FCC / IC TEST REPORT

for

47 CFR, Part 15, Subpart E and RSS-210

Equipment : 802.11a/b/g WLAN Radio Port-220

Trade Name : HP (Hewlett Packard) ProCurve

Model No. : RSVLC-0505

FCC ID : B94RSVLC-0505

IC ID : 466F-RSVLC505

Filing Type : Certification

Applicant : Hewlett-Packard ProCurve Networking
8000 Foothills Boulevard Roseville, CA 95747-5502
USA

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- **Certificate or Test Report must not be used by the applicant to claim the product in this test report endorsement by NVLAP or any agency of U.S. government.**
- The data shown in this test report were carried out on Dec. 6, 2005 at **Sporton International Inc. LAB.**
- Report No.: FR621618E, Report Version: Rev. 01.

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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History of this test report

Report Issue Date: Feb. 20, 2006

Report No.	Description

Certificate No. : FR621618E

CERTIFICATE OF COMPLIANCE

For

47 CFR, Part 15, Subpart E and RSS-210

Equipment	:	**802.11a/b/g WLAN Radio Port-220**
Trade Name	:	**HP (Hewlett Packard) ProCurve**
Model No.	:	**RSVLC-0505**
FCC ID	:	**B94RSVLC-0505**
IC ID	:	**466F-RSVLC505**
Filing Type	:	**Certification**
Applicant	:	**Hewlett-Packard ProCurve Networking** 8000 Foothills Boulevard Roseville, CA 95747-5502 USA

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 - 2003** and the equipment under test was ***passed*** all test items required in FCC Part 15 subpart E, and RSS-210 relative to the equipment under test. Testing was carried out on Nov. 18, 2005 at **SPORTON International Inc.** LAB.

Daniel Lee

Dr. Daniel Lee

SAR/EMC Director

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

1. General Description of Equipment under Test

1.1 Applicant

Hewlett-Packard ProCurve Networking
8000 Foothills Boulevard Roseville, CA 95747-5502 USA

1.2 Manufacturer

Universal Scientific Industrial Co., Ltd.
140, Lane 351, Taiping Road, Sec. 1, Tsao, Tuen, Nan_Tou, Taiwan

1.3 Basic Description of Equipment under Test

Equipment	: 802.11a/b/g WLAN Radio Port-220
Trade Name	: HP (Hewlett Packard) ProCurve
Model No.	: RSVLC-0505
FCC ID	: B94RSVLC-0505
IC ID	: 466F-RSVLC505
Power Supply Type	: PoE

1.4 Feature of Equipment under Test

Product Feature & Specification				
1. Host/Radio Interface	802.11a/b/g WLAN Radio Port-220			
2. Housing Type	Metallic housing for RSLVC-0505			
3. Modulation Type/Data Rate	OFDM:54/48/36/24/18/12/9/6Mbps			
4. Freq.Range/Carrier Freqs.	2400~2483.5MHz; 5150 ~ 5250MHz (Band I); 5250 ~ 5350MHz (Band II)			
5. Number o f Channels	802.11a: 8Ch(5150~5350MHz)			
6. Carrier Frequency of each channel	802.11a: 5000+n*5 MHz, n=36,40,44,48,52,56,60,64			
7. Channel Spacing	802.11a: 20MHz			
8. Maximum Output Power to Antenna (Normal condition)	Refer to power table 1.6			
9. Type of Antenna Connector	Refer to Antenna list 1.5			
10. Antenna Type				
11. Antenna Gain				
12. Function Type	Transmitter		Transceiver	V
13. Power Rating (DC/AC , Voltage)	Power Over Ethernet (48V)			
14. Duty Cycle	100%			

1.5 Antenna List

Antenna Type	Model Name	Net Gain (dBi)	Frequency Range (GHz)	Application	Housing Type	Connector Type
Panel	J8999A	6.9 / 7.7	2.4 ~ 2.5/ 5.15 ~ 5.825	11b/g; 11 a band I/II/III	Metallic	RP-SMA MALE

1.6 Power Table

802.11b	802.11g	802.11a/band 1	802.11a/band 2	802.11a/band 3
N A	N A	15.08 dBm	21.67 dBm	N A

Test Configuration of Equipment under Test

2.1 Test Manner

a. The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.
b. The complete test system refers to section 2.2 and EUT for EMI test.
c. The EUT can operate on 5150MHz to 5350MHz as listed in section 1.4.
d. The following test modes were tested for conduction test:
   Mode 1: Ping mode
e. Radiation test refer to Test Matrix:

Mode Ref. No.	1	2	3	4
Mode Name	802.11a Tx Ch36	802.11a Tx Ch48	802.11a Tx Ch52	802.11a Tx Ch64

f. Conducted test refer to Test Matrix:

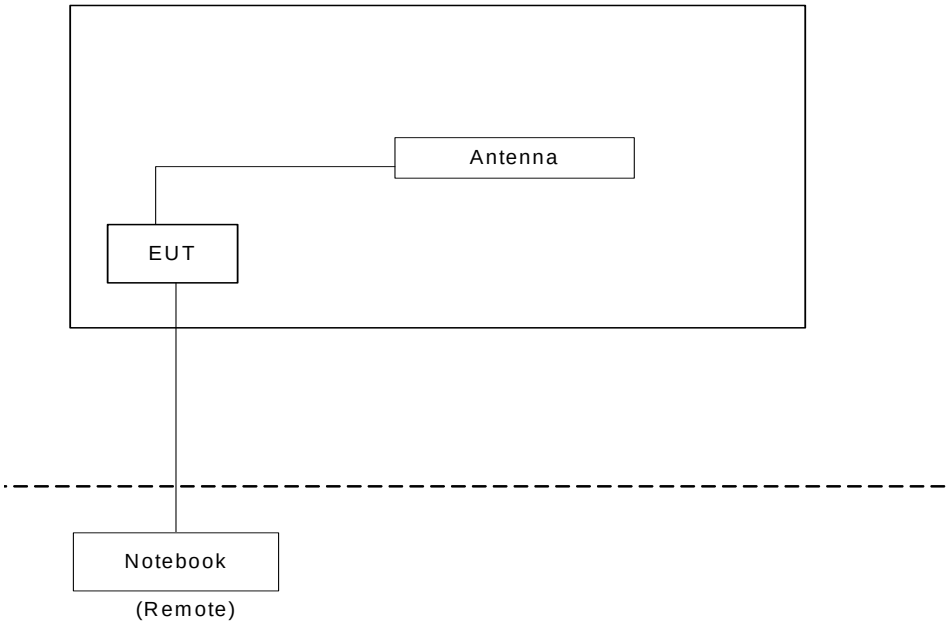
Mode Ref. No.	1	2	3	4
Mode Name	802.11a Tx Ch36	802.11a Tx Ch48	802.11a Tx Ch52	802.11a Tx Ch64

g. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 40000MHz.

2.2 Description of Test System

Item	Asset	Model Name	Power Cord
1.	Notebook (DELL)	D400	N/A
2.	UTP Cable	N/A	Non-shielded, 13m

2.3 Connection Diagram of Test System



Operation of Equipment under Test

During the test, the following programs on WINXP were executed:
one self test program ”WinLEO Version 00.33” to keep transmitting signals.

General Information of Test

Test Site Location	:	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiag, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
Test Site No	:	CO01-HY, 03CH06-HY

4.1 Test Voltage

110V/ 60Hz

4.2 Standard for Methods of Measurement

ANSI C63.4-2003

4.3 Test in Compliance with

FCC Part 15, Subpart E and RSS-210

4.4 Frequency Range Investigated

a. Conduction: from 150 kHz to 30 MHz
b. Radiation: from 30 MHz to 40000MHz

4.5 Test Distance

The test distance of radiated emission from antenna to EUT is 3 M.

