STC Test Report

Date: 2016-08-05
No.: DMA000105

Applicant:	Hip Shing Electronics Limited Units 1.2&3,20/F.,New Treasure Centre, 10., Ng Fong Street, San Po Kong, Kowloon, Hong Kong
Manufacturer:	Dongguan Zhi Cheng Electronic Products Co., Ltd. No.11 Shangbao Road, 188 Industrial Zone, Pingshan, Tangxia, Dongguan, Guangdong, China
Description of Sample(s):	Submitted sample(s) said to be Product: Internet/FM Digital Radio with Bluetooth and Spotify Brand Name: Como Audio Model Number: Solo FCC ID: BZAWDFB16SOLO
Date Sample(s) Received:	2016-07-26
Date Tested:	2016-07-29 to 2016-08-03
Investigation Requested:	Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2015 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):	WIFI (802.11b, 802.11g, 802.11n20)

LONG Yun Jian, Along
Authorized Signatory
ElectroMagnetic Compatibility Department
For and on behalf of
The Hong Kong Standards and Testing Centre Ltd.

STC Test Report

CONTENT:

	Cover	Page 1 of 61
	Content	Page 2 of 61
1.0	**General Details**	
1.1	Test Laboratory	Page 3 of 61
1.2	Equipment Under Test [EUT] Description of EUT operation	Page 3 of 61
1.3	Date of Order	Page 3 of 61
1.4	Submitted Sample(s)	Page 3 of 61
1.5	Test Duration	Page 3 of 61
1.6	Country of Origin	Page 3 of 61
2.0	**Technical Details**	
2.1	Investigations Requested	Page 4 of 61
2.2	Test Standards and Results Summary	Page 4 of 61
3.0	**Test Results**	
3.1	Emission	Page 5-56 of 61
	Appendix A	
	List of Measurement Equipment	Page 57 of 61
	Appendix B	
	Photographs of EUT	Page 58-61 of 61

1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.
EMC Laboratory
10 Dai Wang Street, Taipo Industrial Estate, New Territories, Hong Kong

Telephone: 852 2666 1888
Fax: 852 2664 4353

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

Product:	Internet/FM Digital Radio with Bluetooth and Spotify
Manufacturer:	Dongguan Zhi Cheng Electronic Products Co., Ltd. No.11 Shangbao Road, 188 Industrial Zone, Pingshan, Tangxia, Dongguan, Guangdong, China
Brand Name:	Como Audio
Model Number:	Solo
Rating:	100-240Va.c. 50/60Hz

1.2.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Internet/FM Digital Radio with Bluetooth and Spotify, the transmission signal is digital modulated with channel frequency range 2412-2462MHz..

1.3 Date of Order

2016-07-26

1.4 Submitted Sample(s):

1 Sample

1.5 Test Duration

2016-07-29 to 2016-08-03

1.6 Country of Origin

China

2.0 Technical Details

2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2015 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	☒	☐	☐
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.10:2013	N/A	☒	☐	☐
Conducted Emissions	FCC 47CFR 15.207	ANSI C63.10:2013	N/A	☒	☐	☐
Power Spectral Density	FCC 47CFR 15.247(e)	N/A	N/A	☒	☐	☐
6dB Bandwidth	FCC 47CFR 15.247(a)(2)	N/A	N/A	☒	☐	☐
Band Edge Emissions	FCC 47CFR 15.247(d)	N/A	N/A	☒	☐	☐
Antenna requirement	FCC 47CFR 15.203	N/A	N/A	☒	☐	☐
RF Exposure	FCC 47CFR 15.247(i)	N/A	N/A	☒	☐	☐

Note: N/A - Not Applicable

3.0 Test Results

3.1 Emission

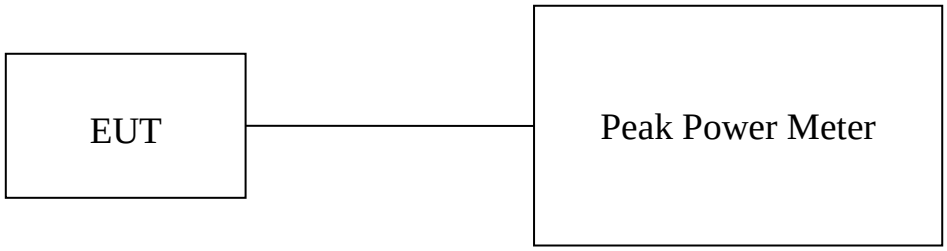
3.1.1 Maximum Peak Output Power

Test Requirement:	FCC 47CFR 15.247(b)(3)
Test Method:	N/A
Test Date:	2016-07-29
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 Watt.

Test Setup:



Note: a temporary antenna connector was soldered to the RF output.

Limits for Maximum Peak Conducted Output Power [FCC 47CFR 15.247]:

The maximum peak output power shall not exceeded the following limits: For frequency hopping systems employing at least 75 hopping channels: 1 Watt For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 Watts For Digital Transmission systems in 2400-2483.5 MHz Band: 1 Watt

Results of WiFi mode 802.11 b, (2412MHz to 2462MHz) : Pass (TX Unit)

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2412	0.04416

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2437	0.05284

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2462	0.05260

Results of WiFi mode 802.11 g, (2412MHz to 2462MHz) : Pass (TX Unit)

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2412	0.06652

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2437	0.07178

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2462	0.06412

Results of WiFi mode 802.11 n20, (2412MHz to 2462MHz) : Pass (TX Unit)

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2412	0.05309

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2437	0.05794

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2462	0.05943

Calculated measurement uncertainty : 30MHz to 1GHz 1.7dB
1GHz to 18GHz 1.7dB

Remark:
1. All test data for each data rate were verified, but only the worst case was reported.
2. The EUT is programmed to transmit signals continuously for all testing.

3.1.2 Radiated Emissions

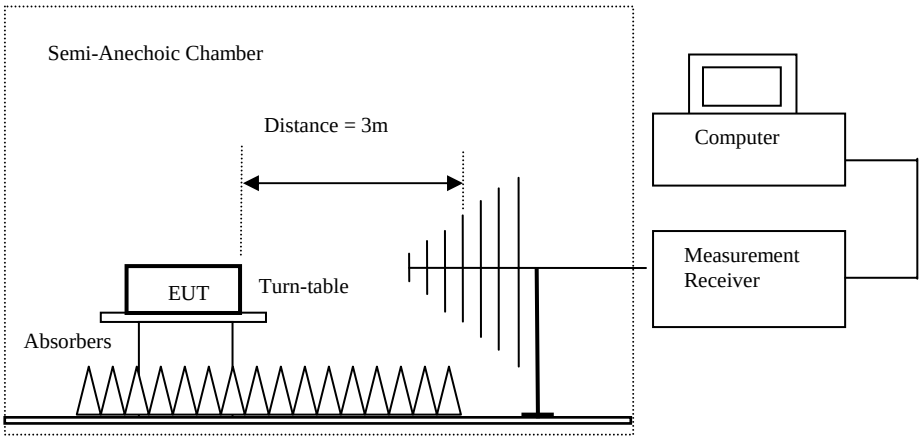
Test Requirement:	FCC 47CFR 15.209
Test Method:	ANSI C63.10:2013
Test Date:	2016-08-02
Mode of Operation:	Tx mode/ WiFi mode

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 The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

Test Setup:



Ground Plane

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

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

Frequency Range [MHz]	Quasi-Peak Limits [μV/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 dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength dBμV/m	Limit dBμV/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

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

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Limit @3m dBμV/m	Margin dBμV/m	E-Field Polarity
4824.0	17.8	41.5	59.3	74.0	14.7	Vertical
4824.0	13.9	42.4	56.3	74.0	17.7	Horizontal
7236.0	11.6	45.1	56.7	74.0	17.3	Vertical
7236.0	7.2	46.2	53.4	74.0	20.6	Horizontal
9648.0	8.1	48	56.1	74.0	17.9	Vertical
9648.0	4.5	48.8	53.3	74.0	20.7	Horizontal
12060.0	4.3	51.8	56.1	74.0	17.9	Vertical
12060.0	0.5	52.4	52.9	74.0	21.1	Horizontal

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	2.6	41.5	44.1	54.0	9.9	Vertical
4824.0	-1.3	42.4	41.1	54.0	12.9	Horizontal
7236.0	-3.7	45.1	41.4	54.0	12.6	Vertical
7236.0	-7.9	46.2	38.3	54.0	15.7	Horizontal
9648.0	-7.0	48	41.0	54.0	13.0	Vertical
9648.0	-10.7	48.8	38.1	54.0	15.9	Horizontal
12060.0	-11.0	51.8	40.8	54.0	13.2	Vertical
12060.0	-14.6	52.4	37.8	54.0	16.2	Horizontal

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

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level dBµV	Correction Factor dB/m	Field Strength dBµV/m	Field Strength dBµV/m	Limit dBµV/m	E-Field Polarity
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 MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
4874.0	17.8	41.6	59.4	74.0	14.6	Vertical
4874.0	13.9	42.5	56.4	74.0	17.6	Horizontal
7311.0	3.9	53.2	57.1	74.0	16.9	Vertical
7311.0	8.3	46.3	54.6	74.0	19.4	Horizontal
9748.0	7.6	48.1	55.7	74.0	18.3	Vertical
9748.0	4.8	48.9	53.7	74.0	20.3	Horizontal
12185.0	4.1	51.6	55.7	74.0	18.3	Vertical
12185.0	1.1	52.5	53.6	74.0	20.4	Horizontal

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	2.6	41.6	44.2	54.0	9.8	Vertical
4874.0	-1.3	42.5	41.2	54.0	12.8	Horizontal
7311.0	-3.4	45.2	41.8	54.0	12.2	Vertical
7311.0	-6.8	46.3	39.5	54.0	14.5	Horizontal
9748.0	-7.5	48.1	40.6	54.0	13.4	Vertical
9748.0	-10.4	48.9	38.5	54.0	15.5	Horizontal
12185.0	-11.1	51.6	40.5	54.0	13.5	Vertical
12185.0	-14.0	52.5	38.5	54.0	15.5	Horizontal

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

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level dBµV	Correction Factor dB/m	Field Strength dBµV/m	Field Strength dBµV/m	Limit dBµV/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 dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
4924.0	17.0	41.4	58.4	74.0	15.6	Vertical
4924.0	11.9	42.7	54.6	74.0	19.4	Horizontal
7386.0	11.0	45.6	56.6	74.0	17.4	Vertical
7386.0	7.3	46.5	53.8	74.0	20.2	Horizontal
9848.0	7.7	48.6	56.3	74.0	17.7	Vertical
9848.0	4.9	49.7	54.6	74.0	19.4	Horizontal
12310.0	3.7	51.7	55.4	74.0	18.6	Vertical
12310.0	0.0	52.7	52.7	74.0	21.3	Horizontal

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	1.9	41.4	43.3	54.0	10.7	Vertical
4924.0	-3.3	42.7	39.4	54.0	14.6	Horizontal
7386.0	-4.4	45.6	41.2	54.0	12.8	Vertical
7386.0	-7.8	46.5	38.7	54.0	15.3	Horizontal
9848.0	-7.4	48.6	41.2	54.0	12.8	Vertical
9848.0	-10.3	49.7	39.4	54.0	14.6	Horizontal
12310.0	-11.6	51.7	40.1	54.0	13.9	Vertical
12310.0	-15.1	52.7	37.6	54.0	16.4	Horizontal

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

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

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

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
4824.0	17.7	41.5	59.2	74.0	14.8	Vertical
4824.0	14.1	42.4	56.5	74.0	17.5	Horizontal
7236.0	11.8	45.1	56.9	74.0	17.1	Vertical
7236.0	7.9	46.2	54.1	74.0	19.9	Horizontal
9648.0	7.8	48	55.8	74.0	18.2	Vertical
9648.0	4.4	48.8	53.2	74.0	20.8	Horizontal
12060.0	4.5	51.8	56.3	74.0	17.7	Vertical
12060.0	0.7	52.4	53.1	74.0	20.9	Horizontal

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	2.5	41.5	44.0	54.0	10.0	Vertical
4824.0	-1.1	42.4	41.3	54.0	12.7	Horizontal
7236.0	-3.0	45.1	42.1	54.0	11.9	Vertical
7236.0	-7.2	46.2	39.0	54.0	15.0	Horizontal
9648.0	-7.4	48	40.6	54.0	13.4	Vertical
9648.0	-10.8	48.8	38.0	54.0	16.0	Horizontal
12060.0	-10.9	51.8	40.9	54.0	13.1	Vertical
12060.0	-14.4	52.4	38.0	54.0	16.0	Horizontal

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

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

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

Field Strength of Spurious Emissions Peak 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	17.2	41.6	58.8	74.0	15.2	Vertical
4874.0	13.8	42.5	56.3	74.0	17.7	Horizontal
7311.0	3.7	45.2	48.9	74.0	25.1	Vertical
7311.0	7.9	46.3	54.2	74.0	19.8	Horizontal
9748.0	7.5	48.1	55.6	74.0	18.4	Vertical
9748.0	4.9	48.9	53.8	74.0	20.2	Horizontal
12185.0	4.5	51.6	56.1	74.0	17.9	Vertical
12185.0	1.0	52.5	53.5	74.0	20.5	Horizontal

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	2.1	41.6	43.7	54.0	10.3	Vertical
4874.0	-1.4	42.5	41.1	54.0	12.9	Horizontal
7311.0	-3.7	45.2	41.5	54.0	12.5	Vertical
7311.0	-7.3	46.3	39.0	54.0	15.0	Horizontal
9748.0	-7.6	48.1	40.5	54.0	13.5	Vertical
9748.0	-10.3	48.9	38.6	54.0	15.4	Horizontal
12185.0	-10.7	51.6	40.9	54.0	13.1	Vertical
12185.0	-14.1	52.5	38.4	54.0	15.6	Horizontal

