SC1220AT2 is a low power CMOS 60GHz radar sensor device and available for 3D motion sensing.

**Features**

- **3S suited for 3D motion sensing**
  - 2 Tx and 2 x 2 Rx antennas detect azimuth / elevation angle, velocity and distance
  - Wide bandwidth (6.8GHz max.) and high-accuracy linear chirp FMCW radar
  - Sensing area example: up to 0.5m$^1$ with < 1cm$^2$ resolution (in case of palm gesture)

- **Highly integrated device enabling easy hardware design**
  - Integrating antennas, radio, ADC, FIFO and SPI interface
  - Enable to use reasonable PCB, less BOM and easy assembly
  - Small package (7.0mm x 7.0mm, LGA package)

- **Low power consumption**
  - 4-Level operation states (Shutdown, Deep Sleep, Light Sleep, Sensing)
  - Intelligent power control sequencer managing flexible duty cycle operation
  - 2.5mW average power consumption at palm gesture sensing$^3$

1. Depending on sensor configuration and environmental conditions
2. To be changed according to further study
3. 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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**Antenna Configuration**

![Antenna Configuration Diagram]

**Block Diagram**

![Block Diagram]

**Specifications**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radar mode</td>
<td>FMCW/FSKCW/CW</td>
</tr>
<tr>
<td>Power Supply</td>
<td>1.5V - 1.8V (core) / 1.8 - 3.3V (I/O)</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>308mW (Peak power consumption)</td>
</tr>
<tr>
<td></td>
<td>2.5mW (0.5% duty cycle operation using deep sleep)</td>
</tr>
<tr>
<td>Transmitter</td>
<td>Frequency: 57.1 - 63.9GHz (6.8GHz bandwidth) EIRP: -7dBm</td>
</tr>
<tr>
<td>Receiver</td>
<td>Noise Figure: 12dB</td>
</tr>
<tr>
<td>Digital block</td>
<td>ADC (11bit 10MHz), FIFO (32KB), SPI/F (≤50MHz)</td>
</tr>
<tr>
<td>Temperature</td>
<td>-40 to 85°C</td>
</tr>
</tbody>
</table>

**Evaluation Kit Deliverables**

- SC1220AT2 evaluation kit hardware with USB cable
- Sensor driver/library and 3D 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)