FCC RF Test Report

APPLICANT	:	**Honeywell International Inc.**
EQUIPMENT	:	**Dolphin 9700 Mobile computer**
BRAND NAME	:	**Honeywell**
MODEL NAME	:	**Dolphin 9700**
FCC ID	:	**HD59700LUP**
STANDARD	:	**FCC Part 15 Subpart E**
CLASSIFICATION	:	**Unlicensed National Information Infrastructure (UNII)**

The product was received on Oct. 30, 2009 and completely tested on Dec. 08, 2009. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by: Roy Wu / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR9O3036C	Rev. 01	Initial issue of report	Dec. 24, 2009

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	A9.2	26dB & 99% Bandwidth	-	Pass	-
3.2	15.407(a)	A9.2	Maximum Conducted Output Power	≤ 17, 24, 30 dBm (depend on band)	Pass	-
3.3	15.407(a)	A9.2	Power Spectral Density	≤ 4, 11, 17 dBm (depend on band)	Pass	-
3.4	15.407(b)	A9.3	Frequency Band Edges	≤ -17, -27 dBm (depend on band)&15.209(a)	Pass	-
3.5	15.407(b)	A9.3	Spurious Emission	< 20 dBc	Pass	-
3.6	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 14.4 dB at 0.422 MHz
3.7	15.407(b)	A9.3	Transmitter Radiated Emission	≤ -17, -27 dBm (depend on band)&15.209(a)	Pass	Under limit 10.55 dB at 5150.00 MHz
3.8	15.407(b)	A9.3	Peak Excursion Ratio	≤ 13dB	Pass	-
3.9	15.407(c)	A9.5	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.10	15.407(g)	A9.5	Frequency Stability	Within Operation Band	Pass	-
3.11	15.203 & 15.407(a)	A9.2	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Honeywell International Inc.
700 Vision Drive, PO Box 208 Skeneateles Falls, NY 13513

1.2 Manufacturer

Honeywell International Inc.
700 Vision Drive, PO Box 208 Skeneateles Falls, NY 13513

1.3 Feature of Equipment Under

Product Feature & Specification	
Equipment	Dolphin 9700 Mobile computer
Brand Name	Honeywell
Model Name	Dolphin 9700
FCC ID	HD59700LUP
Tx/Rx Frequency Range	5150 MHz ~ 5250 MHz
Maximum Output Power to Antenna	802.11a : 14.35 dBm / 27.23 mW
Antenna Type	PIFA Antenna with gain -0.16 dBi
HW Version	2.1
SW Version	01
Type of Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Identical Prototype

Remark:

1. For other wireless features of this EUT, test report will be issued separately.
2. This test report recorded only product characteristics and test results of Unlicensed National Information Infrastructure (UNII).

List of Accessory:

Specification of Accessory		
AC Adapter	**Brand Name**	DVE
	Model Name	DSA-0421S-09138
	Power Rating	I/P:100-240Vac, 50-60Hz, 1.2A, 80VA; O/P: 9.5Vdc, 4A
	DC Power Cord Type	1.0 meter non-shielded cable with ferrite core
Battery	**Brand Name**	Honeywell
	Model Name	200003231
	Power Rating	7.4Vdc, 1620mAh
	Type	Li-ion
RS232 Cable 1	**Brand Name**	NA
	Model Name	RS232 Charge Comm. Cable
	Signal Line Type	0.5 meter non-shielded cable without ferrite core
RS232 Cable 2	**Brand Name**	NA
	Model Name	RS232 Charge Comm. Cable
	Signal Line Type	1.8 meter non-shielded cable with ferrite core
USB Cable	**Brand Name**	NA
	Model Name	USB Charge Comm. Cable
	Signal Line Type	1.8 meter shielded cable with ferrite core
LCD Panel	**Brand Name**	CASIO
	Model Name	COM37H3M04XLC
Keypad 1	**Brand Name**	NA
	Model Name	Qwerty
Keypad 2	**Brand Name**	NA
	Model Name	Numeric
Scanner 1	**Brand Name**	Hand Held Products
	Model Name	IT5100 Series
Scanner 2	**Brand Name**	Hand Held Products
	Model Name	IT5300 Series
WWAN Module	**Brand Name**	SIEMENS
	Model Name	HC25
	HW Version	B2.12.1
	SW Version	Revision 02.050(SV 15)

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. For accessories equipped with this EUT, please refer to the appendix of the external photo.

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	CO05-HY	03CH06HY	TW1022/4086B-1

1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart E
- FCC Public Notice DA 02-2138, (Measurement Guidelines of UNII)
- ANSI C63.4-2003
- IC RSS-210 Issued 7

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B (DoC), recorded in a separate test report.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	PC	DELL	T3400	FCC DoC	N/A	Unshielded, 1.8 m
4.	PC	DELL	OPTIPLEX 760	FCC DoC	N/A	Unshielded, 1.8 m
5.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
6.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
7.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A
8.	(USB) Mouse	Microsoft	X800898133	FCC DoC	Shielded, 1.8 m	N/A
9.	(USB) Keyboard	DELL	SK-8115	FCC DoC	Shielded, 1.8 m	N/A
10.	(USB) Keyboard	DELL	L100	FCC DoC	Shielded, 1.8 m with core	N/A
11.	Modem	ACCEX	DM1414	IFAXDM1414	Shielded, 1.5 m	N/A
12.	i-Pod	Apple	A1199	FCC DoC	Shielded, 1.0 m	N/A
13.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A

2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

Channel Spacing 20MHz							
Channel	**Freq. (MHz)**	**Channel**	**Freq. (MHz)**	**Channel**	**Freq. (MHz)**	**Channel**	**Freq. (MHz)**
36	5180	**40**	5200	**44**	5220	**48**	5240

2.2 RF Power

Preliminary RF power output tests were performed in different data rate and recorded the in the following table:

5GHz 802.11a RF Power (dBm)									
Channel	**Frequency (MHz)**	**Data Rate**							
		6 Mbps	**9 Mbps**	**12 Mbps**	**18 Mbps**	**24 Mbps**	**36 Mbps**	**48 Mbps**	**54 Mbps**
CH 36	5180 MHz	13.85	13.03	13.55	14.13	14.09	13.66	14.17	13.73
CH 44	5220 MHz	13.77	**14.35**	13.73	13.78	13.32	13.94	13.21	12.78
CH 48	5240 MHz	12.77	13.22	12.87	13.09	13.00	12.94	13.12	12.74

Remark:

1. The 802.11a data rate was set in 9Mbps due to the highest RF output power.

2. The EUT is programmed to transmit signal continuously for all testing.

2.3 Test Mode

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. Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

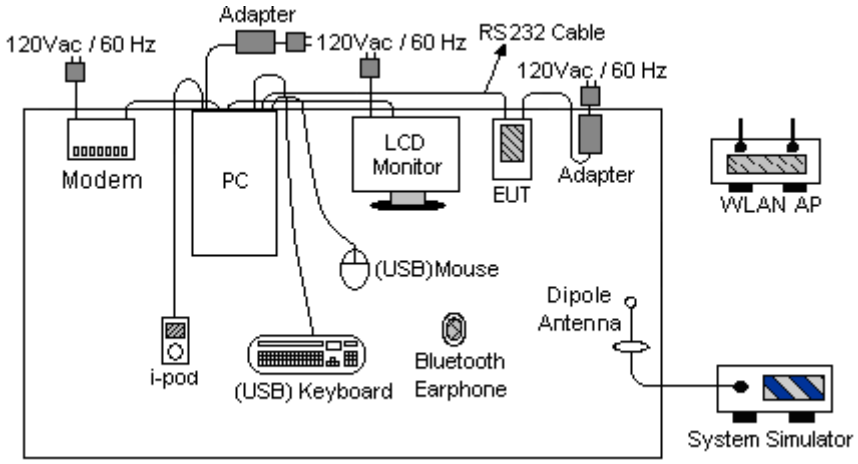
Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations, laptop / tablet modes.

The following tables are showing the test modes as the worst cases and recorded in this report.

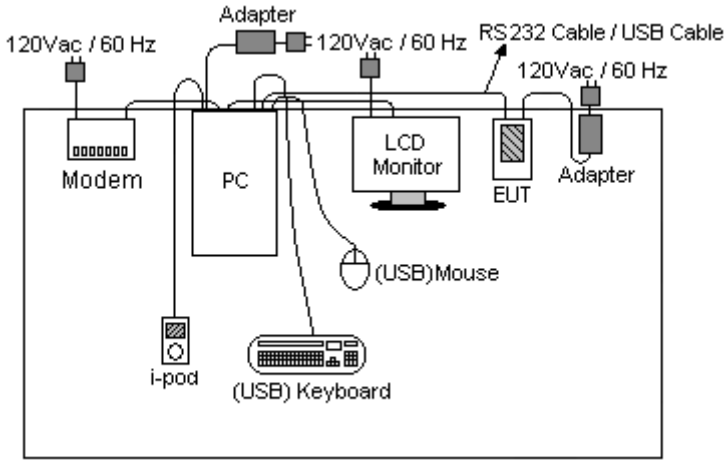
Test Cases	
Test Item	**802.11a (Modulation : OFDM)**
Conducted TCs	■ Mode 1: CH36_5180 MHz ■ Mode 2: CH44_5220 MHz ■ Mode 3: CH48_5240 MHz
Radiated TCs	■ Mode 1: CH36_5180 MHz (EUT with Keypad 1, Scanner 2 and RS232 Cable 1) ■ Mode 2: CH44_5220 MHz (EUT with Keypad 1, Scanner 2 and RS232 Cable 1) ■ Mode 3: CH48_5240 MHz (EUT with Keypad 1, Scanner 2 and RS232 Cable 1) ■ Mode 4: CH44_5220 MHz (EUT with Keypad 2, Scanner 1 and RS232 Cable 1) ■ Mode 5: CH44_5220 MHz (EUT with Keypad 1, Scanner 2 and USB Cable)
AC Conducted Emission	Mode 1 : WCDMA Band II Idle + Bluetooth Link + WLAN(5G) Link + MP3 + Camera + Adapter + RS232 Cable 2 for EUT with Keypad 2 and Scanner 1

2.4 Connection Diagram of Test System

<Conducted Emission>



<Radiated Emission >



2.5 RF Utility

The programmed RF Utility is installed in EUT to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testing. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

3 Test Result

3.1 26dB & 99% Bandwidth Measurement

3.1.1 Limit of 26dB & 99% Bandwidth

There is no restriction limits for bandwidth. The maximum conducted output power can be limited by measured emission bandwidth (B). For the band 5.15~5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10log B. For the band 5.725-5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W (30dBm) or 17 dBm + 10log B.

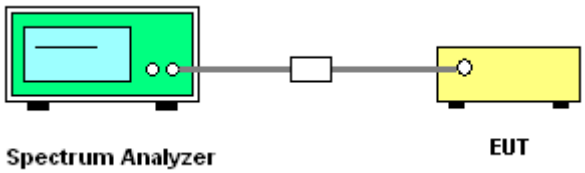
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC Public Notice DA 02-2138 (Measurement Guidelines of UNII).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Read RBW and repeat measurement as needed until the RBW/BW ratio is approximately 1%.
4. Use a RBW = approximately 1% of the emission bandwidth; Set the VBW > RBW; Use a peak detector.
5. Measure the maximum width of the emission that is 26 dB relative to the peak of the emission and 99% occupied bandwidth.

