FCC RF Test Report

APPLICANT	:	Brightstar Corporation
EQUIPMENT	:	Mobile phone
BRAND NAME	:	Avvio
MODEL NAME	:	SN51D、Message phone QS300
FCC ID	:	WVBASN51D
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on May 09, 2012 and completely tested on Jun. 01, 2012. We, SPORTON INTERNATIONAL (KUNSHAN) 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 (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai / Manager

Testing Laboratory 1190

SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR250901B	Rev. 01	Initial issue of report	Jun. 01, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.2	15.247(b)	A8.4	Power Output	≤ 30dBm	Pass	-
3.3	15.247(d)	A8.5	Frequency Band Edges	≤ 20dBc	Pass	-
3.4	15.247(d)	A8.5	Spurious Emission	< 20 dBc	Pass	-
3.5	15.247(e)	A8.2(b)	Power Spectral Density	≤ 8dBm	Pass	-
3.6	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 21.25 dB at 0.37 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 7.86 dB at 4926 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Brightstar Corporation
9725 NW 117th Ave., Miami, Florida, United States

1.2 Manufacturer

KCMobile Co., Ltd.
#502, Ace techno tower 8rd, 191-7 Guro-dong, Guro-Gu, Seoul, South Korea

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Mobile phone
Brand Name	Avvio
Model Name	SN51D、Message phone QS300
FCC ID	WVBASN51D
Tx/Rx Frequency Range	2412 MHz ~ 2462 MHz
Number of Channels	11
Carrier Frequency of Each Channel	2412+(n-1)*5 MHz; n=1~11
Channel Spacing	5 MHz
Maximum Output Power to Antenna	802.11b : 19.54 dBm (0.090 W) 802.11g : 22.19 dBm (0.166 W)
Duty Cycle	802.11b : 100.00% 802.11g : 100.00%
Antenna Type	PIFA Antenna with gain -5.00 dBi
HW Version	QS300_MB_V20
SW Version	SN51D_110CO_52C
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Production Unit

Remark: 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 (KUNSHAN) INC.			
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH01-KS	CO01-KS	03CH01-KS	149928/4086E-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 D01 DTS Meas. Guidance v01
- ANSI C63.4-2003
- IC RSS-210 Issue 8
- IC RSS-Gen Issue 3

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, recorded in a separate test report.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU200	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GWINSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
3.	Bluetooth Earphone	Nokia	BH-106	QTLBH-106	N/A	N/A
4.	Router	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m

2 Test Configuration of Equipment Under Test

2.1 Pre-Scanned RF Power

Preliminary tests were performed in different data rate as below table and the highest power data rates (11b, 11g modes) were chosen for full test in the following sections to demonstrate compliance to the FCC limit line.

2.4GHz 802.11b mode				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	19.54	19.52	18.79	19.27

2.4GHz 802.11g mode								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	22.19	22.15	22.04	22.06	22.14	22.11	22.08	22.15

2.2 Maximum Peak Conducted Output Power:

Band	2.4GHz 802.11b RF Power (dBm)			2.4GHz 802.11g RF Power (dBm)		
Channel	1	6	11	1	6	11
Frequency (MHz)	2412	2437	2462	2412	2437	2462
Peak Power	16.09	17.94	19.54	19.22	20.95	22.19

Remark:

The data rates of WLAN 802.11b/g were set in 1Mbps for 802.11b and 6Mbps for 802.11g for all the test cases due to the highest RF output power.

2.3 Maximum Average Conducted Output Power:

Band	2.4GHz 802.11b RF Power (dBm)			2.4GHz 802.11g RF Power (dBm)		
Channel	1	6	11	1	6	11
Frequency (MHz)	2412	2437	2462	2412	2437	2462
Average Power	13.01	14.72	16.42	10.11	12.05	13.48

Remark:

1. The average power, which is used by the test method, AVG2, in DTS Meas. Guidance v01, is reporting only.
2. The EUT is programmed to transmit signals continuously.

2.4 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).

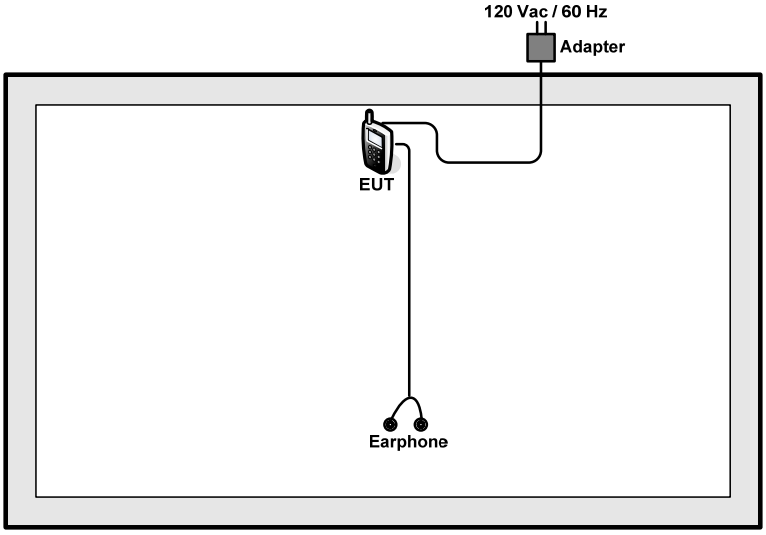
Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations.

The following tables are showing the test modes as the worst cases (Yplane) and recorded in this report.

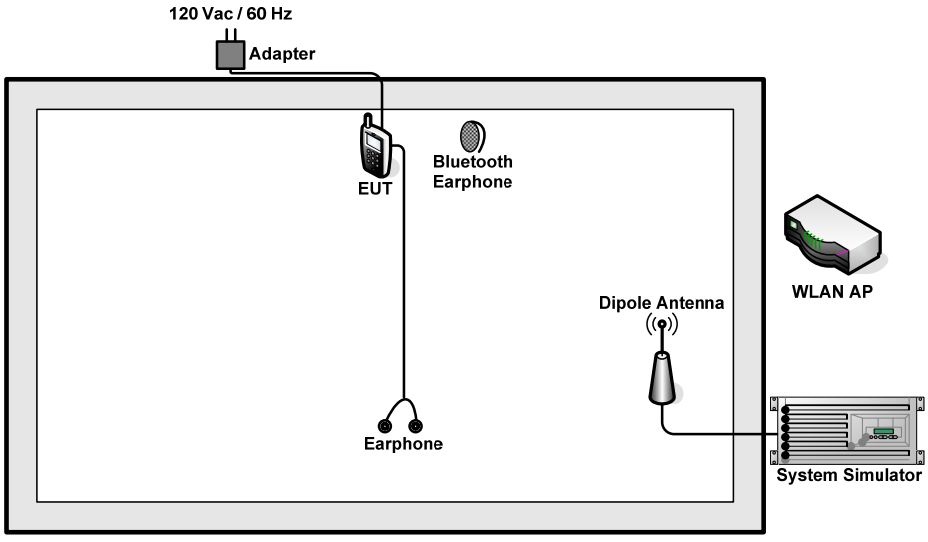
Test Cases		
Test Item	**802.11b**	**802.11g**
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4 : 802.11g CH01_2412 MHz Mode 5 : 802.11g CH06_2437 MHz Mode 6 : 802.11g CH11_2462 MHz
Radiated TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b 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	Mode 1 :GSM850 Idle + Bluetooth Idle + WLAN Idle + Adapter + Earphone + Camera	

2.5 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.6 RF Utility

For WLAN function, the RF utility, "＊1222＊＃" 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 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

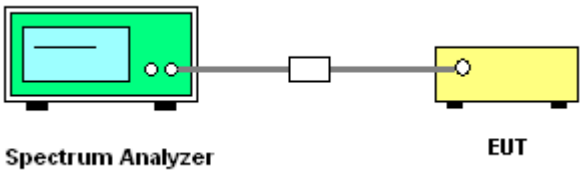
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 1-5% of the emission bandwidth (EBW).Set the Video bandwidth (VBW) ≥ 3 * RBW. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 KHz.
4. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

3.1.4 Test Setup

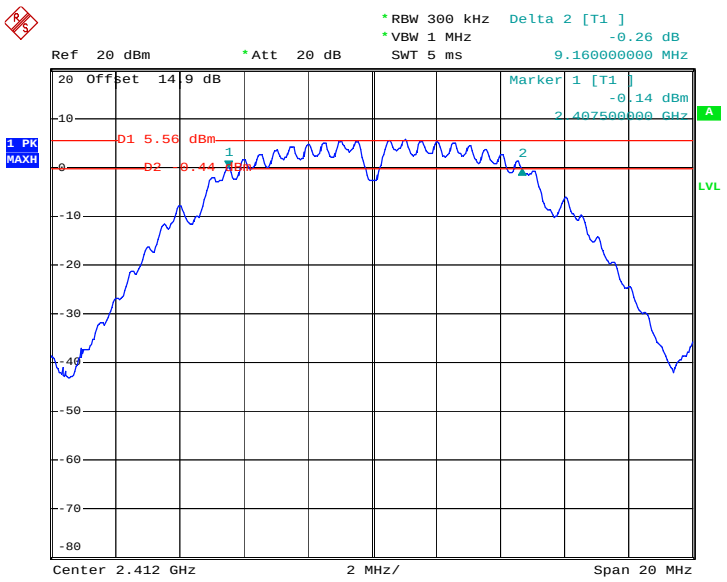


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	9.16	0.5	Pass
06	2437	9.16	0.5	Pass
11	2462	9.16	0.5	Pass

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



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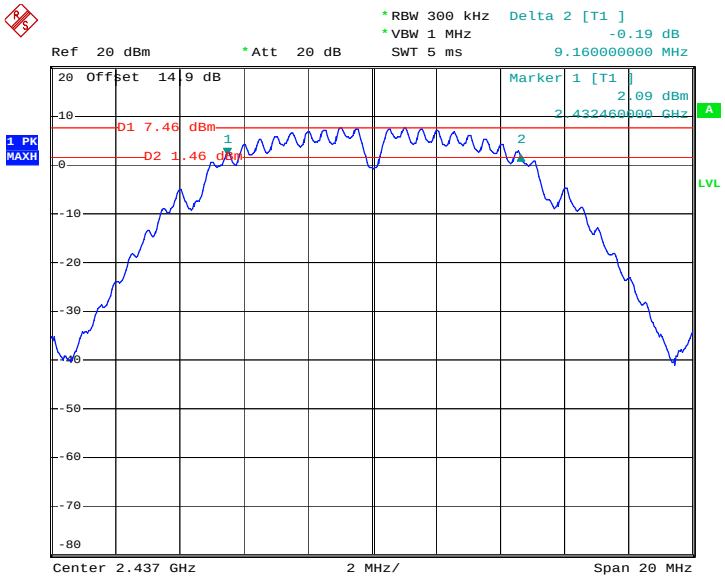
Mode 2 : 6 dB Bandwidth Plot on 802.11b Channel 06



