

FCC RF Test Report

APPLICANT : Huawei Technologies Co., Ltd.
EQUIPMENT : Ereader
BRAND NAME : Huawei
MODEL NAME : T62W
FCC ID : QIST62W
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Transmission System (DTS)

The product was received on Jun. 07, 2010 and completely tested on Jul. 27, 2010. 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:



Anderson Chiu / Vice Manager



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

TABLE OF CONTENTS

REVISION HISTORY	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant	5
1.2 Manufacturer	5
1.3 Feature of Equipment Under Test	5
1.4 Testing Site	6
1.5 Applied Standards	6
1.6 Ancillary Equipment List	6
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	7
2.1 RF Power	7
2.2 Test Mode	8
2.3 Connection Diagram of Test System	9
2.4 RF Utility	9
3 TEST RESULT	10
3.1 6dB Bandwidth Measurement	10
3.2 Output Power Measurement	15
3.3 Band Edges Measurement	17
3.4 Spurious Emission Measurement	23
3.5 Power Spectral Density Measurement	30
3.6 AC Conducted Emission Measurement	35
3.7 Radiated Emission Measurement	39
3.8 Antenna Requirements	54
4 LIST OF MEASURING EQUIPMENT	55
5 UNCERTAINTY OF EVALUATION	56
APPENDIX A. SETUP PHOTOGRAPHS	

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR060718A	Rev. 01	Initial issue of report	Aug. 03, 2010

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.2	15.247(b)	A8.4	Power Output	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(d)	A8.5	Frequency Band Edges	$\leq 20\text{dBc}$	Pass	-
3.4	15.247(d)	A8.5	Spurious Emission	$< 20\text{ dBc}$	Pass	-
3.5	15.247(e)	A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}$	Pass	-
3.6	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 11.96 dB at 0.60 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 1.02 dB at 2390 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Huawei Technologies Co., Ltd.

Bantian, Longgang District, Shenzhen 518129, P.R.China

1.2 Manufacturer

Huawei Technologies Co., Ltd.

Bantian, Longgang District, Shenzhen 518129, P.R.China

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Ereader
Brand Name	Huawei
Model Name	T62W
FCC ID	QIST62W
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz
Number of Channels	11
Carrier Frequency of Each Channel	2412+(n-1)*5 MHz; n=1~11
Channel Spacing	5 MHz
Maximum Output Power to Antenna	802.11b : 19.02 dBm (0.080 W) 802.11g : 21.54 dBm (0.143 W)
Antenna Type	Chip Antenna with gain 1 dBi
HW Version	SH421A-MB-P3.0
SW Version	20100531smdk6410_images
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Production Unit

Remark:

1. For other wireless features of this EUT, test report will be issued separately.
2. This test report recorded only product characteristics and test results of Digital Transmission System (DTS).
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 (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.	
	CO01-KS	03CH01-KS

1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 (Measurement Guidelines of DTS)
- ANSI C63.4-2003
- IC RSS-210 Issue 7

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	Notebook	Dell	P08S	QDS-BRCM1030	N/A	AC I/P: Unshielded, 1.84m DC O/P: Shielded, 0.9m
3.	Bluetooth Earphone	Nokia	HS-12W	PYAHS-12W	N/A	N/A

2 Test Configuration of Equipment Under Test

2.1 RF Power

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

Channel	Frequency	2.4GHz 802.11b RF Power (dBm)			
		At DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	17.30	17.50	17.50	17.46
CH 06	2437 MHz	19.02	19.01	18.89	18.92
CH 11	2462 MHz	17.89	17.87	17.80	18.12

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		At OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	20.01	19.60	20.21	19.74	20.37	19.80	19.94	20.25
CH 06	2437 MHz	21.28	20.94	21.51	21.05	21.45	21.28	21.23	21.54
CH 11	2462 MHz	19.92	19.88	20.13	19.83	20.18	19.96	19.93	20.19

Remark:

1. The data rates of WLAN 802.11b/g were set in 1Mbps for 802.11b and 54Mbps for 802.11g, for all the test cases due to the highest RF output power.
2. The EUT is programmed to transmit signals continuously for all testing.

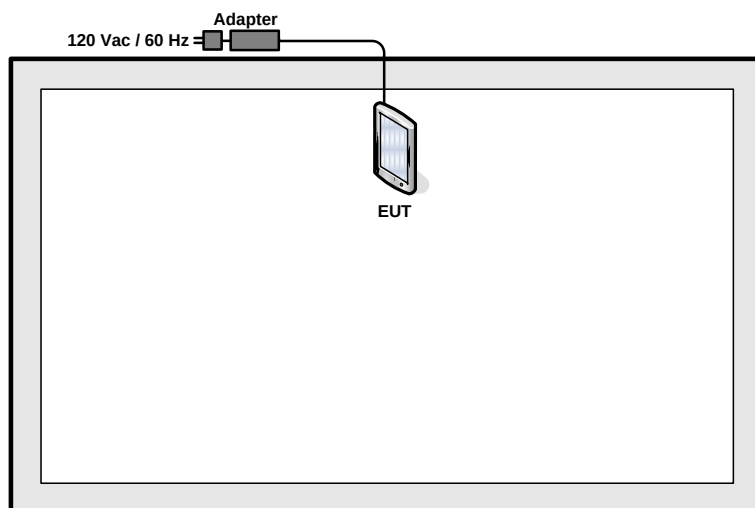
2.2 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz), radiated emission (30 MHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). Pre-scanned tests were conducted to determine the final configuration from all possible combinations. The following tables are showing the test modes as the worst cases and recorded in this report.

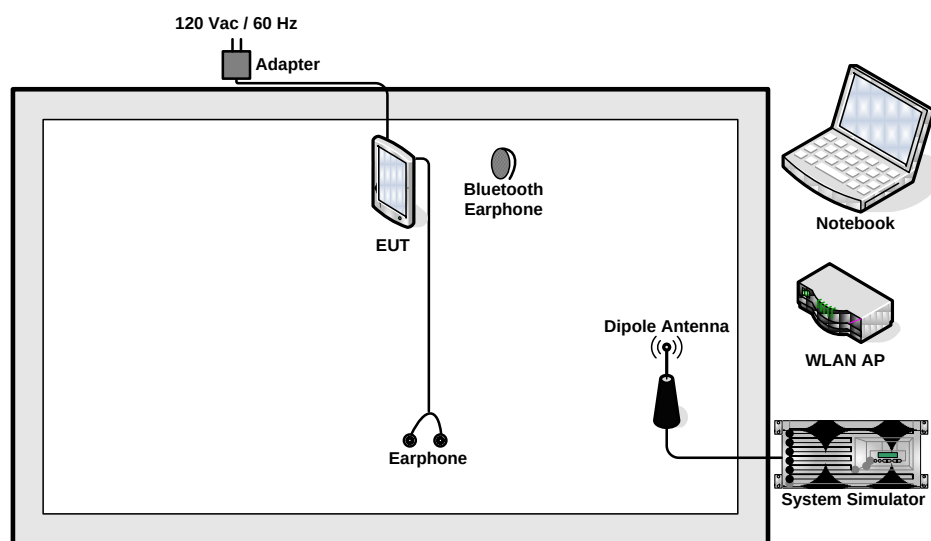
Test Cases		
Test Item	802.11b	802.11g
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz	Mode 4 : 802.11g CH01_2412 MHz
	Mode 2 : 802.11b CH06_2437 MHz	Mode 5 : 802.11g CH06_2437 MHz
	Mode 3 : 802.11b CH11_2462 MHz	Mode 6 : 802.11g CH11_2462 MHz
Radiated TCs	Mode 1 : 802.11b CH01_2412 MHz	Mode 4 : 802.11g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

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<EUT with Adapter and Earphone Mode>



2.4 RF Utility

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

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

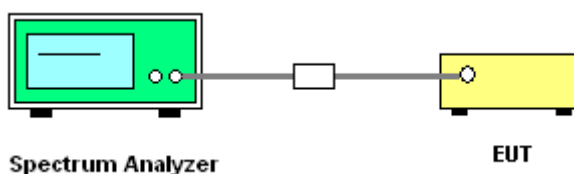
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz.
In order to make an accurate measurement, set the span greater than RBW. The 6 dB bandwidth must be greater than 500 kHz.
4. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

3.1.4 Test Setup

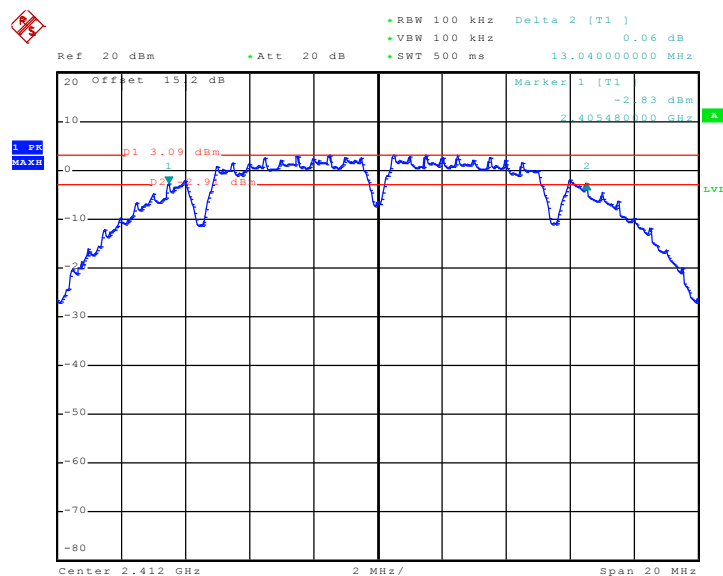


3.1.5 Test Result of 6dB Bandwidth

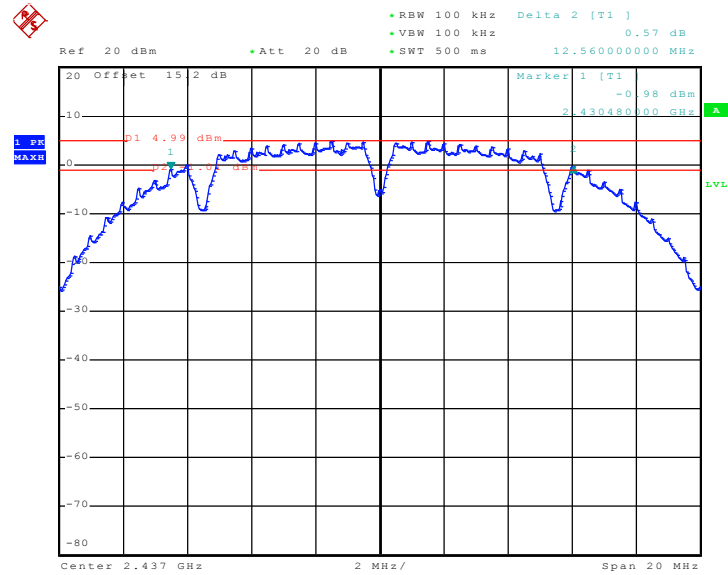
Test Mode :	Mode 1, 2, 3	Temperature :	20~21℃
Test Engineer :	Sky Liu	Relative Humidity :	40~41%

