FCC RF Test Report

APPLICANT	:	TP-LINK TECHNOLOGIES CO., LTD.
EQUIPMENT	:	AC1200 High Gain Wireless Dual Band USB Adapter
BRAND NAME	:	TP-LINK
MODEL NAME	:	T4UH
FCC ID	:	TE7T4UH
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Jul. 02, 2014 and testing was completed on Oct. 06, 2014. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been 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 INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

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APPENDIX A. TEST RESULT OF RADIATED EMISSION

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR470201A	Rev. 01	Initial issue of report	Oct. 24, 2014
FR470201A	Rev. 02	Adding Measuring Equipment in section 4	Oct. 28, 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	≥ 0.5MHz	Pass	-
3.2	15.247(b)	RSS-210 A8.4	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	RSS-210 A8.2(b)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	RSS-210 A8.5	Conducted Band Edges	≤ 20dBc	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 0.17 dB at 2390.000 MHz
3.6	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 6.60 dB at 0.190 MHz
3.7	15.203 & 15.247(b)	RSS-210 A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

TP-LINK TECHNOLOGIES CO., LTD.
Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

1.2 Manufacturer

TP-LINK TECHNOLOGIES CO., LTD.
Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	AC1200 High Gain Wireless Dual Band USB Adapter
Brand Name	TP-LINK
Model Name	T4UH
FCC ID	TE7T4UH
EUT supports Radios application	WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80
EUT Stage	Production Unit

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 subjective to this standard

<table>
<tr><th colspan="2">Product Specification subjective to this standard</th></tr>
<tr><td>Tx/Rx Channel Frequency Range</td><td>802.11b/g/n : 2412 MHz ~ 2462 MHz
802.11a/n/ac: 5745~5825MHz.</td></tr>
<tr><td>Maximum Output Power to antenna</td><td><Ant. 1>
<2412 MHz ~ 2462 MHz >
802.11b : 20.20 dBm (0.1047 W)
802.11g : 25.13 dBm (0.3258 W)
802.11n HT20 : 24.40 dBm (0.2754 W)
802.11n HT40 : 24.12 dBm (0.2582 W)
<5745 MHz ~ 5825 MHz >
802.11a : 23.46 dBm (0.2218 W)
802.11n HT20 : 23.33 dBm (0.2153 W)
802.11n HT40 : 23.29 dBm (0.2133 W)
802.11ac VHT20 : 23.34 dBm (0.2158 W)
802.11ac VHT40 : 23.36 dBm (0.2168 W)
802.11ac VHT80 : 25.07 dBm (0.3214 W)
<MIMO Ant. 1+2>
<2412 MHz ~ 2462 MHz >
802.11n HT20 : 27.62 dBm (0.5781 W)
802.11n HT40 : 27.34 dBm (0.5420 W)
<5745 MHz ~ 5825 MHz >
802.11n HT20 : 26.52 dBm (0.4487 W)
802.11n HT40 : 26.49 dBm (0.4457 W)
802.11ac VHT20 : 26.48 dBm (0.4446 W)
802.11ac VHT40 : 26.39 dBm (0.4355 W)
802.11ac VHT80 : 25.20 dBm (0.3311 W)</td></tr>
<tr><td>Antenna Type</td><td><Ant 1>
802.11b/g/n : Dipole Antenna type with gain 2.26 dBi
802.11a/n/ac : Dipole Antenna type with gain 3.34 dBi
<Ant 2>
802.11b/g/n : Dipole Antenna type with gain 2.26 dBi
802.11a/n/ac : Dipole Antenna type with gain 3.34 dBi</td></tr>
<tr><td>Type of Modulation</td><td>802.11b : DSSS (DBPSK / DQPSK / CCK)
802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)</td></tr>
<tr><td>Antenna Function for Transmitter</td><td><table>
<tr><th></th><th>Chain Port 0 Ant. 1</th><th>Chain Port 1 Ant. 2</th></tr>
<tr><td>802.11 a/b/g</td><td>V</td><td>-</td></tr>
<tr><td>802.11 n/ac SISO</td><td>V</td><td>-</td></tr>
<tr><td>802.11 n/ac MIMO</td><td>V</td><td>V</td></tr>
</table></td></tr>
</table>

1.5 Modification of EUT

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

1.6 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	**Sporton Site No.**		
	TH02-HY	CO05-HY	03CH05-HY

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 v03r02
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- FCC KDB 644545 D01 Guidance for IEEE 802 11ac Old Rules v01r02
- FCC KDB 644545 D03 Guidance for IEEE 802 11ac New Rules v01
- 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 and Y 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 and 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		

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.

<Ant. 1>

802.11b				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	20.20	20.13	20.09	20.19

802.11g								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	25.13	25.02	24.96	24.73	24.95	24.86	24.91	24.98

2.4GHz 802.11n HT20								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	24.40	24.38	24.33	24.34	24.35	24.32	24.39	24.38

2.4GHz 802.11n HT40								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	24.12	24.02	24.04	24.08	24.05	24.10	24.00	23.92

802.11a								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	23.46	23.33	23.31	23.20	23.31	23.29	23.25	23.30

5GHz 802.11n HT20								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	23.33	23.27	23.27	23.25	23.31	23.26	23.32	23.28

5GHz 802.11n HT40								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	23.29	23.22	23.29	23.27	23.26	23.22	23.20	23.15

5GHz 802.11ac VHT20 mode									
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
Peak Power (dBm)	23.34	23.23	23.21	23.22	23.15	23.16	23.26	23.11	23.26

5GHz 802.11ac VHT40 mode										
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
Peak Power (dBm)	23.36	23.35	23.29	23.35	23.26	23.29	23.34	23.31	23.33	23.32

5GHz 802.11ac VHT80 mode										
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
Peak Power (dBm)	25.07	24.24	24.36	25.04	24.30	24.60	24.46	24.82	24.50	24.62

MIMO <Ant. 1+2>

2.4GHz 802.11n HT20								
Data Rate (MHz)	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Peak Power (dBm)	27.62	27.30	27.28	27.29	27.45	27.33	27.48	27.38

2.4GHz 802.11n HT40								
Data Rate (MHz)	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Peak Power (dBm)	27.34	27.24	27.09	27.22	27.30	27.33	27.27	27.25

5GHz 802.11n HT20								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	26.52	26.28	26.21	26.18	26.28	26.25	26.24	26.22

5GHz 802.11n HT40								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	26.49	26.30	26.29	26.34	26.34	26.34	26.34	26.30

5GHz 802.11ac VHT20 mode									
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
Peak Power (dBm)	26.48	26.42	26.35	26.33	26.28	26.30	26.37	26.36	26.35

5GHz 802.11ac VHT40 mode										
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
Peak Power (dBm)	26.39	26.32	26.25	26.33	23.25	26.22	26.29	26.32	26.25	26.19

5GHz 802.11ac VHT80 mode										
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
Peak Power (dBm)	25.20	24.72	24.80	24.81	24.89	24.71	24.95	24.84	24.93	24.90

Note: MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.

2.3 Test Mode

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

<2.4GHz>

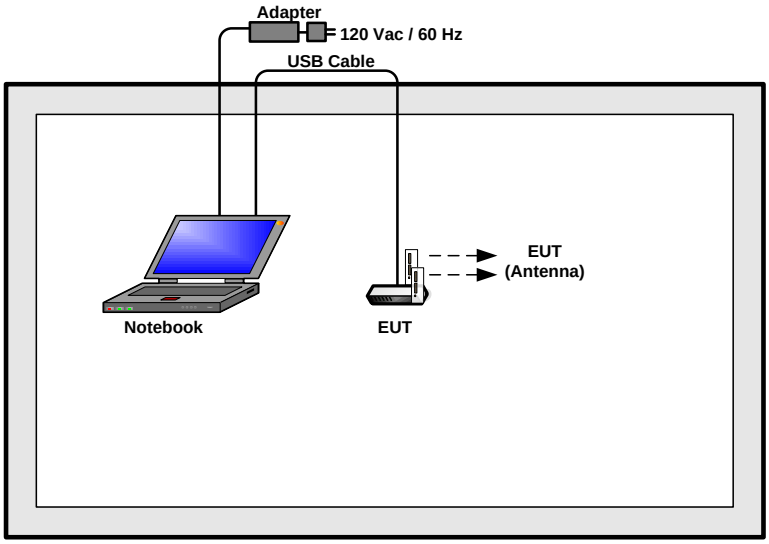
Test Cases				
	Test Items	Mode	Data Rate	Test Channel
Conducted TCs	6dB BW Power Spectral Density Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
		802.11n HT40	MCS0	3/6/9
	Conducted Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	MCS0	1/6/11
		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 TCs	Radiated Band Edge	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 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>

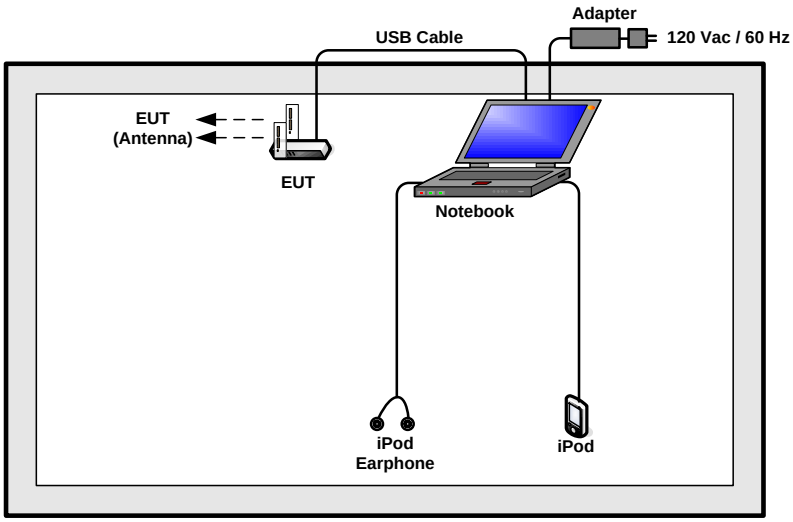
Test Cases				
Conducted TCs	Test Items	Mode	Data Rate	Test Channel
	6dB BW Power Spectral Density Output Power	802.11a	6 Mbps	149/157/161
		802.11n HT20	MCS0	149/157/161
		802.11n HT40	MCS0	151/159
		802.11ac VHT20	MCS0	149/157/161
		802.11ac VHT40	MCS0	151/159
		802.11ac VHT80	MCS0	155
	Conducted Band Edge	802.11a	6 Mbps	149/161
		802.11n HT20	MCS0	149/157/161
		802.11n HT40	MCS0	151/159
		802.11ac VHT20	MCS0	149/157/161
		802.11ac VHT40	MCS0	151/159
		802.11ac VHT80	MCS0	155
	Conducted Spurious Emission	802.11a	6 Mbps	149/157/161
		802.11n HT20	MCS0	149/157/161
		802.11n HT40	MCS0	151/159
		802.11ac VHT20	MCS0	149/157/161
		802.11ac VHT40	MCS0	151/159
		802.11ac VHT80	MCS0	155
	Radiated Spurious Emission	802.11a	6 Mbps	149/157/161
		802.11n HT20	MCS0	149/157/161
		802.11n HT40	MCS0	151/159
		802.11ac VHT80	MCS0	155
AC Conducted Emission	Mode 1 : WLAN (2.4GHz) Link + USB Cable (Charging from Notebook) Mode 2 : WLAN (5GHz) Link + USB Cable (Charging from Notebook)			
Remark: The worst case of conducted emission is mode 1; only the test data of it was reported.				

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
2.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	Notebook	DELL	NB-09	N/A	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
5.	LCD Monitor	DELL	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m

2.6 EUT Operation Test Setup

For WLAN function, programmed RF utility installed in the notebook make the EUT provide functions like channel selection and power level for continuous transmitting and receiving signals.

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 4.2 dB and 10dB attenuator.

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

= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

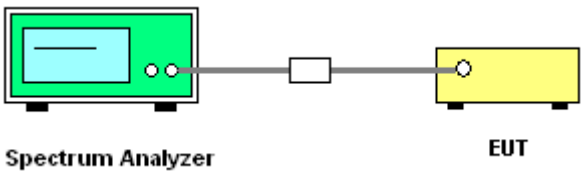
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v03r02.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. Measure and record the results in the test report.

3.1.4 Test Setup



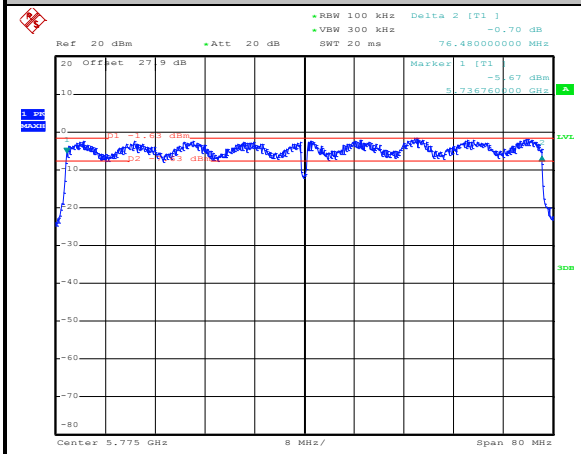
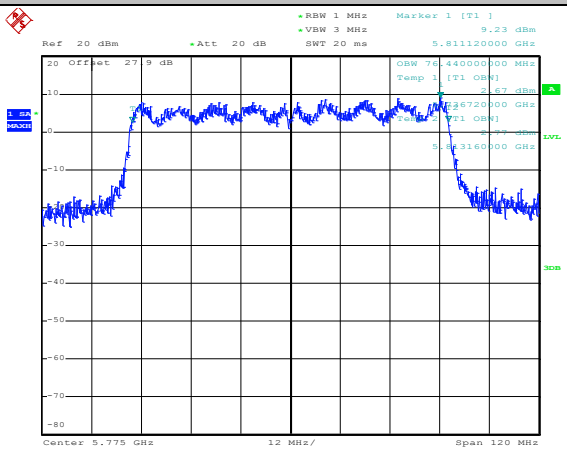
3.1.5 Test Result of 6dB Occupied Bandwidth

Test Band :	2.4GHz	Temperature :	21~25℃
Test Engineer :	Stuart Lin	Relative Humidity :	51~54%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	99% Bandwidth (MHz)		6dB Bandwidth (MHz)		6dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Ant. 1	Ant. 2	Ant. 1	Ant. 2		
11b	1Mbps	1	1	2412	15.25	-	10.06	-	0.5	Pass
11b	1Mbps	1	6	2437	15.25	-	10.06	-	0.5	Pass
11b	1Mbps	1	11	2462	15.30	-	10.10	-	0.5	Pass
11g	6Mbps	1	1	2412	18.00	-	16.56	-	0.5	Pass
11g	6Mbps	1	6	2437	18.35	-	16.58	-	0.5	Pass
11g	6Mbps	1	11	2462	18.00	-	16.56	-	0.5	Pass
HT20	MCS0	1	1	2412	18.95	-	17.76	-	0.5	Pass
HT20	MCS0	1	6	2437	19.00	-	17.78	-	0.5	Pass
HT20	MCS0	1	11	2462	19.05	-	17.74	-	0.5	Pass
HT40	MCS0	1	3	2422	37.20	-	36.44	-	0.5	Pass
HT40	MCS0	1	6	2437	37.10	-	36.48	-	0.5	Pass
HT40	MCS0	1	9	2452	37.10	-	36.48	-	0.5	Pass
HT20	MCS0	2	1	2412	18.75	18.70	17.64	17.76	0.5	Pass
HT20	MCS0	2	6	2437	18.70	18.70	17.68	17.76	0.5	Pass
HT20	MCS0	2	11	2462	18.65	18.75	17.68	17.76	0.5	Pass
HT40	MCS0	2	3	2422	36.80	37.00	36.32	36.60	0.5	Pass
HT40	MCS0	2	6	2437	36.80	36.90	36.32	36.48	0.5	Pass
HT40	MCS0	2	9	2452	36.80	36.90	36.32	36.48	0.5	Pass

Test Band :	5GHz	Temperature :	21~25℃
Test Engineer :	Stuart Lin	Relative Humidity :	51~54%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	99% Bandwidth (MHz)		6dB Bandwidth (MHz)		6dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Ant. 1	Ant. 2	Ant. 1	Ant. 2		
11a	6Mbps	1	149	5745	18.75	-	16.52	-	0.5	Pass
11a	6Mbps	1	157	5785	18.50	-	16.58	-	0.5	Pass
11a	6Mbps	1	161	5805	18.50	-	16.56	-	0.5	Pass
HT20	MCS0	1	149	5745	19.00	-	17.80	-	0.5	Pass
HT20	MCS0	1	157	5785	19.10	-	17.80	-	0.5	Pass
HT20	MCS0	1	161	5805	19.05	-	17.80	-	0.5	Pass
HT40	MCS0	1	151	5755	37.30	-	36.48	-	0.5	Pass
HT40	MCS0	1	159	5795	37.10	-	36.44	-	0.5	Pass
VHT20	MCS0	1	149	5745	19.20	-	17.80	-	0.5	Pass
VHT20	MCS0	1	157	5785	19.10	-	17.80	-	0.5	Pass
VHT20	MCS0	1	161	5805	19.30	-	17.80	-	0.5	Pass
VHT40	MCS0	1	151	5755	37.30	-	36.48	-	0.5	Pass
VHT40	MCS0	1	159	5795	37.00	-	36.48	-	0.5	Pass
VHT80	MCS0	1	155	5775	76.44	-	76.48	-	0.5	Pass
HT20	MCS0	2	149	5745	18.65	18.80	17.64	17.70	0.5	Pass
HT20	MCS0	2	157	5785	18.65	18.60	17.64	17.80	0.5	Pass
HT20	MCS0	2	161	5805	18.75	18.65	17.64	17.76	0.5	Pass
HT40	MCS0	2	151	5755	36.90	37.00	36.40	36.56	0.5	Pass
HT40	MCS0	2	159	5795	36.90	36.90	36.32	36.56	0.5	Pass
VHT20	MCS0	2	149	5745	18.75	18.70	17.60	17.80	0.5	Pass
VHT20	MCS0	2	157	5785	18.70	18.70	17.64	17.80	0.5	Pass
VHT20	MCS0	2	161	5805	18.80	18.70	17.64	17.80	0.5	Pass
VHT40	MCS0	2	151	5755	36.80	37.00	36.40	36.56	0.5	Pass
VHT40	MCS0	2	159	5795	36.90	36.90	36.32	36.48	0.5	Pass
VHT80	MCS0	2	155	5775	75.48	75.60	75.68	75.68	0.5	Pass

Minimum 6dB Bandwidth	Maximum 99% Occupied Bandwidth
	

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

3.2 Peak Output Power Measurement

3.2.1 Limit of Peak 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 with directional gain greater than 6dBi is 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.

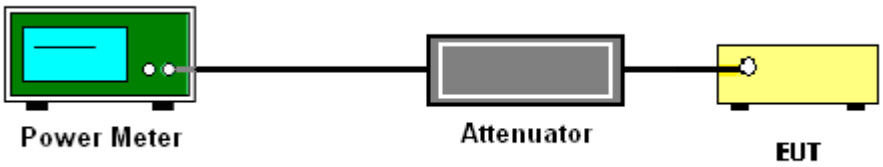
3.2.2 Measuring Instruments

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 v03r02.
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.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Test Band :	2.4GHz	Temperature :	21~25℃
Test Engineer :	Stuart Lin	Relative Humidity :	51~54%

Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Peak Conducted Power (dBm)			Max. Limit (dBm)		DG (dBi)		Pass/Fail
					Ant. 1	Ant. 2	SUM	Ant. 1	Ant. 2	Ant. 1	Ant. 2	
11b	1Mbps	1	1	2412	19.99	-	-	30.00	30.00	2.26	2.26	Pass
11b	1Mbps	1	6	2437	20.20	-		30.00	30.00	2.26	2.26	Pass
11b	1Mbps	1	11	2462	20.05	-		30.00	30.00	2.26	2.26	Pass
11g	6Mbps	1	1	2412	24.03	-		30.00	30.00	2.26	2.26	Pass
11g	6Mbps	1	6	2437	25.13	-		30.00	30.00	2.26	2.26	Pass
11g	6Mbps	1	11	2462	22.53	-		30.00	30.00	2.26	2.26	Pass
HT20	MCS0	1	1	2412	24.26	-		30.00	30.00	2.26	2.26	Pass
HT20	MCS0	1	6	2437	24.40	-		30.00	30.00	2.26	2.26	Pass
HT20	MCS0	1	11	2462	24.28	-		30.00	30.00	2.26	2.26	Pass
HT40	MCS0	1	3	2422	24.12	-		30.00	30.00	2.26	2.26	Pass
HT40	MCS0	1	6	2437	24.10	-		30.00	30.00	2.26	2.26	Pass
HT40	MCS0	1	9	2452	23.77	-		30.00	30.00	2.26	2.26	Pass
HT20	MCS0	2	1	2412	24.79	24.42	27.62	30.00		2.26		Pass
HT20	MCS0	2	6	2437	24.64	23.97	27.33	30.00		2.26		Pass
HT20	MCS0	2	11	2462	24.48	24.30	27.40	30.00		2.26		Pass
HT40	MCS0	2	3	2422	24.16	24.46	27.32	30.00		2.26		Pass
HT40	MCS0	2	6	2437	24.13	24.52	27.34	30.00		2.26		Pass
HT40	MCS0	2	9	2452	23.84	23.18	26.53	30.00		2.26		Pass

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

Test Band :	5GHz	Temperature :	21~25℃
Test Engineer :	Stuart Lin	Relative Humidity :	51~54%

Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Peak Conducted Power (dBm)			Max. Limit (dBm)		DG (dBi)		Pass/Fail
					Ant. 1	Ant. 2	Worst +10log(2)	Ant. 1	Ant. 2	Ant. 1	Ant. 2	
11a	6Mbps	1	149	5745	23.46	-	-	30.00	30.00	3.34	3.34	Pass
11a	6Mbps	1	157	5785	23.35	-		30.00	30.00	3.34	3.34	Pass
11a	6Mbps	1	161	5805	23.28	-		30.00	30.00	3.34	3.34	Pass
HT20	MCS0	1	149	5745	23.33	-		30.00	30.00	3.34	3.34	Pass
HT20	MCS0	1	157	5785	23.20	-		30.00	30.00	3.34	3.34	Pass
HT20	MCS0	1	161	5805	23.14	-		30.00	30.00	3.34	3.34	Pass
HT40	MCS0	1	151	5755	23.29	-		30.00	30.00	3.34	3.34	Pass
HT40	MCS0	1	159	5795	23.21	-		30.00	30.00	3.34	3.34	Pass
VHT20	MCS0	1	149	5745	23.34	-		30.00	30.00	3.34	3.34	Pass
VHT20	MCS0	1	157	5785	23.32	-		30.00	30.00	3.34	3.34	Pass
VHT20	MCS0	1	161	5805	23.25	-		30.00	30.00	3.34	3.34	Pass
VHT40	MCS0	1	151	5755	23.36	-		30.00	30.00	3.34	3.34	Pass
VHT40	MCS0	1	159	5795	23.02	-		30.00	30.00	3.34	3.34	Pass
VHT80	MCS0	1	155	5775	25.07	-		30.00	30.00	3.34	3.34	Pass
HT20	MCS0	2	149	5745	23.19	23.12	26.17	30.00		3.34		Pass
HT20	MCS0	2	157	5785	23.01	22.94	25.99	30.00		3.34		Pass
HT20	MCS0	2	161	5805	23.60	23.41	26.52	30.00		3.34		Pass
HT40	MCS0	2	151	5755	23.46	23.49	26.49	30.00		3.34		Pass
HT40	MCS0	2	159	5795	22.85	22.89	25.88	30.00		3.34		Pass
VHT20	MCS0	2	149	5745	23.26	23.16	26.22	30.00		3.34		Pass
VHT20	MCS0	2	157	5785	22.93	22.94	25.95	30.00		3.34		Pass
VHT20	MCS0	2	161	5805	23.53	23.41	26.48	30.00		3.34		Pass
VHT40	MCS0	2	151	5755	23.37	23.39	26.39	30.00		3.34		Pass
VHT40	MCS0	2	159	5795	22.90	22.83	25.88	30.00		3.34		Pass
VHT80	MCS0	2	155	5775	21.73	22.61	25.20	30.00		3.34		Pass

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

3.2.6 Test Result of Average output Power (Reporting Only)

Test Band :	2.4GHz	Temperature :	21~25℃
Test Engineer :	Stuart Lin	Relative Humidity :	51~54%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)		
					Ant. 1	Ant. 2	Ant. 1	Ant. 2	Sum Power
11b	1Mbps	1	1	2412	0.00	-	17.70	-	-
11b	1Mbps	1	6	2437	0.00	-	17.94	-	
11b	1Mbps	1	11	2462	0.00	-	17.83	-	
11g	6Mbps	1	1	2412	0.00	-	15.76	-	
11g	6Mbps	1	6	2437	0.00	-	17.85	-	
11g	6Mbps	1	11	2462	0.00	-	14.26	-	
HT20	MCS0	1	1	2412	0.00	-	16.65	-	
HT20	MCS0	1	6	2437	0.00	-	16.83	-	
HT20	MCS0	1	11	2462	0.00	-	16.74	-	
HT40	MCS0	1	3	2422	0.00	-	17.06	-	
HT40	MCS0	1	6	2437	0.00	-	16.78	-	
HT40	MCS0	1	9	2452	0.00	-	16.74	-	
HT20	MCS0	2	1	2412	0.00	0.00	17.16	16.96	20.07
HT20	MCS0	2	6	2437	0.00	0.00	17.12	16.51	19.84
HT20	MCS0	2	11	2462	0.00	0.00	17.16	16.73	19.96
HT40	MCS0	2	3	2422	0.00	0.00	17.01	16.70	19.87
HT40	MCS0	2	6	2437	0.00	0.00	17.22	16.65	19.95
HT40	MCS0	2	9	2452	0.00	0.00	15.49	15.93	18.73

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

Test Band :	5GHz	Temperature :	21~25℃
Test Engineer :	Stuart Lin	Relative Humidity :	51~54%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)		
					Ant. 1	Ant. 2	Ant. 1	Ant. 2	Sum Power
11a	6Mbps	1	149	5745	0.00	-	17.76	-	-
11a	6Mbps	1	157	5785	0.00	-	17.70	-	
11a	6Mbps	1	161	5805	0.00	-	17.50	-	
HT20	MCS0	1	149	5745	0.00	-	17.18	-	
HT20	MCS0	1	157	5785	0.00	-	17.15	-	
HT20	MCS0	1	161	5805	0.00	-	17.12	-	
HT40	MCS0	1	151	5755	0.00	-	17.20	-	
HT40	MCS0	1	159	5795	0.00	-	17.17	-	
VHT20	MCS0	1	149	5745	0.00	-	17.12	-	
VHT20	MCS0	1	157	5785	0.00	-	17.06	-	
VHT20	MCS0	1	161	5805	0.00	-	16.96	-	
VHT40	MCS0	1	151	5755	0.00	-	16.72	-	
VHT40	MCS0	1	159	5795	0.00	-	16.65	-	
VHT80	MCS0	1	155	5775	0.00	-	16.92	-	
HT20	MCS0	2	149	5745	0.00	0.00	16.80	16.60	19.71
HT20	MCS0	2	157	5785	0.00	0.00	16.56	16.58	19.58
HT20	MCS0	2	161	5805	0.00	0.00	17.02	16.72	19.88
HT40	MCS0	2	151	5755	0.00	0.00	16.71	16.92	19.83
HT40	MCS0	2	159	5795	0.00	0.00	16.60	16.75	19.69
VHT20	MCS0	2	149	5745	0.00	0.00	16.49	16.99	19.76
VHT20	MCS0	2	157	5785	0.00	0.00	16.60	16.62	19.62
VHT20	MCS0	2	161	5805	0.00	0.00	16.86	17.10	19.99
VHT40	MCS0	2	151	5755	0.00	0.00	16.73	16.98	19.87
VHT40	MCS0	2	159	5795	0.00	0.00	16.67	16.73	19.71
VHT80	MCS0	2	155	5775	0.00	0.00	16.90	16.81	19.87

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 v03r02
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.
7. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

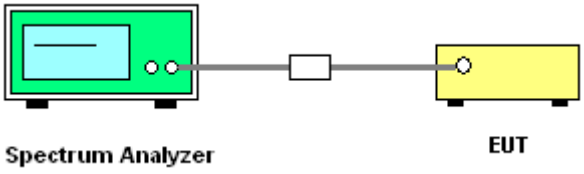
   If measurements performed using method (2) plus 10 log (N) exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

   Method (1): Measure and sum the spectra across the outputs.

   The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

   Method (2): Measure and add 10 log (N) dB, where N is the number of outputs. (N=2)

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Test Band :	2.4GHz	Temperature :	21~25℃
Test Engineer :	Stuart Lin	Relative Humidity :	51~54%

Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Peak Power Density (dBm/3kHz)			Max. Limit (dBm/3kHz)		DG (dBi)		Pass/Fail
					Ant. 1	Ant. 2	Worst +10log(2)	Ant. 1	Ant. 2	Ant. 1	Ant. 2	
11b	1Mbps	1	1	2412	-13.02	-	-	2.26	2.26	8.00	8.00	Pass
11b	1Mbps	1	6	2437	-12.76	-		2.26	2.26	8.00	8.00	Pass
11b	1Mbps	1	11	2462	-12.91	-		2.26	2.26	8.00	8.00	Pass
11g	6Mbps	1	1	2412	-12.89	-		2.26	2.26	8.00	8.00	Pass
11g	6Mbps	1	6	2437	-10.90	-		2.26	2.26	8.00	8.00	Pass
11g	6Mbps	1	11	2462	-14.16	-		2.26	2.26	8.00	8.00	Pass
HT20	MCS0	1	1	2412	-10.96	-		2.26	2.26	8.00	8.00	Pass
HT20	MCS0	1	6	2437	-11.00	-		2.26	2.26	8.00	8.00	Pass
HT20	MCS0	1	11	2462	-10.32	-		2.26	2.26	8.00	8.00	Pass
HT40	MCS0	1	3	2422	-12.23	-		2.26	2.26	8.00	8.00	Pass
HT40	MCS0	1	6	2437	-12.62	-		2.26	2.26	8.00	8.00	Pass
HT40	MCS0	1	9	2452	-12.44	-		2.26	2.26	8.00	8.00	Pass
HT20	MCS0	2	1	2412	-10.50	-10.76	-7.49	5.27		8.00		Pass
HT20	MCS0	2	6	2437	-11.15	-11.45	-8.14	5.27		8.00		Pass
HT20	MCS0	2	11	2462	-10.12	-10.98	-7.11	5.27		8.00		Pass
HT40	MCS0	2	3	2422	-14.00	-13.14	-10.13	5.27		8.00		Pass
HT40	MCS0	2	6	2437	-14.05	-12.73	-9.72	5.27		8.00		Pass
HT40	MCS0	2	9	2452	-14.63	-13.80	-10.79	5.27		8.00		Pass

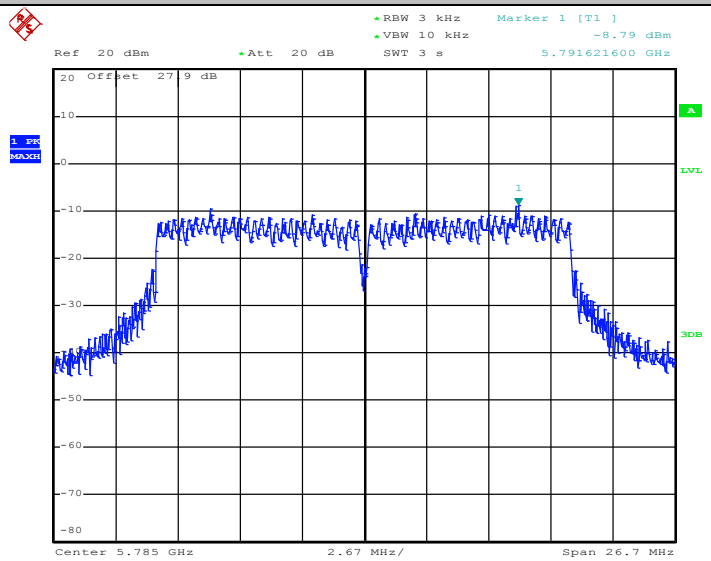
Note: Measured power density (dBm) has offset with cable loss.

Test Band :	5GHz	Temperature :	21~25℃
Test Engineer :	Stuart Lin	Relative Humidity :	51~54%

Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Peak Power Density (dBm/3kHz)			Max. Limit (dBm/3kHz)		DG (dBi)		Pass/Fail
					Ant. 1	Ant. 2	Worst +10log(2)	Ant. 1	Ant. 2	Ant. 1	Ant. 2	
11a	6Mbps	1	149	5745	-9.81	-	-	3.34	3.34	8.00	8.00	Pass
11a	6Mbps	1	157	5785	-9.93	-		3.34	3.34	8.00	8.00	Pass
11a	6Mbps	1	161	5805	-10.79	-		3.34	3.34	8.00	8.00	Pass
HT20	MCS0	1	149	5745	-9.35	-		3.34	3.34	8.00	8.00	Pass
HT20	MCS0	1	157	5785	-8.98	-		3.34	3.34	8.00	8.00	Pass
HT20	MCS0	1	161	5805	-10.78	-		3.34	3.34	8.00	8.00	Pass
HT40	MCS0	1	151	5755	-11.85	-		3.34	3.34	8.00	8.00	Pass
HT40	MCS0	1	159	5795	-12.56	-		3.34	3.34	8.00	8.00	Pass
VHT20	MCS0	1	149	5745	-8.86	-		3.34	3.34	8.00	8.00	Pass
VHT20	MCS0	1	157	5785	-8.79	-		3.34	3.34	8.00	8.00	Pass
VHT20	MCS0	1	161	5805	-9.98	-		3.34	3.34	8.00	8.00	Pass
VHT40	MCS0	1	151	5755	-11.88	-		3.34	3.34	8.00	8.00	Pass
VHT40	MCS0	1	159	5795	-13.50	-		3.34	3.34	8.00	8.00	Pass
VHT80	MCS0	1	155	5775	-15.39	-		3.34	3.34	8.00	8.00	Pass
HT20	MCS0	2	149	5745	-10.07	-9.34	-6.33	6.35		7.65		Pass
HT20	MCS0	2	157	5785	-10.00	-9.95	-6.94	6.35		7.65		Pass
HT20	MCS0	2	161	5805	-10.75	-10.27	-7.26	6.35		7.65		Pass
HT40	MCS0	2	151	5755	-13.32	-12.97	-9.96	6.35		7.65		Pass
HT40	MCS0	2	159	5795	-13.31	-11.93	-8.92	6.35		7.65		Pass
VHT20	MCS0	2	149	5745	-10.00	-10.56	-6.99	6.35		7.65		Pass
VHT20	MCS0	2	157	5785	-10.53	-10.45	-7.44	6.35		7.65		Pass
VHT20	MCS0	2	161	5805	-10.80	-12.49	-7.79	6.35		7.65		Pass
VHT40	MCS0	2	151	5755	-11.73	-13.60	-8.72	6.35		7.65		Pass
VHT40	MCS0	2	159	5795	-12.33	-12.34	-9.32	6.35		7.65		Pass
VHT80	MCS0	2	155	5775	-15.32	-15.68	-12.31	6.35		7.65		Pass

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

Worst Case Power Density (dBm/3kHz)



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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).

