

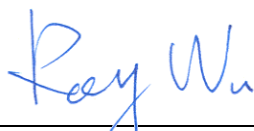
FCC RF Test Report

APPLICANT : Acer Incorporated
EQUIPMENT : Smart HandHeld
BRAND NAME : Acer
MODEL NAME : E400 & P400
FCC ID : HLZDME400
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Transmission System (DTS)

The product was received on Jan. 16, 2010 and completely tested on Feb. 25, 2010. 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 the 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



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
FR011603-02B	Rev. 01	Initial issue of report	Mar. 12, 2010

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.2	15.247(b)	A8.4	Power Output	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(d)	A8.5	Frequency Band Edges	$\leq 20\text{dBc}$	Pass	-
3.4	15.247(d)	A8.5	Spurious Emission	$< 20\text{ dBc}$	Pass	-
3.5	15.247(e)	A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}$	Pass	-
3.6	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 14.0 dB at 1.262 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.04 dB at 2483.66 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Acer Incorporated

8F., No. 88, Sec. 1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan

1.2 Manufacturer

Compal Communication (Nanjing)

No. 68-2, Suyuan Street, Nanjing Jingning Export Processing Zone (South Area)

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Smart HandHeld
Brand Name	Acer
Model Name	E400 & P400
FCC ID	HLZDME400
Sample A	EUT + LCD Panel 1 + Touch Lens 1 + Memory 1
Sample B	EUT + LCD Panel 2 + Touch Lens 2 + Memory 2
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz
Number of Channels	11
Carrier Frequency of Each Channel	2412+(n-1)*5 MHz; n=1~11
Channel Spacing	5 MHz
Maximum Output Power to Antenna	802.11b : 17.96 dBm (62.52 mW) 802.11g : 23.62 dBm (230.14 mW)
Antenna Type	PIFA Antenna with gain -3 dBi
HW Version	GA-240 Rev:0D (DVT2)
SW Version	E400 : Base band : 0.3.01 Build number : Acer.0.0012.00 P400 : OS : Acer_E110_0.010f_EN Modem : E110-0.010f
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g : 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 Digital Transmission System (DTS).
3. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
4. E400 and P400 are almost the same, and the only difference between them is SW version. Only E400 was performed for this test.

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st 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	03CH07-HY	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 C §15.247
- ♦ FCC KDB Publication No. 558074 (Measurement Guidelines of DTS)
- ♦ ANSI C63.4-2003
- ♦ IC RSS-210 Issue 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.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P:Unshielded, 1.2 m DC O/P:Shielded, 1.8 m
5.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A

2 Test Configuration of Equipment Under Test

2.1 RF Power

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

Channel	Frequency	2.4GHz 802.11b RF Power (dBm)			
		At DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	17.52	17.86	17.49	17.96
CH 06	2437 MHz	17.70	17.49	17.63	17.81
CH 11	2462 MHz	17.16	17.16	16.99	17.46

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		At OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	22.65	23.16	23.09	22.45	21.22	22.63	23.05	22.68
CH 06	2437 MHz	22.90	23.05	23.23	22.78	22.56	22.75	22.90	22.54
CH 11	2462 MHz	22.75	23.62	23.00	22.25	22.02	22.23	22.49	22.35

Remark:

1. The data rates of WLAN 802.11b/g were set in 11Mbps for 802.11b and 9Mbps for 802.11g, for all the test cases due to the highest RF output power.
2. The EUT is programmed to transmit signals continuously for all testing.

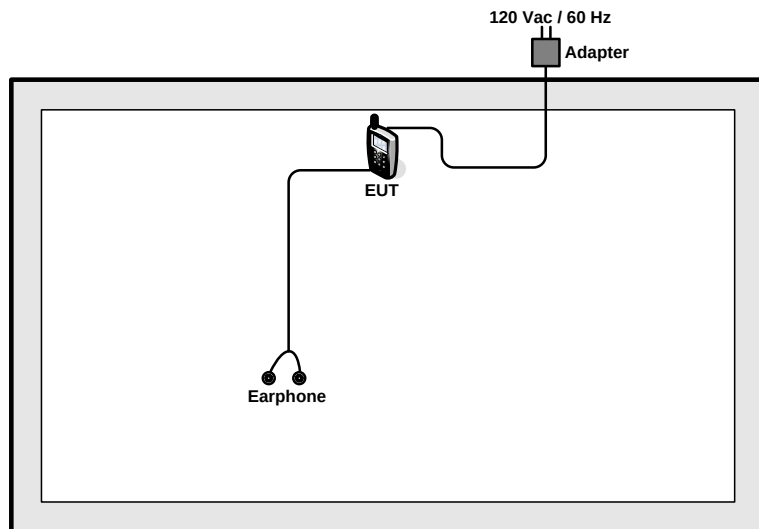
2.2 Test Mode

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: conducted emission (150 kHz to 30 MHz), radiated emission (30 MHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). Pre-scanned tests were conducted to determine the final configuration from all possible combinations. The following tables are showing the test modes as the worst cases and recorded in this report.

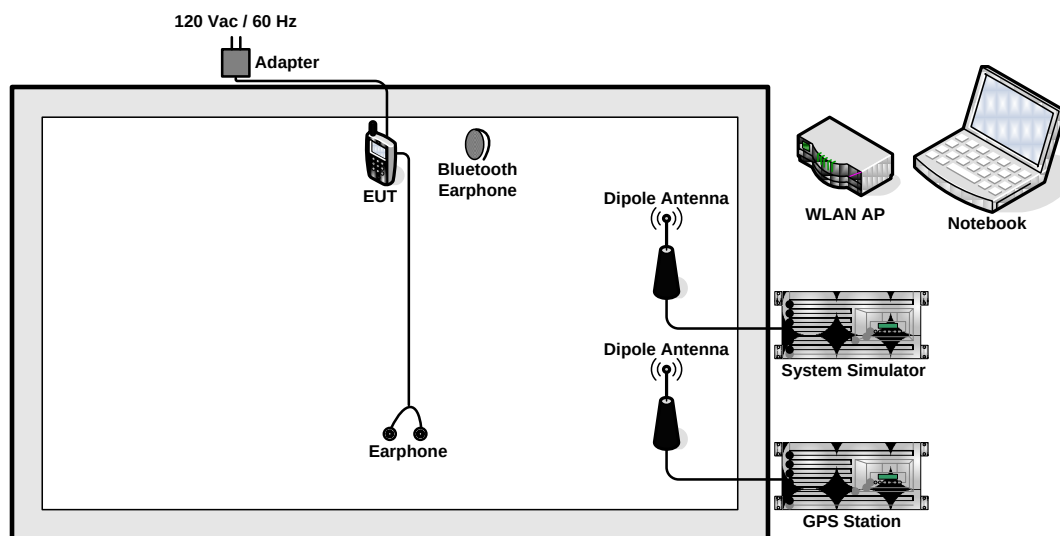
Test Cases		
Conducted TCs	802.11b	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz
	802.11g	Mode 4 : 802.11g CH01_2412 MHz Mode 5 : 802.11g CH06_2437 MHz Mode 6 : 802.11g CH11_2462 MHz
Radiated TCs	802.11b	Mode 1 : 802.11b CH01_2412 MHz + Adapter + Earphone for Sample A Mode 2 : 802.11b CH06_2437 MHz + Adapter + Earphone for Sample A Mode 3 : 802.11b CH11_2462 MHz + Adapter + Earphone for Sample A
	802.11g	Mode 4 : 802.11g CH01_2412 MHz + Adapter + Earphone for Sample A Mode 5 : 802.11g CH06_2437 MHz + Adapter + Earphone for Sample A Mode 6 : 802.11g CH11_2462 MHz + Adapter + Earphone for Sample A Mode 7 : 802.11g CH11_2462 MHz + Adapter + Earphone for Sample B
AC Conducted Emission		Mode 1 : GSM850 Idle + Bluetooth Link + WLAN Link + GPS Rx + Adapter + Earphone for Sample A Mode 2 : GSM850 Idle + Bluetooth Link + WLAN Link + GPS Rx + Adapter + Earphone for Sample B
Remark: The worst case of conducted emission is mode 1; only the test data of it was reported.		

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<EUT with Adapter Mode>



2.4 RF Utility

The programmed RF utility was 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 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

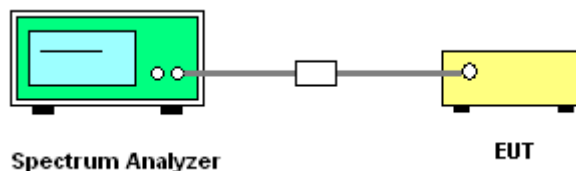
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz.
In order to make an accurate measurement, set the span greater than RBW. The 6 dB bandwidth must be greater than 500 kHz.
4. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

3.1.4 Test Setup

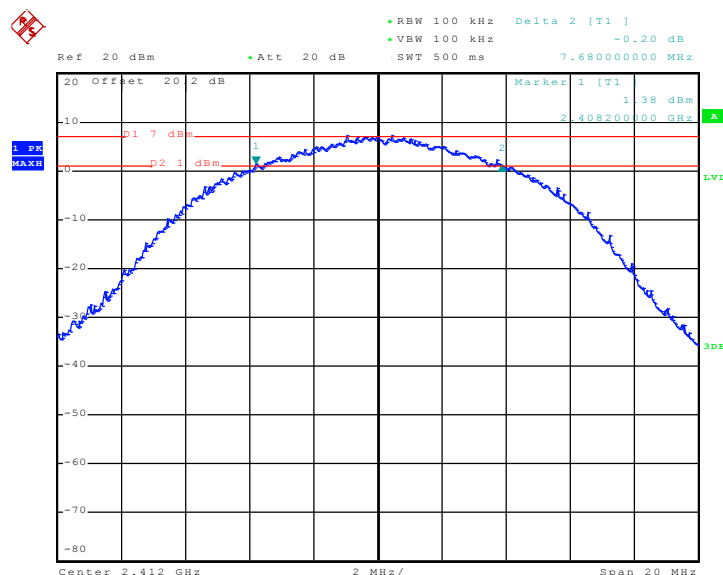


3.1.5 Test Result of 6dB Bandwidth

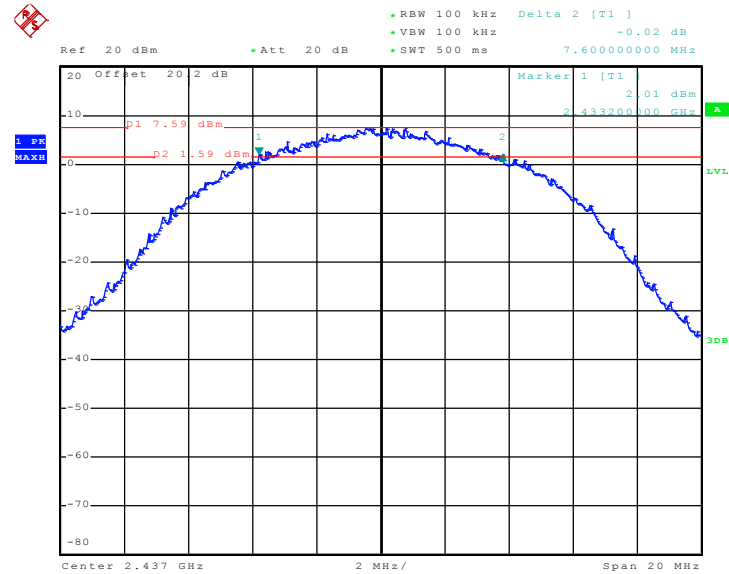
Test Mode :	Mode 1, 2, 3	Temperature :	23~25℃
Test Engineer :	Andy Yeh	Relative Humidity :	43~46%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	7.68	0.5	Pass
06	2437	7.60	0.5	Pass
11	2462	8.04	0.5	Pass

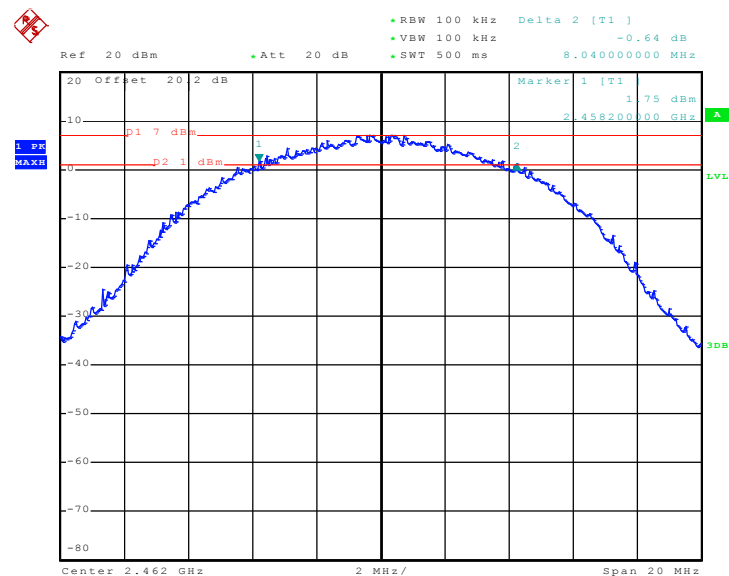
Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01



Date: 12.FEB.2010 19:25:21

Mode 2 : 6 dB Bandwidth Plot on 802.11b Channel 06


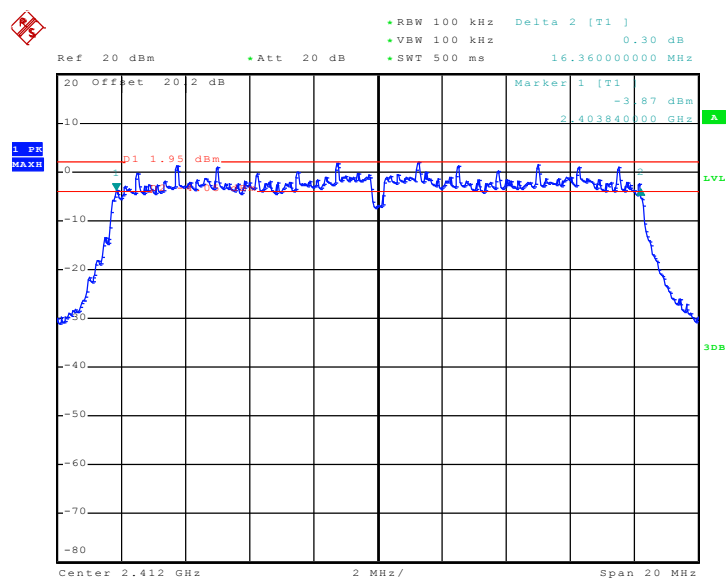
Date: 12.FEB.2010 19:28:12

Mode 3 : 6 dB Bandwidth Plot on 802.11b Channel 11


Date: 12.FEB.2010 19:31:44

Test Mode :	Mode 4, 5, 6	Temperature :	23~25°C
Test Engineer :	Andy Yeh	Relative Humidity :	43~46%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.36	0.5	Pass
06	2437	16.36	0.5	Pass
11	2462	16.36	0.5	Pass

Mode 4 : 6 dB Bandwidth Plot on 802.11g Channel 01


Date: 12.FEB.2010 19:38:43



Mode 6 : 6 dB Bandwidth Plot on 802.11g Channel 11



3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

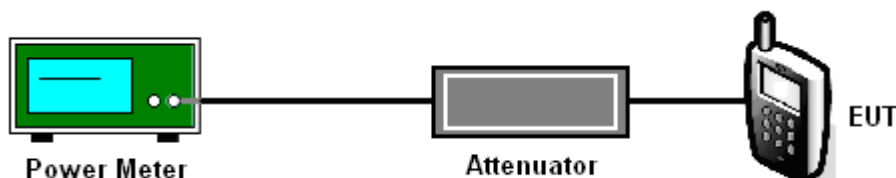
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the power meter by a low loss cable.
3. Measure the power by power meter.

