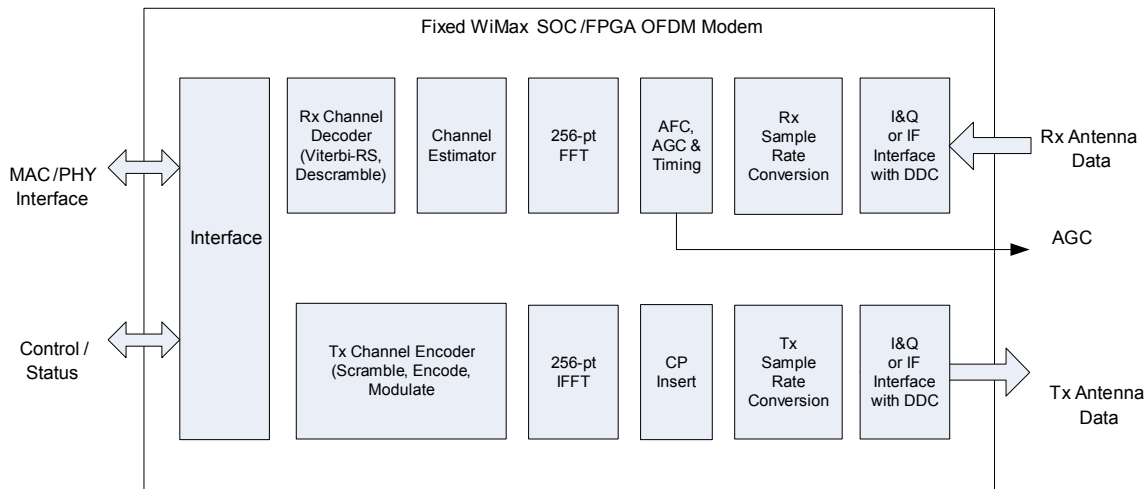


Product Brief

Fixed WiMax OFDM Modem



IP Core Names

Name:	R3WMAX-FIXED-FPGA
Description:	Fixed WiMax OFDM Modem Optimized for FPGA Implementation
Name:	R3WMAX-FIXED-SOC
Description:	Fixed WiMax OFDM Modem Optimized for ASIC Implementation

- Support for all WiMAX Forum™ specified channel bandwidths and data rates
- Flexible RF interface supports either I/Q or IF RF interfaces with Digital Up/Down Conversion
- Programmable Sample Rate Conversion (SRC) Filters enables use of a single ADC/DAC clock for all channel bandwidths
- Optimized for both ASIC and low-cost FPGA implementations

Features

- Complete Fixed WiMax OFDM modem targeted towards Wireless Metropolitan Area Networks (WMAN)
- Silicon verified
- Support for both Access Point (AP) and Subscriber Stations (SS) configurations

Deliverables

- Synthesizable RTL source code in VHDL
- Comprehensive verification test bench and vectors
- Integration documentation and support

RAD3 IP Cores Series: Fixed WiMax OFDM Modem

Overview

The Fixed WiMax Modem is a WiMax compliant OFDM modem. It is designed to be WiMAX Forum™ compliant and meets all requirements for the WiMAX specified system profiles. The core is designed to easily interface to an external microprocessor which can be used to control the PHY, providing a flexible solution meeting the requirements for both AP's and SS's.

Functionality includes:

- Channel coding including implementation of the mandatory concatenated Reed-Solomon/Convolution Code (RS-CC) FEC
- Support for the modulation and code rates as shown in Table 1.
- Includes support for the maximum data rates required for 20 MHz channel bandwidth with QAM-64 modulation.
- Support for Uplink Subchannelization and TDD, FDD and H-FDD operation
- Automatic Gain Control (AGC) and Automatic Frequency Control (AFC) circuitry
- Internal or external Frame Control Header (FCH) Decode
- Guard Intervals of 1/4, 1/8, 1/16 or 1/32
- Transmission and synchronization using long and short preambles
- Programmable sample rate conversion filters allowing use of a single sample clock for all channel bandwidths
- Digital up/down conversion for IF interface
- Optional baseband I&Q transmit and receive interface

- Optional support for BTC/CTC FEC
- Optional support for Alamouti Space Time Coding (STC) and Adaptive Antenna Systems (AAS)
- MIB support registers for statistics collection

Modulation	Overall Coding Rate	RS Code	Coding Rate
BPSK	1/2	(12,12,0)	1/2
QPSK	1/2	(32,24,4)	2/3
QPSK	3/4	(40,36,2)	5/6
16-QAM	1/2	(64,48,8)	2/3
16-QAM	3/4	(80,72,4)	5/6
64-QAM	2/3	(108,96,6)	3/4
64-QAM	3/4	(120,108,6)	5/6

Table 1: IEEE 802.16-2004 Supported Modulation Modes

The design is targeted for use in ASICs and FPGAs and utilizes RAD3' industry proven signal processing cores to provide an extremely area-efficient 802.16-2004 physical layer solution.

The FPGA optimized modem can be targeted to low cost FPGA product families such as Xilinx Spartan devices and will support the maximum data rates required for 20 MHz channel bandwidth with QAM-64 modulation.

Specifications subject to change without notice. Information furnished by RAD3 is believed to be accurate and reliable. However, no responsibility is assumed by RAD3 for its use. All company and product names are trademarks or registered trademarks of their respective owners. All rights reserved. © 2009 RAD3 Communications Inc.

WiMAX Forum™ and WiMAX Forum Certified™ are registered trademarks of the WiMAX Forum