Application Document for FCC Part 15, Subpart E (Intentional Radiator)
Class II Permissive change

Product Name: **IBM 11a/b/g Wireless LAN Mini PCI Adapter**

Document Number: FCC 19-0210-0

FCC ID: ANO20030400LEG

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EMC R&D Staff Engineer
Toshiya Murota
Signature:
IBM Japan, Ltd.
EMC Engineering
LAB-S59
1623-14, Shimotsuruma,
Yamato-shi Kanagawa-ken 242-8502, Japan
Phone: +81-46-215-6574
Fax: +81-46-273-7420
E-Mail: murota@jp.ibm.com

EMC Engineering Manager / NVLAP signatory
Akihisa Sakurai
Signature:
IBM Japan, Ltd.
EMC Engineering
LAB-S59
1623-14, Shimotsuruma,
Yamato-shi Kanagawa-ken 242-8502, Japan
Phone: +81-46-215-2613
Fax: +81-46-273-7420
E-Mail: akihisa@jp.ibm.com

Portable Product Development No.2 Manager
Tabo Mitsuo
Signature:
IBM Japan, Ltd.
Portable Systems
LAB-R16
1623-14, Shimotsuruma,
Yamato-shi Kanagawa-ken 242-8502, Japan
Phone: +81-46-215-2711

Portable Systems Director
Arimasa Naitoh
Signature:
IBM Japan, Ltd.
Portable Systems
LAB-R11
1623-14, Shimotsuruma,
Yamato-shi Kanagawa-ken 242-8502, Japan
Phone: +81-46-215-6110

Yellow Sheet : No. **EMA00, EMA12**

Outline of Submission

1. Objective

This is a Certification Compliance Report for FCC Part 15 subpart E (Intentional Radiator).

- The applying equipment : **IBM 11a/b/g Wireless LAN Mini PCI Adapter**
- FCC ID : **ANO20030400LEG**
- Original grant date : **July/03/2003**

The following new antenna systems(host PC devices) is added in this **Class II change** application.

- IBM ThinkPad T40 Series
- IBM ThinkPad X30 Series

2. Product Description

The applying modular transmitter device is an OEM mini-PCI wireless LAN card supplied by PHILIPS Components. The modular device complies with the following transmission modes.

- IEEE802.11a (5.2GHz band OFDM)
- IEEE802.11a (5.8GHz band OFDM)
- IEEE802.11b (2.4GHz band Direct Sequence Spread Spectrum)
- IEEE802.11g (2.4GHz band OFDM)

This application includes 5.2GHz band OFDM mode only. The other three modes are subjected to the FCC 15 subpart C (DTS device), and are to be certified with a separate application as **composite** device.

3. Installation of the applying transmitter

The applying LMA transmitter is an **user installable** wireless card. An unique electrical connector (so called "**Electronic Handshake**" BIOS Lock) is employed for the host devices to satisfy the FCC Part 15.203 or RSS-210 §5.5, and the FCC Part 15.407(d) or RSS 6.2.2 q1(i). **This mechanism enables users to install the applying LMA transmitter to the specified hosts (ThinkPad T40 Series, and X30 Series).**

The detail explanation of the unique coupling between the LMA transmitter and antenna systems is shown in the separate exhibit "Confidential_BIOS_Lock", however IBM would like to hold it in confidence to maintain the secure "unique operability" with the applying card and IBM antenna systems.

The BIOS Lock function is also effective for the user's maintenance in replacing a broken card with a spare part.

4. Collocation with other transmitter

The applying LMA transmitter collocates with the following Bluetooth transmitters and transmits simultaneously.

- IBM Integrated Bluetooth with 56 Modem (FCC ID: ANO20020100MTN)
- Bluetooth UltraPort Module from IBM (FCC ID: PI4BT-ULTRA)
- Bluetooth PC Card II (FCC ID: PI4BT-IBM-PCII)

As for the RF safety evaluation, refer to the separate "RF Exposure" exhibit.

5. Declaration of Equivalency to previous granted devices

The transmitter module was previously granted with different FCC IDs for the following two complete systems.

- FCC ID: ANO20020302R1L for ThinkPad T40 Series
- FCC ID: ANO20020304T2L for ThinkPad X30 Series

But the IEEE802.11**g** transmission mode was excluded at the period, since the driver software for the mode was not implemented for the host PCs.

