

iDevices, LLC

Application
For
Certification

FCC ID: 2ABDJ-SWITCH4

OUTDOOR SWITCH

Model: IDEV0004

WiFi Transceiver

Report No.: 150729018SZN-002

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 [10-1-13]

Prepared and Checked by:

Approved by:

Sign on file

Leo Lai
Project Engineer

Andy Yan
Senior Project Engineer
Date: August 28, 2015

- The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
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- The evaluation data of the report will be kept for 3 years from the date of issuance.

TRF no.: FCC 15C_Tx_b

Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch

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INTERTEK TESTING SERVICE

MEASUREMENT/TECHNICAL REPORT

iDevices, LLC - MODEL: IDEV0004

FCC ID: 2ABDJ-SWITCH4

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

Equipment Type: DTS - Part 15 Digital Transmission Systems (WiFi 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 [10-01-13 Edition] provision.

Report prepared by:

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INTERTEK TESTING SERVICES

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List of attached file

Exhibit Type	File Description	Filename
Cover Letter	Letter of Agency	agency.pdf
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Setup Photo	Conducted Emission	conducted 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

EXHIBIT 1

SUMMARY OF TEST RESULTS

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1.0 Summary of Test

iDevices, LLC - MODEL: IDEV0004

FCC ID: 2ABDJ-SWITCH4

TEST	REFERENCE	RESULTS
Max. Output power	15.247(b)	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
AC Conducted Emission	15.207	Pass
Antenna Requirement	15.203	Pass (See Notes)

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

EXHIBIT 2

GENERAL DESCRIPTION

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2.0 **General Description**

2.1 Product Description

The Equipment Under Test (EUT) is a OUTDOOR SWITCH with internal WiFi function operating at 2412-2462MHz for 802.11b/g/n-HT20, 11 channels with 5MHz channel spacing. It is powered by 125VAC 60Hz. For more detailed features description, please refer to the user's manual.

Type of Modulation: DBPSK,DQPSK, BPSK,QPSK, 16QAM and 64QAM.

Antenna Type: Integral Antenna.

Max antenna Gain: 2.0 dBi

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 (WiFi transmitter portion)

Remaining portions are subject to the following procedures:

1. Bluetooth LE 4.0 (2.4G band): 150729018SZN-001

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2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009) and KDB 558074. 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. Kejiyuan Branch** and located at 6F, Block D, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: 242492).

EXHIBIT 3
SYSTEM TEST CONFIGURATION

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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 125VAC 60Hz, and only the worst case data was recorded in this report.

The simultaneous transmission spurious was tested, only the worst case data was recorded in this report.

The signal is maximized through rotation and placement in the three orthogonal axes. 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.

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.

Power Parameters of IEEE 802.11b/g/n

On 802.11n (20MHz) mode, only one antenna is used for transmission.

We test all data rate and only the worst – case data is shown in the report.

3.3 Special Accessories

N/A.

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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 iDevices, LLC will be incorporated in each production model sold / leased in the United States.

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

3.6 Support Equipment List and Description

This product was tested in the following configuration:

N/A.

EXHIBIT 4

MEASUREMENT RESULTS

INTERTEK TESTING SERVICES

Applicant: iDevices, LLC
Date of Test: August 18, 2015
Model: IDEV0004

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 (+30dBm).

IEEE 802.11b (Antenna Gain = 2.0 dBi) (BPSK, 1Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	19.10	81.28
Middle Channel: 2437	19.00	79.43
High Channel: 2462	19.80	95.50

IEEE 802.11g (Antenna Gain =2.0 dBi) (DBPSK, 6Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	21.50	141.25
Middle Channel: 2437	21.04	127.06
High Channel: 2462	21.28	134.28

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IEEE 802.11n 20M (Antenna Gain = 2.0 dBi) (BPSK, 6.5Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	21.25	133.35
Middle Channel: 2437	20.82	120.78
High Channel: 2462	20.25	105.93

Cable loss: 0.5 dB External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT dBm max. output level = 21.50dBm

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

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Applicant: iDevices, LLC
Date of Test: August 18, 2015
Model: IDEV0004

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 RBW was set to 100 KHz according to FCC KDB 558074. 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 (BPSK, 1Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	8.032
2437	9.045
2462	7.525

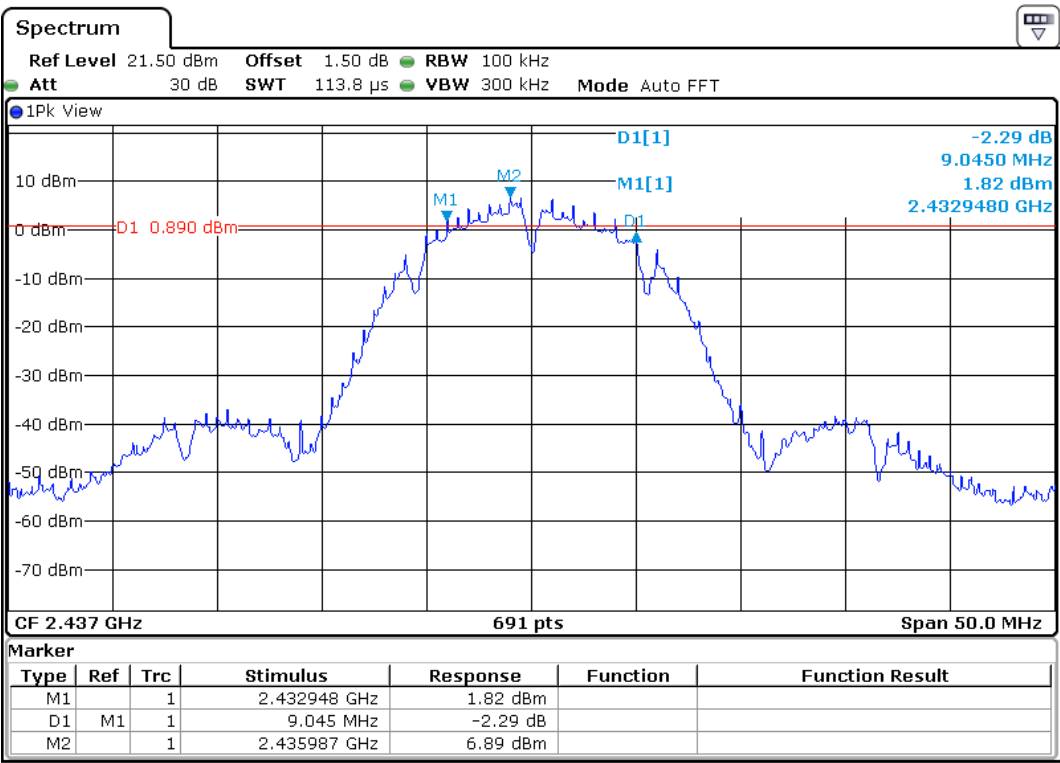
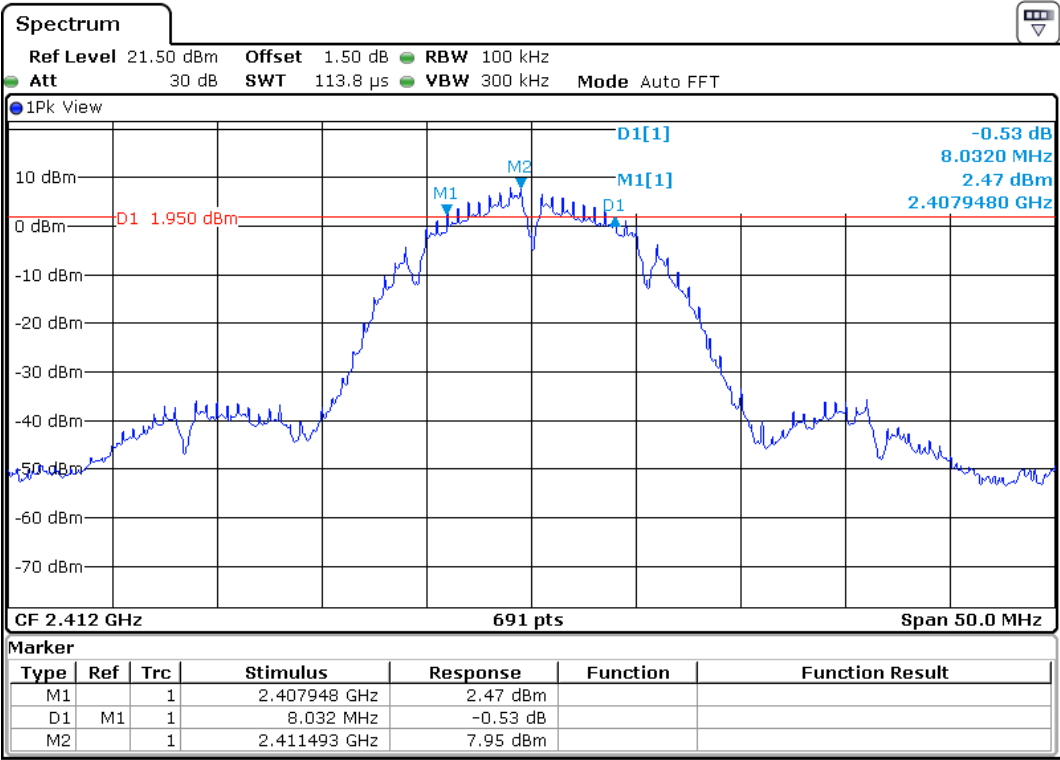
IEEE 802.11g (DBPSK, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	15.427
2437	15.340
2462	14.530

IEEE 802.11n 20M (BPSK, 6.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	15.195
2437	15.166
2462	16.903

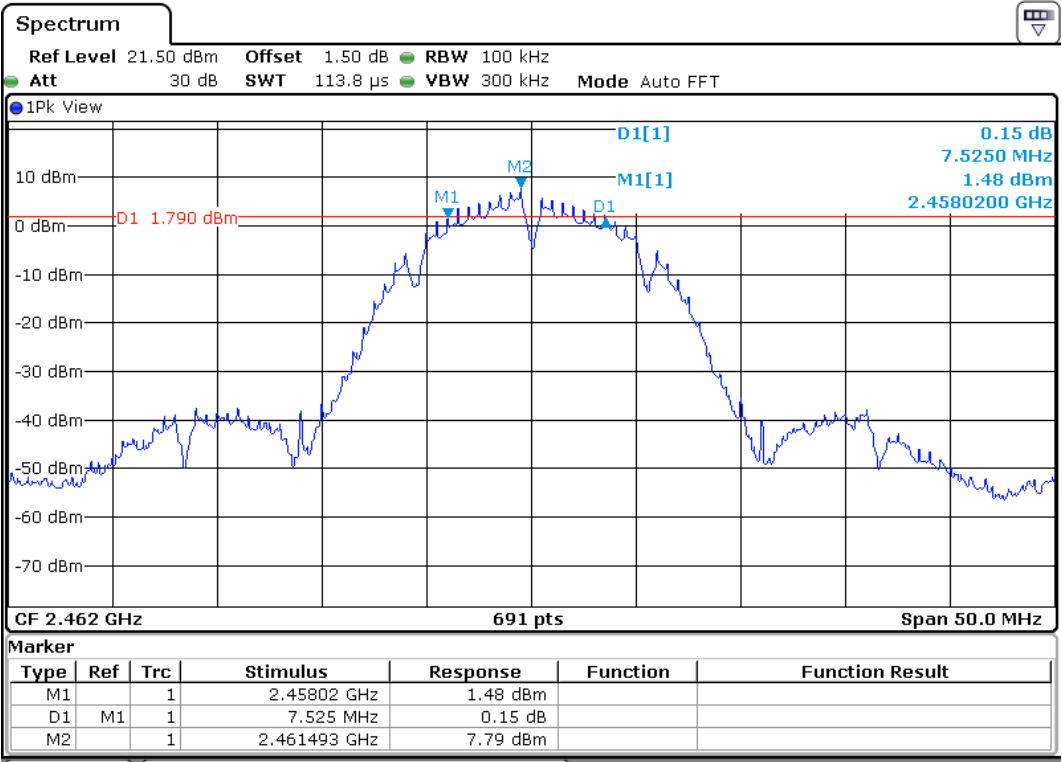
The test plots are attached as below.

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802.11b

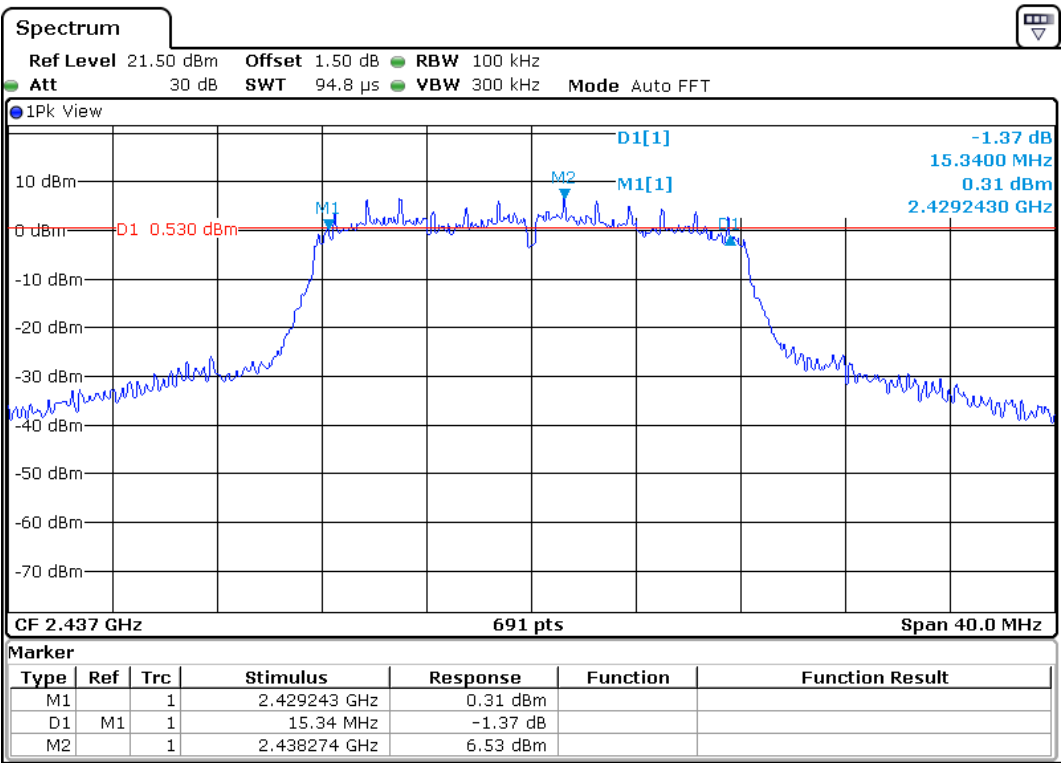
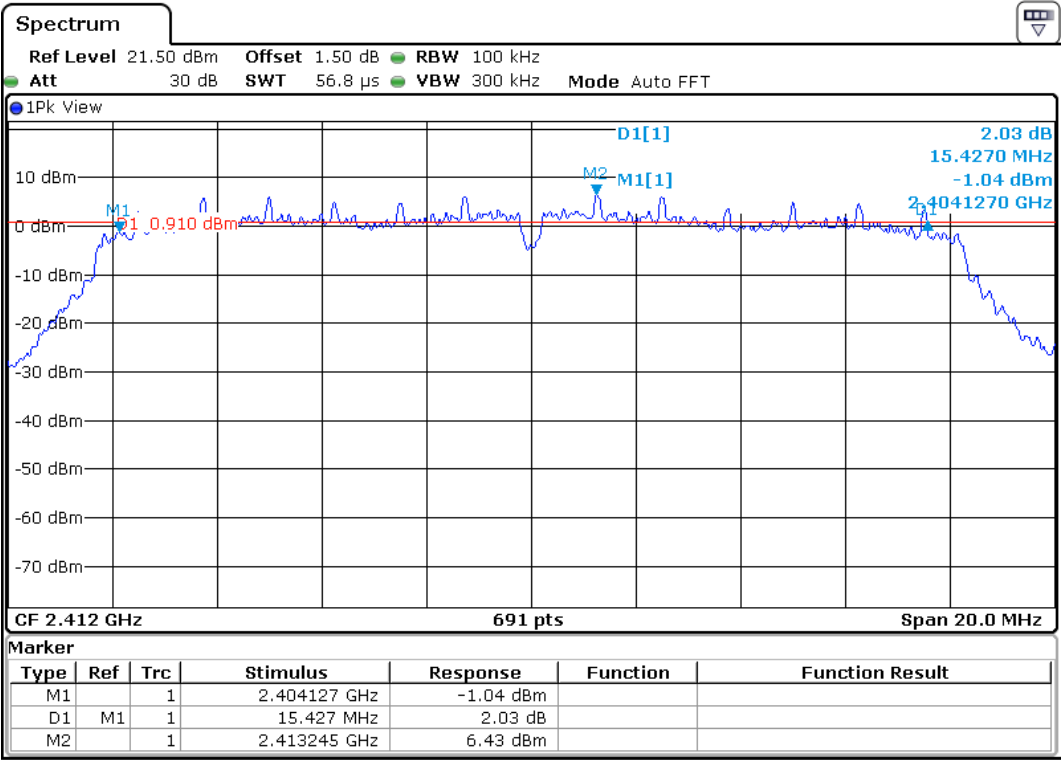


