

FCC RF Test Report

APPLICANT : TECOM CO., LTD.
EQUIPMENT : WiMAX Indoor CPE
BRAND NAME : Alvarion
MODEL NAME : WM5347N-3G8
FCC ID : D6XWM5347N
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Transmission System (DTS)

The product was received on Aug. 04, 2011 and completely tested on Sep. 07, 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
FR180414	Rev. 01	Initial issue of report	Sep. 14, 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 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 20.8 dB at 2.55 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 3 dB at 4824 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

TECOM CO., LTD.

23, R&D ROAD 2 SCIENCE-BASED INDUSTRIAL PARK HSIN-CHU TAIWAN R. O. C.

1.2 Manufacturer

TECOM CO., LTD.

23, R&D ROAD 2 SCIENCE-BASED INDUSTRIAL PARK HSIN-CHU TAIWAN R. O. C.

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	WiMAX Indoor CPE
Brand Name	Alvarion
Model Name	WM5347N-3G8
FCC ID	D6XWM5347N
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 : 20.36 dBm (0.1086 W) 802.11g : 22.56 dBm (0.1803 W) 802.11n (BW 20MHz) : 22.51 dBm (0.1782 W)
Antenna Type	PCB Antenna with gain 0 dBi
HW Version	RD6
SW Version	V2881
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Production Unit

Remark:

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

1.4 Testing Site

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

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 (Certification), 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	Agilent	E6651A	ATO-72749	N/A	Unshielded, 1.8 m
2.	Phone	HTT	HTT-198	N/A	N/A	N/A
3.	Notebook	DELL	P20G	FCC DOC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

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	20.14	-	-	-
CH 06	2437 MHz	20.36	20.20	20.21	20.29
CH 11	2462 MHz	19.85	-	-	-

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	22.56	22.50	22.45	22.47	22.41	22.38	22.27	22.12
CH 06	2437 MHz	22.43	-	-	-	-	-	-	-
CH 11	2462 MHz	22.07	-	-	-	-	-	-	-

Channel	Frequency	2.4GHz 802.11n (BW 20MHz) RF Power (dBm)							
		OFDM Data Rate							
		MCS=0	MCS=1	MCS=2	MCS=3	MCS=4	MCS=5	MCS=6	MCS=7
		6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps
CH 01	2412 MHz	22.46	-	-	-	-	-	-	-
CH 06	2437 MHz	22.51	22.14	22.06	22.00	21.93	21.77	21.75	21.68
CH 11	2462 MHz	22.08	-	-	-	-	-	-	-

Remark:

1. The data rates of WLAN 802.11b/g/n were set in 1Mbps for 802.11b, 6Mbps for 802.11g, and MCS=0 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.
3. Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports.

2.2 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz), radiated emission (30 MHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

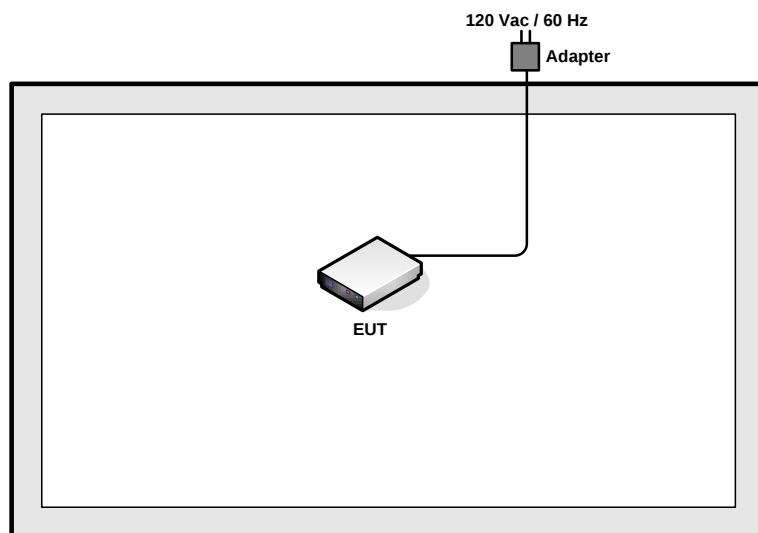
Pre-scanned tests were conducted to determine the final configuration from all possible combinations.

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

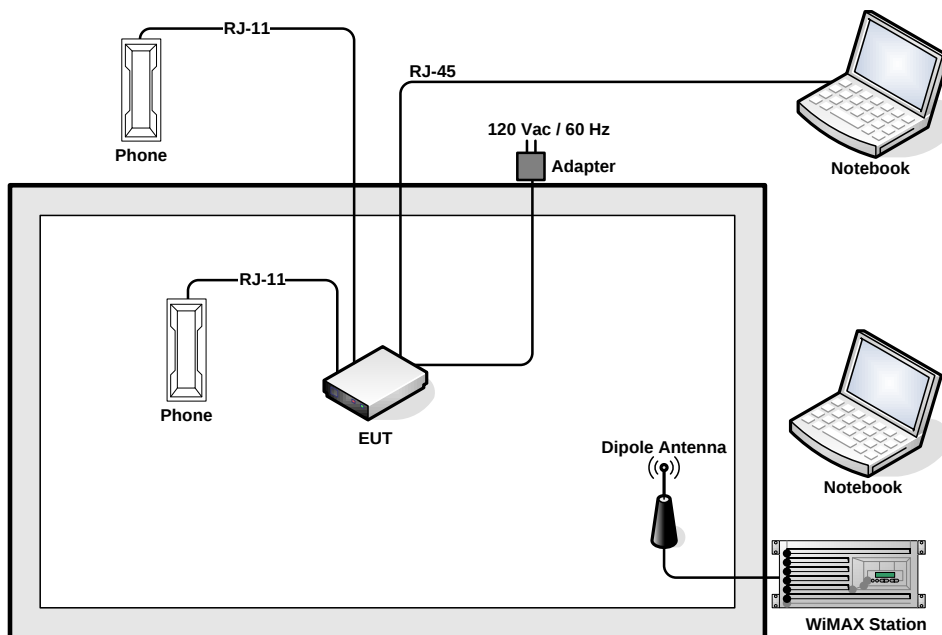
Test Cases		
Test Item	802.11b (Modulation : DSSS)	802.11g/n (Modulation : OFDM)
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4: 802.11g_CH01_2412 MHz Mode 5: 802.11g_CH06_2437 MHz Mode 6: 802.11g_CH11_2462 MHz Mode 7: 802.11n (BW 20M)_CH01_2412 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 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
AC Conducted Emission	Mode 1 : WiMAX Idle + WLAN (2.4G) Link + VOIP Link + Adapter	

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<EUT with Adapter Mode>





2.4 RF Utility

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

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

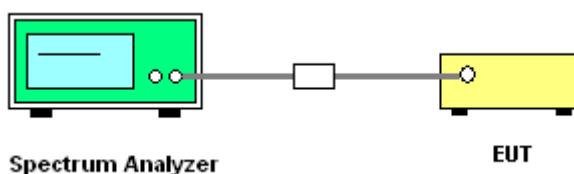
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup

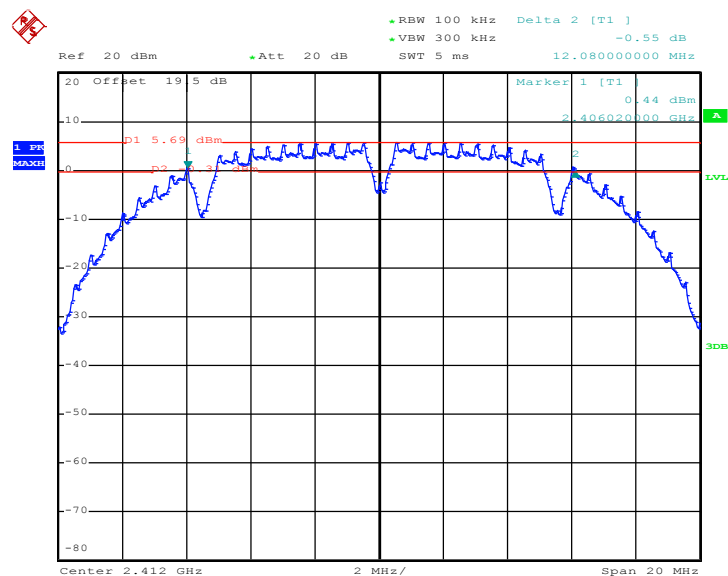


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	24~26℃
Test Engineer :	Pinkston Tu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	12.08	0.5	Pass
06	2437	12.12	0.5	Pass
11	2462	12.08	0.5	Pass

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



Date: 30.AUG.2011 11:24:16



• RBW 100 kHz Delta 2 [T1]
 • VBW 300 kHz 0.10 dB
 Ref 20 dBm • Att 20 dB SWT 5 ms 12.120000000 MHz

20 Offset 19.5 dB
 -10
 -20
 -30
 -40
 -50
 -60
 -70
 -80

Marker 1 [T1]
 -0.45 dBm
 2.430980000 MHz

p1 5.46 dBm
 p2 5.46 dBm

2
 -0.45 dBm
 2.430980000 MHz

Center 2.437 GHz 2 MHz/ Span 20 MHz

Date: 30.AUG.2011 11:38:47

1.5% RASH

Ref 20 dBm Att 20 dB SWT 5 ms Delta 2 [T1] 12.08000000 MHz

Marker 1 [T1] 0.90 dBm 2.456000000 GHz

D1 6.12 dBm D2 0.12 dBm

Center 2.462 GHz 2 MHz/ Span 20 MHz

3DB

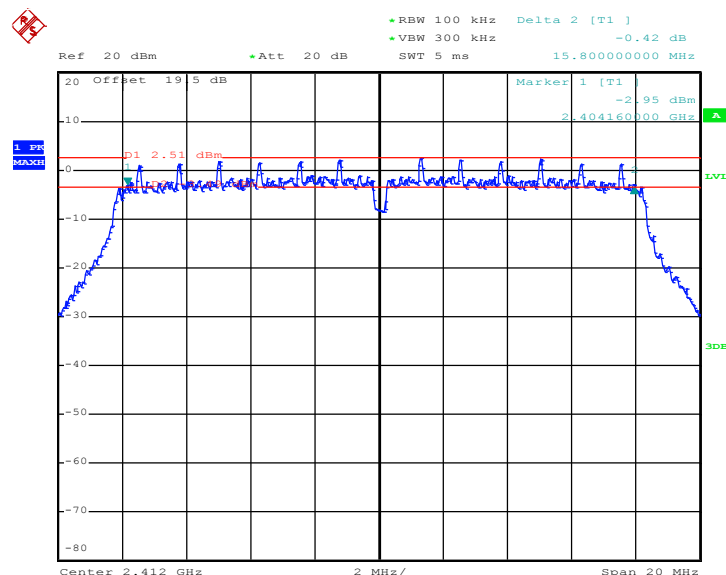
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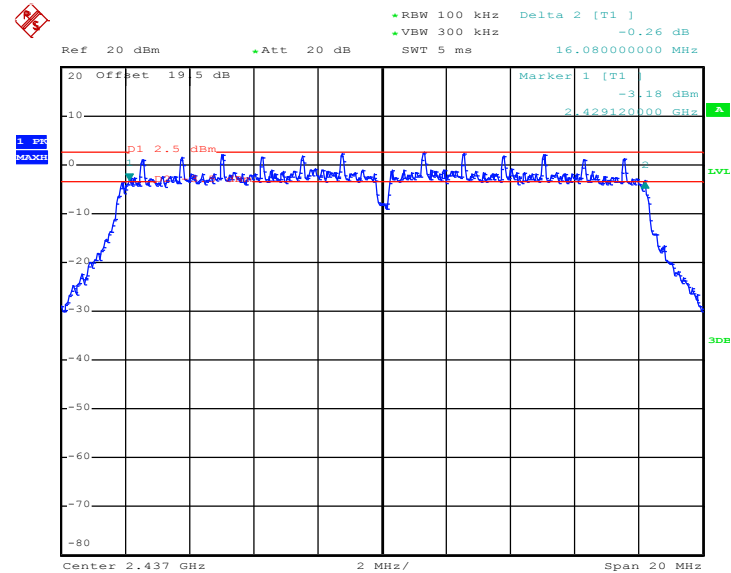
Test Mode :	Mode 4, 5, 6	Temperature :	24~26°C
Test Engineer :	Pinkston Tu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	15.80	0.5	Pass
06	2437	16.08	0.5	Pass
11	2462	15.84	0.5	Pass

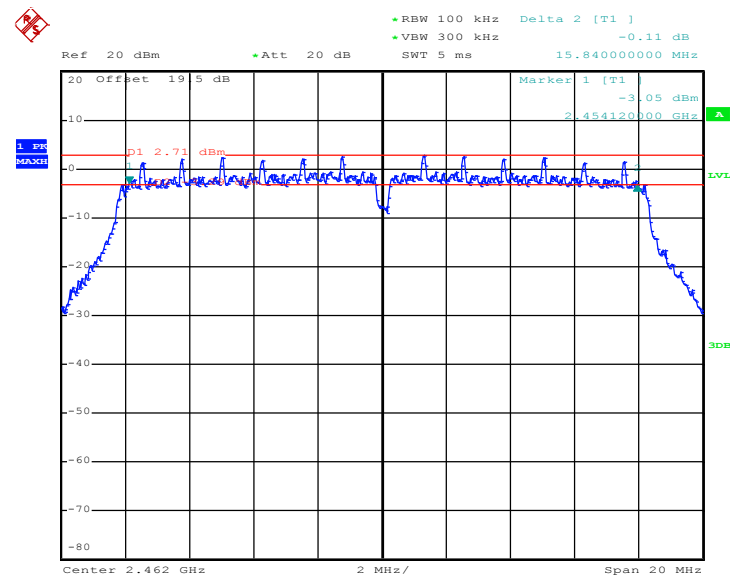
Mode 4 : 6 dB Bandwidth Plot on 802.11g Channel 01



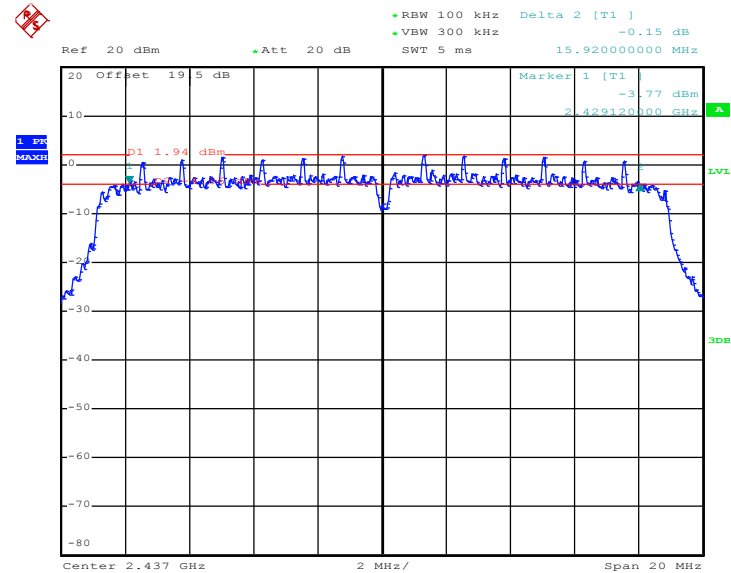
Date: 30.AUG.2011 14:14:09

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


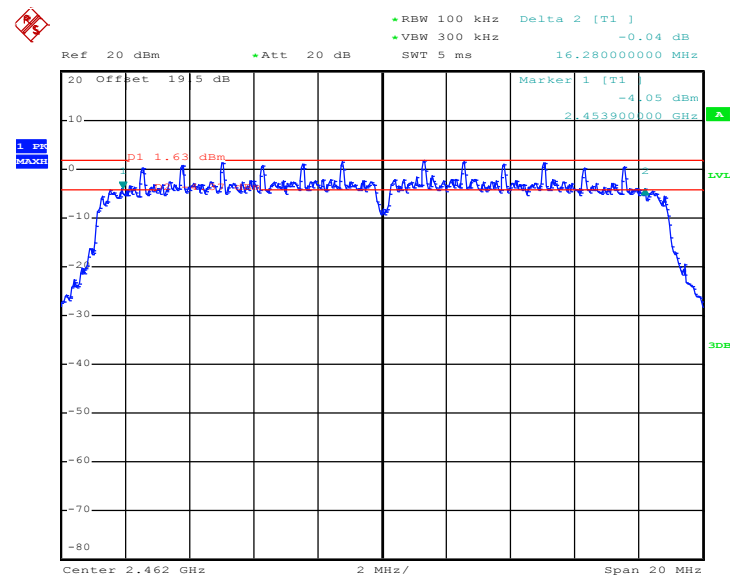
Date: 30.AUG.2011 17:09:39

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


Date: 30.AUG.2011 12:31:07

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


Date: 30.AUG.2011 17:51:20

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


Date: 30.AUG.2011 18:29:22

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.

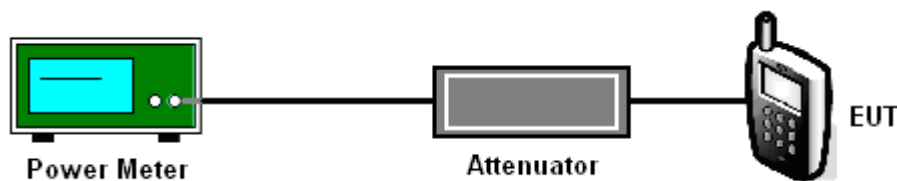
3.2.2 Measuring Instruments

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 :	24~26℃
Test Engineer :	Pinkston Tu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	20.14	30	Pass
06	2437	20.36	30	Pass
11	2462	19.85	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	24~26℃
Test Engineer :	Pinkston Tu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	22.56	30	Pass
06	2437	22.43	30	Pass
11	2462	22.07	30	Pass

Test Mode :	Mode 7, 8, 9	Temperature :	24~26℃
Test Engineer :	Pinkston Tu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	22.46	30	Pass
06	2437	22.51	30	Pass
11	2462	22.08	30	Pass

3.3 Band Edges Measurement

3.3.1 Limit of Band Edges

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB.

