

PCI Extreme

PCIE100

Operational Description

Reference:
Revision:
Date:

WM_DEV_PCIE-100_PTS_002
001
July, 01th 2008

Document Information

Level	Date	History of the evolution	
001	01/07/2008	Creation (Preliminary version)	

Overview

This document gives the operational description of PCIE100 Wavecom product.

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Cautions

This platform contains a modular transmitter. This device is used for wireless applications. Note that all electronics parts and elements are ESD sensitive.

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1 References

1.1 References documents

For more details, several references documents can be consulted. The WAVECOM reference documents are provided in the WAVECOM documents package contrary at the general reference documents which are not WAVECOM owner.

1.1.1 WAVECOM reference document

1.1.2 General reference document

- [1] PCI EXPRESS MINI CARD ELECTROMECHANICAL SPECIFICATION, REV 1.2
- [2] USB2.0 standard

1.2 List of abbreviations

Abbreviation	Definition
AT	AT tention (prefix for modem commands)
CLK	CL ock
CS	C oding S cheme
dB	Deci bel
DCS	D igital C ellular S ystem
E-GSM	E xtended GSM
ESD	E lectro S tatic D ischarges
FTA	F ull T ype A pproval
GND	Grou ND
GPIO	G eneral P urpose I nput O utput
GPRS	G eneral P acket R adio S ervice
GSM	G lobal S ystem for M obile communications
LED	L ight E mitting D iode
na	N ot A pplicable
NOM	NOM inal
NTC	N égative T emperature C oefficient
RF	R adio F requency
RST	ReSeT
RX	R eceive
SIM	S ubscriber I dentification M odule
SPI	S erial P eripheral I nterface
SPL	S ound P ressure L evel
SPK	SP ea K er
TBC	T o B e C onfirmed
TDMA	T ime D ivision M ultiple A ccess
TP	T est P oint
TX	T ransmit
TYP	TYP ical
USB	U niversal S erial B us
VSWR	V oltage S tanding W ave R atio

2 General description

2.1 General information

2.1.1 Wireless capabilities

PCIE-100 is a self-contained processor with following wireless capabilities

- E-GSM/GPRS/EDGE in 850/900/1800/1900 band
- WCDMA/HSDPA in 850/1900/2100 band

2.1.2 Overall dimensions

- Length: 51 mm
- Width: 30 mm
- Thickness: 4.5 mm
- Weight: **under 12g**
- Package: conform to Mini-PCI express standard

2.1.3 Environment and mechanics

- Green policy: RoHS compliant
- Belt and cover mechanics

The PCIE-100 is compliant with RoHS (Restriction of Hazardous Substances in Electrical and Electronic Equipment) Directive 2002/95/EC which sets limits for the use of certain restricted hazardous substances.

This directive states that “from 1st July 2006, new electrical and electronic equipment put on the market does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE)”.

2.1.4 GSM/GPRS Features

PCIE-100 supports following GSM/GPRS features

- High speed packet-switched data:
- Quad-Band: 850 / 900 / 1800 / 1900 MHz
- GSM Power Class 4 (2W) (850/900 MHz)
- GSM Power class 1 (1W) (1800/1900 MHz)
- E-GPRS Class B Type 1 MT
- EDGE Power Class E2
- Multi-slot E-GPRS Multi-slot Class 12
- Packet-switched data:

2.1.5 WCDMA - HSxPA Features

PCIE-100 supports following WCDMA/HSxPA features

- Tri-Band:
 - 2100 MHz (Band I)
 - 1900 MHz (Band II)
 - 850 MHz (Band V)
- Customer product able to support alternative multiband combinations (including UMTS900 – Band VIII)
- UE Power Class 3 (+24 dBm).
- Dual Antenna Receive Diversity.
- 3GPP FDD R5 Compliant, with R6 HSUPA feature
- HSDPA: Category 8 (7,2MHz)
- HSUPA upgradeable to Category 3 (1.4 Mbps)
- MMSE Receiver Equalization. 3GPP R6 Type 3 compliant.

2.1.6 Main Interfaces

- Power Supply
- RF
- 3V/1V8 SIM interface
- USB 2.0 Slave
- Diagnostics LEDs for wireless network status

2.2 Functional description

2.2.1 GSM / GPRS / EDGE RF functionalities

The GSM/GPRS/EDGE Radio Frequency (RF) range complies with the 3GPP recommendation. The frequencies are:

	Transmit band (Tx)	Receive band (Rx)
GSM 850	824 to 849 MHz	869 to 894 MHz
E-GSM 900	880 to 915 MHz	925 to 960 MHz
DCS 1800	1710 to 1785 MHz	1805 to 1880 MHz
PCS 1900	1850 to 1910 MHz	1930 to 1990 MHz

2.2.2 GSM / GPRS / EDGE RF Power class

The GSM/GPRS/EDGE Radio Frequency (RF) range complies with the 3GPP recommendation. The frequencies are:

	GSM/GPRS	EDGE
GSM 850	Class 4	Class E2 (27 dBm)
E-GSM 900	Class 4	Class E2 (27 dBm)
DCS 1800	Class 1	Class E2 (26 dBm)
PCS 1900	Class 1	Class E2 (26 dBm)

2.2.3 WCDMA/HSDPA RF functionalities

The WCDMA/HSDPA Radio Frequency (RF) range complies with the 3GPP recommendation. The frequencies are:

	Transmit band (Tx)	Receive band (Rx)
WCDMA 2100	1920 to 1980 MHz	2110 to 2170 MHz
WCDMA 1900	1850 to 1910 MHz	1930 to 1990 MHz
WCDMA 850	824 to 849 MHz	869 to 894 MHz

Wavecom PCIE-100 offers enhanced Type III receiver performances according to 25.101 (Release 6). An enhanced Type III receiver supports full RX diversity and simultaneous MMSE (Minimum Mean Square Error) equalization.

2.2.4 WCDMA/HSxPA RF class

Wavecom PCIE-100 is conform with UE class (24 dBm)

2.3 Software description

The PCIE-100 is controlled via AT Commands compliant with 3GPP 27.007 specifications.

Multiple data channels are multiplexed together for transfer via the USB on PCIE-100. These channels are then de-multiplexed on the PC to provide several COM ports and virtual Ethernet adapters. The multiplexer function is compatible with the 3GPP 27.010 standard.