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RONGYEJIA ELECTRONICS LTD

TEST REPORT

SCOPE OF WORK
FCC Testing–iUVC1

REPORT NUMBER
200630046SZN-001

ISSUE DATE **[REVISED DATE]**
13 August 2020 [----------]

PAGES
58

DOCUMENT CONTROL NUMBER
FCC ID 247_b
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TEST REPORT

Intertek Report No.: 200630046SZN-001

RONGYEJIA ELECTRONICS LTD

Application
For
Certification

FCC ID: 2AW6R-IUVC1

iUVC1 UVC Smart Lamp

Model: iUVC1

2.4GHz Wi-Fi Transceiver

Report No.: 200630046SZN-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 [10-1-19]

Prepared and Checked by:

Judy Xu
Asst. Engineer

Approved by:

Peter Kang
Senior Technical Supervisor
Date: 13 August 2020

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MEASUREMENT/TECHNICAL REPORT

This report concerns (check one) Original Grant ___X___ 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 ___X___

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 ___X___

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-19] Edition provision.

Report prepared by:

Judy Xu
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1.0 Summary of Test results

Applicant: RONGYEJIA ELECTRONICS LTD
Applicant Address: Baiyun 1 Road 172#, Danshui Town, Huiyang District Huizhou City
Manufacturer: RONGYEJIA ELECTRONICS LTD
Manufacturer Address: Baiyun 1 Road 172#, Danshui Town, Huiyang District Huizhou City

Model: iUVC1
FCC ID: 2AW6R-IUVC1

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), 15.209, FCC 15.205	Pass
AC Conducted Emission	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.

2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a iUVC1 UVC Smart Lamp with Wi-Fi function operating at 2412-2462MHz for 802.11b/g/n-HT20, 11 channels with 5MHz channel spacing and 5.8G microwave inductor at 5800 MHz. The EUT is powered by 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
Antenna Gain: 2dBi

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).

Remaining portions are subject to the following procedures:
1. Receiver portion of WiFi: exempt from technical requirement of this Part.
2. Other Digital Function: Subject to FCC Part 18 SDOC.
3. For the 5.8G microwave inductor function was tested and demonstrated in report 200630046SZN-002

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 v05r02. 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.

2.4 Test Facility

The Semi-anechoic chamber and shielded room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Longhua Branch** and located at 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing 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.

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 AC120V/60Hz during the test.

On 802.11b/g/n-HT20 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.

Test software: SecureCRT, Version 7.2.3

3.3 Special Accessories

N/A.

3.4 Measurement Uncertainty

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

3.5 Equipment Modification

Any modifications installed previous to testing by RONGYEJIA ELECTRONICS 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

Description	Manufacturer	Model No.
Mobile Phone	Samsung	SM-G9300
Wireless router	TP-LINK	TL-WDR7500

Applicant: RONGYEJIA ELECTRONICS LTD
Date of Test: July 18, 2020 Model: iUVC1

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 = 2dBi) (CCK, 1Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	21.04	127.06
Middle Channel: 2437	20.12	102.80
High Channel: 2462	19.25	84.14

IEEE 802.11g (Antenna Gain = 2dBi) (16QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	22.69	185.78
Middle Channel: 2437	22.72	187.07
High Channel: 2462	22.42	174.58

IEEE 802.11n-HT20 (Antenna Gain = 2dBi) (64QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	22.80	190.55
Middle Channel: 2437	22.78	189.67
High Channel: 2462	22.53	179.06

Cable loss: 0.5 dB External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT max. output level = 22.80dBm
EUT max. E.I.R.P = 22.80dBm + 2dBi = 24.80dBm = 302.00mW

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

Applicant: RONGYEJIA ELECTRONICS LTD
Date of Test: July 18, 2020 Model: iUVC1

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 v05r02. 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.

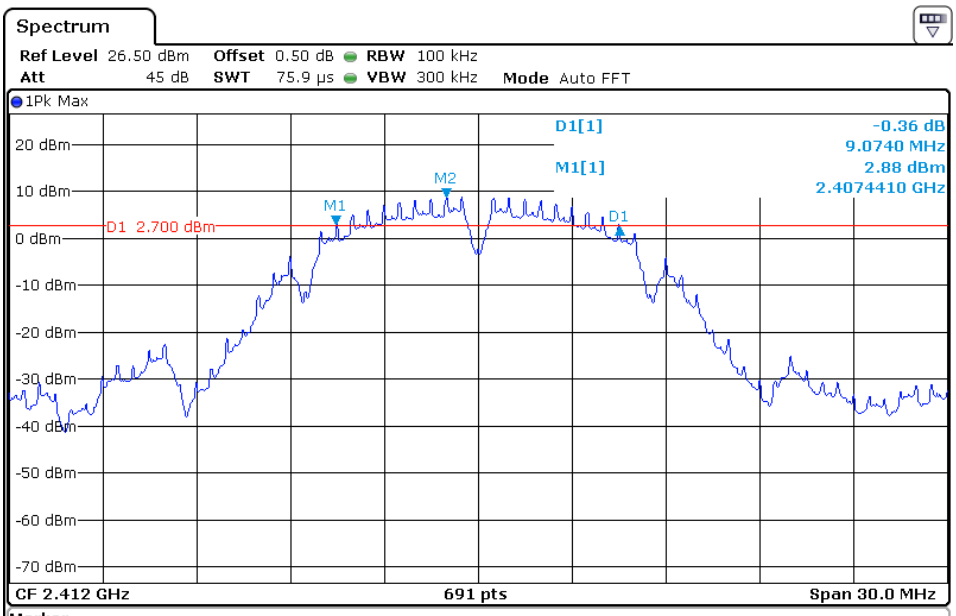
IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	9.074
2437	9.074
2462	9.030

IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	15.803
2437	16.064
2462	16.064

IEEE 802.11n-HT20 (64QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	16.281
2437	16.281
2462	16.064

The test plots are attached as below.

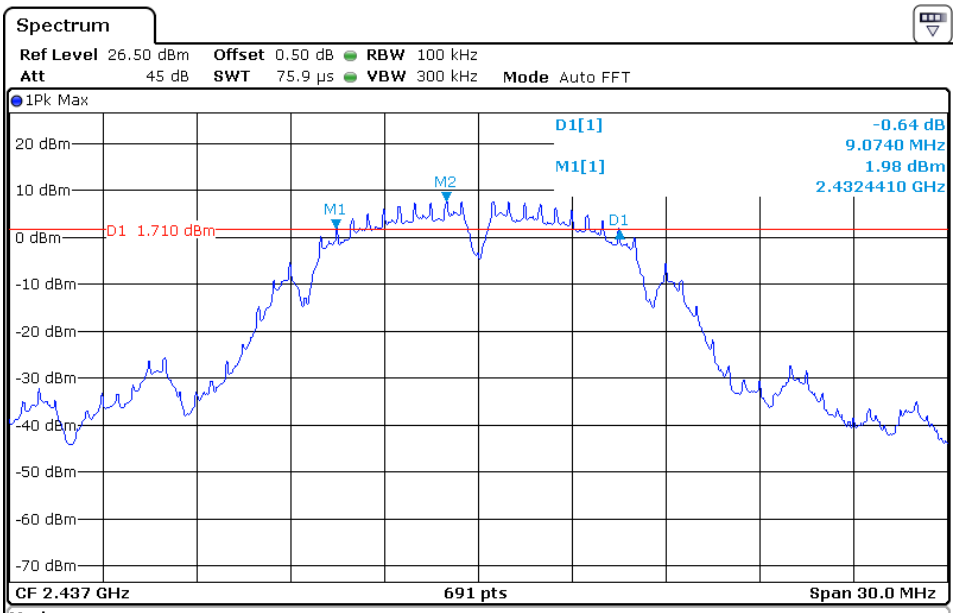
802.11b



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.407441 GHz	2.88 dBm		
D1	M1	1	9.074 MHz	-0.36 dB		
M2		1	2.410958 GHz	8.70 dBm		

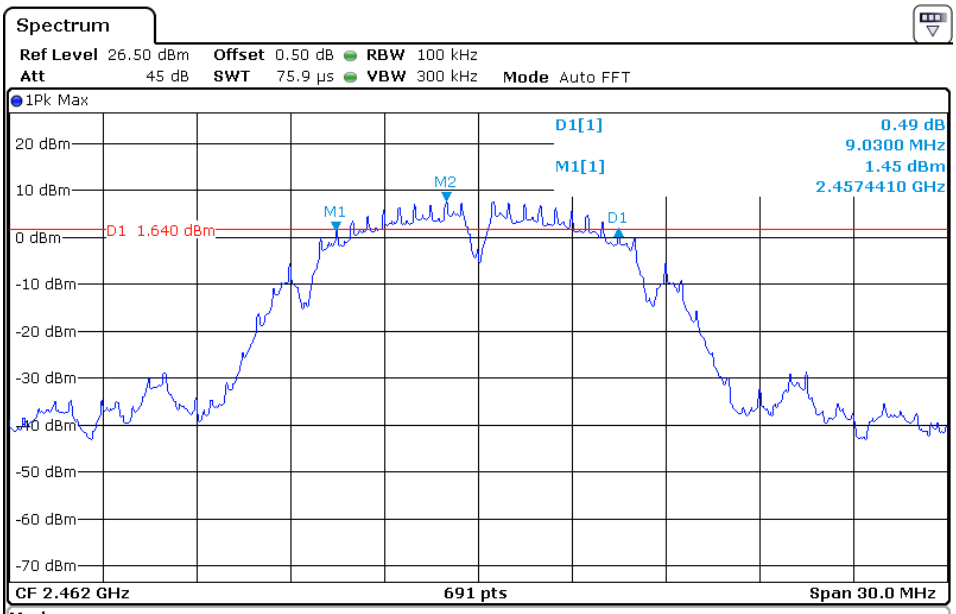
Date: 18.JUL.2020 15:35:43



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.432441 GHz	1.98 dBm		
D1	M1	1	9.074 MHz	-0.64 dB		
M2		1	2.435958 GHz	7.71 dBm		

Date: 18.JUL.2020 15:38:53

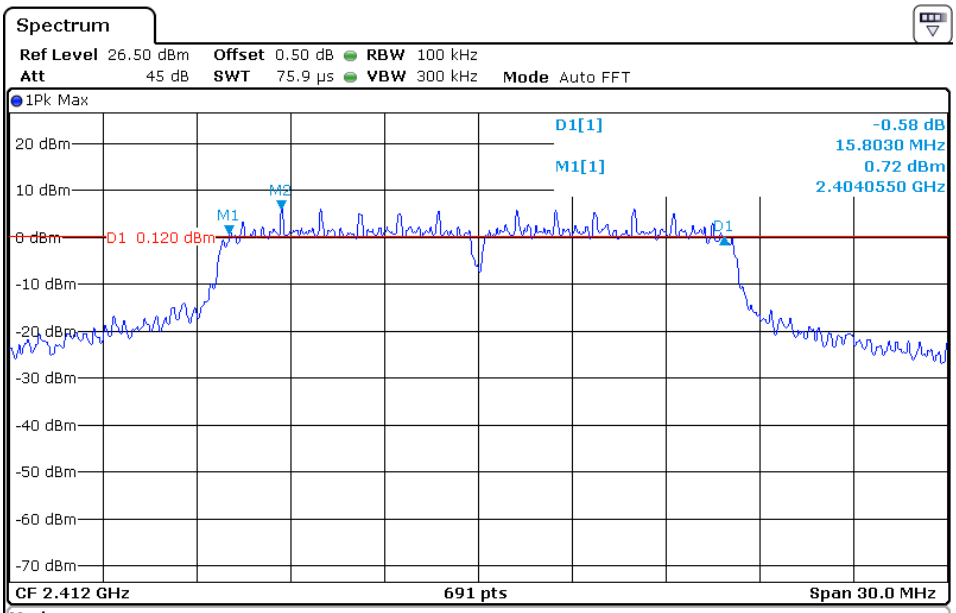


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.457441 GHz	1.45 dBm		
D1	M1	1	9.03 MHz	0.49 dB		
M2		1	2.460958 GHz	7.64 dBm		

Date: 18.JUL.2020 15:53:09

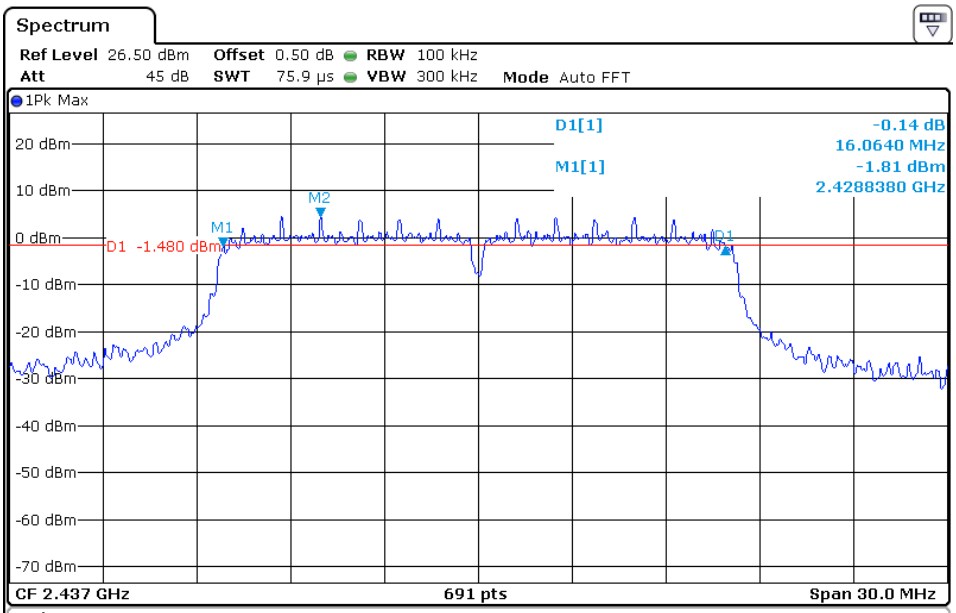
802.11g



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.404055 GHz	0.72 dBm		
D1	M1	1	15.803 MHz	-0.58 dB		
M2		1	2.405705 GHz	6.12 dBm		

