

FCC RF Test Report

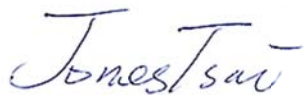
APPLICANT : DELL Inc.
EQUIPMENT : Tablet PC
BRAND NAME : Dell
MODEL NAME : T02D; T02D004
TYPE NAME : T02D004
FCC ID : E2K-T02D004
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Mar. 18, 2014 and testing was completed on Aug. 29, 2014. We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and the testing has shown the tested sample to be in 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 (SHENZHEN) INC., the test report shall not be reproduced except in full.



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL (SHENZHEN) INC.

No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District,
Shenzhen, Guangdong, P.R.C.



TABLE OF CONTENTS

REVISION HISTORY.....	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant.....	5
1.2 Manufacturer.....	5
1.3 Feature of Equipment Under Test	5
1.4 Product Specification of Equipment Under Test.....	6
1.5 Modification of EUT	7
1.6 Testing Location	7
1.7 Applicable Standards.....	7
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	8
2.1 Carrier Frequency Channel	8
2.2 Pre-Scanned RF Power.....	9
2.3 Test Mode.....	11
2.4 Connection Diagram of Test System.....	13
2.5 Support Unit used in test configuration and system	14
2.6 EUT Operation Test Setup	14
2.7 Measurement Results Explanation Example.....	14
3 TEST RESULT	15
3.1 6dB and 99% Bandwidth Measurement	15
3.2 Output Power Measurement.....	18
3.3 Power Spectral Density Measurement	23
3.4 Conducted Band Edges and Spurious Emission Measurement	26
3.5 Radiated Band Edges and Spurious Emission Measurement	54
3.6 AC Conducted Emission Measurement.....	91
3.7 Antenna Requirements.....	95
4 LIST OF MEASURING EQUIPMENT	96
5 UNCERTAINTY OF EVALUATION	97
APPENDIX A. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR431806-01C	Rev. 01	Initial issue of report	Aug. 29, 2014

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	RSS-210 A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	RSS-Gen 4.6.1	99% Bandwidth	-	Pass	-
3.2	15.247(b)	RSS-210 A8.4	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	RSS-210 A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	RSS-210 A8.5	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
			Conducted Spurious Emission		Pass	-
3.5	15.247(d)	RSS-210 A8.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 4.35 dB at 2484.910 MHz
3.6	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 8.97 dB at 0.370 MHz
3.7	15.203 & 15.247(b)	RSS-210 A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

DELL Inc.

One Dell Way, Round Rock, Texas 78682, United States

1.2 Manufacturer

DELL Inc.

One Dell Way, Round Rock, Texas 78682, United States

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Tablet PC
Brand Name	Dell
Model Name	T02D; T02D004
Type Name	T02D004
FCC ID	E2K-T02D004
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/ HSPA+(Downlink Only)/DC-HSDPA/LTE/ 802.11a/b/g/n (HT20 / HT40)/ 802.11ac (VHT20/VHT40/VHT80)/ Bluetooth v3.0 + EDR / Bluetooth v4.0 LE
HW Version	DVT-B-V0.40
SW Version	YTP802A410830
EUT Stage	Identical Prototype

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

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx/Rx Channel Frequency Range	802.11b/g/n/ac : 2412 MHz ~ 2462 MHz 802.11a/n/ac: 5745~5825MHz.
Maximum (Peak) Output Power to Antenna	<2412 MHz ~ 2462 MHz> 802.11b : 16.71 dBm (0.0469 W) 802.11g : 22.02 dBm (0.1592 W) 802.11n HT20 : 22.30 dBm (0.1698 W) 802.11n HT40 : 22.30 dBm (0.1698 W) <5745 MHz ~ 5825 MHz> 802.11a : 18.83 dBm (0.0764 W) 802.11n HT20 : 18.93 dBm (0.0782 W) 802.11n HT40 : 18.93 dBm (0.0782 W) 802.11ac VHT20 : 18.96 dBm (0.0787 W) 802.11ac VHT40 : 18.92 dBm (0.0780 W) 802.11ac VHT80 : 19.18 dBm (0.0828 W)
99% Occupied Bandwidth	<2412 MHz ~ 2462 MHz> 802.11b : 11.75MHz 802.11g : 18.40MHz 802.11n HT20 : 19.15MHz 802.11n HT40 : 36.80MHz <5745 MHz ~ 5825 MHz> 802.11a : 18.25MHz 802.11n HT20 : 19.05MHz 802.11n HT40 : 36.80MHz 802.11ac VHT20 : 19.60MHz 802.11ac VHT40 : 36.90MHz 802.11ac VHT80 : 76.00MHz
Antenna Type	802.11b/g/n : IFA Antenna with gain 4.30 dBi 802.11a/n/ac : IFA Antenna with gain 4.20 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)

1.5 Modification of EUT

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

1.6 Testing Location

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/IC Registration No.
	TH01-SZ	03CH01-SZ	CO01-SZ	831040/4086E-1

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

1.7 Applicable 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
- ♦ FCC KDB 644545 D01 Guidance for IEEE 802.11ac and Pre-ac Device Emissions Testing v01r02.
- ♦ 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) 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	157	5785
	151	5755	159	5795
	153	5765	161	5805
	155	5775	165	5825

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 Power (dBm)			
		DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	16.10	16.00	16.02	16.06
CH 06	2437 MHz	16.19	16.13	16.10	16.13
CH 11	2462 MHz	16.71	16.64	16.68	16.66

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	21.56	21.53	21.52	21.50	20.98	21.16	21.46	20.52
CH 06	2437 MHz	21.67	21.61	21.61	21.58	21.06	21.24	21.54	20.60
CH 11	2462 MHz	22.02	21.96	21.95	21.93	21.38	21.59	21.89	20.95

Channel	Frequency	2.4GHz 802.11n HT20 RF Power (dBm)							
		OFDM Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412 MHz	21.71	21.68	21.67	21.64	21.60	21.64	21.67	21.58
CH 06	2437 MHz	21.89	21.84	21.83	21.80	21.76	21.80	21.83	21.74
CH 11	2462 MHz	22.30	22.24	22.23	22.20	22.16	22.20	22.23	22.14

Channel	Frequency	2.4GHz 802.11n HT40 RF Power (dBm)							
		OFDM Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 03	2422 MHz	21.89	21.65	21.60	21.79	21.76	21.52	21.45	21.63
CH 06	2437 MHz	22.03	21.76	21.71	21.90	21.87	21.63	21.56	21.74
CH 09	2452 MHz	22.30	22.01	21.96	22.15	22.12	21.88	21.81	21.99

Channel	Frequency	5GHz 802.11a RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 149	5745 MHz	18.29	18.25	18.26	18.17	18.19	18.14	18.25	18.16
CH 157	5785 MHz	18.74	18.70	18.71	18.62	18.64	18.59	18.70	18.61
CH 165	5825 MHz	18.83	18.79	18.80	18.71	18.73	18.68	18.79	18.70

Channel	Frequency	5GHz 802.11n HT20 RF Power (dBm)							
		OFDM Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 149	5745 MHz	18.76	18.71	18.69	18.72	18.74	18.69	18.71	18.73
CH 157	5785 MHz	18.93	18.88	18.86	18.89	18.91	18.86	18.88	18.90
CH 165	5825 MHz	18.88	18.83	18.81	18.84	18.86	18.81	18.83	18.85

Channel	Frequency	5GHz 802.11n HT40 RF Power (dBm)							
		OFDM Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 151	5755 MHz	18.61	18.58	18.55	18.59	18.57	18.60	18.52	18.53
CH 159	5795 MHz	18.93	18.87	18.88	18.91	18.89	18.91	18.84	18.85

Channel	Frequency	5GHz 802.11ac VHT20 RF Power (dBm)								
		OFDM Data Rate								
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
CH 149	5745 MHz	18.67	18.62	18.63	18.64	18.65	18.56	18.64	18.61	18.59
CH 157	5785 MHz	18.96	18.91	18.92	18.93	18.94	18.85	18.93	18.90	18.88
CH 165	5825 MHz	18.88	18.83	18.84	18.85	18.86	18.77	18.85	18.82	18.80

Channel	Frequency	5GHz 802.11ac VHT40 RF Power (dBm)									
		OFDM Data Rate									
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
CH 151	5755 MHz	18.55	18.50	18.53	18.52	18.54	18.49	18.49	18.52	18.51	18.53
CH 159	5795 MHz	18.92	18.87	18.90	18.89	18.91	18.86	18.86	18.89	18.88	18.90

Channel	Frequency	5GHz 802.11ac VHT80 RF Power (dBm)									
		OFDM Data Rate									
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
CH 155	5775 MHz	19.18	19.10	18.79	19.16	19.05	18.95	19.03	18.93	18.92	19.03

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
	6dB and 99% BW Power Spectral Density Output Power	802.11b 802.11g 802.11n HT20 802.11n HT40	1 Mbps 6 Mbps MCS0 MCS0	1/6/11 1/6/11 1/6/11 3/6/9
Conducted TCs	Conducted Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	MCS0	1/6/11
		802.11n HT40	MCS0	3/6/9
	Conducted Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
		802.11n HT40	MCS0	3/6/9
	Radiated Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	MCS0	1/6/11
		802.11n HT40	MCS0	3/6/9
Radiated TCs	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
		802.11n HT40	MCS0	3/6/9

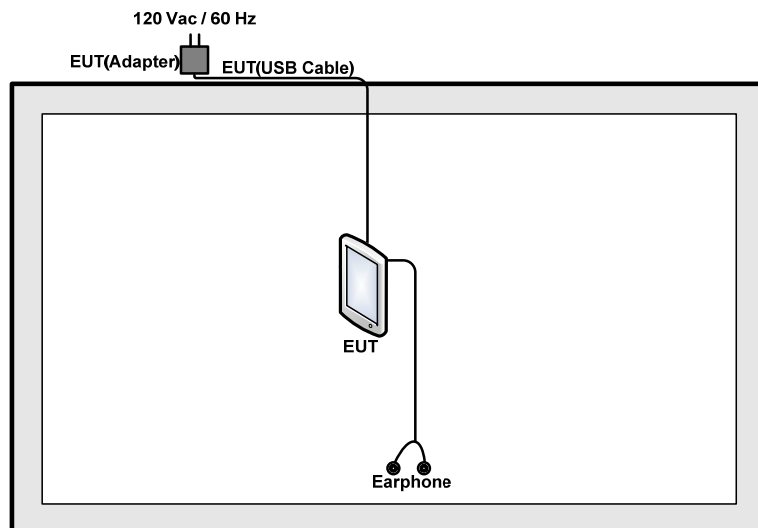
<5GHz>

Test Cases				
Conducted TCs	Test Items	Mode	Data Rate	Test Channel
	6dB and 99% BW Power Spectral Density Output Power	802.11a	6 Mbps	149/157/165
		802.11n HT20	MCS0	149/157/165
		802.11n HT40	MCS0	151/159
		802.11ac VHT20	MCS0	149/157/165
		802.11ac VHT40	MCS0	151/159
		802.11ac VHT80	MCS0	155
	Conducted Band Edge	802.11a	6 Mbps	149/165
		802.11n HT20	MCS0	149/157/165
		802.11n HT40	MCS0	151/159
		802.11ac VHT20	MCS0	149/157/165
		802.11ac VHT40	MCS0	151/159
		802.11ac VHT80	MCS0	155
	Conducted Spurious Emission	802.11a	6 Mbps	149/157/165
		802.11n HT20	MCS0	149/157/165
		802.11n HT40	MCS0	151/159
		802.11ac VHT20	MCS0	149/157/165
		802.11ac VHT40	MCS0	151/159
		802.11ac VHT80	MCS0	155
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
		802.11ac VHT20	MCS0	149/157/165
		802.11ac VHT40	MCS0	151/159
		802.11ac VHT80	MCS0	155

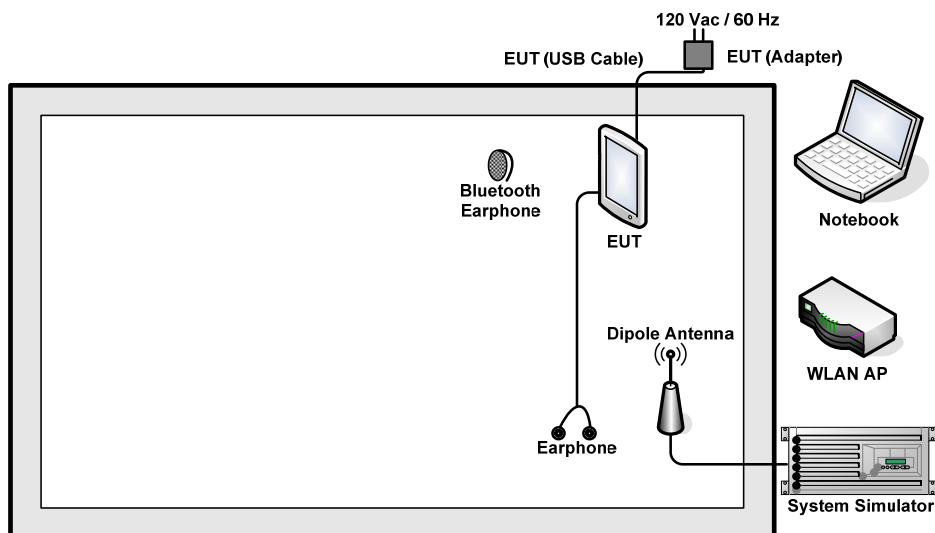
Test Cases	
AC Conducted Emission	Mode 1 : GSM850 Idle + Bluetooth Link + WLAN (2.4GHz) Link + USB Cable (Charging from Adapter) + Earphone
	Mode 2 : GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + USB Cable (Charging from Adapter) + Earphone
Remark: 1. The worst case of conducted emission is mode 2; only the test data of it is reported. 2. For radiated TCs, the tests were performed with adapter, earphone, and USB cable.	

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.	WLAN AP	D-Link	DIR-815	KA2IR815A1	N/A	Unshielded, 1.8 m
2.	System Simulator	R&S	CMW 500	N/A	N/A	Unshielded, 1.8 m
3.	Notebook	Dell	Vostro1440	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Earphone	Lenovo	SH100	FCC DoC	Unshielded, 1.2 m	N/A
5.	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.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

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 7.5 dB and 10dB attenuator.

$$\begin{aligned}
 \text{Offset (dB)} &= \text{RF cable loss (dB)} + \text{attenuator factor (dB)} \\
 &= 7.5 + 10 = 17.5 \text{ (dB)}
 \end{aligned}$$

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

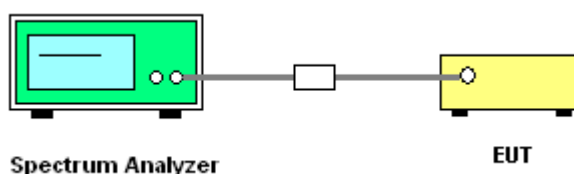
3.1.2 Measuring Instruments

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. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1MHz and set the Video bandwidth (VBW) = 3MHz.
6. Measure and record the results in the test report.

3.1.4 Test Setup



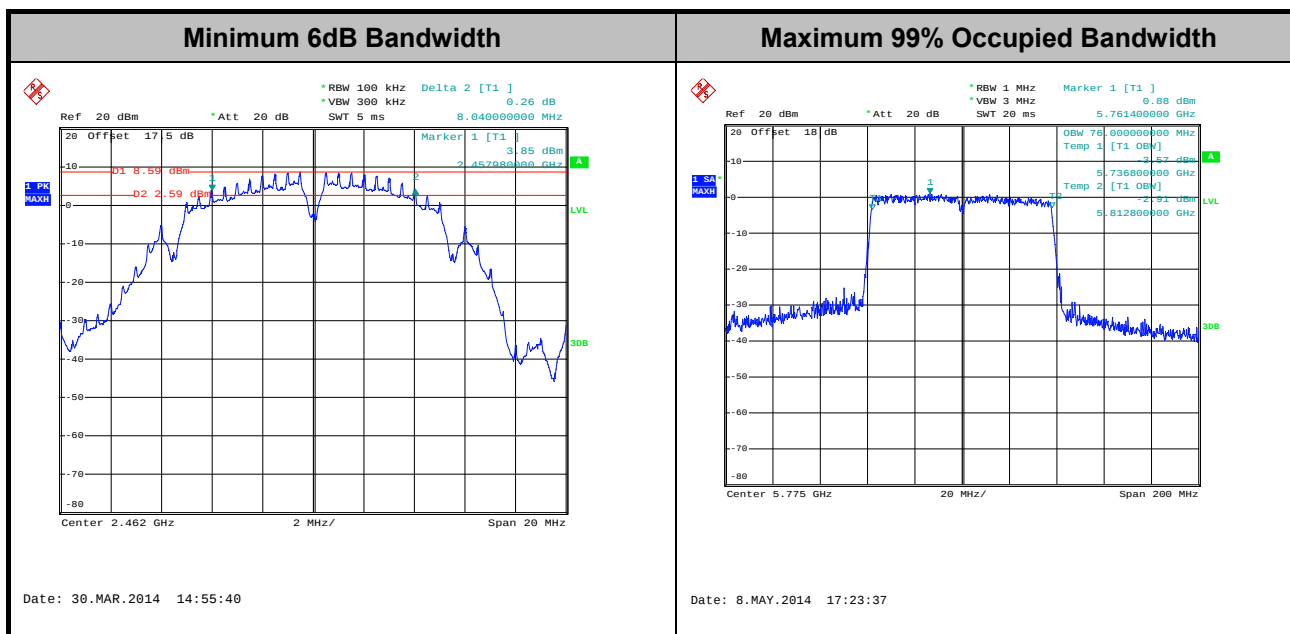
3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

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)	99% Bandwidth (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	11.75	8.52	0.5	Pass
11b	1Mbps	1	6	2437	11.75	8.52	0.5	Pass
11b	1Mbps	1	11	2462	11.65	8.04	0.5	Pass
11g	6Mbps	1	1	2412	18.35	16.36	0.5	Pass
11g	6Mbps	1	6	2437	18.40	16.32	0.5	Pass
11g	6Mbps	1	11	2462	18.30	16.32	0.5	Pass
HT20	MCS0	1	1	2412	19.15	17.56	0.5	Pass
HT20	MCS0	1	6	2437	19.10	17.60	0.5	Pass
HT20	MCS0	1	11	2462	19.15	17.60	0.5	Pass
HT40	MCS0	1	3	2422	36.80	36.32	0.5	Pass
HT40	MCS0	1	6	2437	36.80	36.32	0.5	Pass
HT40	MCS0	1	9	2452	36.80	36.32	0.5	Pass



Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	99% Bandwidth (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
11a	6Mbps	1	149	5745	18.25	16.36	0.5	Pass
11a	6Mbps	1	157	5785	18.25	16.36	0.5	Pass
11a	6Mbps	1	165	5825	18.25	16.36	0.5	Pass
HT20	MCS0	1	149	5745	18.90	17.56	0.5	Pass
HT20	MCS0	1	157	5785	19.05	17.56	0.5	Pass
HT20	MCS0	1	165	5825	19.05	17.56	0.5	Pass
HT40	MCS0	1	151	5755	36.80	36.32	0.5	Pass
HT40	MCS0	1	159	5795	36.70	36.32	0.5	Pass
VHT20	MCS0	1	149	5745	19.45	17.56	0.5	Pass
VHT20	MCS0	1	157	5785	19.60	17.56	0.5	Pass
VHT20	MCS0	1	165	5825	19.40	17.60	0.5	Pass
VHT40	MCS0	1	151	5755	36.90	36.28	0.5	Pass
VHT40	MCS0	1	159	5795	36.90	36.32	0.5	Pass
VHT80	MCS0	1	155	5775	76.00	76.00	0.5	Pass



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

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.

