FCC RF Test Report

APPLICANT	:	Samsung Electronics Co., Ltd.
EQUIPMENT	:	Mobile Phone
BRAND NAME	:	SAMSUNG
MODEL NAME	:	SCH-P709E
FCC ID	:	A3LSCHP709E
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Jan. 08, 2014 and testing was completed on Feb. 11, 2014. We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown to be compliant with the applicable technical standards.

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

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory
2353

SPORTON INTERNATIONAL (SHENZHEN) INC.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR410803C	Rev. 01	Initial issue of report	Feb. 14, 2014
FR410803C	Rev. 02	Added the Amplifier which up to 40GHz on section 4.	Feb. 19, 2014

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.2	15.247(b)	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	Conducted Band Edges	≤ 20dBc	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 6.23 dB at 2484.250 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 6.04 dB at 13.62 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Samsung Electronics Co., Ltd.
A3 Building, No.185 Kexue Avenue,Science City,Guang Zhou,PRC

1.2 Manufacturer

Samsung Electronics Co., Ltd.
129, Samsung-ro, Yeongtong-gu, Suwon-city,Gyeonggi-do, 443-742, Korea

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Phone
Brand Name	SAMSUNG
Model Name	SCH-P709E
FCC ID	A3LSCHP709E
GSM Operating Band(s)	GSM 850/900/1800/1900MHz
GPRS / EGPRS Multi Slot Class	GPRS Class 10 , EGPRS Class 10
WCDMA Operating Band(s)	FDDI/FDDII/FDDV
Wi-Fi Specification	802.11b/g/n (HT20) 802.11a/n (HT20/HT40)
Bluetooth Version	Bluetooth v3.0+EDR, Bluetooth v4.0 LE
NFC Specification	Type A/B
HW Version	P709E.03
SW Version	P709EKEUAMK1
EUT Stage	Pre-Production

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

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx/Rx Channel Frequency Range	802.11b/g/n : 2412 MHz ~ 2462 MHz 802.11a/n: 5745~5825MHz.
Maximum (Peak) Output Power to Antenna	**<2412 MHz ~ 2462 MHz>** 802.11b : 20.03 dBm (0.1007 W) 802.11g : 22.81 dBm (0.1910 W) 802.11n HT20 : 22.23 dBm (0.1671 W) **<5745 MHz ~ 5825 MHz>** 802.11a : 20.83 dBm (0.1211 W) 802.11n HT20 : 20.27 dBm (0.1064 W) 802.11n HT40 : 21.24 dBm (0.1330 W)
Antenna Type	802.11b/g/n : FPCB Antenna type with gain -0.90 dBi 802.11a/n : FPCB Antenna type with gain -2.30 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Site

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.			
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C. TEL: +86-755- 3320-2398			
Test Site No.	Sporton Site No.			FCC Registration No.
	TH01-SZ	CO01-SZ	03CH01-SZ	831040

Note: The test site complies with ANSI C63.4 2003 requirement.

1.7 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 D01 DTS Meas. Guidance v03r01
- ANSI C63.4-2003

Remark:

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

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals 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) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane for 2.4GHz; Y plane for 5GHz band 4) were recorded in this report.

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.3.

2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437	-	-

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4	149	5745	159	5795
	151	5755	161	5805
	153	5765	165	5825
	157	5785	-	-

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and data rate associated with the highest power were chosen for full test shown in the following tables.

Channel	Frequency	2.4GHz 802.11b RF Peak Output Power (dBm)			
		DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	19.82	19.73	19.74	19.79
CH 06	2437 MHz	19.33	19.24	19.25	19.30
CH 11	2462 MHz	**20.03**	19.94	19.95	20.00

Channel	Frequency	2.4GHz 802.11g RF Peak Output 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	22.52	22.50	22.49	22.47	22.46	22.48	22.49	22.49
CH 06	2437 MHz	22.37	22.35	22.34	22.32	22.31	22.33	22.34	22.34
CH 11	2462 MHz	**22.81**	22.79	22.78	22.76	22.75	22.77	22.78	22.78

Channel	Frequency	2.4GHz 802.11n HT20 RF Peak Output Power (dBm)							
		OFDM Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412 MHz	22.07	22.01	22.02	22.03	22.03	22.01	22.04	22.03
CH 06	2437 MHz	21.92	21.86	21.87	21.88	21.88	21.86	21.89	21.88
CH 11	2462 MHz	**22.23**	22.17	22.18	22.19	22.19	22.17	22.20	22.19

Channel	Frequency	5GHz 802.11a RF Peak Output Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH149	5745 MHz	20.42	20.40	20.36	20.34	20.35	20.39	20.34	20.37
CH157	5785 MHz	**20.83**	20.81	20.77	20.75	20.76	20.80	20.75	20.78
CH165	5825 MHz	20.74	20.72	20.68	20.66	20.67	20.71	20.66	20.69

Channel	Frequency	5GHz 802.11n HT-20 RF Peak Output Power (dBm)							
		OFDM Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH149	5745 MHz	19.72	19.66	19.65	19.69	19.66	19.68	19.65	19.67
CH157	5785 MHz	**20.27**	20.21	20.20	20.24	20.21	20.23	20.20	20.22
CH165	5825 MHz	20.13	20.07	20.06	20.10	20.07	20.09	20.06	20.08

Channel	Frequency	5GHz 802.11n HT-40 RF Peak Output Power (dBm)							
		OFDM Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH151	5755 MHz	20.63	20.61	20.60	20.59	20.55	20.54	20.58	20.59
CH159	5795 MHz	**21.24**	21.22	21.21	21.20	21.16	21.15	21.19	21.20

2.3 Test Mode

Final results of test modes, data rates and test channels are shown as following table.

<2.4GHz>

Test Cases				
	Test Items	Mode	Data Rate	Test Channel
Conducted TCs	6dB BW and Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
	Conducted Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	MCS0	1/11
	Conducted Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
Radiated TCs	Radiated Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	MCS0	1/11
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11

<5GHz>

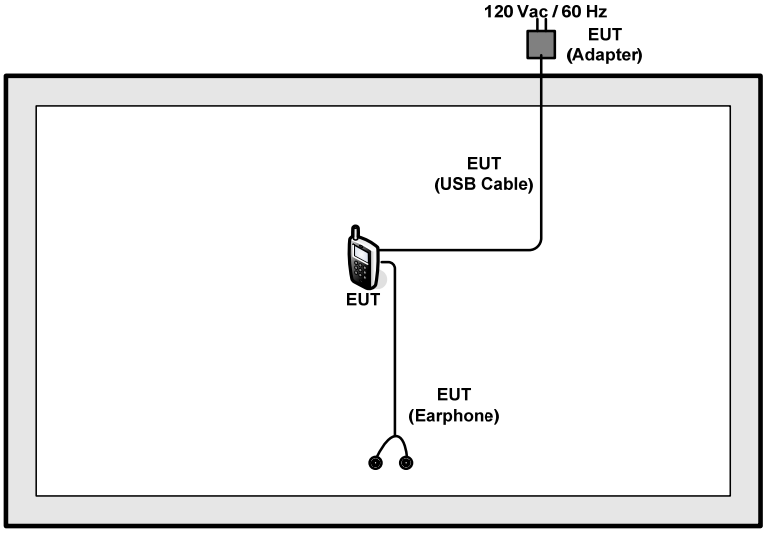
Test Cases				
	Test Items	Mode	Data Rate	Test Channel
Conducted TCs	6dB BW and Power Spectral Density	802.11a	6 Mbps	149/157/165
		802.11n HT20	MCS0	149/157/165
		802.11n HT40	MCS0	151/159
	Output Power	802.11a	6 Mbps	149/157/165
		802.11n HT20	MCS0	149/157/165
		802.11n HT40	MCS0	151/159
	Conducted Band Edge	802.11a	6 Mbps	149/165
		802.11n HT20	MCS0	149/165
		802.11n HT40	MCS0	151/159
	Conducted Spurious Emission	802.11a	6 Mbps	149/157/165
		802.11n HT20	MCS0	149/157/165
		802.11n HT40	MCS0	151/159
Radiated TCs	Radiated Spurious Emission	802.11a	6 Mbps	149/157/165
		802.11n HT20	MCS0	149/157/165
		802.11n HT40	MCS0	151/159

Test Cases	
AC Conducted Emission	Mode 1 : GSM850 Idle + Bluetooth Link + WLAN (2.4GHz) Link + NFC On + Earphone + USB Cable (Charging from Adapter) + SIM1 Mode 2 : GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + NFC On + Earphone + USB Cable (Charging from Adapter) + SIM1

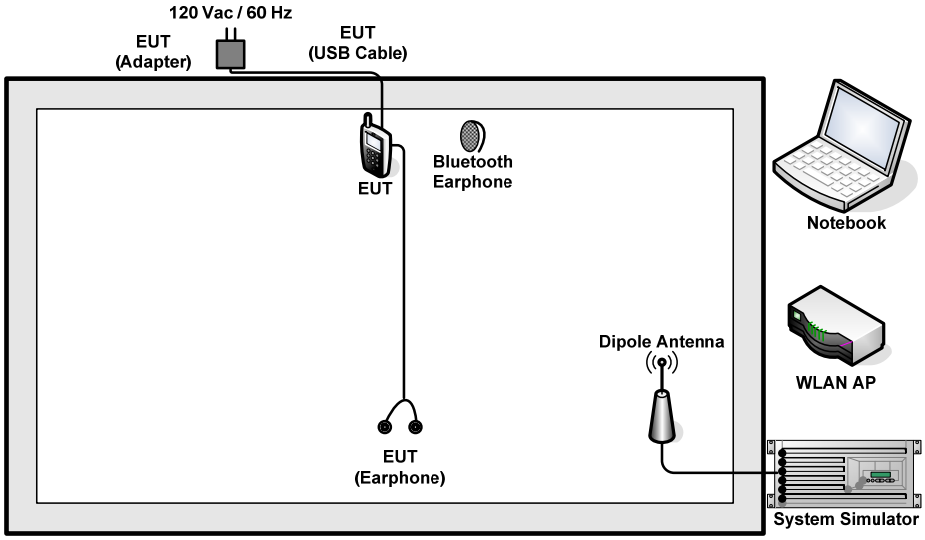
Remark: The worst case of AC conducted emission is mode 1; only the test data of it was reported.

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMW 500	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-815	KA2DIR815A1	N/A	Unshielded, 1.8 m
3.	Notebook	DELL	Vostro 2420	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Nokia	BH-108	PYAHS-107W	N/A	N/A

2.6 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuous transmit/receive.

2.7 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

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.

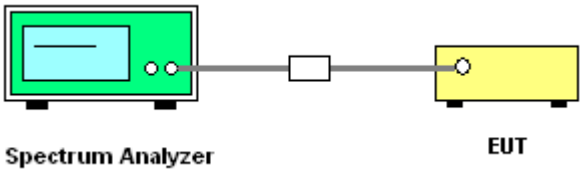
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v03r01.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. Measure and record the results in the test report.

3.1.4 Test Setup



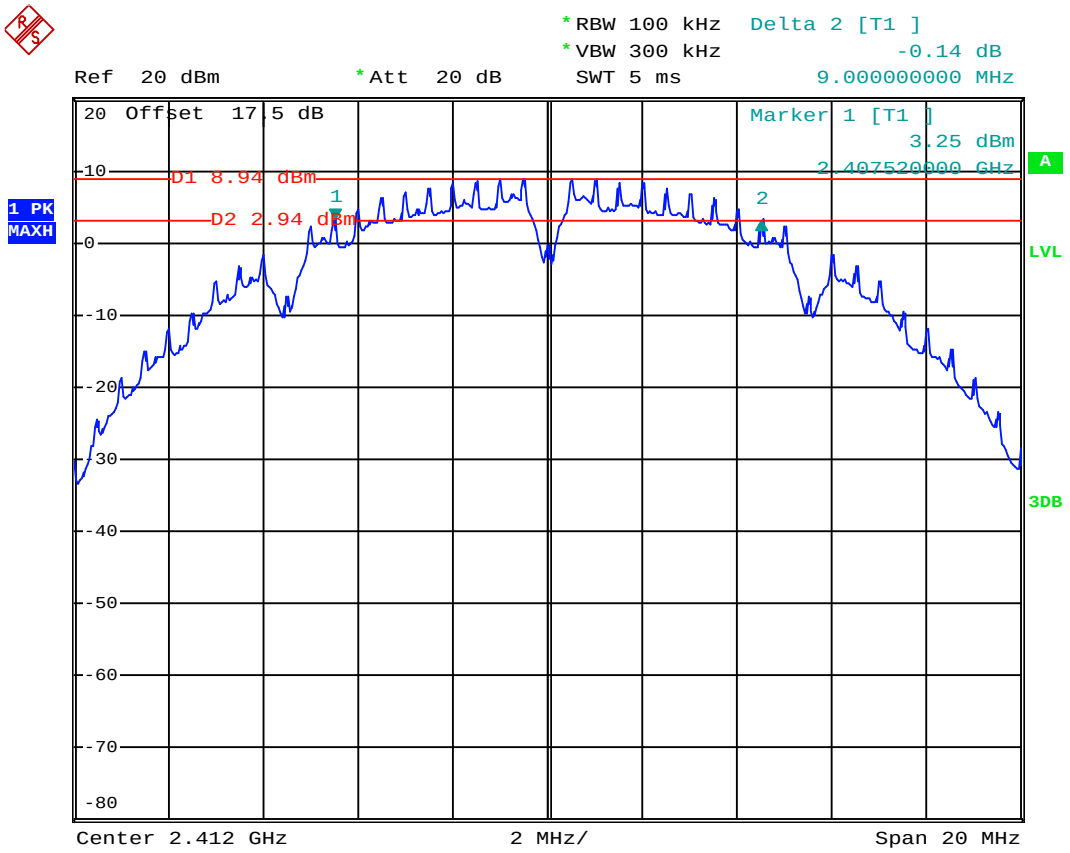
3.1.5 Test Result of 6dB Occupied Bandwidth

Test Band :	2.4GHz + 5GHz band 4	Temperature :	24~26℃
Test Engineer :	Fly Liang	Relative Humidity :	50~53%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	9.00	0.5	Pass
11b	1Mbps	1	6	2437	9.00	0.5	Pass
11b	1Mbps	1	11	2462	9.00	0.5	Pass
11g	6Mbps	1	1	2412	16.34	0.5	Pass
11g	6Mbps	1	6	2437	16.32	0.5	Pass
11g	6Mbps	1	11	2462	16.32	0.5	Pass
HT20	MCS0	1	1	2412	17.56	0.5	Pass
HT20	MCS0	1	6	2437	17.58	0.5	Pass
HT20	MCS0	1	11	2462	17.56	0.5	Pass

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
11a	6Mbps	1	149	5745	16.34	0.5	Pass
11a	6Mbps	1	157	5785	16.36	0.5	Pass
11a	6Mbps	1	165	5825	16.36	0.5	Pass
HT20	MCS0	1	149	5745	17.56	0.5	Pass
HT20	MCS0	1	157	5785	17.56	0.5	Pass
HT20	MCS0	1	165	5825	17.56	0.5	Pass
HT40	MCS0	1	151	5755	35.36	0.5	Pass
HT40	MCS0	1	159	5795	35.44	0.5	Pass

Minimum 6dB Bandwidth



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3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz and 5725-5850MHz, 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.

