PRODUCT BRIEF

XENSIV™ radar sensor BGT60UTR11AIP

The smallest 60 GHz AIP radar sensor

The XENSIV™ BGT60UTR11AIP is a highly integrated 60 GHz radar sensor for consumer electronics and IoT applications. The chip has been optimized for low power and system cost optimization. With an area of only 16 mm², it is suitable for the smallest devices. The MMIC is manufactured in Infineon's B11 SiGe BiCMOS technology.

The 5.6 GHz ultra-wide bandwidth allows FMCW operations with extremely high resolution. The detection of sub-mm movements ensures not only extremely sensitive presence and motion detection up to 15 m, but also enables precise range measurements, 1D gestures as well as the measurement of vital signs such as breathing rate and heart rate.

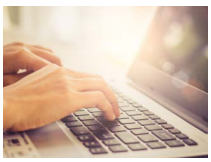
A 50 MHz digital SPI interface enables sensor configuration and data transfer. The integrated broadcast mode facilitates the parallel configuration and triggering of multiple BGT60UTR11AIP devices connected to the same bus. Device specific programmable wake-up times allow time domain multiplexed radar frames.

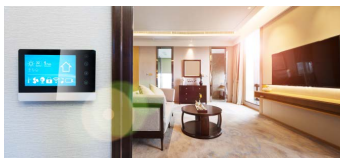
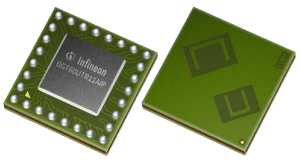
Real time data acquisition without interaction to the processor is enabled by an integrated state machine. It also manages the various modulation schemes and power modes. Three different power modes provide the user **full flexibility between performance and power consumption** optimizations. Sub-mA average current consumption enables the usage in battery-powered devices.

Target applications:

- **Smart building devices** such as door locks, smart doorbells and air conditioners
- **Smart home devices** such as smart speakers and thermostats
- **Smart appliances** such as refrigerators and kitchen machines
- **Healthcare devices** such as baby monitors and sleep tracker
- **Service robots** such as vacuum cleaners and lawn mowers
- **Security devices** such as motion detectors and IP cameras
- **Wearables** such as headphones and smartwatches
- **Screen based devices** such as TVs and notebooks



Key features

The **BGT60UTR11AIP** is a **60 GHz** radar sensor with up to **15 m** detection range and **< 1 mW** power consumption.

Key figures:

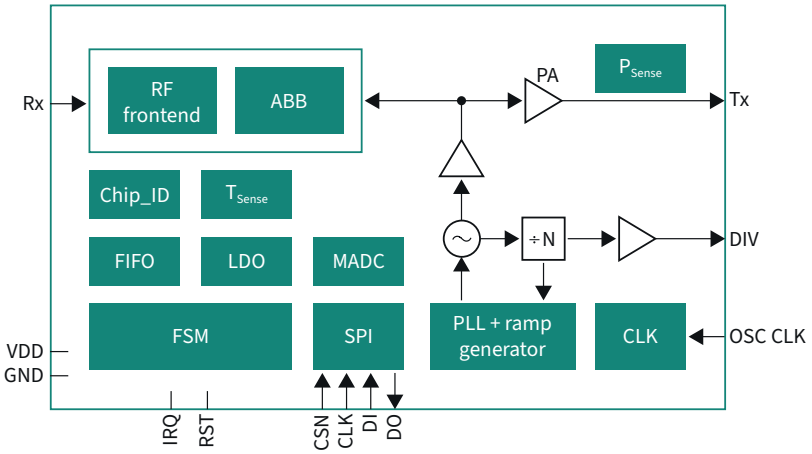
- 4.05 x 4.05 x 0.86 mm³ package size
- 500 µm ball pitch size
- 1 Tx 1 Rx Antennas in Package (AIP) with 90° half power beam-width
- 25 dB Tx-to-Rx isolation
- 5 dBm output power
- 3 dBi antenna gain
- 12 dB Rx noise figure (High SNR)
- 5.6 GHz ultra-wide bandwidth
- 400 MHz/µs ramp speed
- 12-bits ADC channel
- 4 MSps ADC sampling
- 50 MHz SPI interface
- -20 to +70°C operating temperature

Key benefits

- **Ultra-low power** operation enabled by hardware deep-sleep mode
- **Small size** (16 mm²) for integration into the smallest products
- **Vital sensing** (heart rate & respiration rate) enabled at low cost
- **High bandwidth** enables distance measurements with mm accuracy
- **Synchronize multiple chips** via the integrated broadcast mode
- **On chip sensors** to measure RF power, Tx output and temperature

Highly integrated 60 GHz FMCW radar sensor

The BGT60UTR11AIP contains an optimized **RF frontend** for short range sensing, Analog Base Band **(ABB)** for signal filtering and amplification including a programmable anti-aliasing filter to extend the detection range, low-dropout for supply voltage regulation **(LDO)**, reference clock **(CLK)** of 80 MHz or 38.4/40 MHz using an internal frequency doubler, phase-locked loop **(PLL)** for frequency stabilization, Finite State Machine **(FSM)** for independent data acquisition without processor, 12-bits Multichannel Analog-to-Digital Converter **(MADC)**, full duplex **FIFO** based memory for data buffering, **SPI** interface for communication, a 48-bits unique **CHIP_ID**, power sensor **(P_{Sense})**, temperature sensor **(T_{Sense})** and u-slotted patch antennas **(Tx, Rx)** integrated into the laminate package.



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BGT60UTR11AIP is supported by Infineon's Radar Development Kit
Get it here: softwaretools.infineon.com/tools/com.ifx.tb.tool.ifxradarsdk

Infineon Developer Center

Product overview

Sales name	SP number	Description	Status
BGT 60UTR11AIP	SP005407929	Chip samples (Package: VF2BGA-28-1)	ES available STD targeted Q3'23
DEMO BGT60UTR11AIP	SP005745304	Demonstration Kit (60 GHz base-board + Shield BGT60UTR11AIP)	Targeted Q3'23
SHIELD_BGT60UTR11AIP	SP005745302	Shield fitting on 60 GHz baseboard (DEMO RADAR MCU7, SP005339506)	Targeted Q3'23
		Demo board BGT60UTR11AIP + PSoC4	On request only

Smart home · Smart lighting · IP camera · Smoke detector · Thermostat · Smart speaker · TV · Notebook · Home appliance · Service robots · Hearables · Health care

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