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

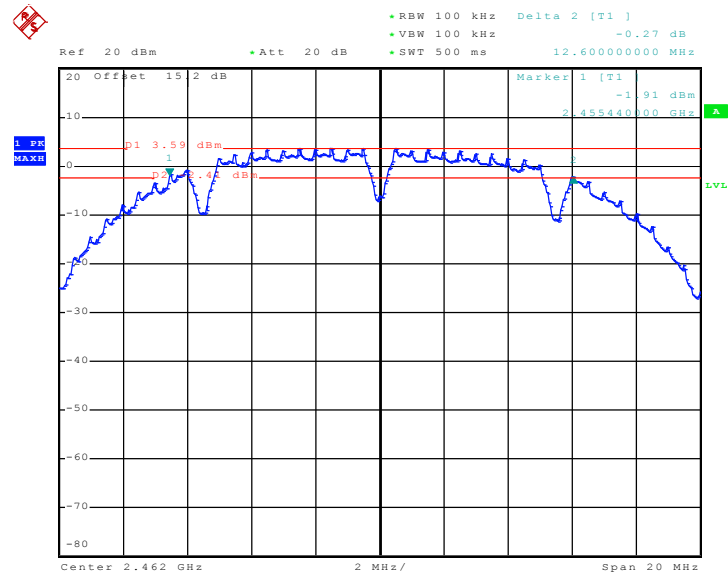
Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01



Date: 13.JUN.2010 15:10:42

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


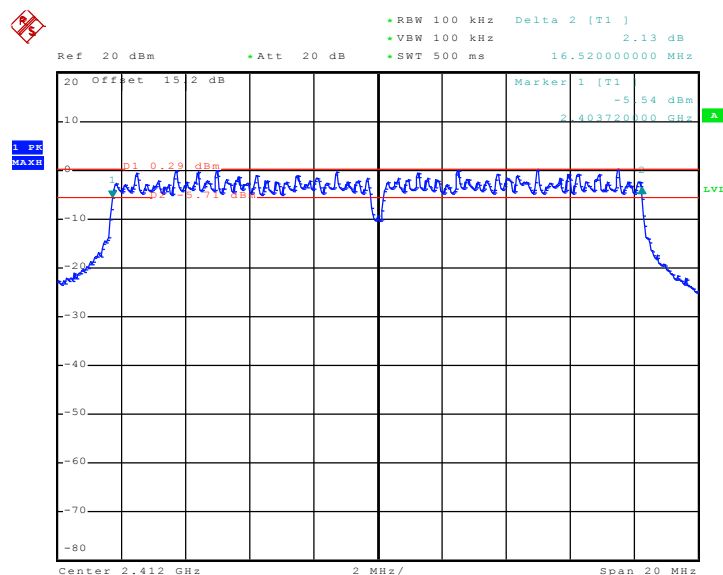
Date: 13.JUN.2010 15:12:26

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


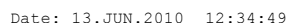
Date: 13.JUN.2010 15:08:34

Test Mode :	Mode 4, 5, 6	Temperature :	20~21°C
Test Engineer :	Sky Liu	Relative Humidity :	40~41%

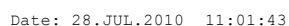
Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.52	0.5	Pass
06	2437	16.48	0.5	Pass
11	2462	16.44	0.5	Pass

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


Date: 13.JUN.2010 12:32:51



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



3.2 Output Power Measurement

3.2.1 Limit of Output Power

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

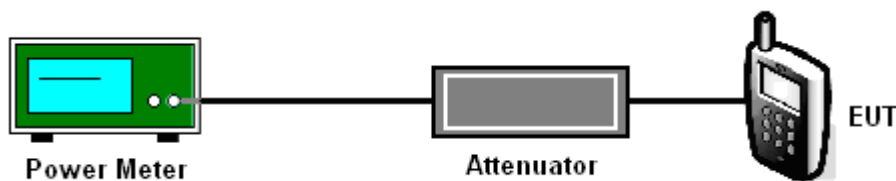
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the power meter by a low loss cable. Measure the power by power meter.

3.2.4 Test Setup



3.2.5 Test Result of Output Power

Test Mode :	Mode 1, 2, 3	Temperature :	20~21℃
Test Engineer :	Sky Liu	Relative Humidity :	40~41%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	17.30	30	Pass
06	2437	19.02	30	Pass
11	2462	17.89	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	20~21℃
Test Engineer :	Sky Liu	Relative Humidity :	40~41%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	20.25	30	Pass
06	2437	21.54	30	Pass
11	2462	20.19	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

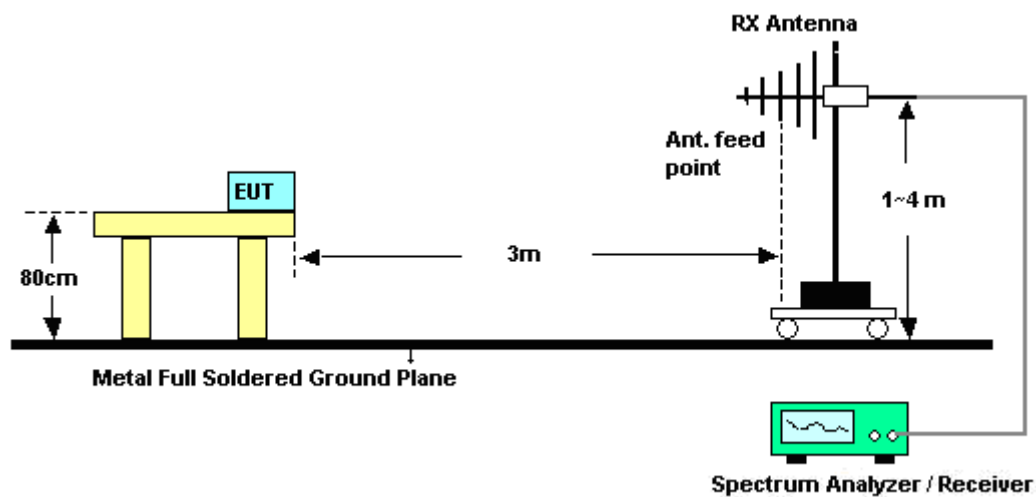
See list of measuring instruments of this test report.

3.3.3 Test Procedures

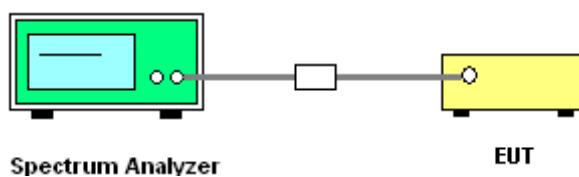
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) $\geq$ RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 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).

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℃
Test Band :	802.11b	Relative Humidity :	41~42%
Test Channel :	01	Test Engineer :	Haitao Yin

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
2325.77	57.95	-16.05	74	56.92	32.76	3.1	34.83	103	163	Peak
2325.77	48.68	-5.32	54	47.65	32.76	3.1	34.83	103	163	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
2327.86	60.95	-13.05	74	59.92	32.76	3.1	34.83	100	248	Peak
2327.86	52.67	-1.33	54	51.64	32.76	3.1	34.83	100	248	Average

Test Mode :	Mode 3	Temperature :	21~22℃
Test Band :	802.11b	Relative Humidity :	41~42%
Test Channel :	11	Test Engineer :	Haitao Yin

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.61	46.75	-27.25	74	45.39	33.01	3.2	34.85	100	255	Peak
2484.61	34.54	-19.46	54	33.18	33.01	3.2	34.85	100	255	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
2485.75	50.42	-23.58	74	49.06	33.01	3.2	34.85	100	182	Peak
2485.75	34.34	-19.66	54	32.98	33.01	3.2	34.85	100	182	Average



Test Mode :	Mode 4	Temperature :	21~22℃
Test Band :	802.11g	Relative Humidity :	41~42%
Test Channel :	01	Test Engineer :	Haitao Yin

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	65.49	-8.51	74	64.32	32.86	3.15	34.84	123	335	Peak
2390	50.67	-3.33	54	49.5	32.86	3.15	34.84	123	335	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	69.24	-4.76	74	68.07	32.86	3.15	34.84	135	342	Peak
2390	52.98	-1.02	54	51.81	32.86	3.15	34.84	135	342	Average

Test Mode :	Mode 6	Temperature :	21~22℃
Test Band :	802.11g	Relative Humidity :	41~42%
Test Channel :	11	Test Engineer :	Haitao Yin

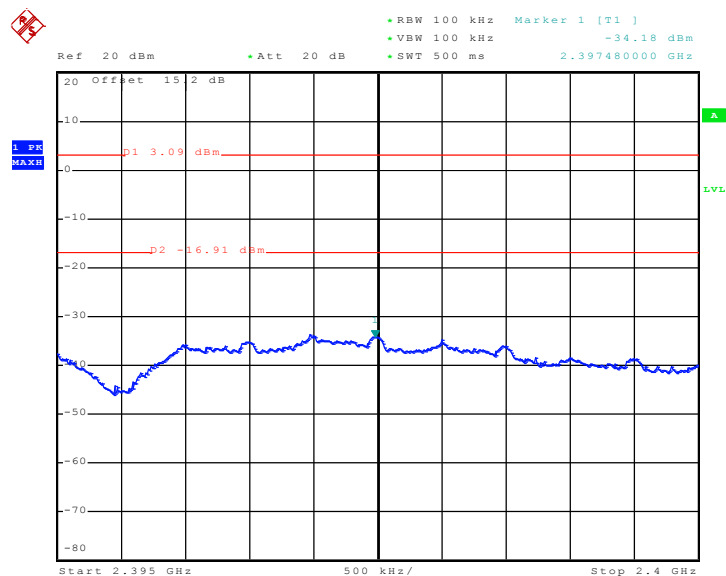
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	58.52	-15.48	74	57.16	33.01	3.2	34.85	100	325	Peak
2483.5	42.75	-11.25	54	41.39	33.01	3.2	34.85	100	325	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	64.28	-9.72	74	62.92	33.01	3.2	34.85	100	271	Peak
2483.5	46.34	-7.66	54	44.98	33.01	3.2	34.85	100	271	Average

