

# FCC/IC RF Test Report

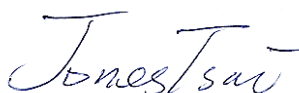
APPLICANT : Kilpatrick LLC  
EQUIPMENT : Tablet PC  
MODEL NAME : C9R6QM  
FCC ID : S2F-8560  
IC : 10888A-8560  
STANDARD : FCC Part 15 Subpart C §15.247  
IC RSS-210 issue 8  
CLASSIFICATION : (DTS) Digital Transmission System

The product testing was completed on Aug. 30, 2013. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown to be compliant with the applicable technical standards.

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



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



**SPORTON INTERNATIONAL INC.**

No. 52, Hwa Ya 1<sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

Report No. : FR332726-04B-CON  
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## SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	RSS-210 A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	RSS-Gen 4.6.1	99% Bandwidth	-	Pass	-
3.2	15.247(b)	RSS-210 A8.4	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	RSS-210 A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	RSS-210 A8.5	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
			Conducted Spurious Emission		Pass	-
3.5	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 7.90 dB at 0.174 MHz
3.6	15.203 & 15.247(b)	RSS-210 A8.4	Antenna Requirement	N/A	Pass	-

# 1 General Description

## 1.1 Applicant

Kilpatrick LLC  
102 S. Tejon Street  
Suite 1100  
Colorado Springs, Colorado 80903

## 1.2 Feature of Equipment Under Test

Product Feature	
Equipment	Tablet PC
Model Name	C9R6QM
FCC ID	S2F-8560
IC	10888A-8560
EUT supports Radios application	WLAN 11a/b/g/n HT20/HT40 Bluetooth v3.0

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

### 1.3 Product Specification of Equipment Under Test

Product Specification subjective to this standard																
<b>Tx/Rx Channel Frequency Range</b>	802.11b/g/n : 2412 MHz ~ 2462 MHz 802.11a/n: 5745~5825MHz.															
<b>Maximum Output Power to Antenna</b>	<b>&lt;2412 MHz ~ 2462 MHz &gt;</b> <b>MIMO &lt;Ant. 1+2&gt;</b> 802.11b : 21.7 dBm (0.1479 W) 802.11g : 23.4 dBm (0.2188 W) 802.11n HT20 : 23.7 dBm (0.2344 W) <b>&lt;5745 MHz ~ 5825 MHz &gt;</b> <b>MIMO &lt;Ant. 1+2&gt;</b> 802.11a : 20.2 dBm (0.1047 W) 802.11n HT20 : 20.6 dBm (0.1148 W) 802.11n HT40 : 19.3 dBm (0.0851 W)															
<b>99% Occupied Bandwidth</b>	<b>&lt;2412 MHz ~ 2462 MHz&gt;</b> <b>MIMO &lt;Ant. 1+2&gt;</b> 802.11b : 12.25MHz 802.11g : 17.60MHz 802.11n HT20 : 18.55MHz <b>&lt;5745 MHz ~ 5825 MHz&gt;</b> <b>MIMO &lt;Ant. 1+2&gt;</b> 802.11a : 17.45MHz 802.11n HT20 : 18.45MHz 802.11n HT40 : 36.20MHz															
<b>Antenna Type</b>	<b>&lt;Main Antenna&gt;</b> 802.11b/g/n : Fixed internal Antenna with gain 4.10 dBi 802.11a/n : Fixed internal Antenna with gain 3.20 dBi <b>&lt;Aux. Antenna&gt;</b> 802.11b/g/n : Fixed internal Antenna with gain 1.10 dBi 802.11a/n : Fixed internal Antenna with gain 1.60 dBi															
<b>Type of Modulation</b>	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)															
<b>Antenna Function for Transmitter</b>	<table border="1"> <thead> <tr> <th></th> <th>Ant. 1</th> <th>Ant. 2</th> </tr> </thead> <tbody> <tr> <td>802.11 b MIMO</td> <td>√</td> <td>√</td> </tr> <tr> <td>802.11 g MIMO</td> <td>√</td> <td>√</td> </tr> <tr> <td>802.11 a MIMO</td> <td>√</td> <td>√</td> </tr> <tr> <td>802.11 n MIMO</td> <td>√</td> <td>√</td> </tr> </tbody> </table>		Ant. 1	Ant. 2	802.11 b MIMO	√	√	802.11 g MIMO	√	√	802.11 a MIMO	√	√	802.11 n MIMO	√	√
	Ant. 1	Ant. 2														
802.11 b MIMO	√	√														
802.11 g MIMO	√	√														
802.11 a MIMO	√	√														
802.11 n MIMO	√	√														

### 1.4 Modification of EUT

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

## 1.5 Testing Site

<b>Test Site</b>	SPORTON INTERNATIONAL INC.			
<b>Test Site Location</b>	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978			
<b>Test Site No.</b>	<b>Sporton Site No.</b>			<b>FCC/IC Registration No.</b>
	TH02-HY	CO05-HY	03CH08-HY	636805/4086B-1

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

## 1.6 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02.
- ♦ ANSI C63.4-2003
- ♦ IC RSS-210 Issue 8
- ♦ IC RSS-Gen Issue 3
- ♦ NOTICE 2012-DRS0126

### 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.
3. Per the section 2.2.3 of Notice of 2012-DRS0126, " Receivers Excluded from Industry Canada Requirements", only radiocommunication receivers operating in stand-alone mode within the band 30-960 MHz and scanner receivers are subject to Industry Canada requirements.

## 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).

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 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	159	5795
	151	5755	161	5805
	153	5765	165	5825
	157	5785	-	-



## 2.2 Pre-Scanned RF Power

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

### MIMO <Ant. 1+2>

802.11b				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	21.7	21.5	21.3	21.4

802.11g								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	23.4	23.3	23.2	23.4	23.3	23.2	23.1	23.1

2.4GHz 802.11n HT20								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	23.7	23.6	23.5	23.6	23.6	23.6	23.6	23.2
Data Rate (MHz)	MSC 8	MSC 9	MSC 10	MSC 11	MSC 12	MSC 13	MSC 14	MSC 15
Peak Power (dBm)	23.6	23.6	23.6	23.6	23.6	23.1	23.5	23.3

802.11a								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	20.2	20.0	19.8	19.9	20.2	20.0	19.9	19.9

5GHz 802.11n HT20								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	20.6	20.3	20.1	20.5	20.5	20.4	20.3	20.3
Data Rate (MHz)	MSC 8	MSC 9	MSC 10	MSC 11	MSC 12	MSC 13	MSC 14	MSC 15
Peak Power (dBm)	20.1	20.0	20.0	20.2	20.1	20.1	20.4	20.1

5GHz 802.11n HT40								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	19.3	19.2	19.1	19.1	19.0	19.0	19.0	19.0
Data Rate (MHz)	MSC 8	MSC 9	MSC 10	MSC 11	MSC 12	MSC 13	MSC 14	MSC 15
Peak Power (dBm)	18.9	19.1	19.2	19.0	19.1	18.9	19.1	19.0

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>

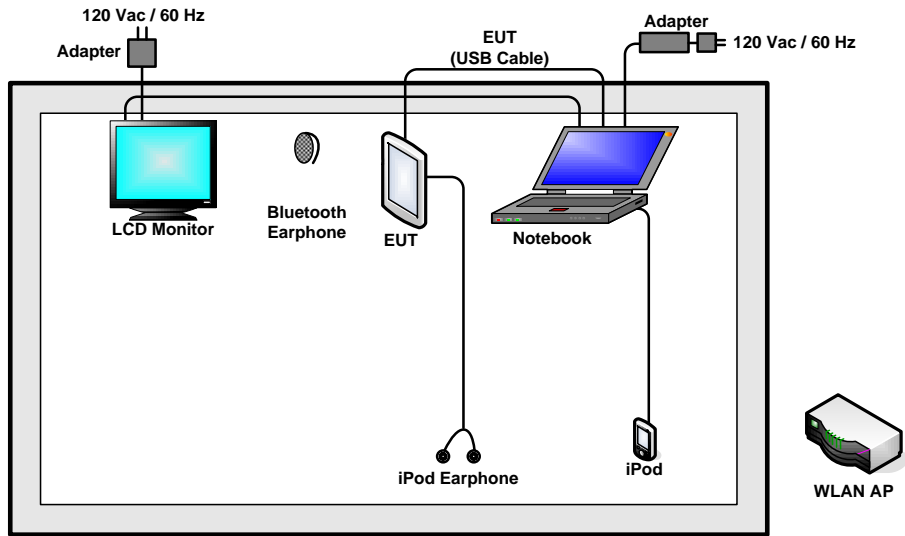
Test Cases				
Conducted TCs	Test Items	Mode	Data Rate	Test Channel
	6dB and 99% BW Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/2/6/10/11
		802.11n HT20	MSC0	1/2/6/10/11
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/2/6/10/11
		802.11n HT20	MSC0	1/2/6/10/11
	Conducted Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/2/6/10/11
		802.11n HT20	MSC0	1/2/6/10/11
	Conducted Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/2/6/10/11
		802.11n HT20	MSC0	1/2/6/10/11

**<5GHz>**

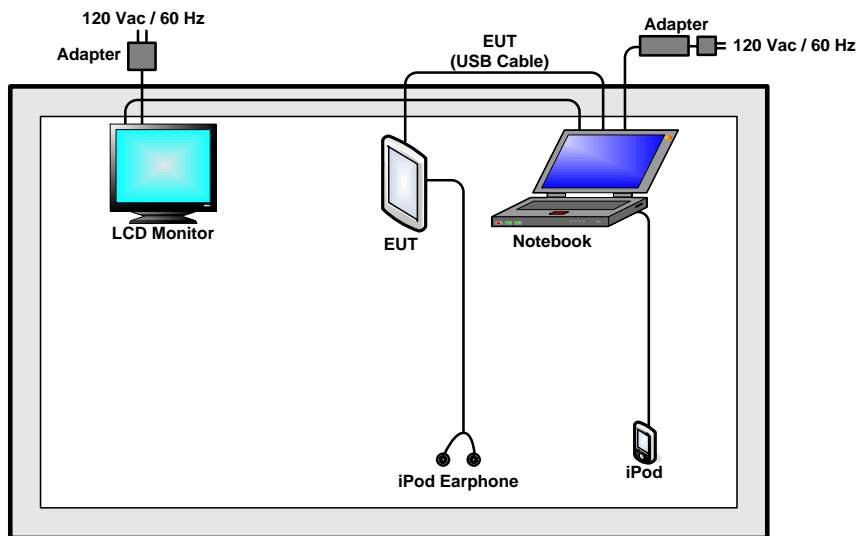
Test Cases				
<b>Conducted TCs</b>	<b>Test Items</b>	<b>Mode</b>	<b>Data Rate</b>	<b>Test Channel</b>
	<b>6dB and 99% BW Power Spectral Density</b>	<b>802.11a</b>	<b>6 Mbps</b>	<b>149/157/165</b>
		<b>802.11n HT20</b>	<b>MSC0</b>	<b>149/157/165</b>
		<b>802.11n HT40</b>	<b>MSC0</b>	<b>151/159</b>
	<b>Output Power</b>	<b>802.11a</b>	<b>6 Mbps</b>	<b>149/157/165</b>
		<b>802.11n HT20</b>	<b>MSC0</b>	<b>149/157/165</b>
		<b>802.11n HT40</b>	<b>MSC0</b>	<b>151/159</b>
	<b>Conducted Band Edge</b>	<b>802.11a</b>	<b>6 Mbps</b>	<b>149/165</b>
		<b>802.11n HT20</b>	<b>MSC0</b>	<b>149/165</b>
		<b>802.11n HT40</b>	<b>MSC0</b>	<b>151/159</b>
	<b>Conducted Spurious Emission</b>	<b>802.11a</b>	<b>6 Mbps</b>	<b>149/157/165</b>
		<b>802.11n HT20</b>	<b>MSC0</b>	<b>149/157/165</b>
		<b>802.11n HT40</b>	<b>MSC0</b>	<b>151/159</b>

Test Cases	
<b>AC Conducted Emission</b>	<p>Mode 1 : WLAN (2.4GHz) Link + Bluetooth Link + Earphone + USB Cable (Data Link with Notebook) + Camera &lt;Fig.1&gt;</p> <p>Mode 2 : WLAN (5GHz) Link + Bluetooth Link + Earphone + USB Cable (Data Link with Notebook) + Camera &lt;Fig.1&gt;</p> <p>Mode 3 : WLAN (2.4GHz) MIMO Tx + Earphone + USB Cable (Data Link with Notebook) + Camera &lt;Fig. 2&gt;</p>

## 2.4 Connection Diagram of Test System



<Fig. 1>



<Fig. 2>

## 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	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	LCD Monitor	DELL	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
4.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
5.	iPod Earphone	Apple	N/A	FCC DoC	Unshielded, 1.0 m	N/A
6.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
7.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A
8.	Adapter	Foxlink	PE98ED	Verification	N/A	N/A

## 2.6 Description of RF Function Operation Test Setup

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

## 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 and 99% Bandwidth Measurement

#### 3.1.1 Limit of 6dB and 99% Bandwidth

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

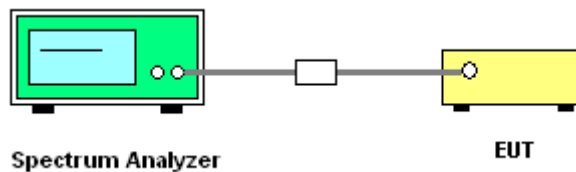
#### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v03r01.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1MHz and set the Video bandwidth (VBW) = 3MHz.
6. Measure and record the results in the test report.

#### 3.1.4 Test Setup



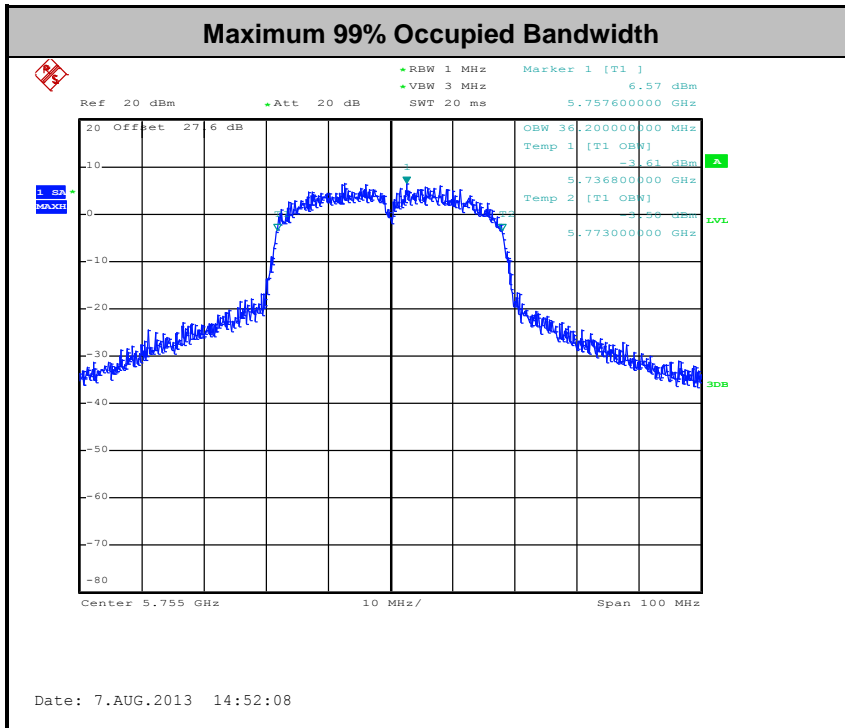
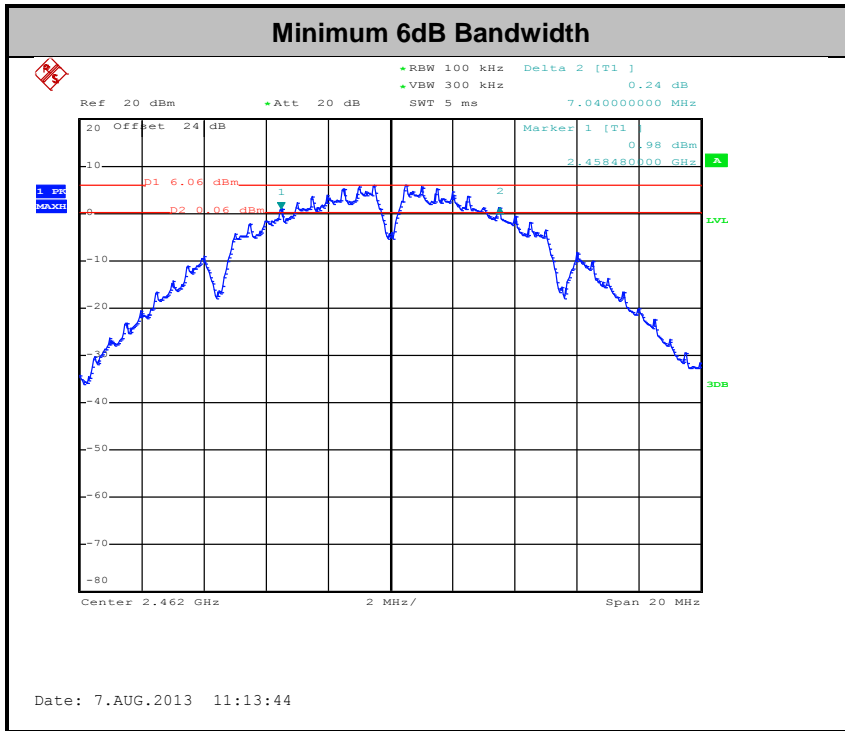
### 3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

<b>Test Band :</b>	2.4GHz + 5GHz band 4	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Reece Lee	<b>Relative Humidity :</b>	55~58%

Mod.	Data Rate	N <sub>TX</sub>	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	2	1	2412	12.20	12.25	7.08	7.08	0.5	Pass
11b	1Mbps	2	6	2437	12.10	12.05	7.08	7.08	0.5	Pass
11b	1Mbps	2	11	2462	12.10	12.10	7.06	7.04	0.5	Pass
11g	6Mbps	2	1	2412	17.40	17.30	16.28	16.32	0.5	Pass
11g	6Mbps	2	2	2417	17.50	17.45	16.32	16.32	0.5	Pass
11g	6Mbps	2	6	2437	17.60	17.45	16.28	16.30	0.5	Pass
11g	6Mbps	2	10	2457	17.55	17.35	16.32	16.32	0.5	Pass
11g	6Mbps	2	11	2462	17.40	17.40	16.28	16.28	0.5	Pass
HT20	MCS0	2	1	2412	18.45	18.45	16.78	17.20	0.5	Pass
HT20	MCS0	2	2	2417	18.50	18.40	16.84	16.90	0.5	Pass
HT20	MCS0	2	6	2437	18.55	18.50	16.78	16.92	0.5	Pass
HT20	MCS0	2	10	2457	18.45	18.45	16.88	17.28	0.5	Pass
HT20	MCS0	2	11	2462	18.45	18.45	16.80	17.18	0.5	Pass

Mod.	Data Rate	N <sub>TX</sub>	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	2	149	5745	17.40	17.25	15.52	15.76	0.5	Pass
11a	6Mbps	2	157	5785	17.45	17.20	15.32	15.80	0.5	Pass
11a	6Mbps	2	165	5825	17.40	17.15	15.88	15.88	0.5	Pass
HT20	MCS0	2	149	5745	18.40	18.20	16.88	16.76	0.5	Pass
HT20	MCS0	2	157	5785	18.45	18.25	16.52	16.80	0.5	Pass
HT20	MCS0	2	165	5825	18.40	18.15	16.16	16.80	0.5	Pass
HT40	MCS0	2	151	5755	36.20	36.00	32.56	33.76	0.5	Pass
HT40	MCS0	2	159	5795	36.20	35.90	32.64	32.60	0.5	Pass





## 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.

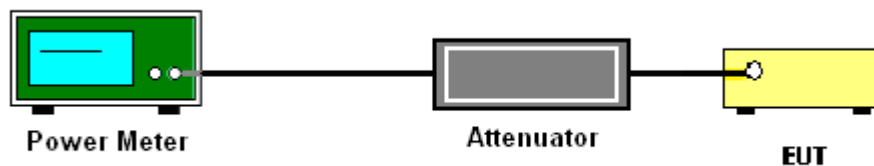
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r01.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02.

### 3.2.4 Test Setup



### 3.2.5 Test Result of Peak Output Power

Test Band :	2.4GHz	Temperature :	24~26°C
Test Engineer :	Reece Lee	Relative Humidity :	55~58%

Mod.	Data Rate	N <sub>TX</sub>	Channel	Freq. (MHz)	RF Output Power (dBm)			Power Limit (dBm)	DG (dBi)	Pass/Fail
					Ant. 1	Ant. 2	Sum Power			
11b	1Mbps	2	1	2412	17.9	17.4	20.6	30	2.85	Pass
11b	1Mbps	2	6	2437	19.2	18.2	21.7	30	2.85	Pass
11b	1Mbps	2	11	2462	18.9	18.3	21.6	30	2.85	Pass
11g	6Mbps	2	1	2412	14.4	12.8	16.6	30	2.85	Pass
11g	6Mbps	2	2	2417	18.8	17.6	21.3	30	2.85	Pass
11g	6Mbps	2	6	2437	20.8	19.9	23.4	30	2.85	Pass
11g	6Mbps	2	10	2457	19.2	18.2	21.7	30	2.85	Pass
11g	6Mbps	2	11	2462	15.6	14.1	17.9	30	2.85	Pass
HT20	MCS0	2	1	2412	13.7	12.2	16.0	30	2.85	Pass
HT20	MCS0	2	2	2417	18.6	17.4	21.0	30	2.85	Pass
HT20	MCS0	2	6	2437	21.1	20.2	23.7	30	2.85	Pass
HT20	MCS0	2	10	2457	19.6	18.4	22.1	30	2.85	Pass
HT20	MCS0	2	11	2462	16.1	14.6	18.5	30	2.85	Pass

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

<b>Test Band :</b>	5GHz band 4	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Reece Lee	<b>Relative Humidity :</b>	55~58%

Mod.	Data Rate	N <sub>TX</sub>	Channel	Freq. (MHz)	RF Output Power (dBm)			Power Limit (dBm)	DG (dBi)	Pass/Fail
					Ant. 1	Ant. 2	Sum Power			
11a	6Mbps	2	149	5745	18.2	15.8	20.2	30	2.47	Pass
11a	6Mbps	2	157	5785	17.9	15.7	20.0	30	2.47	Pass
11a	6Mbps	2	165	5825	17.9	15.5	19.9	30	2.47	Pass
HT20	MCS0	2	149	5745	18.5	16.3	20.6	30	2.47	Pass
HT20	MCS0	2	157	5785	18.1	16.3	20.3	30	2.47	Pass
HT20	MCS0	2	165	5825	18.1	15.7	20.1	30	2.47	Pass
HT40	MCS0	2	151	5755	17.5	14.7	19.3	30	2.47	Pass
HT40	MCS0	2	159	5795	17.5	14.4	19.2	30	2.47	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 :	24~26°C
Test Engineer :	Reece Lee	Relative Humidity :	55~58%

Mod.	Data Rate	N <sub>TX</sub>	Channel	Freq. (MHz)	RF Output Power (dBm)			Power Limit (dBm)	DG (dBi)	Pass/Fail
					Ant. 1	Ant. 2	Sum Power			
11b	1Mbps	2	1	2412	15.6	14.9	18.3	30	2.85	Pass
11b	1Mbps	2	6	2437	16.0	15.0	18.5	30	2.85	Pass
11b	1Mbps	2	11	2462	16.0	15.0	18.5	30	2.85	Pass
11g	6Mbps	2	1	2412	8.4	6.5	10.6	30	2.85	Pass
11g	6Mbps	2	2	2417	12.9	11.7	15.3	30	2.85	Pass
11g	6Mbps	2	6	2437	15.3	14.5	17.9	30	2.85	Pass
11g	6Mbps	2	10	2457	13.2	12.4	15.8	30	2.85	Pass
11g	6Mbps	2	11	2462	9.5	7.8	11.7	30	2.85	Pass
HT20	MCS0	2	1	2412	7.5	5.6	9.6	30	2.85	Pass
HT20	MCS0	2	2	2417	12.4	11.1	14.8	30	2.85	Pass
HT20	MCS0	2	6	2437	15.3	14.4	17.9	30	2.85	Pass
HT20	MCS0	2	10	2457	13.7	12.2	16.0	30	2.85	Pass
HT20	MCS0	2	11	2462	9.9	8.0	12.1	30	2.85	Pass

<b>Test Band :</b>	5GHz band 4	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Reece Lee	<b>Relative Humidity :</b>	55~58%

Mod.	Data Rate	N <sub>TX</sub>	Channel	Freq. (MHz)	RF Output Power (dBm)			Power Limit (dBm)	DG (dBi)	Pass/Fail
					Ant. 1	Ant. 2	Sum Power			
11a	6Mbps	2	149	5745	12.8	9.6	14.5	30	2.47	Pass
11a	6Mbps	2	157	5785	13.0	10.0	14.8	30	2.47	Pass
11a	6Mbps	2	165	5825	13.0	9.9	14.7	30	2.47	Pass
HT20	MCS0	2	149	5745	13.0	10.0	14.8	30	2.47	Pass
HT20	MCS0	2	157	5785	13.0	10.0	14.8	30	2.47	Pass
HT20	MCS0	2	165	5825	12.9	9.4	14.5	30	2.47	Pass
HT40	MCS0	2	151	5755	13.0	9.9	14.7	30	2.47	Pass
HT40	MCS0	2	159	5795	13.0	9.5	14.6	30	2.47	Pass

## 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

See list of measuring instruments of this test report.