Report of Measurements and Examinations

5.1 List of Measurements and Examinations

FCC Rule	IC Rule	Description of Test	Result
15.407(b)(5)	6.6	Conducted Emission	Pass
15.407(a)(1) (2)	6.2.2(q1) (i) (ii)	Peak Transmit Power	Pass
15.407(b)(1)(2)(5)	6.2.2(q1) (i) (ii)	Radiated Emission	Pass
15.407(a) (1) (2)	6.2.2(q1) (i) (ii)	Power Spectral Density	Pass
15.407(b)(1)(2)	6.2.2(q1) (i) (ii)	Band Edges Measurement	Pass
15.407(a)(1)(2)	6.2.2(q1) (i) (ii)	Antenna Requirement	Pass
15.407(a)(6)	6.2.2(q1) (iv)	Peak Excursion Ratio Measurement	Pass
15.407(c)	6.2.2(q1) (iv) (d)	Automatically Discontinue Transmission	Pass

5.2 Emission Bandwidth

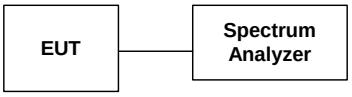
5.2.1 Measuring Instruments：

As described in chapter 6 of this test report.

5.2.2 Test Procedure：

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to approximately 1% of the emission bandwidth. For these tests, the resolution bandwidth is 300 kHz, and peak detection is used. The 26 dB bandwidth is defined as the frequency range where the power is higher than the peak power minus 26 dB.

Test Setup Layout：



5.2.3 Test Result：

- Temperature : 24℃
- Relative Humidity :52%

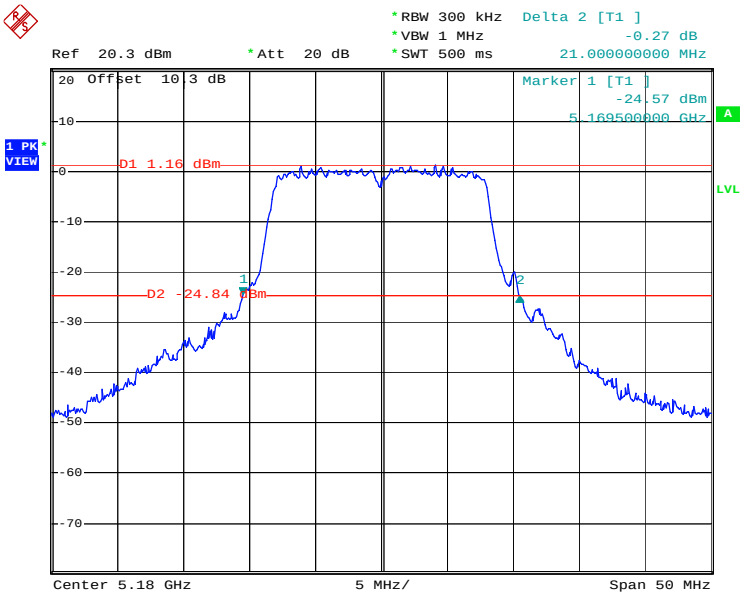
➢ Application: 802.11a

Channel	Frequency (MHz)	26dB Emission bandwidth (MHz)	Mode Ref. No.
36	5180	21.00	1
48	5240	21.36	2
52	5260	35.10	3
64	5320	33.10	4

5.2.4 Test Data

Mode Ref. No.

1



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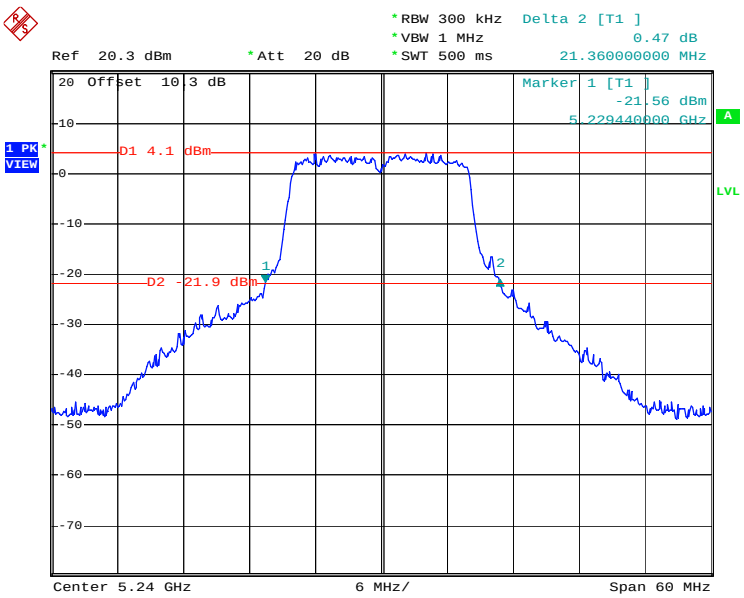

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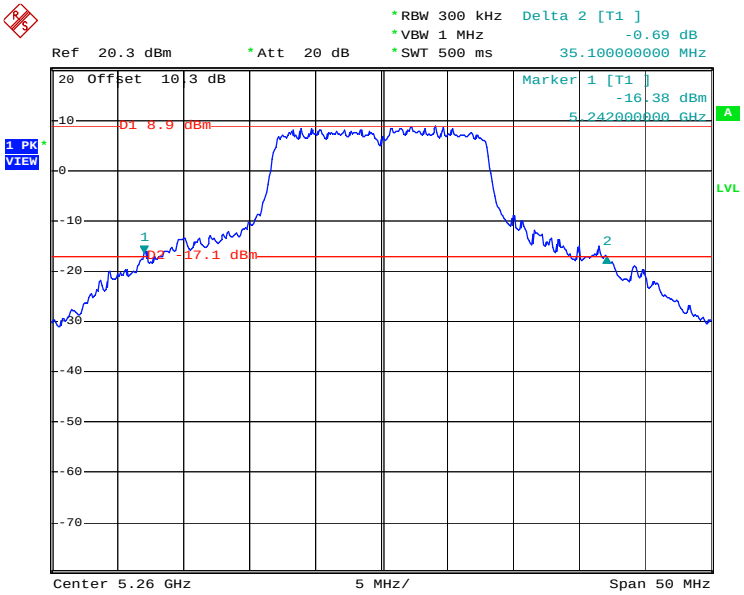

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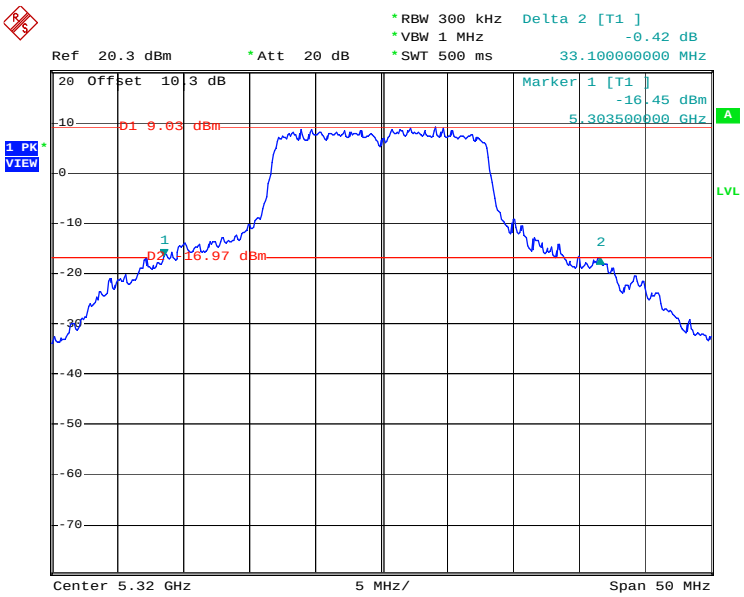

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5.3 Peak Transmit Power

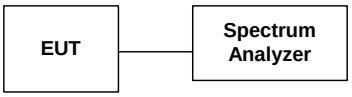
5.3.1 Measuring Instruments：

As described in chapter 6 of this test report.

5.3.2 Test Procedure：

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz, and peak detection is used. The peak power is measured by channel power integration over the previously measured emissions bandwidth..