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

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level dBµV	Correction Factor dB/m	Field Strength dBµV/m	Field Strength dBµV/m	Limit dBµV/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 dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
4924.0	17.0	41.4	58.4	74.0	15.6	Vertical
4924.0	11.7	42.7	54.4	74.0	19.6	Horizontal
7386.0	11.1	45.6	56.7	74.0	17.3	Vertical
7386.0	6.8	46.5	53.3	74.0	20.7	Horizontal
9848.0	7.3	48.6	55.9	74.0	18.1	Vertical
9848.0	3.7	49.7	53.4	74.0	20.6	Horizontal
12310.0	3.9	51.7	55.6	74.0	18.4	Vertical
12310.0	0.6	52.7	53.3	74.0	20.7	Horizontal

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	1.9	41.4	43.3	54.0	10.7	Vertical
4924.0	-3.5	42.7	39.2	54.0	14.8	Horizontal
7386.0	-4.3	45.6	41.3	54.0	12.7	Vertical
7386.0	-8.3	46.5	38.2	54.0	15.8	Horizontal
9848.0	-7.8	48.6	40.8	54.0	13.2	Vertical
9848.0	-11.5	49.7	38.2	54.0	15.8	Horizontal
12310.0	-11.4	51.7	40.3	54.0	13.7	Vertical
12310.0	-14.5	52.7	38.2	54.0	15.8	Horizontal

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

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level dBµV	Correction Factor dB/m	Field Strength dBµV/m	Field Strength dBµV/m	Limit dBµV/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 dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
4824.0	17.3	41.5	58.8	74.0	15.2	Vertical
4824.0	14.0	42.4	56.4	74.0	17.6	Horizontal
7236.0	11.3	45.1	56.4	74.0	17.6	Vertical
7236.0	8.1	46.2	54.3	74.0	19.7	Horizontal
9648.0	7.8	48	55.8	74.0	18.2	Vertical
9648.0	4.9	48.8	53.7	74.0	20.3	Horizontal
12060.0	4.2	51.8	56.0	74.0	18.0	Vertical
12060.0	1.0	52.4	53.4	74.0	20.6	Horizontal

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	2.2	41.5	43.7	54.0	10.3	Vertical
4824.0	-1.2	42.4	41.2	54.0	12.8	Horizontal
7236.0	-4.0	45.1	41.1	54.0	12.9	Vertical
7236.0	-7.0	46.2	39.2	54.0	14.8	Horizontal
9648.0	-7.3	48	40.7	54.0	13.3	Vertical
9648.0	-10.3	48.8	38.5	54.0	15.5	Horizontal
12060.0	-11.2	51.8	40.6	54.0	13.4	Vertical
12060.0	-14.1	52.4	38.3	54.0	15.7	Horizontal

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

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

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

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
4874.0	17.0	41.6	58.6	74.0	15.4	Vertical
4874.0	13.4	42.5	55.9	74.0	18.1	Horizontal
7311.0	3.6	53.2	56.8	74.0	17.2	Vertical
7311.0	8.3	46.3	54.6	74.0	19.4	Horizontal
9748.0	7.6	48.1	55.7	74.0	18.3	Vertical
9748.0	4.8	48.9	53.7	74.0	20.3	Horizontal
12185.0	4.1	51.6	55.7	74.0	18.3	Vertical
12185.0	0.9	52.5	53.4	74.0	20.6	Horizontal

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	1.9	41.6	43.5	54.0	10.5	Vertical
4874.0	-1.8	42.5	40.7	54.0	13.3	Horizontal
7311.0	-3.7	45.2	41.5	54.0	12.5	Vertical
7311.0	-6.8	46.3	39.5	54.0	14.5	Horizontal
9748.0	-7.5	48.1	40.6	54.0	13.4	Vertical
9748.0	-10.4	48.9	38.5	54.0	15.5	Horizontal
12185.0	-11.1	51.6	40.5	54.0	13.5	Vertical
12185.0	-14.2	52.5	38.3	54.0	15.7	Horizontal

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

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level dBµV	Correction Factor dB/m	Field Strength dBµV/m	Field Strength dBµV/m	Limit dBµV/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 dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
4924.0	17.2	41.4	58.6	74.0	15.4	Vertical
4924.0	11.4	42.7	54.1	74.0	19.9	Horizontal
7386.0	11.0	45.6	56.6	74.0	17.4	Vertical
7386.0	6.9	46.5	53.4	74.0	20.6	Horizontal
9848.0	7.5	48.6	56.1	74.0	17.9	Vertical
9848.0	3.6	49.7	53.3	74.0	20.7	Horizontal
12310.0	3.8	51.7	55.5	74.0	18.5	Vertical
12310.0	0.5	52.7	53.2	74.0	20.8	Horizontal

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	2.1	41.4	43.5	54.0	10.5	Vertical
4924.0	-3.8	42.7	38.9	54.0	15.1	Horizontal
7386.0	-4.4	45.6	41.2	54.0	12.8	Vertical
7386.0	-8.2	46.5	38.3	54.0	15.7	Horizontal
9848.0	-7.6	48.6	41.0	54.0	13.0	Vertical
9848.0	-11.6	49.7	38.1	54.0	15.9	Horizontal
12310.0	-11.5	51.7	40.2	54.0	13.8	Vertical
12310.0	-14.7	52.7	38.0	54.0	16.0	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): 2.0dB
(30MHz -1GHz): 4.9dB
(1GHz -6GHz): 4.02dB
(6GHz -26.5GHz): 4.03dB

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

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 dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
2390.0	13.8	36.8	50.6	74.0	23.4	Vertical
2390.0	9.7	36.4	46.1	74.0	27.9	Horizontal

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
2390.0	3.4	36.8	40.2	54.0	13.8	Vertical
2390.0	-0.8	36.4	35.6	54.0	18.4	Horizontal

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

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
2483.5	12.0	36.8	48.8	74.0	25.2	Vertical
2483.5	7.9	36.4	44.3	74.0	29.7	Horizontal

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
2483.5	1.8	36.8	38.6	54.0	15.4	Vertical
2483.5	-2.4	36.4	34.0	54.0	20.0	Horizontal

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

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
2390.0	13.4	36.8	50.2	74.0	23.8	Vertical
2390.0	9.3	36.4	45.7	74.0	28.3	Horizontal

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
2390.0	3.0	36.8	39.8	54.0	14.2	Vertical
2390.0	-1.2	36.4	35.2	54.0	18.8	Horizontal

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

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
2483.5	10.9	36.8	47.7	74.0	26.3	Vertical
2483.5	8.2	36.4	44.6	74.0	29.4	Horizontal

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
2483.5	0.7	36.8	37.5	54.0	16.5	Vertical
2483.5	-2.1	36.4	34.3	54.0	19.7	Horizontal

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

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
2390.0	13.0	36.8	49.8	74.0	24.2	Vertical
2390.0	8.8	36.4	45.2	74.0	28.8	Horizontal

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
2390.0	2.6	36.8	39.4	54.0	14.6	Vertical
2390.0	-1.7	36.4	34.7	54.0	19.3	Horizontal

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

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
2483.5	10.9	36.8	47.7	74.0	26.3	Vertical
2483.5	8.2	36.4	44.6	74.0	29.4	Horizontal

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dBµV/m	E-Field Polarity
2483.5	0.8	36.8	37.6	54.0	16.4	Vertical
2483.5	-2.0	36.4	34.4	54.0	19.6	Horizontal

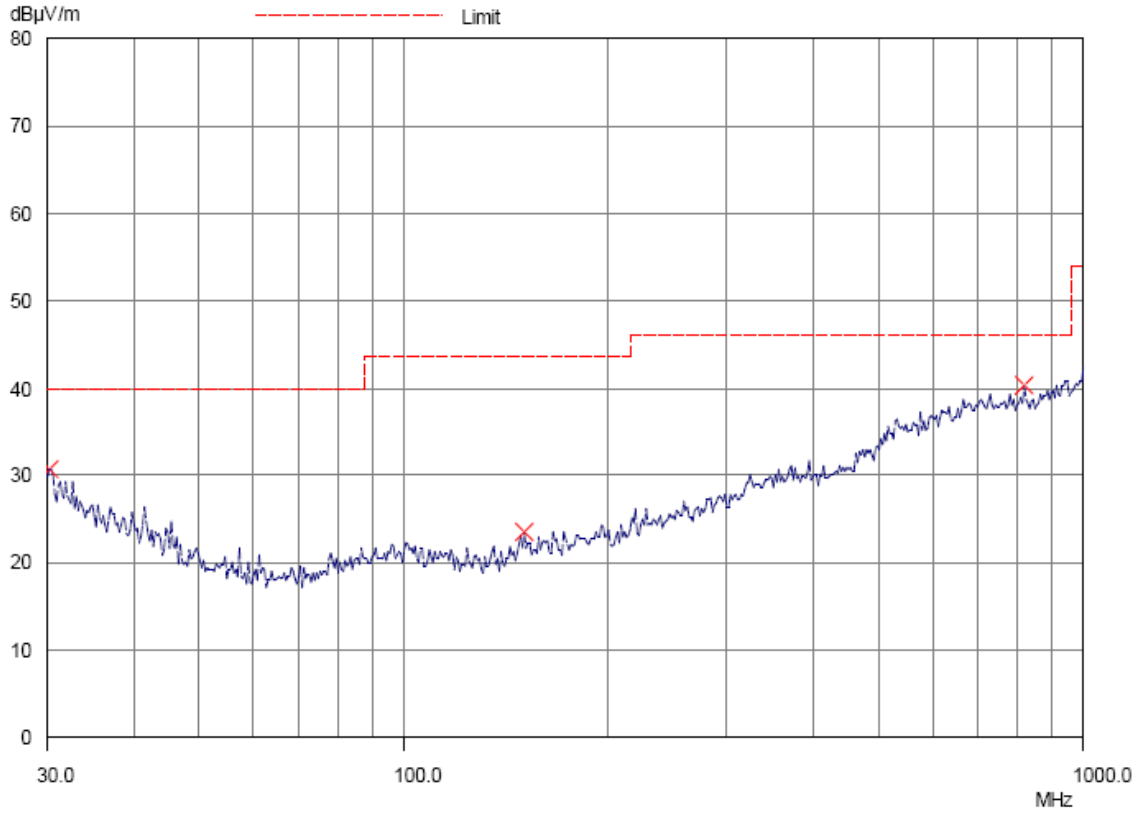
Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range	Quasi-Peak Limits
[MHz]	[μV/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 (2412MHz, 802.11b) (30MHz – 1GHz): Pass
Please refer to the following table for result details

Horizontal



Result of WiFi mode (2412MHz, 802.11b) (30MHz – 1GHz): Pass

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dBµV/m	Limit @3m dBµV/m	Level @3m µV/m	Limit @3m µV/m
30.1	Horizontal	30.7	40.0	34.3	100
150.3	Horizontal	23.4	43.5	14.8	150
816.9	Horizontal	38.3	46.0	82.2	200

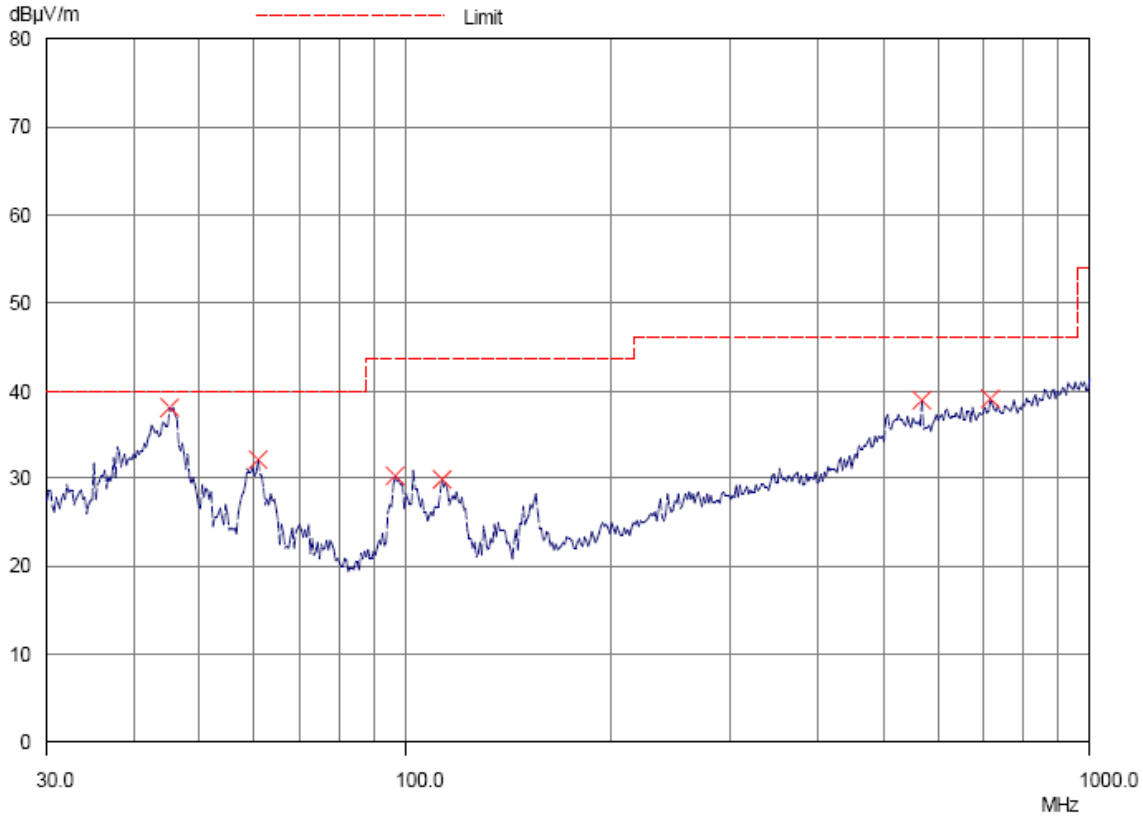
Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range	Quasi-Peak Limits
[MHz]	[μV/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 (2412MHz, 802.11b) (30MHz – 1GHz): Pass
Please refer to the following table for result details

