FCC RF Test Report

APPLICANT	:	**Meru Networks Inc.**
EQUIPMENT	:	**Single Radio Access Point AP1000**
BRAND NAME	:	**Meru Networks Inc.**
MODEL NAME	:	**AP1010i**
FCC ID	:	**RE7-AP1010**
STANDARD	:	**FCC Part 15 Subpart E**
CLASSIFICATION	:	**Unlicensed National Information Infrastructure (UNII)**

The product was received on Aug. 26, 2010 and completely tested on Sep. 29, 2010. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown 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:

Anderson Chiu

Anderson Chiu / Deputy Manager

Testing Laboratory 1190

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
FR082617-01B	Rev. 01	Initial issue of report	Sep. 29, 2010

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	A9.2	26dB Bandwidth	-	Pass	-
3.2	15.407(a)	A9.2	Maximum Conducted Output Power	≤ 17, 24, 30 dBm (depend on band)	Pass	-
3.3	15.407(a)	A9.2	Power Spectral Density	≤ 4, 11, 17 dBm (depend on band)	Pass	-
3.4	15.407(b)	A9.3	Frequency Band Edges	≤ -17, -27 dBm (depend on band)&15.209(a)	Pass	-
3.5	15.407(b)	A9.3	Spurious Emission	EIRP < -27 dBm/MHz	Pass	-
3.6	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 2.31 dB at 10.402 MHz
3.7	15.407(b)	A9.3	Transmitter Radiated Emission	≤ -17, -27 dBm (depend on band)&15.209(a)	Pass	Under limit 3.16 dB at 43.23 MHz
3.8	15.407(b)	A9.3	Peak Excursion Ratio	≤ 13dB	Pass	-
3.9	15.407(c)	A9.5	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.10	15.407(g)	A9.5	Frequency Stability	Within Operation Band	Pass	-
3.11	15.203 & 15.407(a)	A9.2	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Meru Networks Inc.
894 Ross Drive Sunnyvale, CA 94089 USA

1.2 Manufacturer

Universal Scientific Industrial (Shanghai)
No. 1558, Zhang Dong Road, Zhangjiang Hi-Tech Park, Shanghai, P.R. China 201203

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Single Radio Access Point AP1000
Brand Name	Meru Networks Inc.
Model Name	AP1010i
FCC ID	RE7-AP1010
Tx/Rx Frequency Range	5150 MHz ~ 5250 MHz
Maximum Output Power to Antenna	802.11a : 15.20 dBm / 0.033 W 802.11n (BW 20MHz) : 15.48 dBm / 0.035 W 802.11n (BW 40MHz) : 14.82 dBm / 0.030 W
HW Version	MVT 3.0
SW Version	MVT 3.0
Type of Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Production Unit

Antenna Information		
Antenna	**Model Name**	N-I1-XX-F
	Antenna Type	PIFA Antenna
	Antenna Gain	3.5 dBi for WLAN (2.4G) ; 6 dBi for WLAN (5G)

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 Unlicensed National Information Infrastructure (UNII).
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 1st 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.**
	03CH07HY	TW1022/4086B-1

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C. TEL: +886-2-2603-5367 / +886-2-2601-1640 FAX: +886-2-2601-1695
Test Site No.	Sporton Site No. :
	CO01-LK

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 E
- FCC Public Notice DA 02-2138, (Measurement Guidelines of UNII)
- ANSI C63.4-2003
- IC RSS-210 Issued 7

Remark:

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

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P:Shielded, 1.8 m
2.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
3.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
4.	iPod	Apple	A1199	FCC DoC	Shielded, 1.0 m	N/A
5.	POE	PHIHONG	POE20U-560(G)	N/A	N/A	N/A

2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

802.11a Carrier Frequency Channel							
Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
36	5180	40	5200	44	5220	48	5240

802.11n (BW 20MHz) Carrier Frequency Channel							
Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
36	5180	40	5200	44	5220	48	5240

802.11n (BW 40MHz) Carrier Frequency Channel			
Channel	Freq. (MHz)	Channel	Freq. (MHz)
38	5190	46	5230

2.2 RF Power

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

Channel	Frequency	Chain	5GHz 802.11a RF Power (dBm)							
			Data Rate							
			6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 36	5180 MHz	A	15.14	-	-	-	-	-	-	-
CH 40	5200 MHz	A	**15.20**	14.89	14.88	15.02	14.79	14.83	15.11	14.55
CH 48	5240 MHz	A	15.10	-	-	-	-	-	-	-
CH 36	5180 MHz	B	15.10	-	-	-	-	-	-	-
CH 40	5200 MHz	B	15.18	14.81	14.86	15.04	14.76	14.77	14.67	14.69
CH 48	5240 MHz	B	15.14	-	-	-	-	-	-	-

Channel	Frequency	Chain	5GHz 802.11n (BW 20MHz) RF Power (dBm)							
			Data Rate							
			6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps
CH 36	5180 MHz	A+B	**15.48**	15.40	15.05	14.76	14.79	14.66	14.72	14.76
CH 40	5200 MHz	A+B	15.34	-	-	-	-	-	-	-
CH 48	5240 MHz	A+B	15.19	-	-	-	-	-	-	-
Channel	**Frequency**	**Chain**	**13 Mbps**	**26 Mbps**	**39 Mbps**	**52 Mbps**	**78 Mbps**	**104 Mbps**	**117 Mbps**	**130 Mbps**
CH 36	5180 MHz	A+B	15.20	15.06	14.79	14.72	14.59	14.26	13.94	13.55
CH 40	5200 MHz	A+B	-	-	-	-	-	-	-	-
CH 48	5240 MHz	A+B	-	-	-	-	-	-	-	-

Channel	Frequency	Chain	5GHz 802.11n (BW 40MHz) RF Power (dBm)							
			Data Rate							
			13.5 Mbps	27 Mbps	40.5 Mbps	54 Mbps	81 Mbps	108 Mbps	121.5 Mbps	135 Mbps
CH 38	5190 MHz	A+B	**14.82**	-	-	-	-	-	-	-
CH 46	5230 MHz	A+B	14.67	14.58	14.38	14.38	14.46	14.44	14.55	14.50
Channel	**Frequency**	**Chain**	**27 Mbps**	**54 Mbps**	**81 Mbps**	**108 Mbps**	**162 Mbps**	**216 Mbps**	**243 Mbps**	**270 Mbps**
CH 38	5190 MHz	A+B	-	-	-	-	-	-	-	-
CH 46	5230 MHz	A+B	14.47	14.47	14.60	14.36	14.28	14.33	14.31	14.14

Remark:

1. Chain A+B was tested by combiner, and the chain A and B was tested individually and calculated with the formula of 10*LOG (10^ (chain A/10) + 10^ (chain B/10)).
2. The data rates of WLAN 802.11a were set in 6Mbps, 6.5Mbps for 5GHz 802.11n (BW 20MHz), 13.5Mbps for 5GHz 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.

4. SISO stands for single input and single output. It means that only one chain transmits signals at a time.
5. 2Tx is one type of MIMO, which means that two chains transmit signals at the same time.

2.3 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: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

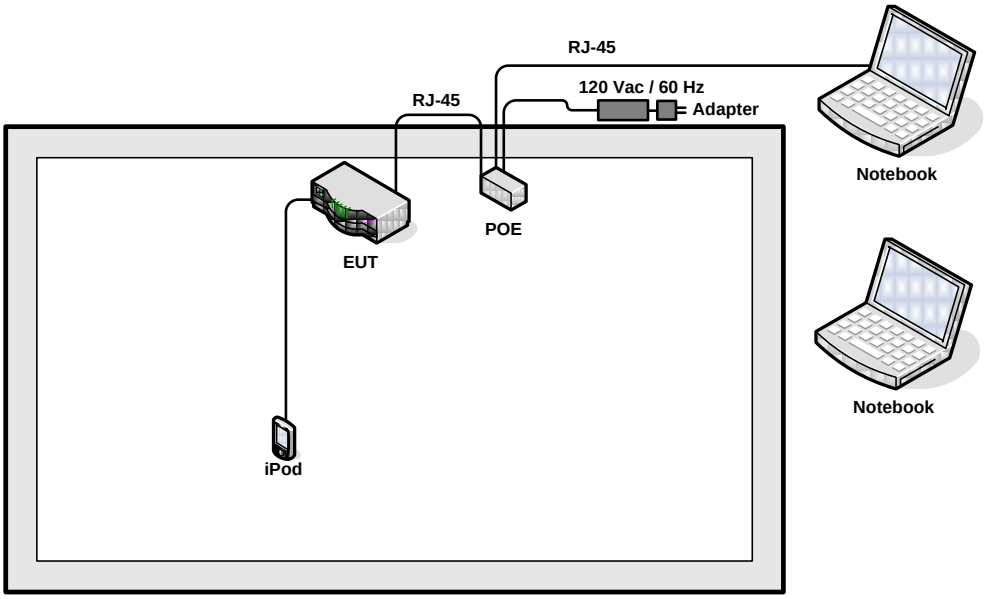
Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations modes.

The following table is showing the total pre-scanned test modes, and the worst modes are recorded in this report only.

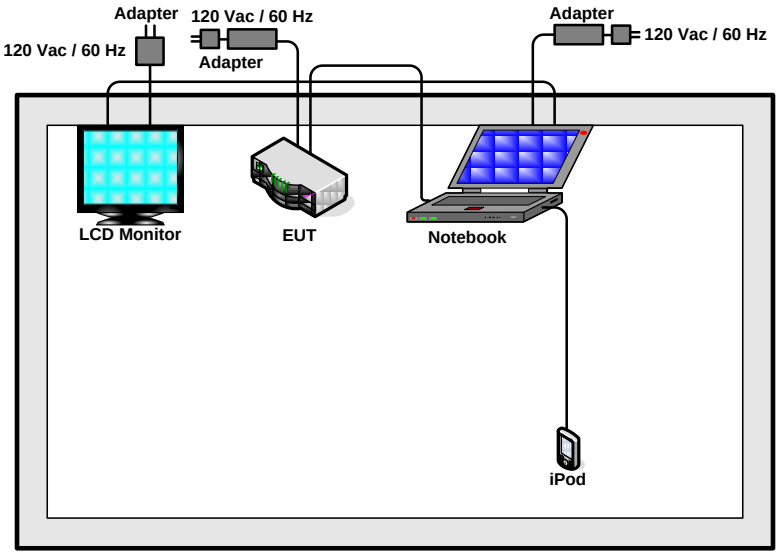
	Test Cases
Test Item	**802.11a (Modulation : OFDM)**
Conducted TCs	■ Mode 1: 802.11a_CH36_5180 MHz ■ Mode 2: 802.11a_CH40_5200 MHz ■ Mode 3: 802.11a_CH48_5240 MHz ■ Mode 4: 802.11n_CH36_5180 MHz (BW 20M) ■ Mode 5: 802.11n_CH40_5200 MHz (BW 20M) ■ Mode 6: 802.11n_CH48_5240 MHz (BW 20M) ■ Mode 7: 802.11n_CH38_5190 MHz (BW 40M) ■ Mode 8: 802.11n_CH46_5230 MHz (BW 40M)
Radiated TCs	■ Mode 1: 802.11a_CH36_5180 MHz ■ Mode 2: 802.11a_CH40_5200 MHz ■ Mode 3: 802.11a_CH48_5240 MHz ■ Mode 4: 802.11n_CH36_5180 MHz (BW 20M) ■ Mode 5: 802.11n_CH40_5200 MHz (BW 20M) ■ Mode 6: 802.11n_CH48_5240 MHz (BW 20M) ■ Mode 7: 802.11n_CH38_5190 MHz (BW 40M) ■ Mode 8: 802.11n_CH46_5230 MHz (BW 40M)
AC Conducted Emission	WLAN (5G) Link + POE

2.4 Connection Diagram of Test System

< EUT with POE Mode>



<WLAN Tx Mode>



2.5 RF Utility

The programmed RF Utility “Hypeterminal”, is installed in Notebook 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 26dB and 99%Bandwidth Measurement

3.1.1 Limit of 26dB Bandwidth

There is no restriction limits for bandwidth. The maximum conducted output power can be limited by measured emission bandwidth (B). For the band 5.15~5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B.

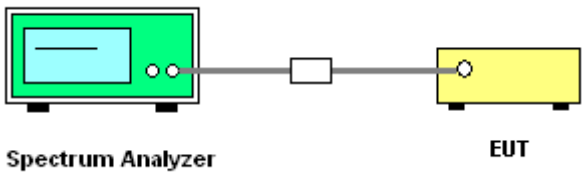
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC Public Notice DA 02-2138 (Measurement Guidelines of UNII).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Read RBW and repeat measurement as needed until the RBW/BW ratio is approximately 1%.
4. Use a RBW = approximately 1% of the emission bandwidth; Set the VBW > RBW; Use a peak detector.
5. Measure the maximum width of the emission that is 26 dB relative to the peak of the emission and 99% occupied bandwidth.

3.1.4 Test Setup



3.1.5 Test Result of 26dB Bandwidth

Test Mode :	Mode 1~3	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11a 26dB Bandwidth (MHz)	Pass/Fail
		Chain A	
36	5180	20.80	Pass
40	5200	20.96	Pass
48	5240	20.96	Pass

Test Mode :	Mode 4~6	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz, 2Tx) 26dB Bandwidth (MHz)	Pass/Fail
		Chain A+B	
36	5180	20.64	Pass
40	5200	20.56	Pass
48	5240	20.64	Pass

Test Mode :	Mode 7~8	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 40MHz, 2Tx) 26dB Bandwidth (MHz)	Pass/Fail
		Chain A+B	
38	5190	41.76	Pass
46	5230	42.08	Pass

3.1.6 Test Result of 99% Occupied Bandwidth

Test Mode :	Mode 1~3	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11a 99% Occupied Bandwidth (MHz)	Pass/Fail
		Chain A	
36	5180	18.64	Pass
40	5200	18.56	Pass
48	5240	18.64	Pass

Test Mode :	Mode 4~6	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz, 2Tx) 99% Occupied Bandwidth (MHz)	Pass/Fail
		Chain A+B	
36	5180	18.56	Pass
40	5200	18.56	Pass
48	5240	18.56	Pass

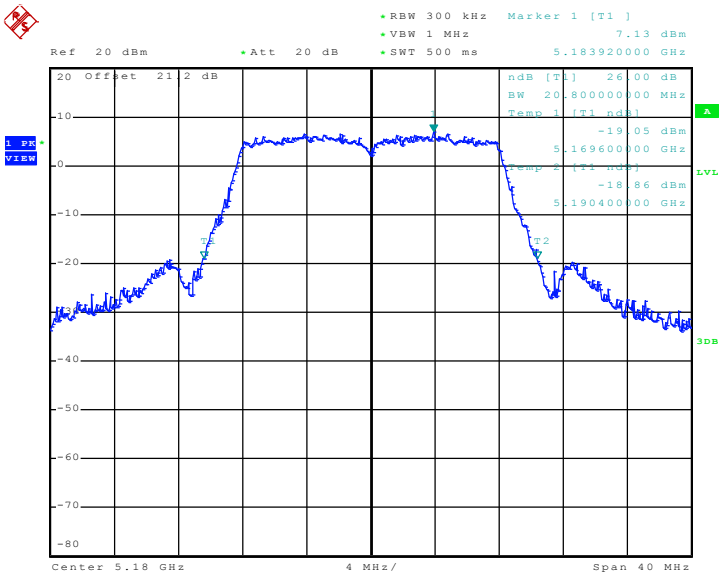
Test Mode :	Mode 7~8	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 40MHz, 2Tx) 99% Occupied Bandwidth (MHz)	Pass/Fail
		Chain A+B	
38	5190	37.12	Pass
46	5230	37.12	Pass

3.1.7 Test Result of 26dB Bandwidth Plots

Mode 01 :

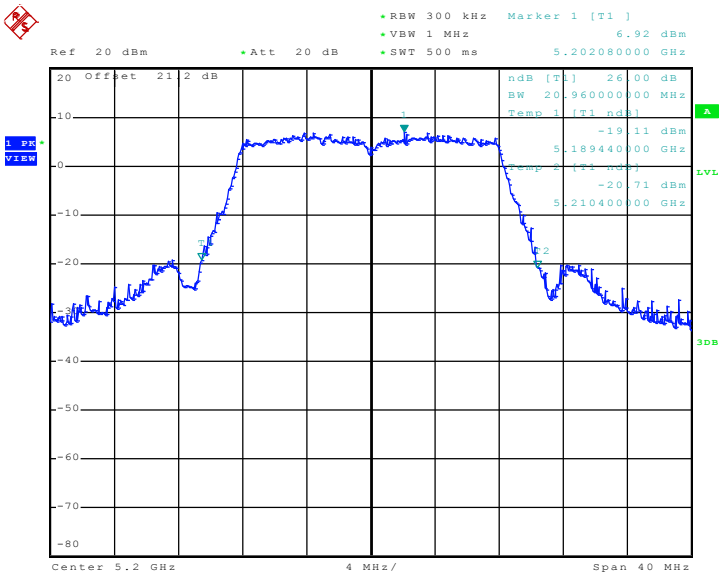
26 dB Bandwidth Plot on 802.11a Channel 36 – Chain A



Date: 2.SEP.2010 06:01:59

Mode 02 :

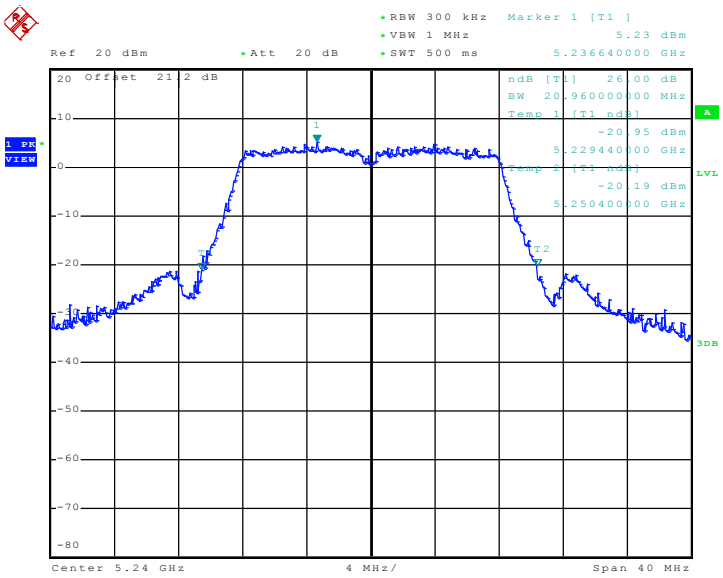
26 dB Bandwidth Plot on 802.11a Channel 40 – Chain A



Date: 2.SEP.2010 06:01:14

Mode 03 :

26 dB Bandwidth Plot on 802.11a Channel 48 – Chain A



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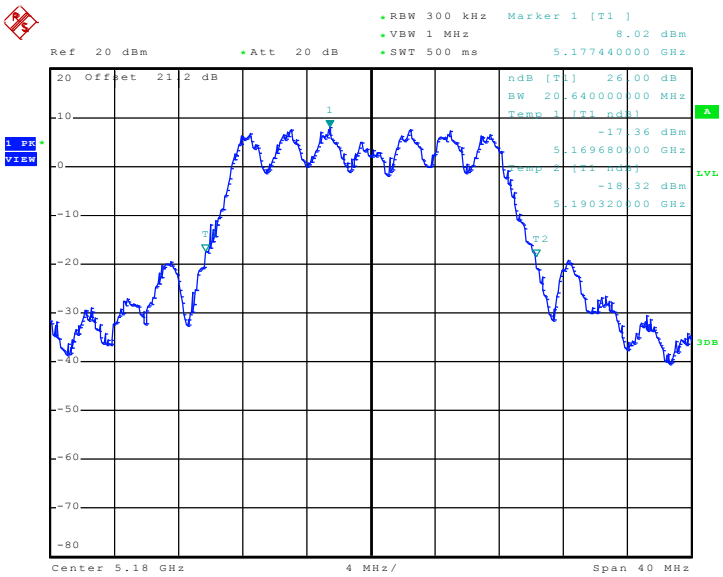
Mode 04 :

26 dB Bandwidth Plot on 802.11n (BW 20MHz) Channel 36 – Chain A+B



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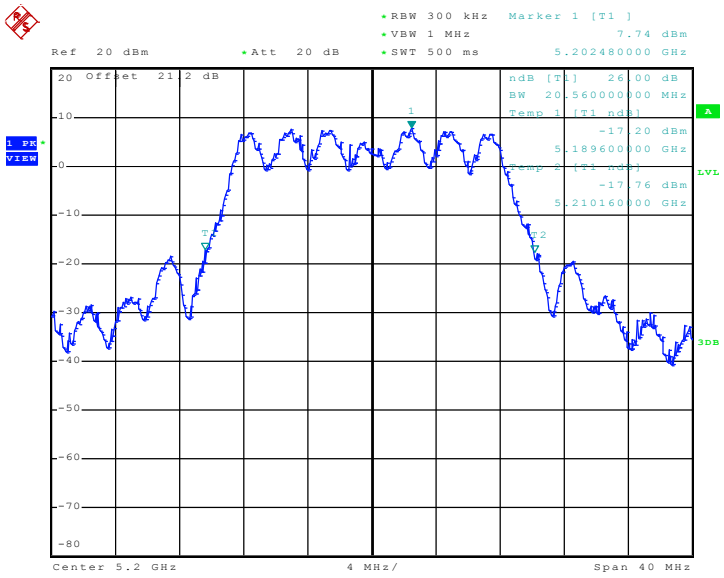
Mode 05 :

