Test Report

Date : 2022-02-23
No. : HMD22010012

Applicant	:	Icarsoft Technology Inc. 1629 K St. Suite 300 N.W. Washington D.C., 20006 United States
Supplier / Manufacturer	:	Shenzhen Bonor Technologies Co. Ltd 6th floor of Silver Star Technology Building, No. 1301, Guanguang Road, Guanlan Street, Longhua new District, Shenzhen
Description of Sample(s)	:	Submitted sample(s) said to be Product: Car Diagnostic Tool Brand Name: iCarsoft Model No.: CR Genius FCC ID: 2AWD8-CRGENIUS
Date Samples Received	:	2022-01-26
Date Tested	:	2022-02-10 to 2022-02-17
Investigation Requested	:	Perform Electro Magnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 and ANSI C63.10:2013 for FCC Certification.
Conclusions	:	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.
Remarks	:	WIFI (802.11b/g/n20/n40) For additional model(s) details, please see page 3.

Dr.CHAN Kwok Hung, Brian
Authorized Signatory

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
Telephone: 852 2666 1888
Fax: 852 2664 4353

1.2 Equipment Under Test [EUT]

Description of Sample(s)

Product:	Car Diagnostic Tool
Manufacturer:	Shenzhen Bonor Technologies Co. Ltd 6th floor of Silver Star Technology Building, No. 1301, Guanguang Road, Guanlan Street, Longhua new District, Shenzhen
Brand Name:	iCarsoft
Model Number:	CR Genius
Additional model numbers:	CR V3.0
Rating:	5Vd.c. by adaptor / 3.7Vd.c. (Li-ion battery)

The AC/DC adaptor was provided by the applicant with following details:
Brand name: N/A, Model no.: BI12T-050200-BdVu / BI12T-050200-BdBu, Input: 100-240Va.c. 50/60Hz 0.5A, Output: 5Vd.c. 2A
Remark: AC mains mode and battery mode have been investigated and the worst-case test results are recorded in this report.

1.2.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Car Diagnostic Tool r. The transmission signal is digital modulated with channel frequency range 2412-2462MHz.

1.3 Antenna Details

Antenna Type:	monopole antenna
Antenna Gain:	2.15dBi

1.4 Date of Order

2022-01-26

1.5 Submitted Sample(s):

1 Sample

1.6 Test Duration

2022-02-10 to 2022-02-17

1.7 Country of Origin

China

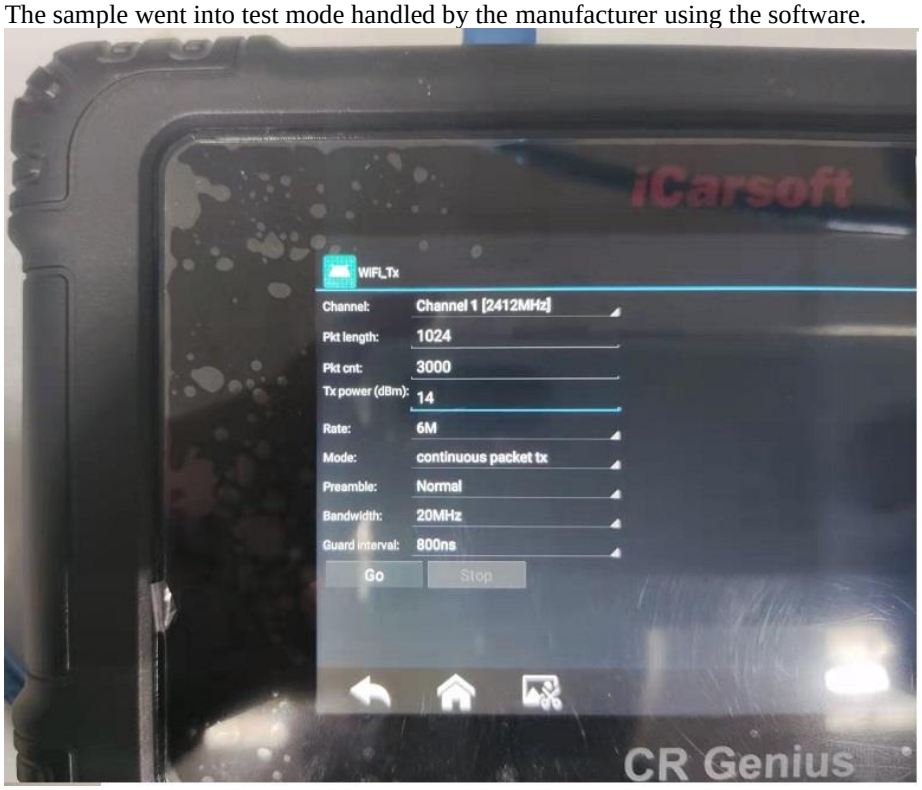
2.0 Technical Details

2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 Regulations and ANSI C63.10:2013 for FCC Certification.
According FCC KDB 558074 DTS Measurement Guidance, Duty cycle ≧98%.
The test mode sample is provided by manufacturer.

2.1.0 Operating conditions for the EUT

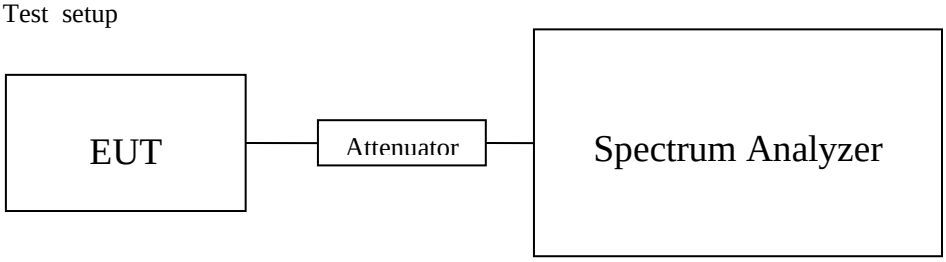
The sample went into test mode handled by the manufacturer using the software.



2.1.1 EUT Duty cycle

The EUT shall be configured or modified to transmit continuously. The intent is to test at 100% duty cycle; however, a small reduction in duty cycle (to no lower than 98%) is permitted if required by the EUT for amplitude control purposes.
The test mode sample is provided by manufacturer.

Test setup

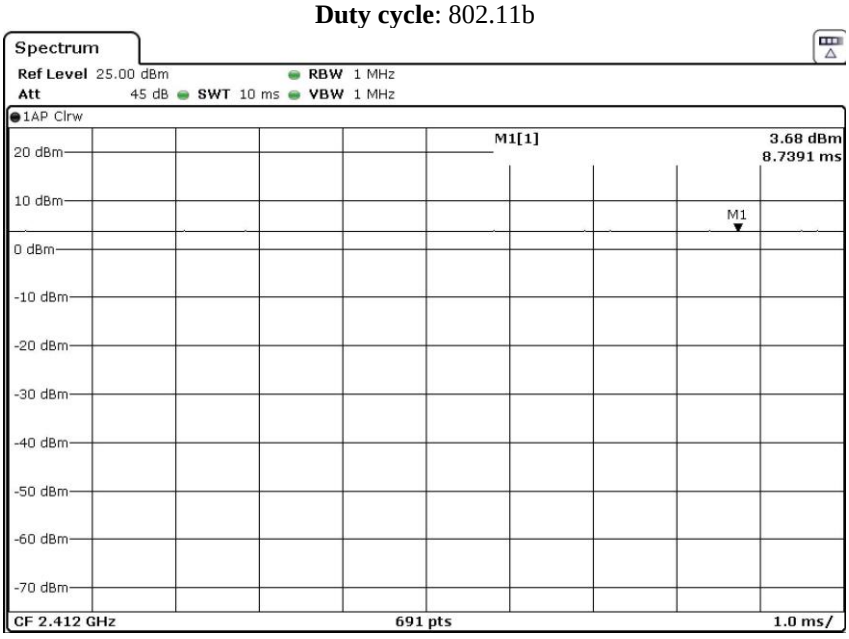


Results

Mode	On Time (msec)	Period (msec)	Duty Cycle X (Linear)	Duty Cycle (%)*
802.11b	1	1	1	100
802.11g	1	1	1	100
802.11n20	1	1	1	100
802.11n40	1	1	1	100

-*: If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

Duty cycle: 802.11b



2.2 Test Standards and Results Summary Tables

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	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	☒	☐	☐

Note: N/A - Not Applicable

3.0 Test Results

3.1 Emission

3.1.1 Maximum Peak Output Power

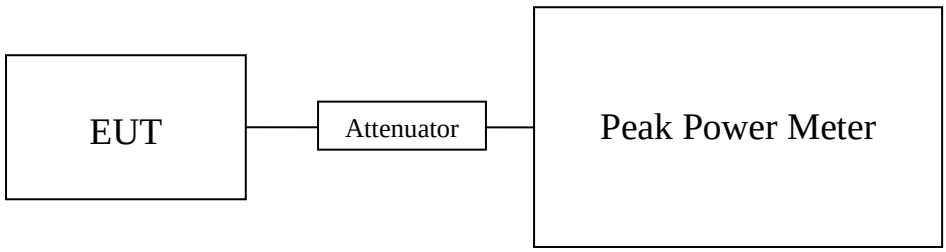
Test Requirement:	FCC 47CFR 15.247(b)(3)
Test Method:	ANSI C63.10: 2013
Test Date:	2022-02-10
Mode of Operation:	WIFI Tx mode

Ambient Temperature: 25℃ Relative Humidity: 51% Atmospheric Pressure: 101 kPa

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

Channel	Frequency (MHz)	Output Power (Watt)
Low	2412	0.02845
Middle	2437	0.02728
High	2462	0.02647

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

Channel	Frequency (MHz)	Output Power (Watt)
Low	2412	0.02695
Middle	2437	0.02666
High	2462	0.02581

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

Channel	Frequency (MHz)	Output Power (Watt)
Low	2412	0.02714
Middle	2437	0.02699
High	2462	0.02546

Results of WiFi mode 802.11 n40, (2422MHz to 2452MHz): Pass (TX Unit)
Maximum conducted output power

Channel	Frequency (MHz)	Output Power (Watt)
Low	2422	0.01938
Middle	2437	0.01861
High	2452	0.01759

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

3.1.2 Radiated Emissions

Test Requirement:	FCC 47CFR 15.209
Test Method:	ANSI C63.10:2013
Test Date:	2022-02-10
Mode of Operation:	WIFI Tx mode

Ambient Temperature: 24℃ Relative Humidity: 52% Atmospheric Pressure: 101 kPa

Test Method:

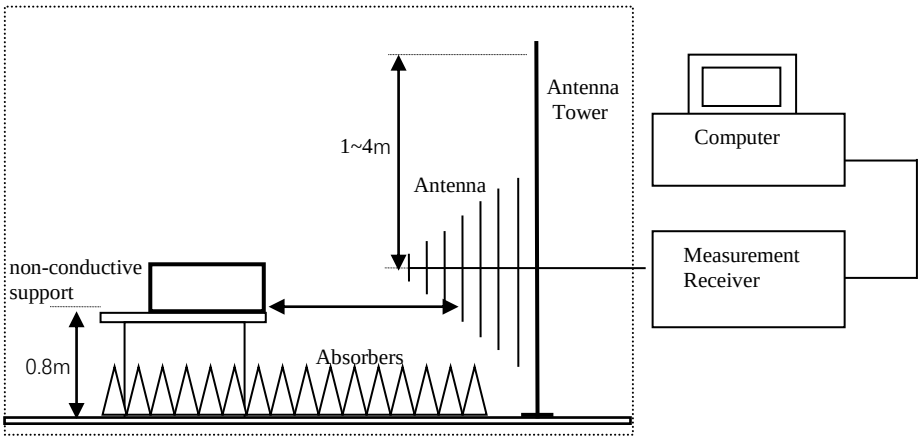
For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. 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.

Spectrum Analyzer Setting:

9KHz – 30MHz (Pk & Av)	RBW:	10kHz
	VBW:	30kHz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold
30MHz – 1GHz (QP)	RBW:	120kHz
	VBW:	120kHz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold
Above 1GHz (Pk)	RBW:	1MHz
	VBW:	1MHz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold
Above 1GHz (Av)	RBW:	1MHz
	VBW:	10Hz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold

Test Setup:



- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used.

Limits for Radiated Emissions FCC 47 CFR 15.247]:

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 Tx mode (2412.0 MHz) (802.11b) (9kHz – 30MHz): Pass

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

Result of Tx mode (2412.0 MHz) (802.11b) (1GHz-25GHz): 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 dB	E-Field Polarity
4824.0	57.7	0.82	58.5	74.0	15.5	Vertical
4824.0	58.2	0.52	58.7	74.0	15.3	Horizontal
7236.0	50.9	7.00	57.9	74.0	16.1	Vertical
7236.0	51.1	6.50	57.6	74.0	16.4	Horizontal
9648.0	47.3	8.50	55.8	74.0	18.2	Vertical
9648.0	47.1	8.30	55.4	74.0	18.7	Horizontal
12060.0	45.3	10.90	56.2	74.0	17.8	Vertical
12060.0	45.3	10.80	56.1	74.0	17.9	Horizontal

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dB	E-Field Polarity
4824.0	41.6	0.82	42.5	54.0	11.6	Vertical
4824.0	42.8	0.52	43.3	54.0	10.7	Horizontal
7236.0	35.4	7.00	42.4	54.0	11.6	Vertical
7236.0	35.6	6.50	42.1	54.0	11.9	Horizontal
9648.0	31.8	8.50	40.3	54.0	13.7	Vertical
9648.0	31.8	8.30	40.1	54.0	13.9	Horizontal
12060.0	29.3	10.90	40.2	54.0	13.8	Vertical
12060.0	29.3	10.80	40.1	54.0	14.0	Horizontal

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

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

Result of Tx mode (2437.0 MHz) (802.11b) (1GHz-25GHz): 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 dB	E-Field Polarity
4874.0	57.7	0.82	58.6	74.0	15.5	Vertical
4874.0	57.3	0.52	57.8	74.0	16.2	Horizontal
7311.0	50.5	7.00	57.5	74.0	16.5	Vertical
7311.0	51.3	6.50	57.8	74.0	16.2	Horizontal
9748.0	48.1	8.50	56.6	74.0	17.5	Vertical
9748.0	47.4	8.30	55.7	74.0	18.3	Horizontal
12185.0	45.1	10.90	56.0	74.0	18.0	Vertical
12185.0	45.4	10.80	56.2	74.0	17.8	Horizontal

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 dB	E-Field Polarity
4874.0	42.2	0.82	43.0	54.0	11.0	Vertical
4874.0	42.5	0.52	43.0	54.0	11.0	Horizontal
7311.0	35.2	7.00	42.2	54.0	11.8	Vertical
7311.0	34.8	6.50	41.3	54.0	12.7	Horizontal
9748.0	33.1	8.50	41.6	54.0	12.4	Vertical
9748.0	32.9	8.30	41.2	54.0	12.8	Horizontal
12185.0	30.3	10.90	41.2	54.0	12.8	Vertical
12185.0	30.3	10.80	41.1	54.0	13.0	Horizontal

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

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

Result of Tx mode (2462.0 MHz) (802.11b) (1GHz-25GHz): 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 dB	E-Field Polarity
4924.0	57.4	0.82	58.2	74.0	15.8	Vertical
4924.0	57.8	0.52	58.4	74.0	15.7	Horizontal
7386.0	51.0	7.00	58.0	74.0	16.0	Vertical
7386.0	50.9	6.50	57.4	74.0	16.6	Horizontal
9848.0	47.7	8.50	56.2	74.0	17.8	Vertical
9848.0	47.7	8.30	56.0	74.0	18.0	Horizontal
12310.0	45.6	10.90	56.5	74.0	17.5	Vertical
12310.0	45.4	10.80	56.2	74.0	17.8	Horizontal

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dB	E-Field Polarity
4924.0	42.3	0.82	43.1	54.0	10.9	Vertical
4924.0	42.7	0.52	43.2	54.0	10.8	Horizontal
7386.0	35.5	7.00	42.5	54.0	11.6	Vertical
7386.0	35.9	6.50	42.4	54.0	11.7	Horizontal
9848.0	32.8	8.50	41.3	54.0	12.7	Vertical
9848.0	33.1	8.30	41.4	54.0	12.6	Horizontal
12310.0	29.3	10.90	40.2	54.0	13.8	Vertical
12310.0	30.4	10.80	41.2	54.0	12.8	Horizontal

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

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

Result of Tx mode (2412.0 MHz) (802.11g) (1GHz-25GHz): 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 dB	E-Field Polarity
4824.0	57.1	0.82	58.0	74.0	16.0	Vertical
4824.0	57.1	0.52	57.6	74.0	16.4	Horizontal
7236.0	49.9	7.00	56.9	74.0	17.1	Vertical
7236.0	50.8	6.50	57.3	74.0	16.8	Horizontal
9648.0	47.3	8.50	55.8	74.0	18.2	Vertical
9648.0	47.7	8.30	56.0	74.0	18.0	Horizontal
12060.0	45.3	10.90	56.2	74.0	17.8	Vertical
12060.0	45.0	10.80	55.8	74.0	18.2	Horizontal

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dB	E-Field Polarity
4824.0	42.0	0.82	42.8	54.0	11.2	Vertical
4824.0	41.6	0.52	42.1	54.0	11.9	Horizontal
7236.0	34.0	7.00	41.0	54.0	13.0	Vertical
7236.0	35.6	6.50	42.1	54.0	11.9	Horizontal
9648.0	31.9	8.50	40.4	54.0	13.6	Vertical
9648.0	33.0	8.30	41.3	54.0	12.8	Horizontal
12060.0	30.4	10.90	41.3	54.0	12.7	Vertical
12060.0	30.0	10.80	40.8	54.0	13.2	Horizontal

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

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

Result of Tx mode (2437.0 MHz) (802.11g) (1GHz-25GHz): 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 dB	E-Field Polarity
4874.0	56.7	0.82	57.5	74.0	16.5	Vertical
4874.0	57.2	0.52	57.7	74.0	16.3	Horizontal
7311.0	49.1	7.00	56.1	74.0	18.0	Vertical
7311.0	50.7	6.50	57.2	74.0	16.8	Horizontal
9748.0	47.1	8.50	55.6	74.0	18.4	Vertical
9748.0	47.2	8.30	55.5	74.0	18.5	Horizontal
12185.0	45.1	10.90	56.0	74.0	18.0	Vertical
12185.0	45.5	10.80	56.3	74.0	17.7	Horizontal

