FCC CFR47 PART 15 SUBPART E CERTIFICATION

TEST REPORT

FOR

D-LINK SYSTEMS, INC.

802.11 a/b BAND PCI ADAPTER

MODEL NUMBER: PC22, DWL-AB520, WPC-D11

BRAND NAME: D-LINK

FCC ID: KA22002080002-1

REPORT NUMBER: 02U1466-1

ISSUE DATE: AUGUST 19, 2002

Prepared for
D-LINK CORPORATION
NO. 8, LI-SHING ROAD VII,
SCIENCE-BASED INDUSTRIAL PARK
HSINCHU, TAIWAN R.O.C.

Prepared by
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1. TEST RESULT CERTIFICATION

COMPANY NAME: **D-LINK CORPORATION**
NO.8, LI-SHING ROAD VII
SCIENCE-BASED INDUSTRIAL PARK
HSINCHU, TAIWAN R.O.C.

EUT DESCRIPTION: **802.11 a/b BAND PCI ADAPTER**

MODEL NUMBER: **PC22, DWL-AB520, WPC-D11**

BRAND NAME: **D-LINK**

DATE TESTED: **AUGUST 12 – 16, 2002**

TYPE OF EQUIPMENT	INTENTIONAL RADIATOR
EQUIPMENT TYPE	(5.15 – 5.35) & (5.725 – 5.825) GHz TRANSCEIVER
MEASUREMENT PROCEDURE	ANSI 63.4 / 1992, TIA/EIA 603
PROCEDURE	CERTIFICATION
FCC RULE	CFR 47 PART 15.E

Compliance Certification Services, Inc. tested the above equipment for compliance with the requirements set forth in CFR 47, PART 15, Subpart E. 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:

STEVE CHENG
EMC ENGINEERING MANAGER
COMPLIANCE CERTIFICATION SERVICES

Tested By:

FRANK IBRAHIM
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. EUT DESCRIPTION

The D-Link WLAN 802.11a/b PCI adaptor is based on the AR5001 three-chip set which implements IEEE 802.11a, IEEE 802.11b/g and intended for desktop applications. It operates in the 5.15-5.35 GHz, 5.725 - 5.825GHz, and 2.40-2.4835GHz bands with a maximum Tx output power of 17.3 dBm in 802.11a (UNII), band. The product uses one internal antenna with gain of 3.25dBi and one external antenna with gain of 4dBi for diversity operation.

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	NVLAP 200065-0
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	FC 1300
Japan	VCCI	CISPR 22 Two OATS and one conducted Site	VCCI 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	N 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	N ELA-171
Taiwan	BSMI	CNS 13438	商檢 SL2-IN-E-1012
Canada	Industry Canada	RSS210 Low Power Transmitter and Receiver	Canada 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 EQUIPMENTS LIST				
Name of Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Due Date**
Spectrum Analyzer	HP	8564E	3943A01643	7/22/03
Horn Antenna	EMCO	3115	6717	1/31/03
Pre-amplifier,35.5 dB (1 - 26.5GHz)	HP	8449B	3008A00369	6/30/03
Horn Antenna,(18 - 26GHz)	Antenna Research Associate	MWH 1826/B	1013	7/26/03
Microwave Amp(2- 8GHz)	HP	11975A	2517A01067	8/23/02
Harmonic Mixer(26.5 - 40GHz)	HP	11970A	3003A04190	9/22/02
Horn Antenna	Diamond Antenna & Microwave	1149	002	9/22/02
Spectrum Analyzer	HP	8563E	Not Available	3/18/04
EMI Test Receiver	Rohde & Schwarz	ESHS 20	827129/006	4/17/03
LISN	Fischer 9k - 100MHz	FCC-LISN-50/250-25-2	114	4/23/03
LISN	Solar Elec. Co.	8012-50-R-24-BNC	837990	4/25/03
Line Filter	Lindgren 10k - 10GHz	LMF-3489	497	N.C.R.
Spectrum Analyzer	HP 0.1K - 1.5GHz	8568B	2732A03661	5/16/03
Spectrum Display	HP	85662A	2816A16696	5/16/03
Quasi Peak Adapter	HP9K - 1GHz	85650A	2811A01155	5/16/03
Pre-Amplifier,25 dB	HP0.1 - 1300MHz	8447D (P5)	2944A06550	8/10/03
Antenna, Bicon	Eaton30 - 200MHz	94455-1	1214	3/30/03
Antenna, LP	EMCO200 - 2000MHz	3146	9107-3163	3/30/03
Environmental Chamber	Thermotron	SE-600-10-10	29800	4/26/03

6. SETUP OF EQUIPMENT UNDER TEST

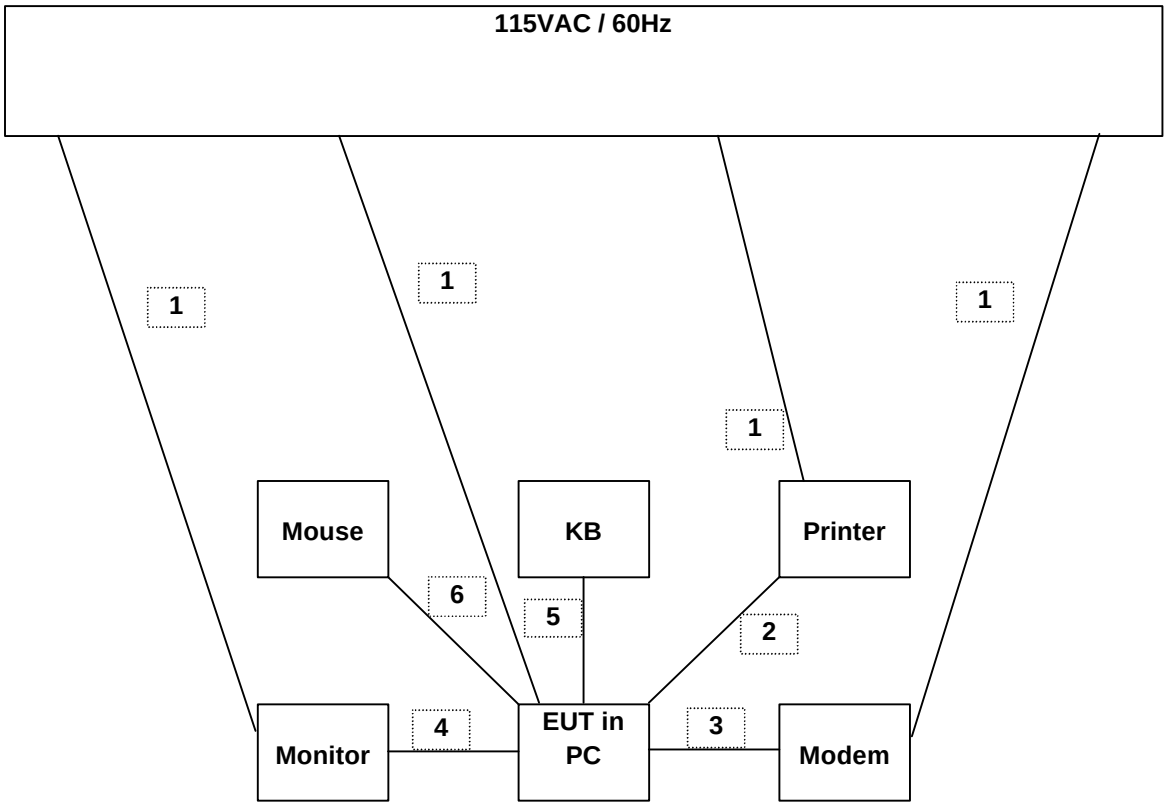
SUPPORT EQUIPMENT

TEST PERIPHERALS				
Device Type	**Manufacturer**	**Model Number**	**Serial Number**	**FCC ID**
PC	Enlight Corp	Kudos	Not Available	DoC
Monitor	Zenith	ZCM-1750-DT	3P5-60500786A0	DBL1785GM
PS/2 Mouse	Logitech	M-CAA43	LZE02855315	DoC
Keyboard	Acer	6511-TA	3882A039	DoC
MODEM	ACEEX	1414	9013538	IFAXDM1414
Printer	HP	2225C	2541S41679	DoC

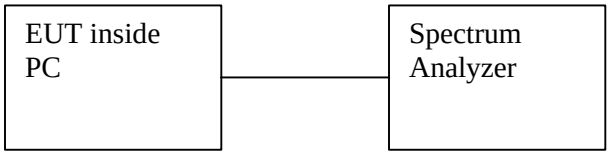
I/O CABLES

TEST I / O CABLES								
Cable No	**I/O Port**	**# of I/O Port**	**Connector Type**	**Type of Cable**	**Cable Length**	**Data Traffic**	**Bundled**	**Remark**
1	AC	4	US 115V	Un-shielded	2m	No	No	EUT power cable bundled only for LC test
2	Parallel	1	DB25	Shielded	2m	Yes	Yes	N/A
3	Serial	1	DB9	Shielded	1m	Yes	Yes	N/A
4	Video	1	DB15	Shielded	2m	Yes	Yes	One Torroid on Each End
5	KB	1	PS/2	Un-shielded	2m	Yes	No	N/A
6	Mouse	1	PS/2	Un-shielded	2m	Yes	No	N/A

SETUP DIAGRAM FOR DIGITAL DEVICE TESTS



SETUP DIAGRAM FOR TRANSMITTER TESTS



7. APPLICABLE RULES AND BRIEF TEST RESULT

§15.403- EMISSION BANDWIDTH

(c) Emission bandwidth. For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

§15.407(a)- POWER LIMIT

(1) For the band 5.15-5.25 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 50mW (17dBm) or 4dBm + 10log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(2) For the band 5.25-5.35 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250mW (24dBm) or 11dBm + 10log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(3) For the band 5.725-5.825 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 1 W (30dBm) or 17dBm + 10log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§15.407(a)- PEAK POWER SPECTRAL DENSITY

(1) For the band 5.15-5.25 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed **4 dBm** in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the band 5.25-5.35 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed **11 dBm** in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.825 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed **17 dBm** in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§15.407(a)- PEAK EXCURSION

(6) The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

§15.407(b)- UNDESIRABLE EMISSION – BAND EDGE

(1 & 2) For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27dBm / MHz.

