



## STC Test Report



**Date:** 2015-05-09  
**No.:** DM119257

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**Applicant:** Ness Corporation  
4/167 Prospect Highway, Seven Hills, Sydney, NSW,  
Australia 2147

**Manufacturer:** Macson Limited  
No. 5, Jun Da Zhong Lu, Dongkeng, Dongguan, Guangdong,  
China

**Description of Sample(s):** Submitted sample(s) said to be  
Product: Doorbell Camera  
Brand Name: NESS  
Model Number: uHoo  
FCC ID: O2K-UHOO-US-W

**Date Sample(s) Received:** 2015-04-23

**Date Tested:** 2015-05-04 to 2015-05-06

**Investigation Requested:** Perform ElectroMagnetic Interference measurement in  
accordance with FCC 47CFR [Codes of Federal Regulations]  
Part 15: 2014 and ANSI C63.10:2013 for FCC Certification.

**Conclusion(s):** The submitted product COMPLIED with the requirements of  
Federal Communications Commission [FCC] Rules and  
Regulations Part 15. The tests were performed in accordance  
with the standards described above and on Section 2.2 in this  
Test Report.

**Remark(s):** ---

  
LONG Yun Jia / Long  
Authorized Signatory  
ElectroMagnetic Compatibility Department  
For and on behalf of  
STC (Dongguan) Company Limited

**STC (Dongguan) Company Limited**

68 Fumin Nan Road, Dalang, Dongguan, China. (Zip Code : 523 770)  
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### **1.0 General Details**

#### **1.1 Test Laboratory**

STC (Dongguan) Company Limited  
EMC Laboratory  
68 Fumin Nan Road, Dalang, Dongguan, Guangdong, China

Telephone: (86 769) 81119888  
Fax: (86 769) 81116222

#### **1.2 Equipment Under Test [EUT] Description of Sample(s)**

Product: Doorbell Camera  
Manufacturer: Macson Limited  
No. 5, Jun Da Zhong Lu, Dongkeng, Dongguan, Guangdong,  
China  
Brand Name: NESS  
Model Number: uHoo  
Rating: 4.5Vd.c.

##### **1.2.1 Description of EUT Operation**

The Equipment Under Test (EUT) is a Doorbell Camera of Ness Corporation , the transmission signal is digital modulated with channel frequency range 2412-2462MHz..

#### **1.3 Date of Order**

2015-04-23

#### **1.4 Submitted Sample(s):**

1 Sample

#### **1.5 Test Duration**

2015-05-04 to 2015-05-06

#### **1.6 Country of Origin**

China

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### 2.0 Technical Details

#### 2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2014 Regulations and ANSI C63.10:2013 for FCC Certification.

#### 2.2 Test Standards and Results Summary Tables

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Fail	N/A
Output Power of Fundamental Emissions	FCC 47CFR 15.247(b)(3)	ANSI C63.10:2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.10:2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emissions	FCC 47CFR 15.207	ANSI C63.10:2013	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Power Spectral Density	FCC 47CFR 15.247(e)	N/A	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6dB Bandwidth	FCC 47CFR 15.247(a)(2)	N/A	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Band Edge Emissions	FCC 47CFR 15.247(d)	N/A	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RF Exposure	FCC 47CFR 15.247(i)	N/A	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable

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### **3.0 Test Results**

#### **3.1 Emission**

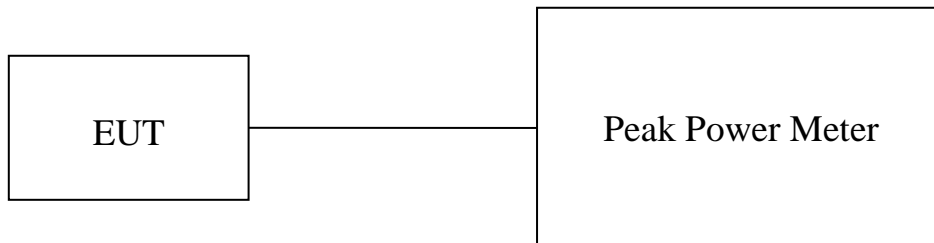
##### **3.1.1 Maximum Peak Output Power**

Test Requirement:	FCC 47CFR 15.247(b)(3)
Test Method:	N/A
Test Date:	2015-05-04
Mode of Operation:	WiFi mode

#### **Test Method:**

The RF output of the EUT was connected to the peak power meter. All the attenuation or cable loss will be added to the measured maximum output power. The results are recorded in mW.

#### **Test Setup:**



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### Limits for Peak Output Power of Fundamental & Harmonics Emissions [FCC 47CFR 15.247]:

For Digital Transmission systems in 2400-2483.5 MHz Band: 1 Watt (30dBm)

Results of WiFi Wifi mode 802.11 b, (2412MHz to 2462MHz) : Pass (TX Unit)		
Maximum conducted output power		
Channel	Frequency(MHz)	Output Power(Watt)
Low	2412	0.052979
Middle	2437	0.048339
High	2462	0.054013

Results of WiFi Wifi mode 802.11 g, (2412MHz to 2462MHz) : Pass (TX Unit)		
Maximum conducted output power		
Channel	Frequency(MHz)	Output Power(Watt)
Low	2412	0.045761
Middle	2437	0.041457
High	2462	0.042491

Results of WiFi Wifi mode 802.11 n20, (2412MHz to 2462MHz) : Pass (TX Unit)		
Maximum conducted output power		
Channel	Frequency(MHz)	Output Power(Watt)
Low	2412	0.030839
Middle	2437	0.028067
High	2462	0.029168

Results of WiFi Wifi mode 802.11 n40, (2422MHz to 2452MHz) : Pass (TX Unit)		
Maximum conducted output power		
Channel	Frequency(MHz)	Output Power(Watt)
Low	2422	0.032092
Middle	2437	0.027460
High	2452	0.029539

Calculated measurement uncertainty : 30MHz to 1GHz 1.7dB  
1GHz to 26GHz 1.7dB

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### 3.1.2 Radiated Emissions

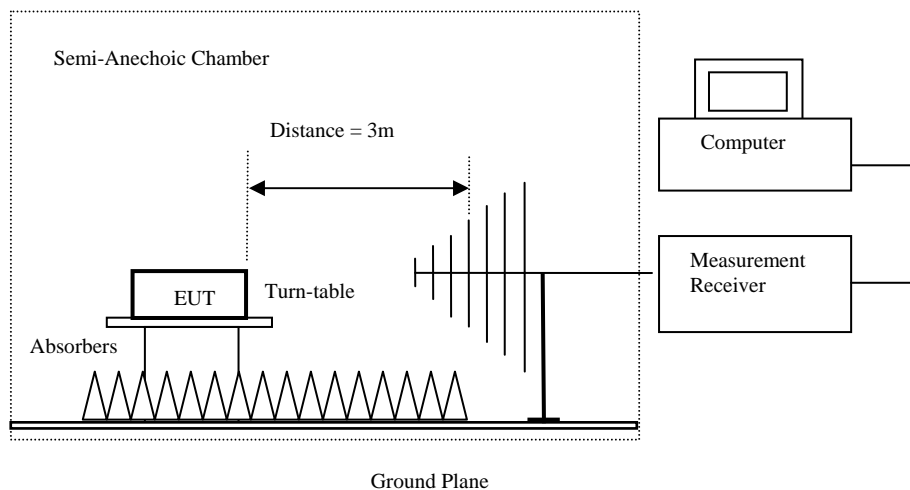
Test Requirement: FCC 47CFR 15.209  
Test Method: ANSI C63.10:2013  
Test Date: 2015-05-05  
Mode of Operation: WiFi mode

#### Test Method:

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber\*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber\*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

\* Semi-anechoic chamber located on the G/F of "STC (Dongguan) Company Limited" with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 629686.

#### Test Setup:



Absorbers placed on top of the ground plane are for measurements above 1000MHz only.

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**Limits for Radiated Emissions [FCC 47 CFR 15.247 Class B]:**

Frequency Range [MHz]	Quasi-Peak Limits [ $\mu$ V/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

**Result of Wifi mode (2412.0 MHz) (802.11b) (9kHz – 30MHz): Pass**

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Limit dB $\mu$ V/m	E-Field Polarity
<b>Emissions detected are more than 20 dB below the FCC Limits</b>						

**Results of Wifi mode (2412.0 MHz) (802.11b) (30MHz – 1000MHz): PASS**

Field Strength of Spurious Emissions Quasi-Peak Value						
Frequency MHz	Measured Level dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Limit dB $\mu$ V/m	E-Field Polarity
<b>Emissions detected are more than 20 dB below the FCC Limits</b>						

**Result of Wifi mode (2412.0 MHz) (802.11b) (Above 1GHz): Pass**

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
4824.0	14.7	41.5	56.2	74.0	17.8	Vertical
4824.0	13.3	42.4	55.7	74.0	18.3	Horizontal
7236.0	10.3	45.1	55.4	74.0	18.6	Vertical
7236.0	8.8	46.2	55.0	74.0	19.0	Horizontal
9648.0	7.5	48	55.5	74.0	18.5	Vertical
9648.0	5.4	48.8	54.2	74.0	19.8	Horizontal
12060.0	3.7	51.5	55.2	74.0	18.8	Vertical
12060.0	2.6	52.4	55.0	74.0	19.0	Horizontal

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Result of Wifi mode (2412.0 MHz) (802.11b) (Above 1GHz): Pass

Field Strength of Spurious Emissions						
Average Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4824.0	2.5	41.5	44.0	54.0	10.0	Vertical
4824.0	-0.1	42.4	42.3	54.0	11.7	Horizontal
7236.0	-3.0	45.1	42.1	54.0	11.9	Vertical
7236.0	-4.9	46.2	41.3	54.0	12.7	Horizontal
9648.0	-6.4	48	41.6	54.0	12.4	Vertical
9648.0	-7.6	48.8	41.2	54.0	12.8	Horizontal
12060.0	-10.0	51.5	41.5	54.0	12.5	Vertical
12060.0	-9.8	52.4	42.6	54.0	11.4	Horizontal

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**Result of Wifi mode (2437.0 MHz) (802.11b) (9kHz – 30MHz): Pass**

Field Strength of Spurious Emissions Average Value						
Frequency	Measured Level	Correction Factor	Field Strength	Field Strength	Limit	E-Field Polarity
MHz	dB $\mu$ V	dB/m	dB $\mu$ V/m	dB $\mu$ V/m	dB $\mu$ V/m	
Emissions detected are more than 20 dB below the FCC Limits						

**Results of Wifi mode (2437.0 MHz) (802.11b) (30MHz – 1000MHz): PASS**

Field Strength of Spurious Emissions Quasi-Peak Value						
Frequency	Measured Level	Correction Factor	Field Strength	Field Strength	Limit	E-Field Polarity
MHz	dB $\mu$ V	dB/m	dB $\mu$ V/m	dB $\mu$ V/m	dB $\mu$ V/m	
Emissions detected are more than 20 dB below the FCC Limits						

**Result of Wifi mode (2437.0 MHz) (802.11b) (Above 1GHz): Pass**

Field Strength of Spurious Emissions Peak Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dB $\mu$ V	dB/m	dB $\mu$ V/m	dB $\mu$ V/m	dB $\mu$ V/m	
4874.0	15.0	41.6	56.6	74.0	17.4	Vertical
4874.0	13.9	42.5	56.4	74.0	17.6	Horizontal
7311.0	10.3	45.2	55.5	74.0	18.5	Vertical
7311.0	9.0	46.3	55.3	74.0	18.7	Horizontal
9748.0	7.3	48.1	55.4	74.0	18.6	Vertical
9748.0	7.2	48.9	56.1	74.0	17.9	Horizontal
12185.0	3.4	51.6	55.0	74.0	19.0	Vertical
12185.0	2.6	52.5	55.1	74.0	18.9	Horizontal

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Result of Wifi mode (2437.0 MHz) (802.11b) (Above 1GHz): Pass

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4874.0	0.4	41.6	42.0	54.0	12.0	Vertical
4874.0	0.2	42.5	42.7	54.0	11.3	Horizontal
7311.0	-3.1	45.2	42.1	54.0	11.9	Vertical
7311.0	-3.8	46.3	42.5	54.0	11.5	Horizontal
9748.0	-6.5	48.1	41.6	54.0	12.4	Vertical
9748.0	-6.4	48.9	42.5	54.0	11.5	Horizontal
12185.0	-9.9	51.6	41.7	54.0	12.3	Vertical
12185.0	-10.2	52.5	42.3	54.0	11.7	Horizontal

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Result of Wifi mode (2462.0 MHz) (802.11b) (9kHz – 30MHz): Pass

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Limit dB $\mu$ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Results of Wifi mode (2462.0 MHz) (802.11b) (30MHz – 1000MHz): PASS

Field Strength of Spurious Emissions Quasi-Peak Value						
Frequency MHz	Measured Level dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Limit dB $\mu$ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Result of Wifi mode (2462.0 MHz) (802.11b) (Above 1GHz): Pass

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
4924.0	14.8	41.4	56.2	74.0	17.8	Vertical
4924.0	12.4	42.7	55.1	74.0	18.9	Horizontal
7386.0	8.4	45.6	54.0	74.0	20.0	Vertical
7386.0	8.1	46.5	54.6	74.0	19.4	Horizontal
9848.0	6.9	48.6	55.5	74.0	18.5	Vertical
9848.0	4.9	49.7	54.6	74.0	19.4	Horizontal
12310.0	3.3	51.7	55.0	74.0	19.0	Vertical
12310.0	3.0	52.7	55.7	74.0	18.3	Horizontal

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Result of Wifi mode (2462.0 MHz) (802.11b) (Above 1GHz): Pass

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4924.0	1.1	41.4	42.5	54.0	11.5	Vertical
4924.0	-0.4	42.7	42.3	54.0	11.7	Horizontal
7386.0	-4.0	45.6	41.6	54.0	12.4	Vertical
7386.0	-5.1	46.5	41.4	54.0	12.6	Horizontal
9848.0	-6.5	48.6	42.1	54.0	11.9	Vertical
9848.0	-8.0	49.7	41.7	54.0	12.3	Horizontal
12310.0	-10.3	51.7	41.4	54.0	12.6	Vertical
12310.0	-11.4	52.7	41.3	54.0	12.7	Horizontal

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**Result of Wifi mode (2412.0 MHz) (802.11g) (9kHz – 30MHz): Pass**

<b>Field Strength of Spurious Emissions</b>						
<b>Average Value</b>						
Frequency MHz	Measured Level dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Limit dB $\mu$ V/m	E-Field Polarity
<b>Emissions detected are more than 20 dB below the FCC Limits</b>						

**Results of Wifi mode (2412.0 MHz) (802.11g) (30MHz – 1000MHz): PASS**

<b>Field Strength of Spurious Emissions</b>						
<b>Quasi-Peak Value</b>						
Frequency MHz	Measured Level dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Limit dB $\mu$ V/m	E-Field Polarity
<b>Emissions detected are more than 20 dB below the FCC Limits</b>						

**Result of Wifi mode (2412.0 MHz) (802.11g) (Above 1GHz): Pass**

<b>Field Strength of Spurious Emissions</b>						
<b>Peak Value</b>						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
4824.0	14.5	41.5	56.0	74.0	18.0	Vertical
4824.0	13.0	42.4	55.4	74.0	18.6	Horizontal
7236.0	11.0	45.1	56.1	74.0	17.9	Vertical
7236.0	8.3	46.2	54.5	74.0	19.5	Horizontal
9648.0	8.1	48	56.1	74.0	17.9	Vertical
9648.0	5.8	48.8	54.6	74.0	19.4	Horizontal
12060.0	3.5	51.5	55.0	74.0	19.0	Vertical
12060.0	2.9	52.4	55.3	74.0	18.7	Horizontal