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dB	E-Field Polarity
4874.0	42.0	0.82	42.8	54.0	11.2	Vertical
4874.0	42.1	0.52	42.6	54.0	11.4	Horizontal
7311.0	34.8	7.00	41.8	54.0	12.2	Vertical
7311.0	35.7	6.50	42.2	54.0	11.8	Horizontal
9748.0	31.8	8.50	40.3	54.0	13.7	Vertical
9748.0	32.8	8.30	41.1	54.0	12.9	Horizontal
12185.0	31.1	10.90	42.0	54.0	12.0	Vertical
12185.0	30.6	10.80	41.4	54.0	12.6	Horizontal

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

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

Result of Tx mode (2462.0 MHz) (802.11g) (1GHz-25GHz): 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 dB	E-Field Polarity
4924.0	57.1	0.82	58.0	74.0	16.0	Vertical
4924.0	57.2	0.52	57.7	74.0	16.3	Horizontal
7386.0	50.1	7.00	57.1	74.0	16.9	Vertical
7386.0	51.4	6.50	57.9	74.0	16.2	Horizontal
9848.0	47.7	8.50	56.2	74.0	17.9	Vertical
9848.0	47.1	8.30	55.4	74.0	18.6	Horizontal
12310.0	45.2	10.90	56.1	74.0	17.9	Vertical
12310.0	45.2	10.80	56.0	74.0	18.0	Horizontal

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dB	E-Field Polarity
4924.0	42.0	0.82	42.8	54.0	11.2	Vertical
4924.0	41.8	0.52	42.4	54.0	11.7	Horizontal
7386.0	35.5	7.00	42.5	54.0	11.5	Vertical
7386.0	36.4	6.50	42.9	54.0	11.1	Horizontal
9848.0	33.0	8.50	41.5	54.0	12.5	Vertical
9848.0	32.3	8.30	40.6	54.0	13.4	Horizontal
12310.0	29.2	10.90	40.1	54.0	13.9	Vertical
12310.0	31.2	10.80	42.0	54.0	12.0	Horizontal

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

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

Result of Tx mode (2412.0 MHz) (802.11n20) (1GHz-25GHz): 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 dB	E-Field Polarity
4824.0	56.7	0.82	57.5	74.0	16.5	Vertical
4824.0	57.1	0.52	57.6	74.0	16.4	Horizontal
7236.0	50.1	7.00	57.1	74.0	16.9	Vertical
7236.0	50.9	6.50	57.4	74.0	16.7	Horizontal
9648.0	47.1	8.50	55.6	74.0	18.4	Vertical
9648.0	47.6	8.30	55.9	74.0	18.1	Horizontal
12060.0	45.2	10.90	56.1	74.0	17.9	Vertical
12060.0	45.5	10.80	56.3	74.0	17.7	Horizontal

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dB	E-Field Polarity
4824.0	41.4	0.82	42.2	54.0	11.8	Vertical
4824.0	41.8	0.52	42.3	54.0	11.7	Horizontal
7236.0	35.3	7.00	42.3	54.0	11.7	Vertical
7236.0	35.9	6.50	42.4	54.0	11.6	Horizontal
9648.0	31.8	8.50	40.3	54.0	13.7	Vertical
9648.0	33.2	8.30	41.5	54.0	12.6	Horizontal
12060.0	30.2	10.90	41.1	54.0	12.9	Vertical
12060.0	30.7	10.80	41.5	54.0	12.5	Horizontal

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

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

Result of Tx mode (2437.0 MHz) (802.11n20) (1GHz-25GHz): 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 dB	E-Field Polarity
4874.0	57.0	0.82	57.8	74.0	16.2	Vertical
4874.0	57.3	0.52	57.8	74.0	16.2	Horizontal
7311.0	49.5	7.00	56.5	74.0	17.5	Vertical
7311.0	50.7	6.50	57.2	74.0	16.8	Horizontal
9748.0	47.0	8.50	55.5	74.0	18.5	Vertical
9748.0	47.2	8.30	55.5	74.0	18.6	Horizontal
12185.0	45.2	10.90	56.1	74.0	17.9	Vertical
12185.0	45.4	10.80	56.2	74.0	17.8	Horizontal

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dB	E-Field Polarity
4874.0	41.8	0.82	42.6	54.0	11.4	Vertical
4874.0	41.8	0.52	42.3	54.0	11.7	Horizontal
7311.0	35.1	7.00	42.1	54.0	11.9	Vertical
7311.0	35.6	6.50	42.1	54.0	11.9	Horizontal
9748.0	0.2	8.50	8.7	54.0	45.3	Vertical
9748.0	32.4	8.30	40.7	54.0	13.3	Horizontal
12185.0	30.2	10.90	41.1	54.0	12.9	Vertical
12185.0	30.9	10.80	41.7	54.0	12.3	Horizontal

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

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

Result of Tx mode (2462.0 MHz) (802.11n20) (1GHz-25GHz): 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 dB	E-Field Polarity
4924.0	57.0	0.82	57.8	74.0	16.2	Vertical
4924.0	57.0	0.52	57.5	74.0	16.5	Horizontal
7386.0	49.9	7.00	56.9	74.0	17.1	Vertical
7386.0	50.7	6.50	57.2	74.0	16.8	Horizontal
9848.0	47.1	8.50	55.6	74.0	18.4	Vertical
9848.0	47.2	8.30	55.5	74.0	18.6	Horizontal
12310.0	45.2	10.90	56.1	74.0	17.9	Vertical
12310.0	45.2	10.80	56.0	74.0	18.0	Horizontal

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dB	E-Field Polarity
4924.0	41.5	0.82	42.3	54.0	11.7	Vertical
4924.0	42.3	0.52	42.8	54.0	11.2	Horizontal
7386.0	34.4	7.00	41.4	54.0	12.6	Vertical
7386.0	35.8	6.50	42.3	54.0	11.7	Horizontal
9848.0	31.6	8.50	40.1	54.0	13.9	Vertical
9848.0	31.9	8.30	40.2	54.0	13.8	Horizontal
12310.0	31.2	10.90	42.1	54.0	12.0	Vertical
12310.0	30.7	10.80	41.5	54.0	12.5	Horizontal

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

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

Result of Tx mode (2422.0 MHz) (802.11n40) (1GHz-25GHz): 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 dB	E-Field Polarity
4844.0	56.2	0.82	57.0	74.0	17.0	Vertical
4844.0	56.9	0.52	57.4	74.0	16.6	Horizontal
7266.0	49.9	7.00	56.9	74.0	17.1	Vertical
7266.0	50.6	6.50	57.1	74.0	16.9	Horizontal
9688.0	46.9	8.50	55.4	74.0	18.6	Vertical
9688.0	47.6	8.30	55.9	74.0	18.1	Horizontal
12110.0	45.2	10.90	56.1	74.0	17.9	Vertical
12110.0	45.6	10.80	56.4	74.0	17.7	Horizontal

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dB	E-Field Polarity
4844.0	41.4	0.82	42.2	54.0	11.8	Vertical
4844.0	41.6	0.52	42.2	54.0	11.9	Horizontal
7266.0	35.1	7.00	42.1	54.0	11.9	Vertical
7266.0	35.6	6.50	42.1	54.0	11.9	Horizontal
9688.0	31.9	8.50	40.4	54.0	13.6	Vertical
9688.0	33.1	8.30	41.4	54.0	12.6	Horizontal
12110.0	30.1	10.90	41.0	54.0	13.0	Vertical
12110.0	30.8	10.80	41.6	54.0	12.4	Horizontal

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

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

Result of Tx mode (2437.0 MHz) (802.11n40) (1GHz-25GHz): 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 dB	E-Field Polarity
4874.0	56.2	0.82	57.0	74.0	17.0	Vertical
4874.0	56.7	0.52	57.2	74.0	16.8	Horizontal
7311.0	56.0	7.00	63.0	74.0	11.0	Vertical
7311.0	50.5	6.50	57.0	74.0	17.0	Horizontal
9748.0	47.0	8.50	55.5	74.0	18.5	Vertical
9748.0	47.5	8.30	55.8	74.0	18.2	Horizontal
12185.0	45.1	10.90	56.0	74.0	18.0	Vertical
12185.0	45.4	10.80	56.2	74.0	17.8	Horizontal

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dB	E-Field Polarity
4874.0	41.6	0.82	42.4	54.0	11.6	Vertical
4874.0	41.5	0.52	42.1	54.0	12.0	Horizontal
7311.0	35.2	7.00	42.2	54.0	11.8	Vertical
7311.0	35.6	6.50	42.1	54.0	11.9	Horizontal
9748.0	32.2	8.50	40.7	54.0	13.3	Vertical
9748.0	32.4	8.30	40.7	54.0	13.3	Horizontal
12185.0	30.3	10.90	41.2	54.0	12.8	Vertical
12185.0	30.9	10.80	41.7	54.0	12.3	Horizontal

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

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

Result of Tx mode (2452.0 MHz) (802.11n40) (1GHz-25GHz): 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 dB	E-Field Polarity
4904.0	55.6	0.82	56.4	74.0	17.6	Vertical
4904.0	56.5	0.52	57.0	74.0	17.0	Horizontal
7356.0	49.9	7.00	56.9	74.0	17.2	Vertical
7356.0	49.8	6.50	56.3	74.0	17.7	Horizontal
9808.0	47.1	8.50	55.6	74.0	18.4	Vertical
9808.0	47.5	8.30	55.8	74.0	18.2	Horizontal
12260.0	45.2	10.90	56.1	74.0	17.9	Vertical
12260.0	45.3	10.80	56.1	74.0	17.9	Horizontal

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Limit @3m dBµV/m	Margin dB	E-Field Polarity
4904.0	41.3	0.82	42.1	54.0	11.9	Vertical
4904.0	41.8	0.52	42.3	54.0	11.7	Horizontal
7356.0	34.5	7.00	41.5	54.0	12.5	Vertical
7356.0	35.6	6.50	42.1	54.0	12.0	Horizontal
9808.0	31.5	8.50	40.0	54.0	14.0	Vertical
9808.0	34.8	8.30	43.1	54.0	10.9	Horizontal
12260.0	31.2	10.90	42.1	54.0	11.9	Vertical
12260.0	30.7	10.80	41.5	54.0	12.5	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 -26GHz): 4.02dB

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： RF Radiated Emissions (Lowest)-802.11b

Field Strength of Band-edge Compliance Peak Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2390.0	63.5	-4.8	58.7	74.0	15.3	Vertical
2390.0	63.0	-4.7	58.3	74.0	15.7	Horizontal

Field Strength of Band-edge Compliance Average Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2390.0	53.5	-4.8	48.7	54.0	5.3	Vertical
2390.0	52.6	-4.7	47.9	54.0	6.1	Horizontal

Result： RF Radiated Emissions (Highest) -802.11b

Field Strength of Band-edge Compliance Peak Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2483.5	67.1	-4.8	62.3	74.0	11.7	Vertical
2483.5	67.7	-4.7	63.0	74.0	11.0	Horizontal

Field Strength of Band-edge Compliance Average Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2483.5	57.0	-4.8	52.2	54.0	1.8	Vertical
2483.5	56.7	-4.7	52.0	54.0	2.0	Horizontal

Result: 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 dB	E-Field Polarity
2390.0	70.1	-4.8	65.3	74.0	8.7	Vertical
2390.0	69.6	-4.7	64.9	74.0	9.1	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 dB	E-Field Polarity
2390.0	49.1	-4.8	44.3	54.0	9.7	Vertical
2390.0	48.1	-4.7	43.4	54.0	10.7	Horizontal

Result: 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 dB	E-Field Polarity
2483.5	74.9	-4.8	70.1	74.0	3.9	Vertical
2483.5	74.8	-4.7	70.1	74.0	3.9	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 dB	E-Field Polarity
2483.5	57.0	-4.8	52.2	54.0	1.8	Vertical
2483.5	57.4	-4.7	52.7	54.0	1.3	Horizontal

Result: RF Radiated Emissions (Lowest)-802.11n20

Field Strength of Band-edge Compliance						
Peak Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2390.0	70.0	-4.8	65.2	74.0	8.8	Vertical
2390.0	69.6	-4.7	64.9	74.0	9.1	Horizontal

Field Strength of Band-edge Compliance						
Average Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2390.0	49.4	-4.8	44.6	54.0	9.4	Vertical
2390.0	48.9	-4.7	44.2	54.0	9.8	Horizontal

Result: RF Radiated Emissions (Highest) -802.11n20

Field Strength of Band-edge Compliance						
Peak Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2483.5	73.5	-4.8	68.7	74.0	5.3	Vertical
2483.5	74.3	-4.7	69.6	74.0	4.4	Horizontal

Field Strength of Band-edge Compliance						
Average Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2483.5	56.4	-4.8	51.6	54.0	2.4	Horizontal
2483.5	57.1	-4.7	52.4	54.0	1.6	Horizontal

Result: RF Radiated Emissions (Lowest)-802.11n40

Field Strength of Band-edge Compliance Peak Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2390.0	73.4	-4.8	68.6	74.0	5.4	Vertical
2390.0	72.3	-4.7	67.6	74.0	6.4	Horizontal

Field Strength of Band-edge Compliance Average Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2390.0	52.6	-4.8	47.8	54.0	6.2	Vertical
2390.0	51.3	-4.7	46.6	54.0	7.5	Horizontal

Result: RF Radiated Emissions (Highest) -802.11n40

Field Strength of Band-edge Compliance Peak Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2483.5	70.2	-4.8	65.4	74.0	8.6	Vertical
2483.5	71.2	-4.7	66.5	74.0	7.5	Horizontal

Field Strength of Band-edge Compliance Average Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Limit @3m	Margin	E-Field Polarity
MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	
2483.5	52.3	-4.8	47.5	54.0	6.5	Horizontal
2483.5	52.6	-4.7	47.9	54.0	6.2	Horizontal

Limits for Radiated Emissions FCC 47 CFR 15.247]:

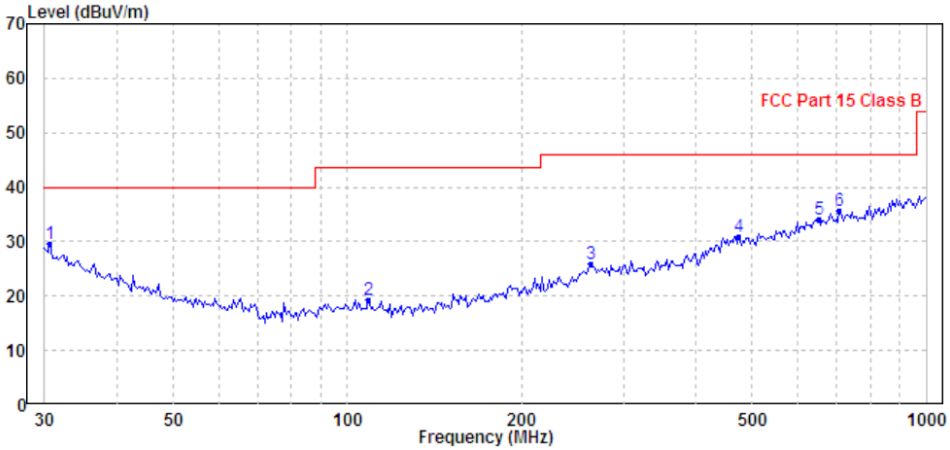
Frequency Range	Quasi-Peak Limits
[MHz]	[μV/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

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.

Results of WIFI TX mode: Pass

Please refer to the following table for result details (The data is the worst cases)

Horizontal



Ambient Temperature: 25C
Relative Humidity : 50%

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB		
1	30.638	29.64	40.00	-10.36	Peak	Horizontal
2	109.029	19.22	43.50	-24.28	Peak	Horizontal
3	263.819	25.80	46.00	-20.20	Peak	Horizontal
4	475.499	30.94	46.00	-15.06	Peak	Horizontal
5	651.942	34.10	46.00	-11.90	Peak	Horizontal
6	709.182	35.57	46.00	-10.43	Peak	Horizontal

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

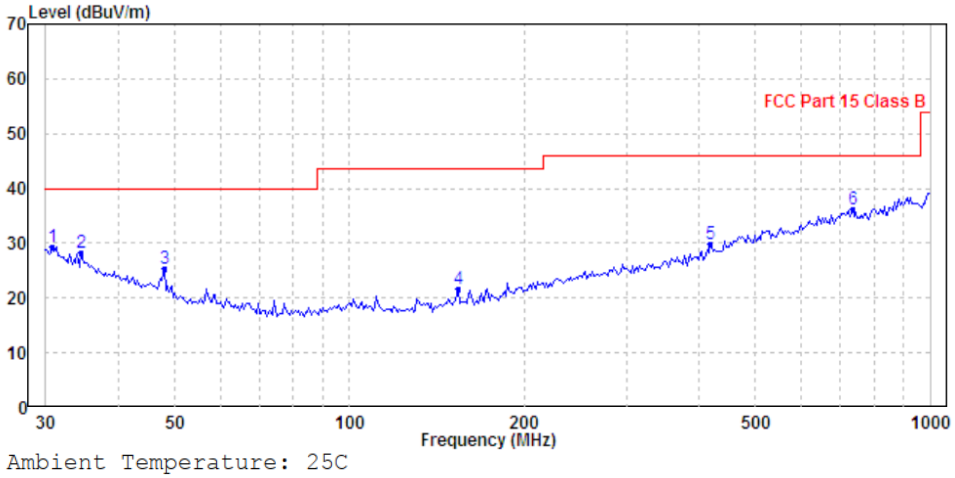
Frequency Range	Quasi-Peak Limits
[MHz]	[μV/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

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.

Results of WIFI TX mode: Pass

Please refer to the following table for result details (The data is the worst cases)

Vertical



Ambient Temperature: 25C
Relative Humidity : 50%

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB		
1	30.853	29.35	40.00	-10.65	Peak	Vertical
2	34.517	28.19	40.00	-11.81	Peak	Vertical
3	47.994	25.40	40.00	-14.60	Peak	Vertical
4	153.739	21.55	43.50	-21.95	Peak	Vertical
5	419.108	29.95	46.00	-16.05	Peak	Vertical
6	734.491	36.14	46.00	-9.86	Peak	Vertical

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)

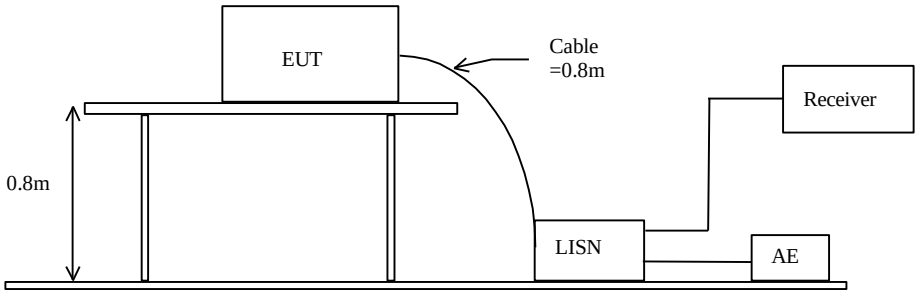
Test Requirement:	FCC 47CFR 15.207
Test Method:	ANSI C63.10:2013
Test Date:	2022-02-10
Mode of Operation:	WIFI TX mode
Test Voltage:	120Va.c. 60Hz

Ambient Temperature: 25℃ Relative Humidity: 51% Atmospheric Pressure: 101 kPa

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.

