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

**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*1, 120 degree*1 angular width

- **Highly integrated device enabling easy hardware design**
  - Integrating antennas, radio, ADC, FIFO and SPI interface
  - 2RX 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*2

*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 at the front door (use in a doorbell)
- Detection of people to switch the liquid crystal display of smart home appliances on and off
- Gesture operations
- Detection of people in rooms such as the living room (use in a smart thermostat)
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Block Diagram

Antenna Configuration

Specifications

<table>
<thead>
<tr>
<th></th>
<th>FMCW/FSK/CW/CW</th>
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<tbody>
<tr>
<td><strong>Radar mode</strong></td>
<td>1.5V - 1.8V (core) / 1.8 - 3.3V (I/O)</td>
</tr>
<tr>
<td><strong>Power Supply</strong></td>
<td>368mW (Peak power consumption)</td>
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<tr>
<td></td>
<td>1mW (0.2% duty cycle operation using Deep sleep)</td>
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<tr>
<td><strong>Power Consumption</strong></td>
<td>6.025 - 61.475GHz</td>
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<tr>
<td></td>
<td>EIRP: +5dBm</td>
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<tr>
<td><strong>Transmitter</strong></td>
<td>Noise Figure: 12dB</td>
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<tr>
<td><strong>Receiver</strong></td>
<td>ADC (11bit), FIFO (32k), SPII/F (≤50MHz)</td>
</tr>
<tr>
<td><strong>Temperature</strong></td>
<td>-40 to 85°C</td>
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Deliverables of the 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 (MATLAB and Sample C source for API)