FCC CFR47 PART 15 SUBPART C CERTIFICATION

TEST REPORT

FOR

PHILIPS COMPONENTS

802.11 COMBO MINI PCI WLAN CARD

MODEL NUMBER: PH11107-E

BRAND NAME: PHILIPS

FCC ID: PUBWCM1008

REPORT NUMBER: 02U1529-1

ISSUE DATE: OCTOBER 22, 2002

Prepared for
PHILIPS COMPONENTS
1000 WEST MAUDE AVE
SUNNYVALE, CA 94085
USA

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TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION

COMPANY NAME: **PHILIPS COMPONENTS**
1000 WEST MAUDE AVE
SUNNYVALE, CA 94085 USA

EUT DESCRIPTION: **802.11 COMBO MINI PCI WLAN CARD**

MODEL NUMBER: **PH11107-E**

DATE TESTED: **OCTOBER 9 – OCTOBER 16 , 2002**

TYPE OF EQUIPMENT	INTENTIONAL RADIATOR
EQUIPMENT TYPE	2.4 – 2.4835 AND 5.725 – 5.850 GHz TRANSCEIVER *
MEASUREMENT PROCEDURE	ANSI 63.4 / 1992, TIA/EIA 603
PROCEDURE	CERTIFICATION
FCC RULE	CFR 47 PART 15C

Only the radiated spurious emissions and AC mains conducted emissions in the 2.4 AND 5.8 GHz bands are documented in this report; other requirements (antenna port conducted measurements) and bands of operation (5.2 GHz) are documented in separate reports. Subject to this scope, Compliance Certification Services, Inc. tested the above equipment for compliance with the requirements as set forth in CFR 47, PART 15, Subpart C. The equipment in the configuration described in this report, shows the measured emission levels emanating from the equipment do not exceed the specified limit.

Note: This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

Approved & Released For CCS By:

MIKE HECKROTTE
CHIEF ENGINEER
COMPLIANCE CERTIFICATION SERVICES

Tested By:

VAN LEE
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. EUT DESCRIPTION

The Philips PH11107 is a high performance 802.11a/b WLAN client product intended for a laptop application. It operates in the 2.4 – 2.4835 GHz, 5.15 - 5.35 GHz and 5.725 - 5.850 GHz bands. The product uses two Dual Band Inverted F type antennas for diversity operation. Each antenna is mounted in the LCD display of the laptop. The Main antenna has a gain of +0.46 dBi in the 2.4 GHz band, +2.98 dBi in the 5.2 GHz band, and –0.49 dBi in the 5.8 GHz band. The Auxilliary antenna has a gain of -1.06 dBi in the 2.4 GHz band, +1.96dBi in the 5.2 GHz band, and –0.12 dBi in the 5.8 GHz band.

For test purposes, the EUT is installed on a cardbus adapter, which is subsequently installed in a laptop computer equipped with a cardbus slot and the appropriate radio testing software. The antennas are mounted in a separate LCD display of the same type that is intended for use in the final end product application.

3. TEST METHODOLOGY

Conducted and radiated testing were performed according to the procedures documented on chapter 13 of ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, and 15.407.

4. FACILITIES AND ACCREDITATION

4.1. FACILITIES AND EQUIPMENT

The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

Receiving equipment (i.e., receiver, analyzer, quasi-peak adapter, pre-selector) and LISNs conform to CISPR specifications for "Radio Interference Measuring Apparatus and Measurement Methods," Publication 16.

4.2. LABORATORY ACCREDITATIONS AND LISTINGS

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200065-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (reference no: 31040/SIT (1300B3) and 31040/SIT (1300F2)).

4.3. TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	NVLAP*	FCC Part 15, CISPR 22, AS/NZS 3548,IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11, CNS 13438	200065-0
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	1300
Japan	VCCI	CISPR 22 Two OATS and one conducted Site	R-1014, R-619, C-640
Norway	NEMKO	EN50081-1, EN50081-2, EN50082-1, EN50082-2, IEC61000-6-1, IEC61000-6-2, EN50083-2, EN50091-2, EN50130-4, EN55011, EN55013, EN55014-1, EN55104, EN55015, EN61547, EN55022, EN55024, EN61000-3-2, EN61000-3-3, EN60945, EN61326-1	ELA 117
Norway	NEMKO	EN60601-1-2 and IEC 60601-1-2, the Collateral Standards for Electro-Medical Products. MDD, 93/42/EEC, AIMD 90/385/EEC	ELA-171
Taiwan	BSMI	CNS 13438	SL2-IN-E-1012
Canada	Industry Canada	RSS210 Low Power Transmitter and Receiver	IC2324 A,B,C, and F

* No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.

5. CALIBRATION AND UNCERTAINTY

5.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

5.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Radiated Emission	
30MHz – 200 MHz	+/- 3.3dB
200MHz – 1000MHz	+4.5/-2.9dB
1000MHz – 2000MHz	+4.6/-2.2dB
Power Line Conducted Emission	
150kHz – 30MHz	+/-2.9

Any results falling within the above values are deemed to be marginal.

5.3. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST AND MEASUREMENT EQUIPMENT LIST				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due Date
Spectrum Analyzer	HP	8566B	3014A06685	6/1/03
Spectrum Display	HP	85662A	2152A03066	6/1/03
Quasi-Peak Detector	HP	85650A	3145A01654	6/1/03
Preamplifier	HP	8447D	2944A06833	8/10/02
Log Periodic Antenna	EMCO	3146	9107-3163	3/30/03
Biconical Antenna	Eaton	94455-1	1197	3/30/03
LISN	F.C.C.	LISN-50/250-25-2	2023	8/2/02
EMI Test Receiver	Rohde & Schwarz	ESHS 20	827129/006	4/17/03
Spectrum Analyzer	HP	8593EM	3710A00205	6/11/03
Preamplifier (1 - 26.5GHz)	MITEQ	NSP2600-44	646456	4/26/03
Horn Antenna (1 - 18GHz)	EMCO	3115	6717	1/31/03
Horn Antenna (18 – 26.5GHz)	ARA	3115	6717	1/31/03
High Pass Filter (7.6GHz)	FSY Microwave	FM-7600-9SS	002	N.C.R.
External Mixer (26.5 – 40 GHz)	HP	11970A	3008A04190	10/15/05
Horn Antenna (26.5 – 40 GHz)	Dico	1149	2	N.C.R.

