

CS3820

802.11a Baseband Core Product Brief



The CS3820 WLAN baseband core is designed to provide a high performance, low power physical layer solution fully compatible with the IEEE802.11a standard. This application specific silicon core achieves high performance with unique stream based architectures and can be combined with a high performance MAC and analog components to produce a leading-edge solution.

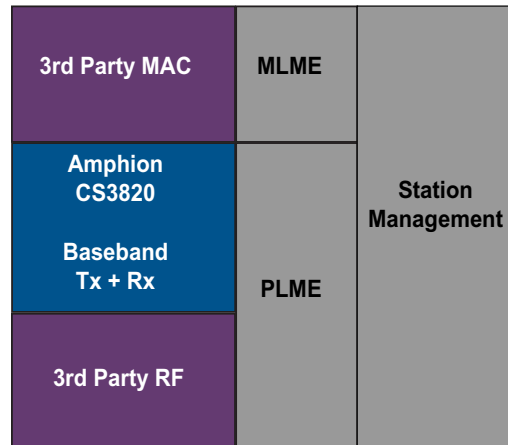


Figure 1: Complete 802.11a Solution Using CS3820

FEATURES

- ◆ Fully compliant with the IEEE802.11a standard
- ◆ Full support of all data rate options (up to 54 Mbps)
- ◆ High performance tracking and recovery algorithms
- ◆ Low implementation loss
- ◆ Innovative tracking algorithm
- ◆ PAPR control
- ◆ ACR filtering
- ◆ Spectral shaping on TX
- ◆ Performance monitoring of key parameters to identify potential system degradation during real world use
 - I/Q phase imbalanced measured
 - DC offset measured and corrected
 - Signal quality estimation
- ◆ Low power consumption
 - Advanced clocking strategy
- ◆ Minimized area
- ◆ No external memory required
- ◆ Complete hardware solution
 - No PHY programming required

BENEFITS

- ◆ Superior error correction capability improves range
- ◆ Highly customizable for tight integration with a variety of RF and MAC solutions
- ◆ Provides efficient signal processing in a compact and reliable solution
- ◆ An excellent platform for building 802.11a SoCs
 - Provides PHY layer functionality for 802.11e and 802.11h
 - Combined with Amphion OCB-AES cores can provide high strength data security 802.11i

KEY METRICS¹

- ◆ Area (Logic + Memory): 340K Gates
- ◆ Clock: 80 MHz
- ◆ Power: 180 mW (Tx), 220 mW (Rx)

APPLICATIONS

- ◆ Home wireless networking
- ◆ Small business network infrastructure
- ◆ Public Internet access in airports, hotels, etc.
- ◆ Wireless video

1. Performance metrics are based on TSMC 180nm Standard Cell libraries.

CS3820 SYSTEM OVERVIEW

Figure 2 provides an overview diagram of the CS3820 baseband processor. Table 1 details the different modulation schemes offered by CS3820 core.

