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CDMA 1xEV-DO USB Modem

Technical Specifications

(CDU-650)

Version : 0.1
Date : May. 13, 2006

CDU-650 Technical Specifications

Disclaimers

Life support – This product is not designed for use in life support appliances or systems where malfunction of these products can reasonably be expected to result in personal injury.

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Revision History

Level	Date	Description
0.1	May.03, 2006	Initial Release
0.1A	May.13, 2006	Cellular/PCS PAM part name exchange(page 7)
0.1B	May.19, 2006	RF spec., Spurious emission offset frequency change

Table of contents

1. Product Overview

1.1. Overview

- Enjoy the freedom to get fast internet connection, anywhere, anytime.
- Now possible anywhere you want to work or play.
- Global wireless access to the internet, e-mail.
- Powerful CDMA 1xEV-DO network.
- Compact, portable, manageable and state-of-the-art device.

1.2. General Features

DATA SERVICES

CDMA 1xEV-DO(IS-856)

Forward: up to 2.4Mbps, Reverse: 153.6Kbps

CDMA 1xRTT(IS-2000)

Forward and reverse link: up to 153.6Kbps

* Limit to Network conditions

GENERAL CHARACTERITICS

Dimension/Weight: 34x75x13(mm)/27g

Operating Temperature: -20°C to 50°C

Qualcomm MSM6500 chipset based(ZIF)

MRD(Mobile Receiver Diversity)

Visual indicator LEDs

USB Series “A” Type plug form factor

Nominal Operation voltage: from USB host

Power consumption: maximum 600mA @5V

ANTENNA

Primary antenna: Rod type

Secondary antenna: internal type

STANDARDS

IS-856 (CDMA 1xEV-DO)

IS-2000(CDMA 1xRTT)

IS-95A/B

IS-707-A Data Service

IS-683A Service Provisioning

IS-707 AT command

SYSTEM REQUIREEMNTS

Windows® 2000/XP

Connection: USB slot A-Type

Disk Drive: CD-ROM

Processor: 667MHz or faster

Memory: 128MB

Disk space: 100MB

FREQUENCY BANDS

CDMA 800MHz(Band class 0)

CDMA 1900MHz(Band class 1)

In packing box: Modem Device, USB Y-cable, Install CD, Manual

- Wave Type

  Cellular: G7W

  US-PCS: G7W

- Frequency Scope

Transmit Frequency(MHz)		Receiver Frequency(MHz)	
Cellular	US-PCS	Cellular	US-PCS
824.82 ~ 848.19	1850 ~ 1910	869.82 ~ 893.19	1930 ~ 1990

- Rated Output Power

  Cellular: 0.25W, CLASS 3

  US-PCS: 0.25W, CLASS 2

- Voltage and Current value of terminal part power amplifier

Band	Part name	Maker	Typical voltage	Max. current	RF output power
Cellular	FC7113-1	FCI	3.4V	480mA	28dBm
US-PCS	FC7213	FCI	3.4V	470mA	28dBm

- Functions of major semi-conductors

Part name	Function
MSM6500	MSM(Mobile Station Modem) Terminal operation control and digital signal processing
MCP (PF38F3050L0YBQ0)	Storing of terminal operation program Flash memory(128Mb) and PSRAM(64Mb)
RFR6000	Convert Rx RF signal to base-band signal
RFT6100	Convert base-band signal to Tx RF signal
FC7510	LNA chip which amplifier front-end Rx RF signal