Receiver Setting:
Bandw. = 9 kHz, Meas. Time= 10.0 ms, Step Width = 5.0kHz
Detector = MaxPeak and CISPR AV

Test Setup:



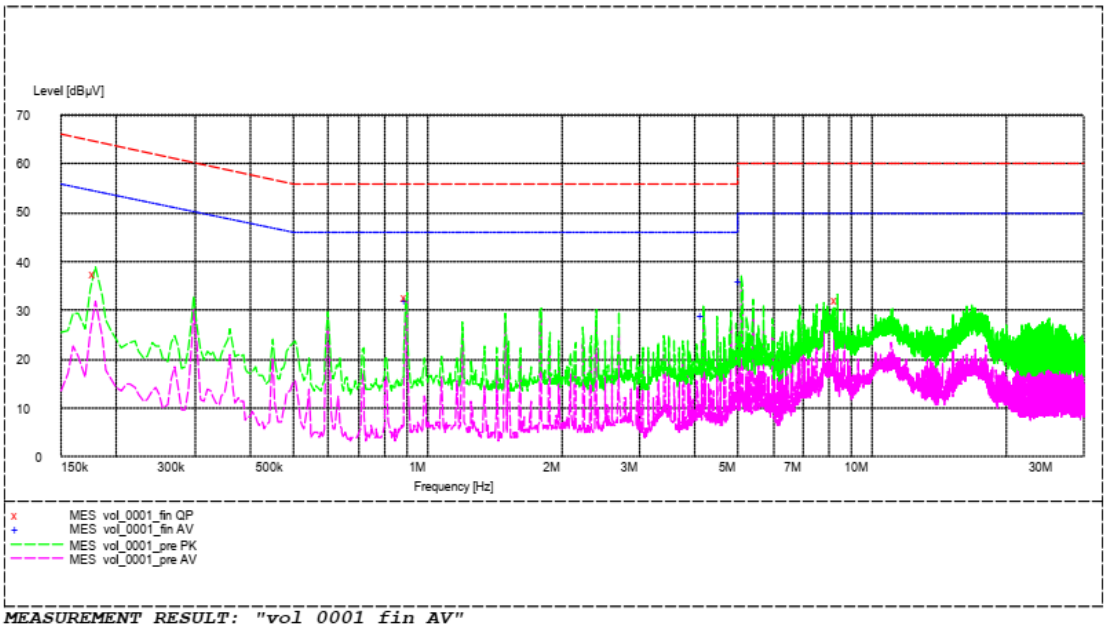
Limits for Conducted Emissions (FCC 47 CFR 15.207):

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

Results of WIFI TX mode (L): PASS

Please refer to the following diagram for individual results.



MEASUREMENT RESULT: "vol_0001_fin AV"

2/10/2022 7:16PM

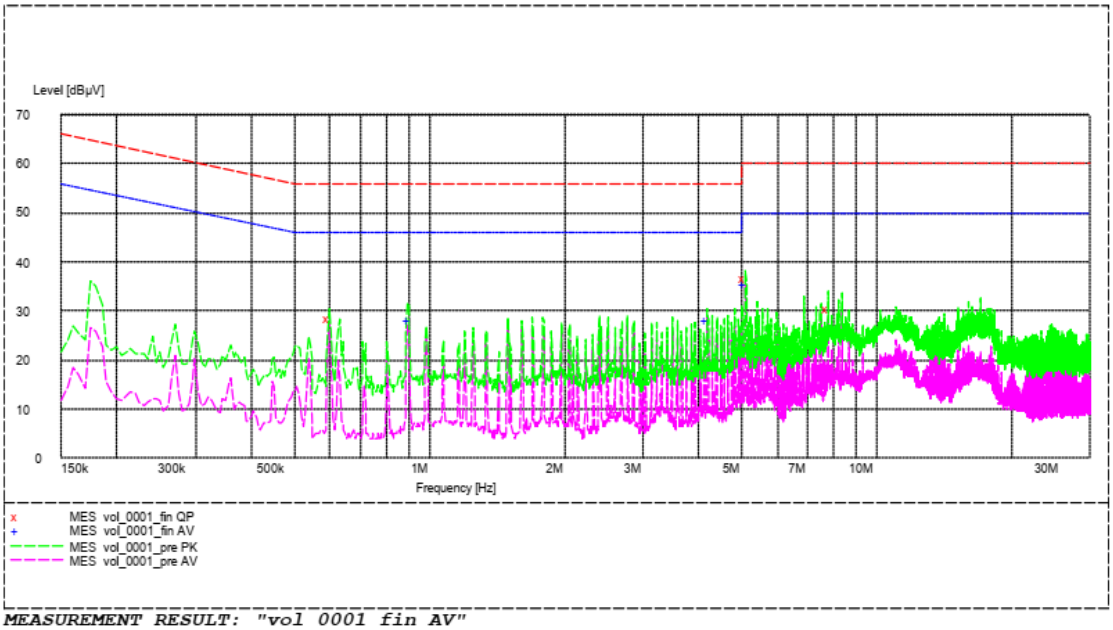
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.900000	32.00	9.7	46	14.0	L1	GND
4.195000	28.80	9.7	46	17.2	L1	GND
5.095000	35.90	9.7	50	14.1	L1	GND

MEASUREMENT RESULT: "vol_0001_fin QP"

2/10/2022 7:16PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.180000	37.30	9.6	65	27.2	L1	GND
0.900000	33.00	9.7	56	23.0	L1	GND
8.395000	32.20	9.8	60	27.8	L1	GND

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



MEASUREMENT RESULT: "vol_0001_fin AV"

2/10/2022 7:14PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.900000	28.30	9.7	46	17.7	N	GND
4.195000	28.40	9.7	46	17.6	N	GND
5.095000	35.60	9.7	50	14.4	N	GND

MEASUREMENT RESULT: "vol_0001_fin QP"

2/10/2022 7:14PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.600000	28.50	9.7	56	27.5	N	GND
5.095000	36.80	9.7	60	23.2	N	GND
7.790000	30.50	9.8	60	29.5	N	GND

3.1.4 Power Spectral Density

Test Requirement:	FCC 47CFR 15.247(e)
Test Method:	ANSI C63.10:2013
Test Date:	2022-02-15
Mode of Operation:	WIFI TX mode

Ambient Temperature: 25℃ Relative Humidity: 51% Atmospheric Pressure: 101 kPa

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=100kHz , VBW= 300KHz , 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 TX 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	-10.066	8dBm
2437.0	-11.232	8dBm
2462.0	-10.643	8dBm

Results of WIFI TX 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	-12.786	8dBm
2437.0	-11.611	8dBm
2462.0	-12.647	8dBm

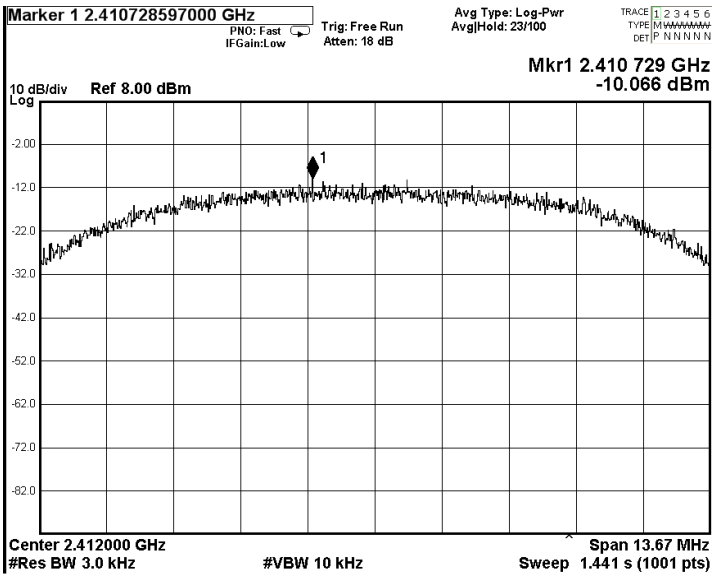
Results of WIFI TX Mode 802.11 n20 (Tx:2412MHz to 2462MHz): Pass (TX Unit)
Maximum power spectral density

Transmitter Frequency (MHz)	Maximum Power spectral density level / 3kHz band (dBm)	Maximum Power spectral density / 3kHz band limit
2412.0	-12.786	8dBm
2437.0	-12.514	8dBm
2462.0	-12.305	8dBm

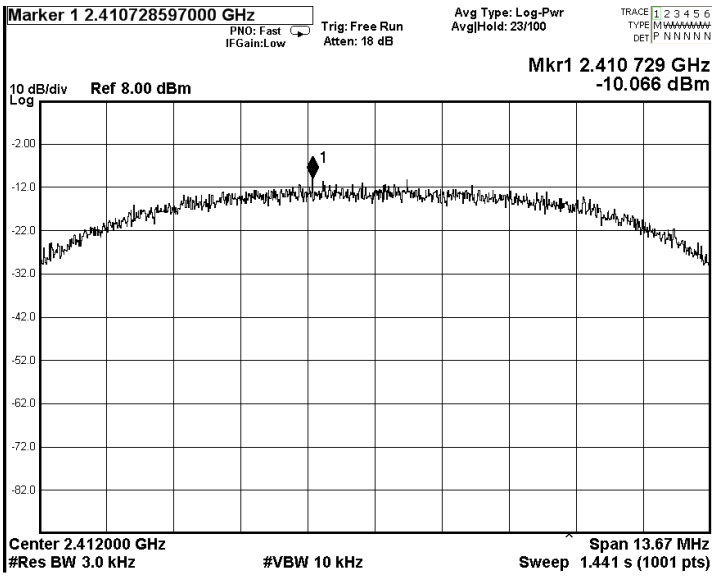
Results of WIFI TX Mode 802.11 n40 (Tx:2422MHz to 2422MHz): Pass (TX Unit)
Maximum power spectral density

Transmitter Frequency (MHz)	Maximum Power spectral density level / 3kHz band (dBm)	Maximum Power spectral density / 3kHz band limit
2422.0	-16.017	8dBm
2437.0	-15.714	8dBm
2452.0	-15.583	8dBm

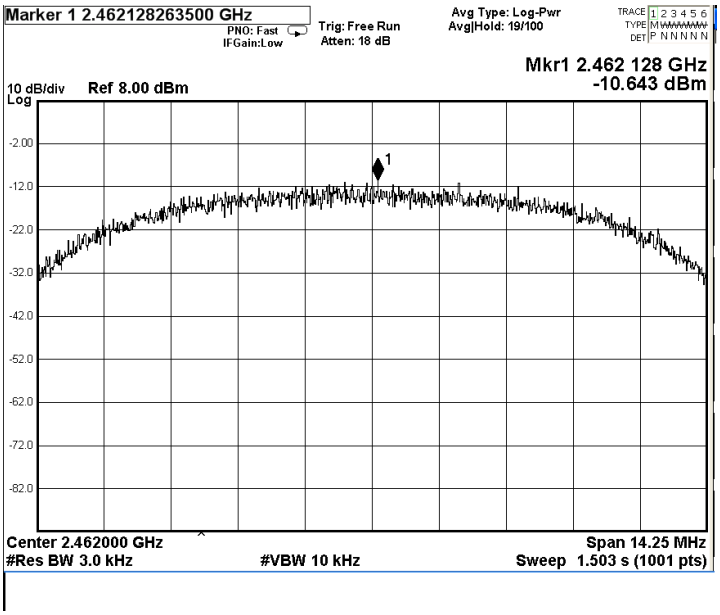
WiFi mode 802.11 b
CH 1 (2412.0 MHz)



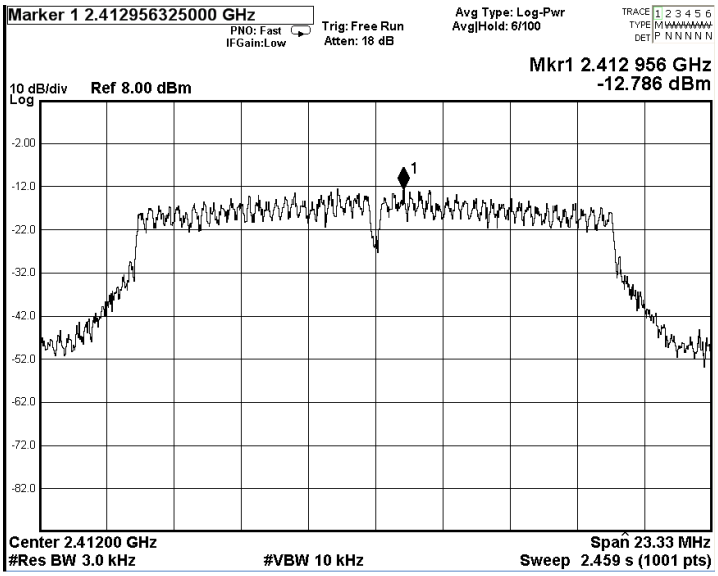
CH 6 (2437.0 MHz)



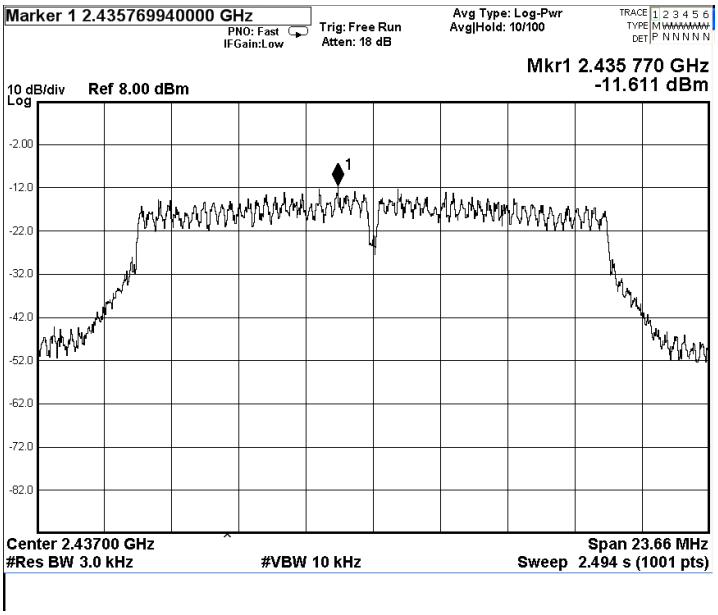
CH 11 (2462.0 MHz)



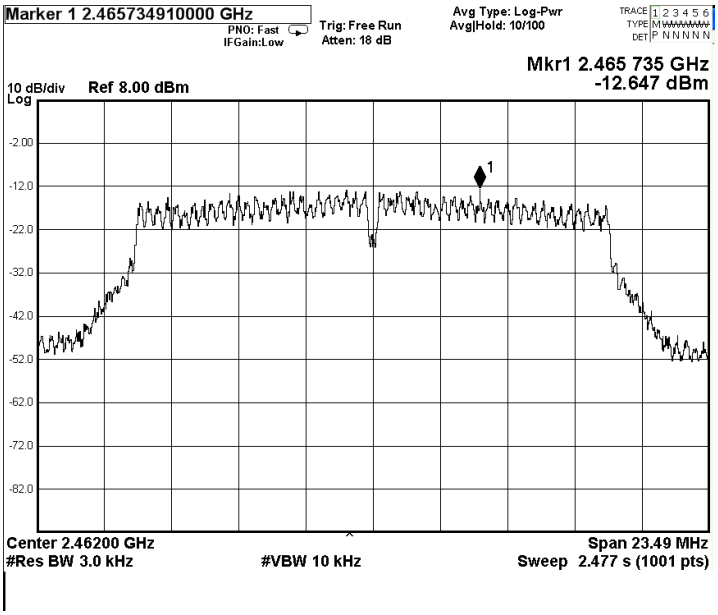
WiFi mode 802.11 g
CH 1 (2412.0 MHz)



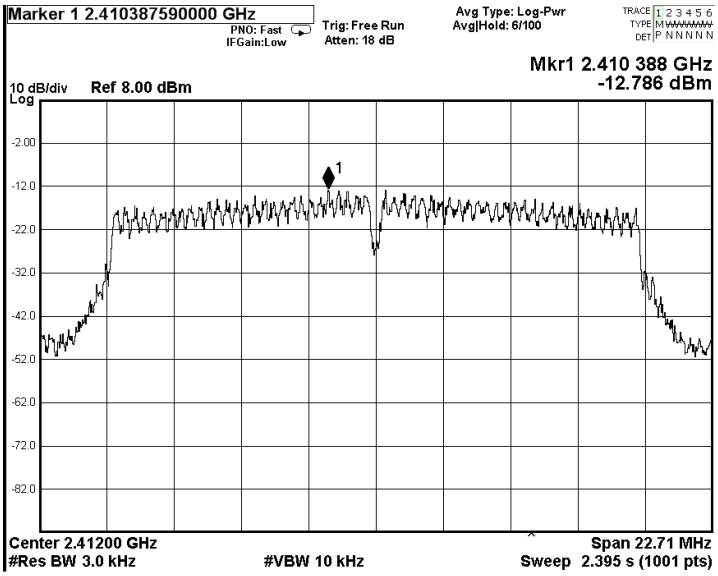
CH 6 (2437.0 MHz)