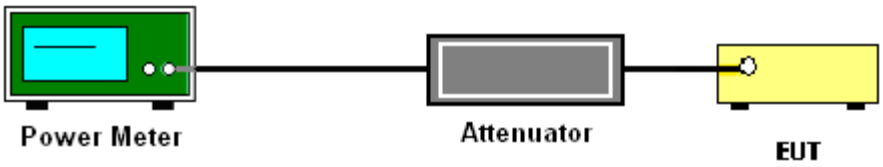
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r01.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Test Mode :	2.4GHz + 5GHz band 4	Temperature :	24~26℃
Test Engineer :	Fly Liang	Relative Humidity :	50~53%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	RF Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	19.82	30	-0.90	Pass
11b	1Mbps	1	6	2437	19.33	30	-0.90	Pass
11b	1Mbps	1	11	2462	20.03	30	-0.90	Pass
11g	6Mbps	1	1	2412	22.52	30	-0.90	Pass
11g	6Mbps	1	6	2437	22.37	30	-0.90	Pass
11g	6Mbps	1	11	2462	22.81	30	-0.90	Pass
HT20	MCS0	1	1	2412	22.07	30	-0.90	Pass
HT20	MCS0	1	6	2437	21.92	30	-0.90	Pass
HT20	MCS0	1	11	2462	22.23	30	-0.90	Pass

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	RF Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	149	5745	20.42	30	-2.30	Pass
11a	6Mbps	1	157	5785	20.83	30	-2.30	Pass
11a	6Mbps	1	165	5825	20.74	30	-2.30	Pass
HT20	MCS0	1	149	5745	19.72	30	-2.30	Pass
HT20	MCS0	1	157	5785	20.27	30	-2.30	Pass
HT20	MCS0	1	165	5825	20.13	30	-2.30	Pass
HT40	MCS0	1	151	5755	20.63	30	-2.30	Pass
HT40	MCS0	1	159	5795	21.24	30	-2.30	Pass

Note: Measured power (dBm) has offset with cable loss.

3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	2.4GHz + 5GHz band 4	Temperature :	24~26℃
Test Engineer :	Fly Liang	Relative Humidity :	50~53%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	Duty Factor (dB)	Average Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	0.04	17.36	30	-0.90	Pass
11b	1Mbps	1	6	2437	0.04	16.85	30	-0.90	Pass
11b	1Mbps	1	11	2462	0.04	17.57	30	-0.90	Pass
11g	6Mbps	1	1	2412	0.29	14.47	30	-0.90	Pass
11g	6Mbps	1	6	2437	0.29	14.52	30	-0.90	Pass
11g	6Mbps	1	11	2462	0.29	14.76	30	-0.90	Pass
HT20	MCS0	1	1	2412	0.31	13.62	30	-0.90	Pass
HT20	MCS0	1	6	2437	0.31	13.77	30	-0.90	Pass
HT20	MCS0	1	11	2462	0.31	13.90	30	-0.90	Pass

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	Duty Factor (dB)	Average Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	149	5745	0.29	14.72	30	-2.30	Pass
11a	6Mbps	1	157	5785	0.29	15.29	30	-2.30	Pass
11a	6Mbps	1	165	5825	0.29	15.00	30	-2.30	Pass
HT20	MCS0	1	149	5745	0.32	12.91	30	-2.30	Pass
HT20	MCS0	1	157	5785	0.32	13.53	30	-2.30	Pass
HT20	MCS0	1	165	5825	0.32	13.21	30	-2.30	Pass
HT40	MCS0	1	151	5755	0.63	16.21	30	-2.30	Pass
HT40	MCS0	1	159	5795	0.63	16.90	30	-2.30	Pass

Note: Measured power (dBm) has offset with cable loss and duty factor.

3.3 Power Spectral Density Measurement

3.3.1 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.

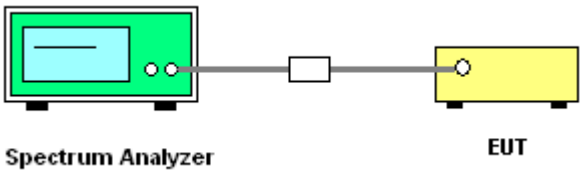
3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

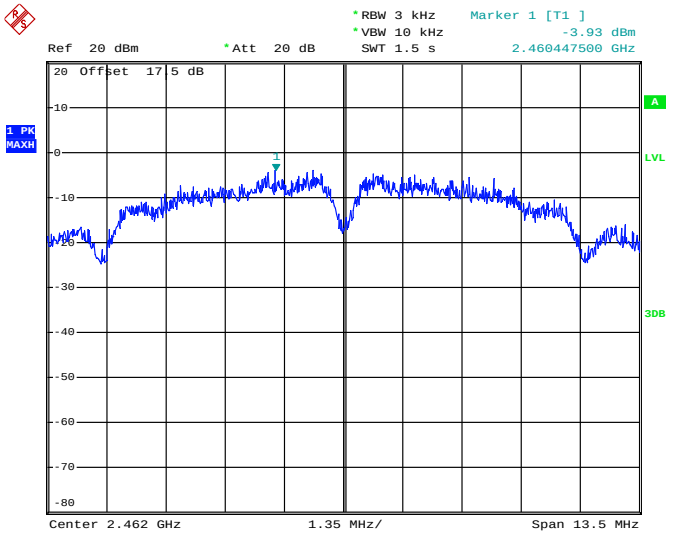
Test Mode :	2.4GHz + 5GHz band 4	Temperature :	24~26℃
Test Engineer :	Fly Liang	Relative Humidity :	50~53%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	Peak Power Density (dBm/3kHz)	Max. Limits (dBm/3kHz)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	-4.32	8	-0.90	Pass
11b	1Mbps	1	6	2437	-4.37	8	-0.90	Pass
11b	1Mbps	1	11	2462	-3.93	8	-0.90	Pass
11g	6Mbps	1	1	2412	-9.55	8	-0.90	Pass
11g	6Mbps	1	6	2437	-9.22	8	-0.90	Pass
11g	6Mbps	1	11	2462	-9.83	8	-0.90	Pass
HT20	MCS0	1	1	2412	-11.33	8	-0.90	Pass
HT20	MCS0	1	6	2437	-11.24	8	-0.90	Pass
HT20	MCS0	1	11	2462	-10.54	8	-0.90	Pass

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	Peak Power Density (dBm/3kHz)	Max. Limits (dBm/3kHz)	DG (dBi)	Pass/Fail
11a	6Mbps	1	149	5745	-9.97	8	-2.30	Pass
11a	6Mbps	1	157	5785	-9.79	8	-2.30	Pass
11a	6Mbps	1	165	5825	-9.80	8	-2.30	Pass
HT20	MCS0	1	149	5745	-12.12	8	-2.30	Pass
HT20	MCS0	1	157	5785	-12.42	8	-2.30	Pass
HT20	MCS0	1	165	5825	-11.99	8	-2.30	Pass
HT40	MCS0	1	151	5755	-12.55	8	-2.30	Pass
HT40	MCS0	1	159	5795	-12.31	8	-2.30	Pass

Note: Measured power density (dBm) has offset with cable loss.

Worst Case Power Density (dBm/3kHz)



Date: 15.JAN.2014 09:31:44

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

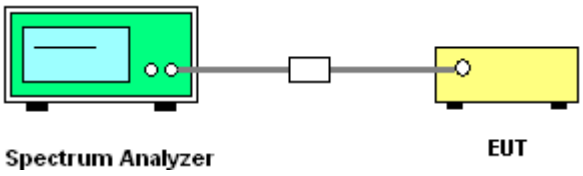
3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup

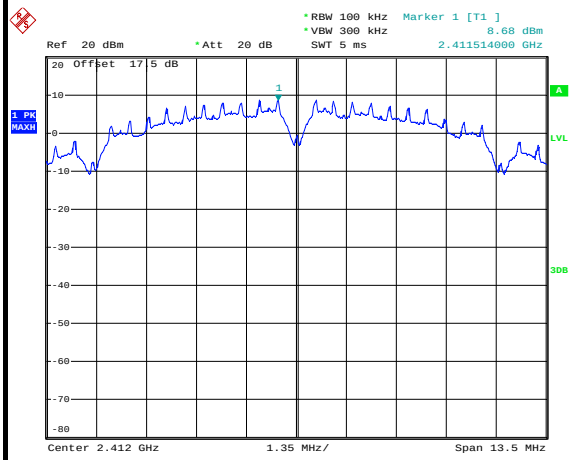


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Mode :	802.11b	**Temperature :**	24~26℃
Test Band :	2.4GHz Low	**Relative Humidity :**	50~53%
Test Channel :	01	**Test Engineer :**	Fly Liang

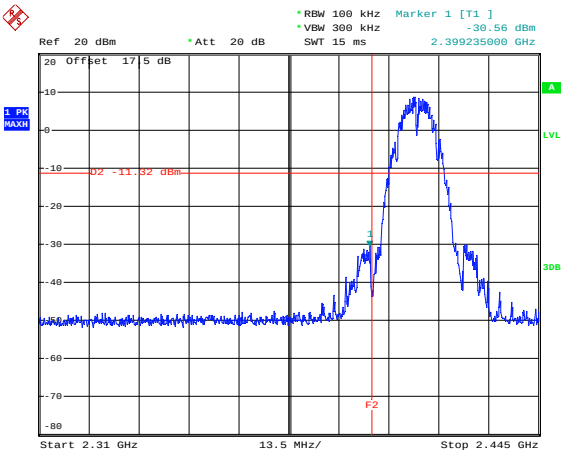
WLAN 802.11b Channel 01

100kHz PSD reference Level



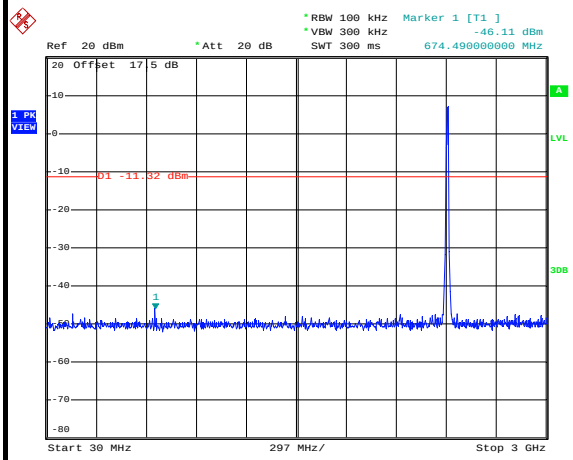
Date: 15.JAN.2014 08:17:26

Low Channel Plot



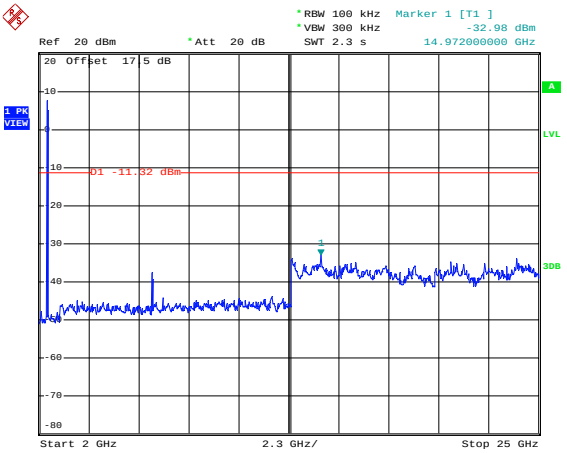
Date: 15.JAN.2014 08:17:40

Spurious Emission 30MHz~3GHz



Date: 15.JAN.2014 08:17:59

Spurious Emission 2GHz~25GHz

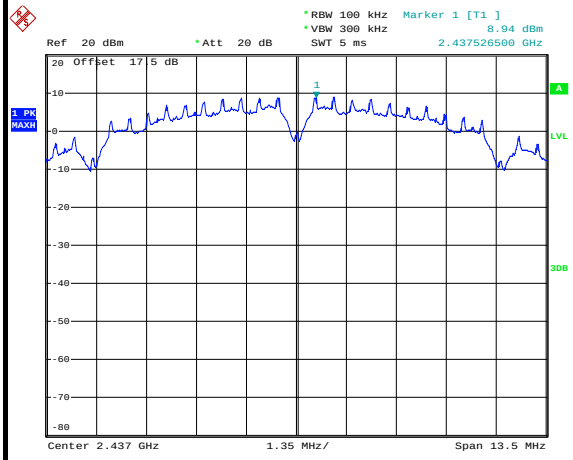


Date: 15.JAN.2014 08:18:18

Test Mode :	802.11b	**Temperature :**	24~26℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	50~53%
Test Channel :	06	**Test Engineer :**	Fly Liang

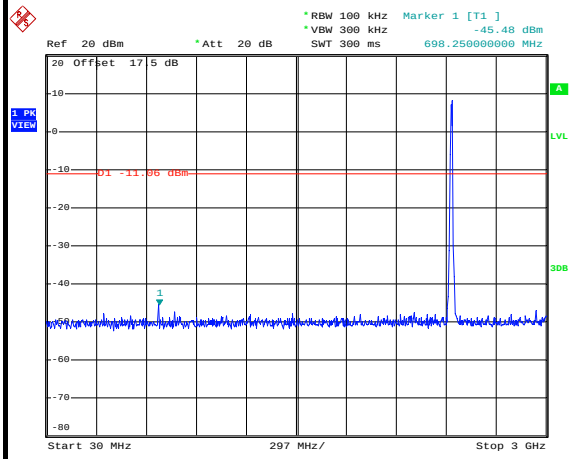
WLAN 802.11b Channel 06

100kHz PSD reference Level



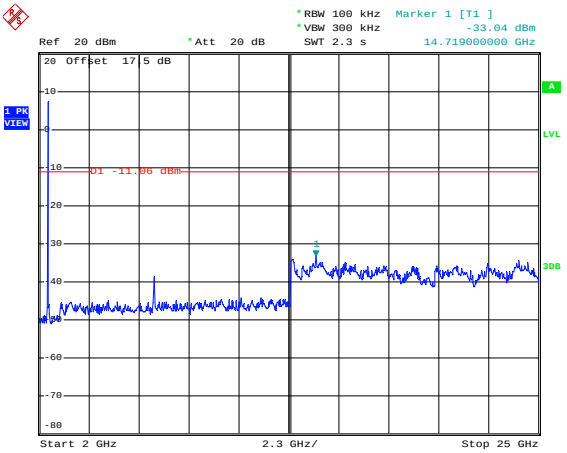
Date: 15.JAN.2014 08:28:01

Spurious Emission 30MHz~3GHz



Date: 15.JAN.2014 08:28:21

Spurious Emission 2GHz~25GHz

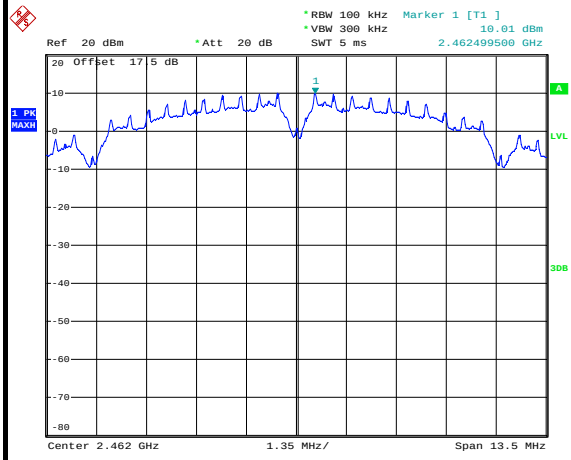


Date: 15.JAN.2014 08:28:39

Test Mode :	802.11b	**Temperature :**	24~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	50~53%
Test Channel :	11	**Test Engineer :**	Fly Liang

