Variant FCC RF Test Report

APPLICANT	:	Acer Incorporated
EQUIPMENT	:	Tablet Computer
BRAND NAME	:	Acer
MODEL NAME	:	A100
FCC ID	:	HLZTMDMA100
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	Digital Transmission System (DTS)

This is a variant report which is only valid together with the original test report. The product was received on Jul. 19, 2011 and completely tested on Jul. 26, 2011. 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:

Jones Tsai

Jones Tsai / Manager

Testing Laboratory 1190

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR132346-04B	Rev. 01	This is a variant report. The original report which can be referred to Sporton Report No. FR132346B as appendix C. Detail changes list as below : 1. Addition adaptor DC cable length 150cm. (layout PCB are same as the original case.) 2. Addition LPDDR2 add Elpida 1GB. 3. Addition eMMC add Samsung 16GB、SanDisk 16GB、Kingston 16GB、Kingston 8GB. 4. Addition 7" WSVGA LCD CMI (w/I V-COM) 5. Addition touch Panel with 4 point. 6. ICT USB cable. For the changes, the test case was verified. Tested in accordance with the requirement of Class 1 Permissive Change.	Aug. 01, 2011

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
2.5	15.247(d)	A8.5	Frequency Band Edges	≤ 20dBc	Pass	-
2.6	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 6.4 dB at 0.182 MHz
2.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.58 dB at 2483.66 MHz
2.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Acer Incorporated
8F., No.88, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 22181, Taiwan (R.O.C)

1.2 Manufacturer

1. **Compal Electronics, Inc.**
   No. 581, Ruiguang Rd., Neihu District, Taipei City 11492, Taiwan
2. **Compal Electronics Technology (Kunshan) Co., Ltd.**
   No. 25, Third Avenue, A Zone, Kunshan Comprehensive Free Trade Zone, Kunshan, Jiangsu, China
3. **Compal Information (Kunshan) Co., Ltd.**
   No. 15, Third Avenue, A Zone, Kunshan Comprehensive Free Trade Zone, Kunshan, Jiangsu, China
4. **Compal Information Technology (Kunshan) Co., Ltd.**
   No. 58, First Avenue, A Zone, Kunshan Comprehensive Free Trade Zone, Kunshan, Jiangsu, China
5. **Compalead Eletrônica Do Brasil Indústria E Comércio Ltda**
   Rua Kanebo 175, Galpões C1, C2, C3, C4, C5 C6 E C12, Bairro Distrito Industrial Jundiaí Business Park, Cep 13213-090, Jundiaí - São Paulo, Brasil
6. **Compal (Vietnam) Co., Ltd.**
   Ba Thien Industrial Zone, Ba Hien Commune, Binh Xuyen County, Vinh Phuc Province, Vietnam

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Tablet Computer
Brand Name	Acer
Model Name	A100
Sample 1	EUT with LP DDR2_4th, and eMMC_3rd
Sample 2	EUT with LP DDR2_4th, and eMMC_4th
Sample 3	EUT with LP DDR2_4th, and eMMC_5th
Sample 4	EUT with LP DDR2_4th, and eMMC_6th
FCC ID	HLZTMDMA100
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	**Sample 1** 802.11b : 17.82 dBm (0.06 W) 802.11g : 22.91 dBm (0.20 W) 802.11n (BW 20MHz) : 22.04 dBm (0.16 W) **Sample 2** 802.11b : 17.9 dBm (0.06 W) 802.11g : 22.89 dBm (0.20 W) 802.11n (BW 20MHz) : 22.22 dBm (0.17 W) **Sample 3** 802.11b : 18.21 dBm (0.07 W) 802.11g : 22.89 dBm (0.20 W) 802.11n (BW 20MHz) : 22.02 dBm (0.16 W) **Sample 4** 802.11b : 17.97 dBm (0.06 W) 802.11g : 22.9 dBm (0.20 W) 802.11n (BW 20MHz) : 22.03 dBm (0.16 W)
Antenna Type	PIFA Antenna with gain 2.38 dBi
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Identical Prototype

Remark:

1. For other wireless features of this EUT, test report will be issued separately.
2. This test report recorded only product characteristics and test results of Digital Transmission System (DTS).
3. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	CO05-HY	03CH07-HY	722060/4086B-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 8

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.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	Bluetooth Base Station	R&S	CBT32	N/A	N/A	Unshielded, 1.8 m
4.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A
5.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
6.	LCD Monitor	Dell	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
7.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
8.	iPod Earphone	Apple	A1285	FCC DoC	Unshielded, 1.2 m	N/A
9.	Earphone + Mic	Ergotech	ET-E200	FCC DoC	Unshielded, 1.8 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:

<Sample 1>

Channel	Frequency	2.4GHz 802.11b RF Power (dBm)			
		DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	**17.82**	17.22	17.26	17.31
CH 06	2437 MHz	17.24	-	-	-
CH 11	2462 MHz	17.11	-	-	-

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	22.82	-	-	-	-	-	-	-
CH 06	2437 MHz	**22.91**	22.88	22.82	22.79	22.81	22.9	22.86	22.84
CH 11	2462 MHz	22.83	-	-	-	-	-	-	-

Channel	Frequency	2.4GHz 802.11n (BW 20MHz) RF Power (dBm)							
		OFDM Data Rate							
		MCS=0	MCS=1	MCS=2	MCS=3	MCS=4	MCS=5	MCS=6	MCS=7
		6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps
CH 01	2412 MHz	21.92	-	-	-	-	-	-	-
CH 06	2437 MHz	**22.04**	21.97	21.89	21.73	21.78	21.94	21.78	21.7
CH 11	2462 MHz	21.98	-	-	-	-	-	-	-

Remark:

1. The data rates of WLAN 802.11b/g/n were set in 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n (BW 20MHz) or all the test cases due to the highest RF output power.
2. The EUT is programmed to transmit signals continuously for all testing.

<Sample 2>

Channel	Frequency	2.4GHz 802.11b RF Power (dBm)			
		DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	17.44	-	-	17.63
CH 06	2437 MHz	17.47	-	-	17.84
CH 11	2462 MHz	17.49	17.67	17.53	**17.9**

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	22.44	-	-	-	-	-	-	-
CH 06	2437 MHz	22.75	-	-	-	-	-	-	-
CH 11	2462 MHz	**22.89**	22.79	22.63	22.59	22.78	22.8	22.73	22.87

Channel	Frequency	2.4GHz 802.11n (BW 20MHz) RF Power (dBm)							
		OFDM Data Rate							
		MCS=0	MCS=1	MCS=2	MCS=3	MCS=4	MCS=5	MCS=6	MCS=7
		6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps
CH 01	2412 MHz	21.54	-	-	-	-	-	-	-
CH 06	2437 MHz	22.07	-	-	-	-	-	-	-
CH 11	2462 MHz	**22.22**	22.08	21.74	21.65	22.15	21.94	22.08	21.93

Remark:

1. The data rates of WLAN 802.11b/g/n were set in 11Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n (BW 20MHz) or all the test cases due to the highest RF output power.

