



FCC RF Test Report

APPLICANT : Foyer LLC
EQUIPMENT : Electronic Display Device
MODEL NAME : D00901
FCC ID : X7N-0610
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Transmission System (DTS)

The product was received on Dec. 16, 2009 and completely tested on Feb. 02, 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 Feature of Equipment Under Test	5
1.3 Testing Site.....	6
1.4 Applied Standards	6
1.5 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.....	8
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



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 8.0 dB at 0.158 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 1.17 dB at 2389.97 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

Foyer LLC
6th floor, 80 State Street Albany, NY 12207-2543

1.2 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Electronic Display Device
Model Name	D00901
FCC ID	X7N-0610
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 : 18.27 dBm (67.14 mW) 802.11g : 21.89 dBm (154.53 mW)
Antenna Type	Fixed Internal Antenna with gain -2.50 dBi
HW Version	DVT
SW Version	Pre-production
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Production Unit

Remark:

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

List of Accessory:

Specification of Accessory		
AC Adapter 1	Brand Name	Foxlink
	Power Rating	I/P:100-240Vac, 50-60Hz, 150mA; O/P: 5.0Vdc, 850mA
AC Adapter 2	Brand Name	Flextronics
	Power Rating	I/P:100-240Vac, 50-60Hz, 150mA; O/P: 5.0Vdc, 850mA
USB Cable	Signal Line Type	1.6 meter non-shielded cable without ferrite core

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.3 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

1.4 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.

1.5 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.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	iPod Earphone	Apple	N/A	FCC DoC	Unshielded, 1.2 m	N/A

2 Test Configuration of Equipment Under Test

2.1 RF Power

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

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	18.27	18.05	17.96	17.87
CH 06	2437 MHz	18.10	18.06	17.56	17.95
CH 11	2462 MHz	18.21	18.16	17.84	18.18

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	21.52	21.22	21.39	21.37	21.30	21.30	21.27	21.46
CH 06	2437 MHz	21.89	21.85	21.80	21.76	21.76	21.81	21.74	21.82
CH 11	2462 MHz	20.91	20.78	20.81	21.15	21.06	20.88	20.87	20.93

Remark:

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

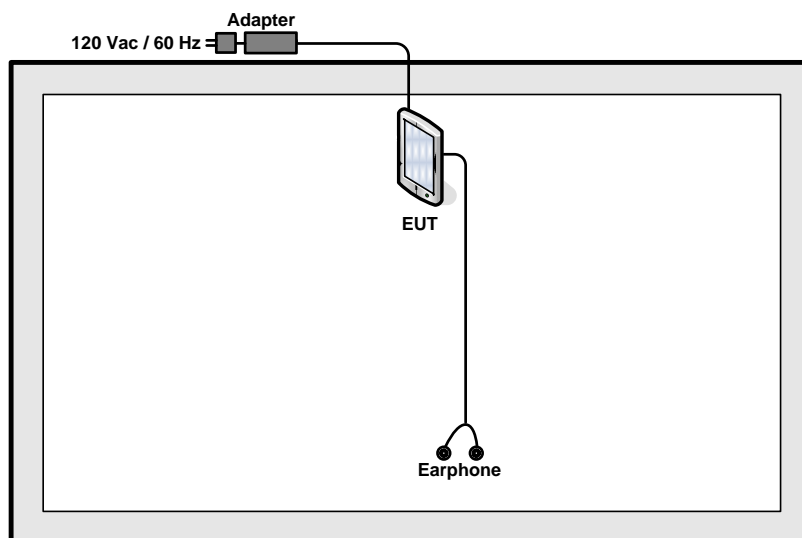
2.2 Test Mode

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 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4 : 802.11g CH01_2412 MHz Mode 5 : 802.11g CH06_2437 MHz Mode 6 : 802.11g CH11_2462 MHz
Radiated TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4 : 802.11g CH01_2412 MHz Mode 5 : 802.11g CH06_2437 MHz Mode 6 : 802.11g CH11_2462 MHz
AC Conducted Emission	Mode 1 : WLAN Link + Earphone + USB Cable (Charging from Adapter 1) Mode 2 : GSM850 Idle + Earphone + USB Cable (Charging from Adapter 2)	
Remark: The worst case of conducted emission is mode 2; only the test data of it was reported.		

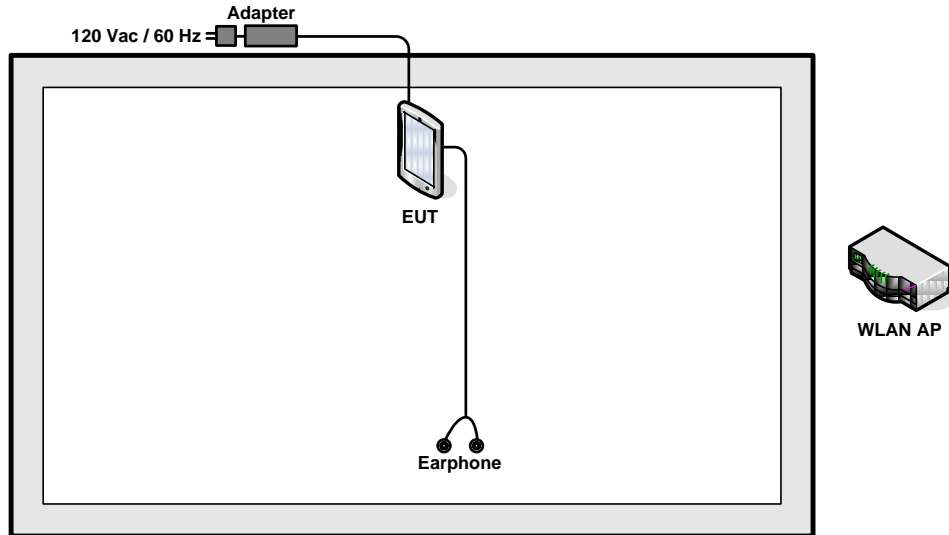
2.3 Connection Diagram of Test System

<Radiation Test>

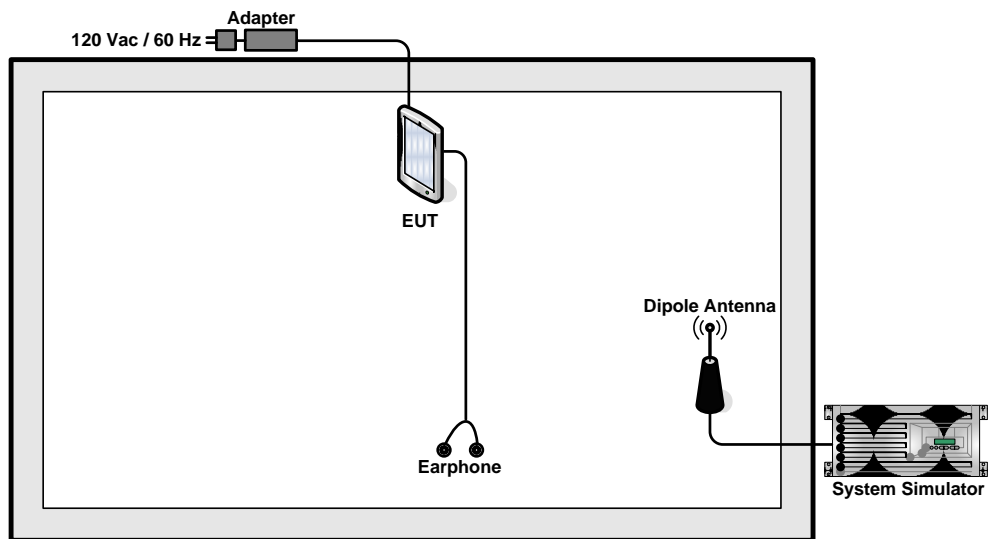


<Conduction Test>

WLAN Link Mode



WWAN Idle Mode





2.4 RF Utility

The programmed RF utility 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.

The special software tool was used for flipping through pages automatically. Execute the program, "Winthrax" under WINXP installed in notebook for active sync files transfer to iPod via USB cable for Conduction Test.

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.

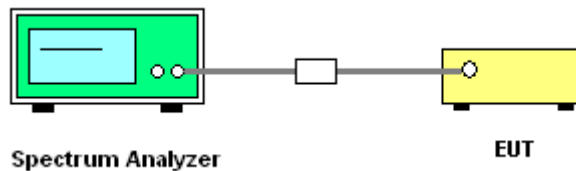
3.1.2 Measuring Instruments

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



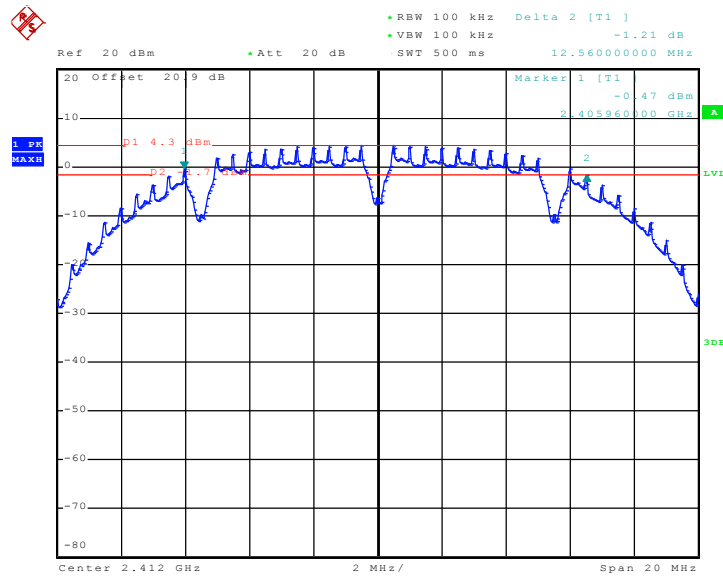


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	25~27°C
Test Engineer :	Andy Yeh	Relative Humidity :	40~43%

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

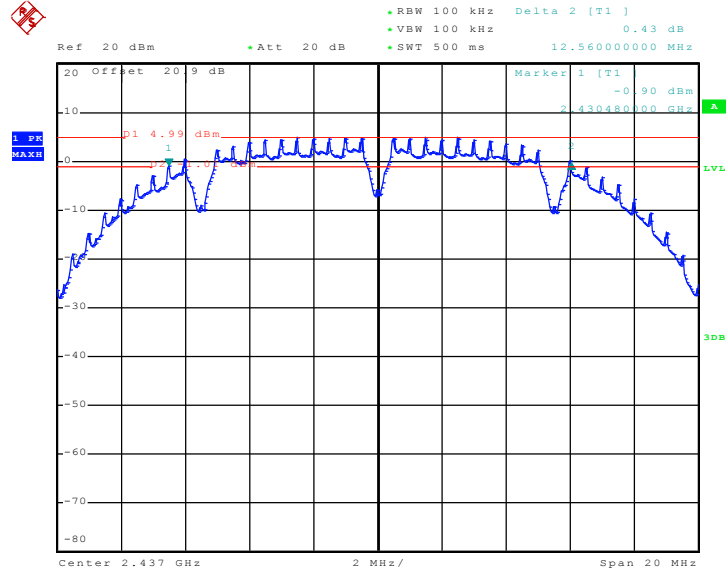
Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01



