

CL1300 WiFi SoC



The first 802.11 4x4 Implicit Beam Forming MIMO SoC for high performance Wireless HD video solutions

Celeno's CL1300 incorporates all the key components required to meet the needs of the growing WiFi multimedia home networking market. The powerful CL1300 System on Chip (SoC) combines the world's first 802.11 4Tx4R Implicit Beam Forming MIMO MAC/PHY with a dedicated embedded network processor and CPU. These unique features make the CL1300 ideal for cost sensitive, high performance applications such as multi-room digital video recorders and WiFi networked set top boxes and TV's.



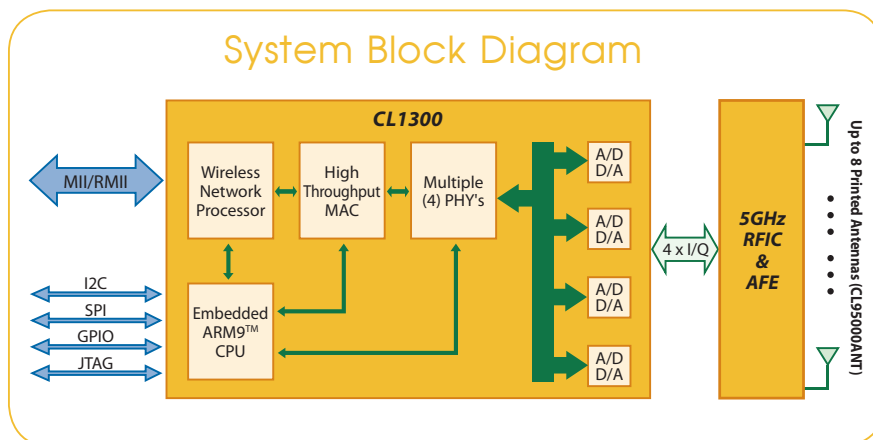
Benefits

- **Wirelessly links multimedia devices** throughout the home:
 - 40m (120 ft) , 4 brick walls, 3+ floors
 - Zero packet error rate
 - 4 concurrent HD streams
- **Future proof Access Point technology:**
 - Consistent high performance independent of client's chipset and antenna design
 - Easy integration into set top boxes, digital video recorders and consumer A/V devices
- **Optimized solution cost structure** utilizing smart access point technology and low cost clients
- **Carrier-grade self installation** and remote management models

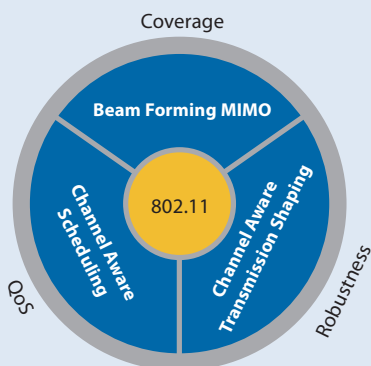
Applications

- IPTV and Cable home gateway video distribution
- Multi room DVR
- WiFi enabled Hybrid DVB-S and DVB-T set top boxes
- Multi room gaming
- Wireless TV for over the top content
- Media server PC content sharing
- Wireless HDMI extenders

System Block Diagram



Celeno OptimizAIR™ Technology



Celeno's WiFi SoC solutions employ a fresh "Base-Station" approach – shifting the intensive and expensive signal processing from the receiver to the transmitter. Powered by the ground-breaking OptimizAIR™ transmit-side, client agnostic technology, the Celeno CL1300 delivers high performance streams to client devices independently of the 802.11n client chipset (even to single stream, single antenna clients). Celeno's open architecture significantly increases flexibility by accommodating future plug & play of any WiFi enabled set top box or TV screen with consistent performance. It also reduces home network costs by leveraging the generic 802.11n mass-market silicon price curve.

OptimizAIR™ combines several innovative technologies that work together intricately at all layers to achieve the full-home, robust throughput needed for HD video streaming. These include 4Tx4R Implicit Beam Forming MIMO, Scheduled Access MAC and real time packet-by-packet channel estimation for fully channel-aware silicon.

Features

- Implicit (client agnostic) 4Tx4R transmit Beam Forming MIMO for up to 12dB gain
- TDM-like Scheduled MAC for guaranteed QoS without collisions
- Real-time channel aware adaptive rate eliminates retransmission and packet loss
- Point to Multipoint solution architecture supporting up to 4 different concurrent HD streams
- Superior interference immunity:
 - Best spectral efficiency using only 20MHz bandwidth
 - Advanced PHY-level interference detection and automatic channel scanning and hopping
- Advanced regulatory requirements support including Dynamic Frequency Selection (DFS)
- IGMP snooping, Multicast to Unicast translation and WDS support for seamless IPTV network integration
- WPS – WiFi Protected Setup for simple setup and security configuration
- HTTP-based GUI management and software upgrades
- Remote management based on SNMP or TR-069 standards
- Full wire speed of 100Mbps Ethernet-WiFi bridging with full classification and QoS based on internal hardware network processor with no MIPS load on host processor
- Fast power-up time of less than 20 seconds until video connectivity
- MII/RMII interface operates as an equivalent Ethernet PHY device for simple integration with host processor
- Full-rate hardware-based encryption engines to support WEP, AES-CCMP / WiFi-WPA2
- Internal printed antennas deliver high spatial diversity and beam forming gain

CL91300VXT Reference Design



Specifications

Frequency Band	4.900–5.950GHz
Supported Client Device Network Standards	802.11a/n
Hardware Encryption	WEP, AES(CCMP)
Host Interface	MII/RMII
Peripheral Interfaces	UART, GPIOs, I2C, SPI
Memory Interface	DDR2, Serial Flash



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