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

<Sample 3>

Channel	Frequency	2.4GHz 802.11b RF Power (dBm)			
		DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	17.72	-	-	-
CH 06	2437 MHz	**18.21**	18.19	18.1	18.16
CH 11	2462 MHz	18	-	-	-

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	22.71	-	-	-	-	-	-	-
CH 06	2437 MHz	22.82	-	-	-	-	-	-	-
CH 11	2462 MHz	**22.89**	22.72	22.75	22.71	22.83	22.81	22.84	22.73

Channel	Frequency	2.4GHz 802.11n (BW 20MHz) RF Power (dBm)							
		OFDM Data Rate							
		MCS=0	MCS=1	MCS=2	MCS=3	MCS=4	MCS=5	MCS=6	MCS=7
		6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps
CH 01	2412 MHz	21.89	-	-	-	-	-	-	-
CH 06	2437 MHz	**22.02**	22	21.91	21.88	21.83	21.98	21.97	21.83
CH 11	2462 MHz	21.98	-	-	-	-	-	-	-

Remark:

1. The data rates of WLAN 802.11b/g/n were set in 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n (BW 20MHz) or all the test cases due to the highest RF output power.

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

<Sample 4>

Channel	Frequency	2.4GHz 802.11b RF Power (dBm)			
		DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	**17.97**	17.87	17.71	17.83
CH 06	2437 MHz	17.63	-	-	-
CH 11	2462 MHz	17.56	-	-	-

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	**22.9**	22.8	22.77	22.65	22.63	22.69	22.73	22.85
CH 06	2437 MHz	22.88	-	-	-	-	-	-	-
CH 11	2462 MHz	22.79	-	-	-	-	-	-	-

Channel	Frequency	2.4GHz 802.11n (BW 20MHz) RF Power (dBm)							
		OFDM Data Rate							
		MCS=0	MCS=1	MCS=2	MCS=3	MCS=4	MCS=5	MCS=6	MCS=7
		6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps
CH 01	2412 MHz	**22.03**	21.86	21.51	21.74	21.85	21.49	21.77	21.45
CH 06	2437 MHz	21.98	-	-	-	-	-	-	-
CH 11	2462 MHz	21.91	-	-	-	-	-	-	-

Remark:

1. The data rates of WLAN 802.11b/g/n were set in 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n (BW 20MHz) or 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

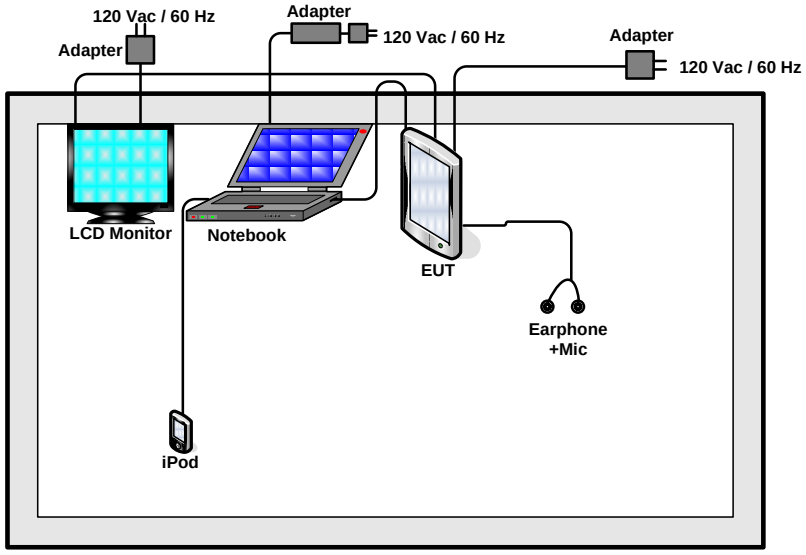
The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz), radiated emission (30 MHz to the 10th harmonic 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.

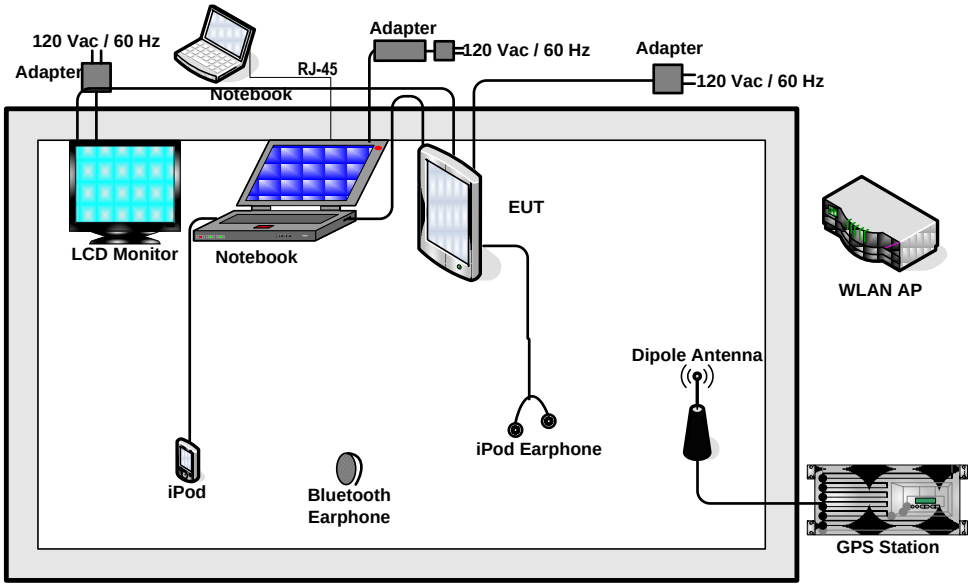
Test Cases		
Test Item	**802.11b (Modulation : DSSS)**	**802.11g/n (Modulation : OFDM)**
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4: 802.11g_CH01_2412 MHz Mode 5: 802.11g_CH06_2437 MHz Mode 6: 802.11g_CH11_2462 MHz Mode 7: 802.11n (BW 20M)_CH01_2412 MHz Mode 8: 802.11n (BW 20M)_CH06_2437 MHz Mode 9: 802.11n (BW 20M)_CH11_2462 MHz
Radiated TCs	N/A	Mode 1: 802.11g_CH11_2462 MHz
AC Conducted Emission	Mode 1 ： WLAN Link + Bluetooth Link + GPS Rx + Adapter + TC	
Remark: TC stands for Test Configuration, and consists of MP3, HDMI, earphone, and USB Link with Notebook.		

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.4 RF Utility

The programmed RF utility “cmd” 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.

2.5 Band Edges Measurement

2.5.1 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.

2.5.2 Measuring Instruments

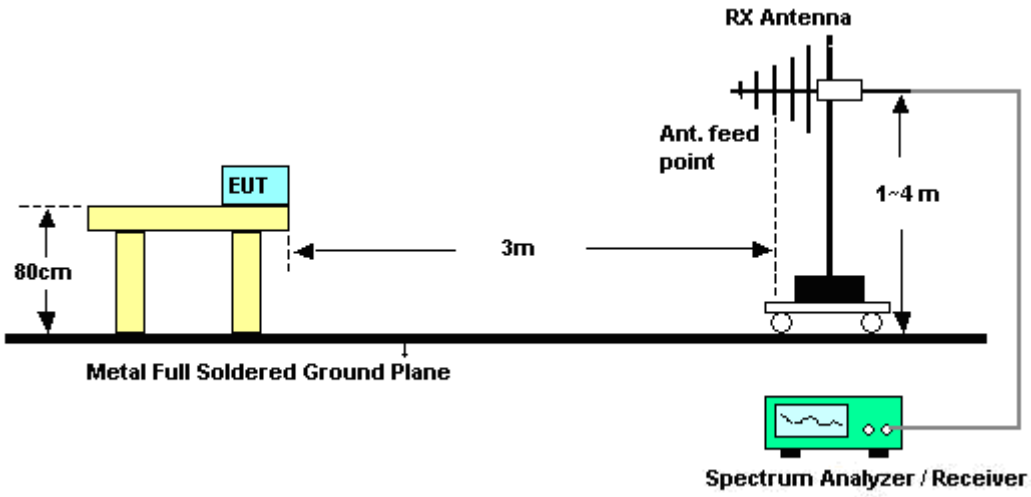
See list of measuring instruments of this test report.

