

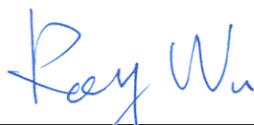
# FCC RF Test Report

**APPLICANT** : Hewlett-Packard Company  
**EQUIPMENT** : SmartBook  
**BRAND NAME** : HP  
**MODEL NAME** : HSTNH-F23C  
**MARKETING NAME** : Compaq AirLife 100  
**FCC ID** : B94HHF23C  
**STANDARD** : FCC Part 15 Subpart C §15.247  
**CLASSIFICATION** : Digital Transmission System (DTS)

The product was received on Nov. 12, 2009 and completely tested on Jan. 11, 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 1<sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.**



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## 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 6.1 dB at 0.326 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 1.82 dB at 2483.85 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-



# 1 General Description

## 1.1 Applicant

**Hewlett-Packard Company**

10955 Tantau Ave., CupertinoCA, 95014-0770, USA

## 1.2 Manufacturer

**FOXCONN Technology Group**

4F., G5, No. 2, 2nd Donghuan Road, 10th Yousong Industrial District, Longhua, Baoan, Shenzhen City, Guangdong Province, China 518109

## 1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	SmartBook
Brand Name	HP
Model Name	HSTNH-F23C
Marketing Name	Compaq AirLife 100
FCC ID	B94HHF23C
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 : 20.07 dBm (101.62 mW) 802.11g : 23.60 dBm (229.09 mW)
Antenna Type	PIFA Antenna with gain -2.3 dBi
HW Version	EVT2.0
SW Version	001.053b
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Production Unit

### 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).

**List of Accessory:**

Specification of Accessory		
<b>AC Adapter</b>	<b>Brand Name</b>	Delta
	<b>Model Name</b>	EADP-15ZB B
	<b>Power Rating</b>	I/P:100-240Vac, 50-60Hz, 600mA; O/P: 9Vdc, 1670mA
	<b>DC Power Cord Type</b>	2.0 meter shielded cable without ferrite core
<b>Battery</b>	<b>Brand Name</b>	Dynapack
	<b>Model Name</b>	HSTNH-F23C-S
	<b>Power Rating</b>	3.7Vdc, 28Wh
	<b>Type</b>	Li-ion
<b>USB Cable</b>	<b>Brand Name</b>	Nwing
	<b>Model Name</b>	CUNC005B-T63W-EF-G
	<b>Signal Line Type</b>	1.1 meter shielded cable without ferrite core
<b>LCD Panel</b>	<b>Brand Name</b>	CMO
	<b>Model Name</b>	N101L6-L01

**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

<b>Test Site</b>	SPORTON INTERNATIONAL INC.		
<b>Test Site Location</b>	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		<b>FCC/IC Registration No.</b>
	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 Base Station	SPIRENT	GSS6560	FCC DoC	Shielded, 1.6 m	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.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
6.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A
7.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
8.	Earphone	Apple	A1285	FCC DoC	Unshielded, 1.2 m	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:

802.11b RF Power (dBm)					
Channel	Frequency (MHz)	Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	19.82	19.83	19.86	19.89
CH 06	2437 MHz	19.65	19.65	19.70	19.70
CH 11	2462 MHz	20.00	20.03	20.05	<b>20.07</b>

802.11g 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 01	2412 MHz	23.37	23.04	23.42	23.27	23.12	23.47	23.21	23.56
CH 06	2437 MHz	<b>23.60</b>	22.77	23.29	22.95	23.27	23.45	22.89	23.58
CH 11	2462 MHz	21.70	21.37	22.19	21.84	22.02	22.59	21.58	22.34

**Remark:**

1. The 802.11b data rates were set in 11 Mbps and 802.11g data rates were set in 6 Mbps for all the test cases, due to the highest RF output power.
2. The EUT is programmed to transmit signals continuously for all testing.



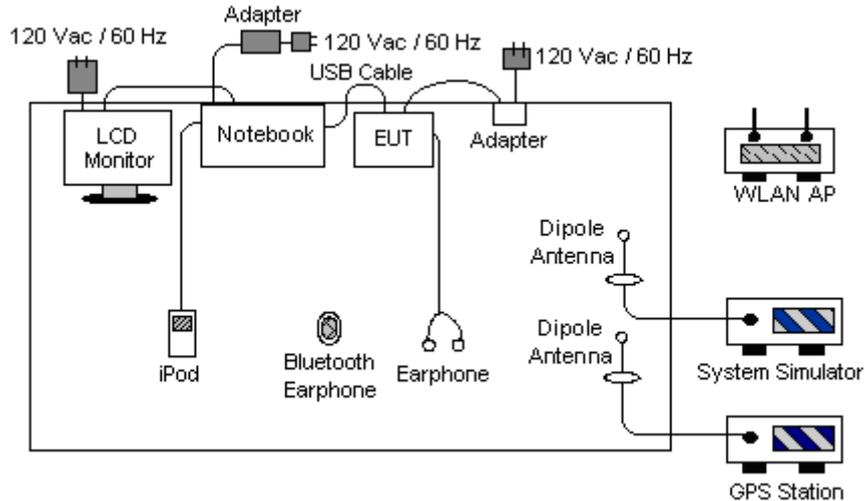
## 2.2 Test Mode

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.

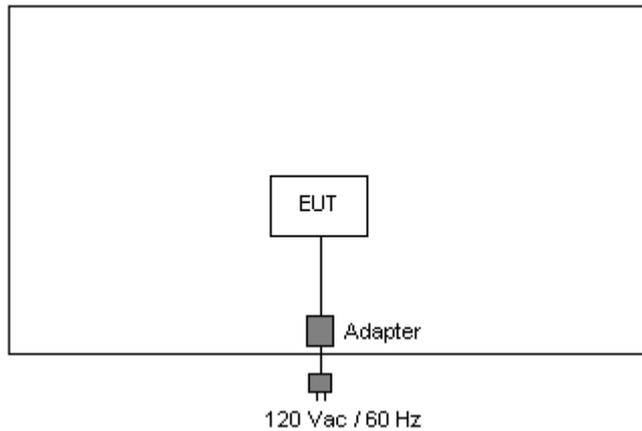
Test Cases		
Test Item	802.11b	802.11g
Conducted TCs	Mode 1 : CH01_2412 MHz	Mode 4 : CH01_2412 MHz
	Mode 2 : CH06_2437 MHz	Mode 5 : CH06_2437 MHz
	Mode 3 : CH11_2462 MHz	Mode 6 : CH11_2462 MHz
Radiated TCs	Mode 1 : CH01_2412 MHz	Mode 4 : CH01_2412 MHz
	Mode 2 : CH06_2437 MHz	Mode 5 : CH06_2437 MHz
	Mode 3 : CH11_2462 MHz	Mode 6 : CH11_2462 MHz
AC Conducted Emission	Mode 1 : GSM850 Idle + WLAN Link + Bluetooth Link + TC + Adapter	
<b>Remark:</b> TC stands for Test Configuration, and consists of earphone, USB cable, and GPS Rx.		

## 2.3 Connection Diagram of Test System

### <Conducted Emission>



### <Radiated Emission>



## 2.4 RF Utility

The programmed RF utility is installed in EUT to provide channel selection, power level, data rate and the application type. Then, set "# athtestcmd -i athwlan0 --tx tx99 --txrate 4 --txpwr 15 --txfreq 2412 --txpktsz 32 --txantenna 1" during testing. 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.

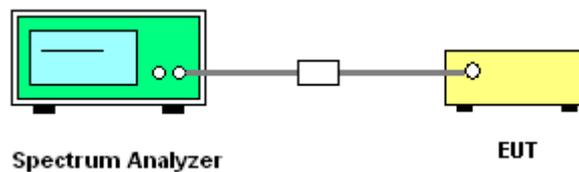
##### 3.1.2 Measuring Instruments

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



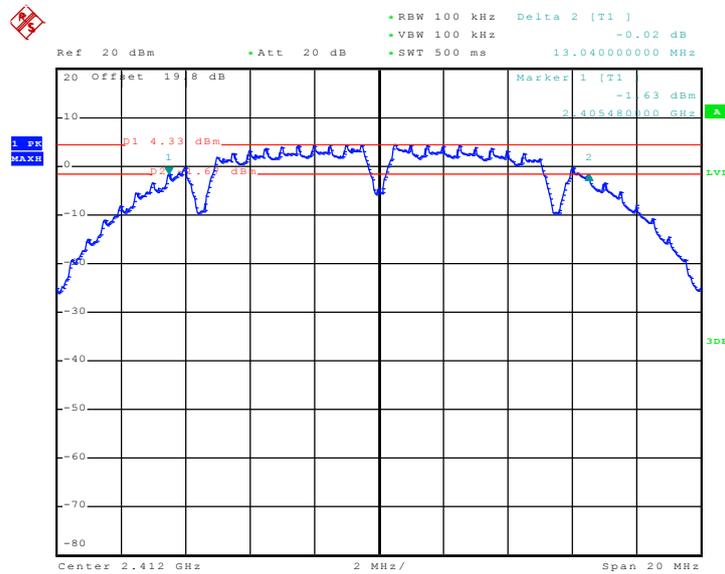


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	25~27°C
Test Engineer :	Tang Liu	Relative Humidity :	52~55%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	13.04	0.5	Pass
06	2437	12.60	0.5	Pass
11	2462	12.56	0.5	Pass

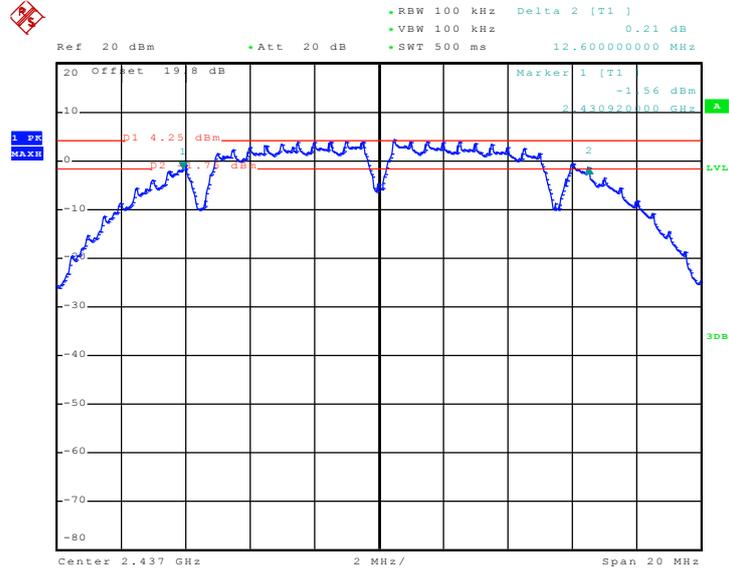
Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01



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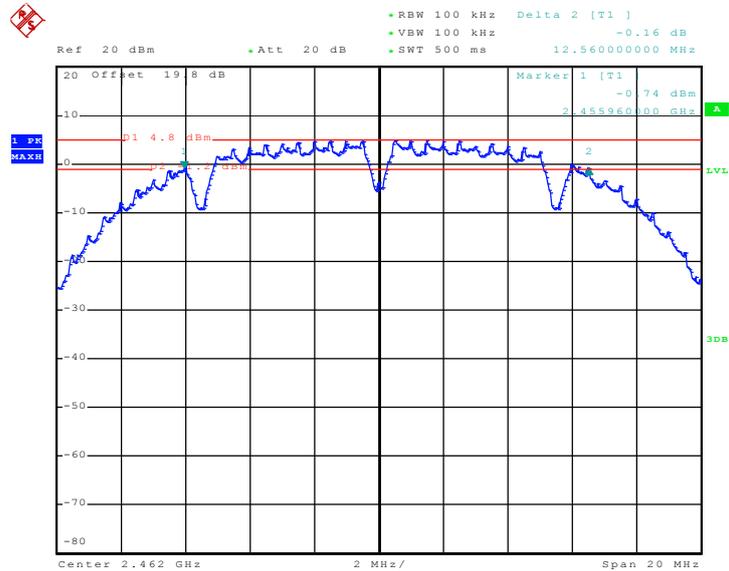


Mode 2 : 6 dB Bandwidth Plot on 802.11b Channel 06



Date: 15.DEC.2009 19:52:55

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



Date: 15.DEC.2009 19:49:55





## 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.

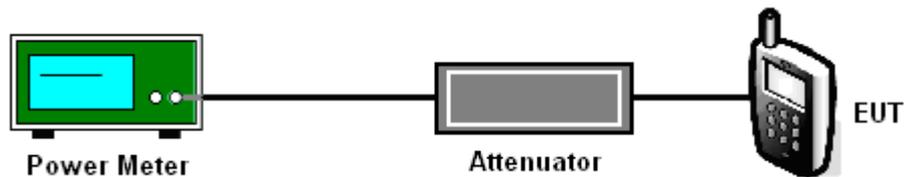
### 3.2.2 Measuring Instruments

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 :	25~27°C
Test Engineer :	Tang Liu	Relative Humidity :	52~55%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	19.89	30	Pass
06	2437	19.70	30	Pass
11	2462	20.07	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	25~27°C
Test Engineer :	Tang Liu	Relative Humidity :	52~55%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	23.37	30	Pass
06	2437	23.60	30	Pass
11	2462	21.70	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**

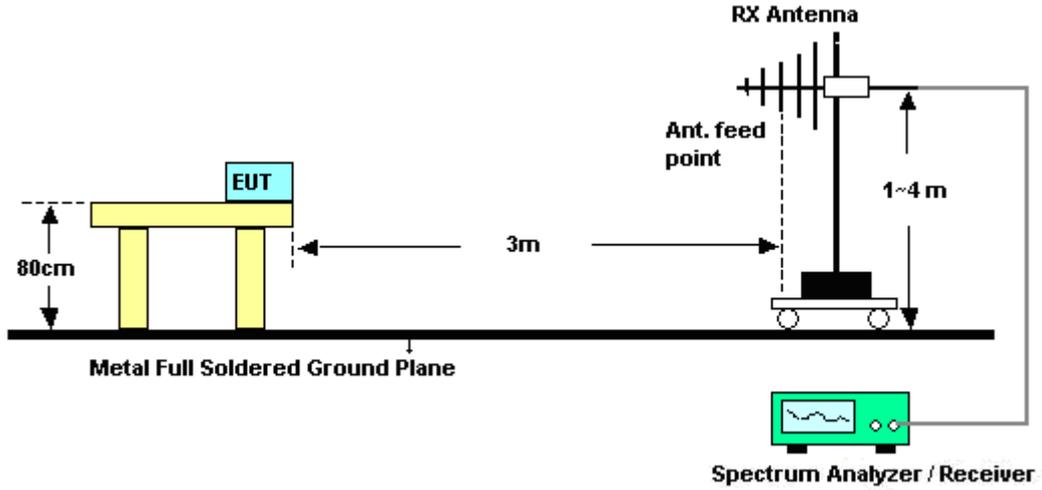
See list of measuring instruments of this test report.

