

FCC RF Test Report

APPLICANT : D-Link Corporation
EQUIPMENT : HSPA+ Mobile Router
BRAND NAME : D-Link
MODEL NAME : DWR-730
FCC ID : KA2WR730A1
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Nov. 23, 2011 and completely tested on Dec. 23, 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
FR1N2312-01	Rev. 01	Initial issue of report	Jan. 06, 2012
FR1N2312-01	Rev. 02	Update report for revising WLAN Antenna Type	Jan. 18, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	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 10.20 dB at 0.150 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 4.66 dB at 2389.420 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

D-Link Corporation

No. 289, Sinhu 3rd Rd, Neihu District Taipei City 114 Taiwan

1.2 Manufacturer

AzureWave Technologies, Inc.

8F., No. 94, Baozhong Rd., Xindian, Taipei Taiwan 231

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	HSPA+ Mobile Router
Brand Name	D-Link
Model Name	DWR-730
FCC ID	KA2WR730A1
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz
Number of Channels	11
Carrier Frequency of Each Channel	$2412 + (n-1) \times 5$ MHz; $n=1 \sim 11$
Channel Spacing	5 MHz
Maximum Output Power to Antenna	802.11b : 13.36 dBm (0.0217 W) 802.11g : 20.62 dBm (0.1153 W) 802.11n (BW 20MHz) : 19.98 dBm (0.0995 W) 802.11n (BW 40MHz) : 20.34 dBm (0.1081 W)
Antenna Type	PIFA Antenna with gain 1.00 dBi
Type of Antenna Connector	N/A
HW Version	A1
SW Version	1.00
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Identical Prototype

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

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL 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	03CH07-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.	Notebook	DELL	P20G	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
4.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 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:

Band	2.4GHz 802.11b RF Power (dBm)			2.4GHz 802.11g RF Power (dBm)		
Channel	1	6	11	1	6	11
Frequency (MHz)	2412	2437	2462	2412	2437	2462
Peak Power	13.36	12.62	12.73	20.62	20.42	20.12

Band	2.4GHz 802.11n (BW 20MHz) RF Power (dBm)		
Channel	1	6	11
Frequency (MHz)	2412	2437	2462
Peak Power	19.98	19.59	19.02

Band	2.4GHz 802.11n (BW 40MHz) RF Power (dBm)		
Channel	3	6	9
Frequency (MHz)	2422	2437	2452
Peak Power	20.34	19.82	19.46

Remark:

1. All the test data for each data rate were verified, but only the worst case was reported.
2. The data rates of WLAN 802.11b/g/n were set in 1Mbps for 802.11b, 6Mbps for 802.11g, MCS0 for 802.11n (BW 20MHz), and MCS0 for 802.11n (BW 40MHz) for all the test cases due to the highest RF output power.
3. The EUT is programmed to transmit signals continuously for all testing.

2.2 Test Mode

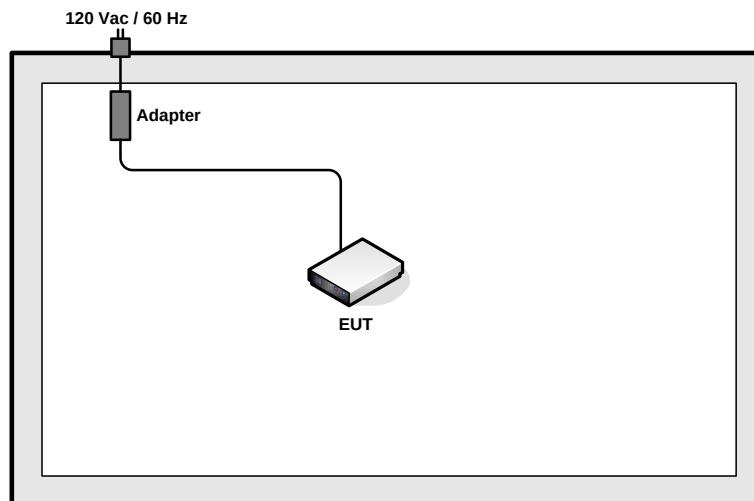
The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 KHz to 30 MHz), radiated emission (30 MHz to the 10th harmonic 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.

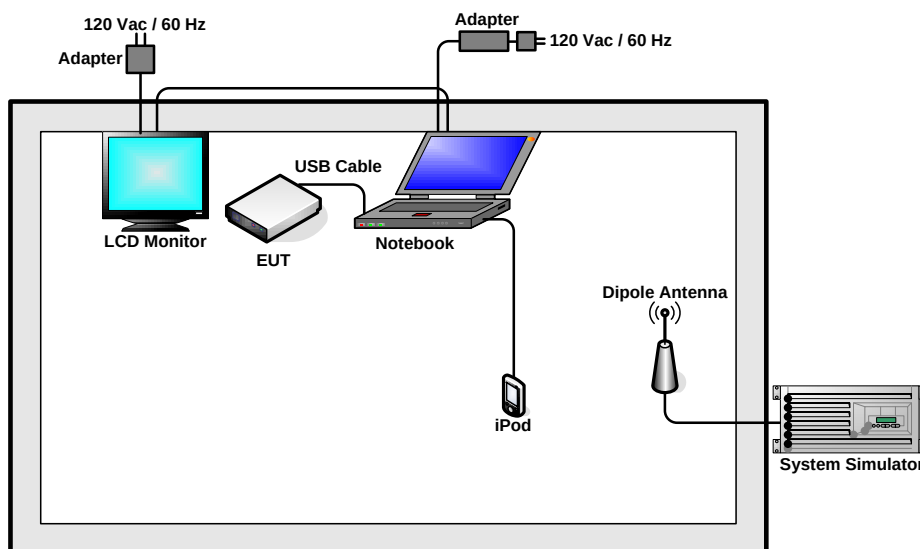
Test Cases		
Test Item	802.11b (Modulation : DSSS)	802.11g/n (Modulation : OFDM)
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4: 802.11g_CH01_2412 MHz Mode 5: 802.11g_CH06_2437 MHz Mode 6: 802.11g_CH11_2462 MHz Mode 7: 802.11n (BW 20M)_CH01_2412 MHz Mode 8: 802.11n (BW 20M)_CH06_2437 MHz Mode 9: 802.11n (BW 20M)_CH11_2462 MHz Mode 10: 802.11n (BW 40M)_CH03_2422 MHz Mode 11: 802.11n (BW 40M)_CH06_2437 MHz Mode 12: 802.11n (BW 40M)_CH09_2452 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 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 Mode 10: 802.11n (BW 40M)_CH03_2422 MHz Mode 11: 802.11n (BW 40M)_CH09_2452 MHz
AC Conducted Emission	Mode 1 :GSM850 Idle + WLAN Link + USB Cable (Charging from Notebook) Mode 2 :GSM1900 Idle + WLAN Link + USB Cable (Charging from Notebook) Mode 3 : GSM850 Idle + WLAN Link + USB Cable (Data Link with Notebook)	
Remark:		
1. The worst case of conducted emission is mode 3; only the test data of it was reported.		
2. Link with Notebook means data application transferred mode between EUT and Notebook.		

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.4 RF Utility

The programmed RF utility through command provides 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.

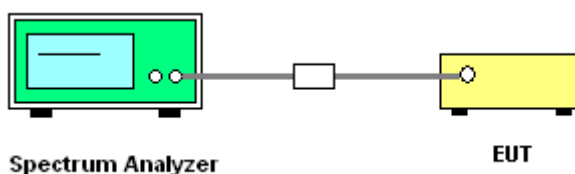
3.1.2 Measuring Instruments

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

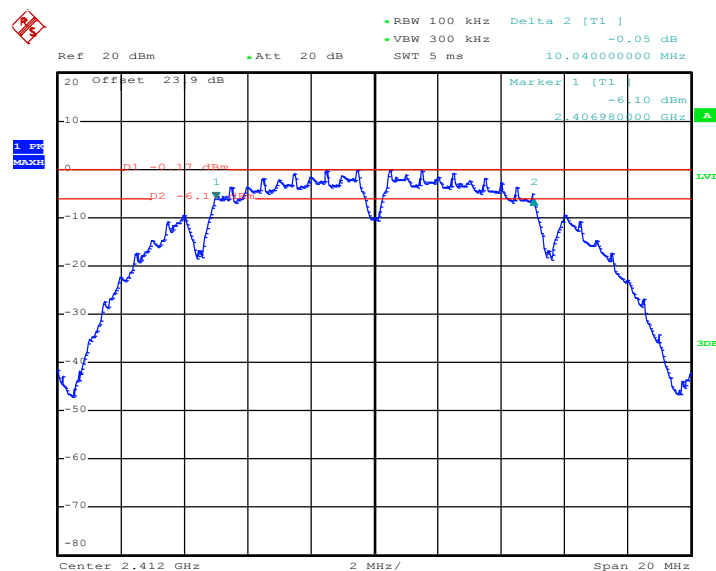


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	21~25℃
Test Engineer :	Reece Li	Relative Humidity :	48~54%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	10.04	0.5	Pass
06	2437	10.00	0.5	Pass
11	2462	10.04	0.5	Pass

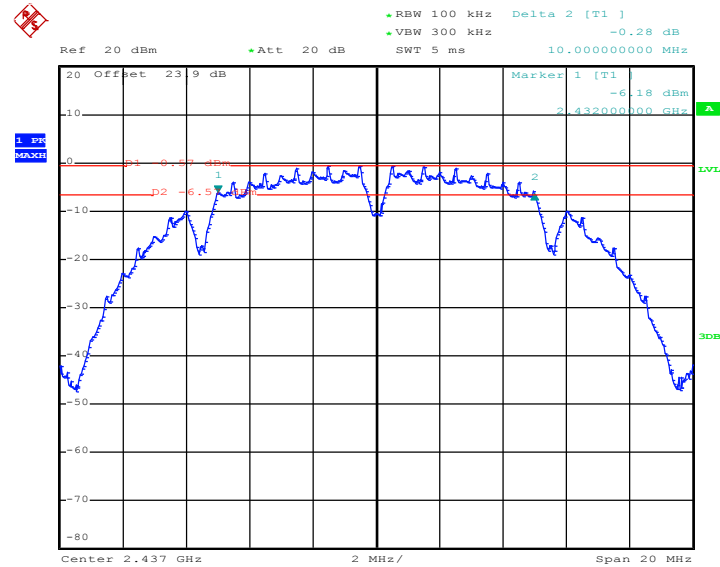
Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01



Date: 8.DEC.2011 20:58:39

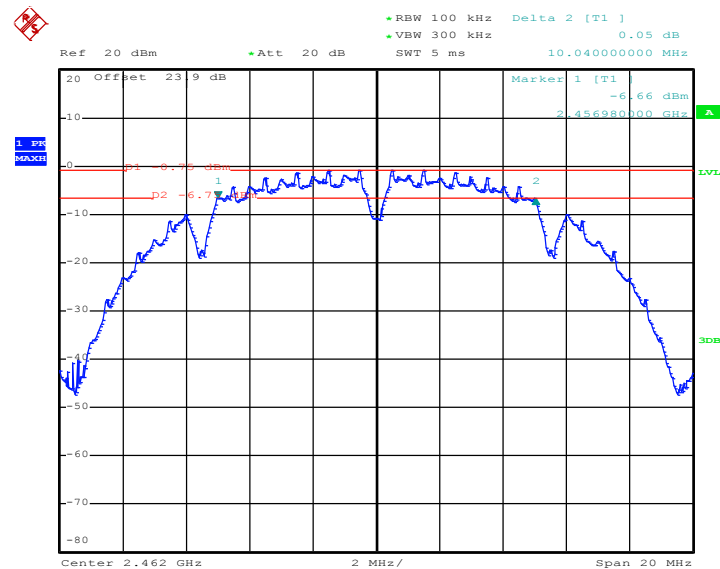


Mode 2 : 6 dB Bandwidth Plot on 802.11b Channel 06



Date: 8.DEC.2011 21:12:30

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



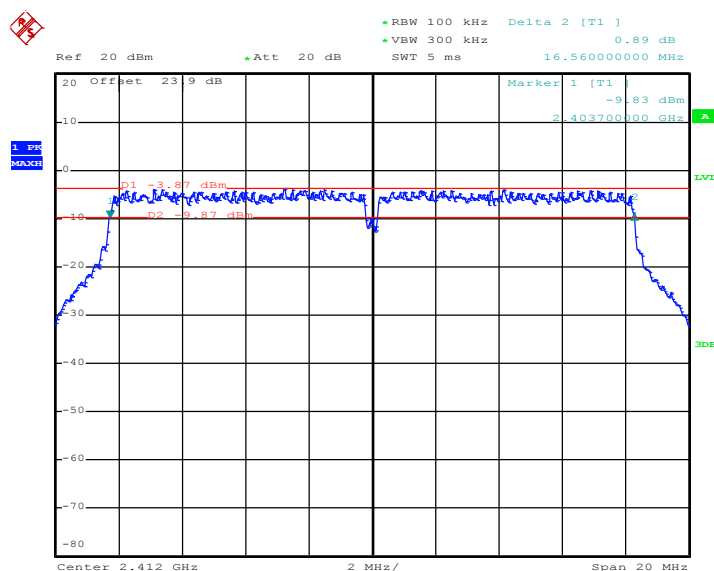
Date: 8.DEC.2011 21:24:42



Test Mode :	Mode 4, 5, 6	Temperature :	21~25°C
Test Engineer :	Reece Li	Relative Humidity :	48~54%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.56	0.5	Pass
06	2437	16.56	0.5	Pass
11	2462	16.56	0.5	Pass

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



Date: 8.DEC.2011 22:07:15



Date: 8.DEC.2011 21:55:21

Ref 20 dBm Att 20 dB SWT 5 ms Delta 2 [T1]

Marker 1 [T1] -9.74 dBm 2.453720000 GHz

1.98 MHz 100 dBm

Center 2.462 GHz Span 20 MHz

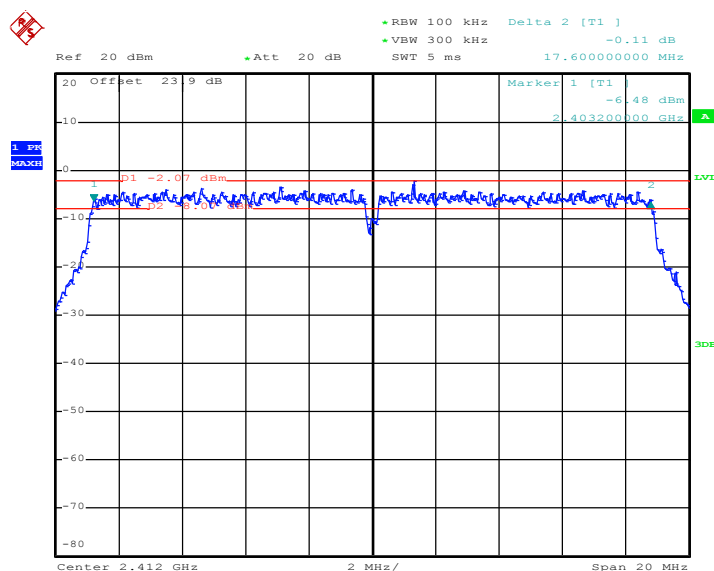
Date: 8.DEC.2011 21:40:37



Test Mode :	Mode 7, 8, 9	Temperature :	21~25°C
Test Engineer :	Reece Li	Relative Humidity :	48~54%

Channel	Frequency (MHz)	802.11n (BW 20MHz) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	17.60	0.5	Pass
06	2437	17.80	0.5	Pass
11	2462	17.80	0.5	Pass

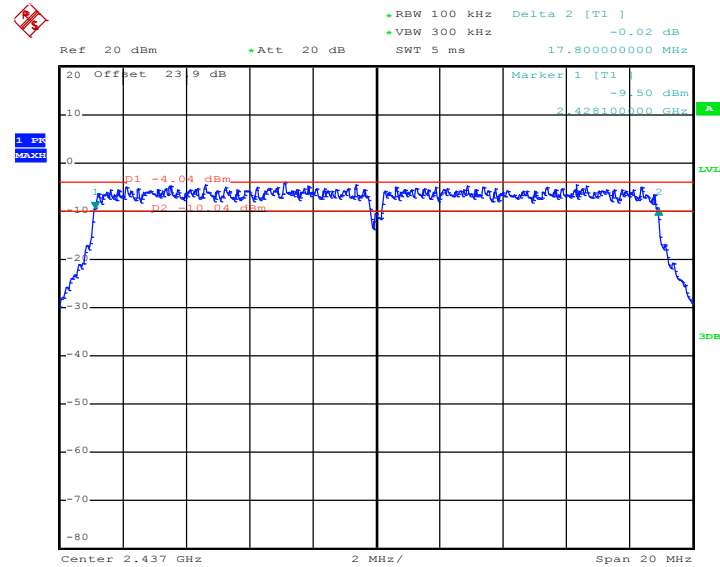
Mode 7 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 01



