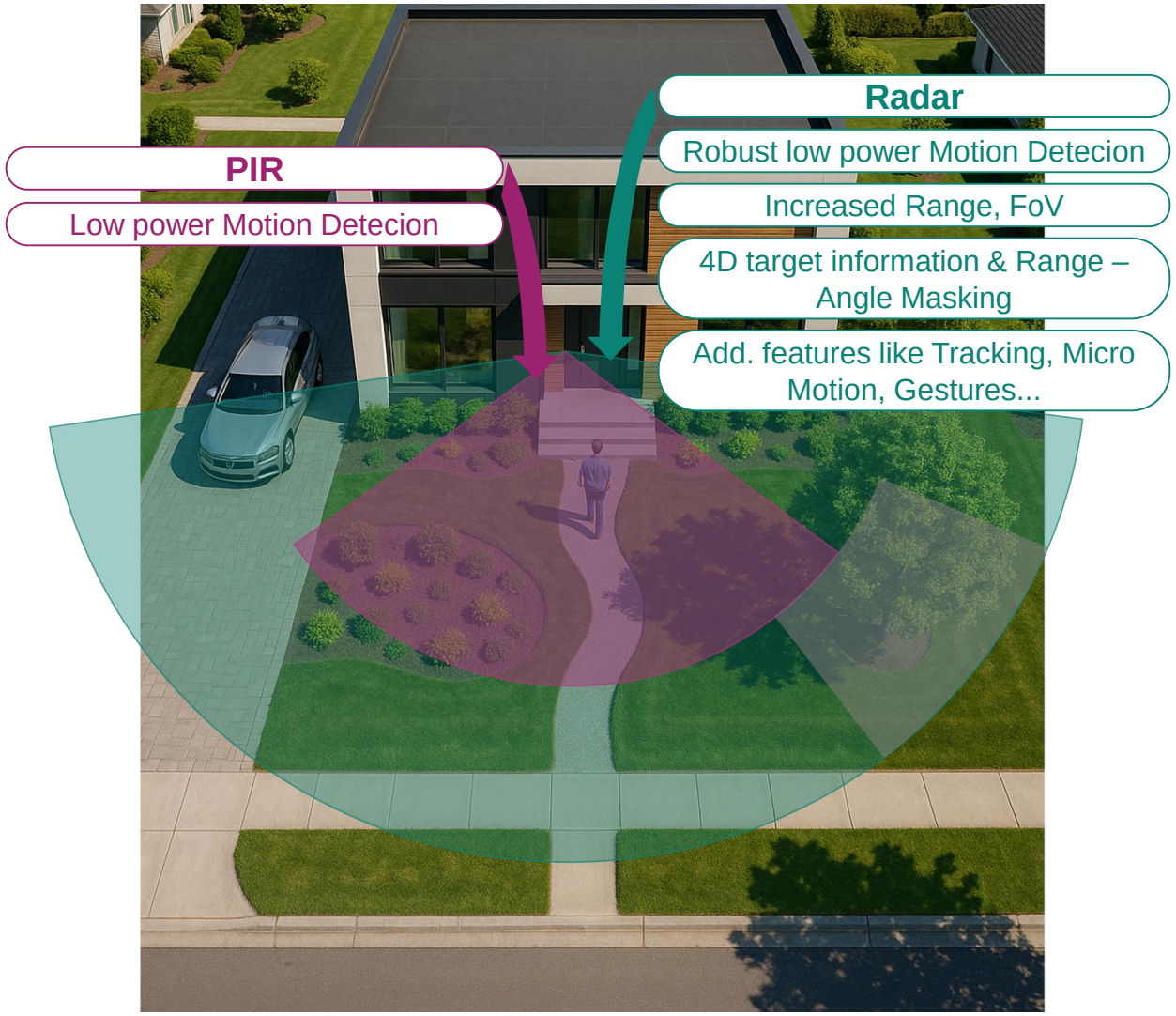
Allows basic push gestures

Seamless integration into final product – no need for optical lens/ window

Video and recording will only start once a preson is approaching the door/ entering defined region of interest

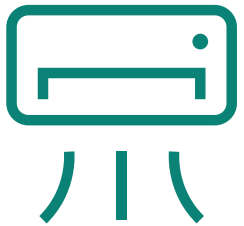
Reduced fals alarm rate will also cause less video data streaming/ storage *Assumption 1080p, 15fps, 20s active*