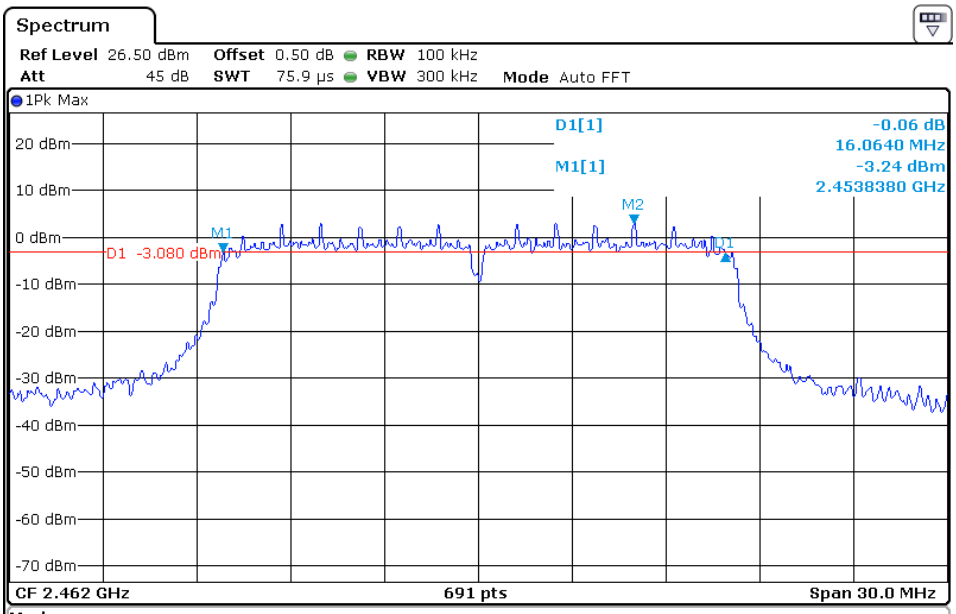
Date: 18.JUL.2020 15:58:27



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.428838 GHz	-1.81 dBm		
D1	M1	1	16.064 MHz	-0.14 dB		
M2		1	2.431964 GHz	4.52 dBm		

Date: 18.JUL.2020 16:01:28

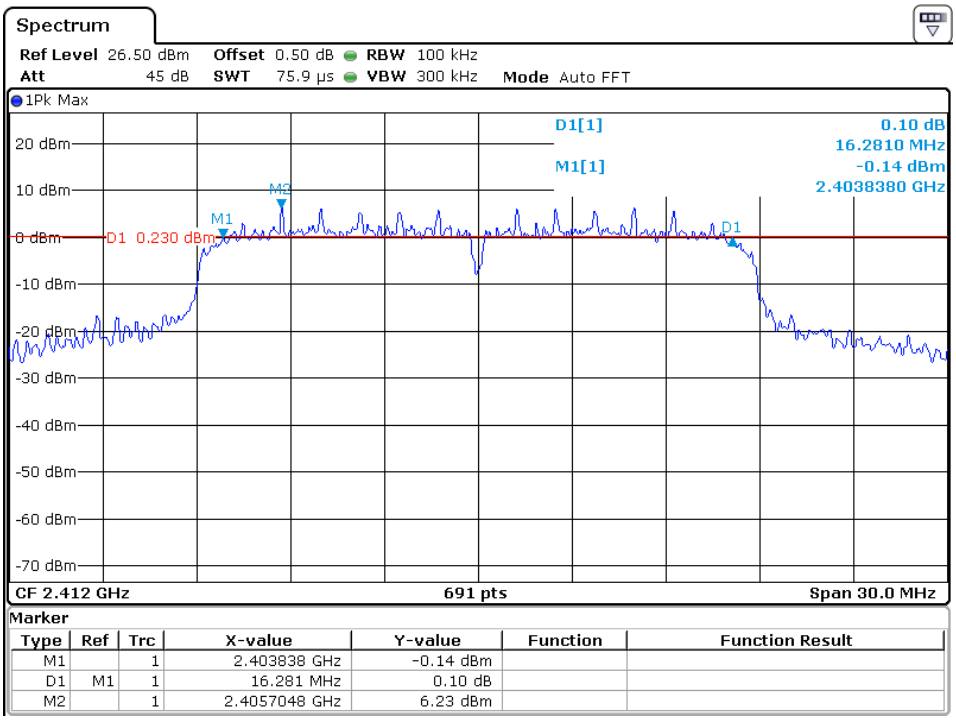


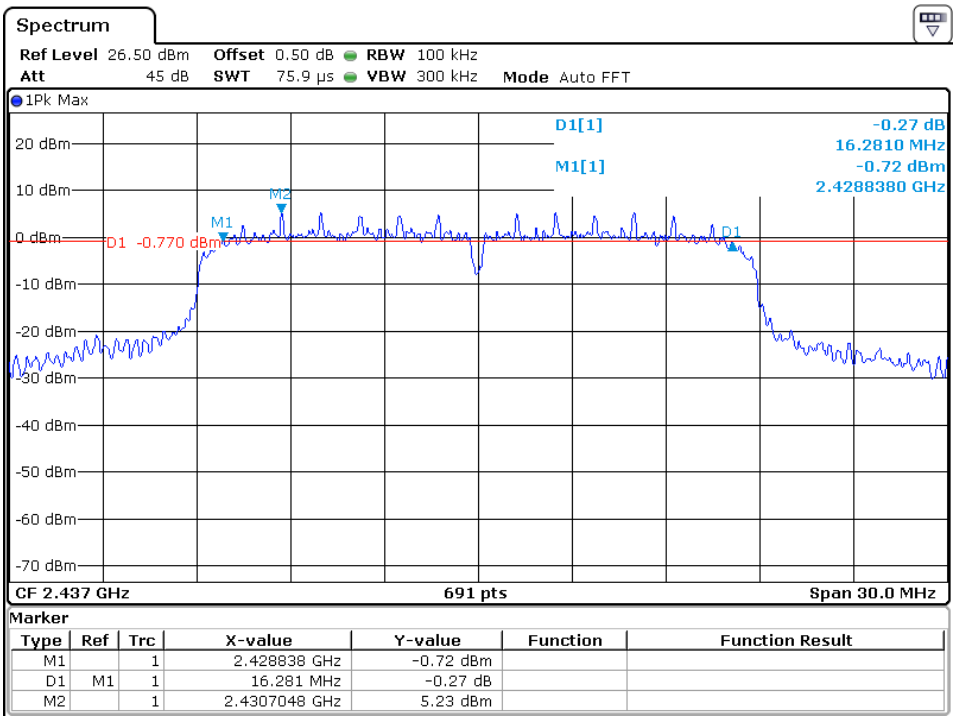
Marker

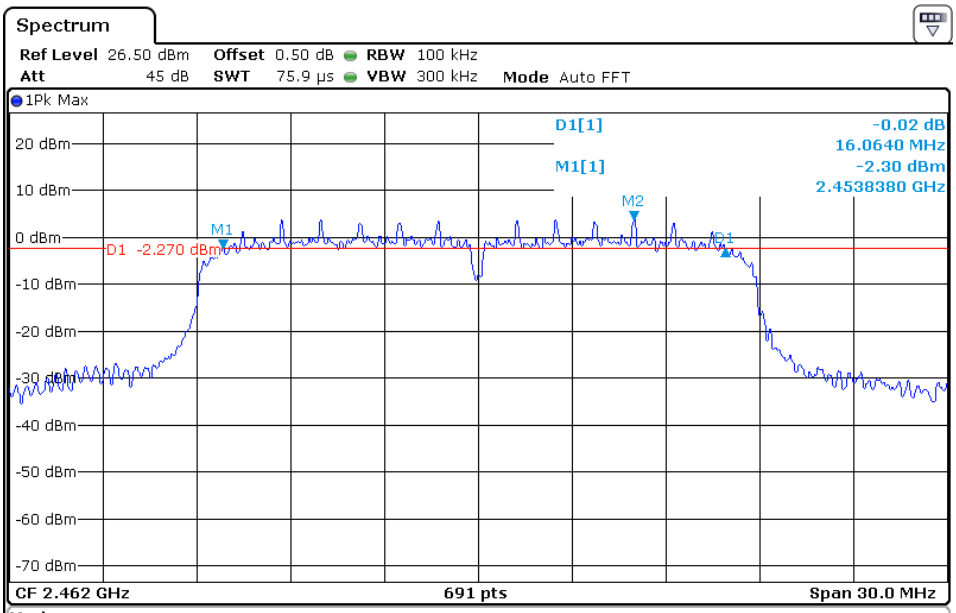
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.453838 GHz	-3.24 dBm		
D1	M1	1	16.064 MHz	-0.06 dB		
M2		1	2.466949 GHz	2.92 dBm		

Date: 18.JUL.2020 16:03:44

802.11n-HT20


Spectrum
Ref Level 26.50 dBm Offset 0.50 dB RBW 100 kHz
Att 45 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 0.10 dB
16.2810 MHz
M1[1] -0.14 dBm
2.4038380 GHz
D1 0.230 dBm
CF 2.412 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.403838 GHz -0.14 dBm
D1 M1 1 16.281 MHz 0.10 dB
M2 1 2.4057048 GHz 6.23 dBm
Date: 18.JUL.2020 15:29:46


Spectrum
Ref Level 26.50 dBm Offset 0.50 dB RBW 100 kHz
Att 45 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -0.27 dB
16.2810 MHz
M1[1] -0.72 dBm
2.4288380 GHz
D1 -0.770 dBm
CF 2.437 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.428838 GHz -0.72 dBm
D1 M1 1 16.281 MHz -0.27 dB
M2 1 2.4307048 GHz 5.23 dBm
Date: 18.JUL.2020 15:23:42



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.453838 GHz	-2.30 dBm		
D1	M1	1	16.064 MHz	-0.02 dB		
M2		1	2.4669493 GHz	3.73 dBm		

Date: 18.JUL.2020 15:20:09

Applicant: RONGYEJIA ELECTRONICS LTD
Date of Test: July 18, 2020 Model: iUVC1

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

The Measurement Procedure PKPSD was set according to the FCC KDB 558074 D01 v05r02.

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.

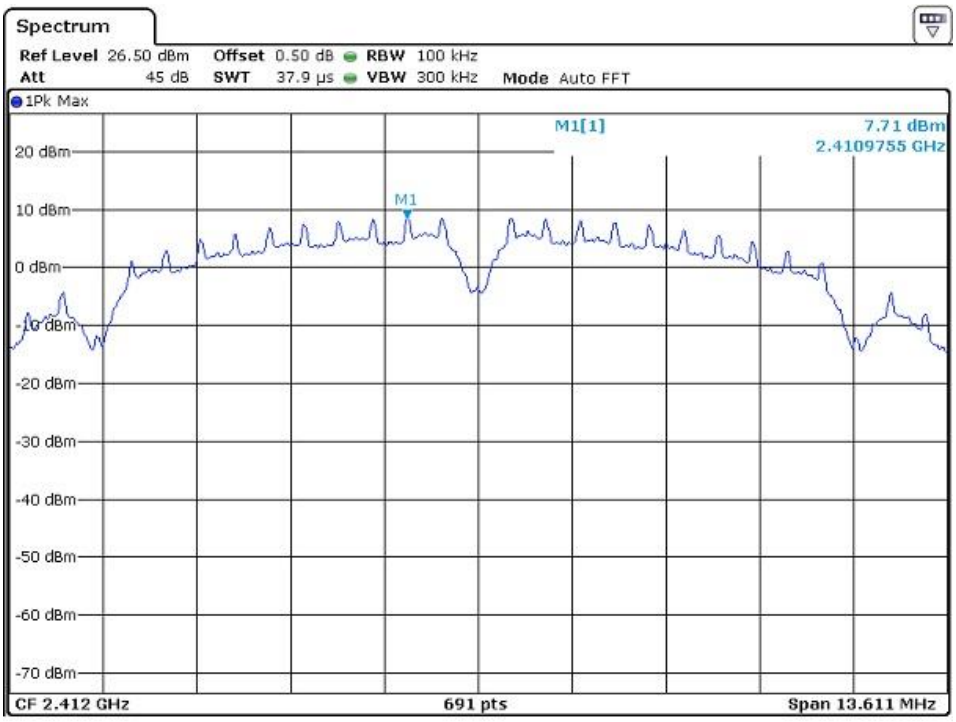
IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	7.71
2437	7.55
2462	6.48

IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	5.42
2437	4.40
2462	2.87

IEEE 802.11n-HT20 (64QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	5.80
2437	5.09
2462	3.63

The test plots are attached as below.

802.11b



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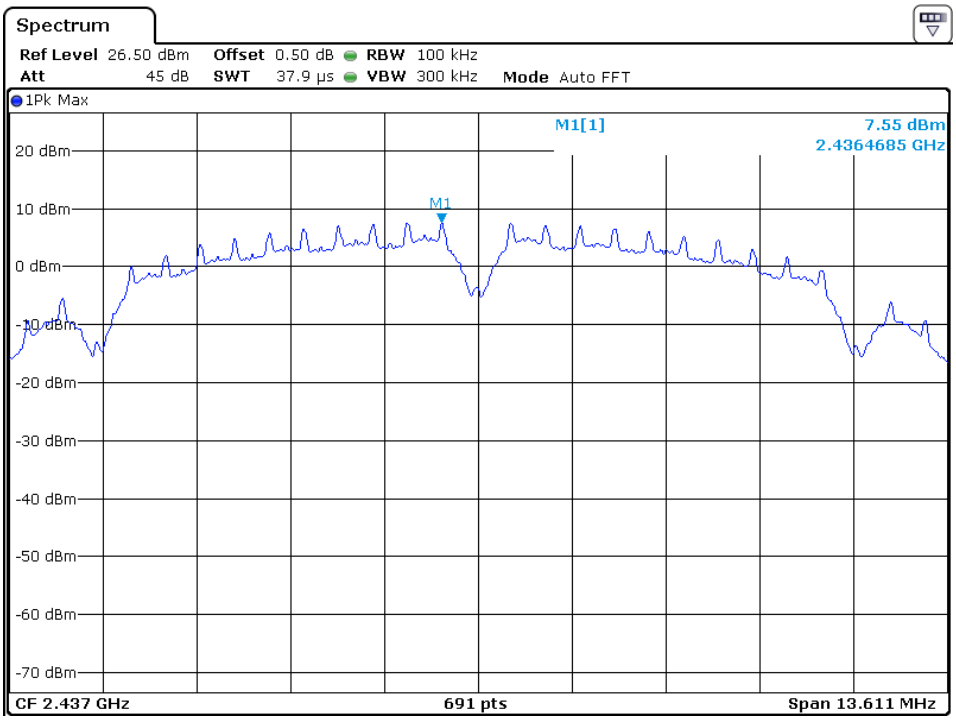

