User's Manual

The attachment is the user's manual (Regulatory Notice) of the specific Lenovo host PC device in this application.   Only the related section is picked up for this application concerning the FCC Part 2, 15B, 22H, 24E and IC RSS-102e, 132, 133, ICES-003.

Section 1: Regulatory Notice of WWAN Portable configuration for ThinkPad T400/R400/T500/W500 Series.

Section 2: Regulatory Notice of WWAN Mobile configuration for ThinkPad T400s Series.

In addition, some electronic user's guidance referred to in the Regulatory Notice is installed in each host PC device, and it is displayed on the LCD screen. This exhibit also includes the screen copies of electronic user's guidance for ThinkPad T400s Series.

Section 3: Screen copies of electronic user's guidance

Section 1: Regulatory Notice of WWAN Portable configuration for ThinkPad T400/R400/T500/W500 Series

ThinkPad Regulatory Notice for the Wireless WAN Adapter

Read first — regulatory information

Read this document before you use the computer. Be sure to also read *ThinkPad Regulatory Notice*, included with your computer. The computer complies with the radio frequency and safety standards of any country or region in which it has been approved for wireless use. You must install and use your computer in strict accordance with the instructions as described hereafter.

Veuillez lire ce document avant d'utiliser l'ordinateur ThinkPad. Veillez à lire également la consigne réglementaire *ThinkPad Regulatory Notice*, fournie avec votre ordinateur. L'ordinateur ThinkPad est conforme aux normes de sécurité et de radiofréquence du pays ou de la région où son utilisation sans fil est agréée. Vous devez installer et utiliser votre ordinateur en respectant scrupuleusement les instructions décrites ci-après.

USA — Federal Communications Commission (FCC)

If your computer integrates the wireless WAN adapter (Model: F3507g), you may connect it to the radiocommunication Public Network in the USA.

I. FCC ID of the wireless adapter

Wireless WAN PCI Express Mini Card:
- FCC ID: VV7-MBMF3507G-L (Model: F3507g)

There is no FCC ID for the adapter shown on the enclosure of your computer. Instead you will find an indicator pointing to the location of the FCC ID on the bottom side of your computer. For the location of the FCC ID indicator, see "Location of the FCC ID and IC Certification number label" in *Access Help*. The FCC ID is affixed on the approved adapter installed in the PCI Express Mini Card slot. For the location of the slot, see "PCI Express Mini Card slot for wireless WAN" in *Access Help*.

II. Installation of the approved wireless adapter

If no integrated wireless WAN PCI Express Mini Card has been preinstalled in your computer, you can install one, provided by Lenovo® as an option. Plug the wireless option adapter into the PCI Express Mini Card slot. For the

installation procedure, see "Installing and replacing the PCI Express Mini Card for wireless WAN connection" in *Access Help*.

Attention: The computers contain an authentication mechanism. If you install an unauthorized wireless WAN PCI Express Mini Card that is not approved for use in your computer, the computer will not start, but only displays an error message and emits audible beeps.

III. RF safety compliance

The radiated energy from the antenna connected to the wireless WAN adapter (Model: F3507g) conforms to the FCC limit of the SAR (Specific Absorption Rate) requirement regarding 47 CFR Part 2 section 1093 when the computer was tested in either conventional notebook or tablet computer orientations.

The transmission antenna is located at the screen section. See "Location of the UltraConnect™ wireless antennas" in *Access Help*.

IV. Emergency Calls

The wireless WAN adapter embedded in the computer does not support voice calls, hence their use for essential communication is not possible, including emergency calls regarding the E911 rule.

V. Simultaneous use of RF transmitters

The wireless WAN adapter (Model: F3507g) is approved for simultaneous use of the wireless devices listed below:

- Wireless LAN/WiMAX adapter (FCC ID: PD9512ANXMU, PD9533ANXMU, PD9512ANXHU, PD9LEN512ANMU, PD9533ANMU, PD9512ANHU, PD9533ANHU, PPD-AR5BHB63-L, or TX2-RTL8191SE-L)
- Wireless USB adapter (FCC ID: TX2RTU7305BG13HMC)
- *Bluetooth* device (FCC ID: QDS-BRCM1033)

Make sure of the following conditions when you use any other external wireless option device:

1. When you use any other RF option device, all other wireless features including the above integrated devices in your computer are required to be turned off.
2. You must follow the RF Safety instructions on wireless option devices that are included in the user manual of the RF option device.

Electronic emission notices

Federal Communications Commission (FCC) Statement
- Model: F3507g

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an authorized dealer or service representative for help.

Lenovo is not responsible for any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:
    Lenovo (United States) Incorporated
    1009 Think Place-Building One
    Morrisville, NC 27560
    Telephone: 1-919-294-5900

FC Tested To Comply
    With FCC Standards
FOR HOME OR OFFICE USE

Canada — Industry Canada (IC)

IC Certification number
User installable wireless WAN adapter:
- IC: 287AG-MBMF3507G (Model: F3507g)

There is no certification number of Industry Canada for the PCI Express Mini Card shown on the enclosure of your computer. Instead you will find an indicator pointing to the location of the certification number on the bottom side of your computer. For the location of the certification number indicator, see ″Location of the FCC ID and IC certification number label″ in *Access Help*. The certification number of Industry Canada is affixed on the approved module installed in the PCI Express Mini Card slot. For the location of the slot, see ″PCI Express Mini Card slot for wireless WAN″ in *Access Help*.

Attention: The computer contains an authentication mechanism. You can install or remove each wireless adapter by yourself. If you install an unauthorized wireless adapter that is not approved for use in the computer, the computer will not start, but only displays an error message and emits audible beeps.

Exposure of humans to RF fields (RSS-102)
The computers employ low gain integral antennas that do not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's Web site at www.hc-sc.gc.ca/

The radiated energy from the antenna connected to the wireless WAN adapter (Model: F3507g, IC: 287AG-MBMF3507G) conforms to the IC limit of the SAR (Specific Absorption Rate) requirement regarding IC RSS-102, Issue 2 clause 4.1.