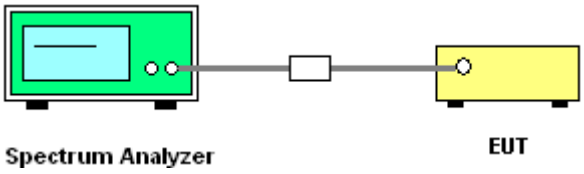
3.4.2 Measuring Instruments

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 v03r02.
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



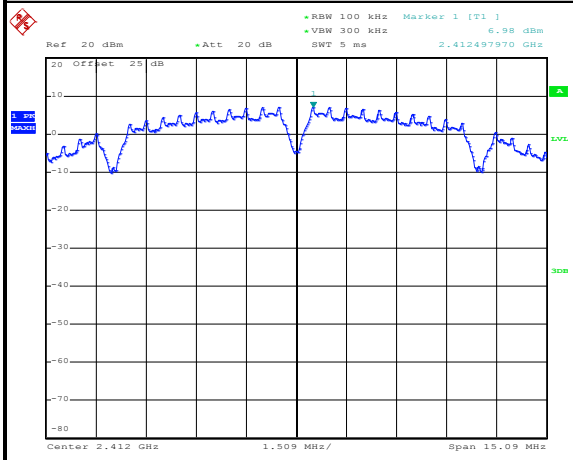
3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Number of TX = 1, Ant. 1 (Measured)

Number of TX	1	**Ant. :**	1
Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	Stuart Lin

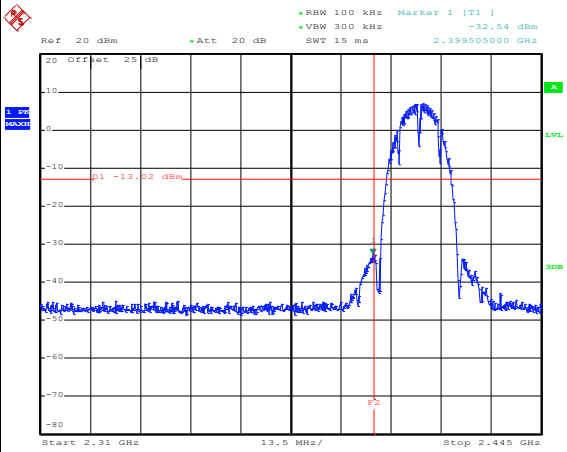
WLAN 802.11b Channel 01

100kHz PSD reference Level



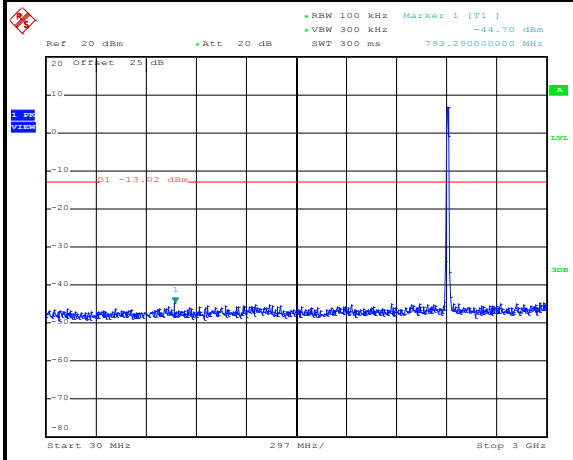
Date: 31.AUG.2014 08:29:20

Low Channel Plot



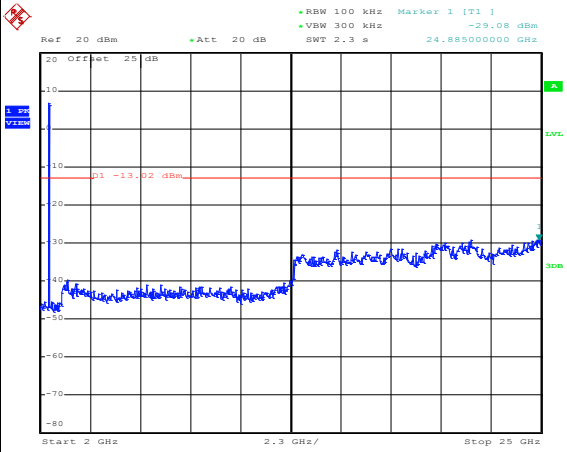
Date: 31.AUG.2014 08:30:45

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 08:30:06

Spurious Emission 2GHz~25GHz

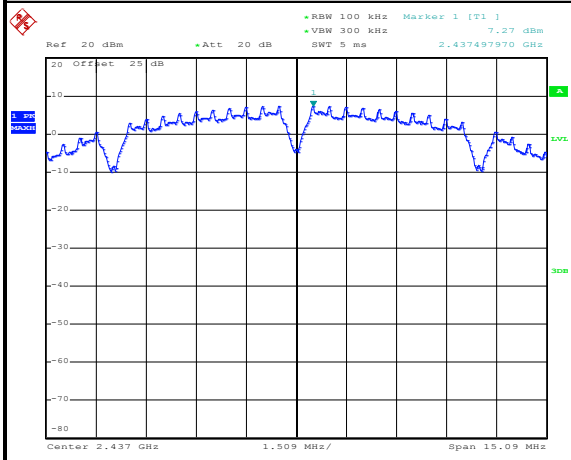


Date: 31.AUG.2014 08:30:24

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	Stuart Lin

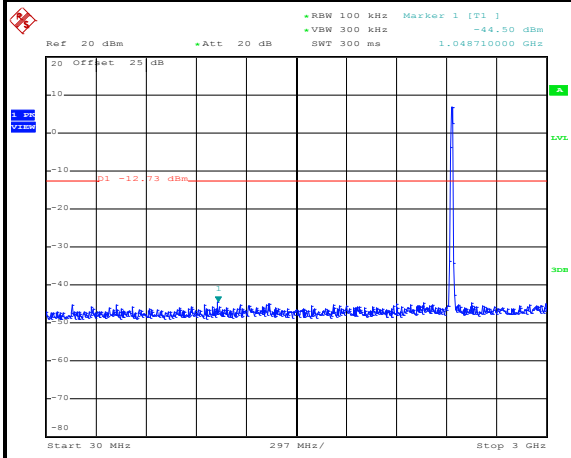
WLAN 802.11b Channel 06

100kHz PSD reference Level



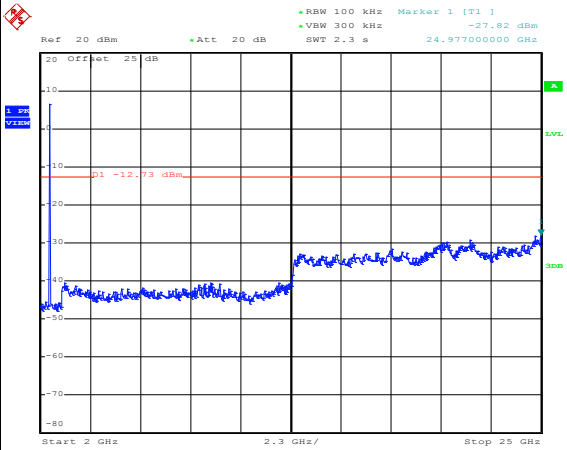
Date: 31.AUG.2014 08:35:44

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 08:36:31

Spurious Emission 2GHz~25GHz

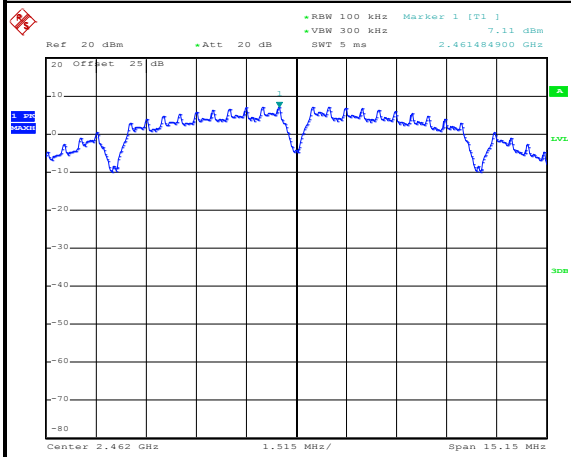


Date: 31.AUG.2014 08:36:49

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	Stuart Lin

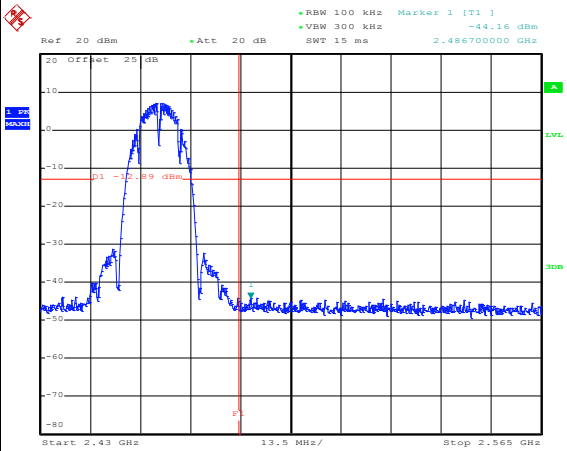
WLAN 802.11b Channel 11

100kHz PSD reference Level



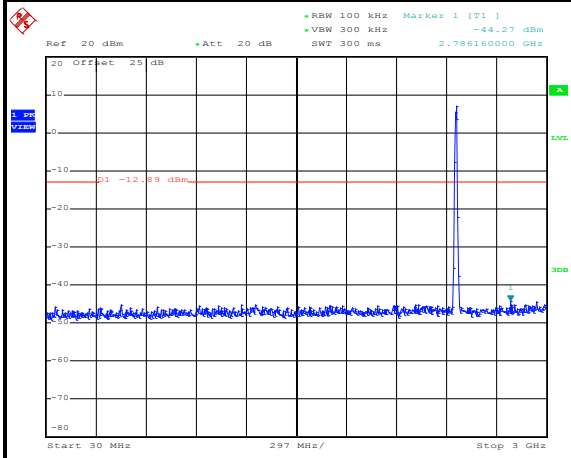
Date: 31.AUG.2014 08:41:07

High Channel Plot



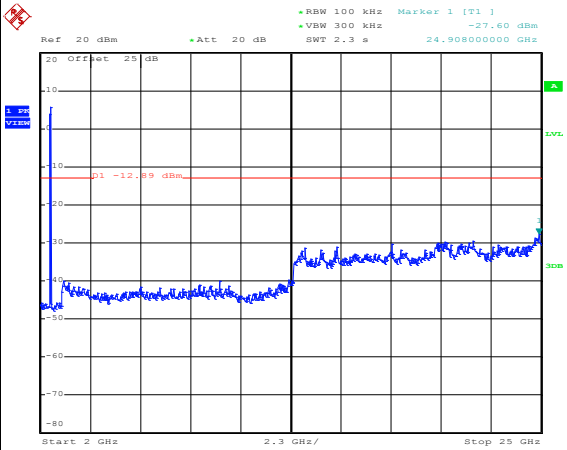
Date: 31.AUG.2014 08:41:24

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 08:41:48

Spurious Emission 2GHz~25GHz

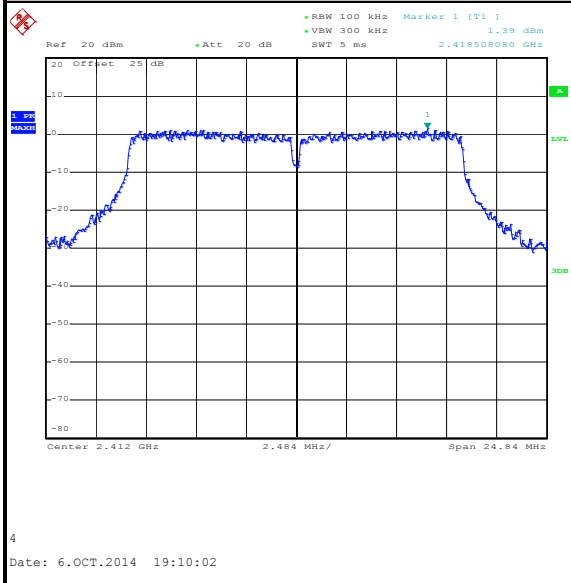


Date: 31.AUG.2014 08:42:06

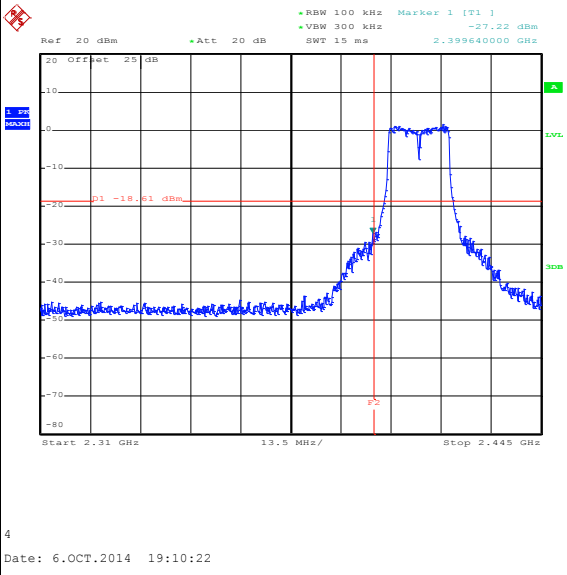
Number of TX :	1	**Ant. :**	1
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	Stuart Lin

WLAN 802.11g Channel 01

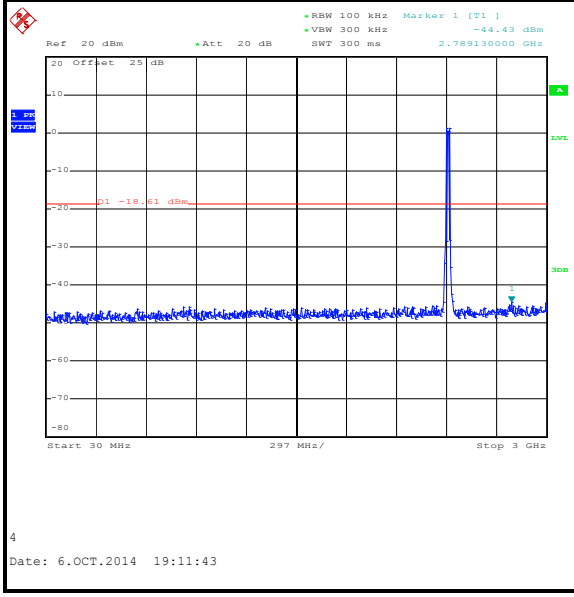
100kHz PSD reference Level



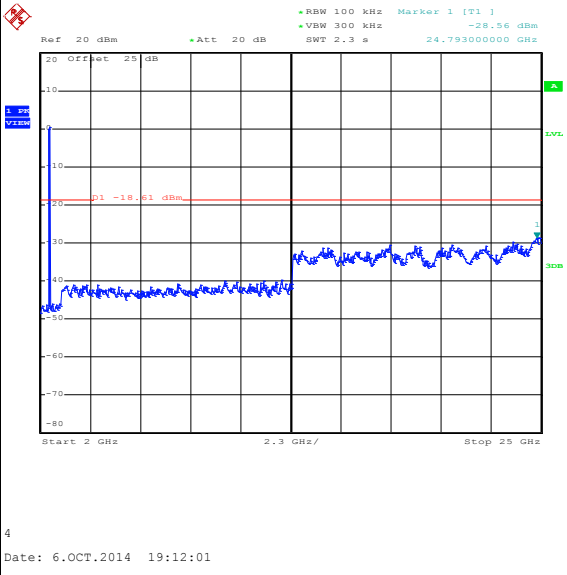
Low Channel Plot



Spurious Emission 30MHz~3GHz



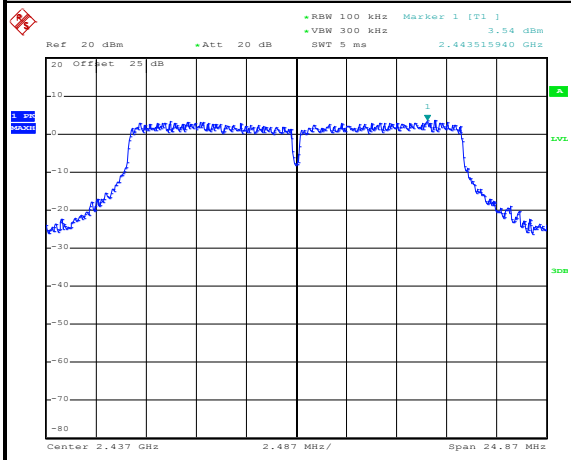
Spurious Emission 2GHz~25GHz



Number of TX :	1	**Ant. :**	1
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	Stuart Lin

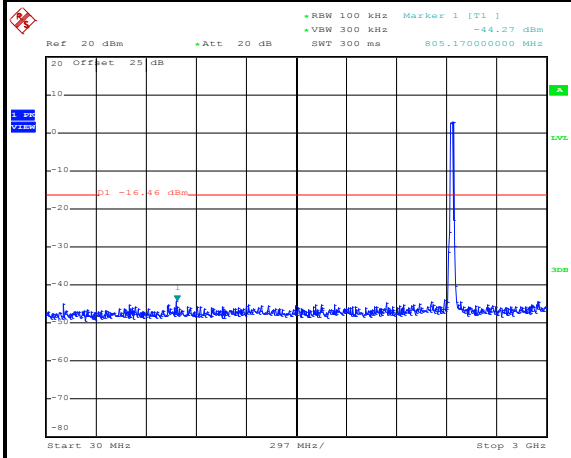
WLAN 802.11g Channel 06

100kHz PSD reference Level



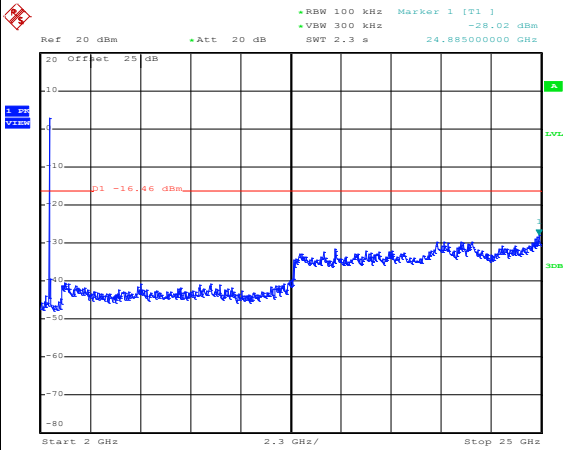
Date: 31.AUG.2014 08:55:19

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 08:55:41

Spurious Emission 2GHz~25GHz

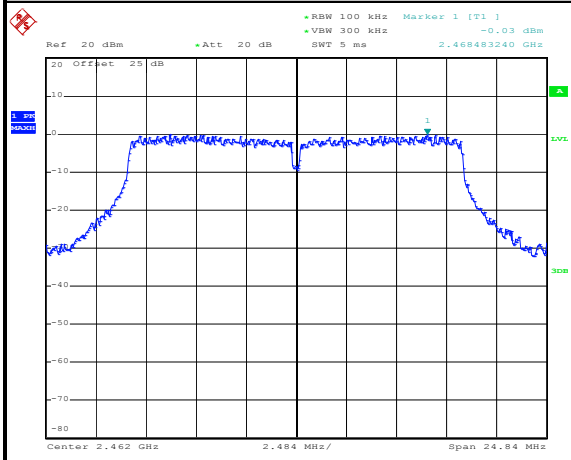


Date: 31.AUG.2014 08:55:59

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	Stuart Lin

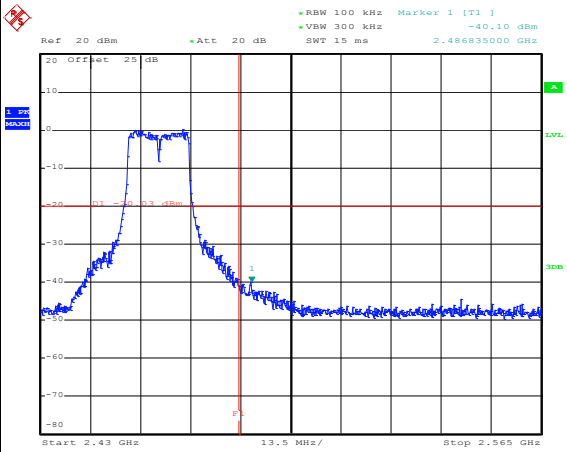
WLAN 802.11g Channel 11

100kHz PSD reference Level



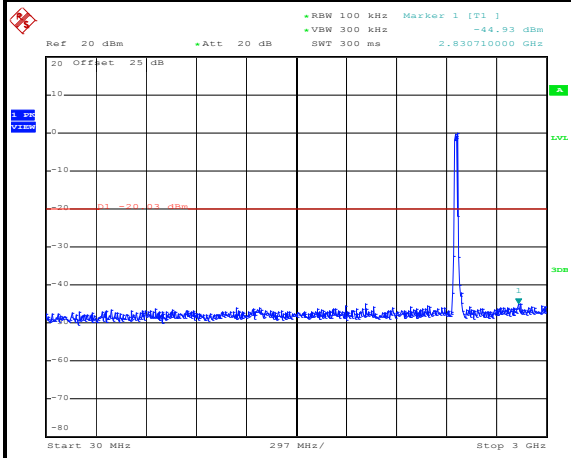
4
Date: 6.OCT.2014 19:17:57

High Channel Plot



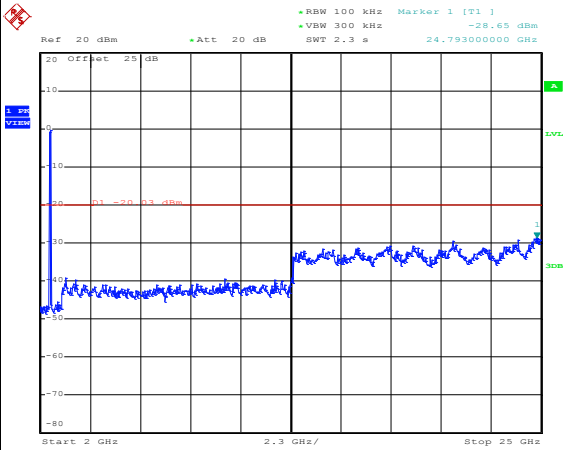
4
Date: 6.OCT.2014 19:18:20

Spurious Emission 30MHz~3GHz



4
Date: 6.OCT.2014 19:18:43

Spurious Emission 2GHz~25GHz

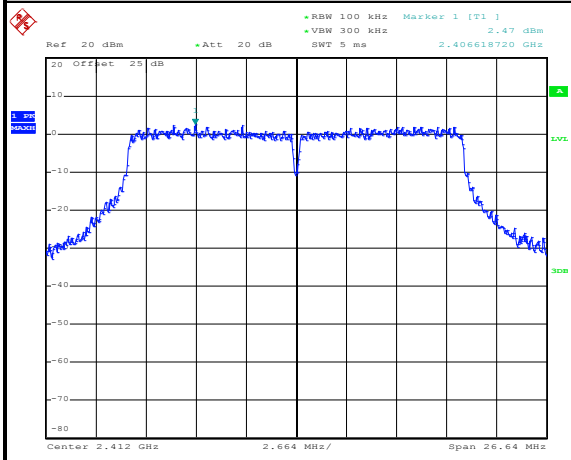


4
Date: 6.OCT.2014 19:19:01

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	Stuart Lin

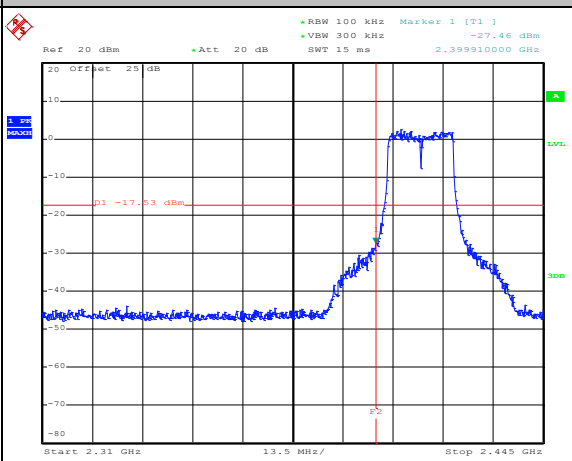
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



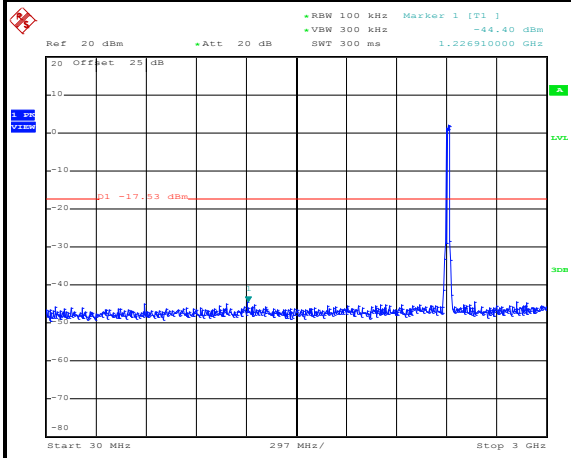
Date: 31.AUG.2014 09:05:53

Low Channel Plot



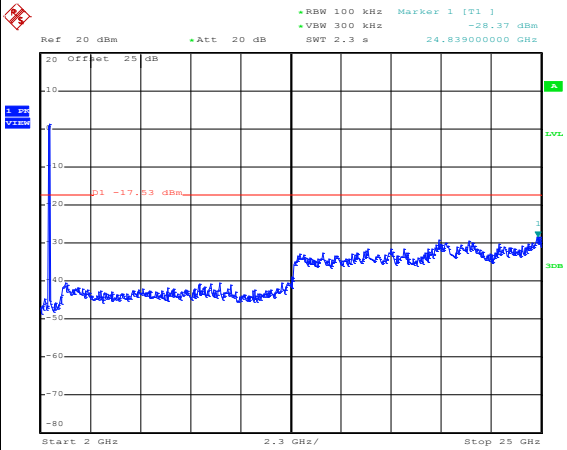
Date: 31.AUG.2014 09:06:54

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 09:07:19

Spurious Emission 2GHz~25GHz

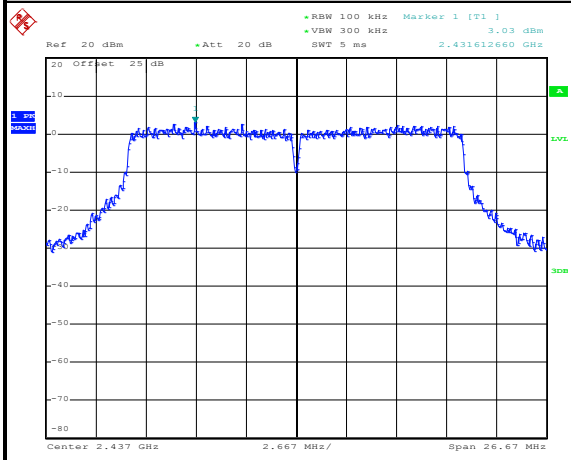


Date: 31.AUG.2014 09:07:38

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	Stuart Lin

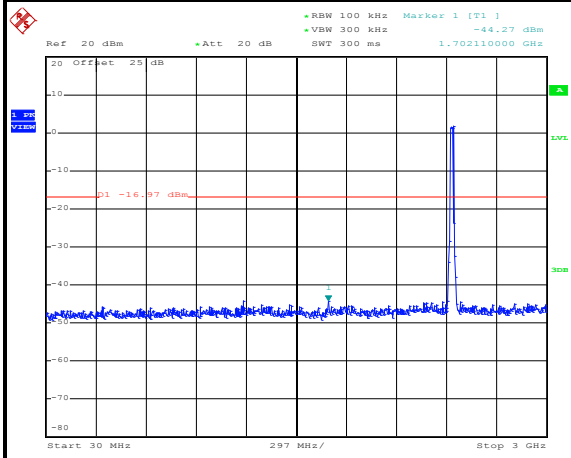
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



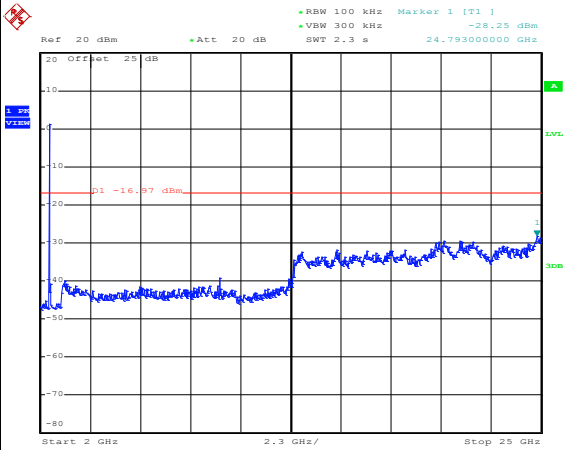
Date: 31.AUG.2014 09:11:03

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 09:11:32

Spurious Emission 2GHz~25GHz

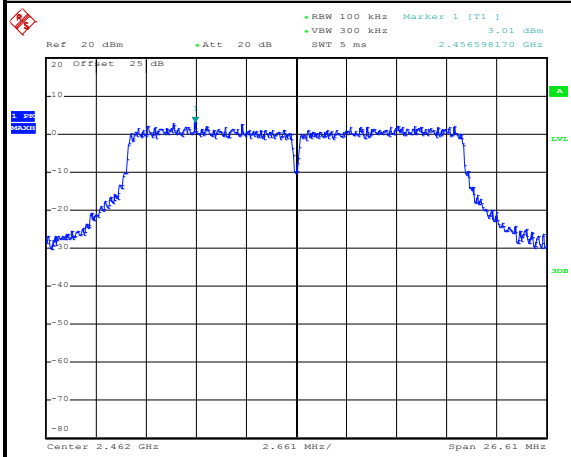


Date: 31.AUG.2014 09:11:50

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	Stuart Lin

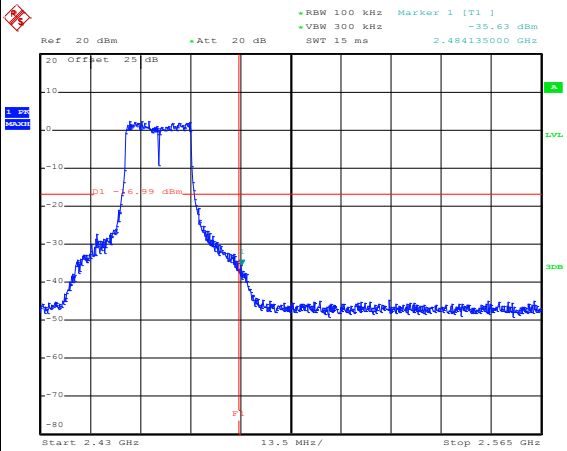
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



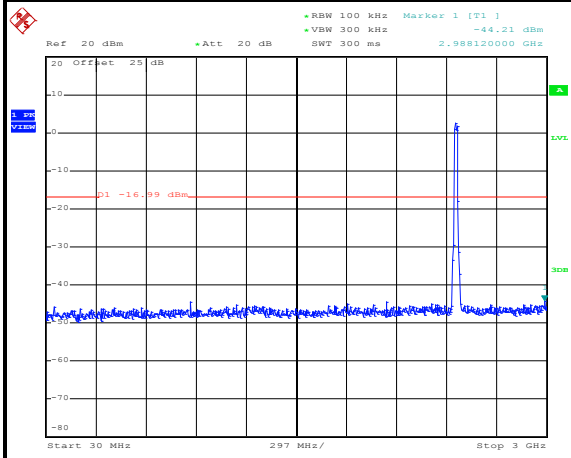
Date: 31.AUG.2014 09:14:34

High Channel Plot



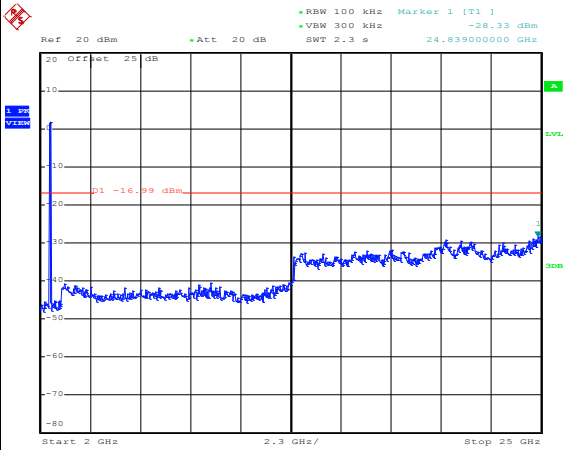
Date: 31.AUG.2014 09:14:57

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 09:15:27

Spurious Emission 2GHz~25GHz

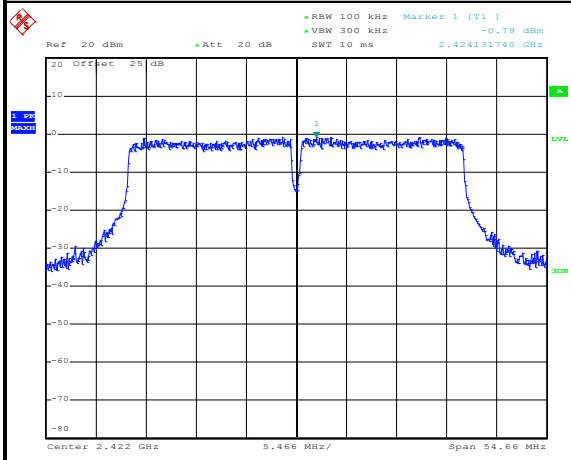


Date: 31.AUG.2014 09:15:45

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	03	**Test Engineer :**	Stuart Lin

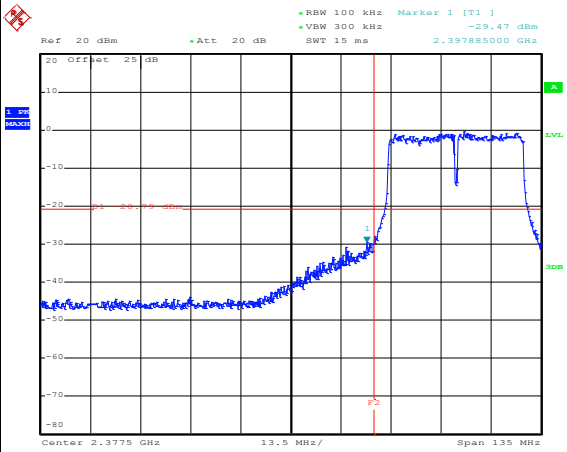
WLAN 802.11n HT40 Channel 03

100kHz PSD reference Level



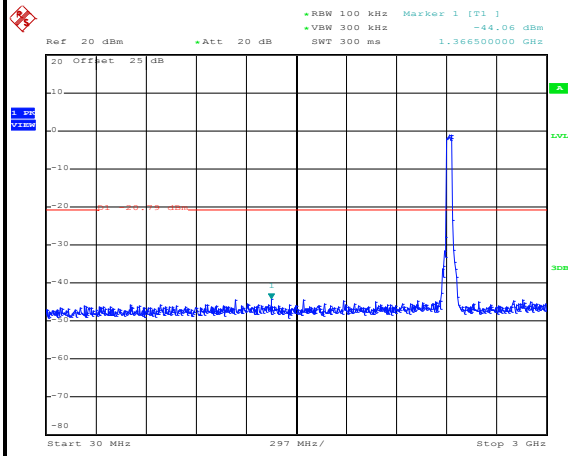
Date: 31.AUG.2014 09:54:00

Low Channel Plot



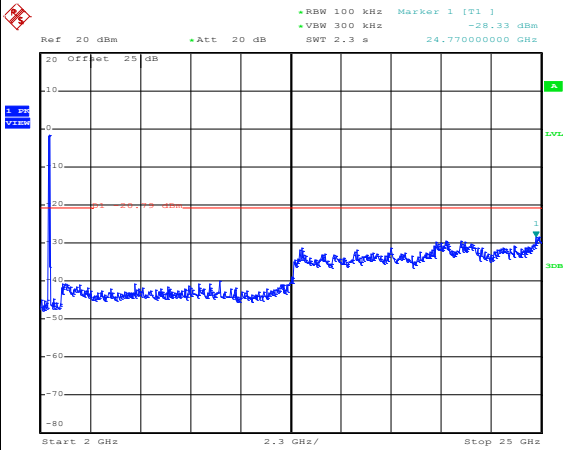
Date: 31.AUG.2014 09:55:29

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 09:55:55

Spurious Emission 2GHz~25GHz

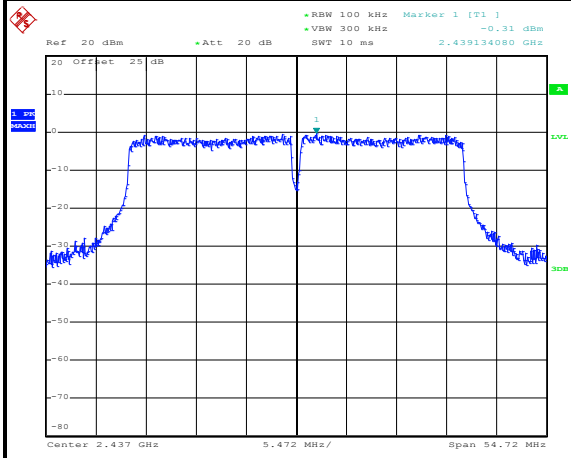


Date: 31.AUG.2014 09:56:13

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	Stuart Lin

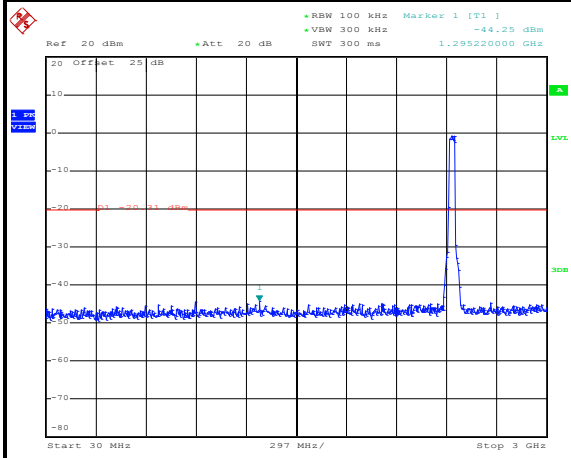
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



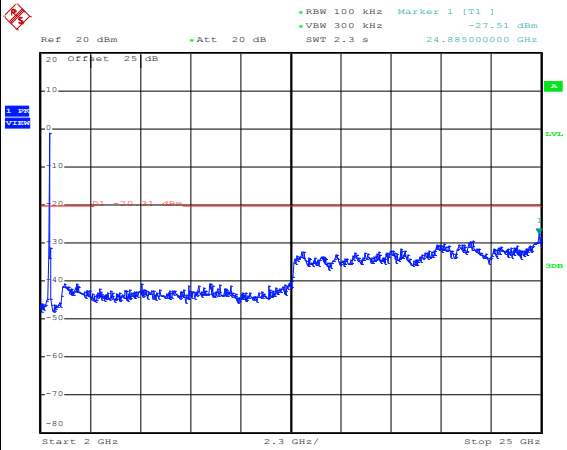
Date: 31.AUG.2014 10:01:03

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 10:02:56

Spurious Emission 2GHz~25GHz

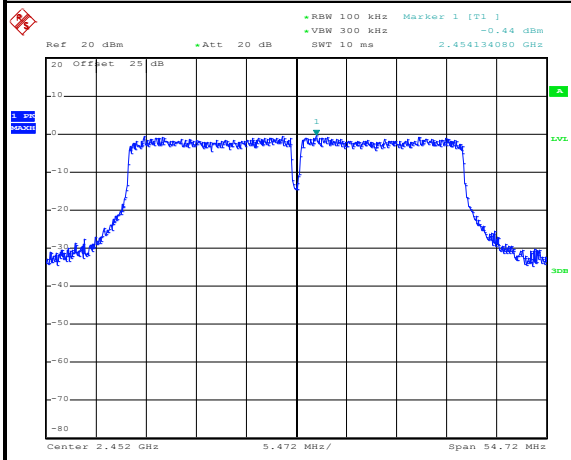


Date: 31.AUG.2014 10:03:14

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	09	**Test Engineer :**	Stuart Lin