Vertical



Result of WiFi mode (2412MHz, 802.11b) (30MHz – 1GHz): Pass

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dBµV/m	Limit @3m dBµV/m	Level @3m µV/m	Limit @3m µV/m
45.3	Vertical	36.2	40.0	64.6	100
60.8	Vertical	32.2	40.0	40.7	100
96.7	Vertical	30.3	43.5	32.7	150
113.3	Vertical	29.7	43.5	30.5	150
564.9	Vertical	37.9	46.0	78.5	200
714.4	Vertical	37.1	46.0	71.6	200

Remarks:
Calculated measurement uncertainty (30MHz – 1GHz): 4.9dB
Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

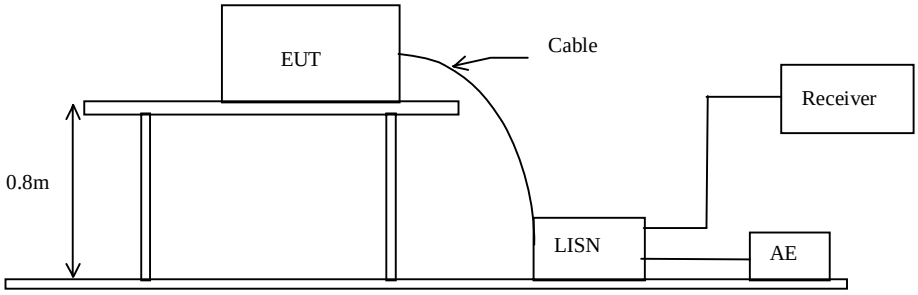
3.1.3 AC Mains Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207
Test Method:	ANSI C63.10:2013
Test Date:	2016-08-02
Mode of Operation:	Wifi mode
Test Voltage:	120Va.c. 60Hz

Test Method:

The test was performed in accordance with ANSI ANSI C63.10:2013, with the following: an initial measurement was performed in peak and average detection mode on the live line, any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

Test Setup:



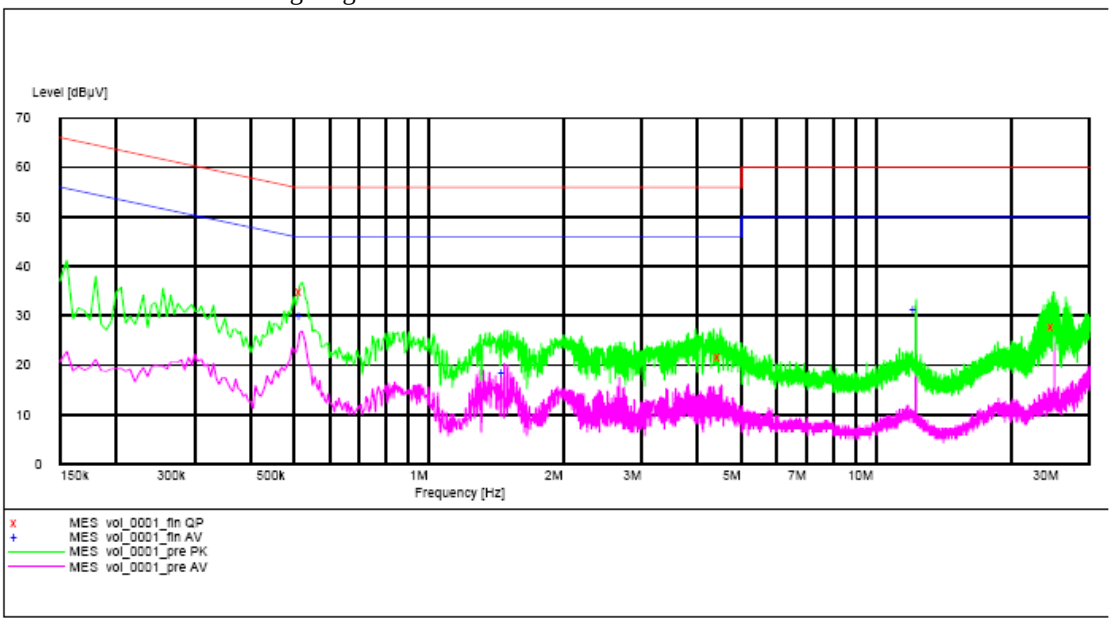
Limit for Conducted Emissions (FCC 47 CFR 15.207):

Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.

Result of Wifi mode (L): PASS
Please refer to the following diagram for individual results.



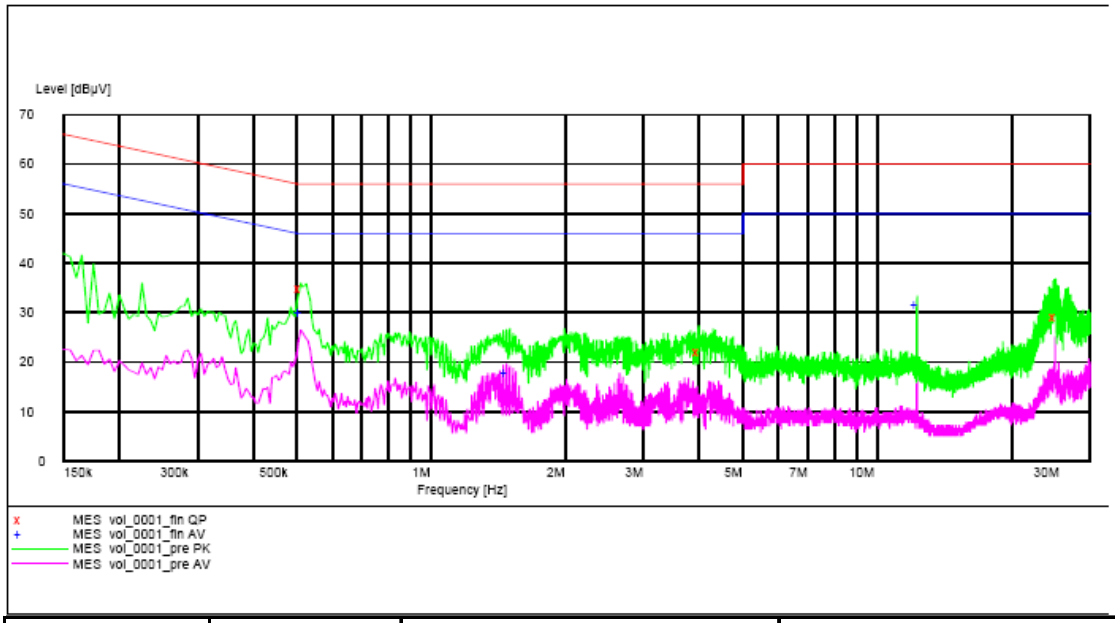
Conductor Live or Neutral	Frequency MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Average Level dBµV	Average Limit dBµV
Live	0.520	35.0	56.0	-*-	-*-
Live	4.490	21.7	56.0	-*-	-*-
Live	24.995	27.9	60.0	-*-	-*-
Live	0.520	-*-	-*-	29.9	46.0
Live	1.475	-*-	-*-	18.6	46.0
Live	12.290	-*-	-*-	31.2	50.0

Limit for Conducted Emissions (FCC 47 CFR 15.207):

Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.
Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.

Result of Wifi mode (N): PASS
Please refer to the following diagram for individual results.



Conductor Live or Neutral	Frequency MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Average Level dBµV	Average Limit dBµV
Neutral	0.510	34.7	56.0	-*-	-*-
Neutral	3.985	22.2	56.0	-*-	-*-
Neutral	25.120	29.0	60.0	-*-	-*-
Neutral	0.510	-*-	-*-	30.1	46.0
Neutral	1.475	-*-	-*-	17.9	46.0
Neutral	12.290	-*-	-*-	31.7	50.0

Remarks:
Calculated measurement uncertainty (0.15MHz – 30MHz): 3.25dB
-*- Emission(s) that is far below the corresponding limit line.

3.1.4 Power Spectral Density

Test Requirement:	FCC 47CFR 15.247(e)
Test Method:	ANSI C63.10:2013
Test Date:	2016-08-02
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=10log (3 kHz/100 kHz=-15.2dB)

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	-13.17	**8dBm**
2437.0	-12.43	**8dBm**
2462.0	-12.11	**8dBm**

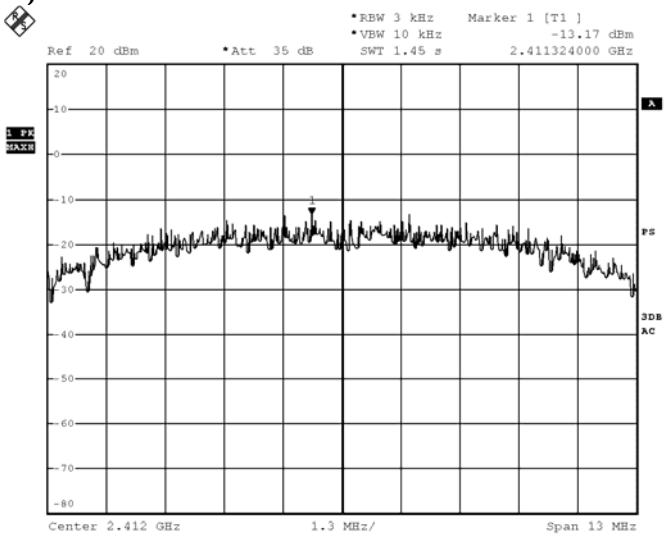
Results of WiFi Mode 802.11 g (Tx:2412MHz to 2462MHz) : Pass (TX Unit)
Maximum power spectral density

Transmitter Frequency (MHz)	Maximum Power spectral density level / 3kHz band (dBm)	Maximum Power spectral density / 3kHz band limit
2412.0	-18.60	**8dBm**
2437.0	-16.91	**8dBm**
2462.0	-16.37	**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	-16.48	**8dBm**
2437.0	-17.00	**8dBm**
2462.0	-15.78	**8dBm**

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



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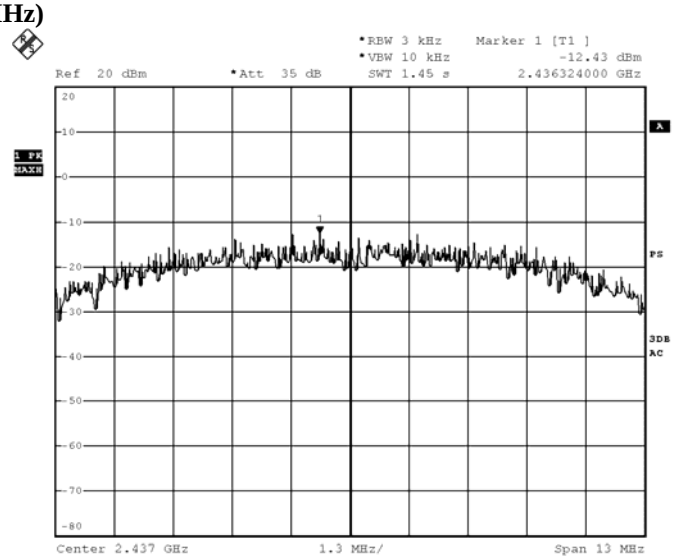
CH 6 (2437.0 MHz)



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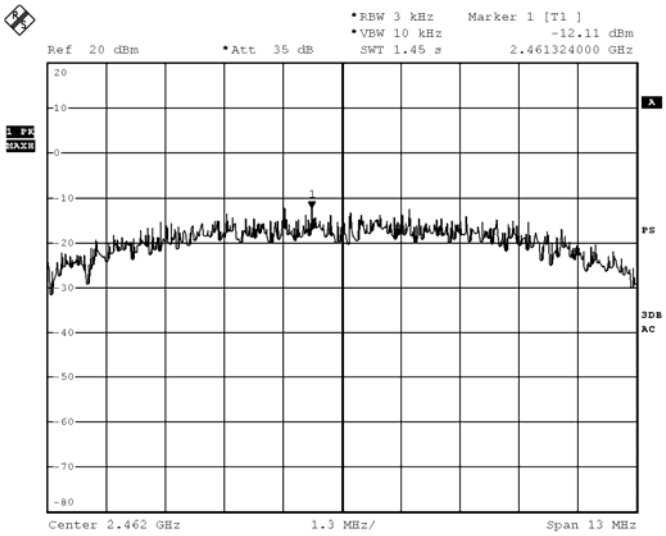
CH 11 (2462.0 MHz)



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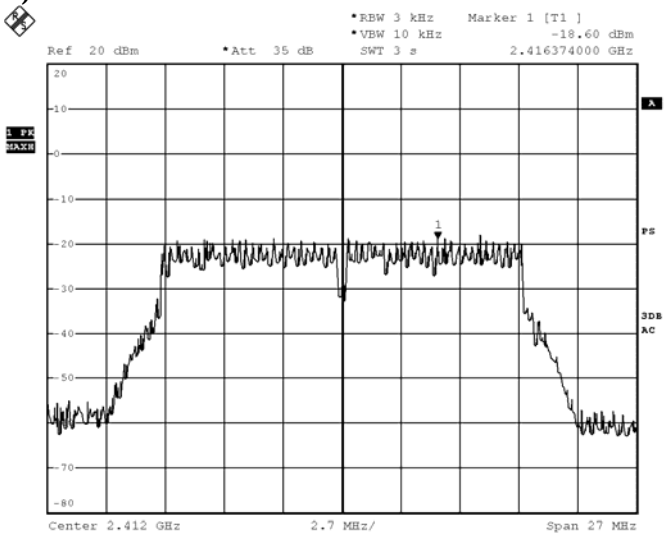
WiFi mode 802.11 g, (Tx:2412MHz to 2462MHz)
Ch 1 (2412.0 MHz)