Industry Canada Class B Emission Compliance Statement
This Class B digital apparatus complies with Canadian ICES-003.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Numéro d'homologation IC
Module sans fil installable par l'utilisateur :
• IC : 287AG-MBMF3507G (Model : F3507g)

Le boîtier de votre ordinateur ThinkPad ne comporte pas de numéro d'homologation IC (Industry Canada) pour la carte mini-PCI Express ; mais sous votre ThinkPad, vous trouverez un indicateur pointant vers l'emplacement du numéro d'homologation IC. Pour connaître l'emplacement du numéro d'homologation, consultez la section "Emplacement de l'étiquette d'identification FCC et du label du numéro de certification" dans *Access Help*. Le numéro d'homologation délivré par Industrie Canada est apposé sur le module homologué installé dans l'emplacement de carte mini-PCI Express. Pour savoir où se trouve cet emplacement, consultez la section "Logement de cartes mici-PCI Express pour réseau étendu sans fil" dans *Access Help*.

Attention: L'ordinateur ThinkPad renferme un mécanisme d'authentification. Vous pouvez installer ou retirer chaque carte sans fil vous-même. Si vous installez une carte sans fil qui n'est pas homologuée dans votre ordinateur ThinkPad, l'ordinateur ne démarrera pas mais affichera un message d'erreur et générera des bips sonores.

Exposition des êtres humains aux champs radioélectriques (RF) (CNR-102)
L'ordinateur ThinkPad utilise des antennes intégrales à faible gain qui n'émettent pas un champ électromagnétique supérieur aux normes imposées par le Ministére de la santé canadien pour la population. Consultez le Safety Code 6 sur le site Web du Ministére de la santé canadien à l'adresse www.hc-sc.gc.ca/

L'énergie émise par l'antenne reliée au adaptateur sans fil (modèle : F3507g, IC : 287AG-MBMF3507G) respecte la limite concernant le débit d'absorption spécifique (DAS) telle que définie par Industrie Canada dans la clause 4.1 du document CNR-102.

Avis de conformité à la réglementation d'Industrie Canada
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Le fonctionnement de ce type d'appareil est soumis aux deux conditions suivantes : (1) Cet appareil ne doit pas perturber les communications radio, et (2) cet appareil doit supporter toute perturbation, y compris les perturbations qui pourraient provoquer son dysfonctionnement.

Trademarks

The following terms are trademarks of Lenovo in the United States, other countries, or both:

Lenovo®
ThinkPad®
UltraConnect

Other company, product, and service names may be trademarks or service marks of others.

Printed in China

For Barcode Position Only

Section 2: Regulatory Notice of WWAN Mobile configuration for ThinkPad T400s Series

ThinkPad Regulatory Notice for the Wireless WAN Adapter

Read first — regulatory information

Read this document before you use the computer. Be sure to also read *ThinkPad Regulatory Notice*, included with your computer. The computer complies with the radio frequency and safety standards of any country or region in which it has been approved for wireless use. You must install and use your computer in strict accordance with the instructions as described hereafter.

Veuillez lire ce document avant d'utiliser l'ordinateur ThinkPad. Veillez à lire également la consigne réglementaire *ThinkPad Regulatory Notice*, fournie avec votre ordinateur. L'ordinateur ThinkPad est conforme aux normes de sécurité et de radiofréquence du pays ou de la région où son utilisation sans fil est agréée. Vous devez installer et utiliser votre ordinateur en respectant scrupuleusement les instructions décrites ci-après.

USA — Federal Communications Commission (FCC)

If your computer integrates the wireless WAN adapter (Model: F3507g), you may connect it to the radiocommunication Public Network in the USA.

I. FCC ID of the wireless adapter

Wireless WAN PCI Express Mini Card:
• FCC ID: VV7-MBMF3507G-L (Model: F3507g)

There is no FCC ID for the adapter shown on the enclosure of your computer. The FCC ID is affixed on the approved adapter installed in the PCI Express Mini Card slot. For the location of the slot, see "PCI Express Mini Card slot for wireless WAN" in *Access Help*.

II. Installation of the approved wireless adapter

If no integrated wireless WAN PCI Express Mini Card has been preinstalled in your computer, you can install one, provided by Lenovo® as an option. Plug the wireless option adapter into the PCI Express Mini Card slot. For the installation procedure, see "Installing and replacing the PCI Express Mini Card for wireless WAN connection" in *Access Help*.

Attention: The computers contain an authentication mechanism. If you install an unauthorized wireless WAN PCI Express Mini Card that is not approved for use in your computer, the computer will not start, but only displays an error message and emits audible beeps.

III. FCC RF safety requirement

The radiated output power of the wireless WAN PCI Express Mini Card authorized to use for your computer is far below the FCC radio frequency exposure limits. Nevertheless, it shall be used in such a manner that the potential for human contact during normal operation is minimized as follows:

Caution: To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm (8 inches) must be maintained between the antenna for the integrated wireless WAN PCI Express Mini Card built into the screen section and all persons. You are not allowed to disable ″sleep (standby) mode″ for the power management function, if you cannot maintain the sufficient antenna separation (at least 20 cm) in any case the LCD is left opened or closed.

The transmission antenna for the wireless WAN adapter is built in the screen section. See "Location of the UltraConnect™ wireless antennas" in *Access Help*.

IV. Emergency Calls

The wireless WAN adapter embedded in the computer does not support voice calls, hence their use for essential communication is not possible, including emergency calls regarding the E911 rule.

V. Simultaneous use of RF transmitters

If your computer contains the wireless LAN adapter (FCC ID: PD9512ANXHU, PD9512ANHU, PD9533ANHU, PPD-AR5BHB63-L, or TX2-RTL8191SE-L), the Wireless USB adapter (FCC ID: TX2RTU7305BG13HMC), or the *Bluetooth* device (FCC ID: QDS-BRCM1033), the wireless WAN adapter (Model: F3507g) is approved for simultaneous use with these radio devices.

Make sure of the following conditions when you use any other external wireless option device:
1. When you use any other RF option device, all other wireless features including the above integrated devices in your computer are required to be turned off.
2. You must follow the RF Safety instructions on wireless option devices that are included in the user manual of the RF option device.

Electronic emission notices

Federal Communications Commission (FCC) Statement
- Model: F3507g

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an authorized dealer or service representative for help.