### 3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02.

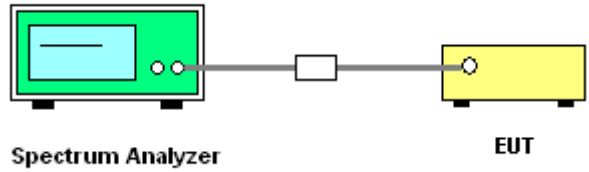
If measurements performed using method (2) plus  $10 \log(N)$  exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

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 + 5GHz band 4	Temperature :	24~26°C
Test Engineer :	Reece Lee	Relative Humidity :	55~58%

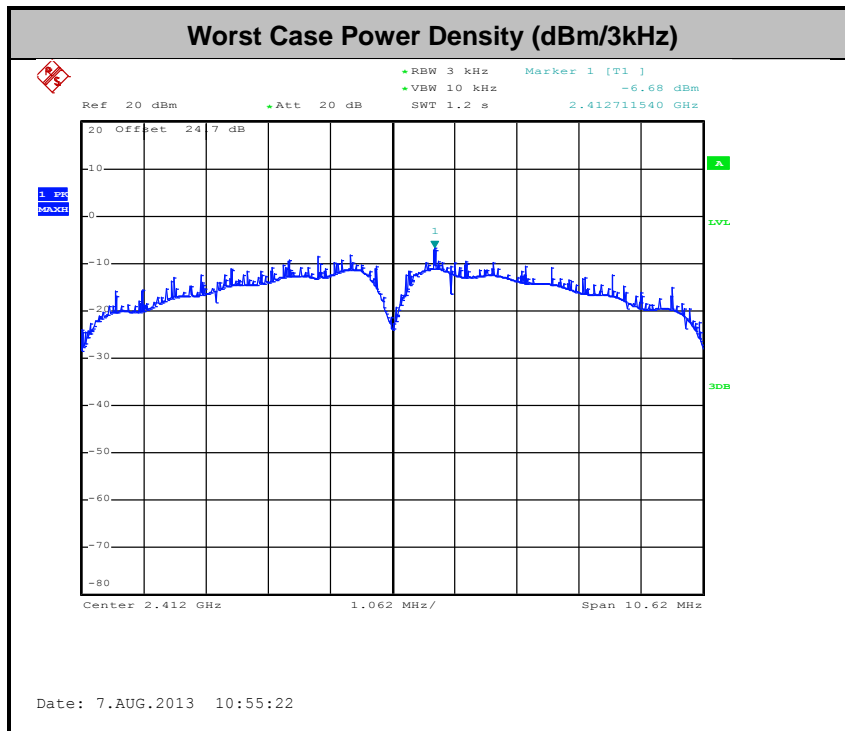
Mod.	Data Rate	N <sub>TX</sub>	Channel	Freq. (MHz)	Peak Power Density (dBm/3kHz)			Max. Limits (dBm/3kHz)	DG (dBi)	Pass/Fail
					Ant. 1	Ant. 2	Worst +10log(2)			
					11b	1Mbps	2			
11b	1Mbps	2	6	2437	-7.28	-8.88	-4.27	8	5.86	Pass
11b	1Mbps	2	11	2462	-8.49	-8.33	-5.32	8	5.86	Pass
11g	6Mbps	2	1	2412	-19.46	-20.46	-16.45	8	5.86	Pass
11g	6Mbps	2	2	2417	-14.35	-14.87	-11.34	8	5.86	Pass
11g	6Mbps	2	6	2437	-12.08	-13.22	-9.07	8	5.86	Pass
11g	6Mbps	2	10	2457	-12.81	-15.24	-9.80	8	5.86	Pass
11g	6Mbps	2	11	2462	-16.97	-19.56	-13.96	8	5.86	Pass
HT20	MCS0	2	1	2412	-19.52	-21.27	-16.51	8	5.86	Pass
HT20	MCS0	2	2	2417	-14.07	-15.61	-11.06	8	5.86	Pass
HT20	MCS0	2	6	2437	-11.97	-13.04	-8.96	8	5.86	Pass
HT20	MCS0	2	10	2457	-14.06	-14.08	-11.05	8	5.86	Pass
HT20	MCS0	2	11	2462	-16.54	-19.51	-13.53	8	5.86	Pass

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



Mod.	Data Rate	N <sub>TX</sub>	Channel	Freq. (MHz)	Peak Power Density (dBm/3kHz)			Max. Limits (dBm/3kHz)	DG (dBi)	Pass/Fail
					Ant. 1	Ant. 2	Worst +10log(2)			
11a	6Mbps	2	149	5745	-15.09	-16.62	-12.08	8	5.48	Pass
11a	6Mbps	2	157	5785	-15.61	-18.10	-12.60	8	5.48	Pass
11a	6Mbps	2	165	5825	-14.26	-17.38	-11.25	8	5.48	Pass
HT20	MCS0	2	149	5745	-14.65	-18.16	-11.64	8	5.48	Pass
HT20	MCS0	2	157	5785	-14.39	-17.84	-11.38	8	5.48	Pass
HT20	MCS0	2	165	5825	-14.96	-18.57	-11.95	8	5.48	Pass
HT40	MCS0	2	151	5755	-17.00	-18.22	-13.99	8	5.48	Pass
HT40	MCS0	2	159	5795	-15.02	-20.08	-12.01	8	5.48	Pass

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



## 3.4 Conducted Band Edges and Spurious Emission Measurement

### 3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

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

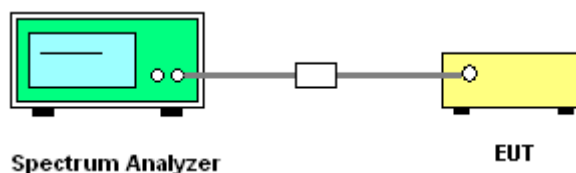
### 3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.4.3 Test Procedures

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

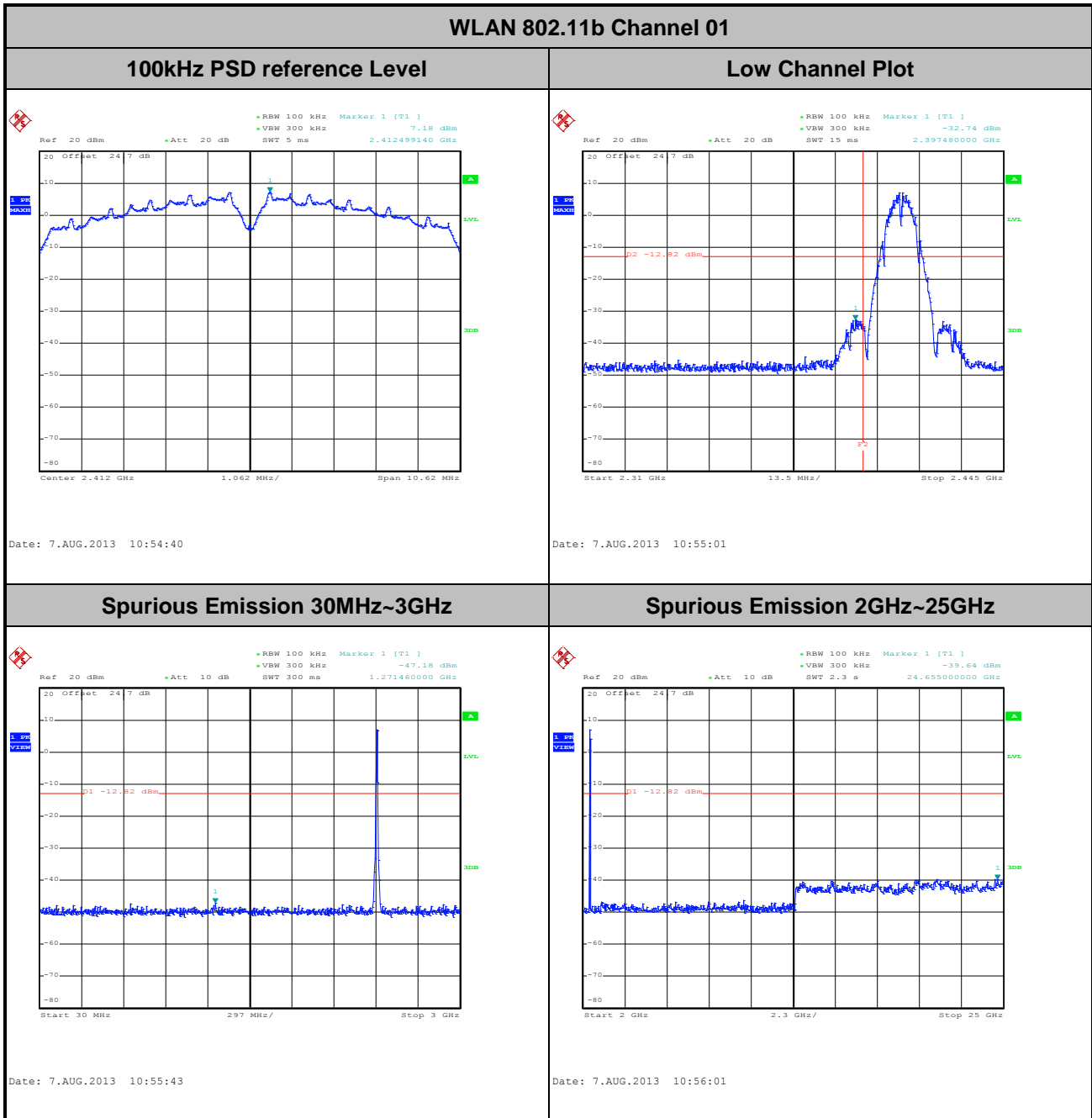
### 3.4.4 Test Setup



### 3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Number of TX = 2, Antenna =1

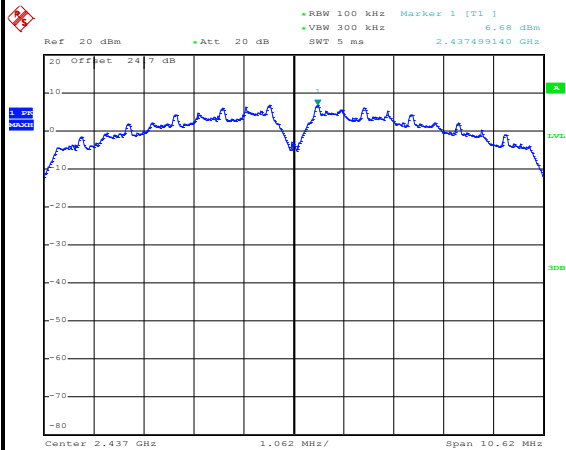
Number of TX :	2	Antenna :	1
Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	55~58%
Test Channel :	01	Test Engineer :	Reece Lee



Number of TX :	2	Antenna :	1
Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	55~58%
Test Channel :	06	Test Engineer :	Reece Lee

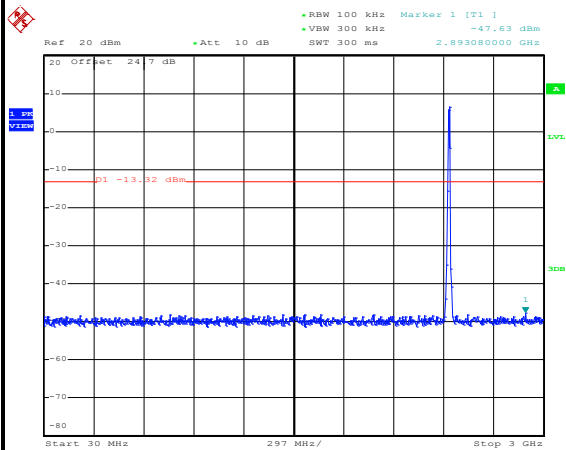
**WLAN 802.11b Channel 06**

**100kHz PSD reference Level**



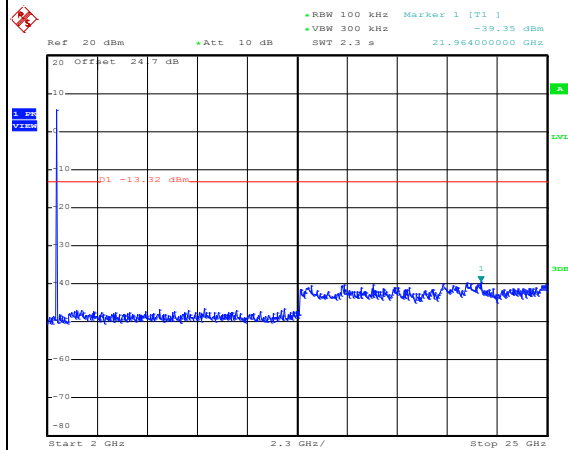
Date: 7.AUG.2013 12:00:37

**Spurious Emission 30MHz~3GHz**



Date: 7.AUG.2013 12:01:30

**Spurious Emission 2GHz~25GHz**

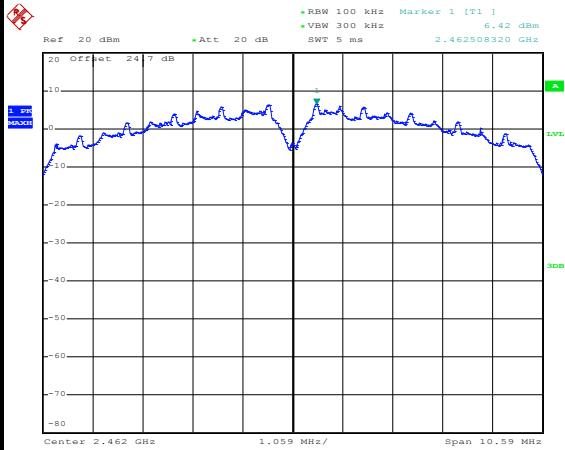


Date: 7.AUG.2013 12:01:48

Number of TX :	2	Antenna :	1
Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	55~58%
Test Channel :	11	Test Engineer :	Reece Lee

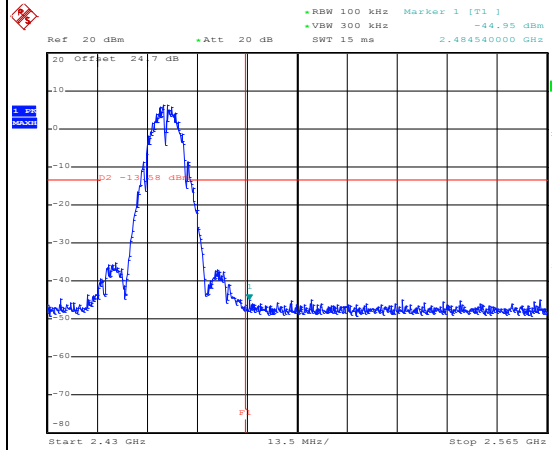
**WLAN 802.11b Channel 11**

**100kHz PSD reference Level**



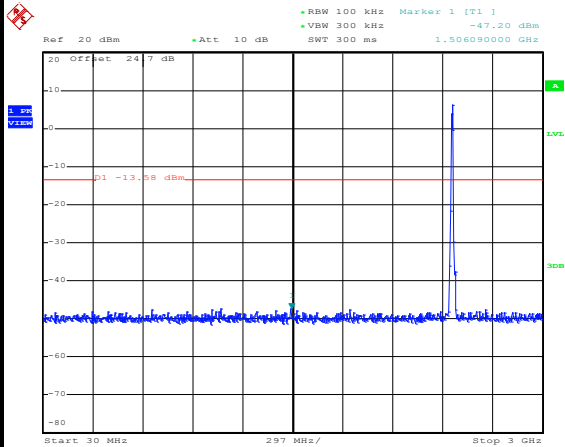
Date: 7.AUG.2013 11:26:34

**High Channel Plot**



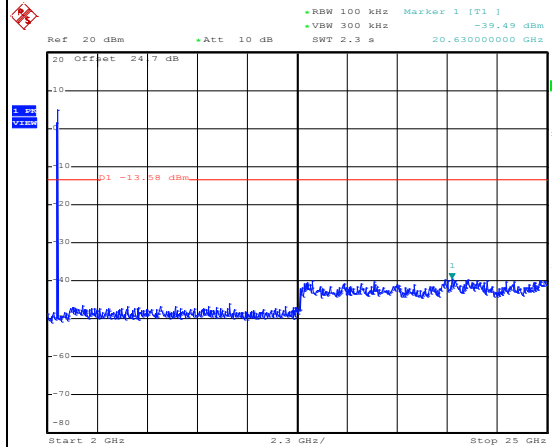
Date: 7.AUG.2013 11:26:48

**Spurious Emission 30MHz~3GHz**



Date: 7.AUG.2013 11:27:11

**Spurious Emission 2GHz~25GHz**

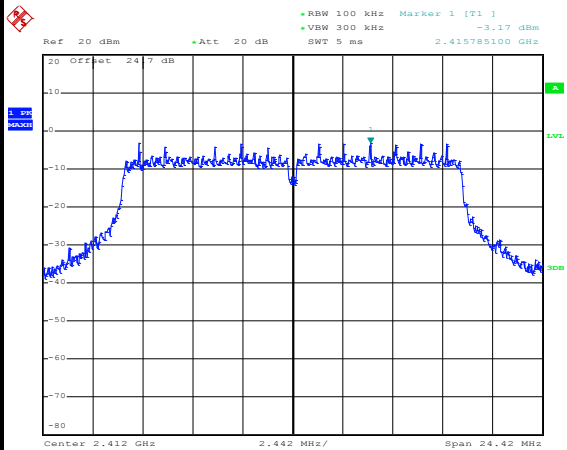


Date: 7.AUG.2013 11:27:30

Number of TX :	2	Antenna :	1
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	55~58%
Test Channel :	01	Test Engineer :	Reece Lee

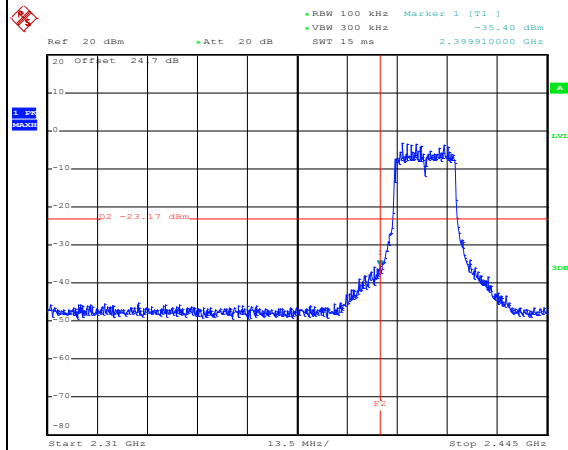
**WLAN 802.11g Channel 01**

**100kHz PSD reference Level**



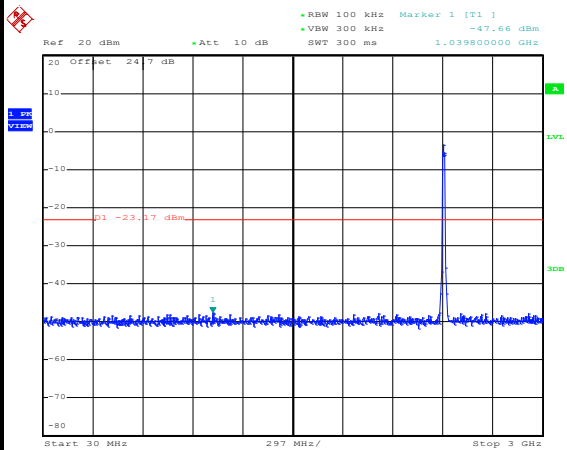
Date: 7.AUG.2013 11:46:29

**Low Channel Plot**



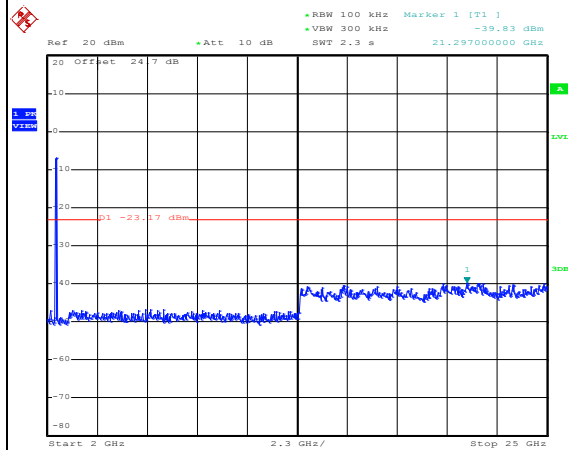
Date: 7.AUG.2013 11:46:43

**Spurious Emission 30MHz~3GHz**



Date: 7.AUG.2013 15:12:50

**Spurious Emission 2GHz~25GHz**

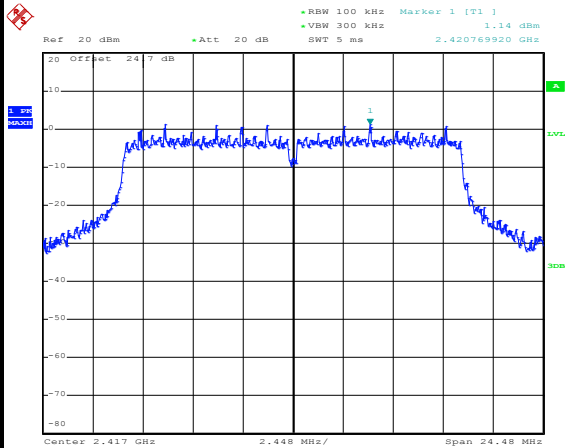


Date: 7.AUG.2013 15:13:09

Number of TX :	2	Antenna :	1
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz	Relative Humidity :	55~58%
Test Channel :	02	Test Engineer :	Reece Lee

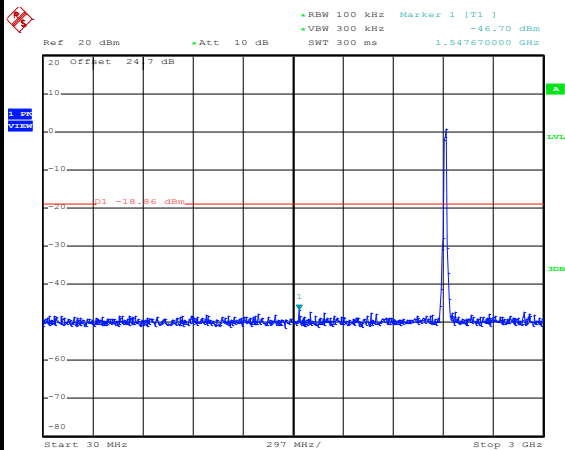
**WLAN 802.11g Channel 02**

**100kHz PSD reference Level**



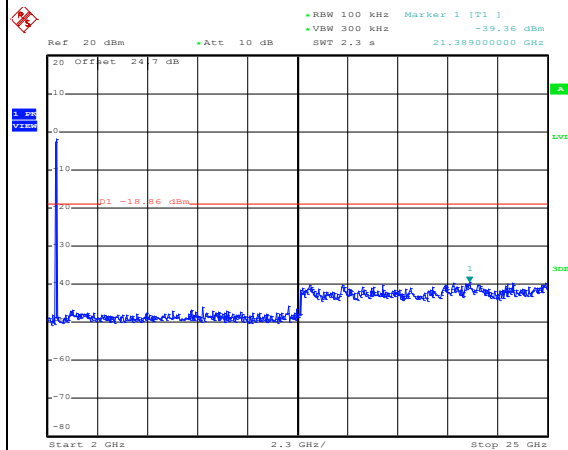
Date: 21.AUG.2013 14:42:29

**Spurious Emission 30MHz~3GHz**



Date: 21.AUG.2013 14:44:04

**Spurious Emission 2GHz~25GHz**

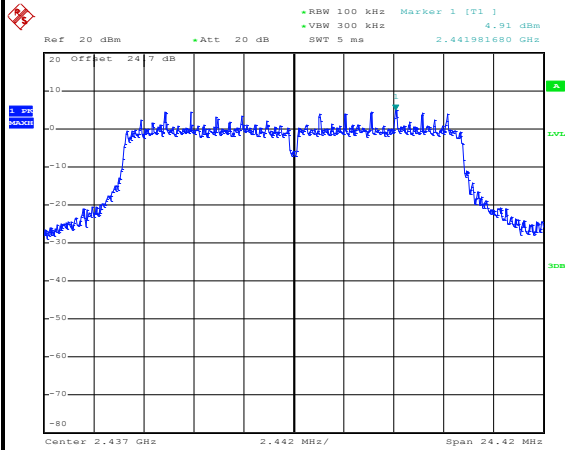


Date: 21.AUG.2013 14:44:22

Number of TX :	2	Antenna :	1
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	55~58%
Test Channel :	06	Test Engineer :	Reece Lee

