

In-Cabin RADAR Sensor

RMR601A

The RMR601A is a radar-based module to keep driver and kids from being dangerous in car. It uses special class millimeter wave(mmWave) radar technology with short wavelength electromagnetic waves. The radar system transmit electromagnetic wave signals that objects in their path and reflect. By capturing the reflected signal, a radar system can determine the range, velocity and angle of the objects. So we provide an optimal solution for the safety of your kids and you. The RMR601A can provides driver's vital-sign(breathing rate and heart rate) and the presence of a rear-seat kids.



Keep the young children from being stuck in car

RMR601A can prevent accidents caused by leaving children inside the vehicle in the hot summer that never gose away. When the vehicle engine is stopped, the radar sensor detects the presence of children in the rear seat and informs the parent.



AI(Artificial Intelligence) included

AI Deep Learning techniques can be used to more accurately determine the presence/absence of a person.The learned AI distinguishes people, objects, and other objects to make more accurate judgments.



Delivery of reliable and accurate information

RMR601A can confirm accurate information without being affected by surrounding conditions than a module using IR/ultrasonic sensor. Even under a number of confitions, such as high temperatures and loud ambient noise, the radar sensor accurately detects them.



Provides more precise judgment

The high frequency of the mmWave wavelength can be used to detect minute movements of an object. The radar sensor using high frequency and very short wavelength can make precise judgments by detecting even the smallest movement, even for sleeping children.

ROA(Rear Occupant Alert) action sequence



Vehicle engine stop



Sensor detect rear seat



Cluster alarm



Emergency light and alert sound



Parent's SMS alert

SPECIFICATIONS & FEATURES

mmWave Transceiver

- FMCW(Frequency Modulated Continuous Wave) radar transceiver
 - Integrated PLL, transmitter, receiver, baseband and A2D
 - 60-64 GHz coverage with 4GHz continuous bandwidth
 - 3 Transmit channels
 - 4 receive channels

Features

- C674x DSP @600MHz for signal processing
- ARM Cortex-R4F @200MHz based radio control system
- Hardware accelerator for signal processing
- Internal memory with ECC
 - 1.75 MB divided for each functions
- 10 MHz Max I/F(Intermediate Frequency)
- 25 Msps Max real sampling rate
- 12.5 Msps Max complex sampling rate
- ASIL B support
- -40 ~ 125 °C Operating junction temperature range
- -55 ~ 150 °C Storage temperature range after soldered onto PC board

Artificial Intelligence

- Edge Computing
 - Include deep learning object detection algorithm
 - Light deep learning technology for edge computing
 - Without significant performance drop
- Deep learning object detection on radar
 - Range, Azimuth, Elevation heatmap data input
 - Object detection bounding box output

Power Management

- Built-in LDO
- I/Os support dual voltage 3.3V

Peripherals for user application

- Up to 6 ADC channels
- Up to 2 SPI ports
- Up to 2 UARTs
- 2 CAN-FD
- I2C
- GPIOs
- 2 lane LVDS interface for raw ADC data and debug instrumentation

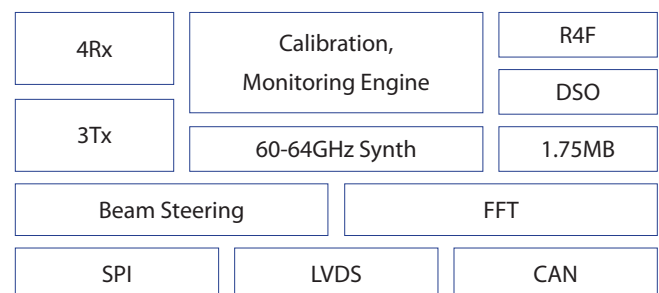
Clock source

- 40.0 MHz crystal with internal oscillator

Peripherals

Parameter	Configuration
Field of view	120° azimuth, 120° elevation
Maximum range	2.7m
Range resolution	5.3cm
Maximum Velocity	1.7m/s
Velocity resolution	1.5cm/s

Block Diagram



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