

FCC RF Test Report

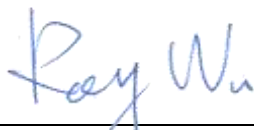
APPLICANT : Acer Inc.
EQUIPMENT : WLAN Module
BRAND NAME : Acer, Gateway, PackardBell
MODEL NAME : BCM94312HMG
FCC ID : HLZ-BRCM1030
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Transmission System (DTS)

The product was installed into Notebook Computer (Brand Name: Acer, Gateway, PackardBell, Model Name: NAV50, NAV60) during the test.

The product was received on Oct. 21, 2009 and completely tested on Nov. 15, 2009. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown 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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SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(d)	A8.5	Frequency Band Edges	$\leq 20\text{dBc}$	Pass	-
3.2	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 7.3 dB at 23.126 MHz
3.3	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.14 dB at 327.30 MHz
3.4	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

Acer Inc.

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

1.2 Manufacturer

1. Compal Electronics (China) Co., Ltd.

No. 988, Tong Feng East Rd., Kunshan Economics & Technical Development Zone, Kunshan, Jiangsu, P.R. China

2. Compal Information (Kunshan) Co., Ltd.

The Third Street, Kunshan Export Processing Zone, Jiangsu, P.R. China

3. Compal Information Technology (Kunshan) Co., Ltd.

No. 58, The 1st Street, Kunshan Export Processing Zone, Jiangsu, P.R. China

4. Compal Electronics Technology (Kunshan) Co., Ltd.

No. 25, The Third Street, Kunshan Export Processing Zone, Jiangsu, P.R. China

5. Kunshang Botai Electronics Co., Ltd.

No. 988, Tong Feng East Rd., Kunshan Economic & Technical Development Zone, Kunshan, Jiangsu, P.R. China

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	WLAN Module
Brand Name	Acer, Gateway, PackardBell
Model Name	BCM94312HMG
FCC ID	HLZ-BRCM1030
Host (Notebook Computer)	Brand Name : Acer, Gateway, PackardBell Model Name : NAV50, NAV60 HW Version : L02 (MB) SW Version : V0.07_ClkGen (BIOS)
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz
Channel Spacing	5 MHz
Type of Antenna Connector	IPEX
Antenna Type	Main Antenna : PIFA Antenna with gain -2.68 dBi Aux. Antenna : PIFA Antenna with gain -2.92 dBi
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Production Unit

Remark: This test report recorded only product characteristics and test results of Digital Transmission System (DTS).

List of Accessory for Host (Notebook Computer):

Specification of Accessory		
AC Adapter	Brand Name	HIPRO
	Model Name	HP-A0301R3
	Power Rating	I/P:100-240Vac, 50-60Hz, 1A; O/P: 19Vdc, 1.58A, 30W
	DC Power Cord Type	1.5 meter shielded cable without ferrite core
Battery	Brand Name	Panasonic
	Model Name	UM09G51
	Power Rating	10.8Vdc, 2200mAh, 24Wh
	Type	Li-ion
Bluetooth Module	Brand Name	FOXCONN
	Model Name	BCM92046

Remark: The above information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description of the host (Notebook Computer).

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	03CH06-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.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
2.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
4.	Earphone	Ergotech	ET-E200	FCC DoC	Unshielded, 1.8 m	N/A
5.	Earphone	Sampo	EK-Y652CS	FCC DoC	Shielded, 1.8 m	N/A
6.	USB Cable	Apple	N/A	N/A	Shielded, 1.0 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:

Channel	Frequency (MHz)	2.4GHz 802.11b RF Power (dBm)			
		At DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	17.70	17.83	18.99	20.38
CH 06	2437 MHz	17.67	17.85	19.10	20.48
CH 11	2462 MHz	17.36	17.85	18.98	20.31

Channel	Frequency (MHz)	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	21.27	21.23	21.29	21.06	21.47	21.53	21.56	21.61
CH 06	2437 MHz	22.78	22.67	22.64	22.48	22.90	22.69	22.94	23.00
CH 11	2462 MHz	19.97	19.93	19.93	19.88	20.30	20.17	20.24	20.12

Remark: 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).

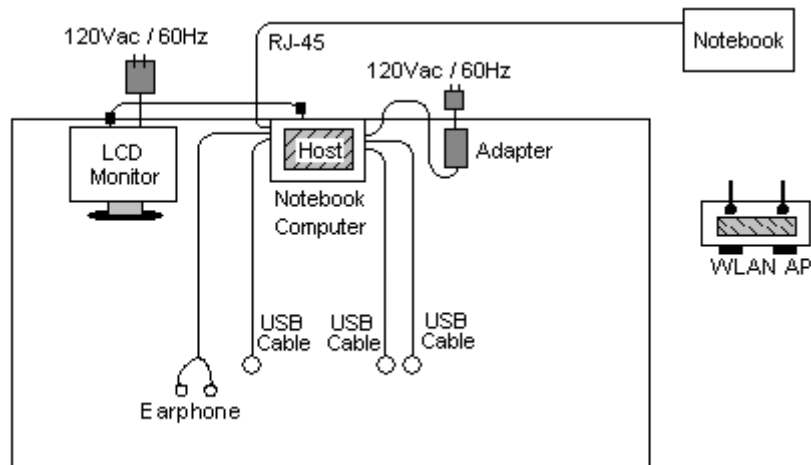
Pre-scanned tests were conducted to determine the final configuration from all possible combinations.

The following table is showing the total pre-scanned test modes, and the worst modes are recorded in this report only.

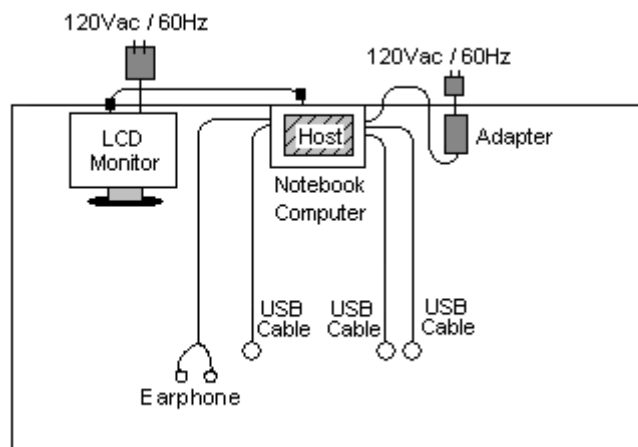
Test Cases	
Test Item	802.11b (Modulation : DSSS) 802.11g (Modulation : OFDM)
Radiated TCs	Mode 1: 802.11b_CH01_2412 MHz Mode 2: 802.11b_CH06_2437 MHz Mode 3: 802.11b_CH11_2462 MHz Mode 4: 802.11g_CH01_2412 MHz Mode 5: 802.11g_CH06_2437 MHz Mode 6: 802.11g_CH11_2462 MHz
AC Conducted Emission	WLAN Link + TC + Adapter
Remark: <ol style="list-style-type: none">1. TC stands for Test Configuration, and consists of USB cable, LCD monitor, earphone, and RJ-45.2. Only the radiated emission and conducted emission tests of the WLAN Module on this Notebook Computer was performed in this report and the conducted test cases can be referred to the integrated WLAN module (Brand Name: Broadcom / Model Name: BCM94312HMG / FCC ID: QDS-BRCM1030 / CCS Report No. 07U11426-1A) report.	

2.3 Connection Diagram of Test System

<Conducted Emission Test>



<Radiated Emission Test>



Note: The EUT is a WLAN module which was installed into the host notebook computer (Brand Name: Acer, Gateway, PackardBell, Model Name: NAV50, NAV60) during the test.

2.4 RF Utility

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



3 Test Result

3.1 Band Edges Measurement

3.1.1 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.

