

RF Exposure

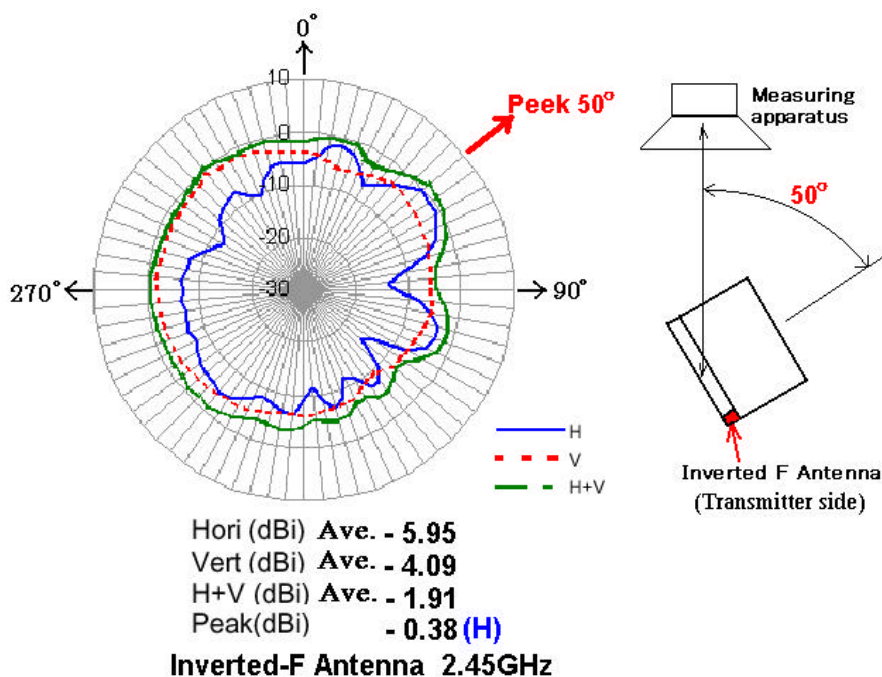
1. IBM ThinkPad 802.11b Wireless LAN Mini-PCI Adapter(P/N: 26P8056)

The applying equipment is a compact size laptop computer which is categorized as a mobile device by FCC CFR 47 Section 2.1091. Therefore the separation distance between the antenna and the human body is 20cm or more. As shown in the following photo, the applying equipment satisfies the requirement of antenna separation.



The separation distance between the antenna and the human body is approximately 31cm.

The peak conducted output power of the applying equipment is 15.3dBm and the maximum antenna gain is -0.38dBi as shown below.



Therefore the peak radiated (EIRP) output power is calculated as follows.

$$EIRP = P + G = 15.3 \text{ dBm} - 0.38 \text{ dBi} = 14.92 \text{ dBm} (31.0 \text{ mW})$$

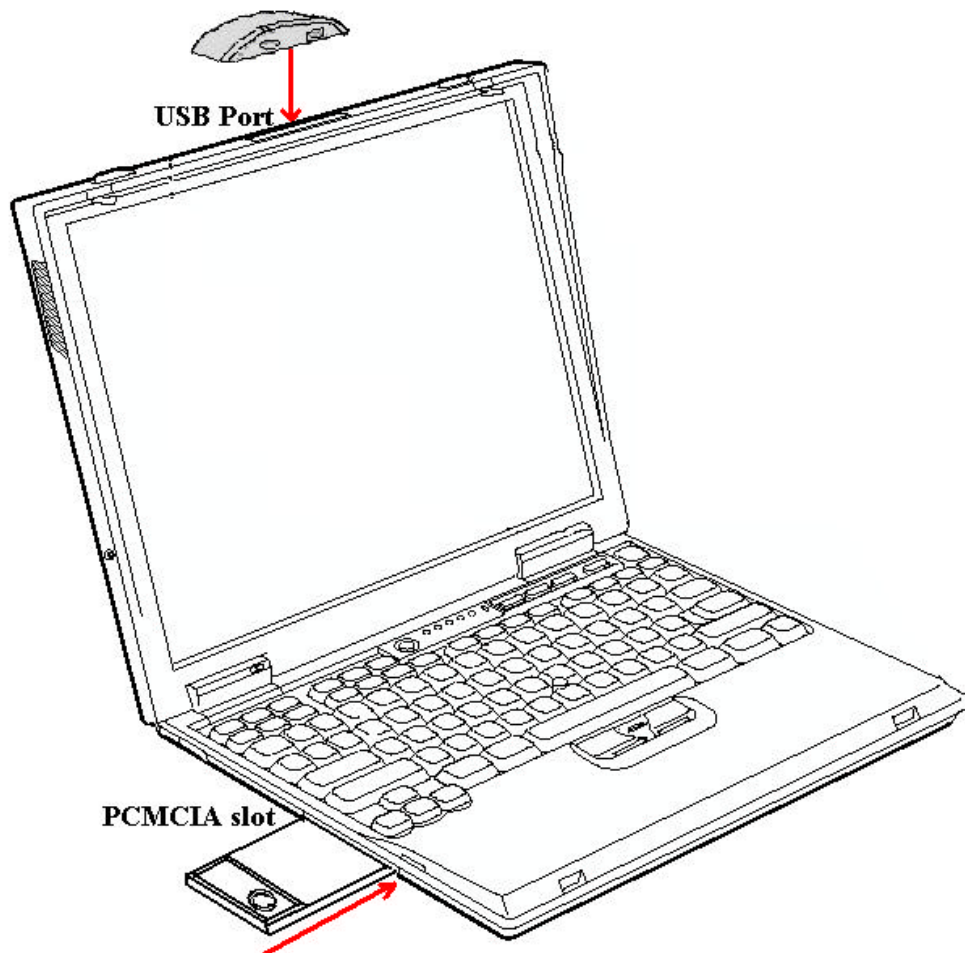
With this result, the maximum power density in 20cm distance is calculated as :

$$S_1 = EIRP / (4 \times R^2 \times \pi) = 0.0062 \text{ mW/cm}^2$$

2. User option Wireless cards

The applying equipment has two interfaces to connect user's option wireless cards. The following wireless cards are used in the PC slot or USB port of the equipment.

