Application Document for FCC Part 15, Subpart C (Intentional Radiator)

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

Document Number: FCC 19-0224-0

FCC ID: ANO20030400LEG

June 02, 2003

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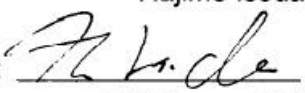
Signature: 

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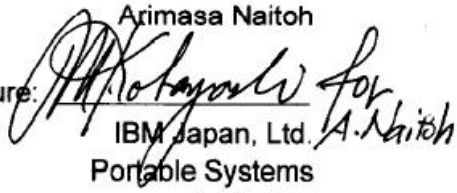
Signature: 

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Outline of Submission

1. Objective

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

- The applying equipment : **IBM 11a/b/g Wireless LAN Mini PCI Adapter**
- FCC ID : **ANO20030400LEG**

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)

The 5.2GHz band OFDM mode is subjected to the FCC 15 subpart E (U-NII device), and is to be certified with a separate application as **composite** device.

The transmitter module was previously granted as a complete system (FCC ID: ANO20020300D3L). But the IEEE802.11g transmission mode was excluded at the period, since the driver software for the mode was not implemented for the host PC.

The following is the enhancement of this application.

- To enable IEEE802.11g (2.4GHz band OFDM) on the specified host (IBM ThinkPad R40 Series)
- To employ the "**Electronic Handshake**" BIOS Loch

A slight change was placed on the applying module but the core PCB and RF components are the same as the previous submission, so the RF electrical characteristics of the transmission modes for IEEE802.11a & 11b are not affected by the enhancement.
Therefore, the measurement test results for those modes are remained the same as the granted device.
Refer to the attached OEM acknowledgement letter issued by the supplier in this exhibit.

3. Installation of the applying transmitter

The applying LMA transmitter is a **user installable** wireless card.
The supported host device for the applying LMA transmitter is IBM ThinkPad R40 Series.

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 host(ThinkPad R40 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 granted device

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 ID of IBM product	Model number of the OEM supplier (PHILIPS Components)
Granted device	ANO20020300D3L	PH11107-X
The applying device	ANO20030400LEG	PH12127-X

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

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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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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