5.3.3 Test Setup Layout：



5.3.4 Test Result：

- Temperature : 24℃
- Relative Humidity :52%

➢ Application: 802.11a

Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (dBm)	Mode Ref. No.
36	5180	15.02	15.3	1
48	5240	15.08	15.3	2
52	5260	21.15	22.3	3
64	5320	21.67	22.3	4

Comments： The peak transmit power shall not exceed the lesser of 17dBm or 4dBm+10logB in 5150~5250 band; 24dBm or 11dBm+10logB in5250~5350 band.

5180MHz 4dBm + 10log(21.0 MHz) = 17.22 dBm

5240MHz 4dBm + 10log(21.36 MHz) = 17.30 dBm

5260MHz 11dBm + 10log(35.10 MHz) = 26.45 dBm

5320MHz 11Bm + 10log(33.10 MHz) = 26.20 dBm

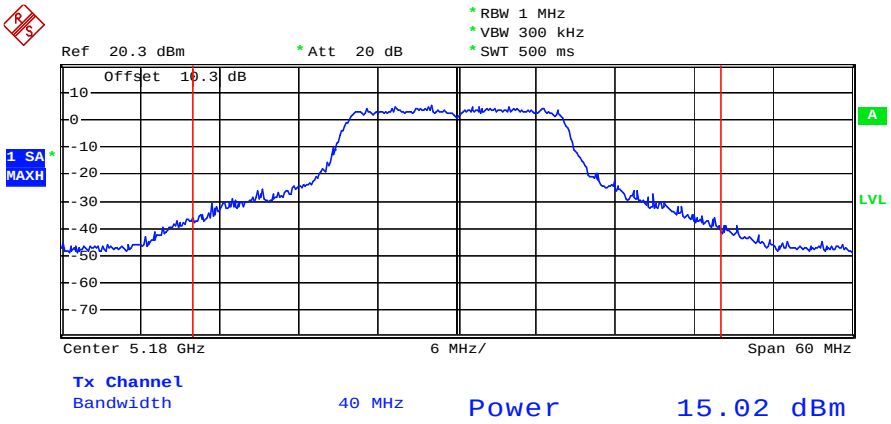
Band I Limit = 17 - (7.7-6) = 15.3 dBm

Band II Limit = 24 - (7.7-6) = 22.3 dBm

5.3.5 Test Data

Mode Ref. No.

1



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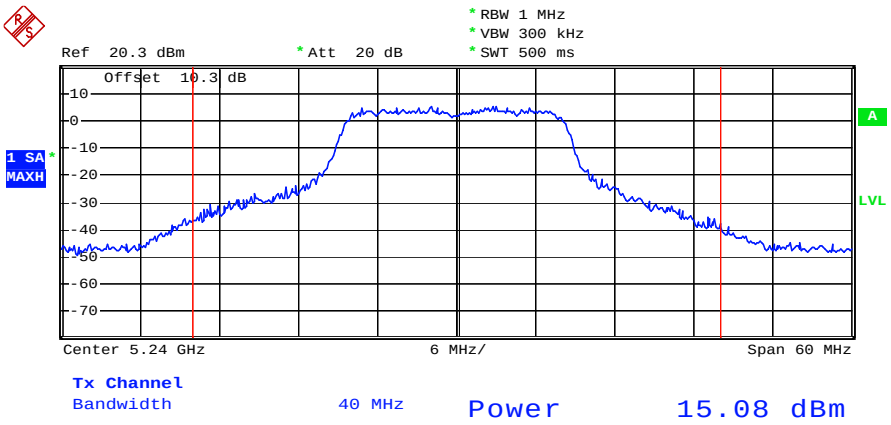

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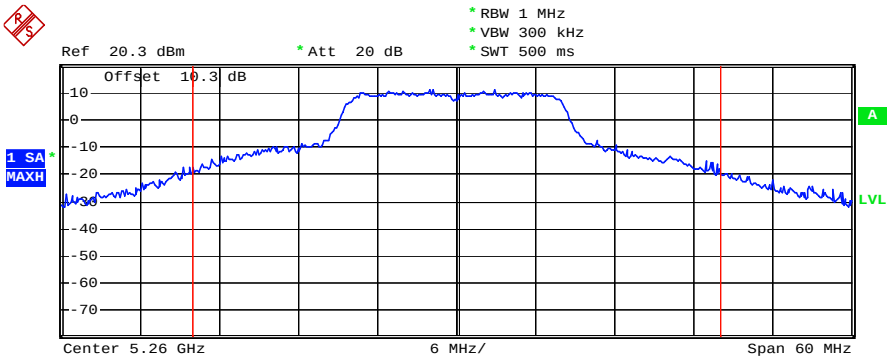
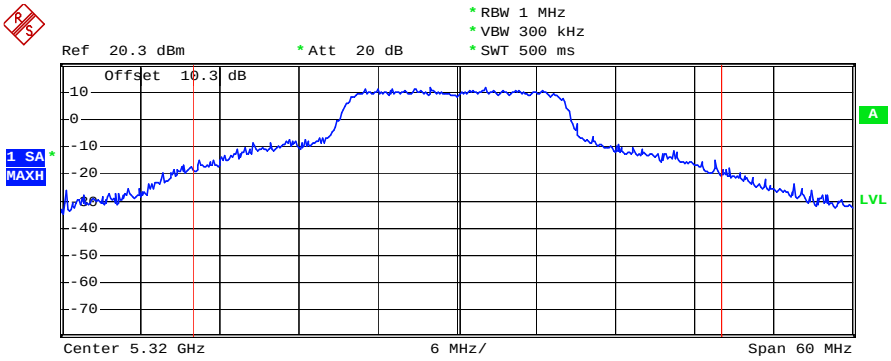


Tx Channel
Bandwidth 40 MHz Power 21.15 dBm

4



Tx Channel
Bandwidth 40 MHz Power 21.67 dBm

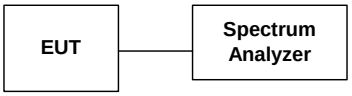
5.4 Peak Power Spectral Density

5.4.1 Measuring Instruments：

As described in chapter 6 of this test report.

5.4.2 Test Procedure：

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz, sample detection is used, and the analyzer is set for video averaging.



5.4.3 Test Result：

- Temperature : 24℃
- Relative Humidity :52%

➢ Application: 802.11a

Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limits (dBm)	Mode Ref. No.
36	5180	-2.99	2.3	1
48	5240	0.10	2.3	2
52	5260	4.64	9.3	3
64	5320	4.63	9.3	4

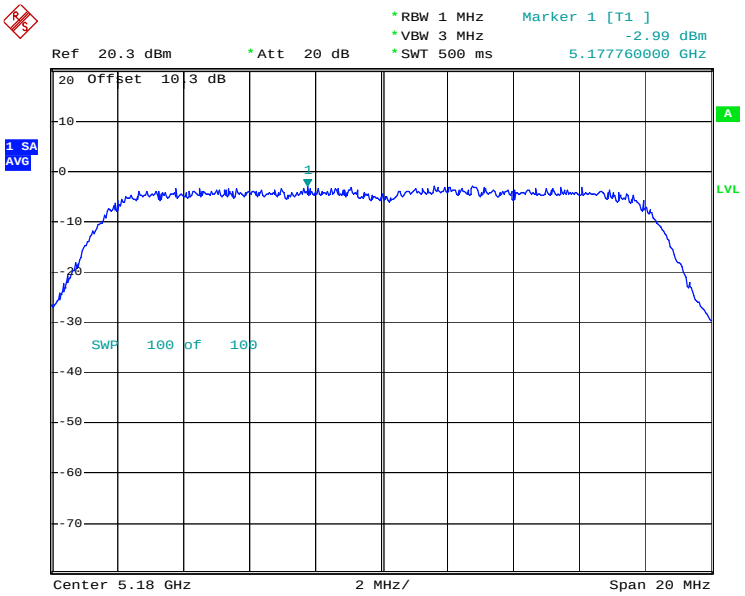
Band I Limit = 4 - (7.7-6) = 2.3 dBm

Band II Limit = 11 - (7.7-6) = 9.3 dBm

5.4.4 Test Data

Mode Ref. No.

