Variant FCC RF Test Report

APPLICANT	:	Acer Incorporated
EQUIPMENT	:	Tablet Computer
BRAND NAME	:	Acer
MODEL NAME	:	A500
FCC ID	:	HLZTMDMA500
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	Digital Spread Spectrum (DSS)

This is a variant report which is only valid together with the original test report. The product was received on May 27, 2011 and completely tested on May 28, 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
FR112908-04A	Rev. 01	This is a variant report. The original report which can be referred to Sporton Report No. FR112908A as appendix C. Detail changes list as below : 1. Add Docking 2. eMMC added Scandisk 64G and Samsung 64G 3. LPDDR2 add Hynix 8Gb 4. Change Bluetooth and WLAN Antenna (module, antenna gain and antenna type are same as the original) 5. Camera add Liteon / 11P2BA501 6. Battery add SANYO GC02001FU00 7. Touch +LCD add AUO + Cando GC02001D610 8. USB cable added ICT(DC081001A00) and MEC(DC081001A00) For the changes, the test case was verified.	Jun. 21, 2011

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(d)	A8.5	Frequency Band Edges	≤ 20dBc	Pass	-
3.2	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 10.6 dB at 3.59 MHz
3.3	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 11.05 dB at 49.17 MHz
3.4	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	A500
Sample 1	EUT with LCM Main, eMMC 1, Carema Main and LP DDR2 1
Sample 2	EUT with LCM 2nd, eMMC 2, Carema 2nd and LP DDR2 2
Sample 3	EUT with LCM 2nd, eMMC 3, Carema 2nd and LP DDR2 2
FCC ID	HLZTMDMA500
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz
Number of Channels	79
Carrier Frequency of Each Channel	2402+n*1 MHz; n=0~78
Channel Spacing	1 MHz
Maximum Output Power to Antenna	Bluetooth (1Mbps) : 2.33 dBm Bluetooth EDR (2Mbps) : 4.56 dBm Bluetooth EDR (3Mbps) : 2.41 dBm
Antenna Type	PIFA Antenna with gain 1.75 dBi
HW Version	LA-6872P Rev. 3
Type of Modulation	Bluetooth (1Mbps) : GFSK Bluetooth EDR (2Mbps) : π /4-DQPSK Bluetooth EDR (3Mbps) : 8-DPSK
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 Spread Spectrum (DSS).
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 Public Notice DA 00-705
- 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.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	LCD Monitor	Dell	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
6.	iPod Earphone	Apple	N/A	N/A	shielded, 1.0 m	N/A
7.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
8.	iPod	Apple	A1199	FCC DoC	Shielded, 1.0 m	N/A
9.	Controller	Acer	IR28012AC3	N/A	N/A	N/A
10.	Bluetooth Base Station	R&S	CBT32	N/A	N/A	Unshielded, 1.8 m

2 Test Configuration of Equipment Under Test

2.1 RF Output Power

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

Channel	Frequency	Bluetooth RF Output Power		
		Data Rate / Modulation		
		GFSK	π /4-DQPSK	8-DPSK
		1Mbps	2Mbps	3Mbps
Ch00	2402MHz	1.40 dBm	3.62 dBm	1.46 dBm
Ch39	2441MHz	1.90 dBm	4.05 dBm	1.99 dBm
Ch78	2480MHz	2.33 dBm	**4.56 dBm**	2.41 dBm

Remark:

1. The data rate was set in 2Mbps for all the test items 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: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Pre-scanned tests 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.

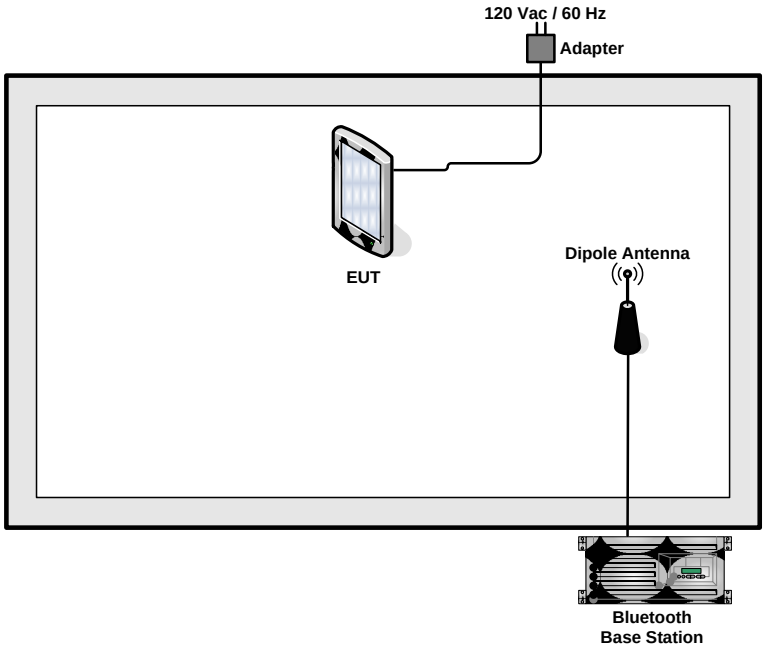
Test Cases			
Test Item	**Data Rate / Modulation**		
	Bluetooth 1Mbps GFSK	**Bluetooth EDR 2Mbps π /4-DQPSK**	**Bluetooth EDR 3Mbps 8-DPSK**
Radiated TCs	N/A	Mode 1: CH00_2402 MHz (E1 Plane) for Sample 2 Mode 2: CH00_2402 MHz (Docking) for Sample 2 Mode 3: CH00_2402 MHz (E1 Plane) for Sample 3 Mode 4: CH00_2402 MHz (Docking) for Sample 3	N/A
AC Conducted Emission	Mode 1 :WLAN Link + Bluetooth Link + GPS Rx + TC + Docking + USB Cable 2 (Link with Notebook) for Sample 2 Mode 2 :WLAN Link + Bluetooth Link + GPS Rx + TC + Docking + USB Cable 3 (Link with Notebook) for Sample 3		