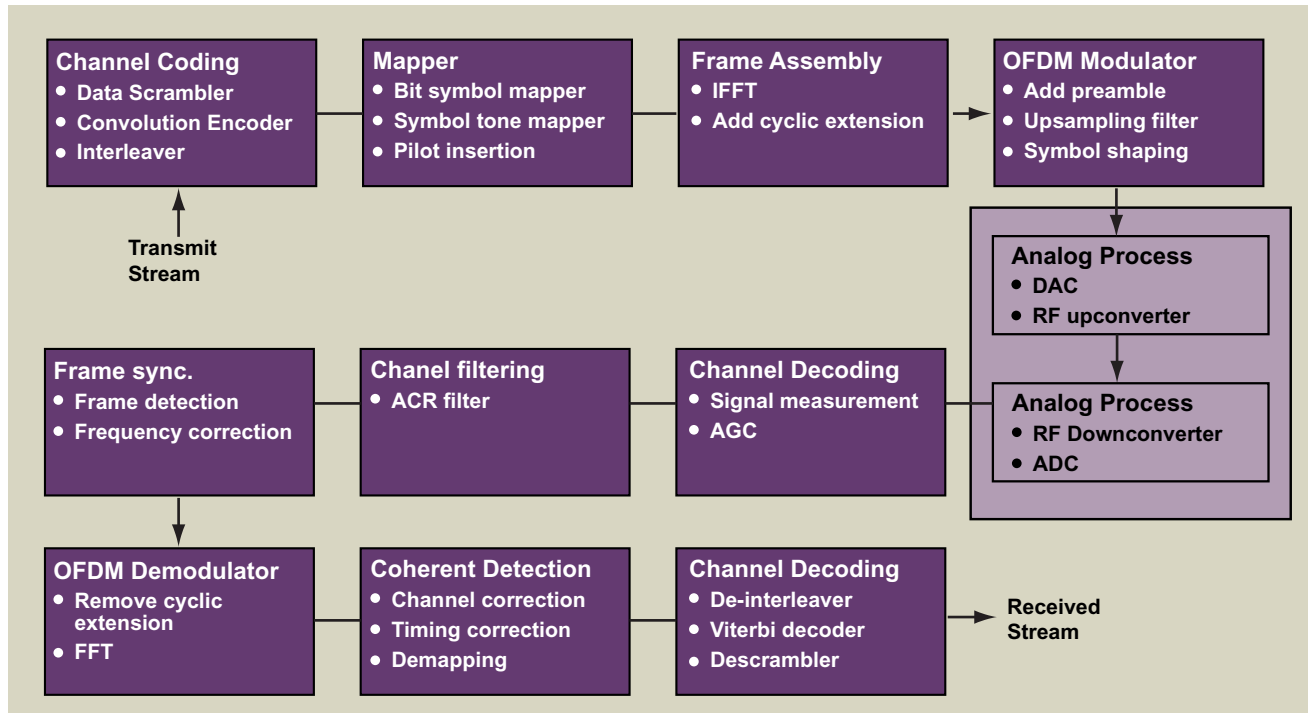


Figure 2: CS3820 System Block Diagram

Table 1: Modulation Schemes Offered by CS3820

Modulation	Coding Rate	Data Rate (Mbps)	Coded Bits per Subcarrier	Coded Bits per OFDM Symbol	Data Bits per OFDM Symbol
BPSK	1/2	6	1	48	24
BPSK	3/4	9	1	48	36
QPSK	1/2	12	2	96	48
QPSK	3/4	18	2	96	72
16-QAM	1/2	24	4	192	96
16-QAM	3/4	36	4	192	144
64-QAM	2/3	48	6	288	192
64-QAM	3/4	54	6	288	216

TRANSMITTER OVERVIEW

CS3820 performs the baseband processing routines required to transmit frames of data under the IEEE802.11a standard and provides high performance features such as spectral shaping and PAPR control at low power.

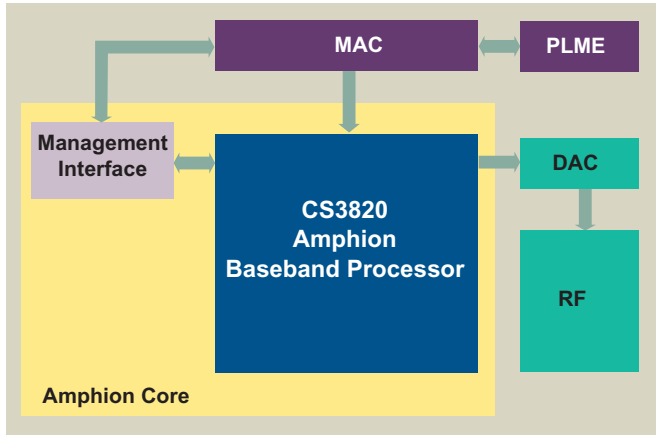


Figure 3: Simplified Baseband Processor Interface, Tx Mode

RECEIVER OVERVIEW

This is the counterpart of transmit model of PHY layer baseband processor. The CS3820 core performs the baseband processing routines required to receive frames of data under the IEEE802.11a standard in the presence of channel interference and component non-linearities. The transmitter and receiver share key blocks to reduce the overall gate count without compromising performance.

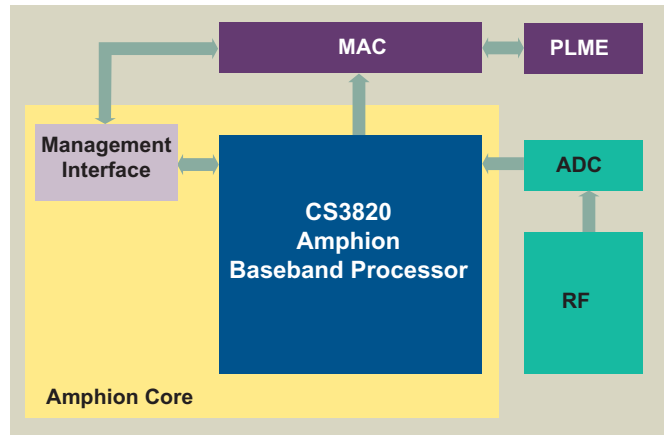


Figure 4: Simplified Baseband Processor Interface, Rx Mode

AVAILABILITY

ASIC CORES

For applications that require the high performance, low cost and high integration of an ASIC, Amphion delivers application specific silicon cores that are pre-optimized to a targeted silicon technology by Amphion experts.

Consult your local Amphion representative for product specific performance information, current availability of individual products, and lead times on ASIC core porting.

Table 2: CS3820 ASIC Cores

PROD- UCT ID #	SILICON VENDOR	PRODUCT NAME/ PROCESS	CLOCK (MHZ)	LOGIC GATES	MEMORY (GATES)	POWER (mW)	
						Transmit	Receive
CS3820TK	TSMC	180nm using Artisan Standard Cell Libraries	80	250K	90K	180	220

For FPGA/PLD implementation information please contact Amphion Semiconductor

ABOUT AMPHION

Amphion (formerly Integrated Silicon Systems) is the leading supplier of speech coding, video/image processing and channel coding application specific silicon cores for system-on-a-chip (SoC) solutions in the broadband, wireless, and multimedia markets

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