(6) The provisions of 15.205 apply to intention radiators operating under this section (–21dBm (for peak) and –41dBm (for average) EIRP in restricted band).

Note: The restricted band limits in (6) are more stringent than the band edge limits in (1&2), given a resolution bandwidth of 1MHz, therefore in this report, test results at 5.15 and 5.35 GHz are compared to the 15.205 / 15.209 restricted limits.

(3) For transmitters operating in the 5.725-5.825 GHz band: all emissions within frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of –17dBm / MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of –27dBm / MHz.

§15.407(g)- FREQUENCY STABILITY

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

§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

§15.407(b)- UNDESIRABLE EMISSION LIMITS

(1 & 2) For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27dBm / MHz.

(5) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(6) The provisions of §15.205 apply to intentional radiators operating under this section.

§15.407(c)- TRANSMISSION IN CASE OF ABSENCE OF INFORMATION

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

§15.407(d)- ANTENNA TYPE

Any U-NII device that operates in the 5.15-5.25 GHz band shall use a transmitting antenna that is an integral part of the device.

§15.407(f)- RADIO FREQUENCY EXPOSURE

U-NII devices are subject to the radio frequency radiation exposure requirements specified in §1.1307(b), §2.1091 and §2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a "general population/uncontrolled" environment. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

§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.

§15.209- 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

8. TEST SETUP, PROCEDURE AND RESULT

8.1. TYPE OF ANTENNA

RESULTS

No non-compliance noted:

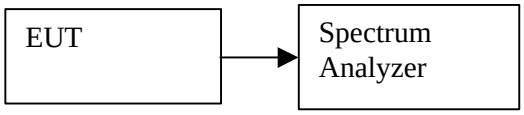
The antenna is integral to the device.

8.2. EMISSION BANDWIDTH

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	☒ Peak ☐ Average	☐ 300 kHz ☒ 1 MHz	☐ 300 kHz ☒ 1 MHz

TEST SETUP



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to approximately 1% of the emission bandwidth. The 26 dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 26 dB.

RESULT:

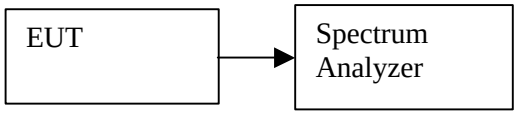
Operating in the 5.15 – 5.35 GHz Band (Normal Mode) – Antenna A port		
Channel	***Frequency (MHz)***	***BW 26dBc (MHz)***
Low	***5180***	***28.08***
Middle	***5260***	***33.00***
High	***5320***	***32.08***
Operating in the 5.15 – 5.35 GHz Band (Normal Mode) – Antenna B port		
Channel	***Frequency (MHz)***	***BW 26dBc (MHz)***
Low	***5180***	***30.25***
Middle	***5260***	***31.75***
High	***5320***	***33.00***
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode) – Antenna A port		
Channel	***Frequency (MHz)***	***BW 26dBc (MHz)***
Low	***5210***	***59.30***
Middle	***5250***	***61.00***
High	***5290***	***65.70***
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode) – Antenna B port		
Channel	***Frequency (MHz)***	***BW 26dBc (MHz)***
Low	***5210***	***61.20***
Middle	***5250***	***64.20***
High	***5290***	***58.80***
Operating in the 5.725 – 5.825 GHz Band (Normal Mode) – Antenna A port		
Channel	***Frequency (MHz)***	***BW 26dBc (MHz)***
Low	***5745***	***31.92***
Middle	***5785***	***30.00***
High	***5805***	***31.58***
Operating in the 5.725 – 5.825 GHz Band (Normal Mode) – Antenna B port		
Channel	***Frequency (MHz)***	***BW 26dBc (MHz)***
Low	***5745***	***33.33***
Middle	***5785***	***33.67***
High	***5805***	***33.58***

Operating in the 5.725 – 5.825 GHz Band (Turbo Mode) – Antenna A port		
Channel	***Frequency (MHz)***	***BW 26dBc (MHz)***
Low	***5760***	***63.20***
Middle	***N/A***	***N/A***
High	***5800***	***59.80***
Operating in the 5.725 – 5.825 GHz Band (Turbo Mode) – Antenna B port		
Channel	***Frequency (MHz)***	***BW 26dBc (MHz)***
Low	***5760***	***61.30***
Middle	***N/A***	***N/A***
High	***5800***	***65.70***

Please refer to Exhibit (**TestPlot-BW.DOC**) for detailed plots.

8.3. PEAK POWER

TEST SETUP



Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	☒ Peak	☒ 1 MHz	☒ 300 kHz ☒ 1 MHz VBW = EBW / (2¶*30)

TEST PROCEDURE

The EUT is configured on a test bench as shown above in a continuously transmitting mode.
For each channel measured, the channel power is measured over the specified bandwidth that was measured in the previous section.

RESULT:

(Antenna A port)

Operating in the 5.15 – 5.35 GHz Band (Normal Mode)			
Channel	***Frequency (MHz)***	***Channel Power Measured (dBm)***	***Limit (dBm)***
Low	***5180***	***13.0***	***17.0***
Middle	***5260***	***17.0***	***24.0***
High	***5320***	***13.1***	***24.0***
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode)			
Channel	***Frequency (MHz)***	***Channel Power Measured (dBm)***	***Limit (dBm)***
Low	***5210***	***15.6***	***17.0***
Middle	***5250***	***16.7***	***17.0***
High	***5290***	***15.9***	***24.0***
Operating in the 5.725 – 5.825 GHz Band (Normal Mode)			
Channel	***Frequency (MHz)***	***Channel Power Measured (dBm)***	***Limit (dBm)***
Low	***5745***	***16.7***	***30.0***
Middle	***5785***	***17.1***	***30.0***
High	***5805***	***17.1***	***30.0***
Operating in the 5.725 – 5.825 GHz Band (Turbo Mode)			
Channel	***Frequency (MHz)***	***Channel Power Measured (dBm)***	***Limit (dBm)***
Low	***5760***	***16.4***	***30.0***
Middle	***N/A***	***N/A***	***N/A***
High	***5800***	***16.9***	***30.0***

(Antenna B port)

Operating in the 5.15 – 5.35 GHz Band (Normal Mode)			
Channel	***Frequency (MHz)***	***Channel Power Measured (dBm)***	***Limit (dBm)***
Low	***5180***	***12.5***	***17.0***
Middle	***5260***	***15.8***	***24.0***
High	***5320***	***13.3***	***24.0***
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode)			
Channel	***Frequency (MHz)***	***Channel Power Measured (dBm)***	***Limit (dBm)***
Low	***5210***	***16.0***	***17.0***
Middle	***5250***	***15.7***	***17.0***
High	***5290***	***15.6***	***24.0***
Operating in the 5.725 – 5.825 GHz Band (Normal Mode)			
Channel	***Frequency (MHz)***	***Channel Power Measured (dBm)***	***Limit (dBm)***
Low	***5745***	***15.9***	***30.0***
Middle	***5785***	***16.1***	***30.0***
High	***5805***	***17.2***	***30.0***
Operating in the 5.725 – 5.825 GHz Band (Turbo Mode)			
Channel	***Frequency (MHz)***	***Channel Power Measured (dBm)***	***Limit (dBm)***
Low	***5760***	***15.8***	***30.0***
Middle	***N/A***	***N/A***	***N/A***
High	***5800***	***17.3***	***30.0***

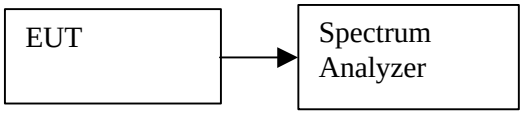
Please refer to Ehibit (TestPlot_PeakPower.DOC) for detailed plots.

8.4. PEAK POWER SPECTRAL DENSITY

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	☒ Peak	☒ 1 MHz	☒ 1 MHz

TEST SETUP



TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer, the maximum level in a 1 MHz bandwidth was measured with the spectrum analyzer using RBW =1 MHz and VBW = 1 MHz. The PPSD is the highest level found across the emission in any 1 MHz band, after sweep of video averaging.

RESULT:

(Antenna A port)

Operating in the 5.15 – 5.35 GHz Band (Normal Mode)			
Channel	***Frequency (MHz)***	***Results (dBm)***	***Limit (dBm)***
Low	***5180***	***-3.17***	***4***
Middle	***5260***	***0.83***	***11***
High	***5320***	***-2.67***	***11***
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode)			
Channel	***Frequency (MHz)***	***Results (dBm)***	***Limit (dBm)***
Low	***5210***	***-5.50***	***4***
Middle	***5250***	***-4.67***	***4***
High	***5290***	***-5.67***	***11***

Using RBW=VBW=3KHz, and set sweep time = span / 3KHz method.

Operating in the 5.725 – 5.825 GHz Band (Normal Mode)			
Channel	***Frequency (MHz)***	***Results (dBm)***	***Limit (dBm)***
Low	***5745***	***0.67***	***17***
Middle	***5785***	***0.33***	***17***
High	***5805***	***-0.67***	***17***
Operating in the 5.725 – 5.825 GHz Band (Turbo Mode)			
Channel	***Frequency (MHz)***	***Results (dBm)***	***Limit (dBm)***
Low	***5760***	***-4.50***	***17***
Middle	***N/A***	***N/A***	***17***
High	***5800***	***-4.33***	***17***

(Antenna B port)

Operating in the 5.15 – 5.35 GHz Band (Normal Mode)			
Channel	***Frequency (MHz)***	***Results (dBm)***	***Limit (dBm)***
Low	***5180***	***-4.17***	***4***
Middle	***5260***	***-2.00***	***11***
High	***5320***	***-1.67***	***11***
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode)			
Channel	***Frequency (MHz)***	***Results (dBm)***	***Limit (dBm)***
Low	***5210***	***-5.50***	***4***
Middle	***5250***	***-5.33***	***4***
High	***5290***	***-5.67***	***11***

Using RBW=VBW=3KHz, and set sweep time = span / 3KHz method.