Remark:

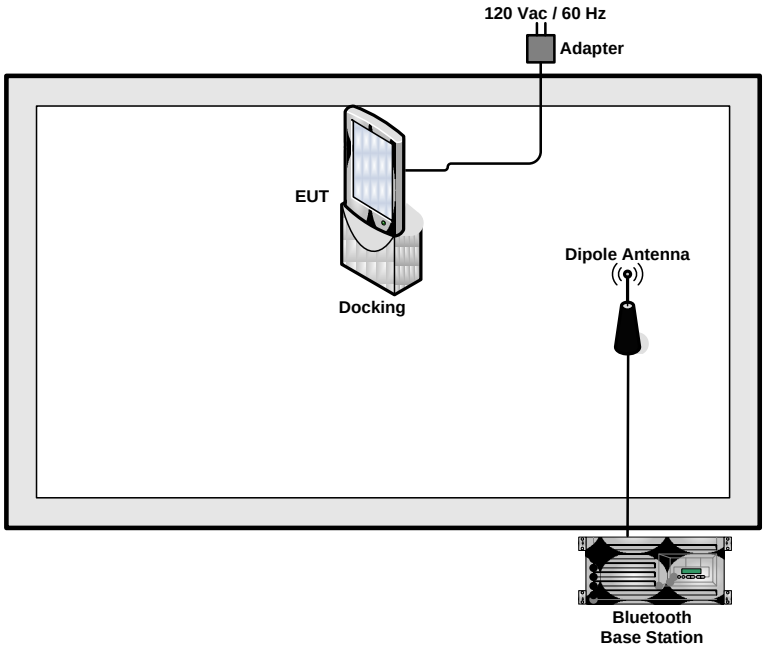
1. TC stands for Test Configuration, and consists of iPod, HDMI cable, and monitor.
2. For radiated TCs, the data rate was set in 2Mbps due to the highest RF output power; only the data of these modes was reported.
3. For conducted emission, the worst case is mode 2; only the test data of this mode was reported.

2.3 Connection Diagram of Test System

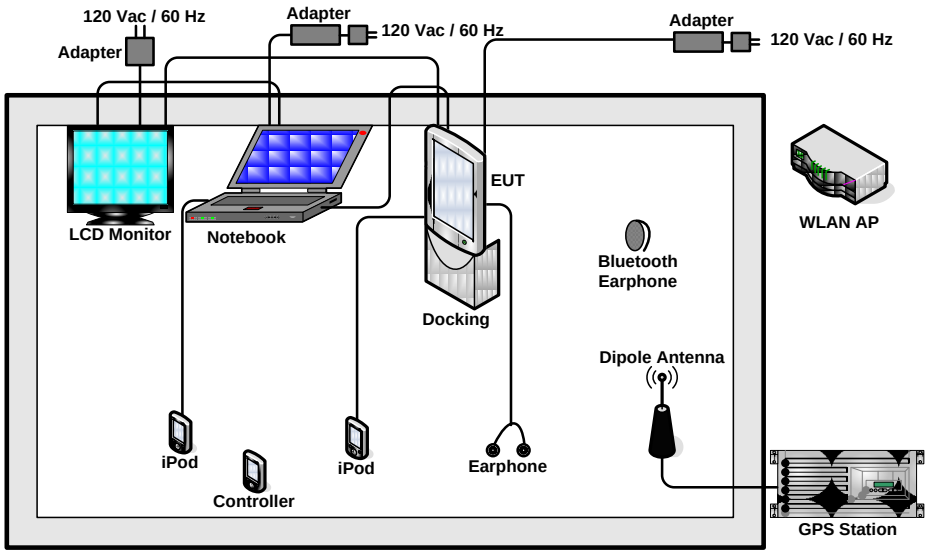
<EUT without Docking in Bluetooth Tx Mode>



<EUT with Docking in Bluetooth Tx Mode>



<AC Conducted Emission Mode>



2.4 RF Utility

For Bluetooth function, the RF utility, “Command” was installed in EUT which was programmed in order to make the EUT into the engineering modes to contact with Bluetooth base station for transmitting and receiving signals continuously.