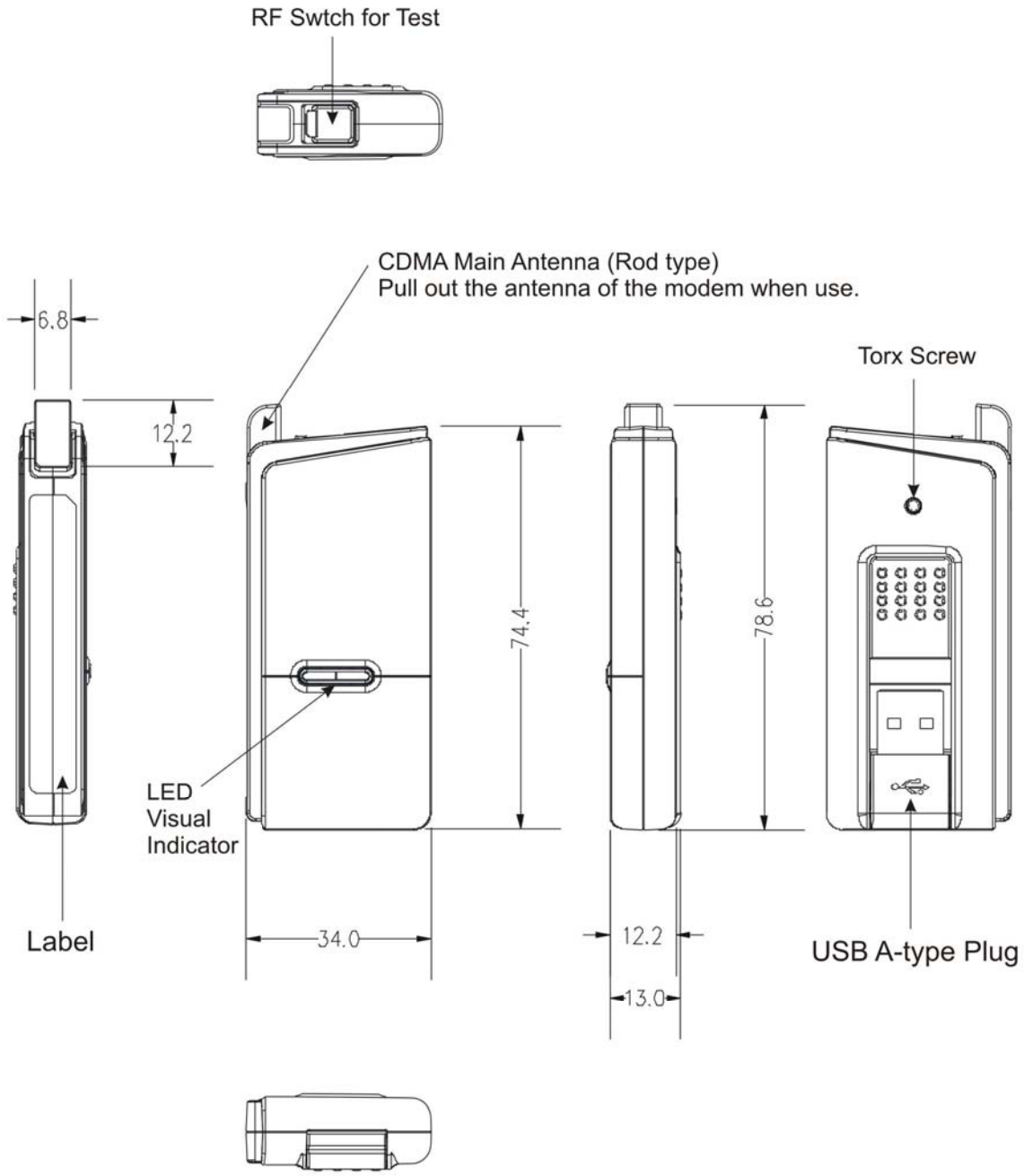
2. Specifications

2.1. Mechanical Specifications

Dimensions	34mm x 74.5mm x 13mm (1.34 x 2.95 x 0.52 inch) * Dimension is in accordance with the following drawing.
Weight	Approx. 27g (0.96 oz)
Form Factor	USB Series “A” Type plug
Antenna	Rod(telescopic) type
RF Switch connector for test	MHC280A --KAE
Visual indicator LEDs	RED-Single color & RED & BLUE- Dual color
Housing Material	PC
Battery Pack	No support
Headset Jack	No support
Power button	No support
Car-kit connector interface	No support