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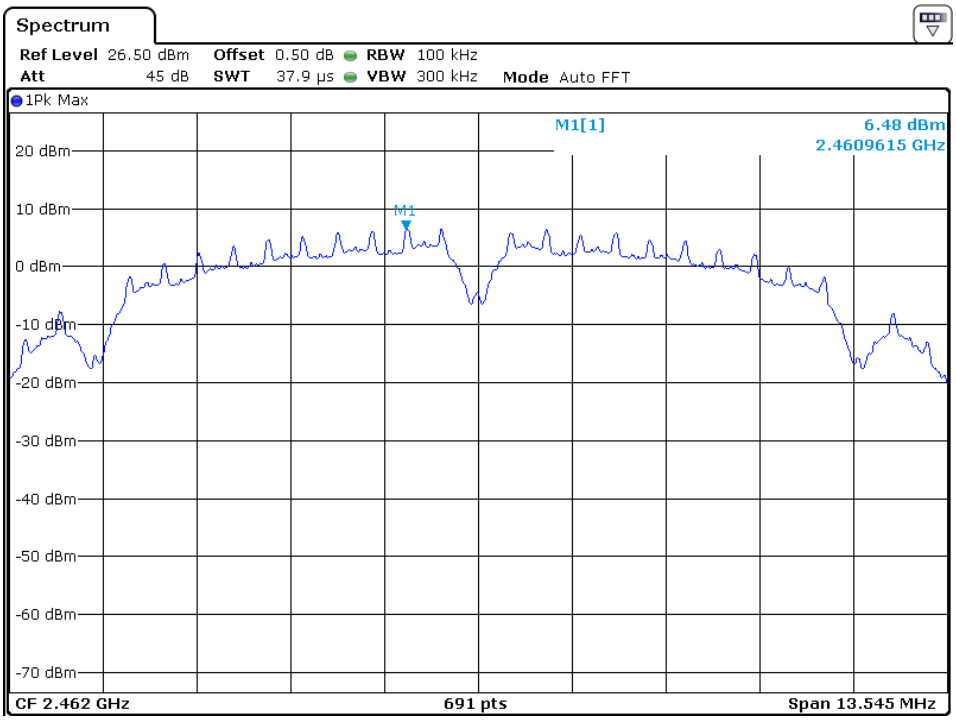
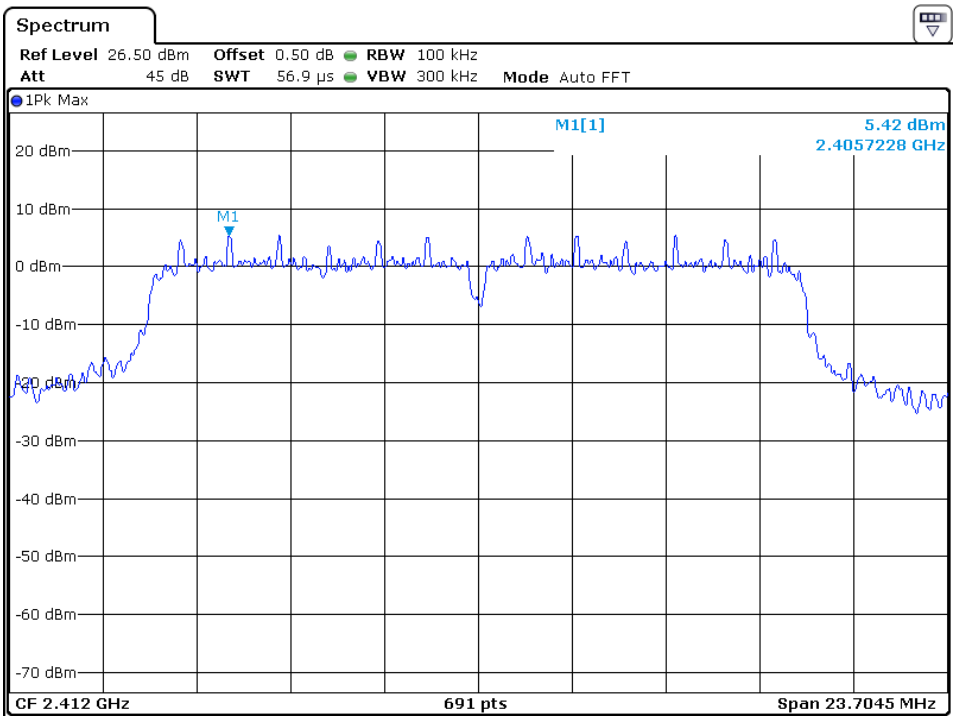
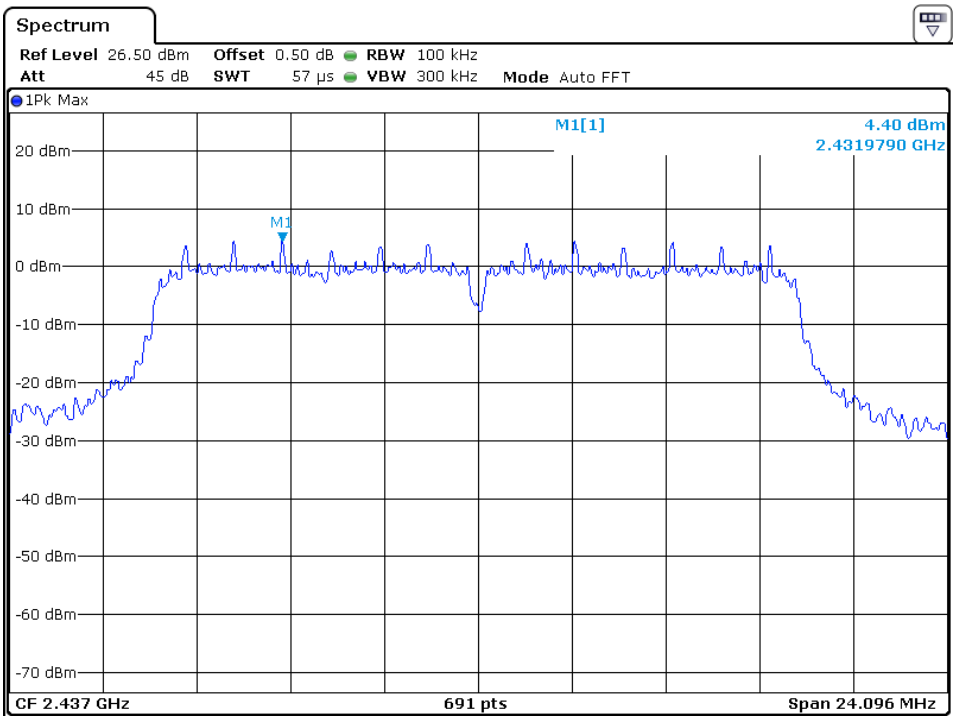


Date: 18.JUL.2020 15:53:37

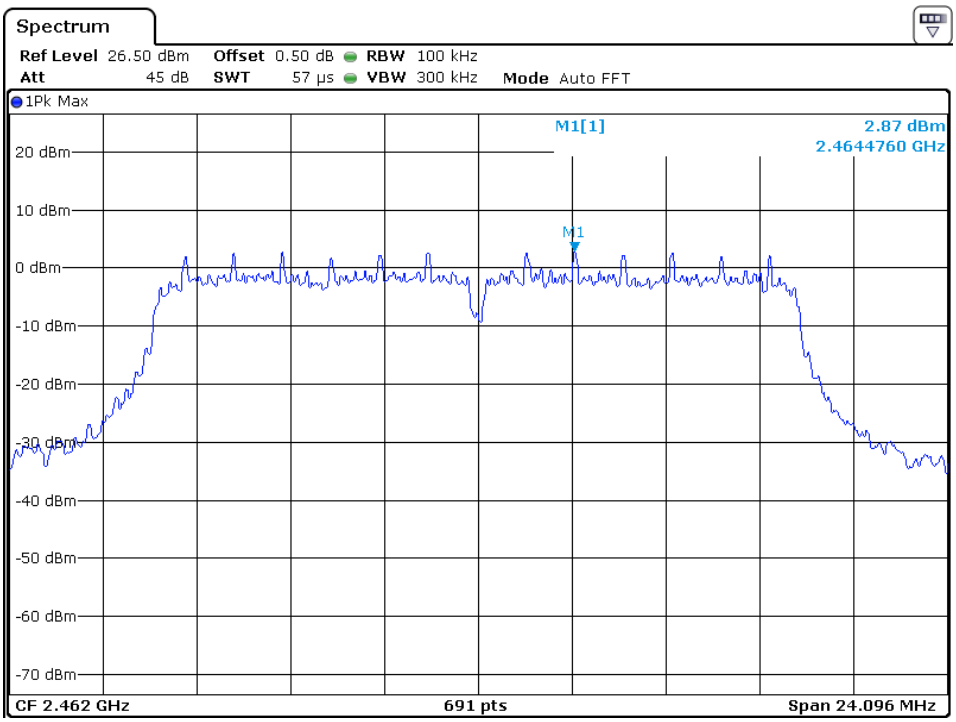
802.11g



Date: 18.JUL.2020 15:59:05

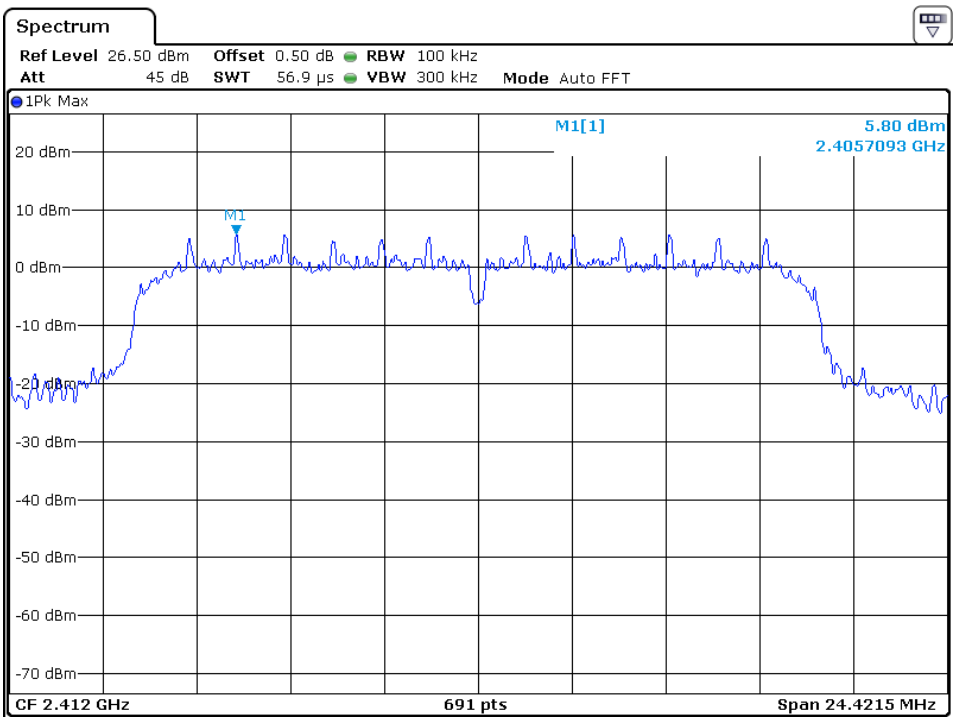


Date: 18.JUL.2020 16:01:55



Date: 18.JUL.2020 16:04:15

802.11n-HT20



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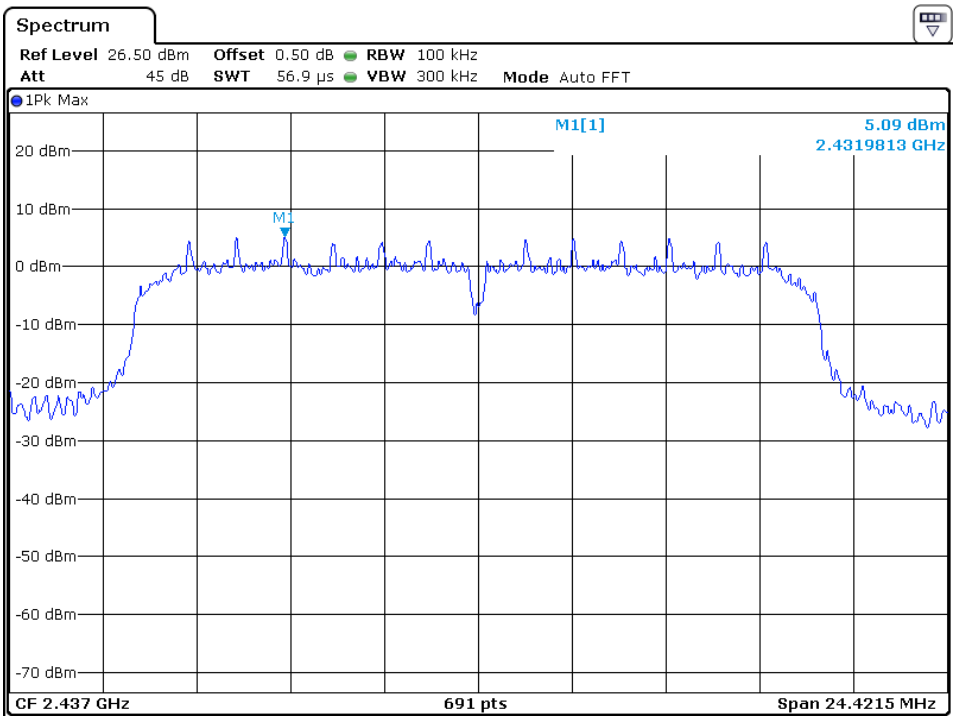

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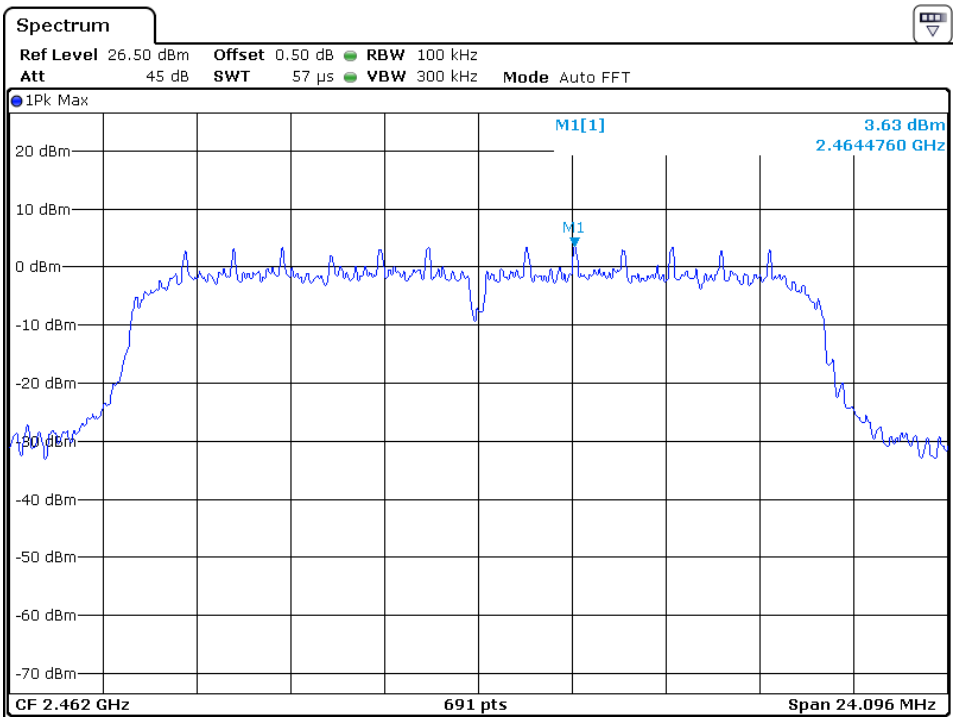


Date: 18.JUL.2020 15:20:40

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 v05r02.