Date: 22..JAN..2010 00:40:24

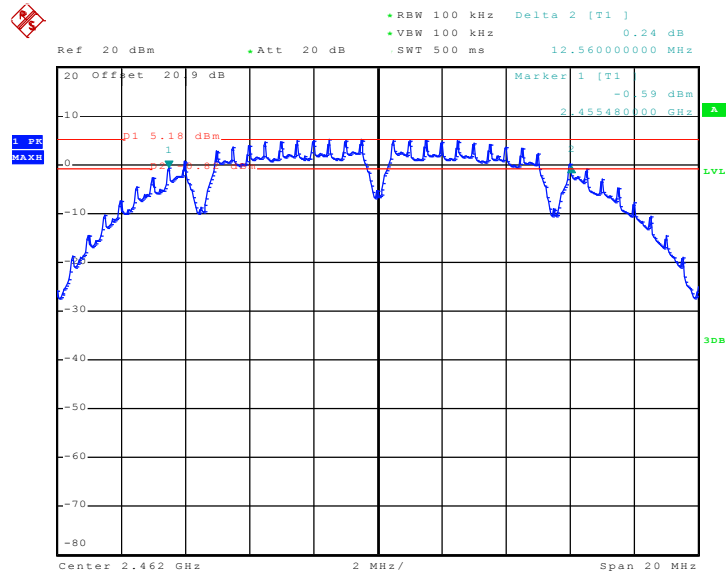


Mode 2 : 6 dB Bandwidth Plot on 802.11b Channel 06



Date: 22.JAN.2010 00:08:21

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



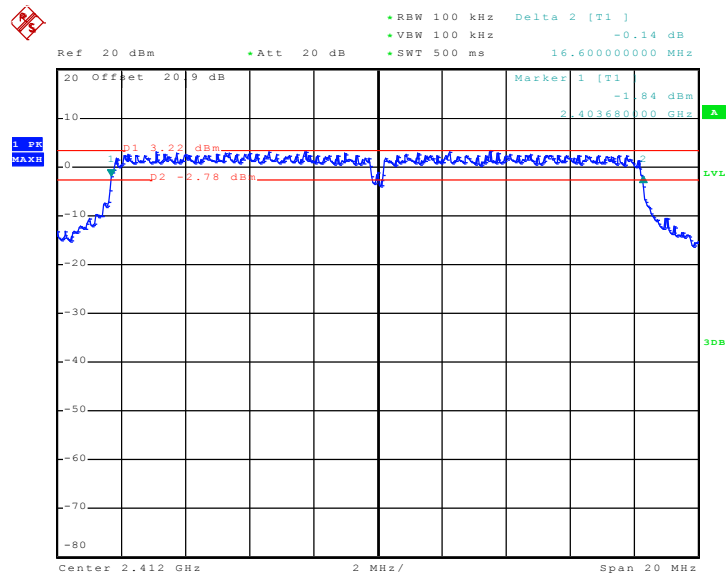
Date: 22.JAN.2010 00:01:14



Test Mode :	Mode 4, 5, 6	Temperature :	25~27°C
Test Engineer :	Andy Yeh	Relative Humidity :	40~43%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.60	0.5	Pass
06	2437	16.60	0.5	Pass
11	2462	16.60	0.5	Pass

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



Date: 21..JAN.2010 22:34:25

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.

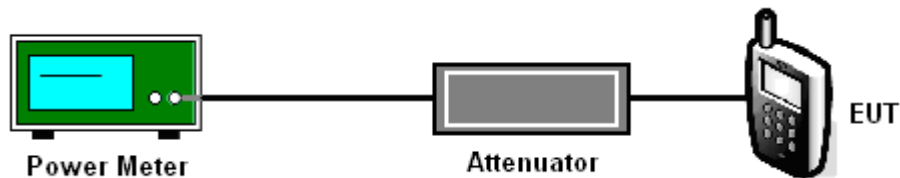
3.2.2 Measuring Instruments

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 :	25~27°C
Test Engineer :	Andy Yeh	Relative Humidity :	40~43%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	18.27	30	Pass
06	2437	18.10	30	Pass
11	2462	18.21	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	25~27°C
Test Engineer :	Andy Yeh	Relative Humidity :	40~43%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	21.52	30	Pass
06	2437	21.89	30	Pass
11	2462	20.91	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

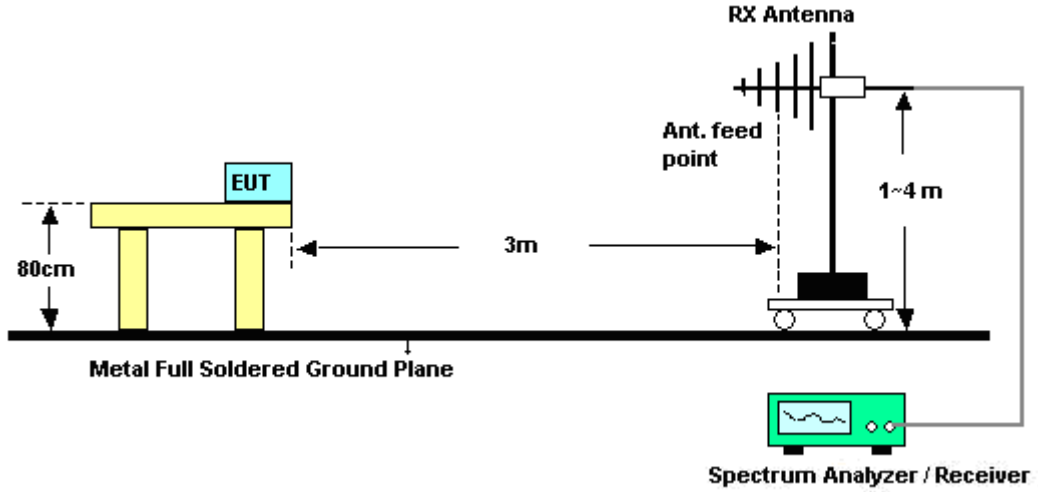
See list of measuring instruments of this test report.

3.3.3 Test Procedures

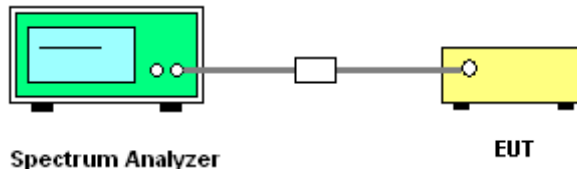
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) \geq RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized 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 :	23~24°C
Test Band :	802.11b	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Mac Lin

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
2382.8	50.83	-23.17	74	51.15	31.83	3.92	36.07	200	232	Peak
2382.8	43.24	-10.76	54	43.56	31.83	3.92	36.07	200	232	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
2386.05	52.6	-21.4	74	52.89	31.86	3.92	36.07	100	21	Peak
2386.05	45.98	-8.02	54	46.27	31.86	3.92	36.07	100	21	Average

Test Mode :	Mode 3	Temperature :	23~24°C
Test Band :	802.11b	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Mac Lin

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
2490.93	54.97	-19.03	74	55.01	32	4.05	36.09	133	322	Peak
2490.93	48.93	-5.07	54	48.97	32	4.05	36.09	133	322	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
2489.2	53.12	-20.88	74	53.16	32	4.05	36.09	100	49	Peak
2489.2	45.69	-8.31	54	45.73	32	4.05	36.09	100	49	Average



Test Mode :	Mode 4	Temperature :	23~24°C
Test Band :	802.11g	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Mac Lin

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
2389.52	70.63	-3.37	74	70.92	31.86	3.92	36.07	200	231	Peak
2389.52	52.14	-1.86	54	52.43	31.86	3.92	36.07	200	231	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
2389.97	72.12	-1.88	74	72.42	31.86	3.92	36.08	100	41	Peak
2389.97	52.83	-1.17	54	53.13	31.86	3.92	36.08	100	41	Average

Test Mode :	Mode 6	Temperature :	23~24°C
Test Band :	802.11g	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Mac Lin

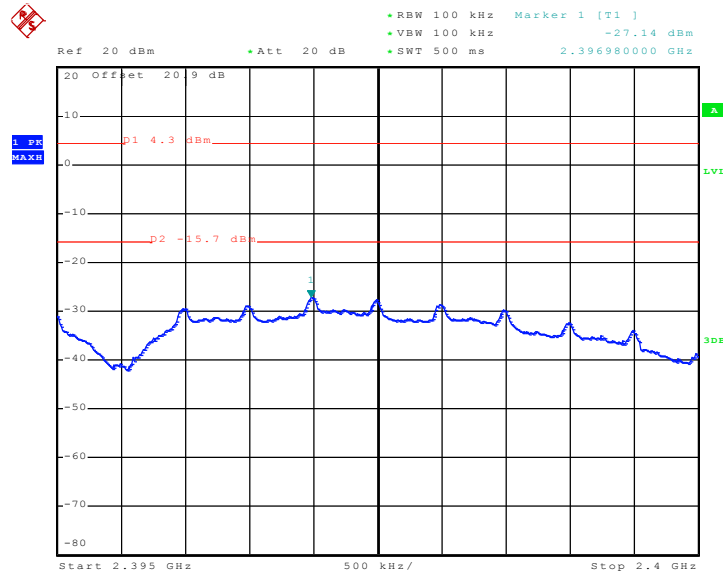
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.35	71.84	-2.16	74	71.9	31.98	4.05	36.09	133	324	Peak
2484.35	49.84	-4.16	54	49.9	31.98	4.05	36.09	133	324	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	72.11	-1.89	74	72.17	31.98	4.05	36.09	100	50	Peak
2483.5	49.79	-4.21	54	49.85	31.98	4.05	36.09	100	50	Average