#### **3.3.3 Test Procedures**

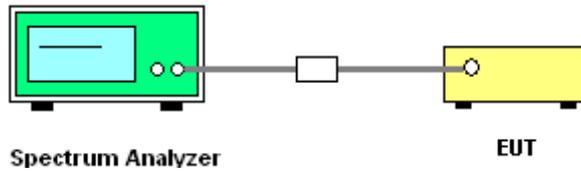
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 1MHz, Video bandwidth (VBW)  $\geq$  RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 1MHz 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 :	25~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Cona Huang

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
2385.81	62.99	-11.01	74	59.55	32.13	5.46	34.15	107	307	Peak
2385.81	51.82	-2.18	54	48.38	32.13	5.46	34.15	107	307	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
2385.81	57.05	-16.95	74	53.61	32.13	5.46	34.15	150	299	Peak
2385.81	45.96	-8.04	54	42.52	32.13	5.46	34.15	150	299	Average

Test Mode :	Mode 3	Temperature :	25~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Cona Huang

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
2488.22	59.95	-14.05	74	56.47	32.3	5.37	34.19	104	310	Peak
2488.22	48.78	-5.22	54	45.3	32.3	5.37	34.19	104	310	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
2488.98	54.94	-19.06	74	51.46	32.3	5.37	34.19	100	289	Peak
2488.98	43.7	-10.3	54	40.22	32.3	5.37	34.19	100	289	Average



Test Mode :	Mode 4	Temperature :	25~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Cona Huang

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
2390	66.87	-7.13	74	63.44	32.13	5.46	34.16	101	306	Peak
2390	50.25	-3.75	54	46.82	32.13	5.46	34.16	101	306	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
2390	65.26	-8.74	74	61.83	32.13	5.46	34.16	100	290	Peak
2390	48.02	-5.98	54	44.59	32.13	5.46	34.16	100	290	Average

Test Mode :	Mode 6	Temperature :	25~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Cona Huang

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
2483.85	72.18	-1.82	74	68.72	32.27	5.38	34.19	104	308	Peak
2483.85	50.6	-3.4	54	47.14	32.27	5.38	34.19	104	308	Average

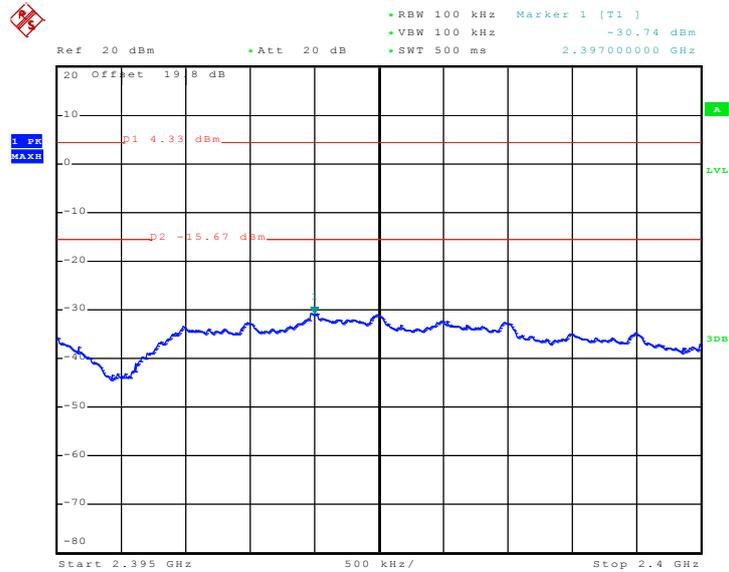
ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.85	68.04	-5.96	74	64.58	32.27	5.38	34.19	118	288	Peak
2483.85	46.84	-7.16	54	43.38	32.27	5.38	34.19	118	288	Average



### 3.3.6 Test Plots of Conducted Band Edges

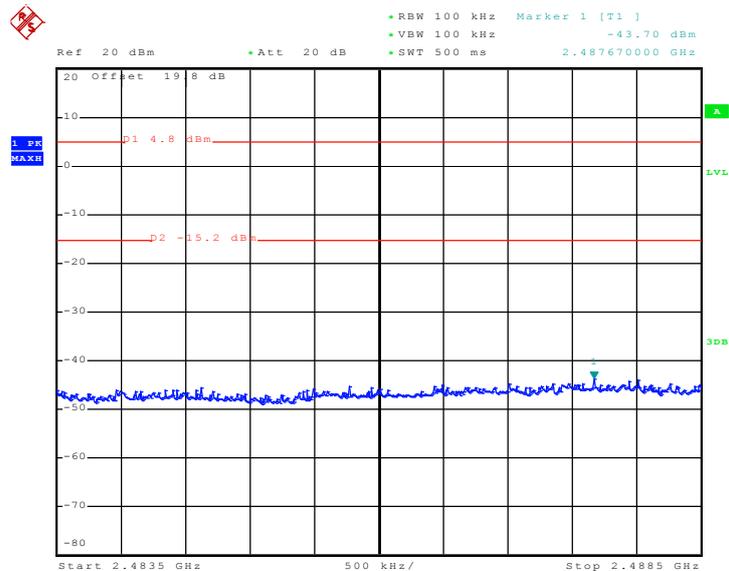
Test Mode :	Mode 1 and 3	Temperature :	25~27°C
Test Band :	802.11b	Relative Humidity :	52~55%
Test Channel :	01 and 11	Test Engineer :	Tang Liu

Low Band Edge Plot on 802.11b Channel 01



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High Band Edge Plot on 802.11b Channel 11

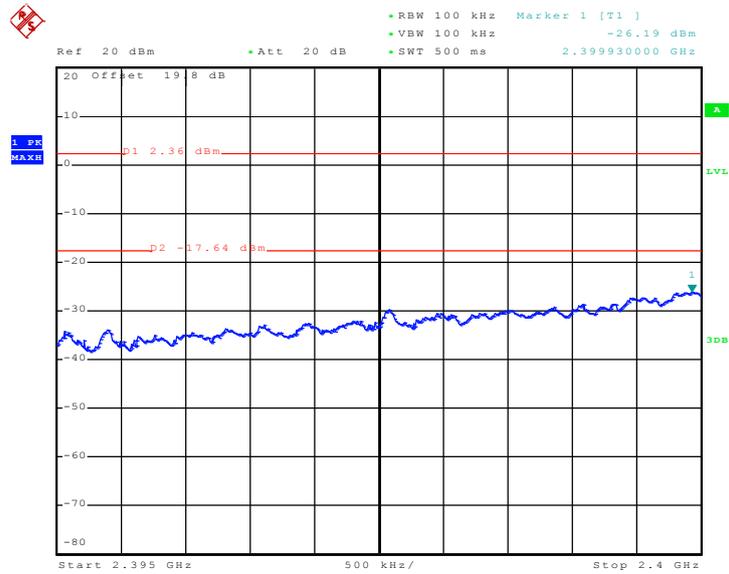


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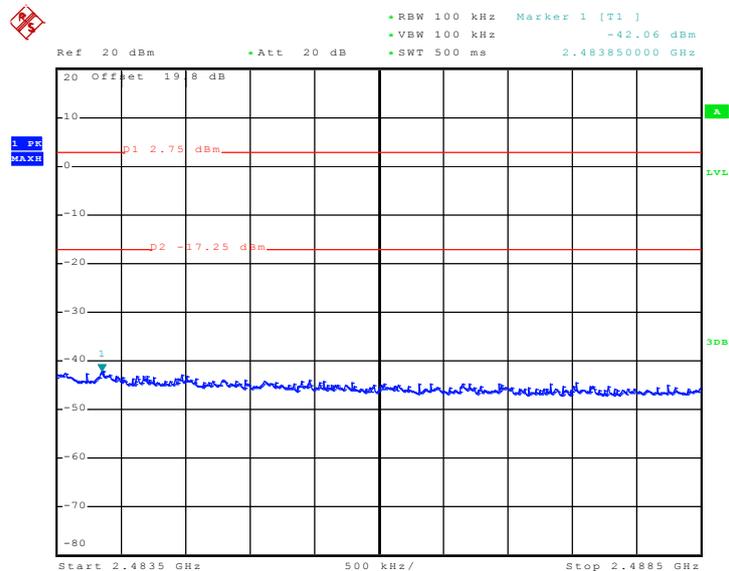


Test Mode :	Mode 4 and 6	Temperature :	25~27°C
Test Band :	802.11g	Relative Humidity :	52~55%
Test Channel :	01 and 11	Test Engineer :	Tang Liu

Low Band Edge Plot on 802.11g Channel 01



High Band Edge Plot on 802.11g Channel 11



## 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.

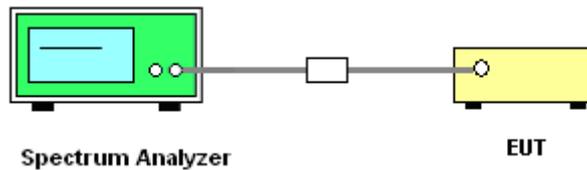
### 3.4.2 Measuring Instruments

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.

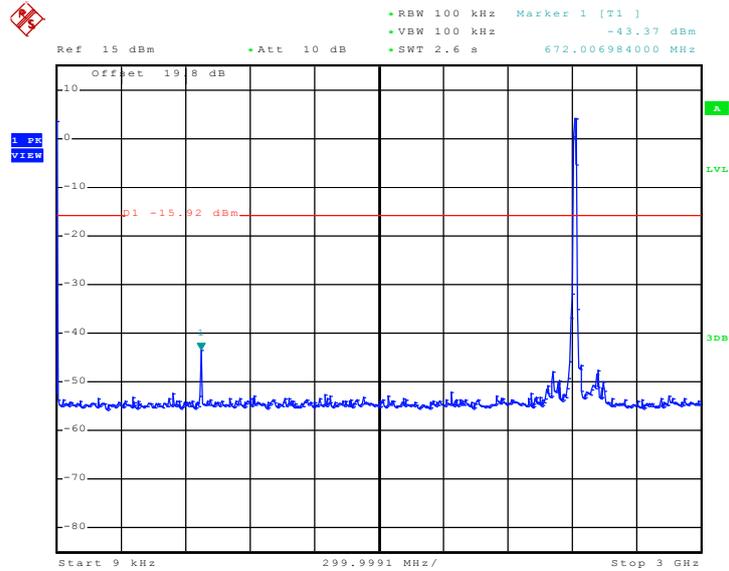
### 3.4.4 Test Setup



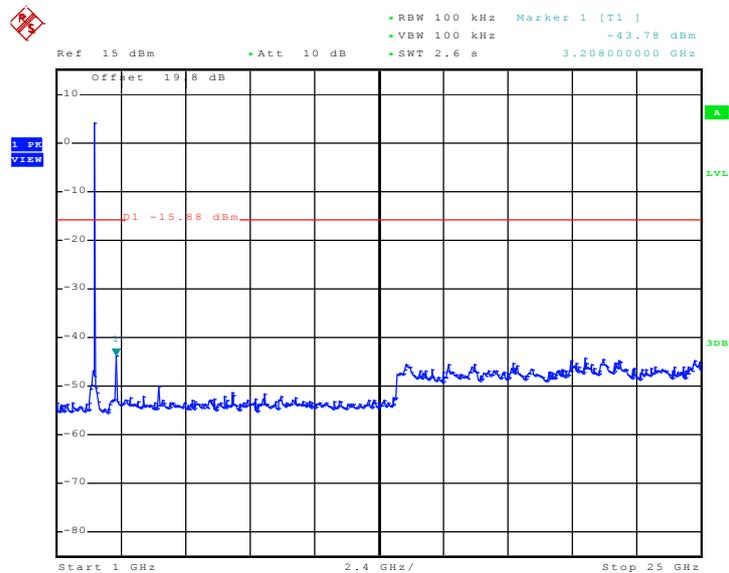
### 3.4.5 Test Plots of Spurious Emission