3.1.2 Measuring Instruments

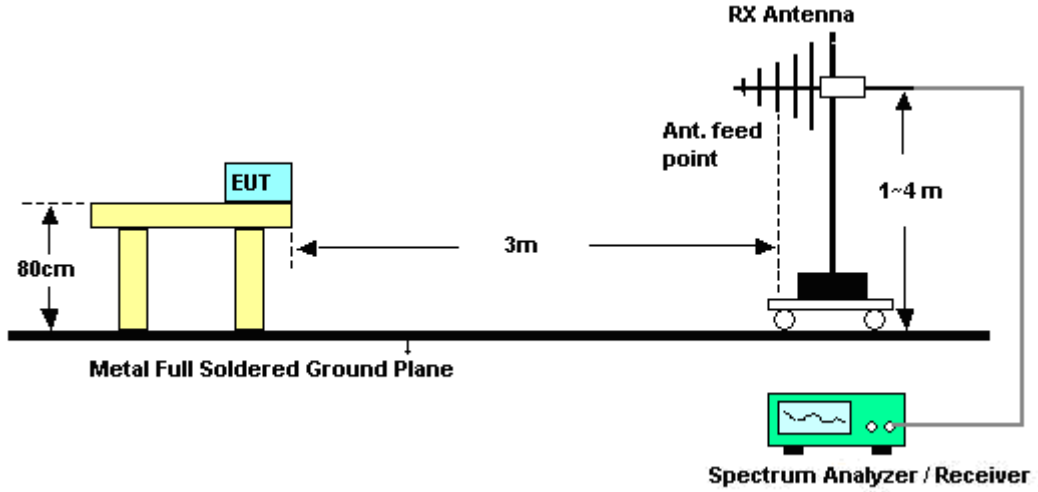
See list of measuring instruments of this test report.

3.1.3 Test Procedures

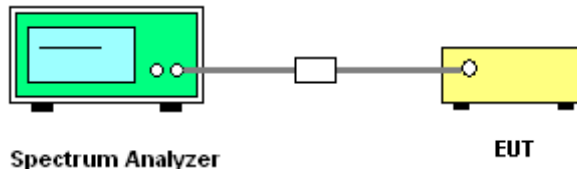
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 1 MHz, Video bandwidth (VBW) > RBW. Band edge emissions must be at least 20 dB below the highest emission level within the authorized band as measured with a 1 MHz RBW. Note: If the output power of this device was measured by power meter, 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).

3.1.4 Test Setup

<Radiated Band Edges>



<Conducted Band Edges>





3.1.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	22~23°C
Test Band :	802.11b	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Mac Lin

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
2387.90	40.28	-13.72	54.00	40.78	31.86	3.92	36.28	129	4	Average
2387.90	63.05	-10.95	74.00	63.55	31.86	3.92	36.28	129	4	Peak

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
2388.85	57.46	-16.54	74.00	57.96	31.86	3.92	36.28	100	301	Peak
2388.85	36.85	-17.15	54.00	37.35	31.86	3.92	36.28	100	301	Average

Test Mode :	Mode 3	Temperature :	22~23°C
Test Band :	802.11b	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Mac Lin

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
2484.42	61.68	-12.32	74.00	61.95	31.98	4.05	36.30	100	11	Peak
2484.42	37.03	-16.97	54.00	37.30	31.98	4.05	36.30	100	11	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
2483.66	62.24	-11.76	74.00	62.51	31.98	4.05	36.29	105	357	Peak
2483.66	37.86	-16.14	54.00	38.13	31.98	4.05	36.29	105	357	Average



Test Mode :	Mode 4	Temperature :	22~23°C
Test Band :	802.11g	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Mac Lin

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
2389.61	62.73	-11.27	74.00	63.23	31.86	3.92	36.28	100	28	Peak
2389.61	38.88	-15.12	54.00	39.38	31.86	3.92	36.28	100	28	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
2389.99	58.59	-15.41	74.00	59.09	31.86	3.92	36.28	100	301	Peak
2389.99	34.70	-19.30	54.00	35.20	31.86	3.92	36.28	100	301	Average

Test Mode :	Mode 6	Temperature :	22~23°C
Test Band :	802.11g	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Mac Lin

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	58.02	-15.98	74.00	58.29	31.98	4.05	36.30	100	355	Peak
2483.50	34.11	-19.89	54.00	34.38	31.98	4.05	36.30	100	355	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	62.13	-11.87	74.00	62.40	31.98	4.05	36.30	104	360	Peak
2483.50	36.03	-17.97	54.00	36.30	31.98	4.05	36.30	104	360	Average



3.2 AC Conducted Emission Measurement

3.2.1 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.

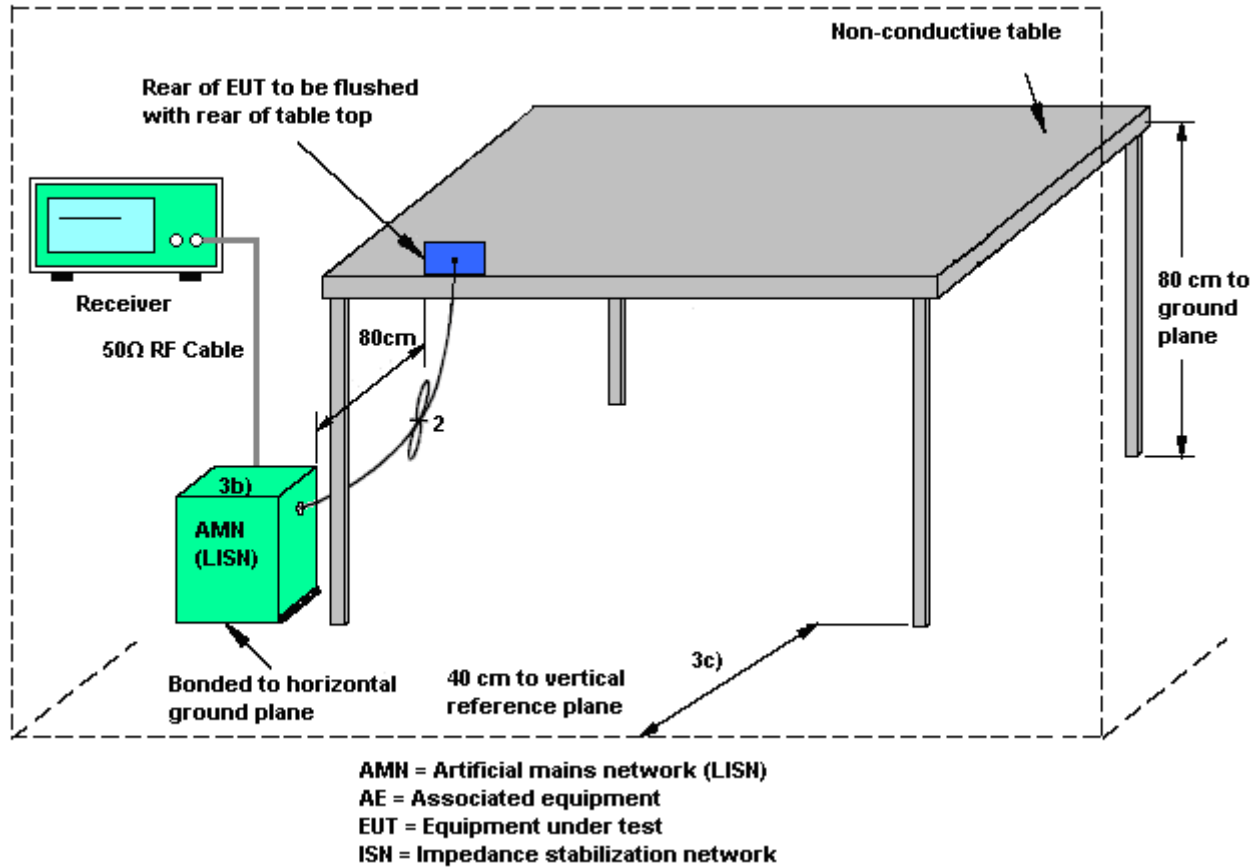
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 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.