3.3.6 Test Plots of Conducted Band Edges

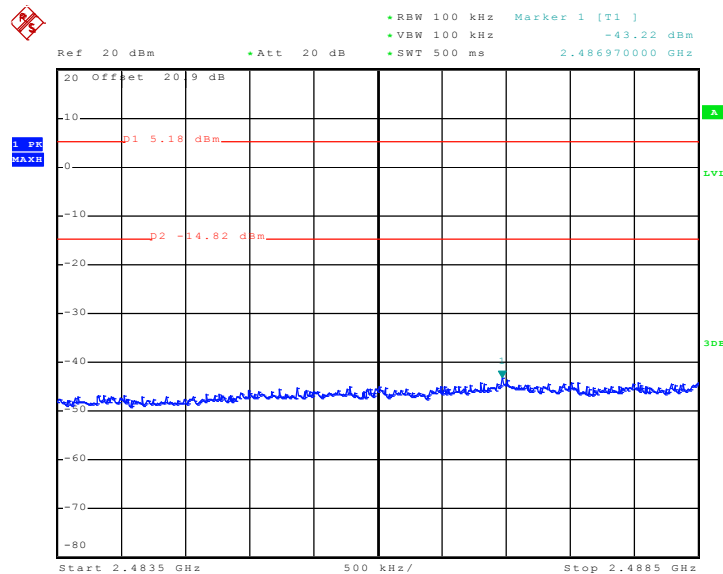
Test Mode :	Mode 1 and 3	Temperature :	25~27°C
Test Band :	802.11b	Relative Humidity :	40~43%
Test Channel :	01 and 11	Test Engineer :	Andy Yeh

Low Band Edge Plot on 802.11b Channel 01



Date: 2.FEB.2010 12:51:26

High Band Edge Plot on 802.11b Channel 11

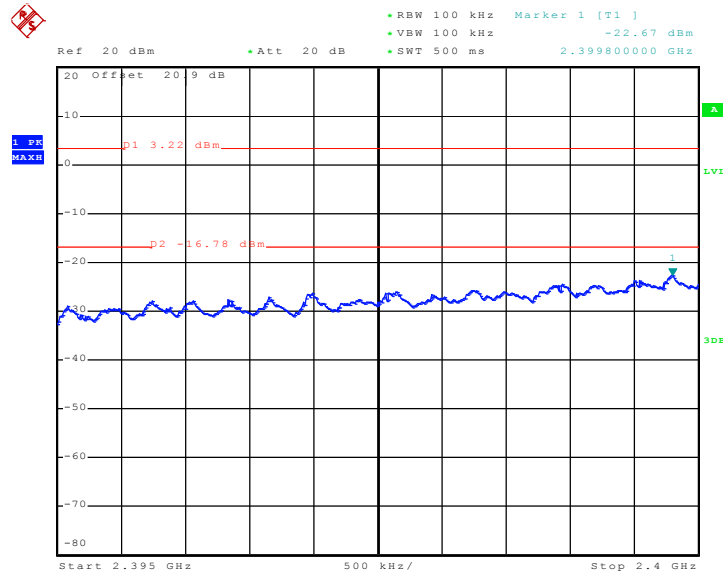


Date: 2.FEB.2010 12:27:14



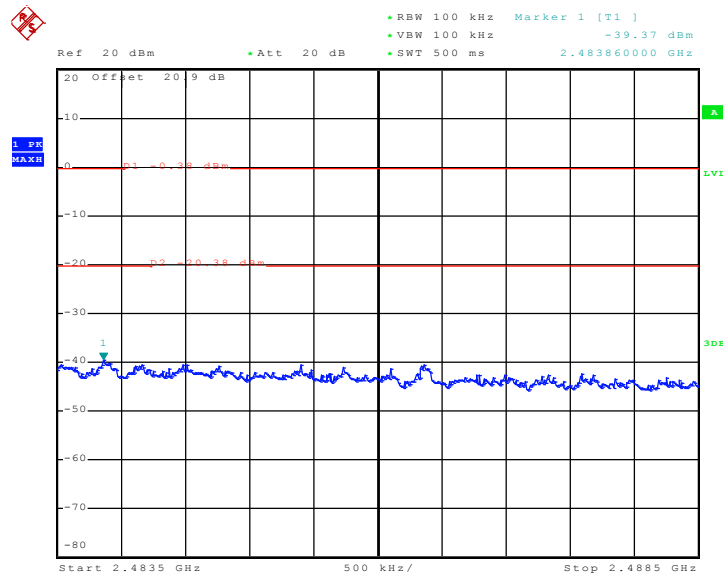
Test Mode :	Mode 4 and 6	Temperature :	25~27°C
Test Band :	802.11g	Relative Humidity :	40~43%
Test Channel :	01 and 11	Test Engineer :	Andy Yeh

Low Band Edge Plot on 802.11g Channel 01



Date: 2.FEB.2010 10:41:14

High Band Edge Plot on 802.11g Channel 11



Date: 2.FEB.2010 15:08:13

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.

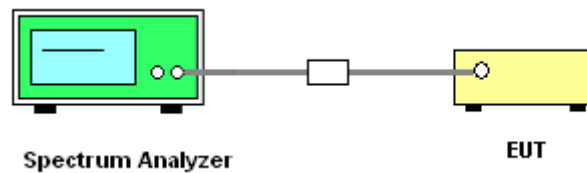
3.4.2 Measuring Instruments

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.

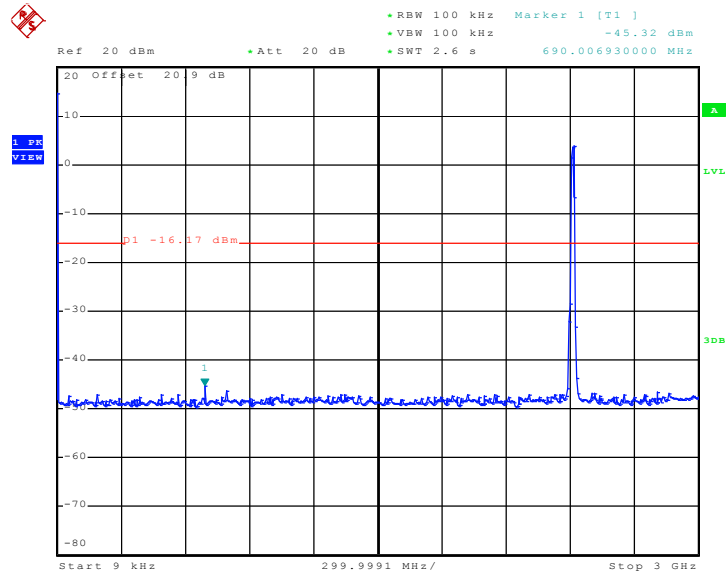
3.4.4 Test Setup



3.4.5 Test Plots of Spurious Emission

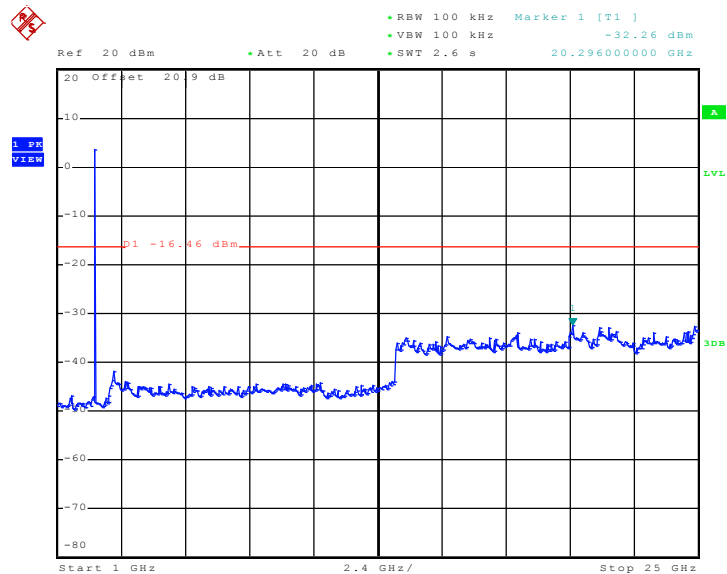
Test Mode :	Mode 1	Temperature :	25~27°C
Test Band :	802.11b	Relative Humidity :	40~43%
Test Channel :	01	Test Engineer :	Andy Yeh

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 2.FEB.2010 12:47:46

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

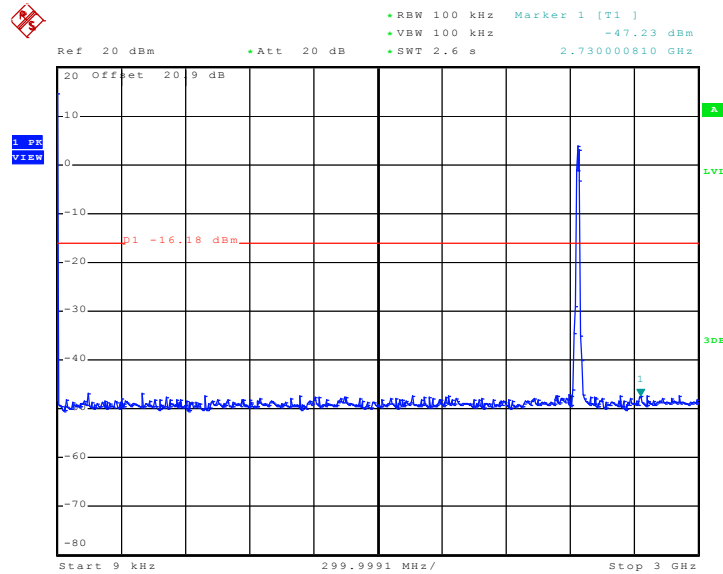


Date: 2.FEB.2010 12:48:37



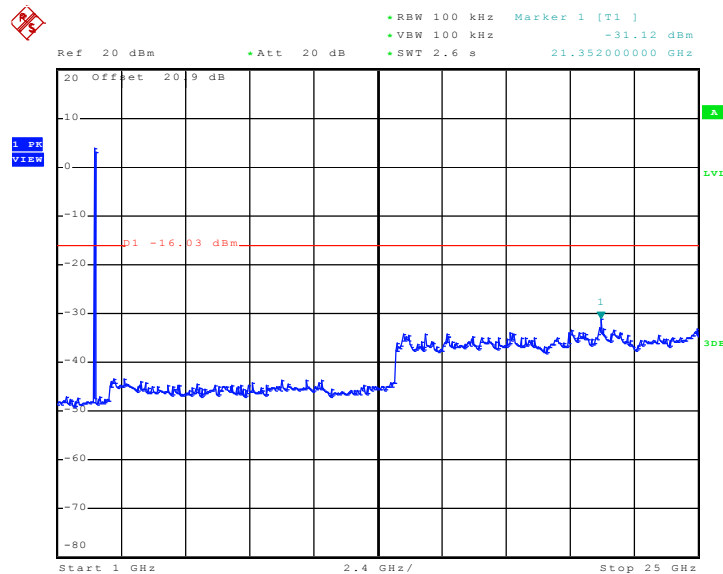
Test Mode :	Mode 2	Temperature :	25~27°C
Test Band :	802.11b	Relative Humidity :	40~43%
Test Channel :	06	Test Engineer :	Andy Yeh

