MEASUREMENT REPORT
of
Wireless Cable Modem Gateway

Applicant : Netgear Inc.
Model No. : CG814W
EUT : Wireless Cable Modem Gateway
FCC ID : PY3CG814W
Report No. : N1015722

Tested by :

Training Research Co., Ltd.

TEL : 886-2-26935155 **FAX : 886-2-26934440**
No. 255, Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C.

CERTIFICATION

We here by verify that:

The test data, data evaluation, test procedures and equipment configurations shown in this report were made mainly in accordance with the procedures given in ANSI C63.4 (1992) as a reference. All test were conducted by ***Training Research Co., Ltd.***, 255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. Also, we attest to the accuracy of each.

We further submit that the energy emitted by the sample EUT tested as described in the report is **in compliance with** the technical requirements set forth in the FCC Rules Part 15 Subpart C Section 15.247.

Applicant	:	Netgear Inc.
Applicant address	:	4500 Great America Parkway, Santa Clara CA 95054
EUT	:	Wireless Cable Modem Gateway
Model No.	:	CG814W
FCC ID	:	PY3CG814W
Report No.	:	N1015722
Test Date	:	August 21, 2002

Prepared by: *Eric Wong*

Approved by: *Frank Tsai*

Tested by :

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255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C.

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Ⅰ. GENERAL

1.1 Introduction

The following measurement report is submitted on behalf of applicant in support that the *cable gateway* certification in accordance with Part 2 Subpart J and Part 15 Subpart A and C of the Commission's Rules and Regulations.

1.2 Description of EUT

EUT	**:**	Wireless Cable Modem Gateway
Model No.	**:**	CG814W
Granted FCC ID	**:**	PY3CG814W
Frequency Range	**:**	2.412 GHz ~ 2.462GHz
Support Channel	**:**	11 Channel
Modulation Skill	**:**	DBPSK, DQPSK, CCK
Power Type	**:**	By the Power adaptor M/N: DSA-0151A-12 I/P: 100-120Vac, 50-60Hz, 40VA O/P: +12VDC, 1.25A
Power Cable	**:**	190cm long, non-shielded, with ferrite core

1.3 Description of Support Equipment

In order to construct the minimum testing, following equipment were used as the support units.

Notebook	**:**	**IBM Think Pad X20**
Type No.	:	2662-11T
Serial No.	:	FX-11922 00/09
FCC ID	:	Doc Approved
檢磁	:	3892B565
AC Adaptor	**:**	**IBM**
Model No.	:	PA2450U
Serial No.	:	02K6654
FCC ID	:	Doc Approved
Power Core	:	Non-shielded, 180cm long, Plastic hoods, with ferrite bead
Power type	:	100 ~ 240VAC, 50 ~ 60Hz, 0.5A ~ 1.2A / 16Vdc, 4.5A

Monitor	**:**	**HP 15’ Color Monitor**
Model No.	:	D2832A
Serial No.	:	MY90615892
FCC ID	:	N/A (DoC Approved)
檢磁	:	4872A167
Power type	:	110 ~ 240 VAC / 50 ~ 60 Hz, Switching
Power cord	:	Shielded, 1.80m long, No ferrite core
Data cable	:	Shielded, 1.50m long, with two ferrite cores

Wireless PC Card		**:LINKSYS**
Model No.	:	WPC11 ver.3
FCC ID	:	PKW-WPC11-V3
Canada Code	:	3839A12075

PC	**:**	**HP Brio 85xx 6/350**
Model No.	:	D6928A
Serial No.	:	SG91801535
FCC ID	:	N/A, DoC (Declaration of Confirmation) Approved
檢磁	:	3872H013
Power type	:	100 ~ 230VAC / 50 ~ 60Hz, 5A, Switching
Power cord	:	Non-shielded, 2.33m long, Plastic, No ferrite core

Monitor	**:**	**HP 15’ Color Monitor**
Model No.	:	D2827A
Serial No.	:	KR91161717
FCC ID	:	C5F7NFCMC1518X
檢磁	:	3872B039
Power type	:	100 ~ 240 VAC / 50 ~ 60 Hz, Switching
Power cord	:	Shielded, 1.83m long, No ferrite core
Data cable	:	Shielded, 1.46m long, with two ferrite cores

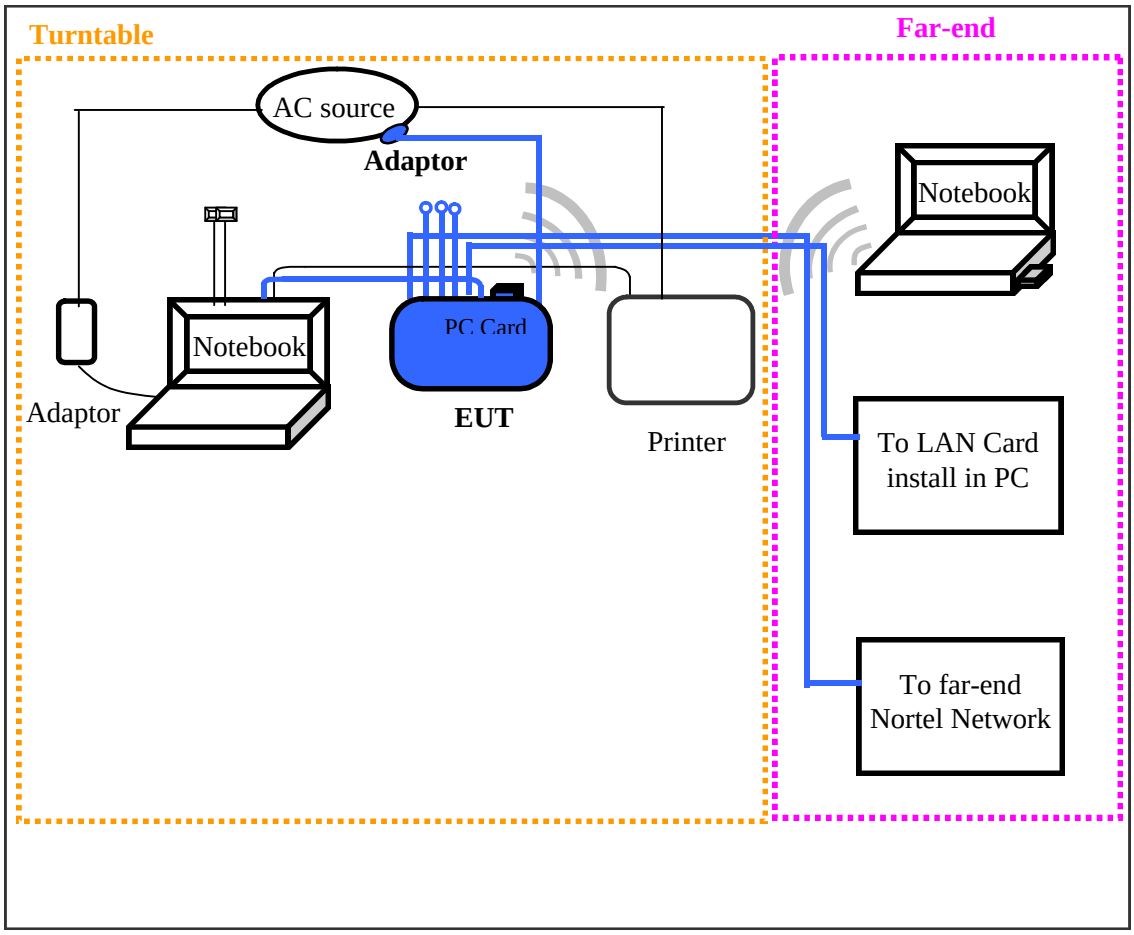
Keyboard	**:**	**HP**
Model No.	:	SK-2501K
Serial No.	:	M990308909
FCC ID	:	GYUR38SK
檢磁	:	3862A621
Power type	:	By PC
Data cable	:	Shielded, 1.73m long, with ferrite core

Mouse	**:**	**HP**
Model No.	:	M-S34
Serial No.	:	LZB90714122
FCC ID	:	DZL211029
檢磁	:	4862A011
Power type	:	By PC
Power cord	:	Non-shielded, 1.88m long, No ferrite core

LAN Card	**:**	**D-Link**
Model No.	:	DFE-530TX
Serial No.	:	0050BAE32FF3, 0050BAE3158B
FCC ID	:	N/A, DoC Approved
Notebook PC	**:**	**ASUSTek Computer**
Model No.	:	AB00F
Serial No.	:	24NP016361
FCC ID	:	DoC Approved
BSMI	:	41016012
Power type	:	100 ~ 240VAC, 1A 50/60 Hz, Switching
Adaptor of Notebook	**:**	**LITE-ON Electronics, Inc.**
Model No.	:	PA-1530-01
Serial No.	:	00151184
FCC ID	:	Doc Approved
檢磁	:	3882B259
Power cable	:	Non-shielded, 1.72m length, Plastic hood, No ferrite core (Between power adaptor and AC power source)
Power cable	:	Shielded, 1.48m length, Plastic hood, with ferrite core (Between power adaptor and notebook)
Nortel Network	**:**	**CMTS-1000**
Model No.	:	DE3801E02
Serial No.	:	01325110
Product No.	:	119851-B

1.4 Configuration of System Under Test

(Conducted and Radiated for unintentional)



The tests below are carried out the EUT transmitter set at high power in TDD mode. The EUT is connected to the computer through the LAN card. The EUT is needed to force selection of output power level and channel number.

