

FCC RF Test Report

APPLICANT : FUJITSU LIMITED
EQUIPMENT : Mobile Phone
BRAND NAME : FOMA
MODEL NAME : F-07D
FCC ID : VQK-F07D
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Transmission System (DTS)

The product was received on Sep. 03, 2011 and completely tested on Nov. 08, 2011. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown the compliance with the applicable technical standards.

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

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR190323B	Rev. 01	Initial issue of report	Nov. 17, 2011

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 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 8.70 dB at 1.462 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 0.93 dB at 7386.000 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

FUJITSU LIMITED

1-1, Kamikodanaka 4-chome, Nakahara-ku Kawasaki 211-8588, Japan

1.2 Manufacturer

FUJITSU LIMITED

1-1, Kamikodanaka 4-chome, Nakahara-ku Kawasaki 211-8588, Japan

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Mobile Phone
Brand Name	FOMA
Model Name	F-07D
FCC ID	VQK-F07D
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 : 18.12 dBm (0.0649 W) 802.11g : 22.10 dBm (0.1622 W) 802.11n (BW 20MHz) : 22.01 dBm (0.1589 W)
Antenna Type	Fixed Internal Antenna with gain -2.00 dBi
HW Version	V2.1
SW Version	V13
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : 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.

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	03CH05-HY	722060/4086B-1

1.5 Applied Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 (Measurement Guidelines of DTS)
- ♦ ANSI C63.4-2003
- ♦ IC RSS-210 Issue 8
- ♦ IC RSS-Gen Issue 3

Remark:

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

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	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.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	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)			
		DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	18.12	18.08	18.04	18.09
CH 06	2437 MHz	17.92	-	-	-
CH 11	2462 MHz	17.75	-	-	-

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	22.10	22.08	22	21.98	21.94	21.92	21.91	21.87
CH 06	2437 MHz	21.78	-	-	-	-	-	-	-
CH 11	2462 MHz	21.42	-	-	-	-	-	-	-

Channel	Frequency	2.4GHz 802.11n (BW 20MHz) RF Power (dBm)							
		OFDM Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412 MHz	22.01	21.85	21.78	21.76	21.75	21.71	21.7	21.68
CH 06	2437 MHz	21.73	-	-	-	-	-	-	-
CH 11	2462 MHz	21.59	-	-	-	-	-	-	-

Remark:

1. The data rates of WLAN 802.11b/g/n were set in 1Mbps for 802.11b, 6Mbps for 802.11g, and MCS0 for 802.11n (BW 20MHz) 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).

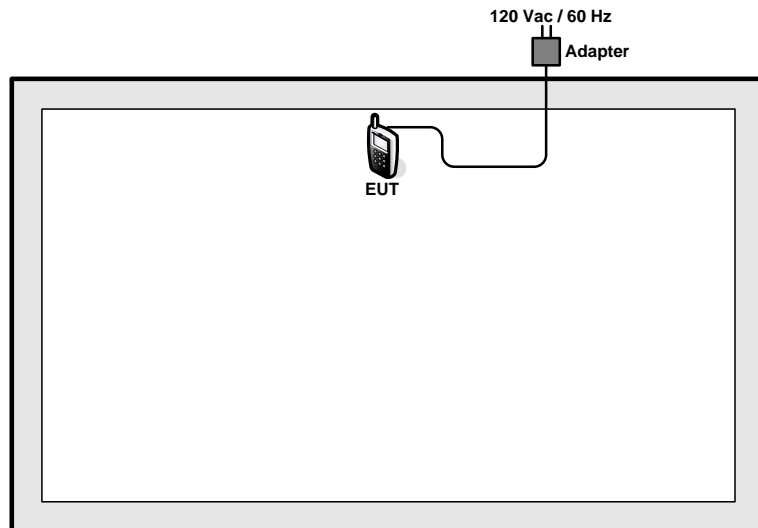
Pre-scanned tests were conducted to determine the final configuration from all possible combinations. Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations, laptop / tablet modes.

The following tables are showing the test modes as the worst cases (E2 plane) and recorded in this report.

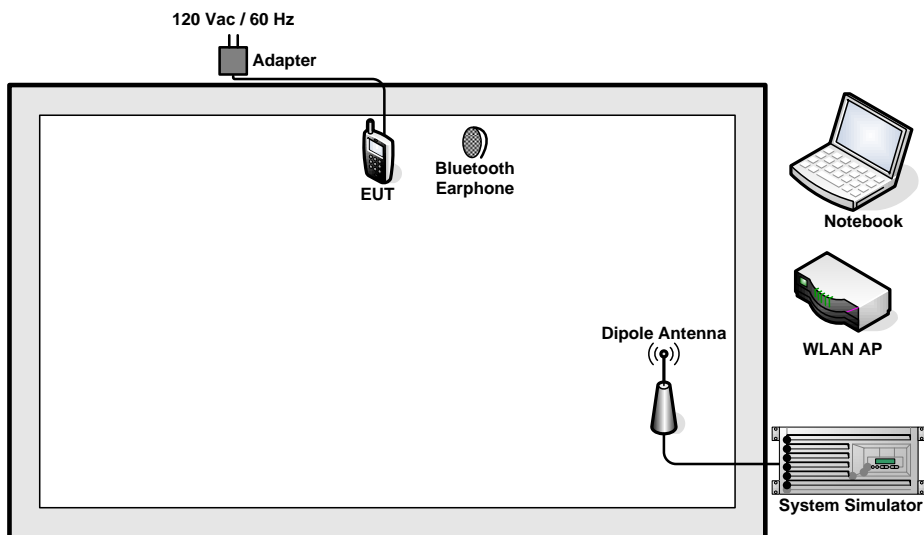
Test Cases	
Test Item	802.11b (Modulation : DSSS) 802.11g/n (Modulation : OFDM)
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz Mode 4: 802.11g_CH01_2412 MHz Mode 5: 802.11g_CH06_2437 MHz Mode 6: 802.11g_CH11_2462 MHz Mode 7: 802.11n (BW 20M)_CH01_2412 MHz Mode 8: 802.11n (BW 20M)_CH06_2437 MHz Mode 9: 802.11n (BW 20M)_CH11_2462 MHz
Radiated TCs	Mode 1 : 802.11b CH01_2412 MHz + Adapter + Battery Mode 2 : 802.11b CH06_2437 MHz + Adapter + Battery Mode 3 : 802.11b CH11_2462 MHz + Adapter + Battery Mode 4: 802.11g_CH01_2412 MHz + Adapter + Battery Mode 5: 802.11g_CH06_2437 MHz + Adapter + Battery Mode 6: 802.11g_CH11_2462 MHz + Adapter + Battery Mode 7: 802.11n (BW 20M)_CH01_2412 MHz + Adapter + Battery Mode 8: 802.11n (BW 20M)_CH06_2437 MHz + Adapter + Battery Mode 9: 802.11n (BW 20M)_CH11_2462 MHz + Adapter + Battery
AC Conducted Emission	Mode 1 : GSM850 Idle + Bluetooth Link + WLAN Link + Camera + Adapter + Battery

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.4 RF Utility

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

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

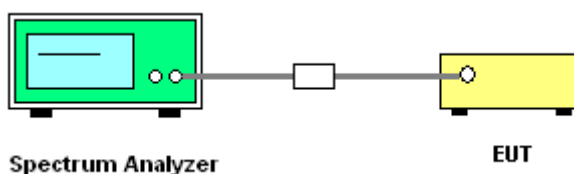
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup

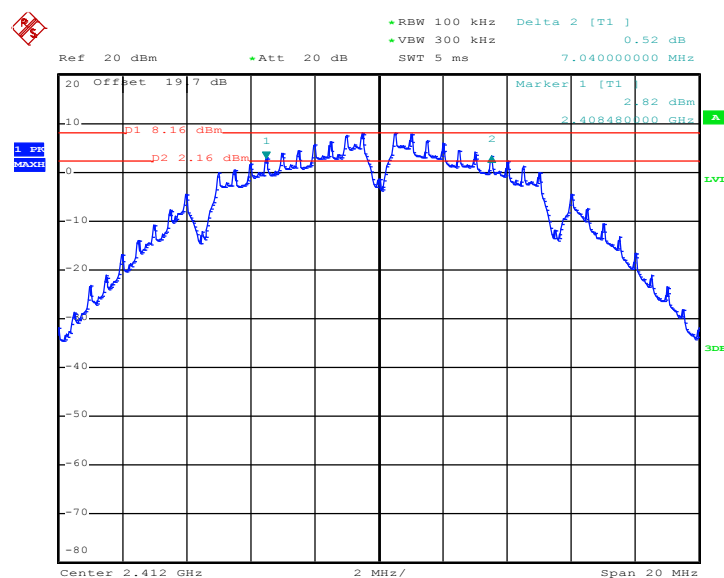


3.1.5 Test Result of 6dB Bandwidth

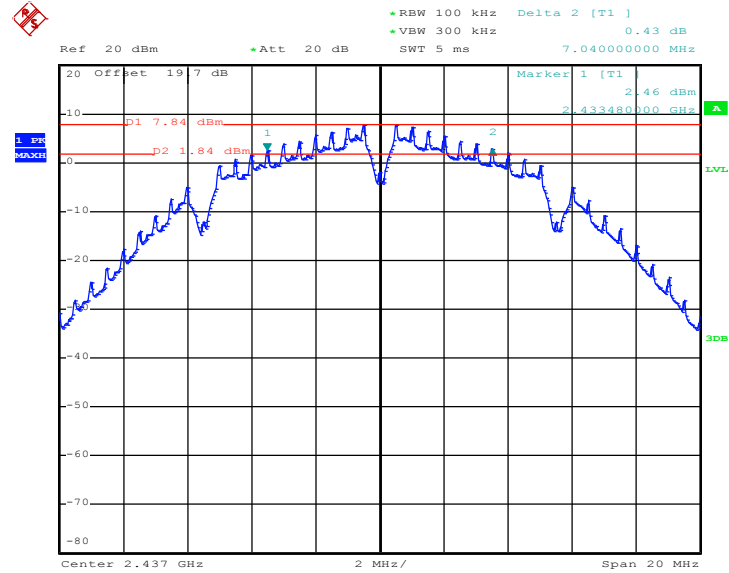
Test Mode :	Mode 1, 2, 3	Temperature :	21~23℃
Test Engineer :	Pinkston	Relative Humidity :	51~55%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	7.04	0.5	Pass
06	2437	7.04	0.5	Pass
11	2462	7.04	0.5	Pass

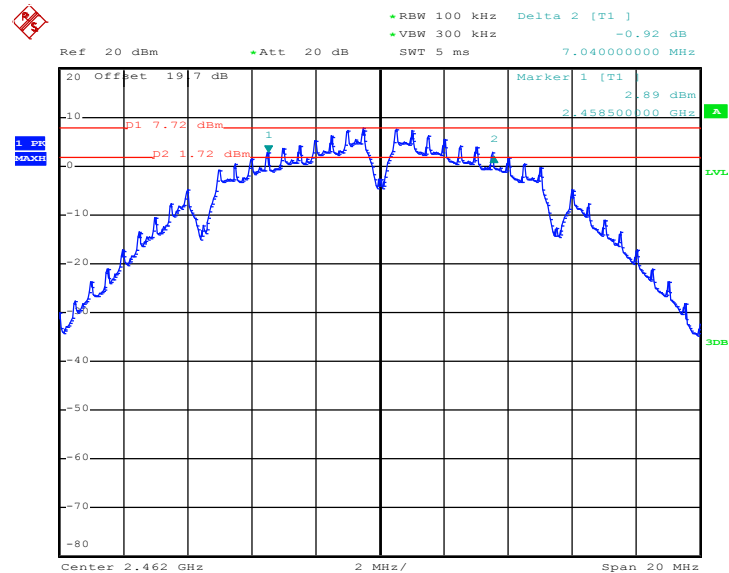
Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01



Date: 28.SEP.2011 09:42:45

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


Date: 28.SEP.2011 09:55:29

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


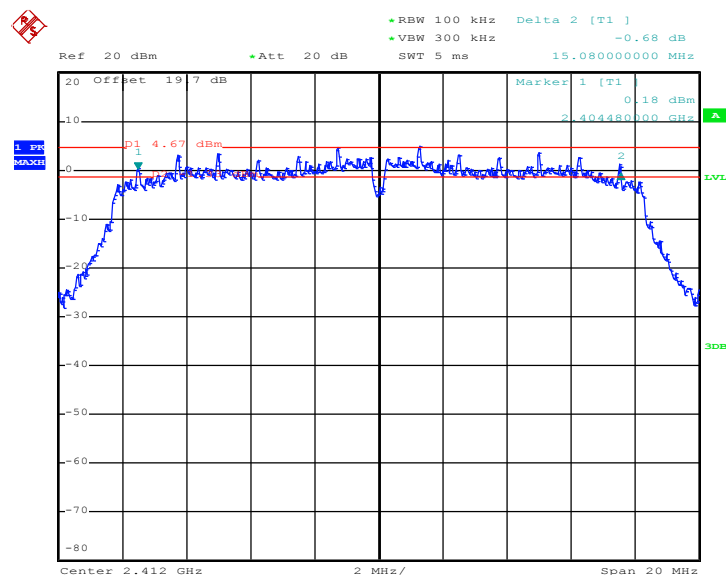
Date: 28.SEP.2011 10:08:03



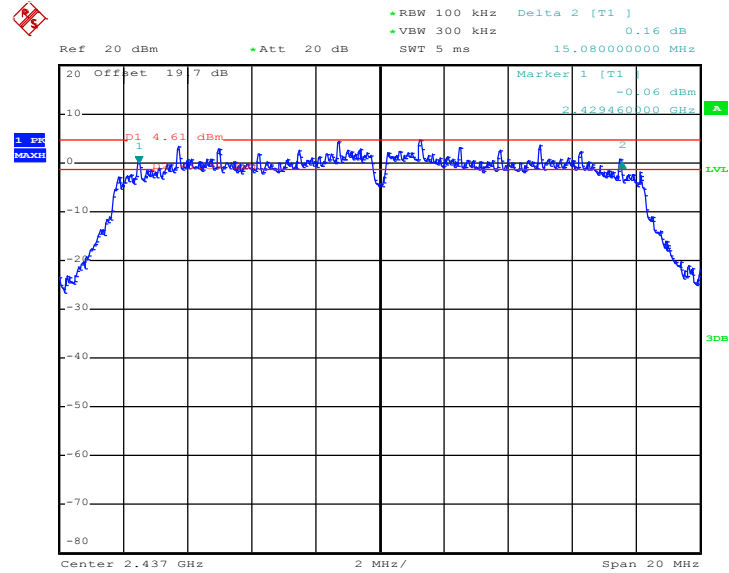
Test Mode :	Mode 4, 5, 6	Temperature :	21~23°C
Test Engineer :	Pinkston	Relative Humidity :	51~55%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	15.08	0.5	Pass
06	2437	15.08	0.5	Pass
11	2462	15.08	0.5	Pass