6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

Device Type	Manufacturer	Model	Serial Number	FCC ID
Laptop	IBM	2366-21U	78-CRG63	DoC
AC Power Adapter	IBM	02K6746	N/A	DoC
Laptop	DELL	PPL	0001421C-12800-87L-0963	DoC
AC Power Adapter	DELL	AA20031	N/A	DoC
Printer	HP	2225C	2541S41679	BS46XU2225
Modem	ACEEX	1414	9013538	DoC

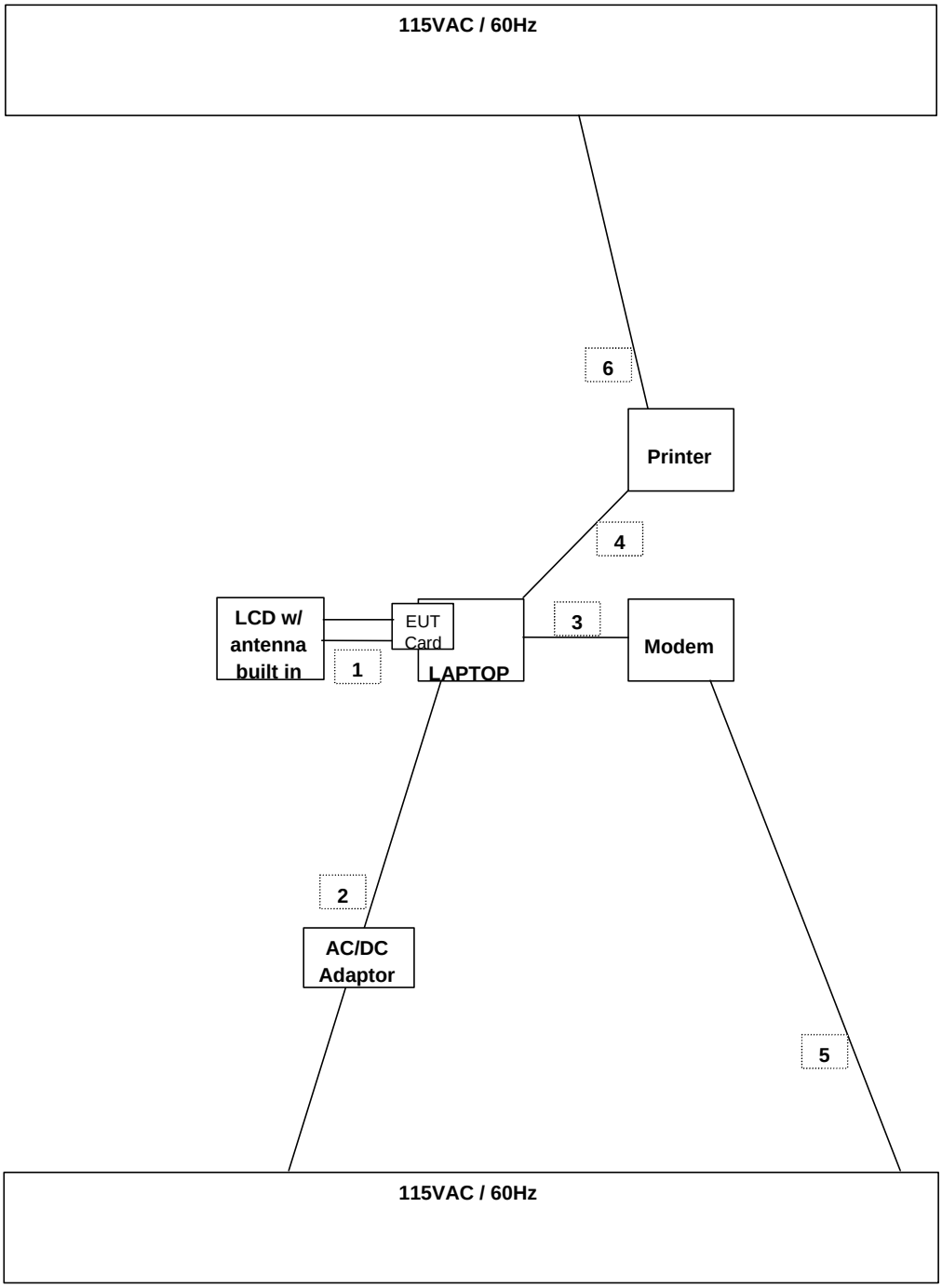
I/O CABLES

Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	Antenna	2	UFL	Coaxial	0.1 m	
2	AC	1	US115	Unshielded	2 m	Integral with AC Adapter
3	Serial	1	Mini DIN	Shielded	2 m	
4	Parallel	1	DB25	Shielded	2 m	
5	AC	1	US115	Unshielded	2 m	
6	AC	1	US115	Unshielded	2 m	

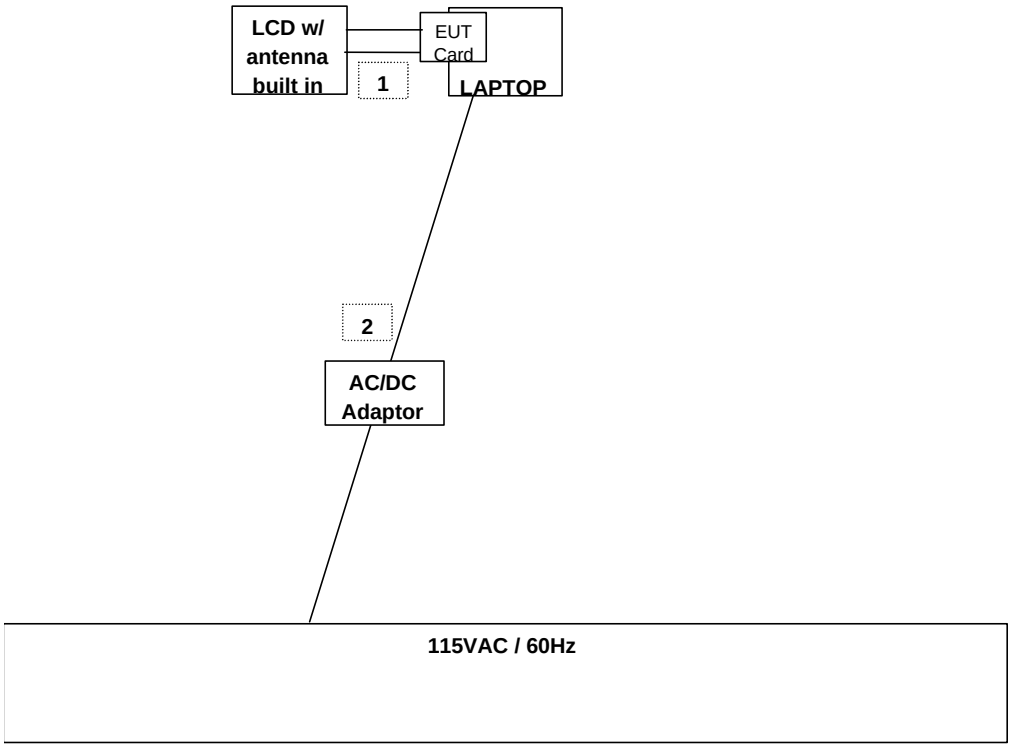
TEST SETUP

The EUT is installed into a laptop computer during the test.

SETUP DIAGRAM FOR DIGITAL DEVICE TESTS



SETUP DIAGRAM FOR TRANSMITTER TESTS



7. APPLICABLE RULES

§15.247 (c)- SPURIOUS EMISSIONS

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in§15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

§15.205- RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2] Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.207- CONDUCTED LIMITS

(a) For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 450 kHz to 30 MHz shall not exceed 250 microvolts. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

FCC PART 15.207

FREQUENCY RANGE	FIELD STRENGTH (Microvolts)	FIELD STRENGTH (dBuV)/QP
450kHz-30MHz	250	48

§15.209- RADIATED EMISSION LIMITS; GENERAL REQUIREMENTS

(a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

(b) In the emission table above, the tighter limit applies at the band edges.