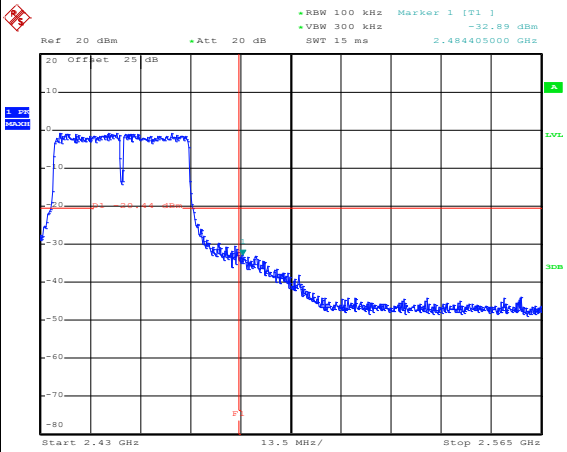
WLAN 802.11n HT40 Channel 09

100kHz PSD reference Level



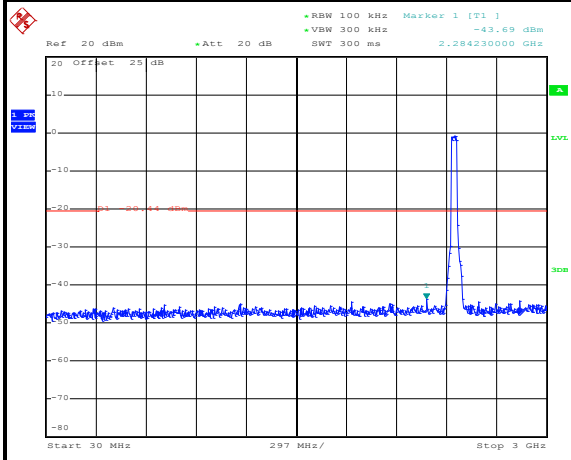
Date: 31.AUG.2014 10:06:16

High Channel Plot



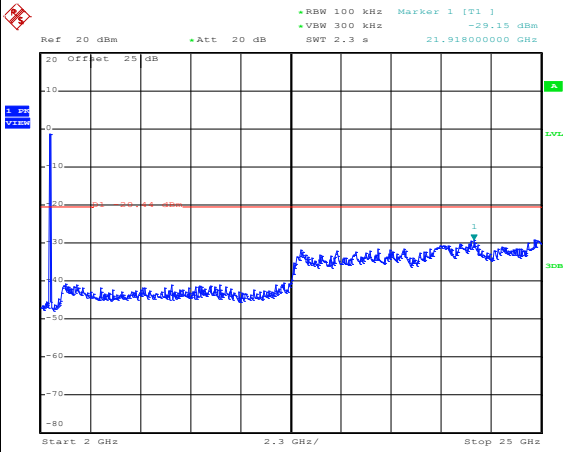
Date: 31.AUG.2014 10:07:32

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 10:09:06

Spurious Emission 2GHz~25GHz

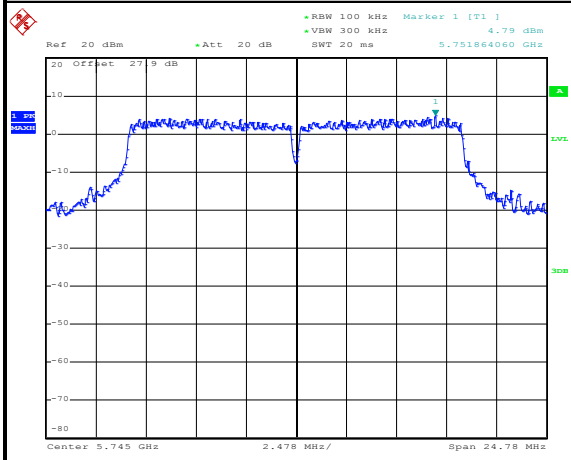


Date: 31.AUG.2014 10:09:24

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11a	**Temperature :**	21~25℃
Test Band :	5GHz Low	**Relative Humidity :**	51~54%
Test Channel :	149	**Test Engineer :**	Stuart Lin

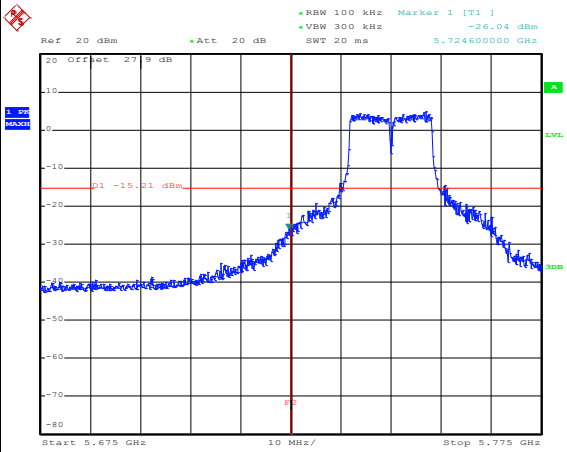
WLAN 802.11a Channel 149

100kHz PSD reference Level



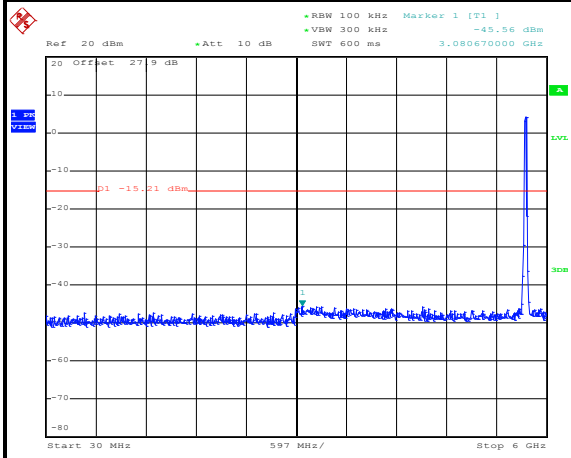
Date: 31.AUG.2014 10:57:31

Low Channel Plot



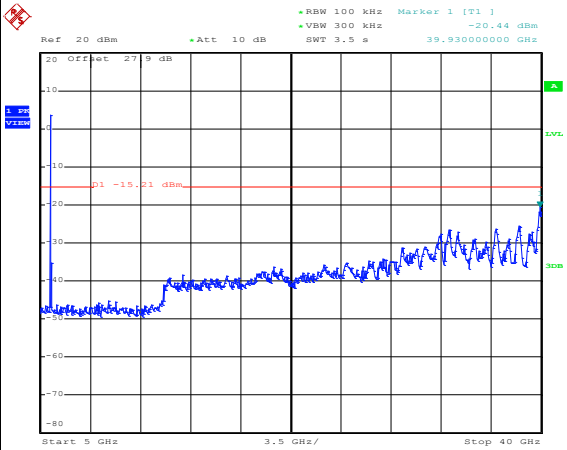
Date: 31.AUG.2014 10:59:55

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 11:02:00

Spurious Emission 5GHz~40GHz

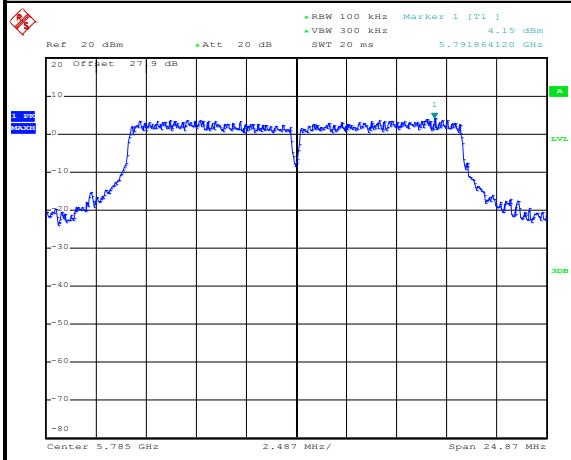


Date: 31.AUG.2014 11:02:18

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11a	**Temperature :**	21~25℃
Test Band :	5GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	157	**Test Engineer :**	Stuart Lin

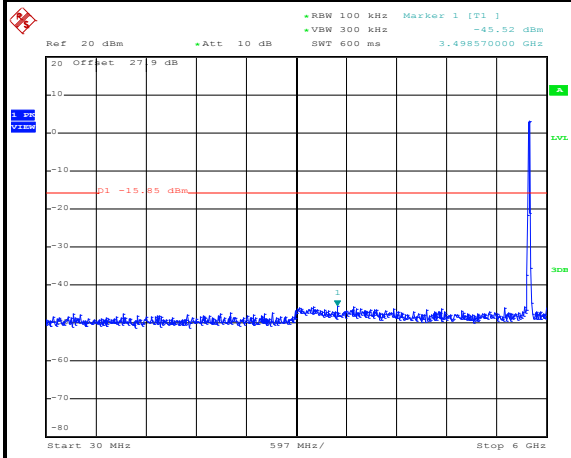
WLAN 802.11a Channel 157

100kHz PSD reference Level



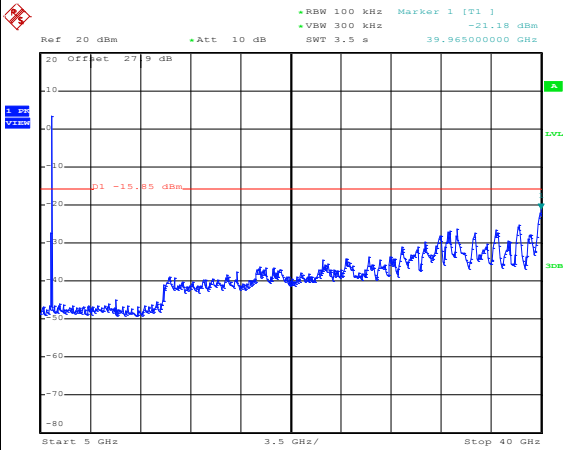
Date: 31.AUG.2014 11:08:33

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 11:09:03

Spurious Emission 5GHz~40GHz

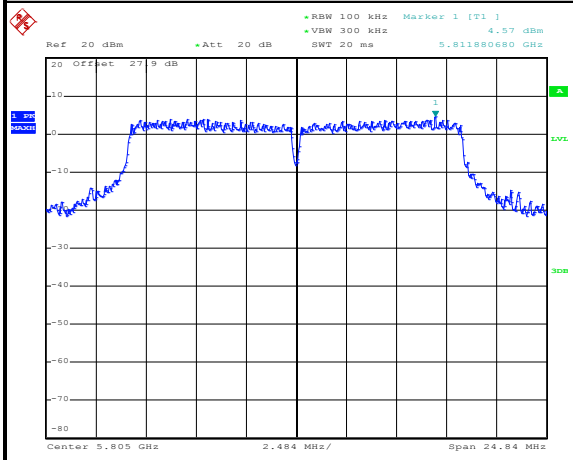


Date: 31.AUG.2014 11:09:21

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11a	**Temperature :**	21~25℃
Test Band :	5GHz High	**Relative Humidity :**	51~54%
Test Channel :	161	**Test Engineer :**	Stuart Lin

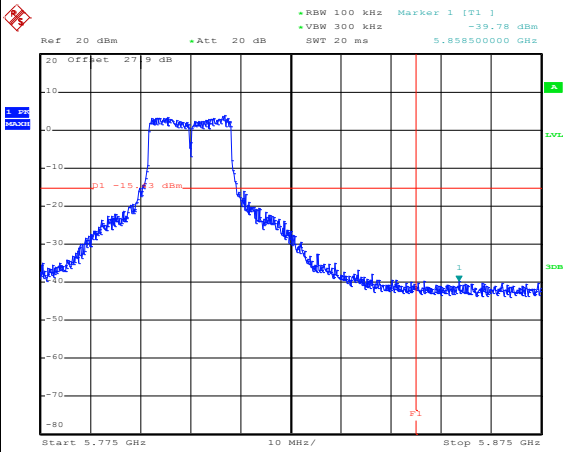
WLAN 802.11a Channel 161

100kHz PSD reference Level



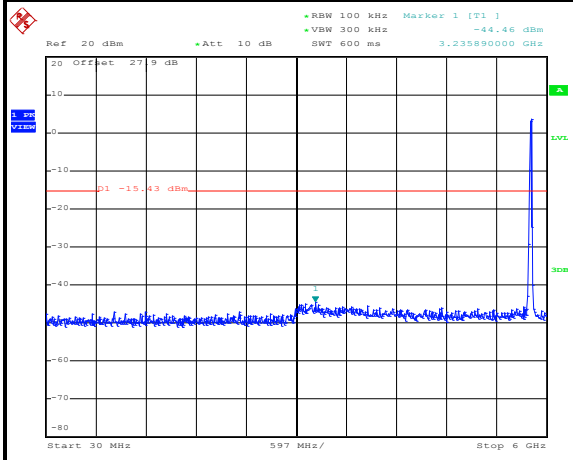
Date: 15.SEP.2014 16:17:29

High Channel Plot



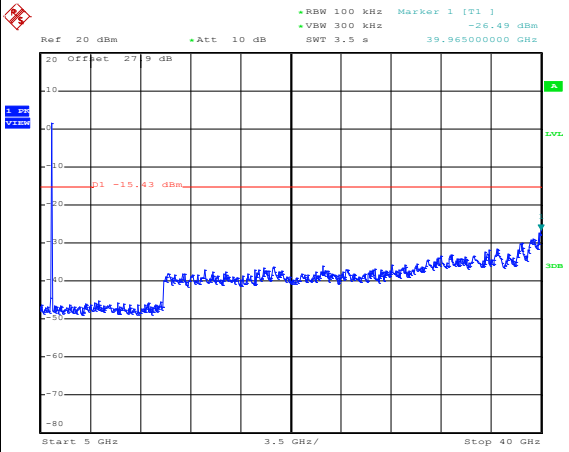
Date: 15.SEP.2014 16:17:53

Spurious Emission 30MHz~6GHz



Date: 15.SEP.2014 16:18:48

Spurious Emission 5GHz~40GHz

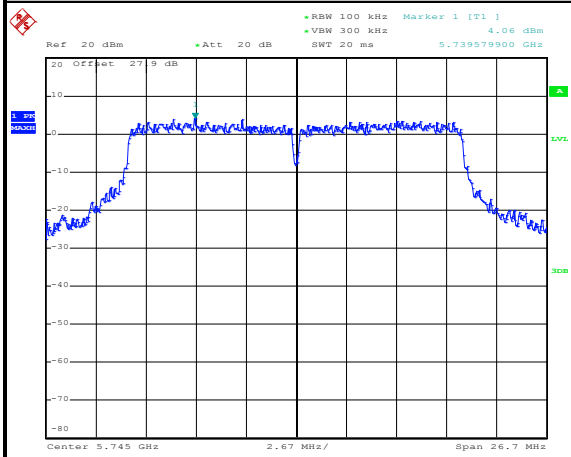


Date: 15.SEP.2014 16:19:06

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	5GHz Low	**Relative Humidity :**	51~54%
Test Channel :	149	**Test Engineer :**	Stuart Lin

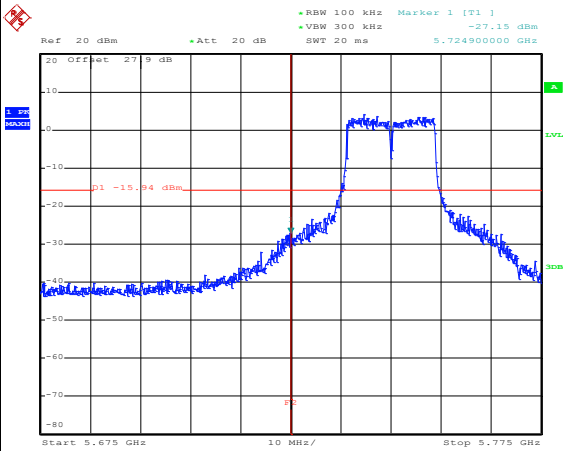
WLAN 802.11n HT20 Channel 149

100kHz PSD reference Level



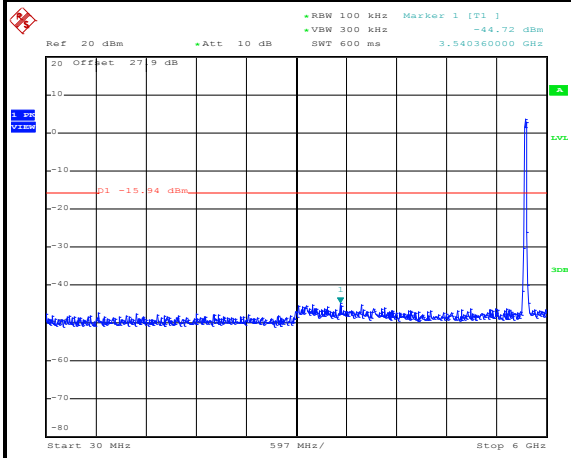
Date: 31.AUG.2014 11:33:33

Low Channel Plot



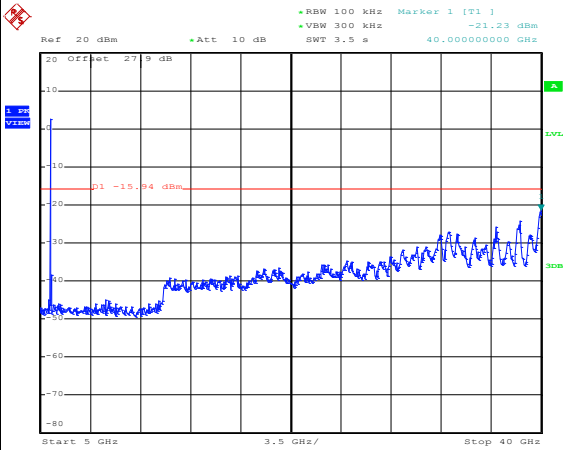
Date: 31.AUG.2014 11:34:14

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 11:35:03

Spurious Emission 5GHz~40GHz

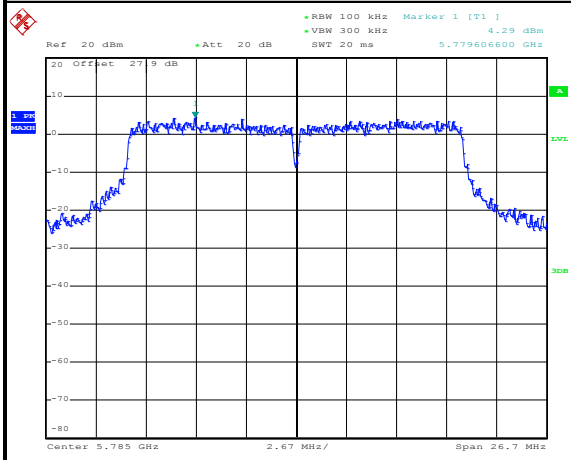


Date: 31.AUG.2014 11:35:21

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	5GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	157	**Test Engineer :**	Stuart Lin

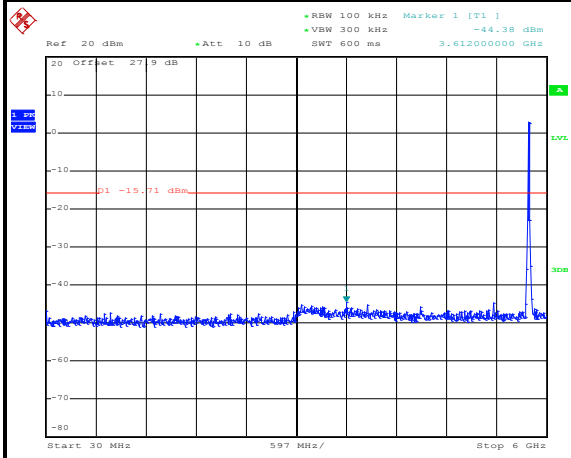
WLAN 802.11n HT20 Channel 157

100kHz PSD reference Level



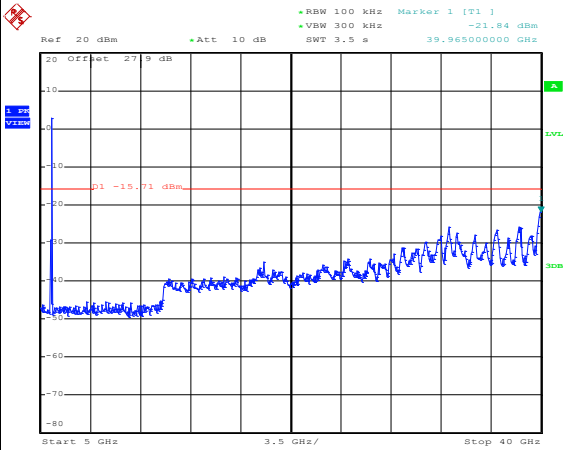
Date: 31.AUG.2014 11:27:05

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 11:27:58

Spurious Emission 5GHz~40GHz

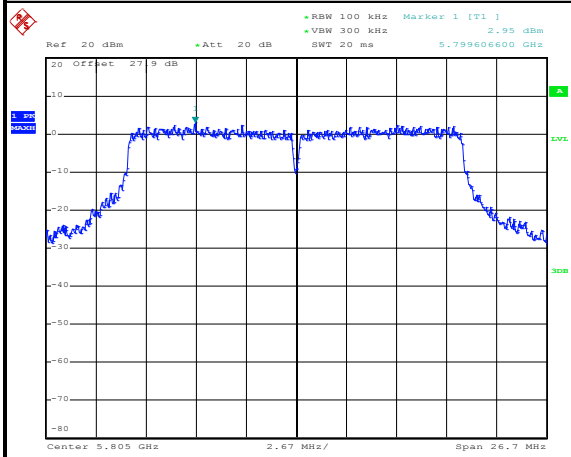


Date: 31.AUG.2014 11:28:16

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	5GHz High	**Relative Humidity :**	51~54%
Test Channel :	161	**Test Engineer :**	Stuart Lin

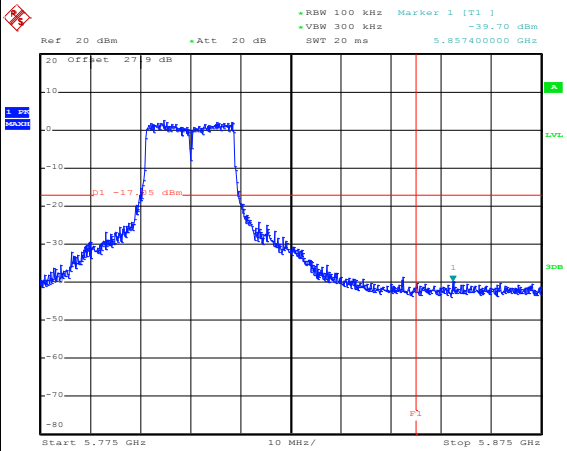
WLAN 802.11n HT20 Channel 161

100kHz PSD reference Level



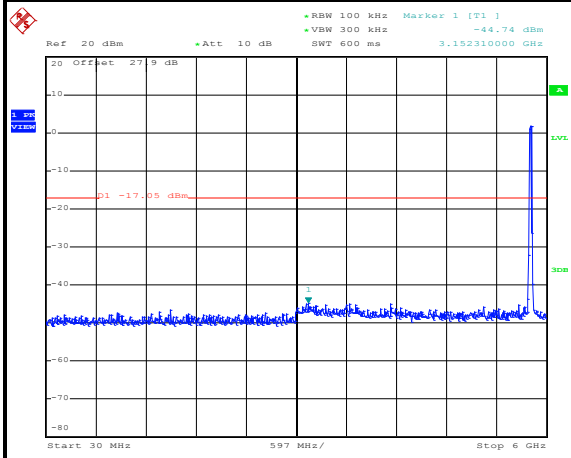
Date: 15.SEP.2014 16:31:23

High Channel Plot



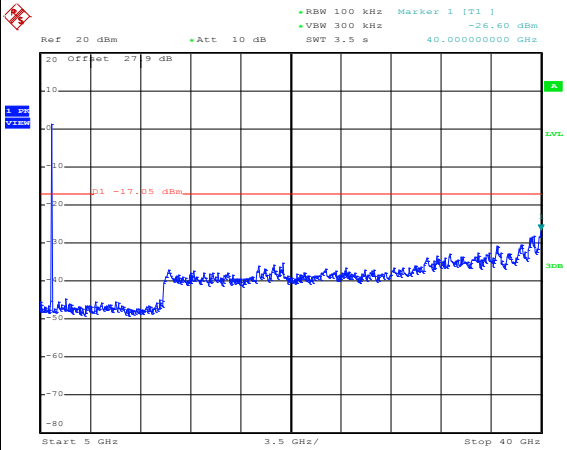
Date: 15.SEP.2014 16:31:38

Spurious Emission 30MHz~6GHz



Date: 15.SEP.2014 16:32:00

Spurious Emission 5GHz~40GHz

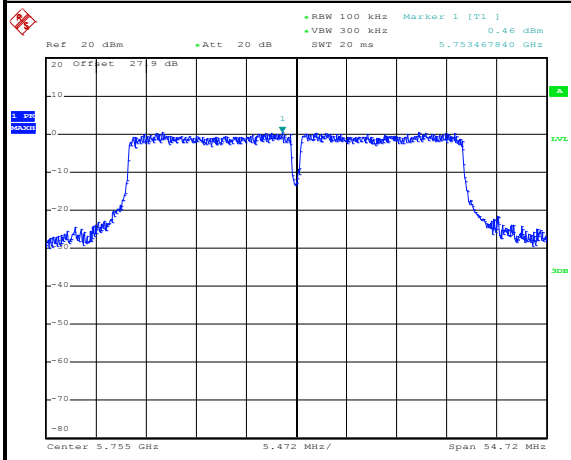


Date: 15.SEP.2014 16:32:18

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	5GHz Low	**Relative Humidity :**	51~54%
Test Channel :	151	**Test Engineer :**	Stuart Lin

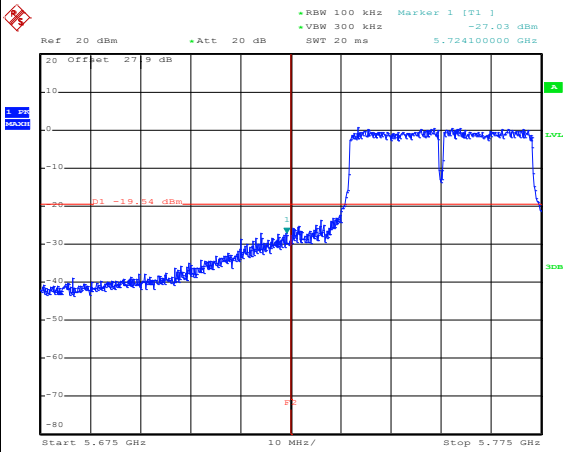
WLAN 802.11n HT40 Channel 151

100kHz PSD reference Level



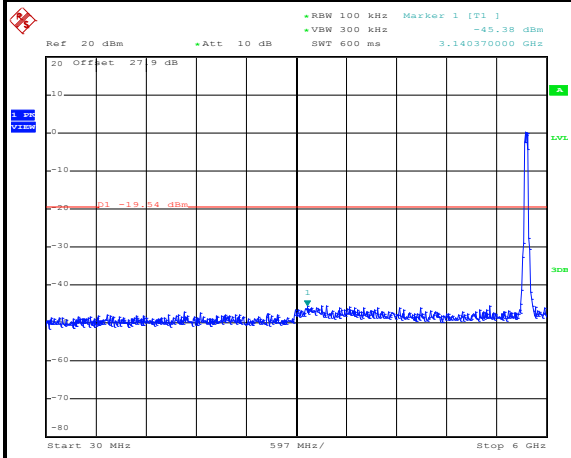
Date: 31.AUG.2014 12:54:38

Low Channel Plot



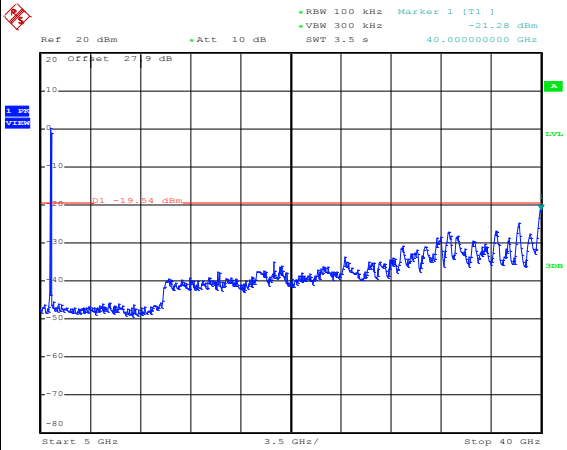
Date: 31.AUG.2014 12:55:16

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 12:56:12

Spurious Emission 5GHz~40GHz

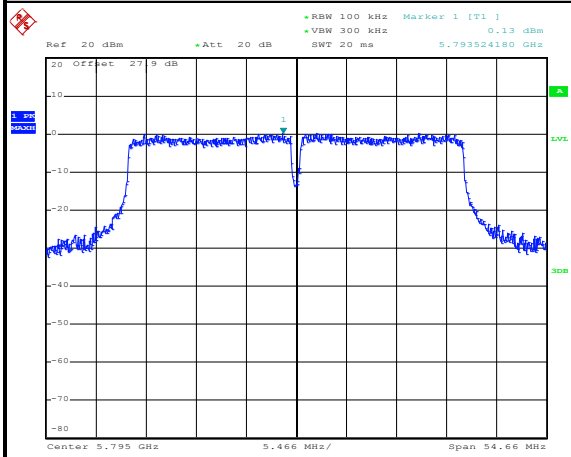


Date: 31.AUG.2014 12:56:30

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	5GHz High	**Relative Humidity :**	51~54%
Test Channel :	159	**Test Engineer :**	Stuart Lin

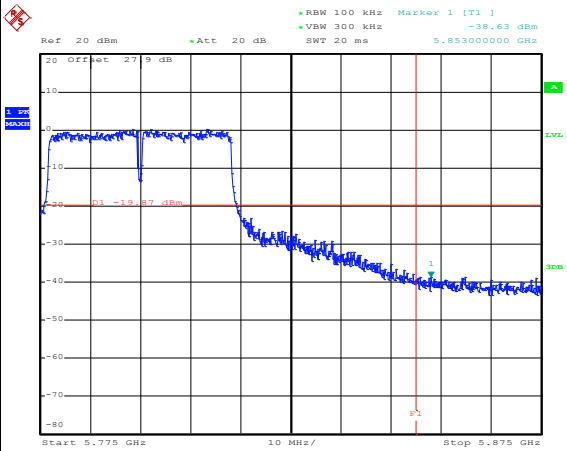
WLAN 802.11n HT40 Channel 159

100kHz PSD reference Level



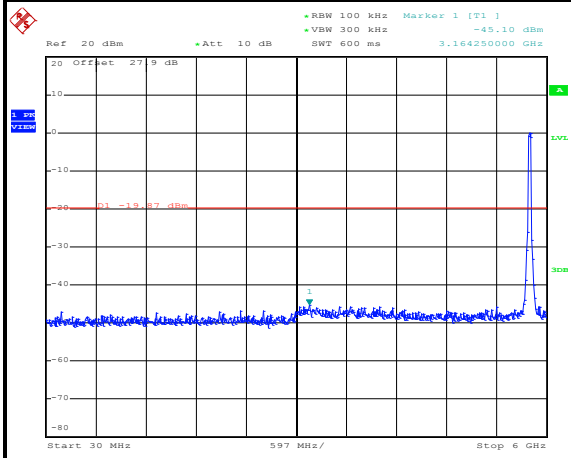
Date: 31.AUG.2014 13:01:04

High Channel Plot



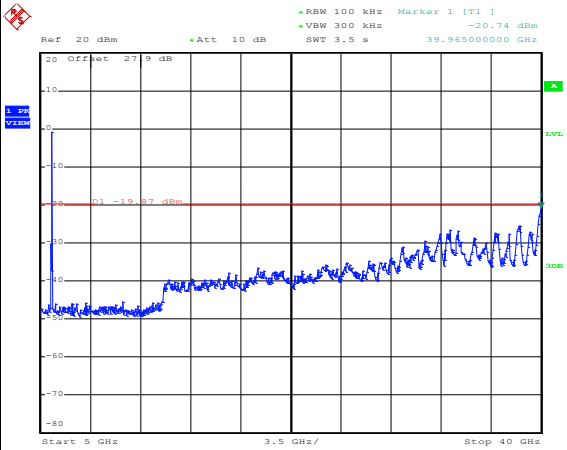
Date: 31.AUG.2014 13:01:32

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 13:01:56

Spurious Emission 5GHz~40GHz

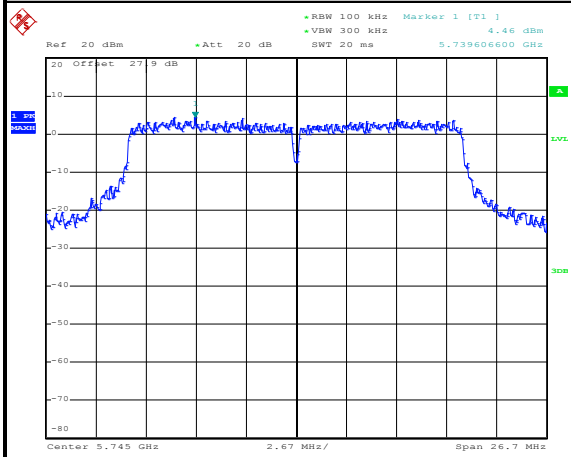


Date: 31.AUG.2014 13:02:14

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	5GHz Low	**Relative Humidity :**	51~54%
Test Channel :	149	**Test Engineer :**	Stuart Lin

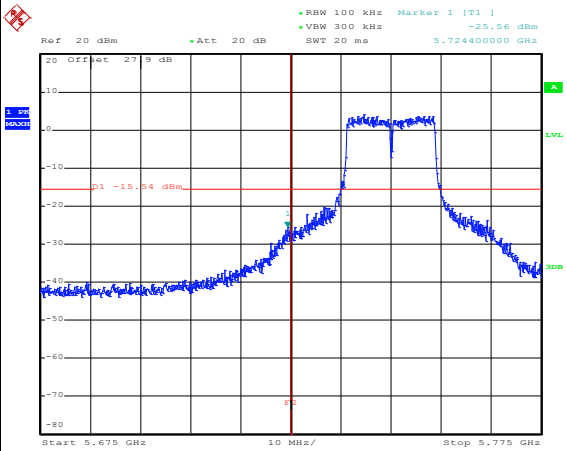
WLAN 802.11ac VHT20 Channel 149

100kHz PSD reference Level



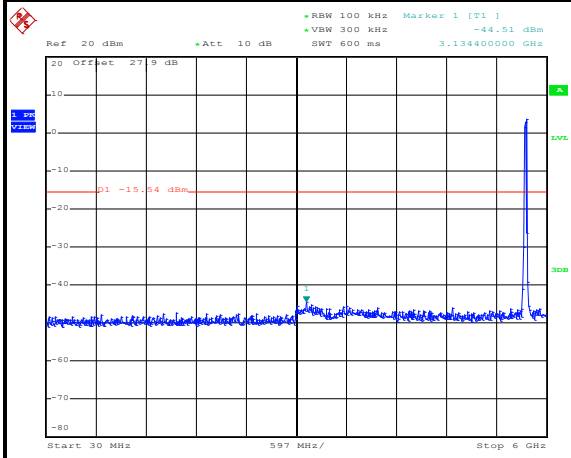
Date: 31.AUG.2014 13:31:20

Low Channel Plot



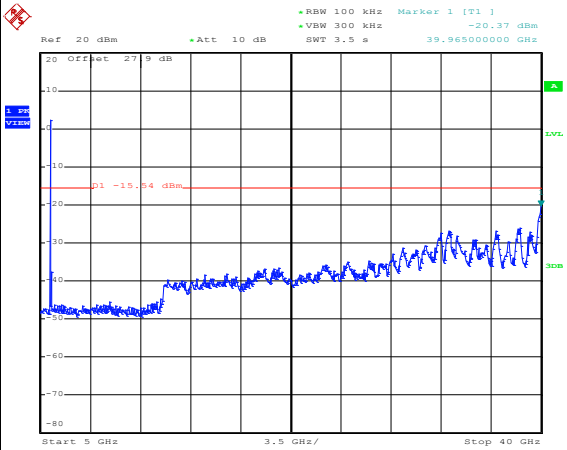
Date: 31.AUG.2014 13:32:13

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 13:33:09

Spurious Emission 5GHz~40GHz

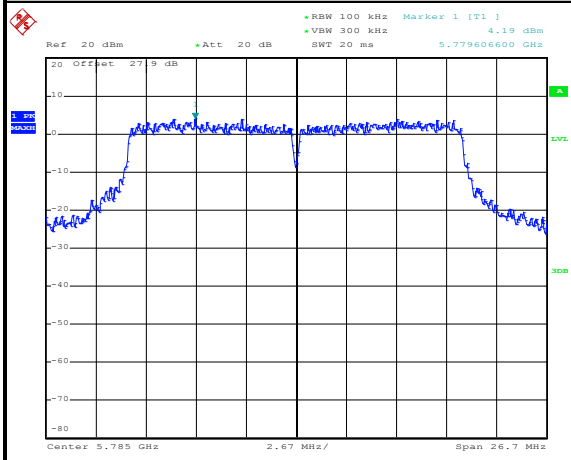


Date: 31.AUG.2014 13:33:27

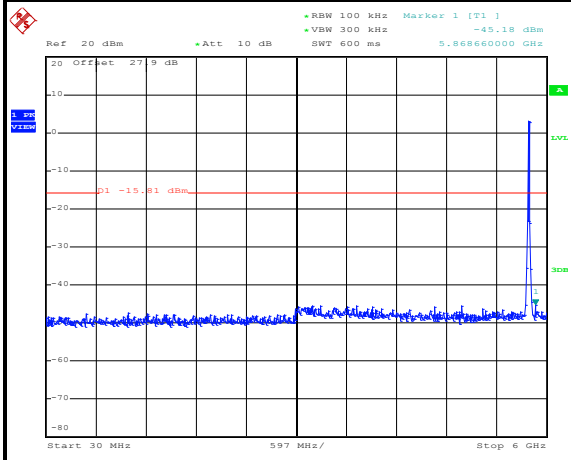
Number of TX :	1	**Ant. :**	1
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	5GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	157	**Test Engineer :**	Stuart Lin