3.2.4 Test Setup



3.2.5 Test Result of Output Power

Test Mode :	Mode 1, 2, 3	Temperature :	23~25℃
Test Engineer :	Andy Yeh	Relative Humidity :	43~46%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	17.96	30	Pass
06	2437	17.81	30	Pass
11	2462	17.46	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	23~25℃
Test Engineer :	Andy Yeh	Relative Humidity :	43~46%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	23.16	30	Pass
06	2437	23.05	30	Pass
11	2462	23.62	30	Pass

3.3 Band Edges Measurement

3.3.1 Limit of Band Edges

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB.

3.3.2 Measuring Instruments

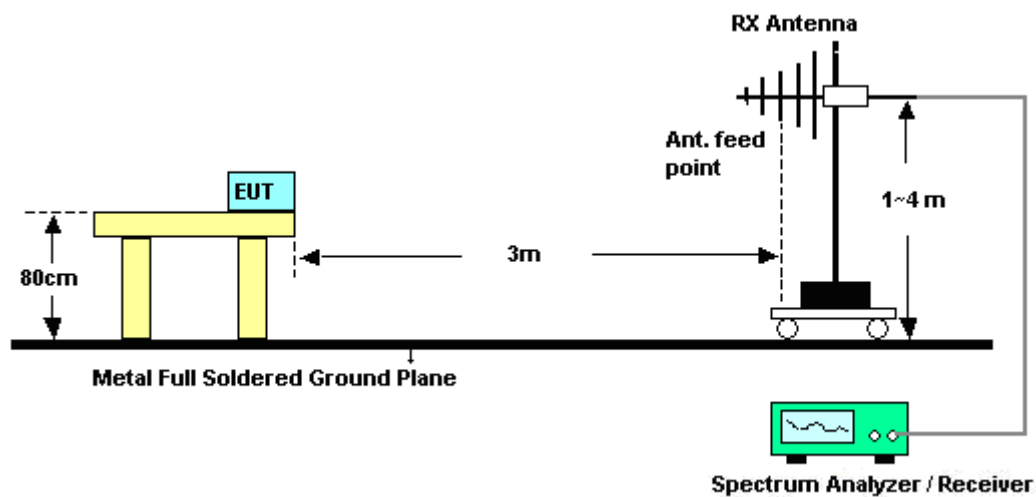
See list of measuring instruments of this test report.

3.3.3 Test Procedures

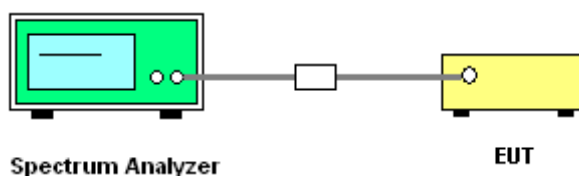
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) $\geq$ RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. Note: If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.
3. Radiated emission test: Apply to band edge emissions that fall in the restricted bands listed in FCC Section 15.205. The maximum permitted average field strength is listed in FCC Section 15.209. A pre-amp is necessary for this measurement. For measurements above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep=Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation as in FCC Section 15.35(b) and (c).

3.3.4 Test Setup

<Radiated Band Edges>



<Conducted Band Edges>



3.3.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	23~24℃
Test Band :	802.11b	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Kay Wu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2386.38	54.39	-19.61	74.00	50.95	32.13	5.46	34.15	100	116	Peak
2386.38	43.40	-10.60	54.00	39.96	32.13	5.46	34.15	100	116	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2387.14	54.46	-19.54	74.00	51.02	32.13	5.46	34.15	100	308	Peak
2387.14	45.67	-8.33	54.00	42.23	32.13	5.46	34.15	100	308	Average

Test Mode :	Mode 3	Temperature :	23~24℃
Test Band :	802.11b	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Kay Wu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2491.26	55.71	-18.29	74.00	52.23	32.30	5.37	34.19	105	20	Peak
2491.26	43.80	-10.20	54.00	40.32	32.30	5.37	34.19	105	20	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.94	51.81	-22.19	74.00	48.34	32.27	5.38	34.19	100	307	Peak
2485.94	39.61	-14.39	54.00	36.14	32.27	5.38	34.19	100	307	Average



Test Mode :	Mode 4	Temperature :	23~24℃
Test Band :	802.11g	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Kay Wu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.99	68.84	-5.16	74.00	65.41	32.13	5.46	34.16	100	116	Peak
2389.99	39.09	-14.91	54.00	35.66	32.13	5.46	34.16	100	116	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.61	69.29	-4.71	74.00	65.85	32.13	5.46	34.15	100	309	Peak
2389.61	50.77	-3.23	54.00	47.33	32.13	5.46	34.15	100	309	Average

Test Mode :	Mode 6	Temperature :	23~24℃
Test Band :	802.11g	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Kay Wu

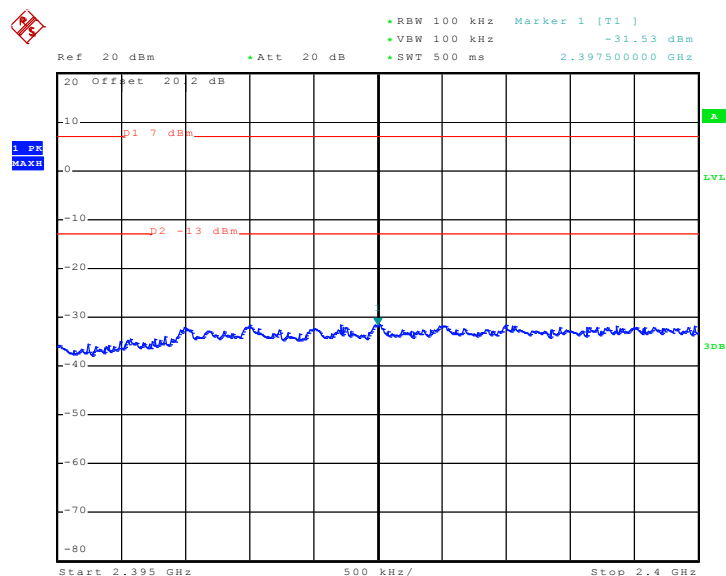
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.50	68.92	-5.08	74.00	65.45	32.27	5.38	34.19	104	21	Peak
2483.50	50.88	-3.12	54.00	47.41	32.27	5.38	34.19	104	21	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.50	66.95	-7.05	74.00	63.48	32.27	5.38	34.19	100	315	Peak
2483.50	49.84	-4.16	54.00	46.37	32.27	5.38	34.19	100	315	Average

3.3.6 Test Plots of Conducted Band Edges

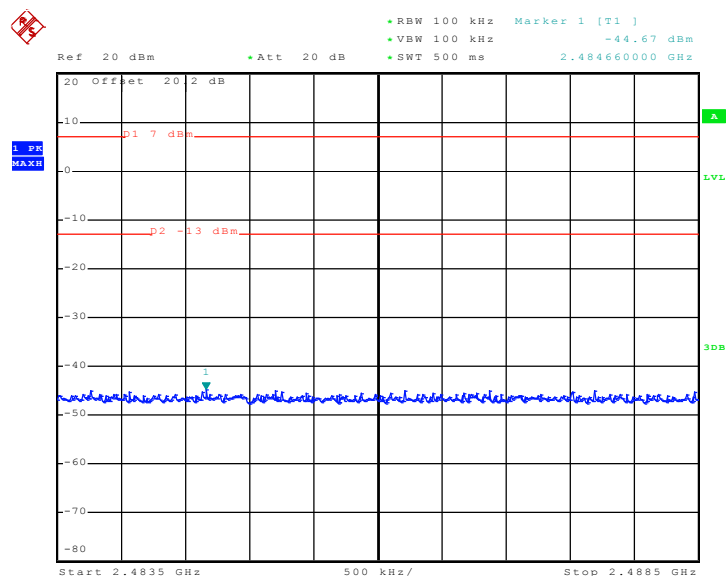
Test Mode :	Mode 1 and 3	Temperature :	23~25°C
Test Band :	802.11b	Relative Humidity :	43~46%
Test Channel :	01 and 11	Test Engineer :	Andy Yeh

Low Band Edge Plot on 802.11b Channel 01



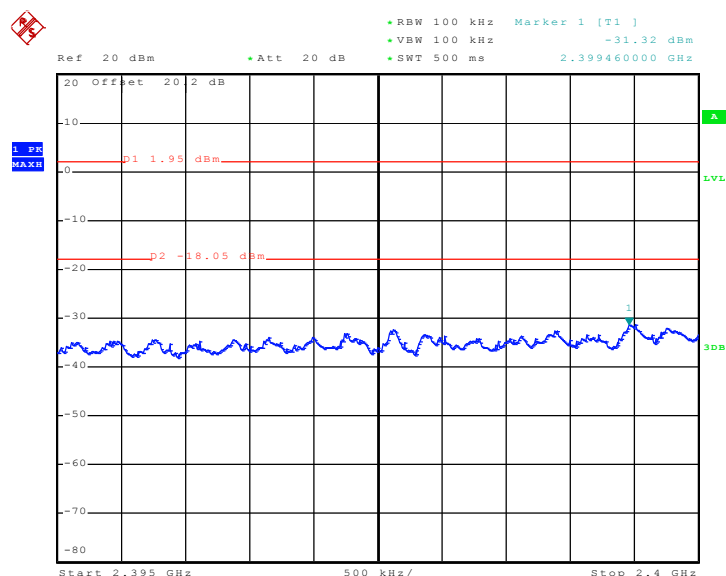
Date: 24.FEB.2010 09:23:56

High Band Edge Plot on 802.11b Channel 11

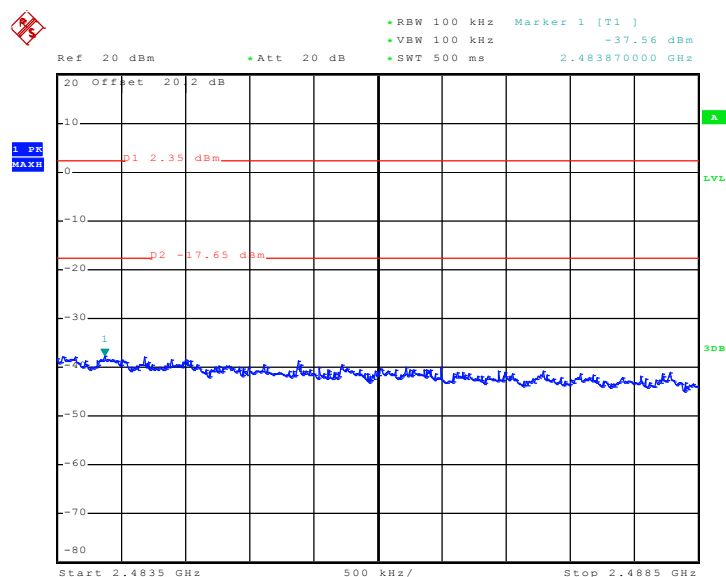


Date: 12.FEB.2010 20:03:34

Test Mode :	Mode 4 and 6	Temperature :	23~25°C
Test Band :	802.11g	Relative Humidity :	43~46%
Test Channel :	01 and 11	Test Engineer :	Andy Yeh

Low Band Edge Plot on 802.11g Channel 01


Date: 12.FEB.2010 20:18:13

High Band Edge Plot on 802.11g Channel 11


Date: 12.FEB.2010 20:09:27

3.4 Spurious Emission Measurement

3.4.1 Limit of Spurious Emission Measurement

All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band.