INTERTEK TESTING SERVICES

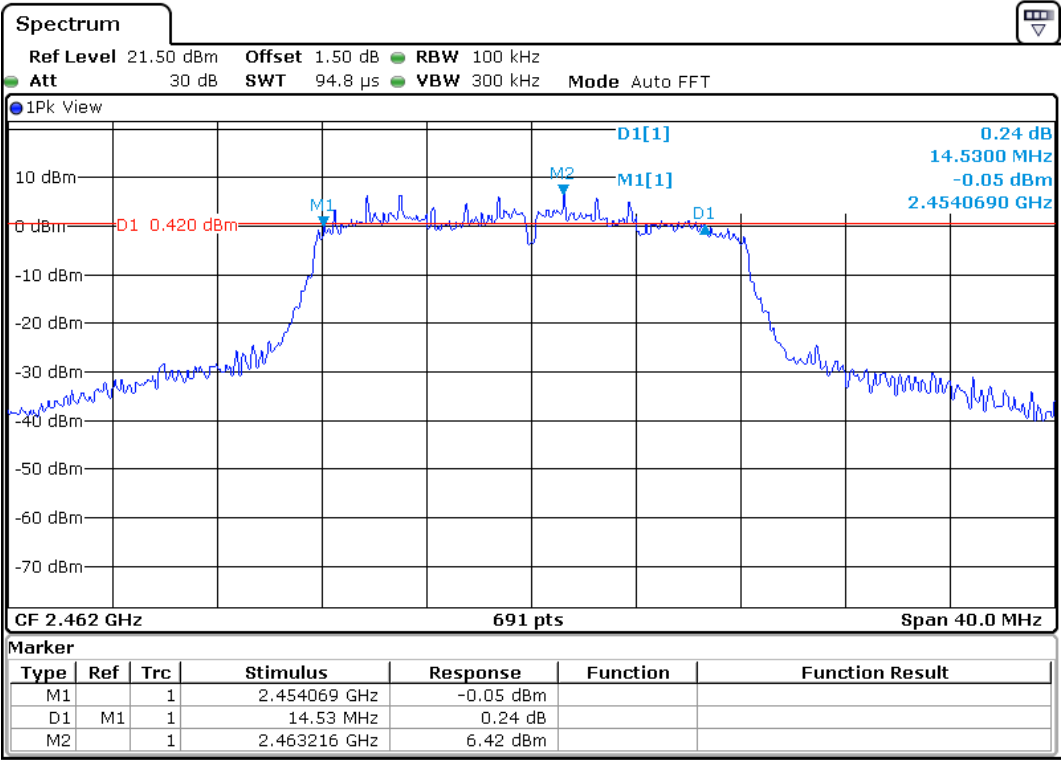


INTERTEK TESTING SERVICES

802.11g

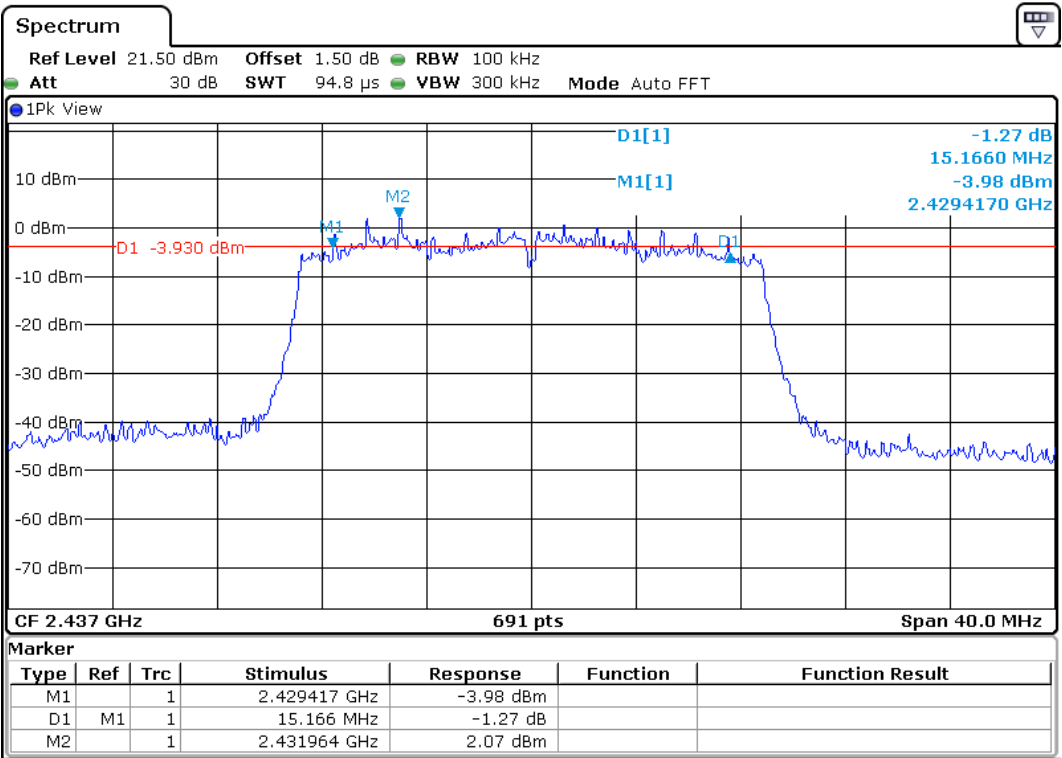
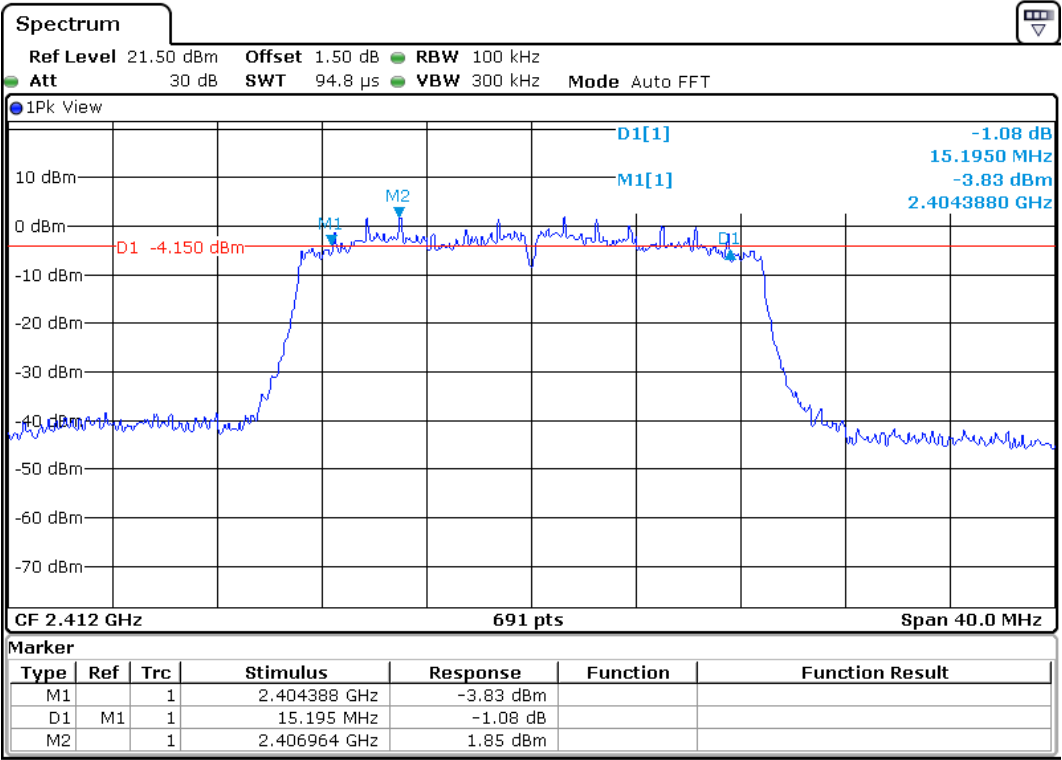


INTERTEK TESTING SERVICES

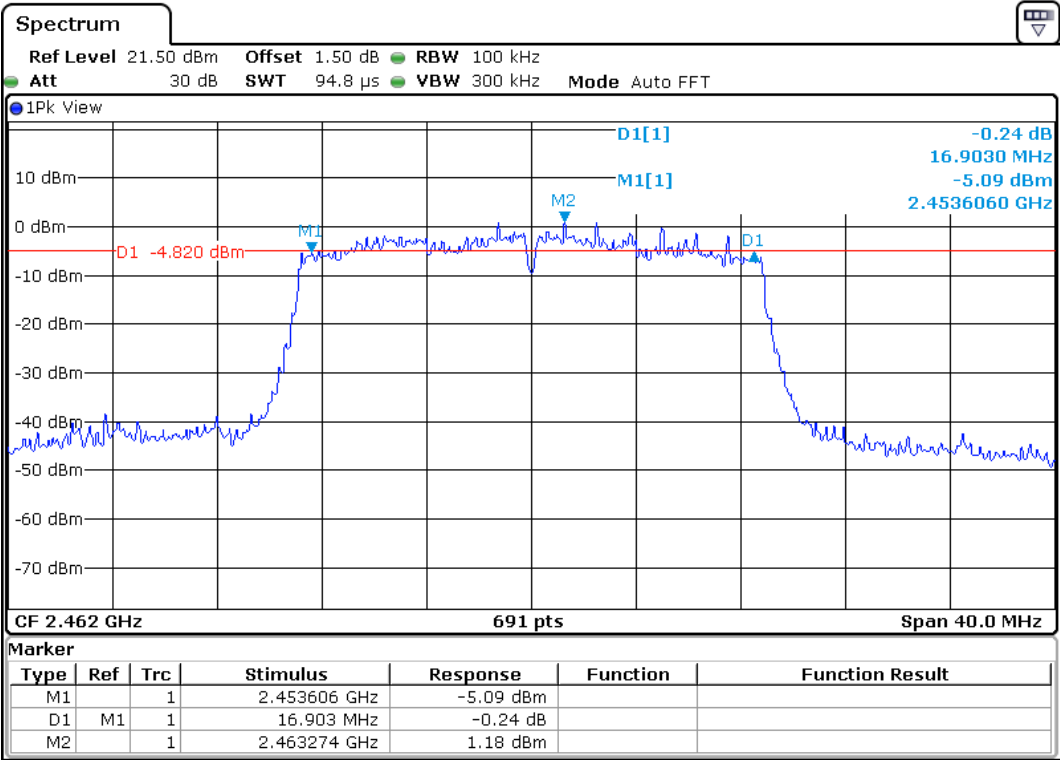


INTERTEK TESTING SERVICES

802.11n-HT20



INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES

Applicant: iDevices, LLC
Date of Test: August 18, 2015
Model: IDEV0004

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

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

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 (BPSK, 1Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	8.08
2437	7.95
2462	7.43

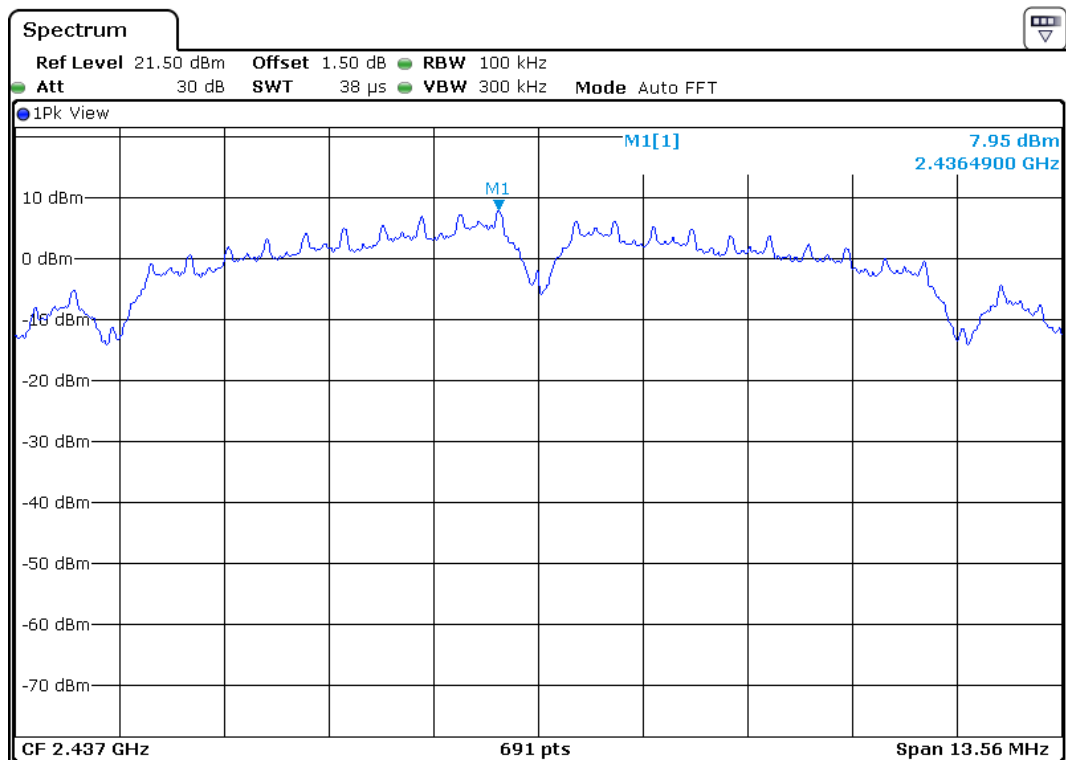
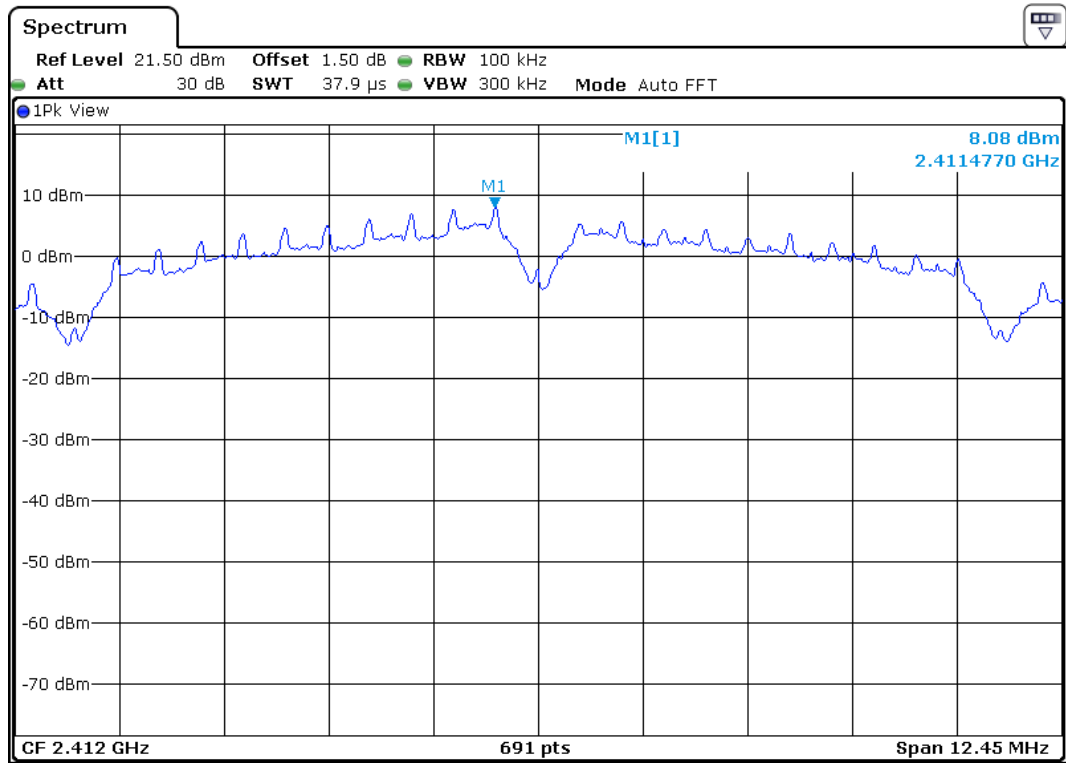
IEEE 802.11g (DBPSK, 6Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	4.15
2437	6.07
2462	5.69