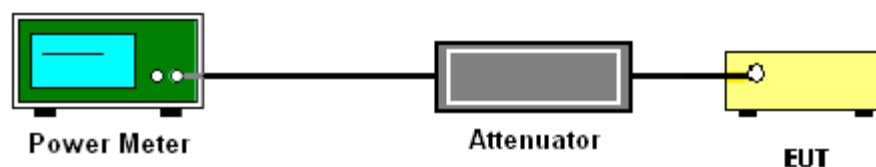
3.2.2 Measuring Instruments

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	16.10	30	4.30	Pass
11b	1Mbps	1	6	2437	16.19	30	4.30	Pass
11b	1Mbps	1	11	2462	16.71	30	4.30	Pass
11g	6Mbps	1	1	2412	21.56	30	4.30	Pass
11g	6Mbps	1	6	2437	21.67	30	4.30	Pass
11g	6Mbps	1	11	2462	22.02	30	4.30	Pass
HT20	MCS0	1	1	2412	21.71	30	4.30	Pass
HT20	MCS0	1	6	2437	21.89	30	4.30	Pass
HT20	MCS0	1	11	2462	22.30	30	4.30	Pass
HT40	MCS0	1	3	2422	21.89	30	4.30	Pass
HT40	MCS0	1	6	2437	22.03	30	4.30	Pass
HT40	MCS0	1	9	2452	22.30	30	4.30	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	18.29	30	4.20	Pass
11a	6Mbps	1	157	5785	18.74	30	4.20	Pass
11a	6Mbps	1	165	5825	18.83	30	4.20	Pass
HT20	MCS0	1	149	5745	18.76	30	4.20	Pass
HT20	MCS0	1	157	5785	18.93	30	4.20	Pass
HT20	MCS0	1	165	5825	18.88	30	4.20	Pass
HT40	MCS0	1	151	5755	18.61	30	4.20	Pass
HT40	MCS0	1	159	5795	18.93	30	4.20	Pass
VHT20	MCS0	1	149	5745	18.67	30	4.20	Pass
VHT20	MCS0	1	157	5785	18.96	30	4.20	Pass
VHT20	MCS0	1	165	5825	18.88	30	4.20	Pass
VHT40	MCS0	1	151	5755	18.55	30	4.20	Pass
VHT40	MCS0	1	159	5795	18.92	30	4.20	Pass
VHT80	MCS0	1	155	5775	19.18	30	4.20	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	0.06	12.69	30	4.30	Pass
11b	1Mbps	1	6	2437	0.06	12.83	30	4.30	Pass
11b	1Mbps	1	11	2462	0.06	13.29	30	4.30	Pass
11g	6Mbps	1	1	2412	0.30	12.15	30	4.30	Pass
11g	6Mbps	1	6	2437	0.30	12.34	30	4.30	Pass
11g	6Mbps	1	11	2462	0.30	12.76	30	4.30	Pass
HT20	MCS0	1	1	2412	0.33	11.65	30	4.30	Pass
HT20	MCS0	1	6	2437	0.33	11.77	30	4.30	Pass
HT20	MCS0	1	11	2462	0.33	12.24	30	4.30	Pass
HT40	MCS0	1	3	2422	0.62	12.02	30	4.30	Pass
HT40	MCS0	1	6	2437	0.62	12.37	30	4.30	Pass
VHT40	MCS0	1	9	2452	0.62	12.70	30	4.30	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	10.24	30	4.20	Pass
11a	6Mbps	1	157	5785	0.29	10.33	30	4.20	Pass
11a	6Mbps	1	165	5825	0.29	10.73	30	4.20	Pass
HT20	MCS0	1	149	5745	0.31	10.16	30	4.20	Pass
HT20	MCS0	1	157	5785	0.31	10.27	30	4.20	Pass
HT20	MCS0	1	165	5825	0.31	10.21	30	4.20	Pass
HT40	MCS0	1	151	5755	0.57	10.15	30	4.20	Pass
HT40	MCS0	1	159	5795	0.57	10.52	30	4.20	Pass
VHT20	MCS0	1	149	5745	0.34	10.17	30	4.20	Pass
VHT20	MCS0	1	157	5785	0.34	10.38	30	4.20	Pass
VHT20	MCS0	1	165	5825	0.34	10.16	30	4.20	Pass
VHT40	MCS0	1	151	5755	0.63	10.25	30	4.20	Pass
VHT40	MCS0	1	159	5795	0.63	10.54	30	4.20	Pass
VHT80	MCS0	1	155	5775	1.18	10.53	30	4.20	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.

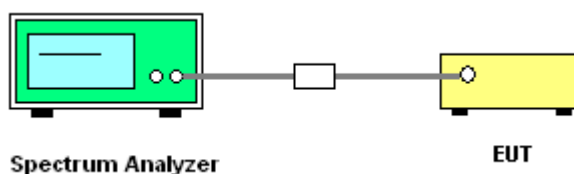
3.3.2 Measuring Instruments

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



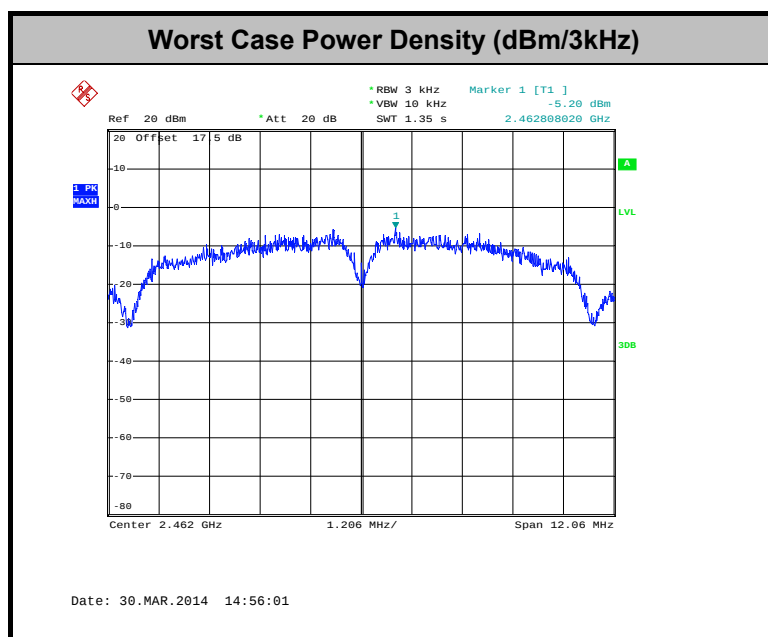
3.3.5 Test Result of Power Spectral Density

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	-5.97	8	4.30	Pass
11b	1Mbps	1	6	2437	-6.49	8	4.30	Pass
11b	1Mbps	1	11	2462	-5.20	8	4.30	Pass
11g	6Mbps	1	1	2412	-11.22	8	4.30	Pass
11g	6Mbps	1	6	2437	-11.00	8	4.30	Pass
11g	6Mbps	1	11	2462	-12.11	8	4.30	Pass
HT20	MCS0	1	1	2412	-12.81	8	4.30	Pass
HT20	MCS0	1	6	2437	-11.70	8	4.30	Pass
HT20	MCS0	1	11	2462	-12.42	8	4.30	Pass
HT40	MCS0	1	3	2422	-15.05	8	4.30	Pass
HT40	MCS0	1	6	2437	-15.41	8	4.30	Pass
HT40	MCS0	1	9	2452	-14.88	8	4.30	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	-14.67	8	4.20	Pass
11a	6Mbps	1	157	5785	-16.00	8	4.20	Pass
11a	6Mbps	1	165	5825	-15.38	8	4.20	Pass
HT20	MCS0	1	149	5745	-16.17	8	4.20	Pass
HT20	MCS0	1	157	5785	-16.42	8	4.20	Pass
HT20	MCS0	1	165	5825	-15.33	8	4.20	Pass
HT40	MCS0	1	151	5755	-17.62	8	4.20	Pass
HT40	MCS0	1	159	5795	-18.26	8	4.20	Pass
VHT20	MCS0	1	149	5745	-15.26	8	4.20	Pass
VHT20	MCS0	1	157	5785	-15.06	8	4.20	Pass
VHT20	MCS0	1	165	5825	-15.80	8	4.20	Pass
VHT40	MCS0	1	151	5755	-18.55	8	4.20	Pass
VHT40	MCS0	1	159	5795	-19.04	8	4.20	Pass
VHT80	MCS0	1	155	5775	-22.24	8	4.20	Pass

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



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).

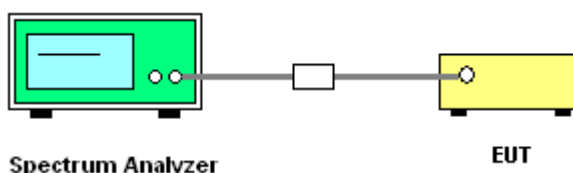
3.4.2 Measuring Instruments

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



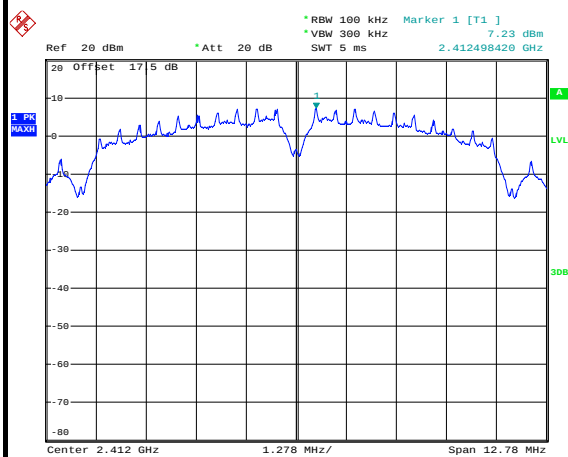


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

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

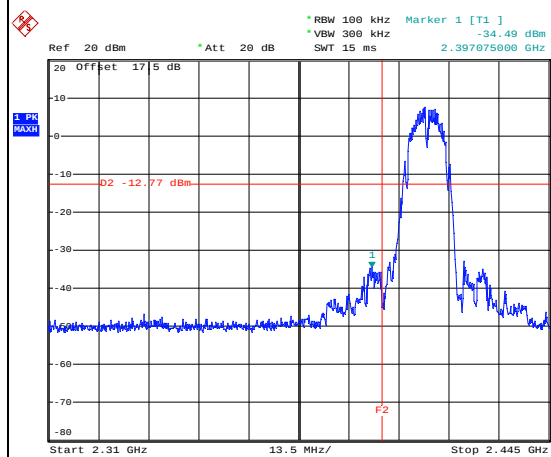
WLAN 802.11b Channel 01

100kHz PSD reference Level



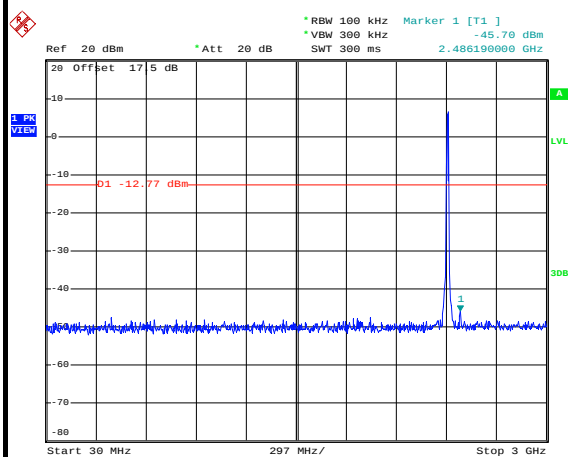
Date: 30.MAR.2014 14:46:12

Low Channel Plot



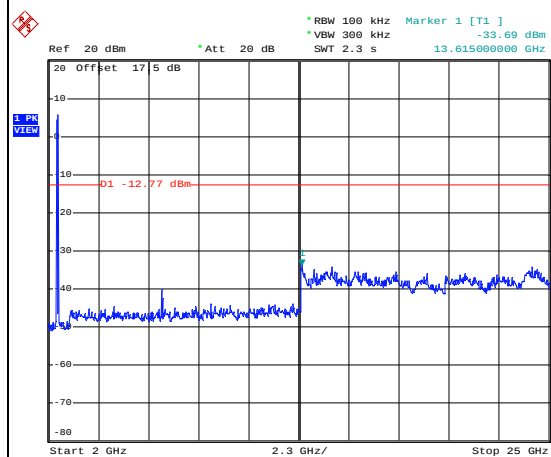
Date: 30.MAR.2014 14:46:26

Spurious Emission 30MHz~3GHz



Date: 30.MAR.2014 14:46:45

Spurious Emission 2GHz~25GHz



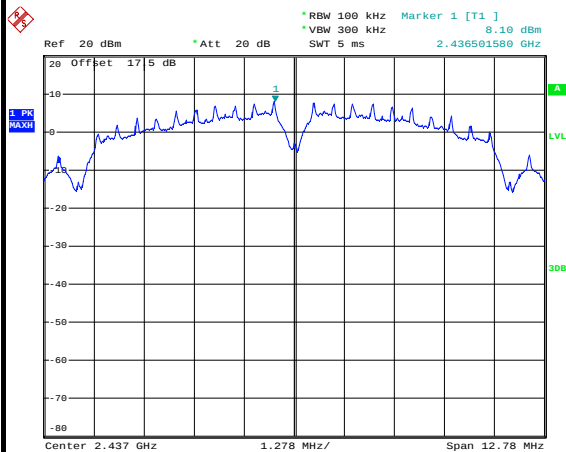
Date: 30.MAR.2014 14:47:03



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

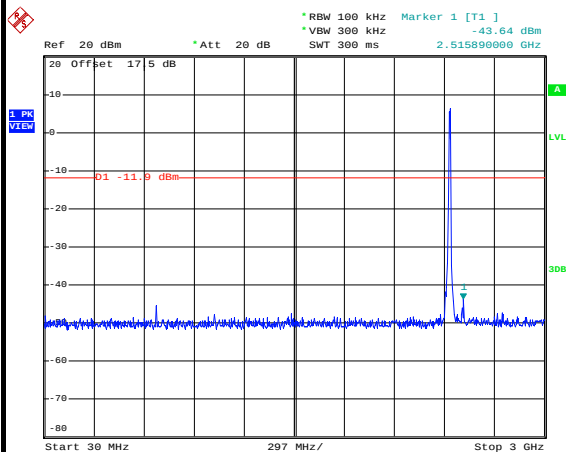
WLAN 802.11b Channel 06

100kHz PSD reference Level



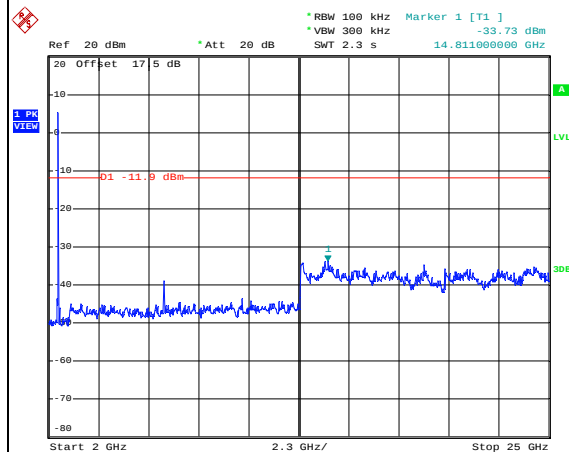
Date: 30.MAR.2014 14:50:56

Spurious Emission 30MHz~3GHz



Date: 30.MAR.2014 14:51:16

Spurious Emission 2GHz~25GHz



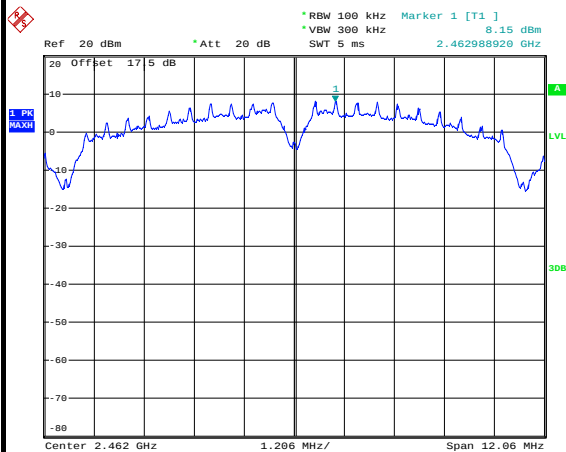
Date: 30.MAR.2014 14:51:34



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

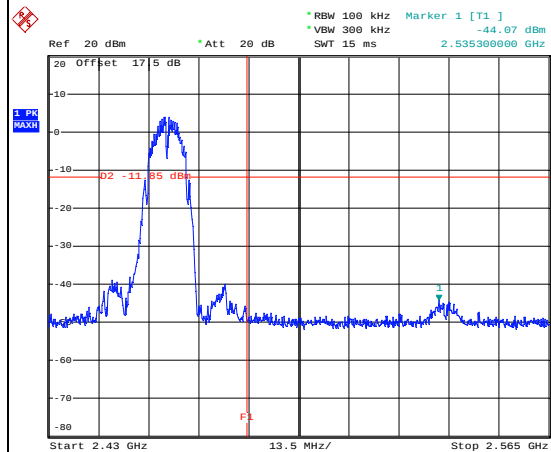
WLAN 802.11b Channel 11

100kHz PSD reference Level



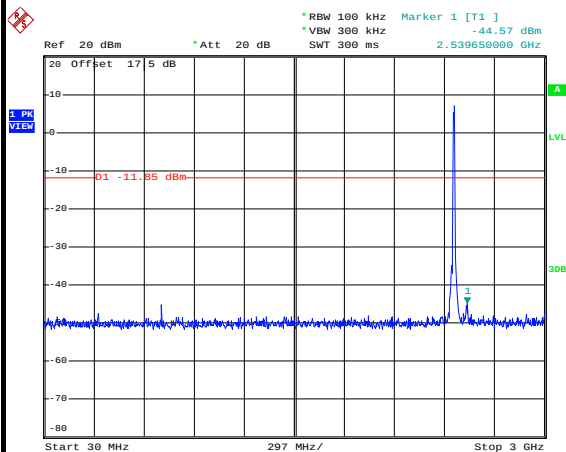
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High Channel Plot



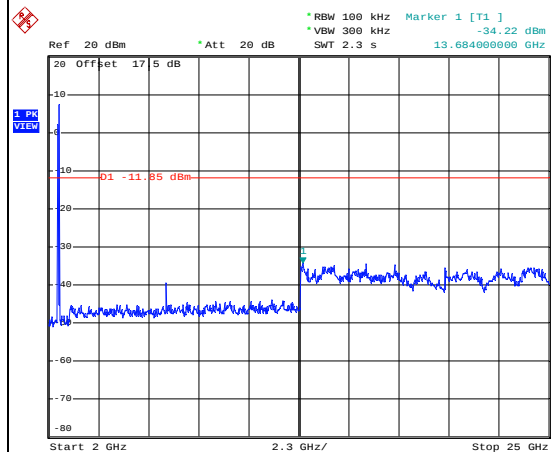
Date: 21.MAY.2014 11:51:22

Spurious Emission 30MHz~3GHz



Date: 30.MAR.2014 14:56:43

Spurious Emission 2GHz~25GHz



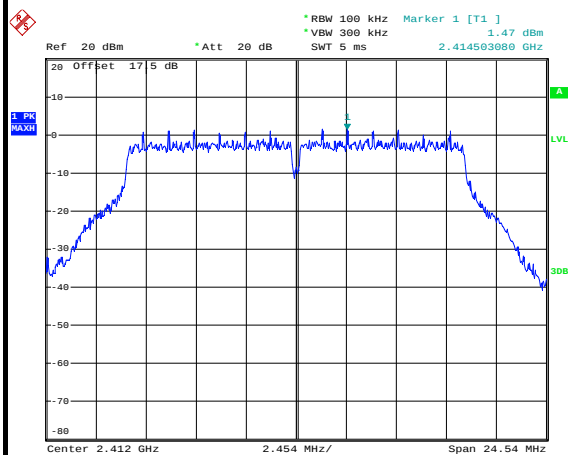
Date: 30.MAR.2014 14:57:01



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

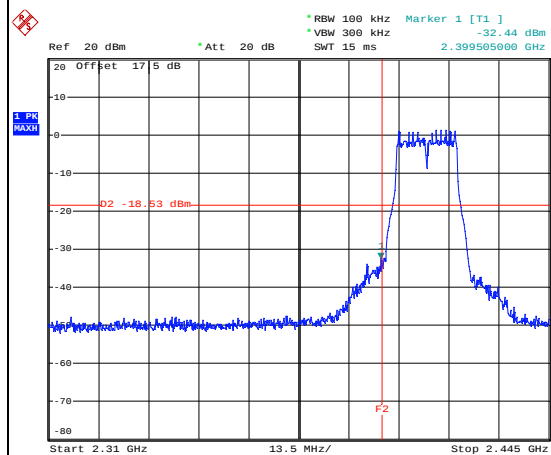
WLAN 802.11g Channel 01

100kHz PSD reference Level



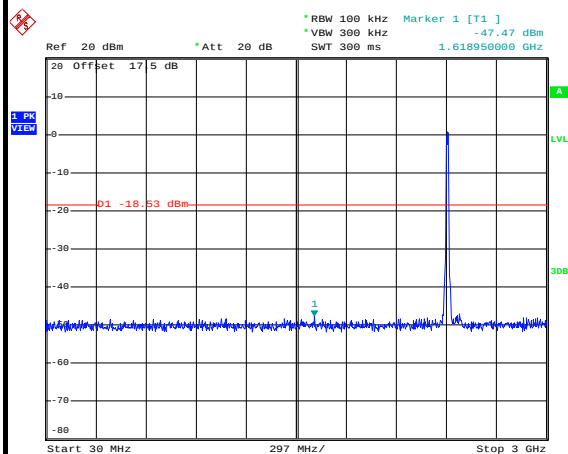
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Low Channel Plot



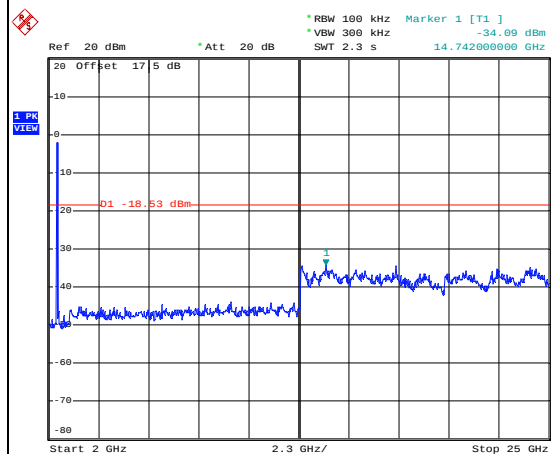
Date: 30.MAR.2014 15:02:01

Spurious Emission 30MHz~3GHz



Date: 30.MAR.2014 15:02:20

Spurious Emission 2GHz~25GHz



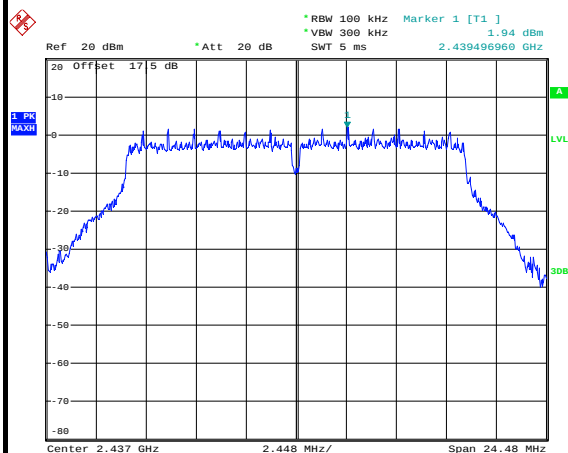
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Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Fly Liang