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. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

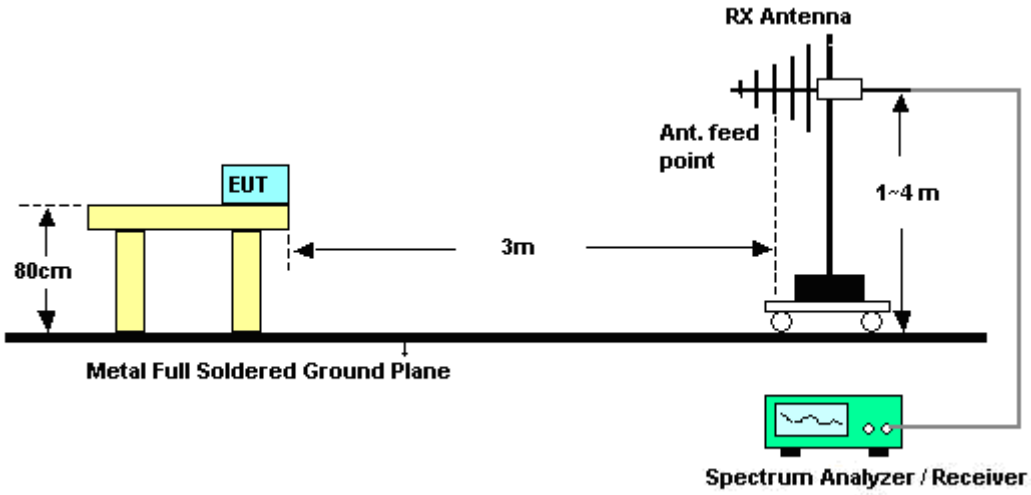
3.1.2 Measuring Instruments

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 Public Notice DA 00-705 Measurement Guidelines.
2. RF antenna conducted test: Set RBW = 300kHz, 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 300k Hz 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: Applies 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 = 1MHz, Sweep: Auto for Peak; set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto for Average. 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. See FCC Section 15.35(b) and (c).
4. In case the emission is fail due to the used RBW / VBW is too wide, marker-delta method of FCC Public Notice DA 00-705 will be followed.

3.1.4 Test Setup



3.1.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	45~48%
		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
2388.09	48.2	-25.8	74	43.84	32.18	6.03	33.85	112	243	Peak
2388.09	36.07	-17.93	54	31.71	32.18	6.03	33.85	112	243	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
2384.1	47.12	-26.88	74	42.78	32.16	6.03	33.85	103	282	Peak
2384.1	34.19	-19.81	54	29.85	32.16	6.03	33.85	103	282	Average

Test Mode :	Mode 2	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	45~48%
		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
2388.85	46.91	-27.09	74	42.55	32.18	6.03	33.85	136	354	Peak
2388.85	34.4	-19.6	54	30.04	32.18	6.03	33.85	136	354	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
2388.85	49.54	-24.46	74	45.18	32.18	6.03	33.85	100	165	Peak
2388.85	35.87	-18.13	54	31.51	32.18	6.03	33.85	100	165	Average

Test Mode :	Mode 3	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	45~48%
		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
2389.42	49.54	-24.46	74	45.18	32.18	6.03	33.85	155	254	Peak
2389.42	36.14	-17.86	54	31.78	32.18	6.03	33.85	155	254	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2387.33	49.25	-24.75	74	44.89	32.18	6.03	33.85	104	274	Peak
2387.33	35.57	-18.43	54	31.21	32.18	6.03	33.85	104	274	Average

Test Mode :	Mode 4	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	45~48%
		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
2389.42	46.42	-27.58	74	42.06	32.18	6.03	33.85	127	356	Peak
2389.42	34.23	-19.77	54	29.87	32.18	6.03	33.85	127	356	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
2384.86	49.47	-24.53	74	45.13	32.16	6.03	33.85	100	164	Peak
2384.86	35.84	-18.16	54	31.5	32.16	6.03	33.85	100	164	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.