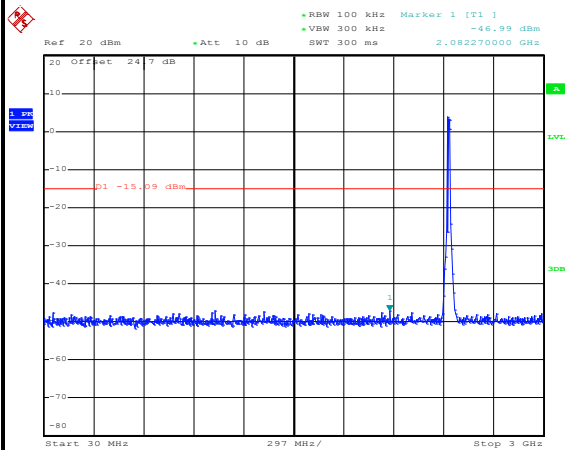
### WLAN 802.11g Channel 06

#### 100kHz PSD reference Level



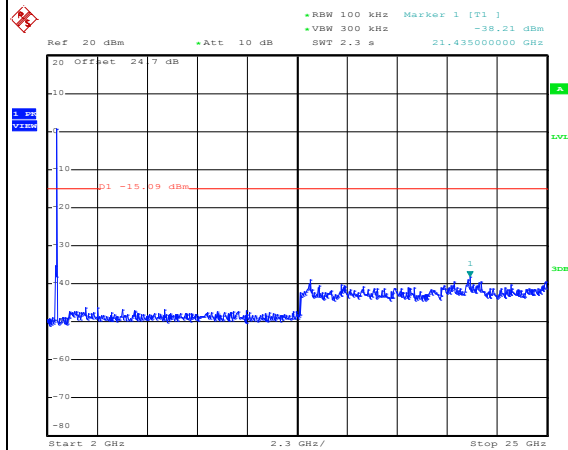
Date: 7.AUG.2013 11:34:51

#### Spurious Emission 30MHz~3GHz



Date: 7.AUG.2013 11:35:11

#### Spurious Emission 2GHz~25GHz



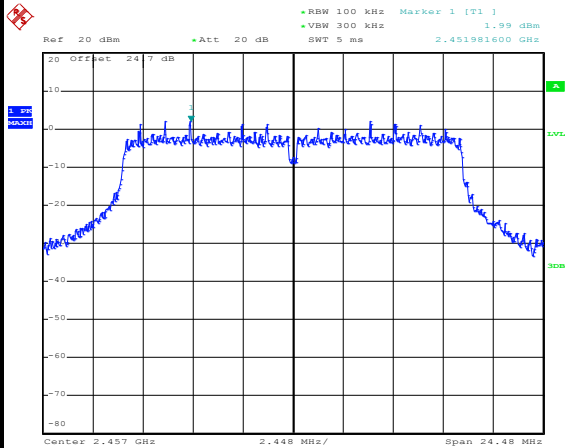
Date: 7.AUG.2013 11:35:30



Number of TX :	2	Antenna :	1
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz	Relative Humidity :	55~58%
Test Channel :	10	Test Engineer :	Reece Lee

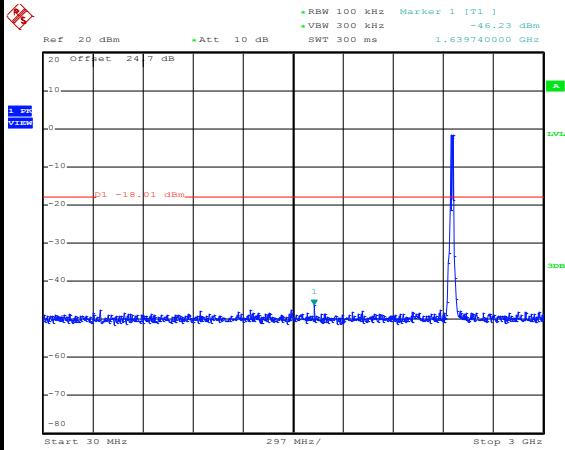
**WLAN 802.11g Channel 10**

**100kHz PSD reference Level**



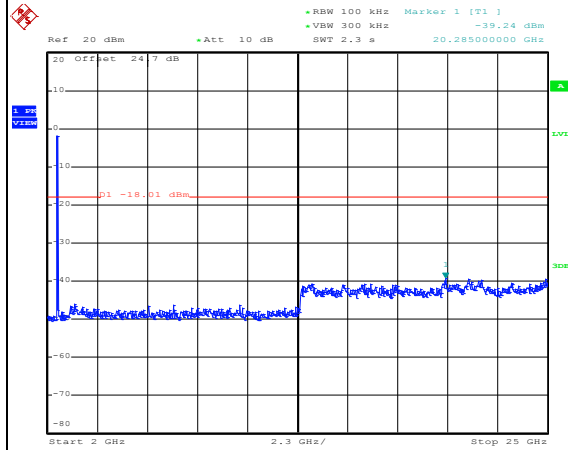
Date: 21.AUG.2013 14:55:45

**Spurious Emission 30MHz~3GHz**



Date: 21.AUG.2013 14:56:07

**Spurious Emission 2GHz~25GHz**

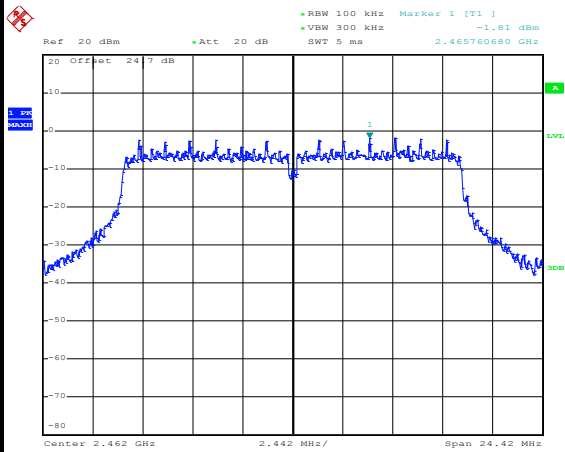


Date: 21.AUG.2013 14:56:25

Number of TX :	2	Antenna :	1
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	55~58%
Test Channel :	11	Test Engineer :	Reece Lee

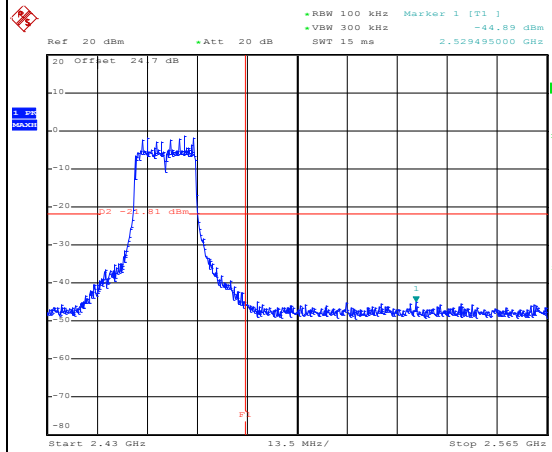
**WLAN 802.11g Channel 11**

**100kHz PSD reference Level**



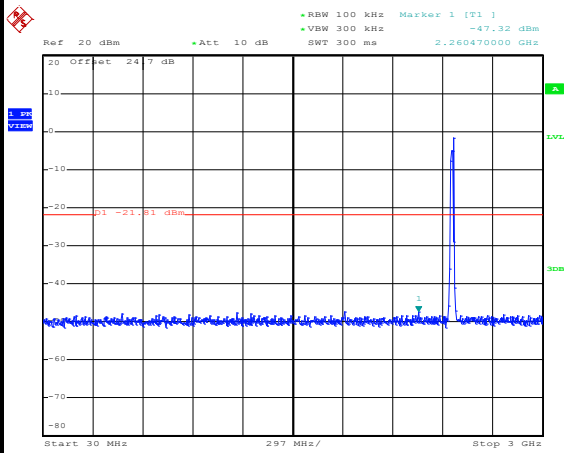
Date: 7.AUG.2013 11:50:52

**High Channel Plot**



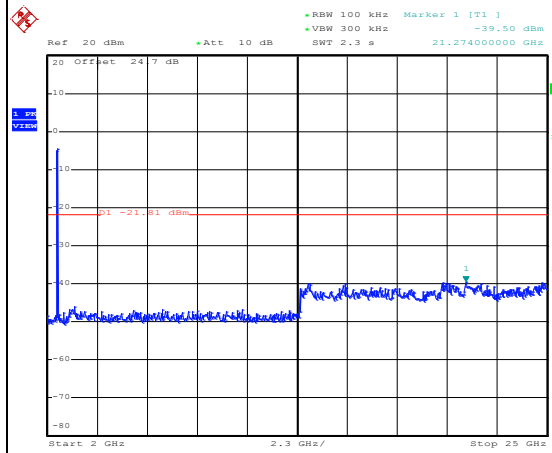
Date: 7.AUG.2013 11:51:09

**Spurious Emission 30MHz~3GHz**



Date: 7.AUG.2013 11:51:33

**Spurious Emission 2GHz~25GHz**

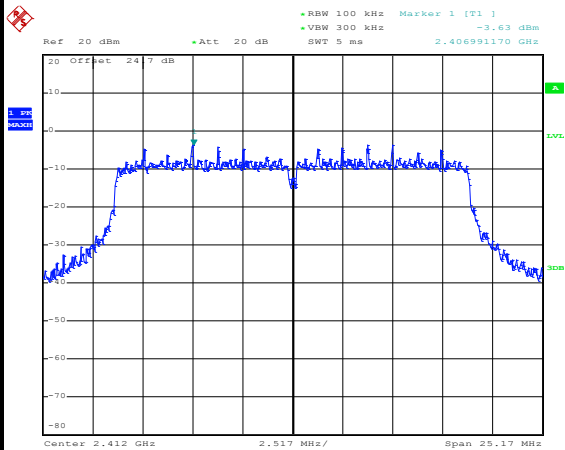


Date: 7.AUG.2013 11:51:52

Number of TX :	2	Antenna :	1
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	55~58%
Test Channel :	01	Test Engineer :	Reece Lee

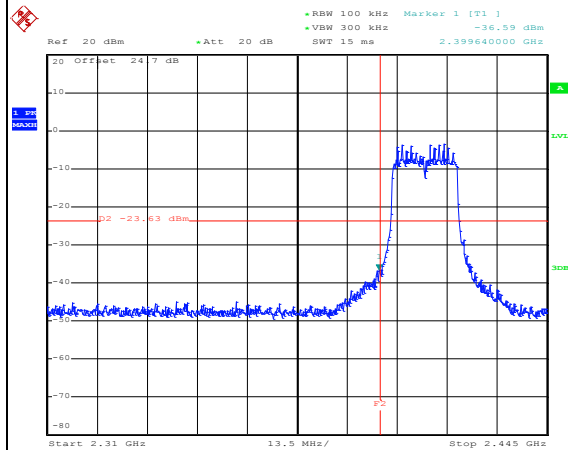
**WLAN 802.11n HT20 Channel 01**

**100kHz PSD reference Level**



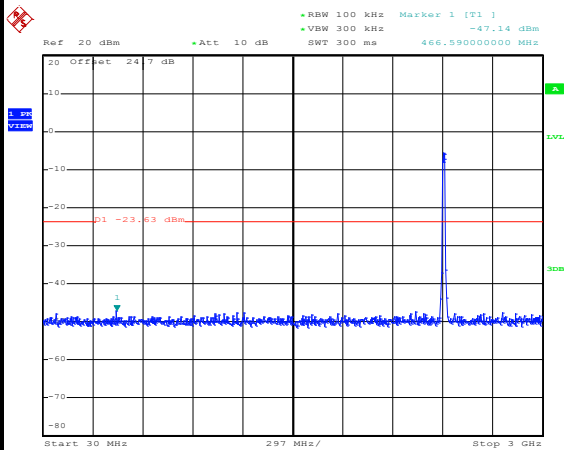
Date: 7.AUG.2013 12:42:12

**Low Channel Plot**



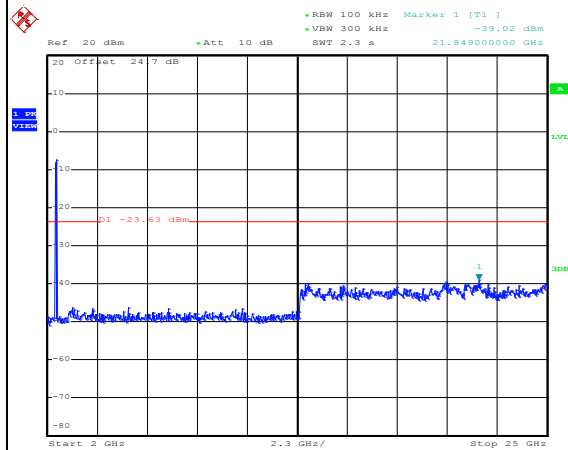
Date: 7.AUG.2013 12:42:27

**Spurious Emission 30MHz~3GHz**



Date: 7.AUG.2013 12:42:52

**Spurious Emission 2GHz~25GHz**

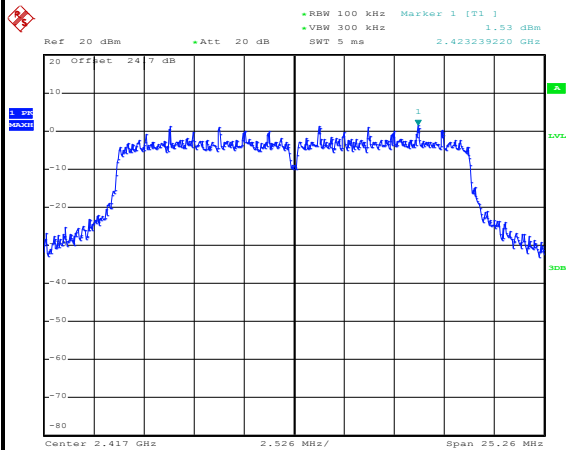


Date: 7.AUG.2013 12:43:11

Number of TX :	2	Antenna :	1
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz	Relative Humidity :	55~58%
Test Channel :	02	Test Engineer :	Reece Lee

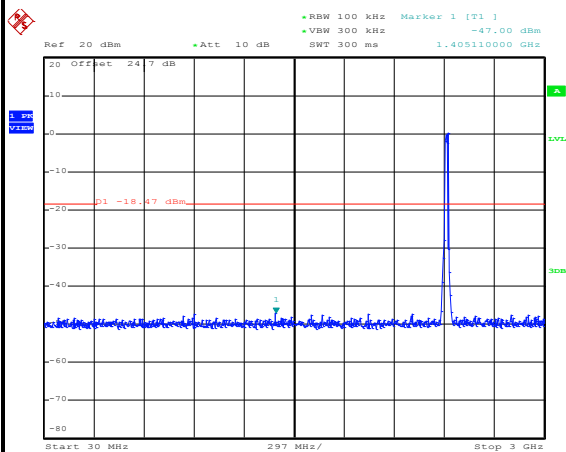
### WLAN 802.11n HT20 Channel 02

#### 100kHz PSD reference Level



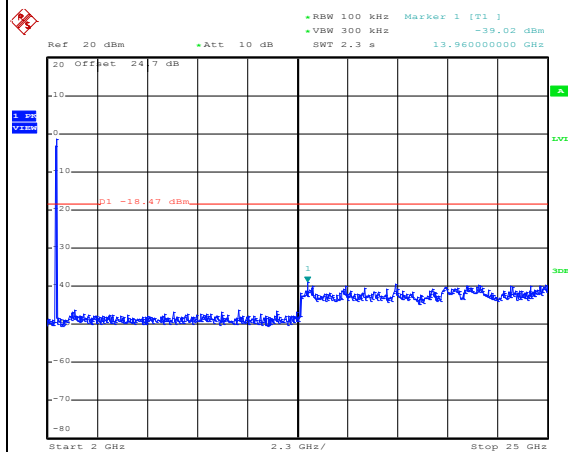
Date: 21.AUG.2013 15:11:17

#### Spurious Emission 30MHz~3GHz



Date: 21.AUG.2013 15:11:45

#### Spurious Emission 2GHz~25GHz

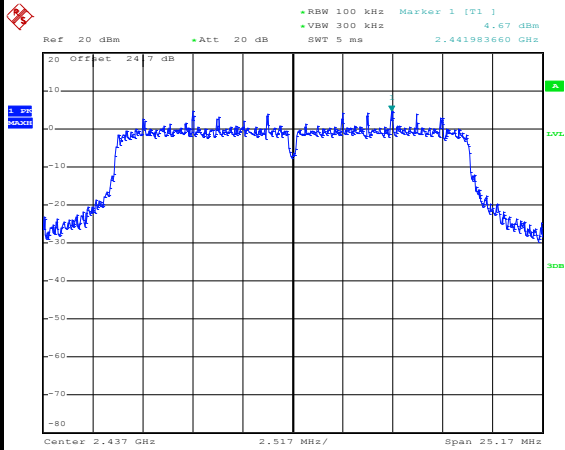


Date: 21.AUG.2013 15:12:03

Number of TX :	2	Antenna :	1
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	55~58%
Test Channel :	06	Test Engineer :	Reece Lee

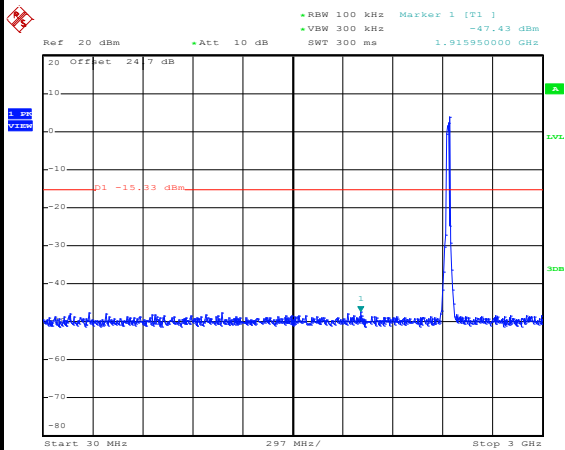
**WLAN 802.11n HT20 Channel 06**

**100kHz PSD reference Level**



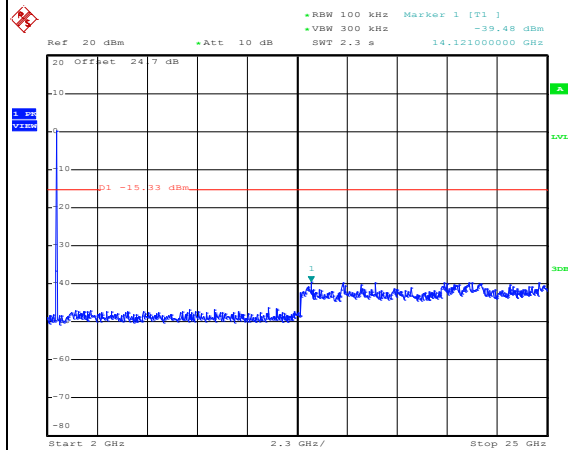
Date: 7.AUG.2013 12:39:02

**Spurious Emission 30MHz~3GHz**



Date: 7.AUG.2013 12:39:23

**Spurious Emission 2GHz~25GHz**

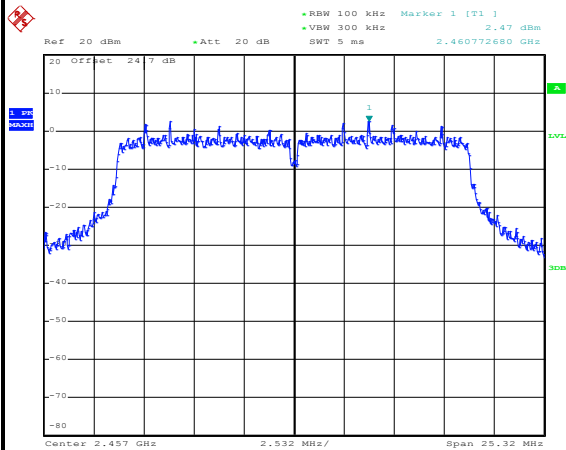


Date: 7.AUG.2013 12:39:42

Number of TX :	2	Antenna :	1
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz	Relative Humidity :	55~58%
Test Channel :	10	Test Engineer :	Reece Lee

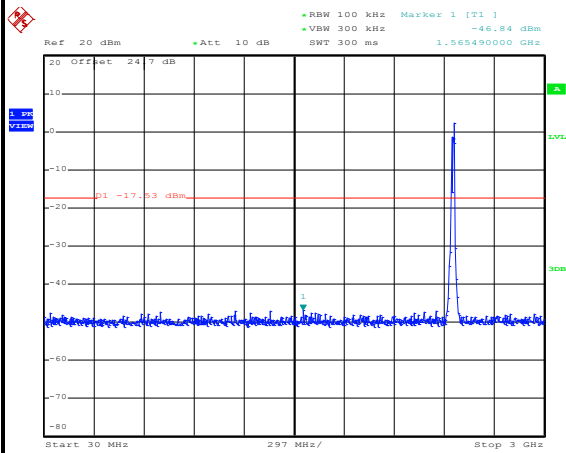
**WLAN 802.11n HT20 Channel 10**

**100kHz PSD reference Level**



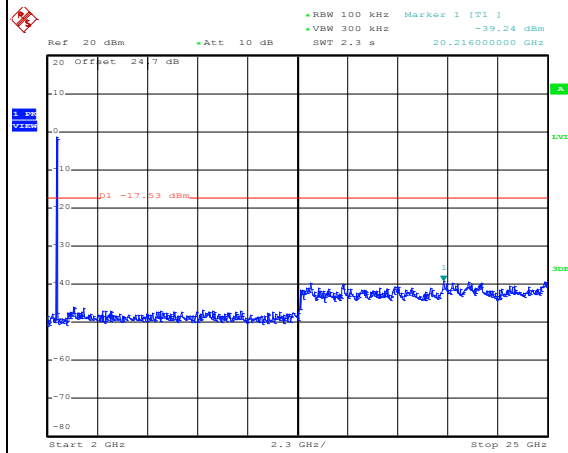
Date: 21.AUG.2013 15:00:18

**Spurious Emission 30MHz~3GHz**



Date: 21.AUG.2013 15:00:44

**Spurious Emission 2GHz~25GHz**

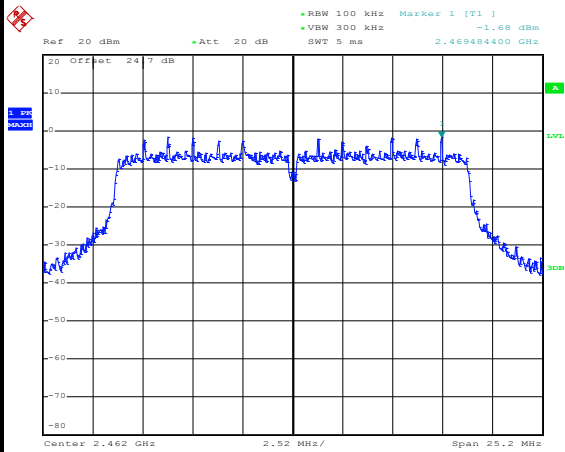


Date: 21.AUG.2013 15:01:03

Number of TX :	2	Antenna :	1
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	55~58%
Test Channel :	11	Test Engineer :	Reece Lee

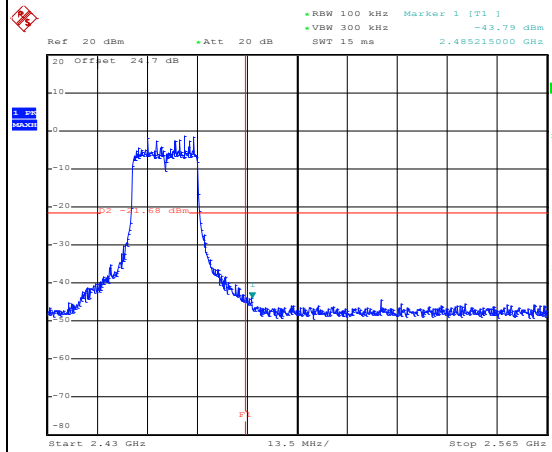
**WLAN 802.11n HT20 Channel 11**

**100kHz PSD reference Level**



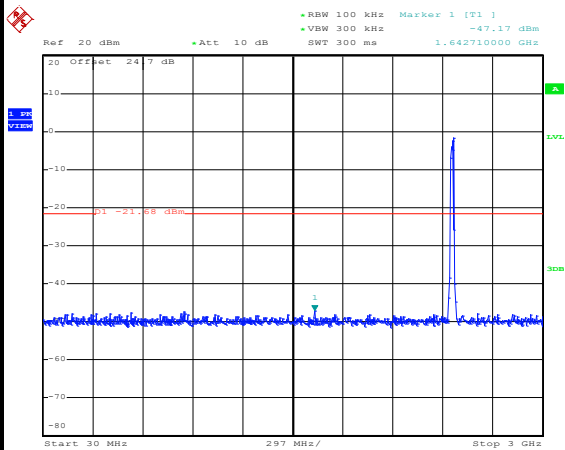
Date: 7.AUG.2013 12:28:51

**High Channel Plot**



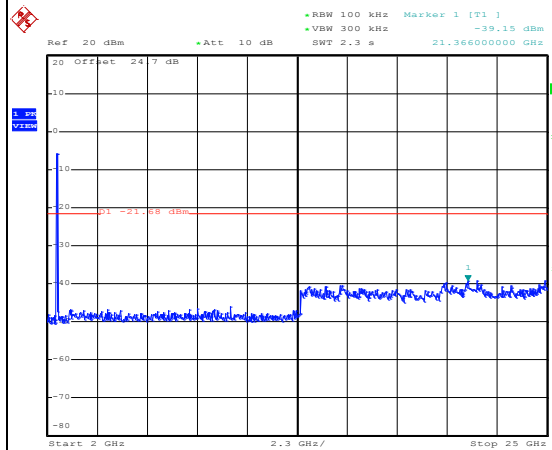
Date: 7.AUG.2013 12:29:07

**Spurious Emission 30MHz~3GHz**



Date: 7.AUG.2013 12:29:28

**Spurious Emission 2GHz~25GHz**

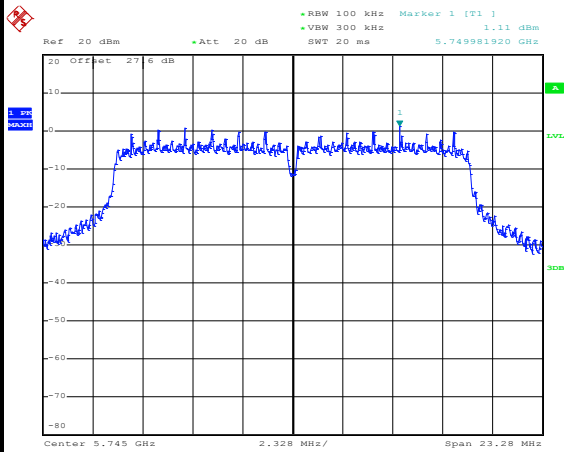


Date: 7.AUG.2013 12:29:46

Number of TX :	2	Antenna :	1
Test Mode :	802.11a	Temperature :	24~26°C
Test Band :	5GHz Low	Relative Humidity :	55~58%
Test Channel :	149	Test Engineer :	Reece Lee

