

Versatile Point-to-Point OFDM Transceiver

Feature Summary

- TTL or CMOS Baseband interface, optional TDM and Ethernet interfaces
- 256 OFDM air interface
- Dynamic Adaptive modulation, 4/16/64QAM
- WiMAX compliant
- Programmable frequency Transceivers
 - Option 1: 2.4/5.8 GHz
 - Option 2: 2.5/3.5 GHz
- Programmable channel bandwidth
- Transmit power control
- RSSI and TX gain monitoring
- Excellent Tx/Rx isolation
- Current sensing and Tx/Rx remote mute
- Built-in test functions
- Small footprint direct conversion design
- Low cost wireless solution

Introduction

The dominance of DSL and Cable modem technologies for broadband Internet access is seriously challenged by the new WiMAX; a new soon to be ubiquitous, long range - carrier grade broadband wireless access technology developed by IEEE 802.16d engineering group. The emerging WiMAX fixed broadband wireless MAN equipments addresses most of the coverage challenges and economic limitations of legacy LOS wireless solutions and will provide a powerful alternative to the current broadband wired technologies especially in less densely and un-served populated areas.

WiMAX brings to the table several unique and novel innovations such as NLOS OFDM air interface, QoS, low cost silicon, dynamic traffic allocation, powerful MAC and other attributes addressing the problems that plagued the current broadband access technologies.

TSI's OEM RIC-100 Transceiver is one of the first WiMAX point to point equipment addressing broadband backhaul connections for cellular RAN, the fast growing WiFi Hot Spots and the emerging WiMAX point to multipoint fixed and mobile infrastructure markets.

Enabling Technologies

Compelling technologies defined as part of IEEE 802.16d standard in the total WiMAX solution include:

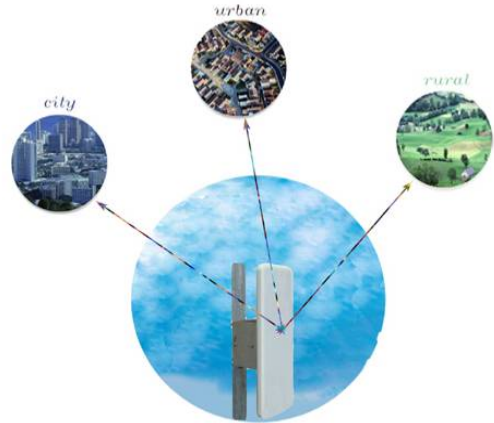
- Orthogonal Frequency Division Multiplexing (OFDM), which eliminates the need for line of sight operation, allowing for simple and fast installations, not to mention improved performance in the presence of inter-symbol interference.
- A fully-featured and flexible Media Access Control (MAC) layer that incorporates guaranteed QoS (Quality of Service) allowing fast Ethernet traffic and/or delay sensitive real-time TDM/IP payload.
- Dynamic adaptive modulation, BPSK/4/16/64QAM and Forward Error Correction (FEC) provide the capability to tradeoff throughput for range, allowing the highest data rate permitted by channel conditions. The result is robust system performance and efficient coverage for cost effective and scalable service deployment in both rural and metropolitan areas.

Non Line of Sight OFDM Transceiver

The RC-100- Trackcom System's versatile and cost efficient transceiver use direct conversion and associated digital data interface for exchanging control commands and status messages with the baseband subsystem MAC (lower MAC). The lower MAC layer interface implements an API that supports commands for dynamic frequency selection and power control. The data and control interfaces are implemented using an FPGA which can be easily adapted and customized to communicate with any third party baseband subsystem including a MUX and MAC layer processor.

The TSI RC-100 allows for optional standard customer interface Unit such as nE1, nT1, DS-3, 100 base-T for up to a maximum of 37Mb/s, each direction in FDD system.

The Transceiver module has an integrated diplexer, with low insertion loss and adjacent channel isolation of >60 dB at 25 MHz edge-to-edge, and T-R spacing of 72.5 MHz.



Feature Description

Features	Benefits
<ul style="list-style-type: none"> • Programmable wide range frequency selection based on a Trackcom "patent pending" algorithms providing single product for wide variety of applications • Programmable FPGA-based high speed digital interface to MAC & Customer Interface Units • OFDM, adaptive Modulation and built in self test 	<ul style="list-style-type: none"> • Reduced spare parts and training. • Lower CAPEX and OPEX for the service providers • Single product applicable to a broad diversity of applications and markets for the system providers • Fast time to market and low recurring cost for OEM customers.
<ul style="list-style-type: none"> • Small footprint Direct-Conversion transceiver design 	<ul style="list-style-type: none"> • "Plug and Play" CPE performing self alignment reducing installation cost and limiting truck rolls • Ideal for rural broadband service • Fewer components and low cost solution • Low power consumption design • Standard PC chassis integration

Overall Specification

Parameter	Specification	2.5 / 3.5 GHz		2.4 / 5.8 GHz	Units
Frequency	Band	2.4-2.7	3.4-3.8	2.4-2.5/4.9-5.9	GHz
RF Channel	Freq. Step	1	1	1	MHz
Interface	RF Connectors	SMA	SMA	SMA	
Power Supply & Ethernet-to- ODU	48VDC in CAT-5 Cable	RJ-45	RJ-45	RJ-45	
Baseband Data – Customer Interface	100base-T & E1/T1	RJ-45	RJ-45	RJ-45	
System Performance	Forward Error Correction	3	3	3	dB
Power	DC watts	18	18	18	watts
Environmental	Temp.	- 40 to 85	- 40 to 85	- 40 to 85	°C
Dimensions	Indoor 1 Rack Mounting	19x1.75x12	19x1.75x12	19x1.75x12	inches

Transmit Specification

Parameter	Specification	2.5 / 3.5 GHz		2.4 / 5.8 GHz	Units
Customer Interface	4E1 / 4T1	3.7/7	3.7/7	3.7/7	MHz
	100 Base-T	7	7	7	MHz
	Optional Interface E-3/DS-3	10	10	10	MHz
Tx Output Power	High power option – P1dB	30	30	30	dBm
	Low power option – P1dB	24	24	24	dBm
Tx Power Control	Control range	0-30	0-30	0-30	dB
Tx Power Mute	Mute range	60	60	60	dB
Tx Power Mute	On / off Time	3	3	3	usec
Tx Power Monitor	Monitor Pout range	0-30	0-30	0-30	dB

Receive Specification

Parameter	Specification	2.5 / 3.5 GHz		2.4 / 5.8 GHz	Units
Customer Interface	4E1 / 4T1	3.7/7	3.7/7	3.7/7	MHz
	100 Base-T	7	7	7	MHz
	Optional Interface E-3/DS-3	10	10	10	MHz
Rx Power	High sensitivity	- 20	- 20	- 20	dBm
	Low sensitivity	- 90	- 90	- 90	dBm
Rx Power Control	Control range	0-90	0-90	0-90	dB
Rx Power Mute	Mute range & Attenuation	90	90	90	dB
Rx Power Mute	On/Off Time	3	3	3	usec
RSSI Monitor	Monitor range	- 20 to -80	- 20 to -80	- 20 to -80	dB

Summary

- Low cost, state of the art, NLOS Transceiver maximizing the plug and play operation, compliant with OFDM WiMAX standards.
- Simple two Transceiver options to cover all the usable low frequency bands minimizing operating costs.
- Small size indoor/ outdoor mounting integrated in a flat (12x12inches) antenna or inside in a one rack mounting space minimizing the space requirement.

This translate into a maintenance free, cost effective, low NRE user friendly OEM Transceiver



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