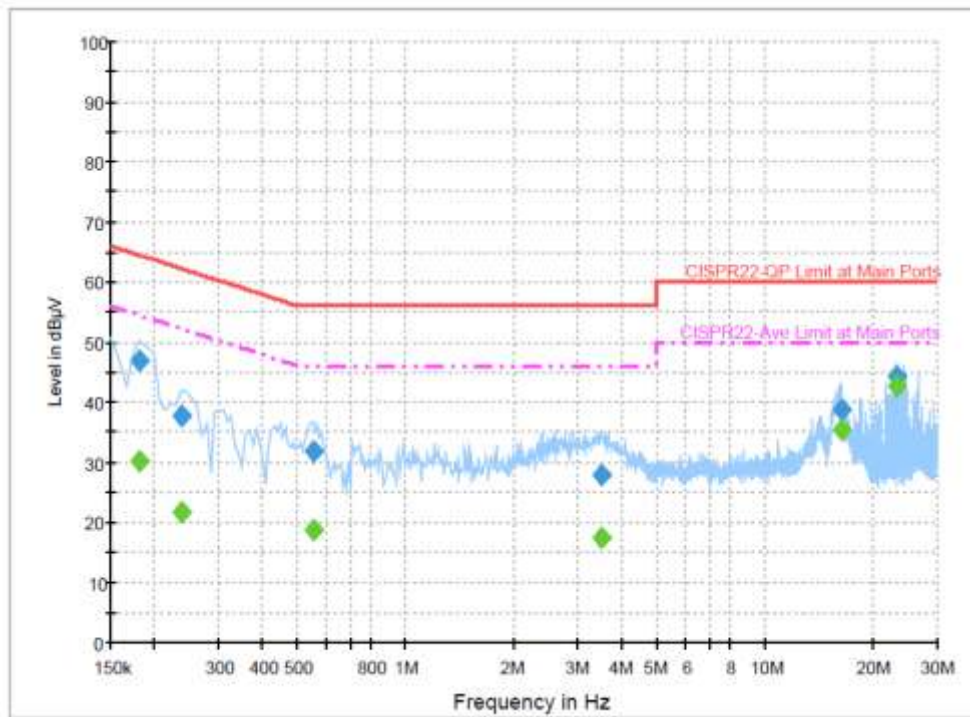
3.2.4 Test Setup





3.2.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Hayden Wu	Relative Humidity :	54~57%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN Link + TC + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

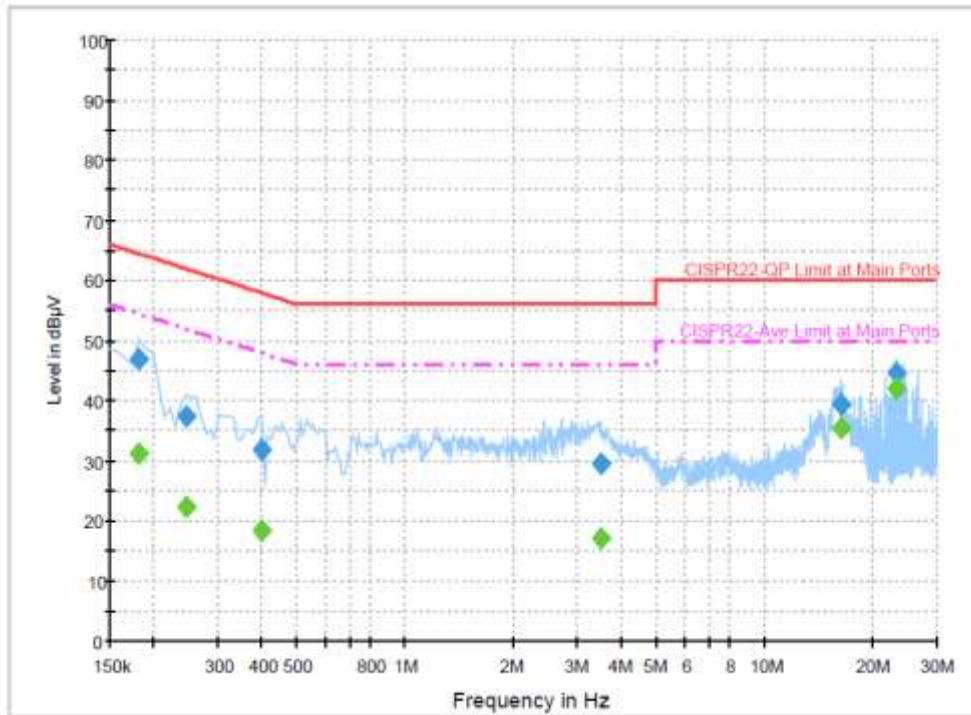
Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	46.8	Off	L1	19.5	17.6	64.4
0.238000	37.6	Off	L1	19.6	24.6	62.2
0.550000	31.8	Off	L1	19.5	24.2	56.0
3.478000	27.8	Off	L1	19.5	28.2	56.0
16.230000	38.8	Off	L1	19.7	21.2	60.0
23.126000	44.4	Off	L1	19.8	15.6	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	30.3	Off	L1	19.5	24.1	54.4
0.238000	21.6	Off	L1	19.6	30.6	52.2
0.550000	18.6	Off	L1	19.5	27.4	46.0
3.478000	17.3	Off	L1	19.5	28.7	46.0
16.230000	35.4	Off	L1	19.7	14.6	50.0
23.126000	42.7	Off	L1	19.8	7.3	50.0



Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Hayden Wu	Relative Humidity :	54~57%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN 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)
0.182000	46.7	Off	N	19.5	17.7	64.4
0.246000	37.3	Off	N	19.6	24.6	61.9
0.398000	31.8	Off	N	19.5	26.1	57.9
3.486000	29.6	Off	N	19.5	26.4	56.0
16.230000	39.4	Off	N	19.8	20.6	60.0
23.126000	44.5	Off	N	19.9	15.5	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	31.1	Off	N	19.5	23.3	54.4
0.246000	22.3	Off	N	19.6	29.6	51.9
0.398000	18.3	Off	N	19.5	29.6	47.9
3.486000	17.0	Off	N	19.5	29.0	46.0
16.230000	35.3	Off	N	19.8	14.7	50.0
23.126000	42.0	Off	N	19.9	8.0	50.0



3.3 Radiated Emission Measurement

3.3.1 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

3.3.2 Measuring Instruments

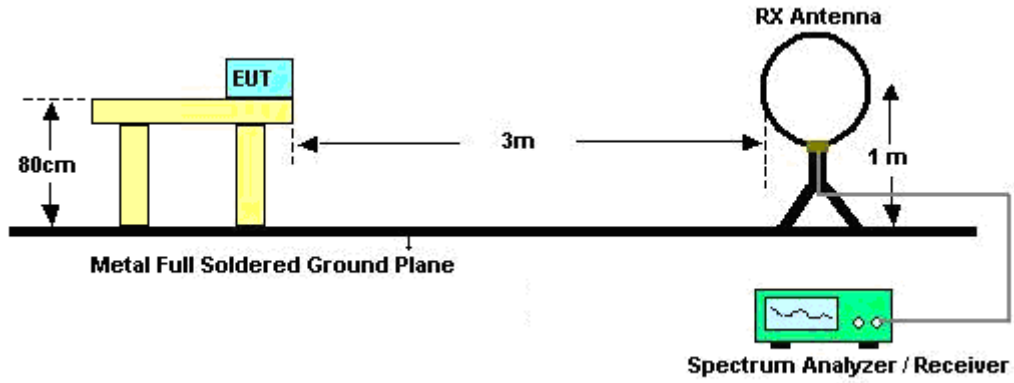
See list of measuring instruments of this test report.

3.3.3 Test Procedures

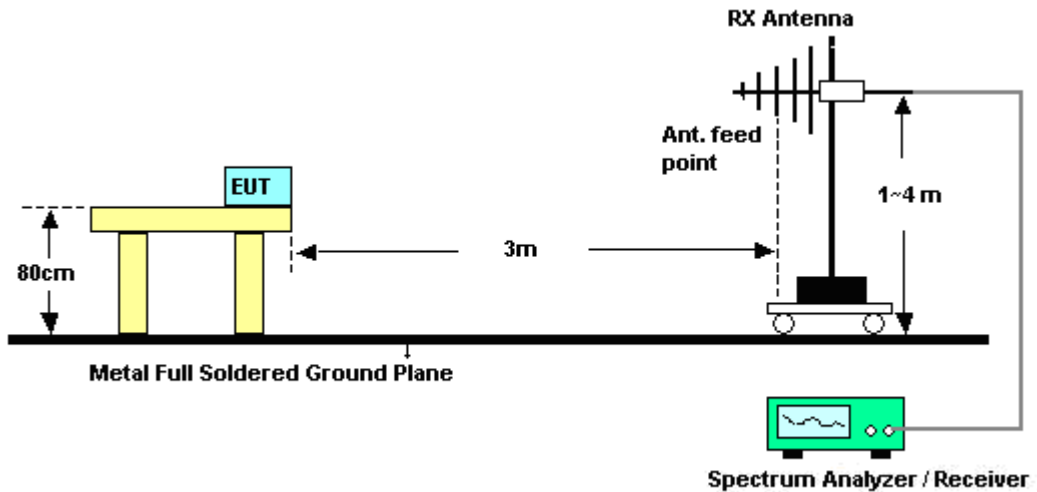
1. The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Use the following spectrum analyzer settings:
Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW \geq RBW; Sweep = auto; 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.

3.3.4 Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz





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

Test Engineer :	Mac Lin	Temperature :	22~23°C	
		Relative Humidity :	47~48%	
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.