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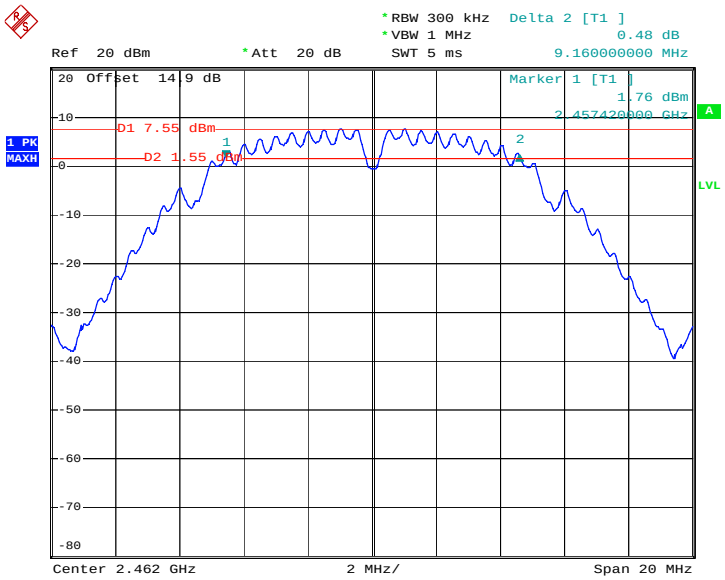
Mode 3 : 6 dB Bandwidth Plot on 802.11b Channel 11



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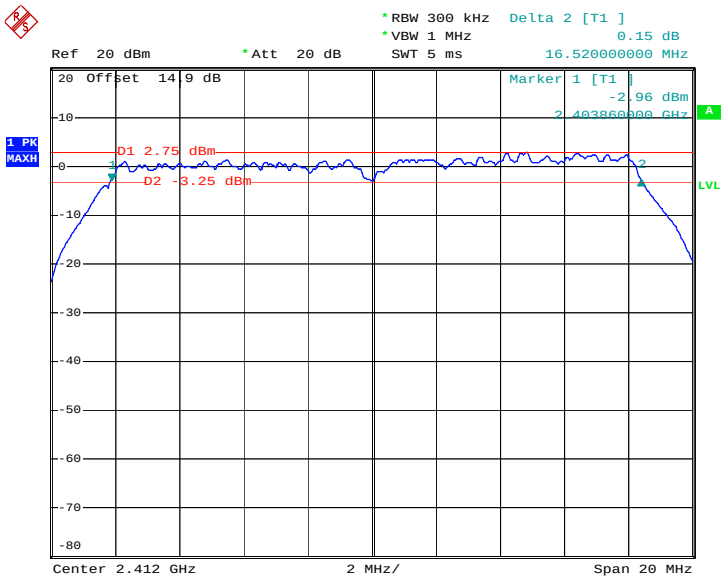
Test Mode :	Mode 4, 5, 6	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.52	0.5	Pass
06	2437	16.76	0.5	Pass
11	2462	16.80	0.5	Pass

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



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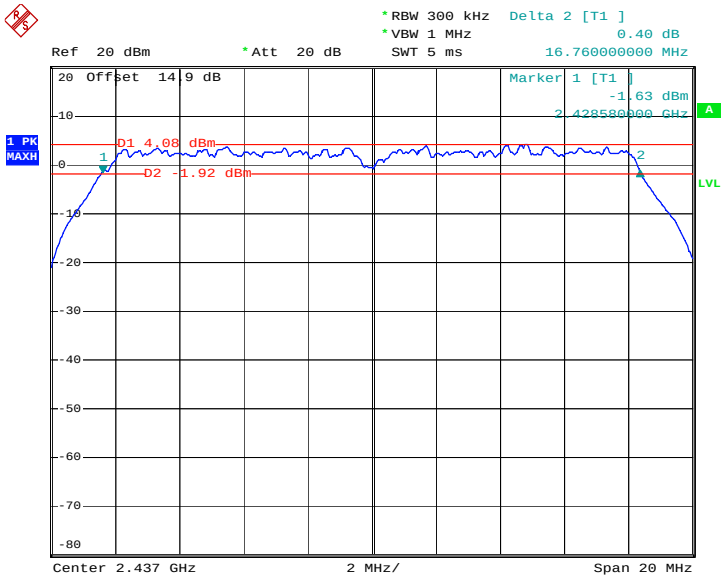
Mode 5 : 6 dB Bandwidth Plot on 802.11g Channel 06



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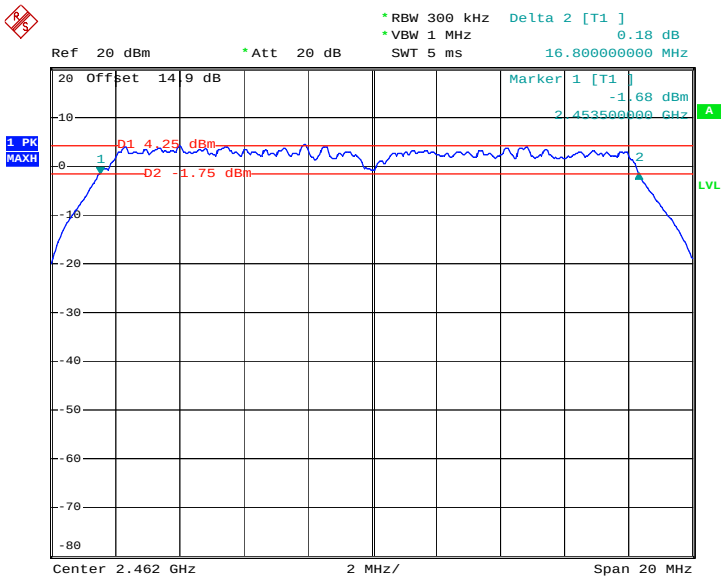
Mode 6 : 6 dB Bandwidth Plot on 802.11g Channel 11



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3.2 Output Power Measurement

3.2.1 Limit of Output Power

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

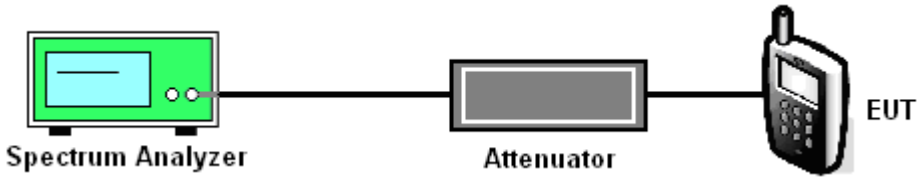
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure PK2 of FCC KDB No. 558074 DTS Meas. Guidance v01.
2. The RF output of EUT was connected to the power meter by a low loss cable. The path loss was compensated to the results for each measurement.
3. The spectrum analyzer's settings are Resolution bandwidth (RBW) = 1MHz, Video bandwidth (VBW) = 3MHz, Peak Detector, auto sweep time, and the frequency span to a value that is 5-30 % greater than the EBW.
4. The spectrum analyzer’s integrated band power measurement function is used to measure the peak power and the test results are demonstrated to compliance to the limit line as following plots.

3.2.4 Test Setup



3.2.5 Test Result of Output Power

Test Mode :	Mode 1, 2, 3	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	16.09	30	Pass
06	2437	17.94	30	Pass
11	2462	19.54	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	19.22	30	Pass
06	2437	20.95	30	Pass
11	2462	22.19	30	Pass

3.3 Band Edges Measurement

3.3.1 Limit of Band Edges

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

3.3.2 Measuring Instruments

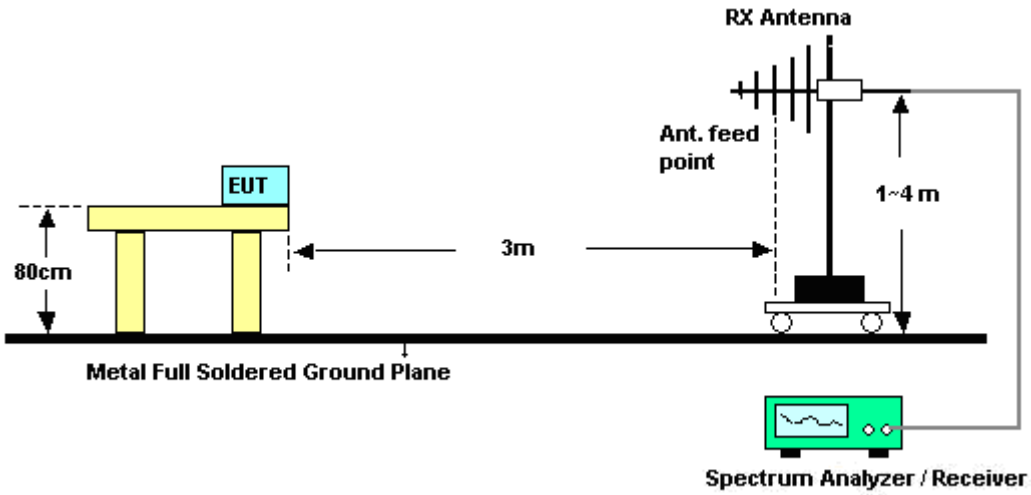
See list of measuring instruments of this test report.

3.3.3 Test Procedures

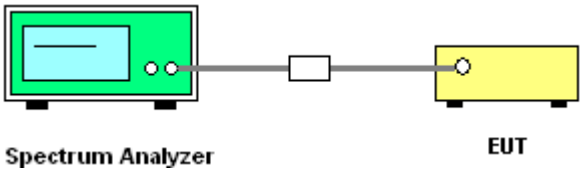
1. The testing follows the guidelines in ANSI C63.4-2003 and the Measurement Procedure of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. Conducted emission test: Set RBW = 100 KHz, Video bandwidth (VBW) ≥ RBW. Out of the authorized frequency band emissions must be at least 20 dB lower than the highest emission level within the authorized band as measured with a 100 KHz RBW. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
3. Radiated emission test: Apply to band edge emissions that falling on 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 measurement above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep=Auto. If the emission is pulsed, then modify the unit for continuous operation. Use the settings in this paragraph to correct the reading level by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation per 15.35(b) and (c).