2.5.3 Test Procedures

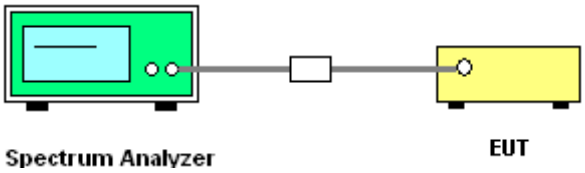
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) ≥ RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized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

2.5.4 Test Setup

<Radiated Band Edges>



<Conducted Band Edges>



2.5.5 Test Result of Radiated Band Edges

<Sample 1>

Test Mode :	Mode 1	**Temperature :**	20~21℃
Test Band :	802.11g	**Relative Humidity :**	45~47%
Test Channel :	11	**Test Engineer :**	David Yang

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	69.47	-4.53	74	64.91	32.28	6.18	33.9	129	28	Peak
2483.85	48.35	-5.65	54	43.79	32.28	6.18	33.9	129	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**
2483.5	65.64	-8.36	74	61.08	32.28	6.18	33.9	100	262	Peak
2483.5	45.2	-8.8	54	40.64	32.28	6.18	33.9	100	262	Average

<Sample 2>

Test Mode :	Mode 1	**Temperature :**	20~21℃
Test Band :	802.11g	**Relative Humidity :**	45~47%
Test Channel :	11	**Test Engineer :**	David Yang

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**
2483.66	70.42	-3.58	74	65.86	32.28	6.18	33.9	184	28	Peak
2483.66	48.54	-5.46	54	43.98	32.28	6.18	33.9	184	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**
2483.66	63.71	-10.29	74	59.15	32.28	6.18	33.9	121	278	Peak
2483.66	43.03	-10.97	54	38.47	32.28	6.18	33.9	121	278	Average

<Sample 3>

Test Mode :	Mode 1	Temperature :	20~21℃
Test Band :	802.11g	Relative Humidity :	45~47%
Test Channel :	11	Test Engineer :	David Yang

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
2483.5	68.92	-5.08	74	64.36	32.28	6.18	33.9	186	22	Peak
2483.5	48.68	-5.32	54	44.12	32.28	6.18	33.9	186	22	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
2483.5	64.44	-9.56	74	59.88	32.28	6.18	33.9	122	278	Peak
2483.5	43.68	-10.32	54	39.12	32.28	6.18	33.9	122	278	Average

<Sample 4>

Test Mode :	Mode 1	Temperature :	20~21℃
Test Band :	802.11g	Relative Humidity :	45~47%
Test Channel :	11	Test Engineer :	David Yang

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
2483.5	68.88	-5.12	74	64.32	32.28	6.18	33.9	101	26	Peak
2483.5	48.42	-5.58	54	43.86	32.28	6.18	33.9	101	26	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	64.55	-9.45	74	59.99	32.28	6.18	33.9	101	96	Peak
2483.85	44.57	-9.43	54	40.01	32.28	6.18	33.9	101	96	Average

2.6 AC Conducted Emission Measurement

2.6.1 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.

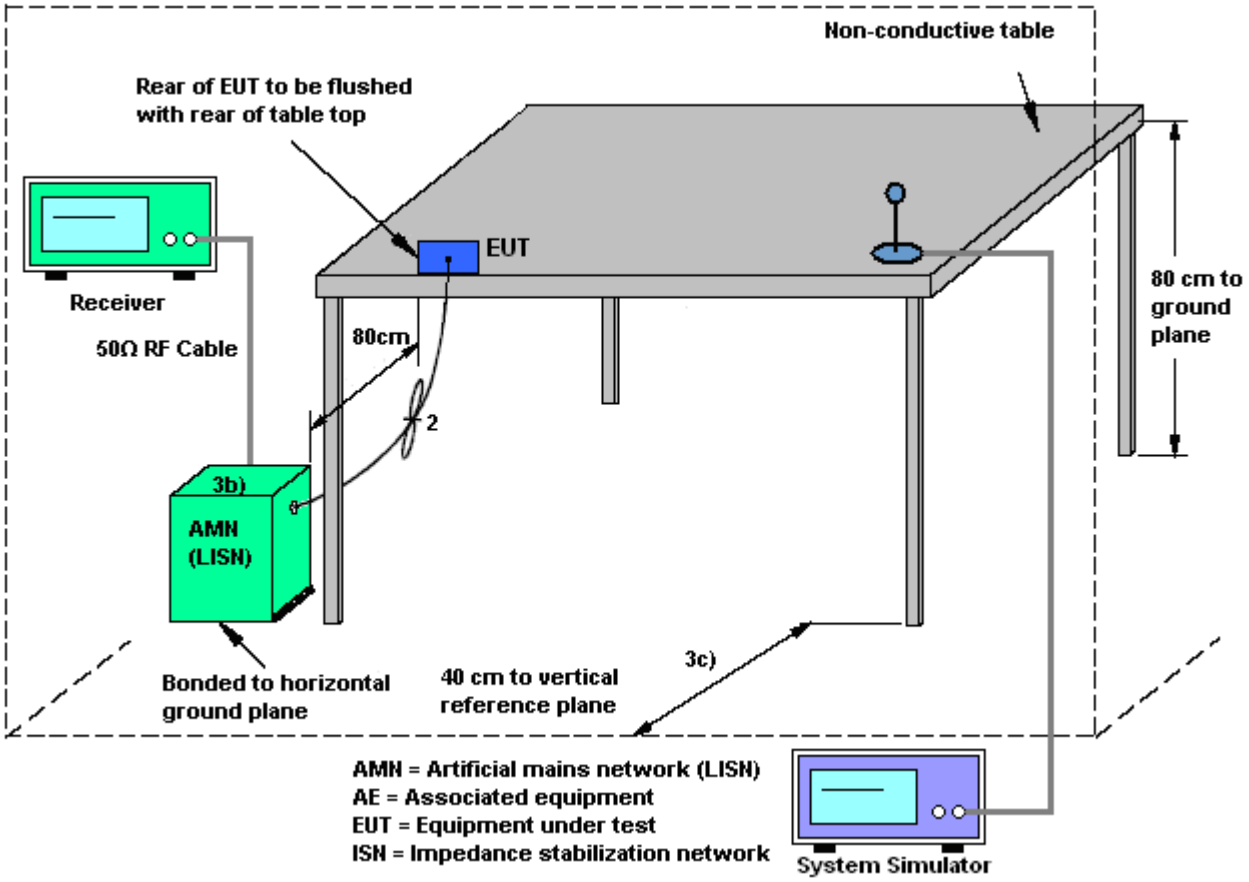
2.6.2 Measuring Instruments

See list of measuring instruments of this test report.

2.6.3 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.