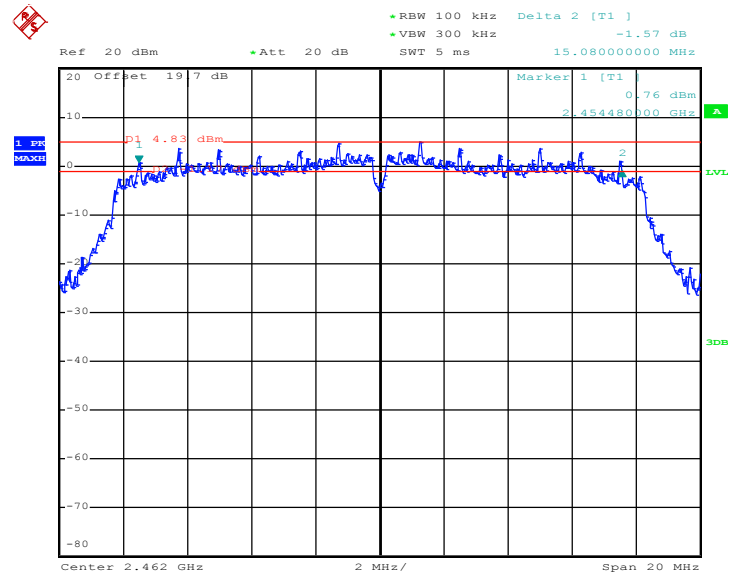
Mode 4 : 6 dB Bandwidth Plot on 802.11g Channel 01



Date: 28.SEP.2011 10:37:59

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


Date: 28.SEP.2011 10:53:07

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


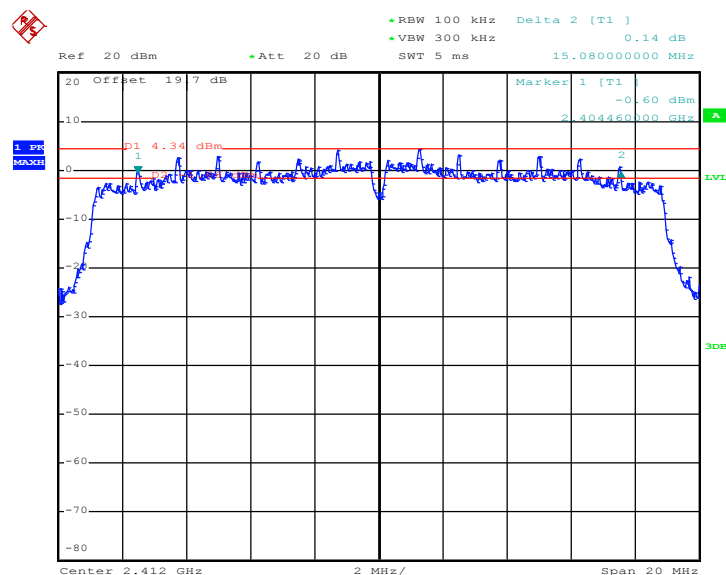
Date: 28.SEP.2011 10:21:34



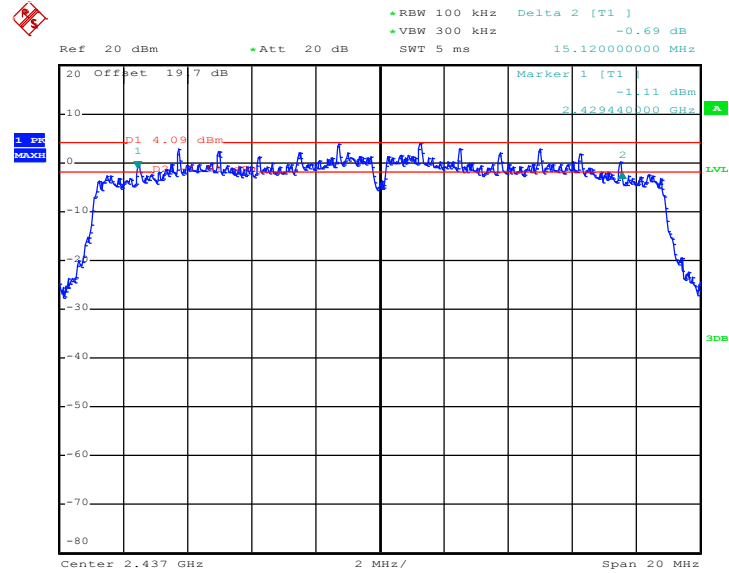
Test Mode :	Mode 7, 8, 9	Temperature :	21~23°C
Test Engineer :	Pinkston	Relative Humidity :	51~55%

Channel	Frequency (MHz)	802.11n (BW 20MHz) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	15.08	0.5	Pass
06	2437	15.12	0.5	Pass
11	2462	15.12	0.5	Pass

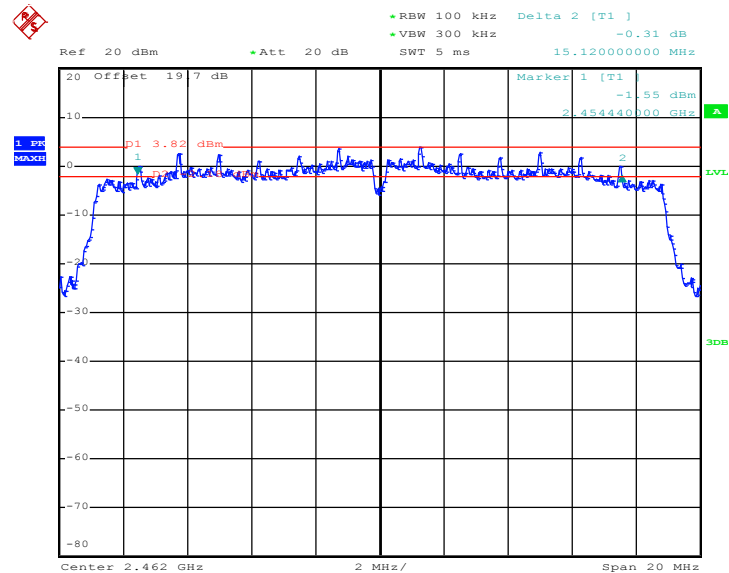
Mode 7 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 01



Date: 28.SEP.2011 11:22:51

Mode 8 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 06


Date: 28.SEP.2011 11:57:44

Mode 9 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 11


Date: 28.SEP.2011 11:39:55

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.

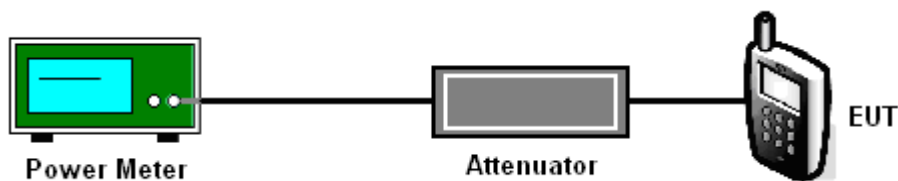
3.2.2 Measuring Instruments

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 :	21~23℃
Test Engineer :	Pinkston	Relative Humidity :	51~55%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	18.12	30	Pass
06	2437	17.92	30	Pass
11	2462	17.75	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	21~23℃
Test Engineer :	Pinkston	Relative Humidity :	51~55%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	22.10	30	Pass
06	2437	21.78	30	Pass
11	2462	21.42	30	Pass

Test Mode :	Mode 7, 8, 9	Temperature :	21~23℃
Test Engineer :	Pinkston	Relative Humidity :	51~55%

Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	22.01	30	Pass
06	2437	21.73	30	Pass
11	2462	21.59	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

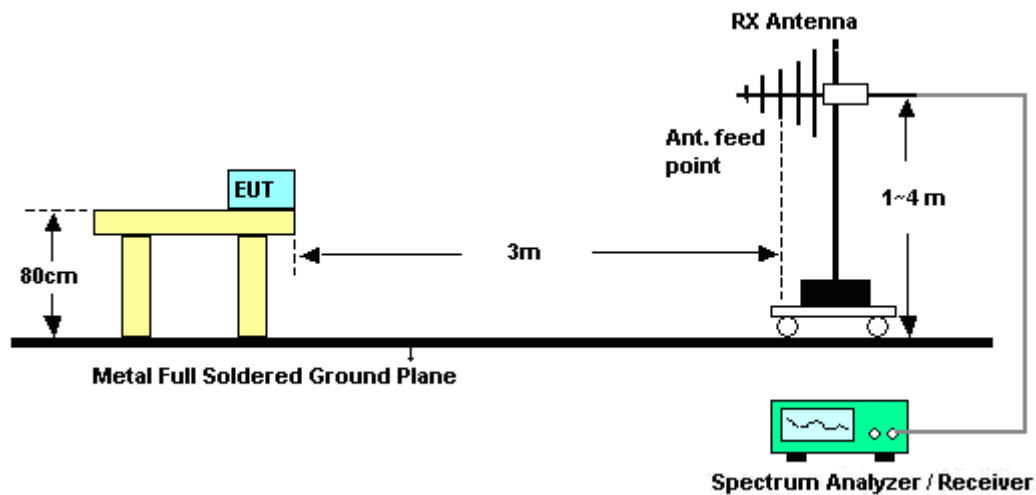
See list of measuring instruments of this test report.

3.3.3 Test Procedures

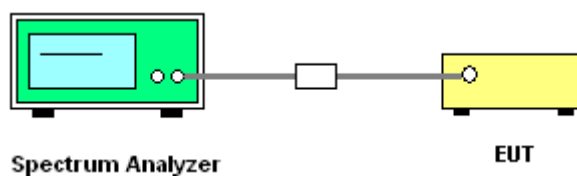
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) \geq RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized 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 :	22~25°C
Test Band :	802.11b	Relative Humidity :	53~58%
Test Channel :	01	Test Engineer :	Wii Chang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.85	57.16	-16.84	74	54.64	32.02	4.58	34.08	160	241	Peak
2388.85	45.44	-8.56	54	42.92	32.02	4.58	34.08	160	241	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.85	50.13	-23.87	74	47.61	32.02	4.58	34.08	108	114	Peak
2388.85	37.54	-16.46	54	35.02	32.02	4.58	34.08	108	114	Average

Test Mode :	Mode 3	Temperature :	22~25°C
Test Band :	802.11b	Relative Humidity :	53~58%
Test Channel :	11	Test Engineer :	Wii Chang

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
2484.23	54.47	-19.53	74	51.82	32.09	4.64	34.08	130	111	Peak
2484.23	46.78	-7.22	54	44.13	32.09	4.64	34.08	130	111	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
2488.98	47.94	-26.06	74	45.28	32.1	4.64	34.08	112	152	Peak
2488.98	37.91	-16.09	54	35.25	32.1	4.64	34.08	112	152	Average

Test Mode :	Mode 4	Temperature :	22~25°C
Test Band :	802.11g	Relative Humidity :	53~58%
Test Channel :	01	Test Engineer :	Wii Chang

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
2389.23	69.63	-4.37	74	67.11	32.02	4.58	34.08	103	151	Peak
2389.23	50.24	-3.76	54	47.72	32.02	4.58	34.08	103	151	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
2389.8	56.37	-17.63	74	53.85	32.02	4.58	34.08	114	258	Peak
2389.8	41.34	-12.66	54	38.82	32.02	4.58	34.08	114	258	Average

Test Mode :	Mode 6	Temperature :	22~25°C
Test Band :	802.11g	Relative Humidity :	53~58%
Test Channel :	11	Test Engineer :	Wii Chang

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
2483.85	71.92	-2.08	74	69.27	32.09	4.64	34.08	102	172	Peak
2483.85	51.84	-2.16	54	49.19	32.09	4.64	34.08	102	172	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	65.37	-8.63	74	62.72	32.09	4.64	34.08	112	153	Peak
2483.5	45.47	-8.53	54	42.82	32.09	4.64	34.08	112	153	Average

Test Mode :	Mode 7	Temperature :	22~25°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	53~58%
Test Channel :	01	Test Engineer :	Wii Chang

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
2389.8	72.68	-1.32	74	70.16	32.02	4.58	34.08	105	151	Peak
2389.8	50.93	-3.07	54	48.41	32.02	4.58	34.08	105	151	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.66	60.27	-13.73	74	57.75	32.02	4.58	34.08	107	215	Peak
2388.66	43.84	-10.16	54	41.32	32.02	4.58	34.08	107	215	Average

Test Mode :	Mode 9	Temperature :	22~25°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	53~58%
Test Channel :	11	Test Engineer :	Wii Chang

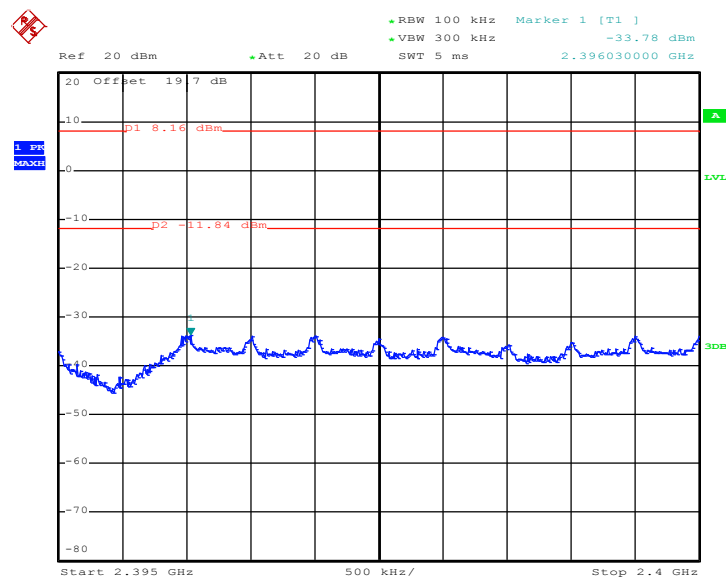
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	70.43	-3.57	74	67.78	32.09	4.64	34.08	103	171	Peak
2483.5	51.49	-2.51	54	48.84	32.09	4.64	34.08	103	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
2483.66	63.99	-10.01	74	61.34	32.09	4.64	34.08	111	154	Peak
2483.66	44.98	-9.02	54	42.33	32.09	4.64	34.08	111	154	Average

3.3.6 Test Plots of Conducted Band Edges

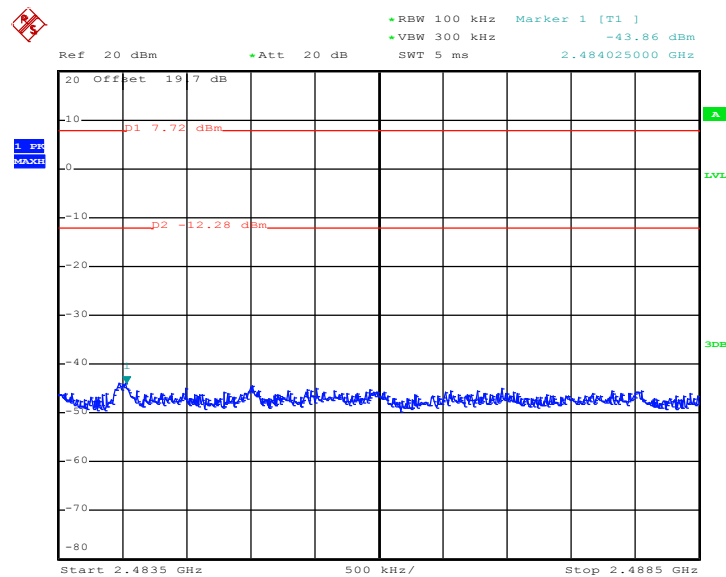
Test Mode :	Mode 1 and 3	Temperature :	21~23°C
Test Band :	802.11b	Relative Humidity :	51~55%
Test Channel :	01 and 11	Test Engineer :	Pinkston