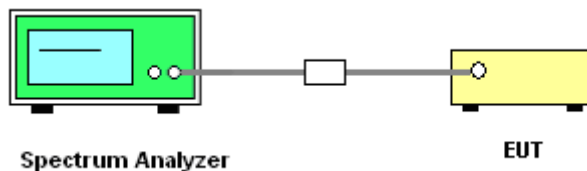
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedure

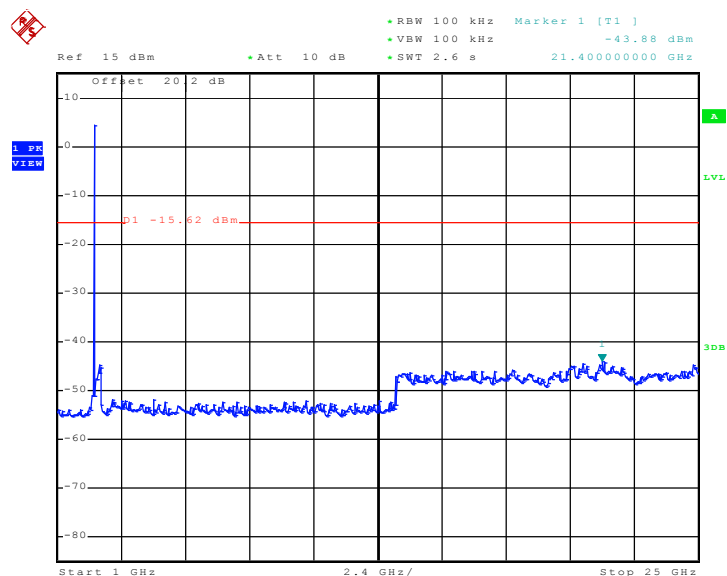
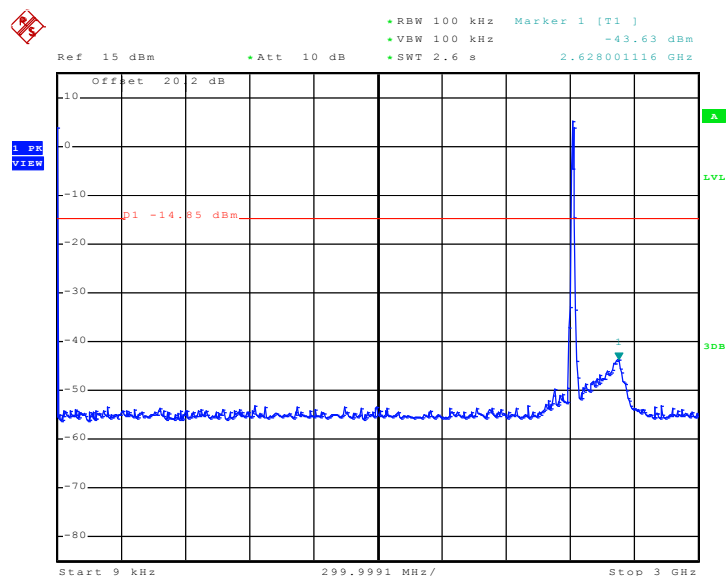
1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set RBW = 100 kHz, Video bandwidth (VBW) $\geq$ RBW, scan up through 10th harmonic. All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100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

3.4.4 Test Setup





Test Mode :	Mode 1	Temperature :	23~25℃
Test Band :	802.11b	Relative Humidity :	43~46%
Test Channel :	01	Test Engineer :	Andy Yeh



Date: 24.FEB.2010 09:06:15



Test Mode :	Mode 2	Temperature :	23~25℃
Test Band :	802.11b	Relative Humidity :	43~46%
Test Channel :	06	Test Engineer :	Andy Yeh

[illegible]

Date: 24.FEB.2010 09:10:58

Ref 15 dBm Att 10 dB RBW 100 kHz VBW 100 kHz SWT 2.6 s Marker 1 [T1] -43.18 dBm 17.992000000 GHz

Offset 20.2 dB

1.78 V1.78

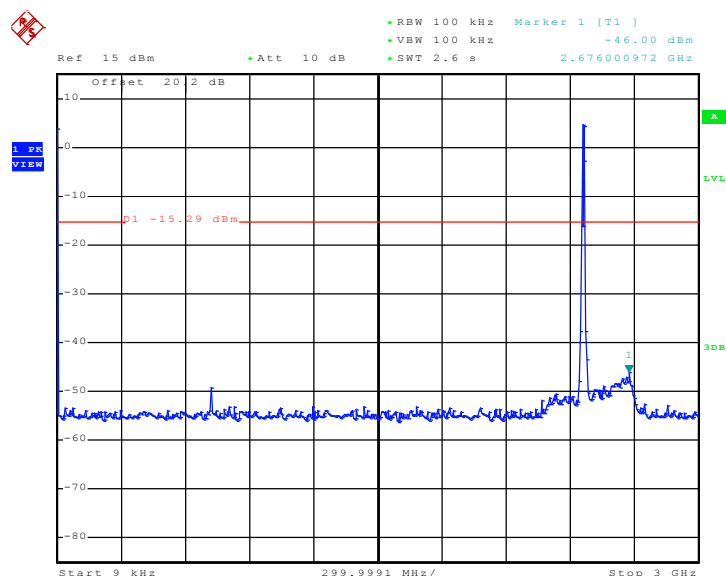
p1 -13.46 dBm

Start 1 GHz Stop 2.5 GHz

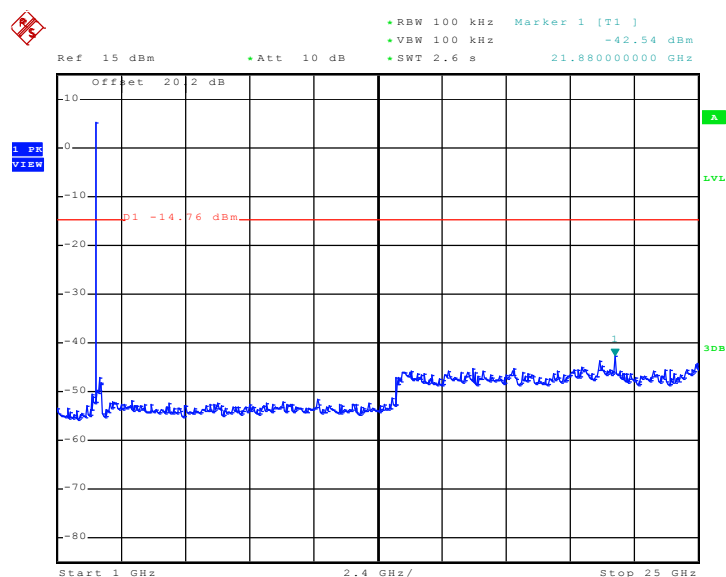
Date: 24.FEB.2010 09:11:50



Test Mode :	Mode 3	Temperature :	23~25°C
Test Band :	802.11b	Relative Humidity :	43~46%
Test Channel :	11	Test Engineer :	Andy Yeh

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz

Date: 24.FEB.2010 09:12:48

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

Date: 24.FEB.2010 09:13:06



Test Mode :	Mode 4	Temperature :	23~25℃
Test Band :	802.11g	Relative Humidity :	43~46%
Test Channel :	01	Test Engineer :	Andy Yeh

• RBW 100 kHz Marker 1 [T1] -44.14 dBm
 • VBW 100 kHz
 • SWT 2.6 s 2.634001098 GHz

Ref 15 dBm • Att 10 dB

Offset 20 dB

P1 -19.05 dBm

1.78
 V1.15

A
 LVL
 3dB

Start 9 kHz 299.9991 MHz/ Stop 3 GHz

Date: 24.FEB.2010 09:13:58

Ref 15 dBm Att 10 dB RBW 100 kHz Marker 1 [T1] -43.55 dBm
 VBW 100 kHz
 SWT 2.6 s 21.30400000 GHz

Offset 20 dB

1.78
 View

D1 -19.53 dBm

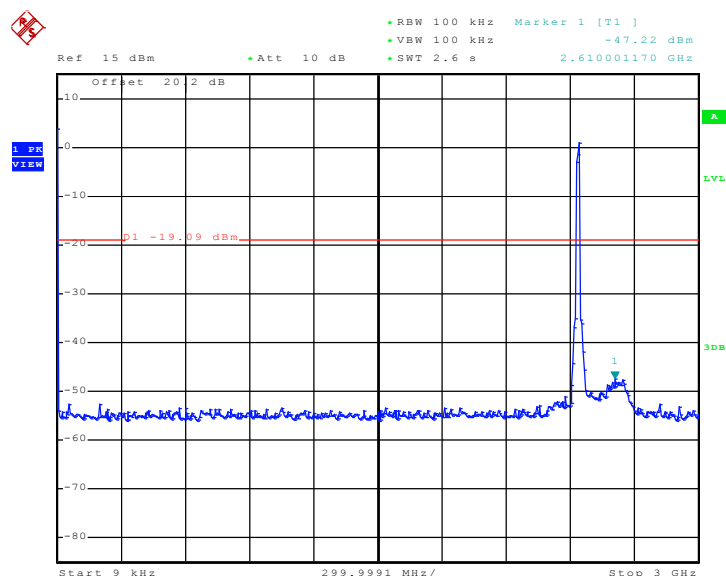
A
 LVL

Start 1 GHz 2.4 GHz/ Stop 2.5 GHz

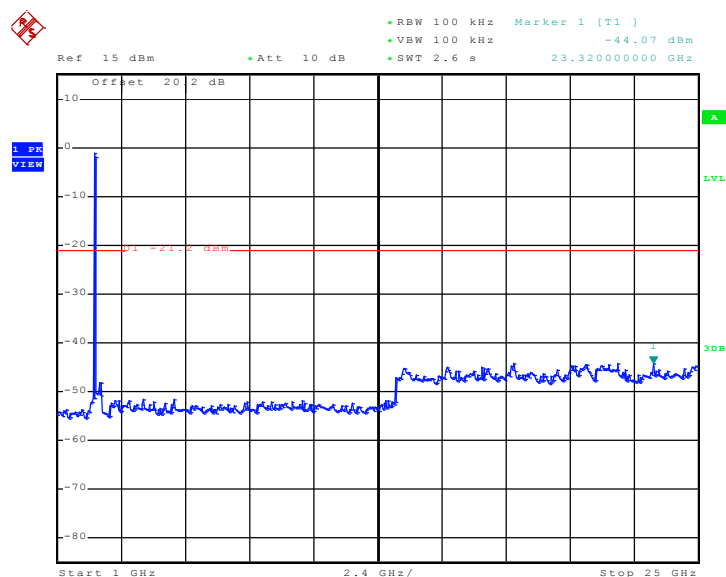
Date: 24.FEB.2010 09:14:15



Test Mode :	Mode 5	Temperature :	23~25°C
Test Band :	802.11g	Relative Humidity :	43~46%
Test Channel :	06	Test Engineer :	Andy Yeh

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz

Date: 24.FEB.2010 09:15:01

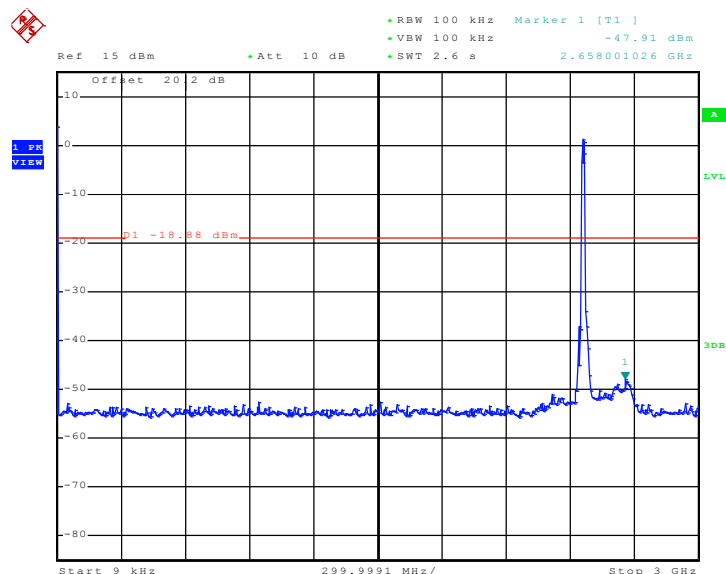
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

Date: 24.FEB.2010 09:15:26



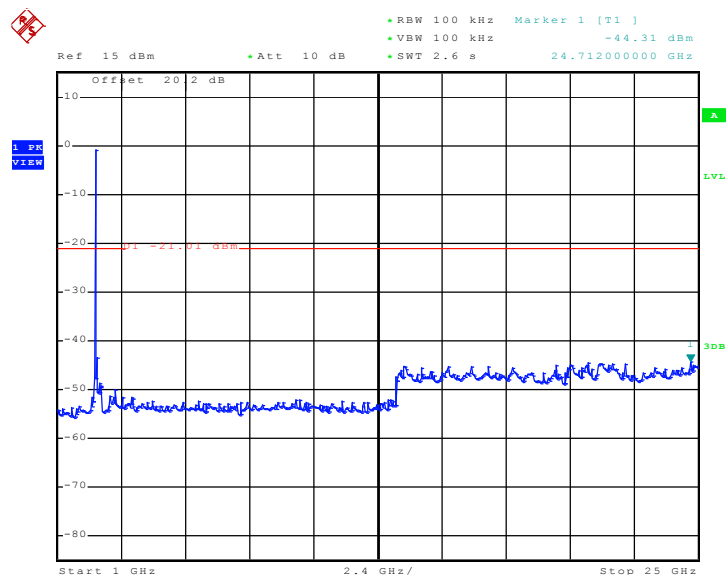
Test Mode :	Mode 6	Temperature :	23~25°C
Test Band :	802.11g	Relative Humidity :	43~46%
Test Channel :	11	Test Engineer :	Andy Yeh

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 24.FEB.2010 09:16:09

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz



Date: 24.FEB.2010 09:16:25

3.5 Power Spectral Density Measurement

3.5.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

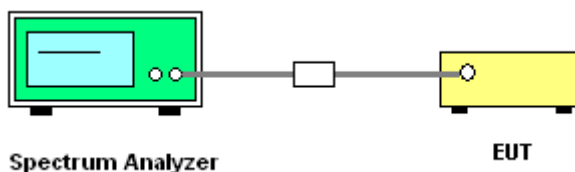
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The test follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Take the measured data from spectrum analyzer.