FCC PART 15.209

MEASURING DISTANCE OF 3 METER		
FREQUENCY RANGE (MHz)	FIELD STRENGTH (Microvolts/m)	FIELD STRENGTH (dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

CONDUCTED AND RADIATED EMISSION LIMITS; ALTERNATIVE REQUIREMENTS

For the digital device radiated emissions and AC mains conducted emissions, CISPR 22 (EN 55022) Class B limits may be applied in leiu of the §15.207 and §15.209 limits specified above. For the purposes of this report, these alternative CISPR limits are used.

8. TEST SETUP, PROCEDURE AND RESULT

8.1. UNDESIRABLE EMISSIONS – RADIATED MEASUREMENTS

8.1.1. RADIATED EMISSIONS SETUP AND SYSTEM NOISE FLOOR

TEST SETUP

For measurements of the EUT as a digital device, the EUT and all other support equipment were placed on a wooden table 80 cm above the ground plane. For measurements of the EUT as a transmitter , the EUT and the laptop were placed on the wooden table. The antenna to EUT distance is 3 meters for measurements below 1 GHz and 1 meter for measurements above 1 GHz. The EUT is configured in accordance with Section 8 of ANSI C63.4/1992.

The EUT is set to transmit in a continuous mode.

TEST PROCEDURE

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 26.5 GHz is investigated for the 2.4 GHz band transmitter.

The spectrum from 30 MHz to 40 GHz is investigated for the 5.8 GHz band transmitter.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The frequency span is set small enough to easily differentiate between broadcast stations, intermittent ambient signals and EUT emissions. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the suspected signal. Measurements were made with the antenna polarized in both the vertical and the horizontal positions.

SYSTEM NOISE FLOOR FOR HARMONIC AND SPURIOUS MEASUREMENTS

Compliance Certification Services

Worst Case Radiated Emissions System Noise Floor

Each band below corresponds to each horn antenna band
Uses the lowest gain preamplifier; actual preamp used may have higher gain
Uses the longest typical cable configuration; actual cables used may have less loss
Noise floor field strength results are compared to the FCC 15.205 Restricted Band limit

Specification Distance: 3 meters

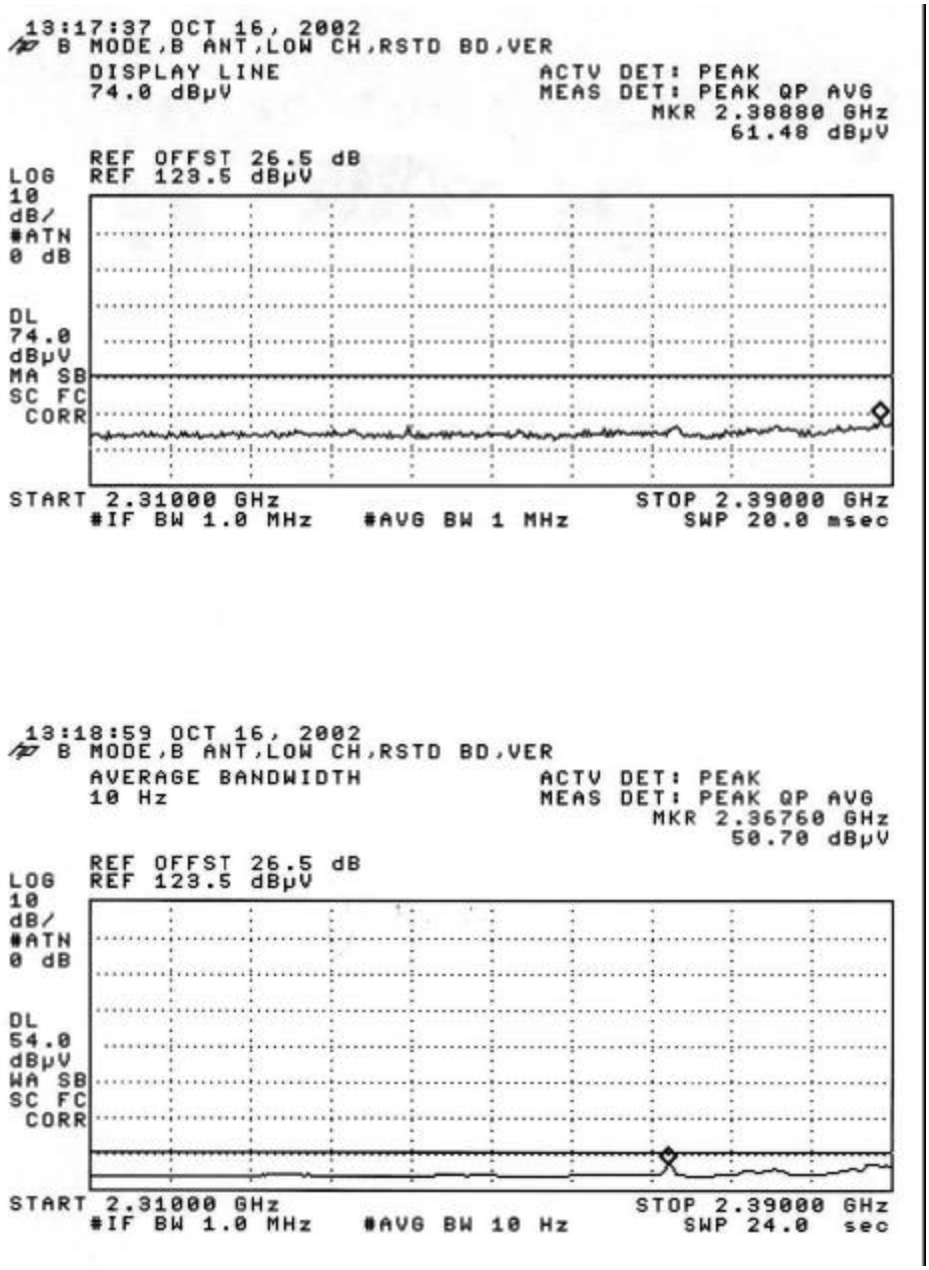
Freq GHz	SA dBuV	AF dB/m	Distance m	Distance dB	Preamp dB	Cable dB	Field dBuV/m	Limit dBuV/m	Margin dB
1 to 18 GHz band									
RBW = 1 MHz, peak detection									
18	41.9	47.8	1	-9.5	32.6	13.5	61.06	74	-12.94
RBW = 1 MHz, average detection									
18	28.7	47.8	1	-9.5	32.6	13.5	47.86	54	-6.14
18 to 26 GHz band									
RBW = 1 MHz, peak detection									
26	44.6	33.4	1	-9.5	35.0	19.5	52.96	74	-21.04
RBW = 1 MHz, average detection									
26	32.4	33.4	1	-9.5	35.0	19.5	40.76	54	-13.24
26 to 40 GHz band									
External mixer is used for this band									
Preamplifier is internal to Spectrum Analyzer, with gain factor built into firmware									
Antenna is mounted directly on external mixer, therefore cable = 0 dB									
RBW = 1 MHz, peak detection									
40	39.2	44.5	0.3	-20.0	0.0	0	63.70	74	-10.30
RBW = 1 MHz, average detection									
40	27.2	44.5	0.3	-20.0	0.0	0	51.70	54	-2.30