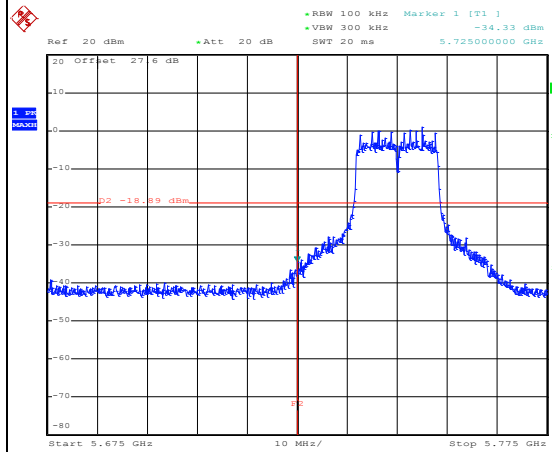
**WLAN 802.11a Channel 149**

**100kHz PSD reference Level**



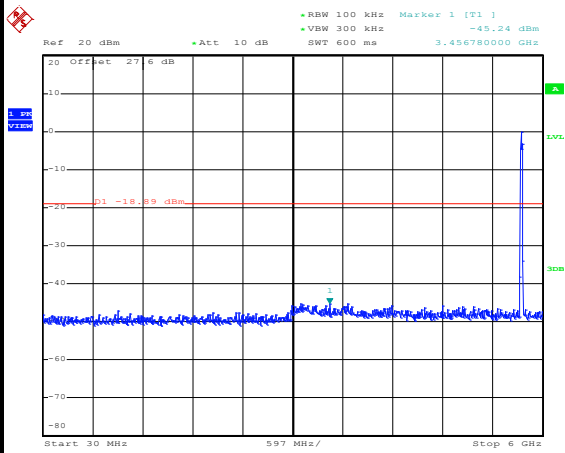
Date: 7.AUG.2013 13:33:24

**Low Channel Plot**



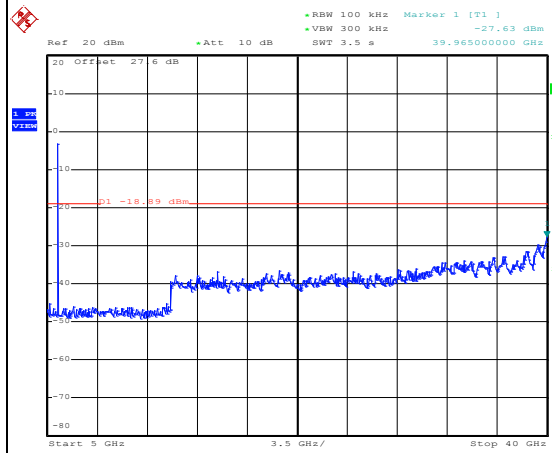
Date: 7.AUG.2013 13:33:39

**Spurious Emission 30MHz~6GHz**



Date: 7.AUG.2013 13:34:13

**Spurious Emission 5GHz~40GHz**



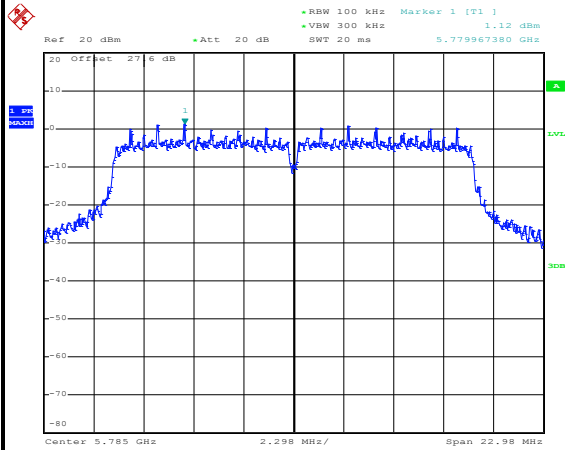
Date: 7.AUG.2013 13:34:32



Number of TX :	2	Antenna :	1
Test Mode :	802.11a	Temperature :	24~26°C
Test Band :	5GHz Mid	Relative Humidity :	55~58%
Test Channel :	157	Test Engineer :	Reece Lee

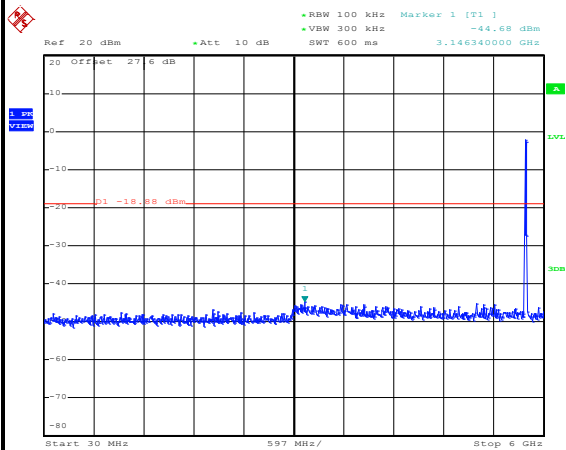
**WLAN 802.11a Channel 157**

**100kHz PSD reference Level**



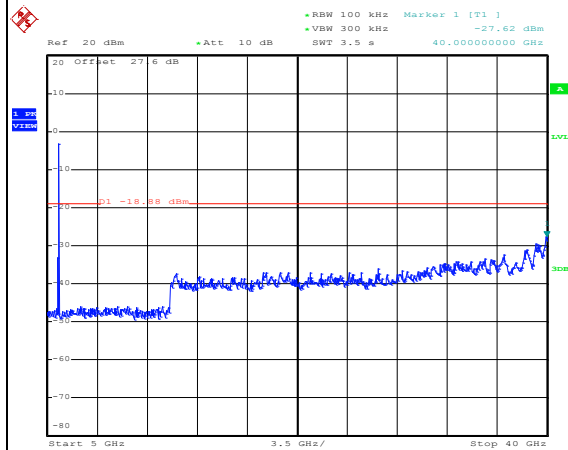
Date: 7.AUG.2013 13:47:18

**Spurious Emission 30MHz~6GHz**



Date: 7.AUG.2013 13:47:42

**Spurious Emission 5GHz~40GHz**

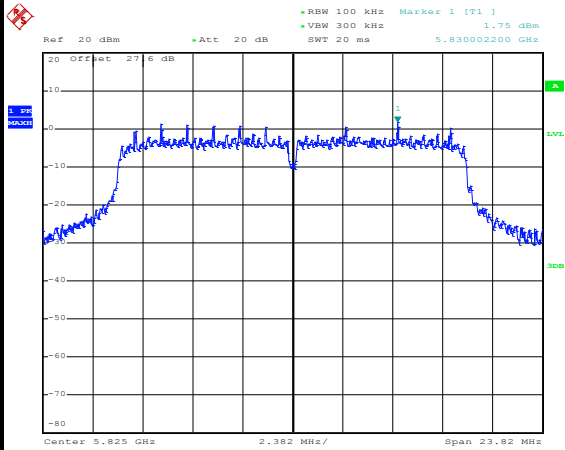


Date: 7.AUG.2013 13:48:00

Number of TX :	2	Antenna :	1
Test Mode :	802.11a	Temperature :	24~26°C
Test Band :	5GHz High	Relative Humidity :	55~58%
Test Channel :	165	Test Engineer :	Reece Lee

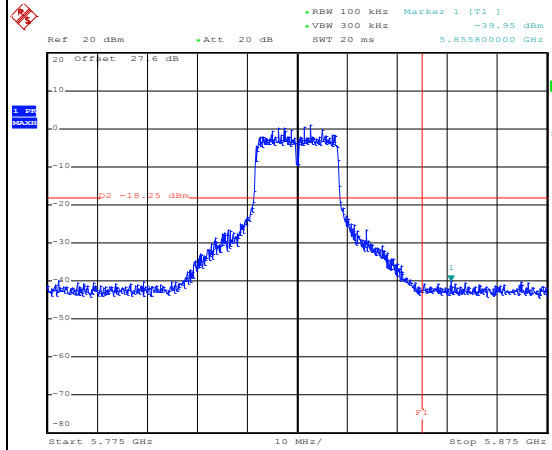
**WLAN 802.11a Channel 165**

**100kHz PSD reference Level**



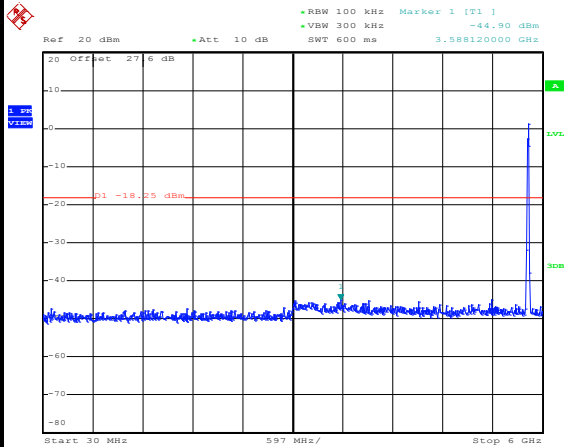
Date: 7.AUG.2013 13:52:22

**High Channel Plot**



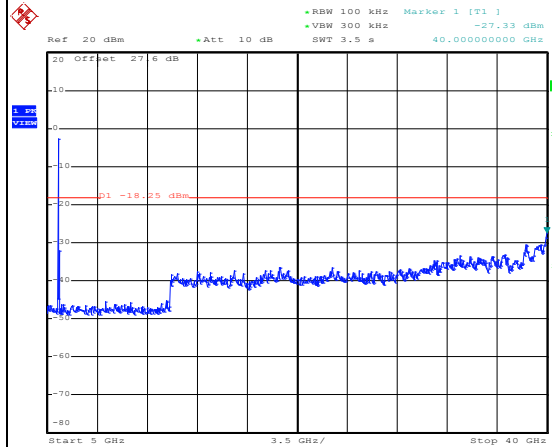
Date: 7.AUG.2013 13:52:46

**Spurious Emission 30MHz~6GHz**



Date: 7.AUG.2013 13:53:14

**Spurious Emission 5GHz~40GHz**

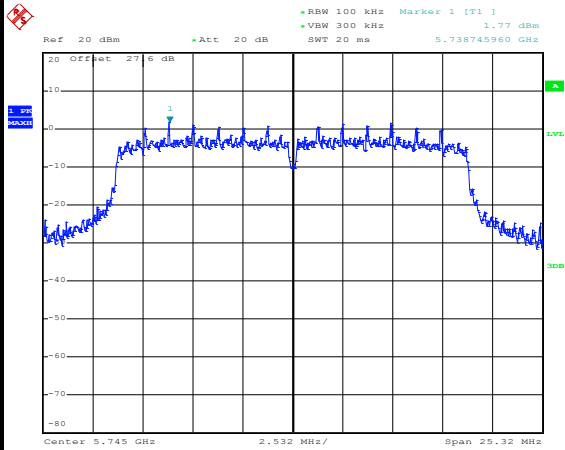


Date: 7.AUG.2013 13:53:32

Number of TX :	2	Antenna :	1
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	5GHz Low	Relative Humidity :	55~58%
Test Channel :	149	Test Engineer :	Reece Lee

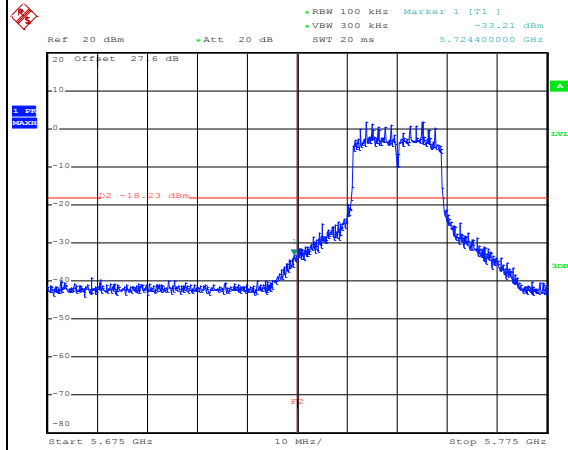
**WLAN 802.11n HT20 Channel 149**

**100kHz PSD reference Level**



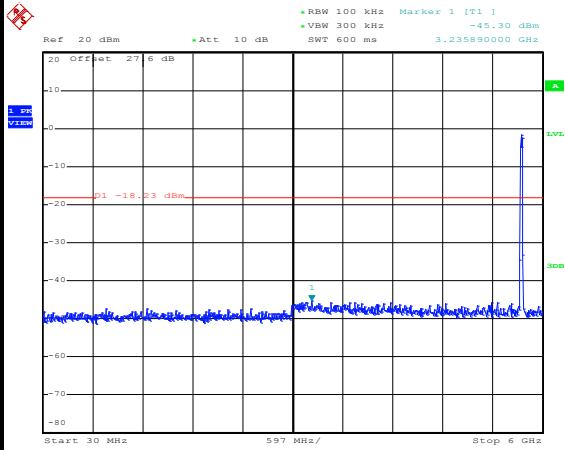
Date: 7.AUG.2013 14:40:45

**Low Channel Plot**



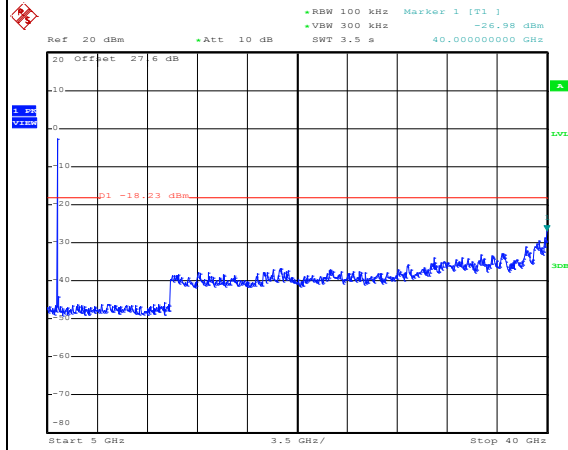
Date: 7.AUG.2013 14:41:38

**Spurious Emission 30MHz~6GHz**



Date: 7.AUG.2013 14:41:57

**Spurious Emission 5GHz~40GHz**

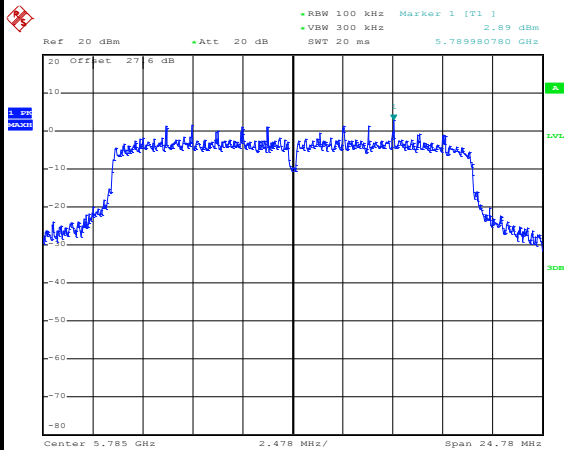


Date: 7.AUG.2013 14:42:16

Number of TX :	2	Antenna :	1
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	5GHz Mid	Relative Humidity :	55~58%
Test Channel :	157	Test Engineer :	Reece Lee

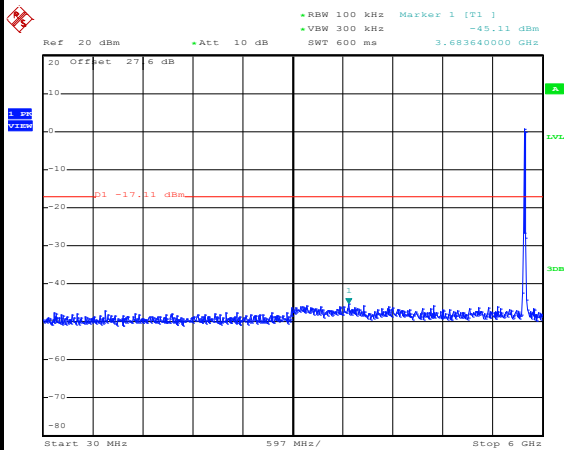
**WLAN 802.11n HT20 Channel 157**

**100kHz PSD reference Level**



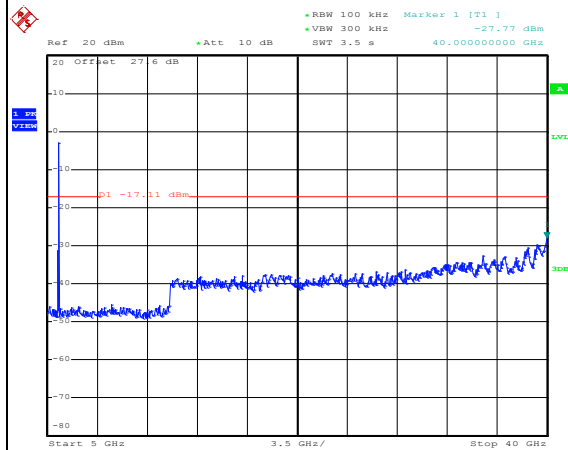
Date: 7.AUG.2013 14:19:18

**Spurious Emission 30MHz~6GHz**



Date: 7.AUG.2013 14:20:20

**Spurious Emission 5GHz~40GHz**

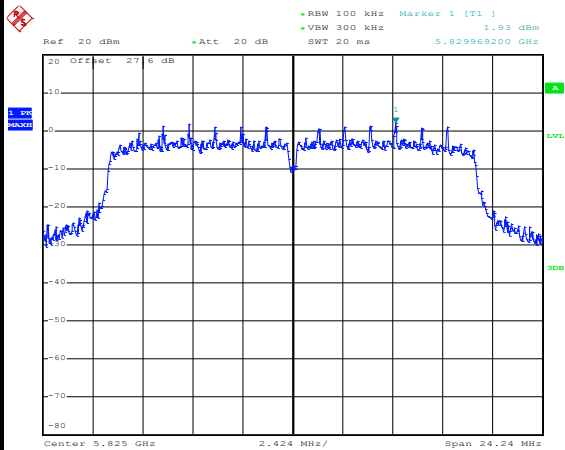


Date: 7.AUG.2013 14:20:39

Number of TX :	2	Antenna:	1
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	5GHz High	Relative Humidity :	55~58%
Test Channel :	165	Test Engineer :	Reece Lee

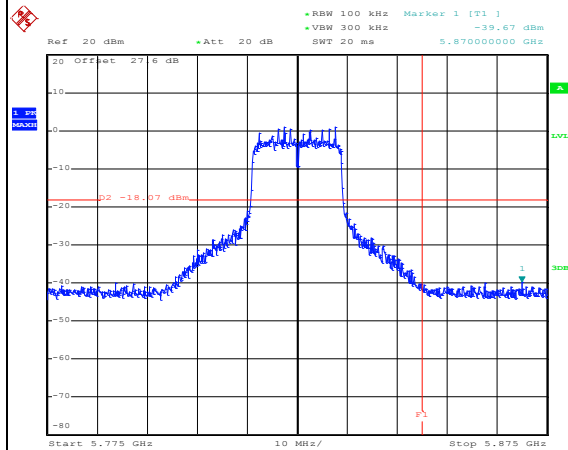
**WLAN 802.11n HT20 Channel 165**

**100kHz PSD reference Level**



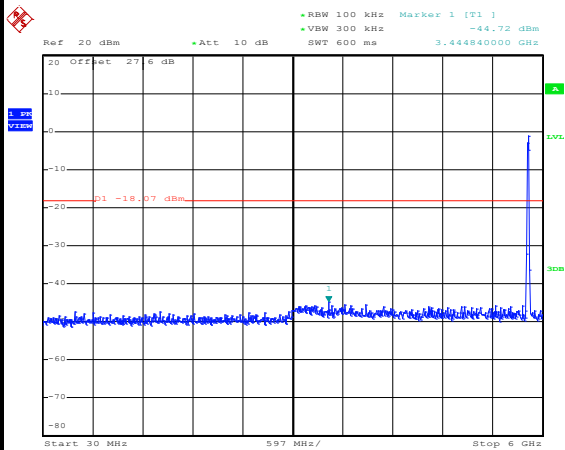
Date: 7.AUG.2013 14:11:02

**High Channel Plot**



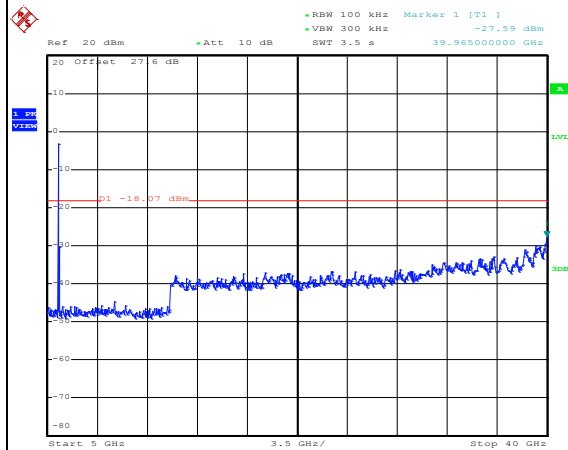
Date: 7.AUG.2013 14:11:46

**Spurious Emission 30MHz~6GHz**



Date: 7.AUG.2013 14:13:22

**Spurious Emission 5GHz~40GHz**

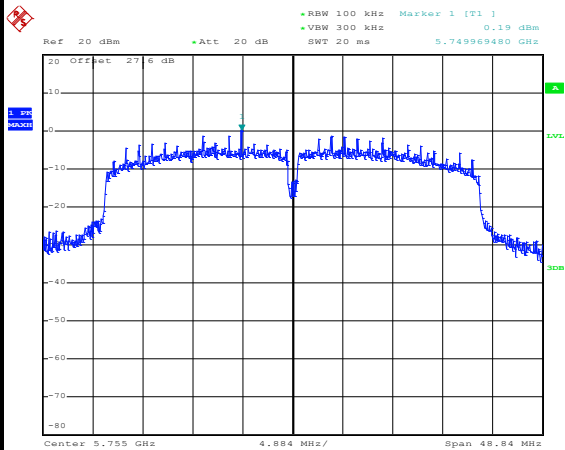


Date: 7.AUG.2013 14:13:40

Number of TX :	2	Antenna :	1
Test Mode :	802.11n HT40	Temperature :	24~26°C
Test Band :	5GHz Low	Relative Humidity :	55~58%
Test Channel :	151	Test Engineer :	Reece Lee