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Result of Wifi mode (2412.0 MHz) (802.11g) (Above 1GHz): Pass

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4824.0	0.6	41.5	42.1	54.0	11.9	Vertical
4824.0	-1.2	42.4	41.2	54.0	12.8	Horizontal
7236.0	-2.7	45.1	42.4	54.0	11.6	Vertical
7236.0	-4.2	46.2	42.0	54.0	12.0	Horizontal
9648.0	-6.6	48	41.4	54.0	12.6	Vertical
9648.0	-7.5	48.8	41.3	54.0	12.7	Horizontal
12060.0	-9.3	51.5	42.2	54.0	11.8	Vertical
12060.0	-9.7	52.4	42.7	54.0	11.3	Horizontal

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**Result of Wifi mode (2437.0 MHz) (802.11g) (9kHz – 30MHz): Pass**

<b>Field Strength of Spurious Emissions</b>						
<b>Average Value</b>						
Frequency	Measured Level	Correction Factor	Field Strength	Field Strength	Limit	E-Field Polarity
MHz	dB $\mu$ V	dB/m	dB $\mu$ V/m	dB $\mu$ V/m	dB $\mu$ V/m	
<b>Emissions detected are more than 20 dB below the FCC Limits</b>						

**Results of Wifi mode (2437.0 MHz) (802.11g) (30MHz – 1000MHz): PASS**

<b>Field Strength of Spurious Emissions</b>						
<b>Quasi-Peak Value</b>						
Frequency	Measured Level	Correction Factor	Field Strength	Field Strength	Limit	E-Field Polarity
MHz	dB $\mu$ V	dB/m	dB $\mu$ V/m	dB $\mu$ V/m	dB $\mu$ V/m	
<b>Emissions detected are more than 20 dB below the FCC Limits</b>						

**Result of Wifi mode (2437.0 MHz) (802.11g) (Above 1GHz): Pass**

<b>Field Strength of Spurious Emissions</b>						
<b>Peak Value</b>						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dBuV/m	
4874.0	14.3	41.6	55.9	74.0	18.1	Vertical
4874.0	13.1	42.5	55.6	74.0	18.4	Horizontal
7311.0	10.0	45.2	55.2	74.0	18.8	Vertical
7311.0	9.0	46.3	55.3	74.0	18.7	Horizontal
9748.0	7.4	48.1	55.5	74.0	18.5	Vertical
9748.0	6.1	48.9	55.0	74.0	19.0	Horizontal
12185.0	3.7	51.6	55.3	74.0	18.7	Vertical
12185.0	3.9	52.5	56.4	74.0	17.6	Horizontal

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Result of Wifi mode (2437.0 MHz) (802.11g) (Above 1GHz): Pass

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4874.0	-0.6	41.6	41.0	54.0	13.0	Vertical
4874.0	-1.1	42.5	41.4	54.0	12.6	Horizontal
7311.0	-3.1	45.2	42.1	54.0	11.9	Vertical
7311.0	-4.8	46.3	41.5	54.0	12.5	Horizontal
9748.0	-6.3	48.1	41.8	54.0	12.2	Vertical
9748.0	-6.7	48.9	42.2	54.0	11.8	Horizontal
12185.0	-9.9	51.6	41.7	54.0	12.3	Vertical
12185.0	-10.0	52.5	42.5	54.0	11.5	Horizontal

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**Result of Wifi mode (2462.0 MHz) (802.11g) (9kHz – 30MHz): Pass**

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Limit dB $\mu$ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

**Results of Wifi mode (2462.0 MHz) (802.11g) (30MHz – 1000MHz): PASS**

Field Strength of Spurious Emissions Quasi-Peak Value						
Frequency MHz	Measured Level dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Limit dB $\mu$ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

**Result of Wifi mode (2462.0 MHz) (802.11g) (Above 1GHz): Pass**

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
4924.0	14.8	41.4	56.2	74.0	17.8	Vertical
4924.0	13.1	42.7	55.8	74.0	18.2	Horizontal
7386.0	9.4	45.6	55.0	74.0	19.0	Vertical
7386.0	7.6	46.5	54.1	74.0	19.9	Horizontal
9848.0	7.6	48.6	56.2	74.0	17.8	Vertical
9848.0	5.8	49.7	55.5	74.0	18.5	Horizontal
12310.0	4.0	51.7	55.7	74.0	18.3	Vertical
12310.0	2.5	52.7	55.2	74.0	18.8	Horizontal

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Result of Wifi mode (2462.0 MHz) (802.11g) (Above 1GHz): Pass

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4924.0	1.0	41.4	42.4	54.0	11.6	Vertical
4924.0	-0.6	42.7	42.1	54.0	11.9	Horizontal
7386.0	-4.0	45.6	41.6	54.0	12.4	Vertical
7386.0	-5.1	46.5	41.4	54.0	12.6	Horizontal
9848.0	-6.5	48.6	42.1	54.0	11.9	Vertical
9848.0	-8.4	49.7	41.3	54.0	12.7	Horizontal
12310.0	-9.7	51.7	42.0	54.0	12.0	Vertical
12310.0	-11.1	52.7	41.6	54.0	12.4	Horizontal

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Result of Wifi mode (2412.0 MHz) (802.11n20) (9kHz – 30MHz): Pass

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Limit dB $\mu$ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Results of Wifi mode (2412.0 MHz) (802.11n20) (30MHz – 1000MHz): PASS

Field Strength of Spurious Emissions Quasi-Peak Value						
Frequency MHz	Measured Level dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Limit dB $\mu$ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Result of Wifi mode (2412.0 MHz) (802.11n20) (Above 1GHz): Pass

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
4824.0	15.1	41.5	56.6	74.0	17.4	Vertical
4824.0	13.1	42.4	55.5	74.0	18.5	Horizontal
7236.0	9.9	45.1	55.0	74.0	19.0	Vertical
7236.0	9.1	46.2	55.3	74.0	18.7	Horizontal
9648.0	8.1	48	56.1	74.0	17.9	Vertical
9648.0	5.9	48.8	54.7	74.0	19.3	Horizontal
12060.0	5.0	51.5	56.5	74.0	17.5	Vertical
12060.0	2.6	52.4	55.0	74.0	19.0	Horizontal

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Result of Wifi mode (2412.0 MHz) (802.11n20) (Above 1GHz): Pass

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4824.0	-0.1	41.5	41.4	54.0	12.6	Vertical
4824.0	-0.2	42.4	42.2	54.0	11.8	Horizontal
7236.0	-2.4	45.1	42.7	54.0	11.3	Vertical
7236.0	-4.1	46.2	42.1	54.0	11.9	Horizontal
9648.0	-6.8	48	41.2	54.0	12.8	Vertical
9648.0	-7.5	48.8	41.3	54.0	12.7	Horizontal
12060.0	-9.1	51.5	42.4	54.0	11.6	Vertical
12060.0	-9.7	52.4	42.7	54.0	11.3	Horizontal

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**Result of Wifi mode (2437.0 MHz) (802.11n20) (9kHz – 30MHz): Pass**

Field Strength of Spurious Emissions Average Value						
Frequency	Measured Level	Correction Factor	Field Strength	Field Strength	Limit	E-Field Polarity
MHz	dB $\mu$ V	dB/m	dB $\mu$ V/m	dB $\mu$ V/m	dB $\mu$ V/m	
<b>Emissions detected are more than 20 dB below the FCC Limits</b>						

**Results of Wifi mode (2437.0 MHz) (802.11n20) (30MHz – 1000MHz): PASS**

Field Strength of Spurious Emissions Quasi-Peak Value						
Frequency	Measured Level	Correction Factor	Field Strength	Field Strength	Limit	E-Field Polarity
MHz	dB $\mu$ V	dB/m	dB $\mu$ V/m	dB $\mu$ V/m	dB $\mu$ V/m	
<b>Emissions detected are more than 20 dB below the FCC Limits</b>						

**Result of Wifi mode (2437.0 MHz) (802.11n20) (Above 1GHz): Pass**

Field Strength of Spurious Emissions Peak Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dB $\mu$ V	dB/m	dB $\mu$ V/m	dB $\mu$ V/m	dB $\mu$ V/m	
4874.0	15.5	41.6	57.1	74.0	16.9	Vertical
4874.0	13.7	42.5	56.2	74.0	17.8	Horizontal
7311.0	10.4	45.2	55.6	74.0	18.4	Vertical
7311.0	9.4	46.3	55.7	74.0	18.3	Horizontal
9748.0	7.9	48.1	56.0	74.0	18.0	Vertical
9748.0	7.6	48.9	56.5	74.0	17.5	Horizontal
12185.0	4.0	51.6	55.6	74.0	18.4	Vertical
12185.0	3.7	52.5	56.2	74.0	17.8	Horizontal

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Result of Wifi mode (2437.0 MHz) (802.11n20) (Above 1GHz): Pass

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4874.0	0.4	41.6	42.0	54.0	12.0	Vertical
4874.0	-0.3	42.5	42.2	54.0	11.8	Horizontal
7311.0	-3.9	45.2	41.3	54.0	12.7	Vertical
7311.0	-3.8	46.3	42.5	54.0	11.5	Horizontal
9748.0	-5.7	48.1	42.4	54.0	11.6	Vertical
9748.0	-6.8	48.9	42.1	54.0	11.9	Horizontal
12185.0	-10.3	51.6	41.3	54.0	12.7	Vertical
12185.0	-11.1	52.5	41.4	54.0	12.6	Horizontal

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Result of Wifi mode (2462.0 MHz) (802.11n20) (9kHz – 30MHz): Pass

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Limit dB $\mu$ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Results of Wifi mode (2462.0 MHz) (802.11n20) (30MHz – 1000MHz): PASS

Field Strength of Spurious Emissions Quasi-Peak Value						
Frequency MHz	Measured Level dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Limit dB $\mu$ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Result of Wifi mode (2462.0 MHz) (802.11n20) (Above 1GHz): Pass

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
4924.0	15.0	41.4	56.4	74.0	17.6	Vertical
4924.0	12.4	42.7	55.1	74.0	18.9	Horizontal
7386.0	8.9	45.6	54.5	74.0	19.5	Vertical
7386.0	8.9	46.5	55.4	74.0	18.6	Horizontal
9848.0	7.0	48.6	55.6	74.0	18.4	Vertical
9848.0	4.9	49.7	54.6	74.0	19.4	Horizontal
12310.0	4.0	51.7	55.7	74.0	18.3	Vertical
12310.0	3.0	52.7	55.7	74.0	18.3	Horizontal

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Result of Wifi mode (2462.0 MHz) (802.11n20) (Above 1GHz): Pass

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4924.0	2.2	41.4	43.6	54.0	10.4	Vertical
4924.0	-0.5	42.7	42.2	54.0	11.8	Horizontal
7386.0	-4.0	45.6	41.6	54.0	12.4	Vertical
7386.0	-5.3	46.5	41.2	54.0	12.8	Horizontal
9848.0	-6.5	48.6	42.1	54.0	11.9	Vertical
9848.0	-8.4	49.7	41.3	54.0	12.7	Horizontal
12310.0	-10.7	51.7	41.0	54.0	13.0	Vertical
12310.0	-11.2	52.7	41.5	54.0	12.5	Horizontal

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**Result of Wifi mode (2422.0 MHz) (802.11n40) (9kHz – 30MHz): Pass**

Field Strength of Spurious Emissions						
Average Value						
Frequency	Measured Level	Correction Factor	Field Strength	Field Strength	Limit	E-Field Polarity
MHz	dB $\mu$ V	dB/m	dB $\mu$ V/m	dB $\mu$ V/m	dB $\mu$ V/m	
<b>Emissions detected are more than 20 dB below the FCC Limits</b>						

**Results of Wifi mode (2422.0 MHz) (802.11n40) (30MHz – 1000MHz): PASS**

Field Strength of Spurious Emissions						
Quasi-Peak Value						
Frequency	Measured Level	Correction Factor	Field Strength	Field Strength	Limit	E-Field Polarity
MHz	dB $\mu$ V	dB/m	dB $\mu$ V/m	dB $\mu$ V/m	dB $\mu$ V/m	
<b>Emissions detected are more than 20 dB below the FCC Limits</b>						

**Result of Wifi mode (2422.0 MHz) (802.11n40) (Above 1GHz): Pass**

Field Strength of Spurious Emissions						
Peak Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dB $\mu$ V	dB/m	dB $\mu$ V/m	dB $\mu$ V/m	dB $\mu$ V/m	
4844.0	13.5	41.5	55.0	74.0	19.0	Vertical
4844.0	12.2	42.4	54.6	74.0	19.4	Horizontal
7266.0	10.0	45.1	55.1	74.0	18.9	Vertical
7266.0	9.0	46.2	55.2	74.0	18.8	Horizontal
9688.0	7.3	48	55.3	74.0	18.7	Vertical
9688.0	6.1	48.8	54.9	74.0	19.1	Horizontal
12110.0	4.5	51.5	56.0	74.0	18.0	Vertical
12110.0	2.8	52.4	55.2	74.0	18.8	Horizontal

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Result of Wifi mode (2422.0 MHz) (802.11n40) (Above 1GHz): Pass

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4844.0	-1.4	41.5	40.1	54.0	13.9	Vertical
4844.0	-3.3	42.4	39.1	54.0	14.9	Horizontal
7266.0	-4.4	45.1	40.7	54.0	13.3	Vertical
7266.0	-5.9	46.2	40.3	54.0	13.7	Horizontal
9688.0	-7.0	48	41.0	54.0	13.0	Vertical
9688.0	-7.7	48.8	41.1	54.0	12.9	Horizontal
12110.0	-9.4	51.5	42.1	54.0	11.9	Vertical
12110.0	-10.9	52.4	41.5	54.0	12.5	Horizontal

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Result of Wifi mode (2437.0 MHz) (802.11n40) (9kHz – 30MHz): Pass

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Limit dB $\mu$ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Results of Wifi mode (2437.0 MHz) (802.11n40) (30MHz – 1000MHz): PASS

Field Strength of Spurious Emissions Quasi-Peak Value						
Frequency MHz	Measured Level dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Limit dB $\mu$ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Result of Wifi mode (2437.0 MHz) (802.11n40) (Above 1GHz): Pass

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
4874.0	14.2	41.6	55.8	74.0	18.2	Vertical
4874.0	12.7	42.5	55.2	74.0	18.8	Horizontal
7311.0	10.3	45.2	55.5	74.0	18.5	Vertical
7311.0	9.0	46.3	55.3	74.0	18.7	Horizontal
9748.0	7.7	48.1	55.8	74.0	18.2	Vertical
9748.0	7.1	48.9	56.0	74.0	18.0	Horizontal
12185.0	4.3	51.6	55.9	74.0	18.1	Vertical
12185.0	3.6	52.5	56.1	74.0	17.9	Horizontal

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Result of Wifi mode (2437.0 MHz) (802.11n40) (Above 1GHz): Pass