Operating in the 5.725 – 5.825 GHz Band (Normal Mode)			
Channel	***Frequency (MHz)***	***Results (dBm)***	***Limit (dBm)***
Low	***5745***	***-1.67***	***17***
Middle	***5785***	***-2.00***	***17***
High	***5805***	***-0.50***	***17***
Operating in the 5.725 – 5.825 GHz Band (Turbo Mode)			
Channel	***Frequency (MHz)***	***Results (dBm)***	***Limit (dBm)***
Low	***5760***	***-6.17***	***17***
Middle	***N/A***	***N/A***	***17***
High	***5800***	***-5.67***	***17***

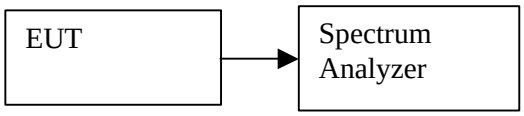
Please refer to Exhibit (TestPlot-PPSD.DOC) for detailed plots.

8.5. PEAK EXCURSION (PEAK – AVERAGE RATIO)

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	☒ Peak ☒ Average	☒ 1 MHz ☒ 1 MHz	☒ 1 MHz ☒ 30 KHz

TEST SETUP



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer through an attenuator. The spectrum analyzer is set to 1 MHz RESOLUTION BW and 1MHz VIDEO BW. Trace A is set to Max Hold, then to View. The VIDEO BW is readjusted to 30 kHz, and the signal under this measurement condition is captured in Trace B.

The difference between the traces is investigated. The marker is placed at the frequency which shows the largest difference. The amplitude delta between the traces at this frequency is the peak excursion.

RESULT:

No non-compliance noted.

(Antenna A port)

Operating in the 5.15 – 5.35 GHz Band (Normal Mode)			
Channel	***Frequency (MHz)***	***Results (dBm)***	***Limit (dBm)***
Low	***5180***	***8.00***	***13***
Middle	***5260***	***7.67***	***13***
High	***5320***	***7.84***	***13***
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode)			
Channel	***Frequency (MHz)***	***Results (dBm)***	***Limit (dBm)***
Low	***5210***	***6.84***	***13***
Middle	***5250***	***7.50***	***13***
High	***5290***	***6.84***	***13***
Operating in the 5.725 – 5.825 GHz Band (Normal Mode)			
Channel	***Frequency (MHz)***	***Results (dBm)***	***Limit (dBm)***
Low	***5745***	***7.33***	***13***
Middle	***5785***	***8.33***	***13***
High	***5805***	***7.67***	***13***
Operating in the 5.725 – 5.825 GHz Band (Turbo Mode)			
Channel	***Frequency (MHz)***	***Results (dBm)***	***Limit (dBm)***
Low	***5760***	***7.50***	***13***
Middle	***N/A***	***N/A***	***13***
High	***5800***	***7.000***	***13***

(Antenna B port)

Operating in the 5.15 – 5.35 GHz Band (Normal Mode)			
Channel	***Frequency (MHz)***	***Results (dBm)***	***Limit (dBm)***
Low	***5180***	***7.67***	***13***
Middle	***5260***	***7.33***	***13***
High	***5320***	***7.84***	***13***
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode)			
Channel	***Frequency (MHz)***	***Results (dBm)***	***Limit (dBm)***
Low	***5210***	***8.00***	***13***
Middle	***5250***	***7.50***	***13***
High	***5290***	***7.83***	***13***
Operating in the 5.725 – 5.825 GHz Band (Normal Mode)			
Channel	***Frequency (MHz)***	***Results (dBm)***	***Limit (dBm)***
Low	***5745***	***8.34***	***13***
Middle	***5785***	***7.83***	***13***
High	***5805***	***7.33***	***13***
Operating in the 5.725 – 5.825 GHz Band (Turbo Mode)			
Channel	***Frequency (MHz)***	***Results (dBm)***	***Limit (dBm)***
Low	***5760***	***7.50***	***13***
Middle	***N/A***	***N/A***	***13***
High	***5800***	***7.33***	***13***

Please refer to Exhibit (**TestPlot-PeakExcur.DOC**) for detailed plots.

8.6. UNDESIRABLE EMISSION - BAND EDGE & RESTRICTED BANDS (15.205)

RESULTS:

8.6.1 BandEdge Emissions:

(Antenna A2)

Operating in the 5.15 – 5.35 GHz Band (Normal Mode)					
Band Edge	***Frequency (MHz)***	***AV Reading (dBm)***	***Comments***	***15.407 Limit (dBm) EIRP***	***Margin (dB)***
Low	***5150***	***-42.37***		***-27***	***-15.37***
High	***5350***	***-42.03***		***-27***	***-15.03***
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode)					
Band Edge	***Frequency (MHz)***	***AV Reading (dBm)***	***Comments***	***15.407 Limit (dBm) EIRP***	***Margin (dB)***
Low	***5150***	***-42.70***		***-27***	***-15.70***
High	***5350***	***-43.20***		***-27***	***-16.20***
Operating in the 5.725 – 5.825 GHz Band (Normal Mode)					
Band Edge	***Frequency (MHz)***	***AV Reading (dBm)***	***Comments***	***15.407 Limit (dBm) EIRP***	***Margin (dB)***
Low	***5725***	***-27.77***		***-17***	***-10.77***
High	***5825***	***-26.77***		***-17***	***-9.77***
Operating in the 5.725 – 5.825 GHz Band (Turbo Mode)					
Band Edge	***Frequency (MHz)***	***AV Reading (dBm)***	***Comments***	***15.407 Limit (dBm) EIRP***	***Margin (dB)***
Low	***5725***	***-29.93***		***-17***	***-12.93***
High	***5825***	***-24.27***		***-17***	***-7.27***

(Antenna A1)

Operating in the 5.15 – 5.35 GHz Band (Normal Mode)					
Band Edge	***Frequency (MHz)***	***AV Reading (dBm)***	***Comments***	***15.407 Limit (dBm) EIRP***	***Margin (dB)***
Low	***5150***	***-42.37***		***-27***	***-15.37***
High	***5350***	***-41.53***		***-27***	***-14.53***
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode)					
Band Edge	***Frequency (MHz)***	***AV Reading (dBm)***	***Comments***	***15.407 Limit (dBm) EIRP***	***Margin (dB)***
Low	***5150***	***-42.53***		***-27***	***-15.53***
High	***5350***	***-41.60***		***-27***	***-14.60***
Operating in the 5.725 – 5.825 GHz Band (Normal Mode)					
Band Edge	***Frequency (MHz)***	***AV Reading (dBm)***	***Comments***	***15.407 Limit (dBm) EIRP***	***Margin (dB)***
Low	***5725***	***-26.77***		***-17***	***-9.77***
High	***5825***	***-27.93***		***-17***	***-10.93***
Operating in the 5.725 – 5.825 GHz Band (Turbo Mode)					
Band Edge	***Frequency (MHz)***	***AV Reading (dBm)***	***Comments***	***15.407 Limit (dBm) EIRP***	***Margin (dB)***
Low	***5725***	***-30.27***		***-17***	***-13.27***
High	***5825***	***-24.93***		***-17***	***-7.93***

(Antenna B)

Operating in the 5.15 – 5.35 GHz Band (Normal Mode)					
Band Edge	***Frequency (MHz)***	***AV Reading (dBm)***	***Comments***	***15.407 Limit (dBm) EIRP***	***Margin (dB)***
Low	***5150***	***-44.37***		***-27***	***-17.37***
High	***5350***	***-41.87***		***-27***	***-15.03***
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode)					
Band Edge	***Frequency (MHz)***	***AV Reading (dBm)***	***Comments***	***15.407 Limit (dBm) EIRP***	***Margin (dB)***
Low	***5150***	***-41.87***		***-27***	***-14.87***
High	***5350***	***-43.37***		***-27***	***-16.37***
Operating in the 5.725 – 5.825 GHz Band (Normal Mode)					
Band Edge	***Frequency (MHz)***	***AV Reading (dBm)***	***Comments***	***15.407 Limit (dBm) EIRP***	***Margin (dB)***
Low	***5725***	***-29.10***		***-17***	***-12.10***
High	***5825***	***-33.10***		***-17***	***-15.27***
Operating in the 5.725 – 5.825 GHz Band (Turbo Mode)					
Band Edge	***Frequency (MHz)***	***AV Reading (dBm)***	***Comments***	***15.407 Limit (dBm) EIRP***	***Margin (dB)***
Low	***5725***	***-34.43***		***-17***	***-17.43***
High	***5825***	***-29.60***		***-17***	***-12.60***

Notes:

1. **EUT was tested for both vertical and horizontal polarizations, reported readings for band edges are for the worst polarization.**

2. **Band edge data in the low band (5.15 – 5.35) GHz are taken from restricted bands plots.**

3. **Average readings in dBm in these tables are the readings in dBuV on the Bandedge and Restricted bands plots subtracted by a factor of 95.2**

8.6.2 Restricted Bands Emissions:

(Antenna A2)

