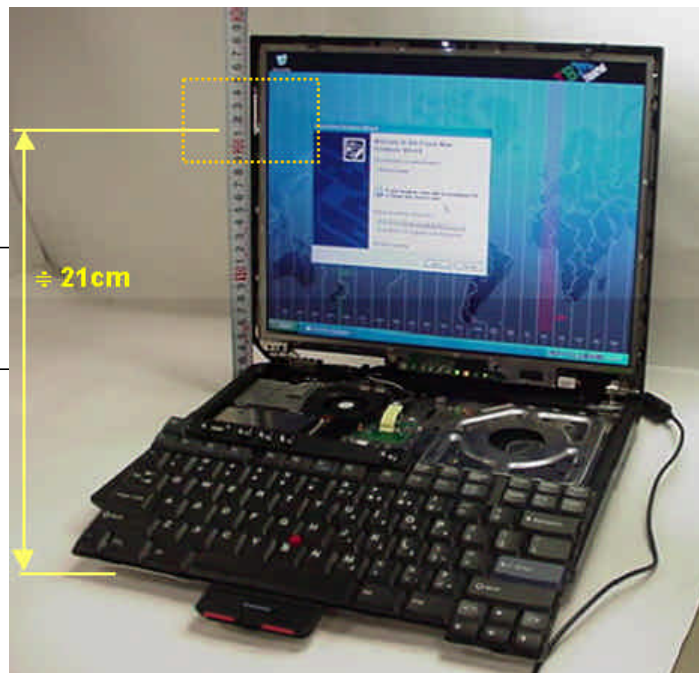


1. RF Exposure Evaluation for the built in type antennas

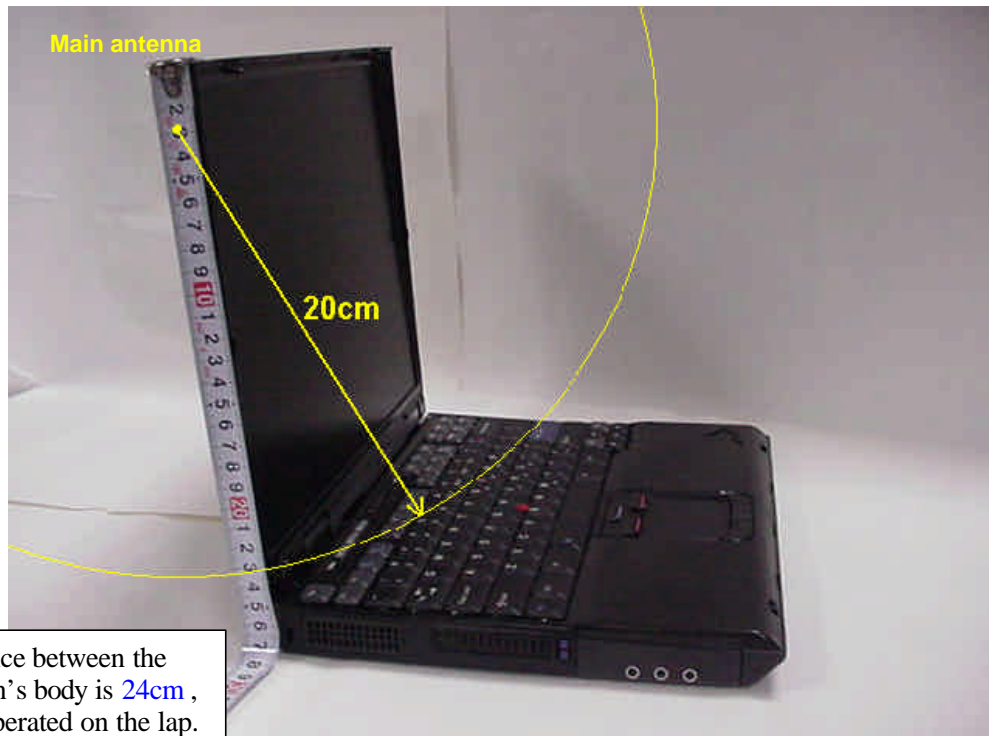
The separation distance between the transmission antennas located in the LCD section of each host device (ThinkPad R32, T30, or X30) and the person's body is more 20 cm. So the applying transmitter with the built in antenna systems are able to be categorized as the mobile device by FCC CFR 47 section 2.1091