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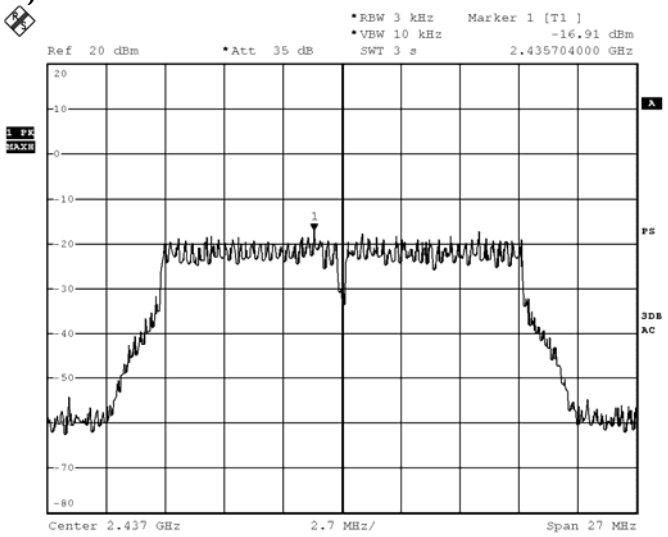
Date: 2.AUG.2016 21:28:08

CH 6 (2437.0 MHz)



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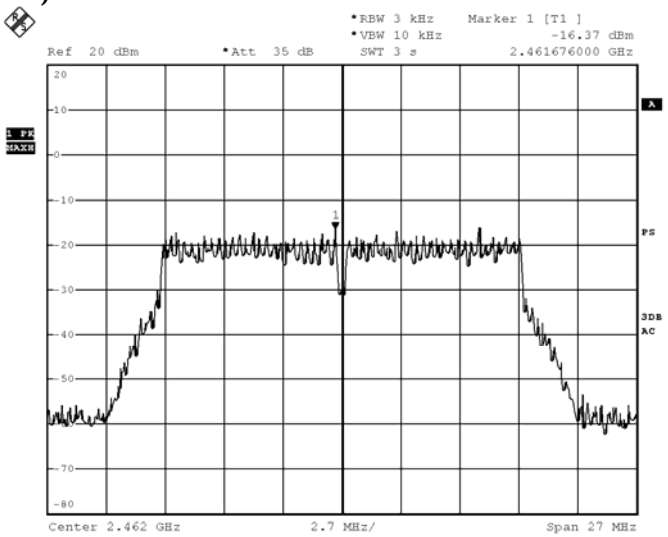
Date: 2.AUG.2016 21:28:59

CH 11 (2462.0 MHz)



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Date: 2.AUG.2016 21:29:45

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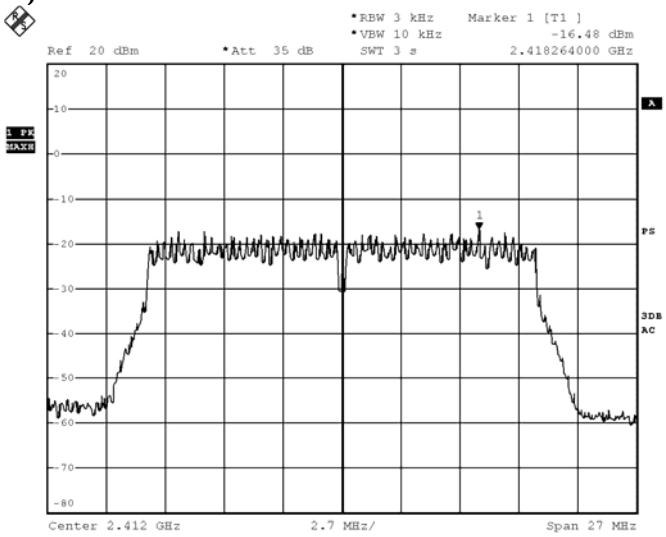
WiFi mode 802.11 n20, (Tx: 2412MHz to 2462MHz)
CH 1 (2412.0 MHz)



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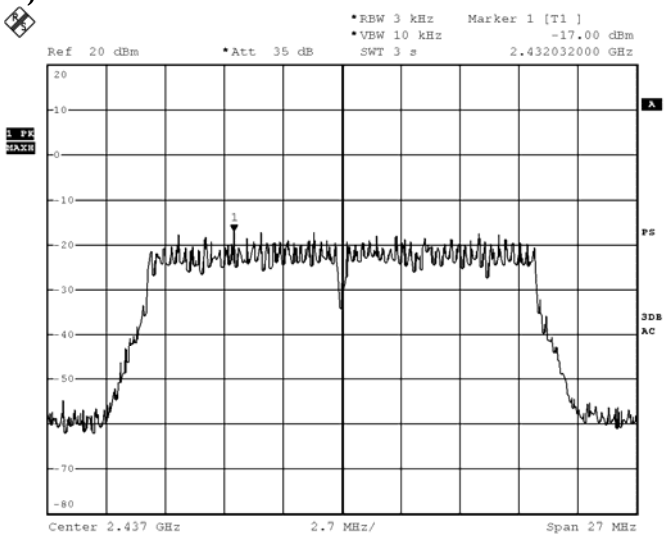
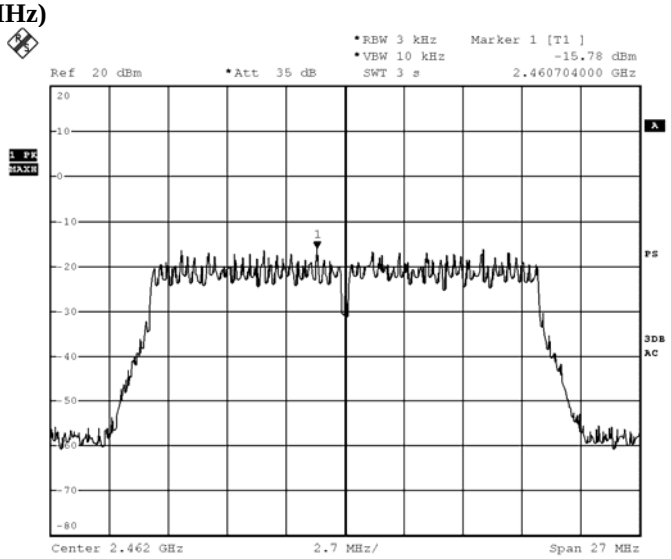
Date: 2.AUG.2016 21:20:17

CH 6 (2437.0 MHz)



BMP
Date: 2.AUG.2016 21:09:49

Ch 11 (2462.0 MHz)



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Date: 2.AUG.2016 21:08:46

3.1.5 6dB Spectrum Bandwidth Measurement

Test Requirement:	FCC 47CFR 15.247(a)(2)
Test Method:	ANSI C63.10:2013
Test Date:	2016-08-02
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.

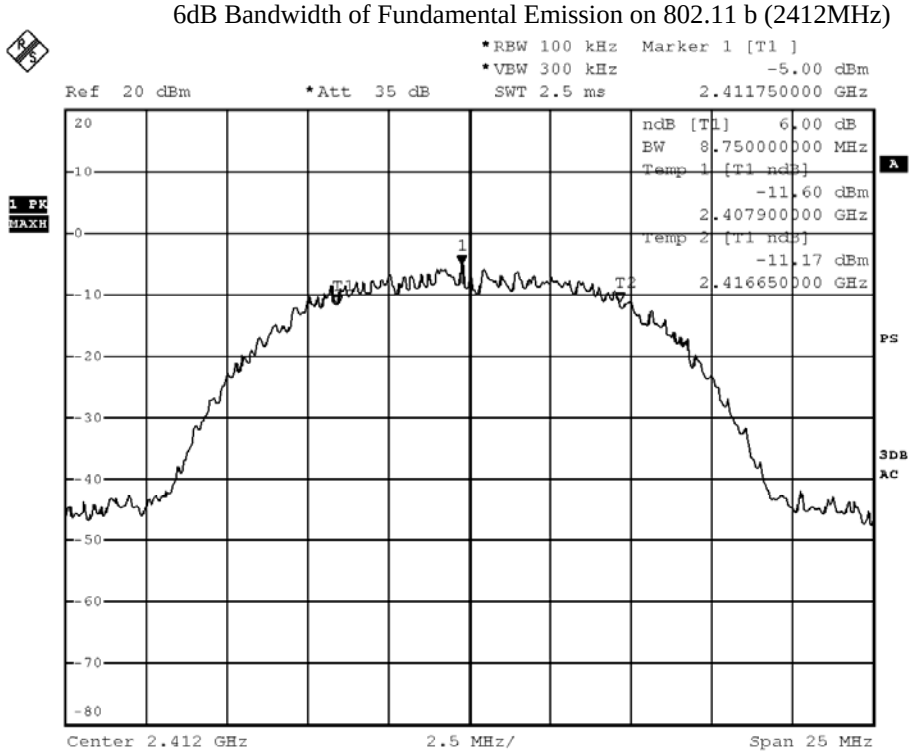
Test Setup:

As Test Setup of clause 3.1.1 in this test report.

Limits for 6dB Spectrum Bandwidth Measurement:

Center Frequency [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2412.0	8.750	> 500

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



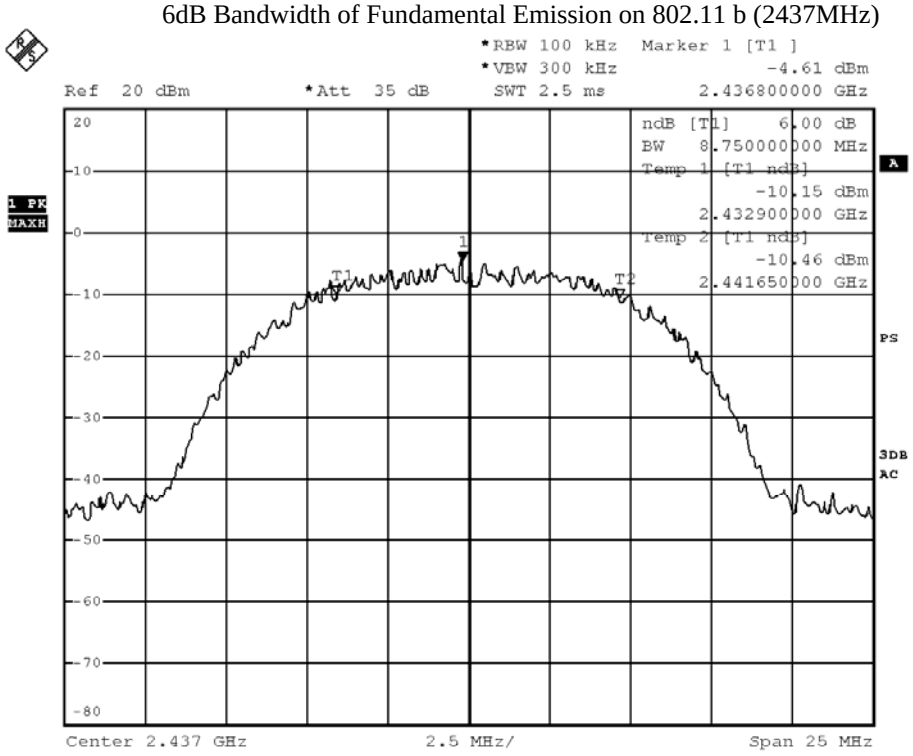
BMP

Date: 2.AUG.2016 20:56:06

Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2437.0	8.750	> 500

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



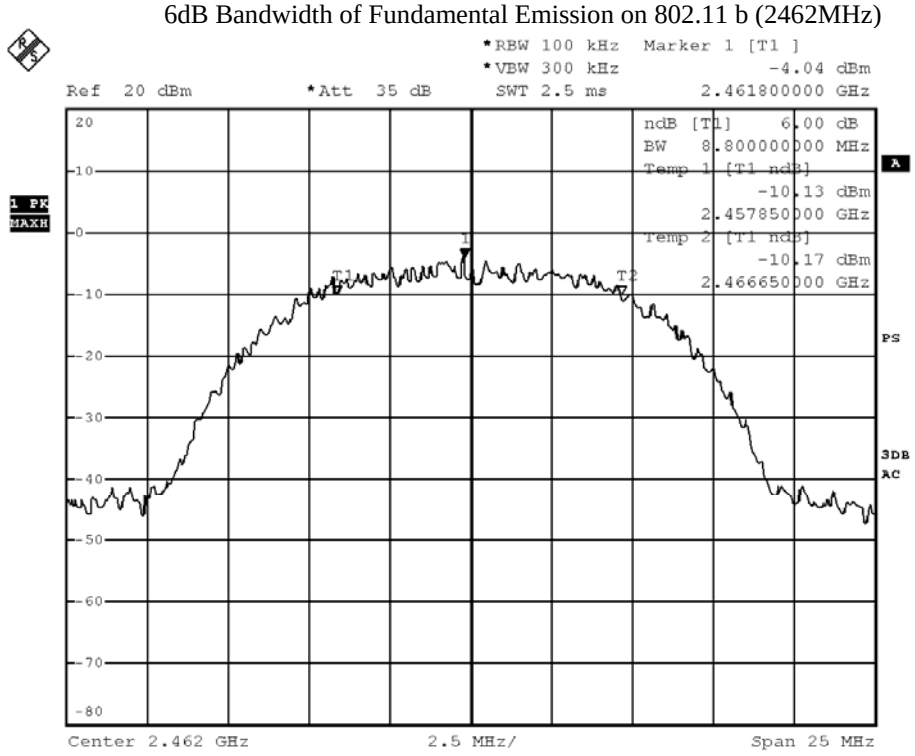
BMP

Date: 2.AUG.2016 20:54:28

Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2462.0	8.800	> 500

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



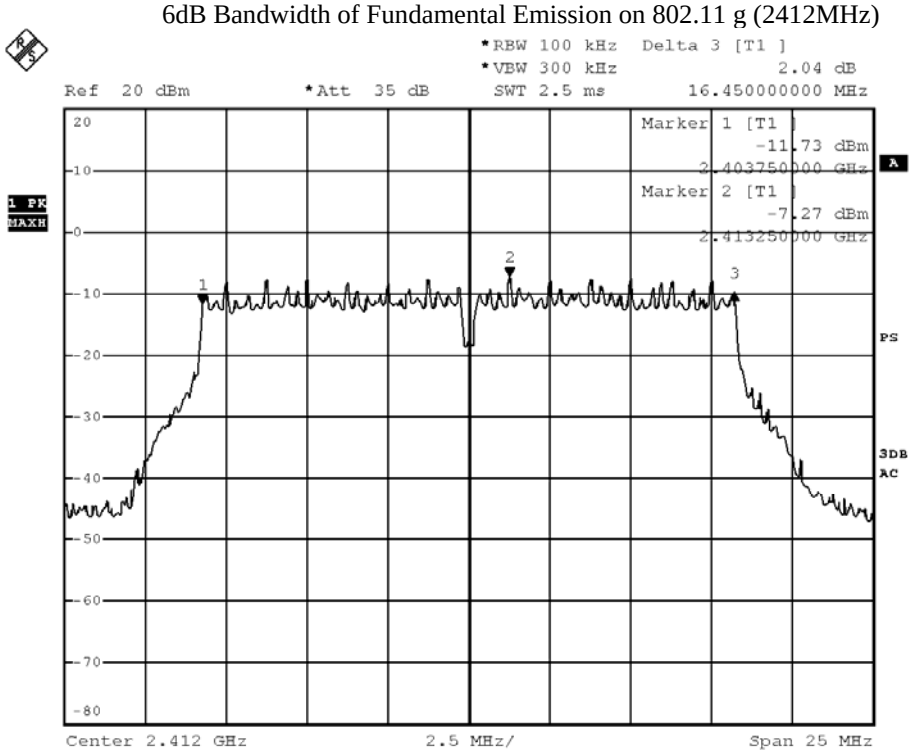
BMP

Date: 2.AUG.2016 20:52:53

Limits for 6dB Spectrum Bandwidth Measurement:

Center Frequency [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2412.0	16.450	> 500

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



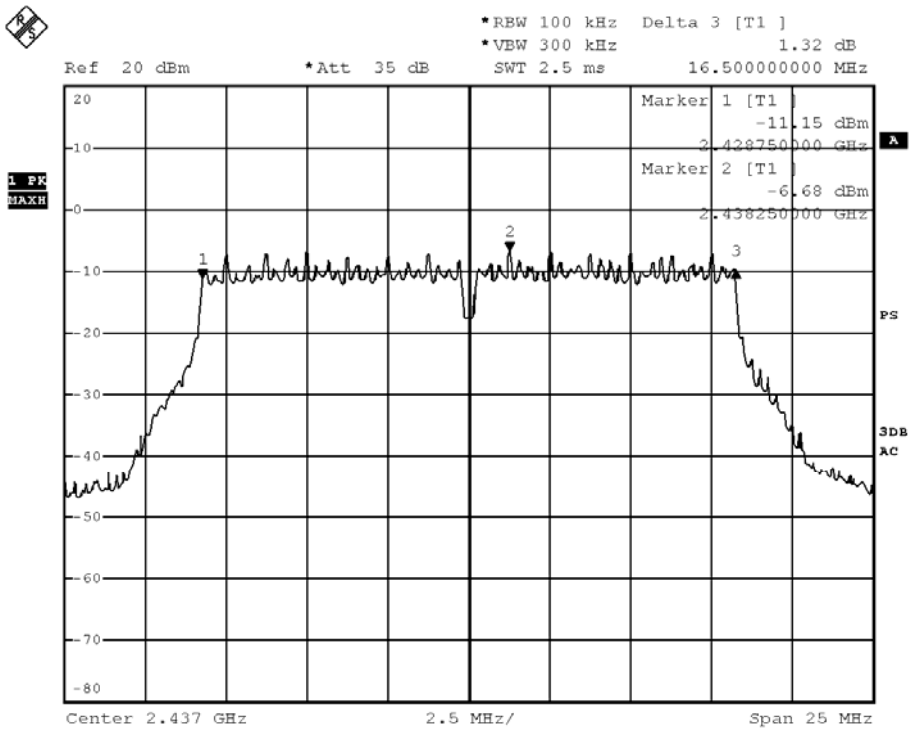
BMP

Date: 2.AUG.2016 20:48:04

Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2437.0	16.500	> 500

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



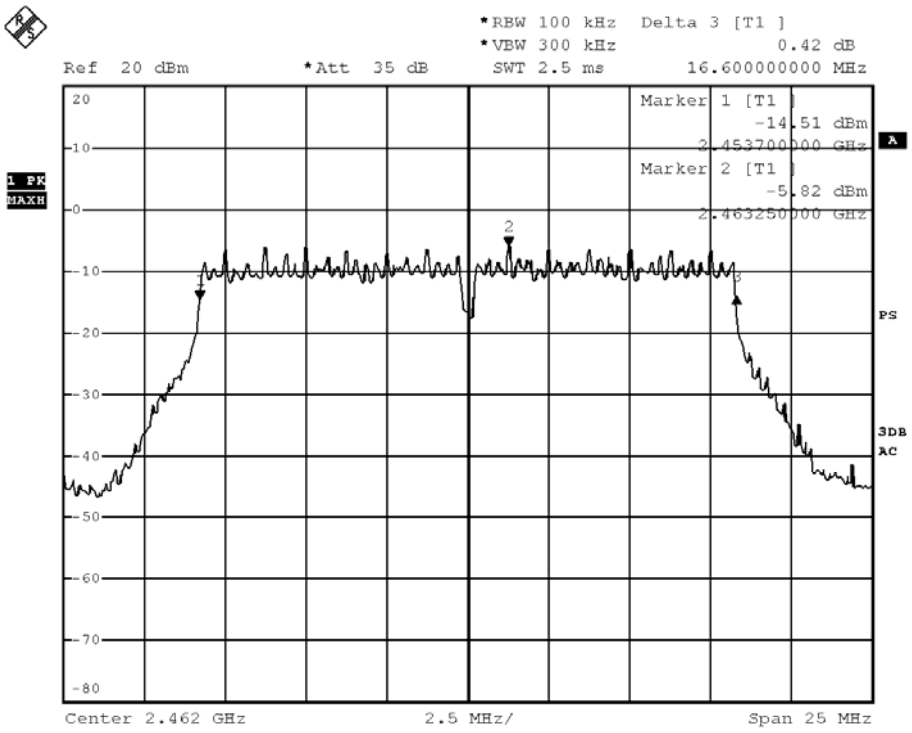
BMP

Date: 2.AUG.2016 20:49:51

Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2462.0	16.600	> 500

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



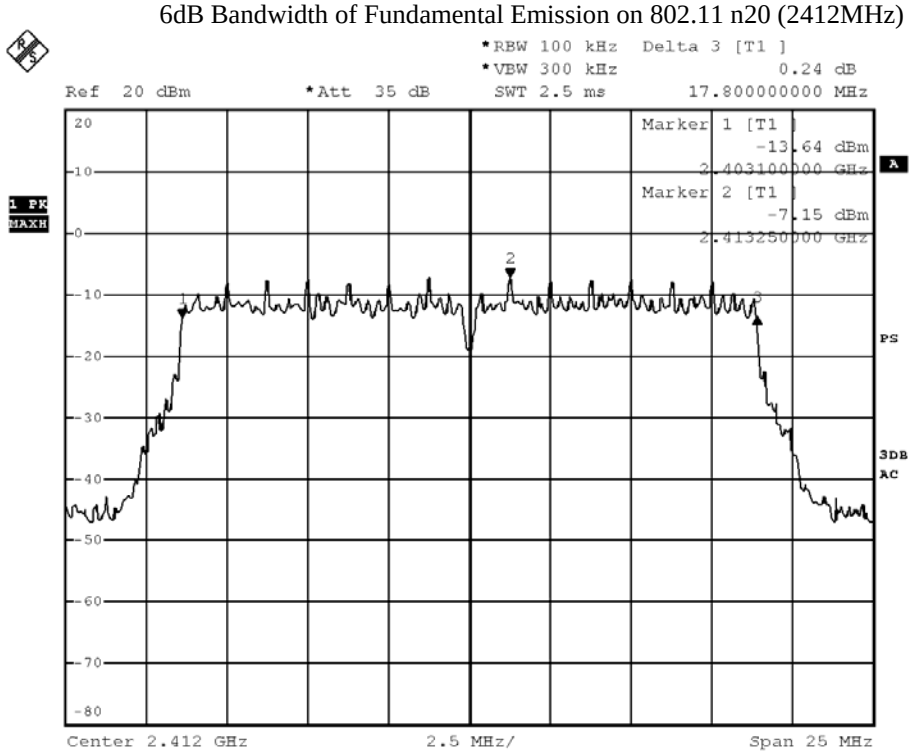
BMP

Date: 2.AUG.2016 20:51:03

Limits for 6dB Spectrum Bandwidth Measurement:

Center Frequency [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2412.0	17.800	> 500

6dB Bandwidth of Fundamental Emission on 802.11 n20 (2412MHz)



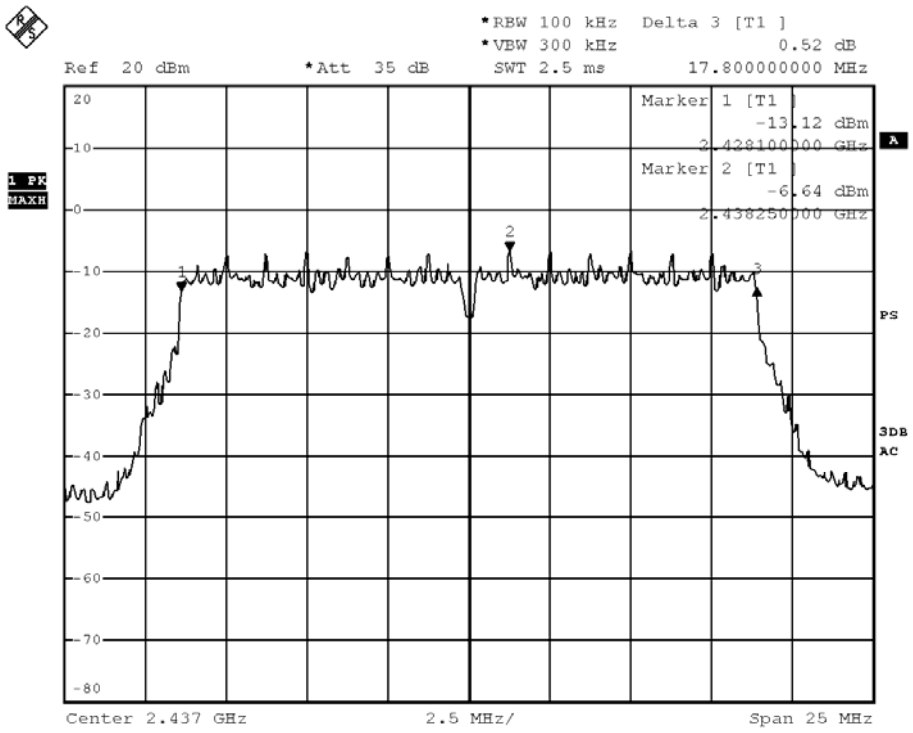
BMP

Date: 2.AUG.2016 20:46:14

Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2437.0	17.800	> 500

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



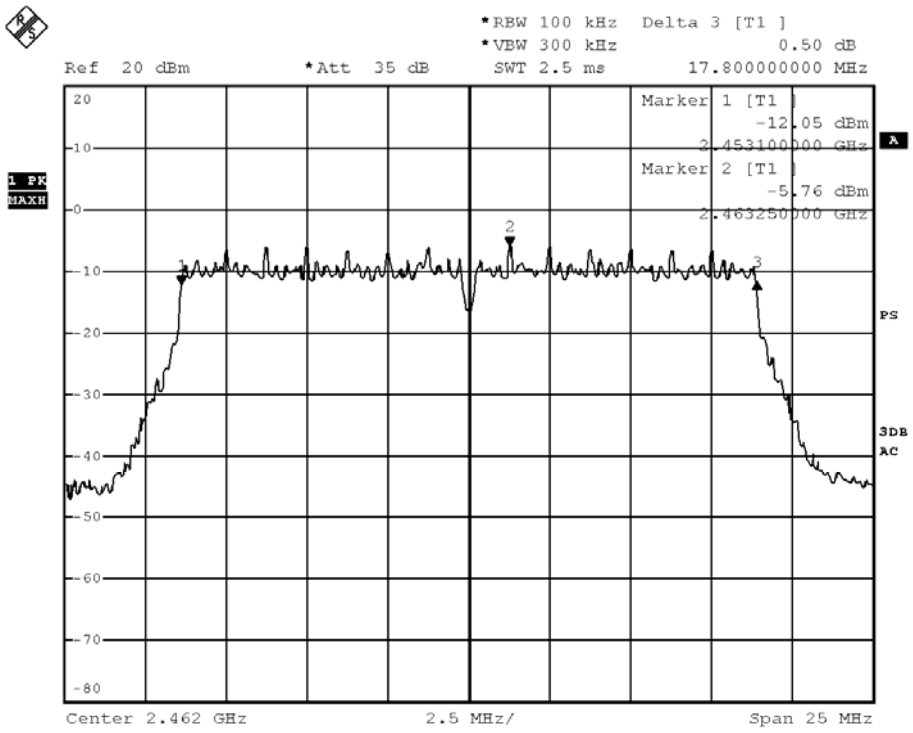
BMP

Date: 2.AUG.2016 20:45:04

Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2462.0	17.800	> 500

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



BMP

Date: 2.AUG.2016 20:42:52

3.1.6 Band Edges Measurement

Test Requirement:	FCC 47CFR 15.247
Test Method:	ANSI C63.10:2013
Test Date:	2016-08-02
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.

