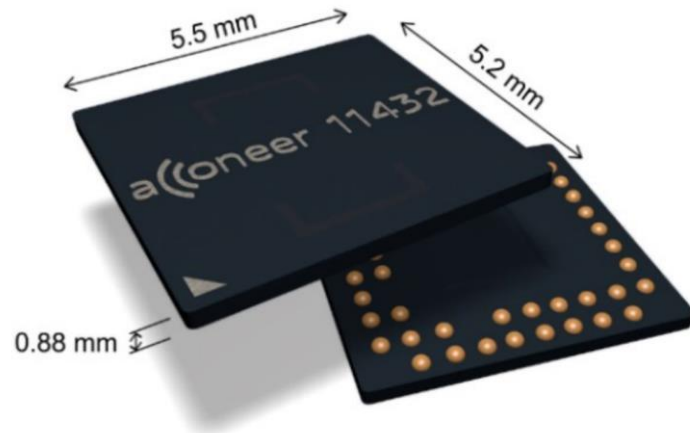# A121 – Feature overview

Pulsed coherent radar (PCR) technology setting a new benchmark for power consumption and distance accuracy

Fully integrated sensor

- 60 GHz Pulsed Coherent Radar (PCR)
- Integrated Baseband, RF front-end and Antenna in Package (AiP)
- 5.5 x 5.2 x 0.88 mm fcCSP, 0.5 mm pitch

Features

- Range up to 20 meters (dependent on object size, shape & dielectric properties)
- 57-64 GHz unlicensed ISM band
- Millimeter accuracy absolute distance
- Sub-millimiter accuracy realtive measurements
- Can detect multiple objects
- Power Consumption:
  - 0.1 Hz update rate : 0.2 mW
  - 10 Hz update rate: 1 mW
  - 100 Hz update rate: 20 mW
- Half Power Beam Width (HPBW): 40° / 80°

A121 Improved Performance

➢ Improved jitter performance

➢ Increased buffer memory (4x) to allow longer sweeps

➢ Power consumption improvements
- Sleep power consumption reduced
  - Active/Sleep ratio improved. Possible to stay longer in Sleep
  - Power consumption reduced
- Hibernate power consumption reduced
  - Possibility to switch off Major part of Digital power domain with Config memory retained.
- Current leakage (at ENABLE low) reduced from typical 66µA to <1µA

➢ IO improvements
- Possible to run sensor IO interface on 1.8-3.3 V
- Changed GPIO default state to Input PD instead of Input Hi-Z

➢ Built-in temperature sensor

➢ Radar Service improvement
- Sparse service now provides phase information (Sparse IQ data)
- Sparse service distance steps now possible to configure between 2.5-60 mm
- Sparse service with small distance steps can be used as a replacement for IQ to allow high sweep rates with long ranges (note: with IQ can do 30 cm/s and with Sparse IQ data can do m/s)

The A121 is pin compatible with A111

A111/A121 Product details – System overview

The **digital block** includes sensor control.