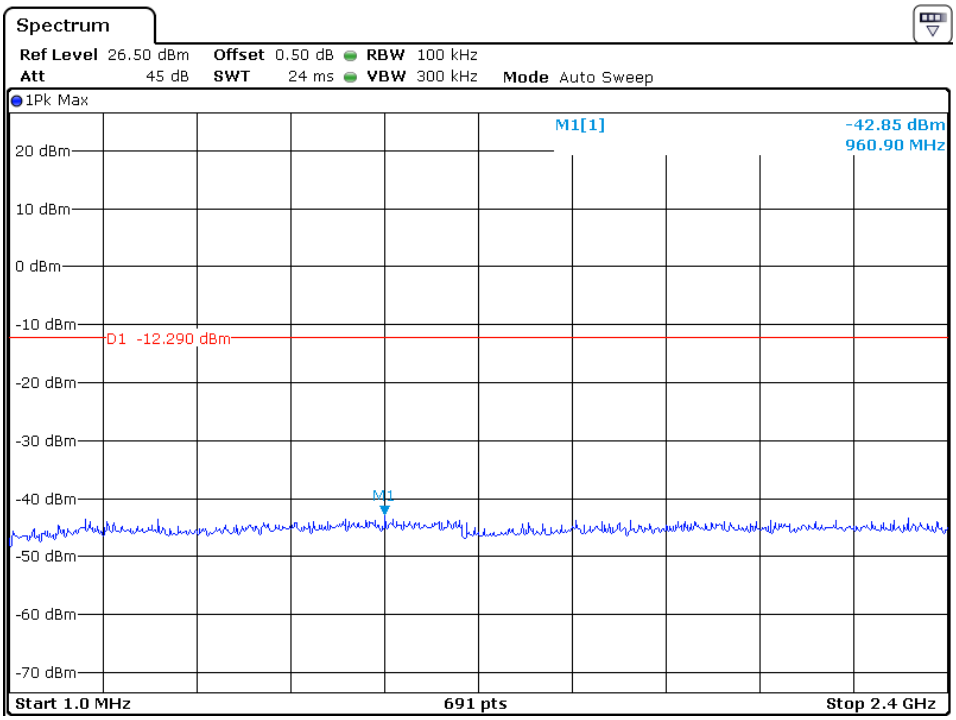
All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

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.

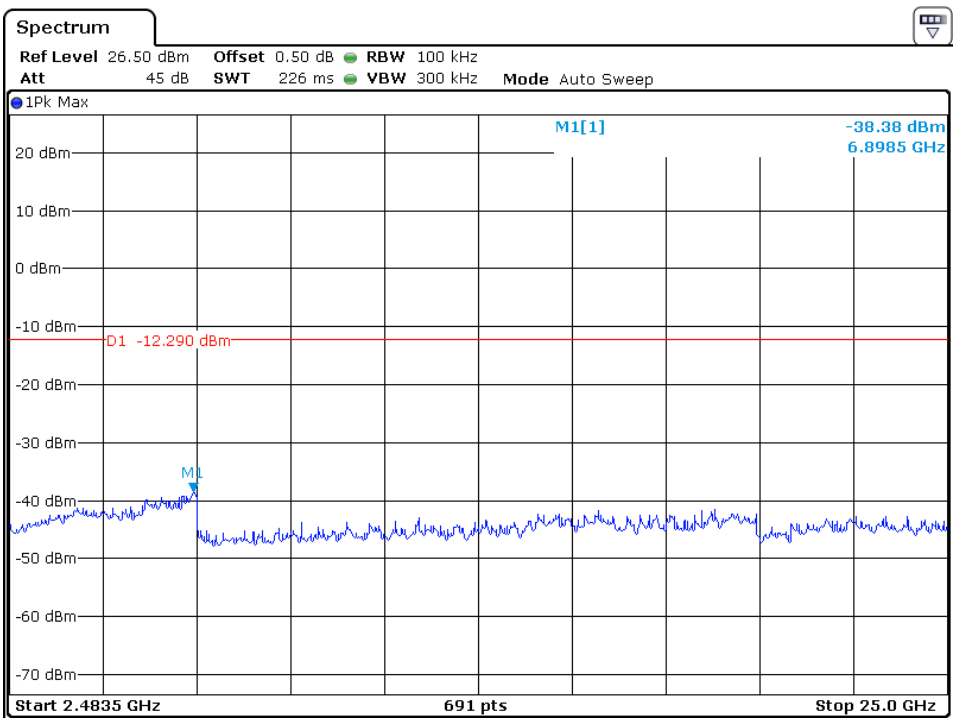
The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

The test plots are attached as below.

802.11b
Channel 01 (2412MHz) Reference Level: 7.71dBm



Date: 6.AUG.2020 10:46:52



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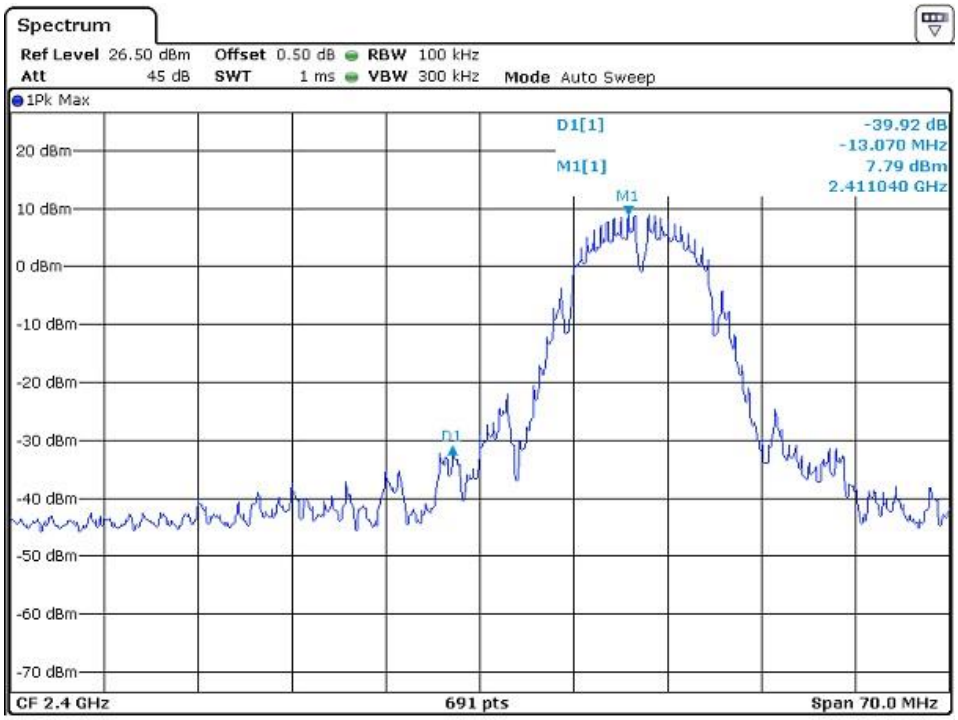
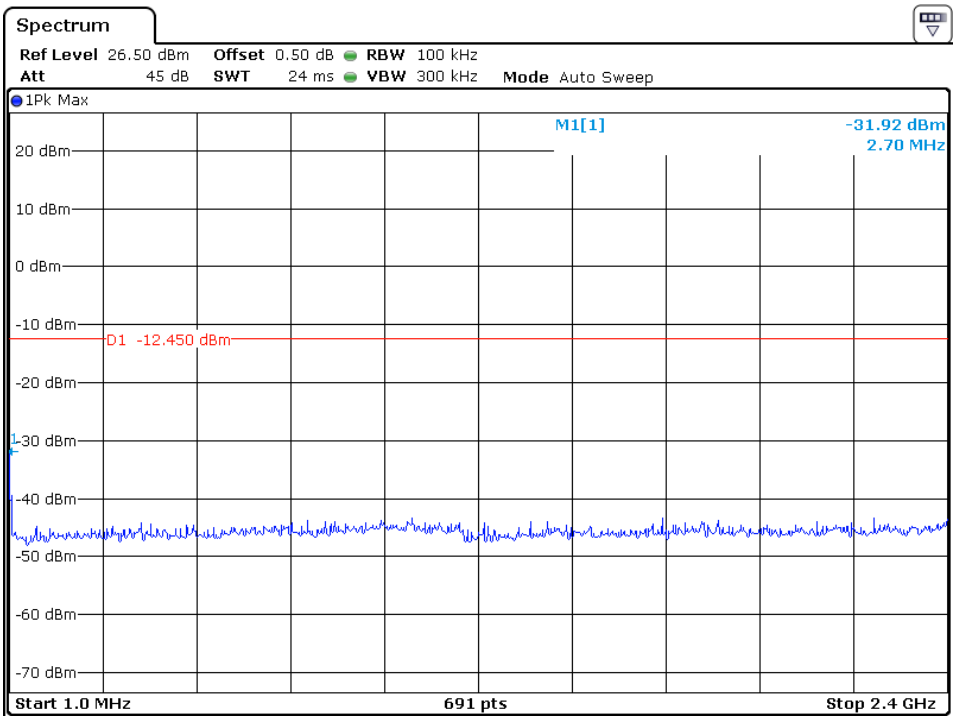
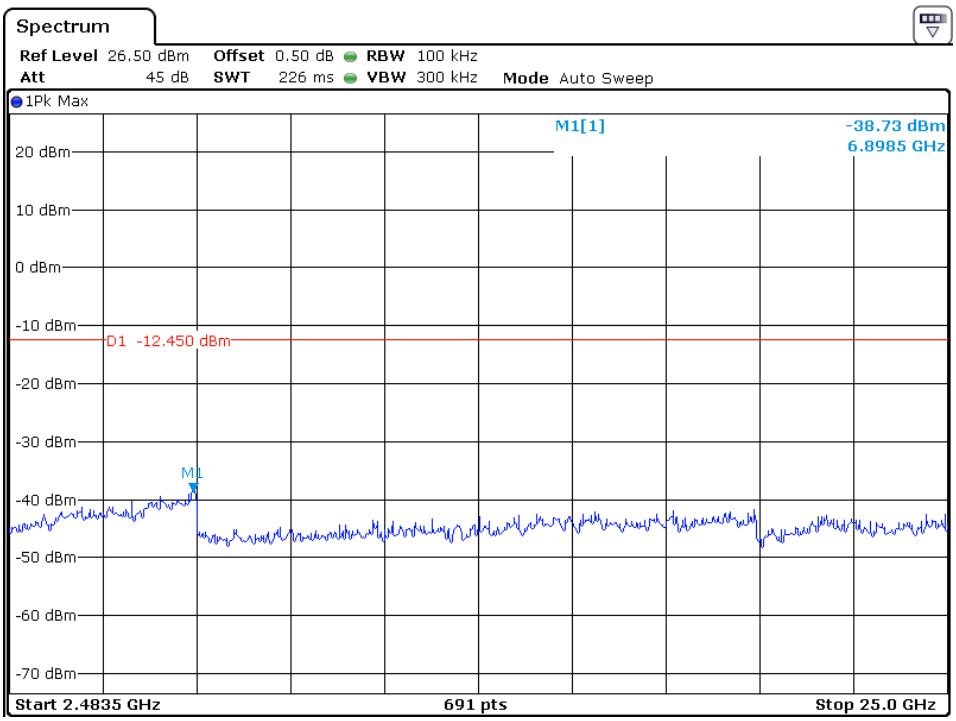


Date: 18.JUL.2020 15:32:00

Channel 06 (2437MHz) Reference Level: 7.55dBm

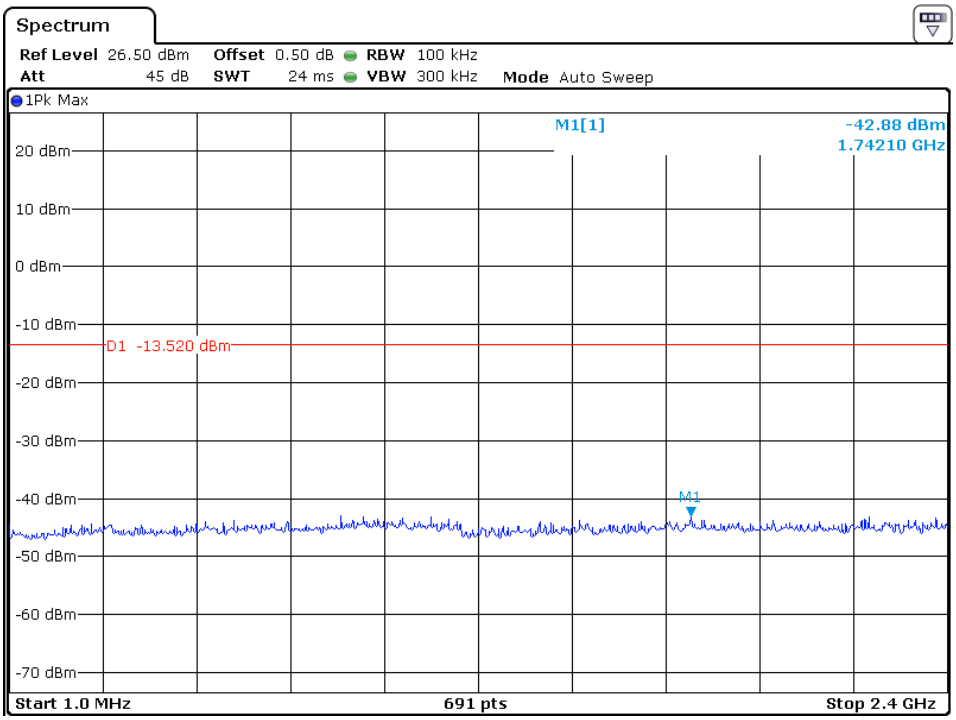


Date: 18.JUL.2020 15:39:47



Date: 18.JUL.2020 15:40:02

Channel 11 (2462MHz) Reference Level: 6.48dBm



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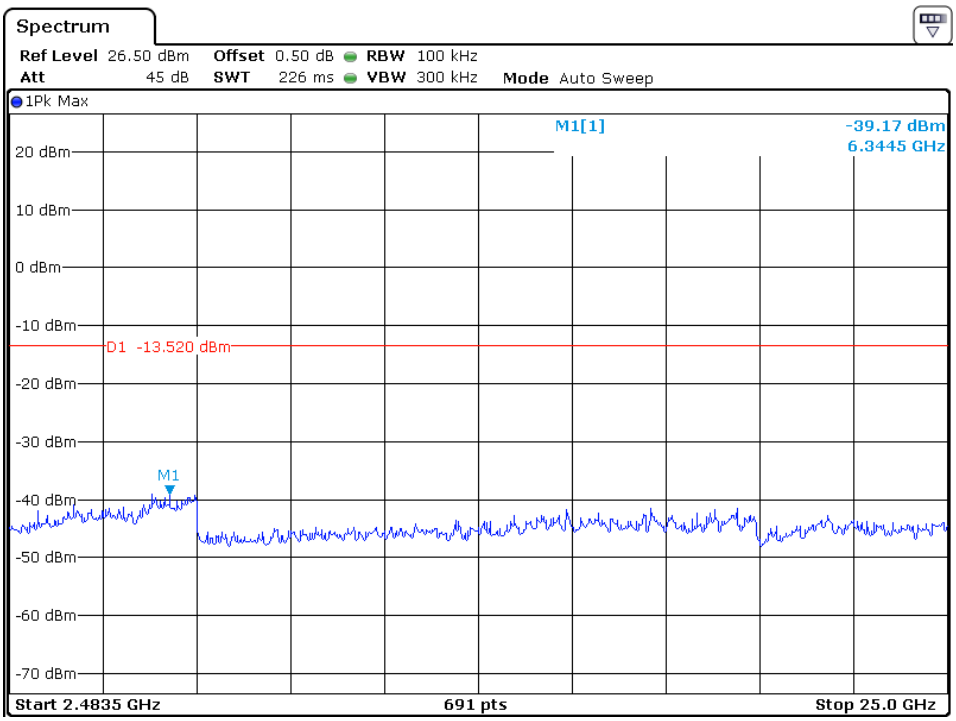