LED function descriptions

Function	LED Color		
	RED	RED	BLUE
POWER ON	ON	ON	
ACQUISITION- Fail	Flash (500ms)	Flash (500ms)	
Idle(1x & HDR)	ON		ON
DATA CALL: 1X(QNC)	ON	Flash (500ms)	Flash (500ms)
DATA CALL: HDR	ON		Flash (500ms)
Dormant state	ON	ON	ON
Incoming SMS	ON		Flash (200ms) , 4 times



2.2. Environment Specifications

Operating conditions	-20°C ~ +50°C , 85%(at 50(C), relative humidity (non-condensing)
Storage Temperature	-40°C ~ +70°C
Humidity	95%, non-condensing
Vibration Stability	
Shock Stability	
ESD -Contact discharge	
ESD -Air discharge	

2.3. Hardware Specifications

Main Chipset	MSM6500 ZIF
Memory(FLASH/RAM)	128Mb/64Mb (16MB/8MB)
Interface Type	Full-speed USB 2.0 Compliant
Common Air Interface	Dual-band 1xEV-DO & 1xRTT
Frequency band	Band class 0 & 1
Mobile Receiver Diversity	Support
Battery and Charger	N/A
Display type	N/A
Voice capability	N/A
DC input operating voltage	+5VDC from USB Host port
Maximum current @ +5VDC, HDR, DRC=2.4Mbps, Maximum TX Power (24+/- 0.3dBm)	Under 600mA
On communication Ior=-75dBm Ior=-104dBm	Under 200mA Under 450mA

(Note) The current consumption might vary of 5% over the whole operating temperature range.

2.4. CDMA RF performance

RF performances are compliant with IS-95A/B, cdma2000-1X, and 1xEV-DO.

CDMA2000-1X RX & TX specifications

Receiver Specifications

	Cellular	USPCS
Frequency range (MHz)	869.94 ~ 893.37	1931.25 ~ 1990.00
Frequency Bandwidth	1.23MHz	
Receiver Sensitivity	Under -104dBm	
Single Tone Desensitization	Under -101dBm	
Inter-Modulation		
@Tone Power -43dBm	Under -101dBm	Under -101dBm
@Tone Power -32dBm	Under -90dBm	
@Tone Power -21dBm	Under -79dBm	

Transmitter Specifications

	Cellular	USPCS
Frequency range (MHz)	824.64 ~ 848.37MHz	1851.25 ~ 1910.00MHz
Output Power (dBm/1.23MHz)	23 ~ 30 (Class 3)	23 ~ 30 (Class 2)
Frequency Bandwidth	1.23MHz	
Frequency Accuracy	+/- 300Hz	+/- 150Hz
Spurious Emission Limits		
Offset Freq @ +/- 900kHz	Under -42dBc / 30kHz	
Offset Freq @ +/- 1.25MHz		Under -42dBc / 30kHz
Offset Freq @ +/- 1.98 MHz	Under -54dBc / 30kHz	Under -50dBc / 30kHz

1xEV-DO RX & TX specifications

Receiver Specifications

	Cellular	USPCS
Frequency range (MHz)	869.94 ~ 893.37	1931.25 ~ 1990.00
Receiver Sensitivity FTAP Rate = 307.2 kbps 2Slot QPSK FTAP Rate = 2457.6 kbps 1Slot 16QAM	 Under -105.5dBm, 0.5% @ -25dBm 0.5%	
Single Tone Desensitization	Under -102.4dBm	
Inter-Modulation		
@Tone Power -43dBm	Under -102.4dBm	Under -102.4dBm
@Tone Power -32dBm	Under -91.4dBm	
@Tone Power -21dBm	Under -80.4dBm	

