

FCC RF Test Report

APPLICANT : Motorola Inc.
EQUIPMENT : Smart phone
BRAND NAME : MOTOROLA
MODEL NAME : XT502
MARKETING NAME : QUENCH XT3 / QUENCH XT5
FCC ID : IHDP56LH1
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Transmission System (DTS)

The product was received on Apr. 28, 2009 and completely tested on Jun. 25, 2010. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:



Roy Wu / Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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	7
1.5 Applied Standards	7
1.6 Ancillary Equipment List	7
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	8
2.1 RF Power	8
2.2 Test Mode	9
2.3 Connection Diagram of Test System	10
2.4 RF Utility	10
3 TEST RESULT	11
3.1 6dB Bandwidth Measurement	11
3.2 Output Power Measurement	16
3.3 Band Edges Measurement	18
3.4 Spurious Emission Measurement	24
3.5 Power Spectral Density Measurement	31
3.6 AC Conducted Emission Measurement	36
3.7 Radiated Emission Measurement	40
3.8 Antenna Requirements	55
4 LIST OF MEASURING EQUIPMENT	56
5 UNCERTAINTY OF EVALUATION	57
APPENDIX A. PHOTOGRAPHS OF EUT	
APPENDIX B. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR981906-16A	Rev. 01	Initial issue of report	Jun. 28, 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 20.0 dB at 0.534 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 9.09 dB at 30.54 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Motorola Inc.

600 N. U.S. Highway 45 Libertyville, IL 60048-5343

1.2 Manufacturer

Chi Mei Communication Systems, Inc.

No. 4, Mingsheng Street, Tucheng City, Taipei County 23678, Taiwan

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Smart phone
Brand Name	MOTOROLA
Model Name	XT502
Marketing Name	Quench XT3 / Quench XT5
FCC ID	IHDP56LH1
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz
Number of Channels	11
Carrier Frequency of Each Channel	$2412+(n-1)*5$ MHz; $n=1\sim11$
Channel Spacing	5 MHz
Maximum Output Power to Antenna	802.11b : 18.65 dBm (73.28 mW) 802.11g : 22.64 dBm (183.65 mW)
Antenna Type	PIFA Antenna with gain -2.42 dBi
HW Version	P3.3
SW Version	V1.300
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Identical Prototype

Remark:

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

List of Accessory:

Specification of Accessory		
AC Adapter	Brand Name	MOTOROLA
	Model Name	FMP5334A--(US plug) FMP5342A--(EU plug)
	Power Rating	I/P:100-240Vac, 50-60Hz, 0.15A; O/P: 5Vdc, 550mA
	DC Power Cord Type	1.8 meter non-shielded cable without ferrite core
Battery	Brand Name	MOTOROLA
	Model Name	OM6C
	Power Rating	3.7Vdc, 1230mAh, 4.55Wh
	Type	Li-ion
Earphone	Brand Name	Full-Sound
	Model Name	TDM-600-002
	Signal Line Type	1.7 meter non-shielded cable without ferrite core
USB Cable	Brand Name	Hon Hai
	Model Name	CUNC004B-T19-EF
	Signal Line Type	0.95 meter shielded cable without ferrite core
LCD Panel	Brand Name	WINTEK
	Model Name	WD-F3248Y-6FLW
Camera	Brand Name	Foxconn
	Model Name	C265

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. For accessories equipped with this EUT, please refer to the appendix of the external photo.

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	CO05-HY	03CH06-HY	TW1022/4086B-1

1.5 Applied Standards

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

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

Remark:

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

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	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	18.24	18.1	17.67	18.42
CH 06	2437 MHz	18.63	18.09	18.19	18.65
CH 11	2462 MHz	18.09	18.13	18.23	18.31

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	22.16	21.34	22.11	21.34	22.09	21.99	21.49	22.48
CH 06	2437 MHz	22.27	21.49	22.46	21.84	22.36	21.69	22.00	22.56
CH 11	2462 MHz	22.43	22.04	21.98	21.83	22.17	21.83	22.17	22.64

Remark:

1. The data rates of WLAN 802.11b/g were set in 11Mbps 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.

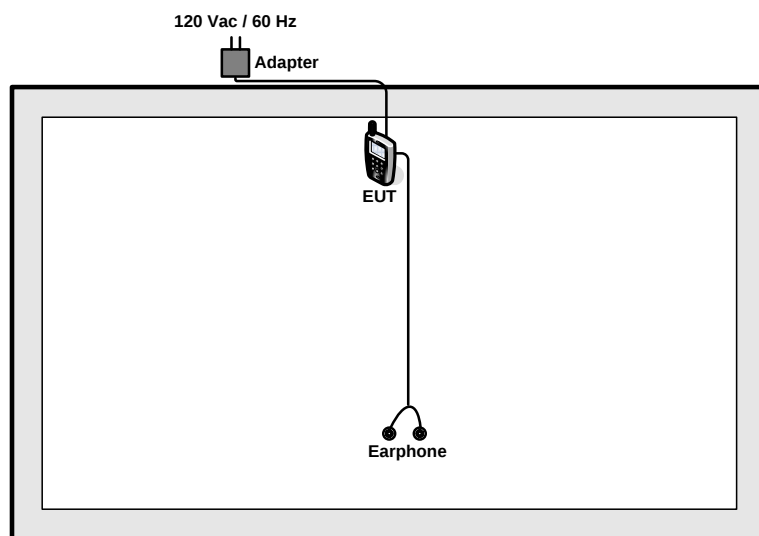
2.2 Test Mode

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.

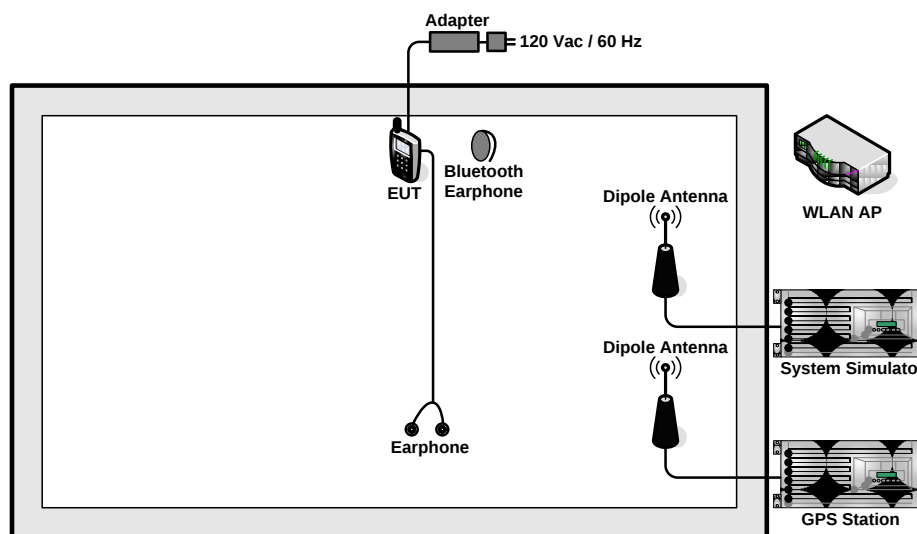
Test Cases		
Test Item	802.11b	802.11g
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz	Mode 4 : 802.11g CH01_2412 MHz
	Mode 2 : 802.11b CH06_2437 MHz	Mode 5 : 802.11g CH06_2437 MHz
	Mode 3 : 802.11b CH11_2462 MHz	Mode 6 : 802.11g CH11_2462 MHz
Radiated TCs	Mode 1 : 802.11b CH01_2412 MHz	Mode 4 : 802.11g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

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<Conduction Mode>



2.4 RF Utility

Key in “* # * # 373 # * # *” on the EUT directly. Then, the EUT will have the functions like channel selection and power level for continuous transmitting and receiving signals. 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.

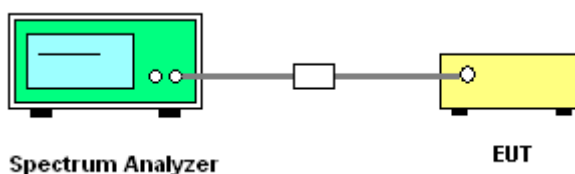
3.1.2 Measuring Instruments

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

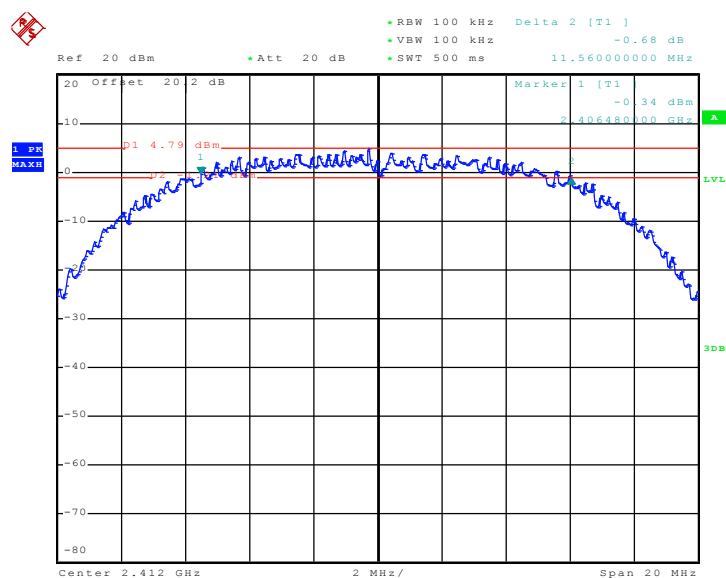


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	22.6°C
Test Engineer :	Ken Hsu	Relative Humidity :	32%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	11.56	0.5	Pass
06	2437	11.56	0.5	Pass
11	2462	11.56	0.5	Pass

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



Date: 25.JUN.2010 10:55:00



Ref 20 dBm Att 20 dB RBW 100 kHz VBW 100 kHz SWT 500 ms Delta 2 [T1] -0.78 dB 11.560000000 MHz

20 Offset 20.2 dB

Marker 1 [T1] -0.77 dBm 2.431480000 GHz

1 PR MAX

dBm

4.29

2.431480000 GHz

Center 2.437 GHz Span 20 MHz

Date: 25.JUN.2010 11:00:21

1.9% MAX

Ref 20 dBm Att 20 dB RBW 100 kHz VBW 100 kHz SWT 500 ms Delta 2 [T1] -0.53 dB 11.56000000 MHz