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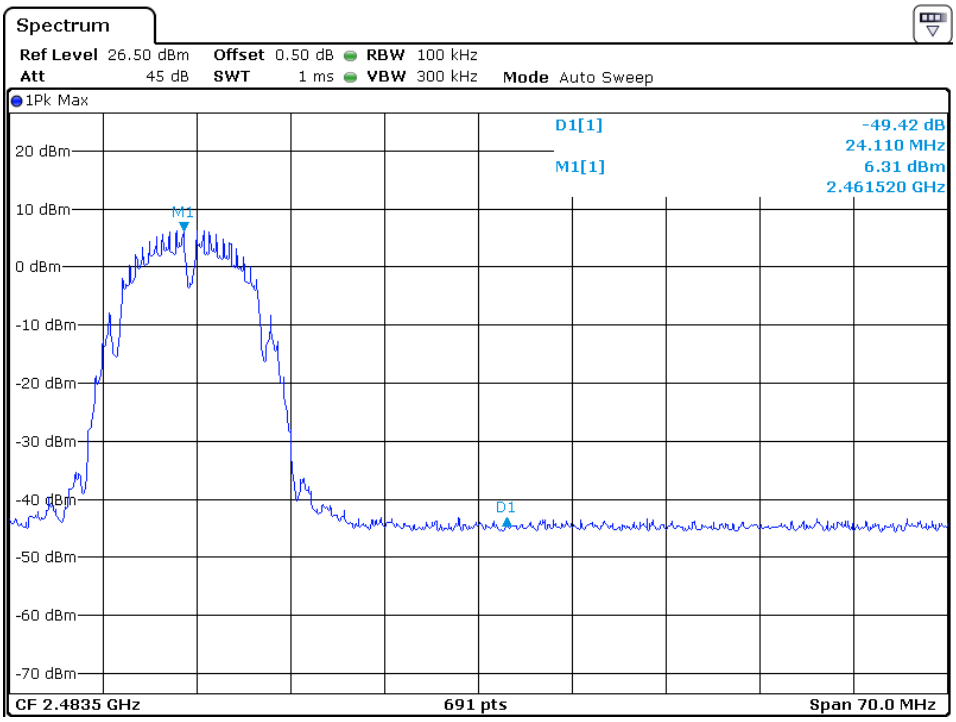
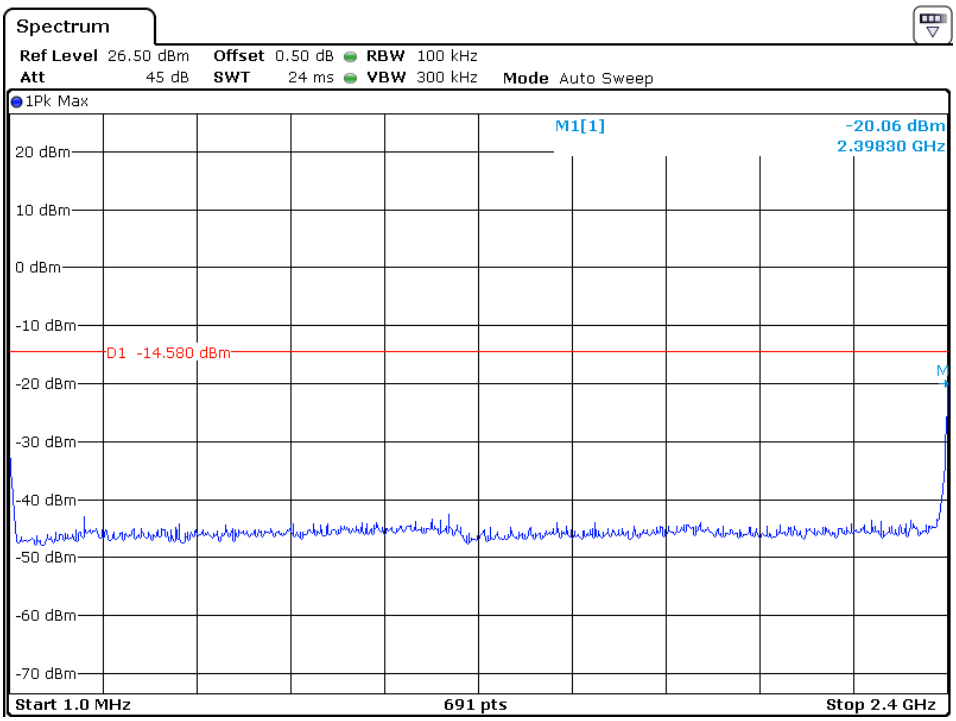


Date: 18.JUL.2020 15:57:06

802.11g
Channel 01 (2412MHz) Reference Level: 5.42dBm



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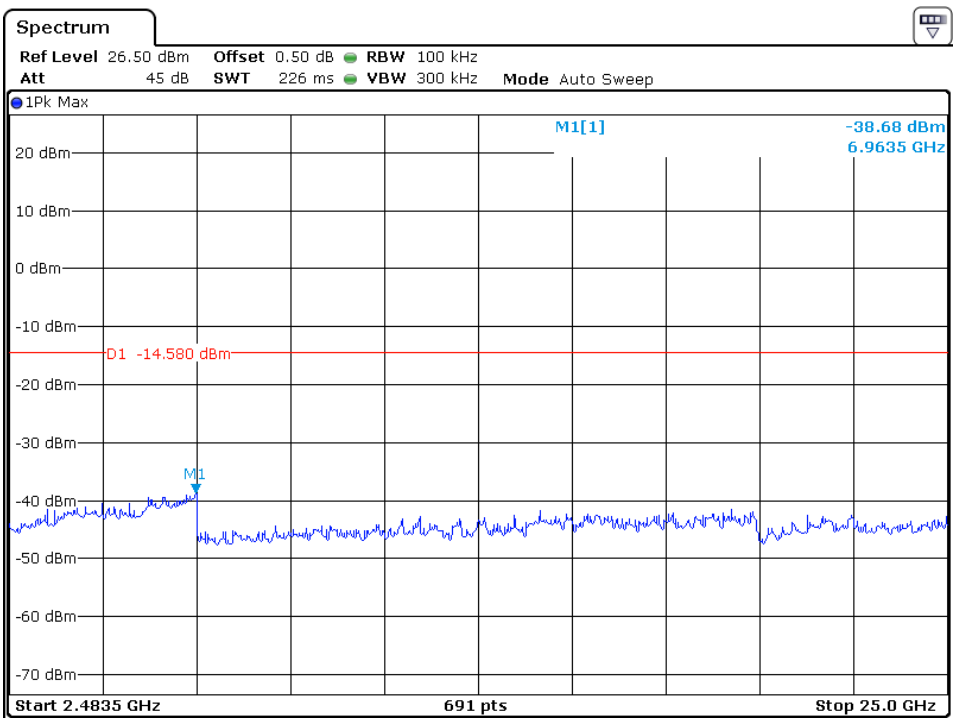

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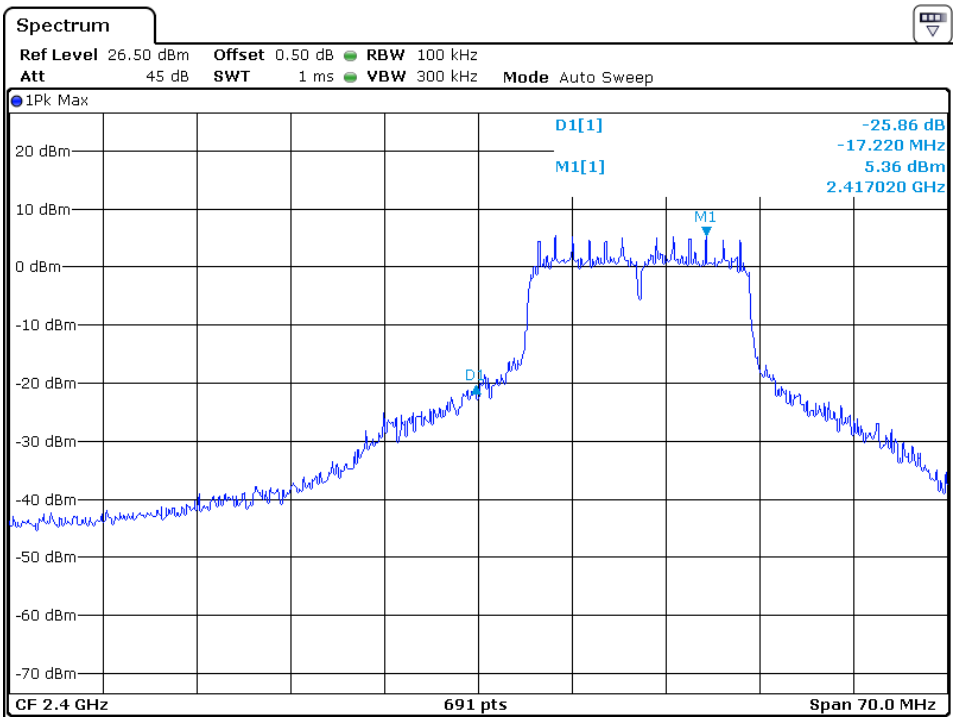
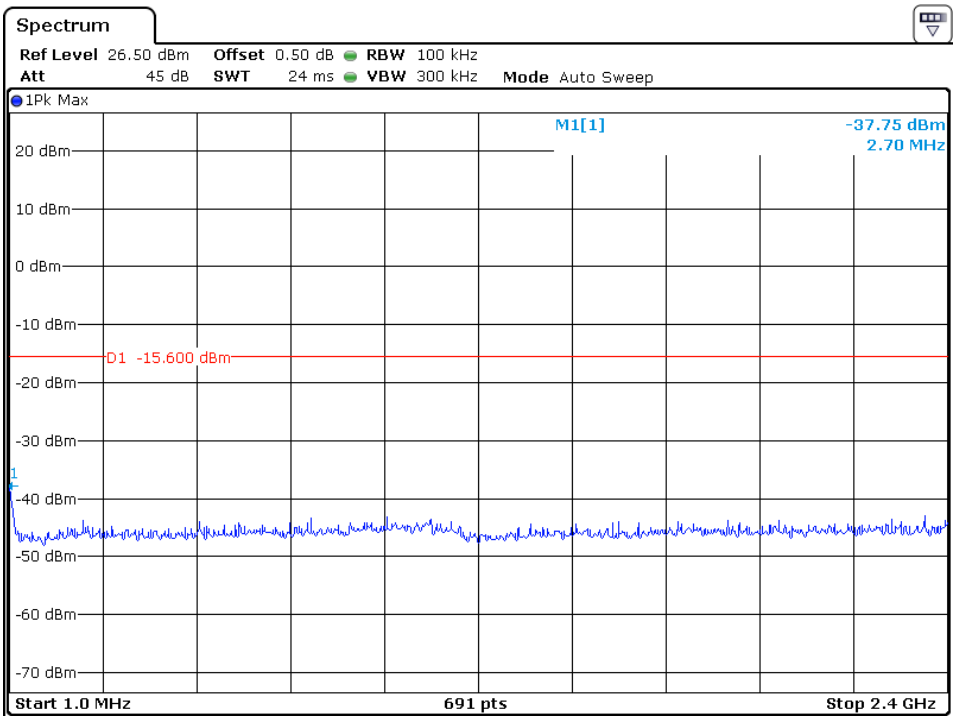