3.1.4 Test Setup



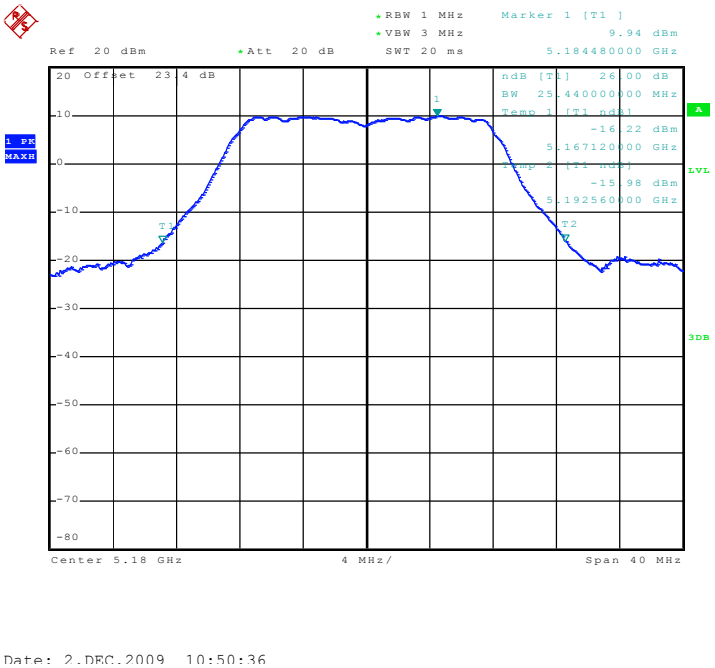
3.1.5 Test Result of 26dB & 99% Bandwidth

Test Mode :	Mode 1~3	Temperature :	25~27℃
Test Engineer :	Ken Hsu	Relative Humidity :	51~54%

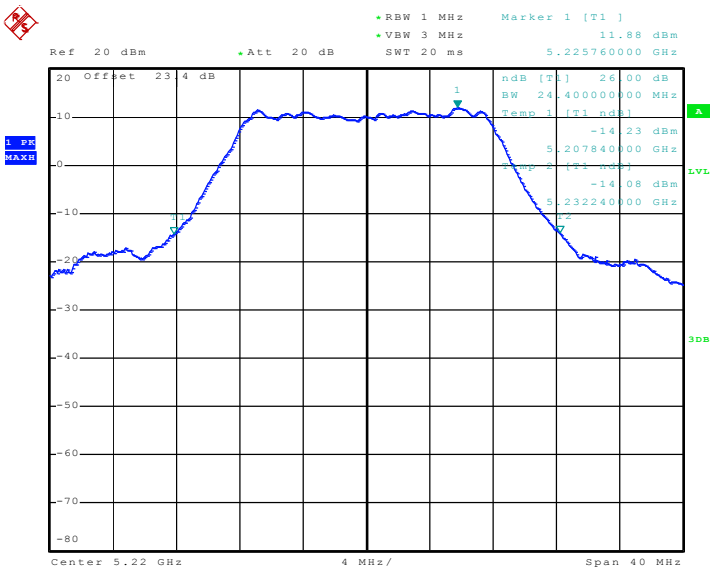
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
36	5180	25.44	Pass
44	5220	24.40	Pass
48	5240	26.72	Pass

3.1.6 Test Result of 26dB Bandwidth Plots

Mode 1 : 26 dB Bandwidth Plot on 802.11a Channel 36



Mode 2 : 26 dB Bandwidth Plot on 802.11a Channel 44



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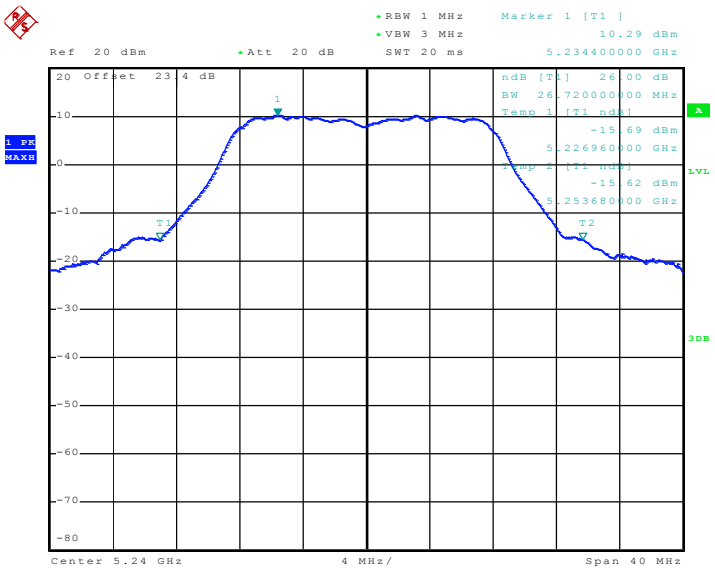
Mode 3 : 26 dB Bandwidth Plot on 802.11a Channel 48



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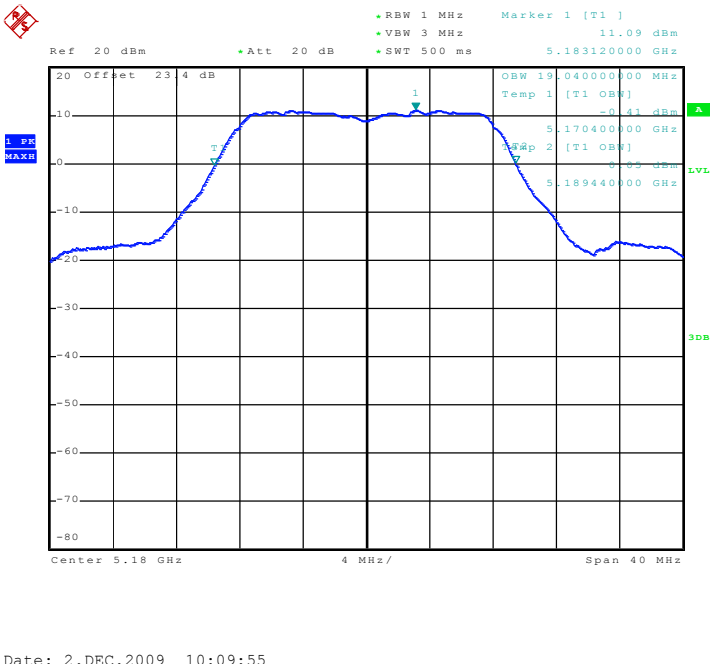
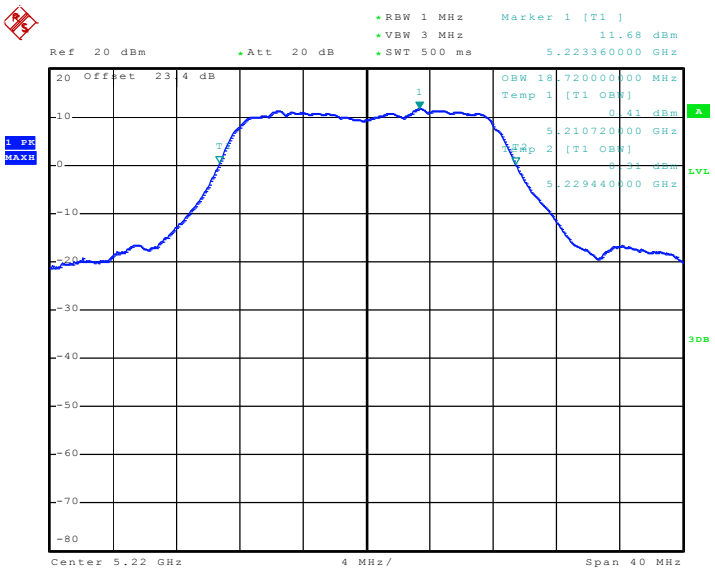
Test Mode :	Mode 1~3	Temperature :	25~27℃
Test Engineer :	Ken Hsu	Relative Humidity :	51~54%

Channel	Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
36	5180	19.04	Pass
44	5220	18.72	Pass
48	5240	18.72	Pass

Mode 1 : 99% Bandwidth Plot on 802.11a Channel 36

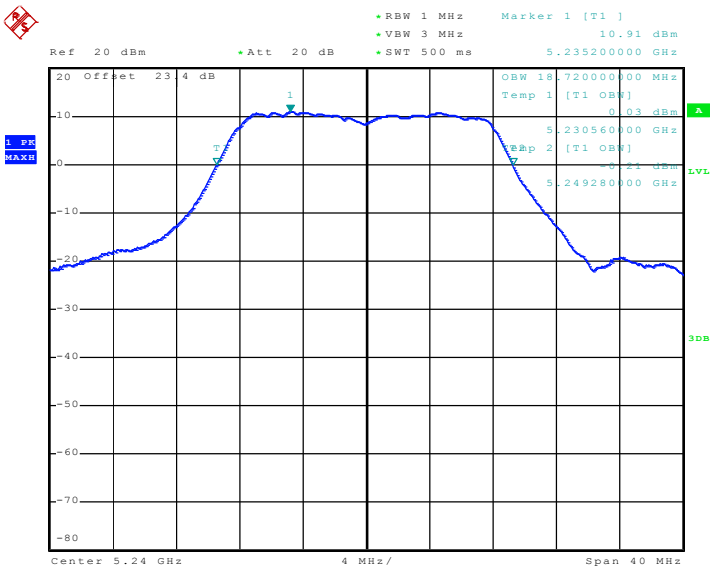


Mode 2 : 99% Bandwidth Plot on 802.11a Channel 44



Date: 2.DEC.2009 09:49:19

Mode 3 : 99% Bandwidth Plot on 802.11a Channel 48



Date: 2.DEC.2009 09:49:41

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

For the band 5.15~5.25 GHz, the maximum conducted output power shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B, where B is the 26 dB emissions bandwidth in MHz. If transmitting antenna directional gain is greater than 6 dBi, the peak output power and power density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

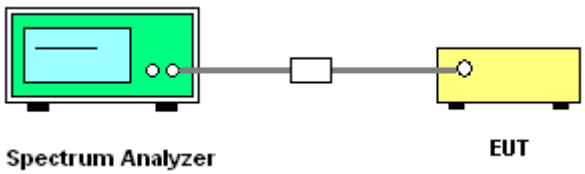
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows FCC Public Notice DA 02-2138 (Measurement Guidelines of UNII).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Measure the power and record it.

3.2.4 Test Setup



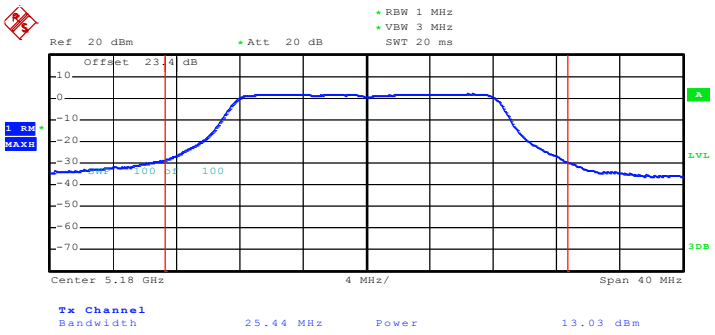
3.2.5 Test Result of Maximum Conducted Output Power

Test Mode :	Mode 1~3	Temperature :	25~27℃
Test Engineer :	Ken Hsu	Relative Humidity :	51~54%

Channel	Frequency (MHz)	Measured Power Output (dBm)	Max. Limits (dBm)	Pass/Fail
36	5180	13.03	17	Pass
44	5220	14.35	17	Pass
48	5240	13.22	17	Pass

3.2.6 Test Result of Power Output Plots

Mode 1 : Output Power Plot on 802.11a Channel 36



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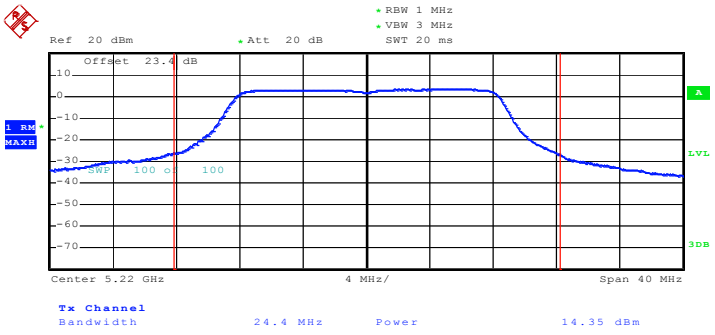
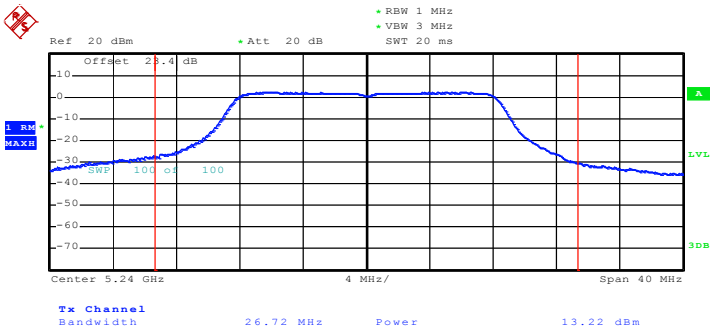
Mode 2 : Output Power Plot on 802.11a Channel 44



Date: 2.DEC.2009 10:27:00

Mode 3 : Output Power Plot on 802.11a Channel 48



Date: 2.DEC.2009 10:31:29

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

For the band 5.15–5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1MHz band. If transmitting antenna directional gain is greater than 6 dBi, the maximum conducted output 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.

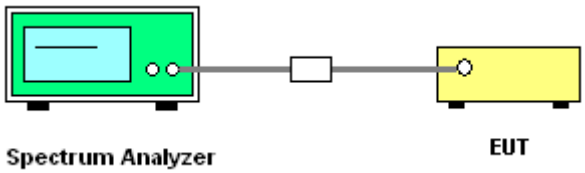
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

The transmitter output is connected to the spectrum analyzer. According to the method 3 of DA-02-2138, the resolution bandwidth is set to 1 MHz, video bandwidth is 3MHz, trace average 100 traces in power averaging mode, and sample detection is used, and the analyzer is set for video averaging.