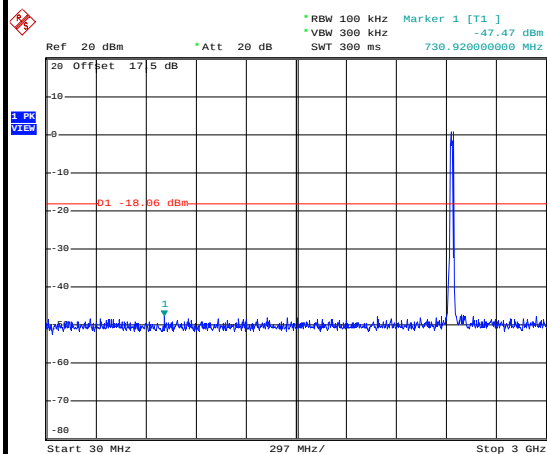
WLAN 802.11g Channel 06

100kHz PSD reference Level



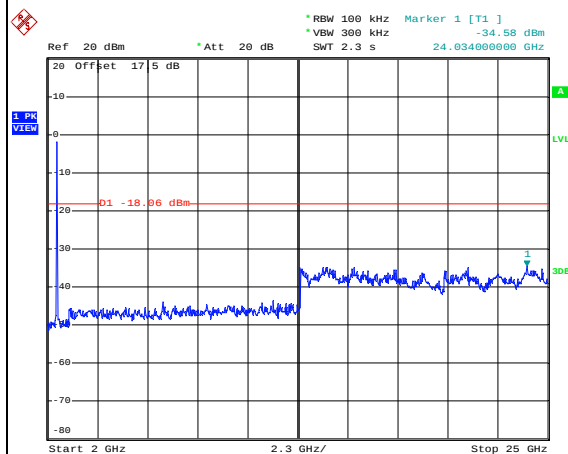
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Spurious Emission 30MHz~3GHz



Date: 30.MAR.2014 15:05:57

Spurious Emission 2GHz~25GHz



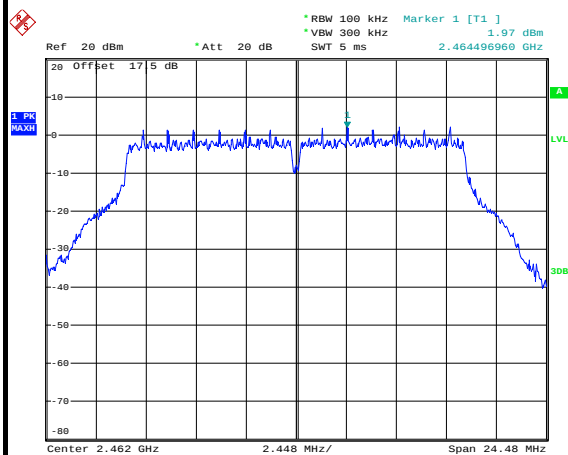
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Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Fly Liang

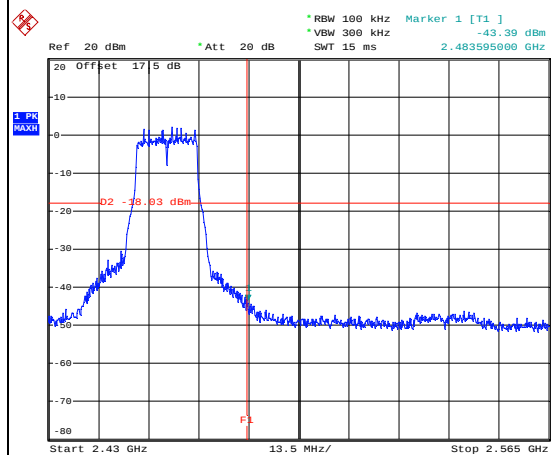
WLAN 802.11g Channel 11

100kHz PSD reference Level



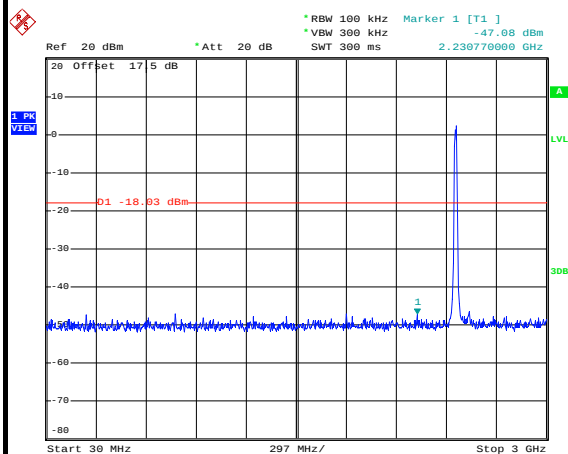
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High Channel Plot



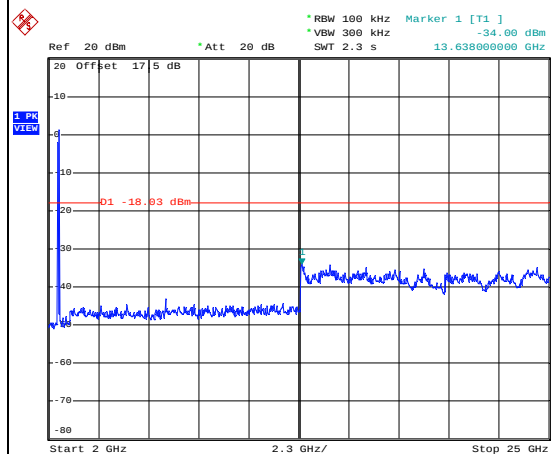
Date: 30.MAR.2014 15:10:59

Spurious Emission 30MHz~3GHz



Date: 30.MAR.2014 15:11:18

Spurious Emission 2GHz~25GHz



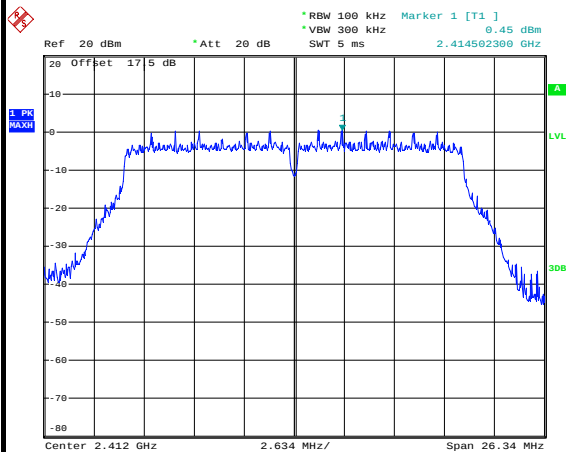
Date: 30.MAR.2014 15:11:37



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

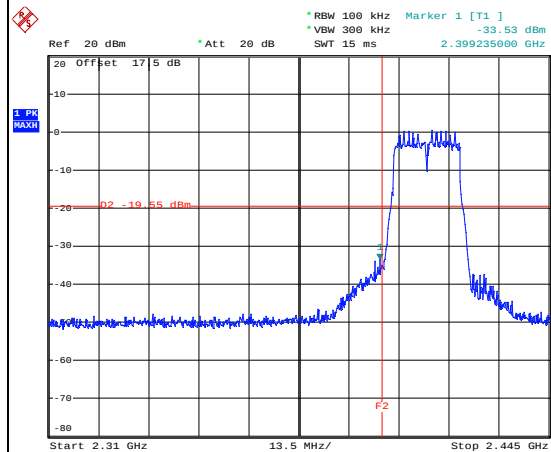
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



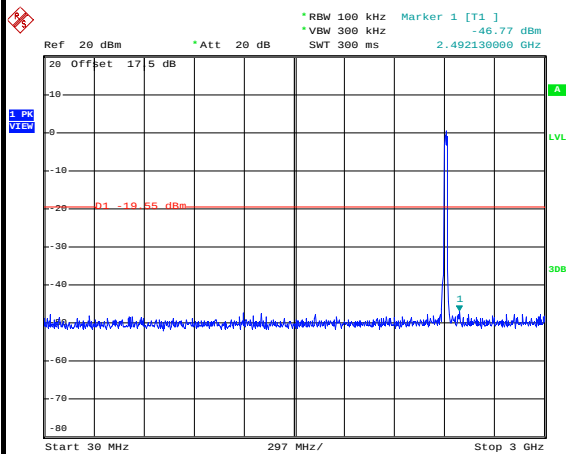
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Low Channel Plot



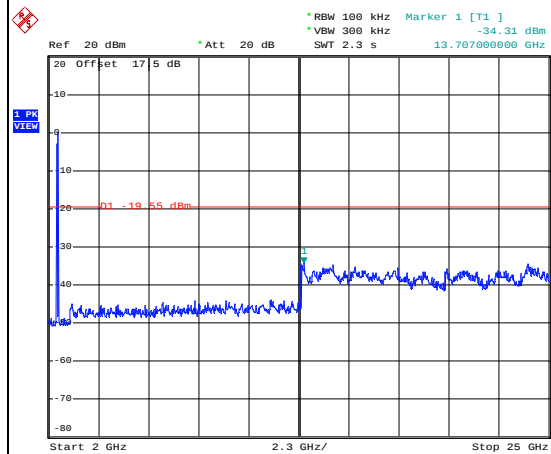
Date: 30.MAR.2014 15:18:05

Spurious Emission 30MHz~3GHz



Date: 30.MAR.2014 15:18:24

Spurious Emission 2GHz~25GHz



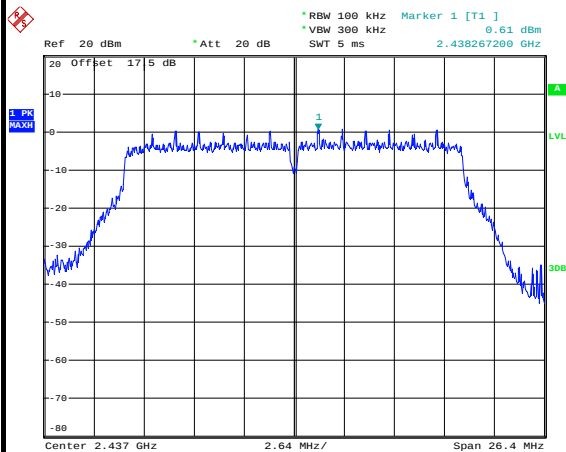
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Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Fly Liang

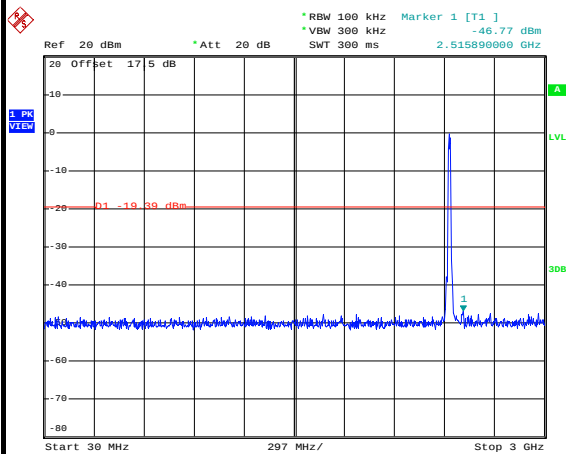
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



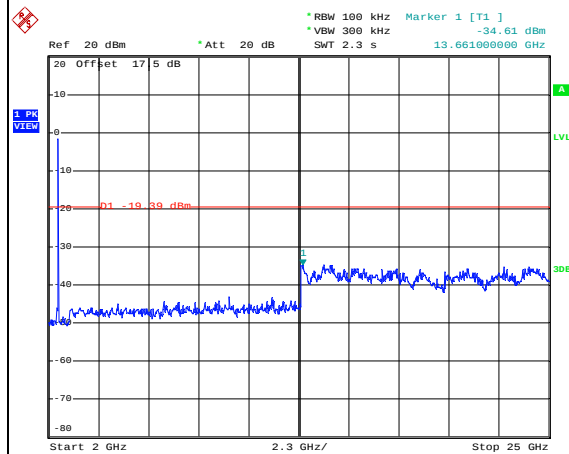
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Spurious Emission 30MHz~3GHz



Date: 30.MAR.2014 15:21:43

Spurious Emission 2GHz~25GHz



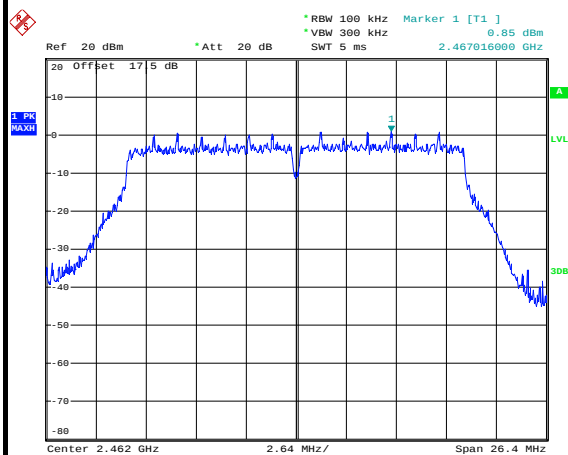
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Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Fly Liang

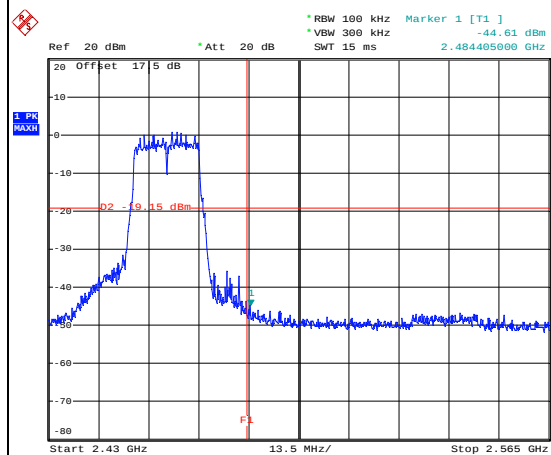
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



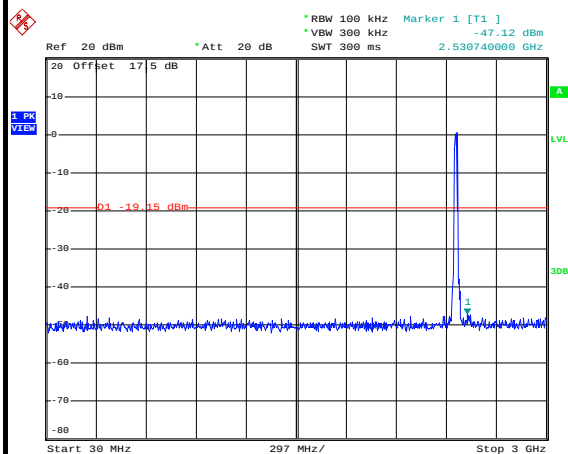
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High Channel Plot



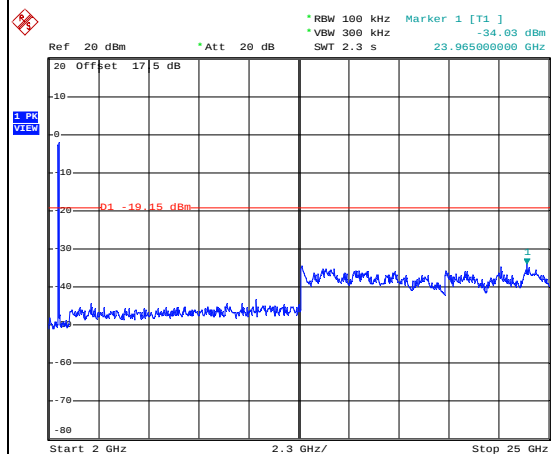
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Spurious Emission 30MHz~3GHz



Date: 30.MAR.2014 15:30:50

Spurious Emission 2GHz~25GHz



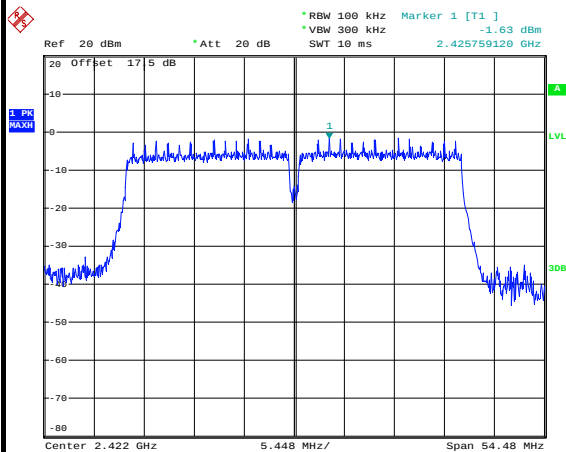
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Test Mode :	802.11n HT40	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	03	Test Engineer :	Fly Liang

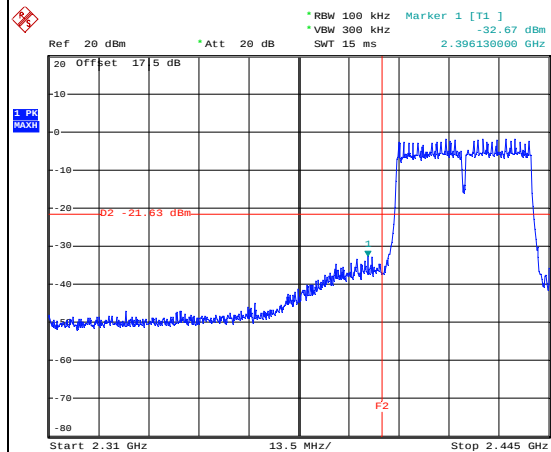
WLAN 802.11n HT40 Channel 03

100kHz PSD reference Level



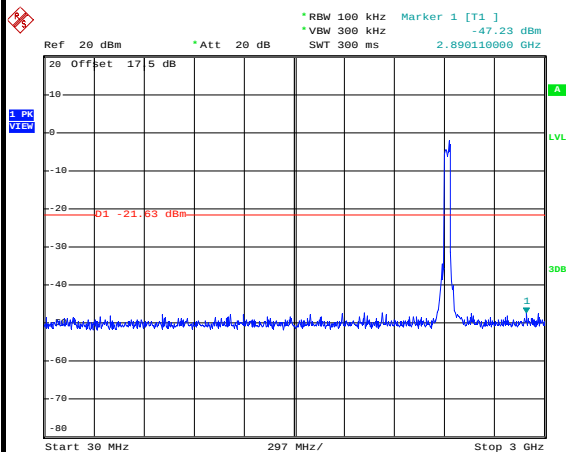
Date: 30.MAR.2014 15:37:15

Low Channel Plot



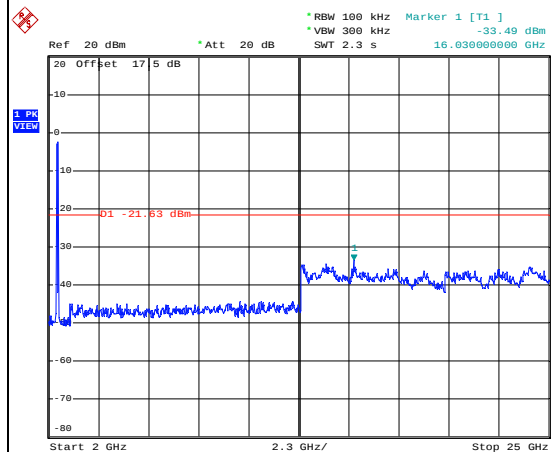
Date: 30.MAR.2014 15:37:29

Spurious Emission 30MHz~3GHz



Date: 30.MAR.2014 15:41:48

Spurious Emission 2GHz~25GHz



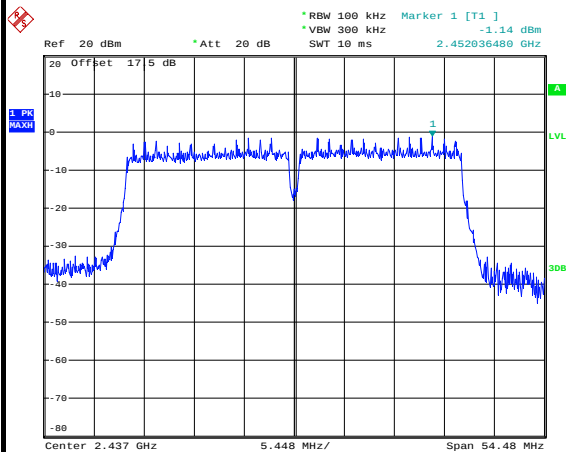
Date: 30.MAR.2014 15:42:06



Test Mode :	802.11n HT40	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Fly Liang

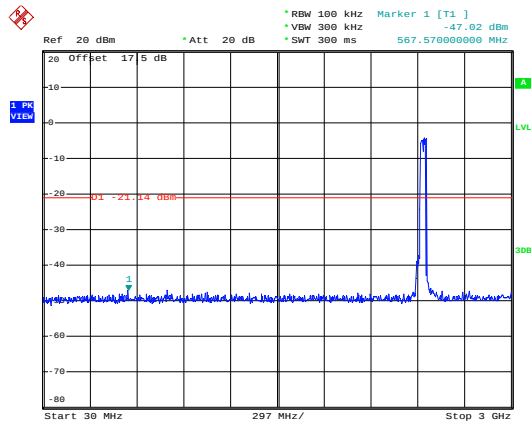
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