Date: 18.JUL.2020 16:00:07

Channel 06 (2437MHz) Reference Level: 4.40dBm



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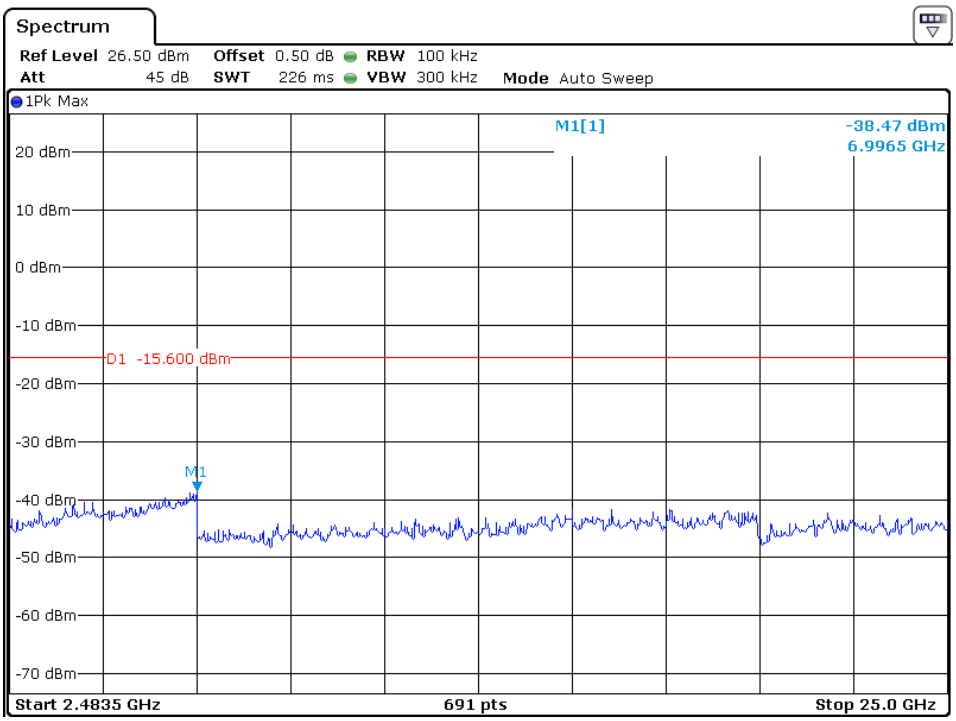
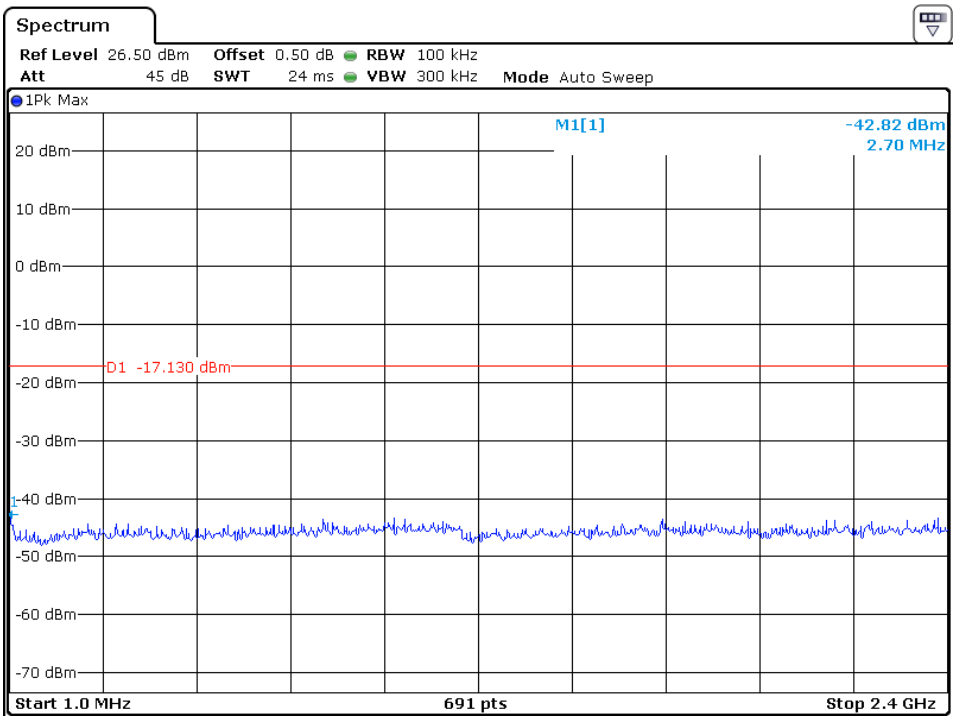


Date: 18.JUL.2020 16:02:34

Channel 11 (2462MHz) Reference Level: 2.87dBm



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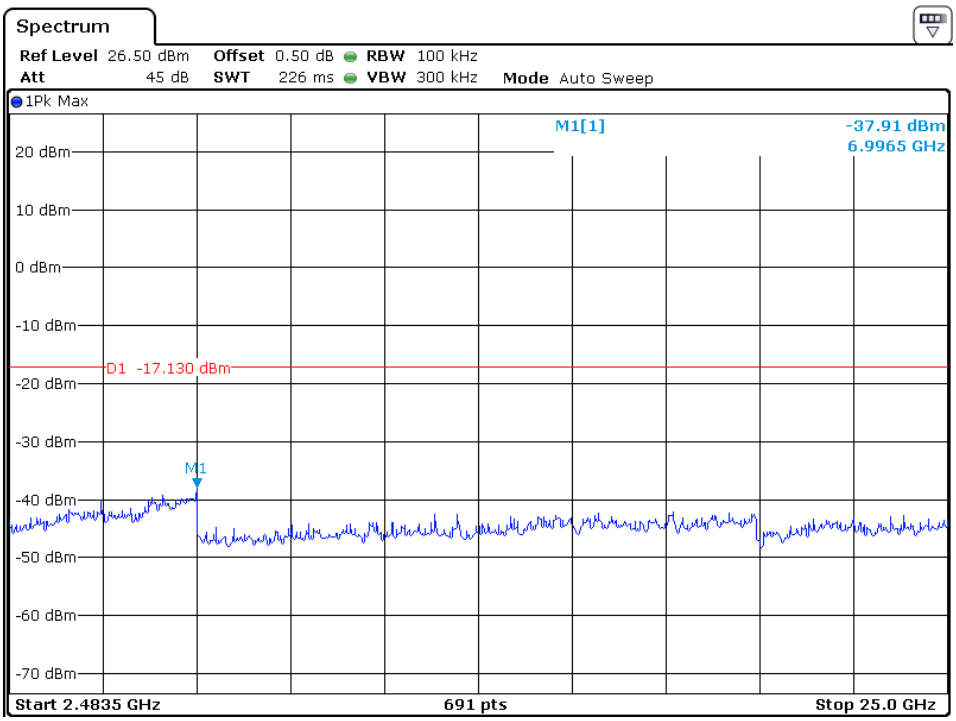

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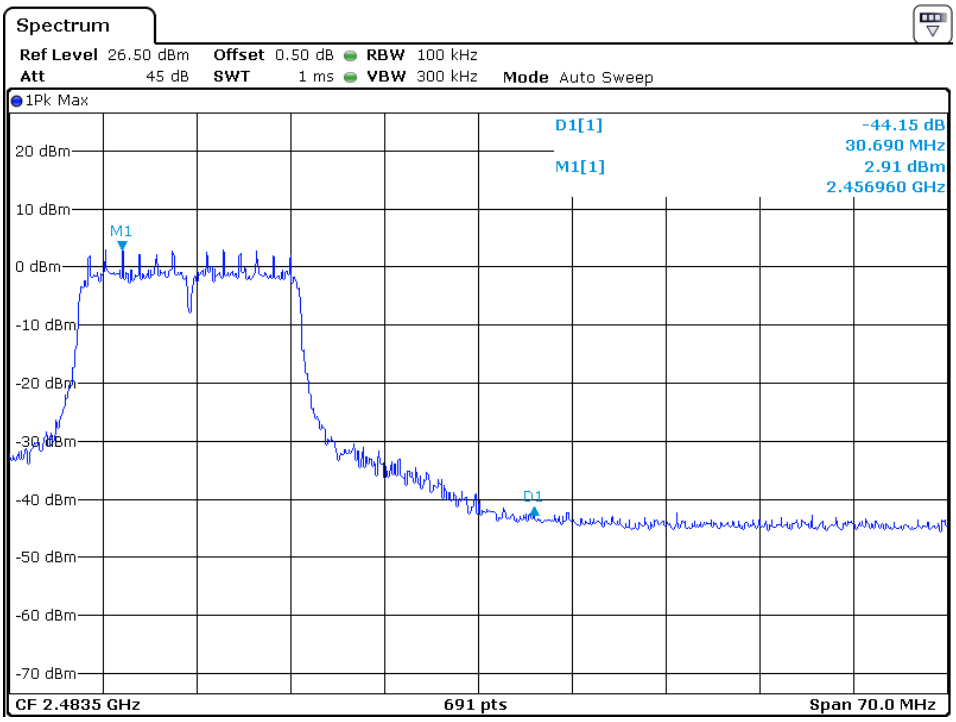
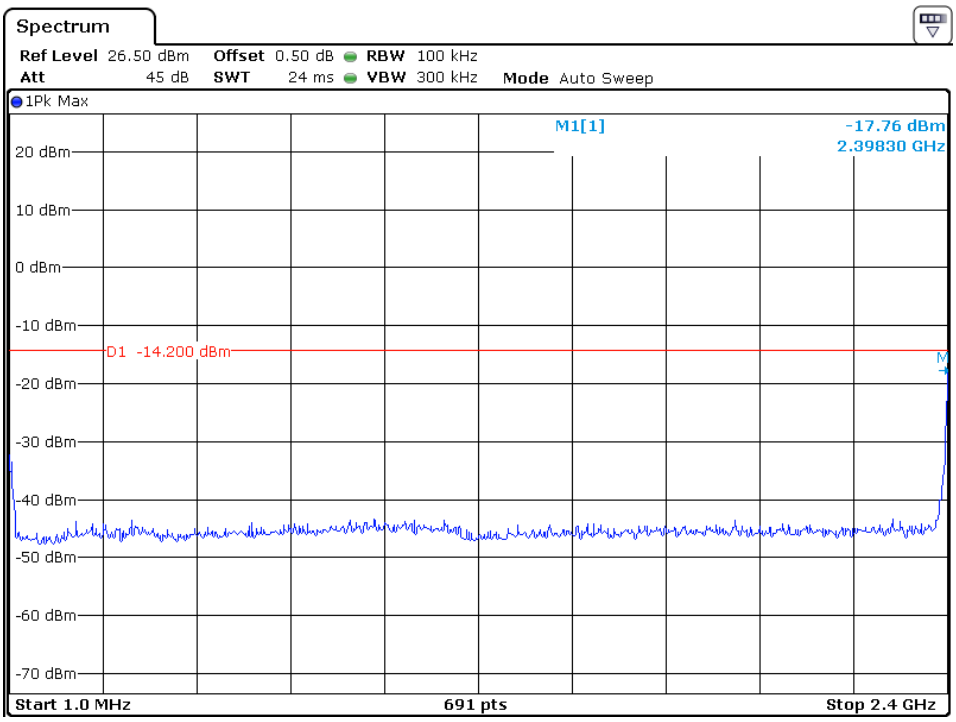
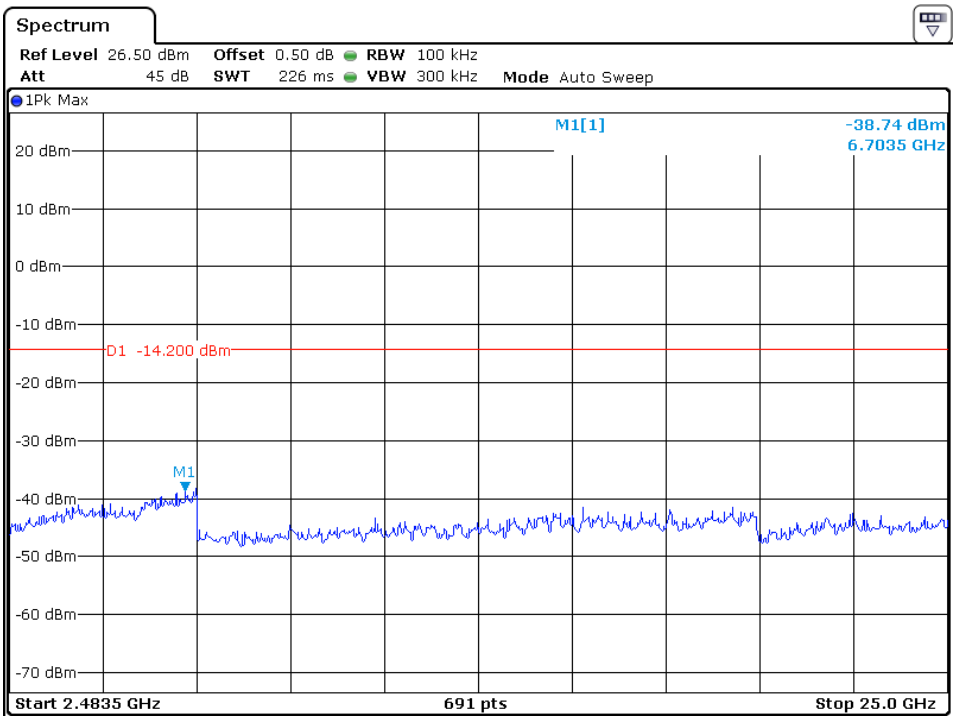