→ 25MB/s while camera is active
→ ~500MB less data per false alarm



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Application/ Use Case Example
High-end indoor Applications
AirCon



Application Use Case: AirCon
Advantage using 60GHz Radar for advanced features

Increased energy efficiency by reliable reliable presence detection and tracking

→ Adapt airflow based on activity and the number of persons in the room

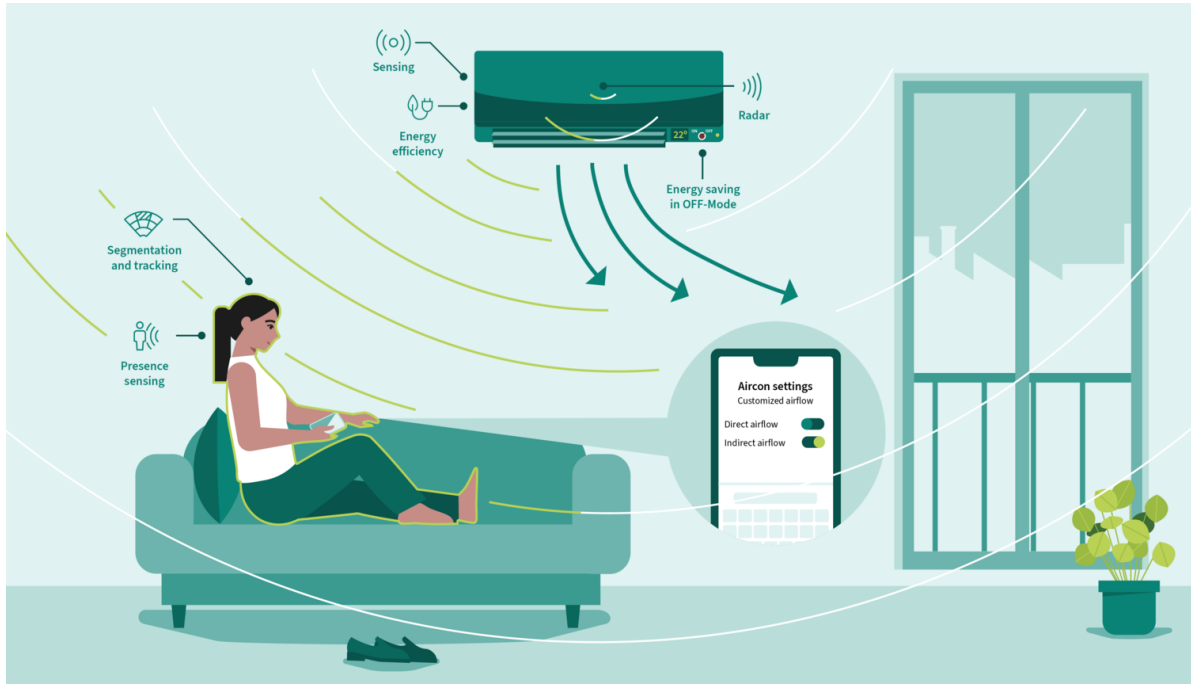
→ Turn on/off the device based on presence detection

Allows basic push gestures

Seamless integration into final product – no need for optical lens/ window

No need to collect video data

Enable comfort features like steering of the airflow based on peoples position inside the room



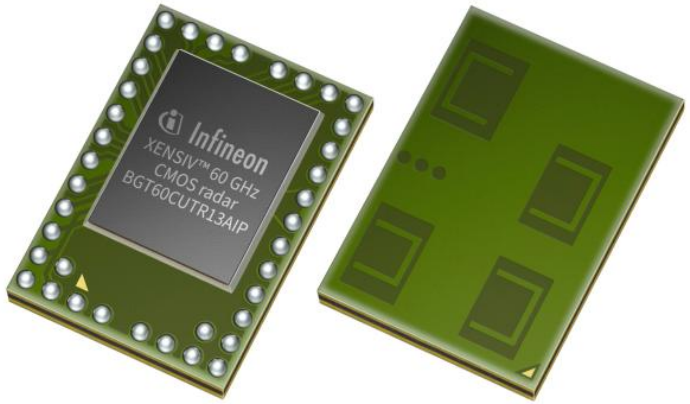
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XENSIV™ 60 GHz CMOS Radar Sensor

BGT60CUTR13AIP



Video Doorbell





Smart TV



Smart Speaker



Smart Light



HVAC



Security Camera

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Support/Information



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Regional Product Marketing for Radar & Time of Flight Sensors
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