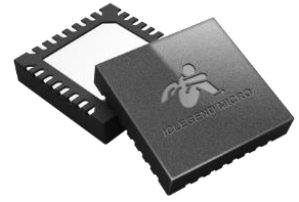


S3KM111L



1 General Description

The S3KM111L is an integrated single-chip mmWave sensor SoC based on FMCW radar transceiver technology. It works in the 24 GHz K-band with up to 1 GHz modulation bandwidth in every single frequency sweeping chirp.

The S3KM111L offers a low-cost fully integrated solution for all critical mmWave functions with full transceiver and signal processing path, including full K-band RF transceiver, on-chip pattern generator, PLL, and ADC. The pattern generator supports multiple frequency sweeping modes with different time-frequency waveforms, e.g. saw-tooth and triangular waveforms. The pattern generator and PLL support fast chirp mode up to 8 kHz chirp rate. The digitized signals from the receiver chain can be serialized via multiple output interfaces.

The device is packaged in a 32 pin 4 mm x 4 mm leadless ROHS compliant QFN package for easy interfacing to a wide range of antenna board technologies.

2 Main Features

- 24 GHz K-band highly integrated FMCW radar sensor SoC
- Up to 1 GHz bandwidth FM tuning range
- Integrated signal generator, low phase noise PLL, transmitter, receiver, baseband, and ADC
- One transmit channel and one receive channel
- TX maximum output power: 12 dBm
- RX noise figure: 10.5 dB
- Phase noise: -97 dBc/Hz @ 1 MHz offset
- Support flexible power supply modes
- Built-in 2.5 MHz output rate ADC with 16 bits resolution
- Built-in hardware accelerator for FFT, filtering, and CFAR processing
- Configuration interface support: I2C/SPI/UART
- Processed data output interface support: SPI/UART
- Easy hardware design: 4 x 4 mm² QFN32 package for ultra-compact and low-cost PCB design
- Junction temperature range from -40°C to 105°C

3 Applications

- Smart Home Radar sensor
- Robotics
- Proximity and Position sensor
- Motion detector
- Gesture recognition
- Vital signs monitoring

4 Block Diagram

Figure 4-1 presents an illustration of the design of S3KM111L.

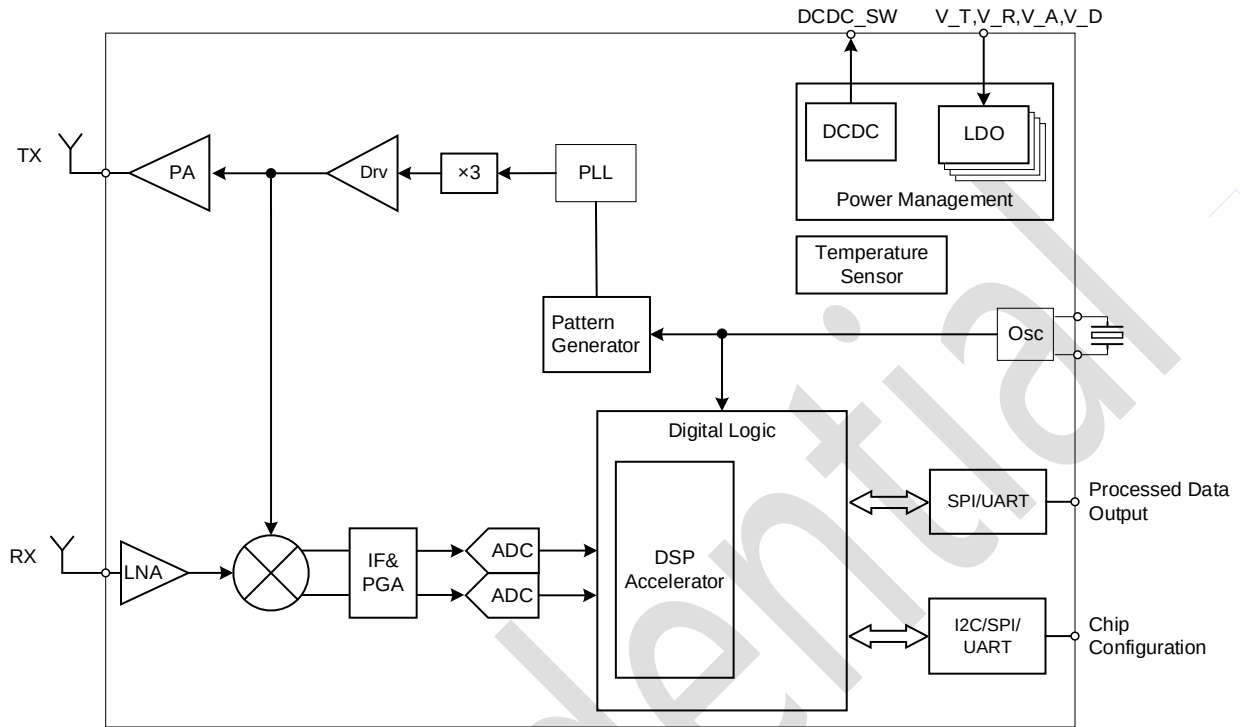


Figure 4-1 S3KM111L diagram