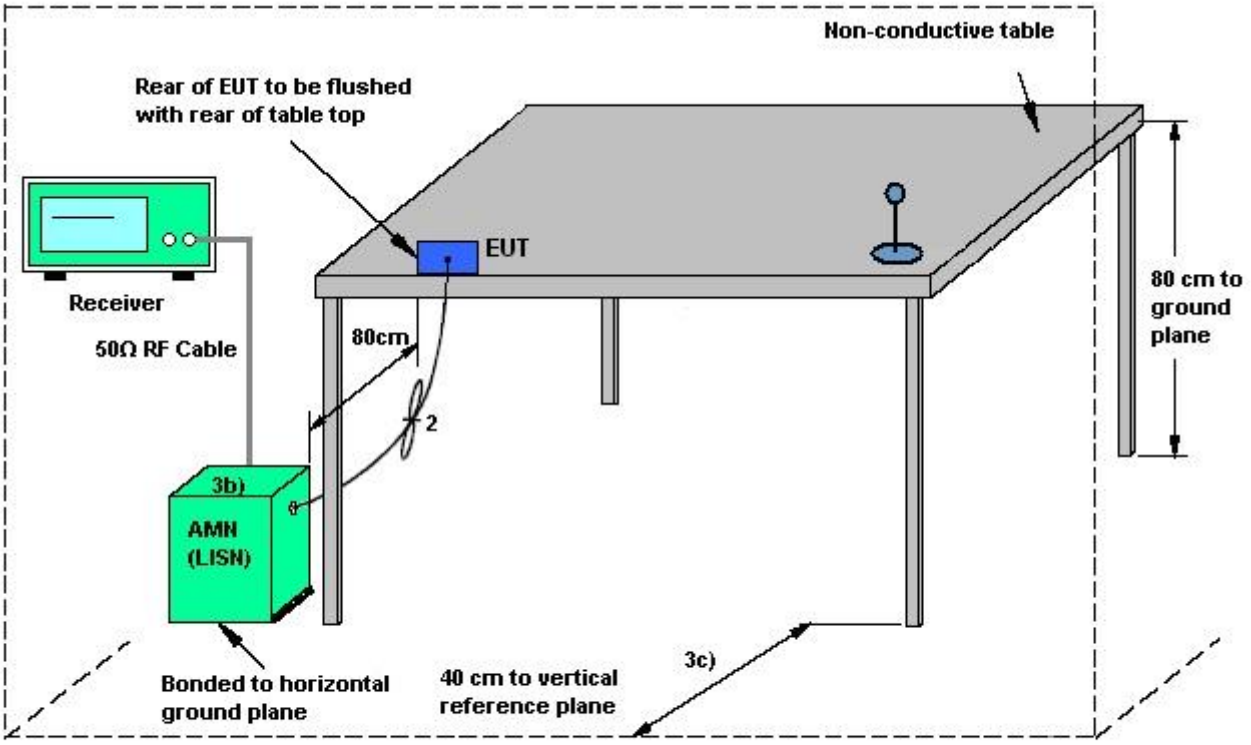
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

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

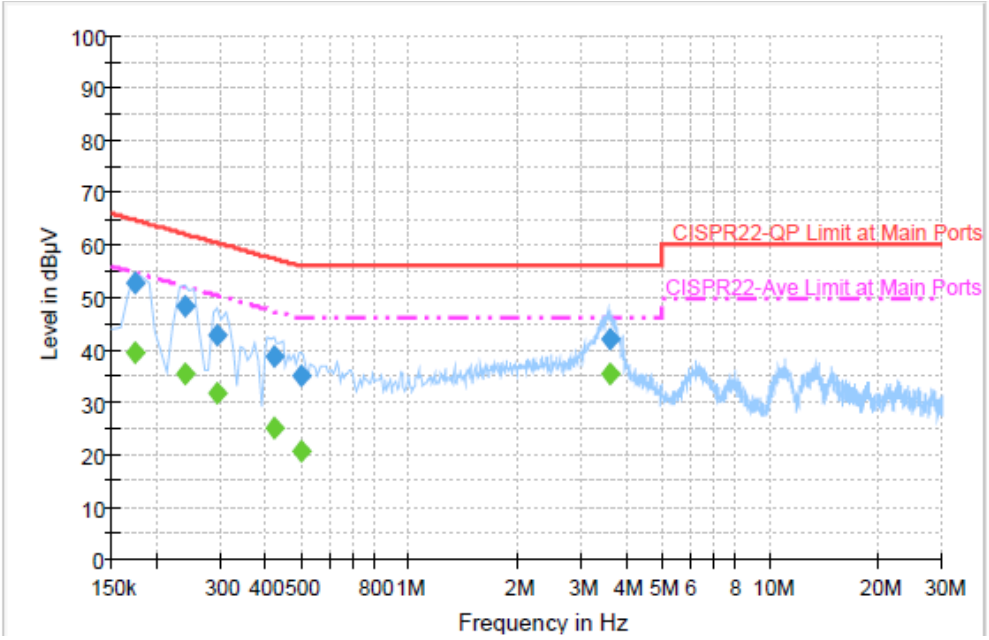
3.2.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.2.5 Test Result of AC Conducted Emission

Test Mode :	Mode 2	**Temperature :**	20~22℃
Test Engineer :	Novic Chiang	**Relative Humidity :**	40~42%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	WLAN Link + Bluetooth Link + GPS Rx + TC + Docking + USB Cable 3 (Link with Notebook) for Sample 3		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