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4874.0	-1.6	41.6	40.0	54.0	14.0	Vertical
4874.0	-1.2	42.5	41.3	54.0	12.7	Horizontal
7311.0	-4.4	45.2	40.8	54.0	13.2	Vertical
7311.0	-5.8	46.3	40.5	54.0	13.5	Horizontal
9748.0	-6.1	48.1	42.0	54.0	12.0	Vertical
9748.0	-6.8	48.9	42.1	54.0	11.9	Horizontal
12185.0	-10.2	51.6	41.4	54.0	12.6	Vertical
12185.0	-11.3	52.5	41.2	54.0	12.8	Horizontal

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**Result of Wifi mode (2452.0 MHz) (802.11n40) (9kHz – 30MHz): Pass**

Field Strength of Spurious Emissions						
Average Value						
Frequency	Measured Level	Correction Factor	Field Strength	Field Strength	Limit	E-Field Polarity
MHz	dB $\mu$ V	dB/m	dB $\mu$ V/m	dB $\mu$ V/m	dB $\mu$ V/m	
<b>Emissions detected are more than 20 dB below the FCC Limits</b>						

**Results of Wifi mode (2452.0 MHz) (802.11n40) (30MHz – 1000MHz): PASS**

Field Strength of Spurious Emissions						
Quasi-Peak Value						
Frequency	Measured Level	Correction Factor	Field Strength	Field Strength	Limit	E-Field Polarity
MHz	dB $\mu$ V	dB/m	dB $\mu$ V/m	dB $\mu$ V/m	dB $\mu$ V/m	
<b>Emissions detected are more than 20 dB below the FCC Limits</b>						

**Result of Wifi mode (2452.0 MHz) (802.11n40) (Above 1GHz): Pass**

Field Strength of Spurious Emissions						
Peak Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dB $\mu$ V	dB/m	dB $\mu$ V/m	dB $\mu$ V/m	dB $\mu$ V/m	
4904.0	14.6	41.4	56.0	74.0	18.0	Vertical
4904.0	12.7	42.7	55.4	74.0	18.6	Horizontal
7356.0	9.3	45.6	54.9	74.0	19.1	Vertical
7356.0	9.2	46.5	55.7	74.0	18.3	Horizontal
9808.0	7.1	48.6	55.7	74.0	18.3	Vertical
9808.0	5.1	49.7	54.8	74.0	19.2	Horizontal
12260.0	4.1	51.7	55.8	74.0	18.2	Vertical
12260.0	2.9	52.7	55.6	74.0	18.4	Horizontal

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Result of Wifi mode (2452.0 MHz) (802.11n40) (Above 1GHz): Pass

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4904.0	0.7	41.4	42.1	54.0	11.9	Vertical
4904.0	-1.4	42.7	41.3	54.0	12.7	Horizontal
7356.0	-4.6	45.6	41.0	54.0	13.0	Vertical
7356.0	-5.2	46.5	41.3	54.0	12.7	Horizontal
9808.0	-6.6	48.6	42.0	54.0	12.0	Vertical
9808.0	-8.7	49.7	41.0	54.0	13.0	Horizontal
12260.0	-11.1	51.7	40.6	54.0	13.4	Vertical
12260.0	-11.3	52.7	41.4	54.0	12.6	Horizontal

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

\* Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 9kHz-30MHz 3.3dB  
30MHz -1GHz 4.6dB  
1GHz -26GHz 4.4dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

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### Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

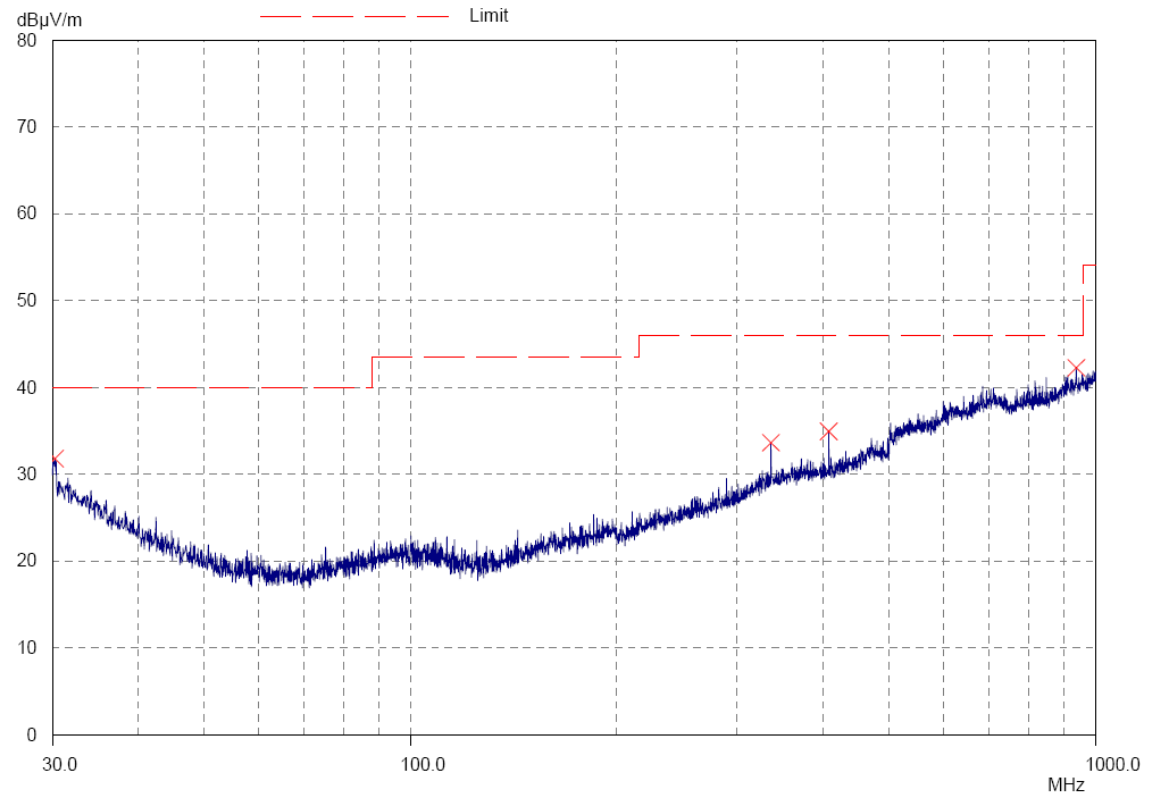
Frequency Range [MHz]	Quasi-Peak Limits [ $\mu\text{V}/\text{m}$ ]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

### Result of WiFi mode (30MHz – 1GHz): Pass

Please refer to the following table for result details

#### Horizontal



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Result of WiFi mode (30MHz – 1GHz): Pass

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Level @3m dB $\mu$ V/m	Limit @3m dB $\mu$ V/m
30.3	Horizontal	31.8	40.0	38.9	100
336.0	Horizontal	33.6	46.0	47.9	200
408.0	Horizontal	34.9	46.0	55.6	200
937.9	Horizontal	42.2	46.0	128.8	200

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### Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

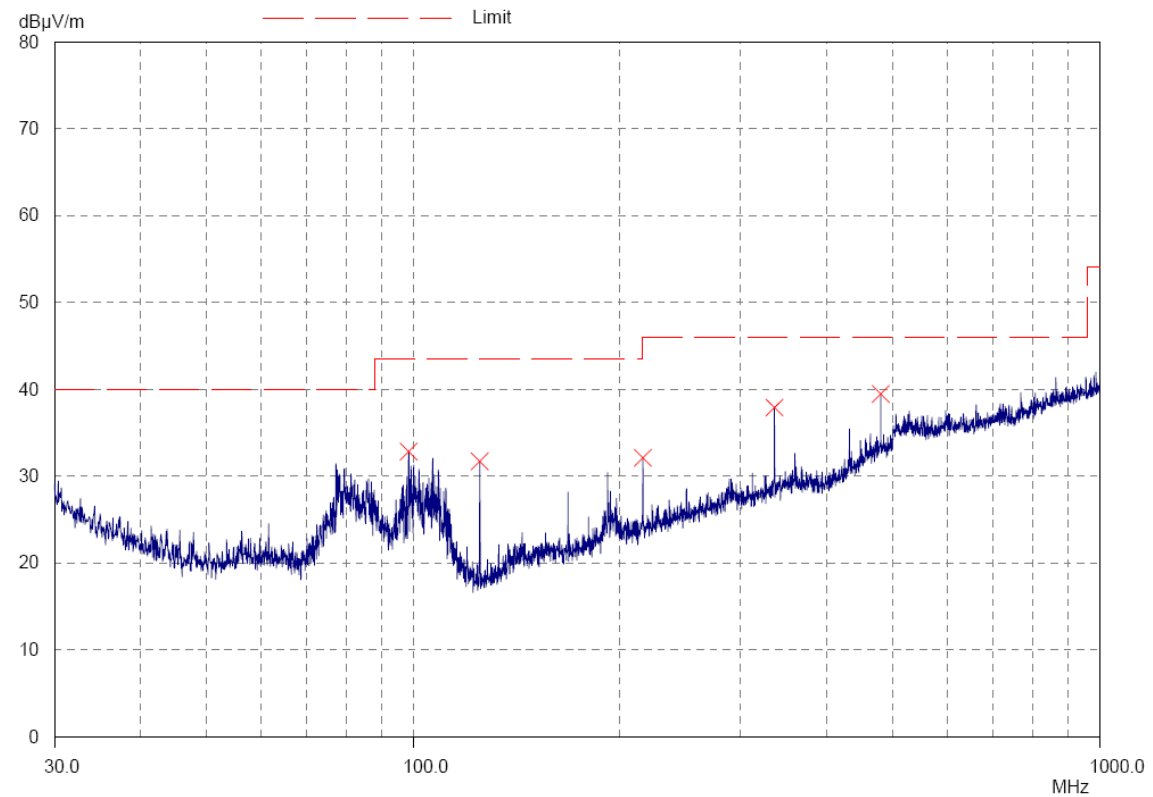
Frequency Range [MHz]	Quasi-Peak Limits [ $\mu\text{V}/\text{m}$ ]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

### Result of WiFi mode (30MHz – 1GHz): Pass

Please refer to the following table for result details

Vertical



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Result of WiFi mode (30MHz – 1GHz): Pass

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Level @3m dB $\mu$ V/m	Limit @3m dB $\mu$ V/m
98.5	Vertical	32.8	43.5	43.7	150
125.0	Vertical	31.7	43.5	38.5	150
216.0	Vertical	32.1	46.0	40.3	150
336.0	Vertical	37.9	46.0	78.5	200
480.0	Vertical	39.4	46.0	93.3	200

Remarks:

Calculated measurement uncertainty (30MHz – 1GHz): 4.6dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

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### 3.1.3 Power Spectral Density

Test Requirement: FCC 47CFR 15.247(e)  
Test Method: ANSI C63.10:2013  
Test Date: 2015-05-04  
Mode of Operation: WiFi mode

#### Test Method:

The RF output of the EUT was connected to the spectrum analyzer. Set the fundamental frequency as the center frequency of the spectral analyzer. Use RBW=3kHz , VBW= 10KHz , Set the span to 1.5 times the DTS channel bandwidth. Detector = peak, Sweep time = auto couple , Trace mode = max hold. Measure the Power Spectral Density (PSD) and record the results in dBm.

#### Test Setup:

As Test Setup of clause 3.1.1 in this test report.

#### Test Limit:

The maximum power spectral density (PSD) shall not exceeded 8dBm in any 3kHz band.

Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF=10\log(3\text{ kHz}/100\text{ kHz}=-15.2\text{dB})$

#### Results of WiFi Mode 802.11 b (Tx:2412MHz to 2462MHz) : Pass (TX Unit)

##### Maximum power spectral density

Transmitter Frequency (MHz)	Maximum Power spectral density level / 3kHz band (dBm)	Maximum Power spectral density / 3kHz band limit
2412.0	-9.93	8dBm
2437.0	-10.28	8dBm
2462.0	-10.19	8dBm

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Results of WiFi Mode 802.11 g (Tx:2412MHz to 2462MHz) : Pass (TX Unit)

Maximum power spectral density

Transmitter Frequency (MHz)	Maximum Power spectral density level / 3kHz band (dBm)	Maximum Power spectral density / 3kHz band limit
2412.0	-21.71	8dBm
2437.0	-21.08	8dBm
2462.0	-20.99	8dBm

Results of WiFi Mode 802.11 n20 (Tx:2412MHz to 2462MHz) : Pass (TX Unit)

Maximum power spectral density

Transmitter Frequency (MHz)	Maximum Power spectral density level / 3kHz band (dBm)	Maximum Power spectral density / 3kHz band limit
2412.0	-22.52	8dBm
2437.0	-22.24	8dBm
2462.0	-22.18	8dBm

Results of WiFi Mode 802.11 n40 (Tx:2422MHz to 2452MHz) : Pass (TX Unit)

Maximum power spectral density

Transmitter Frequency (MHz)	Maximum Power spectral density level / 3kHz band (dBm)	Maximum Power spectral density / 3kHz band limit
2422.0	-24.69	8dBm
2437.0	-24.00	8dBm
2452.0	-24.71	8dBm

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# STC Test Report

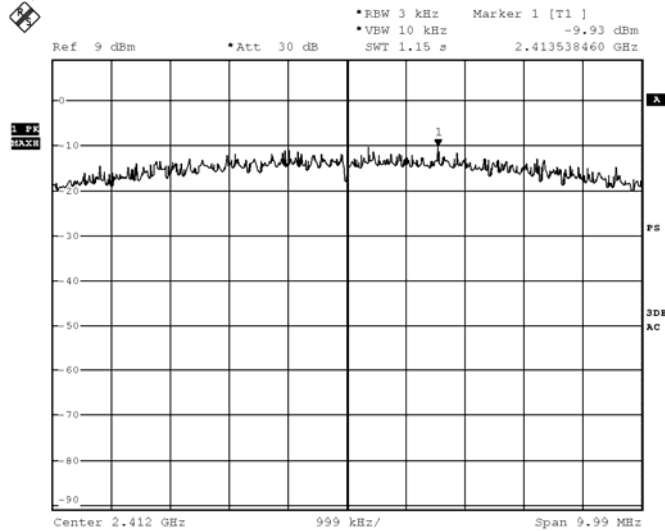
Date: 2015-05-09

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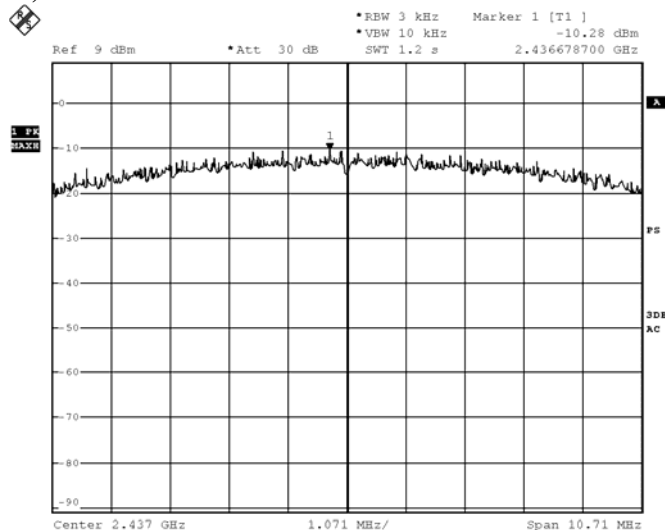
WiFi mode 802.11 b, (Tx: 2412MHz to 2462MHz)

CH 1 (2412.0 MHz)



BMP  
 Date: 4.MAY.2015 19:06:29

CH 6 (2437.0 MHz)