Operating in the 5.15 – 5.35 GHz Band (Normal Mode)									
Restricted Band (MHz)	***Frequency (MHz) PK, AV***	***Reading (dBuV/m)***		***Ant Pol***	***Comments***	***15.205 Limit (dBuV/m)***		***Margin (dB)***	
		Peak	***Ave***			***Peak***	***Ave***	***Peak***	***Ave***
4500-5150	*5150, 5150*	*70.00*	*52.83*	*V*		*74*	*54*	*-4.00*	*-1.17*
4500-5150	*5150, 5150*	*67.17*	*51.50*	*H*		*74*	*54*	*-6.83*	*-2.50*
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode)									
Restricted Band (MHz)	***Frequency (MHz) PK, AV***	***Reading (dBuV/m)***		***Ant Pol***	***Comments***	***15.205 Limit (dBuV/m)***		***Margin (dB)***	
		Peak	***Ave***			***Peak***	***Ave***	***Peak***	***Ave***
4500-5150	*5150, 5150*	*65.67*	*52.50*	*V*		*74*	*54*	*-8.33*	*-1.50*
4500-5150	*5109, 5149*	*63.17*	*49.83*	*H*		*74*	*54*	*-10.83*	*-4.17*
Operating in the 5.15 – 5.35 GHz Band (Normal Mode)									
Restricted Band (MHz)	***Frequency (MHz) PK, AV***	***Reading (dBuV/m)***		***Ant Pol***	***Comments***	***15.205 Limit (dBuV/m)***		***Margin (dB)***	
		Peak	***Ave***			***Peak***	***Ave***	***Peak***	***Ave***
5350-5460	*5350, 5350*	*68.33*	*53.17*	*V*		*74*	*54*	*-5.67*	*-0.83*
5350-5460	*5351, 5350*	*65.33*	*51.50*	*H*		*74*	*54*	*-8.67*	*-2.50*
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode)									
Restricted Band (MHz)	***Frequency (MHz) PK, AV***	***Reading (dBuV/m)***		***Ant Pol***	***Comments***	***15.205 Limit (dBuV/m)***		***Margin (dB)***	
		Peak	***Ave***			***Peak***	***Ave***	***Peak***	***Ave***
5350-5460	*5350, 5408*	*64.67*	*52.00*	*V*		*74*	*54*	*-9.33*	*-2.00*
5350-5460	*5350, 5408*	*62.83*	*50.33*	*H*		*74*	*54*	*-11.17*	*-3.67*

(Antenna A1)

Operating in the 5.15 – 5.35 GHz Band (Normal Mode)									
Restricted Band (MHz)	Frequency (MHz) PK, AV	Reading (dBuV/m)		Ant Pol	Comments	15.205 Limit (dBuV/m)		Margin (dB)	
		Peak	Ave			Peak	Ave	Peak	Ave
4500-5150	5150, 5148	68.50	52.83	V		74	54	-5.50	-1.17
4500-5150	5148, 5148	66.33	51.33	H		74	54	-7.67	-2.67
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode)									
Restricted Band (MHz)	Frequency (MHz) PK, AV	Reading (dBuV/m)		Ant Pol	Comments	15.205 Limit (dBuV/m)		Margin (dB)	
		Peak	Ave			Peak	Ave	Peak	Ave
4500-5150	5150, 5150	65.00	52.17	V		74	54	-9.00	-1.83
4500-5150	5146, 5150	65.67	52.67	H		74	54	-8.33	-1.33
Operating in the 5.15 – 5.35 GHz Band (Normal Mode)									
Restricted Band (MHz)	Frequency (MHz) PK, AV	Reading (dBuV/m)		Ant Pol	Comments	15.205 Limit (dBuV/m)		Margin (dB)	
		Peak	Ave			Peak	Ave	Peak	Ave
5350-5460	5352, 5352	65.33	52.33	V		74	54	-8.67	-1.67
5350-5460	5351, 5352	68.00	53.67	H		74	54	-6.00	-0.33
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode)									
Restricted Band (MHz)	Frequency (MHz) PK, AV	Reading (dBuV/m)		Ant Pol	Comments	15.205 Limit (dBuV/m)		Margin (dB)	
		Peak	Ave			Peak	Ave	Peak	Ave
5350-5460	5358, 5386	65.43	53.60	V		74	54	-8.57	-0.40
5350-5460	5355, 5386	65.43	53.60	H		74	54	-8.57	-0.40

(Antenna B)

Operating in the 5.15 – 5.35 GHz Band (Normal Mode)									
Restricted Band (MHz)	*Frequency (MHz) PK, AV*	*Reading (dBuV/m)*		*Ant Pol*	*Comments*	*15.205 Limit (dBuV/m)*		*Margin (dB)*	
		Peak	*Ave*					*Peak*	*Ave*
4500-5150	*5148, 5148*	*64.00*	*50.83*	*V*		*74*	*54*	*-10.00*	*-3.17*
4500-5150	*5066, 5000*	*62.83*	*49.50*	*H*		*74*	*54*	*-11.17*	*-4.50*
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode)									
Restricted Band (MHz)	*Frequency (MHz) PK, AV*	*Reading (dBuV/m)*		*Ant Pol*	*Comments*	*15.205 Limit (dBuV/m)*		*Margin (dB)*	
		Peak	*Ave*						*Peak*
4500-5150	*5147, 5150*	*66.33*	*53.33*	*V*		*74*	*54*	*-7.67*	*-0.67*
4500-5150	*5150, 5149*	*64.17*	*50.83*	*H*		*74*	*54*	*-9.83*	*-3.17*
Operating in the 5.15 – 5.35 GHz Band (Normal Mode)									
Restricted Band (MHz)	*Frequency (MHz) PK, AV*	*Reading (dBuV/m)*		*Ant Pol*	*Comments*	*15.205 Limit (dBuV/m)*		*Margin (dB)*	
		Peak	*Ave*						*Peak*
5350-5460	*5351, 5350*	*68.33*	*53.33*	*V*		*74*	*54*	*-5.67*	*-0.67*
5350-5460	*5362, 5350*	*62.83*	*49.83*	*H*		*74*	*54*	*-11.17*	*-4.17*
Operating in the 5.15 – 5.35 GHz Band (Turbo Mode)									
Restricted Band (MHz)	*Frequency (MHz) PK, AV*	*Reading (dBuV/m)*		*Ant Pol*	*Comments*	*15.205 Limit (dBuV/m)*		*Margin (dB)*	
		Peak	*Ave*						*Peak*
5350-5460	*5351, 5350*	*65.00*	*51.83*	*V*		*74*	*54*	*-9.00*	*-2.17*
5350-5460	*5402, 5350*	*62.83*	*50.00*	*H*		*74*	*54*	*-11.17*	*-4.00*

Please refer to Exhibit (**TestPlot-BE.DOC**) for detailed band edges plots.
Please refer to Exhibit (**TestPlot-RestrBands.DOC**) for detailed restricted bands plots.

8.7. UNDESIRABLE EMISSIONS – RADIATED MEASUREMENTS

TEST SETUP

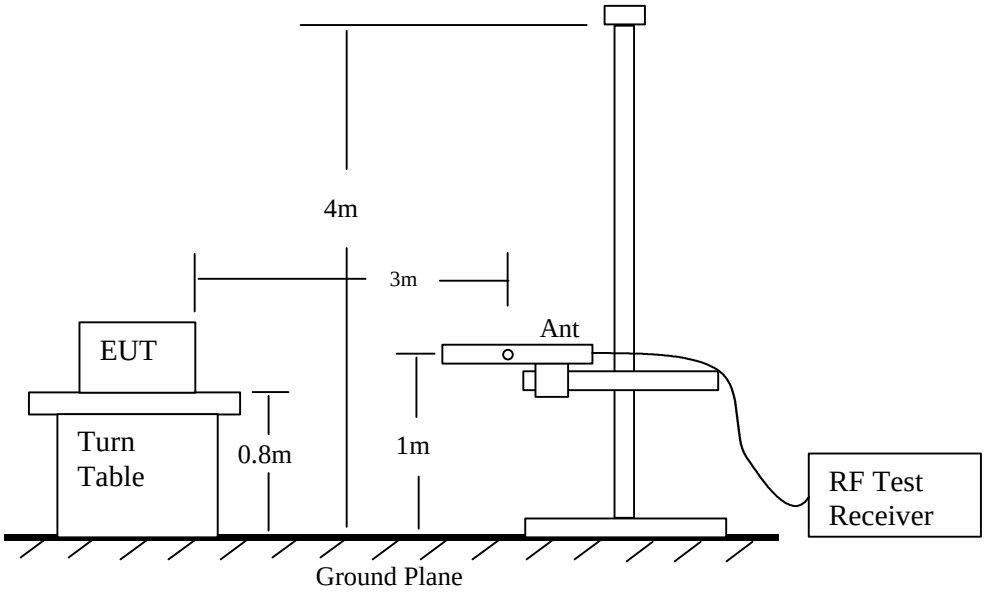
For measurements of the EUT as a digital device, the EUT and all other support equipment were placed on a wooden table 80 cm above the ground plane. For measurements of the EUT as a transmitter , the EUT and the laptop were placed on the wooden table. The antenna to EUT distance is 3 meters for measurements 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.

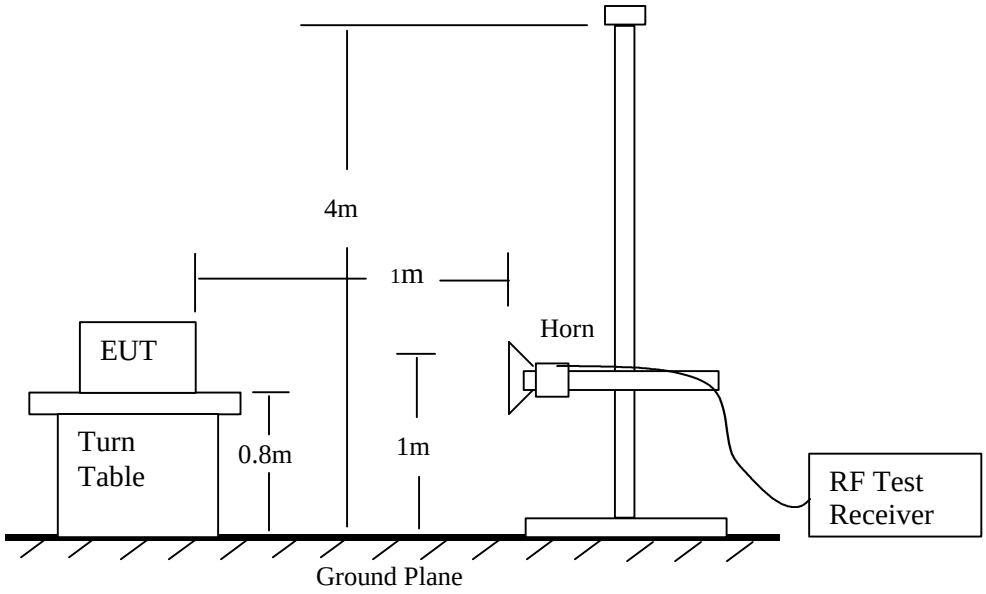
Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Below 1000	☒ Peak ☐ Q.P.	☒ 100 kHz ☐ 1 MHz	☒ 100 kHz ☐ 10 Hz
Above 1000	☒ Peak ☐ Average	☒ 1 MHz ☐ 1 MHz	☒ 1 MHz ☐ 10 Hz

TEST SETUP



Radiated Emission Measurement 30 to 1000MHz.



