



# How RADAR Sensors are Transforming the Future of Smart Home

## The Significance of 24GHz RADAR Sensors and How They Are Transforming the Future of Smart Homes

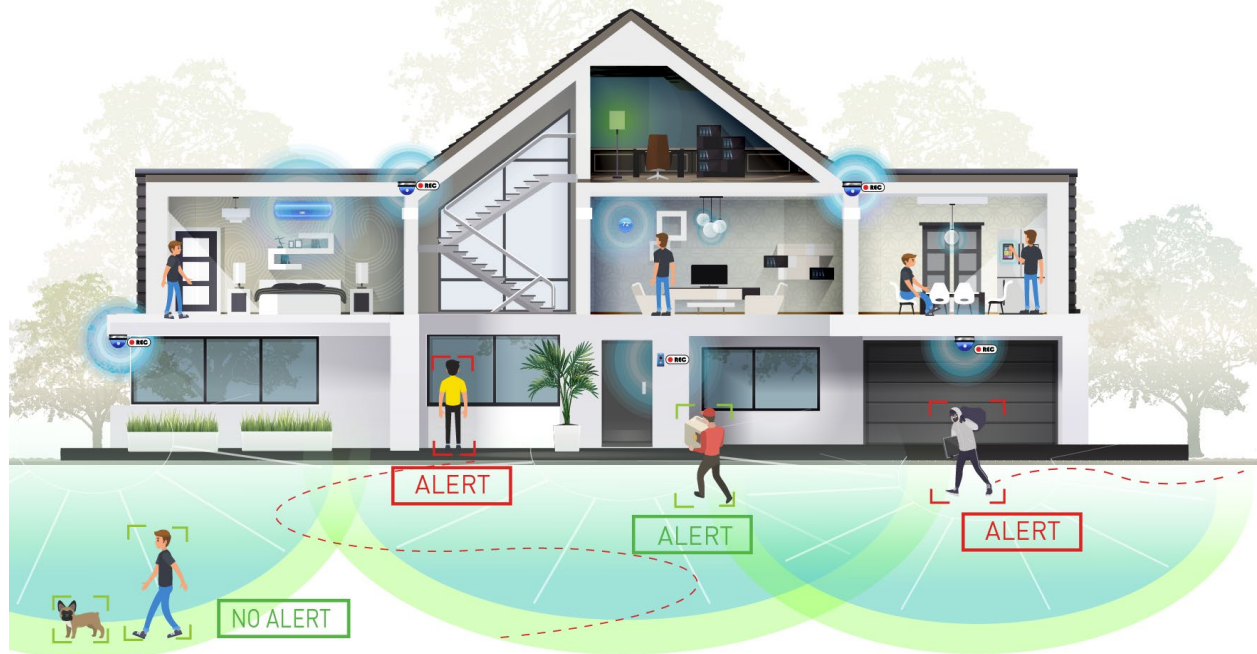
According to recent market data, there are billions of IoT smart devices currently in use throughout the world and smart sensors play a big role in making that possible.

24GHz RADAR Sensors now can be found in a wide range of connected IoT consumer devices such as smart security cameras, air quality monitors, video doorbells, smart lighting, video conference systems, dashcams, and a vast array of modern appliances and home electronics.

Unlike traditional sensing technologies, RADAR technology offers many specific benefits for locating objects, sounds, and delivering data rapidly for processing.

One example - video doorbells. More homeowners and renters these days are concerned about home security and safety, and RADAR sensing technology offers many advantages. For instance, these sensors enable users the ability to set up a physical threshold to monitor an object or a person entering and exiting a significant area of space in front of the house. This kind of application is served by the 24GHz RF CMOS sensor from Socionext, a low power, all-in-one device that provides a range of up to 30 feet or more with 120-degree FOV.

The smart sensor can measure an object's detailed distance and is able to identify and track the object's movement in real time. When an object crosses the distance threshold, the connected device takes the information from the RADAR and triggers an automated alert to the homeowner, while signaling the built-in camera to initiate video recording. This sequence of events is prompted by the RADAR sensing capabilities along with features like image recognition and data analysis.