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 2.FEB.2010 12:40:39

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

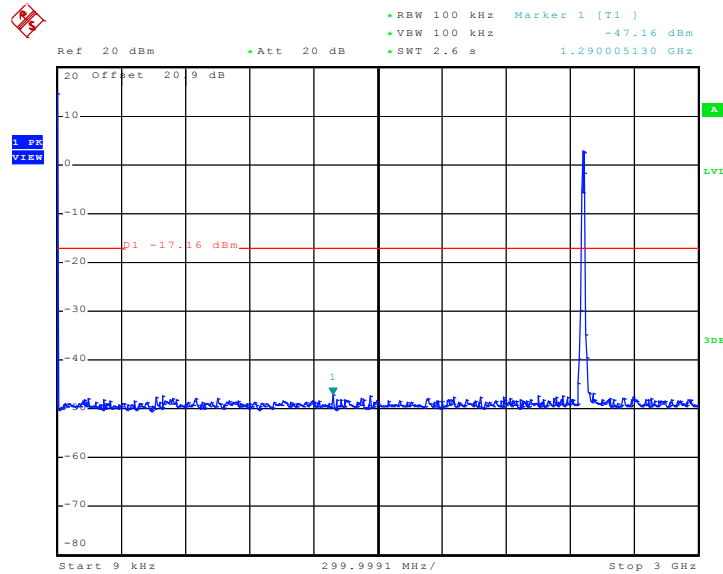


Date: 2.FEB.2010 12:41:32



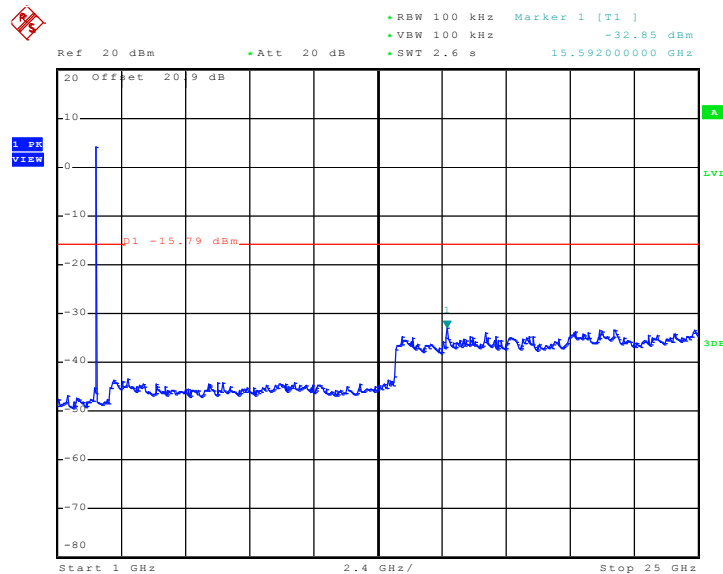
Test Mode :	Mode 3	Temperature :	25~27°C
Test Band :	802.11b	Relative Humidity :	40~43%
Test Channel :	11	Test Engineer :	Andy Yeh

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 2.FEB.2010 12:33:33

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

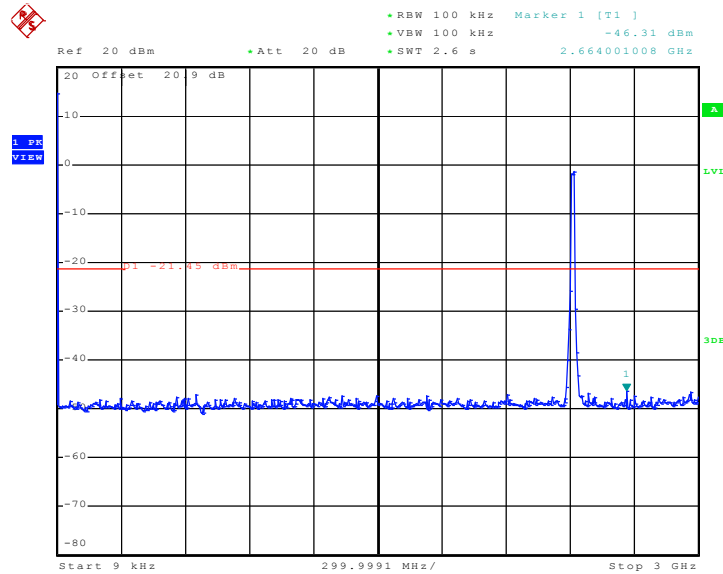


Date: 2.FEB.2010 12:34:32



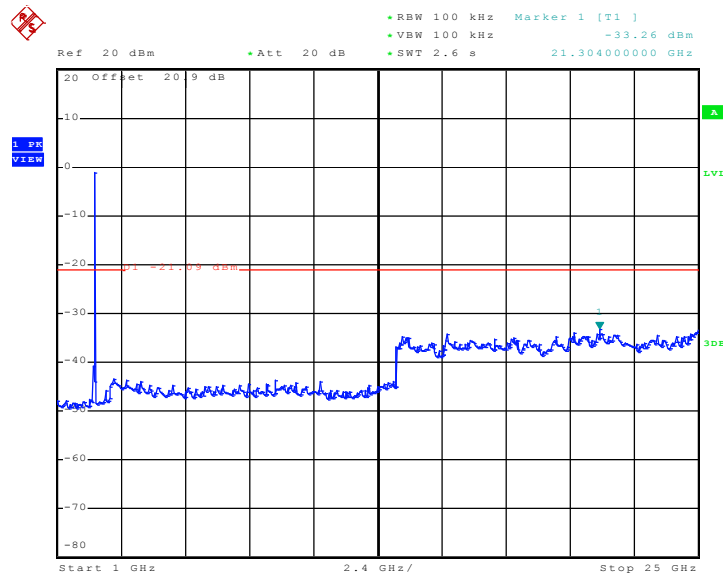
Test Mode :	Mode 4	Temperature :	25~27°C
Test Band :	802.11g	Relative Humidity :	40~43%
Test Channel :	01	Test Engineer :	Andy Yeh

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 2.FEB.2010 10:51:56

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

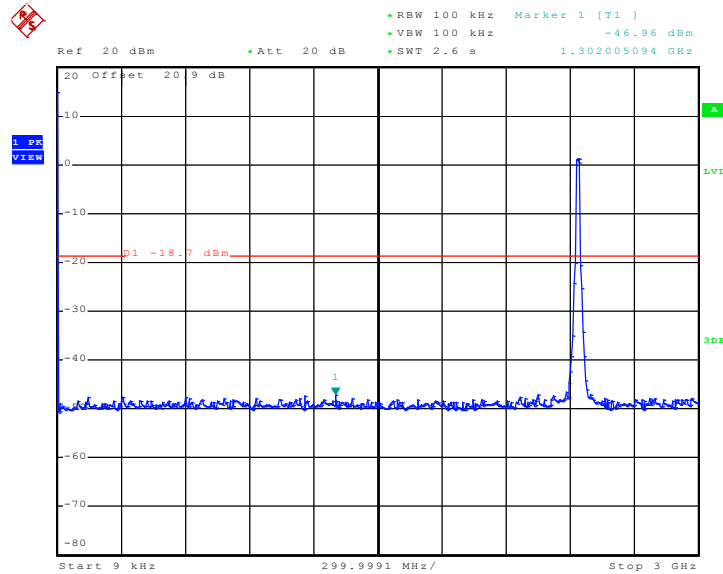


Date: 2.FEB.2010 10:48:18



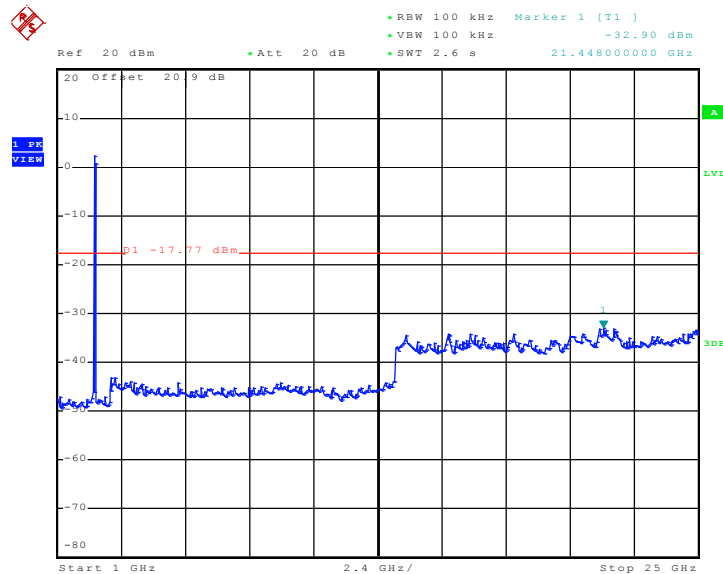
Test Mode :	Mode 5	Temperature :	25~27°C
Test Band :	802.11g	Relative Humidity :	40~43%
Test Channel :	06	Test Engineer :	Andy Yeh

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 2.FEB.2010 11:06:36

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

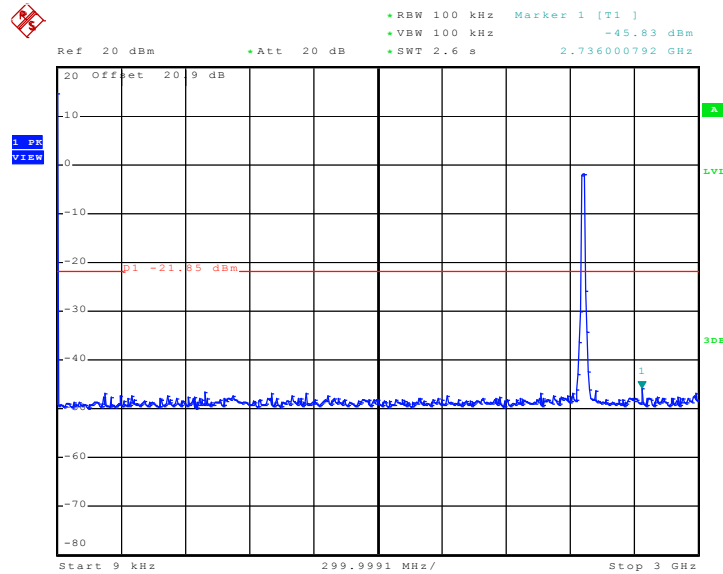


Date: 2.FEB.2010 11:07:38



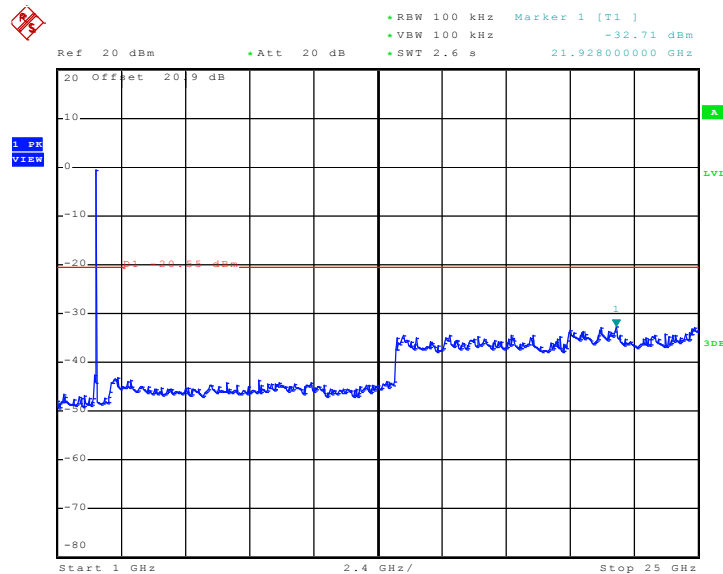
Test Mode :	Mode 6	Temperature :	25~27°C
Test Band :	802.11g	Relative Humidity :	40~43%
Test Channel :	11	Test Engineer :	Andy Yeh

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 2.FEB.2010 11:19:17

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz



Date: 2.FEB.2010 11:20:11

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.

