Gobi2000

User Guide

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Revision history

Revision	Date	Description
A	December 2008	Initial release

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1   Introduction

1.1   Documentation overview

The Gobi2000™ is the second-generation PCI Express™ Mini Card that enables notebook computer wireless data connectivity. This datacard solution delivers WWAN connectivity for the CDMA2000® 1X, 1x EV-DO, UMTS (HSDPA and HSUPA), and GSM/GPRS/EDGE protocols, plus GPS position location, in a single package. The complete Gobi2000 solution includes all hardware and software necessary for embedded wireless connectivity in notebook PCs.

All released Gobi2000 documents are posted at the CDMA Tech Support website (https://support.cdmatech.com) and are available for download.

This Gobi2000 user guide is organized as follows:

Chapter 1   Provides an overview of Gobi2000, provides the list of supported frequencies, operating modes, and defines terms and acronyms used throughout this document.

Chapter 2   Provides standards compliance and regulatory information.

Table 1-1 lists documents referred to throughout the Gobi2000 document set; consult these documents for additional information.

Table 1-1   Reference documents

Ref No.	Document
[4]	FCC Regulations - CFR 47, Part 1, 2, 15, 22, and 24

1.2   Application description

The Gobi2000 platform includes a universal embedded data-connectivity modem in the form of a PCI Express Mini Card, plus the associated software suite for notebook PC applications. Table 1-2 lists Gobi2000 frequency range:

Table 1-2   Gobi2000 supported frequency range

Mode	Band	UL frequency (MHz)	DL frequency (MHz)
WCDMA Release 99 ***HSDPA Release 5*** ***HSUPA Release 6***	1	1920-1980	2110-2170
	2	1850-1910	1930-1990
	5	824-849	869-894
	6	830-840	875-885
	8	880-915	925-960
GSM ***GPRS*** ***EGPRS***	850	824-849	869-894
	900	880-915	925-960
	1800	1710-1785	1805-1875
	1900	1850-1910	1930-1990
CDMA2000 1X ***CDMA2000 1xEV-DO*** ▪ Rev. 0 ▪ Rev. A	BC0	824-849	869-894
	BC1	1850-1910	1930-1990
GPS position location	GPS L1	-	1574.42 - 1576.42

Key connectivity support includes:

- USB 2.0 high-speed
- Universal integrated circuit card (UICC) for RUIM/USIM
- Primary and secondary antenna connectors
- Status LED driver output
- DC power supply input and enable/disable control

1.3   Gobi2000 operating modes

Example Gobi2000 platform operating modes and their expected data throughput rates are summarized in Table 1-3. Operating modes are set by the host computer via the USB interface.

Table 1-3   Gobi2000 operating modes and throughput rates[1]

Operating mode	Data throughput rate[2]	
	Forward link	**Reverse link**
CDMA 1x RTT	153 kbps	153 kbps
CDMA 1x EV-DO	3.1 Mbps	1.8 Mbps
WCDMA R99	384 kbps	384 kbps
WCDMA - HSDPA	7.2 Mbps	---
WCDMA - HSUPA	---	5.76 Mbps
GSM	14.4 kbps	14.4 kbps

Table 1-3   Gobi2000 operating modes and throughput rates[1] (cont.)

Operating mode	Data throughput rate[2]	
	Forward link	**Reverse link**
GPRS	85.6 kbps	42.8 kbps
EDGE	236.8 kbps	118.4 kbps

1. GPS position location can be enabled simultaneously with any airlink operating mode, or Rx diversity can be enabled during any CDMA or WCDMA operating mode.
2. Target peak data rates are listed; actual throughput performance varies depending on operating and RF environment conditions.

1.4   Terms and acronyms

Table 1-4 defines the terms and acronyms used throughout this document.

Table 1-4   Terms and acronyms

Term	Definition
AMSS	Advanced Mobile Subscriber Software
CAPI	Computer application programmable interface
CDMA	Code Division Multiple Access
CE	Mandatory conformity marking on many European products
Cell	Cellular band
CTIA	Cellular Telecommunications and Internet Association
DCS	Digital cellular system at 1800 MHz
DDR SDRAM	Dual data rate synchronous dynamic random access memory
EDGE	Enhanced Data Rate for GSM Evolution
EMC	Electromagnetic compatibility
ESD	Electrostatic discharge
FCC	Federal Communications Commission
GPRS	General packet radio service
GPS	Global positioning system
GSM	Global System for Mobile communications
HSDPA	High speed downlink packet access
HSUPA	High speed uplink packet access
IMT	International mobile telecommunications
ISOD	Interface specification and operational description
JTAG	Joint Test Action Group
MDM	Mobile Data Modem
PA	Power amplifier

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Table 1-4   Terms and acronyms (cont.)