3.3.2 Measuring Instruments

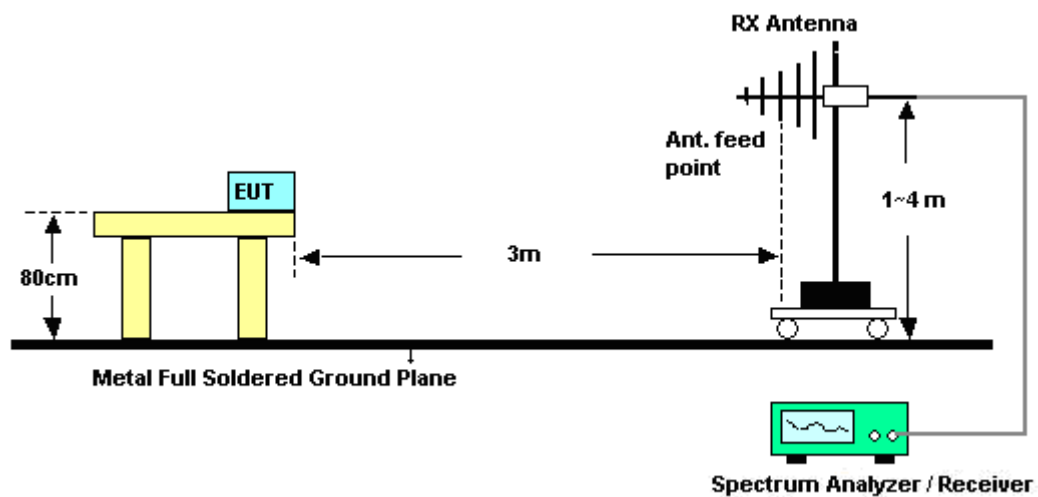
See list of measuring instruments of this test report.

3.3.3 Test Procedures

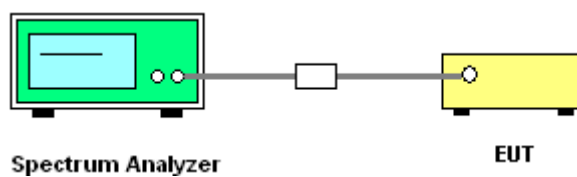
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) $\geq$ RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. Note: If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.
3. Radiated emission test: Apply to band edge emissions that fall in the restricted bands listed in FCC Section 15.205. The maximum permitted average field strength is listed in FCC Section 15.209. A pre-amp is necessary for this measurement. For measurements above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep=Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation as in FCC Section 15.35(b) and (c).

3.3.4 Test Setup

<Radiated Band Edges>



<Conducted Band Edges>



3.3.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	23~25℃
Test Band :	802.11b	Relative Humidity :	42~44%
Test Channel :	01	Test Engineer :	Elvis Chen

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2386.57	53.8	-20.2	74	50.89	31.9	5.4	34.39	100	96	Peak
2386.57	42.82	-11.18	54	39.91	31.9	5.4	34.39	100	96	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
2350.09	54.28	-19.72	74	51.51	31.84	5.34	34.41	102	49	Peak
2350.09	43.78	-10.22	54	41.01	31.84	5.34	34.41	102	49	Average

Test Mode :	Mode 3	Temperature :	23~25℃
Test Band :	802.11b	Relative Humidity :	42~44%
Test Channel :	11	Test Engineer :	Elvis Chen

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2488.22	49.76	-24.24	74	46.61	32	5.52	34.37	100	92	Peak
2488.22	38.15	-15.85	54	35	32	5.52	34.37	100	92	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	52.18	-21.82	74	49.05	31.98	5.52	34.37	100	41	Peak
2483.5	40.66	-13.34	54	37.53	31.98	5.52	34.37	100	41	Average



Test Mode :	Mode 4	Temperature :	23~25°C
Test Band :	802.11g	Relative Humidity :	42~44%
Test Channel :	01	Test Engineer :	Elvis Chen

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.99	61.03	-12.97	74	58.12	31.9	5.4	34.39	100	94	Peak
2389.99	42.97	-11.03	54	40.06	31.9	5.4	34.39	100	94	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	64.05	-9.95	74	61.14	31.9	5.4	34.39	102	48	Peak
2389.99	45.55	-8.45	54	42.64	31.9	5.4	34.39	102	48	Average

Test Mode :	Mode 6	Temperature :	23~25°C
Test Band :	802.11g	Relative Humidity :	42~44%
Test Channel :	11	Test Engineer :	Elvis Chen

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.85	53.39	-20.61	74	50.26	31.98	5.52	34.37	131	91	Peak
2483.85	36.4	-17.6	54	33.27	31.98	5.52	34.37	131	91	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	60.28	-13.72	74	57.15	31.98	5.52	34.37	100	43	Peak
2483.66	41.93	-12.07	54	38.8	31.98	5.52	34.37	100	43	Average



Test Mode :	Mode 7	Temperature :	23~25℃
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	42~44%
Test Channel :	01	Test Engineer :	Elvis Chen

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.99	65.95	-8.05	74	63.04	31.9	5.4	34.39	100	96	Peak
2389.99	43.66	-10.34	54	40.75	31.9	5.4	34.39	100	96	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	68.81	-5.19	74	65.9	31.9	5.4	34.39	100	47	Peak
2389.99	46.09	-7.91	54	43.18	31.9	5.4	34.39	100	47	Average

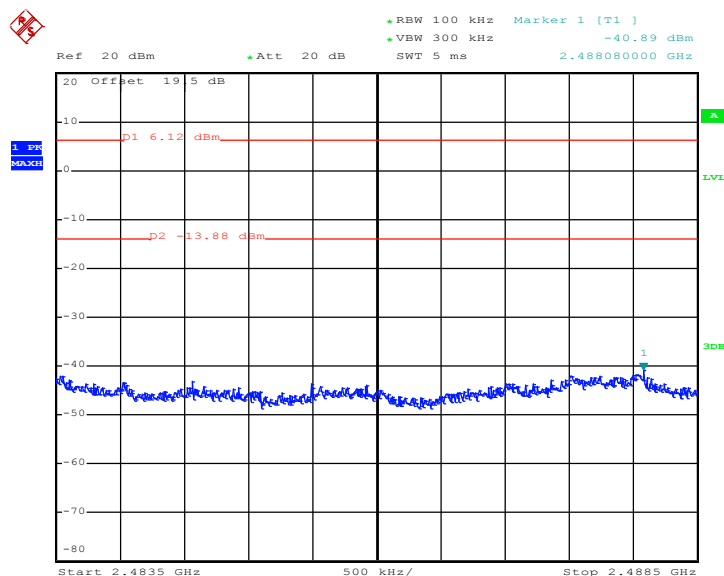
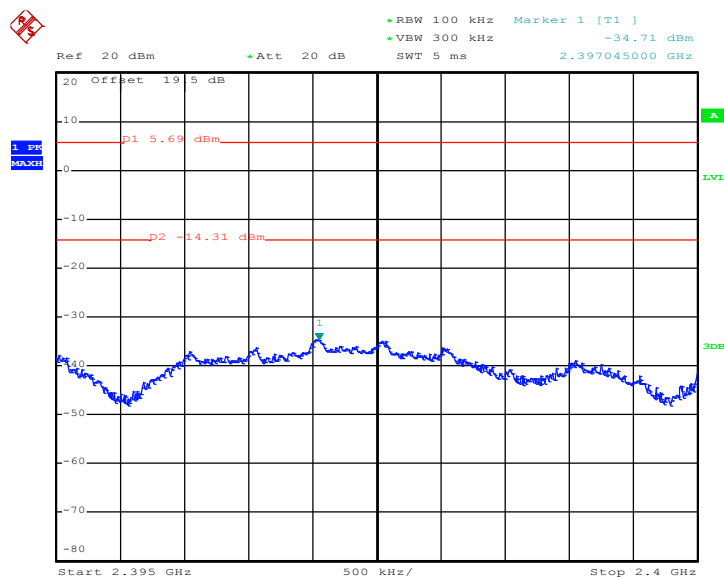
Test Mode :	Mode 9	Temperature :	23~25℃
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	42~44%
Test Channel :	11	Test Engineer :	Elvis Chen

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	55.99	-18.01	74	52.86	31.98	5.52	34.37	100	93	Peak
2483.5	37.47	-16.53	54	34.34	31.98	5.52	34.37	100	93	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	61.42	-12.58	74	58.29	31.98	5.52	34.37	100	41	Peak
2483.5	41.72	-12.28	54	38.59	31.98	5.52	34.37	100	41	Average

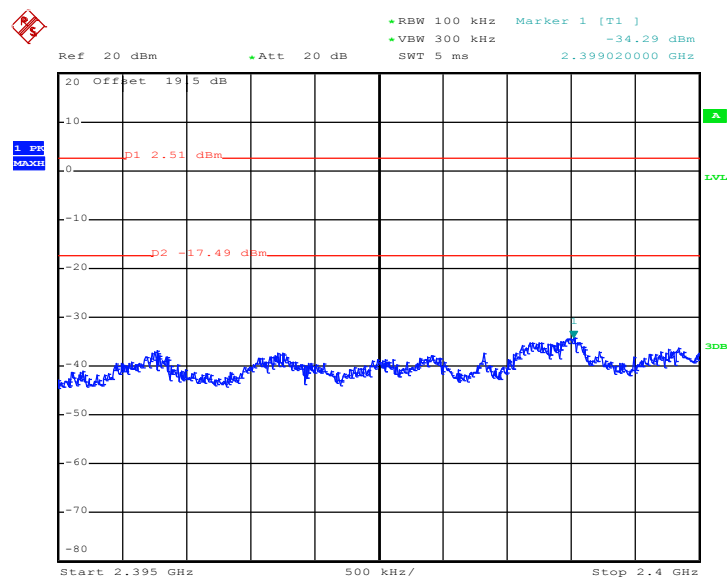


Test Mode :	Mode 1 and 3	Temperature :	24~26℃
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Pinkston Tu

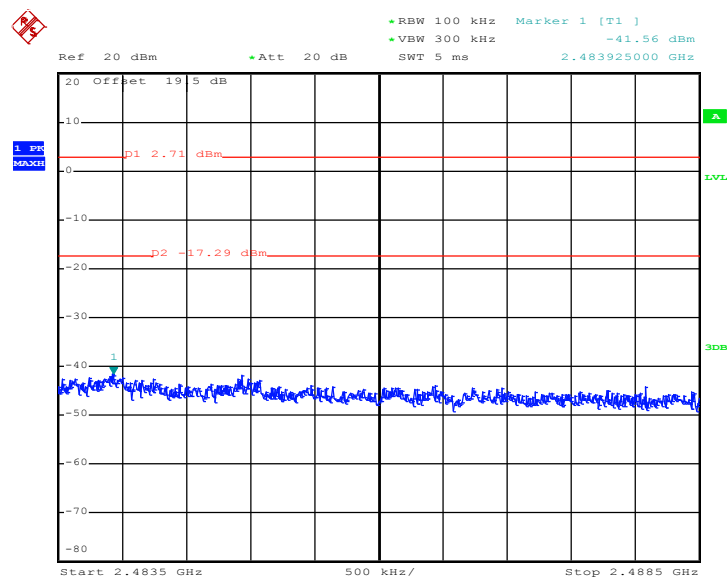




Test Mode :	Mode 4 and 6	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Pinkston Tu

Low Band Edge Plot on 802.11g Channel 01

Date: 30.AUG.2011 14:15:18

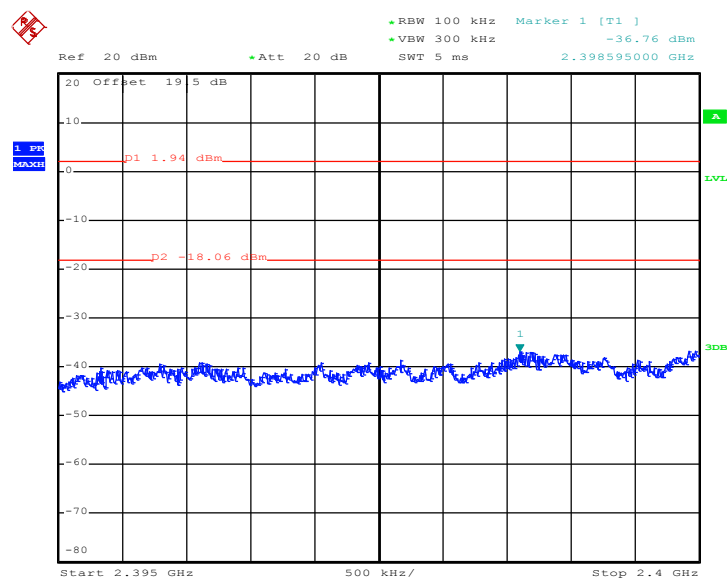
High Band Edge Plot on 802.11g Channel 11

Date: 30.AUG.2011 12:31:56



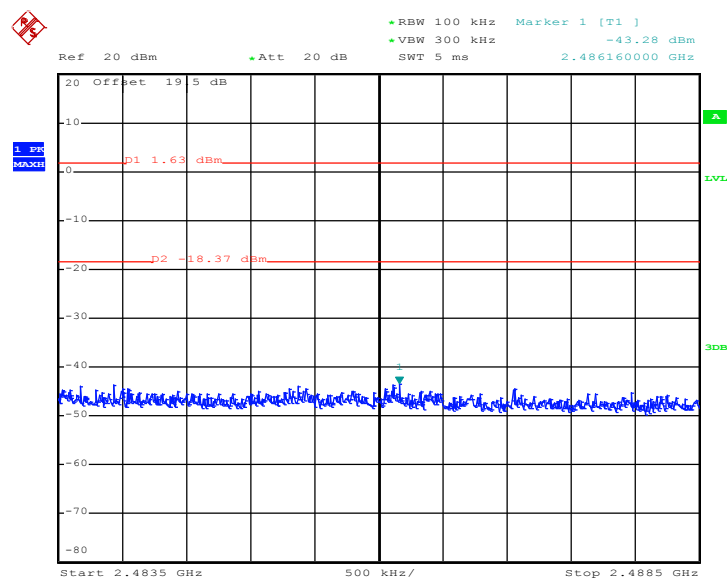
Test Mode :	Mode 7 and 9	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Pinkston Tu

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



Date: 30.AUG.2011 17:48:54

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



Date: 30.AUG.2011 18:30:09

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.

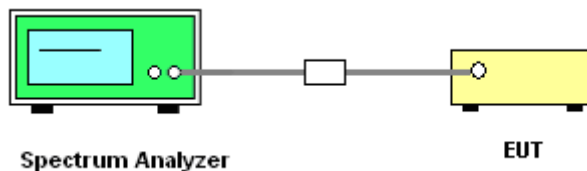
3.4.2 Measuring Instruments

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.