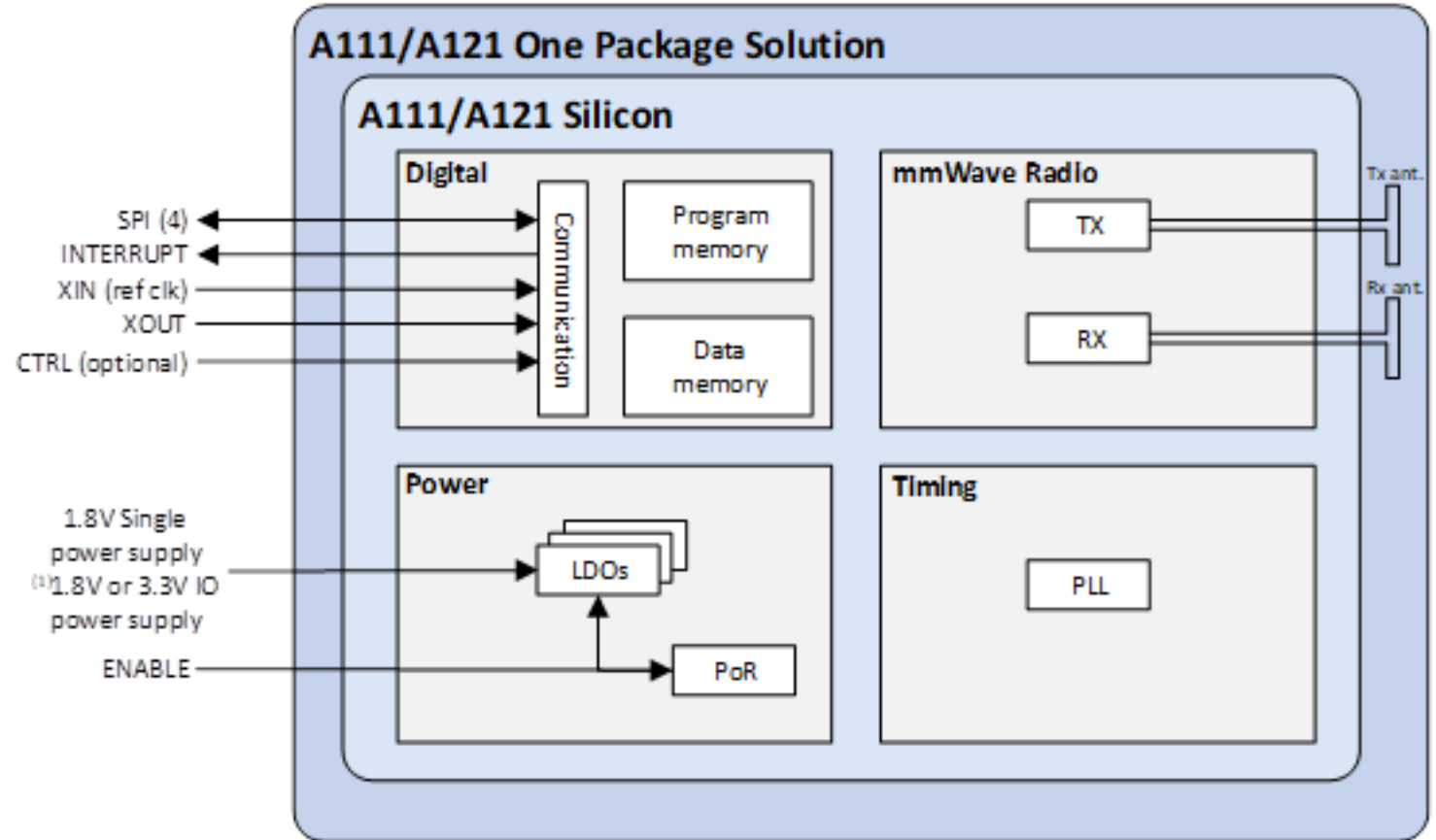The data memory stores the radar sweep data from the ADC.

SPI is the host data interface.

The **timing block** includes the timing circuitry.

The **Power block** includes LDOs and Power on Reset (PoR).