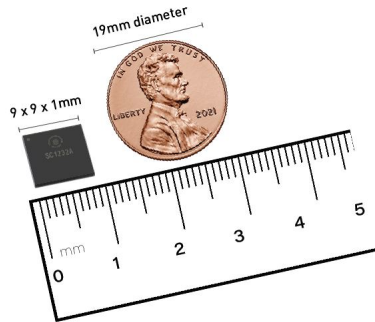


Advanced RADAR Sensor for Smart Home

There are many objectives that can be realized in smart home applications by applying RADAR sensing technology in combination with software algorithms and AI to deliver significant control and feature-rich functionalities.

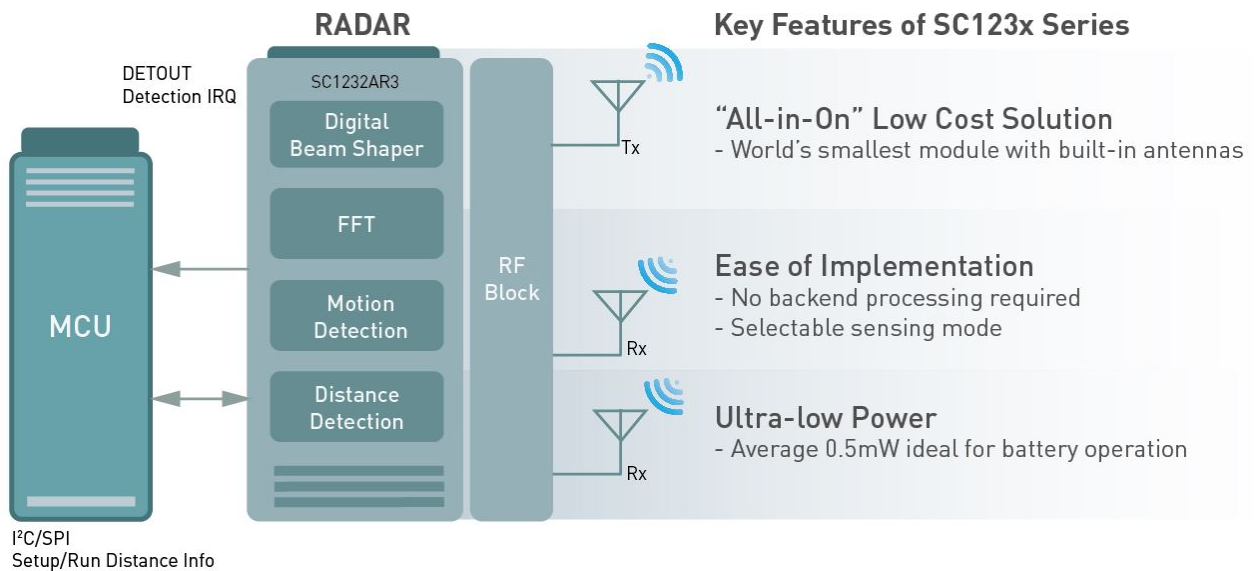
**The SC123x Series from Socionext Fits These Applications**

Socionext offers a portfolio of 24 GHz radar sensors that detect motion, direction of motion, speed, angle, and position of a target.

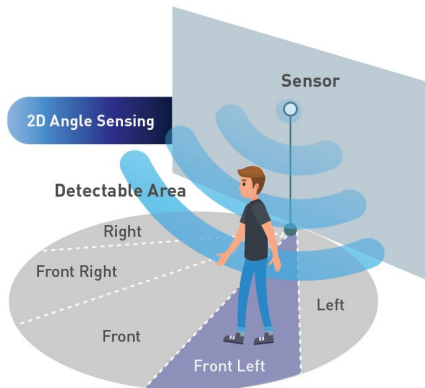


Measuring at a compact 9 x 9 x 1mm, Socionext’s SC123x series all-in-one 24GHz radio-controlled FMCW (frequency-modulated continuous-wave) radar sensors feature wide detection areas. They are ideal for battery operation, with an ultra-low 0.5mW average power requirement for human detecting applications (0.1% duty cycle).

The highly integrated and ultra-low power 24GHz sensor perceives entry motion and adds distance detection without the need for an external backend processing. These features make it an optimal replacement for PIR sensors.



When paired with an MCU, the sensor can also perform 2D angle detection.