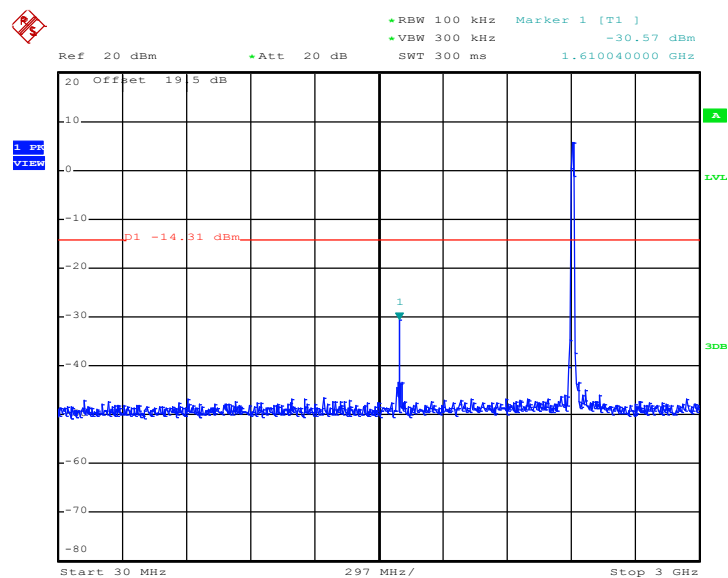
3.4.4 Test Setup



3.4.5 Test Plots of Spurious Emission

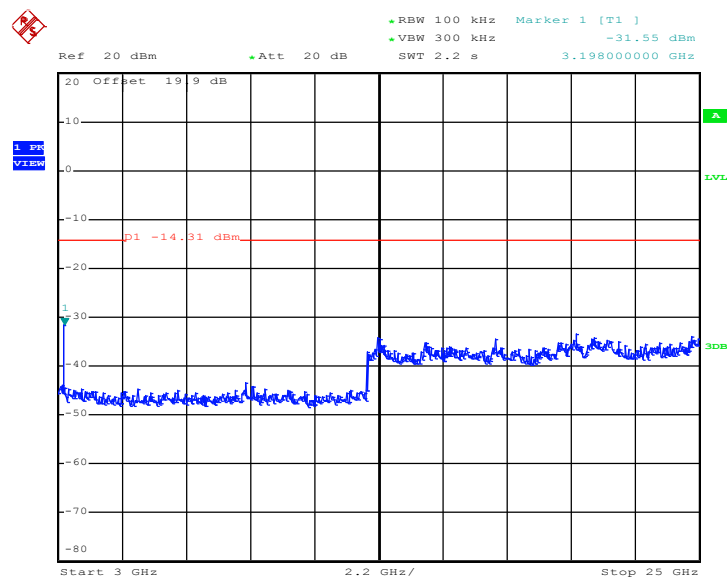
Test Mode :	Mode 1	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Pinkston Tu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 30.AUG.2011 11:35:22

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

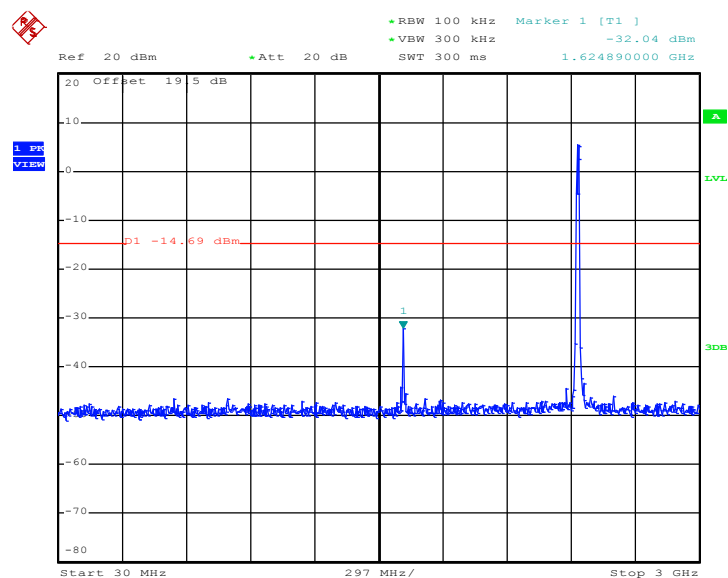


Date: 30.AUG.2011 11:35:39



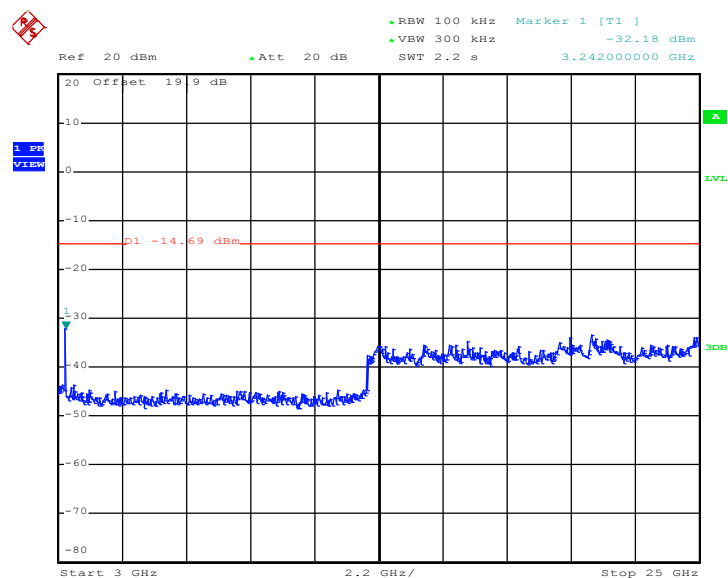
Test Mode :	Mode 2	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Pinkston Tu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



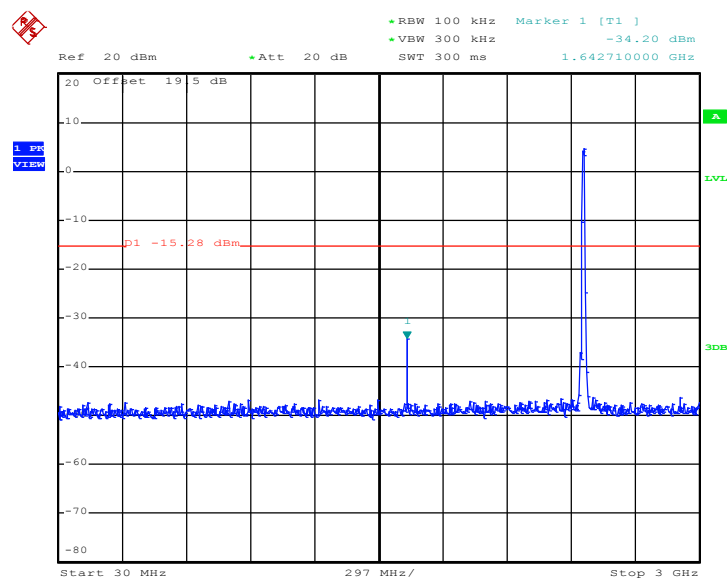
Date: 30.AUG.2011 11:48:11

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

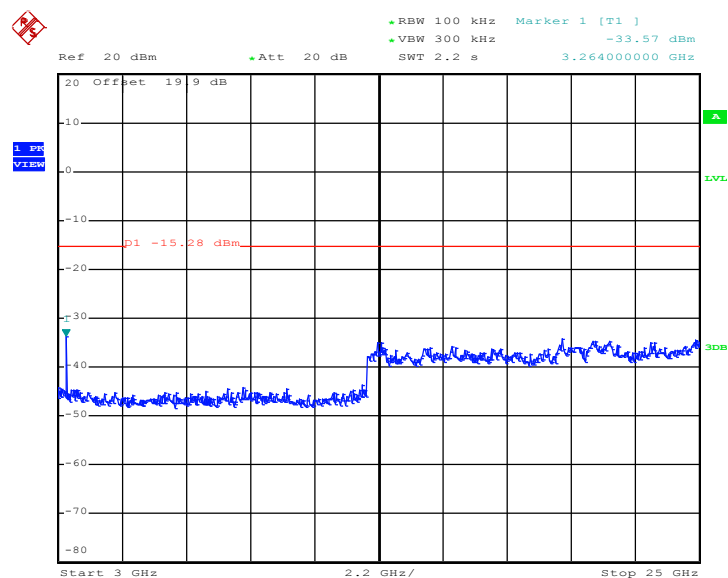


Date: 30.AUG.2011 11:48:28

Test Mode :	Mode 3	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Pinkston Tu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


Date: 30.AUG.2011 12:24:50

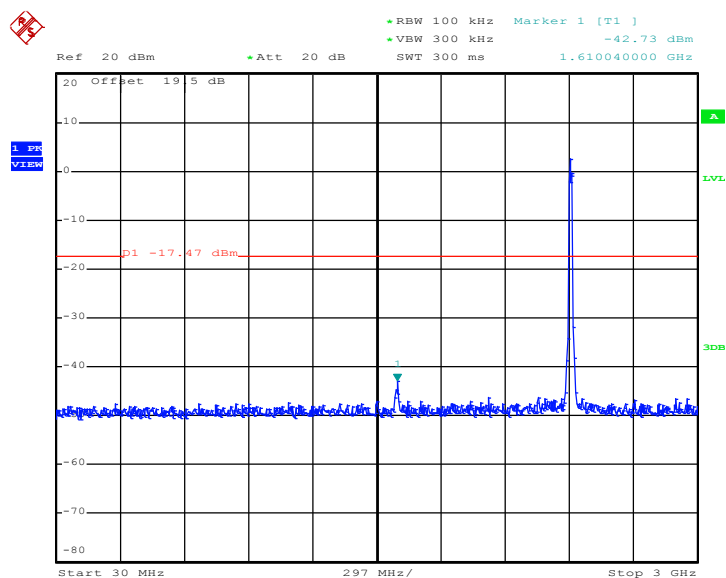
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


Date: 30.AUG.2011 12:25:07



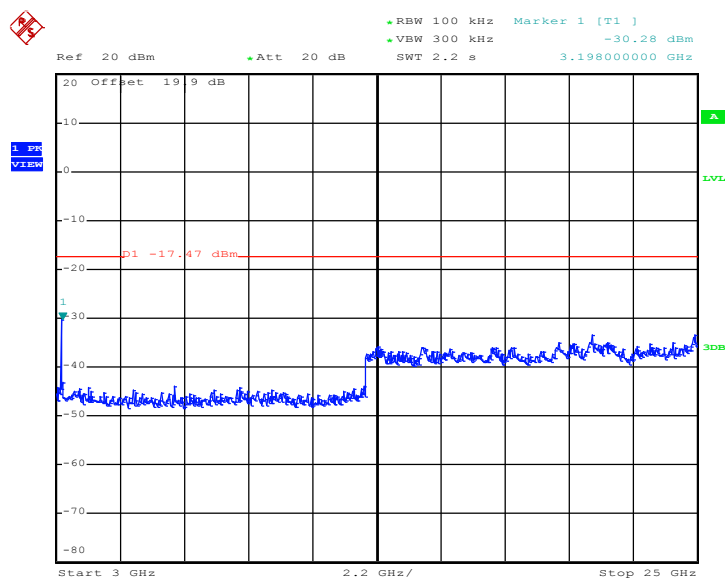
Test Mode :	Mode 4	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Pinkston Tu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 30.AUG.2011 14:42:01

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

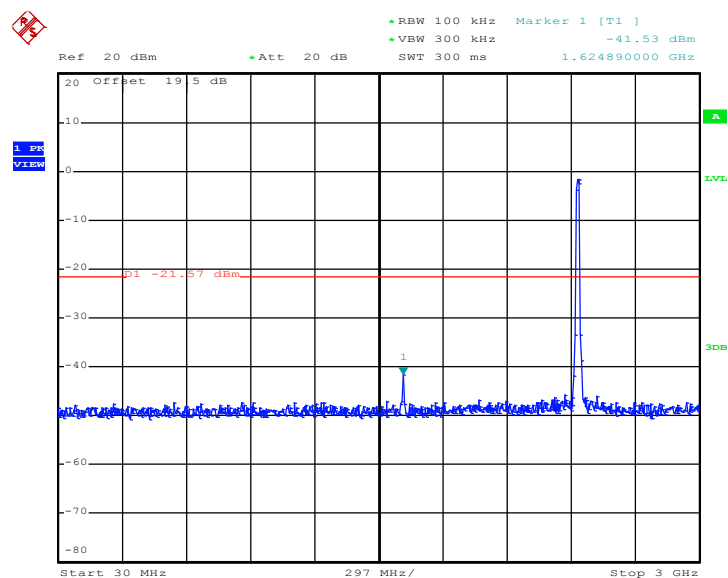


Date: 30.AUG.2011 14:42:18



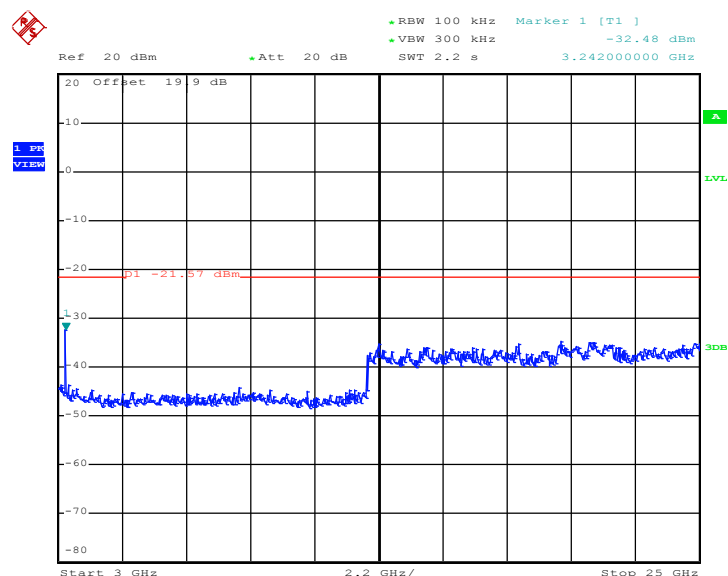
Test Mode :	Mode 5	Temperature :	24~26
Test Band :	802.11g	Relative Humidity :	50~53
Test Channel :	06	Test Engineer :	Pinkston Tu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



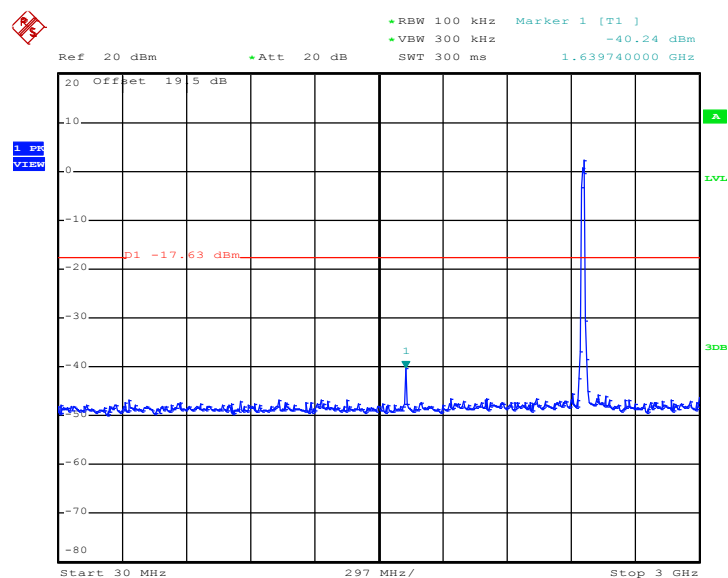
Date: 30.AUG.2011 17:19:07

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

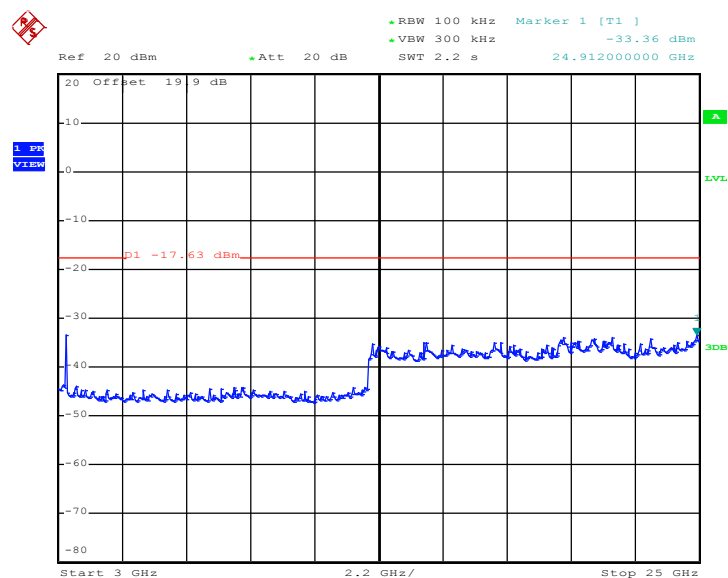


Date: 30.AUG.2011 17:19:24

Test Mode :	Mode 6	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Pinkston Tu

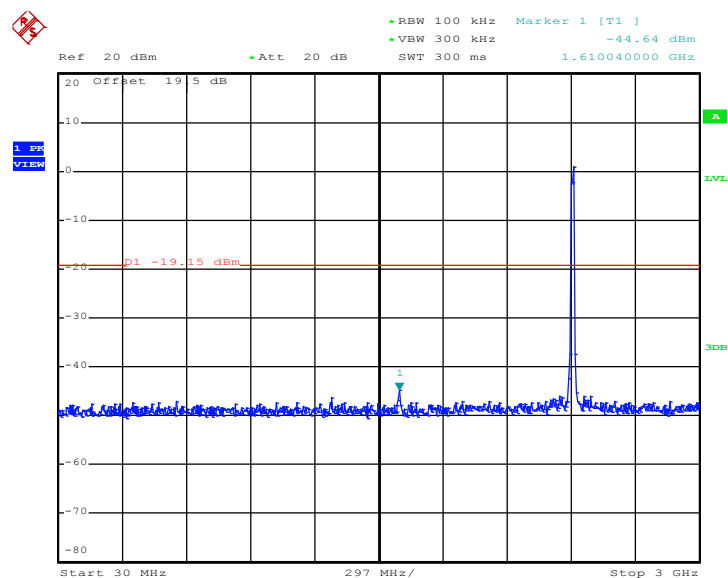
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


Date: 30.AUG.2011 13:28:34

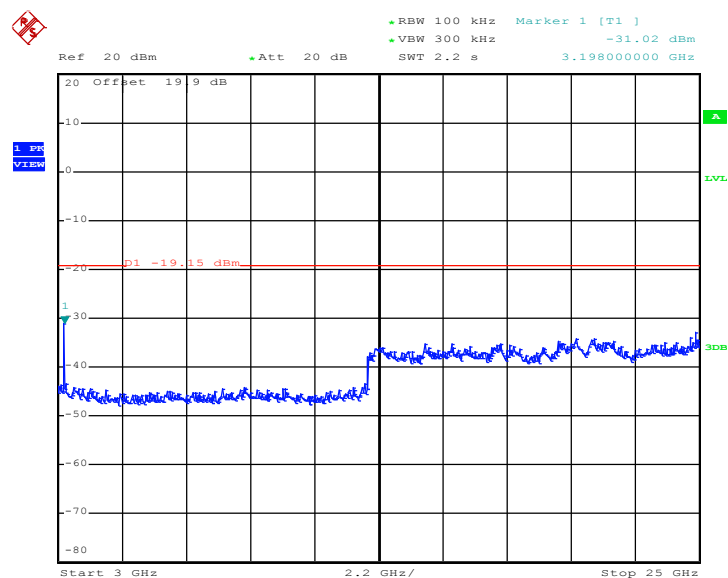
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


