



WaveLAN IEEE PC Card Type II

Guidance document to FCC Test reports

Introduction

The purpose of this document is to provide some guidance to OEM users of WaveLAN IEEE PC Cards (hereafter referred to PC Card) in obtaining FCC certification for their applications.

Compliance Verification

The attached test reports show that the PC Card complies with the applicable FCC Part 15 rules.

Except for the Processing Gain, which was tested by Lucent, compliance of the PC Card has been verified by a recognized test laboratory, SENTON in Germany.

Test were performed with the PC Card installed in a notebook PC and with the standard Lucent external antenna attached.

Note that the PC Card as tested has been modified slightly which will not effect the compliance. See modification list attached.

The Lucent test configuration however does not fully represent the intended applications of OEM users, where the PC card together with their proprietary antennae will be integrated in host units, like hand-held equipment, etc.

The main concern with respect to FCC compliance of these applications may be with meeting the radiated emission requirements.

The attached test reports show a high radiated emission level at some frequencies in the frequency band 30 - 1000MHz. This is caused by emissions generated by the host PC itself and radiated likely by the antenna(cable).

Therefore, the OEM user has to pay much attention to the emissions generated by their host unit and the length and routing of the antenna cables.

The Processing Gain has been tested by Lucent Technologies, because it is too complex to be performed by the test laboratory.

Similar test reports of previous WaveLAN products were accepted for certification by FCC.

The OEM user has to negotiate with FCC, whether, or not this report can be used for certification.

However, if the test has to be repeated then Lucent may provide the necessary support to the OEM user.

Certification

FCC certification of the PC Card including propriety antennae will be obtained by the OEM user under their own name.

The application for certification requires, among others, that the product documentation of the PC Card, like schematics, etc. have to be provided. However, these documents are company confidential.

Upon written request by the OEM user copies will be send by Lucent to the FCC directly.

Introduction

The PC Card type II (integrated) pcb version 8U116 has been tested for compliance with FCC Rules by SENTON test house.

Meanwhile, another pcb version has been developed, 8U125, in which all 'hand-made' modifications of the 8U116 are implemented. The 8U125 will be released for pilot production.

For mass production the 8U145 will be released, which includes the latest modifications.

The purpose of this document is to describe the differences between the mentioned 3 pc board versions in order to support the OEM user in certifying the product.

Modifications

The following table includes the modifications made to subsequent board versions.

	8U116 (tested by Senton)	→ 8U125	→ 8U145
1.	<i>manual</i> modification of the IF-Rx channel matching to improve the sensitivity.	IF-Rx channel matching modification <i>implemented</i> on pcb.	no further change.
2.	<i>manual</i> modification of the loop filter of the IF synthesizer to reduce lock time.	loop filter modification <i>implemented</i> on pcb.	no further change.
3.	<i>manual</i> modification of the loop filter of the RF synthesizer to reduce lock time.	loop filter modification <i>implemented</i> on pcb.	no further change.
4.	<i>manual</i> placement of a 1pF capacitor near the MAIN antenna connector to improve Tx output spectrum.	<i>manual</i> placement of a 1pF capacitor near the MAIN antenna connector to improve Tx output spectrum.	1pF capacitor <i>implemented</i> on pcb.
5.		<i>implemented</i> reduction of distance between coupled lines of directional coupler at Tx output to improve the transfer ratio of the power sensor.	no further change
6.		<i>manual</i> increase of the pcb Cu area at the anode of the power detector diode to improve the transfer ratio of the power sensor	increased pcb Cu area <i>implemented</i> on pcb.

Notes:

The table shows that modification 1 thru 4 have already been done manually on 8U116 as tested by SENTON. PCB implementation of these modifications on 8U125, except for modification 4, will not affect the performance of the PC Card.

Modifications 5 and 6 refer to the power sensor, which measures the Tx power by means of a transmission line placed parallel the Tx output transmission line and rectifying the output voltage by means of a detector diode. The distance between those mutually coupled lines has been decreased, in order to increase the coupling ratio. For the same reason the Cu area (capacitance) at the anode of the power detector diode has been increased. Because both modifications apply to the 'cold' coupled side of the power sensor (approx. 20dB coupling ratio), it is expected not to affect the impedance of the Tx output circuit, or subsequently the emission spectrum.