Lenovo is not responsible for any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:
   Lenovo (United States) Incorporated
   1009 Think Place-Building One
   Morrisville, NC 27560
   Telephone: 1-919-294-5900

FC Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

Canada — Industry Canada (IC)

IC Certification number
User installable wireless WAN adapter:
- IC: 287AG-MBMF3507G (Model: F3507g)

There is no certification number of Industry Canada for PCI Express Mini Card shown on the enclosure of your computer. The certification number of Industry Canada is affixed on the approved adapter installed in the PCI Express Mini Card slot. For the location of the slot, see "PCI Express Mini Card slot for wireless WAN" in *Access Help*.

Attention: The computer contains an authentication mechanism. You can install or remove each wireless adapter by yourself. If you install an unauthorized wireless adapter that is not approved for use in the computer, the computer will not start, but only displays an error message and emits audible beeps.

Exposure of humans to RF fields (RSS-102)
The computers employ low gain integral antennas that do not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's Web site at www.hc-sc.gc.ca/

The radiated energy from the antenna connected to the wireless WAN adapter (Model: F3507g, IC: 287AG-MBMF3507G) conforms to the IC limit of the RF exposure requirement regarding IC RSS-102, Issue 2 clause 4.2.

Industry Canada Class B Emission Compliance Statement
This Class B digital apparatus complies with Canadian ICES-003.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Numéro d'homologation IC

Module sans fil installable par l'utilisateur :

- IC : 287AG-MBMF3507G (Model : F3507g)

Le boîtier de votre ordinateur ThinkPad ne comporte pas de numéro d'homologation IC (Industry Canada) pour la carte mini-PCI Express. Le numéro d'homologation délivré par Industrie Canada est apposé sur le module homologué installé dans l'emplacement de carte mini-PCI Express. Pour savoir où se trouve cet emplacement, consultez la section "Logement de cartes mici-PCI Express pour réseau étendu sans fil" dans *Access Help*.

Attention: L'ordinateur ThinkPad renferme un mécanisme d'authentification. Vous pouvez installer ou retirer chaque carte sans fil vous-même. Si vous installez une carte sans fil qui n'est pas homologuée dans votre ordinateur ThinkPad, l'ordinateur ne démarrera pas mais affichera un message d'erreur et générera des bips sonores.

Exposition des êtres humains aux champs radioélectriques (RF) (CNR-102)

L'ordinateur ThinkPad utilise des antennes intégrales à faible gain qui n'émettent pas un champ électromagnétique supérieur aux normes imposées par le Ministére de la santé canadien pour la population. Consultez le Safety Code 6 sur le site Web du Ministére de la santé canadien à l'adresse www.hc-sc.gc.ca/

L'énergie émise par l'antenne reliée au adaptateur sans fil (modèle : F3507g, IC : 287AG-MBMF3507G) respecte la limite d'exposition aux radiofréquences telle que définie par Industrie Canada dans la clause 4.2 du document CNR-102.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Le fonctionnement de ce type d'appareil est soumis aux deux conditions suivantes : (1) Cet appareil ne doit pas perturber les communications radio, et (2) cet appareil doit supporter toute perturbation, y compris les perturbations qui pourraient provoquer son dysfonctionnement.

Trademarks

The following terms are trademarks of Lenovo in the United States, other countries, or both:

Lenovo®
ThinkPad®
UltraConnect

Other company, product, and service names may be trademarks or service marks of others.

For Barcode Position Only

Section 3: Screen copies of electronic user's guidance

ThinkPad tour

To see the location of a feature of the computer, or of any piece of hardware, click the mark ✓ for it in the table.

	T400s	T400	R400	T500	W500	R500
Front view	✓	✓	✓	✓	✓	✓
Right-side view	✓	✓	✓	✓	✓	✓
Left-side view	✓	✓	✓	✓	✓	✓
Bottom view	✓	✓	✓	✓	✓	✓
Rear view	✓	✓	✓	✓	✓	✓

ThinkPad

There is no FCC ID or IC Certification number for the PCI Express Mini Card shown on the enclosure of your computer. The FCC ID and IC Certification number label is affixed on the card installed in the Mini PCI Express Card slot of your ThinkPad computer.

TX FCC ID and IC Certification number for installed transmitter cards are located under the customer removable access panel, Keyboard, or Palmrest – see User Manual

WWAN PCI Express Mini Card

WLAN Half PCI Express Mini Card
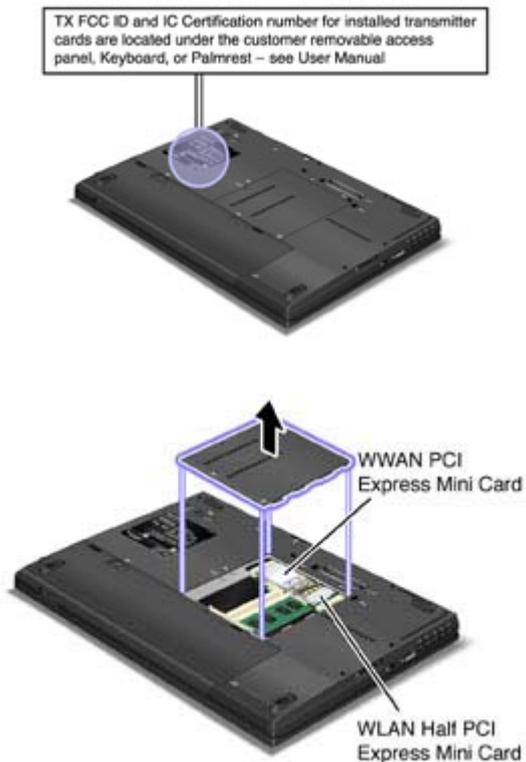
If no integrated wireless PCI Express Mini Card has been preinstalled in your computer, you can install one. To do this, follow the procedure in Installing and replacing the PCI Express Mini Card for wireless LAN/WiMAX connection or Installing and replacing the PCI Express Mini Card for wireless WAN connection.
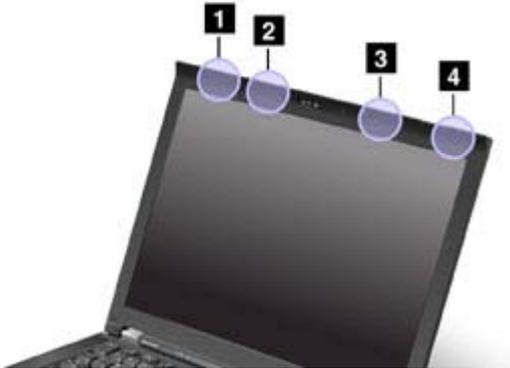
There are two types of anntena locations. Your computer corresponds to any of the following.