IEEE 802.11n 20M (BPSK, 6.5Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	0.76
2437	1.92
2462	0.73

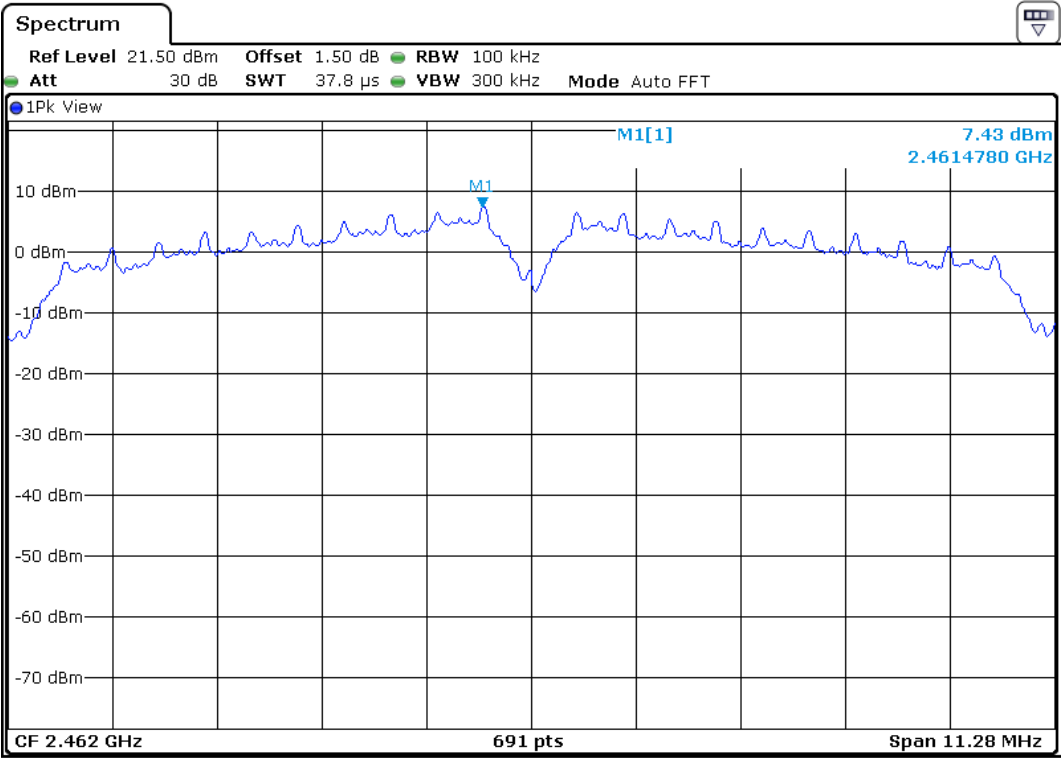
The test plots are attached as below.

INTERTEK TESTING SERVICES

802.11b

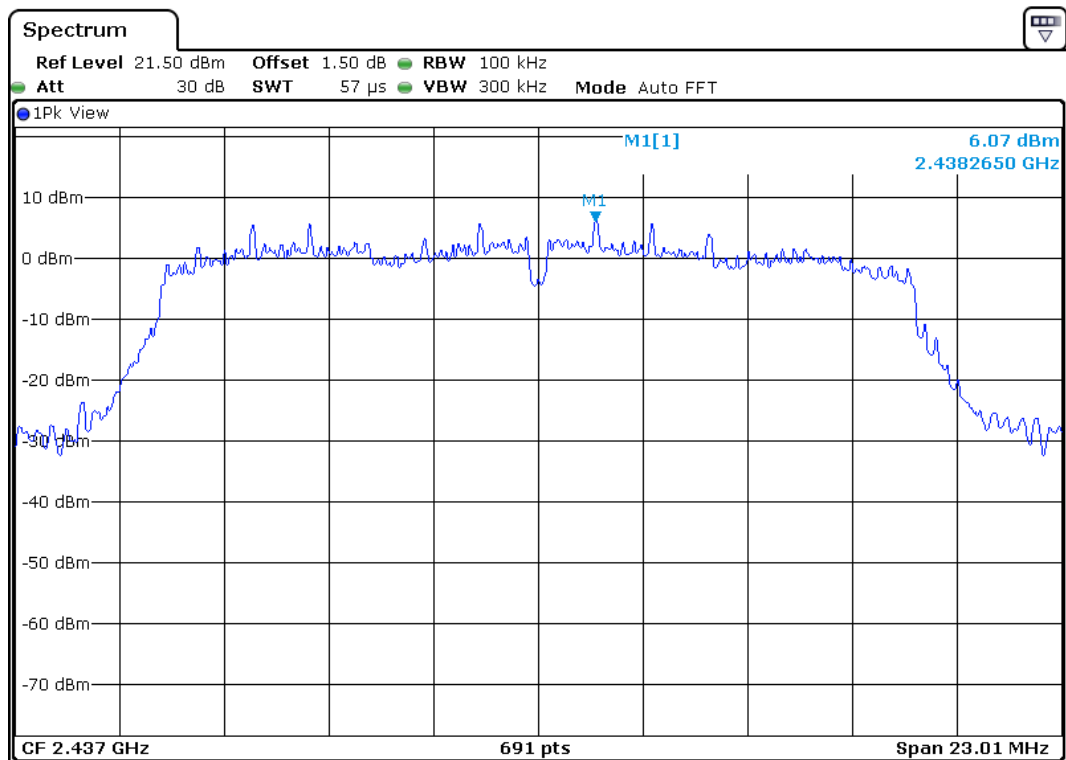
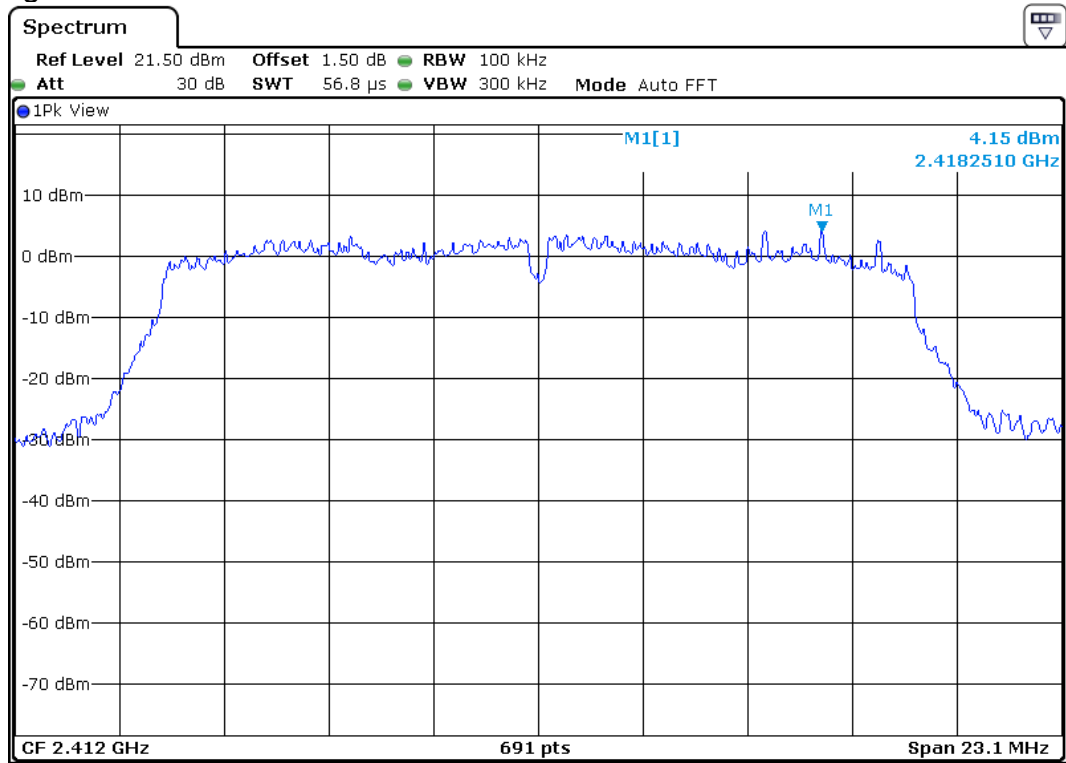


INTERTEK TESTING SERVICES

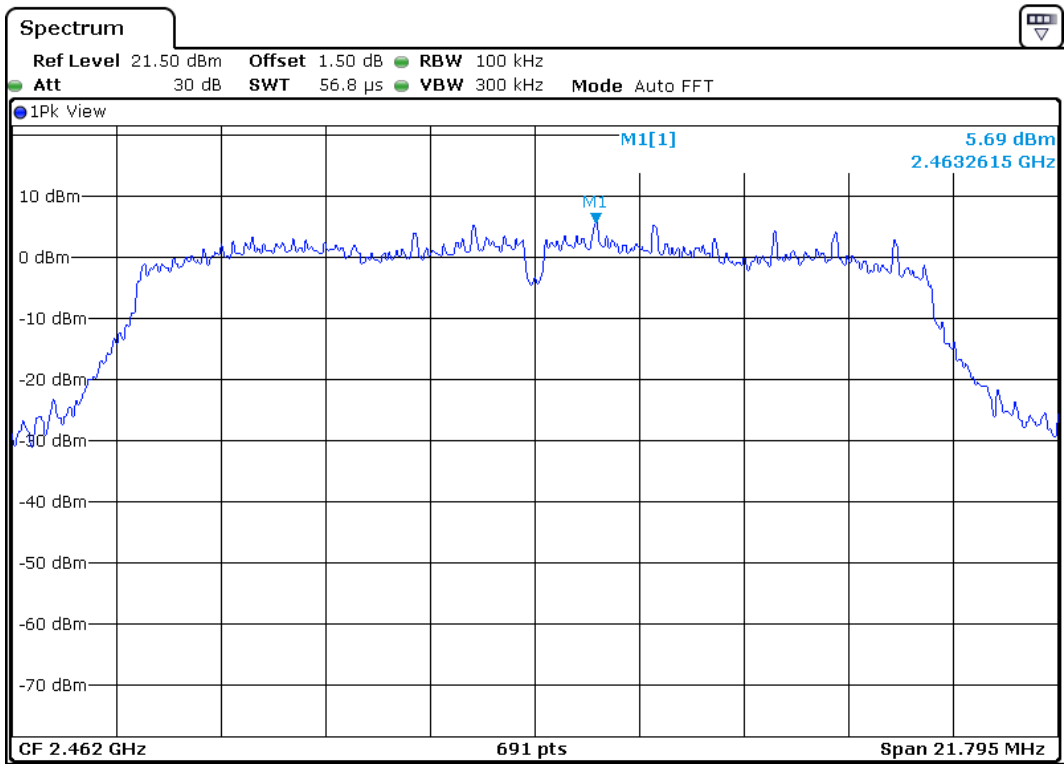


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802.11g

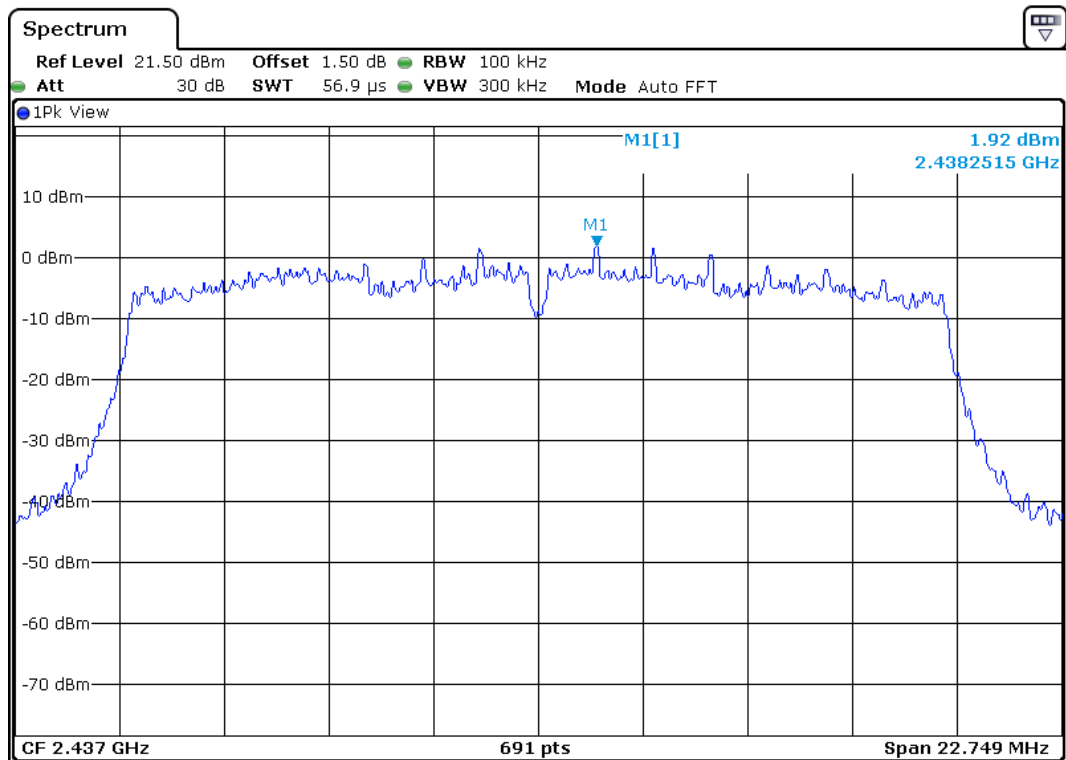
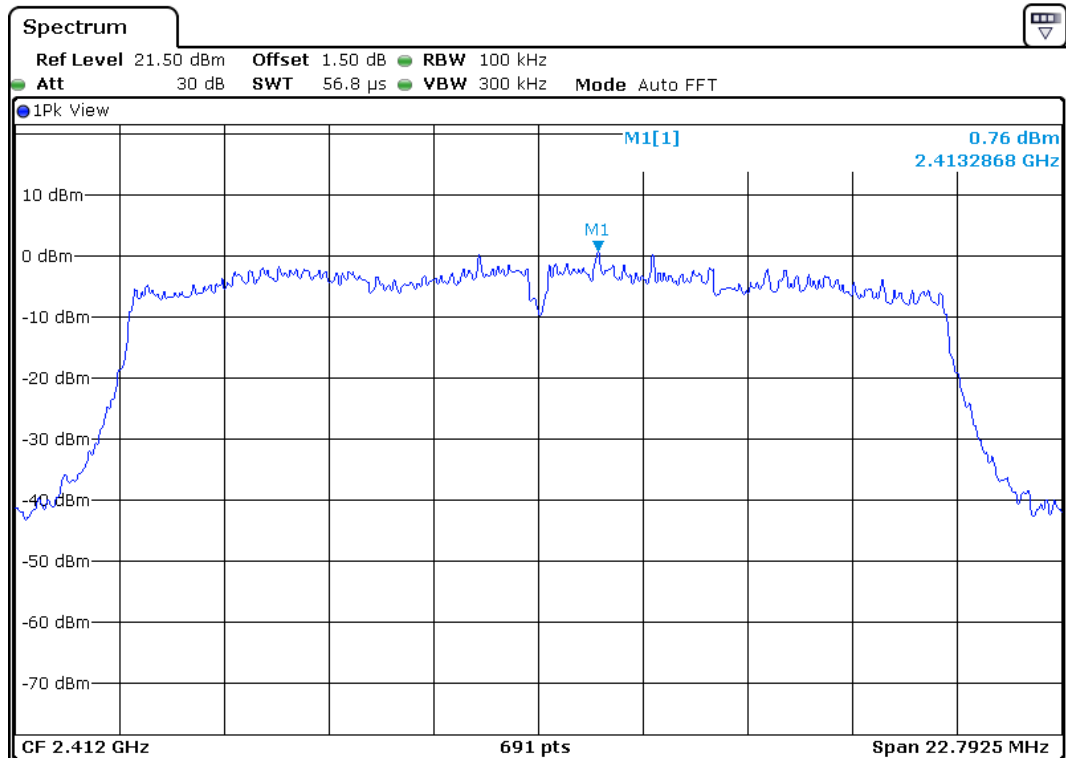