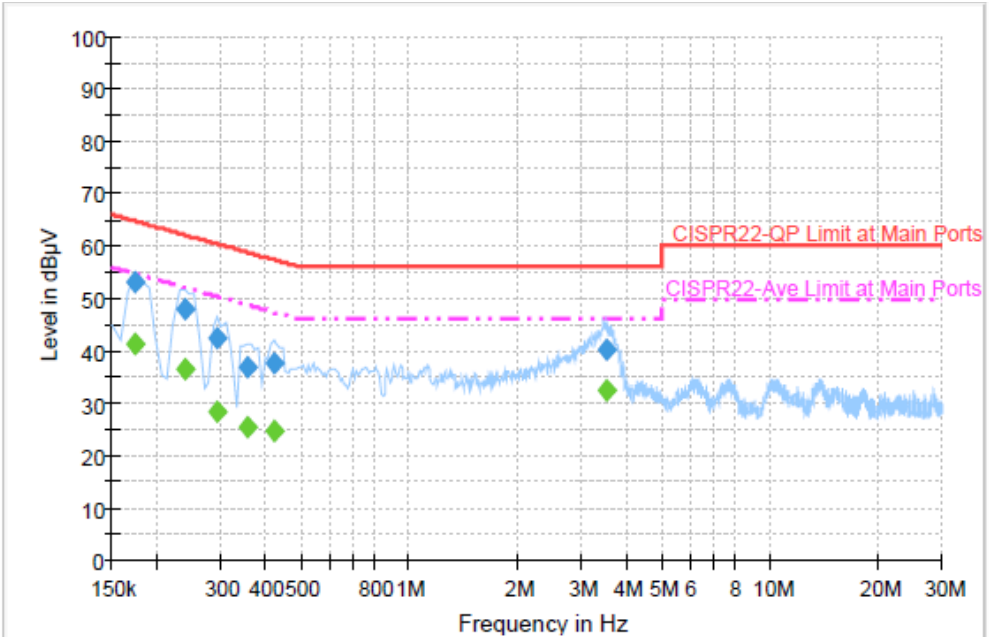
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.174000	52.8	Off	L1	19.4	12.0	64.8
0.238000	48.4	Off	L1	19.4	13.8	62.2
0.294000	42.9	Off	L1	19.4	17.5	60.4
0.422000	38.9	Off	L1	19.5	18.5	57.4
0.502000	35.2	Off	L1	19.4	20.8	56.0
3.598000	42.2	Off	L1	19.5	13.8	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.174000	39.3	Off	L1	19.4	15.5	54.8
0.238000	35.4	Off	L1	19.4	16.8	52.2
0.294000	31.8	Off	L1	19.4	18.6	50.4
0.422000	25.2	Off	L1	19.5	22.2	47.4
0.502000	20.8	Off	L1	19.4	25.2	46.0
3.598000	35.4	Off	L1	19.5	10.6	46.0

Test Mode :	Mode 2	**Temperature :**	20~22℃
Test Engineer :	Novic Chiang	**Relative Humidity :**	40~42%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	WLAN Link + Bluetooth Link + GPS Rx + TC + Docking + USB Cable 3 (Link with Notebook) for Sample 3		
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	53.0	Off	N	19.4	11.8	64.8
0.238000	48.0	Off	N	19.4	14.2	62.2
0.294000	42.5	Off	N	19.4	17.9	60.4
0.358000	36.8	Off	N	19.4	22.0	58.8
0.422000	37.5	Off	N	19.5	19.9	57.4
3.542000	40.2	Off	N	19.5	15.8	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.174000	41.3	Off	N	19.4	13.5	54.8
0.238000	36.7	Off	N	19.4	15.5	52.2
0.294000	28.4	Off	N	19.4	22.0	50.4
0.358000	25.5	Off	N	19.4	23.3	48.8
0.422000	24.7	Off	N	19.5	22.7	47.4
3.542000	32.6	Off	N	19.5	13.4	46.0

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. 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

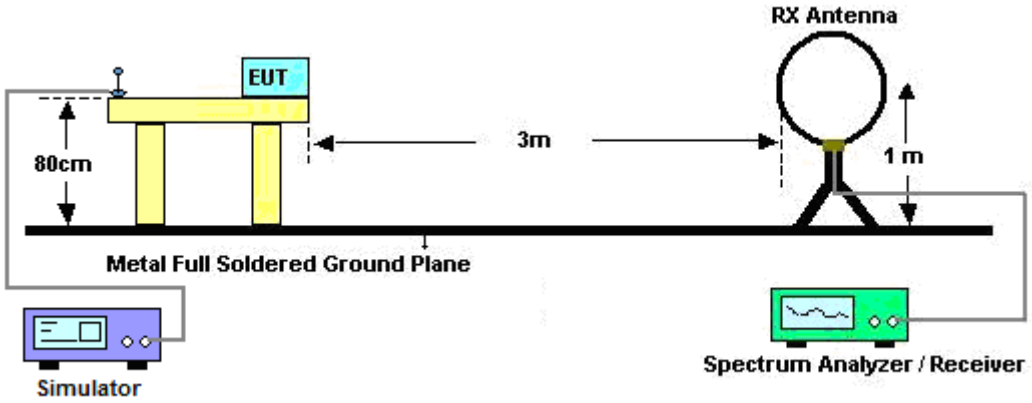
See list of measuring instruments of this test report.