Test Mode :	Mode 1	Temperature :	25~27°C
Test Channel :	01	Relative Humidity :	52~55%
		Test Engineer :	Tang Liu

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



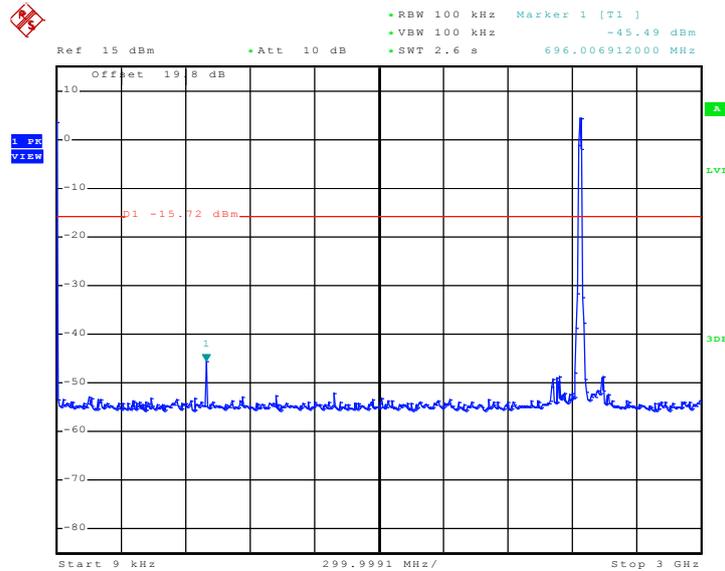
Conducted Spurious Emission Plot between 1GHz ~ 25 GHz





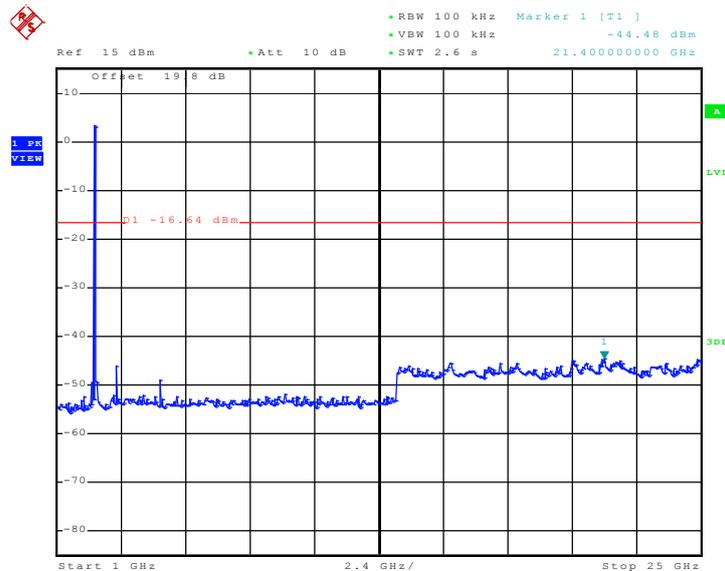
Test Mode :	Mode 2	Temperature :	25~27°C
Test Channel :	06	Relative Humidity :	52~55%
		Test Engineer :	Tang Liu

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 15.DEC.2009 20:03:19

Conducted Spurious Emission Plot between 1GHz ~ 25 GHz

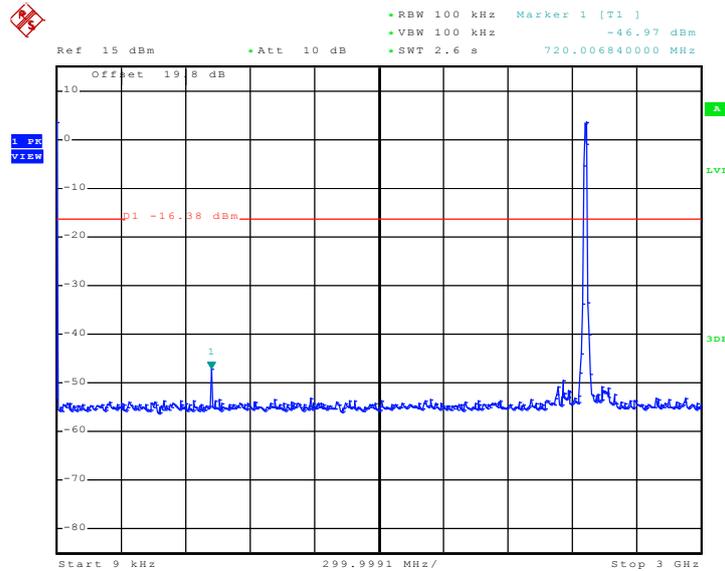


Date: 15.DEC.2009 20:03:42



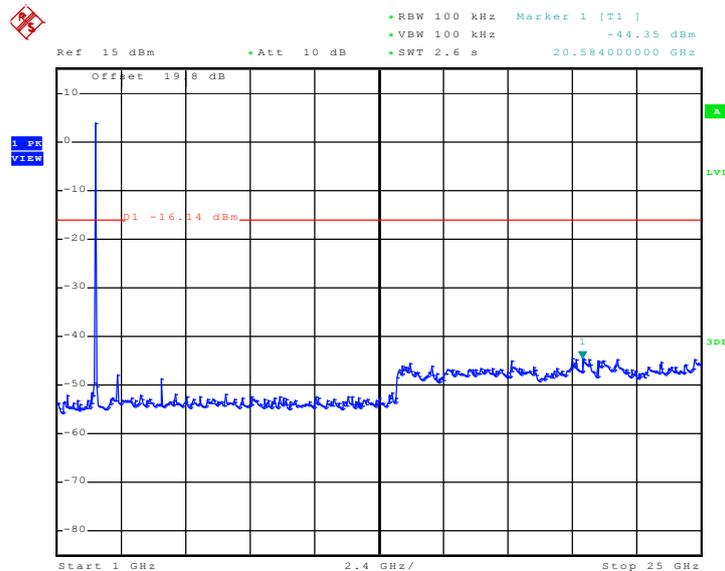
Test Mode :	Mode 3	Temperature :	25~27°C
Test Channel :	11	Relative Humidity :	52~55%
		Test Engineer :	Tang Liu

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 15.DEC.2009 20:04:20

Conducted Spurious Emission Plot between 1GHz ~ 25 GHz

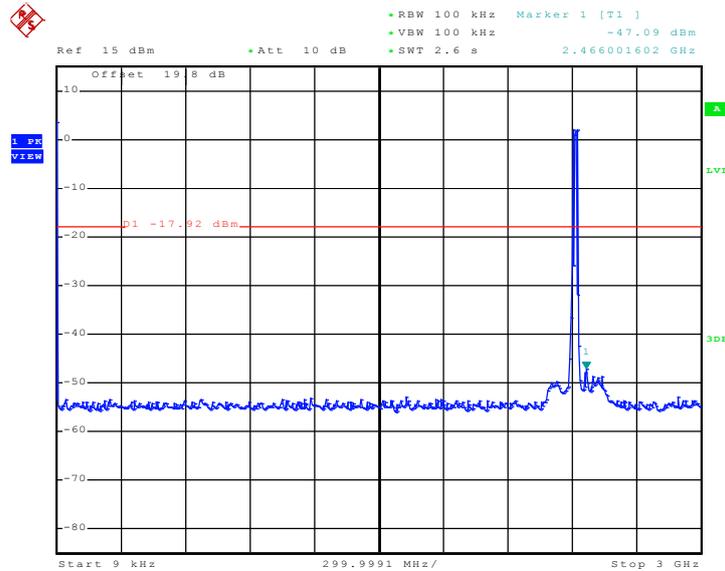


Date: 15.DEC.2009 20:04:38



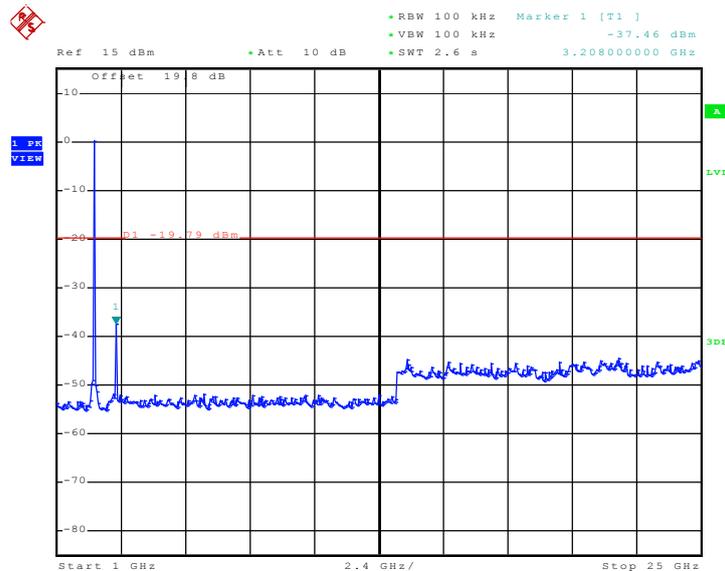
Test Mode :	Mode 4	Temperature :	25~27°C
Test Channel :	01	Relative Humidity :	52~55%
		Test Engineer :	Tang Liu

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 15.DEC.2009 20:05:34

Conducted Spurious Emission Plot between 1GHz ~ 25 GHz

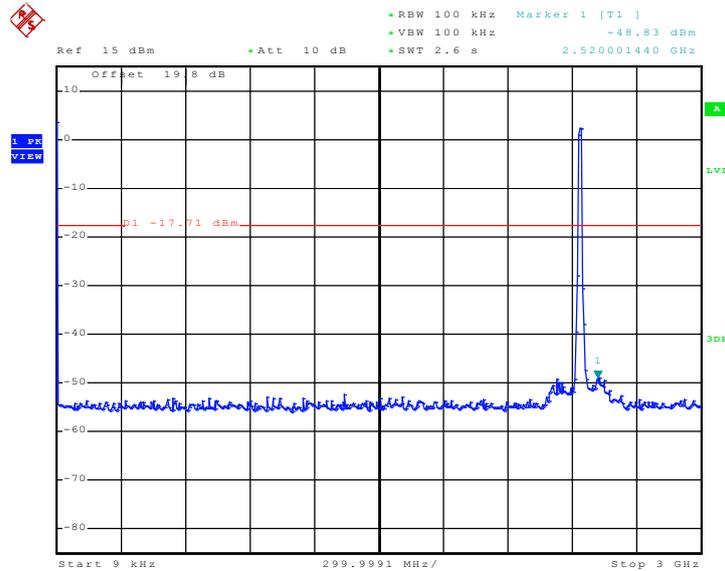


Date: 15.DEC.2009 20:05:56



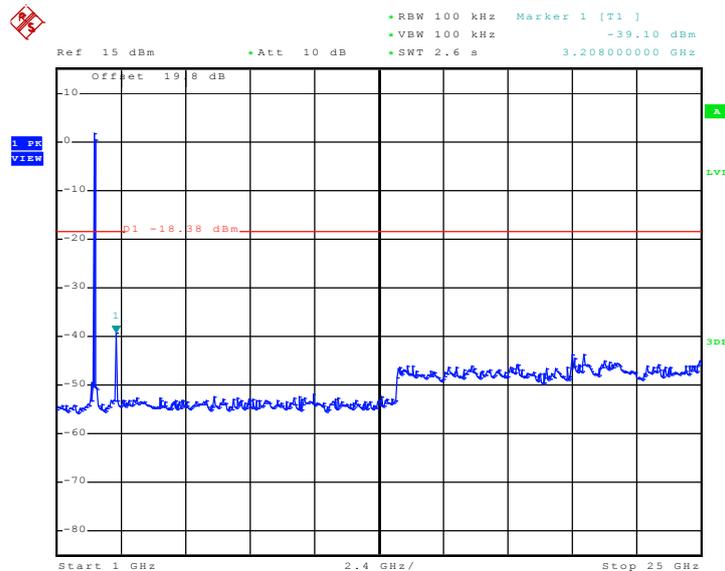
Test Mode :	Mode 5	Temperature :	25~27°C
Test Channel :	06	Relative Humidity :	52~55%
		Test Engineer :	Tang Liu