The setting up procedure was recorded in <Appendix A>.

Connections of Computer

Notebook:

*Parallel Port --- a Printer

*Line Jack --- A RJ11 cable with 600ohm termination

*LAN Jack --- A RJ11 cable with 100ohm termination

*USB A Port --- **EUT**

Connections of EUT

Power adaptor:

--- M/N: DSA-0151A-12

I/P: 100-120Vac, 50-60Hz, 40VA

O/P: +12VDC, 1.25A

*Power cable of adaptor x 1

--- 190cm long, non-shielded, with ferrite core

Cable Gateway:

*RJ45 Cable x 3

--- 1.5m long, non-shielded, no ferrite core

*RJ45 Cable x 1

--- 30m long, non-shielded, no ferrite core

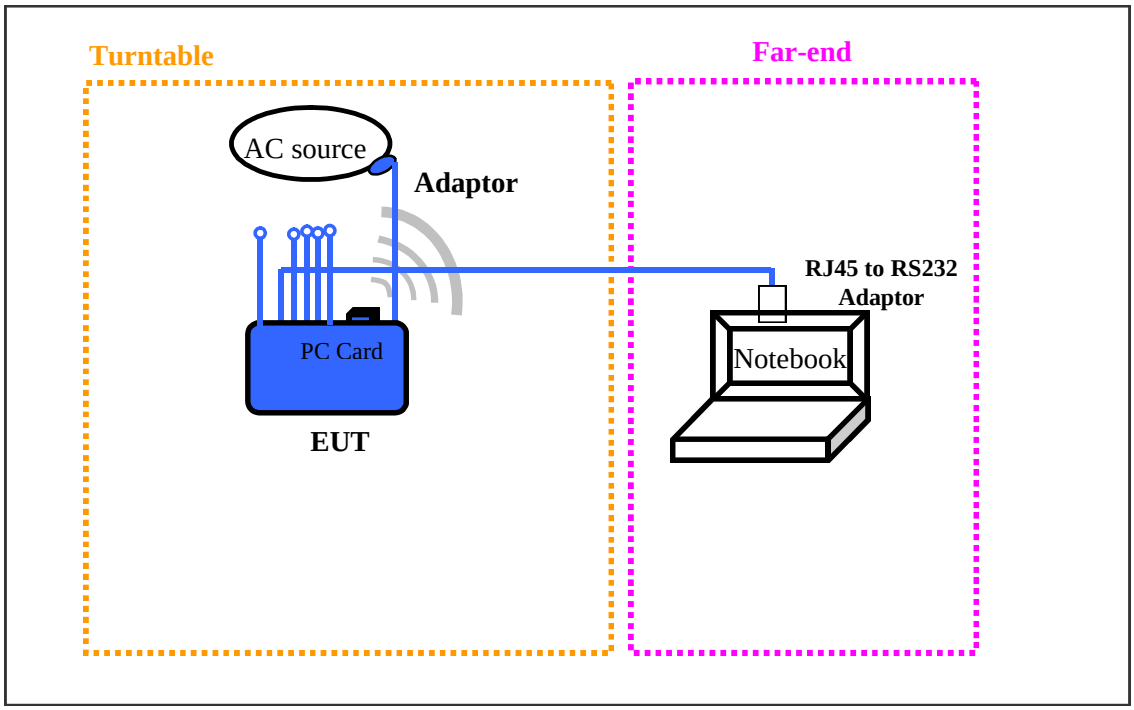
*USB Cable x 1

--- 1.85m long, shielded, no ferrite core

*BNC Cable x 1

--- 15m long, shielded, no ferrite core

(Radiated of intentional)



The tests below are carried out the EUT transmitter set at high power in TDD mode. The EUT is connected to the computer through the LAN Port via RJ45 to RS232 adaptor. The EUT is needed to force selection of output power level and channel number.

The setting up procedure was recorded in <Appendix A>.

Connections of EUT

Power adaptor:

--- M/N: DSA-0151A-12
I/P: 100-120Vac, 50-60Hz, 40VA
O/P: +12VDC, 1.25A
*Power cable of adaptor x 1
--- 190cm long, non-shielded, with ferrite core

Cable Gateway:

*RJ45 Cable x 3
--- 1.5m long, non-shielded, no ferrite core
*RJ45 Cable x 1
--- 30m long, non-shielded, no ferrite core
*USB Cable x 1
--- 1.85m long, shielded, no ferrite core
*BNC Cable x 1
--- 1.2m long, shielded, no ferrite core

1.5 Verify the Frequency and Channel

Channel	Frequency (GHz)
1	2.412
2	2.417
3	2.422
4	2.427
5	2.432
6	2.437
7	2.442
8	2.447
9	2.452
10	2.457
11	2.462

Note:
1.This is for confirming that all frequencies are in 2.412GHz to 2.462GHz.

2.Section 15.31(m): Measurements on intentional radiators or receivers shall be performed at three frequencies for operating frequency range over 10 MHz.
(The locations of these frequencies one near the top, one near the middle and one near the bottom.)

3.After test, the EUT operating frequencies are in 2.412GHz to 2.462GHz. So all the items as followed in testing report are need to test these three frequencies:
Top: Channel – 1; Middle: Channel – 6; Bottom: Channel – 11.

1.6 Test Procedure

All measurements contained in this report were performed mainly according to the techniques described in ANSI C63.4 (1992) and the pre-setup was written on Appendix A, the detail setup was written on each test item.

1.7 Location of the Test Site

The radiated emissions measurements required by the rules were performed on the **three-meter**, **Anechoic Chamber (Registration Number: 93906)** maintained by *Training Research Co., Ltd.* 1F, No. 255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. Complete description and measurement data have been placed on file with the commission. The conducted power line emissions tests and other test items were performed in a anechoic chamber also located at Training Research Co., Ltd.

No. 255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. *Training Research Co., Ltd.* is listed by the FCC as a facility available to do measurement work for others on a contract basis.

1.8 General Test Condition

The conditions under which the EUT operates were varied to determine their effect on the equipment's emission characteristics. The final configuration of the test system and the mode of operation used during these tests were chosen as that which produced the highest emission levels. However, only those conditions, which the EUT was considered likely to encounter in normal use were investigated.

In test, they were set in high power and continuously transmitting mode that controlled by computer. The ch01, ch06 and ch11 of EUT were all tested. The setting up procedure is recorded on Appendix A.

II. Section 15.101(a): Equipment authorization of unintentional radiators

The EUT equipped with a USB bus interface and should be operated with the computer. It was categorized to *Class B personal computers and peripherals* as cannot be operated stand-alone. The authorization requires Certification and the items required such as Sect.15.107 (Conducted limits) and Sect.15.109 (Radiated emission limits) is same as Sect.15.207 and 15.247(C) we' d performed respectively. We dropped this part, as the result will be repeated as the part we mentioned above.

III. Section 15.203: Antenna requirement

The EUT has an integrated antenna permanently attached on the PCB. In addition, there is no external antenna or connector employed. The antenna requirement stated in Sect.15.203 is inapplicable to this EUT.

IV. Section 15.207: Power Line Conducted Emissions for AC Powered Units

4.1 Test Condition & Setup

The power line conducted emission measurements were performed in an anechoic chamber. The EUT was assembled on a wooden table, which is 80 centimeters high, was placed 40 centimeters from the backwall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and Line Impedance Stabilization Networks (LISNs). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer (or EMI receiver) was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPER quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 450 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 2.4.

There is a test condition apply in this test item, the test procedure description as the following:

1.EUT transmit only:
Using the LAN card install in computer and software to control the EUT. Then making access to the mode of continuous transmission and setting the testing channel. Three channels were tested, one in the top (CH01), one in the middle (CH06) and the other in bottom (CH11).

The setting up procedure is recorded on <Appendix A>.