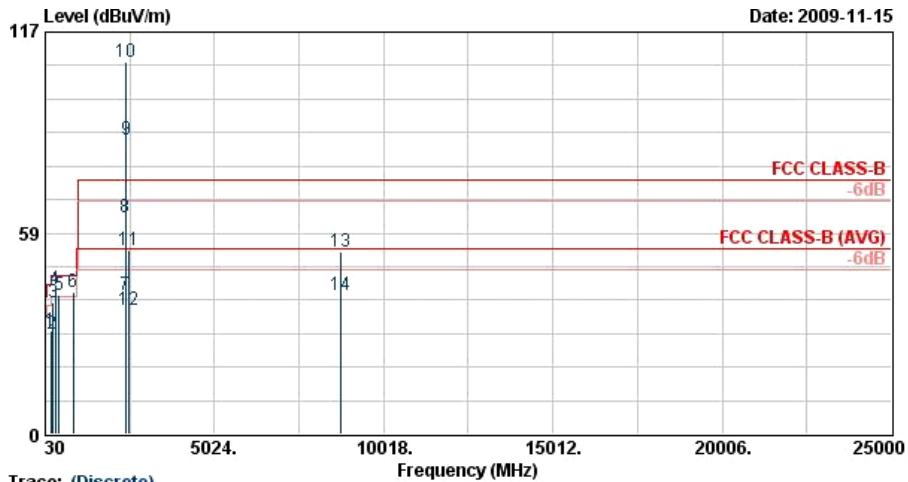
Distance extrapolation factor = $40 \log(\text{specific distance} / \text{test distance})$ (dB);

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



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

Test Mode :	Mode 1	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		

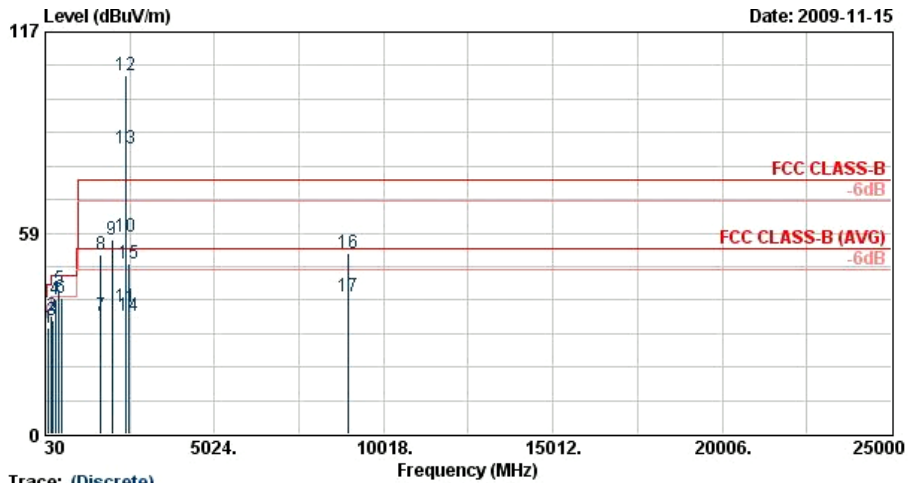


Trace: (Discrete)
 Site : 03CH06-HV
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
 Project : FR 902108-02
 Memo : Mode 1

	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	196.59	29.94	-13.56	43.50	51.30	8.35	2.38	32.08	---	---	Peak
2	216.03	29.35	-16.65	46.00	50.06	8.82	2.49	32.02	---	---	Peak
3	261.93	38.11	-7.89	46.00	54.75	12.47	2.77	31.87	---	---	Peak
4 !	327.30	42.32	-3.68	46.00	57.25	13.80	3.17	31.90	100	133	Peak
5 !	434.40	40.26	-5.74	46.00	52.28	16.29	3.68	31.99	---	---	Peak
6 !	864.90	41.35	-4.65	46.00	47.67	20.50	5.36	32.18	---	---	Peak
7	2387.90	40.28	-13.72	54.00	40.78	31.86	3.92	36.28	129	4	Average
8	2387.90	63.05	-10.95	74.00	63.55	31.86	3.92	36.28	129	4	Peak
9 @	2412.00	85.68			86.13	31.88	3.95	36.28	129	4	Average
10 @	2412.00	108.39			108.84	31.88	3.95	36.28	129	4	Peak
11	2486.00	53.43	-20.57	74.00	53.70	31.98	4.05	36.30	129	4	Peak
12	2486.00	35.94	-18.06	54.00	36.21	31.98	4.05	36.30	129	4	Average
13	8742.00	52.87	-21.13	74.00	46.28	35.89	7.50	36.80	100	281	Peak
14	8742.00	40.28	-13.72	54.00	33.69	35.89	7.50	36.80	100	281	Average



Test Mode :	Mode 1	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Vertical
Remark :	1. #9 signal is not in the restricted band. 2. #12 and #13 are Fundamental Signals which can be ignored.		

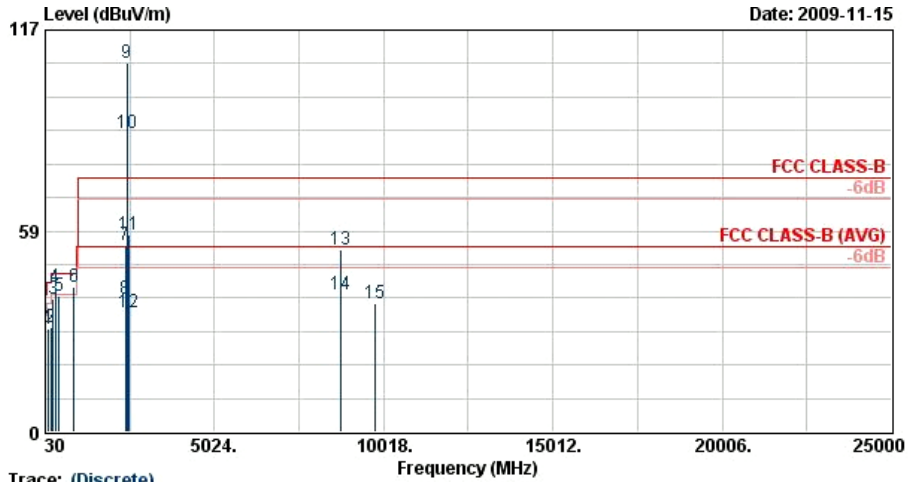


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
 Project : FR 902108-02
 Memo : Mode 1

	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	130.98	30.92	-12.58	43.50	49.19	11.59	1.84	31.69	---	---	Peak
2	216.84	34.31	-11.69	46.00	54.94	8.86	2.49	31.99	---	---	Peak
3	247.89	32.85	-13.15	46.00	49.94	12.03	2.68	31.80	---	---	Peak
4	327.30	39.34	-6.66	46.00	54.28	13.80	3.17	31.90	---	---	Peak
5 !	432.30	42.19	-3.81	46.00	54.25	16.26	3.67	31.99	100	147	Peak
6	495.30	39.45	-6.55	46.00	50.17	17.39	3.95	32.07	---	---	Peak
7	1662.00	34.41	-19.59	54.00	38.70	29.10	3.01	36.41	100	169	Average
8	1662.00	52.11	-21.89	74.00	56.40	29.10	3.01	36.41	100	169	Peak
9	1996.00	56.48			57.98	31.30	3.40	36.20	100	0	Peak
10	2388.85	57.46	-16.54	74.00	57.96	31.86	3.92	36.28	100	301	Peak
11	2388.85	36.85	-17.15	54.00	37.35	31.86	3.92	36.28	100	301	Average
12 @	2412.00	104.52			104.97	31.88	3.95	36.28	100	301	Peak
13 X	2412.00	83.02			83.47	31.88	3.95	36.28	100	301	Average
14	2492.00	34.56	-19.44	54.00	34.81	32.00	4.05	36.30	100	301	Average
15	2492.00	49.47	-24.53	74.00	49.72	32.00	4.05	36.30	100	301	Peak
16	8952.00	52.83	-21.17	74.00	45.91	36.06	7.74	36.88	100	257	Peak
17	8952.00	40.09	-13.91	54.00	33.17	36.06	7.74	36.88	100	257	Average