26 dB Bandwidth Plot on 802.11n (BW 20MHz) Channel 40 – Chain A+B



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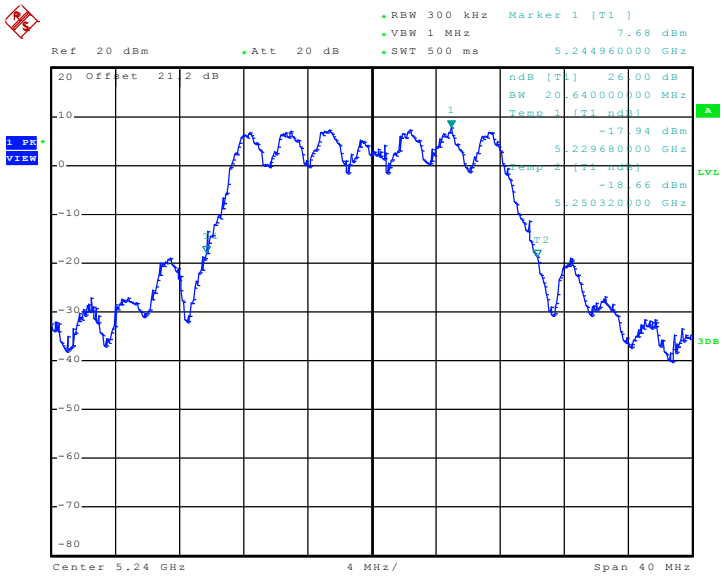
Mode 06 :

26 dB Bandwidth Plot on 802.11n (BW 20MHz) Channel 48 – Chain A+B



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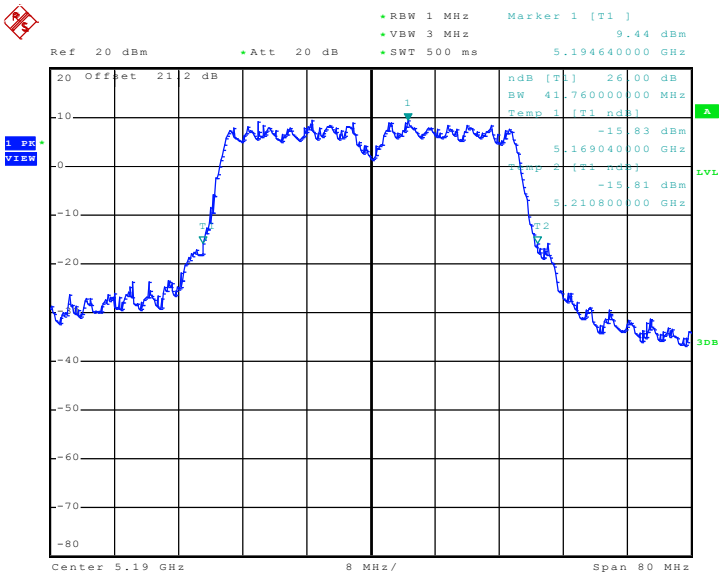
Mode 07 :

26 dB Bandwidth Plot on 802.11n (BW 40MHz) Channel 38 – Chain A+B



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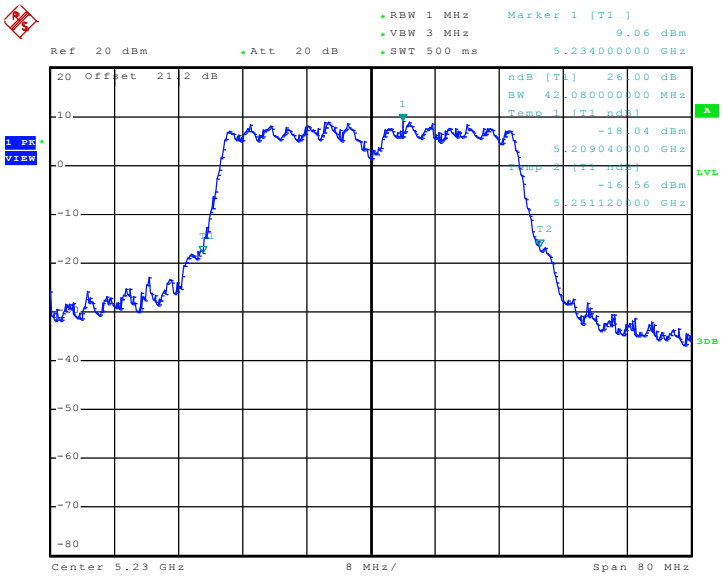
Mode 08 :

26 dB Bandwidth Plot on 802.11n (BW 40MHz) Channel 46 – Chain A+B

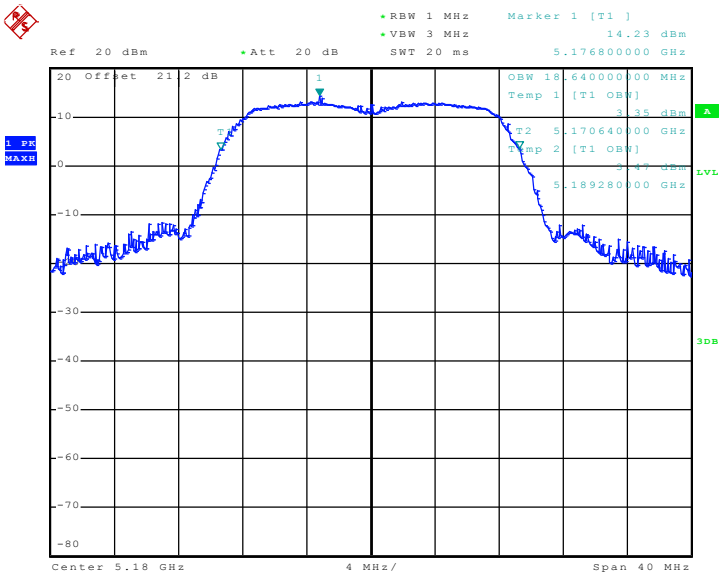


Date: 28.SEP.2010 06:57:02

3.1.8 Test Result of 99% Occupied Bandwidth Plots

Mode 01 :

99% Occupied Bandwidth Plot on 802.11a Channel 36 – Chain A



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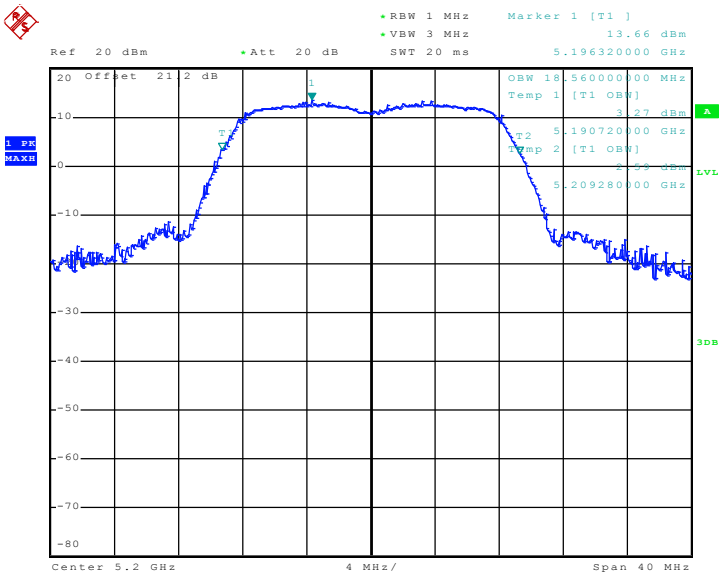
Mode 02 :

99% Occupied Bandwidth Plot on 802.11a Channel 40 – Chain A



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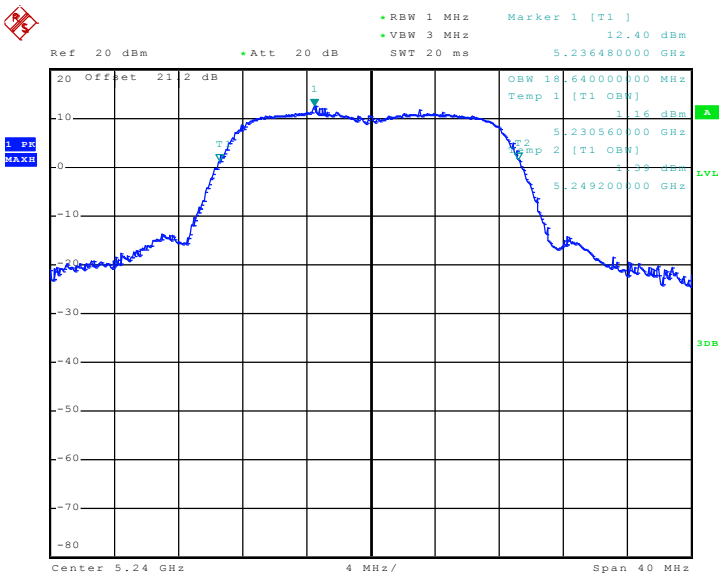
Mode 03 :

99% Occupied Bandwidth Plot on 802.11a Channel 48 – Chain A



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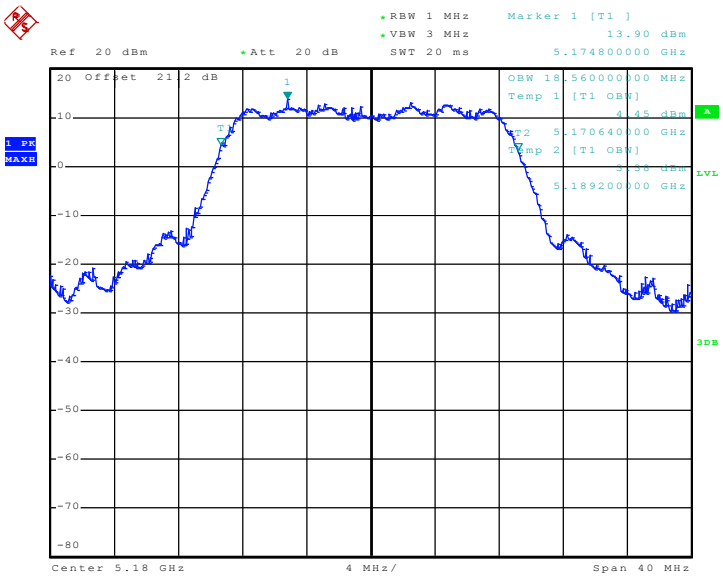
Mode 04 :

99% Occupied Bandwidth Plot on 802.11n (BW 20MHz) Channel 36 – Chain A+B



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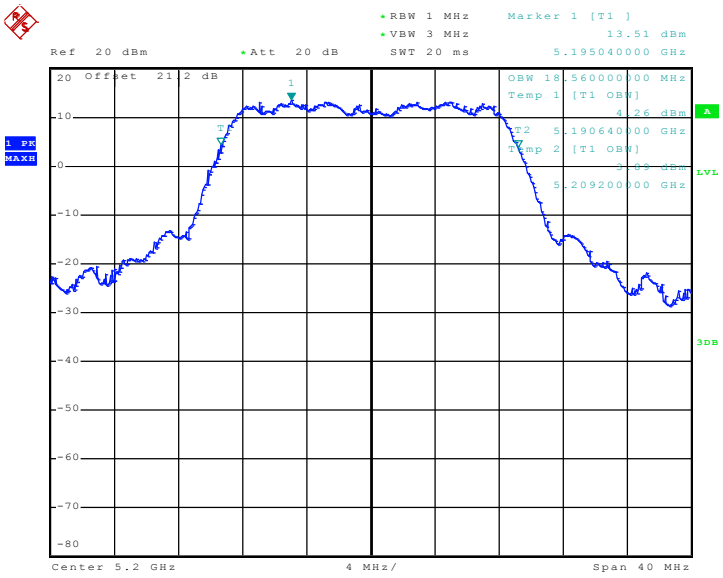
Mode 05 :

99% Occupied Bandwidth Plot on 802.11n (BW 20MHz) Channel 40 – Chain A+B



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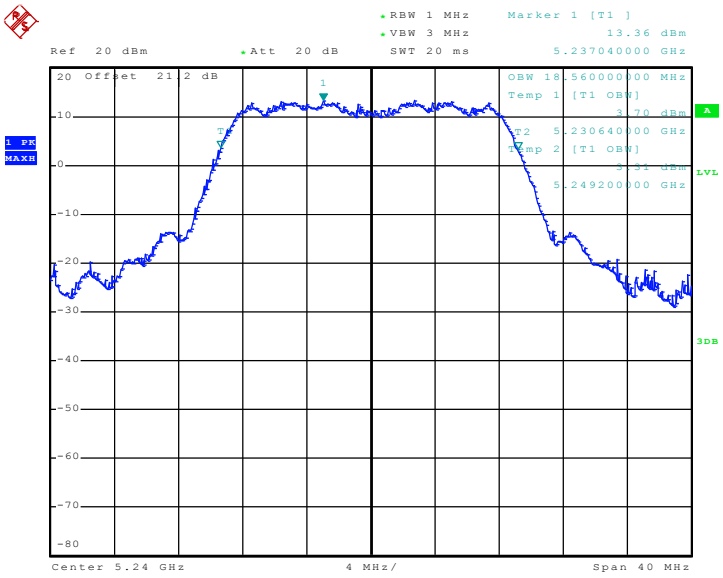
Mode 06 :

99% Occupied Bandwidth Plot on 802.11n (BW 20MHz) Channel 48 – Chain A+B



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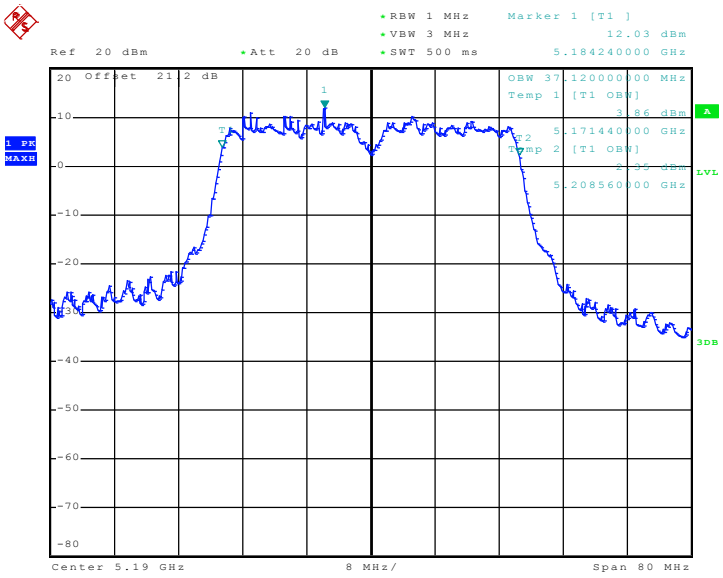
Mode 07 :

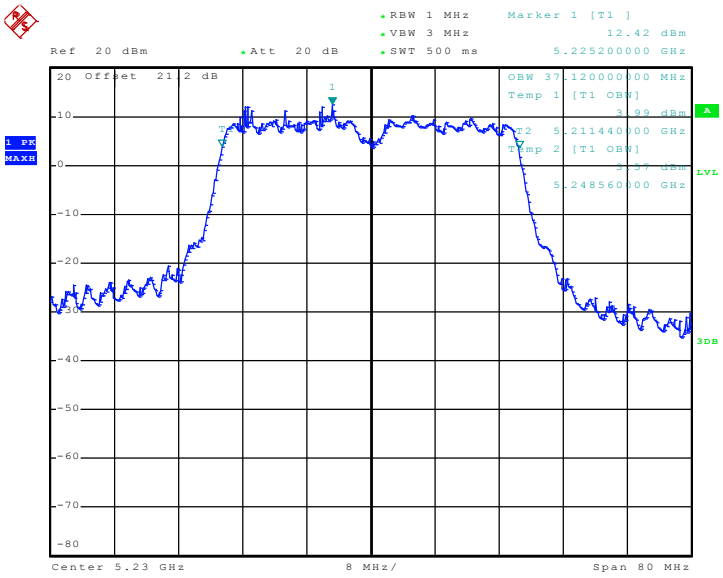
99% Occupied Bandwidth Plot on 802.11n (BW 40MHz) Channel 38 – Chain A+B



Date: 28.SEP.2010 07:09:53

Mode 08 :

99% Occupied Bandwidth Plot on 802.11n (BW 40MHz) Channel 46 – Chain A+B



Date: 28.SEP.2010 07:07:44

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

For the band 5.15~5.25 GHz, the maximum conducted output power shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B, where B is the 26 dB emissions bandwidth in MHz. If transmitting antenna directional gain is greater than 6 dBi, the peak output power and power density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

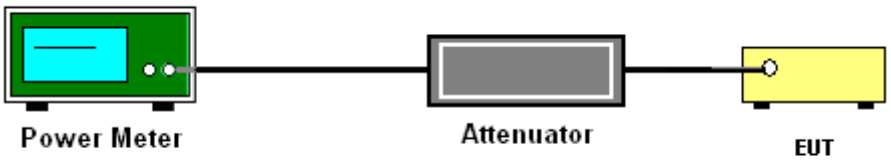
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows FCC Public Notice DA 02-2138 (Measurement Guidelines of UNII).
2. The RF output of EUT was connected to the power meter by a low loss cable.
3. Measure the power and record it.

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Test Mode :	Mode 1~3	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11a Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
		Chain A		
36	5180	15.14	17	Pass
40	5200	15.20	17	Pass
48	5240	15.10	17	Pass

Test Mode :	Mode 4~6	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz, 2Tx) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
		Chain A+B		
36	5180	15.48	17	Pass
40	5200	15.34	17	Pass
48	5240	15.19	17	Pass

Test Mode :	Mode 7~8	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 40MHz, 2Tx) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
		Chain A+B		
38	5190	14.82	17	Pass
46	5230	14.67	17	Pass

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

For the band 5.15–5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1MHz band. If transmitting antenna directional gain is greater than 6 dBi, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

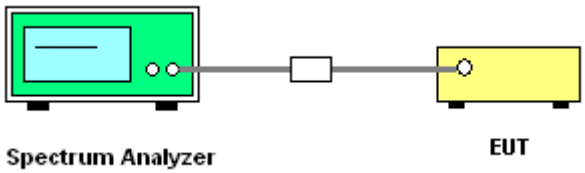
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

The transmitter output is connected to the spectrum analyzer. According to the method 3 of DA-02-2138, the resolution bandwidth is set to 1 MHz, video bandwidth is 3MHz, trace average 100 traces in power averaging mode, and sample detection is used, and the analyzer is set for video averaging.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Test Mode :	Mode 1~3	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11a Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
		Chain A		
36	5180	2.70	4	Pass
40	5200	2.22	4	Pass
48	5240	0.16	4	Pass

Test Mode :	Mode 4~6	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz, 2Tx) Measured PSD (dBm)			Max. Limits (dBm)	Pass/Fail
		Chain A	Chain B	Chain A+B		
36	5180	-1.52	-0.21	2.19	4	Pass
40	5200	-0.58	-0.98	2.23	4	Pass
48	5240	-2.21	-2.27	0.82	4	Pass

Note: Chain A+B was tested by combiner, and the chain A and B was tested individually and calculated with the formula of 10*LOG (10^ (chain A/10) + 10^ (chain B/10)).

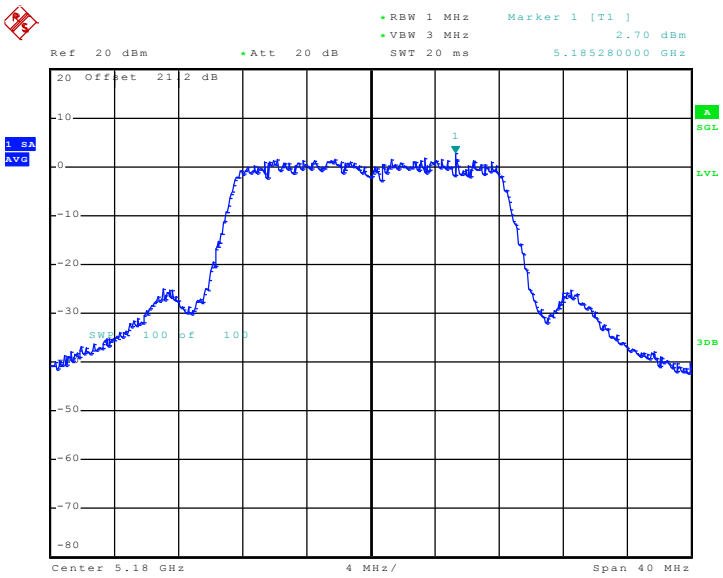
Test Mode :	Mode 7~8	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 40MHz, 2Tx) Measured PSD (dBm)			Max. Limits (dBm)	Pass/Fail
		Chain A	Chain B	Chain A+B		
38	5190	-6.69	-8.72	-4.58	4	Pass
46	5230	-6.21	-7.24	-3.68	4	Pass

Note: Chain A+B was tested by combiner, and the chain A and B was tested individually and calculated with the formula of 10*LOG (10^ (chain A/10) + 10^ (chain B/10)).