4.2 List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
EMI Receiver	8546A	H P	3520A00242	06/28/02	06/28/03
RF Filter Section	85460A	H P	3448A00217	06/28/02	06/28/03
LISN (EUT)	LISN-01	TRC	9912-03,04	12/09/01	12/09/02
LISN (Support E.)	LISN-01	TRC	9912-05	07/15/02	07/15/03
Switch/Control Unit (< 30MHz)	3488A	HP	N/A	11/20/01	11/20/02
Auto Switch Box (< 30MHz)	ASB-01	TRC	9904-01	11/20/01	11/20/02

The level of confidence of 95%, the uncertainty of measurement of conducted emission is ± 2.02dB.

4.3 Test configuration

Conducted Emissions Test Placement

4.4 Test Result of Conducted Emissions

EUT station transmit only

The following table shows a summary of the highest emissions of power line conducted emissions on the LIVE and NETURAL conductors of the EUT power cord.

Test Conditions: Testing room : Temperature : 23 °C Humidity : 43 % RH

Table 1 Power Line Conducted Emissions

Power Connected Emissions				*FCC Class B*	
Conductor	***Frequency (KHz)***	***Peak Amplitude (dBmV)***	***QP Amplitude (dBmV)***	***Limit (dBmV)***	***Margin (dB)***
Line 1	483.00	44.43	---	48.00	-3.57
	560.00	43.68	---	48.00	-4.32
	575.00	43.89	---	48.00	-4.11
	590.00	44.16	---	48.00	-3.84
	650.00	42.87	---	48.00	-5.13
	667.00	42.82	---	48.00	-5.18
	769.00	43.64	---	48.00	-4.36
	833.00	42.69	---	48.00	-5.31
	2680.00	43.78	---	48.00	-4.22
	2730.00	43.55	---	48.00	-4.45
Line 2	486.00	44.54	---	48.00	-3.46
	579.00	43.57	---	48.00	-4.43
	590.00	43.39	---	48.00	-4.61
	759.00	42.83	---	48.00	-5.17
	1468.00	42.86	---	48.00	-5.14
	1555.00	43.33	---	48.00	-4.67
	1635.00	43.15	---	48.00	-4.85
	2510.00	43.92	---	48.00	-4.08
	2580.00	45.55	---	48.00	-2.45
	2710.00	47.56	---	48.00	-0.44

NOTE:

(1)Margin = Peak Amplitude – Limit, ***The reading amplitudes are all under limit.***

(2)A "+" sign in the margin column means the emission is OVER the Class B Limit and "–" sign of means UNDER the Class B limit

V. Section 15.247 (a): Technical description of the EUT

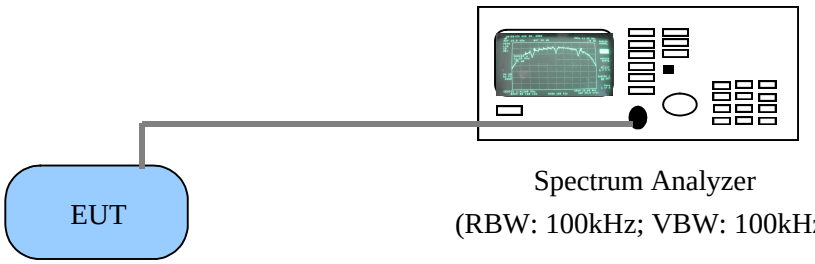
Based on the Section 2.1, *Direct Sequence System* is a spread spectrum system in which the carrier has been modulated by a high speed spreading code and an information data stream. The high speed code sequence dominates the "modulating function" and is the direct cause of the wide spreading of the transmitted signal. In the Exhibit H, operational description demonstrates the operation principles of the Baseband processor employed by the EUT, shows that which is a complete DSSS baseband processor and meets the definition of the Direct sequence spread spectrum system.

VI. Section 15.247(a)(2): Bandwidth for Direct Sequence System.

6.1 Test Condition & Setup

The transmitter bandwidth measurements were performed by the contact manner. The EUT was set to transmit continuously, also various channels were investigated to find the maximum occupied bandwidth.. The output of the EUT was connected to the spectrum analyzer. The bandwidth of the fundamental frequency is observed by the spectrum analyzer with 100kHz RBW and 100kHz VBW.

6.2 Test Instruments Configuration



Test Configuration of Bandwidth for Direct Sequence System

P.S.: Notebook computer to control the EUT at maximal power output and channel Number and set antenna kit