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 15.DEC.2009 20:06:49

Conducted Spurious Emission Plot between 1GHz ~ 25 GHz

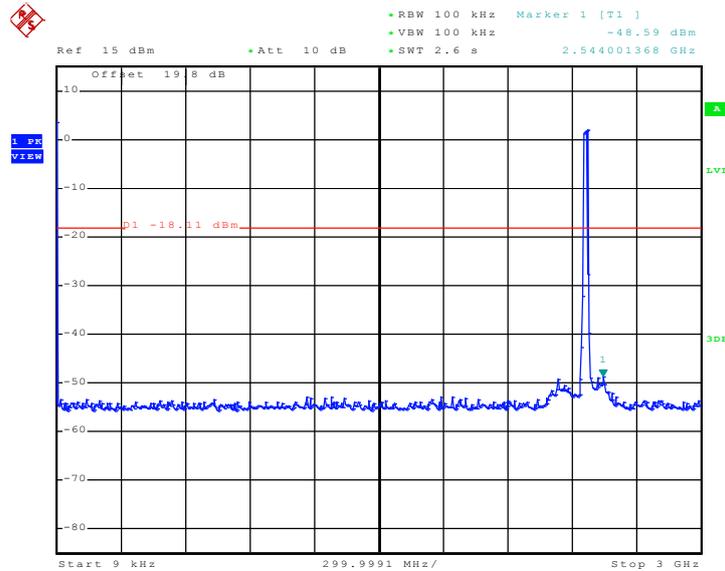


Date: 15.DEC.2009 20:07:03



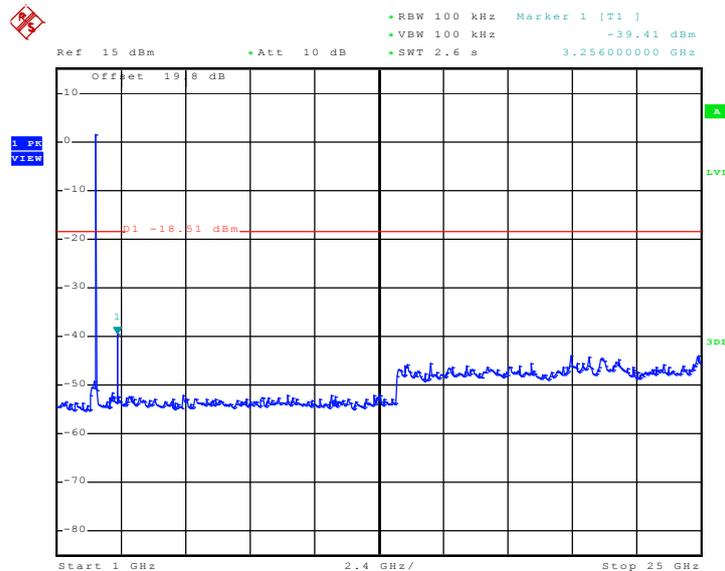
Test Mode :	Mode 6	Temperature :	25~27°C
Test Channel :	11	Relative Humidity :	52~55%
		Test Engineer :	Tang Liu

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 15.DEC.2009 20:07:51

Conducted Spurious Emission Plot between 1GHz ~ 25 GHz



Date: 15.DEC.2009 20:08:10

## 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.

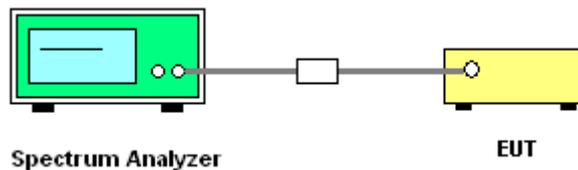
### 3.5.2 Measuring Instruments

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



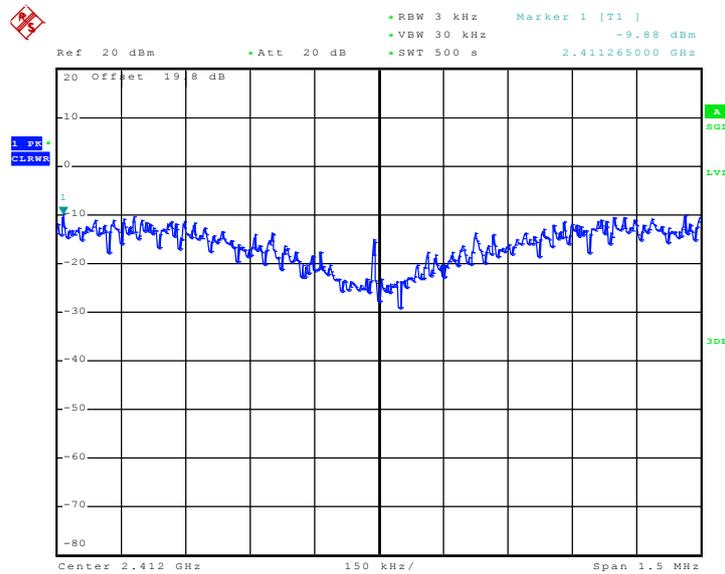


3.5.5 Test Result of Power Spectral Density

Test Mode :	Mode 1, 2, 3	Temperature :	25~27°C
Test Engineer :	Tang Liu	Relative Humidity :	52~55%

Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-9.88	8	Pass
06	2437	-10.26	8	Pass
11	2462	-9.40	8	Pass

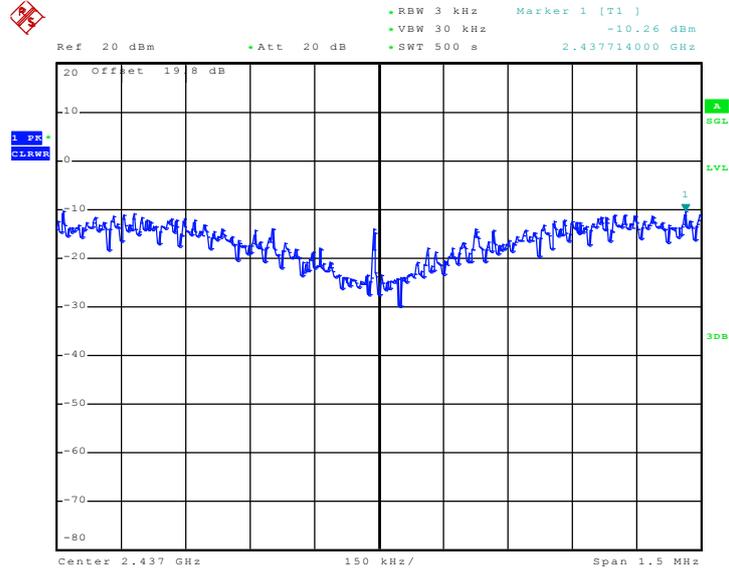
Mode 1 : PSD Plot on 802.11b Channel 01



Date: 15.DEC.2009 21:07:58

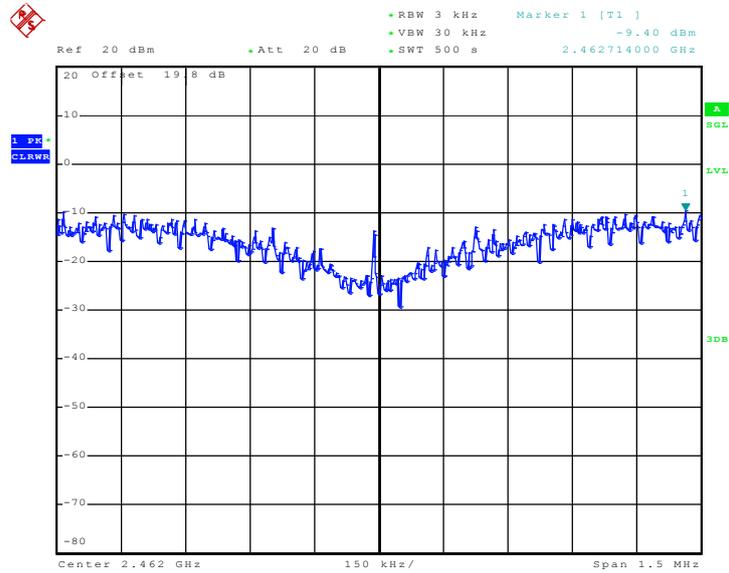


Mode 2 : PSD Plot on 802.11b Channel 06



Date: 15.DEC.2009 20:40:55

Mode 3 : PSD Plot on 802.11b Channel 11



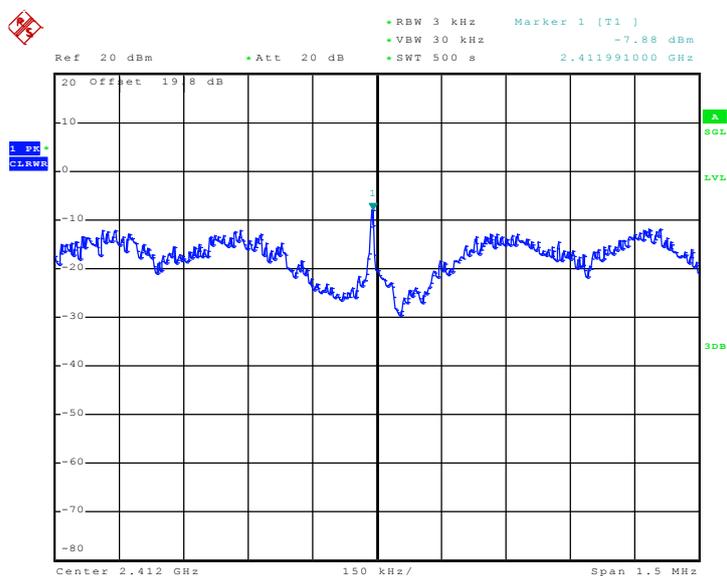
Date: 15.DEC.2009 20:31:47



Test Mode :	Mode 4, 5, 6	Temperature :	25~27°C
Test Engineer :	Tang Liu	Relative Humidity :	52~55%

Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-7.88	8	Pass
06	2437	-7.72	8	Pass
11	2462	-7.11	8	Pass

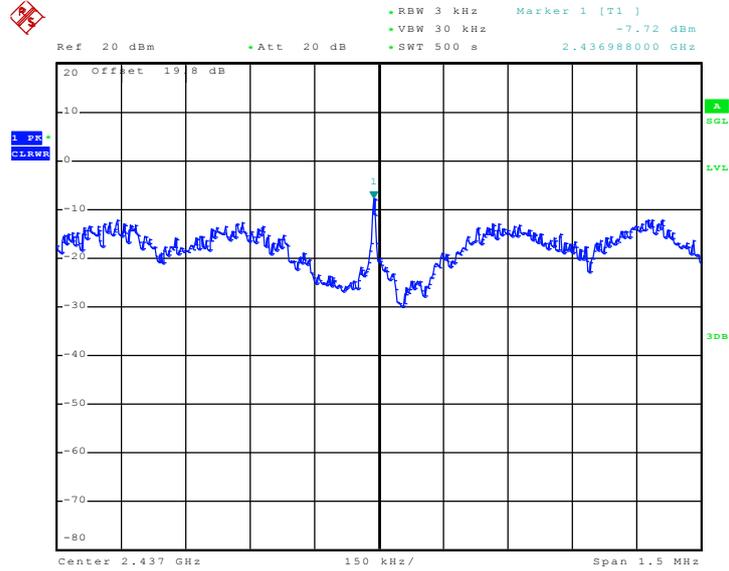
Mode 4 : PSD Plot on 802.11g Channel 01



Date: 15.DEC.2009 20:58:44

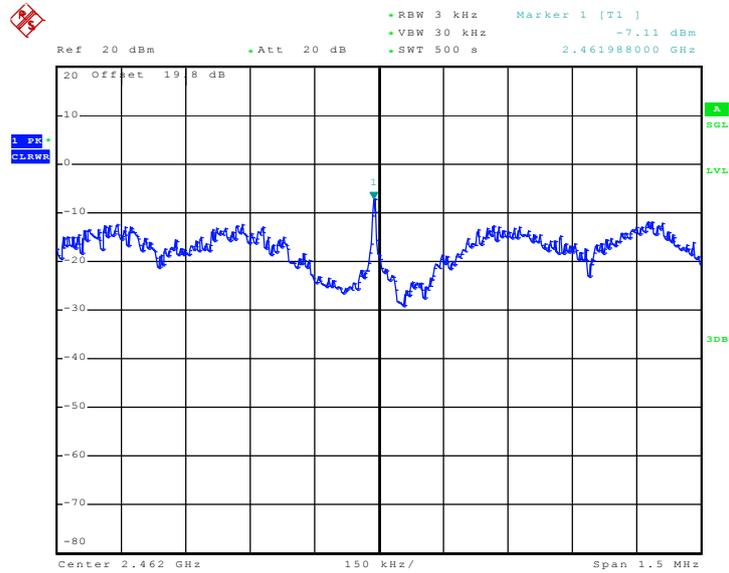


Mode 5 : PSD Plot on 802.11g Channel 06



Date: 15.DEC.2009 20:49:48

Mode 6 : PSD Plot on 802.11g Channel 11



Date: 15.DEC.2009 20:21:55

## 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.

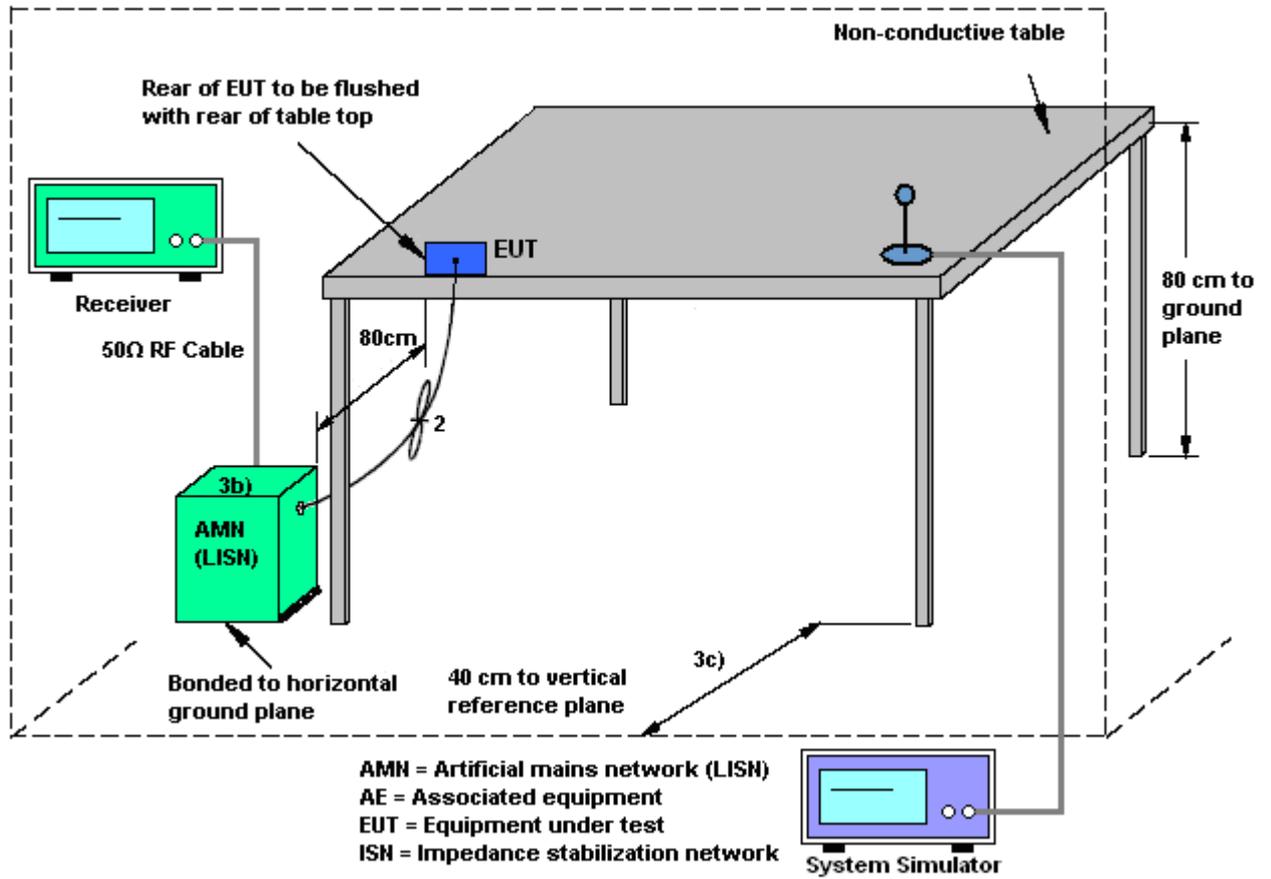
### 3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.6.3 Test Procedures