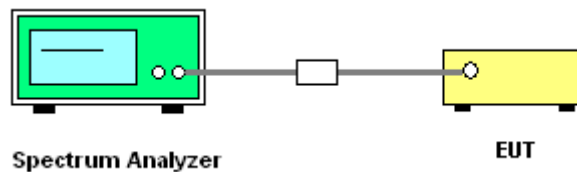
3.5.2 Measuring Instruments

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

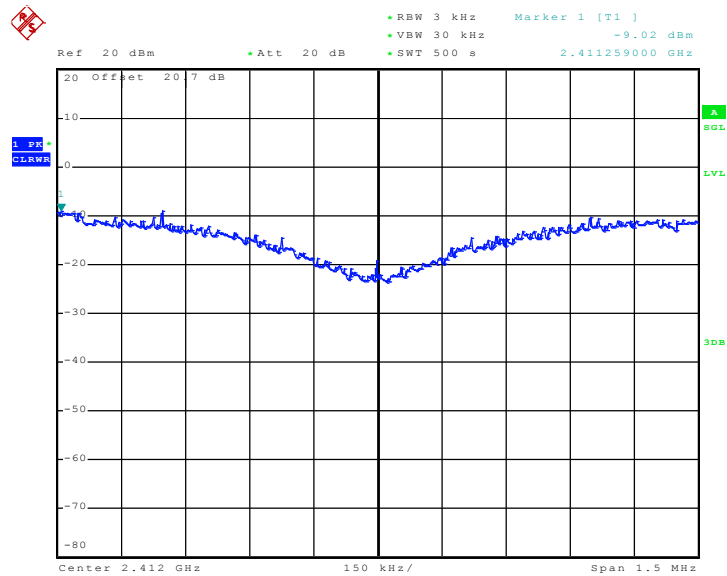


3.5.5 Test Result of Power Spectral Density

Test Mode :	Mode 1, 2, 3	Temperature :	25~27°C
Test Engineer :	Andy Yeh	Relative Humidity :	40~43%

Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-9.02	8	Pass
06	2437	-3.22	8	Pass
11	2462	-10.18	8	Pass

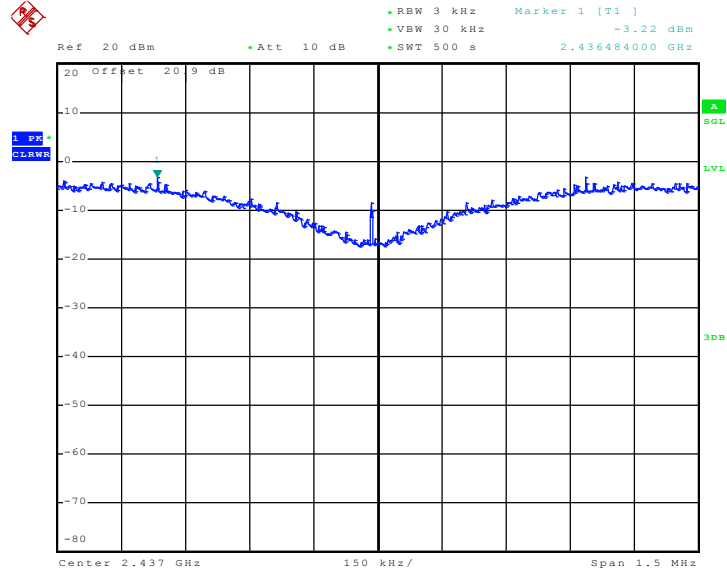
Mode 1 : PSD Plot on 802.11b Channel 01



Date: 24.DEC.2009 13:29:34

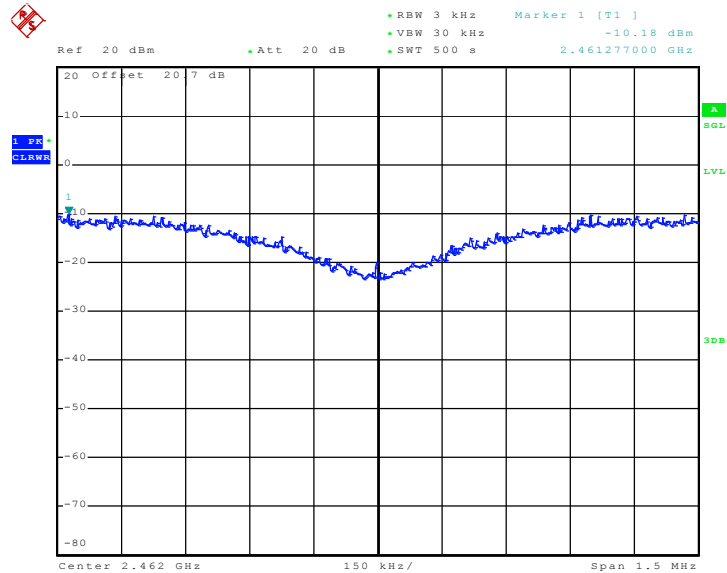


Mode 2 : PSD Plot on 802.11b Channel 06



Date: 22.JAN.2010 22:59:30

Mode 3 : PSD Plot on 802.11b Channel 11



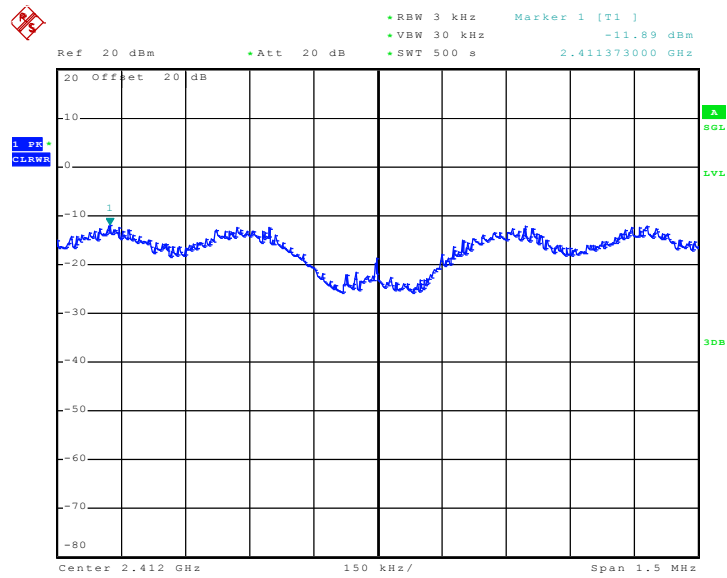
Date: 24.DEC.2009 14:07:32



Test Mode :	Mode 4, 5, 6	Temperature :	25~27°C
Test Engineer :	Andy Yeh	Relative Humidity :	40~43%

Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-11.89	8	Pass
06	2437	-9.97	8	Pass
11	2462	-9.38	8	Pass

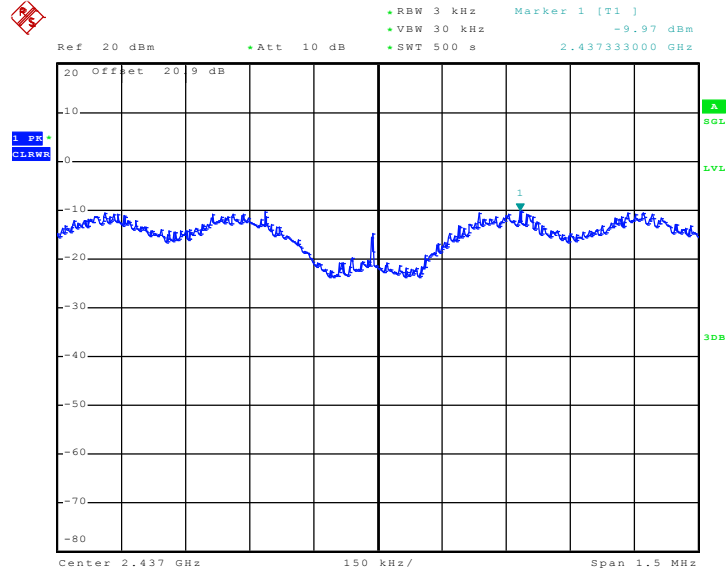
Mode 4 : PSD Plot on 802.11g Channel 01



Date: 24.DEC.2009 12:25:45

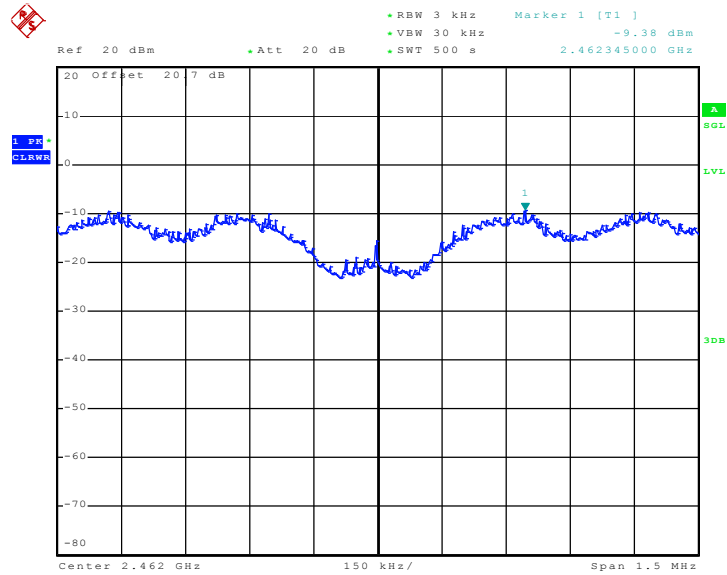


Mode 5 : PSD Plot on 802.11g Channel 06



Date: 22.JAN.2010 22:36:53

Mode 6 : PSD Plot on 802.11g Channel 11



Date: 24.DEC.2009 11:13:37

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.