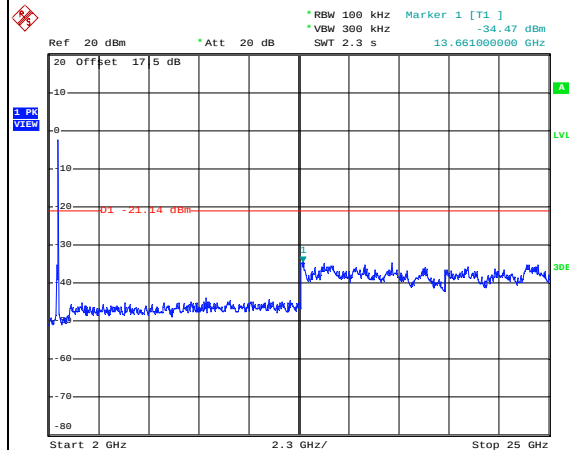
Date: 30.MAR.2014 15:46:49

Spurious Emission 30MHz~3GHz



Date: 20.MAY.2014 23:12:28

Spurious Emission 2GHz~25GHz



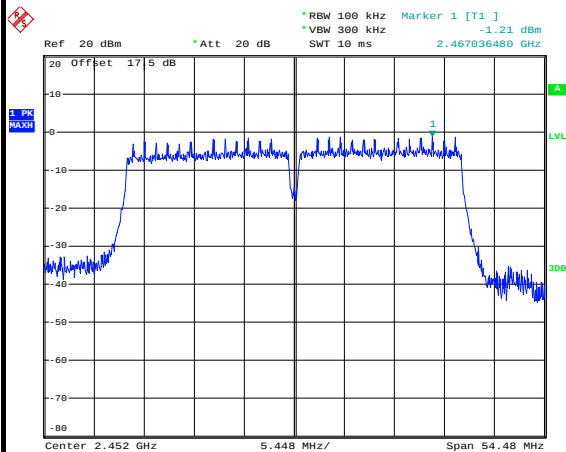
Date: 30.MAR.2014 15:52:15



Test Mode :	802.11n HT40	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	09	Test Engineer :	Fly Liang