Date: 8.DEC.2011 22:21:24

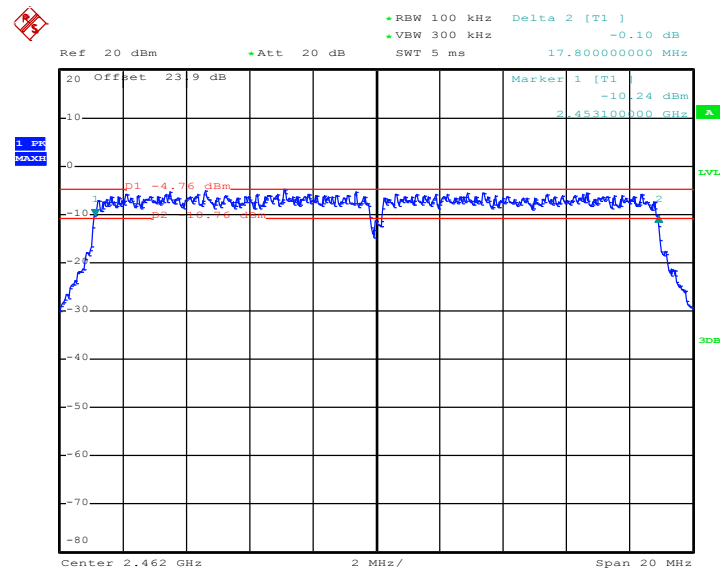


Mode 8 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 06



Date: 8.DEC.2011 22:34:43

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



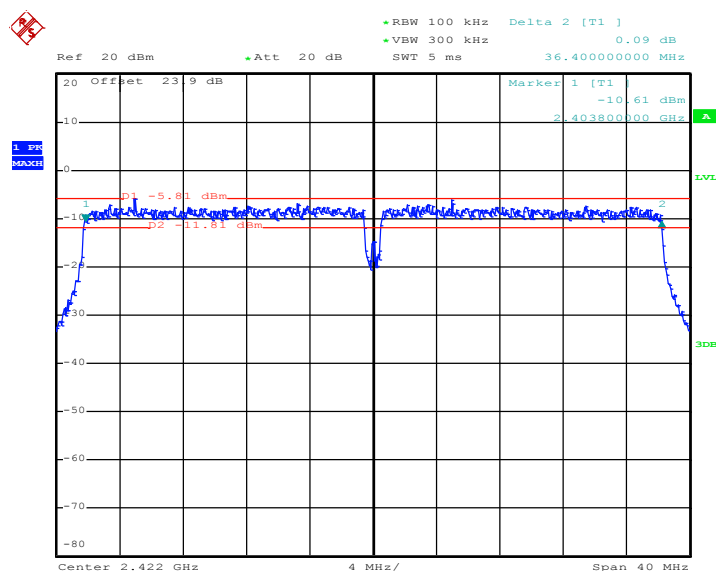
Date: 8.DEC.2011 22:46:59



Test Mode :	Mode 10, 11, 12	Temperature :	21~25°C
Test Engineer :	Reece Li	Relative Humidity :	48~54%

Channel	Frequency (MHz)	802.11n (BW 40MHz) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
03	2422	36.40	0.5	Pass
06	2437	36.40	0.5	Pass
09	2452	36.40	0.5	Pass

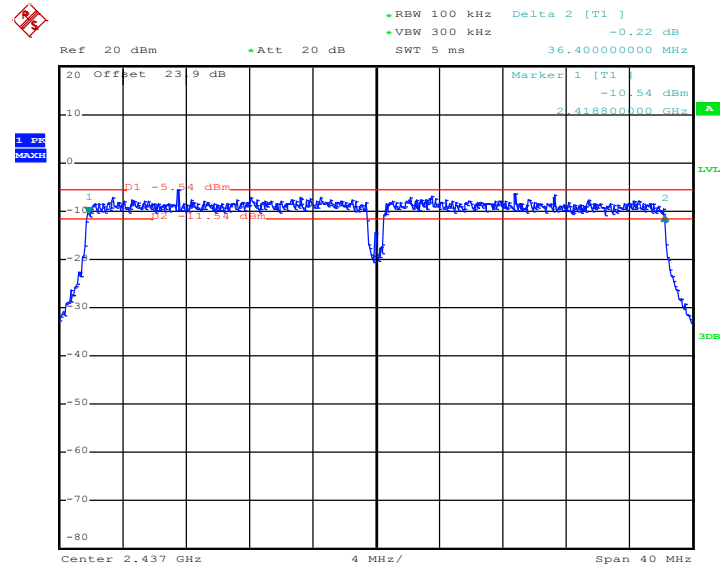
Mode 10 : 6 dB Bandwidth Plot on 802.11n(BW 40MHz) Channel 03



Date: 8.DEC.2011 23:27:58

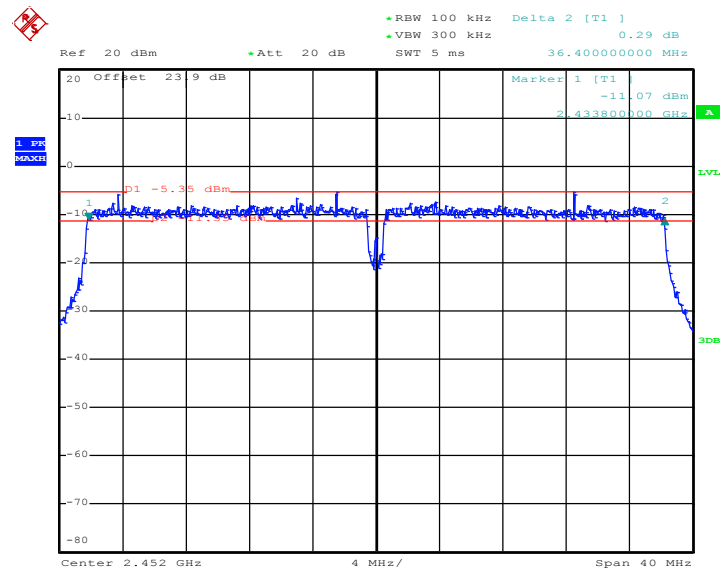


Mode 11 : 6 dB Bandwidth Plot on 802.11n(BW 40MHz) Channel 06



Date: 8.DEC.2011 23:15:14

Mode 12 : 6 dB Bandwidth Plot on 802.11n(BW 40MHz) Channel 09



Date: 8.DEC.2011 23:42:39

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.

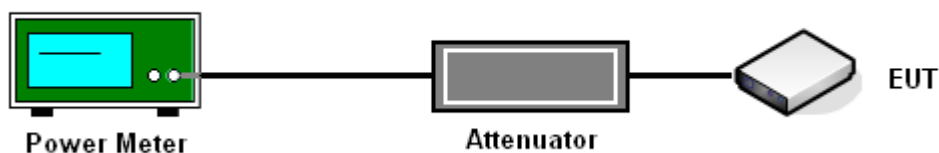
3.2.2 Measuring Instruments

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 :	21~25℃
Test Engineer :	Reece Li	Relative Humidity :	48~54%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	13.36	30	Pass
06	2437	12.62	30	Pass
11	2462	12.73	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	21~25℃
Test Engineer :	Reece Li	Relative Humidity :	48~54%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	20.62	30	Pass
06	2437	20.42	30	Pass
11	2462	20.12	30	Pass

Test Mode :	Mode 7, 8, 9	Temperature :	21~25℃
Test Engineer :	Reece Li	Relative Humidity :	48~54%

Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	19.98	30	Pass
06	2437	19.59	30	Pass
11	2462	19.02	30	Pass

Test Mode :	Mode 10, 11, 12	Temperature :	21~25℃
Test Engineer :	Reece Li	Relative Humidity :	48~54%

Channel	Frequency (MHz)	802.11n (BW 40MHz) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
03	2422	20.34	30	Pass
06	2437	19.82	30	Pass
09	2452	19.46	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

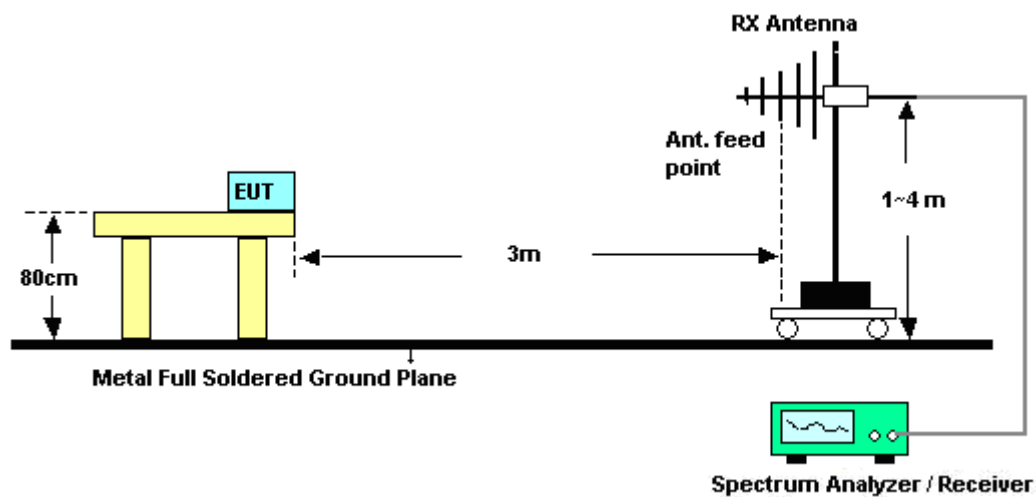
See list of measuring instruments of this test report.

3.3.3 Test Procedures

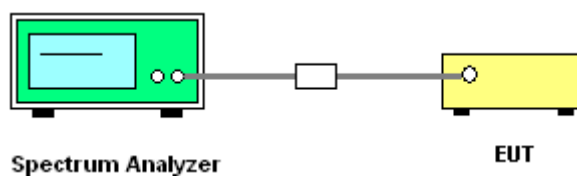
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 KHz, Video bandwidth (VBW) $\geq$ RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized 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 :	22~24℃
Test Band :	802.11b	Relative Humidity :	50~52%
Test Channel :	01	Test Engineer :	Kyle Jhuang

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
2388.09	50.39	-23.61	74	46.26	32.06	6.03	33.96	100	280	Peak
2388.09	35.58	-18.42	54	31.45	32.06	6.03	33.96	100	280	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
2384.1	46.99	-27.01	74	42.89	32.03	6.03	33.96	185	334	Peak
2384.1	34.17	-19.83	54	30.07	32.03	6.03	33.96	185	334	Average

Test Mode :	Mode 3	Temperature :	22~24℃
Test Band :	802.11b	Relative Humidity :	50~52%
Test Channel :	11	Test Engineer :	Kyle Jhuang

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
2488.22	46.83	-27.17	74	42.45	32.2	6.18	34	100	281	Peak
2488.22	34.29	-19.71	54	29.91	32.2	6.18	34	100	281	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.18	45.73	-28.27	74	41.37	32.18	6.18	34	104	358	Peak
2485.18	33.58	-20.42	54	29.22	32.18	6.18	34	104	358	Average



Test Mode :	Mode 4	Temperature :	22~24℃
Test Band :	802.11g	Relative Humidity :	50~52%
Test Channel :	01	Test Engineer :	Kyle Jhuang

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	63.1	-10.9	74	58.97	32.06	6.03	33.96	100	280	Peak
2388.85	40.89	-13.11	54	36.76	32.06	6.03	33.96	100	280	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	55.86	-18.14	74	51.73	32.06	6.03	33.96	187	333	Peak
2388.85	37.47	-16.53	54	33.34	32.06	6.03	33.96	187	333	Average

Test Mode :	Mode 6	Temperature :	22~24℃
Test Band :	802.11g	Relative Humidity :	50~52%
Test Channel :	11	Test Engineer :	Kyle Jhuang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.94	62.84	-11.16	74	58.48	32.18	6.18	34	100	282	Peak
2485.94	38	-16	54	33.64	32.18	6.18	34	100	282	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
2487.65	59.36	-14.64	74	54.98	32.2	6.18	34	180	324	Peak
2487.65	35.1	-18.9	54	30.72	32.2	6.18	34	180	324	Average



Test Mode :	Mode 7	Temperature :	22~24℃
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~52%
Test Channel :	01	Test Engineer :	Kyle Jhuang

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
2389.99	63.91	-10.09	74	59.78	32.06	6.03	33.96	100	282	Peak
2389.99	44.9	-9.1	54	40.77	32.06	6.03	33.96	100	282	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.99	58.42	-15.58	74	54.29	32.06	6.03	33.96	186	333	Peak
2389.99	39.7	-14.3	54	35.57	32.06	6.03	33.96	186	333	Average

Test Mode :	Mode 9	Temperature :	22~24℃
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~52%
Test Channel :	11	Test Engineer :	Kyle Jhuang

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
2486.13	65.05	-8.95	74	60.69	32.18	6.18	34	100	286	Peak
2486.13	40.89	-13.11	54	36.53	32.18	6.18	34	100	286	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.18	59.84	-14.16	74	55.48	32.18	6.18	34	180	327	Peak
2485.18	35.92	-18.08	54	31.56	32.18	6.18	34	180	327	Average



Test Mode :	Mode 10	Temperature :	22~24℃
Test Band :	802.11n (BW 40MHz)	Relative Humidity :	50~52%
Test Channel :	03	Test Engineer :	Kyle Jhuang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.42	62.67	-11.33	74	58.54	32.06	6.03	33.96	100	294	Peak
2389.42	49.34	-4.66	54	45.21	32.06	6.03	33.96	100	294	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	56.62	-17.38	74	52.49	32.06	6.03	33.96	187	330	Peak
2388.85	42.3	-11.7	54	38.17	32.06	6.03	33.96	187	330	Average

Test Mode :	Mode 11	Temperature :	22~24℃
Test Band :	802.11n (BW 40MHz)	Relative Humidity :	50~52%
Test Channel :	09	Test Engineer :	Kyle Jhuang

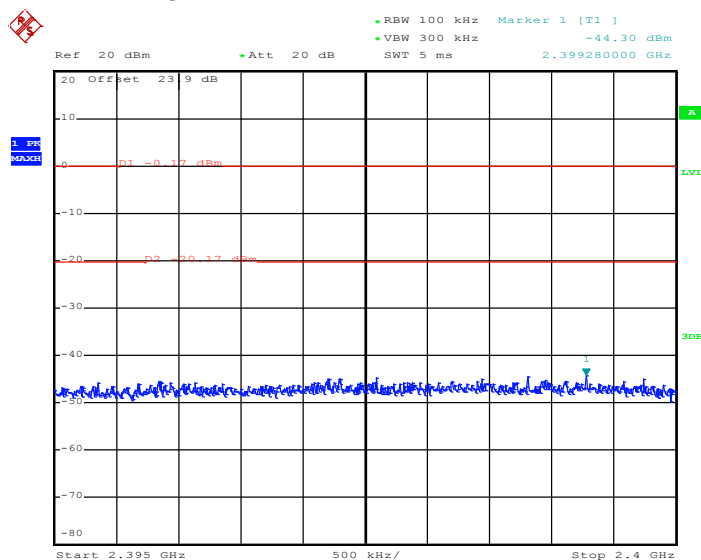
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2488.22	65.65	-8.35	74	61.27	32.2	6.18	34	100	280	Peak
2488.22	44.72	-9.28	54	40.34	32.2	6.18	34	100	280	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	56.72	-17.28	74	52.36	32.18	6.18	34	183	324	Peak
2483.5	39.37	-14.63	54	35.01	32.18	6.18	34	183	324	Average

3.3.6 Test Plots of Conducted Band Edges

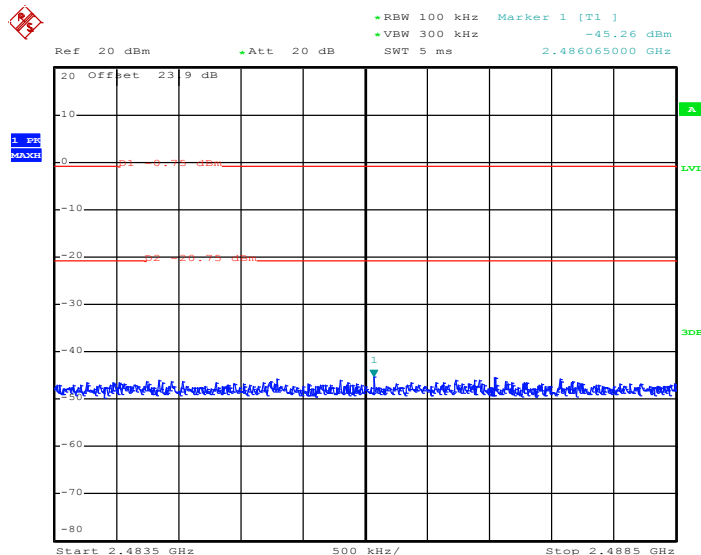
Test Mode :	Mode 1 and 3	Temperature :	21~25°C
Test Band :	802.11b	Relative Humidity :	48~54%
Test Channel :	01 and 11	Test Engineer :	Reece Li

Low Band Edge Plot on 802.11b Channel 01



Date: 8.DEC.2011 20:59:47

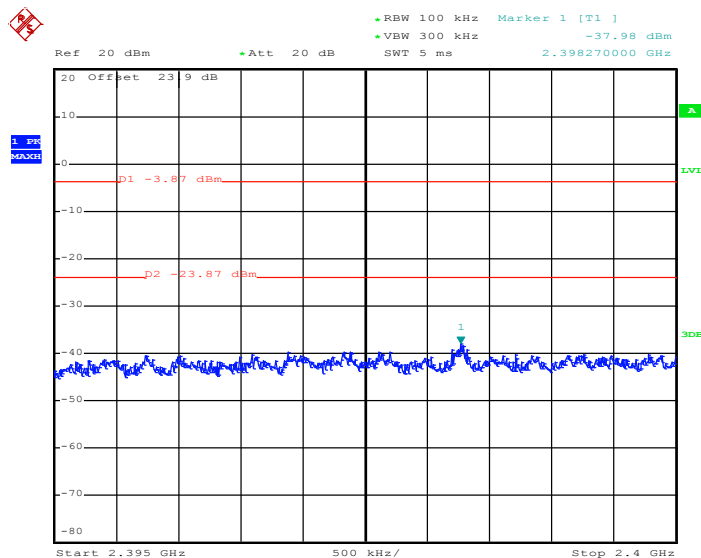
High Band Edge Plot on 802.11b Channel 11