Date: 30.AUG.2011 13:30:23

Test Mode :	Mode 7	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Pinkston Tu

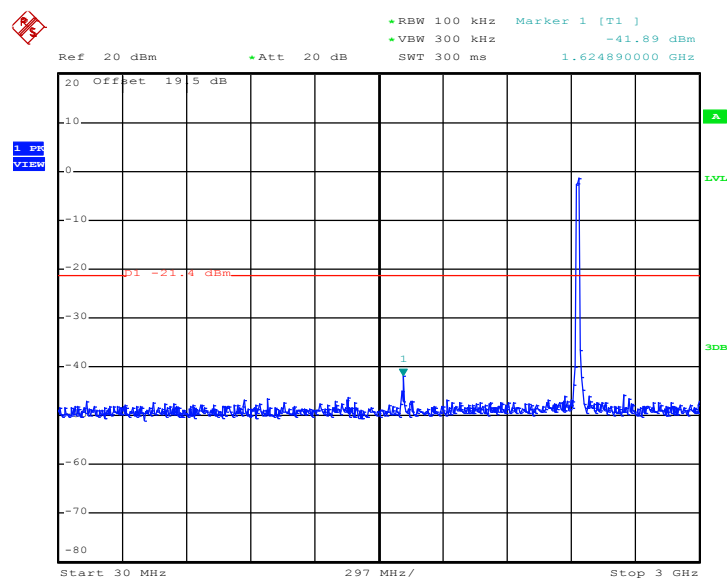
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


Date: 30.AUG.2011 19:19:05

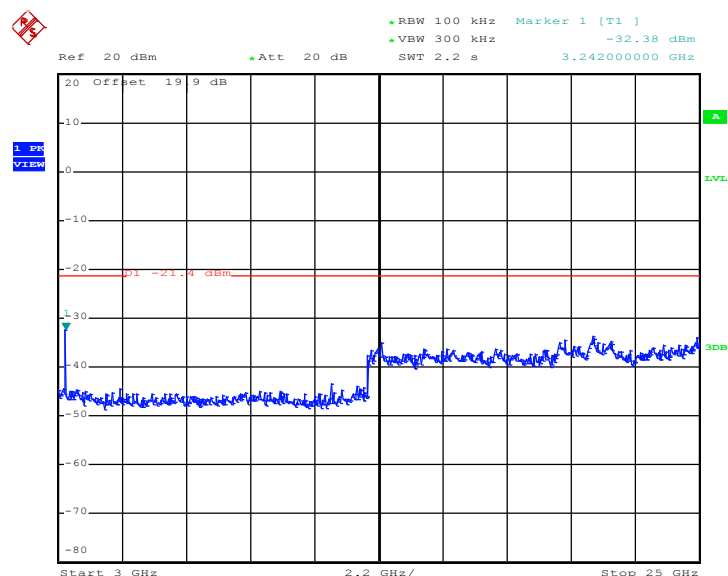
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


Date: 30.AUG.2011 19:22:50

Test Mode :	Mode 8	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Pinkston Tu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


Date: 30.AUG.2011 18:01:01

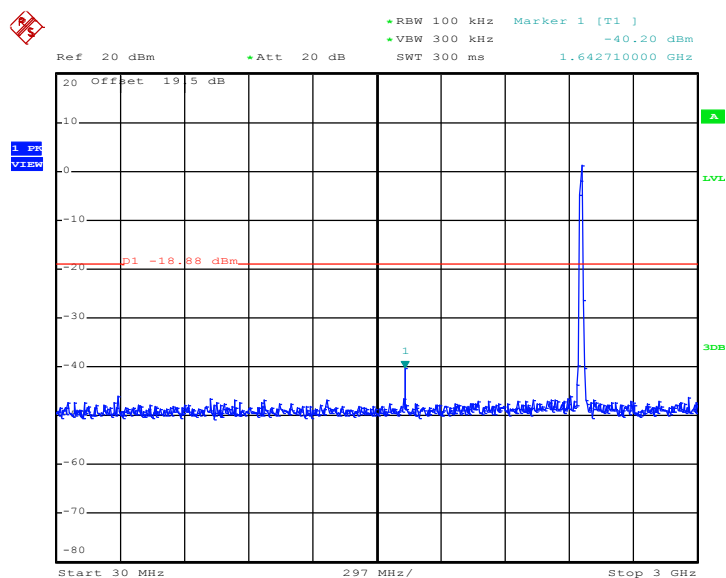
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


Date: 30.AUG.2011 18:01:18



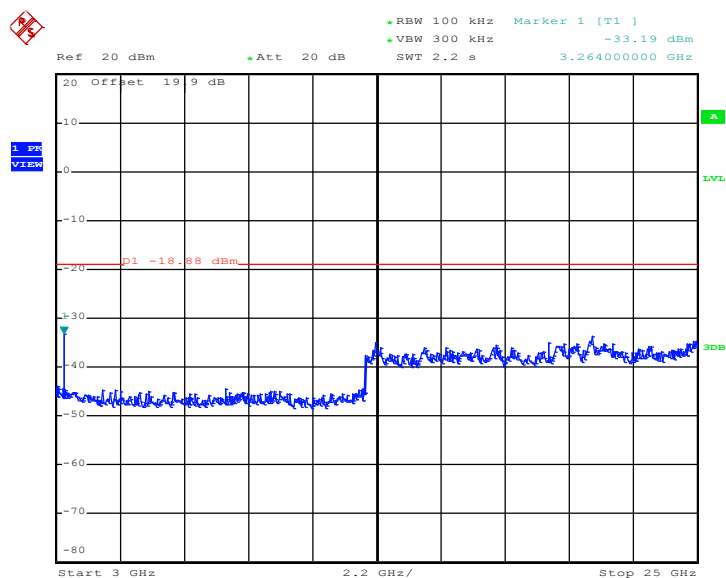
Test Mode :	Mode 9	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Pinkston Tu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 30.AUG.2011 18:18:01

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 30.AUG.2011 18:18:18

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.

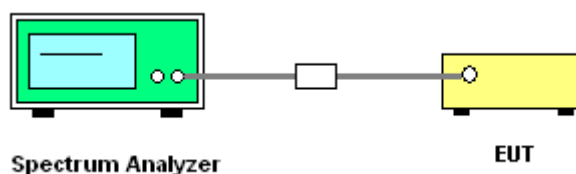
3.5.2 Measuring Instruments

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

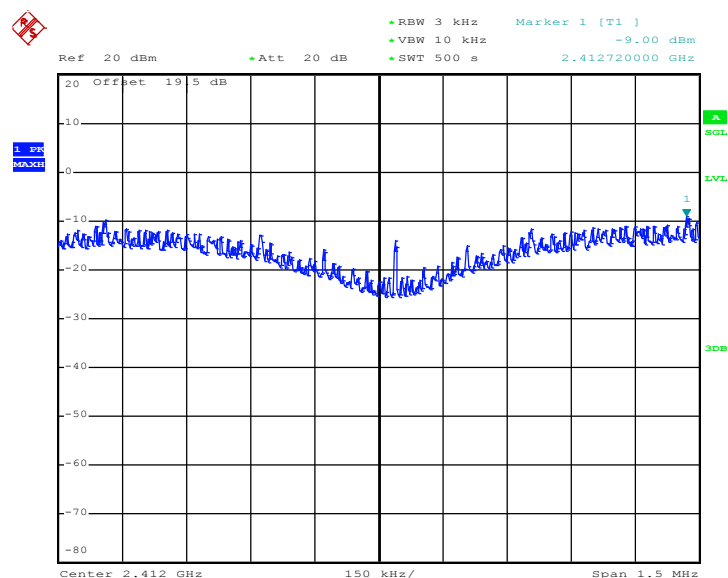


3.5.5 Test Result of Power Spectral Density

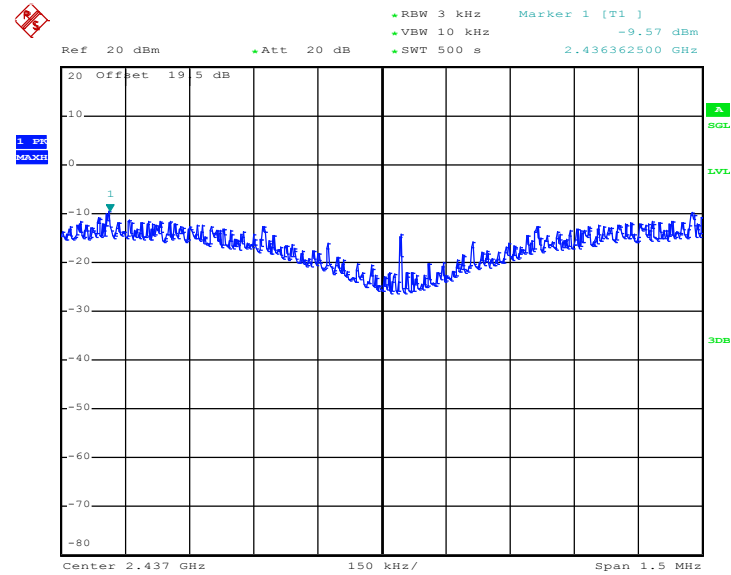
Test Mode :	Mode 1, 2, 3	Temperature :	24~26℃
Test Engineer :	Pinkston Tu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-9.00	8	Pass
06	2437	-9.57	8	Pass
11	2462	-9.16	8	Pass

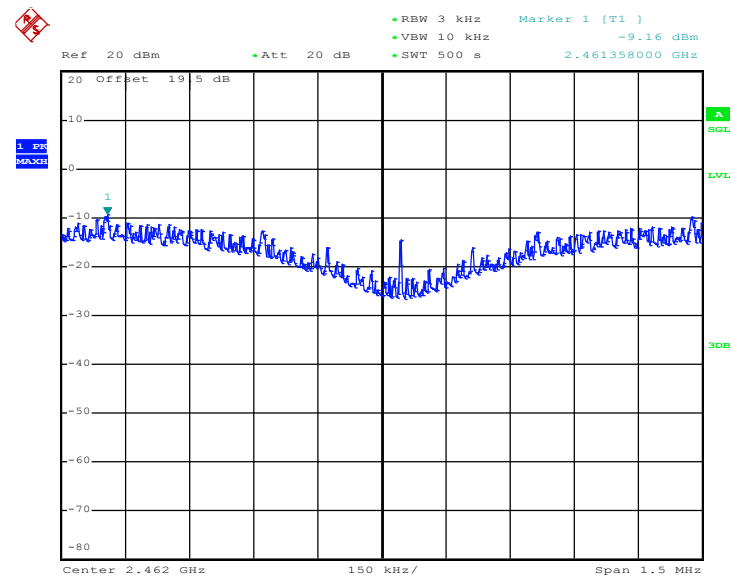
Mode 1 : PSD Plot on 802.11b Channel 01



Date: 30.AUG.2011 11:35:01

Mode 2 : PSD Plot on 802.11b Channel 06


Date: 30.AUG.2011 11:47:50

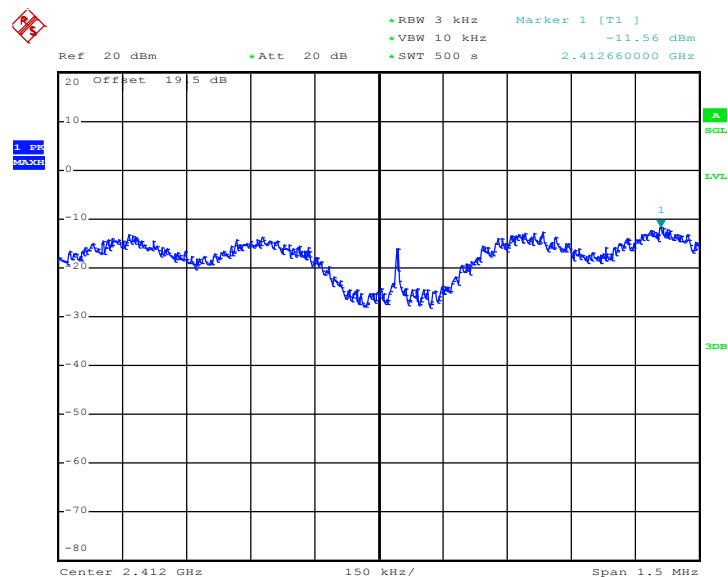
Mode 3 : PSD Plot on 802.11b Channel 11


Date: 30.AUG.2011 12:23:30

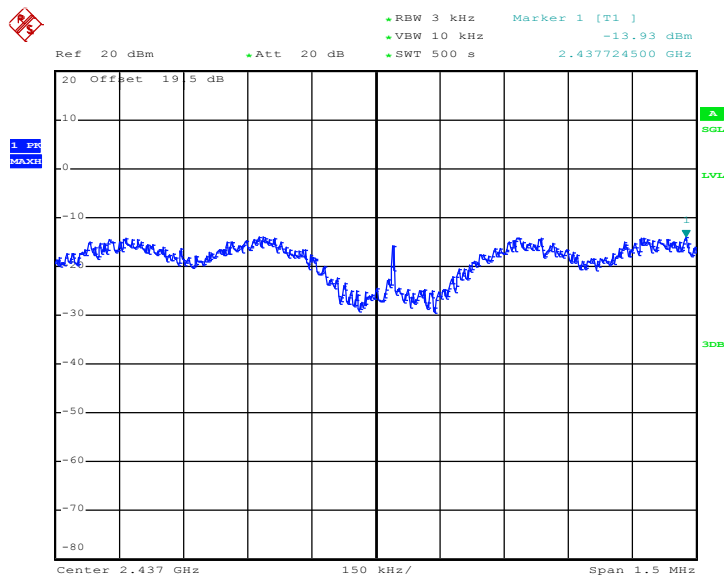


Test Mode :	Mode 4, 5, 6	Temperature :	24~26℃
Test Engineer :	Pinkston Tu	Relative Humidity :	50~53%

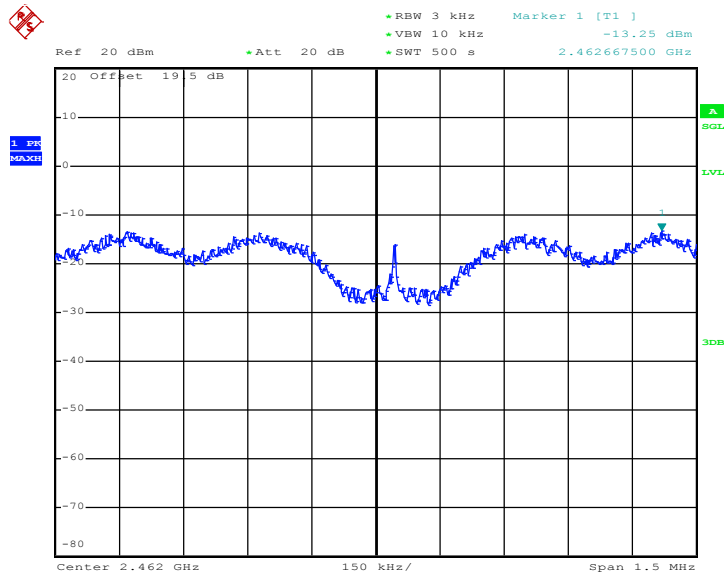
Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-11.56	8	Pass
06	2437	-13.93	8	Pass
11	2462	-13.25	8	Pass

Mode 4 : PSD Plot on 802.11g Channel 01

Date: 30.AUG.2011 14:37:02



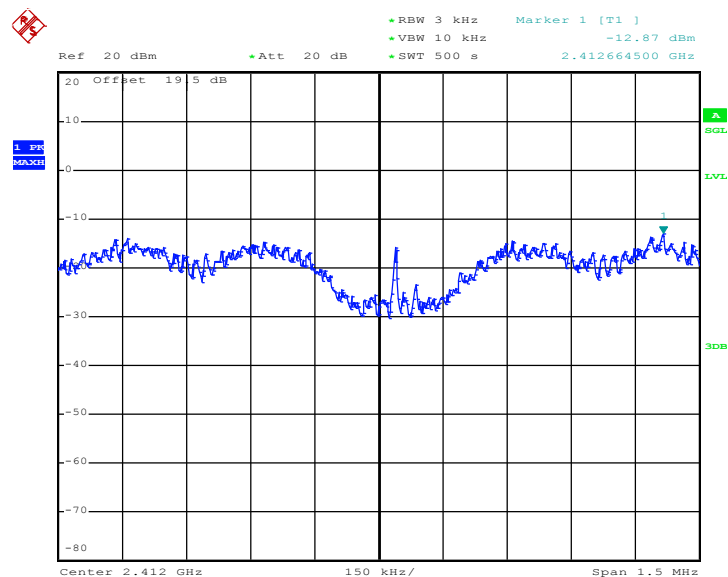
Date: 30.AUG.2011 17:18:45



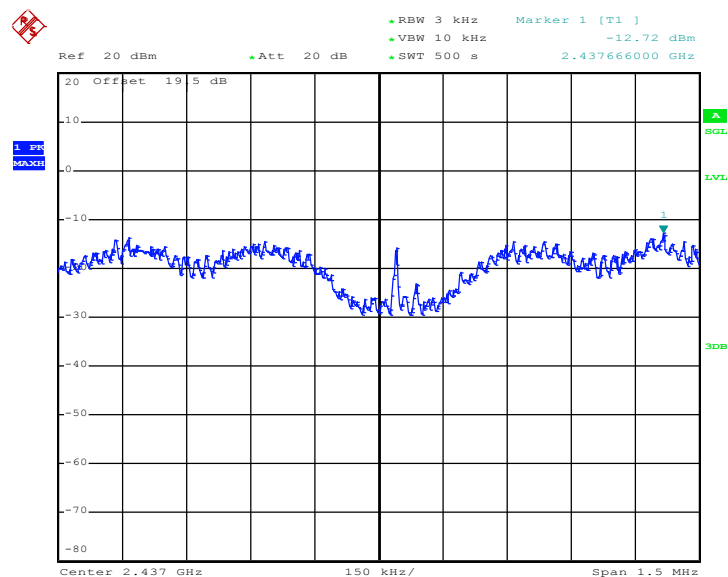
Date: 30.AUG.2011 13:09:06

Test Mode :	Mode 7, 8, 9	Temperature :	24~26℃
Test Engineer :	Pinkston Tu	Relative Humidity :	50~53%

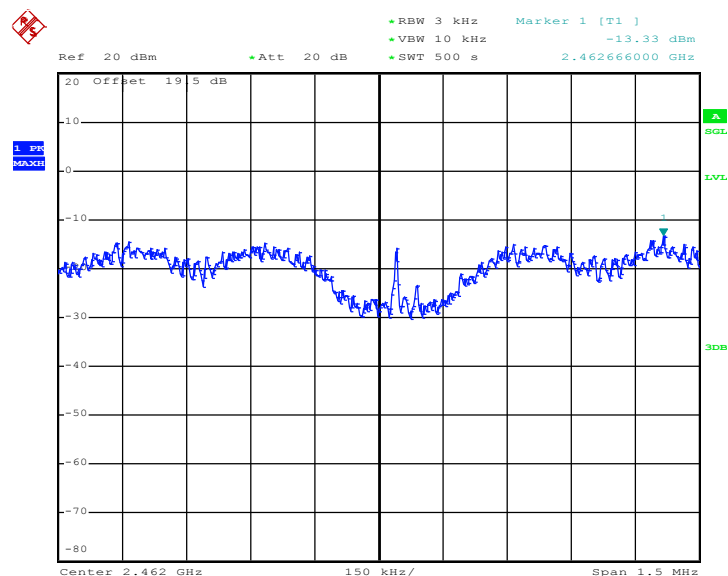
Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-12.87	8	Pass
06	2437	-12.72	8	Pass
11	2462	-13.33	8	Pass

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


Date: 30.AUG.2011 17:39:06

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


Date: 30.AUG.2011 18:00:40

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


Date: 30.AUG.2011 18:17:40

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.