20 Offset 20 2 dB

Marker 1 [T1] -1.44 dBm 2.456480000 GHz

p1 3.69 dBm

p2 3.69 dBm

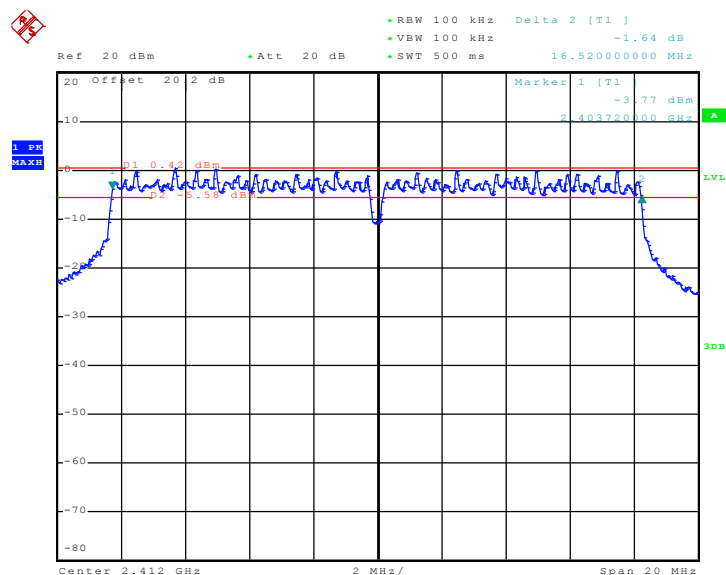
Center 2.462 GHz Span 20 MHz

Date: 25.JUN.2010 11:07:27

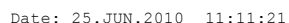


Test Mode :	Mode 4, 5, 6	Temperature :	22.6°C
Test Engineer :	Ken Hsu	Relative Humidity :	32%

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	16.48	0.5	Pass

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

Date: 25.JUN.2010 11:12:35



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.

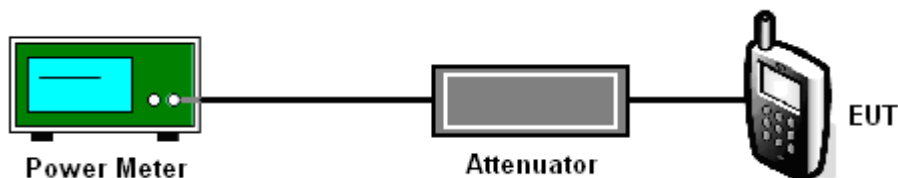
3.2.2 Measuring Instruments

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.
3. 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 :	22.6℃
Test Engineer :	Ken Hsu	Relative Humidity :	32%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	18.42	30	Pass
06	2437	18.65	30	Pass
11	2462	18.31	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	22.6℃
Test Engineer :	Ken Hsu	Relative Humidity :	32%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	22.48	30	Pass
06	2437	22.56	30	Pass
11	2462	22.64	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

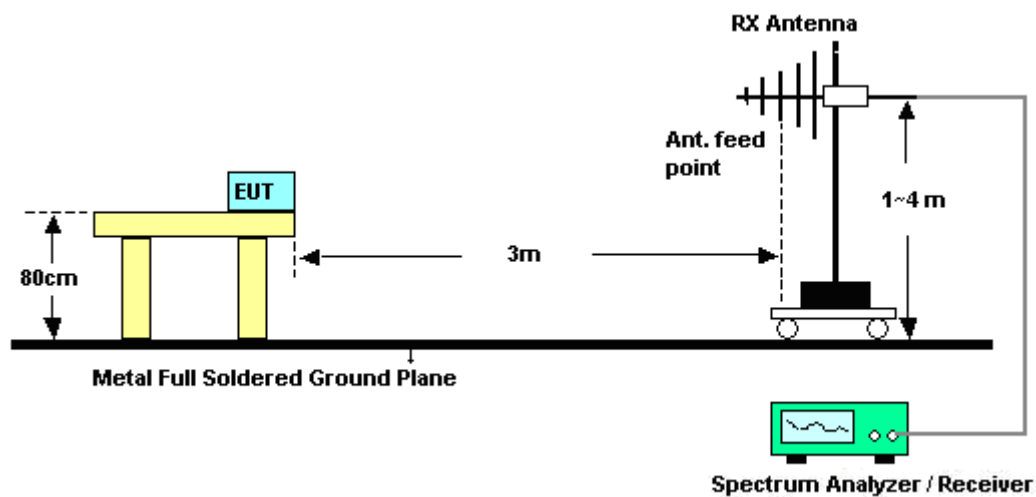
See list of measuring instruments of this test report.

3.3.3 Test Procedures

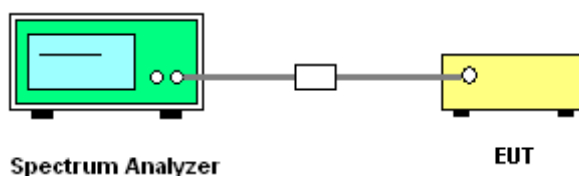
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) $\geq$ RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized 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 :	21~23℃
Test Band :	802.11b	Relative Humidity :	46~48%
Test Channel :	01	Test Engineer :	Elvis Chen

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2387.33	51.56	-22.44	74	50.17	31.86	3.92	34.39	100	44	Peak
2387.33	35.49	-18.51	54	34.1	31.86	3.92	34.39	100	44	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.99	48.16	-25.84	74	46.77	31.86	3.92	34.39	135	145	Peak
2389.99	35.58	-18.42	54	34.19	31.86	3.92	34.39	135	145	Average

Test Mode :	Mode 3	Temperature :	21~23℃
Test Band :	802.11b	Relative Humidity :	46~48%
Test Channel :	11	Test Engineer :	Elvis Chen

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
2485.94	47.5	-26.5	74	45.84	31.98	4.05	34.37	100	173	Peak
2485.94	34.4	-19.6	54	32.74	31.98	4.05	34.37	100	173	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.66	46.44	-27.56	74	44.78	31.98	4.05	34.37	100	144	Peak
2483.66	34.15	-19.85	54	32.49	31.98	4.05	34.37	100	144	Average



Test Mode :	Mode 4	Temperature :	21~23℃
Test Band :	802.11g	Relative Humidity :	46~48%
Test Channel :	01	Test Engineer :	Elvis Chen

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.42	63.74	-10.26	74	62.35	31.86	3.92	34.39	200	171	Peak
2389.42	41.91	-12.09	54	40.52	31.86	3.92	34.39	200	171	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.99	61.17	-12.83	74	59.78	31.86	3.92	34.39	100	323	Peak
2389.99	40.4	-13.6	54	39.01	31.86	3.92	34.39	100	323	Average

Test Mode :	Mode 6	Temperature :	21~23℃
Test Band :	802.11g	Relative Humidity :	46~48%
Test Channel :	11	Test Engineer :	Elvis Chen

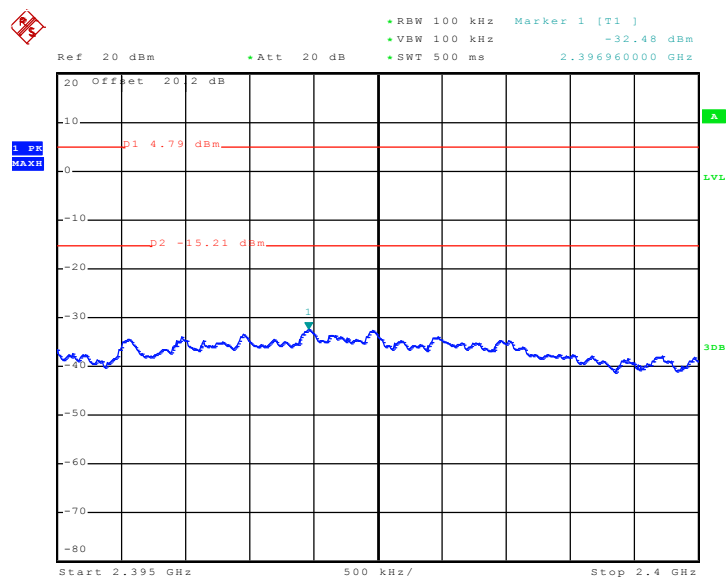
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.66	55.91	-18.09	74	54.25	31.98	4.05	34.37	100	190	Peak
2483.66	38.3	-15.7	54	36.64	31.98	4.05	34.37	100	190	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
2485.18	51	-23	74	49.34	31.98	4.05	34.37	200	171	Peak
2485.18	37.34	-16.66	54	35.68	31.98	4.05	34.37	200	171	Average

3.3.6 Test Plots of Conducted Band Edges

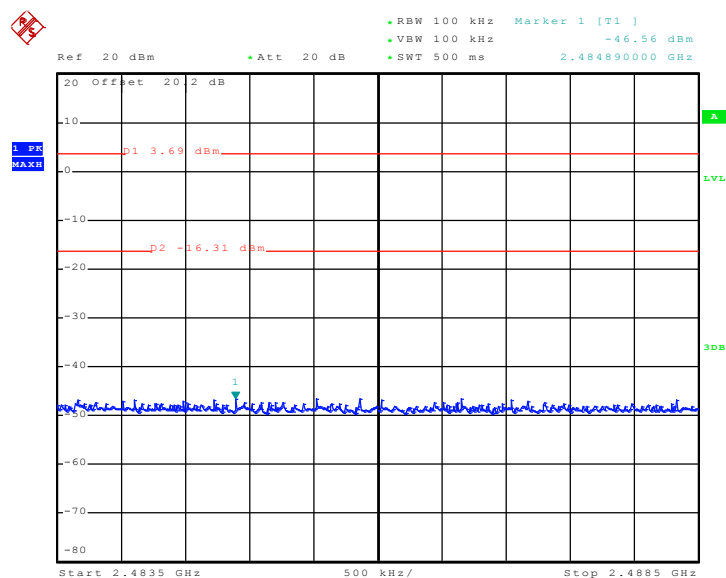
Test Mode :	Mode 1 and 3	Temperature :	22.6°C
Test Band :	802.11b	Relative Humidity :	32%
Test Channel :	01 and 11	Test Engineer :	Ken Hsu