Test Mode :	Mode 2	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		



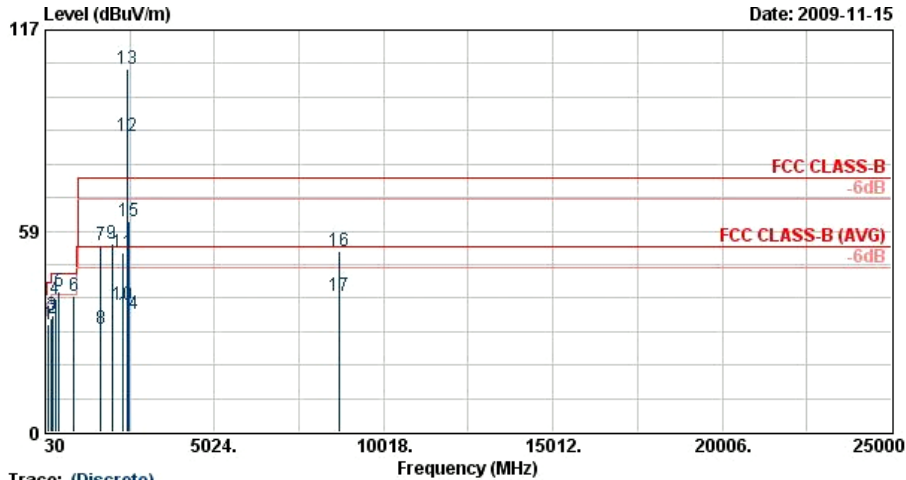
Trace: (Discrete)

Site : 03CH06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
 Project : FR 902108-02
 Memo : Mode 2

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	130.98	29.94	-13.56	43.50	48.21	11.59	1.84	31.69	---	---	Peak
2	196.59	30.38	-13.12	43.50	51.74	8.35	2.38	32.08	---	---	Peak
3	257.34	38.50	-7.50	46.00	55.22	12.39	2.73	31.84	---	---	Peak
4 !	327.30	42.00	-4.00	46.00	56.94	13.80	3.17	31.90	---	---	Peak
5	432.30	39.58	-6.42	46.00	51.63	16.26	3.67	31.99	---	---	Peak
6 !	868.40	42.20	-3.80	46.00	48.45	20.52	5.36	32.13	100	244	Peak
7	2390.00	54.32	-19.68	74.00	54.82	31.86	3.92	36.28	163	43	Peak
8	2390.00	38.89	-15.11	54.00	39.39	31.86	3.92	36.28	163	43	Average
9 @	2437.00	107.27			107.64	31.93	3.99	36.29	163	43	Peak
10 @	2437.00	86.91			87.28	31.93	3.99	36.29	163	43	Average
11	2494.00	57.50	-16.50	74.00	57.75	32.00	4.05	36.30	163	43	Peak
12	2494.00	34.91	-19.09	54.00	35.16	32.00	4.05	36.30	163	43	Average
13	8757.00	52.92	-21.08	74.00	46.31	35.90	7.50	36.80	100	79	Peak
14	8757.00	40.19	-13.81	54.00	33.59	35.90	7.50	36.80	100	79	Average
15	9748.00	37.31	-36.69	74.00	76.44	-10.02	7.98	37.10	100	0	Peak



Test Mode :	Mode 2	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Vertical
Remark :	1. #9 signal is not in the restricted band. 2. #12 and #13 are Fundamental Signals which can be ignored.		

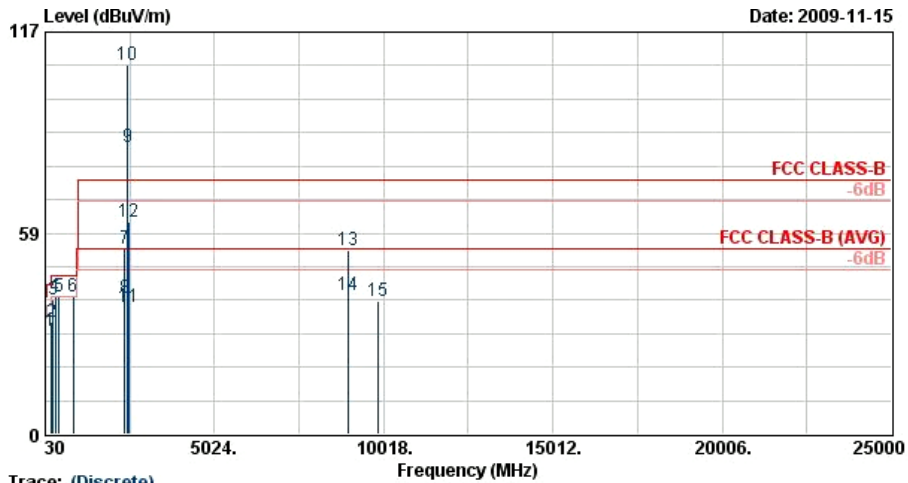


Trace: (Discrete)
 Site : 03CH06-HV
 Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
 Project : FR 902108-02
 Memo : Mode 2

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	131.79	31.28	-12.22	43.50	49.59	11.53	1.85	31.70	---	---	Peak
2	216.03	33.00	-13.00	46.00	53.71	8.82	2.49	32.02	---	---	Peak
3	247.89	33.89	-12.11	46.00	50.98	12.03	2.68	31.80	---	---	Peak
4	327.30	38.86	-7.14	46.00	53.79	13.80	3.17	31.90	---	---	Peak
5 !	432.30	40.70	-5.30	46.00	52.76	16.26	3.67	31.99	100	23	Peak
6	868.40	39.39	-6.61	46.00	45.64	20.52	5.36	32.13	---	---	Peak
7	1662.00	54.59	-19.41	74.00	58.88	29.10	3.01	36.41	100	182	Peak
8	1662.00	29.94	-24.06	54.00	34.23	29.10	3.01	36.41	100	182	Average
9	1996.00	54.71			56.35	31.19	3.37	36.20	100	0	Peak
10	2318.00	36.89	-17.11	54.00	37.57	31.76	3.82	36.27	131	360	Average
11	2318.00	52.16	-21.84	74.00	52.84	31.76	3.82	36.27	131	360	Peak
12 @	2437.00	86.11			86.48	31.93	3.99	36.29	131	360	Average
13 X	2437.00	105.56			105.95	31.90	3.99	36.29	131	360	Peak
14	2492.00	34.20	-19.80	54.00	34.45	32.00	4.05	36.30	131	360	Average
15	2492.00	61.28	-12.72	74.00	61.53	32.00	4.05	36.30	131	360	Peak
16	8712.00	52.44	-21.56	74.00	45.90	35.87	7.45	36.78	100	114	Peak
17	8712.00	39.66	-14.34	54.00	33.12	35.87	7.45	36.78	100	114	Average



Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		

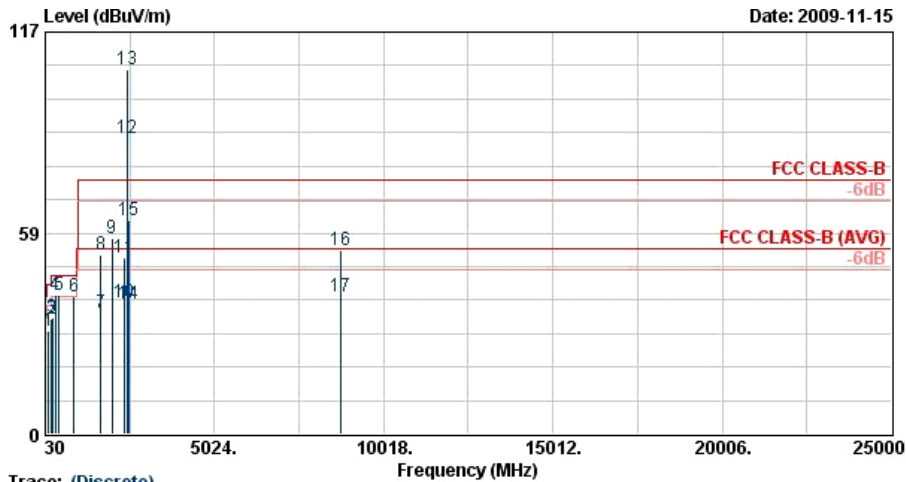


Trace: (Discrete)
 Site : 03CH06-HV
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
 Project : FR 902108-02
 Memo : Mode 3

	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	196.59	30.21	-13.29	43.50	51.57	8.35	2.38	32.08	---	---	Peak
2	216.84	32.48	-13.52	46.00	53.11	8.86	2.49	31.99	---	---	Peak
3	261.93	39.05	-6.95	46.00	55.69	12.47	2.77	31.87	---	---	Peak
4 !	327.30	40.07	-5.93	46.00	55.00	13.80	3.17	31.90	100	113	QP
5	434.40	39.89	-6.11	46.00	51.91	16.29	3.68	31.99	---	---	Peak
6	864.90	39.98	-6.02	46.00	46.30	20.50	5.36	32.18	100	321	QP
7	2382.00	53.75	-20.25	74.00	54.27	31.83	3.92	36.28	100	11	Peak
8	2382.00	39.49	-14.51	54.00	40.01	31.83	3.92	36.28	100	11	Average
9 X	2462.00	83.72			84.04	31.95	4.02	36.29	100	11	Average
10 @	2462.00	107.29			107.61	31.95	4.02	36.29	100	11	Peak
11	2484.42	37.03	-16.97	54.00	37.30	31.98	4.05	36.30	100	11	Average
12	2484.42	61.68	-12.32	74.00	61.95	31.98	4.05	36.30	100	11	Peak
13	8952.00	53.51	-20.49	74.00	46.59	36.06	7.74	36.88	100	352	Peak
14	8952.00	40.36	-13.64	54.00	33.44	36.06	7.74	36.88	100	352	Average
15	9848.00	38.68	-35.32	74.00	77.55	-9.77	8.04	37.14	100	0	Peak



Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Vertical
Remark :	1. #9 signal is not in the restricted band. 2. #12 and #13 are Fundamental Signals which can be ignored.		

