

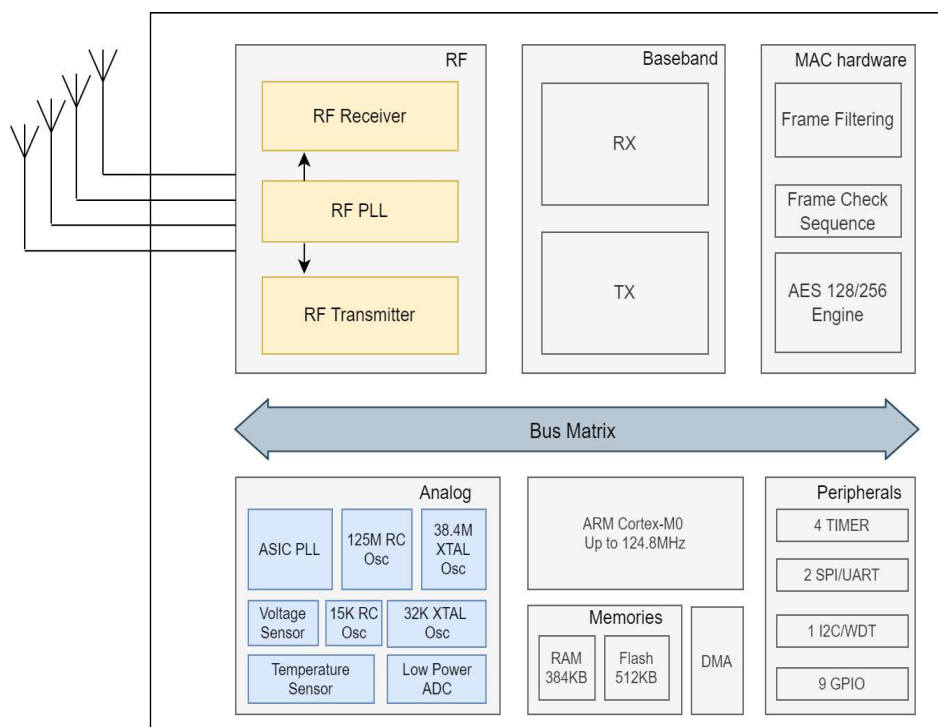
Product Brief: UWB SoC GT1500

Overview

- GT1500 is a fully integrated single chip Ultra-Wideband (UWB) SoC compliant with the latest IEEE802.15.4-2020, IEEE802.15.4z-2020, FiRa and CCC standards
- Supports ranging precision of $\pm 3\text{cm}$, and 3D Angle of Arrival (AoA) with angle precision of $\pm 3^\circ$
- Supports high data rate communications, up to 31.2Mbps
- Highly immune to multipath fading – allows reliable communications in high fading environments
- Extremely low power consumption allows operation with batteries for long lifetime
- The smallest package size and significantly reduced external component count allow the implementation of cost-effective solutions

Key Advantages

- 1T4R architecture significantly reduces 3D AoA design complexity, component count, and product BOM costs
- The smallest package size allows close antenna placement thus improving signal reception and overall UWB performance
- Extremely low power consumption prolongs the battery life and enhances user experiences
- Standards based solution (IEEE, FiRa and CCC) eases interoperability



Functional Block Diagram

Target Applications

GT1500 is optimized for applications in mobile phones, wearables, tags, wireless audio, AR/VR, TV, smart home, Internet of Things (IoT), digital keys for vehicles, building, office and home, and indoor positioning of industrial, commercial and government facilities.

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Technical Data

- Highly integrated SoC, comprising of RF, analog, baseband, MCU, SRAM, flash and peripherals
- Frequency range from 4.0GHz to 9.0GHz, supports UWB channel number 3, 5, 6, 8, 9 and 10
- Supports 1 Tx antenna and maximum of 4 Rx antennas for 3D AoA positioning applications
- Supports 850Kbps, 6.8Mbps, 7.8Mbps, 27.2Mbps and 31.2Mbps
- Supports the base pulse repetition frequency (BPRF) mode with 64MHz peak PRF and higher pulse repetition frequency (HPRF) mode with 124.8MHz and 249.6MHz peak PRF
- ARM Cortex 32bit processor with the clock up to 124.8MHz
- 384KB RAM and 512KB flash
- SPI/UART/I2C/GPIO peripheral interfaces
- SPI interface with the clock up to 40MHz
- Integrated AES-128/256 for secure ranging
- Transmit Power: -18 dBm to 10 dBm
- Receiver sensitivity: -93dBm @6.8Mbps and -101dBm @850Kbps
- TX peak power consumption: 68.4mW*
(1.2V/54mA=64.8mW; 2.1V/1.71mA=3.6mW)
- RX peak power consumption: 121mW
(1.2V/97.5mA=117mW; 2.1V/1.88mA=4mW)
- 1.3uA deep sleep mode current
- Dual power supply voltage: VDD1: 2.1V to 3.3V, VDD2: 1.15V to 1.8V
- Various SoC working mode for different application scenarios: power off, deep sleep, sleep, receiving and transmitting
- Supports various types of ranging and positioning: Two Way Ranging (TWR) based on Time of Flight (ToF), Time Difference of Arrival (TDoA), 3D Angle of Arrival (3D AoA)
- Supports secured ranging based on scrambled timestamp sequence (STS)
- Operating temperature -40°C to +85°C
- 3.2mm x 2.8mm WLCSP package

*Test condition: -41.3dBm/MHz output power

For more information, please contact: sales@giantsemi.com