Low Band Edge Plot on 802.11b Channel 01



Date: 25.JUN.2010 11:32:06

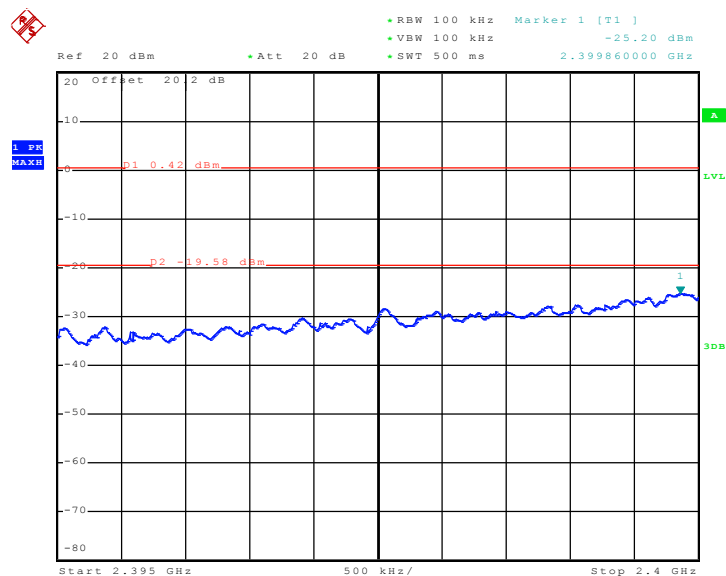
High Band Edge Plot on 802.11b Channel 11



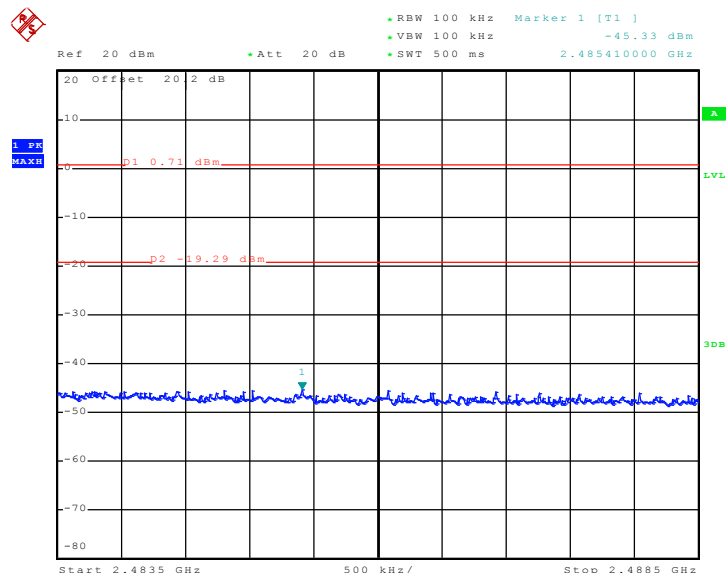
Date: 25.JUN.2010 11:29:21



Test Mode :	Mode 4 and 6	Temperature :	22.6°C
Test Band :	802.11g	Relative Humidity :	32%
Test Channel :	01 and 11	Test Engineer :	Ken Hsu

Low Band Edge Plot on 802.11g Channel 01

Date: 25.JUN.2010 11:38:52

High Band Edge Plot on 802.11g Channel 11

Date: 25.JUN.2010 11:45:17

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.

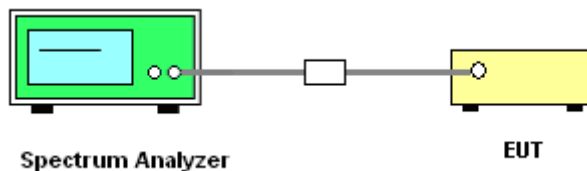
3.4.2 Measuring Instruments

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.

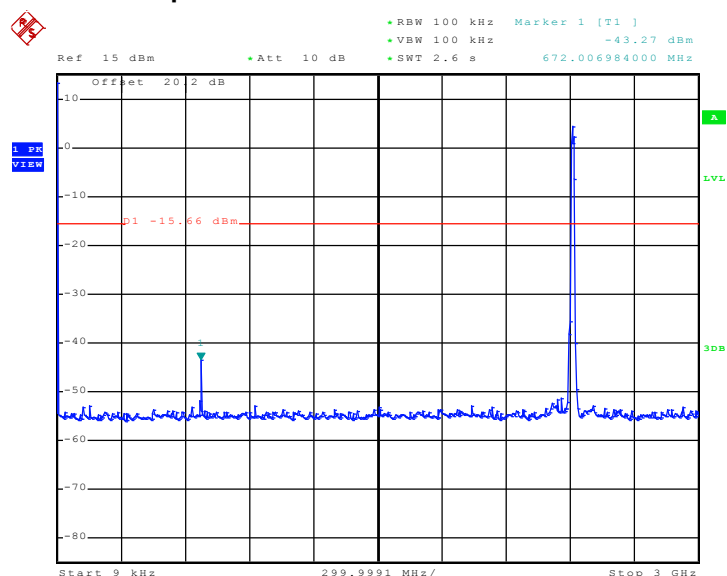
3.4.4 Test Setup



3.4.5 Test Plots of Spurious Emission

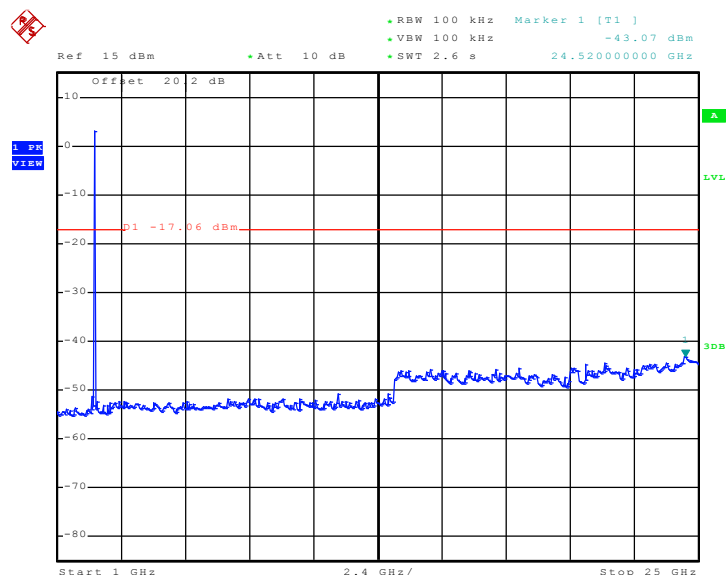
Test Mode :	Mode 1	Temperature :	22.6°C
Test Band :	802.11b	Relative Humidity :	32%
Test Channel :	01	Test Engineer :	Ken Hsu

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



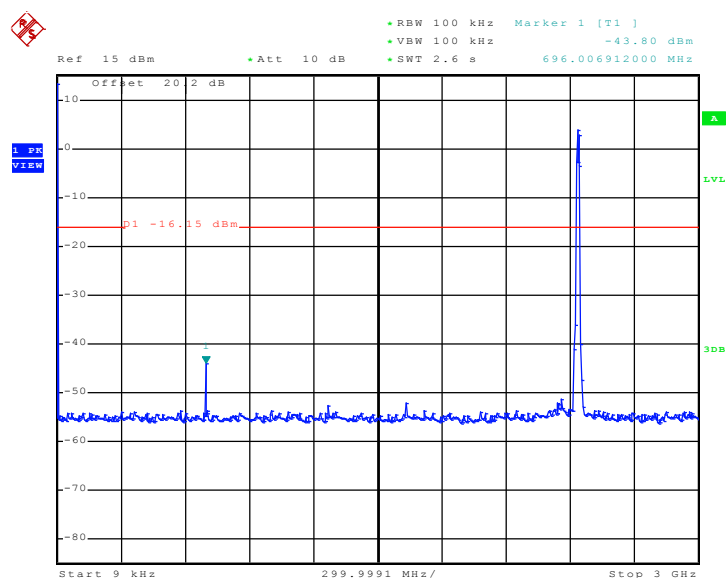
Date: 25.JUN.2010 11:56:25

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

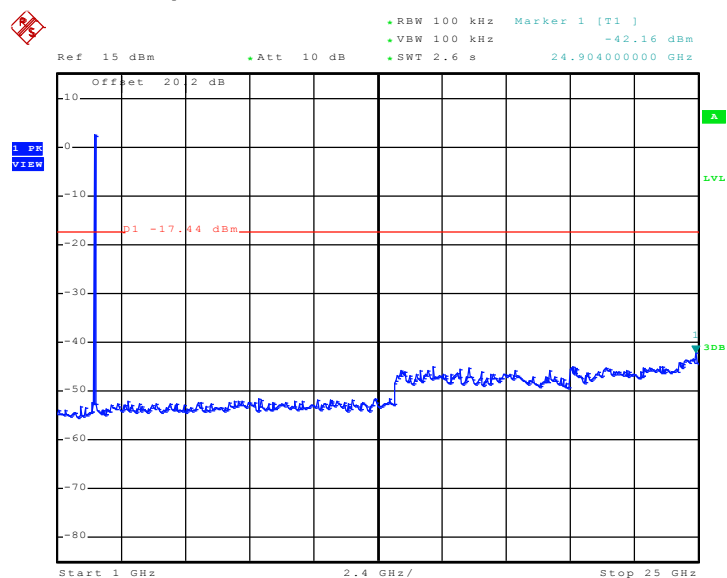


Date: 25.JUN.2010 11:56:54

Test Mode :	Mode 2	Temperature :	22.6°C
Test Band :	802.11b	Relative Humidity :	32%
Test Channel :	06	Test Engineer :	Ken Hsu