Low Band Edge Plot on 802.11b Channel 01



Date: 28.SEP.2011 09:43:53

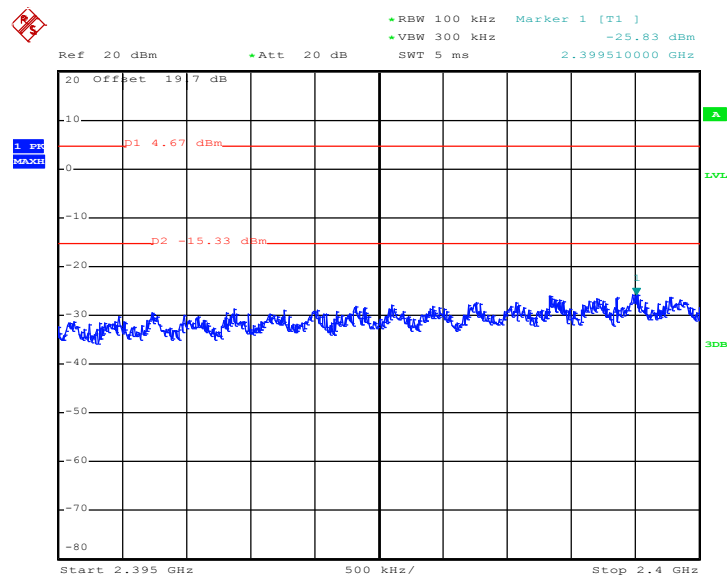
High Band Edge Plot on 802.11b Channel 11



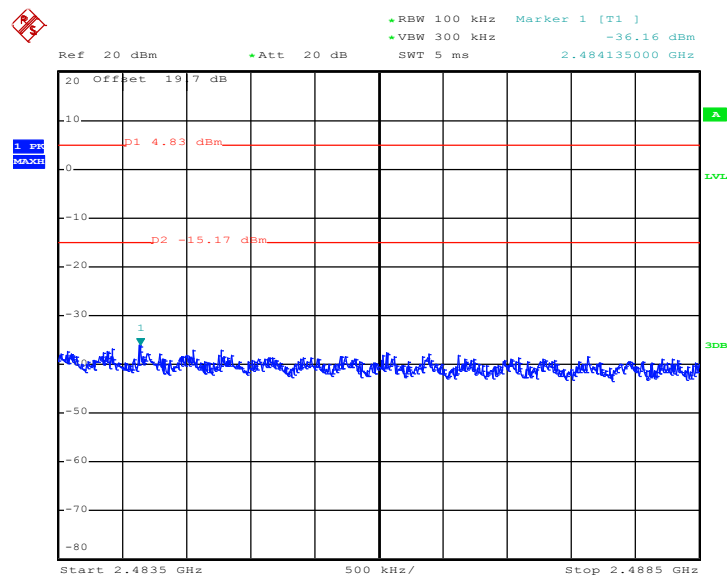
Date: 28.SEP.2011 10:08:49



Test Mode :	Mode 4 and 6	Temperature :	21~23°C
Test Band :	802.11g	Relative Humidity :	51~55%
Test Channel :	01 and 11	Test Engineer :	Pinkston

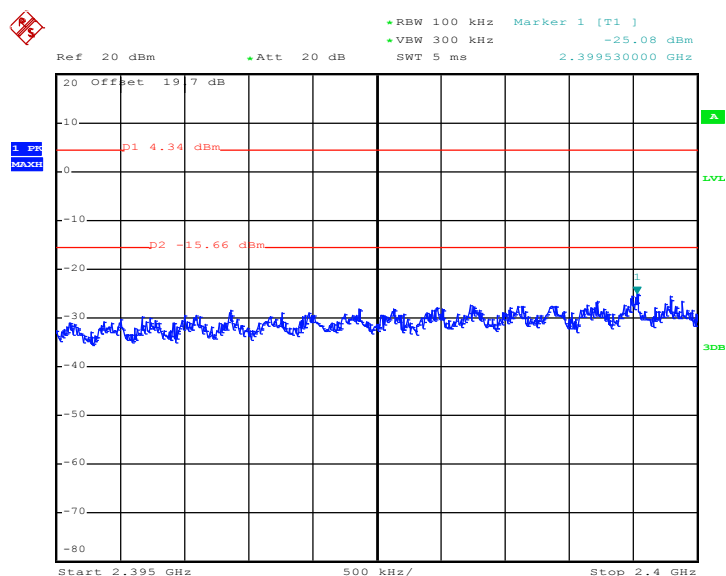
Low Band Edge Plot on 802.11g Channel 01

Date: 28.SEP.2011 10:39:07

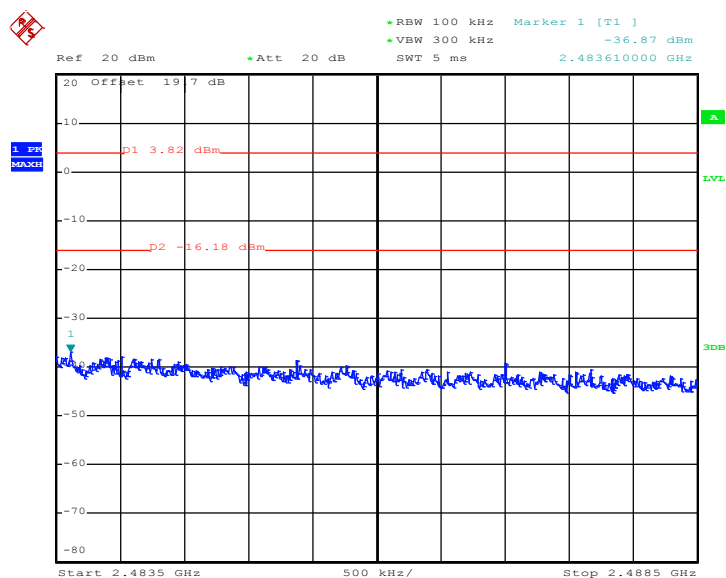
High Band Edge Plot on 802.11g Channel 11

Date: 28.SEP.2011 10:22:20

Test Mode :	Mode 7 and 9	Temperature :	21~23°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	51~55%
Test Channel :	01 and 11	Test Engineer :	Pinkston

Low Band Edge Plot on 802.11n (BW 20MHz) Channel 01


Date: 28.SEP.2011 11:23:59

High Band Edge Plot on 802.11n (BW 20MHz) Channel 11


Date: 28.SEP.2011 11:40:42

3.4 Spurious Emission Measurement

3.4.1 Limit of Spurious Emission Measurement

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

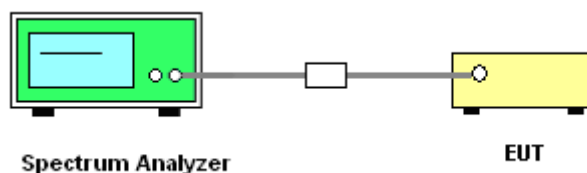
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedure

1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
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.

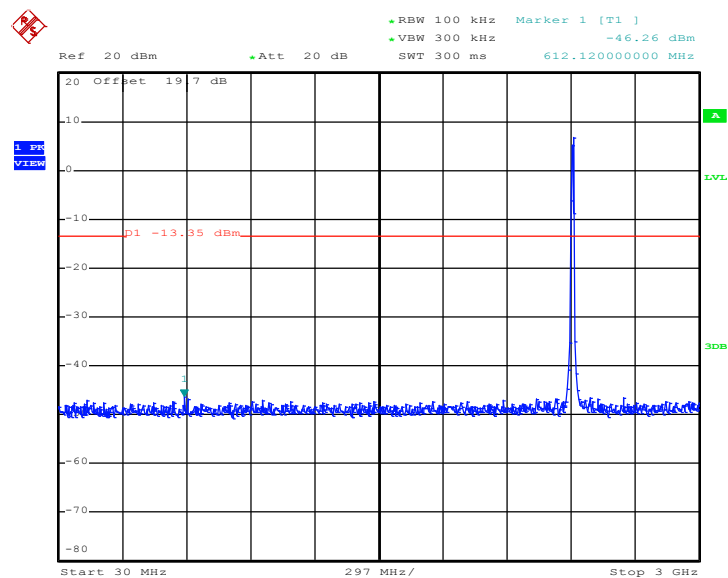
3.4.4 Test Setup



3.4.5 Test Plots of Spurious Emission

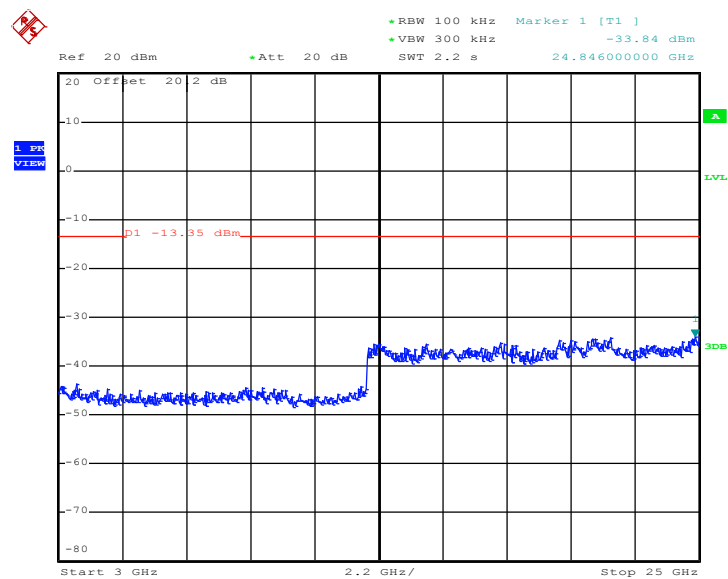
Test Mode :	Mode 1	Temperature :	21~23°C
Test Band :	802.11b	Relative Humidity :	51~55%
Test Channel :	01	Test Engineer :	Pinkston

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



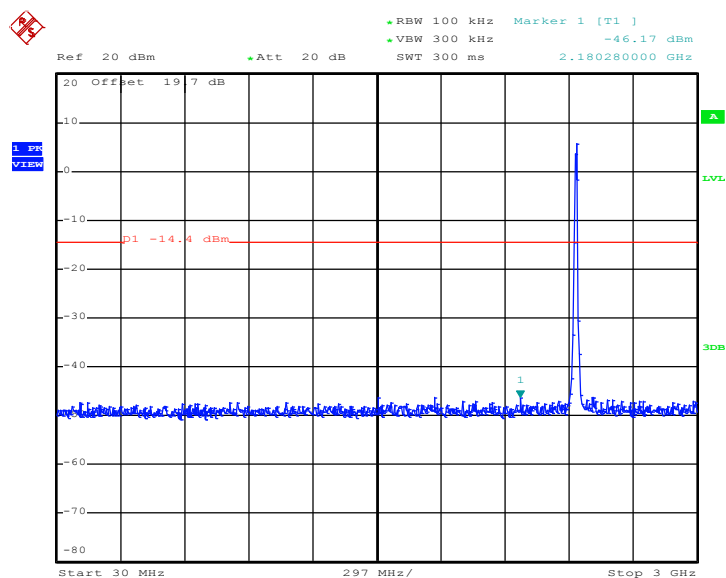
Date: 28.SEP.2011 09:53:12

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

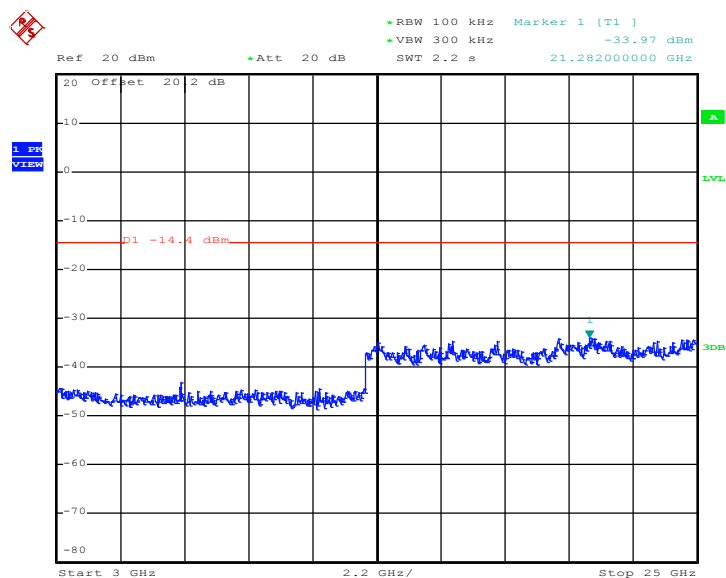


Date: 28.SEP.2011 09:53:29

Test Mode :	Mode 2	Temperature :	21~23°C
Test Band :	802.11b	Relative Humidity :	51~55%
Test Channel :	06	Test Engineer :	Pinkston

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


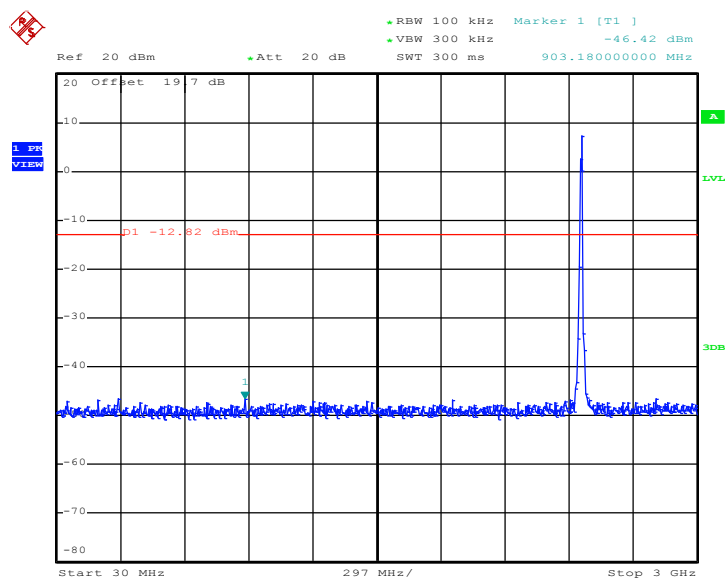
Date: 28.SEP.2011 10:05:02

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


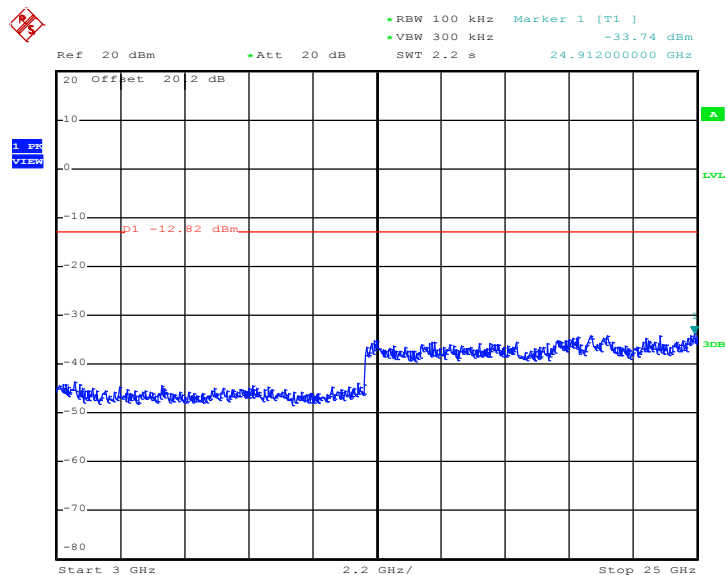
Date: 28.SEP.2011 10:05:19



Test Mode :	Mode 3	Temperature :	21~23°C
Test Band :	802.11b	Relative Humidity :	51~55%
Test Channel :	11	Test Engineer :	Pinkston

