

RAA270205

Automotive Radar Transceiver

Description

Radar MMIC is a multi-channel high resolution MIMO RADAR device targeted for automotive applications.

Operating in the 76 to 81GHz frequency band, the device supports the highest number channels with best phase noise and linearity in the industry and offers superior reliability based on the optimal combination of RF and digital macros for RADAR processing.

With integrated multi-channel high-resolution ADCs, VCOs, PLL, PAs, LNAs, phase-shifters, and signal processing accelerators, the device enables OEMs to significantly reduce the overall system cost, footprint, and power consumption.

With the support of multi-device aggregation, ultra-wide-bandwidth, and MIMO processing, the RAA270205 provides best-in-class angular resolution and range in a very small form-factor for imaging and autonomous radar applications.

A variety of safety mechanisms such as on chip loop back test, voltage/clock monitors and sorts of digital error checkers are implemented in MMIC to satisfy ISO26262 functional safety requirement.

Typical Application

- Imaging RADAR
- Adaptive Cruise Control (ACC)
- Autonomous Emergency Braking (AEB)
- Lane Change Assistance (LCA)
- Blind Spot Detection (BSD)
- Front/Rear Cross-Traffic-Alert (FCTA/RCTA)

Features

High performance 76–81 GHz MIMO RADAR

Single device supports both long- and short-range radar applications

Integrated mixed-signal RFIC with on-chip modulator and data converters

On-board engine for range FFT calculation

Optimized RF performance

- Highest output power of 13dBm per channel
- Dedicated 360° phase shifters for 79GHz beam forming
- Best in-class receiver noise figure, programmable to 9dB per channel
- Supports single-ended 79GHz interface
- Best in-class VCO phase noise of -97.5dBc/Hz at 1MHz
- Best in-class PLL noise floor of -226 dBc
- Programmable linearity modes up to -8dBm P1dB

Enables superior range and angular resolution

- Wide modulation bandwidth of 4GHz
- Highest number of channels in a single device
- Four independent transmit and receive channels

Excellent interference performance

Fast ADC with 68dB Dynamic Range

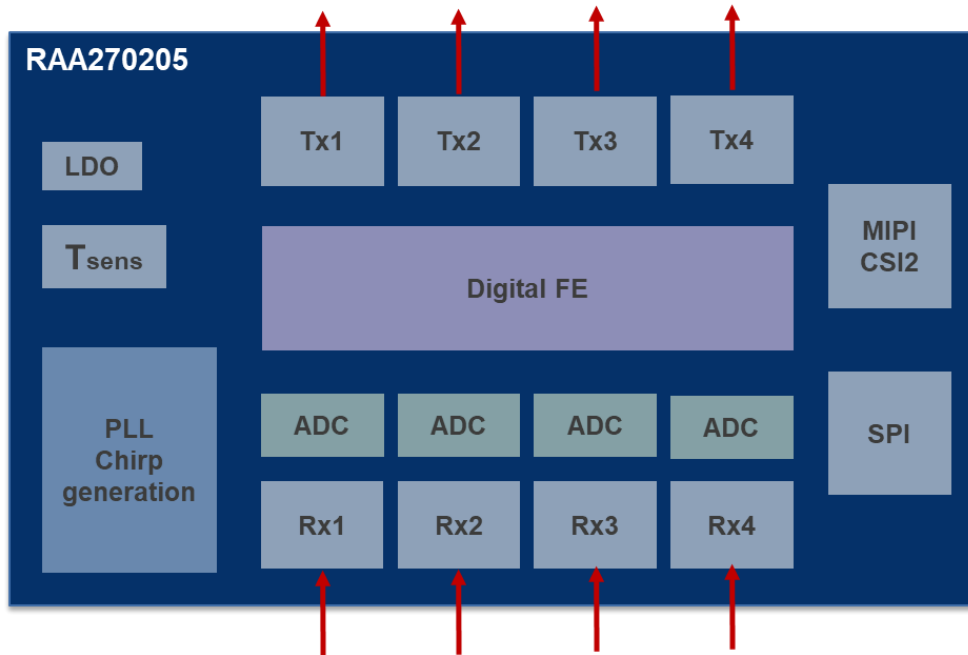
Lowest power consumption of 970mW¹

- Power detector at all internal signal nodes for failure detection

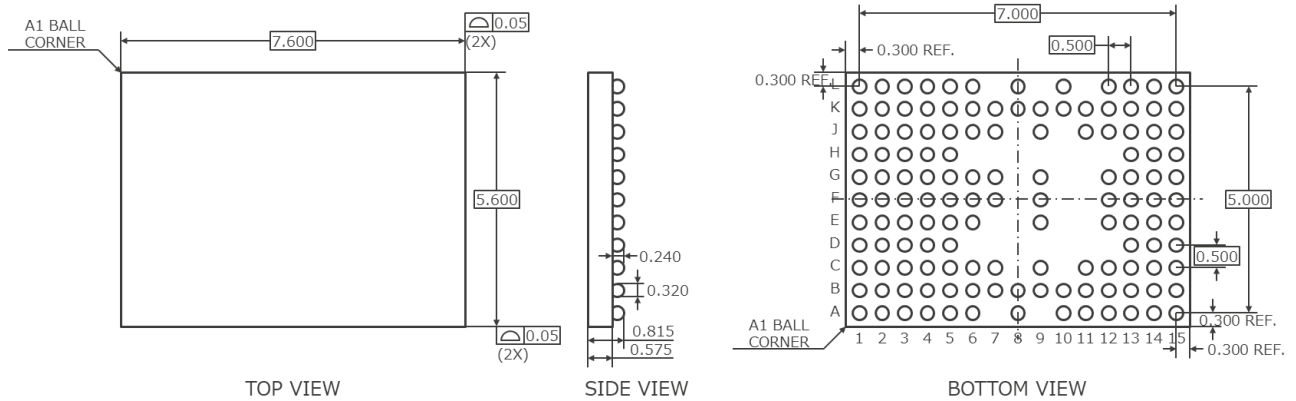
Smallest solution size with 7.6mm × 5.6mm eWLB package

¹ Preliminary power estimate with processing speed of 40 Frames/Second (FPS)

Block Diagram



Package Outline Drawings



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