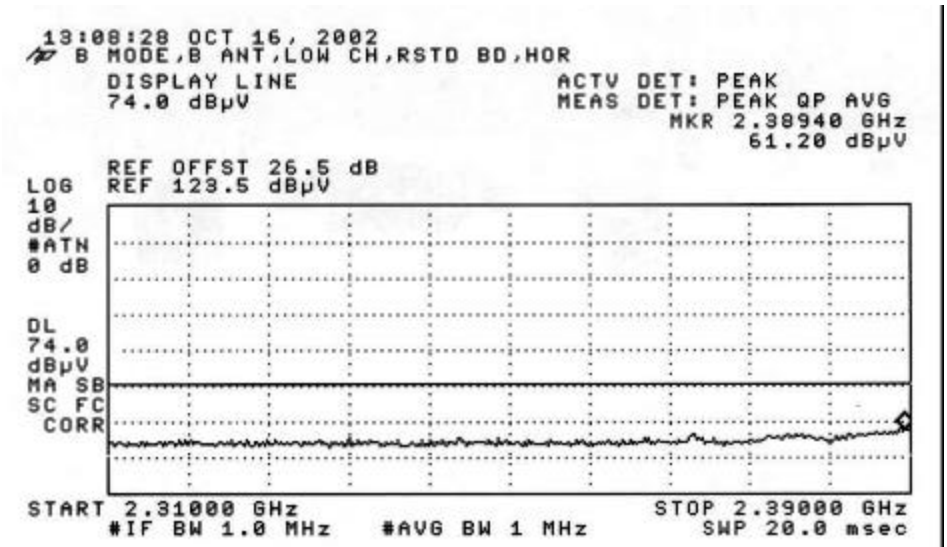
8.1.2. RADIATED EMISSIONS FOR OPERATION IN 2.4 GHz BAND

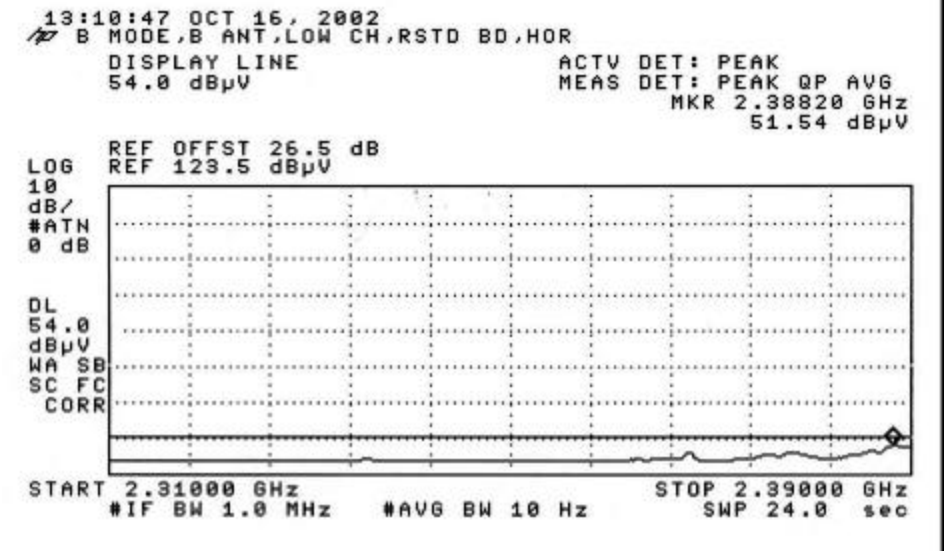
TEST RESULTS

No non-compliance noted:

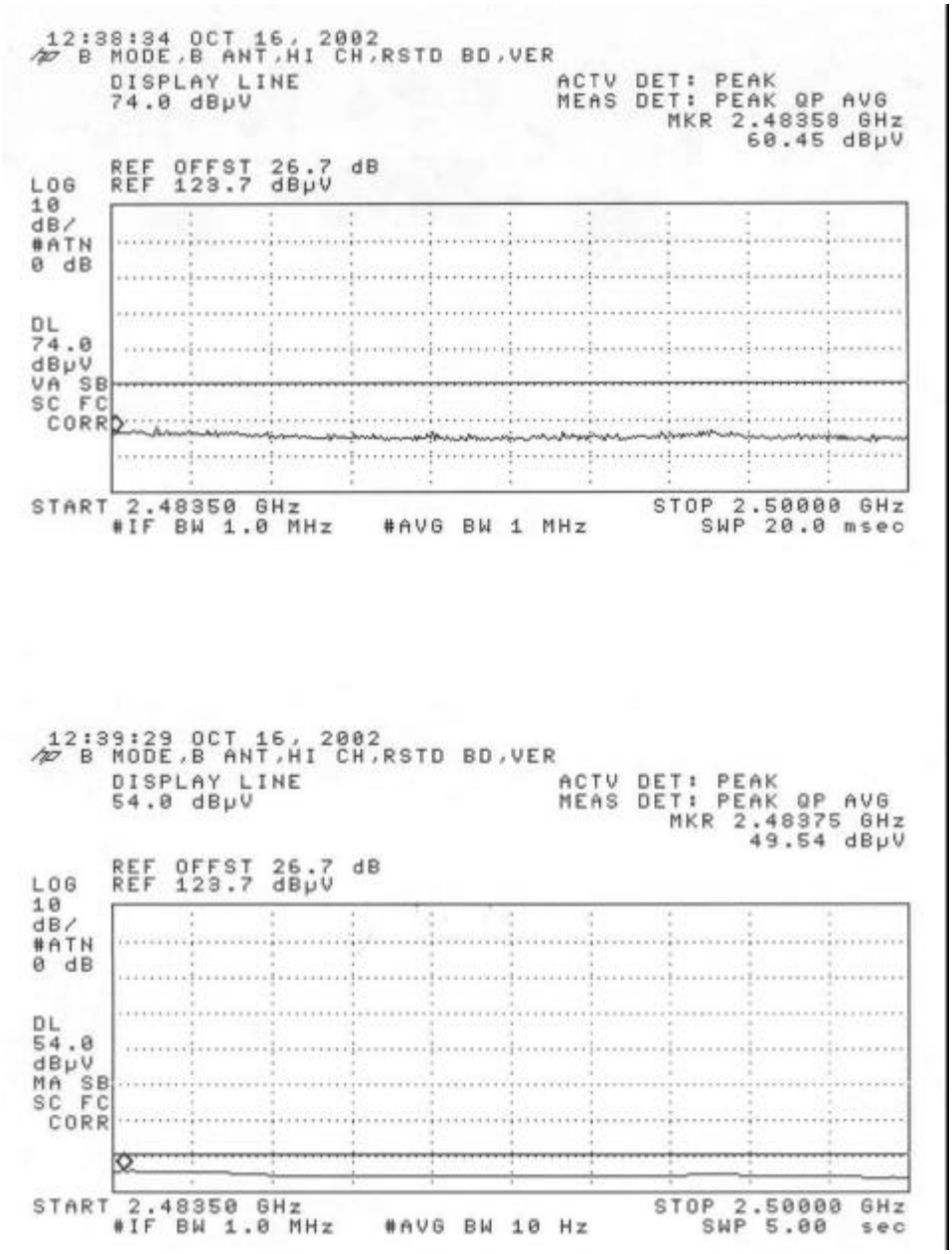
RESTRICTED BAND LOW

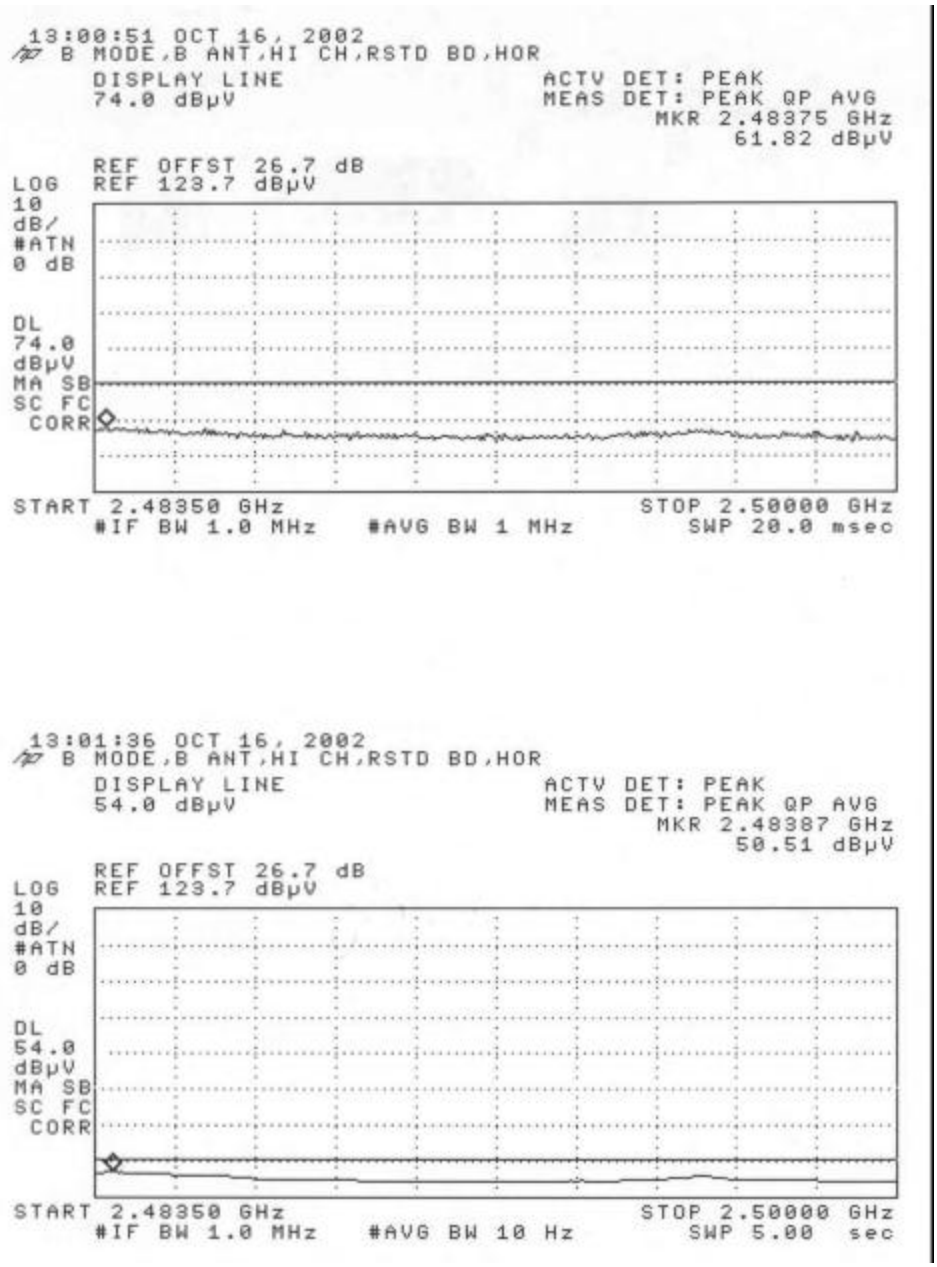






RESTRICTED BAND HIGH





FUNDAMENTAL, HARMONIC AND SPURIOUS RADIATED EMISSIONS

Description of Test:			Radiated Emissions								
Project Number:			02U1529								
Date:			10/15/02								
Test Engineer:			Van Lee								
Company:			Philips								
EUT Description:			802.11 Combo Mini PCI WLAN Card								
Test Configuration:			EUT / Antennas / Laptop / AC Adapter								
Mode of Operation:			Constant Tx, Low Channel 2412 MHz								
Specification Distance:			3.0	meters							
Actual Distance:			1.5	meters		Cable Length:		14.0	feet		
Freq	**Pol**	**Det**	**SA**	**Dist**	**AF**	**Preamp**	**Filter**	**Cable**	**Field**	**Limit**	**Margin**
GHz	**V/H**		**dBuV**	**dB**	**dB/m**	**dB**	**dB**	**dB**	**dBuV/m**	**dBuV/m**	**dB**
Note 1: 100 kHz RBW used for fundamental and spurious emissions outside restricted bands.											
Note 2: 1 MHz RBW used for spurious emissions within restricted bands.											
Fundamental:											
2.412	H	100 k	72.8	-6.0	28.9	0.0	0.0	3.6	99.3		
2.412	V	100 k	74.9	-6.0	28.9	0.0	0.0	3.6	101.4		
Lower Band Edge:											
2.400	V	100 k	36.2	-6.0	28.9	0.0	0.0	3.6	62.6	81.4	-18.8
2.400	H	100 k	36.5	-6.0	28.9	0.0	0.0	3.6	62.9	81.4	-18.5
Harmonics and Spurious:											
4.824	V	Peak	36.9	-6.0	33.8	36.0	1.0	5.3	35.0	74.0	-39.0
4.824	V	Avg	32.4	-6.0	33.8	36.0	1.0	5.3	30.5	54.0	-23.5
4.824	H	Peak	35.5	-6.0	33.8	36.0	1.0	5.3	33.6	74.0	-40.4
4.824	H	Avg	29.6	-6.0	33.8	36.0	1.0	5.3	27.7	54.0	-26.3
5.580	V	100 k	55.0	-6.0	35.1	36.3	1.0	5.9	54.6	81.4	-26.8
5.580	H	100 k	53.2	-6.0	35.1	36.3	1.0	5.9	52.8	81.4	-28.6
6.333	V	100 k	58.3	-6.0	35.4	36.5	1.0	6.3	58.5	81.4	-22.9
6.333	H	100 k	56.0	-6.0	35.4	36.5	1.0	6.3	56.2	81.4	-25.2
7.236	V	100 k	49.2	-6.0	37.0	36.4	1.0	6.8	51.6	81.4	-29.8
7.236	H	100 k	46.0	-6.0	37.0	36.4	1.0	6.8	48.4	81.4	-33.0
Note 3: No other non-harmonic spurious emissions were detected.											
Note 4: All other harmonic spurious emissions were below the system noise floor.											

