STC Test Report

Date : 2011-09-08

No. : MH185639

Applicant (C00676): Creative Labs INC.
1901 McCarthy Blvd Milpitas, CA 95035, United States

Manufacturer: Dongguan zhi cheng electronic products co., Ltd.
China, Dongguanshi, Tangxia, Ping San 188 Ind. Zone

Description of Sample(s): Submitted sample(s) said to be

Product:	Cambridge SoundWorks Ambiance Touch World Radio
Brand Name:	SoundWorks
Model Number:	CW0380
FCC ID:	IBAAVPCW0380

Date Sample(s) Received: 2011-08-19

Date Tested: 2011-08-23 to 2011-08-26

Investigation Requested: Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2010 and ANSI C63.4:2009 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): ---

Dr. LEE Kam Chuen
Authorized Signatory
ElectroMagnetic Compatibility Department
For and on behalf of
The Hong Kong Standards and Testing Centre Ltd.

The Hong Kong Standards and Testing Centre Ltd.
10 Dai Wang Street, Taipo Industrial Estate, N.T., Hong Kong
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STC Test Report

CONTENT:

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

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

Product:	Cambridge SoundWorks Ambiance Touch World Radio
Manufacturer:	Dongguan zhi cheng electronic products co., Ltd. China, Dongguanshi, Tangxia, Ping San 188 Ind. Zone
Brand Name:	SoundWorks
Model Number:	CW0380
Rating:	9.0Vd.c. with Jack

The AC/DC adapter was provided by the applicant with following details:
Brand name: N/A; Model no.GPE602-180330D; Input: 100-240Va.c. 50/60Hz 1.5A; Output: 18Vd.c. 3300 mA 59.4W.

1.2.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Creative Labs INC, Cambridge SoundWorks Ambiance Touch World Radio. the transmission signal is digital modulated with channel frequency range 2412-2462MHz. The EUT supports IEEE 802.11b (Data Rate 11 Mbps) and IEEE 802.11g (Data Rate 54 Mbps) Wifi modes for wireless internet access. The LAN port on the EUT is solely for wired internet access.

1.3 Date of Order

2011-08-19

1.4 Submitted Sample(s):

1 Sample

1.5 Test Duration

2011-08-23 to 2011-08-26

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: 2010 Regulations and ANSI C63.4:2009 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 C63.4:2009	N/A	☒	☐	☐
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.4:2009	N/A	☒	☐	☐
Conducted Emissions	FCC 47CFR 15.207	ANSI C63.4:2009	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	☒	☐	☐
RF Exposure	FCC 47CFR 15.247(i)	N/A	N/A	☒	☐	☐
Antenna requirement	FCC 47CFR 15.203	N/A	N/A	☒	☐	☐

Note: N/A - Not Applicable

3.0 Test Results

3.1 Emission

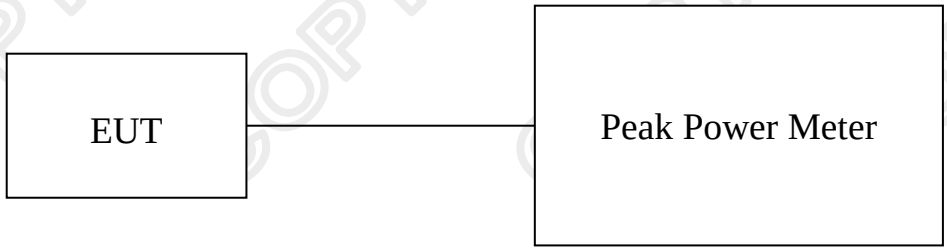
3.1.1 Maximum Peak Output Power

Test Requirement:	FCC 47CFR 15.247(b)(3)
Test Method:	N/A
Test Date:	2011-08-25
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:



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 Tx Mode 802.11 b, (2412MHz to 2462MHz) : Pass (TX Unit)
Maximum conducted output power

Channel	Frequency(MHz)	Output Power
Low	2412	7.17 dBm
Middle	2437	6.25 dBm
High	2462	6.81 dBm

Results of WiFi Tx Mode 802.11 g, (2412MHz to 2462MHz) : Pass (TX Unit)
Maximum conducted output power

Channel	Frequency(MHz)	Output Power
Low	2412	6.88 dBm
Middle	2437	5.84 dBm
High	2462	5.45 dBm

Calculated measurement uncertainty : 30MHz to 1GHz 5.1dB
1GHz to 25GHz 5.1dB

3.1.2 Radiated Emissions

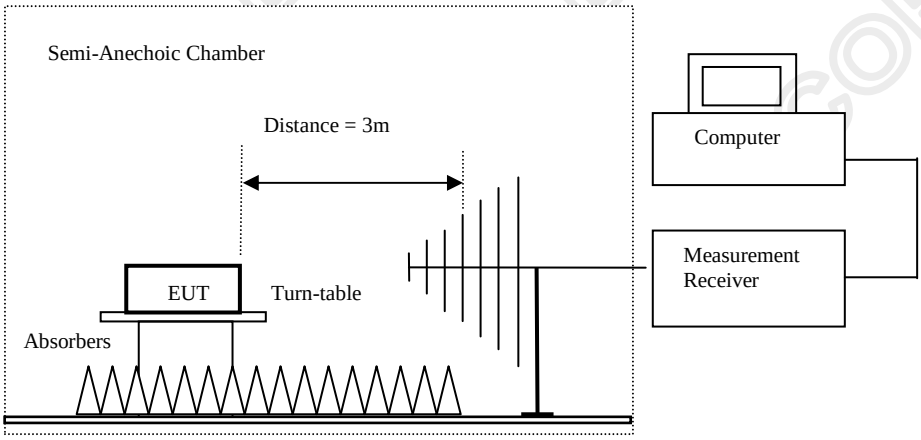
Test Requirement:	FCC 47CFR 15.209
Test Method:	ANSI C63.4:2009
Test Date:	2011-08-25
Mode of Operation:	FM mode / WiFi mode / Internet Radio mode / iPod mode/Aux in mode/DAB mode

Test Method:

The sample was placed 0.8m 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 Tx mode 802.11b (2412 MHz): PASS

Field Strength of Harmonic Emissions PeakValue						
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	7.1	41.9	49.0	74.0	-25.0	Horizontal
4824.0	7.8	41.9	49.7	74.0	-24.3	Vertical
7236.0	5.8	47.8	53.6	74.0	-20.4	Horizontal
7236.0	4.5	47.8	52.3	74.0	-21.7	Vertical

Field Strength of Harmonic Emissions AverageValue						
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	0.3	41.9	42.2	54.0	-11.8	Horizontal
4824.0	3.6	41.9	45.5	54.0	-8.5	Vertical
7236.0	-1.5	47.8	46.3	54.0	-7.7	Horizontal
7236.0	-2.8	47.8	45.0	54.0	-9.0	Vertical

Remarks:

* 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 : 30MHz to 1GHz 5.1dB
1GHz to 25GHz 5.1dB

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 Tx mode 802.11b (2437 MHz): PASS

Field Strength of Harmonic Emissions PeakValue						
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	6.7	41.9	48.6	74.0	-25.4	Horizontal
4874.0	7.4	41.9	49.3	74.0	-24.7	Vertical
7311.0	4.1	47.8	51.9	74.0	-22.1	Horizontal
7311.0	5.2	47.8	53.0	74.0	-21.0	Vertical

Field Strength of Harmonic Emissions AverageValue						
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	1.6	41.9	43.5	54.0	-10.5	Horizontal
4874.0	3.1	41.9	45.0	54.0	-9.0	Vertical
7311.0	-1.2	47.8	46.6	54.0	-7.4	Horizontal
7311.0	-1.8	47.8	46.0	54.0	-8.0	Vertical

Remarks:

* 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 : 30MHz to 1GHz 5.1dB
1GHz to 25GHz 5.1dB

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 Tx mode 802.11b (2462 MHz): PASS

Field Strength of Harmonic Emissions PeakValue						
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	8.7	41.9	50.6	74.0	-23.4	Horizontal
4924.0	6.9	41.9	48.8	74.0	-25.2	Vertical
7386.0	4.7	47.8	52.5	74.0	-21.5	Horizontal
7386.0	4.2	47.8	52.0	74.0	-22.0	Vertical

Field Strength of Harmonic Emissions AverageValue						
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	2.7	41.9	44.6	54.0	-9.4	Horizontal
4924.0	3.5	41.9	45.4	54.0	-8.6	Vertical
7386.0	-1.6	47.8	46.2	54.0	-7.8	Horizontal
7386.0	-2.0	47.8	45.8	54.0	-8.2	Vertical

Remarks:

* 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 : 30MHz to 1GHz 5.1dB
1GHz to 25GHz 5.1dB

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 Tx mode 802.11g (2412 MHz): PASS

Field Strength of Harmonic Emissions PeakValue						
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	12.5	41.9	54.4	74.0	-19.6	Horizontal
4824.0	9.3	41.9	51.2	74.0	-22.8	Vertical
7236.0	6.1	47.8	53.9	74.0	-20.1	Horizontal
7236.0	3.9	47.8	51.7	74.0	-22.3	Vertical

Field Strength of Harmonic Emissions AverageValue						
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	1.5	41.9	43.4	54.0	-10.6	Horizontal
4824.0	4.1	41.9	46.0	54.0	-8.0	Vertical
7236.0	1.1	47.8	48.9	54.0	-5.1	Horizontal
7236.0	0.6	47.8	48.4	54.0	-5.6	Vertical

Remarks:

* 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 : 30MHz to 1GHz 5.1dB
1GHz to 25GHz 5.1dB

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 Tx mode 802.11g (2437 MHz): PASS

Field Strength of Harmonic Emissions PeakValue						
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	11.2	41.9	53.1	74.0	-20.9	Horizontal
4874.0	8.4	41.9	50.3	74.0	-23.7	Vertical
7311.0	6.5	47.8	54.3	74.0	-19.7	Horizontal
7311.0	3.8	47.8	51.6	74.0	-22.4	Vertical

Field Strength of Harmonic Emissions AverageValue						
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	1.2	41.9	43.1	54.0	-10.9	Horizontal
4874.0	4.4	41.9	46.3	54.0	-7.7	Vertical
7311.0	1.6	47.8	49.4	54.0	-4.6	Horizontal
7311.0	0.8	47.8	48.6	54.0	-5.4	Vertical

Remarks:

* 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 : 30MHz to 1GHz 5.1dB
1GHz to 25GHz 5.1dB

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 Tx mode 802.11g (2462 MHz): PASS

Field Strength of Harmonic Emissions PeakValue						
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	14.2	41.9	56.1	74.0	-17.9	Horizontal
4924.0	10.7	41.9	52.6	74.0	-21.4	Vertical
7386.0	6.3	47.8	54.1	74.0	-19.9	Horizontal
7386.0	3.9	47.8	51.7	74.0	-22.3	Vertical

Field Strength of Harmonic Emissions AverageValue						
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	0.6	41.9	42.5	54.0	-11.5	Horizontal
4924.0	4.5	41.9	46.4	54.0	-7.6	Vertical
7386.0	-0.4	47.8	47.4	54.0	-6.6	Horizontal
7386.0	1.3	47.8	49.1	54.0	-4.9	Vertical

Remarks:

* 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 : 30MHz to 1GHz 5.1dB
1GHz to 25GHz 5.1dB

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

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
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.

Results of FM mode (88.1 MHz): PASS

Please refer to the following table for result details

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
41.8	Vertical	34.8	40.0	55.0	100
143.4	Vertical	33.2	43.5	45.7	150
194.0	Horizontal	31.0	43.5	35.5	150
227.2	Vertical	32.7	46.0	43.2	200
231.5	Vertical	35.6	46.0	60.3	200
294.9	Horizontal	35.9	46.0	62.4	200

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB

1GHz to 18GHz 5.1dB

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

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
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.

Results of FM mode (98.1 MHz): PASS
Please refer to the following table for result details

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
42.3	Vertical	33.8	40.0	49.0	100
50.5	Vertical	34.4	40.0	52.5	100
77.5	Vertical	33.4	40.0	46.8	100
231.5	Vertical	35.1	46.0	56.9	200
245.7	Horizontal	37.5	46.0	75.0	200
294.9	Horizontal	37.3	46.0	73.3	200

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB
1GHz to 18GHz 5.1dB

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

Frequency Range [MHz]	Quasi-Peak Limits [µV/m]
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.