6.3 List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
Spectrum Analyzer	8592A	H P	3003AD1401	01/02/02	01/01/03

6.4 Test Result of Bandwidth

Bandwidth of Channel 1

Bandwidth	:	11.05 MHz
The min. 6 dB BW at least	:	500 KHz

Bandwidth of Channel 6

Bandwidth	:	11.10 MHz
The min. 6 dB BW at least	:	500 KHz

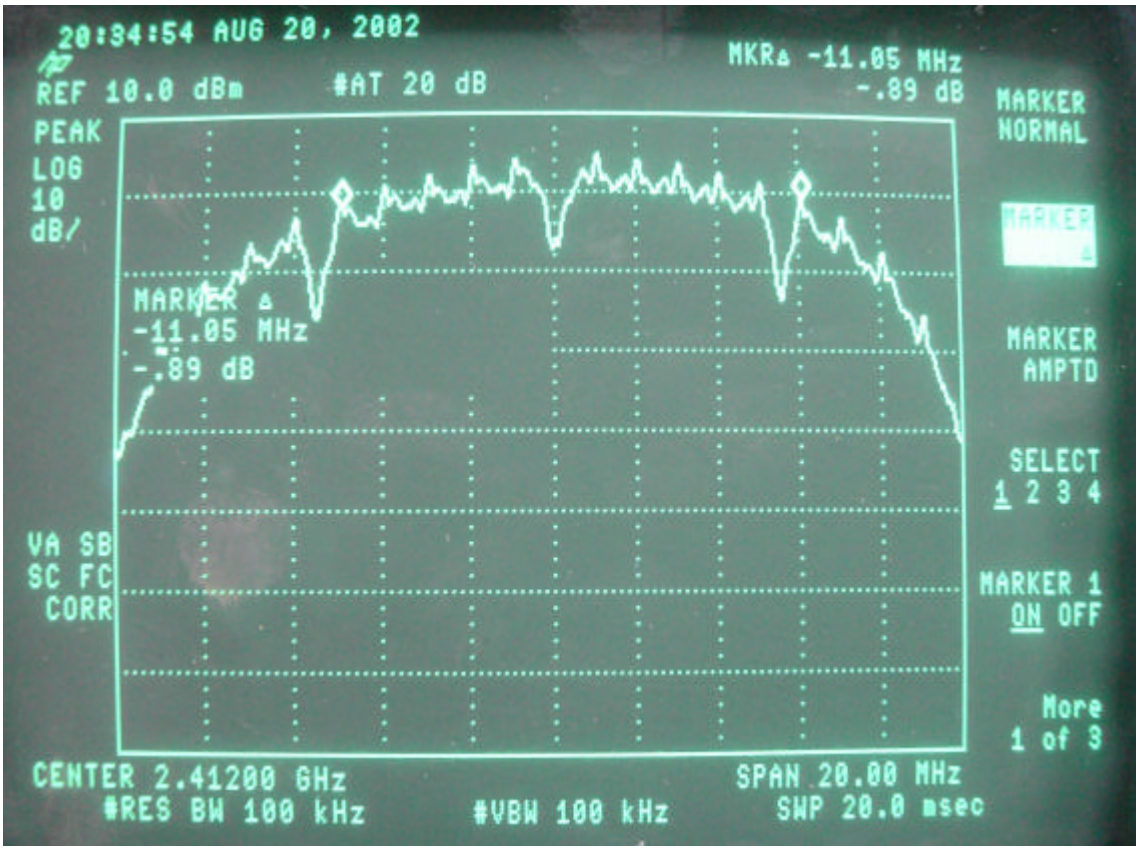
Bandwidth of Channel 11

Bandwidth	:	11.10 MHz
The min. 6 dB BW at least	:	500 KHz

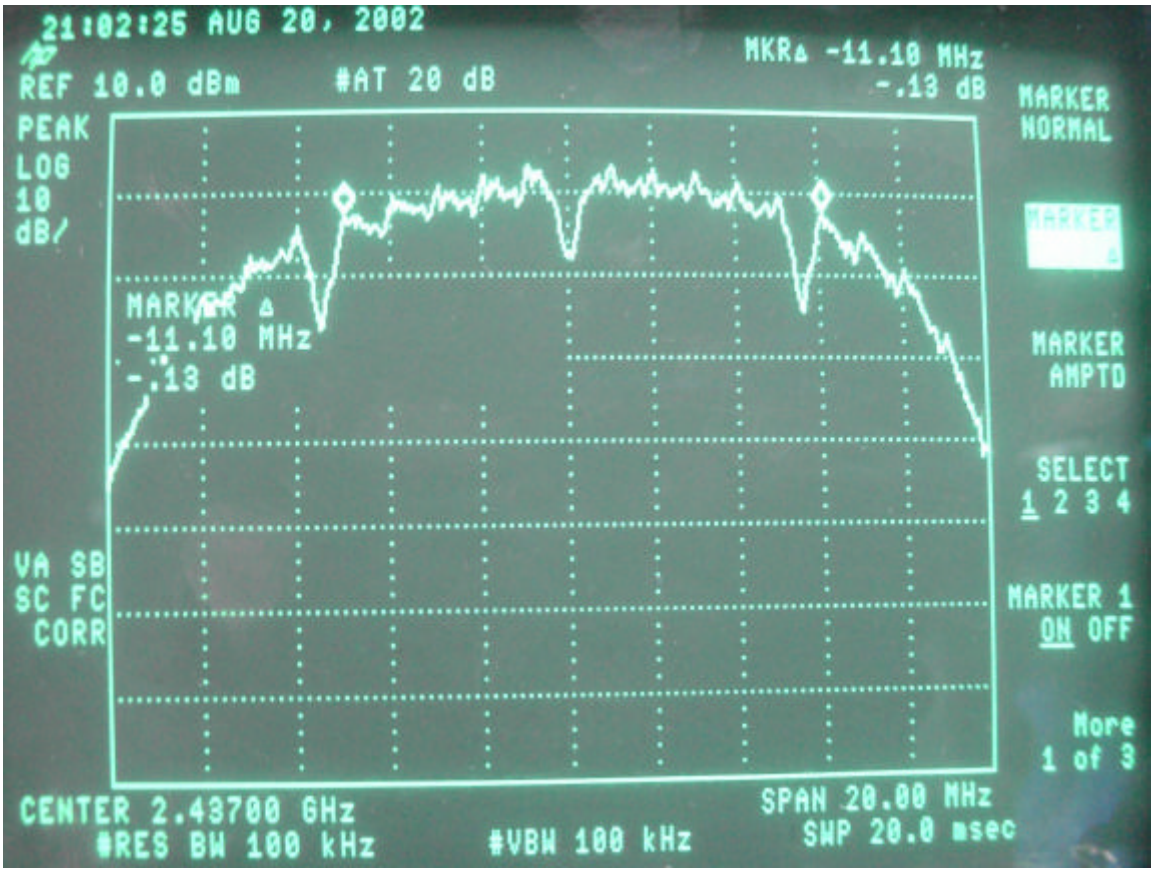
Note:

1. The data in the above table are summarizing the following attachment spectrum analyzer hard copy. According to the guidance, we' d made the measurement with the spectrum analyzer' s resolution bandwidth *(RBW)=100kHz* and set the *span>>RBW*. The results show the measured 6dB bandwidth comply with the minimum 500kHz requirement.
2. The attachments show these on the following pages.

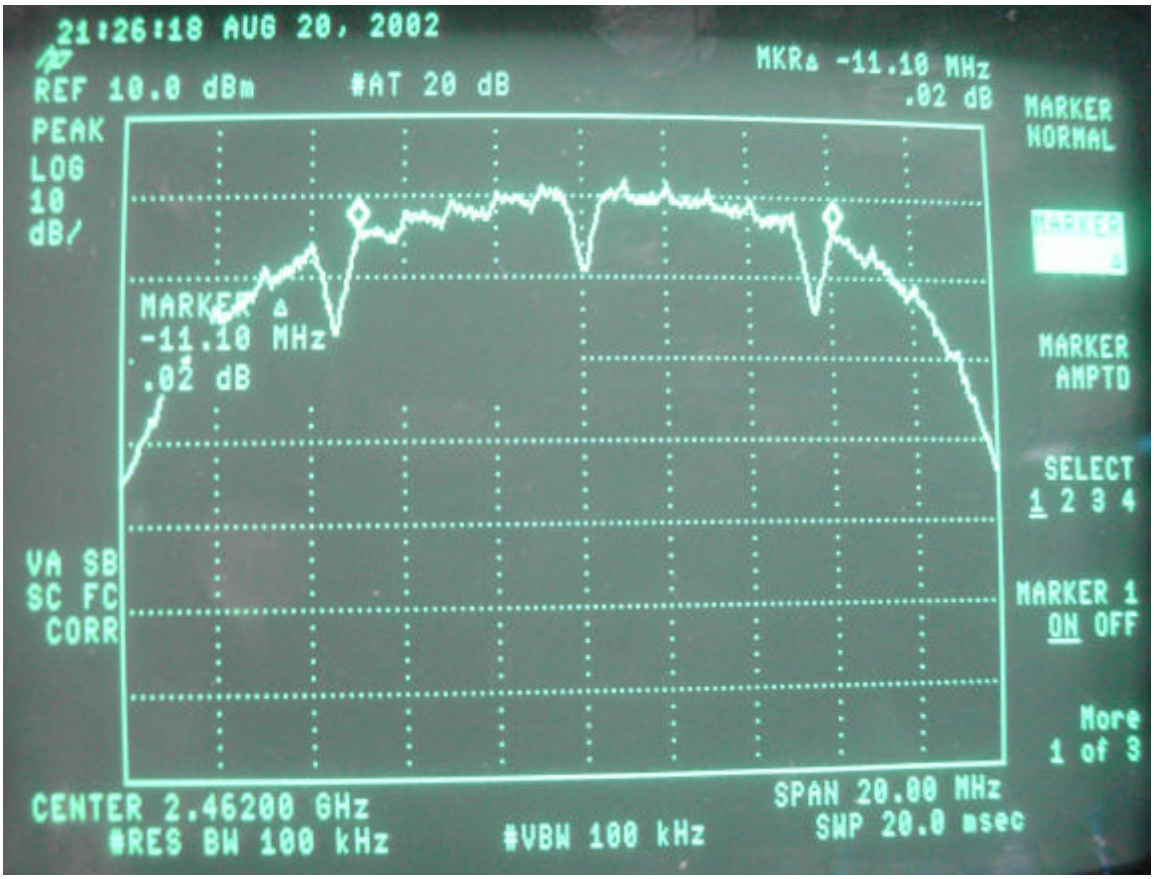
Bandwidth of Channel 1: 11.05 MHz



Bandwidth of Channel 6: 11.10 MHz

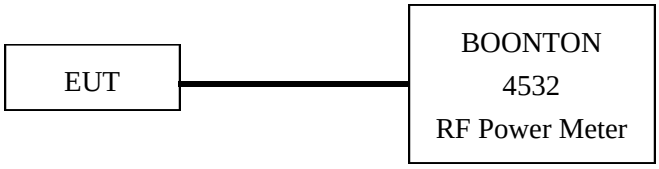


Bandwidth of Channel 11: 11.10 MHz



VII. Section 15.247(b): Power Output

7.1 Test Condition & Setup



1. The output of the transmitter is connected to the BOONTON RF Power Meter.
2. The calibration is performed before every tests. The values of the output power of the EUT will shown in the dBm directly are the transmitter output peak power. Recording as follows.

7.2 List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.
RF Power Meter	4532	BOONTON	117501

7.3 Test Result

Formula:
Signal generator + |Cable loss| = Output peak power

Channel	Signal Generator	Cable Loss	Limit	Output peak power	
	dBm	dBm	(DTS)	dBm	mW
CH 1	14.18	0.7	100mW	14.88	30.761
CH 6	13.32	0.7	100mW	14.02	25.235
CH 11	12.00	0.7	100mW	12.70	18.621

Note:
The limit is vary according to the equipment class, listed below:
1. Digital Transmission System (DTS): 100mW
2. Spread Spectrum Transmitter (DSS): 1W

VIII. Section 15.247 (C): Spurious Emissions (Radiated)

8.1 Test Condition & Setup

We' d performed the test by the *radiated emission* skill: The EUT was placed in an anechoic chamber, and set the EUT transmitting continuously and scanned at 3-meter distance to determine its emission characteristics. The physical arrangement of the EUT was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude, directivity, and frequency. The exact system configuration, which produced the highest emissions was noted so it could be reproduced later during the final tests. For the measurement above 1GHz, according to the guidance we' d set the spectrum analyzer' s 6dB bandwidth RBW to 1MHz.

This was done to ensure that the final measurements would demonstrate the worst-case interference potential of the EUT.

Final radiation measurements were made on a three-meter, anechoic chamber. The EUT system was placed on a nonconductive turntable, which is 0.8 meters height, top surface 1.0 x 1.5 meter.

The spectrum was examined from 30 MHz to 1000 MHz using an Hewlett Packard 85460A EMI Receiver, Schaffner whole range Bi-Log antenna (Model No.: CBL6141A) is used to measure frequency from 30 MHz to 1GHz.The final test is used the spectrum HP 85460A and spectrum was examined from 1GHz to 18GHz using an Hewlett Packard 8564E Spectrum Analyzer, EMCO Horn Antenna (Model 3115) for 1G ~ 18GHz.