Description of Test:				Radiated Emissions							
Project Number:				02U1529							
Date:				10/15/02							
Test Engineer:				Van Lee							
Company:				Philips							
EUT Description:				802.11 Combo Mini PCI WLAN Card							
Test Configuration:				EUT / Antennas / Laptop / AC Adapter							
Mode of Operation:				Constant Tx, Mid Channel 2437 MHz							
Specification Distance:				3.0	meters						
Actual Distance:				1.5	meters	Cable Length:		14.0	feet		
Freq	**Pol**	**Det**	**SA**	**Dist**	**AF**	**Preamp**	**Filter**	**Cable**	**Field**	**Limit**	**Margin**
GHz	**V/H**		**dBuV**	**dB**	**dB/m**	**dB**	**dB**	**dB**	**dBuV/m**	**dBuV/m**	**dB**
Note 1: 100 kHz RBW used for fundamental and spurious emissions outside restricted bands.											
Note 2: 1 MHz RBW used for spurious emissions within restricted bands.											
Fundamental:											
2.437	H	100 k	72.9	-6.0	29.0	0.0	0.0	3.6	99.4		
2.437	V	100 k	71.5	-6.0	29.0	0.0	0.0	3.6	98.0		
Harmonics and Spurious:											
4.874	V	Peak	35.2	-6.0	33.9	36.0	1.0	5.4	33.5	74.0	-40.5
4.874	V	Avg	30.2	-6.0	33.9	36.0	1.0	5.4	28.5	54.0	-25.5
4.874	H	Peak	33.7	-6.0	33.9	36.0	1.0	5.4	32.0	74.0	-42.0
4.874	H	Avg	27.7	-6.0	33.9	36.0	1.0	5.4	26.0	54.0	-28.0
5.580	V	100 k	59.0	-6.0	35.1	36.3	1.0	5.9	58.6	79.4	-20.8
5.580	H	100 k	58.0	-6.0	35.1	36.3	1.0	5.9	57.6	79.4	-21.8
6.333	V	100 k	60.0	-6.0	35.4	36.5	1.0	6.3	60.2	79.4	-19.2
6.333	H	100 k	55.8	-6.0	35.4	36.5	1.0	6.3	56.0	79.4	-23.4
7.311	V	Peak	50.7	-6.0	37.2	36.3	1.0	6.8	53.3	74.0	-20.7
7.311	V	Avg	44.3	-6.0	37.2	36.3	1.0	6.8	46.9	54.0	-7.1
7.311	H	Peak	51.0	-6.0	37.2	36.3	1.0	6.8	53.6	74.0	-20.4
7.311	H	Avg	42.0	-6.0	37.2	36.3	1.0	6.8	44.6	54.0	-9.4
Note 3: No other non-harmonic spurious emissions were detected.											
Note 4: All other harmonic spurious emissions were below the system noise floor.											

Description of Test:				Radiated Emissions							
Project Number:				02U1529							
Date:				10/15/02							
Test Engineer:				Van Lee							
Company:				Philips							
EUT Description:				802.11 Combo Mini PCI WLAN Card							
Test Configuration:				EUT / Antennas / Laptop / AC Adapter							
Mode of Operation:				Constant Tx, High Channel 2462 MHz							
Specification Distance:				3.0	meters						
Actual Distance:				1.5	meters	Cable Length:		14.0	feet		
Freq	**Pol**	**Det**	**SA**	**Dist**	**AF**	**Preamp**	**Filter**	**Cable**	**Field**	**Limit**	**Margin**
GHz	**V/H**		**dBuV**	**dB**	**dB/m**	**dB**	**dB**	**dB**	**dBuV/m**	**dBuV/m**	**dB**
Note 1: 100 kHz RBW used for fundamental and spurious emissions outside restricted bands.											
Note 2: 1 MHz RBW used for spurious emissions within restricted bands.											
Fundamental:											
2.462	H	100 k	74.5	-6.0	29.0	0.0	0.0	3.6	101.1		
2.462	V	100 k	72.8	-6.0	29.0	0.0	0.0	3.6	99.4		
Harmonics and Spurious:											
4.924	V	Peak	33.7	-6.0	34.1	36.0	1.0	5.4	32.1	74.0	-41.9
4.924	V	Avg	25.6	-6.0	34.1	36.0	1.0	5.4	24.0	54.0	-30.0
4.924	H	Peak	34.1	-6.0	34.1	36.0	1.0	5.4	32.5	74.0	-41.5
4.924	H	Avg	24.5	-6.0	34.1	36.0	1.0	5.4	22.9	54.0	-31.1
5.620	V	100 k	60.3	-6.0	35.2	36.4	1.0	5.9	60.0	81.1	-21.1
5.620	H	100 k	59.7	-6.0	35.2	36.4	1.0	5.9	59.4	81.1	-21.7
6.333	V	100 k	60.5	-6.0	35.4	36.5	1.0	6.3	60.7	81.1	-20.4
6.333	H	100 k	55.7	-6.0	35.4	36.5	1.0	6.3	55.9	81.1	-25.2
7.386	V	Peak	50.7	-6.0	37.3	36.3	1.0	6.8	53.6	74.0	-20.4
7.386	V	Avg	43.7	-6.0	37.3	36.3	1.0	6.8	46.6	54.0	-7.4
7.386	H	Peak	47.2	-6.0	37.3	36.3	1.0	6.8	50.1	74.0	-23.9
7.386	H	Avg	37.7	-6.0	37.3	36.3	1.0	6.8	40.6	54.0	-13.4
Note 3: No other non-harmonic spurious emissions were detected.											
Note 4: All other harmonic spurious emissions were below the system noise floor.											