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


Date: 25.JUN.2010 11:57:45

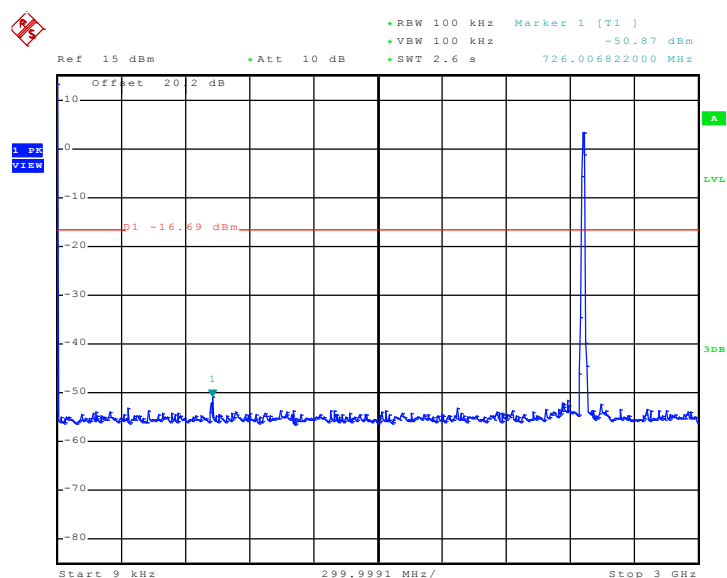
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


Date: 25.JUN.2010 11:58:08



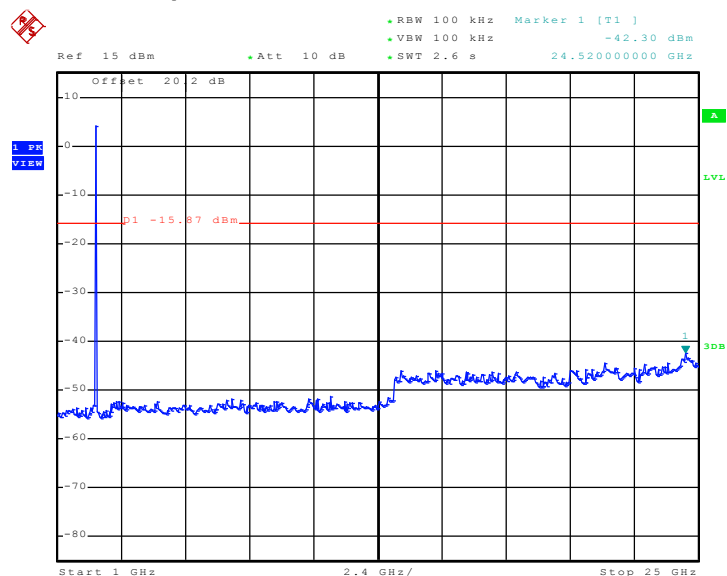
Test Mode :	Mode 3	Temperature :	22.6°C
Test Band :	802.11b	Relative Humidity :	32%
Test Channel :	11	Test Engineer :	Ken Hsu

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 25.JUN.2010 14:01:25

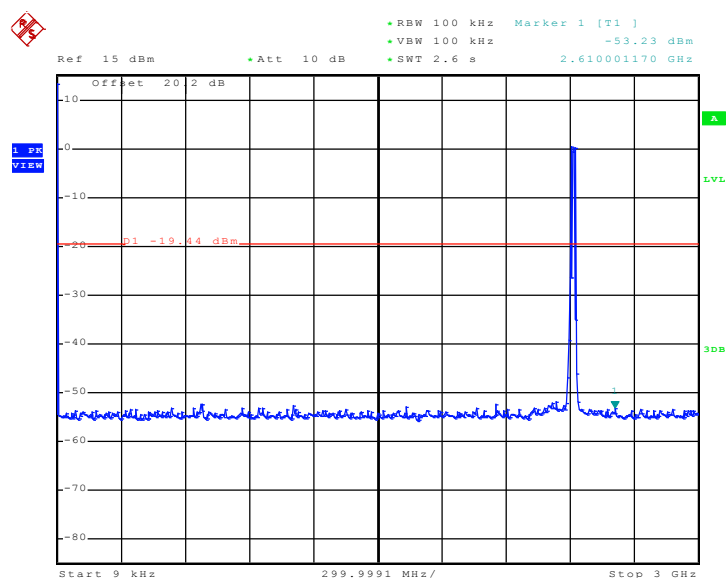
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz



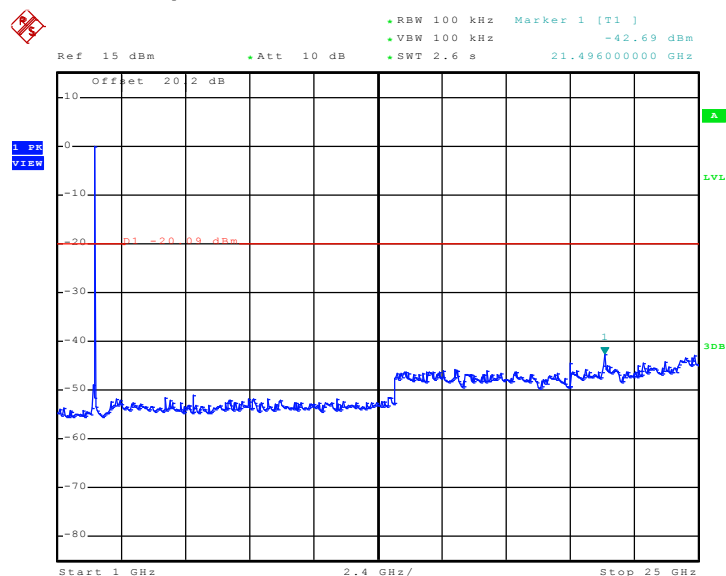
Date: 25.JUN.2010 14:00:52



Test Mode :	Mode 4	Temperature :	22.6°C
Test Band :	802.11g	Relative Humidity :	32%
Test Channel :	01	Test Engineer :	Ken Hsu

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz

Date: 25.JUN.2010 12:01:24

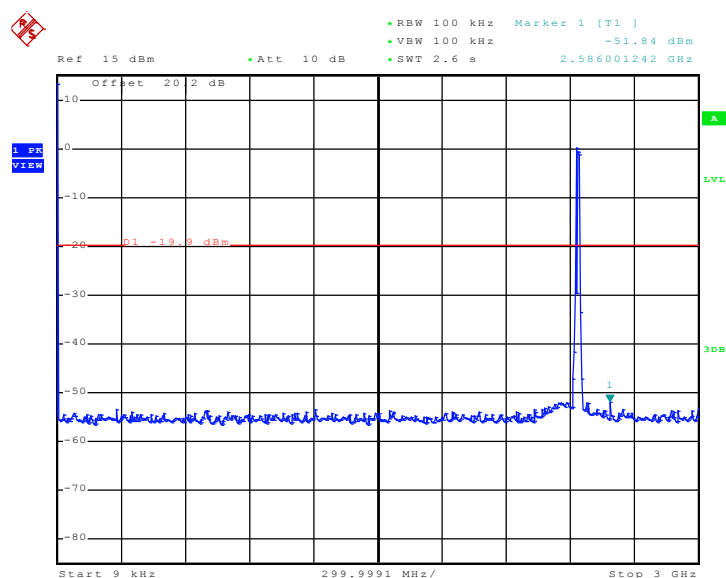
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

Date: 25.JUN.2010 12:01:52



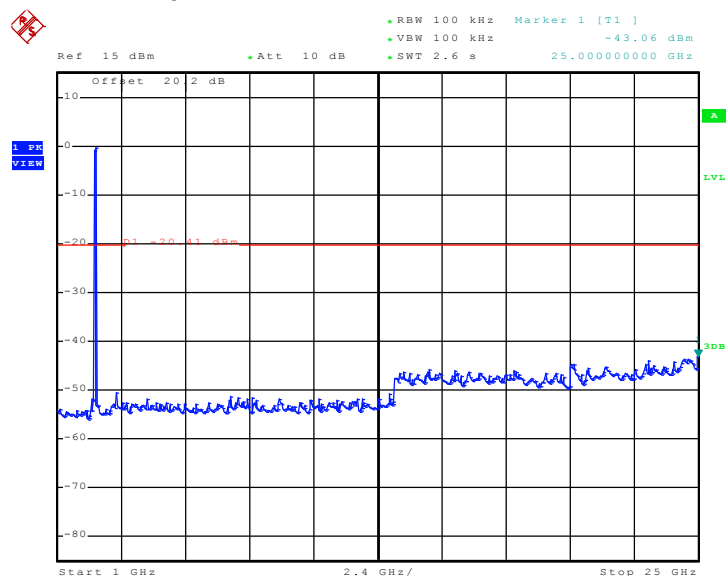
Test Mode :	Mode 5	Temperature :	22.6°C
Test Band :	802.11g	Relative Humidity :	32%
Test Channel :	06	Test Engineer :	Ken Hsu

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 25.JUN.2010 12:02:17

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

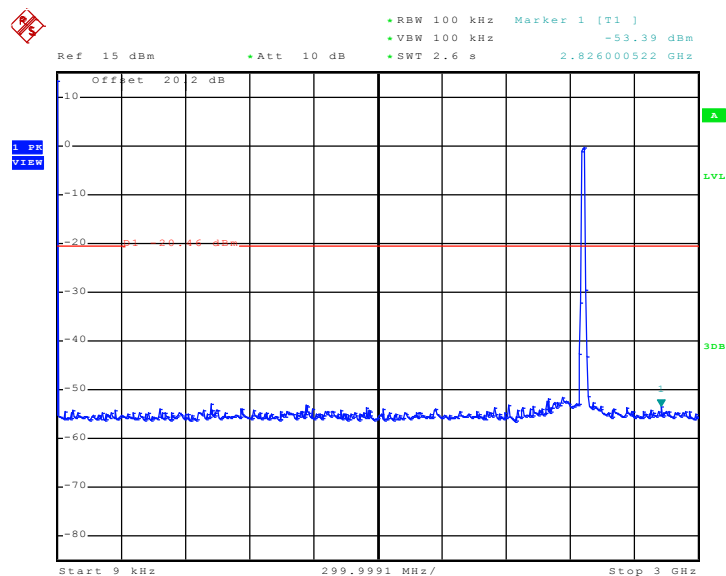


Date: 25.JUN.2010 12:02:34



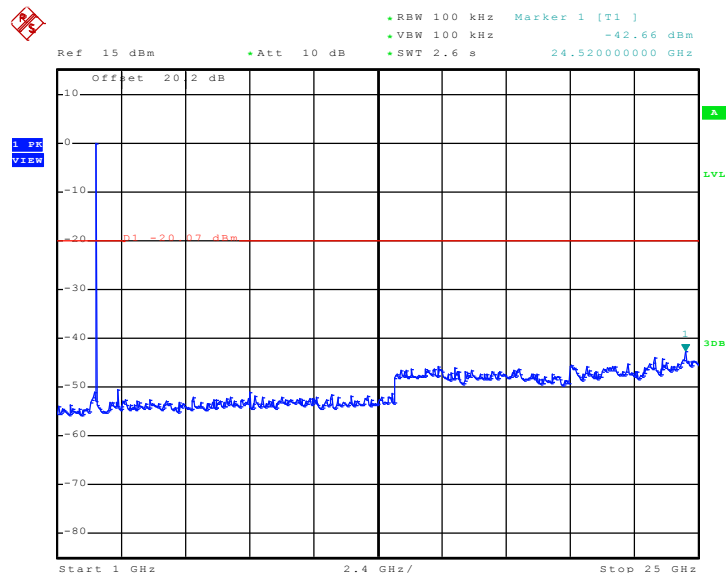
Test Mode :	Mode 6	Temperature :	22.6°C
Test Band :	802.11g	Relative Humidity :	32%
Test Channel :	11	Test Engineer :	Ken Hsu

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 25.JUN.2010 12:03:00

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz



Date: 25.JUN.2010 12:03:14

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.