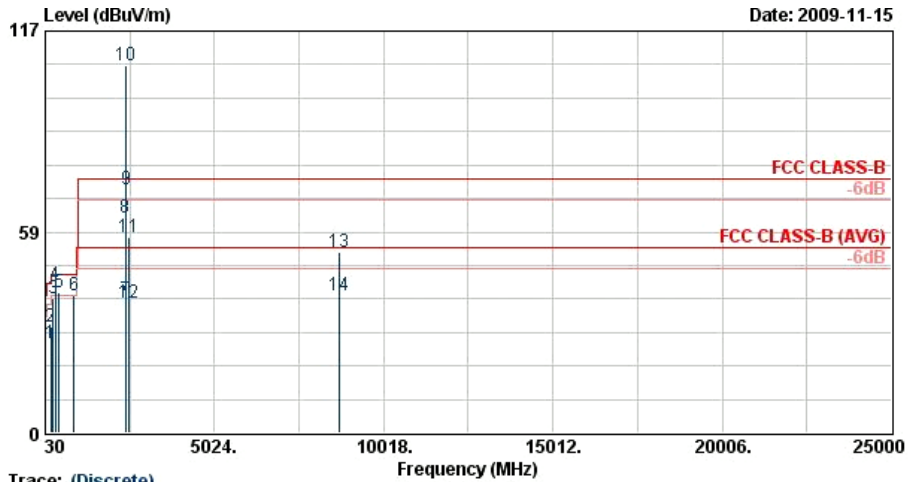


Trace: (Discrete)
 Site : 03CH06-HV
 Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
 Project : FR 902108-02
 Memo : Mode 3

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	131.79	30.00	-13.50	43.50	48.32	11.53	1.85	31.70	---	---	Peak
2	216.03	33.34	-12.66	46.00	54.05	8.82	2.49	32.02	---	---	Peak
3	247.89	33.96	-12.04	46.00	51.05	12.03	2.68	31.80	---	---	Peak
4 !	327.30	40.44	-5.56	46.00	55.37	13.80	3.17	31.90	100	29	Peak
5 !	432.30	40.36	-5.64	46.00	52.42	16.26	3.67	31.99	---	---	Peak
6	868.40	39.98	-6.02	46.00	46.23	20.52	5.36	32.13	---	---	Peak
7	1662.00	35.02	-18.98	54.00	39.31	29.10	3.01	36.41	100	177	Average
8	1662.00	52.22	-21.78	74.00	56.51	29.10	3.01	36.41	100	177	Peak
9	1996.00	57.03			58.67	31.19	3.37	36.20	100	0	Peak
10	2382.00	38.16	-15.84	54.00	38.68	31.83	3.92	36.28	105	357	Average
11	2382.00	51.54	-22.46	74.00	52.06	31.83	3.92	36.28	105	357	Peak
12 @	2462.00	86.24			86.56	31.95	4.02	36.29	105	357	Average
13 X	2462.00	106.00			106.32	31.95	4.02	36.29	105	357	Peak
14	2483.66	37.86	-16.14	54.00	38.13	31.98	4.05	36.30	105	357	Average
15	2483.66	62.24	-11.76	74.00	62.51	31.98	4.05	36.30	105	357	Peak
16	8736.00	53.30	-20.70	74.00	46.73	35.89	7.48	36.79	100	163	Peak
17	8736.00	40.16	-13.84	54.00	33.59	35.89	7.48	36.79	100	163	Average



Test Mode :	Mode 4	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		

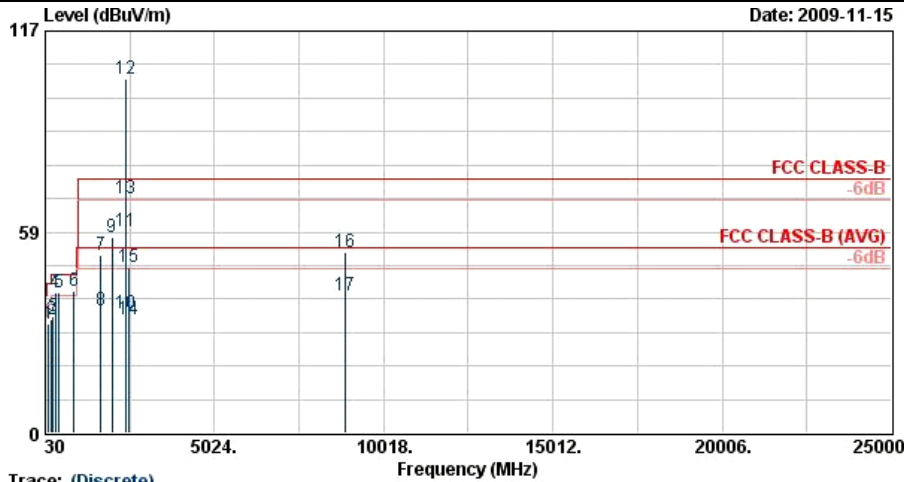


Trace: (Discrete)
 Site : 03CH06-HV
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
 Project : FR 902108-02
 Memo : Mode 4

	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	185.79	26.29	-17.21	43.50	47.14	8.89	2.30	32.05	---	---	Peak
2	196.59	30.93	-12.57	43.50	52.29	8.35	2.38	32.08	---	---	Peak
3	257.34	38.99	-7.01	46.00	55.71	12.39	2.73	31.84	---	---	Peak
4 !	327.30	42.86	-3.14	46.00	57.79	13.80	3.17	31.90	100	29	Peak
5 !	434.40	41.07	-4.93	46.00	53.09	16.29	3.68	31.99	---	---	Peak
6 !	868.40	40.16	-5.84	46.00	46.41	20.52	5.36	32.13	100	330	QP
7	2389.61	38.88	-15.12	54.00	39.38	31.86	3.92	36.28	100	28	Average
8	2389.61	62.73	-11.27	74.00	63.23	31.86	3.92	36.28	100	28	Peak
9 X	2412.00	70.72			71.17	31.88	3.95	36.28	100	28	Average
10 @	2412.00	107.16			107.61	31.88	3.95	36.28	100	28	Peak
11	2492.00	56.97	-17.03	74.00	57.22	32.00	4.05	36.30	100	28	Peak
12	2492.00	37.70	-16.30	54.00	37.95	32.00	4.05	36.30	100	28	Average
13	8712.00	52.62	-21.38	74.00	46.09	35.87	7.45	36.78	100	214	Peak
14	8712.00	40.05	-13.95	54.00	33.51	35.87	7.45	36.78	100	214	Average



Test Mode :	Mode 4	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Vertical
Remark :	1. #9 signal is not in the restricted band. 2. #12 and #13 are Fundamental Signals which can be ignored.		

