

Cocoon Labs Ltd

TEST REPORT

SCOPE OF WORK
FCC TESTING-CS03A

REPORT NUMBER
180119008SZN-001

ISSUE DATE [REVISED DATE]

19 March 2018 [-----]

PAGES
90

DOCUMENT CONTROL NUMBER
FCC ID 247_b
© 2017 INTERTEK



Cocoon Labs Ltd

Application
For
Certification

FCC ID: 2AENXCS03A

Security camera

Model: CS03A

2.4GHz Wi-Fi Transceiver

Report No.: 180119008SZN-001

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-16]

Prepared and Checked by:

Damon Wang
Engineer

Approved by:

Kidd Yang
Technical Supervisor
Date: 19 March 2018

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

Intertek Testing Service Shenzhen Ltd. Longhua Branch

1F/2F, Building B, QiaoAn Scientific Technology Park, Shangkeng Community, Guanhua Subdistrict, Longhua District, Shenzhen, P.R. China.
Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751

LIST OF EXHIBITS

INTRODUCTION

<i>EXHIBIT 1:</i>	Summary of Tests
<i>EXHIBIT 2:</i>	General Description
<i>EXHIBIT 3:</i>	System Test Configuration
<i>EXHIBIT 4:</i>	Measurement Results
<i>EXHIBIT 5:</i>	Equipment Photographs
<i>EXHIBIT 6:</i>	Product Labeling
<i>EXHIBIT 7:</i>	Technical Specifications
<i>EXHIBIT 8:</i>	Instruction Manual
<i>EXHIBIT 9:</i>	Confidentiality Request
<i>EXHIBIT 10:</i>	Miscellaneous Information
<i>EXHIBIT 11:</i>	Test Equipment List

MEASUREMENT/TECHNICAL REPORT**Security camera****Model: CS03A****FCC ID: 2AENXCS03A**

This report concerns (check one) Original Grant Class II Change

Equipment Type: DTS - Part 15 Digital Transmission Systems (Wi-Fi transmitter portion)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes No

If yes, defer until : _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes No

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-16] Edition] provision.

Report prepared by:

Damon Wang
Intertek Testing Services Shenzhen Ltd.
Longhua Branch
1F/2F, Building B, QiaoAn Scientific Technology
Park, Shangkeng Community, Guanhu Subdistrict,
Longhua District, Shenzhen, P.R. China
Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751

Table of Contents

1.0	<u>Summary of Test results</u>	7
2.0	<u>General Description</u>	9
2.1	Product Description	9
2.2	Related Submittal(s) Grants	9
2.3	Test Methodology.....	9
2.4	Test Facility.....	9
3.0	<u>System Test Configuration</u>	11
3.1	Justification	11
3.2	EUT Exercising Software	11
3.3	Special Accessories	12
3.4	Measurement Uncertainty	12
3.5	Equipment Modification	12
3.6	Support Equipment List and Description	12
4.0	<u>Measurement Results</u>	14
4.1	Maximum Conducted Output Power at Antenna Terminals.....	14
4.2	Minimum 6 dB RF Bandwidth.....	16
4.3	Maximum Power Density Reading	25
4.4	Out of Band Conducted Emissions.....	34
4.5	Out of Band Radiated Emissions.....	55
4.6	Transmitter Radiated Emissions in Restricted Bands	56
4.7	Field Strength Calculation	57
4.8	Radiated Spurious Emission	58
4.9	Conducted Emission	72
4.10	Radiated Emissions from Digital Section of Transceiver.....	75
4.11	Transmitter Duty Cycle Calculation and Measurements	76
5.0	<u>Equipment Photographs</u>	78
6.0	<u>Product Labelling</u>	80
7.0	<u>Technical Specifications</u>	82
8.0	<u>Instruction Manual</u>	84
9.0	<u>Confidentiality Request</u>	86
10.0	<u>Discussion of Pulse Desensitization</u>	88
11.0	<u>Test Equipment List</u>	90

List of attached file

Exhibit type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Conducted Emission	conducted photos.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
Operation Description	Technical Description	descri.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Confidentiality Letter	request.pdf
Cover Letter	Letter of Agency	agency.pdf

EXHIBIT 1**SUMMARY OF TEST RESULTS**

1.0 Summary of Test results**Security camera****Model: CS03A****FCC ID: 2AENXCS03A**

TEST ITEM	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d)	Pass
Conducted Emission at Mains Terminal	15.207	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.



Total Quality. Assured.

TEST REPORT

Intertek Report No.: 180119008SZN-001

EXHIBIT 2

GENERAL DESCRIPTION

2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a Security camera with Wi-Fi function operating at 2412-2462MHz for 802.11b/g/n-HT20, 11 channels with 5MHz channel spacing and 2422-2452MHz for 802.11n-HT40, 9 channels with 5MHz channel spacing. The EUT is powered by AC adaptor through AC120V/60Hz. For more detailed features description, please refer to the user's manual.

Type of Modulation: BPSK, QPSK, 16QAM, 64QAM for OFDM. CCK, DQPSK, DBPSK for DSSS.

Antenna Type: Integral Antenna

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of:

DTS- Part 15 Digital Transmission Systems (2.4GHz Wi-Fi transmitter portion).

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013) and KDB 558074 D01 v04. Radiated emission measurement was performed in Semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The Semi-Anechoic chamber and shield room used to collect the radiated data and conducted data are Intertek **Testing Services Shenzhen Ltd. Longhua Branch** and located at 1F/2F, Building B, QiaoAn Scientific Technology Park, Shangkeng Community, Guanhu Subdistrict, Longhua District, Shenzhen, P.R. China. This test facility and site measurement data have been fully placed on file with File Number: CN1188.



Total Quality. Assured.

TEST REPORT

Intertek Report No.: 180119008SZN-001

EXHIBIT 3

SYSTEM TEST CONFIGURATION

3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by AC adaptor through AC120V/60Hz during the test. Only the worst case mode is shown in the report.

On 802.11b/g/n-HT20/n-HT40 mode, only one antenna is used, and all data rate were tested and only the worst case data is shown in the report.

For maximizing emissions, the EUT was rotated through 360°, the EUT was placed on the styrene turntable with 0.8m up to 1GHz and 1.5 m above 1GHz. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

The rear of unit shall be flushed with the rear of the table.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

3.2 EUT Exercising Software

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

The parameters of test software setting:

During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

3.3 Special Accessories

N/A.

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

3.5 Equipment Modification

Any modifications installed previous to testing by Cocoon Labs Ltd will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Longhua Branch.

3.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

Description	Manufacturer	Detail
Adapter	COCOON	Model: SAW06D-050-0800UD Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5V 800mA



Total Quality. Assured.

TEST REPORT

Intertek Report No.: 180119008SZN-001

EXHIBIT 4

MEASUREMENT RESULTS

Applicant: Cocoon Labs Ltd
Date of Test: March 09, 2018

Model: CS03A

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter have a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals with cable loss added.

For antennas with gains of 6 dBi or less, maximum allowed Transmitter output is 1 watt (+30 dBm).

IEEE 802.11b (Antenna Gain = 1.58dBi) (CCK, 1Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	15.15	32.73
Middle Channel: 2437	15.49	35.40
High Channel: 2462	15.07	32.14

IEEE 802.11g (Antenna Gain = 1.58dBi) (16QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	19.54	89.95
Middle Channel: 2437	19.38	86.70
High Channel: 2462	18.99	79.25

IEEE 802.11n-HT20 (Antenna Gain = 1.58dBi) (64QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	18.26	66.99
Middle Channel: 2437	18.50	70.79
High Channel: 2462	18.11	64.71

IEEE 802.11n-HT40 (Antenna Gain = 1.58dBi) (64QAM, 13.5Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2422	18.19	65.92
Middle Channel: 2437	18.26	66.99
High Channel: 2452	17.98	62.81

Cable loss: 1.0 dB External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT max. output level = 19.54 dBm

EUT max. E.I.R.P = 19.54dBm + 1.58dBi = 21.12dBm = 129.42mW

For RF Exposure, the information is saved with filename: RF exposure.pdf.

Applicant: Cocoon Labs Ltd
Date of Test: March 09, 2018

Model: CS03A

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a) (2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074 D01 v04. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Limit: The 6 dB Bandwidth is at least 500 kHz.

IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	10.072
2437	10.072
2462	10.072

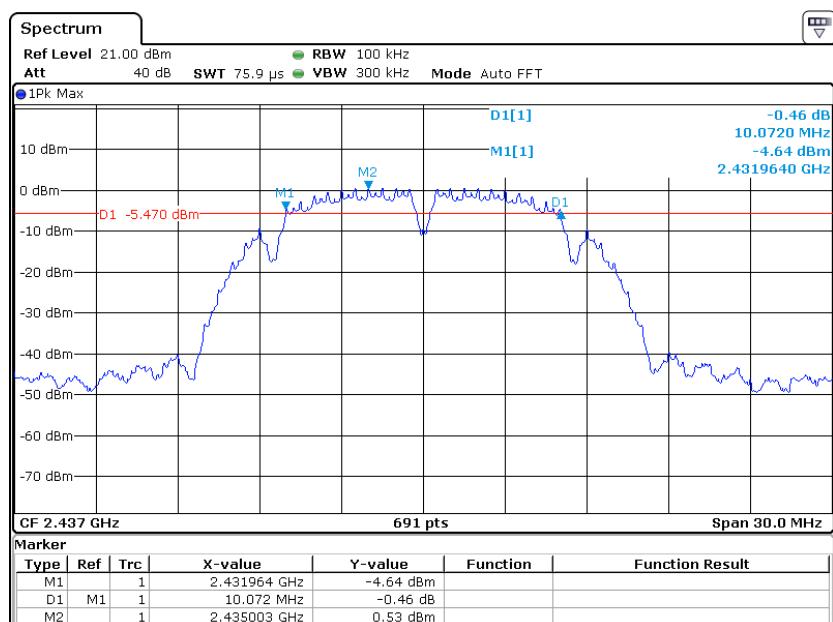
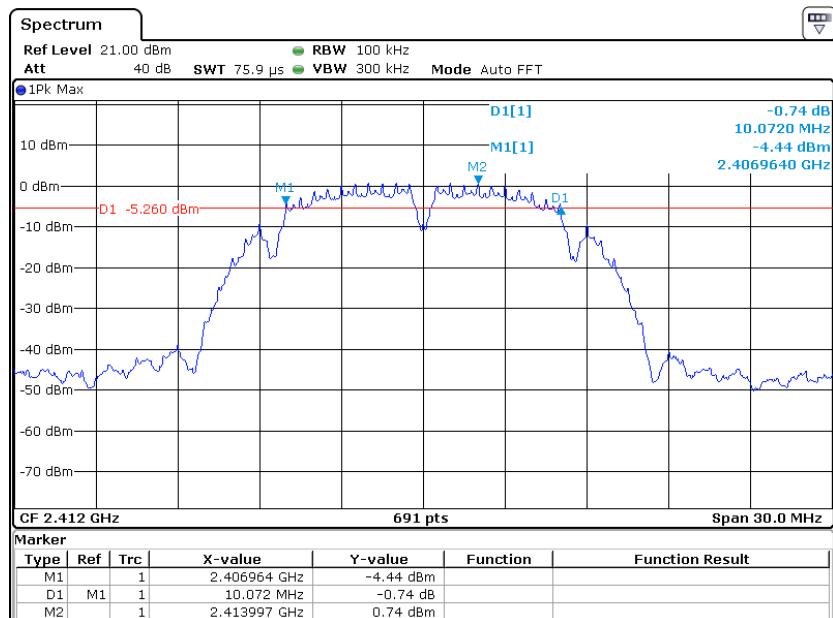
IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	16.382
2437	16.382
2462	16.382

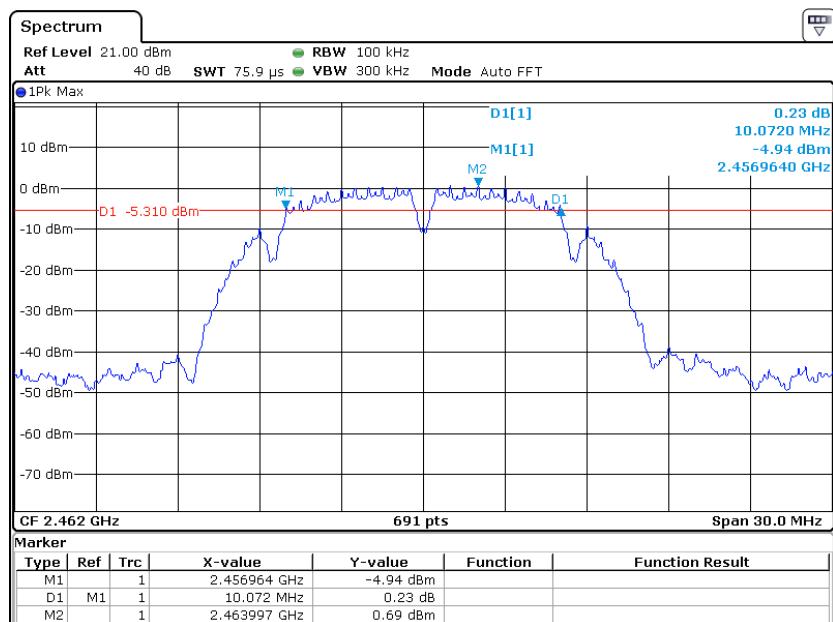
IEEE 802.11n-HT20 (64QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	17.250
2437	17.250
2462	17.250

IEEE 802.11n-HT40 (64QAM, 13.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2422	35.514
2437	35.601
2452	35.514

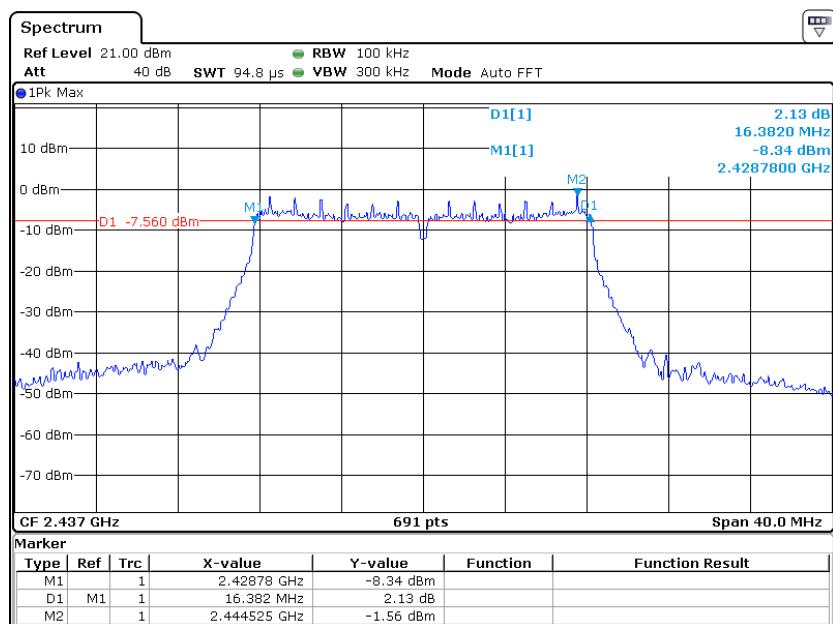
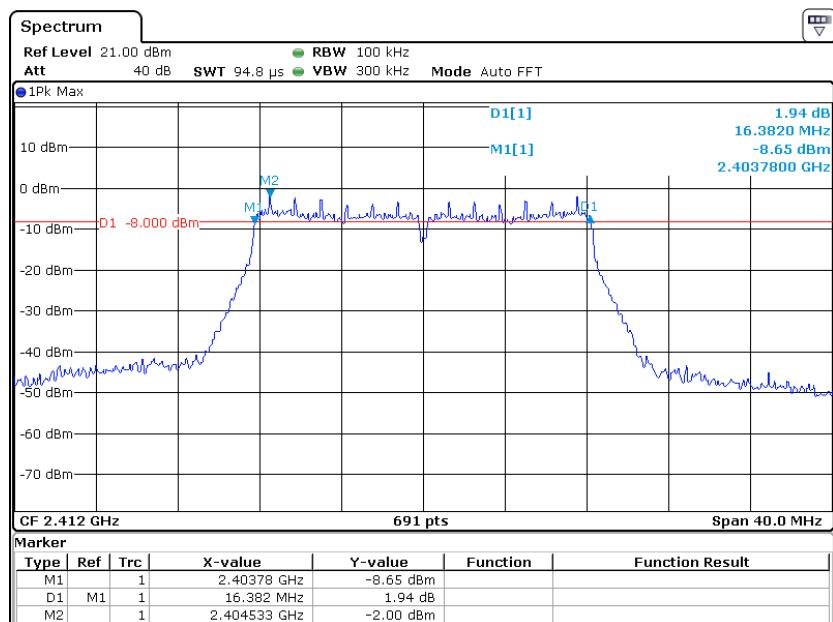
The test plots are attached as below.