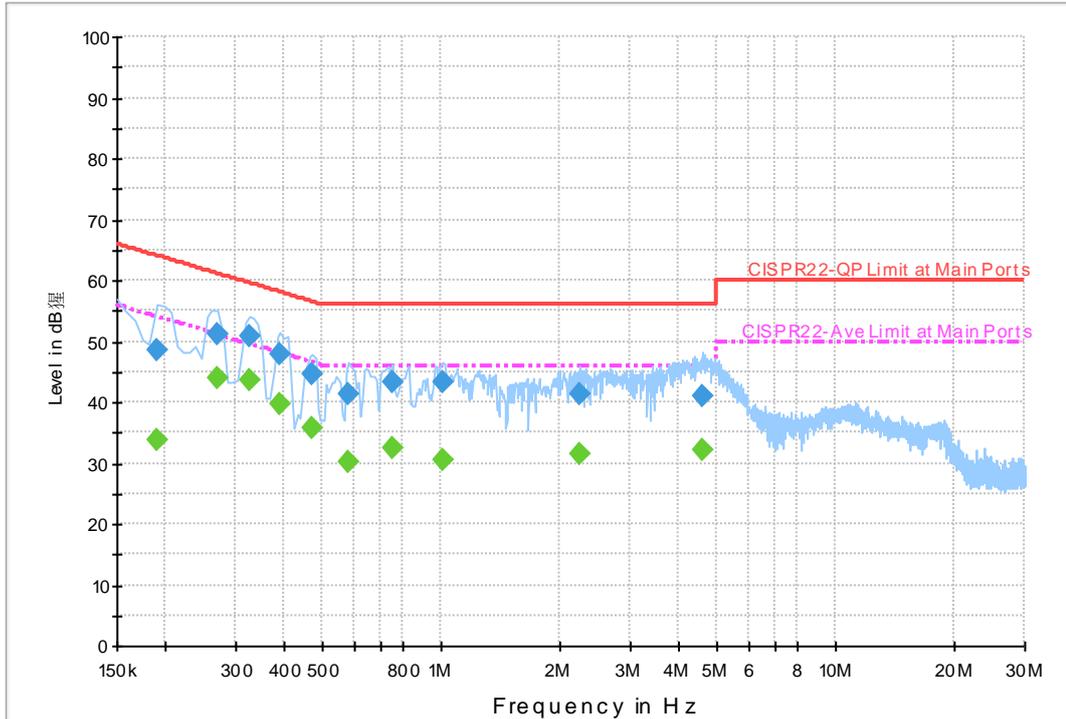
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (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 :	22~24°C
Test Engineer :	Hayden Wu	Relative Humidity :	40~43%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + WLAN Link + Bluetooth Link + TC + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



#### Final Result 1

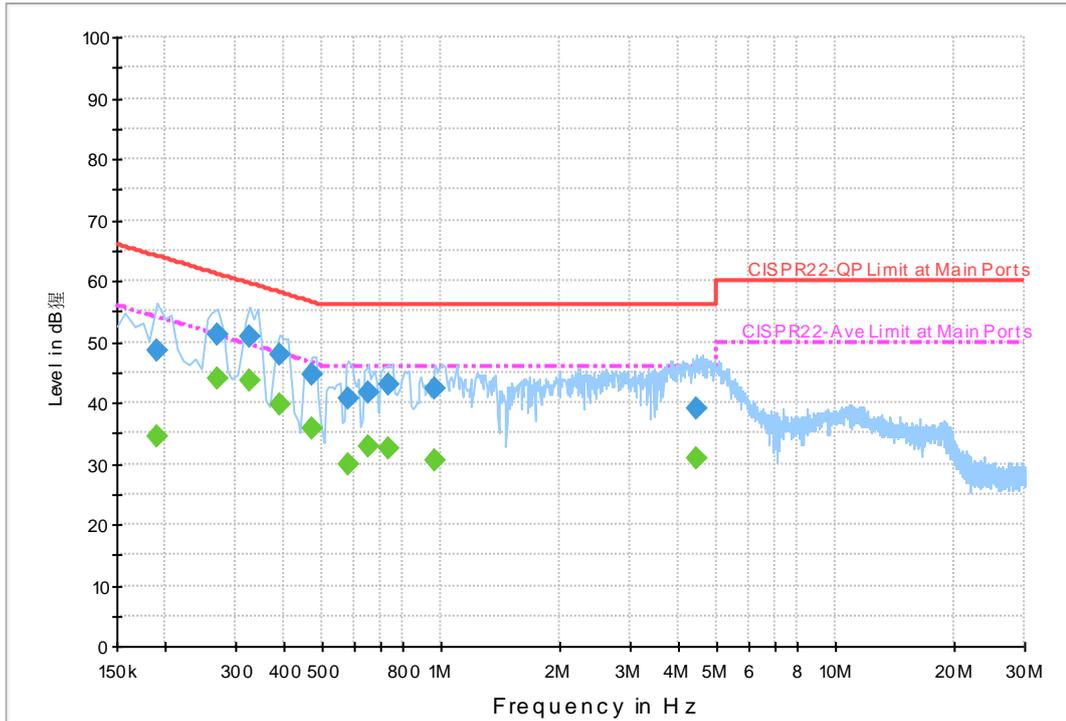
Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.190000	48.4	Off	L1	19.5	15.6	64.0
0.270000	51.1	Off	L1	19.4	10.0	61.1
0.326000	50.9	Off	L1	19.5	8.7	59.6
0.390000	48.0	Off	L1	19.4	10.1	58.1
0.470000	44.5	Off	L1	19.4	12.0	56.5
0.582000	41.5	Off	L1	19.5	14.5	56.0
0.750000	43.3	Off	L1	19.5	12.7	56.0
1.006000	43.3	Off	L1	19.4	12.7	56.0
2.238000	41.2	Off	L1	19.5	14.8	56.0
4.574000	41.1	Off	L1	19.6	14.9	56.0



Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.190000	33.8	Off	L1	19.5	20.2	54.0
0.270000	44.0	Off	L1	19.4	7.1	51.1
0.326000	43.5	Off	L1	19.5	6.1	49.6
0.390000	39.7	Off	L1	19.4	8.4	48.1
0.470000	35.8	Off	L1	19.4	10.7	46.5
0.582000	30.1	Off	L1	19.5	15.9	46.0
0.750000	32.4	Off	L1	19.5	13.6	46.0
1.006000	30.4	Off	L1	19.4	15.6	46.0
2.238000	31.4	Off	L1	19.5	14.6	46.0
4.574000	32.2	Off	L1	19.6	13.8	46.0

Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Hayden Wu	Relative Humidity :	40~43%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + WLAN Link + Bluetooth Link + TC + Adapter		
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)
0.190000	48.5	Off	N	19.5	15.5	64.0
0.270000	51.0	Off	N	19.4	10.1	61.1
0.326000	51.0	Off	N	19.5	8.6	59.6
0.390000	47.8	Off	N	19.4	10.3	58.1
0.470000	44.5	Off	N	19.4	12.0	56.5
0.582000	40.8	Off	N	19.5	15.2	56.0
0.654000	41.8	Off	N	19.5	14.2	56.0
0.734000	42.8	Off	N	19.5	13.2	56.0
0.958000	42.4	Off	N	19.4	13.6	56.0
4.422000	39.1	Off	N	19.5	16.9	56.0



Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.190000	34.6	Off	N	19.5	19.4	54.0
0.270000	43.9	Off	N	19.4	7.2	51.1
0.326000	43.5	Off	N	19.5	6.1	49.6
0.390000	39.6	Off	N	19.4	8.5	48.1
0.470000	35.9	Off	N	19.4	10.6	46.5
0.582000	29.8	Off	N	19.5	16.2	46.0
0.654000	32.9	Off	N	19.5	13.1	46.0
0.734000	32.5	Off	N	19.5	13.5	46.0
0.958000	30.6	Off	N	19.4	15.4	46.0
4.422000	30.7	Off	N	19.5	15.3	46.0

### 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

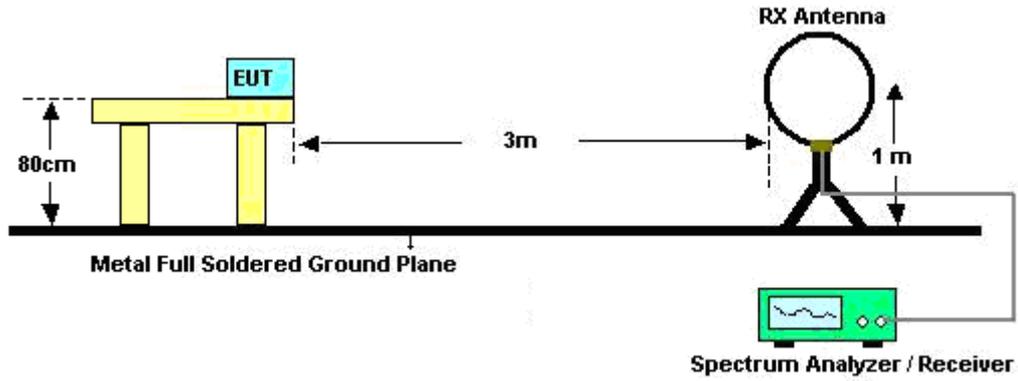
See list of measuring instruments of this test report.

#### 3.7.3 Test Procedures

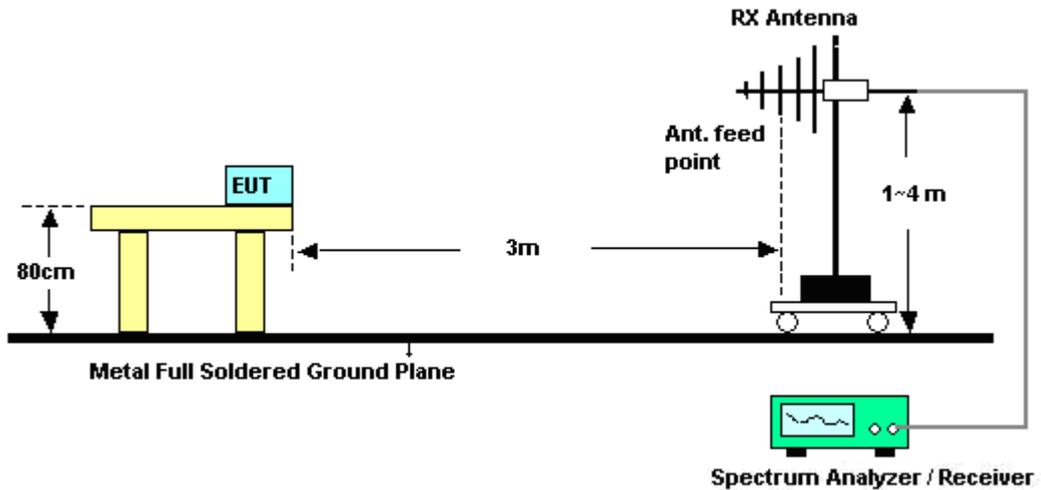
1. The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Use the following spectrum analyzer settings:  
Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for  $f \geq 1$  GHz, 100 kHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold.
3. 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 :	Cona Huang	Temperature :	25~26°C	
		Relative Humidity :	50~53%	
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.