3.3.6 Test Plots of Conducted Band Edges

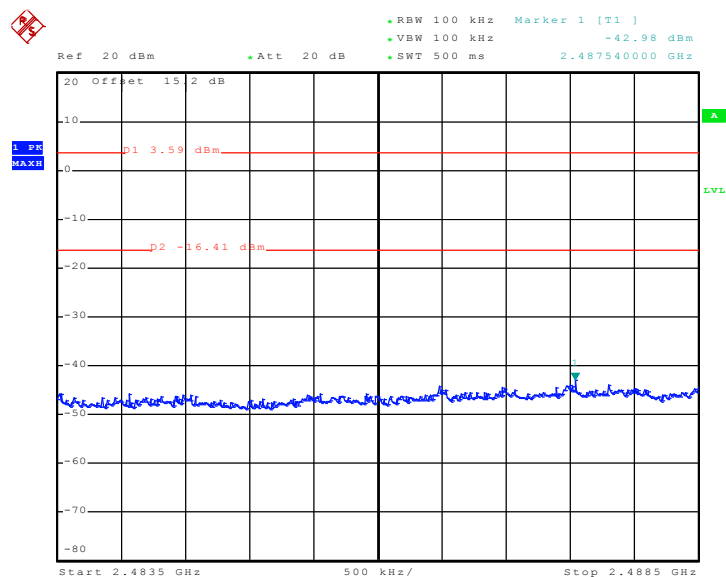
Test Mode :	Mode 1 and 3	Temperature :	20~21℃
Test Band :	802.11b	Relative Humidity :	40~41%
Test Channel :	01 and 11	Test Engineer :	Sky Liu

Low Band Edge Plot on 802.11b Channel 01



Date: 13.JUN.2010 15:17:20

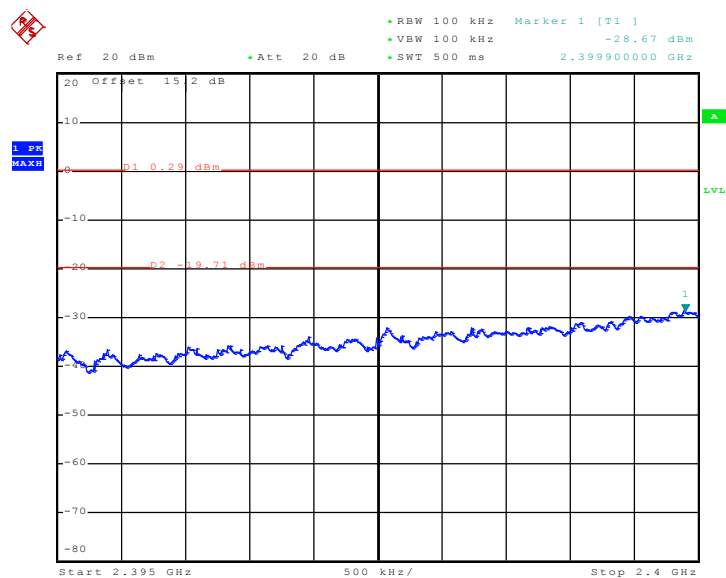
High Band Edge Plot on 802.11b Channel 11



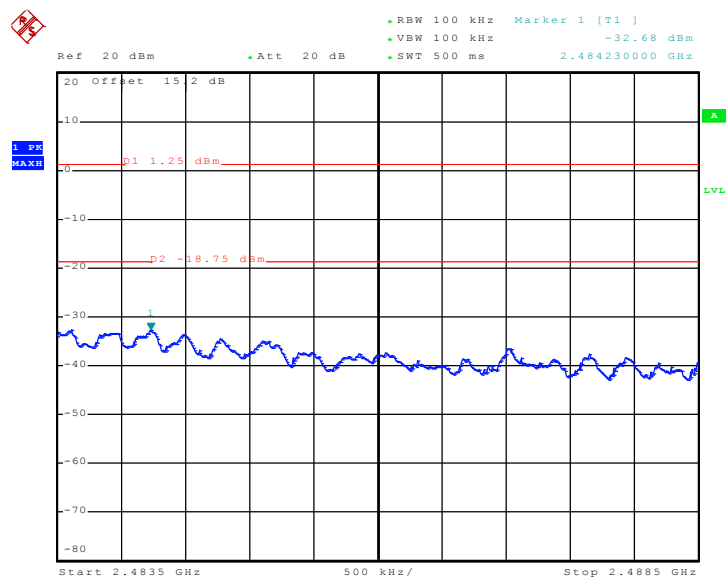
Date: 13.JUN.2010 15:19:06



Test Mode :	Mode 4 and 6	Temperature :	20~21°C
Test Band :	802.11g	Relative Humidity :	40~41%
Test Channel :	01 and 11	Test Engineer :	Sky Liu

Low Band Edge Plot on 802.11g Channel 01

Date: 13.JUN.2010 12:45:17

High Band Edge Plot on 802.11g Channel 11

Date: 27.JUL.2010 14:37:09

3.4 Spurious Emission Measurement

3.4.1 Limit of Spurious Emission Measurement

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

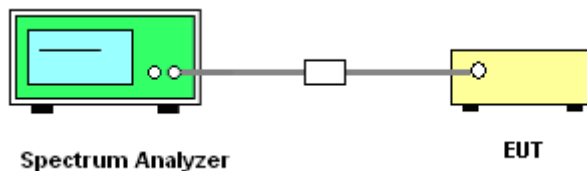
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedure

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

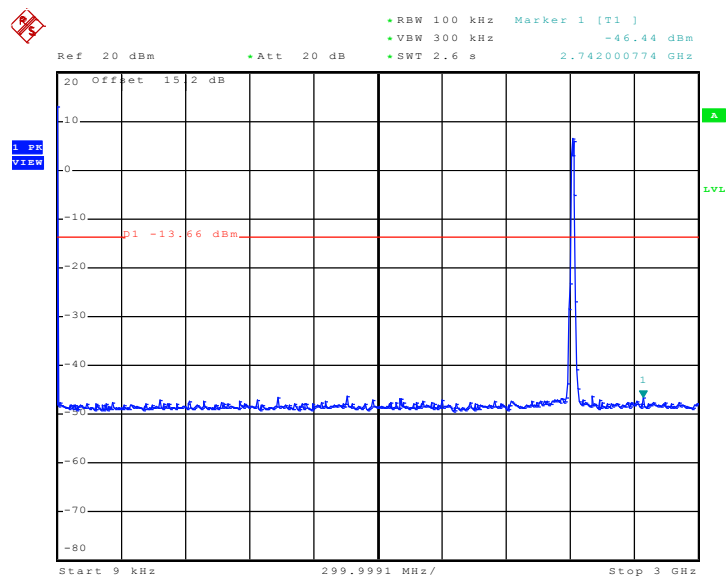
3.4.4 Test Setup



3.4.5 Test Plots of Spurious Emission

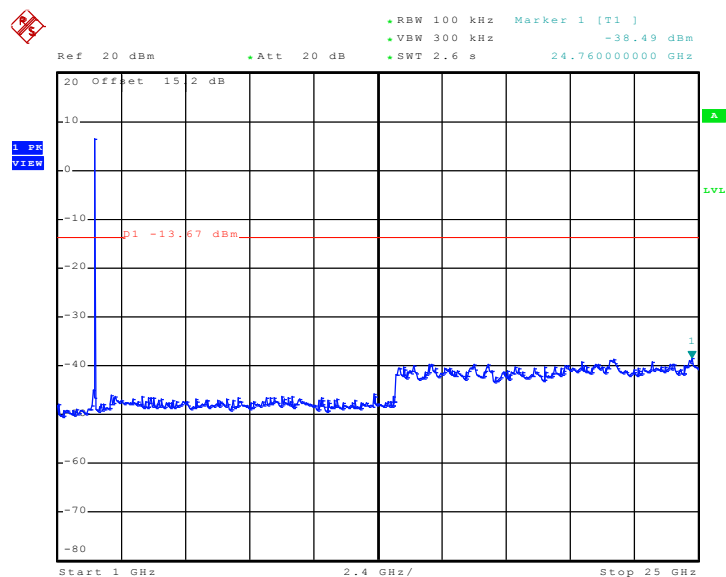
Test Mode :	Mode 1	Temperature :	20~21°C
Test Band :	802.11b	Relative Humidity :	40~41%
Test Channel :	01	Test Engineer :	Sky Liu

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



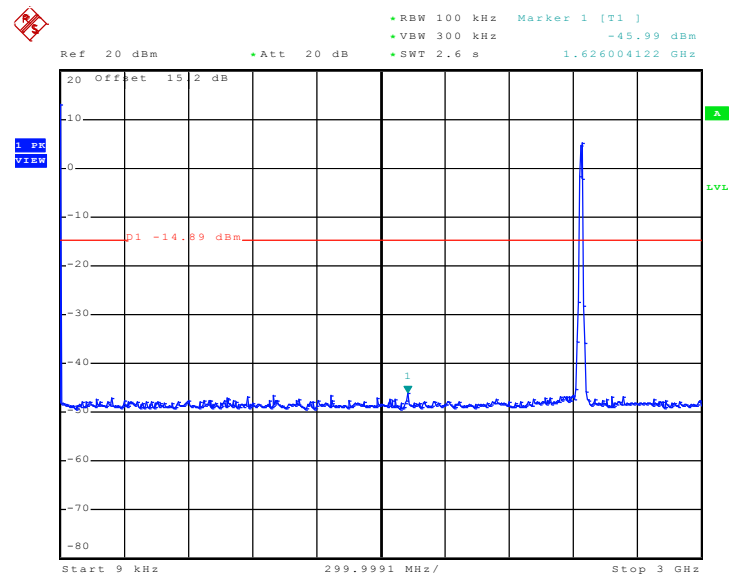
Date: 27.JUL.2010 14:09:47

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

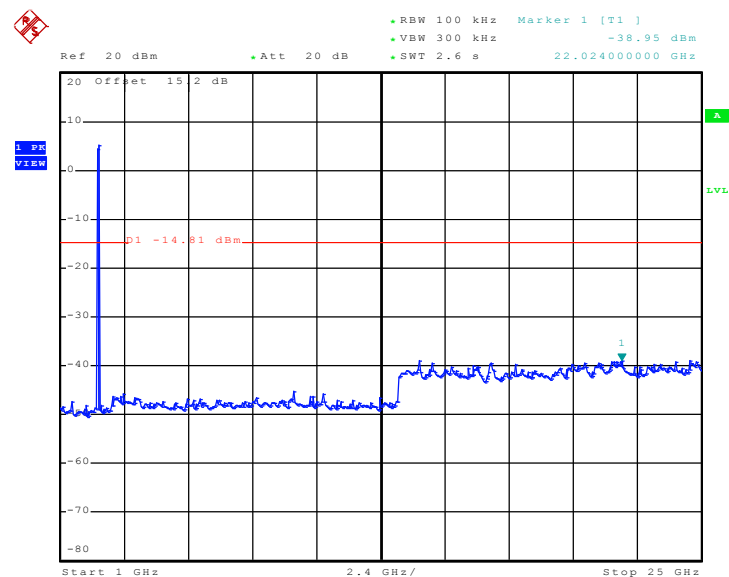


Date: 27.JUL.2010 14:31:13

Test Mode :	Mode 2	Temperature :	20~21°C
Test Band :	802.11b	Relative Humidity :	40~41%
Test Channel :	06	Test Engineer :	Sky Liu