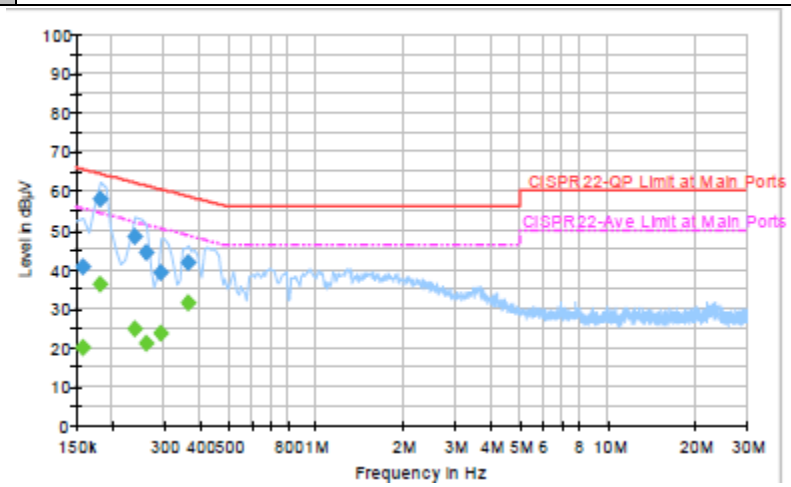
2.6.4 Test Setup



2.6.5 Test Result of AC Conducted Emission

<Sample 1>

Test Mode :	Mode 1	**Temperature :**	21~23℃
Test Engineer :	Hayden Wu	**Relative Humidity :**	41~43%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	WLAN Link + Bluetooth Link + GPS Rx + Adapter + TC		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



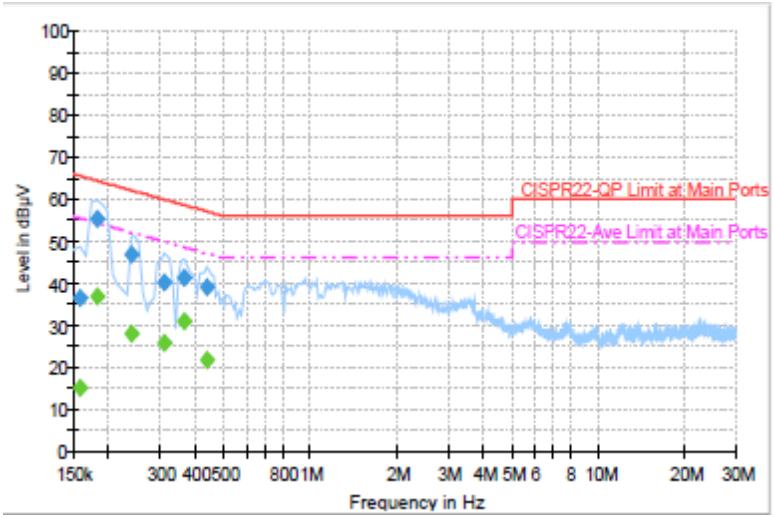
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	40.4	Off	L1	19.3	25.2	65.6
0.182000	58.0	Off	L1	19.4	6.4	64.4
0.238000	48.5	Off	L1	19.4	13.7	62.2
0.262000	44.2	Off	L1	19.3	17.2	61.4
0.294000	39.3	Off	L1	19.3	21.1	60.4
0.366000	41.8	Off	L1	19.3	16.8	58.6

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	19.8	Off	L1	19.3	35.8	55.6
0.182000	36.2	Off	L1	19.4	18.2	54.4
0.238000	24.7	Off	L1	19.4	27.5	52.2
0.262000	20.9	Off	L1	19.3	30.5	51.4
0.294000	23.7	Off	L1	19.3	26.7	50.4
0.366000	31.5	Off	L1	19.3	17.1	48.6

Test Mode :	Mode 1	Temperature :	21~23℃
Test Engineer :	Hayden Wu	Relative Humidity :	41~43%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN Link + Bluetooth Link + GPS Rx + Adapter + TC		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

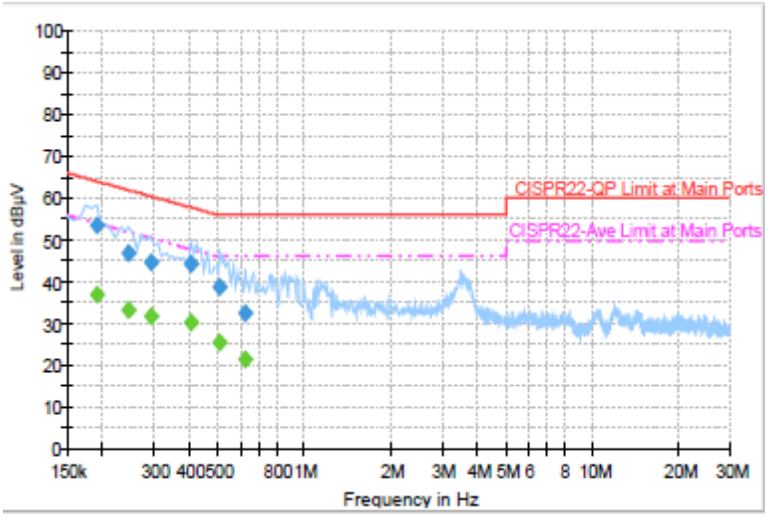
Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	36.5	Off	N	19.4	29.1	65.6
0.182000	55.4	Off	N	19.4	9.0	64.4
0.238000	47.0	Off	N	19.4	15.2	62.2
0.310000	40.2	Off	N	19.3	19.8	60.0
0.366000	41.5	Off	N	19.3	17.1	58.6
0.438000	39.0	Off	N	19.4	18.1	57.1

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	15.1	Off	N	19.4	40.5	55.6
0.182000	36.8	Off	N	19.4	17.6	54.4
0.238000	28.0	Off	N	19.4	24.2	52.2
0.310000	25.9	Off	N	19.3	24.1	50.0
0.366000	31.2	Off	N	19.3	17.4	48.6
0.438000	21.9	Off	N	19.4	25.2	47.1

<Sample 2>

Test Mode :	Mode 1	**Temperature :**	21~23℃
Test Engineer :	Hayden Wu	**Relative Humidity :**	41~43%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	WLAN Link + Bluetooth Link + GPS Rx + Adapter + TC		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



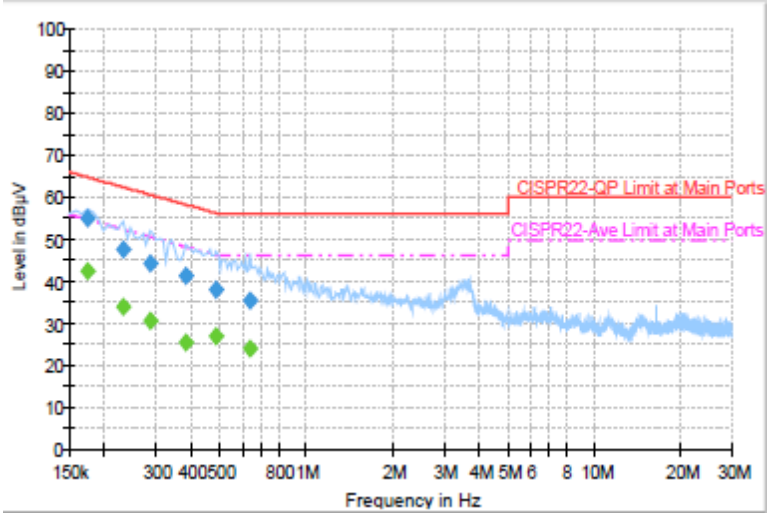
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	53.4	Off	L1	19.4	10.6	64.0
0.246000	46.8	Off	L1	19.4	15.1	61.9
0.294000	44.5	Off	L1	19.3	15.9	60.4
0.406000	44.1	Off	L1	19.4	13.6	57.7
0.510000	38.7	Off	L1	19.3	17.3	56.0
0.622000	32.4	Off	L1	19.3	23.6	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	37.0	Off	L1	19.4	17.0	54.0
0.246000	33.2	Off	L1	19.4	18.7	51.9
0.294000	31.6	Off	L1	19.3	18.8	50.4
0.406000	30.1	Off	L1	19.4	17.6	47.7
0.510000	25.5	Off	L1	19.3	20.5	46.0
0.622000	21.3	Off	L1	19.3	24.7	46.0