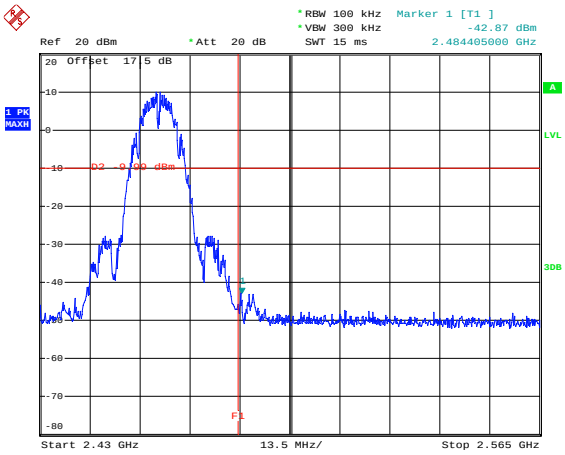
WLAN 802.11b Channel 11

100kHz PSD reference Level



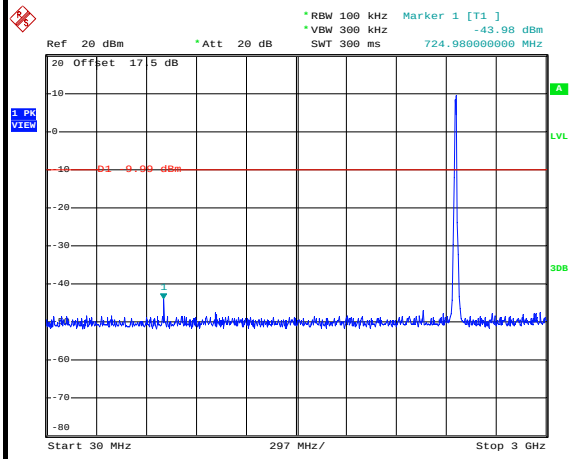
Date: 15.JAN.2014 08:33:47

High Channel Plot



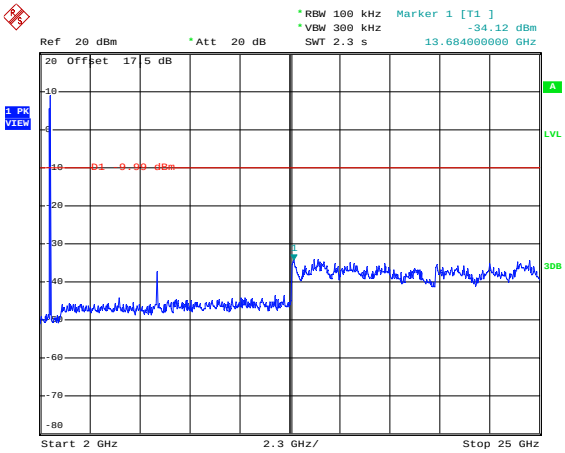
Date: 15.JAN.2014 08:34:01

Spurious Emission 30MHz~3GHz



Date: 15.JAN.2014 08:34:20

Spurious Emission 2GHz~25GHz

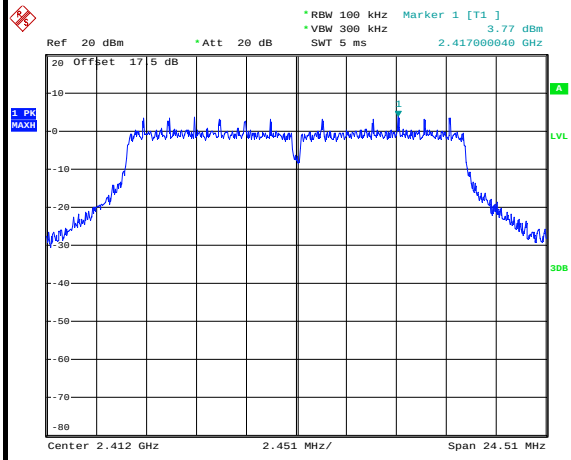


Date: 15.JAN.2014 08:34:39

Test Mode :	802.11g	**Temperature :**	24~26℃
Test Band :	2.4GHz Low	**Relative Humidity :**	50~53%
Test Channel :	01	**Test Engineer :**	Fly Liang

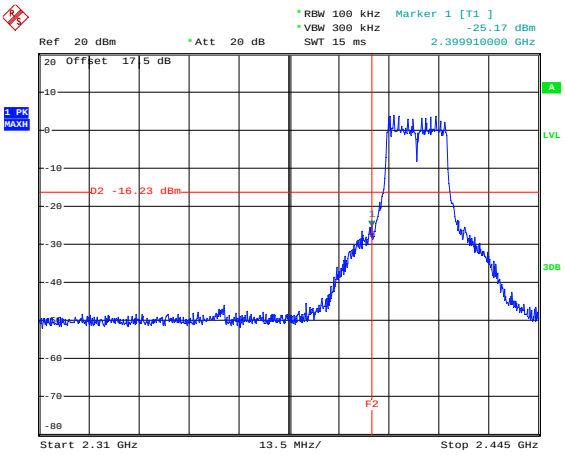
WLAN 802.11g Channel 01

100kHz PSD reference Level



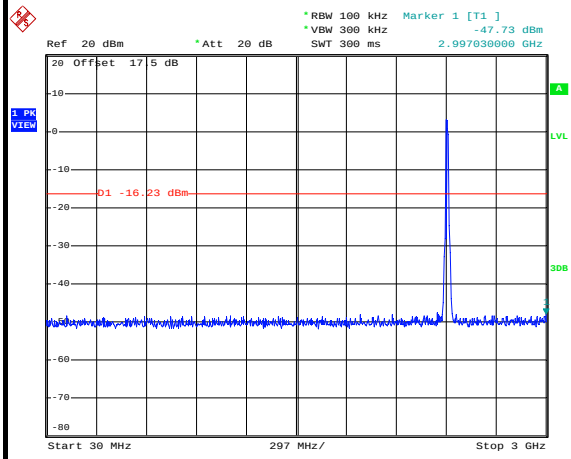
Date: 15.JAN.2014 08:48:16

Low Channel Plot



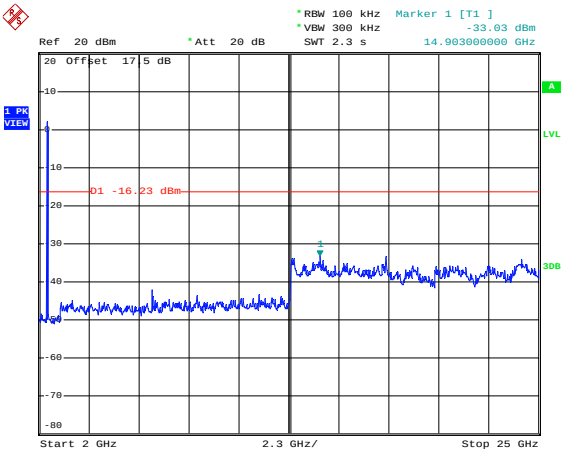
Date: 15.JAN.2014 08:48:30

Spurious Emission 30MHz~3GHz



Date: 15.JAN.2014 08:48:49

Spurious Emission 2GHz~25GHz

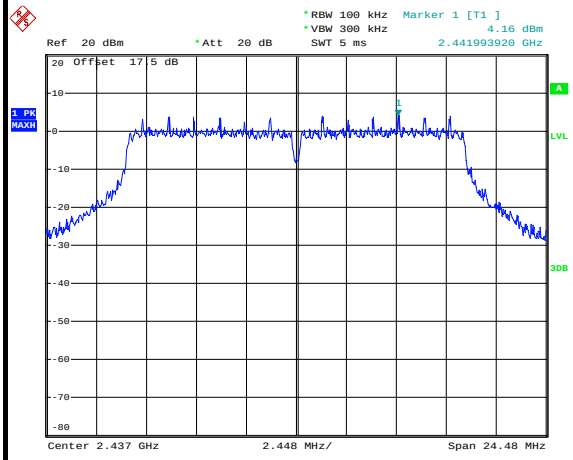


Date: 15.JAN.2014 08:49:08

Test Mode :	802.11g	**Temperature :**	24~26℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	50~53%
Test Channel :	06	**Test Engineer :**	Fly Liang

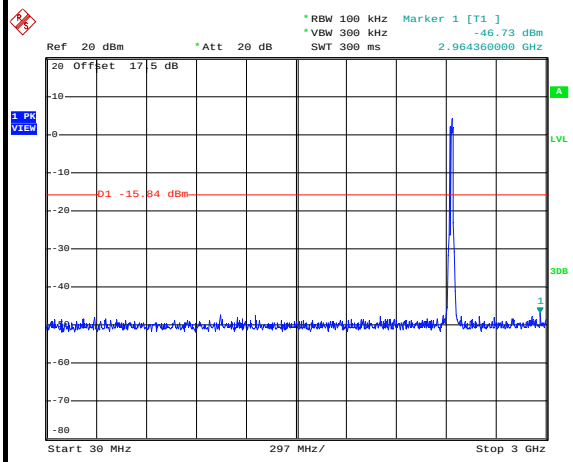
WLAN 802.11g Channel 06

100kHz PSD reference Level



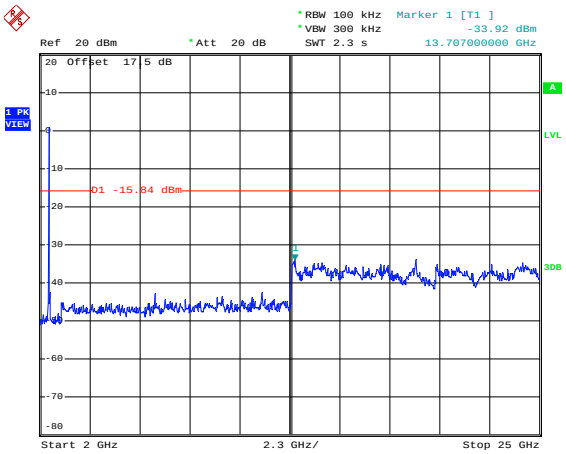
Date: 15.JAN.2014 08:43:20

Spurious Emission 30MHz~3GHz



Date: 15.JAN.2014 08:43:40

Spurious Emission 2GHz~25GHz

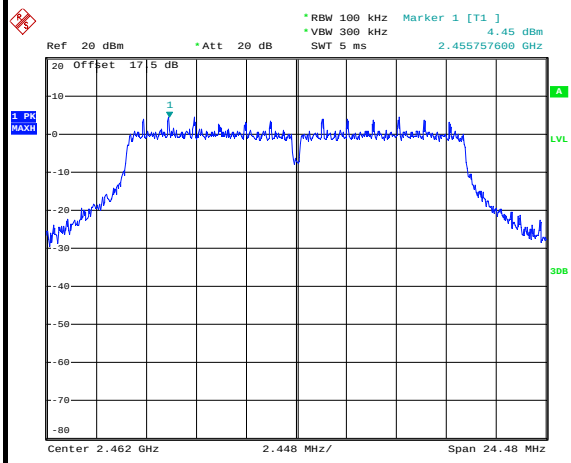


Date: 15.JAN.2014 08:43:58

Test Mode :	802.11g	**Temperature :**	24~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	50~53%
Test Channel :	11	**Test Engineer :**	Fly Liang

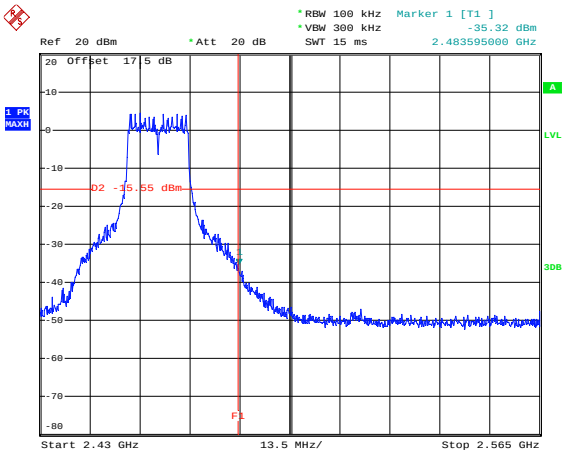
WLAN 802.11g Channel 11

100kHz PSD reference Level



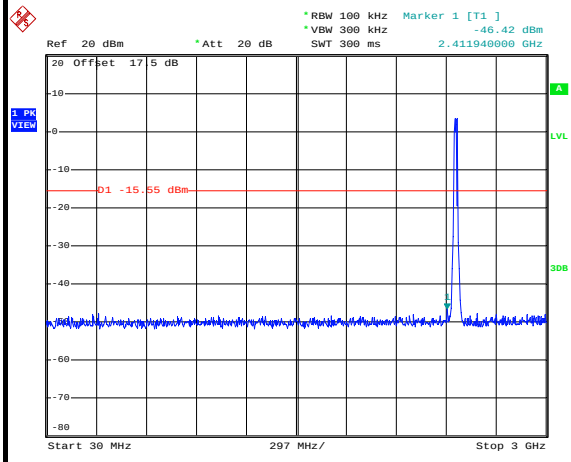
Date: 15.JAN.2014 08:37:56

High Channel Plot



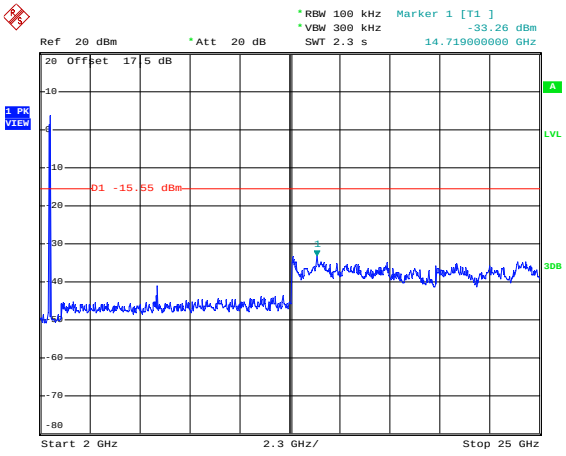
Date: 15.JAN.2014 08:38:10

Spurious Emission 30MHz~3GHz



Date: 15.JAN.2014 08:40:18

Spurious Emission 2GHz~25GHz

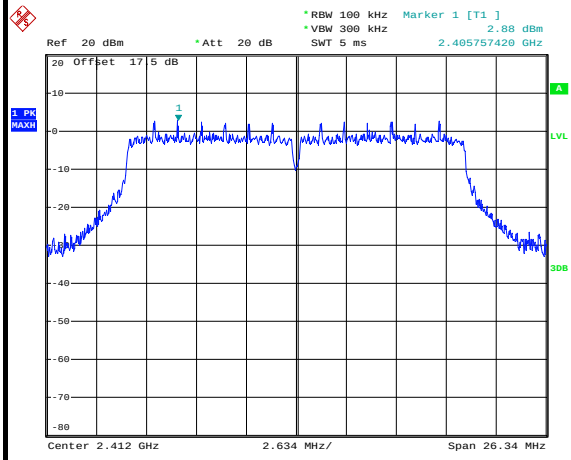


Date: 15.JAN.2014 08:40:37

Test Mode :	802.11n HT20	**Temperature :**	24~26℃
Test Band :	2.4GHz Low	**Relative Humidity :**	50~53%
Test Channel :	01	**Test Engineer :**	Fly Liang

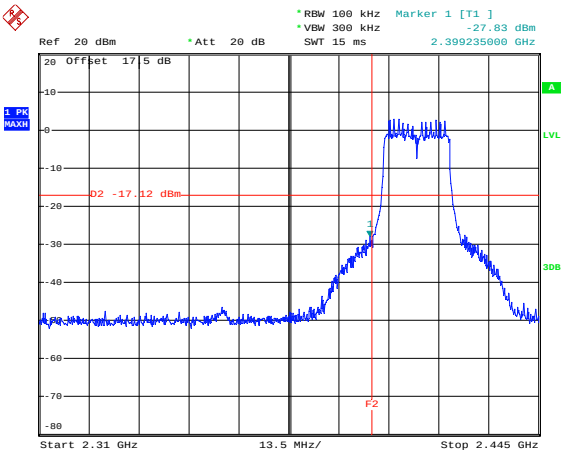
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