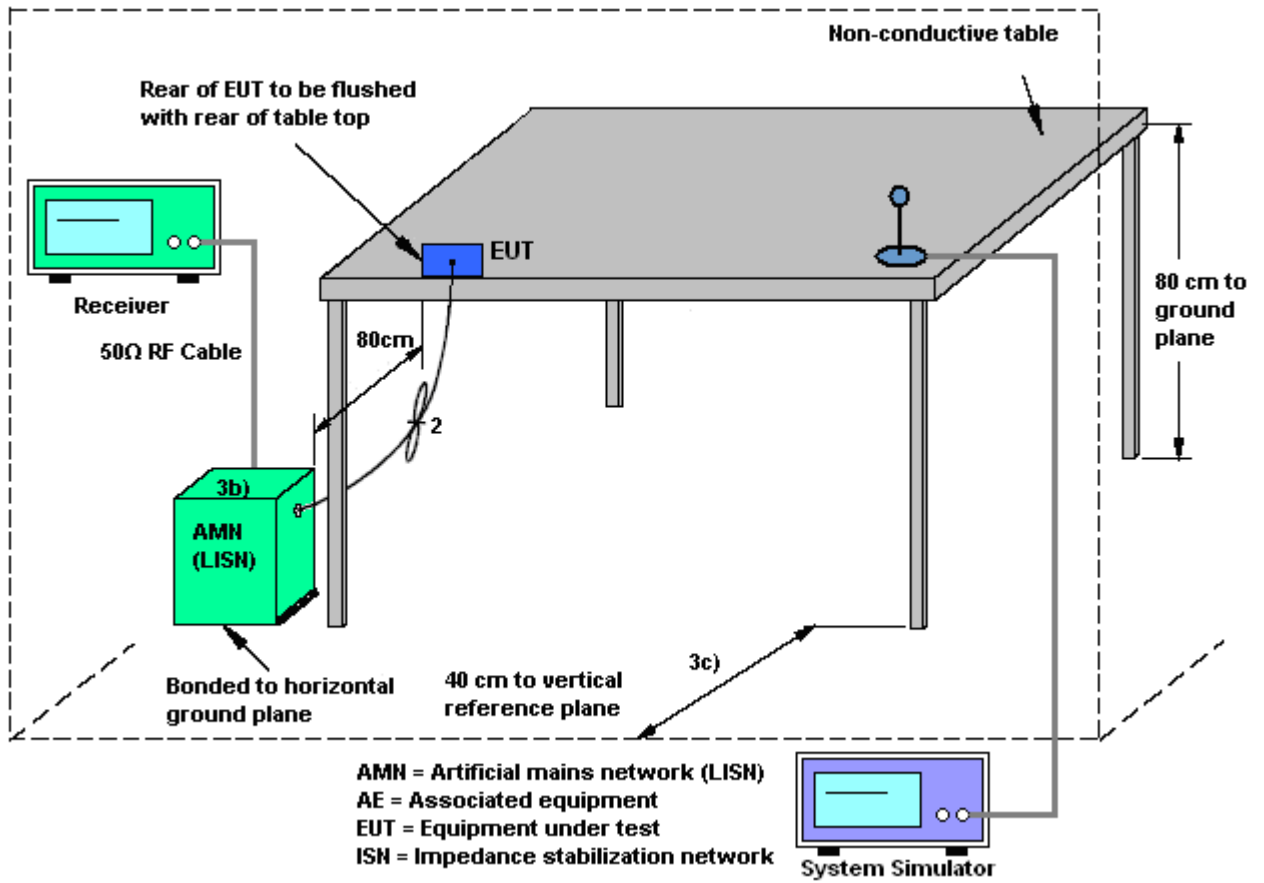
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

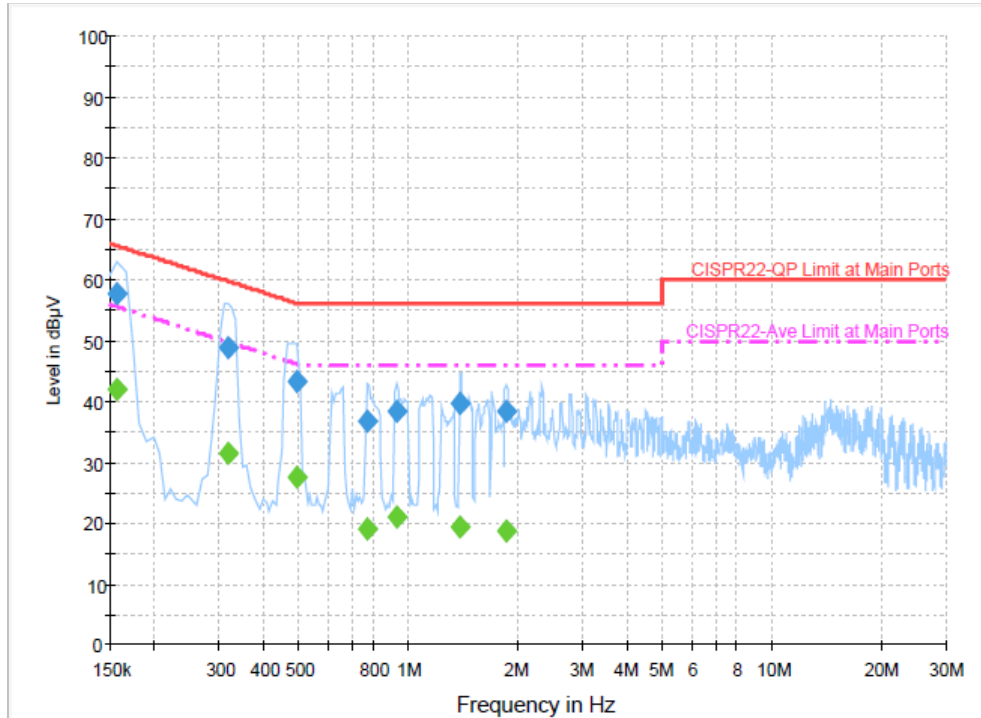
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (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 2	Temperature :	20~22°C
Test Engineer :	Hayden Wu	Relative Humidity :	38~41%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Earphone + USB Cable (Charging from Adapter 2)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

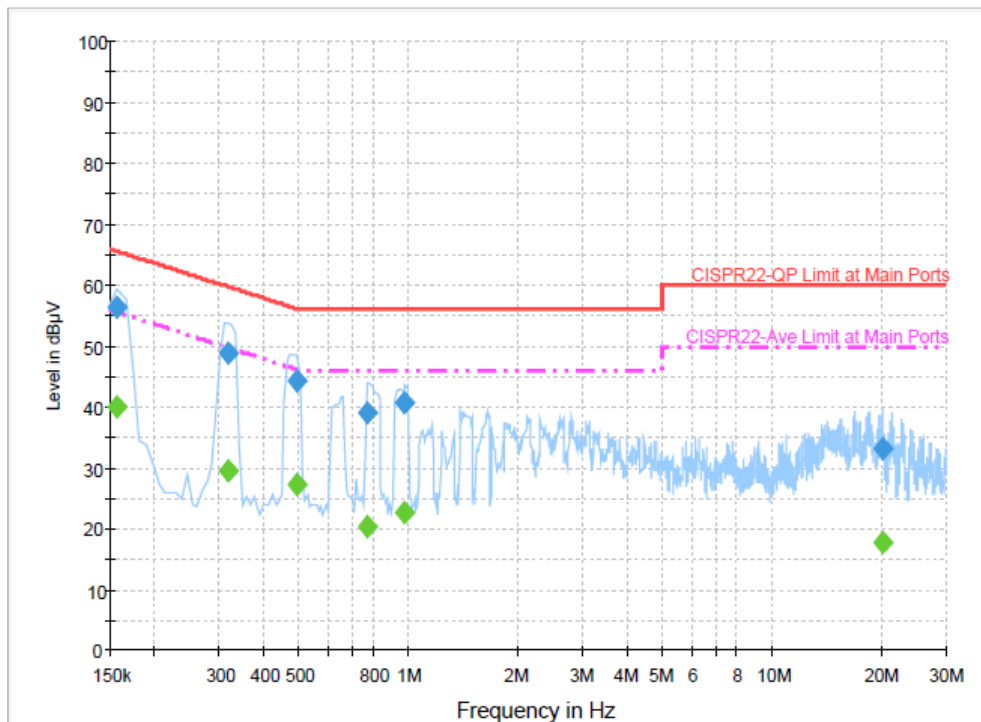
Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	57.6	Off	L1	19.5	8.0	65.6
0.318000	48.7	Off	L1	19.5	11.1	59.8
0.494000	43.1	Off	L1	19.4	13.0	56.1
0.766000	36.9	Off	L1	19.5	19.1	56.0
0.926000	38.2	Off	L1	19.4	17.8	56.0
1.382000	39.8	Off	L1	19.5	16.2	56.0
1.854000	38.2	Off	L1	19.5	17.8	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	42.0	Off	L1	19.5	13.6	55.6
0.318000	31.6	Off	L1	19.5	18.2	49.8
0.494000	27.6	Off	L1	19.4	18.5	46.1
0.766000	19.0	Off	L1	19.5	27.0	46.0
0.926000	21.1	Off	L1	19.4	24.9	46.0
1.382000	19.3	Off	L1	19.5	26.7	46.0
1.854000	18.7	Off	L1	19.5	27.3	46.0



Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Hayden Wu	Relative Humidity :	38~41%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Earphone + USB Cable (Charging from Adapter 2)		
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	56.4	Off	N	19.5	9.2	65.6
0.318000	48.7	Off	N	19.5	11.1	59.8
0.494000	44.3	Off	N	19.4	11.8	56.1
0.766000	38.9	Off	N	19.4	17.1	56.0
0.974000	40.8	Off	N	19.4	15.2	56.0
20.054000	33.0	Off	N	19.8	27.0	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	40.0	Off	N	19.5	15.6	55.6
0.318000	29.7	Off	N	19.5	20.2	49.8
0.494000	27.3	Off	N	19.4	18.8	46.1
0.766000	20.3	Off	N	19.4	25.7	46.0
0.974000	22.6	Off	N	19.4	23.4	46.0
20.054000	17.6	Off	N	19.8	32.4	50.0

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

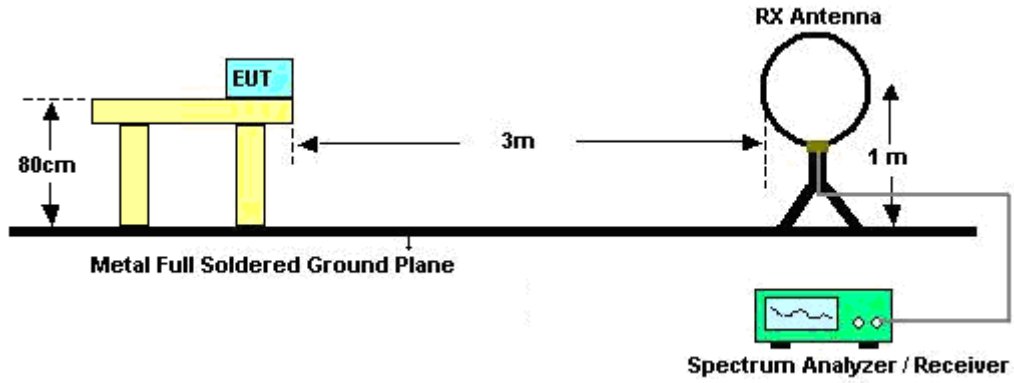
See list of measuring instruments of this test report.