BMP  
 Date: 4.MAY.2015 19:07:27

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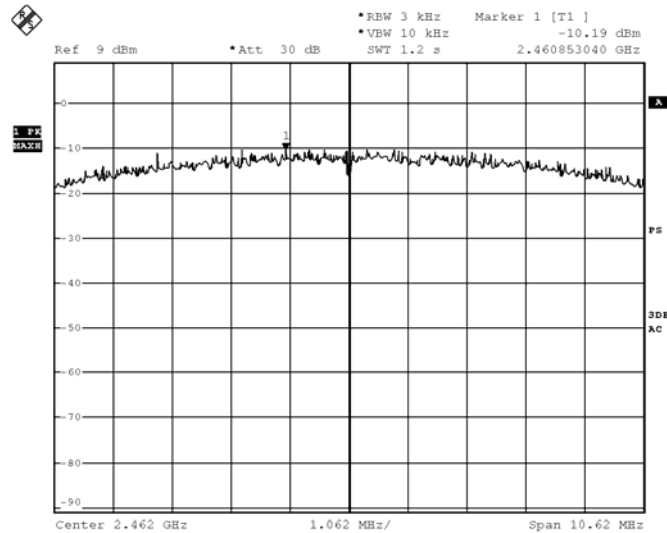
# STC Test Report

Date: 2015-05-09

No.: DM119257

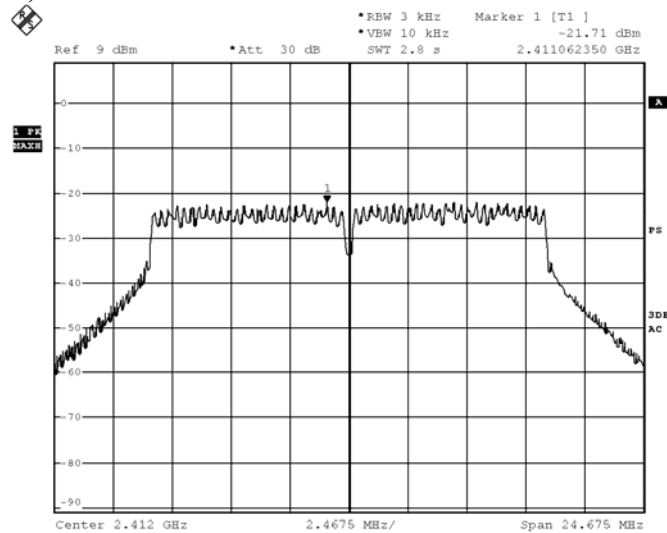
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CH 11 (2462.0 MHz)



BMP  
Date: 4.MAY.2015 19:11:01

WiFi mode 802.11 g, (Tx:2412MHz to 2462MHz)  
Ch 1 (2412.0 MHz)



BMP  
Date: 4.MAY.2015 19:14:24

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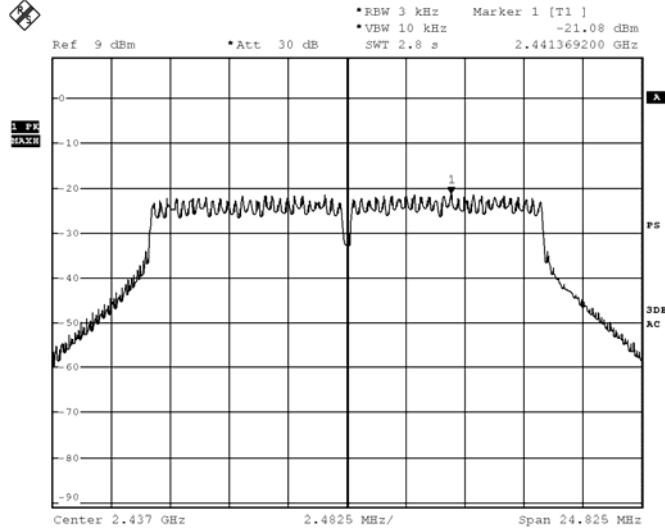


# STC Test Report

Date: 2015-05-09  
No.: DM119257

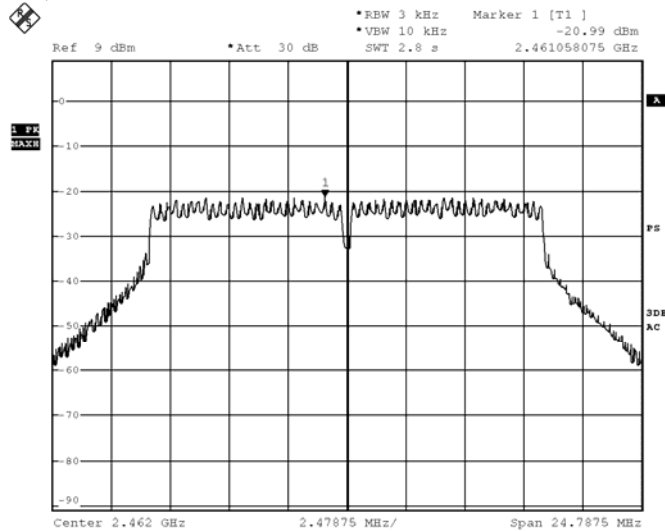
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## CH 6 (2437.0 MHz)



BMP  
Date: 4.MAY.2015 19:13:36

## CH 11 (2462.0 MHz)



BMP  
Date: 4.MAY.2015 19:12:20

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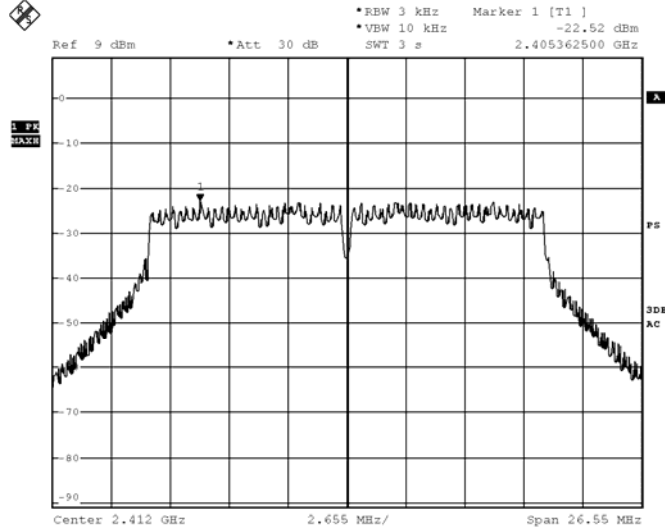


# STC Test Report

Date: 2015-05-09  
No.: DM119257

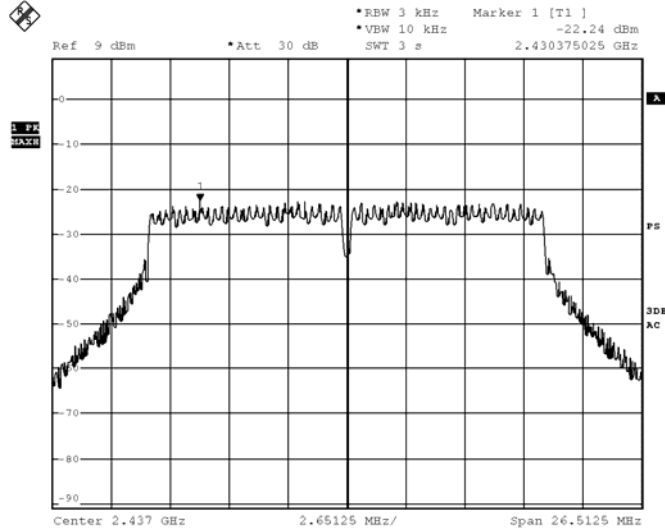
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WiFi mode 802.11 n20, (Tx: 2412MHz to 2462MHz)  
CH 1 (2412.0 MHz)



BMP  
Date: 4.MAY.2015 19:16:01

CH 6 (2437.0 MHz)



BMP  
Date: 4.MAY.2015 19:19:00

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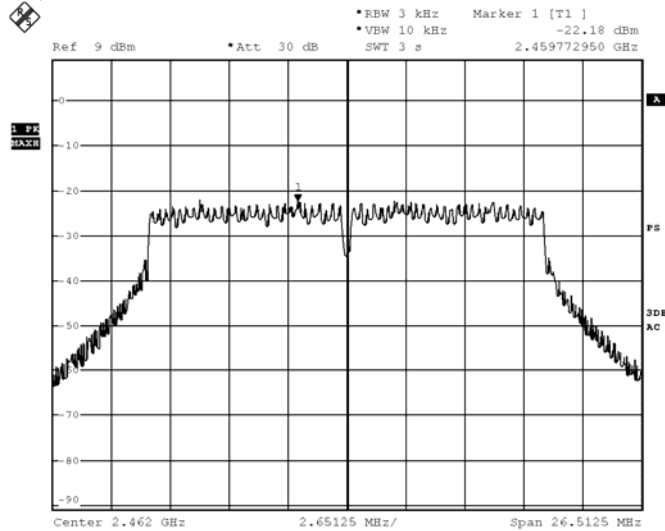
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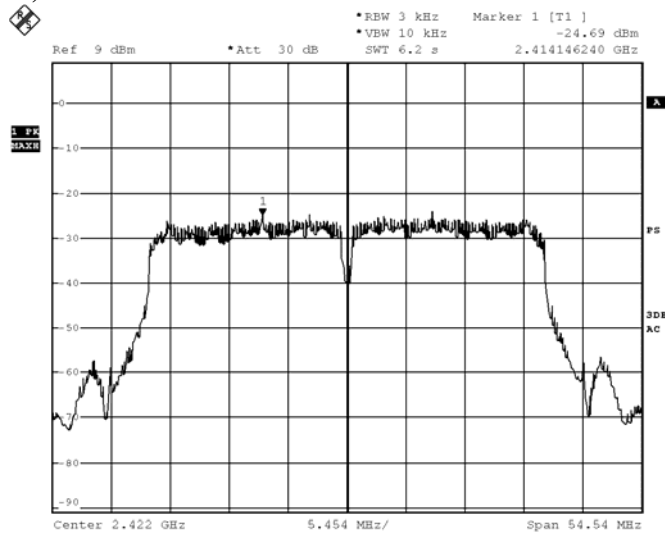
Ch 11 (2462.0 MHz)



BMP  
Date: 4.MAY.2015 19:20:05

WiFi mode 802.11 n40, (Tx: 2422MHz to 2452MHz)

CH 1 (2422.0 MHz)



BMP  
Date: 4.MAY.2015 19:22:18

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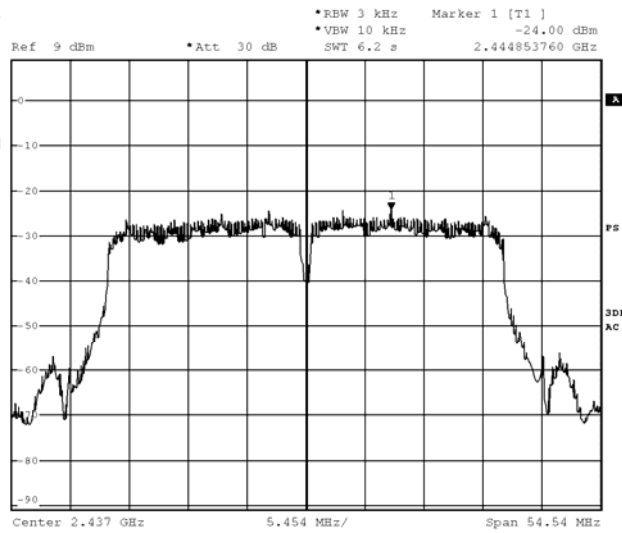
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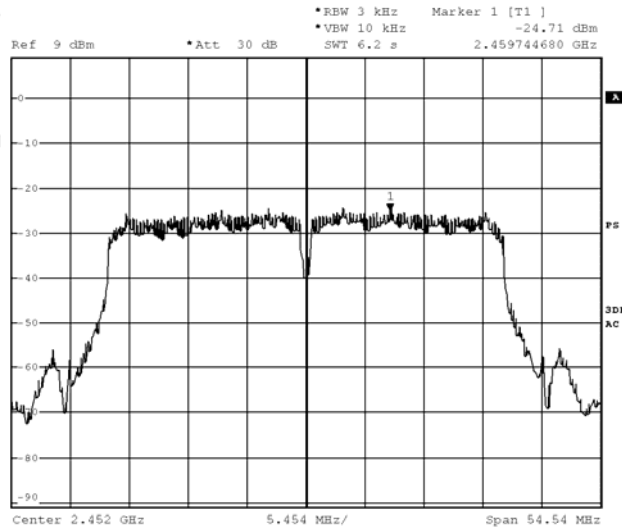
CH 6 (2437.0 MHz)



BMP

Date: 4.MAY.2015 19:23:41

Ch 9 (2452.0 MHz)



BMP

Date: 4.MAY.2015 19:25:10

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### **3.1.4 6dB Spectrum Bandwidth Measurement**

Test Requirement:	FCC 47CFR 15.247(a)(2)
Test Method:	ANSI C63.10:2013
Test Date:	2015-05-04
Mode of Operation:	WiFi mode

#### **Test Method:**

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

#### **Test Setup:**

As Test Setup of clause 3.1.1 in this test report.