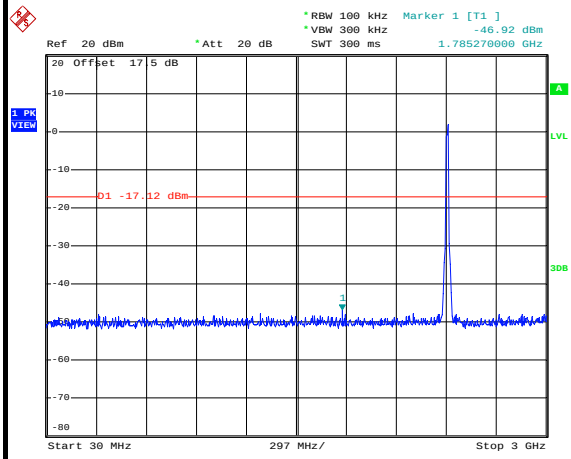
Date: 15.JAN.2014 08:55:04

Low Channel Plot



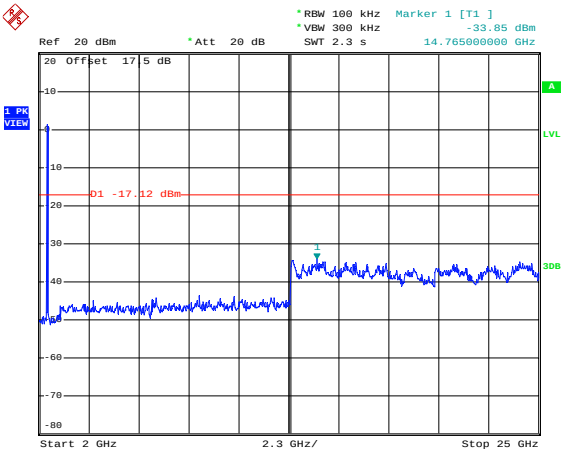
Date: 15.JAN.2014 08:55:17

Spurious Emission 30MHz~3GHz



Date: 15.JAN.2014 08:55:37

Spurious Emission 2GHz~25GHz

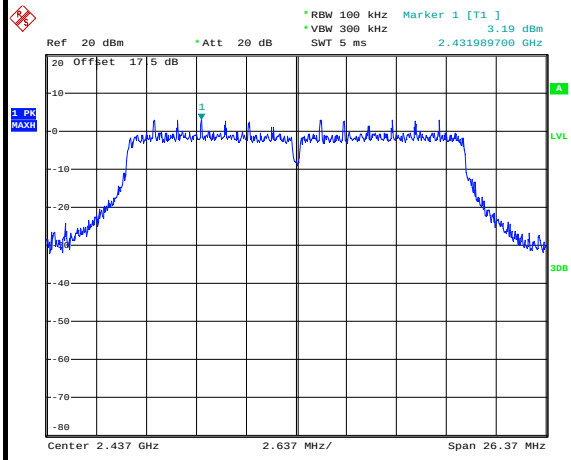


Date: 15.JAN.2014 08:55:55

Test Mode :	802.11n HT20	**Temperature :**	24~26℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	50~53%
Test Channel :	06	**Test Engineer :**	Fly Liang

WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



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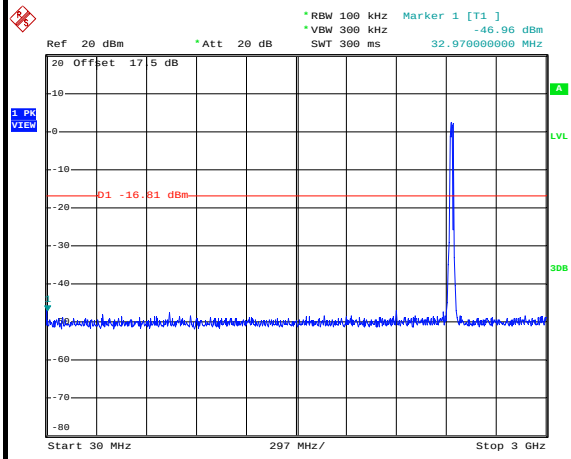
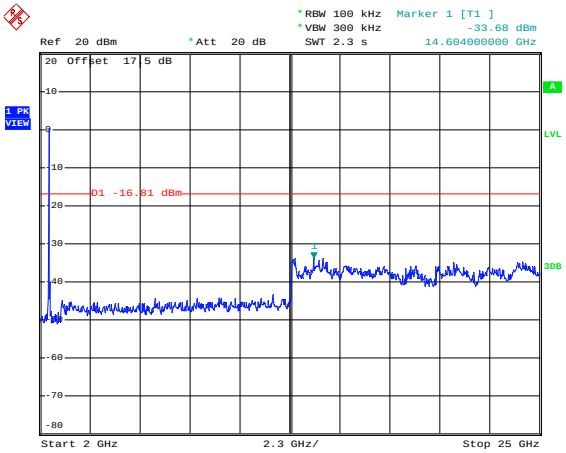
Spurious Emission 30MHz~3GHz



Date: 15.JAN.2014 09:07:24

Spurious Emission 2GHz~25GHz

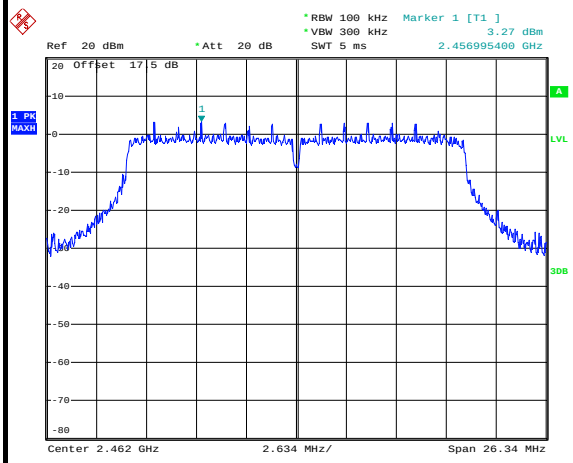


Date: 15.JAN.2014 09:07:43

Test Mode :	802.11n HT20	**Temperature :**	24~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	50~53%
Test Channel :	11	**Test Engineer :**	Fly Liang

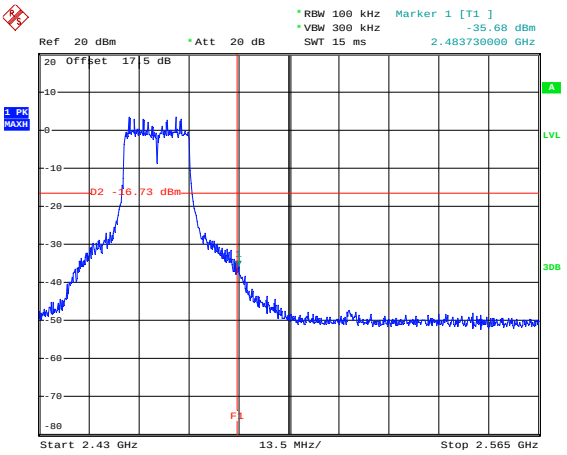
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



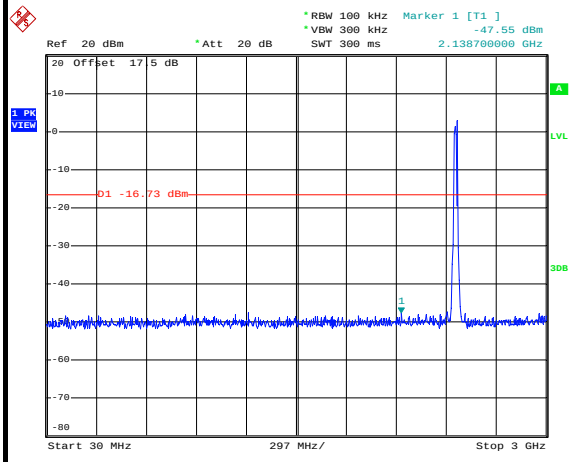
Date: 15.JAN.2014 09:15:08

High Channel Plot



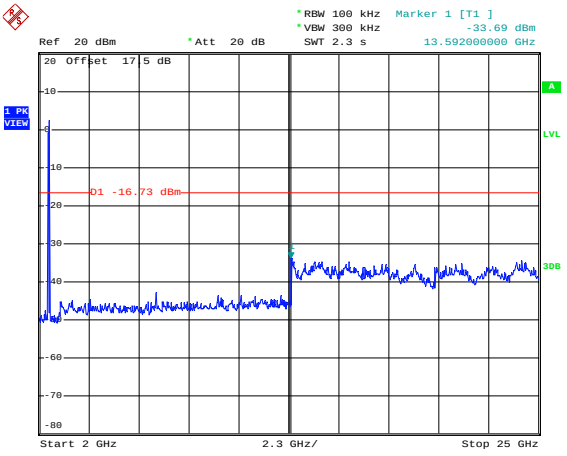
Date: 15.JAN.2014 09:15:22

Spurious Emission 30MHz~3GHz



Date: 15.JAN.2014 09:15:41

Spurious Emission 2GHz~25GHz

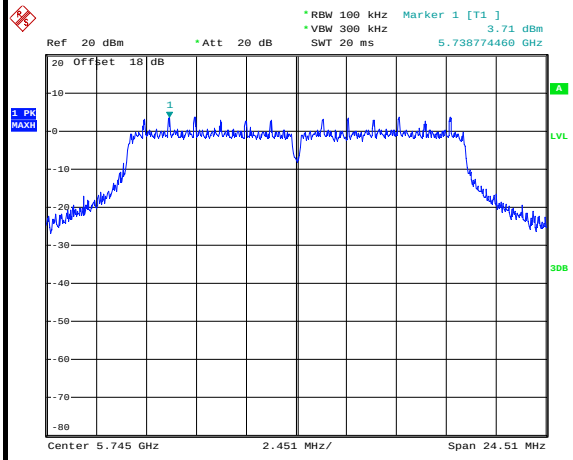


Date: 15.JAN.2014 09:16:00

Test Mode :	802.11a	**Temperature :**	24~26℃
Test Band :	5GHz Low	**Relative Humidity :**	50~53%
Test Channel :	149	**Test Engineer :**	Fly Liang

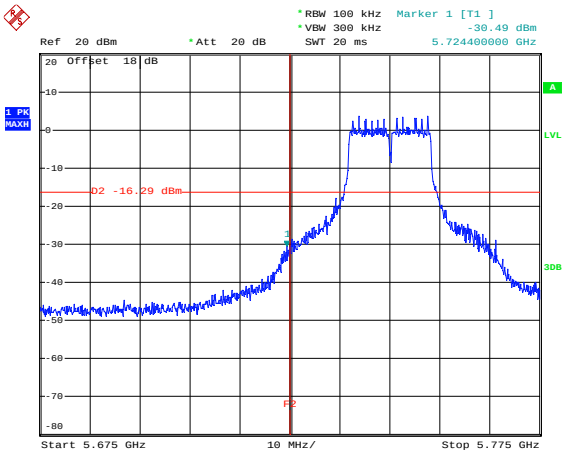
WLAN 802.11a Channel 149

100kHz PSD reference Level



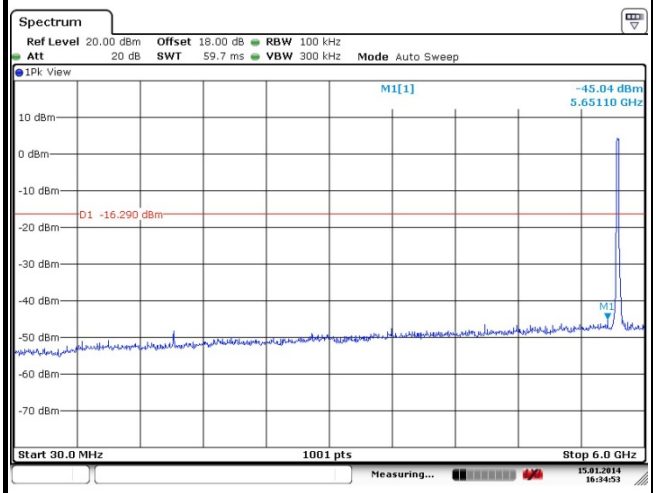
Date: 15.JAN.2014 14:08:27

Low Channel Plot



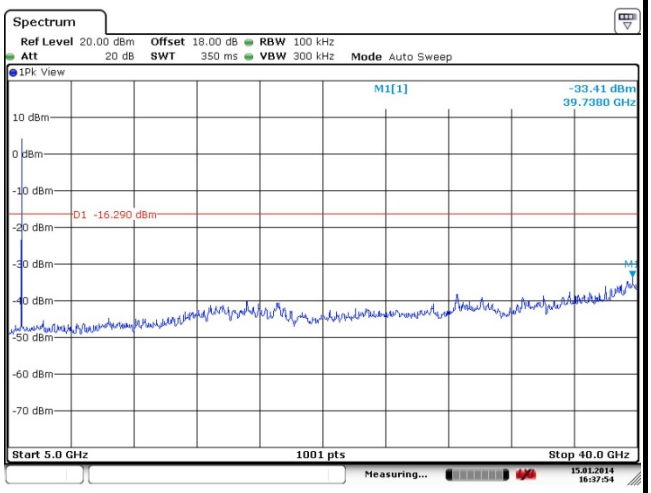
Date: 15.JAN.2014 14:08:41

Spurious Emission 30MHz~6GHz



Date: 15.JAN.2014 16:34:53

Spurious Emission 5GHz~40GHz

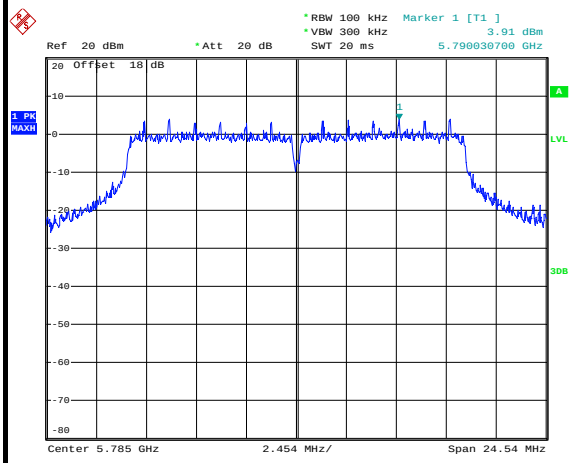


Date: 15.JAN.2014 16:37:54

Test Mode :	802.11a	**Temperature :**	24~26℃
Test Band :	5GHz Mid	**Relative Humidity :**	50~53%
Test Channel :	157	**Test Engineer :**	Fly Liang

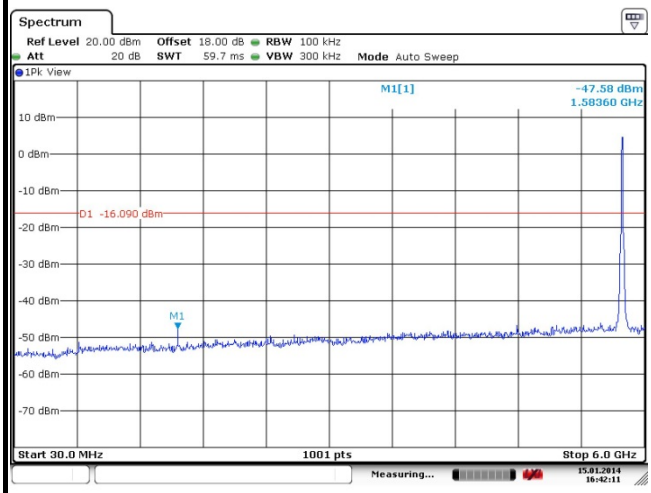
WLAN 802.11a Channel 157

100kHz PSD reference Level



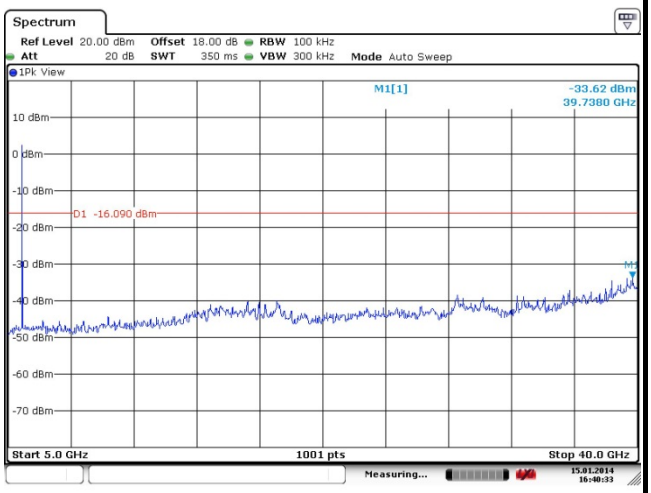
Date: 15.JAN.2014 14:14:09

Spurious Emission 30MHz~6GHz



Date: 15.JAN.2014 16:42:11

Spurious Emission 5GHz~40GHz

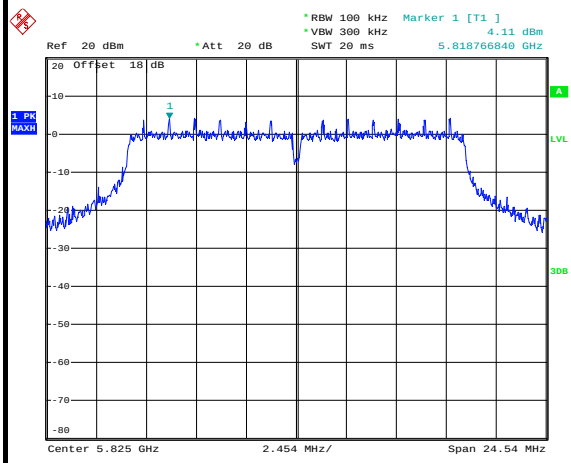


Date: 15.JAN.2014 16:40:33

Test Mode :	802.11a	**Temperature :**	24~26℃
Test Band :	5GHz High	**Relative Humidity :**	50~53%
Test Channel :	165	**Test Engineer :**	Fly Liang