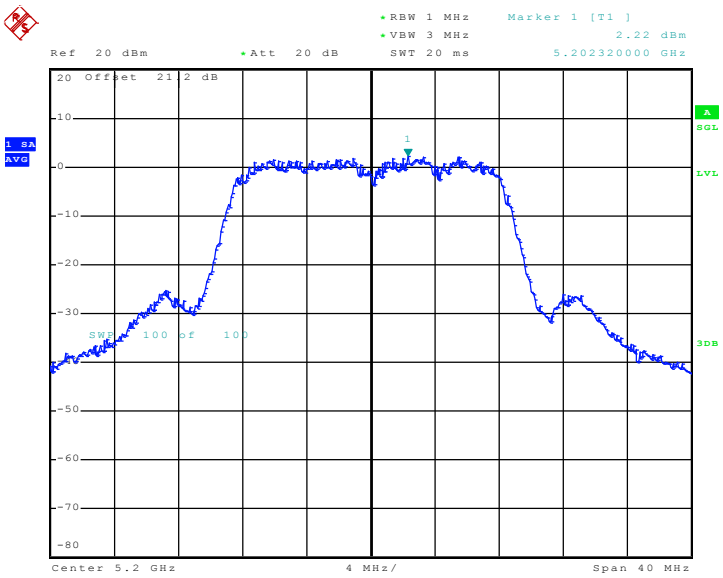
3.3.6 Test Result of Power Spectral Density Plots

Mode 01 : PSD Plot on 802.11a Channel 36 – Chain A



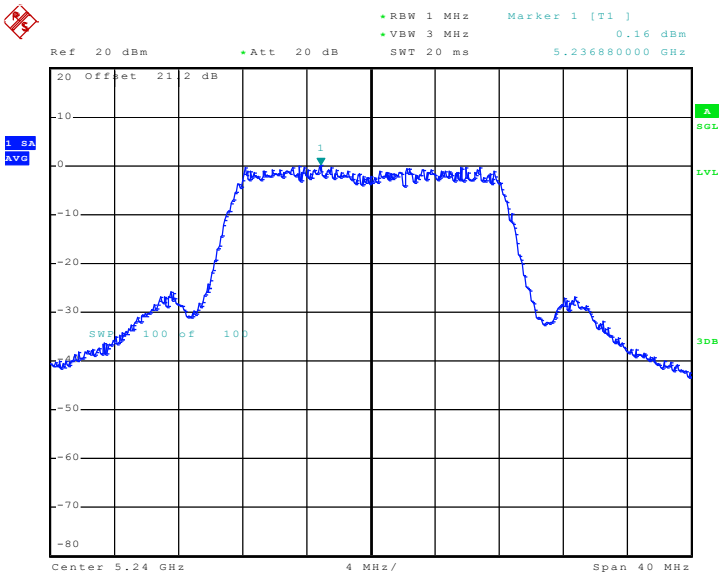
Date: 2.SEP.2010 05:25:18

Mode 02 : PSD Plot on 802.11a Channel 40 – Chain A



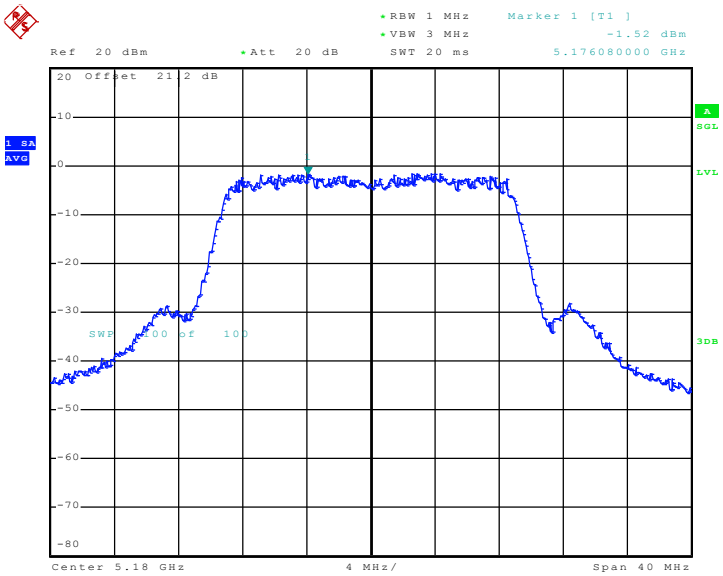
Date: 2.SEP.2010 05:26:43

Mode 03 : PSD Plot on 802.11a Channel 48 – Chain A



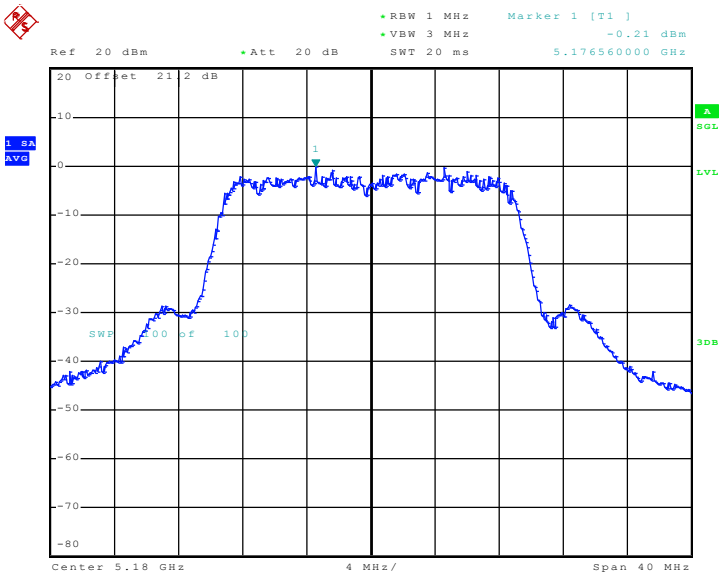
Date: 27.SEP.2010 15:53:49

Mode 4 : PSD Plot on 802.11n (BW 20MHz) Channel 36 - Chain A



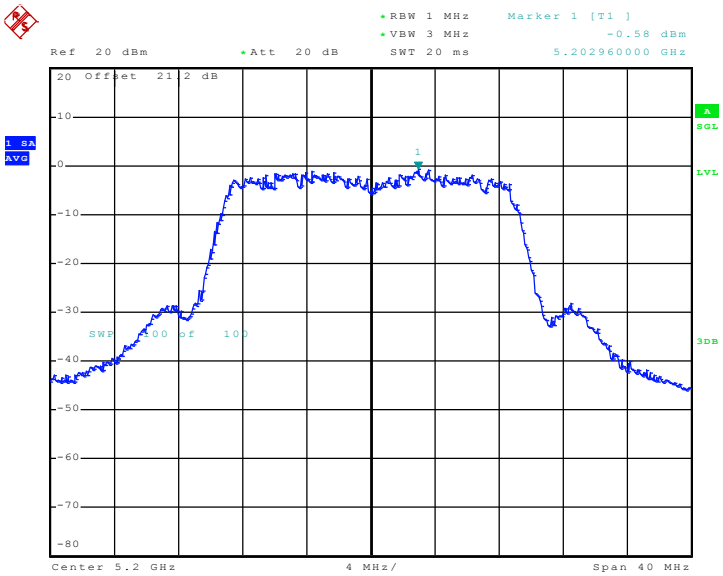
Date: 2.SEP.2010 05:40:42

Mode 4 : PSD Plot on 802.11n (BW 20MHz) Channel 36 - Chain B



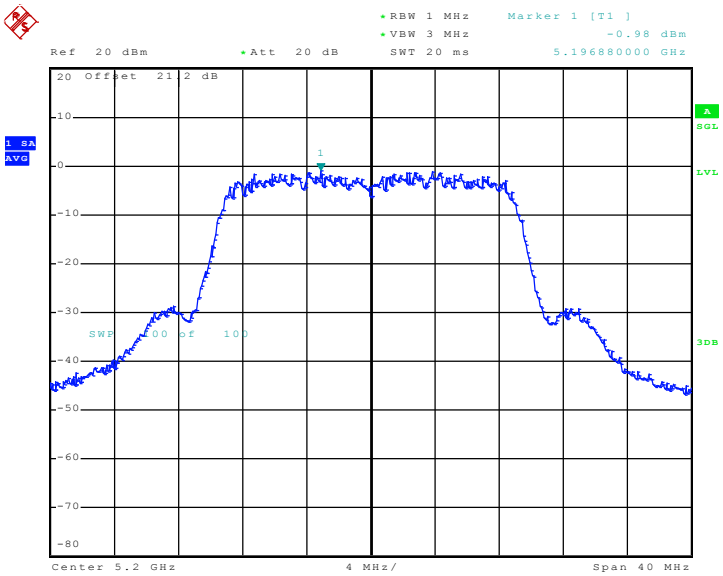
Date: 2.SEP.2010 05:38:57

Mode 5 : PSD Plot on 802.11n (BW 20MHz) Channel 40 - Chain A



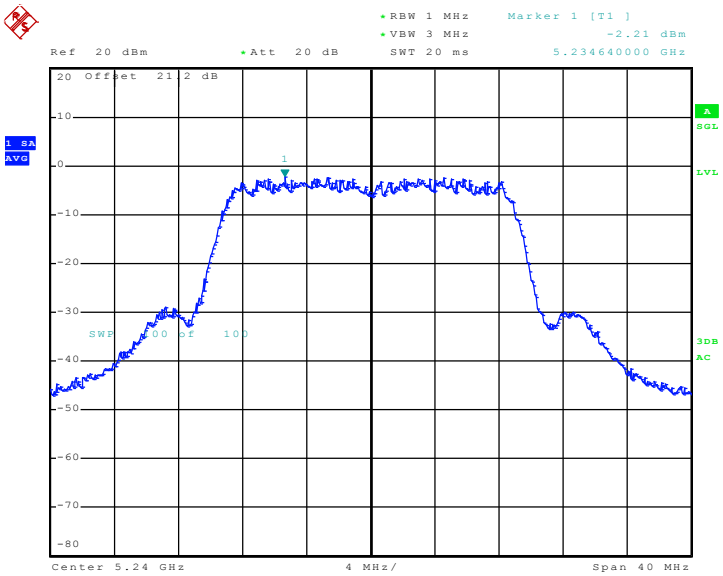
Date: 2.SEP.2010 05:41:56

Mode 5 : PSD Plot on 802.11n (BW 20MHz) Channel 40 - Chain B



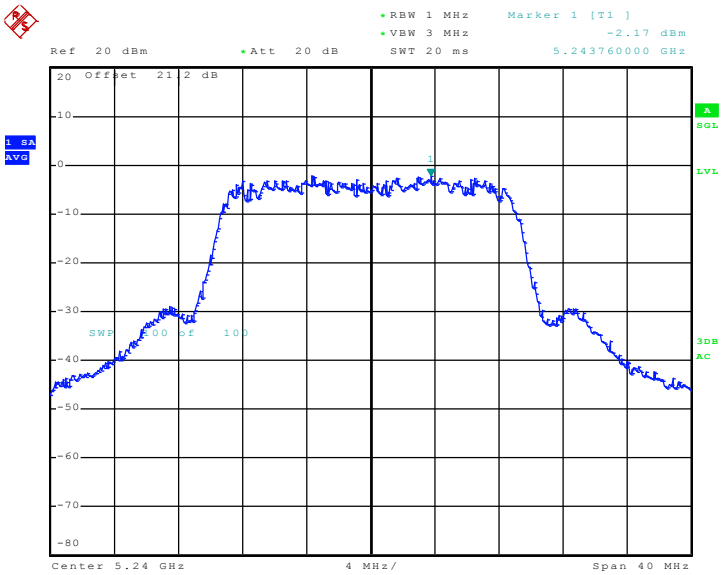
Date: 2.SEP.2010 05:42:58

Mode 6 : PSD Plot on 802.11n (BW 20MHz) Channel 48 - Chain A



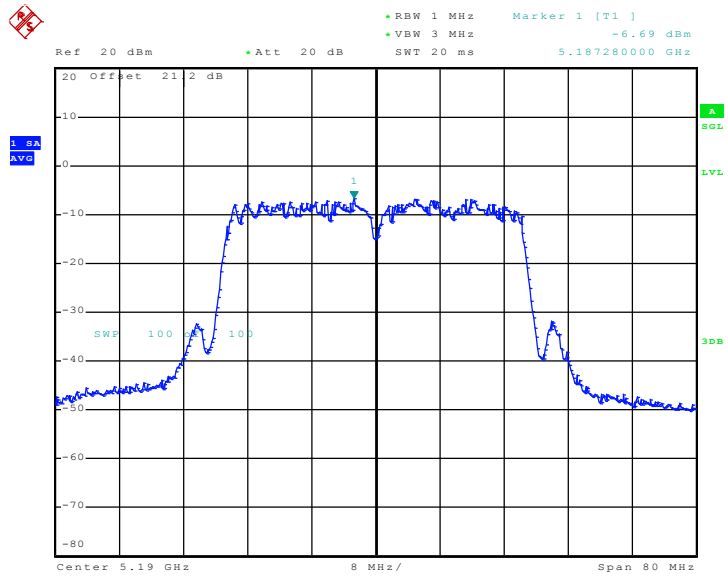
Date: 29.SEP.2010 20:59:06

Mode 6 : PSD Plot on 802.11n (BW 20MHz) Channel 48 - Chain B



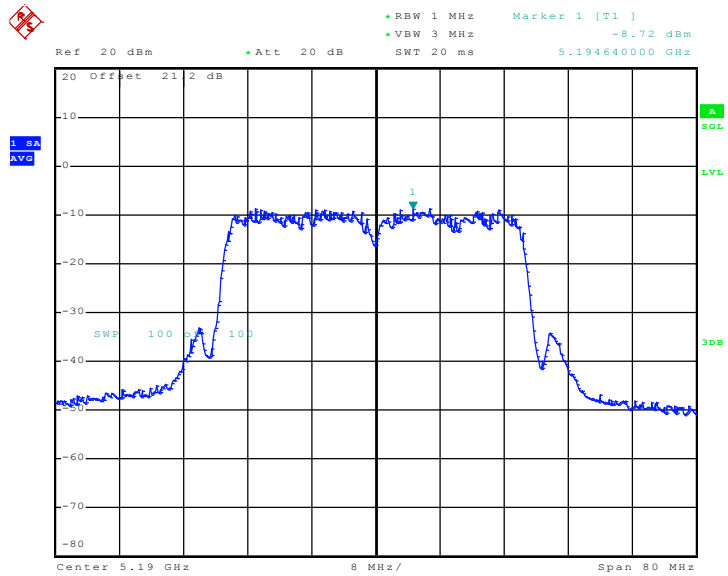
Date: 29.SEP.2010 21:01:58

Mode 7 : PSD Plot on 802.11n (BW 40MHz) Channel 38 - Chain A



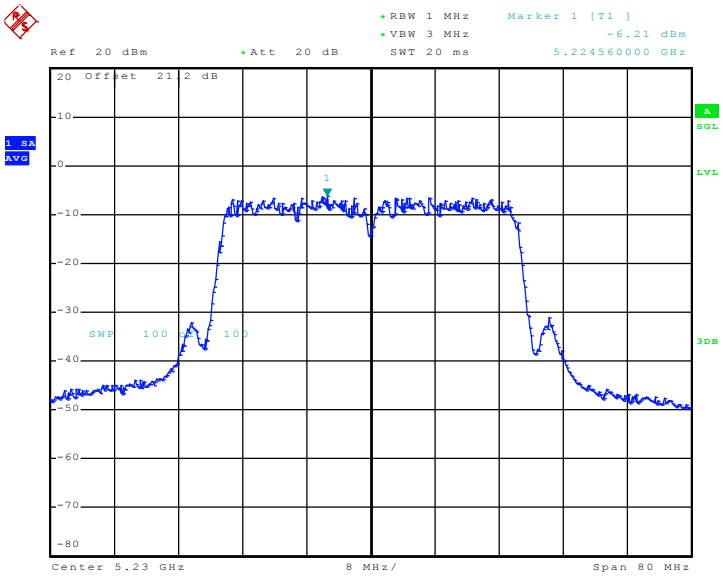
Date: 28.SEP.2010 13:15:27

Mode 7 : PSD Plot on 802.11n (BW 40MHz) Channel 38 - Chain B



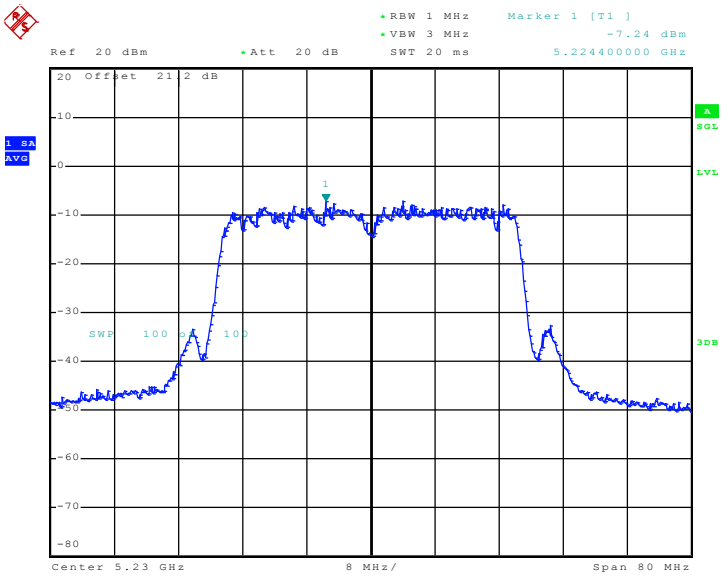
Date: 28.SEP.2010 13:16:11

Mode 8 : PSD Plot on 802.11n (BW 40MHz) Channel 46 - Chain A



Date: 28.SEP.2010 13:14:38

Mode 8 : PSD Plot on 802.11n (BW 40MHz) Channel 46 - Chain B



Date: 28.SEP.2010 13:16:51

3.4 Band Edges Measurement

3.4.1 Limit of Band Edges

(1) For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz. For transmitters operating in the 5.25–5.35 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz. Devices operating in the 5.25–5.35 GHz band that generate emissions in the 5.15–5.25 GHz band must meet all applicable technical requirements for operation in the 5.15–5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of –27 dBm/MHz in the 5.15–5.25 GHz band.

(2) The provisions of Section 15.205 Restricted bands of operation of this part apply to intentional radiators operating under this section.

3.4.2 Measuring Instruments

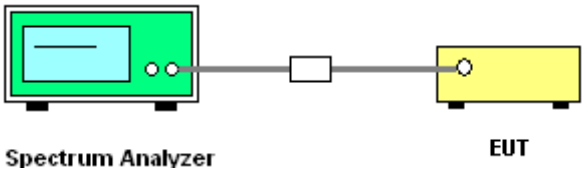
See list of measuring instruments of this test report.

3.4.3 Test Procedures

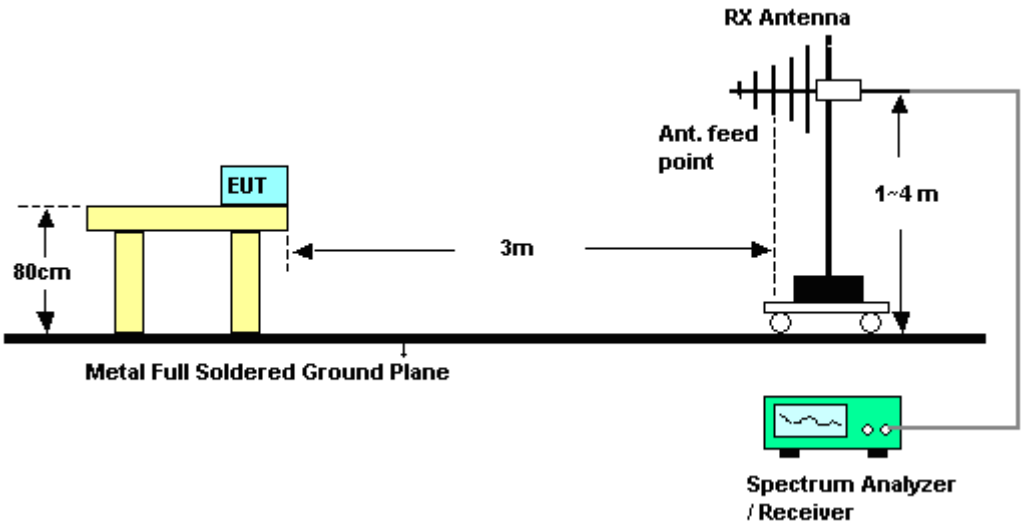
1. Set both RBW and VBW of spectrum analyzer to 1MHz with convenient frequency span including 1MHz bandwidth from band edge.
2. The band edges was measured and recorded.