Type 1: Antenna location

1. Wireless LAN and WiMAX combo antenna and Wireless WAN antenna (Auxiliary)
The auxiliary antenna connected to the wireless LAN, WiMAX, or wireless WAN feature is located at the top left corner of the computer display.

2. Wireless USB antenna
If your computer comes with a wireless USB feature, the antenna is located at the top left portion of the computer display, near the center.

3. Wireless LAN antenna (Third)
If your computer has the Multiple Input Output (MIMO) wireless LAN feature, the third antenna is located at the top right portion of the computer display, near the center.

4. Wireless LAN and WiMAX combo antenna and Wireless WAN antenna (Main)
The main antenna connected to the wireless LAN, WiMAX, or wireless WAN feature is located at the top right corner of the computer display.

Type 2: Antenna location

1. Wireless LAN and WiMAX combo antenna and Wireless WAN antenna (Auxiliary)
The auxiliary antenna connected to the wireless LAN, WiMAX, or wireless WAN feature is located at the top left corner of the computer display.

2. Wireless USB antenna
If your computer comes with a wireless USB feature, the antenna is located at the top left portion of the computer display, near the center.

3. Wireless LAN and WiMAX combo antenna (Main) and Wireless LAN antenna (Third)
The main antenna connected to the wireless LAN or WiMAX feature is located at the top right portion of the computer display, near the center. If your computer has the Multiple Input Output (MIMO) wireless LAN feature, the third antenna is located at the top right portion of the computer display, near the center.

4. Wireless WAN antenna (Main)
If your computer comes with a wireless WAN feature, the main antenna is located at the top right corner of the computer display.

Location: *Bluetooth* antenna

ThinkPad® T400s

Front   **Right**   **Left**   **Bottom**   **Rear**

18 *Bluetooth* antenna

Some models have the Integrated *Bluetooth* features.

Location: PCI Express Mini Card slot for Wireless WAN

ThinkPad® T400s

**Front**   **Right**   **Left**   Bottom   **Rear**
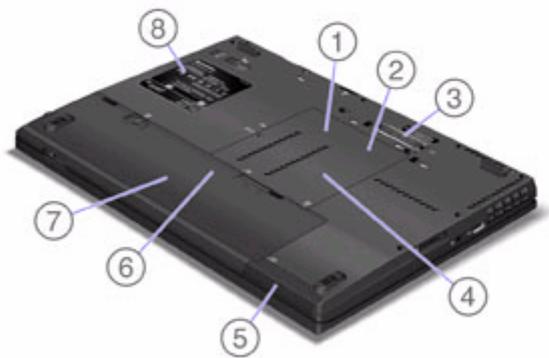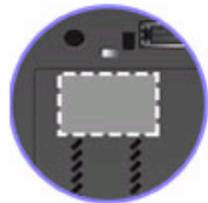
 PCI Express Mini Card slot for Wireless WAN

Your computer might include a PCI Express Mini Card in the PCI Express Mini Card slot which enables wireless WAN communications.

Location: PCI Express Mini Card slot for Wireless LAN/WiMAX

ThinkPad® T400s

Front   Right   Left   Bottom   Rear
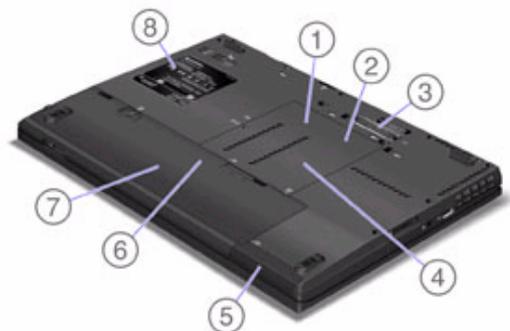
2 PCI Express Mini Card slot for Wireless LAN/WiMAX

Your computer might include a PCI Express Mini Card in the PCI Express Mini Card slot which enables wireless LAN/WiMAX communications.

Location: Wireless USB card slot

ThinkPad® T400s

③ Wireless USB card slot

Some models have the Wireless USB features.

Before you start, print these instructions.

To replace the PCI Express Mini Card, do as follows:

1. Turn off the computer; then disconnect the AC adapter and all cables from the computer. Wait for a few minutes, till the inside of the computer cools, before you start the following procedures.
2. Close the computer display, and turn the computer over.
3. Remove the battery.
4. Loosen the screw on the memory slot cover **(1)**, then remove the cover **(2)**.
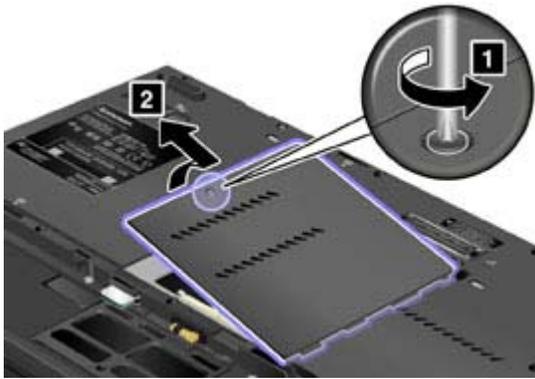
5. If a tool for removing connectors is included in the package with the new card, use it to disconnect the cables from the card. If no such tool is included, disconnect the cables by picking up the connectors with your fingers and gently unplugging them.
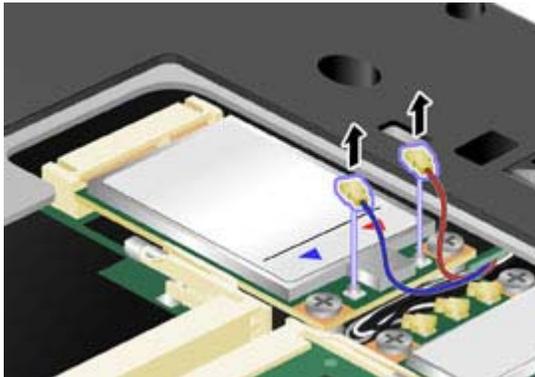
✳ **Note:** Depending on the system configuration of your computer, the card may have only one connector.