3.5.4 Test Setup

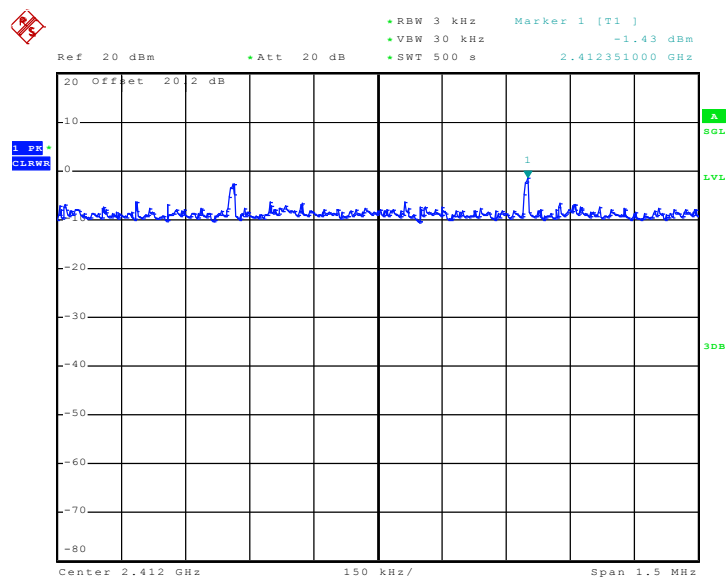


3.5.5 Test Result of Power Spectral Density

Test Mode :	Mode 1, 2, 3	Temperature :	23~25℃
Test Engineer :	Andy Yeh	Relative Humidity :	43~46%

Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-1.43	8	Pass
06	2437	-1.34	8	Pass
11	2462	-1.04	8	Pass

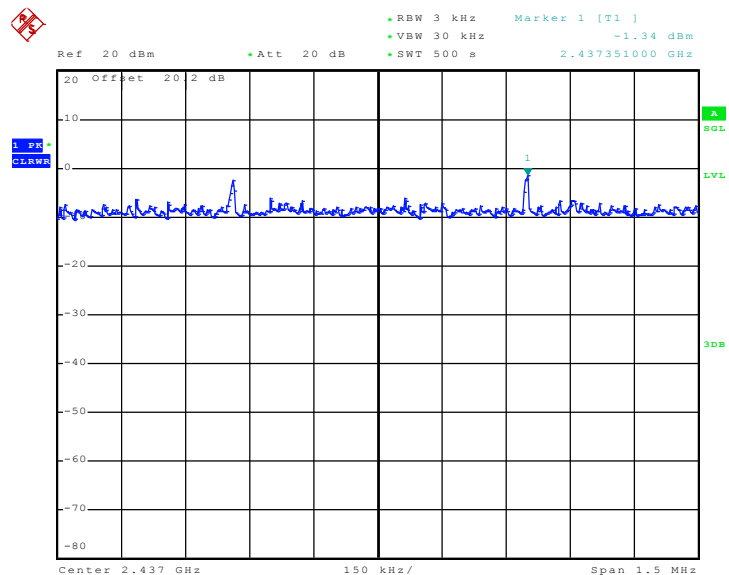
Mode 1 : PSD Plot on 802.11b Channel 01



Date: 12.FEB.2010 20:46:12

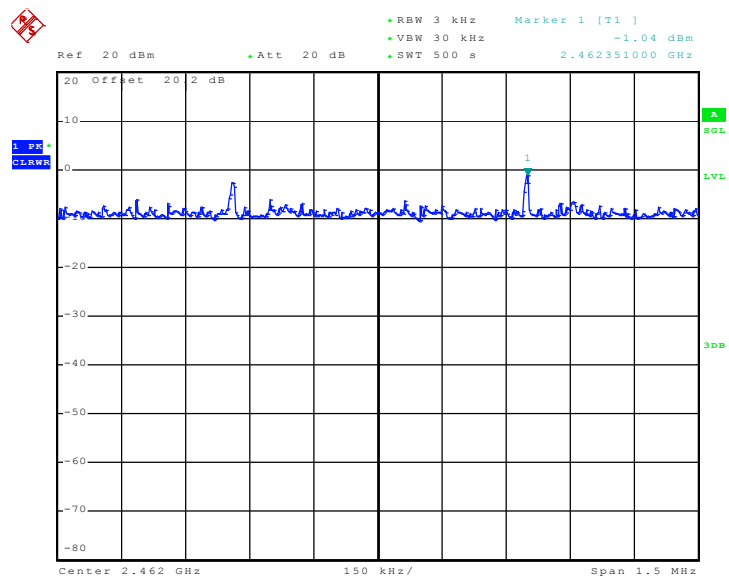


Mode 2 : PSD Plot on 802.11b Channel 06



Date: 12.FEB.2010 21:09:08

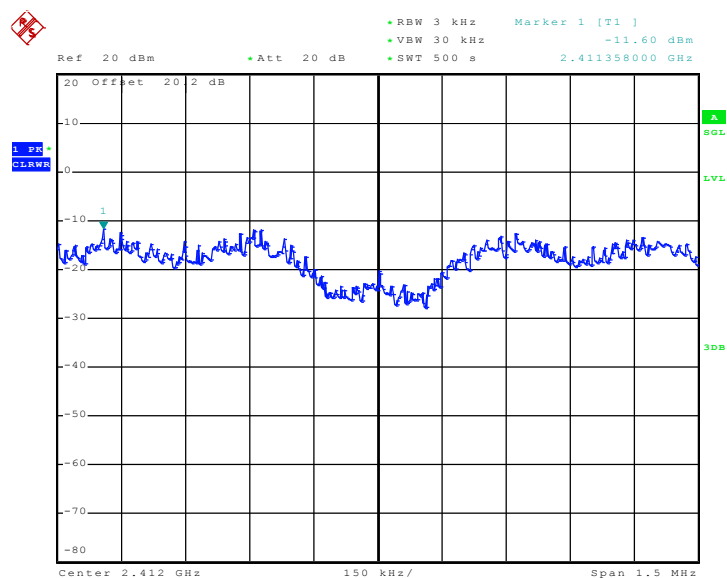
Mode 3 : PSD Plot on 802.11b Channel 11



Date: 12.FEB.2010 21:35:57

Test Mode :	Mode 4, 5, 6	Temperature :	23~25℃
Test Engineer :	Andy Yeh	Relative Humidity :	43~46%

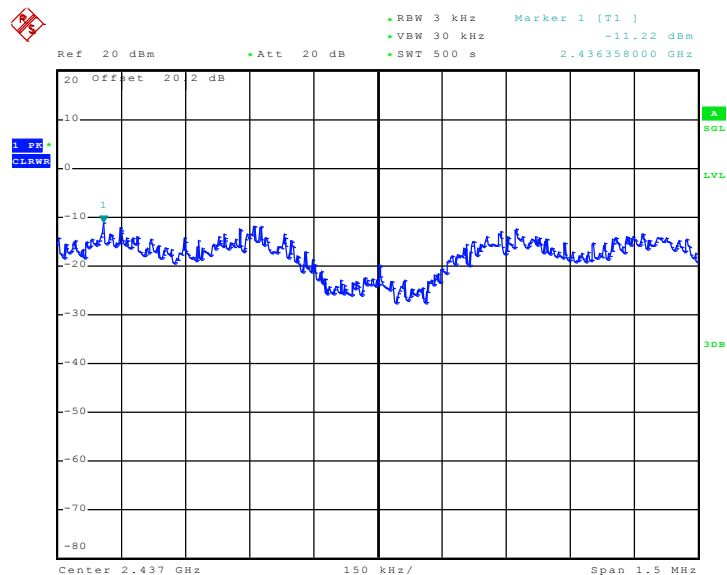
Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-11.60	8	Pass
06	2437	-11.22	8	Pass
11	2462	-11.24	8	Pass

Mode 4 : PSD Plot on 802.11g Channel 01


Date: 12.FEB.2010 20:56:57

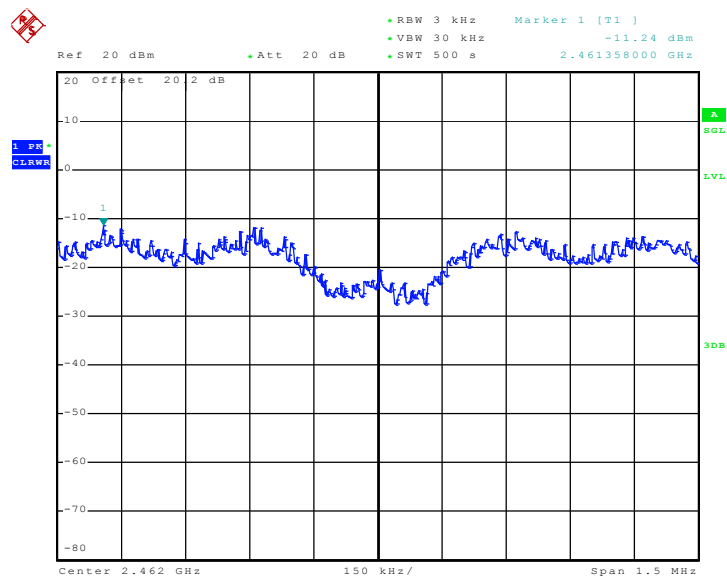


Mode 5 : PSD Plot on 802.11g Channel 06



Date: 12.FEB.2010 21:21:16

Mode 6 : PSD Plot on 802.11g Channel 11



Date: 12.FEB.2010 21:46:48

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.

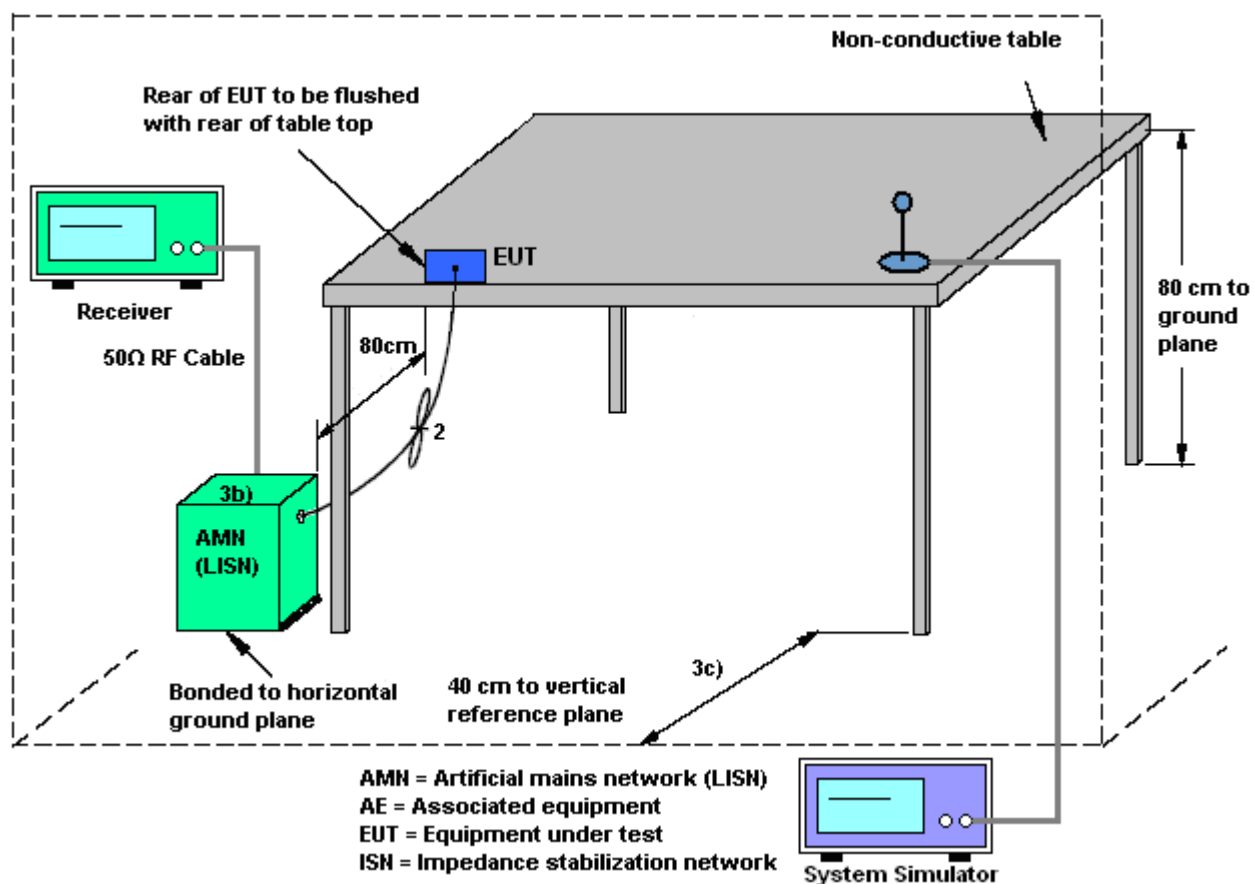
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

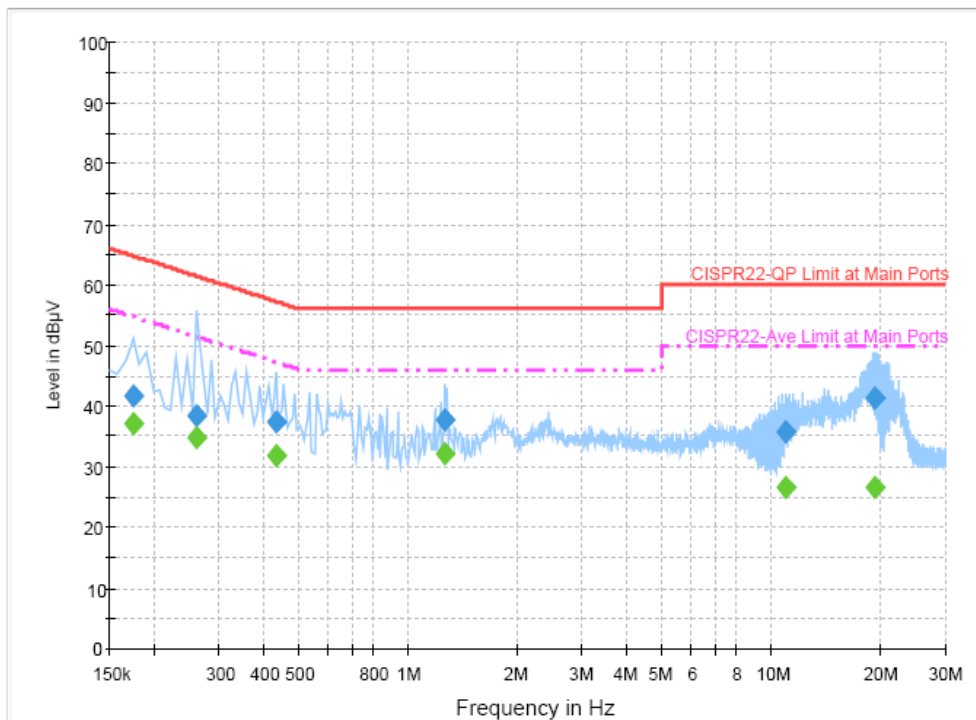
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (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 :	19~20°C
Test Engineer :	Hayden Wu	Relative Humidity :	39~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + GPS Rx + Adapter + Earphone for Sample A		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