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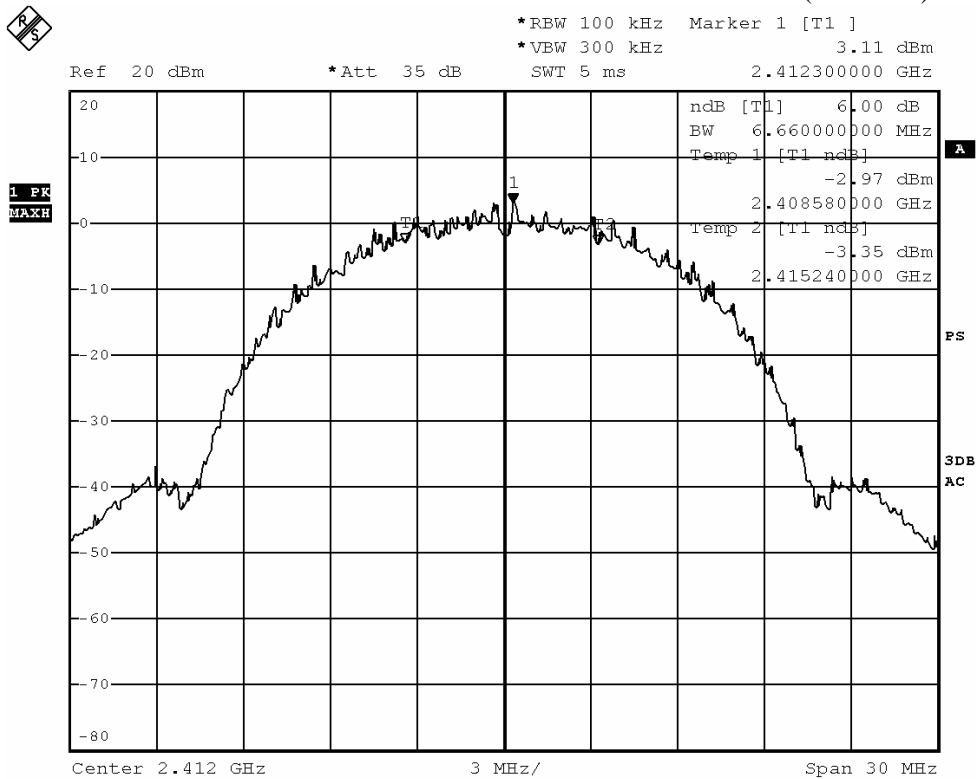
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No.: DM119257

### Limits for 6dB Spectrum Bandwidth Measurement:

Center Frequency [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2412.0	6.66	> 500

### 6dB Bandwidth of Fundamental Emission on 802.11 b (2412MHz)



BMP

Date: 4.MAY.2015 18:29:57

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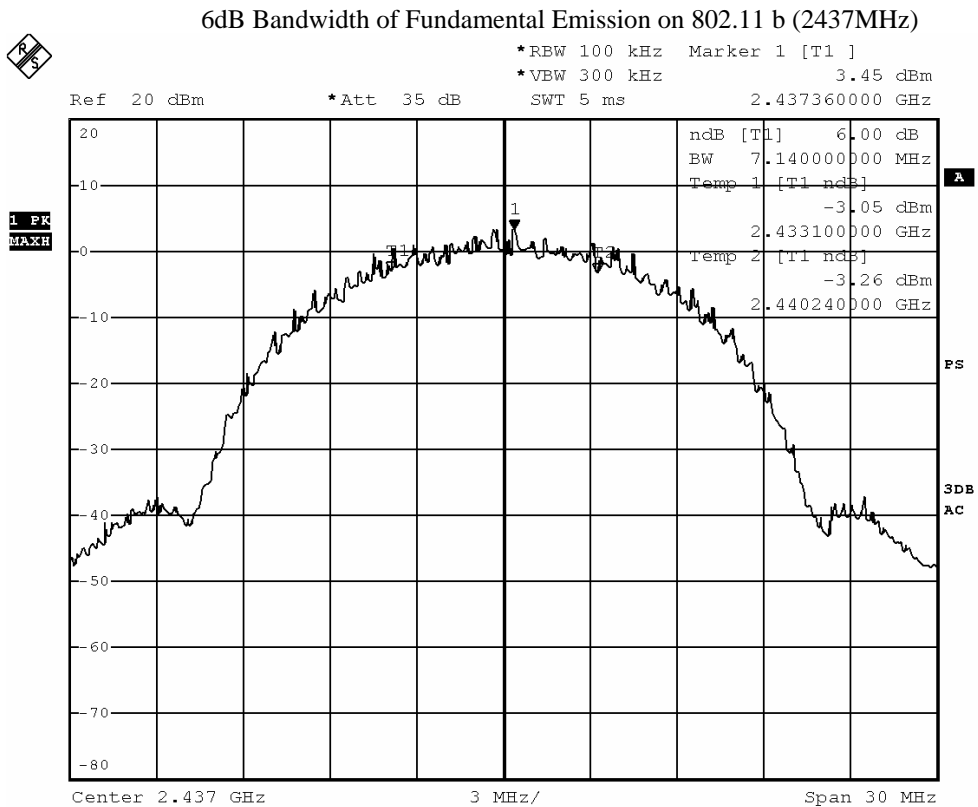
Date: 2015-05-09

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No.: DM119257

### Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2437.0	7.14	> 500



BMP

Date: 4.MAY.2015 18:31:47

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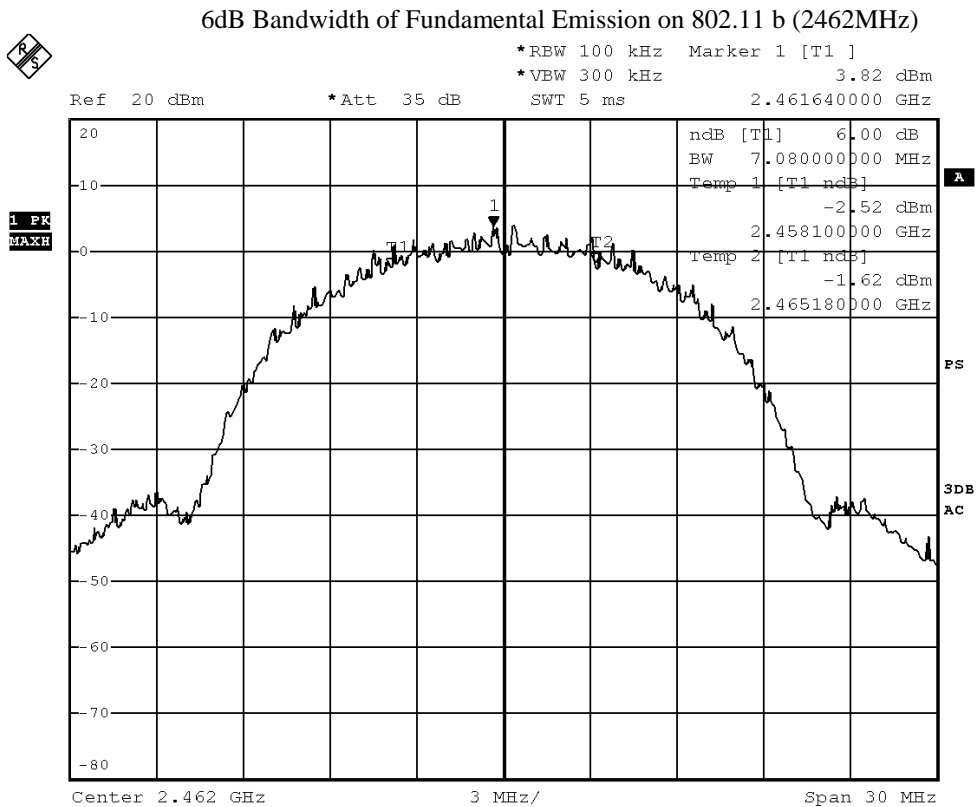
Date: 2015-05-09

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**Limits for 6dB Spectrum Bandwidth Measurement:**

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2462.0	7.08	> 500



BMP

Date: 4.MAY.2015 18:32:58

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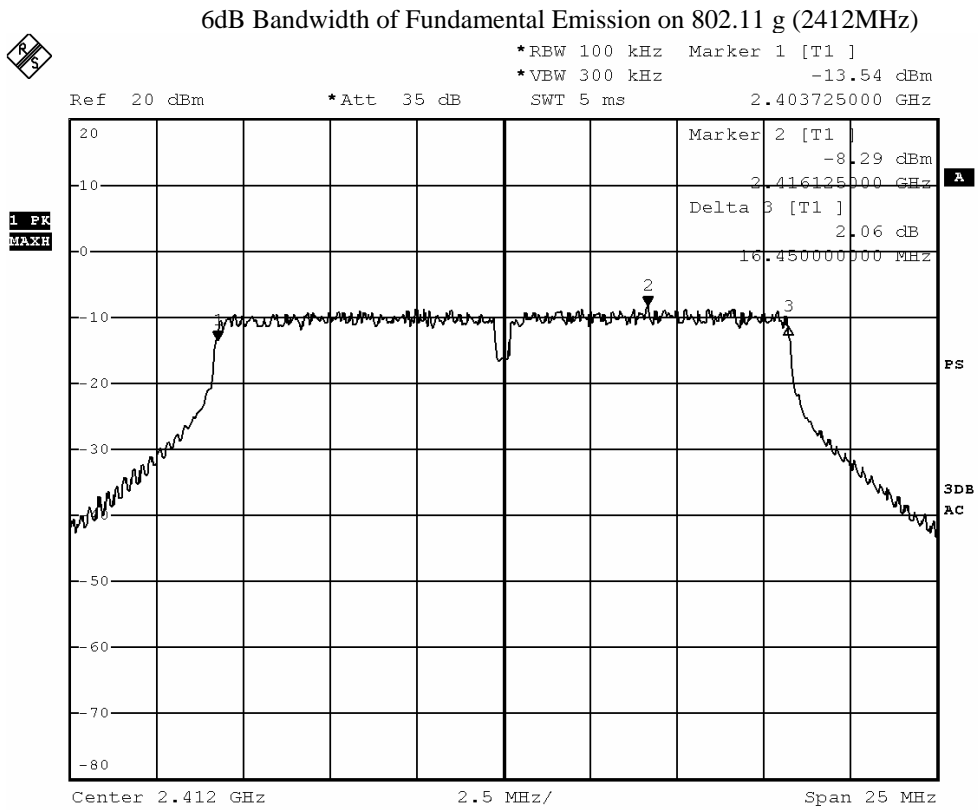
Date: 2015-05-09

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No.: DM119257

### Limits for 6dB Spectrum Bandwidth Measurement:

Center Frequency [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2412.0	16.45	> 500



BMP

Date: 4.MAY.2015 18:42:21

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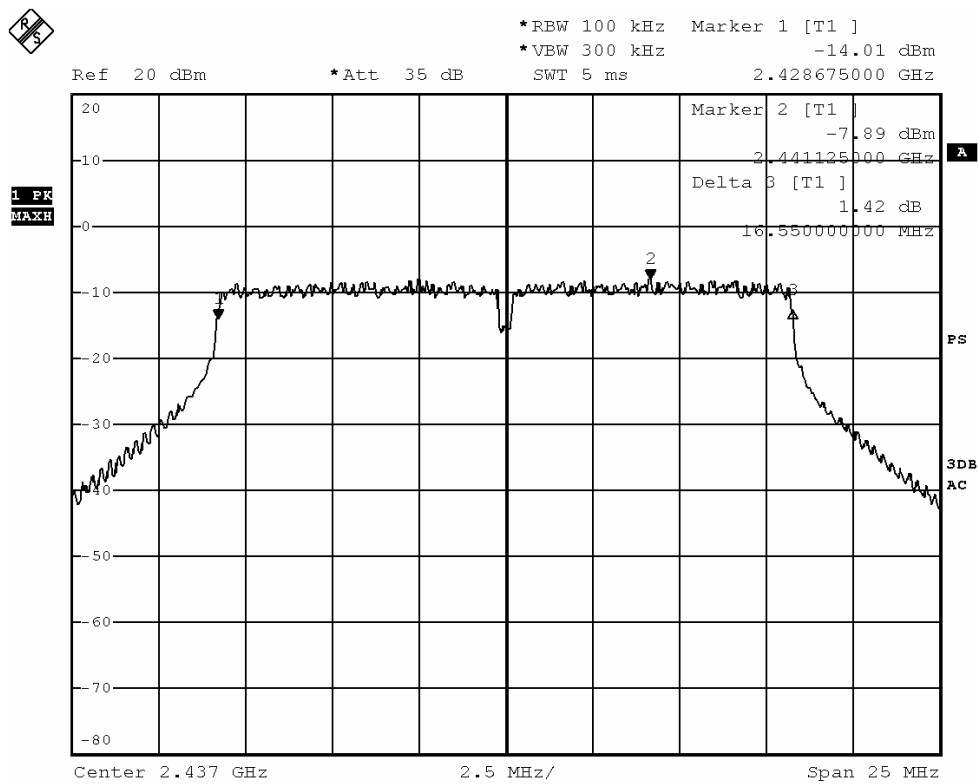
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No.: DM119257

### Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2437.0	16.55	> 500

### 6dB Bandwidth of Fundamental Emission on 802.11 g (2437MHz)



BMP

Date: 4.MAY.2015 18:38:58

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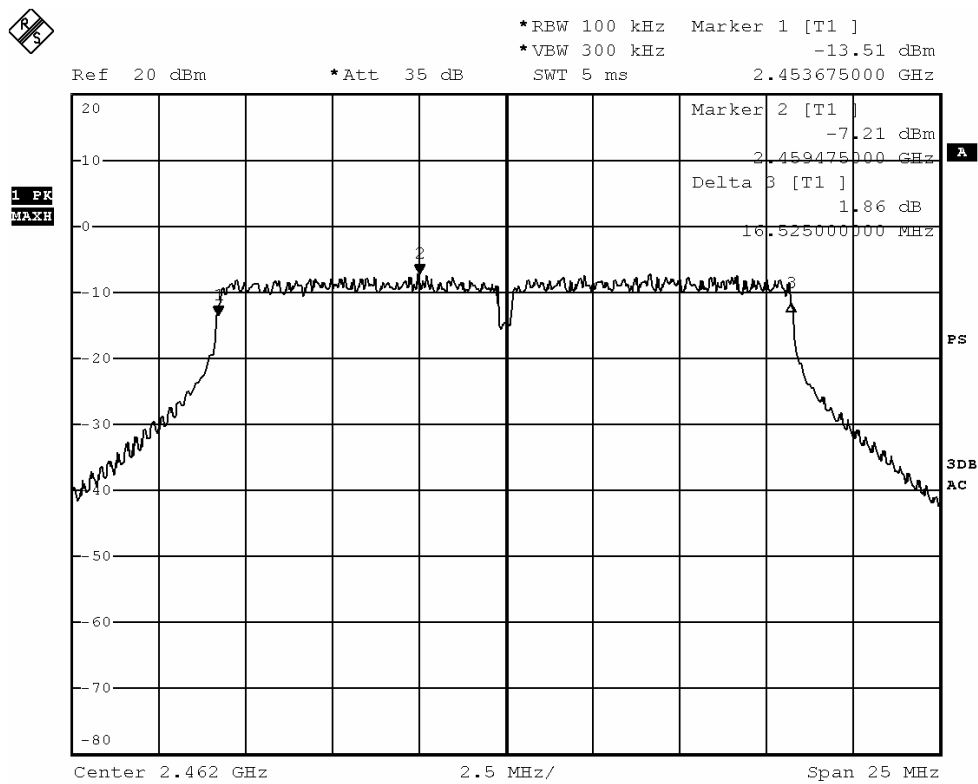
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No.: DM119257

### Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2462.0	16.525	> 500

### 6dB Bandwidth of Fundamental Emission on 802.11 g (2462MHz)



BMP

Date: 4.MAY.2015 18:40:39

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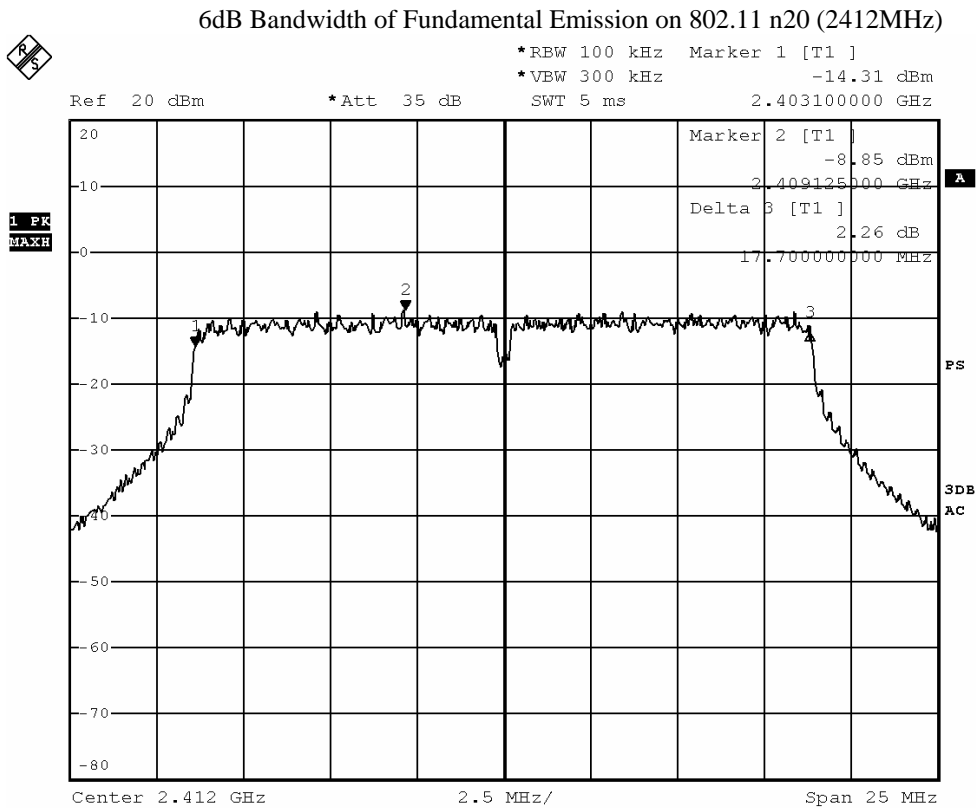
Date: 2015-05-09