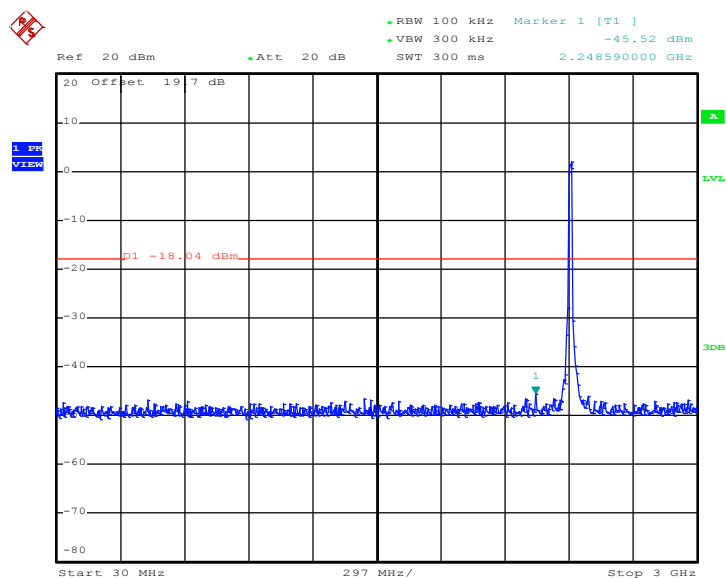
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

Date: 28.SEP.2011 10:18:09

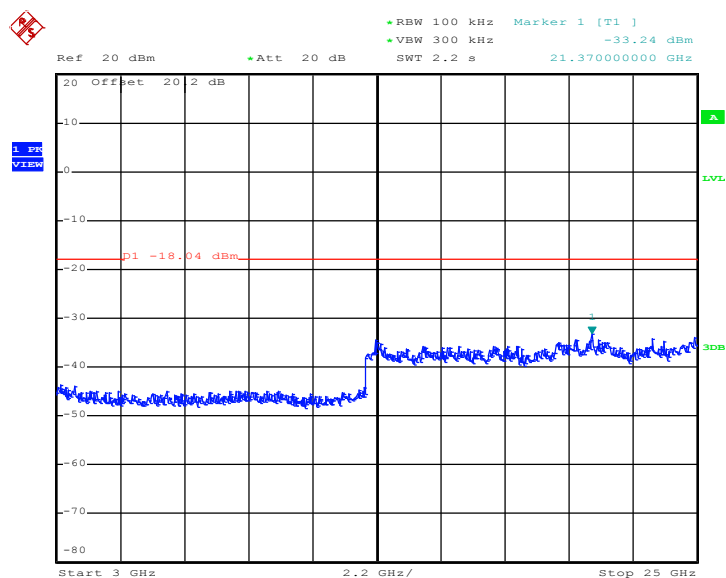
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

Date: 28.SEP.2011 10:18:26

Test Mode :	Mode 4	Temperature :	21~23°C
Test Band :	802.11g	Relative Humidity :	51~55%
Test Channel :	01	Test Engineer :	Pinkston

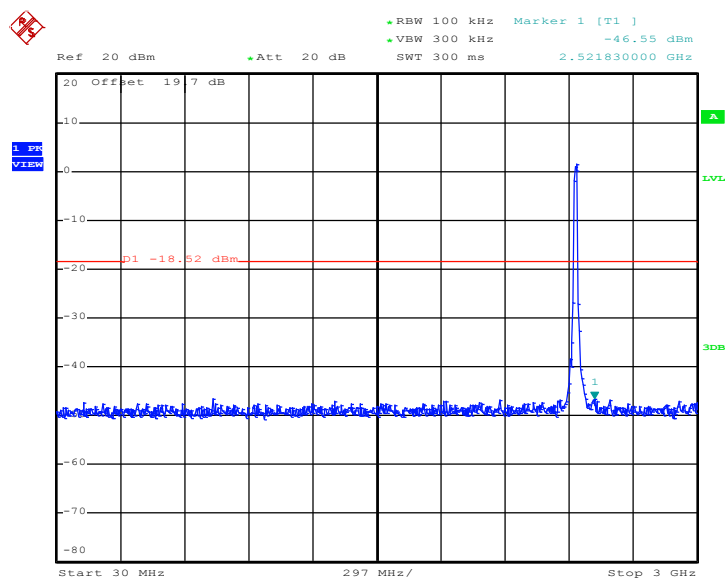
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


Date: 28.SEP.2011 10:48:56

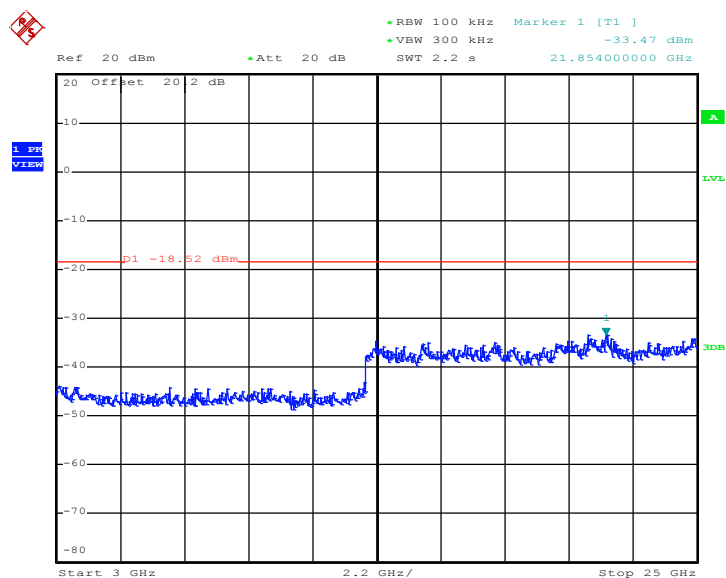
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


Date: 28.SEP.2011 10:49:13

Test Mode :	Mode 5	Temperature :	21~23
Test Band :	802.11g	Relative Humidity :	51~55
Test Channel :	06	Test Engineer :	Pinkston

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


Date: 28.SEP.2011 11:12:46

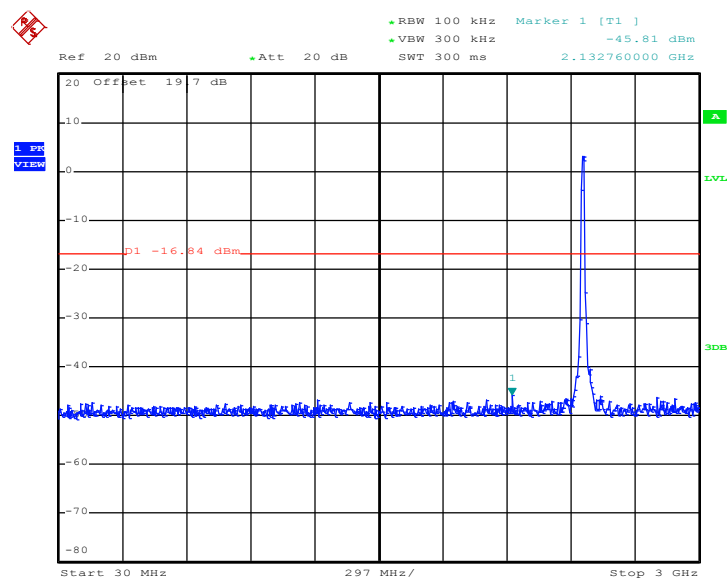
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


Date: 28.SEP.2011 11:13:03



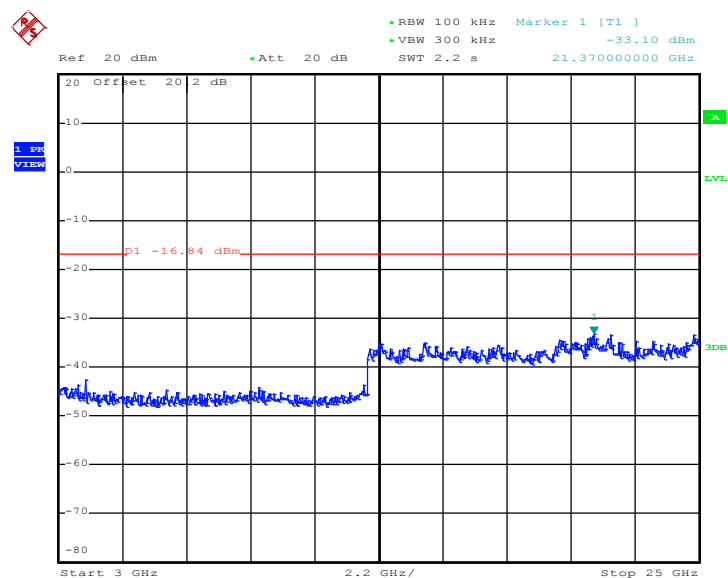
Test Mode :	Mode 6	Temperature :	21~23℃
Test Band :	802.11g	Relative Humidity :	51~55%
Test Channel :	11	Test Engineer :	Pinkston

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



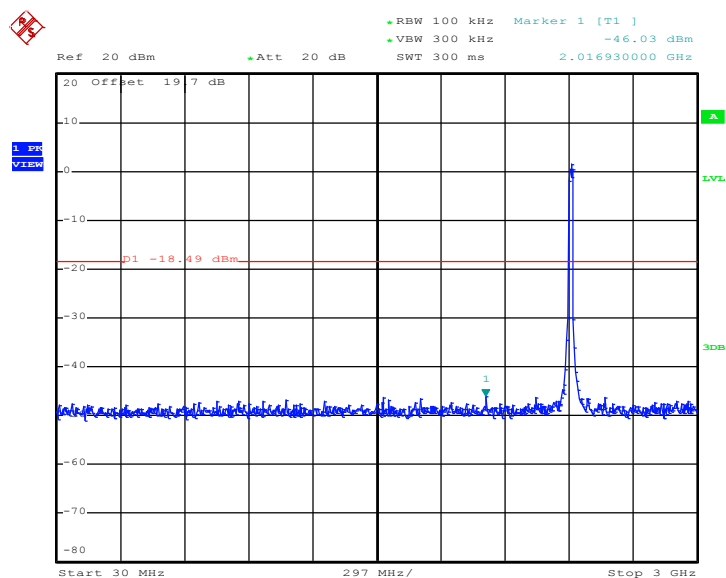
Date: 28.SEP.2011 10:32:41

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

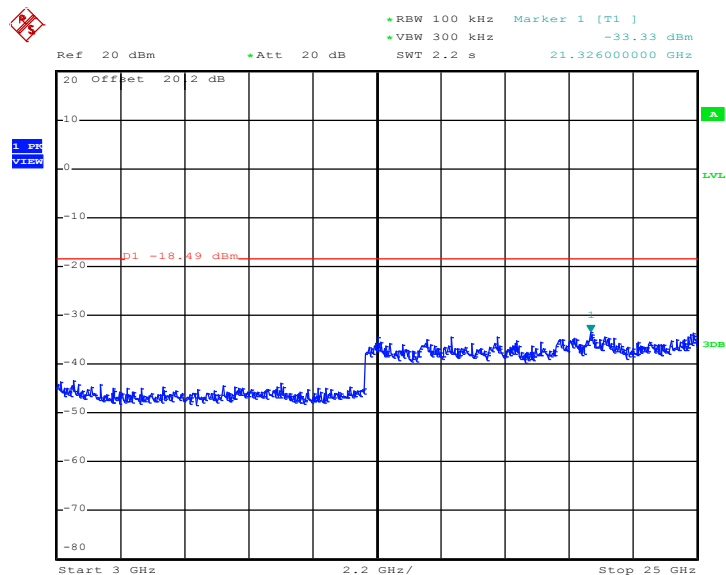


Date: 28.SEP.2011 10:32:58

Test Mode :	Mode 7	Temperature :	21~23°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	51~55%
Test Channel :	01	Test Engineer :	Pinkston

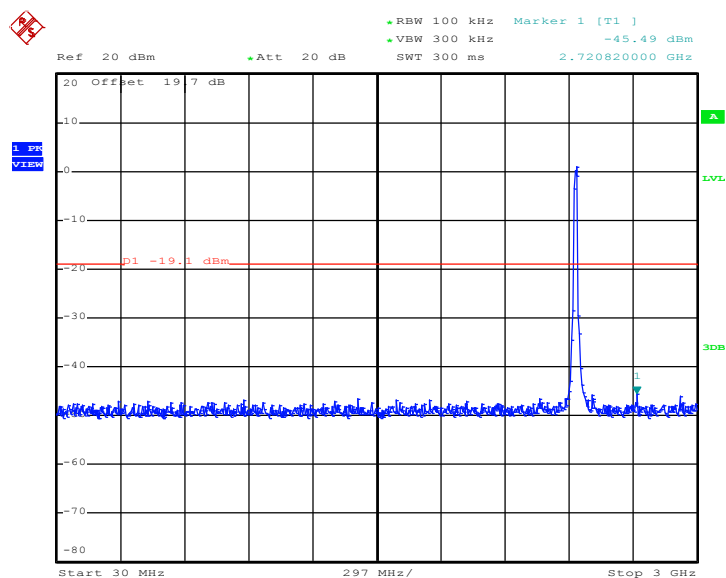
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