3.4.4 Test Setup

<Conducted>



<Radiated>



3.4.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	24~25°C
Test Band :	802.11a	Relative Humidity :	44~45%
Test Channel :	36	Test Engineer :	David Yang

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
5150	64.01	-9.99	74	55	34.25	9.41	34.65	112	356	Peak
5150	43.41	-10.59	54	34.4	34.25	9.41	34.65	112	356	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
5150	64.9	-9.1	74	55.89	34.25	9.41	34.65	102	12	Peak
5150	47.56	-6.44	54	38.55	34.25	9.41	34.65	102	12	Average

Test Mode :	Mode 3	Temperature :	24~25°C
Test Band :	802.11a	Relative Humidity :	44~45%
Test Channel :	48	Test Engineer :	David Yang

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
5350	50.09	-23.91	74	41.3	34.45	9.74	35.4	100	352	Peak
5350	39.48	-14.52	54	30.69	34.45	9.74	35.4	100	352	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
5350	53.07	-20.93	74	44.28	34.45	9.74	35.4	126	6	Peak
5350	41.02	-12.98	54	32.23	34.45	9.74	35.4	126	6	Average

Test Mode :	Mode 4	Temperature :	24~25°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	44~45%
Test Channel :	36	Test Engineer :	David Yang

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
5150	59.53	-14.47	74	50.52	34.25	9.41	34.65	114	355	Peak
5150	41.39	-12.61	54	32.38	34.25	9.41	34.65	114	355	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
5150	58.51	-15.49	74	49.5	34.25	9.41	34.65	114	11	Peak
5150	44.19	-9.81	54	35.18	34.25	9.41	34.65	114	11	Average

Test Mode :	Mode 6	Temperature :	24~25°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	44~45%
Test Channel :	48	Test Engineer :	David Yang

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
5350	51.01	-22.99	74	42.22	34.45	9.74	35.4	143	46	Peak
5350	39.44	-14.56	54	30.65	34.45	9.74	35.4	143	46	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
5350	51.98	-22.02	74	43.19	34.45	9.74	35.4	126	8	Peak
5350	40.24	-13.76	54	31.45	34.45	9.74	35.4	126	8	Average

Test Mode :	Mode 7	Temperature :	24~25°C
Test Band :	802.11n (BW 40MHz)	Relative Humidity :	44~45%
Test Channel :	38	Test Engineer :	David Yang

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
5150	57.36	-16.64	74	48.35	34.25	9.41	34.65	100	40	Peak
5150	43.26	-10.74	54	34.25	34.25	9.41	34.65	100	40	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
5150	66.11	-7.89	74	57.1	34.25	9.41	34.65	115	349	Peak
5150	50.66	-3.34	54	41.65	34.25	9.41	34.65	115	349	Average

Test Mode :	Mode 8	Temperature :	24~25°C
Test Band :	802.11n (BW 40MHz)	Relative Humidity :	44~45%
Test Channel :	46	Test Engineer :	David Yang

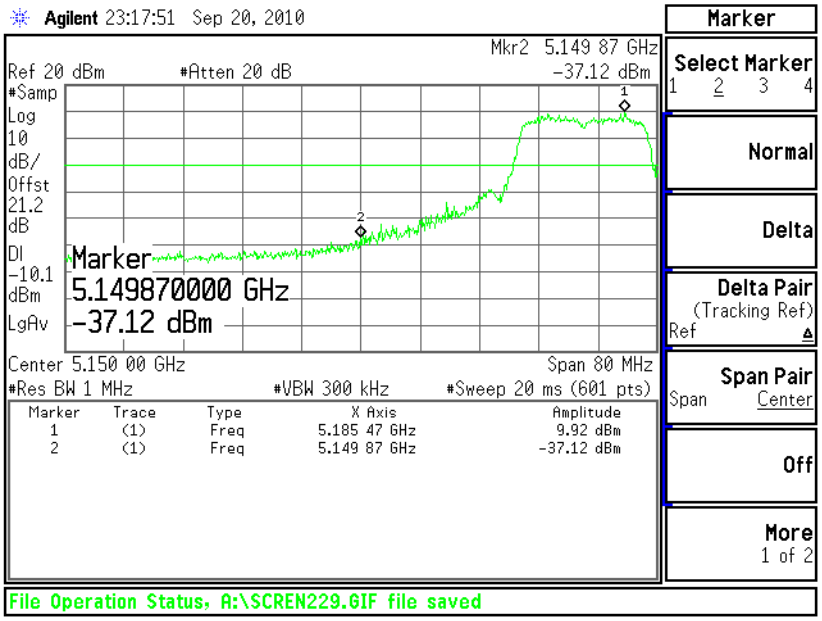
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5350	50.8	-23.2	74	42.01	34.45	9.74	35.4	100	55	Peak
5350	39.13	-14.87	54	30.34	34.45	9.74	35.4	100	55	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
5350	51.82	-22.18	74	43.03	34.45	9.74	35.4	130	350	Peak
5350	39.77	-14.23	54	30.98	34.45	9.74	35.4	130	350	Average

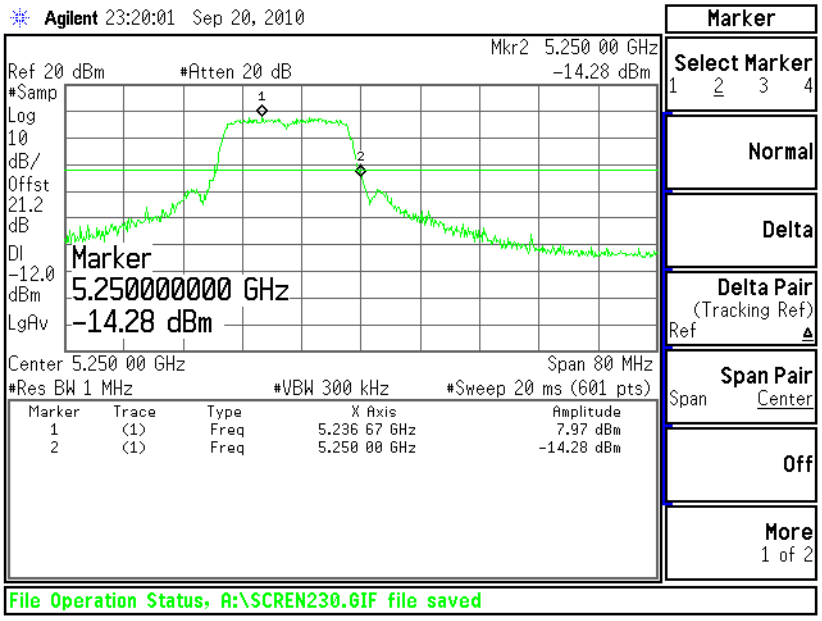
3.4.6 Test Result of Conducted Band Edges

Test Mode :	Mode 1 and Mode 3	Temperature :	25~27℃
Test Band :	802.11a	Relative Humidity :	50~53%
Test Channel :	36 and 48	Test Engineer :	Lancelot Chen

Mode 1 : Low Band Edge Plot on Channel 36 – Chain A

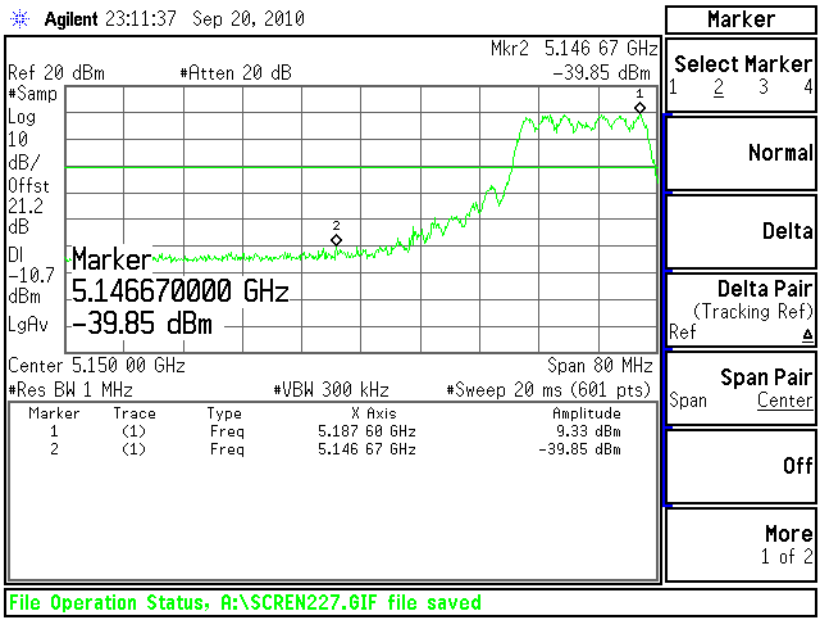


Mode 3 : High Band Edge Plot on Channel 48 – Chain A

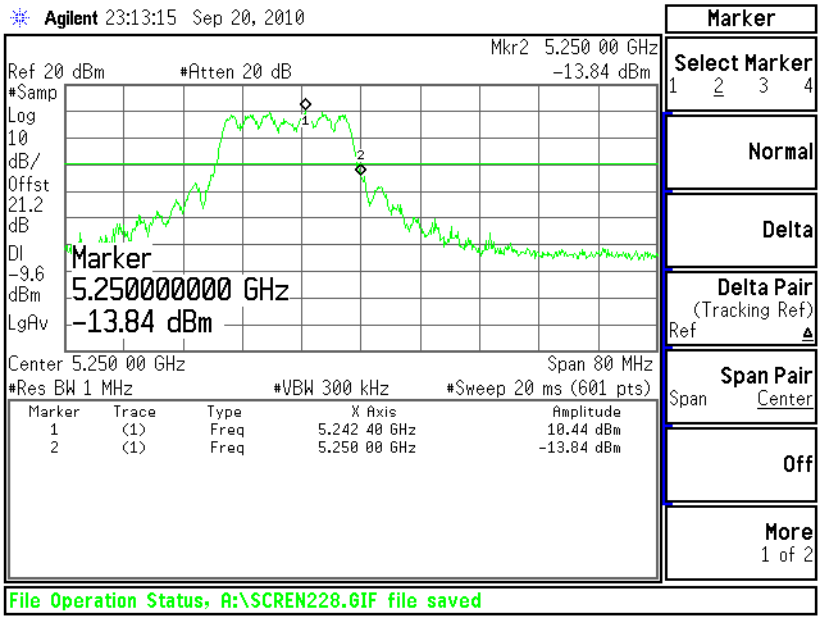


Test Mode :	Mode 4 and Mode 6	Temperature :	25~27℃
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	36 and 48	Test Engineer :	Lancelot Chen

Mode 4 : Low Band Edge Plot on Channel 36 – Chain A+B

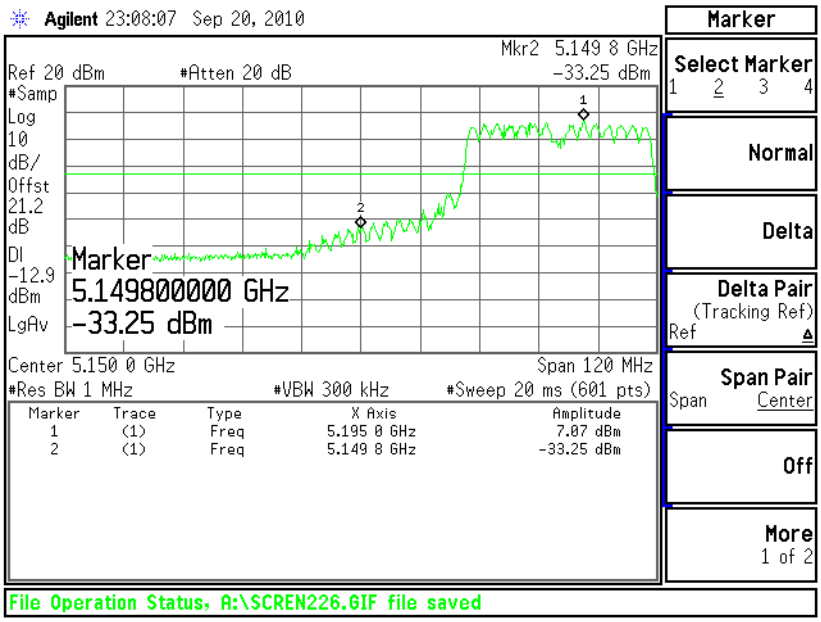


Mode 6 : High Band Edge Plot on Channel 48 – Chain A+B

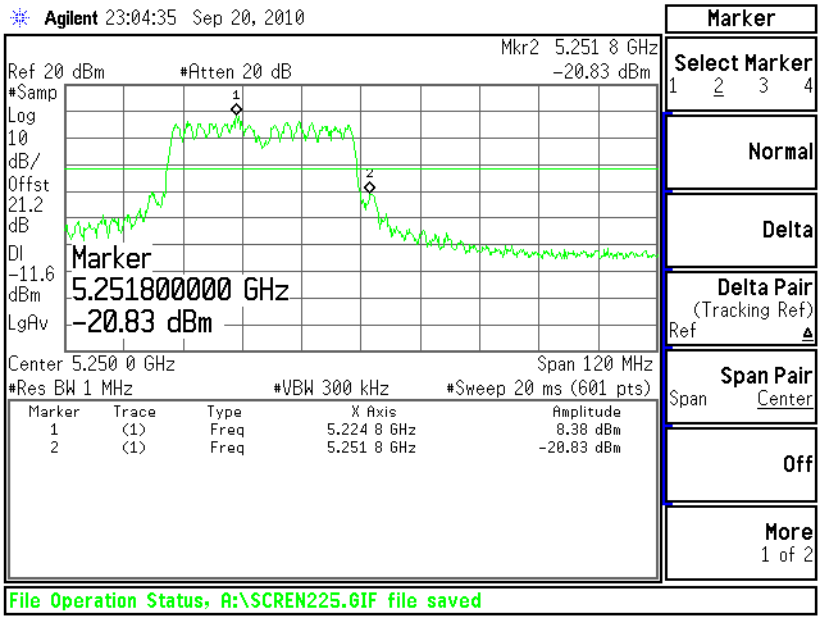


Test Mode :	Mode 7 and Mode 8	Temperature :	25~27℃
Test Band :	802.11n (BW 40MHz)	Relative Humidity :	50~53%
Test Channel :	38 and 46	Test Engineer :	Lancelot Chen

Mode 7 : Low Band Edge Plot on Channel 38 – Chain A+B



Mode 8 : High Band Edge Plot on Channel 46 – Chain A+B



3.5 Spurious Emission

3.5.1 Limit of Spurious Emission Measurement

For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz.

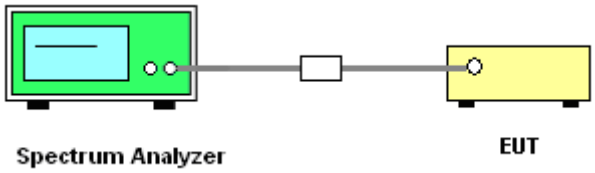
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedure

1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set RBW = VBW = 1 MHz, Video bandwidth (VBW), scan from 30 MHz to 40 GHz.

3.5.4 Test Setup



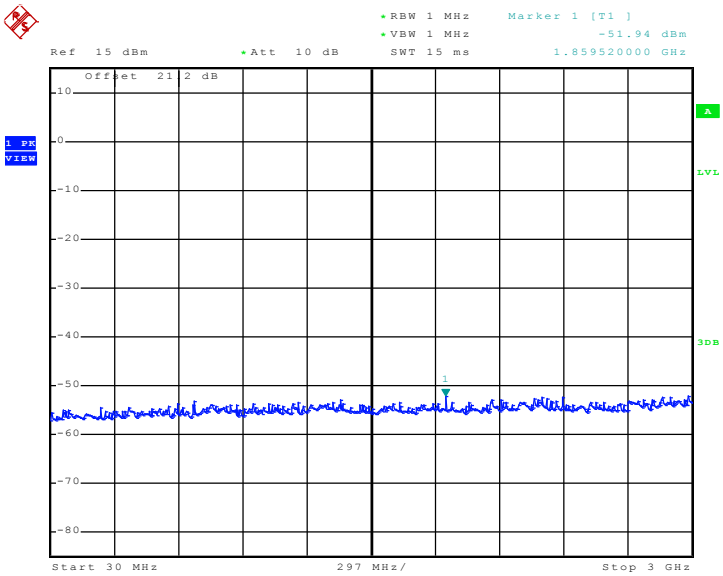
3.5.5 Test Result

Test Mode :	Mode 1~3	Temperature :	25~27℃
Test Band :	802.11a	Relative Humidity :	50~53%
Test Channel :	36, 40, 48	Test Engineer :	Lancelot Chen

Channel	Frequency (MHz)	Chain	Frequency (MHz)	Level (dBm)	Antenna Gain (dBi)	EIRP Test Result (dBm)	Limit (dBm)
36	5180	A	1859.52	-51.94	6	-45.94	-27
			5332	-39.23	6	-33.23	
			40000	-34.43	6	-28.43	
40	5200	A	2833.68	-51.94	6	-45.94	-27
			5353.2	-38.45	6	-32.45	
			40000	-34.91	6	-28.91	
48	5240	A	2982.18	-51.89	6	-45.89	-27
			5395.6	-37.8	6	-31.8	
			40000	-35.06	6	-29.06	

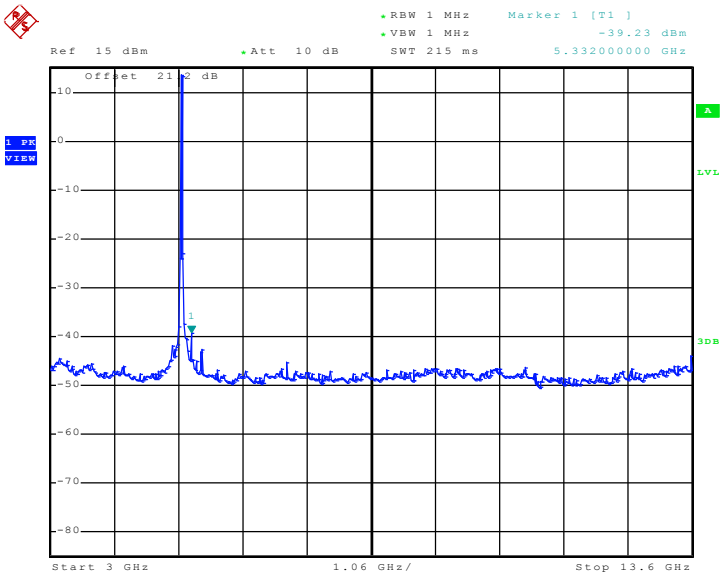
Mode 1 : Conducted Spurious Emission Plot between