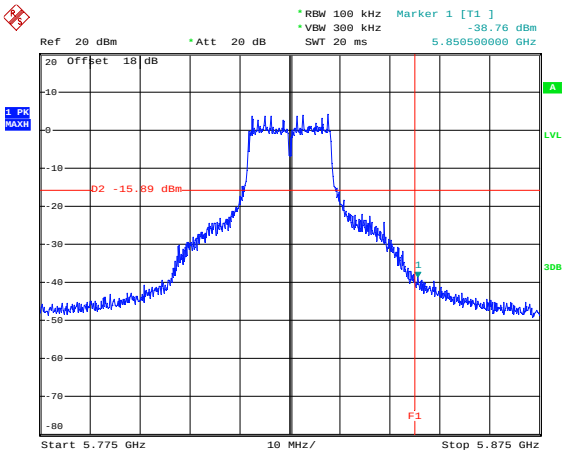
WLAN 802.11a Channel 165

100kHz PSD reference Level



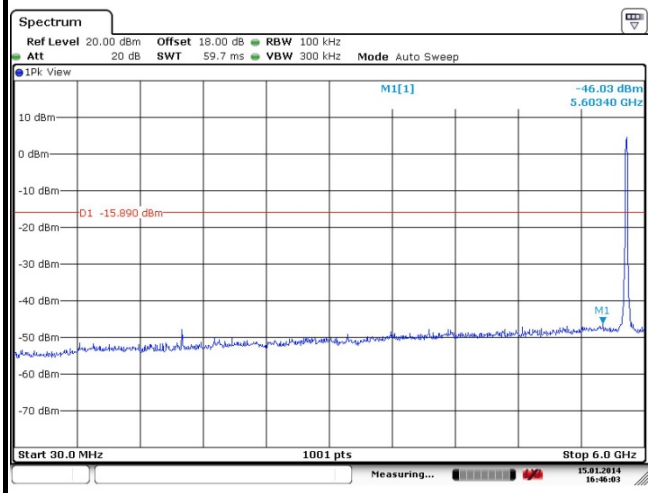
Date: 15.JAN.2014 14:21:13

High Channel Plot



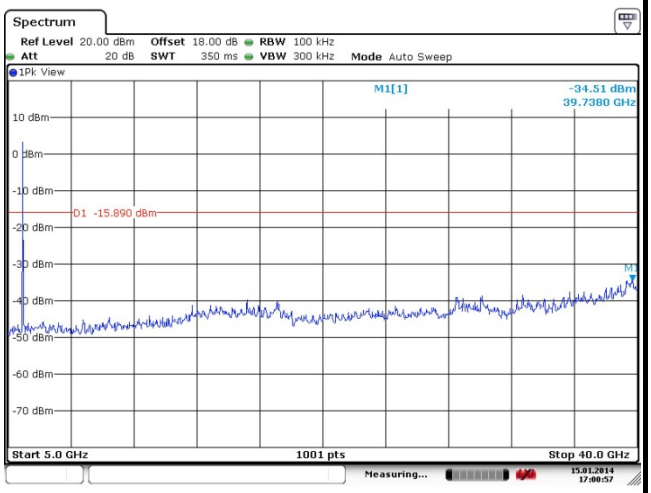
Date: 15.JAN.2014 14:21:27

Spurious Emission 30MHz~6GHz



Date: 15.JAN.2014 16:46:03

Spurious Emission 5GHz~40GHz

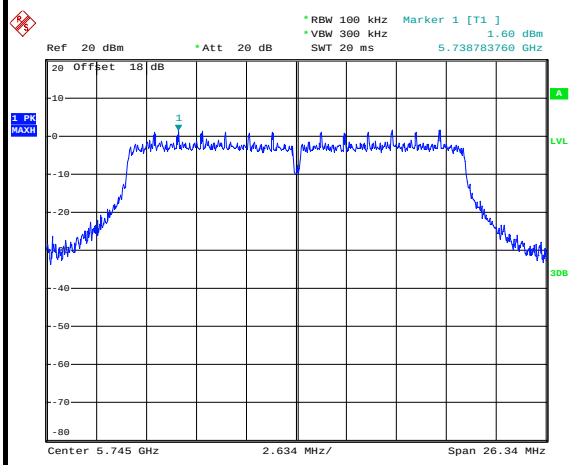


Date: 15.JAN.2014 17:00:58

Test Mode :	802.11n HT20	**Temperature :**	24~26℃
Test Band :	5GHz Low	**Relative Humidity :**	50~53%
Test Channel :	149	**Test Engineer :**	Fly Liang

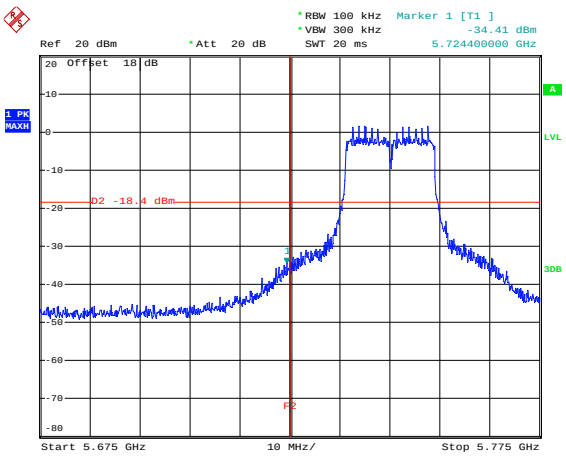
WLAN 802.11n HT20 Channel 149

100kHz PSD reference Level



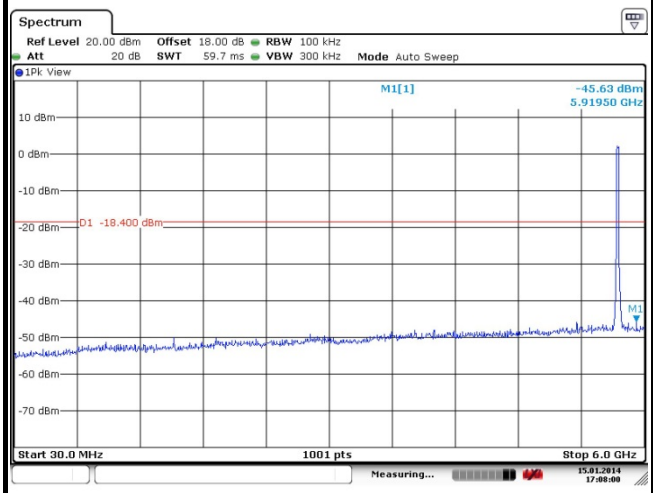
Date: 15.JAN.2014 14:36:05

Low Channel Plot



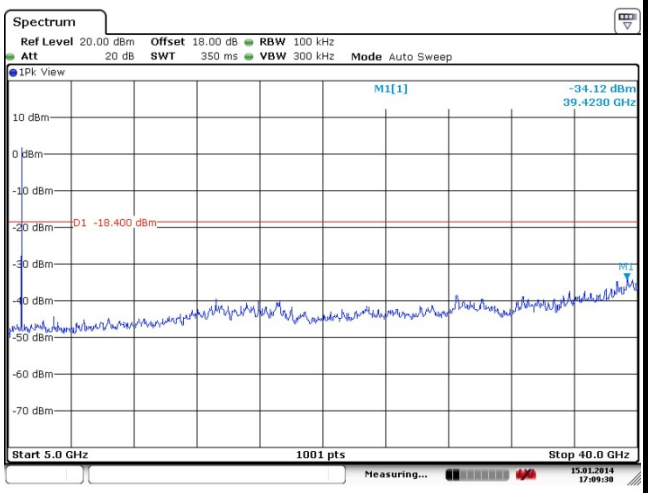
Date: 15.JAN.2014 14:36:19

Spurious Emission 30MHz~6GHz



Date: 15.JAN.2014 17:08:00

Spurious Emission 5GHz~40GHz

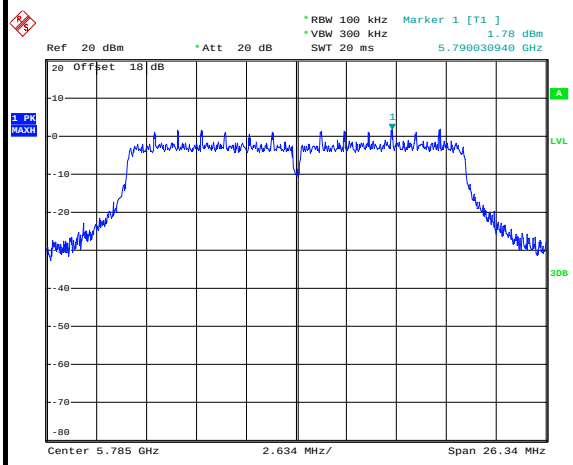


Date: 15.JAN.2014 17:09:30

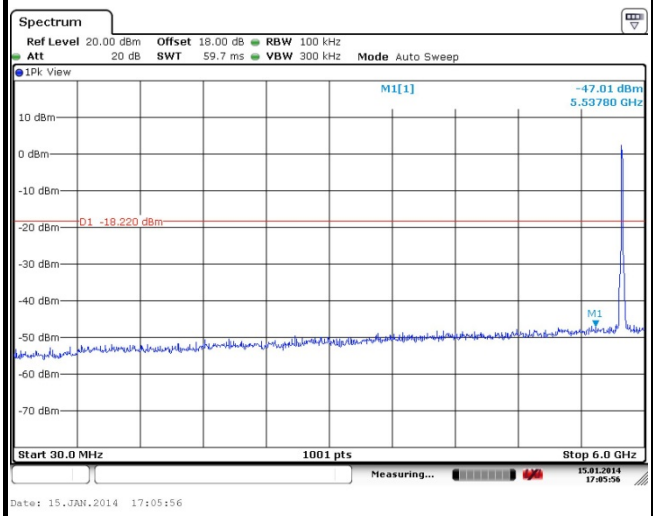
Test Mode :	802.11n HT20	**Temperature :**	24~26℃
Test Band :	5GHz Mid	**Relative Humidity :**	50~53%
Test Channel :	157	**Test Engineer :**	Fly Liang

WLAN 802.11n HT20 Channel 157

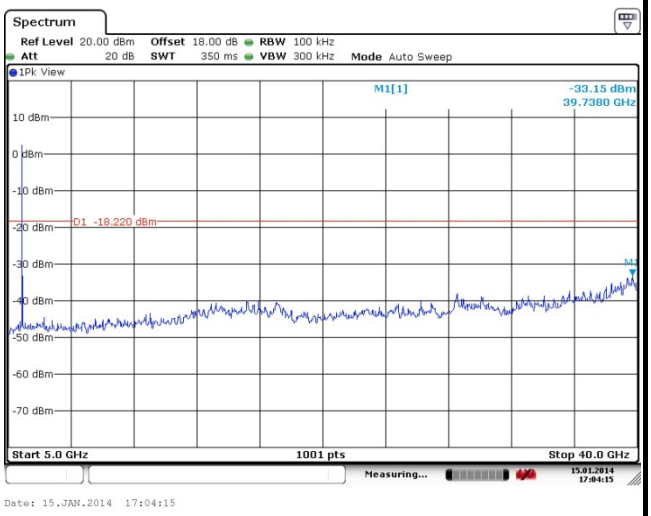
100kHz PSD reference Level



Spurious Emission 30MHz~6GHz



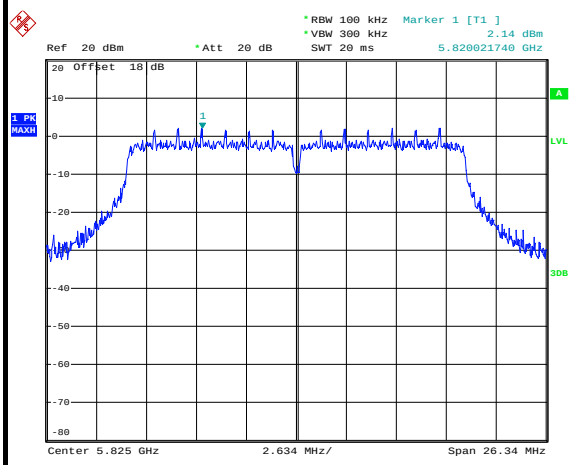
Spurious Emission 5GHz~40GHz



Test Mode :	802.11n HT20	**Temperature :**	24~26℃
Test Band :	5GHz High	**Relative Humidity :**	50~53%
Test Channel :	165	**Test Engineer :**	Fly Liang

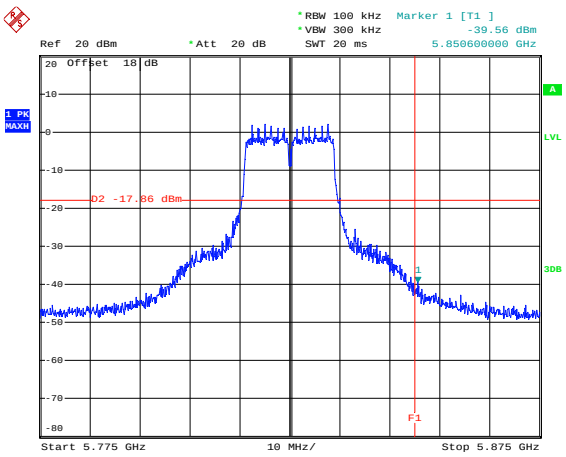
WLAN 802.11n HT20 Channel 165

100kHz PSD reference Level



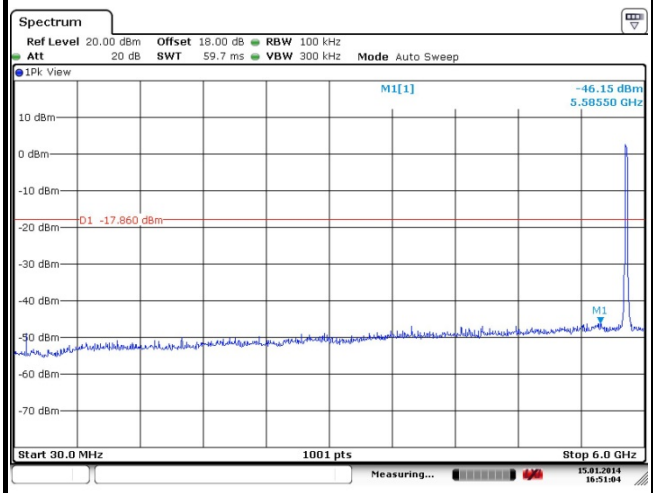
Date: 15.JAN.2014 14:27:29

High Channel Plot



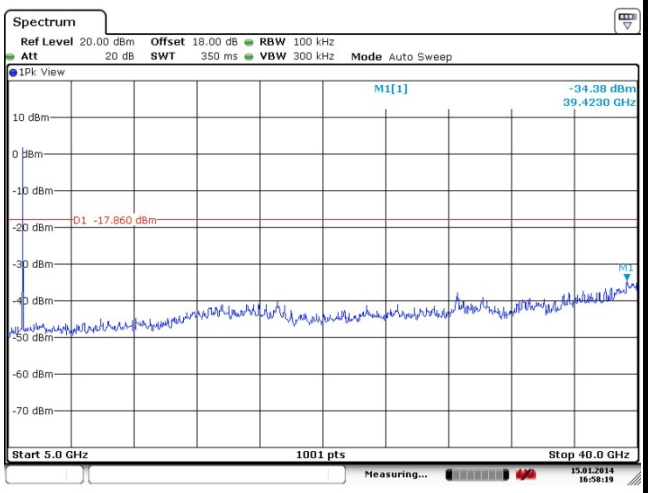
Date: 15.JAN.2014 14:27:43

Spurious Emission 30MHz~6GHz



Date: 15.JAN.2014 16:51:04

Spurious Emission 5GHz~40GHz

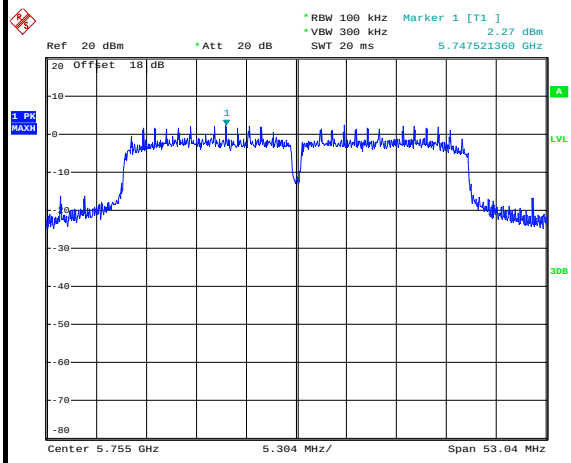


Date: 15.JAN.2014 16:58:20

Test Mode :	802.11n HT40	**Temperature :**	24~26℃
Test Band :	5GHz Low	**Relative Humidity :**	50~53%
Test Channel :	151	**Test Engineer :**	Fly Liang