3.3.4 Test Setup



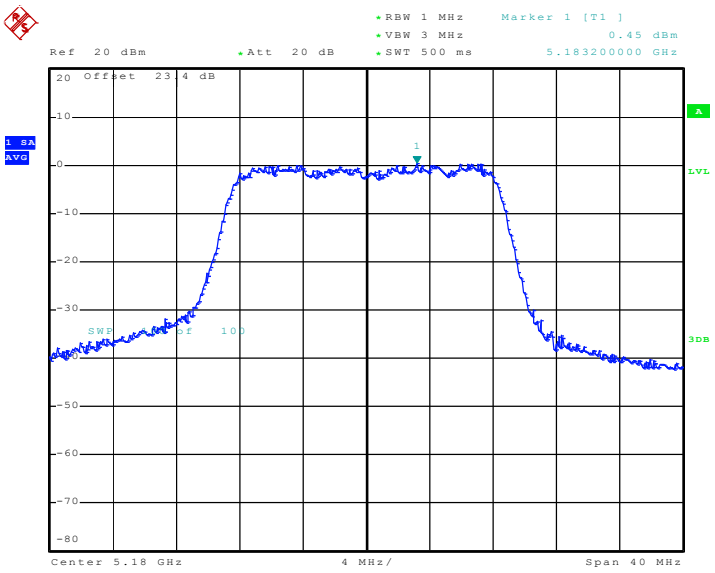
3.3.5 Test Result of Power Spectral Density

Test Mode :	Mode 1~3	Temperature :	25~27℃
Test Engineer :	Ken Hsu	Relative Humidity :	51~54%

Channel	Frequency (MHz)	Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
36	5180	0.45	4	Pass
44	5220	1.40	4	Pass
48	5240	0.89	4	Pass

3.3.6 Test Result of Power Spectral Density Plots

Mode 1 : PSD Plot on 802.11a Channel 36



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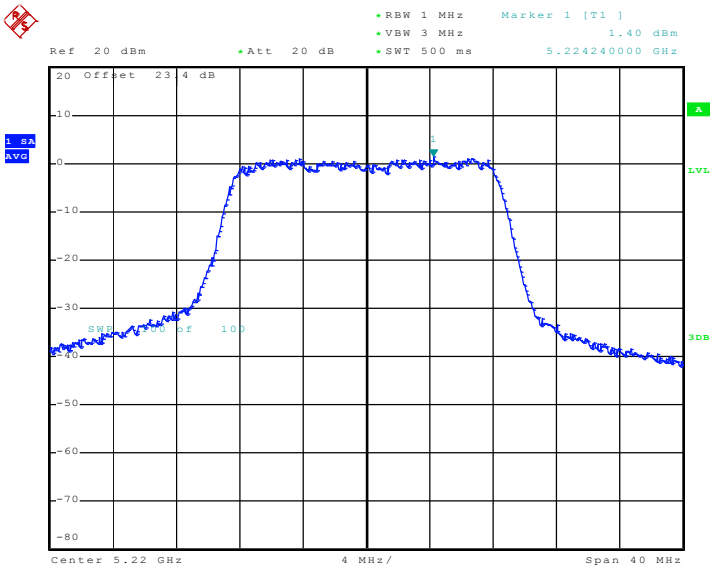
Mode 2 : PSD Plot on 802.11a Channel 44



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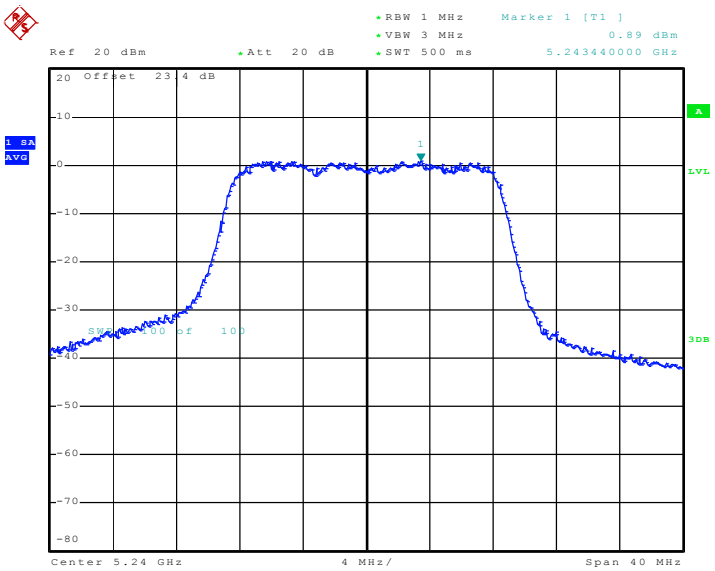
Mode 3 : PSD Plot on 802.11a Channel 48



3.4 Band Edges Measurement

3.4.1 Limit of Band Edges

(1) For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz. For transmitters operating in the 5.25–5.35 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz. Devices operating in the 5.25–5.35 GHz band that generate emissions in the 5.15–5.25 GHz band must meet all applicable technical requirements for operation in the 5.15–5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of –27 dBm/MHz in the 5.15–5.25 GHz band. For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.

(2) The provisions of Section 15.205 Restricted bands of operation of this part apply to intentional radiators operating under this section.

3.4.2 Measuring Instruments

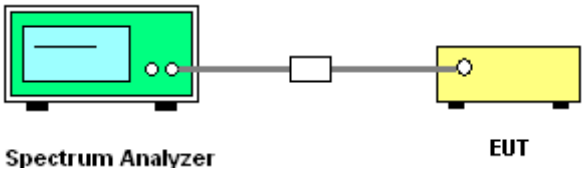
See list of measuring instruments of this test report.

3.4.3 Test Procedures

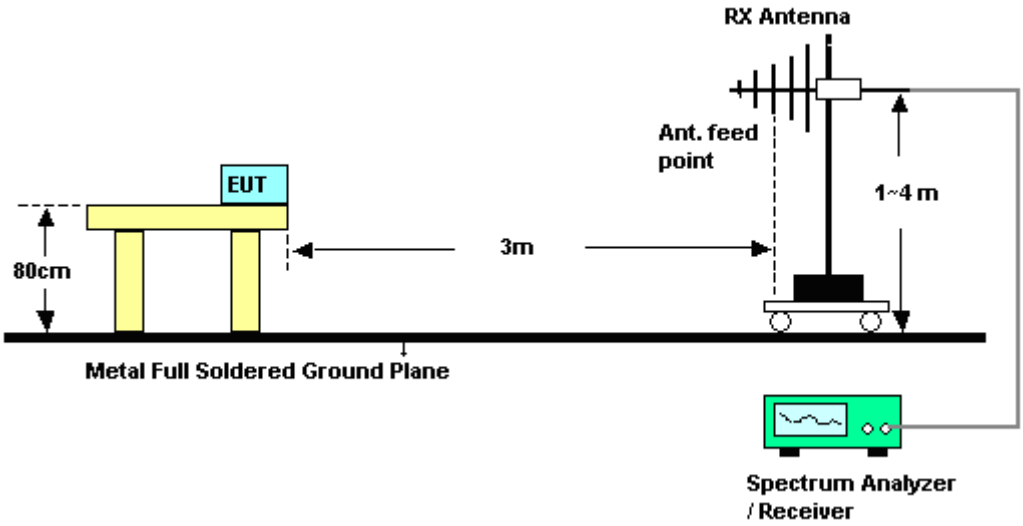
1. Set both RBW and VBW of spectrum analyzer to 1MHz with convenient frequency span including 1MHz bandwidth from band edge.
2. The band edges was measured and recorded.

3.4.4 Test Setup

<Conducted>



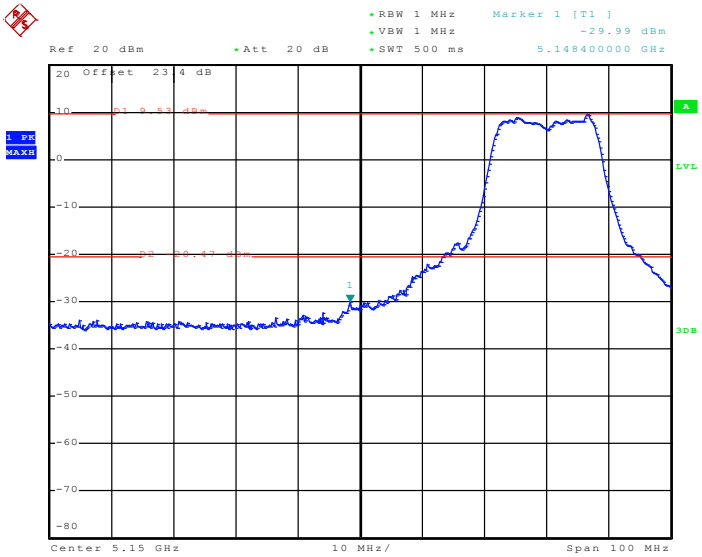
<Radiated>



3.4.5 Test Result of Conducted Band Edges

Test Mode :	Mode 1 and Mode 3	Temperature :	25~27℃
Test Engineer :	Ken Hsu	Relative Humidity :	51~54%

Mode 1 : Low Band Edge Plot on Channel 36



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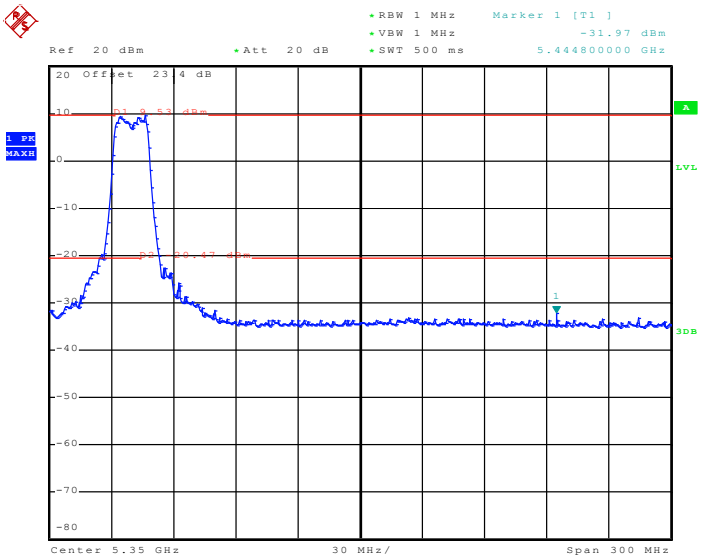
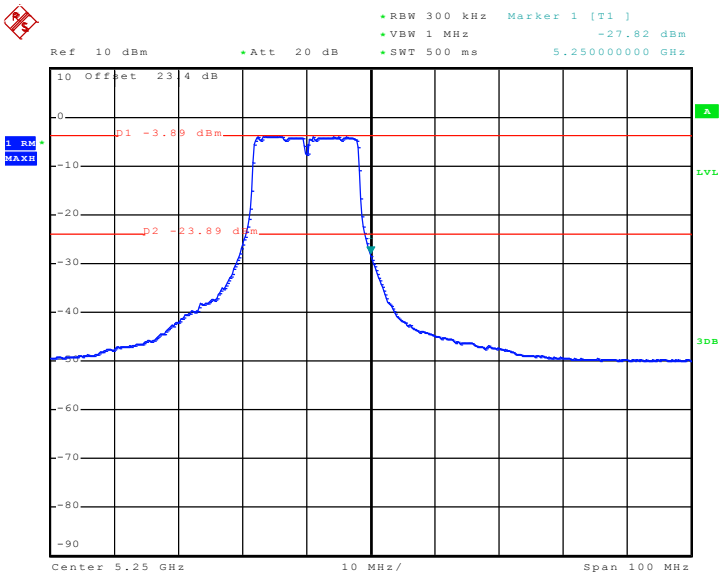
Mode 3 : High Band Edge Plot on Channel 48



Date: 10.DEC.2009 10:29:52

Mode 3 : High Band Edge Plot on Channel 48 with 20dBc



Date: 10.DEC.2009 10:44:17

3.5 Spurious Emission

3.5.1 Limit of Spurious Emission Measurement

All harmonics/spurs must be at least 30 dB down from the highest emission level within the authorized band.

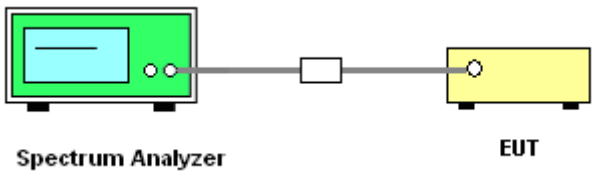
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedure

1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set RBW = 100 kHz, Video bandwidth (VBW) > RBW, scan up through 10th harmonic. All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.