Test Mode :	Mode 1	Temperature :	21~23℃
Test Engineer :	Hayden Wu	Relative Humidity :	41~43%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN Link + Bluetooth Link + GPS Rx + Adapter + TC		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

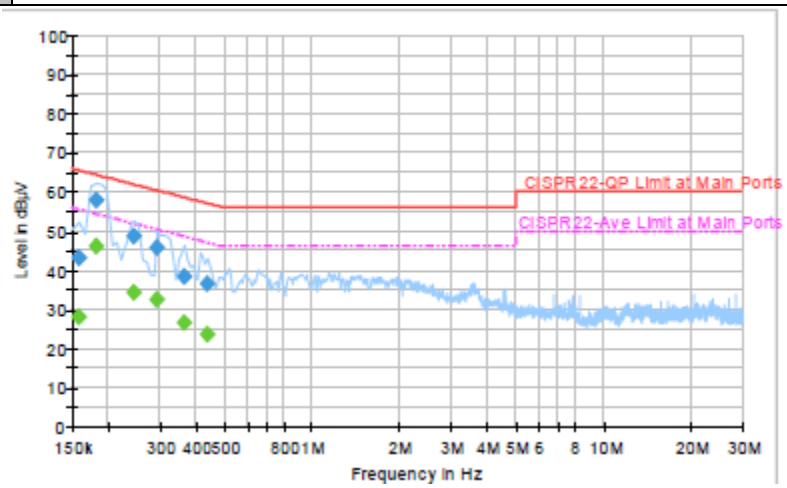
Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.174000	55.0	Off	N	19.3	9.8	64.8
0.230000	47.6	Off	N	19.4	14.8	62.4
0.286000	44.4	Off	N	19.3	16.2	60.6
0.382000	41.2	Off	N	19.4	17.0	58.2
0.486000	38.2	Off	N	19.4	18.0	56.2
0.638000	35.4	Off	N	19.4	20.6	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.174000	42.4	Off	N	19.3	12.4	54.8
0.230000	33.8	Off	N	19.4	18.6	52.4
0.286000	30.5	Off	N	19.3	20.1	50.6
0.382000	25.6	Off	N	19.4	22.6	48.2
0.486000	26.8	Off	N	19.4	19.4	46.2
0.638000	24.0	Off	N	19.4	22.0	46.0

<Sample 3>

Test Mode :	Mode 1	Temperature :	21~23℃
Test Engineer :	Hayden Wu	Relative Humidity :	41~43%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN Link + Bluetooth Link + GPS Rx + Adapter + TC		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



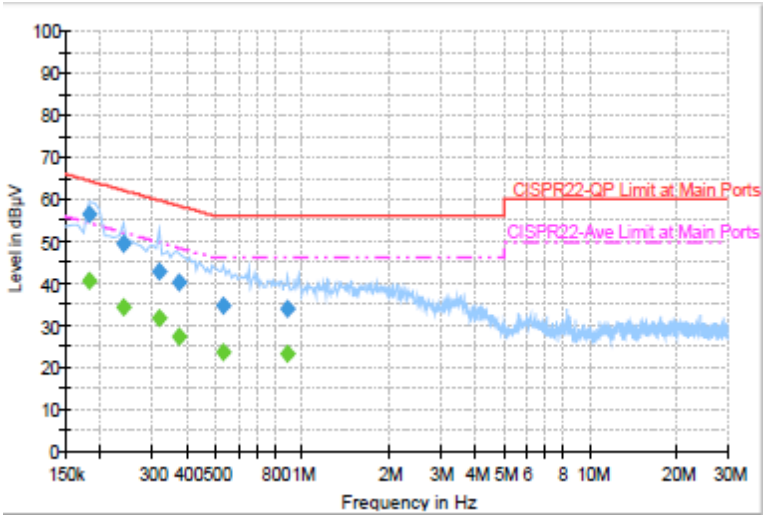
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	43.2	Off	L1	19.3	22.4	65.6
0.182000	57.8	Off	L1	19.4	6.6	64.4
0.246000	48.7	Off	L1	19.4	13.2	61.9
0.294000	45.7	Off	L1	19.3	14.7	60.4
0.366000	38.4	Off	L1	19.3	20.2	58.6
0.438000	36.4	Off	L1	19.4	20.7	57.1

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	28.0	Off	L1	19.3	27.6	55.6
0.182000	46.3	Off	L1	19.4	8.1	54.4
0.246000	34.3	Off	L1	19.4	17.6	51.9
0.294000	32.3	Off	L1	19.3	18.1	50.4
0.366000	26.6	Off	L1	19.3	22.0	48.6
0.438000	23.7	Off	L1	19.4	23.4	47.1

Test Mode :	Mode 1	Temperature :	21~23℃
Test Engineer :	Hayden Wu	Relative Humidity :	41~43%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN Link + Bluetooth Link + GPS Rx + Adapter + TC		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

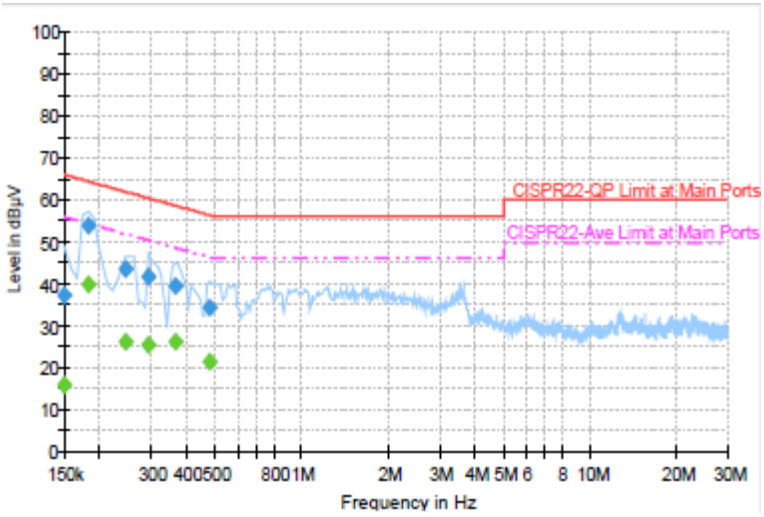
Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	56.5	Off	N	19.4	7.9	64.4
0.238000	49.5	Off	N	19.4	12.7	62.2
0.318000	42.6	Off	N	19.3	17.2	59.8
0.374000	40.1	Off	N	19.4	18.3	58.4
0.534000	34.6	Off	N	19.3	21.4	56.0
0.886000	33.9	Off	N	19.4	22.1	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	40.5	Off	N	19.4	13.9	54.4
0.238000	34.2	Off	N	19.4	18.0	52.2
0.318000	31.6	Off	N	19.3	18.2	49.8
0.374000	27.2	Off	N	19.4	21.2	48.4
0.534000	23.8	Off	N	19.3	22.2	46.0
0.886000	23.1	Off	N	19.4	22.9	46.0