Radiated Emission Above 1000MHz

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 40 GHz is investigated.

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.

SAMPLE CALCULATIONS

Given

$$E = \sqrt{(30 * P * G)} / d$$

where

E = Field Strength in Volts / meter
P = Power in watts
G = Numeric antenna gain
d = distance in meters

Rearranging terms yields:

$$P * G = (d * E) \wedge 2 / 30$$

Converting to the logarithmic form and changing to units of mW and uV/m, using:

$$P (mW) = P (W) / 1000 \text{ and}$$
$$E (uV/m) = E (V/m) / 1000000$$

yields

$$10 \log (P * G) = 10 \log (d \wedge 2) + 10 \log (E \wedge 2) - 10 \log (30) - 10 \log (10 \wedge 9)$$
$$= 20 \log (d) + 20 \log (E) - 104.77$$

In this logarithmic form

10 log (P * G) is PG in dBm and
20 log (E) is E in dBuV/m

Since EIRP = P * G, then at a specification distance of 3 meters, the EIRP in terms of field strength is:

$$EIRP (dBm) = P * G (dBm) = E (dBuV/m) - 95.2$$

TEST RESULTS

No non-compliance noted:

08/12/02 **FCC Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.18 GHz, Normal Mode, Internal Antenna A1

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.180	3.3	71.9	58.9	34.6	6.0	0.0	-9.5	0.0	103.0	90.0					V
10.360	3.3	53.0	40.8	39.5	11.8	-34.7	-9.5	1.0	61.1	48.9		68.2		-19.3	V
15.540	3.3	44.7	34.2	38.9	15.2	-33.9	-9.5	1.0	56.4	45.9	74.0	54.0	-17.6	-8.1	V, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	V, Noise Floor
5.180	3.3	71.7	62.9	34.6	6.0	0.0	-9.5	0.0	102.8	94.0					H
10.360	3.3	50.8	38.7	39.5	11.8	-34.7	-9.5	1.0	58.9	46.8		68.2		-21.4	H
15.540	3.3	45.0	34.5	38.9	15.2	-33.9	-9.5	1.0	56.7	46.2	74.0	54.0	-17.3	-7.8	H, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.26 GHz, Normal Mode, Internal Antenna A1

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.260	3.3	79.0	69.8	34.8	6.0	0.0	-9.5	0.0	110.3	101.1					V
10.520	3.3	49.0	37.3	39.2	11.9	-34.4	-9.5	1.0	57.2	45.5		68.2		-22.7	V
15.780	3.3	45.5	34.2	38.8	15.4	-34.0	-9.5	1.0	57.2	45.9	74.0	54.0	-16.8	-8.1	V, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	V, Noise Floor
5.260	3.3	78.3	69.7	34.8	6.0	0.0	-9.5	0.0	109.6	100.7					H
10.520	3.3	45.2	35.3	39.2	11.9	-34.4	-9.5	1.0	53.3	43.5		68.2		-24.7	H
15.780	3.3	45.5	34.2	38.8	15.4	-34.0	-9.5	1.0	57.2	45.9	74.0	54.0	-16.8	-8.1	H, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.32 GHz, Normal Mode, Internal Antenna A1

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.320	3.3	72.8	64.7	34.8	6.0	0.0	-9.5	0.0	104.1	96.0					V
10.640	3.3	44.0	33.0	39.2	11.9	-34.3	-9.5	1.0	52.3	41.3	74.0	54.0	-21.7	-12.7	V, Noise Floor
15.960	3.3	43.8	33.6	38.7	15.6	-34.0	-9.5	1.0	55.6	45.4	74.0	54.0	-18.4	-8.6	V, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	V, Noise Floor
5.320	3.3	71.5	62.7	34.8	6.0	0.0	-9.5	0.0	109.5	99.8					H
10.640	3.3	44.0	33.0	39.2	11.9	-34.3	-9.5	1.0	52.3	41.3	74.0	54.0	-21.7	-12.7	H, Noise Floor
15.960	3.3	43.8	33.6	38.7	15.6	-34.0	-9.5	1.0	55.6	45.4	74.0	54.0	-18.4	-8.6	H, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.745 GHz, Normal Mode, Internal Antenna A1

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.745	3.3	73.0	63.8	35.3	8.5	0.0	-9.5	0.0	107.3	98.1					V
11.490	3.3	42.8	28.3	39.7	12.3	-33.9	-9.5	1.0	52.5	38.0	74.0	54.0	-21.5	-16.0	V, Noise Floor
17.235	3.3	45.8	28.5	44.0	16.6	-32.8	-9.5	1.0	65.1	47.8		68.2		-20.4	V, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	V, Noise Floor
5.745	3.3	78.2	68.8	35.3	8.5	0.0	-9.5	0.0	112.5	103.1					H
11.490	3.3	42.8	28.3	39.7	12.3	-33.9	-9.5	1.0	52.5	38.0	74.0	54.0	-21.5	-16.0	H, Noise Floor
17.235	3.3	45.8	28.5	44.0	16.6	-32.8	-9.5	1.0	65.1	47.8		68.2		-20.4	H, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.785 GHz, Normal Mode, Internal Antenna A1

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.785	3.3	73.7	64.5	35.3	8.5	0.0	-9.5	0.0	108.0	98.8					V
11.570	3.3	44.0	28.3	39.7	12.4	-33.9	-9.5	1.0	53.7	38.0	74.0	54.0	-20.3	-16.0	V, Noise Floor
17.355	3.3	43.7	28.5	44.0	16.7	-32.8	-9.5	1.0	63.1	47.9		68.2		-20.3	V, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	V, Noise Floor
5.785	3.3	78.8	70.3	35.3	8.5	0.0	-9.5	0.0	113.1	104.6					H
11.570	3.3	44.0	28.3	39.7	12.4	-33.9	-9.5	1.0	53.7	38.0	74.0	54.0	-20.3	-16.0	H, Noise Floor
17.355	3.3	43.7	28.5	44.0	16.7	-32.8	-9.5	1.0	63.1	47.9		68.2		-20.3	H, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.805 GHz, Normal Mode, Internal Antenna A1

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.805	3.3	71.5	63.2	35.3	8.5	0.0	-9.5	0.0	105.8	97.5					V
11.610	3.3	43.8	28.3	39.7	12.4	-33.9	-9.5	1.0	53.5	38.0	74.0	54.0	-20.5	-16.0	V, Noise Floor
17.415	3.3	43.0	28.5	44.0	16.7	-32.8	-9.5	1.0	62.4	47.9		68.2		-20.3	V, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	V, Noise Floor
5.805	3.3	78.3	69.2	35.3	8.5	0.0	-9.5	0.0	112.6	103.5					H
11.610	3.3	43.8	28.3	39.7	12.4	-33.9	-9.5	1.0	53.5	38.0	74.0	54.0	-20.5	-16.0	H, Noise Floor
17.415	3.3	43.0	28.5	44.0	16.7	-32.8	-9.5	1.0	62.4	47.9		68.2		-20.3	H, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.21 GHz, Turbo Mode, Internal Antenna A1

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.210	3.3	69.7	62.3	34.6	6.0	0.0	-9.5	0.0	100.8	93.4					V
10.420	3.3	41.7	29.7	39.5	11.8	-34.7	-9.5	1.0	49.8	37.8		68.2		-30.4	V
15.630	3.3	40.0	28.8	38.8	15.3	-33.9	-9.5	1.0	51.7	40.6	74.0	54.0	-22.3	-13.4	V, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	V, Noise Floor
5.210	3.3	70.7	61.8	34.6	6.0	0.0	-9.5	0.0	101.8	92.9					H
10.420	3.3	41.3	30.0	39.5	11.8	-34.7	-9.5	1.0	49.4	38.1		68.2		-30.1	H, Noise Floor
15.630	3.3	40.0	28.8	38.8	15.3	-33.9	-9.5	1.0	51.7	40.6	74.0	54.0	-22.3	-13.4	H, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.25 GHz, Turbo Mode, Internal Antenna A1

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.250	3.3	72.3	62.5	34.8	6.0	0.0	-9.5	0.0	103.6	93.8					V
10.500	3.3	40.3	28.2	39.2	11.9	-34.4	-9.5	1.0	48.5	36.3		68.2		-31.9	V, Noise Floor
15.750	3.3	40.2	28.8	38.8	15.4	-34.0	-9.5	1.0	51.9	40.5	74.0	54.0	-22.1	-13.5	V, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	V, Noise Floor
5.250	3.3	71.3	60.7	34.8	6.0	0.0	-9.5	0.0	102.6	92.0					H
10.500	3.3	42.0	30.0	39.2	11.9	-34.4	-9.5	1.0	50.2	38.2		68.2		-30.0	H
15.750	3.3	40.2	28.8	38.8	15.4	-34.0	-9.5	1.0	51.9	40.5	74.0	54.0	-22.1	-13.5	H, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.29 GHz, Turbo Mode, Internal Antenna A1

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.290	3.3	71.5	61.0	34.8	6.0	0.0	-9.5	0.0	102.8	92.3					V
10.580	3.3	40.3	28.0	39.2	11.9	-34.3	-9.5	1.0	48.6	36.3		68.2		-31.9	V, Noise Floor
15.870	3.3	39.2	28.5	38.7	15.5	-34.0	-9.5	1.0	50.9	40.2	74.0	54.0	-23.1	-13.8	V, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	V, Noise Floor
5.290	3.3	69.8	59.8	34.8	6.0	0.0	-9.5	0.0	101.1	91.1					H
10.580	3.3	40.3	28.0	39.2	11.9	-34.3	-9.5	1.0	48.6	36.3		68.2		-31.9	H, Noise Floor
15.870	3.3	39.2	28.5	38.7	15.5	-34.0	-9.5	1.0	50.9	40.2	74.0	54.0	-23.1	-13.8	H, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.76 GHz, Turbo Mode, Internal Antenna A1