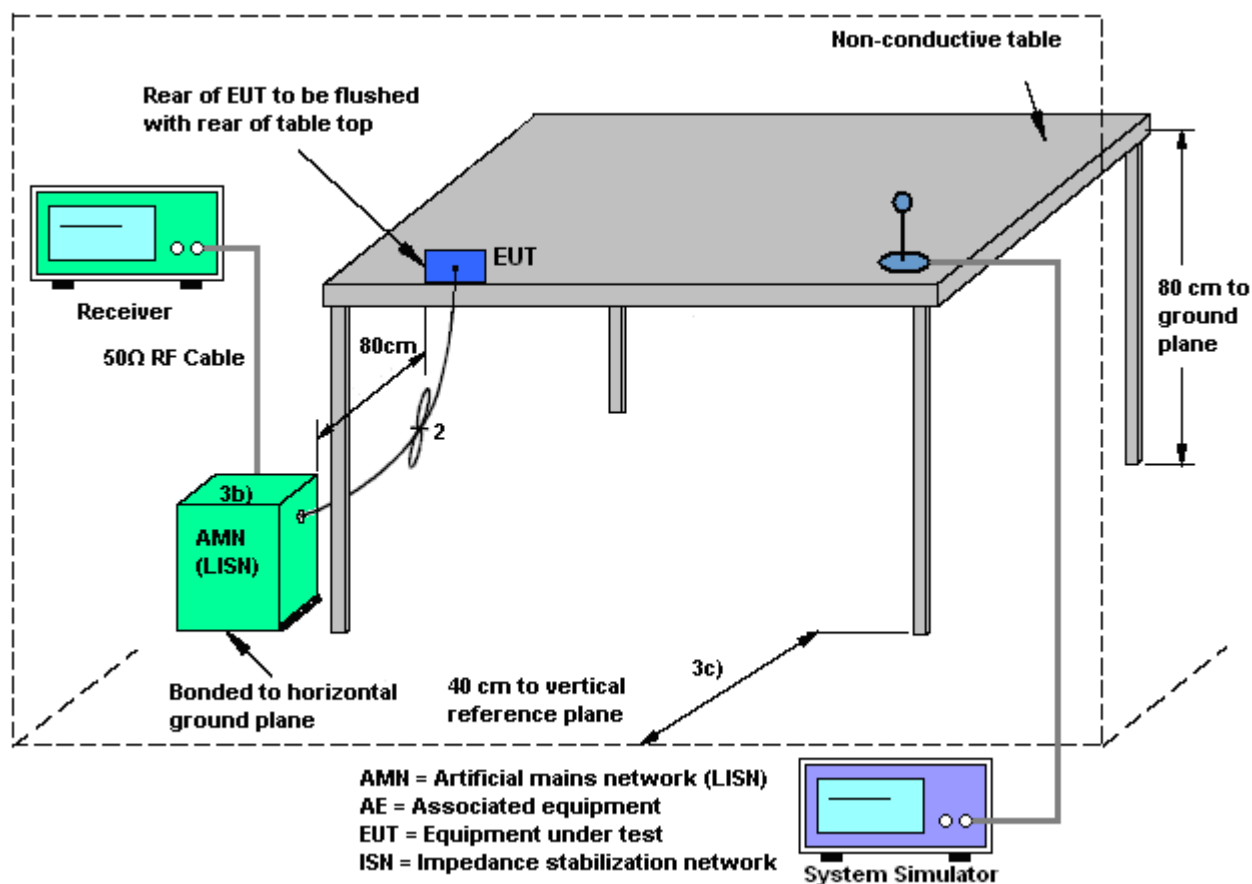
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

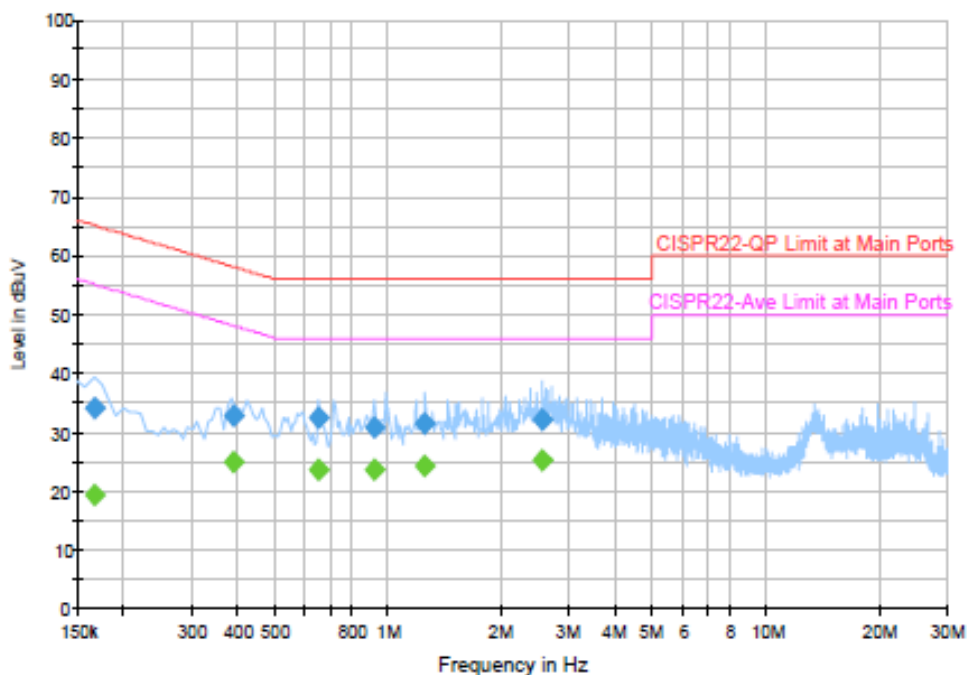
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (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 :	21~23°C
Test Engineer :	Novic Chiang	Relative Humidity :	41~43%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WiMAX Idle + WLAN (2.4G) Link + VOIP Link + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



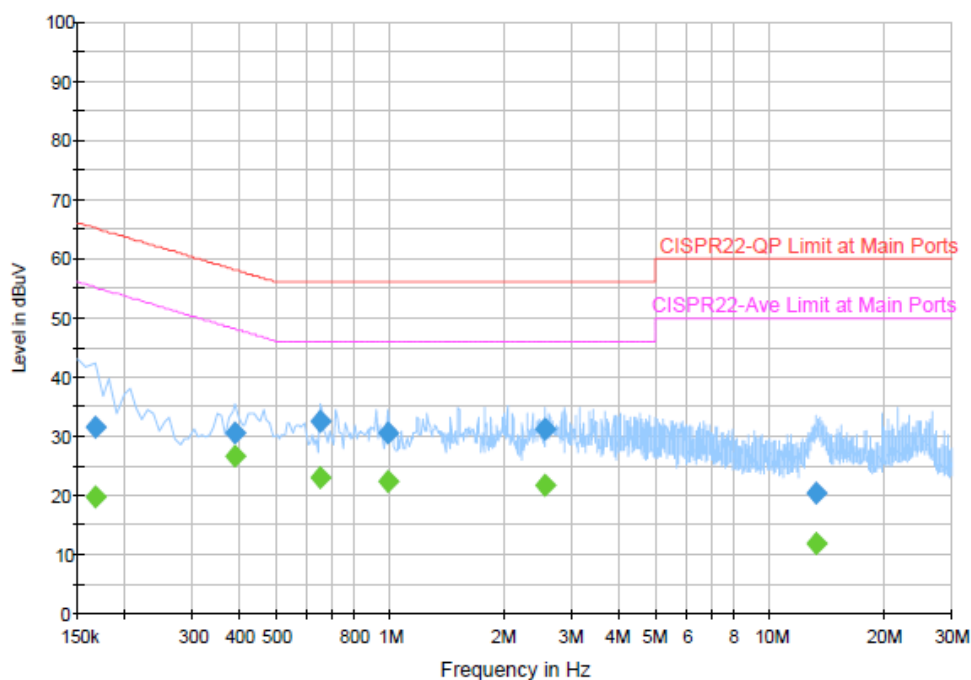
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	34.2	Off	L1	19.4	31.0	65.2
0.390000	32.7	Off	L1	19.4	25.4	58.1
0.654000	32.5	Off	L1	19.4	23.5	56.0
0.918000	31.0	Off	L1	19.4	25.0	56.0
1.246000	31.6	Off	L1	19.4	24.4	56.0
2.550000	32.0	Off	L1	19.4	24.0	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	19.3	Off	L1	19.4	35.9	55.2
0.390000	24.9	Off	L1	19.4	23.2	48.1
0.654000	23.5	Off	L1	19.4	22.5	46.0
0.918000	23.6	Off	L1	19.4	22.4	46.0
1.246000	24.4	Off	L1	19.4	21.6	46.0
2.550000	25.2	Off	L1	19.4	20.8	46.0

Test Mode :	Mode 1	Temperature :	21~23°C
Test Engineer :	Novic Chiang	Relative Humidity :	41~43%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WiMAX Idle + WLAN (2.4G) Link + VOIP Link + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	31.5	Off	N	19.4	33.7	65.2
0.390000	30.6	Off	N	19.4	27.5	58.1
0.654000	32.4	Off	N	19.4	23.6	56.0
0.982000	30.4	Off	N	19.5	25.6	56.0
2.550000	31.3	Off	N	19.5	24.7	56.0
13.222000	20.2	Off	N	19.7	39.8	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	19.6	Off	N	19.4	35.6	55.2
0.390000	26.7	Off	N	19.4	21.4	48.1
0.654000	23.1	Off	N	19.4	22.9	46.0
0.982000	22.2	Off	N	19.5	23.8	46.0
2.550000	21.6	Off	N	19.5	24.4	46.0
13.222000	11.9	Off	N	19.7	38.1	50.0

3.7 Radiated Emission Measurement

3.7.1 Limit of Radiated Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.7.2 Measuring Instruments

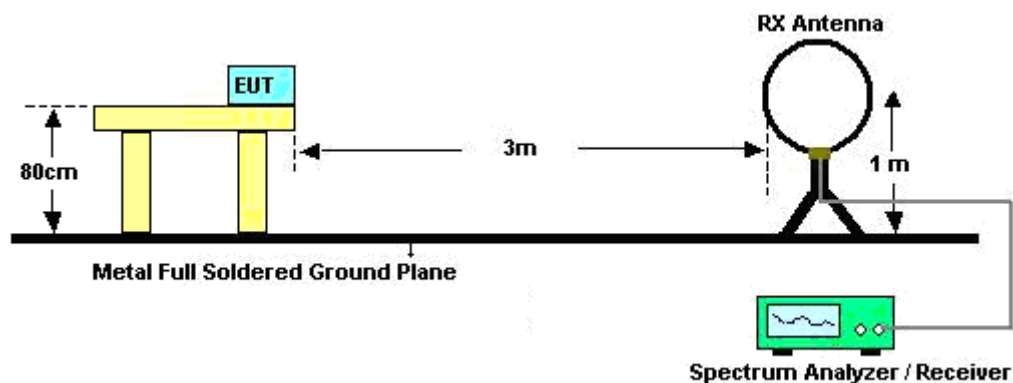
See list of measuring instruments of this test report.

3.7.3 Test Procedures

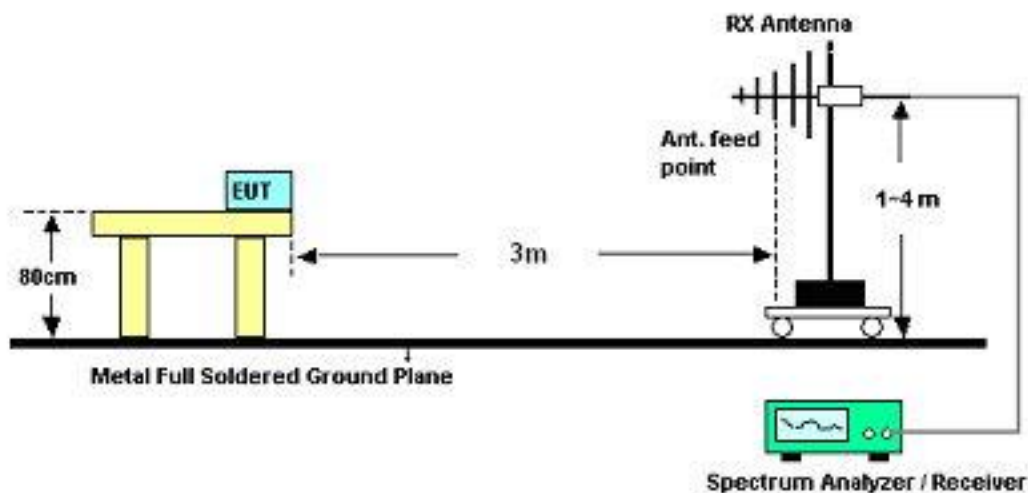
- The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
- Use the following spectrum analyzer settings:
 - Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep =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

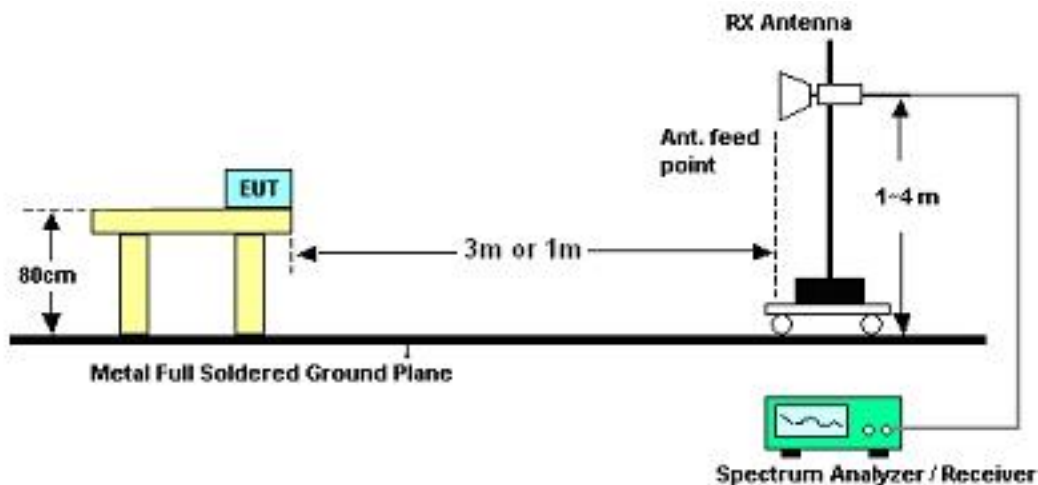
For radiated emissions below 30MHz



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 :	Elvis Chen	Temperature :	23~25℃	
		Relative Humidity :	42~44%	

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

Note:

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

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

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

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

Test Mode :	Mode 1	Temperature :	23~25℃
Test Channel :	01	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Horizontal
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 3213 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
172.29	24.38	-19.12	43.5	44.84	9.64	1.57	31.67	-	-	Peak
191.19	20.17	-23.33	43.5	40.83	9.39	1.61	31.66	-	-	Peak
249.78	25.7	-20.3	46	42.83	12.67	1.85	31.65	-	-	Peak
498.8	24.43	-21.57	46	35.76	17.79	2.66	31.78	-	-	Peak
901.3	27.43	-18.57	46	33.62	21.63	3.76	31.58	-	-	Peak
959.4	28.83	-17.17	46	34.2	21.9	3.8	31.07	100	64	Peak
2386.57	42.82	-11.18	54	39.91	31.9	5.4	34.39	100	96	Average
2386.57	53.8	-20.2	74	50.89	31.9	5.4	34.39	100	96	Peak
2412	98.14	-	-	95.19	31.91	5.43	34.39	100	96	Average
2412	102.2	-	-	99.25	31.91	5.43	34.39	100	96	Peak
2484	47.7	-26.3	74	44.57	31.98	5.52	34.37	100	96	Peak
2484	35	-19	54	31.87	31.98	5.52	34.37	100	96	Average
3213	58.48	-23.72	82.2	74.18	32.58	6.35	54.63	-	-	Peak
4824	51.85	-22.15	74	65.34	34.4	7.96	55.85	100	204	Peak
4824	48.96	-5.04	54	62.45	34.4	7.96	55.85	100	204	Average

Test Mode :	Mode 1	Temperature :	23~25℃
Test Channel :	01	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 3213 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
51.33	26.33	-13.67	40	49.24	7.92	0.87	31.7	100	137	Peak
75.09	25.49	-14.51	40	49.49	6.62	1.07	31.69	-	-	Peak
191.19	25.2	-18.3	43.5	45.86	9.39	1.61	31.66	-	-	Peak
399.4	28.06	-17.94	46	41.68	15.76	2.41	31.79	-	-	Peak
449.8	27.12	-18.88	46	39.67	16.8	2.5	31.85	-	-	Peak
493.9	27.14	-18.86	46	38.58	17.69	2.65	31.78	-	-	Peak
2350.09	43.78	-10.22	54	41.01	31.84	5.34	34.41	102	49	Average
2350.09	54.28	-19.72	74	51.51	31.84	5.34	34.41	102	49	Peak
2412	105.1	-	-	102.15	31.91	5.43	34.39	102	49	Peak
2412	101.11	-	-	98.16	31.91	5.43	34.39	102	49	Average
2492	37.18	-16.82	54	34.03	32	5.52	34.37	102	49	Average
2492	49.6	-24.4	74	46.45	32	5.52	34.37	102	49	Peak
3213	60.48	-24.62	85.1	76.18	32.58	6.35	54.63	-	-	Peak
4824	53.43	-20.57	74	66.92	34.4	7.96	55.85	100	35	Peak
4824	51	-3	54	64.49	34.4	7.96	55.85	100	35	Average

Test Mode :	Mode 2	Temperature :	23~25℃
Test Channel :	06	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Horizontal
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 3246 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
173.64	24.63	-18.87	43.5	45.14	9.6	1.57	31.68	-	-	Peak
191.73	20.6	-22.9	43.5	41.26	9.39	1.61	31.66	-	-	Peak
249.78	25.03	-20.97	46	42.16	12.67	1.85	31.65	-	-	Peak
498.8	24.58	-21.42	46	35.91	17.79	2.66	31.78	-	-	Peak
901.3	25.76	-20.24	46	31.95	21.63	3.76	31.58	-	-	Peak
959.4	28.82	-17.18	46	34.19	21.9	3.8	31.07	100	264	Peak
2374	51.87	-22.13	74	49.02	31.88	5.37	34.4	100	94	Peak
2374	41.08	-12.92	54	38.23	31.88	5.37	34.4	100	94	Average
2437	100.06	-	-	97.03	31.95	5.46	34.38	100	94	Peak
2437	96.29	-	-	93.26	31.95	5.46	34.38	100	94	Average
2500	49.36	-24.64	74	46.21	32	5.52	34.37	100	94	Peak
2500	38.47	-15.53	54	35.32	32	5.52	34.37	100	94	Average
3246	59.07	-20.99	80.06	74.71	32.6	6.4	54.64	-	-	Peak
4874	49.49	-24.51	74	62.99	34.37	8	55.87	100	0	Peak

Test Mode :	Mode 2	Temperature :	23~25℃
Test Channel :	06	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Vertical
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 3246 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
51.33	26.42	-13.58	40	49.33	7.92	0.87	31.7	100	237	Peak
75.09	25.45	-14.55	40	49.45	6.62	1.07	31.69	-	-	Peak
189.84	25.02	-18.48	43.5	45.68	9.4	1.6	31.66	-	-	Peak
399.4	27.82	-18.18	46	41.44	15.76	2.41	31.79	-	-	Peak
449.8	26.94	-19.06	46	39.49	16.8	2.5	31.85	-	-	Peak
901.3	27.95	-18.05	46	34.14	21.63	3.76	31.58	-	-	Peak
2374	53.41	-20.59	74	50.56	31.88	5.37	34.4	100	42	Peak
2374	43.37	-10.63	54	40.52	31.88	5.37	34.4	100	42	Average
2437	104.23	-	-	101.2	31.95	5.46	34.38	100	42	Peak
2437	100.24	-	-	97.21	31.95	5.46	34.38	100	42	Average
2484	52.03	-21.97	74	48.9	31.98	5.52	34.37	100	42	Peak
2484	40.53	-13.47	54	37.4	31.98	5.52	34.37	100	42	Average
3246	59.95	-24.28	84.23	75.59	32.6	6.4	54.64	-	-	Peak
4874	50.05	-23.95	74	63.55	34.37	8	55.87	100	0	Peak

Test Mode :	Mode 3	Temperature :	23~25℃
Test Channel :	11	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Horizontal
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 3282 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
173.64	25.14	-18.36	43.5	45.65	9.6	1.57	31.68	-	-	Peak
191.73	20.62	-22.88	43.5	41.28	9.39	1.61	31.66	-	-	Peak
249.78	25.52	-20.48	46	42.65	12.67	1.85	31.65	-	-	Peak
719.3	24.66	-21.34	46	33.75	19.66	3.3	32.05	-	-	Peak
901.3	27.11	-18.89	46	33.3	21.63	3.76	31.58	-	-	Peak
959.4	29.78	-16.22	46	35.15	21.9	3.8	31.07	100	78	Peak
2342	51.27	-22.73	74	48.5	31.84	5.34	34.41	100	92	Peak
2342	40.43	-13.57	54	37.66	31.84	5.34	34.41	100	92	Average
2462	100.01	-	-	96.93	31.97	5.49	34.38	100	92	Peak
2462	96.03	-	-	92.95	31.97	5.49	34.38	100	92	Average
2488.22	38.15	-15.85	54	35	32	5.52	34.37	100	92	Average
2488.22	49.76	-24.24	74	46.61	32	5.52	34.37	100	92	Peak
3282	58.86	-21.15	80.01	75.11	32.61	6.43	55.29	-	-	Peak
4924	46.51	-27.49	74	60.65	34.34	8.04	56.52	100	0	Peak

Test Mode :	Mode 3	Temperature :	23~25℃
Test Channel :	11	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Vertical
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 3282 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
49.98	26.2	-13.8	40	48.97	8.08	0.86	31.71	-	-	Peak
75.09	26.29	-13.71	40	50.29	6.62	1.07	31.69	100	22	Peak
189.84	25.78	-17.72	43.5	46.44	9.4	1.6	31.66	-	-	Peak
399.4	28.55	-17.45	46	42.17	15.76	2.41	31.79	-	-	Peak
449.8	27.6	-18.4	46	40.15	16.8	2.5	31.85	-	-	Peak
901.3	28.34	-17.66	46	34.53	21.63	3.76	31.58	-	-	Peak
2342	52.82	-21.18	74	50.05	31.84	5.34	34.41	100	41	Peak
2342	42.23	-11.77	54	39.46	31.84	5.34	34.41	100	41	Average
2462	103.71	-	-	100.63	31.97	5.49	34.38	100	41	Peak
2462	99.69	-	-	96.61	31.97	5.49	34.38	100	41	Average
2483.5	40.66	-13.34	54	37.53	31.98	5.52	34.37	100	41	Average
2483.5	52.18	-21.82	74	49.05	31.98	5.52	34.37	100	41	Peak
3282	58.48	-25.23	83.71	74.73	32.61	6.43	55.29	-	-	Peak
4924	45.54	-28.46	74	59.68	34.34	8.04	56.52	100	0	Peak

Test Mode :	Mode 4	Temperature :	23~25℃
Test Channel :	01	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Horizontal
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 3213 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
173.64	24.13	-19.37	43.5	44.64	9.6	1.57	31.68	-	-	Peak
191.19	20.94	-22.56	43.5	41.6	9.39	1.61	31.66	-	-	Peak
249.78	25.08	-20.92	46	42.21	12.67	1.85	31.65	-	-	Peak
497.4	23.83	-22.17	46	35.18	17.77	2.66	31.78	-	-	Peak
901.3	27.88	-18.12	46	34.07	21.63	3.76	31.58	-	-	Peak
959.4	28.95	-17.05	46	34.32	21.9	3.8	31.07	100	64	Peak
2389.99	42.97	-11.03	54	40.06	31.9	5.4	34.39	100	94	Average
2389.99	61.03	-12.97	74	58.12	31.9	5.4	34.39	100	94	Peak
2412	101.07	-	-	98.12	31.91	5.43	34.39	100	94	Peak
2412	91.97	-	-	89.02	31.91	5.43	34.39	100	94	Average
2500	35.37	-18.63	54	32.22	32	5.52	34.37	100	94	Average
2500	48.96	-25.04	74	45.81	32	5.52	34.37	100	94	Peak
3213	57.49	-23.58	81.07	73.81	32.58	6.35	55.25	-	-	Peak
4824	45.51	-28.49	74	59.6	34.4	7.96	56.45	100	0	Peak

Test Mode :	Mode 4	Temperature :	23~25℃
Test Channel :	01	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 3213 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
51.33	26.58	-13.42	40	49.49	7.92	0.87	31.7	100	37	Peak
75.09	26.04	-13.96	40	50.04	6.62	1.07	31.69	-	-	Peak
187.68	25.86	-17.64	43.5	46.54	9.4	1.59	31.67	-	-	Peak
399.4	27.96	-18.04	46	41.58	15.76	2.41	31.79	-	-	Peak
449.8	27.38	-18.62	46	39.93	16.8	2.5	31.85	-	-	Peak
901.3	27	-19	46	33.19	21.63	3.76	31.58	-	-	Peak
2389.99	45.55	-8.45	54	42.64	31.9	5.4	34.39	102	48	Average
2389.99	64.05	-9.95	74	61.14	31.9	5.4	34.39	102	48	Peak
2412	104.1	-	-	101.15	31.91	5.43	34.39	102	48	Peak
2412	95.09	-	-	92.14	31.91	5.43	34.39	102	48	Average
2494	37.55	-16.45	54	34.4	32	5.52	34.37	102	48	Average
2494	50.24	-23.76	74	47.09	32	5.52	34.37	102	48	Peak
3213	60.89	-23.21	84.1	77.21	32.58	6.35	55.25	-	-	Peak
4824	46.69	-27.31	74	60.78	34.4	7.96	56.45	100	0	Peak

Test Mode :	Mode 5	Temperature :	23~25℃
Test Channel :	06	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Horizontal
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 3246 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
172.29	24.52	-18.98	43.5	44.98	9.64	1.57	31.67	-	-	Peak
191.19	21.11	-22.39	43.5	41.77	9.39	1.61	31.66	-	-	Peak
249.78	25	-21	46	42.13	12.67	1.85	31.65	-	-	Peak
857.9	27.94	-18.06	46	34.95	21.27	3.58	31.86	-	-	Peak
901.3	28.88	-17.12	46	35.07	21.63	3.76	31.58	-	-	Peak
959.4	29.56	-16.44	46	34.93	21.9	3.8	31.07	100	164	Peak
2380	51.03	-22.97	74	48.14	31.88	5.4	34.39	132	93	Peak
2380	39.75	-14.25	54	36.86	31.88	5.4	34.39	132	93	Average
2437	100.59	-	-	97.58	31.93	5.46	34.38	132	93	Peak
2437	91.45	-	-	88.42	31.95	5.46	34.38	132	93	Average
2494	36.75	-17.25	54	33.6	32	5.52	34.37	132	93	Average
2494	48.7	-25.3	74	45.55	32	5.52	34.37	132	93	Peak
3246	58.2	-22.39	80.59	74.47	32.6	6.4	55.27	-	-	Peak

Test Mode :	Mode 5	Temperature :	23~25℃
Test Channel :	06	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Vertical
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 3246 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
49.98	26.7	-13.3	40	49.47	8.08	0.86	31.71	100	247	Peak
75.09	25.62	-14.38	40	49.62	6.62	1.07	31.69	-	-	Peak
187.14	24.74	-18.76	43.5	45.41	9.41	1.59	31.67	-	-	Peak
399.4	27.38	-18.62	46	41	15.76	2.41	31.79	-	-	Peak
449.8	27.57	-18.43	46	40.12	16.8	2.5	31.85	-	-	Peak
901.3	27.19	-18.81	46	33.38	21.63	3.76	31.58	-	-	Peak
2374	52.27	-21.73	74	49.42	31.88	5.37	34.4	100	46	Peak
2374	41.06	-12.94	54	38.21	31.88	5.37	34.4	100	46	Average
2437	102.82	-	-	99.79	31.95	5.46	34.38	100	46	Peak
2437	93.41	-	-	90.38	31.95	5.46	34.38	100	46	Average
2500	39.92	-14.08	54	36.77	32	5.52	34.37	100	46	Average
2500	51.87	-22.13	74	48.72	32	5.52	34.37	100	46	Peak
3246	59.64	-23.18	82.82	75.91	32.6	6.4	55.27	-	-	Peak

Test Mode :	Mode 6	Temperature :	23~25℃
Test Channel :	11	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Horizontal
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 3282 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
171.48	23.84	-19.66	43.5	44.27	9.67	1.57	31.67	-	-	Peak
249.78	24.97	-21.03	46	42.1	12.67	1.85	31.65	-	-	Peak
299.73	28.38	-17.62	46	44.53	13.46	2.06	31.67	-	-	Peak
719.3	25.37	-20.63	46	34.46	19.66	3.3	32.05	-	-	Peak
901.3	26.05	-19.95	46	32.24	21.63	3.76	31.58	-	-	Peak
959.4	28.62	-17.38	46	33.99	21.9	3.8	31.07	100	164	Peak
2364	50.25	-23.75	74	47.42	31.86	5.37	34.4	131	91	Peak
2364	38.33	-15.67	54	35.5	31.86	5.37	34.4	131	91	Average
2462	99.93	-	-	96.85	31.97	5.49	34.38	131	91	Peak
2462	90.67	-	-	87.59	31.97	5.49	34.38	131	91	Average
2483.85	53.39	-20.61	74	50.26	31.98	5.52	34.37	131	91	Peak
2483.85	36.4	-17.6	54	33.27	31.98	5.52	34.37	131	91	Average
3282	59.09	-20.84	79.93	75.34	32.61	6.43	55.29	-	-	Peak
4924	46.42	-27.58	74	60.56	34.34	8.04	56.52	100	0	Peak

Test Mode :	Mode 6	Temperature :	23~25℃
Test Channel :	11	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Vertical
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 3282 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
49.98	27.38	-12.62	40	50.15	8.08	0.86	31.71	100	127	Peak
75.09	25.66	-14.34	40	49.66	6.62	1.07	31.69	-	-	Peak
189.84	25.96	-17.54	43.5	46.62	9.4	1.6	31.66	-	-	Peak
399.4	27.61	-18.39	46	41.23	15.76	2.41	31.79	-	-	Peak
449.8	27.24	-18.76	46	39.79	16.8	2.5	31.85	-	-	Peak
497.4	26.26	-19.74	46	37.61	17.77	2.66	31.78	-	-	Peak
2350	52.53	-21.47	74	49.76	31.84	5.34	34.41	100	43	Peak
2350	40.42	-13.58	54	37.65	31.84	5.34	34.41	100	43	Average
2462	103.33	-	-	100.25	31.97	5.49	34.38	100	43	Peak
2462	94.09	-	-	91.01	31.97	5.49	34.38	100	43	Average
2483.66	41.93	-12.07	54	38.8	31.98	5.52	34.37	100	43	Average
2483.66	60.28	-13.72	74	57.15	31.98	5.52	34.37	100	43	Peak
3282	58.18	-25.15	83.33	74.43	32.61	6.43	55.29	-	-	Peak
4924	46.39	-27.61	74	60.53	34.34	8.04	56.52	100	0	Peak

Test Mode :	Mode 7	Temperature :	23~25℃
Test Channel :	01	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Horizontal
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 3213 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
175.53	23.62	-19.88	43.5	44.19	9.55	1.56	31.68	-	-	Peak
189.84	20.4	-23.1	43.5	41.06	9.4	1.6	31.66	-	-	Peak
249.78	25.68	-20.32	46	42.81	12.67	1.85	31.65	-	-	Peak
717.9	27.87	-18.13	46	36.99	19.63	3.3	32.05	-	-	Peak
901.3	28.04	-17.96	46	34.23	21.63	3.76	31.58	-	-	Peak
959.4	28.7	-17.3	46	34.07	21.9	3.8	31.07	100	78	Peak
2389.99	43.66	-10.34	54	40.75	31.9	5.4	34.39	100	96	Average
2389.99	65.95	-8.05	74	63.04	31.9	5.4	34.39	100	96	Peak
2412	90.6	-	-	87.65	31.91	5.43	34.39	100	96	Average
2412	100.23	-	-	97.28	31.91	5.43	34.39	100	96	Peak
2486	47.69	-26.31	74	44.56	31.98	5.52	34.37	100	96	Peak
2486	34.99	-19.01	54	31.86	31.98	5.52	34.37	100	96	Average
3213	58.04	-22.19	80.23	73.74	32.58	6.35	54.63	-	-	Peak
4824	47.29	-26.71	74	60.78	34.4	7.96	55.85	100	0	Peak