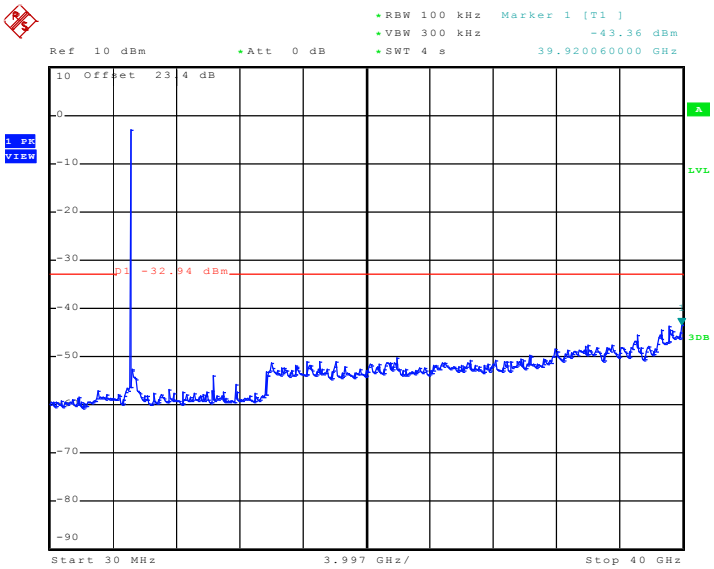
3.5.4 Test Setup



3.5.5 Test Result

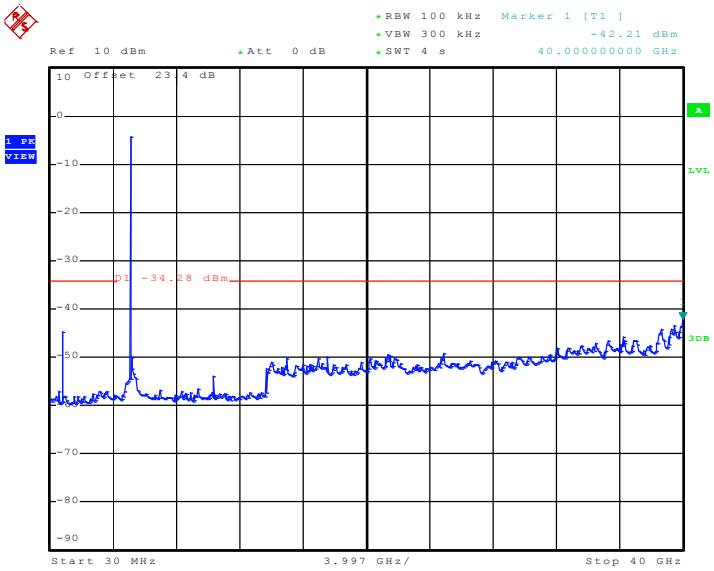
Test Mode :	Mode 1~3	Temperature :	25~27℃
Test Engineer :	Ken Hsu	Relative Humidity :	51~54%

Mode 1 : Spurious Emission Plot on channel 36 between 30 MHz~40 GHz



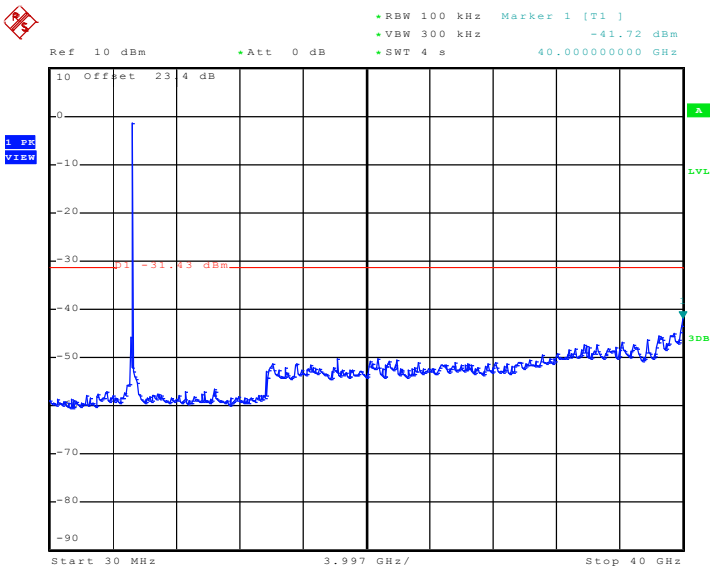
Date: 8.DEC.2009 13:13:40

Mode 2 : Spurious Emission Plot on channel 44 between 30 MHz~40 GHz



Date: 8.DEC.2009 13:17:34

Mode31 : Spurious Emission Plot on channel 48 between 30 MHz~40 GHz



Date: 8.DEC.2009 13:22:30

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that 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 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

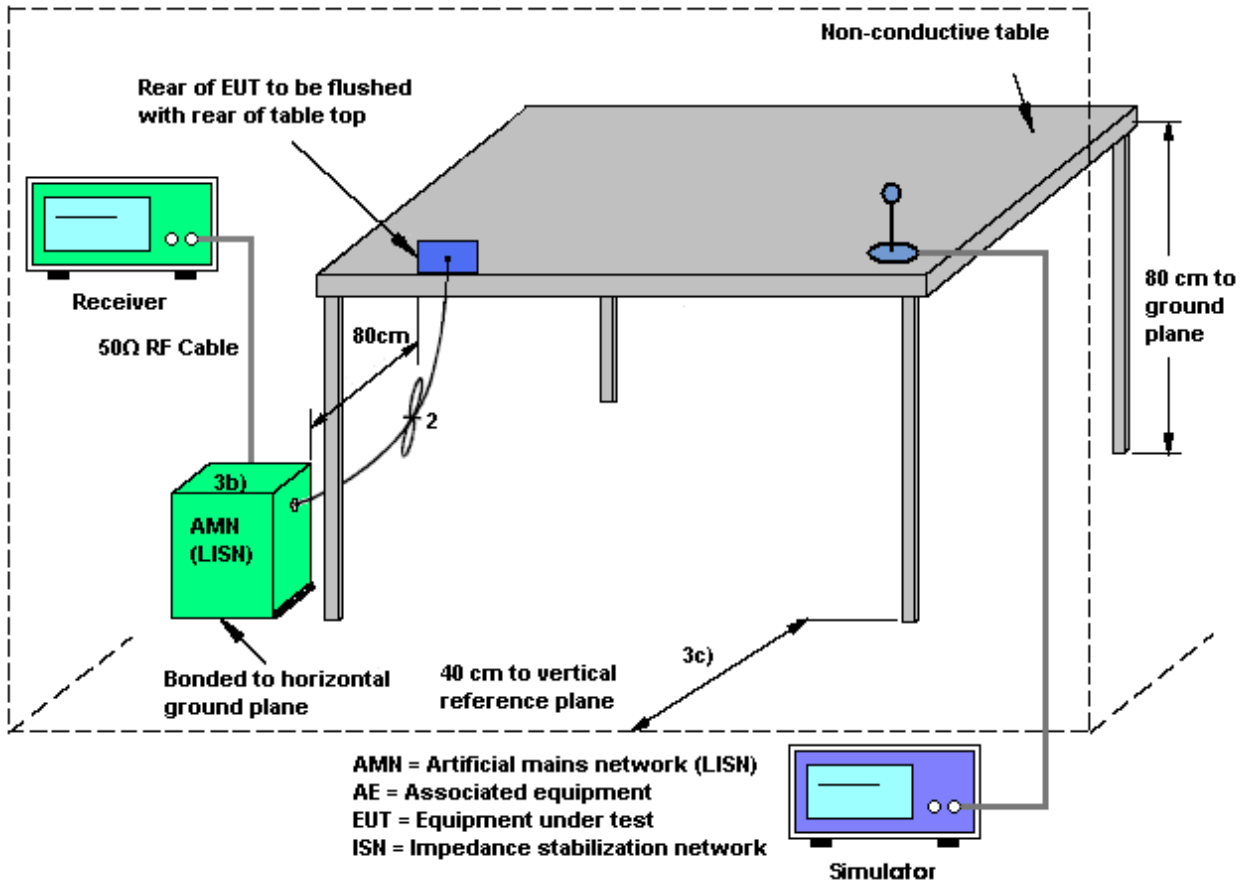
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

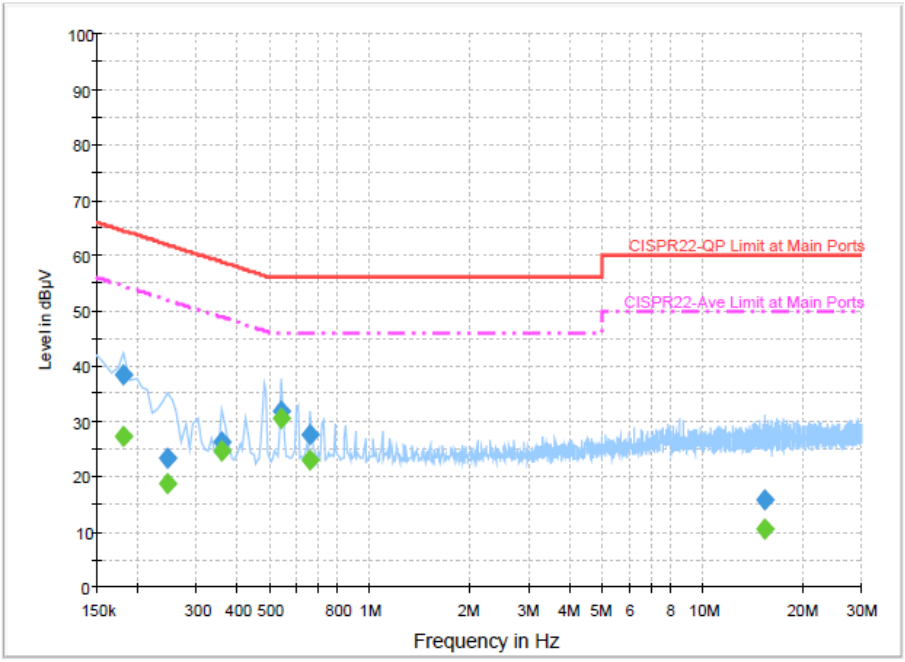
1. Please follow the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 kHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	**Temperature :**	22~24℃
Test Engineer :	Hayden Wu	**Relative Humidity :**	40~43%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	WCDMA Band II Idle + Bluetooth Link + WLAN(5G) Link + MP3 + Camera + Adapter + RS232 Cable 2 for EUT with Keypad 2 and Scanner 1		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



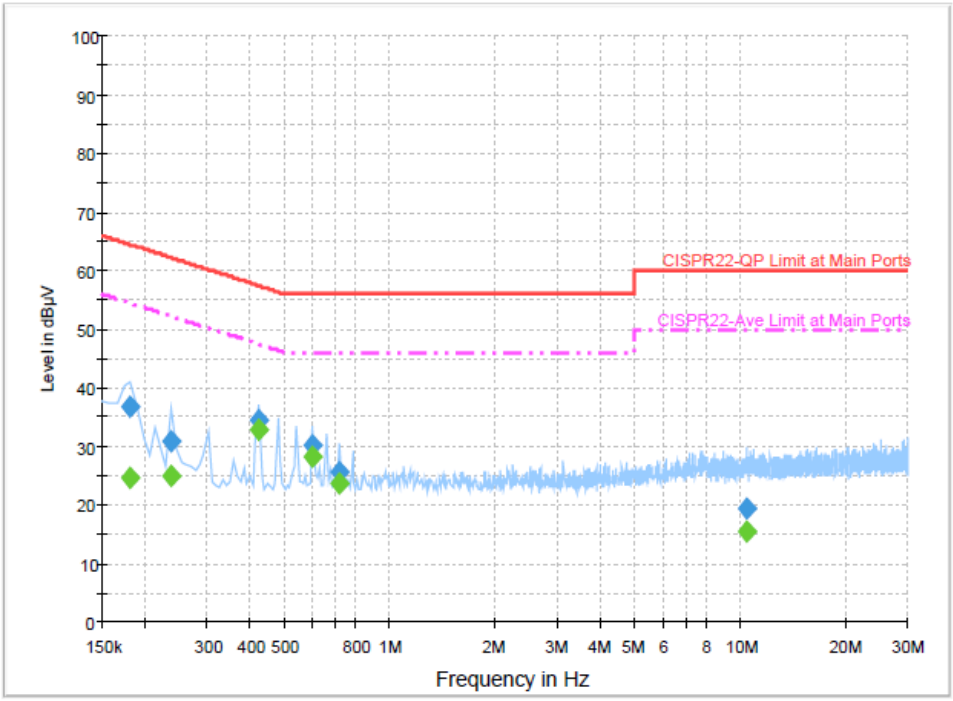
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	38.3	Off	L1	19.5	26.1	64.4
0.246000	23.4	Off	L1	19.5	38.5	61.9
0.358000	26.1	Off	L1	19.5	32.7	58.8
0.542000	31.7	Off	L1	19.5	24.3	56.0
0.662000	27.4	Off	L1	19.5	28.6	56.0
15.350000	15.7	Off	L1	19.7	44.3	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	27.2	Off	L1	19.5	27.2	54.4
0.246000	18.7	Off	L1	19.5	33.2	51.9
0.358000	24.6	Off	L1	19.5	24.2	48.8
0.542000	30.4	Off	L1	19.5	15.6	46.0
0.662000	22.8	Off	L1	19.5	23.2	46.0
15.350000	10.7	Off	L1	19.7	39.3	50.0