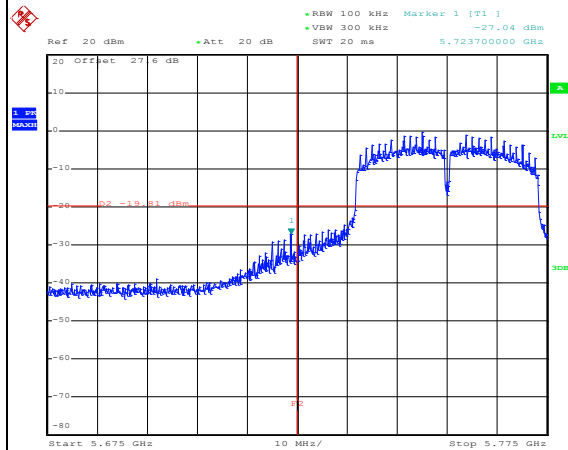
**WLAN 802.11n HT40 Channel 151**

**100kHz PSD reference Level**



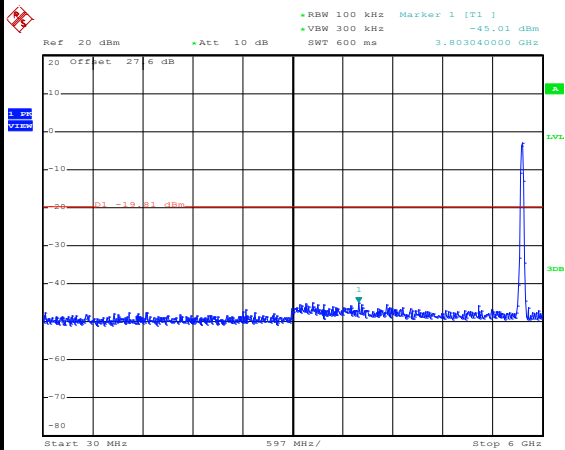
Date: 7.AUG.2013 14:50:29

**Low Channel Plot**



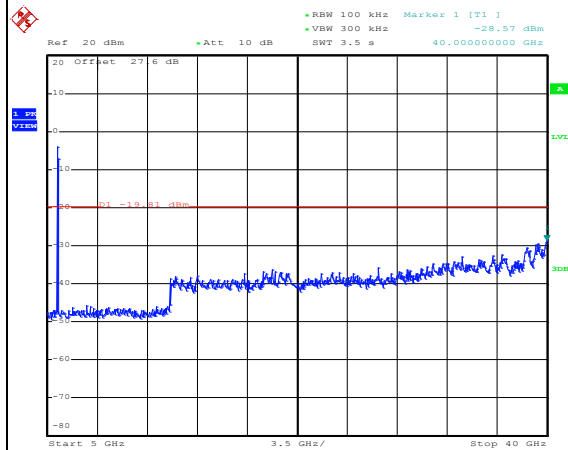
Date: 7.AUG.2013 14:51:07

**Spurious Emission 30MHz~6GHz**



Date: 7.AUG.2013 14:51:28

**Spurious Emission 5GHz~40GHz**

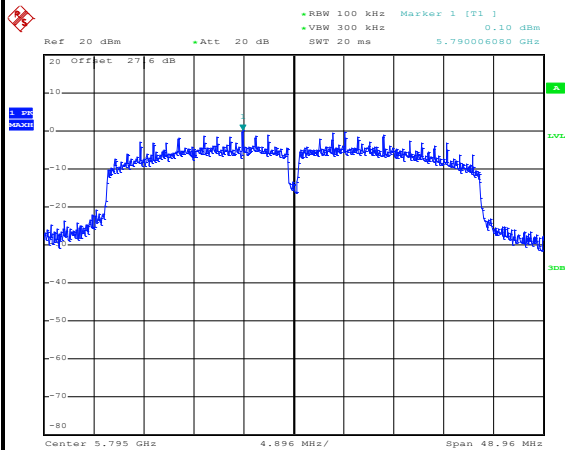


Date: 7.AUG.2013 14:51:47

Number of TX :	2	Antenna :	1
Test Mode :	802.11n HT40	Temperature :	24~26°C
Test Band :	5GHz High	Relative Humidity :	55~58%
Test Channel :	159	Test Engineer :	Reece Lee

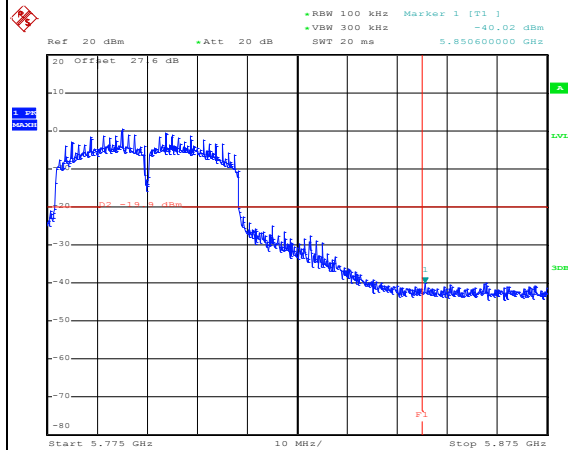
**WLAN 802.11n HT40 Channel 159**

**100kHz PSD reference Level**



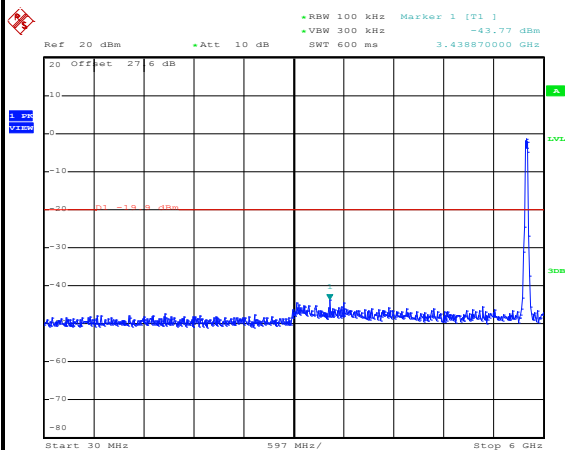
Date: 7.AUG.2013 15:17:13

**High Channel Plot**



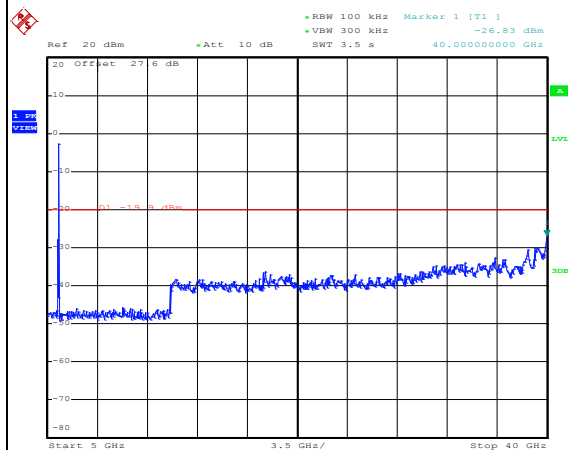
Date: 7.AUG.2013 15:17:59

**Spurious Emission 30MHz~6GHz**



Date: 7.AUG.2013 15:18:47

**Spurious Emission 5GHz~40GHz**



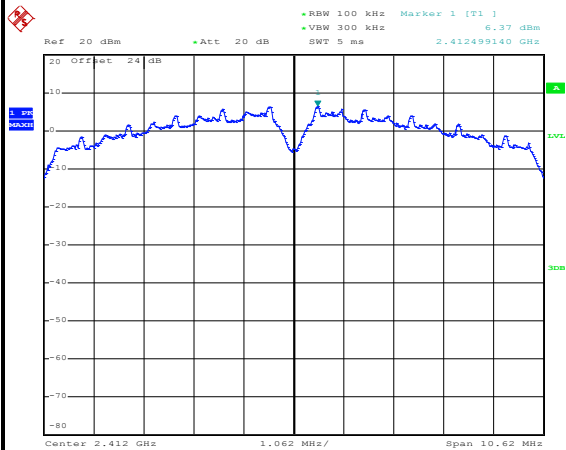
Date: 7.AUG.2013 15:19:05

Number of TX = 2, Antenna =2

Number of TX :	2	Antenna :	2
Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	55~58%
Test Channel :	01	Test Engineer :	Reece Lee

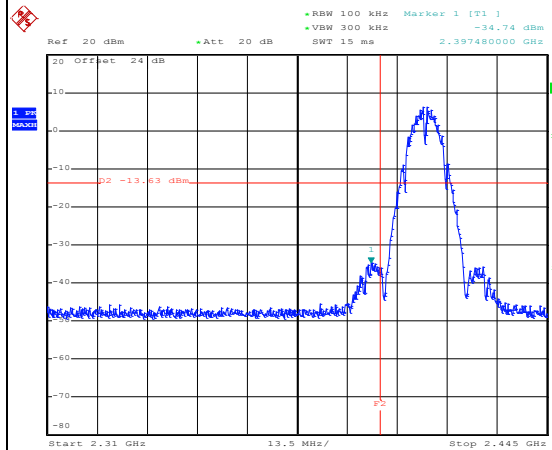
WLAN 802.11b Channel 01

100kHz PSD reference Level



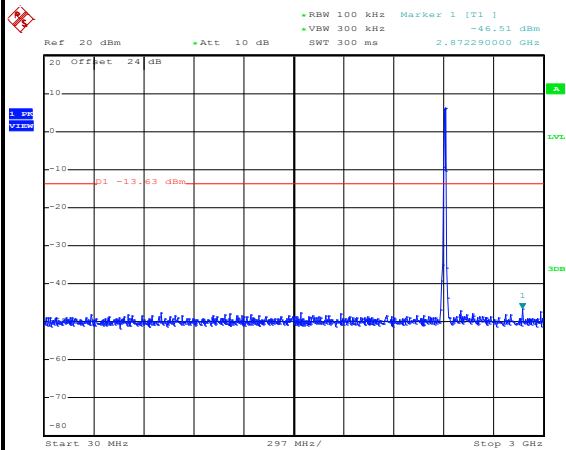
Date: 7.AUG.2013 11:09:51

Low Channel Plot



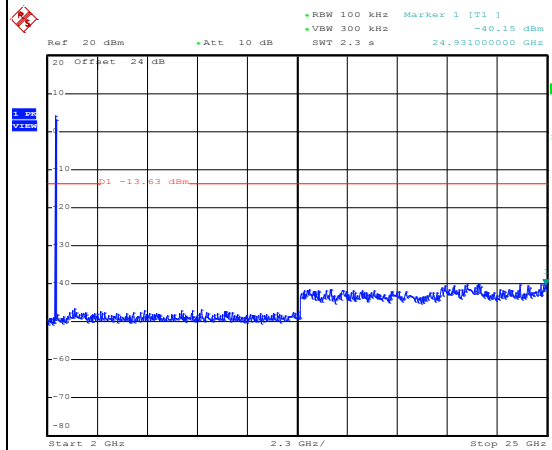
Date: 7.AUG.2013 11:10:15

Spurious Emission 30MHz~3GHz



Date: 7.AUG.2013 11:10:45

Spurious Emission 2GHz~25GHz



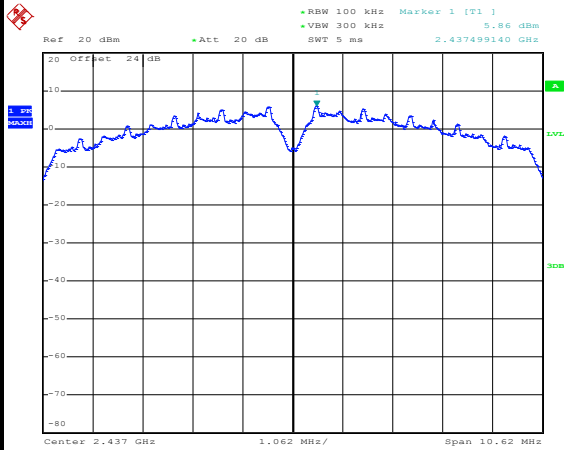
Date: 7.AUG.2013 11:11:03



Number of TX :	2	Antenna :	2
Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	55~58%
Test Channel :	06	Test Engineer :	Reece Lee

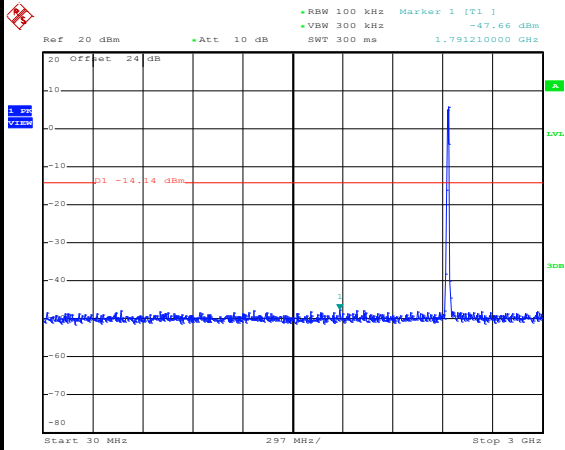
**WLAN 802.11b Channel 06**

**100kHz PSD reference Level**



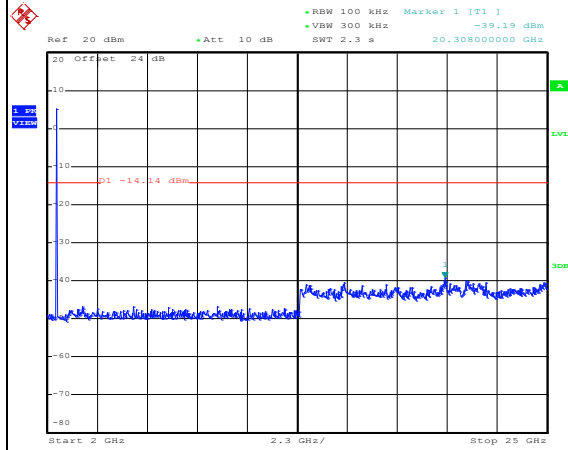
Date: 7.AUG.2013 11:06:45

**Spurious Emission 30MHz~3GHz**



Date: 7.AUG.2013 11:07:07

**Spurious Emission 2GHz~25GHz**

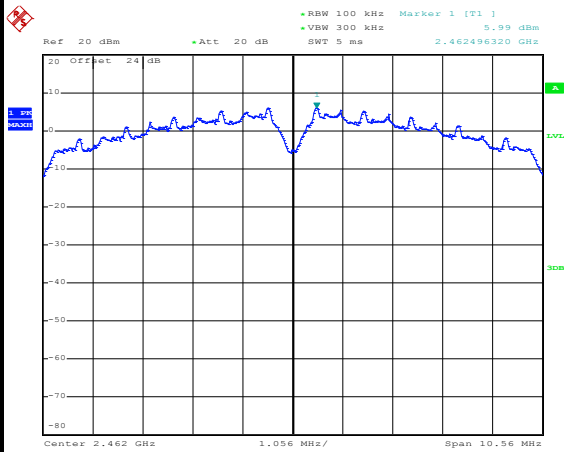


Date: 7.AUG.2013 11:07:26

Number of TX :	2	Antenna :	2
Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	55~58%
Test Channel :	11	Test Engineer :	Reece Lee

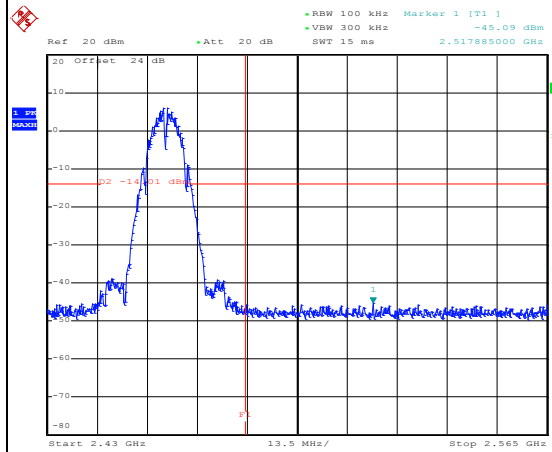
**WLAN 802.11b Channel 11**

**100kHz PSD reference Level**



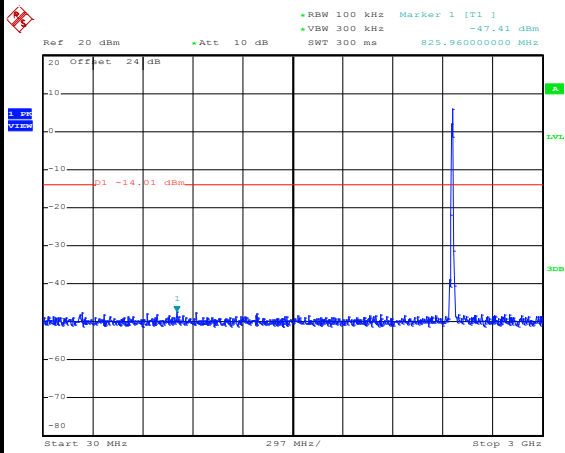
Date: 7.AUG.2013 11:14:25

**High Channel Plot**



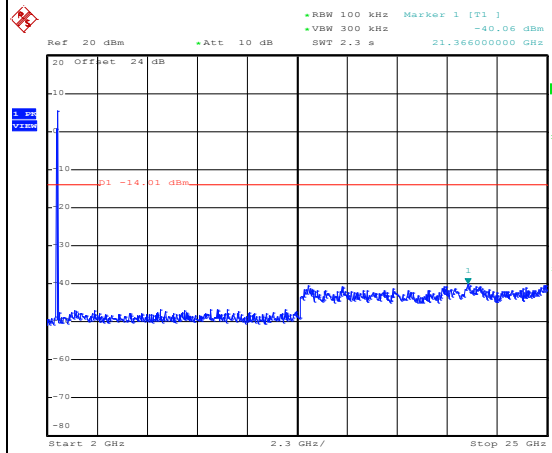
Date: 7.AUG.2013 11:14:48

**Spurious Emission 30MHz~3GHz**



Date: 7.AUG.2013 11:15:14

**Spurious Emission 2GHz~25GHz**

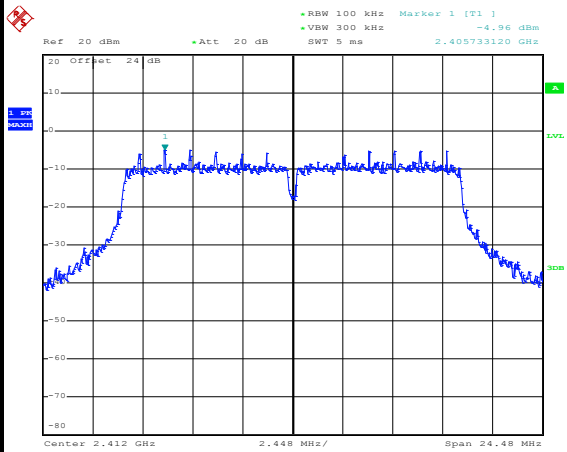


Date: 7.AUG.2013 11:15:33

Number of TX :	2	Antenna :	2
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	55~58%
Test Channel :	01	Test Engineer :	Reece Lee

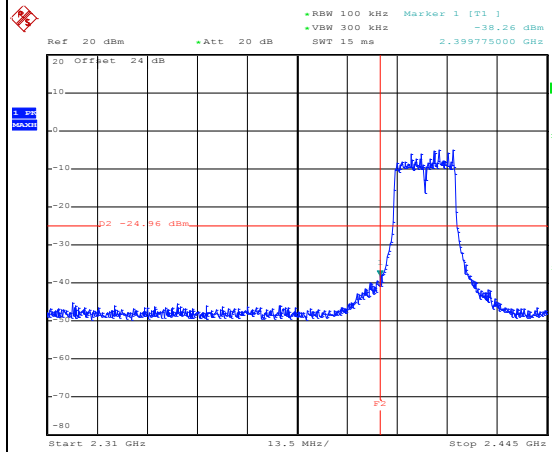
**WLAN 802.11g Channel 01**

**100kHz PSD reference Level**



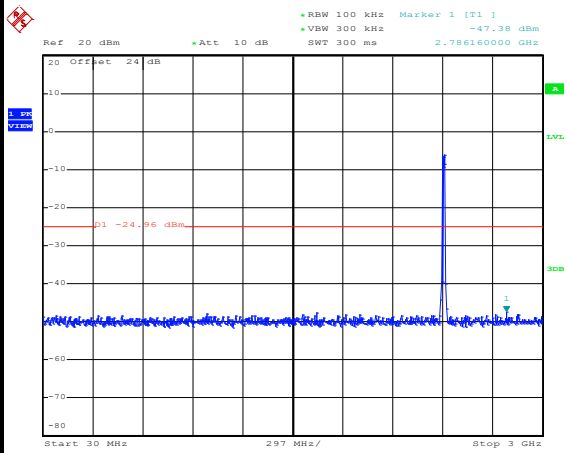
Date: 7.AUG.2013 11:42:53

**Low Channel Plot**



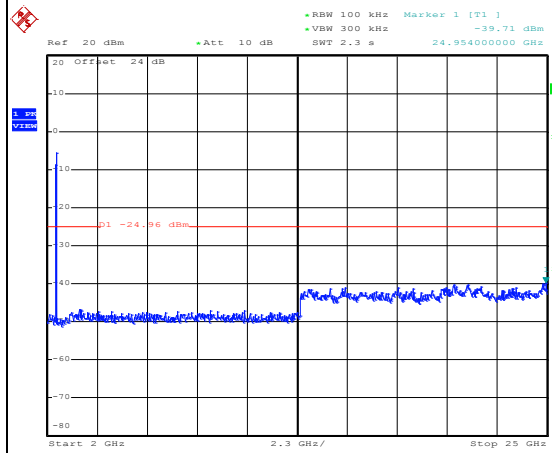
Date: 7.AUG.2013 11:43:09

**Spurious Emission 30MHz~3GHz**



Date: 7.AUG.2013 11:43:35

**Spurious Emission 2GHz~25GHz**

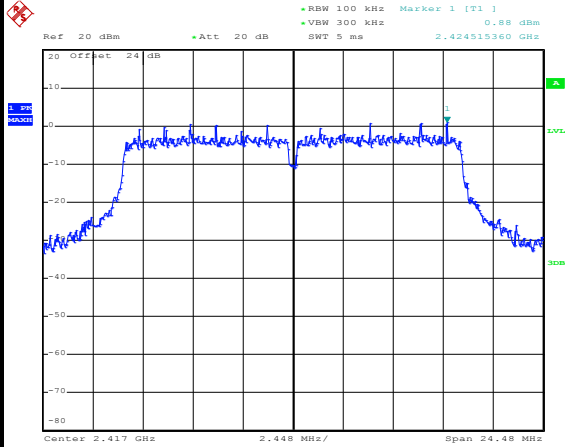


Date: 7.AUG.2013 11:43:53

Number of TX :	2	Antenna :	2
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz	Relative Humidity :	55~58%
Test Channel :	02	Test Engineer :	Reece Lee

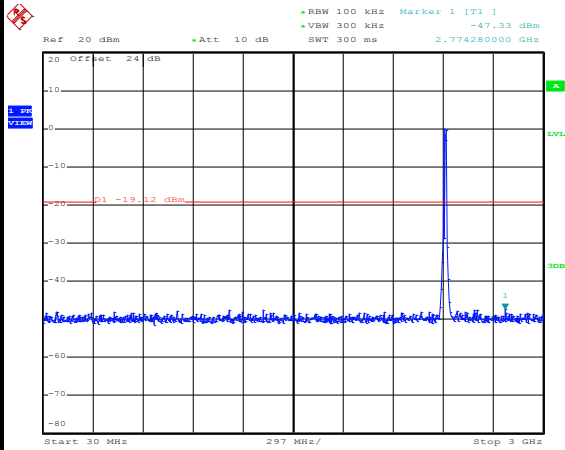
**WLAN 802.11g Channel 02**

**100kHz PSD reference Level**



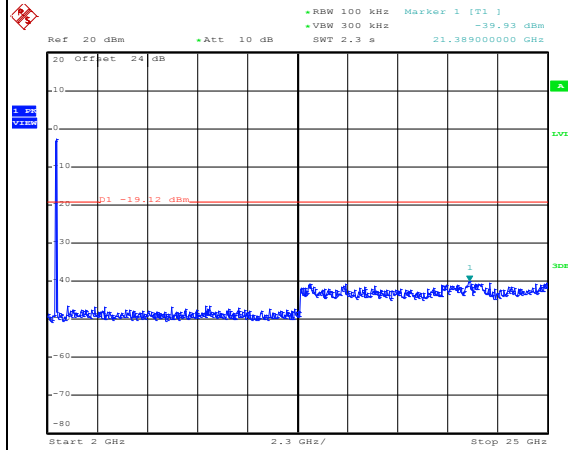
Date: 21.AUG.2013 14:47:11

**Spurious Emission 30MHz~3GHz**



Date: 21.AUG.2013 14:47:31

**Spurious Emission 2GHz~25GHz**

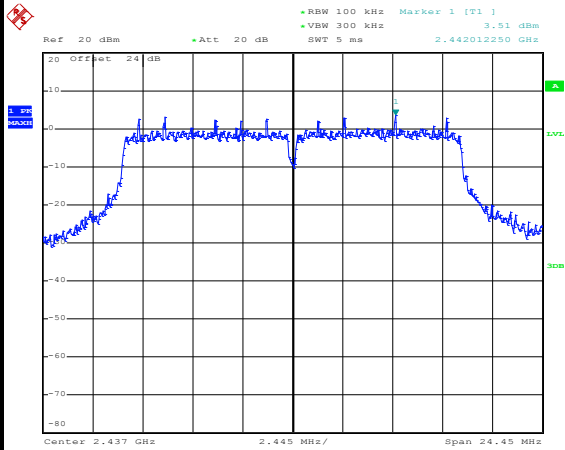


Date: 21.AUG.2013 14:47:50

Number of TX :	2	Antenna :	2
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	55~58%
Test Channel :	06	Test Engineer :	Reece Lee