3.7.3 Test Procedures

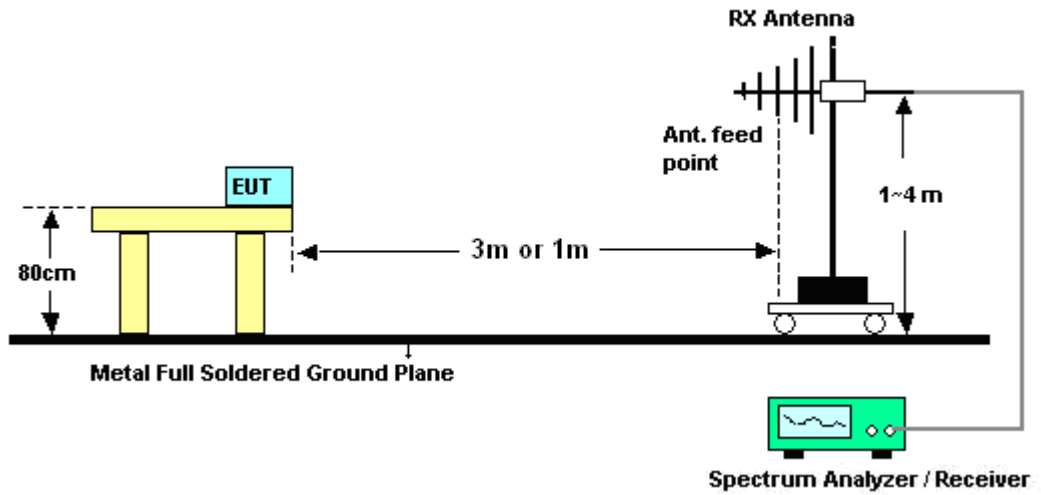
1. The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Use the following spectrum analyzer settings:
 - (1) Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold.
 - (2) Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.
 Distance extrapolation factor = $20 \log(\text{specific distance [3m]} / \text{test distance [1m]})$ (dB)
3. Follow the guidelines in ANSI C63.4-2003 with respect to maximizing the emission by rotating the EUT, measuring the emission for three EUT orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for this test in order to get the good signal level.

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 :	Mac Lin	Temperature :	23~24°C	
		Relative Humidity :	47~48%	
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 :	23~24°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Horizontal
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 9648 MHz is not within a restricted band.		

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
264.63	31.89	-14.11	46	48.49	12.52	2.78	31.9	-	-	Peak
273.54	33.72	-12.28	46	50.17	12.67	2.84	31.96	-	-	Peak
282.99	32.88	-13.12	46	49.18	12.83	2.9	32.03	-	-	Peak
304.9	31.82	-14.18	46	47.66	13.23	3.04	32.11	-	-	Peak
474.3	32.44	-13.56	46	43.62	17.01	3.86	32.05	-	-	Peak
511.4	39.19	-6.81	46	49.66	17.61	4	32.08	100	200	Peak
2382.8	43.24	-10.76	54	43.56	31.83	3.92	36.07	200	232	Average
2382.8	50.83	-23.17	74	51.15	31.83	3.92	36.07	200	232	Peak
2412	100.09	-	-	100.34	31.88	3.95	36.08	200	232	Average
2412	103.95	-	-	104.2	31.88	3.95	36.08	200	232	Peak
2494	46.38	-27.62	74	46.43	32	4.05	36.1	200	232	Peak
2494	35.47	-18.53	54	35.52	32	4.05	36.1	200	232	Average
8952	53.21	-20.79	74	46.29	36.06	7.74	36.88	100	352	Peak
8952	39.97	-14.03	54	33.05	36.06	7.74	36.88	100	352	Average
9648	42.27	-41.68	83.95	81.75	-10.32	7.94	37.1	100	0	Peak



Test Mode :	Mode 1	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 9648 MHz is not within a restricted band.		

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	23.87	-16.13	40	36.65	17.98	0.85	31.61	-	-	Peak
39.18	22.25	-17.75	40	39.59	13.42	0.96	31.72	-	-	Peak
282.99	25.89	-20.11	46	42.19	12.83	2.9	32.03	-	-	Peak
474.3	28	-18	46	39.18	17.01	3.86	32.05	-	-	Peak
511.4	32.91	-13.09	46	43.38	17.61	4	32.08	100	144	Peak
638.8	27.92	-18.08	46	36.4	18.92	4.54	31.94	-	-	Peak
2386.05	45.98	-8.02	54	46.27	31.86	3.92	36.07	100	21	Average
2386.05	52.6	-21.4	74	52.89	31.86	3.92	36.07	100	21	Peak
2412	97.73	-	-	97.98	31.88	3.95	36.08	100	21	Average
2412	101.59	-	-	101.84	31.88	3.95	36.08	100	21	Peak
2494	44.04	-29.96	74	44.09	32	4.05	36.1	100	21	Peak
2494	32.65	-21.35	54	32.7	32	4.05	36.1	100	21	Average
8877	53.18	-20.82	74	46.39	35.99	7.65	36.85	100	19	Peak
8877	39.96	-14.04	54	33.17	35.99	7.65	36.85	100	19	Average
9648	40.18	-41.41	81.59	79.66	-10.32	7.94	37.1	100	0	Peak



Test Mode :	Mode 2	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Horizontal
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 9748 MHz is not within a restricted band.		

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
132.06	32.83	-10.67	43.5	51.37	11.76	1.37	31.67	-	-	Peak
179.85	36.25	-7.25	43.5	57.17	9.09	1.61	31.62	100	35	Peak
273.54	35.86	-10.14	46	52.23	13.09	1.99	31.45	-	-	Peak
374.9	37.67	-8.33	46	50.98	15.47	2.47	31.25	-	-	Peak
511.4	37.26	-8.74	46	47	18.38	2.97	31.09	-	-	Peak
903.4	34.1	-11.9	46	37.41	23.22	4.17	30.7	-	-	Peak
2334	52.88	-21.12	74	49.48	32.02	5.51	34.13	100	231	Peak
2334	41.93	-12.07	54	38.53	32.02	5.51	34.13	100	231	Average
2437	106.39	-	-	102.94	32.19	5.43	34.17	100	231	Peak
2437	101.4	-	-	97.94	32.22	5.41	34.17	100	231	Average
2492	40.13	-13.87	54	36.66	32.3	5.37	34.2	100	231	Average
2492	49.53	-24.47	74	46.06	32.3	5.37	34.2	100	231	Peak
8382	54.81	-19.19	74	43.81	36	10.1	35.1	100	22	Peak
8382	41.01	-12.99	54	30.01	36	10.1	35.1	100	22	Average
9748	42.19	-44.2	86.39	76.55	-9.87	10.81	35.3	100	0	Peak



Test Mode :	Mode 2	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	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
34.86	36.85	-3.15	40	51.14	16.73	0.68	31.7	122	342	Peak
179.85	32.91	-10.59	43.5	53.83	9.09	1.61	31.62	-	-	Peak
275.97	30.89	-15.11	46	47.19	13.14	2.01	31.45	-	-	Peak
382.6	32.01	-13.99	46	45.08	15.67	2.49	31.23	-	-	Peak
511.4	32.33	-13.67	46	42.07	18.38	2.97	31.09	-	-	Peak
895.7	32.66	-13.34	46	36.09	23.13	4.14	30.7	-	-	Peak
2334	51.23	-22.77	74	47.83	32.02	5.51	34.13	122	47	Peak
2334	42.05	-11.95	54	38.65	32.02	5.51	34.13	122	47	Average
2437	105.42	-	-	101.96	32.22	5.41	34.17	122	47	Peak
2437	102.41	-	-	98.95	32.22	5.41	34.17	122	47	Average
2492	41.94	-12.06	54	38.47	32.3	5.37	34.2	122	47	Average
2492	48.29	-25.71	74	44.82	32.3	5.37	34.2	122	47	Peak
8433	54.52	-19.48	74	43.49	36	10.13	35.1	100	229	Peak
8433	40.65	-13.35	54	29.62	36	10.13	35.1	100	229	Average



Test Mode :	Mode 3	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Horizontal
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 9848 MHz is not within a restricted band.		

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
75.63	27.61	-12.39	40	51.09	7.02	1.35	31.85	-	-	Peak
168.78	32.01	-11.49	43.5	51.99	9.77	2.14	31.89	-	-	Peak
273.54	33.29	-12.71	46	49.74	12.67	2.84	31.96	-	-	Peak
304.9	30.84	-15.16	46	46.68	13.23	3.04	32.11	-	-	Peak
483.4	32.49	-13.51	46	43.5	17.16	3.89	32.06	-	-	Peak
511.4	39.39	-6.61	46	49.86	17.61	4	32.08	100	195	Peak
2356	48.35	-25.65	74	48.75	31.81	3.86	36.07	133	322	Peak
2356	40.24	-13.76	54	40.64	31.81	3.86	36.07	133	322	Average
2462	100.97	-	-	101.09	31.95	4.02	36.09	133	322	Average
2462	104.61	-	-	104.73	31.95	4.02	36.09	133	322	Peak
2490.93	48.93	-5.07	54	48.97	32	4.05	36.09	133	322	Average
2490.93	54.97	-19.03	74	55.01	32	4.05	36.09	133	322	Peak
8706	52.6	-21.4	74	46.07	35.86	7.45	36.78	100	284	Peak
8706	39.42	-14.58	54	32.89	35.86	7.45	36.78	100	284	Average
9848	37.29	-47.32	84.61	76.25	-9.9	8.04	37.1	100	0	Peak



Test Mode :	Mode 3	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Vertical
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 9848 MHz is not within a restricted band.		