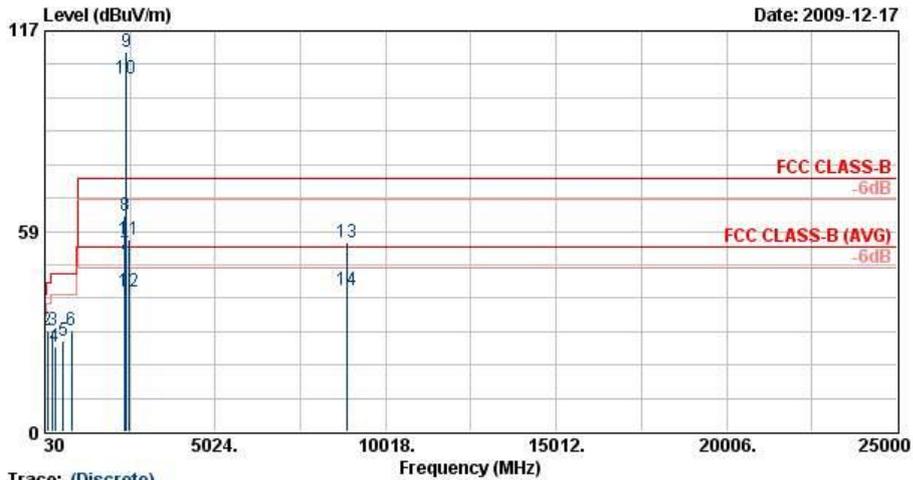
Distance extrapolation factor =  $40 \log(\text{specific distance} / \text{test distance})$  (dB);

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



3.7.6 Test Result of Radiated Emission (30 MHz ~ 10<sup>th</sup> Harmonic)

Test Mode :	Mode 1	Temperature :	25~26°C
Test Channel :	01	Relative Humidity :	50~53%
Test Engineer :	Cona Huang	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		

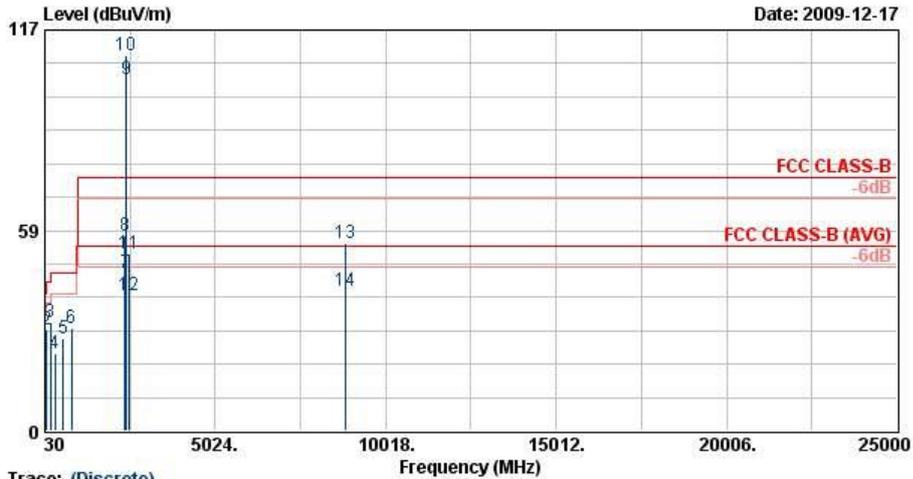


Trace: (Discrete)  
 Site : D3CR07-HY  
 Condition : FCC CLASS-B SHF-EHF HORN\_001208 HORIZONTAL  
 Project : FR 9N1201-01

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark	
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.00	22.26	-17.74	40.00	33.81	19.51	0.64	31.70	---	---	Peak
2	115.05	29.57	-13.93	43.50	48.22	11.78	1.25	31.68	100	229	Peak
3	255.18	29.39	-16.61	46.00	46.10	12.84	1.94	31.49	---	---	Peak
4	330.10	24.93	-21.07	46.00	39.76	14.26	2.26	31.34	---	---	Peak
5	568.10	26.39	-19.61	46.00	34.81	19.46	3.15	31.03	---	---	Peak
6	811.00	29.64	-16.36	46.00	34.14	22.32	3.87	30.70	---	---	Peak
7 !	2385.81	51.82	-2.18	54.00	48.38	32.13	5.46	34.15	107	307	Average
8	2385.81	62.99	-11.01	74.00	59.55	32.13	5.46	34.15	107	307	Peak
9 X	2412.00	111.02			107.58	32.16	5.44	34.16	107	307	Peak
10 @	2412.00	103.01			99.57	32.16	5.44	34.16	107	307	Average
11	2494.00	56.18	-17.82	74.00	52.71	32.30	5.37	34.20	107	307	Peak
12	2494.00	40.98	-13.02	54.00	37.51	32.30	5.37	34.20	107	307	Average
13	8862.00	55.16	-18.84	74.00	43.83	36.21	10.29	35.17	100	28	Peak
14	8862.00	41.48	-12.52	54.00	30.15	36.21	10.29	35.17	100	28	Average



Test Mode :	Mode 1	Temperature :	25~26°C
Test Channel :	01	Relative Humidity :	50~53%
Test Engineer :	Cona Huang	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		

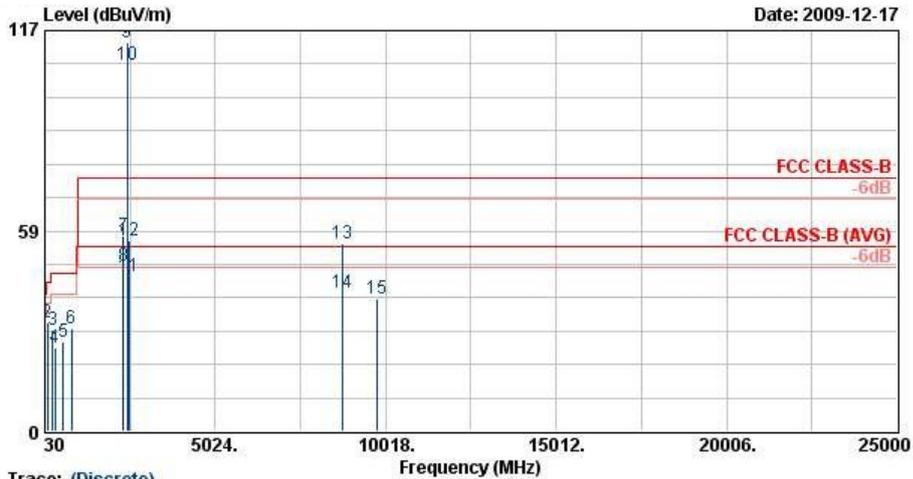


Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC CLASS-B SHF-EHF HORN\_001208 VERTICAL  
 Project : FR 001201-01

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	36.21	27.91	-12.09	40.00	42.73	16.20	0.69	31.70	---	---	Peak
2	92.37	29.54	-13.96	43.50	50.95	9.17	1.12	31.70	---	---	Peak
3	203.61	31.62	-11.88	43.50	52.62	8.87	1.72	31.59	110	112	Peak
4	330.10	22.41	-23.59	46.00	37.23	14.26	2.26	31.34	---	---	Peak
5	568.10	26.90	-19.10	46.00	35.32	19.46	3.15	31.03	---	---	Peak
6	811.00	29.96	-16.04	46.00	34.46	22.32	3.87	30.70	---	---	Peak
7	2385.81	45.96	-8.04	54.00	42.52	32.13	5.46	34.15	150	299	Average
8	2385.81	57.05	-16.95	74.00	53.61	32.13	5.46	34.15	150	299	Peak
9 X	2412.00	102.44			99.00	32.16	5.44	34.16	150	299	Average
10 X	2412.00	109.54			106.10	32.16	5.44	34.16	150	299	Peak
11	2494.00	51.92	-22.08	74.00	48.45	32.30	5.37	34.20	150	299	Peak
12	2494.00	39.42	-14.58	54.00	35.95	32.30	5.37	34.20	150	299	Average
13	8853.00	54.66	-19.34	74.00	43.33	36.21	10.29	35.17	100	311	Peak
14	8853.00	40.88	-13.12	54.00	29.55	36.21	10.29	35.17	100	311	Average



Test Mode :	Mode 2	Temperature :	25~26°C
Test Channel :	06	Relative Humidity :	50~53%
Test Engineer :	Cona Huang	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		

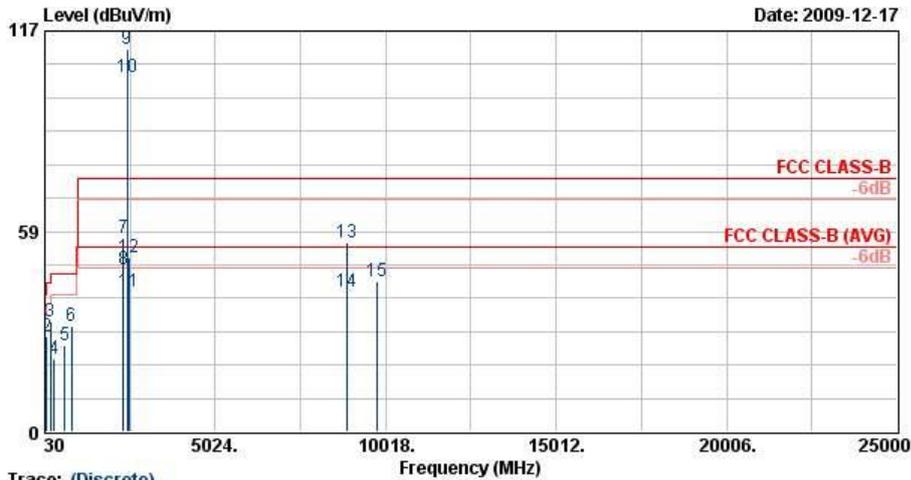


Trace: (Discrete)  
 Site : 03CR07-HY  
 Condition : FCC CLASS-B SHF-EHF HORN\_001208 HORIZONTAL  
 Project : FR 9N1201-01

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.00	22.96	-17.04	40.00	34.51	19.51	0.64	31.70	---	---	Peak
2	115.05	31.73	-11.77	43.50	50.38	11.78	1.25	31.68	100	298	Peak
3	253.29	29.55	-16.45	46.00	46.30	12.81	1.93	31.49	---	---	Peak
4	330.10	24.23	-21.77	46.00	39.05	14.26	2.26	31.34	---	---	Peak
5	568.10	26.21	-19.79	46.00	34.63	19.46	3.15	31.03	---	---	Peak
6	811.00	29.92	-16.08	46.00	34.42	22.32	3.87	30.70	---	---	Peak
7	2334.00	57.02	-16.98	74.00	53.61	32.02	5.51	34.13	102	309	Peak
8 !	2334.00	48.35	-5.65	54.00	44.94	32.02	5.51	34.13	102	309	Average
9 X	2437.00	113.66			110.20	32.22	5.41	34.17	102	309	Peak
10 @	2437.00	107.02			103.56	32.22	5.41	34.17	102	309	Average
11	2486.00	45.13	-8.87	54.00	41.66	32.27	5.38	34.19	102	309	Average
12	2486.00	55.65	-18.35	74.00	52.19	32.27	5.38	34.19	102	309	Peak
13	8733.00	54.97	-19.03	74.00	43.72	36.14	10.25	35.15	100	167	Peak
14	8733.00	40.62	-13.38	54.00	29.37	36.14	10.25	35.15	100	167	Average
15	9748.00	38.66	-35.34	74.00	73.03	-9.87	10.81	35.30	100	0	Peak



Test Mode :	Mode 2	Temperature :	25~26°C
Test Channel :	06	Relative Humidity :	50~53%
Test Engineer :	Cona Huang	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		

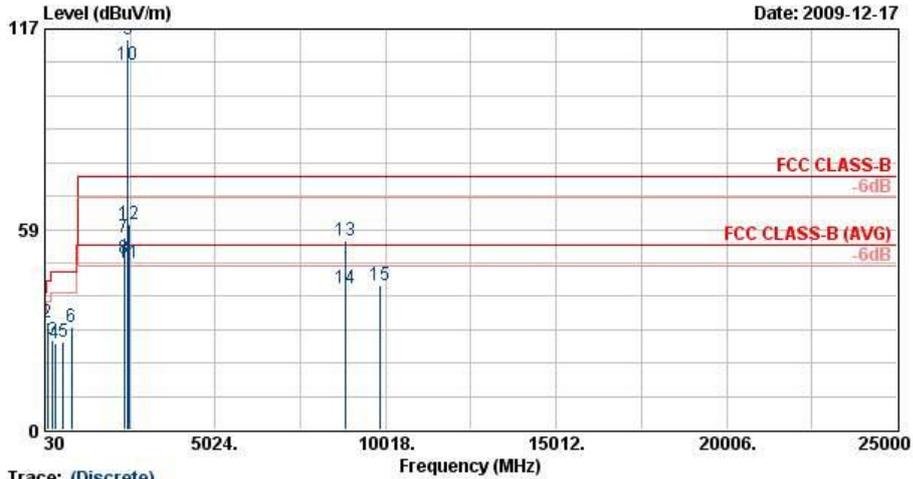


Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC CLASS-B SHF-EHF HORN\_001208 VERTICAL  
 Project : FR 001201-01