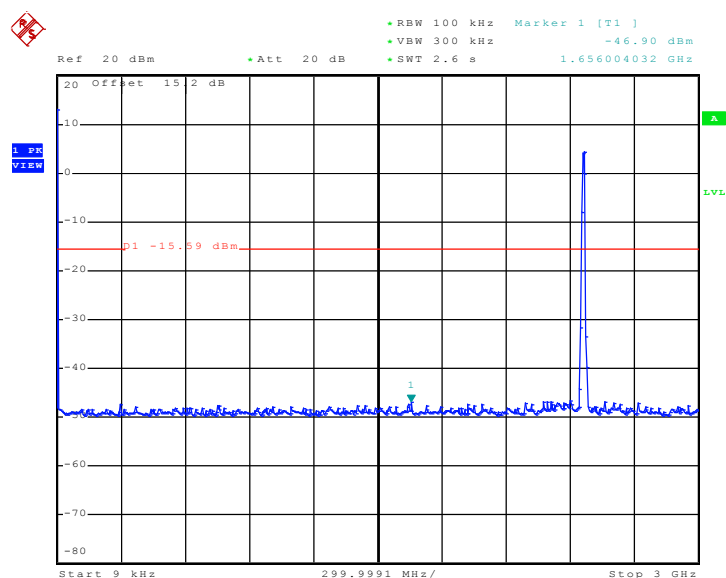
Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


Date: 27.JUL.2010 14:12:46

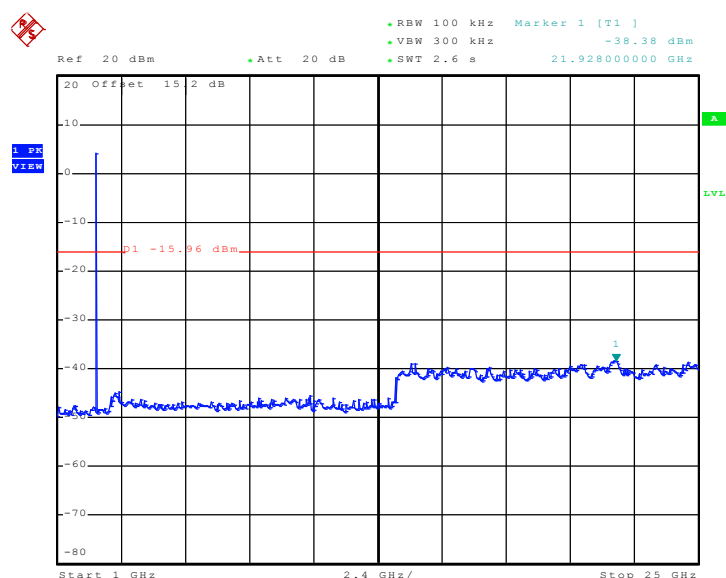
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


Date: 27.JUL.2010 14:32:00

Test Mode :	Mode 3	Temperature :	20~21°C
Test Band :	802.11b	Relative Humidity :	40~41%
Test Channel :	11	Test Engineer :	Sky Liu

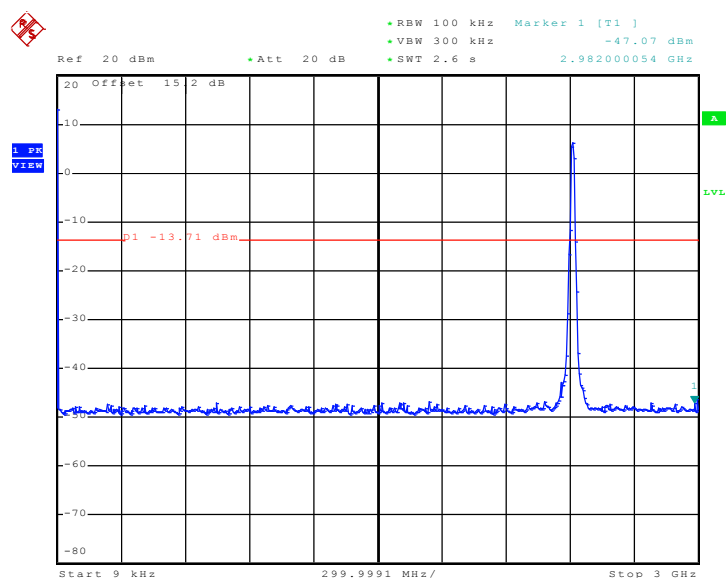
Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


Date: 27.JUL.2010 14:13:56

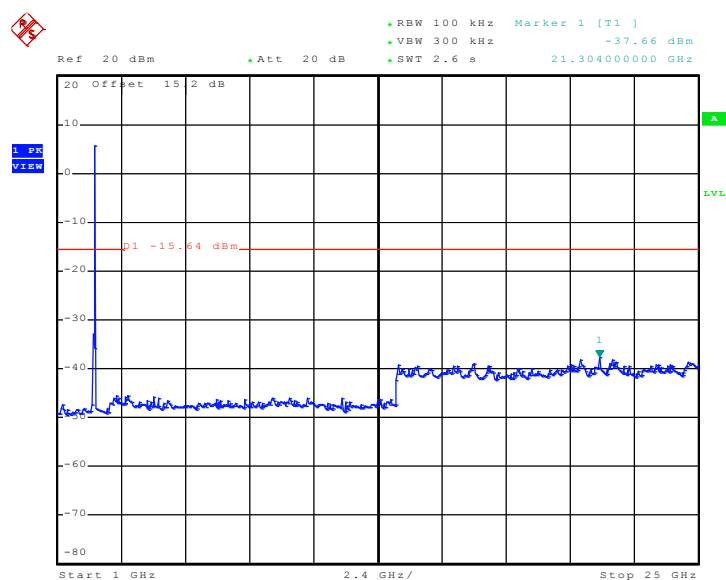
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


Date: 27.JUL.2010 14:33:18

Test Mode :	Mode 4	Temperature :	20~21°C
Test Band :	802.11g	Relative Humidity :	40~41%
Test Channel :	01	Test Engineer :	Sky Liu

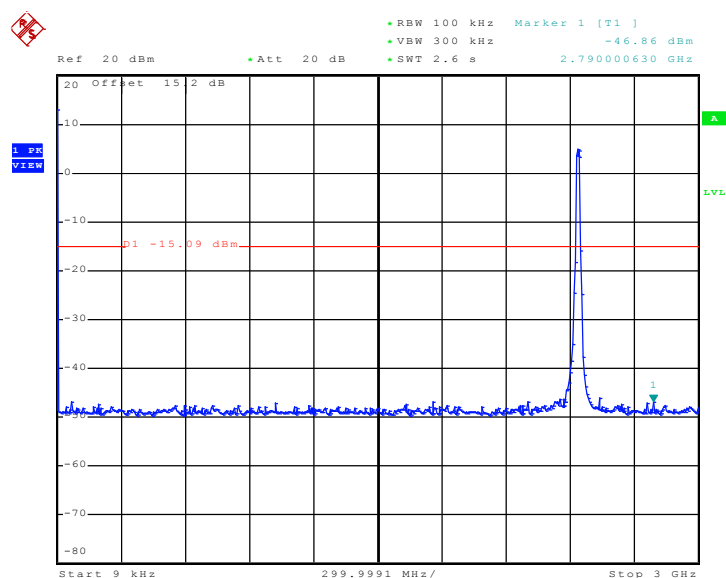
Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


Date: 27.JUL.2010 14:16:09

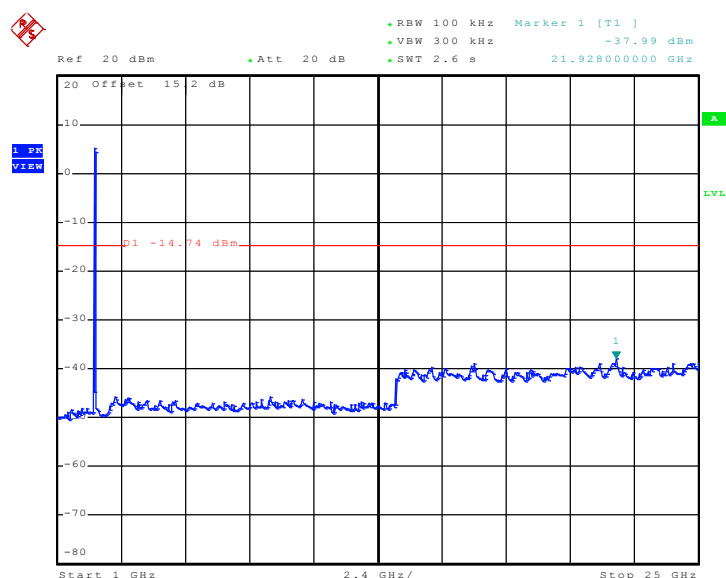
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


Date: 27.JUL.2010 14:30:26

Test Mode :	Mode 5	Temperature :	20~21°C
Test Band :	802.11g	Relative Humidity :	40~41%
Test Channel :	06	Test Engineer :	Sky Liu

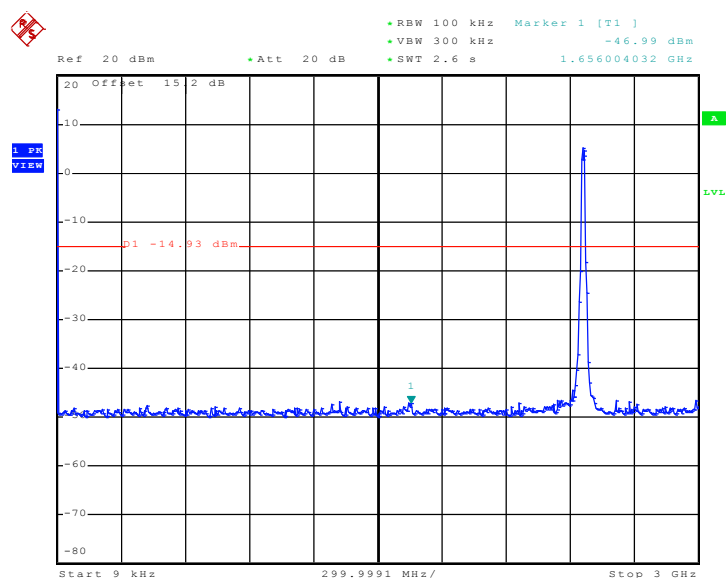
Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