The **mmWave radio block** is the analog RF part that generates and detects radar pulses. The mmWave radio includes PA and interfaces with TX and RX antenna in package (AiP).
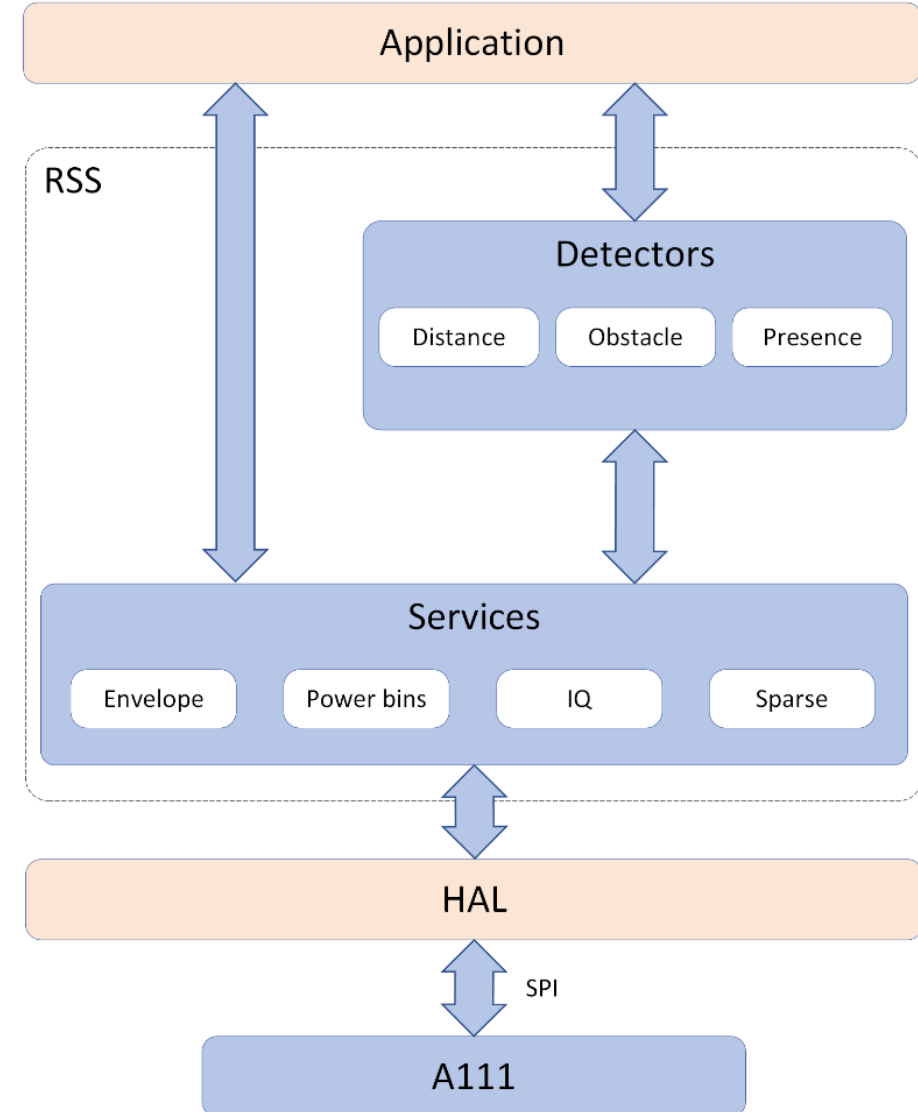
The ASIC is manufactured in GF 40 nm LP process.
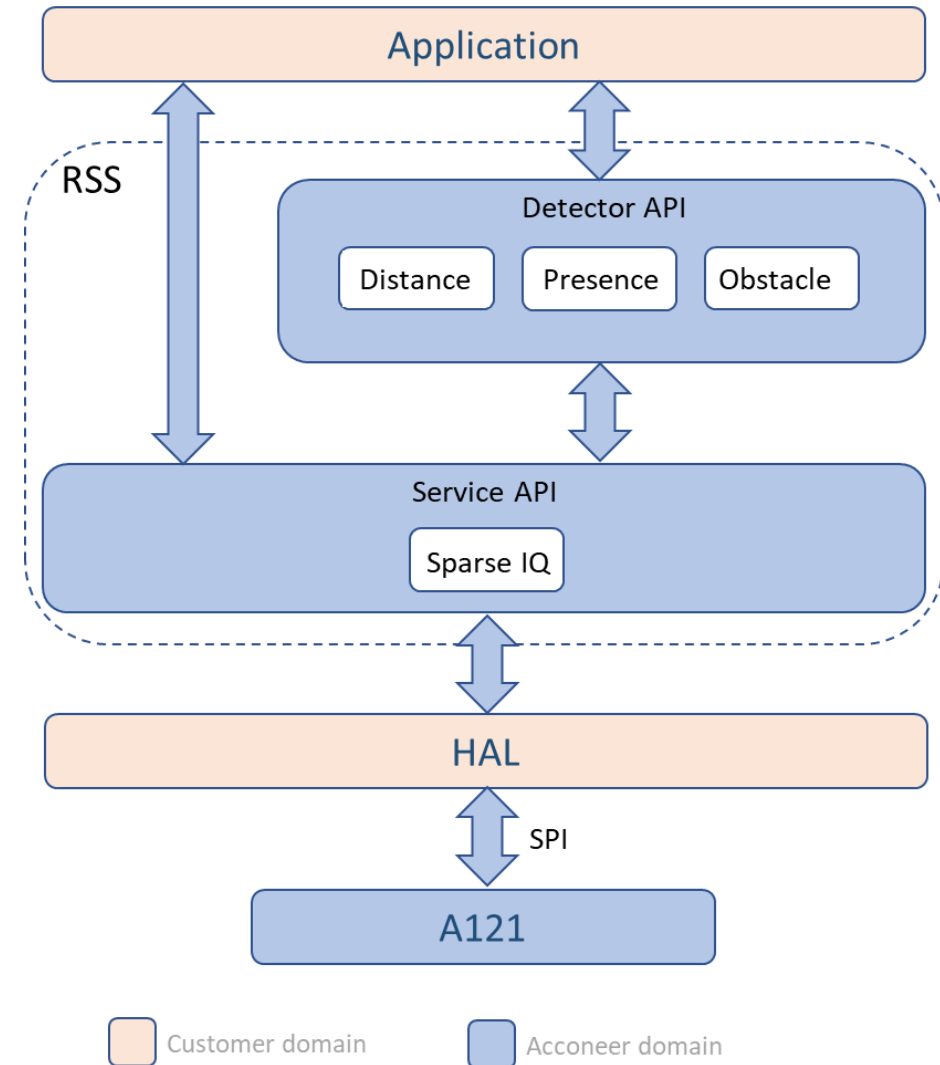

(1) A121 only

A111 Acconeer Software

- The RSS (Radar System Software) provides output at two different levels, Service and Detector.

- RSS provides an Application Programming Interface (API) for application utilization of various Services and Detectors.

- The Acconeer software is written in C and is portable to any OS and HW platform.

- Acconeer provides several example applications to support customer own application development.

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