INTERTEK TESTING SERVICES



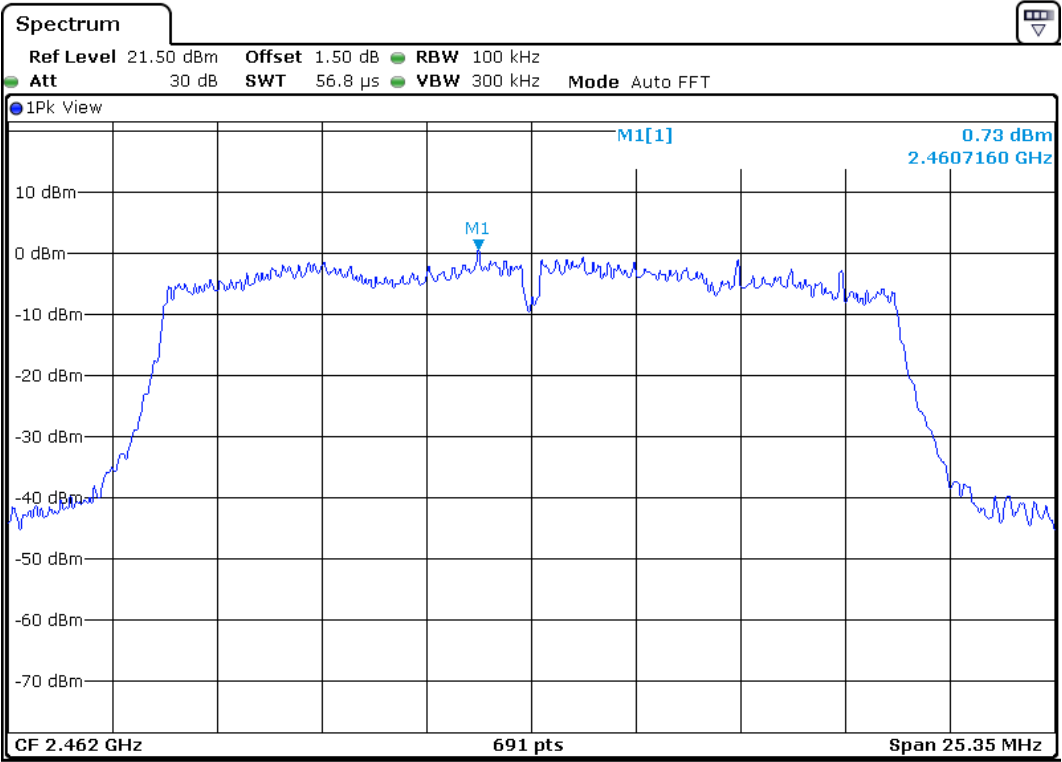
INTERTEK TESTING SERVICES

802.11n-HT20



TRF no.: FCC 15C_TX_b
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Applicant: iDevices, LLC
Date of Test: August 18, 2015
Model: IDEV0004

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

In any 100 kHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20dB below that of the maximum in-band 100 kHz emission, or else shall meet the general limits for radiated emissions at frequencies outside the passband, whichever results in lower attenuation. The Measurement Procedure was set according to the FCC KDB 558074.

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

Refer to the attached test plot for out of band conducted emissions data with rate of 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n HT20.

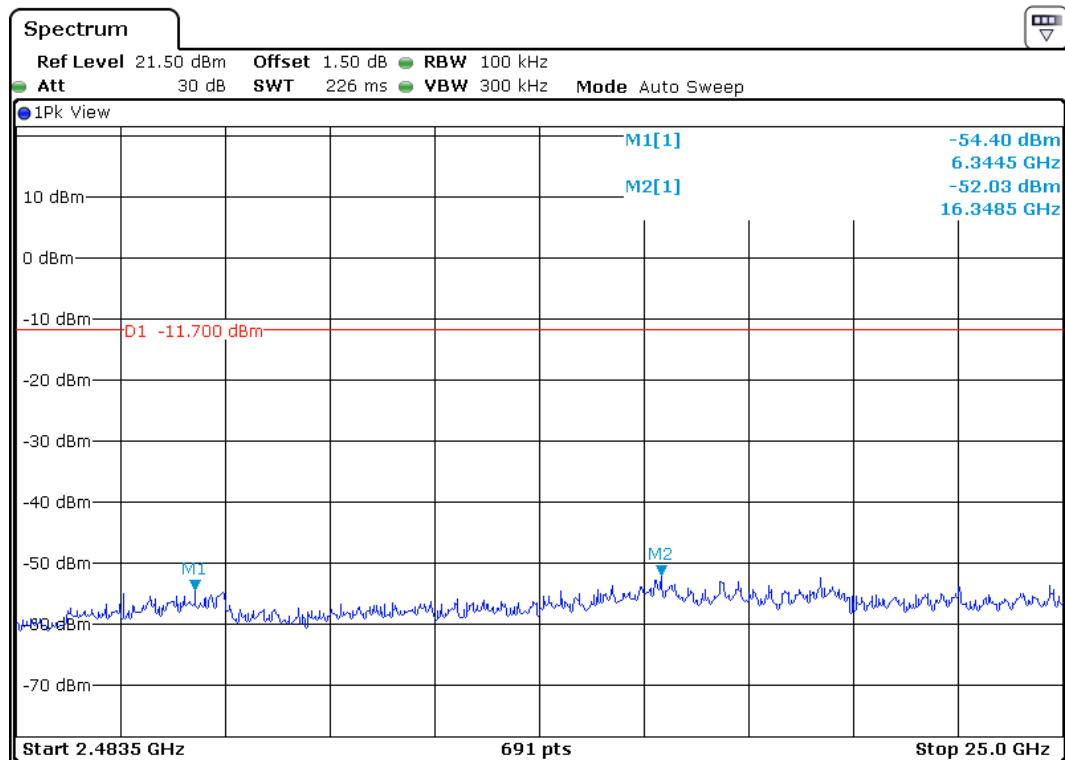
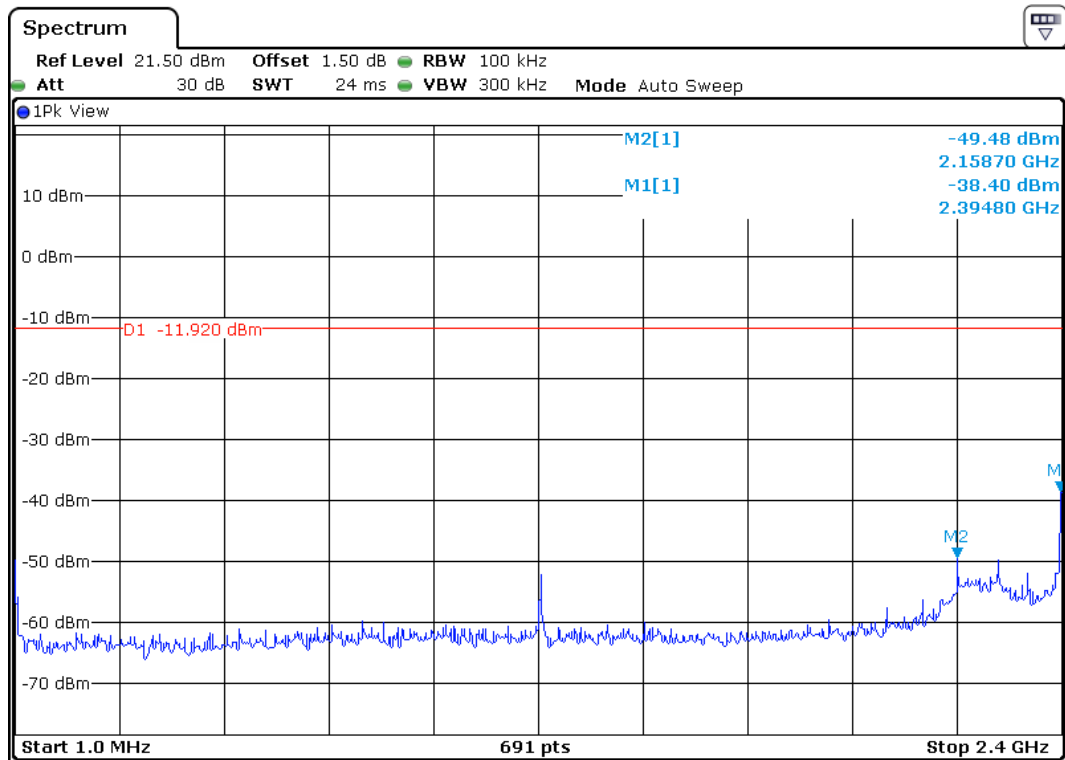
The test plots showed all spurious emission and up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

The test plots are attached as below.

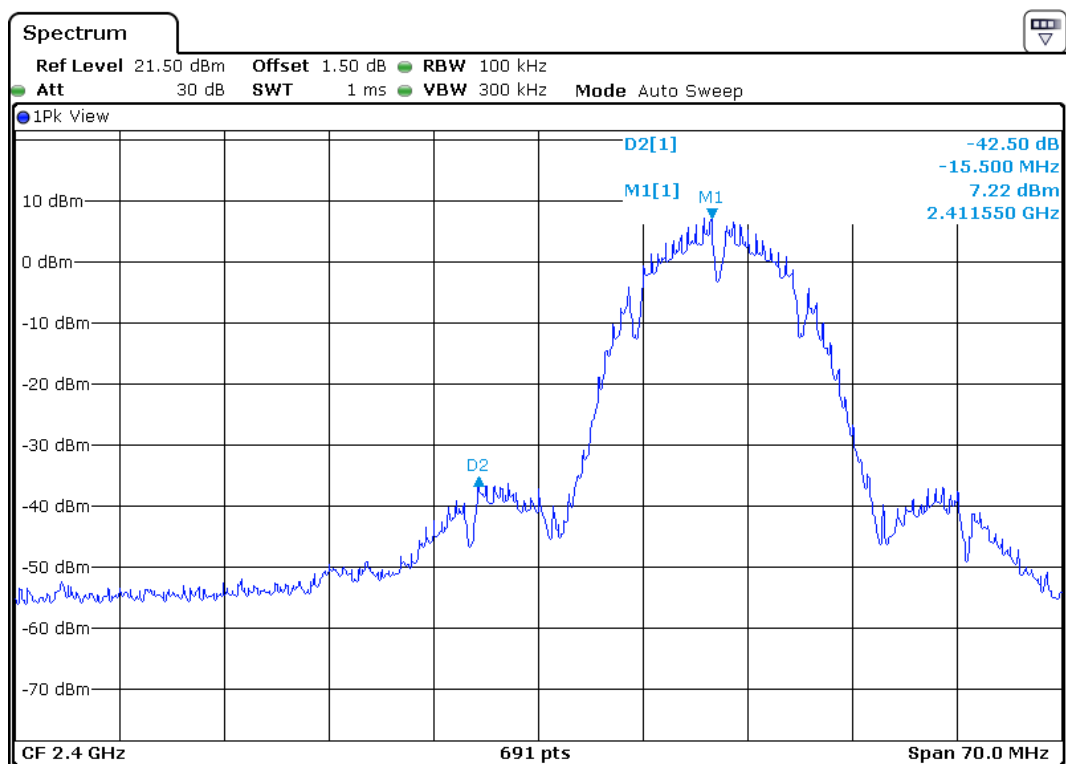
INTERTEK TESTING SERVICES

802.11b

Channel 1 (2412MHz) Reference Level: 8.08dBm

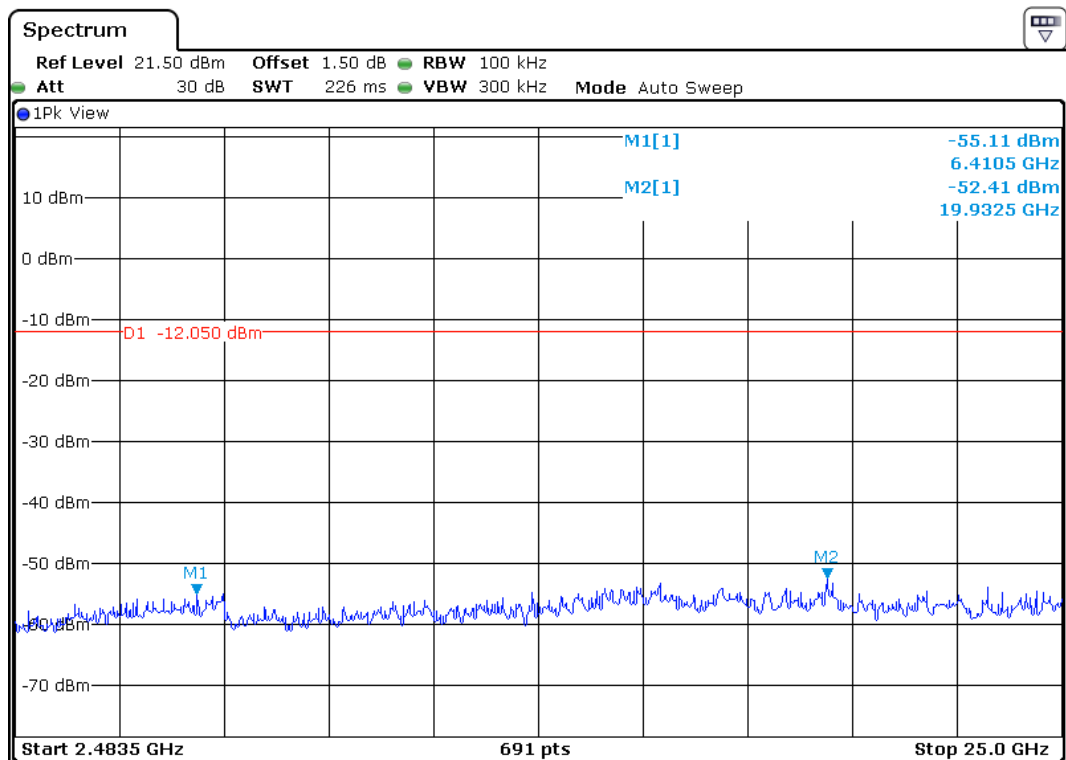
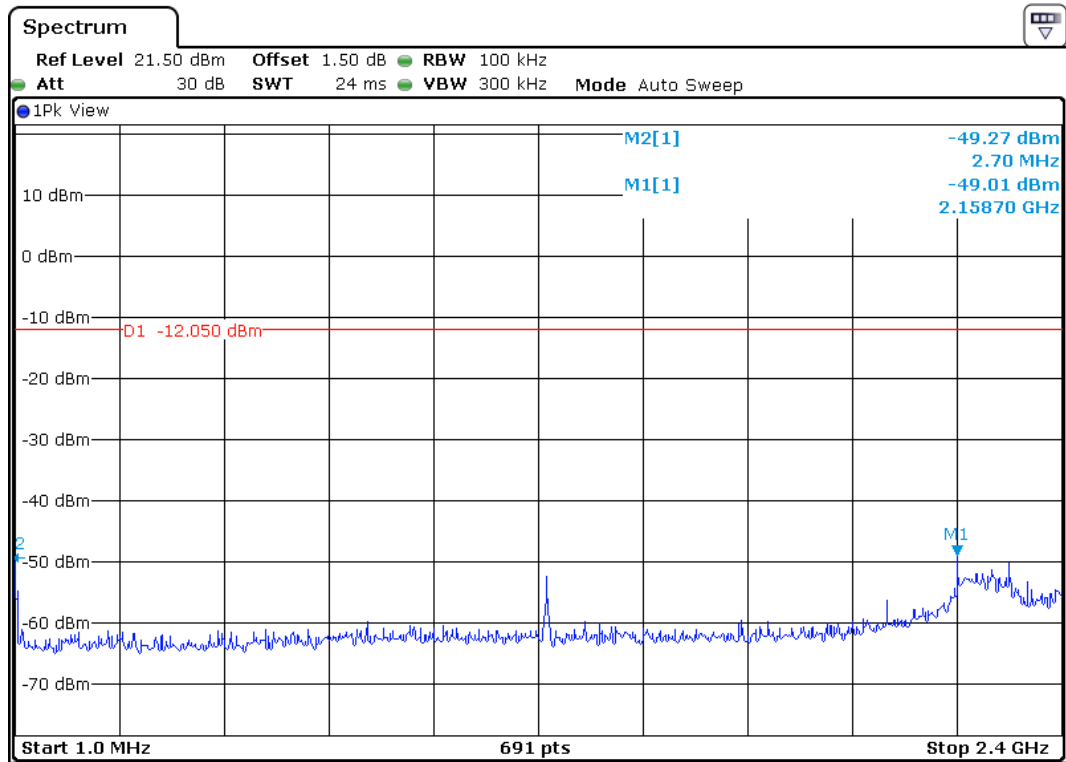