1



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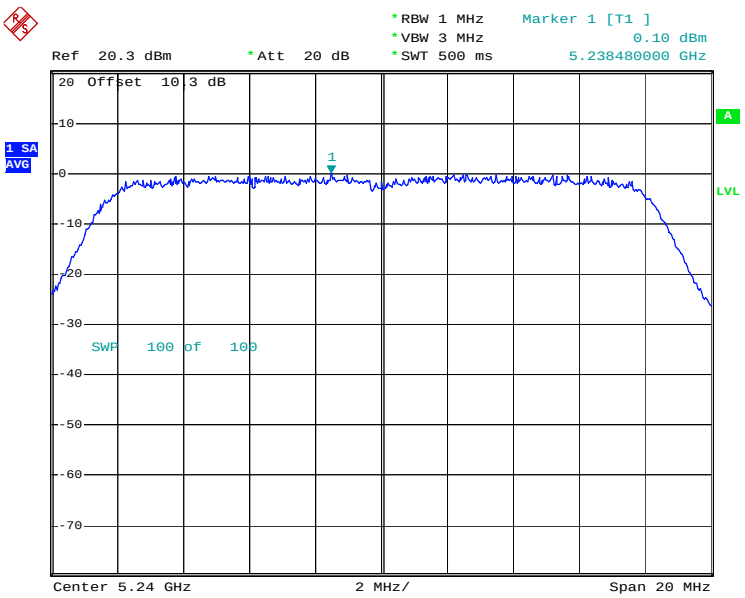

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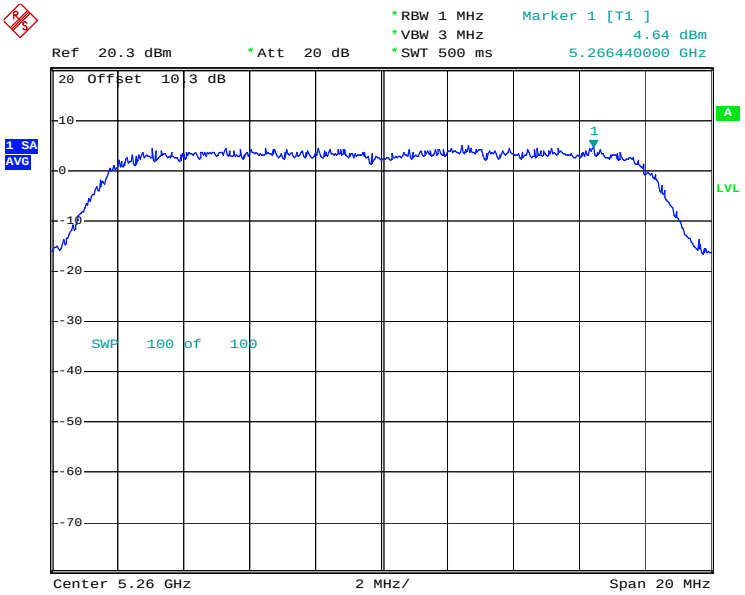

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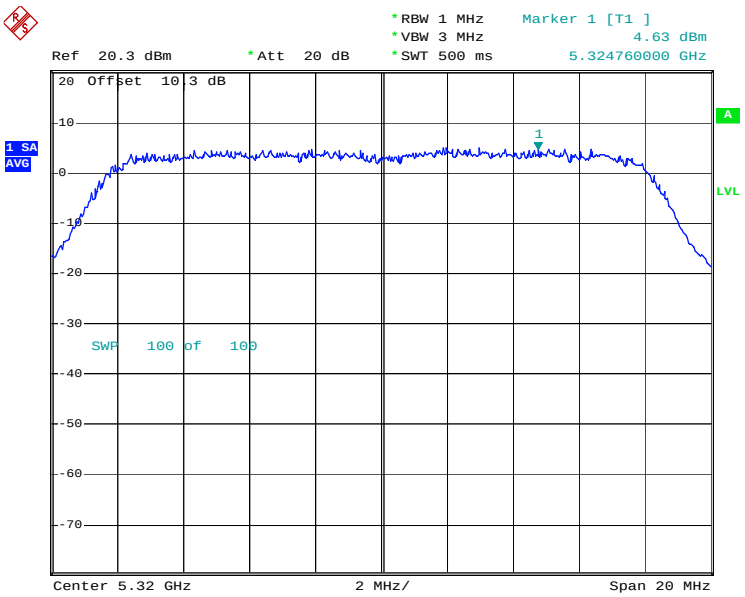


Date: 17.NOV.2005 22:41:39

5.5 Test of Conducted Emission

As described in chapter 6 of this test report.

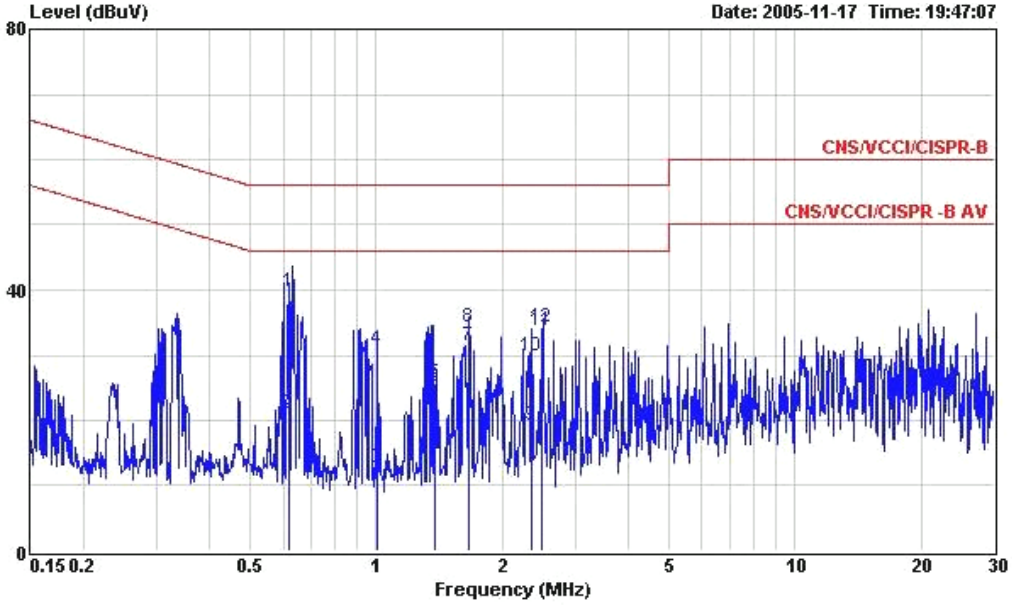
5.5.1 Test Procedures：

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power port of a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