Figure A. Antenna separation from human's body: ThinkPad R32 Series



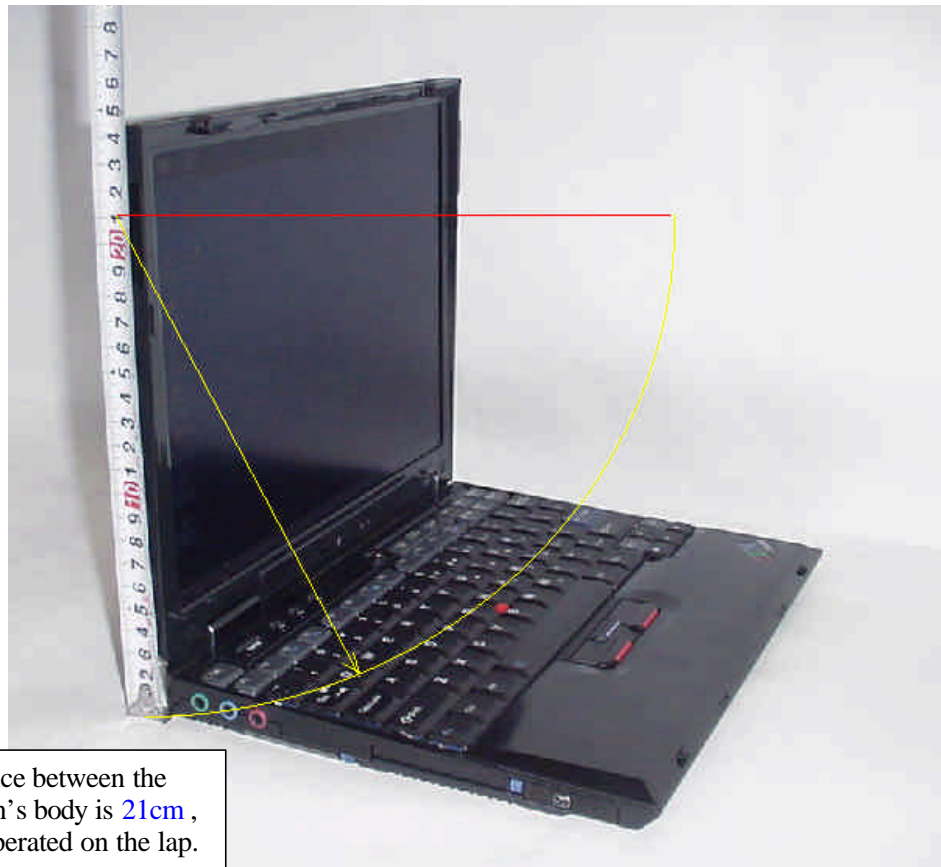
The shortest distance between the antenna and human's body is 21cm , when the host is operated on the lap.

[Figure B. Antenna separation from human's body: ThinkPad T30 Series](#)



The shortest distance between the antenna and human's body is 24cm , when the host is operated on the lap.

[Figure C. Antenna separation from human's body: ThinkPad X30 Series](#)



The shortest distance between the antenna and human's body is 21cm , when the host is operated on the lap.