30 MHz ~ 3 GHz - Chain A



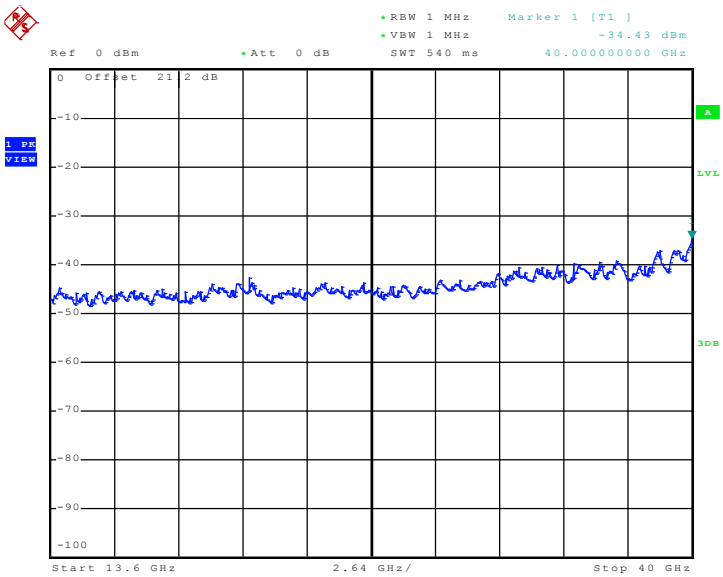
Date: 28.SEP.2010 13:32:35

Mode 1 : Conducted Spurious Emission Plot between 3 GHz ~ 13.6 GHz - Chain A



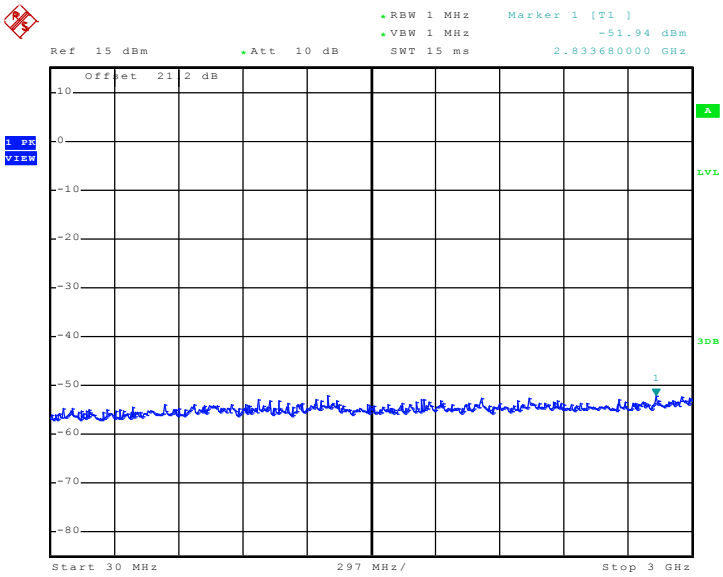
Date: 28.SEP.2010 13:38:42

Mode 1 : Conducted Spurious Emission Plot between 13.6 GHz ~ 40 GHz - Chain A



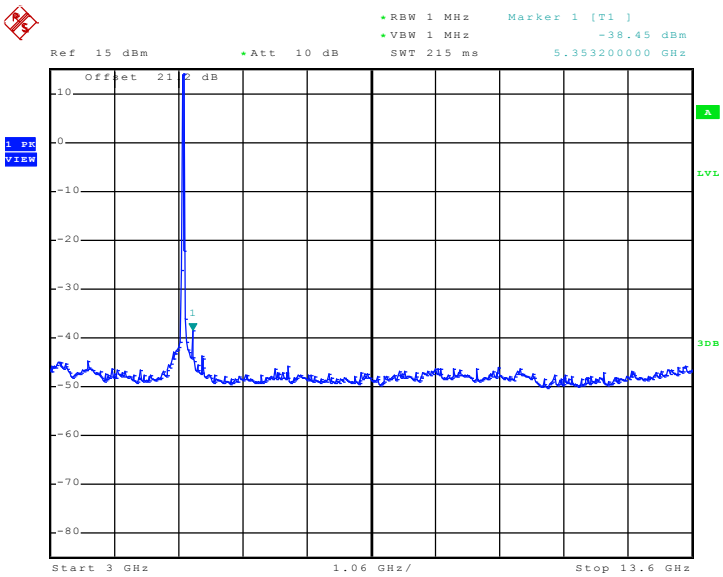
Date: 28.SEP.2010 13:33:00

Mode 2 : Conducted Spurious Emission Plot between 30 MHz ~ 3 GHz - Chain A



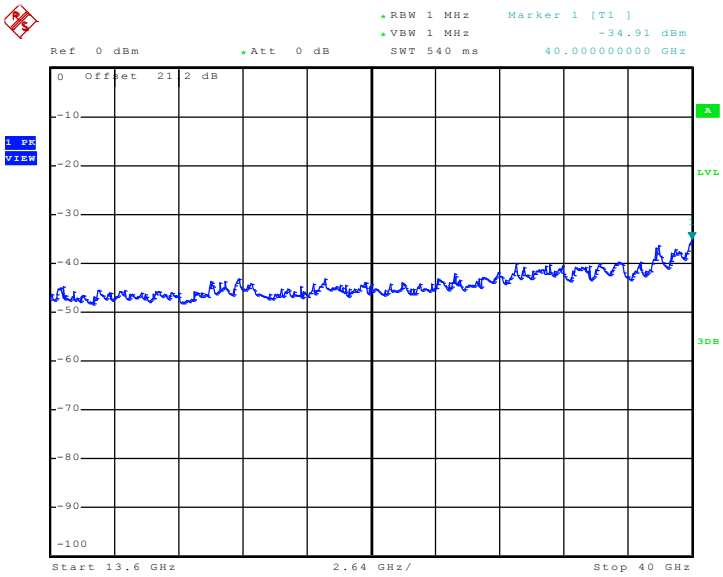
Date: 28.SEP.2010 13:31:28

Mode 2 : Conducted Spurious Emission Plot between 3 GHz ~ 13.6 GHz - Chain A



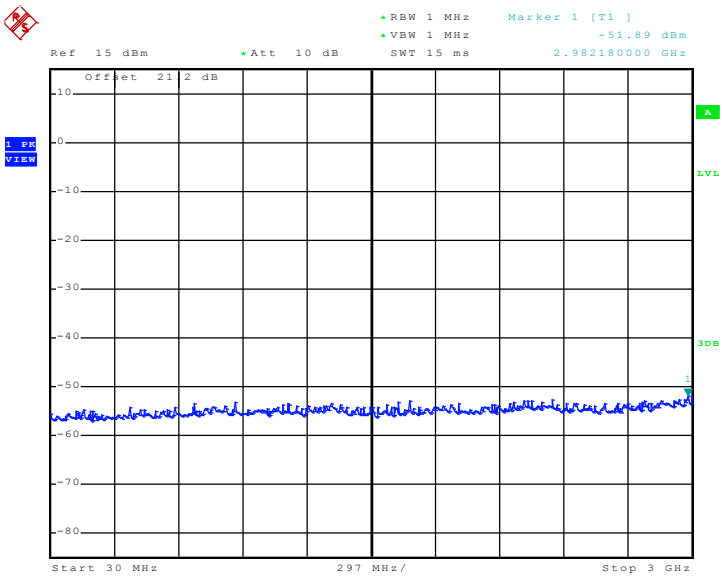
Date: 28.SEP.2010 13:31:40

Mode 2 : Conducted Spurious Emission Plot between 13.6 GHz ~ 40 GHz - Chain A



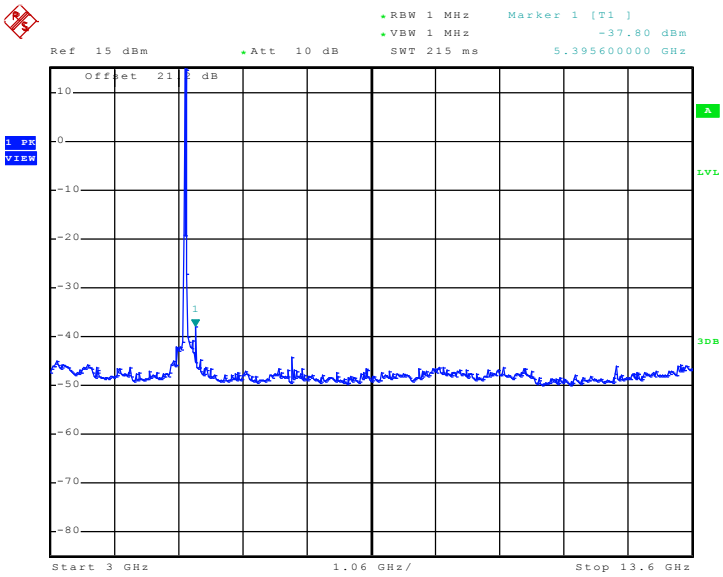
Date: 28.SEP.2010 13:31:53

Mode 3 : Conducted Spurious Emission Plot between 30 MHz ~ 3 GHz - Chain A



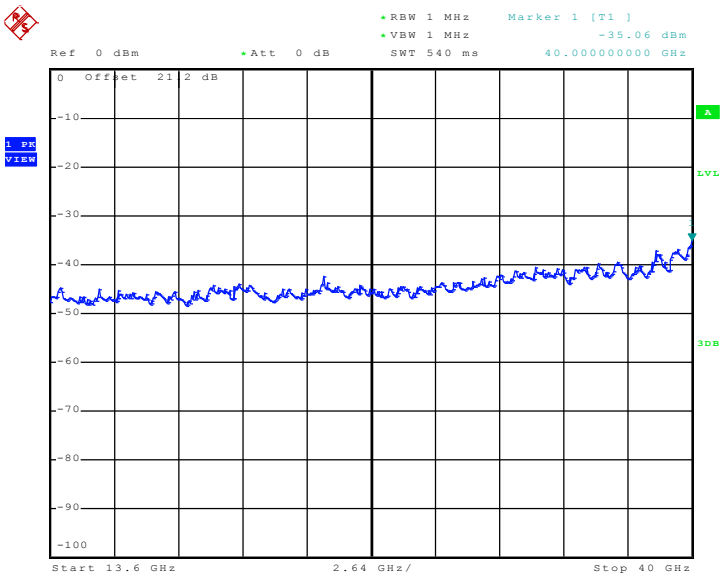
Date: 28.SEP.2010 13:30:22

Mode 3 : Conducted Spurious Emission Plot between 3 GHz ~ 13.6 GHz - Chain A



Date: 28.SEP.2010 13:30:34

Mode 3 : Conducted Spurious Emission Plot between 13.6 GHz ~ 40 GHz - Chain A



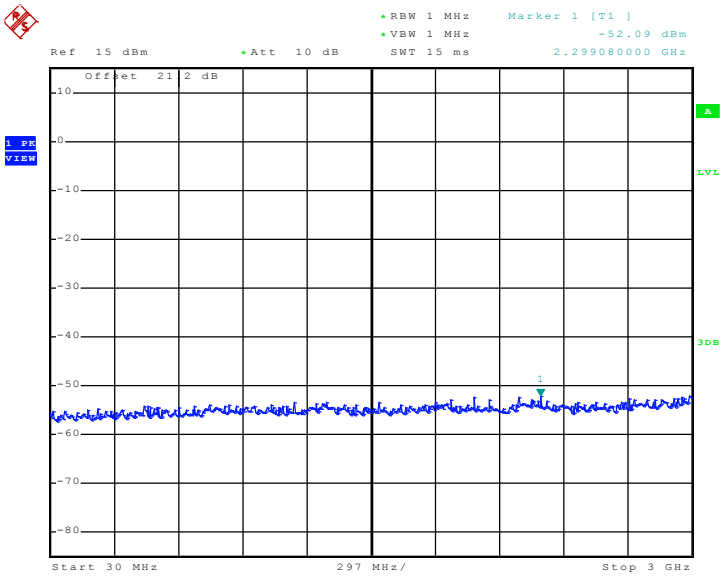
Date: 28.SEP.2010 13:30:47

Test Mode :	Mode 4~6	Temperature :	25~27℃
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	36, 40, 48	Test Engineer :	Lancelot Chen

Channel	Frequency (MHz)	Chain	Frequency (MHz)	Level (dBm)	Antenna Gain (dBi)	EIRP Test Result (dBm)	Limit (dBm)
36	5180	A+B	2299.08	-52.09	6	-46.09	-27
			5332	-37.56	6	-31.56	
			40000	-33.69	6	-27.69	
40	5200	A+B	2952.48	-51.73	6	-45.73	-27
			5332	-38.73	6	-32.73	
			40000	-35.07	6	-29.07	
48	5240	A+B	3000	-51.74	6	-45.74	-27
			5395.6	-39.46	6	-33.46	
			40000	-34.62	6	-28.62	

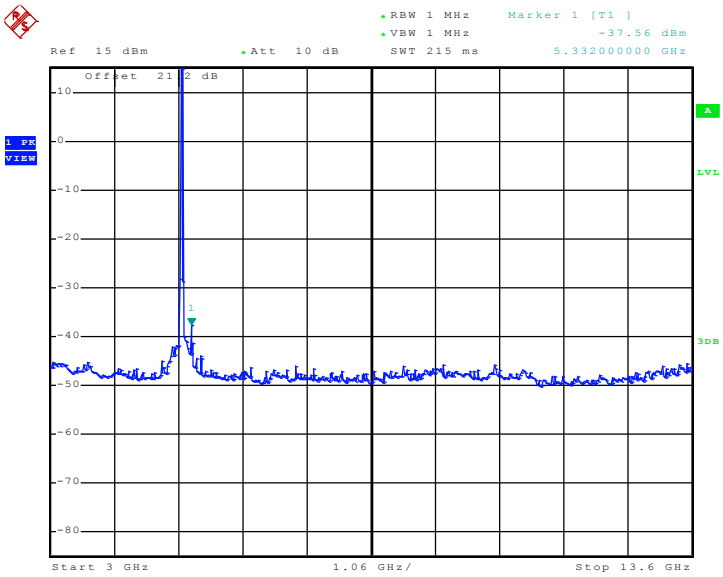
Mode 4 : Conducted Spurious Emission Plot between

30 MHz ~ 3 GHz - Chain A+B



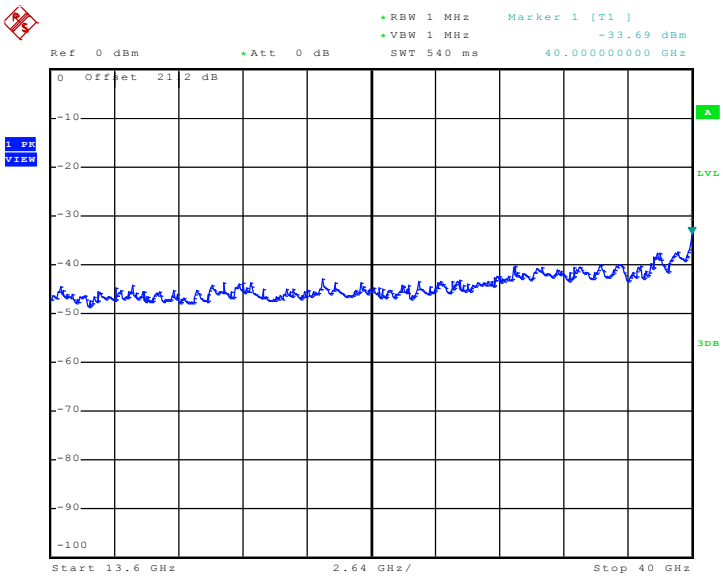
Date: 28.SEP.2010 12:43:29

Mode 4 : Conducted Spurious Emission Plot between 3 GHz ~ 13.6 GHz - Chain A+B



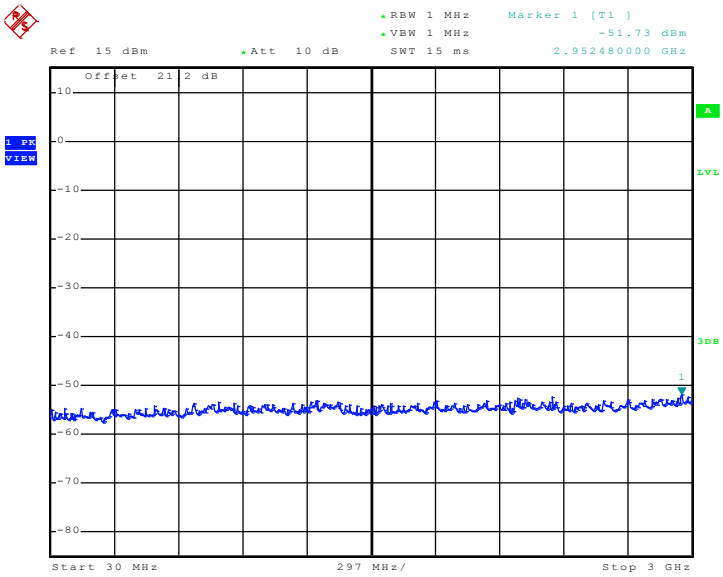
Date: 28.SEP.2010 12:43:41

Mode 4 : Conducted Spurious Emission Plot between 13.6 GHz ~ 40 GHz - Chain A+B



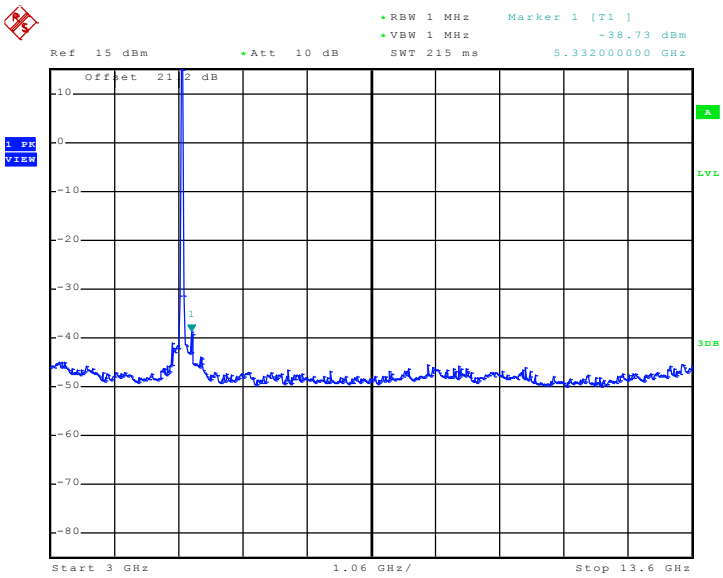
Date: 28.SEP.2010 12:43:54

Mode 5 : Conducted Spurious Emission Plot between 30 MHz ~ 3 GHz - Chain A+B



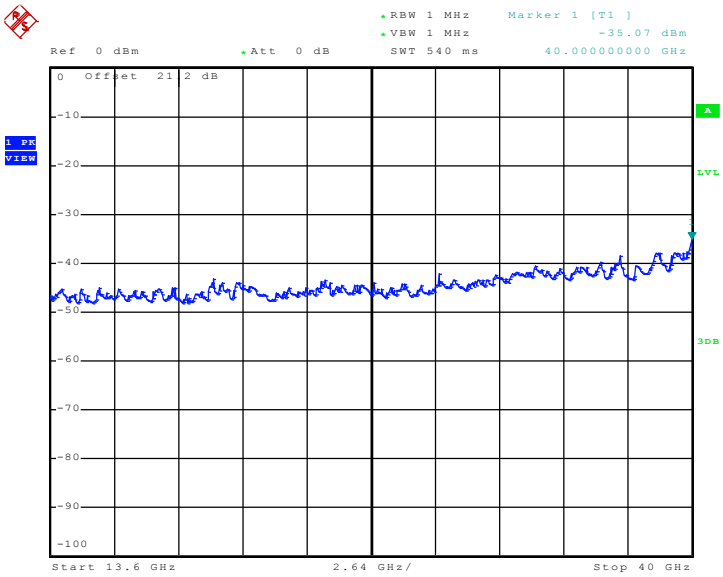
Date: 28.SEP.2010 12:44:07

Mode 5 : Conducted Spurious Emission Plot between 3 GHz ~ 13.6 GHz - Chain A+B



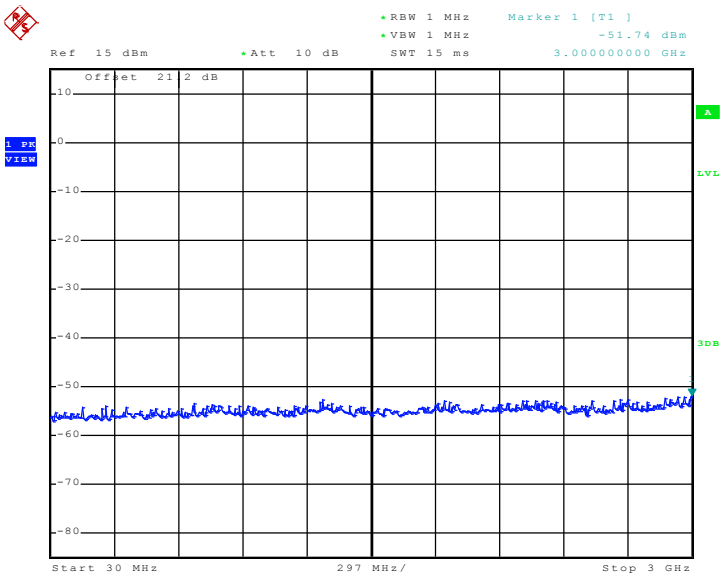
Date: 28.SEP.2010 12:44:19

Mode 5 : Conducted Spurious Emission Plot between 13.6 GHz ~ 40 GHz - Chain A+B



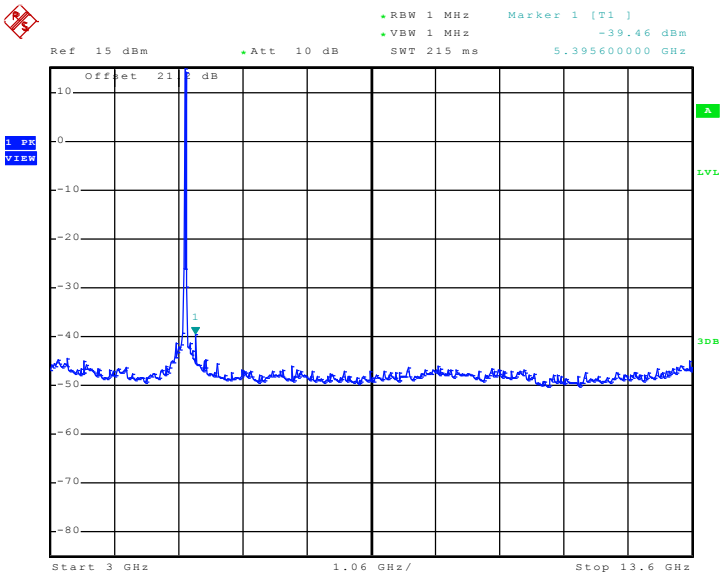
Date: 28.SEP.2010 12:44:31

Mode 6 : Conducted Spurious Emission Plot between 30 MHz ~ 3 GHz - Chain A+B



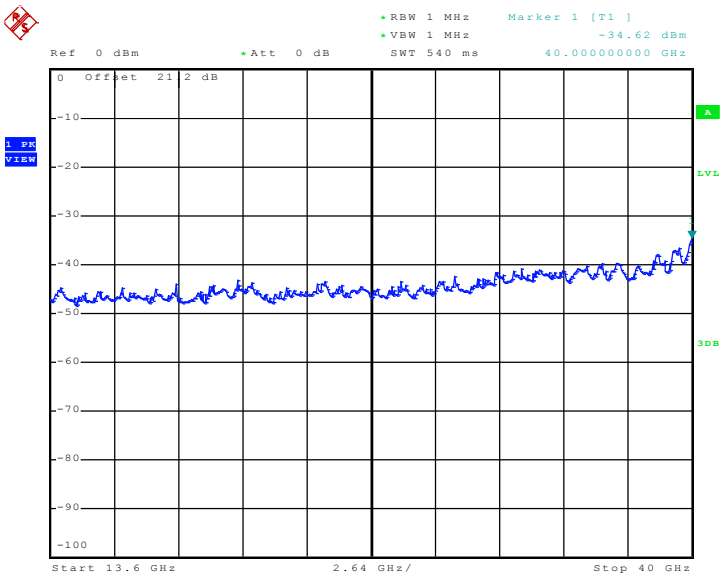
Date: 28.SEP.2010 12:45:05

Mode 6 : Conducted Spurious Emission Plot between 3 GHz ~ 13.6 GHz - Chain A+B



Date: 28.SEP.2010 12:45:18

Mode 6 : Conducted Spurious Emission Plot between 13.6 GHz ~ 40 GHz - Chain A+B

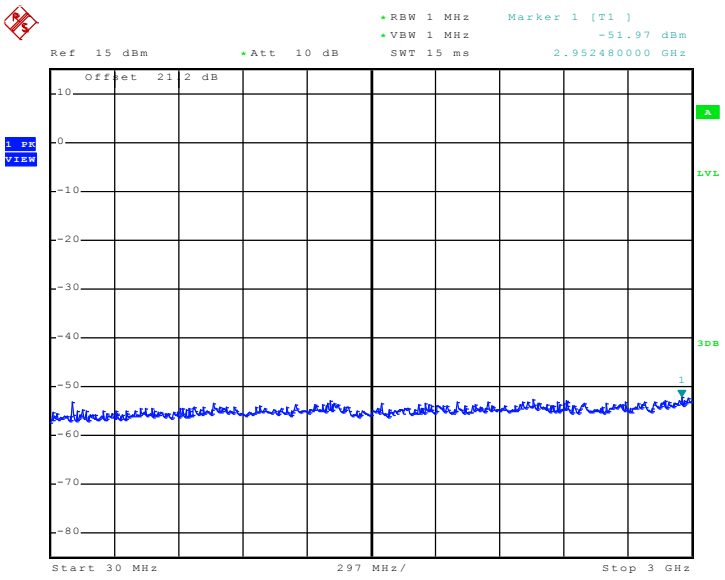


Date: 28.SEP.2010 12:45:30

Test Mode :	Mode 7~8	Temperature :	25~27℃
Test Band :	802.11n (BW 40MHz)	Relative Humidity :	50~53%
Test Channel :	38, 46	Test Engineer :	Lancelot Chen