Test Mode :	Mode 1	Temperature :	22~24℃
Test Engineer :	Hayden Wu	Relative Humidity :	40~43%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band II Idle + Bluetooth Link + WLAN(5G) Link + MP3 + Camera + Adapter + RS232 Cable 2 for EUT with Keypad 2 and Scanner 1		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	36.9	Off	N	19.5	27.5	64.4
0.238000	30.7	Off	N	19.5	31.5	62.2
0.422000	34.5	Off	N	19.4	22.9	57.4
0.598000	30.2	Off	N	19.5	25.8	56.0
0.718000	25.7	Off	N	19.5	30.3	56.0
10.414000	19.3	Off	N	19.6	40.7	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	24.4	Off	N	19.5	30.0	54.4
0.238000	24.8	Off	N	19.5	27.4	52.2
0.422000	33.0	Off	N	19.4	14.4	47.4
0.598000	28.4	Off	N	19.5	17.6	46.0
0.718000	23.7	Off	N	19.5	22.3	46.0
10.414000	15.5	Off	N	19.6	34.5	50.0

3.7 Radiated Emission Measurement

3.7.1 Limit of Radiated Emission

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

(1) For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz.

(2) The provisions of Section 15.205 Restricted bands of operation of this part apply to intentional radiators operating under this section.

3.7.2 Measuring Instruments

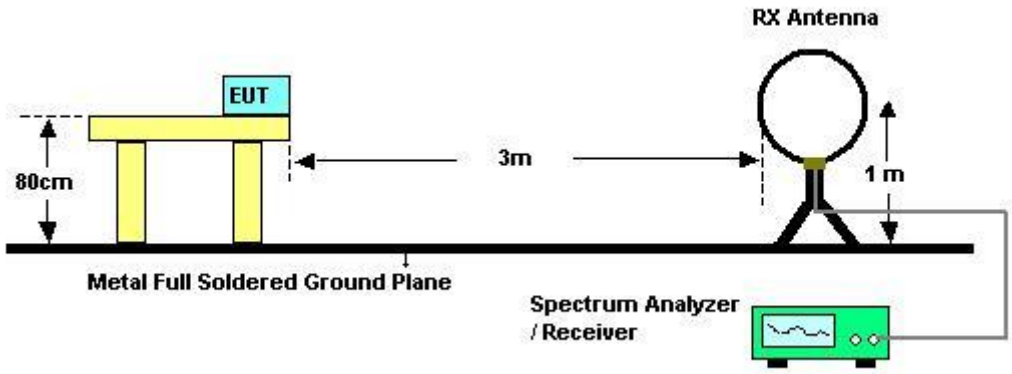
See list of measuring instruments of this test report.

3.7.3 Test Procedures

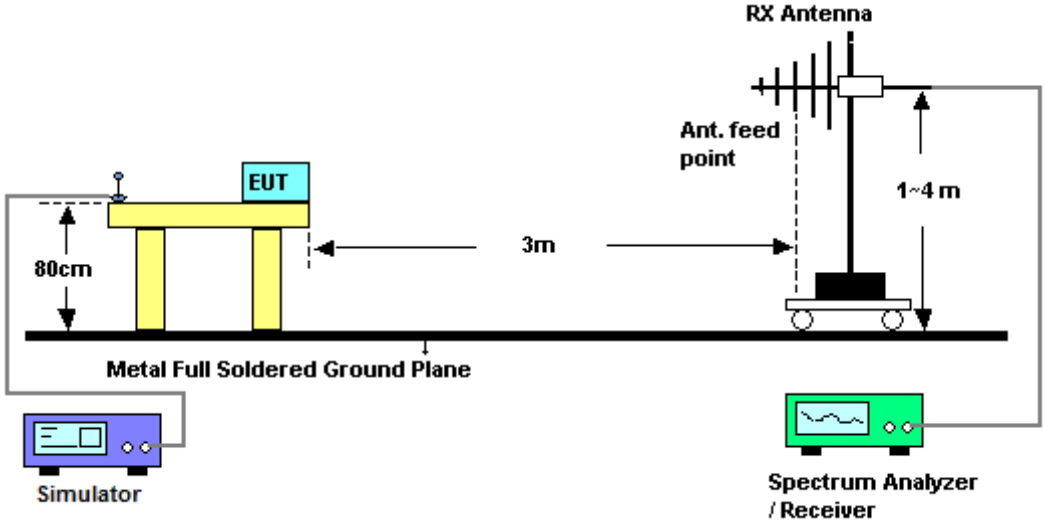
1. The testing follows the guidelines in FCC Public Notice DA 02-2138, (Measurement Guidelines of UNII)
2. The EUT was placed on a rotatable table top 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest radiation.
5. The antenna is a broadband antenna and its height is adjusted 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.
6. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
7. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
8. 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.
9. 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.

3.7.4 Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz



3.7.5 Test Results of Radiated Emissions (9kHz ~ 30MHz)

Temperature	21~23°C	Humidity	46~48%
Test Engineer	Elvis Chen		

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

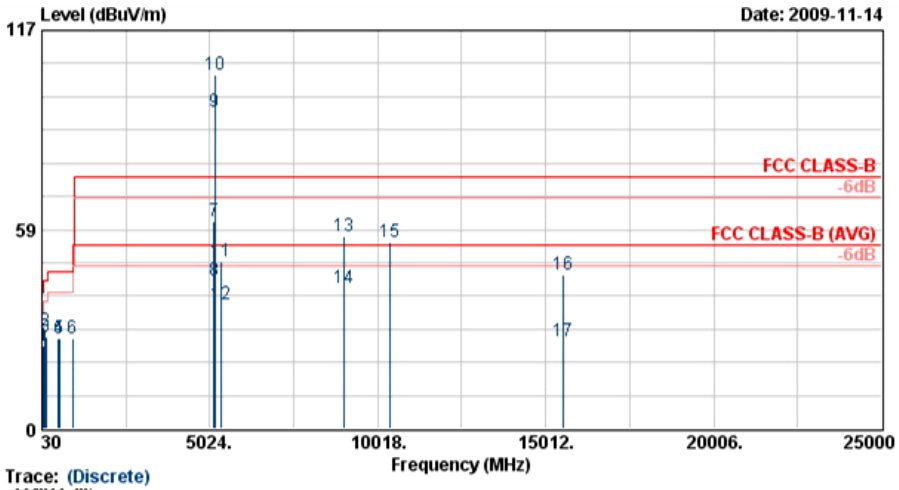
The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

3.7.6 Test Result of Radiated Emission (30MHz ~ 25GHz)

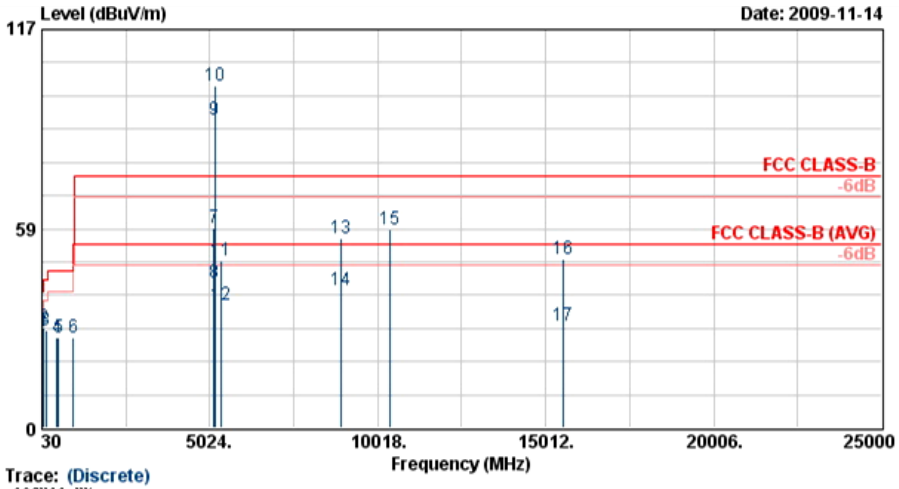
Test Mode :	Mode 1	Temperature :	21~23°C
Test Channel :	36	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored. #15 is not within a restricted band, and the limit of the value is 68.3 dBuV/m (peak).		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
Project : FR 903036
Memo : Mode 1

	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	89.94	24.55	-18.95	43.50	46.26	8.93	1.49	32.13	---	---	Peak
2	138.54	28.57	-14.93	43.50	47.23	11.15	1.92	31.73	100	267	Peak
3	150.69	27.10	-16.40	43.50	46.47	10.30	2.01	31.68	---	---	Peak
4	519.80	26.57	-19.43	46.00	36.91	17.72	4.03	32.09	---	---	Peak
5	554.80	26.59	-19.41	46.00	36.41	18.15	4.16	32.13	---	---	Peak
6	946.80	26.45	-19.55	46.00	31.42	20.92	5.55	31.44	---	---	Peak
7	5150.00	61.02	-12.98	74.00	57.12	34.02	5.98	36.10	100	39	Peak
8	5150.00	43.45	-10.55	54.00	39.55	34.02	5.98	36.10	100	39	Average
9 @	5180.00	93.06			89.12	34.05	6.00	36.10	100	39	Average
10 X	5180.00	103.74			99.80	34.05	6.00	36.10	100	39	Peak
11	5350.00	49.02	-24.98	74.00	44.84	34.18	6.09	36.10	100	39	Peak
12	5350.00	36.46	-17.54	54.00	32.29	34.18	6.09	36.10	100	39	Average
13	9000.00	56.65	-17.35	74.00	49.65	36.10	7.80	36.90	100	97	Peak
14	9000.00	41.50	-12.50	54.00	34.50	36.10	7.80	36.90	100	97	Average
15	10360.00	54.90			92.66	-9.16	8.25	36.85	100	0	Peak
16	15540.00	45.21	-28.79	74.00	79.30	-7.19	9.52	36.42	100	53	Peak
17	15540.00	25.63	-28.37	54.00	59.72	-7.19	9.52	36.42	100	53	Average

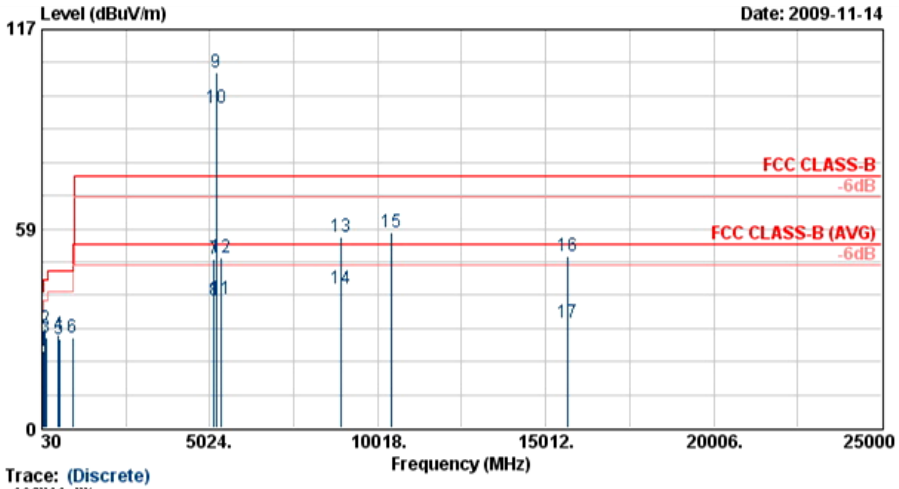
Test Mode :	Mode 1	Temperature :	21~23°C
Test Channel :	36	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored. #15 is not within a restricted band, and the limit of the value is 68.3 dBuV/m (peak).		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
Project : FR 903036
Memo : Mode 1