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	36.21	27.30	-12.70	40.00	42.11	16.20	0.69	31.70	---	---	Peak
2	94.53	27.69	-15.81	43.50	48.64	9.61	1.14	31.70	---	---	Peak
3	203.61	32.38	-11.12	43.50	53.39	8.87	1.72	31.59	121	100	Peak
4	307.00	21.18	-24.82	46.00	36.73	13.67	2.16	31.38	---	---	Peak
5	615.70	25.39	-20.61	46.00	32.88	20.19	3.30	30.98	---	---	Peak
6	811.00	30.73	-15.27	46.00	35.24	22.32	3.87	30.70	---	---	Peak
7	2332.00	56.70	-17.30	74.00	53.29	32.02	5.51	34.13	100	291	Peak
8	2332.00	47.31	-6.69	54.00	43.90	32.02	5.51	34.13	100	291	Average
9 X	2437.00	111.62			108.16	32.22	5.41	34.17	100	291	Peak
10 @	2437.00	103.57			100.11	32.22	5.41	34.17	100	291	Average
11	2484.00	41.07	-12.93	54.00	37.60	32.27	5.38	34.19	100	291	Average
12	2484.00	50.75	-23.25	74.00	47.28	32.27	5.38	34.19	100	291	Peak
13	8862.00	55.18	-18.82	74.00	43.84	36.21	10.29	35.17	100	121	Peak
14	8862.00	40.78	-13.22	54.00	29.45	36.21	10.29	35.17	100	121	Average
15	9748.00	44.02	-29.98	74.00	78.38	-9.87	10.81	35.30	100	0	Peak



Test Mode :	Mode 3	Temperature :	25~26°C
Test Channel :	11	Relative Humidity :	50~53%
Test Engineer :	Cona Huang	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		

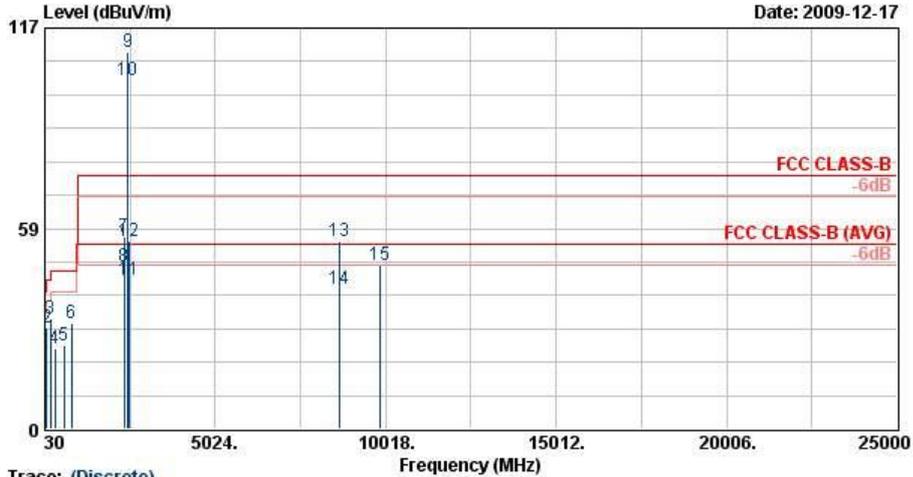


Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC CLASS-B SHF-EHF HORN\_001208 HORIZONTAL  
 Project : FR 0N1201-01

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark	
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.00	22.70	-17.30	40.00	34.25	19.51	0.64	31.70	---	---	Peak
2	112.62	31.50	-12.00	43.50	50.45	11.51	1.23	31.69	133	220	Peak
3	270.30	25.91	-20.09	46.00	42.33	13.05	1.98	31.46	---	---	Peak
4	330.10	25.04	-20.96	46.00	39.87	14.26	2.26	31.34	---	---	Peak
5	568.10	25.71	-20.29	46.00	34.13	19.46	3.15	31.03	---	---	Peak
6	811.00	30.03	-15.97	46.00	34.54	22.32	3.87	30.70	---	---	Peak
7	2358.00	56.18	-17.82	74.00	52.76	32.08	5.49	34.14	104	310	Peak
8 !	2358.00	49.99	-4.01	54.00	46.56	32.08	5.49	34.14	104	310	Average
9 X	2462.00	113.97			110.50	32.24	5.40	34.18	104	310	Peak
10 @	2462.00	106.53			103.07	32.24	5.40	34.18	104	310	Average
11 !	2488.22	48.78	-5.22	54.00	45.30	32.30	5.37	34.19	104	310	Average
12	2488.22	59.95	-14.05	74.00	56.47	32.30	5.37	34.19	104	310	Peak
13	8850.00	55.11	-18.89	74.00	43.78	36.21	10.29	35.17	100	27	Peak
14	8850.00	41.44	-12.56	54.00	30.11	36.21	10.29	35.17	100	27	Average
15	9848.00	42.03	-31.97	74.00	76.08	-9.63	10.89	35.30	100	0	Peak



Test Mode :	Mode 3	Temperature :	25~26°C
Test Channel :	11	Relative Humidity :	50~53%
Test Engineer :	Cona Huang	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		

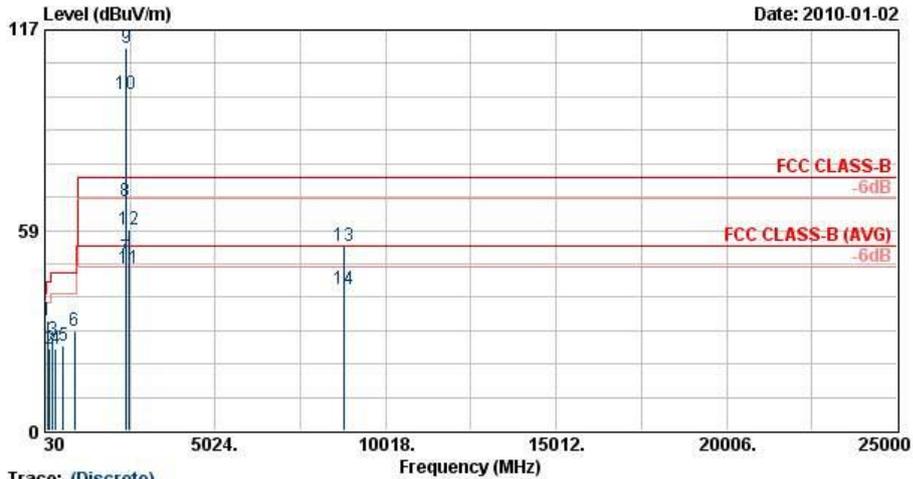


Trace: (Discrete)  
 Site : D3CH07-HY  
 Condition : FCC CLASS-B SHF-EHF HORN\_001208 VERTICAL  
 Project : FR 9N1201-01

	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	dB	cm	deg	
1	35.94	27.21	-12.79	40.00	42.03	16.20	0.69	31.70	---	Peak
2	92.37	29.41	-14.09	43.50	50.82	9.17	1.12	31.70	---	Peak
3	202.53	32.40	-11.10	43.50	53.43	8.85	1.71	31.59	111	320 Peak
4	330.10	23.70	-22.30	46.00	38.52	14.26	2.26	31.34	---	Peak
5	592.60	24.45	-21.55	46.00	32.31	19.92	3.23	31.01	---	Peak
6	811.00	31.01	-14.99	46.00	35.51	22.32	3.87	30.70	---	Peak
7	2358.00	56.17	-17.83	74.00	52.75	32.08	5.49	34.14	100	289 Peak
8	2358.00	47.61	-6.39	54.00	44.18	32.08	5.49	34.14	100	289 Average
9 X	2462.00	109.90			106.43	32.24	5.40	34.18	100	289 Peak
10 X	2462.00	101.89			98.43	32.24	5.40	34.18	100	289 Average
11	2488.98	43.70	-10.30	54.00	40.22	32.30	5.37	34.19	100	289 Average
12	2488.98	54.94	-19.06	74.00	51.46	32.30	5.37	34.19	100	289 Peak
13	8673.00	54.68	-19.32	74.00	43.48	36.10	10.23	35.14	100	157 Peak
14	8673.00	41.07	-12.93	54.00	29.87	36.10	10.23	35.14	100	157 Average
15	9848.00	47.97	-26.03	74.00	82.01	-9.63	10.89	35.30	100	0 Peak



Test Mode :	Mode 4	Temperature :	25~26°C
Test Channel :	01	Relative Humidity :	50~53%
Test Engineer :	Cona Huang	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		



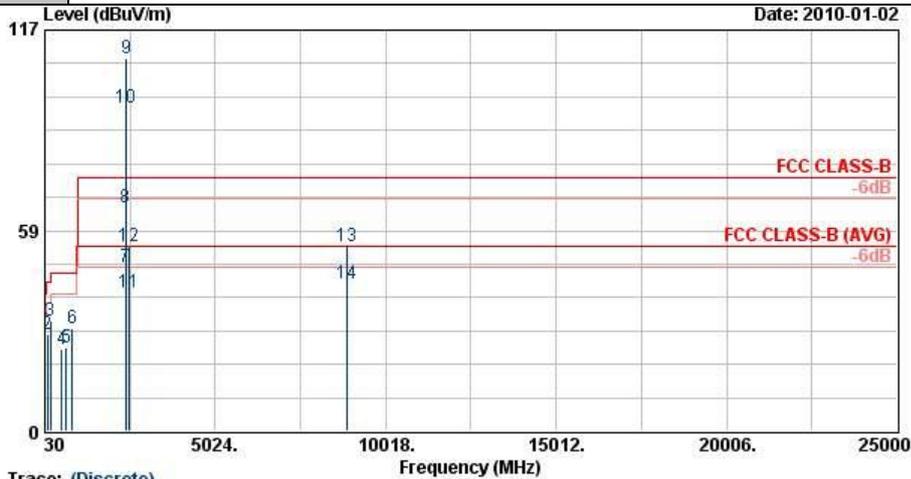
Trace: (Discrete)

Site : 03CH07-RY  
 Condition : FCC CLASS-B SHF-EHF HORN\_091208 HORIZONTAL  
 Project : FR 9N1201-01

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	115.05	32.25	-11.25	43.50	50.91	11.78	1.25	31.68	100	251	Peak
2	163.65	23.81	-19.69	43.50	43.82	10.10	1.53	31.64	---	---	Peak
3	271.38	26.40	-19.60	46.00	42.80	13.07	1.99	31.46	---	---	Peak
4	354.60	24.03	-21.97	46.00	38.03	14.93	2.37	31.29	---	---	Peak
5	568.10	24.88	-21.12	46.00	33.30	19.46	3.15	31.03	---	---	Peak
6	900.60	29.03	-16.97	46.00	32.37	23.19	4.16	30.70	---	---	Peak
7 !	2390.00	50.25	-3.75	54.00	46.82	32.13	5.46	34.16	101	306	Average
8	2390.00	66.87	-7.13	74.00	63.44	32.13	5.46	34.16	101	306	Peak
9 X	2412.00	111.63			108.19	32.16	5.44	34.16	101	306	Peak
10 @	2412.00	98.28			94.84	32.16	5.44	34.16	101	306	Average
11	2494.00	47.44	-6.56	54.00	43.97	32.30	5.37	34.20	101	306	Average
12	2494.00	58.81	-15.19	74.00	55.34	32.30	5.37	34.20	101	306	Peak
13	8814.00	54.04	-19.96	74.00	42.73	36.19	10.28	35.16	110	78	Peak
14	8814.00	41.41	-12.59	54.00	30.10	36.19	10.28	35.16	110	78	Average



Test Mode :	Mode 4	Temperature :	25~26°C
Test Channel :	01	Relative Humidity :	50~53%
Test Engineer :	Cona Huang	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		

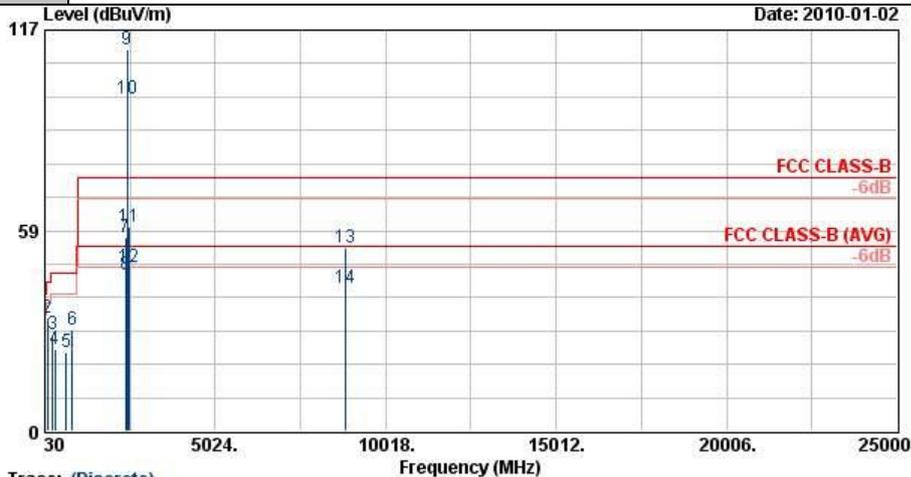


Site : 03CH07-HY  
 Condition : FCC CLASS-B SHF-EHF HORN\_001208 VERTICAL  
 Project : FR 9N1201-01