Transmitter Specifications

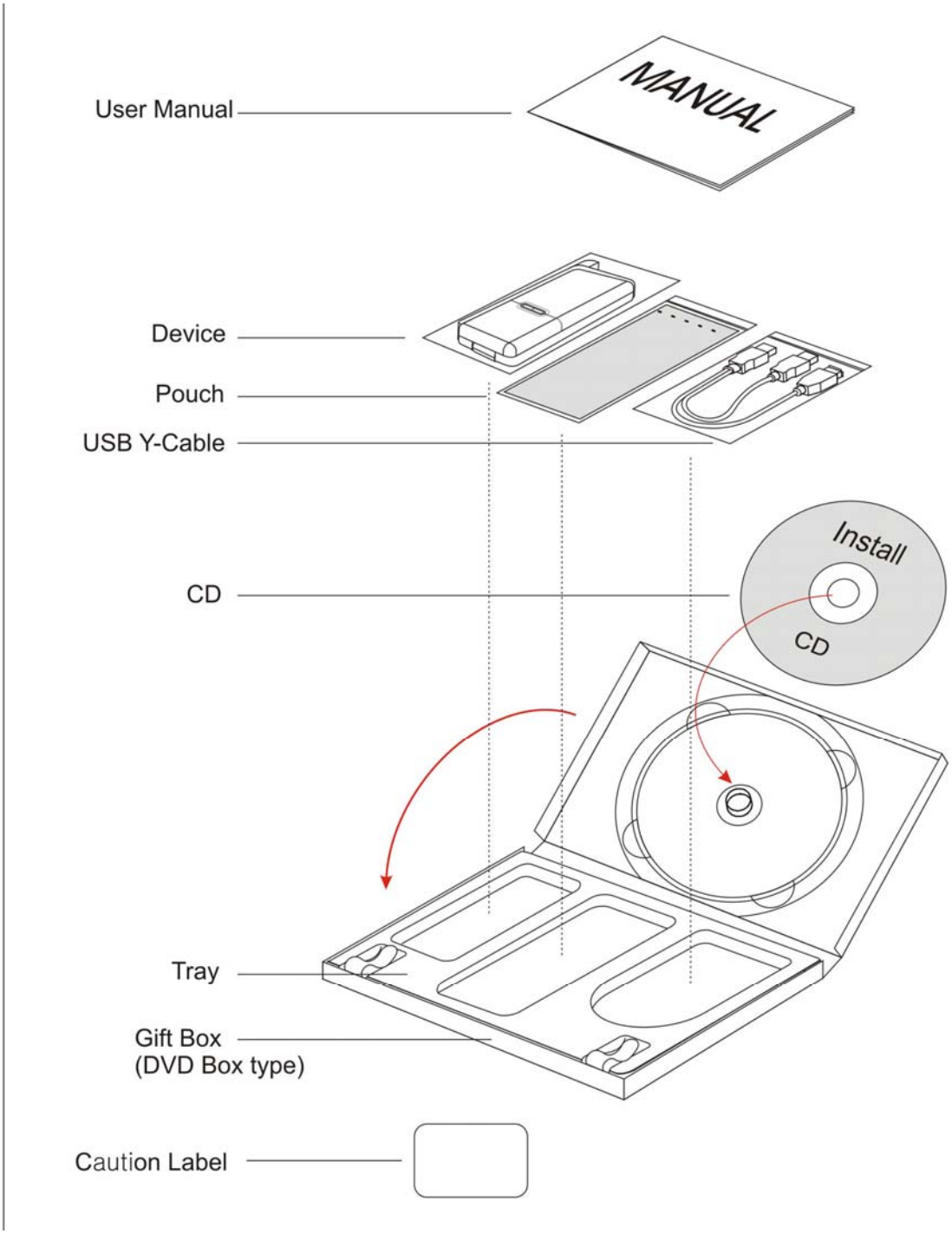
	Cellular	USPCS
Frequency range (MHz)	824.64 ~ 848.37	1851.25 ~ 1910.00
Output Power (dBm/1.23MHz)	23 ~ 30 (Class 3)	23 ~ 30 (Class 2)
Frequency Bandwidth	1.23MHz	
Time Reference	Within ±1.0μs	
Waveform Quality	Over 0.944	
Frequency Accuracy	Within ±300	Within ±150Hz
Spurious Emission Limits		
Offset Freq @ +/- 900kHz	Under -42dBc / 30kHz	
Offset Freq @ +/- 1.25MHz		Under -42dBc / 30kHz
Offset Freq @ +/- 1.98 MHz	Under -54dBc / 30kHz	Under -50dBc / 30kHz

