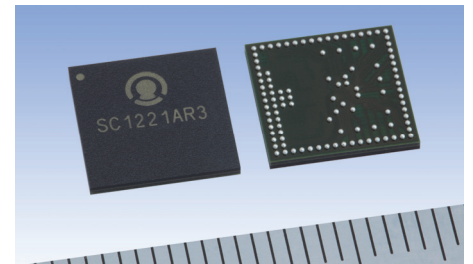


## SC1221AR3

### 60GHz Radio-Wave Ranging Sensor/ 2D Detection Model



SC1221AR3 is a low power CMOS 60GHz radar sensor device and available for 2D location sensing.



Exterior photo of SC1221AR3

## ■ Features

### ● Suited for 2D motion sensing

- 1 x 4 uniform linear array Rx antennas detect azimuth angle, velocity and distance of multiple objects
- High-accuracy linear chirp FMCW radar
- Sensing area example: up to 10m\*<sup>1</sup>, 120 degree\*<sup>1</sup> angular width

### ● Highly integrated device enabling easy hardware design

- Integrating antennas, radio, ADC, FIFO and SPI interface
- 2 Rx antennas capable of 2D angle detection with external MCU calculation
- Small package (9.0mm x 9.0mm, BGA package)

### ● Low power consumption

- 4-Level operation states (Shutdown, Deep Sleep, Light Sleep, Sensing)
- Intelligent power control sequencer managing flexible duty cycle operation
- 1mW average power consumption at 2D location sensing\*<sup>2</sup>

\*1: Depending on sensor configuration and environmental conditions. To be changed according to further study

\*2: In case of conditions that Socionext assumed

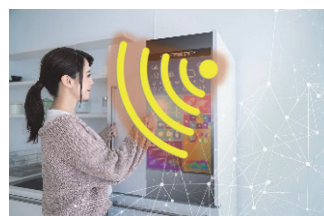
## ■ Applications



Detection of people the front door  
(use in a doorbell)



Vital sign monitoring  
(e.g., during sleep)

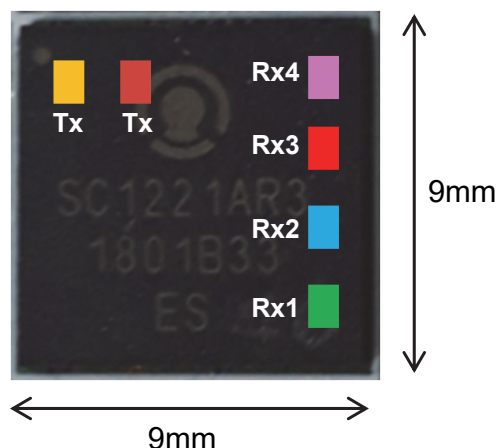


Human detection for LCD  
on/off control

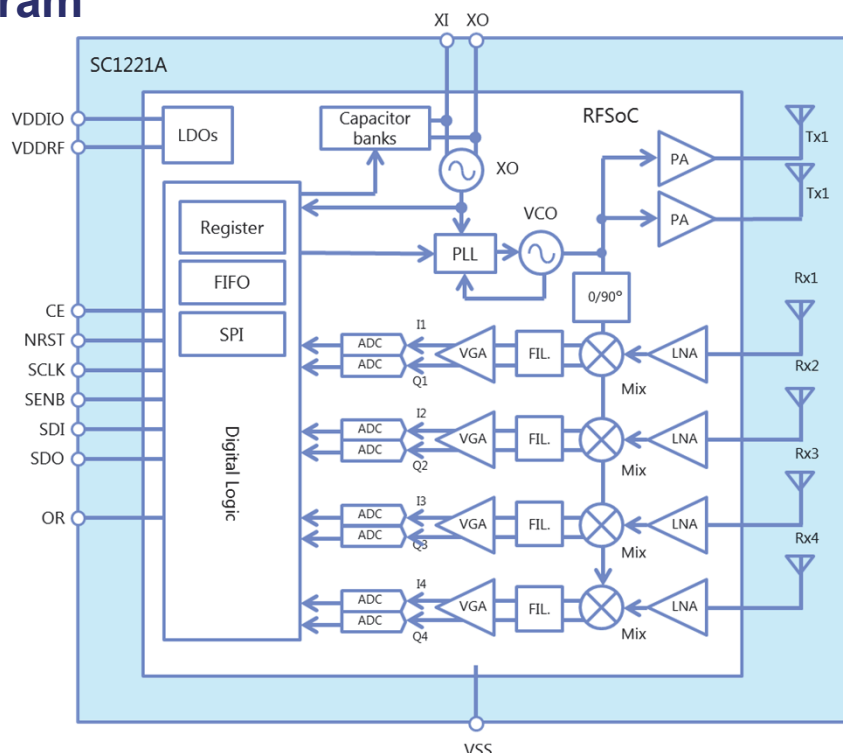


Detection of people in places  
like the living room

## ■ Antenna Configuration



## ■ Block Diagram



## ■ Specifications

|                              |                                                                |
|------------------------------|----------------------------------------------------------------|
| <b>Radar mode</b>            | FMCW/ FSKCW/ CW                                                |
| <b>Power Supply</b>          | 1.5V - 1.8V (core) / 1.8V - 3.3V (I/O)                         |
| <b>Power Consumption</b>     | 368mW (Peak), 1mW (0.2% duty cycle operation using Deep sleep) |
| <b>Transmitter</b>           | Frequency: 57.1 - 63.9GHz, EIRP: +5dBm                         |
| <b>Receiver</b>              | Noise Figure: 12dB                                             |
| <b>Digital block</b>         | ADC (11bit, 10MHz), FIFO (32KB), SPI I/F (≤50MHz)              |
| <b>Operating temperature</b> | -40 to 85°C                                                    |

## ■ Deliverables of Evaluation Kit

- SC1221AR3 Evaluation Kit hardware with USB cable
- Sensor Driver/ Library and 2D Location Sensing Evaluation Software (GUI)
- Related documents
  - Evaluation software (GUI) operation manual
  - API specification of control API
  - Application note (Sample C source for API)

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AD04-00133-3E August 2025  
Edited : Smart Sensor Solution Team, IoT & Radar Sensing Business Unit

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