<Sample 4>

Test Mode :	Mode 1	Temperature :	21~23℃
Test Engineer :	Hayden Wu	Relative Humidity :	41~43%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN Link + Bluetooth Link + GPS Rx + Adapter + TC		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



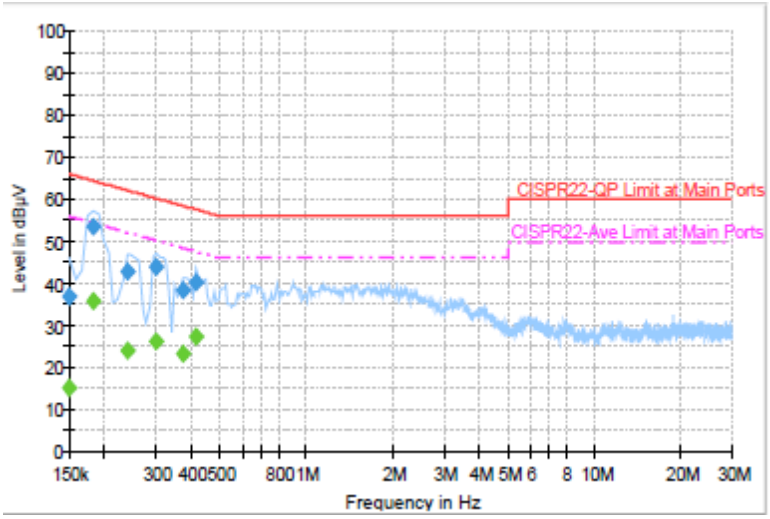
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	37.4	Off	L1	19.4	28.6	66.0
0.182000	53.8	Off	L1	19.4	10.6	64.4
0.246000	43.4	Off	L1	19.4	18.5	61.9
0.294000	41.8	Off	L1	19.3	18.6	60.4
0.366000	39.6	Off	L1	19.3	19.0	58.6
0.478000	34.5	Off	L1	19.4	21.9	56.4

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	15.9	Off	L1	19.4	40.1	56.0
0.182000	39.9	Off	L1	19.4	14.5	54.4
0.246000	26.3	Off	L1	19.4	25.6	51.9
0.294000	25.3	Off	L1	19.3	25.1	50.4
0.366000	26.2	Off	L1	19.3	22.4	48.6
0.478000	21.5	Off	L1	19.4	24.9	46.4

Test Mode :	Mode 1	Temperature :	21~23℃
Test Engineer :	Hayden Wu	Relative Humidity :	41~43%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN Link + Bluetooth Link + GPS Rx + Adapter + TC		
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)
0.150000	36.9	Off	N	19.4	29.1	66.0
0.182000	53.7	Off	N	19.4	10.7	64.4
0.238000	42.7	Off	N	19.4	19.5	62.2
0.302000	44.0	Off	N	19.3	16.2	60.2
0.374000	38.3	Off	N	19.4	20.1	58.4
0.414000	40.4	Off	N	19.4	17.2	57.6

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	15.2	Off	N	19.4	40.8	56.0
0.182000	35.7	Off	N	19.4	18.7	54.4
0.238000	24.1	Off	N	19.4	28.1	52.2
0.302000	26.2	Off	N	19.3	24.0	50.2
0.374000	23.4	Off	N	19.4	25.0	48.4
0.414000	27.2	Off	N	19.4	20.4	47.6

2.7 Radiated Emission Measurement

2.7.1 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

2.7.2 Measuring Instruments

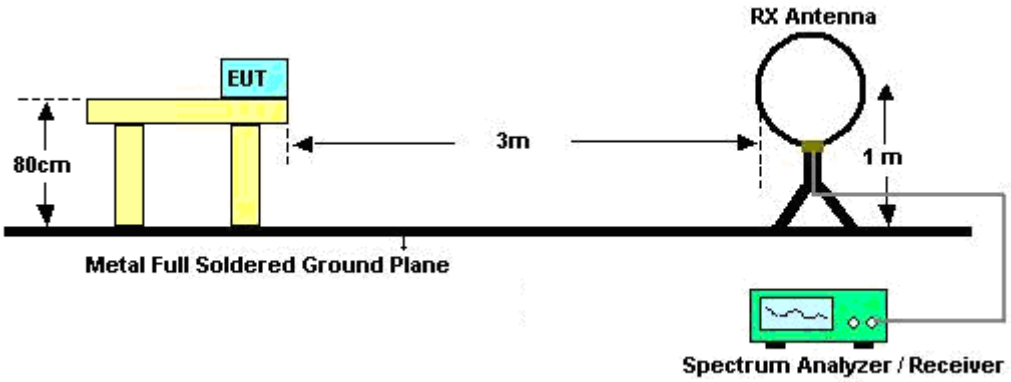
See list of measuring instruments of this test report.

2.7.3 Test Procedures

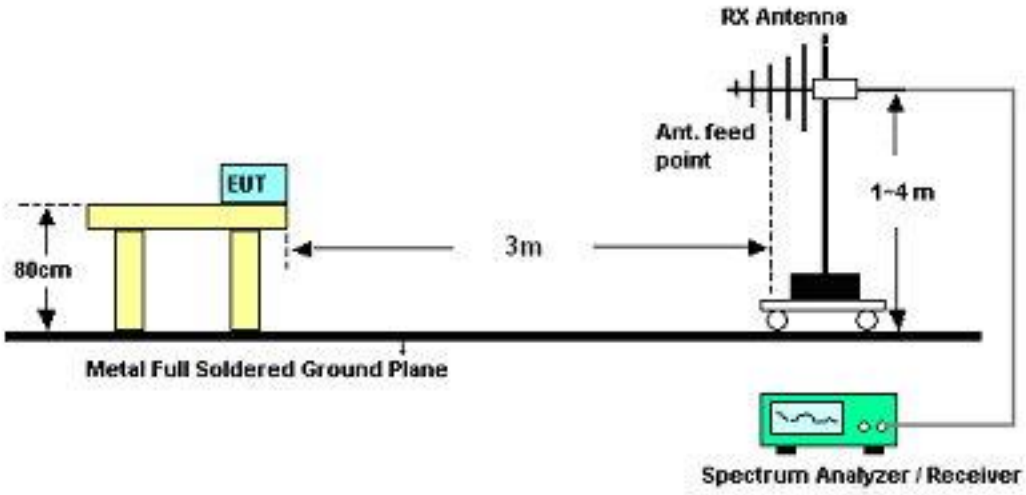
1. The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Use the following spectrum analyzer settings:
   (1) Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
   (2) Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.
   Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB)
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.