Date: 27.JUL.2010 14:25:58

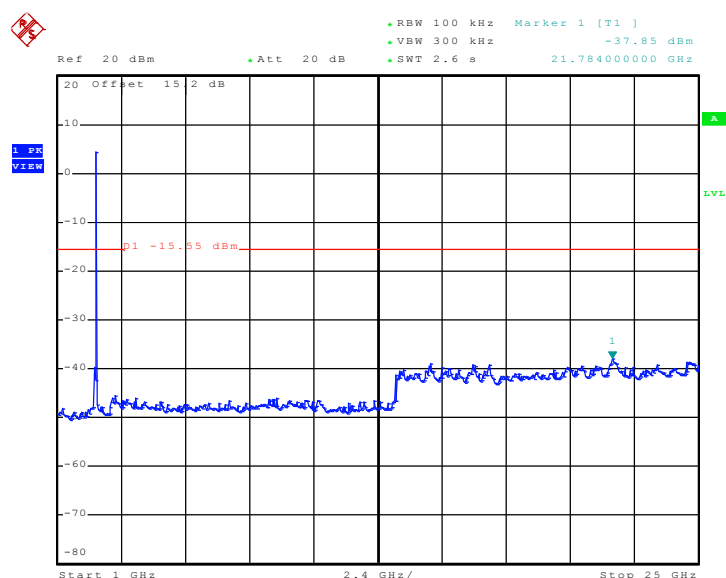
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


Date: 27.JUL.2010 14:29:00

Test Mode :	Mode 6	Temperature :	20~21°C
Test Band :	802.11g	Relative Humidity :	40~41%
Test Channel :	11	Test Engineer :	Sky Liu

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


Date: 27.JUL.2010 14:27:13

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


Date: 27.JUL.2010 14:28:08

3.5 Power Spectral Density Measurement

3.5.1 Limit of Power Spectral Density

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

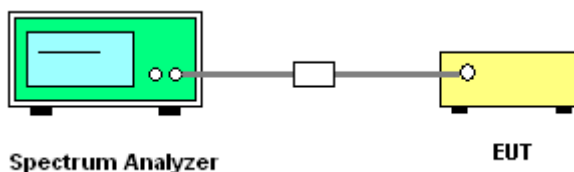
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The test follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Take the measured data from spectrum analyzer.

3.5.4 Test Setup

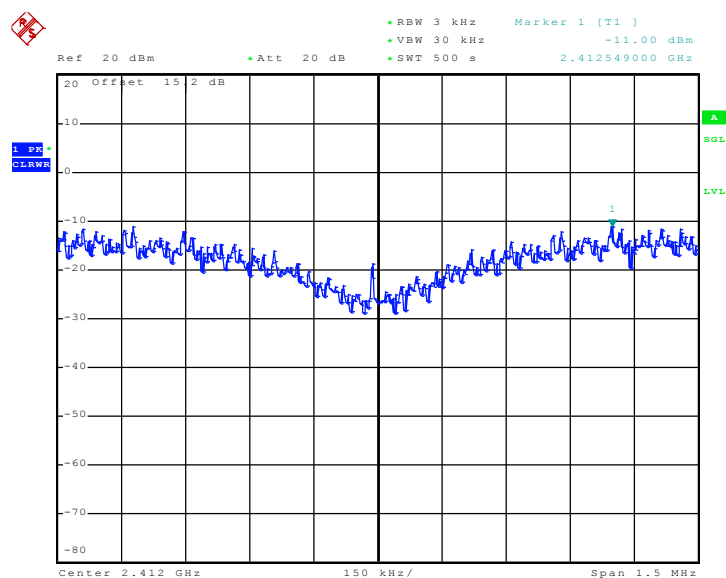


3.5.5 Test Result of Power Spectral Density

Test Mode :	Mode 1, 2, 3	Temperature :	20~21℃
Test Engineer :	Sky Liu	Relative Humidity :	40~41%

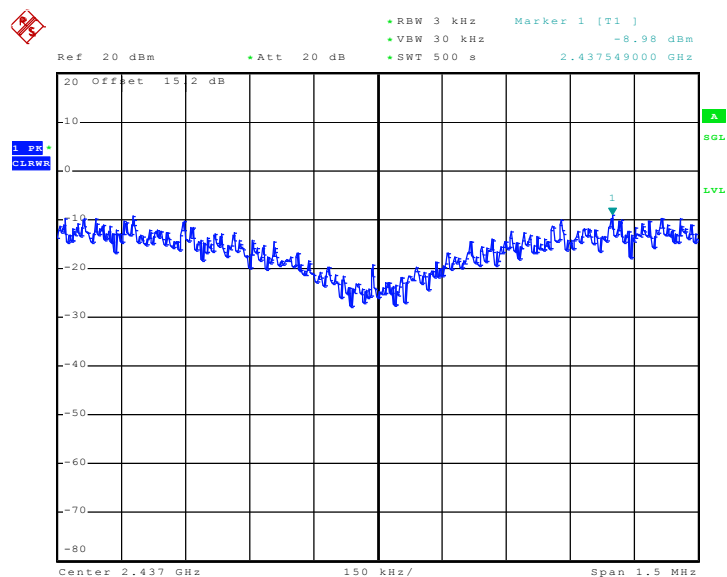
Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-11.00	8	Pass
06	2437	-8.98	8	Pass
11	2462	-10.57	8	Pass

Mode 1 : PSD Plot on 802.11b Channel 01



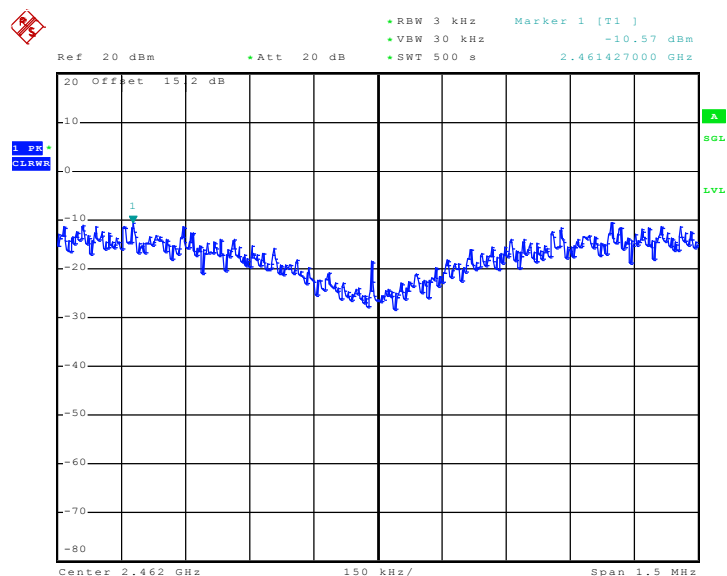
Date: 13.JUN.2010 14:41:02

Mode 2 : PSD Plot on 802.11b Channel 06



Date: 13.JUN.2010 14:55:06

Mode 3 : PSD Plot on 802.11b Channel 11

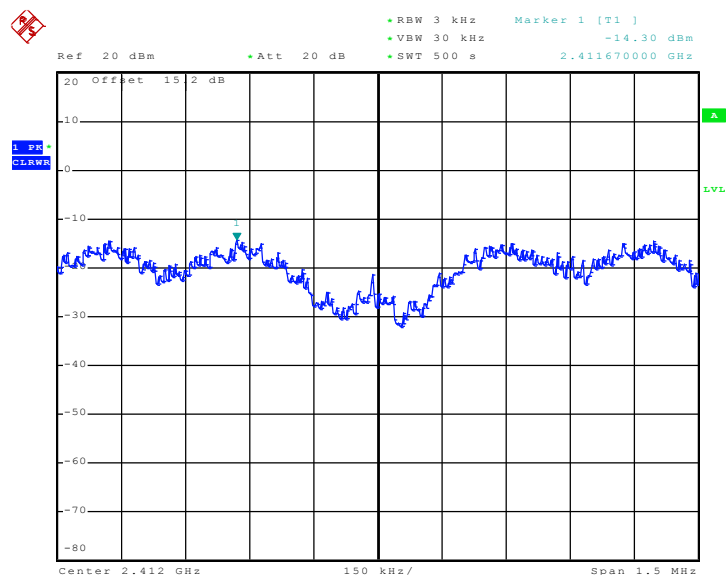


Date: 13.JUN.2010 15:04:32



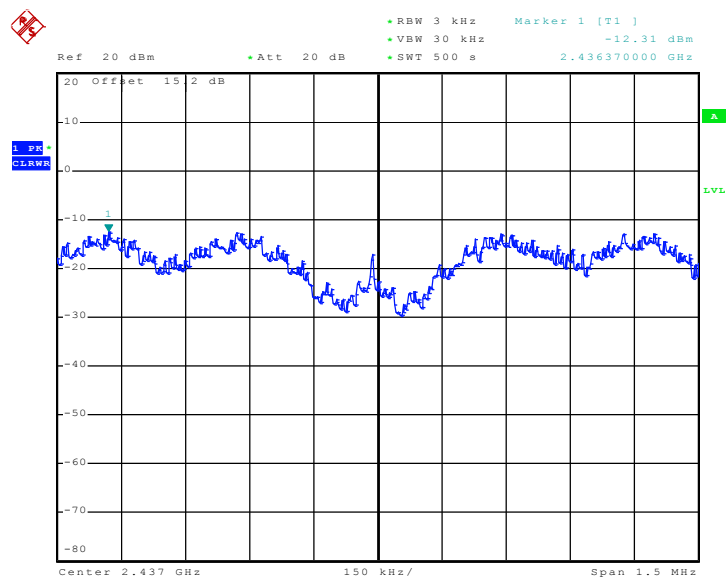
Test Mode :	Mode 4, 5, 6	Temperature :	20~21℃
Test Engineer :	Sky Liu	Relative Humidity :	40~41%

Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-14.30	8	Pass
06	2437	-12.31	8	Pass
11	2462	-13.30	8	Pass

Mode 4 : PSD Plot on 802.11g Channel 01

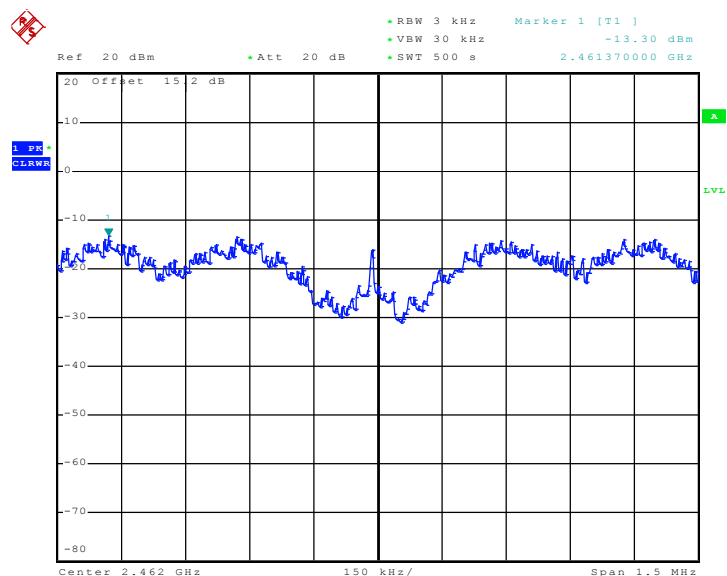
Date: 13.JUN.2010 14:05:38

Mode 5 : PSD Plot on 802.11g Channel 06



Date: 13.JUN.2010 13:29:55

Mode 6 : PSD Plot on 802.11g Channel 11



Date: 13.JUN.2010 13:47:43

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

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

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

*Decreases with the logarithm of the frequency.