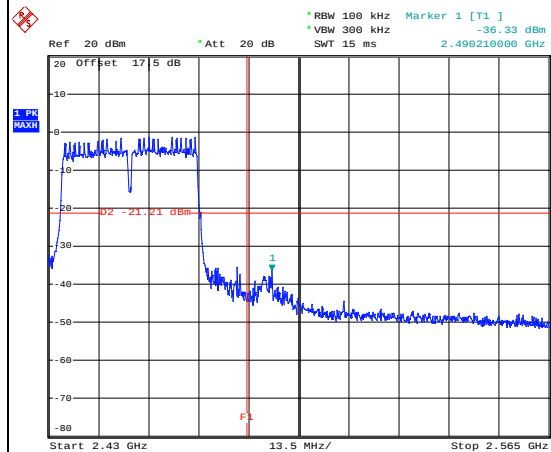
WLAN 802.11n HT40 Channel 09

100kHz PSD reference Level



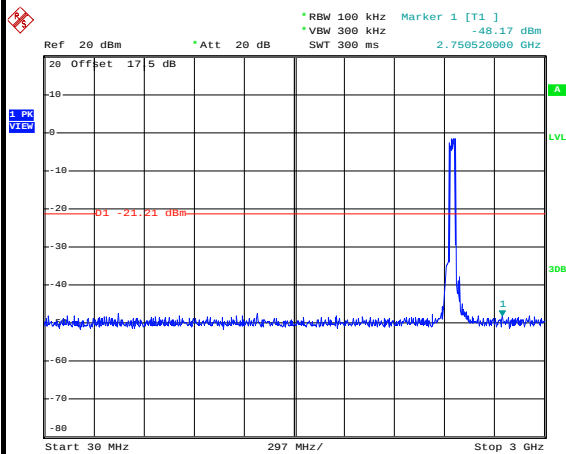
Date: 30.MAR.2014 15:55:43

High Channel Plot



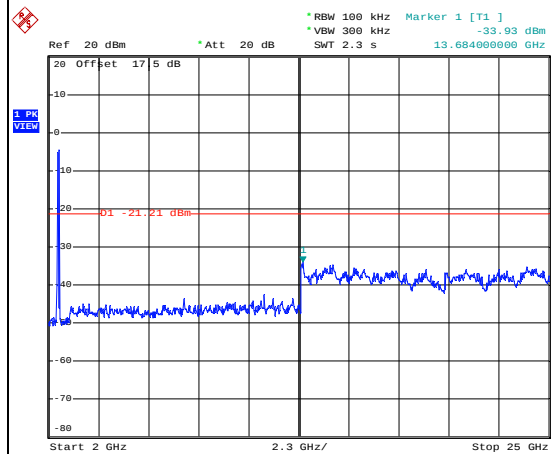
Date: 30.MAR.2014 15:55:57

Spurious Emission 30MHz~3GHz



Date: 30.MAR.2014 16:02:06

Spurious Emission 2GHz~25GHz



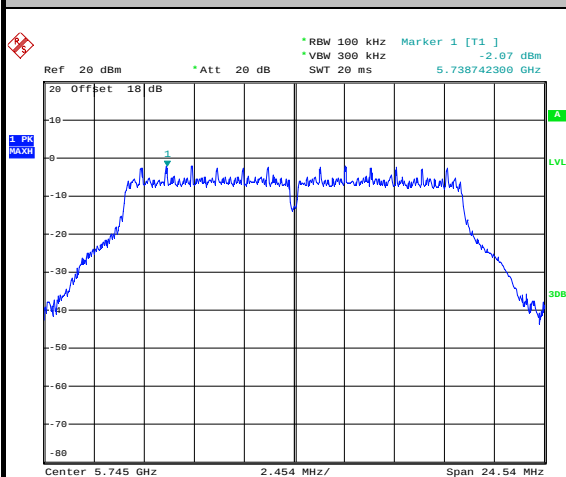
Date: 30.MAR.2014 16:00:26



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

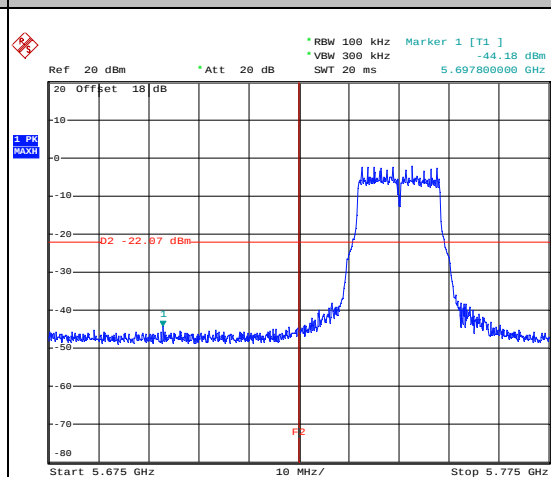
WLAN 802.11a Channel 149

100kHz PSD reference Level



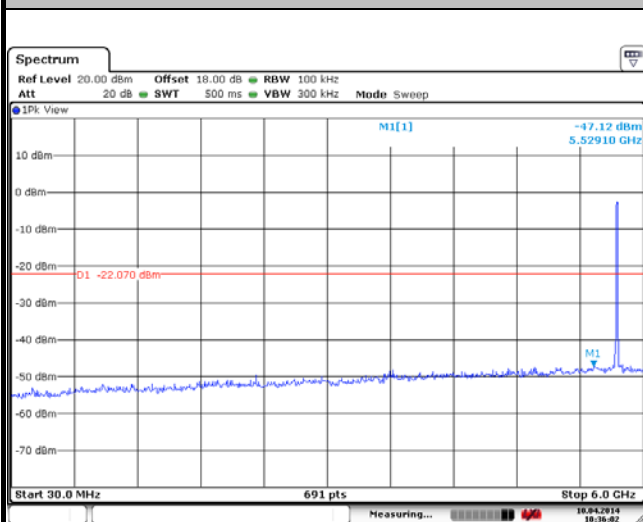
Date: 8.MAY.2014 14:41:34

Low Channel Plot



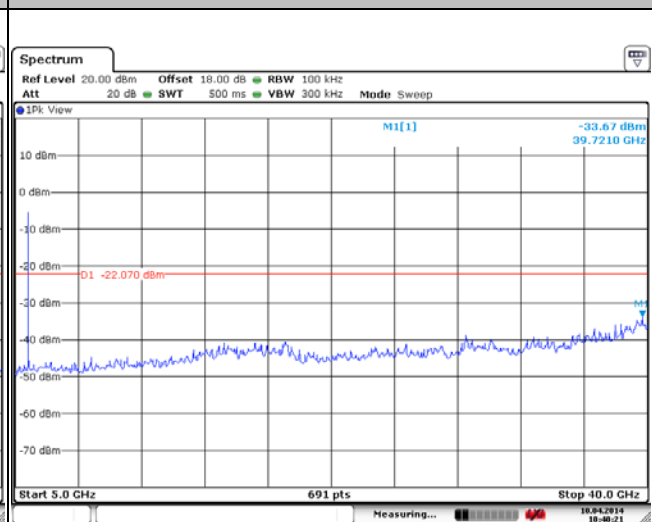
Date: 8.MAY.2014 14:41:48

Spurious Emission 30MHz~6GHz



Date: 10.APR.2014 10:36:02

Spurious Emission 5GHz~40GHz



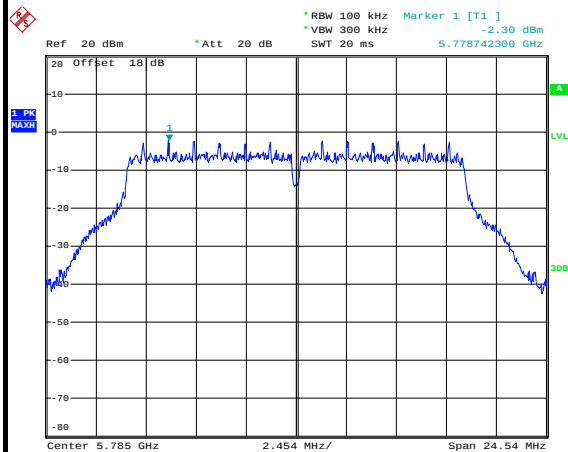
Date: 10.APR.2014 10:40:21



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

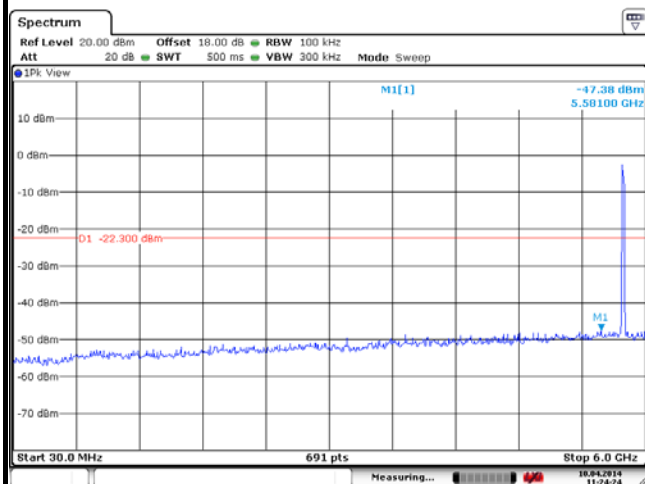
WLAN 802.11a Channel 157

100kHz PSD reference Level



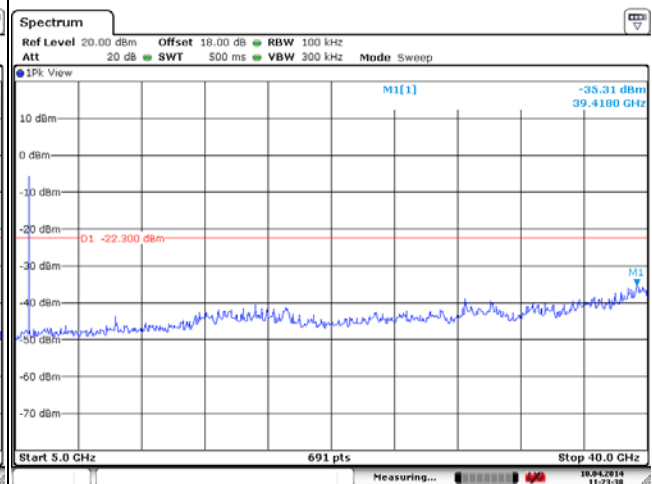
Date: 8.MAY.2014 14:55:28

Spurious Emission 30MHz~6GHz



Date: 10.APR.2014 11:24:24

Spurious Emission 5GHz~40GHz



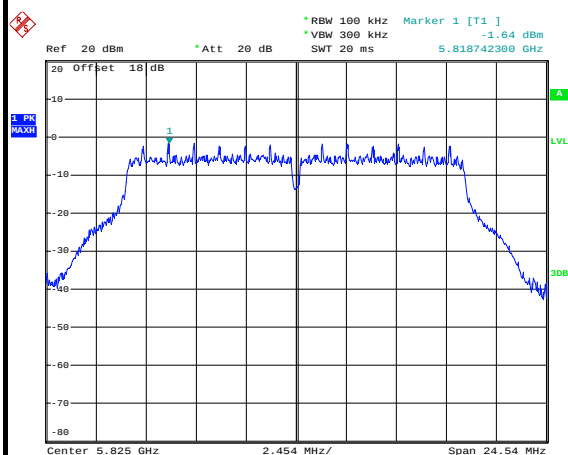
Date: 10.APR.2014 11:23:38



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

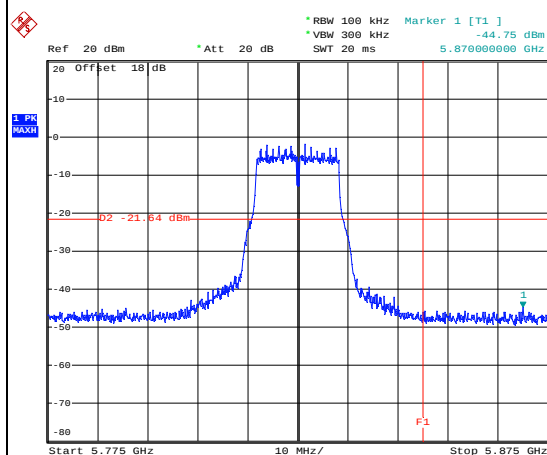
WLAN 802.11a Channel 165

100kHz PSD reference Level



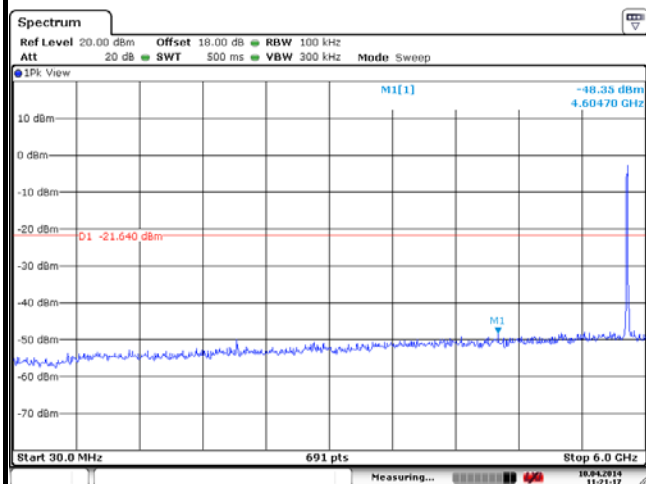
Date: 8.MAY.2014 15:03:43

High Channel Plot



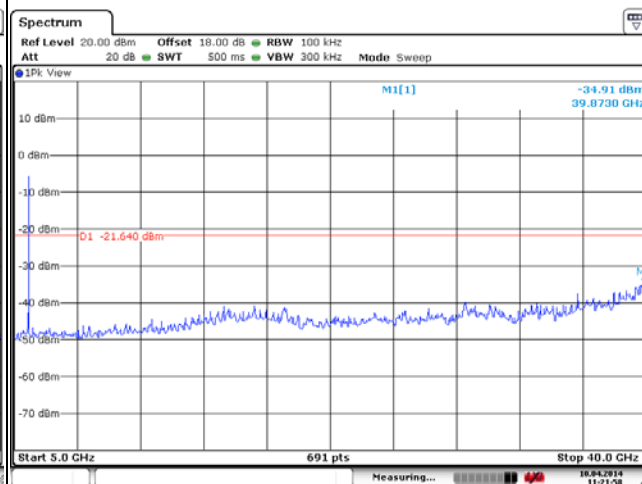
Date: 8.MAY.2014 15:03:57

Spurious Emission 30MHz~6GHz



Date: 10.APR.2014 11:21:17

Spurious Emission 5GHz~40GHz



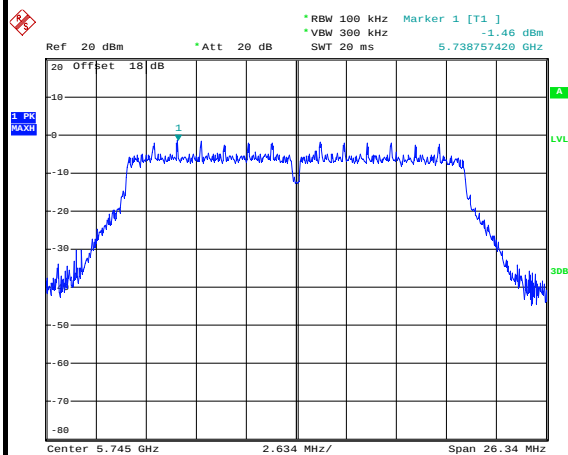
Date: 10.APR.2014 11:21:57



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

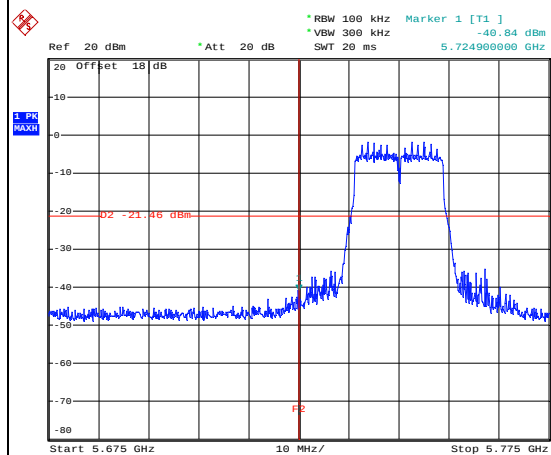
WLAN 802.11n HT20 Channel 149

100kHz PSD reference Level



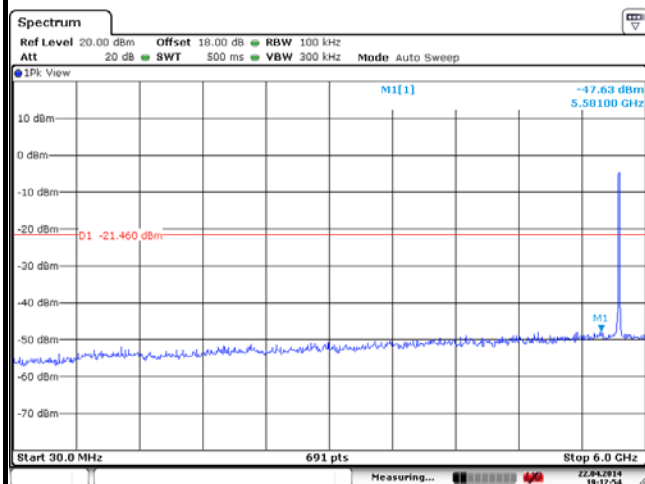
Date: 8.MAY.2014 15:19:31

Low Channel Plot



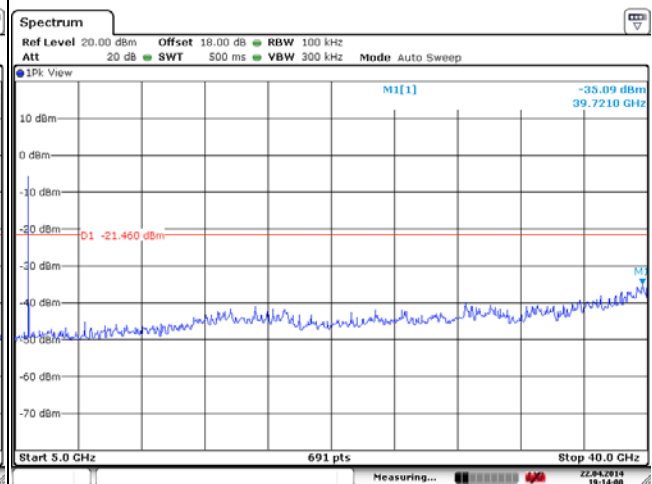
Date: 8.MAY.2014 15:19:45

Spurious Emission 30MHz~6GHz



Date: 22.APR.2014 19:12:54

Spurious Emission 5GHz~40GHz



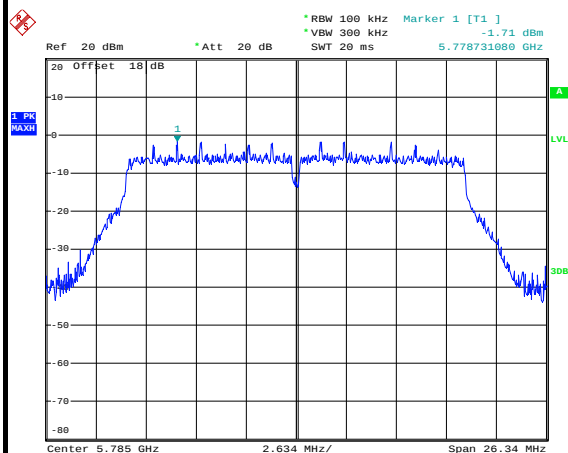
Date: 22.APR.2014 19:14:00



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

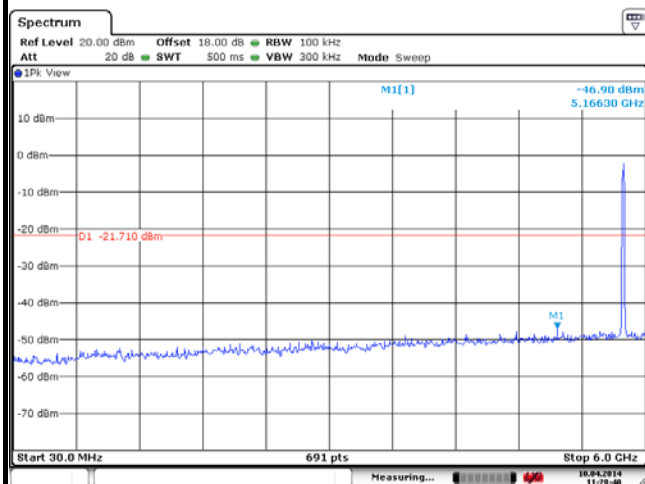
WLAN 802.11n HT20 Channel 157

100kHz PSD reference Level



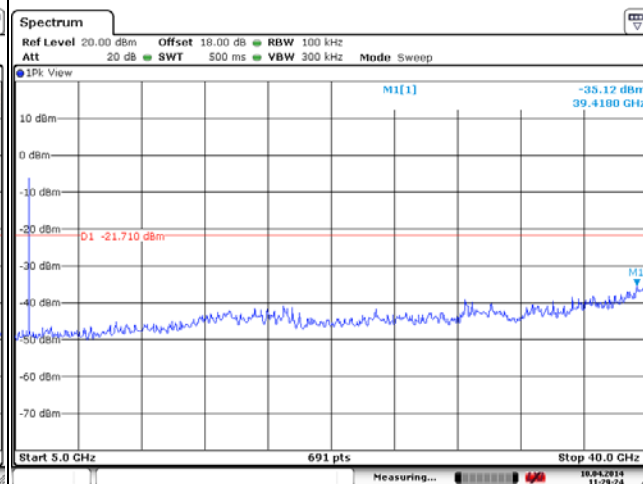
Date: 8.MAY.2014 15:38:10

Spurious Emission 30MHz~6GHz



Date: 10.APR.2014 11:28:40

Spurious Emission 5GHz~40GHz



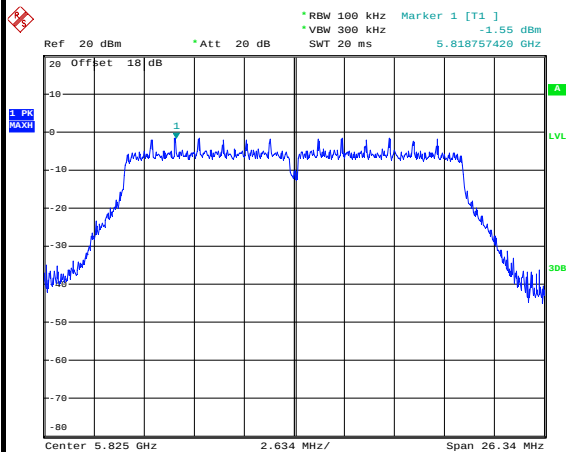
Date: 10.APR.2014 11:29:24



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

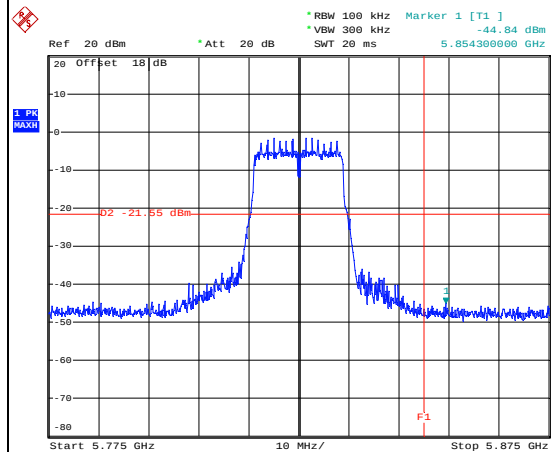
WLAN 802.11n HT20 Channel 165

100kHz PSD reference Level



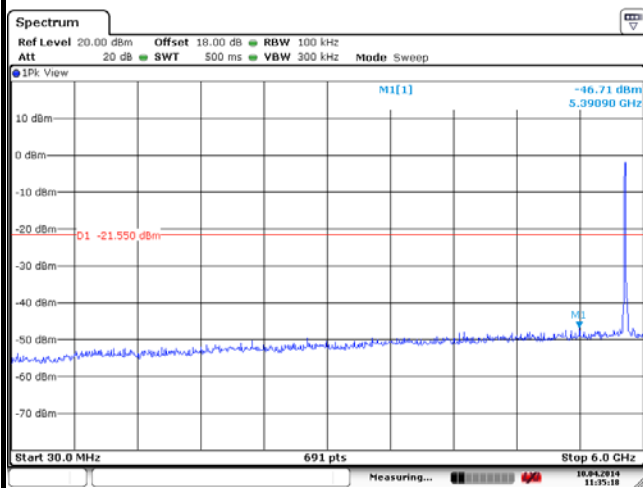
Date: 8.MAY.2014 15:43:07

High Channel Plot



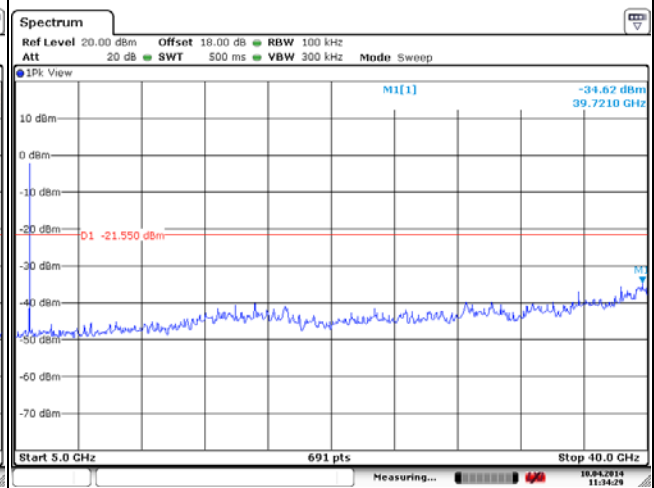
Date: 8.MAY.2014 15:43:21

Spurious Emission 30MHz~6GHz



Date: 10.APR.2014 11:35:17

Spurious Emission 5GHz~40GHz



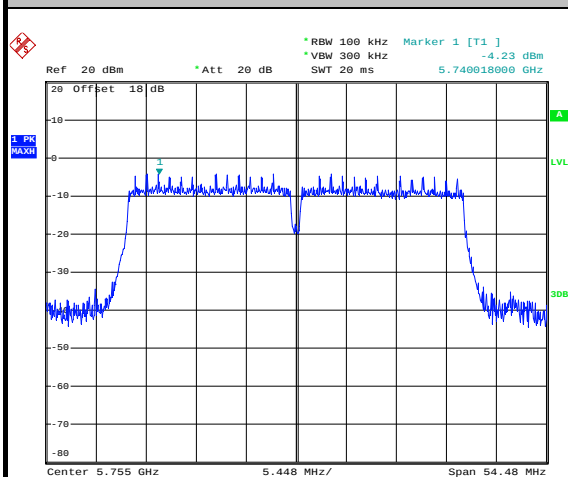
Date: 10.APR.2014 11:34:28



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

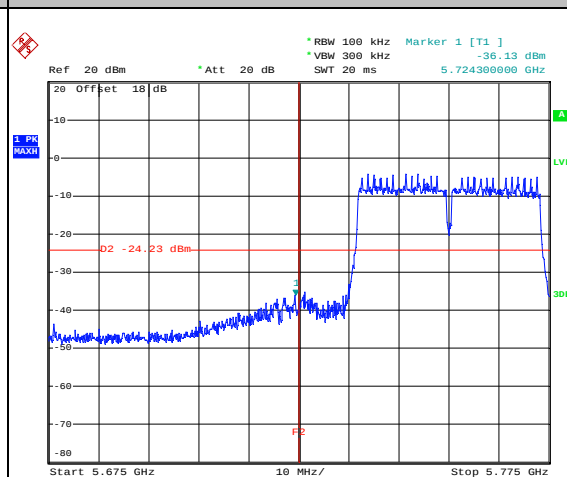
WLAN 802.11n HT40 Channel 151

100kHz PSD reference Level



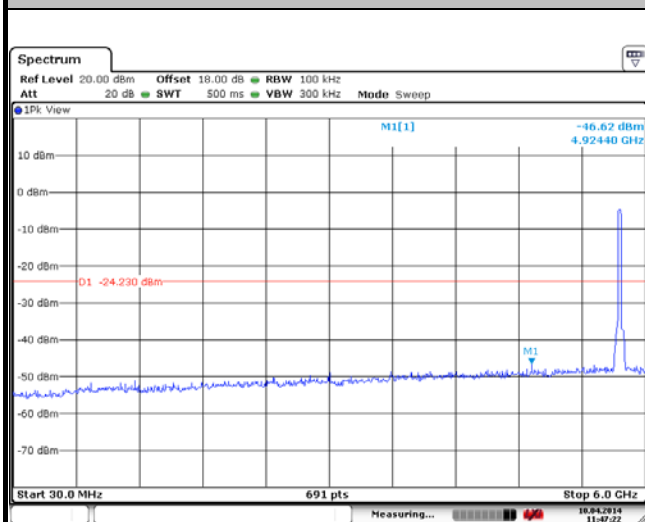
Date: 8.MAY.2014 15:55:27

Low Channel Plot



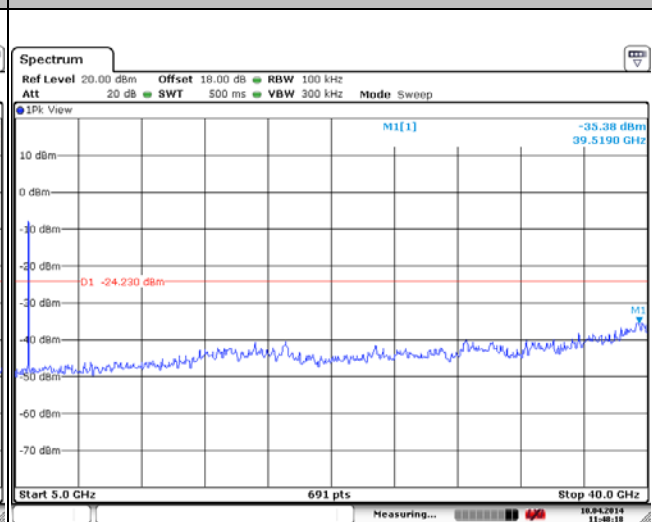
Date: 8.MAY.2014 15:55:41

Spurious Emission 30MHz~6GHz



Date: 10.APR.2014 11:47:22

Spurious Emission 5GHz~40GHz



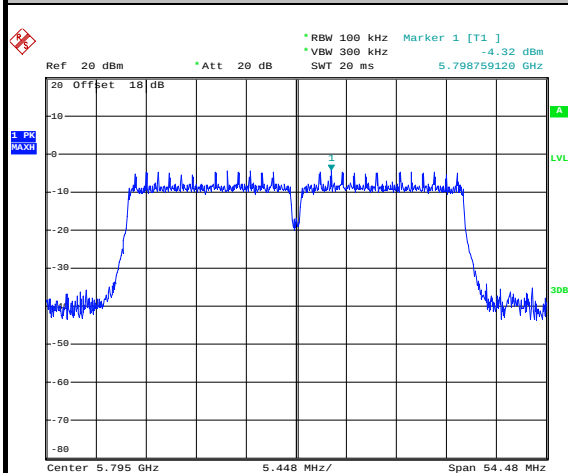
Date: 10.APR.2014 11:48:18



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

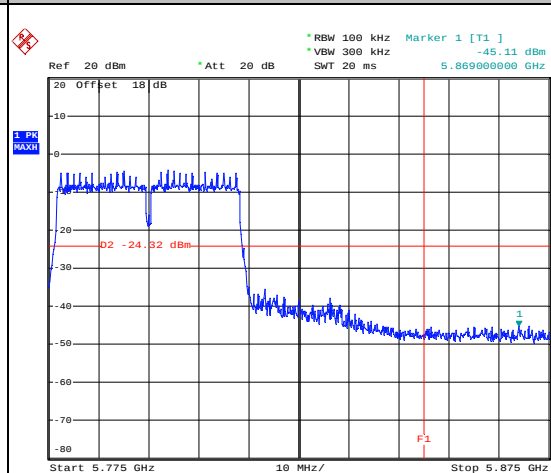
WLAN 802.11n HT40 Channel 159

100kHz PSD reference Level



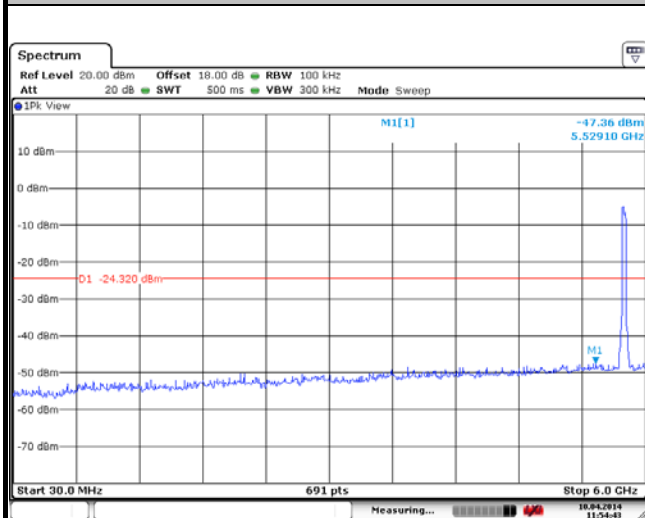
Date: 8.MAY.2014 16:02:45

High Channel Plot



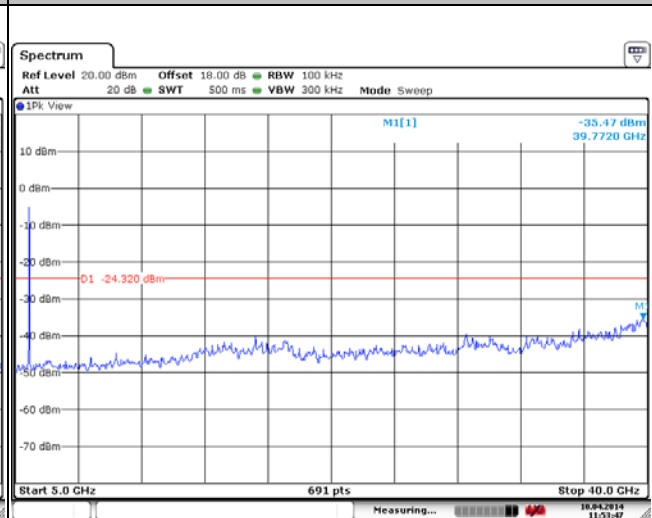
Date: 8.MAY.2014 16:02:59

Spurious Emission 30MHz~6GHz



Date: 10.APR.2014 11:54:43

Spurious Emission 5GHz~40GHz



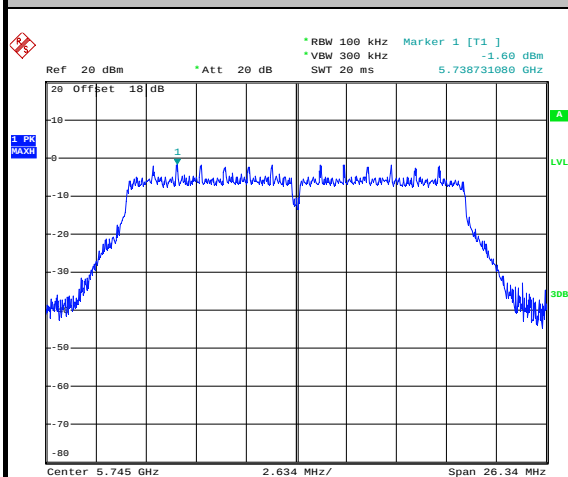
Date: 10.APR.2014 11:53:47



Test Mode :	802.11ac VHT20	Temperature :	24~26°C
Test Band :	5GHz Low	Relative Humidity :	50~53%
Test Channel :	149	Test Engineer :	Fly Liang

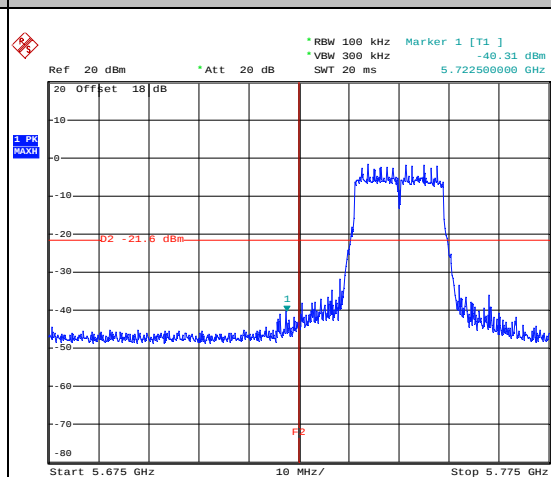
WLAN 802.11ac VHT20 Channel 149

100kHz PSD reference Level



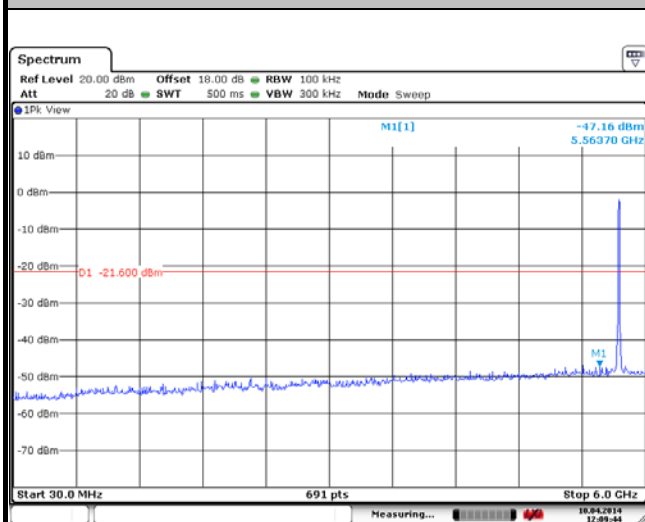
Date: 8.MAY.2014 16:17:14

Low Channel Plot



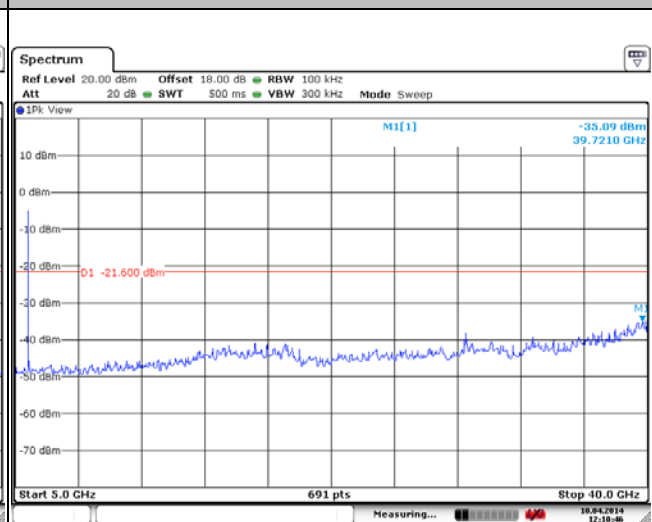
Date: 8.MAY.2014 16:17:28

Spurious Emission 30MHz~6GHz



Date: 10.APR.2014 12:09:44

Spurious Emission 5GHz~40GHz



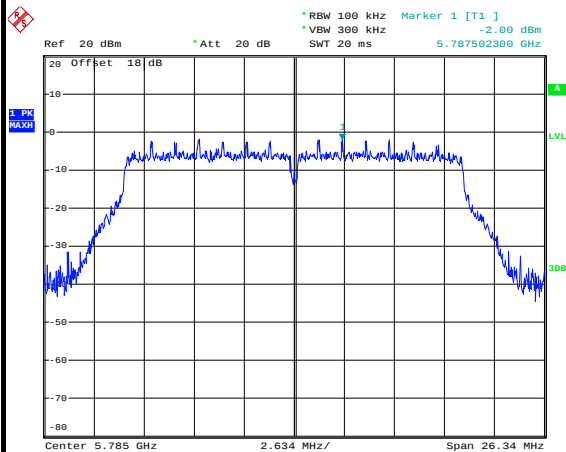
Date: 10.APR.2014 12:10:46



Test Mode :	802.11ac VHT20	Temperature :	24~26°C
Test Band :	5GHz Mid	Relative Humidity :	50~53%
Test Channel :	157	Test Engineer :	Fly Liang