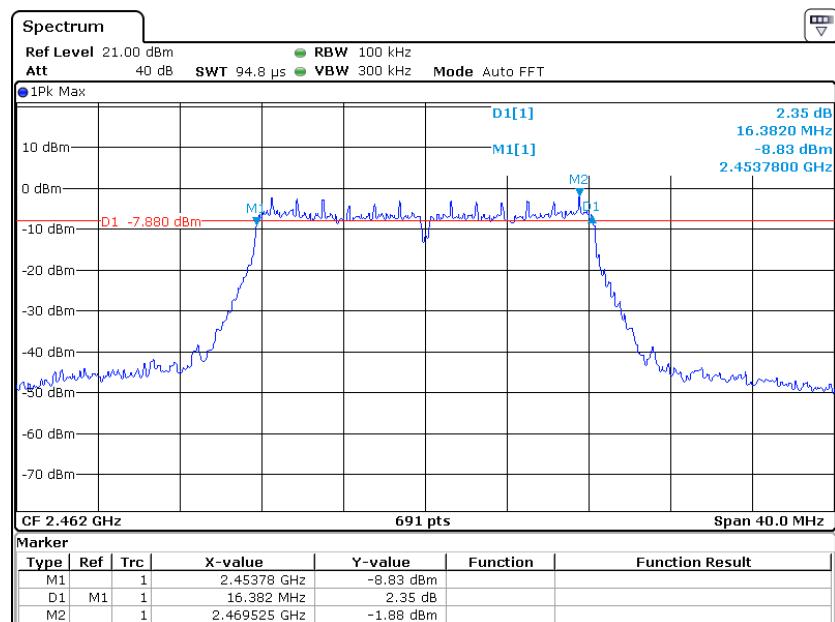
802.11b



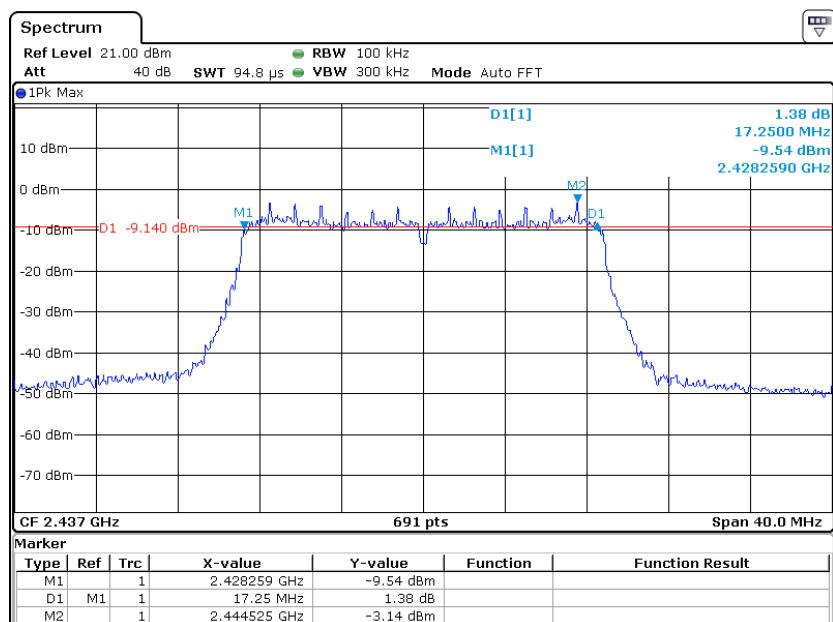
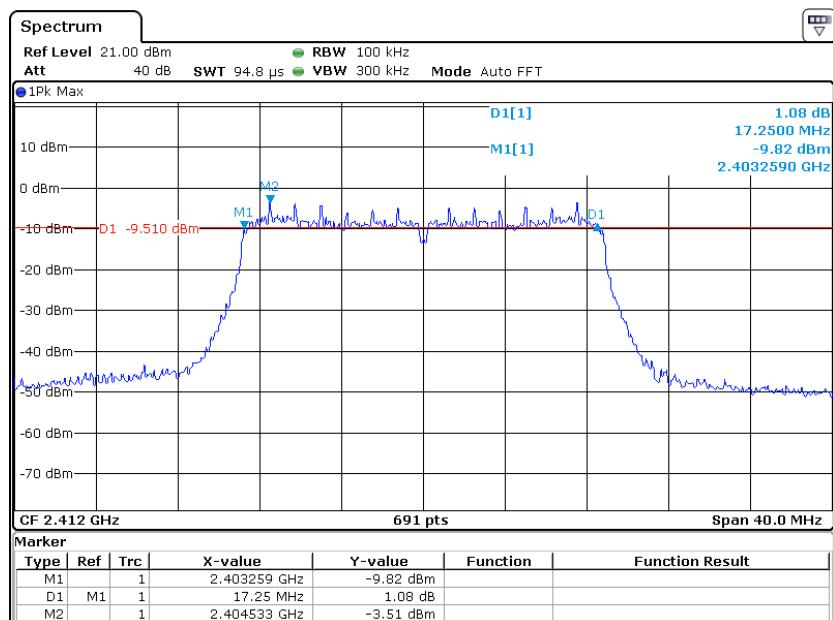


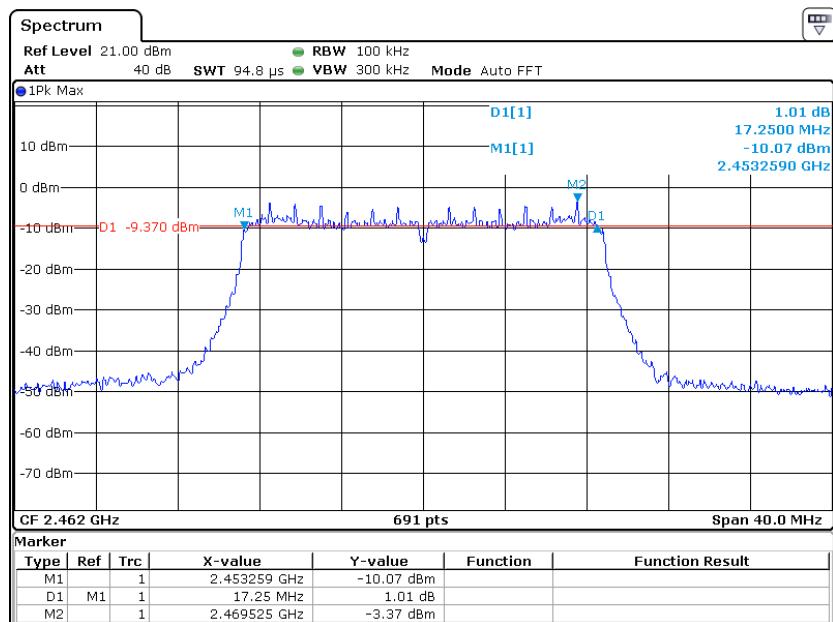
802.11g



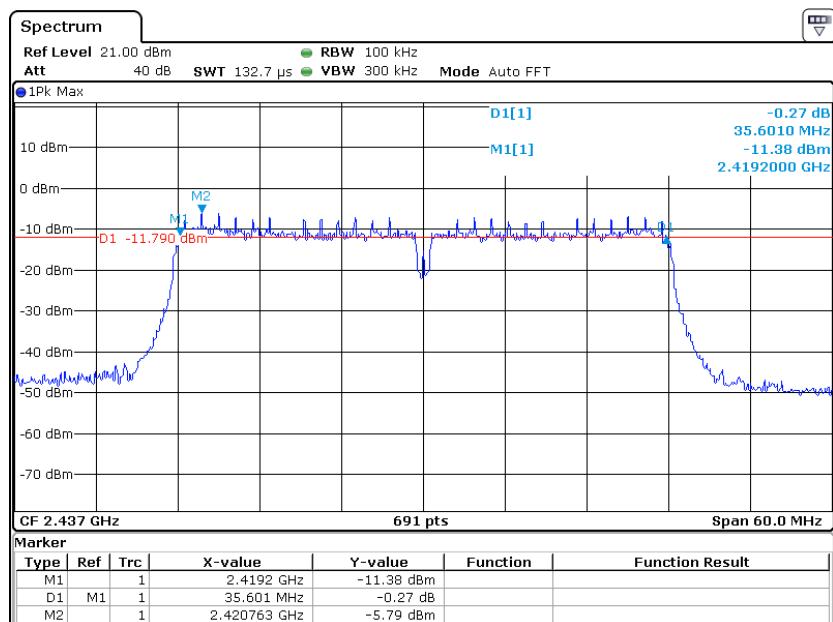
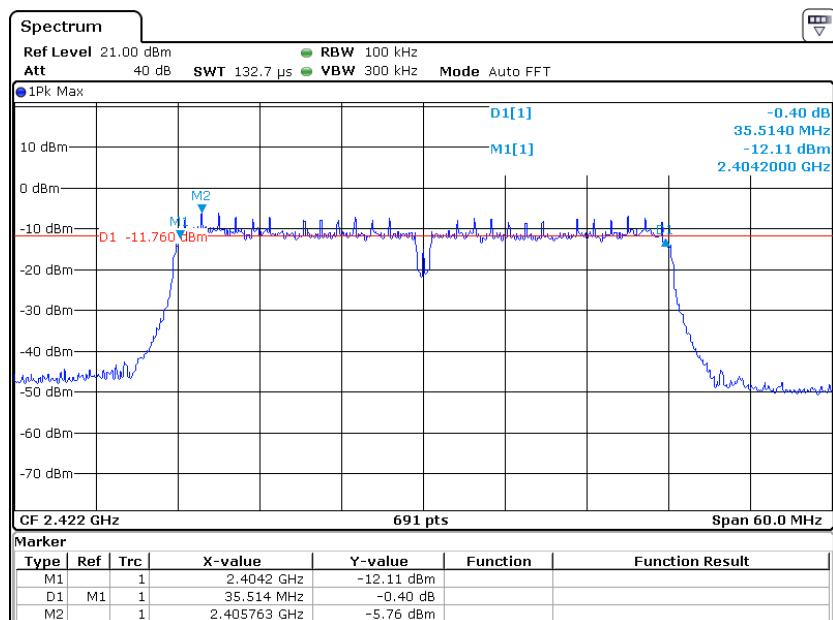


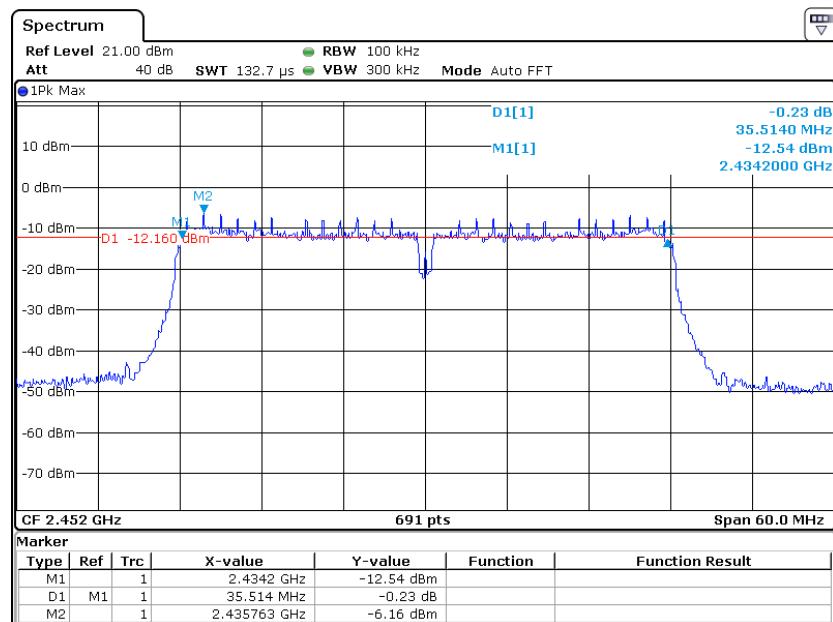
802.11n-HT20





802.11n-HT40





Applicant: Cocoon Labs Ltd
Date of Test: March 09, 2018

Model: CS03A

4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

The Measurement Procedure PKPSD was set according to the FCC KDB 558074 D01 v04.

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

Limit: The Power Density does not exceed 8dBm/3 kHz.

IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	0.19
2437	0.55
2462	0.22

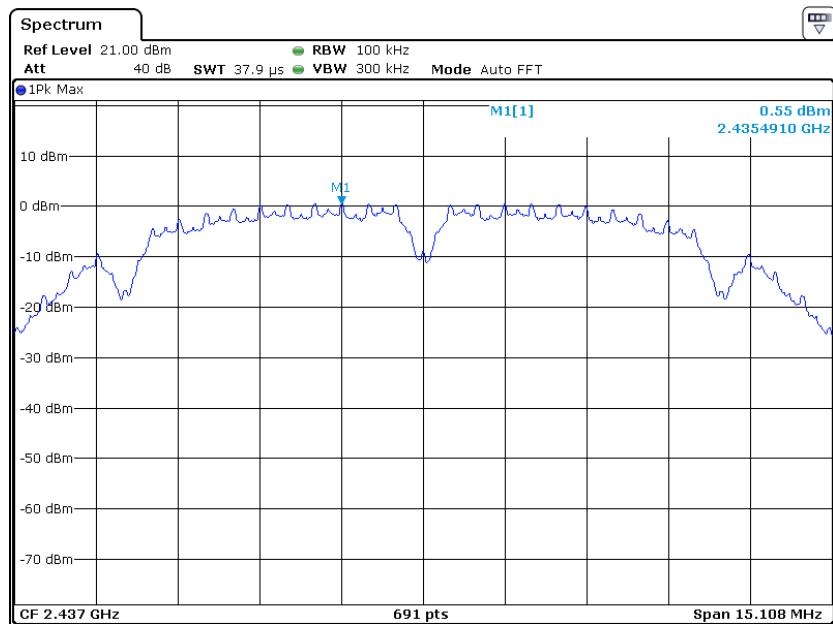
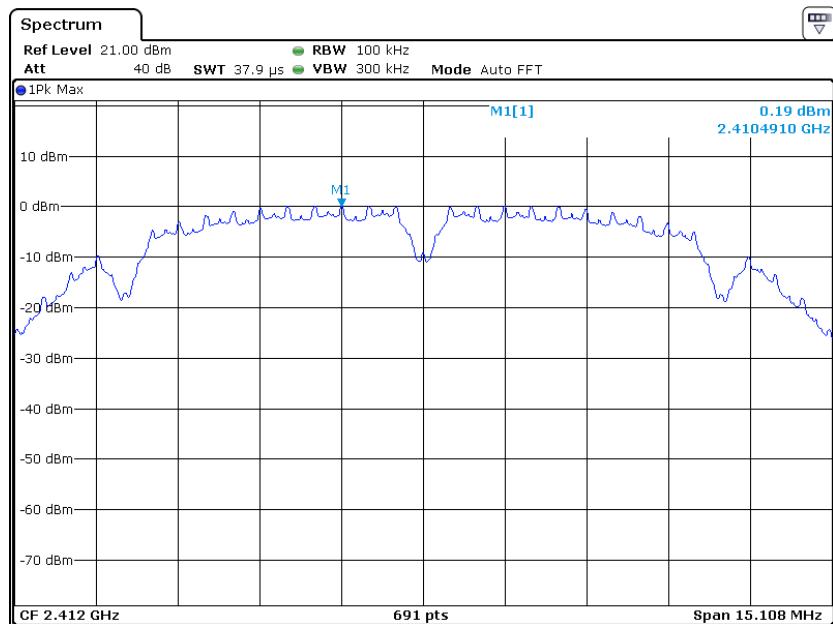
IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	-2.09
2437	-1.63
2462	-1.87

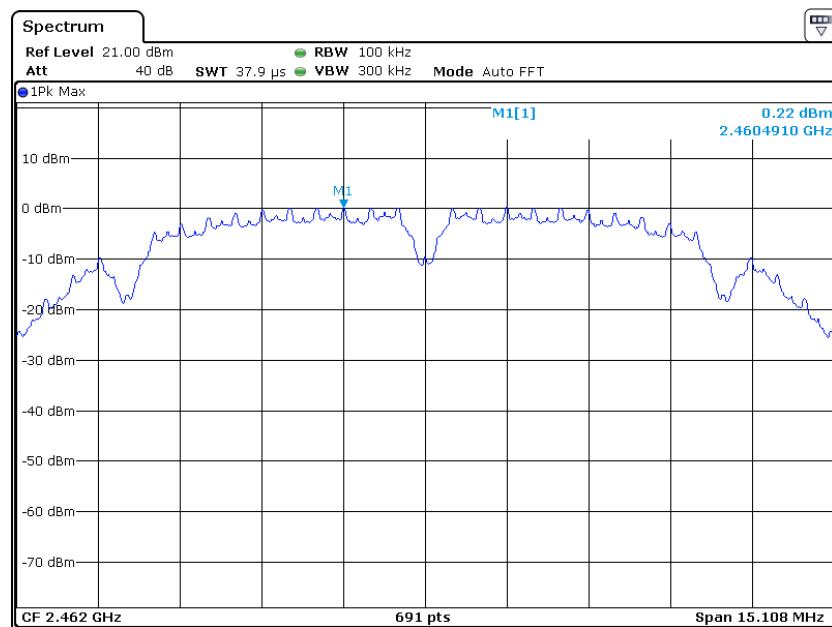
IEEE 802.11n-HT20 (64QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	-3.53
2437	-3.16
2462	-3.41

IEEE 802.11n-HT20 (64QAM, 13.5Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2422	-6.53
2437	-5.75
2452	-6.19

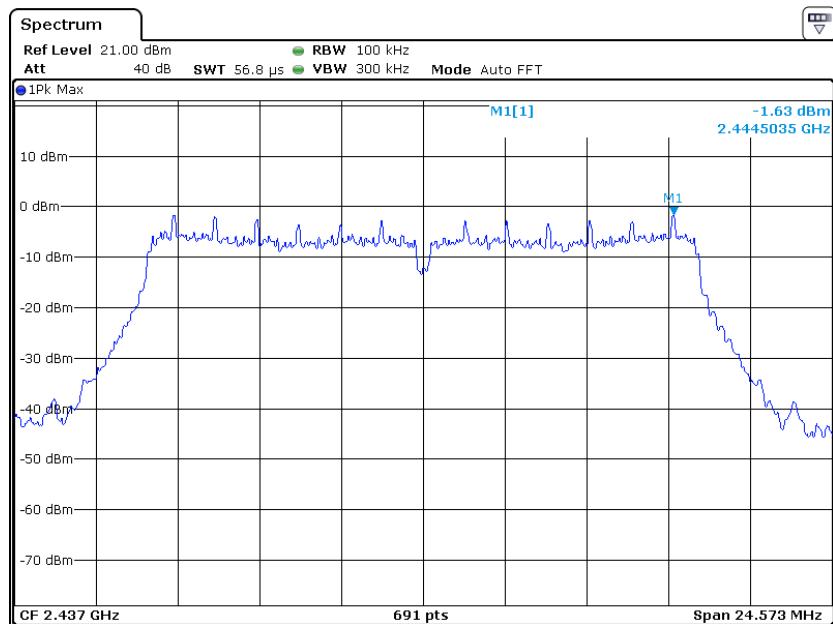
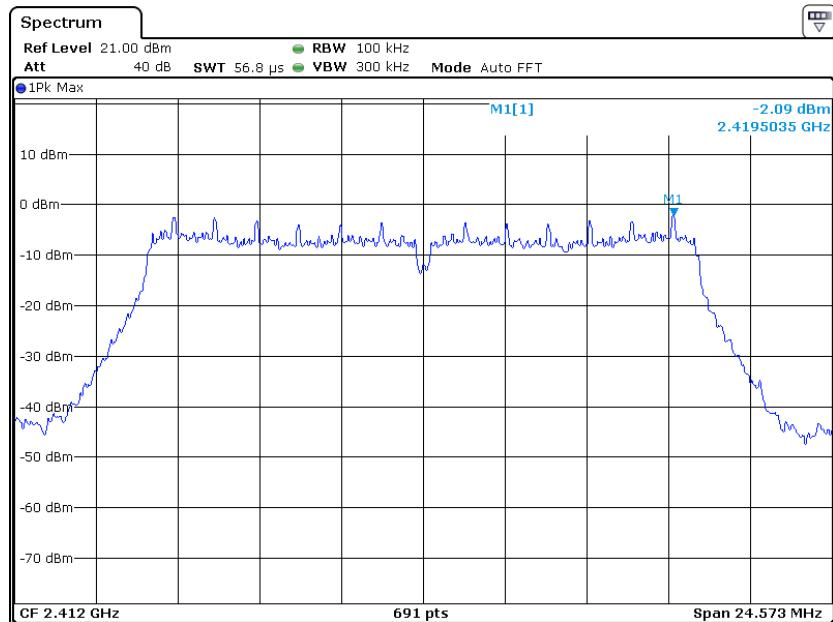
The test plots are attached as below.

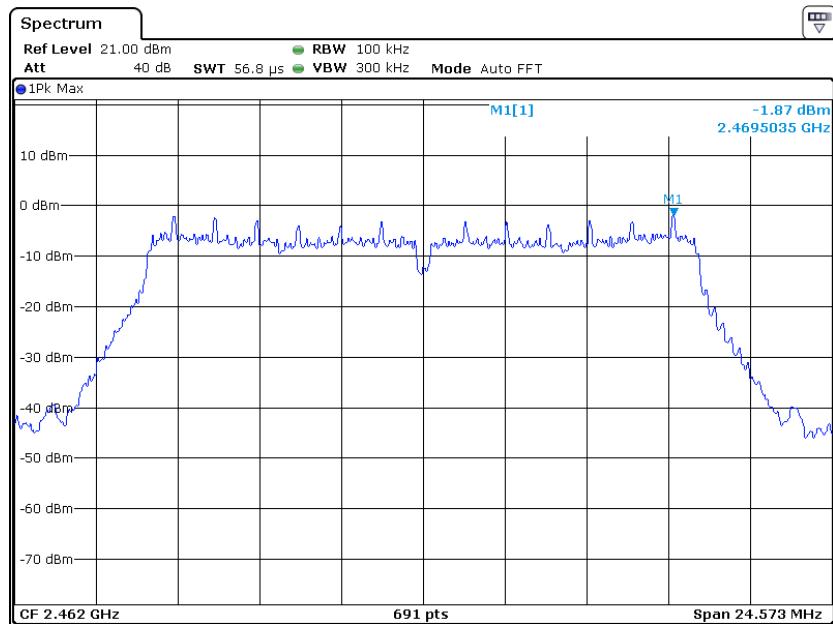
802.11b



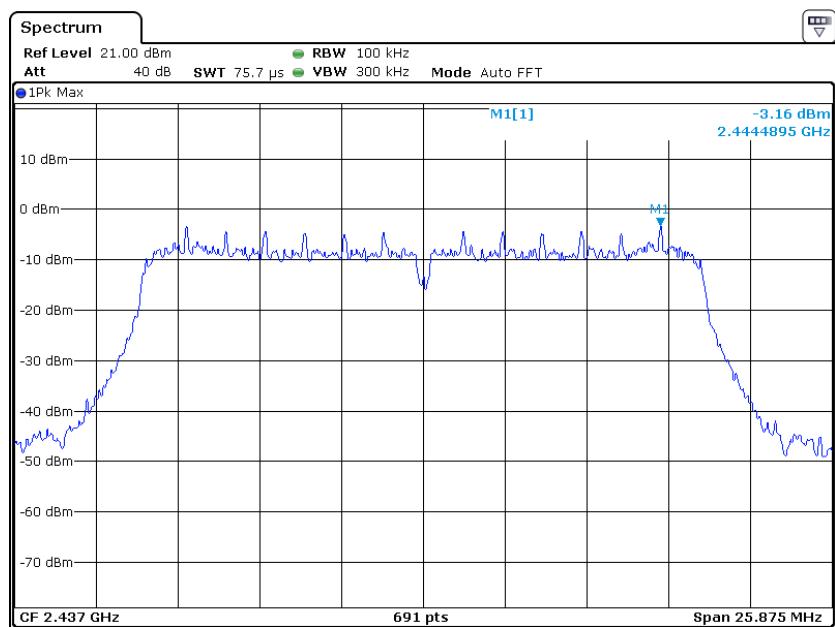
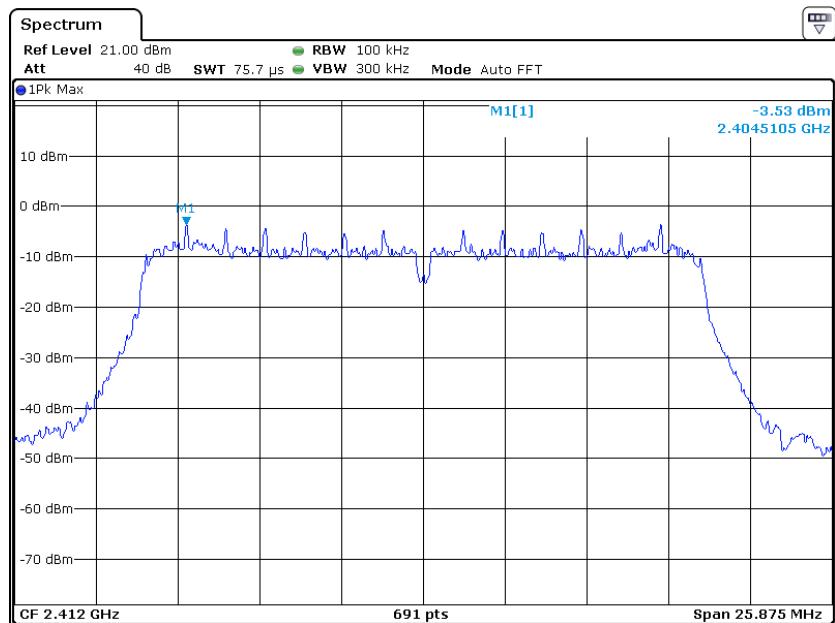


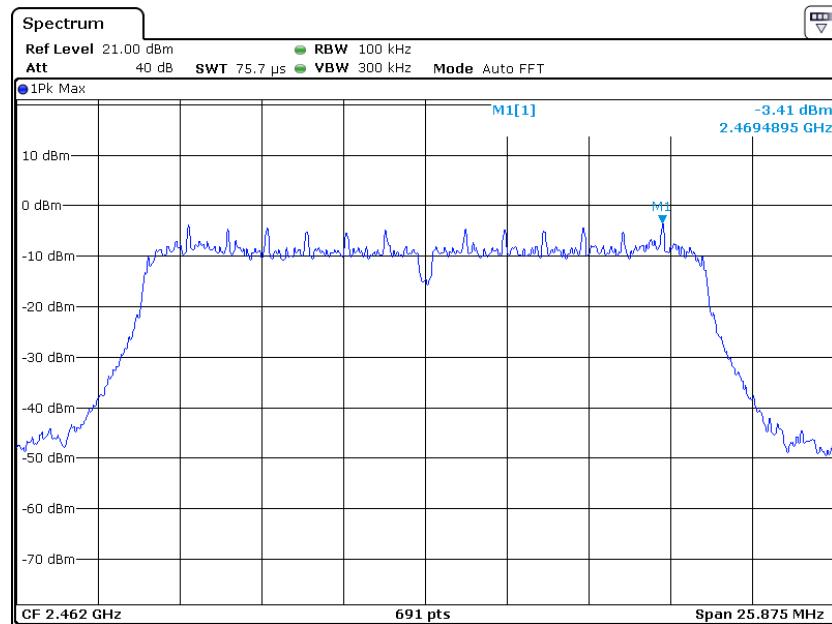
802.11g



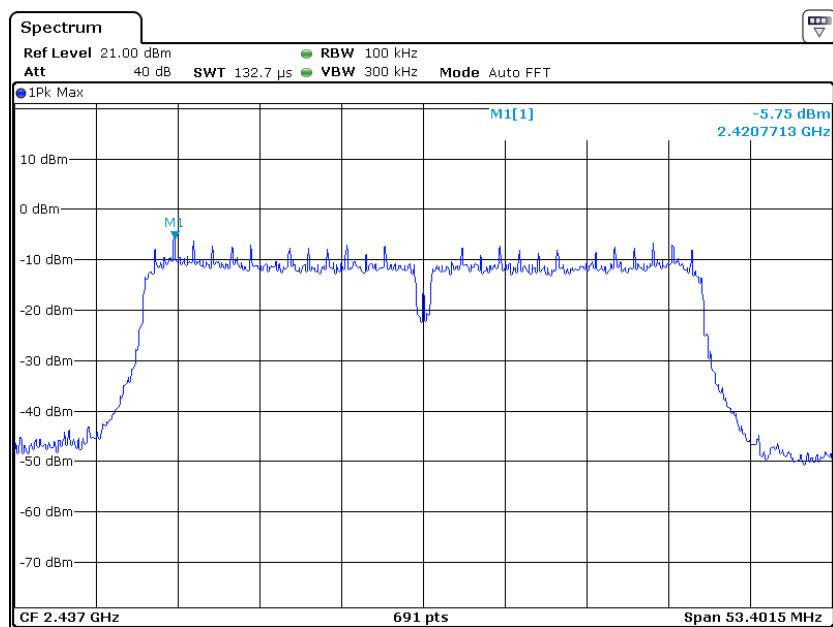
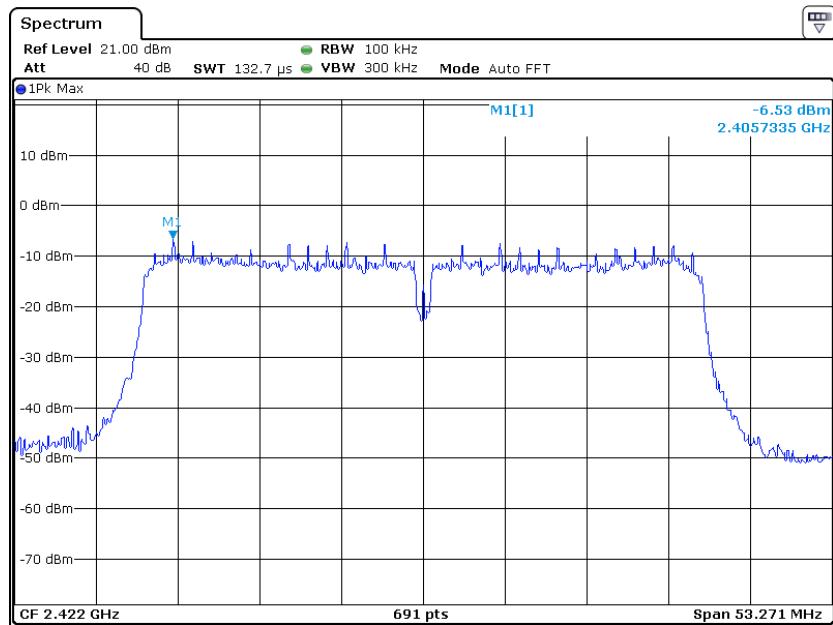