3.3.3 Test Procedures

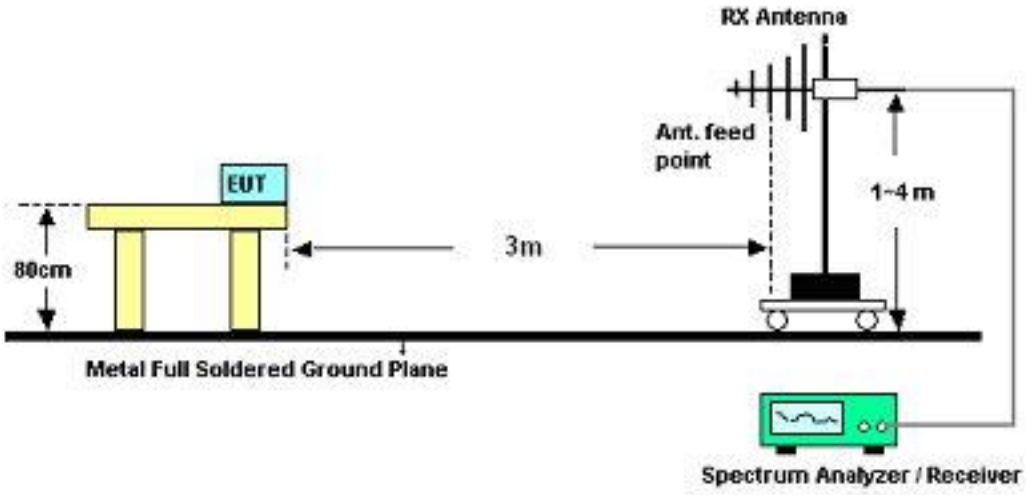
1. The testing follows the guidelines in FCC Public Notice DA 00-705 Measurement Guidelines.
2. Use the following spectrum analyzer settings:
   (1) Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = 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.
4. Measured average value for the peak value is greater than 54 dBuv/m

3.3.4 Test Setup

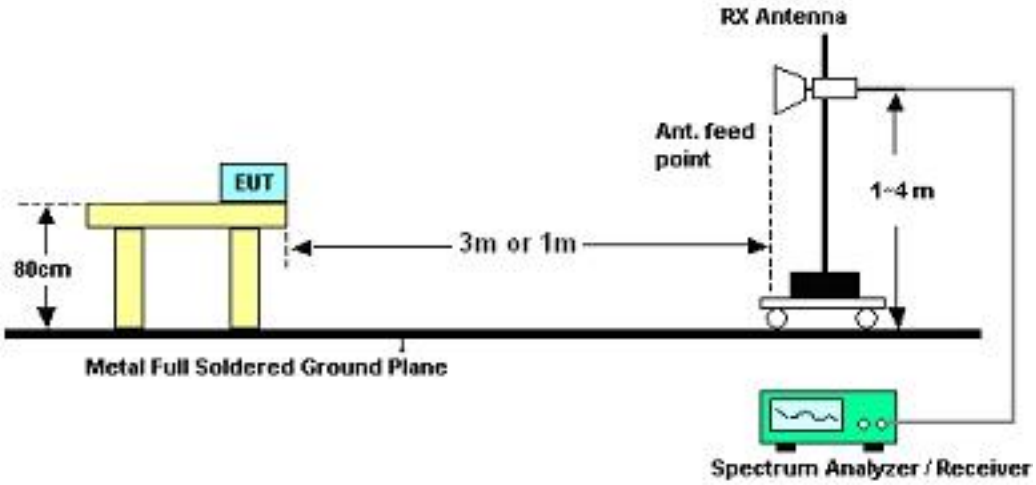
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

Test Engineer :	David Yang	Temperature :	21~23°C
		Relative Humidity :	45~48%

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 (specific distance / test distance) (dB);