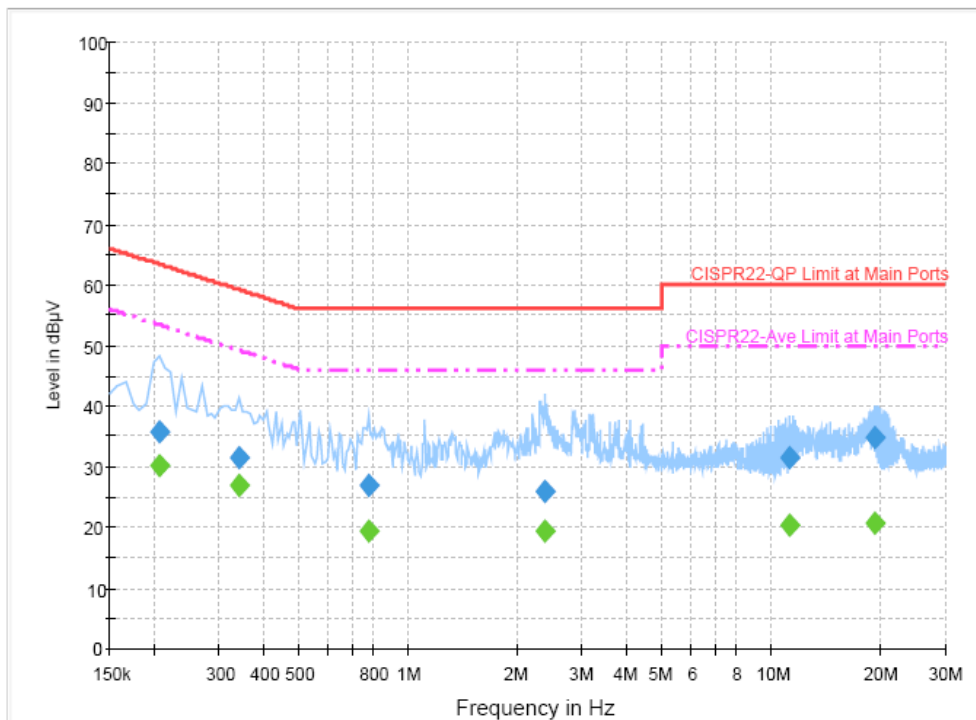
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.174000	41.6	Off	L1	19.5	23.2	64.8
0.262000	38.5	Off	L1	19.4	22.9	61.4
0.430000	37.4	Off	L1	19.4	19.9	57.3
1.262000	37.7	Off	L1	19.5	18.3	56.0
10.878000	35.8	Off	L1	19.6	24.2	60.0
19.198000	41.5	Off	L1	19.7	18.5	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.174000	37.1	Off	L1	19.5	17.7	54.8
0.262000	34.8	Off	L1	19.4	16.6	51.4
0.430000	31.9	Off	L1	19.4	15.6	47.3
1.262000	32.0	Off	L1	19.5	14.0	46.0
10.878000	26.6	Off	L1	19.6	23.4	50.0
19.198000	26.6	Off	L1	19.7	23.4	50.0

Test Mode :	Mode 1	Temperature :	19~20°C
Test Engineer :	Hayden Wu	Relative Humidity :	39~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + GPS Rx + Adapter + Earphone for Sample A		
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)
0.206000	35.8	Off	N	19.5	27.6	63.4
0.342000	31.5	Off	N	19.4	27.7	59.2
0.774000	26.8	Off	N	19.4	29.2	56.0
2.366000	26.0	Off	N	19.5	30.0	56.0
11.158000	31.6	Off	N	19.6	28.4	60.0
19.238000	34.7	Off	N	19.8	25.3	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.206000	30.0	Off	N	19.5	23.4	53.4
0.342000	27.0	Off	N	19.4	22.2	49.2
0.774000	19.4	Off	N	19.4	26.6	46.0
2.366000	19.4	Off	N	19.5	26.6	46.0
11.158000	20.3	Off	N	19.6	29.7	50.0
19.238000	20.5	Off	N	19.8	29.5	50.0

3.7 Radiated Emission Measurement

3.7.1 Limit of Radiated Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

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

3.7.2 Measuring Instruments

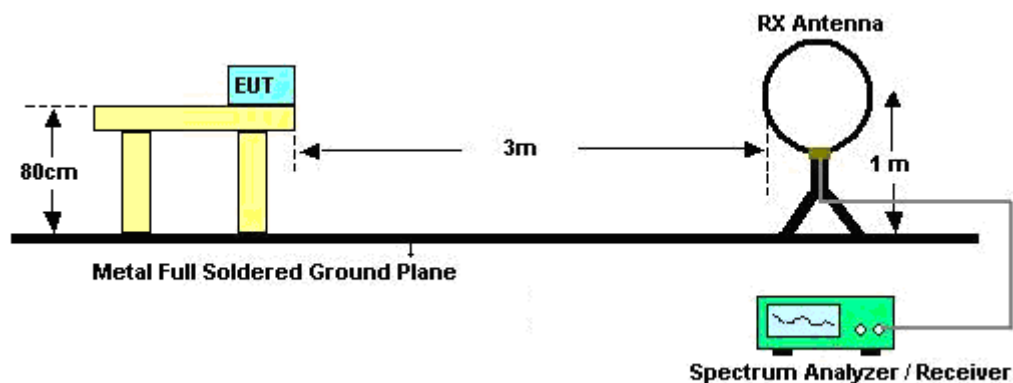
See list of measuring instruments of this test report.

3.7.3 Test Procedures

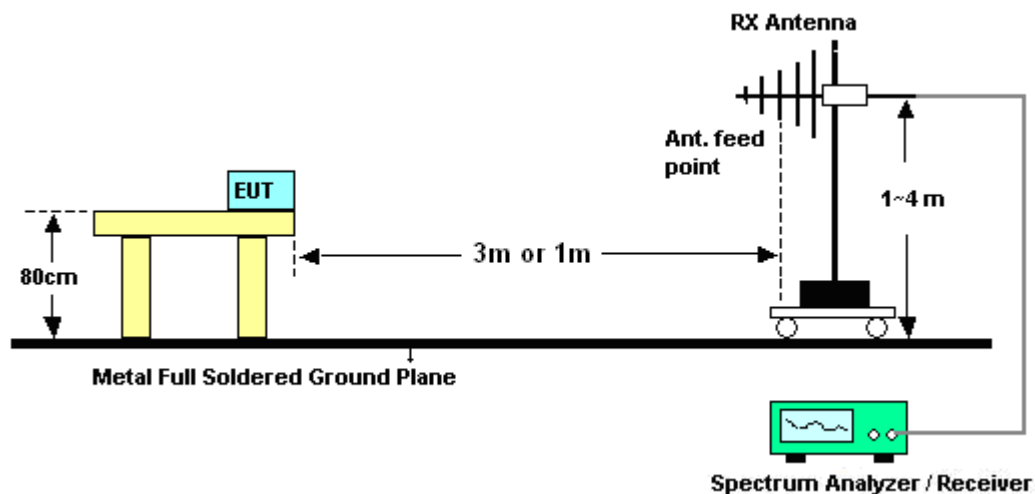
- The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
- Use the following spectrum analyzer settings:
 - Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
 - Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.
Distance extrapolation factor = $20 \log (\text{specific distance [3m]} / \text{test distance [1m]})$ (dB)
- Follow the guidelines in ANSI C63.4-2003 with respect to maximizing the emission by rotating the EUT, measuring the emission for three EUT orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for this test in order to get the good signal level.

3.7.4 Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz



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

Test Engineer :	Kay Wu	Temperature :	23~24℃	
		Relative Humidity :	42~43%	

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

Note:

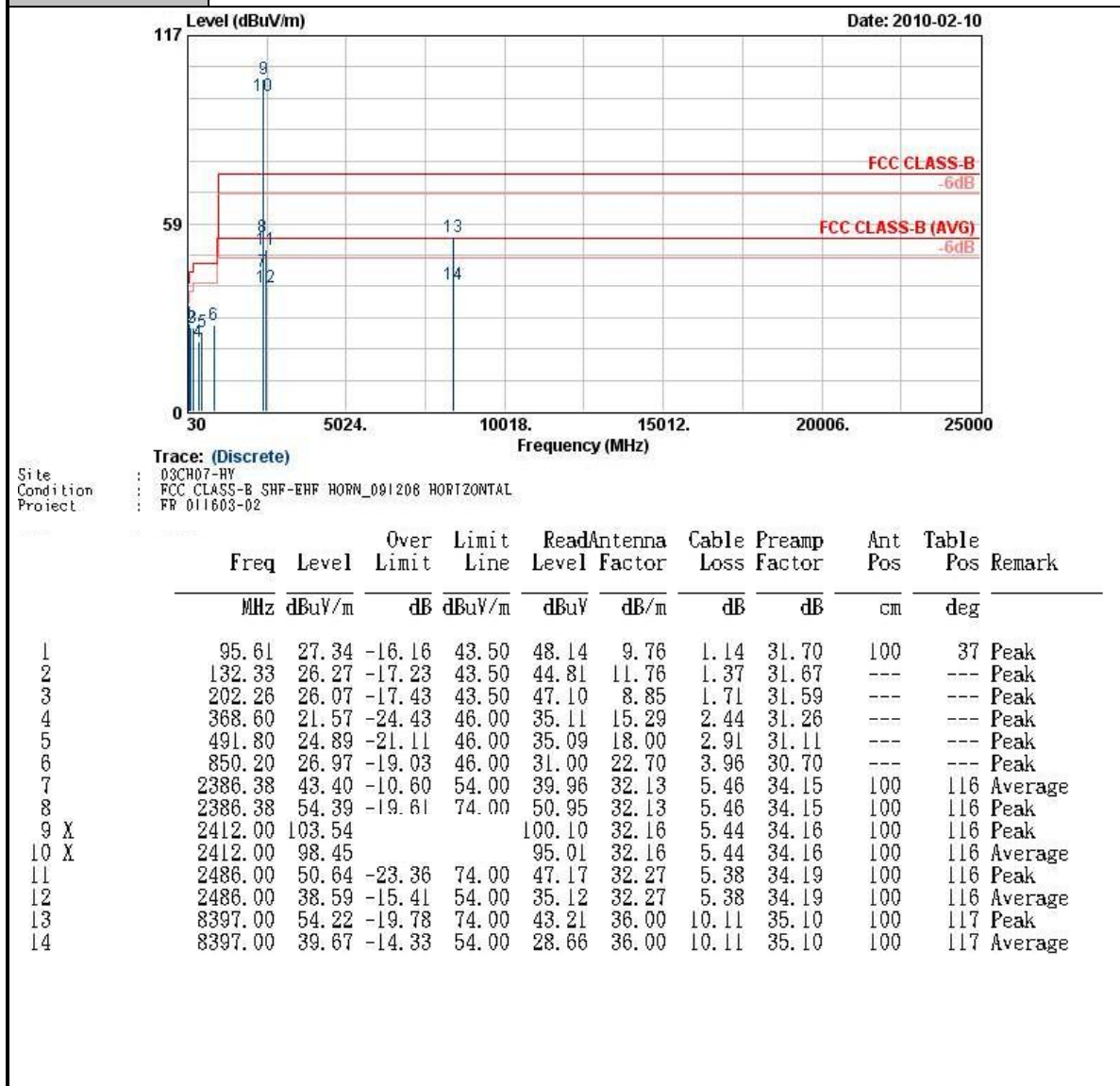
The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

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

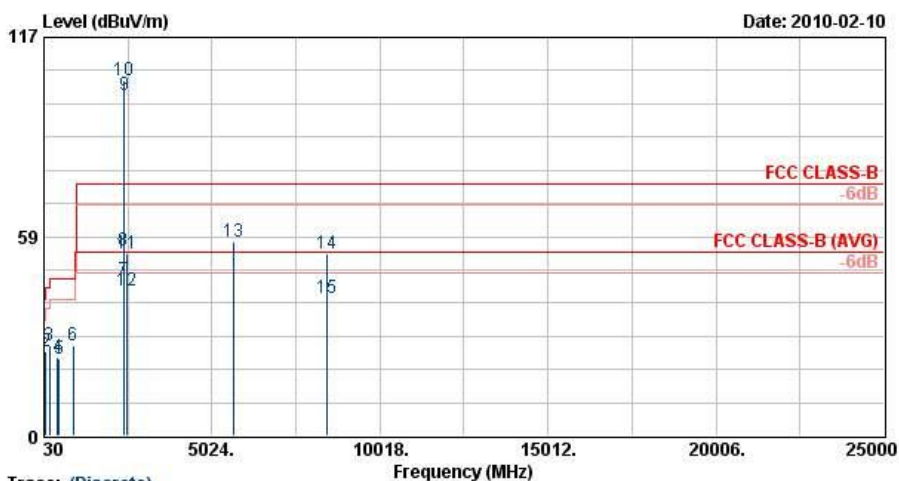
3.7.6 Test Result of Radiated Emission (30 MHz ~ 10th Harmonic)

Test Mode :	Mode 1	Temperature :	23~24℃
Test Channel :	01 for Sample A	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		





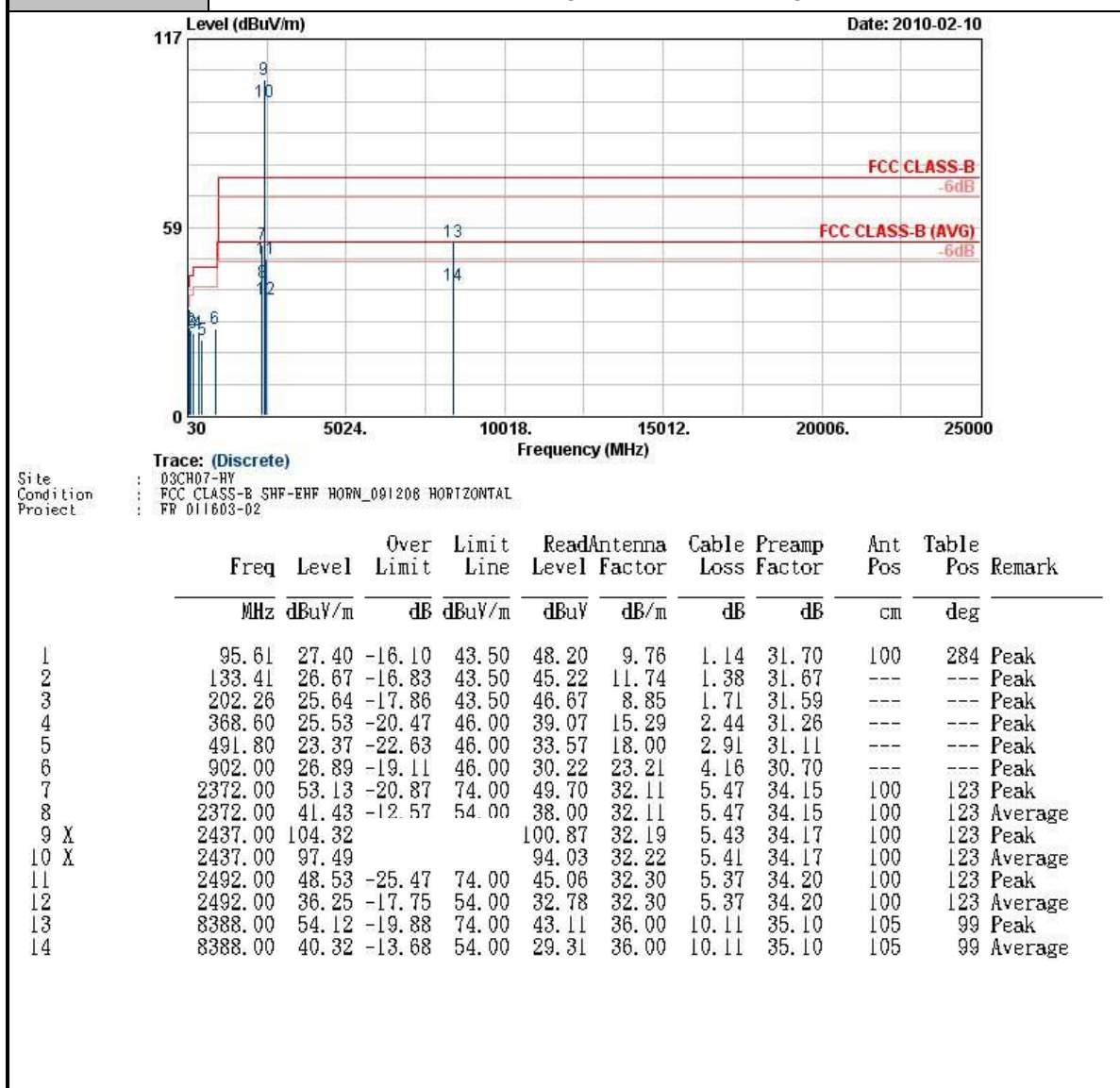
Test Mode :	Mode 1	Temperature :	23~24°C
Test Channel :	01 for Sample A	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		