Date: 18.JUL.2020 16:05:23

802.11n-HT20
Channel 01 (2412MHz) Reference Level: 5.80dBm



Date: 18.JUL.2020 15:30:41



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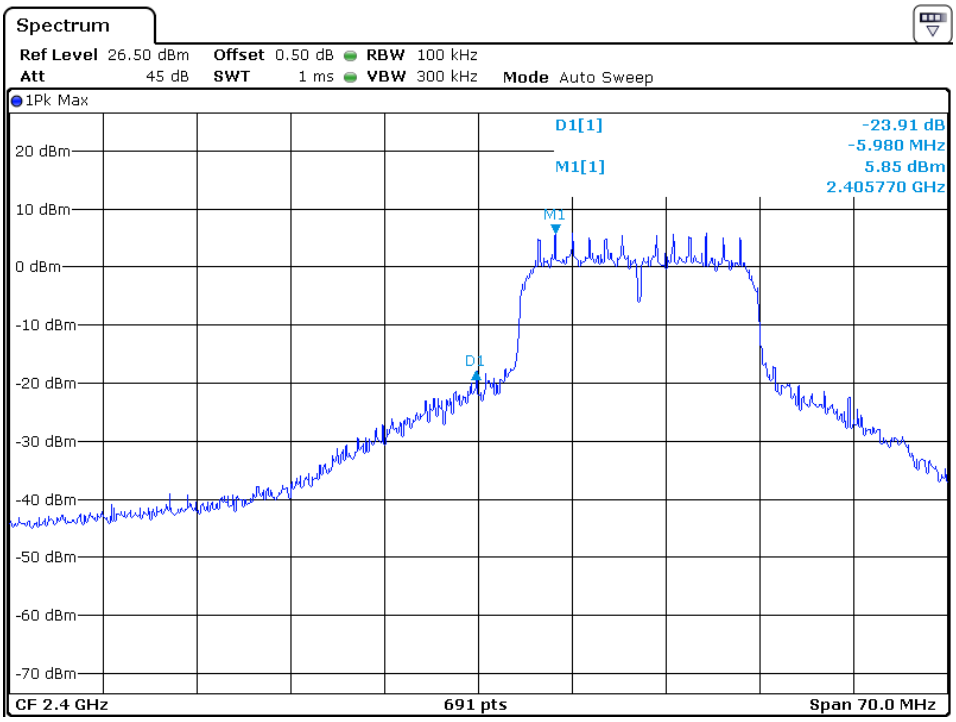
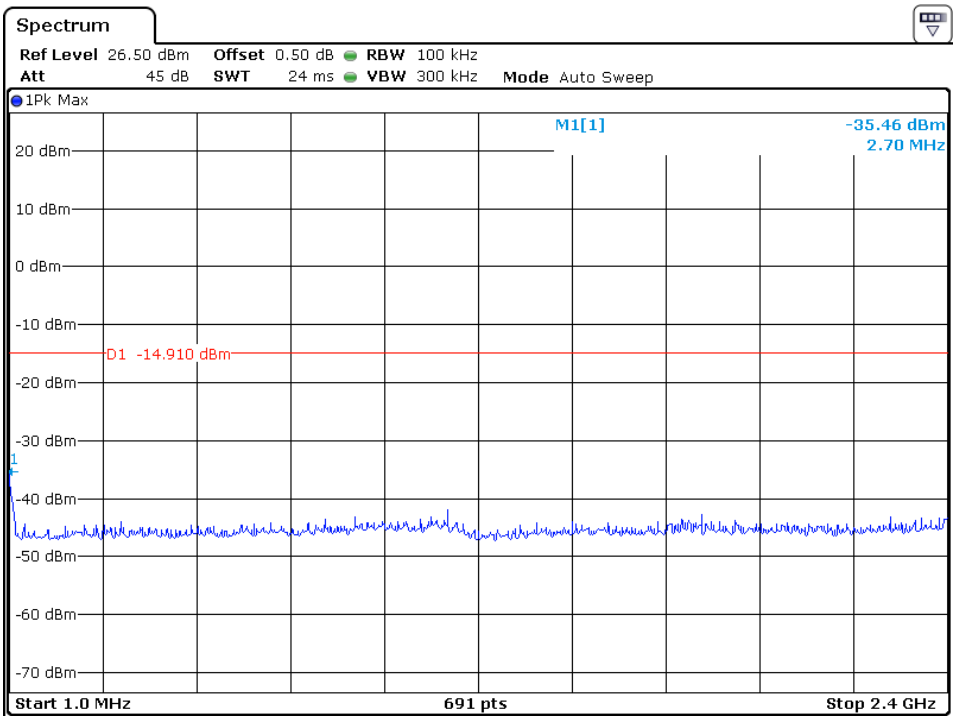
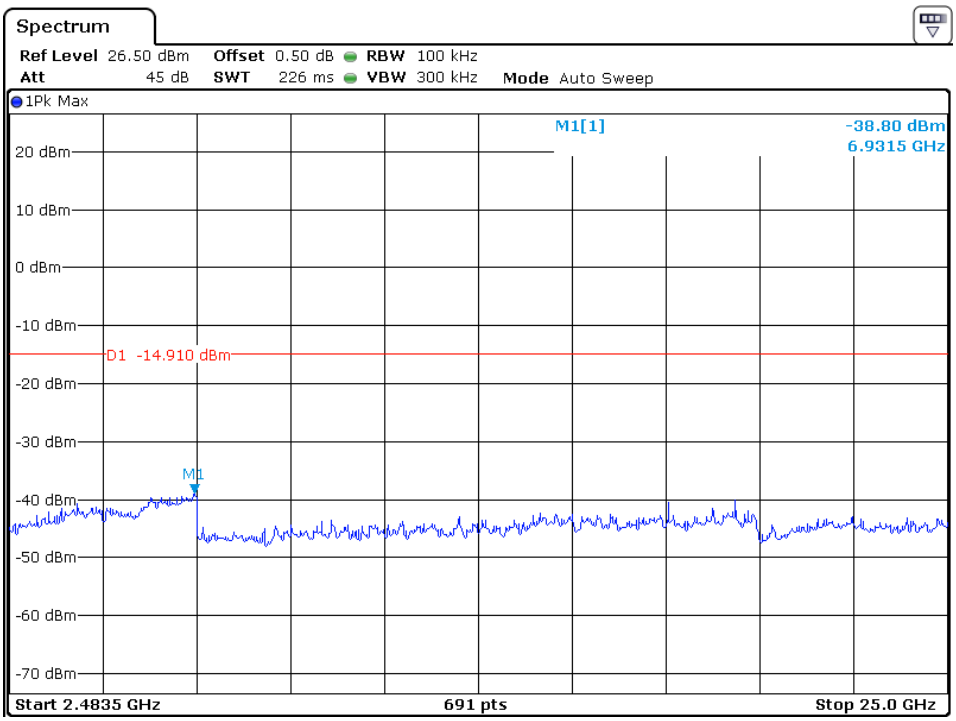


Date: 18.JUL.2020 15:31:14

Channel 06 (2437MHz) Reference Level: 5.09dBm

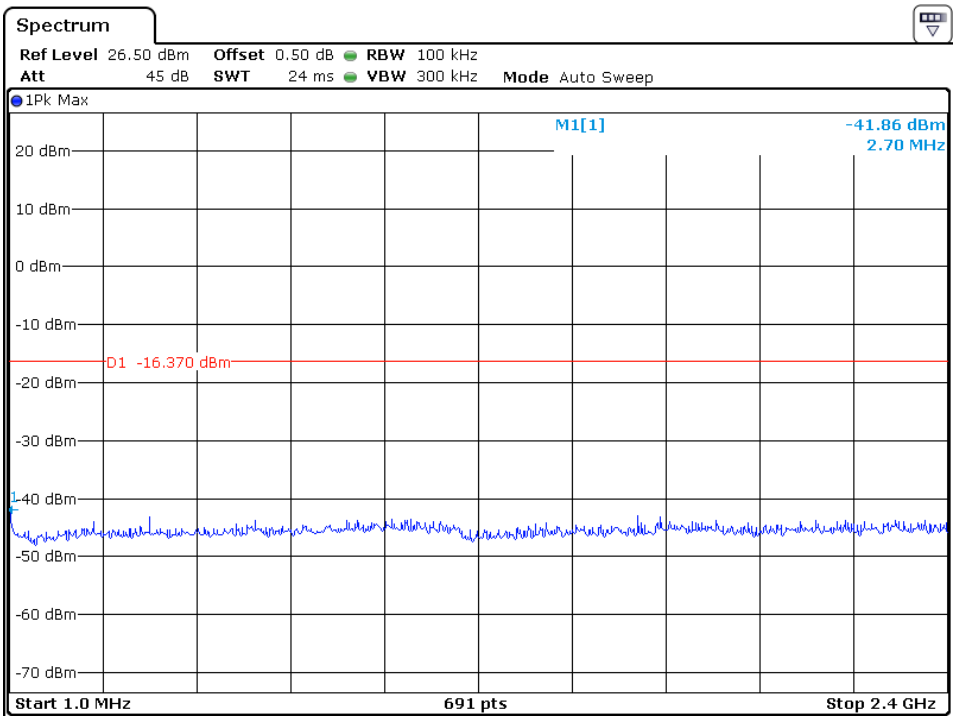


Date: 18.JUL.2020 15:24:28



Date: 18.JUL.2020 15:24:47

Channel 11 (2462MHz) Reference Level: 3.63dBm



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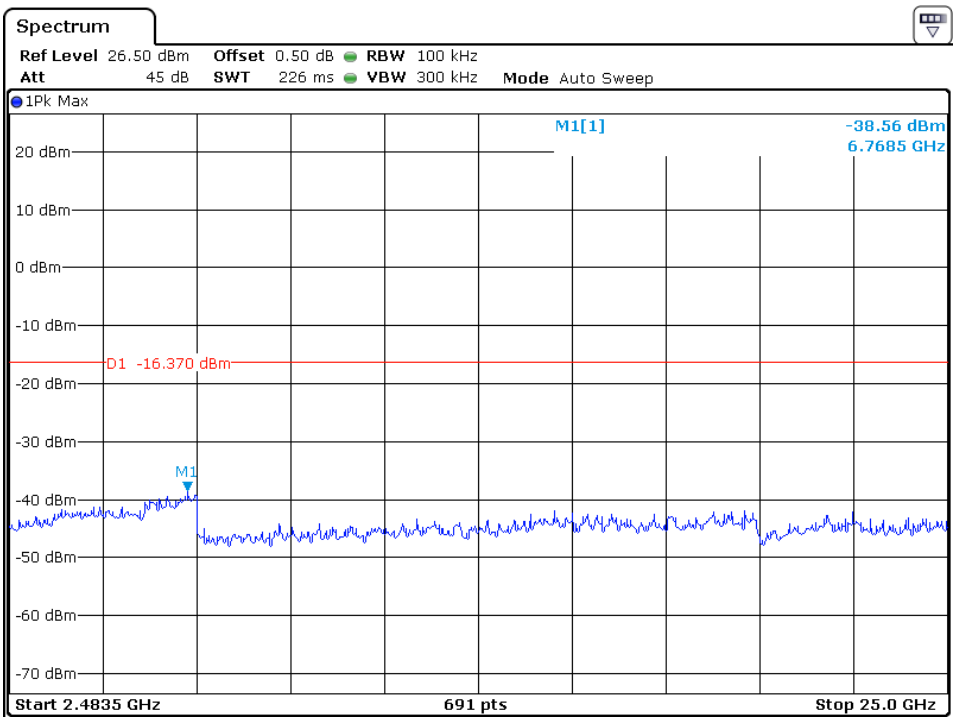

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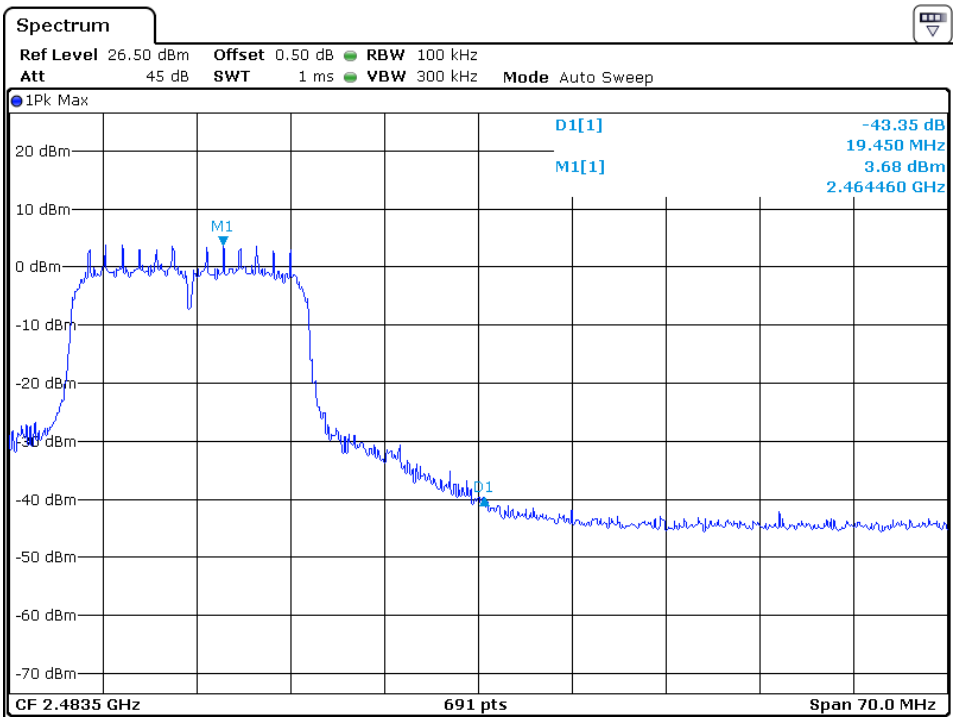


Date: 18.JUL.2020 15:21:57

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

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

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 dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
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

<u>Example</u>
Assume a receiver reading of 62.0 dBμV 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 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB
FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 dBμV/m

Level in mV/m = Common Antilogarithm [(42 dBμV/m)/20] = 125.9 μV/m

Applicant: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020 Model: iUVC1

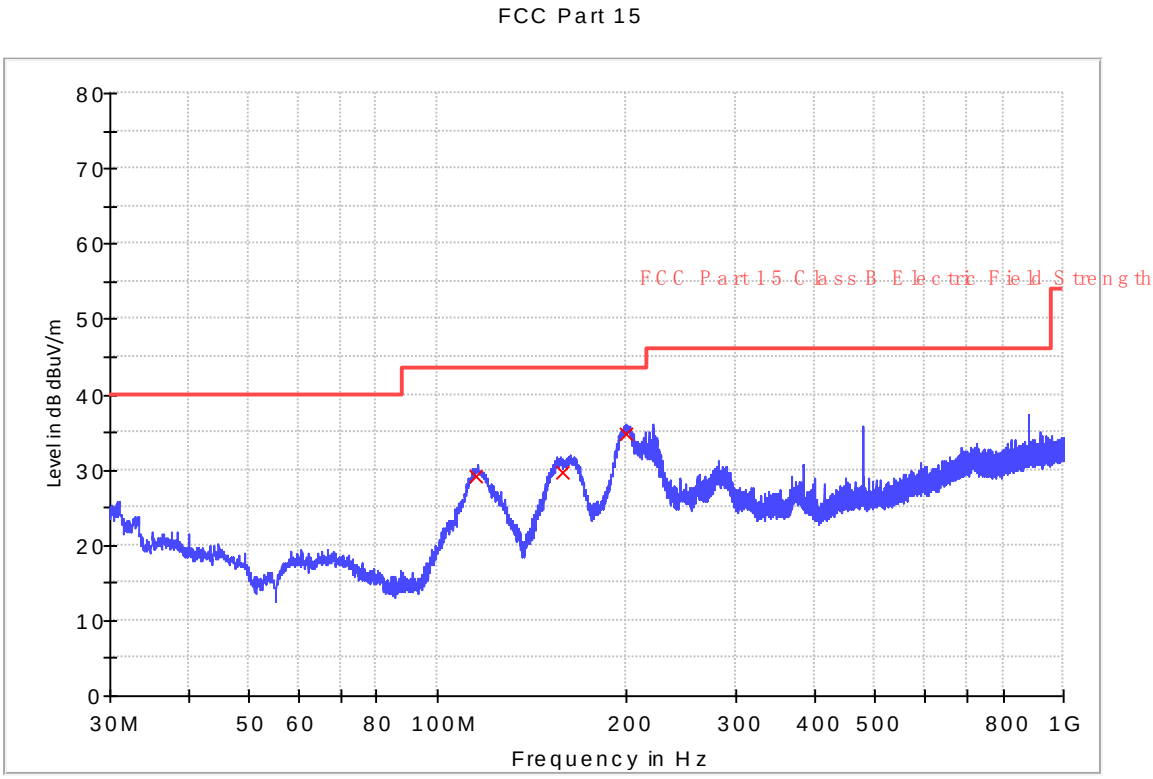
4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission
at 54.585680MHz
is passed by 1.6dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf. Simultaneous transmission was considered during the test.