Date: 28.SEP.2011 11:35:25

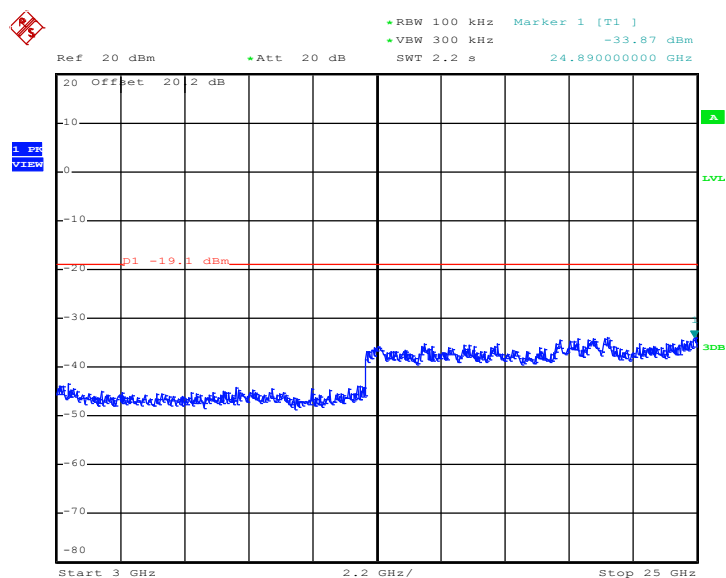
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


Date: 28.SEP.2011 11:35:42

Test Mode :	Mode 8	Temperature :	21~23°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	51~55%
Test Channel :	06	Test Engineer :	Pinkston

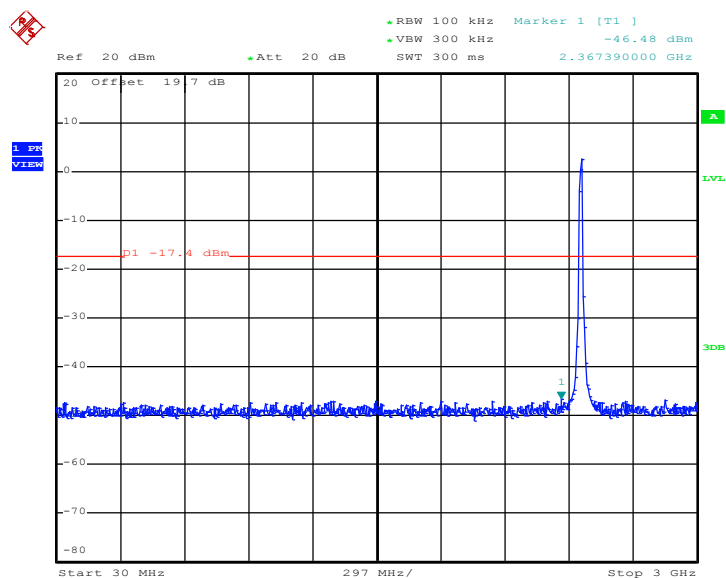
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


Date: 28.SEP.2011 12:18:26

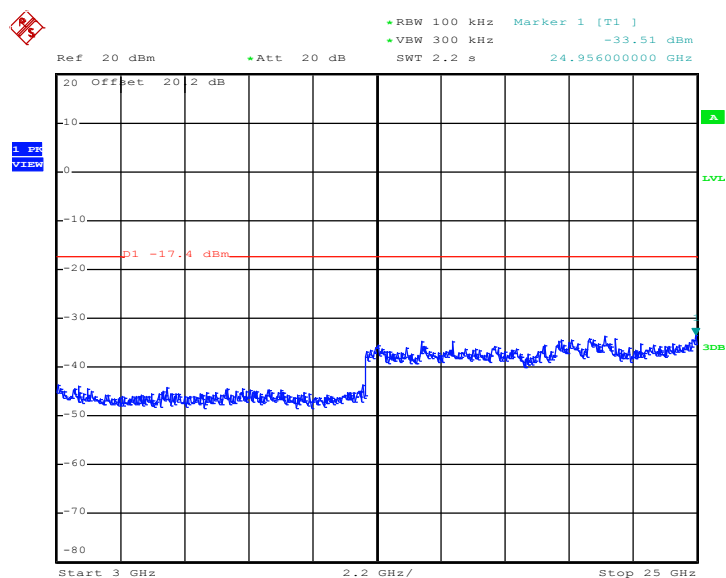
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


Date: 28.SEP.2011 12:18:43

Test Mode :	Mode 9	Temperature :	21~23°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	51~55%
Test Channel :	11	Test Engineer :	Pinkston

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


Date: 28.SEP.2011 11:55:37

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


Date: 28.SEP.2011 11:55:54

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.

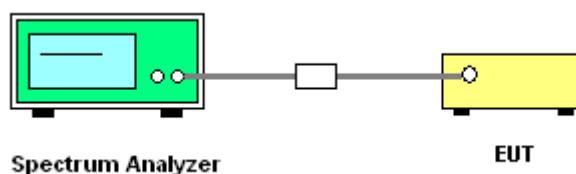
3.5.2 Measuring Instruments

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

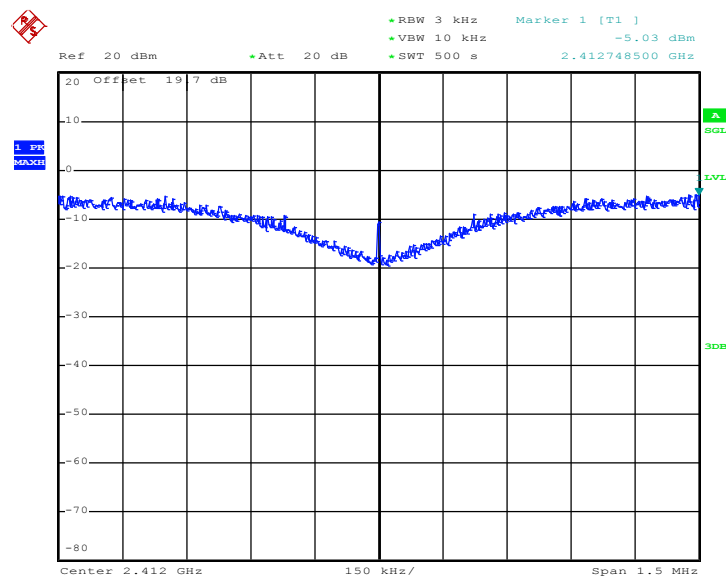


3.5.5 Test Result of Power Spectral Density

Test Mode :	Mode 1, 2, 3	Temperature :	21~23℃
Test Engineer :	Pinkston	Relative Humidity :	51~55%

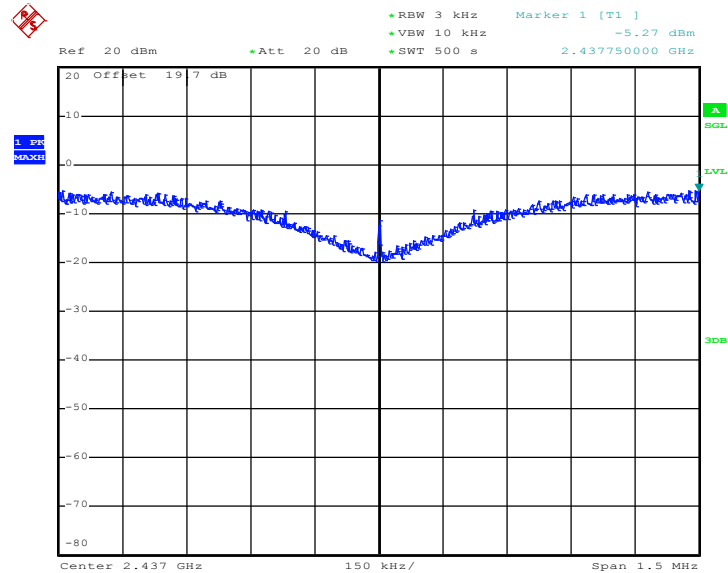
Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-5.03	8	Pass
06	2437	-5.27	8	Pass
11	2462	-5.28	8	Pass

Mode 1 : PSD Plot on 802.11b Channel 01



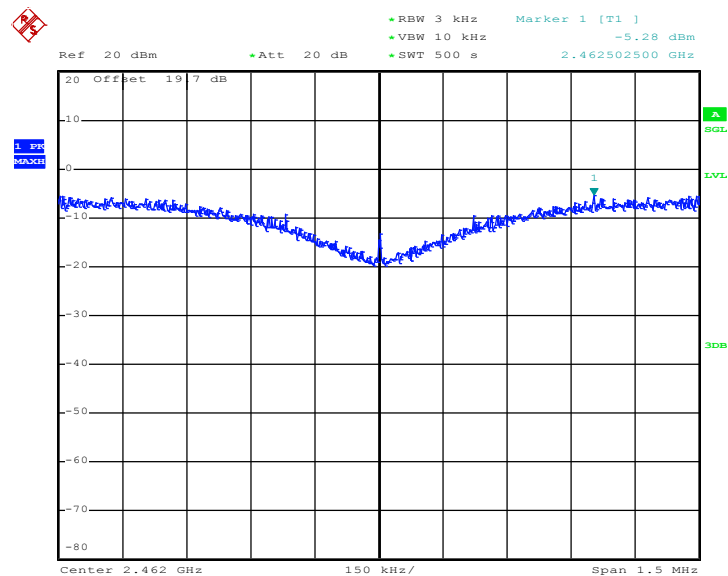
Date: 28.SEP.2011 09:52:52

Mode 2 : PSD Plot on 802.11b Channel 06



Date: 28.SEP.2011 10:04:41

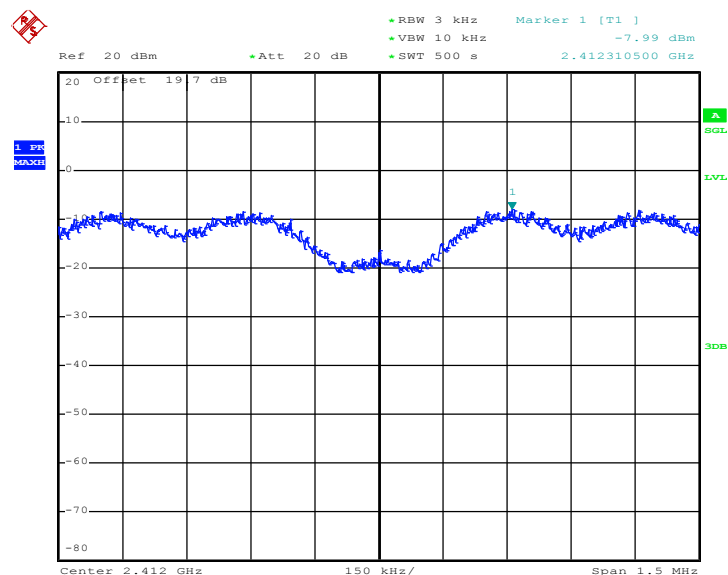
Mode 3 : PSD Plot on 802.11b Channel 11



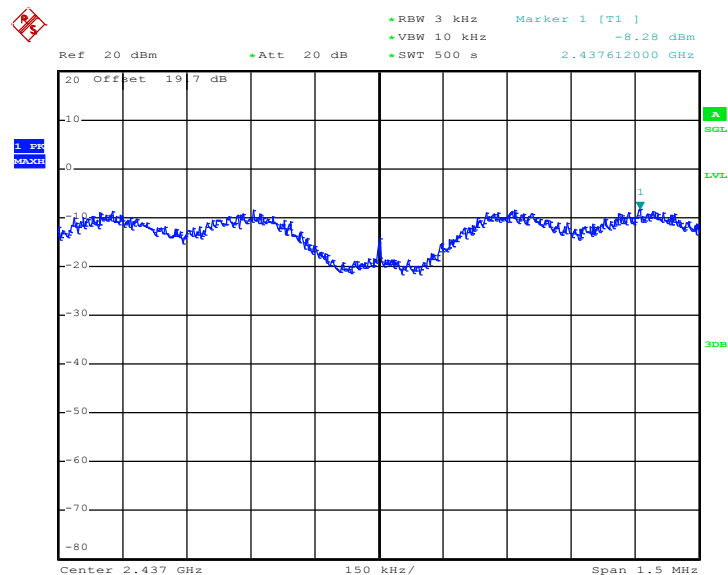
Date: 28.SEP.2011 10:17:48

Test Mode :	Mode 4, 5, 6	Temperature :	21~23°C
Test Engineer :	Pinkston	Relative Humidity :	51~55%

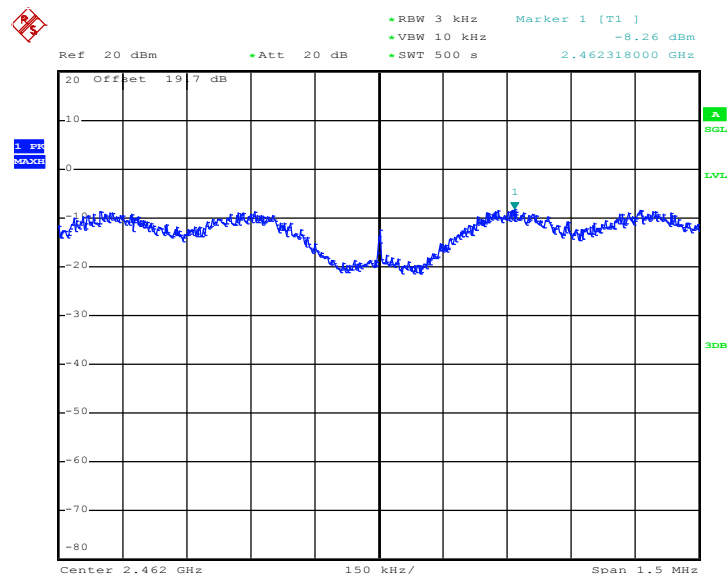
Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-7.99	8	Pass
06	2437	-8.28	8	Pass
11	2462	-8.26	8	Pass

Mode 4 : PSD Plot on 802.11g Channel 01


Date: 28.SEP.2011 10:48:35

Mode 5 : PSD Plot on 802.11g Channel 06


Date: 28.SEP.2011 11:11:45

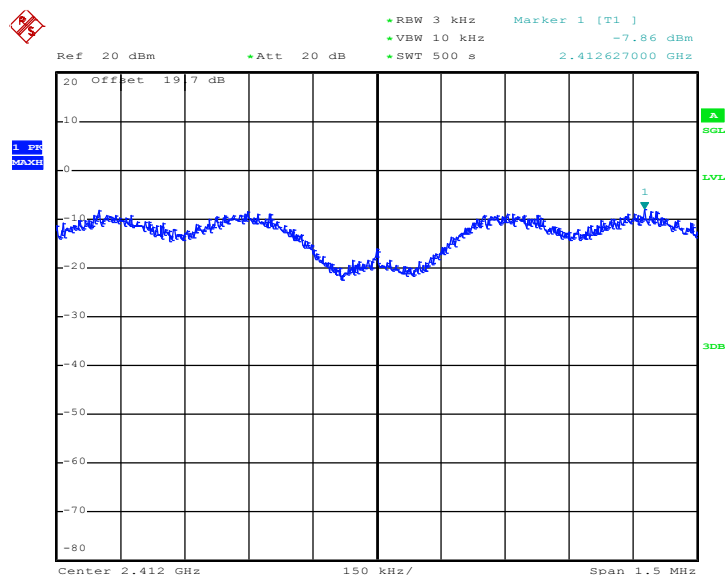
Mode 6 : PSD Plot on 802.11g Channel 11


Date: 28.SEP.2011 10:31:33



Test Mode :	Mode 7, 8, 9	Temperature :	21~23°C
Test Engineer :	Pinkston	Relative Humidity :	51~55%