3.3.4 Test Setup

<Radiated Band Edges>



<Conducted Band Edges>



3.3.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	21~22°C
Test Band :	802.11b	Relative Humidity :	41~42%
Test Channel :	01	Test Engineer :	Steven Hao

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2315.13	35.67	-18.33	54	33.58	32.73	3.22	33.86	138	123	Average
2315.13	49.64	-24.36	74	47.55	32.73	3.22	33.86	138	123	Peak

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2386.95	38.99	-15.01	54	36.71	32.86	3.47	34.05	133	43	Average
2386.95	49.82	-24.18	74	47.54	32.86	3.47	34.05	133	43	Peak

Test Mode :	Mode 3	Temperature :	21~22°C
Test Band :	802.11b	Relative Humidity :	41~42%
Test Channel :	11	Test Engineer :	Steven Hao

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.18	39.26	-14.74	54	36.77	33.01	3.68	34.2	100	38	Average
2485.18	50.07	-23.93	74	47.58	33.01	3.68	34.2	100	38	Peak

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2496.39	35.91	-18.09	54	33.37	33.05	3.72	34.23	162	120	Average
2496.39	48.96	-25.04	74	46.42	33.05	3.72	34.23	162	120	Peak

Test Mode :	Mode 4	Temperature :	21~22°C
Test Band :	802.11g	Relative Humidity :	41~42%
Test Channel :	01	Test Engineer :	Steven Hao

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.61	41.06	-12.94	54	38.78	32.86	3.47	34.05	129	37	Average
2389.61	52.33	-21.67	74	50.05	32.86	3.47	34.05	129	37	Peak

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.8	37.48	-16.52	54	35.2	32.86	3.47	34.05	199	117	Average
2389.8	49.69	-24.31	74	47.41	32.86	3.47	34.05	199	117	Peak

Test Mode :	Mode 6	Temperature :	21~22°C
Test Band :	802.11g	Relative Humidity :	41~42%
Test Channel :	11	Test Engineer :	Steven Hao

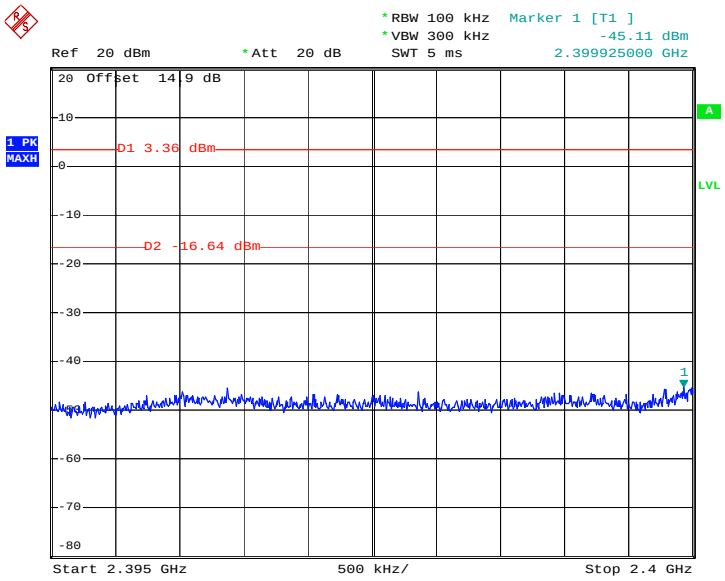
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.99	43.99	-10.01	54	41.5	33.01	3.68	34.2	100	39	Average
2484.99	57.55	-16.45	74	55.06	33.01	3.68	34.2	100	39	Peak

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.94	38.93	-15.07	54	36.44	33.01	3.68	34.2	115	310	Average
2485.94	50.5	-23.5	74	48.01	33.01	3.68	34.2	115	310	Peak

3.3.6 Test Plots of Conducted Band Edges

Test Mode :	Mode 1 and 3	Temperature :	23~24℃
Test Band :	802.11b	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Lizy Li

Low Band Edge Plot on 802.11b Channel 01



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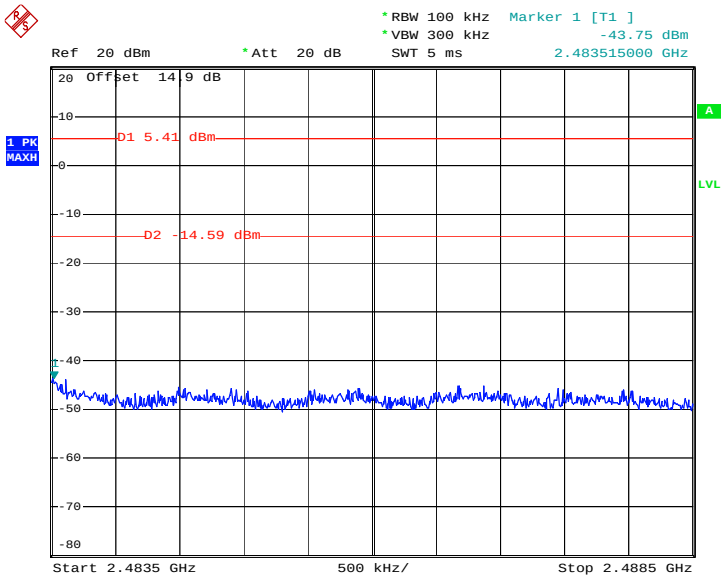
High Band Edge Plot on 802.11b Channel 11



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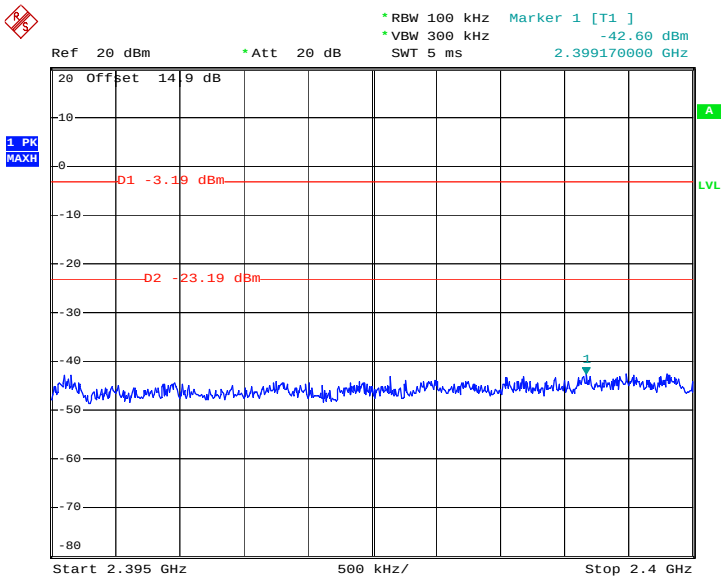
Test Mode :	Mode 4 and 6	Temperature :	23~24℃
Test Band :	802.11g	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Lizy Li

Low Band Edge Plot on 802.11g Channel 01



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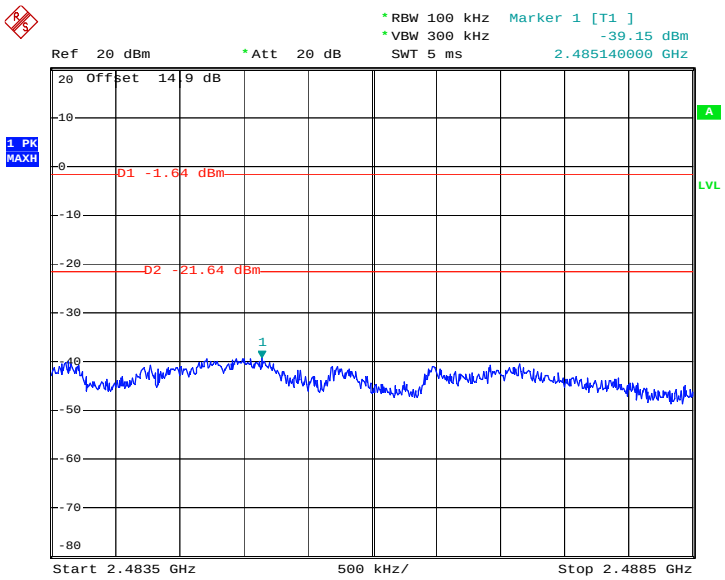
High Band Edge Plot on 802.11g Channel 11



Date: 24.MAY.2012 05:51:51

3.4 Spurious Emission Measurement

3.4.1 Limit of Spurious Emission Measurement

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

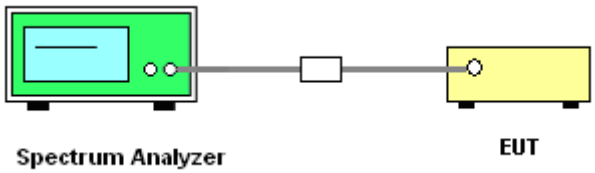
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedure

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

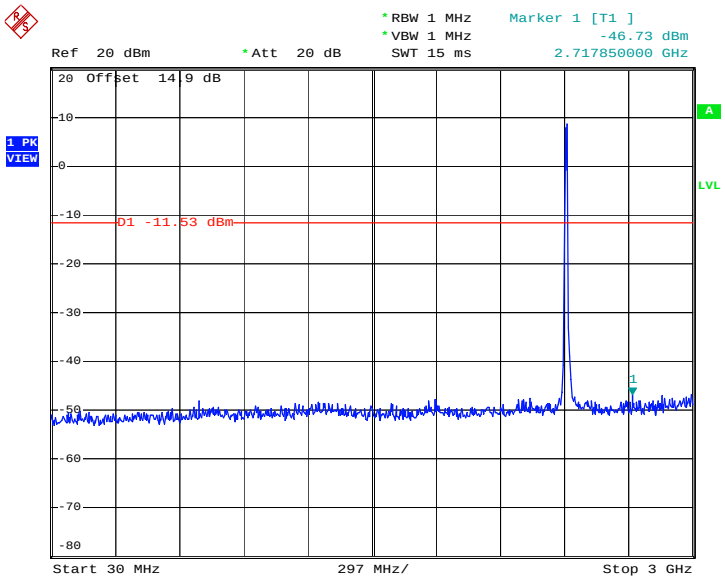
3.4.4 Test Setup



3.4.5 Test Plots of Spurious Emission

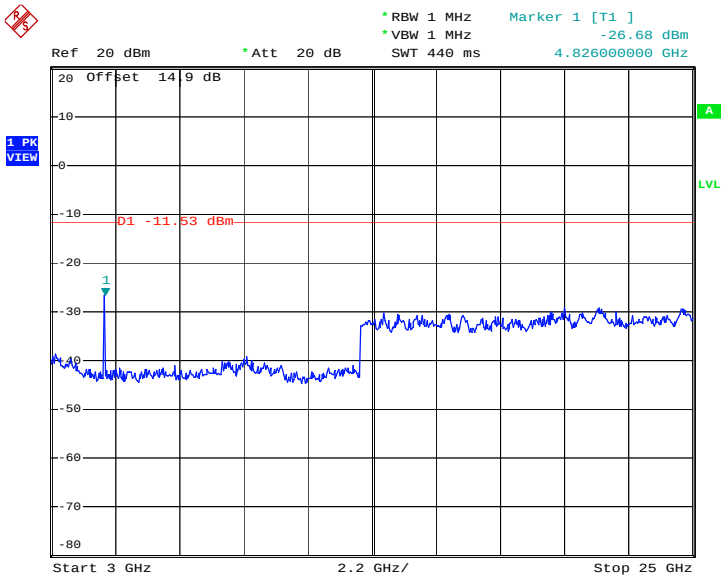
Test Mode :	Mode 1	Temperature :	23~24℃
Test Band :	802.11b	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Lizy Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 24.MAY.2012 05:28:24

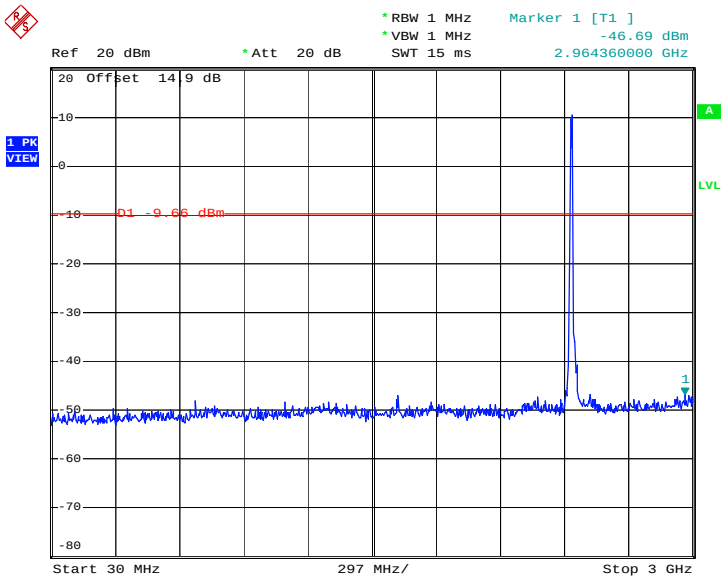
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 24.MAY.2012 05:28:42