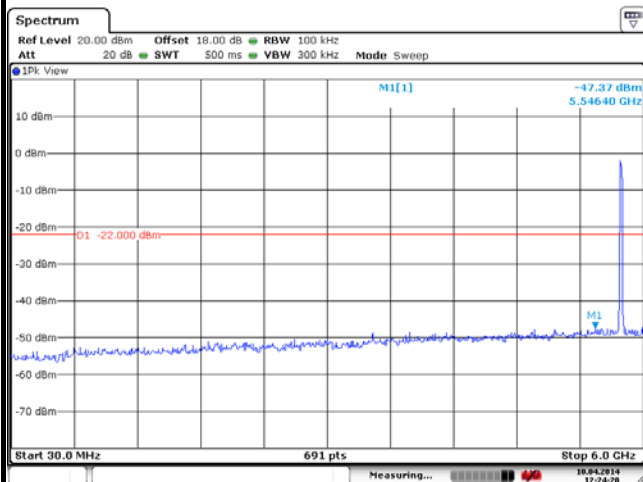
WLAN 802.11ac VHT20 Channel 157

100kHz PSD reference Level



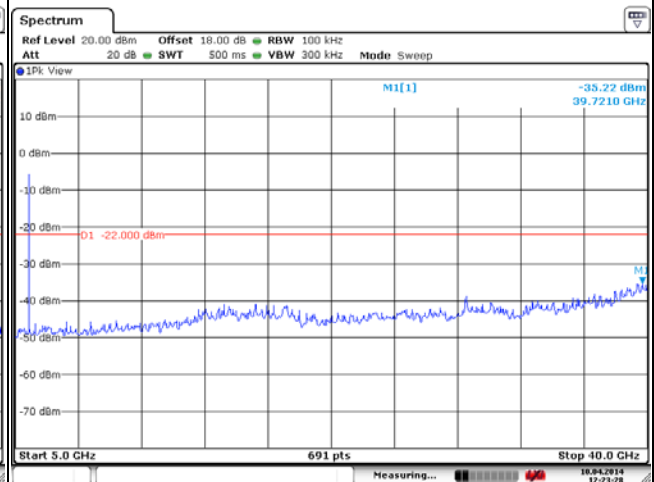
Date: 8.MAY.2014 16:29:47

Spurious Emission 30MHz~6GHz



Date: 10.APR.2014 12:24:20

Spurious Emission 5GHz~40GHz



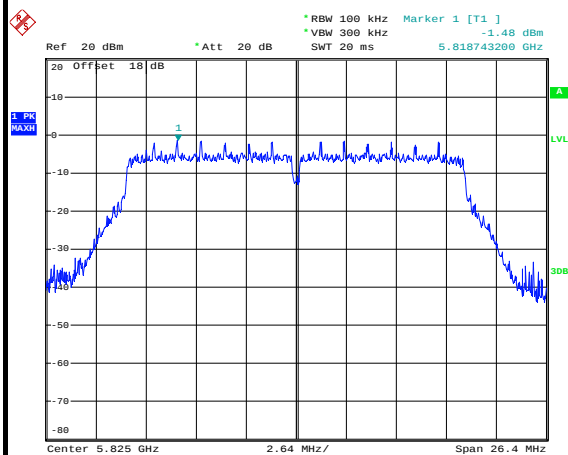
Date: 10.APR.2014 12:23:28



Test Mode :	802.11ac VHT20	Temperature :	24~26°C
Test Band :	5GHz High	Relative Humidity :	50~53%
Test Channel :	165	Test Engineer :	Fly Liang

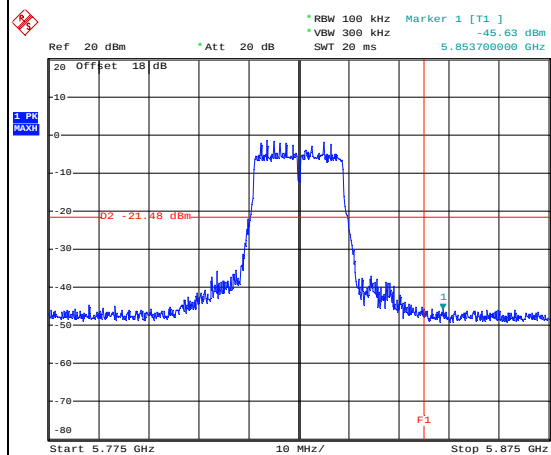
WLAN 802.11ac VHT20 Channel 165

100kHz PSD reference Level



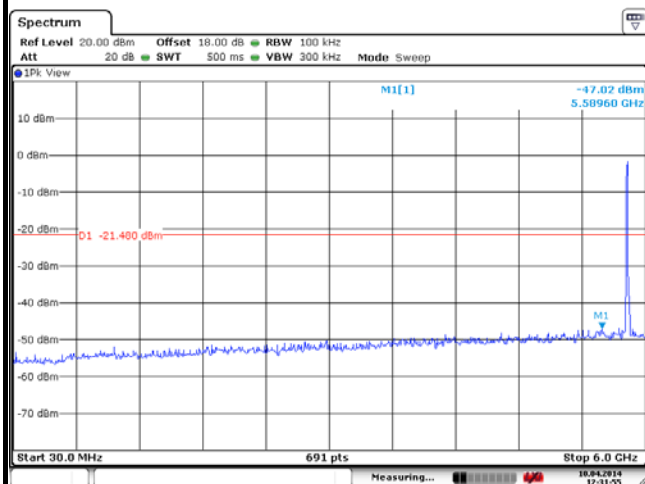
Date: 8.MAY.2014 16:38:44

High Channel Plot



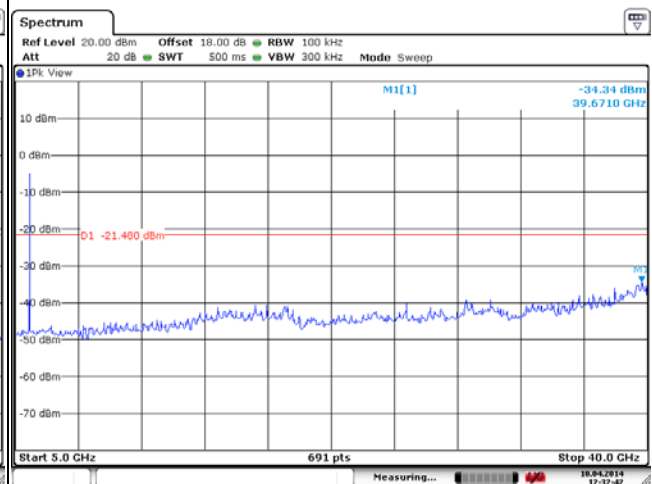
Date: 8.MAY.2014 16:38:58

Spurious Emission 30MHz~6GHz



Date: 10.APR.2014 12:31:55

Spurious Emission 5GHz~40GHz



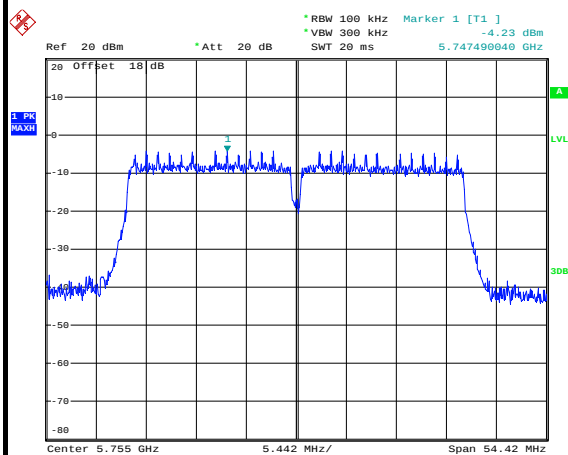
Date: 10.APR.2014 12:32:42



Test Mode :	802.11ac VHT40	Temperature :	24~26°C
Test Band :	5GHz Low	Relative Humidity :	50~53%
Test Channel :	151	Test Engineer :	Fly Liang

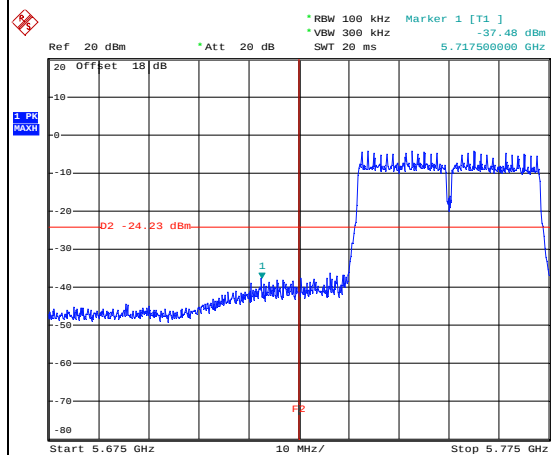
WLAN 802.11ac VHT40 Channel 151

100kHz PSD reference Level



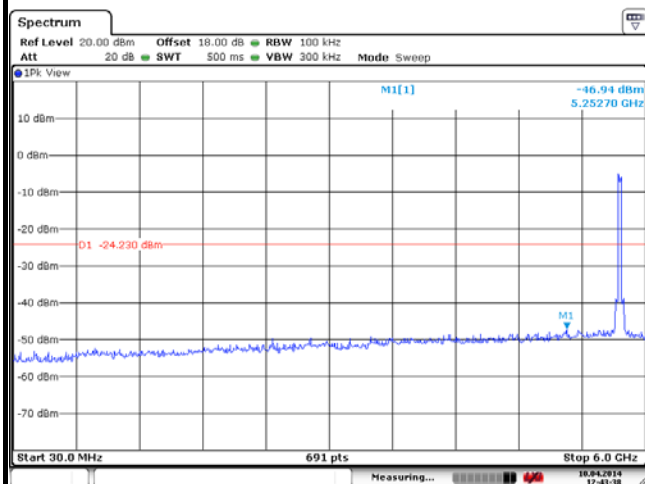
Date: 8.MAY.2014 16:48:54

Low Channel Plot



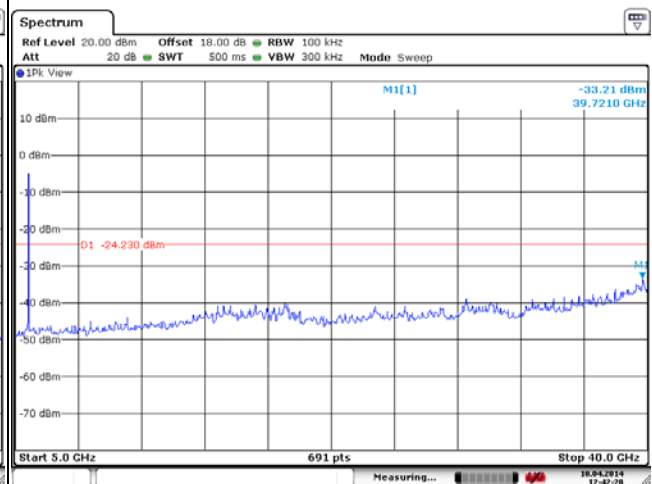
Date: 8.MAY.2014 16:49:08

Spurious Emission 30MHz~6GHz



Date: 10.APR.2014 12:43:38

Spurious Emission 5GHz~40GHz



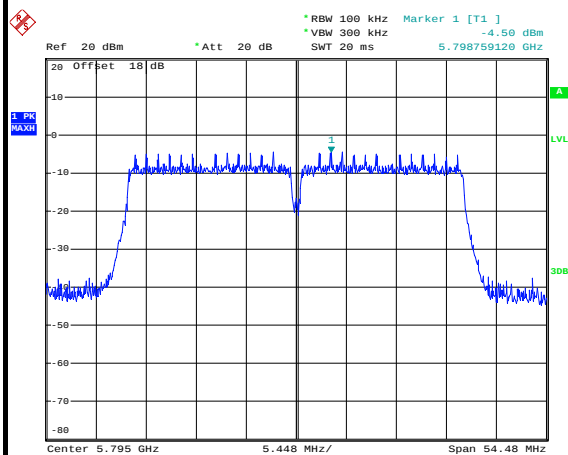
Date: 10.APR.2014 12:42:20



Test Mode :	802.11ac VHT40	Temperature :	24~26°C
Test Band :	5GHz High	Relative Humidity :	50~53%
Test Channel :	159	Test Engineer :	Fly Liang

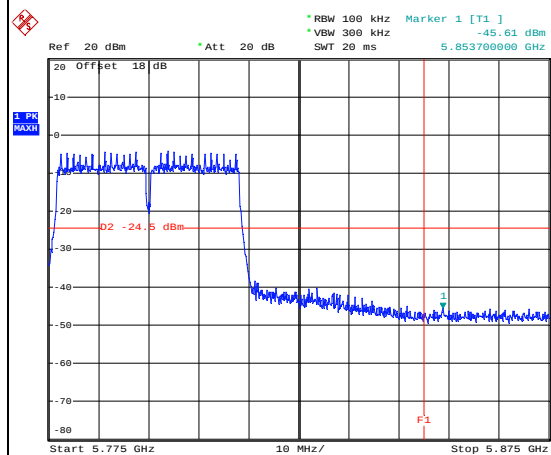
WLAN 802.11ac VHT40 Channel 159

100kHz PSD reference Level



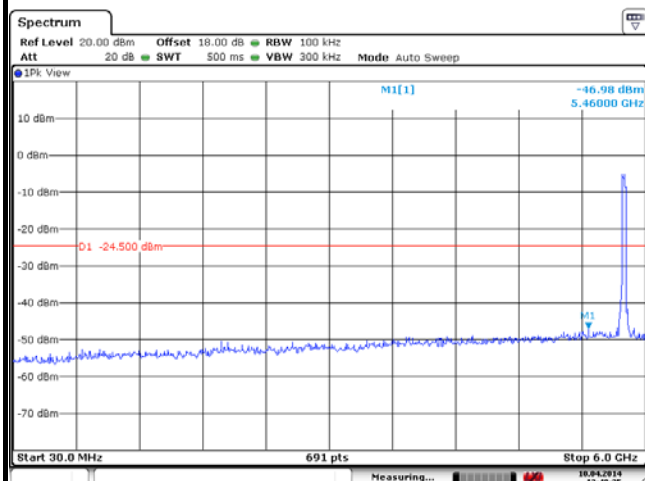
Date: 8.MAY.2014 17:12:50

High Channel Plot



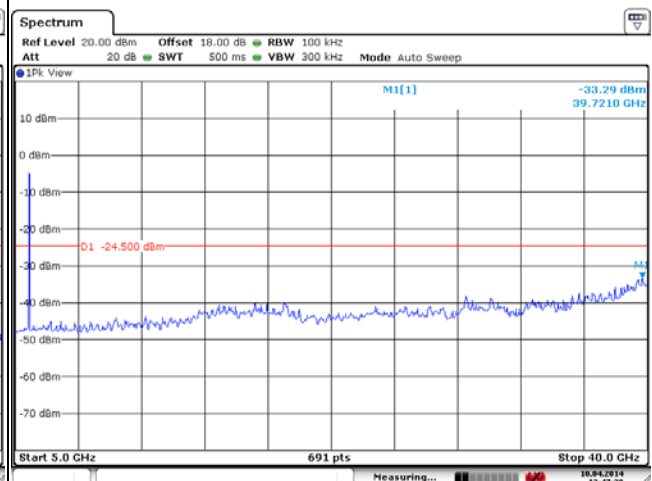
Date: 8.MAY.2014 17:13:04

Spurious Emission 30MHz~6GHz



Date: 10.APR.2014 13:48:24

Spurious Emission 5GHz~40GHz



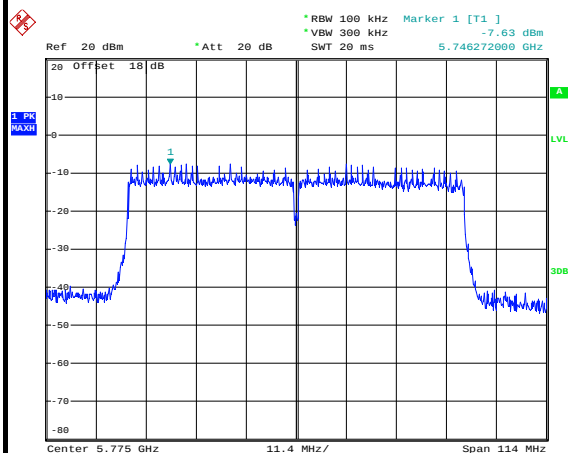
Date: 10.APR.2014 13:47:20



Test Mode :	802.11ac VHT80	Temperature :	24~26°C
Test Band :	5GHz	Relative Humidity :	50~53%
Test Channel :	155	Test Engineer :	Fly Liang

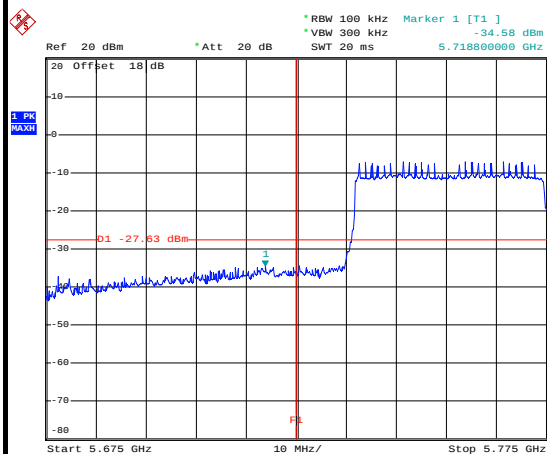
WLAN 802.11ac VHT80 Channel 155

100kHz PSD reference Level



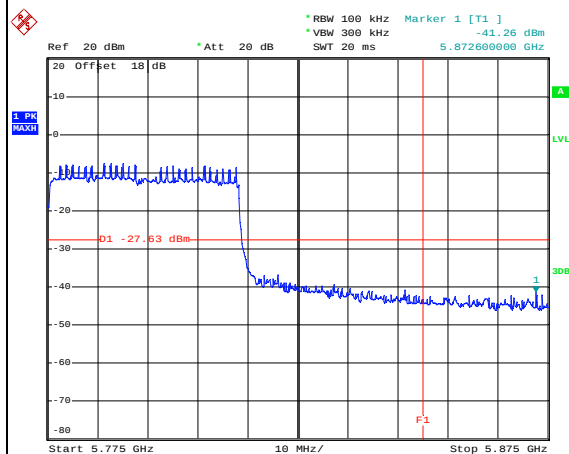
Date: 8.MAY.2014 17:21:14

Low Channel Plot

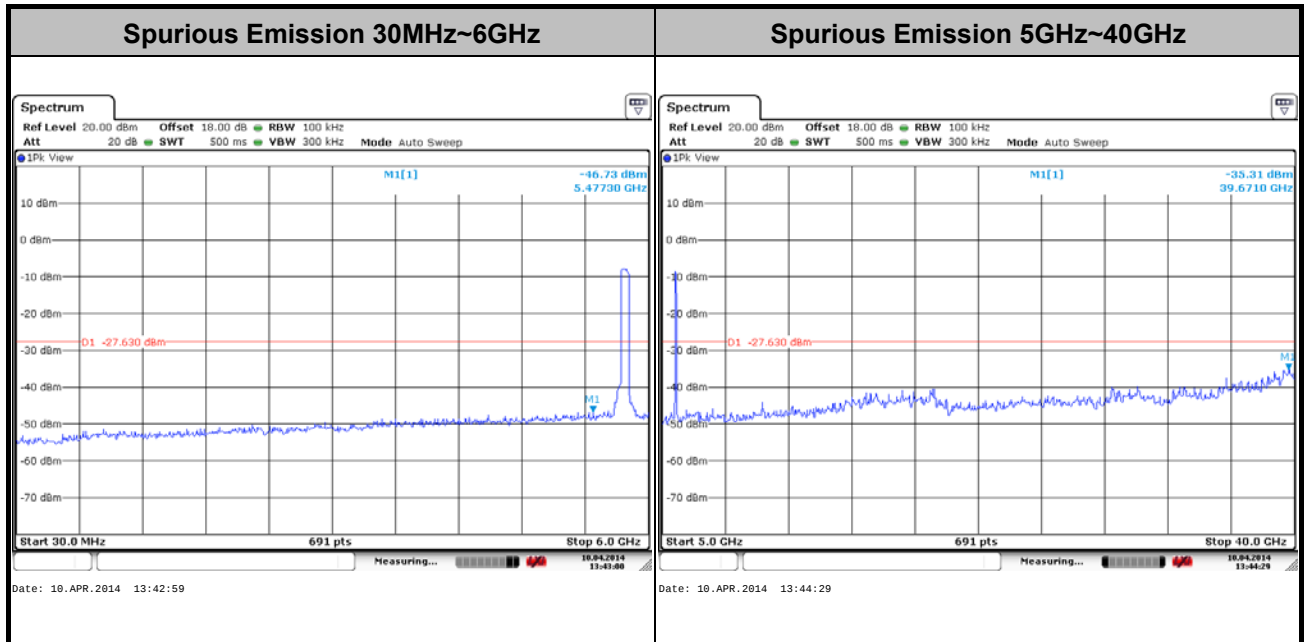


Date: 22.MAY.2014 16:16:50

High Channel Plot



Date: 22.MAY.2014 16:18:00



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; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.