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

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

Test Mode :	Mode 1	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	45~48%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	2402 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
42.69	19.57	-20.43	40	38.85	11.59	0.64	31.51	111	182	Peak
248.97	22.24	-23.76	46	39.52	12.6	1.53	31.41	-	-	Peak
259.77	22.41	-23.59	46	39.42	12.82	1.59	31.42	-	-	Peak
393.8	22.82	-23.18	46	35.51	16.38	2.13	31.2	-	-	Peak
710.2	22.81	-23.19	46	29.6	21.04	2.96	30.79	-	-	Peak
853.7	25.19	-20.81	46	29.55	23.09	3.28	30.73	-	-	Peak
2388.09	48.2	-25.8	74	43.84	32.18	6.03	33.85	112	243	Peak
2388.09	36.07	-17.93	54	31.71	32.18	6.03	33.85	112	243	Average
2402	102.41	-	-	98.03	32.2	6.03	33.85	112	243	Peak
2402	84.67	-	-	80.31	32.18	6.03	33.85	112	243	Average
2494	31.83	-22.17	54	27.25	32.3	6.18	33.9	112	243	Average
2494	43.57	-30.43	74	38.99	32.3	6.18	33.9	112	243	Peak

Test Mode :	Mode 1	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	45~48%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2402 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
34.05	26.56	-13.44	40	41.89	15.57	0.57	31.47	-	-	Peak
48.09	27.57	-12.43	40	49.33	9.08	0.68	31.52	109	226	Peak
259.77	27.56	-18.44	46	44.57	12.82	1.59	31.42	-	-	Peak
612.9	21.14	-24.86	46	29.41	19.91	2.73	30.91	-	-	Peak
771.8	24.49	-21.51	46	30.05	22.03	3.1	30.69	-	-	Peak
875.4	25.6	-20.4	46	29.65	23.35	3.31	30.71	-	-	Peak
2384.1	47.12	-26.88	74	42.78	32.16	6.03	33.85	103	282	Peak
2384.1	34.19	-19.81	54	29.85	32.16	6.03	33.85	103	282	Average
2402	99.5	-	-	95.12	32.2	6.03	33.85	103	282	Peak
2402	82.26	-	-	77.9	32.18	6.03	33.85	103	282	Average
2484	31.84	-22.16	54	27.28	32.28	6.18	33.9	103	282	Average
2484	44.83	-29.17	74	40.27	32.28	6.18	33.9	103	282	Peak

Test Mode :	Mode 2	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	45~48%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	2402 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
106.41	17.72	-25.78	43.5	37.87	10.37	1.03	31.55	-	-	Peak
243.3	18.68	-27.32	46	36.38	12.19	1.53	31.42	-	-	Peak
271.38	19.25	-26.75	46	35.97	13.01	1.64	31.37	-	-	Peak
624.1	21.88	-24.12	46	29.99	20.03	2.76	30.9	-	-	Peak
797	23.77	-22.23	46	28.89	22.42	3.14	30.68	144	203	Peak
968.5	26.8	-27.2	54	29.39	24.5	3.48	30.57	-	-	Peak
2388.85	46.91	-27.09	74	42.55	32.18	6.03	33.85	136	354	Peak
2388.85	34.4	-19.6	54	30.04	32.18	6.03	33.85	136	354	Average
2402	98.61	-	-	94.23	32.2	6.03	33.85	136	354	Peak
2402	81.56	-	-	77.2	32.18	6.03	33.85	136	354	Average
2484	32	-22	54	27.44	32.28	6.18	33.9	136	354	Average
2484	44.41	-29.59	74	39.85	32.28	6.18	33.9	136	354	Peak

Test Mode :	Mode 2	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	45~48%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2402 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
33.78	27.63	-12.37	40	42.96	15.57	0.57	31.47	-	-	Peak
49.17	28.95	-11.05	40	51.11	8.68	0.69	31.53	112	192	Peak
271.38	26.8	-19.2	46	43.52	13.01	1.64	31.37	-	-	Peak
393.8	20.47	-25.53	46	33.16	16.38	2.13	31.2	-	-	Peak
654.9	21.95	-24.05	46	29.59	20.38	2.85	30.87	-	-	Peak
862.1	24.81	-21.19	46	29.05	23.19	3.29	30.72	-	-	Peak
2388.85	49.54	-24.46	74	45.18	32.18	6.03	33.85	100	165	Peak
2388.85	35.87	-18.13	54	31.51	32.18	6.03	33.85	100	165	Average
2402	102.62	-	-	98.24	32.2	6.03	33.85	100	165	Peak
2402	85.1	-	-	80.74	32.18	6.03	33.85	100	165	Average
2492	32.03	-21.97	54	27.45	32.3	6.18	33.9	100	165	Average
2492	44.4	-29.6	74	39.82	32.3	6.18	33.9	100	165	Peak

