Use case brief

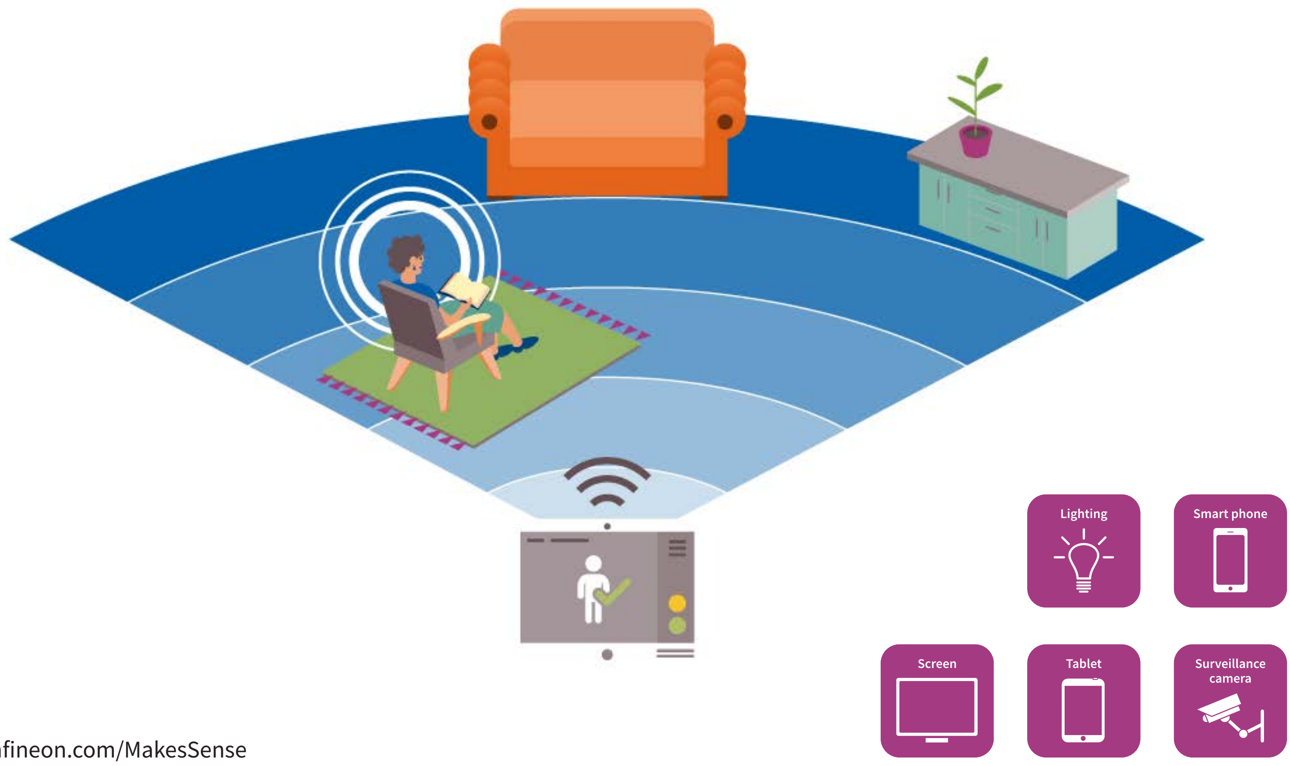
Presence detection enabled by XENSIV™ radar IC

Infineon's radar IC is so sensitive that it can even detect the pulse in a wrist or person just breathing

Motion detection with PIR (Passive Infrared) sensors is a familiar technique for recognizing a person's presence in a room, but it is rather crude as anyone who has had to wave their hands at the detector is familiar with. There are a growing number of applications that require a level of sensitivity way beyond this – keeping a device on, such as lighting or air conditioning, only when someone is present but not actively moving. To meet this need, Infineon has developed XENSIV™ radar chip BGT60TR13C that can detect micro movements – tiny vital signs, such as a heartbeat, a pulse in a wrist, chest movement while breathing, and even the twitch of an eyelash. An alternative way to achieve such a high level of sensitivity would be with cameras and sophisticated video processing algorithms, which is expensive, power hungry and has privacy issues as images of people are involved.

Use case's and product's benefits for your application

- Concealing behind non-metallic materials
- Adj. detection up to 10 m
- Ideal for vital sign, micro movements detection
- Integrated antennas
- Very low power consumption for always on mode
- No camera so no privacy issues and no complex video processing



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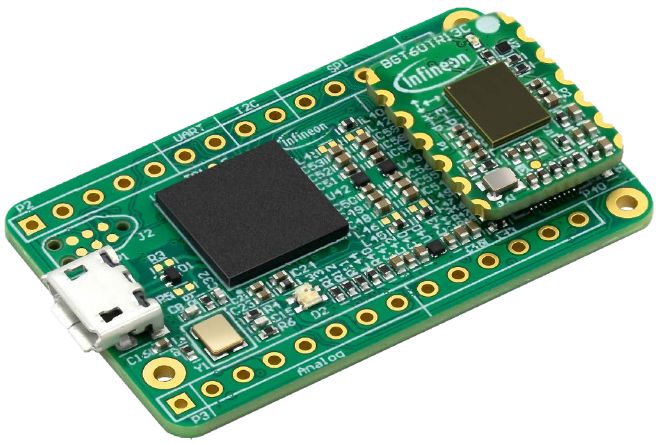
PIR just detects the IR emitted by the human body whereas the Radar IC sends out pulses and detects their reflected echoes. It is an FMCW radar (FMCW = Frequency Modulated Continuous Wave) that uses the echoes to determine the rate of movement and its direction. As it works with a 5.5 GHz bandwidth at 60 GHz, this is done to an extremely high level of resolution and the raw radar data can be extracted from the chip for detailed signal processing using customized algorithms. With very low power consumption, the sensor can be always on to detect new movement and to wake the rest of device from sleep mode.

Applications, using presence detection, are evolving to meet user demands for more contextual intelligence with smart on/off control that reacts according to people presence via vital sensing.



- **For lighting control**, it provides the perfect solution for situations where the user is chilling, reading a book or working on their laptop and hardly moving.
- **For smart devices such as smart speakers**, it can activate and keep applications on when the user is nearby and turn devices off when people go away.
- **For health monitoring in a smart watch or a bedside monitoring device**, it provides the ability to detect tiny vital signs for applications for contactless monitoring of heart rate and breathing to, for example, monitor pulse rates for babies or elderly people and alert if issues arise when sleeping.[1)]

Its ability to detect even the smallest of movements enables you to build in a level of smart awareness that is unprecedented to really take your product design & functionalities to the next level.

1) Possible with a firmware upgrade in the future

Try it out and innovate your product development process here.

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