6. Remove the screws **(1)**. The card pops up **(2)**.
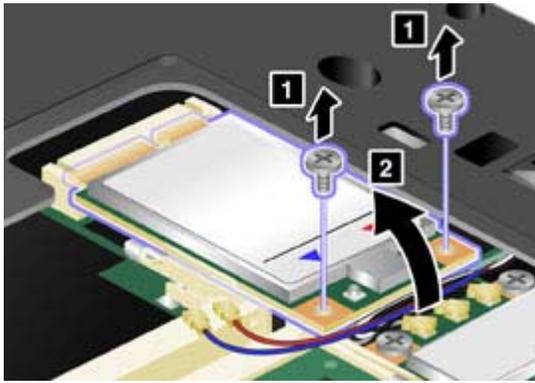
7. Remove the card.
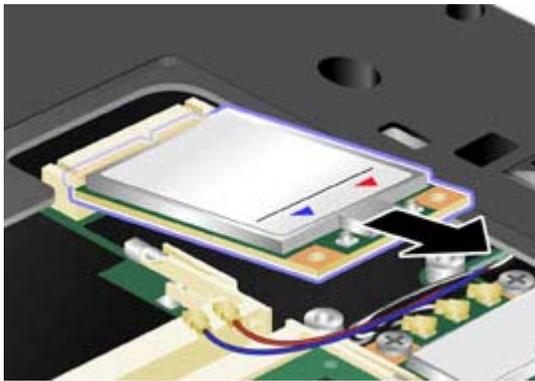
8. Align the contact edge of the new PCI Express Mini Card with the corresponding socket.
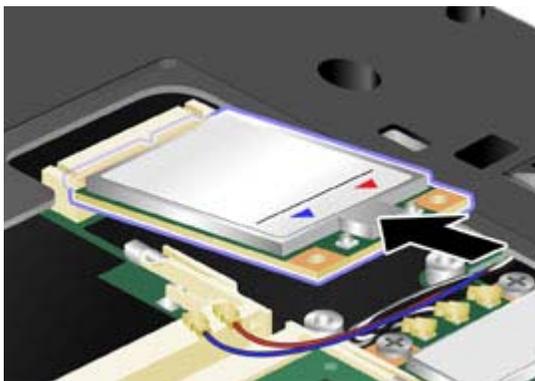
9. Pivot the card until you can snap it into place by pressing the upper side of each connector **(1)**. Secure the card with the two screws **(2).**
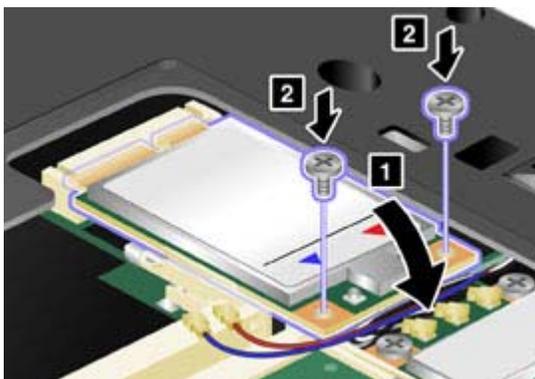
10. Connect the cables to the new PCI Express Mini Card.
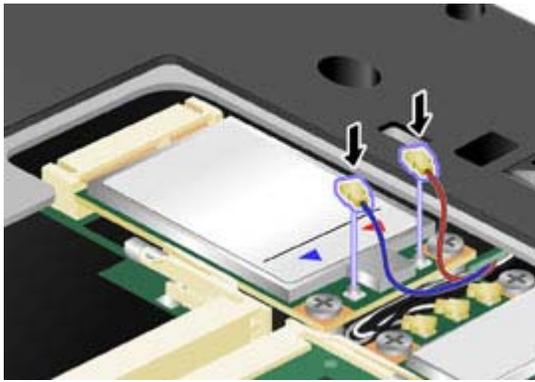
> ✳ **Note:** Depending on the system configuration of your computer, the card may have only one connector.

11. Put the memory slot cover back in place **(1)**, close the cover **(2)**, and then tighten the screw **(3)**.
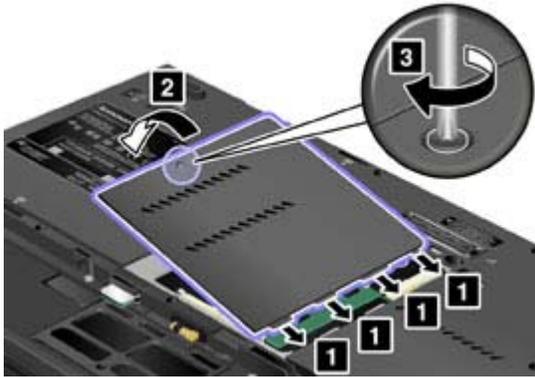
12. [Reinstall the battery](#).

13. Turn the computer over again. Connect the AC adapter and cables to the computer; then turn it on.

Location: system and power-status indicators

ThinkPad® T400s

| Front | Right | Left | Bottom | Rear |

⑧ System and power-status indicators

㉒ CapsLock indicator

Your computer has two system-status indicators: CapsLock and Device Access.

If your computer is shipped with a wireless LAN feature, a wireless WAN feature, a WiMAX feature, a *Bluetooth* feature, and a Wireless USB feature, it has the following indicators: Wireless LAN/WAN/WiMAX status and *Bluetooth*/Wireless USB status.

Location: wireless radio switch

ThinkPad® T400s

Front   **Right**   **Left**   **Bottom**   **Rear**

3 Wireless radio switch

You can use this switch to disable the wireless radio of all the wireless devices on your computer.

Wireless connections

Wireless connection is the transfer of data without the use of cables by means of radio waves only.