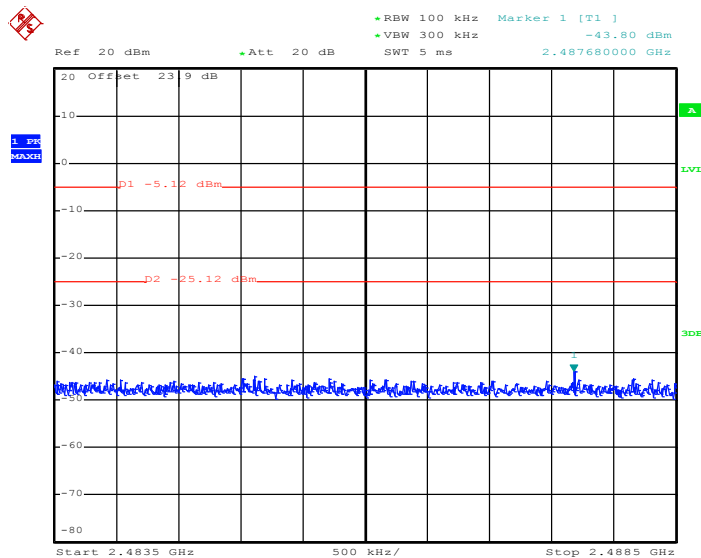
Date: 8.DEC.2011 21:25:28



Test Mode :	Mode 4 and 6	Temperature :	21~25°C
Test Band :	802.11g	Relative Humidity :	48~54%
Test Channel :	01 and 11	Test Engineer :	Reece Li

Low Band Edge Plot on 802.11g Channel 01

Date: 8.DEC.2011 22:08:23

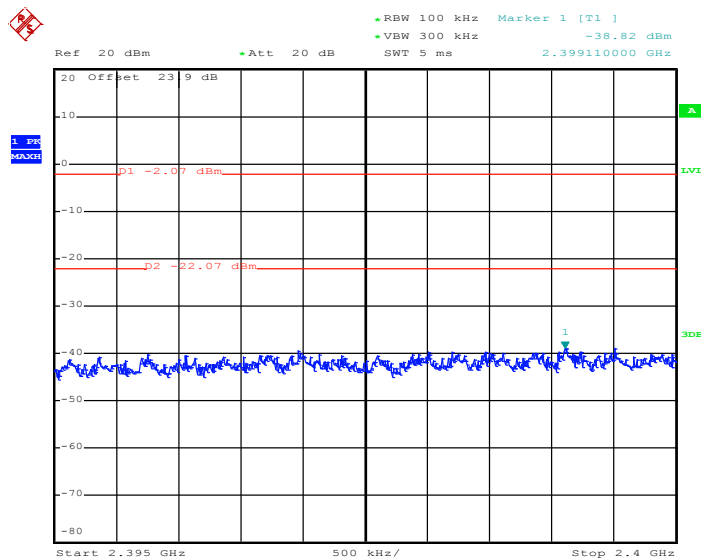
High Band Edge Plot on 802.11g Channel 11

Date: 8.DEC.2011 21:41:23



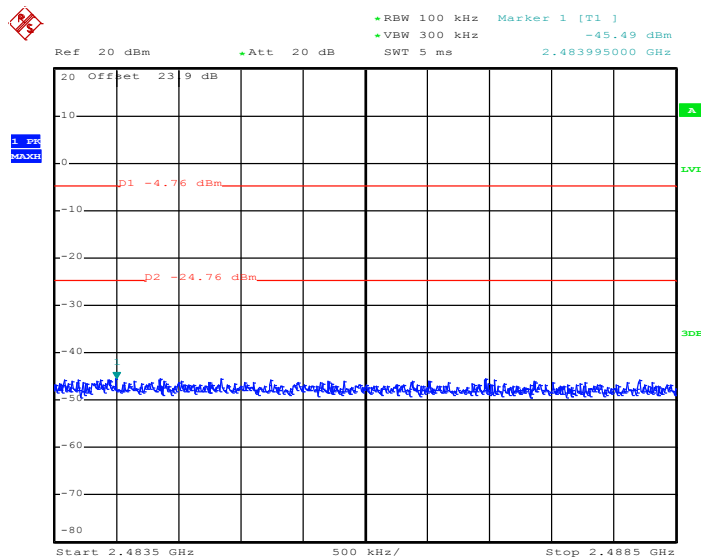
Test Mode :	Mode 7 and 9	Temperature :	21~25°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	48~54%
Test Channel :	01 and 11	Test Engineer :	Reece Li

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



Date: 8.DEC.2011 22:22:32

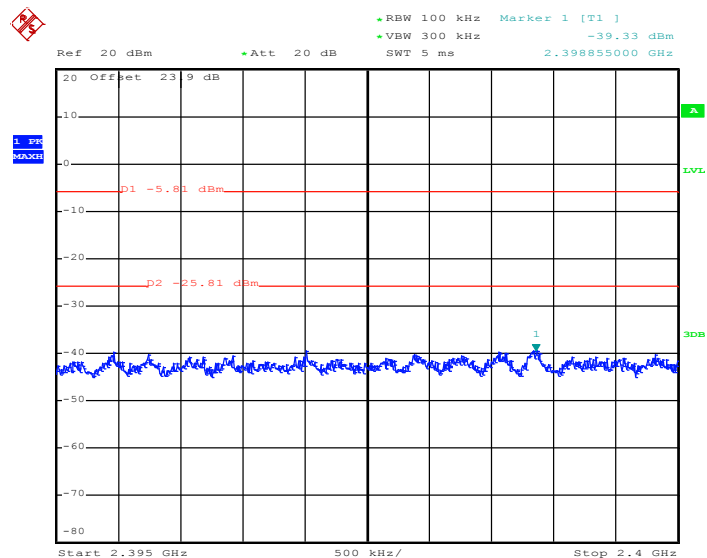
High Band Edge Plot on 802.11n (BW 20MHz) Channel 11



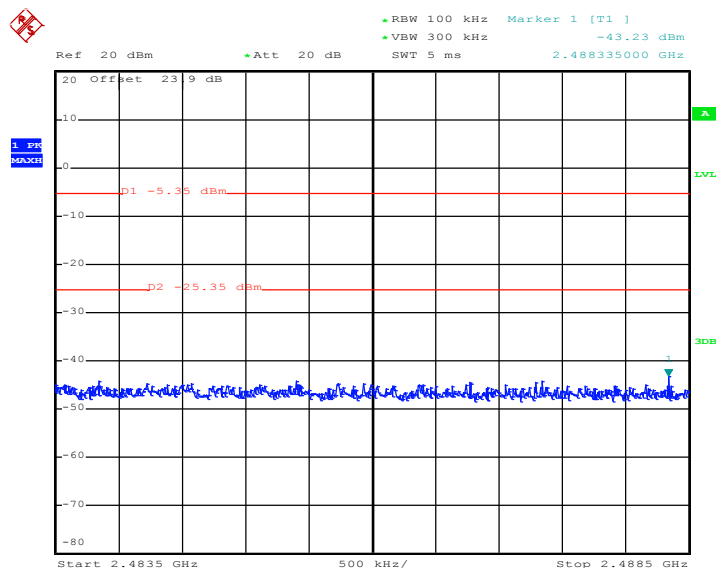
Date: 8.DEC.2011 22:47:45



Test Mode :	Mode 10 and 12	Temperature :	21~25°C
Test Band :	802.11n (BW 40MHz)	Relative Humidity :	48~54%
Test Channel :	03 and 09	Test Engineer :	Reece Li

Low Band Edge Plot on 802.11n (BW 40MHz) Channel 03

Date: 8.DEC.2011 23:29:06

High Band Edge Plot on 802.11n (BW 40MHz) Channel 09

Date: 8.DEC.2011 23:43:04

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.

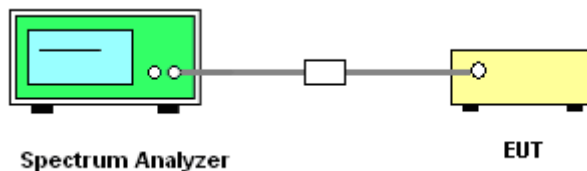
3.4.2 Measuring Instruments

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.

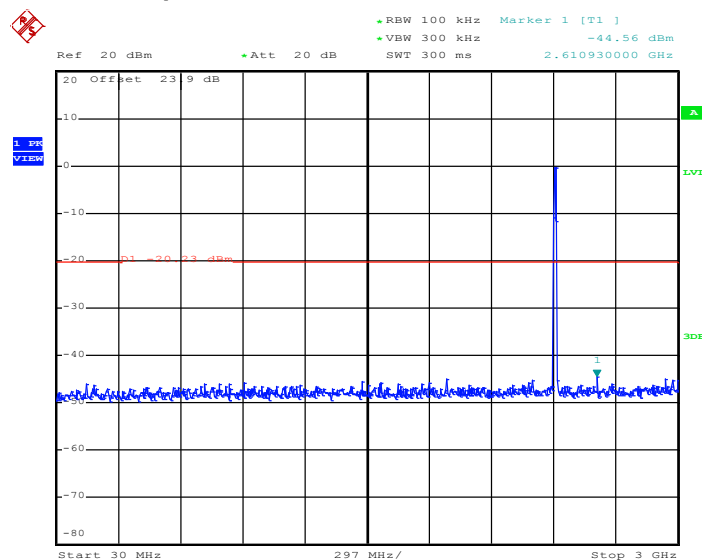
3.4.4 Test Setup



3.4.5 Test Plots of Spurious Emission

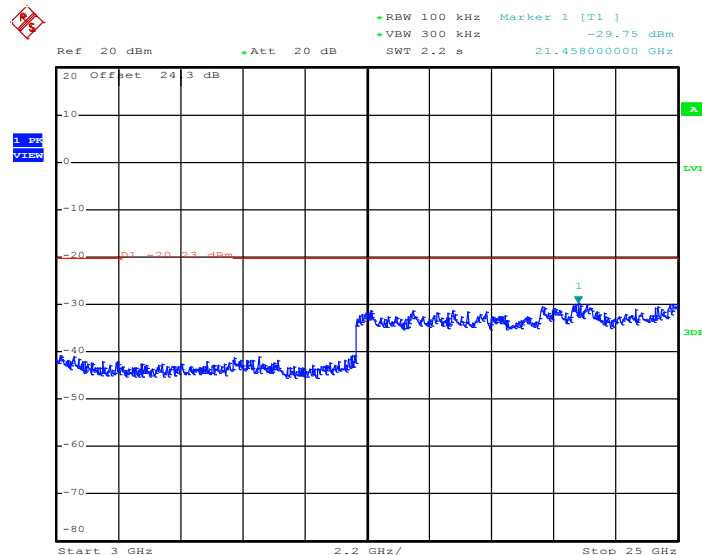
Test Mode :	Mode 1	Temperature :	21~25°C
Test Band :	802.11b	Relative Humidity :	48~54%
Test Channel :	01	Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



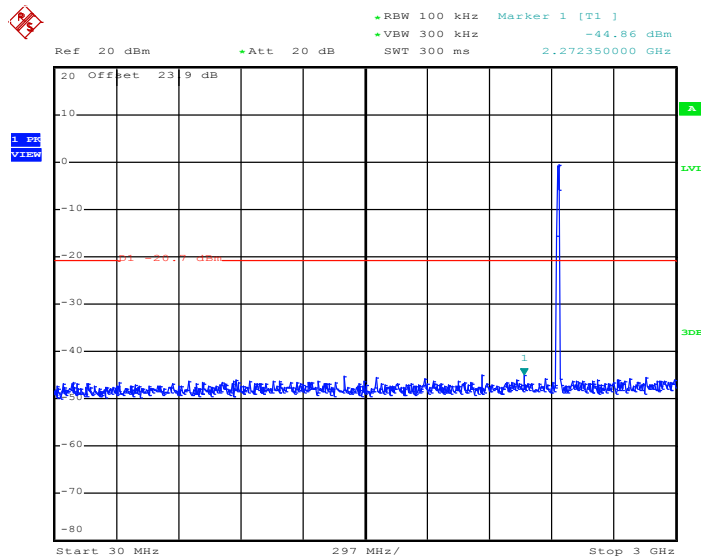
Date: 9.DEC.2011 00:04:12

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

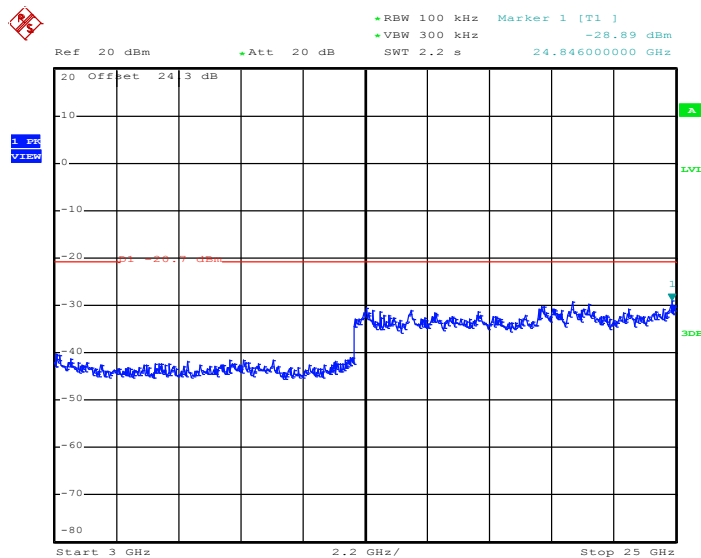


Date: 9.DEC.2011 00:04:29

Test Mode :	Mode 2	Temperature :	21~25°C
Test Band :	802.11b	Relative Humidity :	48~54%
Test Channel :	06	Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


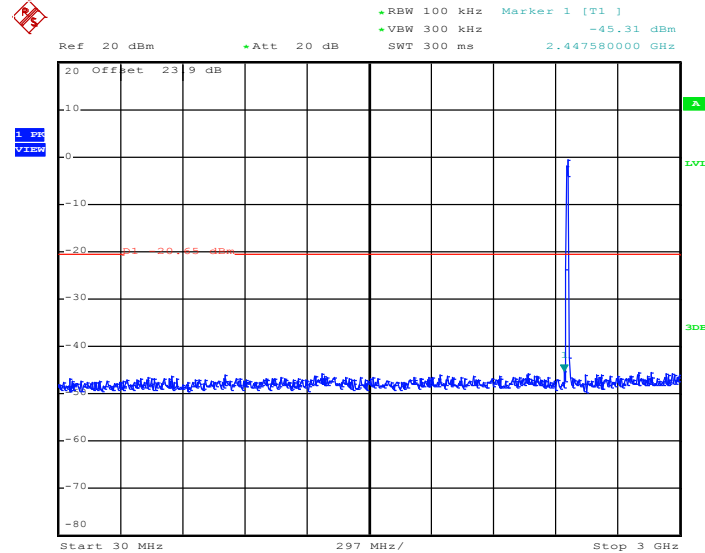
Date: 9.DEC.2011 00:05:19

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


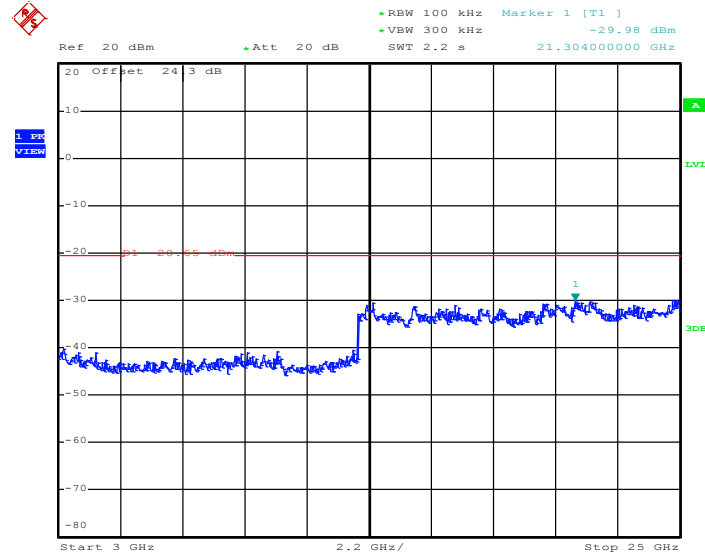
Date: 9.DEC.2011 00:05:36



Test Mode :	Mode 3	Temperature :	21~25°C
Test Band :	802.11b	Relative Humidity :	48~54%
Test Channel :	11	Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

Date: 9.DEC.2011 00:06:34

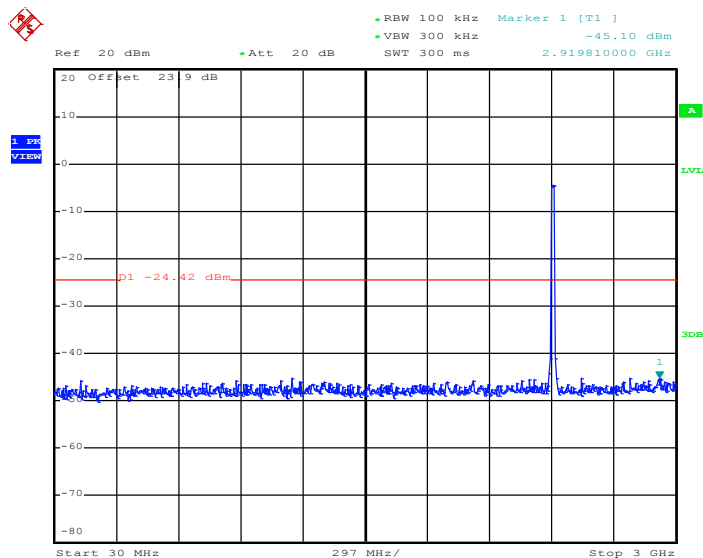
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