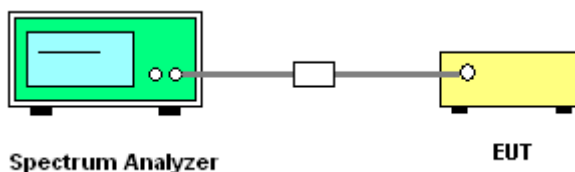
3.5.2 Measuring Instruments

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

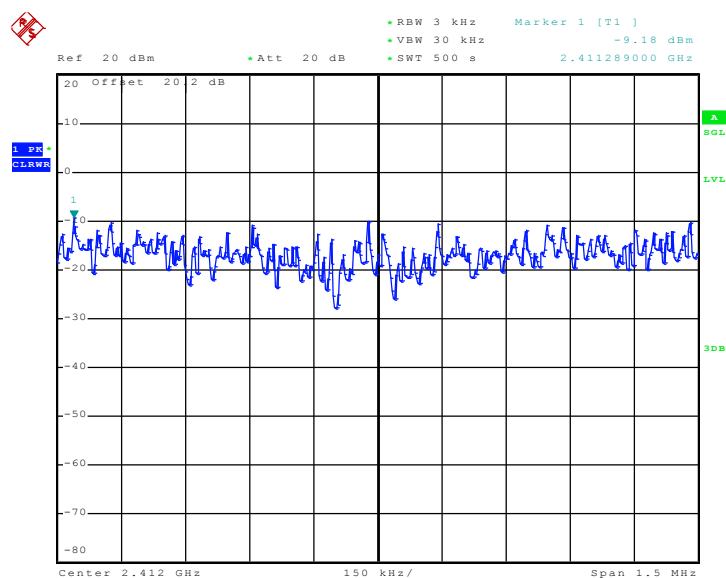


3.5.5 Test Result of Power Spectral Density

Test Mode :	Mode 1, 2, 3	Temperature :	22.6°C
Test Engineer :	Ken Hsu	Relative Humidity :	32%

Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-9.18	8	Pass
06	2437	-9.70	8	Pass
11	2462	-10.04	8	Pass

Mode 1 : PSD Plot on 802.11b Channel 01



Date: 25.JUN.2010 13:27:32



The screenshot shows a Spectrum Analyzer interface with the following details:

- Top Bar:**
 - Left: A red square icon with a white 'X' and a blue square icon with a white 'X'.
 - Center: A green dot and the text "Att 20 dB".
 - Right: A green dot and the text "SWT 500 s".
- Top Right:**
 - Green text: "RBW 3 kHz", "VBW 30 kHz", and "Marker 1 [T1]".
 - Blue text: "-9.70 dBm" and "2.436289000 GHz".
- Left Panel:**
 - A blue box with "1" and "dBm".
 - A blue box with "CLAWR".
- Main Display:**
 - A grid with a vertical center line at 2.437 GHz.
 - A blue trace showing a noisy signal centered around -20 dBm.
 - A green dot on the trace at approximately -10 dBm.
 - Labels on the right side of the grid: "A SGL", "LVL", and "3dB".
- Bottom Bar:**
 - Left: "Center 2.437 GHz".
 - Center: "150 kHz/".
 - Right: "Span 1.5 MHz".

Date: 25.JUN.2010 13:36:35

Ref 20 dBm Att 20 dB RBW 3 kHz VBW 30 kHz SWT 500 s Marker 1 [T1] -10.04 dBm 2.461289000 GHz

20 Offset 20 dB

1 Freq CLR BW

A SGL LVL 3DB

Center 2.462 GHz 150 kHz/ Span 1.5 MHz

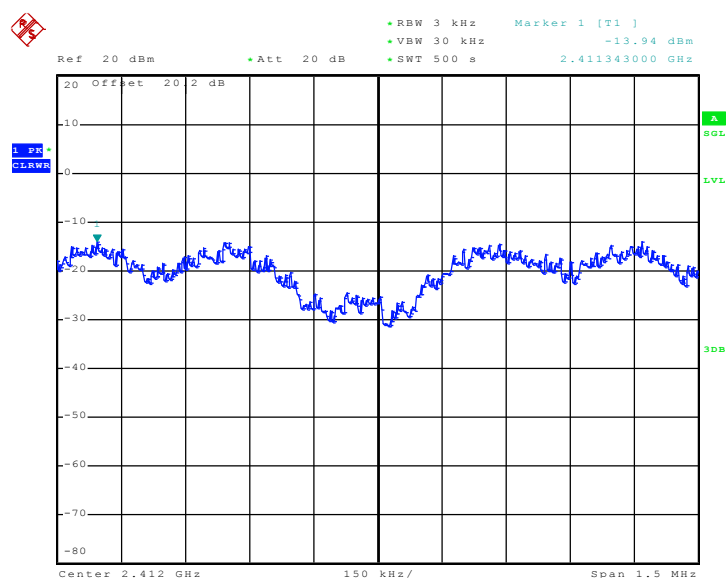
Date: 25.JUN.2010 13:50:02



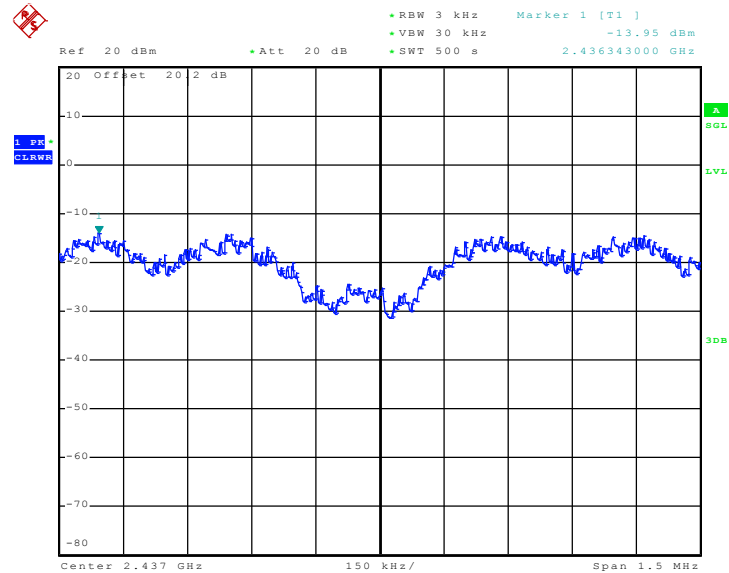
Test Mode :	Mode 4, 5, 6	Temperature :	22.6°C
Test Engineer :	Ken Hsu	Relative Humidity :	32%

Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-13.94	8	Pass
06	2437	-13.95	8	Pass
11	2462	-13.51	8	Pass

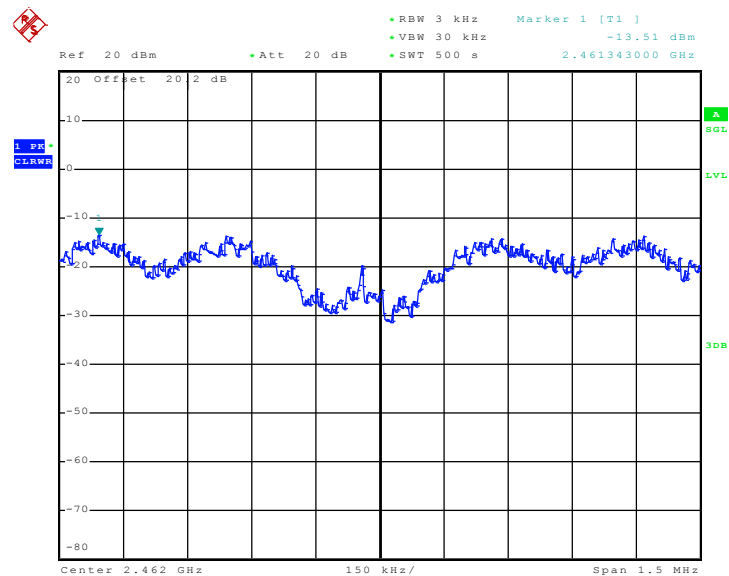
Mode 4 : PSD Plot on 802.11g Channel 01



Date: 25.JUN.2010 12:44:12

Mode 5 : PSD Plot on 802.11g Channel 06


Date: 25.JUN.2010 12:34:35

Mode 6 : PSD Plot on 802.11g Channel 11


Date: 25.JUN.2010 12:24:32

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.