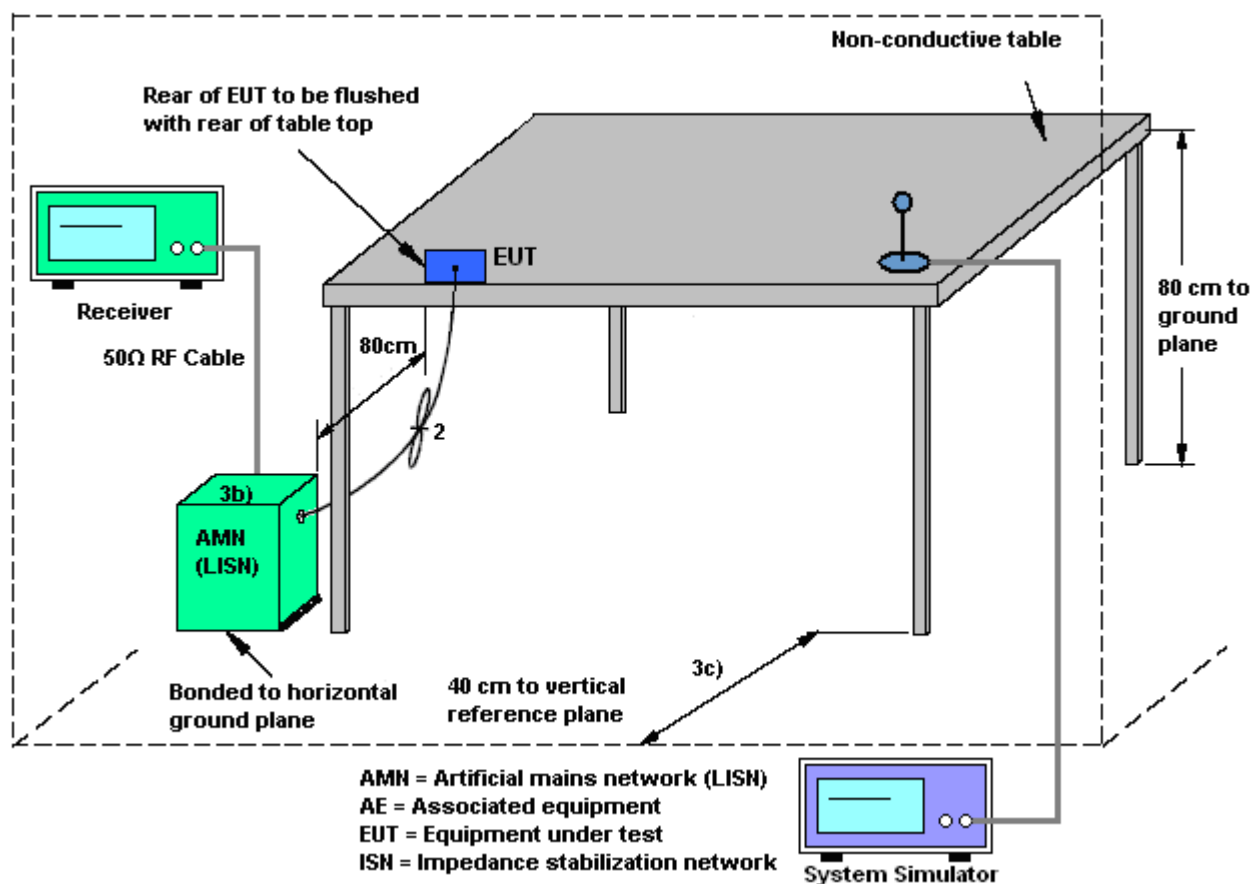
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

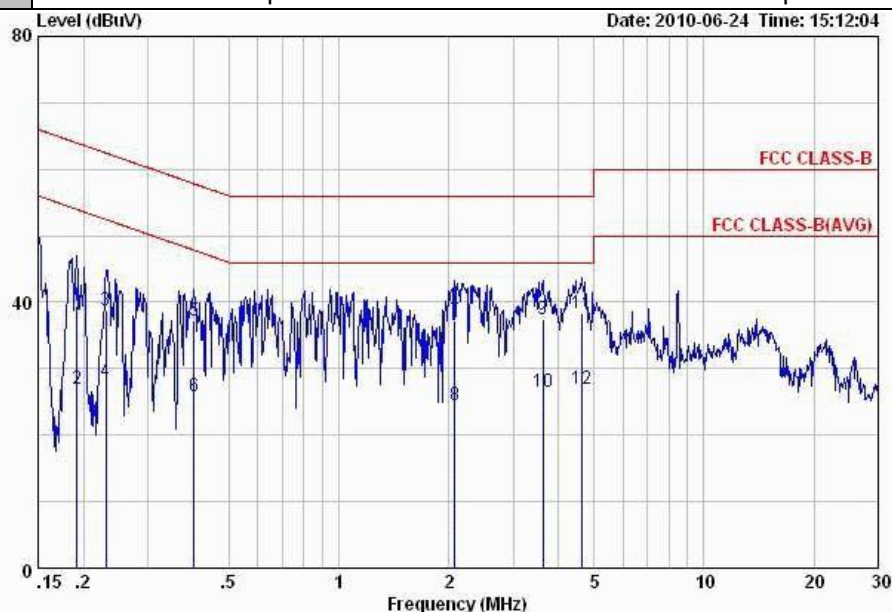
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network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

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	22~23°C
Test Engineer :	Terry Wang	Relative Humidity :	42~43%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + Earphone + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

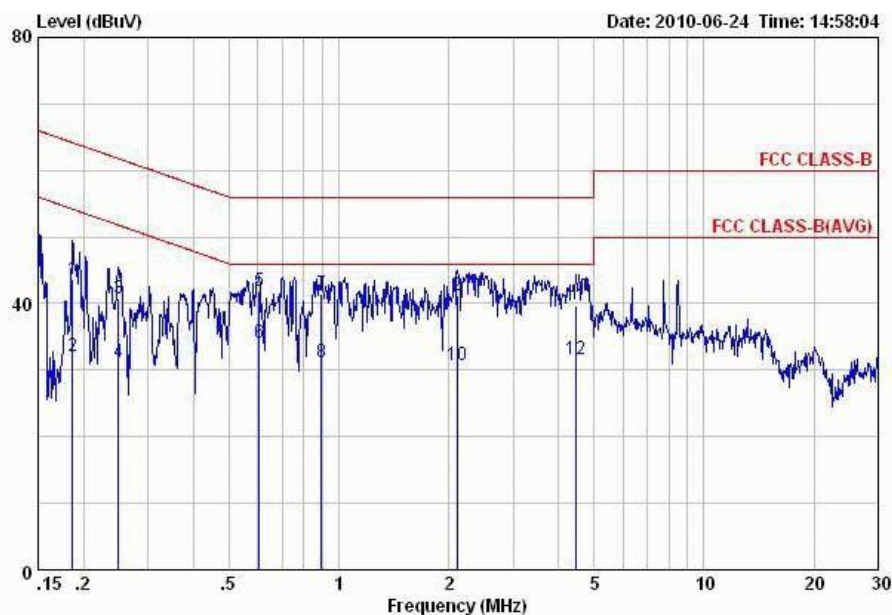


Condition: FCC CLASS-B LISN-071001 LINE

Power : 120Vac/60Hz
Mode : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.19	39.38	-24.58	63.96	29.30	-0.07	10.15	QP
2	0.19	26.88	-27.08	53.96	16.80	-0.07	10.15	Average
3	0.23	38.69	-23.74	62.43	28.60	-0.07	10.16	QP
4	0.23	28.19	-24.24	52.43	18.10	-0.07	10.16	Average
5	0.40	37.11	-20.70	57.81	27.00	-0.08	10.19	QP
6	0.40	25.81	-22.00	47.81	15.70	-0.08	10.19	Average
7	2.08	37.12	-18.88	56.00	26.90	-0.11	10.33	QP
8	2.08	24.52	-21.48	46.00	14.30	-0.11	10.33	Average
9	3.62	37.36	-18.64	56.00	27.10	-0.12	10.38	QP
10	3.62	26.56	-19.44	46.00	16.30	-0.12	10.38	Average
11	4.62	38.27	-17.73	56.00	28.00	-0.13	10.40	QP
12	4.62	26.97	-19.03	46.00	16.70	-0.13	10.40	Average

Test Mode :	Mode 1	Temperature :	22~23°C
Test Engineer :	Terry Wang	Relative Humidity :	42~43%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + Earphone + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Condition: FCC CLASS-B LISN-071001 NEUTRAL

Power : 120Vac/60Hz

Mode : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.19	43.57	-20.63	64.20	33.49	-0.07	10.15	QP
2	0.19	32.07	-22.13	54.20	21.99	-0.07	10.15	Average
3	0.25	40.69	-21.11	61.80	30.60	-0.07	10.16	QP
4	0.25	31.09	-20.71	51.80	21.00	-0.07	10.16	Average
5	0.60	41.84	-14.16	56.00	31.70	-0.08	10.22	QP
6	0.60	34.04	-11.96	46.00	23.90	-0.08	10.22	Average
7	0.89	41.47	-14.53	56.00	31.31	-0.09	10.25	QP
8	0.89	31.27	-14.73	46.00	21.11	-0.09	10.25	Average
9	2.12	41.23	-14.77	56.00	31.00	-0.11	10.34	QP
10	2.12	30.73	-15.27	46.00	20.50	-0.11	10.34	Average
11	4.48	39.76	-16.24	56.00	29.50	-0.13	10.39	QP
12	4.48	31.56	-14.44	46.00	21.30	-0.13	10.39	Average

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

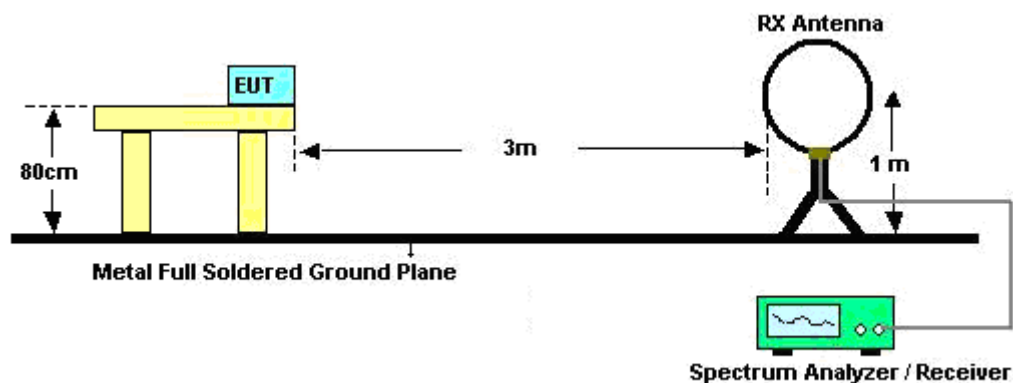
See list of measuring instruments of this test report.