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No.: DM119257

**Limits for 6dB Spectrum Bandwidth Measurement:**

Center Frequency [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2412.0	17.70	> 500



BMP

Date: 4.MAY.2015 18:44:17

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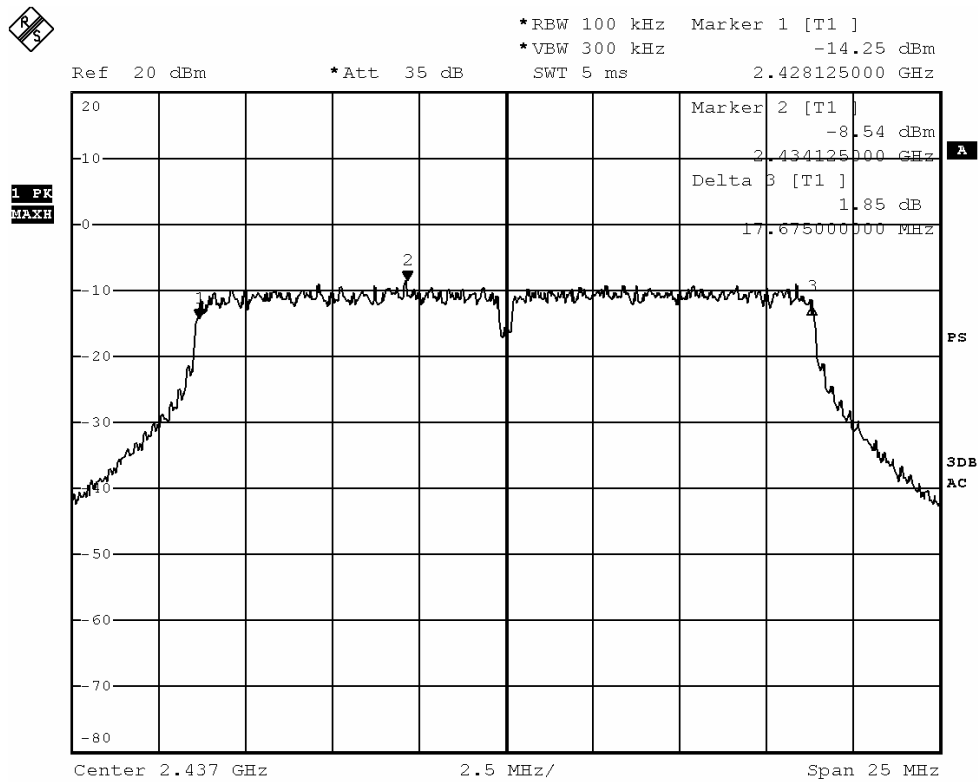
Date: 2015-05-09  
 No.: DM119257

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**Limits for 6dB Spectrum Bandwidth Measurement:**

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2437.0	17.675	> 500

6dB Bandwidth of Fundamental Emission on 802.11 n20 (2437MHz)



BMP

Date: 4.MAY.2015 18:45:33

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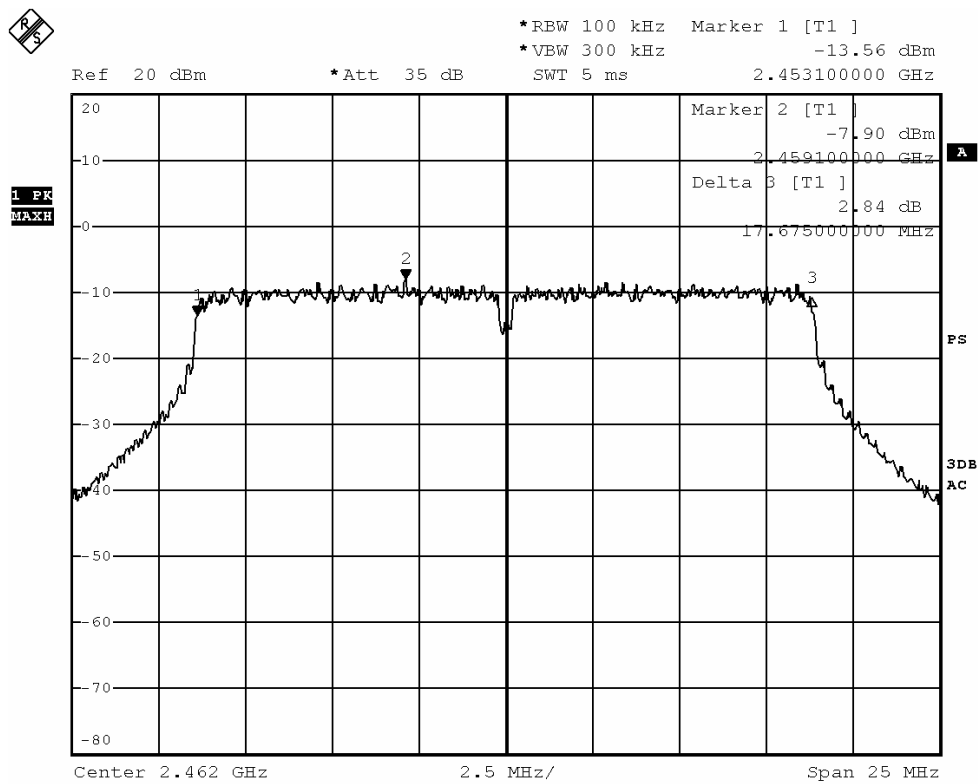
**Page 53 of 75**

**No.: DM119257**

**Limits for 6dB Spectrum Bandwidth Measurement:**

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2462.0	17.675	> 500

6dB Bandwidth of Fundamental Emission on 802.11 n20 (2462MHz)



BMP

Date: 4.MAY.2015 18:47:38

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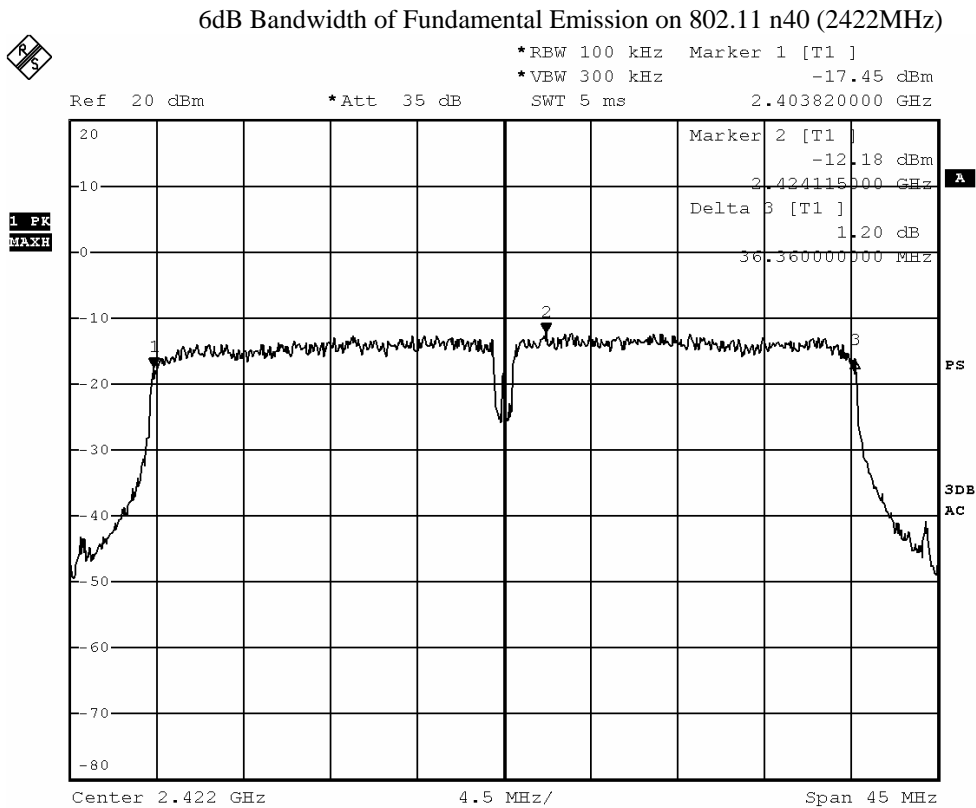
**Date: 2015-05-09**

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**No.: DM119257**

**Limits for 6dB Spectrum Bandwidth Measurement:**

Center Frequency [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2422.0	36.36	> 500



BMP

Date: 4.MAY.2015 18:49:45

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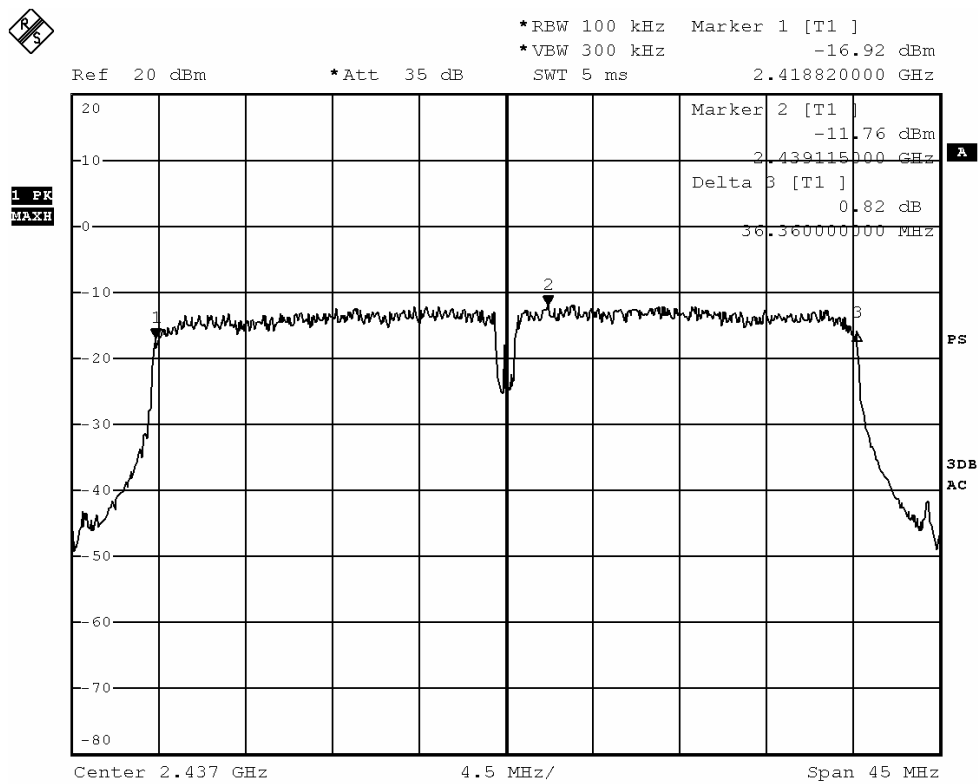
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No.: DM119257

### Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2437.0	36.36	> 500

### 6dB Bandwidth of Fundamental Emission on 802.11 n40 (2437MHz)



BMP

Date: 4.MAY.2015 18:51:29

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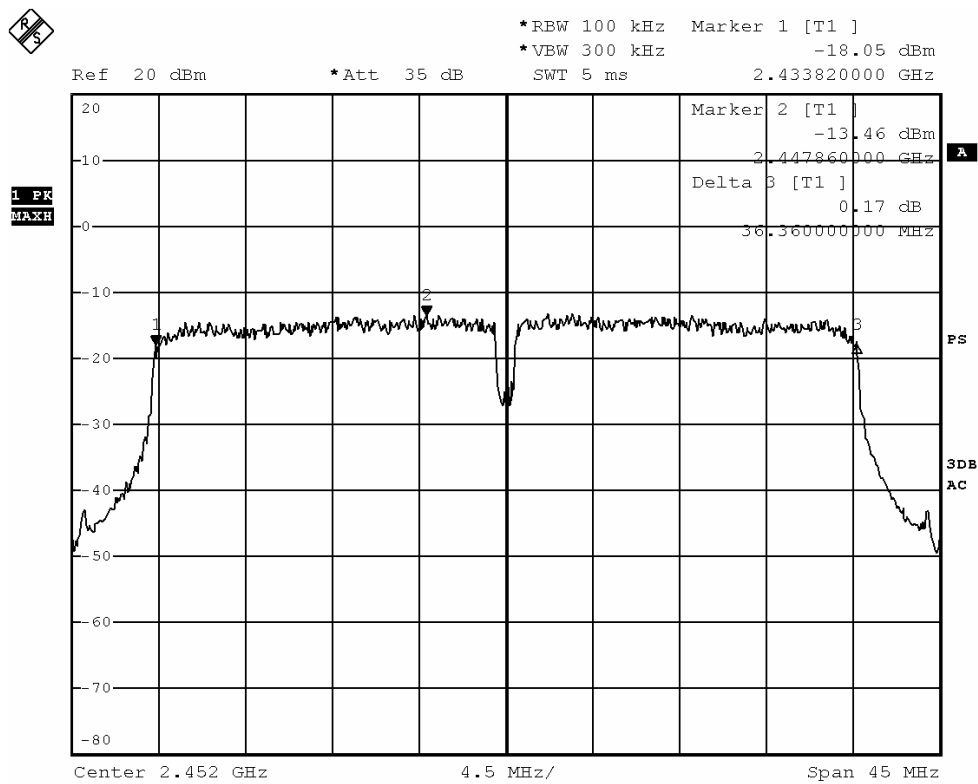
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No.: DM119257

### Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2452.0	36.36	> 500

### 6dB Bandwidth of Fundamental Emission on 802.11 n40 (2452MHz)



BMP

Date: 4.MAY.2015 20:05:12

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## **STC Test Report**

**Date: 2015-05-09**  
**No.: DM119257**

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### **3.1.5 Band Edges Measurement**

Test Requirement:	FCC 47CFR 15.247
Test Method:	ANSI C63.10:2013
Test Date:	2015-05-04
Mode of Operation:	WiFi mode

#### **Test Method:**

The band edge is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. The RBW and VBW are set to 100kHz for this measurement.

#### **Test Setup:**

As Test Setup of clause 3.1.2 in this test report.