WLAN 802.11ac VHT20 Channel 157

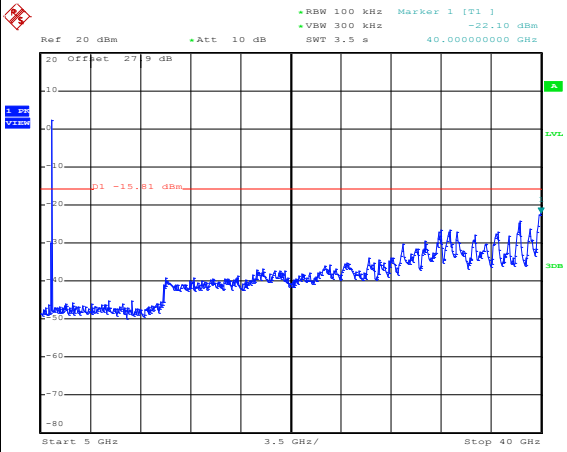
100kHz PSD reference Level



Spurious Emission 30MHz~6GHz



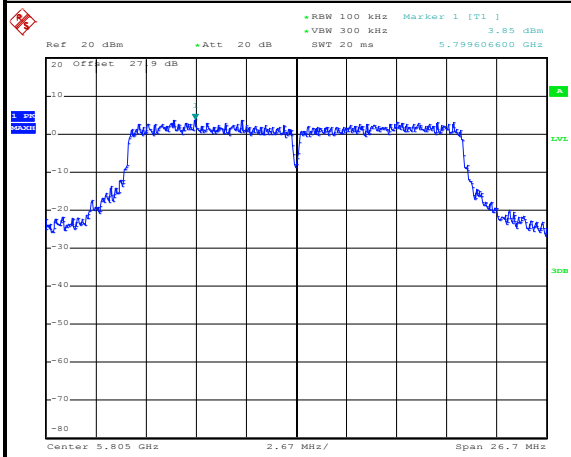
Spurious Emission 5GHz~40GHz



Number of TX :	1	**Ant. :**	1
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	5GHz High	**Relative Humidity :**	51~54%
Test Channel :	161	**Test Engineer :**	Stuart Lin

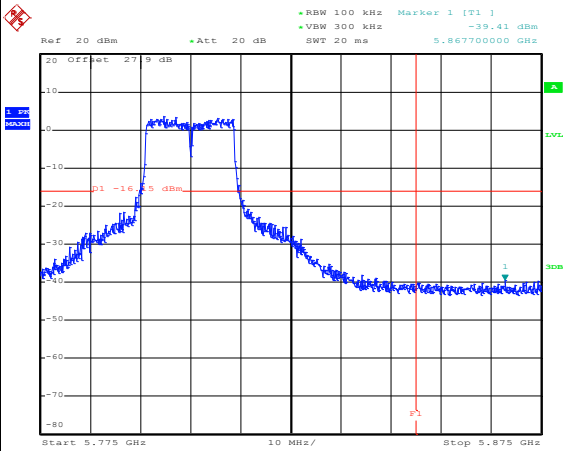
WLAN 802.11ac VHT20 Channel 161

100kHz PSD reference Level



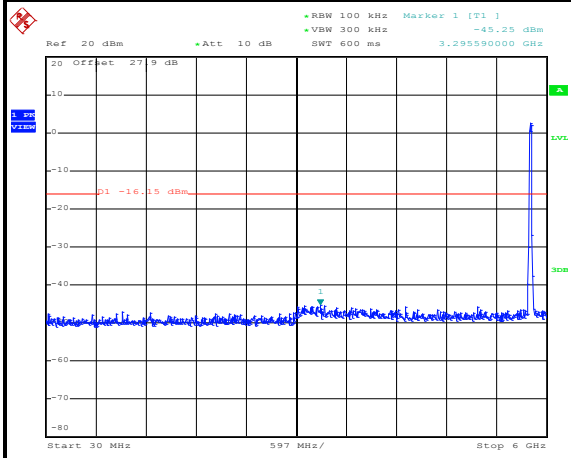
Date: 16.SEP.2014 19:37:36

High Channel Plot



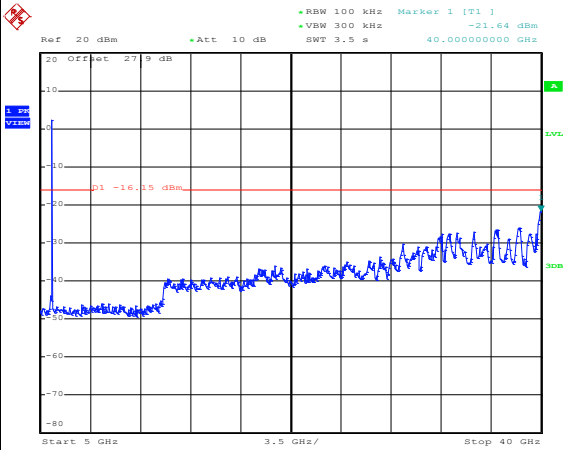
Date: 16.SEP.2014 19:38:26

Spurious Emission 30MHz~6GHz



Date: 16.SEP.2014 19:38:58

Spurious Emission 5GHz~40GHz

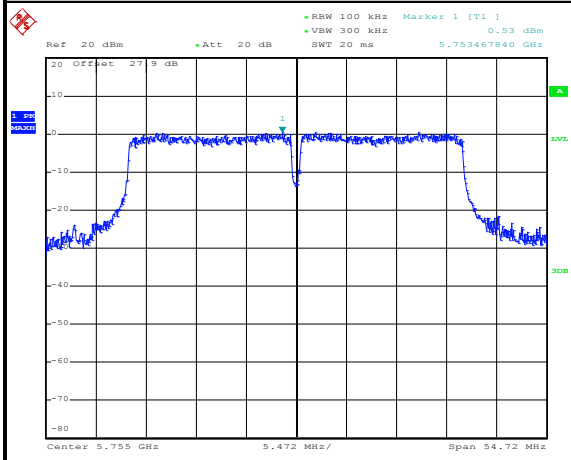


Date: 16.SEP.2014 19:39:16

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11ac VHT40	**Temperature :**	21~25℃
Test Band :	5GHz Low	**Relative Humidity :**	51~54%
Test Channel :	151	**Test Engineer :**	Stuart Lin

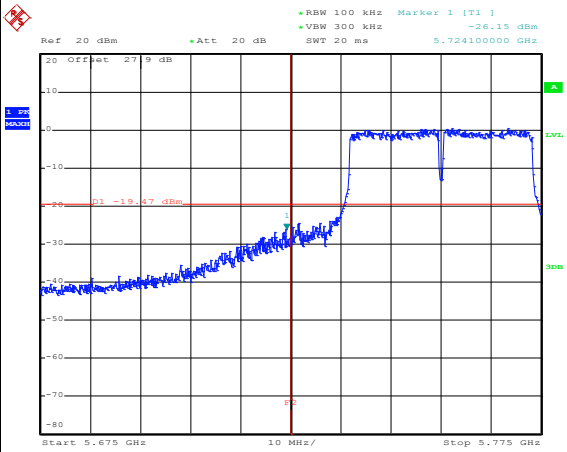
WLAN 802.11ac VHT40 Channel 151

100kHz PSD reference Level



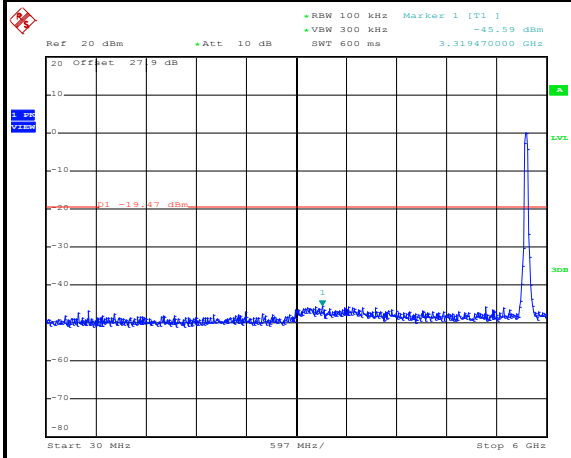
Date: 31.AUG.2014 14:21:06

Low Channel Plot



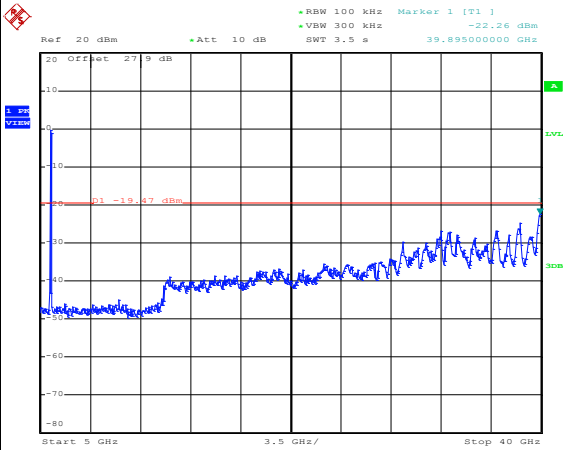
Date: 31.AUG.2014 14:22:08

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 14:22:56

Spurious Emission 5GHz~40GHz

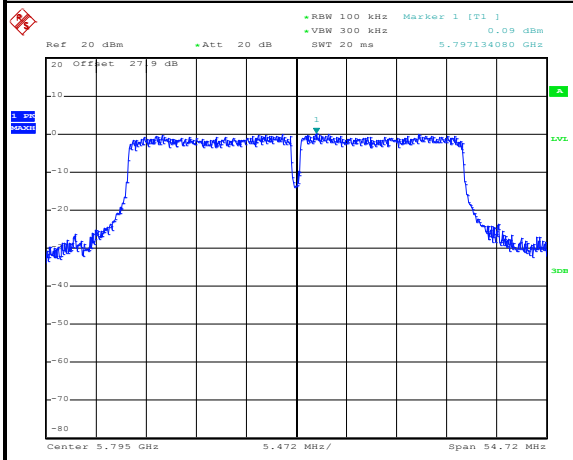


Date: 31.AUG.2014 14:23:14

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11ac VHT40	**Temperature :**	21~25℃
Test Band :	5GHz High	**Relative Humidity :**	51~54%
Test Channel :	159	**Test Engineer :**	Stuart Lin

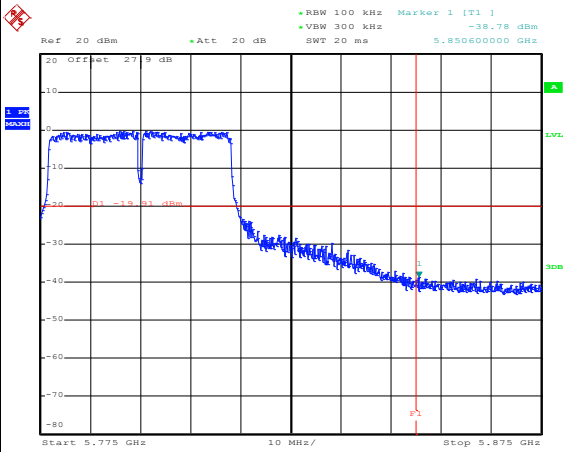
WLAN 802.11ac VHT40 Channel 159

100kHz PSD reference Level



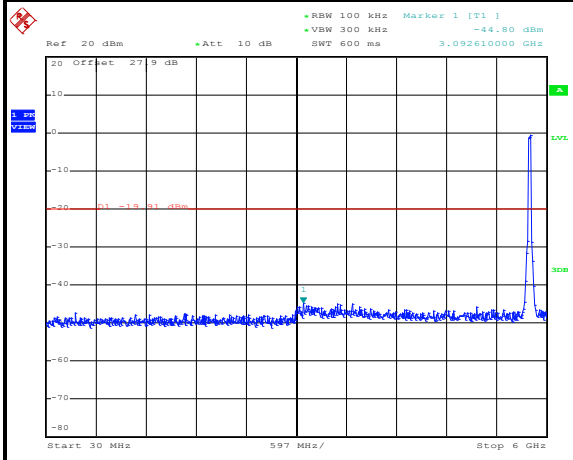
Date: 31.AUG.2014 14:26:51

High Channel Plot



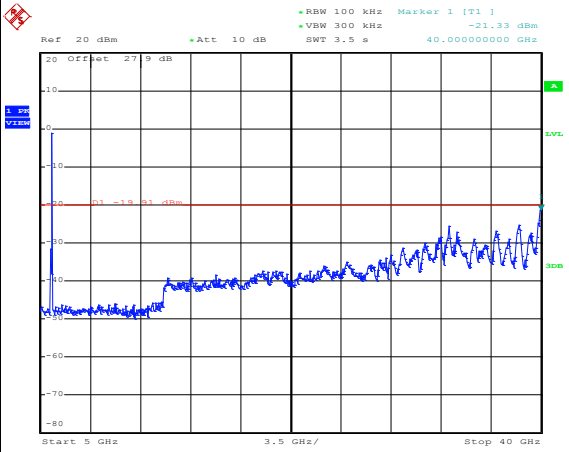
Date: 31.AUG.2014 14:27:19

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 14:28:15

Spurious Emission 5GHz~40GHz

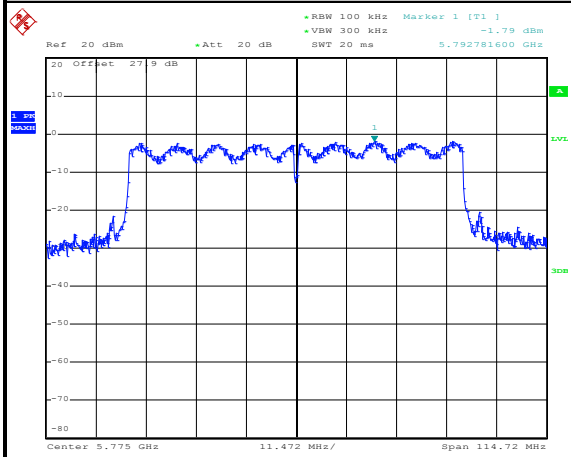


Date: 31.AUG.2014 14:28:33

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11ac VHT80	**Temperature :**	21~25℃
Test Band :	5GHz	**Relative Humidity :**	51~54%
Test Channel :	155	**Test Engineer :**	Stuart Lin

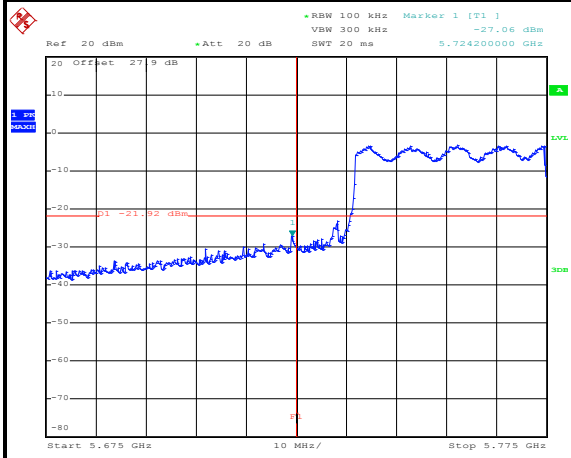
WLAN 802.11ac VHT80 Channel 155

100kHz PSD reference Level



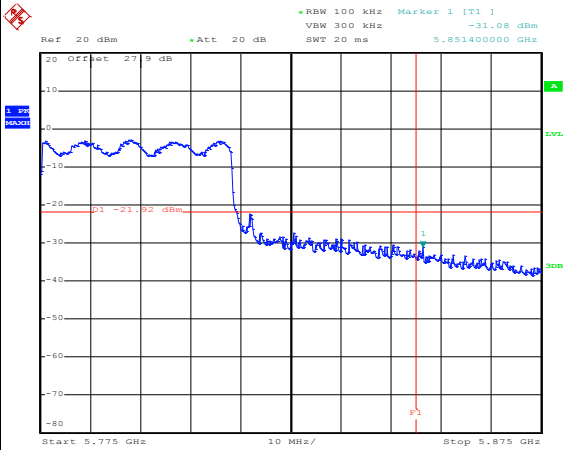
Date: 31.AUG.2014 14:54:30

Low Channel Plot

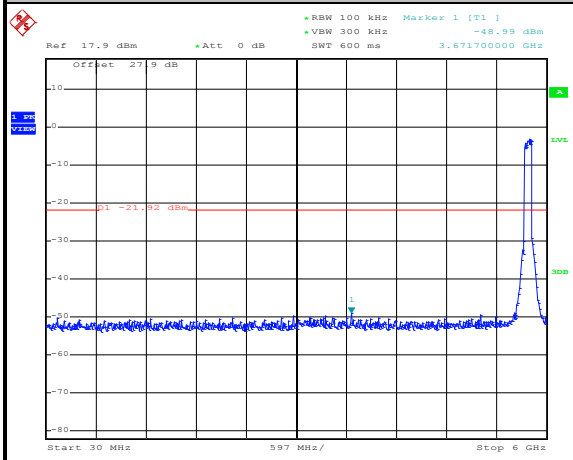
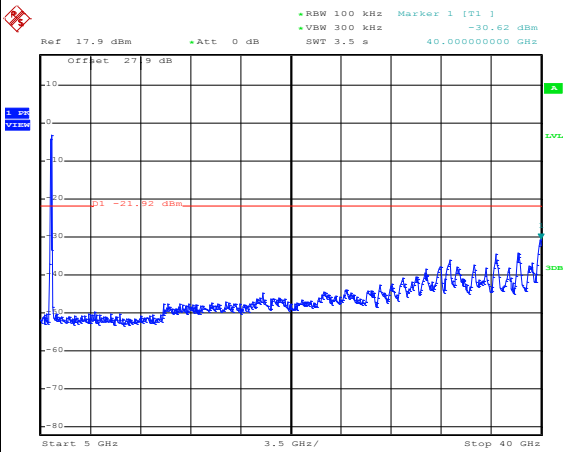


Date: 16.SEP.2014 20:05:10

High Channel Plot



Date: 16.SEP.2014 20:07:13

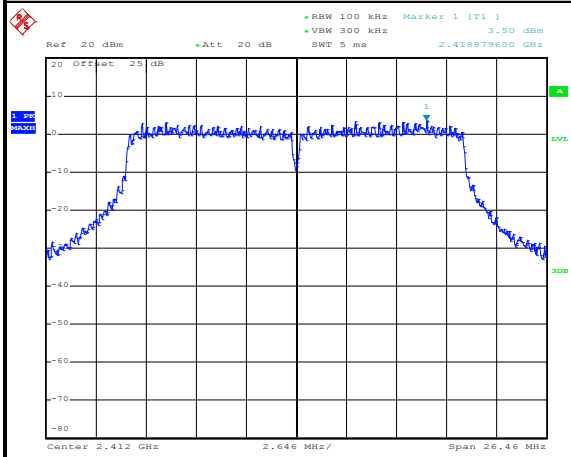
Spurious Emission 30MHz~6GHz	Spurious Emission 5GHz~40GHz
	
Date: 16.SEP.2014 20:12:24	Date: 16.SEP.2014 20:12:42

Number of TX = 2, Ant. 1 (Measured)

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	Stuart Lin

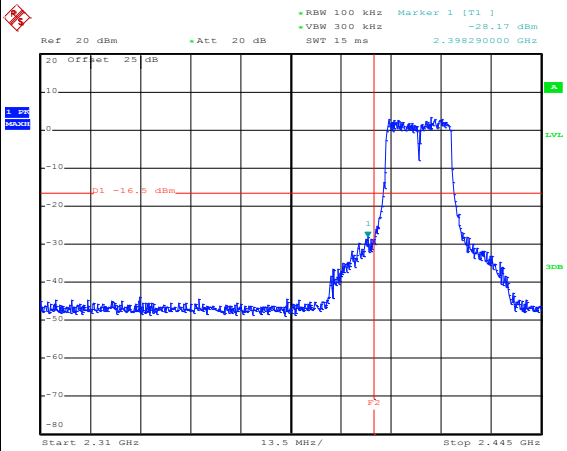
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



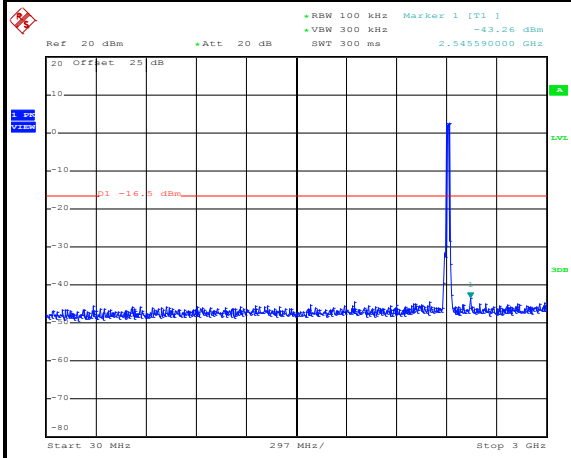
Date: 31.AUG.2014 09:41:16

Low Channel Plot



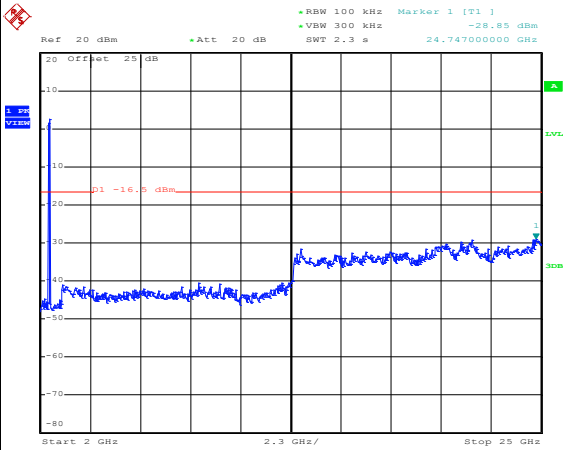
Date: 31.AUG.2014 09:41:41

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 09:42:02

Spurious Emission 2GHz~25GHz

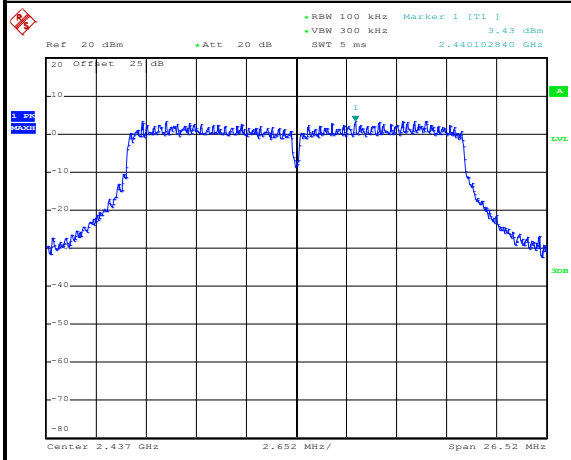


Date: 31.AUG.2014 09:42:20

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	Stuart Lin

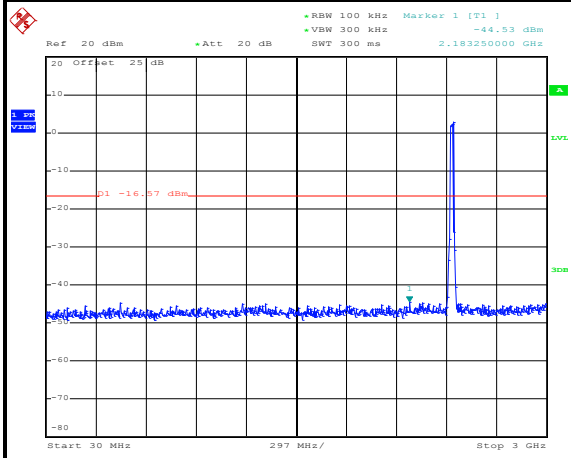
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



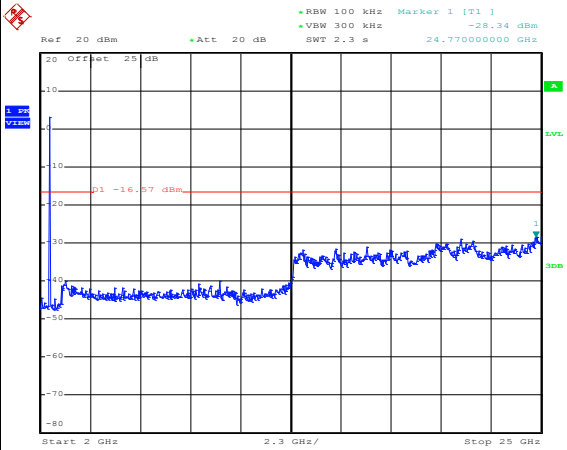
Date: 31.AUG.2014 09:36:35

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 09:37:18

Spurious Emission 2GHz~25GHz

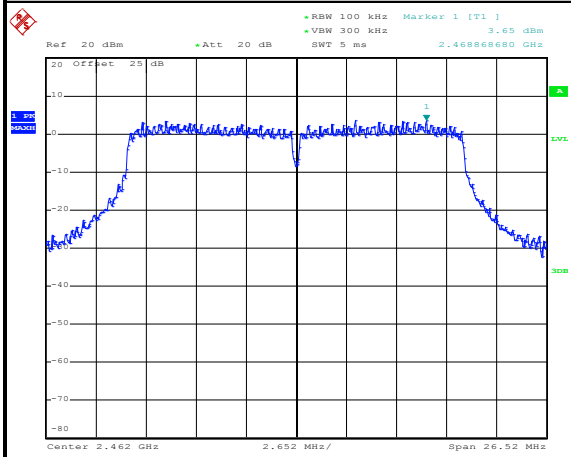


Date: 31.AUG.2014 09:37:36

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	Stuart Lin

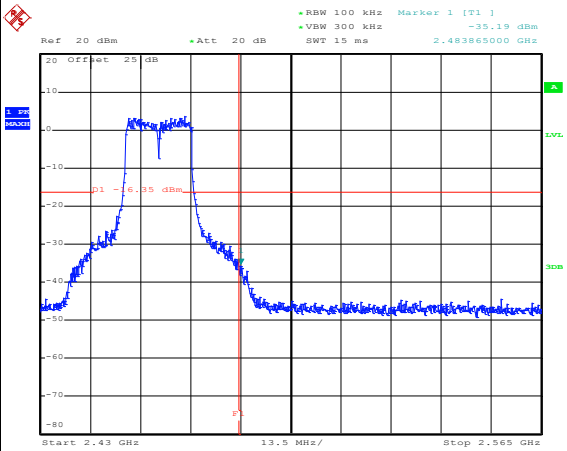
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



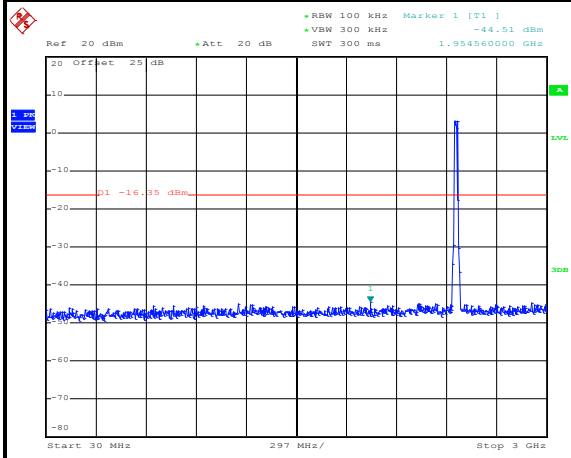
Date: 31.AUG.2014 09:19:42

High Channel Plot



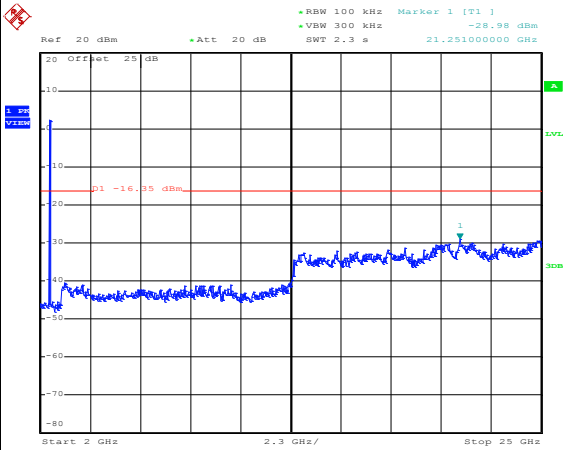
Date: 31.AUG.2014 09:20:18

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 09:21:16

Spurious Emission 2GHz~25GHz

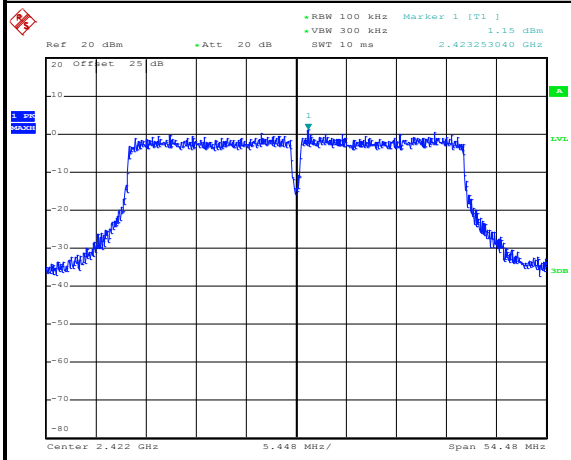


Date: 31.AUG.2014 09:21:34

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	03	**Test Engineer :**	Stuart Lin

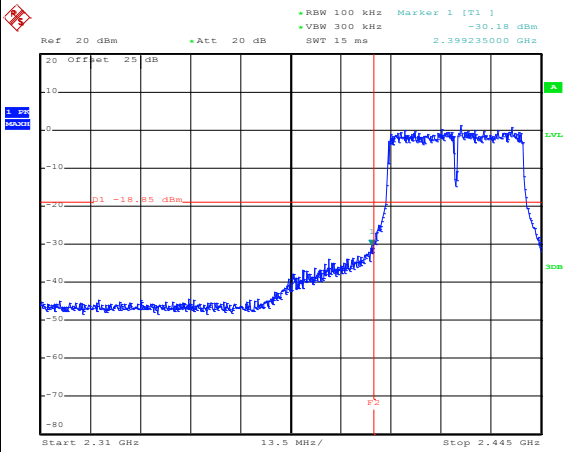
WLAN 802.11n HT40 Channel 03

100kHz PSD reference Level



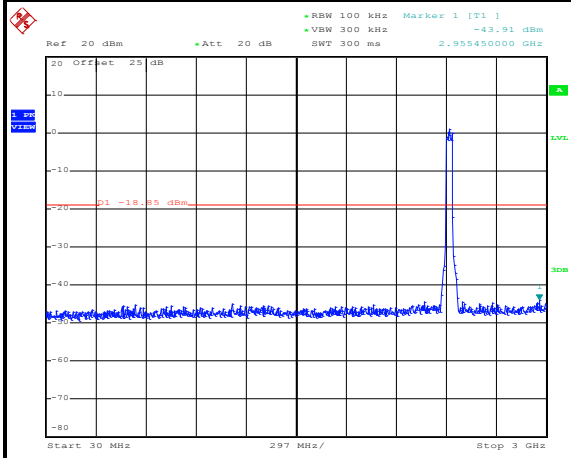
Date: 31.AUG.2014 10:39:29

Low Channel Plot



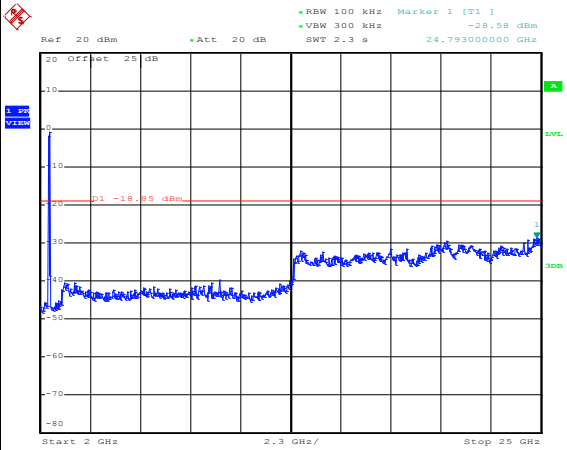
Date: 31.AUG.2014 10:42:36

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 10:43:02

Spurious Emission 2GHz~25GHz

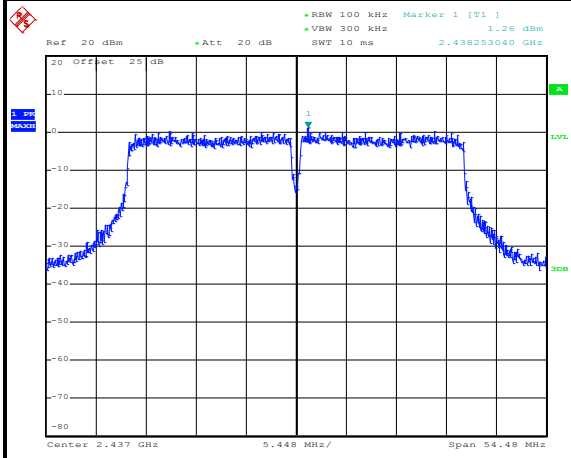


Date: 31.AUG.2014 10:43:20

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	Stuart Lin

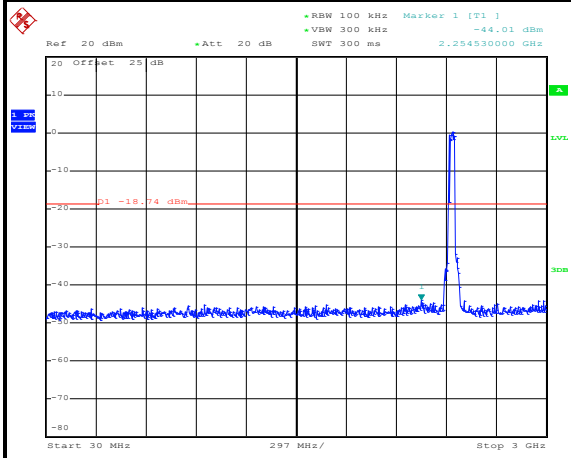
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



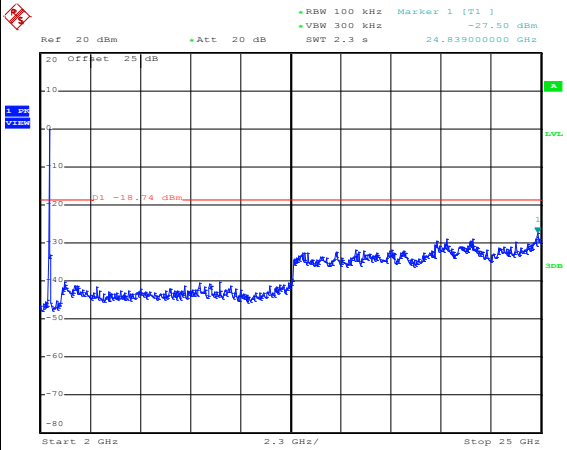
Date: 31.AUG.2014 10:30:21

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 10:32:57

Spurious Emission 2GHz~25GHz

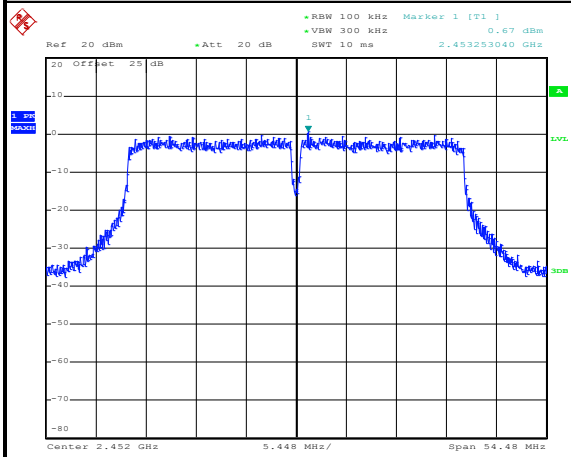


Date: 31.AUG.2014 10:33:15

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	09	**Test Engineer :**	Stuart Lin

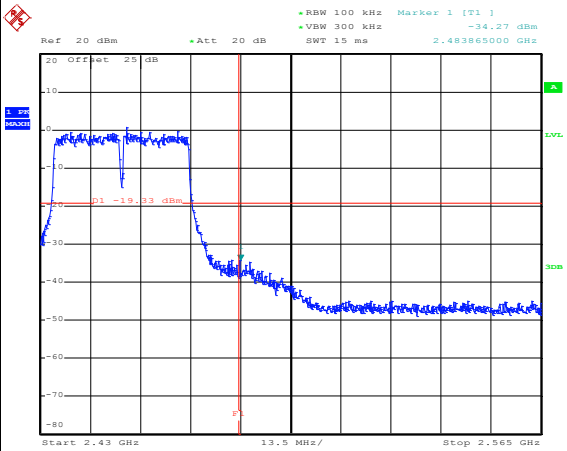
WLAN 802.11n HT40 Channel 09

100kHz PSD reference Level



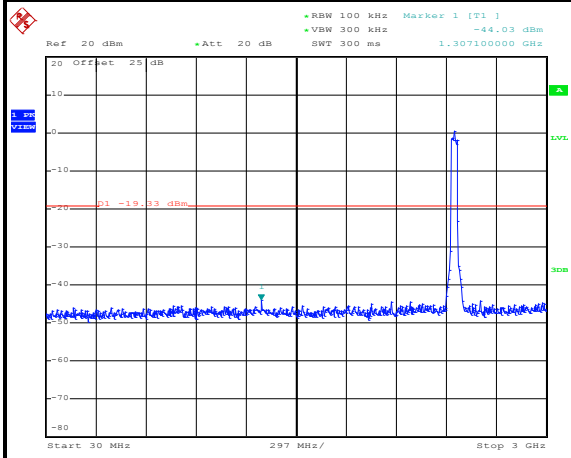
Date: 31.AUG.2014 10:12:38

High Channel Plot



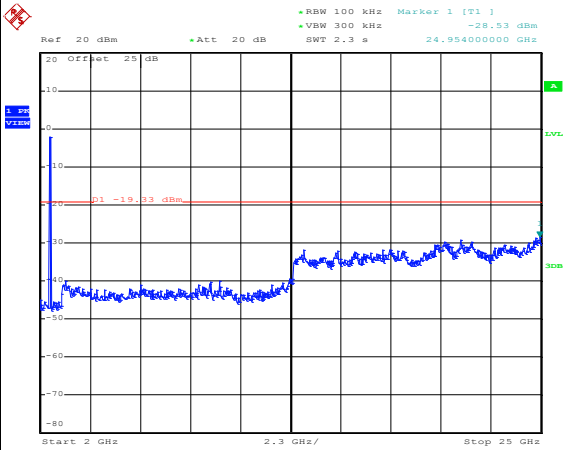
Date: 31.AUG.2014 10:13:04

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 10:13:43

Spurious Emission 2GHz~25GHz

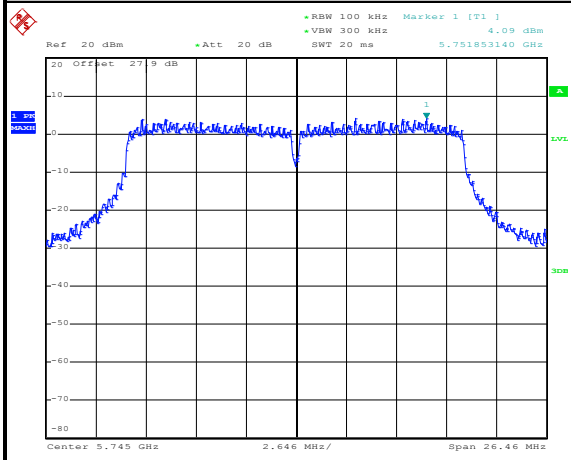


Date: 31.AUG.2014 10:14:01

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	5GHz Low	**Relative Humidity :**	51~54%
Test Channel :	149	**Test Engineer :**	Stuart Lin