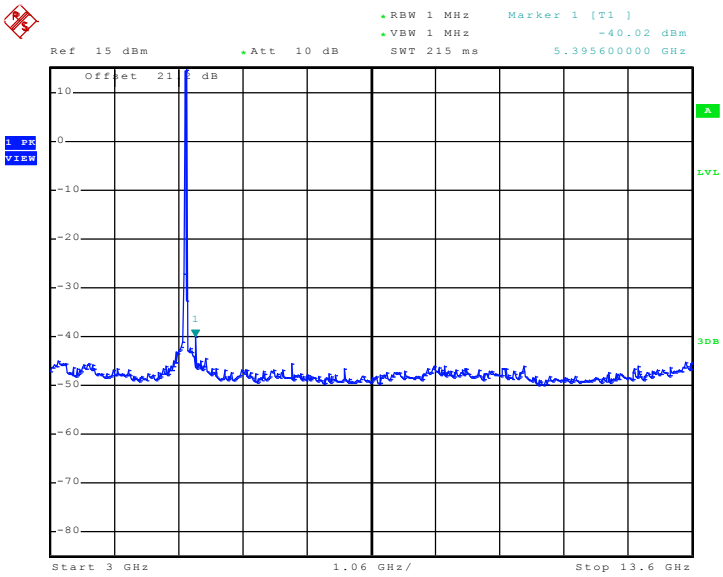
Channel	Frequency (MHz)	Chain	Frequency (MHz)	Level (dBm)	Antenna Gain (dBi)	EIRP Test Result (dBm)	Limit (dBm)
38	5190	A+B	2952.48	-51.97	6	-45.97	-27
			5395.6	-40.02	6	-34.02	
			40000	-35.22	6	-29.22	
46	5230	A+B	2251.56	-52.15	6	-46.15	-27
			5395.6	-39.44	6	-33.44	
			40000	-34.56	6	-28.56	

Mode 7 : Conducted Spurious Emission Plot between 30 MHz ~ 3 GHz - Chain A+B



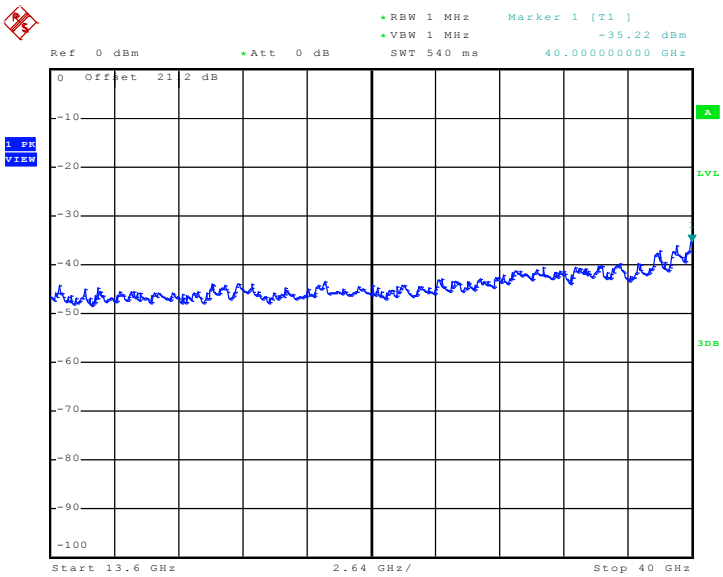
Date: 28.SEP.2010 12:51:23

Mode 7 : Conducted Spurious Emission Plot between 3 GHz ~ 13.6 GHz - Chain A+B



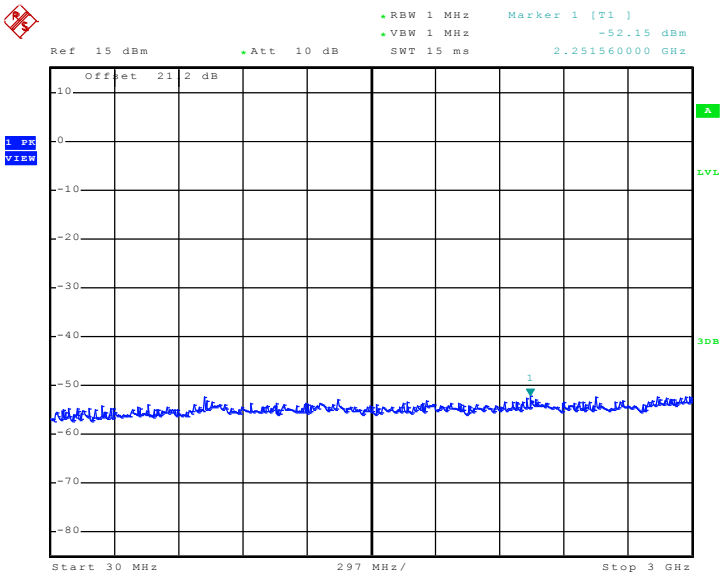
Date: 28.SEP.2010 12:51:35

Mode 7 : Conducted Spurious Emission Plot between 13.6 GHz ~ 40 GHz - Chain A+B



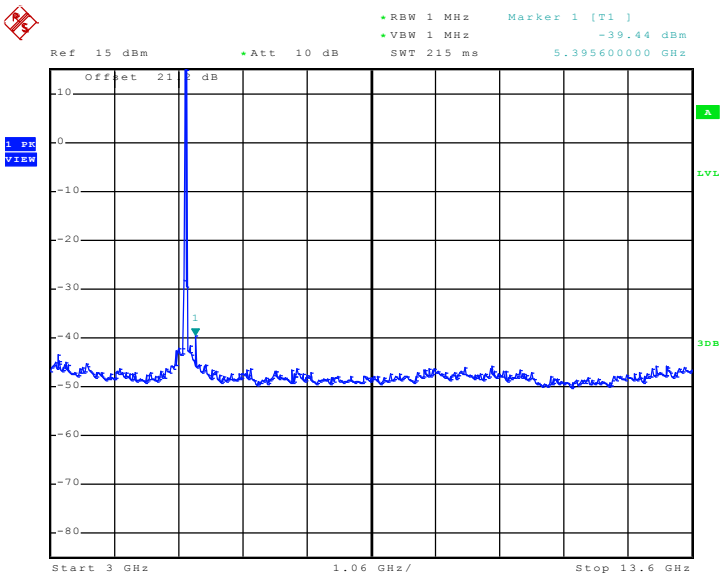
Date: 28.SEP.2010 12:51:48

Mode 8 : Conducted Spurious Emission Plot between 30 MHz ~ 3 GHz - Chain A+B



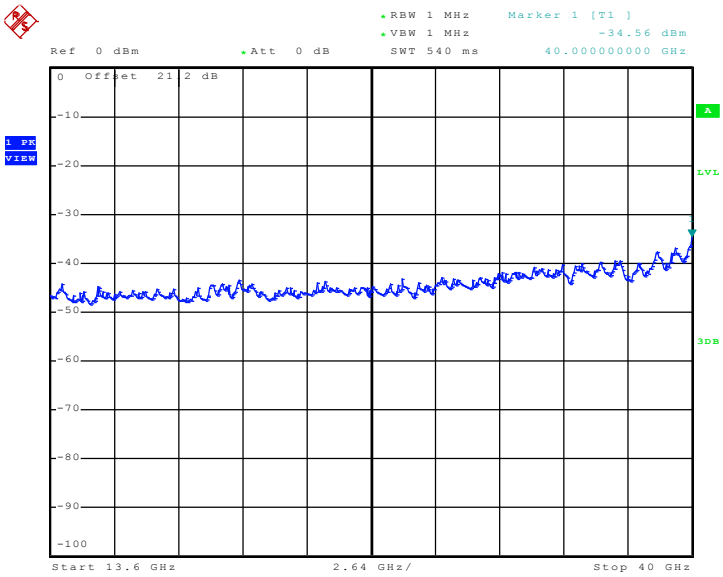
Date: 28.SEP.2010 12:52:35

Mode 8 : Conducted Spurious Emission Plot between 3 GHz ~ 13.6 GHz - Chain A+B



Date: 28.SEP.2010 12:52:48

Mode 8 : Conducted Spurious Emission Plot between 13.6 GHz ~ 40 GHz - Chain A+B



Date: 28.SEP.2010 12:53:00

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.

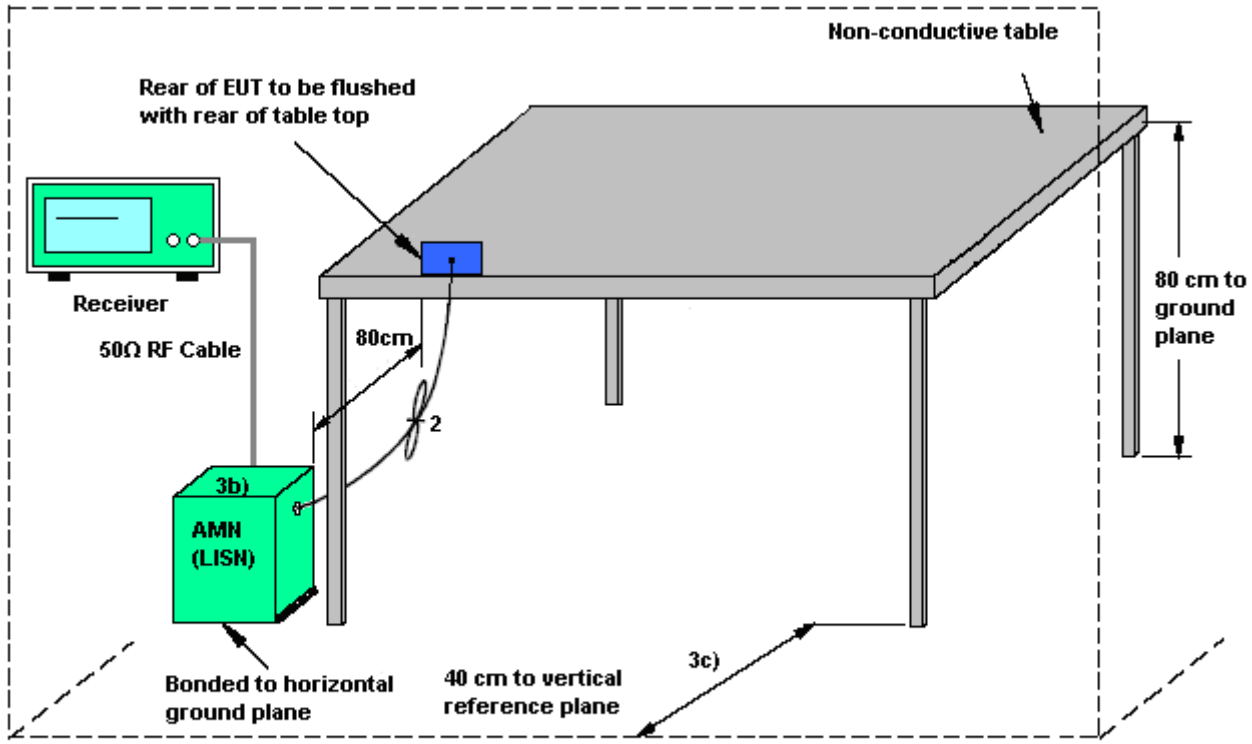
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

1. Please follow the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room 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.

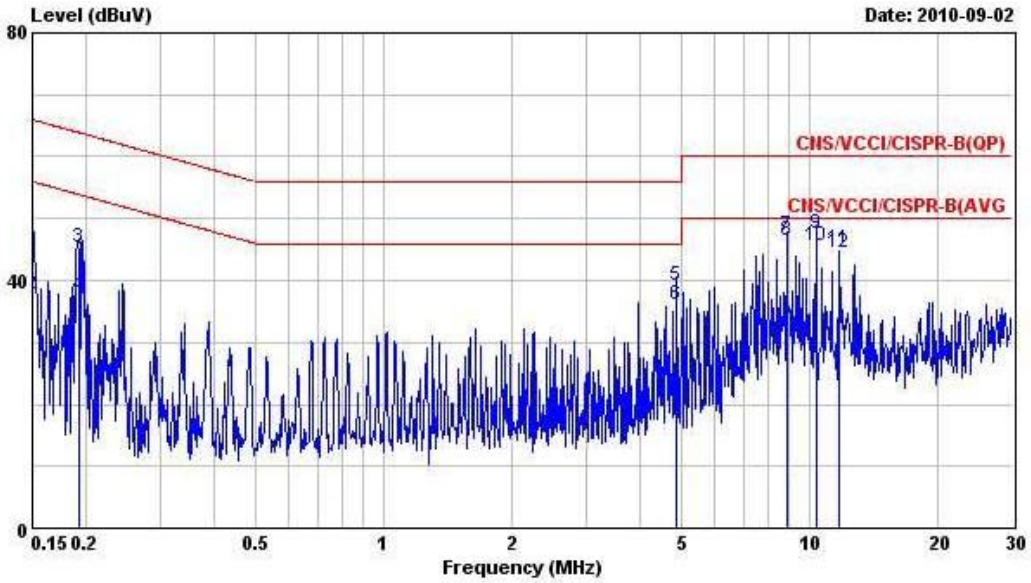
3.6.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.6.5 Test Result of AC Conducted Emission

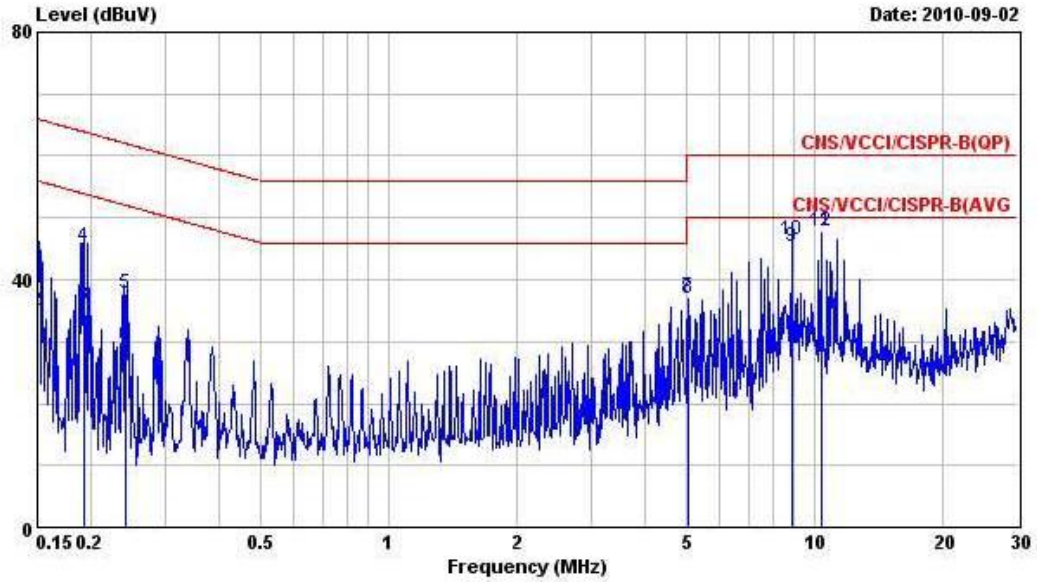
Test Mode :	Mode 1	Temperature :	25℃
Test Engineer :	Novic Jiang	Relative Humidity :	63%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (5G) Link + POE		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : LK_CO01
Condition : LISN_98087_20091008 LINE
Project : FR082617
Mode : Mode 1
Temp : 25 C
Humidity : 63 %

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.150	46.45	-19.55	66.00	46.24	0.17	0.04	QP
2	0.150	37.69	-18.31	56.00	37.48	0.17	0.04	Average
3	0.193	45.45	-18.46	63.91	45.28	0.16	0.01	QP
4	0.193	37.34	-16.57	53.91	37.17	0.16	0.01	Average
5	4.897	39.14	-16.86	56.00	38.65	0.30	0.19	QP
6	4.897	36.09	-9.91	46.00	35.60	0.30	0.19	Average
7	8.873	47.22	-12.78	60.00	46.51	0.46	0.25	QP
8 @	8.873	46.43	-3.57	50.00	45.72	0.46	0.25	Average
9	10.401	47.48	-12.52	60.00	46.70	0.52	0.26	QP
10	10.401	45.53	-4.47	50.00	44.75	0.52	0.26	Average
11	11.780	45.02	-14.98	60.00	44.16	0.58	0.28	QP
12	11.780	44.41	-5.59	50.00	43.55	0.58	0.28	Average

Test Mode :	Mode 1	Temperature :	25℃
Test Engineer :	Novic Jiang	Relative Humidity :	63%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN (5G) Link + POE		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : LK_CO01
Condition : LISN_98087_20091008 NEUTRAL
Project : FR082617
Mode : Mode 1
Temp : 25 C
Humidity : 63 %

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.150	43.73	-22.27	66.00	43.46	0.23	0.04	QP
2	0.150	34.87	-21.13	56.00	34.60	0.23	0.04	Average
3	0.193	35.91	-18.00	53.91	35.68	0.22	0.01	Average
4	0.193	45.24	-18.67	63.91	45.01	0.22	0.01	QP
5	0.241	37.84	-24.21	62.05	37.60	0.22	0.02	QP
6	0.241	29.29	-22.76	52.05	29.05	0.22	0.02	Average
7	5.048	37.12	-22.88	60.00	36.58	0.35	0.19	QP
8	5.048	36.97	-13.03	50.00	36.43	0.35	0.19	Average
9	8.870	45.36	-4.64	50.00	44.63	0.48	0.25	Average
10	8.870	46.44	-13.56	60.00	45.71	0.48	0.25	QP
11	10.400	47.78	-12.22	60.00	46.98	0.54	0.26	QP
12 @	10.402	47.69	-2.31	50.00	46.89	0.54	0.26	Average

3.7 Radiated Emission Measurement

3.7.1 Limit of Radiated Emission

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209.

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

(1) For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz.

(2) For transmitters operating in the 5.25–5.35 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz. Devices operating in the 5.25–5.35 GHz band that generate emissions in the 5.15–5.25 GHz band must meet all applicable technical requirements for operation in the 5.15–5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of –27 dBm/MHz in the 5.15–5.25 GHz band.

(3) For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.

(4) The provisions of Section 15.205 Restricted bands of operation of this part apply to intentional radiators operating under this section.

3.7.2 Measuring Instruments

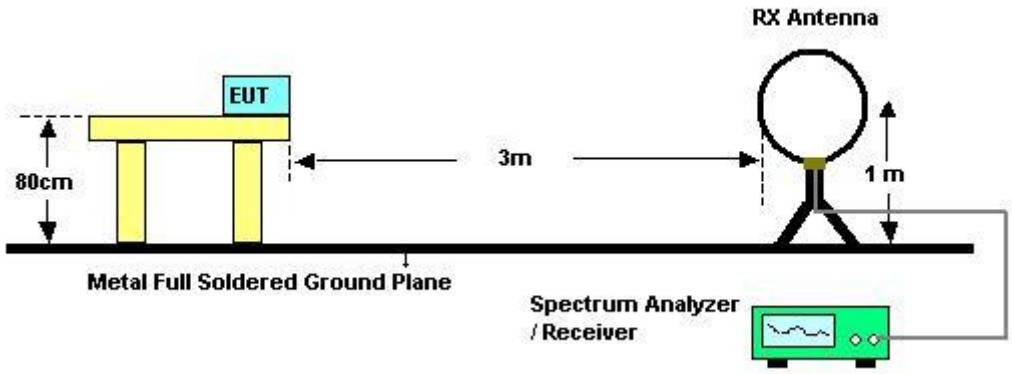
See list of measuring instruments of this test report.