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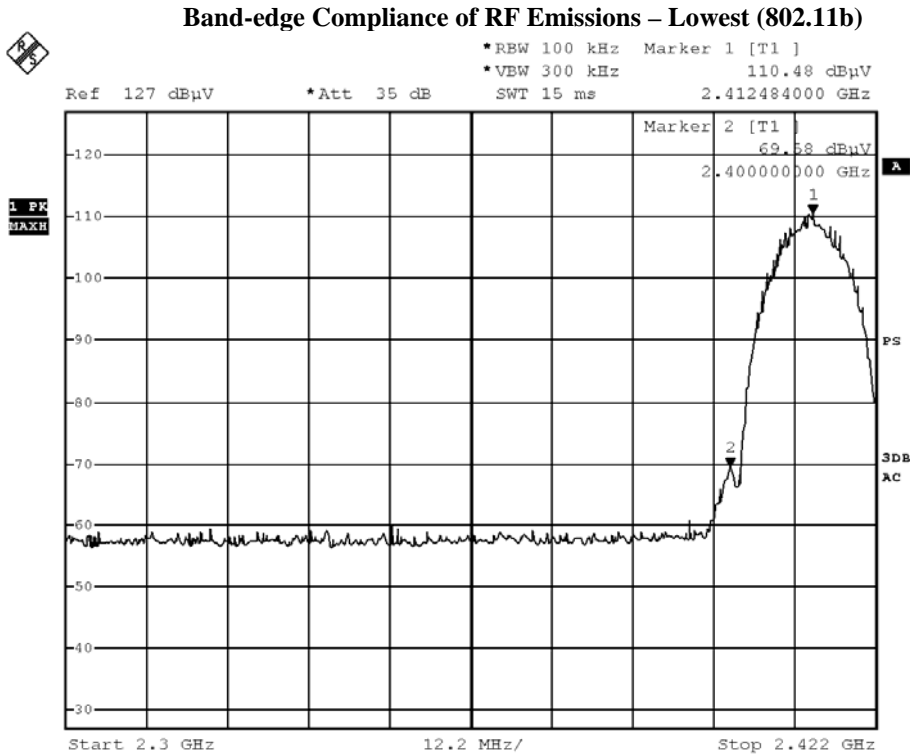
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### Band-edge Compliance of RF Conducted Emissions Measurement:

#### Limit :

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2400 – Lowest Fundamental (2412)	40.90



BMP

Date: 4.MAY.2015 17:03:16

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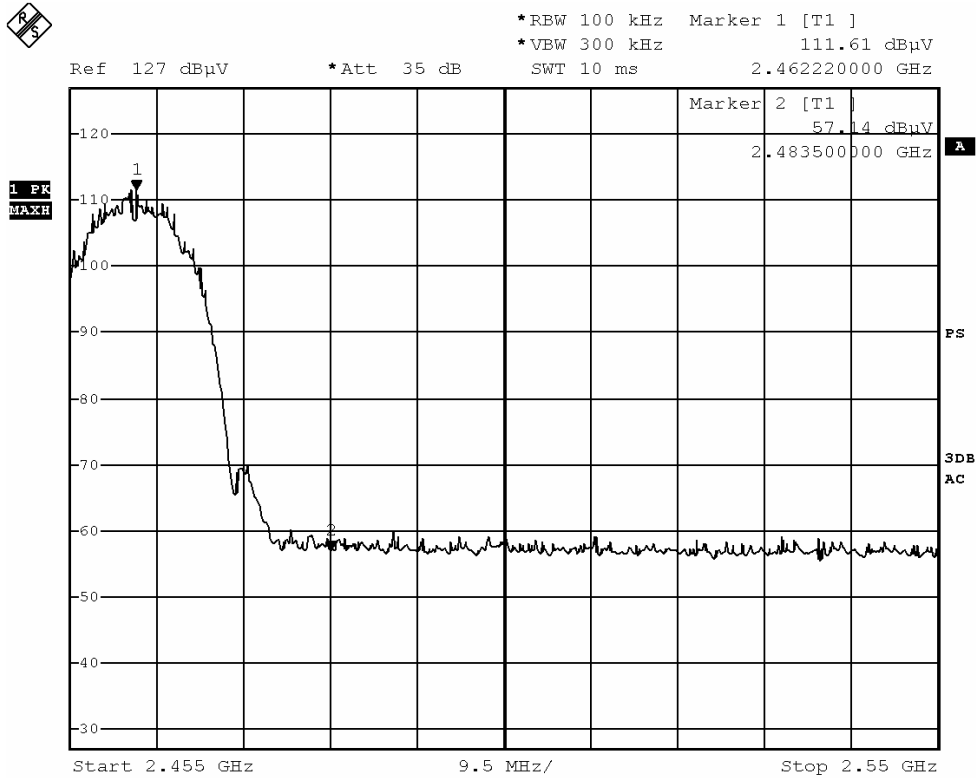
Date: 2015-05-09  
No.: DM119257

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## Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2483.5 - Highest Fundamental (2462)	54.47

## Band-edge Compliance of RF Emissions – Highest (802.11b)



BMP

Date: 4.MAY.2015 17:08:26

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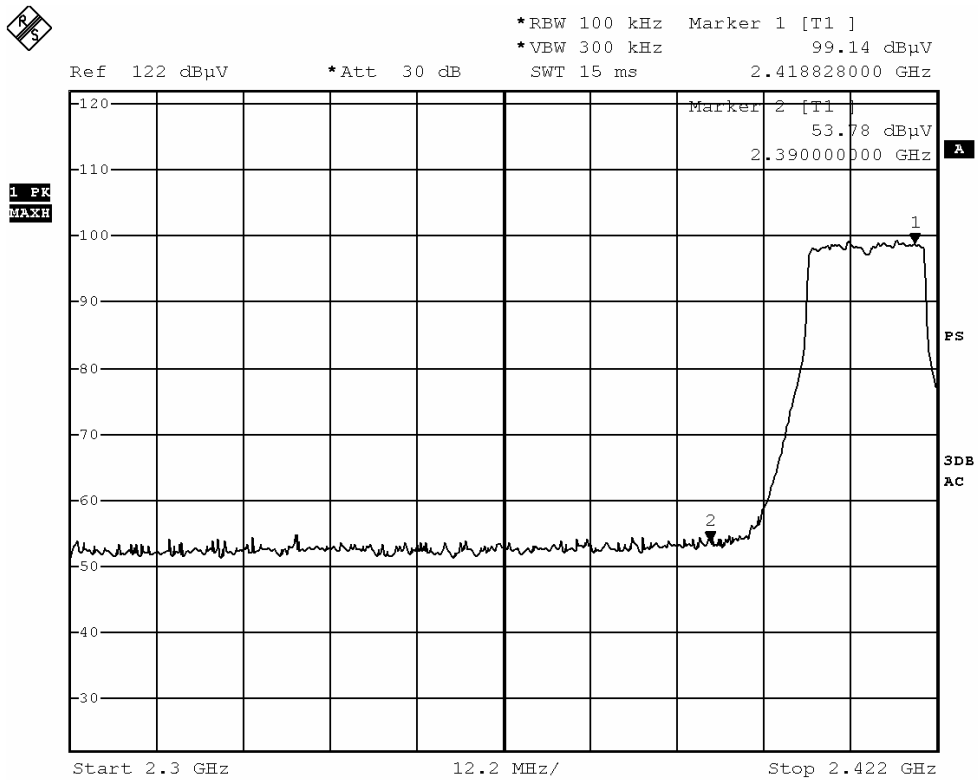
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### Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2400 – Lowest Fundamental (2412)	45.36

### Band-edge Compliance of RF Emissions – Lowest (802.11g)



BMP

Date: 4.MAY.2015 17:11:16

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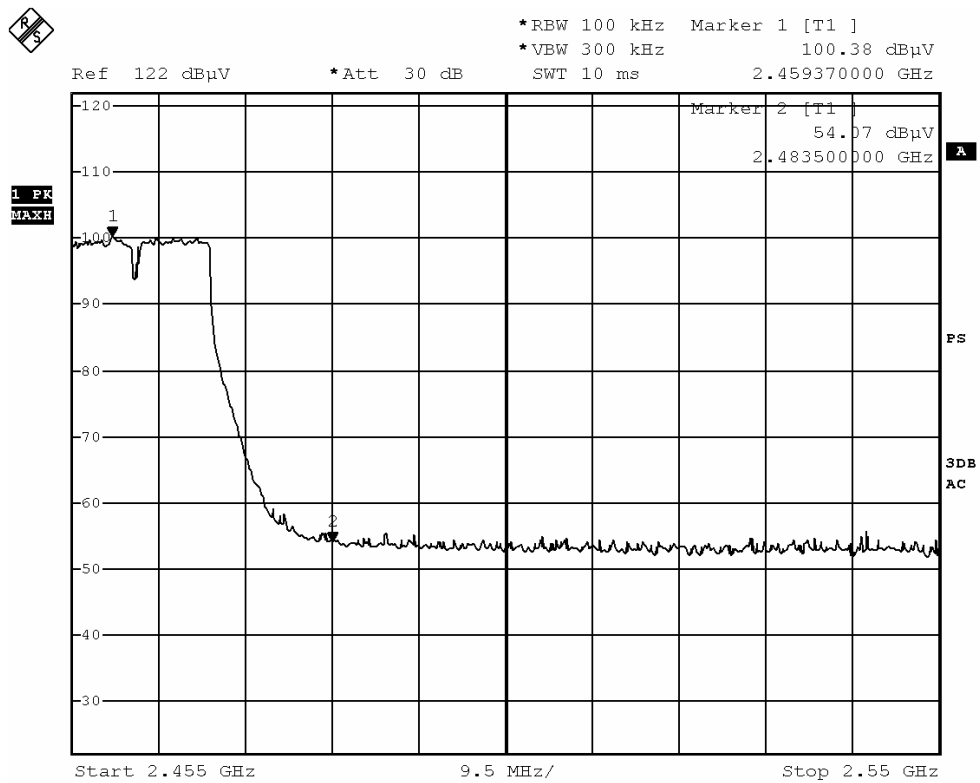
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## Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2483.5 - Highest Fundamental (2462)	46.31

## Band-edge Compliance of RF Emissions – Highest (802.11g)



BMP

Date: 4.MAY.2015 17:10:05

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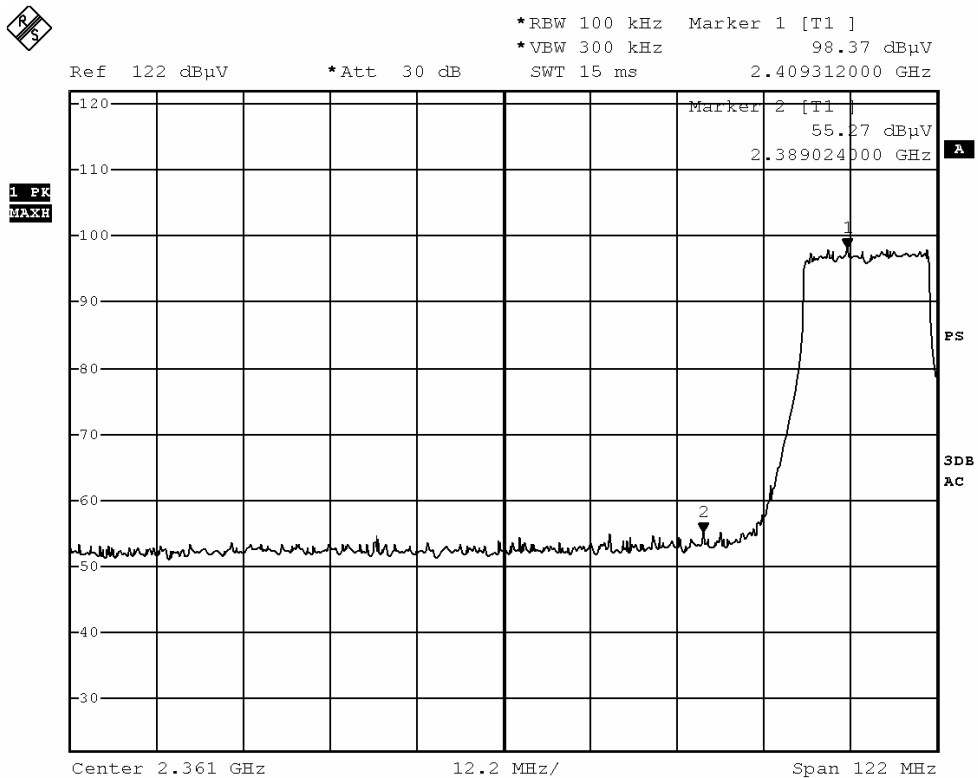
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## Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2400 – Lowest Fundamental (2412)	43.10

## Band-edge Compliance of RF Emissions – Lowest (802.11n20)



BMP

Date: 4.MAY.2015 17:13:23

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# STC Test Report

Date: 2015-05-09  
No.: DM119257

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## Band-edge Compliance of RF Conducted Emissions Measurement:

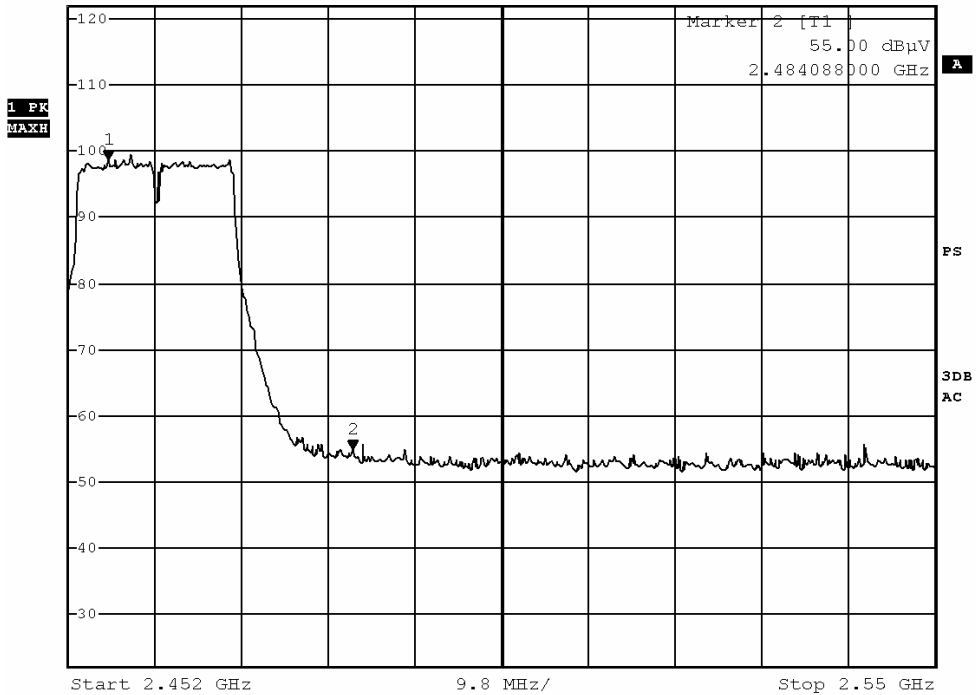
Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2483.5 - Highest Fundamental (2462)	43.77