8.1.3. RADIATED EMISSIONS FOR OPERATION IN 5.8 GHz BAND

TEST RESULTS

No non-compliance noted:

FUNDAMENTAL, HARMONIC AND SPURIOUS RADIATED EMISSIONS

Description of Test:				Radiated Emissions							
Project Number:				02U1529							
Date:				10/10/02							
Test Engineer:				Frank Ibrahim							
Company:				Philips							
EUT Description:				802.11 Combo Mini PCI WLAN Card							
Test Configuration:				EUT / Antennas / Laptop / AC Adapter							
Mode of Operation:				Constant Tx, Low Channel 5745 MHz							
Specification Distance:				3.0	meters						
Actual Distance:				1.0	meters	Cable Length:		14.0	feet		
Freq	**Pol**	**Det**	**SA**	**Dist**	**AF**	**Preamp**	**Filter**	**Cable**	**Field**	**Limit**	**Margin**
GHz	**V/H**		**dBuV**	**dB**	**dB/m**	**dB**	**dB**	**dB**	**dBuV/m**	**dBuV/m**	**dB**
Note 1: 100 kHz RBW used for fundamental and spurious emissions outside restricted bands.											
Note 2: 1 MHz RBW used for spurious emissions within restricted bands.											
Fundamental:											
5.745	H	100 k	73.8	-9.5	35.3	0.0	0.0	3.9	103.5		
5.745	V	100 k	72.5	-9.5	35.3	0.0	0.0	3.9	102.2		
Low Band Edge:											
5.725	H	100 k	45.0	-9.5	35.3	0.0	0.0	3.9	74.7	83.5	-8.8
5.725	V	100 k	43.5	-9.5	35.3	0.0	0.0	3.9	73.2	83.5	-10.3
Harmonics and Spurious:											
11.490	V	Peak	60.1	-9.5	39.5	36.0	1.0	8.6	63.7	74.0	-10.3
11.490	V	Avg	45.0	-9.5	39.5	36.0	1.0	8.6	48.6	54.0	-5.4
11.490	H	Peak	49.6	-9.5	39.5	36.0	1.0	8.6	53.2	74.0	-20.8
11.490	H	Avg	38.4	-9.5	39.5	36.0	1.0	8.6	42.0	54.0	-12.0
Note 3: No other non-harmonic spurious emissions were detected.											
Note 4: All other harmonic spurious emissions were below the system noise floor.											

Description of Test:				Radiated Emissions							
Project Number:				02U1529							
Date:				10/10/02							
Test Engineer:				Frank Ibrahim							
Company:				Philips							
EUT Description:				802.11 Combo Mini PCI WLAN Card							
Test Configuration:				EUT / Antennas / Laptop / AC Adapter							
Mode of Operation:				Constant Tx, Mid Channel 5785 MHz							
Specification Distance:				3.0	meters						
Actual Distance:				1.0	meters	Cable Length:		14.0	feet		
Freq	**Pol**	**Det**	**SA**	**Dist**	**AF**	**Preamp**	**Filter**	**Cable**	**Field**	**Limit**	**Margin**
GHz	**V/H**		**dBuV**	**dB**	**dB/m**	**dB**	**dB**	**dB**	**dBuV/m**	**dBuV/m**	**dB**
Note 1: 100 kHz RBW used for fundamental and spurious emissions outside restricted bands.											
Note 2: 1 MHz RBW used for spurious emissions within restricted bands.											
Fundamental:											
5.785	H	100 k	76.3	-9.5	35.4	0.0	0.0	3.9	106.0		
5.785	V	100 k	74.1	-9.5	35.4	0.0	0.0	3.9	103.8		
Harmonics and Spurious:											
11.570	V	Peak	51.4	-9.5	39.5	36.0	1.0	8.7	54.9	74.0	-19.1
11.570	V	Avg	40.5	-9.5	39.5	36.0	1.0	8.7	44.0	54.0	-10.0
11.570	H	Peak	53.8	-9.5	39.5	36.0	1.0	8.7	57.3	74.0	-16.7
11.570	H	Avg	42.5	-9.5	39.5	36.0	1.0	8.7	46.0	54.0	-8.0
Note 3: No other non-harmonic spurious emissions were detected.											
Note 4: All other harmonic spurious emissions were below the system noise floor.											

Description of Test:			Radiated Emissions								
Project Number:			02U1529								
Date:			10/10/02								
Test Engineer:			Frank Ibrahim								
Company:			Philips								
EUT Description:			802.11 Combo Mini PCI WLAN Card								
Test Configuration:			EUT / Antennas / Laptop / AC Adapter								
Mode of Operation:			Constant Tx, High Channel 5825 MHz								
Specification Distance:			3.0	meters							
Actual Distance:			1.0	meters		Cable Length:		14.0	feet		
Freq	**Pol**	**Det**	**SA**	**Dist**	**AF**	**Preamp**	**Filter**	**Cable**	**Field**	**Limit**	**Margin**
GHz	**V/H**		**dBuV**	**dB**	**dB/m**	**dB**	**dB**	**dB**	**dBuV/m**	**dBuV/m**	**dB**
Note 1: 100 kHz RBW used for fundamental and spurious emissions outside restricted bands.											
Note 2: 1 MHz RBW used for spurious emissions within restricted bands.											
Fundamental:											
5.825	H	100 k	73.4	-9.5	35.4	0.0	0.0	3.9	103.1		
5.825	V	100 k	71.4	-9.5	35.4	0.0	0.0	3.9	101.1		
Upper Band Edge:											
5.850	H	100 k	39.9	-9.5	35.4	0.0	0.0	3.9	69.6	83.1	-13.5
5.850	V	100 k	38.0	-9.5	35.4	0.0	0.0	3.9	67.7	83.1	-15.4
Harmonics and Spurious:											
11.650	V	Peak	52.8	-9.5	39.4	36.1	1.0	8.7	56.3	74.0	-17.7
11.650	V	Avg	40.1	-9.5	39.4	36.1	1.0	8.7	43.6	54.0	-10.4
11.650	H	Peak	49.2	-9.5	39.4	36.1	1.0	8.7	52.7	74.0	-21.3
11.650	H	Avg	37.3	-9.5	39.4	36.1	1.0	8.7	40.8	54.0	-13.2
Note 3: No other non-harmonic spurious emissions were detected.											
Note 4: All other harmonic spurious emissions were below the system noise floor.											

8.1.4. DIGITAL DEVICE RADIATED EMISSIONS

TEST RESULTS

No non-compliance noted:

COMPLIANCE Certification Services

FCC, VCCI, CISPR, CE, AUSTEL, NZ
UL, CSA, TUV, BSMI, DHHS, NVLAP

561F MONTEREY ROAD, SAN JOSE, CA 95037-9001
PHONE: (408) 463-0885 FAX: (408) 463-0888

Project #:	02U1529-1
Report #:	021015B1
Date& Time:	10/15/02 3:53 PM
Test Engr:	Thanh Nguyen
Company:	PHILIPS COMPONENTS
EUT Description:	802.11 Combo MiniPCI WLAN Card
Test Configuration :	EUT, LapTop,Printer,Modem, Antenna
Type of Test:	EN55022 Class B, FCC Class B
Mode of Operation:	Normal Continous TX

<< Main Sheet

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit EN_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
33.00	32.90	15.74	1.60	28.52	21.72	30.00	-8.28	10mV	180.00	1.00	P
844.15	29.20	19.98	7.63	28.45	28.35	37.00	-8.65	10mV	0.00	1.00	P
754.14	28.60	19.32	7.16	28.74	26.33	37.00	-10.67	10mV	180.00	1.00	P
62.64	38.90	5.65	2.06	28.47	18.13	30.00	-11.87	10mV	180.00	1.00	P
116.02	32.20	11.54	2.71	28.41	18.04	30.00	-11.96	10mV	0.00	1.00	P
582.33	28.30	18.46	6.17	28.91	24.03	37.00	-12.97	10mV	180.00	1.00	P
6 Worst Data											

8.2. POWER LINE CONDUCTED EMISSIONS

TEST SETUP

The EUT is placed on a wooden table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane on the floor.

