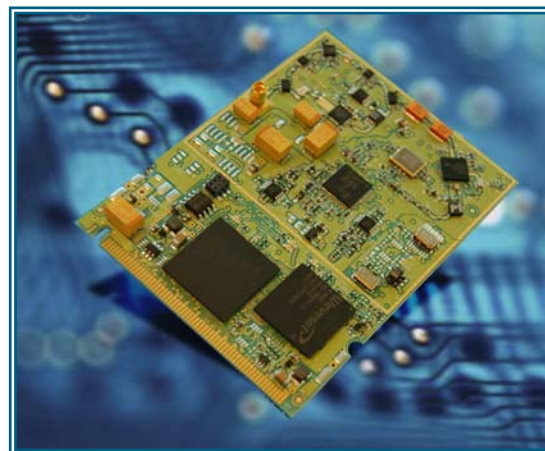


WiMAX 5.8 GHz Mini-PCI Reference Design Evolution™ WiMAX DM256 Series

Introduction

The Evolution™ WiMAX 5.8 GHz Mini-PCI Modem Card is a reference design for a 5.8 GHz WiMAX-compliant wireless modem using the Wavesat DM256 integrated circuit and the MC236-PCI MAC coprocessor. This modem card in the form of an extended-length Mini-PCI reference design facilitates system design by providing a complete plug-and-play solution for the lower layer air interface and time critical low-level MAC functionality. It allows the customer to tailor the motherboard providing the higher layer application processor and peripherals according to their specific needs, hence reducing development efforts. The motherboard processor has access to and from the modem card through the Mini-PCI Interface.



Product Features

The Mini-PCI card is an industrial modem card designed according to the IEEE Std. 802.16-2004 standard for Fixed Wireless Metropolitan Area Networks (WMAN). Specifically, due to its small footprint and low power consumption it is optimized for (but not restricted to) usage in a Customer Premises Equipment (CPE). The air interface PHY layer protocol is implemented in the Wavesat DM256 ASIC (see inset below). For data transmission the DM256 encodes and modulates the digital data from the MAC into an OFDM analog signal which is sent to the RF circuitry. For data reception, the DM256 receives the OFDM analog signal from the RF chipset and demodulates and encodes it into digital data for the MAC.

Please consult Wavesat for ordering information

Product Specifications*

Mini-PCI Board Mechanical/Rating	
Form factor	59.75x70.00mm ² (Extended Mini-PCI Type 3B), width 1mm
Maximum component height	Top
	Bottom:
	5.3mm (antenna port) 1.65mm (capacitor)
Operating Voltages	3.3, 5V (through Mini-PCI connector)
Average Power Consumption	3.7W (at 25% duty cycle)
Operating Temperature Rating	[-33,+40]°C (Indoor & Outdoor)
Regulatory Compliance	RoHS, WiMAX, CE-Mark (ETSI), FCC



Evolution™ WiMAX DM256 ASIC

The DM256 is a low-cost integrated circuit with low power consumption that implements the IEEE 802.16-2004 OFDM™ PHY layer protocol. It is designed to be the main component of an OFDM modem for Broadband Wireless Access (BWA).

The chip can be used for a Base Station as well as for a CPE. The DM256 includes an analog front end, which provides digital IF, analog IF (real or complex values) or analog baseband I/Q interface. TDD, HFDD, and FDD duplexing modes are supported. Different bandwidths can be selected and the IF frequency is programmable.

**Subject to change without notice*

Air Interface Specifications			
Standard	IEEE 802.16-2004, HiperMAN/WiMAX WirelessHUMAN Fixed Profile		
Modulation	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)		
RF Frequency	5.150-5.875 GHz by band options of 200MHz in steps of 5Mhz		
Tx Center Average Frequency Tolerance	< ±2% subcarrier spacing		
Symbol Clock Frequency Tolerance	< ±5ppm		
Frequency Control	Automatic Frequency Control (AFC)		
Spectral Mask Requirements	As per IEEE Std 802.16-2004 Item 8.5.2		
Spectral Flatness Requirements	Spectral lines from -50 to -1 and +1 to +50	± 2 dB from the measured energy averaged over all 200 active tones	
	Spectral lines from -100 to -50 and +50 to +100	+2/- 4d B from the measured energy averaged over all 200 active tones	
Adjacent Channel Rejection C/I [dB]	16-QAM 3/4	64QAM 3/4	
	-11dB	-4dB	
Nonadjacent Channel Rejection C/I [dB]	16-QAM 3/4	64QAM 3/4	
	-30dB	-23dB	
Bandwidth	10 MHz		
Duplexing Method	TDD		
Spectral Efficiency	5 bits/sec/Hz (64-QAM uncoded)		
Supported Frame Lengths	[2.5,4,5,8,10 & 20] ms		
Supported Cyclic Prefix Lengths	1/4, 1/8, 1/16, 1/32		
Tx Maximum output Power (at antenna connector)	17 dBm		
Tx Dynamic Range	30dB		
Relative Tx Constellation Error (@17dBm output power)	Burst Type	IEEE Spec. [dB]	Typical [dB]
	BPSK 1/2	-13.0	-30.0
	QPSK 1/2	-16.0	-30.0
	QPSK 3/4	-18.5	-30.0
	16QAM 1/2	-21.5	-30.0
	16QAM 3/4	-25.0	-30.0
	64QAM 2/3	-29.0	-30.0
64QAM 3/4	-30.0	-30.0	
Maximum Rx Power (BER <10 ⁻⁶)	-20dBm		
Maximum tolerable Rx Power	0dBm		
Maximum Rx Receiver Sensitivity (BER <10 ⁻⁶)	Burst Type	IEEE Spec. [dBm]	Typical [dBm]
	BPSK 1/2	-88.5	-89.0
	QPSK 1/2	-85.5	-86.0
	QPSK 3/4	-83.0	-83.5
	16QAM 1/2	-80.0	-80.5
	16QAM 3/4	-76.5	-77.0
	64QAM 2/3	-72.5	-72.5
64QAM 3/4	-70.5	-70.5	
Rx Input Dynamic Range	60 dB		
Power Control	Automatic Gain Control (AGC), Automatic Link Control (ALC)		
DFS	DFS ready, radar detection circuitry built-in, frequency control		