3.7.3 Test Procedures

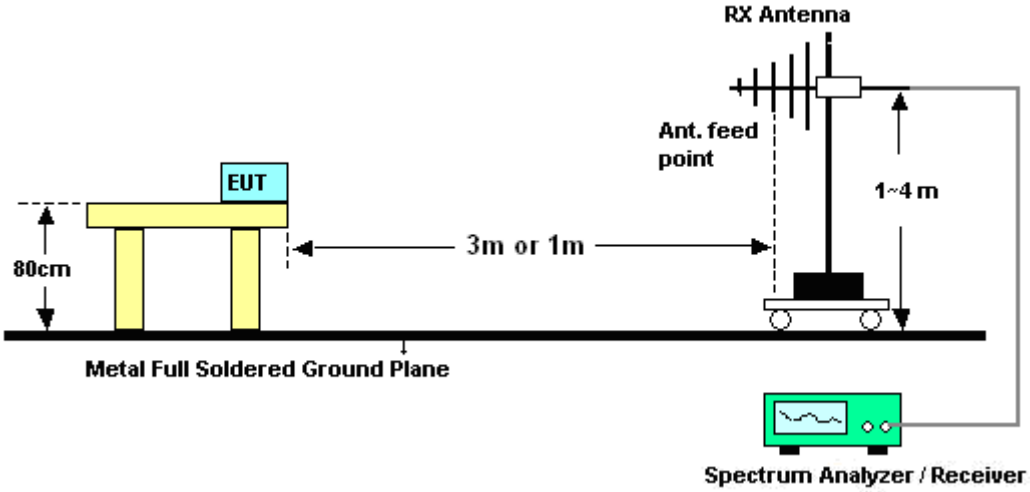
1. The testing follows the guidelines in FCC Public Notice DA 02-2138, (Measurement Guidelines of UNII)
2. The EUT was placed on a rotatable table top 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest radiation.
5. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
6. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
7. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
8. For testing below 1GHz, If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported.
9. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.7.4 Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz



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

Temperature	24~25°C	Humidity	44~45%
Test Engineer	David Yang		

Freq. (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 (specific distance / test distance) (dB);

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

3.7.7 Test Result of Radiated Emission (30MHz ~ 25GHz)

Test Mode :	Mode 1	Temperature :	24~25°C
Test Channel :	36	Relative Humidity :	44~45%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	5180 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
43.23	36.64	-3.36	40	55.95	11.55	0.64	31.5	100	134	Peak
83.73	35.86	-4.14	40	58.54	7.96	0.9	31.54	-	-	Peak
250.05	37.58	-8.42	46	54.69	12.77	1.53	31.41	-	-	Peak
407.8	37.18	-8.82	46	49.91	16.27	2.17	31.17	-	-	Peak
478.5	31.18	-14.82	46	42.15	17.72	2.37	31.06	-	-	Peak
900.6	34.36	-11.64	46	38.53	23.19	3.34	30.7	-	-	Peak
5150	43.41	-10.59	54	34.4	34.25	9.41	34.65	112	356	Average
5150	64.01	-9.99	74	55	34.25	9.41	34.65	112	356	Peak
5180	93.25	-	-	84.29	34.28	9.45	34.77	112	356	Average
5180	103.52	-	-	94.56	34.28	9.45	34.77	112	356	Peak
5350	50.11	-23.89	74	41.32	34.45	9.74	35.4	112	356	Peak
5350	39.02	-14.98	54	30.23	34.45	9.74	35.4	112	356	Average
8238	54.88	-19.12	74	42.53	35.55	10.91	34.11	124	138	Peak
8238	41.01	-12.99	54	28.66	35.55	10.91	34.11	124	138	Average

Test Mode :	Mode 1	Temperature :	24~25°C
Test Channel :	36	Relative Humidity :	44~45%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	5180 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
43.23	36.48	-3.52	40	55.79	11.55	0.64	31.5	103	151	Peak
83.46	32.37	-7.63	40	55.05	7.96	0.9	31.54	-	-	Peak
139.89	31.18	-12.32	43.5	49.83	11.7	1.2	31.55	-	-	Peak
316.1	28.9	-17.1	46	44.52	13.9	1.8	31.32	-	-	Peak
575.8	25.45	-20.55	46	34.17	19.61	2.62	30.95	-	-	Peak
785.8	33.68	-12.32	46	39.23	22.02	3.12	30.69	-	-	Peak
5150	47.56	-6.44	54	38.55	34.25	9.41	34.65	102	12	Average
5150	64.9	-9.1	74	55.89	34.25	9.41	34.65	102	12	Peak
5180	99.7	-	-	90.74	34.28	9.45	34.77	102	12	Average
5180	110.41	-	-	101.45	34.28	9.45	34.77	102	12	Peak
5350	50.75	-23.25	74	41.96	34.45	9.74	35.4	102	12	Peak
5350	39.68	-14.32	54	30.89	34.45	9.74	35.4	102	12	Average
8110	54.41	-19.59	74	42.15	35.52	10.86	34.12	136	312	Peak
8110	41.07	-12.93	54	28.81	35.52	10.86	34.12	136	312	Average
10360	39.85	-48.45	88.3	71.84	-9.18	11.31	34.12	100	0	Peak
15540	41.61	-32.39	74	67.06	-6.62	14.11	32.94	100	0	Peak

Test Mode :	Mode 2	Temperature :	24~25°C
Test Channel :	40	Relative Humidity :	44~45%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	5200 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
71.58	36.07	-3.93	40	60.01	6.77	0.84	31.55	114	245	Peak
216.3	35.69	-10.31	46	56.67	9.08	1.4	31.46	-	-	Peak
264.09	37.99	-8.01	46	54.82	12.96	1.61	31.4	-	-	Peak
330.1	36.8	-9.2	46	52	14.26	1.85	31.31	-	-	Peak
455.4	32.81	-13.19	46	44.33	17.26	2.31	31.09	-	-	Peak
775.3	31.93	-14.07	46	37.65	21.87	3.1	30.69	-	-	Peak
5150	52.87	-21.13	74	43.86	34.25	9.41	34.65	100	355	Peak
5150	40.76	-13.24	54	31.75	34.25	9.41	34.65	100	355	Average
5200	92.92	-	-	83.97	34.3	9.49	34.84	100	355	Average
5200	103.4	-	-	94.45	34.3	9.49	34.84	100	355	Peak
5350	51.32	-22.68	74	42.53	34.45	9.74	35.4	100	355	Peak
5350	38.95	-15.05	54	30.16	34.45	9.74	35.4	100	355	Average
8308	56.83	-17.17	74	44.44	35.56	10.93	34.1	121	247	Peak
8308	41.63	-12.37	54	29.24	35.56	10.93	34.1	121	247	Average

Test Mode :	Mode 2	Temperature :	24~25°C
Test Channel :	40	Relative Humidity :	44~45%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	5200 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
42.96	36.72	-3.28	40	55.4	12.18	0.64	31.5	102	311	Peak
95.61	35.11	-8.39	43.5	55.9	9.76	0.98	31.53	-	-	Peak
135.57	32.56	-10.94	43.5	51.21	11.73	1.18	31.56	-	-	Peak
318.9	30.42	-15.58	46	45.96	13.97	1.81	31.32	-	-	Peak
547.8	29.7	-16.3	46	39.05	19.08	2.55	30.98	-	-	Peak
750.1	36	-10	46	42.12	21.52	3.06	30.7	-	-	Peak
5150	55.36	-18.64	74	46.35	34.25	9.41	34.65	100	12	Peak
5150	42.79	-11.21	54	33.78	34.25	9.41	34.65	100	12	Average
5200	99.19	-	-	90.24	34.3	9.49	34.84	100	12	Average
5200	110.58	-	-	101.63	34.3	9.49	34.84	100	12	Peak
5350	53.36	-20.64	74	44.57	34.45	9.74	35.4	100	12	Peak
5350	39.74	-14.26	54	30.95	34.45	9.74	35.4	100	12	Average
8404	56.39	-17.61	74	43.94	35.58	10.96	34.09	141	120	Peak
8404	41.15	-12.85	54	28.7	35.58	10.96	34.09	141	120	Average
10400	40.08	-48.22	88.3	72.07	-9.12	11.24	34.11	100	0	Peak

Test Mode :	Mode 3	Temperature :	24~25°C
Test Channel :	48	Relative Humidity :	44~45%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	5240 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
43.5	36.39	-3.61	40	55.7	11.55	0.64	31.5	112	96	Peak
71.58	35.76	-4.24	40	59.7	6.77	0.84	31.55	-	-	Peak
191.73	31.61	-11.89	43.5	52.92	8.9	1.29	31.5	-	-	Peak
332.2	37.33	-8.67	46	52.45	14.33	1.86	31.31	-	-	Peak
528.2	28.68	-17.32	46	38.48	18.71	2.51	31.02	-	-	Peak
900.6	35.23	-10.77	46	39.4	23.19	3.34	30.7	-	-	Peak
5150	51.51	-22.49	74	42.5	34.25	9.41	34.65	100	352	Peak
5150	40.83	-13.17	54	31.82	34.25	9.41	34.65	100	352	Average
5240	104.07	-	-	95.17	34.33	9.53	34.96	100	352	Peak
5240	93.3	-	-	84.36	34.33	9.57	34.96	100	352	Average
5350	50.09	-23.91	74	41.3	34.45	9.74	35.4	100	352	Peak
5350	39.48	-14.52	54	30.69	34.45	9.74	35.4	100	352	Average
8244	55.98	-18.02	74	43.63	35.55	10.91	34.11	136	174	Peak
8244	40.86	-13.14	54	28.51	35.55	10.91	34.11	136	174	Average

Test Mode :	Mode 3	Temperature :	24~25°C
Test Channel :	48	Relative Humidity :	44~45%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	5240 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
42.96	36.32	-3.68	40	55	12.18	0.64	31.5	107	321	Peak
98.58	33.9	-9.6	43.5	54.26	10.19	0.99	31.54	-	-	Peak
191.73	30.08	-13.42	43.5	51.39	8.9	1.29	31.5	-	-	Peak
500.2	29.38	-16.62	46	39.82	18.18	2.45	31.07	-	-	Peak
567.4	28.43	-17.57	46	37.34	19.45	2.6	30.96	-	-	Peak
788.6	33.6	-12.4	46	39.1	22.06	3.12	30.68	-	-	Peak
5150	54.02	-19.98	74	45.01	34.25	9.41	34.65	126	6	Peak
5150	41.71	-12.29	54	32.7	34.25	9.41	34.65	126	6	Average
5240	109.45	-	-	100.51	34.33	9.57	34.96	126	6	Peak
5240	99.04	-	-	90.1	34.33	9.57	34.96	126	6	Average
5350	53.07	-20.93	74	44.28	34.45	9.74	35.4	126	6	Peak
5350	41.02	-12.98	54	32.23	34.45	9.74	35.4	126	6	Average
8142	54.85	-19.15	74	42.57	35.53	10.87	34.12	124	193	Peak
8142	41.46	-12.54	54	29.18	35.53	10.87	34.12	124	193	Average
10480	38.19	-50.11	88.3	70.15	-9.02	11.14	34.08	100	0	Peak
15720	41.51	-32.49	74	67.08	-6.68	14.2	33.09	100	0	Peak

Test Mode :	Mode 4	Temperature :	24~25°C
Test Channel :	36	Relative Humidity :	44~45%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	5180 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	36.49	-3.51	40	48.46	18.95	0.54	31.46	-	-	Peak
43.23	36.84	-3.16	40	56.15	11.55	0.64	31.5	100	360	Peak
264.09	35.28	-10.72	46	52.11	12.96	1.61	31.4	-	-	Peak
332.2	35.6	-10.4	46	50.72	14.33	1.86	31.31	-	-	Peak
528.2	28.42	-17.58	46	38.22	18.71	2.51	31.02	-	-	Peak
719.3	27.5	-18.5	46	34.17	21.11	2.99	30.77	-	-	Peak
5150	41.39	-12.61	54	32.38	34.25	9.41	34.65	114	355	Average
5150	59.53	-14.47	74	50.52	34.25	9.41	34.65	114	355	Peak
5180	91.99	-	-	83.03	34.28	9.45	34.77	114	355	Average
5180	101.68	-	-	92.72	34.28	9.45	34.77	114	355	Peak
5350	50.4	-23.6	74	41.61	34.45	9.74	35.4	114	355	Peak
5350	38.89	-15.11	54	30.1	34.45	9.74	35.4	114	355	Average
8334	56	-18	74	43.58	35.57	10.95	34.1	127	283	Peak
8334	41.54	-12.46	54	29.12	35.57	10.95	34.1	127	283	Average

Test Mode :	Mode 4	Temperature :	24~25°C
Test Channel :	36	Relative Humidity :	44~45%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	5180 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
71.58	36.11	-3.89	40	60.05	6.77	0.84	31.55	116	296	Peak
135.57	33.87	-9.63	43.5	52.52	11.73	1.18	31.56	-	-	Peak
240.06	30.18	-15.82	46	48.47	11.6	1.53	31.42	-	-	Peak
310.5	30.59	-15.41	46	46.38	13.74	1.79	31.32	-	-	Peak
455.4	29.24	-16.76	46	40.76	17.26	2.31	31.09	-	-	Peak
788.6	30.31	-15.69	46	35.81	22.06	3.12	30.68	-	-	Peak
5150	44.19	-9.81	54	35.18	34.25	9.41	34.65	114	11	Average
5150	58.51	-15.49	74	49.5	34.25	9.41	34.65	114	11	Peak
5180	97.99	-	-	89.03	34.28	9.45	34.77	114	11	Average
5180	108.89	-	-	99.93	34.28	9.45	34.77	114	11	Peak
5350	50.54	-23.46	74	41.75	34.45	9.74	35.4	114	11	Peak
5350	39.52	-14.48	54	30.73	34.45	9.74	35.4	114	11	Average
8156	54.44	-19.56	74	42.15	35.53	10.87	34.11	116	129	Peak
8156	41.01	-12.99	54	28.72	35.53	10.87	34.11	116	129	Average
10360	37.32	-50.98	88.3	69.31	-9.18	11.31	34.12	100	0	Peak

Test Mode :	Mode 5	Temperature :	24~25°C
Test Channel :	40	Relative Humidity :	44~45%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	5200 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
43.23	36.6	-3.4	40	55.91	11.55	0.64	31.5	110	142	Peak
95.61	38.79	-4.71	43.5	59.58	9.76	0.98	31.53	-	-	Peak
191.73	35.63	-7.87	43.5	56.94	8.9	1.29	31.5	-	-	Peak
312.6	37.06	-8.94	46	52.8	13.79	1.79	31.32	-	-	Peak
430.9	32.67	-13.33	46	44.8	16.75	2.25	31.13	-	-	Peak
806.1	29.05	-16.95	46	34.3	22.28	3.16	30.69	-	-	Peak
5150	51.26	-22.74	74	42.25	34.25	9.41	34.65	102	59	Peak
5150	39.93	-14.07	54	30.92	34.25	9.41	34.65	102	59	Average
5200	94.07	-	-	85.12	34.3	9.49	34.84	102	59	Average
5200	104.82	-	-	95.87	34.3	9.49	34.84	102	59	Peak
5350	51.79	-22.21	74	43	34.45	9.74	35.4	102	59	Peak
5350	39.04	-14.96	54	30.25	34.45	9.74	35.4	102	59	Average
8212	55.53	-18.47	74	43.21	35.54	10.89	34.11	126	302	Peak
8212	41.63	-12.37	54	29.31	35.54	10.89	34.11	126	302	Average

Test Mode :	Mode 5	Temperature :	24~25°C
Test Channel :	40	Relative Humidity :	44~45%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	5200 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.54	36.83	-3.17	40	48.8	18.95	0.54	31.46	100	358	Peak
43.23	36.3	-3.7	40	55.61	11.55	0.64	31.5	-	-	Peak
191.73	34.29	-9.21	43.5	55.6	8.9	1.29	31.5	-	-	Peak
407.8	30.55	-15.45	46	43.28	16.27	2.17	31.17	-	-	Peak
564.6	25.96	-20.04	46	34.94	19.39	2.59	30.96	-	-	Peak
817.3	30.81	-15.19	46	35.93	22.39	3.19	30.7	-	-	Peak
5150	53.31	-20.69	74	44.3	34.25	9.41	34.65	100	12	Peak
5150	41.7	-12.3	54	32.69	34.25	9.41	34.65	100	12	Average
5200	98.32	-	-	89.37	34.3	9.49	34.84	100	12	Average
5200	108.43	-	-	99.48	34.3	9.49	34.84	100	12	Peak
5350	53.87	-20.13	74	45.08	34.45	9.74	35.4	100	12	Peak
5350	39.72	-14.28	54	30.93	34.45	9.74	35.4	100	12	Average
8302	56.34	-17.66	74	43.95	35.56	10.93	34.1	114	125	Peak
8302	41.55	-12.45	54	29.16	35.56	10.93	34.1	114	125	Average
10400	37.18	-51.12	88.3	69.17	-9.12	11.24	34.11	100	0	Peak

Test Mode :	Mode 6	Temperature :	24~25°C
Test Channel :	48	Relative Humidity :	44~45%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	5240 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
43.5	36.36	-3.64	40	55.67	11.55	0.64	31.5	108	123	Peak
95.61	38.61	-4.89	43.5	59.4	9.76	0.98	31.53	-	-	Peak
264.09	35.46	-10.54	46	52.29	12.96	1.61	31.4	-	-	Peak
323.8	35.9	-10.1	46	51.29	14.1	1.83	31.32	-	-	Peak
430.9	33.18	-12.82	46	45.31	16.75	2.25	31.13	-	-	Peak
785.8	32.25	-13.75	46	37.8	22.02	3.12	30.69	-	-	Peak
5150	51.47	-22.53	74	42.46	34.25	9.41	34.65	143	46	Peak
5150	40.14	-13.86	54	31.13	34.25	9.41	34.65	143	46	Average
5240	105.41	-	-	96.51	34.33	9.53	34.96	143	46	Peak
5240	93.78	-	-	84.84	34.33	9.57	34.96	143	46	Average
5350	51.01	-22.99	74	42.22	34.45	9.74	35.4	143	46	Peak
5350	39.44	-14.56	54	30.65	34.45	9.74	35.4	143	46	Average
8356	55.72	-18.28	74	43.29	35.57	10.95	34.09	124	154	Peak
8356	41.13	-12.87	54	28.7	35.57	10.95	34.09	124	154	Average

Test Mode :	Mode 6	Temperature :	24~25°C
Test Channel :	48	Relative Humidity :	44~45%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	5240 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.54	36.84	-3.16	40	48.81	18.95	0.54	31.46	100	354	Peak
43.5	36.35	-3.65	40	55.66	11.55	0.64	31.5	-	-	Peak
139.89	34.25	-9.25	43.5	52.9	11.7	1.2	31.55	-	-	Peak
326.6	26.48	-19.52	46	41.77	14.18	1.84	31.31	-	-	Peak
528.2	24.54	-21.46	46	34.34	18.71	2.51	31.02	-	-	Peak
724.9	25.6	-20.4	46	32.19	21.17	3	30.76	-	-	Peak
5150	52.39	-21.61	74	43.38	34.25	9.41	34.65	126	8	Peak
5150	40.62	-13.38	54	31.61	34.25	9.41	34.65	126	8	Average
5240	108.76	-	-	99.82	34.33	9.57	34.96	126	8	Peak
5240	98.35	-	-	89.41	34.33	9.57	34.96	126	8	Average
5350	51.98	-22.02	74	43.19	34.45	9.74	35.4	126	8	Peak
5350	40.24	-13.76	54	31.45	34.45	9.74	35.4	126	8	Average
8294	56.21	-17.79	74	43.82	35.56	10.93	34.1	116	304	Peak
8294	41.66	-12.34	54	29.27	35.56	10.93	34.1	116	304	Average
10480	36.94	-51.36	88.3	68.9	-9.02	11.14	34.08	100	0	Peak

Test Mode :	Mode 7	Temperature :	24~25°C
Test Channel :	38	Relative Humidity :	44~45%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	5190 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
43.5	36.65	-3.35	40	55.96	11.55	0.64	31.5	111	125	Peak
95.61	38.26	-5.24	43.5	59.05	9.76	0.98	31.53	-	-	Peak
264.09	35.54	-10.46	46	52.37	12.96	1.61	31.4	-	-	Peak
419	34.9	-11.1	46	47.33	16.51	2.21	31.15	-	-	Peak
528.2	28.77	-17.23	46	38.57	18.71	2.51	31.02	-	-	Peak
948.2	28.67	-17.33	46	31.87	23.91	3.46	30.57	-	-	Peak
5150	43.26	-10.74	54	34.25	34.25	9.41	34.65	100	40	Average
5150	57.36	-16.64	74	48.35	34.25	9.41	34.65	100	40	Peak
5190	79.34	-	-	70.34	34.28	9.49	34.77	100	40	Average
5190	98.16	-	-	89.21	34.3	9.49	34.84	100	40	Peak
5350	50.33	-23.67	74	41.54	34.45	9.74	35.4	100	40	Peak
5350	39.12	-14.88	54	30.33	34.45	9.74	35.4	100	40	Average
8118	54.66	-19.34	74	42.4	35.52	10.86	34.12	133	241	Peak
8118	40.9	-13.1	54	28.64	35.52	10.86	34.12	133	241	Average