INTERTEK TESTING SERVICES



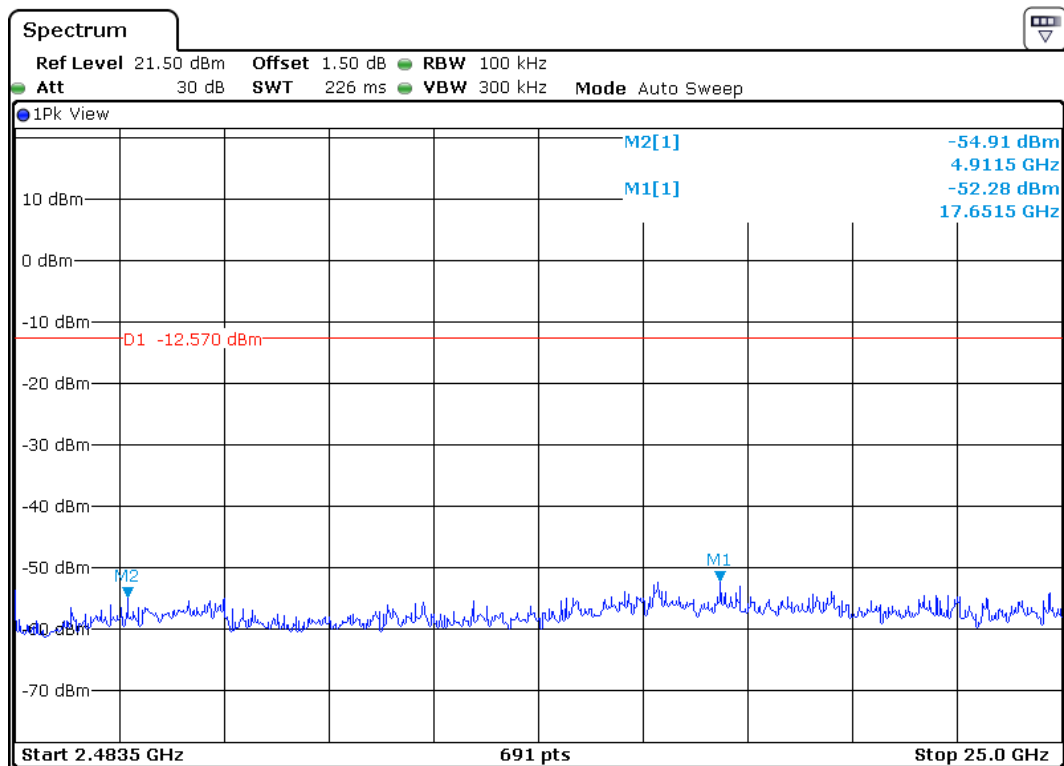
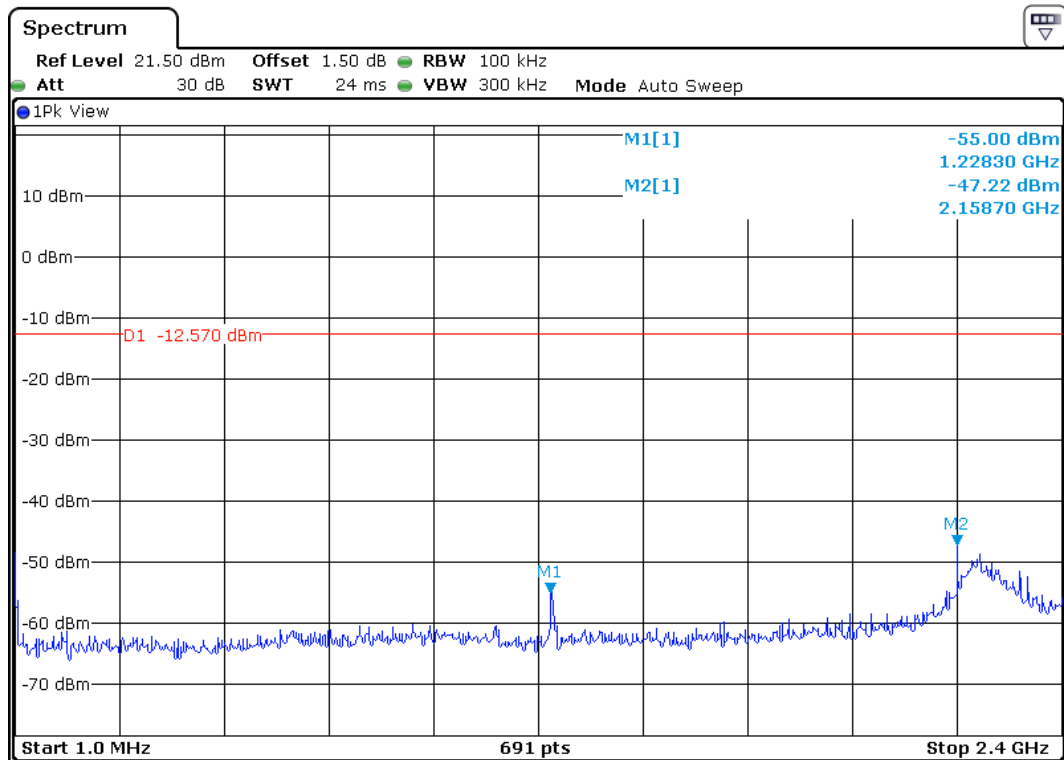
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 7.95dBm



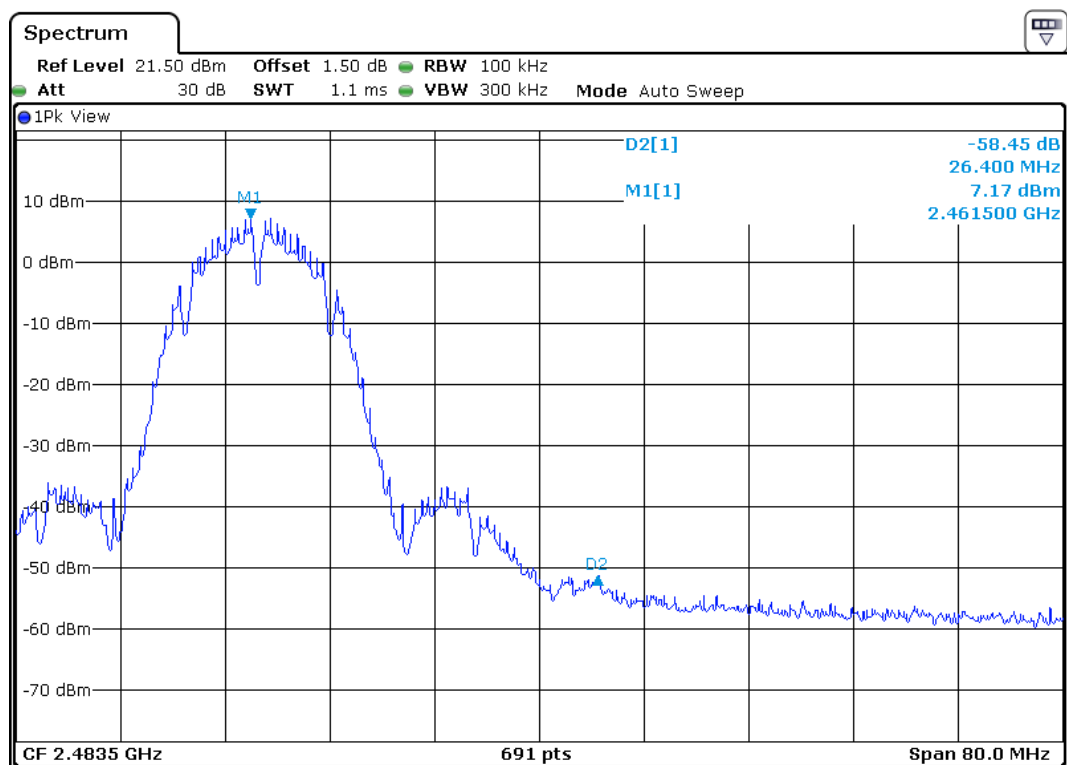
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Channel 11 (2462MHz) Reference Level: 7.43dBm



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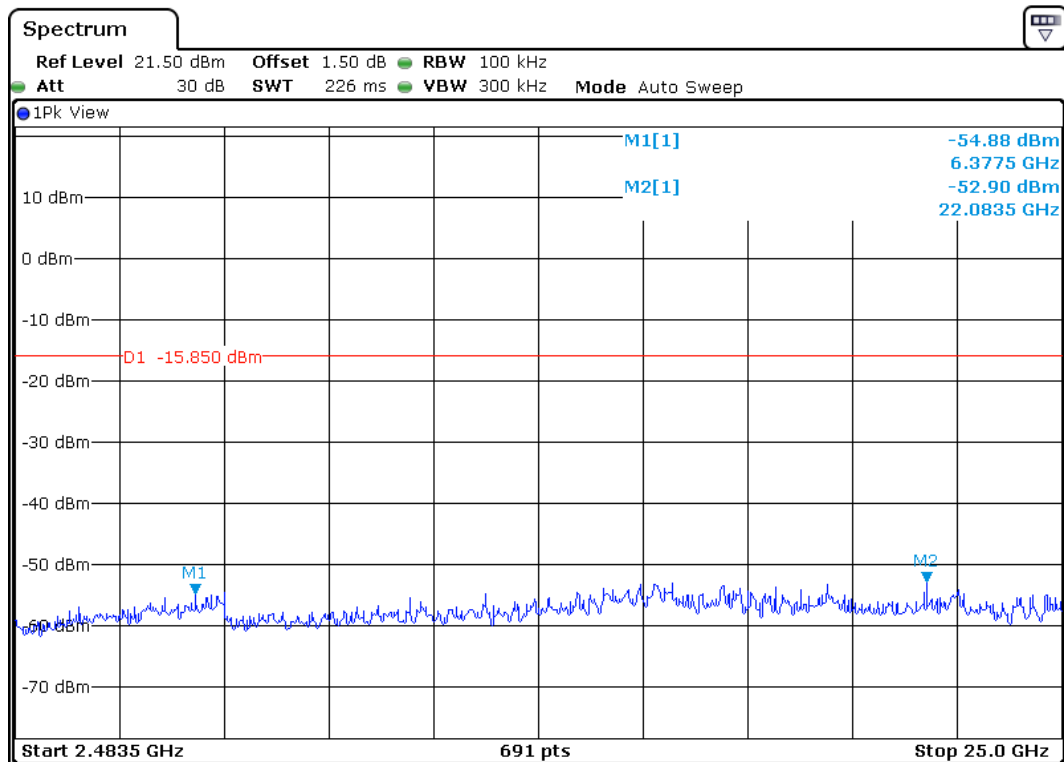
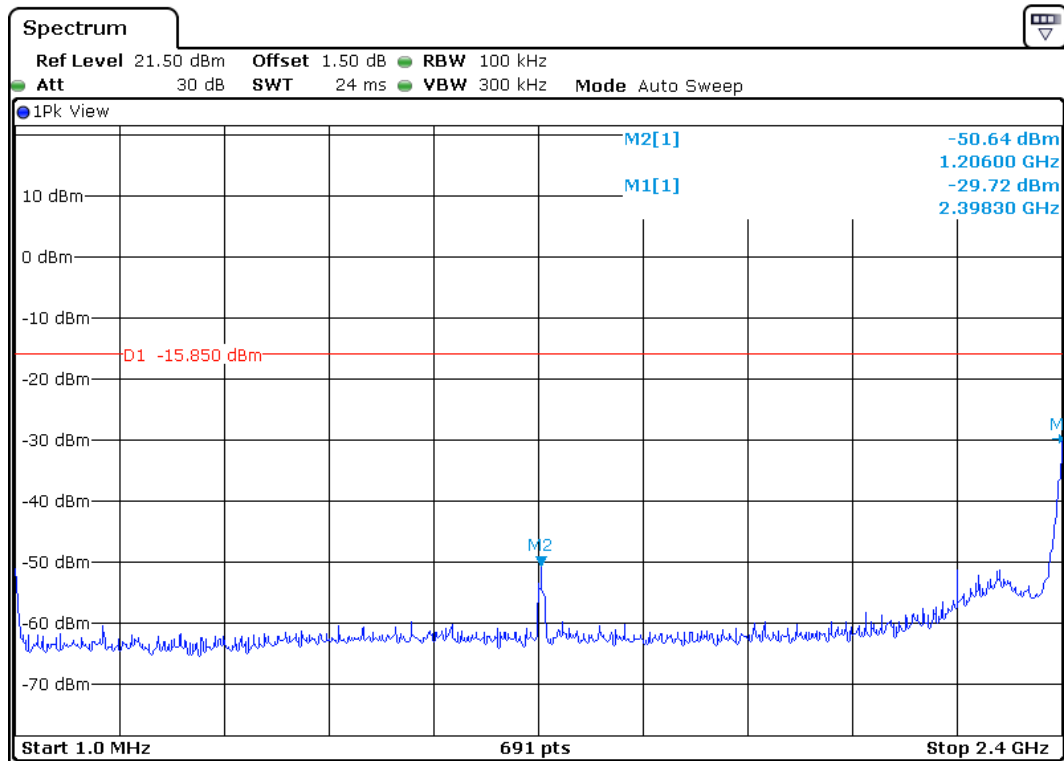
INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES

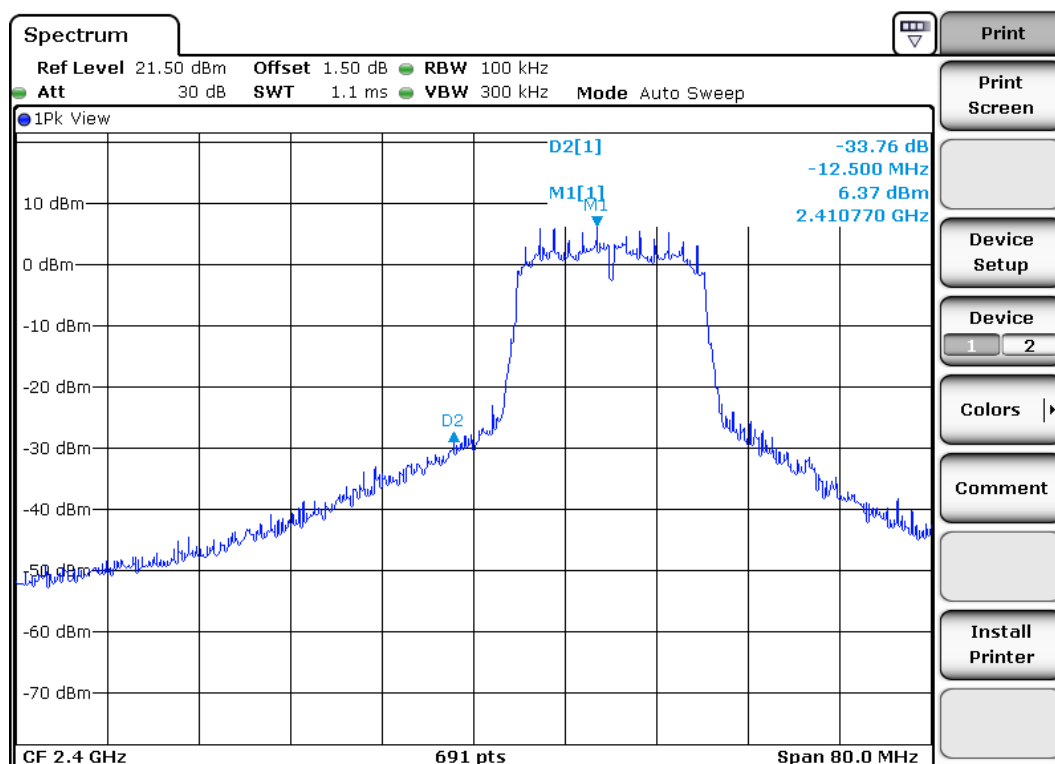
802.11g

Channel 1 (2412MHz) Reference Level: 4.15dBm



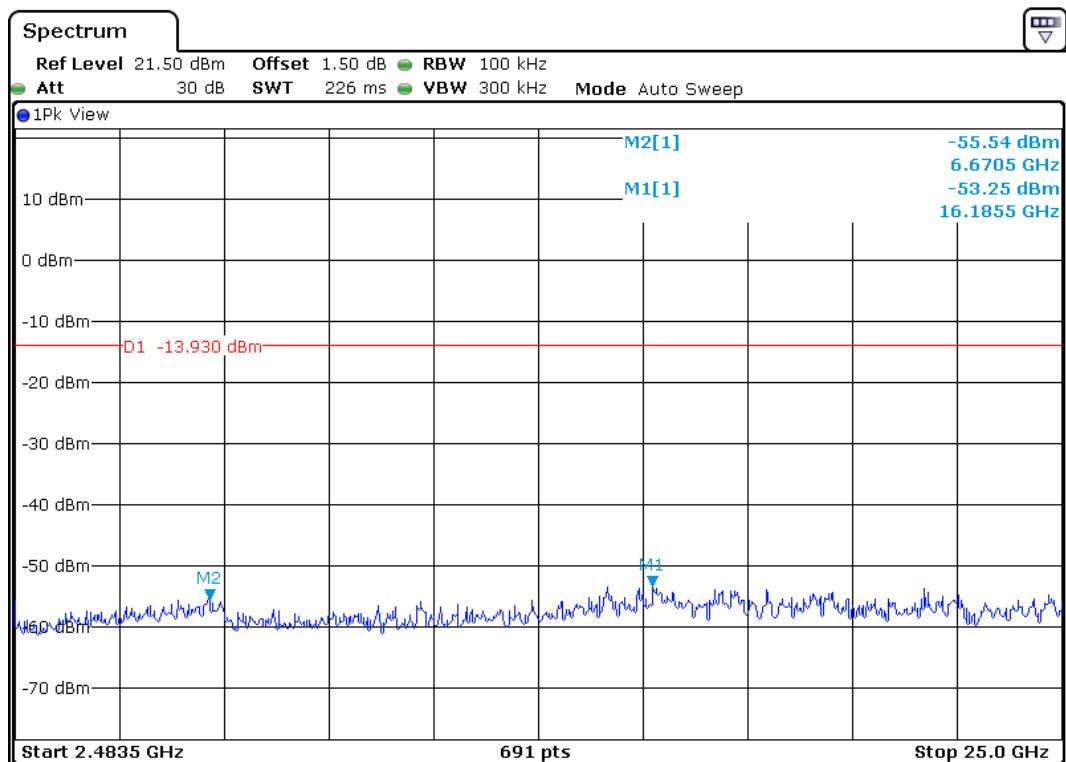
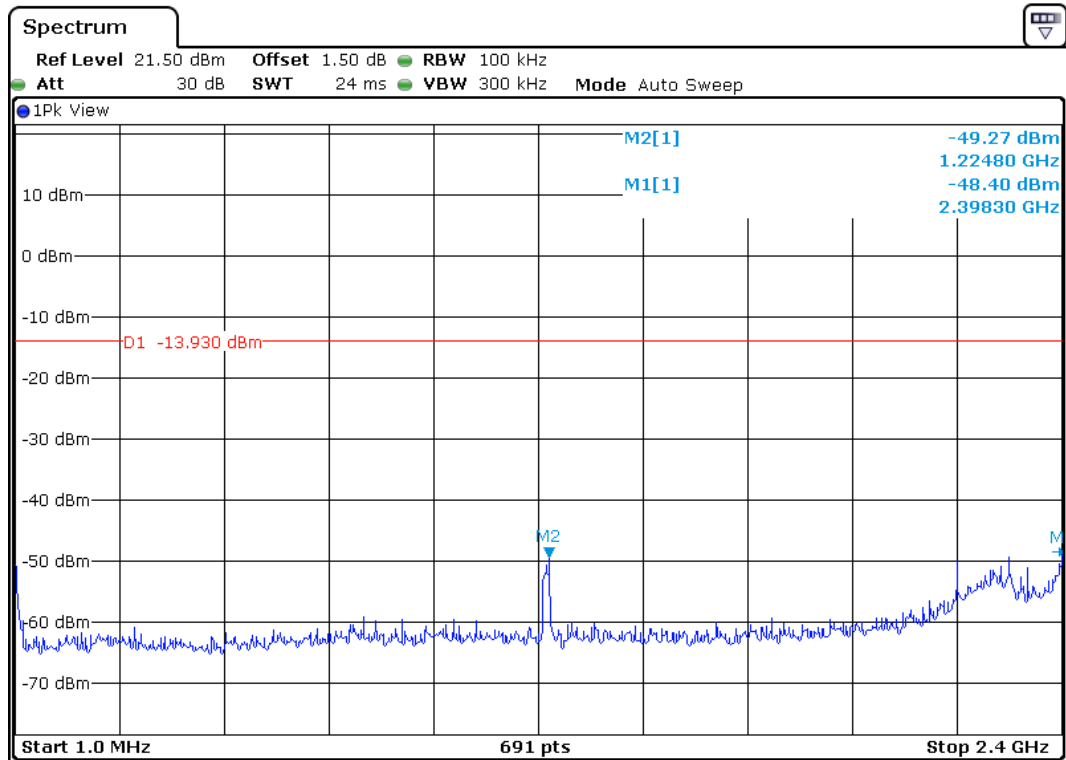
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FCC ID: 2ABDJ-SWITCH4
Report No.: 150729018SZN-002

INTERTEK TESTING SERVICES



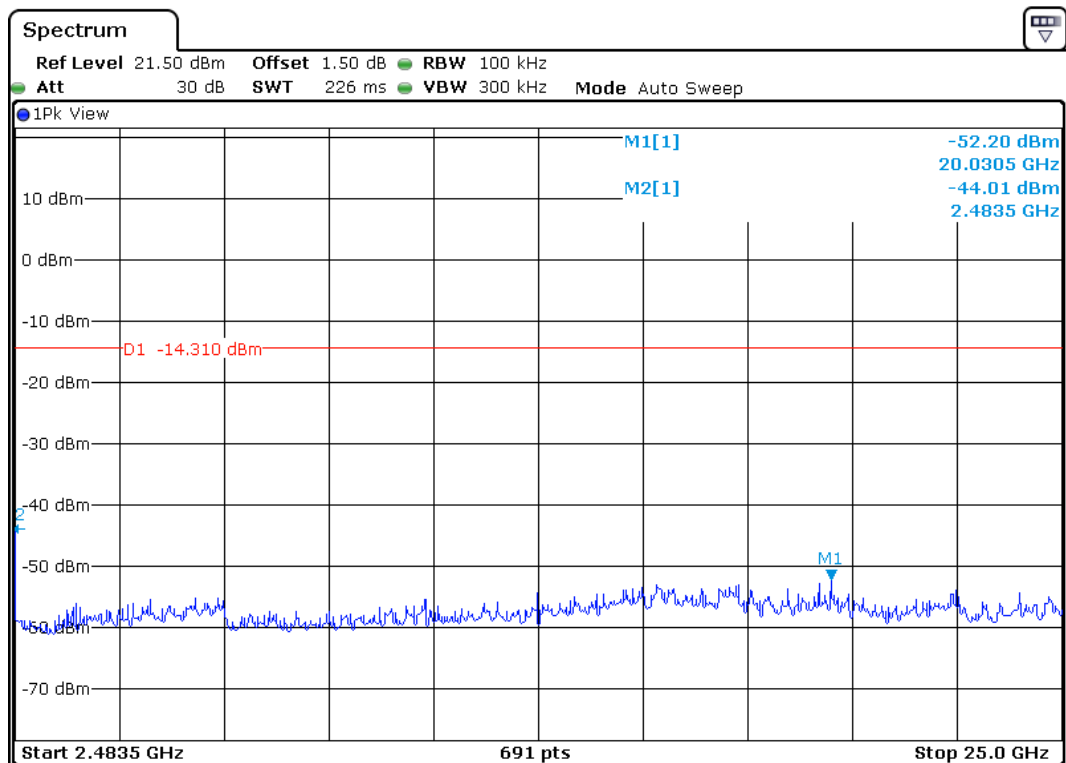
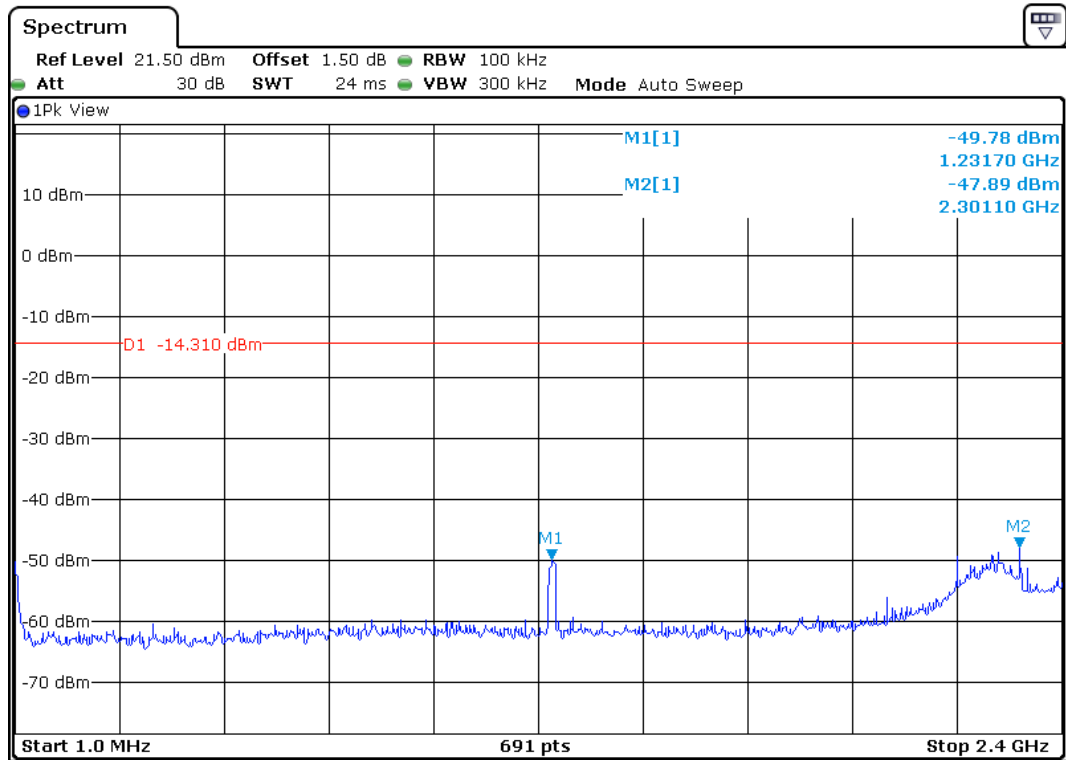
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 6.07dBm

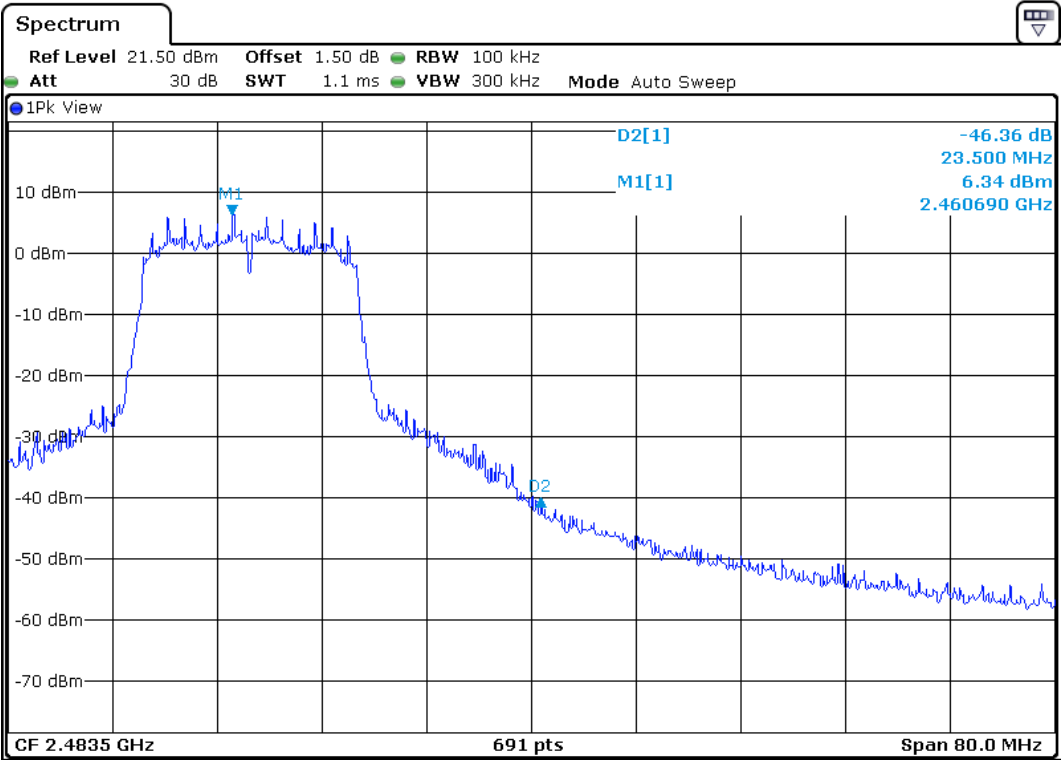


INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: 5.69dBm



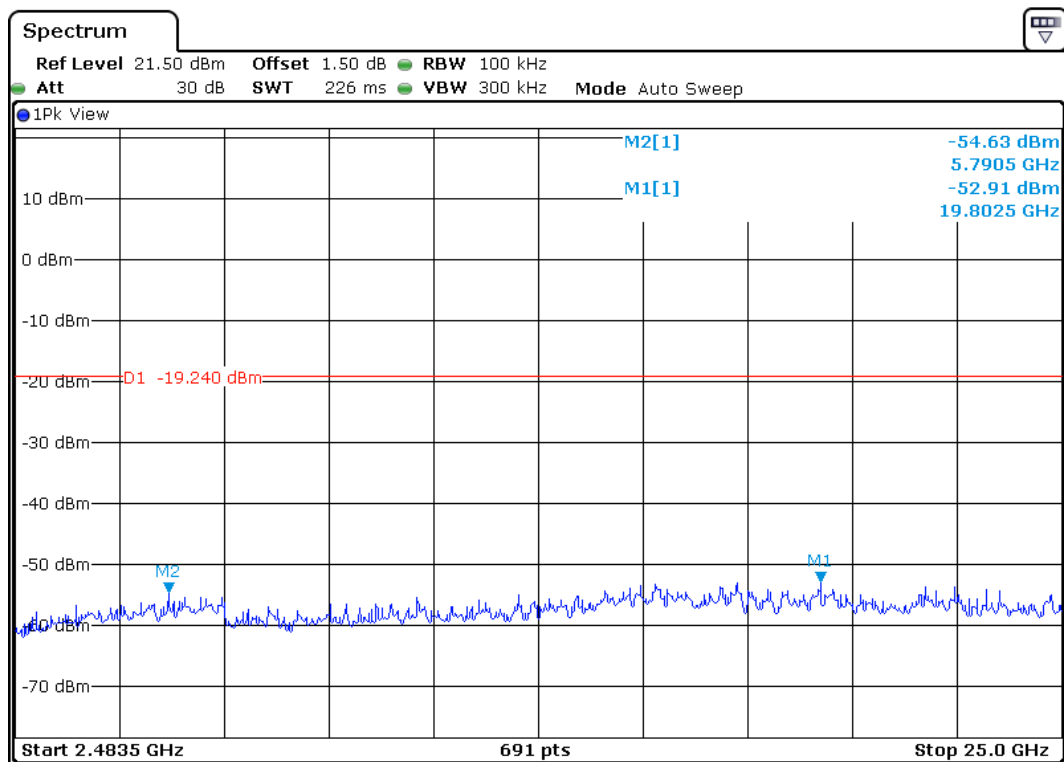
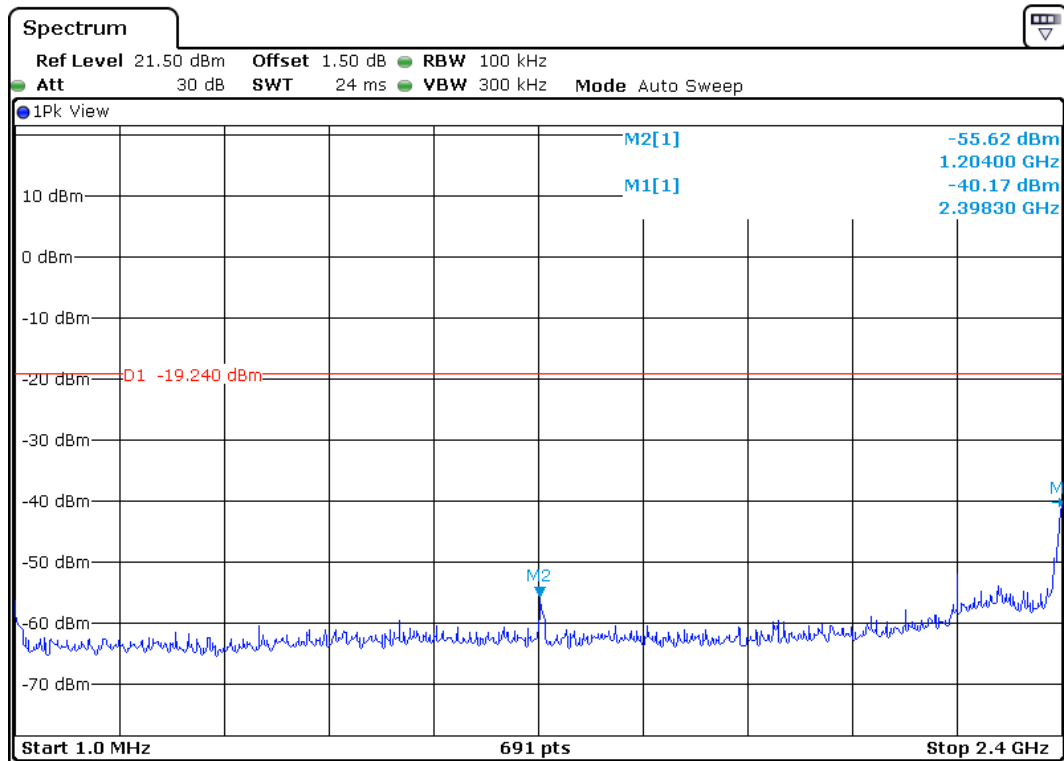
INTERTEK TESTING SERVICES