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.760	3.3	66.8	56.5	35.3	8.5	0.0	-9.5	0.0	101.1	90.8					V
11.520	3.3	39.0	28.3	39.7	12.4	-33.9	-9.5	1.0	48.7	38.0	74.0	54.0	-25.3	-16.0	V, Noise Floor
17.280	3.3	38.2	28.5	44.0	16.6	-32.8	-9.5	1.0	57.5	47.8		68.2		-20.4	V, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	V, Noise Floor
5.760	3.3	71.2	61.5	35.3	8.5	0.0	-9.5	0.0	105.5	95.8					H
11.520	3.3	39.0	28.3	39.7	12.4	-33.9	-9.5	1.0	48.7	38.0	74.0	54.0	-25.3	-16.0	H, Noise Floor
17.280	3.3	38.2	28.5	44.0	16.6	-32.8	-9.5	1.0	57.5	47.8		68.2		-20.4	H, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.8 GHz, Turbo Mode, Internal Antenna A1

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.800	3.3	67.2	57.5	35.3	8.5	0.0	-9.5	0.0	101.5	91.8					V
11.600	3.3	40.2	28.3	39.7	12.4	-33.9	-9.5	1.0	49.9	38.0	74.0	54.0	-24.1	-16.0	V, Noise Floor
17.400	3.3	39.8	28.2	44.0	16.7	-32.8	-9.5	1.0	59.3	47.6		68.2		-20.6	V, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	V, Noise Floor
5.800	3.3	73.7	62.8	35.3	8.5	0.0	-9.5	0.0	108.0	97.1					H
11.600	3.3	40.2	28.3	39.7	12.4	-33.9	-9.5	1.0	49.9	38.0	74.0	54.0	-24.1	-16.0	H, Noise Floor
17.400	3.3	39.8	28.2	44.0	16.7	-32.8	-9.5	1.0	59.3	47.6		68.2		-20.6	H, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.18 GHz, Normal Mode, Internal Antenna A2

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
10.360	3.3	43.8	30.2	39.5	11.8	-34.7	-9.5	1.0	51.9	38.3		68.2		-29.9	V
15.540	3.3	44.7	34.2	38.9	15.2	-33.9	-9.5	1.0	56.4	45.9	74.0	54.0	-17.6	-8.1	V, Noise Floor
10.360	3.3	43.8	30.0	39.5	11.8	-34.7	-9.5	1.0	51.9	38.1		68.2		-30.1	H
15.540	3.3	45.0	34.5	38.9	15.2	-33.9	-9.5	1.0	56.7	46.2	74.0	54.0	-17.3	-7.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.26 GHz, Normal Mode, Internal Antenna A2

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
10.520	3.3	47.5	33.5	39.2	11.9	-34.4	-9.5	1.0	55.7	41.7		68.2		-26.5	V
15.780	3.3	45.5	34.2	38.8	15.4	-34.0	-9.5	1.0	57.2	45.9	74.0	54.0	-16.8	-8.1	V, Noise Floor
10.520	3.3	45.7	31.8	39.2	11.9	-34.4	-9.5	1.0	53.8	40.0		68.2		-28.2	H
15.780	3.3	45.5	34.2	38.8	15.4	-34.0	-9.5	1.0	57.2	45.9	74.0	54.0	-16.8	-8.1	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.32 GHz, Normal Mode, Internal Antenna A2

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
10.640	3.3	44.0	33.0	39.2	11.9	-34.3	-9.5	1.0	51.6	37.8	74.0	54.0	-22.4	-16.2	V
15.960	3.3	43.8	33.6	38.7	15.6	-34.0	-9.5	1.0	55.6	45.4	74.0	54.0	-18.4	-8.6	V, Noise Floor
10.640	3.3	43.0	29.8	39.2	11.9	-34.3	-9.5	1.0	51.3	38.1	74.0	54.0	-22.7	-15.9	H
15.960	3.3	43.8	33.6	38.7	15.6	-34.0	-9.5	1.0	55.6	45.4	74.0	54.0	-18.4	-8.6	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.745 GHz, Normal Mode, Internal Antenna A2

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
11.490	3.3	42.8	28.3	39.7	12.3	-33.9	-9.5	1.0	51.7	39.4	74.0	54.0	-22.3	-14.6	V
17.235	3.3	45.8	28.5	44.0	16.6	-32.8	-9.5	1.0	65.1	47.8		68.2		-20.4	V, Noise Floor
11.490	3.3	42.0	29.3	39.7	12.3	-33.9	-9.5	1.0	51.7	39.0	74.0	54.0	-22.3	-15.0	H
17.235	3.3	45.8	28.5	44.0	16.6	-32.8	-9.5	1.0	65.1	47.8		68.2		-20.4	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.785 GHz, Normal Mode, Internal Antenna A2

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
11.570	3.3	43.0	28.3	39.7	12.3	-33.9	-9.5	1.0	51.7	37.9	74.0	54.0	-22.3	-16.1	V
17.355	3.3	43.7	28.5	44.0	16.6	-32.8	-9.5	1.0	63.0	47.8		68.2		-20.4	V, Noise Floor
11.570	3.3	42.0	29.0	39.7	12.3	-33.9	-9.5	1.0	51.6	38.6	74.0	54.0	-22.4	-15.4	H
17.355	3.3	43.7	28.5	44.0	16.6	-32.8	-9.5	1.0	63.0	47.8		68.2		-20.4	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.805 GHz, Normal Mode, Internal Antenna A2

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
11.610	3.3	43.5	30.7	39.7	12.4	-33.9	-9.5	1.0	53.2	40.4	74.0	54.0	-20.8	-13.6	V
17.415	3.3	43.0	28.5	44.0	16.7	-32.8	-9.5	1.0	62.4	47.9		68.2		-20.3	V, Noise Floor
11.610	3.3	42.3	30.0	39.7	12.4	-33.9	-9.5	1.0	52.0	39.7	74.0	54.0	-22.0	-14.3	H
17.415	3.3	43.0	28.5	44.0	16.7	-32.8	-9.5	1.0	62.4	47.9		68.2		-20.3	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.21 GHz, Turbo Mode, Internal Antenna A2

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
10.420	3.3	43.2	30.0	39.5	11.8	-34.7	-9.5	1.0	51.3	38.1		68.2		-30.1	V
15.630	3.3	40.0	28.8	38.8	15.3	-33.9	-9.5	1.0	51.7	40.6	74.0	54.0	-22.3	-13.4	V, Noise Floor
10.420	3.3	43.7	30.5	39.5	11.8	-34.7	-9.5	1.0	51.8	38.6		68.2		-29.6	H
15.630	3.3	40.0	28.8	38.8	15.3	-33.9	-9.5	1.0	51.7	40.6	74.0	54.0	-22.3	-13.4	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.25 GHz, Turbo Mode, Internal Antenna A2

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
10.500	3.3	43.0	29.7	39.2	11.9	-34.4	-9.5	1.0	51.2	37.8		68.2		-30.4	V
15.750	3.3	40.2	28.8	38.8	15.4	-34.0	-9.5	1.0	51.9	40.5	74.0	54.0	-22.1	-13.5	V, Noise Floor
10.500	3.3	44.2	30.3	39.2	11.9	-34.4	-9.5	1.0	52.4	38.5		68.2		-29.7	H
15.750	3.3	40.2	28.8	38.8	15.4	-34.0	-9.5	1.0	51.9	40.5	74.0	54.0	-22.1	-13.5	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.29 GHz, Turbo Mode, Internal Antenna A2

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
10.580	3.3	40.3	28.0	39.2	11.9	-34.3	-9.5	1.0	48.6	36.3		68.2		-31.9	V, Noise Floor
15.870	3.3	39.2	28.5	38.7	15.5	-34.0	-9.5	1.0	50.9	40.2	74.0	54.0	-23.1	-13.8	V, Noise Floor
10.580	3.3	40.3	28.0	39.2	11.9	-34.3	-9.5	1.0	48.6	36.3		68.2		-31.9	H, Noise Floor
15.870	3.3	39.2	28.5	38.7	15.5	-34.0	-9.5	1.0	50.9	40.2	74.0	54.0	-23.1	-13.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.76 GHz, Turbo Mode, Internal Antenna A2

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
11.520	3.3	39.0	28.3	39.7	12.4	-33.9	-9.5	1.0	48.7	38.0	74.0	54.0	-25.3	-16.0	V, Noise Floor
17.280	3.3	38.2	28.5	44.0	16.6	-32.8	-9.5	1.0	57.5	47.8		68.2		-20.4	V, Noise Floor
11.520	3.3	39.0	28.3	39.7	12.4	-33.9	-9.5	1.0	48.7	38.0	74.0	54.0	-25.3	-16.0	H, Noise Floor
17.280	3.3	38.2	28.5	44.0	16.6	-32.8	-9.5	1.0	57.5	47.8		68.2		-20.4	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.8 GHz, Turbo Mode, Internal Antenna A2

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
11.600	3.3	40.2	28.3	39.7	12.4	-33.9	-9.5	1.0	49.9	38.0	74.0	54.0	-24.1	-16.0	V, Noise Floor
17.400	3.3	39.8	28.2	44.0	16.7	-32.8	-9.5	1.0	59.3	47.6		68.2		-20.6	V, Noise Floor
11.600	3.3	40.2	28.3	39.7	12.4	-33.9	-9.5	1.0	49.9	38.0	74.0	54.0	-24.1	-16.0	H, Noise Floor
17.400	3.3	39.8	28.2	44.0	16.7	-32.8	-9.5	1.0	59.3	47.6		68.2		-20.6	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.18 GHz, Normal Mode, External Antenna B

