



ICL1112 mmWave Sensor SoC

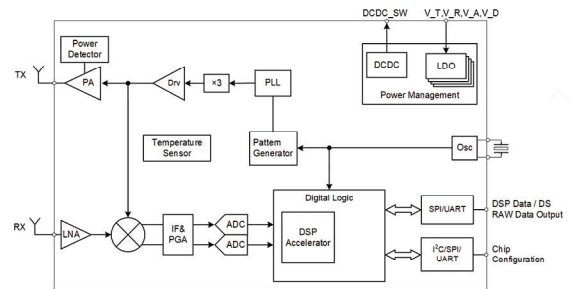
µA-level 24G 1T1R mmWave sensor SoC

The ICL1112 stands as an industry-leading µA-level 24GHz mmWave sensor SoC, boasting an impressive combination of ultra-low power consumption (a mere 55 µA in a typical working scenario) and remarkable long-range detection capability (extending beyond 150 meters). This chip presents a fully integrated mmWave sensing solution, with all transceiver and signal processing paths consolidated onto a single, robust CMOS chip. With fewer external peripherals and enhanced user-friendliness, it ushers in a new era of convenience.

The latest enhancements not only cater to battery-powered applications but also empower extended-range monitoring in consumer scenarios. This innovative solution offers an ideal fit for a wide spectrum of sensor applications, facilitating the detection of human movement and even life presence. The ICL1112 is set to redefine sensor technology.

Key Parameters	ICL1112
RF Channel	1T1R
Operating Frequency Range	24 ~ 25 GHz
Max. TX Output Power	12 dBm
FMCW Ramp Rate	Max. 20 MHz/µs
Frequency Modulation Error	0.045% @250 MHz, FCC/CE compliant
RX Noise Figure	10 dB
PLL Phase Noise	-97 dBc @1 MHz
ADC	2.5 MHz/16 bit
DSP	Super-Resolution/Filter/CFAR Detection etc.
Interface	I2C/SPI/UART
Supply Voltage	3.0 ~ 3.6 V
Average Current Consumption	55 µA @0.3% duty cycle
High-precision TX Power Control/Detection	Support
Package and Size	QFN32/4 mm × 4 mm

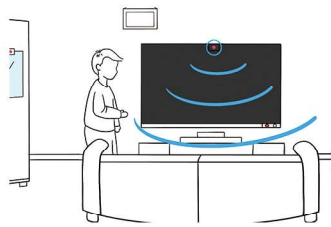
- ### Features
- Single chip SoC solution, with integration of 1 Tx, 1 Rx, ADC, PLL, DSP, PMIC. Powerful on-chip algorithms such as super-resolution, filtering and CFAR object detection for real-time detection of target's distance and velocity.
 - Capable of µA-level battery-powered operation with the integration of power management and multiple low-power mode and suitable for ultra-low power consumption AIoT applications.
 - Extremely low frequency modulation error, large dynamic range and excellent RF performance. Capable of high precision and wide range detection, suitable for human presence detection.



ICL1112 Block Diagram



Low Energy Smart Homes Devices
Smart Lock



Human Presence Sensor
Smart Appliances



Distance and Velocity Detection
Radar for Two-wheelers