	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	83.73	28.28	-11.72	40.00	51.03	7.84	1.46	32.05	100	32	Peak
2	89.13	29.56	-13.94	43.50	51.42	8.77	1.49	32.12	---	---	Peak
3	156.09	28.78	-14.72	43.50	48.37	10.17	2.07	31.83	---	---	Peak
4	484.80	26.47	-19.53	46.00	37.43	17.20	3.90	32.06	---	---	Peak
5	519.80	26.58	-19.42	46.00	36.91	17.72	4.03	32.09	---	---	Peak
6	955.90	26.57	-19.43	46.00	31.37	20.96	5.58	31.34	---	---	Peak
7	5150.00	58.60	-15.40	74.00	54.70	34.02	5.98	36.10	100	359	Peak
8	5150.00	42.45	-11.55	54.00	38.55	34.02	5.98	36.10	100	359	Average
9 @	5180.00	90.62			86.68	34.05	6.00	36.10	100	359	Average
10 X	5180.00	100.66			96.72	34.05	6.00	36.10	100	359	Peak
11	5350.00	49.13	-24.87	74.00	44.96	34.18	6.09	36.10	100	359	Peak
12	5350.00	36.23	-17.77	54.00	32.06	34.18	6.09	36.10	100	359	Average
13	8908.00	55.70	-18.30	74.00	48.83	36.02	7.71	36.86	100	19	Peak
14	8908.00	40.50	-13.50	54.00	33.63	36.02	7.71	36.86	100	19	Average
15	10360.00	58.33			96.09	-9.16	8.25	36.85	100	0	Peak
16	15540.00	49.60	-24.40	74.00	83.69	-7.19	9.52	36.42	100	268	Peak
17	15540.00	30.00	-24.00	54.00	64.09	-7.19	9.52	36.42	100	268	Average

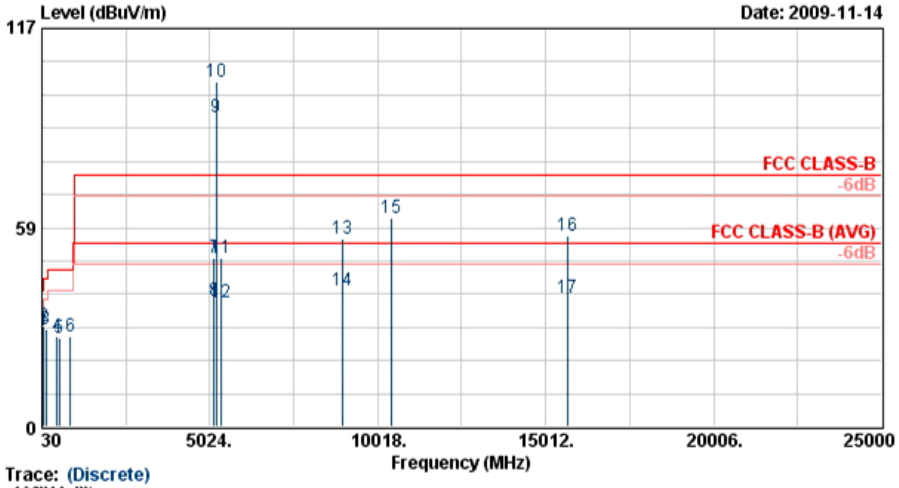
Test Mode :	Mode 2	Temperature :	21~23°C
Test Channel :	44	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored. #15 is not within a restricted band, and the limit of the value is 68.3 dBuV/m (peak).		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
Project : FR 903036
Memo : Mode 2

		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		83.73	22.42	-17.58	40.00	45.18	7.84	1.46	32.05	---	---	Peak
2		138.54	29.07	-14.43	43.50	47.72	11.15	1.92	31.73	100	237	Peak
3		156.09	26.57	-16.93	43.50	46.16	10.17	2.07	31.83	---	---	Peak
4		519.80	27.35	-18.65	46.00	37.68	17.72	4.03	32.09	---	---	Peak
5		554.80	26.10	-19.90	46.00	35.91	18.15	4.16	32.13	---	---	Peak
6		953.80	26.51	-19.49	46.00	31.37	20.95	5.57	31.38	---	---	Peak
7		5150.00	49.78	-24.22	74.00	45.88	34.02	5.98	36.10	108	14	Peak
8		5150.00	37.28	-16.72	54.00	33.38	34.02	5.98	36.10	108	14	Average
9	X	5220.00	104.46			100.46	34.07	6.02	36.10	108	14	Peak
10	@	5220.00	94.14			90.14	34.07	6.02	36.10	108	14	Average
11		5350.00	38.05	-15.95	54.00	33.88	34.18	6.09	36.10	108	14	Average
12		5350.00	50.14	-23.86	74.00	45.97	34.18	6.09	36.10	108	14	Peak
13		8928.00	56.01	-17.99	74.00	49.14	36.03	7.71	36.87	100	69	Peak
14		8928.00	40.87	-13.13	54.00	33.99	36.03	7.71	36.87	100	69	Average
15		10440.00	57.48			95.08	-9.11	8.28	36.78	100	0	Peak
16		15660.00	50.40	-23.60	74.00	84.58	-7.22	9.56	36.53	100	55	Peak
17		15660.00	30.78	-23.22	54.00	64.97	-7.22	9.56	36.53	100	55	Average

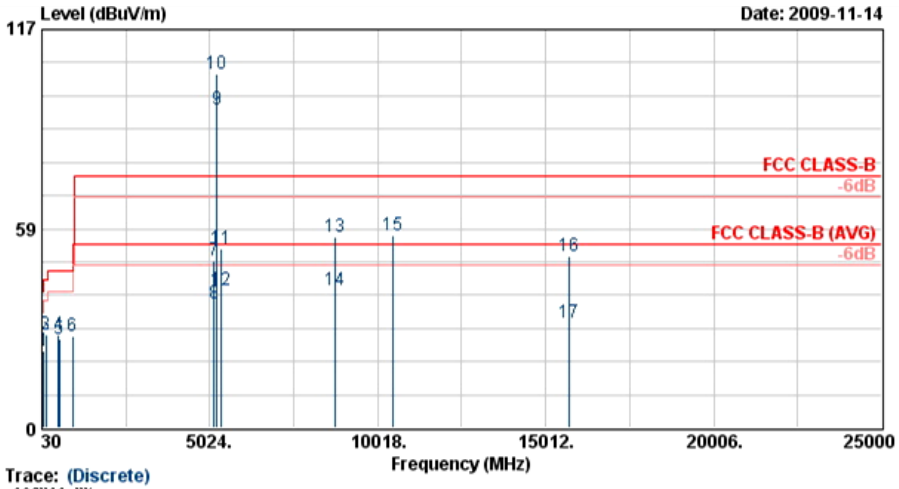
Test Mode :	Mode 2	Temperature :	21~23°C
Test Channel :	44	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored. #15 is not within a restricted band, and the limit of the value is 68.3 dBuV/m (peak).		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
Project : FR 9O3036
Memo : Mode 2

		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		83.19	28.06	-11.94	40.00	50.81	7.84	1.46	32.05	100	132	Peak
2		89.94	29.72	-13.78	43.50	51.43	8.93	1.49	32.13	---	---	Peak
3		156.09	28.58	-14.92	43.50	48.17	10.17	2.07	31.83	---	---	Peak
4		484.80	26.40	-19.60	46.00	37.36	17.20	3.90	32.06	---	---	Peak
5		554.80	25.88	-20.12	46.00	35.69	18.15	4.16	32.13	---	---	Peak
6		887.30	26.63	-19.37	46.00	32.41	20.65	5.42	31.85	---	---	Peak
7		5150.00	49.56	-24.44	74.00	45.66	34.02	5.98	36.10	100	359	Peak
8		5150.00	37.01	-16.99	54.00	33.11	34.02	5.98	36.10	100	359	Average
9	X	5220.00	90.91			86.91	34.07	6.02	36.10	100	359	Average
10	X	5220.00	101.29			97.29	34.07	6.02	36.10	100	359	Peak
11		5350.00	49.52	-24.48	74.00	45.35	34.18	6.09	36.10	100	359	Peak
12		5350.00	36.68	-17.32	54.00	32.51	34.18	6.09	36.10	100	359	Average
13		8968.00	55.36	-18.64	74.00	48.40	36.07	7.77	36.88	100	76	Peak
14		8968.00	40.13	-13.87	54.00	33.17	36.07	7.77	36.88	100	76	Average
15		10440.00	61.19			98.79	-9.11	8.28	36.78	100	0	Peak
16		15660.00	56.28	-17.72	74.00	90.47	-7.22	9.56	36.53	100	290	Peak
17		15660.00	37.63	-16.37	54.00	71.82	-7.22	9.56	36.53	100	290	Average

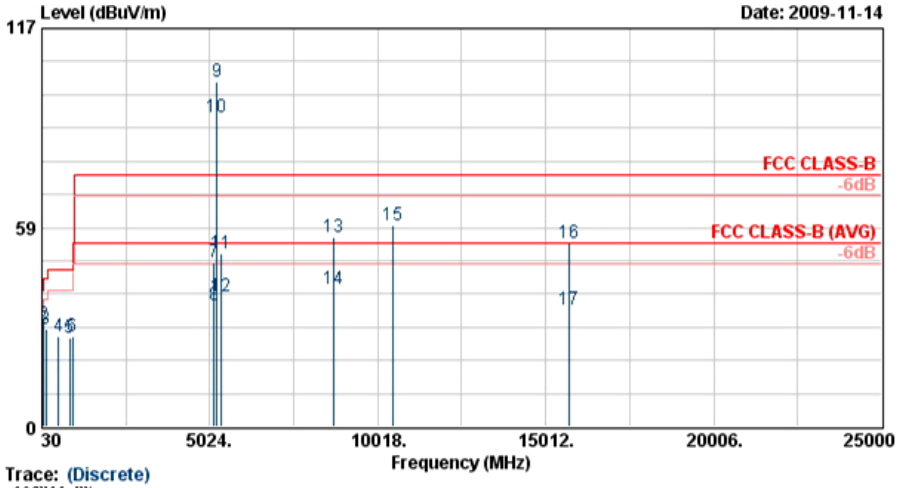
Test Mode :	Mode 3	Temperature :	21~23°C
Test Channel :	48	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored. #15 is not within a restricted band, and the limit of the value is 68.3 dBuV/m (peak).		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
Project : FR 903036
Memo : Mode 3

		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		83.73	22.65	-17.35	40.00	45.40	7.84	1.46	32.05	---	---	Peak
2		141.24	27.25	-16.25	43.50	46.07	10.95	1.94	31.72	100	97	Peak
3		151.23	27.25	-16.25	43.50	46.66	10.28	2.02	31.71	---	---	Peak
4		519.80	27.48	-18.52	46.00	37.82	17.72	4.03	32.09	---	---	Peak
5		537.30	26.22	-19.78	46.00	36.30	17.94	4.09	32.11	---	---	Peak
6		934.90	26.99	-19.02	46.00	32.08	20.87	5.53	31.50	---	---	Peak
7		5150.00	48.95	-25.05	74.00	45.04	34.02	5.98	36.10	106	12	Peak
8		5150.00	36.48	-17.52	54.00	32.58	34.02	5.98	36.10	106	12	Average
9	@	5240.00	93.43			89.41	34.09	6.04	36.10	106	12	Average
10	X	5240.00	103.83			99.79	34.10	6.04	36.10	106	12	Peak
11		5350.00	52.45	-21.55	74.00	48.28	34.18	6.09	36.10	106	12	Peak
12		5350.00	40.39	-13.61	54.00	36.22	34.18	6.09	36.10	106	12	Average
13		8764.00	55.89	-18.11	74.00	49.25	35.91	7.53	36.80	100	14	Peak
14		8764.00	40.66	-13.34	54.00	34.01	35.91	7.53	36.80	100	14	Average
15		10480.00	56.40			93.90	-9.08	8.30	36.73	100	0	Peak
16		15720.00	50.65	-23.35	74.00	84.88	-7.24	9.57	36.57	100	48	Peak
17		15720.00	31.02	-22.98	54.00	65.25	-7.24	9.57	36.57	100	48	Average

