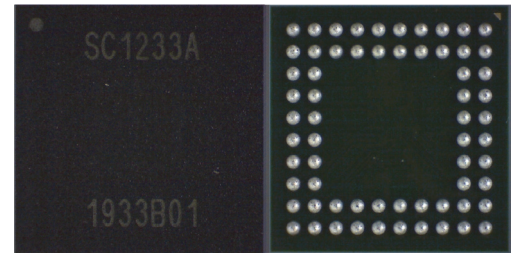


24GHz Radio-wave ranging sensor 2D Detection model SC1233AR3



Easy-to-use, all-in-one 24GHz radar sensor enabling motion & distance detection without the need for external MCU. The sensor also performs angle detection with light MCU calculations.



SC1233AR3

■ 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

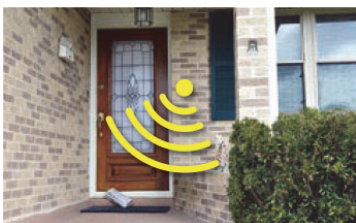
- 0.5mW average operating power consumption on human detection application^{*3}
- After sensor setup & run, MCU can sleep until something detected

*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



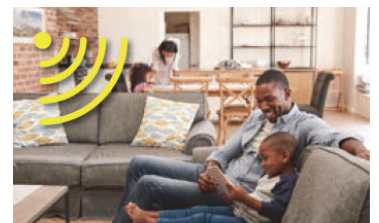
Detection of people at the front door
(use in a doorbell)



Detection of people to switch the liquid crystal
display of smart home appliances on and off

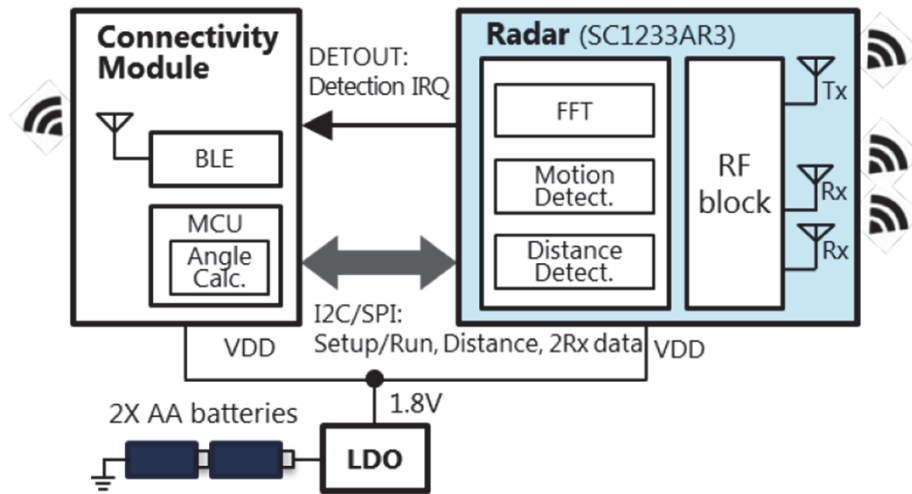


Gesture operations



Detection of people in rooms such as the
living room(use in a smart thermostat)

Example System Configuration

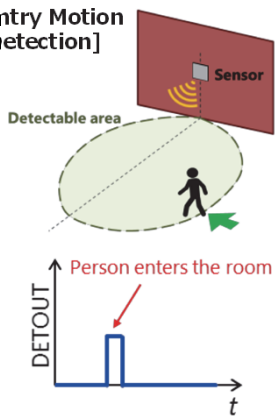


Example use case

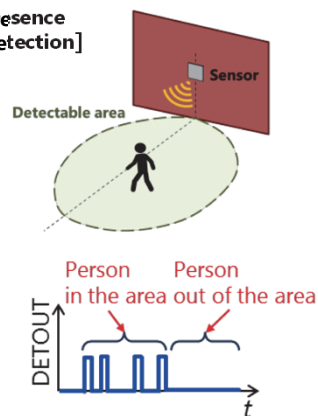
● Entry Motion/ Presence Detection

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

[Entry Motion Detection]

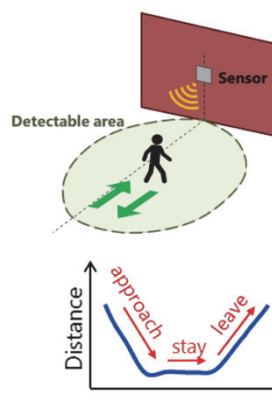


[Presence Detection]



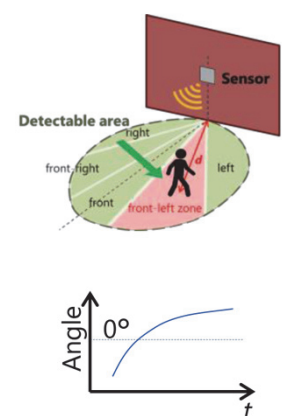
● Distance Detection

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

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

*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)