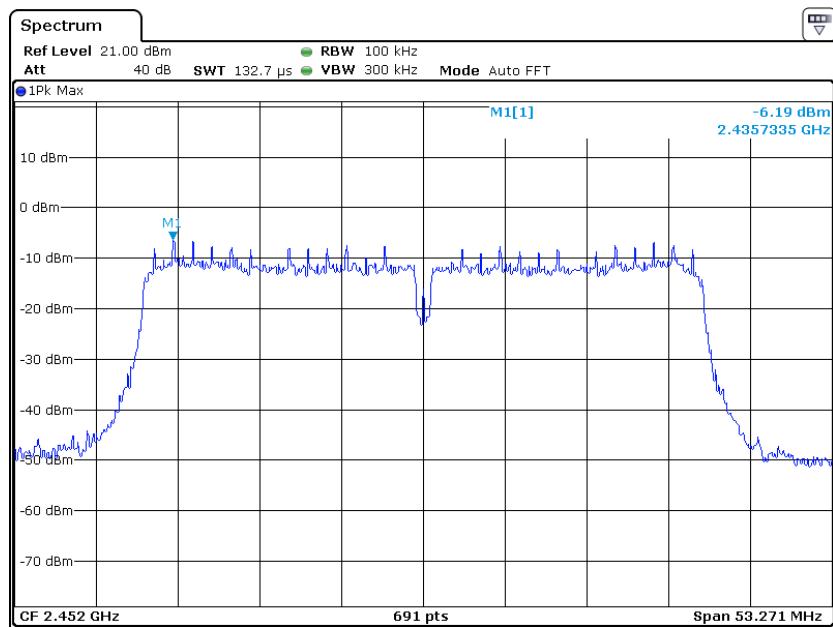
802.11n-HT20





802.11n-HT40





Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d)

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. The Measurement Procedure was set according to the FCC KDB 558074 D01 v04.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

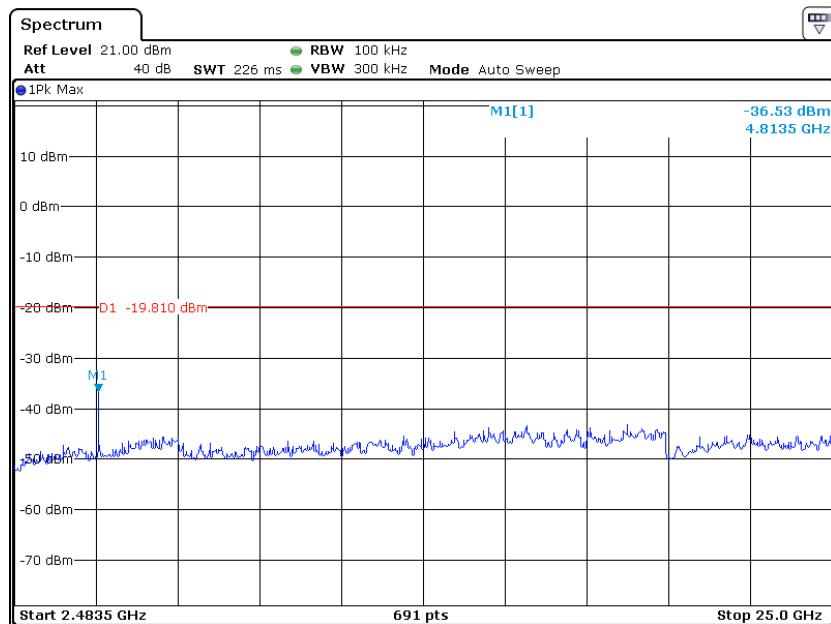
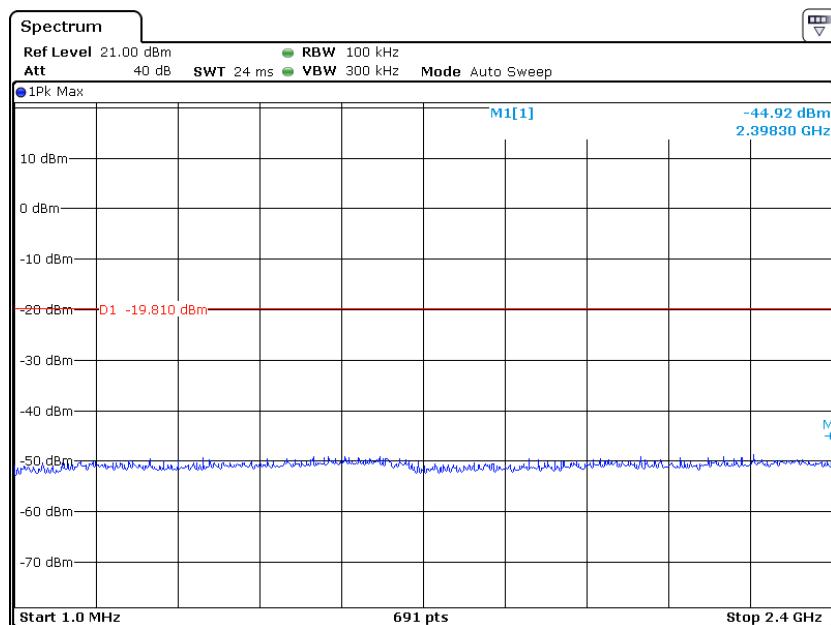
Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for 802.11b and 6Mbps for 802.11g and 6Mbps for 802.11n-HT20 and 13.5 Mbps for 802.11n-HT40.

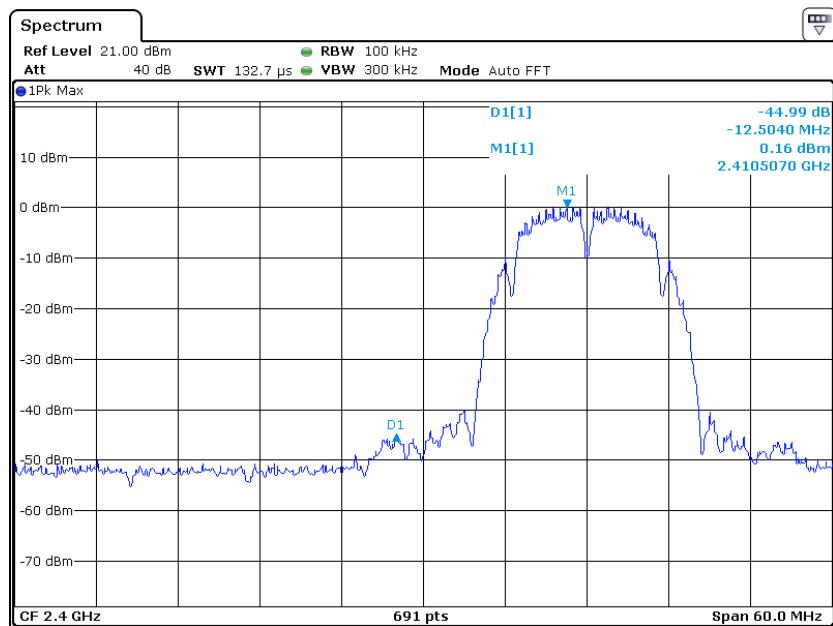
The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

The test plots are attached as below.

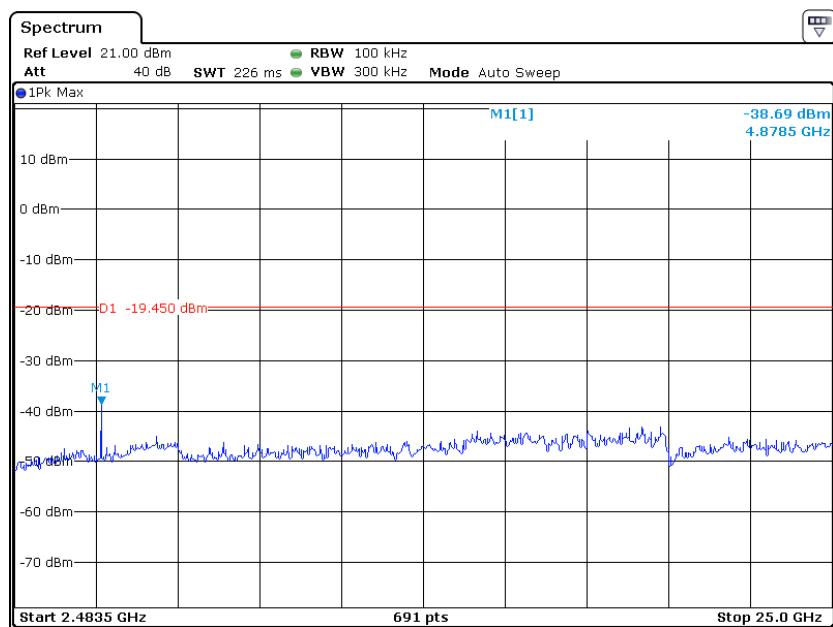
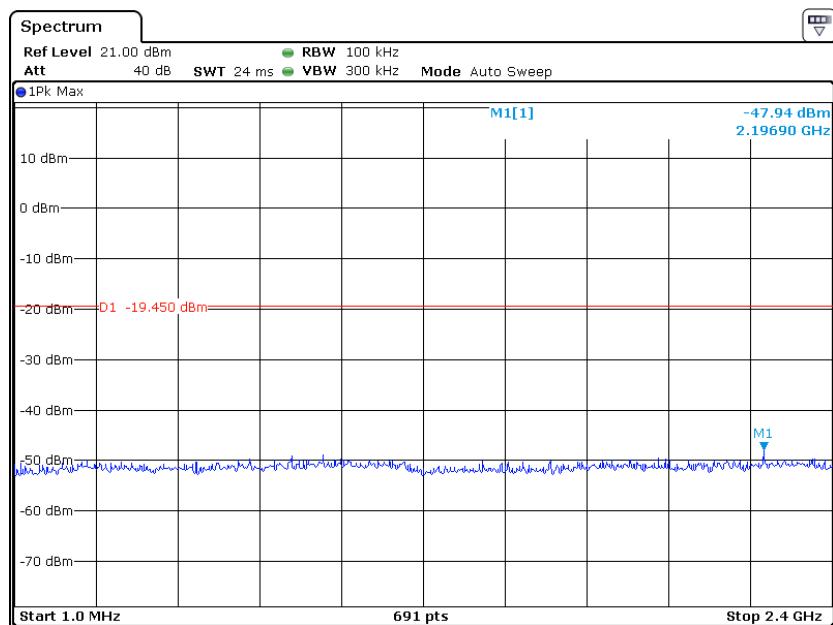
802.11b

Channel 01 (2412MHz) Reference Level: 0.19dBm

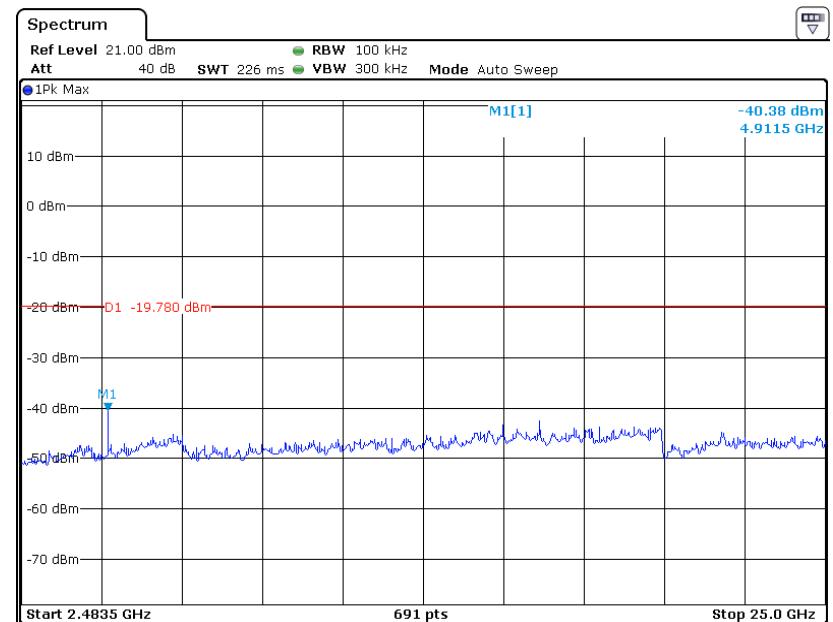
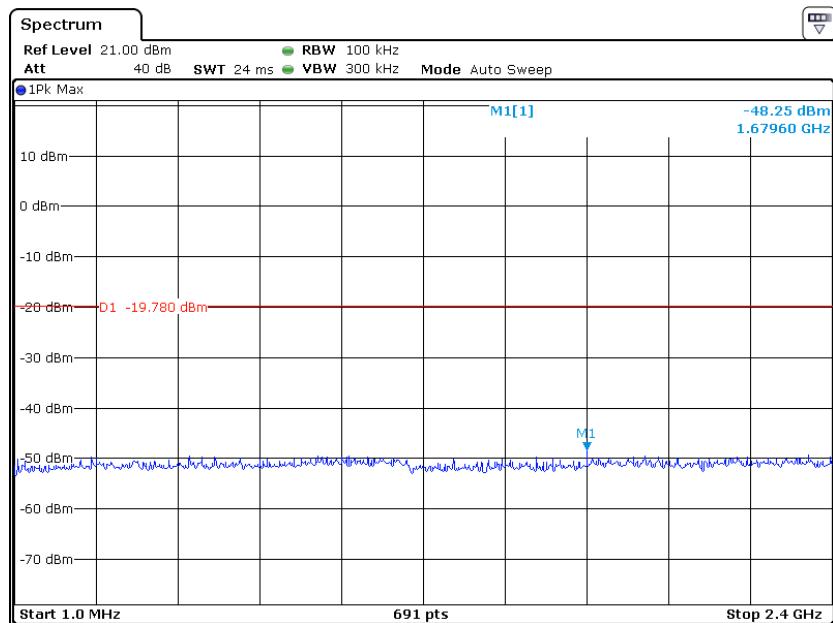