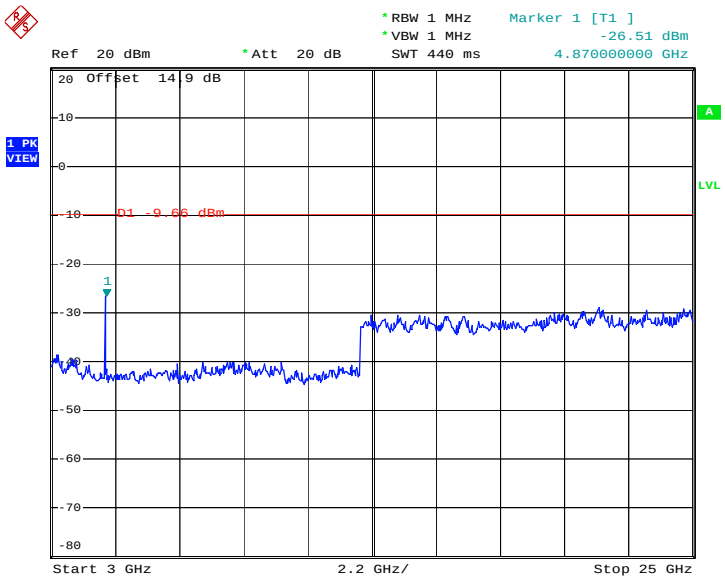
Test Mode :	Mode 2	Temperature :	23~24℃
Test Band :	802.11b	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Lizy Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 24.MAY.2012 05:32:45

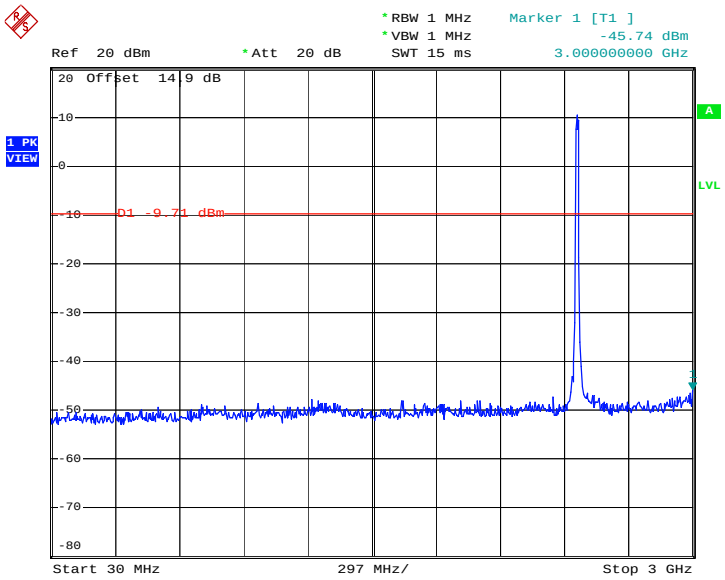
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 24.MAY.2012 05:33:04

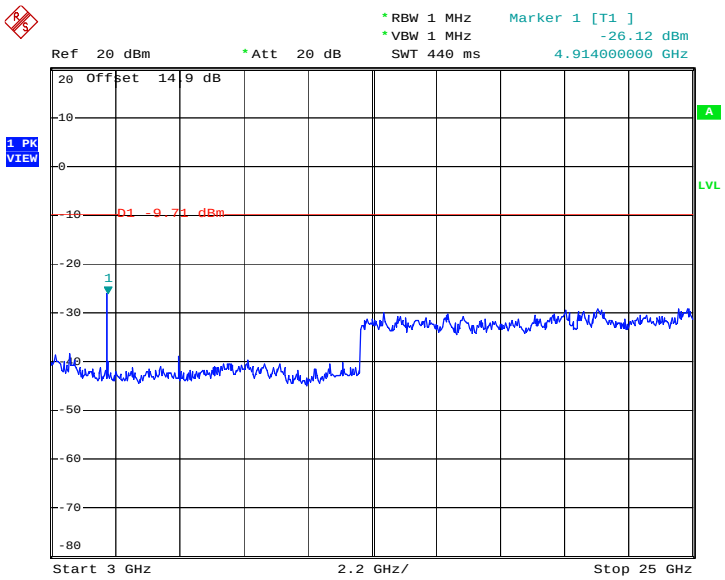
Test Mode :	Mode 3	Temperature :	23~24℃
Test Band :	802.11b	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Lizy Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 24.MAY.2012 05:40:12

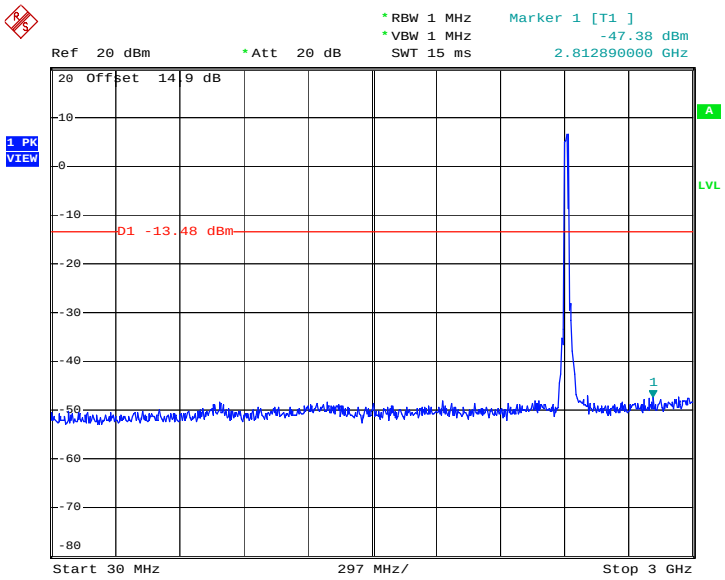
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 24.MAY.2012 05:40:31

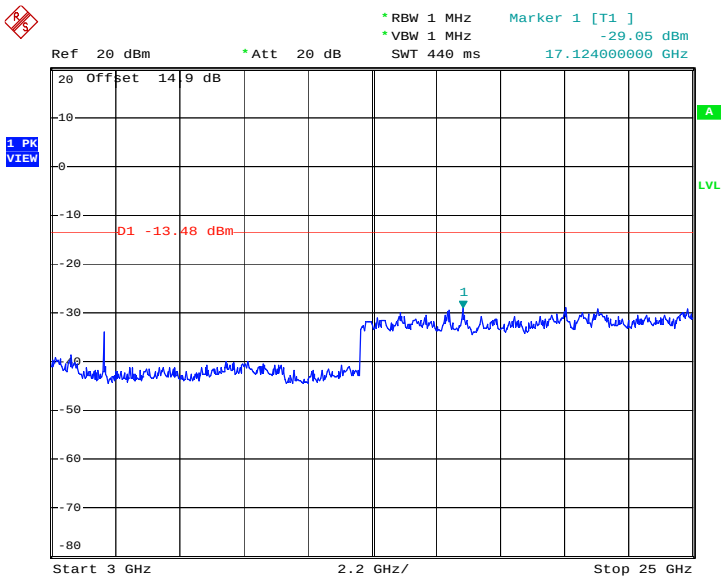
Test Mode :	Mode 4	Temperature :	23~24℃
Test Band :	802.11g	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Lizy Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 24.MAY.2012 05:45:01

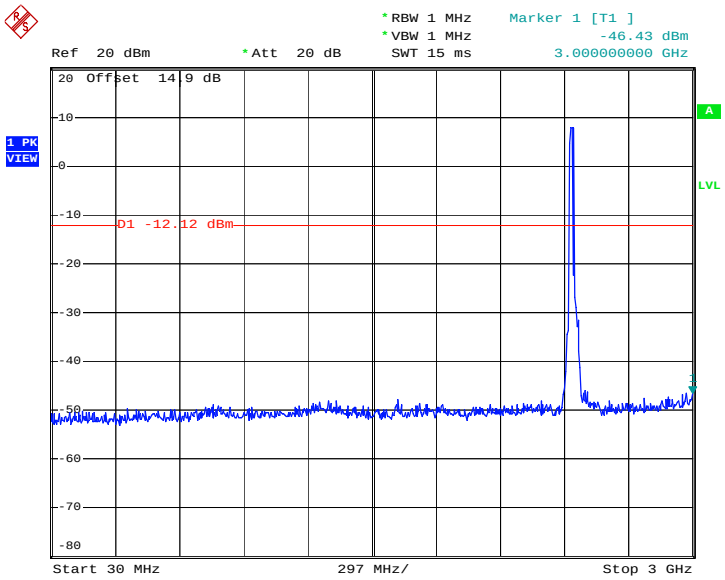
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 24.MAY.2012 05:45:19

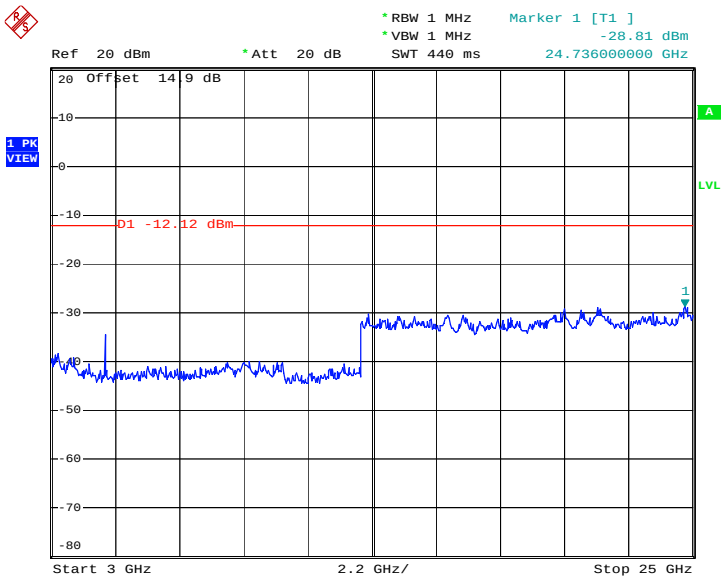
Test Mode :	Mode 5	Temperature :	23~24℃
Test Band :	802.11g	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Lizy Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 24.MAY.2012 05:48:57

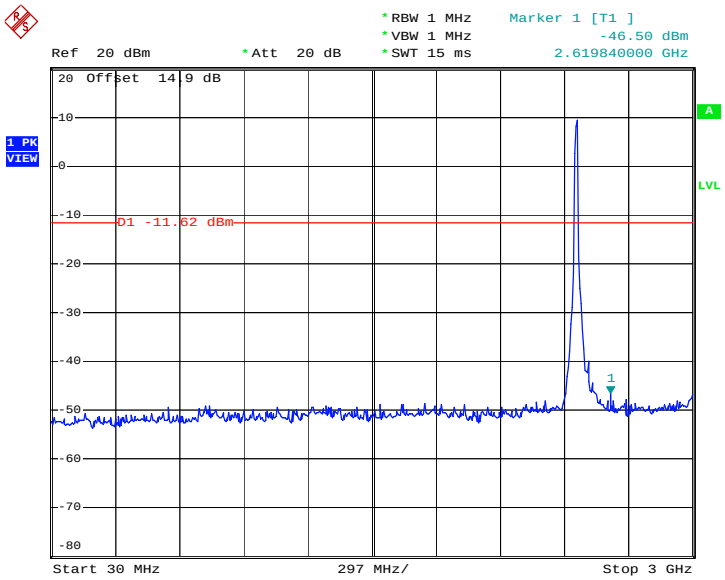
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 24.MAY.2012 05:49:15