Applicant: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020 Model: iUVC1
Worst Case Operating Mode: Simultaneous transmission

ANT Polarity: Horizontal



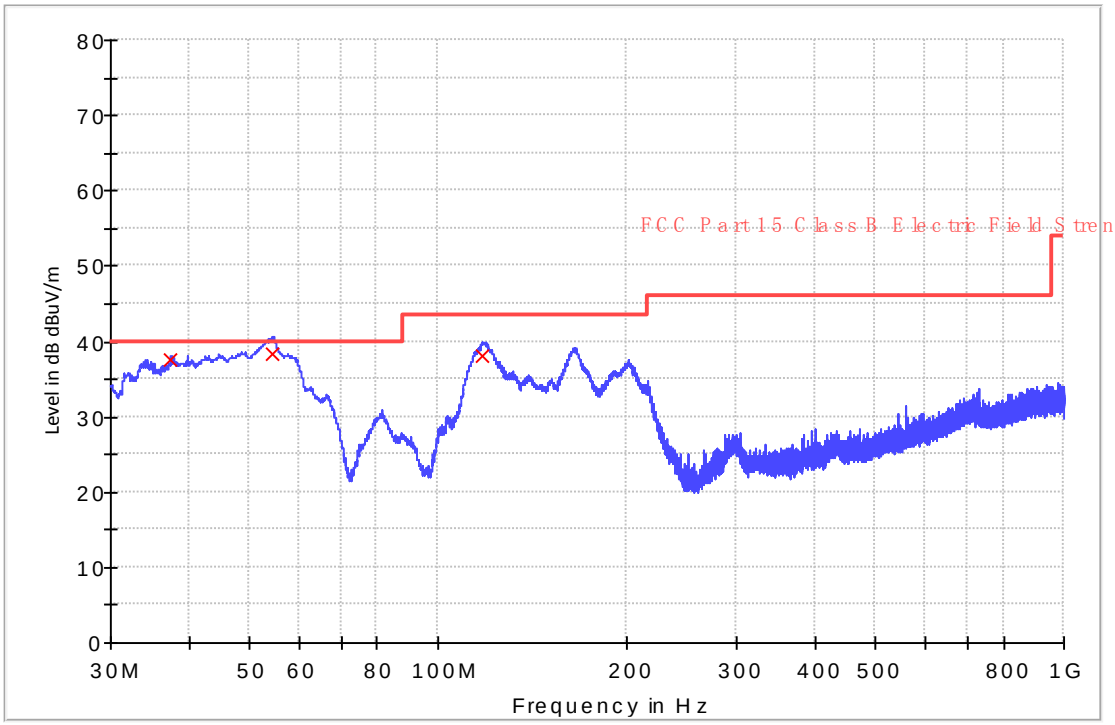
Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
115.036667	29.0	1000.0	120.000	H	9.5	14.5	43.5
158.880667	29.8	1000.0	120.000	H	11.4	13.7	43.5
200.600000	34.7	1000.0	120.000	H	12.7	8.8	43.5

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBµV/m)= Corr. (dB/m)+ Read Level (dBµV)
3. Margin (dB) = Limit Line(dBµV/m) – Level (dBµV/m)

Applicant: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020 Model: iUVC1
Worst Case Operating Mode: Simultaneous transmission

ANT Polarity: Vertical

FCC Part 15



Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
37.440613	37.6	1000.0	120.000	V	14.8	2.4	40.0
54.585680	38.4	1000.0	120.000	V	8.1	1.6	40.0
117.558667	38.0	1000.0	120.000	V	9.7	5.5	43.5

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBµV/m)= Corr. (dB/m)+ Read Level (dBµV)
3. Margin (dB) = Limit Line(dBµV/m) – Level (dBµV/m)

Applicant: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020 Model: iUVC1
Worst Case Operating Mode: Transmitting (802.11b-Channel 01)

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	64.8	36.8	33.5	61.5	74.0	-12.5
Horizontal	*2390.000	44.4	36.4	29.1	37.1	74.0	-36.9

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	50.9	36.8	33.5	47.6	54.0	-6.4
Horizontal	*2390.000	37.6	36.4	29.1	30.3	54.0	-23.7

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: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020 Model: iUVC1
Worst Case Operating Mode: Transmitting (802.11b-Channel 06)

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	63.4	36.7	33.4	60.1	74.0	-13.9
Horizontal	*7311.000	51.1	36.6	35.8	50.3	74.0	-23.7

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	48.8	36.7	33.4	45.5	54.0	-8.5
Horizontal	*7311.000	41.4	36.6	35.8	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: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020 Model: iUVC1
Worst Case Operating Mode: Transmitting (802.11b-Channel 11)

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	61.2	36.8	33.3	57.7	74.0	-16.3
Horizontal	*7386.000	56.0	36.5	29.3	48.8	74.0	-25.2

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	51.8	36.8	33.3	48.3	54.0	-5.7
Horizontal	*7386.000	47.5	36.5	29.3	40.3	54.0	-13.7

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: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020 Model: iUVC1
Worst Case Operating Mode: Transmitting (802.11g-Channel 01)

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	53.2	36.8	33.5	49.9	74.0	-24.1
Horizontal	*2390.000	42.9	36.4	29.1	35.6	74.0	-38.4

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	40.0	36.8	33.5	36.7	54.0	-17.3
Horizontal	*2390.000	37.5	36.4	29.1	30.2	54.0	-23.8

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: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020 Model: iUVC1
Worst Case Operating Mode: Transmitting (802.11g-Channel 06)

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	49.8	36.7	33.4	46.5	74.0	-27.5
Horizontal	*7311.000	43.8	36.6	35.8	43.0	74.0	-31.0

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	38.5	36.7	33.4	35.2	54.0	-18.8
Horizontal	*7311.000	34.6	36.6	35.8	33.8	54.0	-20.2

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: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020 Model: iUVC1
Worst Case Operating Mode: Transmitting (802.11g-Channel 11)

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	53.8	36.8	33.3	50.3	74.0	-23.7
Horizontal	*7386.000	57.9	36.5	29.3	50.7	74.0	-23.3

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	43.1	36.8	33.3	39.6	54.0	-14.4
Horizontal	*7386.000	49.2	36.5	29.3	42.0	54.0	-12.0

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: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020 Model: iUVC1
Worst Case Operating Mode: Transmitting (802.11n20-Channel 01)

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	53.4	36.8	33.5	50.1	74.0	-23.9
Horizontal	*2390.000	44.5	36.4	29.1	37.2	74.0	-36.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	42.2	36.8	33.5	38.9	54.0	-15.1
Horizontal	*2390.000	38.0	36.4	29.1	30.7	54.0	-23.3

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: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020 Model: iUVC1
Worst Case Operating Mode: Transmitting (802.11n20-Channel 06)

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	51.9	36.7	33.4	48.6	74.0	-25.4
Horizontal	*7311.000	48.0	36.6	35.8	47.2	74.0	-26.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	40.8	36.7	33.4	37.5	54.0	-16.5
Horizontal	*7311.000	36.6	36.6	35.8	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: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020 Model: iUVC1
Worst Case Operating Mode: Transmitting (802.11n20-Channel 11)

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	57.2	36.8	33.3	53.7	74.0	-20.3
Horizontal	*7386.000	60.5	36.5	29.3	53.3	74.0	-20.7

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	42.2	36.8	33.3	38.7	54.0	-15.3
Horizontal	*7386.000	44.7	36.5	29.3	37.5	54.0	-16.5

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: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020
Model: iUVC1

4.9 Conducted Emission

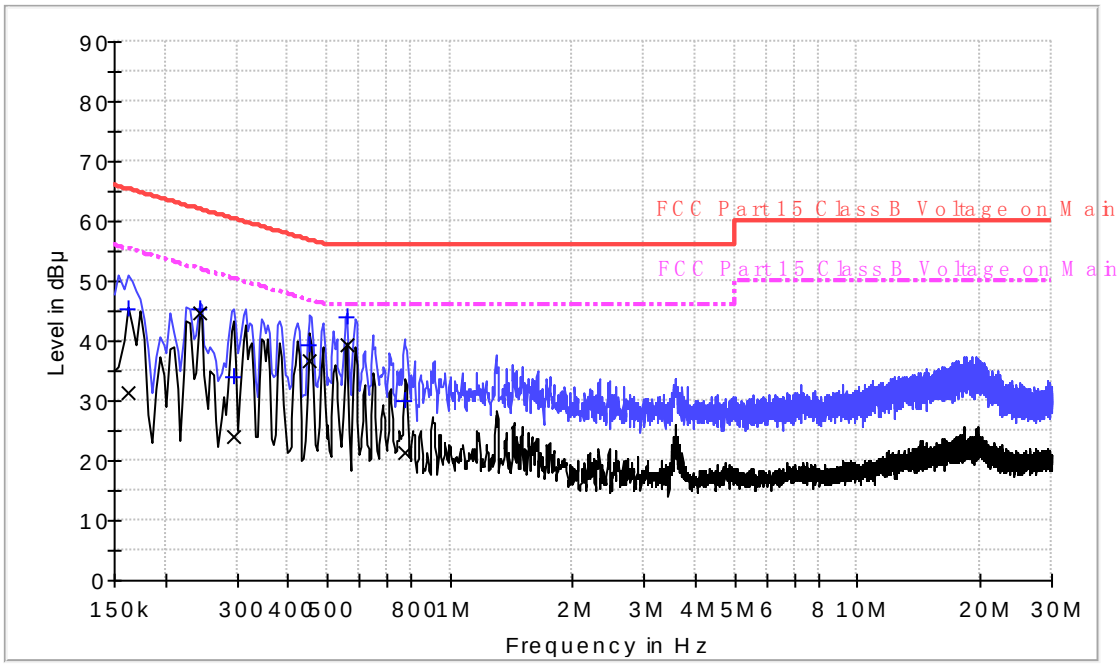
Worst Case Conducted Emission (802.11b-Channel 01)
at 0.558MHz
is passed by 6.7dB margin.

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

Applicant: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020
Model: iUVC1
Worst Case Operating Mode: Simultaneous transmission
Phase: Live

Graphic / Data Table

Conducted Emissions
Pursuant to FCC 15.207: Emissions Requirement



Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.162000	45.2	9.000	L1	9.7	20.2	65.4
0.242000	45.2	9.000	L1	9.7	16.8	62.0
0.294000	33.9	9.000	L1	9.7	26.5	60.4
0.454000	39.3	9.000	L1	9.7	17.5	56.8
0.558000	43.9	9.000	L1	9.7	12.1	56.0
0.774000	30.0	9.000	L1	9.7	26.0	56.0

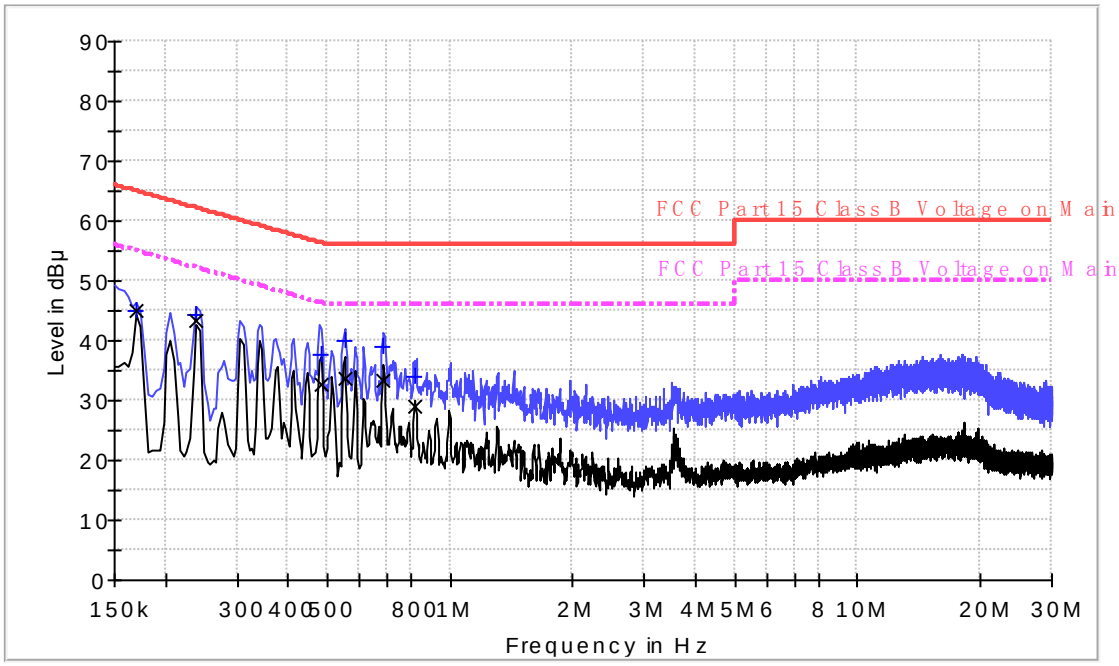
Limit and Margin AV

Frequency (MHz)	Average (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.162000	31.3	9.000	L1	9.7	24.1	55.4
0.242000	44.7	9.000	L1	9.7	7.3	52.0
0.294000	23.9	9.000	L1	9.7	26.5	50.4
0.454000	36.6	9.000	L1	9.7	10.2	46.8
0.558000	39.3	9.000	L1	9.7	6.7	46.0
0.774000	21.2	9.000	L1	9.7	24.8	46.0

Applicant: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020
Model: iUVC1
Worst Case Operating Mode: Simultaneous transmission
Phase: Neutral

Graphic / Data Table

Conducted Emissions
Pursuant to FCC 15.207: Emissions Requirement



Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.170000	45.1	9.000	N	9.7	19.9	65.0
0.238000	44.4	9.000	N	9.7	17.8	62.2
0.482000	37.8	9.000	N	9.7	18.5	56.3
0.550000	39.8	9.000	N	9.7	16.2	56.0
0.686000	39.0	9.000	N	9.7	17.0	56.0
0.818000	34.1	9.000	N	9.7	21.9	56.0

Limit and Margin AV

Frequency (MHz)	Average (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.170000	44.9	9.000	N	9.7	10.1	55.0
0.238000	43.3	9.000	N	9.7	8.9	52.2
0.482000	32.5	9.000	N	9.7	13.8	46.3
0.550000	33.8	9.000	N	9.7	12.2	46.0
0.686000	33.3	9.000	N	9.7	12.7	46.0
0.818000	29.1	9.000	N	9.7	16.9	46.0

Applicant: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020
Model: iUVC1

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: RONGYEJIA ELECTRONICS LTD
Date of Test: July 28, 2020
Model: iUVC1

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.

5.0 Equipment Photographs

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

6.0 Product Labeling

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

7.0 Technical Specifications

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

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.

9.0 Confidentiality Request

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

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.

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	2020-05-27	2021-05-27
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	2020-05-27	2021-05-27
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	2018-09-14	2020-09-14
SZ185-01	EMI Receiver	R&S	ESCI	100547	2019-12-24	2020-12-24
SZ061-08	Horn Antenna	ETS	3115	00092346	2019-09-07	2021-09-07
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	2019-05-24	2021-05-24
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	2020-05-27	2021-05-27
SZ056-06	Signal Analyzer	R&S	FSV 40	101101	2020-05-27	2021-05-27
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	2020-05-27	2021-05-27
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	2018-12-15	2021-12-15
SZ062-02	RF Cable	RADIALL	RG 213U	--	2020-06-12	2020-12-12
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	2020-02-26	2020-08-26
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	2020-02-26	2020-08-26
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	2020-05-27	2021-05-27
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	2019-10-29	2020-10-29
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	2019-10-29	2020-10-29
SZ188-03	Shielding Room	ETS	RFD-100	4100	2020-01-07	2023-01-07

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