Test Mode :	Mode 7	Temperature :	23~25℃
Test Channel :	01	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 3213 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
51.33	26.58	-13.42	40	49.49	7.92	0.87	31.7	100	237	Peak
75.09	25.55	-14.45	40	49.55	6.62	1.07	31.69	-	-	Peak
187.14	26.07	-17.43	43.5	46.74	9.41	1.59	31.67	-	-	Peak
399.4	27.39	-18.61	46	41.01	15.76	2.41	31.79	-	-	Peak
449.8	27.94	-18.06	46	40.49	16.8	2.5	31.85	-	-	Peak
901.3	27.95	-18.05	46	34.14	21.63	3.76	31.58	-	-	Peak
2389.99	46.09	-7.91	54	43.18	31.9	5.4	34.39	100	47	Average
2389.99	68.81	-5.19	74	65.9	31.9	5.4	34.39	100	47	Peak
2412	103.13	-	-	100.18	31.91	5.43	34.39	100	47	Peak
2412	93.28	-	-	90.33	31.91	5.43	34.39	100	47	Average
2494	37.06	-16.94	54	33.91	32	5.52	34.37	100	47	Average
2494	49.3	-24.7	74	46.15	32	5.52	34.37	100	47	Peak
3213	61.42	-21.71	83.13	77.12	32.58	6.35	54.63	-	-	Peak
4824	47.25	-26.75	74	60.74	34.4	7.96	55.85	100	0	Peak

Test Mode :	Mode 8	Temperature :	23~25℃
Test Channel :	06	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Horizontal
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 3246 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
172.29	24.71	-18.79	43.5	45.17	9.64	1.57	31.67	-	-	Peak
191.73	19.78	-23.72	43.5	40.44	9.39	1.61	31.66	-	-	Peak
249.78	25.61	-20.39	46	42.74	12.67	1.85	31.65	-	-	Peak
493.9	25.54	-20.46	46	36.98	17.69	2.65	31.78	-	-	Peak
901.3	27.86	-18.14	46	34.05	21.63	3.76	31.58	-	-	Peak
959.4	29.02	-16.98	46	34.39	21.9	3.8	31.07	100	278	Peak
2388	50.69	-23.31	74	47.78	31.9	5.4	34.39	132	92	Peak
2388	38.96	-15.04	54	36.05	31.9	5.4	34.39	132	92	Average
2437	100.04	-	-	97.03	31.93	5.46	34.38	132	92	Peak
2437	90.58	-	-	87.55	31.95	5.46	34.38	132	92	Average
2500	48.54	-25.46	74	45.39	32	5.52	34.37	132	92	Peak
2500	36.71	-17.29	54	33.56	32	5.52	34.37	132	92	Average
3246	60.25	-19.79	80.04	75.89	32.6	6.4	54.64	-	-	Peak

Test Mode :	Mode 8	Temperature :	23~25℃
Test Channel :	06	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Vertical
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 3246 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
49.98	27.06	-12.94	40	49.83	8.08	0.86	31.71	100	67	Peak
75.09	25.76	-14.24	40	49.76	6.62	1.07	31.69	-	-	Peak
187.68	25.12	-18.38	43.5	45.8	9.4	1.59	31.67	-	-	Peak
399.4	27.87	-18.13	46	41.49	15.76	2.41	31.79	-	-	Peak
449.8	27.73	-18.27	46	40.28	16.8	2.5	31.85	-	-	Peak
901.3	28.18	-17.82	46	34.37	21.63	3.76	31.58	-	-	Peak
2364	52.85	-21.15	74	50.02	31.86	5.37	34.4	100	40	Peak
2364	40.83	-13.17	54	38	31.86	5.37	34.4	100	40	Average
2437	102.71	-	-	99.7	31.93	5.46	34.38	100	40	Peak
2437	92.88	-	-	89.85	31.95	5.46	34.38	100	40	Average
2486	51.24	-22.76	74	48.11	31.98	5.52	34.37	100	40	Peak
2486	39.54	-14.46	54	36.41	31.98	5.52	34.37	100	40	Average
3246	61.37	-21.34	82.71	77.01	32.6	6.4	54.64	-	-	Peak

Test Mode :	Mode 9	Temperature :	23~25℃
Test Channel :	11	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Horizontal
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 3282 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
173.64	23.14	-20.36	43.5	43.65	9.6	1.57	31.68	-	-	Peak
193.89	20.99	-22.51	43.5	41.65	9.38	1.62	31.66	-	-	Peak
249.78	25.36	-20.64	46	42.49	12.67	1.85	31.65	-	-	Peak
493.9	24.42	-21.58	46	35.86	17.69	2.65	31.78	-	-	Peak
901.3	28.13	-17.87	46	34.32	21.63	3.76	31.58	-	-	Peak
959.4	29.03	-16.97	46	34.4	21.9	3.8	31.07	100	64	Peak
2342	50.56	-23.44	74	47.79	31.84	5.34	34.41	100	93	Peak
2342	37.94	-16.06	54	35.17	31.84	5.34	34.41	100	93	Average
2462	98.67	-	-	95.59	31.97	5.49	34.38	100	93	Peak
2462	88.78	-	-	85.7	31.97	5.49	34.38	100	93	Average
2483.5	37.47	-16.53	54	34.34	31.98	5.52	34.37	100	93	Average
2483.5	55.99	-18.01	74	52.86	31.98	5.52	34.37	100	93	Peak
3282	60.59	-18.08	78.67	76.21	32.61	6.43	54.66	-	-	Peak

Test Mode :	Mode 9	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	42~44%
Test Engineer :	Elvis Chen	Polarization :	Vertical
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 3282 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
51.33	27.43	-12.57	40	50.34	7.92	0.87	31.7	100	37	Peak
75.09	25.48	-14.52	40	49.48	6.62	1.07	31.69	-	-	Peak
189.84	25.33	-18.17	43.5	45.99	9.4	1.6	31.66	-	-	Peak
399.4	27.71	-18.29	46	41.33	15.76	2.41	31.79	-	-	Peak
449.8	27.94	-18.06	46	40.49	16.8	2.5	31.85	-	-	Peak
901.3	27.92	-18.08	46	34.11	21.63	3.76	31.58	-	-	Peak
2348	52.77	-21.23	74	50	31.84	5.34	34.41	100	41	Peak
2348	40.66	-13.34	54	37.89	31.84	5.34	34.41	100	41	Average
2462	101.85	-	-	98.77	31.97	5.49	34.38	100	41	Peak
2462	92.15	-	-	89.07	31.97	5.49	34.38	100	41	Average
2483.5	41.72	-12.28	54	38.59	31.98	5.52	34.37	100	41	Average
2483.5	61.42	-12.58	74	58.29	31.98	5.52	34.37	100	41	Peak
3282	60.96	-20.89	81.85	76.58	32.61	6.43	54.66	-	-	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 PCB Antenna without connector and it is considered to meet antenna requirement.

3.8.3 Antenna Gain

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

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 13, 2011	Jun. 12, 2012	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 13, 2010	Sep. 12, 2011	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 14, 2010	Sep. 13, 2011	Conducted (TH02-HY)
WiMAX Base Station (System Simulator)	Agilent	E6651A	N/A	N/A	N/A	N/A	Radiation (03CH06-HY)
Spectrum Analyzer	R&S	FSP40	100057	9KHz-40GHz	Oct. 25, 2010	Oct. 24, 2011	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20MHz-1000MHz	May 10, 2011	May 09, 2012	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Oct. 31, 2010	Oct. 30, 2011	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz~18GHz	Aug. 01, 2011	Jul. 31, 2012	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Training Research	AH-0801	95119	8GHz~18GHz	Oct. 20, 2010	Oct. 19, 2011	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 18, 2010	Oct. 17, 2011	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz- 26.5GHz	Apr. 14, 2011	Apr. 13, 2012	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz~1GHz	Apr. 14, 2011	Apr. 13, 2012	Radiation (03CH06-HY)

5 Uncertainty of Evaluation

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

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.10	Normal (k=2)	0.05
Cable Loss	0.10	Normal (k=2)	0.05
AMN Insertion Loss	2.50	Rectangular	0.63
Receiver Specification	1.50	Rectangular	0.43
Site Imperfection	1.39	Rectangular	0.80
Mismatch	+0.34 / -0.35	U-Shape	0.24
Combined Standard Uncertainty $U_c(y)$	1.13		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.26		

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
Combined Standard Uncertainty $U_c(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.54		

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

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



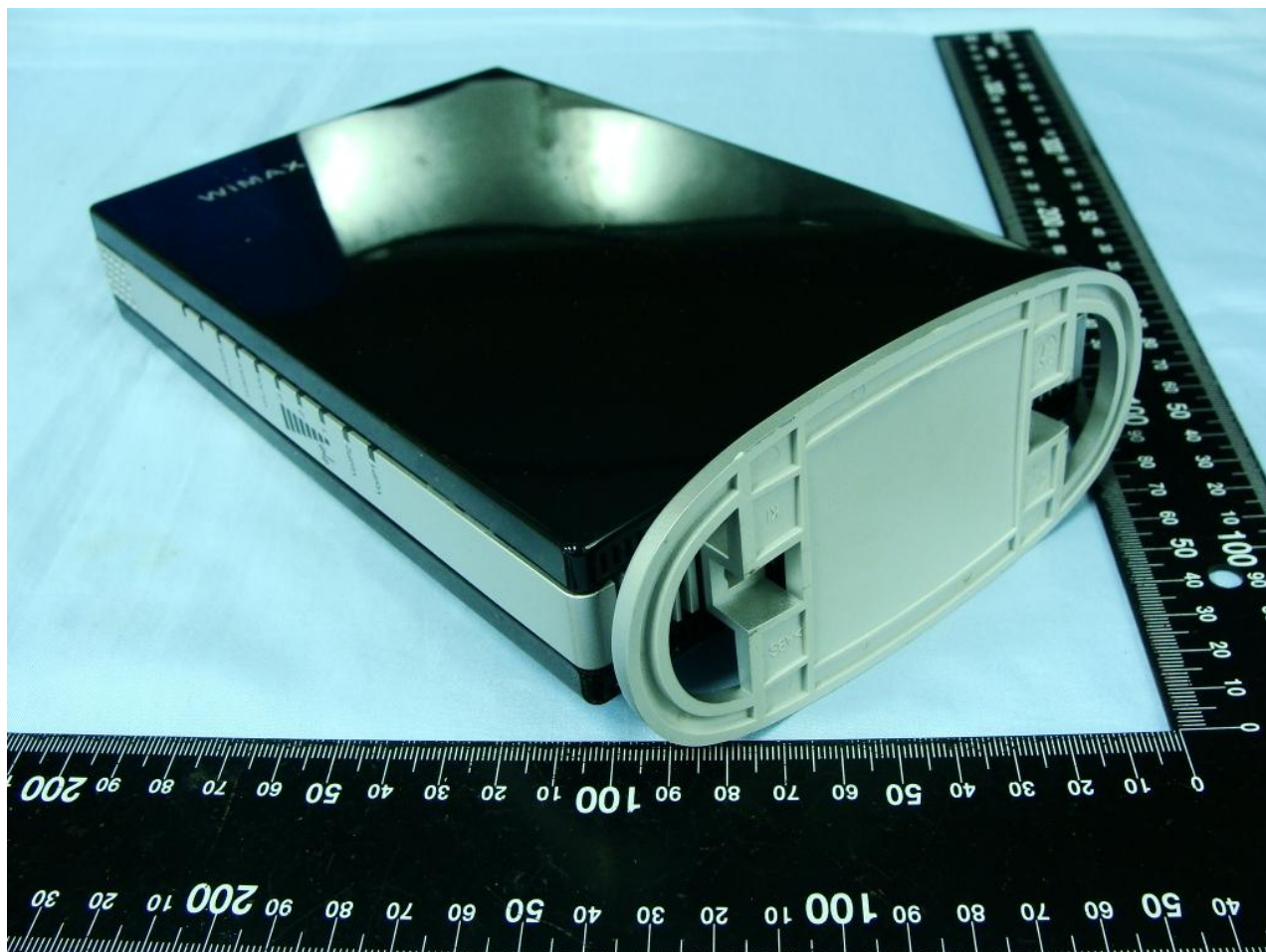
Appendix A. Photographs of EUT

Please refer to Sporton report number EP180414 as below.



1. External Photograph of EUT

Brand Name: Alvarion / Model Name: WM5347N-3G8





Brand Name: Alvarion / Model Name: WM5347N-3G8





2. Photograph of Accessory

Brand Name: Alvarion / Model Name: WM5347N-3G8

List of Accessory:

Specification of Accessory		
AC Adapter	Brand Name	Technics Electronic Co., Ltd.
	Model Name	TESA2G-1202100d

Remark: For accessories equipped with this EUT, please refer to the following photos.