2.7.4 Test Setup

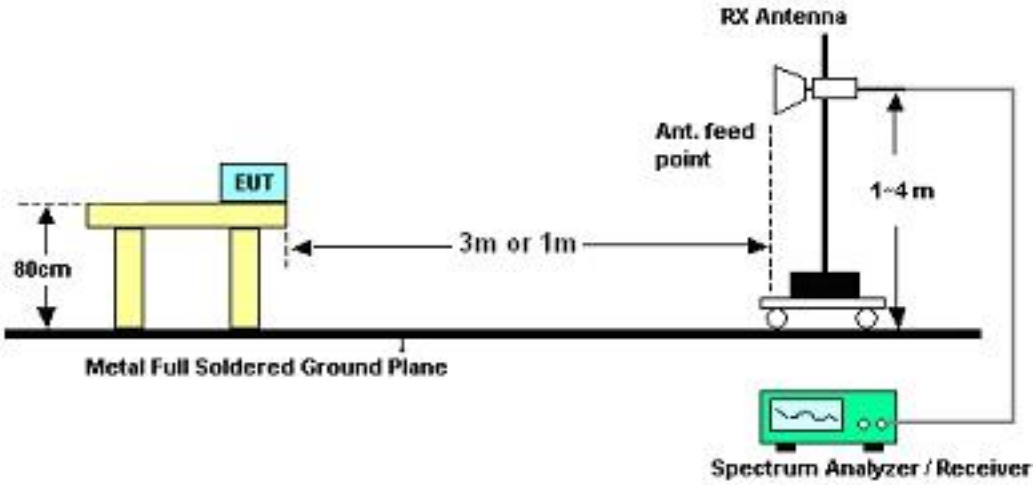
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

Test Engineer :	David Yang	Temperature :	20~21℃
		Relative Humidity :	45~47%

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 (specific distance / test distance) (dB);

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

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

<Sample 1>

Test Mode :	Mode 1	**Temperature :**	20~21℃
Test Channel :	11	**Relative Humidity :**	45~47%
Test Engineer :	David Yang	**Polarization :**	Horizontal
Remark :	2462 MHz is Fundamental Signals which can be ignored.		

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
48.36	36.04	-3.96	40	57.8	9.08	0.68	31.52	145	231	Peak
56.46	32.85	-7.15	40	56.95	6.71	0.74	31.55	-	-	Peak
120.45	15.16	-28.34	43.5	34.09	11.53	1.1	31.56	-	-	Peak
408.5	17.39	-28.61	46	29.69	16.7	2.17	31.17	-	-	Peak
617.8	21.35	-24.65	46	29.54	19.97	2.74	30.9	-	-	Peak
808.9	24.08	-21.92	46	29.04	22.57	3.16	30.69	-	-	Peak
2388	52.93	-21.07	74	48.57	32.18	6.03	33.85	129	28	Peak
2388	39.22	-14.78	54	34.86	32.18	6.03	33.85	129	28	Average
2462	90.71	-	-	86.2	32.26	6.14	33.89	129	28	Average
2462	108.66	-	-	104.15	32.26	6.14	33.89	129	28	Peak
2483.85	69.47	-4.53	74	64.91	32.28	6.18	33.9	129	28	Peak
2483.85	48.35	-5.65	54	43.79	32.28	6.18	33.9	129	28	Average
7386	44.63	-29.37	74	57.32	35.38	10.1	58.17	100	0	Peak

Test Mode :	Mode 1	Temperature :	20~21℃
Test Channel :	11	Relative Humidity :	45~47%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2462 MHz is Fundamental Signals which can be ignored.		

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
48.09	34.15	-5.85	40	55.91	9.08	0.68	31.52	100	312	Peak
92.37	23.11	-20.39	43.5	44.77	8.9	0.96	31.52	-	-	Peak
220.62	25.39	-20.61	46	44.81	10.61	1.43	31.46	-	-	Peak
423.9	17.91	-28.09	46	29.87	16.96	2.22	31.14	-	-	Peak
657	23.42	-22.58	46	31.03	20.4	2.85	30.86	-	-	Peak
721.4	25.37	-20.63	46	31.92	21.23	2.99	30.77	-	-	Peak
2390	37.15	-16.85	54	32.79	32.18	6.03	33.85	100	262	Average
2390	50.48	-23.52	74	46.12	32.18	6.03	33.85	100	262	Peak
2462	87.16	-	-	82.65	32.26	6.14	33.89	100	262	Average
2462	104.71	-	-	100.2	32.26	6.14	33.89	100	262	Peak
2483.5	65.64	-8.36	74	61.08	32.28	6.18	33.9	100	262	Peak
2483.5	45.2	-8.8	54	40.64	32.28	6.18	33.9	100	262	Average
7386	44.85	-29.15	74	57.54	35.38	10.1	58.17	100	0	Peak

<Sample 2>

Test Mode :	Mode 1	**Temperature :**	20~21℃
Test Channel :	11	**Relative Humidity :**	45~47%
Test Engineer :	David Yang	**Polarization :**	Horizontal
Remark :	2462 MHz is Fundamental Signals which can be ignored.		

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
45.66	20.36	-19.64	40	40.93	10.27	0.66	31.5	-	-	Peak
92.37	27.56	-15.94	43.5	49.22	8.9	0.96	31.52	-	-	Peak
234.93	19.31	-26.69	46	37.67	11.57	1.5	31.43	-	-	Peak
377	24.16	-21.84	46	37.44	15.87	2.09	31.24	-	-	Peak
539.4	21.94	-24.06	46	31.58	18.83	2.53	31	-	-	Peak
755.7	32.19	-13.81	46	38.06	21.76	3.07	30.7	168	274	Peak
2388	50.15	-23.85	74	45.79	32.18	6.03	33.85	184	28	Peak
2388	36.65	-17.35	54	32.29	32.18	6.03	33.85	184	28	Average
2462	89.96	-	-	85.45	32.26	6.14	33.89	184	28	Average
2462	107.88	-	-	103.37	32.26	6.14	33.89	184	28	Peak
2483.66	70.42	-3.58	74	65.86	32.28	6.18	33.9	184	28	Peak
2483.66	48.54	-5.46	54	43.98	32.28	6.18	33.9	184	28	Average
7386	48.21	-25.79	74	60.9	35.38	10.1	58.17	100	0	Peak

Test Mode :	Mode 1	Temperature :	20~21℃
Test Channel :	11	Relative Humidity :	45~47%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2462 MHz is Fundamental Signals which can be ignored.		

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
40.26	27.17	-12.83	40	45.55	12.5	0.63	31.51	114	326	Peak
118.29	22.38	-21.12	43.5	41.49	11.36	1.09	31.56	-	-	Peak
192.54	20.91	-22.59	43.5	42.04	9.08	1.29	31.5	-	-	Peak
377	22.41	-23.59	46	35.69	15.87	2.09	31.24	-	-	Peak
539.4	22.12	-23.88	46	31.76	18.83	2.53	31	-	-	Peak
755.7	30.54	-15.46	46	36.41	21.76	3.07	30.7	-	-	Peak
2382	50.38	-23.62	74	46.04	32.16	6.03	33.85	121	278	Peak
2382	37.61	-16.39	54	33.27	32.16	6.03	33.85	121	278	Average
2462	88.2	-	-	83.69	32.26	6.14	33.89	121	278	Average
2462	106.2	-	-	101.69	32.26	6.14	33.89	121	278	Peak
2483.66	63.71	-10.29	74	59.15	32.28	6.18	33.9	121	278	Peak
2483.66	43.03	-10.97	54	38.47	32.28	6.18	33.9	121	278	Average
7386	46.46	-27.54	74	59.15	35.38	10.1	58.17	100	0	Peak

<Sample 3>

Test Mode :	Mode 1	**Temperature :**	20~21℃
Test Channel :	11	**Relative Humidity :**	45~47%
Test Engineer :	David Yang	**Polarization :**	Horizontal
Remark :	2462 MHz is Fundamental Signals which can be ignored.		