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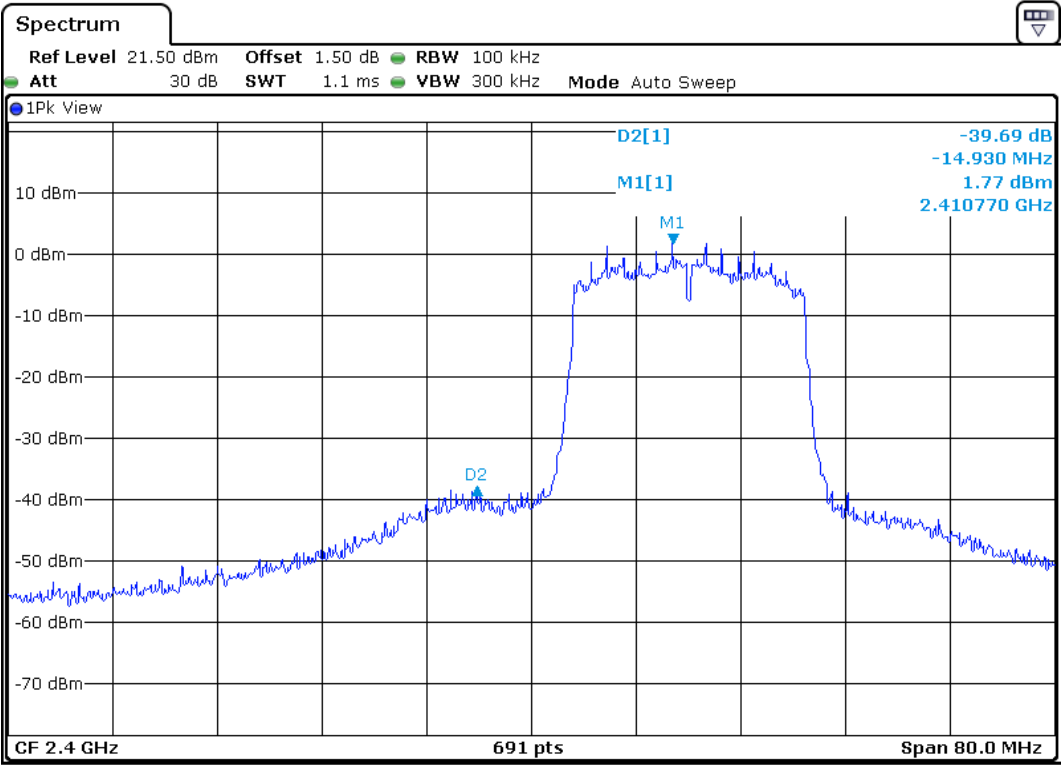
802.11n-HT20

Channel 1 (2412MHz) Reference Level: 0.76dBm



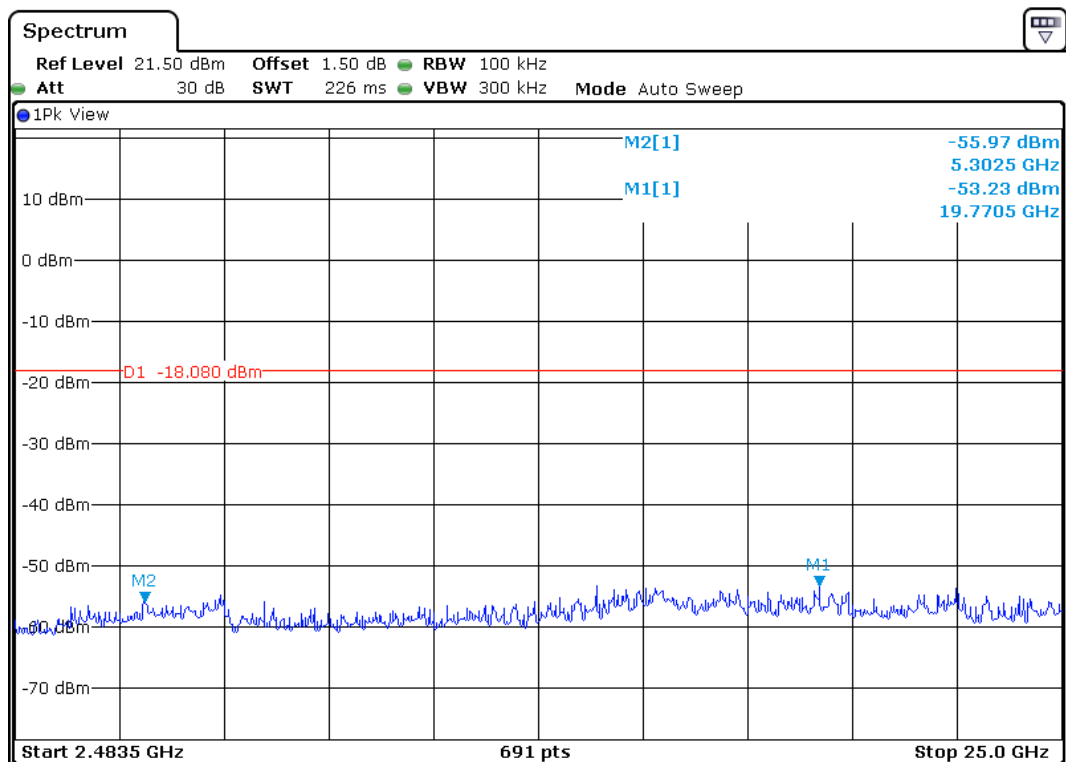
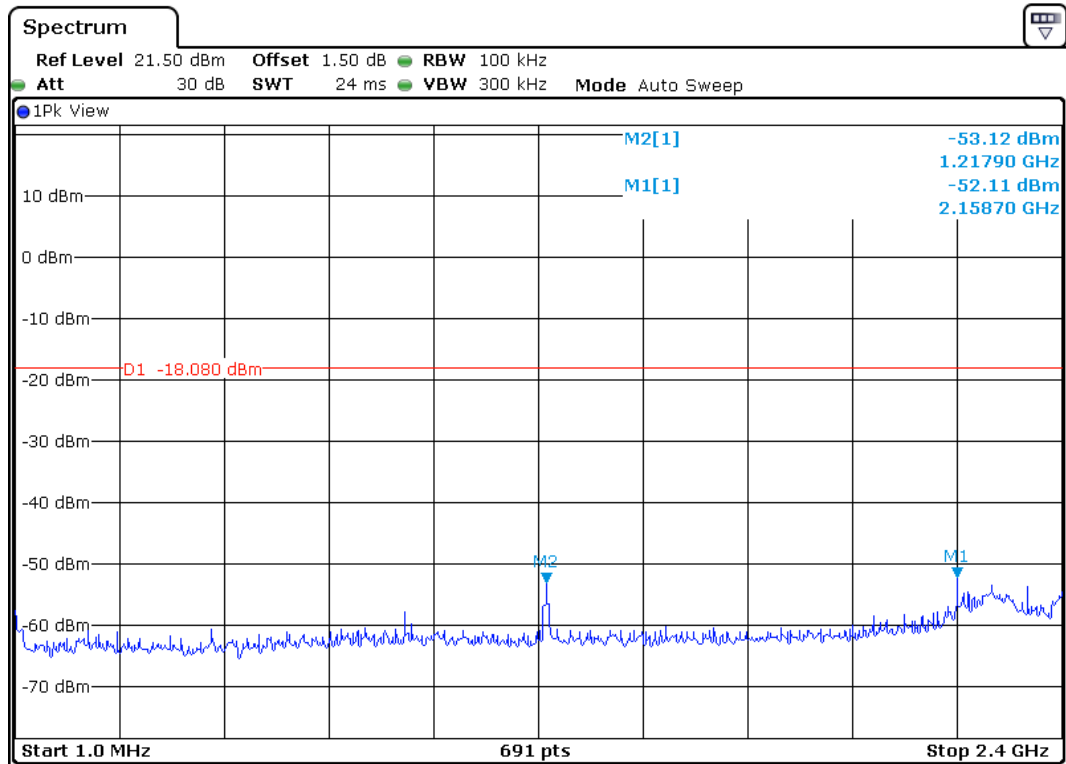
TRF no.: FCC 15C_TX_b
FCC ID: 2ABDJ-SWITCH4
Report No.: 150729018SZN-002

INTERTEK TESTING SERVICES



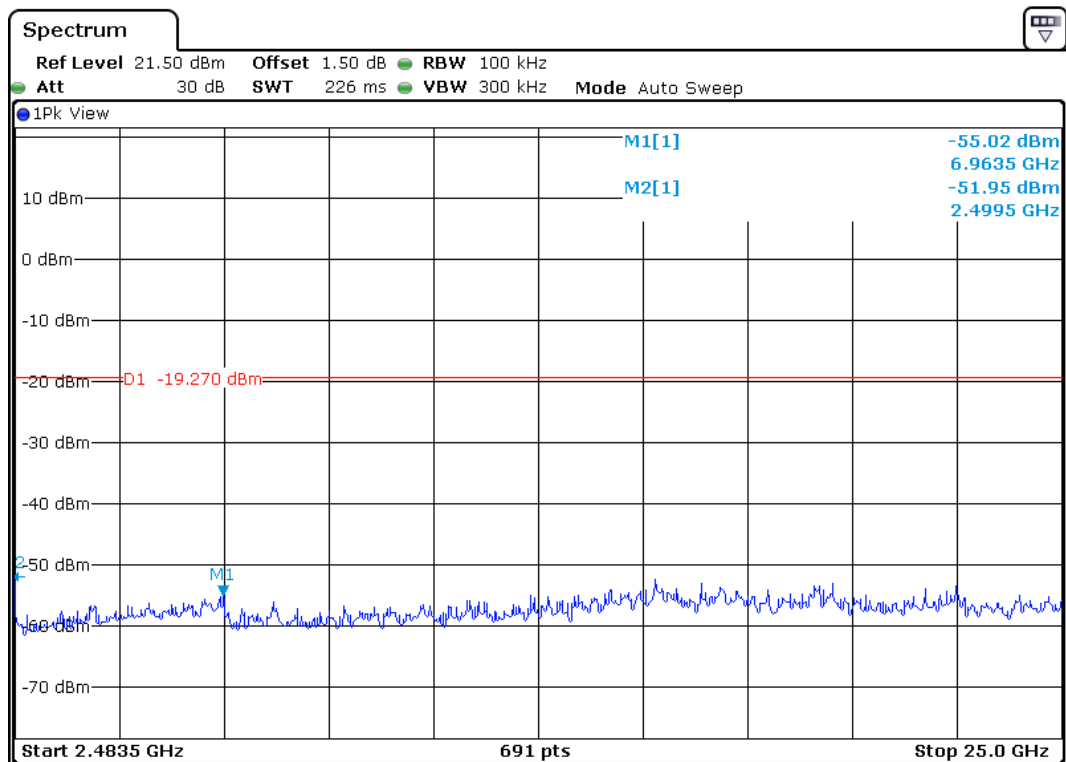
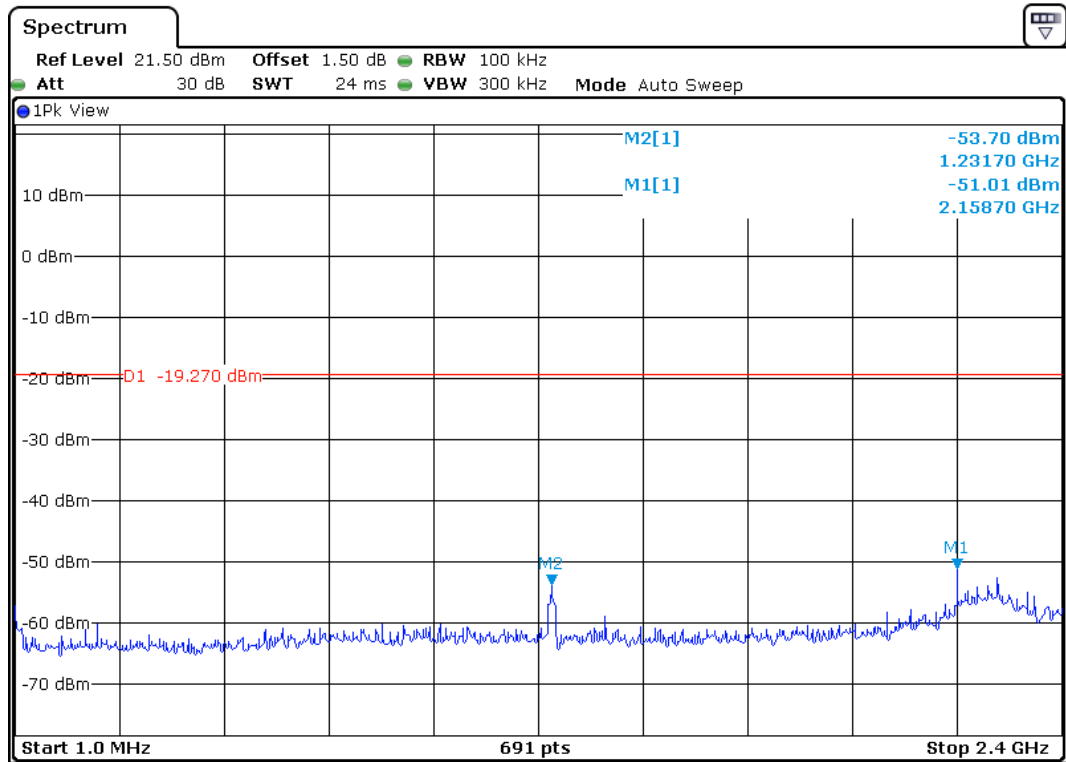
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 1.92dBm

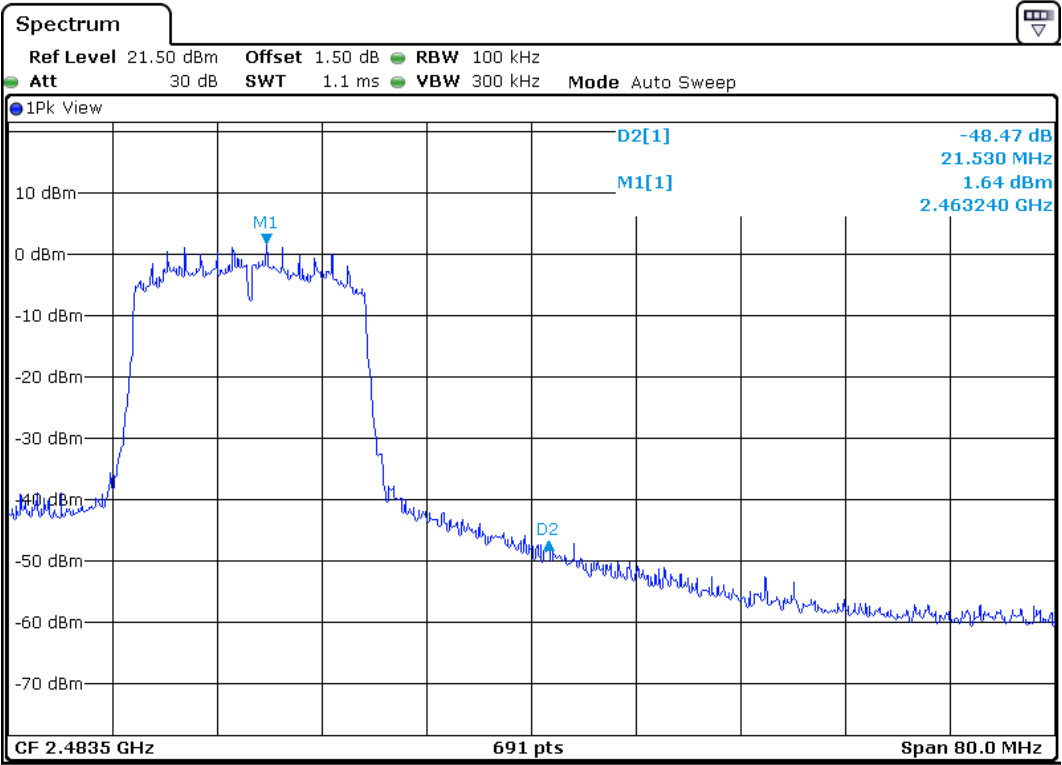


INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: 0.73dBm



INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES

Applicant: iDevices, LLC

Date of Test: August 18, 2015

Model: IDEV0004

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

INTERTEK TESTING SERVICES

Applicant: iDevices, LLC

Date of Test: August 18, 2015

Model: IDEV0004

4.6 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.