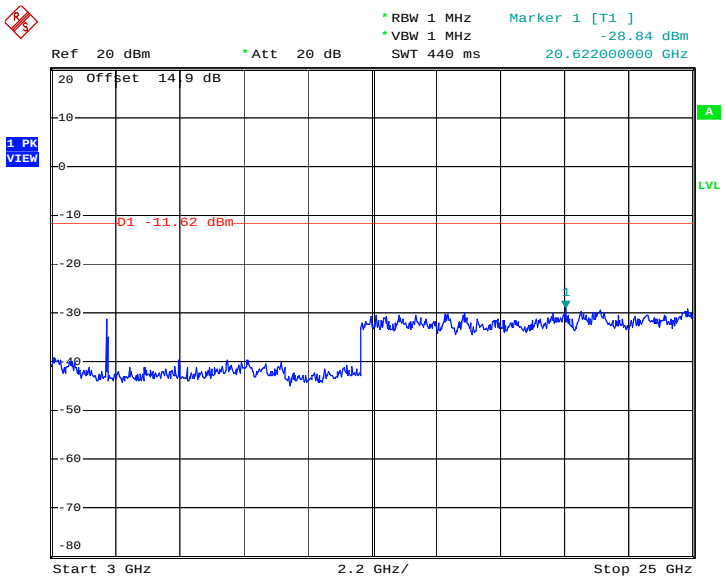
Test Mode :	Mode 6	Temperature :	23~24℃
Test Band :	802.11g	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Lizy Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 29.MAY.2012 10:14:26

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 24.MAY.2012 05:52:36

3.5 Power Spectral Density Measurement

3.5.1 Limit of Power Spectral Density

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

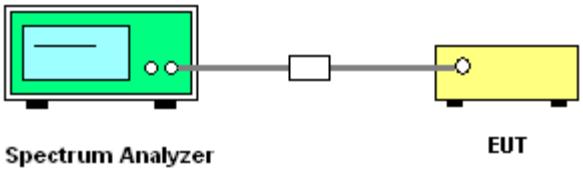
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The testing follows Measurement Procedure PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Record the measurement data derived from spectrum analyzer.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 KHz. Video bandwidth (VBW) >= 300 KHz In order to make an accurate measurement, set the span to 5-30% greater than Emission Bandwidth (EBW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
6. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log (3 kHz/100 kHz = -15.2 dB).

3.5.4 Test Setup



3.5.5 Test Result of Power Spectral Density

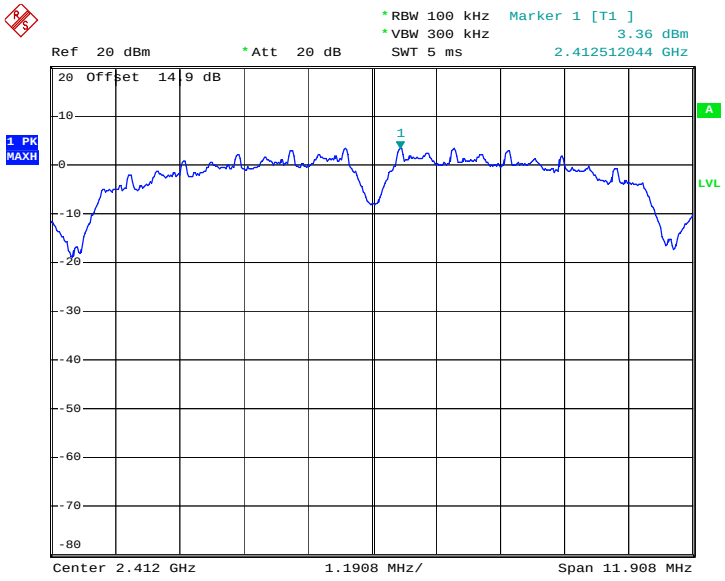
Test Mode :	Mode 1, 2, 3	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11b Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	3.36	-11.84	8	Pass
06	2437	5.37	-9.83	8	Pass
11	2462	5.41	-9.79	8	Pass

Note:

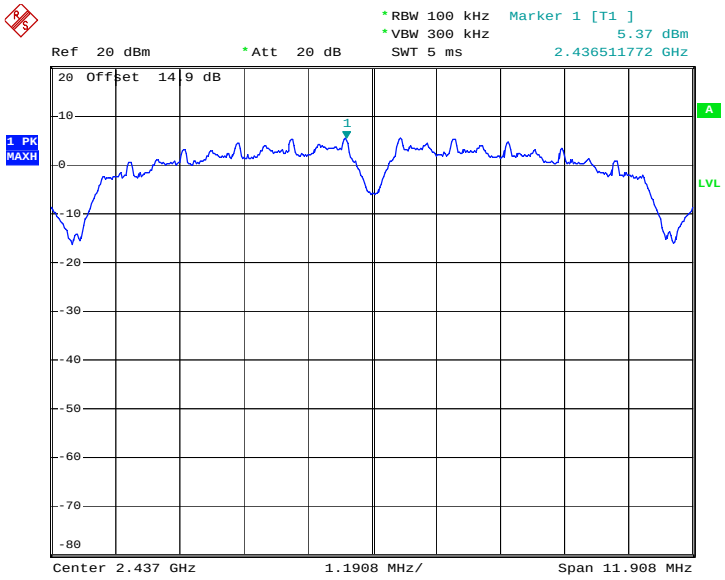
1. *Measured power density (dBm) has offset with cable loss.*
2. *BWCF (dB) = 10 log (3k/100k) = -15.2 dB*
3. *Power Density/ 3kHz (dBm)= Measured power density/ 100KHz (dBm) + BWCF (dB)*

Mode 1 : PSD Plot on 802.11b Channel 01



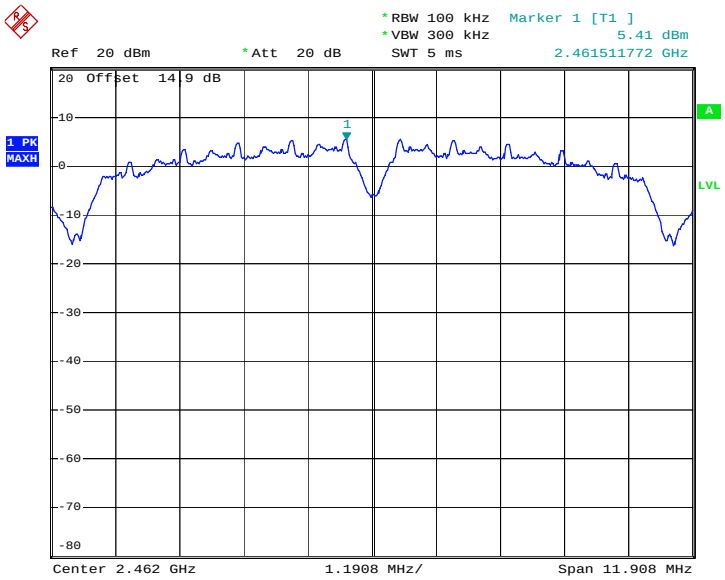
Date: 24.MAY.2012 05:27:11

Mode 2 : PSD Plot on 802.11b Channel 06



Date: 24.MAY.2012 05:31:05

Mode 3 : PSD Plot on 802.11b Channel 11



Date: 24.MAY.2012 05:34:57

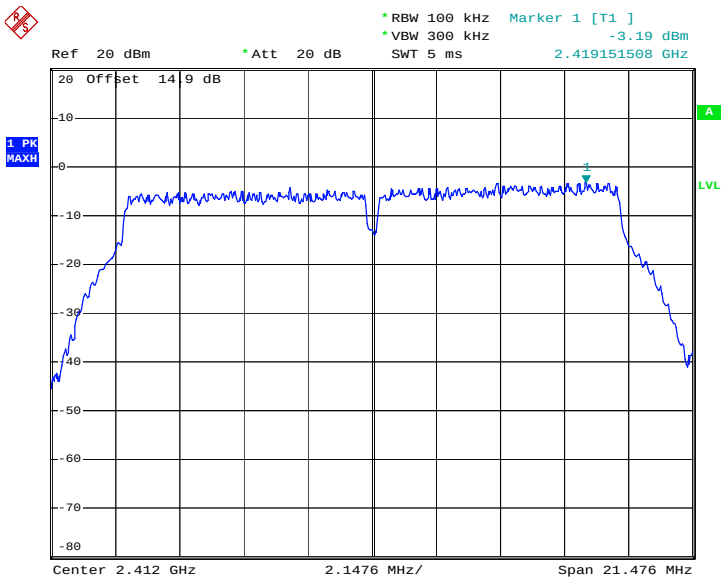
Test Mode :	Mode 4, 5, 6	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-3.19	-18.39	8	Pass
06	2437	-2.04	-17.24	8	Pass
11	2462	-1.64	-16.84	8	Pass

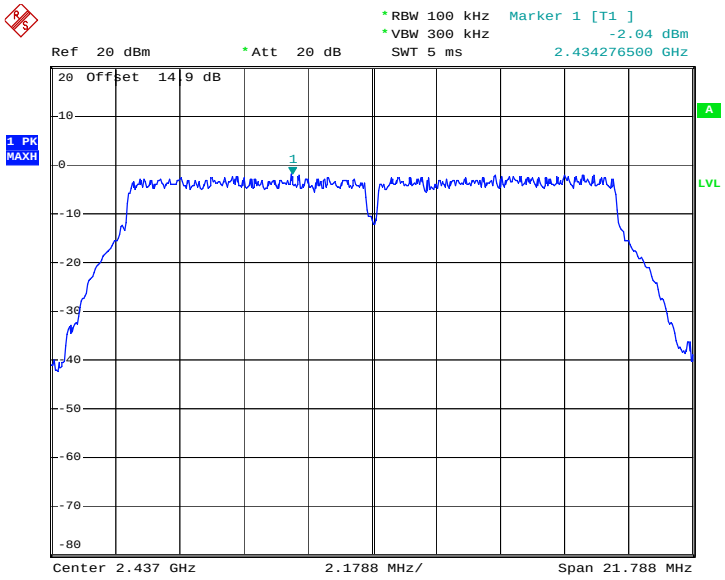
Note:

1. *Measured power density (dBm) has offset with cable loss.*
2. *BWCF (dB) = 10 log (3k/100k) = -15.2 dB*
3. *Power Density/ 3KHz (dBm)= Measured power density/ 100KHz (dBm) + BWCF (dB)*