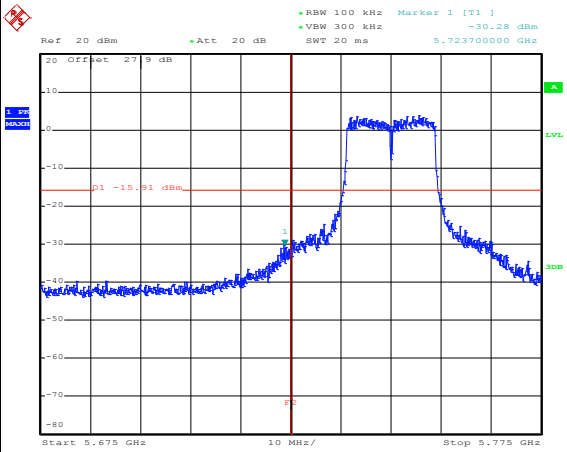
WLAN 802.11n HT20 Channel 149

100kHz PSD reference Level



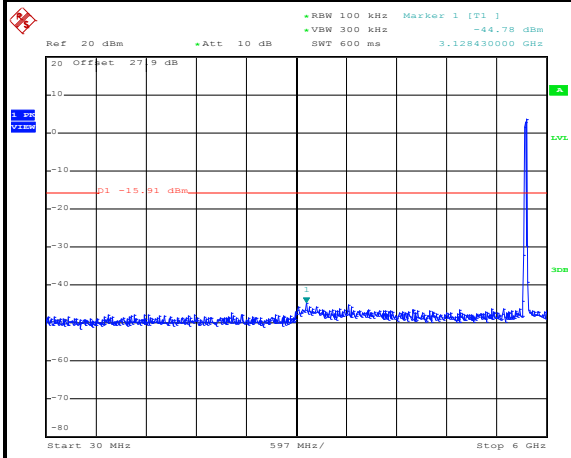
Date: 31.AUG.2014 12:47:24

Low Channel Plot



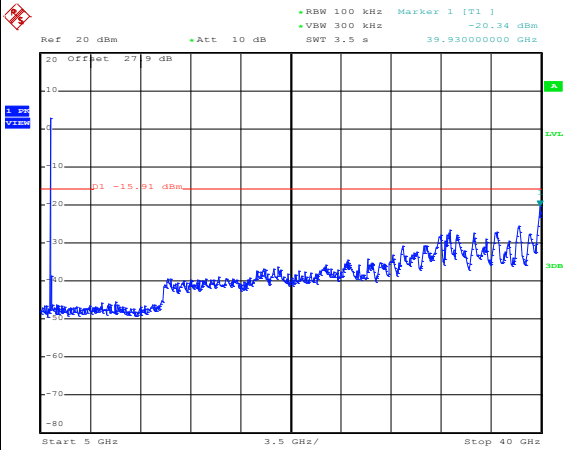
Date: 31.AUG.2014 12:48:13

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 12:49:04

Spurious Emission 5GHz~40GHz

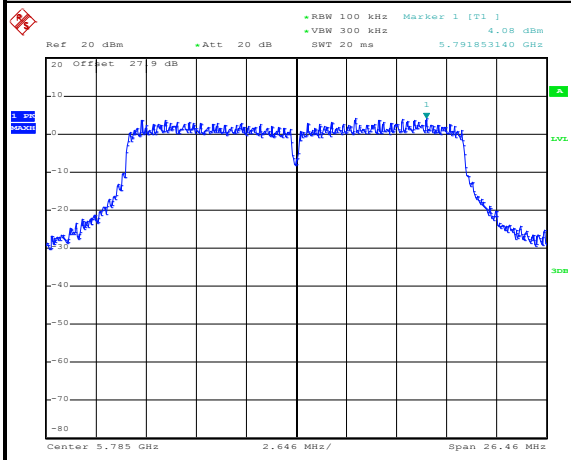


Date: 31.AUG.2014 12:49:22

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	5GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	157	**Test Engineer :**	Stuart Lin

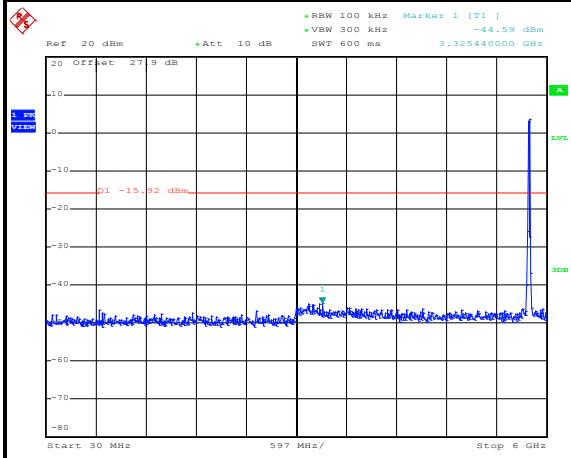
WLAN 802.11n HT20 Channel 157

100kHz PSD reference Level



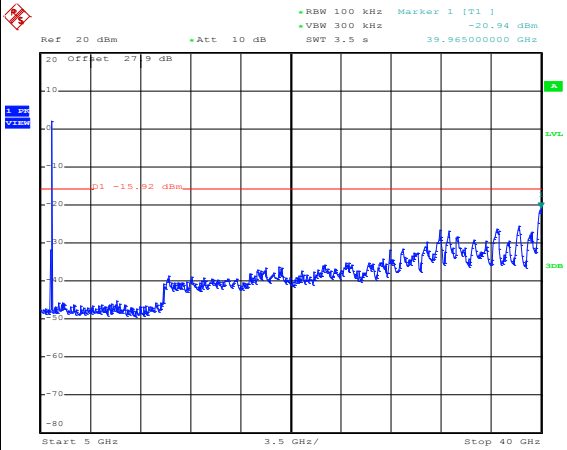
Date: 31.AUG.2014 12:37:18

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 12:38:04

Spurious Emission 5GHz~40GHz

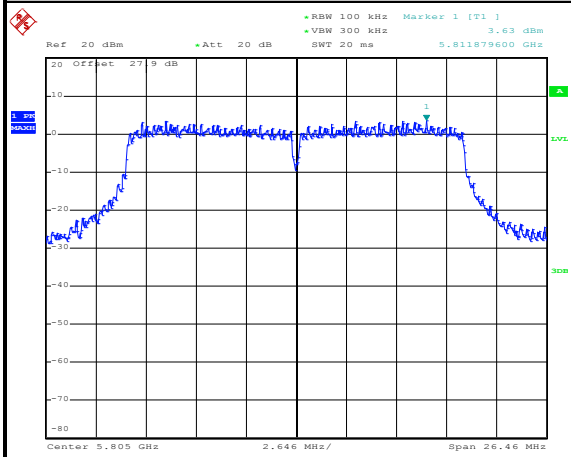


Date: 31.AUG.2014 12:38:23

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	5GHz High	**Relative Humidity :**	51~54%
Test Channel :	161	**Test Engineer :**	Stuart Lin

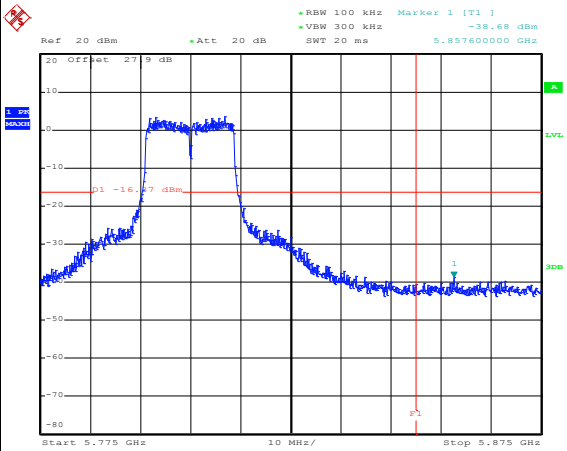
WLAN 802.11n HT20 Channel 161

100kHz PSD reference Level



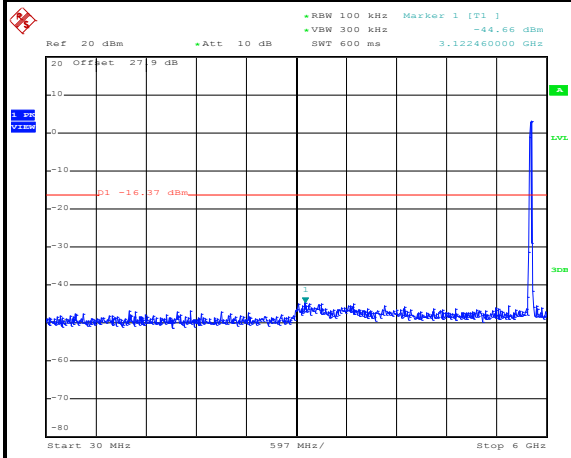
Date: 15.SEP.2014 16:45:04

High Channel Plot



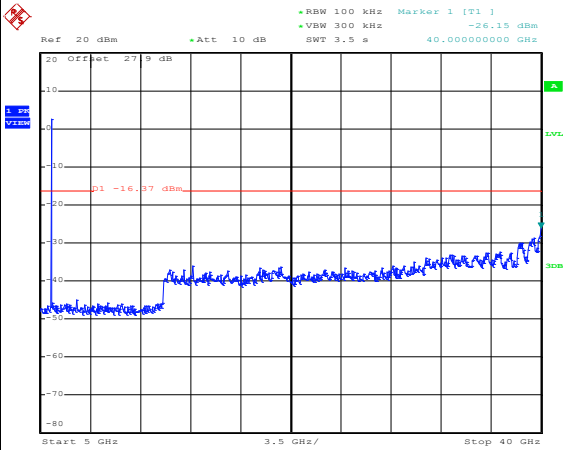
Date: 15.SEP.2014 16:45:21

Spurious Emission 30MHz~6GHz



Date: 15.SEP.2014 16:46:21

Spurious Emission 5GHz~40GHz

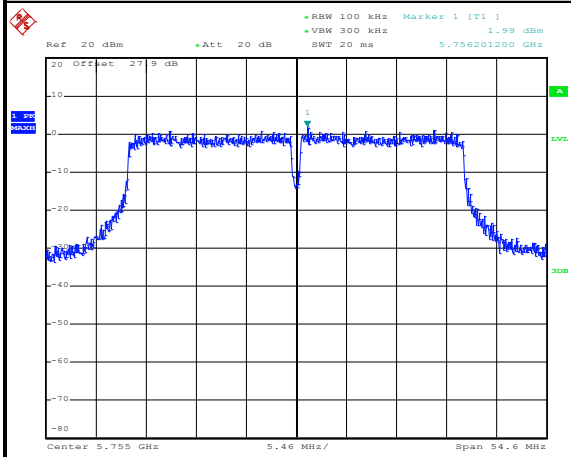


Date: 15.SEP.2014 16:46:39

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	5GHz Low	**Relative Humidity :**	51~54%
Test Channel :	151	**Test Engineer :**	Stuart Lin

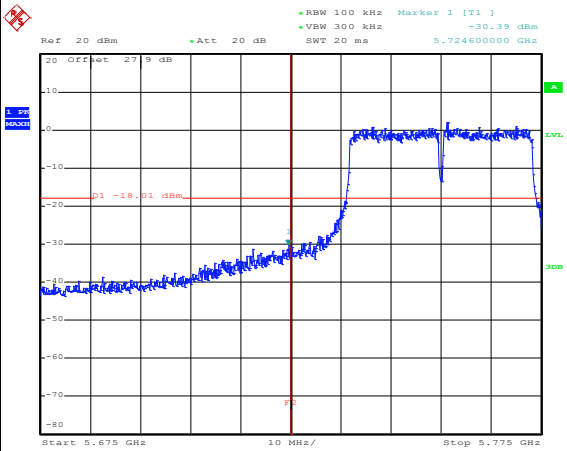
WLAN 802.11n HT40 Channel 151

100kHz PSD reference Level



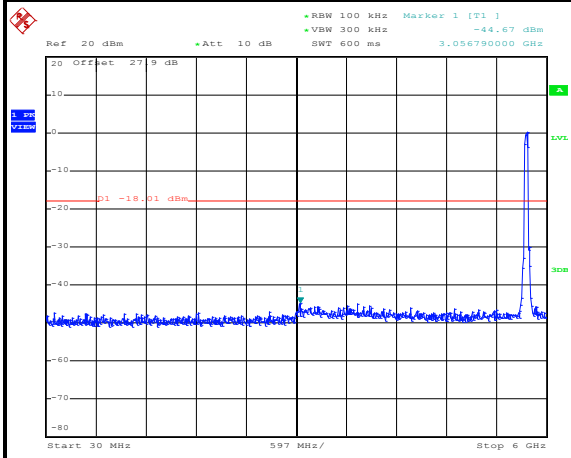
Date: 31.AUG.2014 13:24:42

Low Channel Plot



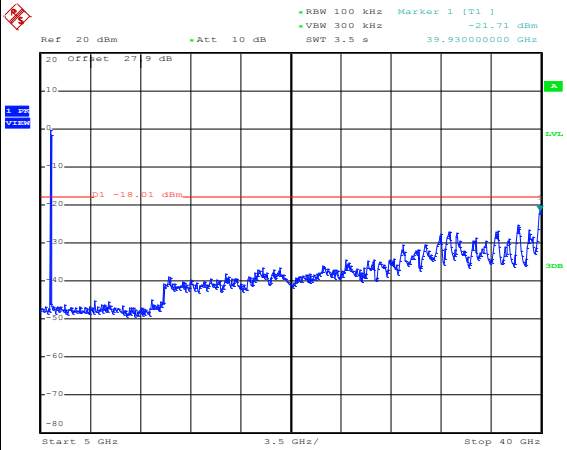
Date: 31.AUG.2014 13:25:18

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 13:26:07

Spurious Emission 5GHz~40GHz

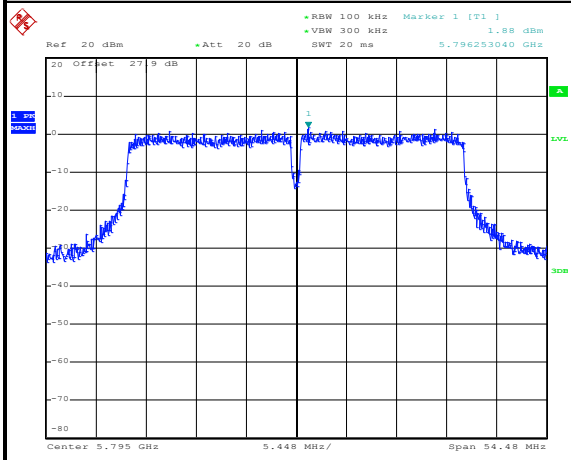


Date: 31.AUG.2014 13:26:25

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	5GHz High	**Relative Humidity :**	51~54%
Test Channel :	159	**Test Engineer :**	Stuart Lin

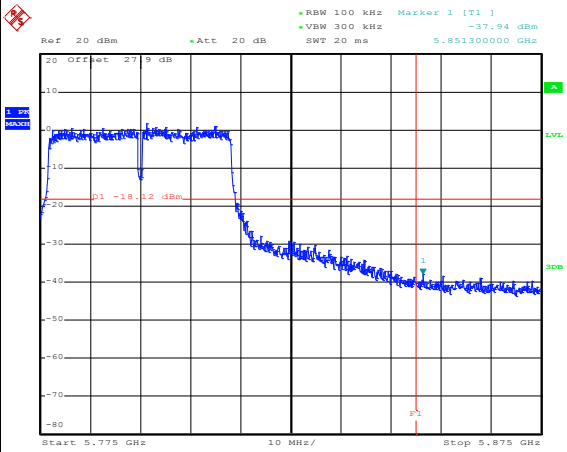
WLAN 802.11n HT40 Channel 159

100kHz PSD reference Level



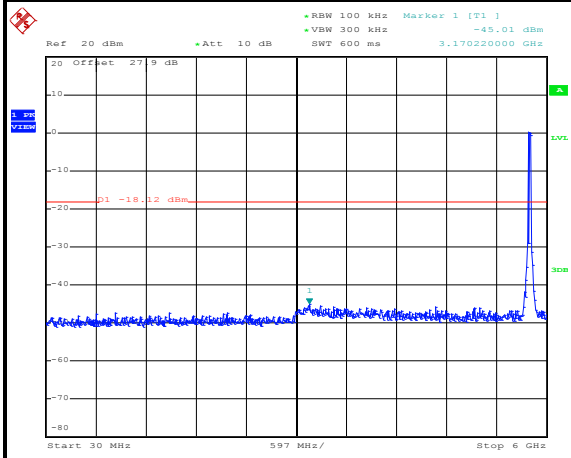
Date: 31.AUG.2014 13:08:16

High Channel Plot



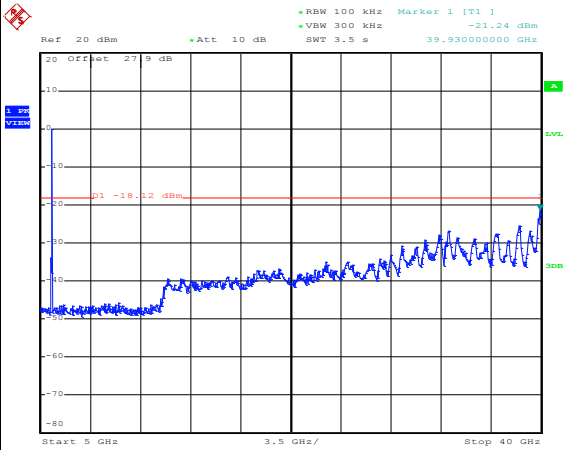
Date: 31.AUG.2014 13:08:43

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 13:09:07

Spurious Emission 5GHz~40GHz

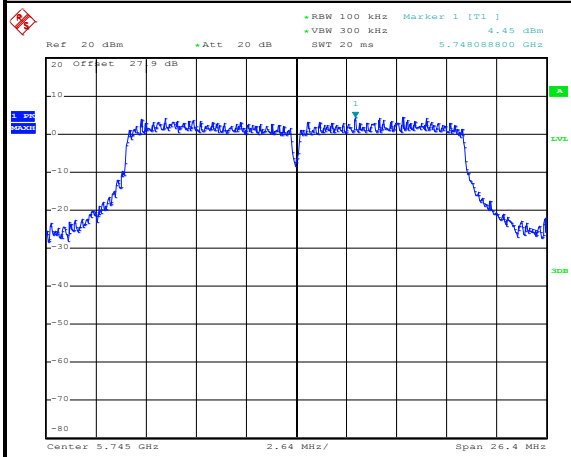


Date: 31.AUG.2014 13:09:25

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	5GHz Low	**Relative Humidity :**	51~54%
Test Channel :	149	**Test Engineer :**	Stuart Lin

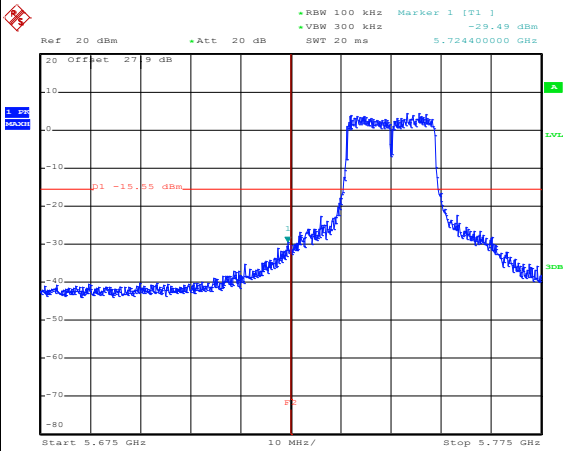
WLAN 802.11ac VHT20 Channel 149

100kHz PSD reference Level



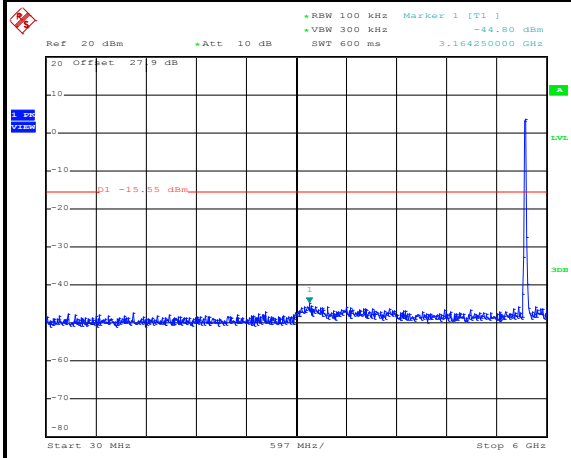
Date: 31.AUG.2014 14:14:37

Low Channel Plot



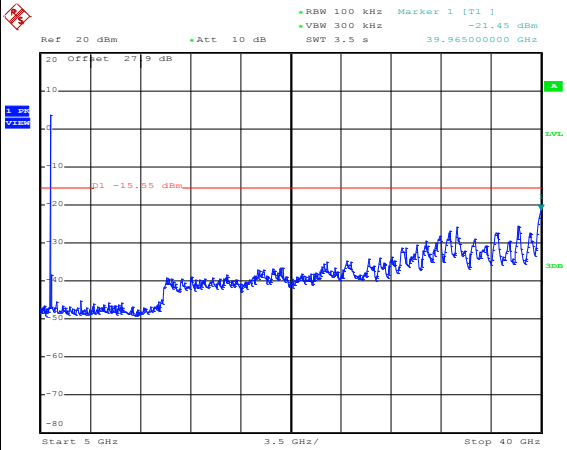
Date: 31.AUG.2014 14:15:14

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 14:15:52

Spurious Emission 5GHz~40GHz

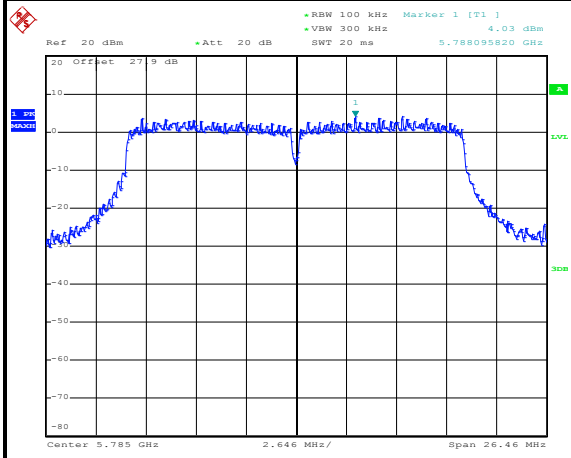


Date: 31.AUG.2014 14:16:10

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	5GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	157	**Test Engineer :**	Stuart Lin

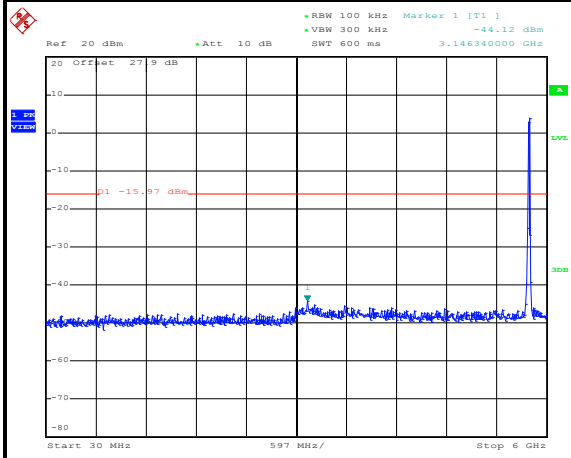
WLAN 802.11ac VHT20 Channel 157

100kHz PSD reference Level



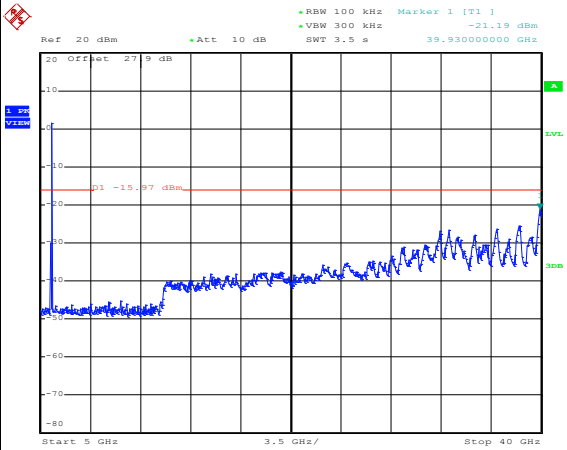
Date: 31.AUG.2014 14:04:47

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 14:05:37

Spurious Emission 5GHz~40GHz

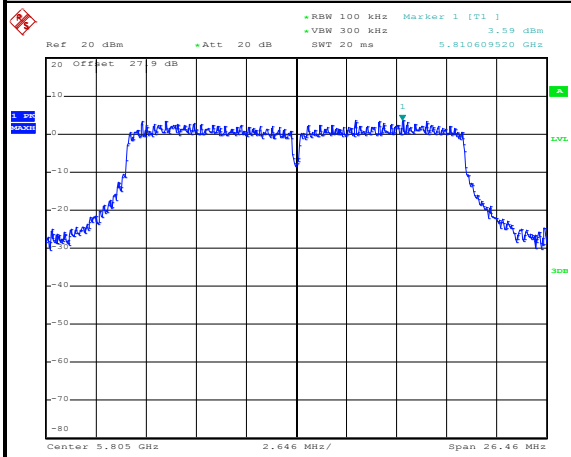


Date: 31.AUG.2014 14:05:55

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	5GHz High	**Relative Humidity :**	51~54%
Test Channel :	161	**Test Engineer :**	Stuart Lin

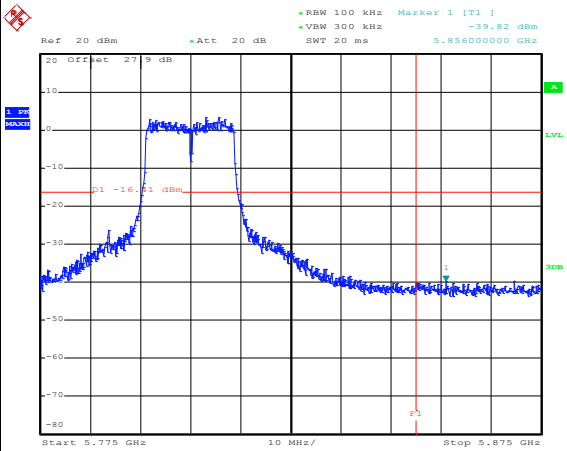
WLAN 802.11ac VHT20 Channel 161

100kHz PSD reference Level



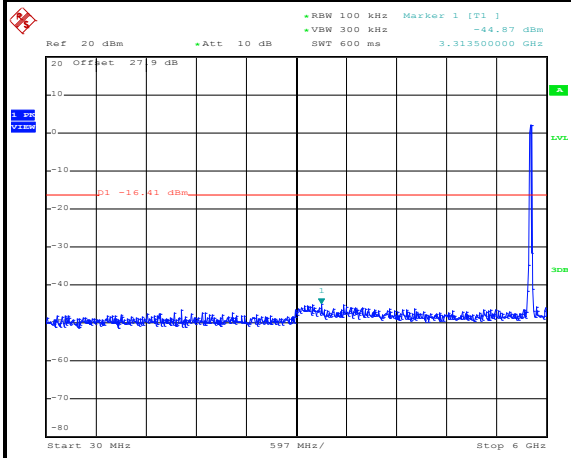
Date: 16.SEP.2014 19:44:41

High Channel Plot



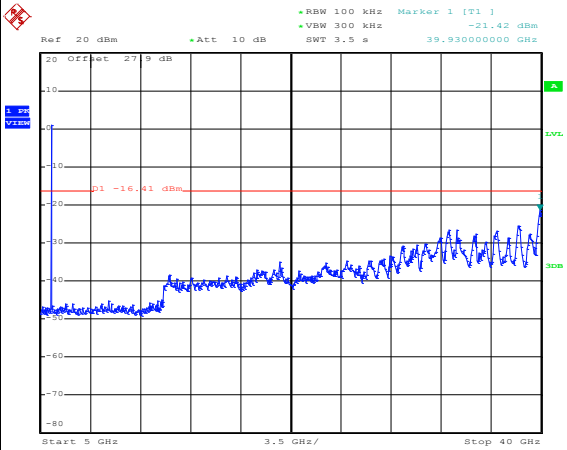
Date: 16.SEP.2014 19:45:57

Spurious Emission 30MHz~6GHz



Date: 16.SEP.2014 19:47:02

Spurious Emission 5GHz~40GHz

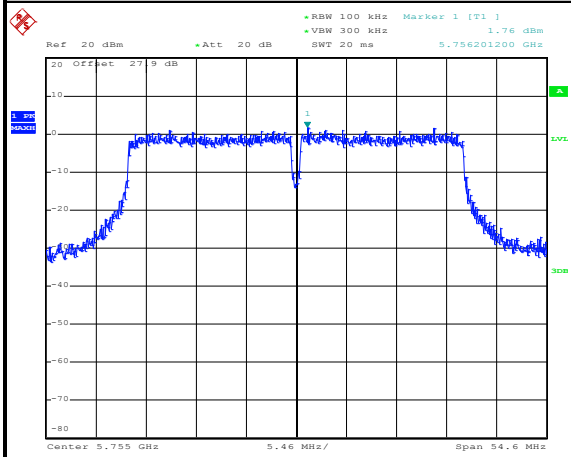


Date: 16.SEP.2014 19:47:20

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT40	**Temperature :**	21~25℃
Test Band :	5GHz Low	**Relative Humidity :**	51~54%
Test Channel :	151	**Test Engineer :**	Stuart Lin

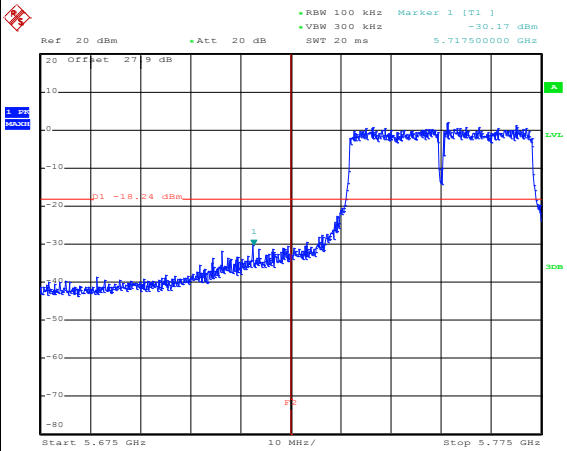
WLAN 802.11ac VHT40 Channel 151

100kHz PSD reference Level



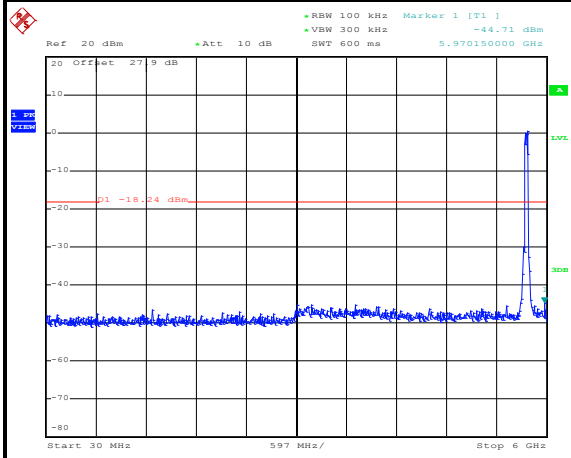
Date: 31.AUG.2014 14:43:12

Low Channel Plot



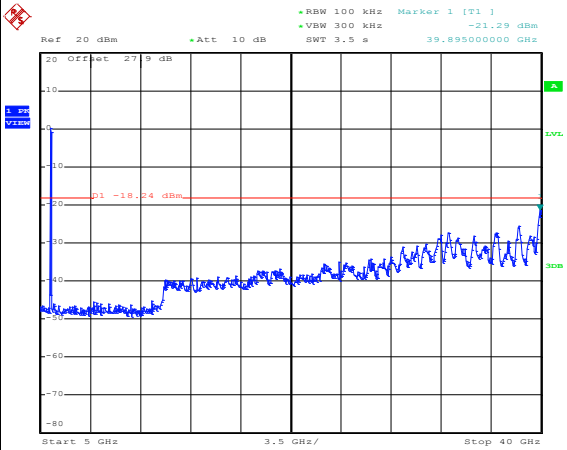
Date: 31.AUG.2014 14:43:31

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 14:44:36

Spurious Emission 5GHz~40GHz

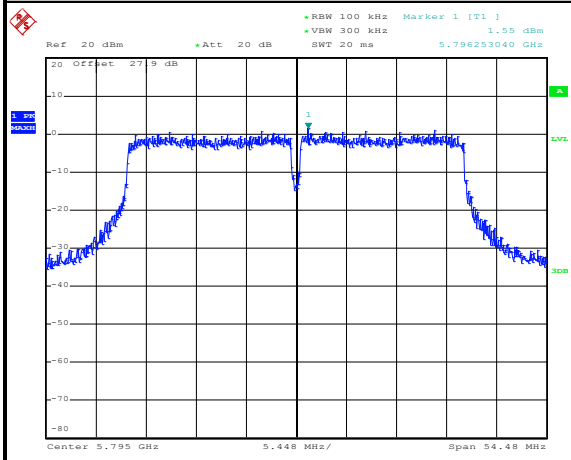


Date: 31.AUG.2014 14:44:54

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT40	**Temperature :**	21~25℃
Test Band :	5GHz High	**Relative Humidity :**	51~54%
Test Channel :	159	**Test Engineer :**	Stuart Lin

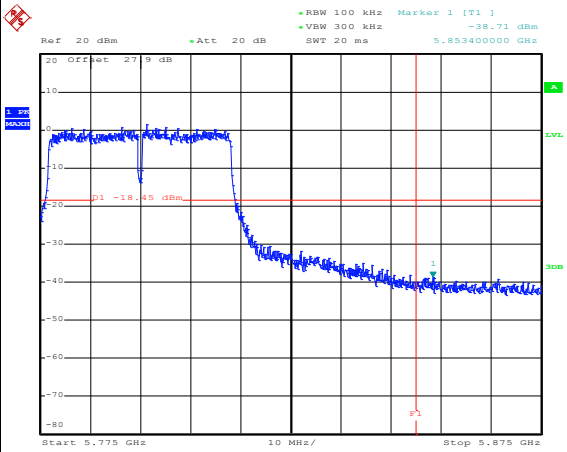
WLAN 802.11ac VHT40 Channel 159

100kHz PSD reference Level



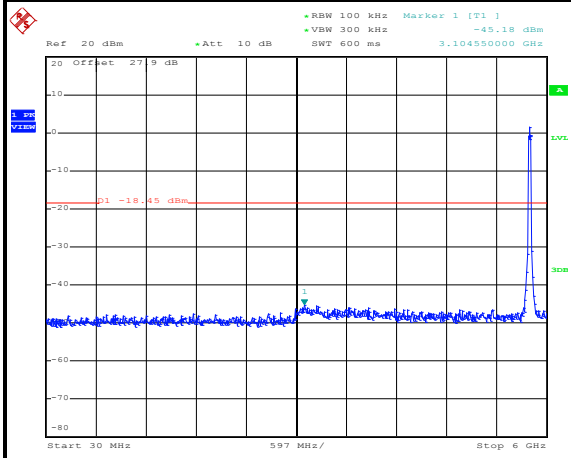
Date: 31.AUG.2014 14:32:46

High Channel Plot



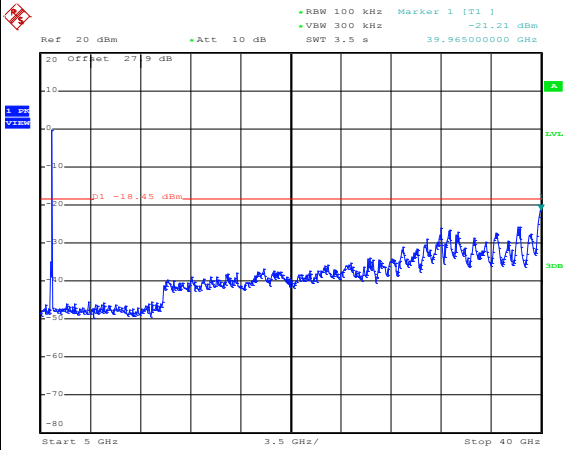
Date: 31.AUG.2014 14:33:36

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 14:34:32

Spurious Emission 5GHz~40GHz

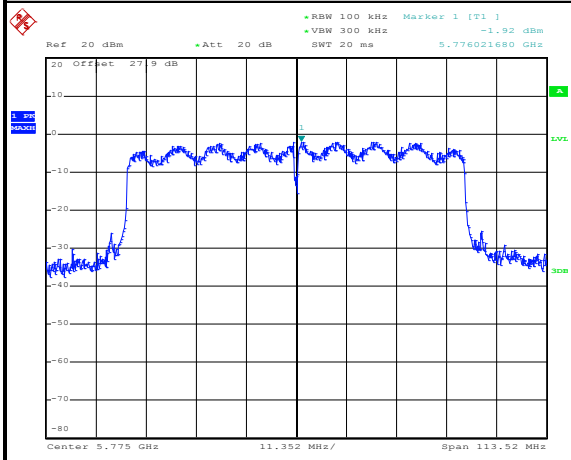


Date: 31.AUG.2014 14:34:50

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11ac VHT80	**Temperature :**	21~25℃
Test Band :	5GHz	**Relative Humidity :**	51~54%
Test Channel :	155	**Test Engineer :**	Stuart Lin