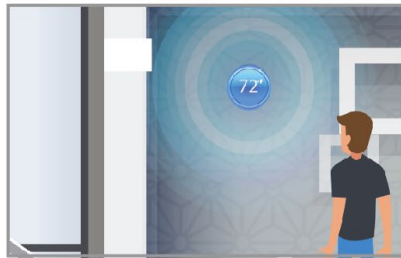


SC123x	Motion Detection		Distance	2D Angle
	Entry	Presence		
SC1239	✓	✓		
SC1232	✓	✓	✓	
SC1233	✓	✓	✓	✓

SC123x Products and Features

### SC123x 24GHz RADAR Applications

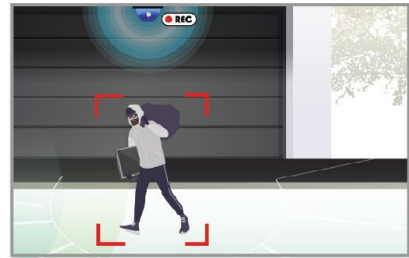
Device makers can benefit from the use of smart RADAR sensors in their product design and development. Applications include, but not limited to the following:



Thermostat



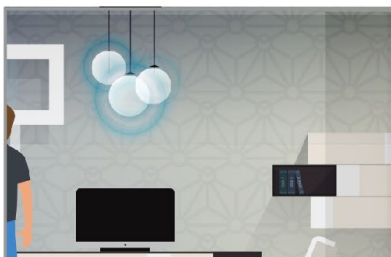
Video Doorbell



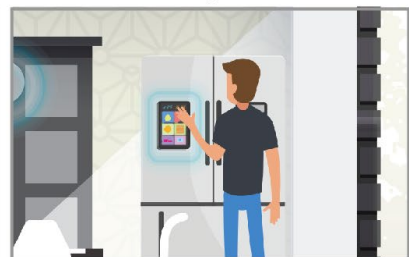
Security Camera



Air Conditioner

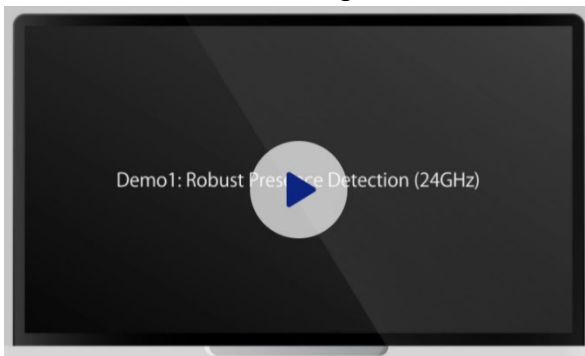


Light Control



Appliance Displays

Watch a video demonstrating Presence Detection Using Socionext 24GHz RADAR Sensor:



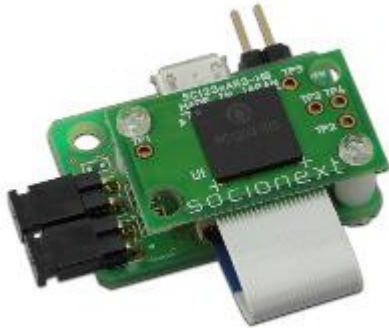
[Click here](#) or the image to watch the video.



Socionext RADAR sensors offer many features and advantages by combining high level of integration into a single IC and package, and incorporating a full CMOS based semiconductor design to help reduce power consumption and lower manufacturing costs.

Design kits are now available. Contact Socionext for more details.  
Below are the 24 & 60GHz products and deliverables.

### 24GHz Sensor Evaluation Kit SC1232/1233/1239AR3-B-001



- Evaluation kit hardware with USB cable (A to micro-B)
- Sensor library / Evaluation software (GUI)
- Related documents
- Evaluation software (GUI) operation manual
- API specification of control API
- Application note (Sensor setting parameters / Sample C source for API)

### 60GHz Sensor Evaluation Kit SC1220AT2-B-113/1221AR3-B-122



- Evaluation kit hardware with USB cable
- Sensor driver/ library and 3D location sensing valuation software (GUI)
- Evaluation software (GUI) operation manual
- API specification of control API
- Application note (MATLAB and Sample C source for API)

To learn more, visit [socionextus.com/radar](http://socionextus.com/radar)

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