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	36.21	27.48	-12.52	40.00	42.30	16.20	0.69	31.70	---	---	Peak
2	106.41	28.14	-15.36	43.50	47.66	10.97	1.20	31.69	---	---	Peak
3	200.10	32.02	-11.48	43.50	53.12	8.80	1.70	31.60	123	221	Peak
4	520.50	24.05	-21.95	46.00	33.56	18.57	3.00	31.08	---	---	Peak
5	663.30	24.39	-21.61	46.00	31.33	20.56	3.45	30.94	---	---	Peak
6	841.80	30.00	-16.00	46.00	34.13	22.62	3.94	30.70	---	---	Peak
7 !	2390.00	48.02	-5.98	54.00	44.59	32.13	5.46	34.16	100	290	Average
8	2390.00	65.26	-8.74	74.00	61.83	32.13	5.46	34.16	100	290	Peak
9 X	2412.00	108.73			105.29	32.16	5.44	34.16	100	290	Peak
10 @	2412.00	94.58			91.14	32.16	5.44	34.16	100	290	Average
11	2494.00	40.42	-13.58	54.00	36.95	32.30	5.37	34.20	100	290	Average
12	2494.00	53.81	-20.19	74.00	50.34	32.30	5.37	34.20	100	290	Peak
13	8865.00	53.85	-20.15	74.00	42.51	36.22	10.30	35.17	100	36	Peak
14	8865.00	43.22	-10.78	54.00	31.87	36.22	10.30	35.17	100	36	Average



Test Mode :	Mode 5	Temperature :	25~26°C
Test Channel :	06	Relative Humidity :	50~53%
Test Engineer :	Cona Huang	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		

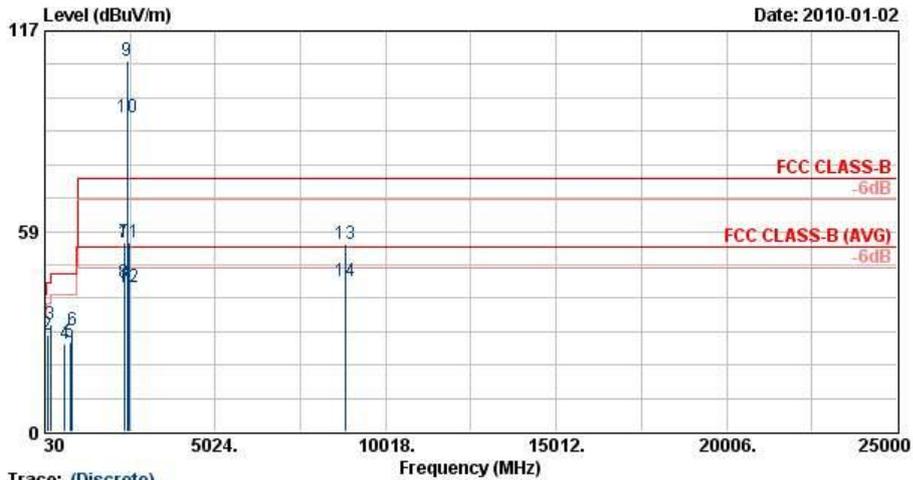


Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC CLASS-B SHF-EHF HORN\_091208 HORIZONTAL  
 Project : FR 9N1201-01

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.54	22.28	-17.72	40.00	34.37	18.95	0.65	31.70	---	---	Peak
2	112.62	32.93	-10.57	43.50	51.88	11.51	1.23	31.69	100	31	Peak
3	250.86	28.34	-17.66	46.00	45.13	12.78	1.92	31.50	---	---	Peak
4	330.10	23.86	-22.14	46.00	38.69	14.26	2.26	31.34	---	---	Peak
5	663.30	23.19	-22.81	46.00	30.12	20.56	3.45	30.94	---	---	Peak
6	841.80	29.75	-16.25	46.00	33.88	22.62	3.94	30.70	---	---	Peak
7	2390.00	56.71	-17.29	74.00	53.28	32.13	5.46	34.16	100	307	Peak
8	2390.00	45.50	-8.50	54.00	42.07	32.13	5.46	34.16	100	307	Average
9 X	2437.00	111.30			107.84	32.22	5.41	34.17	100	307	Peak
10 @	2437.00	96.99			93.53	32.22	5.41	34.17	100	307	Average
11	2484.00	59.50	-14.50	74.00	56.03	32.27	5.38	34.19	100	307	Peak
12	2484.00	47.82	-6.18	54.00	44.35	32.27	5.38	34.19	100	307	Average
13	8817.00	53.71	-20.29	74.00	42.40	36.19	10.28	35.17	120	100	Peak
14	8817.00	41.91	-12.09	54.00	30.60	36.19	10.28	35.17	120	100	Average



Test Mode :	Mode 5	Temperature :	25~26°C
Test Channel :	06	Relative Humidity :	50~53%
Test Engineer :	Cona Huang	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		

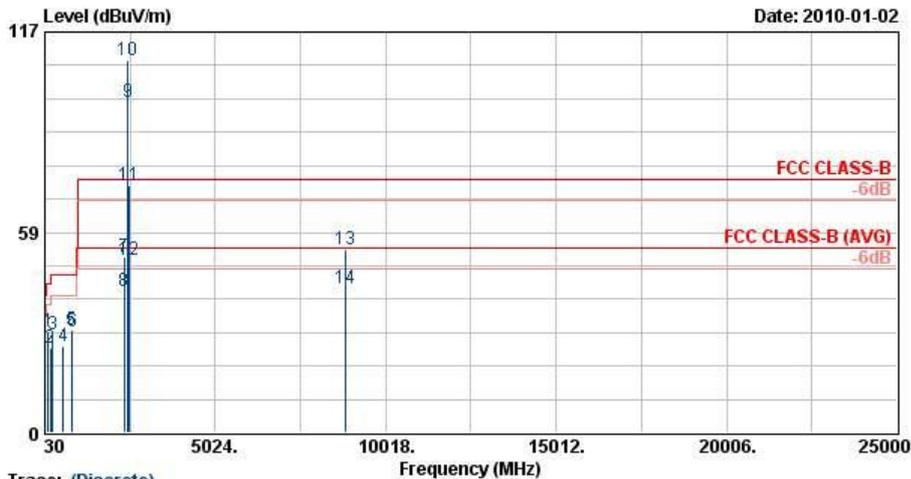


Trace: (Discrete)  
 Site : D3CH07-HY  
 Condition : FCC CLASS-B SHF-EHF HORN\_001208 VERTICAL  
 Project : FR 9N1201-01

	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	38.37	25.97	-14.03	40.00	42.36	14.59	0.72	31.70	---	---	Peak
2	112.62	28.44	-15.06	43.50	47.38	11.51	1.23	31.69	---	---	Peak
3	201.18	31.25	-12.25	43.50	52.33	8.82	1.70	31.60	105	100	Peak
4	615.70	25.77	-20.23	46.00	33.26	20.19	3.30	30.98	---	---	Peak
5	761.30	26.06	-19.94	46.00	31.41	21.68	3.73	30.78	---	---	Peak
6	841.80	29.68	-16.32	46.00	33.81	22.62	3.94	30.70	---	---	Peak
7	2350.00	55.10	-18.90	74.00	51.69	32.05	5.50	34.14	100	290	Peak
8	2350.00	43.60	-10.40	54.00	40.19	32.05	5.50	34.14	100	290	Average
9 X	2437.00	108.29			104.83	32.22	5.41	34.17	100	290	Peak
10 @	2437.00	91.81			88.35	32.22	5.41	34.17	100	290	Average
11	2484.00	55.18	-18.82	74.00	51.71	32.27	5.38	34.19	100	290	Peak
12	2484.00	42.09	-11.91	54.00	38.62	32.27	5.38	34.19	100	290	Average
13	8841.00	54.59	-19.41	74.00	43.27	36.20	10.29	35.17	100	105	Peak
14	8841.00	44.00	-10.00	54.00	32.68	36.20	10.29	35.17	100	105	Average



Test Mode :	Mode 6	Temperature :	25~26°C
Test Channel :	11	Relative Humidity :	50~53%
Test Engineer :	Cona Huang	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		



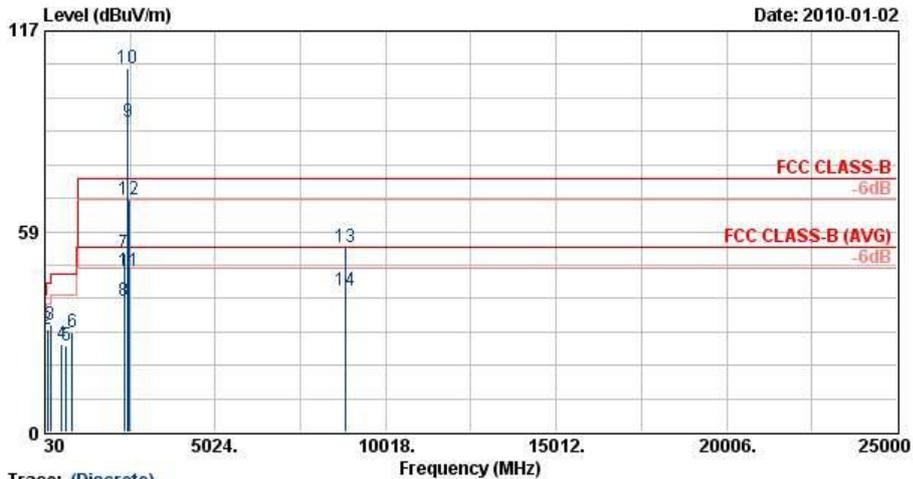
Trace: (Discrete)

Site : 03CH07-HY  
 Condition : FCC CLASS-B SHF-EHF HORN\_091208 HORIZONTAL  
 Project : FR 9N1201-01

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	118.29	29.42	-14.08	43.50	47.78	12.05	1.27	31.68	100	321	Peak
2	187.41	24.66	-18.84	43.50	45.67	8.96	1.65	31.61	---	---	Peak
3	252.48	28.60	-17.40	46.00	45.37	12.80	1.93	31.50	---	---	Peak
4	568.10	25.43	-20.57	46.00	33.85	19.46	3.15	31.03	---	---	Peak
5	811.00	29.83	-16.17	46.00	34.33	22.32	3.87	30.70	---	---	Peak
6	841.80	29.61	-16.39	46.00	33.75	22.62	3.94	30.70	---	---	Peak
7	2358.00	51.15	-22.85	74.00	47.73	32.08	5.49	34.14	104	308	Peak
8	2358.00	41.41	-12.59	54.00	37.98	32.08	5.49	34.14	104	308	Average
9 X	2462.00	96.77			93.31	32.24	5.40	34.18	104	308	Average
10 X	2462.00	108.61			105.14	32.24	5.40	34.18	104	308	Peak
11 !	2483.85	72.18	-1.82	74.00	68.71	32.27	5.38	34.19	104	308	Peak
12 !	2483.85	50.60	-3.40	54.00	47.13	32.27	5.38	34.19	104	308	Average
13	8820.00	53.47	-20.53	74.00	42.17	36.19	10.28	35.17	100	205	Peak
14	8820.00	42.21	-11.79	54.00	30.90	36.19	10.28	35.17	100	205	Average



Test Mode :	Mode 6	Temperature :	25~26°C
Test Channel :	11	Relative Humidity :	50~53%
Test Engineer :	Cona Huang	Polarization :	Vertical
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		



Trace: (Discrete)

Site : 03CH07-HY  
 Condition : FCC CLASS-B SHF-EHF HORN\_091208 VERTICAL  
 Project : FR 9N1201-01

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.00	26.88	-13.12	40.00	38.43	19.51	0.64	31.70	---	---	Peak
2	112.62	30.05	-13.45	43.50	49.00	11.51	1.23	31.69	---	---	Peak
3	193.89	31.39	-12.11	43.50	52.45	8.87	1.68	31.61	100	25	Peak
4	520.50	25.86	-20.14	46.00	35.37	18.57	3.00	31.08	---	---	Peak
5	663.30	25.35	-20.65	46.00	32.29	20.56	3.45	30.94	---	---	Peak
6	841.80	29.31	-16.69	46.00	33.44	22.62	3.94	30.70	---	---	Peak
7	2358.00	52.21	-21.79	74.00	48.78	32.08	5.49	34.14	118	288	Peak
8	2358.00	38.10	-15.90	54.00	34.67	32.08	5.49	34.14	118	288	Average
9 X	2462.00	90.55			87.09	32.24	5.40	34.18	118	288	Average
10 X	2462.00	106.02			102.55	32.24	5.40	34.18	118	288	Peak
11	2483.85	46.84	-7.16	54.00	43.37	32.27	5.38	34.19	118	288	Average
12 !	2483.85	68.04	-5.96	74.00	64.57	32.27	5.38	34.19	118	288	Peak
13	8817.00	53.96	-20.04	74.00	42.65	36.19	10.28	35.17	110	30	Peak
14	8817.00	41.20	-12.80	54.00	29.89	36.19	10.28	35.17	110	30	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)
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. 17, 2008	Dec. 16, 2009	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32 dB.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)
System Simulator	R&S	CMU200	117997	N/A	May 14, 2009	May 13, 2011	-

## 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
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>1.13</b>		
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>2.26</b>		

### 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
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>1.27</b>		
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>2.54</b>		

**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
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>2.36</b>				
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>4.72</b>				

## 6 Certification of TAF Accreditation



Certificate No. : L1190-091230

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**

<b>Accreditation Criteria</b>	: ISO/IEC 17025:2005
<b>Accreditation Number</b>	: 1190
<b>Originally Accredited</b>	: December 15, 2003
<b>Effective Period</b>	: January 10, 2010 to January 09, 2013
<b>Accredited Scope</b>	: Testing Field, see described in the Appendix
<b>Specific Accreditation Program</b>	: Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory Accreditation Program for BSMI Mutual Recognition Arrangement with Foreign Authorities

  
Jay-San Chen  
President, Taiwan Accreditation Foundation  
Date : December 30, 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 EP9N1201-01 as below.