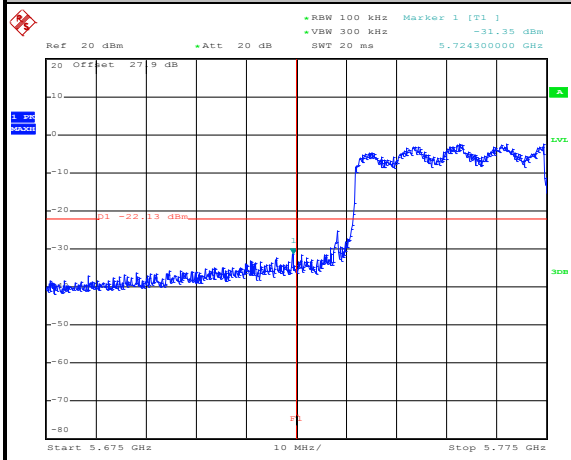
WLAN 802.11ac VHT80 Channel 155

100kHz PSD reference Level



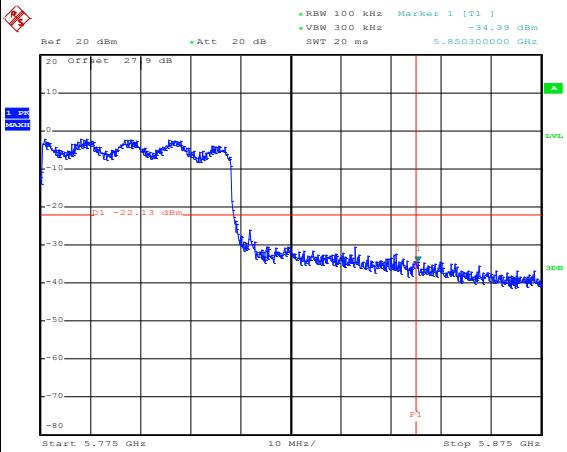
Date: 31.AUG.2014 15:06:24

Low Channel Plot

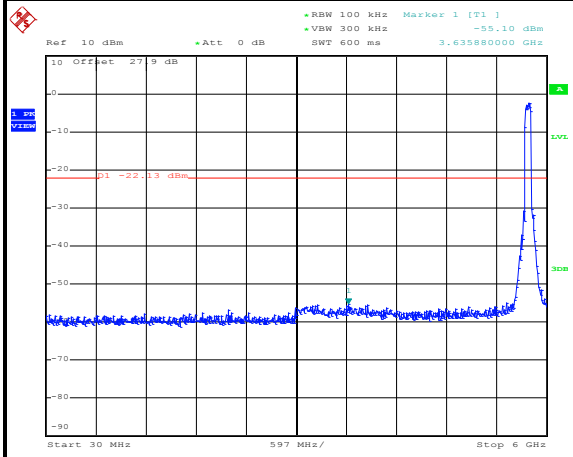
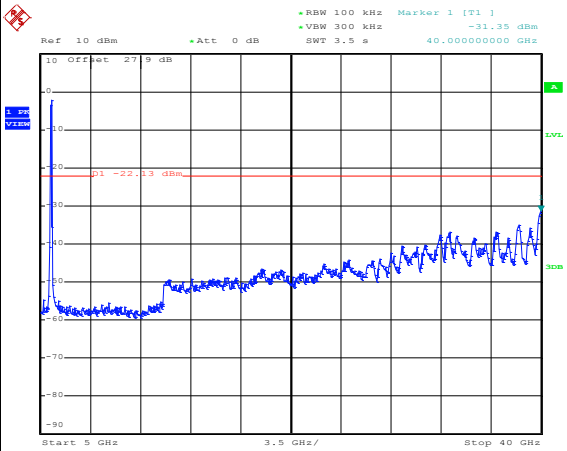


Date: 31.AUG.2014 15:11:04

High Channel Plot



Date: 31.AUG.2014 15:12:52

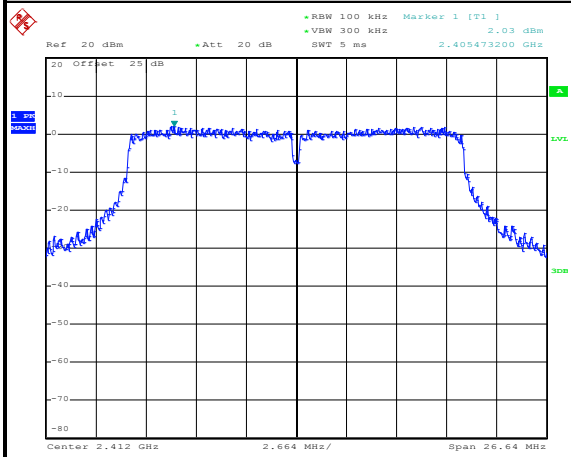
Spurious Emission 30MHz~6GHz	Spurious Emission 5GHz~40GHz
	
Date: 31.AUG.2014 15:09:47	Date: 31.AUG.2014 15:10:05

Number of TX = 2, Ant. 2 (Measured)

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	Stuart Lin

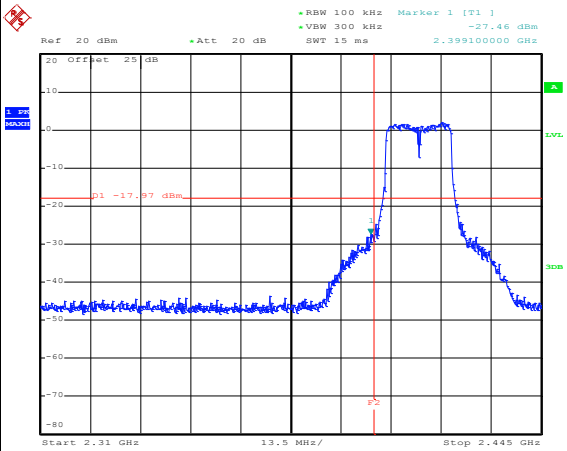
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



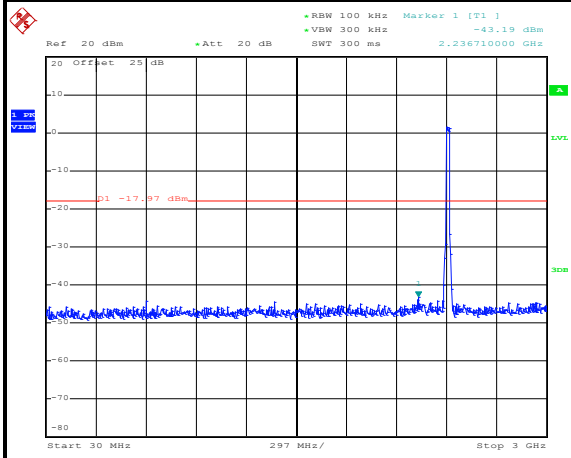
Date: 31.AUG.2014 09:45:43

Low Channel Plot



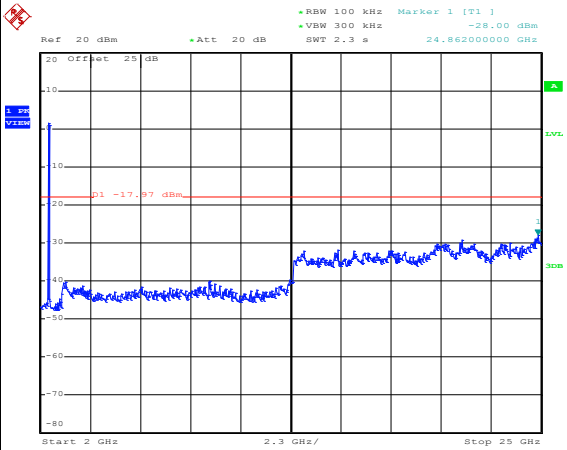
Date: 31.AUG.2014 09:46:48

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 09:47:12

Spurious Emission 2GHz~25GHz

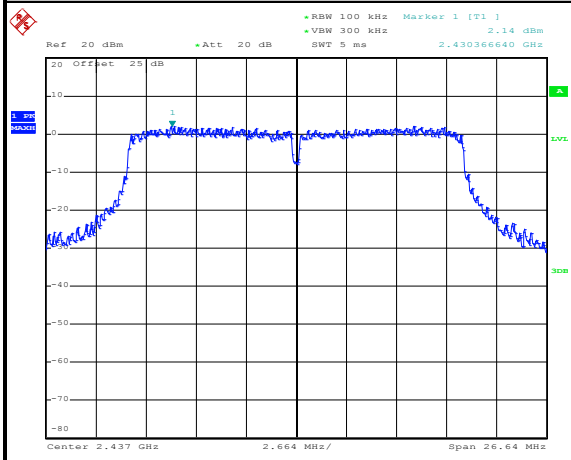


Date: 31.AUG.2014 09:47:30

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	Stuart Lin

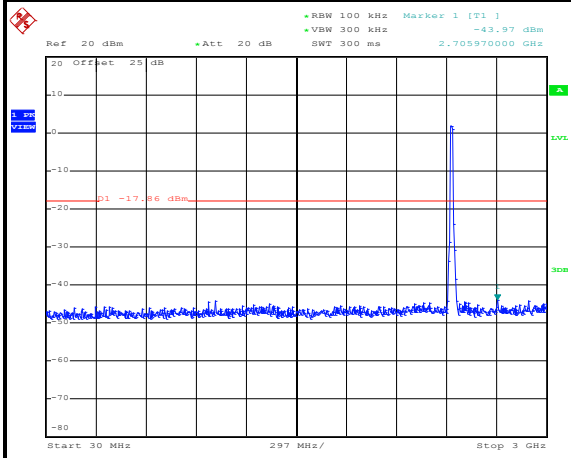
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



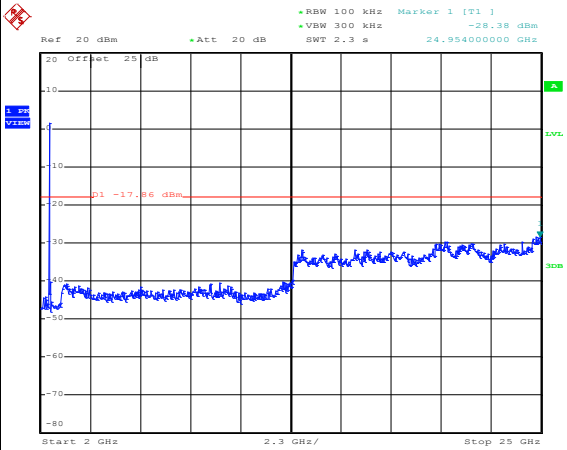
Date: 31.AUG.2014 09:32:45

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 09:33:26

Spurious Emission 2GHz~25GHz

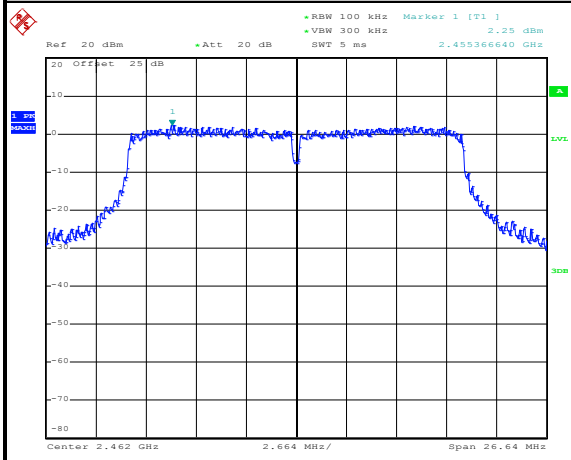


Date: 31.AUG.2014 09:33:44

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	Stuart Lin

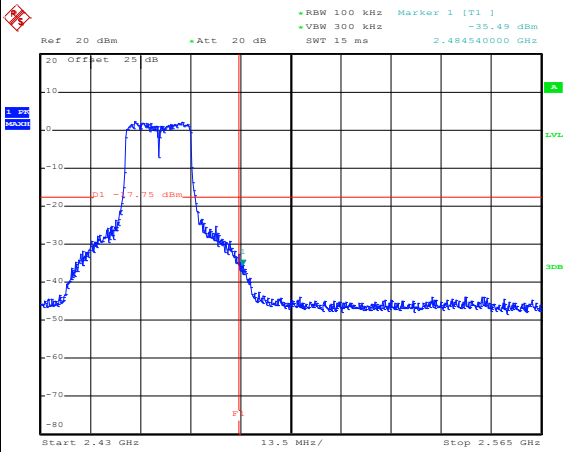
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



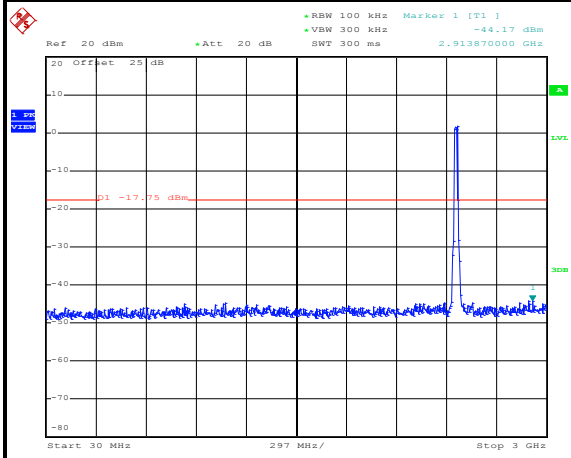
Date: 31.AUG.2014 09:24:30

High Channel Plot



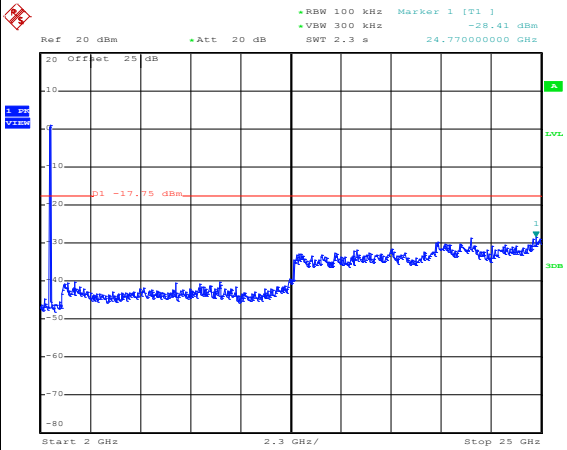
Date: 31.AUG.2014 09:25:47

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 09:26:12

Spurious Emission 2GHz~25GHz

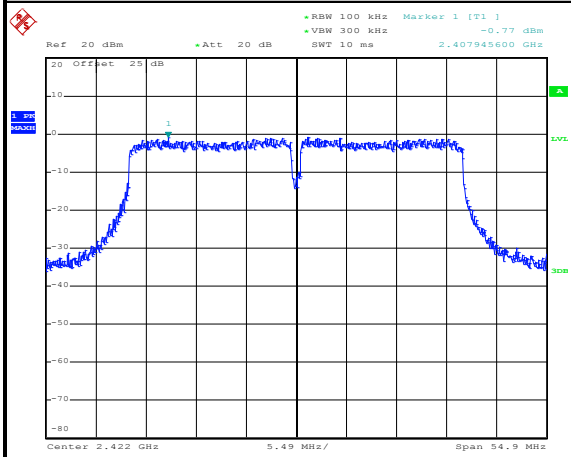


Date: 31.AUG.2014 09:26:30

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	03	**Test Engineer :**	Stuart Lin

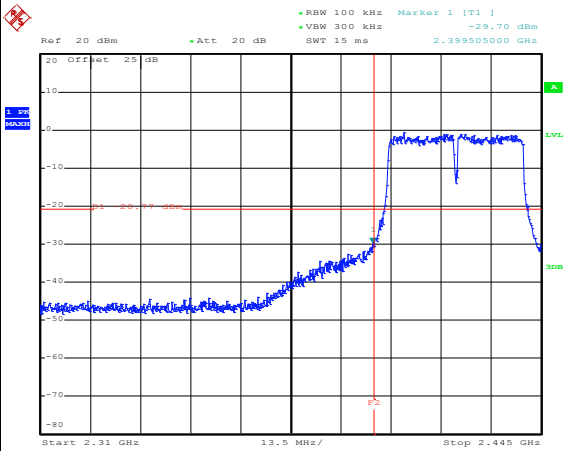
WLAN 802.11n HT40 Channel 03

100kHz PSD reference Level



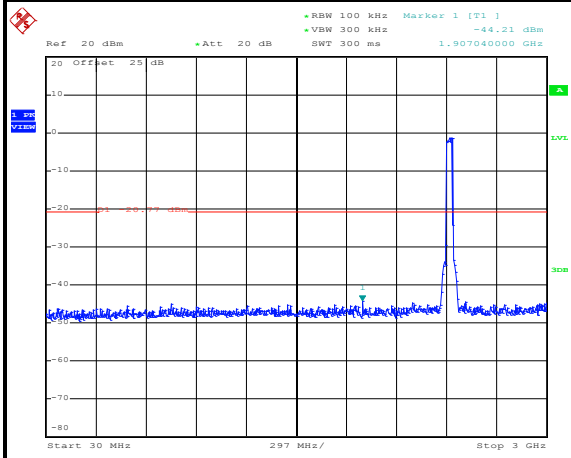
Date: 31.AUG.2014 10:48:17

Low Channel Plot



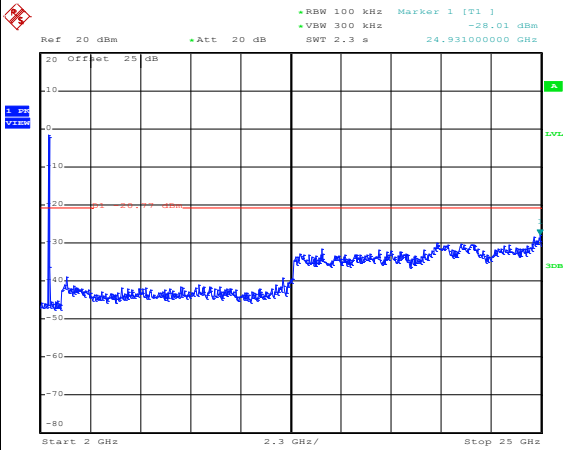
Date: 31.AUG.2014 10:50:59

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 10:51:23

Spurious Emission 2GHz~25GHz

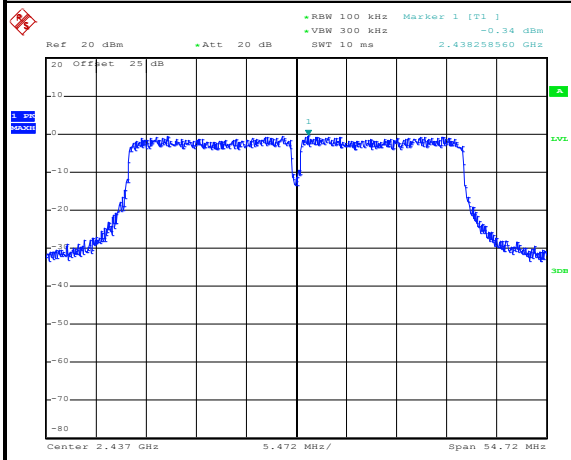


Date: 31.AUG.2014 10:51:41

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	Stuart Lin

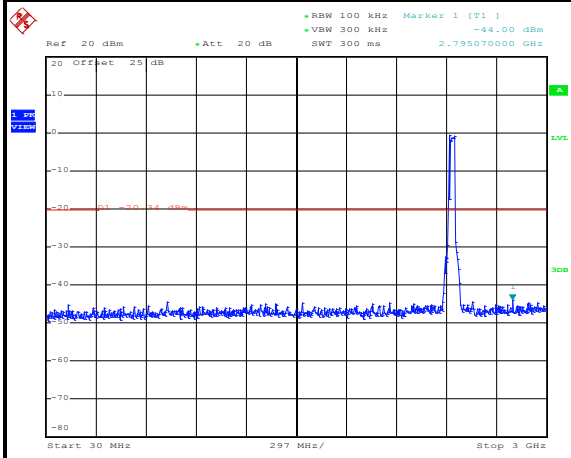
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



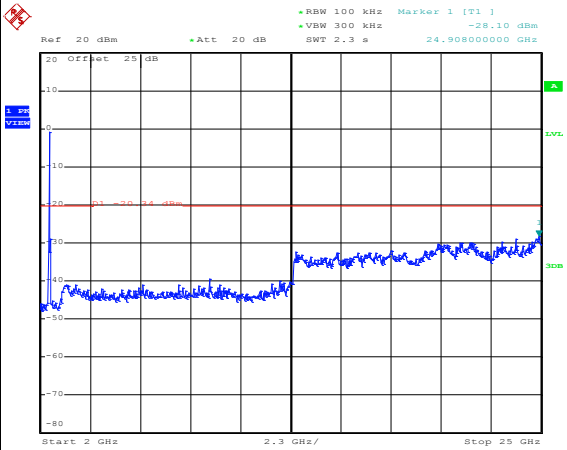
Date: 31.AUG.2014 10:24:30

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 10:25:22

Spurious Emission 2GHz~25GHz

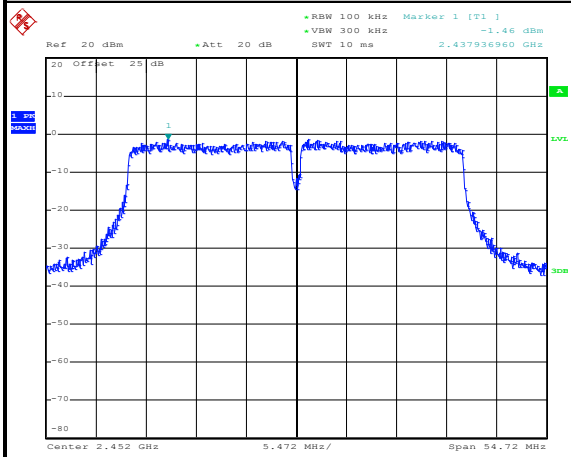


Date: 31.AUG.2014 10:25:40

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	09	**Test Engineer :**	Stuart Lin

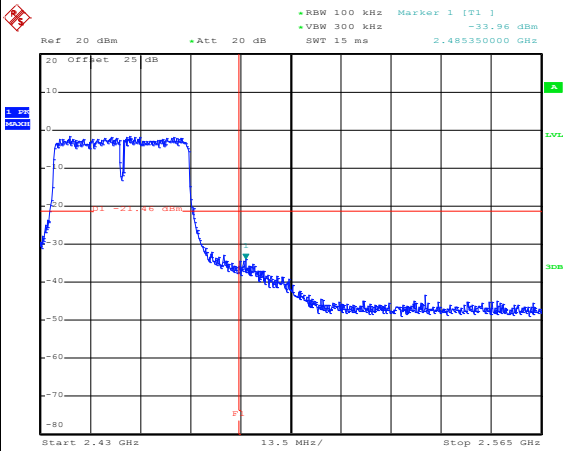
WLAN 802.11n HT40 Channel 09

100kHz PSD reference Level



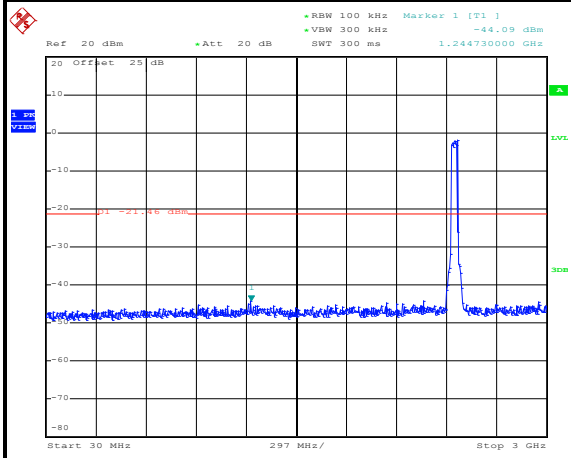
Date: 31.AUG.2014 10:17:08

High Channel Plot



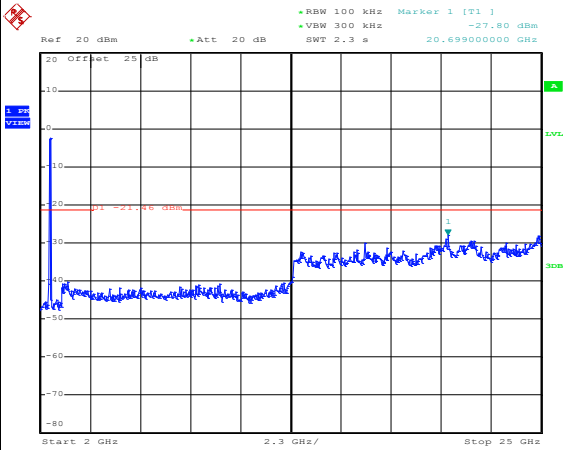
Date: 31.AUG.2014 10:17:58

Spurious Emission 30MHz~3GHz



Date: 31.AUG.2014 10:19:22

Spurious Emission 2GHz~25GHz

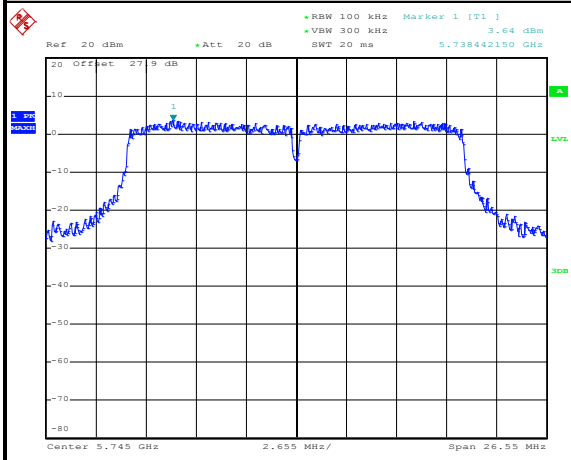


Date: 31.AUG.2014 10:19:40

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	5GHz Low	**Relative Humidity :**	51~54%
Test Channel :	149	**Test Engineer :**	Stuart Lin

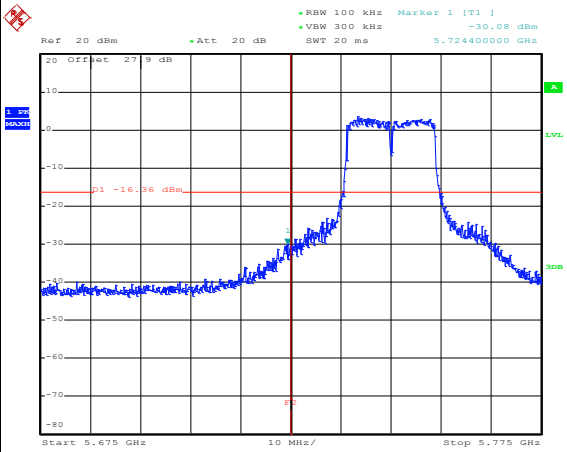
WLAN 802.11n HT20 Channel 149

100kHz PSD reference Level



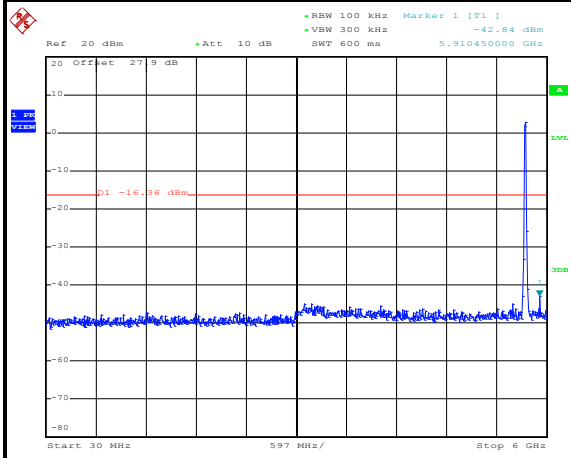
Date: 31.AUG.2014 12:42:40

Low Channel Plot



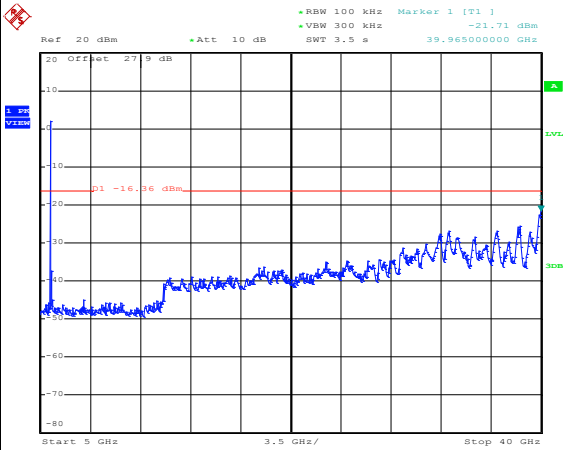
Date: 31.AUG.2014 12:43:20

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 12:43:57

Spurious Emission 5GHz~40GHz

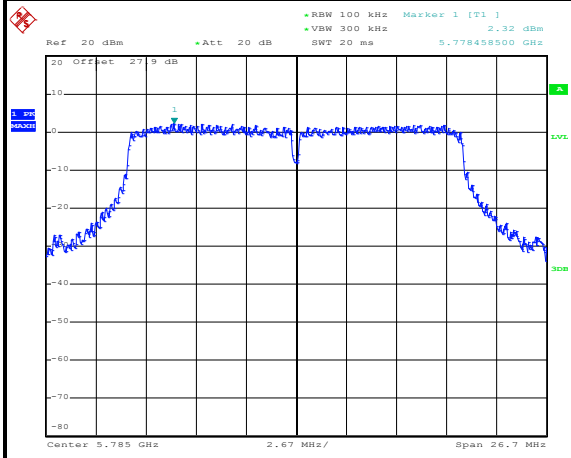


Date: 31.AUG.2014 12:44:15

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	5GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	157	**Test Engineer :**	Stuart Lin

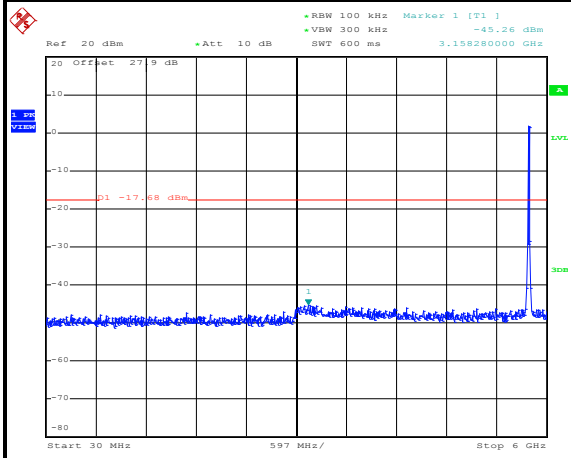
WLAN 802.11n HT20 Channel 157

100kHz PSD reference Level



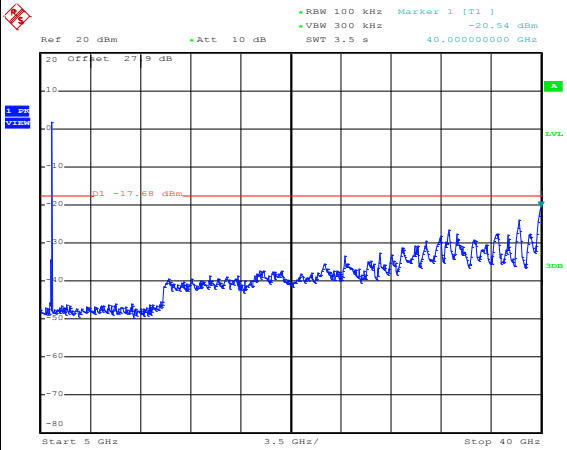
Date: 31.AUG.2014 12:33:10

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 12:33:38

Spurious Emission 5GHz~40GHz

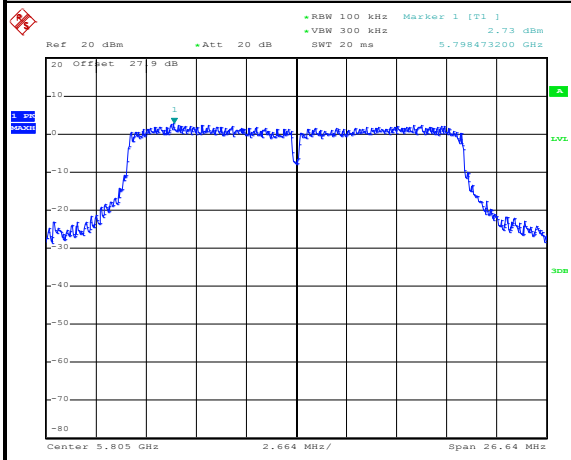


Date: 31.AUG.2014 12:33:56

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	5GHz High	**Relative Humidity :**	51~54%
Test Channel :	161	**Test Engineer :**	Stuart Lin

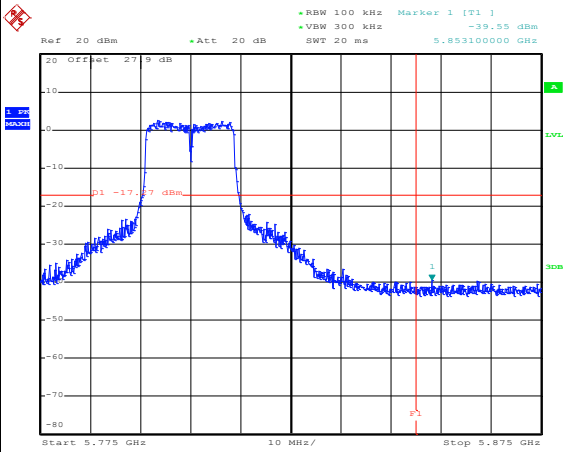
WLAN 802.11n HT20 Channel 161

100kHz PSD reference Level



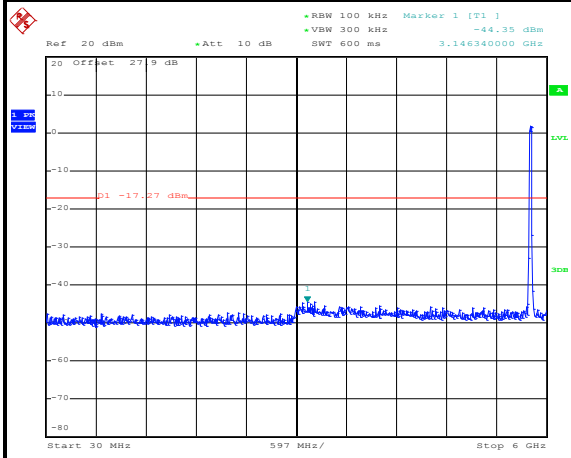
Date: 15.SEP.2014 16:48:49

High Channel Plot



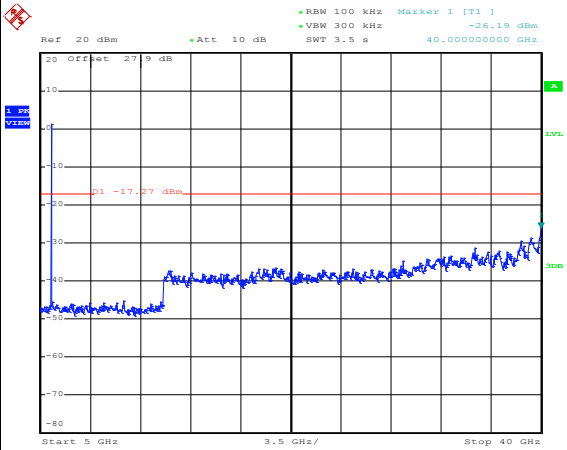
Date: 15.SEP.2014 16:49:06

Spurious Emission 30MHz~6GHz



Date: 15.SEP.2014 16:49:46

Spurious Emission 5GHz~40GHz

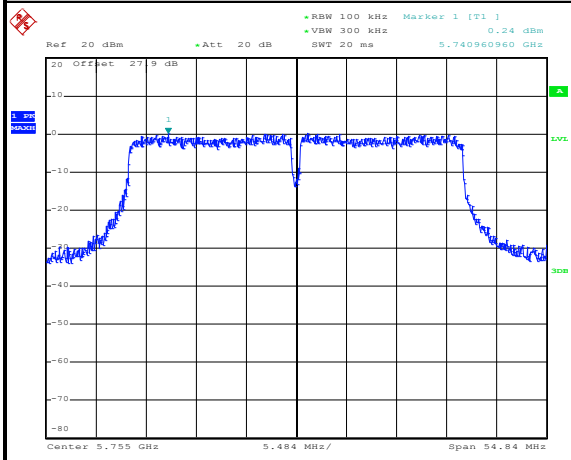


Date: 15.SEP.2014 16:50:04

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	5GHz Low	**Relative Humidity :**	51~54%
Test Channel :	151	**Test Engineer :**	Stuart Lin