Date: 9.DEC.2011 00:06:51



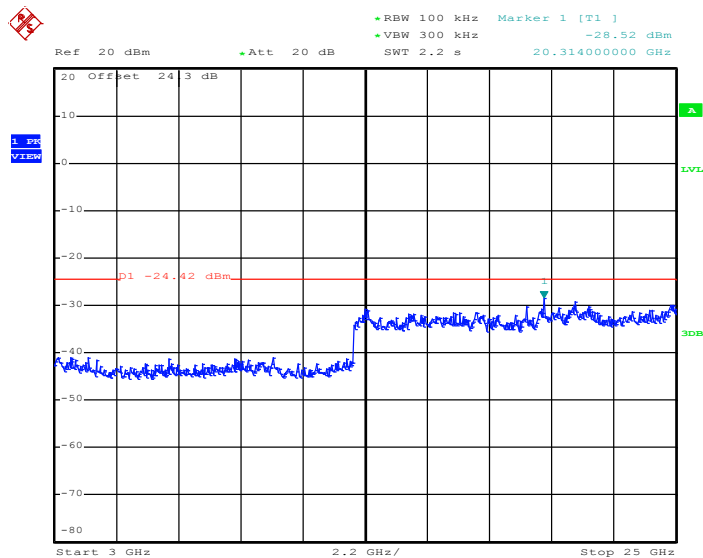
Test Mode :	Mode 4	Temperature :	21~25°C
Test Band :	802.11g	Relative Humidity :	48~54%
Test Channel :	01	Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 9.DEC.2011 00:09:52

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

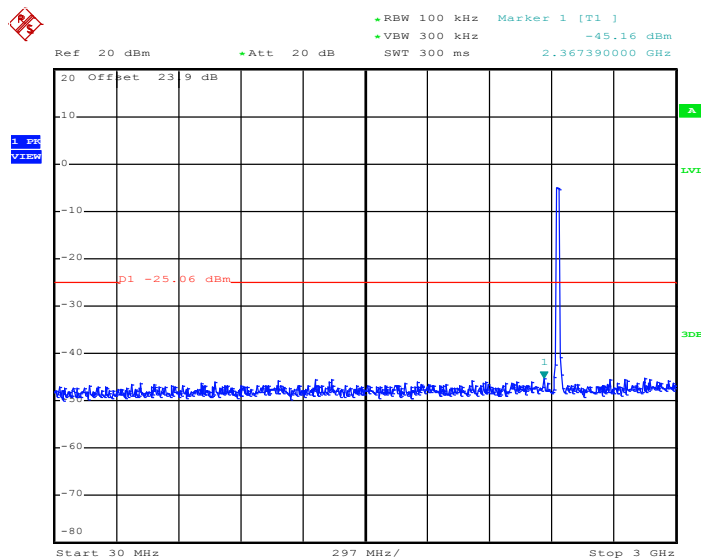


Date: 9.DEC.2011 00:10:09

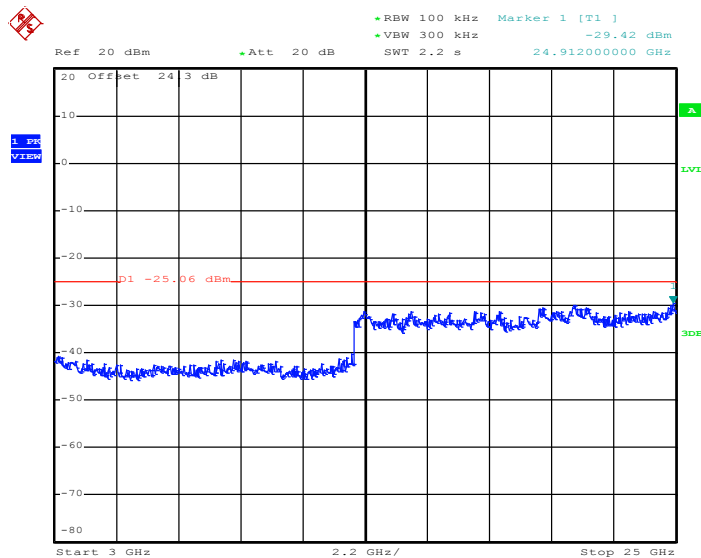


Report No. : FR1N2312-01

Test Mode :	Mode 5	Temperature :	21~25
Test Band :	802.11g	Relative Humidity :	48~54
Test Channel :	06	Test Engineer :	Reece Li



Date: 9.DEC.2011 00:08:59

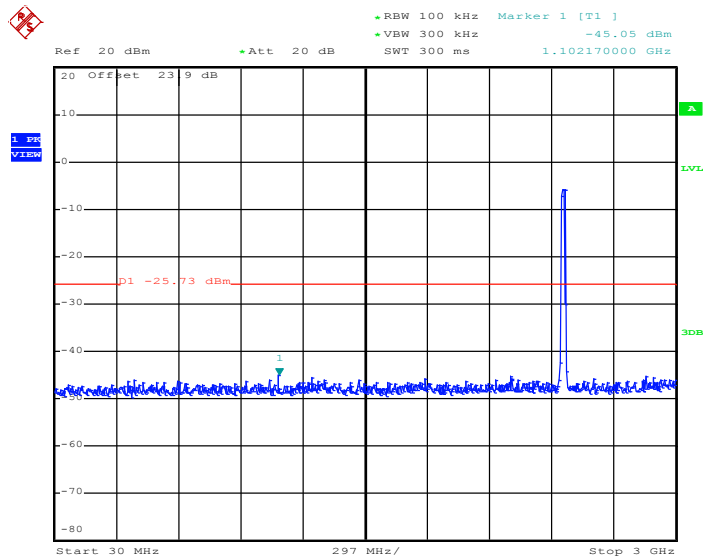


Date: 9.DEC.2011 00:09:15



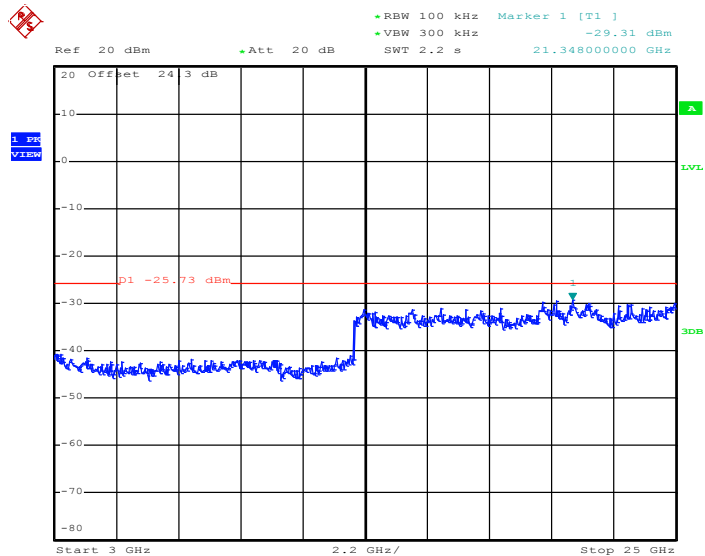
Test Mode :	Mode 6	Temperature :	21~25°C
Test Band :	802.11g	Relative Humidity :	48~54%
Test Channel :	11	Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 9.DEC.2011 00:08:04

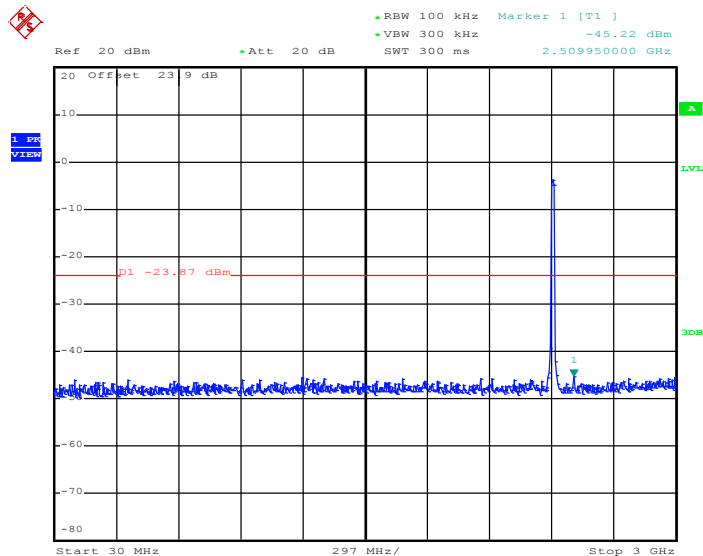
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



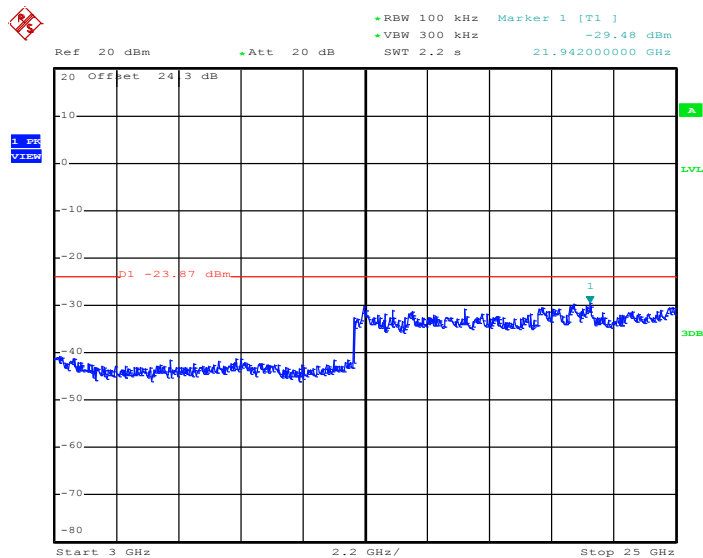
Date: 9.DEC.2011 00:08:21



Test Mode :	Mode 7	Temperature :	21~25°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	48~54%
Test Channel :	01	Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

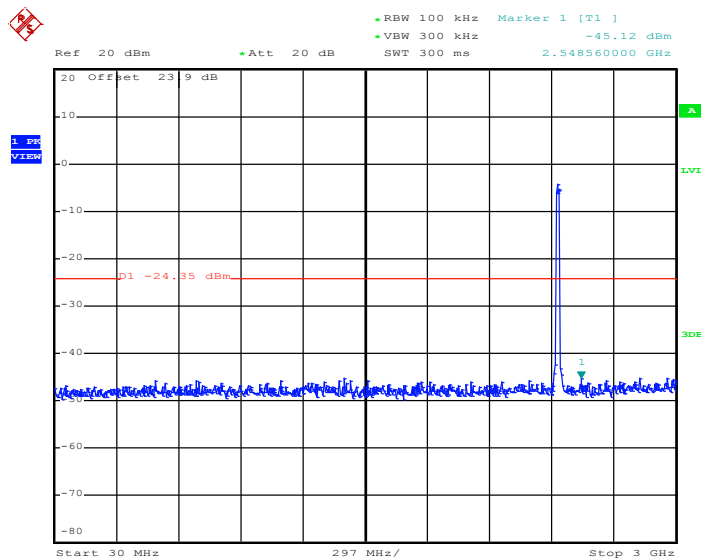
Date: 9.DEC.2011 00:11:06

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

Date: 9.DEC.2011 00:11:22

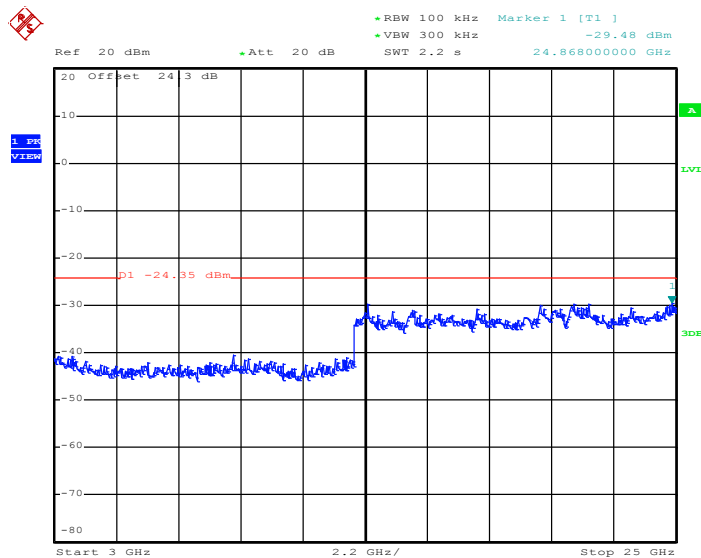
Test Mode :	Mode 8	Temperature :	21~25℃
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	48~54%
Test Channel :	06	Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 9.DEC.2011 00:13:02

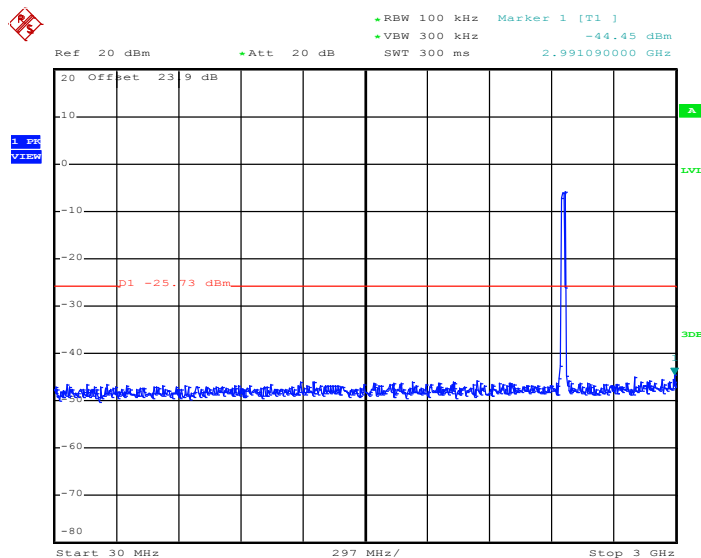
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



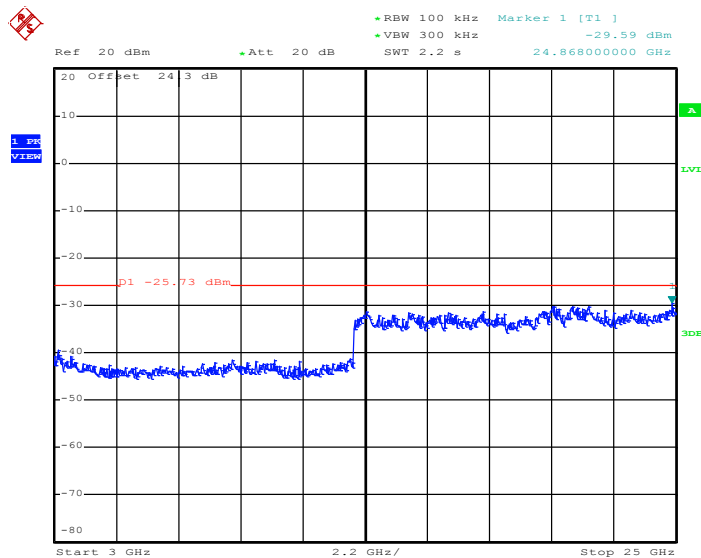
Date: 9.DEC.2011 00:13:19



Test Mode :	Mode 9	Temperature :	21~25°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	48~54%
Test Channel :	11	Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

Date: 9.DEC.2011 00:14:01

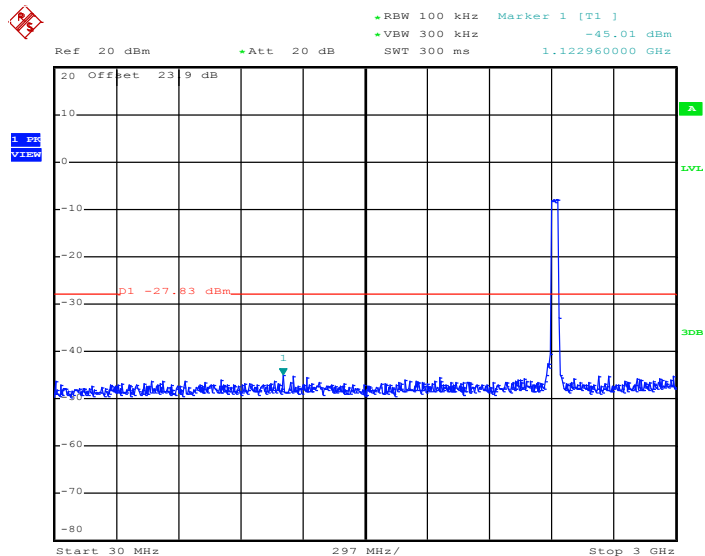
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