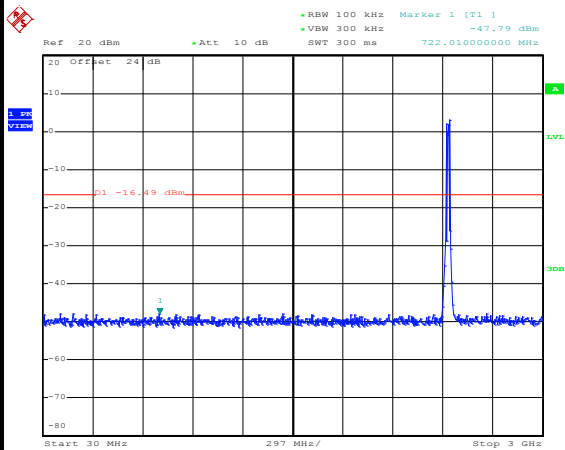
**WLAN 802.11g Channel 06**

**100kHz PSD reference Level**



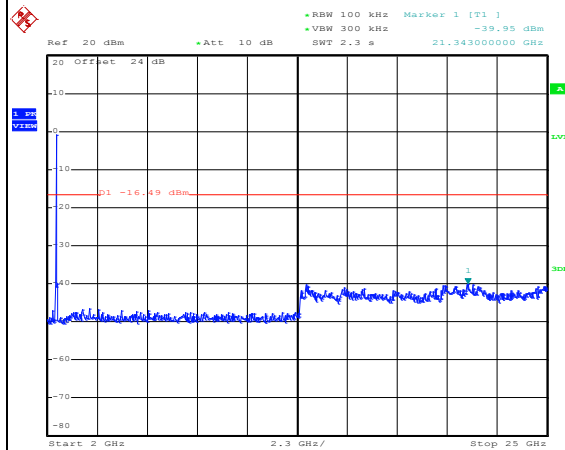
Date: 7.AUG.2013 11:38:38

**Spurious Emission 30MHz~3GHz**



Date: 7.AUG.2013 11:38:59

**Spurious Emission 2GHz~25GHz**

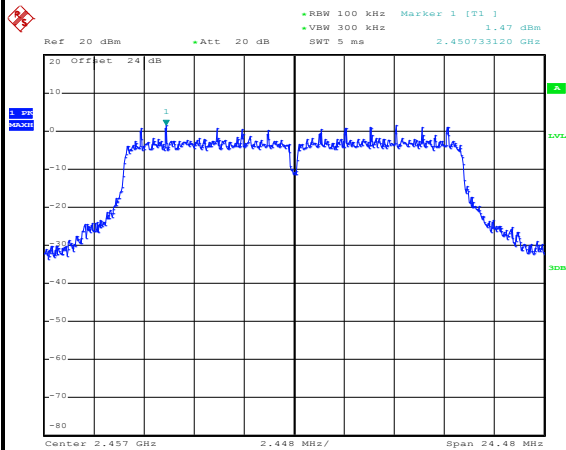


Date: 7.AUG.2013 11:39:17

Number of TX :	2	Antenna :	2
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz	Relative Humidity :	55~58%
Test Channel :	10	Test Engineer :	Reece Lee

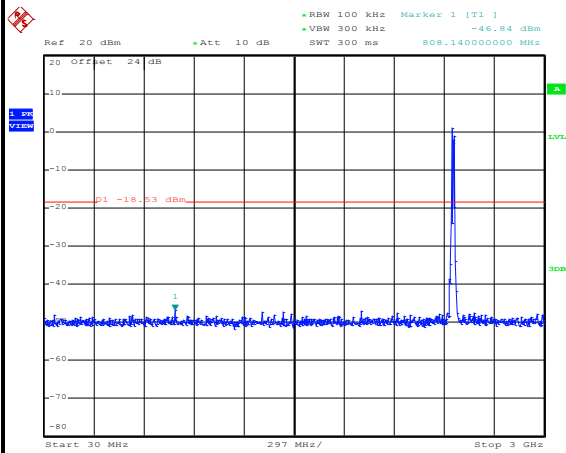
### WLAN 802.11g Channel 10

#### 100kHz PSD reference Level



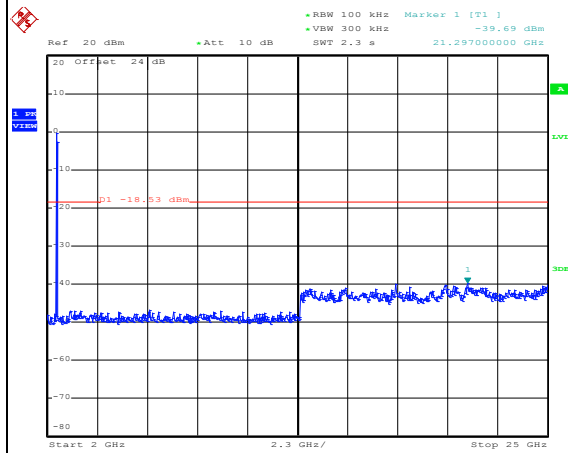
Date: 21.AUG.2013 14:52:18

#### Spurious Emission 30MHz~3GHz



Date: 21.AUG.2013 14:52:40

#### Spurious Emission 2GHz~25GHz

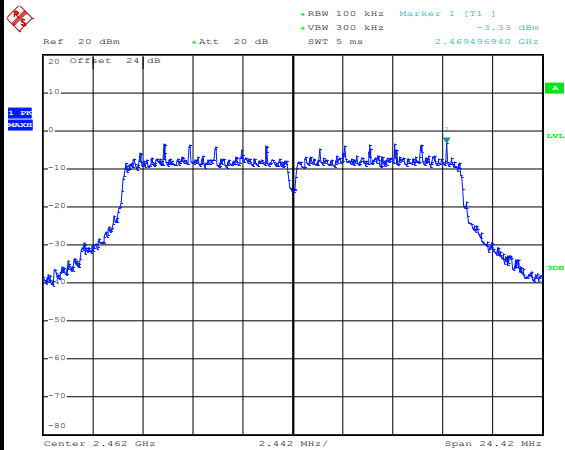


Date: 21.AUG.2013 14:52:59

Number of TX :	2	Antenna :	2
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	55~58%
Test Channel :	11	Test Engineer :	Reece Lee

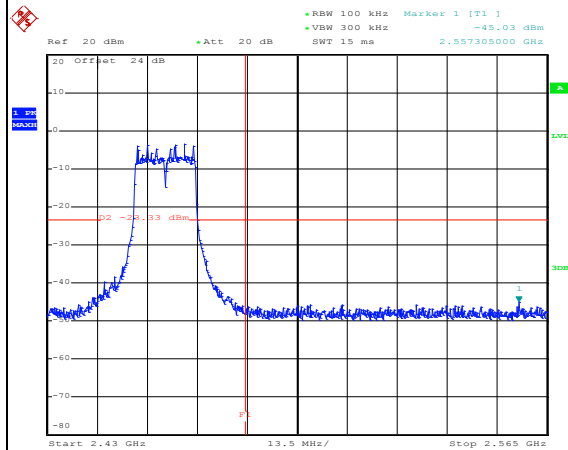
**WLAN 802.11g Channel 11**

**100kHz PSD reference Level**



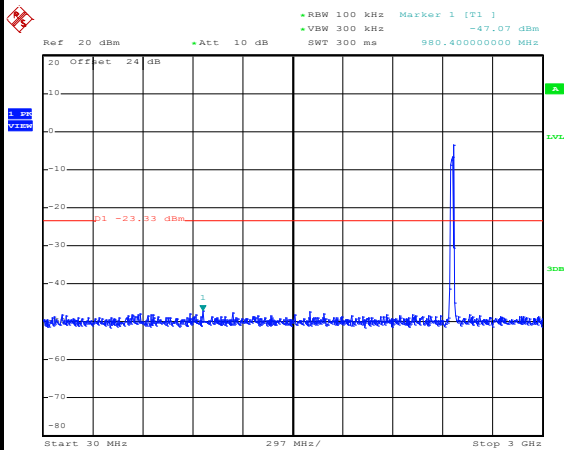
Date: 7.AUG.2013 11:55:22

**High Channel Plot**



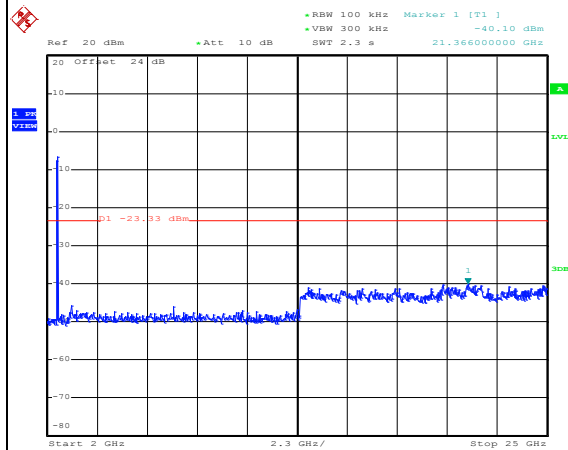
Date: 7.AUG.2013 11:55:44

**Spurious Emission 30MHz~3GHz**



Date: 7.AUG.2013 11:56:06

**Spurious Emission 2GHz~25GHz**

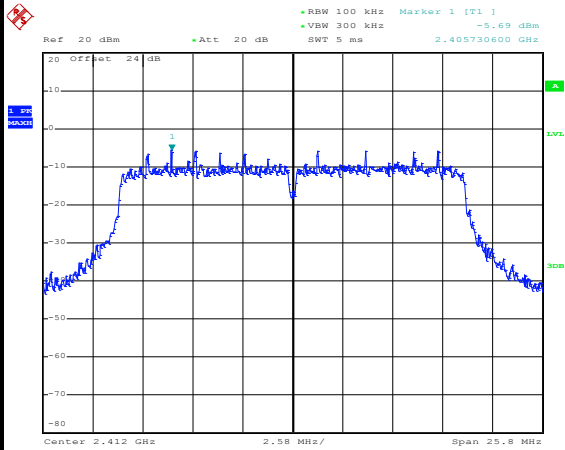


Date: 7.AUG.2013 11:56:25

Number of TX :	2	Antenna :	2
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	55~58%
Test Channel :	01	Test Engineer :	Reece Lee

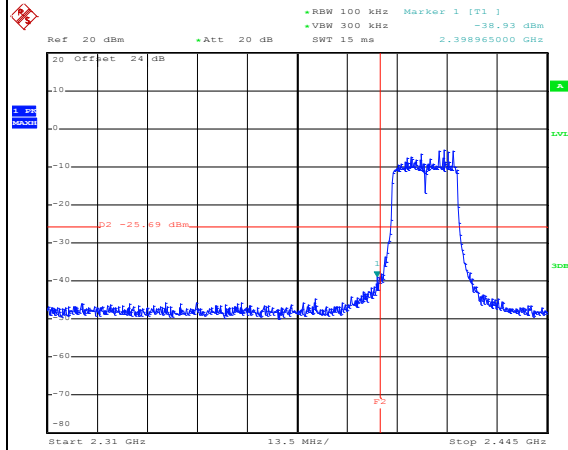
**WLAN 802.11n HT20 Channel 01**

**100kHz PSD reference Level**



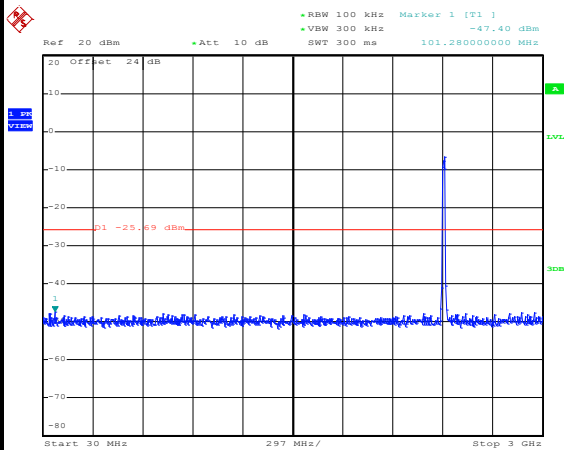
Date: 7.AUG.2013 12:45:39

**Low Channel Plot**



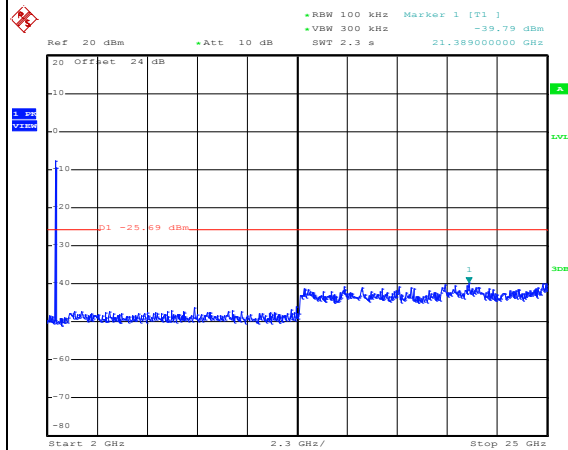
Date: 7.AUG.2013 12:46:11

**Spurious Emission 30MHz~3GHz**



Date: 7.AUG.2013 12:46:31

**Spurious Emission 2GHz~25GHz**



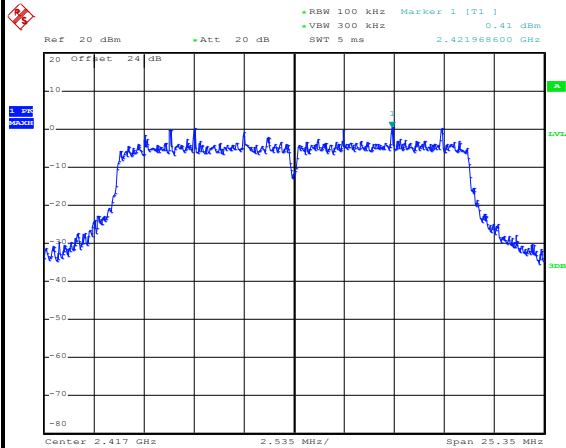
Date: 7.AUG.2013 12:46:50



Number of TX :	2	Antenna :	2
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz	Relative Humidity :	55~58%
Test Channel :	02	Test Engineer :	Reece Lee

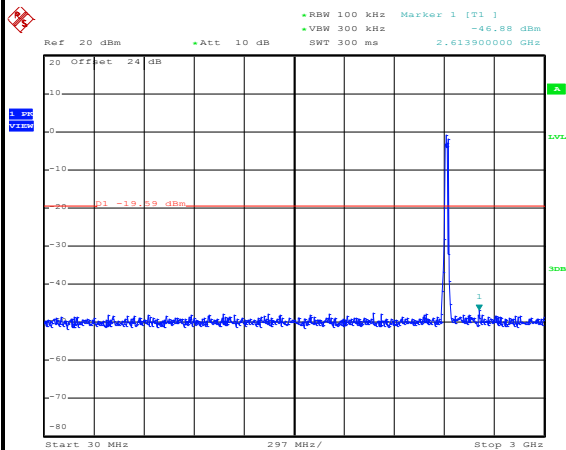
**WLAN 802.11n HT20 Channel 02**

**100kHz PSD reference Level**



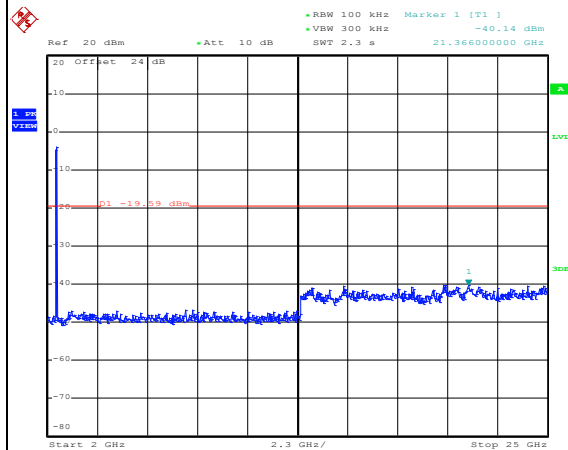
Date: 21.AUG.2013 15:07:04

**Spurious Emission 30MHz~3GHz**



Date: 21.AUG.2013 15:07:26

**Spurious Emission 2GHz~25GHz**

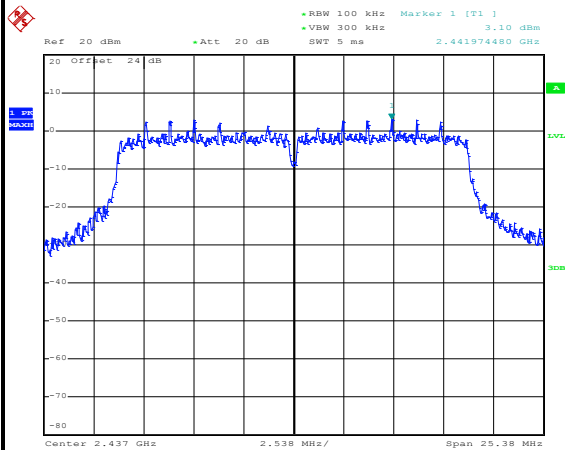


Date: 21.AUG.2013 15:07:44

Number of TX :	2	Antenna :	2
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	55~58%
Test Channel :	06	Test Engineer :	Reece Lee

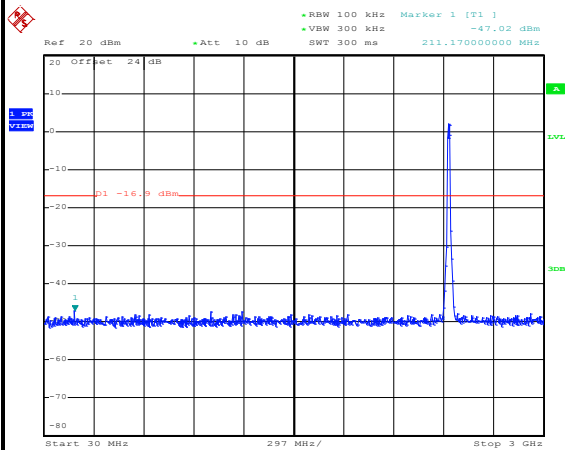
**WLAN 802.11n HT20 Channel 06**

**100kHz PSD reference Level**



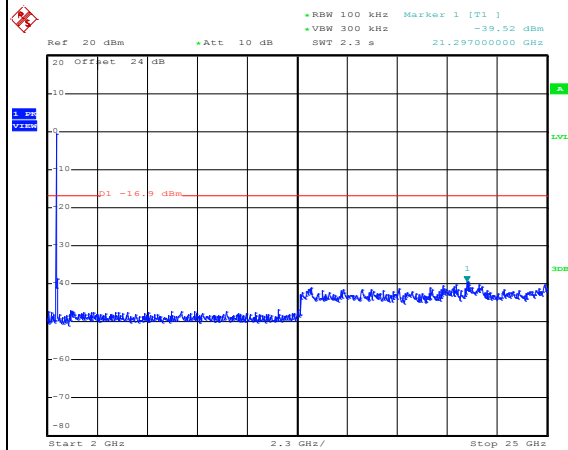
Date: 7.AUG.2013 12:35:14

**Spurious Emission 30MHz~3GHz**



Date: 7.AUG.2013 12:35:50

**Spurious Emission 2GHz~25GHz**

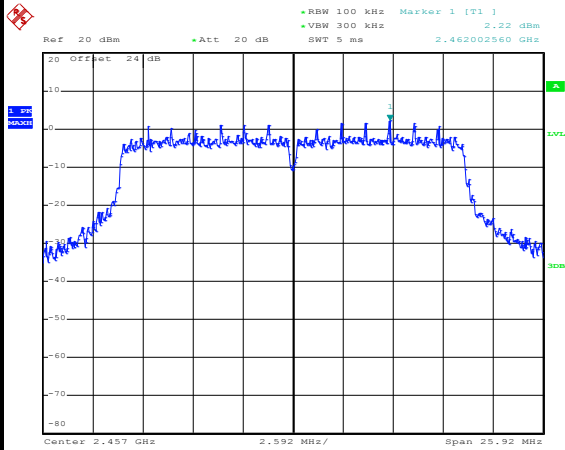


Date: 7.AUG.2013 12:36:09

Number of TX :	2	Antenna :	2
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz	Relative Humidity :	55~58%
Test Channel :	10	Test Engineer :	Reece Lee

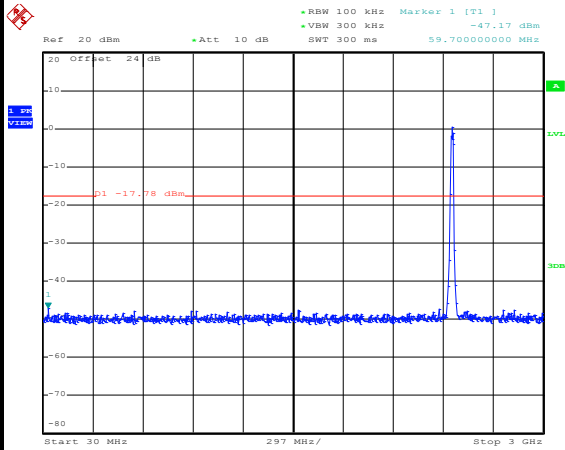
**WLAN 802.11n HT20 Channel 10**

**100kHz PSD reference Level**



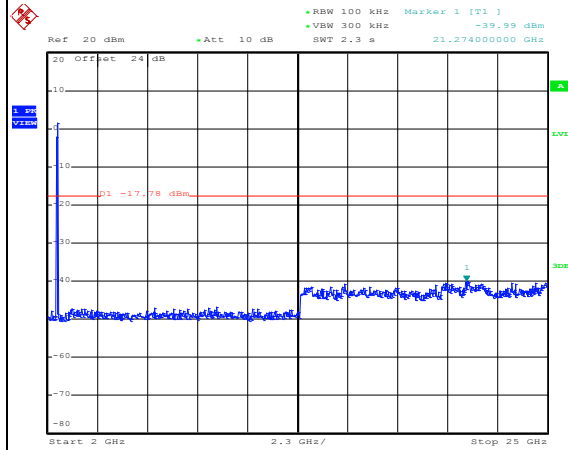
Date: 21.AUG.2013 15:03:29

**Spurious Emission 30MHz~3GHz**



Date: 21.AUG.2013 15:04:16

**Spurious Emission 2GHz~25GHz**

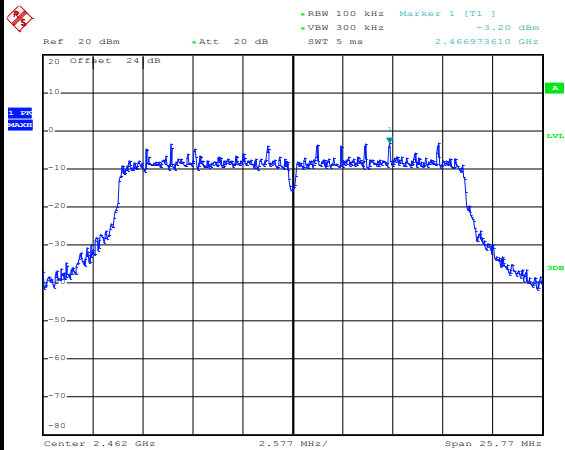


Date: 21.AUG.2013 15:04:35

Number of TX :	2	Antenna :	2
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	55~58%
Test Channel :	11	Test Engineer :	Reece Lee

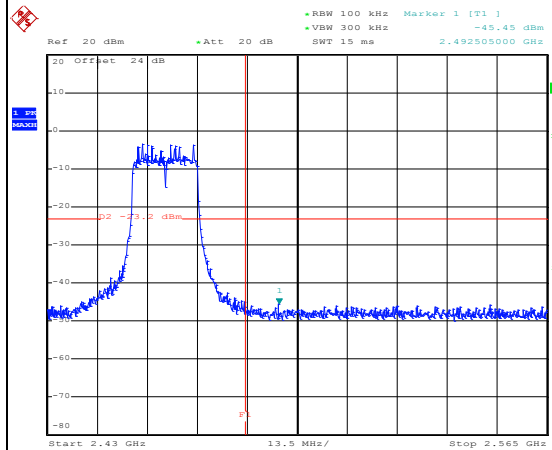
**WLAN 802.11n HT20 Channel 11**

**100kHz PSD reference Level**



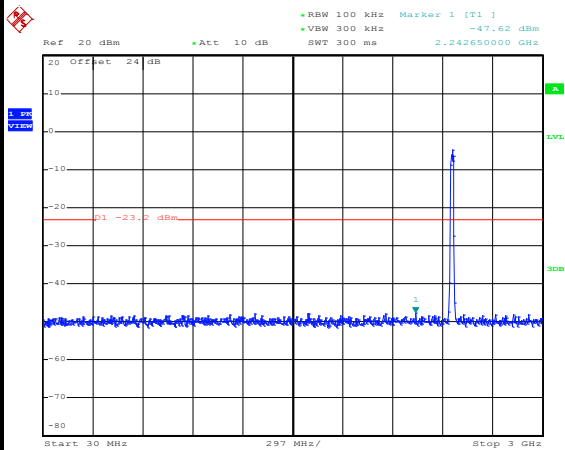
Date: 7.AUG.2013 12:31:37

**High Channel Plot**



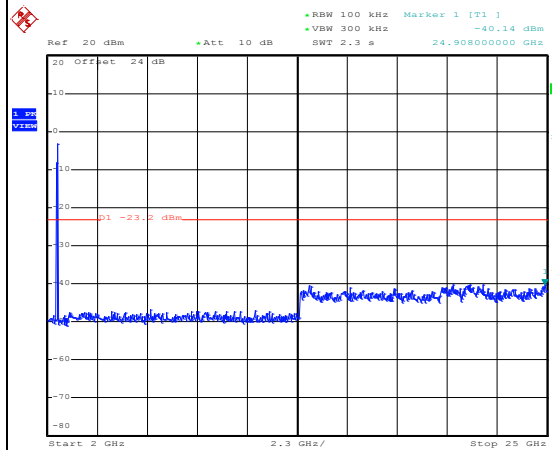
Date: 7.AUG.2013 12:31:52

**Spurious Emission 30MHz~3GHz**



Date: 7.AUG.2013 12:32:51

**Spurious Emission 2GHz~25GHz**

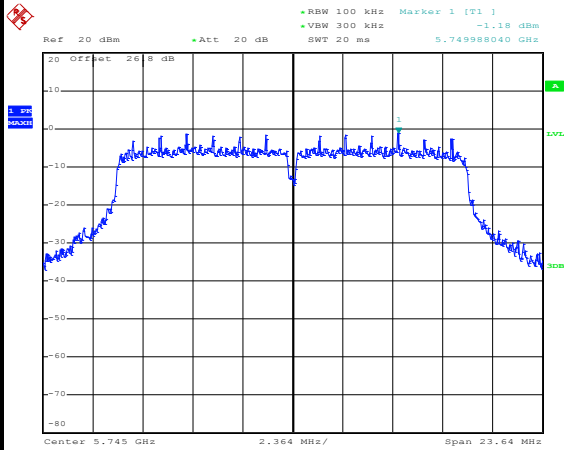


Date: 7.AUG.2013 12:33:10

Number of TX :	2	Antenna :	2
Test Mode :	802.11a	Temperature :	24~26°C
Test Band :	5GHz Low	Relative Humidity :	55~58%
Test Channel :	149	Test Engineer :	Reece Lee