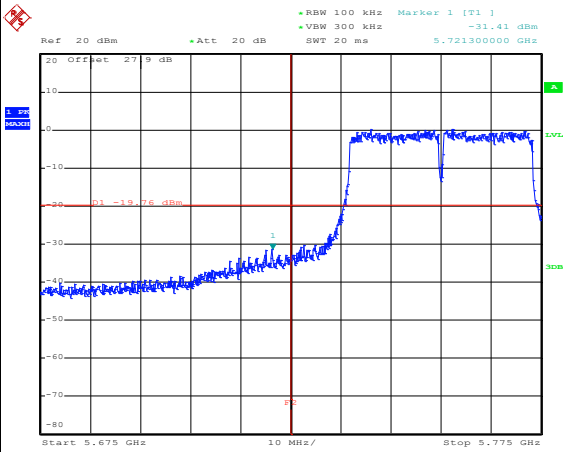
WLAN 802.11n HT40 Channel 151

100kHz PSD reference Level



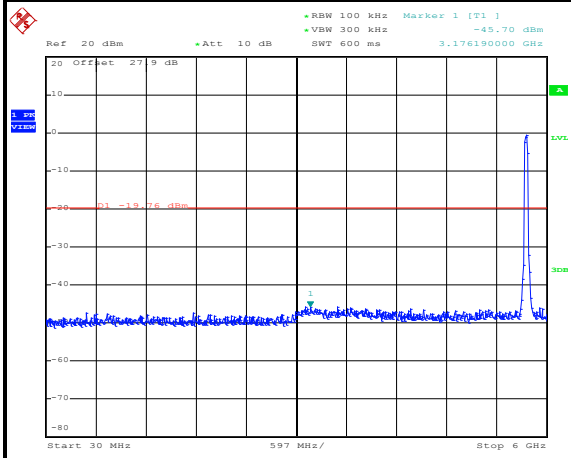
Date: 31.AUG.2014 13:20:32

Low Channel Plot



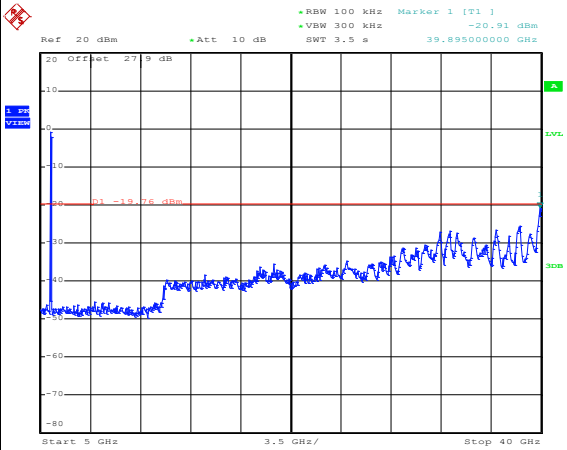
Date: 31.AUG.2014 13:21:22

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 13:21:43

Spurious Emission 5GHz~40GHz

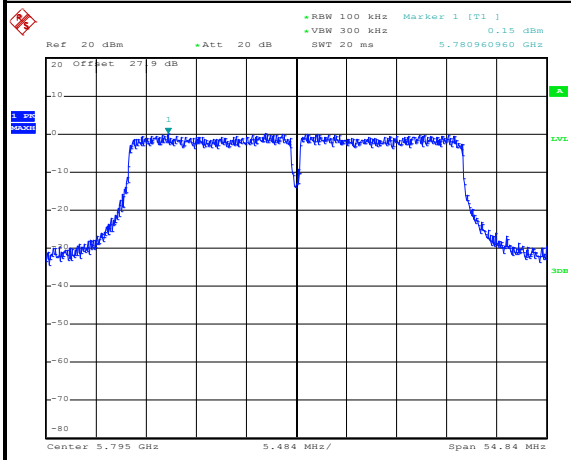


Date: 31.AUG.2014 13:22:01

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	5GHz High	**Relative Humidity :**	51~54%
Test Channel :	159	**Test Engineer :**	Stuart Lin

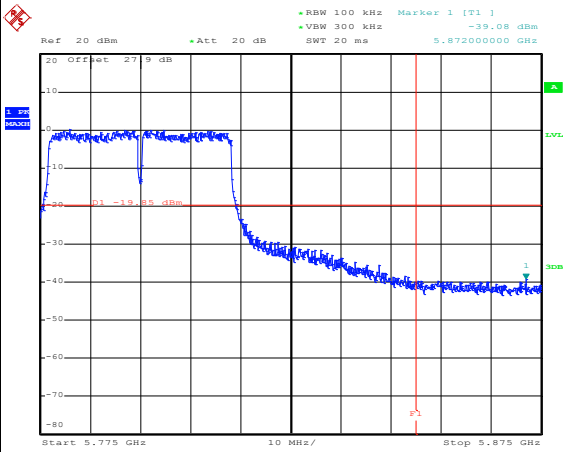
WLAN 802.11n HT40 Channel 159

100kHz PSD reference Level



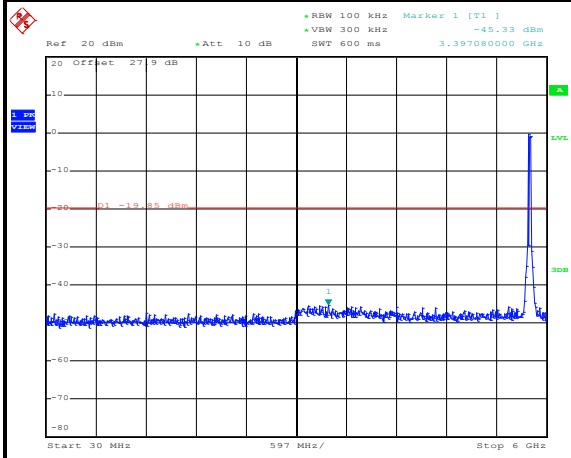
Date: 31.AUG.2014 13:12:51

High Channel Plot



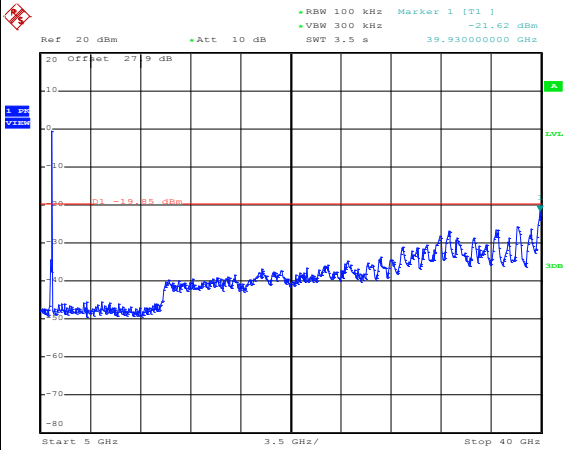
Date: 31.AUG.2014 13:13:14

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 13:13:57

Spurious Emission 5GHz~40GHz

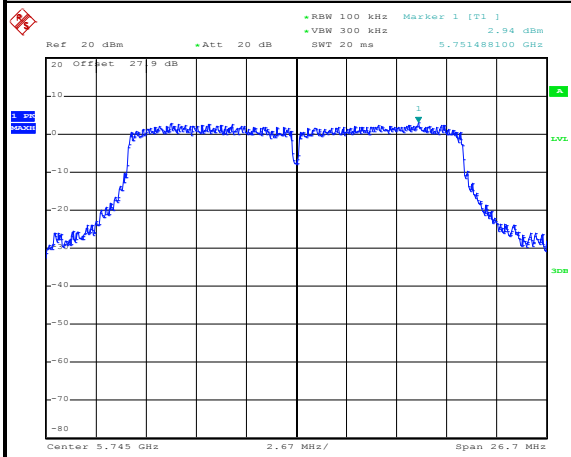


Date: 31.AUG.2014 13:14:15

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	5GHz Low	**Relative Humidity :**	51~54%
Test Channel :	149	**Test Engineer :**	Stuart Lin

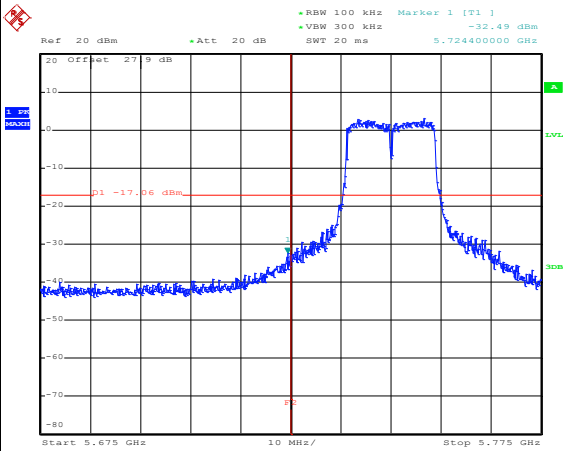
WLAN 802.11ac VHT20 Channel 149

100kHz PSD reference Level



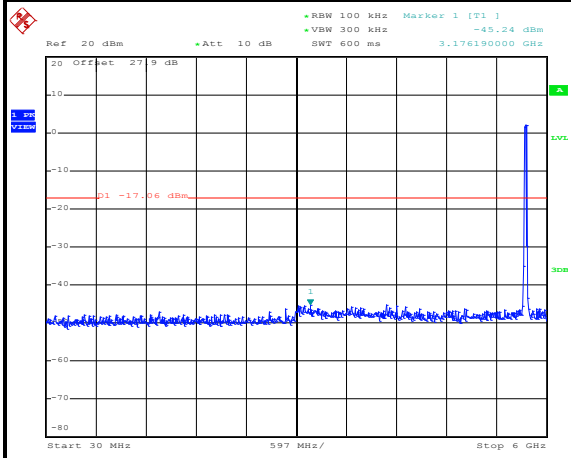
Date: 31.AUG.2014 14:10:29

Low Channel Plot



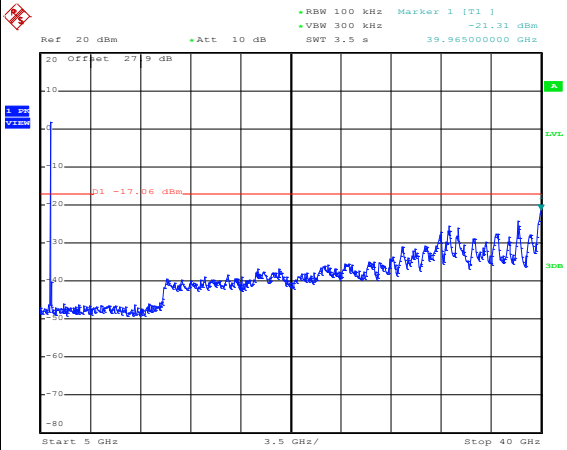
Date: 31.AUG.2014 14:11:22

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 14:12:05

Spurious Emission 5GHz~40GHz

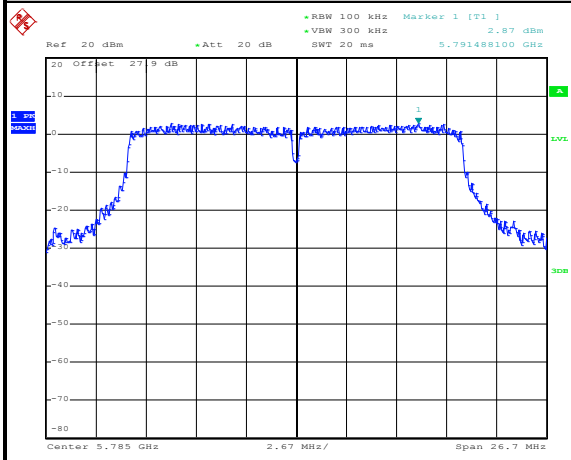


Date: 31.AUG.2014 14:12:23

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	5GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	157	**Test Engineer :**	Stuart Lin

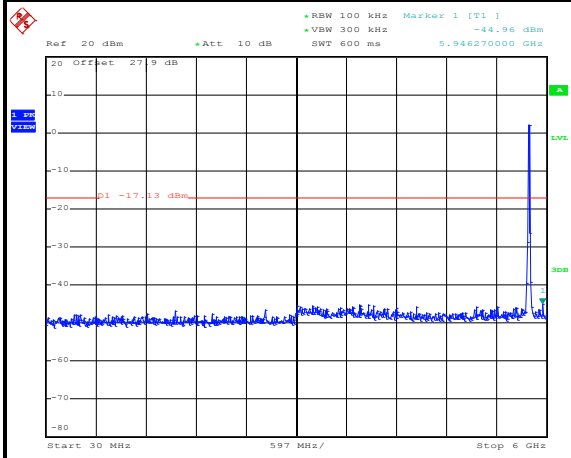
WLAN 802.11ac VHT20 Channel 157

100kHz PSD reference Level



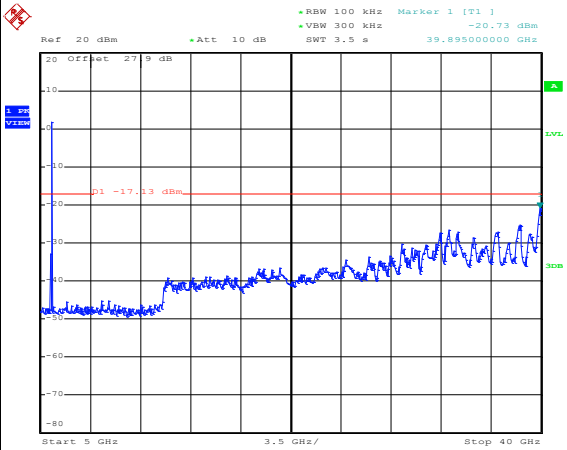
Date: 31.AUG.2014 14:01:11

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 14:01:45

Spurious Emission 5GHz~40GHz

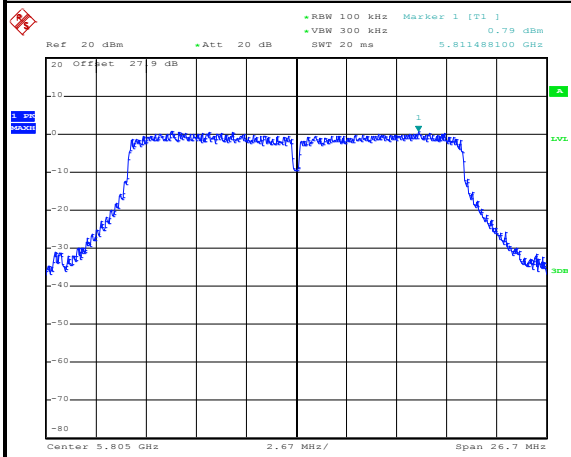


Date: 31.AUG.2014 14:02:03

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT20	**Temperature :**	21~25℃
Test Band :	5GHz High	**Relative Humidity :**	51~54%
Test Channel :	161	**Test Engineer :**	Stuart Lin

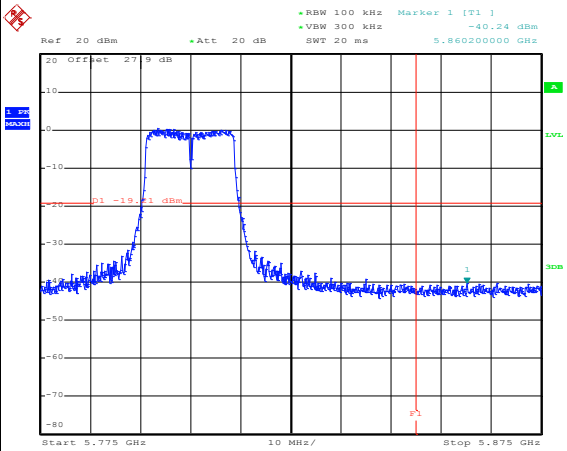
WLAN 802.11ac VHT20 Channel 161

100kHz PSD reference Level



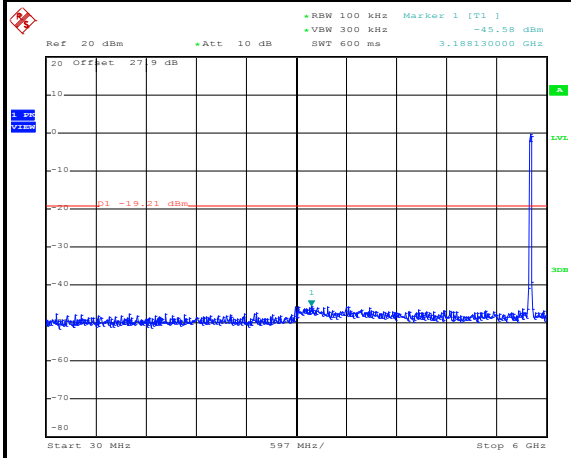
Date: 16.SEP.2014 19:51:50

High Channel Plot



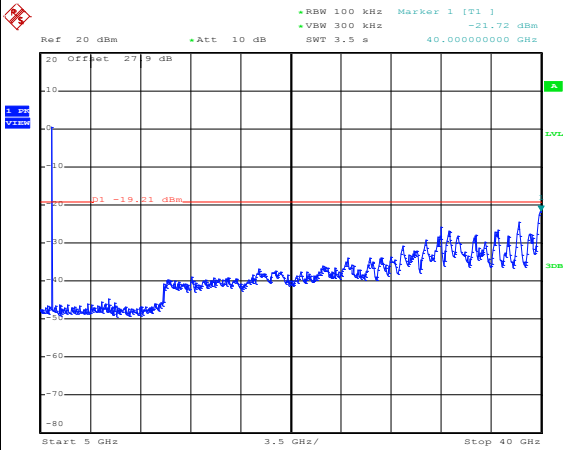
Date: 16.SEP.2014 19:53:18

Spurious Emission 30MHz~6GHz



Date: 16.SEP.2014 19:53:42

Spurious Emission 5GHz~40GHz

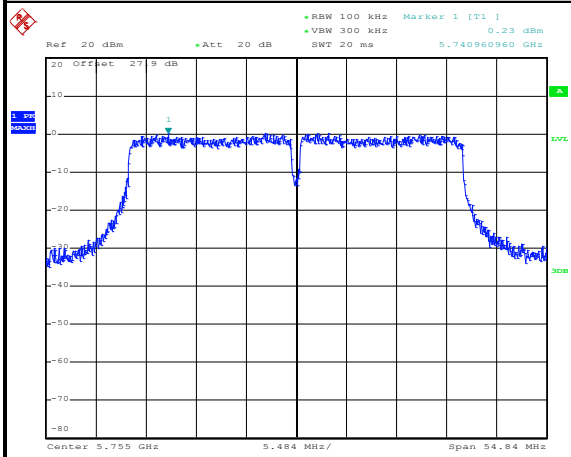


Date: 16.SEP.2014 19:54:00

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT40	**Temperature :**	21~25℃
Test Band :	5GHz Low	**Relative Humidity :**	51~54%
Test Channel :	151	**Test Engineer :**	Stuart Lin

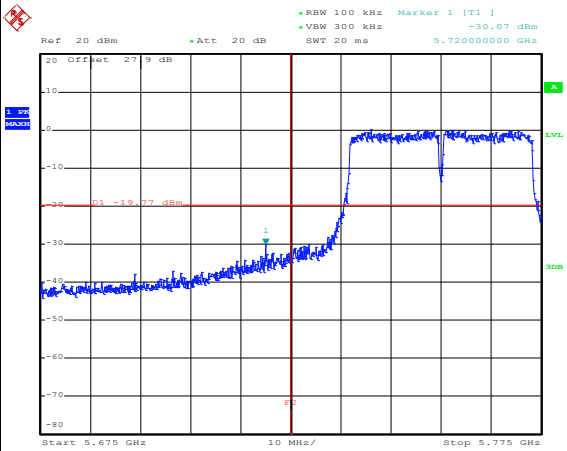
WLAN 802.11ac VHT40 Channel 151

100kHz PSD reference Level



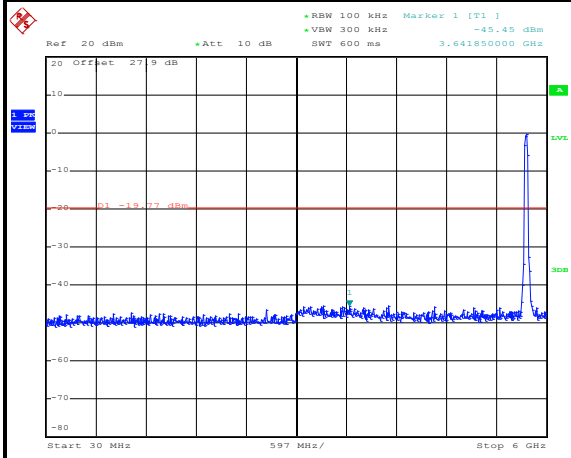
Date: 31.AUG.2014 14:48:37

Low Channel Plot



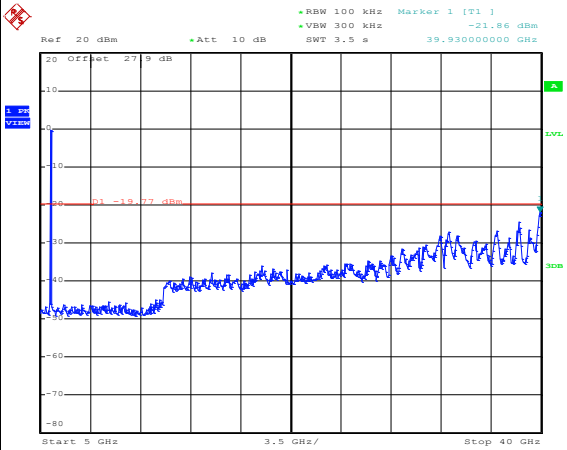
Date: 31.AUG.2014 14:49:17

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 14:49:53

Spurious Emission 5GHz~40GHz

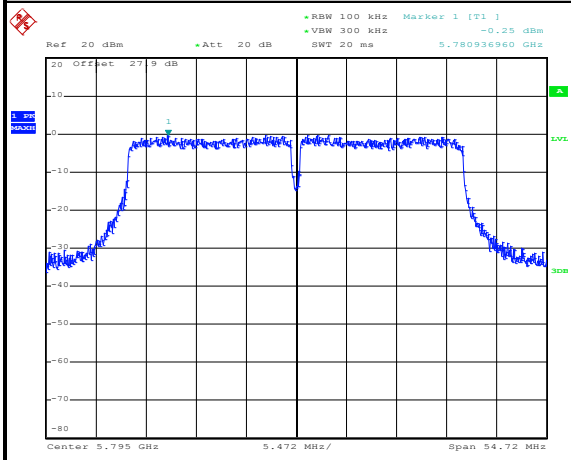


Date: 31.AUG.2014 14:50:11

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT40	**Temperature :**	21~25℃
Test Band :	5GHz High	**Relative Humidity :**	51~54%
Test Channel :	159	**Test Engineer :**	Stuart Lin

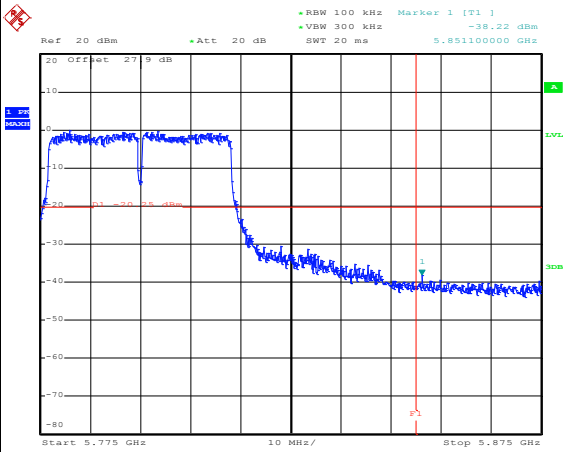
WLAN 802.11ac VHT40 Channel 159

100kHz PSD reference Level



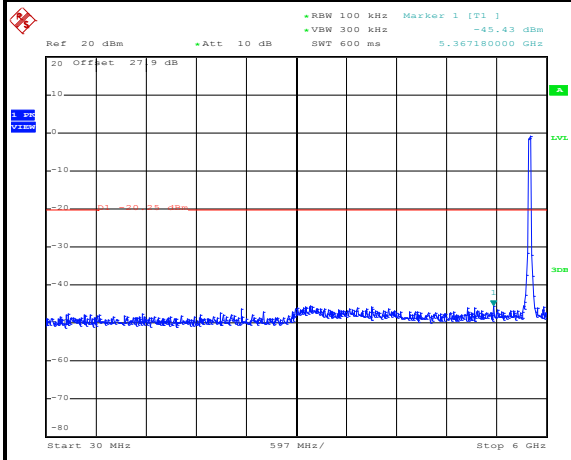
Date: 31.AUG.2014 14:38:36

High Channel Plot



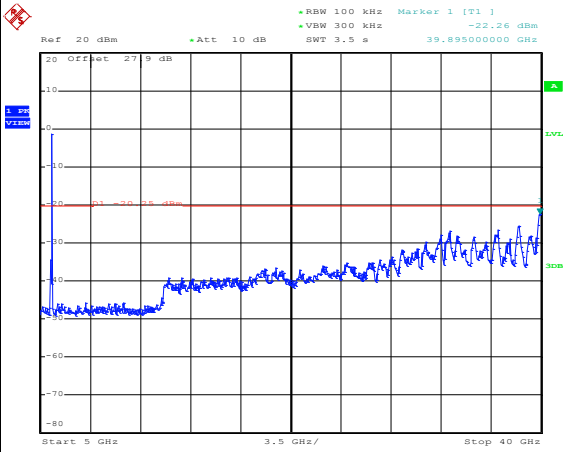
Date: 31.AUG.2014 14:39:04

Spurious Emission 30MHz~6GHz



Date: 31.AUG.2014 14:39:30

Spurious Emission 5GHz~40GHz

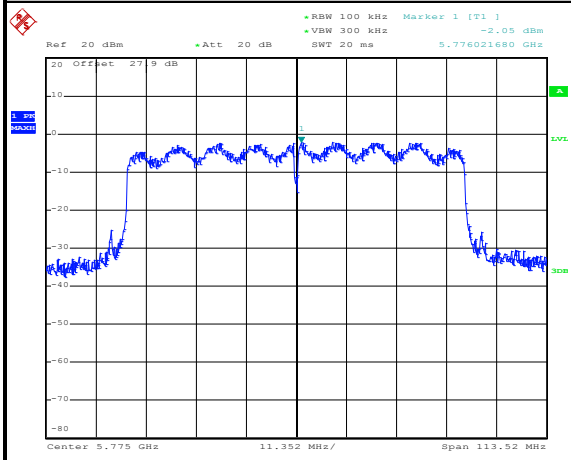


Date: 31.AUG.2014 14:39:48

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11ac VHT80	**Temperature :**	21~25℃
Test Band :	5GHz	**Relative Humidity :**	51~54%
Test Channel :	155	**Test Engineer :**	Stuart Lin

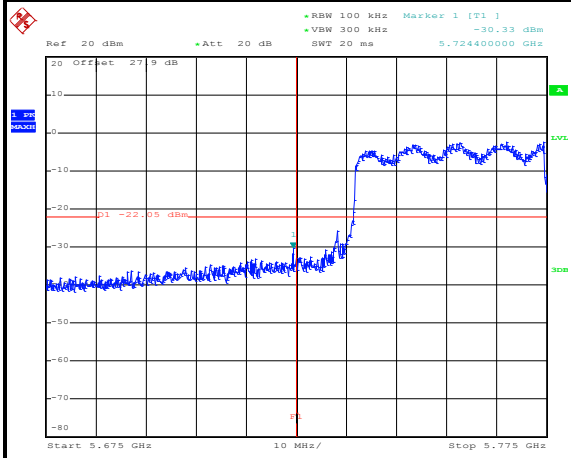
WLAN 802.11ac VHT80 Channel 155

100kHz PSD reference Level



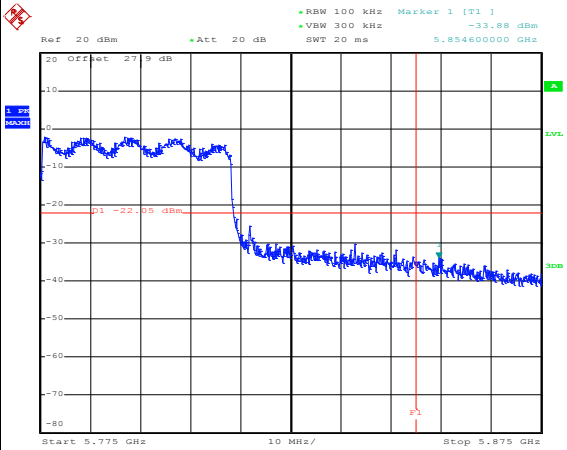
Date: 31.AUG.2014 15:16:00

Low Channel Plot

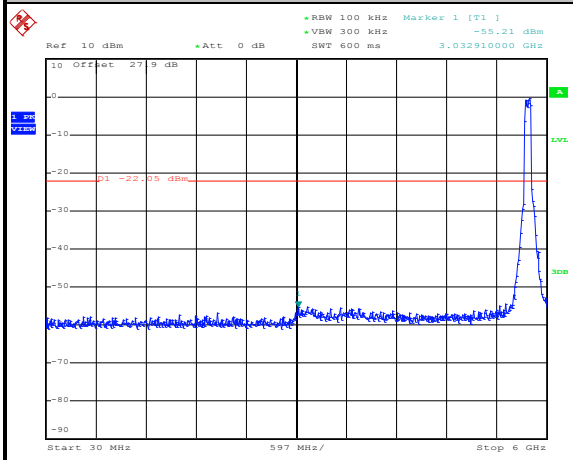
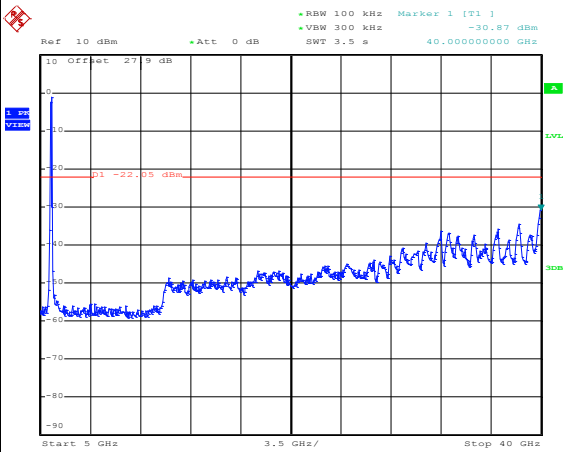


Date: 31.AUG.2014 15:17:58

High Channel Plot



Date: 31.AUG.2014 15:18:24

Spurious Emission 30MHz~6GHz	Spurious Emission 5GHz~40GHz
	
Date: 31.AUG.2014 15:39:38	Date: 31.AUG.2014 15:39:56

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.

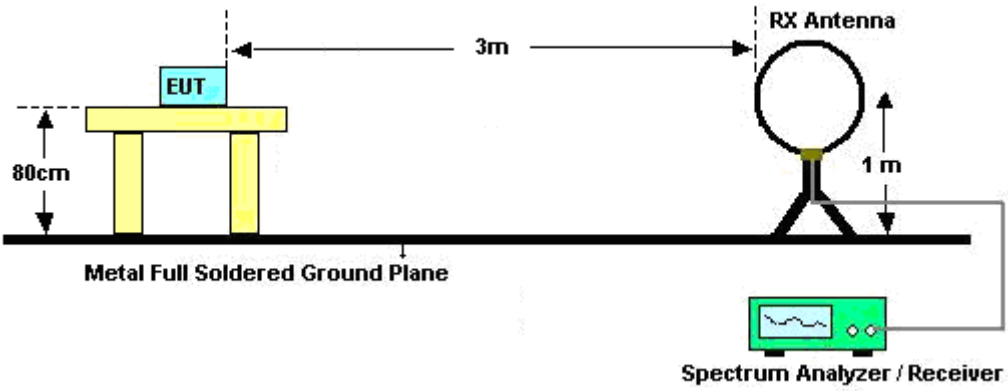
3.5.3 Test Procedure

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r02.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

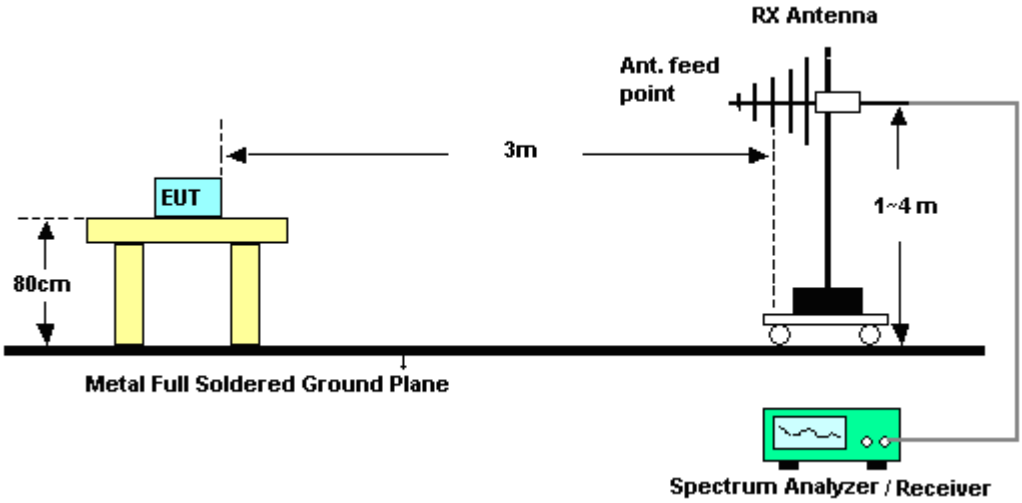
Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1	802.11b	100.00	-	-	10Hz
1	802.11g	100.00	-	-	
1+2	2.4GHz 802.11n HT20 for Ant. 1	100.00	-	-	
1+2	2.4GHz 802.11n HT40 for Ant. 2	100.00	-	-	
1	802.11a	100.00	-	-	
1+2	5GHz 802.11n HT20 for Ant. 1	100.00	-	-	
1+2	5GHz 802.11n HT20 for Ant. 2	100.00	-	-	
1+2	5GHz 802.11n HT40 for Ant. 1	100.00	-	-	
1+2	5GHz 802.11n HT40 for Ant. 2	100.00	-	-	
1+2	5GHz 802.11n VHT80 for Ant. 1	100.00	-	-	
1+2	5GHz 802.11n VHT80 for Ant. 2	100.00	-	-	

3.5.4 Test Setup

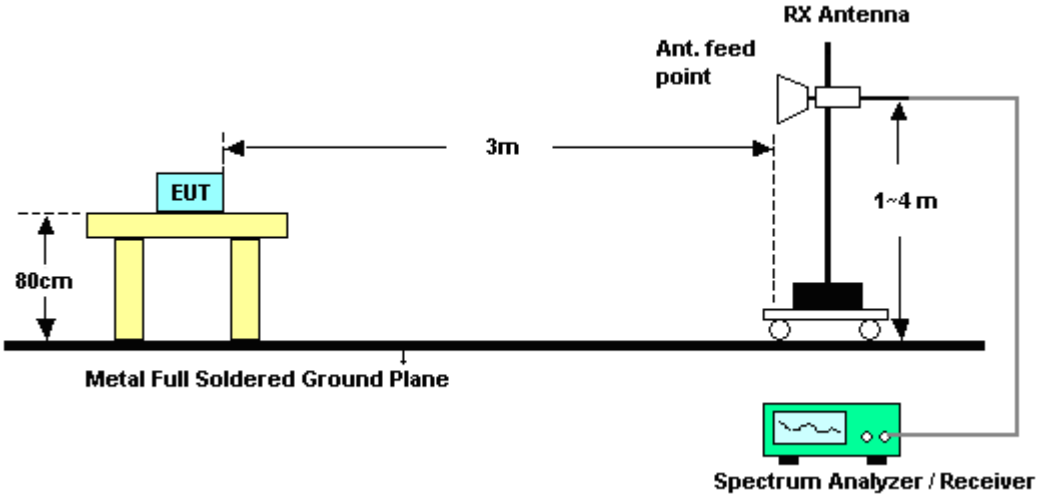
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated 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

Please refer to Appendix A.