Brand Name: Alvarion / Model Name: WM5347N-3G8

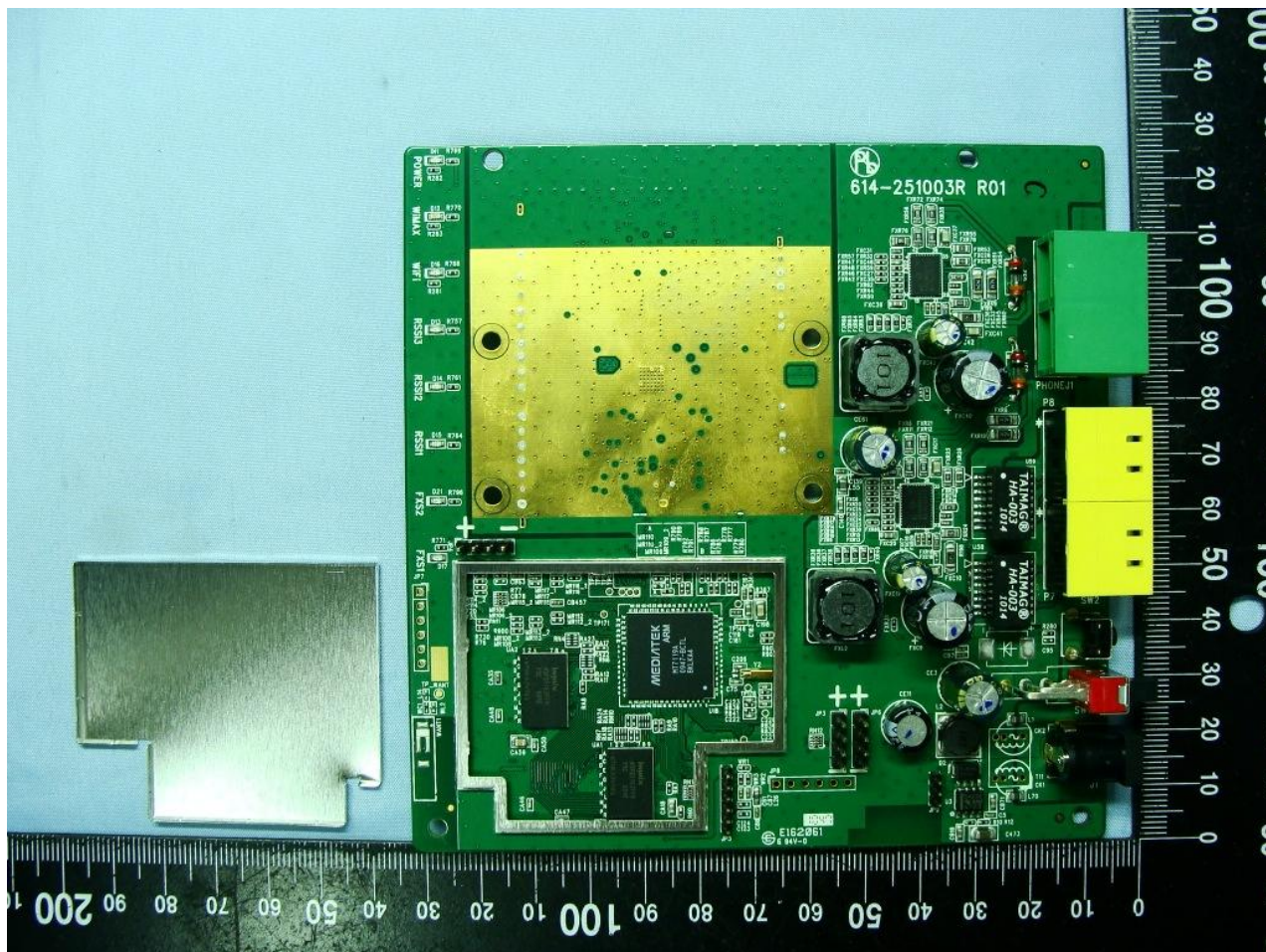


Brand Name: Alvarion / Model Name: WM5347N-3G8

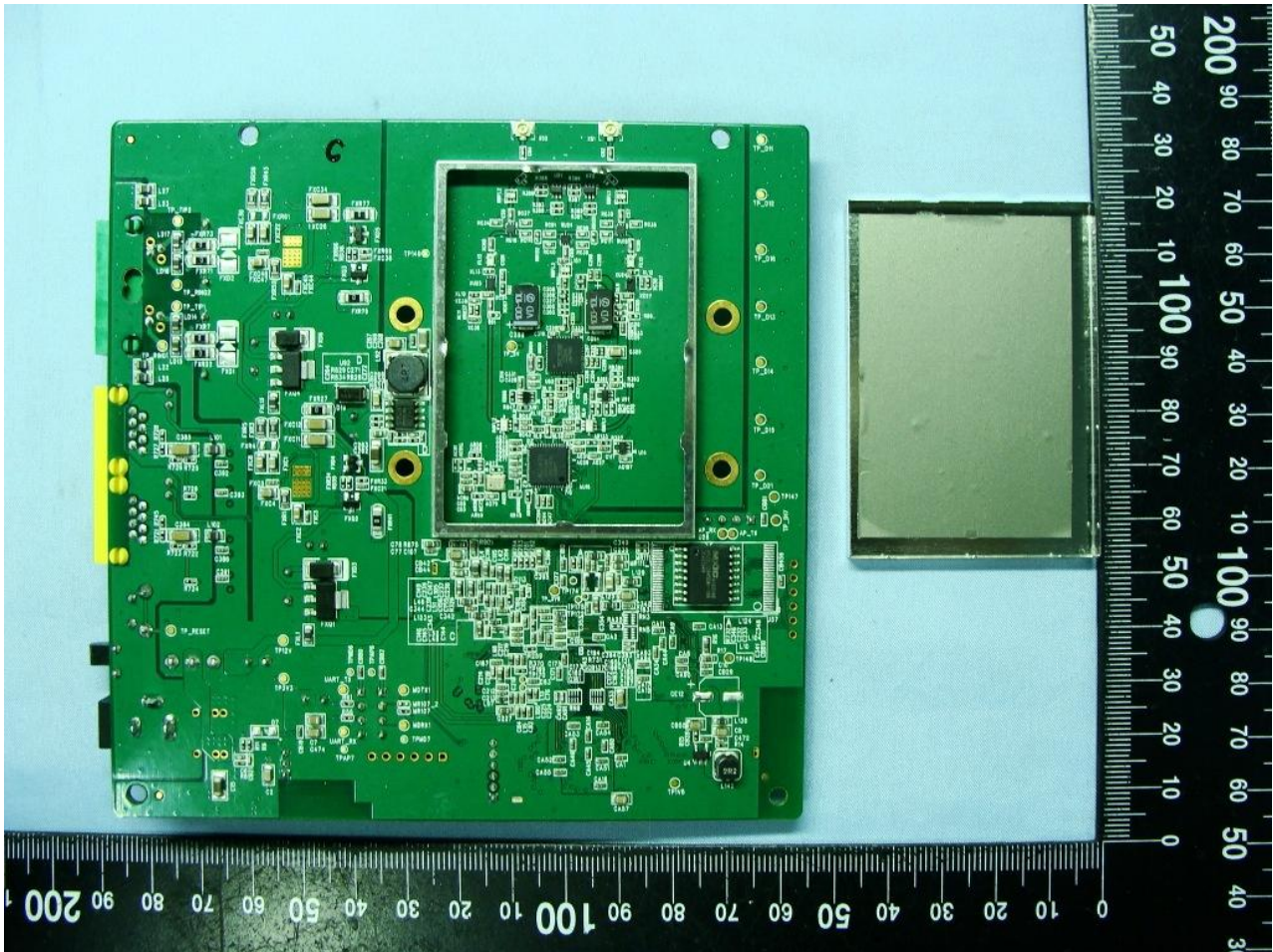


3. Internal Photograph of EUT

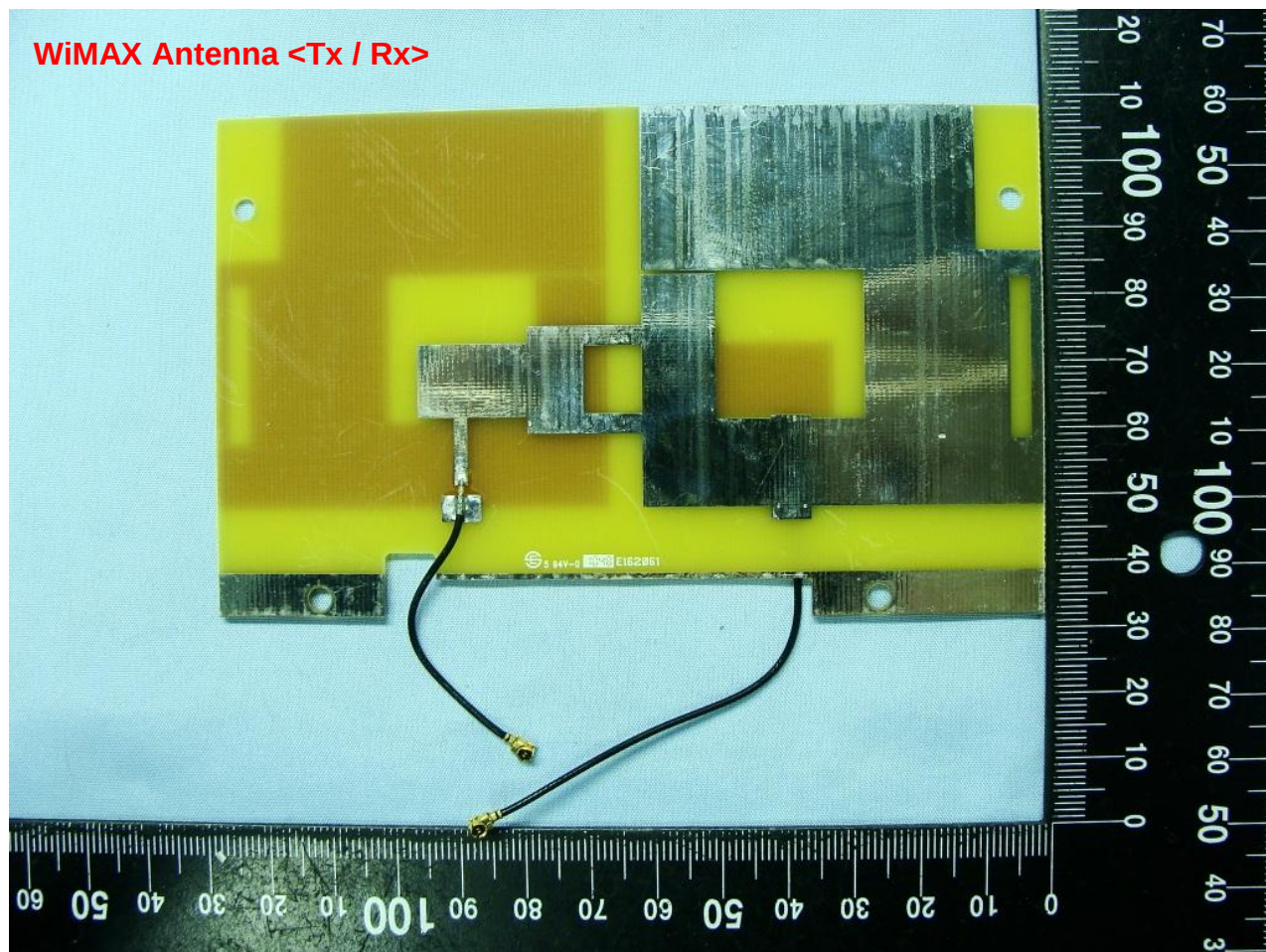
Brand Name: Alvarion / Model Name: WM5347N-3G8



Brand Name: Alvarion / Model Name: WM5347N-3G8

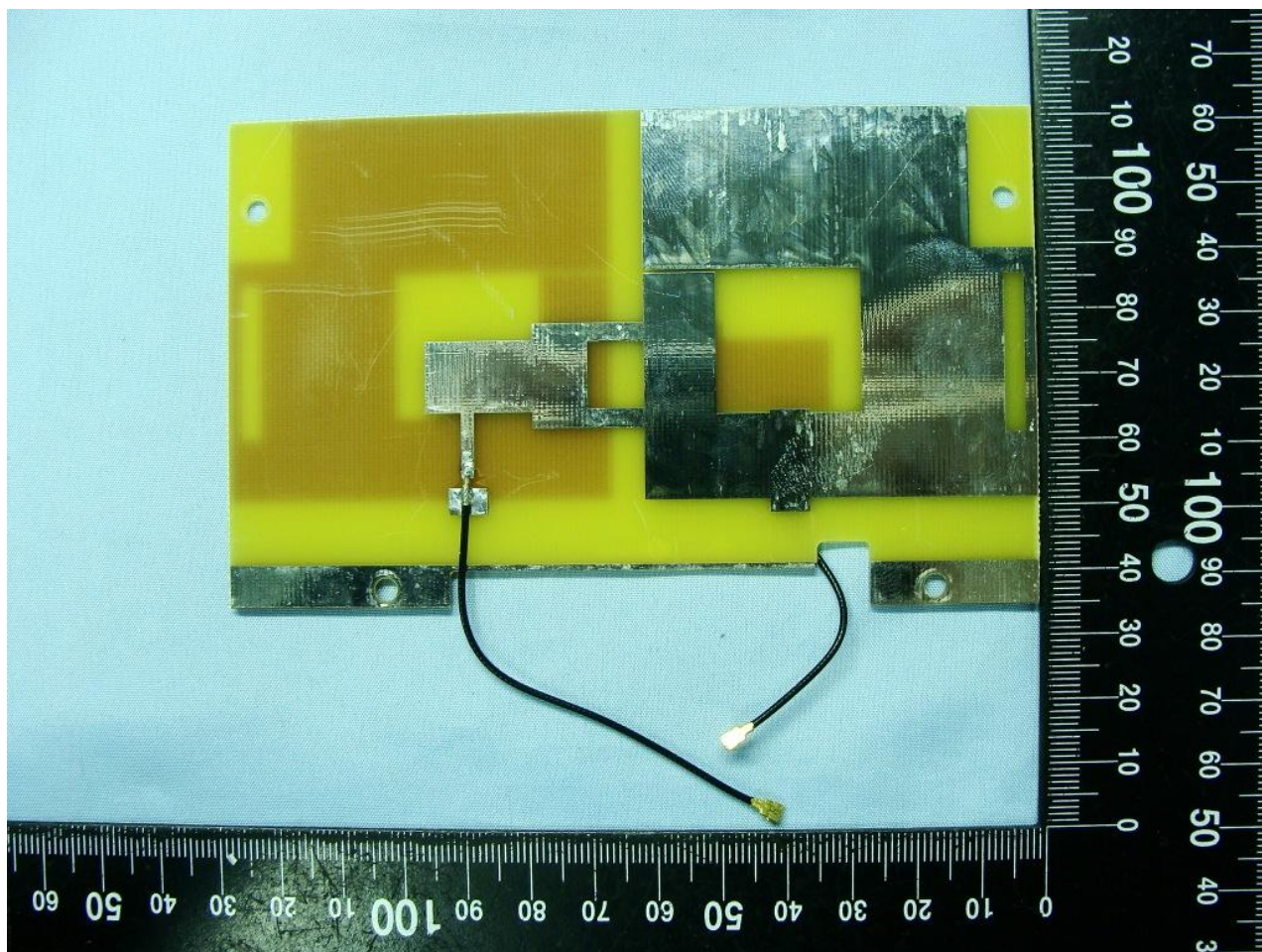


Brand Name: Alvarion / Model Name: WM5347N-3G8



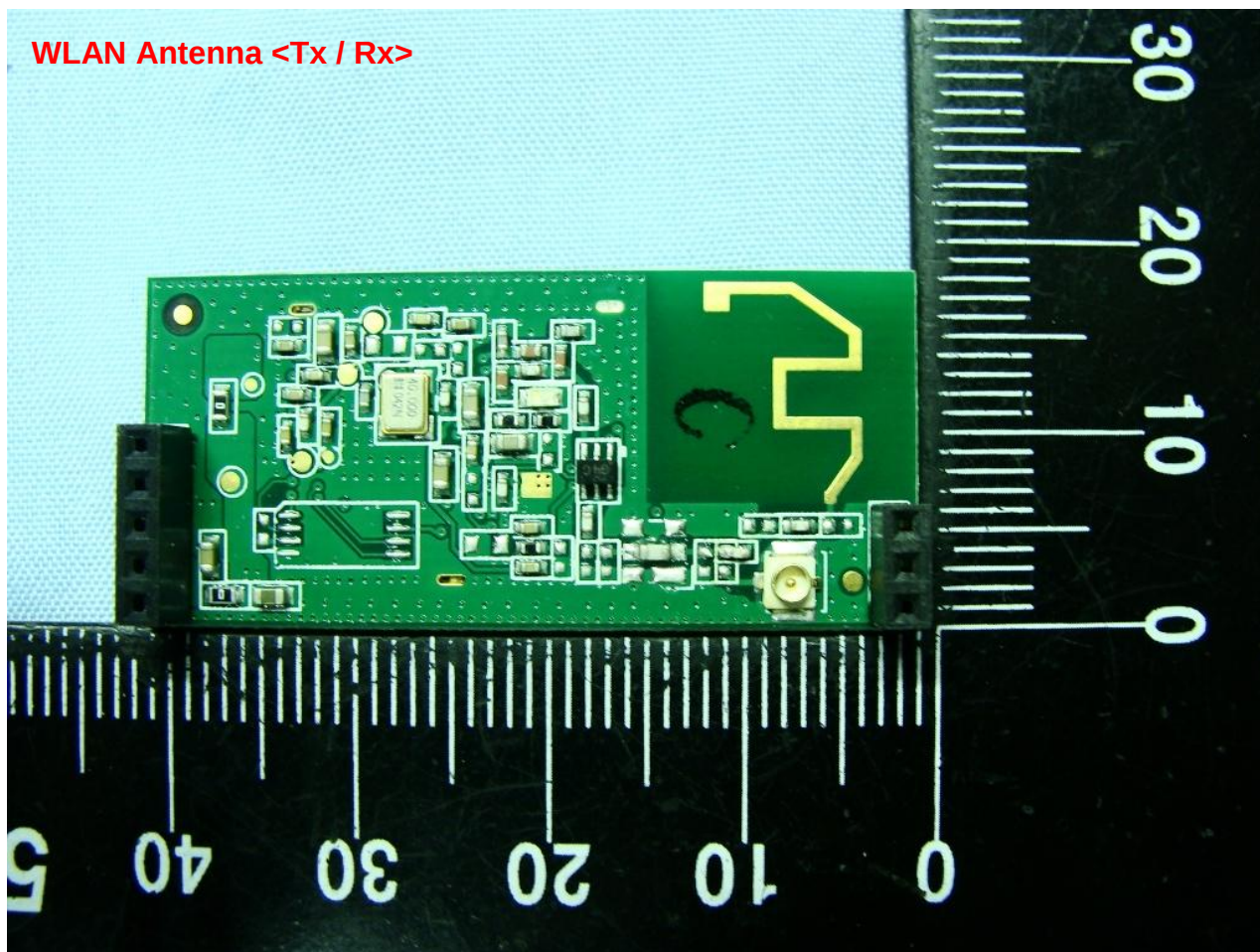


Brand Name: Alvarion / Model Name: WM5347N-3G8



Brand Name: Alvarion / Model Name: WM5347N-3G8

WLAN Antenna <Tx / Rx>



Appendix B. Setup Photographs

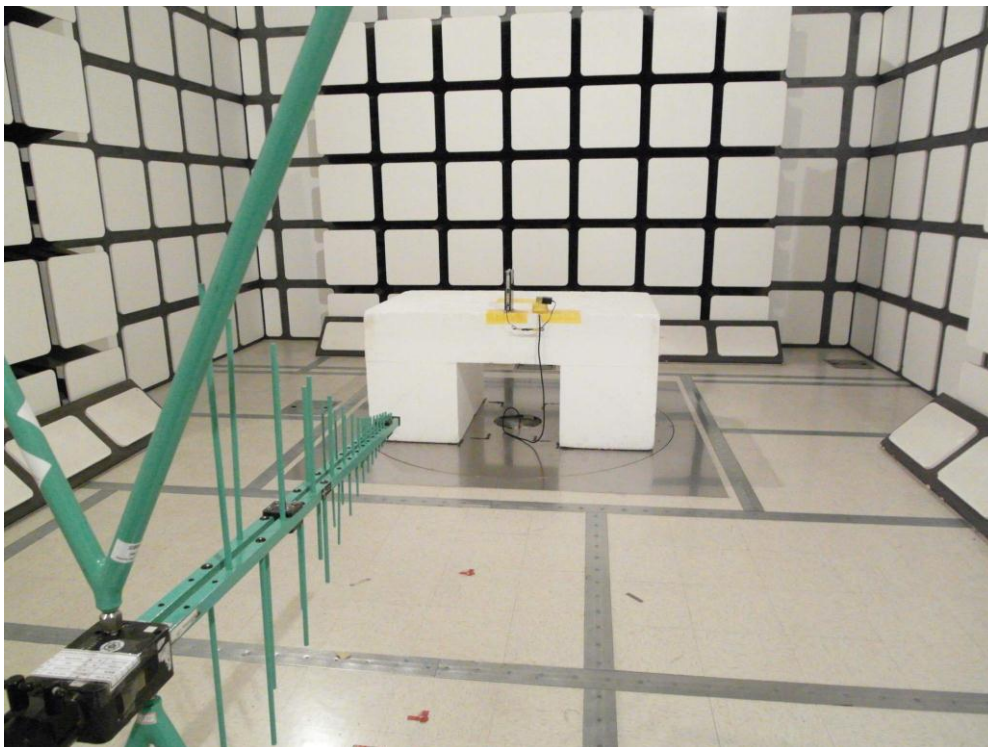
<Conducted Emission>



<Radiated Emission>

Mode 1

LF



HF