Depending on the frequency used for data transmission, the area covered, or the type of the device used for data transfer, the following categories of wireless networks may be available to you:

Wireless LAN
A wireless local area network covers a relatively small geographic area, such as an office building or a house. Devices based on the 802.11 standards can connect to this network.

Wireless WAN
A wireless wide area network covers a broader geographic area. Cellular networks are used for data transmission, and access is provided by a wireless service carrier.

Bluetooth
One of a number of technologies used to create a wireless personal area network. *Bluetooth* can connect devices a short distance from one another, and is commonly used for connecting peripheral devices to a computer, transferring data between hand-held devices and PC, or remotely controlling and communicating with devices such as mobile phones.

Wireless USB
This wireless analog of the USB standard can create a wireless personal area network by implementing short-range large-bandwidth radio transmissions. It is used primarily for connecting a PC to peripherals that are no more than a short distance from the host.

WiMAX (Worldwide Interoperability for Microwave Access)
This long-range wireless data transmission technology based on the 802.16 standard, is expected to provide the user a "last mile" broadband connectivity similar to that provided by cable or ADSL, but without the need to physically connect a cable to the PC.

- **Using wireless LAN connections**

- **Using wireless WAN connections**

- **Using *Bluetooth***

- **Using Wireless USB**

- **Using WiMAX**

- **Checking wireless connection status**

Using wireless LAN connections

Your computer comes with a built-in wireless networking card and a configuration utility to help you make wireless connections and monitor the status of your connection, so that you can stay connected to your network while you are in the office, in a meeting room, or at home, with no need for a wired connection.

⊙ **Attention:**

- If you carry your ThinkPad computer with the wireless LAN feature into an airplane, check the services with the airline before boarding the airplane.

- If there are restrictions on the use of computers on an airplane with the wireless feature, you need to disable it before boarding. To disable it, refer to the instructions in Enabling or disabling the wireless feature.

✳ **Note:** You can purchase a wireless networking card as an option. For more information, refer to Finding ThinkPad options.

Tips for using the wireless LAN feature

- Place your computer so that there are as few obstacles as possible between the wireless LAN access point and the computer.

- For the best connection of the wireless LAN feature, open your computer display to an angle of slightly more than 90 degrees.

- If you use the wireless feature (the 802.11 standard) of your computer simultaneously with a *Bluetooth* option, data transmission speed can be delayed and the performance of the wireless feature can be degraded.

- **Wireless networking setup**

- **Wireless upgradeable ThinkPad models**

Using wireless WAN connections

Wireless Wide Area Network (wireless WAN) enables you to establish wireless connections over remote public or private networks. These connections can be maintained over a large geographical area, such as a city or an entire country, by use of multiple antenna sites or satellite systems maintained by wireless service providers.

Some ThinkPad® computers come with a built-in wireless WAN card integrating some wireless WAN technologies, such as 1xEV-DO or HSPA. You can connect to the Internet or your company network with the built-in wireless WAN card and the configuration utility to make a wireless WAN connection and monitor its status.

Note: Wireless WAN service is provided by authorized service providers in some countries.

To find the location of the wireless WAN antenna on your computer, click here.

To use the wireless WAN feature, start Access Connections™.

To start the Access Connections wizard, click **Start** --> **All Programs** --> **ThinkVantage** --> **Access Connections**, and follow the instructions on the screen.

Using WiMAX

Some ThinkPad® computers come with a built-in wireless LAN card integrating WiMAX technology.

WiMAX -- a long-range wireless data transmission technology based on the 802.16 standard -- provides you with a "last mile" broadband connectivity similar to that offered by cable or ADSL, but without the need to physically connect a cable to the PC.

To use the WiMAX feature, start Access Connections™.

To start the Access Connections wizard, click **Start** --> **All Programs** --> **ThinkVantage** --> **Access Connections**, and follow the instructions on the screen.

Using Wireless USB

Note: For Japanese models, when you use the Wireless USB feature, use AC power to run your computer. If you do not use AC adapter, the Wireless USB feature will not work.

If your computer is equipped with Wireless USB features, you can enable or disable those features by pressing Fn+F5. If you press Fn+F5, a list of wireless features is displayed. You can enable or disable the Wireless USB radio with a single click.

Note: Only a Certified Wireless USB device can be connected to your ThinkPad® computer.

Using a Wireless USB device with your computer for the first time

When a Wireless USB device is used for the first time, you must associate it with your computer, by doing the following:

1. Open the Wireless USB Manager by double-clicking its icon in the task tray.
2. Connect the Wireless USB device to your computer, using a USB cable.
3. Wait until the Wireless USB device is listed in the Wireless USB Manager and the balloon message "Wireless USB device associated done" appears.
4. Remove the USB cable.
5. Wait until the Wireless USB device icon in the Wireless USB Manager brightens up.

Once the device is associated, it will automatically connect without a USB cable as long as it is within a range of availability. For more details, refer to the manual provided with the device.

Note: The Wireless USB device may reconnect automatically even after you click the "Disconnect" button in the USB Connection Manager. To completely disconnect the Wireless USB device, press Fn + F5 keys.

Using *Bluetooth*

- **[For Windows Vista®](#)**

- **[For Windows® XP](#)**

For Windows Vista:

If your computer is equipped with the Integrated *Bluetooth* features, you can enable or disable the features by pressing Fn+F5. If you press Fn+F5, a list of wireless features is displayed. You can enable or disable the *Bluetooth* features with a single click.

To configure a *Bluetooth* device or manage connection settings, you can also use ***Bluetooth* Devices** in Control Panel.

1. Click **Start** --> **Control Panel**.
2. Click **Hardware and Sound**.
3. Click ***Bluetooth* Devices**.

To send data to a *Bluetooth*-enabled device, do as follows:

1. Right-click data that you want to send.
2. Select **Send To -> *Bluetooth* Devices**.

For details, refer to the Windows online help.

✳ **Note:** If you use the wireless feature (the 802.11 standard) of your computer simultaneously with a *Bluetooth* option, data transmission speed can be delayed and the performance of the wireless feature can be degraded.