5.5.2 Test Data

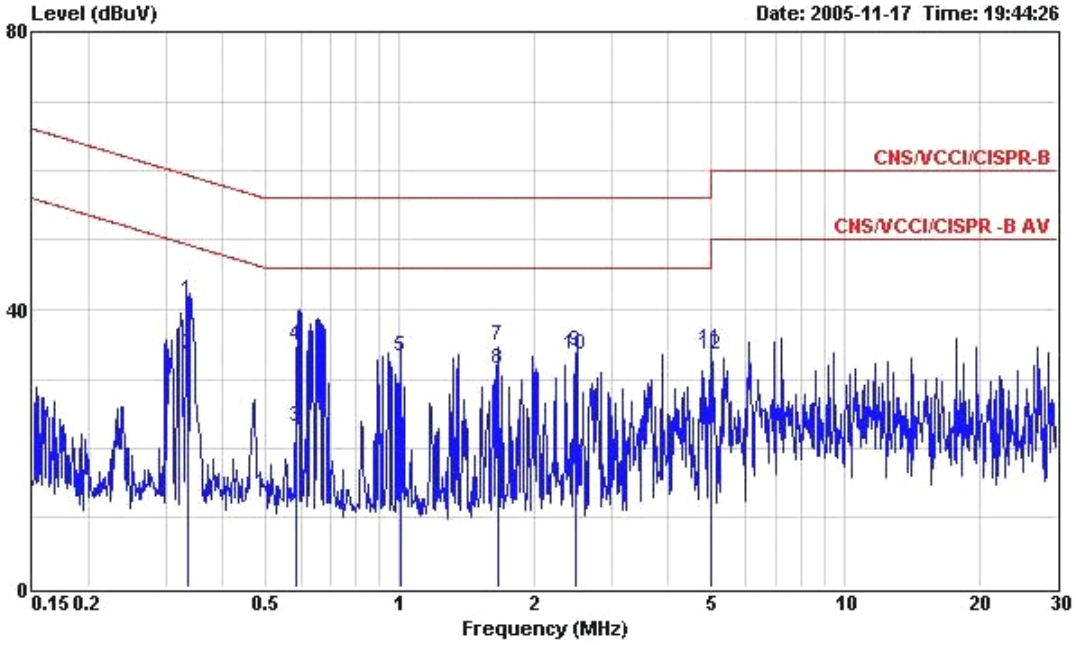
- Frequency Range of Test : 150kHz to 30 MHz
- Test Mode : Mode 1
- Temperature : 24℃
- Relative Humidity : 52%
- Test Enginner : Jay

■ The test that passed at minimum margin was marked by the frame in the following table.



Site : CO01-HY
Condition : CNS/VCCI/CISPR-B 2001/004 200505 LINE
EUT : 802.11a/b/g WLAN Radio Port -220
Power : 120V/60Hz
Model : FD5O2016
Memo : PING MODE
Memo : RSVLC-0505
Memo :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.617	39.84	-16.16	56.00	39.71	0.08	0.05	QP
2	0.617	21.02	-24.98	46.00	20.89	0.08	0.05	Average
3	1.010	12.64	-33.36	46.00	12.47	0.11	0.06	Average
4	1.010	30.90	-25.10	56.00	30.73	0.11	0.06	QP
5	1.386	25.64	-20.36	46.00	25.46	0.11	0.07	Average
6	1.386	25.32	-30.68	56.00	25.14	0.11	0.07	QP
7	1.661	31.33	-14.67	46.00	31.15	0.11	0.07	Average
8	1.661	34.30	-21.70	56.00	34.12	0.11	0.07	QP
9	2.350	19.28	-26.72	46.00	19.05	0.13	0.10	Average
10	2.350	29.97	-26.03	56.00	29.74	0.13	0.10	QP
11	2.494	33.75	-22.25	56.00	33.50	0.14	0.11	QP
12	2.494	34.39	-11.61	46.00	34.14	0.14	0.11	Average



Site : CO01-HY
Condition : CNS/VCCI/CISPR-B 2001/004 200505 NEUTRAL
EUT : 802.11a/b/g WLAN Radio Port-220
Power : 120V/60Hz
Model : FD5O2016
Memo : PING MODE
Memo : RSVLC-0505
Memo :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.333	41.35	-18.02	59.37	41.20	0.11	0.04	QP
2	0.333	33.38	-15.99	49.37	33.23	0.11	0.04	Average
3	0.587	23.09	-22.91	46.00	22.88	0.16	0.05	Average
4	0.587	34.86	-21.14	56.00	34.65	0.16	0.05	QP
5	1.009	33.18	-22.82	56.00	32.89	0.23	0.06	QP
6	1.009	15.54	-30.46	46.00	15.25	0.23	0.06	Average
7	1.662	34.72	-21.28	56.00	34.42	0.23	0.07	QP
8	1.662	31.45	-14.55	46.00	31.15	0.23	0.07	Average
9	2.496	34.03	-11.97	46.00	33.69	0.23	0.11	Average
10	2.496	33.60	-22.40	56.00	33.26	0.23	0.11	QP
11	4.990	34.38	-21.62	56.00	33.95	0.25	0.18	QP
12	4.990	33.48	-12.52	46.00	33.05	0.25	0.18	Average

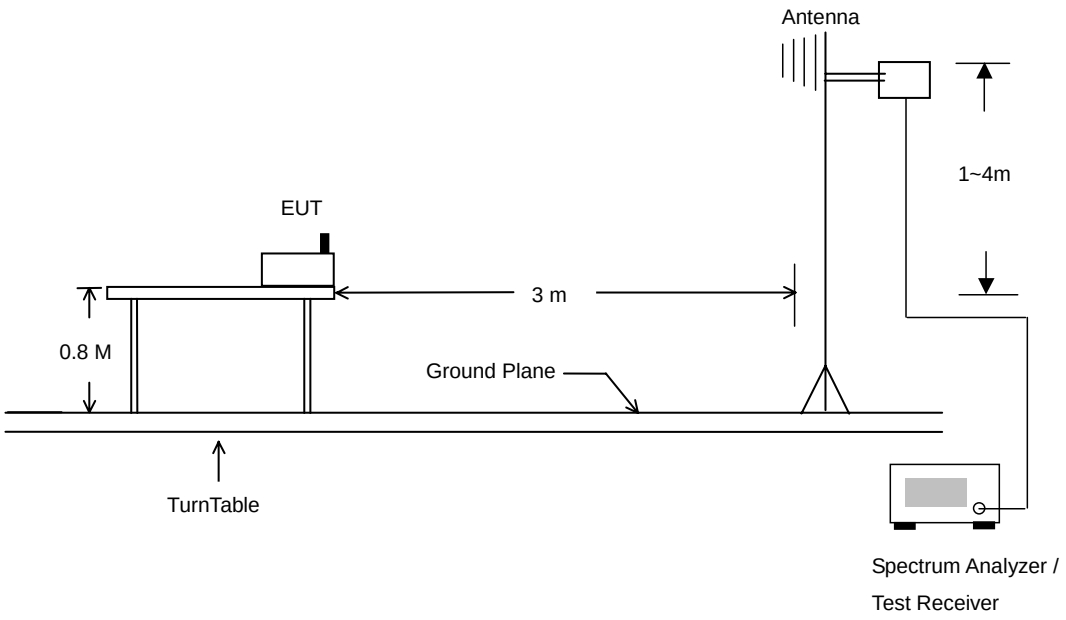
5.6 Test of Radiated Emission

As described in chapter 6 of this test report.

5.6.1 Test Procedures

a. The EUT was placed on a rotatable table top 0.8 meter above ground.
b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
c. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
e. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
g. For testing below 1GHz, If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported.
h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

5.6.2 Typical Test Setup Layout of Radiated Emission



5.6.3 Test Data

➢ Test Mode : Mode 1

- Temperature : 26℃
- Relative Humidity :53%
- Test Enginner : Jay
- Polarization : Horizontal

■ The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	5150.00	60.20	-13.80	74.00	56.06	33.83	6.50	36.19	100	0	Peak
2 @	5150.00	49.09	-4.91	54.00	44.95	33.83	6.50	36.19	148	360	Average
3 @	5180.00	108.34			104.17	33.84	6.51	36.18	100	0	Peak
4 @	5180.00	99.84			95.67	33.84	6.51	36.18	148	360	Average
5 @	5350.00	57.34	-16.66	74.00	52.99	33.87	6.56	36.08	100	0	Peak
6 @	5350.00	46.81	-7.19	54.00	42.46	33.87	6.56	36.08	148	360	Average

Remark: #3 and #4 Fundamental Signal

- Polarization : Vertical

■ The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	5150.00	53.15	-20.85	74.00	49.01	33.83	6.50	36.19	200	0	Peak
2 @	5150.00	43.98	-10.02	54.00	39.84	33.83	6.50	36.19	100	40	Average
3 @	5180.00	96.59			92.43	33.84	6.51	36.18	200	0	Peak
4 @	5180.00	88.06			83.89	33.84	6.51	36.18	100	40	Average
5 @	5350.00	52.29	-21.71	74.00	47.94	33.87	6.56	36.08	200	0	Peak
6 @	5350.00	43.34	-10.66	54.00	38.99	33.87	6.56	36.08	100	40	Average