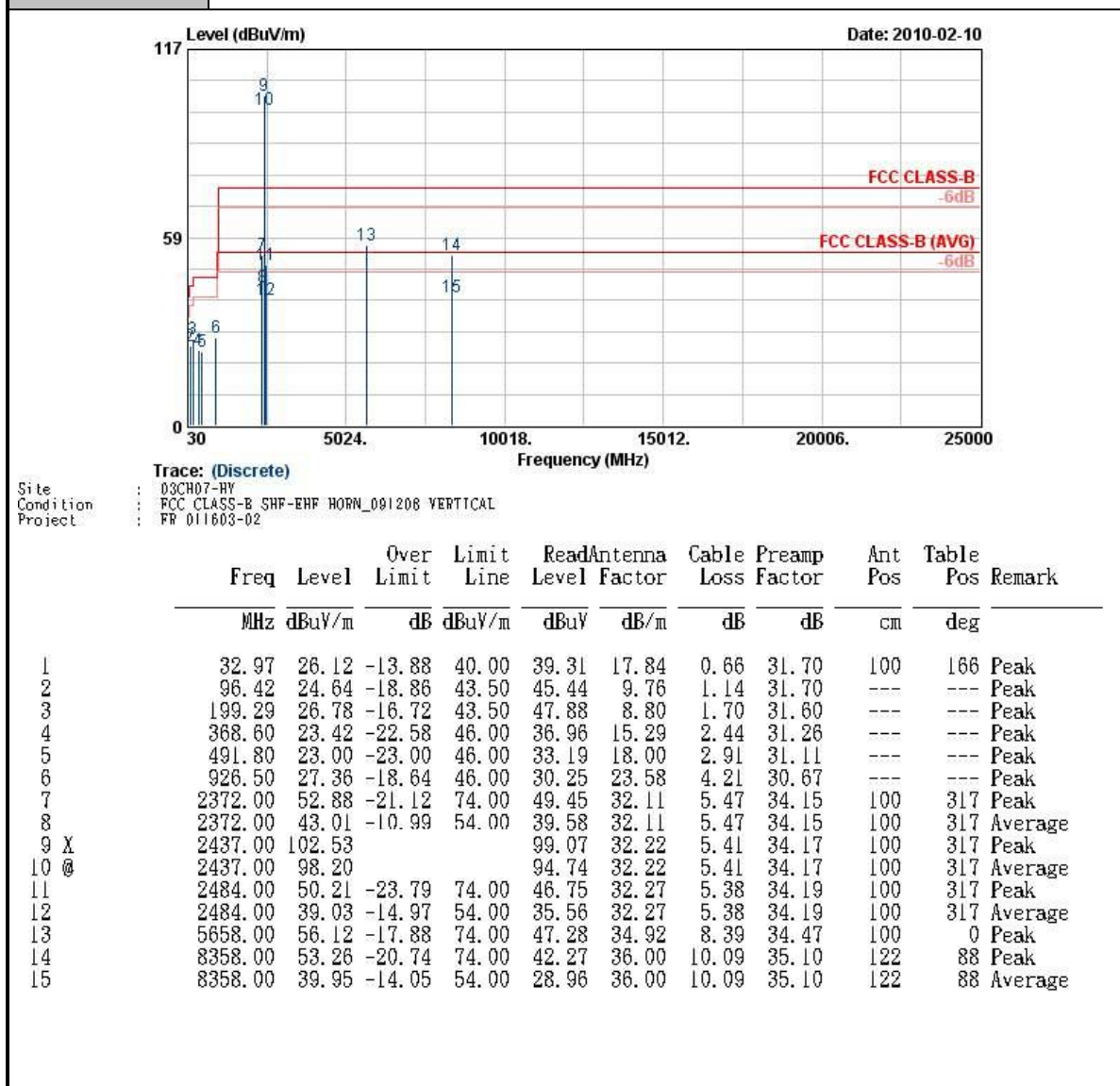
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	38.37	27.14	-12.86	40.00	43.53	14.59	0.72	31.70	100	284 Peak
2	95.61	24.91	-18.59	43.50	45.71	9.76	1.14	31.70	---	---
3	202.26	26.69	-16.81	43.50	47.72	8.85	1.71	31.59	---	---
4	441.40	23.23	-22.77	46.00	34.66	16.97	2.77	31.16	---	---
5	491.80	22.74	-23.26	46.00	32.94	18.00	2.91	31.11	---	---
6	902.00	26.74	-19.26	46.00	30.07	23.21	4.16	30.70	---	---
7	2387.14	45.67	-8.33	54.00	42.23	32.13	5.46	34.15	100	308 Average
8	2387.14	54.46	-19.54	74.00	51.02	32.13	5.46	34.15	100	308 Peak
9 @	2412.00	99.91			96.47	32.16	5.44	34.16	100	308 Average
10 X	2412.00	104.25			100.80	32.16	5.44	34.16	100	308 Peak
11	2494.00	53.44	-20.56	74.00	49.97	32.30	5.37	34.20	100	308 Peak
12	2494.00	42.66	-11.34	54.00	39.19	32.30	5.37	34.20	100	308 Average
13	5649.00	56.97	-17.03	74.00	48.15	34.89	8.38	34.46	100	0 Peak
14	8421.00	53.38	-20.62	74.00	42.34	36.00	10.13	35.10	152	33 Peak
15	8421.00	40.55	-13.45	54.00	29.52	36.00	10.13	35.10	152	33 Average



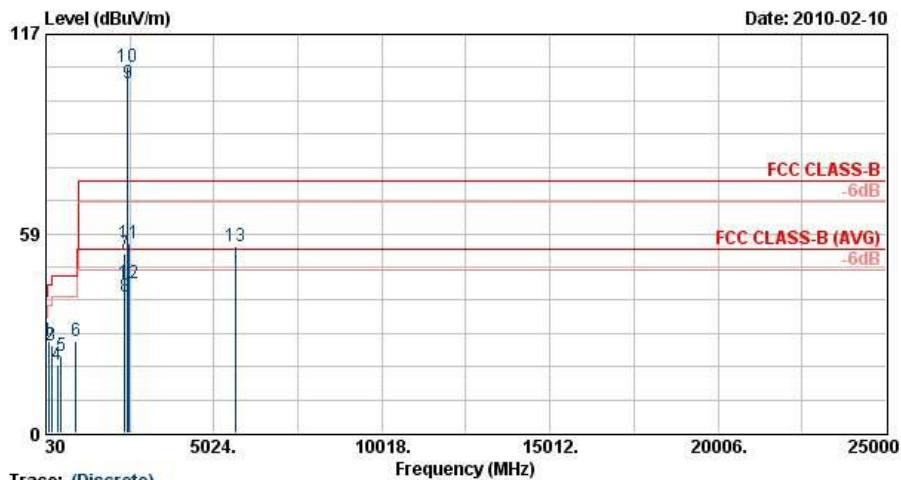
Test Mode :	Mode 2	Temperature :	23~24°C
Test Channel :	06 for Sample A	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		



Test Mode :	Mode 2	Temperature :	23~24°C
Test Channel :	06 for Sample A	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		



Test Mode :	Mode 3	Temperature :	23~24°C
Test Channel :	11 for Sample A	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		



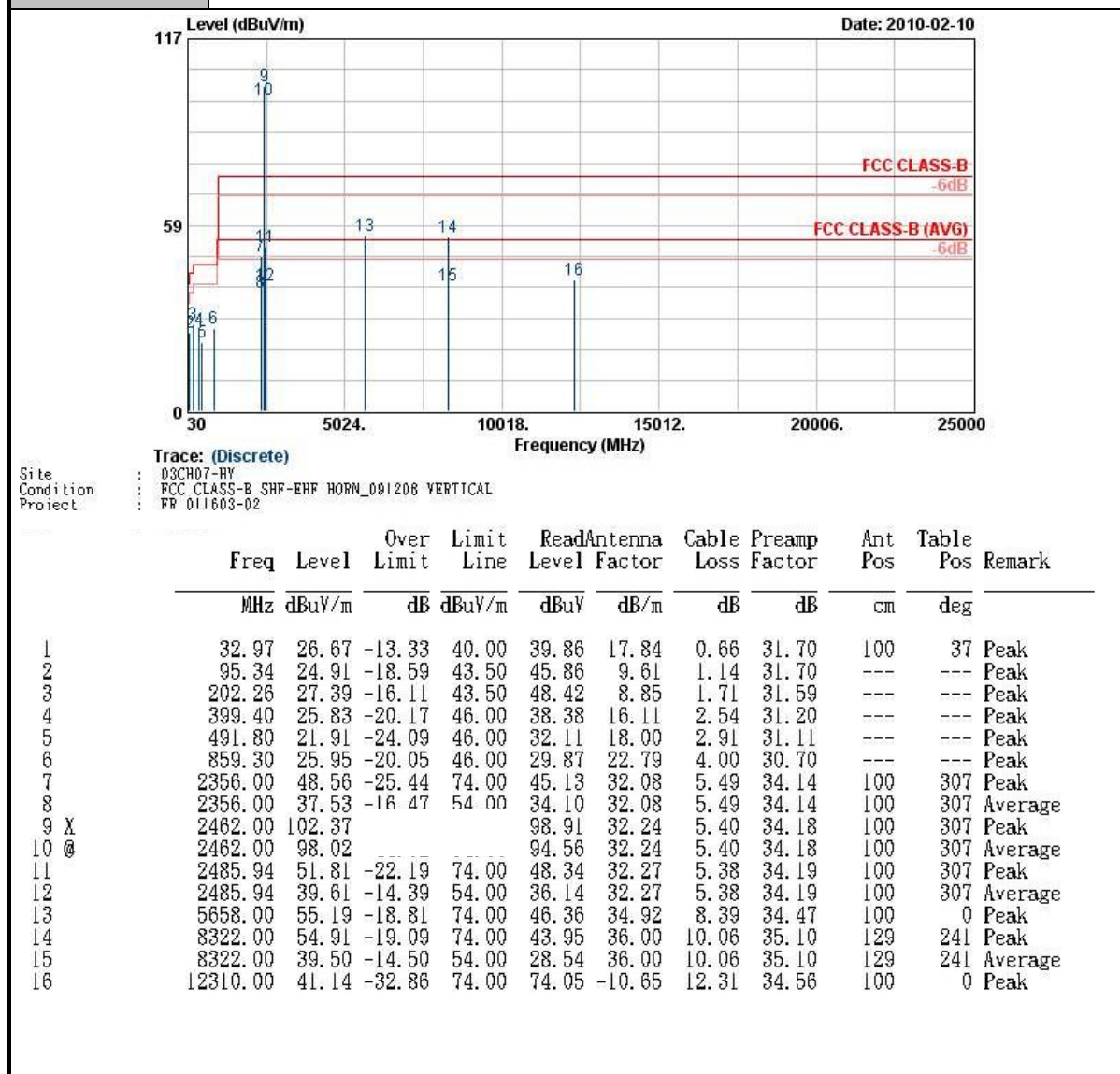
Trace: (Discrete)

Site : 03CH07-HY
Condition : FCC CLASS-B SHF-EHF HORN_091208 HORIZONTAL
Project : FR 011603-02

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	96.69	26.87	-16.63	43.50	47.52	9.90	1.15	31.70	100	27 Peak
2	135.30	25.87	-17.63	43.50	44.42	11.73	1.39	31.66	---	---
3	202.26	25.71	-17.79	43.50	46.74	8.85	1.71	31.59	---	---
4	368.60	20.05	-25.95	46.00	33.59	15.29	2.44	31.26	---	---
5	491.80	22.55	-23.45	46.00	32.75	18.00	2.91	31.11	---	---
6	925.80	26.95	-19.05	46.00	29.84	23.58	4.21	30.67	---	---
7	2382.00	52.48	-21.52	74.00	49.05	32.11	5.47	34.15	105	20 Peak
8	2382.00	39.82	-14.18	54.00	36.39	32.11	5.47	34.15	105	20 Average
9 @	2462.00	102.62			99.16	32.24	5.40	34.18	105	20 Average
10 X	2462.00	107.57			104.11	32.24	5.40	34.18	105	20 Peak
11	2491.26	55.71	-18.29	74.00	52.23	32.30	5.37	34.19	105	20 Peak
12	2491.26	43.80	-10.20	54.00	40.32	32.30	5.37	34.19	105	20 Average
13	5649.00	55.01	-18.99	74.00	46.20	34.89	8.38	34.46	100	0 Peak

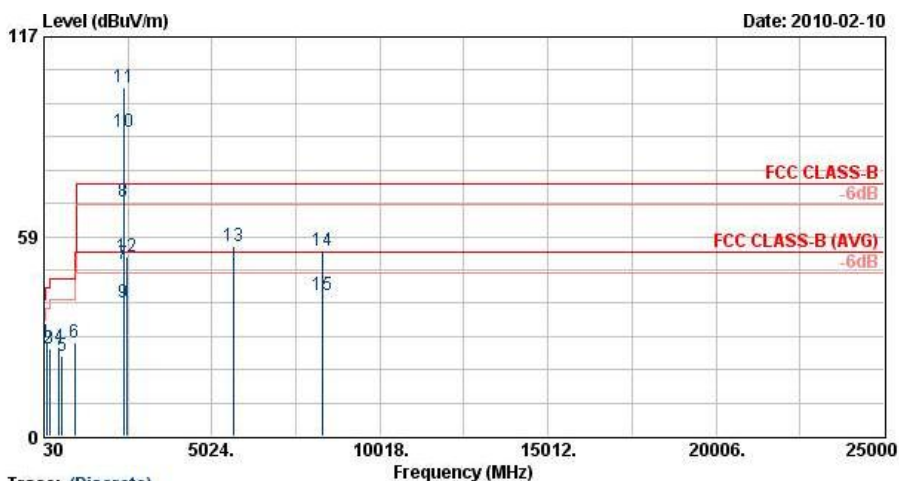


Test Mode :	Mode 3	Temperature :	23~24°C
Test Channel :	11 for Sample A	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		





Test Mode :	Mode 4	Temperature :	23~24°C
Test Channel :	01 for Sample A	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	#10 and #11 are Fundamental Signals which can be ignored.		