FCC ID : PI4BT-ULTRA
Grantee Name : TDK Systems Europe Ltd.
Product Name : Bluetooth Ultraport Module
EIRP in FCC test report : 1.4 mW
Granted Date : May/22/2001



FCC ID : O2OBTPCM101
Grantee Name : Deigianswer A/S
Product Name : Motorola Bluetooth 0dBm PC-Card (type no.: BTPCM100)
EIRP in FCC test report : 2.7mW
Granted Date : October/18/2000

The distance from the USB port to the human body is more than 20cm, also operators can maintain the sufficient antenna separation from the PC slot as shown in the photo.



The minimum antenna separation to satisfy the MPE limits (1mW/cm²), and the maximum power density in 20cm distance of each card are :

FCC ID	EIRP	Min. separation to satisfy the MPE limits *1	Max. power density at 20cm *2
PI4BT-ULTRA	1.4mW	0.34cm	S ₂ = 0.00028 mW/cm ²
O2OBTPCM101	2.7mW	0.47cm	S ₃ = 0.00054 mW/cm ²

$$*1 = \text{SQR} [\text{EIRP} / (1\text{mW}/\text{cm}^2 \times 4 \times \pi)]$$

$$*2 = \text{EIRP} / (4 \times 20\text{cm}^2 \times \pi)$$

When an operator will use the three transmitters simultaneously during 30 minutes continuously in normal operation, the time-averaging exposure is : (S₁ + S₂ + S₃) x 30 = 0.21
 So the source-based time-averaging duty factor is considered as 100% duty.

Therefore the applying equipment meets the MPE requirements for general Population/Uncontrolled exposure.

3. RF Exposure Info of User’s Manual :

The attachment in the next page is the RF exposure user’s information described in the page 52 and 53 of the user’s manual.

Wireless Regulatory information

The ThinkPad X22 must be installed and used in strict accordance with the instructions as described hereafter. This product complies with the following radio frequency and safety standards.

USA - Federal Communications Commission (FCC)

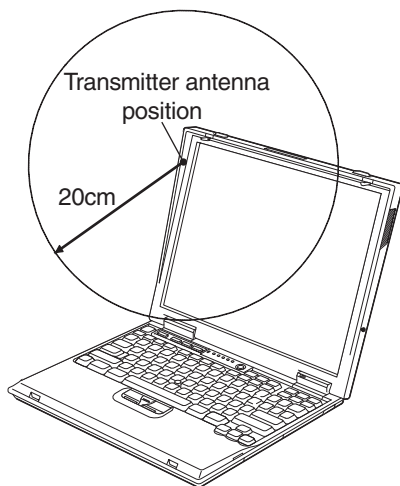
This product complies with FCC Part 15. The operation of Wireless LAN Mini-PCI Adapter integrated in the product is subject to the following two conditions.

- It may not cause harmful interference.
- It accepts any interference that may cause undesired operation.

Exposure to Radio Frequency Radiation

The radiated output power of Wireless LAN Mini-PCI Adapter is far below the FCC radio frequency exposure limits. Nevertheless, the ThinkPad X22 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 of this device and all persons.



- In principle the FCC certification does not permit the use of any other wireless PCMCIA card in your ThinkPad X22 in order to restrain the RF Exposure to human body. However some PCMCIA cards conform to the limit of the requirement and are admitted safe to use together with the Wireless LAN Mini-PCI Adapter in your ThinkPad notebook. Please visit IBM's web site for the latest certifications granted to check the available option wireless adapters.

Interference Statement

An improper installation or unauthorized use may cause harmful interference to radio communications. Also any tampering of the internal antenna will void the FCC certification and your warranty. Refer to the "Electronic emission notices" on page 45 for more detail.

Canada - Industry Canada (IC)

Low Power License-Exempt Radiocommunication Devices (RSS-210)

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.

Permis d'émission à faible puissance - Cas des appareils de communications radio (CNR-210)

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

Notice to EMEA users

- Belgie B	Gebruik buiten gebouw alleen op kanalen 10 (2462 MHz) en 11 (2467 MHz). Voor privé-gebruik buiten gebouw over publieke grond over afstand kleiner dan 300m geen registratie bij BIPT/IBPT nodig; voor gebruik over afstand groter dan 300m is wel registratie bij BIPT/IBPT nodig. Voor publiek gebruik buiten gebouwen is licentie van BIPT/IBPT verplicht. Voor registratie of licentie kunt u contact opnemen met BIPT.
- Belgium B	For outdoor usage only channel 10 (2462 MHz) and 11 (2467 MHz) is allowed. For private usage outside buildings across public grounds over less than 300m no special registration with IBPT/BIPT is required. Registration to IBPT/BIPT is required for private usage outside buildings across public grounds over more than 300m. An IBPT/BIPT licence is required for public usage outside building. For registration and license please contact IBPT/BIPT.