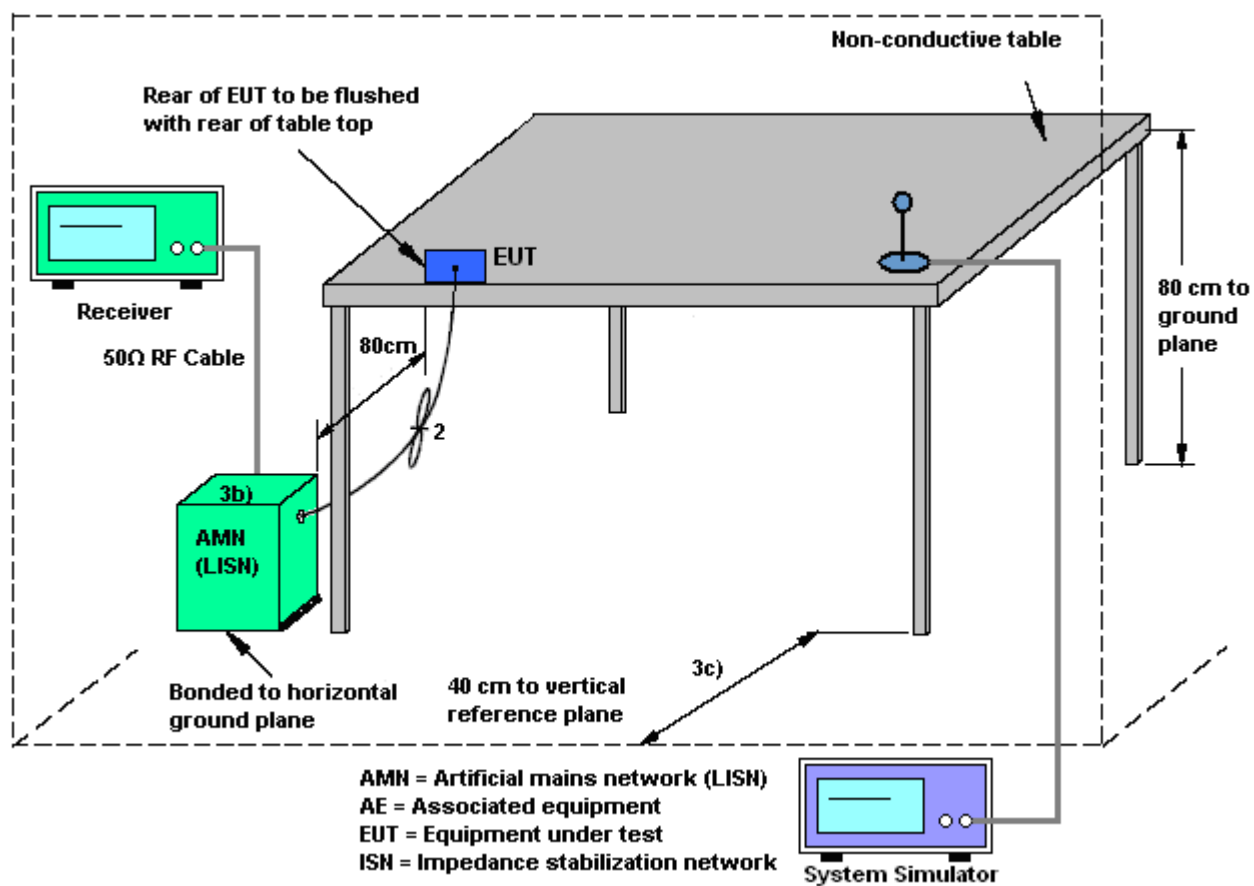
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

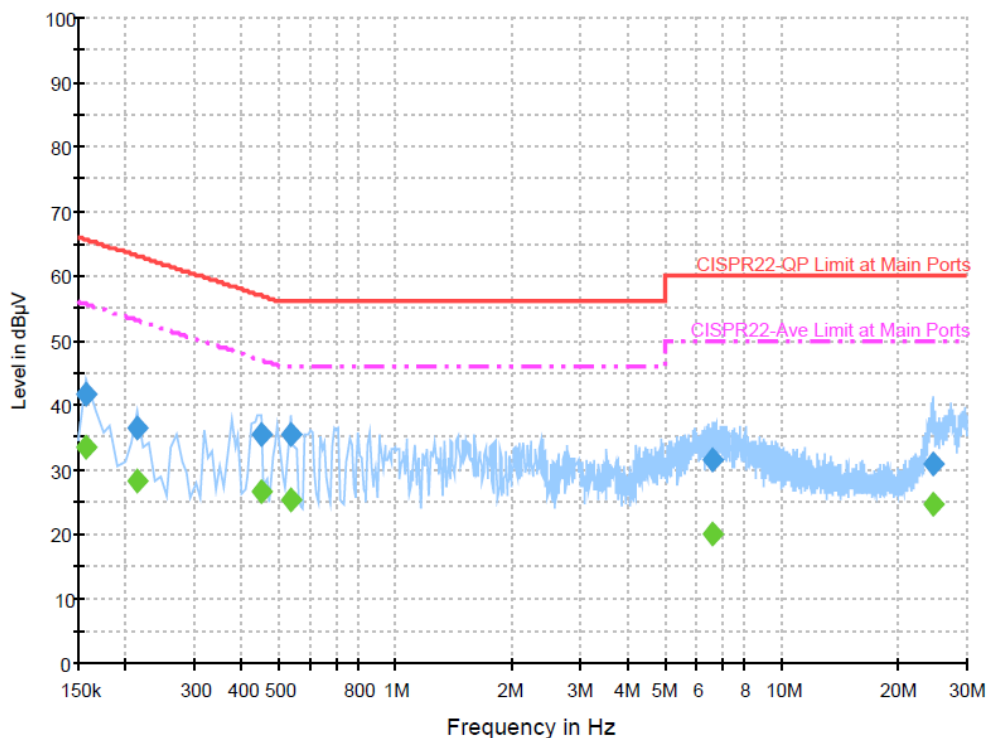
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (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 :	20~22°C
Test Engineer :	Novic Jiang	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + WLAN Link + Bluetooth Link + GPS Rx + Earphone + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



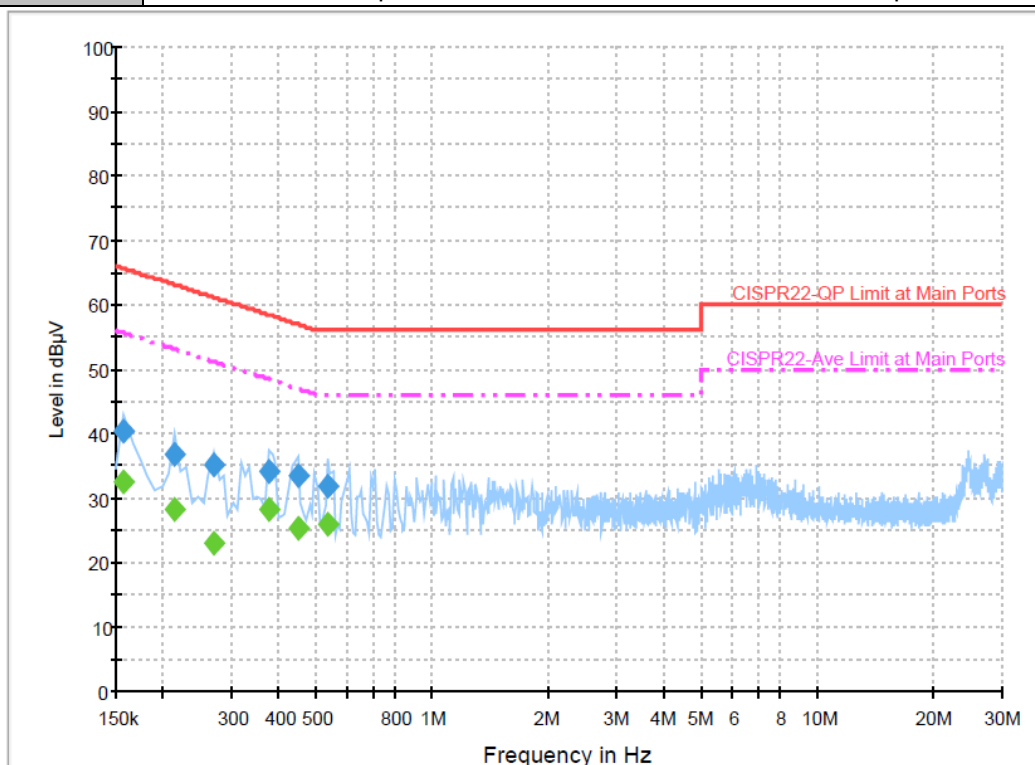
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	41.7	Off	L1	19.3	23.9	65.6
0.214000	36.3	Off	L1	19.3	26.7	63.0
0.446000	35.4	Off	L1	19.3	21.5	56.9
0.534000	35.4	Off	L1	19.3	20.6	56.0
6.566000	31.5	Off	L1	19.5	28.5	60.0
24.430000	30.8	Off	L1	19.8	29.2	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	33.4	Off	L1	19.3	22.2	55.6
0.214000	28.3	Off	L1	19.3	24.7	53.0
0.446000	26.5	Off	L1	19.3	20.4	46.9
0.534000	25.1	Off	L1	19.3	20.9	46.0
6.566000	20.0	Off	L1	19.5	30.0	50.0
24.430000	24.5	Off	L1	19.8	25.5	50.0

Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Novic Jiang	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + WLAN Link + Bluetooth Link + GPS Rx + Earphone + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	40.4	Off	N	19.4	25.2	65.6
0.214000	36.9	Off	N	19.4	26.1	63.0
0.270000	35.0	Off	N	19.3	26.1	61.1
0.374000	34.1	Off	N	19.4	24.3	58.4
0.446000	33.5	Off	N	19.3	23.4	56.9
0.534000	31.9	Off	N	19.3	24.1	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	32.5	Off	N	19.4	23.1	55.6
0.214000	28.2	Off	N	19.4	24.8	53.0
0.270000	23.0	Off	N	19.3	28.1	51.1
0.374000	28.1	Off	N	19.4	20.3	48.4
0.446000	25.4	Off	N	19.3	21.5	46.9
0.534000	26.0	Off	N	19.3	20.0	46.0

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

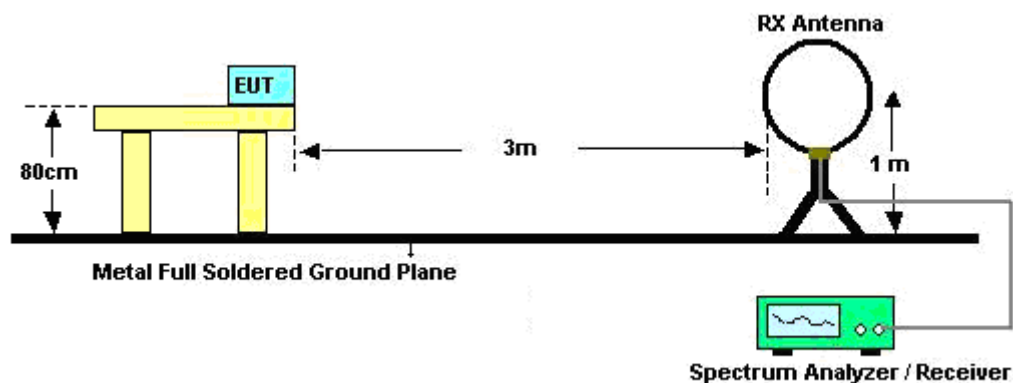
See list of measuring instruments of this test report.