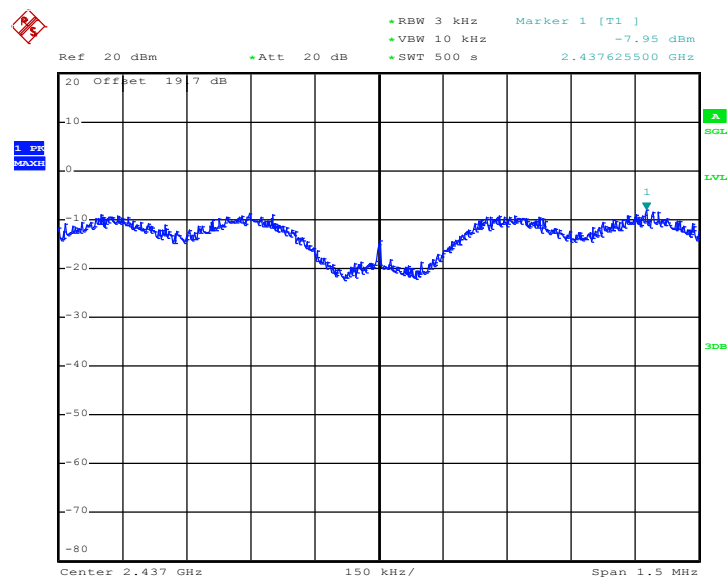
Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-7.86	8	Pass
06	2437	-7.95	8	Pass
11	2462	-7.98	8	Pass

Mode 7 : PSD Plot on 802.11n (BW 20MHz) Channel 01

Date: 28.SEP.2011 11:34:23

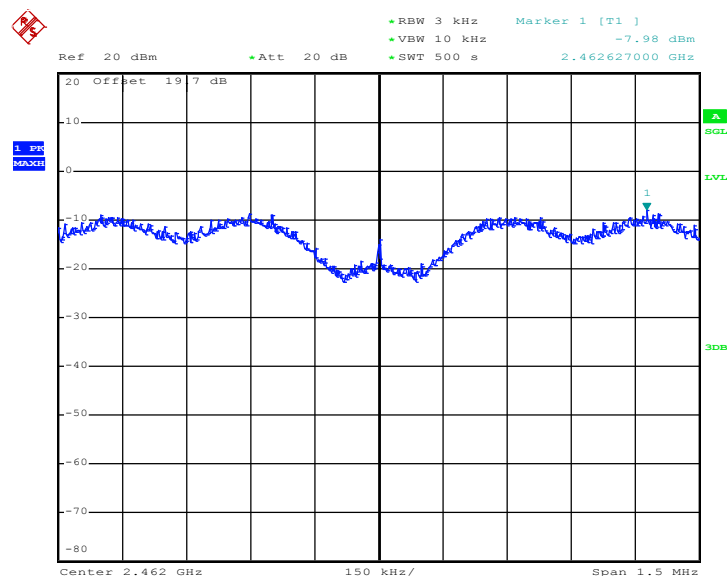


Mode 8 : PSD Plot on 802.11n (BW 20MHz) Channel 06



Date: 28.SEP.2011 12:18:05

Mode 9 : PSD Plot on 802.11n (BW 20MHz) Channel 11



Date: 28.SEP.2011 11:53:10

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.

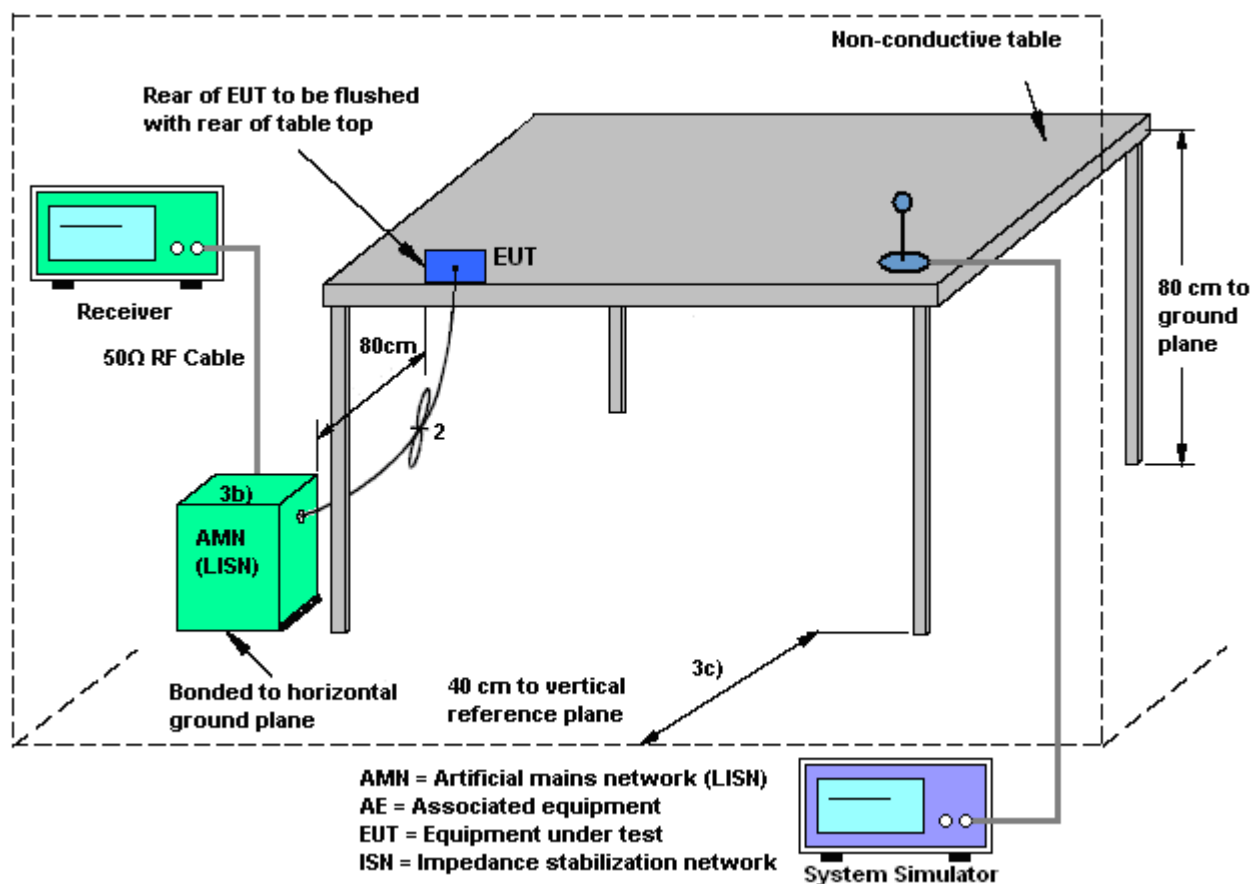
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

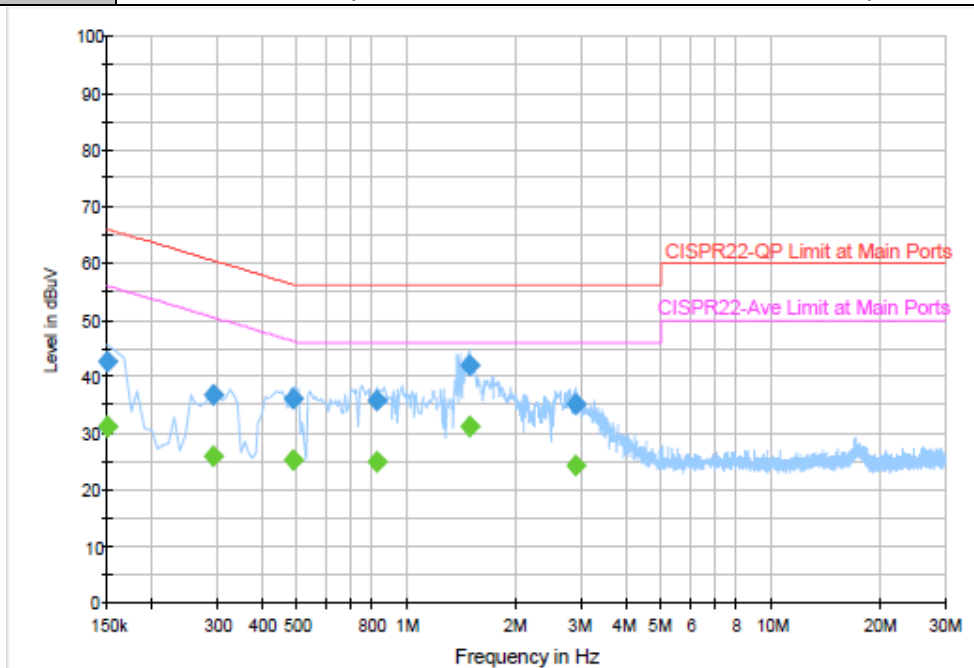
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network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



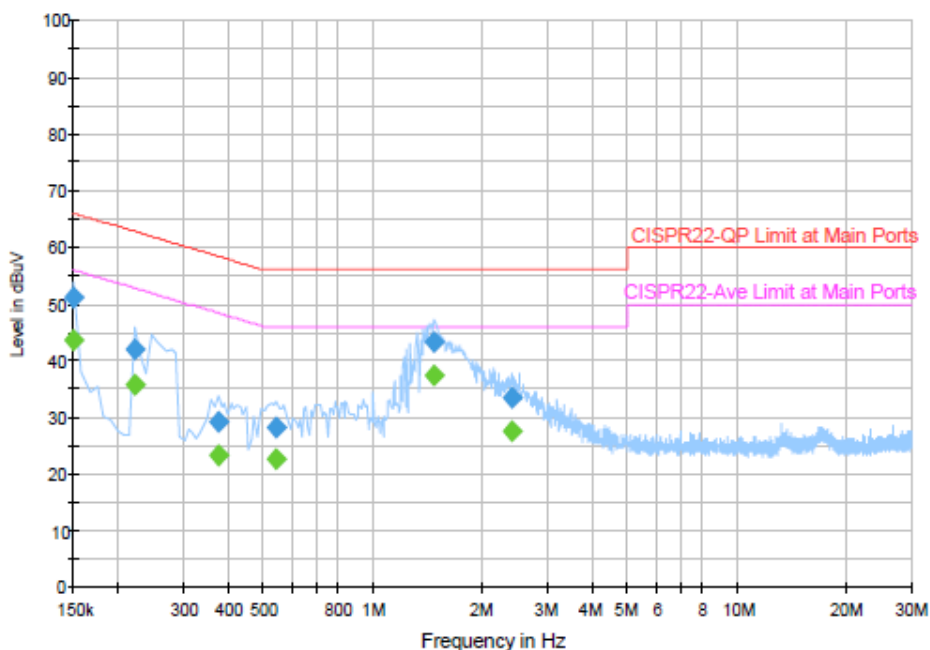
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	42.6	Off	L1	19.4	23.4	66.0
0.294000	36.6	Off	L1	19.4	23.8	60.4
0.486000	36.0	Off	L1	19.4	20.2	56.2
0.822000	35.8	Off	L1	19.4	20.2	56.0
1.478000	42.1	Off	L1	19.4	13.9	56.0
2.902000	35.0	Off	L1	19.4	21.0	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	31.3	Off	L1	19.4	24.7	56.0
0.294000	26.0	Off	L1	19.4	24.4	50.4
0.486000	25.3	Off	L1	19.4	20.9	46.2
0.822000	24.8	Off	L1	19.4	21.2	46.0
1.478000	31.2	Off	L1	19.4	14.8	46.0
2.902000	24.1	Off	L1	19.4	21.9	46.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + Camera + Adapter + Battery		
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)
0.150000	51.1	Off	N	19.4	14.9	66.0
0.222000	41.9	Off	N	19.4	20.8	62.7
0.374000	29.3	Off	N	19.4	29.1	58.4
0.542000	28.3	Off	N	19.4	27.7	56.0
1.462000	43.3	Off	N	19.5	12.7	56.0
2.390000	33.3	Off	N	19.5	22.7	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	43.7	Off	N	19.4	12.3	56.0
0.222000	35.7	Off	N	19.4	17.0	52.7
0.374000	23.2	Off	N	19.4	25.2	48.4
0.542000	22.5	Off	N	19.4	23.5	46.0
1.462000	37.3	Off	N	19.5	8.7	46.0
2.390000	27.5	Off	N	19.5	18.5	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

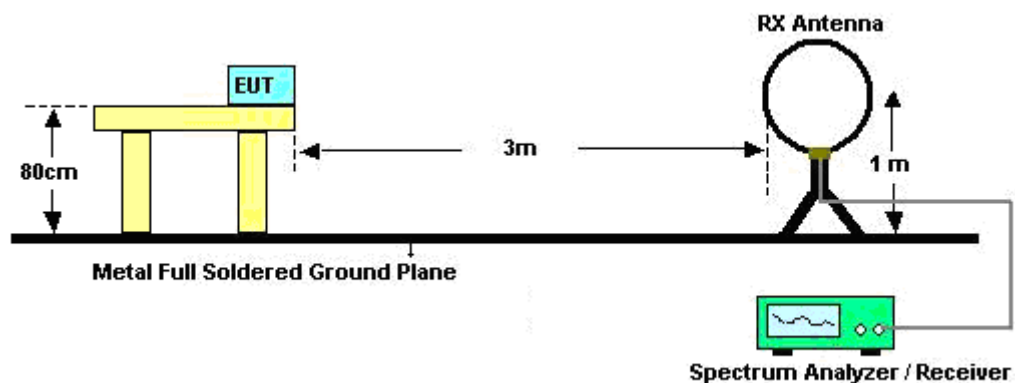
See list of measuring instruments of this test report.