Term	Definition
PCI	Peripheral component interconnect
PCS	Personal communication system
PHY	Physical layer (USB transceiver)
PM, PMIC	Power management, power management integrated circuit
QDL	Qualcomm Down Loader
RFR	Radio frequency receiver
RoHS	Restriction of hazardous substances
RTR	Radio frequency transceiver
RUIM	Removable user identity module
TIA/EIA	Telecommunication Industry Association/Electronic Industries Alliance
TS	Technical specification
TXCO	Temperature-compensated crystal oscillator
UICC	Universal integrated circuit card
ULPI	USB transceiver macrocell interface + low pin interface
UMTS	Universal Mobile Telecommunications System
Gobi2000	Gobi2000 refers to a particular Qualcomm product
USB	Universal serial bus
USIM	Universal subscriber identity module
VCTCXO	Voltage controlled temperature-compensated crystal oscillator
WCDMA	Wideband Code Division Multiple Access
WLAN	Wireless local area network
WHQL	Windows® Hardware Quality Labs
WWAN	Wireless wide area network

2 Standards and Regulatory Compliance

2.1 Standards and certification

The Gobi2000 platform conforms to the following standards and certification requirements:

- CDMA
  - TIA/EIA IS-98E (CDMA2000 1X)
  - TIA/EIA IS-866 (1x EV-DO)
- UMTS (WCDMA)
  - TS 25.101
- GSM
  - TS 45.005
- FCC
  - 47 CFR Part 1 – RF radiation exposure limits
  - 47 CFR Part 2 – Equipment authorization
  - 47 CFR Part 15 – Unintentional radiators
  - 47 CFR Part 22 – Cellular
  - 47 CFR Part 24 – PCS
- CE
  - EMC protection requirements
    - EN 301 489-1 – Common technical requirements
    - EN 301 489-7 – GSM and DCS
    - EN 301 489-24 – WCDMA 2100
  - Effective use of spectrum to avoid unwanted interference requirements
    - EN 301 908-1 – General requirements
    - EN 301 908-2 – WCDMA 900/2100
    - EN 301 511 – GSM900/GSM1800
    - EN 301 607-1 – GSM900/GSM1800
- CTIA/GCF/PTCRB
- Safety

    ☐ EN 50360/61 full carrier certification (carriers TBD)

 ■ Microsoft® WHQL certification

 ■ RoHS compliance

2.2 Regulatory information

2.2.1 Safety warnings

Do not operate the Gobi2000 platform in the following environments:

 ■ In active blasting areas

 ■ In potentially explosive environments such as refuelling points, fuel depots, or chemical plants

 ■ Near medical equipment, especially life support equipment that might be susceptible to radio interference

 ■ In an aircraft as follows:

    ☐ Gobi2000 transmissions could interfere with aircraft electrical and communication systems. Like cell phones, using the Gobi2000 platform in an aircraft is illegal in some jurisdictions.

    ☐ If cell phone usage is permitted while the aircraft is on the ground, normal Gobi2000 operation is also permitted.

2.2.2 North American compliance

The Gobi2000 platform has been authorized for mobile operation in North America. The initial authorization grant does not permit end-user installation.

A permissive change will be submitted to add end-user installation and/or portable usage conditions. The permissive change application includes detailed information on Gobi2000's two-way authentication procedure, preventing use of the module in unauthorized notebooks.

For mobile applications, the following conditions must be met:

1. Maintain at least a 20 cm separation between the antenna and the user's body.

2. Radiated transmit power must be equal to or lower than that specified in the FCC Grant of Equipment Authorization for FCC ID: J9CGOBI2000.

3. To comply with FCC/IC regulations limiting both maximum RF output power and human exposure to RF radiation, maximum antenna gain (including cable loss) must not exceed:

    ☐ Cellular band **<** 7.5 dBi

    ☐ PCS band **<** 3.5 dBi

4. Independent Gobi2000 operation — the Gobi2000 platform must not be colocated or jointly operated with any other transmitter or antenna within the host device.

5. Installation of the Gobi2000 module into a host device can only be completed by authorized personnel unless the FCC certification addresses FCC host/module authentication requirements.

6. A label with the following statements must be attached to the host end product:

   □ This device contains Tx FCC ID: J9CGOBI2000

   □ This equipment contains equipment certified under IC: 2723A-GOBI2000

   □ Other regional required regulatory markings

7. The host end product must include a user manual that clearly defines operating requirements and conditions that must be observed to ensure compliance with current FCC/IC RF exposure guidelines.

8. The host end product must also pass the FCC Part 15 unintentional emission testing requirement and be properly authorized per FCC Part 15.

For portable devices, in addition to conditions 3 through 6 described above, a separate approval is required to satisfy the SAR requirements of FCC Part 2.1093 and IC RSS-102.