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.180	3.3	74.5	65.1	34.6	6.0	0.0	-9.5	0.0	105.6	96.2					V
10.360	3.3	50.2	38.7	39.5	11.8	-34.7	-9.5	1.0	58.3	46.8		68.2		-21.4	V
15.540	3.3	43.8	34.3	38.9	15.2	-33.9	-9.5	1.0	55.5	46.0	74.0	54.0	-18.5	-8.0	V, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	V, Noise Floor
5.180	3.3	71.2	60.6	34.6	6.0	0.0	-9.5	0.0	102.3	91.7					H
10.360	3.3	48.0	38.0	39.5	11.8	-34.7	-9.5	1.0	56.1	46.1		68.2		-22.1	H
15.540	3.3	44.5	34.3	38.9	15.2	-33.9	-9.5	1.0	56.2	46.0	74.0	54.0	-17.8	-8.0	H, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.26 GHz, Normal Mode, External Antenna B

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.260	3.3	76.5	66.8	34.8	6.0	0.0	-9.5	0.0	107.8	98.1					V
10.520	3.3	48.5	38.5	39.2	11.9	-34.4	-9.5	1.0	56.7	46.7		68.2	56.7	-21.5	V
15.780	3.3	45.8	34.0	38.8	15.4	-34.0	-9.5	1.0	57.5	45.7	74.0	54.0	-16.5	-8.3	V, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	V, Noise Floor
5.260	3.3	68.5	58.8	34.8	6.0	0.0	-9.5	0.0	99.8	90.1					H
10.520	3.3	49.2	37.0	39.2	11.9	-34.4	-9.5	1.0	57.4	45.2		68.2		-23.0	H
15.780	3.3	45.8	34.0	38.8	15.4	-34.0	-9.5	1.0	57.5	45.7	74.0	54.0	-16.5	-8.3	H, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.32 GHz, Normal Mode, External Antenna B

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
10.640	3.3	42.3	29.8	39.2	11.9	-34.3	-9.5	1.0	50.6	38.1	74.0	54.0	-23.4	-15.9	V
15.960	3.3	43.8	33.6	38.7	15.6	-34.0	-9.5	1.0	55.6	45.4	74.0	54.0	-18.4	-8.6	V, Noise Floor
10.640	3.3	42.7	30.2	39.2	11.9	-34.3	-9.5	1.0	51.0	38.5	74.0	54.0	-23.0	-15.5	H
15.960	3.3	43.8	33.6	38.7	15.6	-34.0	-9.5	1.0	55.6	45.4	74.0	54.0	-18.4	-8.6	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.745 GHz, Normal Mode, External Antenna B

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.745	3.3	74.2	65.2	35.3	8.5	0.0	-9.5	0.0	108.5	99.5					V
11.490	3.3	42.8	28.3	39.7	12.3	-33.9	-9.5	1.0	52.5	38.0	74.0	54.0	-21.5	-16.0	V, Noise Floor
17.235	3.3	45.5	28.5	44.0	16.6	-32.8	-9.5	1.0	64.8	47.8		68.2		-20.4	V, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	V, Noise Floor
5.745	3.3	62.7	54.5	35.3	8.5	0.0	-9.5	0.0	97.0	88.8					H
11.490	3.3	42.8	28.3	39.7	12.3	-33.9	-9.5	1.0	52.5	38.0	74.0	54.0	-21.5	-16.0	H, Noise Floor
17.235	3.3	45.5	28.5	44.0	16.6	-32.8	-9.5	1.0	64.8	47.8		68.2		-20.4	H, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.785 GHz, Normal Mode, External Antenna B

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.785	3.3	77.5	68.2	35.3	8.5	0.0	-9.5	0.0	111.8	102.5					V
11.570	3.3	44.0	28.3	39.7	12.4	-33.9	-9.5	1.0	53.7	38.0	74.0	54.0	-20.3	-16.0	V, Noise Floor
17.355	3.3	43.7	28.5	44.0	16.7	-32.8	-9.5	1.0	63.1	47.9		68.2		-20.3	V, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	V, Noise Floor
5.785	3.3	68.8	61.3	35.3	8.5	0.0	-9.5	0.0	103.1	95.6					H
11.570	3.3	44.0	28.3	39.7	12.4	-33.9	-9.5	1.0	53.7	38.0	74.0	54.0	-20.3	-16.0	H, Noise Floor
17.355	3.3	43.7	28.5	44.0	16.7	-32.8	-9.5	1.0	63.1	47.9		68.2		-20.3	H, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.805 GHz, Normal Mode, External Antenna B

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5.805	3.3	74.0	66.0	35.3	8.5	0.0	-9.5	0.0	108.3	100.3					V
11.610	3.3	43.8	28.3	39.7	12.4	-33.9	-9.5	1.0	53.5	38.0	74.0	54.0	-20.5	-16.0	V, Noise Floor
17.415	3.3	43.0	28.5	44.0	16.7	-32.8	-9.5	1.0	62.4	47.9		68.2		-20.3	V, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	V, Noise Floor
5.805	3.3	66.0	57.5	35.3	8.5	0.0	-9.5	0.0	100.3	91.8					H
11.610	3.3	43.8	28.3	39.7	12.4	-33.9	-9.5	1.0	53.5	38.0	74.0	54.0	-20.5	-16.0	H, Noise Floor
17.415	3.3	43.0	28.5	44.0	16.7	-32.8	-9.5	1.0	62.4	47.9		68.2		-20.3	H, Noise Floor
26.000	3.3	30.5	22.3	32.9	23.6	-35.1	-9.5	1.0	43.4	35.2	74.0	54.0	-30.6	-18.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.21 GHz, Turbo Mode, External Antenna B

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
10.420	3.3	43.7	30.3	39.5	11.8	-34.7	-9.5	1.0	51.8	38.4		68.2		-29.8	V
15.630	3.3	40.0	28.8	38.8	15.3	-33.9	-9.5	1.0	51.7	40.6	74.0	54.0	-22.3	-13.4	V, Noise Floor
10.420	3.3	43.3	30.3	39.5	11.8	-34.7	-9.5	1.0	51.4	40.6		68.2		-27.6	H
15.630	3.3	40.0	28.8	38.8	15.3	-33.9	-9.5	1.0	51.7	40.6	74.0	54.0	-22.3	-13.4	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.25 GHz, Turbo Mode, External Antenna B

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
10.500	3.3	43.8	30.3	39.2	11.9	-34.4	-9.5	1.0	52.0	38.4		68.2		-29.8	V
15.750	3.3	40.2	28.8	38.8	15.4	-34.0	-9.5	1.0	51.9	40.5	74.0	54.0	-22.1	-13.5	V, Noise Floor
10.500	3.3	45.0	30.8	39.2	11.9	-34.4	-9.5	1.0	53.2	38.9		68.2		-29.3	H
15.750	3.3	40.2	28.8	38.8	15.4	-34.0	-9.5	1.0	51.9	40.5	74.0	54.0	-22.1	-13.5	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.29 GHz, Turbo Mode, External Antenna B

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
10.580	3.3	43.0	29.8	39.2	11.9	-34.3	-9.5	1.0	51.3	38.1		68.2		-30.1	V
15.870	3.3	39.2	28.5	38.7	15.5	-34.0	-9.5	1.0	50.9	40.2	74.0	54.0	-23.1	-13.8	V, Noise Floor
10.580	3.3	40.3	28.0	39.2	11.9	-34.3	-9.5	1.0	48.6	36.3		68.2		-31.9	H, Noise Floor
15.870	3.3	39.2	28.5	38.7	15.5	-34.0	-9.5	1.0	50.9	40.2	74.0	54.0	-23.1	-13.8	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.76 GHz, Turbo Mode, External Antenna B

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
11.520	3.3	39.0	28.3	39.7	12.4	-33.9	-9.5	1.0	48.7	38.0	74.0	54.0	-25.3	-16.0	V, Noise Floor
17.280	3.3	38.2	28.5	44.0	16.6	-32.8	-9.5	1.0	57.5	47.8		68.2		-20.4	V, Noise Floor
11.520	3.3	39.0	28.3	39.7	12.4	-33.9	-9.5	1.0	48.7	38.0	74.0	54.0	-25.3	-16.0	H, Noise Floor
17.280	3.3	38.2	28.5	44.0	16.6	-32.8	-9.5	1.0	57.5	47.8		68.2		-20.4	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

08/12/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 02U1644-1
Company: W-Link Systems
EUT Descrip.: 802.11 a/b/g Dual Band PCI Adapter
EUT M/N: PC22
Test Target: FCC 15.407

Equipment for 1-22 GHz:
HP8564E Analyzer
HP 8449B Amplifier
EMCO 3115 Antenna
Cable: 20.0 feet

Equipment for 22 - 58 GHz:
HP8564E Analyzer
HP 11975A Amplifier (LO)
HP 11970K External mixer/antenna
Cable: IF Only (321 MHz)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1MHz Resolution Bandwidth
10Hz Video Bandwidth

5.8 GHz, Turbo Mode, External Antenna B

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
11.600	3.3	40.2	28.3	39.7	12.4	-33.9	-9.5	1.0	49.9	38.0	74.0	54.0	-24.1	-16.0	V, Noise Floor
17.400	3.3	39.8	28.2	44.0	16.7	-32.8	-9.5	1.0	59.3	47.6		68.2		-20.6	V, Noise Floor
11.600	3.3	40.2	28.3	39.7	12.4	-33.9	-9.5	1.0	49.9	38.0	74.0	54.0	-24.1	-16.0	H, Noise Floor
17.400	3.3	39.8	28.2	44.0	16.7	-32.8	-9.5	1.0	59.3	47.6		68.2		-20.6	H, Noise Floor

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Note: No other signals found between 1 and 40 GHz, all signals are below system noise floor

DIGITAL DEVICE RADIATED EMISSIONS

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 #:	02U1466-1
Report #:	020814C2
Date& Time:	08/14/02 8:04 PM
Test Engr:	Mike Heckrotte

Company:	W-Link Systems, Inc.
EUT Description:	Harmony / Skyline 802.11 a/b
Test Configuration :	EUT/PC/Monitor/KB/Mouse/Printer/Modem
Type of Test:	FCC Class B
Mode of Operation:	Transmitting, EMCtest

<< Main Sheet

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
76.00	58.50	6.80	1.05	27.42	38.94	40.00	-1.06	3mV	0.00	1.00	P
72.66	57.00	6.24	1.03	27.42	36.84	40.00	-3.16	3mV	0.00	1.00	P
70.66	57.20	5.90	1.01	27.43	36.69	40.00	-3.31	3mV	0.00	1.00	P
288.00	50.20	14.05	2.49	26.64	40.09	46.00	-5.91	3mH	135.00	1.20	P
300.00	46.90	14.66	2.58	26.64	37.50	46.00	-8.50	3mV	180.00	1.80	P
300.00	45.80	14.66	2.58	26.64	36.40	46.00	-9.60	3mH	180.00	1.00	P
6 Worst Data											

Note: Changing the transmitter band, mode or channel does not affect these emissions.