3.7.3 Test Procedures

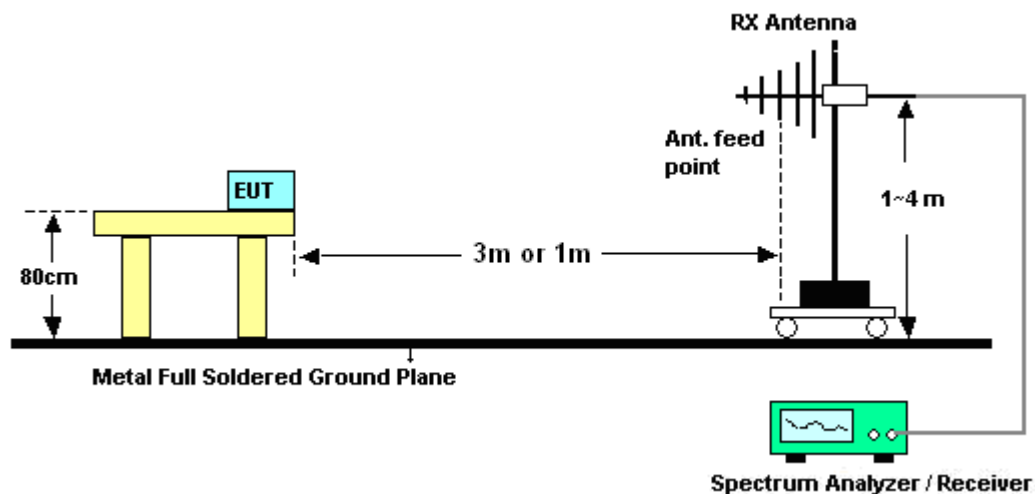
- The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
- Use the following spectrum analyzer settings:
 - Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = 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 :	Elvis Chen	Temperature :	21~23℃	
		Relative Humidity :	46~48%	

Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

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

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

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

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

Test Mode :	Mode 1	Temperature :	21~23℃
Test Channel :	01	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	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
30	28.09	-11.91	40	40.43	18.51	0.83	31.68	-	-	Peak
39.99	28.24	-11.76	40	46.08	12.81	0.97	31.62	100	21	Peak
71.58	18.49	-21.51	40	42.01	6.73	1.33	31.58	-	-	Peak
532.4	21.98	-24.02	46	31.58	17.88	4.07	31.55	-	-	Peak
586.3	24.21	-21.79	46	32.97	18.55	4.36	31.67	-	-	Peak
771.8	25.81	-20.19	46	32.51	19.84	5.02	31.56	-	-	Peak
2387.33	35.49	-18.51	54	34.1	31.86	3.92	34.39	100	44	Average
2387.33	51.56	-22.44	74	50.17	31.86	3.92	34.39	100	44	Peak
2412	98.6	-	-	97.16	31.88	3.95	34.39	100	44	Average
2412	106.54	-	-	105.1	31.88	3.95	34.39	100	44	Peak
2500	32.76	-21.24	54	31.08	32	4.05	34.37	100	44	Average
2500	44.68	-29.32	74	43	32	4.05	34.37	100	44	Peak
7974	52.95	-21.05	74	43.59	35.79	7.51	33.94	100	10	Peak
7974	42.49	-11.51	54	33.13	35.79	7.51	33.94	100	10	Average

Test Mode :	Mode 1	Temperature :	21~23℃
Test Channel :	01	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	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
31.08	29.84	-10.16	40	42.67	17.98	0.85	31.66	100	163	Peak
54.03	20.44	-19.56	40	41.52	9.34	1.14	31.56	-	-	Peak
64.29	23.78	-16.22	40	47.59	6.49	1.28	31.58	-	-	Peak
399.4	21.99	-24.01	46	34.26	15.66	3.53	31.46	-	-	Peak
665.4	23.82	-22.18	46	31.79	19.06	4.61	31.64	-	-	Peak
869.8	26.65	-19.35	46	31.84	20.53	5.37	31.09	-	-	Peak
2389.99	48.16	-25.84	74	46.77	31.86	3.92	34.39	135	145	Peak
2389.99	35.58	-18.42	54	34.19	31.86	3.92	34.39	135	145	Average
2412	97.91	-	-	96.47	31.88	3.95	34.39	135	145	Average
2412	105.85	-	-	104.41	31.88	3.95	34.39	135	145	Peak
2492	32.76	-21.24	54	31.08	32	4.05	34.37	135	145	Average
2492	45.43	-28.57	74	43.75	32	4.05	34.37	135	145	Peak
7974	53	-21	74	43.64	35.79	7.51	33.94	100	346	Peak
7974	42.38	-11.62	54	33.02	35.79	7.51	33.94	100	346	Average

Test Mode :	Mode 2	Temperature :	21~23℃
Test Channel :	06	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	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
30	28.62	-11.38	40	40.96	18.51	0.83	31.68	100	193	Peak
38.64	21.85	-18.15	40	39.09	13.42	0.96	31.62	-	-	Peak
44.58	21.73	-18.27	40	42.14	10.17	1.07	31.65	-	-	Peak
722.8	25.08	-20.92	46	32.5	19.43	4.8	31.65	-	-	Peak
785.8	25.71	-20.29	46	32.23	19.95	5.06	31.53	-	-	Peak
959.4	27.91	-18.09	46	31.89	20.97	5.59	30.54	-	-	Peak
2342	48.61	-25.39	74	47.38	31.78	3.86	34.41	100	172	Peak
2342	37.42	-16.58	54	36.19	31.78	3.86	34.41	100	172	Average
2437	105.7	-	-	104.16	31.93	3.99	34.38	100	172	Peak
2437	97.76	-	-	96.22	31.93	3.99	34.38	100	172	Average
2500	46.56	-27.44	74	44.88	32	4.05	34.37	100	137	Peak
2500	33.85	-20.15	54	32.17	32	4.05	34.37	100	172	Average
8553	52.99	-21.01	74	44.1	35.74	7.27	34.12	100	282	Peak
8553	41.87	-12.13	54	32.98	35.74	7.27	34.12	100	282	Average

Test Mode :	Mode 2	Temperature :	21~23℃
Test Channel :	06	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	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
30.54	29.98	-10.02	40	42.81	17.98	0.85	31.66	100	44	Peak
56.19	24.77	-15.23	40	46.81	8.36	1.16	31.56	-	-	Peak
62.13	23.8	-16.2	40	47.67	6.45	1.27	31.59	-	-	Peak
383.3	23.97	-22.03	46	36.74	15.24	3.45	31.46	-	-	Peak
710.9	24.62	-21.38	46	32.22	19.33	4.74	31.67	-	-	Peak
929.3	27.28	-18.72	46	31.65	20.85	5.52	30.74	-	-	Peak
2358	48.44	-25.56	74	47.14	31.81	3.89	34.4	103	144	Peak
2358	36.67	-17.33	54	35.37	31.81	3.89	34.4	103	144	Average
2437	103.96	-	-	102.42	31.93	3.99	34.38	103	144	Peak
2437	95.97	-	-	94.43	31.93	3.99	34.38	103	144	Average
2486	45.43	-28.57	74	43.77	31.98	4.05	34.37	103	144	Peak
2486	32.1	-21.9	54	30.44	31.98	4.05	34.37	103	144	Average
8517	52.79	-21.21	74	43.95	35.71	7.21	34.08	100	172	Peak
8517	41.56	-12.44	54	32.72	35.71	7.21	34.08	100	172	Average

Test Mode :	Mode 3	Temperature :	21~23℃
Test Channel :	11	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	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
30	29.02	-10.98	40	41.36	18.51	0.83	31.68	100	10	Peak
35.13	22.5	-17.5	40	37.31	15.88	0.91	31.6	-	-	Peak
43.23	19.22	-20.78	40	39.11	10.7	1.05	31.64	-	-	Peak
523.3	22.83	-23.17	46	32.54	17.77	4.05	31.53	-	-	Peak
719.3	26.18	-19.82	46	33.65	19.4	4.79	31.66	-	-	Peak
922.3	28.05	-17.95	46	32.51	20.82	5.51	30.79	-	-	Peak
2366	49.97	-24.03	74	48.67	31.81	3.89	34.4	100	173	Peak
2366	35.04	-18.96	54	33.74	31.81	3.89	34.4	100	173	Average
2462	106.44	-	-	104.85	31.95	4.02	34.38	100	173	Peak
2462	97.36	-	-	95.77	31.95	4.02	34.38	100	173	Average
2485.94	47.5	-26.5	74	45.84	31.98	4.05	34.37	100	173	Peak
2485.94	34.4	-19.6	54	32.74	31.98	4.05	34.37	100	173	Average
8685	52.98	-21.02	74	43.94	35.85	7.42	34.23	100	16	Peak
8685	42.19	-11.81	54	33.15	35.85	7.42	34.23	100	16	Average

Test Mode :	Mode 3	Temperature :	21~23℃
Test Channel :	11	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	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
30.54	27.85	-12.15	40	40.68	17.98	0.85	31.66	100	246	Peak
36.21	24.34	-15.66	40	39.75	15.27	0.92	31.6	-	-	Peak
64.83	23.68	-16.32	40	47.46	6.51	1.28	31.57	-	-	Peak
528.9	22.1	-23.9	46	31.75	17.83	4.06	31.54	-	-	Peak
698.3	24.06	-21.94	46	31.82	19.23	4.69	31.68	-	-	Peak
868.4	27.11	-18.89	46	32.33	20.52	5.36	31.1	-	-	Peak
2366	47.4	-26.6	74	46.1	31.81	3.89	34.4	100	144	Peak
2366	36.64	-17.36	54	35.34	31.81	3.89	34.4	100	144	Average
2462	104.06	-	-	102.47	31.95	4.02	34.38	100	144	Peak
2462	94.42	-	-	92.83	31.95	4.02	34.38	100	144	Average
2483.66	46.44	-27.56	74	44.78	31.98	4.05	34.37	100	144	Peak
2483.66	34.15	-19.85	54	32.49	31.98	4.05	34.37	100	144	Average
7842	52.92	-21.08	74	43.72	35.73	7.44	33.97	100	322	Peak
7842	41.14	-12.86	54	31.94	35.73	7.44	33.97	100	322	Average