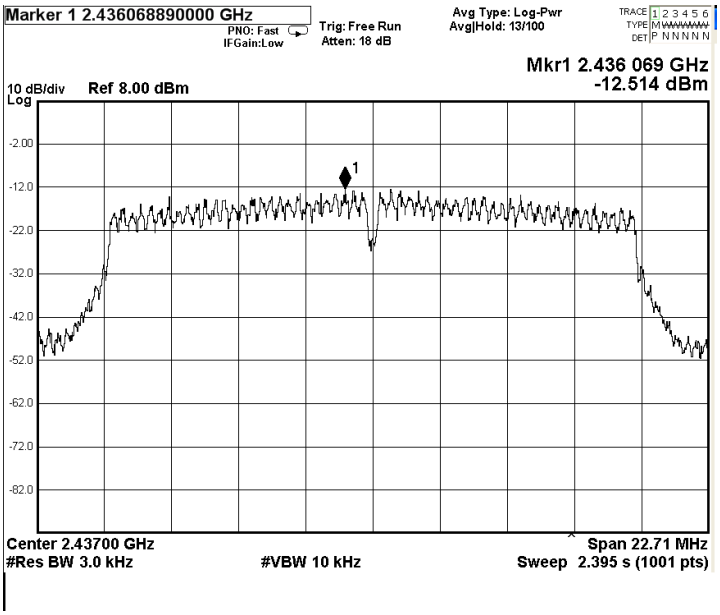
CH 11 (2462.0 MHz)



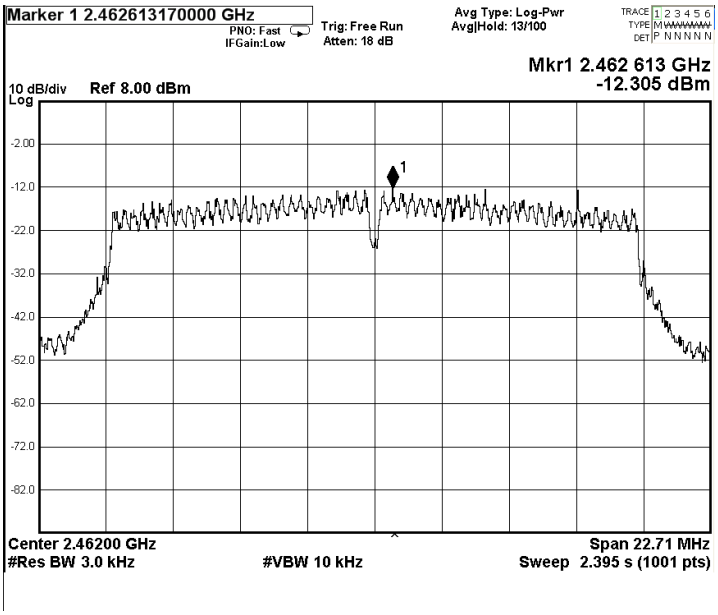
WiFi mode 802.11 n20
CH 1 (2412.0 MHz)



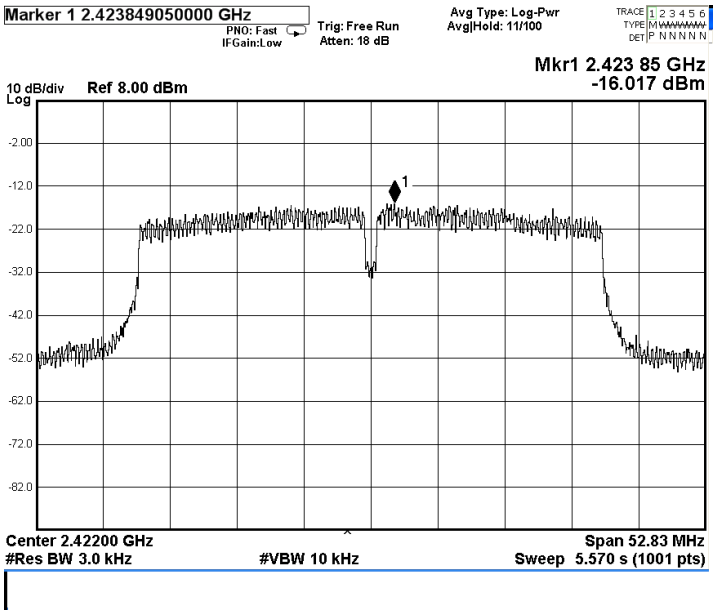
CH 6 (2437.0 MHz)



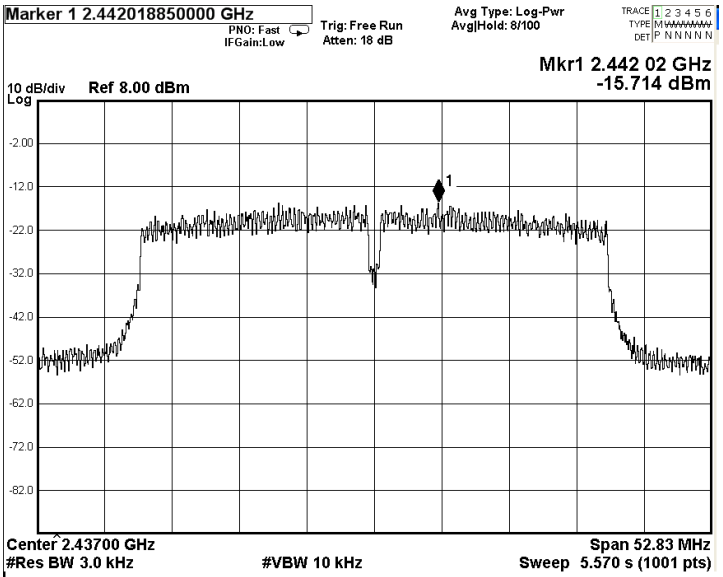
CH 11 (2462.0 MHz)



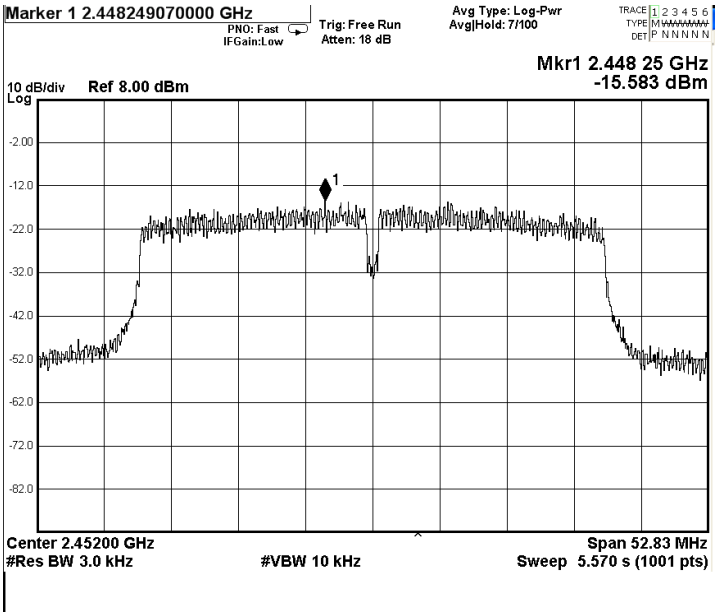
WiFi mode 802.11 n40
CH 3 (2422.0 MHz)



CH 6 (2437.0 MHz)



CH 9 (2452.0 MHz)



3.1.5 6dB Spectrum Bandwidth Measurement

Test Requirement:	FCC 47CFR 15.247(a)(2)
Test Method:	ANSI C63.10:2013
Test Date:	2022-02-15
Mode of Operation:	WIFI TX mode

Ambient Temperature: 25℃ Relative Humidity: 51% Atmospheric Pressure: 101 kPa

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.

Spectrum Analyzer Setting:

RBW = 100kHz, VBW ≥ 3*RBW, Sweep = Auto couple
Detector = Peak, Trace = Max. hold

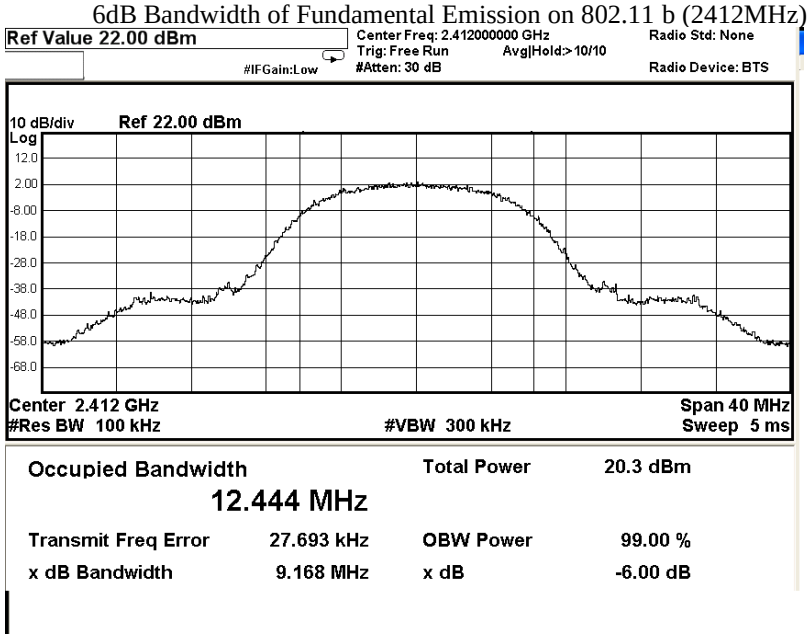
Test Setup:

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	9.168	> 500

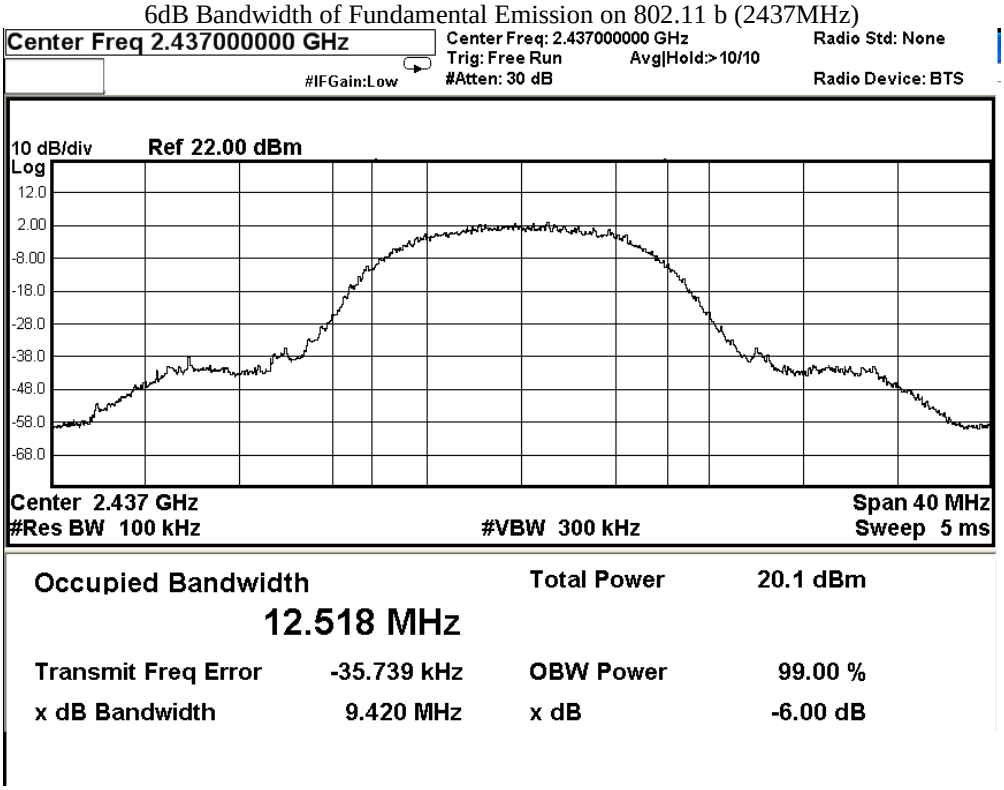
6dB Bandwidth of Fundamental Emission on 802.11 b (2412MHz)



Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2437.0	9.420	> 500

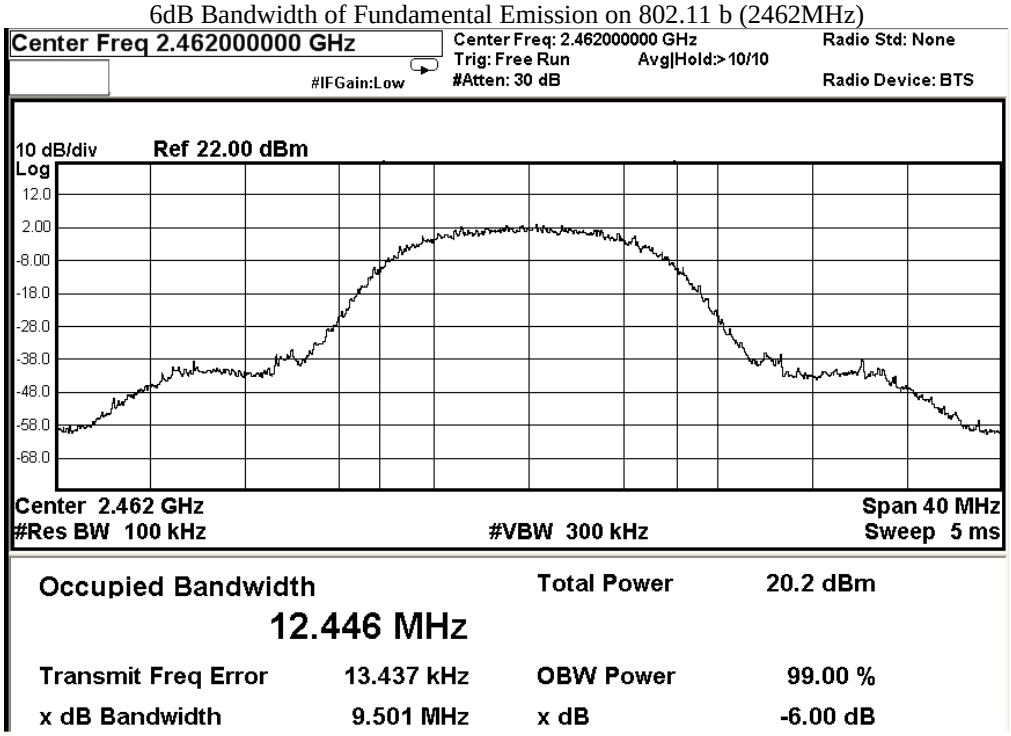
6dB Bandwidth of Fundamental Emission on 802.11 b (2437MHz)



Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2462.0	9.501	> 500

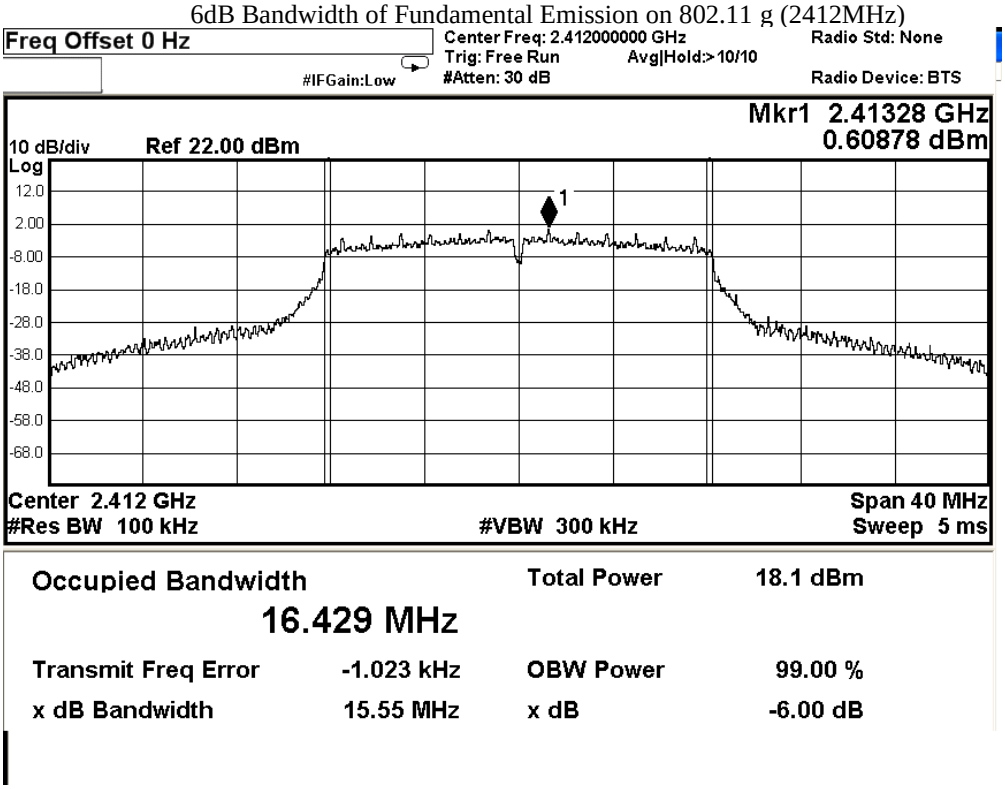
6dB Bandwidth of Fundamental Emission on 802.11 b (2462MHz)



Limits for 6dB Spectrum Bandwidth Measurement:

Center Frequency [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2412.0	15.550	> 500

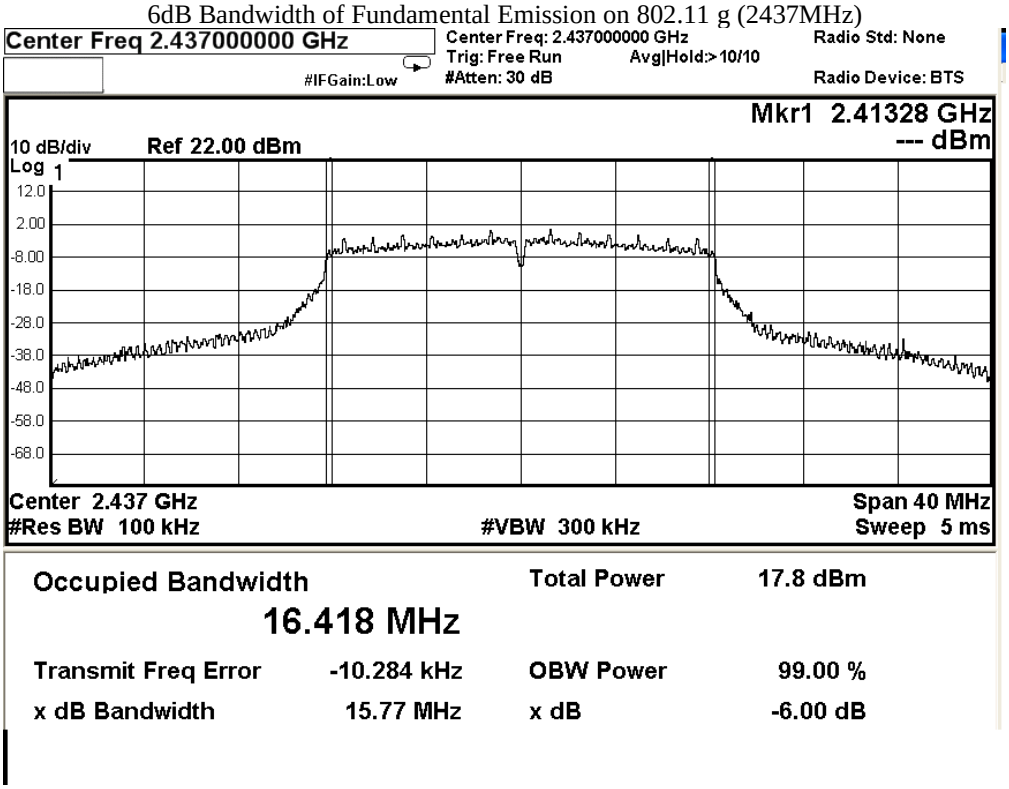
6dB Bandwidth of Fundamental Emission on 802.11 g (2412MHz)



Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2437.0	15.770	> 500

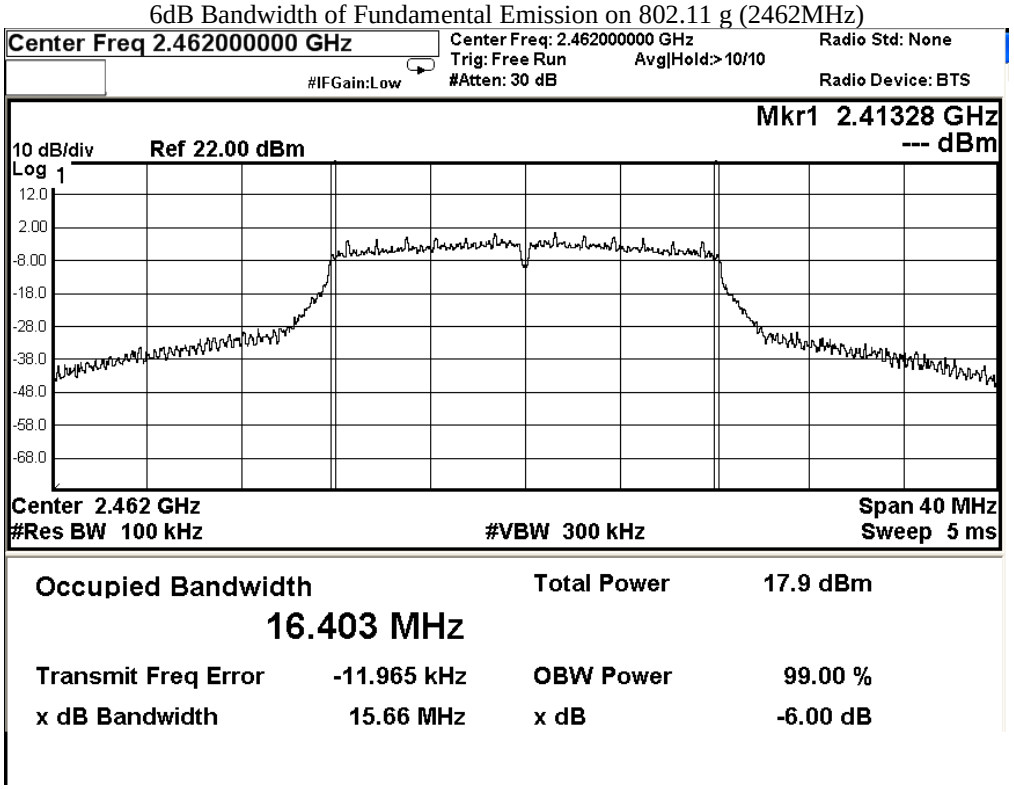
6dB Bandwidth of Fundamental Emission on 802.11 g (2437MHz)



Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2462.0	15.660	> 500

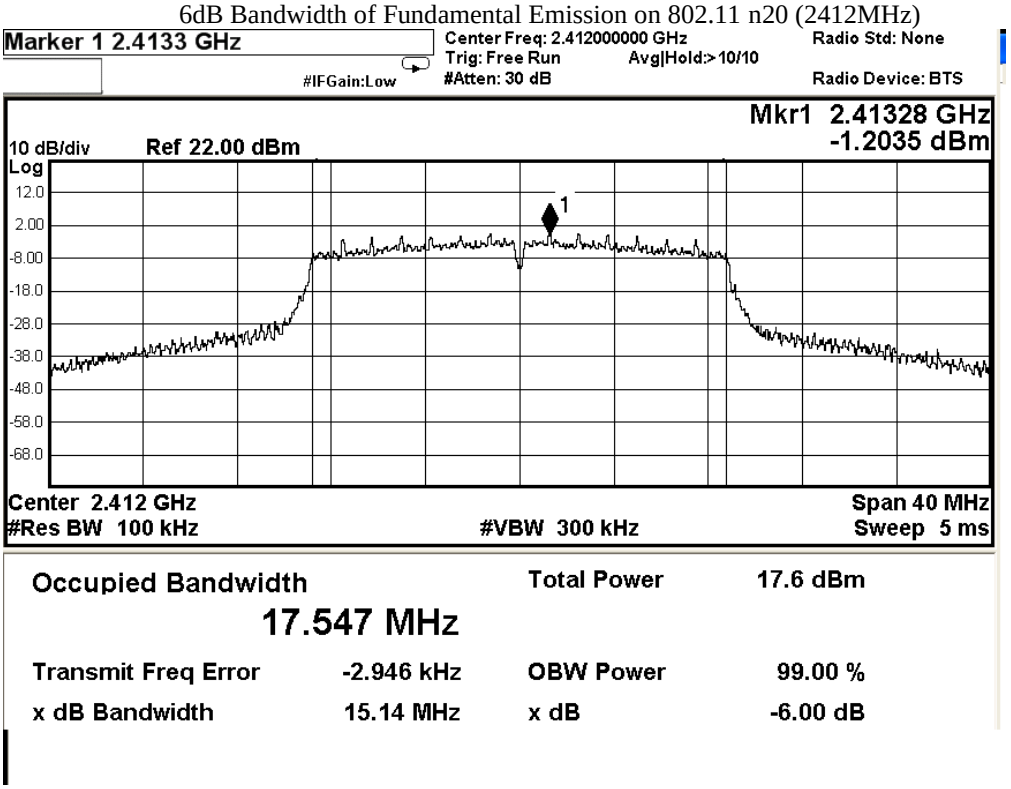
6dB Bandwidth of Fundamental Emission on 802.11 g (2462MHz)



Limits for 6dB Spectrum Bandwidth Measurement:

Center Frequency [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2412.0	15.140	> 500

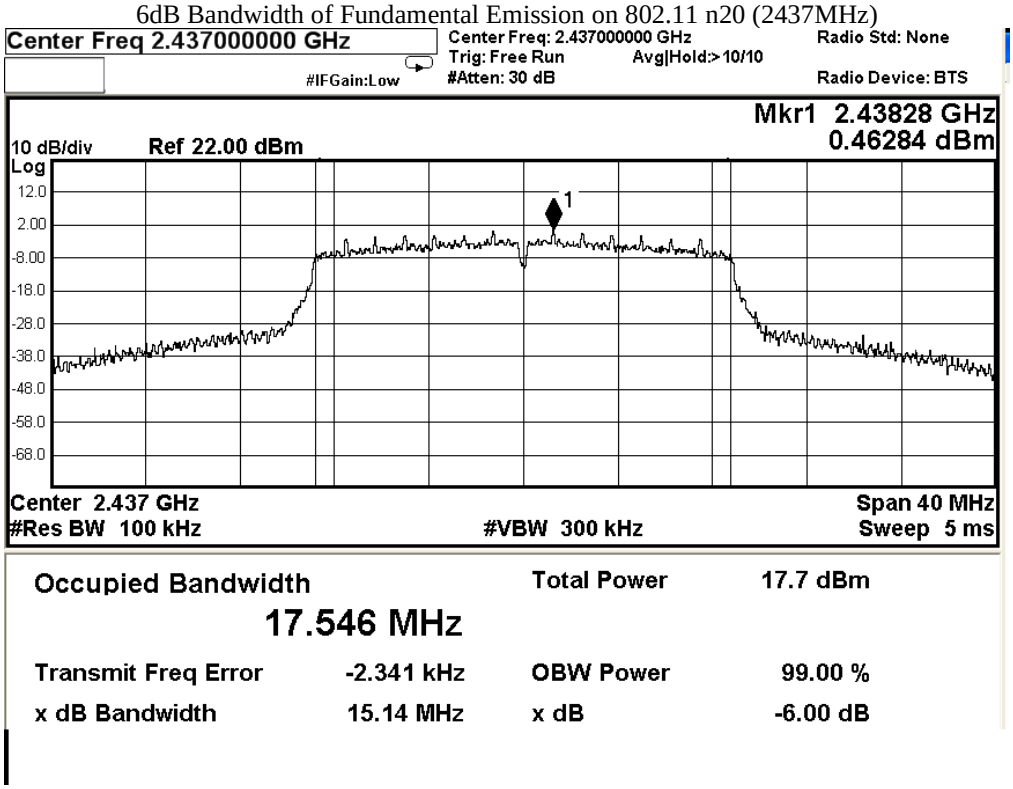
6dB Bandwidth of Fundamental Emission on 802.11 n20 (2412MHz)



Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2437.0	15.140	> 500

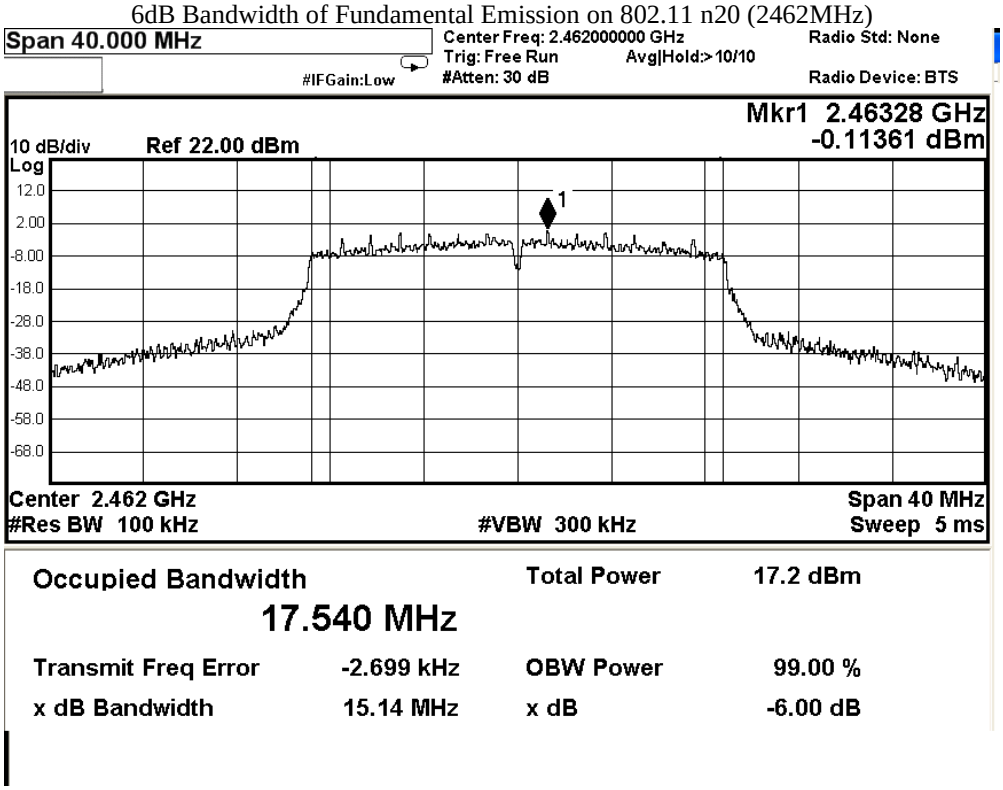
6dB Bandwidth of Fundamental Emission on 802.11 n20 (2437MHz)



Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2462.0	15.140	> 500

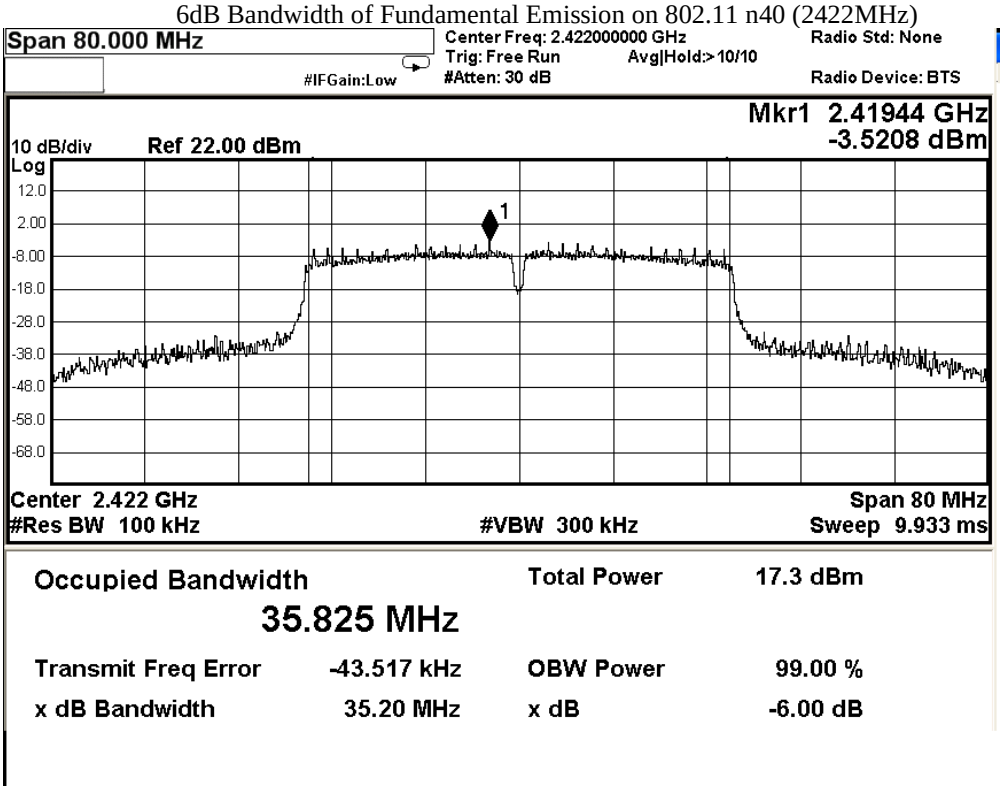
6dB Bandwidth of Fundamental Emission on 802.11 n20 (2462MHz)



Limits for 6dB Spectrum Bandwidth Measurement:

Center Frequency [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2422.0	35.200	> 500

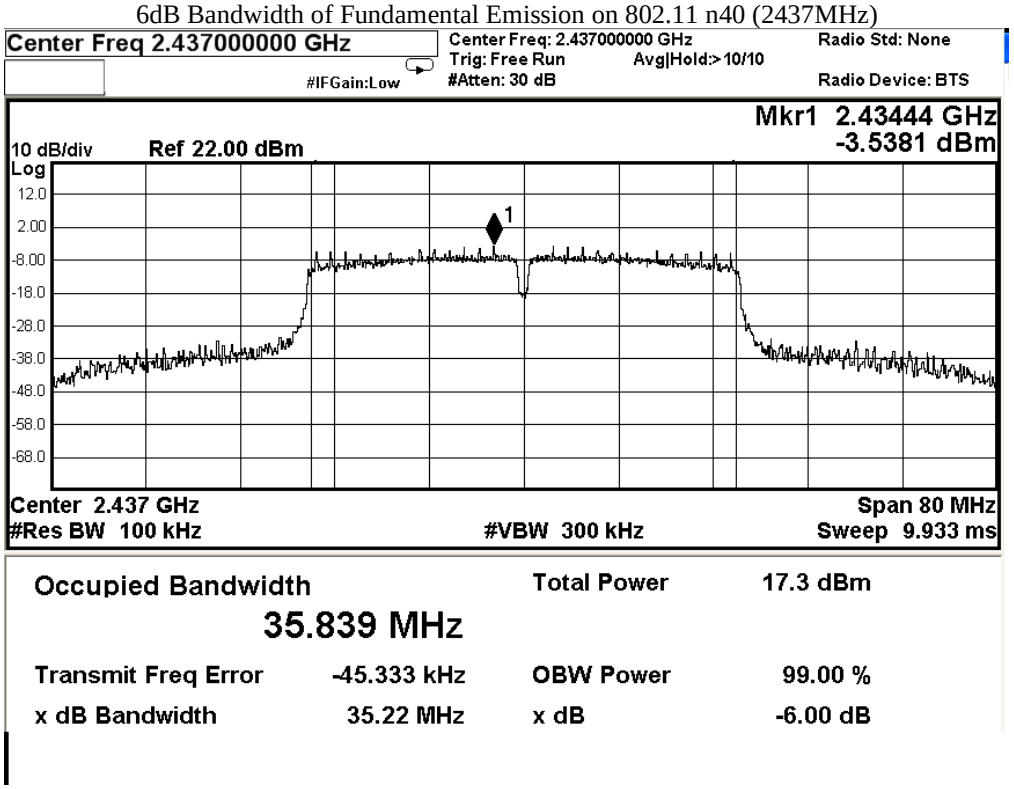
6dB Bandwidth of Fundamental Emission on 802.11 n40 (2422MHz)



Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2437.0	35.220	> 500

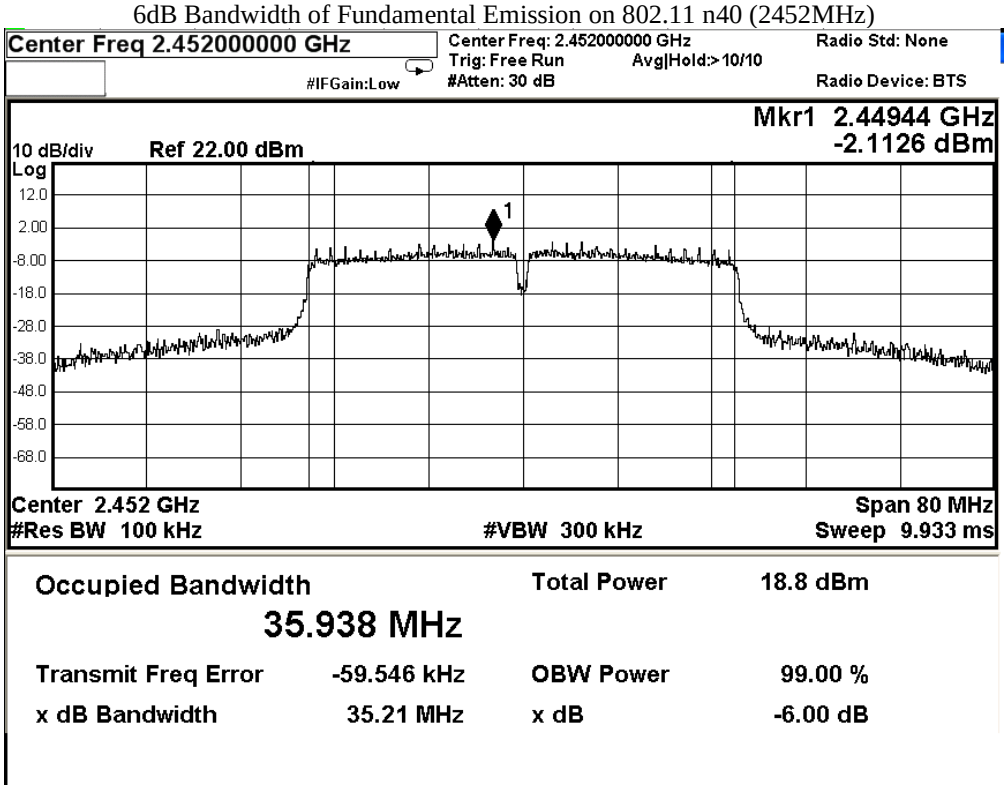
6dB Bandwidth of Fundamental Emission on 802.11 n40 (2437MHz)



Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range [MHz]	6dB Bandwidth [MHz]	FCC Limits [kHz]
2452.0	35.210	> 500

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



3.1.6 Band Edges Measurement

Test Requirement:	FCC 47CFR 15.247
Test Method:	ANSI C63.10:2013
Test Date:	2022-02-15
Mode of Operation:	WIFI TX mode

Ambient Temperature: 25℃ Relative Humidity: 51% Atmospheric Pressure: 101 kPa

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 are set to 100kHz and VBW are set to 300kHz for this measurement.