Although new test reports for the IEEE802.11**g** are added and a slight change was placed on the applying module, the core PCB and RF components of the applying LMA transmitter device are the same as the ones of above devices. So the RF electrical characteristics for the Tx modes of IEEE802.11**a** & 11**b** are not affected. Therefore, the measurement test results for those Tx modes are remained the same as the granted devices.

The attachment in next page is the declaration of equivalency for the RF electrical characteristics between the applying LMA transmitter and the previous granted device.

The subjected devices :

	FCC IDs of IBM product	Model number of the OEM supplier (PHILIPS Components)
Granted device	ANO20020302R1L ANO20020304T2L	PH11107-X
The applying device	ANO20030400LEG	PH12127-X

6. Submittal documents

- LAM Qualification — omitted (identical with the original filing)
- Product Labeling — omitted (ditto)
- Internal Photos — omitted (ditto)
- External Photos — omitted (ditto)
- Block Diagrams — omitted (ditto)
- Schematic Diagrams — omitted (ditto)
- Parts List — omitted (ditto)
- Circuitry Descriptions of LMA transmitter — omitted (ditto)
- Electronic Handshake BIOS Lock logic — Yes
- The new antenna system Info. — Yes
- Test Report with the new antenna system — Yes
- Test Setup Photos — Yes
- RF Exposure evaluation for the new antenna — Yes
- IBM Web site concerning the grant condition — Yes
- Users Manual — Yes

TECHNICAL REPORT

802.11 Combo MiniPCI WLAN Card
Model No: PH11107-X / PH12127-X

Declaration Of Equivalency

Author(s): A.D.McPherson

Date: 29th May 2003

ACCTON & PHILIPS Wireless Networking
1962 Zanker Road
San Jose
Ca 95112
United States of America

CHANGE HISTORY

Revision	By Whom	Comment	Date
Issue 1	D McPherson	Initial Preparation.	May 29th, 2003

CONTENTS

1 Preface

1.1 Purpose

This document serves to declare that the PH11107-X / PH12127-X design is equivalent to the PH11107-X design that has been previously certified.

1.2 Scope

This document describes the PH11107-X / PH12127-X design.

1.3 Audience

The intended audience is technical staff external to the hardware design team.

1.4 Abbreviations & Definitions

MAC	Media Access Controller
GHz	Giga-Hertz
IEEE	Institute of Electrical & Electronic Engineers
RF	Radio Frequency
RX	Receiver
TX	Transmitter

1.5 References

{1} IEEE Std 802.11a-1999, Wireless LAN Medium Access Control and Physical Layer Specifications – High Speed Physical Layer in the 5GHz Band.
{2} IEEE Std P802.11g/D8.2, Wireless LAN Medium Access Control and Physical Layer Specifications – Higher Speed Physical Layer Extension in the 2.4GHz Band.
{3} Mini-PCI Specification version 1.0 from PCI-SIG

2 Declaration Of Equivalency

2.1 PH11107-X / PH12127-X Mini PCI Card

The PH11107-X / PH12127-X IEEE 802.11a/g Combo Mini-PCI Card supports both the high-speed 5GHz IEEE 802.11a standard {1} and the prevalent 2.4GHz IEEE 802.11g standard {2}, which incorporates the prior IEEE802.11b protocol, by means of a unique design contained within a Mini-PCI {3} Type IIIA form factor.

The design of the PH11107-X / PH12127-X Mini PCI Card is identical in every respect to the PH11107-X design that has been previously granted certification, with the single exception that the MAC Processor & Baseband Interface device has been upgraded to incorporate functionality compliant with the latest revision of the IEEE 802.11g specification {2}. In all other respects, the electrical design of the PH11107-X / PH12127-X is identical to the PH11107-X.

Of particular relevance is that the RF design of the PH11107-X / PH12127-X is unchanged from the PH11107-X RF design. The RF performance of both designs have been measured and found to be directly equivalent.

Labeling will be changed to reflect the revision of the PH11107-X design to PH11107-X / PH12127-X.

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TNO Certin B.V.
Smidshornerweg 18
9822 ZG Niekerk NETHERLANDS

3/2/2003

Please be advised that Atheros Communications has released an updated version of the digital integrated circuit designated AR5212 responsible for Media Access and Baseband functions of Wireless LAN devices. This component is a pin-compatible replacement of the AR5211 version chip. The updated I.C. improves digital performance and has no impact on RF characteristics. Atheros Communications has determined that the use of AR5212 in place of AR5211 does not degrade any characteristics subject to FCC or ETSI RF & EMC conformance requirements.

Sincerely,

Michael Green
Manager of Global Product Compliance