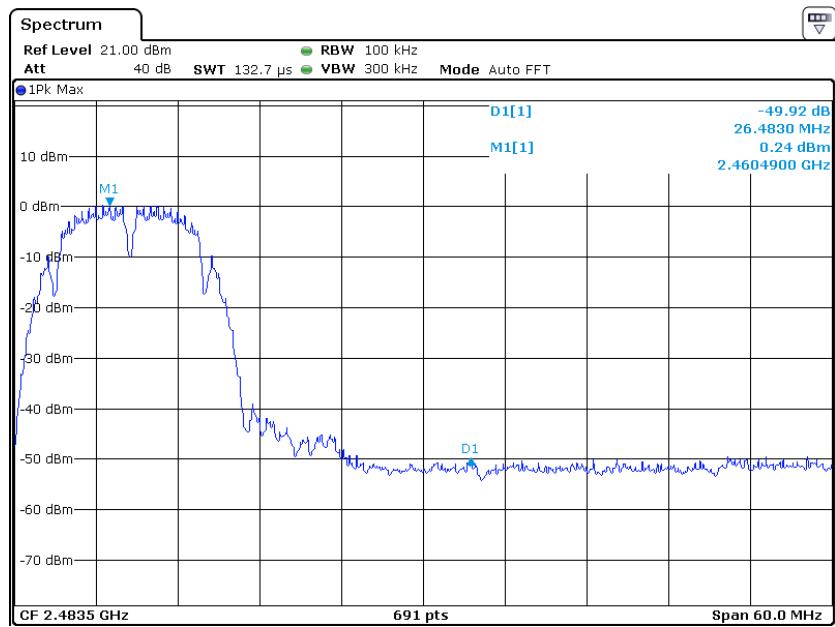


Channel 06 (2437MHz) Reference Level: 0.55dBm



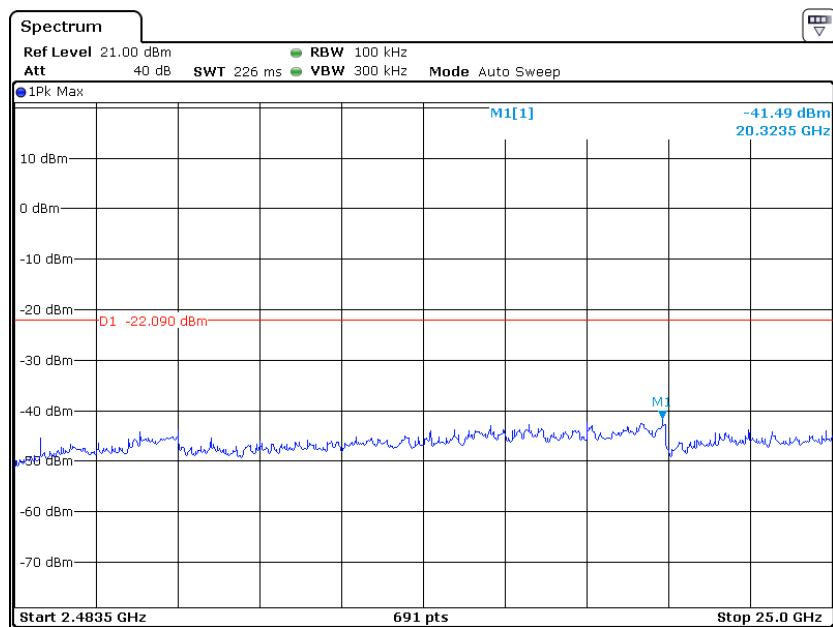
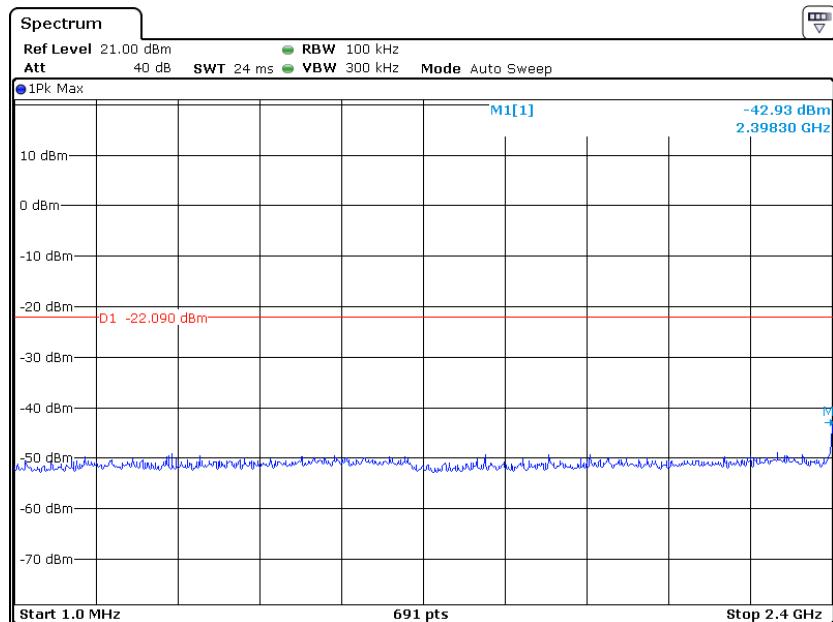
Channel 11 (2462MHz) Reference Level: 0.22dBm

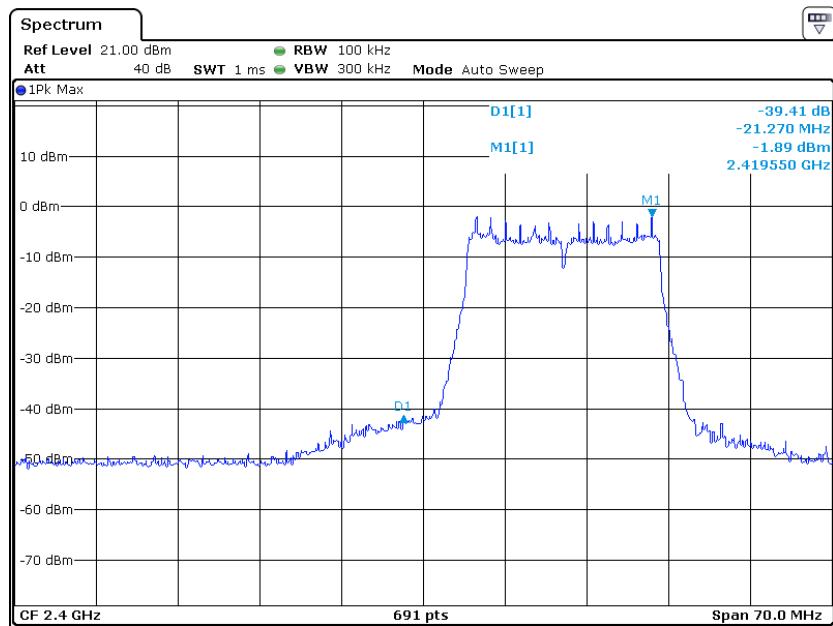




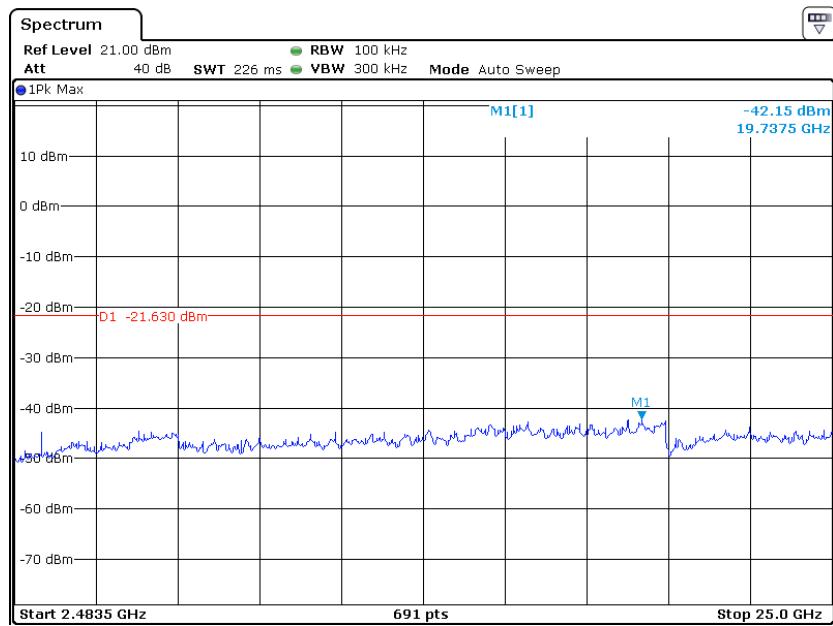
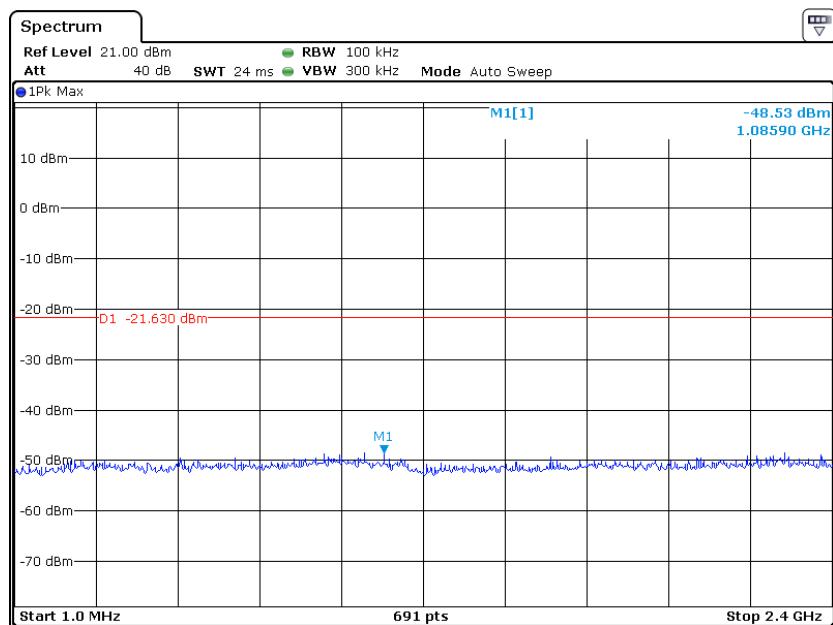
802.11g

Channel 01 (2412MHz) Reference Level: -2.09dBm

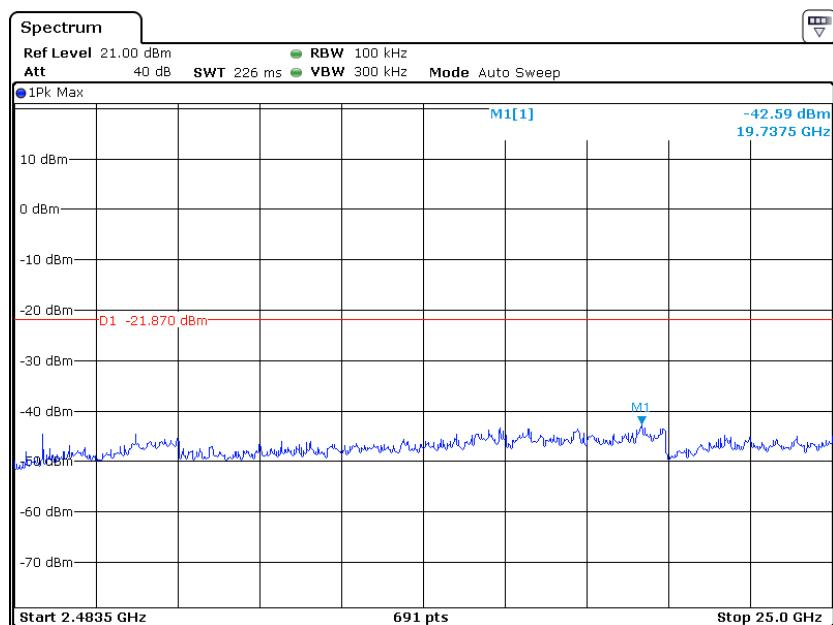
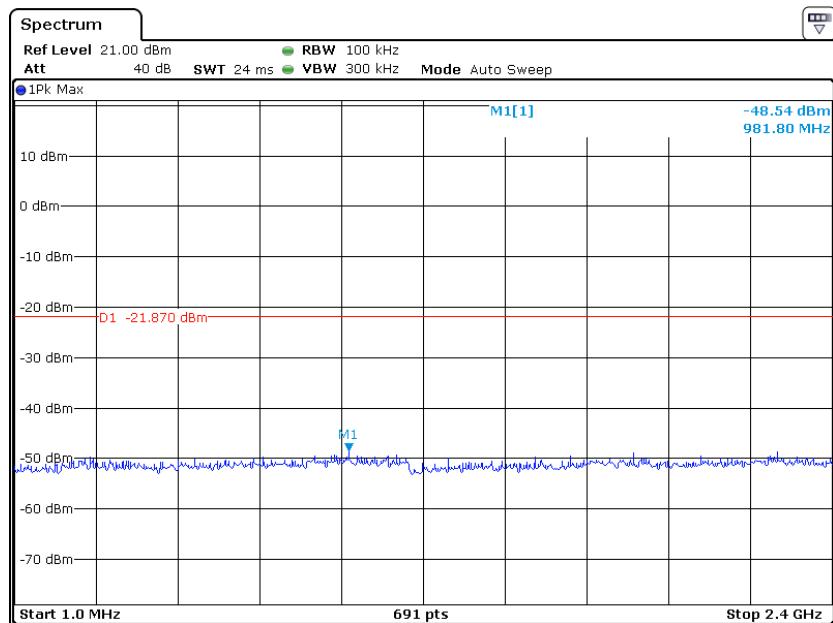