At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. There are two spectrum analyzers use on this testing, HP 85460A for frequency 30MHz to 1000MHz, and 8564E for frequency 1GHz to 18GHz. No post-detector video filters were used in the test. The spectrum analyzer's 6dB bandwidth was set to 120KHz (spectrum was examined from 30 MHz to 1000 MHz), the spectrum analyzer's 6 dB bandwidth was set to 1 MHz (spectrum was examined from 1GHz to 18GHz) and the analyzer was operated in the maximum hold mode. There is a test condition apply in this test item, the test procedure description as the following:

Making access to the mode of continuous transmission by the software in the computer via the LAN port. Three channels were tested, one in the top (CH01), one in the middle (CH06) and the other in bottom (CH11).

With the transmitter operating from a AC source and using the internal of EUT, radiates spurious emissions falling within the restricted bands of 15.209 were measured at operating frequencies corresponding to upper, middle and bottom channels in the 2400 ~ 2483.5 MHz band.

The actual field intensity in decibels referenced to 1 microvolt per meter (dBμV/m) is determined by algebraically adding the measured reading in dBμV, the antenna factor (dB), and cable loss (dB) at the appropriate frequency. Since the EUT was set to transmit continuously, no *duty cycle* is present.

For frequency between 30MHz to 1000MHz

FIa (dBuV/m) = FIr (dBμV) – Correction Factors

FIa : Actual Field Intensity

FIr : Reading of the Field Intensity

Correction Factors = Antenna Factor + Cable Loss – Amplifier Gain

For frequency between 1 GHz to 18 GHz

FIa (dBμV/m) = FIr (dBμV) + Correction Factor

FIa : Actual Field Intensity

FIr : Reading of the Field Intensity

Correction Factors = Antenna Factor + Cable Loss – Amplifier Gain

The setting up procedure is recorded on Appendix A.

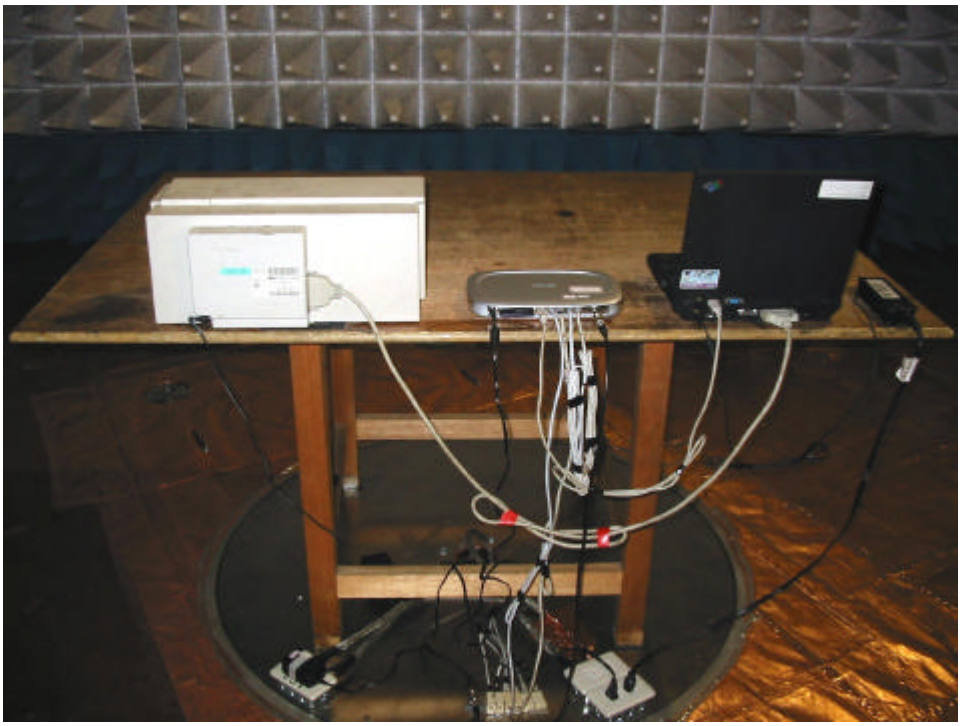
8.2 List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
Spectrum analyzer	8591EM	H P	3710A01203	05/29/02	05/29/03
Pre-selector (>30MHz)	AMP-01	TRC	REP-001	10/02/01	10/02/02
Spectrum analyzer	8568B	H P	3004A18617	06/19/02	06/19/03
Quasi-peak Adapter	85650A	H P	2521A00984	06/20/02	06/20/03
RF Pre-selector	85685A	H P	2947A01011	06/20/02	06/20/03
RF Pre-selector	AMP-01	TRC	REP-002	10/02/01	10/02/02
Bi-log Antenna	VULB9160	M. E.	3064	07/09/02	07/09/03
Antenna (30M-2GHz)	3142	EMCO	9610-1094	10/02/01	10/02/02
Open test side (Antenna, Amplify, cable calibrated together)				05/20/02	05/20/03
Spectrum Analyzer	8564E	HP	US36433002	08/01/02	08/01/03
Microwave Preamplifier	83051A	HP	3232A00347	08/01/02	08/01/03
Horn Antenna	3115	EMCO	9704 – 5178	08/01/02	08/01/03

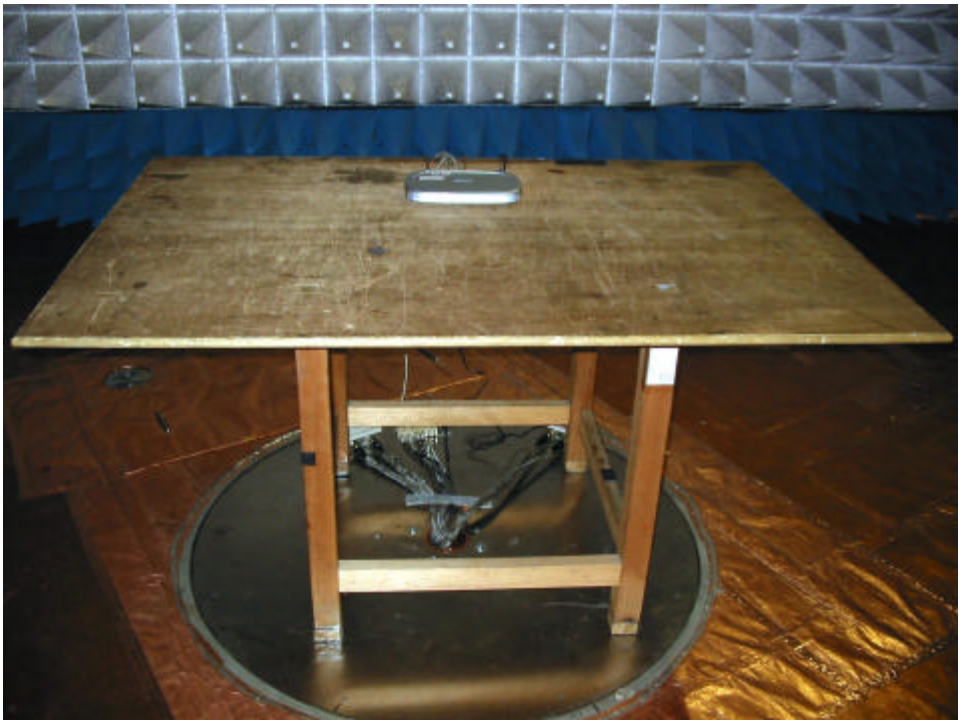
The level of confidence of 95% , the uncertainty of measurement of radiated emission is ± 3.44dB .

8.3 Test Instruments Configuration

Front View of the Test Configuration of Unintentional



Rear View of the Test Configuration Unintentional



Front View of the Test Configuration of Intentional

Rear View of the Test Configuration Intentional

8.4 Test Result of Spurious Radiated Emissions

EUT's transmit only

The highest peak values of radiated emissions form the EUT at various antenna heights, antenna polarizations, EUT orientation, etc. are recorded on the following.