3.7.3 Test Procedures

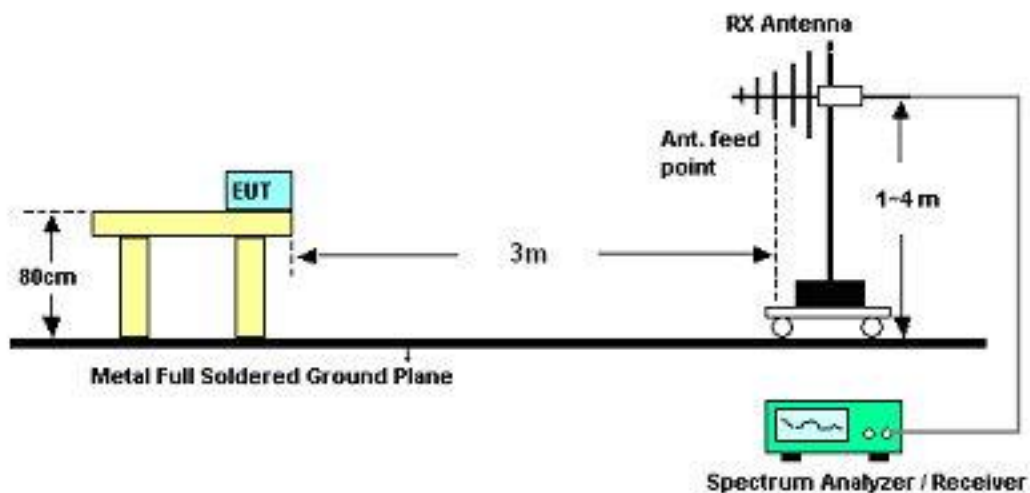
- The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
- Use the following spectrum analyzer settings:
 - Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW \geq RBW; Sweep = auto; 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

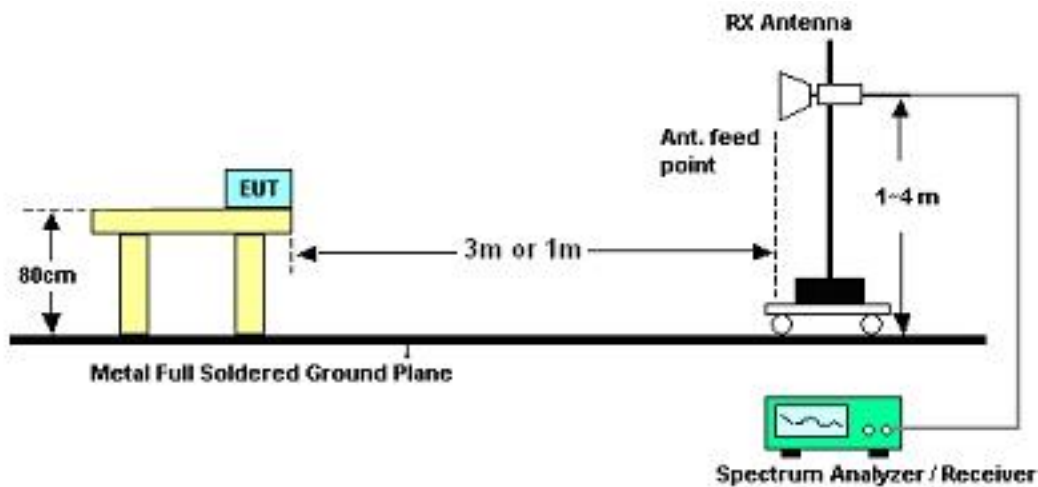
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

Test Engineer :	Wii Chang	Temperature :	22~25℃	
		Relative Humidity :	53~58%	

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 :	22~25℃
Test Channel :	01	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	Polarization :	Horizontal
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 7236 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
30.27	19.96	-20.04	40	32.46	18.36	0.7	31.56	-	-	Peak
147.45	26.94	-16.56	43.5	46.8	10.37	1.27	31.5	100	39	Peak
173.64	23.1	-20.4	43.5	44.54	8.73	1.37	31.54	-	-	Peak
344.8	13.82	-32.18	46	29.89	13.35	1.89	31.31	-	-	Peak
464.5	17.72	-28.28	46	30.43	16.25	2.17	31.13	-	-	Peak
542.2	18.63	-27.37	46	29.53	17.76	2.31	30.97	-	-	Peak
2388.85	45.44	-8.56	54	42.92	32.02	4.58	34.08	160	241	Average
2388.85	57.16	-16.84	74	54.64	32.02	4.58	34.08	160	241	Peak
2412	97.61	-	-	95.07	32.03	4.59	34.08	160	241	Average
2412	104.95	-	-	102.41	32.03	4.59	34.08	160	241	Peak
2492	41.74	-12.26	54	39.08	32.1	4.64	34.08	160	241	Average
2492	50.54	-23.46	74	47.88	32.1	4.64	34.08	160	241	Peak
7236	56.66	-28.29	84.95	69.12	35.6	8.29	56.35	100	0	Peak

Test Mode :	Mode 1	Temperature :	22~25°C
Test Channel :	01	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 7236 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
36.75	23.63	-16.37	40	39.82	14.59	0.74	31.52	-	-	Peak
134.76	28.9	-14.6	43.5	48.37	10.79	1.25	31.51	100	28	Peak
209.01	24.54	-18.96	43.5	45.68	8.83	1.5	31.47	-	-	Peak
307	17.75	-28.25	46	34.87	12.36	1.8	31.28	-	-	Peak
365.1	14.67	-31.33	46	30.16	13.85	1.93	31.27	-	-	Peak
527.5	25.3	-20.7	46	36.5	17.53	2.28	31.01	-	-	Peak
2388.85	37.54	-16.46	54	35.02	32.02	4.58	34.08	108	114	Average
2388.85	50.13	-23.87	74	47.61	32.02	4.58	34.08	108	114	Peak
2412	91.79	-	-	89.25	32.03	4.59	34.08	108	114	Average
2412	98.68	-	-	96.14	32.03	4.59	34.08	108	114	Peak
2492	36.14	-17.86	54	33.48	32.1	4.64	34.08	108	114	Average
2492	46.19	-27.81	74	43.53	32.1	4.64	34.08	108	114	Peak
7236	54.93	-23.75	78.68	67.39	35.6	8.29	56.35	100	0	Peak

Test Mode :	Mode 2	Temperature :	22~25℃
Test Channel :	06	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	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
32.43	23.94	-16.06	40	38.13	16.63	0.72	31.54	100	45	Peak
147.45	27.15	-16.35	43.5	47.01	10.37	1.27	31.5	-	-	Peak
258.15	23.03	-22.97	46	41.09	11.75	1.68	31.49	-	-	Peak
307	16.5	-29.5	46	33.62	12.36	1.8	31.28	-	-	Peak
343.4	14.25	-31.75	46	30.37	13.3	1.88	31.3	-	-	Peak
551.3	19.38	-26.62	46	30.09	17.91	2.33	30.95	-	-	Peak
2356	43.49	-10.51	54	41.04	31.99	4.55	34.09	125	110	Average
2356	50.91	-23.09	74	48.46	31.99	4.55	34.09	125	110	Peak
2437	98.27	-	-	95.68	32.06	4.61	34.08	125	110	Average
2437	105.11	-	-	102.52	32.06	4.61	34.08	125	110	Peak
2484	37.92	-16.08	54	35.27	32.09	4.64	34.08	125	110	Average
2484	49.1	-24.9	74	46.45	32.09	4.64	34.08	125	110	Peak
7311	52.16	-1.84	54	64.46	35.6	8.42	56.32	107	346	Average
7311	55.79	-18.21	74	68.09	35.6	8.42	56.32	107	346	Peak

Test Mode :	Mode 2	Temperature :	22~25℃
Test Channel :	06	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	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
36.75	24.09	-15.91	40	40.28	14.59	0.74	31.52	-	-	Peak
115.05	33.12	-10.38	43.5	52.93	10.53	1.18	31.52	100	64	Peak
135.03	29.19	-14.31	43.5	48.66	10.79	1.25	31.51	-	-	Peak
307	18.78	-27.22	46	35.9	12.36	1.8	31.28	-	-	Peak
388.2	15.66	-30.34	46	30.43	14.46	1.98	31.21	-	-	Peak
526.8	18.88	-27.12	46	30.1	17.51	2.28	31.01	-	-	Peak
2358	37.27	-16.73	54	34.79	31.99	4.57	34.08	105	113	Average
2358	46.64	-27.36	74	44.16	31.99	4.57	34.08	105	113	Peak
2437	92.02	-	-	89.43	32.06	4.61	34.08	105	113	Average
2437	98.62	-	-	96.03	32.06	4.61	34.08	105	113	Peak
2500	32.8	-21.2	54	30.14	32.1	4.64	34.08	105	113	Average
2500	44.08	-29.92	74	41.42	32.1	4.64	34.08	105	113	Peak
7311	50.54	-3.46	54	62.84	35.6	8.42	56.32	122	120	Average
7311	55.62	-18.38	74	67.92	35.6	8.42	56.32	122	120	Peak

Test Mode :	Mode 3	Temperature :	22~25°C
Test Channel :	11	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	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	20.08	-19.92	40	32.58	18.36	0.7	31.56	-	-	Peak
146.91	34.18	-9.32	43.5	54.04	10.37	1.27	31.5	100	29	Peak
258.15	20.91	-25.09	46	38.97	11.75	1.68	31.49	-	-	Peak
307	13.99	-32.01	46	31.11	12.36	1.8	31.28	-	-	Peak
393.8	15.72	-30.28	46	30.31	14.61	2	31.2	-	-	Peak
547.1	18.56	-27.44	46	29.36	17.84	2.32	30.96	-	-	Peak
2384	44.09	-9.91	54	41.59	32	4.58	34.08	130	111	Average
2384	51.5	-22.5	74	49	32	4.58	34.08	130	111	Peak
2462	98.69	-	-	96.08	32.07	4.62	34.08	130	111	Average
2462	105.78	-	-	103.17	32.07	4.62	34.08	130	111	Peak
2484.23	46.78	-7.22	54	44.13	32.09	4.64	34.08	130	111	Average
2484.23	54.47	-19.53	74	51.82	32.09	4.64	34.08	130	111	Peak
7386	53.07	-0.93	54	65.21	35.6	8.55	56.29	101	39	Average
7386	58.41	-15.59	74	70.55	35.6	8.55	56.29	101	39	Peak

Test Mode :	Mode 3	Temperature :	22~25°C
Test Channel :	11	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	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
36.75	24.95	-15.05	40	41.14	14.59	0.74	31.52	-	-	Peak
134.49	29.11	-14.39	43.5	48.58	10.79	1.25	31.51	100	91	Peak
209.01	23.81	-19.69	43.5	44.95	8.83	1.5	31.47	-	-	Peak
307	15.97	-30.03	46	33.09	12.36	1.8	31.28	-	-	Peak
426.7	22.29	-23.71	46	35.99	15.38	2.08	31.16	-	-	Peak
588.4	20.04	-25.96	46	30	18.53	2.4	30.89	-	-	Peak
2378	35.96	-18.04	54	33.47	32	4.57	34.08	112	152	Average
2378	45.61	-28.39	74	43.12	32	4.57	34.08	112	152	Peak
2462	91.76	-	-	89.15	32.07	4.62	34.08	112	152	Average
2462	98.35	-	-	95.74	32.07	4.62	34.08	112	152	Peak
2488.98	37.91	-16.09	54	35.25	32.1	4.64	34.08	112	152	Average
2488.98	47.94	-26.06	74	45.28	32.1	4.64	34.08	112	152	Peak
7386	52.97	-1.03	54	65.11	35.6	8.55	56.29	111	121	Average
7386	57.62	-16.38	74	69.76	35.6	8.55	56.29	111	121	Peak

Test Mode :	Mode 4	Temperature :	22~25°C
Test Channel :	01	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	Polarization :	Horizontal
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 7236 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	19.96	-20.04	40	32.46	18.36	0.7	31.56			Peak
147.45	26.74	-16.76	43.5	46.6	10.37	1.27	31.5	100	87	Peak
233.58	18.72	-27.28	46	38.11	10.52	1.59	31.5	-	-	Peak
307	14.61	-31.39	46	31.73	12.36	1.8	31.28	-	-	Peak
419.7	15.89	-30.11	46	29.77	15.23	2.06	31.17	-	-	Peak
595.4	19.81	-26.19	46	29.64	18.64	2.41	30.88	-	-	Peak
2389.23	50.24	-3.76	54	47.72	32.02	4.58	34.08	103	151	Average
2389.23	69.63	-4.37	74	67.11	32.02	4.58	34.08	103	151	Peak
2412	91.51	-	-	88.97	32.03	4.59	34.08	103	151	Average
2412	108.09	-	-	105.55	32.03	4.59	34.08	103	151	Peak
2497.72	40.49	-13.51	54	37.83	32.1	4.64	34.08	103	151	Average
2497.72	54.36	-19.64	74	51.7	32.1	4.64	34.08	103	151	Peak
7236	56.46	-31.63	88.09	68.92	35.6	8.29	56.35	100	0	Peak

Test Mode :	Mode 4	Temperature :	22~25°C
Test Channel :	01	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 7236 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
33.51	33	-7	40	47.74	16.06	0.73	31.53	100	51	Peak
135.03	28.9	-14.6	43.5	48.37	10.79	1.25	31.51	-	-	Peak
282.72	26.04	-19.96	46	43.66	12	1.74	31.36	-	-	Peak
307	19.75	-26.25	46	36.87	12.36	1.8	31.28	-	-	Peak
439.3	17.24	-28.76	46	30.62	15.67	2.11	31.16	-	-	Peak
608	20.42	-25.58	46	30.07	18.75	2.45	30.85	-	-	Peak
2389.8	41.34	-12.66	54	38.82	32.02	4.58	34.08	114	258	Average
2389.8	56.37	-17.63	74	53.85	32.02	4.58	34.08	114	258	Peak
2412	84.8	-	-	82.26	32.03	4.59	34.08	114	258	Average
2412	100.04	-	-	97.5	32.03	4.59	34.08	114	258	Peak
2490	33.48	-20.52	54	30.82	32.1	4.64	34.08	114	258	Average
2490	45.37	-28.63	74	42.71	32.1	4.64	34.08	114	258	Peak
7236	55.38	-24.66	80.04	67.84	35.6	8.29	56.35	100	0	Peak

Test Mode :	Mode 5	Temperature :	22~25℃
Test Channel :	06	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	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	19.35	-20.65	40	31.85	18.36	0.7	31.56	-	-	Peak
147.45	27.63	-15.87	43.5	47.49	10.37	1.27	31.5	100	57	Peak
258.15	22.4	-23.6	46	40.46	11.75	1.68	31.49	-	-	Peak
307	14.2	-31.8	46	31.32	12.36	1.8	31.28	-	-	Peak
406.4	16.12	-29.88	46	30.35	14.92	2.03	31.18	-	-	Peak
570.2	19.05	-26.95	46	29.37	18.23	2.37	30.92	-	-	Peak
2378.59	40.93	-13.07	54	38.44	32	4.57	34.08	104	169	Average
2378.59	57.3	-16.7	74	54.81	32	4.57	34.08	104	169	Peak
2437	91.51	-	-	88.92	32.06	4.61	34.08	104	169	Average
2437	107.34	-	-	104.75	32.06	4.61	34.08	104	169	Peak
2483.5	39.19	-14.81	54	36.54	32.09	4.64	34.08	104	169	Average
2483.5	55.58	-18.42	74	52.93	32.09	4.64	34.08	104	169	Peak
7311	44.71	-9.29	54	57.01	35.6	8.42	56.32	107	347	Average
7311	56.17	-17.83	74	68.47	35.6	8.42	56.32	107	347	Peak

