“Easy-to-use” & “All-in-one” 24GHz radar sensor enabling motion & distance detection without any external MCU, and angle detection with light MCU calculations.

# Features

- **Easy to use**
  - System BOM can be reduced by “All-in-one” package radar sensor
  - Built-in autonomous motion/distance detection function enables only I²C/SPI connection for settings & result acquisition

- **Wide detection area with 2D detection**
  - Preferable detection area: 8m\(^1\) in front direction, FOV: 120deg\(^1\)*2
  - 2RX antennas capable of 2D angle detection with external MCU calculation

- **Suited for battery operation**
  - 0.5mW average operating power consumption on human detection application\(^3\)
  - After sensor setup & run, MCU can sleep until something detected

*1: Detection area depends on environmental condition
*2: Half distance angle
*3: In case of 0.1% duty cycle operation in Motion Detection mode

# 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)
Example System Configuration

Example use case

- **Entry Motion/Presence Detection**
  - Internal processing engine calculates & outputs Motion Detection (Entry Motion / Presence Detection) result through DETOUT.

- **Distance Detection**
  - Internal processing engine calculates & outputs Distance to the moving objects through I2C or SPI.

- **Angle Detection**
  - Angle of the detected object can be calculated in the ext. MCU, and be used for sector-level det.

Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>24.06 - 24.24GHz</td>
</tr>
<tr>
<td>Size, Package</td>
<td>Size: 9mm x 9mm x 1.18mm, BGA package, 0.8mm pitch, 64pin</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>1.8V</td>
</tr>
<tr>
<td>Power consumption</td>
<td>average 0.5mW*3</td>
</tr>
<tr>
<td>Operating package temperature</td>
<td>-40 to 105°C</td>
</tr>
<tr>
<td>Output power</td>
<td>Tx EIRP (typ) 4.0dBm</td>
</tr>
<tr>
<td>Detection area</td>
<td>Preferable detection area: 8m<em>1 in front direction FOV</em>2: 120º</td>
</tr>
<tr>
<td>Sensor output</td>
<td>Motion Detection result, Distance Detection result, 2ch Complex data for Angle Detection</td>
</tr>
</tbody>
</table>

*1: Detection area depends on environmental condition  
*2: Half distance angle  
*3: In case of 0.1% duty cycle operation in Motion Detection mode

Deliverables of the Evaluation kit

- SC1233AR3 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)