Mode 4 : PSD Plot on 802.11g Channel 01

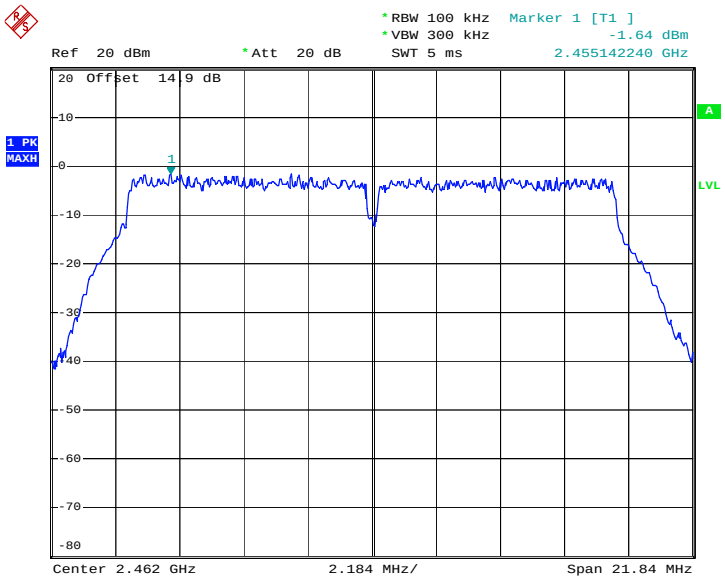


Mode 5 : PSD Plot on 802.11g Channel 06



Date: 24.MAY.2012 05:47:51

Mode 6 : PSD Plot on 802.11g Channel 11



Date: 24.MAY.2012 05:51:20

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 KHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

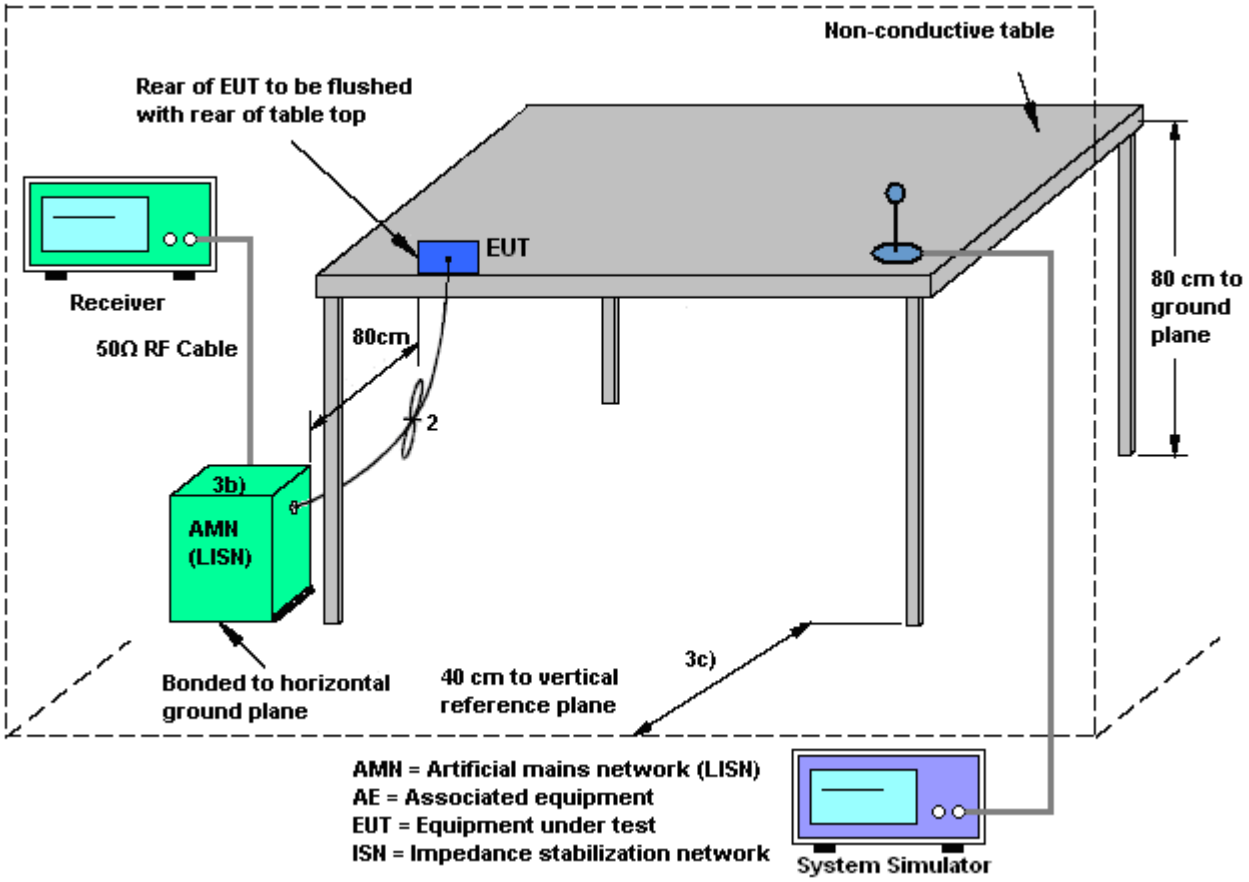
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

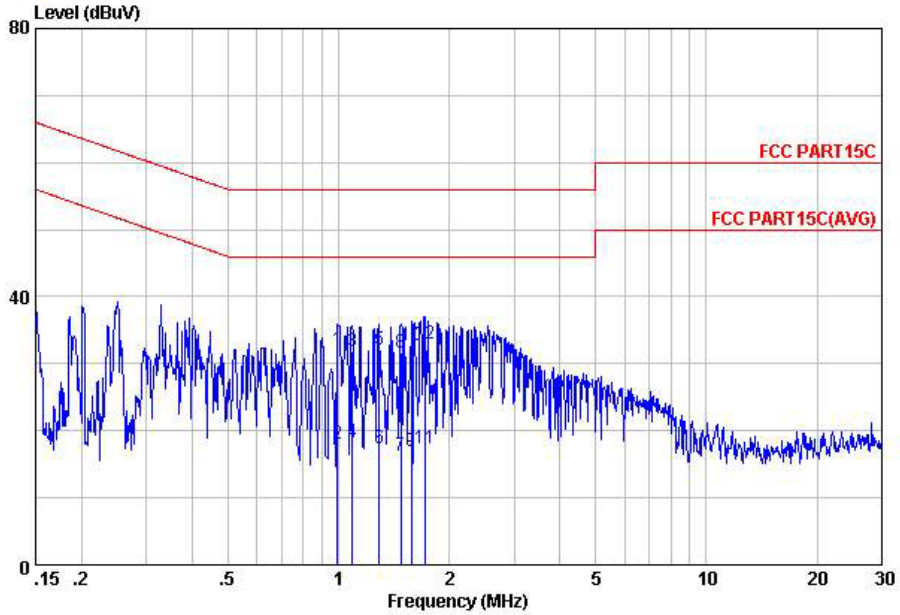
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network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

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	19~20℃
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Idle + WLAN Idle + Adapter + Earphone + Camera		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

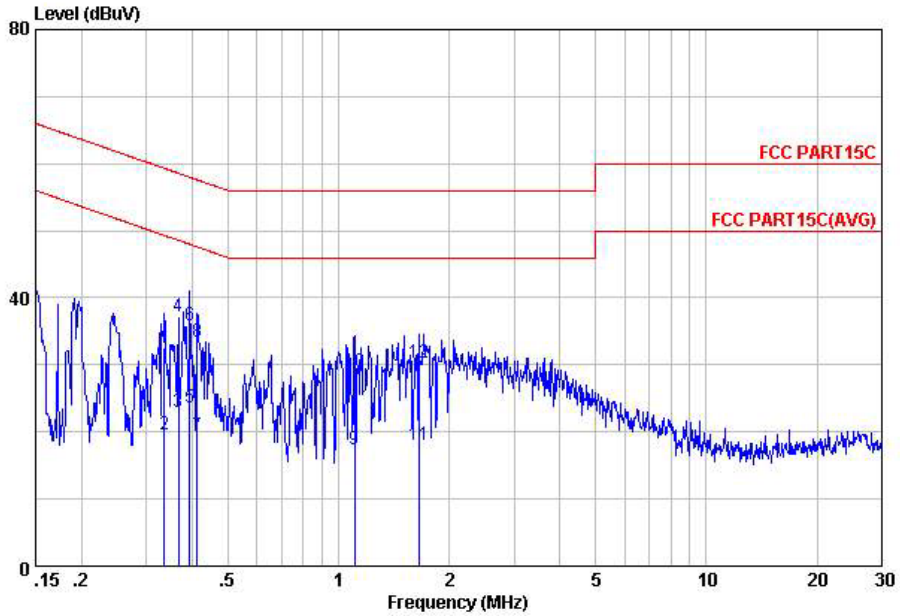


Site : C001-KS
Condition: FCC PART15C LISN-100807 LINE

mode : Mode 1
IMEI : 357418039961506

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.99	32.06	-23.94	56.00	21.90	-0.10	10.26	QP
2	0.99	17.96	-28.04	46.00	7.80	-0.10	10.26	Average
3	1.09	31.87	-24.13	56.00	21.70	-0.10	10.27	QP
4	1.09	18.37	-27.63	46.00	8.20	-0.10	10.27	Average
5	1.29	32.08	-23.92	56.00	21.89	-0.10	10.29	QP
6	1.29	17.28	-28.72	46.00	7.09	-0.10	10.29	Average
7	1.48	16.19	-29.81	46.00	6.00	-0.11	10.30	Average
8	1.48	31.69	-24.31	56.00	21.50	-0.11	10.30	QP
9	1.58	16.90	-29.10	46.00	6.70	-0.11	10.31	Average
10	1.58	32.70	-23.30	56.00	22.50	-0.11	10.31	QP
11	1.73	17.31	-28.69	46.00	7.11	-0.11	10.31	Average
12	1.73	32.91	-23.09	56.00	22.71	-0.11	10.31	QP

Test Mode :	Mode 1	Temperature :	19~20℃
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Idle + WLAN Idle + Adapter + Earphone + Camera		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS
Condition: FCC PART15C LISN-100807 NEUTRAL

mode : Mode 1
IMEI : 357418039961506

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.34	32.60	-26.71	59.31	22.50	-0.08	10.18	QP
2	0.34	19.70	-29.61	49.31	9.60	-0.08	10.18	Average
3	0.37	23.01	-25.55	48.56	12.91	-0.08	10.18	Average
4	0.37	37.31	-21.25	58.56	27.21	-0.08	10.18	QP
5	0.39	23.51	-24.48	47.99	13.40	-0.08	10.19	Average
6	0.39	35.91	-22.08	57.99	25.80	-0.08	10.19	QP
7	0.41	19.31	-28.28	47.59	9.20	-0.08	10.19	Average
8	0.41	33.41	-24.18	57.59	23.30	-0.08	10.19	QP
9	1.11	17.28	-28.72	46.00	7.10	-0.09	10.27	Average
10	1.11	28.98	-27.02	56.00	18.80	-0.09	10.27	QP
11	1.65	18.10	-27.90	46.00	7.90	-0.11	10.31	Average
12	1.65	30.30	-25.70	56.00	20.10	-0.11	10.31	QP

3.7 Radiated Emission Measurement

3.7.1 Limit of Radiated Emission

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

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(KHz)	300
0.490 – 1.705	24000/F(KHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.7.2 Measuring Instruments

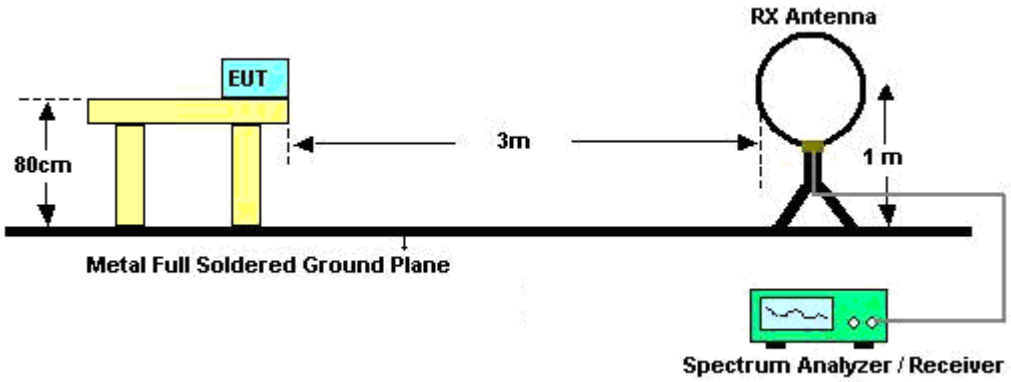
See list of measuring instruments of this test report.