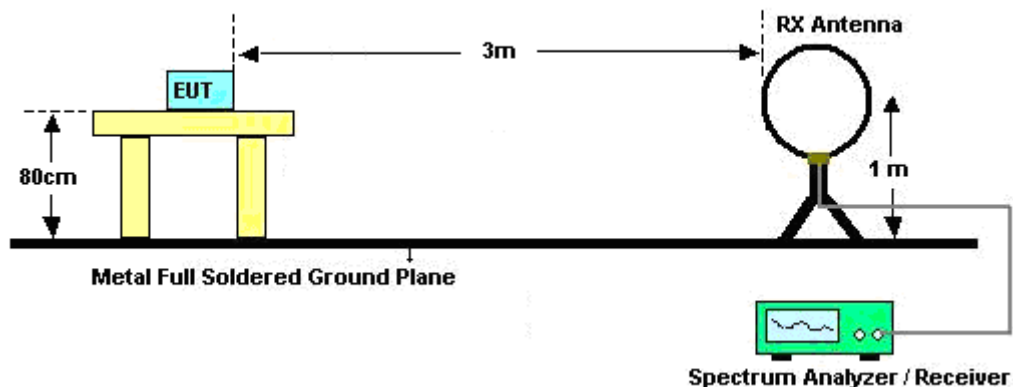
For average measurement:

 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, 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.

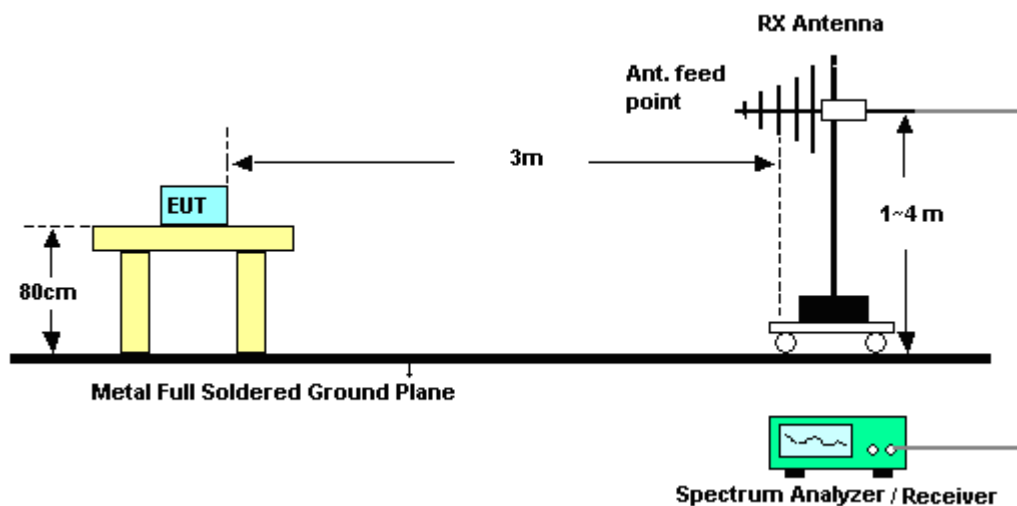
Band	Duty Cycle (%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	98.624	-	-	10Hz
802.11g	93.220	1.430	0.699	1kHz
2.4GHz 802.11n HT20	92.758	1.332	0.751	1kHz
2.4GHz 802.11n HT40	86.753	0.668	1.497	3kHz
802.11a	93.464	1.430	0.699	1kHz
5GHz 802.11n HT20	93.007	1.330	0.752	1kHz
5GHz 802.11n HT40	87.712	0.671	1.490	3kHz
5GHz 802.11ac VHT20	92.541	1.340	0.746	1kHz
5GHz 802.11ac VHT40	86.494	0.666	1.502	3kHz
5GHz 802.11ac VHT80	76.147	0.332	3.012	10kHz

3.5.4 Test Setup

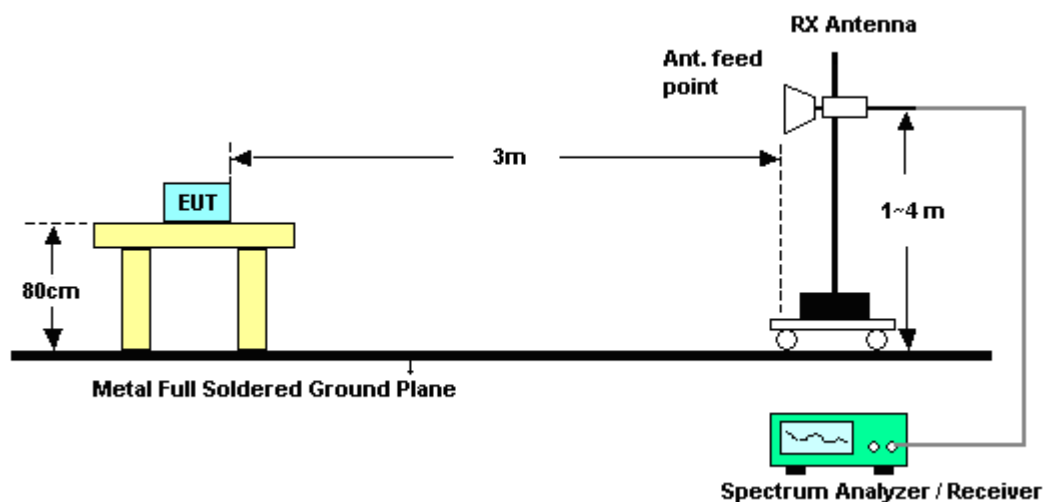
For radiated emissions below 30MHz



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 :	24~25°C
Test Band :	Low	Relative Humidity :	48~49%
Test Channel :	01	Test Engineer :	Leo Liao

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
2388.93	53.67	-20.33	74	43.84	31.98	5.59	27.74	129	127	Peak
2387.22	42.58	-11.42	54	32.75	31.98	5.59	27.74	129	127	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	52.05	-21.95	74	42.17	31.98	5.62	27.72	200	90	Peak
2387.04	40.83	-13.17	54	31	31.98	5.59	27.74	200	90	Average

Test Mode :	802.11b	Temperature :	24~25°C
Test Band :	High	Relative Humidity :	48~49%
Test Channel :	11	Test Engineer :	Leo Liao

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
2486.2	53.06	-20.94	74	40.78	32.41	9.5	29.63	100	214	Peak
2483.5	41.32	-12.68	54	29.04	32.41	9.5	29.63	100	214	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
2495.56	51.78	-22.22	74	39.33	32.5	9.55	29.6	184	262	Peak
2483.5	40.79	-13.21	54	28.51	32.41	9.5	29.63	184	262	Average



Test Mode :	802.11g	Temperature :	24~25°C
Test Band :	Low	Relative Humidity :	48~49%
Test Channel :	01	Test Engineer :	Leo Liao

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
2389.74	56.31	-17.69	74	46.48	31.98	5.59	27.74	100	168	Peak
2389.92	44.05	-9.95	54	34.17	31.98	5.62	27.72	100	168	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
2389.11	55.6	-18.4	74	45.77	31.98	5.59	27.74	200	91	Peak
2389.92	43.47	-10.53	54	33.59	31.98	5.62	27.72	200	91	Average

Test Mode :	802.11g	Temperature :	24~25°C
Test Band :	High	Relative Humidity :	48~49%
Test Channel :	11	Test Engineer :	Leo Liao

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
2483.59	65.33	-8.67	74	54.88	32.41	5.71	27.67	100	126	Peak
2483.56	46.56	-7.44	54	36.11	32.41	5.71	27.67	100	126	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
2484.22	61.75	-12.25	74	51.3	32.41	5.71	27.67	191	75	Peak
2483.59	44.04	-9.96	54	33.59	32.41	5.71	27.67	191	75	Average



Test Mode :	802.11n HT20	Temperature :	24~25°C
Test Band :	Low	Relative Humidity :	48~49%
Test Channel :	01	Test Engineer :	Leo Liao

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
2389.83	61.59	-12.41	74	51.71	31.98	5.62	27.72	129	130	Peak
2389.56	47.08	-6.92	54	37.25	31.98	5.59	27.74	129	130	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
2389.56	59.69	-14.31	74	49.86	31.98	5.59	27.74	200	73	Peak
2389.92	44.52	-9.48	54	34.64	31.98	5.62	27.72	200	73	Average

Test Mode :	802.11n HT20	Temperature :	24~25°C
Test Band :	High	Relative Humidity :	48~49%
Test Channel :	11	Test Engineer :	Leo Liao

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
2483.8	66.53	-7.47	74	56.08	32.41	5.71	27.67	100	126	Peak
2483.83	46.17	-7.83	54	35.72	32.41	5.71	27.67	100	126	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
2484.43	65.02	-8.98	74	54.57	32.41	5.71	27.67	194	74	Peak
2483.62	44.57	-9.43	54	34.12	32.41	5.71	27.67	194	74	Average



Test Mode :	802.11n HT40	Temperature :	24~25°C
Test Band :	Low	Relative Humidity :	48~49%
Test Channel :	03	Test Engineer :	Leo Liao

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
2389.38	54.55	-19.45	74	43.07	31.98	9.28	29.78	200	205	Peak
2388.75	42.67	-11.33	54	31.19	31.98	9.28	29.78	200	205	Average
2487.04	52.51	-21.49	74	40.23	32.41	9.5	29.63	200	205	Peak
2484.55	42.75	-11.25	54	30.47	32.41	9.5	29.63	200	205	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
2389.65	54.45	-19.55	74	42.97	31.98	9.28	29.78	100	264	Peak
2388.84	42.92	-11.08	54	31.44	31.98	9.28	29.78	100	264	Average
2486.17	52.21	-21.79	74	39.93	32.41	9.5	29.63	100	264	Peak
2485.3	42.05	-11.95	54	29.77	32.41	9.5	29.63	100	264	Average



Test Mode :	802.11n HT40	Temperature :	24~25°C
Test Band :	High	Relative Humidity :	48~49%
Test Channel :	09	Test Engineer :	Leo Liao

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
2383.44	51.92	-22.08	74	42.17	31.9	5.59	27.74	100	131	Peak
2386.59	41.59	-12.41	54	31.76	31.98	5.59	27.74	100	131	Average
2488.18	69.57	-4.43	74	59.03	32.5	5.71	27.67	100	131	Peak
2484.91	49.65	-4.35	54	39.2	32.41	5.71	27.67	100	131	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
2360.49	51.38	-22.62	74	41.77	31.81	5.56	27.76	192	73	Peak
2385.51	41.3	-12.7	54	31.47	31.98	5.59	27.74	192	73	Average
2488.42	65.96	-8.04	74	55.42	32.5	5.71	27.67	192	73	Peak
2483.5	47.73	-6.27	54	37.28	32.41	5.71	27.67	192	73	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 :	24~25°C
Test Channel :	01	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	99.39	-	-	89.42	32.07	5.62	27.72	129	127	Peak
2412	97.22	-	-	87.25	32.07	5.62	27.72	129	127	Average
4824	42.1	-31.9	74	57.18	33.82	8.36	57.26	110	115	Peak

Test Mode :	802.11b	Temperature :	24~25°C
Test Channel :	01	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	96.34	-	-	86.37	32.07	5.62	27.72	200	90	Peak
2412	94	-	-	84.03	32.07	5.62	27.72	200	90	Average
4824	39.7	-34.3	74	54.78	33.82	8.36	57.26	110	115	Peak

Test Mode :	802.11b	Temperature :	24~25°C
Test Channel :	06	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	100.21	-	-	90.03	32.24	5.65	27.71	130	128	Peak
2437	97.98	-	-	87.8	32.24	5.65	27.71	130	128	Average
4874	35.92	-38.08	74	50.75	33.93	8.41	57.17	125	223	Peak
7311	35.73	-38.27	74	49.01	33.89	9.99	57.16	146	312	Peak

Test Mode :	802.11b	Temperature :	24~25°C
Test Channel :	06	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	97.81	-	-	87.63	32.24	5.65	27.71	197	91	Peak
2437	95.67	-	-	85.49	32.24	5.65	27.71	197	91	Average
4874	35.62	-38.38	74	50.45	33.93	8.41	57.17	125	223	Peak
7311	36.45	-37.55	74	49.73	33.89	9.99	57.16	146	312	Peak

Test Mode :	802.11b	Temperature :	24~25°C
Test Channel :	11	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	102.43	-	-	90.32	32.33	9.44	29.66	100	214	Peak
2462	100.27	-	-	88.16	32.33	9.44	29.66	100	214	Average
4924	34	-40	74	33.27	34.05	12.93	46.25	146	347	Peak
7386	35.6	-38.4	74	33.95	33.94	15.11	47.4	145	274	Peak

Test Mode :	802.11b	Temperature :	24~25°C
Test Channel :	11	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	101.07	-	-	88.96	32.33	9.44	29.66	184	262	Peak
2462	98.73	-	-	86.62	32.33	9.44	29.66	184	262	Average
4924	29.71	-44.29	74	33.45	34.05	8.46	46.25	146	347	Peak
7386	29.83	-44.17	74	33.27	33.94	10.02	47.4	145	274	Peak

Test Mode :	802.11g	Temperature :	24~25°C
Test Channel :	01	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	99.99	-	-	90.02	32.07	5.62	27.72	100	168	Peak
2412	92.2	-	-	82.23	32.07	5.62	27.72	100	168	Average
4824	36.9	-37.1	74	51.98	33.82	8.36	57.26	110	115	Peak

Test Mode :	802.11g	Temperature :	24~25°C
Test Channel :	01	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	98.68	-	-	88.71	32.07	5.62	27.72	200	91	Peak
2412	90.29	-	-	80.32	32.07	5.62	27.72	200	91	Average
4824	34.51	-39.49	74	49.59	33.82	8.36	57.26	110	115	Peak

Test Mode :	802.11g	Temperature :	24~25°C
Test Channel :	06	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	102.37	-	-	92.19	32.24	5.65	27.71	100	169	Peak
2437	94.53	-	-	84.35	32.24	5.65	27.71	100	169	Average
4874	34.81	-39.19	74	49.64	33.93	8.41	57.17	125	223	Peak
7311	36.2	-37.8	74	49.48	33.89	9.99	57.16	146	312	Peak

Test Mode :	802.11g	Temperature :	24~25°C
Test Channel :	06	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	100.05	-	-	89.87	32.24	5.65	27.71	196	89	Peak
2437	91.99	-	-	81.81	32.24	5.65	27.71	196	89	Average
4874	34.98	-39.02	74	49.81	33.93	8.41	57.17	125	223	Peak
7311	36.14	-37.86	74	49.42	33.89	9.99	57.16	146	312	Peak

Test Mode :	802.11g	Temperature :	24~25°C
Test Channel :	11	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	103.64	-	-	93.32	32.33	5.68	27.69	100	126	Peak
2462	95.76	-	-	85.44	32.33	5.68	27.69	100	126	Average
4924	33.93	-40.07	74	48.5	34.05	8.46	57.08	178	139	Peak
7386	36.09	-37.91	74	49.18	33.94	10.02	57.05	150	220	Peak

Test Mode :	802.11g	Temperature :	24~25°C
Test Channel :	11	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	101.76	-	-	91.44	32.33	5.68	27.69	191	75	Peak
2462	93.69	-	-	83.37	32.33	5.68	27.69	191	75	Average
4924	34.02	-39.98	74	48.59	34.05	8.46	57.08	178	139	Peak
7386	35.65	-38.35	74	48.74	33.94	10.02	57.05	150	220	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	24~25°C
Test Channel :	01	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	101.37	-	-	91.4	32.07	5.62	27.72	129	130	Peak
2412	92.23	-	-	82.26	32.07	5.62	27.72	129	130	Average
4824	38.04	-35.96	74	53.12	33.82	8.36	57.26	110	115	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	24~25°C
Test Channel :	01	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	98.73	-	-	88.76	32.07	5.62	27.72	200	73	Peak
2412	89.3	-	-	79.33	32.07	5.62	27.72	200	73	Average
4824	34.22	-39.78	74	49.3	33.82	8.36	57.26	110	115	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	24~25°C
Test Channel :	06	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	100.56	-	-	90.38	32.24	5.65	27.71	196	91	Peak
2437	91.04	-	-	80.86	32.24	5.65	27.71	196	91	Average
4874	35.04	-38.96	74	49.87	33.93	8.41	57.17	125	223	Peak
7311	37.36	-36.64	74	50.64	33.89	9.99	57.16	146	312	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	24~25°C
Test Channel :	06	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	98.94	-	-	88.76	32.24	5.65	27.71	195	100	Peak
2437	90.19	-	-	80.01	32.24	5.65	27.71	195	100	Average
4874	34.31	-39.69	74	49.14	33.93	8.41	57.17	125	223	Peak
7311	36.67	-37.33	74	49.95	33.89	9.99	57.16	146	312	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	24~25°C
Test Channel :	11	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	103.86	-	-	93.54	32.33	5.68	27.69	100	126	Peak
2462	94.55	-	-	84.23	32.33	5.68	27.69	100	126	Average
4924	34.32	-39.68	74	48.89	34.05	8.46	57.08	178	139	Peak
7386	37.13	-36.87	74	50.22	33.94	10.02	57.05	150	220	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	24~25°C
Test Channel :	11	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	101.13	-	-	90.81	32.33	5.68	27.69	194	74	Peak
2462	92.59	-	-	82.27	32.33	5.68	27.69	194	74	Average
4924	34.56	-39.44	74	49.13	34.05	8.46	57.08	178	139	Peak
7386	35.38	-38.62	74	48.47	33.94	10.02	57.05	150	220	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	24~25°C
Test Channel :	03	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 2422 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
99.84	21.74	-21.76	43.5	39.03	11.2	1.45	29.94	-	-	Peak
197.81	27.38	-16.12	43.5	46.25	9.02	2.05	29.94	145	360	Peak
336.52	23.65	-22.35	46	36.71	14.2	2.67	29.93	-	-	Peak
733.25	24.96	-21.04	46	31.16	19.6	4.13	29.93	-	-	Peak
811.82	26.37	-19.63	46	31.5	20.4	4.4	29.93	-	-	Peak
972.84	25.94	-28.06	54	29.73	21.21	4.94	29.94	-	-	Peak
2422	99.9	-	-	88.07	32.16	9.39	29.72	200	205	Peak
2422	91.19	-	-	79.36	32.16	9.39	29.72	200	205	Average
4844	34.94	-39.06	74	34.63	33.86	12.85	46.4	126	248	Peak
7266	36.53	-37.47	74	34.89	33.87	15.06	47.29	185	252	Peak



Test Mode :	2.4GHz 802.11n HT40	Temperature :	24~25°C
Test Channel :	03	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 2422 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
34.85	23.71	-16.29	40	36.71	16.1	0.83	29.93	210	360	Peak
150.28	23.6	-19.9	43.5	42.08	9.7	1.76	29.94	-	-	Peak
434.49	20.34	-25.66	46	31.47	15.75	3.04	29.92	-	-	Peak
765.26	25.14	-20.86	46	31.03	19.8	4.24	29.93	-	-	Peak
876.81	25.32	-20.68	46	30	20.66	4.6	29.94	-	-	Peak
968.96	25.04	-28.96	54	28.75	21.3	4.93	29.94	-	-	Peak
2422	97.85	-	-	86.02	32.16	9.39	29.72	100	264	Peak
2422	90.96	-	-	79.13	32.16	9.39	29.72	100	264	Average
4844	30.21	-43.79	74	34.37	33.86	8.38	46.4	126	248	Peak
7266	30.65	-43.35	74	34.09	33.87	9.98	47.29	185	252	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	24~25°C
Test Channel :	06	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	100.31	-	-	90.13	32.24	5.65	27.71	100	127	Peak
2437	92.6	-	-	82.42	32.24	5.65	27.71	100	127	Average
4874	36	-38	74	50.83	33.93	8.41	57.17	158	318	Peak
7311	36.57	-37.43	74	49.85	33.89	9.99	57.16	148	265	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	24~25°C
Test Channel :	06	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	97.9	-	-	87.72	32.24	5.65	27.71	198	76	Peak
2437	89.49	-	-	79.31	32.24	5.65	27.71	198	76	Average
4874	35.25	-38.75	74	50.08	33.93	8.41	57.17	158	318	Peak
7311	36.64	-37.36	74	49.92	33.89	9.99	57.16	148	265	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	24~25°C
Test Channel :	09	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 2452 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
2452	101.12	-	-	90.89	32.24	5.68	27.69	100	131	Peak
2452	92.73	-	-	82.5	32.24	5.68	27.69	100	131	Average
4904	35.49	-38.51	74	50.15	34.01	8.44	57.11	170	215	Peak
7356	36.61	-37.39	74	49.78	33.92	10.01	57.1	163	28	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	24~25°C
Test Channel :	09	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 2452 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
2452	99.5	-	-	89.27	32.24	5.68	27.69	192	73	Peak
2452	90.59	-	-	80.36	32.24	5.68	27.69	192	73	Average
4904	34.61	-39.39	74	49.27	34.01	8.44	57.11	170	215	Peak
7356	36.24	-37.76	74	49.41	33.92	10.01	57.1	163	28	Peak

Test Mode :	802.11a	Temperature :	24~25°C
Test Channel :	149	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	91.18	-	-	74.85	34	9.14	26.81	100	288	Peak
5745	83.73	-	-	67.4	34	9.14	26.81	100	288	Average
11490	38.88	-35.12	74	44.14	37.77	13.39	56.42	145	265	Peak

Test Mode :	802.11a	Temperature :	24~25°C
Test Channel :	149	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	92.72	-	-	76.39	34	9.14	26.81	112	157	Peak
5745	84.66	-	-	68.33	34	9.14	26.81	112	157	Average
11490	38.74	-35.26	74	44	37.77	13.39	56.42	145	265	Peak