3.7.3 Test Procedures

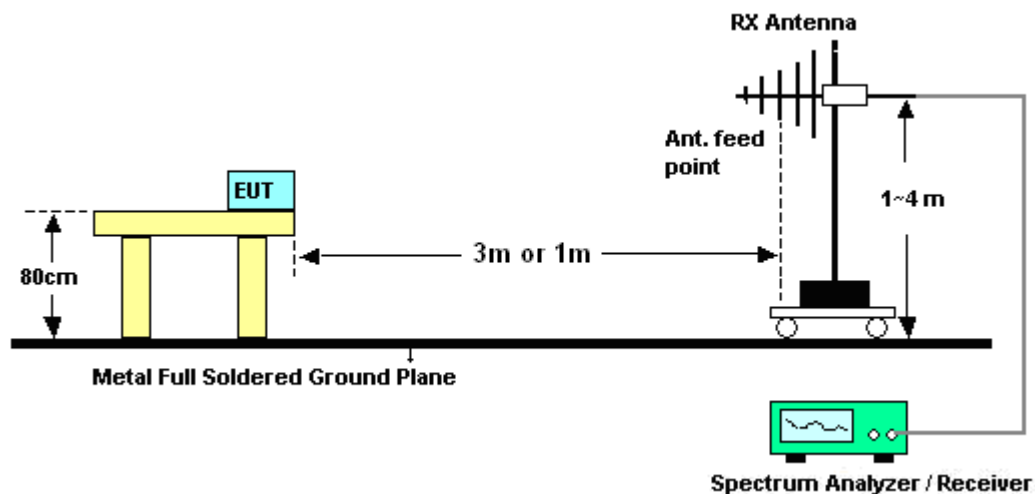
- The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
- Use the following spectrum analyzer settings:
 - Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
 - 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 = $20 \log (\text{specific distance [3m]} / \text{test distance [1m]})$ (dB)
- Follow the guidelines in ANSI C63.4-2003 with respect to maximizing the emission by rotating the EUT, measuring the emission for three EUT orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for this test in order to get the good signal level.

3.7.4 Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz



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

Test Engineer :	Haitao Yin	Temperature :	21~22℃	
		Relative Humidity :	41~42%	
Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

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

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

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

Test Mode :	Mode 1	Temperature :	21~22℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	Polarization :	Horizontal
Remark :	2412 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
116.13	25.76	-17.74	43.5	36.5	11.8	0.46	23	-	-	Peak
152.04	26.63	-16.87	43.5	39.11	9.93	0.59	23	-	-	Peak
264.09	27.1	-18.9	46	37.12	12.23	0.75	23	-	-	Peak
359.5	27.67	-18.33	46	35.1	14.72	0.85	23	-	-	Peak
673.8	33.94	-12.06	46	36.17	19.09	1.12	22.44	100	122	Peak
906.9	29.23	-16.77	46	28.28	20.48	1.29	20.82	-	-	Peak
2325.77	57.95	-16.05	74	56.92	32.76	3.1	34.83	103	163	Peak
2325.77	48.68	-5.32	54	47.65	32.76	3.1	34.83	103	163	Average
2412	102.74	-	-	101.54	32.89	3.15	34.84	102	0	Peak
2412	98.99	-	-	97.79	32.89	3.15	34.84	102	0	Average
2499.43	55.36	-18.64	74	53.95	33.05	3.21	34.85	200	128	Peak
2499.43	40.41	-13.59	54	39	33.05	3.21	34.85	200	128	Average

Test Mode :	Mode 1	Temperature :	21~22℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	Polarization :	Vertical
Remark :	2412 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
80.49	34.72	-5.28	40	50.73	6.6	0.39	23	100	255	Peak
88.86	26.41	-17.09	43.5	40.4	8.61	0.4	23	-	-	Peak
169.86	30.5	-13	43.5	43.68	9.2	0.62	23	-	-	Peak
673.8	39.88	-6.12	46	42.11	19.09	1.12	22.44	-	-	Peak
935.6	27.51	-18.49	46	26.07	20.67	1.31	20.54	-	-	Peak
979.7	27.97	-26.03	54	25.96	20.96	1.34	20.29	-	-	Peak
2327.86	60.95	-13.05	74	59.92	32.76	3.1	34.83	100	248	Peak
2327.86	52.67	-1.33	54	51.64	32.76	3.1	34.83	100	248	Average
2412	107.64	-	-	106.44	32.89	3.15	34.84	133	332	Peak
2412	104.09	-	-	102.89	32.89	3.15	34.84	133	332	Average
2499.43	56.27	-17.73	74	54.86	33.05	3.21	34.85	100	6	Peak
2499.43	43.47	-10.53	54	42.06	33.05	3.21	34.85	100	6	Average

Test Mode :	Mode 2	Temperature :	21~22℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	Polarization :	Horizontal
Remark :	2437 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
98.31	28.26	-15.24	43.5	40.67	10.15	0.44	23	-	-	Peak
169.86	29.15	-14.35	43.5	42.33	9.2	0.62	23	-	-	Peak
259.5	28.13	-17.87	46	38.23	12.15	0.75	23	-	-	Peak
359.5	26.02	-19.98	46	33.45	14.72	0.85	23	-	-	Peak
668.2	29.38	-16.62	46	31.71	19.03	1.12	22.48	-	-	Peak
673.8	37.6	-8.4	46	39.83	19.09	1.12	22.44	100	23	Peak
2350.66	54.42	-19.58	74	53.35	32.78	3.12	34.83	103	311	Peak
2350.66	47.06	-6.94	54	45.99	32.78	3.12	34.83	103	311	Average
2437	101.95	-	-	100.67	32.95	3.17	34.84	165	334	Peak
2437	97.68	-	-	96.4	32.95	3.17	34.84	165	334	Average
2484.23	45.13	-28.87	74	43.77	33.01	3.2	34.85	100	255	Peak
2484.23	33.21	-20.79	54	31.85	33.01	3.2	34.85	100	255	Average

Test Mode :	Mode 2	Temperature :	21~22℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	Polarization :	Vertical
Remark :	2437 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
80.49	34.48	-5.52	40	50.49	6.6	0.39	23	100	156	Peak
152.04	26.49	-17.01	43.5	38.97	9.93	0.59	23	-	-	Peak
169.86	30.22	-13.28	43.5	43.4	9.2	0.62	23	-	-	Peak
500.9	24.16	-21.84	46	28.88	17.2	0.98	22.9	-	-	Peak
673.8	40.3	-5.7	46	42.53	19.09	1.12	22.44	-	-	Peak
972	28.64	-25.36	54	26.74	20.88	1.34	20.32	-	-	Peak
2347.62	55.92	-18.08	74	54.85	32.78	3.12	34.83	103	0	Peak
2347.62	51.06	-2.94	54	49.99	32.78	3.12	34.83	103	0	Average
2437	103.73	-	-	102.45	32.95	3.17	34.84	103	328	Peak
2437	100.96	-	-	99.68	32.95	3.17	34.84	103	328	Average
2485.75	46.44	-27.56	74	45.08	33.01	3.2	34.85	100	233	Peak
2485.75	34.04	-19.96	54	32.68	33.01	3.2	34.85	100	233	Average

Test Mode :	Mode 3	Temperature :	21~22℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	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
98.31	28.84	-14.66	43.5	41.25	10.15	0.44	23	-	-	Peak
116.13	25.74	-17.76	43.5	36.48	11.8	0.46	23	-	-	Peak
169.86	26.31	-17.19	43.5	39.49	9.2	0.62	23	-	-	Peak
359.5	26	-20	46	33.43	14.72	0.85	23	-	-	Peak
673.8	36.09	-9.91	46	38.32	19.09	1.12	22.44	100	254	Peak
940.5	28.47	-25.53	54	26.98	20.69	1.31	20.51	-	-	Peak
2371.94	55.24	-18.76	74	54.12	32.83	3.13	34.84	201	316	Peak
2371.94	48.63	-5.37	54	47.51	32.83	3.13	34.84	201	316	Average
2462	99.01	-	-	97.7	32.98	3.18	34.85	202	310	Peak
2462	94.22	-	-	92.91	32.98	3.18	34.85	202	310	Average
2484.61	46.75	-27.25	74	45.39	33.01	3.2	34.85	100	255	Peak
2484.61	34.54	-19.46	54	33.18	33.01	3.2	34.85	100	255	Average

Test Mode :	Mode 3	Temperature :	21~22℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	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
80.49	30	-10	40	46.01	6.6	0.39	23	-	-	Peak
88.86	27.35	-16.15	43.5	41.34	8.61	0.4	23	-	-	Peak
169.86	29.16	-14.34	43.5	42.34	9.2	0.62	23	-	-	Peak
359.5	21.79	-24.21	46	29.22	14.72	0.85	23	-	-	Peak
673.8	40.63	-5.37	46	42.86	19.09	1.12	22.44	100	128	Peak
972	27.25	-26.75	54	25.35	20.88	1.34	20.32	-	-	Peak
2373.08	56.95	-17.05	74	55.83	32.83	3.13	34.84	130	334	Peak
2373.08	51.28	-2.72	54	50.16	32.83	3.13	34.84	130	334	Average
2462	104.62	-	-	103.31	32.98	3.18	34.85	139	268	Peak
2462	100.71	-	-	99.4	32.98	3.18	34.85	139	268	Average
2485.75	50.42	-23.58	74	49.06	33.01	3.2	34.85	100	182	Peak
2485.75	34.34	-19.66	54	32.98	33.01	3.2	34.85	100	182	Average