Test Mode :	Mode 5	Temperature :	22~25°C
Test Channel :	06	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	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
39.99	24.74	-15.26	40	42.24	13.26	0.75	31.51	-	-	Peak
132.06	29	-14.5	43.5	48.45	10.84	1.23	31.52	100	21	Peak
209.01	24.71	-18.79	43.5	45.85	8.83	1.5	31.47	-	-	Peak
307	19	-27	46	36.12	12.36	1.8	31.28	-	-	Peak
402.2	18.73	-27.27	46	33.06	14.83	2.02	31.18	-	-	Peak
617.8	20.54	-25.46	46	30.1	18.79	2.48	30.83	-	-	Peak
2386	36.7	-17.3	54	34.18	32.02	4.58	34.08	152	61	Average
2386	48.52	-25.48	74	46	32.02	4.58	34.08	152	61	Peak
2437	85.92	-	-	83.33	32.06	4.61	34.08	152	61	Average
2437	100.14	-	-	97.55	32.06	4.61	34.08	152	61	Peak
2484	35.44	-18.56	54	32.79	32.09	4.64	34.08	152	61	Average
2484	52.02	-21.98	74	49.37	32.09	4.64	34.08	152	61	Peak
7311	43.43	-10.57	54	55.73	35.6	8.42	56.32	134	121	Average
7311	55.68	-18.32	74	67.98	35.6	8.42	56.32	134	121	Peak

Test Mode :	Mode 6	Temperature :	22~25°C
Test Channel :	11	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	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	19.79	-20.21	40	32.29	18.36	0.7	31.56	-	-	Peak
147.45	27.62	-15.88	43.5	47.48	10.37	1.27	31.5	100	41	Peak
282.72	20.97	-25.03	46	38.59	12	1.74	31.36	-	-	Peak
337.8	14.51	-31.49	46	30.8	13.14	1.87	31.3	-	-	Peak
370	17.69	-28.31	46	33	14	1.95	31.26	-	-	Peak
493.9	17.88	-28.12	46	29.83	16.92	2.22	31.09	-	-	Peak
2386.95	43.06	-10.94	54	40.54	32.02	4.58	34.08	102	172	Average
2386.95	55.77	-18.23	74	53.25	32.02	4.58	34.08	102	172	Peak
2462	90.66	-	-	88.05	32.07	4.62	34.08	102	172	Average
2462	106.18	-	-	103.57	32.07	4.62	34.08	102	172	Peak
2483.85	51.84	-2.16	54	49.19	32.09	4.64	34.08	102	172	Average
2483.85	71.92	-2.08	74	69.27	32.09	4.64	34.08	102	172	Peak
7386	45.88	-8.12	54	58.02	35.6	8.55	56.29	100	41	Average
7386	60.07	-13.93	74	72.21	35.6	8.55	56.29	100	41	Peak

Test Mode :	Mode 6	Temperature :	22~25°C
Test Channel :	11	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	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
39.99	26.27	-13.73	40	43.77	13.26	0.75	31.51	100	64	Peak
132.06	28.95	-14.55	43.5	48.4	10.84	1.23	31.52	-	-	Peak
209.01	23.38	-20.12	43.5	44.52	8.83	1.5	31.47	-	-	Peak
307	17.69	-28.31	46	34.81	12.36	1.8	31.28	-	-	Peak
402.9	17.27	-28.73	46	31.6	14.83	2.02	31.18	-	-	Peak
538.7	27.46	-18.54	46	38.43	17.7	2.31	30.98	-	-	Peak
2388	35.58	-18.42	54	33.06	32.02	4.58	34.08	112	153	Average
2388	47.56	-26.44	74	45.04	32.02	4.58	34.08	112	153	Peak
2462	84.16	-	54	81.55	32.07	4.62	34.08	112	153	Average
2462	99.82	-	74	97.21	32.07	4.62	34.08	112	153	Peak
2483.5	45.47	-8.53	54	42.82	32.09	4.64	34.08	112	153	Average
2483.5	65.37	-8.63	74	62.72	32.09	4.64	34.08	112	153	Peak
7386	45.15	-8.85	54	57.29	35.6	8.55	56.29	123	122	Average
7386	58.03	-15.97	74	70.17	35.6	8.55	56.29	123	122	Peak

Test Mode :	Mode 7	Temperature :	22~25°C
Test Channel :	01	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	Polarization :	Horizontal
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 7236 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	19.54	-20.46	40	32.04	18.36	0.7	31.56	-	-	Peak
147.45	27.36	-16.14	43.5	47.22	10.37	1.27	31.5	100	211	Peak
258.15	20.59	-25.41	46	38.65	11.75	1.68	31.49	-	-	Peak
340.6	13.79	-32.21	46	29.99	13.22	1.88	31.3	-	-	Peak
379.1	17.61	-28.39	46	32.65	14.23	1.96	31.23	-	-	Peak
526.1	18.76	-27.24	46	30	17.49	2.28	31.01	-	-	Peak
2389.8	50.93	-3.07	54	48.41	32.02	4.58	34.08	105	151	Average
2389.8	72.68	-1.32	74	70.16	32.02	4.58	34.08	105	151	Peak
2412	90.74	-	-	88.2	32.03	4.59	34.08	105	151	Average
2412	107.26	-	-	104.72	32.03	4.59	34.08	105	151	Peak
2485.75	40.08	-13.92	54	37.43	32.09	4.64	34.08	105	151	Average
2485.75	53.51	-20.49	74	50.86	32.09	4.64	34.08	105	151	Peak
7236	56.34	-30.92	87.26	68.8	35.6	8.29	56.35	100	0	Peak

Test Mode :	Mode 7	Temperature :	22~25°C
Test Channel :	01	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 7236 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
39.99	26.43	-13.57	40	43.93	13.26	0.75	31.51	100	131	Peak
135.03	28.63	-14.87	43.5	48.1	10.79	1.25	31.51	-	-	Peak
282.72	24.07	-21.93	46	41.69	12	1.74	31.36	-	-	Peak
307	18.09	-27.91	46	35.21	12.36	1.8	31.28	-	-	Peak
402.9	17.41	-28.59	46	31.74	14.83	2.02	31.18	-	-	Peak
594.7	20.46	-25.54	46	30.31	18.62	2.41	30.88	-	-	Peak
2388.66	43.84	-10.16	54	41.32	32.02	4.58	34.08	107	215	Average
2388.66	60.27	-13.73	74	57.75	32.02	4.58	34.08	107	215	Peak
2412	83.73	-	-	81.19	32.03	4.59	34.08	107	215	Average
2412	99.95	-	-	97.41	32.03	4.59	34.08	107	215	Peak
2488	36.41	-17.59	54	33.75	32.1	4.64	34.08	107	215	Average
2488	47.98	-26.02	74	45.32	32.1	4.64	34.08	107	215	Peak
7236	54.69	-25.26	79.95	67.15	35.6	8.29	56.35	100	0	Peak

Test Mode :	Mode 8	Temperature :	22~25°C
Test Channel :	06	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	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	19.47	-20.53	40	31.97	18.36	0.7	31.56	-	-	Peak
147.45	26.85	-16.65	43.5	46.71	10.37	1.27	31.5	100	50	Peak
258.15	21.08	-24.92	46	39.14	11.75	1.68	31.49	-	-	Peak
307	14.32	-31.68	46	31.44	12.36	1.8	31.28	-	-	Peak
367.2	16.85	-29.15	46	32.24	13.93	1.94	31.26	-	-	Peak
735.4	22.45	-23.55	46	30.52	19.8	2.72	30.59	-	-	Peak
2385.62	41.51	-12.49	54	38.99	32.02	4.58	34.08	105	169	Average
2385.62	59.11	-14.89	74	56.59	32.02	4.58	34.08	105	169	Peak
2437	90.34	-	-	87.75	32.06	4.61	34.08	105	169	Average
2437	106.28	-	-	103.69	32.06	4.61	34.08	105	169	Peak
2485.18	39.93	-14.07	54	37.28	32.09	4.64	34.08	105	169	Average
2485.18	57.16	-16.84	74	54.51	32.09	4.64	34.08	105	169	Peak
7311	43.66	-10.34	54	55.96	35.6	8.42	56.32	107	346	Average
7311	55.58	-18.42	74	67.88	35.6	8.42	56.32	107	346	Peak

Test Mode :	Mode 8	Temperature :	22~25°C
Test Channel :	06	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	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
39.99	26.99	-13.01	40	44.49	13.26	0.75	31.51	100	123	Peak
147.45	29.15	-14.35	43.5	49.01	10.37	1.27	31.5	-	-	Peak
209.01	23.91	-19.59	43.5	45.05	8.83	1.5	31.47	-	-	Peak
307	17.08	-28.92	46	34.2	12.36	1.8	31.28	-	-	Peak
404.3	17.74	-28.26	46	32.03	14.87	2.02	31.18	-	-	Peak
480.6	18.75	-27.25	46	31.03	16.63	2.2	31.11	-	-	Peak
2388	36.43	-17.57	54	33.91	32.02	4.58	34.08	104	115	Average
2388	48.72	-25.28	74	46.2	32.02	4.58	34.08	104	115	Peak
2437	83.63	-	-	81.04	32.06	4.61	34.08	104	115	Average
2437	99.83	-	-	97.24	32.06	4.61	34.08	104	115	Peak
2484	34.31	-19.69	54	31.66	32.09	4.64	34.08	104	115	Average
2484	47.63	-26.37	74	44.98	32.09	4.64	34.08	104	115	Peak
7311	42.66	-11.34	54	54.96	35.6	8.42	56.32	112	121	Average
7311	55.89	-18.11	74	68.19	35.6	8.42	56.32	112	121	Peak

Test Mode :	Mode 9	Temperature :	22~25°C
Test Channel :	11	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	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	19.33	-20.67	40	31.83	18.36	0.7	31.56	-	-	Peak
147.45	26.65	-16.85	43.5	46.51	10.37	1.27	31.5	100	32	Peak
258.15	21.69	-24.31	46	39.75	11.75	1.68	31.49	-	-	Peak
365.8	17.14	-28.86	46	32.6	13.88	1.93	31.27	-	-	Peak
517.7	18.6	-27.4	46	29.99	17.37	2.27	31.03	-	-	Peak
631.1	20.63	-25.37	46	30.06	18.85	2.53	30.81	-	-	Peak
2387.14	42.38	-11.62	54	39.86	32.02	4.58	34.08	103	171	Average
2387.14	55.77	-18.23	74	53.25	32.02	4.58	34.08	103	171	Peak
2462	88.55	-	-	85.94	32.07	4.62	34.08	103	171	Average
2462	106.66	-	-	104.05	32.07	4.62	34.08	103	171	Peak
2483.5	51.49	-2.51	54	48.84	32.09	4.64	34.08	103	171	Average
2483.5	70.43	-3.57	74	67.78	32.09	4.64	34.08	103	171	Peak
7386	45.09	-8.91	54	57.23	35.6	8.55	56.29	100	41	Average
7386	59.52	-14.48	74	71.66	35.6	8.55	56.29	100	41	Peak

Test Mode :	Mode 9	Temperature :	22~25°C
Test Channel :	11	Relative Humidity :	53~58%
Test Engineer :	Wii Chang	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
39.99	28.99	-11.01	40	46.49	13.26	0.75	31.51	100	21	Peak
135.03	29.03	-14.47	43.5	48.5	10.79	1.25	31.51	-	-	Peak
209.01	24.47	-19.03	43.5	45.61	8.83	1.5	31.47	-	-	Peak
307	16.97	-29.03	46	34.09	12.36	1.8	31.28	-	-	Peak
406.4	17.88	-28.12	46	32.11	14.92	2.03	31.18	-	-	Peak
568.1	19.74	-26.26	46	30.11	18.19	2.36	30.92	-	-	Peak
2388	35.31	-18.69	54	32.79	32.02	4.58	34.08	111	154	Average
2388	47.82	-26.18	74	45.3	32.02	4.58	34.08	111	154	Peak
2462	83.6	-	-	80.99	32.07	4.62	34.08	111	154	Average
2462	99.89	-	-	97.28	32.07	4.62	34.08	111	154	Peak
2483.66	44.98	-9.02	54	42.33	32.09	4.64	34.08	111	154	Average
2483.66	63.99	-10.01	74	61.34	32.09	4.64	34.08	111	154	Peak
7386	44.14	-9.86	54	56.28	35.6	8.55	56.29	122	124	Average
7386	57.01	-16.99	74	69.15	35.6	8.55	56.29	122	124	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	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 13, 2011	Sep. 28, 2011	Jun. 12, 2012	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 18, 2011	Sep. 28, 2011	Sep. 17, 2012	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 18, 2011	Sep. 28, 2011	Sep. 17, 2012	Conducted (TH02-HY)
Power Meter	Agilent	E4416A	GB41292344	N/A	Feb. 18, 2011	Sep. 28, 2011	Feb. 17, 2012	Conducted (TH02-HY)
Power Sensor	Agilent	E9327A	US40441548	N/A	Feb. 18, 2011	Sep. 28, 2011	Feb. 17, 2012	Conducted (TH02-HY)
EMI Test Receive	R&S	ESCI 7	100724	9kHz~7GHz	Aug. 22, 2011	Oct. 25, 2011 ~ Oct. 26, 2011	Aug. 21, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz ~ 30MHz	Dec. 03, 2010	Oct. 25, 2011 ~ Oct. 26, 2011	Dec. 02, 2011	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz ~ 30MHz	Dec. 01, 2010	Oct. 25, 2011 ~ Oct. 26, 2011	Nov. 30, 2011	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Oct. 25, 2011 ~ Oct. 26, 2011	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	112403	N/A	Feb. 22, 2011	Oct. 25, 2011 ~ Oct. 26, 2011	Feb. 21, 2012	Conduction (CO05-HY)
Spectrum Analyzer	R&S	FSP30	101352	9KHz-30GHz	Nov. 03, 2011	Nov. 07, 2011 ~ Nov. 08, 2011	Nov. 02, 2012	Radiation (03CH05-HY)
COM-POWER	Double Ridge Horn	AH-118	701030	1GHz~18GHz	N/A	Nov. 07, 2011 ~ Nov. 08, 2011	N/A	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2725	30MHz ~ 1GHz	Oct. 22, 2011	Nov. 07, 2011 ~ Nov. 08, 2011	Oct. 21, 2012	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 - 360 degree	N/A	Nov. 07, 2011 ~ Nov. 08, 2011	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m - 4 m	N/A	Nov. 07, 2011 ~ Nov. 08, 2011	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	66584	1GHz ~ 18GHz	Aug. 04, 2011	Nov. 07, 2011 ~ Nov. 08, 2011	Aug. 03, 2012	Radiation (03CH05-HY)
COM-POWER	COM-POWER	PA-103	161075	1KHz - 1GHz	Mar. 29, 2011	Nov. 07, 2011 ~ Nov. 08, 2011	Mar. 28, 2012	Radiation (03CH05-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz~18GHz	Jul. 19, 2011	Nov. 07, 2011 ~ Nov. 08, 2011	Jul. 18, 2012	Radiation (03CH05-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	159087	1GHz~18GHz	Feb. 21, 2011	Nov. 07, 2011 ~ Nov. 08, 2011	Feb. 20, 2012	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A019 17	1GHz- 26.5GHz	Apr. 14, 2011	Nov. 07, 2011 ~ Nov. 08, 2011	Apr. 13, 2012	Radiation (03CH05-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				



Appendix A. Photographs of EUT

Please refer to Sporton report number EP190323 as below.