Results of FM mode (107.9 MHz): PASS

Please refer to the following table for result details

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
43.1	Vertical	35.4	40.0	58.9	100
49.2	Vertical	35.1	40.0	56.9	100
199.7	Horizontal	32.5	43.5	42.2	150
227.4	Vertical	35.0	46.0	56.2	200
231.5	Vertical	37.2	46.0	72.4	200
294.9	Horizontal	37.4	46.0	74.1	200

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB

1GHz to 18GHz 5.1dB

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

Frequency Range [MHz]	Quasi-Peak Limits [µV/m]
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.

Results of DAB mode (206.352 MHz): PASS

Please refer to the following table for result details

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
41.8	Vertical	34.0	40.0	50.1	100
49.2	Vertical	35.6	40.0	60.3	100
229.1	Horizontal	35.0	46.0	56.2	200
245.7	Horizontal	38.7	46.0	86.1	200
294.9	Horizontal	37.8	46.0	77.6	200
393.2	Horizontal	39.1	46.0	90.2	200

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB

1GHz to 18GHz 5.1dB

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

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
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.

Results of WiFi mode: PASS

Please refer to the following table for result details

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
41.1	Vertical	35.4	40.0	58.9	100
49.2	Vertical	35.2	40.0	57.5	100
122.8	Horizontal	30.7	43.5	34.3	150
229.2	Horizontal	37.5	46.0	75.0	200
294.9	Horizontal	40.6	46.0	107.2	200
700.0	Vertical	41.1	46.0	113.5	200

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB

1GHz to 18GHz 5.1dB

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

Frequency Range [MHz]	Quasi-Peak Limits [µV/m]
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.

Results of Internet Radio mode: PASS
Please refer to the following table for result details

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
32.6	Vertical	33.2	40.0	45.7	100
41.7	Vertical	34.4	40.0	52.5	100
49.2	Vertical	37.0	40.0	70.8	100
227.3	Horizontal	36.5	46.0	66.8	200
245.8	Horizontal	34.9	46.0	55.6	200
294.9	Horizontal	36.2	46.0	64.6	200

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB
1GHz to 18GHz 5.1dB

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

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
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.

Results of iPod mode: PASS

Please refer to the following table for result details

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
49.8	Vertical	35.3	40.0	58.2	100
245.8	Horizontal	36.5	46.0	66.8	200
294.9	Horizontal	39.7	46.0	96.6	200
525.0	Vertical	40.9	46.0	110.9	200
700.0	Vertical	41.5	46.0	118.9	200
945.6	Vertical	41.2	46.0	114.8	200

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB

1GHz to 18GHz 5.1dB

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

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
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.

Results of Aux in mode: PASS

Please refer to the following table for result details

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
49.7	Vertical	35.7	40.0	61.0	100
246.2	Horizontal	36.3	46.0	65.3	200
294.8	Horizontal	39.9	46.0	98.9	200
393.2	Horizontal	38.8	46.0	87.1	200
525.0	Vertical	41.9	46.0	124.5	200
700.0	Vertical	42.0	46.0	125.9	200

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB

1GHz to 18GHz 5.1dB

3.1.3 Power Spectral Density

Test Requirement:	FCC 47CFR 15.247(e)
Test Method:	ANSI C63.4:2009
Test Date:	2011-08-25
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 and sweep time = span/3kHz. Measure the Power Spectral Density (PSD) and record the results in dBm.

For multiple antenna measurement, all the available transmitter output will be connected to the spectrum analyzer through a power combiner.

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.

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 (dBm)
2412.0	-8.37

Transmitter Frequency (MHz)	Maximum power spectral density (dBm)
2437.0	-6.98

Transmitter Frequency (MHz)	Maximum power spectral density (dBm)
2462.0	-7.02

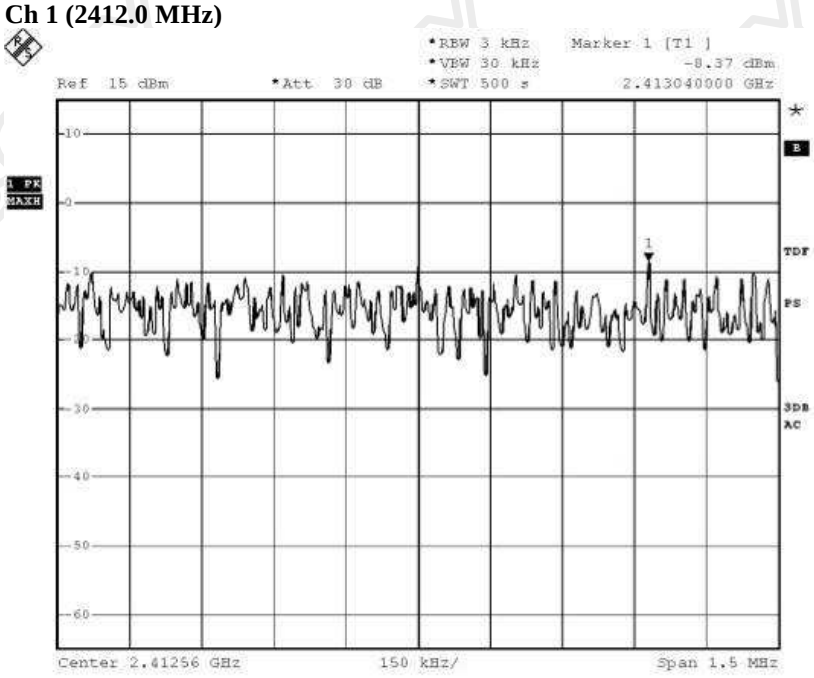
Results of WiFi Mode 802.11 g (Tx:2412MHz to 2462MHz) : Pass (TX Unit)
Maximum power spectral density

Transmitter Frequency (MHz)	Maximum power spectral density (dBm)
2412.0	-10.28

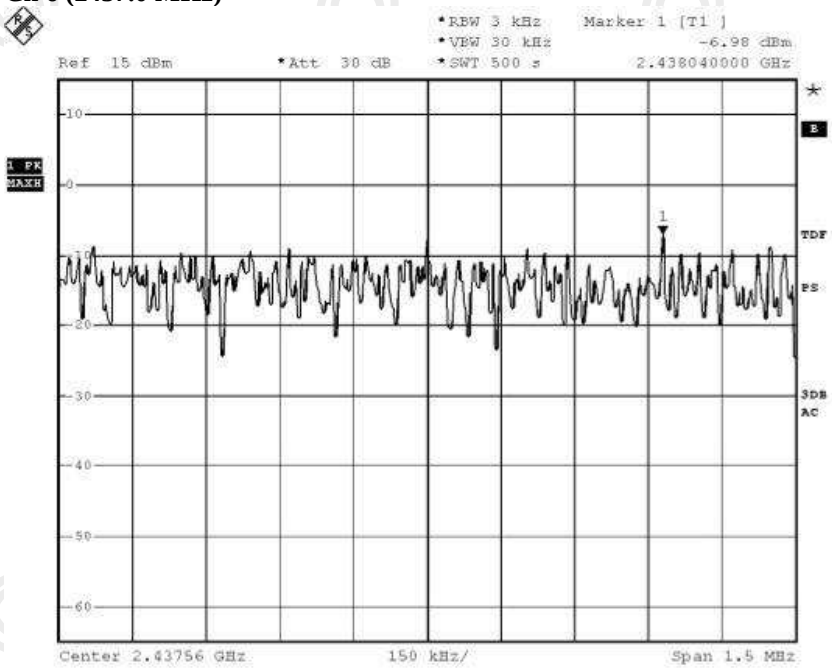
Transmitter Frequency (MHz)	Maximum power spectral density (dBm)
2437.0	-8.55

Transmitter Frequency (MHz)	Maximum power spectral density (dBm)
2462.0	-8.37

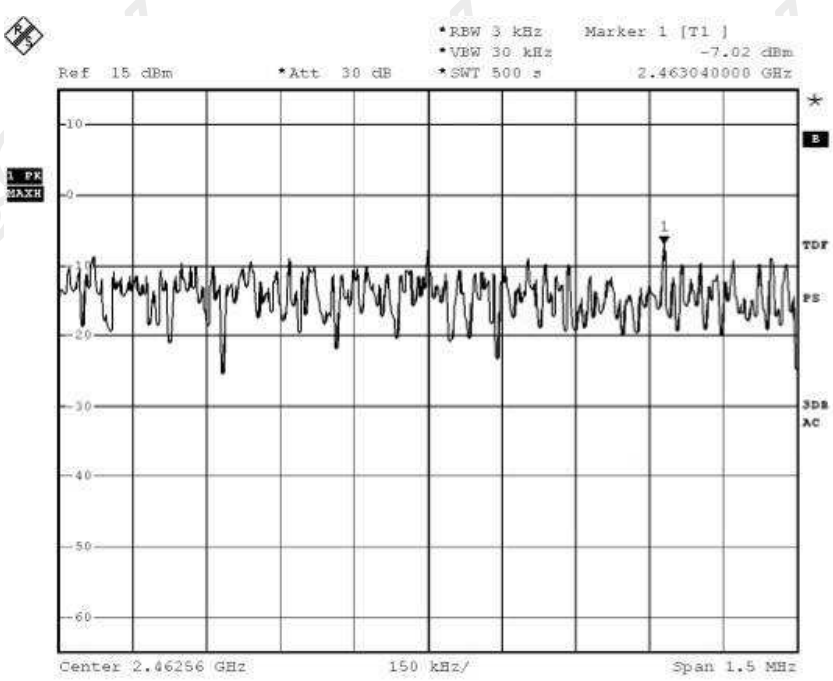
WiFi mode 802.11 b 11Mbit, (Tx:2412MHz to 2462MHz)
Ch 1 (2412.0 MHz)



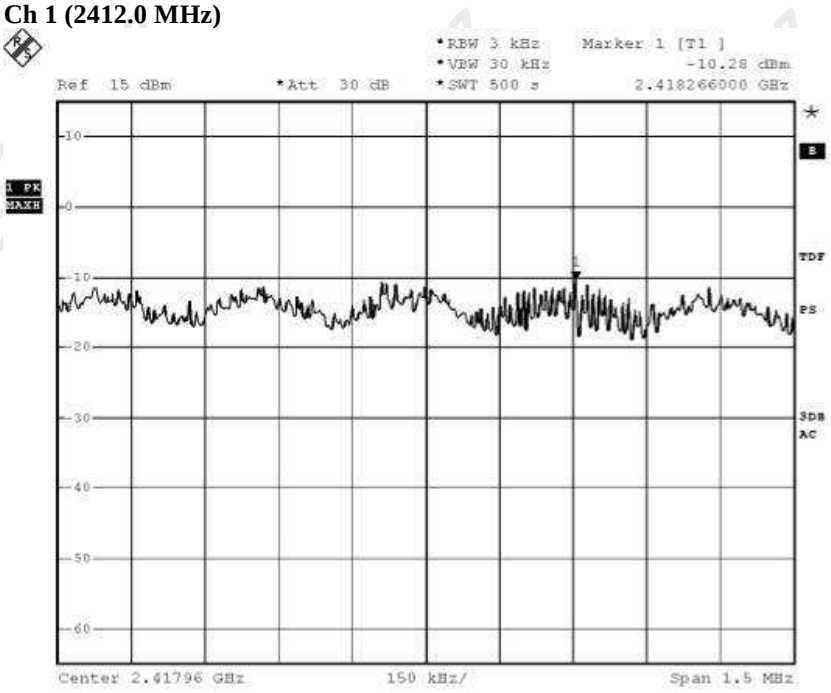
Ch 6 (2437.0 MHz)