Test Mode :	Mode 4	Temperature :	21~23℃
Test Channel :	01	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	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
30	29.38	-10.62	40	41.72	18.51	0.83	31.68	100	46	Peak
40.53	22.93	-17.07	40	41.29	12.28	0.99	31.63	-	-	Peak
71.58	17.93	-22.07	40	41.45	6.73	1.33	31.58	-	-	Peak
565.3	22.68	-23.32	46	31.78	18.29	4.23	31.62	-	-	Peak
770.4	25.26	-20.74	46	32	19.82	5.01	31.57	-	-	Peak
915.3	26.66	-19.34	46	31.22	20.79	5.49	30.84	-	-	Peak
2389.42	41.91	-12.09	54	40.52	31.86	3.92	34.39	200	171	Average
2389.42	63.74	-10.26	74	62.35	31.86	3.92	34.39	200	171	Peak
2412	90.91	-	-	89.47	31.88	3.95	34.39	200	171	Average
2412	104.78	-	-	103.34	31.88	3.95	34.39	200	171	Peak
2494	34.42	-19.58	54	32.74	32	4.05	34.37	200	171	Average
2494	46.64	-27.36	74	44.96	32	4.05	34.37	200	171	Peak
7953	53.28	-20.72	74	43.95	35.78	7.5	33.95	100	75	Peak
7953	42	-12	54	32.67	35.78	7.5	33.95	100	75	Average

Test Mode :	Mode 4	Temperature :	21~23℃
Test Channel :	01	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	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
30.54	30.91	-9.09	40	43.74	17.98	0.85	31.66	100	94	Peak
64.29	24.39	-15.61	40	48.2	6.49	1.28	31.58	-	-	Peak
129.63	16.88	-26.62	43.5	34.96	11.64	1.83	31.55	-	-	Peak
448.4	19.68	-26.32	46	30.88	16.53	3.74	31.47	-	-	Peak
773.9	25.15	-20.85	46	31.84	19.85	5.02	31.56	-	-	Peak
908.3	27.5	-18.5	46	32.16	20.76	5.48	30.9	-	-	Peak
2389.99	61.17	-12.83	74	59.78	31.86	3.92	34.39	100	323	Peak
2389.99	40.4	-13.6	54	39.01	31.86	3.92	34.39	100	323	Average
2412	88.69	-	-	87.25	31.88	3.95	34.39	100	323	Average
2414	100.89	-	-	99.45	31.88	3.95	34.39	100	323	Peak
2494	32.58	-21.42	54	30.9	32	4.05	34.37	100	323	Average
2494	44.85	-29.15	74	43.17	32	4.05	34.37	100	323	Peak
8697	52.99	-21.01	74	43.93	35.86	7.45	34.25	100	239	Peak
8697	41.89	-12.11	54	32.83	35.86	7.45	34.25	100	239	Average



Test Mode :	Mode 5	Temperature :	21~23℃
Test Channel :	06	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	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
30	30.2	-9.8	40	42.54	18.51	0.83	31.68	100	137	30
39.18	24.89	-15.11	40	42.13	13.42	0.96	31.62	-	-	39.18
71.04	17.82	-22.18	40	41.4	6.66	1.33	31.57	-	-	71.04
728.4	25.14	-20.86	46	32.49	19.47	4.83	31.65	-	-	728.4
848.8	26.57	-19.43	46	32.07	20.39	5.31	31.2	-	-	848.8
917.4	27.77	-18.23	46	32.3	20.8	5.5	30.83	-	-	917.4
2334	49.46	-24.54	74	48.25	31.76	3.86	34.41	100	172	2334
2334	36.34	-17.66	54	35.13	31.76	3.86	34.41	100	172	2334
2437	104.31	-	-	102.77	31.93	3.99	34.38	100	172	2437
2437	90.97	-	-	89.43	31.93	3.99	34.38	100	172	2437
2494	47.14	-26.86	74	45.46	32	4.05	34.37	100	172	2494
2494	35.17	-18.83	54	33.49	32	4.05	34.37	100	172	2494
7929	53.79	-20.21	74	44.49	35.77	7.48	33.95	100	348	7929
7929	42.65	-11.35	54	33.35	35.77	7.48	33.95	100	348	7929

Test Mode :	Mode 5	Temperature :	21~23℃
Test Channel :	06	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	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
30.54	30.72	-9.28	40	43.55	17.98	0.85	31.66	100	237	Peak
64.29	23.73	-16.27	40	47.54	6.49	1.28	31.58	-	-	Peak
141.24	17.95	-25.55	43.5	36.56	10.95	1.94	31.5	-	-	Peak
801.9	25.74	-20.26	46	32.02	20.08	5.12	31.48	-	-	Peak
862.8	26.83	-19.17	46	32.12	20.49	5.35	31.13	-	-	Peak
943.3	28.02	-17.98	46	32.2	20.91	5.55	30.64	-	-	Peak
2350	48.81	-25.19	74	47.58	31.78	3.86	34.41	130	138	Peak
2350	35.56	-18.44	54	34.33	31.78	3.86	34.41	130	138	Average
2437	100.58	-	-	99.04	31.93	3.99	34.38	130	138	Peak
2437	88.42	-	-	86.88	31.93	3.99	34.38	130	138	Average
2484	45.97	-28.03	74	44.31	31.98	4.05	34.37	130	138	Peak
2484	33.88	-20.12	54	32.22	31.98	4.05	34.37	130	138	Average
8862	52.99	-21.01	74	43.76	35.98	7.65	34.4	100	235	Peak
8862	41.75	-12.25	54	32.52	35.98	7.65	34.4	100	235	Average

Test Mode :	Mode 6	Temperature :	21~23℃
Test Channel :	11	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	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
30	17.67	-22.33	40	30.01	18.51	0.83	31.68	-	-	Peak
65.64	16.89	-23.11	40	40.65	6.52	1.29	31.57	-	-	Peak
299.73	27.42	-18.58	46	42.77	13.11	3.01	31.47	100	69	Peak
300	24.71	-21.29	46	40.06	13.11	3.01	31.47	-	-	Peak
399.4	25.93	-20.07	46	38.2	15.66	3.53	31.46	-	-	Peak
902	27.09	-18.91	46	31.83	20.74	5.46	30.94	-	-	Peak
2388	49.52	-24.48	74	48.13	31.86	3.92	34.39	100	190	Peak
2388	39.01	-14.99	54	37.62	31.86	3.92	34.39	100	190	Average
2462	104.41	-	-	102.82	31.95	4.02	34.38	100	190	Peak
2462	90.94	-	-	89.35	31.95	4.02	34.38	100	190	Average
2483.66	38.3	-15.7	54	36.64	31.98	4.05	34.37	100	190	Average
2483.66	55.91	-18.09	74	54.25	31.98	4.05	34.37	100	190	Peak
8670	53.75	-20.25	74	44.73	35.83	7.42	34.23	100	61	Peak
8670	41.64	-12.36	54	32.62	35.83	7.42	34.23	100	61	Average



Test Mode :	Mode 6	Temperature :	21~23℃
Test Channel :	11	Relative Humidity :	46~48%
Test Engineer :	Elvis Chen	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
33.78	28.95	-11.05	40	43.27	16.41	0.89	31.62	100	28	Peak
49.44	23.23	-16.77	40	42.65	11.09	1.11	31.62	-	-	Peak
67.53	21.56	-18.44	40	45.25	6.56	1.31	31.56	-	-	Peak
399.4	22.21	-23.79	46	34.48	15.66	3.53	31.46	-	-	Peak
749.4	25.42	-20.58	46	32.45	19.65	4.94	31.62	-	-	Peak
938.4	26.72	-19.28	46	30.97	20.89	5.54	30.68	-	-	Peak
2372	48.76	-25.24	74	47.44	31.83	3.89	34.4	200	171	Peak
2372	37.98	-16.02	54	36.66	31.83	3.89	34.4	200	171	Average
2462	99.6	-	-	98.01	31.95	4.02	34.38	200	171	Peak
2462	86.76	-	-	85.17	31.95	4.02	34.38	200	171	Average
2485.18	37.34	-16.66	54	35.68	31.98	4.05	34.37	200	171	Average
2485.18	51	-23	74	49.34	31.98	4.05	34.37	200	171	Peak
8661	53.3	-20.7	74	44.29	35.83	7.39	34.21	100	77	Peak
8661	41.78	-12.22	54	32.77	35.83	7.39	34.21	100	77	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 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	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 23, 2009	Jun. 22, 2010	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 17, 2009	Sep. 16, 2010	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 10, 2009	Sep. 09, 2010	Conducted (TH02-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9KHz-26.5GHz	Oct. 23, 2009	Oct. 22, 2010	Radiation (03CH06-HY)
Spectrum Analyzer	R&S	FSP40	100057	9KHz-40GHz	Oct. 20, 2009	Oct. 19, 2010	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20MHz-1000MHz	Apr. 28, 2010	Apr. 27, 2011	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Oct. 31, 2009	Oct. 30, 2010	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz~18GHz	Aug. 20, 2009	Aug. 19, 2010	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Training Research	AH-0801	95119	8GHz~18GHz	Nov. 02, 2009	Nov. 01, 2010	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 14, 2009	Oct. 13, 2010	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz- 26.5GHz	Nov. 11, 2009	Nov. 10, 2010	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz~1GHz	Apr. 15, 2010	Apr. 14, 2011	Radiation (03CH06-HY)
System Simulator	R&S	CMU200	117591	N/A	Oct. 15, 2008	Oct. 14, 2010	-

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				



Appendix A. Photographs of EUT

Please refer to Sporton report number EP981906-16 as below.