Test Conditions:

Testing room : Temperature : 22 ° C Humidity : 41 % RH

Testing site : Temperature : 24 ° C Humidity : 34 % RH

Table 2 Radiated Emissions for 30MHz 1GHz [Horizontal]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*FCC Class B (3 m)*	
Frequency (MHz)	*Amplitude (dBmV)*	*Ant. H. (m)*	*Table (°)*	*(dB)*	*(dBmV/m)*	*Limit (dBmV/m)*	*Margin (dB)*
132.001	48.40	2.54	254	-12.21	36.19	43.50	-7.31
150.000	41.70	2.54	45	-10.56	31.14	43.50	-12.36
250.000	46.20	1.00	282	-11.40	34.80	46.00	-11.20
280.000	40.00	1.00	49	-9.66	30.34	46.00	-15.66
300.000	43.00	1.00	162	-8.99	34.01	46.00	-11.99
400.000	40.90	1.00	181	-5.82	35.08	46.00	-10.92
500.024	39.10	1.00	294	-3.06	36.04	46.00	-9.96

Note:

1.Margin = Amplitude – limit, *if margin is minus means under limit.*

2.Corrected Amplitude = Reading Amplitude + Correction Factors

3.Correction factor = Antenna factor + (Cable Loss – Amplitude gain)

Table 3 Radiated Emissions For 30MHz 1GHz [Vertical]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*FCC Class B (3 m)*	
Frequency (MHz)	*Amplitude (dBmV)*	*Ant. H. (m)*	*Table (°)*	*(dB)*	*(dBmV/m)*	*Limit (dBmV/m)*	*Margin (dB)*
50.000	42.70	1.00	229	-13.79	28.91	40.00	-11.09
125.004	45.60	1.00	232	-12.53	33.07	43.50	-10.43
150.000	41.10	1.00	0	-10.56	30.54	43.50	-12.96
250.000	45.40	1.00	77	-11.40	34.00	46.00	-12.00
300.000	41.40	1.00	71	-8.99	32.41	46.00	-13.59
375.015	36.80	1.00	70	-6.35	30.45	46.00	-15.55
400.017	40.10	1.00	99	-5.82	34.28	46.00	-11.72
500.000	36.90	1.00	57	-3.06	33.84	46.00	-12.16

Table 4 Open Field Radiated Emissions For 1GHz 18GHz [Horizontal] [CH 1]

Radiated Emission				Corrected Amplitude (dBμV/m)		FCC Class B (3m) Limit (dBμV/m)		Margin (dB)
Frequency (MHz)	Ant. H. (m)	Table (°)	Correction Factors (dB)	Peak	Average	Peak	Ave.	
2035.50	1.00	258	3.35	52.43	46.68	74.00	54.00	-1.57
2788.37	1.00	241	3.58	50.52	---	74.00	54.00	-3.48

Table 5 Open Field Radiated Emissions For 1GHz 18GHz [Vertical] [CH 1]

Radiated Emission				Corrected Amplitude (dBμV/m)		FCC Class B (3m) Limit (dBμV/m)		Margin (dB)
Frequency (MHz)	Ant. H. (m)	Table (°)	Correction Factors (dB)	Peak	Average	Peak	Ave.	
2035.50	1.00	11	3.35	56.48	50.55	74.00	54.00	-3.45
2788.37	1.00	189	3.58	50.45	---	74.00	54.00	-3.55

Note:

1. Margin = Corrected - Limit.
2. The EUT utilizes a *permanently attached antenna*. In addition the spurious RF conducted emissions levels do comply with the *20dBc limit* both at its bandedges and other spurious emissions.
3. As stated in Section 15.35(b), for any frequencies above 1000MHz, radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. As the results of our test, the peak amplitudes are already below the FCC limit. Thus the average amplitudes of the rest are omitted.

Table 6 Open Field Radiated Emissions For 1GHz 18GHz [Horizontal] [CH 6]

Radiated Emission				*Corrected Amplitude (dBμV/m)*		*FCC Class B (3m)*		
Frequency (MHz)	*Ant. H. (m)*	*Table (°)*	*Correction Factors (dB)*	*Peak*	*Average*	*Limit (dBμV/m) Peak*	*Ave.*	*Margin (dB)*
2061.62	1.00	151	3.24	53.80	52.61	74.00	54.00	-0.20

Table 7 Open Field Radiated Emissions For 1GHz 18GHz [Vertical] [CH 6]

Radiated Emission				*Corrected Amplitude (dBμV/m)*		*FCC Class B (3m)*		
Frequency (MHz)	*Ant. H. (m)*	*Table (°)*	*Correction Factors (dB)*	*Peak*	*Average*	*Limit (dBμV/m) Peak*	*Ave.*	*Margin (dB)*
2061.62	1.00	315	3.24	55.42	49.94	74.00	54.00	-4.06

Note:

1. Margin = Corrected - Limit.
2. The EUT utilizes a *permanently attached antenna*. In addition the spurious RF conducted emissions levels do comply with the *20dBc limit* both at its bandedges and other spurious emissions.
3. As stated in Section 15.35(b), for any frequencies above 1000MHz, radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. As the results of our test, the peak amplitudes are already below the FCC limit. Thus the average amplitudes of the rest are omitted.

Table 8 Open Field Radiated Emissions For 1GHz 18GHz [Horizontal] [CH 11]

Radiated Emission				Corrected Amplitude (dBμV/m)		FCC Class B (3m) Limit (dBμV/m)		Margin (dB)
Frequency (MHz)	Ant. H. (m)	Table (°)	Correction Factors (dB)	Peak	Average	Peak	Ave.	
2085.37	1.00	249	3.18	54.82	49.51	74.00	54.00	-4.49

Table 9 Open Field Radiated Emissions For 1GHz 18GHz [Vertical] [CH 11]

Radiated Emission				Corrected Amplitude (dBμV/m)		FCC Class B (3m) Limit (dBμV/m)		Margin (dB)
Frequency (MHz)	Ant. H. (m)	Table (°)	Correction Factors (dB)	Peak	Average	Peak	Ave.	
2085.37	1.00	65	3.18	54.71	50.24	74.00	54.00	-3.76

Note:

1. Margin = Corrected - Limit.
2. The EUT utilizes a *permanently attached antenna*. In addition the spurious RF conducted emissions levels do comply with the *20dBc limit* both at its bandedges and other spurious emissions.
3. As stated in Section 15.35(b), for any frequencies above 1000MHz, radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. As the results of our test, the peak amplitudes are already below the FCC limit. Thus the average amplitudes of the rest are omitted.

8.5 Test Result of the Bandedge

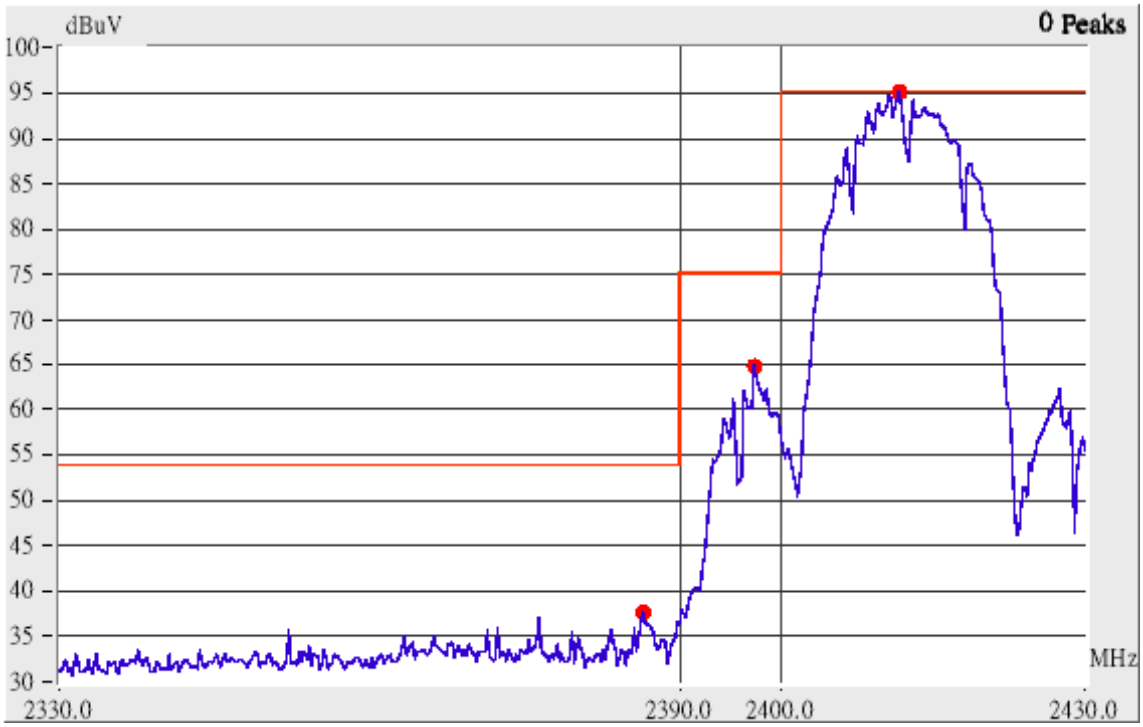
If any 100 kHz bandwidth outside these frequency bands, the radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either *at least 20 dB below that in any 100 kHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified id §15.209(a),*

We perform this section by the *conducted* manner, the RBW is set to 100kHz and VBW>RBW. We' d made the observation *up to 10th harmonics and the criterion is all the harmonic/spurious emissions must be 20dB below the highest emission level measured.* If the emissions fall in the restricted bands stated in the Part15.205(a) must also *comply with the radiated emission limits specified in Part15.209(a).*

The following pages show our observations referring to the channel 1 and 11 respectively.