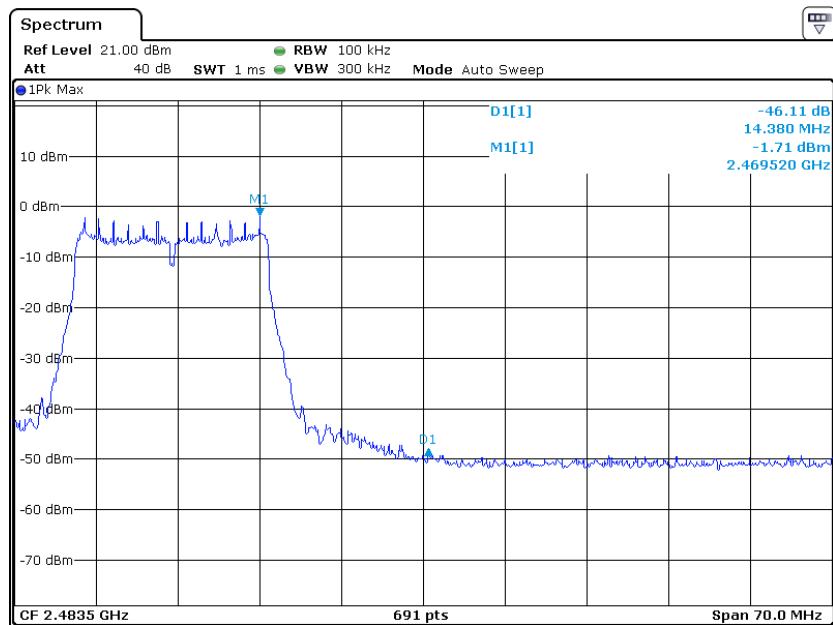


Channel 06 (2437MHz) Reference Level: -1.63dBm



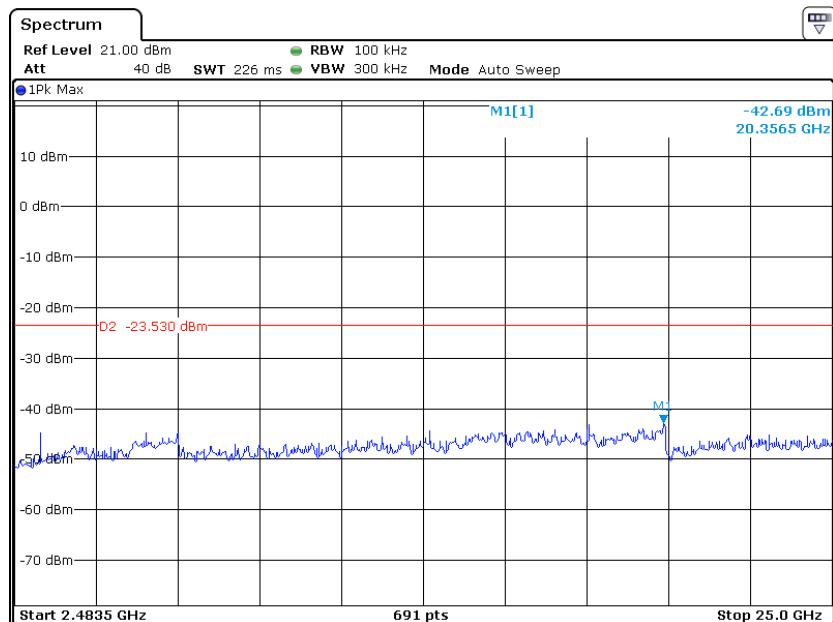
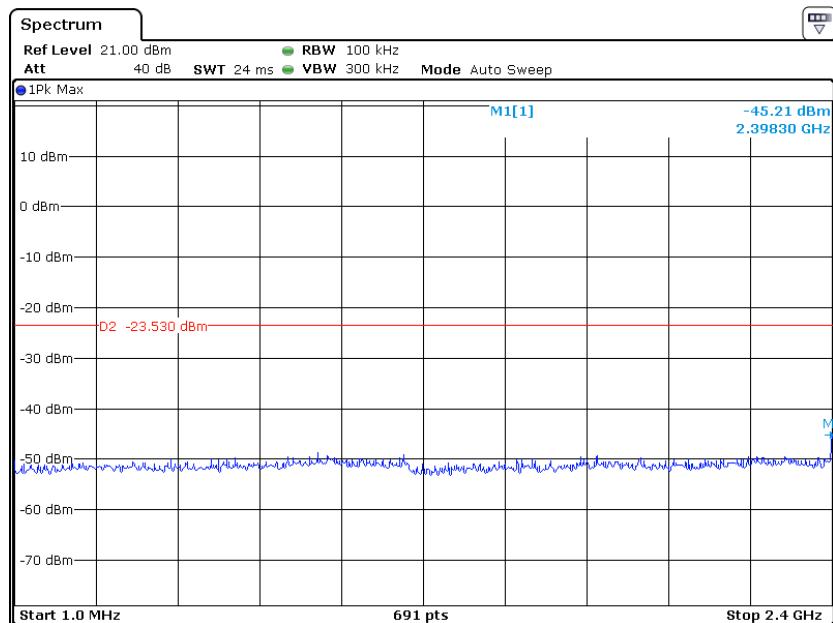
Channel 11 (2462MHz) Reference Level: -1.87dBm

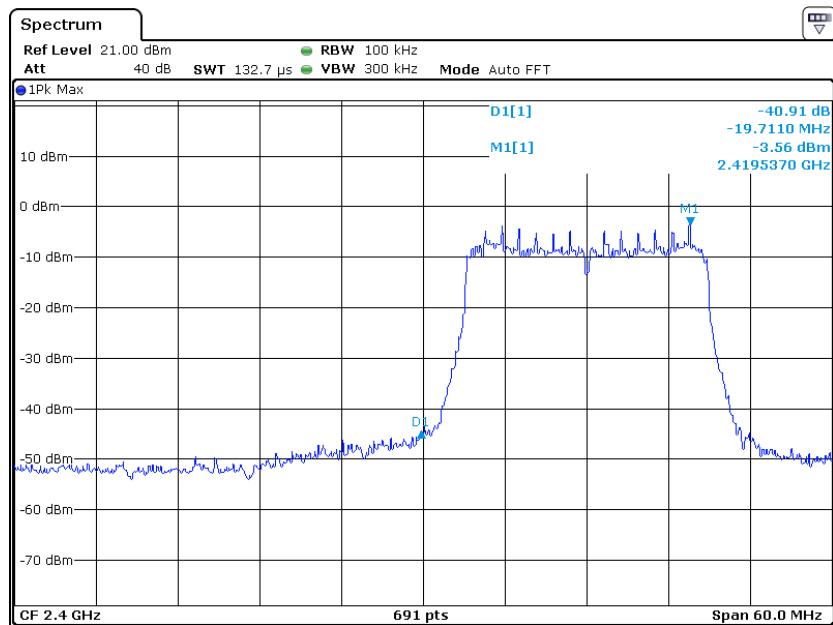




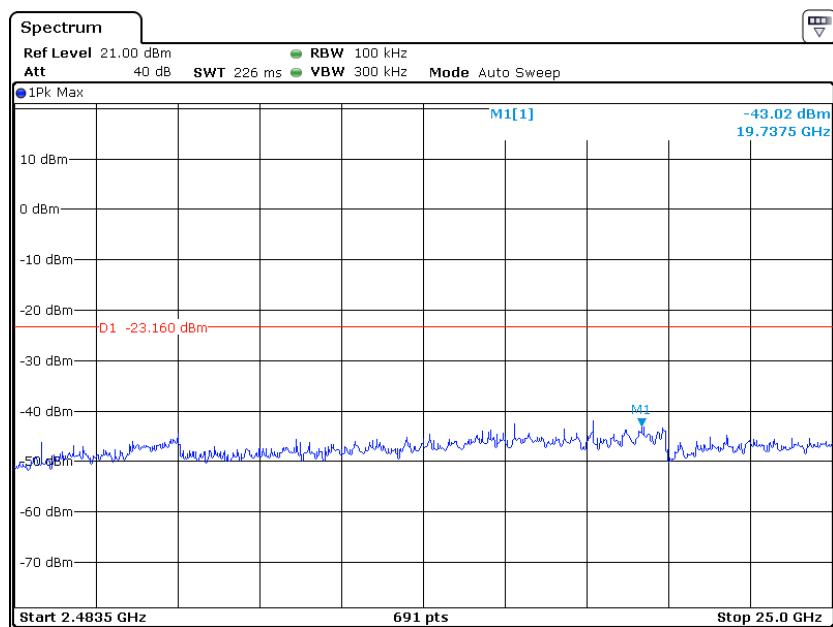
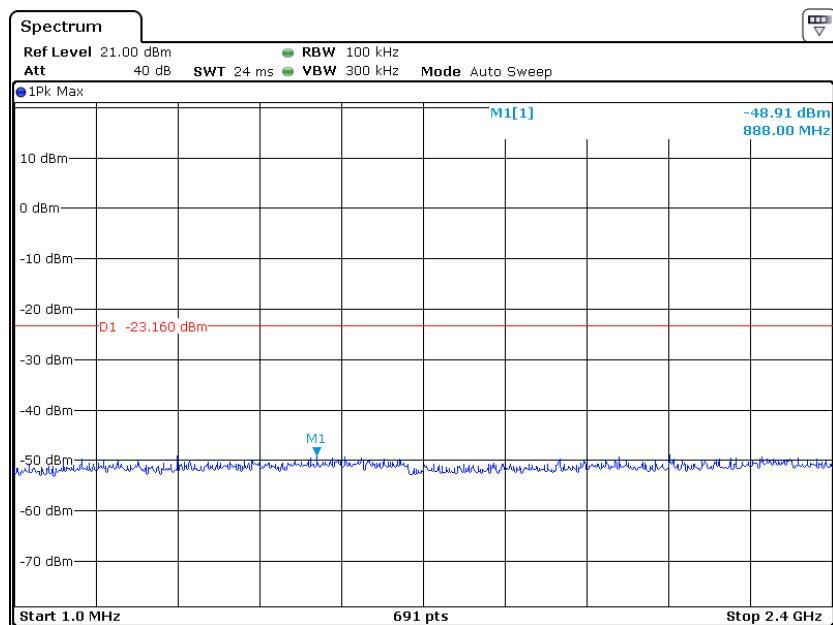
802.11n-HT20

Channel 01 (2412MHz) Reference Level: -3.53dBm

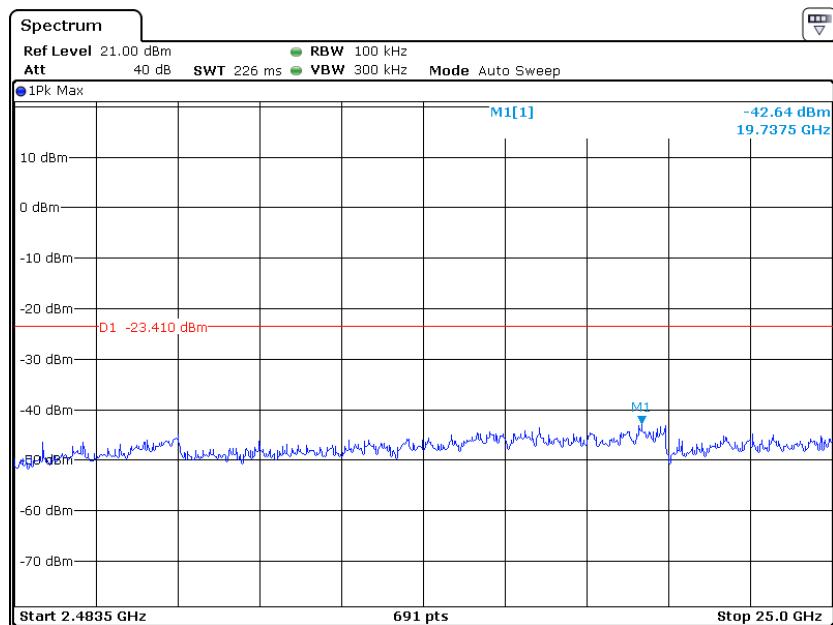
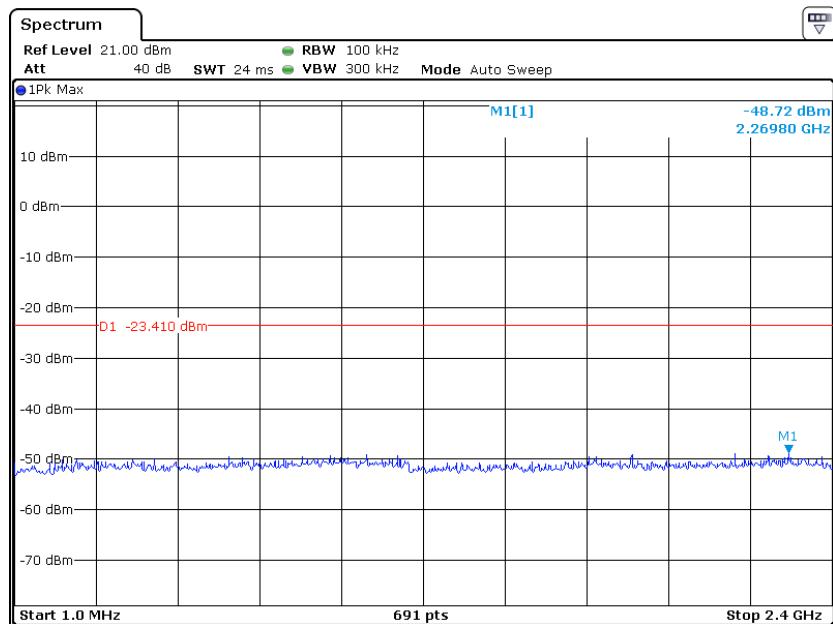