Test Mode :	Mode 7	Temperature :	24~25°C
Test Channel :	38	Relative Humidity :	44~45%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	5190 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
43.23	36.62	-3.38	40	55.93	11.55	0.64	31.5	105	279	Peak
136.65	33.8	-9.7	43.5	52.45	11.72	1.19	31.56	-	-	Peak
240.06	30.29	-15.71	46	48.58	11.6	1.53	31.42	-	-	Peak
318.2	28.04	-17.96	46	43.6	13.95	1.81	31.32	-	-	Peak
407.8	29.6	-16.4	46	42.33	16.27	2.17	31.17	-	-	Peak
743.8	28.94	-17.06	46	35.16	21.44	3.05	30.71	-	-	Peak
5150	50.66	-3.34	54	41.65	34.25	9.41	34.65	115	349	Average
5150	66.11	-7.89	74	57.1	34.25	9.41	34.65	115	349	Peak
5190	92.46	-	-	83.46	34.28	9.49	34.77	115	349	Average
5190	104.18	-	-	95.22	34.28	9.45	34.77	115	349	Peak
5350	50.31	-23.69	74	41.52	34.45	9.74	35.4	115	349	Peak
5350	39.38	-14.62	54	30.59	34.45	9.74	35.4	115	349	Average
8310	56.25	-17.75	74	43.85	35.56	10.94	34.1	120	315	Peak
8310	41.56	-12.44	54	29.16	35.56	10.94	34.1	120	315	Average

Test Mode :	Mode 8	Temperature :	24~25°C
Test Channel :	46	Relative Humidity :	44~45%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	5230 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
43.5	36.72	-3.28	40	56.03	11.55	0.64	31.5	106	98	Peak
95.61	38.82	-4.68	43.5	59.61	9.76	0.98	31.53	-	-	Peak
240.06	36.57	-9.43	46	54.86	11.6	1.53	31.42	-	-	Peak
337.8	34.8	-11.2	46	49.76	14.46	1.88	31.3	-	-	Peak
499.5	28.79	-17.21	46	39.25	18.16	2.45	31.07	-	-	Peak
828.5	25.63	-20.37	46	30.64	22.49	3.21	30.71	-	-	Peak
5150	51.58	-22.42	74	42.57	34.25	9.41	34.65	100	55	Peak
5150	40.63	-13.37	54	31.62	34.25	9.41	34.65	100	55	Average
5230	88.23	-	-	79.33	34.33	9.53	34.96	100	55	Average
5230	101.28	-	-	92.33	34.32	9.53	34.9	100	55	Peak
5350	50.8	-23.2	74	42.01	34.45	9.74	35.4	100	55	Peak
5350	39.13	-14.87	54	30.34	34.45	9.74	35.4	100	55	Average
8222	55.14	-18.86	74	42.81	35.54	10.9	34.11	129	184	Peak
8222	41.11	-12.89	54	28.78	35.54	10.9	34.11	129	184	Average

Test Mode :	Mode 8	Temperature :	24~25°C
Test Channel :	46	Relative Humidity :	44~45%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	5230 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.54	36.83	-3.17	40	48.8	18.95	0.54	31.46	101	354	Peak
83.73	35.4	-4.6	40	58.08	7.96	0.9	31.54	-	-	Peak
191.73	33.36	-10.14	43.5	54.67	8.9	1.29	31.5	-	-	Peak
304.2	29.94	-16.06	46	45.9	13.59	1.78	31.33	-	-	Peak
500.2	31.3	-14.7	46	41.74	18.18	2.45	31.07	-	-	Peak
785.8	32.66	-13.34	46	38.21	22.02	3.12	30.69	-	-	Peak
5150	53.32	-20.68	74	44.31	34.25	9.41	34.65	130	350	Peak
5150	42.6	-11.4	54	33.59	34.25	9.41	34.65	130	350	Average
5230	92.57	-	-	83.67	34.33	9.53	34.96	130	350	Average
5230	104.49	-	-	95.54	34.32	9.53	34.9	130	350	Peak
5350	51.82	-22.18	74	43.03	34.45	9.74	35.4	130	350	Peak
5350	39.77	-14.23	54	30.98	34.45	9.74	35.4	130	350	Average
8316	55.89	-18.11	74	43.49	35.56	10.94	34.1	112	296	Peak
8316	41.59	-12.41	54	29.19	35.56	10.94	34.1	112	296	Average
10460	36.41	-51.89	88.3	68.37	-9.05	11.18	34.09	100	0	Peak

3.8 Peak Excursion Ratio Measurement

3.8.1 Limit of Peak Excursion Ratio

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

3.8.3 Test Procedures

6. The transmitter output is connected to the spectrum analyzer.

7. The resolution bandwidth is set to and maintained at 1 MHz. The video bandwidth is set to 3 MHz.

8. Trace A is set peak detector and to Max Hold, then to View. Then the detector is readjusted to sample detector, max hold to run for 60 seconds, and the signal under this measurement condition is captured in Trace B in Accordance with the method 3 of DA-02-2138.

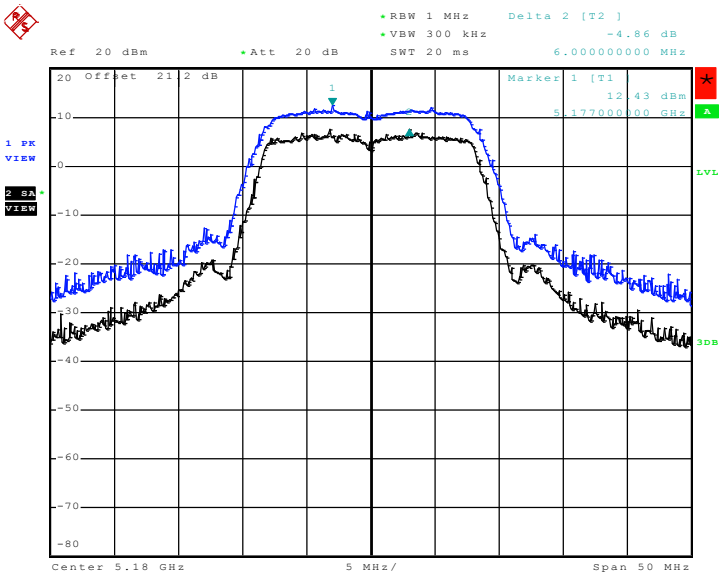
9. The difference between the traces is investigated. The marker is placed at the frequency, which shows the largest difference. The amplitude delta between the traces at this frequency is the peak excursion.

3.8.4 Test Setup

3.8.5 Test Result of Peak Excursion Ratio

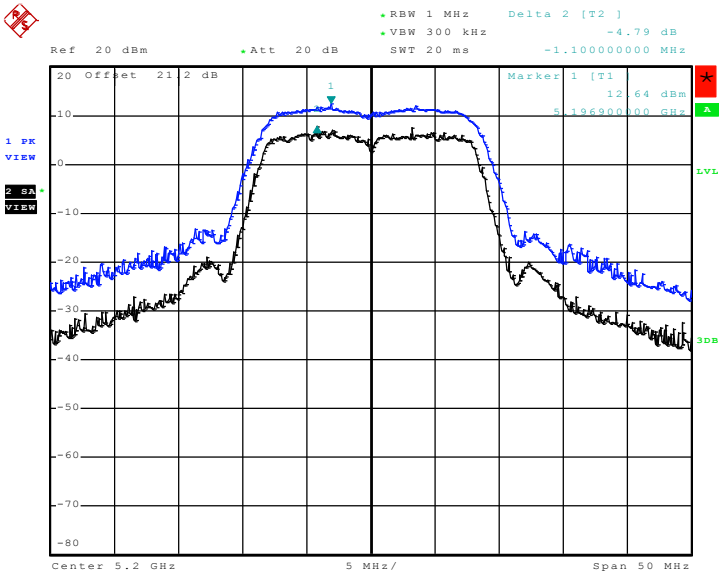
Test Mode :	Mode 1~8	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	50~53%

Mode 1 :
Peak Excursion Ratio Plot on 802.11a Channel 36 – Chain A



Date: 28.SEP.2010 06:10:42

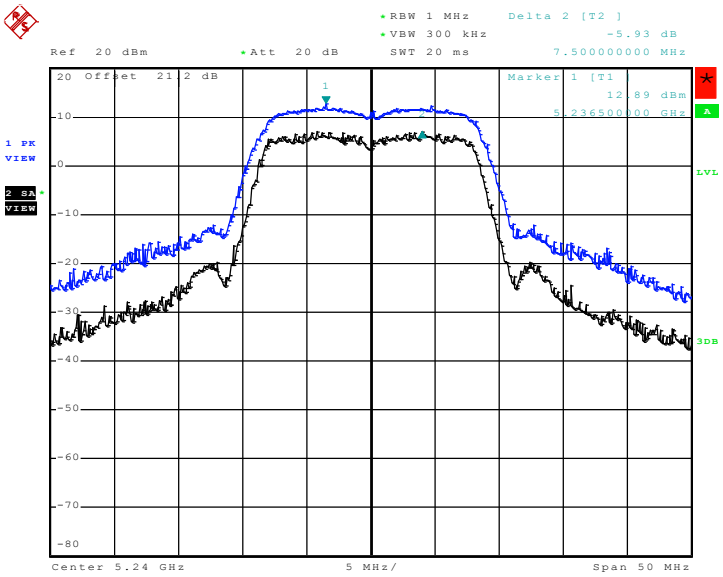
Mode 2 :
Peak Excursion Ratio Plot on 802.11a Channel 40 – Chain A



Date: 28.SEP.2010 06:12:01

Mode 3 :

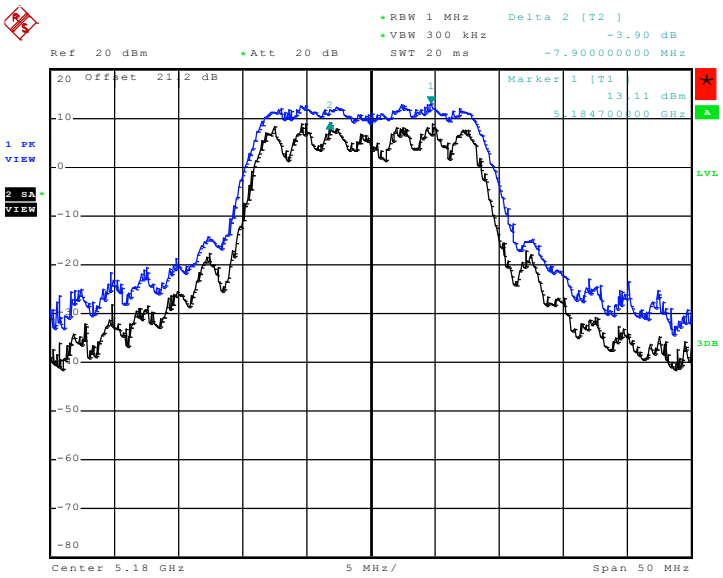
Peak Excursion Ratio Plot on 802.11a Channel 48 – Chain A



Date: 28.SEP.2010 06:13:26

Mode 4 : Peak Excursion Ratio Plot on 802.11n (BW 20MHz)

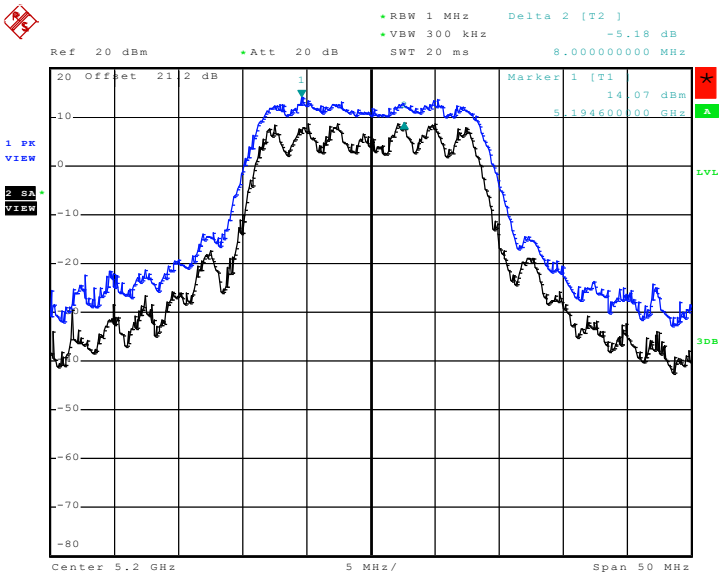
Channel 36 - Chain A+B



Date: 28.SEP.2010 06:21:26

Mode 5 : Peak Excursion Ratio Plot on 802.11n (BW 20MHz)

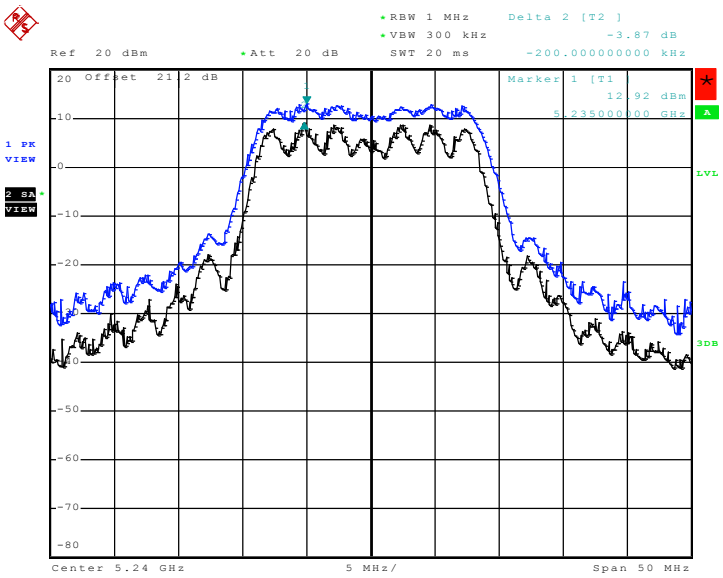
Channel 40 - Chain A+B



Date: 28.SEP.2010 06:24:13

Mode 6 : Peak Excursion Ratio Plot on 802.11n (BW 20MHz)

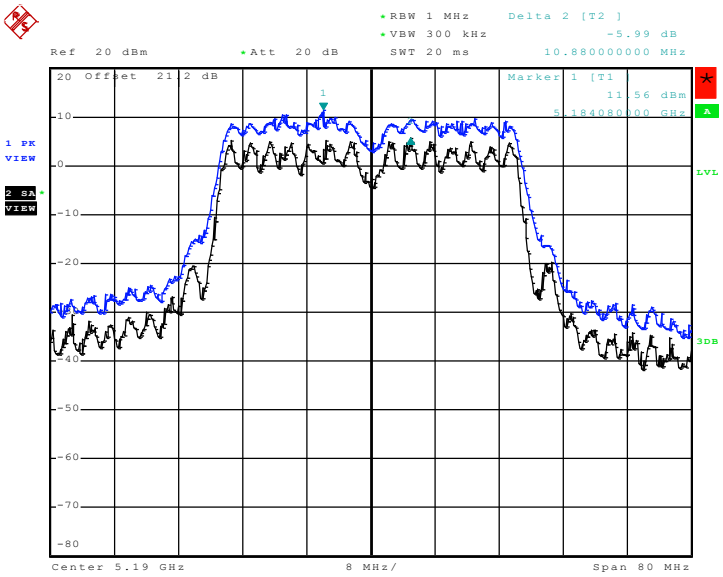
Channel 48 - Chain A+B



Date: 28.SEP.2010 06:25:41

Mode 7 : Peak Excursion Ratio Plot on 802.11n (BW 40MHz)

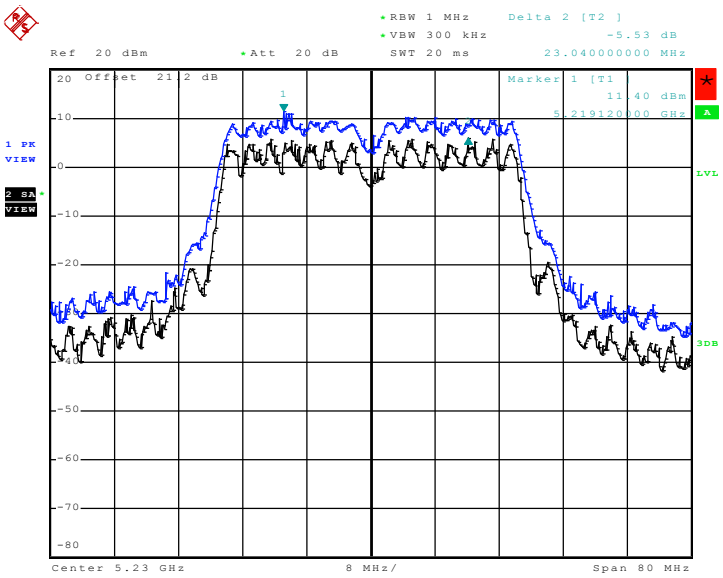
Channel 38 - Chain A+B



Date: 28.SEP.2010 13:06:48

Mode 8 : Peak Excursion Ratio Plot on 802.11n (BW 40MHz)

Channel 46 - Chain A+B



Date: 28.SEP.2010 13:08:10

3.9 Automatically Discontinue Transmission

3.9.1 Limit of Automatically Discontinue Transmission

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

3.9.2 Measuring Instruments

See list of measuring instruments of this test report.

3.9.3 Test Result of Automatically Discontinue Transmission

During no any information transmission, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

3.10Frequency Stability Measurement

3.10.1 Limit of Frequency Stability

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

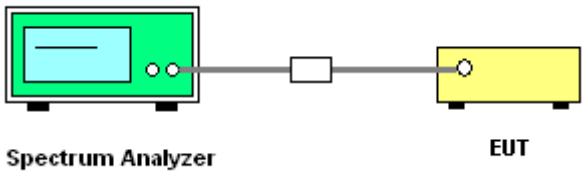
3.10.2 Measuring Instruments

See list of measuring instruments of this test report.

3.10.3 Test Procedures

1. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
2. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
3. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

3.10.4 Test Setup



3.10.5 Test Result of Frequency Stability

Test Mode :	Mode 1~3	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11a		
		Low Frequency (Fl)	High Frequency (Fh)	Frequency Stability (ppm)
36	5180	5171.64	5188.28	-7.72
40	5200	5191.64	5208.28	-7.69
48	5240	5231.64	5248.28	-7.63

Test Mode :	Mode 4~6	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz)		
		Low Frequency (Fl)	High Frequency (Fh)	Frequency Stability (ppm)
36	5180	5171.68	5188.52	19.31
40	5200	5191.68	5208.28	-3.85
48	5240	5231.68	5248.40	7.63

Test Mode :	Mode 7~8	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 40MHz)		
		Low Frequency (Fl)	High Frequency (Fh)	Frequency Stability (ppm)
38	5190	5171.76	5208.24	0.00
46	5230	5211.84	5248.24	7.65

3.11Antenna Requirements

3.11.1 Standard Applicable

According to FCC 47 CFR Section 15.407(a)(1)(2) ,if transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.11.2 Antenna Connected Construction

The antennas type used in this product is PIFA Antenna and it is considered to meet antenna requirement of FCC.

3.11.3 Antenna Gain

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

4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP30	101329	9kHz~30GHz	Apr. 26, 2010	Apr. 25, 2011	Conducted (TH02-HY)
Power Meter	Agilent	E4416A	GB41292344	N/A	Feb. 25, 2010	Feb. 24, 2011	Conducted (TH02-HY)
Power Sensor	Agilent	E9327A	US40441548	N/A	Feb. 25, 2010	Feb. 24, 2011	Conducted (TH02-HY)
Receiver	R&S	ESCS 30	838251/003	9 kHz - 2.75 GHz	Apr. 16, 2010	Apr. 15, 2011	Conduction (CO01-LK)
LISN	Rolf Heine	NNB-2/16Z	98087	9 kHz~30 MHz	Oct. 07, 2009	Oct. 06, 2010	Conduction (CO01-LK)
RF Cable-CON	Suhner Switzerland	RG223/U	CB017	9 kHz~30 MHz	Nov. 04, 2009	Nov. 03, 2010	Conduction (CO01-LK)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 31, 2009	Oct. 30, 2010	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP	101067	9KHz ~ 30GHz	Dec. 04, 2009	Dec. 03, 2010	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 19, 2010	Aug. 18, 2011	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 14, 2009	Oct. 13, 2010	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec.09,2009	Dec. 08, 2010	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32 dB.GAIN	Mar. 27, 2010	Mar. 26, 2011	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Jul. 28, 2011	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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

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 Uc(y)	**1.13**		
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.26**		

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

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 Uc(y)	**1.27**		
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.54**		

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

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 Γ1 = 0.197 Antenna VSWR Γ2 = 0.194 Uncertainty = 20Log(1-Γ1*Γ2)	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty Uc(y)	**2.36**				
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.72**				

Appendix A. Photographs of EUT

Please refer to Sporton report number EP082617-01 as below.