

SQN1310 Mobile WiMAX System-on-Chip for Mobile Devices

802.16e Enhanced Semiconductor Solution



THE HIGHEST LEVEL OF INTEGRATION IN THE WiMAX INDUSTRY

Based on state of the art 65 nm technology and seven years of Sequans' proven field experience, the SQN1310 delivers baseband and dual-band RF in a single die—the highest level of integration yet achieved in the WiMAX industry—leading to unprecedented achievements in performance, power consumption, and size.



APPLICATIONS

The SQN1310 delivers wireless broadband connectivity for fully mobile WiMAX® applications, targeting primarily handset and tablet products. Leveraging previous generation SQN1210 and SQN1280 architecture and software, it provides higher levels of system integration, enabling further system cost reduction and smaller design footprint.

KEY BENEFITS OF SQN1310

ADVANCED MIMO – *mimoMAX*™

SQN1310 features *mimoMAX*™, Sequans' patent-pending, low-complexity MIMO algorithm for maximum likelihood performance on the downlink.

4G-EZ LOW POWER CONSUMPTION

In addition to the low power consumption enabled by its core 65nm architecture and *mimoMAX* technology, SQN1310 employs state-of-the-art power reduction techniques—4G-EZ ultra low power technology—to further reduce power consumption. Special care has been taken to minimize power consumption in idle mode to further extend the battery life of mobile devices. Smart software algorithms optimize resource management for additional power reduction improvements.

4G-EZ ULTRA FAST CHANNEL SCANNING

Leveraging Sequans' patents, the SQN1310 provides ultra high-speed channel scanning for faster network entry, resulting in a better user experience.

HIGHLIGHTS

- ❖ 65 nm, single die, baseband and RF
- ❖ 9x9 mm package, includes SDRAM
- ❖ Dual-band RF: 2.3-2.4 GHz, 2.5-2.7 GHz
- ❖ Maximum likelihood MIMO decoder on the downlink
- ❖ TDD and FDD
- ❖ 4G-EZ ultra-low power technology
- ❖ High throughput > 40 Mbps
- ❖ 4G-EZ software suite includes 3G/4G handover technology and turnkey solution for Android and Microsoft-based host platforms
- ❖ WiMAX Forum Certified™

SEQUANS' 4G-EZ TECHNOLOGY

Sequans' 4G-EZ™ is a collection of innovative 4G platform technologies that provide device manufacturers and operators with solutions for outstanding performance, ease-of-use, and ease-of-design, aimed at enabling truly mass-market 4G.



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HIGH THROUGHPUT

SQN1310 delivers maximum theoretical throughput and the full line rate in all configurations for a combined downlink/uplink throughput of more than 40 Mbps. The SQN1310 supports all categories of H-ARQ.

DUAL-BAND RF

The SQN1310 supports the main international WiMAX bands: 2.3 to 2.4 and 2.5 to 2.7 GHz. Its advanced RF technology supports both TDD and FDD and features direct conversion architecture, on-chip calibration to remove DC offsets and optimize VCO performance, and on-chip digitally-controlled AGC for fast settling time.

FULL-FEATURED MAC LAYER

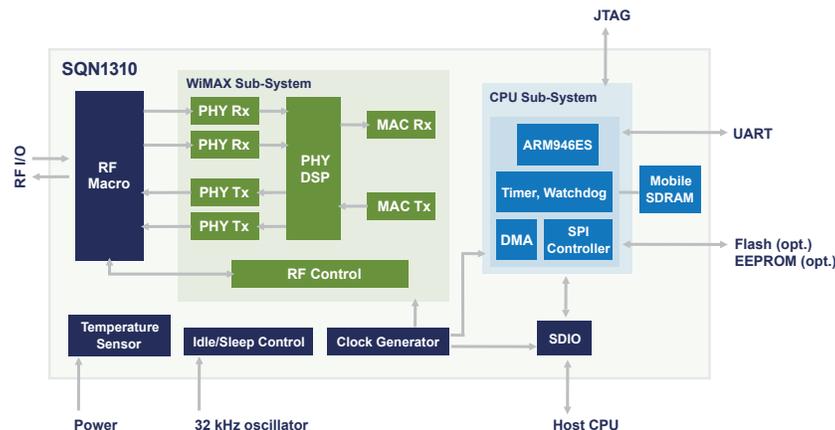
The SQN1310's extremely efficient MAC implementation is strategically partitioned between hardware and software to maximize available throughput and reduce power consumption.

The software runs on an ARM processor, providing flexibility, while the MAC hardware acceleration greatly enhances system performance and throughput. Complete support for mobility is provided, including handover, sleep mode, and idle mode.

4G-EZ COMPREHENSIVE SOFTWARE SUITE

Sequans' comprehensive 4G-EZ software suite is based on seven years of Sequans' proven field experience. It is running in all major deployments around the world, making it the most mature software solution in the global WiMAX ecosystem. 4G-EZ software includes the entire 802.16e software stack and all drivers and host applications required for a complete WiMAX system. Host software includes a turnkey package for all major operating systems (including Android and Windows 7), Sequans' own connection manager, a seamless 3G/4G handover implementation, a supplicant engine for EAP authentication, a standards-compliant OMA-DM client, and a field diagnostic tool. The 4G-EZ software suite also provides a full simulation and verification environment, which can be easily customized to address specific needs.

SQN1310 BLOCK DIAGRAM AND EXTERNAL INTERFACES



PRODUCT CHARACTERISTICS

THROUGHPUT

- » 40 Mbps total DL + UL

DUAL-BAND RF

- » 2.3 – 2.4 GHz
- » 2.5 – 2.7 GHz

PHY

- » S-OFDMA PHY
- » Supports 2 Rx antennas
- » DL MIMO: MRC, Matrix A + MRC, Matrix B
- » Tx diversity
- » TDD with configurable UL/DL splits
- » FDD
- » Adaptive QPSK, 16QAM and 64QAM modulation
- » Fast feedback channel
- » H-ARQ (all categories)
- » Fast scanning

MAC

- » Layer-2 packet forwarding
- » AES-CCM encryption
- » PKMv2 privacy protocol
- » Real-time services
- » Concatenation, fragmentation, packing
- » Automatic repeat request (ARQ)
- » Payload header suppression (PHS)
- » Advanced QoS features
- » Optimized handover
- » Sleep mode
- » Idle mode

DATA INTERFACES

- » SDIO

PACKAGING

- » 9 x 9 x 1.1 mm VFBGA package (SDRAM included)