For Windows XP:

If you press Fn+F5, a list of wireless features is displayed. You can enable or disable the *Bluetooth* features with a single click.

In Windows XP, you can use either ThinkPad® *Bluetooth* with Enhanced Data Rate Software, or the Microsoft® *Bluetooth* software. By default, ThinkPad *Bluetooth* with Enhanced Data Rate Software is installed on your computer.

Using *Bluetooth* for the first time on your computer

If this is the first time *Bluetooth* has been used on your computer, use either of the following procedures:

1. Double-click the **My *Bluetooth* Places** icon on the desktop, or the **Bluetooth** icon in the task bar. The Start Using *Bluetooth* window opens, and some virtual device drivers are installed automatically.
2. Wait until the installation of the drivers is complete.

OR

1. Right-click the **My *Bluetooth* Places** icon on the desktop, or the **Bluetooth** icon in the task bar.
2. Select **Start Using *Bluetooth***. The Start Using *Bluetooth* window opens, and some virtual device drivers are installed automatically.
3. Wait until the installation of the drivers is complete.

Some other virtual device drivers will be installed on demand when you use certain *Bluetooth* profiles for the first time.

Using the Microsoft *Bluetooth* software

If you are using Windows XP and want to use the Microsoft standard *Bluetooth* features, install the software by following the instructions in Installing the Microsoft *Bluetooth* software in Windows XP.

For information about how to use the *Bluetooth* function, do as follows:

1. Press Fn+F5 to turn on *Bluetooth*.
2. Click **Start --> Control Panel**.
3. Click **Printers and Other Hardware**.
4. Click **Bluetooth Devices**.
5. Click the **Options** tab.
6. Click **Learn more about *Bluetooth* Settings**.

Using ThinkPad *Bluetooth* with Enhanced Data Rate Software

If ThinkPad *Bluetooth* with Enhanced Data Rate Software is installed on your computer, two icons are displayed on the screen:

- **My *Bluetooth* Places** on the desktop
- ***Bluetooth* Configuration** in the system tray of the taskbar

My *Bluetooth* Places

To use the *Bluetooth* features, do the following:

1. Double-click the **My *Bluetooth* Places** icon on the desktop.
2. For Windows XP, go to *Bluetooth* Tasks and double-click **View devices in range**. A list of the devices on which *Bluetooth* has been enabled appears.
3. Click the device to which you want access. A list of the services available on that device appears, as follows:
   - *Bluetooth* keyboard and mouse (Human interface devices)
   - Printer (HCRP)
   - Audio gateway
   - Headset
   - PIM synchronization
   - Fax
   - File transfer
   - PIM item transfer
   - Dial-up networking
   - Network access
   - *Bluetooth* serial port
   - *Bluetooth* Imaging
   - Hands Free
   - AV profile

4. Click the service you want.

For more information, press the F1 key to open the online help for *Bluetooth*.

***Bluetooth* Configuration**

To use the configuration features of *Bluetooth*, right-click the icon. A pop-up menu appears. Select ***Bluetooth* Setup Wizard** or **Advanced Configuration**.

The *Bluetooth* Setup Wizard has the following capabilities:

- Finding all *Bluetooth*-enabled devices that can provide services
- Finding a specific *Bluetooth*-enabled device that you want to use, and configuring the services on that device
- Configuring the *Bluetooth*-enabled services on your computer that are provided for remote devices
- Configuring the name and device type of your computer

The Advanced Configuration has the following functions:

- Configuring the name and device type of your computer
- Configuring your computer settings so that remote *Bluetooth*-enabled devices can find your computer
- Configuring your computer settings so that your computer can find remote *Bluetooth*-enabled devices
- Configuring, on your computer, the *Bluetooth*-enabled services provided for remote devices
- Configuring the services on remote *Bluetooth*-enabled devices
- Displaying information about *Bluetooth* hardware

For details, refer to the help for *Bluetooth*. To see the help, double-click **My *Bluetooth* Places**, and click **Help** and then ***Bluetooth* help**. Another way to start the help is to right-click ***Bluetooth* Configuration** in the system tray of the taskbar, and click **Advanced Configuration** and then **Help**.

Installing the Microsoft *Bluetooth* software in Windows XP

If you want to use the Microsoft *Bluetooth* software, do as follows:

First uninstall the ThinkPad *Bluetooth* with Enhanced Data Rate Software.

1. Turn *Bluetooth* power off.

2. Click **Start**-->**Control Panel**.

3. Click **Add/Remove Programs**.
4. Select **ThinkPad *Bluetooth* with Enhanced Data Rate Software**; then click **Change/Remove** to uninstall the software.
5. Follow the instructions on the screen.

Next install the Microsoft *Bluetooth* software, as follows:

1. Turn *Bluetooth* power on. Microsoft *Bluetooth* software is loaded automatically.
2. If the Found New Hardware Wizard window pops up, do the following:
    1. Select **No, not this time**, and then click **Next**.
    2. Select **Install from a list or specific location (Advanced)**; then click **Next**.
    3. Select **Search for the best driver in those locations**.
    4. Select **Include this location in the search:**, and type "C:\SWTOOLS\Drivers\MSBTooth," or specify the location in which you placed the extracted INF file. Then click **Next**.
3. Click **Finish**.

Installing ThinkPad *Bluetooth* with Enhanced Data Rate Software in Windows XP

If you are using the Microsoft *Bluetooth* software and want to use ThinkPad *Bluetooth* with Enhanced Data Rate Software instead, replace the Microsoft *Bluetooth* software with ThinkPad *Bluetooth* with Enhanced Data Rate Software as follows:

1. Press Fn+F5 to turn the *Bluetooth* power on.
2. Click **Start** -> **Run**.
3. Type "C:\SWTOOLS\Drivers\TPBTooth\Setup.exe" (or specify the full path to the setup.exe file you have downloaded from http://www.lenovo.com/think/support); then click **OK**.
4. Click **Next**.
5. Select **I accept the terms in the license agreement**; then click **Next**.
6. Click **Next** to select the default destination folder.

   If you need to change the destination folder, click **Change**, select or enter the name of the destination folder in the Change current destination folder window, and click **OK**.