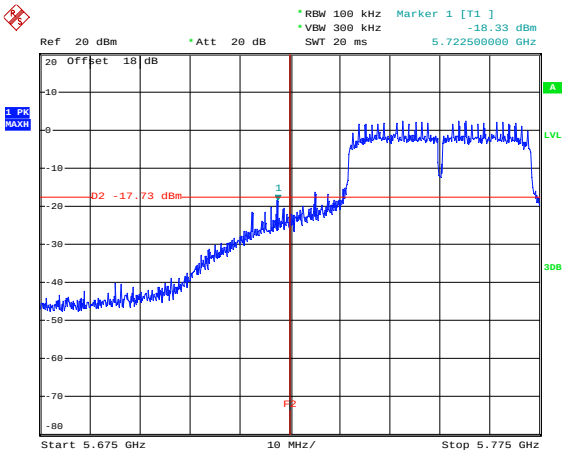
WLAN 802.11n HT40 Channel 151

100kHz PSD reference Level



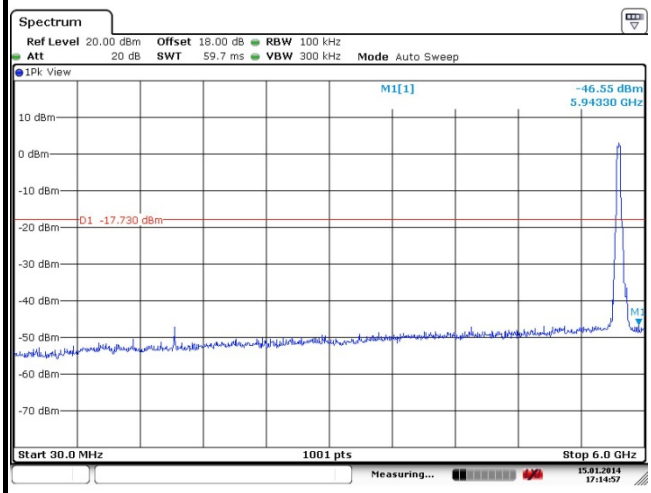
Date: 15.JAN.2014 14:40:55

Low Channel Plot



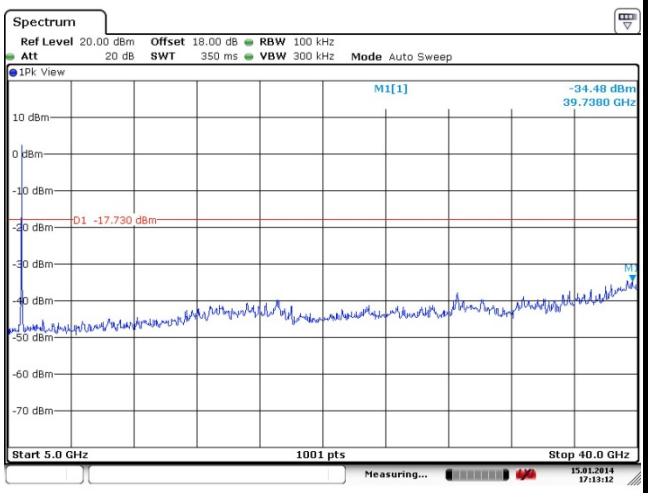
Date: 15.JAN.2014 14:43:11

Spurious Emission 30MHz~6GHz



Date: 15.JAN.2014 17:14:57

Spurious Emission 5GHz~40GHz

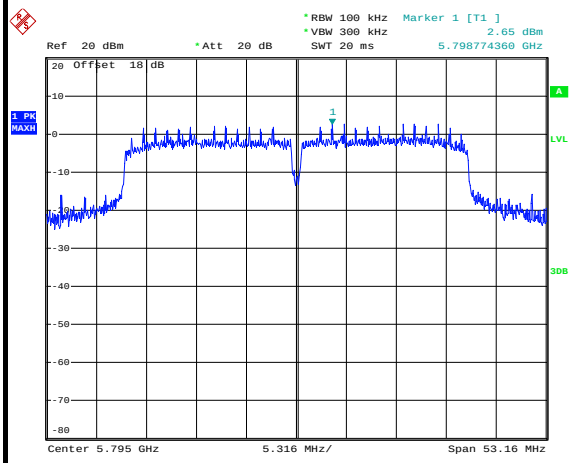


Date: 15.JAN.2014 17:13:12

Test Mode :	802.11n HT40	**Temperature :**	24~26℃
Test Band :	5GHz High	**Relative Humidity :**	50~53%
Test Channel :	159	**Test Engineer :**	Fly Liang

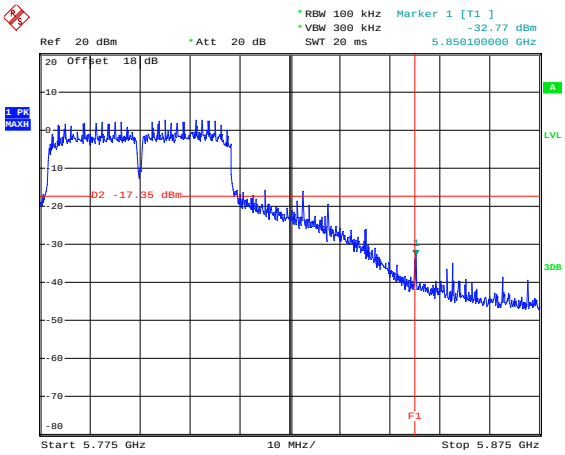
WLAN 802.11n HT40 Channel 159

100kHz PSD reference Level



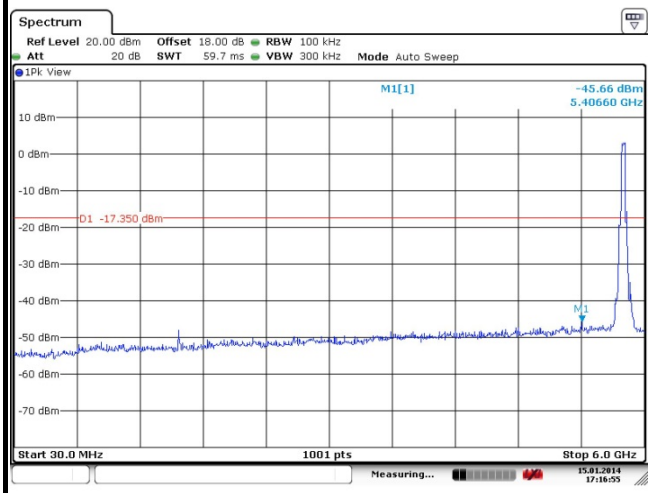
Date: 15.JAN.2014 14:50:47

High Channel Plot



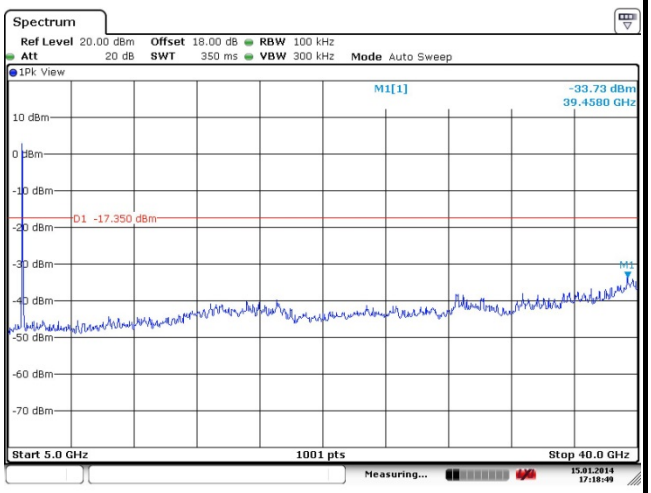
Date: 15.JAN.2014 14:55:20

Spurious Emission 30MHz~6GHz



Date: 15.JAN.2014 17:16:55

Spurious Emission 5GHz~40GHz



Date: 15.JAN.2014 17:18:49

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

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

3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

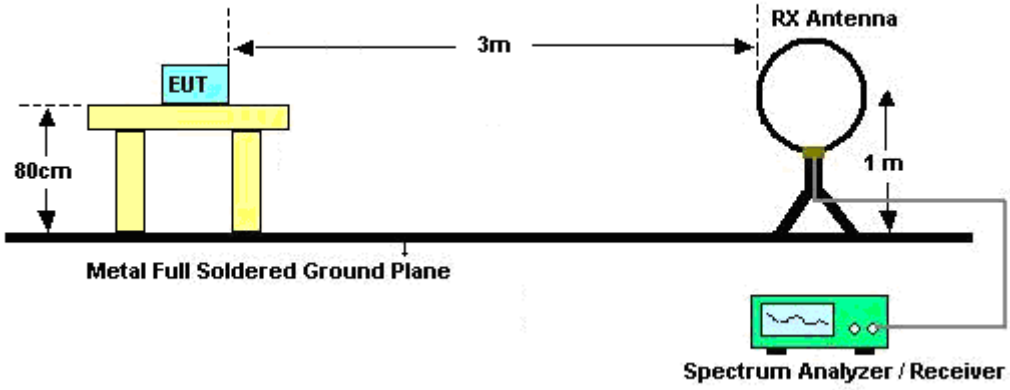
3.5.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

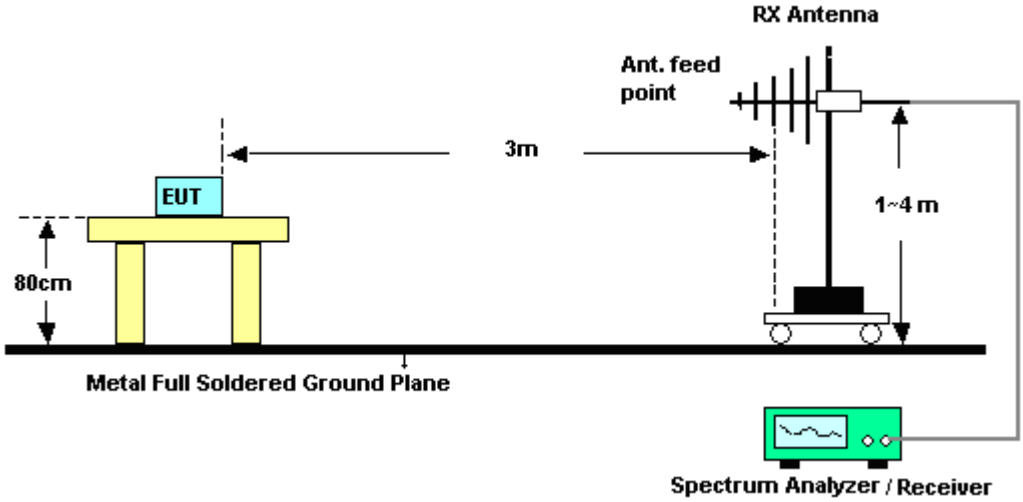
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	99.06	-	-	10Hz
802.11g	93.60	1.40	0.71	1kHz
2.4GHz 802.11n HT20	93.11	1.30	0.77	1kHz
802.11a	93.60	1.40	0.71	1kHz
5GHz 802.11n HT20	92.94	1.30	0.77	1kHz
5GHz 802.11n HT40	86.53	0.63	1.58	3kHz

3.5.4 Test Setup

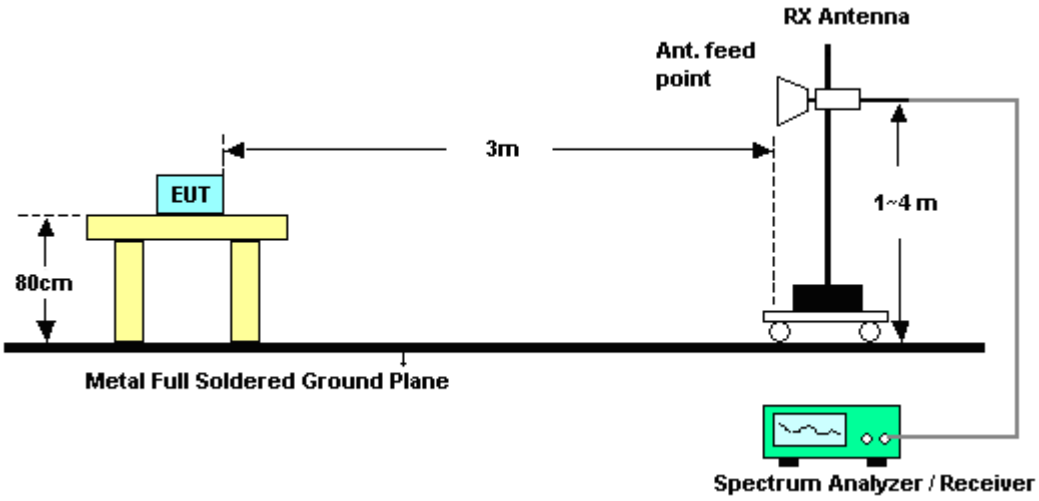
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.5.6 Test Result of Radiated Spurious at Band Edges

Test Mode :	802.11b	**Temperature :**	23~25°C
Test Band :	Low	**Relative Humidity :**	48~52%
Test Channel :	01	**Test Engineer :**	Gavin Zhang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.47	50.24	-23.76	74	43.26	31.98	5.59	30.59	100	234	Peak
2386.32	40.11	-13.89	54	33.13	31.98	5.59	30.59	100	234	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2364.36	52.45	-21.55	74	45.64	31.81	5.59	30.59	119	182	Peak
2386.41	39.74	-14.26	54	32.76	31.98	5.59	30.59	119	182	Average

Test Mode :	802.11b	**Temperature :**	23~25°C
Test Band :	High	**Relative Humidity :**	48~52%
Test Channel :	11	**Test Engineer :**	Gavin Zhang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2495.68	56.05	-17.95	74	48.25	32.5	5.74	30.44	131	10	Peak
2487.67	43.03	-10.97	54	35.29	32.5	5.71	30.47	131	10	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2489.89	49.5	-24.5	74	41.76	32.5	5.71	30.47	100	52	Peak
2484.37	38.41	-15.59	54	30.76	32.41	5.71	30.47	100	52	Average

Test Mode :	802.11g	**Temperature :**	23~25°C
Test Band :	Low	**Relative Humidity :**	48~52%
Test Channel :	01	**Test Engineer :**	Gavin Zhang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2386.77	63.73	-10.27	74	56.75	31.98	5.59	30.59	100	239	Peak
2389.74	46.64	-7.36	54	39.66	31.98	5.59	30.59	100	239	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	56.49	-17.51	74	49.45	31.98	5.62	30.56	119	102	Peak
2389.74	44.86	-9.14	54	37.88	31.98	5.59	30.59	119	102	Average

Test Mode :	802.11g	**Temperature :**	23~25°C
Test Band :	High	**Relative Humidity :**	48~52%
Test Channel :	11	**Test Engineer :**	Gavin Zhang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.89	60.56	-13.44	74	52.91	32.41	5.71	30.47	129	10	Peak
2484.55	47.71	-6.29	54	40.06	32.41	5.71	30.47	129	10	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.34	52.94	-21.06	74	45.29	32.41	5.71	30.47	100	52	Peak
2484.43	41.25	-12.75	54	33.6	32.41	5.71	30.47	100	52	Average

Test Mode :	802.11n HT20	**Temperature :**	23~25°C
Test Band :	Low	**Relative Humidity :**	48~52%
Test Channel :	01	**Test Engineer :**	Gavin Zhang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.92	59.47	-14.53	74	52.43	31.98	5.62	30.56	100	237	Peak
2389.56	46.16	-7.84	54	39.18	31.98	5.59	30.59	100	237	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.92	57.67	-16.33	74	50.63	31.98	5.62	30.56	120	184	Peak
2389.65	43.48	-10.52	54	36.5	31.98	5.59	30.59	120	184	Average

Test Mode :	802.11n HT20	**Temperature :**	23~25°C
Test Band :	High	**Relative Humidity :**	48~52%
Test Channel :	11	**Test Engineer :**	Gavin Zhang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.01	62	-12	74	54.35	32.41	5.71	30.47	129	11	Peak
2484.25	47.77	-6.23	54	40.12	32.41	5.71	30.47	129	11	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.83	53.7	-20.3	74	46.05	32.41	5.71	30.47	100	52	Peak
2483.68	41.23	-12.77	54	33.58	32.41	5.71	30.47	100	52	Average

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

Note: Pre-scanned all test modes and only choose the worst case mode recorded in the test report for radiated spurious emission below 1GHz.