Test Mode :	Mode 4	Temperature :	21~22℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	Polarization :	Horizontal
Remark :	2412 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
98.31	28.51	-14.99	43.5	40.92	10.15	0.44	23	100	233	Peak
152.04	27.65	-15.85	43.5	40.13	9.93	0.59	23	-	-	Peak
169.86	26.85	-16.65	43.5	40.03	9.2	0.62	23	-	-	Peak
359.5	24.3	-21.7	46	31.73	14.72	0.85	23	-	-	Peak
384	24.25	-21.75	46	30.79	15.59	0.87	23	-	-	Peak
978.3	27.52	-26.48	54	25.52	20.96	1.34	20.3	-	-	Peak
2329.57	47.26	-6.74	54	46.23	32.76	3.1	34.83	116	349	Average
2329.57	60.25	-13.75	74	59.22	32.76	3.1	34.83	116	349	Peak
2369.09	44.45	-9.55	54	43.33	32.83	3.13	34.84	142	175	Average
2369.09	57.8	-16.2	74	56.68	32.83	3.13	34.84	142	175	Peak
2390	65.49	-8.51	74	64.32	32.86	3.15	34.84	123	335	Peak
2390	50.67	-3.33	54	49.5	32.86	3.15	34.84	123	335	Average
2412	103.32	-	-	102.12	32.89	3.15	34.84	118	342	Peak
2412	89.39	-	-	88.19	32.89	3.15	34.84	118	342	Average
2496.77	54.78	-19.22	74	53.37	33.05	3.21	34.85	112	318	Peak
2496.77	42.64	-11.36	54	41.23	33.05	3.21	34.85	112	318	Average

Test Mode :	Mode 4	Temperature :	21~22℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	Polarization :	Vertical
Remark :	2412 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
80.49	34.6	-5.4	40	50.61	6.6	0.39	23	100	122	Peak
98.31	28.83	-14.67	43.5	41.24	10.15	0.44	23	-	-	Peak
169.86	29.3	-14.2	43.5	42.48	9.2	0.62	23	-	-	Peak
732.6	26.4	-19.6	46	27.44	19.72	1.16	21.92	-	-	Peak
898.5	26.44	-19.56	46	25.63	20.45	1.29	20.93	-	-	Peak
932.1	27.38	-18.62	46	26	20.65	1.3	20.57	-	-	Peak
2326.53	64.23	-9.77	74	63.2	32.76	3.1	34.83	101	267	Peak
2326.53	51.74	-2.26	54	50.71	32.76	3.1	34.83	101	267	Average
2360.35	59.42	-14.58	74	58.32	32.81	3.12	34.83	124	15	Peak
2360.35	45.15	-8.85	54	44.05	32.81	3.12	34.83	124	15	Average
2390	69.24	-4.76	74	68.07	32.86	3.15	34.84	135	342	Peak
2390	52.98	-1.02	54	51.81	32.86	3.15	34.84	135	342	Average
2412	107.58	-	-	106.38	32.89	3.15	34.84	136	352	Peak
2412	95.07	-	-	93.87	32.89	3.15	34.84	136	352	Average
2493.16	43.03	-10.97	54	41.62	33.05	3.21	34.85	100	155	Average
2493.16	58.18	-15.82	74	56.77	33.05	3.21	34.85	100	155	Peak



Test Mode :	Mode 5	Temperature :	21~22℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	Polarization :	Horizontal
Remark :	2437 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
98.31	27.97	-15.53	43.5	40.38	10.15	0.44	23	100	354	Peak
277.32	24.17	-21.83	46	33.83	12.58	0.76	23	-	-	Peak
295.14	29.41	-16.59	46	38.7	12.93	0.78	23	-	-	Peak
313.3	26.06	-19.94	46	34.94	13.33	0.79	23	-	-	Peak
359.5	25.27	-20.73	46	32.7	14.72	0.85	23	-	-	Peak
969.2	27.77	-26.23	54	25.9	20.86	1.34	20.33	-	-	Peak
2350.85	59.66	-14.34	74	58.59	32.78	3.12	34.83	173	330	Peak
2350.85	48.16	-5.84	54	47.09	32.78	3.12	34.83	173	330	Average
2437	100.96	-	-	99.68	32.95	3.17	34.84	164	332	Peak
2437	91.02	-	-	89.74	32.95	3.17	34.84	164	332	Average
2485.37	54.37	-19.63	74	53.01	33.01	3.2	34.85	100	302	Peak
2485.37	41.48	-12.52	54	40.12	33.01	3.2	34.85	100	302	Average

Test Mode :	Mode 5	Temperature :	21~22℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	Polarization :	Vertical
Remark :	2437 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
80.49	31.53	-8.47	40	47.54	6.6	0.39	23	100	147	Peak
88.86	27.31	-16.19	43.5	41.3	8.61	0.4	23	-	-	Peak
169.86	26.57	-16.93	43.5	39.75	9.2	0.62	23	-	-	Peak
865.6	26.58	-19.42	46	26.06	20.49	1.27	21.24	-	-	Peak
935.6	27.41	-18.59	46	25.97	20.67	1.31	20.54	-	-	Peak
970.6	27.42	-26.58	54	25.54	20.87	1.34	20.33	-	-	Peak
2354.08	63.45	-10.55	74	62.35	32.81	3.12	34.83	142	268	Peak
2354.08	52.28	-1.72	54	51.18	32.81	3.12	34.83	142	268	Average
2385.81	59.16	-14.84	74	58.01	32.86	3.13	34.84	127	332	Peak
2385.81	46.63	-7.37	54	45.48	32.86	3.13	34.84	127	332	Average
2437	107.26	-	-	105.98	32.95	3.17	34.84	135	272	Peak
2437	95.21	-	-	93.93	32.95	3.17	34.84	135	272	Average
2485.37	42.65	-11.35	54	41.29	33.01	3.2	34.85	100	347	Average
2485.37	55.26	-18.74	74	53.9	33.01	3.2	34.85	100	347	Peak

Test Mode :	Mode 6	Temperature :	21~22℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	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
98.31	24.99	-18.51	43.5	37.4	10.15	0.44	23	100	188	Peak
152.04	24.52	-18.98	43.5	37	9.93	0.59	23	-	-	Peak
169.86	24.11	-19.39	43.5	37.29	9.2	0.62	23	-	-	Peak
890.1	26.79	-19.21	46	26.06	20.46	1.29	21.02	-	-	Peak
942.6	28.23	-25.77	54	26.72	20.7	1.31	20.5	-	-	Peak
969.2	27.27	-26.73	54	25.4	20.86	1.34	20.33	-	-	Peak
2372	58.13	-15.87	74	57.01	32.83	3.13	34.84	128	181	Peak
2372	46.26	-7.74	54	45.14	32.83	3.13	34.84	128	181	Average
2462	97.98	-	-	96.67	32.98	3.18	34.85	162	329	Peak
2462	88.58	-	-	87.27	32.98	3.18	34.85	162	329	Average
2483.5	58.52	-15.48	74	57.16	33.01	3.2	34.85	100	325	Peak
2483.5	42.75	-11.25	54	41.39	33.01	3.2	34.85	100	325	Average

Test Mode :	Mode 6	Temperature :	21~22℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	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
80.49	31.18	-8.82	40	47.19	6.6	0.39	23	100	190	Peak
88.86	26.57	-16.93	43.5	40.56	8.61	0.4	23	-	-	Peak
169.86	25.59	-17.91	43.5	38.77	9.2	0.62	23	-	-	Peak
736.8	25.91	-20.09	46	26.85	19.78	1.17	21.89	-	-	Peak
855.1	26.35	-19.65	46	25.89	20.5	1.27	21.31	-	-	Peak
925.1	27.31	-18.69	46	26.03	20.6	1.3	20.62	-	-	Peak
2380	60.98	-13.02	74	59.86	32.83	3.13	34.84	139	265	Peak
2380	48.56	-5.44	54	47.44	32.83	3.13	34.84	139	265	Average
2462	101.77	-	-	100.46	32.98	3.18	34.85	100	256	Peak
2462	90.72	-	-	89.41	32.98	3.18	34.85	100	256	Average
2483.5	64.28	-9.72	74	62.92	33.01	3.2	34.85	100	271	Peak
2483.5	46.34	-7.66	54	44.98	33.01	3.2	34.85	100	271	Average

3.8 Antenna Requirements

3.8.1 Standard Applicable

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

3.8.2 Antenna Connected Construction

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

3.8.3 Antenna Gain

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

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Jan. 18, 2010	Jan. 17, 2011	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Aug. 27, 2009	Aug. 26, 2010	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Aug. 28, 2009	Aug. 27, 2010	Conducted (TH01-KS)
EMI Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 17, 2009	Nov. 16, 2010	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Jan. 18, 2010	Jan. 17, 2011	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Jan. 18, 2010	Jan. 17, 2011	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	N/A	Nov. 26, 2009	Nov. 25, 2010	Conduction (CO01-KS)
System Simulator	R&S	CMU200	837587/066	Full-Band	Jan. 08, 2009	Jan. 07, 2011	Conduction (CO01-KS)
EMI Test Receiver	R&S	ESCI	100724	9kHz – 2.75GHz	Mar. 09, 2010	Mar. 08, 2011	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Jan. 18, 2010	Jan. 17, 2011	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Jan. 18, 2010	Jan. 17, 2011	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 18, 2010	Jan. 17, 2011	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060004	30MHz~2GHz	Feb. 02, 2010	Feb. 01, 2011	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Jan. 18, 2010	Jan. 17, 2011	Radiation (03CH01-KS)
Active horn antenna	com-power	AHA-118	701023	1G-18GHz	Nov. 18, 2009	Nov. 17, 2010	Radiation (03CH01-KS)
Signal Generator	R&S	SMR40	100455	10MHz~40GHz	Jan. 18, 2010	Jan. 17, 2011	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15-40GHz	Oct. 22, 2009	Oct. 21, 2010	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 28, 2008	Jul. 27, 2010	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 $U_c(y)$	1.13		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.26		

Uncertainty of Radiated Emission Measurement (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 $U_c(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.54		

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

Contribution	Uncertainty of X_i		$u(X_i)$	C_i	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	± 0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	± 1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	± 0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	± 2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	± 1.50	Rectangular	0.87	1	0.87
Site Imperfection	± 2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty $U_c(y)$	2.36				
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.72				