Date: 9.DEC.2011 00:14:18



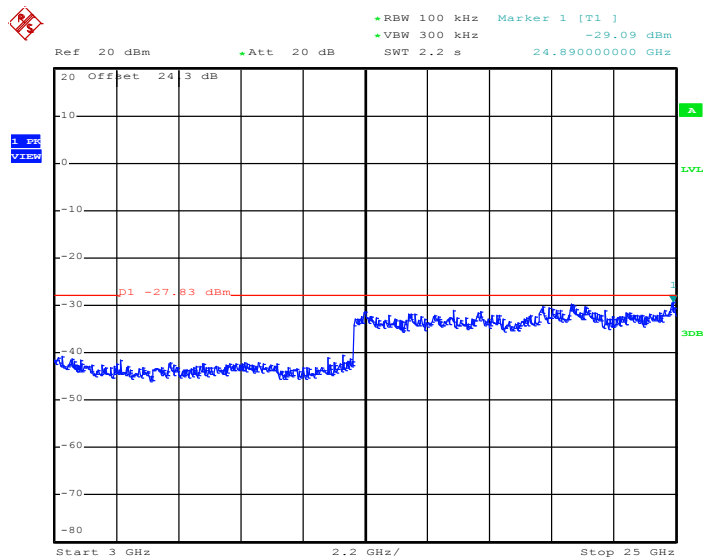
Test Mode :	Mode 10	Temperature :	21~25°C
Test Band :	802.11n (BW 40MHz)	Relative Humidity :	48~54%
Test Channel :	03	Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 9.DEC.2011 00:17:42

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

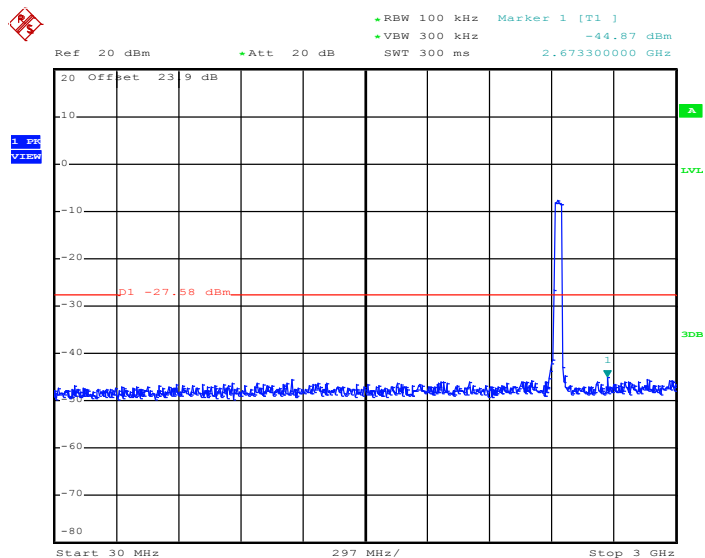


Date: 9.DEC.2011 00:17:59



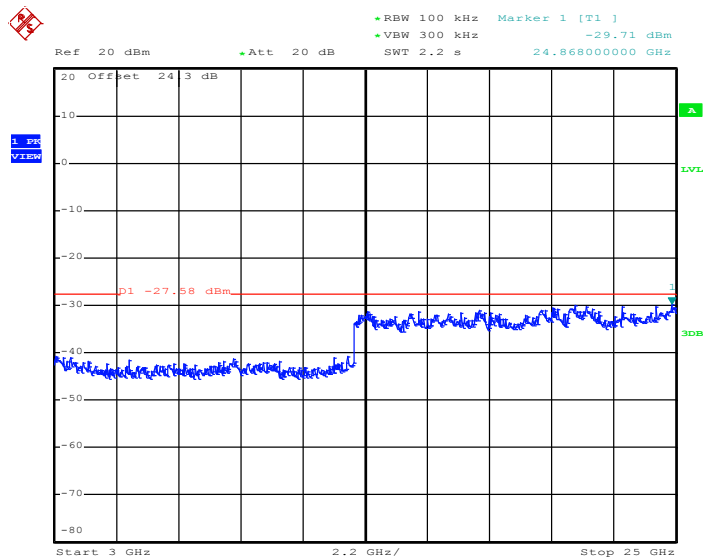
Test Mode :	Mode 11	Temperature :	21~25°C
Test Band :	802.11n (BW 40MHz)	Relative Humidity :	48~54%
Test Channel :	06	Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 9.DEC.2011 00:16:38

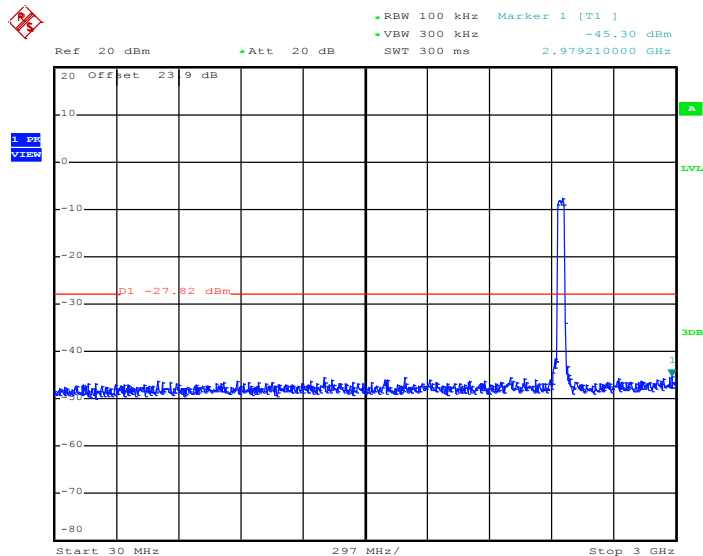
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



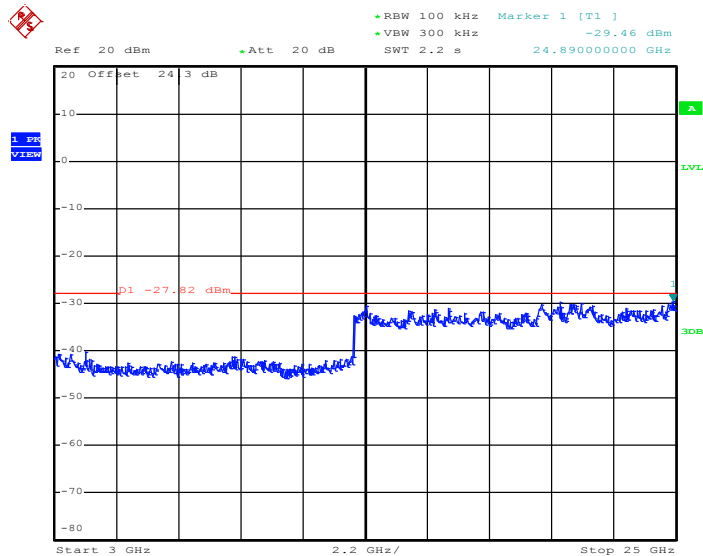
Date: 9.DEC.2011 00:16:55



Test Mode :	Mode 12	Temperature :	21~25°C
Test Band :	802.11n (BW 40MHz)	Relative Humidity :	48~54%
Test Channel :	09	Test Engineer :	Reece Li

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

Date: 9.DEC.2011 00:15:40

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

Date: 9.DEC.2011 00:15:57

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.

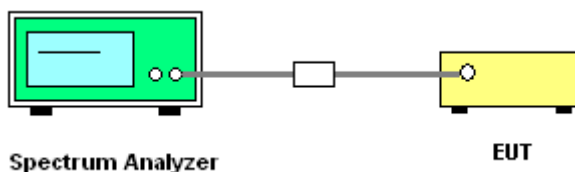
3.5.2 Measuring Instruments

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

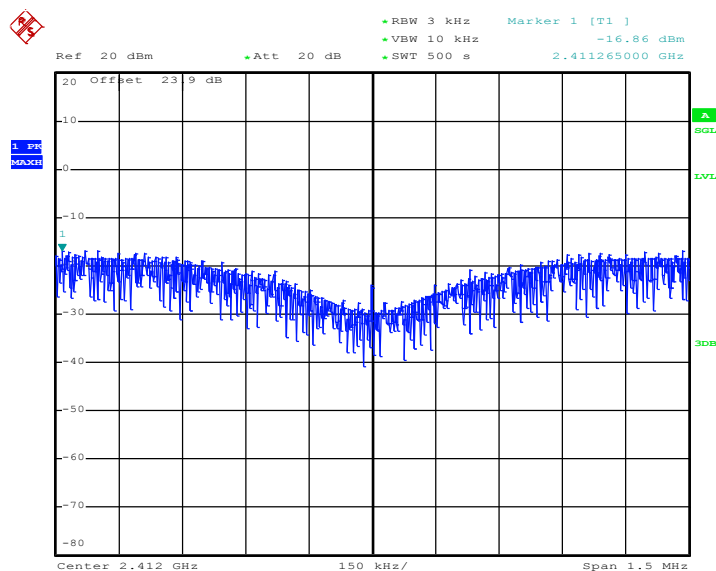


3.5.5 Test Result of Power Spectral Density

Test Mode :	Mode 1, 2, 3	Temperature :	21~25℃
Test Engineer :	Reece Li	Relative Humidity :	48~54%

Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-16.86	8	Pass
06	2437	-17.60	8	Pass
11	2462	-17.49	8	Pass

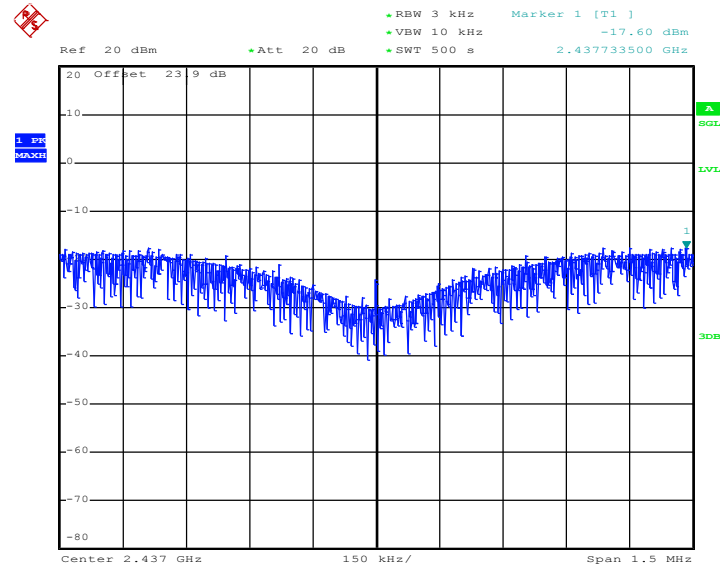
Mode 1 : PSD Plot on 802.11b Channel 01



Date: 8.DEC.2011 21:08:50

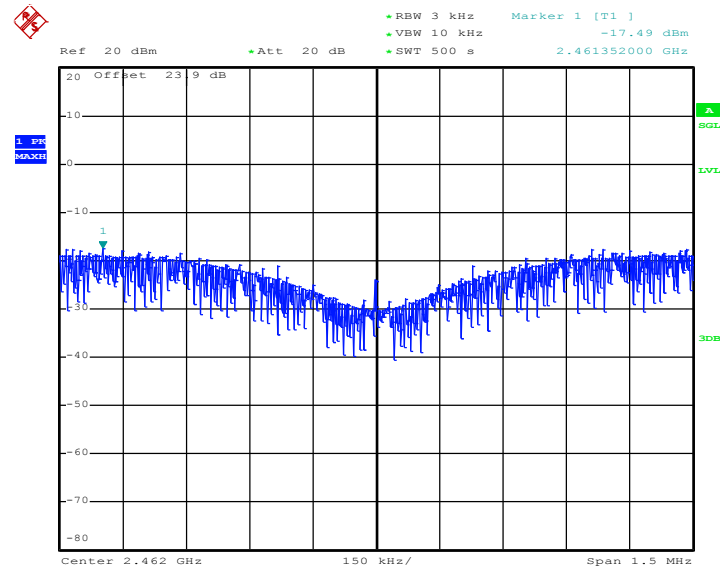


Mode 2 : PSD Plot on 802.11b Channel 06



Date: 8.DEC.2011 21:21:46

Mode 3 : PSD Plot on 802.11b Channel 11

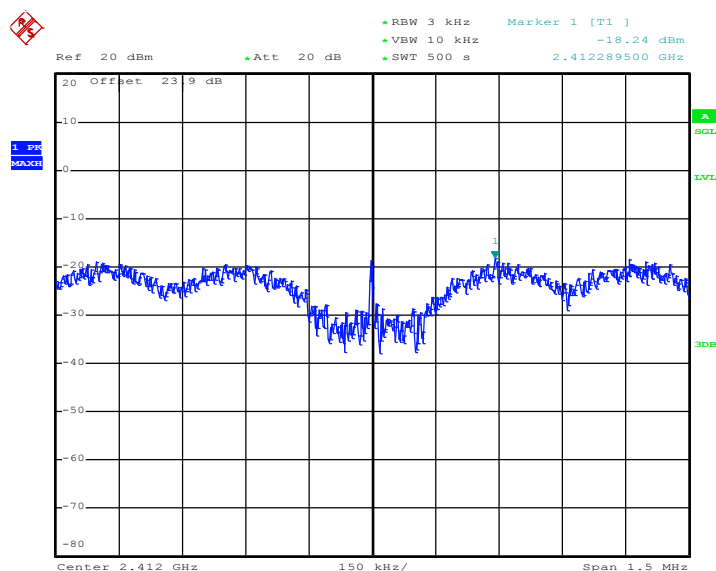


Date: 8.DEC.2011 21:36:32



Test Mode :	Mode 4, 5, 6	Temperature :	21~25℃
Test Engineer :	Reece Li	Relative Humidity :	48~54%

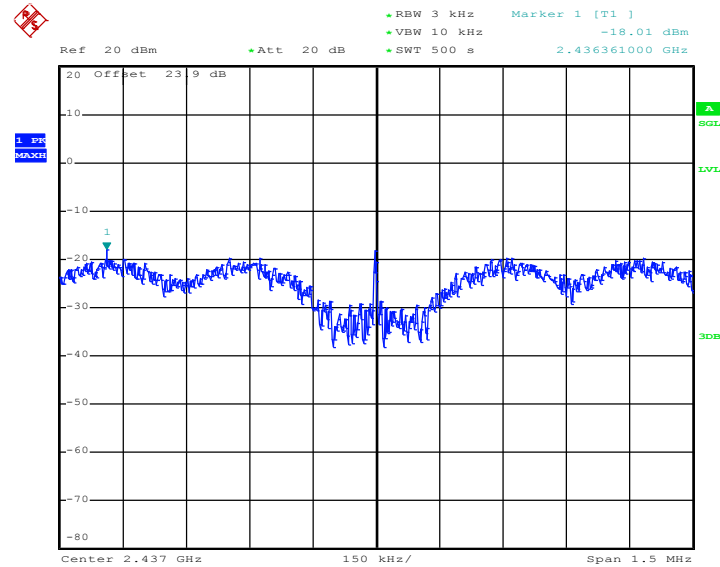
Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-18.24	8	Pass
06	2437	-18.01	8	Pass
11	2462	-19.68	8	Pass

Mode 4 : PSD Plot on 802.11g Channel 01

Date: 8.DEC.2011 22:17:24

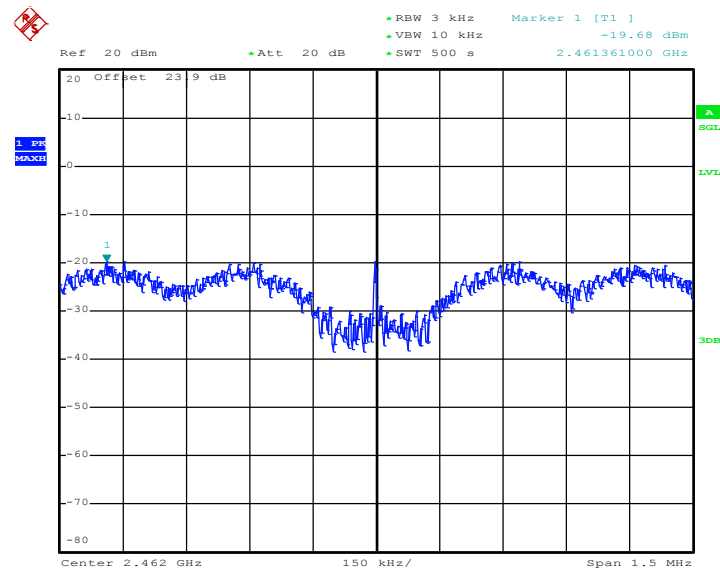


Mode 5 : PSD Plot on 802.11g Channel 06



Date: 8.DEC.2011 22:05:06

Mode 6 : PSD Plot on 802.11g Channel 11



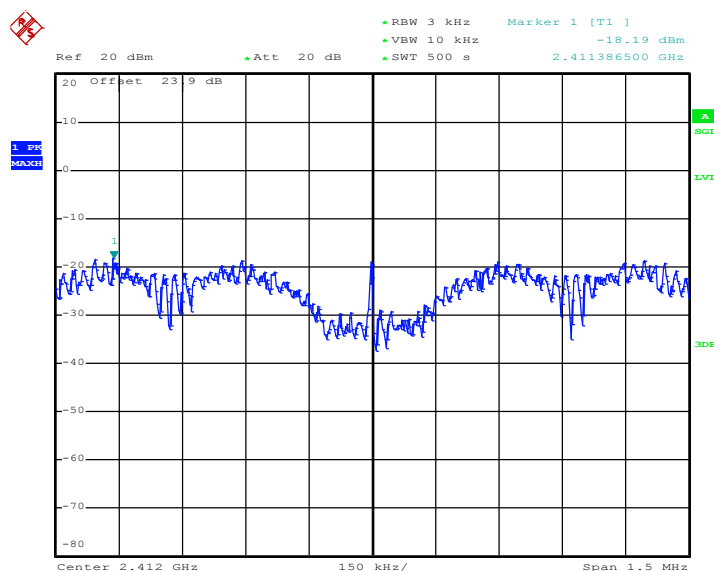
Date: 8.DEC.2011 21:51:54



Test Mode :	Mode 7, 8, 9	Temperature :	21~25℃
Test Engineer :	Reece Li	Relative Humidity :	48~54%

Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-18.19	8	Pass
06	2437	-18.91	8	Pass
11	2462	-19.34	8	Pass

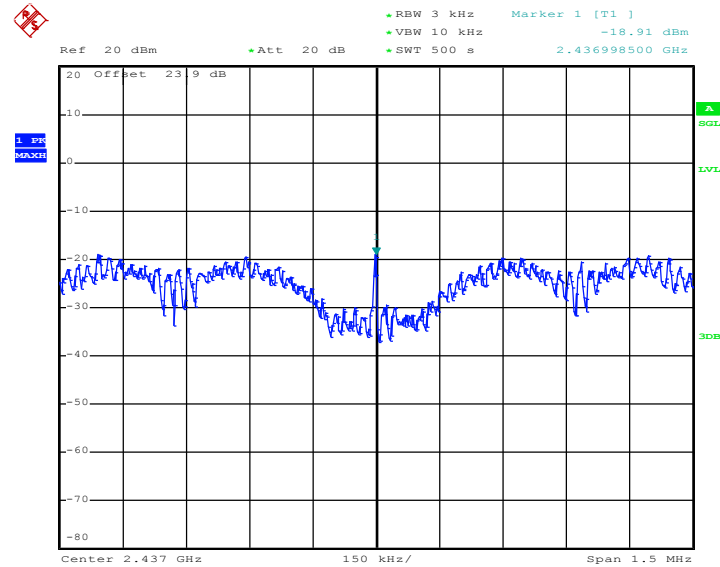
Mode 7 : PSD Plot on 802.11n (BW 20MHz) Channel 01



Date: 8.DEC.2011 22:31:34

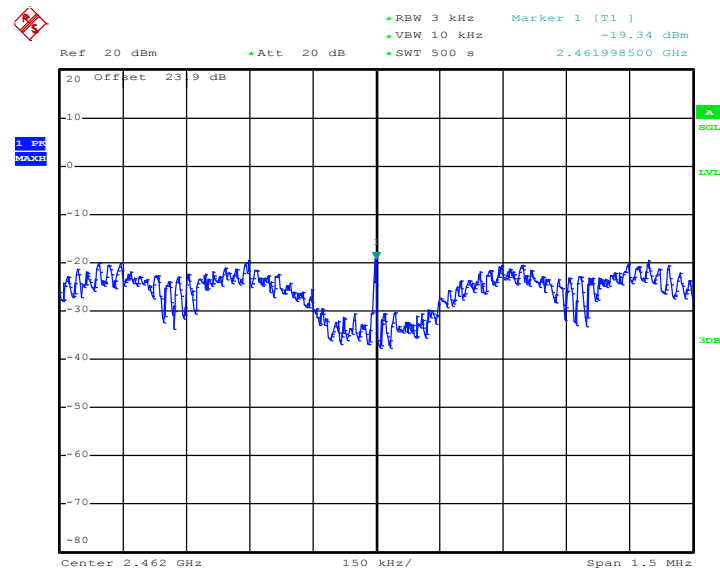


Mode 8 : PSD Plot on 802.11n (BW 20MHz) Channel 06



Date: 8.DEC.2011 22:43:52

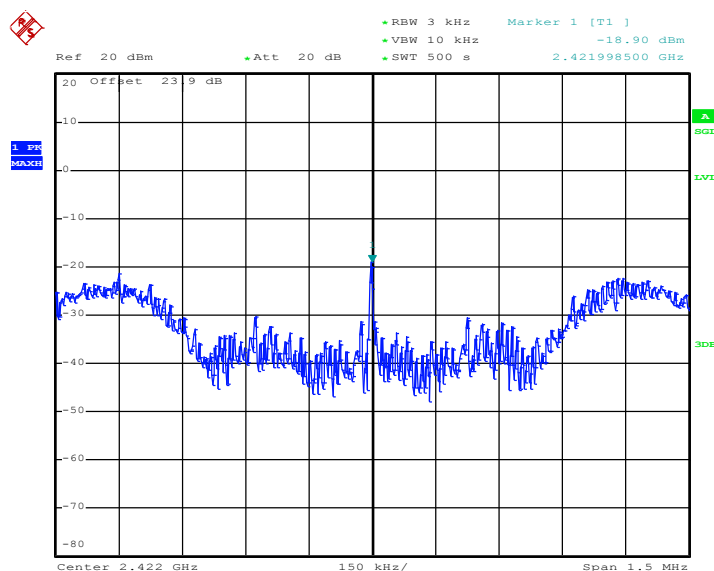
Mode 9 : PSD Plot on 802.11n (BW 20MHz) Channel 11



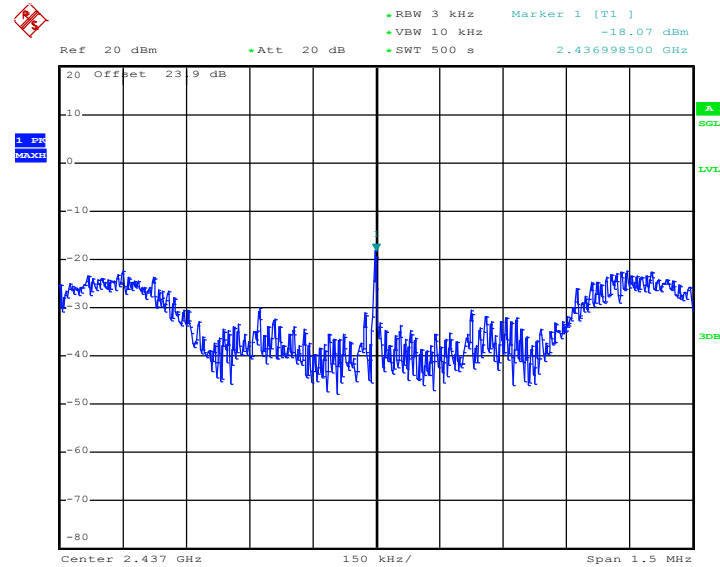
Date: 8.DEC.2011 22:56:55

Test Mode :	Mode 10, 11, 12	Temperature :	21~25
Test Engineer :	Reece Li	Relative Humidity :	48~54

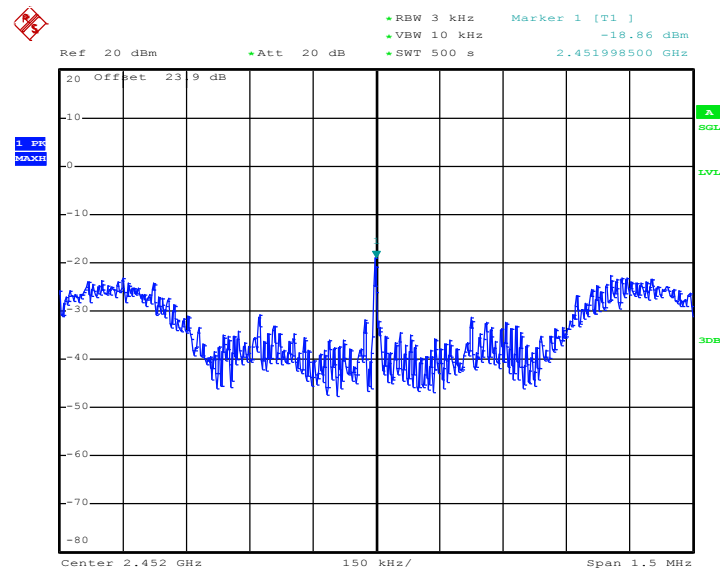
Channel	Frequency (MHz)	802.11n (BW 40MHz) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
03	2422	-18.90	8	Pass
06	2437	-18.07	8	Pass
09	2452	-18.86	8	Pass

Mode 10 : PSD Plot on 802.11n (BW 40MHz) Channel 03


Date: 8.DEC.2011 23:38:28

Mode 11 : PSD Plot on 802.11n (BW 40MHz) Channel 06


Date: 8.DEC.2011 23:24:29

Mode 12 : PSD Plot on 802.11n (BW 40MHz) Channel 09


Date: 8.DEC.2011 23:52:38

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.

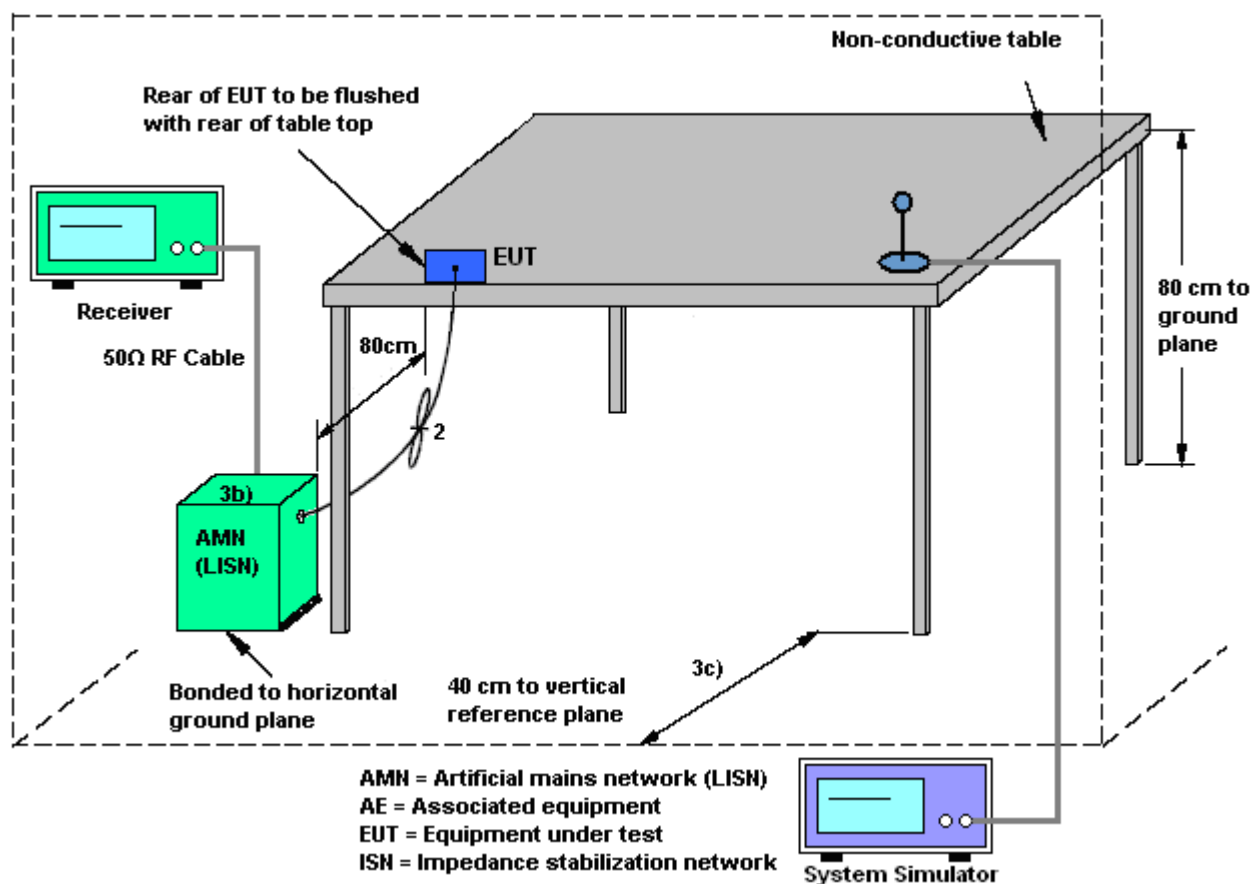
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

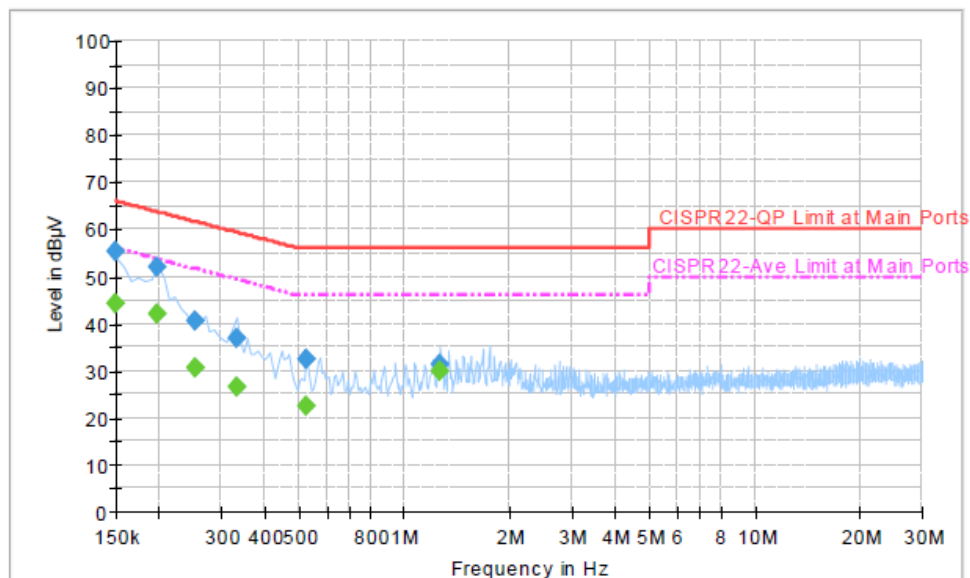
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (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 3	Temperature :	22~24°C
Test Engineer :	Novic Chiang	Relative Humidity :	44~46%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + WLAN Link + USB Cable (Data Link with Notebook)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



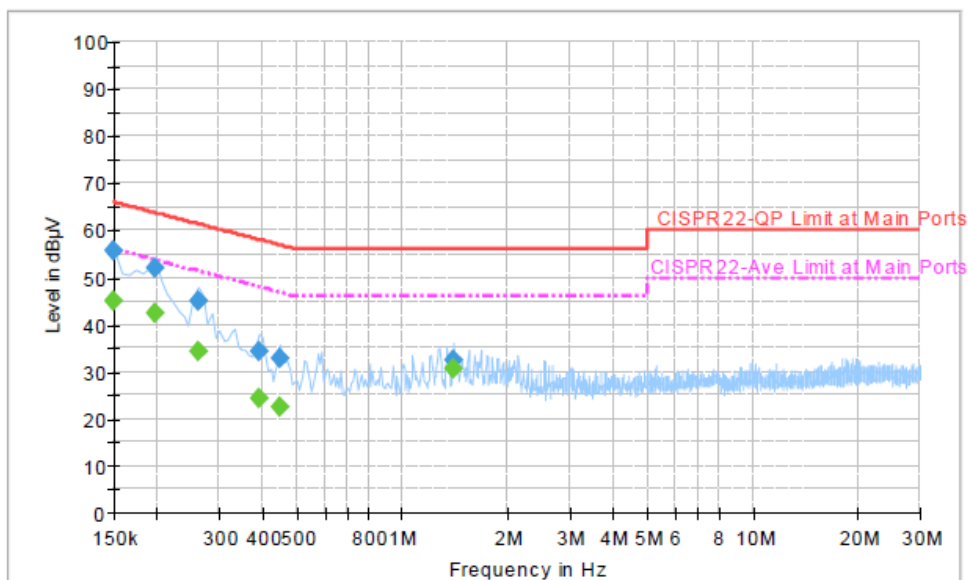
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	55.2	Off	L1	19.4	10.8	66.0
0.198000	51.9	Off	L1	19.3	11.8	63.7
0.254000	40.6	Off	L1	19.3	21.0	61.6
0.334000	36.9	Off	L1	19.3	22.5	59.4
0.526000	32.4	Off	L1	19.3	23.6	56.0
1.270000	31.3	Off	L1	19.4	24.7	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	44.2	Off	L1	19.4	11.8	56.0
0.198000	41.9	Off	L1	19.3	11.8	53.7
0.254000	30.8	Off	L1	19.3	20.8	51.6
0.334000	26.6	Off	L1	19.3	22.8	49.4
0.526000	22.6	Off	L1	19.3	23.4	46.0
1.270000	29.8	Off	L1	19.4	16.2	46.0

Test Mode :	Mode 3	Temperature :	22~24°C
Test Engineer :	Novic Chiang	Relative Humidity :	44~46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + WLAN Link + USB Cable (Data Link with Notebook)		
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	55.8	Off	N	19.4	10.2	66.0
0.198000	52.2	Off	N	19.3	11.5	63.7
0.262000	44.9	Off	N	19.4	16.5	61.4
0.390000	34.2	Off	N	19.4	23.9	58.1
0.446000	32.8	Off	N	19.3	24.1	56.9
1.406000	32.3	Off	N	19.4	23.7	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	45.1	Off	N	19.4	10.9	56.0
0.198000	42.5	Off	N	19.3	11.2	53.7
0.262000	34.2	Off	N	19.4	17.2	51.4
0.390000	24.3	Off	N	19.4	23.8	48.1
0.446000	22.6	Off	N	19.3	24.3	46.9
1.406000	30.8	Off	N	19.4	15.2	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

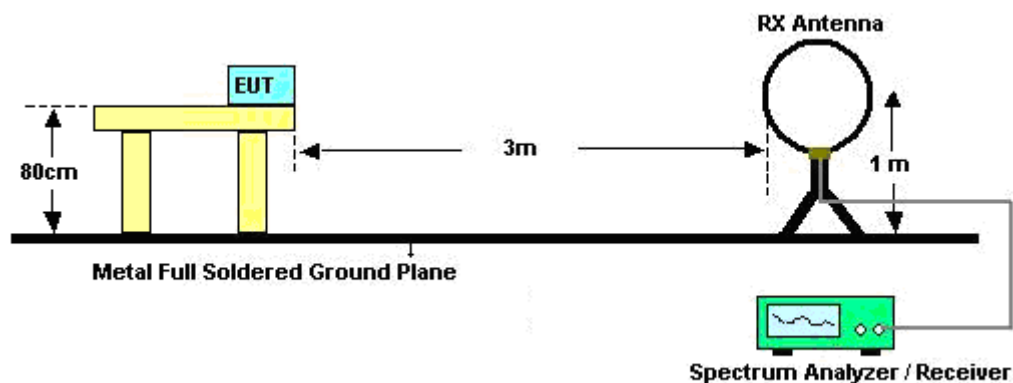
See list of measuring instruments of this test report.