Test Mode :	802.11b	**Temperature :**	23~25°C
Test Channel :	01	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	98.51	-	-	91.38	32.07	5.62	30.56	100	234	Peak
2412	96.41	-	-	89.28	32.07	5.62	30.56	100	234	Average
4824	37.78	-36.22	74	52.86	33.82	8.36	57.26	102	185	Peak

Test Mode :	802.11b	**Temperature :**	23~25°C
Test Channel :	01	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	95.59	-	-	88.46	32.07	5.62	30.56	119	182	Peak
2412	93.4	-	-	86.27	32.07	5.62	30.56	119	182	Average
4824	37.52	-36.48	74	52.6	33.82	8.36	57.26	102	185	Peak

Test Mode :	802.11b	**Temperature :**	23~25°C
Test Channel :	06	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	100.45	-	-	93.09	32.24	5.65	30.53	103	11	Peak
2437	98.18	-	-	90.82	32.24	5.65	30.53	103	11	Average
4874	36.75	-37.25	74	51.58	33.93	8.41	57.17	103	200	Peak
7311	37.68	-36.32	74	50.96	33.89	9.99	57.16	152	324	Peak

Test Mode :	802.11b	**Temperature :**	23~25°C
Test Channel :	06	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	94.59	-	-	87.23	32.24	5.65	30.53	142	14	Peak
2437	92.35	-	-	84.99	32.24	5.65	30.53	142	14	Average
4874	37.16	-36.84	74	51.99	33.93	8.41	57.17	103	200	Peak
7311	38.92	-35.08	74	52.2	33.89	9.99	57.16	152	324	Peak

Test Mode :	802.11b	**Temperature :**	23~25°C
Test Channel :	11	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	101.03	-	-	93.52	32.33	5.68	30.5	131	10	Peak
2462	98.82	-	-	91.31	32.33	5.68	30.5	131	10	Average
4924	36.2	-37.8	74	50.77	34.05	8.46	57.08	120	190	Peak
7386	37.49	-36.51	74	50.58	33.94	10.02	57.05	145	203	Peak

Test Mode :	802.11b	**Temperature :**	23~25°C
Test Channel :	11	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	92.33	-	-	84.82	32.33	5.68	30.5	100	52	Peak
2462	90.23	-	-	82.72	32.33	5.68	30.5	100	52	Average
4924	36.16	-37.84	74	50.73	34.05	8.46	57.08	120	190	Peak
7386	37.22	-36.78	74	50.31	33.94	10.02	57.05	145	203	Peak

Test Mode :	802.11g	**Temperature :**	23~25°C
Test Channel :	01	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	100.98	-	-	93.85	32.07	5.62	30.56	100	239	Peak
2412	92.03	-	-	84.9	32.07	5.62	30.56	100	239	Average
4824	36.93	-37.07	74	52.01	33.82	8.36	57.26	102	185	Peak

Test Mode :	802.11g	**Temperature :**	23~25°C
Test Channel :	01	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	96.4	-	-	89.27	32.07	5.62	30.56	119	102	Peak
2412	87.68	-	-	80.55	32.07	5.62	30.56	119	102	Average
4824	38.15	-35.85	74	53.23	33.82	8.36	57.26	102	185	Peak

Test Mode :	802.11g	**Temperature :**	23~25°C
Test Channel :	06	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	101.66	-	-	94.3	32.24	5.65	30.53	105	9	Peak
2437	92.94	-	-	85.58	32.24	5.65	30.53	105	9	Average
4874	36.95	-37.05	74	51.78	33.93	8.41	57.17	103	200	Peak
7311	38.1	-35.9	74	51.38	33.89	9.99	57.16	152	324	Peak

Test Mode :	802.11g	**Temperature :**	23~25°C
Test Channel :	06	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	95.76	-	-	88.4	32.24	5.65	30.53	178	53	Peak
2437	86.99	-	-	79.63	32.24	5.65	30.53	178	53	Average
4874	38.44	-35.56	74	53.27	33.93	8.41	57.17	103	200	Peak
7311	37.55	-36.45	74	50.83	33.89	9.99	57.16	152	324	Peak

Test Mode :	802.11g	**Temperature :**	23~25°C
Test Channel :	11	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	100.98	-	-	93.47	32.33	5.68	30.5	129	10	Peak
2462	92.11	-	-	84.6	32.33	5.68	30.5	129	10	Average
4924	36.77	-37.23	74	51.34	34.05	8.46	57.08	120	190	Peak
7386	38.55	-35.45	74	51.64	33.94	10.02	57.05	145	203	Peak

Test Mode :	802.11g	**Temperature :**	23~25°C
Test Channel :	11	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	92.67	-	-	85.16	32.33	5.68	30.5	100	52	Peak
2462	84.68	-	-	77.17	32.33	5.68	30.5	100	52	Average
4924	36.19	-37.81	74	50.76	34.05	8.46	57.08	120	190	Peak
7386	37.48	-36.52	74	50.57	33.94	10.02	57.05	145	203	Peak

Test Mode :	2.4GHz 802.11n HT20	**Temperature :**	23~25°C
Test Channel :	01	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	97.59	-	-	90.46	32.07	5.62	30.56	100	237	Peak
2412	88.78	-	-	81.65	32.07	5.62	30.56	100	237	Average
4824	37.23	-36.77	74	52.31	33.82	8.36	57.26	102	185	Peak

Test Mode :	2.4GHz 802.11n HT20	**Temperature :**	23~25°C
Test Channel :	01	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	94.44	-	-	87.31	32.07	5.62	30.56	120	184	Peak
2412	85.76	-	-	78.63	32.07	5.62	30.56	120	184	Average
4824	38.21	-35.79	74	53.29	33.82	8.36	57.26	102	185	Peak

Test Mode :	2.4GHz 802.11n HT20	**Temperature :**	23~25°C
Test Channel :	06	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	100.72	-	-	93.36	32.24	5.65	30.53	104	12	Peak
2437	91.6	-	-	84.24	32.24	5.65	30.53	104	12	Average
4874	37.86	-36.14	74	52.69	33.93	8.41	57.17	103	200	Peak
7311	39.32	-34.68	74	52.6	33.89	9.99	57.16	152	324	Peak

Test Mode :	2.4GHz 802.11n HT20	**Temperature :**	23~25°C
Test Channel :	06	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	97.13	-	-	89.77	32.24	5.65	30.53	116	105	Peak
2437	88.11	-	-	80.75	32.24	5.65	30.53	116	105	Average
4874	37.26	-36.74	74	52.09	33.93	8.41	57.17	103	200	Peak
7311	38.28	-35.72	74	51.56	33.89	9.99	57.16	152	324	Peak

Test Mode :	2.4GHz 802.11n HT20	**Temperature :**	23~25°C
Test Channel :	11	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
61.04	16.74	-23.26	40	38.18	8.08	1.01	30.53	-	-	Peak
170.65	19.03	-24.47	43.5	37.31	10.58	1.57	30.43	-	-	Peak
274.44	23.71	-22.29	46	39.39	12.48	1.93	30.09	-	-	Peak
321.97	24.45	-21.55	46	38.06	14.24	2.08	29.93	-	-	Peak
405.39	27.56	-18.44	46	38.67	16.23	2.31	29.65	158	201	Peak
936.95	26.35	-19.65	46	30.47	21.2	3.43	28.75	-	-	Peak
2462	100.52	-	-	93.01	32.33	5.68	30.5	129	11	Peak
2462	91.96	-	-	84.45	32.33	5.68	30.5	129	11	Average
4924	36.95	-37.05	74	51.52	34.05	8.46	57.08	120	190	Peak
7386	37.26	-36.74	74	50.35	33.94	10.02	57.05	145	203	Peak

Test Mode :	2.4GHz 802.11n HT20	**Temperature :**	23~25°C
Test Channel :	11	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
62.01	17.3	-22.7	40	38.97	7.86	1.01	30.54	-	-	Peak
130.88	17.06	-26.44	43.5	34.09	12.14	1.39	30.56	-	-	Peak
275.41	20.24	-25.76	46	35.89	12.5	1.93	30.08	-	-	Peak
405.39	22.09	-23.91	46	33.2	16.23	2.31	29.65	-	-	Peak
578.05	23.77	-22.23	46	31.72	18.56	2.72	29.23	-	-	Peak
881.66	25.88	-20.12	46	30.66	20.76	3.29	28.83	165	159	Peak
2462	93.75	-	-	86.24	32.33	5.68	30.5	100	52	Peak
2462	84.96	-	-	77.45	32.33	5.68	30.5	100	52	Average
4924	37.09	-36.91	74	51.66	34.05	8.46	57.08	120	190	Peak
7386	38.55	-35.45	74	51.64	33.94	10.02	57.05	145	203	Peak

Test Mode :	802.11a	**Temperature :**	23~25°C
Test Channel :	149	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 5745 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5745	99.48	-	-	85.95	34	9.14	29.61	113	324	Peak
5745	91.12	-	-	77.59	34	9.14	29.61	113	324	Average
11490	49.26	-24.74	74	54.52	37.77	13.39	56.42	145	265	Peak

Test Mode :	802.11a	**Temperature :**	23~25°C
Test Channel :	149	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 5745 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5745	94.91	-	-	81.38	34	9.14	29.61	104	91	Peak
5745	86.56	-	-	73.03	34	9.14	29.61	104	91	Average
11490	49.22	-24.78	74	54.48	37.77	13.39	56.42	145	265	Peak

Test Mode :	802.11a	**Temperature :**	23~25°C
Test Channel :	157	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 5785 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5785	98.77	-	-	85.25	34	9.16	29.64	100	34	Peak
5785	90.52	-	-	77	34	9.16	29.64	100	34	Average
11570	49.1	-24.9	74	54.19	37.86	13.41	56.36	105	198	Peak

Test Mode :	802.11a	**Temperature :**	23~25°C
Test Channel :	157	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 5785 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5785	96.64	-	-	83.12	34	9.16	29.64	123	66	Peak
5785	88.44	-	-	74.92	34	9.16	29.64	123	66	Average
11570	49.49	-24.51	74	54.58	37.86	13.41	56.36	105	198	Peak

Test Mode :	802.11a	**Temperature :**	23~25°C
Test Channel :	165	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 5825 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5825	99.46	-	-	85.95	34	9.17	29.66	110	36	Peak
5825	91.1	-	-	77.59	34	9.17	29.66	110	36	Average
11650	45.88	-28.12	74	50.86	37.91	13.42	56.31	146	347	Peak

Test Mode :	802.11a	**Temperature :**	23~25°C
Test Channel :	165	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 5825 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5825	96.66	-	-	83.15	34	9.17	29.66	113	65	Peak
5825	87.99	-	-	74.48	34	9.17	29.66	113	65	Average
11650	50.12	-23.88	74	55.1	37.91	13.42	56.31	146	347	Peak

Test Mode :	5GHz 802.11n HT20	**Temperature :**	23~25°C
Test Channel :	149	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 5745 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5745	97.99	-	-	84.46	34	9.14	29.61	100	35	Peak
5745	89.48	-	-	75.95	34	9.14	29.61	100	35	Average
11490	48.94	-25.06	74	54.2	37.77	13.39	56.42	145	265	Peak

Test Mode :	5GHz 802.11n HT20	**Temperature :**	23~25°C
Test Channel :	149	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 5745 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5745	93	-	-	79.47	34	9.14	29.61	112	92	Peak
5745	84.46	-	-	70.93	34	9.14	29.61	112	92	Average
11490	49	-25	74	54.26	37.77	13.39	56.42	145	265	Peak

Test Mode :	5GHz 802.11n HT20	**Temperature :**	23~25°C
Test Channel :	157	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 5785 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5785	97.41	-	-	83.89	34	9.16	29.64	111	332	Peak
5785	88.68	-	-	75.16	34	9.16	29.64	111	332	Average
11570	48.15	-25.85	74	53.24	37.86	13.41	56.36	105	198	Peak

Test Mode :	5GHz 802.11n HT20	**Temperature :**	23~25°C
Test Channel :	157	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 5785 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5785	91.75	-	-	78.23	34	9.16	29.64	102	88	Peak
5785	83.71	-	-	70.19	34	9.16	29.64	102	88	Average
11570	50.29	-23.71	74	55.38	37.86	13.41	56.36	105	198	Peak

Test Mode :	5GHz 802.11n HT20	**Temperature :**	23~25°C
Test Channel :	165	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 5825 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5825	96.87	-	-	83.36	34	9.17	29.66	100	326	Peak
5825	88.72	-	-	75.21	34	9.17	29.66	100	326	Average
11650	47.86	-26.14	74	52.84	37.91	13.42	56.31	146	347	Peak

Test Mode :	5GHz 802.11n HT20	**Temperature :**	23~25°C
Test Channel :	165	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 5825 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5825	92.35	-	-	78.84	34	9.17	29.66	103	91	Peak
5825	83.67	-	-	70.16	34	9.17	29.66	103	91	Average
11650	47.2	-26.8	74	52.18	37.91	13.42	56.31	146	347	Peak

Test Mode :	5GHz 802.11n HT40	**Temperature :**	23~25°C
Test Channel :	151	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 5755 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5755	97.52	-	-	83.99	34	9.14	29.61	100	34	Peak
5755	89.44	-	-	75.91	34	9.14	29.61	100	34	Average
11510	49.6	-24.4	74	54.8	37.8	13.4	56.4	174	321	Peak

Test Mode :	5GHz 802.11n HT40	**Temperature :**	23~25°C
Test Channel :	151	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 5755 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5755	93.6	-	-	80.07	34	9.14	29.61	102	104	Peak
5755	85.56	-	-	72.03	34	9.14	29.61	102	104	Average
11510	50.38	-23.62	74	55.58	37.8	13.4	56.4	174	321	Peak

Test Mode :	5GHz 802.11n HT40	**Temperature :**	23~25°C
Test Channel :	159	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Horizontal
Remark :	1. 5795 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5795	97.29	-	-	83.77	34	9.16	29.64	100	38	Peak
5795	89.38	-	-	75.86	34	9.16	29.64	100	38	Average
11590	48.25	-25.75	74	53.32	37.87	13.41	56.35	145	265	Peak

Test Mode :	5GHz 802.11n HT40	**Temperature :**	23~25°C
Test Channel :	159	**Relative Humidity :**	48~52%
Test Engineer :	Gavin Zhang	**Polarization :**	Vertical
Remark :	1. 5795 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5795	93.92	-	-	80.4	34	9.16	29.64	103	68	Peak
5795	85.61	-	-	72.09	34	9.16	29.64	103	68	Average
11590	49.89	-24.11	74	54.96	37.87	13.41	56.35	145	265	Peak

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 (dBμV)	
	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.

