SC1233AR3
All-in-one Radar Sensor for Motion & 2D Detection

**Overview**

“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\(^{(*2)}\) 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

**Example System Configuration**

**Applications**

- Smart Home
- Security/Surveillance
- Smart Devices
- Home Appliances

\(^{(*1)}\): Half distance angle  
\(^{(*2)}\): Detection area depends on environmental condition  
\(^{(*3)}\): in case of 0.1% duty cycle operation in Motion Detection mode
Reference Descriptions

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

1. Entry Motion Det.

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

![Diagram of Entry Motion Detection](image)

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Person enters the room

2. Presence Detection

Person in the area

Person out of area

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

![Diagram of Presence Detection](image)

Distance

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

3. Angle Detection

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

![Diagram of Angle Detection](image)

Angle

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)

Already available