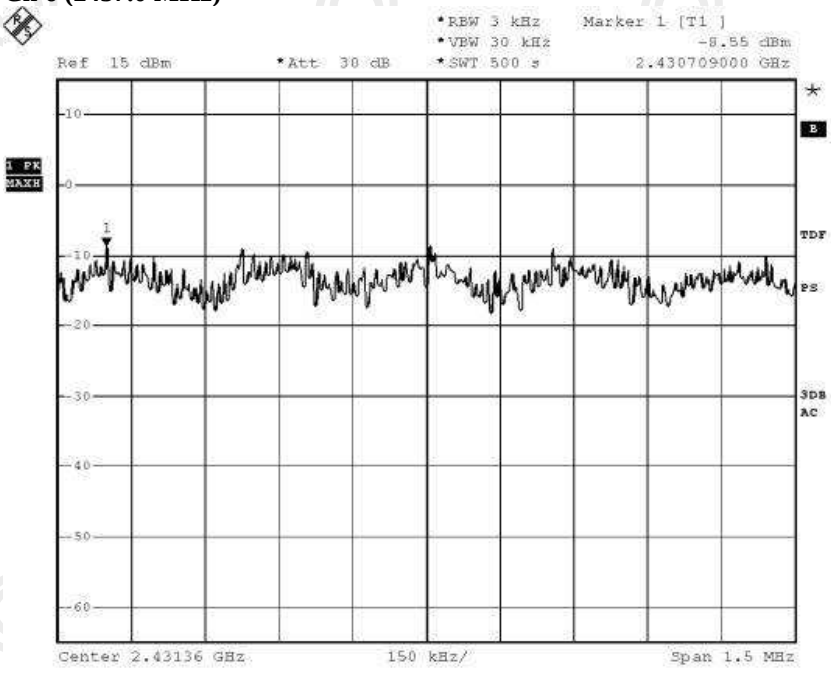
Ch 11 (2462.0 MHz)



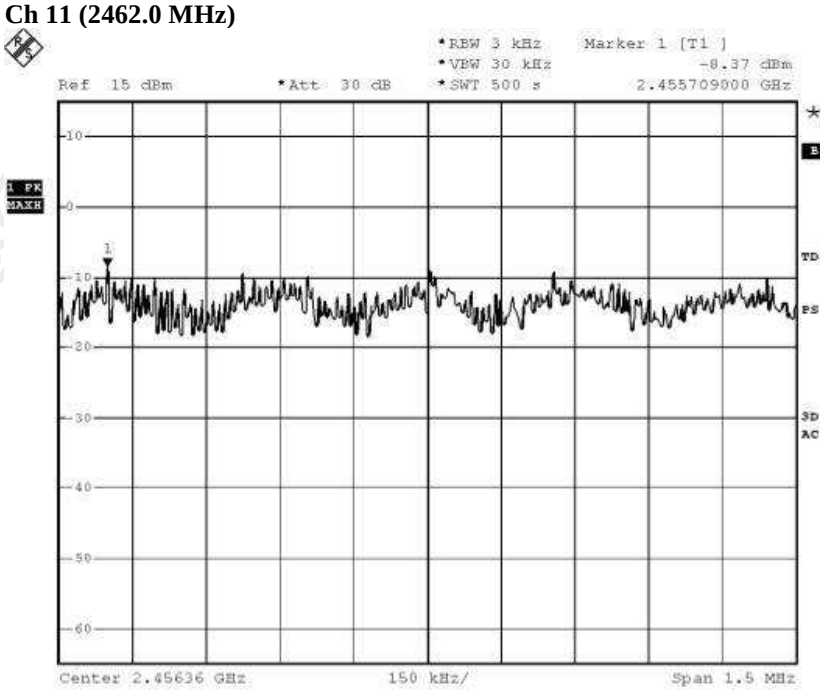
WiFi mode 802.11 g 54Mbit, (Tx:2412MHz to 2462MHz)
Ch 1 (2412.0 MHz)



Ch 6 (2437.0 MHz)



Ch 11 (2462.0 MHz)



3.1.4 6dB Spectrum Bandwidth Measurement

Test Requirement:	FCC 47CFR 15.247(a)(2)
Test Method:	ANSI C63.4:2009
Test Date:	2011-08-25
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.

For multiple antenna measurement, all the available transmitter output will be connected to the spectrum analyzer through a power combiner.

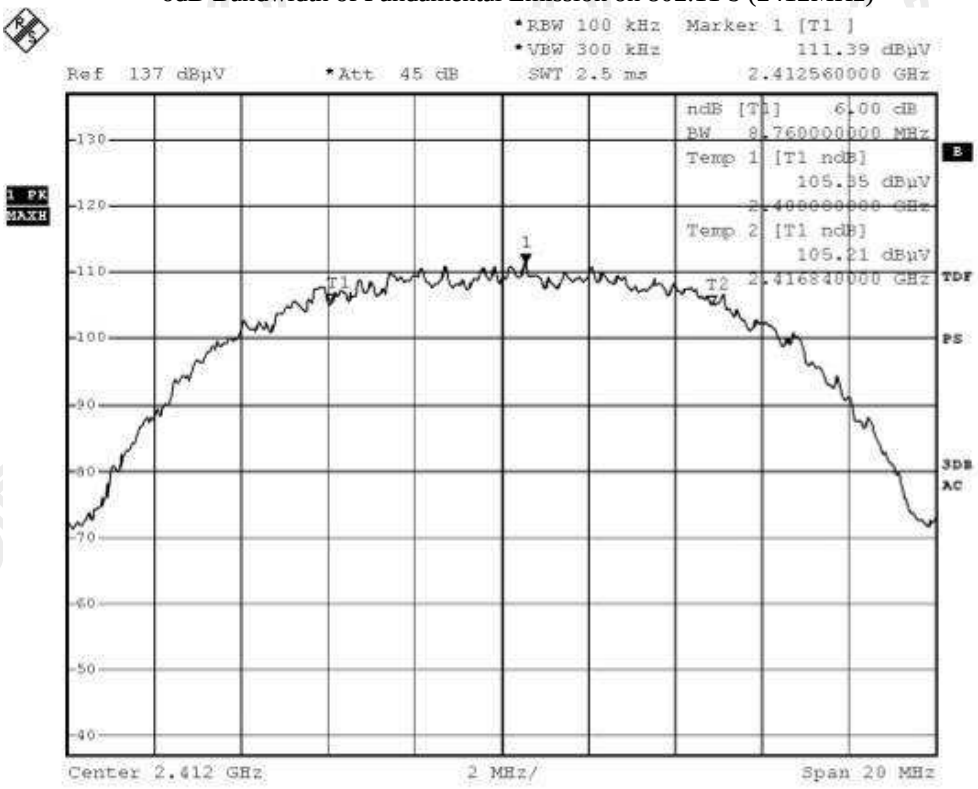
Test Setup:

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	8.76	> 500

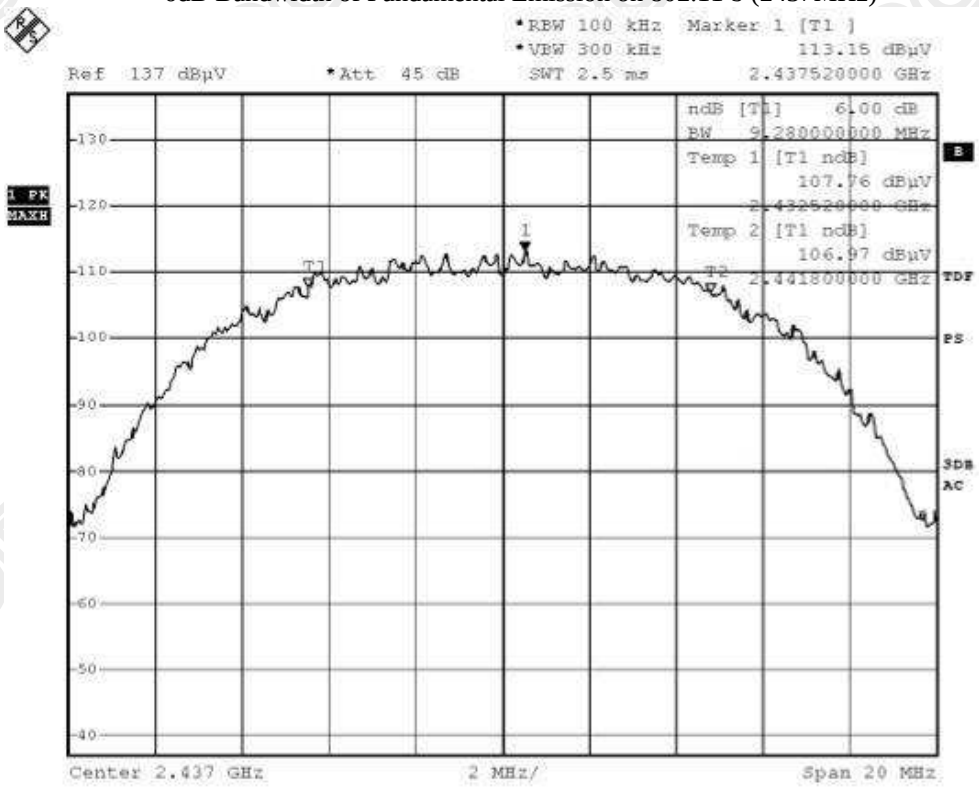
6dB Bandwidth of Fundamental Emission on 802.11 b (2412MHz)



Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2437.0	9.28	> 500

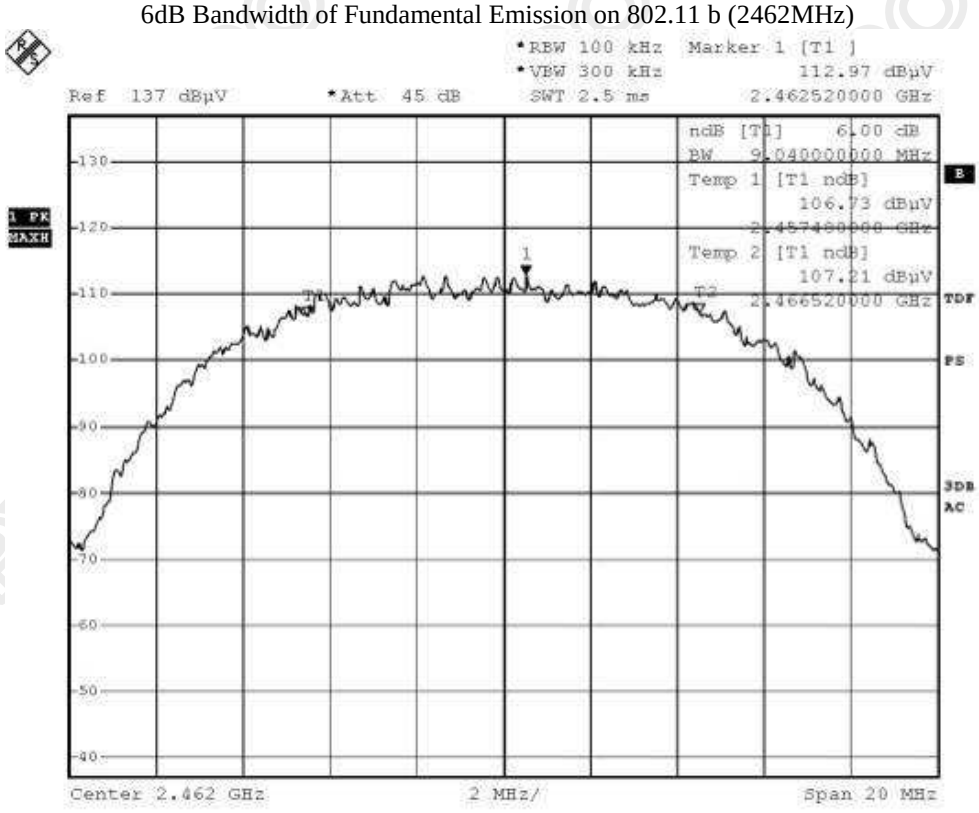
6dB Bandwidth of Fundamental Emission on 802.11 b (2437MHz)



Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2462.0	9.04	> 500

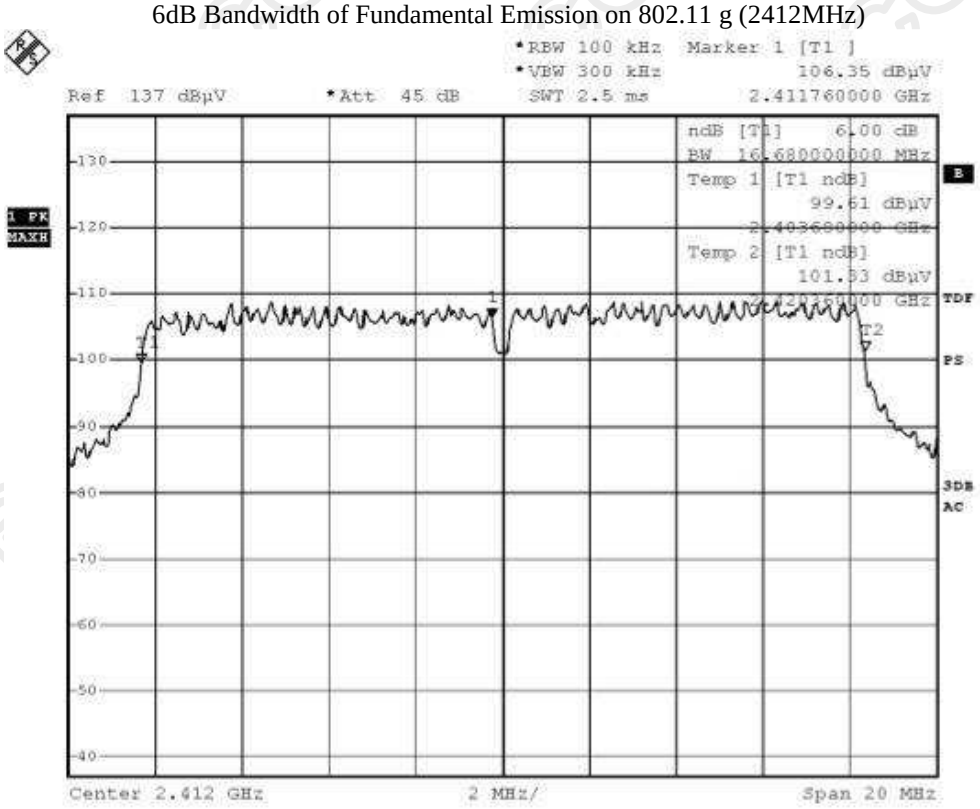
6dB Bandwidth of Fundamental Emission on 802.11 b (2462MHz)



Limits for 6dB Spectrum Bandwidth Measurement:

Center Frequency [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2412.0	16.68	> 500

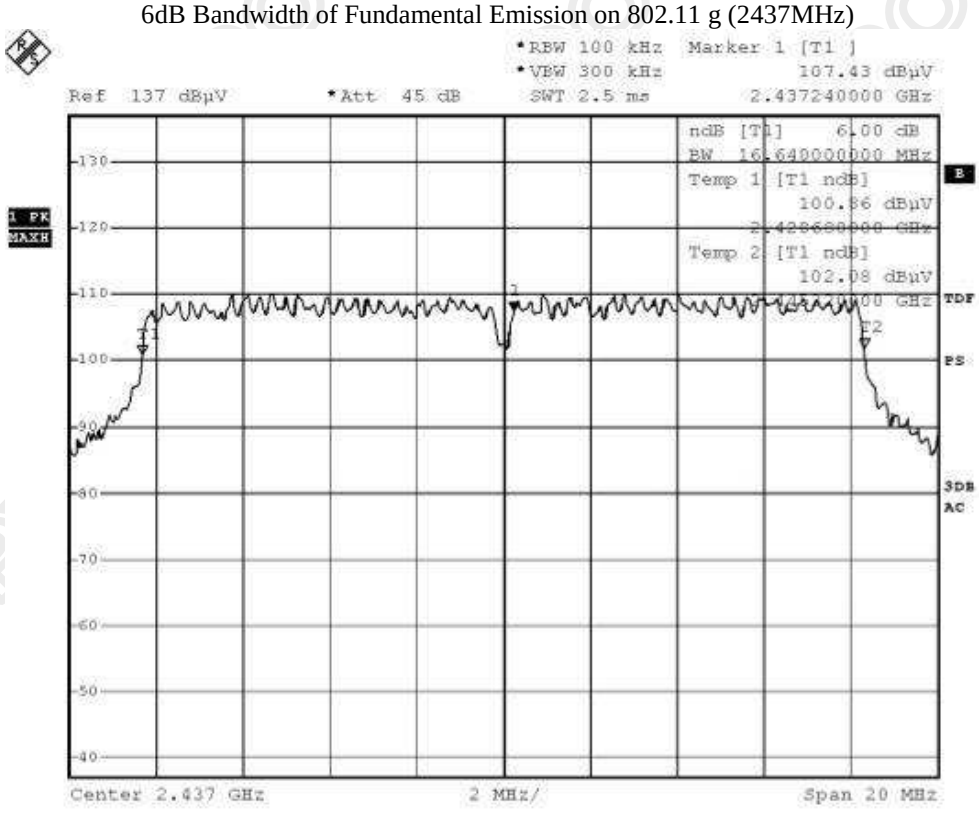
6dB Bandwidth of Fundamental Emission on 802.11 g (2412MHz)



Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2437.0	16.64	> 500

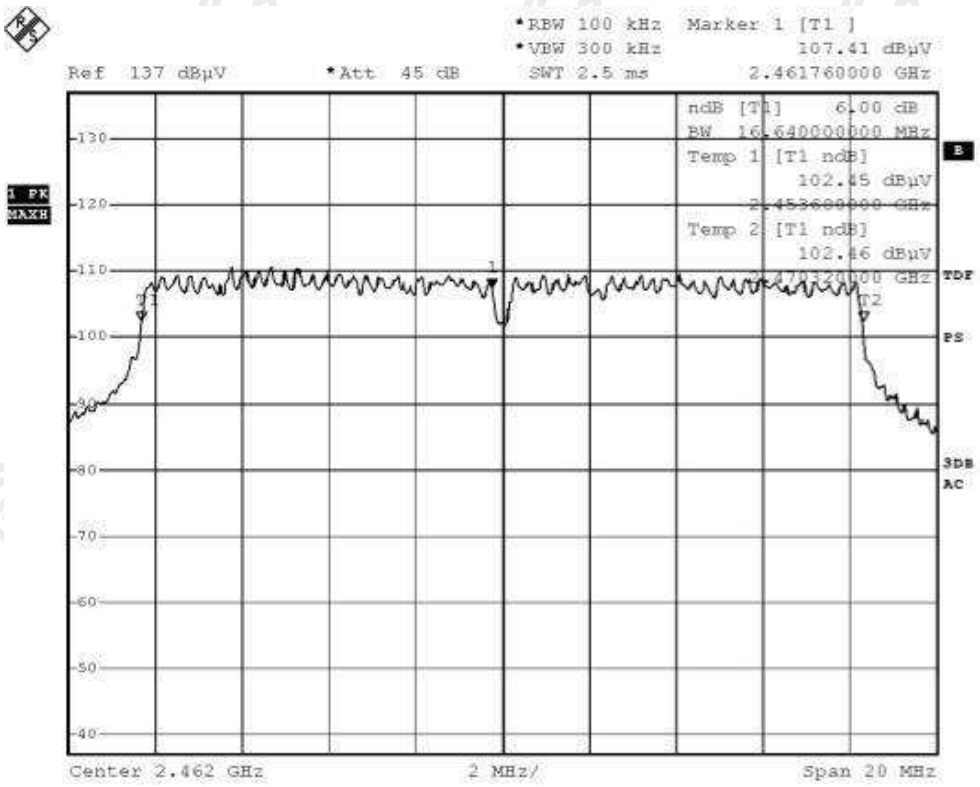
6dB Bandwidth of Fundamental Emission on 802.11 g (2437MHz)



Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2462.0	16.64	> 500

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



3.1.5 Band Edges Measurement

Test Requirement:	FCC 47CFR 15.247
Test Method:	ANSI C63.4:2009
Test Date:	2011-08-25
Mode of Operation:	WiFi mode

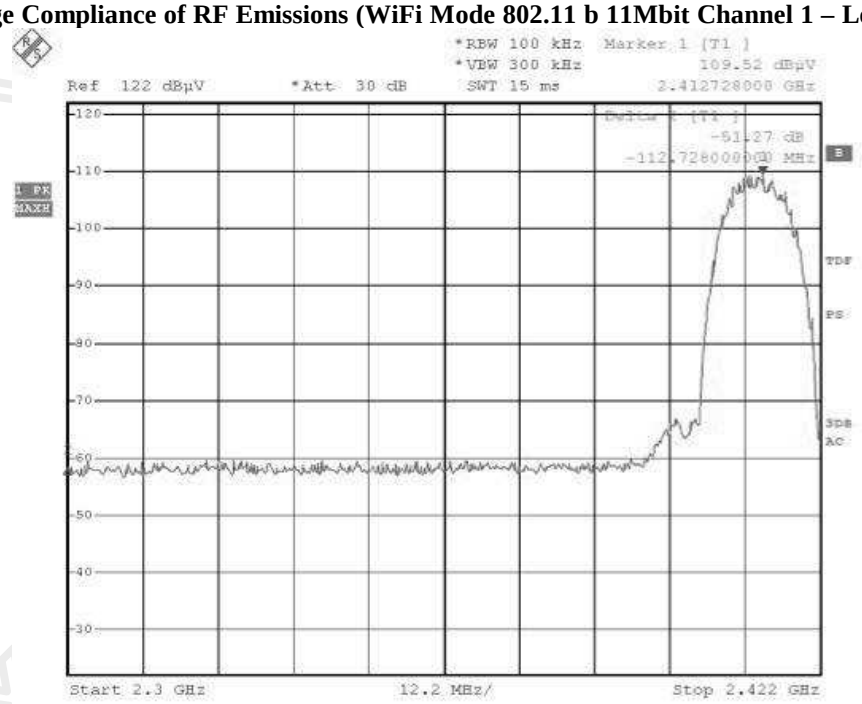
Test Method:

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.

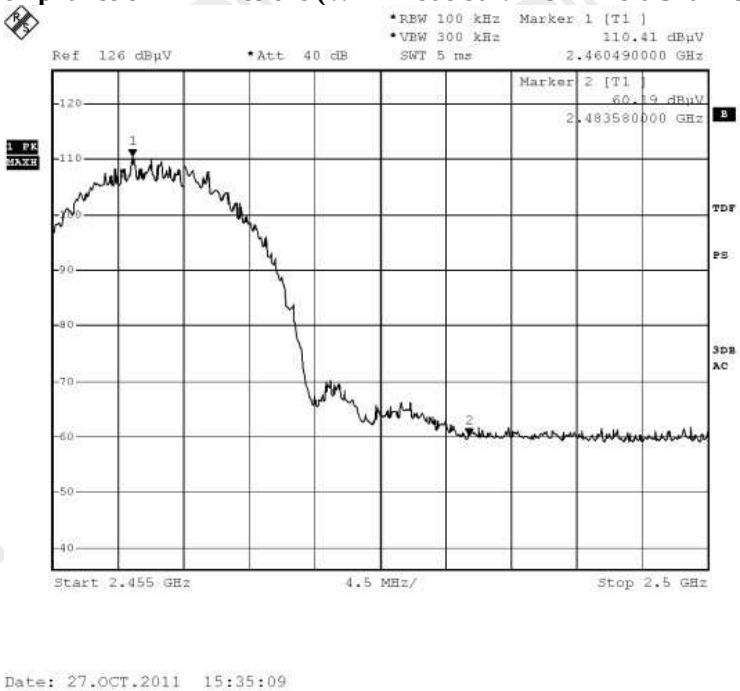
Test Setup:

As Test Setup of clause 3.1.2 in this test report.