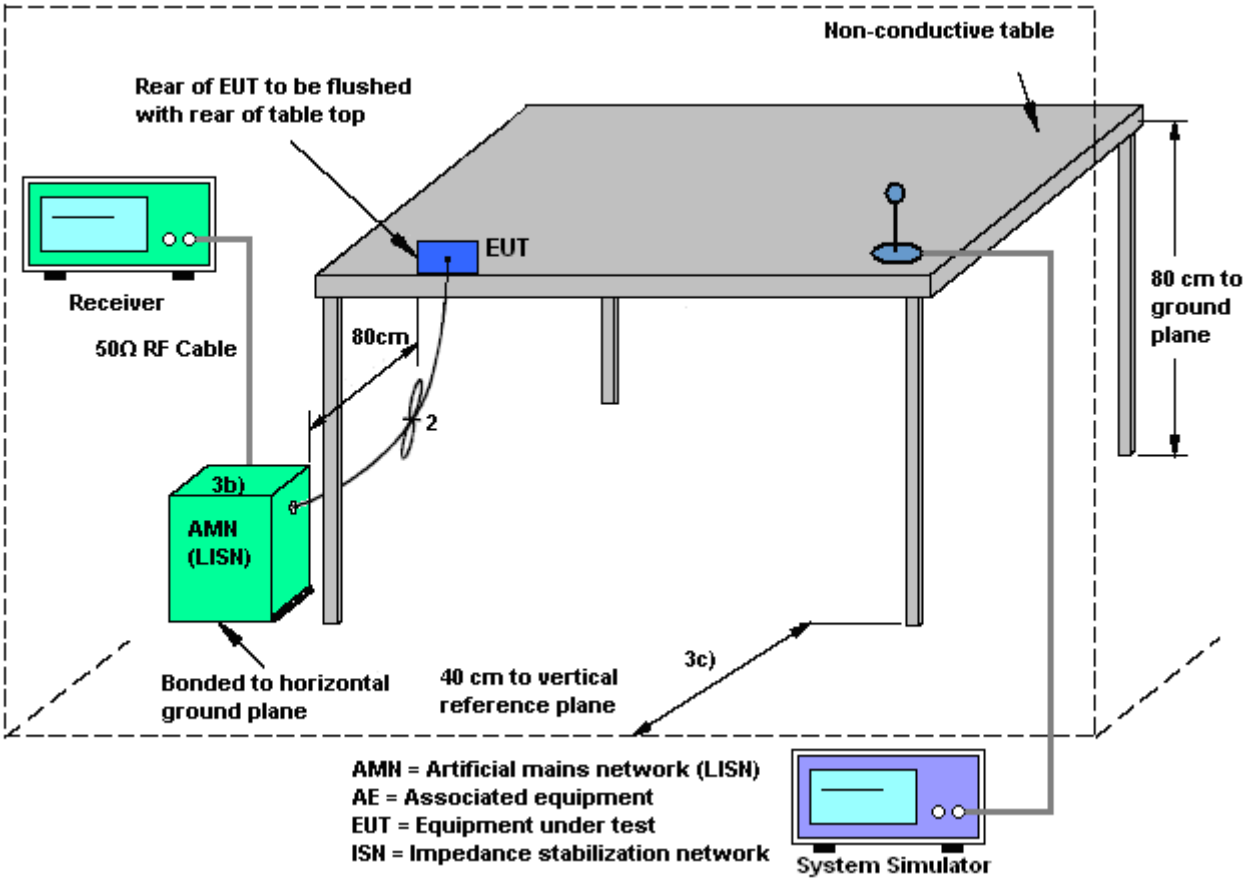
3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

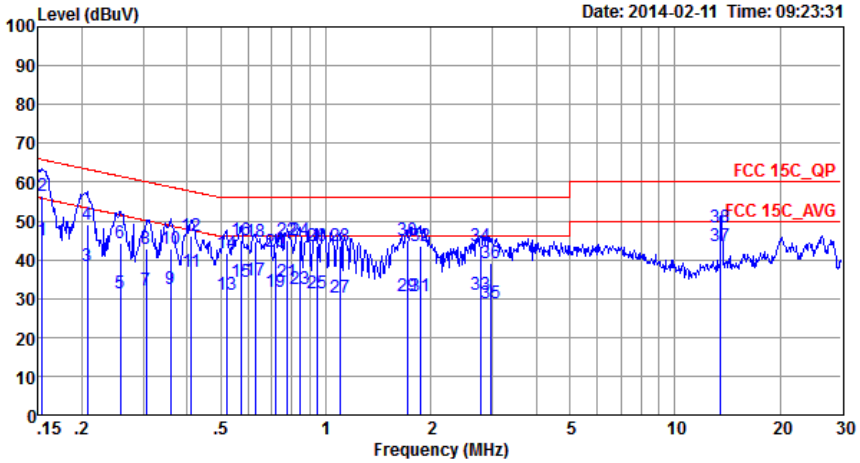
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. 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

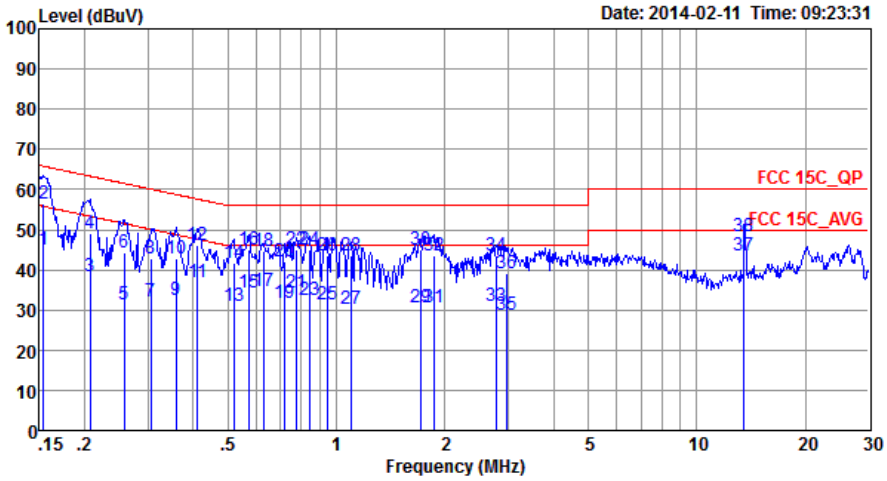
Test Mode :	Mode 1	**Temperature :**	21~22℃
Test Engineer :	Henry Chen	**Relative Humidity :**	41~42%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4GHz) Link + NFC On + Earphone + USB Cable (Charging from Adapter) + SIM1		



Site : CO01-SZ
Condition: FCC 15C QP LISN L 20130328 LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15	44.91	-10.87	55.78	34.50	0.06	10.35	Average
2	0.15	56.51	-9.27	65.78	46.10	0.06	10.35	QP
3	0.21	38.36	-14.96	53.32	28.00	0.07	10.29	Average
4	0.21	48.96	-14.36	63.32	38.60	0.07	10.29	QP
5	0.26	31.52	-19.99	51.51	21.19	0.09	10.24	Average
6	0.26	44.32	-17.19	61.51	33.99	0.09	10.24	QP
7	0.31	32.00	-18.10	50.10	21.70	0.10	10.20	Average
8	0.31	42.80	-17.30	60.10	32.50	0.10	10.20	QP
9	0.36	32.30	-16.44	48.74	22.00	0.12	10.18	Average
10	0.36	42.70	-16.04	58.74	32.40	0.12	10.18	QP
11	0.41	36.99	-10.60	47.59	26.69	0.13	10.17	Average
12	0.41	46.29	-11.30	57.59	35.99	0.13	10.17	QP
13	0.52	30.90	-15.10	46.00	20.60	0.14	10.16	Average
14	0.52	41.80	-14.20	56.00	31.50	0.14	10.16	QP
15	0.57	34.50	-11.50	46.00	24.20	0.15	10.15	Average
16	0.57	44.90	-11.10	56.00	34.60	0.15	10.15	QP
17	0.63	34.50	-11.50	46.00	24.20	0.15	10.15	Average
18	0.63	44.70	-11.30	56.00	34.40	0.15	10.15	QP
19	0.72	31.61	-14.39	46.00	21.30	0.16	10.15	Average
20	0.72	42.11	-13.89	56.00	31.80	0.16	10.15	QP
21	0.77	34.32	-11.68	46.00	24.00	0.17	10.15	Average
22	0.77	44.92	-11.08	56.00	34.60	0.17	10.15	QP
23	0.84	32.53	-13.47	46.00	22.20	0.18	10.15	Average
24	0.84	45.03	-10.97	56.00	34.70	0.18	10.15	QP
25	0.94	31.34	-14.66	46.00	21.00	0.19	10.15	Average
26	0.94	43.54	-12.46	56.00	33.20	0.19	10.15	QP
27	1.10	30.36	-15.64	46.00	20.00	0.20	10.16	Average
28	1.10	43.56	-12.44	56.00	33.20	0.20	10.16	QP
29	1.71	30.80	-15.20	46.00	20.40	0.22	10.18	Average

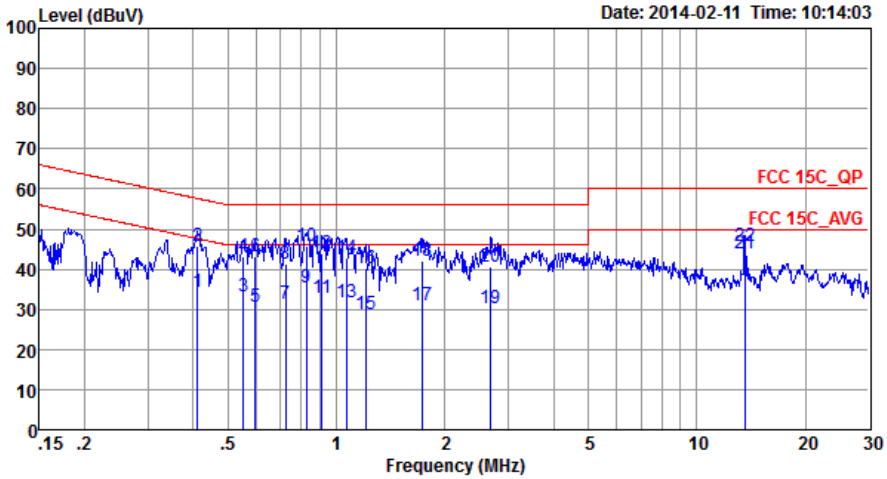
Test Mode :	Mode 1	**Temperature :**	21~22℃
Test Engineer :	Henry Chen	**Relative Humidity :**	41~42%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4GHz) Link + NFC On + Earphone + USB Cable (Charging from Adapter) + SIM1		



Site : CO01-SZ
Condition: FCC 15C QP LISN L 20130328 LINE

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
30		1.71	44.90	-11.10	56.00	34.50	0.22	10.18	QP
31		1.86	30.81	-15.19	46.00	20.40	0.23	10.18	Average
32		1.86	43.41	-12.59	56.00	33.00	0.23	10.18	QP
33		2.78	30.87	-15.13	46.00	20.40	0.26	10.21	Average
34		2.78	43.47	-12.53	56.00	33.00	0.26	10.21	QP
35		2.96	28.68	-17.32	46.00	18.21	0.26	10.21	Average
36		2.96	39.28	-16.72	56.00	28.81	0.26	10.21	QP
37	*	13.55	43.53	-6.47	50.00	32.19	0.86	10.48	Average
38		13.55	48.33	-11.67	60.00	36.99	0.86	10.48	QP

Test Mode :	Mode 1	Temperature :	21~22℃
Test Engineer :	Henry Chen	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4GHz) Link + NFC On + Earphone + USB Cable (Charging from Adapter) + SIM1		



Site : CO01-SZ
Condition: FCC 15C_QP LISN_N_20130328 NEUTRAL

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.41	34.41	-13.18	47.59	24.20	0.04	10.17	Average
2		0.41	45.61	-11.98	57.59	35.40	0.04	10.17	QP
3		0.55	33.19	-12.81	46.00	23.00	0.04	10.15	Average
4		0.55	43.19	-12.81	56.00	33.00	0.04	10.15	QP
5		0.59	30.69	-15.31	46.00	20.50	0.04	10.15	Average
6		0.59	42.99	-13.01	56.00	32.80	0.04	10.15	QP
7		0.72	31.19	-14.81	46.00	21.00	0.04	10.15	Average
8		0.72	41.39	-14.61	56.00	31.20	0.04	10.15	QP
9		0.83	35.49	-10.51	46.00	25.30	0.04	10.15	Average
10		0.83	45.59	-10.41	56.00	35.40	0.04	10.15	QP
11		0.91	32.69	-13.31	46.00	22.50	0.04	10.15	Average
12		0.91	43.79	-12.21	56.00	33.60	0.04	10.15	QP
13		1.07	31.80	-14.20	46.00	21.61	0.04	10.15	Average
14		1.07	42.80	-13.20	56.00	32.61	0.04	10.15	QP
15		1.20	28.71	-17.29	46.00	18.50	0.05	10.16	Average
16		1.20	40.41	-15.59	56.00	30.20	0.05	10.16	QP
17		1.73	30.94	-15.06	46.00	20.70	0.06	10.18	Average
18		1.73	42.24	-13.76	56.00	32.00	0.06	10.18	QP
19		2.68	30.28	-15.72	46.00	19.99	0.08	10.21	Average
20		2.68	40.58	-15.42	56.00	30.29	0.08	10.21	QP
21	*	13.62	43.96	-6.04	50.00	33.00	0.48	10.48	Average
22		13.62	45.76	-14.24	60.00	34.80	0.48	10.48	QP

3.7 Antenna Requirements

3.7.1 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.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

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

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP30	101400	9kHz~30GHz	Mar. 28, 2013	Jan. 09, 2014 ~ Jan. 15, 2014	Mar. 27, 2014	Conducted (TH01-SZ)
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Jun. 17, 2013	Jan. 09, 2014 ~ Jan. 15, 2014	Jun. 16, 2014	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	13dBm~-20dBm	Mar. 28, 2013	Jan. 09, 2014 ~ Jan. 15, 2014	Mar. 27, 2014	Conducted (TH01-SZ)
Power Sensor	Anritsu	MA2411B	1207253	0.3GHz~40GHz	Mar. 28, 2013	Jan. 09, 2014 ~ Jan. 15, 2014	Mar. 27, 2014	Conducted (TH01-SZ)
Spectrum Analyzer	Agilent Technologies	N9038A	MY52260185	20Hz~26.5GHz	Apr. 04, 2013	Jan. 15, 2014	Apr. 03, 2014	Radiation (03CH01-SZ)
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Jun. 17, 2013	Jan. 15, 2014	Jun. 16, 2014	Radiation (03CH01-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 29, 2013	Jan. 15, 2014	May 28, 2014	Radiation (03CH01-SZ)
Bilog Antenna	SCHAFFNER	CBL6112B	2614	30MHz~2GHz	Dec. 23, 2013	Jan. 15, 2014	Dec. 22, 2014	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS Lindgren	3117	00119436	1GHz~18GHz	Oct. 26, 2013	Jan. 15, 2014	Oct. 25, 2014	Radiation (03CH01-SZ)
SHF-EHF-Horn	Schwarzbeck	BBHA9170	BBHA9170249	14GHz~40GHz	Jan. 13, 2014	Jan. 15, 2014	Jan. 12, 2015	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz~3000MHz Gain 30db	Mar. 29, 2013	Jan. 15, 2014	Mar. 28, 2014	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GHz	Mar. 29, 2013	Jan. 15, 2014	Mar. 28, 2014	Radiation (03CH01-SZ)
Amplifier	EM	EM18G40G	060604	18GHz ~ 40GHz	Jun. 20, 2013	Jan. 15, 2014	Jun. 19, 2014	Radiation (03CH01-SZ)
Turn Table	EM Electronics	EM 1000	N/A	0~360 degree	NCR	Jan. 15, 2014	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM Electronics	EM 1000	N/A	1 m~4 m	NCR	Jan. 15, 2014	NCR	Radiation (03CH01-SZ)
ESCIO Test Receiver	R&S	ESCI	100724	9kHz~3GHz	Mar. 29, 2013	Jan. 09, 2014~ Feb. 11, 2014	Mar. 28, 2014	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Mar. 28, 2013	Jan. 09, 2014~ Feb. 11, 2014	Mar. 27, 2014	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Mar. 28, 2013	Jan. 09, 2014~ Feb. 11, 2014	Mar. 27, 2014	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Dec. 17, 2013	Jan. 09, 2014~ Feb. 11, 2014	Dec. 16, 2014	Conduction (CO01-SZ)

5 Uncertainty of Evaluation

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.90