Test Condition & Setup: same as 3.1

Channel 1



This is the hard copy of our bandedge measurement generated by our bandedge testing program. The picture shown above is the bandedge of channel 1.

1. The lobe right by the fundamental side is already 20dB below the highest emission level.
2. The emissions recorded in the restricted band (<2400MHz) is do comply with the Part 15.209(a) – under the limited line marked in red color.

Channel 11

This is the hard copy of our bandedge measurement generated by our bandedge testing program. The picture shown above is the bandedge of channel 11.

1. The lobe right by the fundamental side is already 20dB below the highest emission level.
2. The emissions recorded in the restricted band (>2483.5MHz) is do comply with the Part 15.209(a) – under the limited line marked in red color.

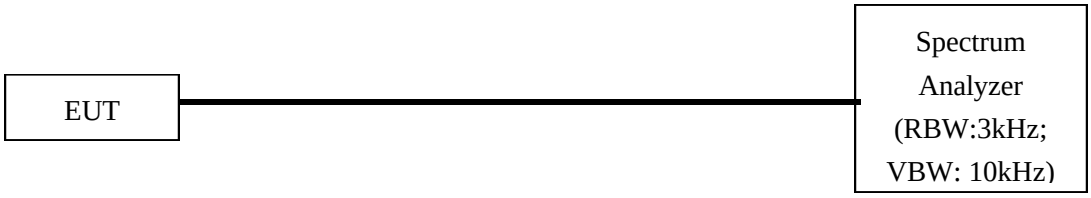
IX. Section 15.247(d): Power Spectral Density

9.1 Test Condition & Setup

The tests below are running with the EUT transmitter set at high power in TDD mode . The EUT is needed to force selection of output power level and channel number. While testing, the EUT was set to transmit continuously and to be tested by the contact manner with the spectrum analyzer.

The attachments below show our observation.

9.2 Test Instruments Configuration



Test Configuration of Power Spectral Density

P.S.: Notebook computer to control the EUT at maximal power output and channel Number and set antenna kit

9.3 List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
Spectrum Analyzer	8592A	H P	3003AD1401	01/02/02	01/01/03

9.4 Test Result of Power spectral density

The following table shows a summary of the test results of the Power Spectral Density.

Channel	*Frequency (GHz)*	*Ppr (dBm)*	*Cable Loss (dB)*	*Ppq (dBm)*	*Limit (dB)*	*Margin (dB)*
CH 01	2.412	-10.40	1.80	-8.60	8.00	-16.60
CH 06	2.437	-11.36	1.85	-9.51	8.00	-17.51
CH 11	2.462	-12.41	1.93	-10.48	8.00	-18.48

Note:

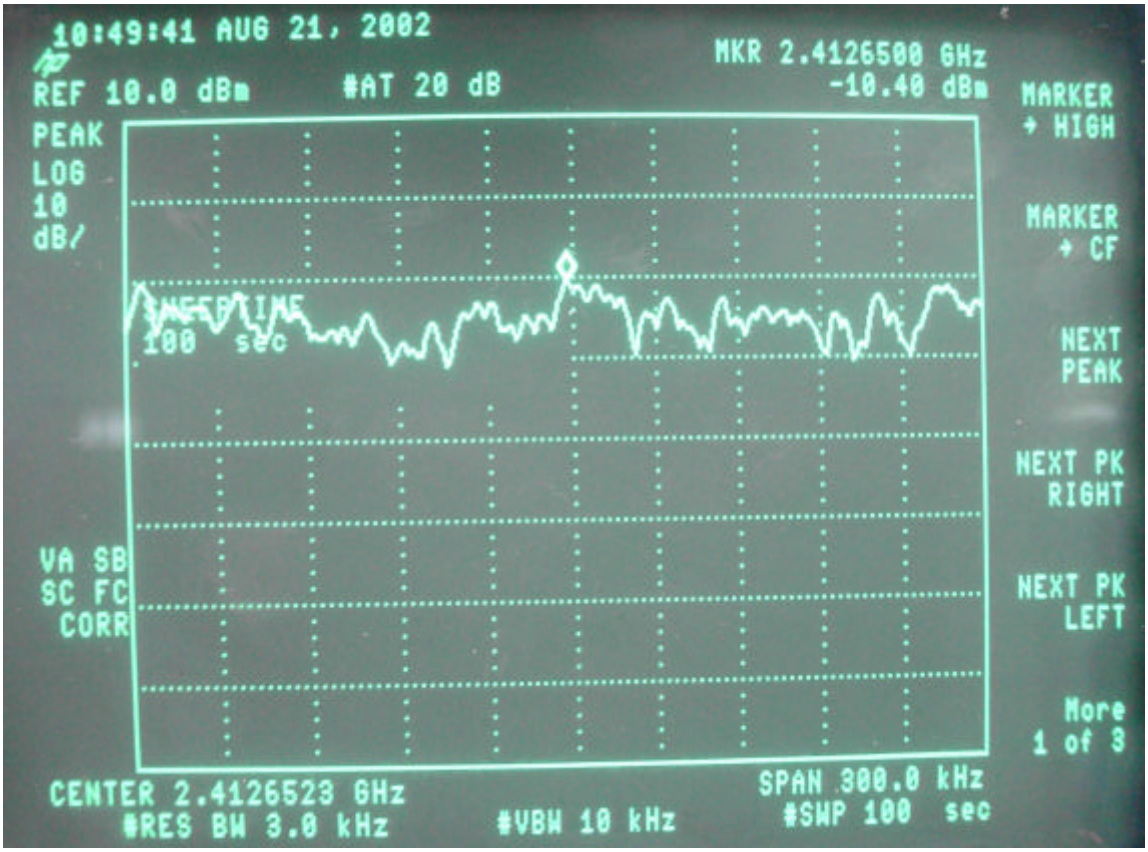
1.The attachment follow by this page and there is no page number.

2.Ppr: spectrum read power density (using peak search mode),

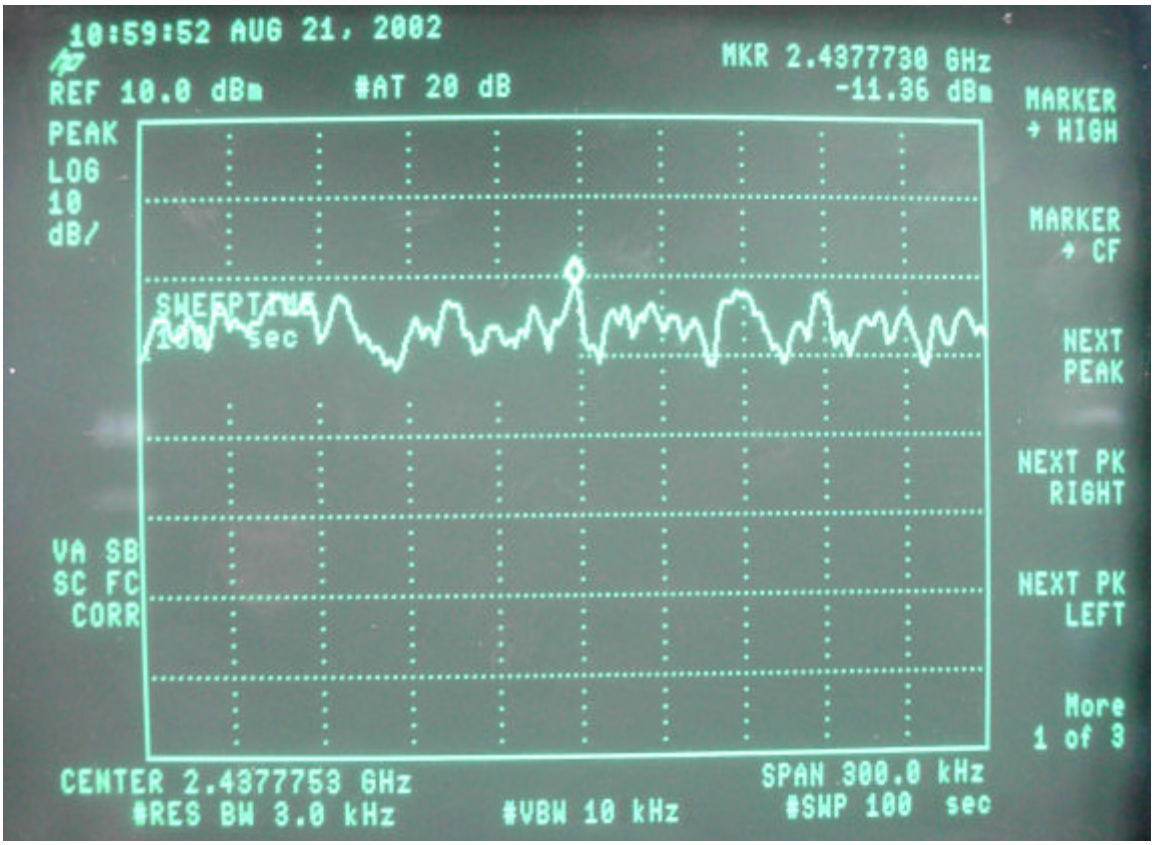
Ppq: actual peak power density in the spread spectrum band.