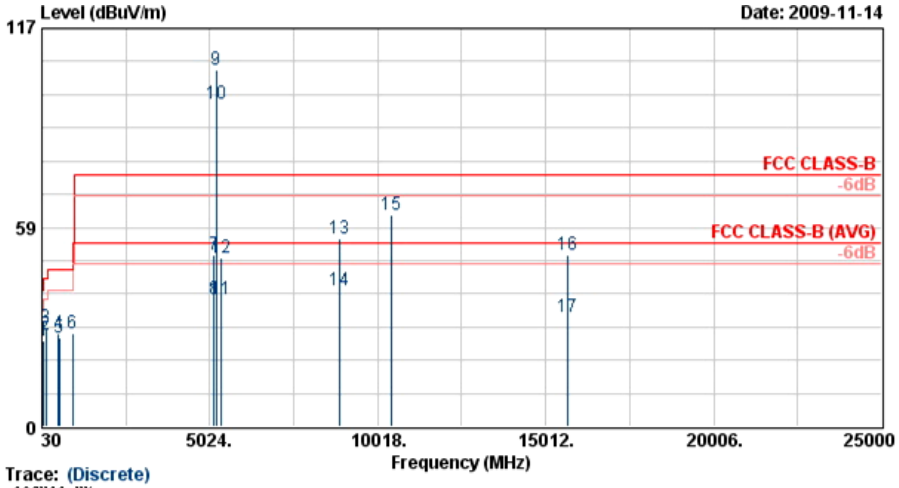
Test Mode :	Mode 3	Temperature :	21~23°C
Test Channel :	48	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored. #15 is not within a restricted band, and the limit of the value is 68.3 dBuV/m (peak).		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
Project : FR 903036
Memo : Mode 3

		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		83.73	26.18	-13.82	40.00	48.94	7.84	1.46	32.05	---	---	Peak
2		89.94	29.93	-13.57	43.50	51.64	8.93	1.49	32.13	100	45	Peak
3		156.09	28.56	-14.94	43.50	48.15	10.17	2.07	31.83	---	---	Peak
4		519.80	26.71	-19.29	46.00	37.05	17.72	4.03	32.09	---	---	Peak
5		862.80	26.11	-19.89	46.00	32.47	20.49	5.35	32.20	---	---	Peak
6		943.30	26.73	-19.27	46.00	31.73	20.91	5.55	31.46	---	---	Peak
7		5150.00	48.28	-25.72	74.00	44.37	34.02	5.98	36.10	110	4	Peak
8		5150.00	35.85	-18.15	54.00	31.95	34.02	5.98	36.10	110	4	Average
9	X	5240.00	101.49			97.47	34.09	6.04	36.10	110	4	Peak
10	@	5240.00	90.73			86.71	34.09	6.04	36.10	110	4	Average
11		5350.00	50.75	-23.25	74.00	46.57	34.18	6.09	36.10	110	4	Peak
12		5350.00	38.26	-15.74	54.00	34.09	34.18	6.09	36.10	110	4	Average
13		8708.00	55.58	-18.42	74.00	49.05	35.86	7.45	36.78	100	65	Peak
14		8708.00	40.38	-13.62	54.00	33.85	35.86	7.45	36.78	100	65	Average
15		10480.00	59.03			96.54	-9.08	8.30	36.73	100	0	Peak
16		15720.00	54.10	-19.90	74.00	88.33	-7.24	9.57	36.57	100	238	Peak
17		15720.00	34.34	-19.66	54.00	68.57	-7.24	9.57	36.57	100	238	Average

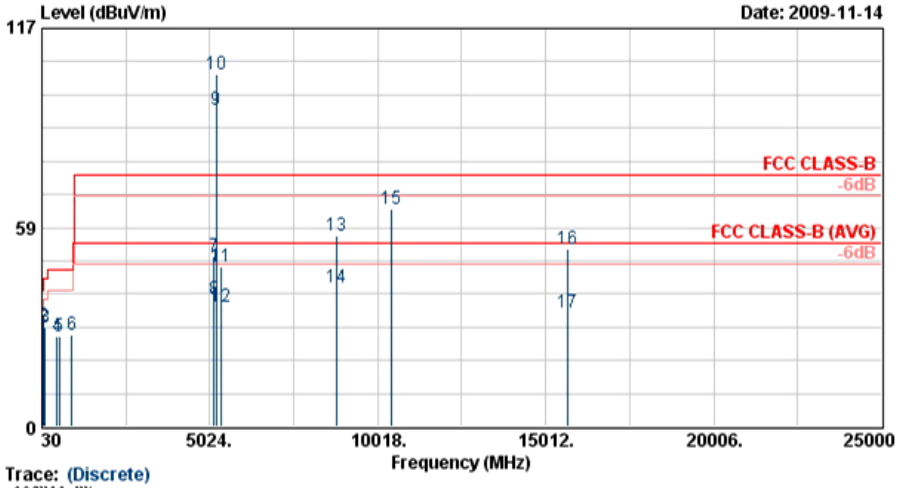
Test Mode :	Mode 4	Temperature :	21~23°C
Test Channel :	44	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored. #15 is not within a restricted band, and the limit of the value is 68.3 dBuV/m (peak).		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
Project : FR 903036
Memo : Mode 4

		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		89.94	25.12	-18.38	43.50	46.83	8.93	1.49	32.13	---	---	Peak
2		141.24	27.13	-16.37	43.50	45.95	10.95	1.94	31.72	---	---	Peak
3		150.69	29.04	-14.46	43.50	48.41	10.30	2.01	31.68	100	195	Peak
4		519.80	27.43	-18.57	46.00	37.76	17.72	4.03	32.09	---	---	Peak
5		554.80	26.27	-19.73	46.00	36.09	18.15	4.16	32.13	---	---	Peak
6		952.40	27.19	-18.81	46.00	32.07	20.94	5.57	31.39	---	---	Peak
7		5150.00	50.44	-23.56	74.00	46.54	34.02	5.98	36.10	137	5	Peak
8		5150.00	37.37	-16.63	54.00	33.47	34.02	5.98	36.10	137	5	Average
9	X	5220.00	104.64			100.64	34.07	6.02	36.10	137	5	Peak
10	@	5220.00	94.83			90.83	34.07	6.02	36.10	137	5	Average
11		5350.00	37.42	-16.58	54.00	33.25	34.18	6.09	36.10	137	5	Average
12		5350.00	49.60	-24.40	74.00	45.42	34.18	6.09	36.10	137	5	Peak
13		8868.00	55.27	-18.73	74.00	48.48	35.99	7.65	36.85	100	112	Peak
14		8868.00	40.07	-13.93	54.00	33.28	35.99	7.65	36.85	100	112	Average
15		10440.00	62.30			99.91	-9.11	8.28	36.78	100	0	Peak
16		15660.00	50.62	-23.38	74.00	84.80	-7.22	9.56	36.53	100	91	Peak
17		15660.00	32.11	-21.89	54.00	66.30	-7.22	9.56	36.53	100	91	Average

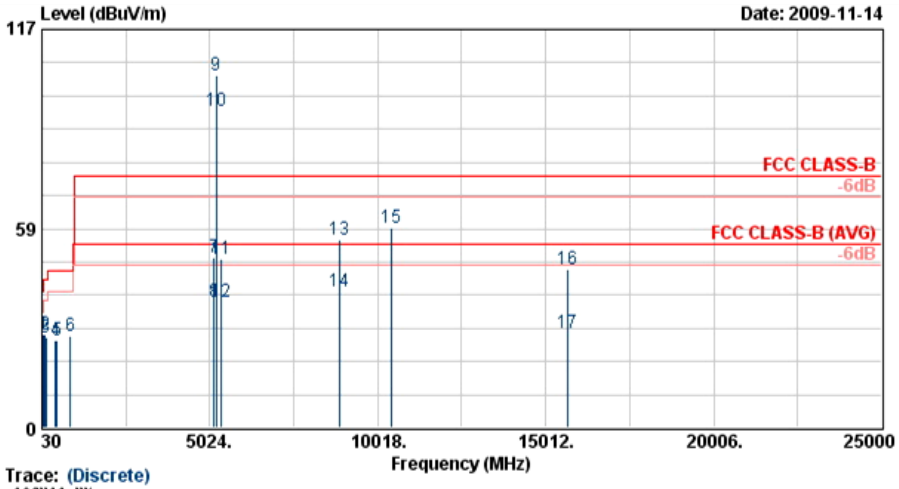
Test Mode :	Mode 4	Temperature :	21~23°C
Test Channel :	44	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored. #15 is not within a restricted band, and the limit of the value is 68.3 dBuV/m (peak).		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
Project : FR 903036
Memo : Mode 4

	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	83.73	27.23	-12.77	40.00	49.99	7.84	1.46	32.05	100	12	Peak
2	89.94	29.48	-14.02	43.50	51.19	8.93	1.49	32.13	---	---	Peak
3	118.29	29.04	-14.46	43.50	47.58	11.46	1.75	31.75	---	---	Peak
4	484.80	26.60	-19.40	46.00	37.56	17.20	3.90	32.06	---	---	Peak
5	554.80	26.39	-19.61	46.00	36.21	18.15	4.16	32.13	---	---	Peak
6	920.90	27.11	-18.89	46.00	32.37	20.81	5.50	31.57	---	---	Peak
7	5150.00	50.23	-23.77	74.00	46.32	34.02	5.98	36.10	100	17	Peak
8	5150.00	37.30	-16.70	54.00	33.40	34.02	5.98	36.10	100	17	Average
9 @	5220.00	93.16			89.16	34.07	6.02	36.10	100	17	Average
10 X	5220.00	103.42			99.43	34.07	6.02	36.10	100	17	Peak
11	5350.00	47.16	-26.84	74.00	42.99	34.18	6.09	36.10	100	17	Peak
12	5350.00	35.03	-18.97	54.00	30.86	34.18	6.09	36.10	100	17	Average
13	8778.00	56.02	-17.98	74.00	49.37	35.93	7.53	36.81	100	98	Peak
14	8778.00	40.82	-13.18	54.00	34.17	35.93	7.53	36.81	100	98	Average
15	10440.00	64.00			101.60	-9.11	8.28	36.78	100	0	Peak
16	15660.00	52.31	-21.69	74.00	86.49	-7.22	9.56	36.53	100	293	Peak
17	15660.00	33.46	-20.54	54.00	67.65	-7.22	9.56	36.53	100	293	Average

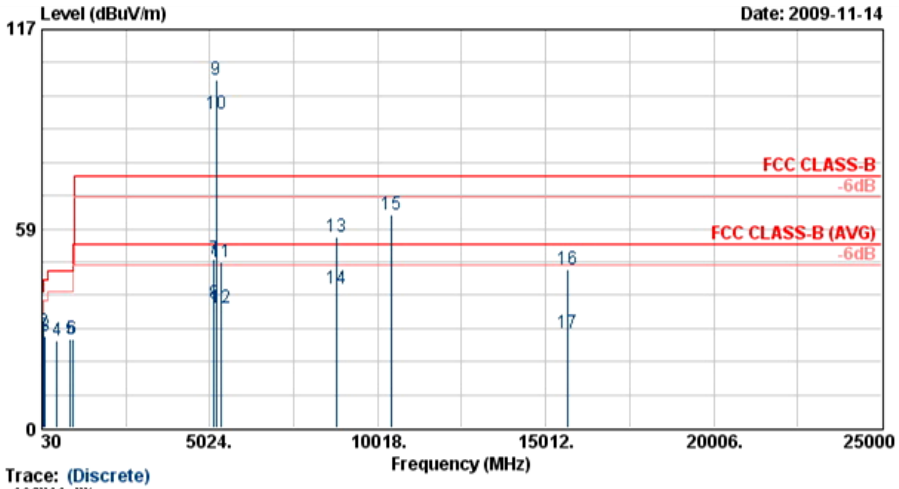
Test Mode :	Mode 5	Temperature :	21~23°C
Test Channel :	44	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored. #15 is not within a restricted band, and the limit of the value is 68.3 dBuV/m (peak).		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
Project : FR 903036
Memo : Mode 5

		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		89.94	27.42	-16.08	43.50	49.13	8.93	1.49	32.13	100	45	Peak
2		138.54	27.37	-16.13	43.50	46.02	11.15	1.92	31.73	---	---	Peak
3		156.09	26.63	-16.87	43.50	46.22	10.17	2.07	31.83	---	---	Peak
4		432.30	25.70	-20.30	46.00	37.76	16.26	3.67	31.99	---	---	Peak
5		484.80	25.87	-20.13	46.00	36.83	17.20	3.90	32.06	---	---	Peak
6		878.90	26.86	-19.14	46.00	32.85	20.59	5.40	31.98	---	---	Peak
7		5150.00	49.86	-24.14	74.00	45.96	34.02	5.98	36.10	122	6	Peak
8		5150.00	36.81	-17.19	54.00	32.91	34.02	5.98	36.10	122	6	Average
9	X	5220.00	103.45			99.45	34.07	6.02	36.10	122	6	Peak
10	@	5220.00	93.07			89.07	34.07	6.02	36.10	122	6	Average
11		5350.00	49.46	-24.54	74.00	45.28	34.18	6.09	36.10	122	6	Peak
12		5350.00	37.18	-16.82	54.00	33.01	34.18	6.09	36.10	122	6	Average
13		8868.00	55.27	-18.73	74.00	48.48	35.99	7.65	36.85	100	112	Peak
14		8868.00	40.07	-13.93	54.00	33.28	35.99	7.65	36.85	100	112	Average
15		10440.00	58.84			96.44	-9.11	8.28	36.78	100	0	Peak
16		15660.00	46.60	-27.40	74.00	80.79	-7.22	9.56	36.53	100	159	Peak
17		15660.00	27.91	-26.09	54.00	62.10	-7.22	9.56	36.53	100	159	Average