Remark: #3 and #4 Fundamental Signal

➢ Test Mode : Mode 2

- Temperature : 26℃
- Relative Humidity :53%
- Test Enginner : Jay
- Polarization : Horizontal

■ **The test that passed at minimum margin was marked by the frame in the following table.**

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	106.68	28.38	-15.12	43.50	45.65	11.25	2.50	31.03	400	0	Peak
2 @	143.13	28.65	-14.85	43.50	47.00	10.24	2.92	31.50	400	0	Peak
3 @	199.83	32.56	-10.94	43.50	50.46	9.93	3.51	31.34	400	0	Peak

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	708.80	30.10	-15.90	46.00	34.36	19.29	6.96	30.51	100	0	Peak
2 @	862.80	31.29	-14.71	46.00	32.92	20.66	7.78	30.08	100	0	Peak
3 @	988.80	32.15	-21.85	54.00	31.45	22.62	8.38	30.30	100	0	Peak

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	5150.00	58.29	-15.71	74.00	54.15	33.83	6.50	36.19	200	0	Peak
2 @	5150.00	47.88	-6.12	54.00	43.74	33.83	6.50	36.19	142	350	Average
3 @	5240.00	108.05			103.83	33.85	6.52	36.15	200	0	Peak
4 @	5240.00	99.54			95.32	33.85	6.52	36.15	142	350	Average
5 @	5350.00	58.07	-15.93	74.00	53.72	33.87	6.56	36.08	200	0	Peak
6 @	5350.00	47.65	-6.35	54.00	43.30	33.87	6.56	36.08	142	350	Average

Remark: #3 and #4 Fundamental Signal

- Polarization : Vertical

■ The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	106.68	28.04	-15.46	43.50	45.31	11.25	2.50	31.03	400	0	Peak
2 @	145.29	27.21	-16.29	43.50	45.90	9.85	2.94	31.49	400	0	Peak
3 @	200.64	26.90	-16.60	43.50	44.82	9.91	3.51	31.34	400	0	Peak

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	479.90	30.61	-15.39	46.00	38.84	16.93	5.61	30.78	100	0	Peak
2 @	729.80	33.87	-12.13	46.00	37.49	19.87	7.05	30.54	100	0	Peak
3 @	789.30	32.17	-13.83	46.00	33.31	21.59	7.42	30.16	100	0	Peak

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	5150.00	52.44	-21.56	74.00	48.31	33.83	6.50	36.19	100	0	Peak
2 @	5150.00	43.57	-10.43	54.00	39.43	33.83	6.50	36.19	109	40	Average
3 @	5240.00	95.91			91.69	33.85	6.52	36.15	100	0	Peak
4 @	5240.00	87.26			83.04	33.85	6.52	36.15	109	40	Average
5 @	5350.00	52.36	-21.64	74.00	48.01	33.87	6.56	36.08	100	0	Peak
6 @	5350.00	43.51	-10.49	54.00	39.16	33.87	6.56	36.08	109	40	Average

Remark: #3 and #4 Fundamental Signal

➢ Test Mode : Mode 3

- Temperature : 26℃
- Relative Humidity :53%
- Test Enginner : Jay
- Polarization : Horizontal

■ The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	5150.00	58.68	-15.32	74.00	54.54	33.83	6.50	36.19	100	0	Peak
2 @	5150.00	48.49	-5.51	54.00	44.35	33.83	6.50	36.19	143	351	Average
3 @	5260.00	113.84			109.59	33.85	6.53	36.14	100	0	Peak
4 @	5260.00	105.45			101.20	33.85	6.53	36.14	143	351	Average
5 @	5350.00	58.57	-15.43	74.00	54.22	33.87	6.56	36.08	100	0	Peak
6 @	5350.00	48.22	-5.78	54.00	43.87	33.87	6.56	36.08	143	351	Average

Remark: #3 and #4 Fundamental Signal

- Polarization : Vertical

■ The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	5150.00	53.66	-20.34	74.00	49.52	33.83	6.50	36.19	200	0	Peak
2 @	5150.00	44.06	-9.94	54.00	39.92	33.83	6.50	36.19	100	45	Average
3 @	5260.00	101.77			97.52	33.85	6.53	36.14	200	0	Peak
4 @	5260.00	93.02			88.77	33.85	6.53	36.14	100	45	Average
5 @	5350.00	52.03	-21.97	74.00	47.68	33.87	6.56	36.08	200	0	Peak
6 @	5350.00	43.39	-10.61	54.00	39.04	33.87	6.56	36.08	100	45	Average

Remark: #3 and #4 Fundamental Signal

➢ Test Mode : Mode 4

- Temperature : 26℃
- Relative Humidity :53%
- Test Enginner : Jay
- Polarization : Horizontal

■ **The test that passed at minimum margin was marked by the frame in the following table.**

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	106.68	28.52	-14.98	43.50	45.79	11.25	2.50	31.03	400	0	Peak
2 @	143.13	28.97	-14.53	43.50	47.31	10.24	2.92	31.50	400	0	Peak
3 @	200.64	31.98	-11.52	43.50	49.90	9.91	3.51	31.34	400	0	Peak

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	644.40	28.73	-17.27	46.00	34.25	18.42	6.61	30.56	100	0	Peak
2 @	708.80	29.64	-16.36	46.00	33.90	19.29	6.96	30.51	100	0	Peak
3 @	803.30	31.41	-14.59	46.00	32.36	21.84	7.47	30.26	100	0	Peak

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	5150.00	59.72	-14.28	74.00	55.58	33.83	6.50	36.19	164	0	Peak
2 @	5150.00	48.92	-5.08	54.00	44.78	33.83	6.50	36.19	164	1	Average
3 @	5320.00	113.36			109.06	33.86	6.54	36.11	164	0	Peak
4 @	5320.00	105.00			100.70	33.86	6.54	36.11	164	1	Average
5 @	5350.00	66.26	-7.74	74.00	61.91	33.87	6.56	36.08	164	0	Peak
6 @	5350.00	52.22	-1.78	54.00	47.87	33.87	6.56	36.08	164	1	Average

Remark: #3 and #4 Fundamental Signal

- Polarization : Vertical

■ **The test that passed at minimum margin was marked by the frame in the following table.**

	Freq	Level	Over Limit	Limit Line	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	467.30	30.53	-15.47	46.00	39.17	16.71	5.50	30.85	100	0	Peak
2 @	726.30	33.13	-12.87	46.00	36.84	19.79	7.03	30.53	100	0	Peak
3 @	983.90	33.36	-20.64	54.00	32.77	22.47	8.36	30.25	100	0	Peak

	Freq	Level	Over Limit	Limit Line	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	37.29	25.28	-14.72	40.00	39.80	15.73	1.49	31.73	400	0	Peak
2 @	106.68	27.36	-16.14	43.50	44.64	11.25	2.50	31.03	400	0	Peak
3 @	145.29	27.10	-16.40	43.50	45.79	9.85	2.94	31.49	400	0	Peak

	Freq	Level	Over Limit	Limit Line	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	5150.00	53.20	-20.80	74.00	49.06	33.83	6.50	36.19	100	350	Peak
2 @	5150.00	43.79	-10.21	54.00	39.65	33.83	6.50	36.19	100	6	Average
3 @	5320.00	91.88			87.58	33.86	6.54	36.11	100	6	Average
4 @	5320.00	98.59			94.29	33.86	6.54	36.11	100	350	Peak
5 @	5350.00	54.19	-19.81	74.00	49.84	33.87	6.56	36.08	100	350	Peak
6 @	5350.00	44.86	-9.14	54.00	40.51	33.87	6.56	36.08	100	6	Average

Remark: #3 and #4 Fundamental Signal

Remark: All the emissions except listed above are 20 dB below FCC limit.

5.7 Band Edges Measurement

5.7.1 Measuring Instruments：

As described in chapter 6 of this test report.