3.Ppq = Ppr + |Cable Loss|

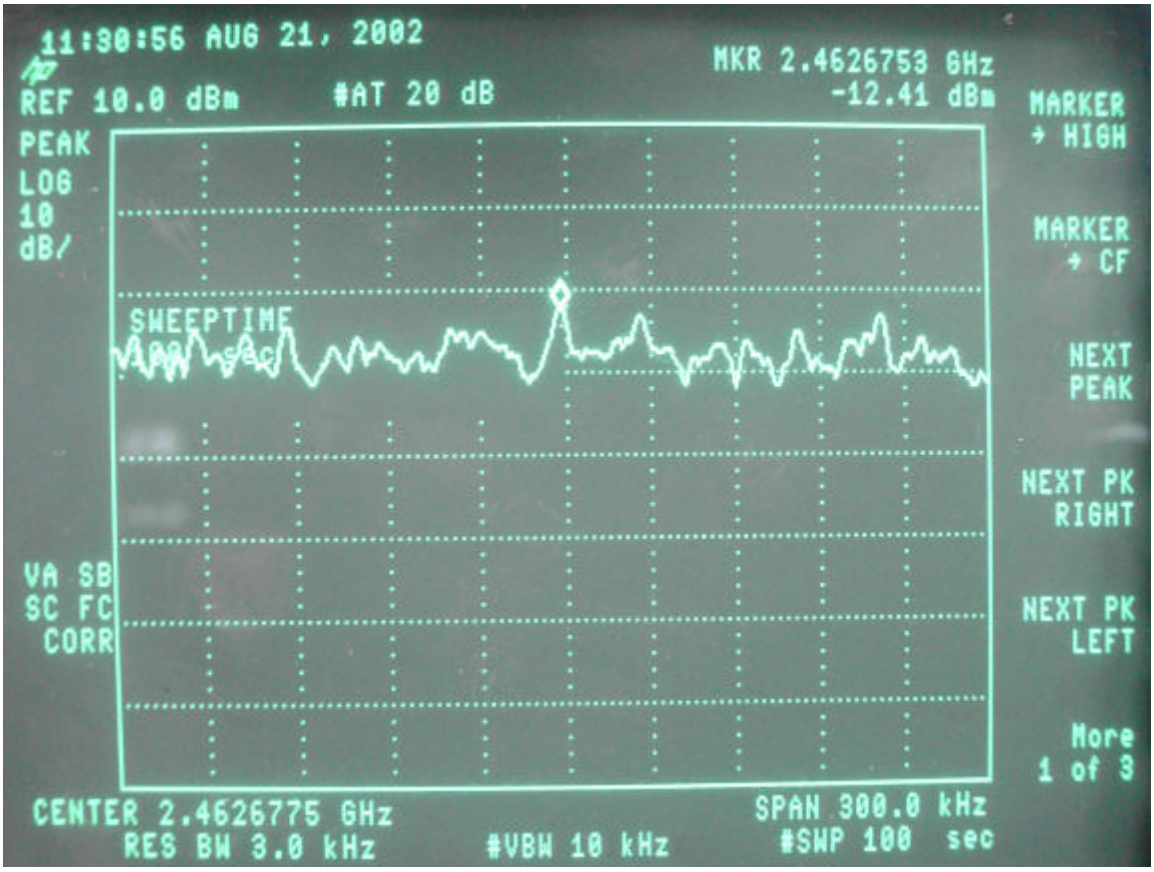
Channel 01


10:49:41 AUG 21, 2002
MKR 2.4126500 GHz
REF 10.0 dBm
#AT 20 dB
-10.40 dBm
PEAK
LOG
10
dB/
MARKER
→ HIGH
MARKER
→ CF
SWEEP TIME
100 sec
NEXT
PEAK
NEXT PK
RIGHT
VA SB
SC FC
CORR
NEXT PK
LEFT
More
1 of 3
CENTER 2.4126523 GHz
#RES BW 3.0 kHz
#VBW 10 kHz
SPAN 300.0 kHz
#SWP 100 sec

Channel 06


10:59:52 AUG 21, 2002
MKR 2.4377730 GHz
REF 10.0 dBm
#AT 20 dB
-11.36 dBm
MARKER
→ HIGH
PEAK
LOG
10
dB/
MARKER
→ CF
SWEEPTIME
100 sec
NEXT
PEAK
NEXT PK
RIGHT
VA SB
SC FC
CORR
NEXT PK
LEFT
More
1 of 3
CENTER 2.4377753 GHz
SPAN 300.0 kHz
#RES BW 3.0 kHz
#VBW 10 kHz
#SWP 100 sec

Channel 11

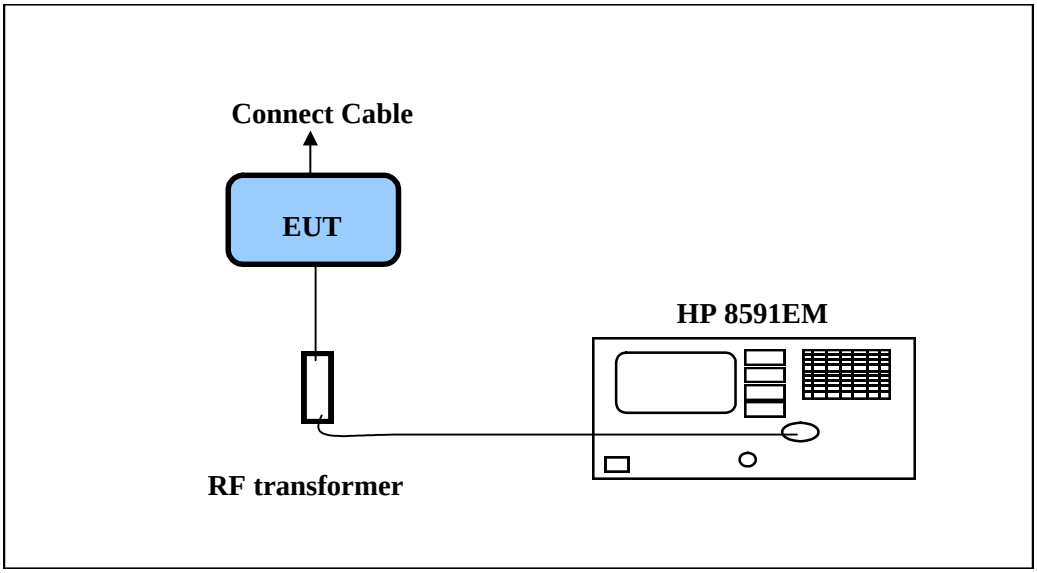

11:30:56 AUG 21, 2002
MKR 2.4626753 GHz
REF 10.0 dBm
#AT 20 dB
-12.41 dBm
MARKER → HIGH
PEAK
LOG
10
dB/
MARKER → CF
SWEEPTIME
NEXT PEAK
NEXT PK RIGHT
VA SB
SC FC
CORR
NEXT PK LEFT
More 1 of 3
CENTER 2.4626775 GHz
SPAN 300.0 kHz
RES BW 3.0 kHz
#VBW 10 kHz
#SWP 100 sec

X. Output Signal Test

10.1 Test condition and setup

During test, the setup is as chapter 1, connect the TV port of the transfer switch to the HP spectrum analyzer 8591EM. There is a RF transformer-matching pad used here. The insertion loss of matching pad is 4.11dB. The other signal and emissions more than 4.6 MHz below or 7.4 MHz above the video carrier frequency all is tested by maximum peak mode.

10.2 The configuration of output signal test



10.3 Output Signal Test Result

Testing room : Temperature : 25 ° C Humidity : 47 % RH

Emission more than 4.6MHz blow or 7.4MHz above the carrier frequency

Frequency (MHz)	**Total Amplitude** (dB μ V)	**Limit** (dB μ V/m)	**Margin**
1173.8	35.54	39.50	-3.96

Appendix A

Setting up Procedure

1. Connect the EUT with the notebook computer through the LAN port. Using the LAN port of Notebook Computer and software to control the wireless gateway.

2. Use the software provided by the manufacturer and operated in the windows to control the EUT's continuous transmission.

3. Then making access to the mode of continuous transmission and set the testing channel.