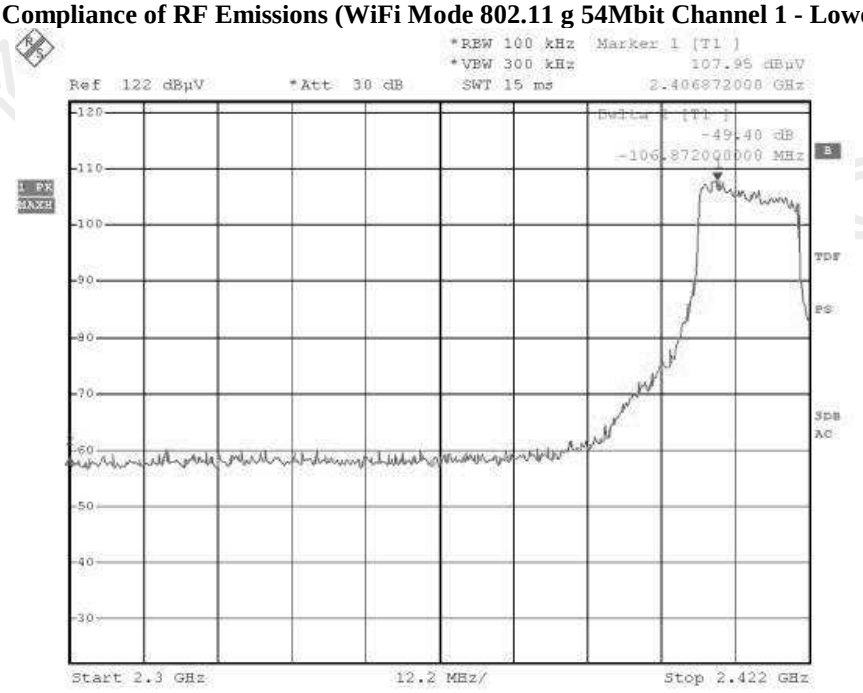
Band-edge Compliance of RF Emissions (WiFi Mode 802.11 b 11Mbit Channel 1 – Lowest Channel)



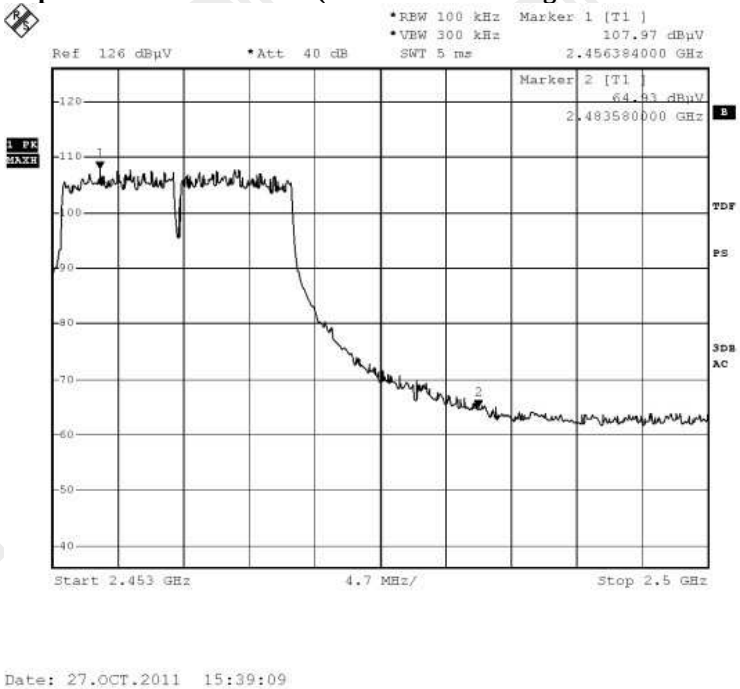
Band-edge Compliance of RF Emissions (WiFi Mode 802.11 b 11Mbit Channel 11 - Highest channel)



Band-edge Compliance of RF Emissions (WiFi Mode 802.11 g 54Mbit Channel 1 - Lowest channel)



Band-edge Compliance of RF Emissions (WiFi Mode 802.11 g 54Mbit Channel 11 - Highest channel)



Date: 27.OCT.2011 15:39:09

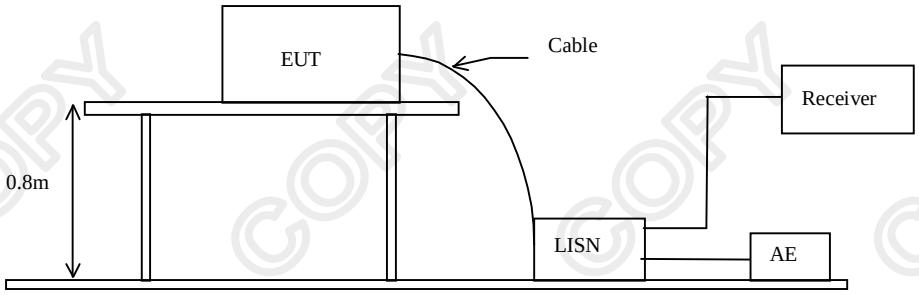
3.1.7 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207
Test Method:	ANSI C63.4:2009
Test Date:	2011-08-23
Mode of Operation:	FM mode / DAB mode / Aux in mode / WiFi mode / Internet Radio mode / iPod mode

Test Method:

The test was performed in accordance with ANSI C63.4:2009, 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):

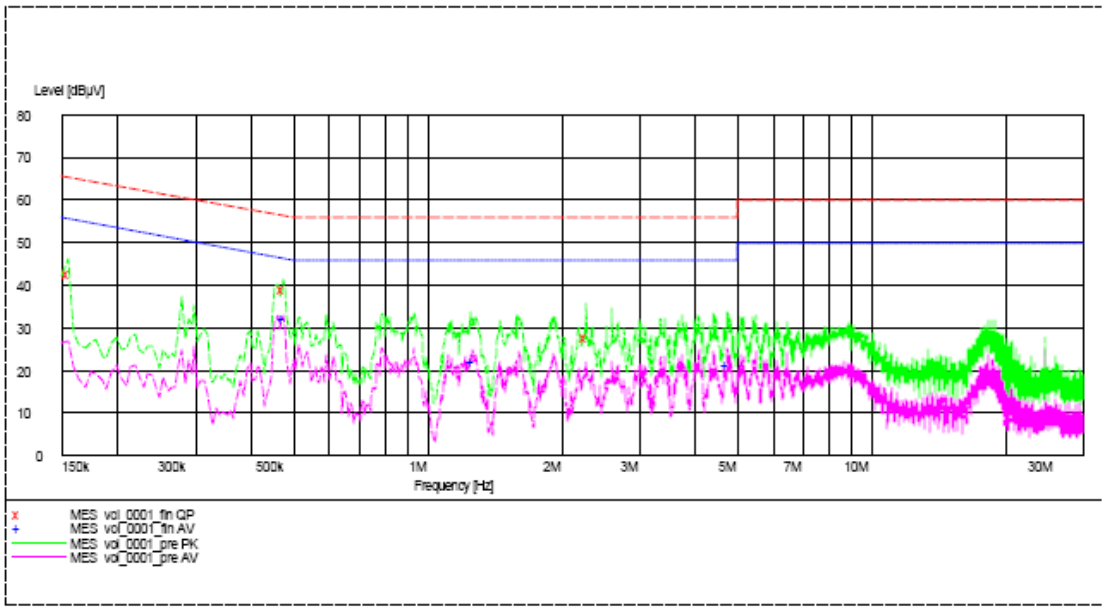
Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* 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.

Results of FM mode (L): PASS

Please refer to the following diagram for individual results.



Remark:
Calculated measurement uncertainty : 3.97dB

Limit for Conducted Emissions (FCC 47 CFR 15.207):

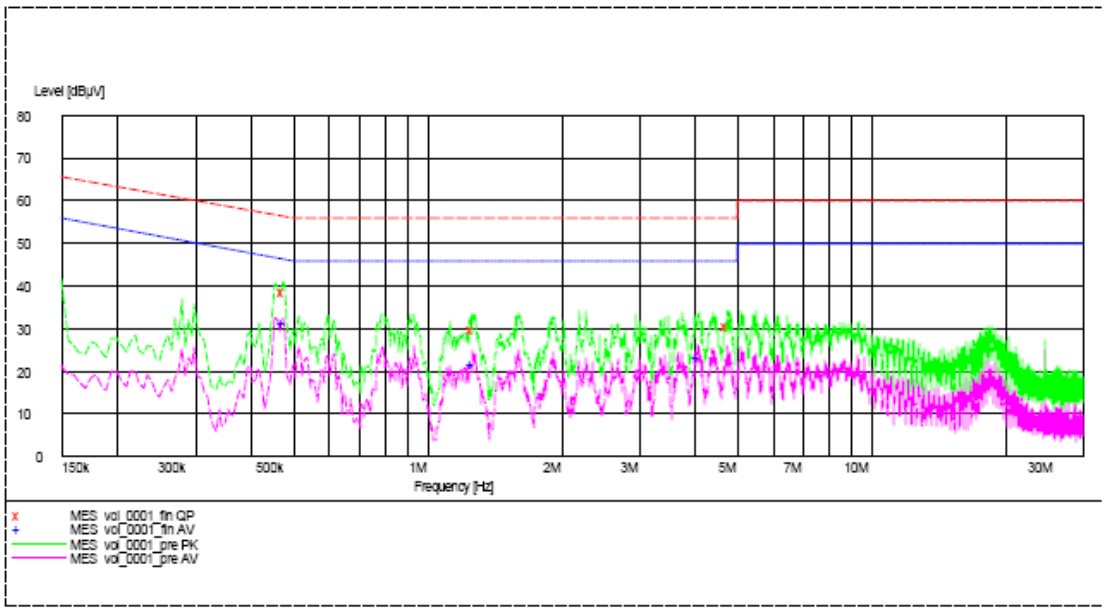
Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* 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.

Results of FM mode (N): PASS

Please refer to the following diagram for individual results.



Remarks

Calculated measurement uncertainty : 3.97dB

Limit for Conducted Emissions (FCC 47 CFR 15.207):

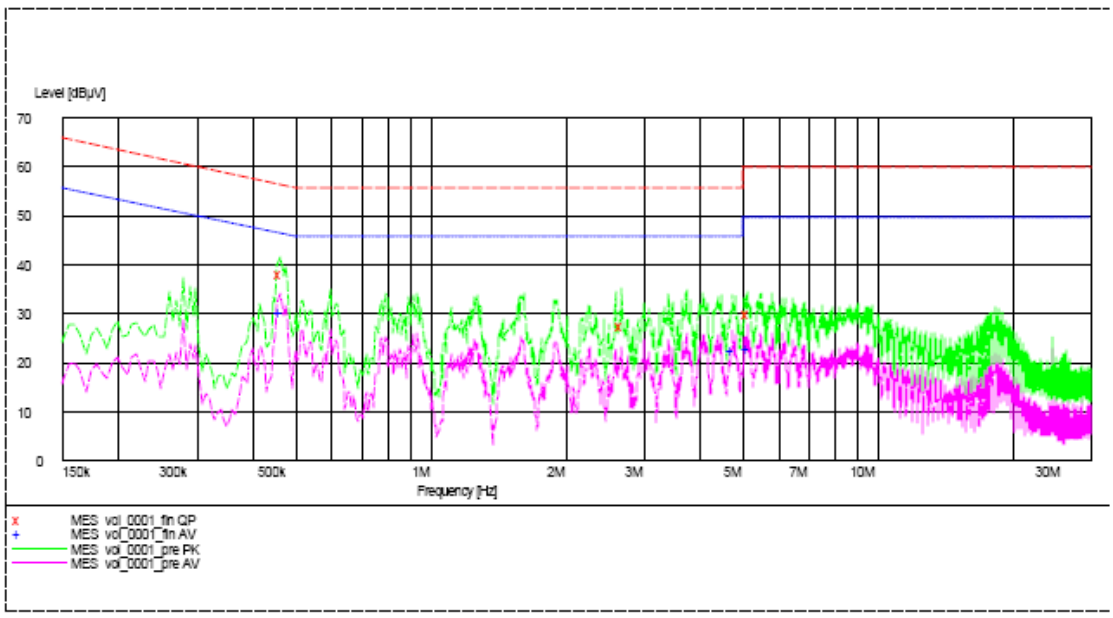
Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* 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.

Results of DAB mode (L): PASS

Please refer to the following diagram for individual results.