8.8. POWER LINE CONDUCTED EMISSION

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
450 KHz to 30 MHz	☒ Peak ☐ CISPR Quasi Peak	☒ 9 KHz	☒ 9 KHz

TEST PROCEDURE

1. The EUT was placed on a wooden table 40 cm from a vertical ground plane and approximately 80 cm above the horizontal ground plane on the floor. The EUT was set to transmit in a continuous mode.

2. Line conducted data was recorded for both NEUTRAL and HOT lines.

RESULT

No non-compliance noted. See plot Line Conduction.

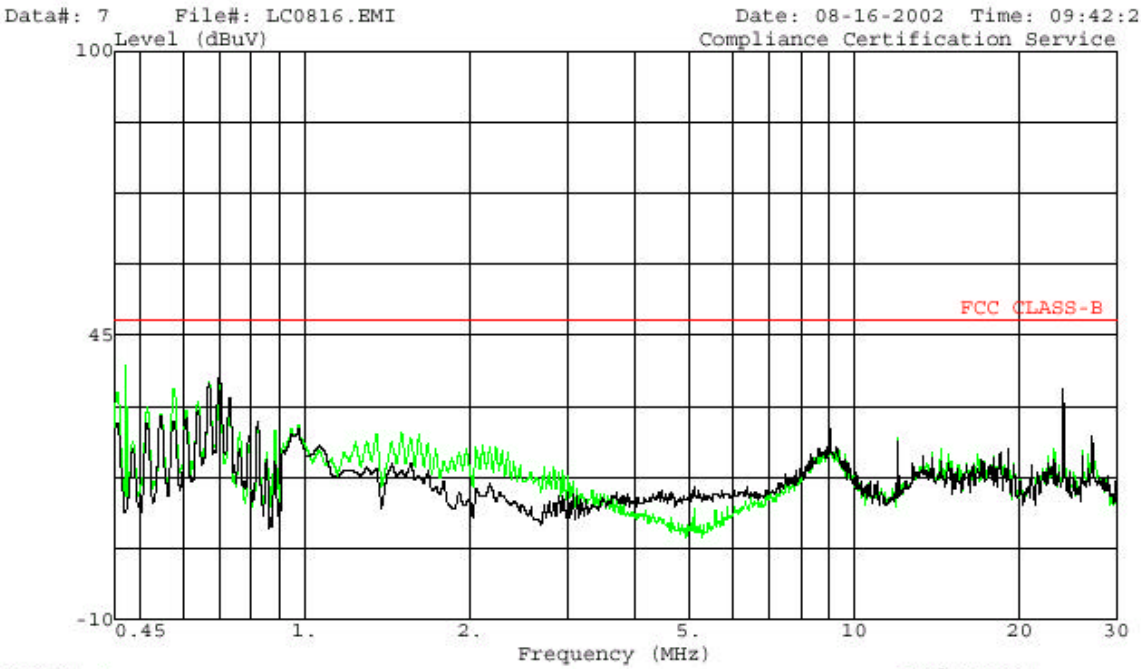
CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.47	39.30	--	--	0.00	56.77	46.77	-17.47	-7.47	L1
0.67	35.89	--	--	0.00	56.00	46.00	-20.11	-10.11	L1
24.01	34.40	--	--	0.00	60.00	50.00	-25.60	-15.60	L1
0.67	35.74	--	--	0.00	56.00	46.00	-20.26	-10.26	L2
0.70	37.22	--	--	0.00	56.00	46.00	-18.78	-8.78	L2
24.01	34.56	--	--	0.00	60.00	50.00	-25.44	-15.44	L2
6 Worst Data									

Fund = 5.26GHz, Antenna A activated.

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	FCC_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.47	39.30	--	--	0.00	48.00	--	-8.70	--	L1
0.70	36.40	--	--	0.00	48.00	--	-11.60	--	L1
24.01	34.50	--	--	0.00	48.00	--	-13.50	--	L1
0.67	35.74	--	--	0.00	48.00	--	-12.26	--	L2
0.70	37.22	--	--	0.00	48.00	--	-10.78	--	L2
24.01	34.56	--	--	0.00	48.00	--	-13.44	--	L2
6 Worst Data									

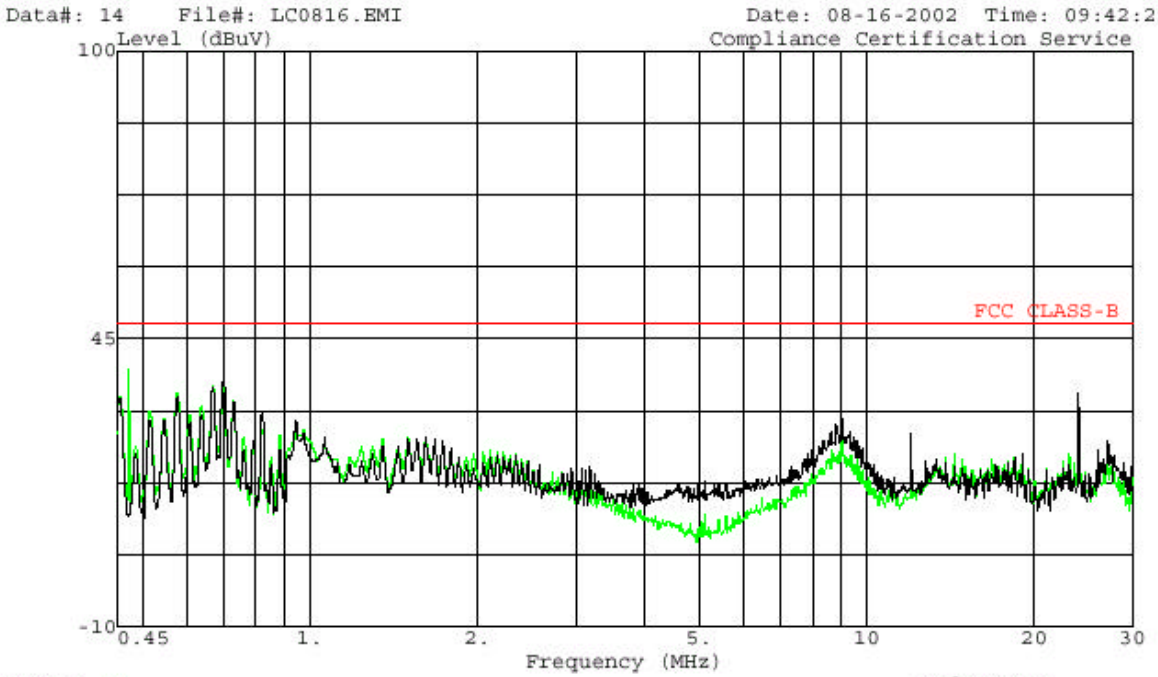
Fund = 5.26GHz, Antenna B activated.

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



Trace: 3 Ref Trace:
Project # : 02U1466-1
Test Engineer: Frank Ibrahim
Company : W-Link Systems, Inc.
EUT : Harmony / Skyline 802.11 a
Test Config : EUT/PC/Monitor/KB/Mouse/Printer/Modem
Mode of Op. : a-mode, A-ant, Mid Ch., PCdac=24
: Peak: L1 (Black), L2 (Green)
: 115Vac, 60 HZ

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



Trace: 10 Ref Trace:
Project # : 02U1466-1
Test Engineer: Frank Ibrahim
Company : W-Link Systems, Inc.
EUT : Harmony / Skyline 802.11 a
Test Config : EUT/PC/Monitor/KB/Mouse/Printer/Modem
Mode of Op. : a-mode, B-ant, Mid Ch., PCdac=23
: Peak: L1 (Black), L2 (Green)
: 115Vac, 60 HZ

9. Frequency Stability

Test Procedure: Place the EUT in an environmental chamber. Set the EUT to transmit a CW signal. Vary the temperature from -30 degrees Celsius to +50 degrees Celsius in 10 degree steps. At each temperature allow enough time for the EUT's temperature to stabilize and then take a measurement of the frequency. Adjust the EUT's supply voltage to 85% and measure the frequency. Repeat at 115% of the supply voltage.

Temp Cent Celsium	Voltage (VAC)	Freq (GHz), Fund=2.437	Freq (GHz), Fund=5.26	Freq (GHz), Fund=5.785
25	115	2.436996	5.259992	5.784991
0	132	2.437	5.259998	5.784998
0	126	2.436999	5.259998	5.784998
0	115	2.436999	5.259997	5.784997
0	105	2.436999	5.259997	5.784997
0	98	2.436999	5.259998	5.784998
55	132	2.437005	5.260011	5.785011
55	126	2.437005	5.26001	5.78501
55	115	2.437005	5.26001	5.785011
55	105	2.437005	5.260009	5.78501
55	98	2.437005	5.26001	5.785011
0	115	2.436999	5.259997	5.784997
10	115	2.436997	5.259994	5.784995
20	115	2.436996	5.25999	5.784992
30	115	2.436995	5.259989	5.784988
40	115	2.436994	5.259985	5.784984
50	115	2.436997	5.259992	5.784991
55	115	2.437005	5.26001	5.785011
Delta		-2kHz -0.82 ppm +9kHz 3.69 ppm	-2kHz -0.38 ppm +19kHz 3.6 ppm	-8kHz -1.38 ppm +20kHz 3.46 ppm

10. SETUP PHOTOS

TRANSMITTER RADIATED RF MEASUREMENT SETUP

DIGITAL DEVICE RADIATED EMISSIONS MEASUREMENT SETUP

FREQUENCY STABILITY SETUP

TRANSMITTER CONDUCTED RF MEASUREMENT SETUP

POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP

END OF REPORT