MPE calculation table

Host device	conducted peak output power (1)	Maximum Antenna gain (2)	EIRP (3)= (1)+(2)	Maximum Power density at 20 cm (S)
ThinkPad R32 Series	16.3 dBm (42.7 mW)	0.55 dBi	16.85 dBm	0.0096 mW/cm ²
ThinkPad T30 Series	17.0 dBm (50.1 mW)	0.53 dBi	17.53 dBm	0.0112 mW/cm ²
ThinkPad X30 Series	17.1 dBm (51.3 mW)	1.42 dBi	18.52 dBm	0.0142 mW/cm ²

The maximum power density at 20cm distance of the applying LMA transmitter is 0.0142mW/cm², which is led by the following calculation.

$$S = 10^{EIRP/10} / (4 \times R^2 \times \pi) = 10^{18.52/10} / (4 \times 20^2 \times \pi) = 0.0142$$

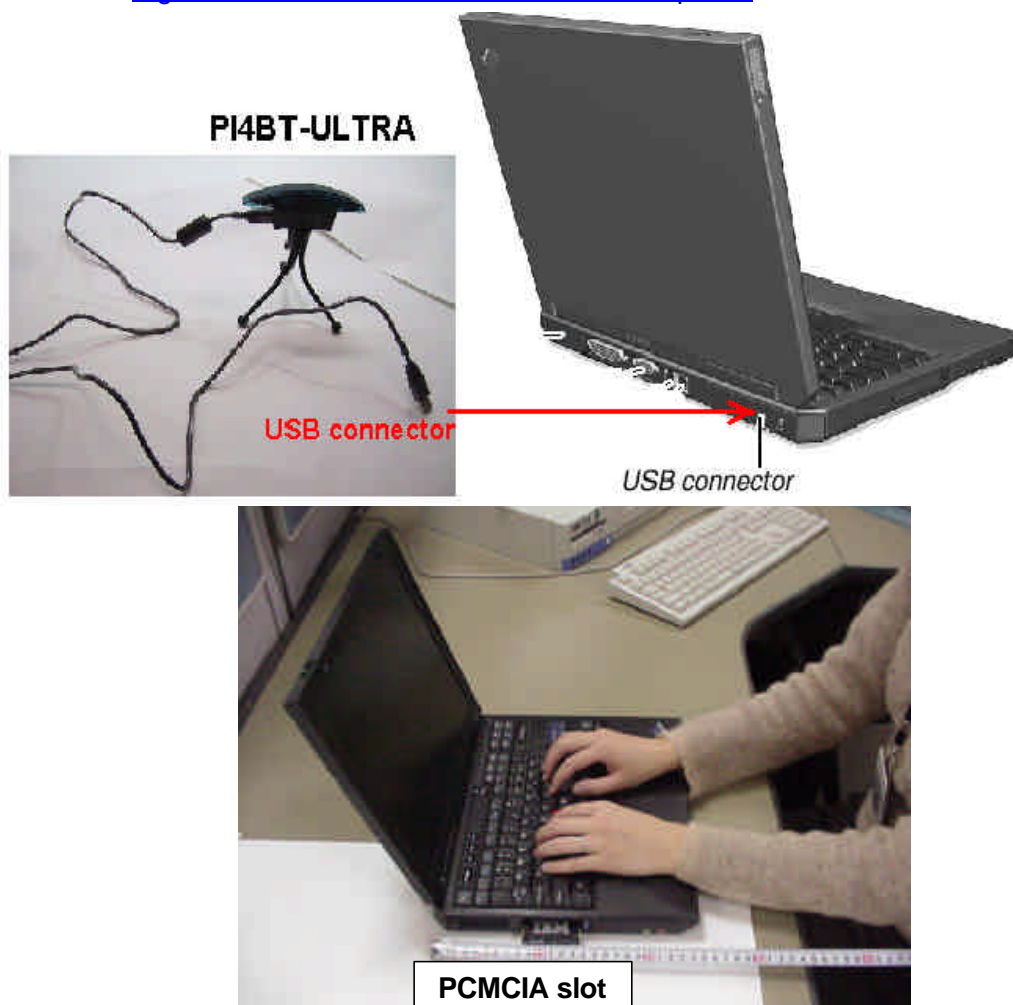
The result is far below the MPE limit (1.0 mW/ cm²) that keeps the sufficient margin for use of continuous RF exposure in normal operation. i.e. the source-based time-averaging duty factor is considered as 100% duty. Therefore the LMA transmitter meets the MPE requirements for general Population/Uncontrolled exposure.