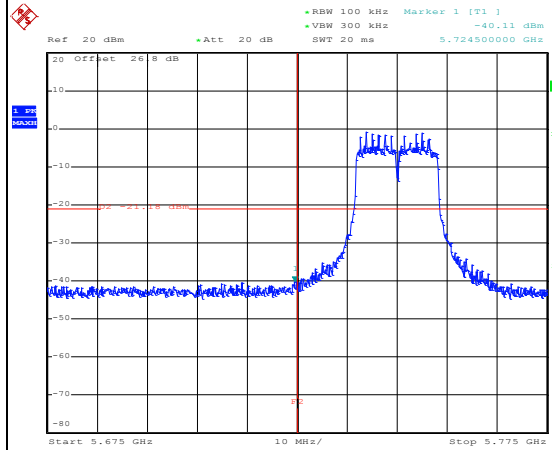
**WLAN 802.11a Channel 149**

**100kHz PSD reference Level**



Date: 7.AUG.2013 13:37:50

**Low Channel Plot**



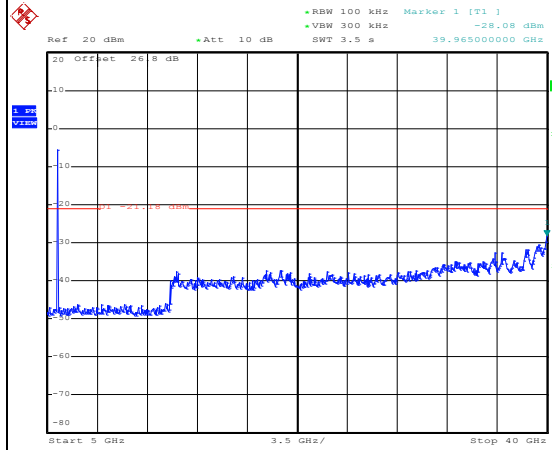
Date: 7.AUG.2013 13:38:05

**Spurious Emission 30MHz~6GHz**



Date: 7.AUG.2013 13:38:39

**Spurious Emission 5GHz~40GHz**

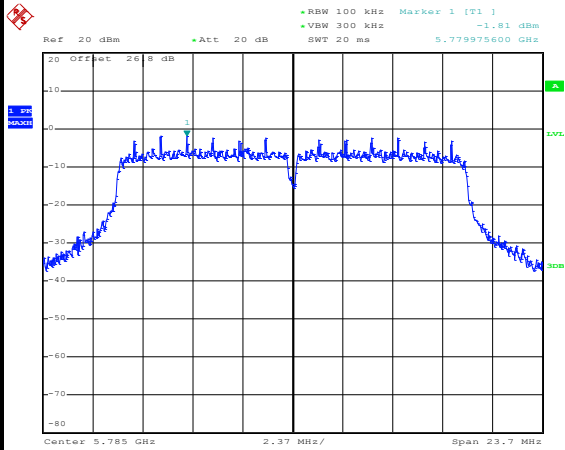


Date: 7.AUG.2013 13:38:58

Number of TX :	2	Antenna :	2
Test Mode :	802.11a	Temperature :	24~26°C
Test Band :	5GHz Mid	Relative Humidity :	55~58%
Test Channel :	157	Test Engineer :	Reece Lee

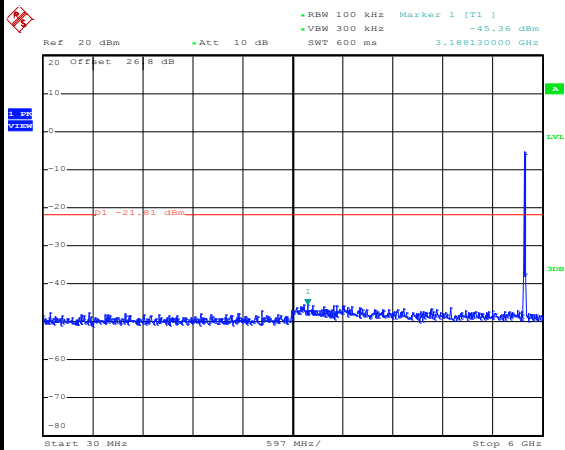
**WLAN 802.11a Channel 157**

**100kHz PSD reference Level**



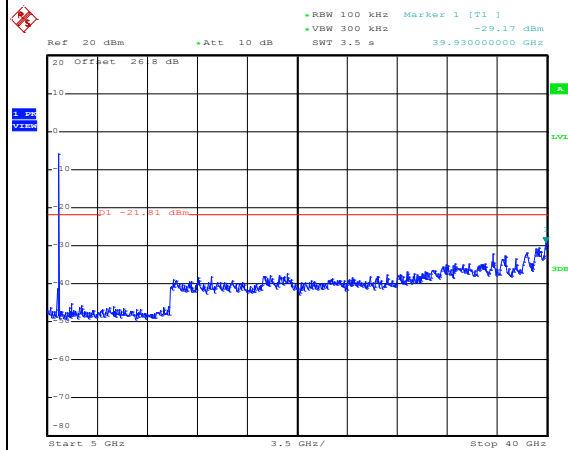
Date: 7.AUG.2013 13:42:37

**Spurious Emission 30MHz~6GHz**



Date: 7.AUG.2013 13:43:14

**Spurious Emission 5GHz~40GHz**

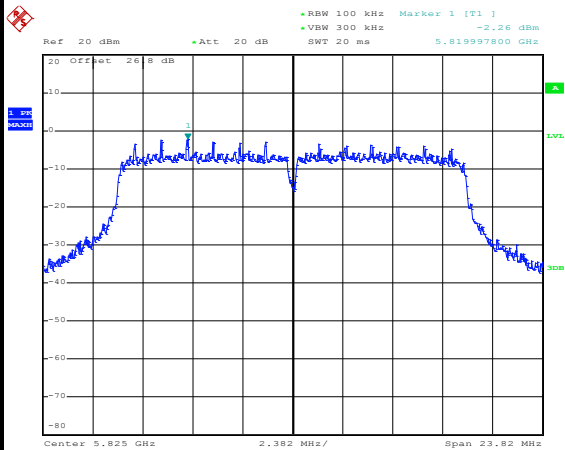


Date: 7.AUG.2013 13:43:32

Number of TX :	2	Antenna :	2
Test Mode :	802.11a	Temperature :	24~26°C
Test Band :	5GHz High	Relative Humidity :	55~58%
Test Channel :	165	Test Engineer :	Reece Lee

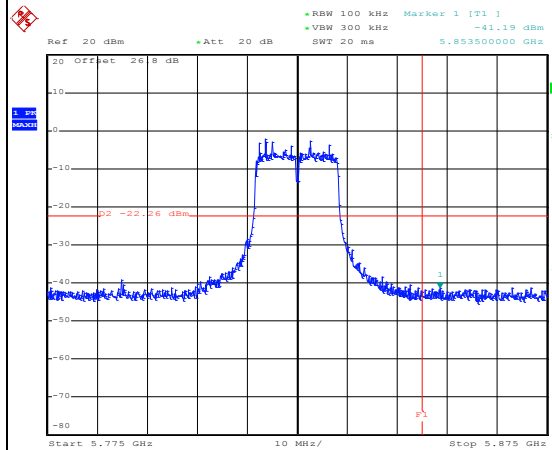
**WLAN 802.11a Channel 165**

**100kHz PSD reference Level**



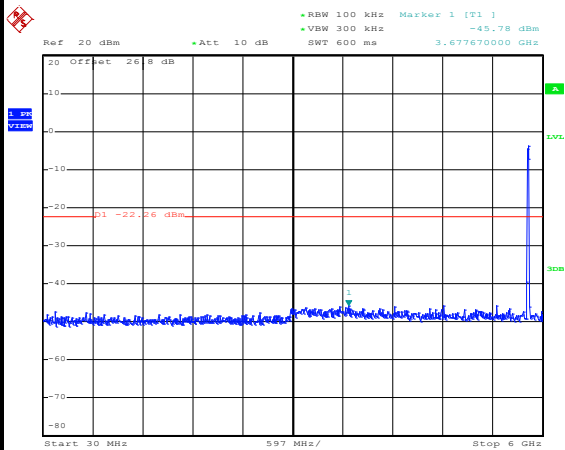
Date: 7.AUG.2013 13:57:12

**High Channel Plot**



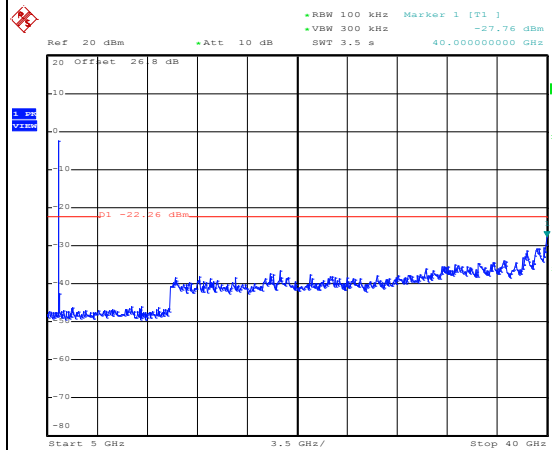
Date: 7.AUG.2013 13:58:10

**Spurious Emission 30MHz~6GHz**



Date: 7.AUG.2013 13:59:07

**Spurious Emission 5GHz~40GHz**

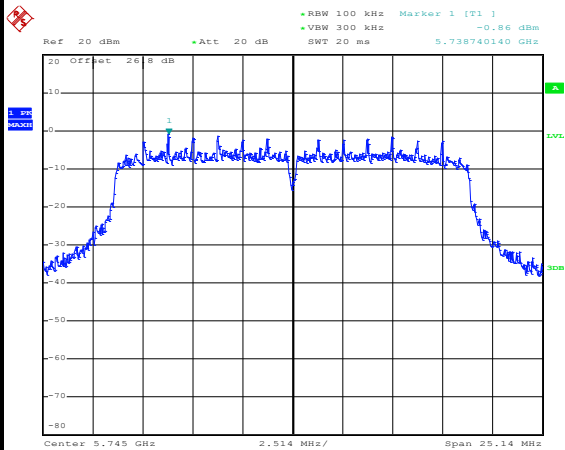


Date: 7.AUG.2013 13:59:26

Number of TX :	2	Antenna :	2
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	5GHz Low	Relative Humidity :	55~58%
Test Channel :	149	Test Engineer :	Reece Lee

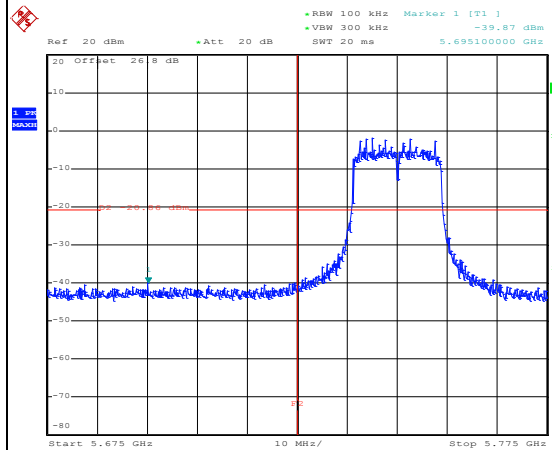
**WLAN 802.11n HT20 Channel 149**

**100kHz PSD reference Level**



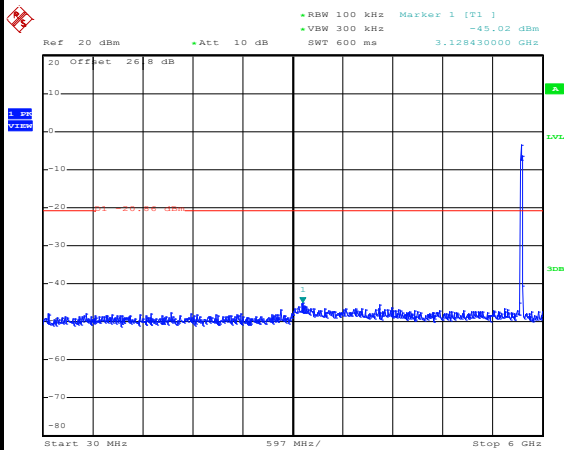
Date: 7.AUG.2013 14:33:03

**Low Channel Plot**



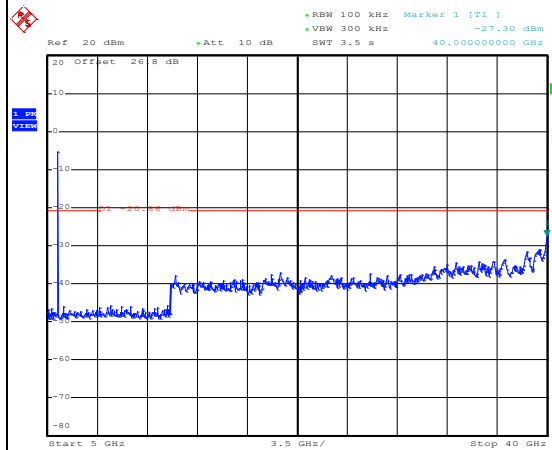
Date: 7.AUG.2013 14:34:05

**Spurious Emission 30MHz~6GHz**



Date: 7.AUG.2013 14:36:23

**Spurious Emission 5GHz~40GHz**



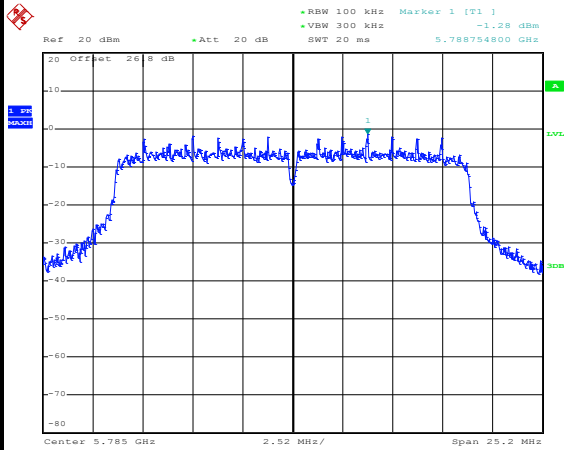
Date: 7.AUG.2013 14:36:41



Number of TX :	2	Antenna :	2
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	5GHz Mid	Relative Humidity :	55~58%
Test Channel :	157	Test Engineer :	Reece Lee

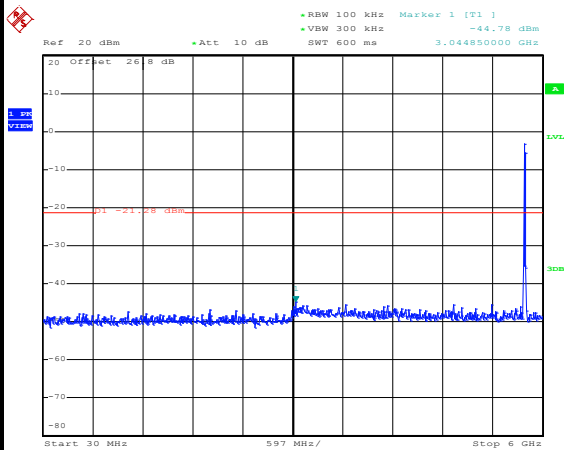
**WLAN 802.11n HT20 Channel 157**

**100kHz PSD reference Level**



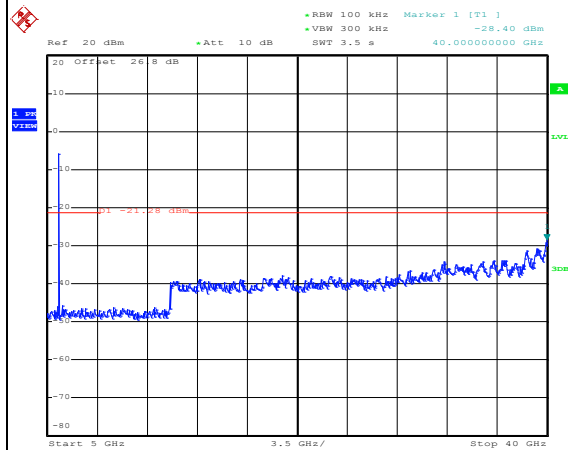
Date: 7.AUG.2013 14:26:43

**Spurious Emission 30MHz~6GHz**



Date: 7.AUG.2013 14:27:06

**Spurious Emission 5GHz~40GHz**

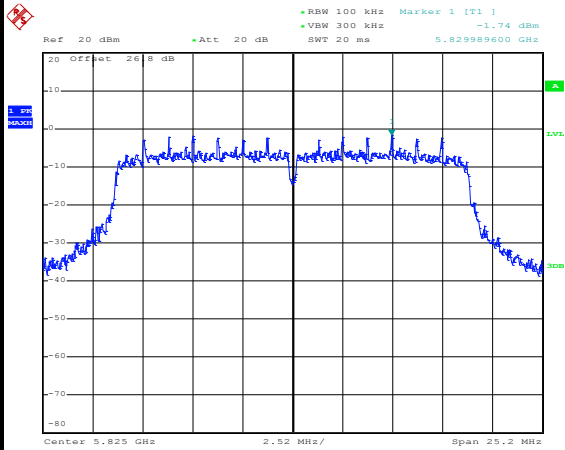


Date: 7.AUG.2013 14:27:25

Number of TX :	2	Antenna :	2
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	5GHz High	Relative Humidity :	55~58%
Test Channel :	165	Test Engineer :	Reece Lee

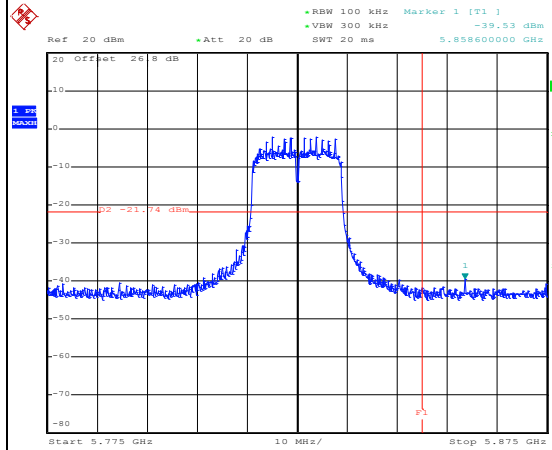
**WLAN 802.11n HT20 Channel 165**

**100kHz PSD reference Level**



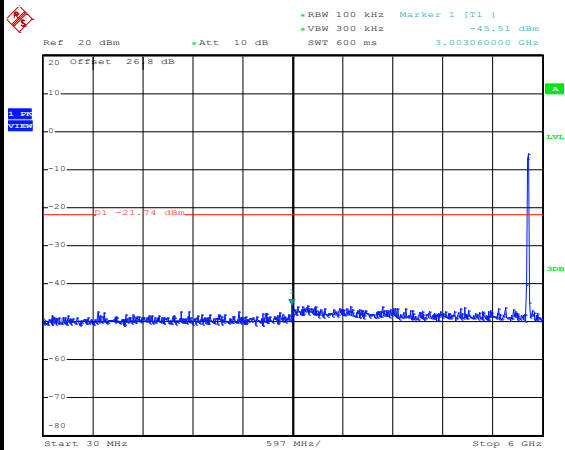
Date: 7.AUG.2013 14:04:39

**High Channel Plot**



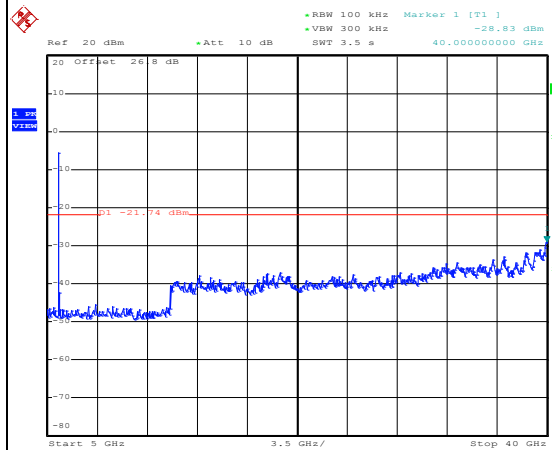
Date: 7.AUG.2013 14:05:35

**Spurious Emission 30MHz~6GHz**



Date: 7.AUG.2013 14:06:08

**Spurious Emission 5GHz~40GHz**

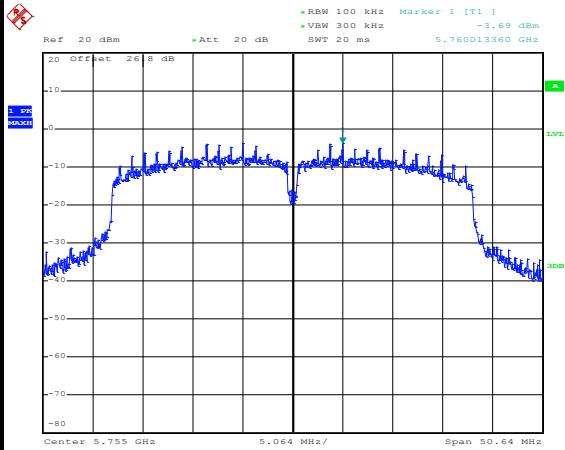


Date: 7.AUG.2013 14:06:27

Number of TX :	2	Antenna :	2
Test Mode :	802.11n HT40	Temperature :	24~26°C
Test Band :	5GHz Low	Relative Humidity :	55~58%
Test Channel :	151	Test Engineer :	Reece Lee

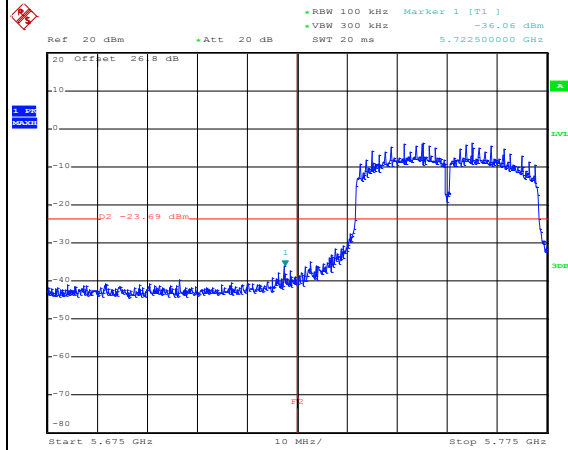
**WLAN 802.11n HT40 Channel 151**

**100kHz PSD reference Level**



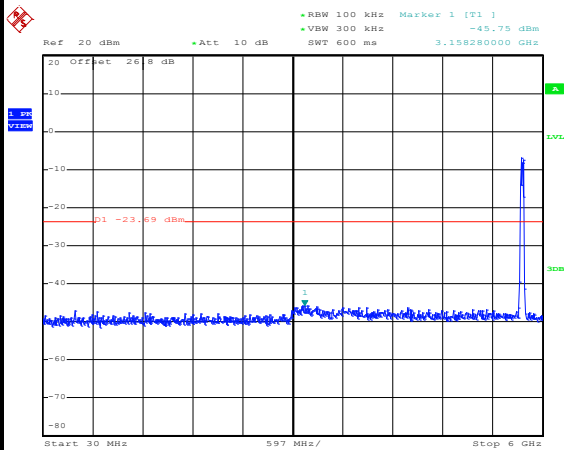
Date: 7.AUG.2013 14:55:43

**Low Channel Plot**



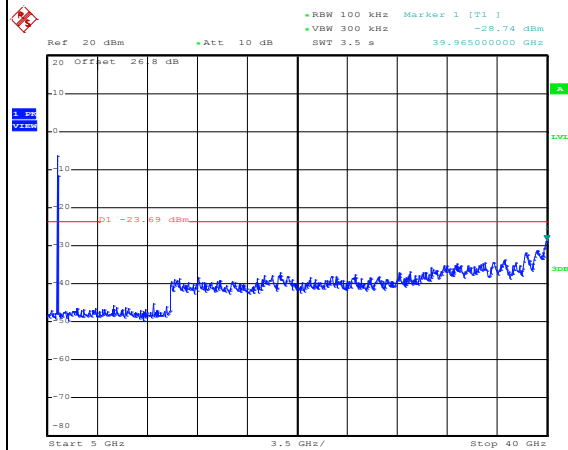
Date: 7.AUG.2013 14:56:31

**Spurious Emission 30MHz~6GHz**



Date: 7.AUG.2013 14:56:52

**Spurious Emission 5GHz~40GHz**

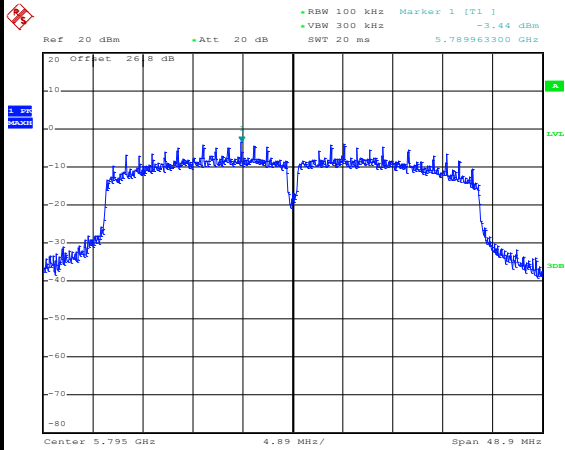


Date: 7.AUG.2013 14:57:11

Number of TX :	2	Antenna :	2
Test Mode :	802.11n HT40	Temperature :	24~26°C
Test Band :	5GHz High	Relative Humidity :	55~58%
Test Channel :	159	Test Engineer :	Reece Lee