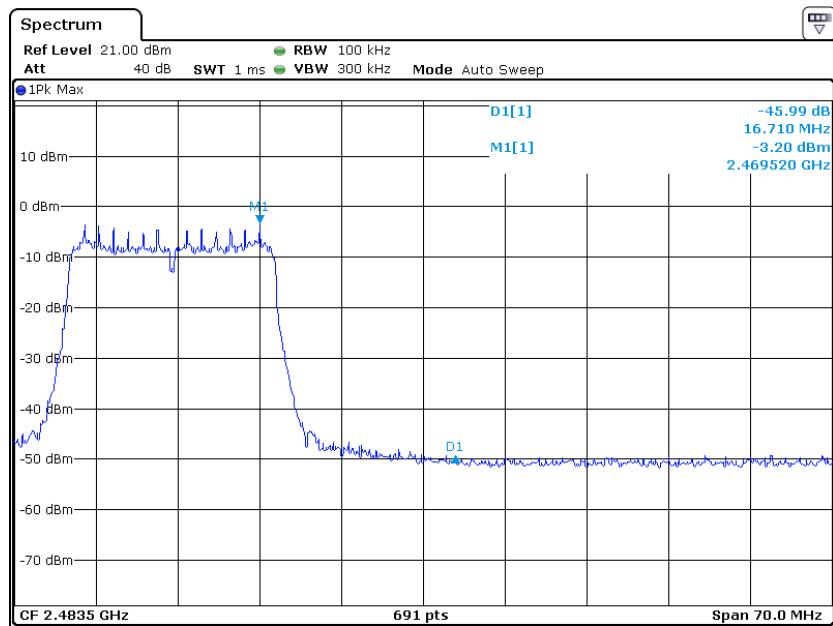


Channel 06 (2437MHz) Reference Level: -3.16dBm



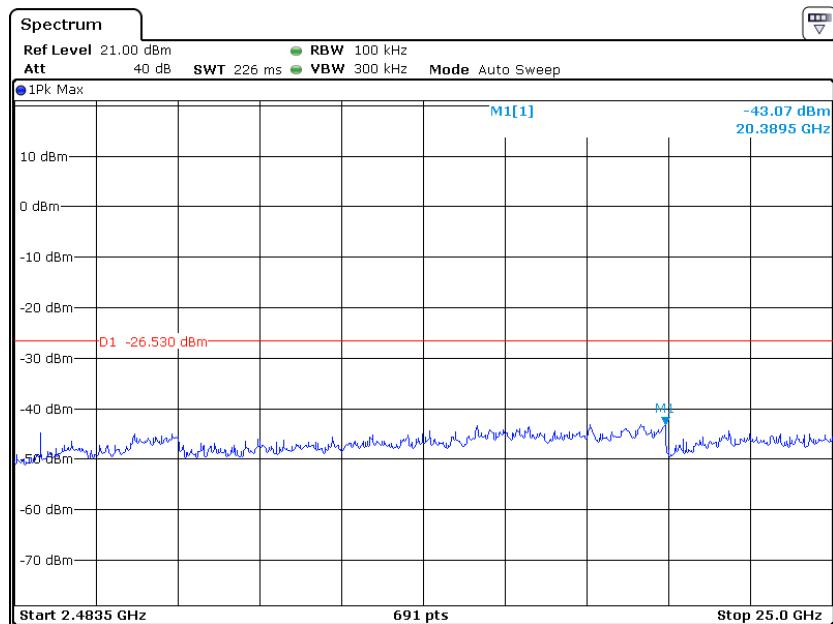
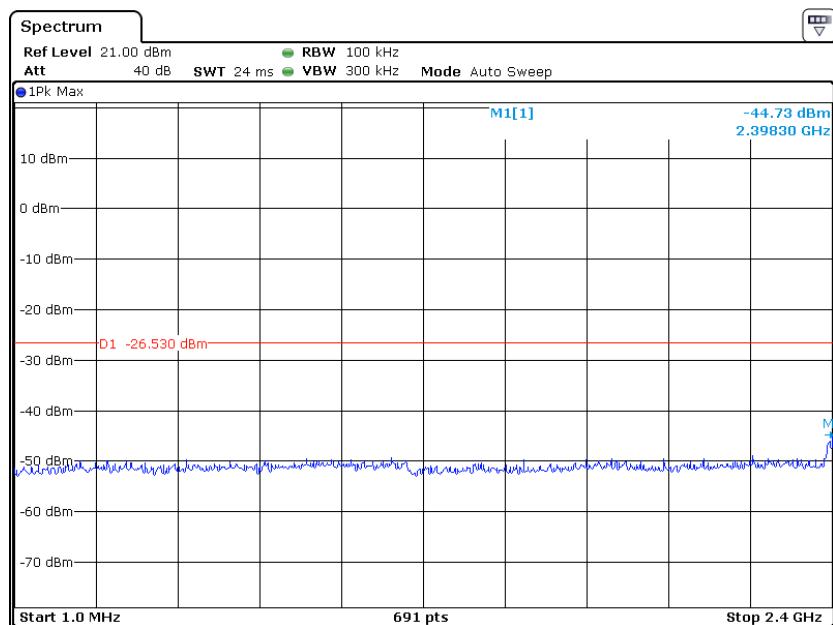
Channel 11 (2462MHz) Reference Level: -3.41dBm

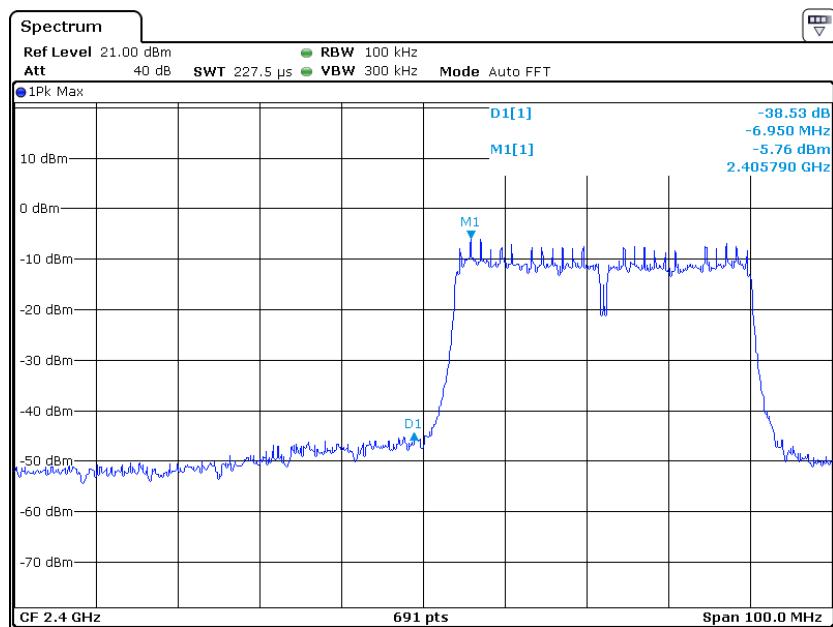




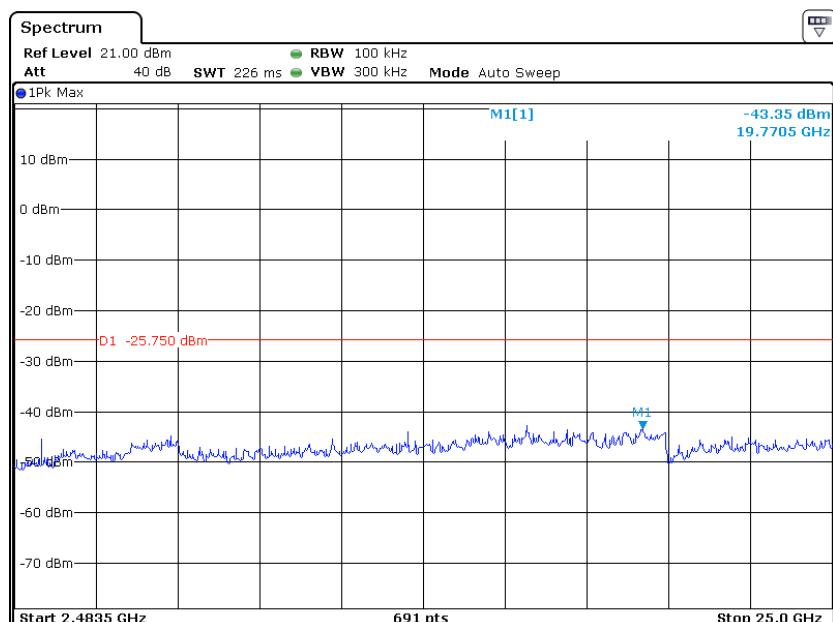
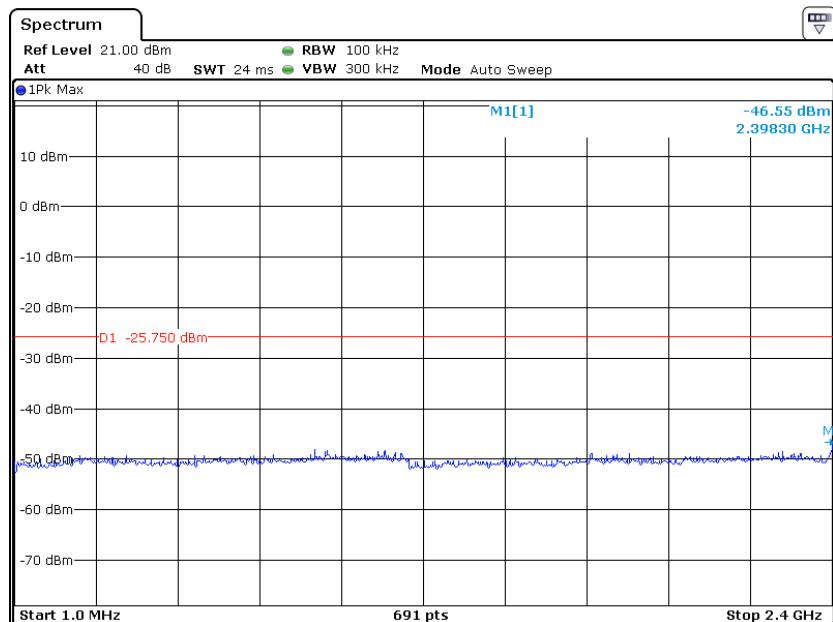
802.11n-HT40

Channel 03 (2422MHz) Reference Level: -6.53dBm

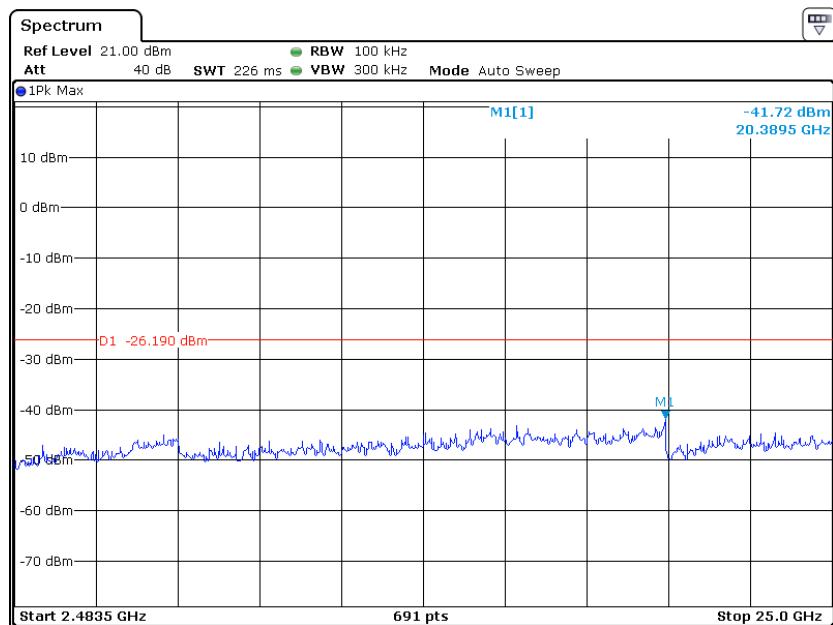
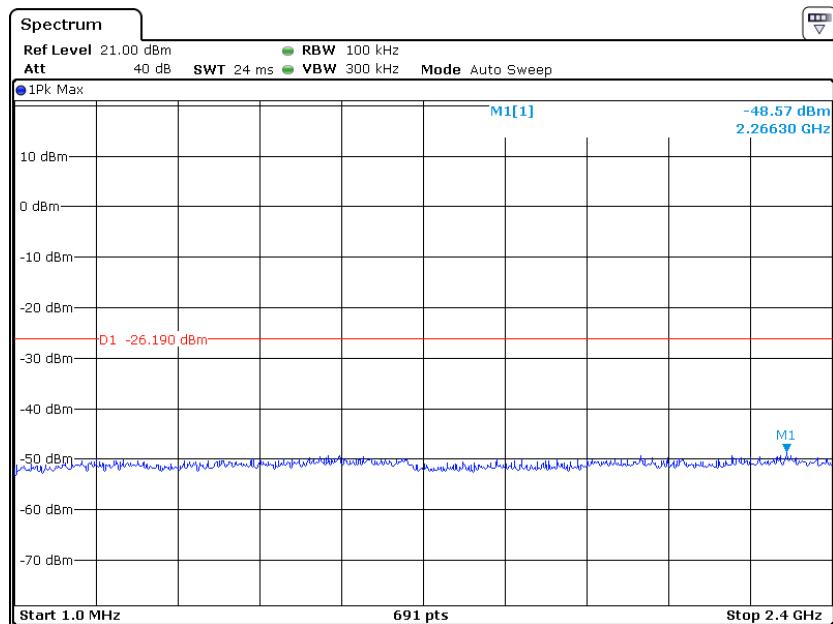


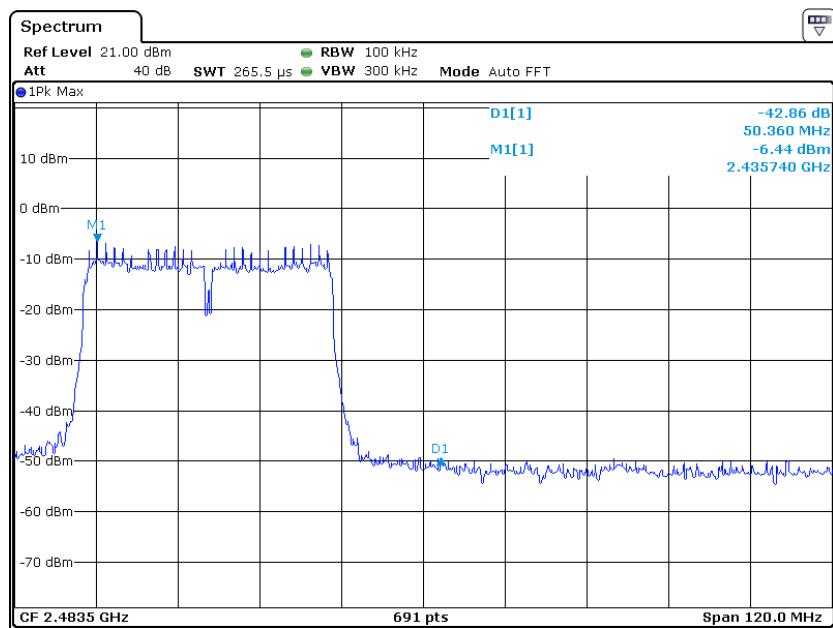


Channel 06 (2437MHz) Reference Level: -5.75dBm



Channel 09 (2452MHz) Reference Level: -6.19dBm





Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

Not required, since all emissions are more than 20dB below fundamental
 See attached data sheet

Applicant: Cocoon Labs Ltd
Date of Test: March 09, 2018

Model: CS03A

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b) (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified. (The simultaneous transmission was considered).

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Applicant: Cocoon Labs Ltd
Date of Test: March 09, 2018

Model: CS03A

4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD$$

Where

FS = Field Strength in $\text{dB}\mu\text{V}/\text{m}$

RA = Receiver Amplitude (including preamplifier) in $\text{dB}\mu\text{V}$

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD$$

Example

Assume a receiver reading of 62.0 $\text{dB}\mu\text{V}$ is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 42 $\text{dB}\mu\text{V}/\text{m}$. This value in $\text{dB}\mu\text{V}/\text{m}$ was converted to its corresponding level in $\mu\text{V}/\text{m}$.

RA = 62.0 $\text{dB}\mu\text{V}$

AF = 7.4 dB

CF = 1.6 dB

AG = 29.0 dB

PD = 0 dB

$$FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 \text{ dB}\mu\text{V}/\text{m}$$

Level in mV/m = Common Antilogarithm $[(42 \text{ dB}\mu\text{V}/\text{m})/20] = 125.9 \mu\text{V}/\text{m}$

Applicant: Cocoon Labs Ltd
Date of Test: March 09, 2018

Model: CS03A

4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission (802.11b-Channel 11)
at
214.646MHz

Judgement: Passed by 2.2dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

Worst Case Operating Mode: Transmitting (802.11b-Channel 11)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	60.856	41.2	20.0	11.3	32.5	40.0	-7.5
Horizontal	214.646	44.5	20.0	16.8	41.3	43.5	-2.2
Horizontal	643.957	37.0	20.0	24.9	41.9	46.0	-4.1
Vertical	214.300	45.8	20.0	10.0	35.8	43.5	-7.7
Vertical	608.193	48.5	20.0	11.3	39.8	46.0	-6.2
Vertical	644.010	34.9	20.0	24.1	39.0	46.0	-7.0

NOTES: 1. Quasi-Peak detector is used for frequency below 1GHz.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.

Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

Operating Mode: Transmitting (802.11b-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	52.5	36.1	34.2	50.6	74.0	-23.4
Horizontal	*2389.135	50.8	34.7	32.4	48.5	74.0	-25.5

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	39.7	36.1	34.2	37.8	54.0	-16.2
Horizontal	*2389.135	38.7	34.7	32.4	36.4	54.0	-17.6

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

Operating Mode: Transmitting (802.11b-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	51.9	36.1	34.6	50.4	74.0	-23.6
Horizontal	*7311.000	53.9	35.6	37.1	55.4	74.0	-18.6

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	39.0	36.1	34.6	37.5	54.0	-16.5
Horizontal	*7311.000	40.3	35.6	37.1	41.8	54.0	-12.2

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

Operating Mode: Transmitting (802.11b-Channel 11)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	51.9	36.1	34.6	50.4	74.0	-23.6
Horizontal	*2484.420	49.9	35.5	33.3	47.7	74.0	-26.3

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	39.3	36.1	34.6	37.8	54.0	-16.2
Horizontal	*2484.420	37.2	35.5	33.3	35.0	54.0	-19.0

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

Operating Mode: Transmitting (802.11g-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	56.0	36.1	34.2	54.1	74.0	-19.9
Horizontal	*2389.135	54.9	34.7	32.4	52.6	74.0	-21.4

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	40.7	36.1	34.2	38.8	54.0	-15.2
Horizontal	*2389.135	40.2	34.7	32.4	37.9	54.0	-16.1

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

Operating Mode: Transmitting (802.11g-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	55.6	36.1	34.6	54.1	74.0	-19.9
Horizontal	*7311.000	54.5	35.6	37.1	56.0	74.0	-18.0

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	39.7	36.1	34.6	38.2	54.0	-15.8
Horizontal	*7311.000	39.3	35.6	37.1	40.8	54.0	-13.2

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

Operating Mode: Transmitting (802.11g-Channel 11)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	56.3	36.1	34.6	54.8	74.0	-19.2
Horizontal	*7386.000	55.6	35.6	37.2	57.2	74.0	-16.8
Horizontal	*2484.420	55.7	35.5	33.3	53.5	74.0	-20.5

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	40.1	36.1	34.6	38.6	54.0	-15.4
Horizontal	*7386.000	39.0	35.6	37.2	40.6	54.0	-13.4
Horizontal	*2484.420	38.0	35.5	33.3	35.8	54.0	-18.2

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

Operating Mode: Transmitting (802.11n20-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	52.5	36.1	34.2	50.6	74.0	-23.4
Horizontal	*2389.135	49.7	34.7	32.4	47.4	74.0	-26.6

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	38.8	36.1	34.2	36.9	54.0	-17.1
Horizontal	*2389.135	35.5	34.7	32.4	33.2	54.0	-20.8

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

Operating Mode: Transmitting (802.11n20-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	52.0	36.1	34.6	50.5	74.0	-23.5
Horizontal	*7311.000	51.8	35.6	37.1	53.3	74.0	-20.7

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	38.4	36.1	34.6	36.9	54.0	-17.1
Horizontal	*7311.000	39.1	35.6	37.1	40.6	54.0	-13.4

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

Operating Mode: Transmitting (802.11n20-Channel 11)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	51.9	36.1	34.6	50.4	74.0	-23.6
Horizontal	*7386.000	52.3	35.6	37.2	53.9	74.0	-20.1
Horizontal	*2484.420	50.2	35.5	33.3	48.0	74.0	-26.0

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	38.6	36.1	34.6	37.1	54.0	-16.9
Horizontal	*7386.000	38.3	35.6	37.2	39.9	54.0	-14.1
Horizontal	*2484.420	36.8	35.5	33.3	34.6	54.0	-19.4

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

Operating Mode: Transmitting (802.11n40-Channel 03)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4844.000	51.7	36.1	34.2	49.8	74.0	-24.2
Horizontal	*7266.000	52.4	36.2	36.2	52.4	74.0	-21.6
Horizontal	*2389.310	49.5	34.7	32.4	47.2	74.0	-26.8

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4844.000	38.5	36.1	34.2	36.6	54.0	-17.4
Horizontal	*7266.000	40.1	36.2	36.2	40.1	54.0	-13.9
Horizontal	*2389.310	36.8	34.7	32.4	34.5	54.0	-19.5

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

Operating Mode: Transmitting (802.11n40-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	51.5	36.1	34.6	50.0	74.0	-24.0
Horizontal	*7311.000	51.7	35.6	37.1	53.2	74.0	-20.8

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	38.3	36.1	34.6	36.8	54.0	-17.2
Horizontal	*7311.000	48.0	35.6	37.1	49.5	54.0	-4.5

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

Operating Mode: Transmitting (802.11n40-Channel 09)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4904.000	51.5	36.1	34.6	50.0	74.0	-24.0
Horizontal	*7356.000	51.5	35.6	37.2	53.1	74.0	-20.9
Horizontal	*2483.600	49.9	35.5	33.3	47.7	74.0	-26.3

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4904.000	38.1	36.1	34.6	36.6	54.0	-17.4
Horizontal	*7356.000	38.3	35.6	37.2	39.9	54.0	-14.1
Horizontal	*2483.600	36.7	35.5	33.3	34.5	54.0	-19.5

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Cocoon Labs Ltd
Date of Test: March 09, 2018

Model: CS03A

4.9 Conducted Emission

Worst Case Radiated Spurious Emission (802.11b-Channel 11)
at 0.498MHz
is passed by 5.6dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: conducted photos.pdf.

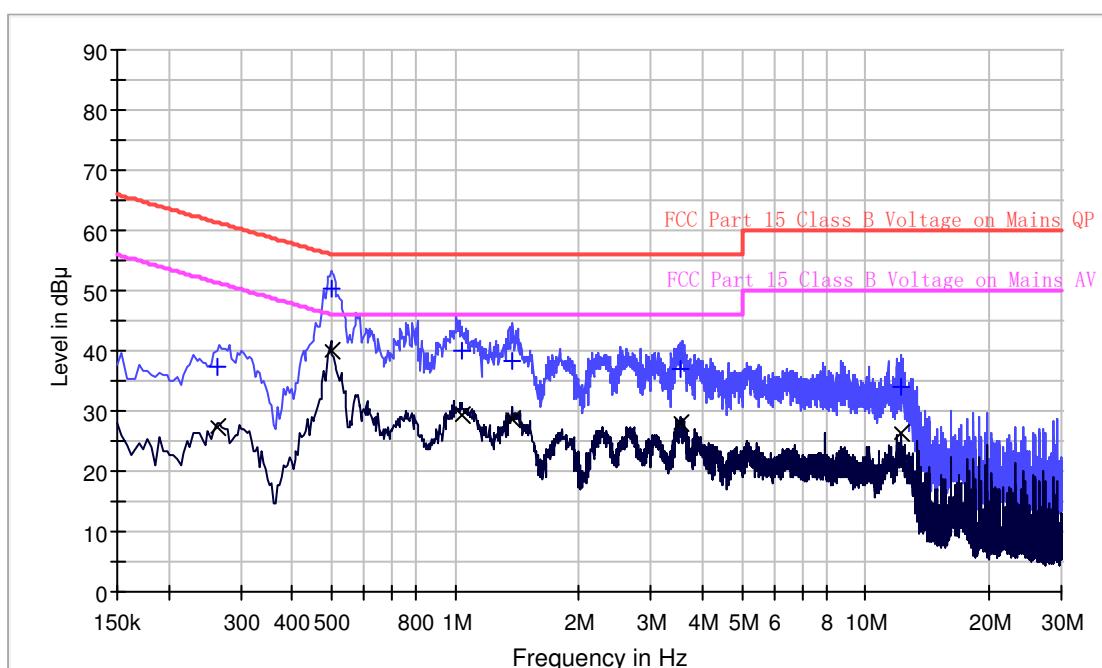
Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

Worst Case Operating Mode: Transmitting (802.11b-Channel 11)

Phase: Live

Graphic / Data Table**Conducted Emissions
Pursuant to FCC 15.207: Emissions Requirement****Limit and Margin QP**

Frequency (MHz)	QuasiPeak (dB IV)	Line	Corr. (dB)	Margin (dB)	Limit (dB IV)
0.262000	37.4	L1	9.7	24.0	61.4
0.498000	50.2	L1	9.7	5.8	56.0
1.038000	40.1	L1	9.7	15.9	56.0
1.374000	38.5	L1	9.7	17.5	56.0
3.538000	37.0	L1	9.8	19.0	56.0
12.198000	33.9	L1	10.0	26.1	60.0

Limit and Margin AV

Frequency (MHz)	Average (dB IV)	Line	Corr. (dB)	Margin (dB)	Limit (dB IV)
0.262000	27.3	L1	9.7	24.1	51.4
0.498000	40.1	L1	9.7	5.9	46.0
1.038000	29.5	L1	9.7	16.5	46.0
1.374000	28.7	L1	9.7	17.3	46.0
3.538000	28.0	L1	9.8	18.0	46.0
12.198000	26.2	L1	10.0	23.8	50.0

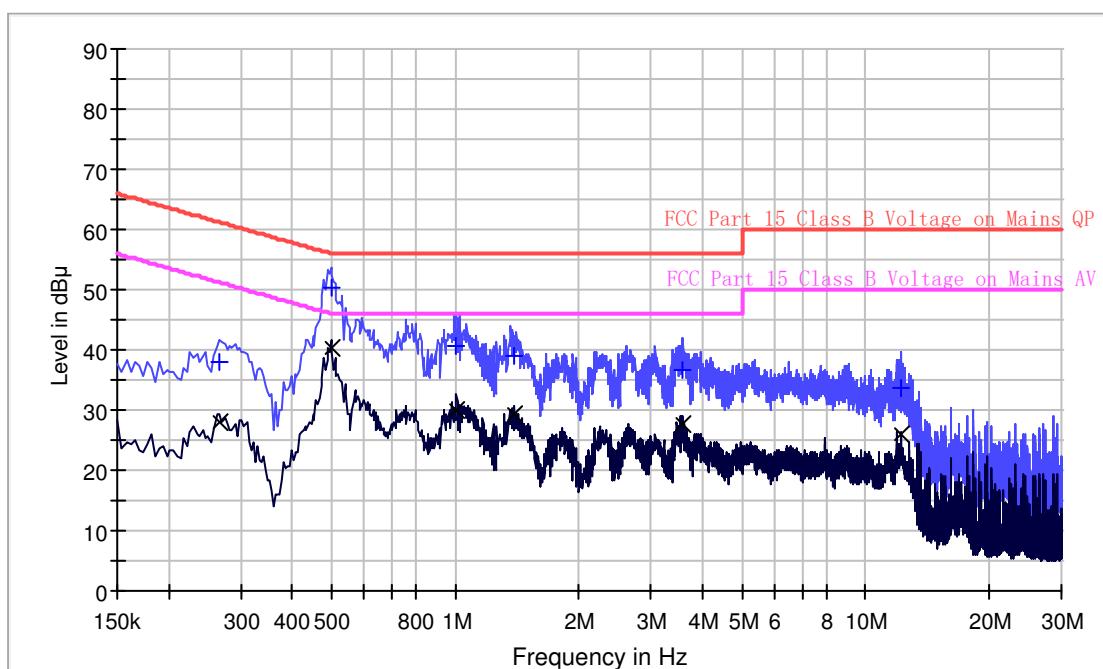
Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

Worst Case Operating Mode: Transmitting (802.11b-Channel 11)

Phase: N

Graphic / Data Table**Conducted Emissions
Pursuant to FCC 15.207: Emissions Requirement****Limit and Margin QP**

Frequency (MHz)	QuasiPeak (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.266000	38.1	N	9.7	23.1	61.2
0.498000	50.4	N	9.7	5.6	56.0
1.006000	40.8	N	9.7	15.2	56.0
1.394000	38.9	N	9.7	17.1	56.0
3.586000	36.6	N	9.8	19.4	56.0
12.138000	33.7	N	10.0	26.3	60.0

Limit and Margin AV

Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.266000	27.9	N	9.7	23.3	51.2
0.498000	40.2	N	9.7	5.8	46.0
1.006000	30.0	N	9.7	16.0	46.0
1.394000	29.4	N	9.7	16.6	46.0
3.586000	27.5	N	9.8	18.5	46.0
12.138000	25.9	N	10.0	24.1	50.0

Applicant: Cocoon Labs Ltd

Date of Test: March 09, 2018

Model: CS03A

4.10 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109

- [] Not required - No digital part
- [] Test results are attached
- [x] Included in the separated report.

Applicant: Cocoon Labs Ltd
Date of Test: March 09, 2018

Model: CS03A

4.11 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:

	See attached spectrum analyzer chart (s) for Transmitter timing
	See Transmitter timing diagram provided by manufacturer
x	Not applicable, duty cycle was not used.

EXHIBIT 5**EQUIPMENT PHOTOGRAPHS**

5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf & internal photos.pdf.

EXHIBIT 6**PRODUCT LABELLING**

6.0 Product Labeling

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.



Total Quality. Assured.

TEST REPORT

Intertek Report No.: 180119008SZN-001

EXHIBIT 7

TECHNICAL SPECIFICATIONS

7.0 Technical Specifications

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.



Total Quality. Assured.

TEST REPORT

Intertek Report No.: 180119008SZN-001

EXHIBIT 8

INSTRUCTION MANUAL

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

EXHIBIT 9**CONFIDENTIALITY REQUEST**

9.0 Confidentiality Request

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

EXHIBIT 10**MISCELLANEOUS INFORMATION**

10.0 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF*.

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.

EXHIBIT 11**TEST EQUIPMENT LIST**

11.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	1-Jun-2017	1-Jun-2018
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	1-Jun-2017	1-Jun-2018
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	20-Sep-2017	20-Sep-2018
SZ185-01	EMI Receiver	R&S	ESCI	100547	24-Jan-2018	24-Jan-2019
SZ061-08	Horn Antenna	ETS	3115	00092346	20-Sep-2017	20-Sep-2018
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	26-May-2017	26-May-2018
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	1-Jun-2017	1-Jun-2018
SZ056-06	Signal Analyzer	R&S	FSV 40	101101	7-Jul-2017	7-Jul-2018
SZ181-04	Preamplifier	Agilent	8449B	3008A024 74	24-Jan-2018	24-Jan-2019
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	16-Jan-2017	16-Jan-2019
SZ062-02	RF Cable	RADIALL	RG 213U	--	10-Dec-2017	10-Dec-2018
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	16-Sep-2017	16-Mar-2018
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	16-Sep-2017	16-Mar-2018
SZ067-04	Notch Filter	Micro-Tronics	BRM5070 2-02	--	14-Jun-2017	14-Jun-2018
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	30-Oct-2017	30-Oct-2018
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	30-Oct-2017	30-Oct-2018
SZ187-02	Two-Line V-Network	R&S	ENV216	100072	12-Jul-2017	12-Jul-2018
SZ188-03	Shielding Room	ETS	RFD-100	4100	16-Jan-2017	16-Jan-2019