3.7.3 Test Procedures

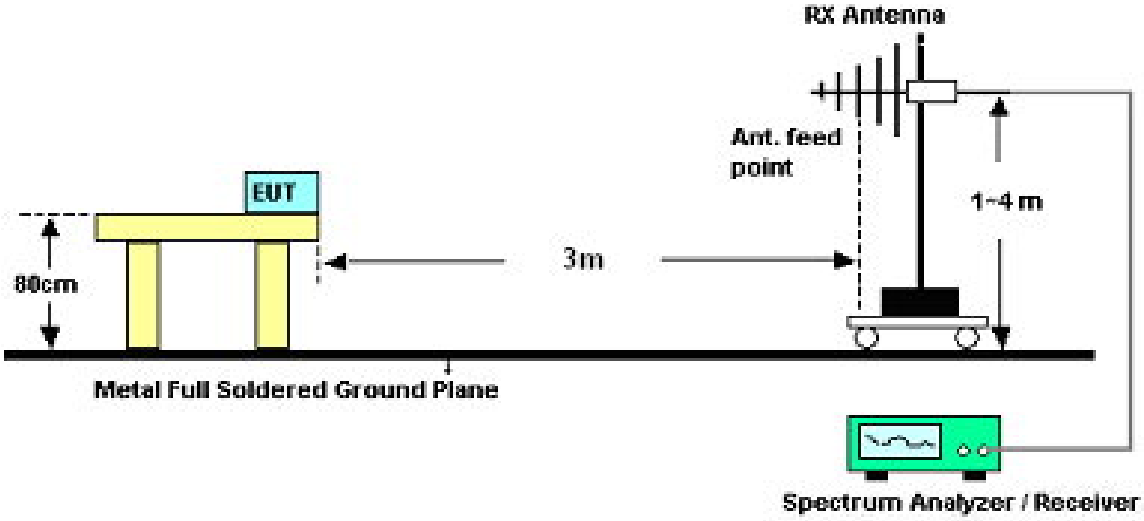
1. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW = 1 MHz for f ≥ 1 GHz, 100 KHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Measurement above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB per decade from 3m to 1m.
   Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB)
2. Maximize the emission by rotating the EUT for three orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines in ANSI C63.4-2003.

3.7.4 Test Setup

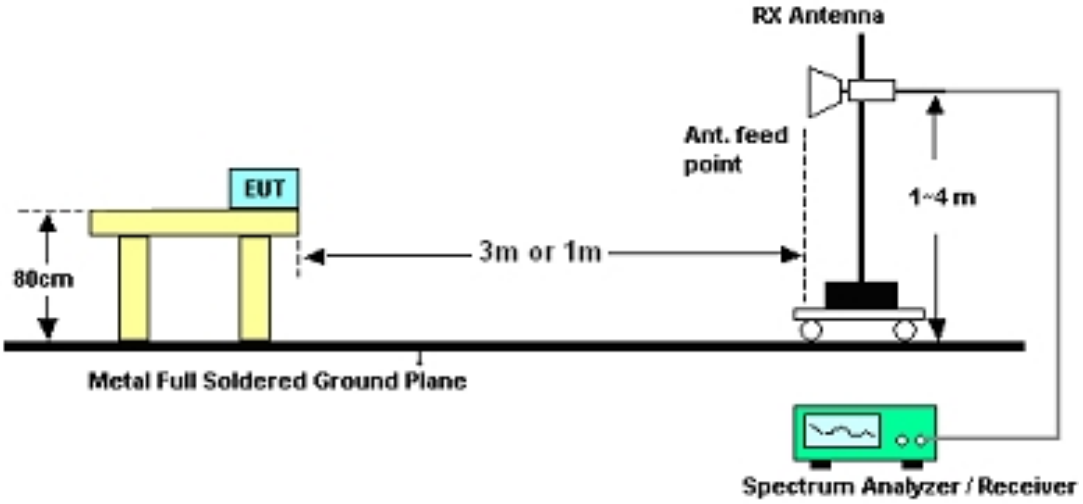
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

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

Test Mode :	Mode 1	Temperature :	21~22℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
33.88	27.6	-12.4	40	41.9	15.56	0.23	30.09	100	0	Peak
236.61	19.05	-26.95	46	36.89	11.35	0.65	29.84	-	-	Peak
528.58	28.66	-17.34	46	39.39	17.99	0.98	29.7	-	-	Peak
604.24	30.26	-15.74	46	40.19	18.62	1.07	29.62	-	-	Peak
719.67	29.09	-16.91	46	38.08	19.52	1.15	29.66	-	-	Peak
991.27	29.23	-24.77	54	36.29	21.05	1.41	29.52	-	-	Peak
2315.13	35.67	-18.33	54	33.58	32.73	3.22	33.86	138	123	Average
2315.13	49.64	-24.36	74	47.55	32.73	3.22	33.86	138	123	Peak
2412	94.36	-	-	92.03	32.89	3.52	34.08	138	123	Average
2412	102.39	-	-	100.06	32.89	3.52	34.08	138	123	Peak
2495.25	35.74	-18.26	54	33.2	33.05	3.72	34.23	138	123	Average
2495.25	48.64	-25.36	74	46.1	33.05	3.72	34.23	138	123	Peak
4827	40.36	-13.64	54	32.49	35.17	4.97	32.27	125	89	Average
4827	53.07	-20.93	74	45.2	35.17	4.97	32.27	125	89	Peak

Test Mode :	Mode 1	Temperature :	21~22℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	30.55	-9.45	40	42.37	18	0.26	30.08	100	256	Peak
377.26	24.29	-21.71	46	38	15.34	0.83	29.88	-	-	Peak
528.58	28.26	-17.74	46	38.99	17.99	0.98	29.7	-	-	Peak
604.24	30.18	-15.82	46	40.11	18.62	1.07	29.62	-	-	Peak
793.39	26.54	-19.46	46	35.04	19.85	1.24	29.59	-	-	Peak
930.16	25.41	-20.59	46	32.98	20.63	1.32	29.52	-	-	Peak
2386.95	38.99	-15.01	54	36.71	32.86	3.47	34.05	133	43	Average
2386.95	49.82	-24.18	74	47.54	32.86	3.47	34.05	133	43	Peak
2412	103.15	-	-	100.82	32.89	3.52	34.08	133	43	Average
2412	109.29	-	-	106.96	32.89	3.52	34.08	133	43	Peak
2495.82	36.81	-17.19	54	34.27	33.05	3.72	34.23	133	43	Average
2495.82	48.55	-25.45	74	46.01	33.05	3.72	34.23	133	43	Peak
4824	45.55	-8.45	54	37.68	35.17	4.97	32.27	110	60	Average
4824	58.1	-15.9	74	50.23	35.17	4.97	32.27	110	60	Peak

Test Mode :	Mode 2	Temperature :	21~22℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.97	31.08	-8.92	40	43.62	17.29	0.25	30.08	100	150	Peak
377.26	26.66	-19.34	46	40.37	15.34	0.83	29.88	-	-	Peak
528.58	34.36	-11.64	46	45.09	17.99	0.98	29.7	-	-	Peak
604.24	31.14	-14.86	46	41.07	18.62	1.07	29.62	-	-	Peak
679.9	29.97	-16.03	46	39.4	19.15	1.12	29.7	-	-	Peak
870.99	27.07	-18.93	46	34.88	20.49	1.29	29.59	-	-	Peak
2310.19	35.57	-18.43	54	33.48	32.73	3.22	33.86	100	39	Average
2310.19	49.44	-24.56	74	47.35	32.73	3.22	33.86	100	39	Peak
2437	98.03	-	-	95.63	32.95	3.6	34.15	100	39	Average
2437	107.77	-	-	105.37	32.95	3.6	34.15	100	39	Peak
2496.01	36.42	-17.58	54	33.88	33.05	3.72	34.23	100	39	Average
2496.01	49.35	-24.65	74	46.81	33.05	3.72	34.23	100	39	Peak
4875	44.93	-9.07	54	37.04	35.18	4.98	32.27	134	60	Average
4875	57.89	-16.11	74	50	35.18	4.98	32.27	134	60	Peak

Test Mode :	Mode 2	Temperature :	21~22℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	27.8	-12.2	40	39.62	18	0.26	30.08	100	0	Peak
189.08	20.5	-23	43.5	41.38	8.49	0.57	29.94	-	-	Peak
528.58	29.25	-16.75	46	39.98	17.99	0.98	29.7	-	-	Peak
604.24	30.24	-15.76	46	40.17	18.62	1.07	29.62	-	-	Peak
719.67	28.28	-17.72	46	37.27	19.52	1.15	29.66	-	-	Peak
987.39	28.54	-25.46	54	35.63	21.03	1.4	29.52	-	-	Peak
2319.5	35.56	-18.44	54	33.43	32.76	3.27	33.9	170	334	Average
2319.5	48.96	-25.04	74	46.83	32.76	3.27	33.9	170	334	Peak
2437	91.83	-	-	89.43	32.95	3.6	34.15	170	334	Average
2437	101.96	-	-	99.56	32.95	3.6	34.15	170	334	Peak
2496	35.79	-18.21	54	33.25	33.05	3.72	34.23	170	334	Average
2496	49.13	-24.87	74	46.59	33.05	3.72	34.23	170	334	Peak
4875	40.3	-13.7	54	32.41	35.18	4.98	32.27	100	360	Average
4875	52.36	-21.64	74	44.47	35.18	4.98	32.27	100	360	Peak

Test Mode :	Mode 3	Temperature :	21~22℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.97	31.08	-8.92	40	43.62	17.29	0.25	30.08	100	0	Peak
377.26	26.66	-19.34	46	40.37	15.34	0.83	29.88	-	-	Peak
528.58	34.36	-11.64	46	45.09	17.99	0.98	29.7	-	-	Peak
604.24	31.14	-14.86	46	41.07	18.62	1.07	29.62	-	-	Peak
679.9	29.97	-16.03	46	39.4	19.15	1.12	29.7	-	-	Peak
870.99	27.07	-18.93	46	34.88	20.49	1.29	29.59	-	-	Peak
2370.8	35.87	-18.13	54	33.63	32.83	3.42	34.01	100	38	Average
2370.8	48.63	-25.37	74	46.39	32.83	3.42	34.01	100	38	Peak
2462	101.36	-	-	98.91	32.98	3.64	34.17	100	38	Average
2462	109.67	-	-	107.22	32.98	3.64	34.17	100	38	Peak
2485.18	39.26	-14.74	54	36.77	33.01	3.68	34.2	100	38	Average
2485.18	50.07	-23.93	74	47.58	33.01	3.68	34.2	100	38	Peak
4926	46.14	-7.86	54	38.22	35.19	4.99	32.26	100	48	Average
4926	58.18	-15.82	74	50.26	35.19	4.99	32.26	100	48	Peak