2.5. Software Specifications

CDMA specifications	1xEV-DO
Data service	Support
SMS	Support
FAX	N/A
IOTA	Under development
OTASP(IS-863A)	Support
OTAPA(IS-863A)	Support
PRL(preferred roaming list)	Support
Authentication	Support
Voice	N/A
NAM	2
E911 & position location	N/A
TTY/Accessibility	N/A
Mobile IP	Support
BREW memory	N/A
Browser	N/A
Languages	US English

3. Instruction

3.1. Package contents



3.2. Getting start

3.2.1. System Requirements

The CDMA USB modem is supported on the following OS;

- **Windows®2000**
- **Windows®XP**

To install and run the CDMA USB modem and UI software, your system requires these minimum resources.

OS(Operating System)	Windows® 2000/XP
Connection port	USB slot A-Type
Processor(CPU)	667MHz or faster
Disk Drive	CD-ROM
Memory	128MB
Disk space	100MB

Note: Special Note for Windows®2000 user's: To function properly, the CDMA USB modem's IOTA protocol requires support for high security 128-bit encryption. If the installer does not detect high-security support on your system, a pop-up window will appear instructing you to update your Windows®2000 to support 128-bit security. Follow the onscreen instructions to update your system.

3.2.2. Installing CDMA USB Modem software and Driver

Follow the instructions below to install the modem UI from the installation CD.

This process requires you to restart your PC at the end of the installation; therefore, we recommend that you quit all open applications before you begin installation.

Note: Windows®2000: Users of Windows 2000 must be logged in with administrative privileges to install the CDMA USB Modem software.

Windows®XP: Users of Windows XP may insert the USB Modem prior to installing the software. You may also require administrative privileges, depending on your XP installation.

Installing the CDMA USB modem

1. Insert the installation CD into your CD-ROM drive.
   A. **Do not insert the CDMA USB modem to your laptop/PC yet**.
   B. This will automatically start the installation and install the required drivers.
2. If the CD does not auto-start, select Start>Run and d:\setup.exe.
   (where d is the letter of your CD-ROM drive)
3. From the CD start-up windows, select **CDMA USB Modem software.**
   This will launch the InstallShield® Wizard.
4. The License Agreement window appears.
   Click **Yes** to accept the agreement and proceed with the installation.
5. Select CDMA USB Modem software and Device Driver.
   And click the **Next** button on the InstallShield screen.
6. Click Next to install the software to the default destination folder (recommended).
   If you need to install the software to a different folder, click Choose and select an alternate install destination.
7. Click Finish or Restart to complete the installation and launch the **CDMA USB Modem software.**
8. Wait for your PC to reboot.
   Windows®2000: You may need to restart your PC manually by selecting Strart>Shutdown>Restrart.

9. Click OK when you are prompted to insert the CDMA USB modem.
   Insert the modem into the USB port.
10. Windows will detect the new hardware (CDMA USB modem) and will install the necessary drivers. The Add New Hardware Wizard or Found New Hardware Wizard will launch, depending on your operating system.
11. Follow the onscreen prompts to allow the wizard to install the drivers.
12. Click OK when you are notified that the installation is complete.

On completion of this step, the CDMA USB modem software and modem driver are installed and you and proceed to activate your card (in it has not already been activated).