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

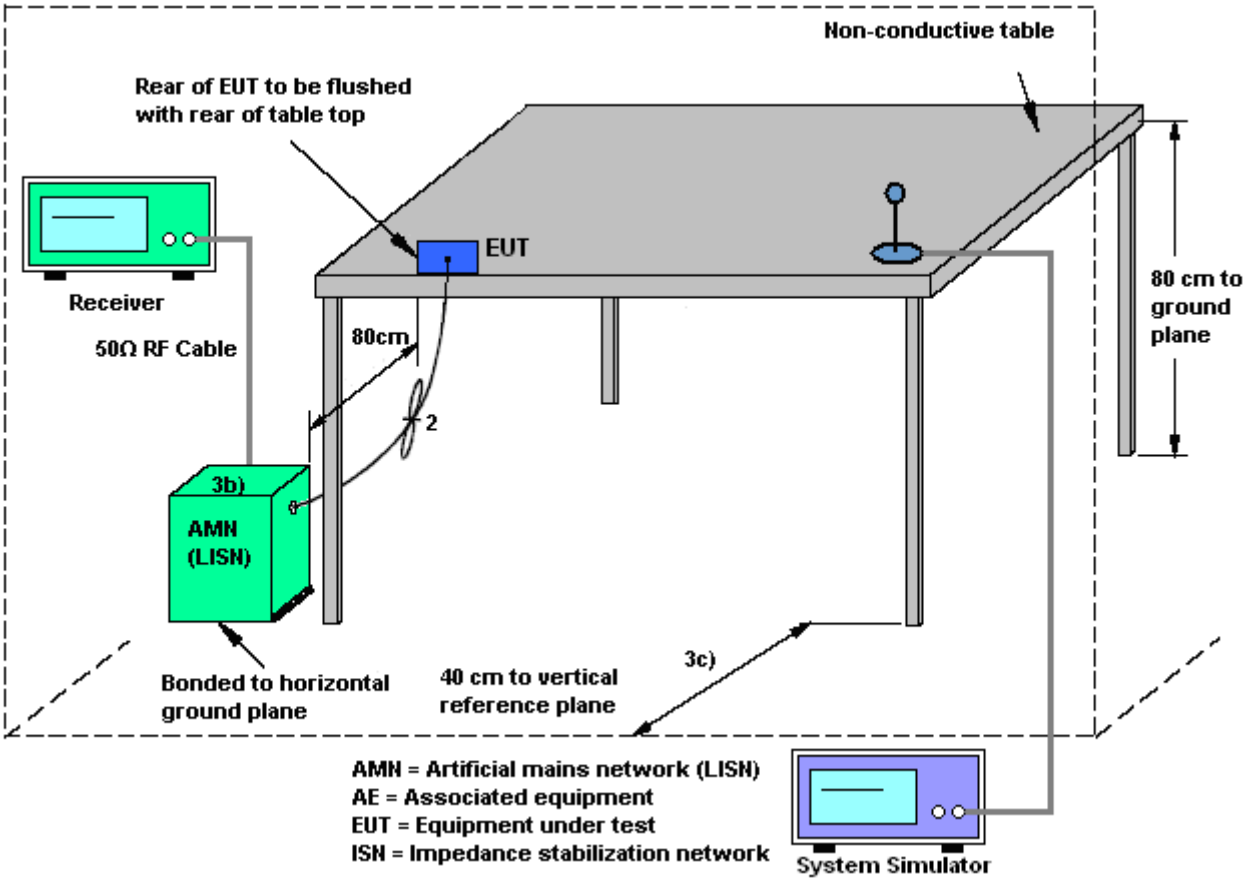
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

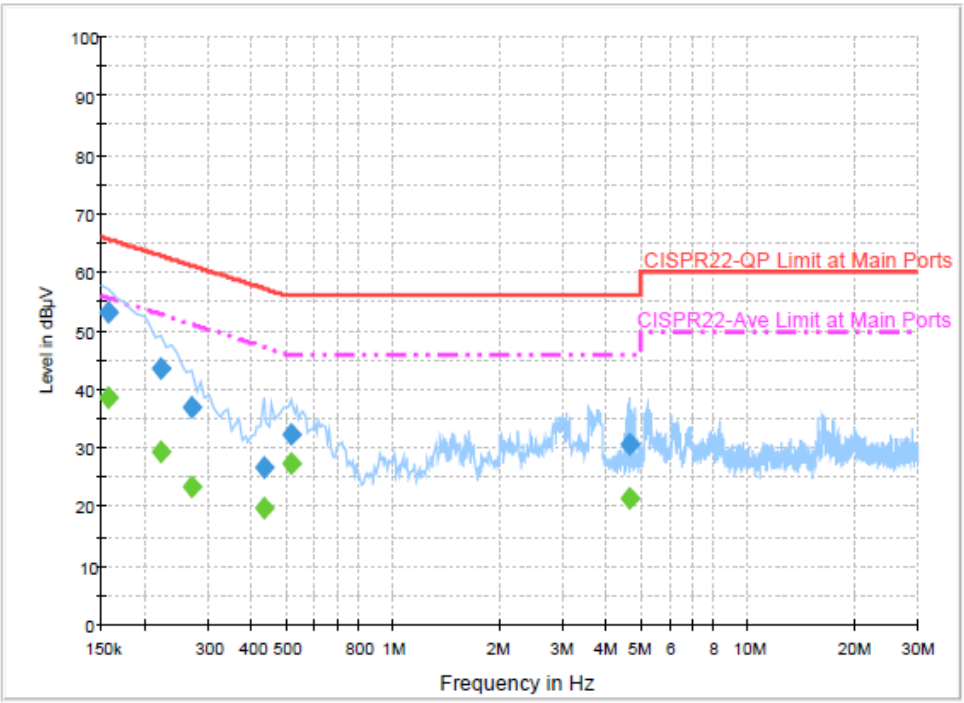
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF bandwidth = 9kHz) with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	**Temperature :**	20~22℃
Test Engineer :	Kai-Chun Chu	**Relative Humidity :**	46~48%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	WLAN (2.4GHz) Link + USB Cable (Charging from Notebook)		



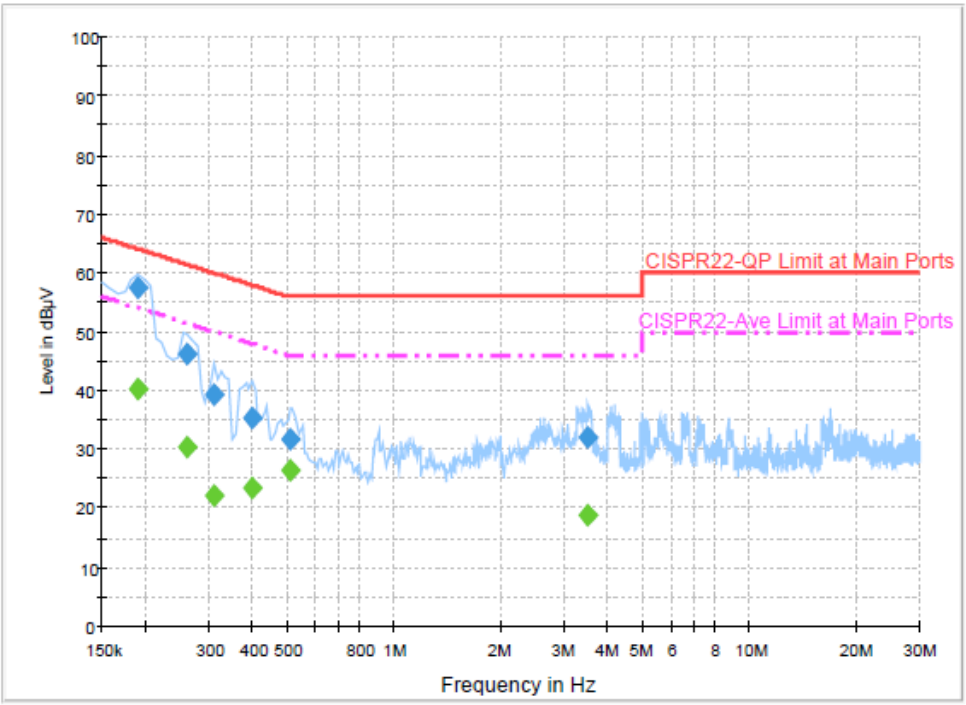
Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	53.0	Off	L1	19.3	12.6	65.6
0.222000	43.7	Off	L1	19.3	19.0	62.7
0.270000	37.0	Off	L1	19.4	24.1	61.1
0.430000	26.6	Off	L1	19.4	30.7	57.3
0.518000	32.3	Off	L1	19.4	23.7	56.0
4.646000	30.7	Off	L1	19.6	25.3	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	38.5	Off	L1	19.3	17.1	55.6
0.222000	29.4	Off	L1	19.3	23.3	52.7
0.270000	23.6	Off	L1	19.4	27.5	51.1
0.430000	19.6	Off	L1	19.4	27.7	47.3
0.518000	27.3	Off	L1	19.4	18.7	46.0
4.646000	21.4	Off	L1	19.6	24.6	46.0

Test Mode :	Mode 1	**Temperature :**	20~22℃
Test Engineer :	Kai-Chun Chu	**Relative Humidity :**	46~48%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	WLAN (2.4GHz) Link + USB Cable (Charging from Notebook)		



Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	57.4	Off	N	19.3	6.6	64.0
0.262000	46.3	Off	N	19.4	15.1	61.4
0.310000	39.3	Off	N	19.4	20.7	60.0
0.398000	35.5	Off	N	19.4	22.4	57.9
0.510000	31.5	Off	N	19.4	24.5	56.0
3.510000	32.0	Off	N	19.6	24.0	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	40.3	Off	N	19.3	13.7	54.0
0.262000	30.3	Off	N	19.4	21.1	51.4
0.310000	22.0	Off	N	19.4	28.0	50.0
0.398000	23.3	Off	N	19.4	24.6	47.9
0.510000	26.3	Off	N	19.4	19.7	46.0
3.510000	18.9	Off	N	19.6	27.1	46.0

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

Non-standard antenna connector is used.

3.7.3 Antenna Gain

FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

For CDD transmissions, directional gain is calculated as

Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = 10 log(N_{ANT}/N_{SS}=1) dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$.

The EUT supports CDD mode.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain “DG” is calculated as following table.

	Ant. 1 (dBi)	Ant. 2 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
2.4 GHz	2.26	2.26	2.26	5.27	0.00	0.00
5 GHz	3.34	3.34	3.34	6.35	0.00	0.35

Power Limit Reduction = DG(Power) – 6dBi, (min = 0)

PSD Limit Reduction = DG(PSD) – 6dBi, (min = 0)

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 09, 2014	Jul. 18, 2014 ~ Oct. 06, 2014	Jun. 08, 2015	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Aug. 17, 2013	Jul. 18, 2014 ~ Aug. 08, 2014	Aug. 16, 2014	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Aug. 09, 2014	Aug. 09, 2014 ~ Oct. 06, 2014	Aug. 08, 2015	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Aug. 17, 2013	Jul. 18, 2014 ~ Aug. 08, 2014	Aug. 16, 2014	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Aug. 09, 2014	Aug. 09, 2014 ~ Oct. 06, 2014	Aug. 08, 2015	Conducted (TH02-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 15, 2013	Jul. 18, 2014	Nov. 14, 2014	Conduction (CO05-HY)
LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2013	Jul. 18, 2014	Dec. 11, 2014	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 04, 2013	Jul. 18, 2014	Dec. 03, 2014	Conduction (CO05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jul. 18, 2014	N/A	Conduction (CO05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 09, 2014	Sep. 04, 2014 ~ Oct. 01, 2014	Jun. 08, 2015	Radiation (03CH05-HY)
Bilog Antenna	Schaffner	CBL6111C	2725	30MHz~1GHz	Oct. 10, 2013	Sep. 04, 2014 ~ Oct. 01, 2014	Oct. 09, 2014	Radiation (03CH05-HY)
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1241	1GHz~18GHz	Apr. 16, 2014	Sep. 04, 2014 ~ Oct. 01, 2014	Apr. 15, 2015	Radiation (03CH05-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz~40GHz	Oct. 03, 2013	Sep. 04, 2014 ~ Oct. 01, 2014	Oct. 02, 2014	Radiation (03CH05-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590074	100kHz~18GHz	Jul. 07, 2014	Sep. 04, 2014 ~ Oct. 01, 2014	Jul. 06, 2015	Radiation (03CH05-HY)
Preamplifier	EMCI	EMC011830	980148	DC~18GHz	Jun. 23, 2014	Sep. 04, 2014 ~ Oct. 01, 2014	Jun. 22, 2015	Radiation (03CH05-HY)
Preamplifier	COM-POWER	PA-103	161075	9kHz~30MHz	Apr. 15, 2014	Sep. 04, 2014 ~ Oct. 01, 2014	Apr. 14, 2015	Radiation (03CH05-HY)
Preamplifier	Miteq	TTA0204	1872107	18GHz~40GHz	May 23, 2014	Sep. 04, 2014 ~ Oct. 01, 2014	May 22, 2015	Radiation (03CH05-HY)
Turn Table	HD	HD100	420/611	0 - 360 degree	N/A	Sep. 04, 2014 ~ Oct. 01, 2014	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	HD100	240/666	1 m - 4 m	N/A	Sep. 04, 2014 ~ Oct. 01, 2014	N/A	Radiation (03CH05-HY)
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz~30 MHz	Dec. 02, 2012	Sep. 04, 2014 ~ Oct. 01, 2014	Dec. 03, 2014	Radiation (03CH05-HY)

5 Uncertainty of Evaluation

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.10

Appendix A. Radiated Spurious Emission

Test Engineer :	Karl Hou	Temperature :	25 ~ 26 °C
		Relative Humidity :	50 ~ 51 %

<Ant. 1>

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2388.75	55.51	-18.49	74	51.77	32.77	4.62	33.65	117	152	P	H
		2385.96	42.79	-11.21	54	39.05	32.77	4.62	33.65	117	152	A	H
	*	2413	105.81	-	-	101.98	32.81	4.65	33.63	117	152	P	H
	*	2411	101.37	-	-	97.54	32.81	4.65	33.63	117	152	A	H
													H
													H
		2389.38	58.11	-15.89	74	54.37	32.77	4.62	33.65	100	306	P	V
		2390	45.73	-8.27	54	41.99	32.77	4.62	33.65	100	306	A	V
	*	2413	110.15	-	-	106.32	32.81	4.65	33.63	100	306	P	V
	*	2411	105.62	-	-	101.79	32.81	4.65	33.63	100	306	A	V
													V
													V
802.11b CH 06 2437MHz		2358.24	57.64	-16.36	74	54.02	32.7	4.6	33.68	185	87	P	H
		2357.88	45.55	-8.45	54	41.93	32.7	4.6	33.68	185	87	A	H
	*	2435.905	112.84	-	-	108.93	32.85	4.68	33.62	185	87	P	H
	*	2436.156	108.48	-	-	104.57	32.85	4.68	33.62	185	87	A	H
		2485.8	57.27	-16.73	74	53.15	32.96	4.73	33.57	185	87	P	H
		2483.64	43.57	-10.43	54	39.45	32.96	4.73	33.57	185	87	A	H
		2360.67	56.88	-17.12	74	53.26	32.7	4.6	33.68	151	178	P	V
		2354.55	42.99	-11.01	54	39.4	32.7	4.57	33.68	151	178	A	V
	*	2435.571	105.42	-	-	101.51	32.85	4.68	33.62	151	178	P	V
	*	2436.156	100.93	-	-	97.02	32.85	4.68	33.62	151	178	A	V
		2487.28	56.82	-17.18	74	52.7	32.96	4.73	33.57	151	178	P	V
		2495.44	43.05	-10.95	54	38.88	33	4.73	33.56	151	178	A	V

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 11 2462MHz	*	2460	113.9	-	-	109.87	32.92	4.7	33.59	116	83	P	H
	*	2460	109.41	-	-	105.38	32.92	4.7	33.59	116	83	A	H
		2483.68	60.28	-13.72	74	56.16	32.96	4.73	33.57	116	83	P	H
		2483.52	48.4	-5.6	54	44.28	32.96	4.73	33.57	116	83	A	H
													H
													H
	*	2460	105.37	-	-	101.34	32.92	4.7	33.59	120	236	P	V
	*	2460	100.86	-	-	96.83	32.92	4.7	33.59	120	236	A	V
		2490	56.48	-17.52	74	52.31	33	4.73	33.56	120	236	P	V
		2483.56	43.92	-10.08	54	39.8	32.96	4.73	33.57	120	236	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	41	-33	74	58.04	35.03	6.54	58.61	100	0	P	H
													H
													H
													H
		4824	40.13	-33.87	74	57.17	35.03	6.54	58.61	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4872	42.43	-31.57	74	59.37	35.02	6.56	58.52	100	0	P	H
		7311	43.17	-30.83	74	56.7	36.39	8.24	58.16	100	0	P	H
													H
													H
		4874	42.54	-31.46	74	59.48	35.02	6.56	58.52	100	0	P	V
		7311	43.13	-30.87	74	56.66	36.39	8.24	58.16	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4924	42.07	-31.93	74	58.88	35.01	6.6	58.42	100	0	P	H
		7386	41.97	-32.03	74	55.53	36.44	8.31	58.31	100	0	P	H
													H
													H
		4924	43.27	-30.73	74	60.08	35.01	6.6	58.42	100	0	P	V
		7386	41.83	-32.17	74	55.39	36.44	8.31	58.31	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2390	73.12	-0.88	74	69.38	32.77	4.62	33.65	120	87	P	H
		2390	52.88	-1.12	54	49.14	32.77	4.62	33.65	120	87	A	H
	*	2410	113.92	-	-	110.09	32.81	4.65	33.63	120	87	P	H
	*	2410	103.57	-	-	99.74	32.81	4.65	33.63	120	87	A	H
													H
													H
		2390	64.65	-9.35	74	60.91	32.77	4.62	33.65	150	242	P	V
		2390	46.59	-7.41	54	42.85	32.77	4.62	33.65	150	242	A	V
	*	2410	108.38	-	-	104.55	32.81	4.65	33.63	150	242	P	V
	*	2410	98.04	-	-	94.21	32.81	4.65	33.63	150	242	A	V
													V
													V
802.11g CH 06 2437MHz		2389.47	67.18	-6.82	74	63.44	32.77	4.62	33.65	117	87	P	H
		2390	46.55	-7.45	54	42.81	32.77	4.62	33.65	117	87	A	H
	*	2435	117.14	-	-	113.23	32.85	4.68	33.62	117	87	P	H
	*	2435	106.85	-	-	102.94	32.85	4.68	33.62	117	87	A	H
		2483.76	71.22	-2.78	74	67.1	32.96	4.73	33.57	117	87	P	H
		2483.52	48.08	-5.92	54	43.96	32.96	4.73	33.57	117	87	A	H
		2389.92	60.3	-13.7	74	56.56	32.77	4.62	33.65	120	237	P	V
		2389.83	43.85	-10.15	54	40.11	32.77	4.62	33.65	120	237	A	V
	*	2435	108.24	-	-	104.33	32.85	4.68	33.62	120	237	P	V
	*	2435	97.93	-	-	94.02	32.85	4.68	33.62	120	237	A	V
		2483.96	61.86	-12.14	74	57.74	32.96	4.73	33.57	120	237	P	V
		2483.8	44.13	-9.87	54	40.01	32.96	4.73	33.57	120	237	A	V

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 11 2462MHz	*	2464	110.52	-	-	106.49	32.92	4.7	33.59	200	243	P	H
	*	2464	100.55	-	-	96.52	32.92	4.7	33.59	200	243	A	H
		2483.88	68.36	-5.64	74	64.24	32.96	4.73	33.57	200	243	P	H
		2483.52	50.14	-3.86	54	46.02	32.96	4.73	33.57	200	243	A	H
													H
													H
	*	2464	102.09	-	-	98.06	32.92	4.7	33.59	100	335	P	V
	*	2464	92.18	-	-	88.15	32.92	4.7	33.59	100	335	A	V
		2483.68	59.49	-14.51	74	55.37	32.96	4.73	33.57	100	335	P	V
		2483.68	59.49	-14.51	74	55.37	32.96	4.73	33.57	100	335	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	40.13	-33.87	74	57.17	35.03	6.54	58.61	100	0	P	H
													H
													H
													H
		4824	40.79	-33.21	74	57.83	35.03	6.54	58.61	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4874	41.51	-32.49	74	58.45	35.02	6.56	58.52	100	0	P	H
		7311	43.26	-30.74	74	56.79	36.39	8.24	58.16	100	0	P	H
													H
													H
		4874	40.99	-33.01	74	57.93	35.02	6.56	58.52	100	0	P	V
		7311	41.82	-32.18	74	55.35	36.39	8.24	58.16	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4924	41.76	-32.24	74	58.57	35.01	6.6	58.42	100	0	P	H
		7386	43.28	-30.72	74	56.84	36.44	8.31	58.31	100	0	P	H
													H
													H
		4924	43.77	-30.23	74	60.58	35.01	6.6	58.42	100	0	P	V
		7386	42.47	-31.53	74	56.03	36.44	8.31	58.31	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz	*	5745	92.99	-	-	82.13	35.79	7.18	32.11	100	56	A	H
	*	5745	102.73	-	-	91.87	35.79	7.18	32.11	100	56	P	H
													H
													H
	*	5746	99.43	-	-	88.57	35.79	7.18	32.11	102	274	A	V
	*	5746	109.62	-	-	98.76	35.79	7.18	32.11	102	274	P	V
													V
802.11a CH 157 5785MHz	*	5785	93.4	-	-	82.48	35.82	7.2	32.1	100	164	A	H
	*	5785	103.46	-	-	92.54	35.82	7.2	32.1	100	164	P	H
													H
													H
	*	5788	100.29	-	-	89.34	35.83	7.22	32.1	100	271	A	V
	*	5788	110.35	-	-	99.4	35.83	7.22	32.1	100	271	P	V
													V
802.11a CH 161 5805MHz	*	5804	93.31	-	-	82.33	35.85	7.22	32.09	100	166	A	H
	*	5804	104.38	-	-	93.4	35.85	7.22	32.09	100	166	P	H
													H
													H
	*	5803	99.55	-	-	88.57	35.85	7.22	32.09	100	272	A	V
	*	5803	109.24	-	-	98.26	35.85	7.22	32.09	100	272	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		11490	43.65	-30.35	74	51.24	38.99	10.33	56.91	100	0	P	H
													H
													H
													H
		11492	48.26	-25.74	74	55.85	38.99	10.33	56.91	100	0	P	V
													V
													V
													V
802.11a CH 157 5785MHz		11572	45.12	-28.88	74	52.64	39.03	10.36	56.91	100	0	P	H
													H
													H
													H
		11572	47.89	-26.11	74	55.41	39.03	10.36	56.91	100	0	P	V
													V
													V
													V
802.11a CH 161 5805MHz		11610	44.74	-29.26	74	52.23	39.04	10.39	56.92	100	0	P	H
													H
													H
													H
		11612	47.22	-26.78	74	54.71	39.04	10.39	56.92	100	0	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 155 5775MHz	*	5777	87.22	-	-	76.3	35.82	7.2	32.1	102	347	A	H
	*	5777	97.69	-	-	86.77	35.82	7.2	32.1	102	347	P	H
													H
													H
													H
													H
	*	5777	92.9	-	-	81.98	35.82	7.2	32.1	100	99	A	V
	*	5777	103.14	-	-	92.22	35.82	7.2	32.1	100	99	P	V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 155 5775MHz		11550	43.78	-30.22	74	51.31	39.02	10.36	56.91	100	0	P	H
													H
													H
													H
		11552	48.25	-25.75	74	55.78	39.02	10.36	56.91	100	0	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C Emission below 1GHz

2.4GHz WIFI 802.11b (LF)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
2.4GHz 802.11b LF		119.91	24.98	-18.52	43.5	44.08	11.5	1.18	31.78			P	H
		143.67	32	-11.5	43.5	51.02	11.5	1.26	31.78			P	H
		166.08	32.97	-10.53	43.5	53.62	9.78	1.35	31.78			P	H
		498.8	28.9	-17.1	46	40.58	17.98	2.23	31.89			P	H
		640.2	30.51	-15.49	46	39.6	20.4	2.55	32.04			P	H
		696.9	37.69	-8.31	46	46.46	20.62	2.65	32.04	158	289	P	H
													H
													H
													H
													H
													H
													H
		141.78	34.46	-9.04	43.5	53.48	11.5	1.26	31.78	101	229	P	V
		200.91	27.57	-15.93	43.5	48.76	9.11	1.48	31.78			P	V
		254.37	27.3	-18.7	46	44.41	13	1.66	31.77			P	V
		498.1	27	-19	46	38.68	17.98	2.23	31.89			P	V
		661.2	31.27	-14.73	46	40.42	20.3	2.59	32.04			P	V
		696.9	29.02	-16.98	46	37.79	20.62	2.65	32.04			P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

15C Emission below 1GHz

5GHz WIFI 802.11a (LF)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
5GHz 802.11a LF		102.36	29.89	-13.61	43.5	50.04	10.52	1.11	31.78			P	H
		166.08	32.94	-10.56	43.5	53.59	9.78	1.35	31.78			P	H
		216.03	29.34	-16.66	46	50.33	9.26	1.53	31.78			P	H
		698.3	37.66	-8.34	46	46.4	20.65	2.65	32.04	109	15	P	H
		747.3	28.12	-17.88	46	35.16	22.2	2.74	31.98			P	H
		800.5	29.38	-16.62	46	36.47	22	2.83	31.92			P	H
													H
													H
													H
													H
													H
													H
		143.67	34.32	-9.18	43.5	53.34	11.5	1.26	31.78	150	114	P	V
		192	27.82	-15.68	43.5	49.35	8.8	1.45	31.78			P	V
		226.56	26.49	-19.51	46	46.83	9.86	1.57	31.77			P	V
		437.9	27.21	-18.79	46	39.95	16.98	2.11	31.83			P	V
		613.6	28.56	-17.44	46	38.1	20.02	2.48	32.04			P	V
		698.3	30.97	-15.03	46	39.71	20.65	2.65	32.04			P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency per 15.209(c).
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is "PASS".

<MIMO Ant. 1+2>

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		2389.92	62.88	-11.12	74	59.14	32.77	4.62	33.65	118	17	P	H
		2390	46.64	-7.36	54	42.9	32.77	4.62	33.65	118	17	A	H
	*	2414	108.54	-	-	104.71	32.81	4.65	33.63	118	17	P	H
	*	2414	97.08	-	-	93.25	32.81	4.65	33.63	118	17	A	H
													H
													H
		2389.47	67.3	-6.7	74	63.56	32.77	4.62	33.65	100	303	P	V
		2390	50.97	-3.03	54	47.23	32.77	4.62	33.65	100	303	A	V
	*	2414	114.17	-	-	110.34	32.81	4.65	33.63	100	303	P	V
	*	2414	102.41	-	-	98.58	32.81	4.65	33.63	100	303	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2377.95	55.89	-18.11	74	52.22	32.73	4.6	33.66	116	15	P	H
		2384.61	42	-12	54	38.31	32.73	4.62	33.66	116	15	A	H
	*	2439	110.02	-	-	106.05	32.89	4.68	33.6	116	15	P	H
	*	2439	98.98	-	-	95.01	32.89	4.68	33.6	116	15	A	H
		2486	55.43	-18.57	74	51.31	32.96	4.73	33.57	116	15	P	H
		2483.52	42.34	-11.66	54	38.22	32.96	4.73	33.57	116	15	A	H
		2356.53	56.33	-17.67	74	52.71	32.7	4.6	33.68	100	300	P	V
		2356.98	43.76	-10.24	54	40.14	32.7	4.6	33.68	100	300	A	V
	*	2435	112.71	-	-	108.8	32.85	4.68	33.62	100	300	P	V
	*	2435	101.48	-	-	97.57	32.85	4.68	33.62	100	300	A	V
		2496.52	56.44	-17.56	74	52.27	33	4.73	33.56	100	300	P	V
		2483.6	42.89	-11.11	54	38.77	32.96	4.73	33.57	100	300	A	V

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 11 2462MHz	*	2464	105.62	-	-	101.59	32.92	4.7	33.59	143	361	P	H
	*	2464	94.77	-	-	90.74	32.92	4.7	33.59	143	361	A	H
		2483.68	64.02	-9.98	74	59.9	32.96	4.73	33.57	143	361	P	H
		2483.52	46.8	-7.2	54	42.68	32.96	4.73	33.57	143	361	A	H
													H
													H
	*	2464	112.49	-	-	108.46	32.92	4.7	33.59	120	201	P	V
	*	2464	101.56	-	-	97.53	32.92	4.7	33.59	120	201	A	V
		2483.64	69.95	-4.05	74	65.83	32.96	4.73	33.57	120	201	P	V
		2483.52	50.62	-3.38	54	46.5	32.96	4.73	33.57	120	201	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		4824	43.02	-30.98	74	60.06	35.03	6.54	58.61	100	0	P	H
													H
													H
													H
		4824	41.11	-32.89	74	58.15	35.03	6.54	58.61	100	0	P	V
													V
													V
													V
802.11n HT20 CH 06 2437MHz		4924	40.45	-33.55	74	57.26	35.01	6.6	58.42	100	0	P	H
		7386	41.81	-32.19	74	55.37	36.44	8.31	58.31	100	0	P	H
													H
													H
		4924	40.98	-33.02	74	57.79	35.01	6.6	58.42	100	0	P	V
		7386	41.93	-32.07	74	55.49	36.44	8.31	58.31	100	0	P	V
													V
													V
802.11n HT20 CH 11 2462MHz		4924	43.61	-30.39	74	60.42	35.01	6.6	58.42	100	0	P	H
		7386	42.36	-31.64	74	55.92	36.44	8.31	58.31	100	0	P	H
													H
													H
		4924	45.49	-28.51	74	62.3	35.01	6.6	58.42	100	0	P	V
		7386	42.44	-31.56	74	56	36.44	8.31	58.31	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 03 2422MHz		2388.84	61.89	-12.11	74	58.15	32.77	4.62	33.65	118	20	P	H
		2390	47.65	-6.35	54	43.91	32.77	4.62	33.65	118	20	A	H
	*	2420	105.4	-	-	101.52	32.85	4.65	33.62	118	20	P	H
	*	2420.04	93.96	-	-	90.08	32.85	4.65	33.62	118	20	A	H
		2497.28	55.66	-18.34	74	51.49	33	4.73	33.56	118	20	P	H
		2484.96	42.43	-11.57	54	38.31	32.96	4.73	33.57	118	20	A	H
		2389.38	68.51	-5.49	74	64.77	32.77	4.62	33.65	100	301	P	V
		2390	53.83	-0.17	54	50.09	32.77	4.62	33.65	100	301	A	V
	*	2420	110.5	-	-	106.62	32.85	4.65	33.62	100	301	P	V
	*	2423.463	99.46	-	-	95.58	32.85	4.65	33.62	100	301	A	V
		2488	55.99	-18.01	74	51.82	33	4.73	33.56	100	301	P	V
		2484.56	43.15	-10.85	54	39.03	32.96	4.73	33.57	100	301	A	V
802.11n HT40 CH 06 2437MHz		2390	59.62	-14.38	74	55.88	32.77	4.62	33.65	115	20	P	H
		2389.92	43.77	-10.23	54	40.03	32.77	4.62	33.65	115	20	A	H
	*	2439	106.91	-	-	102.94	32.89	4.68	33.6	115	20	P	H
	*	2439	95.76	-	-	91.79	32.89	4.68	33.6	115	20	A	H
		2483.52	60.17	-13.83	74	56.05	32.96	4.73	33.57	115	20	P	H
		2483.52	45.2	-8.8	54	41.08	32.96	4.73	33.57	115	20	A	H
		2389.83	64.72	-9.28	74	60.98	32.77	4.62	33.65	100	323	P	V
		2390	47.82	-6.18	54	44.08	32.77	4.62	33.65	100	323	A	V
	*	2435	110.42	-	-	106.51	32.85	4.68	33.62	100	323	P	V
	*	2435	98.98	-	-	95.07	32.85	4.68	33.62	100	323	A	V
		2484.44	63.34	-10.66	74	59.22	32.96	4.73	33.57	100	323	P	V
		2483.52	47.79	-6.21	54	43.67	32.96	4.73	33.57	100	323	A	V

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 09 2452MHz		2388.03	55.21	-18.79	74	51.47	32.77	4.62	33.65	115	28	P	H
		2387.22	41.94	-12.06	54	38.2	32.77	4.62	33.65	115	28	A	H
	*	2439	106.41	-	-	102.44	32.89	4.68	33.6	115	28	P	H
	*	2439	94.45	-	-	90.48	32.89	4.68	33.6	115	28	A	H
		2486.36	64.72	-9.28	74	60.6	32.96	4.73	33.57	115	28	P	H
		2483.52	48.92	-5.08	54	44.8	32.96	4.73	33.57	115	28	A	H
		2378.85	56.44	-17.56	74	52.77	32.73	4.6	33.66	100	333	P	V
		2390	43.14	-10.86	54	39.4	32.77	4.62	33.65	100	333	A	V
	*	2450	109.81	-	-	105.84	32.89	4.68	33.6	100	333	P	V
	*	2450	98.58	-	-	94.61	32.89	4.68	33.6	100	333	A	V
		2483.76	68.92	-5.08	74	64.8	32.96	4.73	33.57	100	333	P	V
		2483.52	52.61	-1.39	54	48.49	32.96	4.73	33.57	100	333	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 03 2422MHz		4844	40.61	-33.39	74	57.61	35.03	6.55	58.58	100	0	P	H
		7266	41.77	-32.23	74	55.3	36.37	8.2	58.1	100	0	P	H
													H
													H
		4844	39.67	-34.33	74	56.67	35.03	6.55	58.58	100	0	P	V
		7266	41.35	-32.65	74	54.88	36.37	8.2	58.1	100	0	P	V
													V
													V
802.11n HT40 CH 06 2437MHz		4874	41	-33	74	57.94	35.02	6.56	58.52	100	0	P	H
		7311	42.88	-31.12	74	56.41	36.39	8.24	58.16	100	0	P	H
													H
													H
		4874	42.2	-31.8	74	59.14	35.02	6.56	58.52	100	0	P	V
		7311	41.82	-32.18	74	55.35	36.39	8.24	58.16	100	0	P	V
													V
													V
802.11n HT40 CH 09 2452MHz		4904	41.29	-32.71	74	58.14	35.02	6.59	58.46	100	0	P	H
		7356	43.15	-30.85	74	56.69	36.42	8.29	58.25	100	0	P	H
													H
													H
		4904	41.79	-32.21	74	58.64	35.02	6.59	58.46	100	0	P	V
		7356	42.49	-31.51	74	56.03	36.42	8.29	58.25	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C Band 4 - 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 149 5745MHz	*	5747	93.53	-	-	82.67	35.79	7.18	32.11	102	177	A	H
	*	5747	104.58	-	-	93.72	35.79	7.18	32.11	102	177	P	H
													H
													H
	*	5747	98.43	-	-	87.57	35.79	7.18	32.11	103	151	A	V
	*	5747	109.44	-	-	98.58	35.79	7.18	32.11	103	151	P	V
													V
													V
802.11n HT20 CH 157 5785MHz	*	5783	92.07	-	-	81.15	35.82	7.2	32.1	100	189	A	H
	*	5783	103.19	-	-	92.27	35.82	7.2	32.1	100	189	P	H
													H
													H
	*	5783	97.61	-	-	86.69	35.82	7.2	32.1	101	149	A	V
	*	5783	109.13	-	-	98.21	35.82	7.2	32.1	101	149	P	V
													V
													V
802.11n HT20 CH 161 5805MHz	*	5807	92.45	-	-	81.47	35.85	7.22	32.09	100	185	A	H
	*	5807	103.75	-	-	92.77	35.85	7.22	32.09	100	185	P	H
													H
													H
	*	5803	97.13	-	-	86.15	35.85	7.22	32.09	100	151	A	V
	*	5803	108.32	-	-	97.34	35.85	7.22	32.09	100	151	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 149 5745MHz		11492	44.52	-29.48	74	52.11	38.99	10.33	56.91	100	0	P	H
													H
													H
													H
		11492	48.18	-25.82	74	55.77	38.99	10.33	56.91	100	0	P	V
													V
													V
													V
802.11n HT20 CH 157 5785MHz		11570	44.07	-29.93	74	51.59	39.03	10.36	56.91	100	0	P	H
													H
													H
													H
		11572	47.8	-26.2	74	55.32	39.03	10.36	56.91	100	0	P	V
													V
													V
													V
802.11n HT20 CH 165 5825MHz		11608	45.32	-28.68	74	52.81	39.04	10.39	56.92	100	0	P	H
													H
													H
													H
		11612	47.54	-26.46	74	55.03	39.04	10.39	56.92	100	0	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz	*	5753	89.93	-	-	79.05	35.81	7.18	32.11	101	177	A	H
	*	5753	100.95	-	-	90.07	35.81	7.18	32.11	101	177	P	H
													H
													H
													H
													H
	*	5757	94.81	-	-	83.93	35.81	7.18	32.11	128	151	A	V
	*	5757	106.01	-	-	95.13	35.81	7.18	32.11	128	151	P	V
													V
													V
													V
													V
802.11n HT40 CH 159 5795MHz	*	5797	88.77	-	-	77.82	35.83	7.22	32.1	100	184	A	H
	*	5797	100.17	-	-	89.22	35.83	7.22	32.1	100	184	P	H
													H
													H
													H
													H
	*	5793	94.15	-	-	83.2	35.83	7.22	32.1	100	156	A	V
	*	5793	105.08	-	-	94.13	35.83	7.22	32.1	100	156	P	V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C Band 4 5725~5850MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz		11510	44.33	-29.67	74	51.89	39	10.34	56.9	100	0	P	H
													H
													H
													H
		11512	47.5	-26.5	74	55.06	39	10.34	56.9	100	0	P	V
													V
													V
													V
802.11n HT40 CH 159 5795MHz		11590	44.75	-29.25	74	52.26	39.03	10.38	56.92	100	0	P	H
													H
													H
													H
		11592	48.08	-25.92	74	55.59	39.03	10.38	56.92	100	0	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 155 5775MHz	*	5773	88.58	-	-	77.66	35.82	7.2	32.1	102	181	A	H
	*	5773	99.19	-	-	88.27	35.82	7.2	32.1	102	181	P	H
													H
													H
													H
													H
	*	5777	93.13	-	-	82.21	35.82	7.2	32.1	101	162	A	V
	*	5777	105.4	-	-	94.48	35.82	7.2	32.1	101	162	P	V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 155 5775MHz		11550	44.93	-29.07	74	52.46	39.02	10.36	56.91	100	0	P	H
													H
													H
													H
		11552	47.36	-26.64	74	54.89	39.02	10.36	56.91	100	0	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C Emission below 1GHz

2.4GHz WIFI 802.11n HT40 (LF)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
2.4GHz 802.11n HT40 LF		166.08	32.87	-10.63	43.5	53.52	9.78	1.35	31.78			P	H
		216.03	30.05	-15.95	46	51.04	9.26	1.53	31.78			P	H
		256.26	28.95	-17.05	46	45.76	13.3	1.66	31.77			P	H
		446.3	34.08	-11.92	46	46.68	17.12	2.12	31.84			P	H
		640.2	33.61	-12.39	46	42.7	20.4	2.55	32.04			P	H
		696.9	37.64	-8.36	46	46.41	20.62	2.65	32.04	119	350	P	H
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		83.73	30.34	-9.66	40	53.43	7.7	1	31.79			P	V
		140.97	34.75	-8.75	43.5	53.77	11.5	1.26	31.78	188	222	P	V
		211.17	29.33	-14.17	43.5	50.39	9.21	1.51	31.78			P	V
		640.2	35.21	-10.79	46	44.3	20.4	2.55	32.04			P	V
		696.9	28.29	-17.71	46	37.06	20.62	2.65	32.04			P	V
		896.4	30.27	-15.73	46	35.47	23.24	3	31.44			P	V
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Remark	1. No other spurious found. 2. All results are PASS against limit line.												

15C Emission below 1GHz

5GHz WIFI 802.11n HT20 (LF)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
5GHz 802.11n HT20 LF		71.85	27.05	-12.95	40	51.35	6.56	0.93	31.79			P	H
		166.08	28.16	-15.34	43.5	48.81	9.78	1.35	31.78			P	H
		216.03	26.33	-19.67	46	47.32	9.26	1.53	31.78			P	H
		324.5	32.06	-13.94	46	48.39	13.6	1.84	31.77			P	H
		640.2	32.78	-13.22	46	41.87	20.4	2.55	32.04			P	H
		696.9	33.14	-12.86	46	41.91	20.62	2.65	32.04	100	185	P	H
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		84.27	26.78	-13.22	40	49.66	7.9	1.01	31.79			P	V
		141.24	31.84	-11.66	43.5	50.86	11.5	1.26	31.78	100	59	P	V
		213.33	23.82	-19.68	43.5	44.85	9.23	1.52	31.78			P	V
		456.1	23.38	-22.62	46	35.77	17.32	2.14	31.85			P	V
		640.2	33.29	-12.71	46	42.38	20.4	2.55	32.04			P	V
		960.1	29.91	-24.09	54	32.86	24.9	3.1	30.95			P	V
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Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency per 15.209(c).
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

3. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

4. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

3. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

4. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

3. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

4. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.