3.7.3 Test Procedures

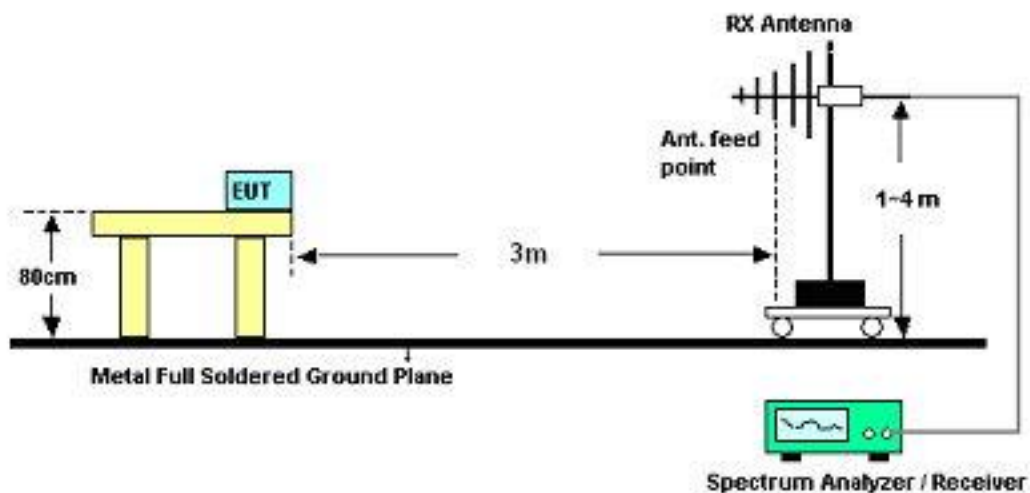
- The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
- Use the following spectrum analyzer settings:
 - Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 KHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep =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

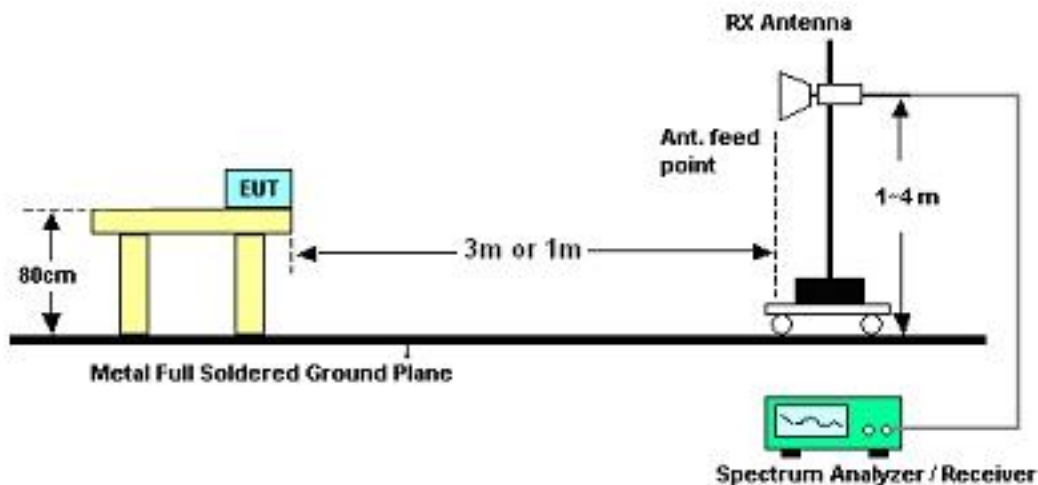
For radiated emissions below 30MHz



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 :	Kyle Jhuang	Temperature :	22~24℃	
		Relative Humidity :	50~52%	

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 :	22~24℃
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. For example, 105.92 dBuV/m - 20dB = 85.92 dBuV/m.		

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
43.77	27.11	-12.89	40	46.87	11.1	0.64	31.5	-	-	Peak
137.73	24.09	-19.41	43.5	43.01	11.44	1.19	31.55	-	-	Peak
248.97	36.75	-9.25	46	54.1	12.53	1.53	31.41	100	35	Peak
402.9	22.7	-23.3	46	35.67	16.06	2.15	31.18	-	-	Peak
710.9	21.95	-24.05	46	29.01	20.76	2.97	30.79	-	-	Peak
903.4	31.03	-14.97	46	35.23	23.14	3.35	30.69	-	-	Peak
2388.09	50.39	-23.61	74	46.26	32.06	6.03	33.96	100	280	Peak
2388.09	35.58	-18.42	54	31.45	32.06	6.03	33.96	100	280	Average
2412	105.92	-	-	101.74	32.08	6.07	33.97	100	280	Peak
2412	102	-	-	97.82	32.08	6.07	33.97	100	280	Average
2494	33.84	-20.16	54	29.46	32.2	6.18	34	100	280	Average
2494	45.65	-28.35	74	41.27	32.2	6.18	34	100	280	Peak
4824	47.4	-26.6	74	63.29	34.1	9.12	59.11	100	0	Peak
7236	45.71	-40.21	85.92	58.09	35.7	10.03	58.11	100	0	Peak

Test Mode :	Mode 1	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.		

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
62.94	28.92	-11.08	40	53.52	6.16	0.78	31.54	100	21	Peak
101.01	25	-18.5	43.5	45.65	9.89	1	31.54	-	-	Peak
250.05	30.06	-15.94	46	47.34	12.6	1.53	31.41	-	-	Peak
340.6	27.95	-18.05	46	42.96	14.4	1.89	31.3	-	-	Peak
752.2	23.78	-22.22	46	30.03	21.39	3.06	30.7	-	-	Peak
903.4	27.59	-18.41	46	31.79	23.14	3.35	30.69	-	-	Peak
2384.1	46.99	-27.01	74	42.89	32.03	6.03	33.96	185	334	Peak
2384.1	34.17	-19.83	54	30.07	32.03	6.03	33.96	185	334	Average
2412	100.74	-	-	96.56	32.08	6.07	33.97	185	334	Peak
2412	96.92	-	-	92.74	32.08	6.07	33.97	185	334	Average
2500	33.38	-20.62	54	29	32.2	6.18	34	185	334	Average
2500	45.21	-28.79	74	40.83	32.2	6.18	34	185	334	Peak
4824	48.07	-25.93	74	63.96	34.1	9.12	59.11	100	0	Peak
7236	46.37	-34.37	80.74	58.75	35.7	10.03	58.11	100	0	Peak



Test Mode :	Mode 2	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	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
30.81	21.24	-18.76	40	32.88	19.28	0.54	31.46	-	-	Peak
206.58	19.95	-23.55	43.5	40.5	9.57	1.35	31.47	-	-	Peak
247.62	37.27	-8.73	46	54.75	12.4	1.53	31.41	100	84	Peak
503	18.73	-27.27	46	29.18	18.15	2.46	31.06	-	-	Peak
800.5	23.98	-22.02	46	29.42	22.1	3.14	30.68	-	-	Peak
993	27.34	-26.66	54	29.92	24.5	3.5	30.58	-	-	Peak
2390	46.59	-27.41	74	42.46	32.06	6.03	33.96	100	291	Peak
2390	35	-19	54	30.87	32.06	6.03	33.96	100	291	Average
2437	104.63	-	-	100.37	32.13	6.11	33.98	100	291	Peak
2437	100.78	-	-	96.52	32.13	6.11	33.98	100	291	Average
2486	45.37	-28.63	74	41.01	32.18	6.18	34	100	291	Peak
2486	33.68	-20.32	54	29.32	32.18	6.18	34	100	291	Average
4874	44.74	-29.26	74	60.55	34.1	9.13	59.04	100	0	Peak



Test Mode :	Mode 2	Temperature :	22~24℃
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	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
31.62	21.13	-18.87	40	33.48	18.56	0.55	31.46	-	-	Peak
101.01	25.04	-18.46	43.5	45.69	9.89	1	31.54	-	-	Peak
248.7	29.78	-16.22	46	47.19	12.47	1.53	31.41	100	52	Peak
300	18.61	-27.39	46	34.87	13.3	1.77	31.33	-	-	Peak
749.4	23	-23	46	29.3	21.34	3.06	30.7	-	-	Peak
979	26.14	-27.86	54	28.95	24.28	3.49	30.58	-	-	Peak
2342	46.4	-27.6	74	42.41	31.98	5.95	33.94	121	334	Peak
2342	33.89	-20.11	54	29.9	31.98	5.95	33.94	121	334	Average
2437	98.23	-	-	94	32.1	6.11	33.98	121	334	Peak
2437	94.4	-	-	90.14	32.13	6.11	33.98	121	334	Average
2494	46.08	-27.92	74	41.7	32.2	6.18	34	121	334	Peak
2494	33.36	-20.64	54	28.98	32.2	6.18	34	121	334	Average
4874	45.99	-28.01	74	61.8	34.1	9.13	59.04	100	0	Peak



Test Mode :	Mode 3	Temperature :	22~24℃
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	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
48.9	23.27	-16.73	40	45.22	8.9	0.68	31.53	-	-	Peak
159.06	19.02	-24.48	43.5	38.75	10.57	1.22	31.52	-	-	Peak
252.21	36.65	-9.35	46	53.89	12.63	1.54	31.41	100	12	Peak
441.4	18.95	-27.05	46	30.92	16.87	2.28	31.12	-	-	Peak
806.1	24.1	-21.9	46	29.47	22.16	3.16	30.69	-	-	Peak
903.4	27.01	-18.99	46	31.21	23.14	3.35	30.69	-	-	Peak
2382	47.4	-26.6	74	43.3	32.03	6.03	33.96	100	281	Peak
2382	34.95	-19.05	54	30.85	32.03	6.03	33.96	100	281	Average
2462	99.04	-	-	94.74	32.15	6.14	33.99	100	281	Average
2462	103.79	-	-	99.49	32.15	6.14	33.99	100	281	Peak
2488.22	46.83	-27.17	74	42.45	32.2	6.18	34	100	281	Peak
2488.22	34.29	-19.71	54	29.91	32.2	6.18	34	100	281	Average
4924	44.7	-29.3	74	60.41	34.1	9.15	58.96	100	0	Peak



Test Mode :	Mode 3	Temperature :	22~24℃
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	2462 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.81	21.76	-18.24	40	33.4	19.28	0.54	31.46	-	-	Peak
101.82	24.22	-19.28	43.5	44.78	9.98	1	31.54	-	-	Peak
247.62	30.46	-15.54	46	47.94	12.4	1.53	31.41	100	42	Peak
512.1	19.37	-26.63	46	29.65	18.3	2.47	31.05	-	-	Peak
842.5	24.18	-21.82	46	29.12	22.53	3.25	30.72	-	-	Peak
903.4	27.28	-18.72	46	31.48	23.14	3.35	30.69	-	-	Peak
2390	46.46	-27.54	74	42.33	32.06	6.03	33.96	104	358	Peak
2390	34	-20	54	29.87	32.06	6.03	33.96	104	358	Average
2462	94.49	-	-	90.19	32.15	6.14	33.99	104	358	Average
2462	98.35	-	-	94.05	32.15	6.14	33.99	104	358	Peak
2485.18	45.73	-28.27	74	41.37	32.18	6.18	34	104	358	Peak
2485.18	33.58	-20.42	54	29.22	32.18	6.18	34	104	358	Average
4924	47.78	-26.22	74	63.49	34.1	9.15	58.96	100	0	Peak

Test Mode :	Mode 4	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.		

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
48.9	25.55	-14.45	40	47.5	8.9	0.68	31.53	-	-	Peak
160.41	23.04	-20.46	43.5	42.84	10.5	1.22	31.52	-	-	Peak
250.05	38.47	-7.53	46	55.75	12.6	1.53	31.41	100	47	Peak
422.5	20	-26	46	32.45	16.48	2.22	31.15	-	-	Peak
783.7	24.6	-21.4	46	30.33	21.85	3.11	30.69	-	-	Peak
903.4	28.14	-17.86	46	32.34	23.14	3.35	30.69	-	-	Peak
2388.85	63.1	-10.9	74	58.97	32.06	6.03	33.96	100	280	Peak
2388.85	40.89	-13.11	54	36.76	32.06	6.03	33.96	100	280	Average
2412	106.68	-	-	102.5	32.08	6.07	33.97	100	280	Peak
2412	97.22	-	-	93.04	32.08	6.07	33.97	100	280	Average
2500	34.5	-19.5	54	30.12	32.2	6.18	34	100	280	Average
2500	47.24	-26.76	74	42.86	32.2	6.18	34	100	280	Peak
4824	44.27	-29.73	74	60.16	34.1	9.12	59.11	100	0	Peak
7236	48.93	-37.75	86.68	61.31	35.7	10.03	58.11	100	0	Peak

Test Mode :	Mode 4	Temperature :	22~24℃
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.54	22.16	-17.84	40	33.8	19.28	0.54	31.46	-	-	Peak
101.01	24.61	-18.89	43.5	45.26	9.89	1	31.54	-	-	Peak
250.05	30.6	-15.4	46	47.88	12.6	1.53	31.41	100	98	Peak
346.2	20.36	-25.64	46	35.15	14.56	1.94	31.29	-	-	Peak
744.5	23.03	-22.97	46	29.42	21.27	3.05	30.71	-	-	Peak
903.4	29.32	-16.68	46	33.52	23.14	3.35	30.69	-	-	Peak
2388.85	55.86	-18.14	74	51.73	32.06	6.03	33.96	187	333	Peak
2388.85	37.47	-16.53	54	33.34	32.06	6.03	33.96	187	333	Average
2412	101.48	-	-	97.3	32.08	6.07	33.97	187	333	Peak
2412	92.31	-	-	88.13	32.08	6.07	33.97	187	333	Average
2486	33.51	-20.49	54	29.15	32.18	6.18	34	187	333	Average
2486	45.29	-28.71	74	40.93	32.18	6.18	34	187	333	Peak
4824	47.37	-26.63	74	63.26	34.1	9.12	59.11	100	0	Peak
7236	50.26	-31.22	81.48	62.64	35.7	10.03	58.11	100	0	Peak

Test Mode :	Mode 5	Temperature :	22~24℃
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	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
48.9	25.81	-14.19	40	47.76	8.9	0.68	31.53	-	-	Peak
159.33	21.29	-22.21	43.5	41.02	10.57	1.22	31.52	-	-	Peak
249.78	39.34	-6.66	46	56.62	12.6	1.53	31.41	100	37	Peak
534.5	20.42	-25.58	46	30.23	18.68	2.52	31.01	-	-	Peak
811.7	24	-22	46	29.3	22.22	3.17	30.69	-	-	Peak
956.6	25.62	-20.38	46	28.78	23.94	3.47	30.57	-	-	Peak
2382	48.04	-25.96	74	43.94	32.03	6.03	33.96	100	282	Peak
2382	36.23	-17.77	54	32.13	32.03	6.03	33.96	100	282	Average
2437	105.75	-	-	101.49	32.13	6.11	33.98	100	282	Peak
2437	96.43	-	-	92.17	32.13	6.11	33.98	100	282	Average
2484	47.02	-26.98	74	42.66	32.18	6.18	34	100	282	Peak
2484	34.63	-19.37	54	30.27	32.18	6.18	34	100	282	Average
7311	47.83	-26.17	74	60.2	35.7	10.06	58.13	100	0	Peak



Test Mode :	Mode 5	Temperature :	22~24℃
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	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
48.9	21.4	-18.6	40	43.35	8.9	0.68	31.53	100	81	Peak
106.41	23.72	-19.78	43.5	43.81	10.43	1.03	31.55	-	-	Peak
264.09	25.58	-20.42	46	42.58	12.79	1.61	31.4	-	-	Peak
430.9	18	-28	46	30.23	16.65	2.25	31.13	-	-	Peak
774.6	23.37	-22.63	46	29.24	21.72	3.1	30.69	-	-	Peak
962.2	26.12	-27.88	54	29.19	24.03	3.47	30.57	-	-	Peak
2388	46.85	-27.15	74	42.72	32.06	6.03	33.96	115	329	Peak
2388	34.29	-19.71	54	30.16	32.06	6.03	33.96	115	329	Average
2437	100.1	-	-	95.87	32.1	6.11	33.98	115	329	Peak
2437	90.74	-	-	86.48	32.13	6.11	33.98	115	329	Average
2492	45.42	-28.58	74	41.04	32.2	6.18	34	115	329	Peak
2492	33.5	-20.5	54	29.12	32.2	6.18	34	115	329	Average
7311	47.55	-26.45	74	59.92	35.7	10.06	58.13	100	0	Peak