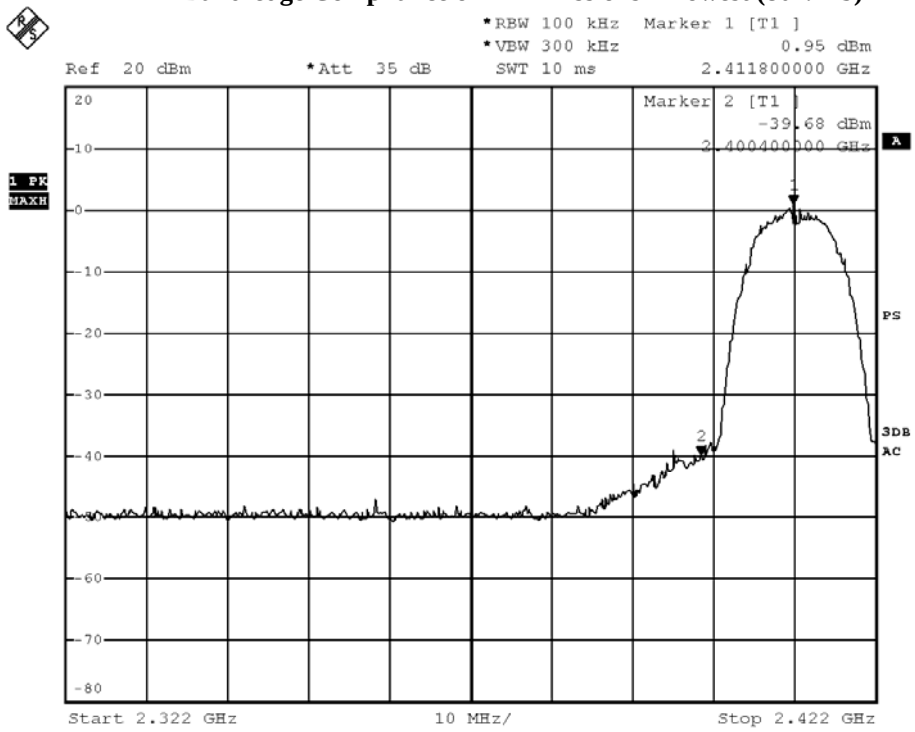
Band-edge Compliance of RF Conducted Emissions Measurement:

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.

Remark: Emissions under the fixed frequency mode and hopping mode have been investigated, the worst-case measurement results were recorded in the test report

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2400 – Lowest Fundamental (2412)	40.63

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

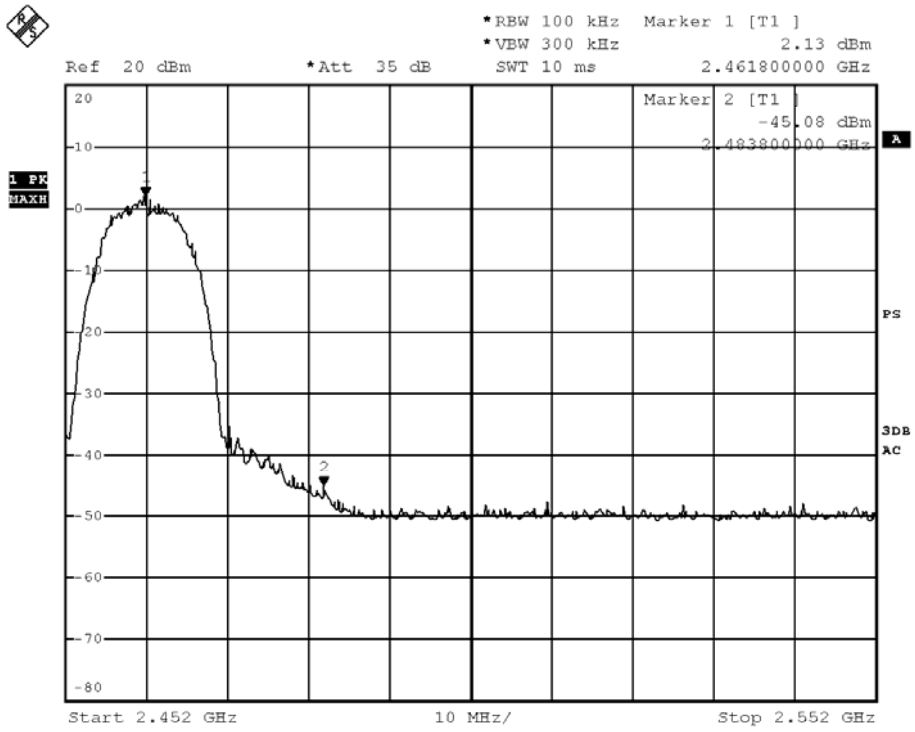


BMP
Date: 2.AUG.2016 21:39:53

Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2483.5 - Highest Fundamental (2462)	47.21

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



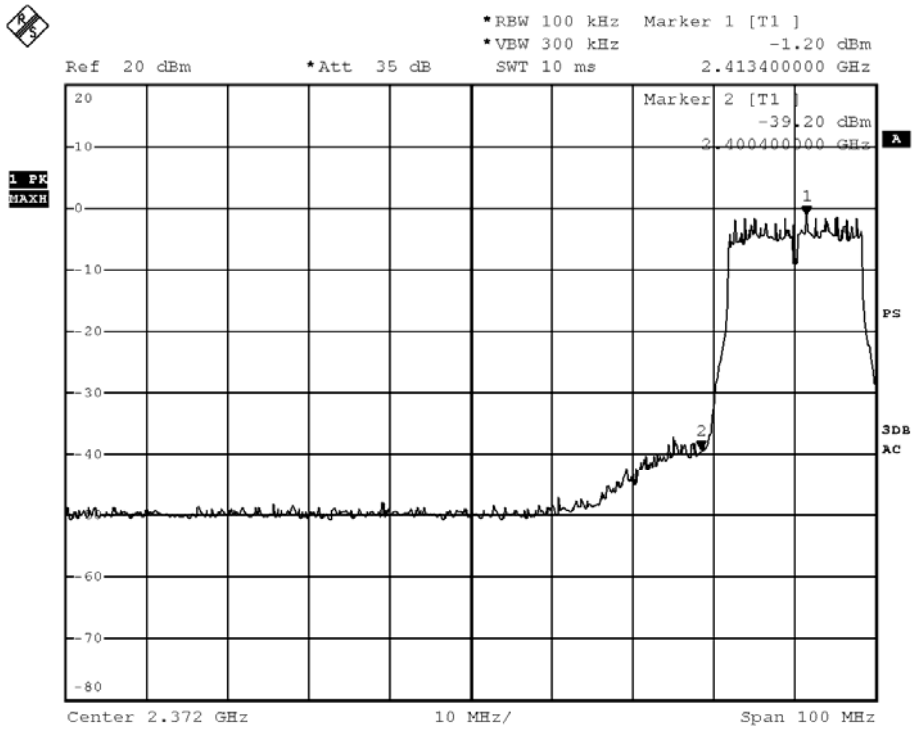
BMP

Date: 2.AUG.2016 21:54:51

Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2400 – Lowest Fundamental (2412)	38.0

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



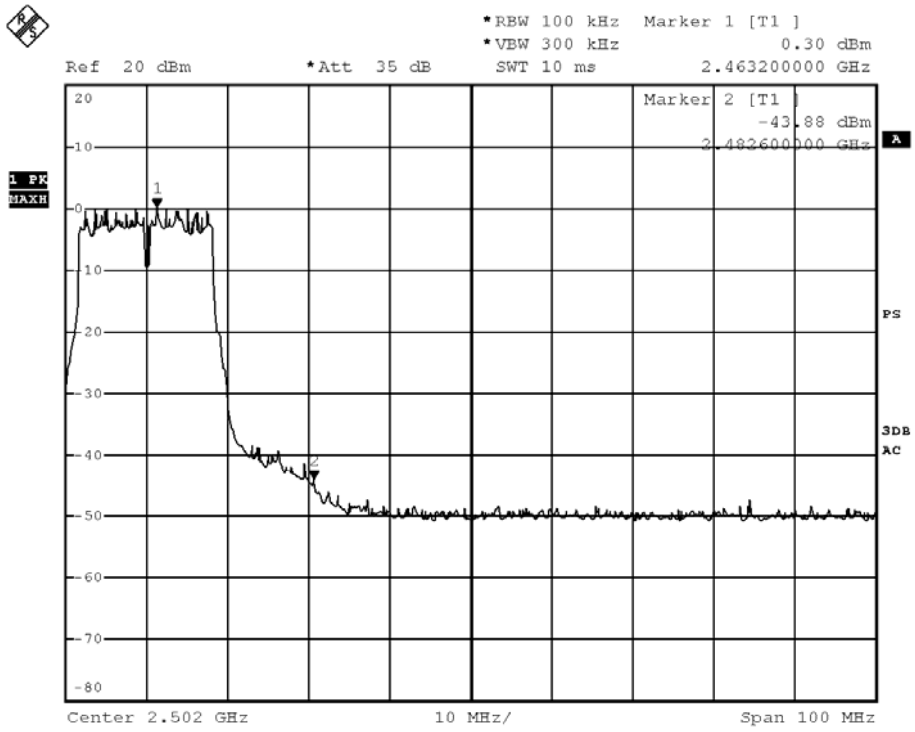
BMP

Date: 2.AUG.2016 21:43:39

Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2483.5 - Highest Fundamental (2462)	44.18

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



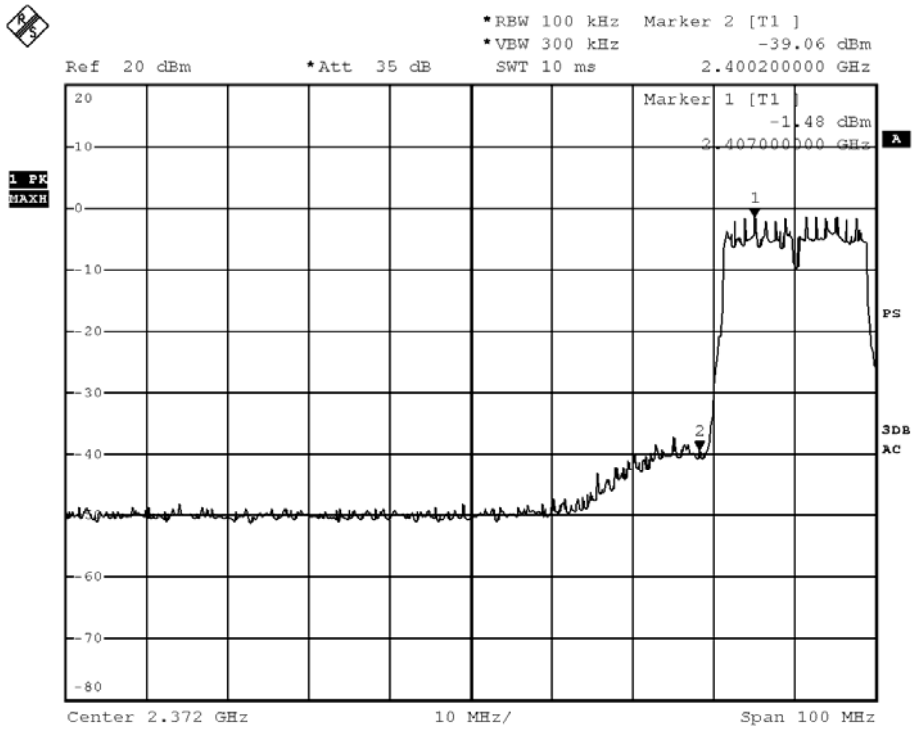
BMP

Date: 2.AUG.2016 21:52:29

Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2400 – Lowest Fundamental (2412)	37.58

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



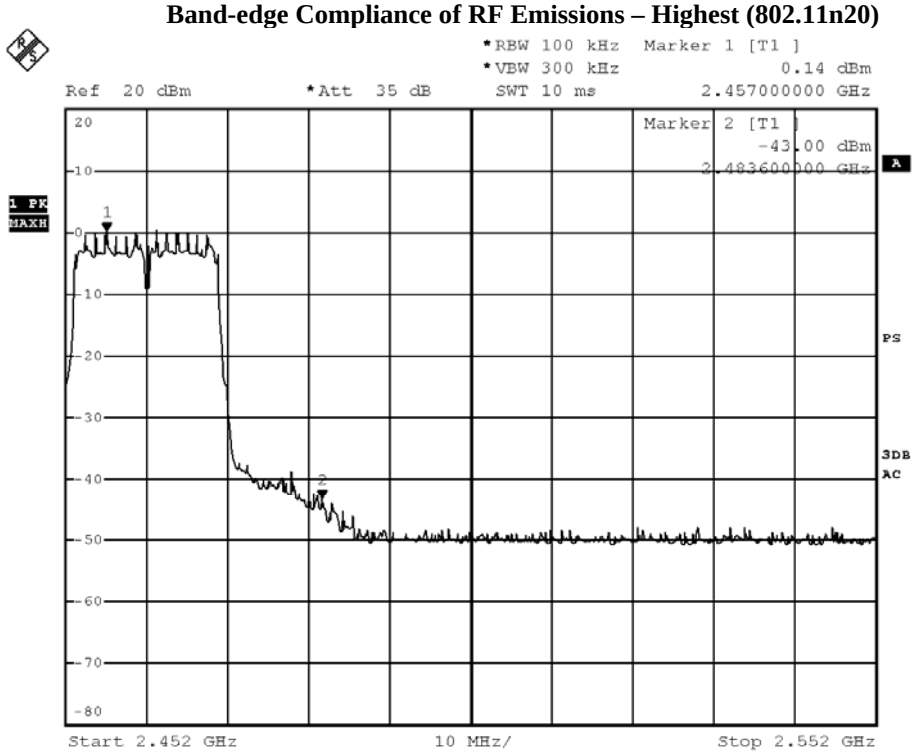
BMP

Date: 2.AUG.2016 21:46:19

Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2483.5 - Highest Fundamental (2462)	43.14