INTERTEK TESTING SERVICES

Applicant: iDevices, LLC

Model: IDEV0004

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 dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ 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 dB μ 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 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

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

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$PD = 0 \text{ dB}$$

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

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

INTERTEK TESTING SERVICES

Applicant: iDevices, LLC

Model: IDEV0004

4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission (802.11g channel 11) at 2483.500MHz is passed by 8.1 dB margin.

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

INTERTEK TESTING SERVICES

Applicant: iDevices, LLC

Date of Test: August 18, 2015

Model: IDEV0004

Worst Case Operating Mode: RF on

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	159.214	28.2	20.0	18.9	27.1	43.5	-16.4
Horizontal	191.682	34.4	20.0	10.6	25.0	43.5	-18.5
Horizontal	359.475	34.0	20.0	14.7	28.7	46.0	-17.3
Vertical	31.288	23.2	20.0	18.9	22.1	40.0	-17.9
Vertical	143.985	25.7	20.0	14.1	19.8	43.5	-23.7
Vertical	432.984	36.6	20.0	10.0	26.6	46.0	-19.4

- NOTES:
1. Quasi-Peak detector is used except for others stated.
 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.
 4. All emissions are below the QP limit.

INTERTEK TESTING SERVICES

Applicant: iDevices, LLC
 Date of Test: August 18, 2015
 Model: IDEV0004
 Mode: 802.11b (TX-Channel 01)

Radiated Emissions

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	60.4	36.7	34.2	57.9	74.0	-16.1
*Horizontal	2389.900	63.6	36.2	28.2	55.6	74.0	-18.4

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	45.6	36.7	34.2	43.1	54.0	-10.9
*Horizontal	2389.900	49.8	36.2	28.2	41.8	54.0	-12.2

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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.

INTERTEK TESTING SERVICES

Applicant: iDevices, LLC
 Date of Test: August 18, 2015
 Model: IDEV0004
 Mode: 802.11b (TX-Channel 06)

Radiated Emissions

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	58.4	36.7	34.6	56.3	74.0	-17.7
*Horizontal	7311.000	55.8	36.7	37.1	56.2	74.0	-17.8

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	44.9	36.7	34.6	42.8	54.0	-11.2
*Horizontal	7311.000	41.3	36.7	37.1	41.7	54.0	-12.3

- NOTES: 1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
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.

INTERTEK TESTING SERVICES

Applicant: iDevices, LLC
 Date of Test: August 18, 2015
 Model: IDEV0004
 Mode: 802.11b (TX-Channel 11)

Radiated Emissions

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	57.5	36.7	34.6	55.4	74.0	-18.6
*Horizontal	7386.000	55.5	36.7	37.2	56.0	74.0	-18.0
*Horizontal	2483.500	62.4	36.2	28.0	54.2	74.0	-19.8

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	4924.000	43.6	36.7	34.6	41.5	54.0	-12.5
*Horizontal	7386.000	40.9	36.7	37.2	41.4	54.0	-12.6
*Horizontal	2483.500	52.1	36.2	28.0	43.9	54.0	-10.1

- NOTES: 1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
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.

INTERTEK TESTING SERVICES

Applicant: iDevices, LLC
 Date of Test: August 18, 2015
 Model: IDEV0004
 Mode: 802.11g (TX-Channel 01)

Radiated Emissions

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	60.3	36.7	34.2	57.8	74.0	-16.2
*Horizontal	2389.900	64.6	36.2	28.2	56.6	74.0	-17.4

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	45.0	36.7	34.2	42.5	54.0	-11.5
*Horizontal	2389.900	49.4	36.2	28.2	41.4	54.0	-12.6

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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.

INTERTEK TESTING SERVICES

Applicant: iDevices, LLC
 Date of Test: August 18, 2015
 Model: IDEV0004
 Mode: 802.11g (TX-Channel 06)

Radiated Emissions

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	58.4	36.7	34.6	56.3	74.0	-17.7
*Horizontal	7311.000	56.1	36.7	37.1	56.5	74.0	-17.5

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	43.7	36.7	34.6	41.6	54.0	-12.4
*Horizontal	7311.000	41.4	36.7	37.1	41.8	54.0	-12.2

- NOTES: 1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
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.

INTERTEK TESTING SERVICES

Applicant: iDevices, LLC

Date of Test: August 18, 2015

Model: IDEV0004

Mode: 802.11g (TX-Channel 11)

Radiated Emissions

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	57.1	36.7	34.6	55.0	74.0	-19.0
*Horizontal	7386.000	56.1	36.7	37.2	56.6	74.0	-17.4
*Horizontal	2483.500	67.4	36.2	28.0	59.2	74.0	-14.8

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	4924.000	42.5	36.7	34.6	40.4	54.0	-13.6
*Horizontal	7386.000	41.7	36.7	37.2	42.2	54.0	-11.8
*Horizontal	2483.500	54.1	36.2	28.0	45.9	54.0	-8.1

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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.

INTERTEK TESTING SERVICES

Applicant: iDevices, LLC
 Date of Test: August 18, 2015
 Model: IDEV0004
 Mode: 802.11n-HT20 (TX-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	60.8	36.7	34.2	58.3	74.0	-15.7
*Horizontal	2389.900	64.3	36.2	28.2	56.3	74.0	-17.7

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	4824.000	43.5	36.7	34.2	41.0	54.0	-13.0
*Horizontal	2389.900	49.3	36.2	28.2	41.3	54.0	-12.7

- NOTES: 1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
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.

INTERTEK TESTING SERVICES

Applicant: iDevices, LLC
 Date of Test: August 18, 2015
 Model: IDEV0004
 Mode: 802.11n-HT20 (TX-Channel 06)

Radiated Emissions

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	60.1	36.7	34.6	58.0	74.0	-16.0
*Horizontal	7311.000	56.6	36.7	37.1	57.0	74.0	-17.0

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	43.5	36.7	34.6	41.4	54.0	-12.6
*Horizontal	7311.000	41.6	36.7	37.1	42.0	54.0	-12.0

- NOTES: 1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
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.

INTERTEK TESTING SERVICES

Applicant: iDevices, LLC

Date of Test: August 18, 2015

Model: IDEV0004

Mode: 802.11n-HT20 (TX-Channel 11)

Radiated Emissions

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	58.9	36.7	34.6	56.8	74.0	-17.2
*Horizontal	7386.000	56.7	36.7	37.2	57.2	74.0	-16.8
*Horizontal	2483.500	67.3	36.2	28.0	59.1	74.0	-14.9

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	4924.000	41.0	36.7	34.6	38.9	54.0	-15.1
*Horizontal	7386.000	41.6	36.7	37.2	42.1	54.0	-11.9
*Horizontal	2483.500	53.3	36.2	28.0	45.1	54.0	-8.9

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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.

4.9 Conducted Emission

Worst Case Neutral-Conducted emission at 0.378MHz is Passed by 8.5 dB margin

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

INTERTEK TESTING SERVICES

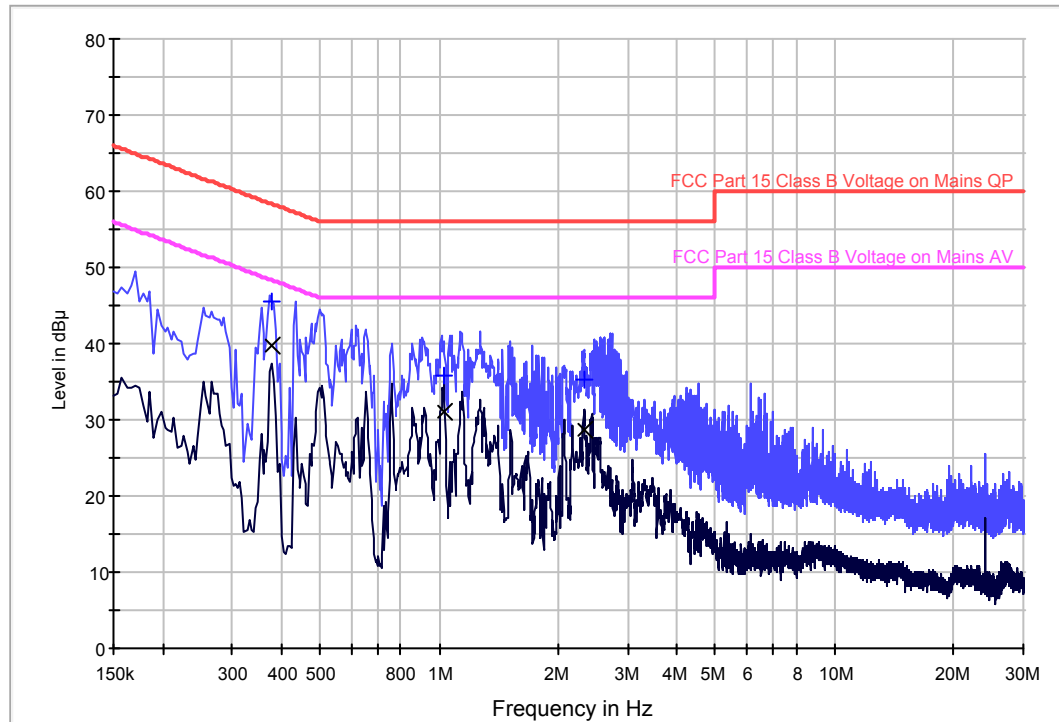
Company: iDevices, LLC

Date of Test: August 18, 2015

Model: IDEV0004

Worst Case Operating Mode: RF on

Conducted Emission Test - FCC



Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBuV)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.378000	45.5	L1	9.9	12.8	58.3
1.030000	35.9	L1	9.9	20.1	56.0
2.326000	35.2	L1	10.0	20.8	56.0

Limit and Margin AV

Frequency (MHz)	Average (dBuV)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.378000	39.8	L1	9.9	8.5	48.3
1.030000	31.1	L1	9.9	14.9	46.0
2.326000	28.7	L1	10.0	17.3	46.0

TRF no.: FCC 15C_TX_b

FCC ID: 2ABDJ-SWITCH4

Report No.: 150729018SZN-002

INTERTEK TESTING SERVICES

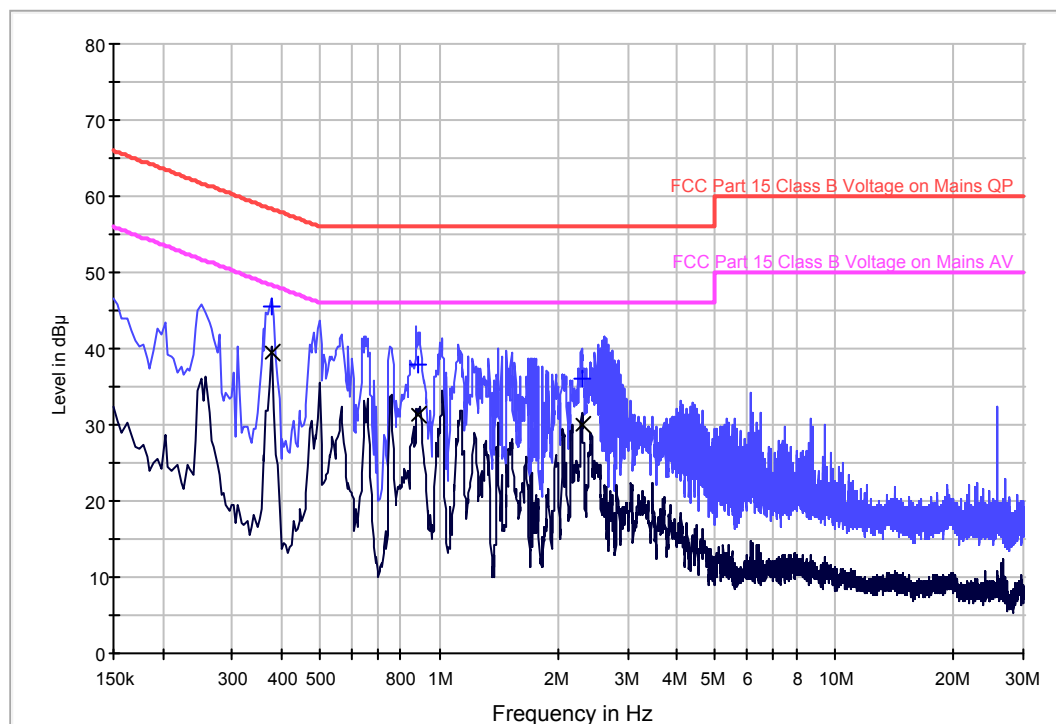
Company: iDevices, LLC

Date of Test: August 18, 2015

Model: IDEV0004

Worst Case Operating Mode: RF on

Conducted Emission Test - FCC



Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBμV)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.378000	45.6	N	10.2	12.7	58.3
0.886000	37.8	N	10.3	18.2	56.0
2.290000	36.2	N	10.3	19.8	56.0

Limit and Margin AV

Frequency (MHz)	Average (dBμV)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.378000	39.4	N	10.2	8.9	48.3
0.886000	31.3	N	10.3	14.7	46.0
2.290000	30.0	N	10.3	16.0	46.0

TRF no.: FCC 15C_TX_b

FCC ID: 2ABDJ-SWITCH4

Report No.: 150729018SZN-002

INTERTEK TESTING SERVICES

Applicant: iDevices, LLC
Date of Test: August 18, 2015
Model: IDEV0004

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

☒ Not required - No digital part

☐ Test results are attached

☐ Included in the separated report.

INTERTEK TESTING SERVICES

Applicant: iDevices, LLC
Date of Test: August 18, 2015
Model: IDEV0004

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.doc & internal photos.pdf.

EXHIBIT 6

PRODUCT LABELLING

6.0 **Product Labelling**

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

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.

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

MISCELLANEOUS INFORMATION

9.0 **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 10
TEST EQUIPMENT LIST

INTERTEK TESTING SERVICES

10.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	20-May-2015	20-May-2016
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	20-May-2015	20-May-2016
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	02-Sep-2014	02-Sep-2015
SZ185-01	EMI Receiver	R&S	ESCI	100547	07-Feb-2015	07-Feb-2016
SZ061-09	Horn Antenna	ETS	3115	00092346	01-Nov-2014	01-Nov-2015
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	03-Sep-2014	03-Sep-2015
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	29-Apr-2015	29-Apr-2016
SZ056-06	Signal Analyzer	R&S	FSV40	Oct-76	08-Jul-2015	08-Jul-2016
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	07-Feb-2015	07-Feb-2016
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	19-Apr-2015	19-Apr-2016
SZ062-02	RF Cable	RADIAL	RG 213U	0	27-Jun-2015	27-Dec-2015
SZ062-05	RF Cable	RADIAL	0.04-26.5GHz	0833254	07-Apr-2015	07-Oct-2015
SZ062-12	RF Cable	RADIAL	0.04-26.5GHz	083387	07-Apr-2015	07-Oct-2015
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	20-May-2015	20-May-2016
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	01-Nov-2014	01-Nov-2015
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	01-Nov-2014	01-Nov-2015
SZ188-03	Shielding Room	ETS	RFD-100	4100	23-Aug-2014	23-Aug-2016