Test Mode :	Mode 3	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	45~48%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	2402 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
42.69	17.15	-22.85	40	36.43	11.59	0.64	31.51	157	131	Peak
106.41	18	-25.5	43.5	38.15	10.37	1.03	31.55	-	-	Peak
259.77	21.4	-24.6	46	38.41	12.82	1.59	31.42	-	-	Peak
631.8	22.39	-23.61	46	30.38	20.12	2.78	30.89	-	-	Peak
780.9	22.76	-23.24	46	28.18	22.16	3.11	30.69	-	-	Peak
973.4	27.56	-26.44	54	30.09	24.56	3.48	30.57	-	-	Peak
2389.42	49.54	-24.46	74	45.18	32.18	6.03	33.85	155	254	Peak
2389.42	36.14	-17.86	54	31.78	32.18	6.03	33.85	155	254	Average
2402	102.94	-	-	98.56	32.2	6.03	33.85	155	254	Peak
2402	84.92	-	-	80.56	32.18	6.03	33.85	155	254	Average
2484	31.93	-22.07	54	27.37	32.28	6.18	33.9	155	254	Average
2484	43.5	-30.5	74	38.94	32.28	6.18	33.9	155	254	Peak

Test Mode :	Mode 3	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	45~48%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2402 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
33.78	27.41	-12.59	40	42.74	15.57	0.57	31.47	102	87	Peak
132.33	22.43	-21.07	43.5	41.26	11.58	1.16	31.57	-	-	Peak
248.97	25.49	-20.51	46	42.77	12.6	1.53	31.41	-	-	Peak
464.5	18.9	-27.1	46	30.01	17.64	2.33	31.08	-	-	Peak
638.1	21.9	-24.1	46	29.79	20.19	2.8	30.88	-	-	Peak
971.3	27.38	-26.62	54	29.95	24.52	3.48	30.57	-	-	Peak
2387.33	49.25	-24.75	74	44.89	32.18	6.03	33.85	104	274	Peak
2387.33	35.57	-18.43	54	31.21	32.18	6.03	33.85	104	274	Average
2402	101.76	-	-	97.38	32.2	6.03	33.85	104	274	Peak
2402	84.41	-	-	80.05	32.18	6.03	33.85	104	274	Average
2500	31.94	-22.06	54	27.36	32.3	6.18	33.9	104	274	Average
2500	44.09	-29.91	74	39.51	32.3	6.18	33.9	104	274	Peak

Test Mode :	Mode 4	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	45~48%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	2402 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
32.97	18.55	-21.45	40	33.66	15.8	0.56	31.47	-	-	Peak
58.62	16.14	-23.86	40	41	5.93	0.75	31.54	-	-	Peak
248.97	20.33	-25.67	46	37.61	12.6	1.53	31.41	-	-	Peak
430.9	19.95	-26.05	46	31.76	17.07	2.25	31.13	-	-	Peak
645.8	22.12	-23.88	46	29.88	20.28	2.83	30.87	-	-	Peak
895.7	25.92	-20.08	46	29.72	23.57	3.33	30.7	139	217	Peak
2389.42	46.42	-27.58	74	42.06	32.18	6.03	33.85	127	356	Peak
2389.42	34.23	-19.77	54	29.87	32.18	6.03	33.85	127	356	Average
2402	99.89	-	-	95.51	32.2	6.03	33.85	127	356	Peak
2402	82.62	-	-	78.26	32.18	6.03	33.85	127	356	Average
2494	31.96	-22.04	54	27.38	32.3	6.18	33.9	127	356	Average
2494	44.22	-29.78	74	39.64	32.3	6.18	33.9	127	356	Peak

Test Mode :	Mode 4	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	45~48%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2402 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
48.9	27.44	-12.56	40	49.21	9.08	0.68	31.53	100	52	Peak
248.97	26	-20	46	43.28	12.6	1.53	31.41	-	-	Peak
271.38	27.07	-18.93	46	43.79	13.01	1.64	31.37	-	-	Peak
523.3	20.24	-25.76	46	30.18	18.59	2.5	31.03	-	-	Peak
719.3	23.12	-22.88	46	29.7	21.2	2.99	30.77	-	-	Peak
985.3	27.41	-26.59	54	29.78	24.71	3.5	30.58	-	-	Peak
2384.86	49.47	-24.53	74	45.13	32.16	6.03	33.85	100	164	Peak
2384.86	35.84	-18.16	54	31.5	32.16	6.03	33.85	100	164	Average
2402	102.69	-	-	98.31	32.2	6.03	33.85	100	164	Peak
2402	84.99	-	-	80.63	32.18	6.03	33.85	100	164	Average
2486	31.95	-22.05	54	27.39	32.28	6.18	33.9	100	164	Average
2486	43.99	-30.01	74	39.43	32.28	6.18	33.9	100	164	Peak

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. 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 without 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. 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)
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)

5 Uncertainty of Evaluation

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

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.10	Normal (k=2)	0.05
Cable Loss	0.10	Normal (k=2)	0.05
AMN Insertion Loss	2.50	Rectangular	0.63
Receiver Specification	1.50	Rectangular	0.43
Site Imperfection	1.39	Rectangular	0.80
Mismatch	+0.34 / -0.35	U-Shape	0.24
Combined Standard Uncertainty 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 EP112908-04 as below.

Appendix C. Original Report

Please refer to Sporton report number FR112908A as below.