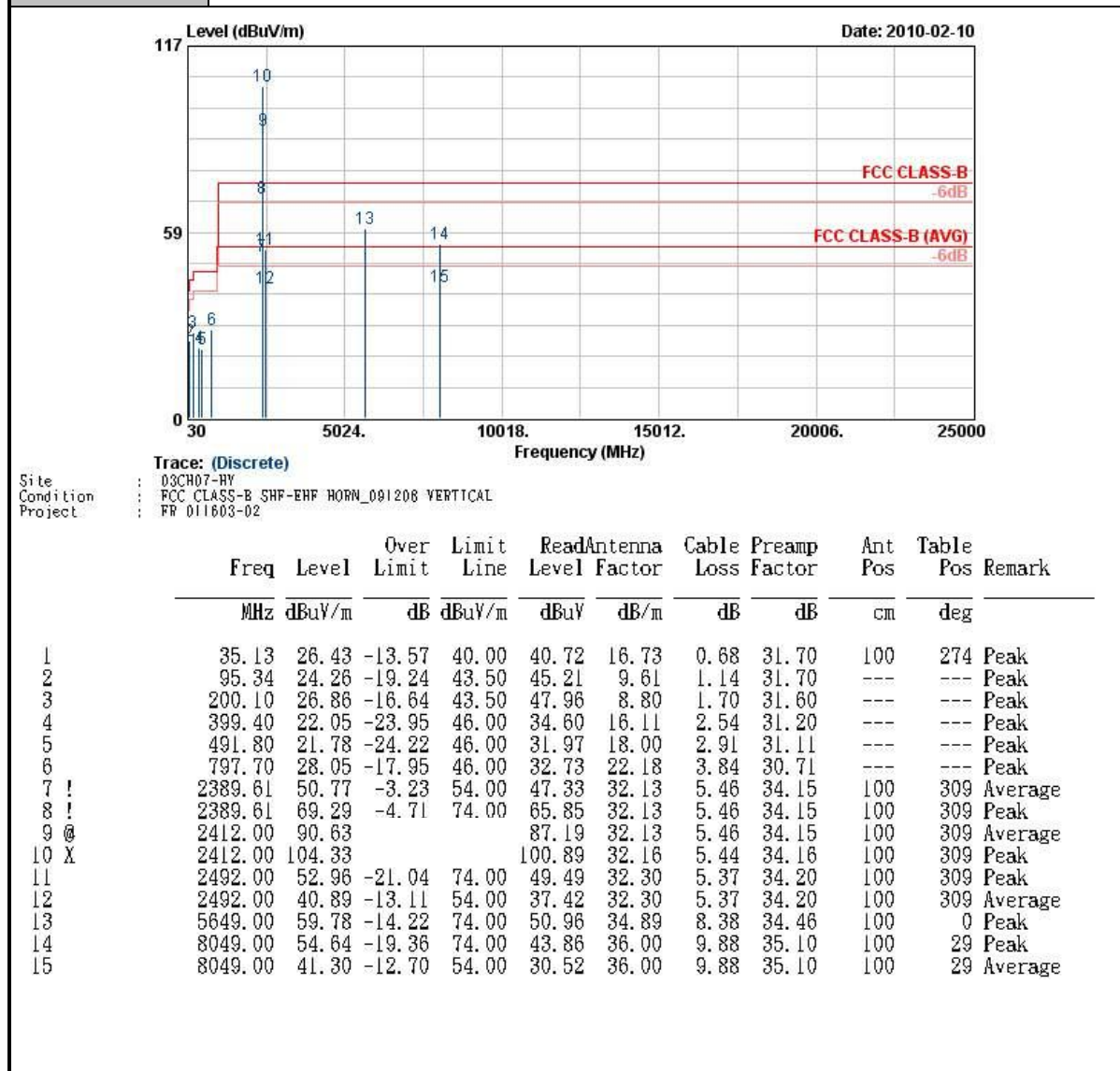


Trace: (Discrete)

Site : 03CH07-RV
Condition : FCC CLASS-B SHF-EHF HORN_001208 HORIZONTAL
Project : FR 011603-02

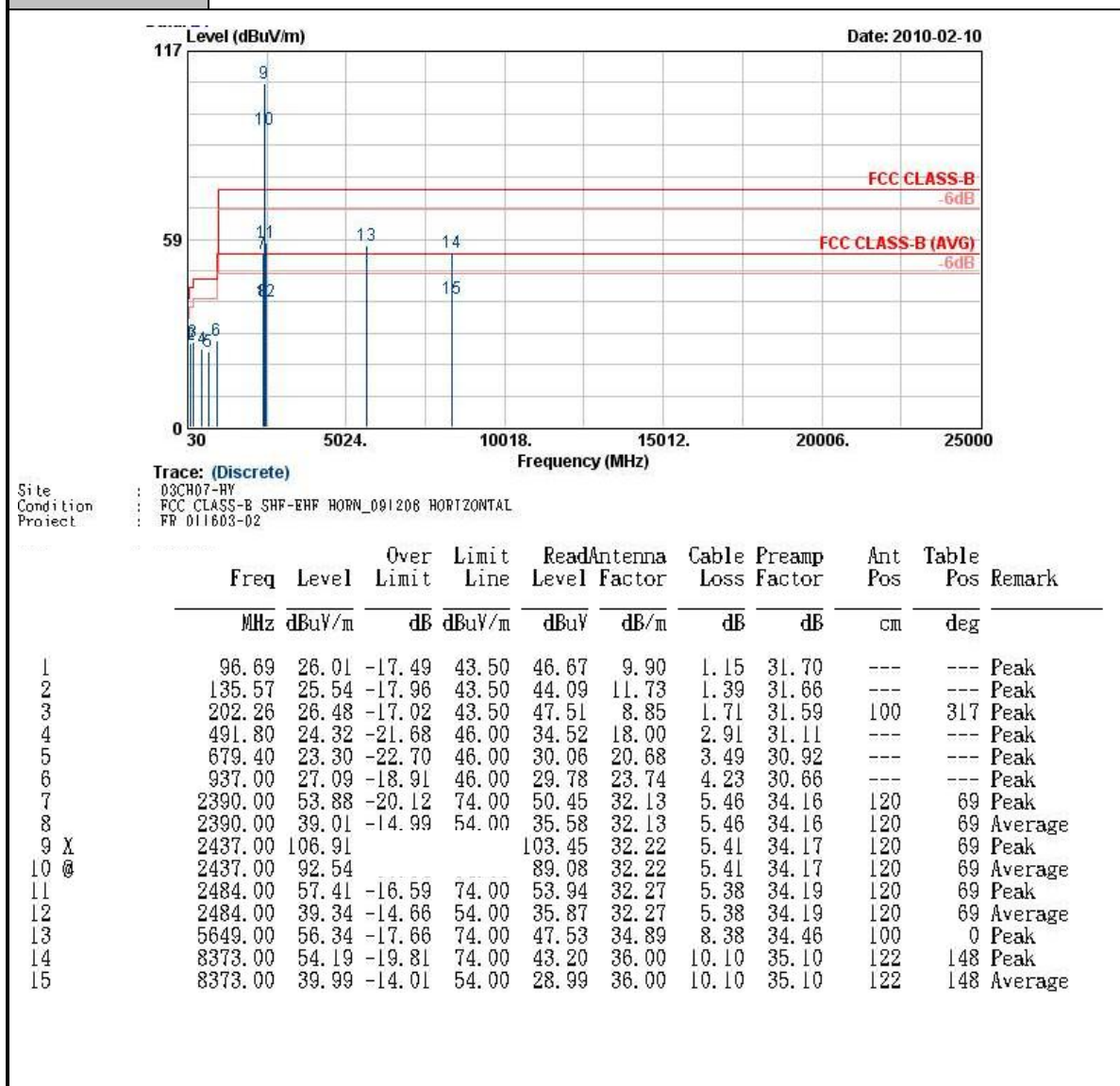
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	97.50	27.21	-16.29	43.50	47.71	10.05	1.15	31.70	100	164 Peak
2	134.49	25.77	-17.73	43.50	44.31	11.74	1.38	31.67	---	---
3	202.53	25.60	-17.90	43.50	46.63	8.85	1.71	31.59	---	---
4	491.80	26.08	-19.92	46.00	36.28	18.00	2.91	31.11	---	---
5	562.50	23.30	-22.70	46.00	31.85	19.35	3.13	31.04	---	---
6	934.20	27.47	-18.53	46.00	30.21	23.69	4.23	30.67	---	---
7 !	2389.99	50.52	-3.48	54.00	47.09	32.13	5.46	34.16	100	116 Average
8 !	2389.99	68.84	-5.16	74.00	65.41	32.13	5.46	34.16	100	116 Peak
9	2389.99	39.09	-14.91	54.00	35.66	32.13	5.46	34.16	100	116 Average
10 X	2412.00	89.36			85.92	32.16	5.44	34.16	100	116 Average
11 X	2412.00	102.23			98.78	32.19	5.43	34.17	100	116 Peak
12	2486.00	52.57	-21.43	74.00	49.10	32.27	5.38	34.19	100	116 Peak
13	5649.00	55.66	-18.34	74.00	46.84	34.89	8.38	34.46	100	0 Peak
14	8289.00	54.22	-19.78	74.00	43.28	36.00	10.04	35.10	111	55 Peak
15	8289.00	41.35	-12.65	54.00	30.41	36.00	10.04	35.10	111	55 Average

Test Mode :	Mode 4	Temperature :	23~24°C
Test Channel :	01 for Sample A	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		



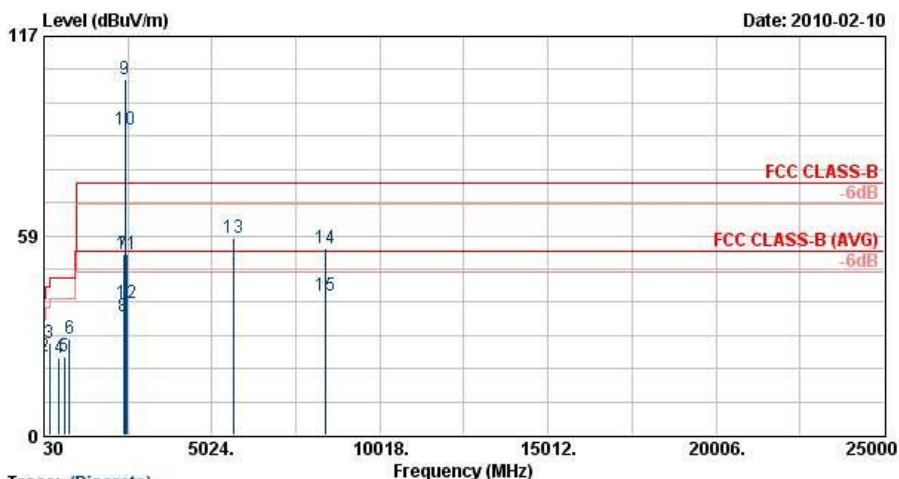


Test Mode :	Mode 5	Temperature :	23~24°C
Test Channel :	06 for Sample A	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		





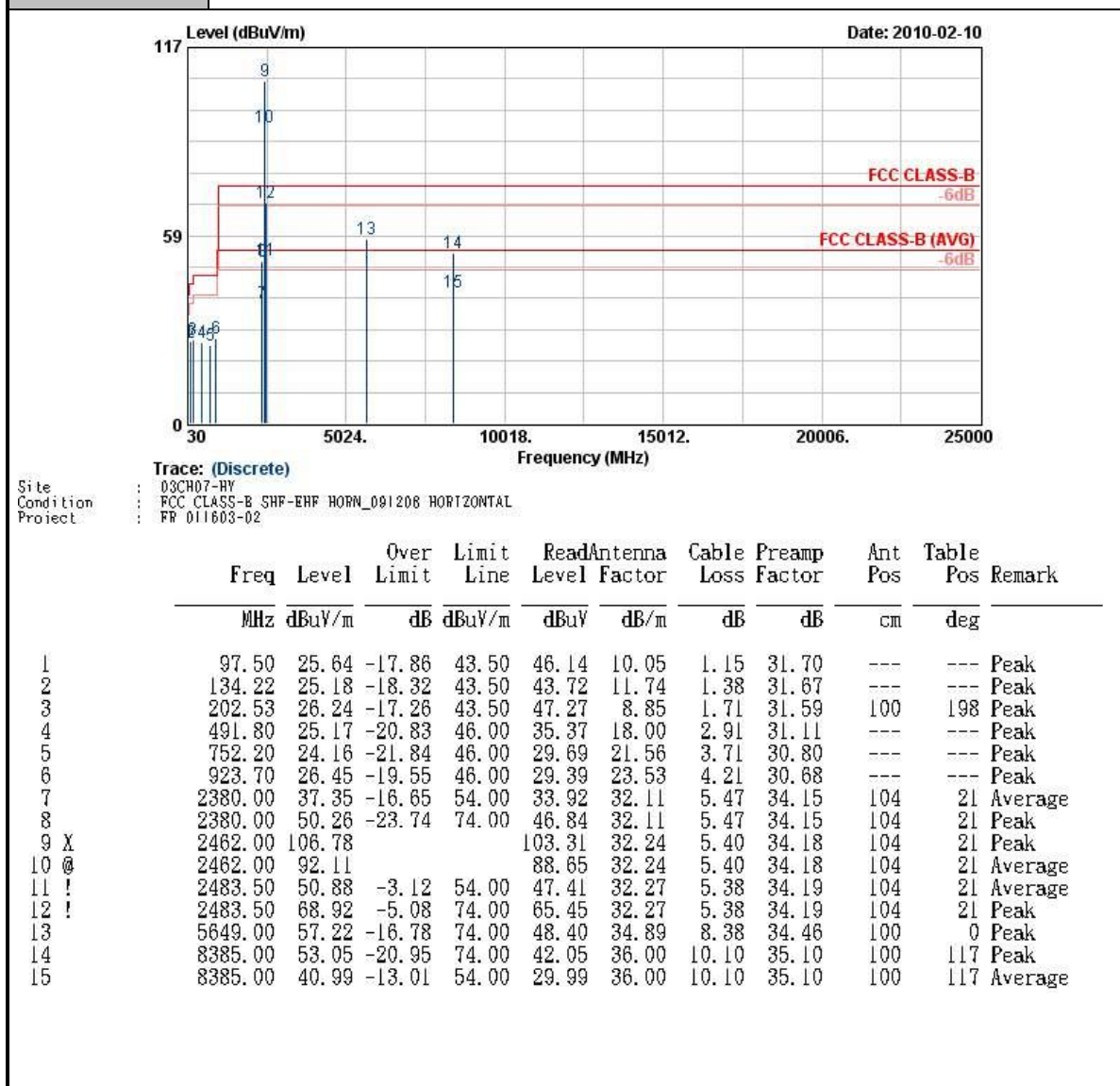
Test Mode :	Mode 5	Temperature :	23~24°C
Test Channel :	06 for Sample A	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		



