



ICL1122 mmWave Sensor SoC

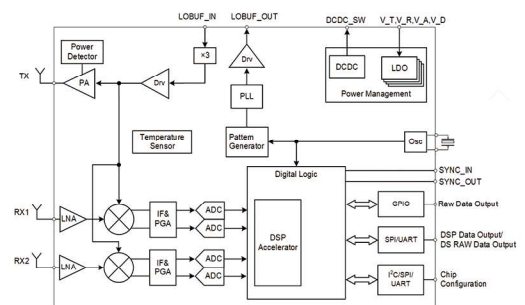
24G 1T2R mmWave sensor SoC

The ICL1122 represents a cutting-edge μ A-level 24GHz mmWave sensor SoC, ushering in the next generation of sensor technology. This remarkable SoC boasts several outstanding features, including ultra-low power consumption (typically operating at a mere 70 μ A), exceptional positioning and detection capabilities across extended ranges and vast areas. The SoC seamlessly integrates the full functionality of a robust sensor into a single CMOS chip, encompassing everything from the mmWave transceiver to baseband signal processing. Moreover, its limitless cascading functionality allows for the unlimited expansion of sensing arrays, with other ICL1122s providing support. With fewer external peripherals and enhanced user-friendliness, this chip heralds a new era of convenience.

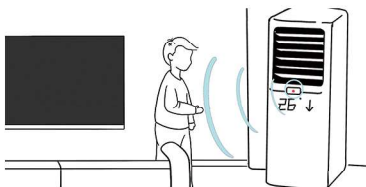
These latest enhancements cater not only to battery-powered applications but also empower extended-area monitoring and positioning in various consumer scenarios. This innovative solution is ideally suited for a wide range of sensor applications, including multiple indoor object tracking and traffic vehicle pedestrian monitoring.

Specifications	ICL1122
RF Channel	1T2R
Operating Frequency Range	24 ~ 25 GHz
Max. TX Output Power	12 dBm
FMCW Ramp Rate	Max. 20 MHz/ μ s
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	70 μ A @0.3% duty cycle
Chip Cascading	Support
High-precision TX Power Control/Detection	Support
Package and Size	QFN32/4 mm \times 4 mm

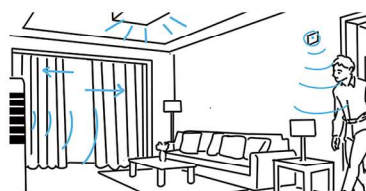
- ### Features
- Single chip SoC solution, with integration of 1 Tx, 2 Rx, ADC, PLL, DSP, PMIC. Powerful on-chip algorithms such as super-resolution, filtering and CFAR object detection for real-time detection of multiple target distances, velocities, and angles.
 - Extremely low frequency modulation error, large dynamic range, capable of detecting both far and near targets. Excellent RF performance, combined with multiple-chip cascading capability, enables high-precision multiple target localization over 150 meters.
 - Capable of μ A-level battery-powered operation with the integration of power management and multiple low-power mode.



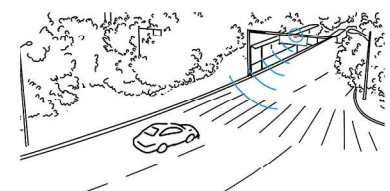
ICL1122 Block Diagram



multi-persons tracking detection
Smart Appliances



Human Position Perception
Smart Home



Long-range Distance and Velocity Detection
Intelligent Transportation