Remark:
Calculated measurement uncertainty : 3.97dB

Limit for Conducted Emissions (FCC 47 CFR 15.207):

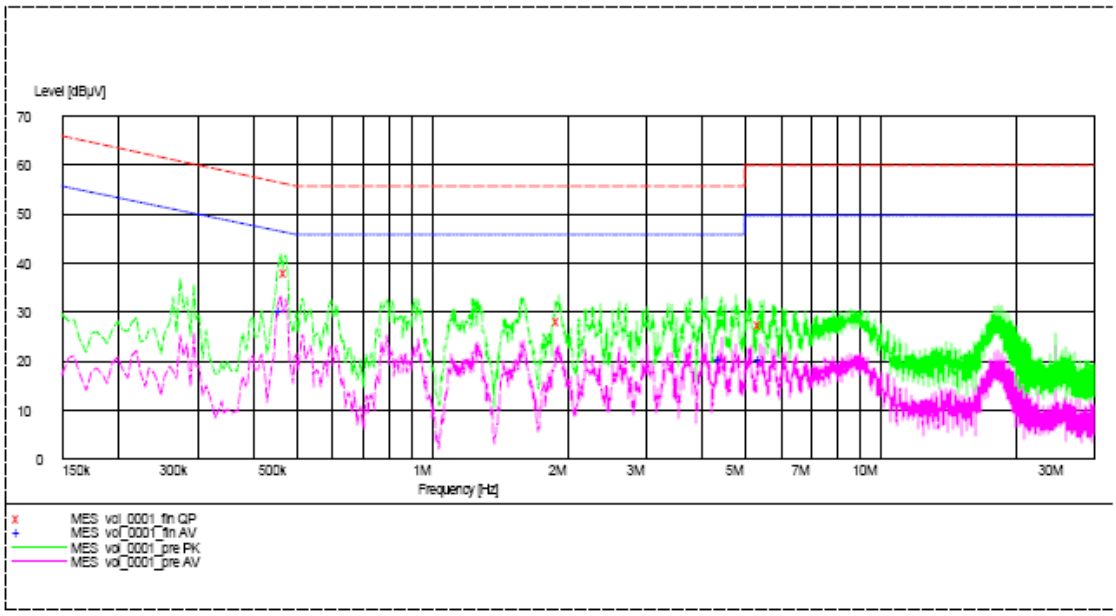
Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* 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.

Results of DAB mode (N): PASS

Please refer to the following diagram for individual results.



Remarks

Calculated measurement uncertainty : 3.97dB

Limit for Conducted Emissions (FCC 47 CFR 15.207):

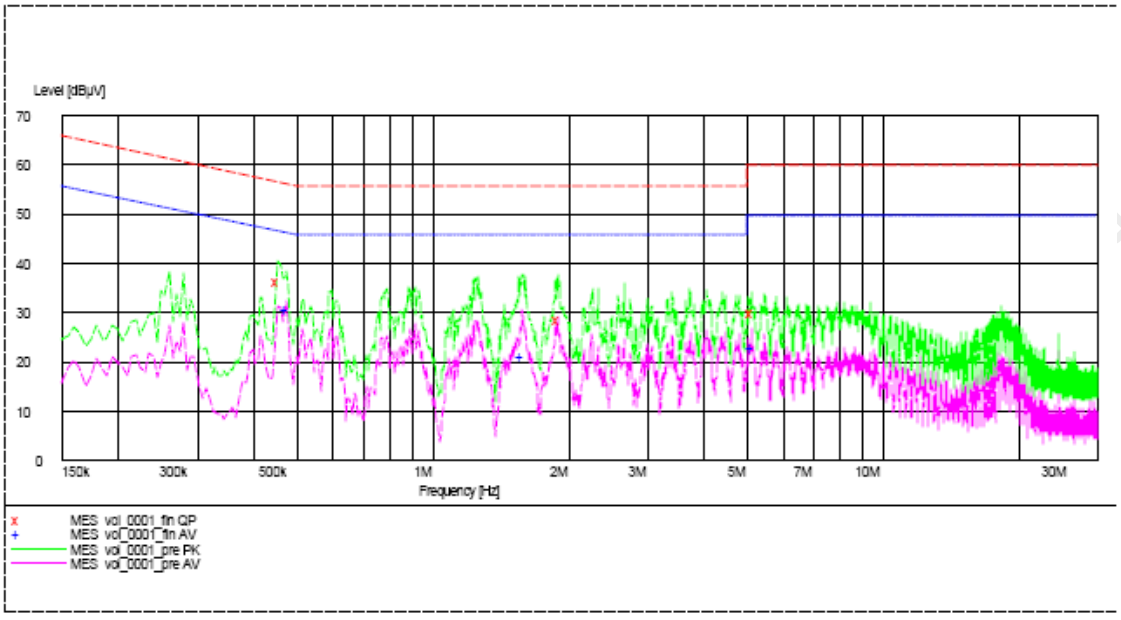
Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* 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.

Results of Aux in mode (L): PASS

Please refer to the following diagram for individual results.



Remark:
Calculated measurement uncertainty : 3.97dB

Limit for Conducted Emissions (FCC 47 CFR 15.207):

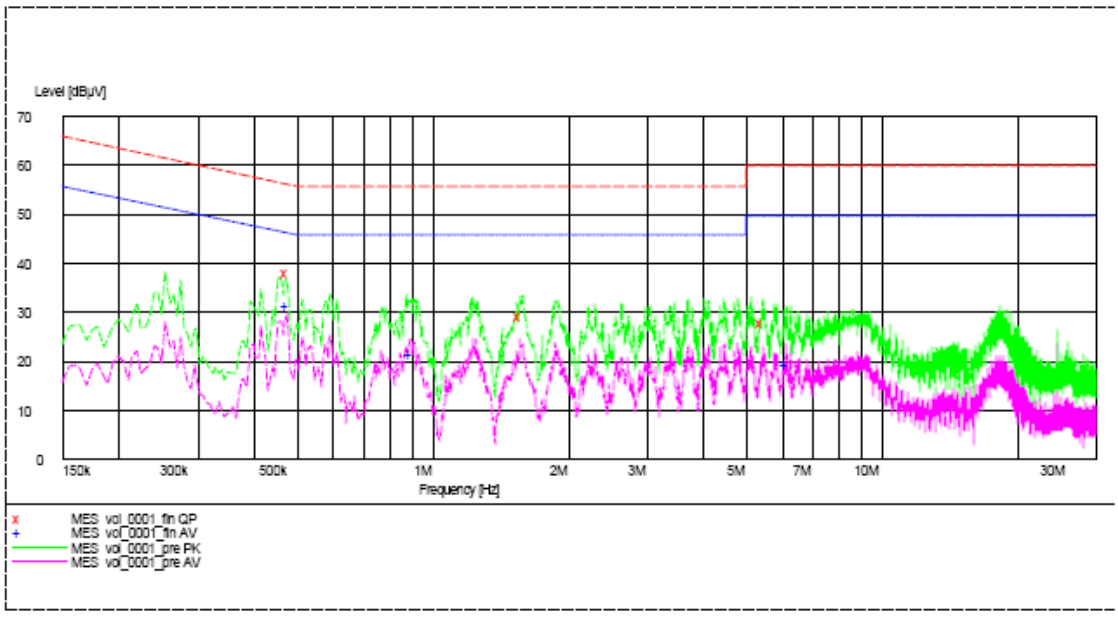
Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* 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.

Results of Aux in mode (N): PASS

Please refer to the following diagram for individual results.



Remarks

Calculated measurement uncertainty : 3.97dB

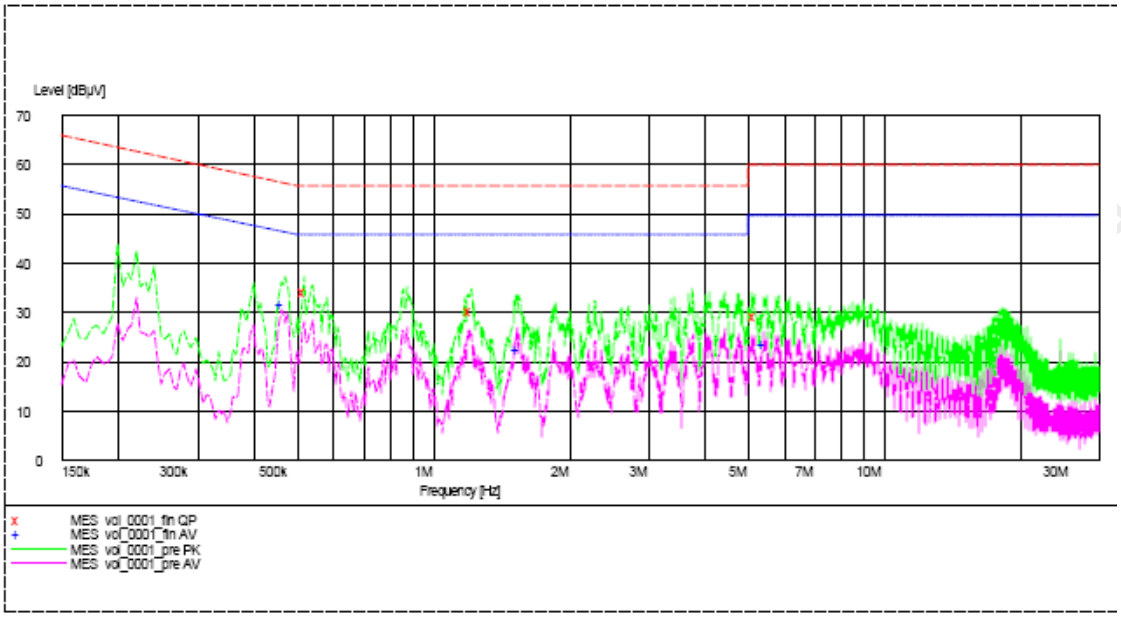
Limit for Conducted Emissions (FCC 47 CFR 15.207):

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.

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



Remark:
Calculated measurement uncertainty : 3.97dB

Limit for Conducted Emissions (FCC 47 CFR 15.207):

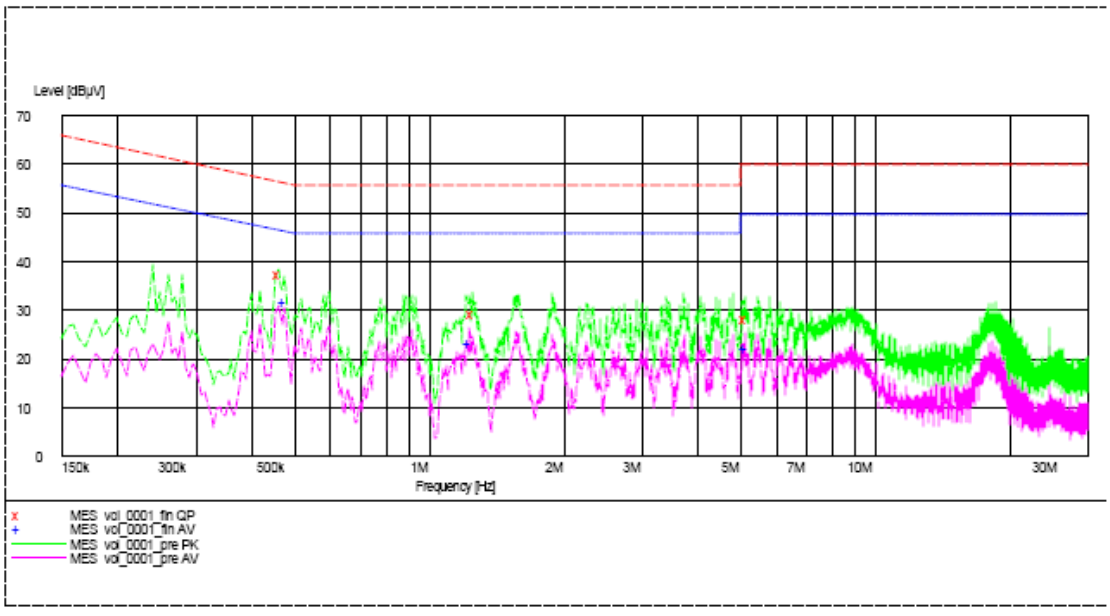
Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* 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.

Results of WiFi mode (N): PASS

Please refer to the following diagram for individual results.