Test Mode :	Mode 5	Temperature :	21~23°C
Test Channel :	44	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored. #15 is not within a restricted band, and the limit of the value is 68.3 dBuV/m (peak).		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
Project : FR 903036
Memo : Mode 5

		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		83.73	26.13	-13.87	40.00	48.89	7.84	1.46	32.05	100	22	Peak
2		89.13	28.25	-15.25	43.50	50.11	8.77	1.49	32.12	---	---	Peak
3		138.54	27.17	-16.33	43.50	45.82	11.15	1.92	31.73	---	---	Peak
4		484.80	25.80	-20.20	46.00	36.75	17.20	3.90	32.06	---	---	Peak
5		876.80	26.14	-19.86	46.00	32.18	20.58	5.39	32.01	---	---	Peak
6		939.80	26.30	-19.70	46.00	31.34	20.89	5.54	31.48	---	---	Peak
7		5150.00	49.47	-24.53	74.00	45.57	34.02	5.98	36.10	100	12	Peak
8		5150.00	36.64	-17.36	54.00	32.74	34.02	5.98	36.10	100	12	Average
9	X	5220.00	102.40			98.40	34.07	6.02	36.10	100	12	Peak
10	@	5220.00	92.39			88.39	34.07	6.02	36.10	100	12	Average
11		5350.00	48.77	-25.23	74.00	44.59	34.18	6.09	36.10	100	12	Peak
12		5350.00	35.10	-18.90	54.00	30.93	34.18	6.09	36.10	100	12	Average
13		8778.00	56.02	-17.98	74.00	49.37	35.93	7.53	36.81	100	98	Peak
14		8778.00	40.82	-13.18	54.00	34.17	35.93	7.53	36.81	100	98	Average
15		10440.00	62.67			100.28	-9.11	8.28	36.78	100	0	Peak
16		15660.00	46.58	-27.42	74.00	80.77	-7.22	9.56	36.53	100	227	Peak
17		15660.00	27.96	-26.04	54.00	62.15	-7.22	9.56	36.53	100	227	Average

3.8 Peak Excursion Ratio Measurement

3.8.1 Limit of Peak Excursion Ratio

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

3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

3.8.3 Test Procedures

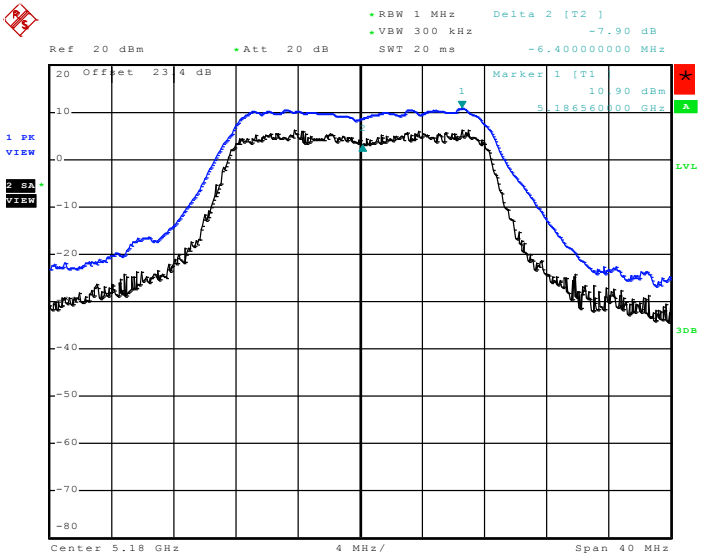
1. The transmitter output is connected to the spectrum analyzer.
2. The resolution bandwidth is set to and maintained at 1 MHz. The video bandwidth is set to 3 MHz.
3. Trace A is set peak detector and to Max Hold, then to View. Then the detector is readjusted to sample detector, max hold to run for 60 seconds, and the signal under this measurement condition is captured in Trace B in Accordance with the method 3 of DA-02-2138.
4. 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.

3.8.4 Test Setup

3.8.5 Test Result of Peak Excursion Ratio

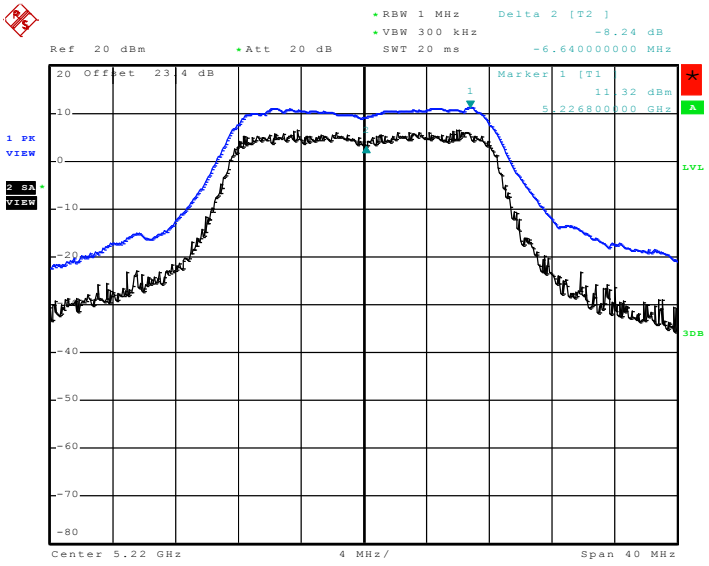
Test Mode :	Mode 1~3	Temperature :	25~27℃
Test Engineer :	Ken Hsu	Relative Humidity :	51~54%

Mode 1 : Peak Excursion Ratio Plot on 802.11a Channel 36



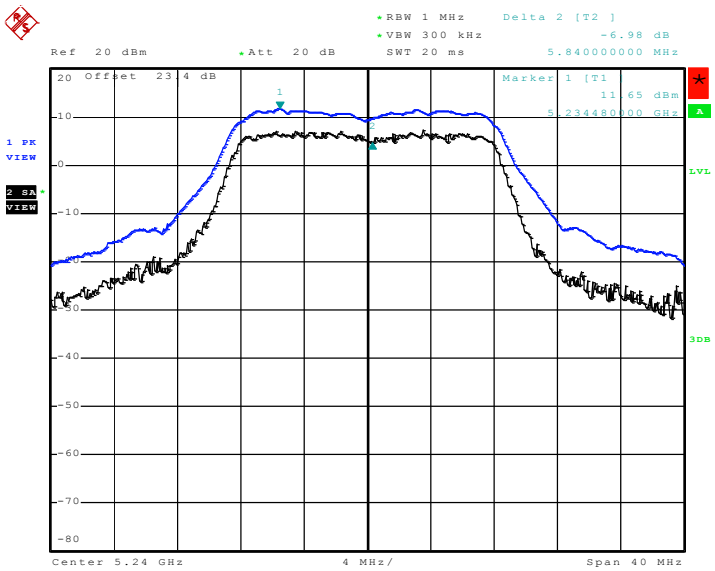
Date: 2.DEC.2009 09:30:02

Mode 2 : Peak Excursion Ratio Plot on 802.11a Channel 44



Date: 2.DEC.2009 09:35:33

Mode 3 : Peak Excursion Ratio Plot on 802.11a Channel 48



Date: 2.DEC.2009 09:37:20

3.9 Automatically Discontinue Transmission

3.9.1 Limit of Automatically Discontinue Transmission

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 signaling 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 to describe how this requirement is met.

3.9.2 Measuring Instruments

See list of measuring instruments of this test report.

3.9.3 Test Result of 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.

3.10 Frequency Stability Measurement

3.10.1 Limit of 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 user's manual.

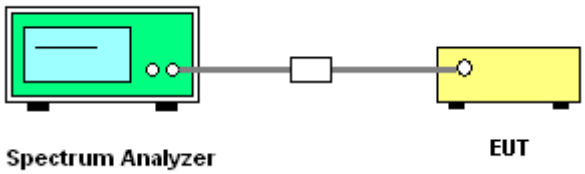
3.10.2 Measuring Instruments

See list of measuring instruments of this test report.

3.10.3 Test Procedures

1. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
2. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
3. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

3.10.4 Test Setup



3.10.5 Test Result of Frequency Stability

Test Mode :	Mode 1~3	Temperature :	25~27℃
Test Engineer :	Ken Hsu	Relative Humidity :	51~54%

Channel	Frequency (MHz)	Low Frequency (Fl)	High Frequency (Fh)	Frequency Stability (ppm)
36	5180	5171.64	5188.32	-3.86
44	5220	5211.64	5228.32	-3.83
48	5240	5231.64	5248.32	-3.82

3.11 Antenna Requirements

3.11.1 Standard Applicable

According to FCC 47 CFR Section 15.407(a)(1)(2) ,if transmitting antenna directional gain is greater than 6 dBi, 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.

3.11.2 Antenna Connected Construction

The antennas type used in this product is PIFA Antenna without connector and it is considered to meet antenna requirement of FCC.

3.11.3 Antenna Gain

The antenna gain is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 23, 2009	Jun. 22, 2010	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 17, 2009	Sep. 16, 2010	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 10, 2009	Sep. 09, 2010	Conducted (TH02-HY)
EMI Test Receive	R&S	ESCS 30	100356	9KHz – 2.75GHz	Aug. 05, 2009	Aug. 04, 2010	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9kHz~30MHz	Nov. 30, 2009	Nov. 29, 2010	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9kHz~30MHz	Nov. 23, 2009	Nov. 22, 2010	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9KHz-26.5GHz	Oct. 23, 2009	Oct. 22, 2010	Radiation (03CH06-HY)
Spectrum Analyzer	R&S	FSP40	100057	9KHz-40GHz	Oct. 20, 2009	Oct. 19, 2010	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20MHz-1000MHz	Apr. 28, 2009	Apr. 27, 2010	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Oct. 31, 2009	Oct. 30, 2010	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz~18GHz	Aug. 20, 2009	Aug. 19, 2010	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Training Research	AH-0801	95119	8GHz~18GHz	Nov. 02, 2009	Nov. 01, 2010	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 14, 2009	Oct. 13, 2010	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz- 26.5GHz	Nov. 11, 2009	Nov. 10, 2010	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz~1GHz	Apr. 20, 2009	Apr. 19, 2010	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9KHz~30MHz	May 22, 2008	May 21, 2010	Radiation (03CH06-HY)
System Simulator	R&S	CMU200	116456	N/A	Jun. 05, 2008	Jun. 04, 2010	-

5 Uncertainty of Evaluation

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 Specification	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-Shape	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		$u(X_i)$	C_i	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	±0.10	Normal (k=2)	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)	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty Uc(y)	**2.36**				
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.72**				

6 Certification of TAF Accreditation

Certificate No. : L1190-090417

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	:	ISO/IEC 17025:2005
Accreditation Number	:	1190
Originally Accredited	:	December 15, 2003
Effective Period	:	January 10, 2007 to January 09, 2010
Accredited Scope	:	Testing Field, see described in the Appendix
Specific Accreditation Program	:	Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory Accreditation Program for BSMI Mutual Recognition Arrangment with Foreign Authorities

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : April 17, 2009

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The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix

Appendix A. Photographs of EUT

Please refer to Sporton report number EP9O3036 as below.

Appendix C. Conducted Power for Reference

Measurement Equipment: Spectrum Analyzer

Channel	Frequency (MHz)	Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 36	5180 MHz	13.85	13.03	13.55	14.13	14.09	13.66	14.17	13.73
CH 44	5220 MHz	13.77	14.35	13.73	13.78	13.32	13.94	13.21	12.78
CH 48	5240 MHz	12.77	13.22	12.87	13.09	13.00	12.94	13.12	12.74

Measurement Equipment: Power Meter

Peak Power									
Channel	Frequency (MHz)	Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 36	5180 MHz	21.25	21.41	21.33	21.12	21.39	21.35	21.25	21.31
CH 44	5220 MHz	21.00	21.01	21.02	20.71	21.03	21.00	20.95	20.92
CH 48	5240 MHz	20.76	20.54	20.76	20.47	20.88	20.74	20.77	20.74

Average Power									
Channel	Frequency (MHz)	Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 36	5180 MHz	13.54	13.73	13.53	13.61	13.44	13.45	13.43	13.36
CH 44	5220 MHz	13.17	13.21	13.19	13.27	13.16	13.06	13.13	13.03
CH 48	5240 MHz	12.84	12.81	12.85	12.85	12.74	12.45	12.76	12.70