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



BMP

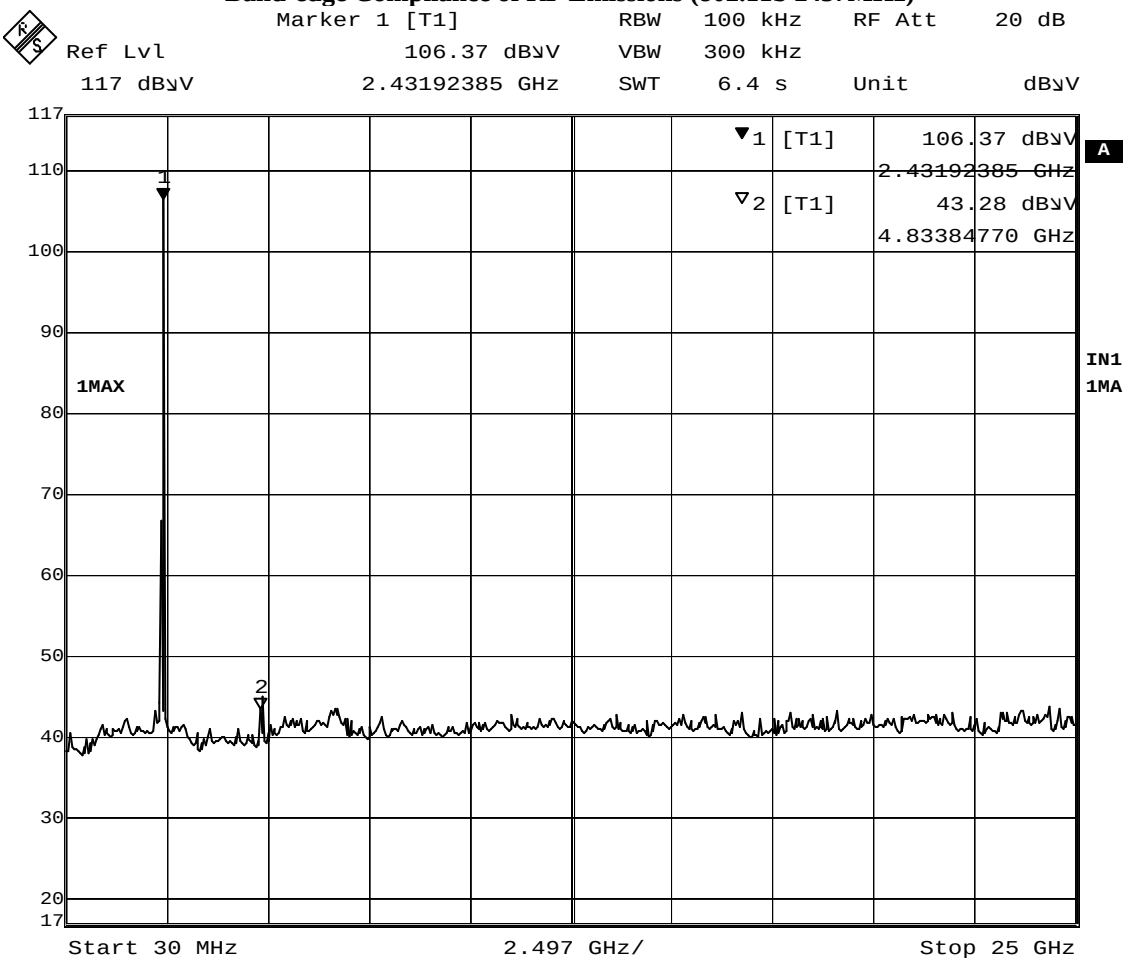
Date: 2.AUG.2016 21:49:54

Band-edge Compliance of RF Conducted Emissions Measurement:

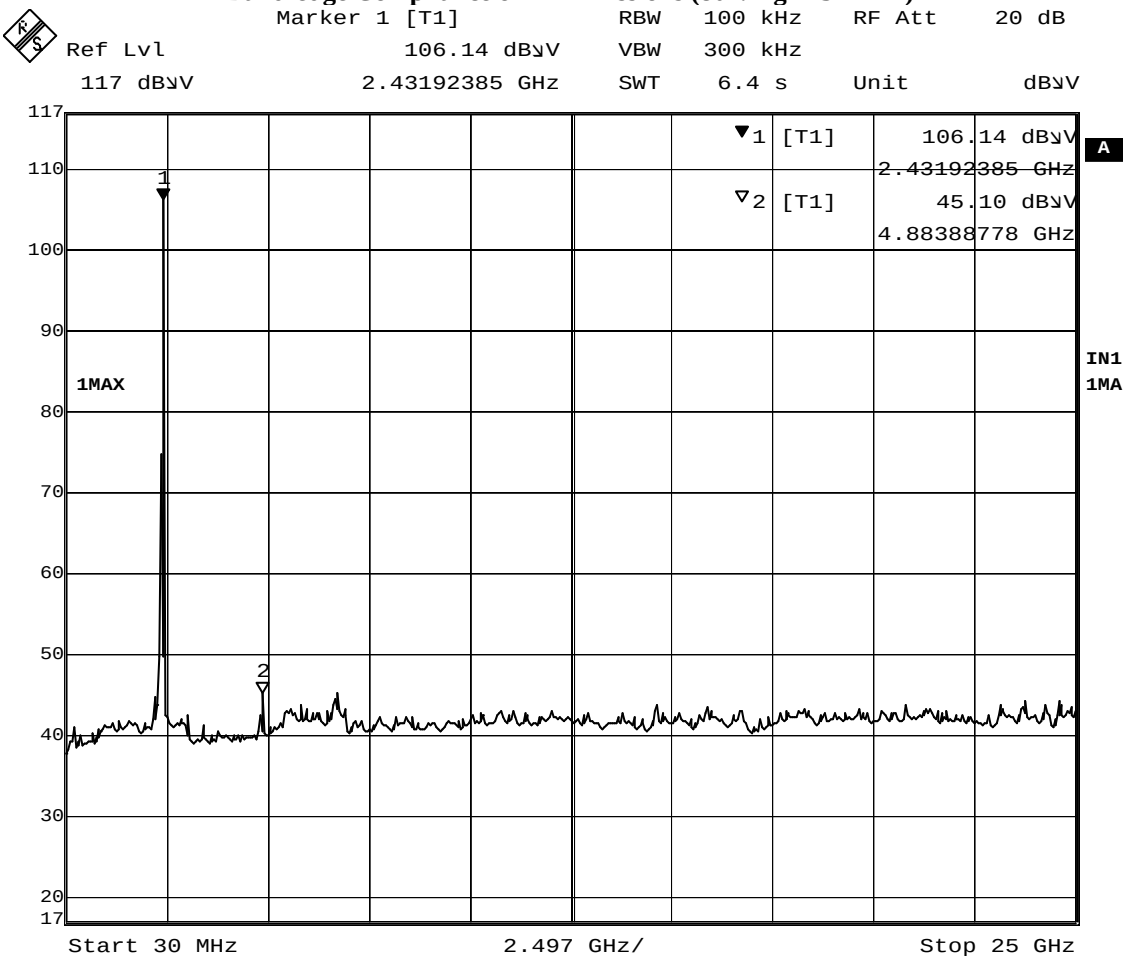
Limit：
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains 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.

Remark: Emissions under the fixed frequency mode and hopping mode have been investigated, the worst-case measurement results were recorded in the test report

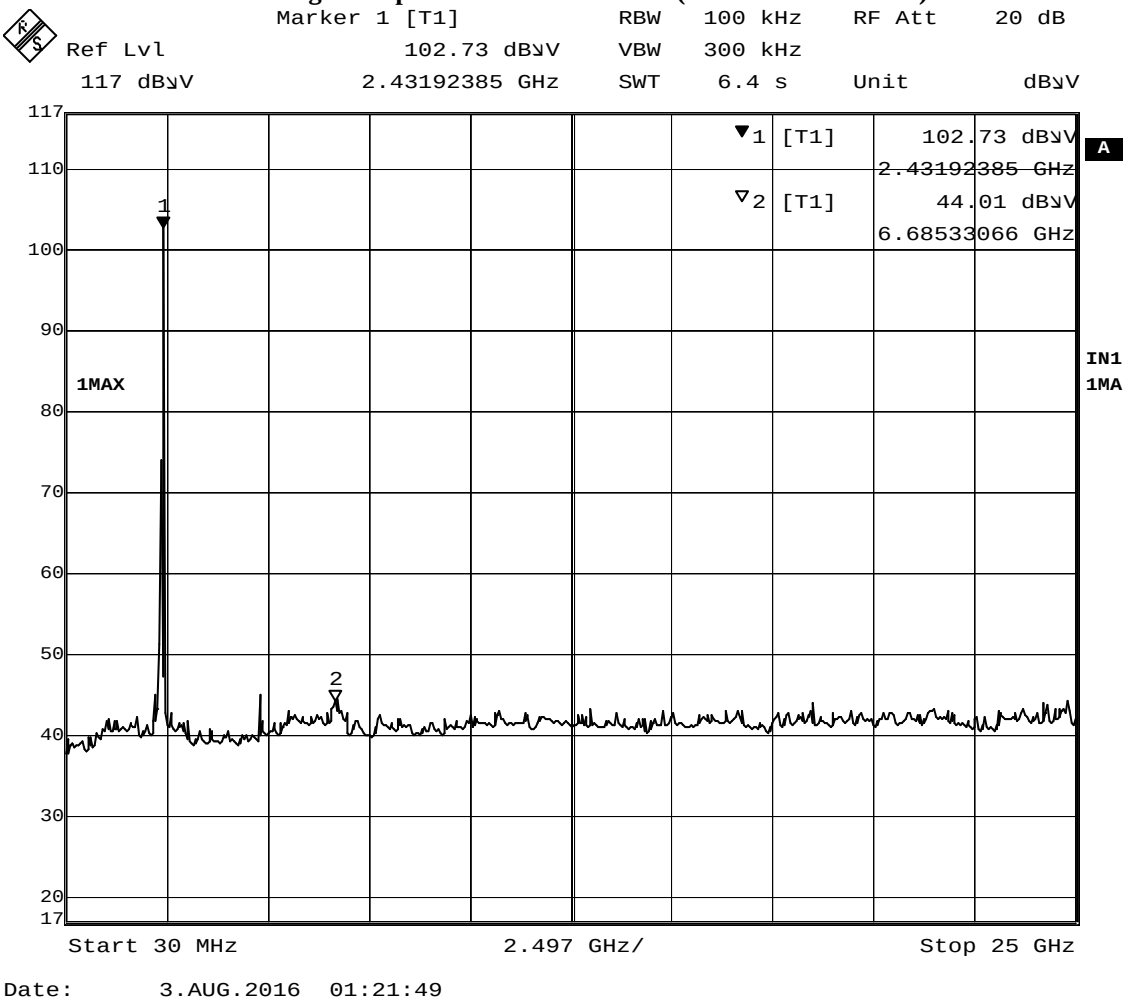
Band-edge Compliance of RF Emissions (802.11b 2437MHz)



Band-edge Compliance of RF Emissions (802.11g 2437MHz)



Band-edge Compliance of RF Emissions (802.11n20 2437MHz)



3.1.7 Antenna Requirement

Test Requirements: § 15.203

Test Specification:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 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 provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Test Results:

This is pcb antenna. There is no external antenna, the antenna gain = 4dBi. User is unable to remove or changed the Antenna.

3.1.8 RF Exposure

Test Requirement:	FCC 47CFR 15.247(i)
Test Date:	2016-08-03
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 =71.78 mW

Pd = PG/ 4pi*R^2 = (71.78x 2.51)/12.566* $(20)^2$
= (180.168)/12.566x 400= 180.168 /5026.4
= 0.0358 mW/cm^2

where:
*Pd = power density in mW/cm2
* G = Antenna numeric gain (2.51); Log G = g/10 (g = 4dBi).
* P = Conducted RF power to antenna (39.54 mW).
* R = Minimum allowable distance.(20 cm)

*The power density Pd = 0.0465mW/cm^2 is less than 1 mW/cm^2 (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.

Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM299	Double-Ridged Waveguide Horn Antenna	ETS-Lindgren	3115	00114120	2016/04/27	2018/04/27
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A
EM216	MINI MAST SYSTEM	EMCO	2075	00026842	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-Lindgren	FACT-3	--	2016/04/24	2017/04/24
EM355	Biconilog Antenna	ETS-Lindgren	3143B	00094856	2016/03/03	2018/03/03
EM229	EMI Test Receiver	R&S	ESIB40	100248	2016/06/01	2017/06/01
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2016/06/01	2017/06/01
EM145	EMI Test Receiver	R & S	ESCS 30	830245/021	2016/06/01	2017/06/01
EM353	LOOP ANTENNA	ETS_LINDGREN	6502	00206533	2016/03/16	2018/03/16
EM302	Precision Omnidirectional Dipole (1 – 6GHz)	Seibersdorf Laboratories	POD 16	161806/L	2016/05/11	2018/05/11
EM303	Precision Omnidirectional Dipole (6 – 18GHz)	Seibersdorf Laboratories	POD 618	6181908/L	2016/05/11	2018/05/11

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM119	LISN	R & S	ESH3-Z5	0831.5518.52	2015/10/22	2016/10/22
EM145	EMI Test Receiver	R & S	ESCS 30	830245/021	2016/06/01	2017/06/01
EM179	IMPULSE LIMITER	ROHDE & SCHWARZ	ESH3-Z2	357-8810.52/54	2016/01/11	2017/01/11
EM154	SHIELDING ROOM	SIEMENS MATSUSHITA COMPONENTS	N/A	803-740-057-99A	2012/02/03	2017/02/03
N/A	mEASUREMENT AND EVALUATION SOFTWARE	ROHDE & SCHWARZ	esib-k1	v1.20	n/a	n/a