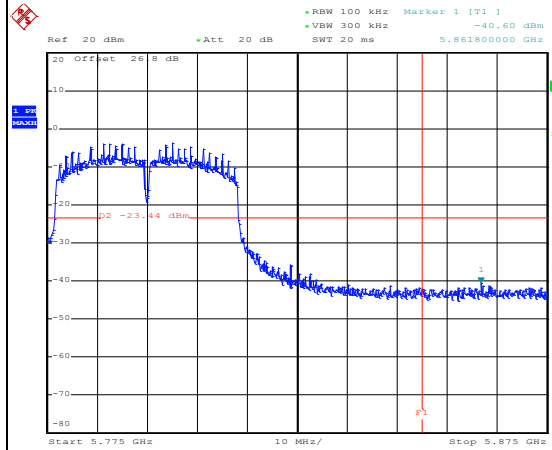
**WLAN 802.11n HT40 Channel 159**

**100kHz PSD reference Level**



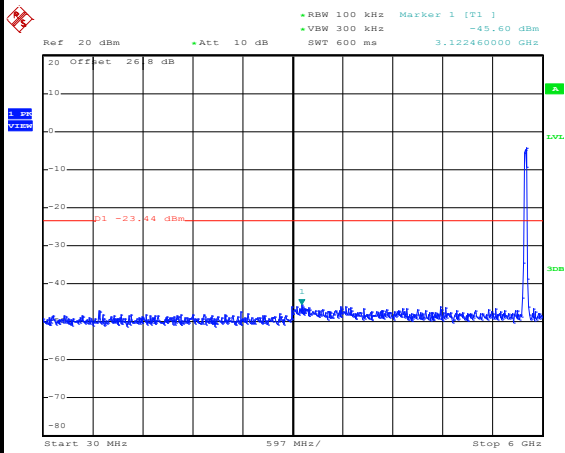
Date: 7.AUG.2013 15:01:43

**High Channel Plot**



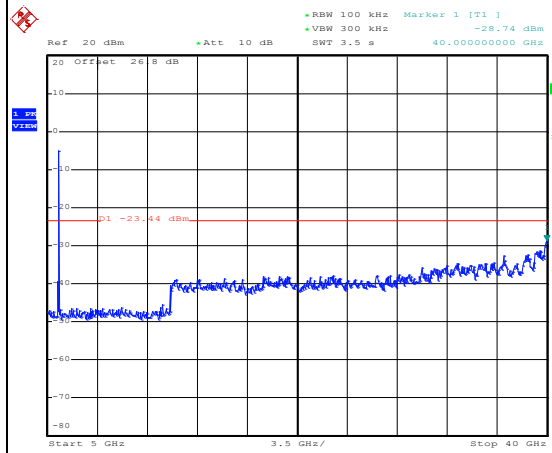
Date: 7.AUG.2013 15:02:27

**Spurious Emission 30MHz~6GHz**



Date: 7.AUG.2013 15:04:21

**Spurious Emission 5GHz~40GHz**



Date: 7.AUG.2013 15:04:40

## 3.5 AC Conducted Emission Measurement

### 3.5.1 Limit of AC Conducted Emission

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

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

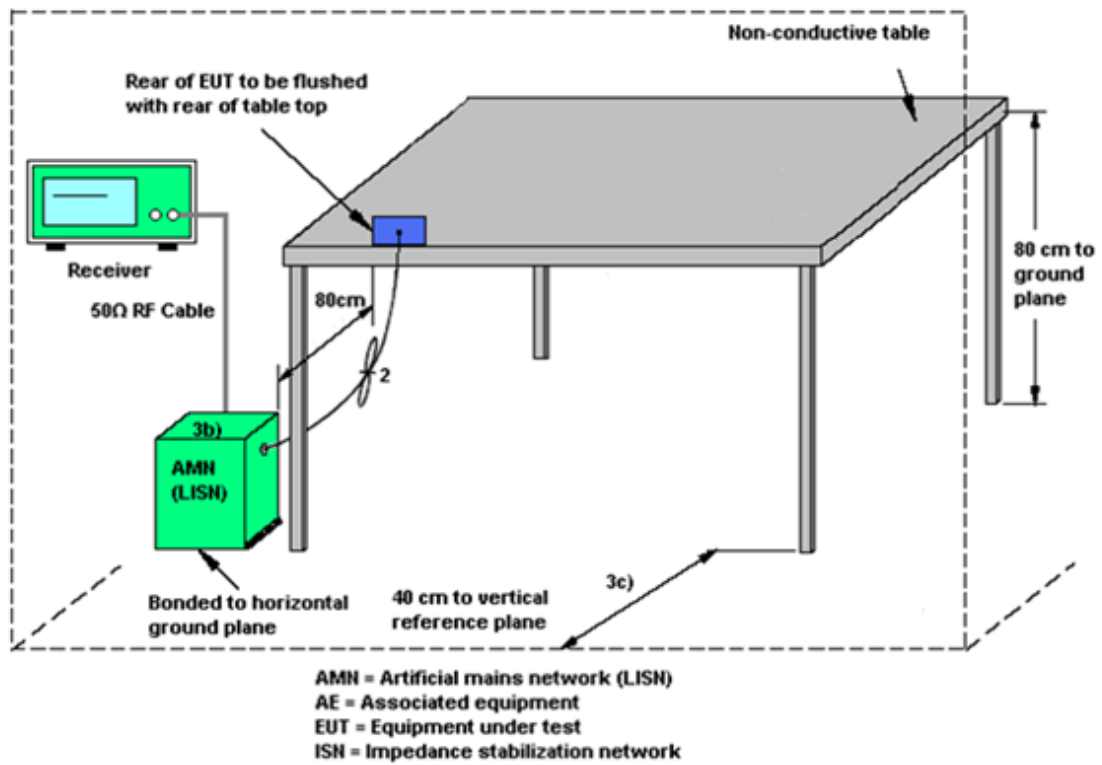
### 3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.5.3 Test Procedures

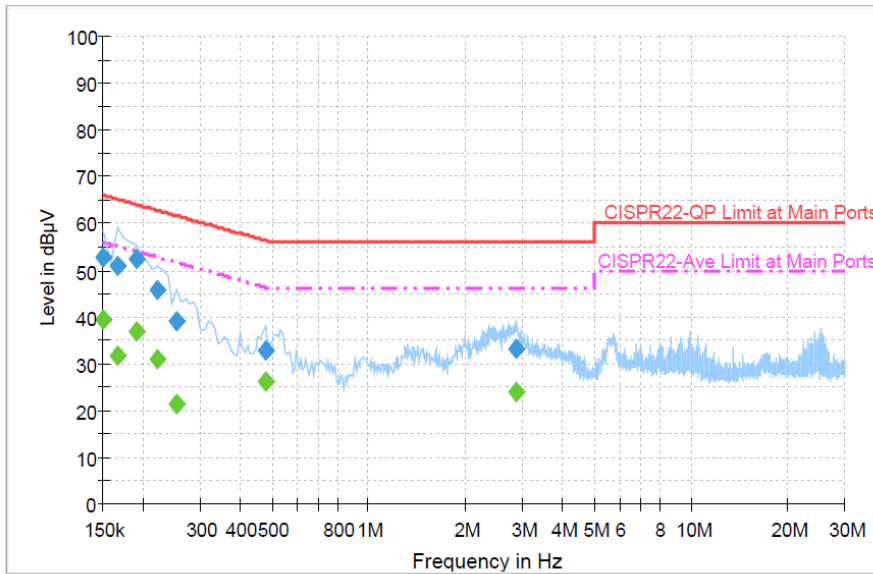
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other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

### 3.5.4 Test Setup



### 3.5.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (2.4GHz) Link + Bluetooth Link + Earphone + USB Cable (Data Link with Notebook) + Camera		



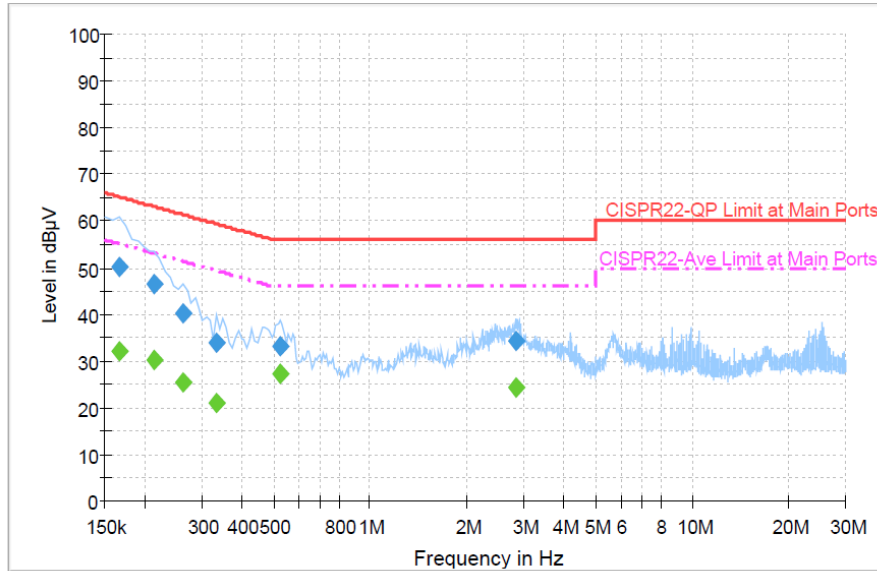
#### Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	52.6	Off	L1	19.4	13.4	66.0
0.166000	51.0	Off	L1	19.4	14.2	65.2
0.190000	52.5	Off	L1	19.4	11.5	64.0
0.222000	45.8	Off	L1	19.4	16.9	62.7
0.254000	39.1	Off	L1	19.5	22.5	61.6
0.478000	32.9	Off	L1	19.4	23.5	56.4
2.878000	33.3	Off	L1	19.6	22.7	56.0

#### Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	39.4	Off	L1	19.4	16.6	56.0
0.166000	31.6	Off	L1	19.4	23.6	55.2
0.190000	37.0	Off	L1	19.4	17.0	54.0
0.222000	31.0	Off	L1	19.4	21.7	52.7
0.254000	21.4	Off	L1	19.5	30.2	51.6
0.478000	26.1	Off	L1	19.4	20.3	46.4
2.878000	23.9	Off	L1	19.6	22.1	46.0

<b>Test Mode :</b>	Mode 1	<b>Temperature :</b>	20~22°C
<b>Test Engineer :</b>	Kai-Chun Chu	<b>Relative Humidity :</b>	45~47%
<b>Test Voltage :</b>	120Vac / 60Hz	<b>Phase :</b>	Neutral
<b>Function Type :</b>	WLAN (2.4GHz) Link + Bluetooth Link + Earphone + USB Cable (Data Link with Notebook) + Camera		



**Final Result : QuasiPeak**

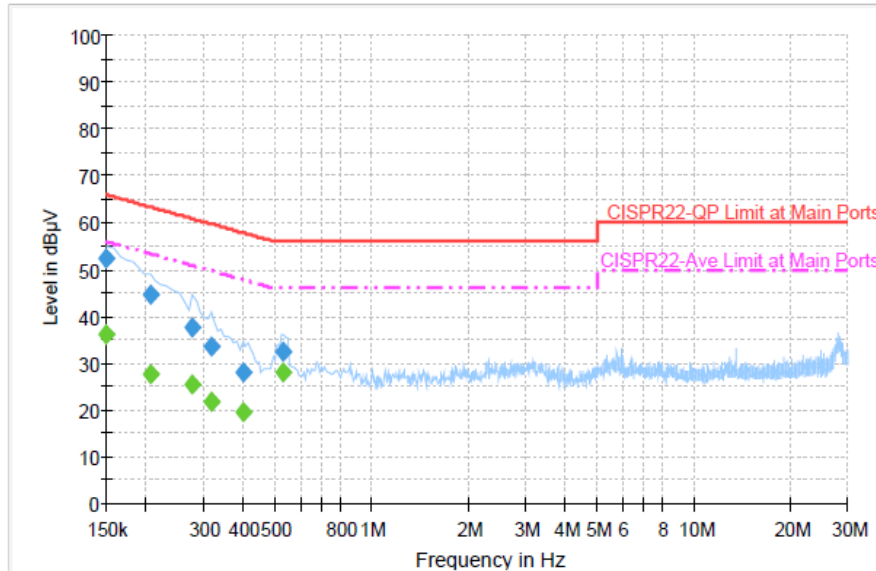
Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	50.1	Off	N	19.4	15.1	65.2
0.214000	46.7	Off	N	19.4	16.3	63.0
0.262000	40.2	Off	N	19.4	21.2	61.4
0.334000	34.0	Off	N	19.4	25.4	59.4
0.526000	33.1	Off	N	19.4	22.9	56.0
2.822000	34.3	Off	N	19.6	21.7	56.0

**Final Result : Average**

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	32.2	Off	N	19.4	23.0	55.2
0.214000	30.4	Off	N	19.4	22.6	53.0
0.262000	25.4	Off	N	19.4	26.0	51.4
0.334000	21.0	Off	N	19.4	28.4	49.4
0.526000	27.3	Off	N	19.4	18.7	46.0
2.822000	24.4	Off	N	19.6	21.6	46.0



<b>Test Mode :</b>	Mode 2	<b>Temperature :</b>	20~22°C
<b>Test Engineer :</b>	Kai-Chun Chu	<b>Relative Humidity :</b>	45~47%
<b>Test Voltage :</b>	120Vac / 60Hz	<b>Phase :</b>	Line
<b>Function Type :</b>	WLAN (5GHz) Link + Bluetooth Link + Earphone + USB Cable (Data Link with Notebook) + Camera		



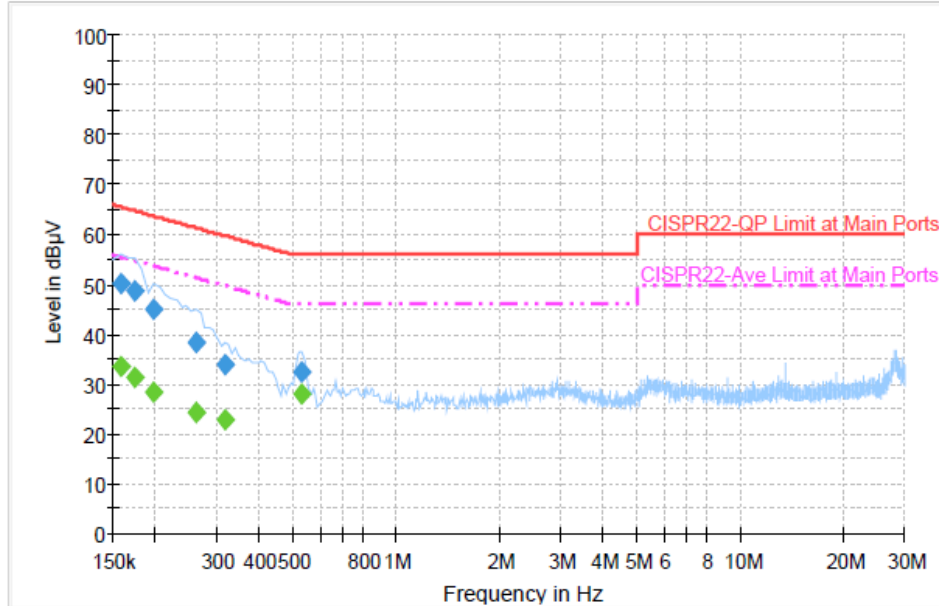
**Final Result : Quasi-Peak**

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	52.4	Off	L1	19.4	13.6	66.0
0.206000	44.6	Off	L1	19.4	18.8	63.4
0.278000	37.5	Off	L1	19.3	23.4	60.9
0.318000	33.6	Off	L1	19.4	26.2	59.8
0.398000	28.0	Off	L1	19.5	29.9	57.9
0.534000	32.3	Off	L1	19.4	23.7	56.0

**Final Result : Average**

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	36.1	Off	L1	19.4	19.9	56.0
0.206000	27.7	Off	L1	19.4	25.7	53.4
0.278000	25.5	Off	L1	19.3	25.4	50.9
0.318000	21.7	Off	L1	19.4	28.1	49.8
0.398000	19.4	Off	L1	19.5	28.5	47.9
0.534000	27.9	Off	L1	19.4	18.1	46.0

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN (5GHz) Link + Bluetooth Link + Earphone + USB Cable (Data Link with Notebook) + Camera		



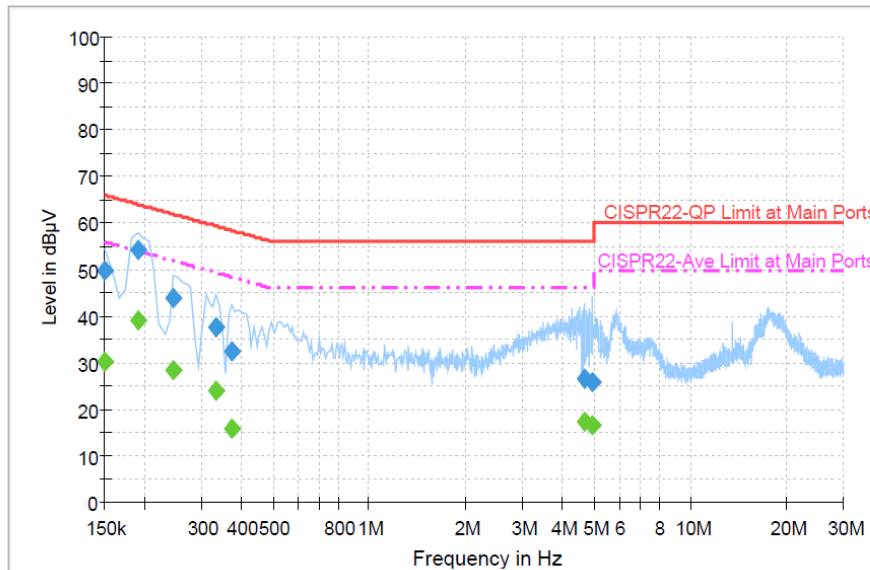
**Final Result : Quasi-Peak**

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	50.2	Off	N	19.3	15.4	65.6
0.174000	48.7	Off	N	19.4	16.1	64.8
0.198000	44.8	Off	N	19.3	18.9	63.7
0.262000	38.4	Off	N	19.4	23.0	61.4
0.318000	33.8	Off	N	19.4	26.0	59.8
0.534000	32.6	Off	N	19.4	23.4	56.0

**Final Result : Average**

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	33.4	Off	N	19.3	22.2	55.6
0.174000	31.5	Off	N	19.4	23.3	54.8
0.198000	28.4	Off	N	19.3	25.3	53.7
0.262000	24.2	Off	N	19.4	27.2	51.4
0.318000	22.8	Off	N	19.4	27.0	49.8
0.534000	27.9	Off	N	19.4	18.1	46.0

Test Mode :	Mode 3	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (2.4GHz) MIMO Tx + Earphone + USB Cable (Data Link with Notebook) + Camera		



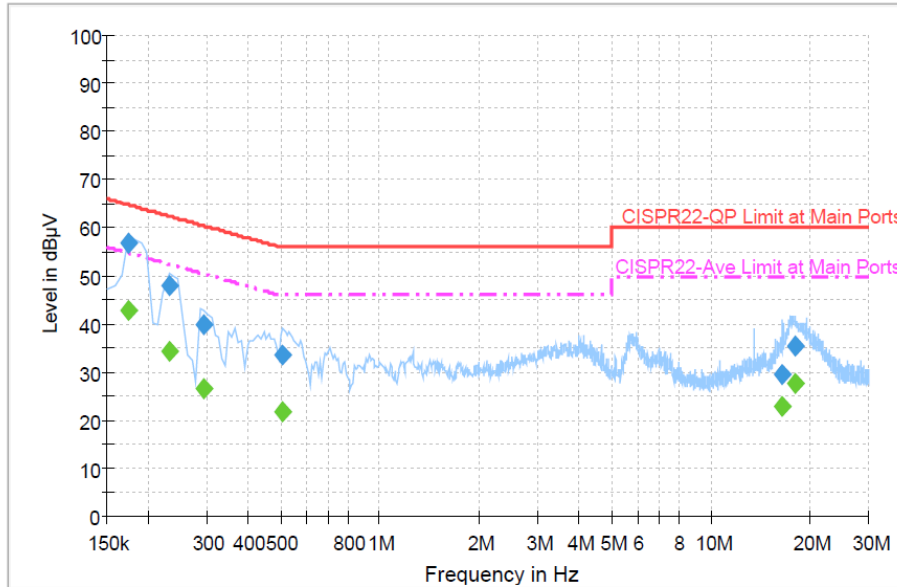
**Final Result : Quasi-Peak**

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	49.7	Off	L1	19.4	16.3	66.0
0.190000	54.1	Off	L1	19.4	9.9	64.0
0.246000	44.1	Off	L1	19.4	17.8	61.9
0.334000	37.8	Off	L1	19.4	21.6	59.4
0.374000	32.5	Off	L1	19.4	25.9	58.4
4.662000	26.7	Off	L1	19.6	29.3	56.0
4.958000	25.9	Off	L1	19.7	30.1	56.0

**Final Result : Average**

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	30.1	Off	L1	19.4	25.9	56.0
0.190000	39.2	Off	L1	19.4	14.8	54.0
0.246000	28.4	Off	L1	19.4	23.5	51.9
0.334000	23.9	Off	L1	19.4	25.5	49.4
0.374000	15.9	Off	L1	19.4	32.5	48.4
4.662000	17.3	Off	L1	19.6	28.7	46.0
4.958000	16.5	Off	L1	19.7	29.5	46.0

Test Mode :	Mode 3	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN (2.4GHz) MIMO Tx + Earphone + USB Cable (Data Link with Notebook) + Camera		



**Final Result : Quasi-Peak**

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.174000	56.9	Off	N	19.4	7.9	64.8
0.230000	47.8	Off	N	19.4	14.6	62.4
0.294000	40.0	Off	N	19.4	20.4	60.4
0.510000	33.7	Off	N	19.4	22.3	56.0
16.470000	29.6	Off	N	19.9	30.4	60.0
17.894000	35.3	Off	N	19.9	24.7	60.0

**Final Result : Average**

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.174000	42.7	Off	N	19.4	12.1	54.8
0.230000	34.2	Off	N	19.4	18.2	52.4
0.294000	26.7	Off	N	19.4	23.7	50.4
0.510000	21.8	Off	N	19.4	24.2	46.0
16.470000	22.7	Off	N	19.9	27.3	50.0
17.894000	27.7	Off	N	19.9	22.3	50.0

## 3.6 Antenna Requirements

### 3.6.1 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.

### 3.6.2 Antenna Connected Construction

Non-standard connector is used.

### 3.6.3 Antenna Gain

FCC KDB 662911 D01 Multiple Transmitter Output v02

For CDD transmissions, directional gain is calculated as

Directional gain =  $G_{ANT} + \text{Array Gain}$ , 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.

			<b>DG</b>	<b>DG</b>	<b>Power</b>	<b>PSD</b>
			<b>for</b>	<b>for</b>	<b>Limit</b>	<b>Limit</b>
	<b>Ant 1</b>	<b>Ant 2</b>	<b>Power</b>	<b>PSD</b>	<b>Reduction</b>	<b>Reduction</b>
	<b>(dBi)</b>	<b>(dBi)</b>	<b>(dBi)</b>	<b>(dBi)</b>	<b>(dB)</b>	<b>(dB)</b>
<b>2.4 GHz</b>	4.10	1.10	2.85	5.86	0.00	0.00
<b>5 GHz</b>	3.20	1.60	2.47	5.48	0.00	0.00

$\text{Power Limit Reduction} = DG(\text{Power}) - 6\text{dBi}, (\text{min} = 0)$

$\text{PSD Limit Reduction} = DG(\text{PSD}) - 6\text{dBi}, (\text{min} = 0)$

## 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. 07, 2013	Aug. 01, 2013~ Aug. 21, 2013	Jun. 06, 2014	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Sep. 08, 2012	Aug. 01, 2013~ Aug. 21, 2013	Sep. 07, 2013	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Sep. 08, 2012	Aug. 01, 2013~ Aug. 21, 2013	Sep. 07, 2013	Conducted (TH02-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 13, 2012	Jun. 24, 2013~ Aug. 30, 2013	Nov. 12, 2013	Conduction (CO05-HY)
Two-LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2012	Jun. 24, 2013~ Aug. 30, 2013	Dec. 11, 2013	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 06, 2012	Jun. 24, 2013~ Aug. 30, 2013	Dec. 05, 2013	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Jun. 24, 2013~ Aug. 30, 2013	N/A	Conduction (CO05-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
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