Remarks

Calculated measurement uncertainty : 3.97dB

Limit for Conducted Emissions (FCC 47 CFR 15.207):

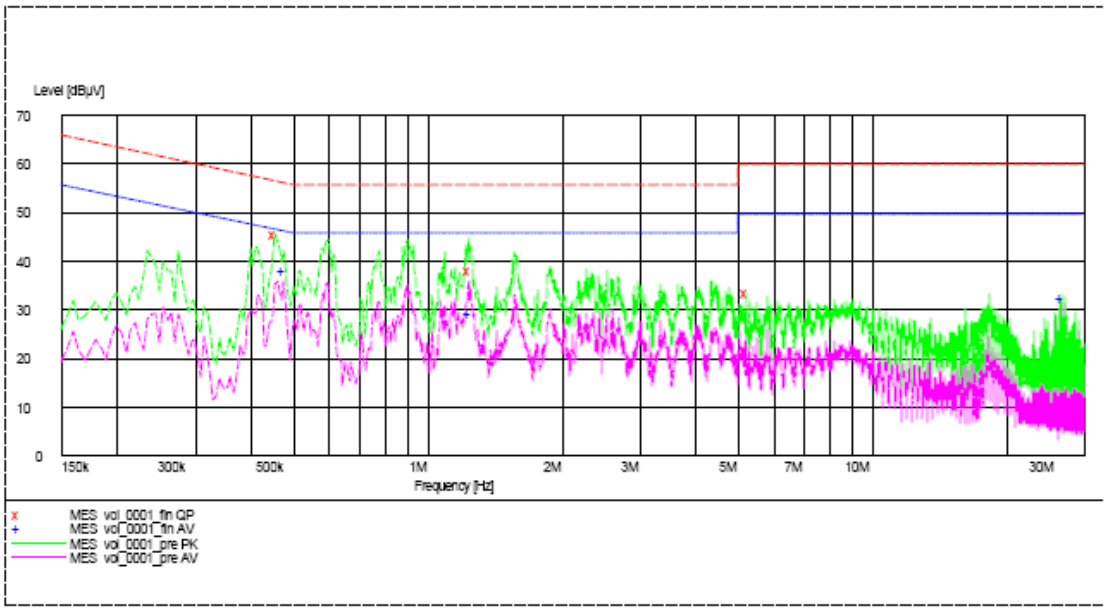
Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* 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.

Results of Internet Radio mode (L): PASS

Please refer to the following diagram for individual results.



Remark:
Calculated measurement uncertainty : 3.97dB

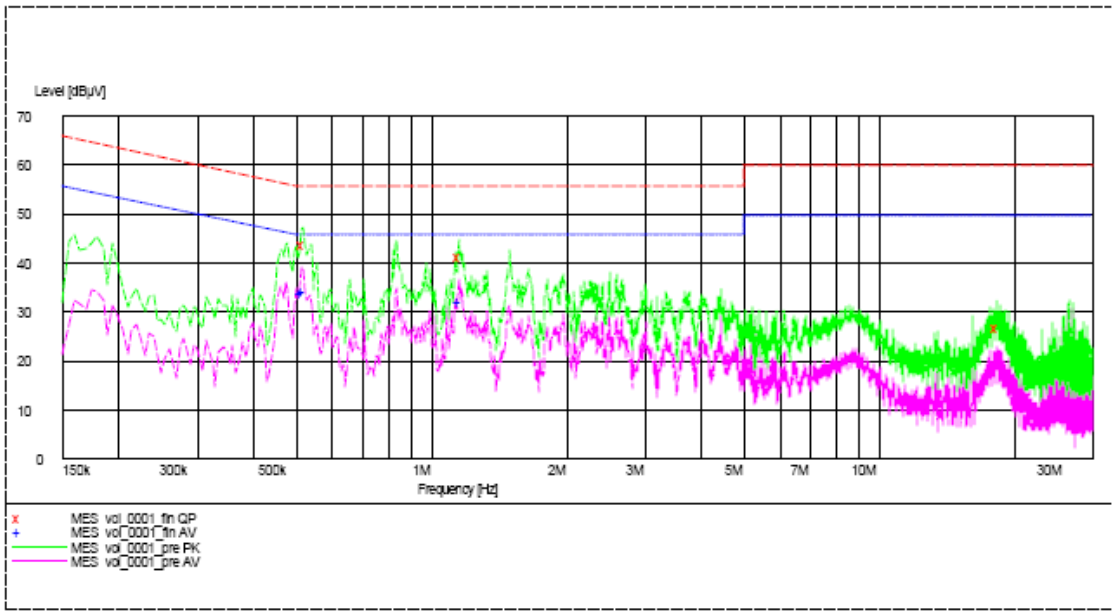
Limit for Conducted Emissions (FCC 47 CFR 15.207):

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.

Results of Internet Radio mode (N): PASS
Please refer to the following diagram for individual results.



Remarks
Calculated measurement uncertainty : 3.97dB

Limit for Conducted Emissions (FCC 47 CFR 15.207):

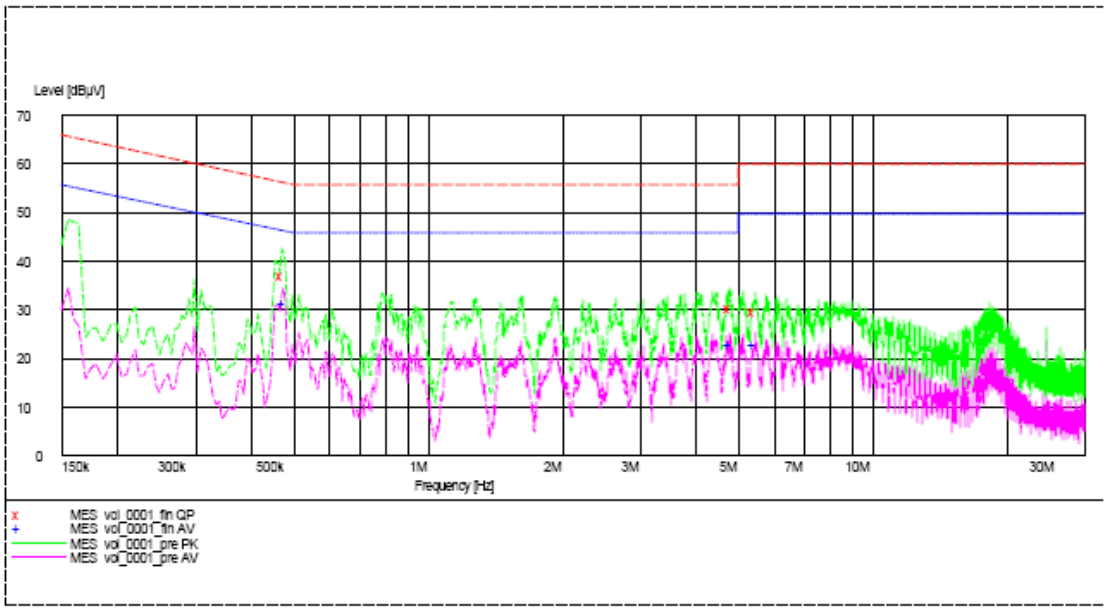
Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* 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.

Results of iPod mode (L): PASS

Please refer to the following diagram for individual results.



Remark:

Calculated measurement uncertainty : 3.97dB

Limit for Conducted Emissions (FCC 47 CFR 15.207):

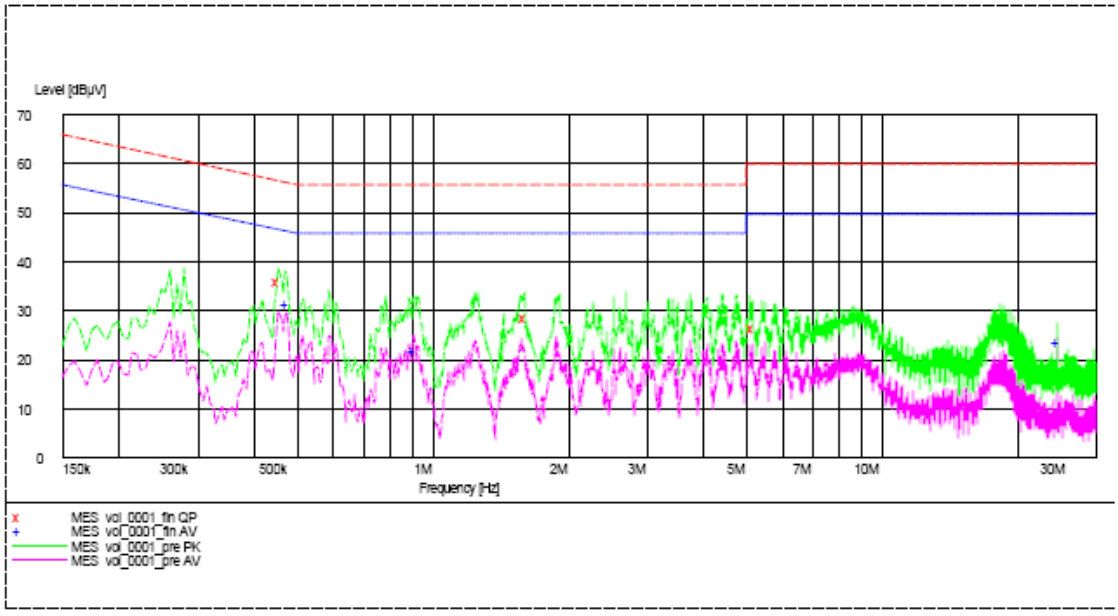
Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* 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.

Results of iPod mode (N): PASS

Please refer to the following diagram for individual results.



Remarks

Calculated measurement uncertainty : 3.97dB

RF Exposure

Test Requirement:	FCC 47CFR 15.247(i)
Test Date:	2011-08-26
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 =8.38 mW

Pd = PG/ 4pi*R^2 = (8.38 x 1.585)/12.566* $(20)^2$
= (13.2823)/12.566x 400= 13.2823 /5026.4
= 0.00264mW/cm^2

where:
*Pd = power density in mW/cm2
* G = Antenna numeric gain (1.585); Log G = g/10 (g = 2.0dBi).
* P = Conducted RF power to antenna (8.38 mW).
* R = Minimum allowable distance.(20 cm)

*The power density Pd = 0.014 mW/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.

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 layout internal antenna. There is no external antenna, the antenna gain = 2.0dBi. All component install on inside of EUT. User unable to remove or changed the Antenna.

Frequency List for 802.11 b/g
For both 20MHz bandwidth systems, use Channel 1-Channel 11.

Item	Frequency（MHz）	Item	Frequency（MHz）
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437	—	—

Appendix A

List of Measurement Equipment

Conducted RF Power

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM229	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB40	100248	2011/04/26	2012/04/26
N/A	2 WAY RESISTIVE POWER COMBINER	JFW	50PD-379	0941	2010/07/15	2011/07/15

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM020	HORN ANTENNA	EMCO	3115	4032	2009/09/02	2011/09/02
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-Linggren	FACT-3	--	2010/10/25	2011/10/25
EM174	BICONILOG ANTENNA	EMCO	3142B	1671	2010/02/09	2012/02/09
EM229	EMI Test Receiver	R&S	ESIB40	100248	2011/04/26	2012/04/26
EM022	LOOP ANTENNA	EMCO	6502	1189-2424	2009/09/07	2011/09/07

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM197	LISN	EMCO	4825/2	1193	2010/10/13	2011/10/13
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2011/04/26	2012/04/26
EM154	SHIELDING ROOM	SIEMENS MATSUSHITA COMPONENTS	N/A	803-740-057-99A	2011/01/23	2012/01/23