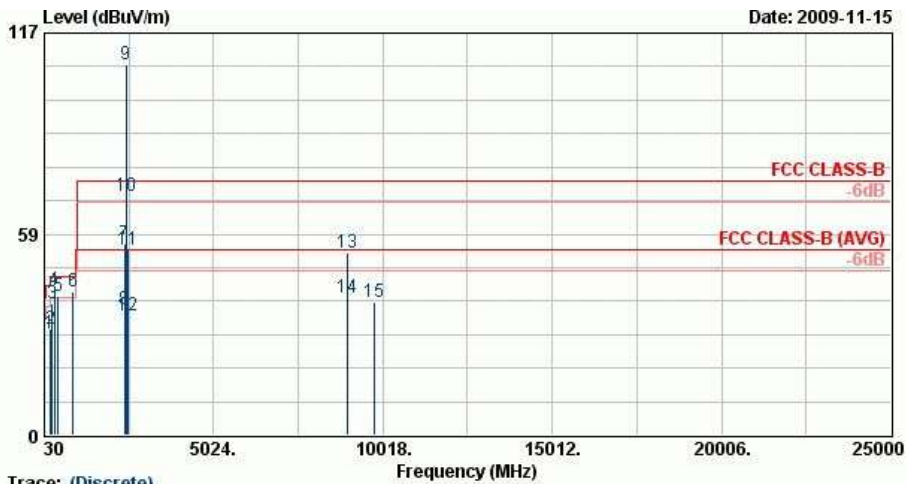


Trace: (Discrete)
 Site : 03CH06-HV
 Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
 Project : FR 902108-02
 Memo : Mode 4

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	130.98	31.56	-11.94	43.50	49.83	11.59	1.84	31.69	---	---	Peak
2	226.29	33.19	-12.81	46.00	53.34	9.27	2.55	31.96	---	---	Peak
3	260.58	33.71	-12.29	46.00	50.37	12.45	2.76	31.87	---	---	Peak
4 !	327.30	40.76	-5.24	46.00	55.70	13.80	3.17	31.90	---	---	Peak
5 !	434.40	40.89	-5.11	46.00	52.91	16.29	3.68	31.99	---	---	Peak
6 !	868.40	41.16	-4.84	46.00	47.41	20.52	5.36	32.13	100	236	Peak
7	1662.00	51.88	-22.12	74.00	56.17	29.10	3.01	36.41	100	180	Peak
8	1662.00	35.88	-18.12	54.00	40.17	29.10	3.01	36.41	100	180	Average
9	1996.00	57.02			58.52	31.30	3.40	36.20	100	0	Peak
10	2389.99	34.70	-19.30	54.00	35.20	31.86	3.92	36.28	100	301	Average
11	2389.99	58.59	-15.41	74.00	59.09	31.86	3.92	36.28	100	301	Peak
12 @	2412.00	103.30			103.74	31.88	3.95	36.28	100	301	Peak
13 X	2412.00	68.25			68.70	31.88	3.95	36.28	100	301	Average
14	2486.00	33.11	-20.89	54.00	33.38	31.98	4.05	36.30	100	301	Average
15	2486.00	48.39	-25.61	74.00	48.66	31.98	4.05	36.30	100	301	Peak
16	8901.00	52.55	-21.45	74.00	45.70	36.02	7.68	36.86	100	312	Peak
17	8901.00	40.06	-13.94	54.00	33.22	36.02	7.68	36.86	100	312	Average



Test Mode :	Mode 5	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		

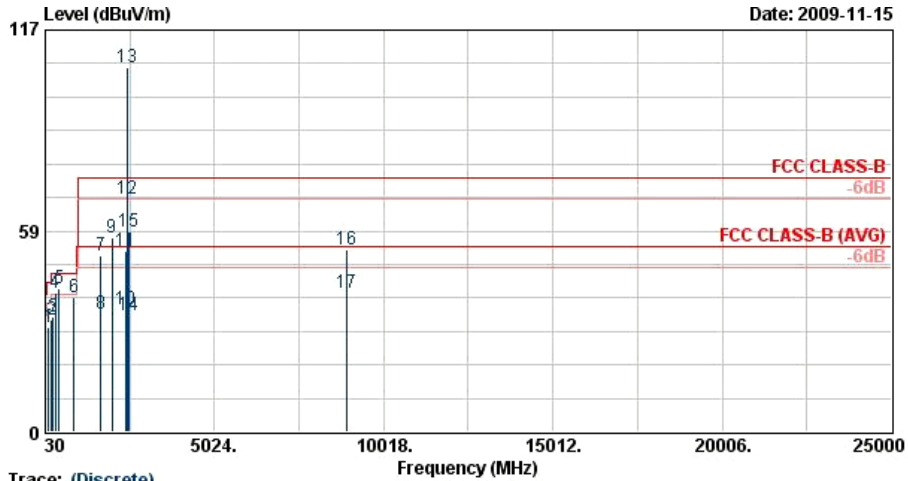


Trace: (Discrete)
 Site : D3CH06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
 Project : FR 902108-02
 Memo : Mode 5

	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	196.59	29.75	-13.75	43.50	51.11	8.35	2.38	32.08	---	---	Peak
2	216.84	30.96	-15.04	46.00	51.60	8.86	2.49	31.99	---	---	Peak
3	256.53	38.20	-7.80	46.00	54.92	12.39	2.73	31.84	---	---	Peak
4 !	327.30	42.36	-3.64	46.00	57.29	13.80	3.17	31.90	100	129	Peak
5 !	434.40	40.31	-5.69	46.00	52.33	16.29	3.68	31.99	---	---	Peak
6 !	868.40	41.71	-4.29	46.00	47.96	20.52	5.36	32.13	---	---	Peak
7	2390.00	55.77	-18.23	74.00	56.28	31.86	3.92	36.28	100	30	Peak
8	2390.00	36.38	-17.62	54.00	36.88	31.86	3.92	36.28	100	30	Average
9 @	2437.00	108.08			108.46	31.93	3.99	36.29	100	30	Peak
10 X	2437.00	69.48			69.85	31.93	3.99	36.29	100	30	Average
11	2484.00	53.99	-20.01	74.00	54.26	31.98	4.05	36.30	100	30	Peak
12	2484.00	34.63	-19.37	54.00	34.90	31.98	4.05	36.30	100	30	Average
13	8976.00	52.96	-21.04	74.00	46.01	36.07	7.77	36.89	100	62	Peak
14	8976.00	40.06	-13.94	54.00	33.11	36.07	7.77	36.89	100	62	Average
15	9748.00	38.62	-35.38	74.00	77.75	-10.02	7.98	37.10	100	0	Peak



Test Mode :	Mode 5	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Vertical
Remark :	1. #9 signal is not in the restricted band. 2. #12 and #13 are Fundamental Signals which can be ignored.		



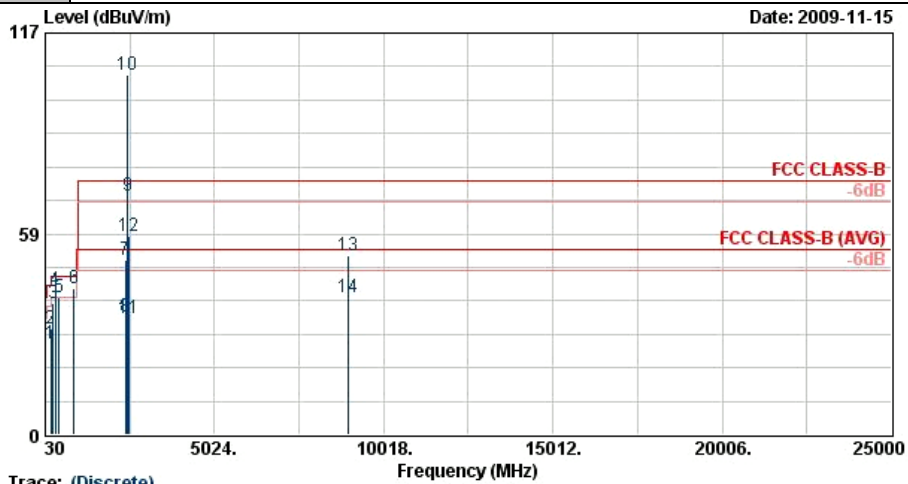
Trace: (Discrete)

Site : 03CH06-HV
 Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
 Project : FR 902108-02
 Memo : Mode 5

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB	cm	deg	
1	130.98	30.58	-12.92	43.50	48.84	11.59	1.84	31.69	---	---	Peak
2	222.24	32.80	-13.20	46.00	53.15	9.04	2.52	31.91	---	---	Peak
3	255.18	33.58	-12.42	46.00	50.33	12.35	2.72	31.83	---	---	Peak
4 !	327.30	40.60	-5.40	46.00	55.53	13.80	3.17	31.90	---	---	Peak
5 !	434.40	41.67	-4.33	46.00	53.69	16.29	3.68	31.99	100	211	Peak
6	868.40	39.14	-6.86	46.00	45.39	20.52	5.36	32.13	---	---	Peak
7	1662.00	51.48	-22.52	74.00	55.77	29.10	3.01	36.41	100	166	Peak
8	1662.00	34.33	-19.67	54.00	38.62	29.10	3.01	36.41	100	166	Average
9	1996.00	56.49			58.13	31.19	3.37	36.20	100	0	Peak
10	2390.00	35.88	-18.12	54.00	36.38	31.86	3.92	36.28	109	360	Average
11	2390.00	52.50	-21.50	74.00	53.00	31.86	3.92	36.28	109	360	Peak
12 X	2437.00	67.82			68.19	31.93	3.99	36.29	109	360	Average
13 @	2437.00	105.98			106.38	31.90	3.99	36.29	109	360	Peak
14	2500.00	33.81	-20.19	54.00	34.06	32.00	4.05	36.30	109	360	Average
15	2500.00	58.17	-15.83	74.00	58.42	32.00	4.05	36.30	109	360	Peak
16	8907.00	52.96	-21.04	74.00	46.12	36.02	7.68	36.86	100	222	Peak
17	8907.00	40.26	-13.74	54.00	33.42	36.02	7.68	36.86	100	222	Average



Test Mode :	Mode 6	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Horizontal
Remark :	#9 and #10 are Fundamental Signals which can be ignored.		