5.7.2 Test Procedure：

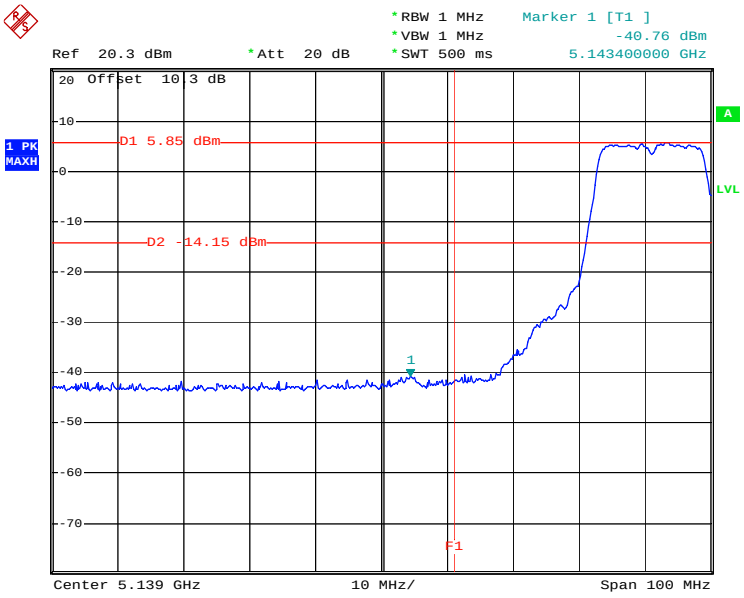
1. Set both RBW and VBW of spectrum analyzer to 1MHz with convenient frequency span including 1MHz bandwidth from band edge.
2. The band edges was measured and recorded.

5.7.3 Test Result：

- Temperature : 24℃
- Relative Humidity :52%

Test Result Mode		Verdict
Test Result for 802.11a band I	:	PASS
Test Result for 802.11a band II	:	PASS

5.7.4 Test Data



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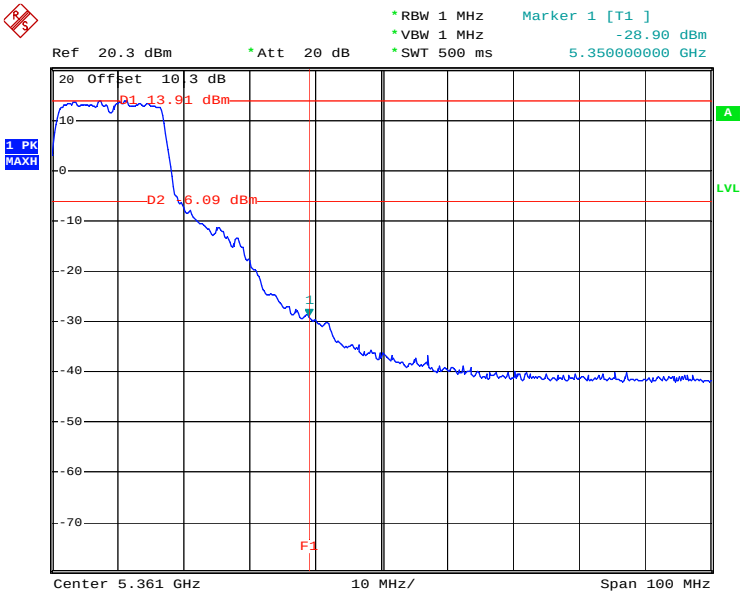


802.11a CH64

5.8 Peak Excursion Ratio Measurement

5.8.1 Measuring Instruments：

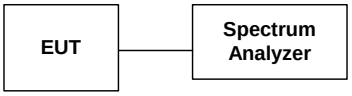
As described in chapter 6 of this test report.

5.8.2 Test Procedure：

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to and maintained at 1 MHz. First the video bandwidth is set to 1 MHz, Trace A is set to Max Hold, then to View. Then the video bandwidth is readjusted to 300 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.

5.8.3 Test Setup Layout：



5.8.4 Test Result：

- Temperature : 24℃
- Relative Humidity :52%

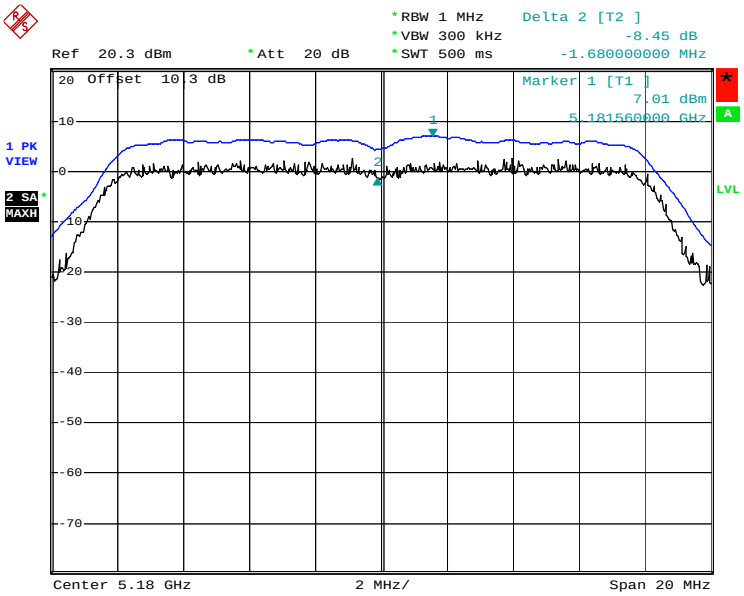
➢ Application: 802.11a

Channel	Frequency (MHz)	Peak Excursion (dB)	Limits (dB)	Mode Ref. No.
36	5180	8.45	13	1
48	5240	8.96	13	2
52	5260	8.30	13	3
64	5320	8.08	13	4

5.8.5 Test Data

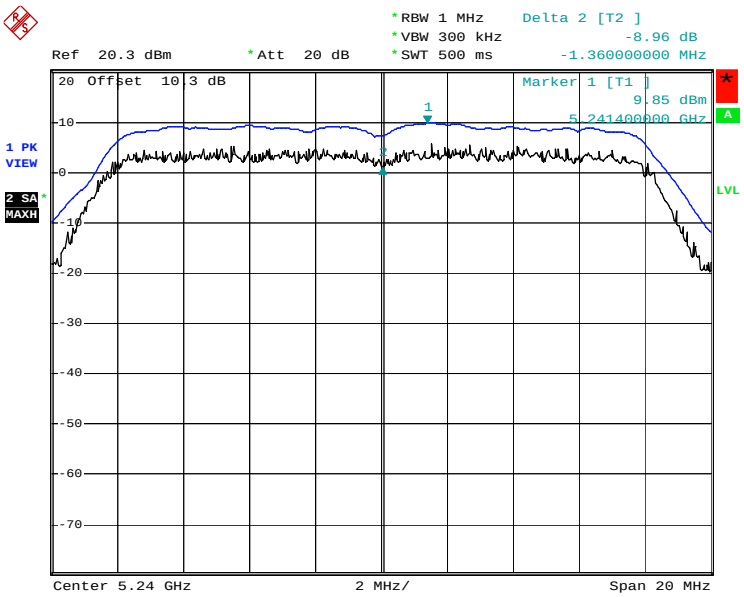
Mode Ref. No.