Remarks:-

CM Corrective Maintenance
N/A Not Applicable
TBD To Be Determined

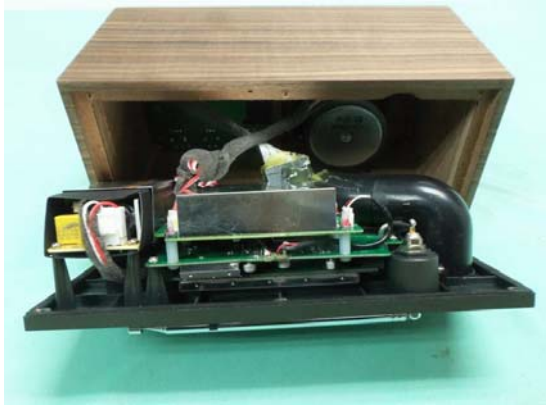
Appendix B

Photographs of EUT

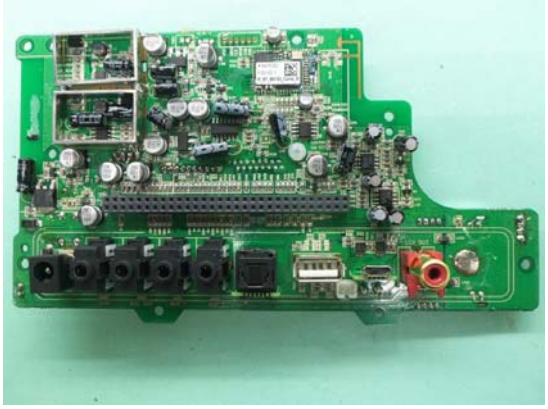
Front View of the product

Rear View of the product

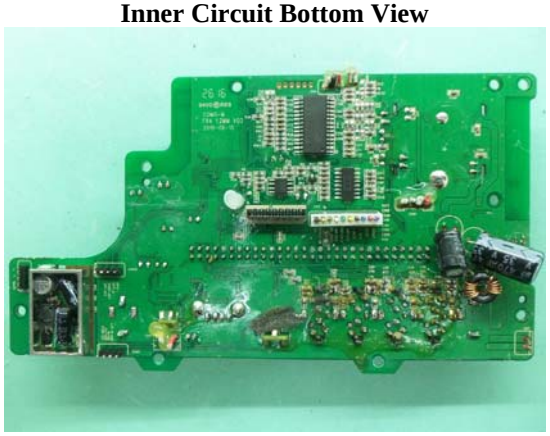
Inside View of the product



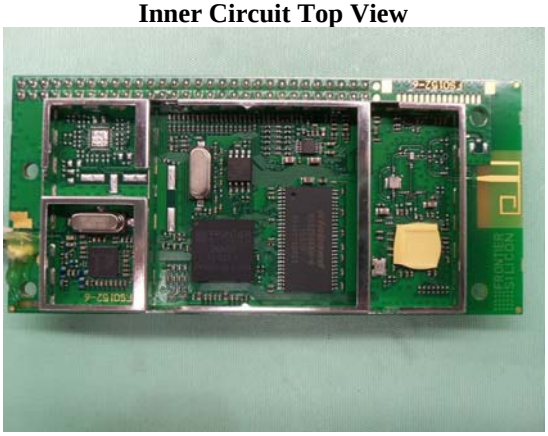
Inner Circuit Top View



Inner Circuit Bottom View



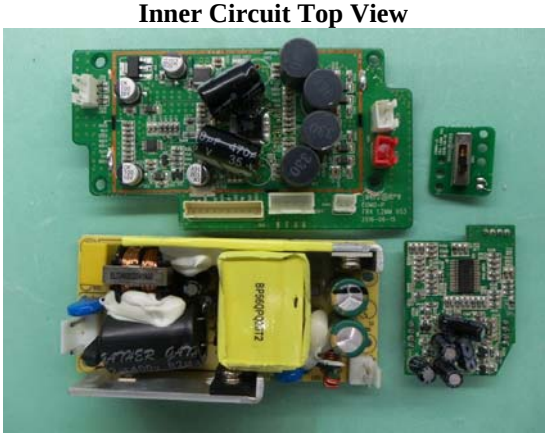
Inner Circuit Top View



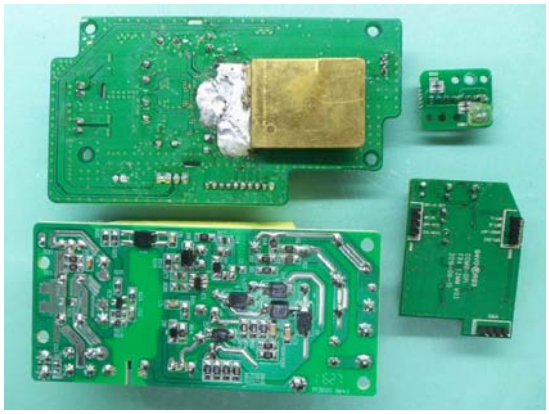
Photographs of EUT

Inner Circuit Bottom View

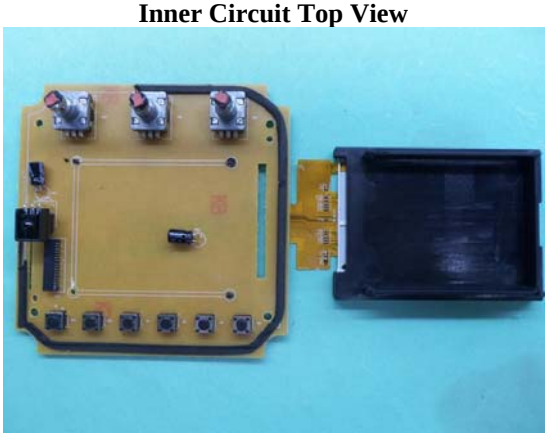
Inner Circuit Top View



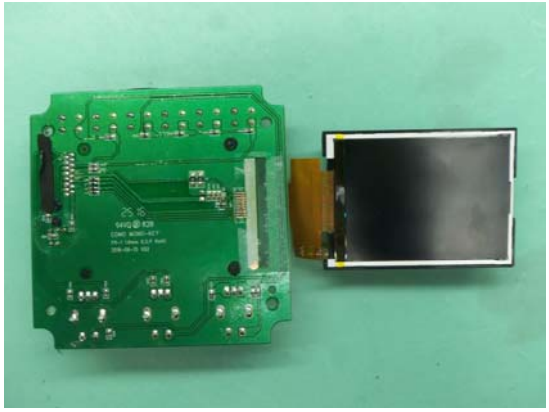
Inner Circuit Bottom View



Inner Circuit Top View

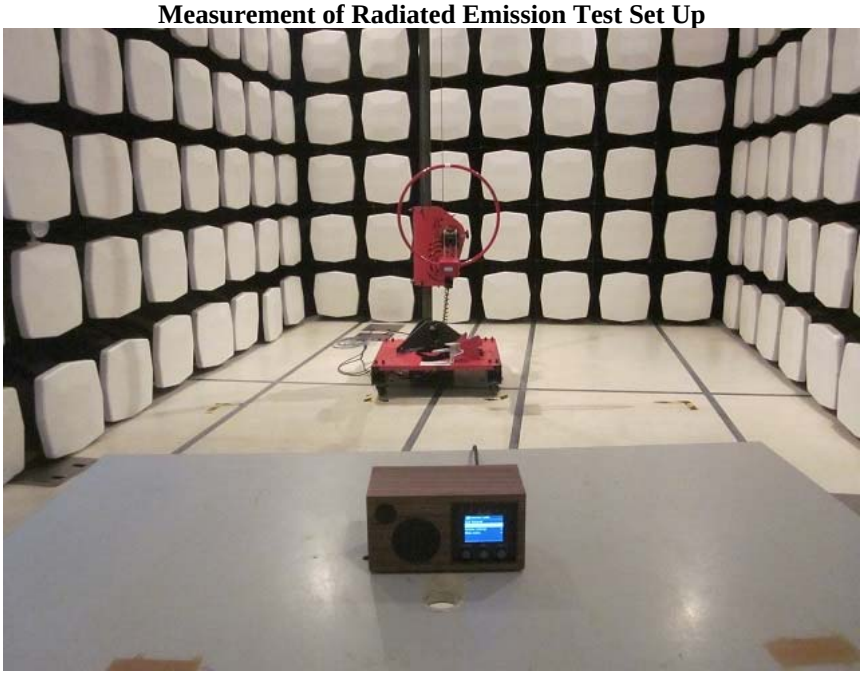


Inner Circuit Bottom View

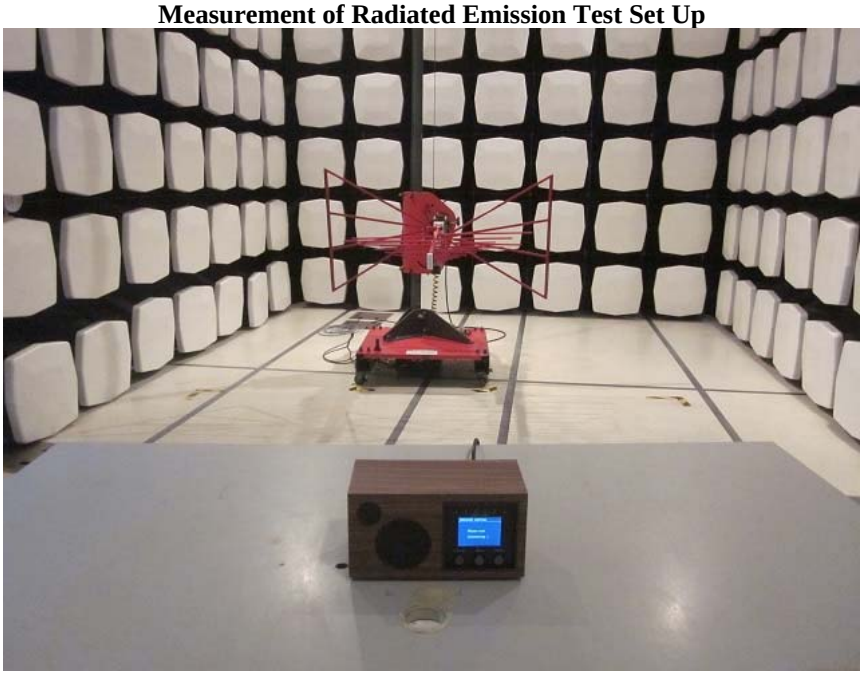


Photographs of EUT

Measurement of Radiated Emission Test Set Up

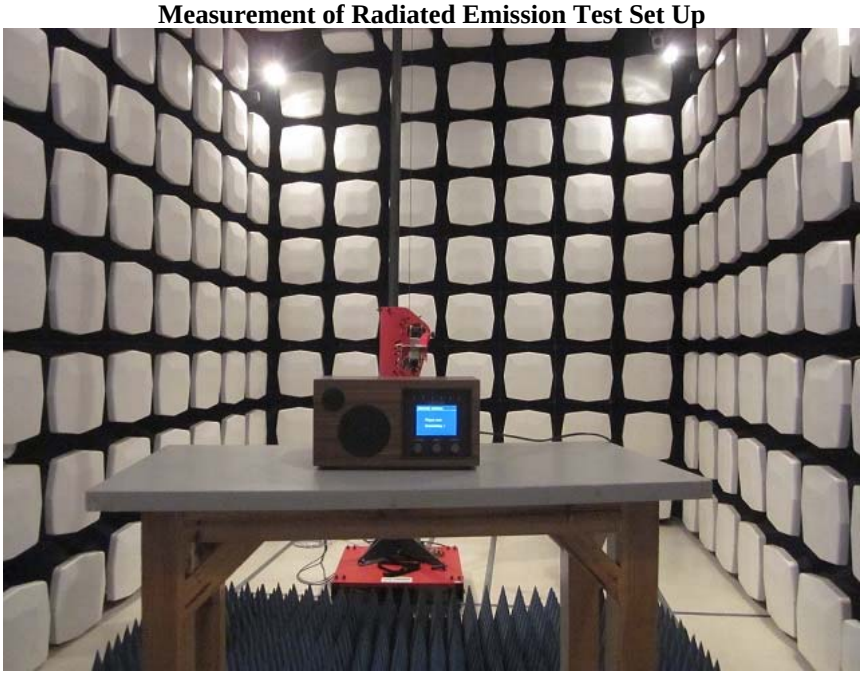


Measurement of Radiated Emission Test Set Up

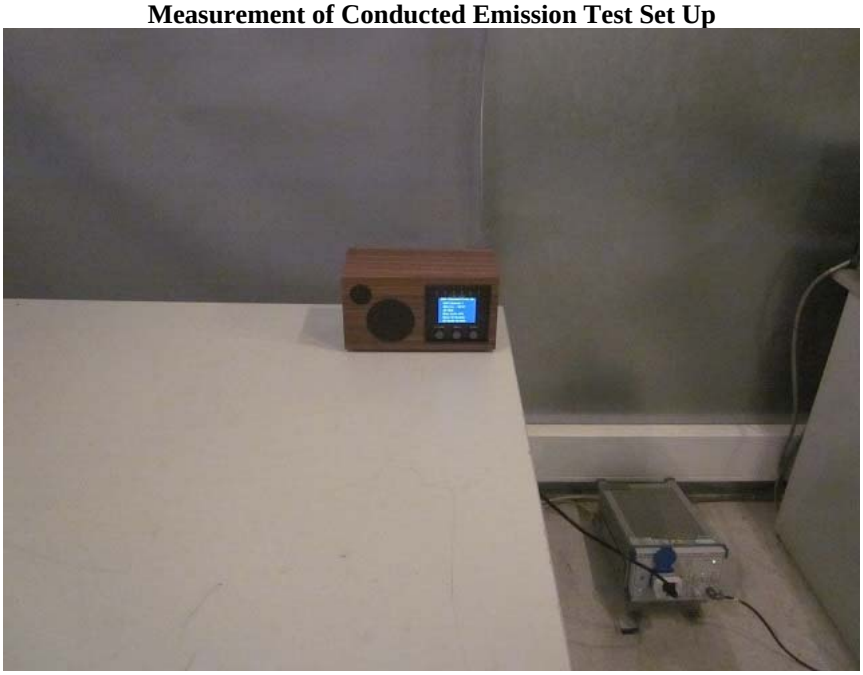


Photographs of EUT

Measurement of Radiated Emission Test Set Up



Measurement of Conducted Emission Test Set Up



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

The Hong Kong Standards and Testing Centre Ltd.

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