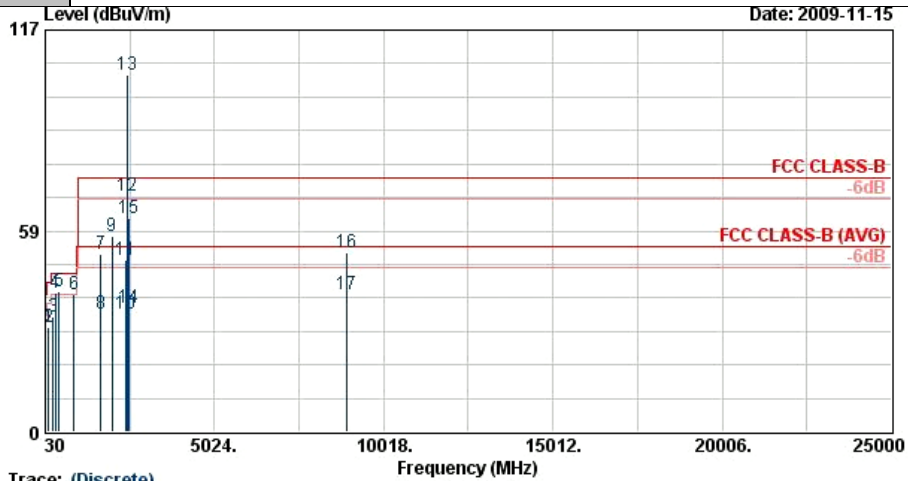


Trace: (Discrete)
 Site : 03CH06-HV
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
 Project : FR 902108-02
 Memo : Mode 6

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	185.79	26.62	-16.88	43.50	47.47	8.89	2.30	32.05	---	---	Peak
2	197.13	30.85	-12.65	43.50	52.21	8.35	2.38	32.08	---	---	Peak
3	253.83	38.29	-7.71	46.00	55.06	12.34	2.72	31.82	---	---	Peak
4 !	327.30	42.07	-3.93	46.00	57.01	13.80	3.17	31.90	---	---	Peak
5	434.40	40.00	-6.00	46.00	52.02	16.29	3.68	31.99	---	---	Peak
6 !	868.40	42.45	-3.55	46.00	48.70	20.52	5.36	32.13	100	145	Peak
7	2390.00	51.03	-22.97	74.00	51.53	31.86	3.92	36.28	100	355	Peak
8	2390.00	34.53	-19.47	54.00	35.03	31.86	3.92	36.28	100	355	Average
9 X	2462.00	69.45			69.77	31.95	4.02	36.29	100	355	Average
10 @	2462.00	104.95			105.28	31.95	4.02	36.30	100	355	Peak
11	2483.50	34.11	-19.89	54.00	34.38	31.98	4.05	36.30	100	355	Average
12	2483.50	58.02	-15.98	74.00	58.29	31.98	4.05	36.30	100	355	Peak
13	8952.00	52.30	-21.70	74.00	45.38	36.06	7.74	36.88	100	255	Peak
14	8952.00	40.11	-13.89	54.00	33.19	36.06	7.74	36.88	100	255	Average



Test Mode :	Mode 6	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Vertical
Remark :	1. #9 signal is not in the restricted band. 2. #12 and #13 are Fundamental Signals which can be ignored.		



Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
 Project : FR 902108-02
 Memo : Mode 6

	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	123.69	30.47	-13.03	43.50	48.56	11.83	1.79	31.71	---	---	Peak
2	130.98	30.55	-12.95	43.50	48.82	11.59	1.84	31.69	---	---	Peak
3	253.29	33.30	-12.70	46.00	50.08	12.32	2.71	31.81	---	---	Peak
4 !	327.30	40.24	-5.76	46.00	55.17	13.80	3.17	31.90	---	---	Peak
5 !	434.40	40.90	-5.10	46.00	52.92	16.29	3.68	31.99	100	216	Peak
6	868.40	39.90	-6.10	46.00	46.15	20.52	5.36	32.13	---	---	Peak
7	1662.00	51.59	-22.41	74.00	55.89	29.10	3.01	36.41	100	173	Peak
8	1662.00	34.53	-19.47	54.00	38.82	29.10	3.01	36.41	100	173	Average
9	1996.00	56.85			58.35	31.30	3.40	36.20	100	0	Peak
10	2388.00	34.25	-19.75	54.00	34.75	31.86	3.92	36.28	104	360	Average
11	2388.00	49.82	-24.18	74.00	50.32	31.86	3.92	36.28	104	360	Peak
12 X	2462.00	68.78			69.10	31.95	4.02	36.29	104	360	Average
13 @	2462.00	104.07			104.40	31.95	4.02	36.29	104	360	Peak
14	2483.50	36.03	-17.97	54.00	36.30	31.98	4.05	36.30	104	360	Average
15	2483.50	62.13	-11.87	74.00	62.40	31.98	4.05	36.30	104	360	Peak
16	8907.00	52.12	-21.88	74.00	45.28	36.02	7.68	36.86	100	201	Peak
17	8907.00	40.06	-13.94	54.00	33.22	36.02	7.68	36.86	100	201	Average



3.4 Antenna Requirements

3.4.1 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.

3.4.2 Antenna Connected Construction

The antennas type used in this product is PIFA Antenna with IPEX connector and it is considered to meet antenna requirement.

3.4.3 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
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. 26, 2008	Nov. 25, 2009	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9kHz~30MHz	Nov. 26, 2008	Nov. 25, 2009	Conduction (CO05-HY)
AC Power Source	APC	APC-1000 W	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9KHz-26.5GHz	Oct. 23, 2009	Oct. 22, 2010	Radiation (03CH06-HY)
Spectrum Analyzer	R&S	FSP40	100057	9KHz-40GHz	Oct. 20, 2009	Oct. 19, 2010	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20MHz-1000MHz	Apr. 28, 2009	Apr. 27, 2010	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Oct. 31, 2009	Oct. 30, 2010	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz~18GHz	Aug. 20, 2009	Aug. 19, 2010	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Training Research	AH-0801	95119	8GHz~18GHz	Nov. 02, 2009	Nov. 01, 2010	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 14, 2009	Oct. 13, 2010	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz- 26.5GHz	Nov. 11, 2009	Nov. 10, 2010	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz~1GHz	Apr. 20, 2009	Apr. 19, 2010	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9KHz~30MHz	May 22, 2008	May 21, 2010	Radiation (03CH06-HY)

5 Uncertainty of Evaluation

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

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.10	Normal (k=2)	0.05
Cable Loss	0.10	Normal (k=2)	0.05
AMN Insertion Loss	2.50	Rectangular	0.63
Receiver Specification	1.50	Rectangular	0.43
Site Imperfection	1.39	Rectangular	0.80
Mismatch	+0.34 / -0.35	U-Shape	0.24
Combined Standard Uncertainty $U_c(y)$	1.13		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.26		

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

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
Combined Standard Uncertainty $U_c(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.54		



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

Contribution	Uncertainty of X_i		$u(X_i)$	C_i	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	±0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	±1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	±0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site Imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ 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				

6 Certification of TAF Accreditation



Certificate No. : L1190-090417

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

Certificate of Accreditation

This is to certify that

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

is accredited in respect of laboratory

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


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

Pl, total 20 pages

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 EP9O2108-02B as below.