Test Setup:

As Test Setup of clause 3.1.2 in this test report.

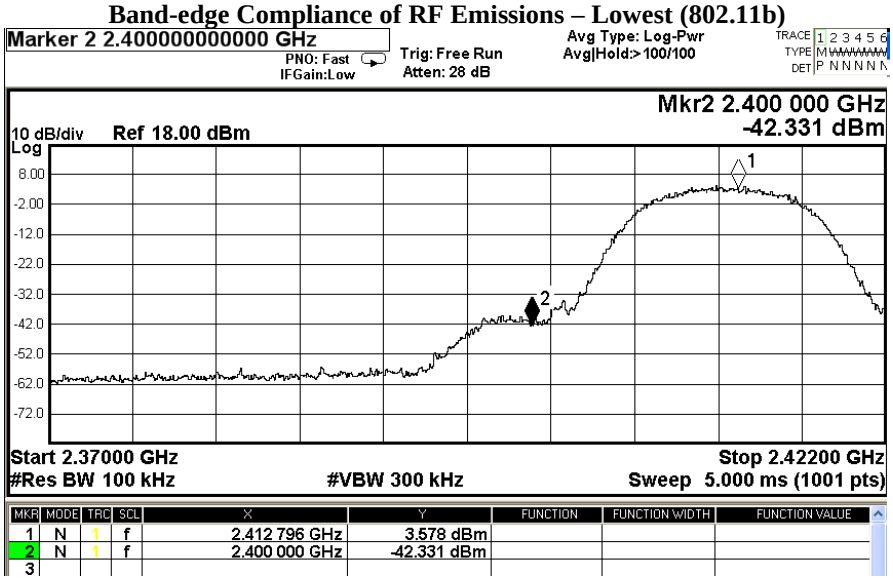
Band-edge Compliance of RF Conducted Emissions Measurement:

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: The worst-case measurement results were recorded in the test report
The following plots include cable losses :0.3dB (There is no Attenuator)

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2400 – Lowest Fundamental (2412)	3.578	-16.422	-42.331	Pass

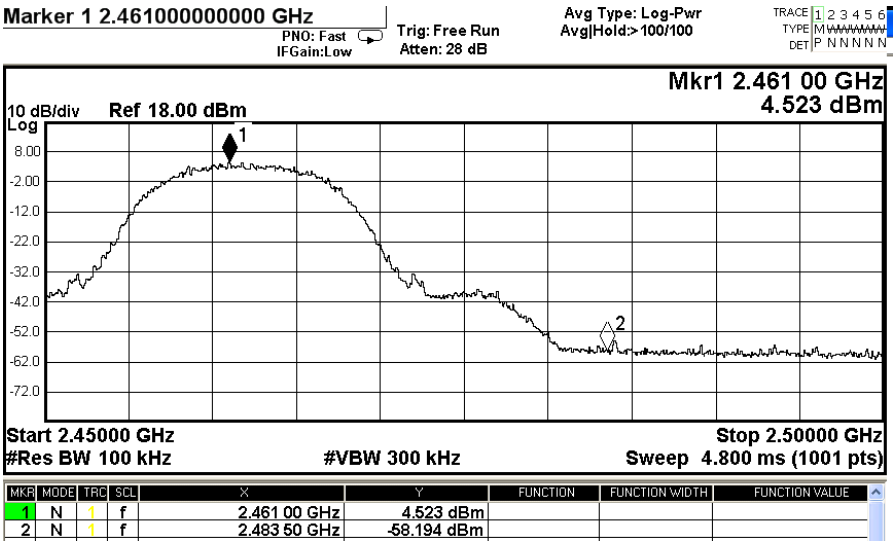
Band-edge Compliance of RF Emissions – Lowest (802.11b)



Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2483.5 – Highest Fundamental (2462)	4.523	-15.447	-58.194	Pass

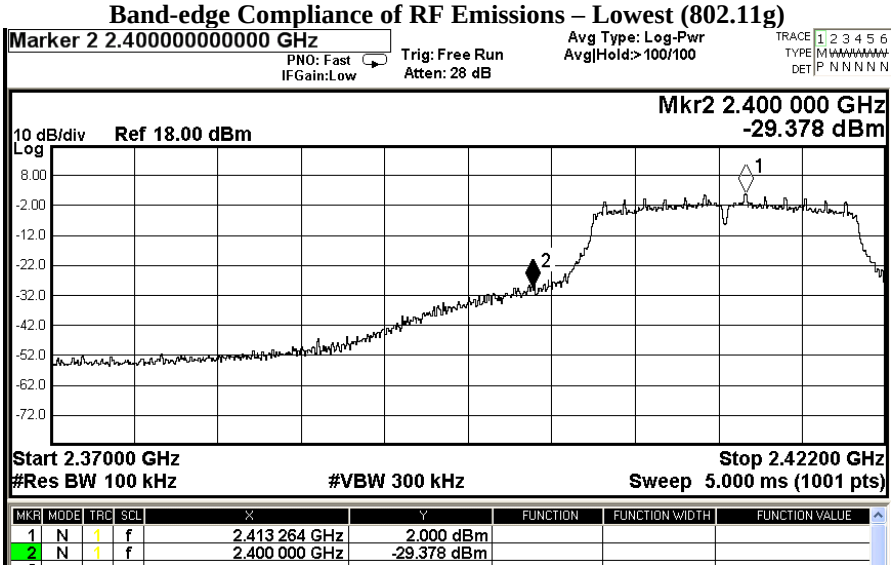
Band-edge Compliance of RF Emissions – Highest (802.11b)



Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2400 – Lowest Fundamental (2412)	2.00	-18.00	-29.378	Pass

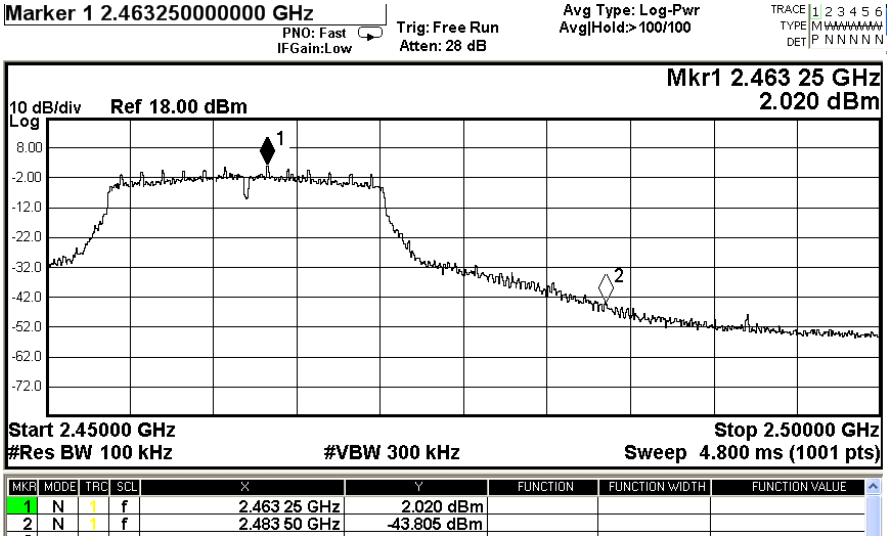
Band-edge Compliance of RF Emissions – Lowest (802.11g)



Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2483.5 – Highest Fundamental (2462)	2.020	-17.98	-43.805	Pass

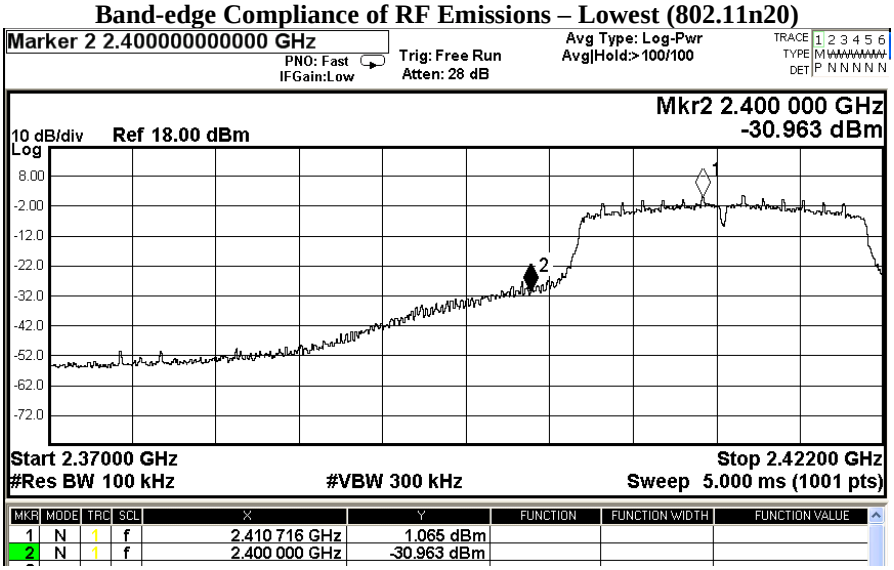
Band-edge Compliance of RF Emissions – Highest (802.11g)



Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2400 – Lowest Fundamental (2412)	1.065	-18.935	-30.963	Pass

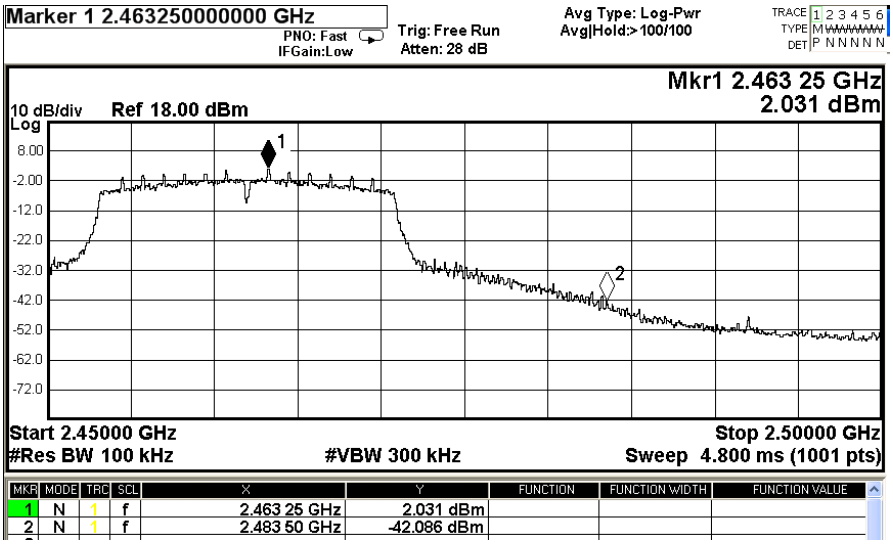
Band-edge Compliance of RF Emissions – Lowest (802.11n20)



Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2483.5 – Highest Fundamental (2462)	2.031	-17.969	-42.086	Pass

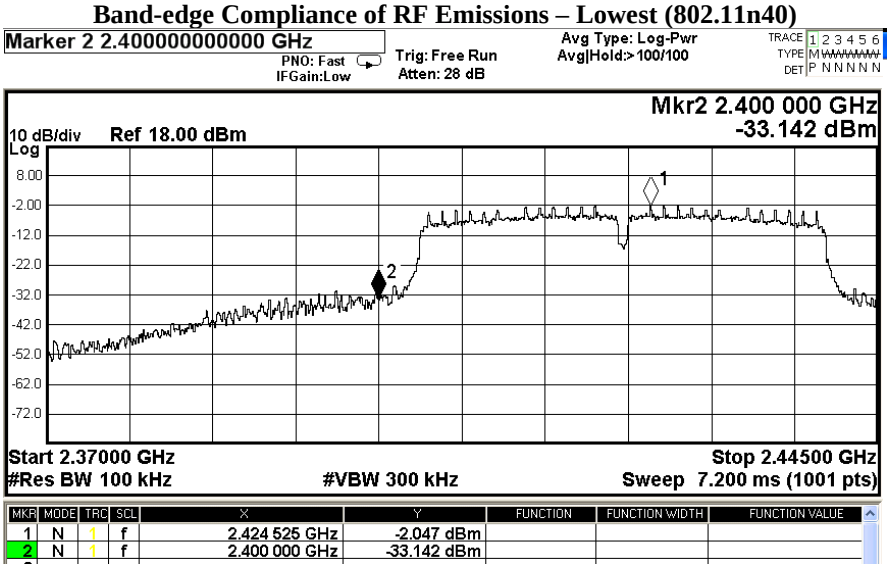
Band-edge Compliance of RF Emissions – Highest (802.11n20)



Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2400 – Lowest Fundamental (2422)	-2.047	-22.047	-33.142	Pass

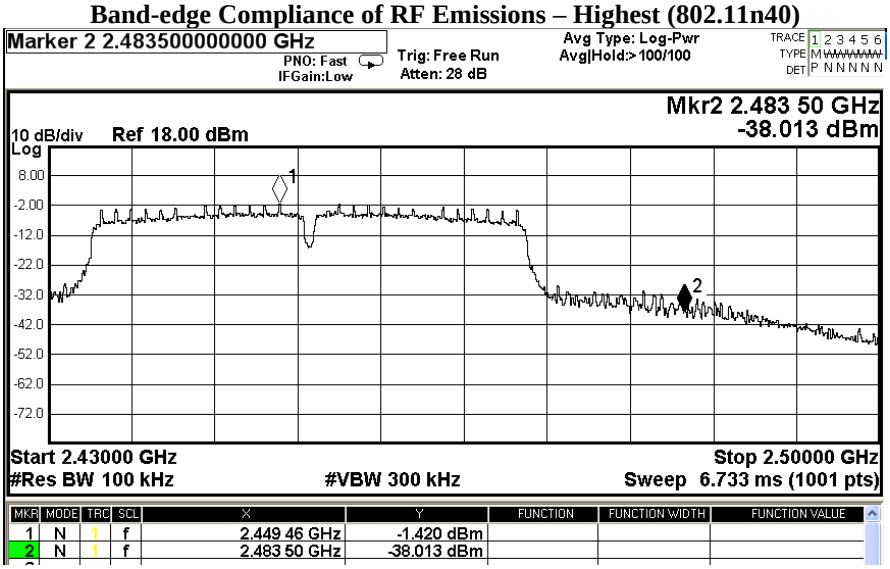
Band-edge Compliance of RF Emissions – Lowest (802.11n40)



Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2483.5 – Highest Fundamental (2452)	-1.420	-21.420	-38.013	Pass

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



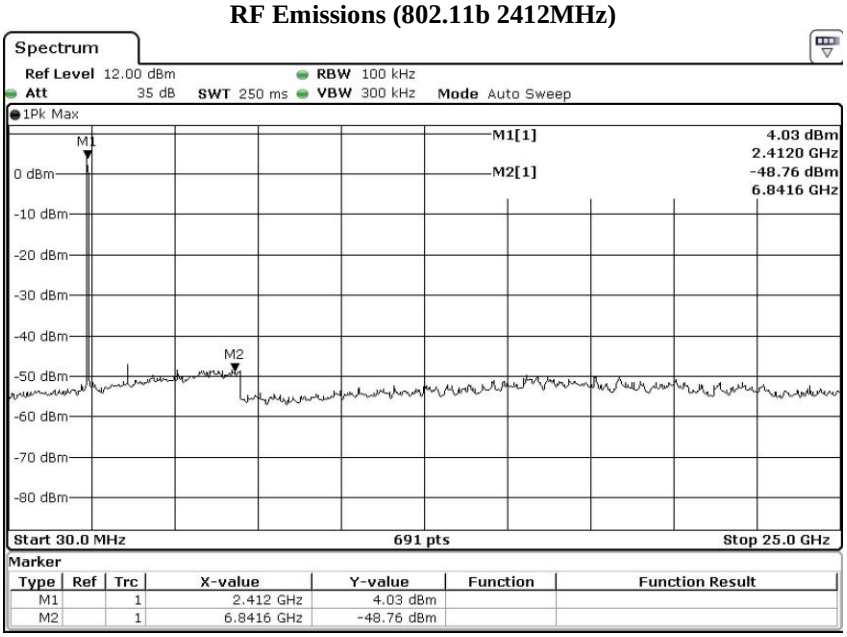
RF Conducted Emissions Measurement:

Limit：

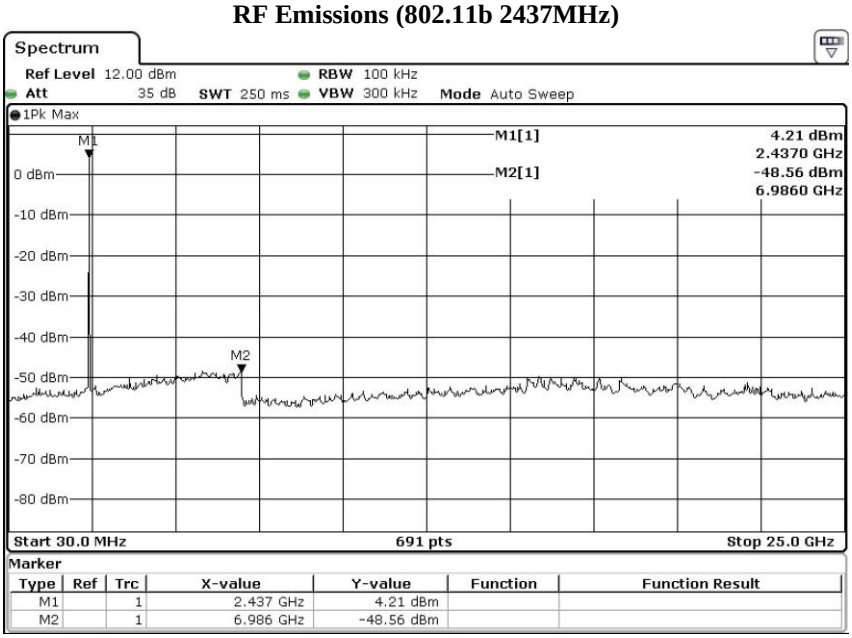
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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: The worst-case measurement results were recorded in the test report
The following plots include cable losses :0.3dB (There is no Attenuator)

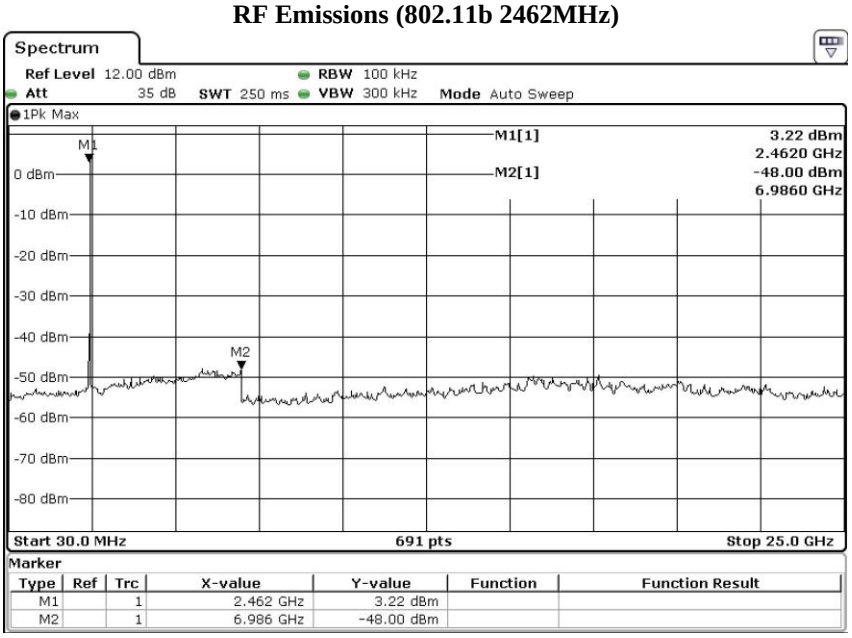
RF Emissions (802.11b 2412MHz)



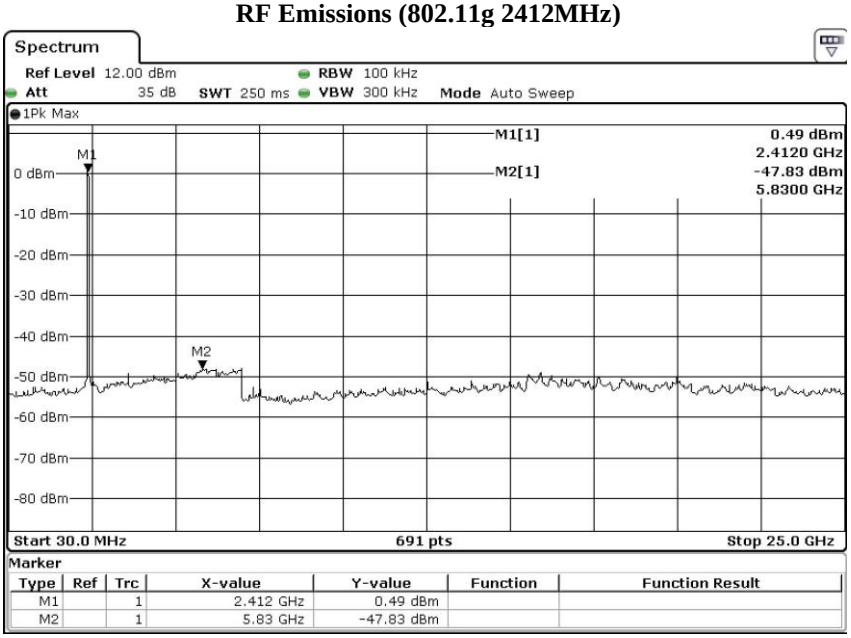
RF Emissions (802.11b 2437MHz)



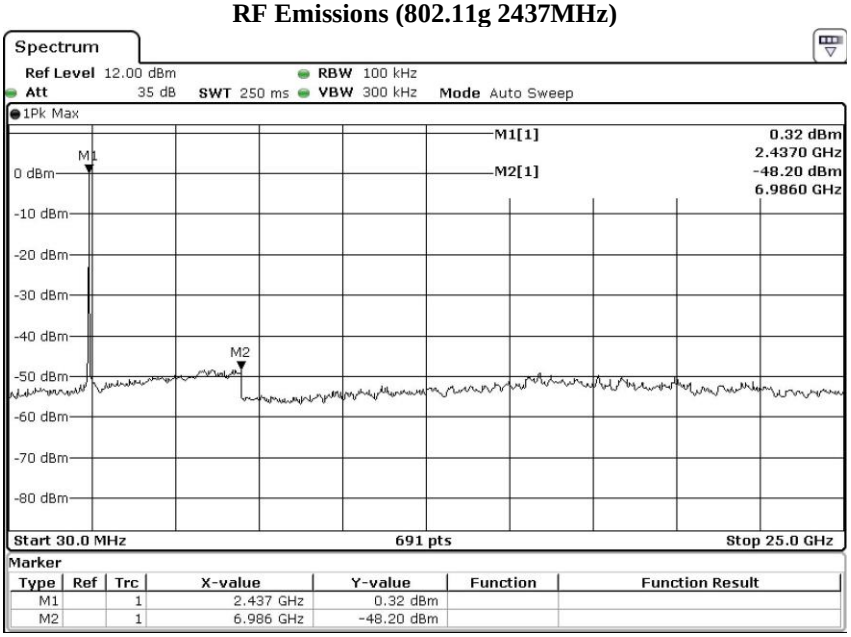
RF Emissions (802.11b 2462MHz)



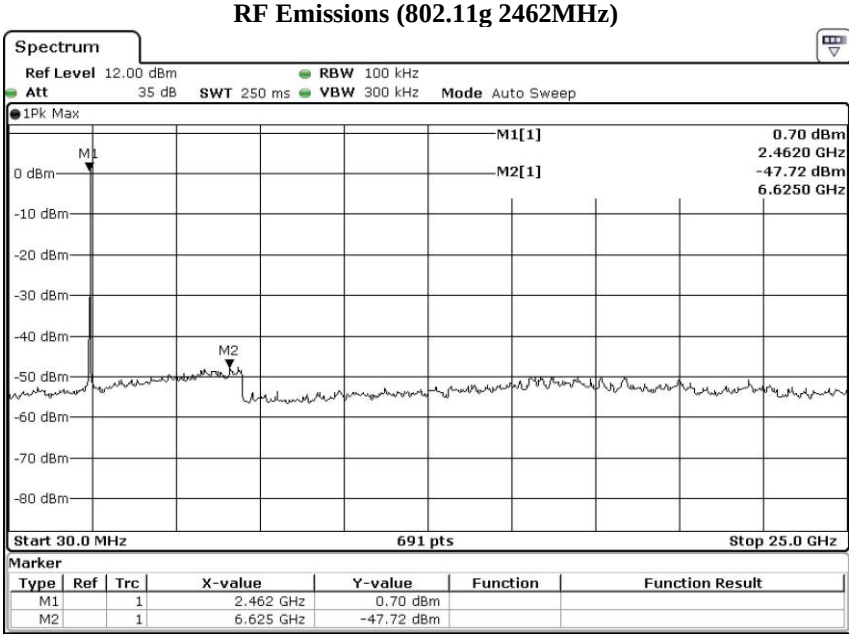
RF Emissions (802.11g 2412MHz)



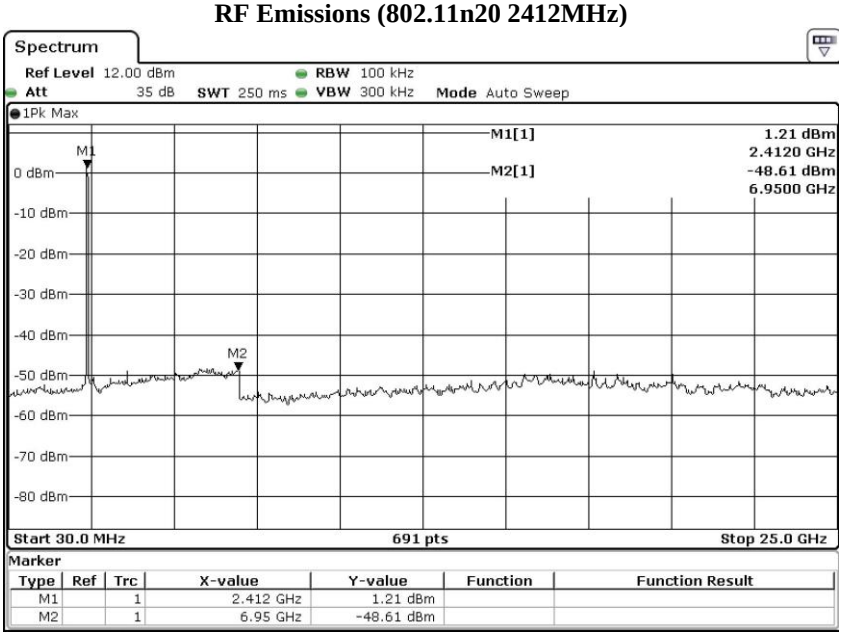
RF Emissions (802.11g 2437MHz)



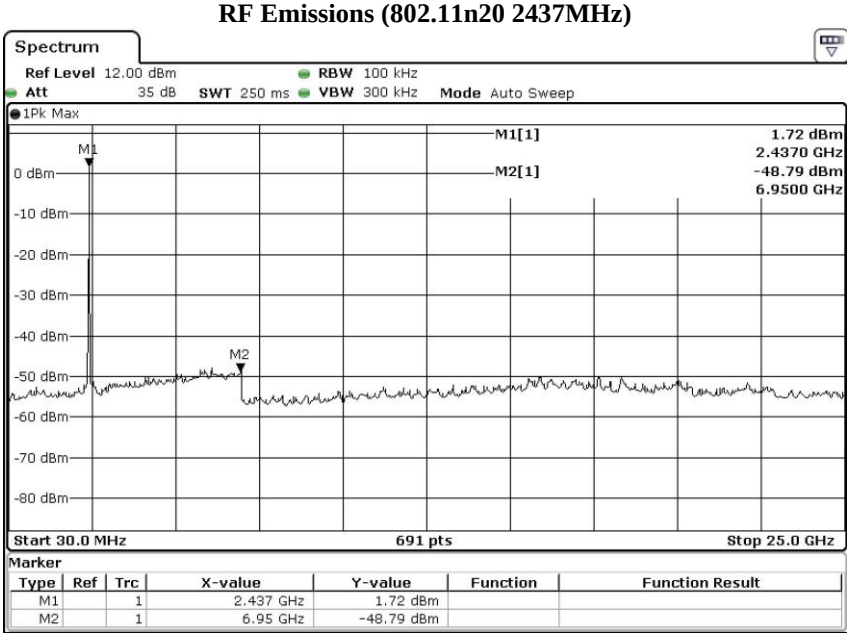
RF Emissions (802.11g 2462MHz)



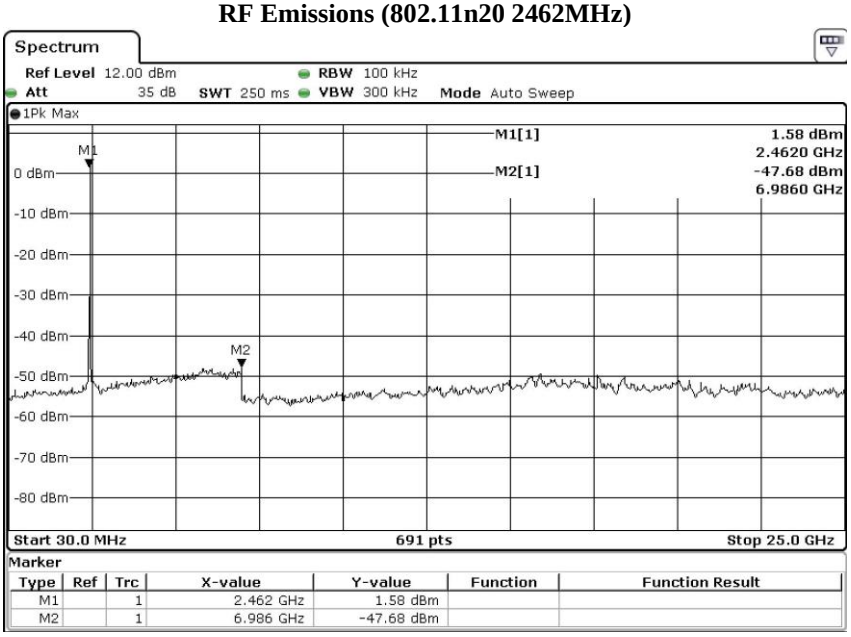
RF Emissions (802.11n20 2412MHz)



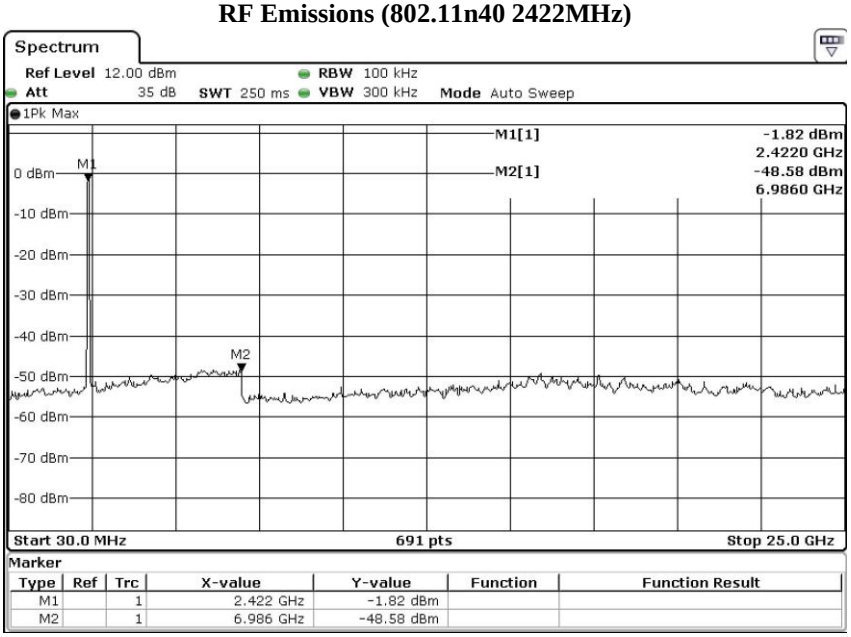
RF Emissions (802.11n20 2437MHz)



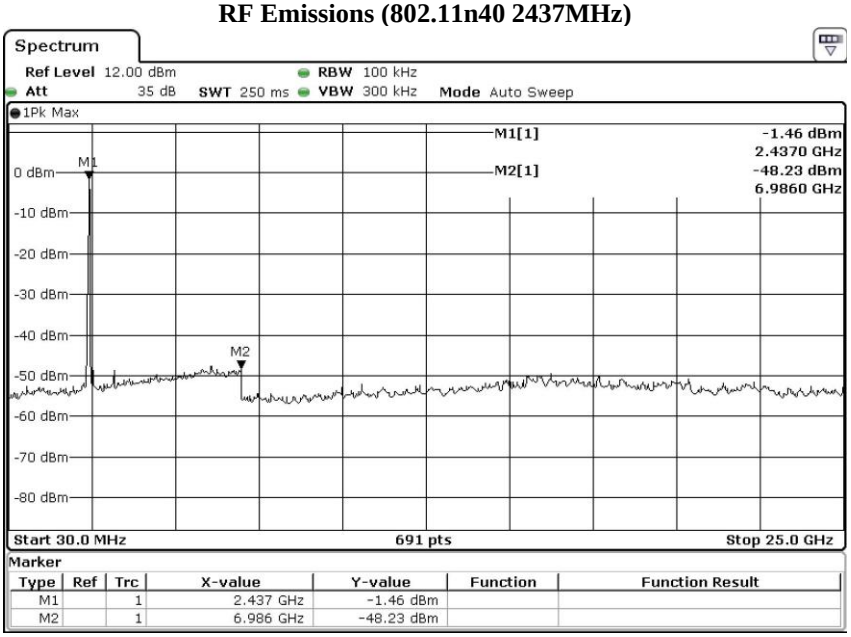
RF Emissions (802.11n20 2462MHz)



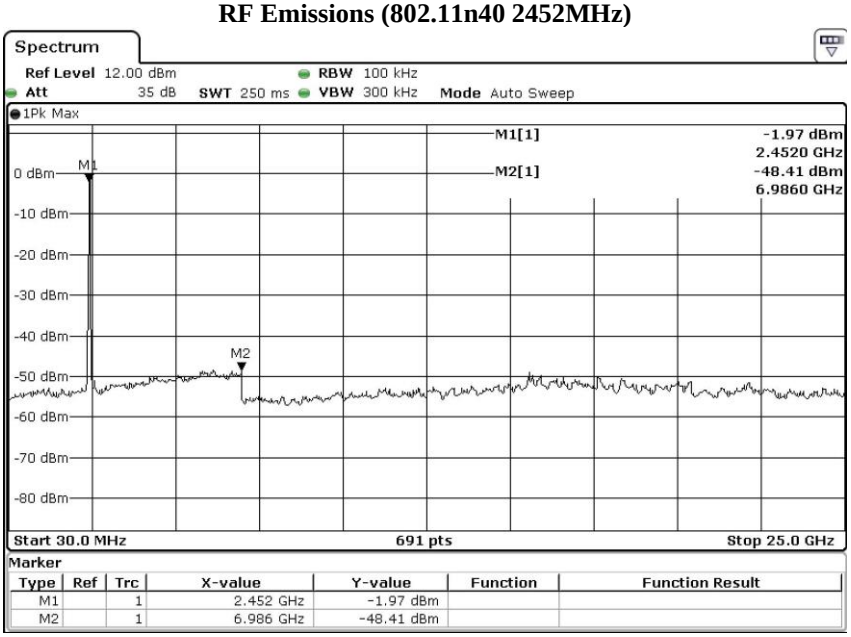
RF Emissions (802.11n40 2422MHz)



RF Emissions (802.11n40 2437MHz)



RF Emissions (802.11n40 2452MHz)



3.1.7 Antenna Requirement

Ambient Temperature: 25℃ Relative Humidity: 51% Atmospheric Pressure: 101 kPa

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 monopole antenna. There is no external antenna, the antenna gain = 2.15dBi. User is unable to remove or changed the Antenna.

Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-LINDGREN	FACT-3	--	2020/04/20	2022/04/20
EM356	ANTENNA POSITIONING TOWER	ETS-LINDGREN	2171B	00150346	N/A	N/A
EM336	PRECISION CONICAL DIPOLE	SEIBERSDORF LABORATORIES	PCD 3100	6236/M	2020/05/30	2022/05/30
EM229	EMI TEST RECEIVER	R&S	ESIB40	100248	2020/05/13	2022/05/13
EM276	BROADBAND HORN ANTENNA	A-INFOMW	JXTXLB-10180-SF	J203109090300 7	2019/03/20	2022/03/29
EM300	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-09	00130130	2020/04/28	2022/04/28
EM301	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-10	00130988	2020/04/28	2022/04/28
EM022	LOOP ANTENNA	ETS_LINDGREN	6502	00206533	2019/11/30	2022/04/28
EM355	Biconilog Antenna	ETS-Lindgren	3143B	00094856	2020/06/17	2022/06/17
EM200	DUAL CHANNEL POWER METER	R & S	NRVD	100592	2019/10/11	2022/10/11
EM012	PRE-AMPLIFIER	HP	HP8448B	3008A00262	2019/11/08	2022/11/08

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM119	LISN	R & S	ESH3-Z5	0831.5518.52	2020/06/30	2022/06/30
EM145	EMI TEST RECEIVER	R & S	ESIB7	100072	2020/05/13	2022/05/13
EM179	IMPULSE LIMITER	ROHDE & SCHWARZ	ESH3-Z2	357-8810.52/54	2020/01/13	2022/01/11
EM154	SHIELDING ROOM	SIEMENS MATSUSHITA COMPONENTS	N/A	803-740-057-99A	2017/02/02	2022/02/02
N/A	MEASUREMENT AND EVALUATION SOFTWARE	ROHDE & SCHWARZ	BSIB-K1	V1.20	N/A	N/A

Remarks:-

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

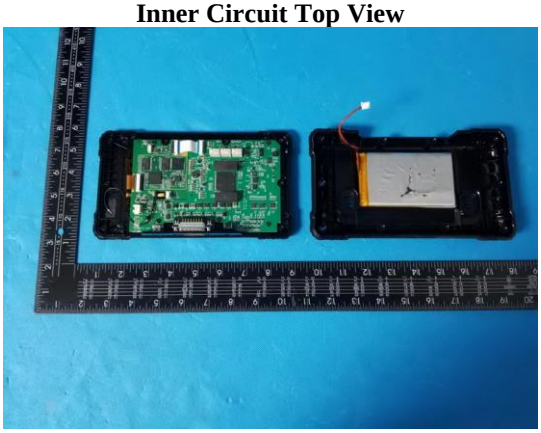
Appendix B

Photographs of EUT

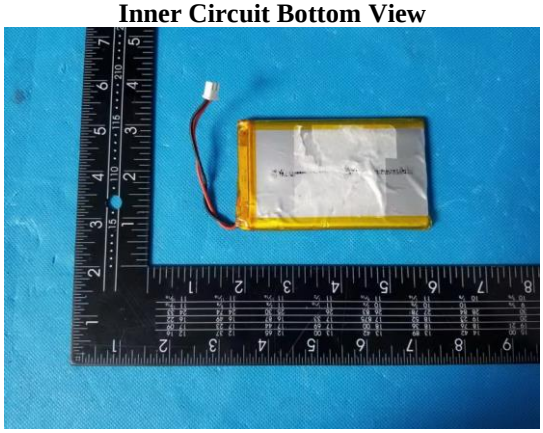
View of the product

View of the product

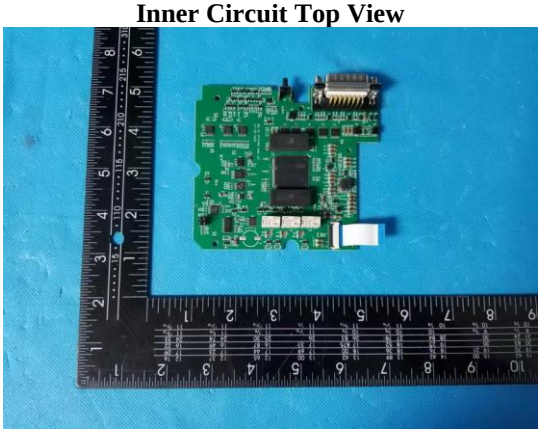
Inner Circuit Top View



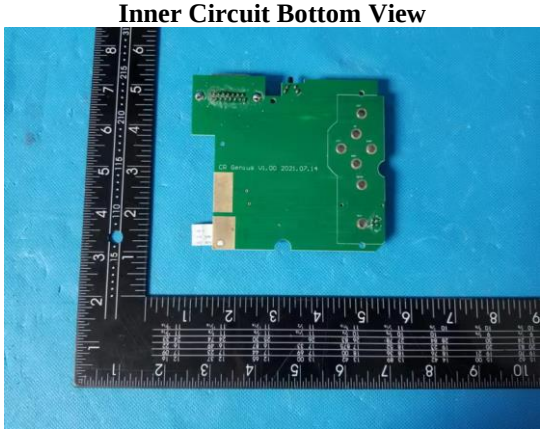
Inner Circuit Bottom View



Inner Circuit Top View

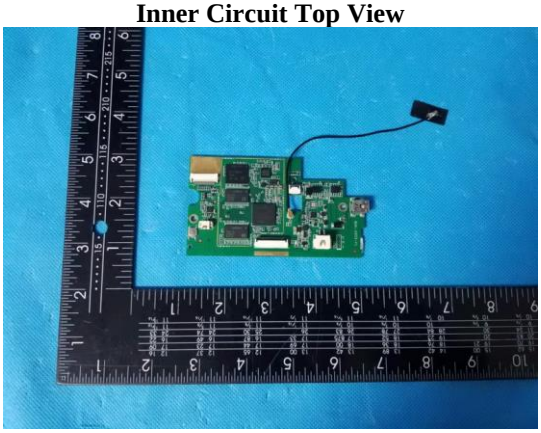


Inner Circuit Bottom View

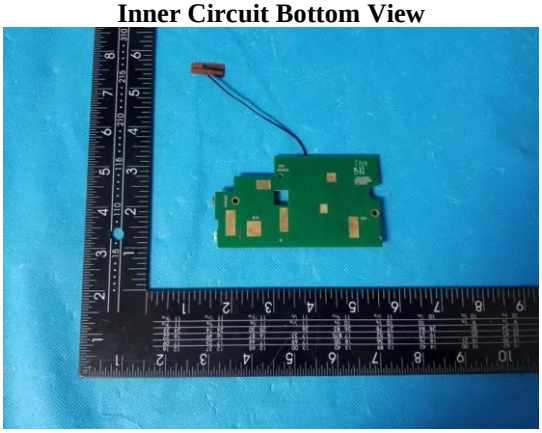


Photographs of EUT

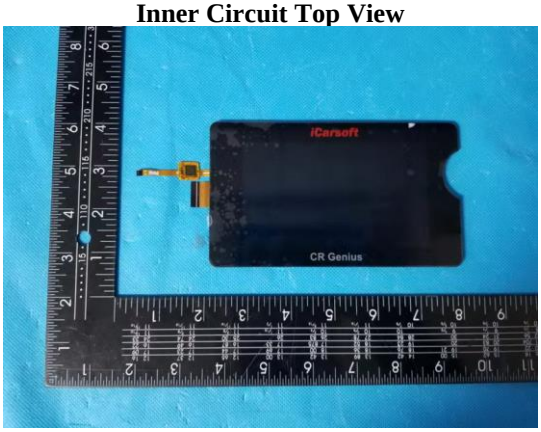
Inner Circuit Top View



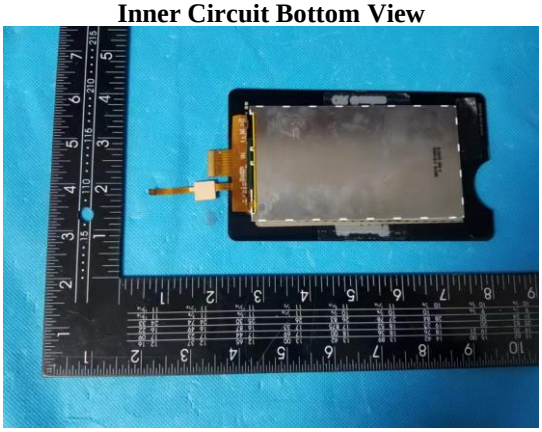
Inner Circuit Bottom View



Inner Circuit Top View

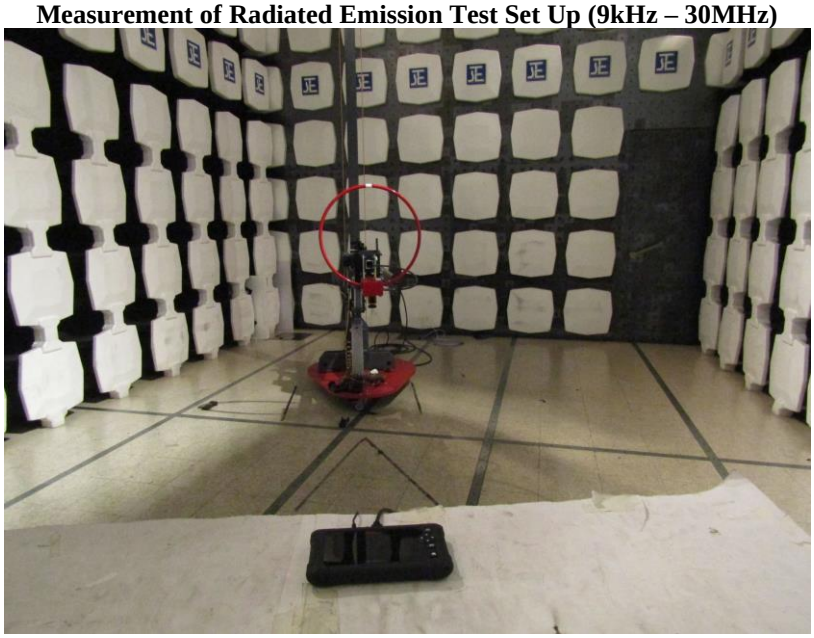


Inner Circuit Bottom View

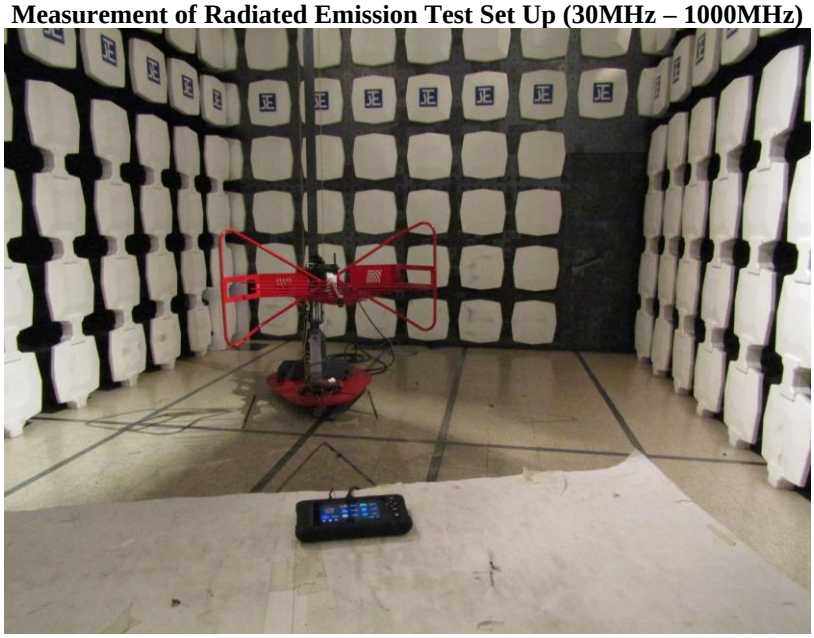


Photographs of EUT

Measurement of Radiated Emission Test Set Up (9kHz – 30MHz)

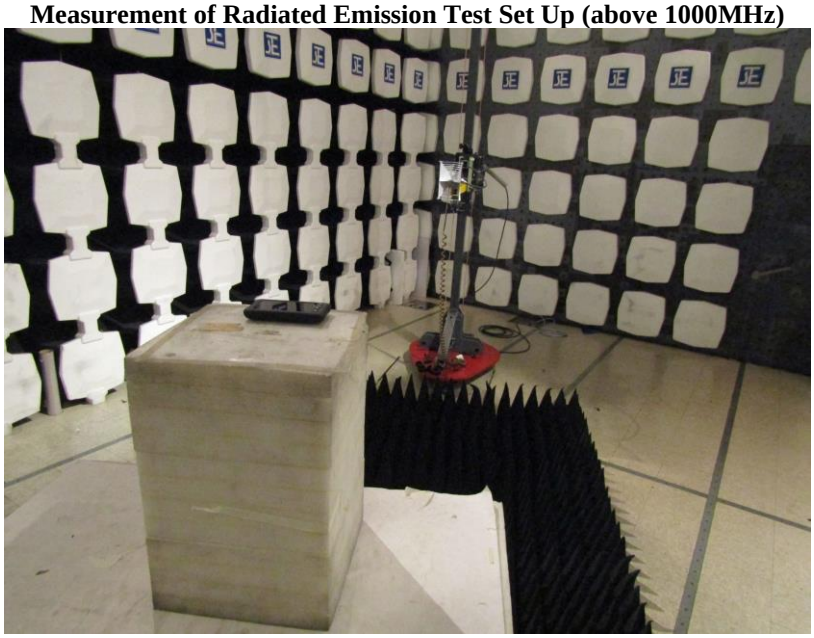


Measurement of Radiated Emission Test Set Up (30MHz – 1000MHz)

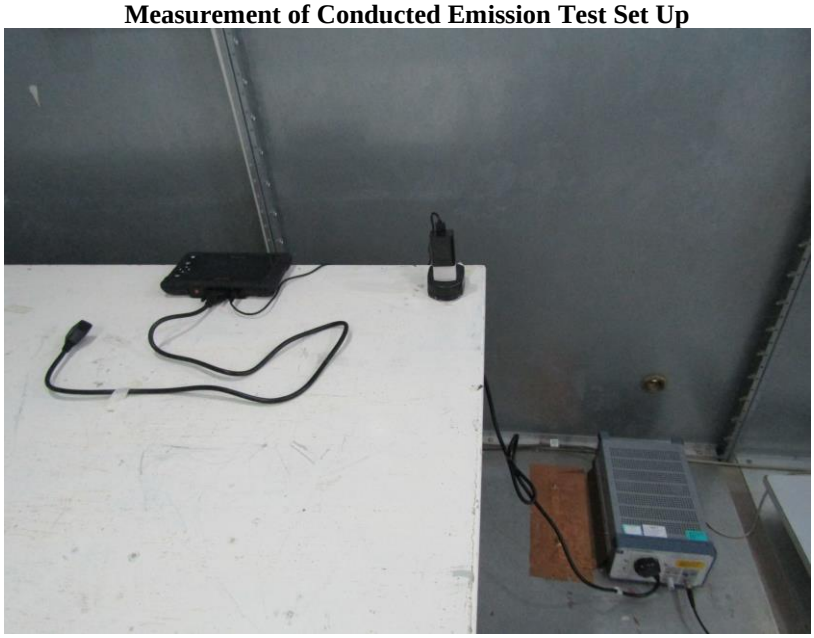


Photographs of EUT

Measurement of Radiated Emission Test Set Up (above 1000MHz)



Measurement of Conducted Emission Test Set Up



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

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2. Any report issued by the Company as a result of this application for testing service (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to his customer, supplier or other persons directly concerned. Subject to clause 3, the Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.

3. The Company shall be at liberty to disclose the testing-related documents and/or files anytime to any third-party accreditation and/or recognition bodies for audit or other related purposes. No liabilities whatsoever shall attach to the Company's act of disclosure.

4. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.

5. The results in Report apply only to the sample as received and do not apply to the bulk, unless the sampling has been carried out by the Company and is stated as such in the Report.

6. When a statement of conformity to a specification or standard is provided, the ILAC-G8 Guidance document (and/or IEC Guide 115 in the electrotechnical sector) will be adopted as a decision rule for the determination of conformity unless it is inherent in the requested specification or standard, or otherwise specified in the Report.

7. In the event of the improper use the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.

8. Sample submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.

9. The Company will not be liable for or accept responsibility for any loss or damage howsoever arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.

10. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.

11. Subject to the variable length of retention time for test data and report stored hereinto as to otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of this test report for a period of three years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after the retention period. Under no circumstances shall we be liable for damages of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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