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
37.29	22.71	-17.29	40	39.47	14.04	0.95	31.75	-	-	Peak
192.54	21.57	-21.93	43.5	42.71	8.55	2.36	32.05	-	-	Peak
282.99	25.31	-20.69	46	41.61	12.83	2.9	32.03	-	-	Peak
484.8	28.94	-17.06	46	39.9	17.2	3.9	32.06	-	-	Peak
511.4	33.08	-12.92	46	43.55	17.61	4	32.08	100	161	Peak
638.8	27.25	-18.75	46	35.73	18.92	4.54	31.94	-	-	Peak
2356	46.68	-27.32	74	47.08	31.81	3.86	36.07	100	49	Peak
2356	38.25	-15.75	54	38.65	31.81	3.86	36.07	100	49	Average
2462	97.91	-	-	98.03	31.95	4.02	36.09	100	49	Average
2462	101.51	-	-	101.63	31.95	4.02	36.09	100	49	Peak
2489.2	45.69	-8.31	54	45.73	32	4.05	36.09	100	49	Average
2489.2	53.12	-20.88	74	53.16	32	4.05	36.09	100	49	Peak
8727	52.27	-21.73	74	45.69	35.89	7.48	36.79	100	333	Peak
8727	39.34	-14.66	54	32.76	35.89	7.48	36.79	100	333	Average
9848	34.57	-46.94	81.51	73.53	-9.9	8.04	37.1	100	0	Peak



Test Mode :	Mode 4	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Horizontal
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 9648 MHz is not within a restricted band.		

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
273.54	33.07	-12.93	46	49.52	12.67	2.84	31.96	-	-	Peak
282.99	33.46	-12.54	46	49.76	12.83	2.9	32.03	-	-	Peak
292.44	32.34	-13.66	46	48.48	12.99	2.97	32.1	-	-	Peak
304.9	31.82	-14.18	46	47.66	13.23	3.04	32.11	-	-	Peak
484.8	32.74	-13.26	46	43.7	17.2	3.9	32.06	-	-	Peak
511.4	39.31	-6.69	46	49.78	17.61	4	32.08	100	199	Peak
2389.52	52.14	-1.86	54	52.43	31.86	3.92	36.07	200	231	Average
2389.52	70.63	-3.37	74	70.92	31.86	3.92	36.07	200	231	Peak
2412	96.83	-	-	97.08	31.88	3.95	36.08	200	231	Average
2412	107.07	-	-	107.32	31.88	3.95	36.08	200	231	Peak
2494	48.11	-25.89	74	48.16	32	4.05	36.1	200	231	Peak
2494	35.73	-18.27	54	35.78	32	4.05	36.1	200	231	Average
8991	52.52	-21.48	74	45.52	36.09	7.8	36.89	100	125	Peak
8991	39.49	-14.51	54	32.49	36.09	7.8	36.89	100	125	Average
9648	51.6	-35.47	87.07	91.08	-10.32	7.94	37.1	100	0	Peak



Test Mode :	Mode 4	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 9648 MHz is not within a restricted band.		

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	22.95	-17.05	40	35.73	17.98	0.85	31.61	-	-	Peak
274.08	24.25	-21.75	46	40.69	12.68	2.85	31.97	-	-	Peak
282.99	25.25	-20.75	46	41.55	12.83	2.9	32.03	-	-	Peak
486.9	29.05	-16.95	46	39.97	17.23	3.91	32.06	-	-	Peak
511.4	33.38	-12.62	46	43.85	17.61	4	32.08	100	247	Peak
638.8	26.86	-19.14	46	35.34	18.92	4.54	31.94	-	-	Peak
2389.97	52.83	-1.17	54	53.13	31.86	3.92	36.08	100	41	Average
2389.97	72.12	-1.88	74	72.42	31.86	3.92	36.08	100	41	Peak
2412	105.88	-	-	106.13	31.88	3.95	36.08	100	41	Peak
2412	95.09	-	-	95.34	31.88	3.95	36.08	100	41	Average
2494	32.86	-21.14	54	32.91	32	4.05	36.1	100	41	Average
2494	44.84	-29.16	74	44.89	32	4.05	36.1	100	41	Peak
8982	52.67	-21.33	74	45.67	36.09	7.8	36.89	100	26	Peak
8982	39.51	-14.49	54	32.51	36.09	7.8	36.89	100	26	Average
9648	47.03	-38.85	85.88	86.51	-10.32	7.94	37.1	100	0	Peak



Test Mode :	Mode 5	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	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
132.06	32.73	-10.77	43.5	51.27	11.76	1.37	31.67	-	-	Peak
179.85	37.4	-6.1	43.5	58.32	9.09	1.61	31.62	135	231	Peak
275.97	35.61	-10.39	46	51.91	13.14	2.01	31.45	-	-	Peak
383.3	37.39	-8.61	46	50.46	15.67	2.49	31.23	-	-	Peak
511.4	35.79	-10.21	46	45.53	18.38	2.97	31.09	-	-	Peak
716.5	32.58	-13.42	46	38.78	21.07	3.6	30.87	-	-	Peak
2390	65.59	-8.41	74	62.16	32.13	5.46	34.16	110	320	Peak
2390	43.76	-10.24	54	40.33	32.13	5.46	34.16	110	320	Average
2437	110.84	-	-	107.39	32.19	5.43	34.17	110	320	Peak
2437	101.94	-	-	98.48	32.22	5.41	34.17	110	320	Average
2484	63.13	-10.87	74	59.67	32.27	5.38	34.19	110	320	Peak
2484	42.66	-11.34	54	39.2	32.27	5.38	34.19	110	320	Average
8442	54.96	-19.04	74	43.92	36	10.14	35.1	125	50	Peak
8442	41.66	-12.34	54	30.62	36	10.14	35.1	125	50	Average



Test Mode :	Mode 5	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Vertical
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 9748 MHz is not within a restricted band.		

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
35.13	36.33	-3.67	40	50.62	16.73	0.68	31.7	162	99	Peak
179.85	31.65	-11.85	43.5	52.57	9.09	1.61	31.62	-	-	Peak
275.97	30.86	-15.14	46	47.16	13.14	2.01	31.45	-	-	Peak
511.4	32.46	-13.54	46	42.2	18.38	2.97	31.09	-	-	Peak
640.2	31.13	-14.87	46	38.33	20.38	3.38	30.96	-	-	Peak
816.6	31.68	-14.32	46	36.11	22.38	3.89	30.7	-	-	Peak
2390	65.59	-8.41	74	62.16	32.13	5.46	34.16	100	174	Peak
2390	42.53	-11.47	54	39.1	32.13	5.46	34.16	100	174	Average
2437	98.67	-	-	95.21	32.22	5.41	34.17	100	174	Average
2437	108.64	-	-	105.19	32.22	5.41	34.18	100	174	Peak
2484	61.53	-12.47	74	58.07	32.27	5.38	34.19	100	174	Peak
2484	40.13	-13.87	54	36.67	32.27	5.38	34.19	100	174	Average
8430	54.29	-19.71	74	43.26	36	10.13	35.1	100	220	Peak
8430	41.3	-12.7	54	30.27	36	10.13	35.1	100	220	Average
9748	44.21	-44.43	88.64	78.54	-9.85	10.82	35.3	100	0	Peak



Test Mode :	Mode 6	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Horizontal
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 9848 MHz is not within a restricted band.		

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
273.54	33.47	-12.53	46	49.92	12.67	2.84	31.96	-	-	Peak
282.18	32.84	-13.16	46	49.15	12.81	2.9	32.02	-	-	Peak
292.44	32.15	-13.85	46	48.29	12.99	2.97	32.1	-	-	Peak
484.8	31.97	-14.03	46	42.93	17.2	3.9	32.06	-	-	Peak
511.4	39.27	-6.73	46	49.74	17.61	4	32.08	100	261	Peak
959.4	31.46	-14.54	46	36.2	20.97	5.59	31.3	-	-	Peak
2380	49.96	-24.04	74	50.28	31.83	3.92	36.07	133	324	Peak
2380	37.66	-16.34	54	37.98	31.83	3.92	36.07	133	324	Average
2462	105.21	-	-	105.33	31.95	4.02	36.09	133	324	Peak
2462	95.21	-	-	95.33	31.95	4.02	36.09	133	324	Average
2484.35	71.84	-2.16	74	71.9	31.98	4.05	36.09	133	324	Peak
2484.35	49.84	-4.16	54	49.9	31.98	4.05	36.09	133	324	Average
8772	53.1	-20.9	74	46.47	35.91	7.53	36.81	100	148	Peak
8772	39.85	-14.15	54	33.22	35.91	7.53	36.81	100	148	Average
9848	51.1	-34.11	85.21	90.06	-9.9	8.04	37.1	100	0	Peak



Test Mode :	Mode 6	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Mac Lin	Polarization :	Vertical
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 9848 MHz is not within a restricted band.		

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	25.7	-14.3	40	37.92	18.51	0.83	31.56	-	-	Peak
60.24	22.75	-17.25	40	47.12	6.42	1.26	32.05	-	-	Peak
282.99	25.17	-20.83	46	41.47	12.83	2.9	32.03	-	-	Peak
488.3	28.24	-17.76	46	39.14	17.25	3.91	32.06	-	-	Peak
511.4	33.42	-12.58	46	43.89	17.61	4	32.08	100	100	Peak
638.8	27.13	-18.87	46	35.61	18.92	4.54	31.94	-	-	Peak
2358	48.96	-25.04	74	49.33	31.81	3.89	36.07	100	50	Peak
2358	37.63	-16.37	54	38	31.81	3.89	36.07	100	50	Average
2462	103.38	-	-	103.5	31.95	4.02	36.09	100	50	Peak
2462	93.73	-	-	93.85	31.95	4.02	36.09	100	50	Average
2483.5	49.79	-4.21	54	49.85	31.98	4.05	36.09	100	50	Average
2483.5	72.11	-1.89	74	72.17	31.98	4.05	36.09	100	50	Peak
8682	53.33	-20.67	74	46.83	35.85	7.42	36.77	100	331	Peak
8682	39.75	-14.25	54	33.25	35.85	7.42	36.77	100	331	Average
9848	46.02	-37.36	83.38	84.98	-9.9	8.04	37.1	100	0	Peak



3.8 Antenna Requirements

3.8.1 Standard Applicable

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

3.8.2 Antenna Connected Construction

The antennas type used in this product is Fixed Internal 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)
EMI Test Receive	R&S	ESCS 30	100356	9KHz – 2.75GHz	Aug. 05, 2009	Aug. 04, 2010	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9kHz~30MHz	Nov. 30, 2009	Nov. 29, 2010	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9kHz~30MHz	Nov. 23, 2009	Nov. 22, 2010	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	105934	N/A	Nov. 11, 2008	Nov. 10, 2010	Conduction (CO05-HY)
Spectrum Analyzer	Agilent	E4408B	MY442110 30	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	834468/00 3	20MHz-1000MHz	Apr. 28, 2009	Apr. 27, 2010	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	BBHA9170 251	15GHz- 40GHz	Oct. 14, 2009	Oct. 13, 2010	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A019 17	1GHz- 26.5GHz	Nov. 11, 2009	Nov. 10, 2010	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz~1GHz	Apr. 20, 2009	Apr. 19, 2010	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/00 1	9KHz~30MHz	May 22, 2008	May 21, 2010	Radiation (03CH06-HY)

5 Uncertainty of Evaluation

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

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