3.3. Inserting and Removing the CDMA USB modem

Inserting the CDMA USB modem

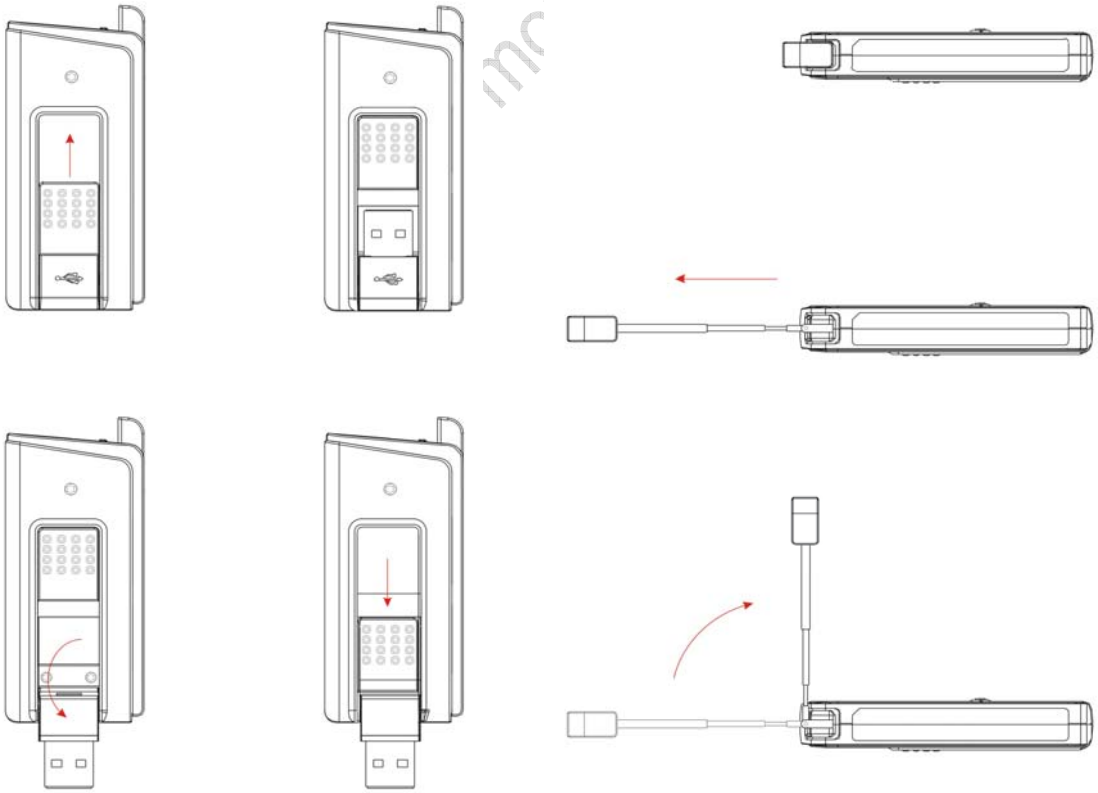
Before you insert the modem, you must first install the CDMA USB Modem software.

Once you have completed the software installation procedure, you may insert your modem into your host PC. Because the modem hangs over your host PC, it is important to remove the modem when transporting and storing your notebook.

The modem is powered as soon as you insert it.

Removing the CDMA USB modem

When the modem is connected to your host PC it has power and is trying to communicate with the network. To remove power, CDMA USB Modem software must be closed and the modem must be ejected from your host PC. When you removing the modem, close the modem program if it running. Click the close icon.



3.4. Care and Maintenance

As with any electronic device, the CDMA USB modem must be handled with care to ensure reliable operation. Follow these guidelines in using and storing the modem:

1. When using in your PC, completely open antenna and USB connector.
2. The modem should fit easily into your USB slot.
   Forcing the modem into a slot may damage the connector pins.
3. Protect the card from liquids, dust, and excessive heat.
4. When not installed in your host PC, store the modem in a safe place.
5. Never force the modem in or out of your host PC slot.
6. When moving your computer, always remove the modem form the USB slot to avoid any damage.
7. When not installed in your host PC, storing the modem after close antenna and USB connector.