Test Mode :	Mode 6	Temperature :	22~24℃
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	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
48.9	25.63	-14.37	40	47.58	8.9	0.68	31.53	-	-	Peak
160.41	20.46	-23.04	43.5	40.26	10.5	1.22	31.52	-	-	Peak
250.05	37.9	-8.1	46	55.18	12.6	1.53	31.41	100	79	Peak
545	19.54	-26.46	46	29.13	18.86	2.54	30.99	-	-	Peak
811	24.14	-21.86	46	29.45	22.21	3.17	30.69	-	-	Peak
982.5	26.63	-27.37	54	29.38	24.34	3.49	30.58	-	-	Peak
2356	52.11	-21.89	74	48.09	32.01	5.95	33.94	100	282	Peak
2356	36.01	-17.99	54	31.99	32.01	5.95	33.94	100	282	Average
2462	95.25	-	-	90.95	32.15	6.14	33.99	100	282	Average
2462	104.67	-	-	100.37	32.15	6.14	33.99	100	282	Peak
2485.94	62.84	-11.16	74	58.48	32.18	6.18	34	100	282	Peak
2485.94	38	-16	54	33.64	32.18	6.18	34	100	282	Average
7386	47.2	-26.8	74	59.56	35.7	10.1	58.16	100	0	Peak



Test Mode :	Mode 6	Temperature :	22~24℃
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	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
31.08	21.08	-18.92	40	32.72	19.28	0.54	31.46	100	74	Peak
101.01	22.97	-20.53	43.5	43.62	9.89	1	31.54	-	-	Peak
248.7	26.43	-19.57	46	43.84	12.47	1.53	31.41	-	-	Peak
315.4	20.17	-25.83	46	35.97	13.72	1.8	31.32	-	-	Peak
730.5	23.02	-22.98	46	29.71	21.05	3.01	30.75	-	-	Peak
996.5	26.26	-27.74	54	28.79	24.54	3.51	30.58	-	-	Peak
2366	47.01	-26.99	74	42.96	32.01	5.99	33.95	180	324	Peak
2366	34.29	-19.71	54	30.24	32.01	5.99	33.95	180	324	Average
2462	89.87	-	-	85.57	32.15	6.14	33.99	180	324	Average
2462	99.25	-	-	94.95	32.15	6.14	33.99	180	324	Peak
2487.65	59.36	-14.64	74	54.98	32.2	6.18	34	180	324	Peak
2487.65	35.1	-18.9	54	30.72	32.2	6.18	34	180	324	Average
7386	48.49	-25.51	74	60.86	35.7	10.1	58.17	100	0	Peak

Test Mode :	Mode 7	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.		

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
48.9	26.28	-13.72	40	48.23	8.9	0.68	31.53	100	46	Peak
142.86	24	-19.5	43.5	43	11.35	1.2	31.55	-	-	Peak
250.05	31.67	-14.33	46	48.95	12.6	1.53	31.41	-	-	Peak
489	19.66	-26.34	46	30.45	17.86	2.41	31.06	-	-	Peak
783.7	23.78	-22.22	46	29.51	21.85	3.11	30.69	-	-	Peak
903.4	29.18	-16.82	46	33.38	23.14	3.35	30.69	-	-	Peak
2389.99	63.91	-10.09	74	59.78	32.06	6.03	33.96	100	282	Peak
2389.99	44.9	-9.1	54	40.77	32.06	6.03	33.96	100	282	Average
2412	107.2	-	-	103.02	32.08	6.07	33.97	100	282	Peak
2412	97.44	-	-	93.26	32.08	6.07	33.97	100	282	Average
2484	35.03	-18.97	54	30.67	32.18	6.18	34	100	282	Average
2484	47.05	-26.95	74	42.69	32.18	6.18	34	100	282	Peak
4824	46.23	-27.77	74	62.12	34.1	9.12	59.11	100	0	Peak
7236	49.72	-37.48	87.2	62.1	35.7	10.03	58.11	100	0	Peak

Test Mode :	Mode 7	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.		

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	21.71	-18.29	40	32.64	20	0.53	31.46	-	-	Peak
92.37	25.2	-18.3	43.5	46.92	8.84	0.96	31.52	-	-	Peak
250.05	30.97	-15.03	46	48.25	12.6	1.53	31.41	100	86	Peak
545	20.32	-25.68	46	29.91	18.86	2.54	30.99	-	-	Peak
757.8	24.11	-21.89	46	30.28	21.46	3.07	30.7	-	-	Peak
903.4	28.9	-17.1	46	33.1	23.14	3.35	30.69	-	-	Peak
2389.99	58.42	-15.58	74	54.29	32.06	6.03	33.96	186	333	Peak
2389.99	39.7	-14.3	54	35.57	32.06	6.03	33.96	186	333	Average
2412	102.07	-	-	97.89	32.08	6.07	33.97	186	333	Peak
2412	92.32	-	-	88.14	32.08	6.07	33.97	186	333	Average
2500	33.67	-20.33	54	29.29	32.2	6.18	34	186	333	Average
2500	45.87	-28.13	74	41.49	32.2	6.18	34	186	333	Peak
4824	47.27	-26.73	74	63.16	34.1	9.12	59.11	100	0	Peak
7236	49.99	-32.08	82.07	62.37	35.7	10.03	58.11	100	0	Peak



Test Mode :	Mode 8	Temperature :	22~24℃
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	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
48.9	25.98	-14.02	40	47.93	8.9	0.68	31.53	-	-	Peak
157.98	21.33	-22.17	43.5	41	10.64	1.22	31.53	-	-	Peak
253.02	38.14	-7.86	46	55.36	12.64	1.55	31.41	100	42	Peak
492.5	19.54	-26.46	46	30.25	17.94	2.42	31.07	-	-	Peak
708.1	22.57	-23.43	46	29.69	20.72	2.96	30.8	-	-	Peak
976.9	26.82	-27.18	54	29.66	24.25	3.49	30.58	-	-	Peak
2372	48.44	-25.56	74	44.37	32.03	5.99	33.95	100	293	Peak
2372	37.45	-16.55	54	33.38	32.03	5.99	33.95	100	293	Average
2437	105.89	-	-	101.66	32.1	6.11	33.98	100	293	Peak
2437	96.34	-	-	92.08	32.13	6.11	33.98	100	293	Average
2484	46.67	-27.33	74	42.31	32.18	6.18	34	100	293	Peak
2484	34.62	-19.38	54	30.26	32.18	6.18	34	100	293	Average
7311	47.12	-26.88	74	59.49	35.7	10.06	58.13	100	0	Peak



Test Mode :	Mode 8	Temperature :	22~24℃
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	2437 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.81	21.23	-18.77	40	32.87	19.28	0.54	31.46	-	-	Peak
101.01	22.87	-20.63	43.5	43.52	9.89	1	31.54	-	-	Peak
249.78	28.23	-17.77	46	45.51	12.6	1.53	31.41	100	92	Peak
343.4	19.19	-26.81	46	34.09	14.48	1.92	31.3	-	-	Peak
724.2	23.16	-22.84	46	29.96	20.96	3	30.76	-	-	Peak
985.3	26.41	-27.59	54	29.11	24.38	3.5	30.58	-	-	Peak
2390	46.84	-27.16	74	42.71	32.06	6.03	33.96	190	328	Peak
2390	34.69	-19.31	54	30.56	32.06	6.03	33.96	190	328	Average
2437	100.63	-	-	96.4	32.1	6.11	33.98	190	328	Peak
2437	91.13	-	-	86.87	32.13	6.11	33.98	190	328	Average
2494	45.3	-28.7	74	40.92	32.2	6.18	34	190	328	Peak
2494	33.48	-20.52	54	29.1	32.2	6.18	34	190	328	Average
7311	47.69	-26.31	74	60.06	35.7	10.06	58.13	100	0	Peak



Test Mode :	Mode 9	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	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
48.9	26.32	-13.68	40	48.27	8.9	0.68	31.53	-	-	Peak
159.33	22.21	-21.29	43.5	41.94	10.57	1.22	31.52	-	-	Peak
251.13	38.33	-7.67	46	55.59	12.61	1.54	31.41	100	44	Peak
514.9	19.84	-26.16	46	30.05	18.35	2.48	31.04	-	-	Peak
774.6	23.38	-22.62	46	29.25	21.72	3.1	30.69	-	-	Peak
996.5	26.66	-27.34	54	29.19	24.54	3.51	30.58	-	-	Peak
2380	48.06	-25.94	74	43.96	32.03	6.03	33.96	100	286	Peak
2380	36.49	-17.51	54	32.39	32.03	6.03	33.96	100	286	Average
2462	95.68	-	-	91.38	32.15	6.14	33.99	100	286	Average
2462	105.21	-	-	100.91	32.15	6.14	33.99	100	286	Peak
2486.13	65.05	-8.95	74	60.69	32.18	6.18	34	100	286	Peak
2486.13	40.89	-13.11	54	36.53	32.18	6.18	34	100	286	Average
7386	45.29	-28.71	74	57.66	35.7	10.1	58.17	100	0	Peak



Test Mode :	Mode 9	Temperature :	22~24℃
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	2462 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.81	22.22	-17.78	40	33.86	19.28	0.54	31.46	-	-	Peak
136.38	24.47	-19.03	43.5	43.38	11.46	1.19	31.56	-	-	Peak
250.05	28.7	-17.3	46	45.98	12.6	1.53	31.41	100	54	Peak
402.9	18.79	-27.21	46	31.76	16.06	2.15	31.18	-	-	Peak
732.6	22.44	-23.56	46	29.08	21.08	3.02	30.74	-	-	Peak
903.4	26.39	-19.61	46	30.59	23.14	3.35	30.69	-	-	Peak
2388	46.58	-27.42	74	42.45	32.06	6.03	33.96	180	327	Peak
2388	34.86	-19.14	54	30.73	32.06	6.03	33.96	180	327	Average
2462	90.69	-	-	86.39	32.15	6.14	33.99	180	327	Average
2462	100.52	-	-	96.22	32.15	6.14	33.99	180	327	Peak
2485.18	59.84	-14.16	74	55.48	32.18	6.18	34	180	327	Peak
2485.18	35.92	-18.08	54	31.56	32.18	6.18	34	180	327	Average
7386	48.3	-25.7	74	60.67	35.7	10.1	58.17	100	0	Peak



Test Mode :	Mode 10	Temperature :	22~24°C
Test Channel :	03	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	2422 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
48.9	26.16	-13.84	40	48.11	8.9	0.68	31.53	-	-	Peak
157.98	24.05	-19.45	43.5	43.72	10.64	1.22	31.53	-	-	Peak
250.86	37.7	-8.3	46	54.96	12.61	1.54	31.41	100	71	Peak
537.3	19.52	-26.48	46	29.27	18.73	2.52	31	-	-	Peak
771.8	23.18	-22.82	46	29.09	21.68	3.1	30.69	-	-	Peak
903.4	31.65	-14.35	46	35.85	23.14	3.35	30.69	-	-	Peak
2389.42	62.67	-11.33	74	58.54	32.06	6.03	33.96	100	294	Peak
2389.42	49.34	-4.66	54	45.21	32.06	6.03	33.96	100	294	Average
2422	104.11	-	-	99.88	32.1	6.11	33.98	100	294	Peak
2422	94.87	-	-	90.67	32.1	6.07	33.97	100	294	Average
2484	35.39	-18.61	54	31.03	32.18	6.18	34	100	294	Average
2484	51.2	-22.8	74	46.84	32.18	6.18	34	100	294	Peak



Test Mode :	Mode 10	Temperature :	22~24℃
Test Channel :	03	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	2422 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.08	21.5	-18.5	40	33.14	19.28	0.54	31.46	-	-	Peak
106.41	24.57	-18.93	43.5	44.66	10.43	1.03	31.55	-	-	Peak
254.37	30.46	-15.54	46	47.67	12.65	1.55	31.41	100	52	Peak
318.2	22.54	-23.46	46	38.25	13.8	1.81	31.32	-	-	Peak
721.4	22.89	-23.11	46	29.75	20.92	2.99	30.77	-	-	Peak
903.4	29.29	-16.71	46	33.49	23.14	3.35	30.69	-	-	Peak
2388.85	56.62	-17.38	74	52.49	32.06	6.03	33.96	187	330	Peak
2388.85	42.3	-11.7	54	38.17	32.06	6.03	33.96	187	330	Average
2422	98.68	-	-	94.48	32.1	6.07	33.97	187	330	Peak
2422	89.3	-	-	85.1	32.1	6.07	33.97	187	330	Average
2486	33.69	-20.31	54	29.33	32.18	6.18	34	187	330	Average
2486	46.45	-27.55	74	42.09	32.18	6.18	34	187	330	Peak
7266	46.95	-27.05	74	59.33	35.7	10.04	58.12	100	0	Peak



Test Mode :	Mode 11	Temperature :	22~24℃
Test Channel :	09	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	2452 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
48.9	25.77	-14.23	40	47.72	8.9	0.68	31.53	-	-	Peak
159.33	23.87	-19.63	43.5	43.6	10.57	1.22	31.52	-	-	Peak
253.29	37.55	-8.45	46	54.77	12.64	1.55	31.41	100	15	Peak
553.4	20.49	-25.51	46	29.9	19.01	2.56	30.98	-	-	Peak
797.7	23.99	-22.01	46	29.47	22.06	3.14	30.68	-	-	Peak
903.4	28.78	-17.22	46	32.98	23.14	3.35	30.69	-	-	Peak
2390	53.24	-20.76	74	49.11	32.06	6.03	33.96	100	280	Peak
2390	37.29	-16.71	54	33.16	32.06	6.03	33.96	100	280	Average
2452	93.36	-	-	89.1	32.13	6.11	33.98	100	280	Average
2452	102.61	-	-	98.35	32.13	6.11	33.98	100	280	Peak
2488.22	65.65	-8.35	74	61.27	32.2	6.18	34	100	280	Peak
2488.22	44.72	-9.28	54	40.34	32.2	6.18	34	100	280	Average



Test Mode :	Mode 11	Temperature :	22~24℃
Test Channel :	09	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	2452 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
54.57	27.1	-12.9	40	50.63	7.3	0.72	31.55	100	87	Peak
92.37	24.94	-18.56	43.5	46.66	8.84	0.96	31.52	-	-	Peak
251.13	29.89	-16.11	46	47.15	12.61	1.54	31.41	-	-	Peak
340.6	19.46	-26.54	46	34.47	14.4	1.89	31.3	-	-	Peak
755	23.14	-22.86	46	29.35	21.42	3.07	30.7	-	-	Peak
903.4	28.68	-17.32	46	32.88	23.14	3.35	30.69	-	-	Peak
2390	48	-26	74	43.87	32.06	6.03	33.96	183	324	Peak
2390	34.66	-19.34	54	30.53	32.06	6.03	33.96	183	324	Average
2452	88.44	-	-	84.18	32.13	6.11	33.98	183	324	Average
2452	98.03	-	-	93.77	32.13	6.11	33.98	183	324	Peak
2483.5	56.72	-17.28	74	52.36	32.18	6.18	34	183	324	Peak
2483.5	39.37	-14.63	54	35.01	32.18	6.18	34	183	324	Average

3.8 Antenna Requirements

3.8.1 Standard Applicable

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

3.8.2 Antenna Connected Construction

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

3.8.3 Antenna Gain

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

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 13, 2011	Dec. 07, 2011~ Dec. 09, 2011	Jun. 12, 2012	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 18, 2011	Dec. 07, 2011~ Dec. 09, 2011	Sep. 17, 2012	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 18, 2011	Dec. 07, 2011~ Dec. 09, 2011	Sep. 17, 2012	Conducted (TH02-HY)
Power Meter	Agilent	E4416A	GB41292344	N/A	Feb. 18, 2011	Dec. 07, 2011~ Dec. 09, 2011	Feb. 17, 2012	Conducted (TH02-HY)
Power Sensor	Agilent	E9327A	US40441548	N/A	Feb. 18, 2011	Dec. 07, 2011~ Dec. 09, 2011	Feb. 17, 2012	Conducted (TH02-HY)
EMI Test Receive	R&S	ESCI 7	100724	9kHz~7GHz	Aug. 22, 2011	Dec. 23, 2011	Aug. 21, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz~30MHz	Dec. 09, 2011	Dec. 23, 2011	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz~30MHz	Dec. 06, 2011	Dec. 23, 2011	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000 W	N/A	N/A	N/A	Dec. 23, 2011	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	112403	N/A	Feb. 22, 2011	Dec. 23, 2011	Feb. 21, 2012	Conduction (CO05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 22, 2011	Dec. 09, 2011	Oct. 21, 2012	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP30	101067	9KHz ~ 30GHz	Dec. 06, 2011	Dec. 09, 2011	Dec. 05, 2012	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 10, 2011	Dec. 09, 2011	Aug. 09, 2012	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec. 05, 2011	Dec. 09, 2011	Dec. 04, 2012	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32 dB.GAIN	Mar. 29, 2011	Dec. 09, 2011	Mar. 28, 2012	Radiation (03CH07-HY)
EMI TEST RECEIVER	R&S	ESCI 7	100724	9kHz~7GHz	Aug. 22, 2011	Dec. 09, 2011	Aug. 21, 2012	Radiation (03CH07-HY)
Pre Amplifier	MITEQ	AMF-7D-00 101800-30-10P	159088	1GHz ~ 18GHz	Feb. 21, 2011	Dec. 09, 2011	Feb. 20, 2012	Radiation (03CH07-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 EP1N2312-01 as below.