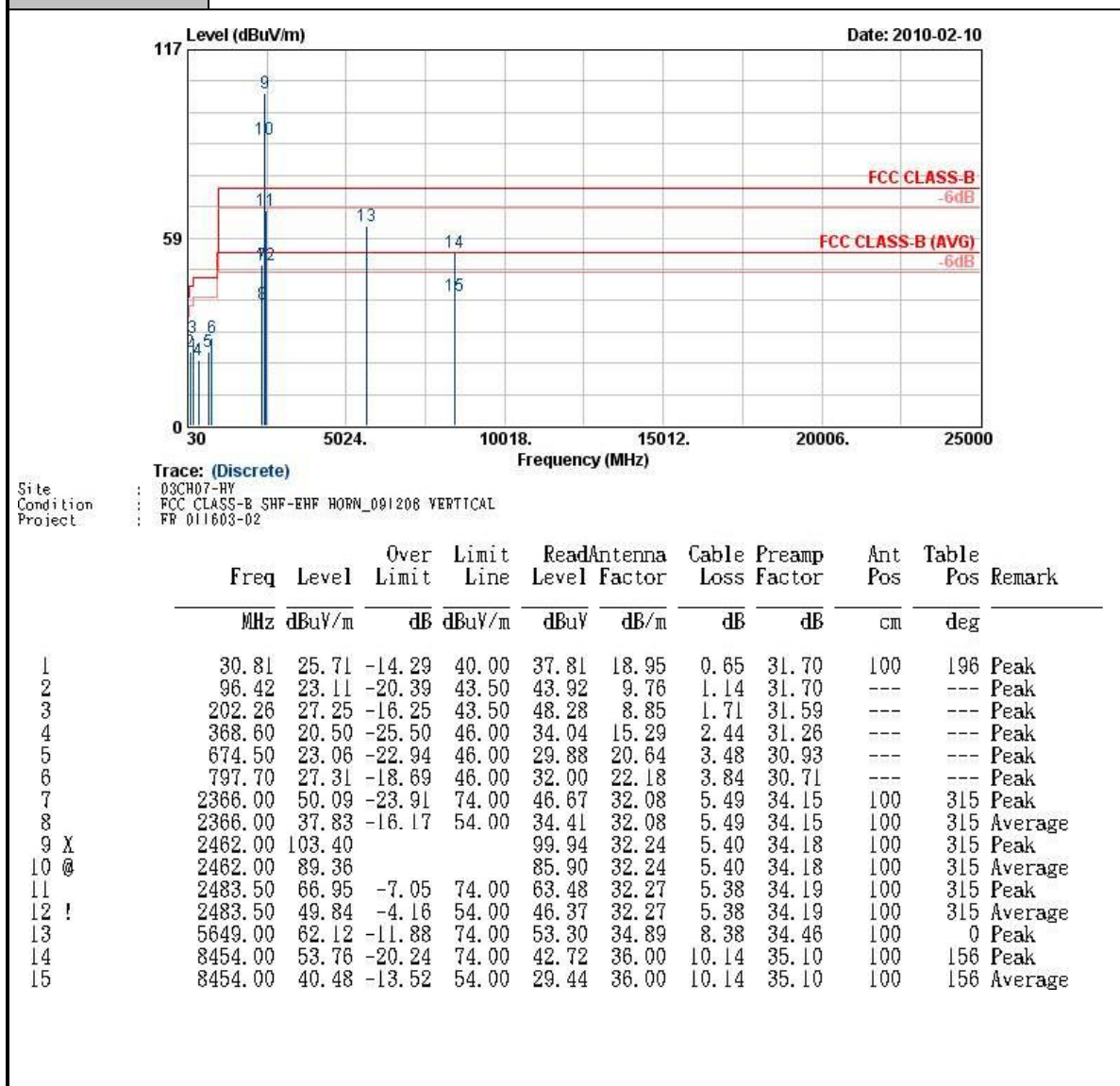
Trace: (Discrete)
Site : D3CH07-RY
Condition : FCC CLASS-B SHF-EHF HORN_091206 VERTICAL
Project : FR 011603-02

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	35.13	26.01	-13.99	40.00	40.30	16.73	0.68	31.70	100	169 Peak
2	46.74	23.25	-16.75	40.00	44.25	9.94	0.76	31.70	---	---
3	202.53	26.99	-16.51	43.50	48.02	8.85	1.71	31.59	---	---
4	491.80	22.49	-23.51	46.00	32.69	18.00	2.91	31.11	---	---
5	632.50	23.15	-22.85	46.00	30.45	20.32	3.35	30.97	---	---
6	797.70	28.24	-17.76	46.00	32.92	22.18	3.84	30.71	---	---
7	2390.00	52.92	-21.08	74.00	49.49	32.13	5.46	34.16	101	34 Peak
8	2390.00	34.82	-19.18	54.00	31.39	32.13	5.46	34.16	101	34 Average
9 X	2437.00	104.38			100.92	32.22	5.41	34.17	101	34 Peak
10 @	2437.00	89.64			86.18	32.22	5.41	34.17	101	34 Average
11	2494.00	52.98	-21.02	74.00	49.51	32.30	5.37	34.20	101	34 Peak
12	2494.00	38.52	-15.48	54.00	35.05	32.30	5.37	34.20	101	34 Average
13	5649.00	58.04	-15.96	74.00	49.22	34.89	8.38	34.46	100	0 Peak
14	8382.00	54.90	-19.10	74.00	43.90	36.00	10.10	35.10	141	330 Peak
15	8382.00	40.89	-13.11	54.00	29.89	36.00	10.10	35.10	141	330 Average

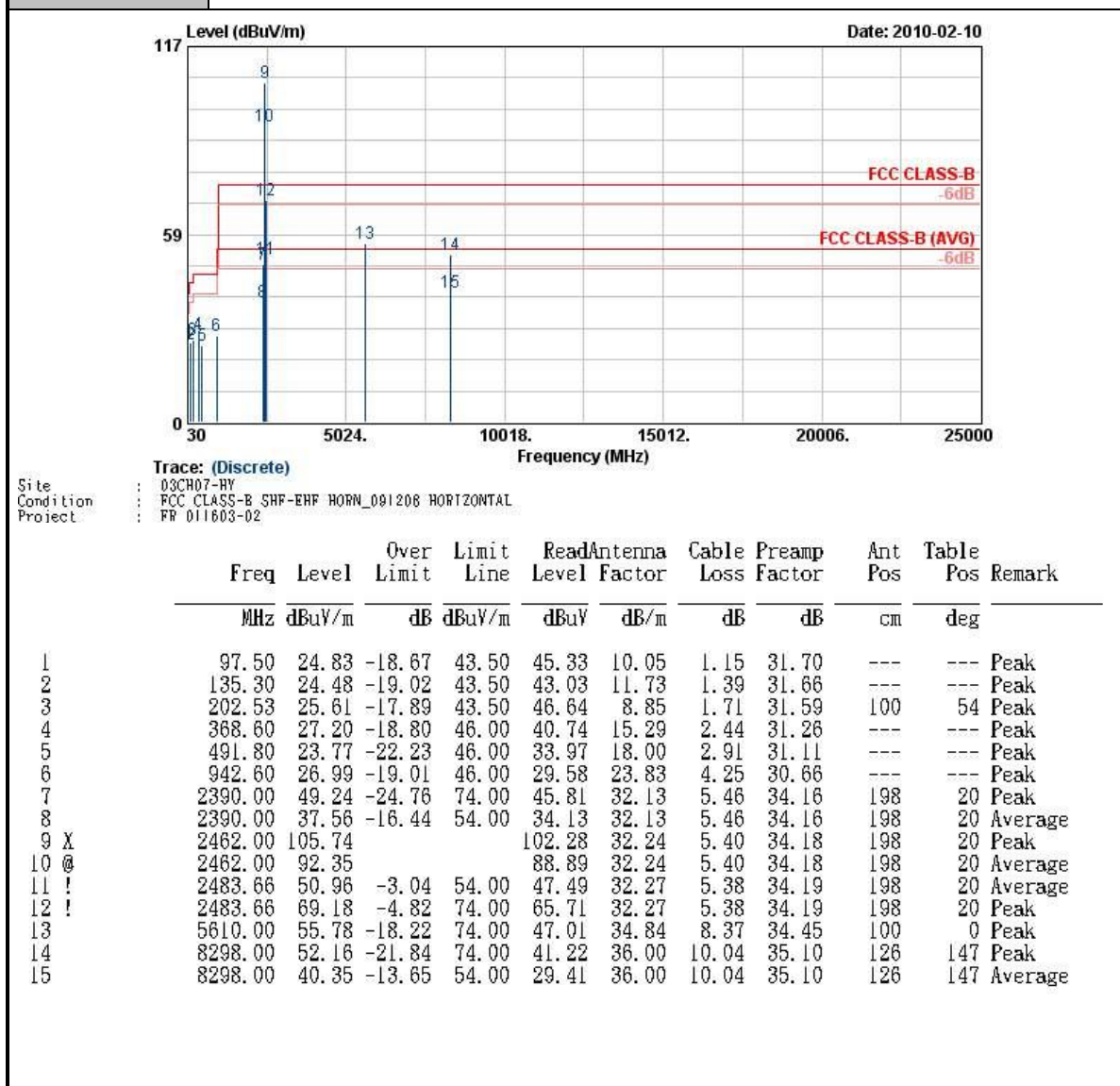
Test Mode :	Mode 6	Temperature :	23~24°C
Test Channel :	11 for Sample A	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		



Test Mode :	Mode 6	Temperature :	23~24°C
Test Channel :	11 for Sample A	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		

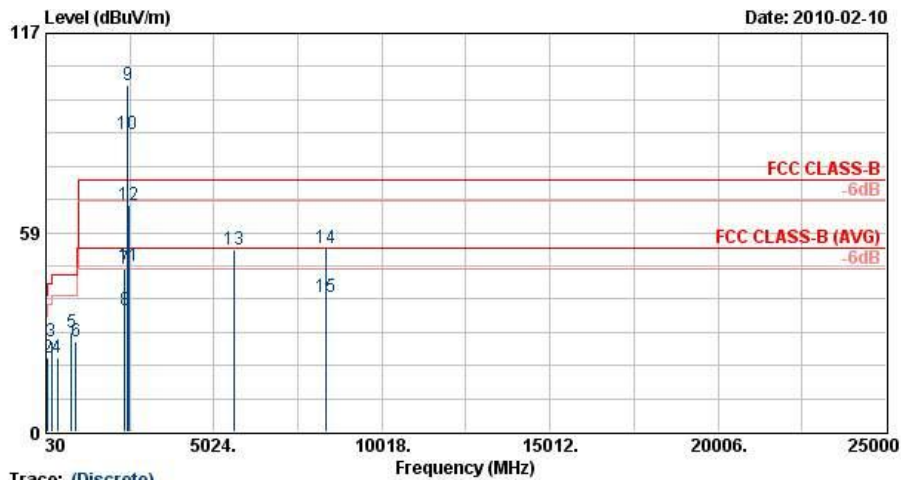


Test Mode :	Mode 7	Temperature :	23~24°C
Test Channel :	11 for Sample B	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		





Test Mode :	Mode 7	Temperature :	23~24°C
Test Channel :	11 for Sample B	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		



	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	35.13	24.89	-15.11	40.00	39.18	16.73	0.68	31.70	100	16 Peak
2	95.61	21.95	-21.55	43.50	42.76	9.76	1.14	31.70	---	---
3	202.53	26.68	-16.82	43.50	47.71	8.85	1.71	31.59	---	---
4	368.60	21.61	-24.39	46.00	35.15	15.29	2.44	31.26	---	---
5	797.70	29.22	-16.78	46.00	33.90	22.18	3.84	30.71	---	---
6	926.50	26.32	-19.68	46.00	29.20	23.58	4.21	30.67	---	---
7	2382.00	47.77	-26.23	74.00	44.34	32.11	5.47	34.15	121	330 Peak
8	2382.00	35.81	-18.19	54.00	32.38	32.11	5.47	34.15	121	330 Average
9 X	2462.00	101.85			98.40	32.24	5.40	34.19	121	330 Peak
10 @	2462.00	87.62			84.16	32.24	5.40	34.18	121	330 Average
11 !	2483.66	48.89	-5.11	54.00	45.42	32.27	5.38	34.19	121	330 Average
12	2483.66	66.51	-7.49	74.00	63.04	32.27	5.38	34.19	121	330 Peak
13	5610.00	53.49	-20.51	74.00	44.72	34.84	8.37	34.45	100	0 Peak
14	8373.00	53.72	-20.28	74.00	42.72	36.00	10.10	35.10	100	224 Peak
15	8373.00	39.66	-14.34	54.00	28.66	36.00	10.10	35.10	100	224 Average

3.8 Antenna Requirements

3.8.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

3.8.2 Antenna Connected Construction

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

3.8.3 Antenna Gain

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

4 List of Measuring Equipment

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)
System Simulator	R&S	CMU200	105934	N/A	Nov. 11, 2008	Nov. 10, 2010	Conduction (CO05-HY)
GPS Station	T&E	GS-50	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 31, 2009	Oct. 30, 2010	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP	101067	9KHz ~ 30GHz	Dec. 04, 2009	Dec. 03, 2010	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 20, 2009	Aug. 19, 2010	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 14, 2009	Oct. 13, 2010	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec.09,2009	Dec. 08, 2010	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32dB.GAIN	Mar. 27, 2009	Mar. 26, 2010	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 KHz~30 MHz	May 22, 2008	May 21, 2010	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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

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 $U_c(y)$	1.13		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.26		

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

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 $U_c(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.54		

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

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 $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty $U_c(y)$	2.36				
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.72				



Appendix A. Photographs of EUT

Please refer to Sporton report number EP011603-02 as below.