Test Mode :	Mode 3	Temperature :	21~22℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	27.8	-12.2	40	39.62	18	0.26	30.08	150	250	Peak
189.08	20.5	-23	43.5	41.38	8.49	0.57	29.94	-	-	Peak
528.58	29.25	-16.75	46	39.98	17.99	0.98	29.7	-	-	Peak
604.24	30.24	-15.76	46	40.17	18.62	1.07	29.62	-	-	Peak
719.67	28.28	-17.72	46	37.27	19.52	1.15	29.66	-	-	Peak
987.39	28.54	-25.46	54	35.63	21.03	1.4	29.52	-	-	Peak
2325.39	35.49	-18.51	54	33.36	32.76	3.27	33.9	162	120	Average
2325.39	49.14	-24.86	74	47.01	32.76	3.27	33.9	162	120	Peak
2462	92.67	-	-	90.22	32.98	3.64	34.17	162	120	Average
2462	103.54	-	-	101.09	32.98	3.64	34.17	162	120	Peak
2496.39	35.91	-18.09	54	33.37	33.05	3.72	34.23	162	120	Average
2496.39	48.96	-25.04	74	46.42	33.05	3.72	34.23	162	120	Peak
4923	53.9	-20.1	74	45.98	35.19	4.99	32.26	201	360	Peak
4923	41.45	-12.55	54	33.53	35.19	4.99	32.26	201	360	Average

Test Mode :	Mode 4	Temperature :	21~22℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
38.73	30.04	-9.96	40	46.85	12.98	0.25	30.04	-	-	Peak
189.08	19.89	-23.61	43.5	40.77	8.49	0.57	29.94	-	-	Peak
225.94	26.16	-19.84	46	44.88	10.59	0.63	29.94	-	-	Peak
377.26	25.66	-20.34	46	39.37	15.34	0.83	29.88	-	-	Peak
528.58	29.29	-16.71	46	40.02	17.99	0.98	29.7	-	-	Peak
679.9	36.94	-9.06	46	46.37	19.15	1.12	29.7	200	0	Peak
2389.61	41.06	-12.94	54	38.78	32.86	3.47	34.05	129	37	Average
2389.61	52.33	-21.67	74	50.05	32.86	3.47	34.05	129	37	Peak
2412	94.85	-	-	92.52	32.89	3.52	34.08	129	37	Average
2412	103.54	-	-	101.21	32.89	3.52	34.08	129	37	Peak
2499.43	36.26	-17.74	54	33.72	33.05	3.72	34.23	129	37	Average
2499.43	48.55	-25.45	74	46.01	33.05	3.72	34.23	129	37	Peak
4821	40.27	-13.73	54	32.4	35.17	4.97	32.27	100	360	Average
4821	53.2	-20.8	74	45.33	35.17	4.97	32.27	100	360	Peak

Test Mode :	Mode 4	Temperature :	21~22℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	28.36	-11.64	40	40.18	18	0.26	30.08	125	224	Peak
239.52	18.55	-27.45	46	36.2	11.51	0.66	29.82	-	-	Peak
377.26	22.87	-23.13	46	36.58	15.34	0.83	29.88	-	-	Peak
528.58	29.26	-16.74	46	39.99	17.99	0.98	29.7	-	-	Peak
679.9	31.82	-14.18	46	41.25	19.15	1.12	29.7	-	-	Peak
987.39	29.08	-24.92	54	36.17	21.03	1.4	29.52	-	-	Peak
2389.8	37.48	-16.52	54	35.2	32.86	3.47	34.05	199	117	Average
2389.8	49.69	-24.31	74	47.41	32.86	3.47	34.05	199	117	Peak
2412	84.67	-	-	82.34	32.89	3.52	34.08	199	117	Average
2412	98.12	-	-	95.79	32.89	3.52	34.08	199	117	Peak
2495.44	35.78	-18.22	54	33.24	33.05	3.72	34.23	199	117	Average
2495.44	48.81	-25.19	74	46.27	33.05	3.72	34.23	199	117	Peak
4824	39.47	-14.53	54	31.6	35.17	4.97	32.27	112	325	Average
4824	52.73	-21.27	74	44.86	35.17	4.97	32.27	112	325	Peak

Test Mode :	Mode 5	Temperature :	21~22℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	31.6	-8.4	40	43.42	18	0.26	30.08	100	0	Peak
225.94	26.78	-19.22	46	45.5	10.59	0.63	29.94	-	-	Peak
528.58	29.2	-16.8	46	39.93	17.99	0.98	29.7	-	-	Peak
604.24	28.19	-17.81	46	38.12	18.62	1.07	29.62	-	-	Peak
679.9	30.84	-15.16	46	40.27	19.15	1.12	29.7	-	-	Peak
926.28	25.75	-20.25	46	33.33	20.61	1.32	29.51	-	-	Peak
2364.91	35.76	-18.24	54	33.55	32.81	3.38	33.98	100	37	Average
2364.91	49.02	-24.98	74	46.81	32.81	3.38	33.98	100	37	Peak
2437	94.9	-	-	92.5	32.95	3.6	34.15	100	37	Average
2437	103.69	-	-	101.29	32.95	3.6	34.15	100	37	Peak
2496.2	36.56	-17.44	54	34.02	33.05	3.72	34.23	100	37	Average
2496.2	48.66	-25.34	74	46.12	33.05	3.72	34.23	100	37	Peak
4875	40.06	-13.94	54	32.17	35.18	4.98	32.27	122	342	Average
4875	54.19	-19.81	74	46.3	35.18	4.98	32.27	122	342	Peak

Test Mode :	Mode 5	Temperature :	21~22℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
35.82	29.8	-10.2	40	45	14.65	0.23	30.08	100	0	Peak
236.61	19.34	-26.66	46	37.18	11.35	0.65	29.84	-	-	Peak
528.58	29	-17	46	39.73	17.99	0.98	29.7	-	-	Peak
679.9	30.27	-15.73	46	39.7	19.15	1.12	29.7	-	-	Peak
718.7	28.93	-17.07	46	37.95	19.5	1.15	29.67	-	-	Peak
990.3	28.53	-25.47	54	35.59	21.05	1.41	29.52	-	-	Peak
2335.27	35.55	-18.45	54	33.38	32.78	3.33	33.94	169	200	Average
2335.27	48.86	-25.14	74	46.69	32.78	3.33	33.94	169	200	Peak
2437	87.5	-	-	85.1	32.95	3.6	34.15	169	200	Average
2437	96.74	-	-	94.34	32.95	3.6	34.15	169	200	Peak
2495.44	35.77	-18.23	54	33.23	33.05	3.72	34.23	169	200	Average
2495.44	48.77	-25.23	74	46.23	33.05	3.72	34.23	169	200	Peak
4874	39.31	-14.69	54	31.42	35.18	4.98	32.27	122	56	Average
4874	52.09	-21.91	74	44.2	35.18	4.98	32.27	122	56	Peak

Test Mode :	Mode 6	Temperature :	21~22℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.97	30.42	-9.58	40	42.96	17.29	0.25	30.08	100	0	Peak
189.08	20.06	-23.44	43.5	40.94	8.49	0.57	29.94	-	-	Peak
377.26	26.91	-19.09	46	40.62	15.34	0.83	29.88	-	-	Peak
528.58	26.2	-19.8	46	36.93	17.99	0.98	29.7	-	-	Peak
679.9	26.94	-19.06	46	36.37	19.15	1.12	29.7	-	-	Peak
901.06	26.24	-19.76	46	33.97	20.45	1.3	29.48	-	-	Peak
2341.35	35.5	-18.5	54	33.33	32.78	3.33	33.94	100	39	Average
2341.35	49.15	-24.85	74	46.98	32.78	3.33	33.94	100	39	Peak
2462	95.43	-	-	92.98	32.98	3.64	34.17	100	39	Average
2462	103.97	-	-	101.52	32.98	3.64	34.17	100	39	Peak
2484.99	43.99	-10.01	54	41.5	33.01	3.68	34.2	100	39	Average
2484.99	57.55	-16.45	74	55.06	33.01	3.68	34.2	100	39	Peak
4926	42.76	-11.24	54	34.84	35.19	4.99	32.26	100	322	Average
4926	54.64	-19.36	74	46.72	35.19	4.99	32.26	100	322	Peak

Test Mode :	Mode 6	Temperature :	21~22℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
37.76	27.46	-12.54	40	43.58	13.7	0.24	30.06	100	0	Peak
236.61	18.9	-27.1	46	36.74	11.35	0.65	29.84	-	-	Peak
528.58	32.35	-13.65	46	43.08	17.99	0.98	29.7	-	-	Peak
604.24	30.56	-15.44	46	40.49	18.62	1.07	29.62	-	-	Peak
719.67	27.87	-18.13	46	36.86	19.52	1.15	29.66	-	-	Peak
992.24	29.24	-24.76	54	36.29	21.06	1.41	29.52	-	-	Peak
2350.47	35.45	-18.55	54	33.28	32.78	3.33	33.94	115	310	Average
2350.47	48.82	-25.18	74	46.65	32.78	3.33	33.94	115	310	Peak
2462	89.01	-	-	86.56	32.98	3.64	34.17	115	310	Average
2462	96.03	-	-	93.58	32.98	3.64	34.17	115	310	Peak
2485.94	38.93	-15.07	54	36.44	33.01	3.68	34.2	115	310	Average
2485.94	50.5	-23.5	74	48.01	33.01	3.68	34.2	115	310	Peak
4924	40.16	-13.84	54	32.24	35.19	4.99	32.26	123	68	Average
4924	51.7	-22.3	74	43.78	35.19	4.99	32.26	123	68	Peak

3.8 Antenna Requirements

3.8.1 Standard Applicable

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

3.8.2 Antenna Connected Construction

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

3.8.3 Antenna Gain

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

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	May 24, 2012	Dec. 29, 2012	Conducted (TH01-KS)
DC Power Supply	TOPWARD	GPS-3030D	E1884515	N/A	Aug. 23, 2011	May 24, 2012	Aug. 22, 2012	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 30, 2011	May 24, 2012	Dec. 29, 2012	Conducted (TH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	Jun. 02, 2011	May 25, 2012	Jun. 01, 2012	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Dec. 30, 2011	May 25, 2012	Dec. 29, 2012	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Dec. 30, 2011	May 25, 2012	Dec. 29, 2012	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	N/A	Nov. 16, 2011	May 25, 2012	Nov. 15, 2012	Conduction (CO01-KS)
System Simulator	R&S	CMU200	837587/066	2G Full-Band	Dec. 30, 2011	May 25, 2012	Dec. 29, 2012	Conduction (CO01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 09, 2011	Jun. 01, 2012	Nov. 08, 2012	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Jun. 01, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 08, 2011	Jun. 01, 2012	Dec. 07, 2012	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/00	9 kHz~30 MHz	Jul. 28, 2011	Jun. 01, 2012	Jul. 27, 2012	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2012	Jun. 01, 2012	Jan. 05, 2013	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060004	30MHz~2GHz	Dec. 30, 2011	Jun. 01, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 30, 2011	Jun. 01, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2011	Jun. 01, 2012	Nov. 06, 2012	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Oct. 11, 2011	Jun. 01, 2012	Oct.10, 2012	Radiation (03CH01-KS)

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 EP250901 as below.