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
32.7	19.12	-20.88	40	34.23	15.8	0.56	31.47	-	-	Peak
68.34	21.41	-18.59	40	45.9	6.23	0.83	31.55	-	-	Peak
216.3	17.5	-28.5	46	37.29	10.27	1.4	31.46	-	-	Peak
377	26.01	-19.99	46	39.29	15.87	2.09	31.24	-	-	Peak
592.6	25.66	-20.34	46	34.27	19.65	2.67	30.93	-	-	Peak
755.7	39.37	-6.63	46	45.24	21.76	3.07	30.7	133	193	Peak
2390	50.11	-23.89	74	45.75	32.18	6.03	33.85	186	22	Peak
2390	37.19	-16.81	54	32.83	32.18	6.03	33.85	186	22	Average
2462	89.82	-	-	85.31	32.26	6.14	33.89	186	22	Average
2462	107.68	-	-	103.17	32.26	6.14	33.89	186	22	Peak
2483.5	68.92	-5.08	74	64.36	32.28	6.18	33.9	186	22	Peak
2483.5	48.68	-5.32	54	44.12	32.28	6.18	33.9	186	22	Average
7386	47.51	-26.49	74	60.2	35.38	10.1	58.17	100	0	Peak

Test Mode :	Mode 1	Temperature :	20~21℃
Test Channel :	11	Relative Humidity :	45~47%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2462 MHz is Fundamental Signals which can be ignored.		

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
40.26	21.82	-18.18	40	40.2	12.5	0.63	31.51	-	-	Peak
144.21	26.73	-16.77	43.5	45.71	11.37	1.2	31.55	-	-	Peak
192.54	23.18	-20.32	43.5	44.31	9.08	1.29	31.5	-	-	Peak
377	22.45	-23.55	46	35.73	15.87	2.09	31.24	-	-	Peak
590.5	30.26	-15.74	46	38.91	19.62	2.66	30.93	-	-	Peak
755.7	34.29	-11.71	46	40.16	21.76	3.07	30.7	121	157	Peak
2382	49.27	-24.73	74	44.93	32.16	6.03	33.85	122	278	Peak
2382	36.99	-17.01	54	32.65	32.16	6.03	33.85	122	278	Average
2462	87.38	-	-	82.87	32.26	6.14	33.89	122	278	Average
2462	106.32	-	-	101.81	32.26	6.14	33.89	122	278	Peak
2483.5	64.44	-9.56	74	59.88	32.28	6.18	33.9	122	278	Peak
2483.5	43.68	-10.32	54	39.12	32.28	6.18	33.9	122	278	Average
7386	48.03	-25.97	74	60.72	35.38	10.1	58.17	100	0	Peak

<Sample 4>

Test Mode :	Mode 1	**Temperature :**	20~21℃
Test Channel :	11	**Relative Humidity :**	45~47%
Test Engineer :	David Yang	**Polarization :**	Horizontal
Remark :	2462 MHz is Fundamental Signals which can be ignored.		

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
31.89	19.09	-20.91	40	33.96	16.04	0.55	31.46	-	-	Peak
139.89	21.5	-22	43.5	40.25	11.6	1.2	31.55	-	-	Peak
258.42	18.53	-27.47	46	35.58	12.79	1.58	31.42	-	-	Peak
393.8	17.07	-28.93	46	29.76	16.38	2.13	31.2	-	-	Peak
592.6	22.04	-23.96	46	30.65	19.65	2.67	30.93	-	-	Peak
755.7	25.23	-20.77	46	31.1	21.76	3.07	30.7	144	278	Peak
2382	52.55	-21.45	74	48.21	32.16	6.03	33.85	101	26	Peak
2382	39.21	-14.79	54	34.87	32.16	6.03	33.85	101	26	Average
2462	108.41	-	-	103.9	32.26	6.14	33.89	101	26	Peak
2462	91.34	-	-	86.83	32.26	6.14	33.89	101	26	Average
2483.5	68.88	-5.12	74	64.32	32.28	6.18	33.9	101	26	Peak
2483.5	48.42	-5.58	54	43.86	32.28	6.18	33.9	101	26	Average
7386	48.26	-25.74	74	60.95	35.38	10.1	58.17	100	0	Peak

Test Mode :	Mode 1	Temperature :	20~21℃
Test Channel :	11	Relative Humidity :	45~47%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2462 MHz is Fundamental Signals which can be ignored.		

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
31.62	19.13	-20.87	40	34	16.04	0.55	31.46	-	-	Peak
140.97	19.13	-24.37	43.5	37.93	11.55	1.2	31.55	-	-	Peak
286.5	22.76	-23.24	46	39.18	13.24	1.67	31.33	-	-	Peak
408.5	17.76	-28.24	46	30.06	16.7	2.17	31.17	-	-	Peak
559	25.15	-20.85	46	34.42	19.13	2.57	30.97	-	-	Peak
789.3	25.41	-20.59	46	30.67	22.3	3.12	30.68	131	102	Peak
2388	51.47	-22.53	74	47.11	32.18	6.03	33.85	101	96	Peak
2388	36.85	-17.15	54	32.49	32.18	6.03	33.85	101	96	Average
2462	107.19	-	-	102.68	32.26	6.14	33.89	101	96	Peak
2462	89.99	-	-	85.48	32.26	6.14	33.89	101	96	Average
2483.85	64.55	-9.45	74	59.99	32.28	6.18	33.9	101	96	Peak
2483.85	44.57	-9.43	54	40.01	32.28	6.18	33.9	101	96	Average
7386	46.24	-27.76	74	58.93	35.38	10.1	58.17	100	0	Peak

2.8 Antenna Requirements

2.8.1 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.

2.8.2 Antenna Connected Construction

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

2.8.3 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.

3 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 31, 2010	Oct. 30, 2011	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP	101067	9KHz ~ 30GHz	Dec. 03, 2010	Dec. 02, 2011	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 19, 2010	Aug. 18, 2011	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 18, 2010	Oct. 17, 2011	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec. 06, 2010	Dec. 05, 2011	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32 dB.GAIN	Mar. 29, 2011	Mar. 28, 2012	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Jul. 28, 2011	Radiation (03CH07-HY)
Bluetooth Base Station	R&S	CBT32	100522	N/A	Jan.13, 2011	Jan.13, 2013	Radiation (03CH07-HY)
EMI Test Receive	R&S	ESCS 30	100356	9KHz – 2.75GHz	Aug. 16, 2010	Aug. 15, 2011	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz – 30MHz	Dec. 03, 2010	Dec. 02, 2011	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz – 30MHz	Dec. 01, 2010	Nov. 30, 2011	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
GPS Station	T&E	GS-50	N/A	N/A	N/A	N/A	Conduction (CO05-HY)

4 Uncertainty of Evaluation

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

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

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

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

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

Contribution	Uncertainty of X_i		$u(X_i)$	C_i	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	±0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	±1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	±0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site Imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR Γ1 = 0.197 Antenna VSWR Γ2 = 0.194 Uncertainty = 20Log(1-Γ1*Γ2)	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty Uc(y)	**2.36**				
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.72**				

Appendix A. Photographs of EUT

Please refer to Sporton report number EP132346-04B as below.

Appendix C. Original Report

Please refer to Sporton report number FR132346B as below.