Remarks:-

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

Appendix B

Ancillary Equipment

ITEM NO.	DESCRIPTION	MODEL NO.	FCC ID	REMARK
1	iPod Player	A1236	N/A	N/A

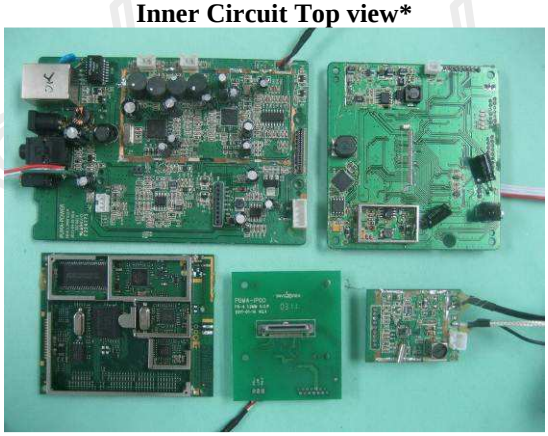
Appendix C

Photographs of EUT

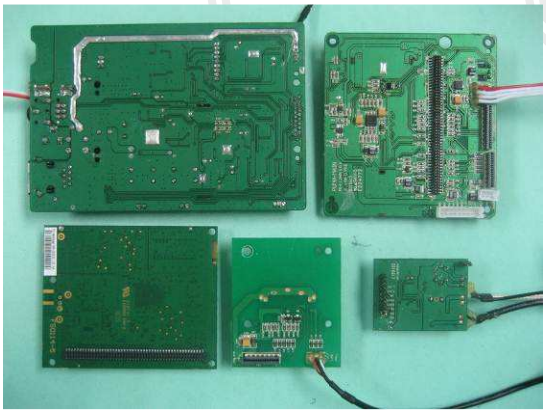
Front View of the product

Rear View of the product

Inner Circuit Top view*



Inner Circuit Bottom view*



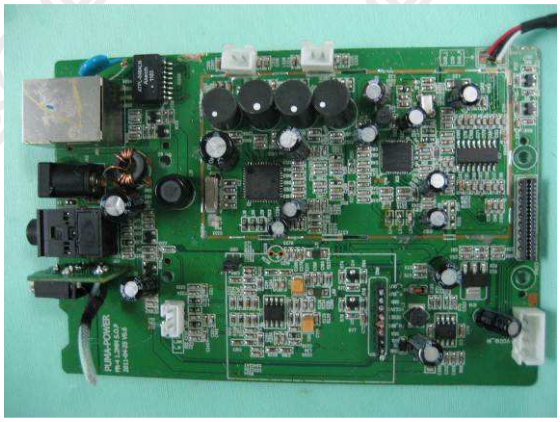
*Name of the PCBs, from left to right:

First row: 1. PUMA-POWER, 2. PUMA-MAIN

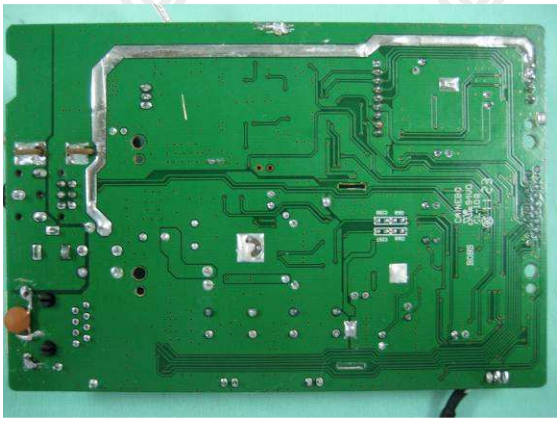
Second row: 3. V8 Module, 4. PUMA-iPOD, 5. Tuner Part

Photographs of EUT

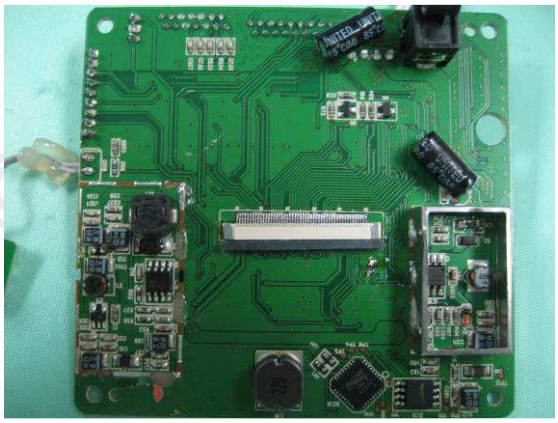
Front View of the PCB - PUMA-POWER



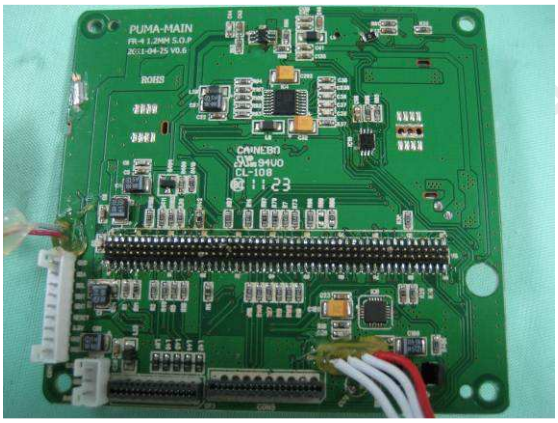
Rear View of the PCB - PUMA-POWER



Front View of the PCB - PUMA-MAIN



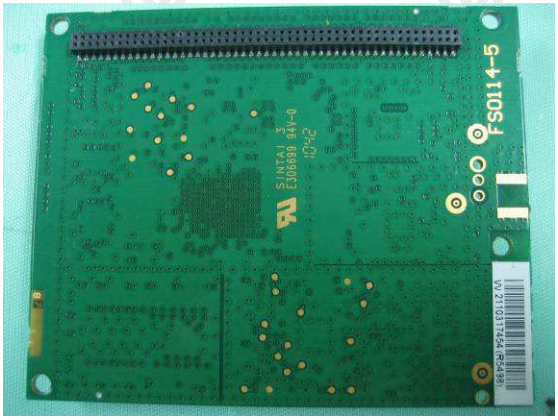
Rear View of the PCB - PUMA-MAIN



Photographs of EUT

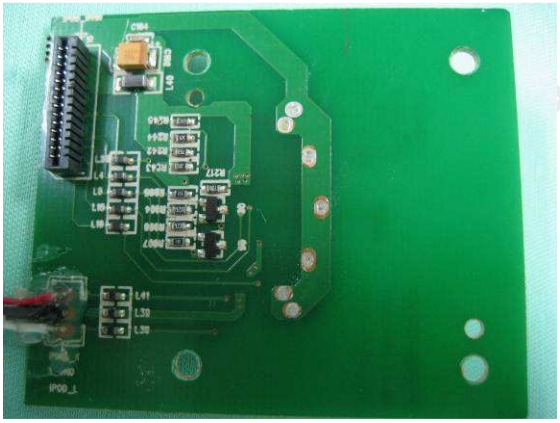
Front View of the PCB – V8 module

Rear View of the PCB - V8 module



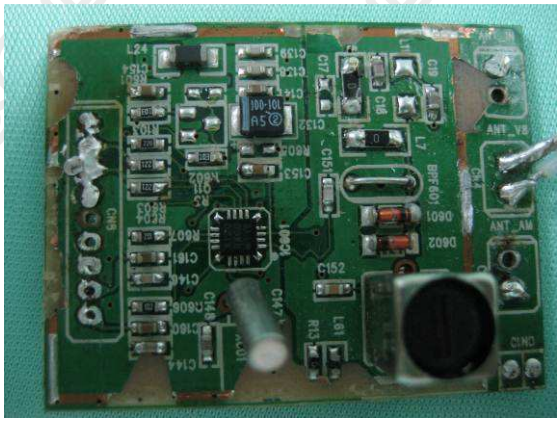
Front View of the PCB - PUMA-IPOD

Rear View of the PCB - PUMA-IPOD

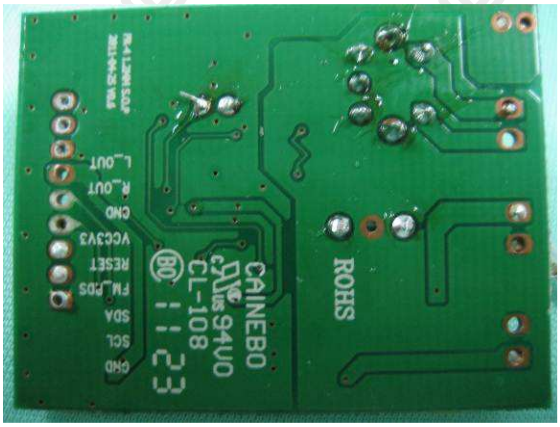


Photographs of EUT

Front View of the PCB – Tuner Part

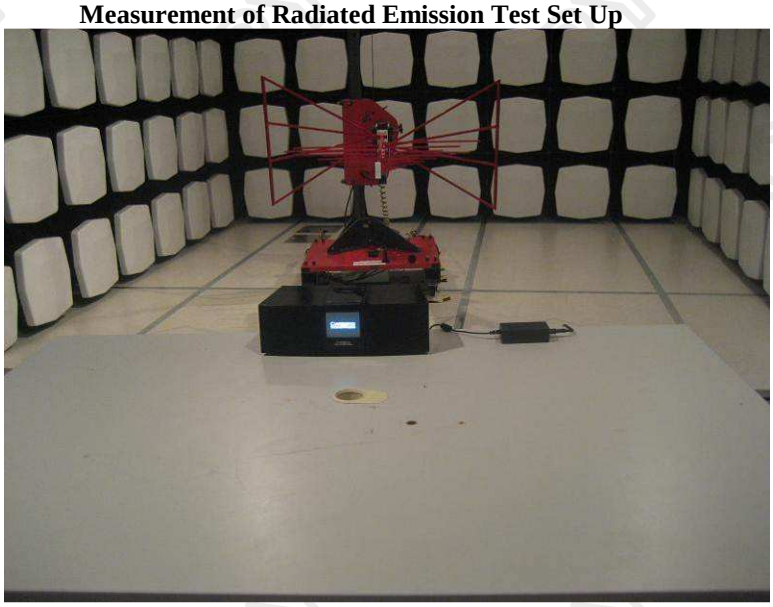


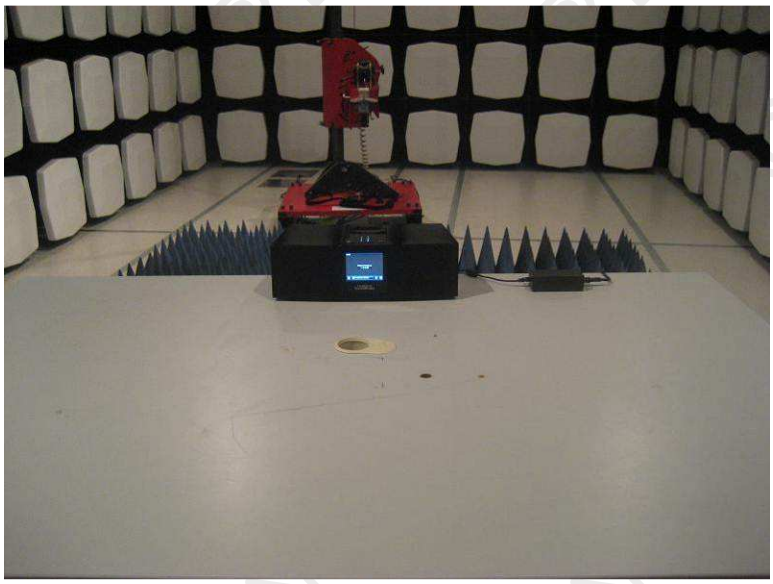
Rear View of the PCB - Tuner Part



Photographs of EUT

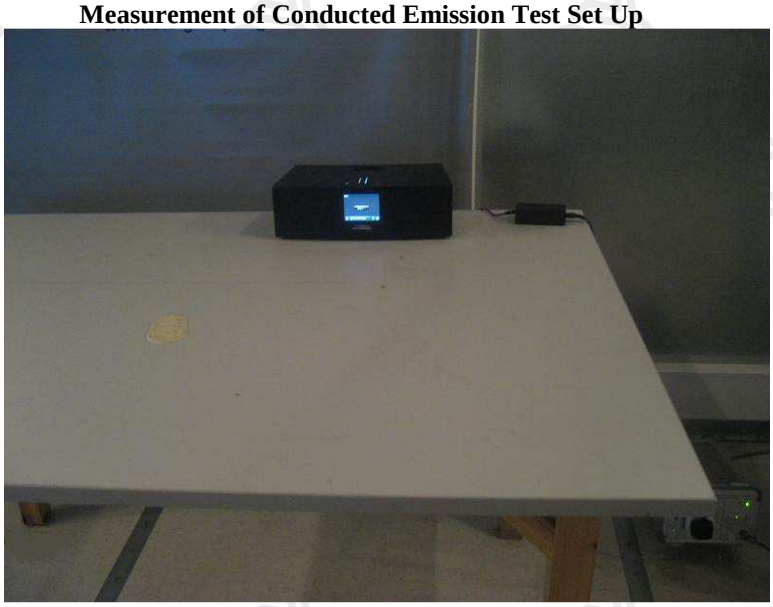
Measurement of Radiated Emission Test Set Up





Photographs of EUT

Measurement of Conducted Emission Test Set Up



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