2. RF Exposure evaluation of option Bluetooth transmitters regarding 'http://hraunfoss.fcc.gov/eas_public/LSI_GET/37'

The host devices used with the applying LMA transmitter support the following two Bluetooth PC options which function with the applying transmitter simultaneously.

Interface	FCC ID	Grantee Name	Product Name	Granted Date	EIRP in FCC test report
USB port	PI4BT-ULTRA	TDK Systems Europe Ltd.	Bluetooth Ultraport Module	May/22/2001	1.4 mW
PC card slot	PI4BT-IBM-PCII		Bluetooth PC Card II	August/21/2001	1.0mW

Figure D. Interfaces to connect Wireless options



When a customer operates the applying PC on his lap, the sufficient separation distance (min. 20cm) between the antennas of above transmitters and the person's body (lap) can not be maintained.

But the footnote of the Section 3 in Supplement C to OET Bulletin 65 states ¹⁴ Both conducted and radiated output power should be considered in near-field exposure conditions. The output indicated in the above (500 mW) is appropriate when the device and its antenna are both operating at more than 2.5 – 3.0 cm from a person's body, such as certain hand-held terminals. If a device, its

antenna or other radiating structures are operating at closer than 2.5 cm from a person's body or in contact with the body, SAR evaluation may be necessary when the output is more than 50 – 100 mW, depending on the device operating configurations and exposure conditions.”

Also the latest conditions for co-located transmitters in Web guidance (http://hraunfoss.fcc.gov/eas_public/LSI_GET/37) states “SAR compliance for co- located transmitters in standalone independently operated product – when SAR evaluation is required for TCB approval, except for the transmitter(s) with the highest output (non- simultaneously transmitting dominant transmitters – AMPS/ TDMA/ CDMA), the output of other co-located transmitters should be less than 2% of the source- based time-averaged conducted and radiated output power levels of the dominant transmitter or 5 mW, whichever is higher.”

When the antenna separation from a person's body is closer than 2.5 cm, the near field estimation which is used for the calculation of EIRP to estimate the source- based time-averaged MPE limit is not proper method for the RF exposure evaluation.

So 5 mW should be considered as the criteria of SAR evaluation for the co-location of transmitters.

The total output power of the two Bluetooth transmitters in the previous table is 2.4mW. Therefore those transmitters can co-locate with the dominant transmitter(WLAN) without SAR evaluation.

3. Other supported PCMCIA cards with SAR compliance

The applying equipment supports the following option wireless PCMCIA card plugged in the PC card slot, which complies to the SAR requirement. (FCC ID: J3OWCB5000A)

FEDERAL COMMUNICATIONS COMMISSION WASHINGTON, D.C. 20554					
COPY		GRANT OF EQUIPMENT AUTHORIZATION Certification		COPY	
Xircom 2300 Corporate Center Drive Thousand Oaks, CA 91320					
Attention: Robert Paxman					
NOT TRANSFERABLE					
EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.					
FCC IDENTIFIER		J3OWCB5000A			
Name of Grantee		Xircom			
Equipment Class:		Unlicensed National Information Infrastructure TX			
Notes:		Intel PRO/ Wireless 5000 Cardbus Adapter			
<u>Grant Notes</u>	<u>FCC Rule Parts</u>	<u>Frequency Range (MHZ)</u>	<u>Output Watts</u>	<u>Frequency Tolerance</u>	<u>Emission Designator</u>
	15	5180 - 5320	0.1		
Output power is conducted. Device is approved for mobile and laptop computer use with similar installation and operating configurations as tested in this filing only. Device with specific antenna has been tested stand-alone for SAR compliance in a typical laptop computer with side PCMCIA slot, as described in this filing. Device has not been tested in a host product for RF exposure compliance in combination with other transmitters. Users and installers must be informed of the installation and operating requirements and configurations for satisfying RF exposure compliance. The highest reported SAR value is 0.67 W/kg.					