1



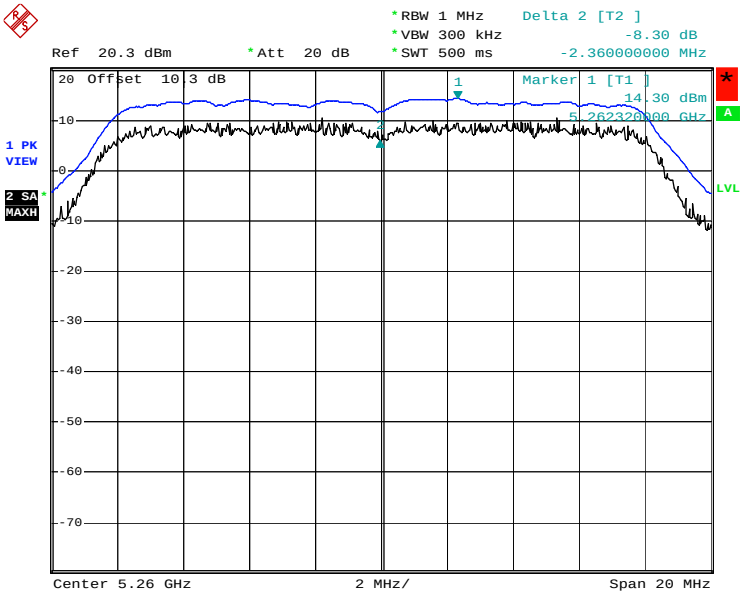
Date: 17.NOV.2005 22:55:53

2



Date: 17.NOV.2005 22:54:44

3



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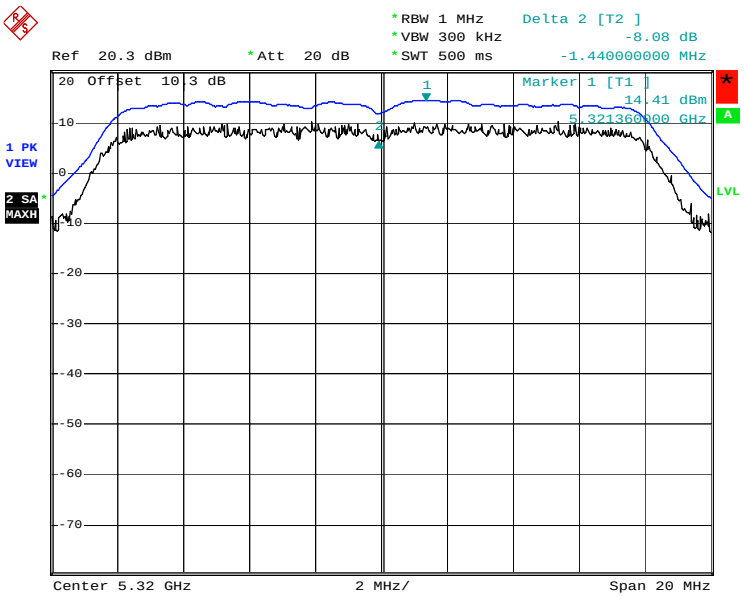
4



Date: 17.NOV.2005 22:44:20

5.9 Frequency Stability

Referring to the theory of operation, the crystal used to set the frequency has a temperature coefficient of +/- 20 ppm. For a transmitter fundamental frequency of 5320MHz, this corresponds to +/- 106.4 kHz.

During band edge testing, it was determined that the smallest margin (along the frequency axis) to the band edge occurred at the upper band (5350MHz) edge , using peak detection, with the antenna horizontal polarized. In this configuration, with the transmitter set to the highest channel, the envelope of the modulation sideband intercepted the 74 dBuV/m limit at 5346 MHz. Adding the maximum peak -to-peak deviation due to the crystal (0.16 MHz) yields 5346.16 MHz, which remains within the authorized band of 5150 to 5350 MHz.

At the lower band (5180MHz) edge, the smallest margin (along the frequency axis) occurred in the base mode, using peak detection, with the antenna vertically polarized. In this configuration, with the transmitter set to the lowest channel, the envelope of the modulation sideband intercepted the 74 dBuV/m limit at 5154 MHz.
Subtracting the maximum peak-to-peak deviation due to the crystal (0.16 MHz) yields 5163.84 MHz, which remains within the authorized band of 5150 to 5350MHz.

Frequency(MHz)	Polarity	Intercepted Point frequency (MHz)	maximum peak-to-peak deviation due to the crystal(MHz)	Deviation Frequency (MHz)	Result
5180	V	5164	0.16	5163.84	Pass
5240	V	5224	0.16	8223.84	Pass
5260	V	5288	0.16	5288.16	Pass
5320	V	5346	0.16	5346.16	Pass

5.10 Automatically discontinue transmission

During no any information transmission, the EUT can automatically discontinue transmission and become standby mode for power saving .The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission .

5.11 Automatically discontinue transmission

During no any information transmission, the EUT can automatically discontinue transmission and become standby mode for power saving .The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission .

5.12 Antenna Requirements

The EUT meets antenna requirement of FCC for the following reasons.

5.12.1 Standard Applicable

According to FCC 47 CFR Section 15.407(a)(1)(2) ,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.

5.12.2 Antenna Connected Construction

The EUT use a detachable antenna via reverse SMA connector for metallic housing. The antenna is considered to comply with antenna requirement.

5 List of Measuring Equipments Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	Oct. 19, 2005	Oct. 19, 2006	Conduction (CO01-HY)
LISN	MessTec	NNB-2/16Z	2001/009	9kHz – 30MHz	Apr. 26, 2005	Apr. 26, 2006	Conduction (CO01-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	2001/004	9kHz – 30MHz	Apr. 20, 2005	Apr. 20, 2006	Conduction (CO01-HY)
EMI Filter	LINDGREN	LRE-2060	1004	< 450Hz	N/A	N/A	Conduction (CO01-HY)
EMI Filter	LINDGREN	N6006	201052	0 – 60Hz	N/A	N/A	Conduction (CO01-HY)
RF Cable-CON	Suhner Switzerland	RG223/U	CB029	9kHz – 30MHz	Dec. 23, 2004	Dec. 23, 2005	Conduction (CO01-HY)
Spectrum analyzer	Agilent	E4408B	MY44211030	9KHz-26.5GHz	Jul. 25, 2005	Jul. 24, 2006	Radiation (03CH06-HY)
Receiver	R&S	ESCS30	100356	9KHz-2.75GHz	Jun. 28, 2005	Jun. 27, 2006	Radiation (03CH06-HY)
Controller	CT	SC100	N/A	N/A	N/A	N/A	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Nov. 22, 2004	Nov. 22, 2005	Radiation (03CH06-HY)
Horn Antenna	Com-Power	AH118	071025	1G-18G	Feb. 22, 2005	Feb. 22, 2006	Radiation (03CH06-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	9170-249	14G - 40G	Jul. 21, 2005	Jul. 20, 2006	Radiation (03CH06-HY)
HF Amplifier	MITEQ	AFS44	973248	0.1G - 26.5G	Dec. 17, 2004	Dec. 17, 2005	Radiation (03CH06-HY)
Amplifier	MITEQ	AMF-6F	997165	26G - 40G	Jul. 21, 2005	Jul. 20, 2006	Radiation (03CH06-HY)
Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	N/A	Radiation (03CH06-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	N/A	Radiation (03CH06-HY)

6 Uncertainty of Test Site

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.10	Normal(k=2)	0.05
Cable loss	0.10	Normal(k=2)	0.05
AMN insertion loss	2.50	Rectangular	0.63
Receiver Spec	1.50	Rectangular	0.43
Site imperfection	1.39	Rectangular	0.80
Mismatch	+0.34/-0.35	U-shape	0.24
combined standard uncertainty Uc(y)	**1.13**		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	**2.26**		

Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.41	Normal(k=2)	0.21
Antenna factor calibration	0.83	Normal(k=2)	0.42
Cable loss calibration	0.25	Normal(k=2)	0.13
Pre Amplifier Gain calibration	0.27	Normal(k=2)	0.14
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.43	Rectangular	0.83
Mismatch	+0.39/-0.41	U-shaped	0.28
combined standard uncertainty Uc(y)	**1.27**		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	**2.54**		

Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)

Contribution	Uncertainty of x_i		$u(x_i)$	Ci	$Ci*u(x_i)$
	dB	Probability Distribution			
Receiver reading	±0.10	Normal(k=1)	0.10	1	0.10
Antenna factor calibration	±1.70	Normal(k=2)	0.85	1	0.85
Cable loss calibration	±0.50	Normal(k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR Γ1= 0.197 Antenna VSWR Γ2= 0.194 Uncertainty=20log(1-Γ1*Γ2*Γ3)	+0.34/-0.35	U-shaped	0.244	1	0.244
Combined standard uncertainty Uc(y)	**2.36**				
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	**4.72**				