7. Click **Install** to begin installation.

8. Click **OK** to accept the driver signature.

9. Click **Finish**.

10. Restart the computer if necessary.

If you did not turn the *Bluetooth* power on before installing ThinkPad *Bluetooth* with Enhanced Data Rate Software--that is, if you skipped step 1--replace the *Bluetooth* driver, as follows:

1. Click **Start**-->**Control Panel**.

2. Click **Performance and Maintenance**; then click **System**.

3. Click the **Hardware** tab; then click **Device Manager**.

4. Double-click *Bluetooth* **Radios** to extract the *Bluetooth* Radios device tree.

5. Double-click the **ThinkPad *Bluetooth* with Enhanced Data Rate** icon to open the Properties window.

6. Click the **Driver** tab; then click **Update Driver**.

7. Click **No, not this time**, and then click **Next**.

8. Select **Install from a list or specific location (Advanced)**, and then click **Next**.

9. Select **Don't search. I will choose the driver to install**; then click **Next**.

10. Select the driver that has no "Digital Signed" icon; then click **Next**.

11. Click **Finish**.

✳ **Note:** If you use the wireless feature (the 802.11 standard) of your computer simultaneously with a *Bluetooth* option, data transmission speed can be delayed and the performance of the wireless feature can be degraded.

Wireless networking setup

To use the built-in wireless networking card (the 802.11 standard) to communicate, start Access Connections™.

To start the Access Connections wizard, click **Start** --> **All Programs** --> **ThinkVantage** --> **Access Connections**, and follow the instructions on the screen.

Note: Before you start setting up wireless networking connections by using Access Connections, obtain a Network Name (SSID) and your encryption information from your network administrator.

Access Connections, a connectivity assistant program, can easily enable one network adapter and disable the other adapters on demand. After setting up your wireless networking connection, you can use the program to quickly switch the network settings.

You can check the signal strength and status of your wireless connection either by opening Access Connections™, or by double-clicking the **Access Connections wireless status** icon in the system tray.

The Access Connections wireless status icon displays the signal strength and status of your wireless connection.

Wireless status icon states: wireless LAN

Power to the wireless radio is off.

Power to the wireless radio is on. The signal strength of the wireless connection is excellent.

Power to the wireless radio is on. The signal strength of the wireless connection is marginal.

Power to the wireless radio is on. The signal strength of the wireless connection is poor. To improve signal strength, move your system closer to the wireless access point.

Note: If you have trouble in making a connection, try moving your computer closer to your wireless access point.

Wireless status icon states: wireless WAN

Power to the WAN radio is off.

No association

No signal

Signal level 1

Signal level 2

Signal level 3

Enabling or disabling the wireless feature

To enable or disable the wireless feature, press Fn+F5. A list of wireless features is displayed. You can turn the feature on and off with a single click.

You can also enable or disable the feature by the following procedures.

To enable the wireless feature, do as follows:

1. Click the Access Connections™ wireless icon in the system tray.

2. Click **Power On Wireless Radio**.

To disable the wireless feature, do as follows:

1. Click the Access Connections wireless icon in the system tray.

2. Click **Power Off Wireless Radio**.

✳ **Note:** You can use the wireless radio switch to disable the wireless radio of all the wireless devices on your computer.

Wireless upgradeable ThinkPad models

Your ThinkPad® computer can be wireless upgradeable. This means that your computer has an antenna that can support wireless LAN access when wireless LAN access points are available. Wireless devices are available from Lenovo: Finding ThinkPad options.

Wireless interoperability

Wireless LAN PCI Express Mini Card is designed to be interoperable with any wireless LAN product that is based on Direct Sequence Spread Spectrum (DSSS), Complementary Code Keying (CCK), and/or Orthogonal Frequency Division Multiplexing (OFDM) radio technology, and is compliant to:

- The The 802.11b/g Standard, 802.11a/b/g or 802.11n draft 2.0 on Wireless LANs, as defined and approved by the Institute of Electrical and Electronics Engineers.
- The Wireless Fidelity (WiFi) certification as defined by the Wi-Fi Alliance.

Bluetooth device is designed to be interoperable with any *Bluetooth* product that is compliant to *Bluetooth* Specification 2.1 + EDR as defined by the *Bluetooth* SIG. Following profiles are supported by *Bluetooth* device:

- Generic Access
- Service Discovery
- Serial Port
- Dial-up Networking
- FAX
- LAN Access using PPP
- Personal Area Network
- Generic Object Exchange
- Generic Object Push
- File Transfer
- Synchronization
- Audio Gateway
- Headset
- Printer
- Human Interface Devices (Keyboard/Mouse)
- Basic Image
- Handsfree
- AV
- Phone Book Access Profile (PBAP) (Windows Vista® only)
- VDP-Sync Profile (Windows Vista only)

Usage environment and your health

Wireless LAN PCI Express Mini Card, Wireless WAN PCI Express Mini Card, and *Bluetooth* device emit radio frequency electromagnetic energy like other radio devices. However, the level of energy emitted is far much less than the electromagnetic energy emitted by wireless devices like for example mobile phones.

Due to the fact that Wireless LAN PCI Express Mini Card, Wireless WAN PCI Express Mini Card, and *Bluetooth* device operate within the guidelines found in radio frequency safety standards and recommendations, Lenovo believes the integrated wireless cards are safe for use by consumers. These standards and recommendations reflect the consensus of the scientific community and result from deliberations of panels and committees of scientists who continually review and interpret the extensive research literature.

In some situation or environment, the use of Wireless LAN PCI Express Mini Card, Wireless WAN PCI Express Mini Card or *Bluetooth* device may be restricted by the proprietor of the building or responsible representatives of the organization. These situations and areas may for example include:

- Using the integrated wireless cards on board of airplanes, in hospitals or near petrol stations, blasting areas (with electro-explosive devices), medical implants or body-worn electronic medical devices, e.g. pace makers.

- In any other environment where the risk of interference to other devices or services is perceived or identified as harmful.

If you are uncertain of the policy that applies on the use of wireless devices in a specific organization (e.g., airport or hospital), you are encouraged to ask for authorization to use Wireless LAN PCI Express Mini Card, Wireless WAN PCI Express Mini Card or *Bluetooth* device prior to turning on the computer.