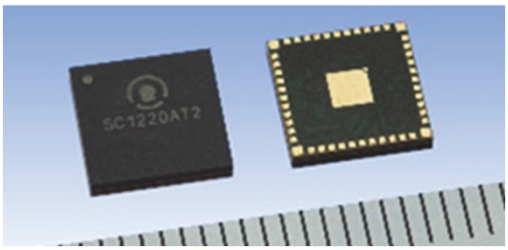
socionext™
The Solution SoC Company

SC1220AT2

60GHz Radio-Wave Ranging Sensor/ 3D Detection Model

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



Exterior photo of SC1220AT2

■ Features

● Suited for 3D motion sensing

- Wide bandwidth (6.8GHz max.) and high-accuracy linear chirp FMCW radar
- 2 Tx and 2x2 Rx antennas, which can support 2x4 MIMO detect azimuth/elevation angle, velocity and distance
- Assumed sensing area : ~ 0.5m[*1] with 0.6cm[*2] resolution (in case of palm gesture)
  : ~ 7.0m[*1] with 6.0cm[*2] resolution (in case of human location)

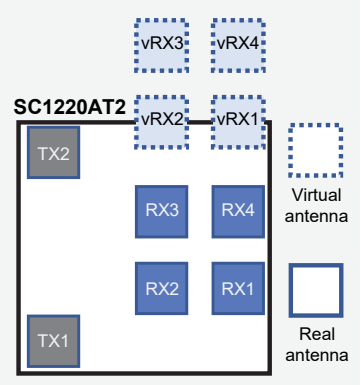
● Highly integrated device enabling easy hardware design

- 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

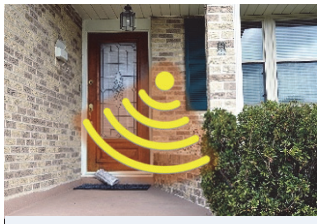
- 4-Level operation states (Shutdown, Deep Sleep, Light Sleep, Sensing)
- Intelligent power control sequencer managing flexible duty cycle
- 2.5mW average power consumption at palm gesture sensing[*3]

*1: Depending on sensor configuration and environmental conditions
*2: To be changed according to further study
*3: In case of conditions that Socionext assumed



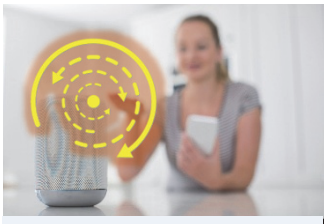
MIMO antenna

■ Applications

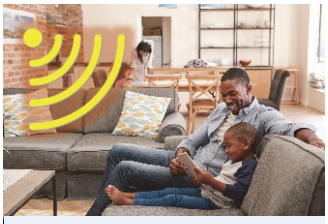


Detection of people the front door (use in a doorbell)

Vital sign monitoring (e.g., during sleep)

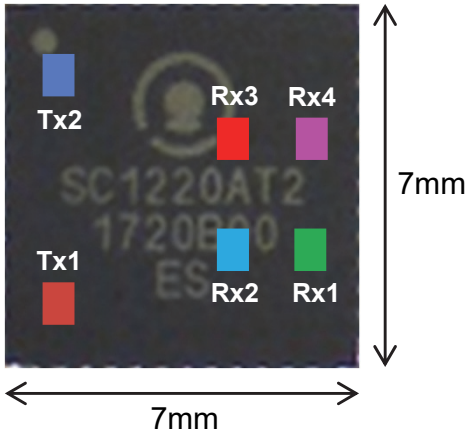


Gesture operations

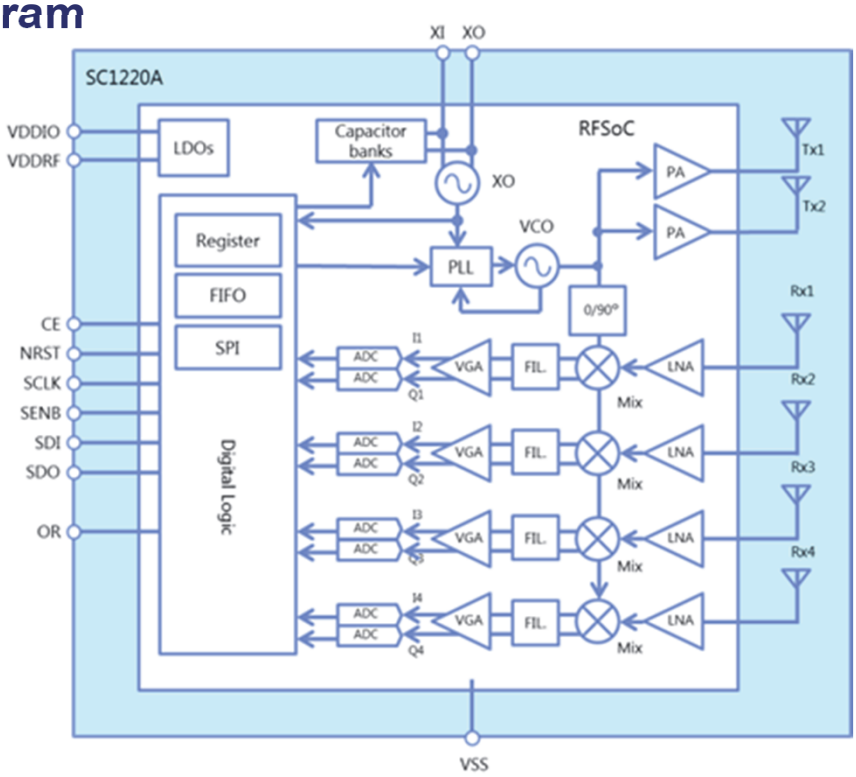


Detection of people in places like the living room

Antenna Configuration



Block Diagram



Specifications

Radar mode	FMCW/ FSKCW/ CW
Power Supply	1.5V - 1.8V (core) / 1.8V - 3.3V (I/O)
Power Consumption*1	368mW (Peak), 2.5mW (0.5% duty cycle operation using Deep sleep)
Transmitter	Frequency: 57.1 - 63.9GHz, EIRP: +5dBm
Receiver	Noise Figure: 12dB
Digital block	ADC (11bit, 10MHz), FIFO (32KB), SPI I/F (≤50MHz)
Operating temperature	-40 to 85°C

*1: Values at -10dBm transmit power

Deliverables of Evaluation Kit

- 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 (Sample C source for API)

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