Test Mode :	802.11a	Temperature :	24~25°C
Test Channel :	157	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	87.34	-	-	71.01	34	9.16	26.83	100	286	Peak
5785	79.92	-	-	63.59	34	9.16	26.83	100	286	Average
11570	37.82	-36.18	74	42.91	37.86	13.41	56.36	105	198	Peak

Test Mode :	802.11a	Temperature :	24~25°C
Test Channel :	157	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	90.05	-	-	73.72	34	9.16	26.83	100	167	Peak
5785	82.65	-	-	66.32	34	9.16	26.83	100	167	Average
11570	37.82	-36.18	74	42.91	37.86	13.41	56.36	105	198	Peak

Test Mode :	802.11a	Temperature :	24~25°C
Test Channel :	165	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	89.02	-	-	72.69	34	9.17	26.84	100	285	Peak
5825	80.39	-	-	64.06	34	9.17	26.84	100	285	Average
11650	39.11	-34.89	74	44.09	37.91	13.42	56.31	146	347	Peak

Test Mode :	802.11a	Temperature :	24~25°C
Test Channel :	165	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	89.8	-	-	73.47	34	9.17	26.84	100	8	Peak
5825	81.88	-	-	65.55	34	9.17	26.84	100	8	Average
11650	38.62	-35.38	74	43.6	37.91	13.42	56.31	146	347	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	24~25°C
Test Channel :	149	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 5745 MHz is fundamental signal which can be ignored. 2. 17235 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. 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	93.36	-	-	79.32	34	9.14	29.1	142	281	Peak
5745	84.61	-	-	70.57	34	9.14	29.1	142	281	Average
11490	46.72	-27.28	74	40.17	37.77	17.26	48.48	145	265	Peak
17235	43.85	-30.15	74	28.21	41.79	20.76	46.91	174	321	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	24~25°C
Test Channel :	149	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 5745 MHz is fundamental signal which can be ignored. 2. 17235 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. 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	97.38	-	-	83.34	34	9.14	29.1	159	94	Peak
5745	89.29	-	-	75.25	34	9.14	29.1	159	94	Average
11490	44.72	-29.28	74	38.17	37.77	17.26	48.48	145	265	Peak
17235	43.77	-30.23	74	28.13	41.79	20.76	46.91	174	321	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	24~25°C
Test Channel :	157	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	87.75	-	-	71.42	34	9.16	26.83	100	299	Peak
5785	80.45	-	-	64.12	34	9.16	26.83	100	299	Average
11570	38.47	-35.53	74	43.56	37.86	13.41	56.36	105	198	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	24~25°C
Test Channel :	157	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	91.17	-	-	74.84	34	9.16	26.83	100	168	Peak
5785	81.38	-	-	65.05	34	9.16	26.83	100	168	Average
11570	39.2	-34.8	74	44.29	37.86	13.41	56.36	105	198	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	24~25°C
Test Channel :	165	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	87.76	-	-	71.43	34	9.17	26.84	100	285	Peak
5825	79.34	-	-	63.01	34	9.17	26.84	100	285	Average
11650	39.66	-34.34	74	44.64	37.91	13.42	56.31	146	347	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	24~25°C
Test Channel :	165	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	90.38	-	-	74.05	34	9.17	26.84	100	8	Peak
5825	82.12	-	-	65.79	34	9.17	26.84	100	8	Average
11650	39.1	-34.9	74	44.08	37.91	13.42	56.31	146	347	Peak

Test Mode :	5GHz 802.11n HT40	Temperature :	24~25°C
Test Channel :	151	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	89.23	-	-	75.19	34	9.14	29.1	100	360	Peak
5755	81.36	-	-	67.32	34	9.14	29.1	100	360	Average
11550	48.08	-25.92	74	41.48	37.84	17.3	48.54	174	321	Peak

Test Mode :	5GHz 802.11n HT40	Temperature :	24~25°C
Test Channel :	151	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	88.26	-	-	74.22	34	9.14	29.1	100	250	Peak
5755	81.02	-	-	66.98	34	9.14	29.1	100	250	Average
11550	44.75	-29.25	74	38.15	37.84	17.3	48.54	174	321	Peak

Test Mode :	5GHz 802.11n HT40	Temperature :	24~25°C
Test Channel :	159	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	86.86	-	-	70.53	34	9.16	26.83	100	298	Peak
5795	77.98	-	-	61.65	34	9.16	26.83	100	298	Average
11590	37.1	-36.9	74	42.17	37.87	13.41	56.35	145	265	Peak

Test Mode :	5GHz 802.11n HT40	Temperature :	24~25°C
Test Channel :	159	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	87.86	-	-	71.53	34	9.16	26.83	100	168	Peak
5795	80.95	-	-	64.62	34	9.16	26.83	100	168	Average
11590	36.69	-37.31	74	41.76	37.87	13.41	56.35	145	265	Peak

Test Mode :	5GHz 802.11ac VHT20	Temperature :	24~25°C
Test Channel :	149	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	90.41	-	-	74.08	34	9.14	26.81	100	289	Peak
5745	83.43	-	-	67.1	34	9.14	26.81	100	289	Average
11490	38.87	-35.13	74	44.13	37.77	13.39	56.42	145	265	Peak

Test Mode :	5GHz 802.11ac VHT20	Temperature :	24~25°C
Test Channel :	149	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	92.29	-	-	75.96	34	9.14	26.81	102	158	Peak
5745	84.01	-	-	67.68	34	9.14	26.81	102	158	Average
11490	39.3	-34.7	74	44.56	37.77	13.39	56.42	145	265	Peak

Test Mode :	5GHz 802.11ac VHT20	Temperature :	24~25°C
Test Channel :	157	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	88.05	-	-	71.72	34	9.16	26.83	100	298	Peak
5785	79.84	-	-	63.51	34	9.16	26.83	100	298	Average
11570	37.93	-36.07	74	43.02	37.86	13.41	56.36	105	198	Peak

Test Mode :	5GHz 802.11ac VHT20	Temperature :	24~25°C
Test Channel :	157	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	90.01	-	-	73.68	34	9.16	26.83	100	168	Peak
5785	82.04	-	-	65.71	34	9.16	26.83	100	168	Average
11570	37.68	-36.32	74	42.77	37.86	13.41	56.36	105	198	Peak

Test Mode :	5GHz 802.11ac VHT20	Temperature :	24~25°C
Test Channel :	165	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	88.78	-	-	72.45	34	9.17	26.84	100	285	Peak
5825	79.77	-	-	63.44	34	9.17	26.84	100	285	Average
11650	39	-35	74	43.98	37.91	13.42	56.31	146	347	Peak

Test Mode :	5GHz 802.11ac VHT20	Temperature :	24~25°C
Test Channel :	165	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	89.84	-	-	73.51	34	9.17	26.84	100	8	Peak
5825	81.38	-	-	65.05	34	9.17	26.84	100	8	Average
11650	37.93	-36.07	74	42.91	37.91	13.42	56.31	146	347	Peak

Test Mode :	5GHz 802.11ac VHT40	Temperature :	24~25°C
Test Channel :	151	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	88.03	-	-	71.7	34	9.14	26.81	100	285	Peak
5755	79.63	-	-	63.3	34	9.14	26.81	100	285	Average
11510	38.51	-35.49	74	43.71	37.8	13.4	56.4	174	321	Peak

Test Mode :	5GHz 802.11ac VHT40	Temperature :	24~25°C
Test Channel :	151	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	88.19	-	-	71.86	34	9.14	26.81	100	158	Peak
5755	81.03	-	-	64.7	34	9.14	26.81	100	158	Average
11510	37.96	-36.04	74	43.16	37.8	13.4	56.4	174	321	Peak

Test Mode :	5GHz 802.11ac VHT40	Temperature :	24~25°C
Test Channel :	159	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	85.82	-	-	69.49	34	9.16	26.83	100	298	Peak
5795	78.27	-	-	61.94	34	9.16	26.83	100	298	Average
11590	37.18	-36.82	74	42.25	37.87	13.41	56.35	145	265	Peak

Test Mode :	5GHz 802.11ac VHT40	Temperature :	24~25°C
Test Channel :	159	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	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	87.63	-	-	71.3	34	9.16	26.83	100	167	Peak
5795	80.56	-	-	64.23	34	9.16	26.83	100	167	Average
11590	38.08	-35.92	74	43.15	37.87	13.41	56.35	145	265	Peak

Test Mode :	5GHz 802.11ac VHT80	Temperature :	24~25°C
Test Channel :	155	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 5775 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
150.28	26.17	-17.33	43.5	44.65	9.7	1.76	29.94	-	-	Peak
199.75	26.53	-16.97	43.5	45.31	9.1	2.06	29.94	100	210	Peak
321	28.98	-17.02	46	42.74	13.57	2.6	29.93	-	-	Peak
646.92	23.18	-22.82	46	30.64	18.6	3.87	29.93	-	-	Peak
743.92	25.22	-20.78	46	30.56	20.42	4.17	29.93	-	-	Peak
937.92	25.33	-20.67	46	29.38	21.08	4.81	29.94	-	-	Peak
5775	98.26	-	-	55.11	34	9.15	0	200	0	Peak
5775	90.23	-	-	47.08	34	9.15	0	200	0	Average
11510	45.94	-28.06	74	39.37	37.8	17.27	48.5	174	321	Peak

Test Mode :	5GHz 802.11ac VHT80	Temperature :	24~25°C
Test Channel :	155	Relative Humidity :	48~49%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 5775 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
104.69	28.31	-15.19	43.5	45.17	11.6	1.48	29.94	200	254	Peak
193.93	23.26	-20.24	43.5	42.32	8.86	2.02	29.94	-	-	Peak
321	20.9	-25.1	46	34.66	13.57	2.6	29.93	-	-	Peak
624.61	23.51	-22.49	46	31.05	18.6	3.78	29.92	-	-	Peak
907.85	26.25	-19.75	46	30.46	21.04	4.69	29.94	-	-	Peak
990.3	25.38	-28.62	54	29.01	21.3	5.01	29.94	-	-	Peak
5775	94.56	-	-	51.41	34	9.15	0	100	0	Peak
5775	87.23	-	-	44.08	34	9.15	0	100	0	Average
11510	48.36	-25.64	74	41.79	37.8	17.27	48.5	174	321	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 (dB μ V)	
	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.

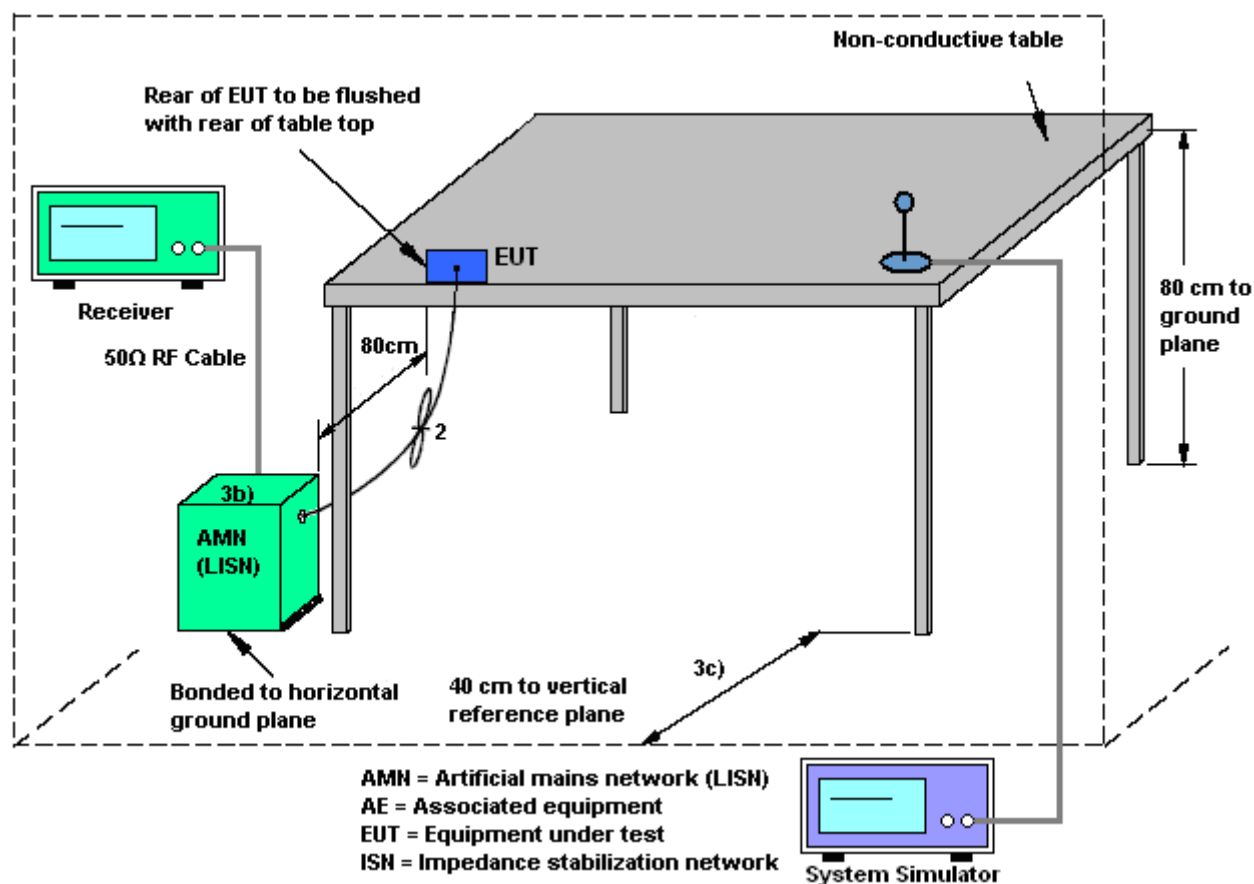
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

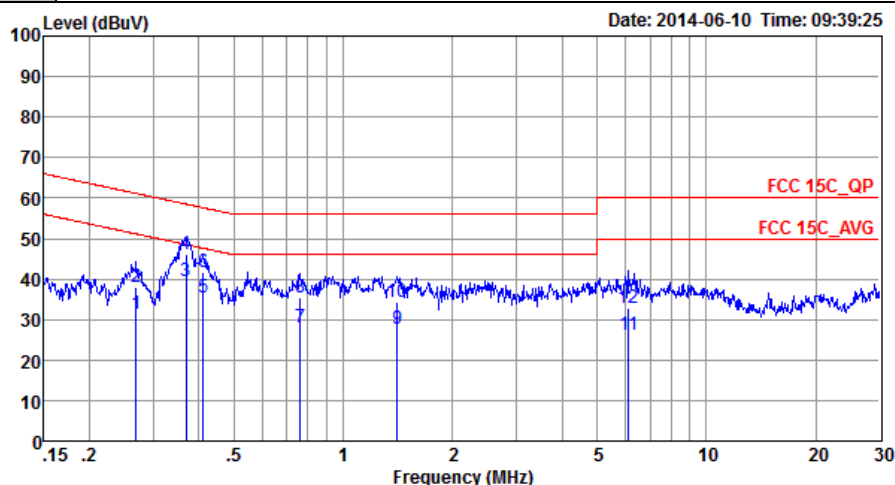
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other 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

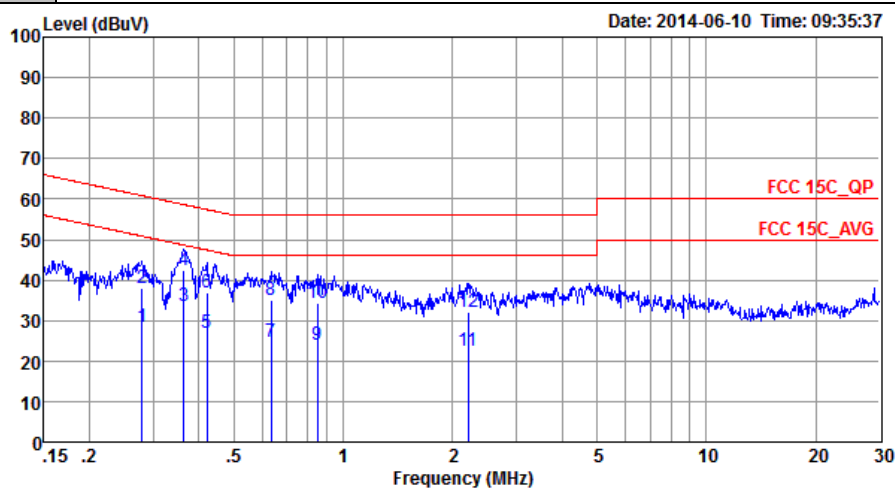
Test Mode :	Mode 2	Temperature :	21~22℃
Test Engineer :	Jack Tian	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + USB Cable (Charging from Adapter) + Earphone		



Site : CO01-SZ
Condition: FCC 15C_QP LISN_L_20140304 LINE

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.27	31.37	-19.79	51.16	20.89	0.25	10.23	Average
2	0.27	38.17	-22.99	61.16	27.69	0.25	10.23	QP
3 *	0.37	39.55	-8.97	48.52	29.10	0.27	10.18	Average
4	0.37	46.05	-12.47	58.52	35.60	0.27	10.18	QP
5	0.41	35.25	-12.34	47.59	24.80	0.28	10.17	Average
6	0.41	41.55	-16.04	57.59	31.10	0.28	10.17	QP
7	0.76	28.15	-17.85	46.00	17.80	0.20	10.15	Average
8	0.76	35.45	-20.55	56.00	25.10	0.20	10.15	QP
9	1.41	27.71	-18.29	46.00	17.30	0.24	10.17	Average
10	1.41	34.21	-21.79	56.00	23.80	0.24	10.17	QP
11	6.12	26.16	-23.84	50.00	15.50	0.40	10.26	Average
12	6.12	32.86	-27.14	60.00	22.20	0.40	10.26	QP

Test Mode :	Mode 2	Temperature :	21~22℃
Test Engineer :	Jack Tian	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + USB Cable (Charging from Adapter) + Earphone		



Site : C001-SZ
Condition: FCC 15C_QP LISN_N_20140304 NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.28	28.47	-22.38	50.85	17.90	0.35	10.22	Average
2	0.28	38.17	-22.68	60.85	27.60	0.35	10.22	QP
3 *	0.36	33.76	-14.89	48.65	23.20	0.38	10.18	Average
4	0.36	42.36	-16.29	58.65	31.80	0.38	10.18	QP
5	0.42	26.86	-20.56	47.42	16.30	0.39	10.17	Average
6	0.42	36.86	-20.56	57.42	26.30	0.39	10.17	QP
7	0.63	24.75	-21.25	46.00	14.30	0.30	10.15	Average
8	0.63	34.95	-21.05	56.00	24.50	0.30	10.15	QP
9	0.85	24.04	-21.96	46.00	13.60	0.29	10.15	Average
10	0.85	34.34	-21.66	56.00	23.90	0.29	10.15	QP
11	2.21	22.58	-23.42	46.00	12.01	0.38	10.19	Average
12	2.21	32.08	-23.92	56.00	21.51	0.38	10.19	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. 03, 2014	Mar. 30, 2014~ May 22, 2014	Mar. 02, 2015	Conducted (TH01-SZ)
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Jun. 17, 2013	Mar. 30, 2014~ May 22, 2014	Jun. 16, 2014	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	13dBm~20dBm	Mar. 03, 2014	Mar. 30, 2014~ May 22, 2014	Mar. 02, 2015	Conducted (TH01-SZ)
Power Sensor	Anritsu	MA2411B	1207253	0.3GHz~40GHz	Mar. 03, 2014	Mar. 30, 2014~ May 22, 2014	Mar. 02, 2015	Conducted (TH01-SZ)
ESCIO TEST Receiver	R&S	ESCI	100724	9kHz~3GHz	Feb. 21, 2014	Aug. 29, 2014	Feb. 20, 2015	Radiation (03CH01-SZ)
Signal Analyzer	R&S	FSV40	101078	10Hz~40GHz	May. 08, 2014	Aug. 29, 2014	May. 07, 2015	Radiation (03CH01-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 09, 2014	Aug. 29, 2014	May 08, 2015	Radiation (03CH01-SZ)
Bilog Antenna	TESEQ	CBL 6112D	23188	30MHz~2GHz	Oct. 26, 2013	Aug. 29, 2014	Oct. 25, 2014	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS Lindgren	3117	00119436	1GHz~18GHz	Oct. 26, 2013	Aug. 29, 2014	Oct. 25, 2014	Radiation (03CH01-SZ)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Mar. 10, 2014	Aug. 29, 2014	Mar. 09, 2015	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz~3000MHz	Feb. 21, 2014	Aug. 29, 2014	Feb. 20, 2015	Radiation (03CH01-SZ)
Amplifier	Agilent	83017A	MY39501302	3Hz~26.5GHz	Mar. 03, 2014	Aug. 29, 2014	Mar. 02, 2015	Radiation (03CH01-SZ)
Turn Table	EM Electronics	EM 1000	N/A	0~360 degree	NCR	Aug. 29, 2014	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM Electronics	EM 1000	N/A	1 m~4 m	NCR	Aug. 29, 2014	NCR	Radiation (03CH01-SZ)
ESCIO TEST Receiver	R&S	ESCI	100724	9kHz~3GHz	Feb. 21, 2014	Jun. 10, 2014	Feb. 20, 2015	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Mar. 04, 2014	Jun. 10, 2014	Mar. 03, 2015	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Mar. 04, 2014	Jun. 10, 2014	Mar. 03, 2015	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	6160200008 91	100Vac~250Vac	Dec. 17, 2013	Jun. 10, 2014	Dec. 16, 2014	Conduction (CO01-SZ)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.3
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.9
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