## Band-edge Compliance of RF Emissions – Highest (802.11n20)



\*RBW 100 kHz Marker 1 [T1 ]  
\*VBW 300 kHz 98.77 dBμV

Ref 122 dBμV \*Att 30 dB SWT 10 ms 2.456508000 GHz



BMP

Date: 4.MAY.2015 17:14:16

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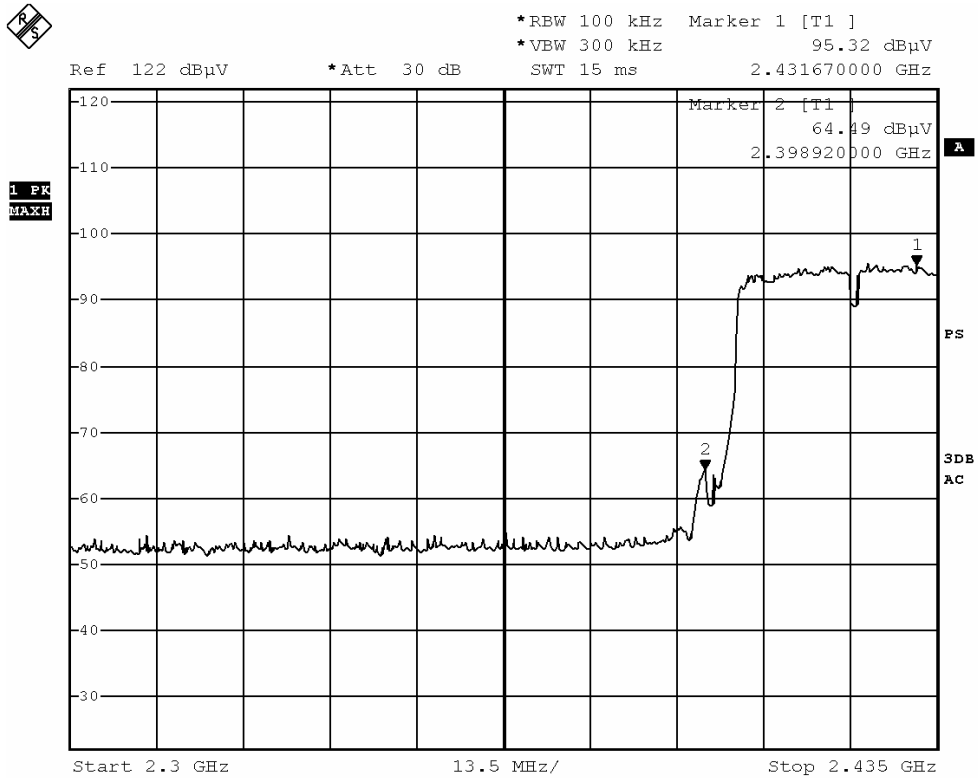
Date: 2015-05-09  
No.: DM119257

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## Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2400 – Lowest Fundamental (2422)	31.13

## Band-edge Compliance of RF Emissions – Lowest (802.11n40)



BMP

Date: 4.MAY.2015 17:16:02

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# STC Test Report

Date: 2015-05-09  
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## Band-edge Compliance of RF Conducted Emissions Measurement:

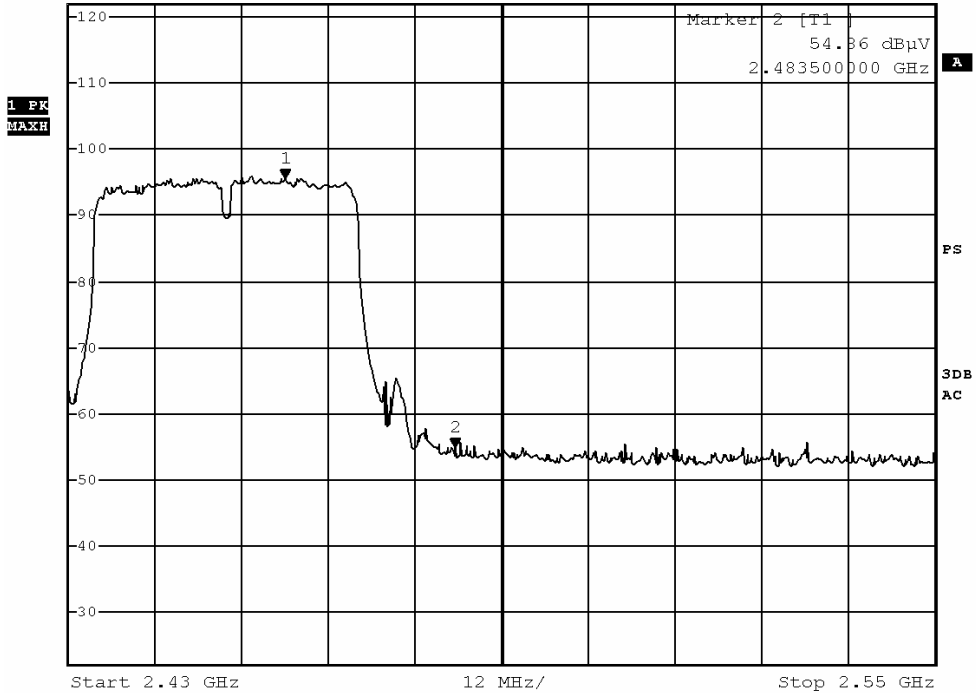
Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2483.5 - Highest Fundamental (2452)	41.17

## Band-edge Compliance of RF Emissions – Highest (802.11n40)



\*RBW 100 kHz Marker 1 [T1 ]  
\*VBW 300 kHz 95.53 dBμV

Ref 122 dBμV \*Att 30 dB SWT 15 ms 2.460000000 GHz



BMP

Date: 4.MAY.2015 17:18:00

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## STC Test Report

Date: 2015-05-09

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### Band-edge Compliance of RF Radiated Emissions Measurement:

#### Limit :

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, 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) (see Section 5.205(c)).

### Result: Band-edge Compliance of RF Radiated Emissions (Lowest)-802.11b

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
2390.0	18.8	36.8	55.6	74.0	18.4	Vertical

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
2390.0	3.6	36.8	40.4	54.0	13.6	Vertical

### Result: Band-edge Compliance of RF Radiated Emissions (Highest) -802.11b

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
2483.5	17.9	36.4	54.3	74.0	19.7	Horizontal

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
2483.5	3.3	36.4	39.7	54.0	14.3	Horizontal

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## STC Test Report

Date: 2015-05-09

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No.: DM119257

Result: Band-edge Compliance of RF Radiated Emissions (Lowest)-802.11g

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
2390.0	16.6	36.8	53.4	74.0	20.6	Vertical

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
2390.0	2.4	36.8	39.2	54.0	14.8	Vertical

Result: Band-edge Compliance of RF Radiated Emissions (Highest) -802.11g

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
2483.5	17.7	36.4	54.1	74.0	19.9	Horizontal

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
2483.5	3.6	36.4	40.0	54.0	14.0	Horizontal

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Result: Band-edge Compliance of RF Radiated Emissions (Lowest)-802.11n20

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
2390.0	18.5	36.8	55.3	74.0	18.7	Vertical

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
2390.0	4.6	36.8	41.4	54.0	12.6	Vertical

Result: Band-edge Compliance of RF Radiated Emissions (Highest) -802.11n20

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
2483.5	18.6	36.4	55.0	74.0	19.0	Horizontal

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
2483.5	3.7	36.4	40.1	54.0	13.9	Horizontal

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Result: Band-edge Compliance of RF Radiated Emissions (Lowest)-802.11n40

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
2390.0	18.1	36.8	54.9	74.0	19.1	Vertical

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
2390.0	3.4	36.8	40.2	54.0	13.8	Vertical

Result: Band-edge Compliance of RF Radiated Emissions (Highest) -802.11n20

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
2483.5	18.3	36.4	54.7	74.0	19.3	Horizontal

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB $\mu$ V/m	E-Field Polarity
2483.5	3.4	36.4	39.8	54.0	14.2	Horizontal

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### **3.1.6 RF Exposure**

Test Requirement: FCC 47CFR 15.247(i)  
Test Date: 2015-05-06  
Mode of Operation: WiFi mode

#### **Test Method:**

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

#### **Test Results:**

The EUT complied with the requirement(s) of this section.  
EUT meets the requirements of these sections as proven through MPE calculation  
The MPE calculation for EUT @ 20cm  
Based on the highest P = 54.013 mW

$$\begin{aligned} P_d &= PG / 4\pi R^2 = (54.013 \times 1.99) / 12.566 \times (20)^2 \\ &= (107.48587) / 12.566 \times 400 = 107.48587 / 5026.4 \\ &= 0.02138 \text{ mW/cm}^2 \end{aligned}$$

where:

- \*Pd = power density in mW/cm<sup>2</sup>
- \* G = Antenna numeric gain (1.99); Log G = g/10 ( g = 2.98dBi ).
- \* P = Conducted RF power to antenna (54.013 mW).
- \* R = Minimum allowable distance.(20 cm)

- \*The power density Pd = 0.02138mW/cm<sup>2</sup> is less than 1 mW/cm<sup>2</sup> (listed MPE limit)
- \*The SAR evaluation is not needed ( this is a desk top device, R> 20 cm )
- \* The EUT( antenna ) must be 0.2 meters away from the General Population.

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### Appendix A

### Appendix A

### List of Measurement Equipment

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EMD004	LISN	ROHDE & SCHWARZ	ESH3-Z5	100102	2015.3.24	2016.3.24
EMD022	EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	100314	2015.3.24	2016.3.24
EMD035	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	100441	2014.06.10	2015.06.10
EMD036	EMI Test Receiver	ROHDE & SCHWARZ	ESIB 26	100388	2014.06.10	2015.06.10
EMD041	TWO-LINE V-NETWORK	ROHDE & SCHWARZ	ENV216	100261	2015.3.24	2016.3.24
EMD061	Biconilog Antenna	ETS.LINDGREN	3142C	00060439	2014.11.29	2016.11.29
EMD062	Double-Ridged Waveguide (1GHz – 18GHz)	ETS.LINDGREN	3117	00075933	2014.11.15	2015.11.15
EMD084	MULTI-DVICE CONTROLLER	ETS.LINDGREN	2090	00060107	N/A	N/A
EMD088	Video Contol Unit	ETS.LINDGREN	Y21953A	2601073	N/A	N/A
EMD093	Monitor	ViewSonic	VA9036	Q8X064201876	N/A	N/A
EMD102	Intelligent Frequency	Ainuo Instrument Co., Ltd	AN97005SS	79707454	N/A	N/A
EMD103	Intelligent Frequency	Ainuo Instrument Co., Ltd	AN97005SS	79707455	N/A	N/A
EMD105	FACT-3 EMC Chamber	ETS.LINDGREN	FACT-3	3803	N/A	N/A
EMD106	Shielding Room #1	ETS.LINDGREN	RFD-100	3802	N/A	N/A
EMD111	Power meter	ROHDE & SCHWARZ	NRVD	102051	2015.3.24	2016.3.24
	100V Insertion Unit	ROHDE & SCHWARZ	URV5-Z4	100464	2015.3.24	2016.3.24
EMD113	Pre-Amplifier	ROHDE & SCHWARZ	N/A	1129588	2015.3.24	2016.3.24
EMD124	Loop Antenna	ETS-Lindgren	6502	00104905	2014.04.28	2016.04.28
EMD131	Standard Gain Horn Antenna (18GHz – 26.5GHz)	Chengdu AINFO Inc.	JTXLXB-42-15-C-KF	J2021100721001	2015.04.09	2017.04.09

Remarks:-

N/A Not Applicable or Not Available

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### Appendix B

#### Photographs of EUT

Front View of the product



Rear View of the product



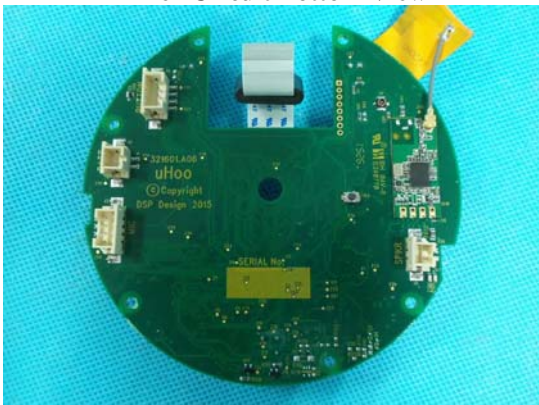
Inside View of the product



Inner Circuit Top View



Inner Circuit Bottom View



Inner Circuit Top View



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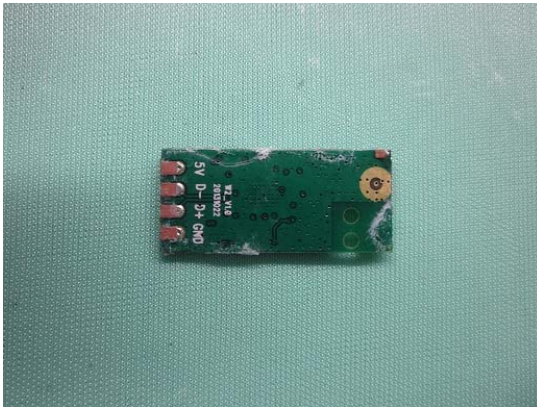
Date: 2015-05-09

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### Photographs of EUT

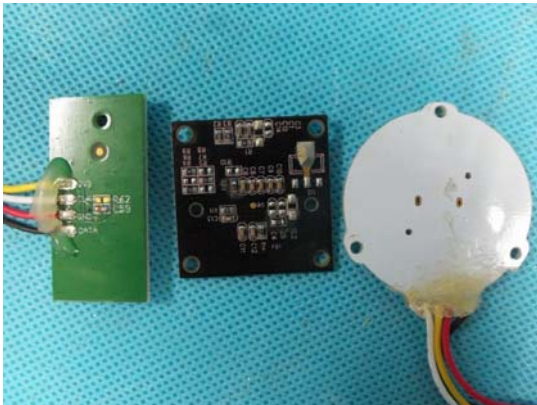
Inner Circuit Bottom View



Inner Circuit Top View



Inner Circuit Bottom View



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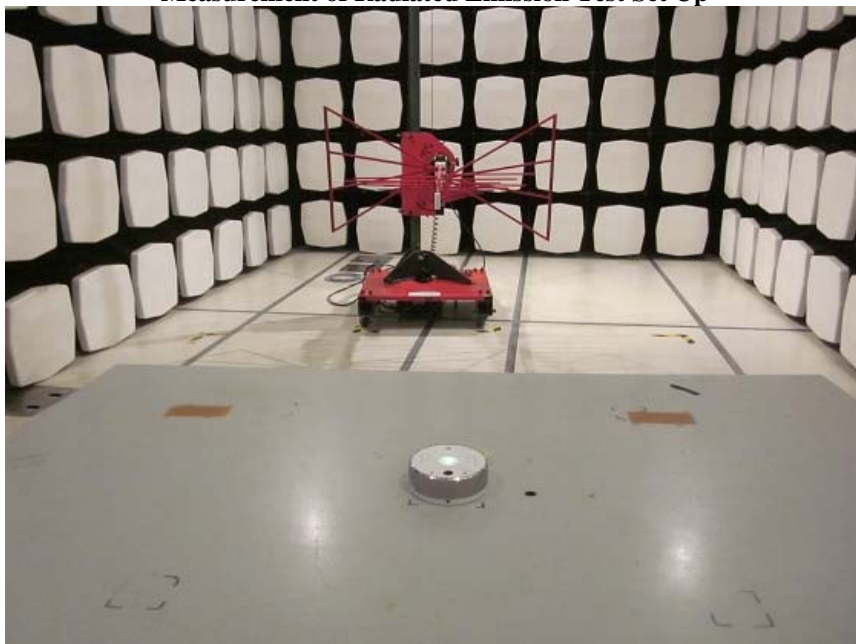
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Photographs of EUT

Measurement of Radiated Emission Test Set Up



Measurement of Radiated Emission Test Set Up



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**Photographs of EUT**

**Measurement of Radiated Emission Test Set Up**



**\*\*\*\*\* End of Test Report \*\*\*\*\***

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