The EUT is set to transmit in a continuous mode.

TEST PROCEDURE

The resolution bandwidth is set to 10 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Line conducted data is recorded for both NEUTRAL and HOT lines.

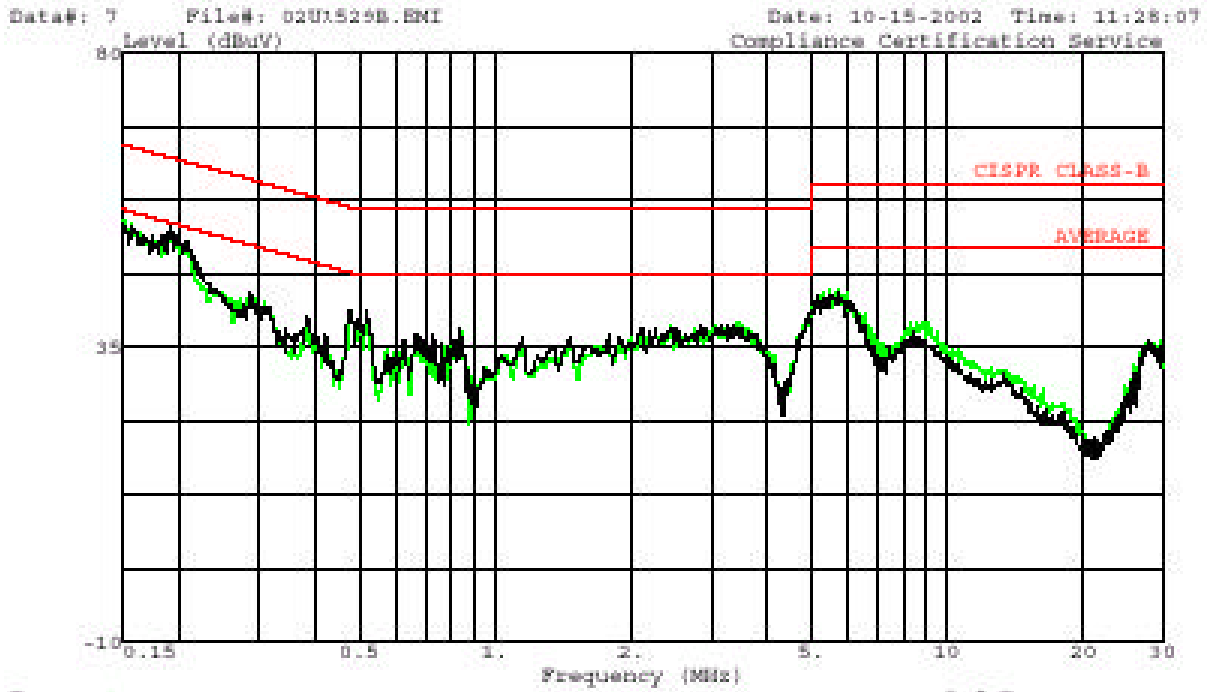
RESULTS

No non-compliance noted:

CONDUCTED EMISSIONS DATA

Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.15	54.46	--	--	0.00	66.00	56.00	-11.54	-1.54	L1
0.19	51.90	--	--	0.00	64.86	54.86	-12.96	-2.96	L1
5.74	43.66	--	--	0.00	60.00	50.00	-16.34	-6.34	L1
0.19	53.64	--	--	0.00	64.86	54.86	-11.22	-1.22	L2
0.15	53.44	--	--	0.00	66.00	56.00	-12.56	-2.56	L2
5.74	43.44	--	--	0.00	60.00	50.00	-16.56	-6.56	L2
6 Worst Data									

561F Monterey Road,
San Jose, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888

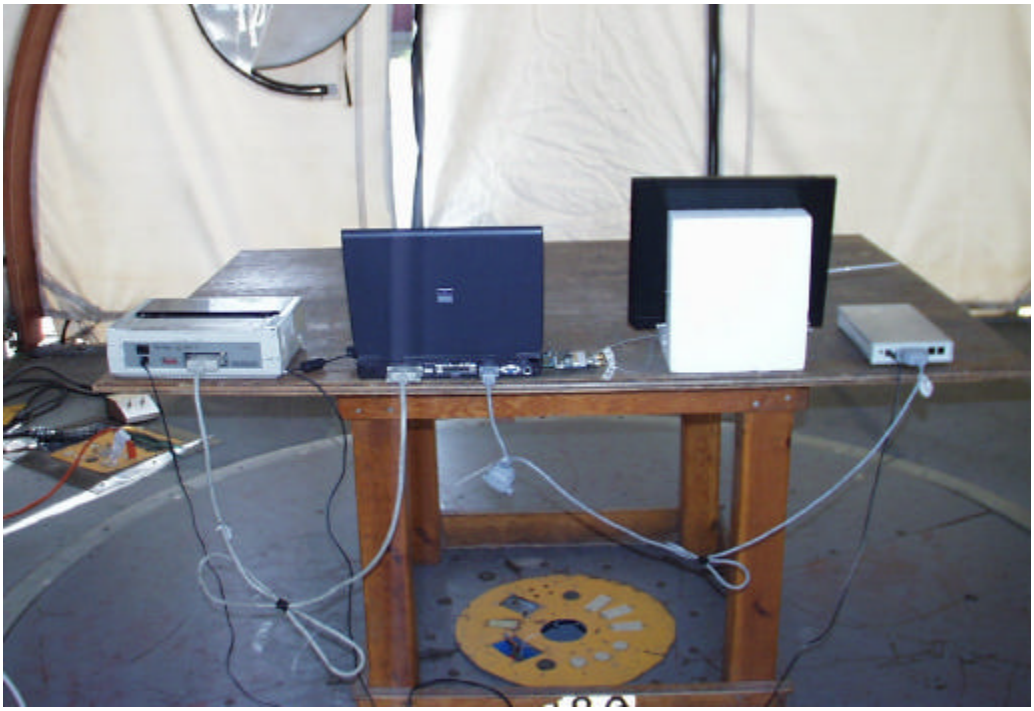


Trace: 3 Ref Trace:
Project # : 02u1529-1
Test Engineer : Thanh Nguyen
Company : Philips Components
EUT : 802.11 Combo MiniPCI WLAN Card
Model Name : Number PN11107-X (X is A,B,C,D&E)
Test Config. : EUT and Support Equipments
Test of Target: FCC Class B
Mode of Op. : Normal Continuous Transmit
: 120VAC @ 60Hz
: PEAK Line 1 (GREEN), Line 2 (Black)

8.3. SETUP PHOTOS

TRANSMITTER RADIATED RF MEASUREMENT SETUP

DIGITAL DEVICE RADIATED EMISSIONS MEASUREMENT SETUP



POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP

END OF REPORT