Leviton Mfg Co, Inc

WiFi Module

FCC 15.247:2019

802.11bgn SISO Radio

Report # LEVT0129 Rev. 1

NVLAP LAB CODE: 200630-0

CERTIFICATE OF TEST

Last Date of Test: September 30, 2019
Leviton Mfg Co, Inc
Model: WiFi Module

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2019	ANSI C63.10:2013
FCC 15.247:2019	ANSI C63.10:2013, KDB 558074

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	Yes	Pass	
6.5, 6.6, 11.12.1, 11.13.2	Spurious Radiated Emissions	Yes	Pass	
11.6	Duty Cycle	Yes	N/A	See value under Output Power
11.8.2	Occupied Bandwidth	No	N/A	Previously tested under FCC ID: VPYLB1GC
11.9.2.2.4	Output Power	Yes	Pass	
11.10.2	Power Spectral Density	No	N/A	Previously tested under FCC ID: VPYLB1GC
11.11	Band Edge Compliance	No	N/A	Previously tested under FCC ID: VPYLB1GC
11.11	Spurious Conducted Emissions	No	N/A	Previously tested under FCC ID: VPYLB1GC

Deviations From Test Standards

None

Approved By:

Kyle Holgate, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		
01	Added Powerline Conducted Emissions data.	2019-10-01	15-21
	Added Powerline Conducted Emissions result and standard FCC 15.207:2019 to Certificate of Test.	2019-10-01	2
	Added new Spurious Radiated Emissions data.	2019-10-01	22-26
	Added Powerline Conducted Emissions to modifications page.	2019-10-01	13
	Updated last date of test to September 30, 2019.	2019-10-01	2, 8, 13
	Added configuration LEVT0129-5.	2019-10-01	12
	Updated standard from FCC 15.247:2018 to FCC 15.247:2019.	2019-10-02	1, 2, 24, 26, 28
	Removed configurations LEVT0129-1 and LEVT0129-2.	2019-10-02	9, 10

ACCREDITATIONS AND AUTHORIZATIONS

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Element to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with ISED.

European Union

European Commission – Within Element, we have a EU Notified Body validated for the EMCD and RED Directives.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIT / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

Vietnam

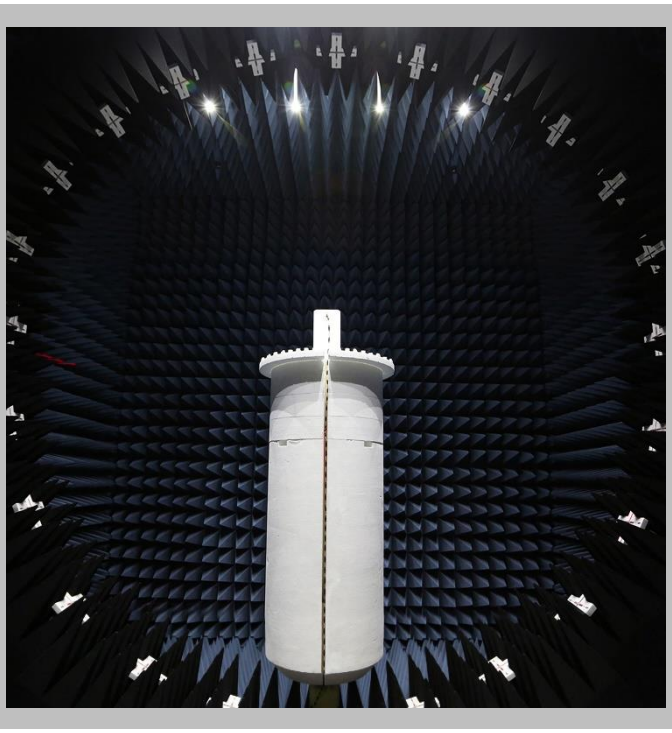
MIC – Recognized by MIC as a CAB for the acceptance of test data.

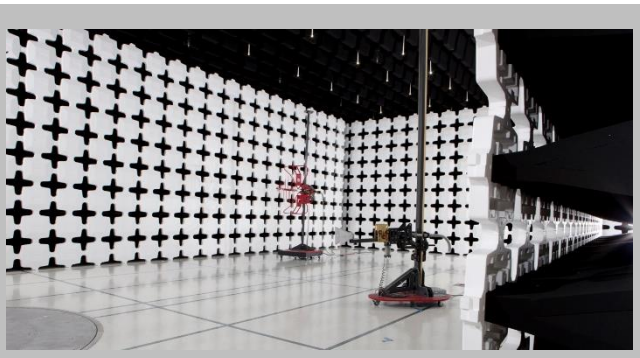
SCOPE

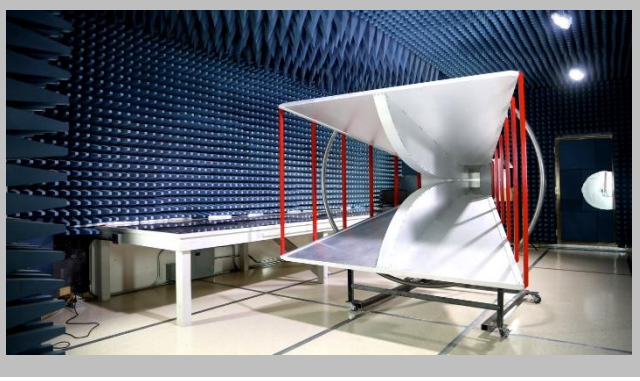
For details on the Scopes of our Accreditations, please visit:
http://portlandcustomer.element.com/ts/scope/scope.htm
http://gsi.nist.gov/global/docs/cabs/designations.html

FACILITIES

California	Minnesota	New York	Oregon	Texas	Washington
Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 98011 (425)984-6600
NVLAP					
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
Innovation, Science and Economic Development Canada					
2834B-1, 2834B-3	2834E-1, 2834E-3	N/A	2834D-1, 2834D-*2*	2834G-1	2834F-1
BSMI					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157







MEASUREMENT UNCERTAINTY

TMU.2015.07.10

Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

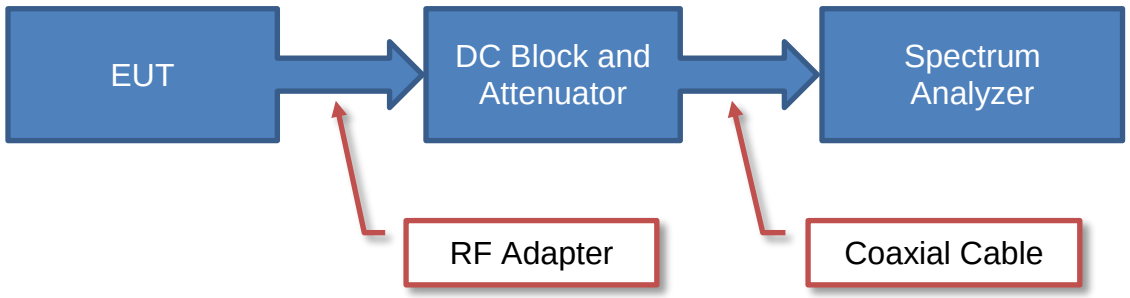
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable test description page. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

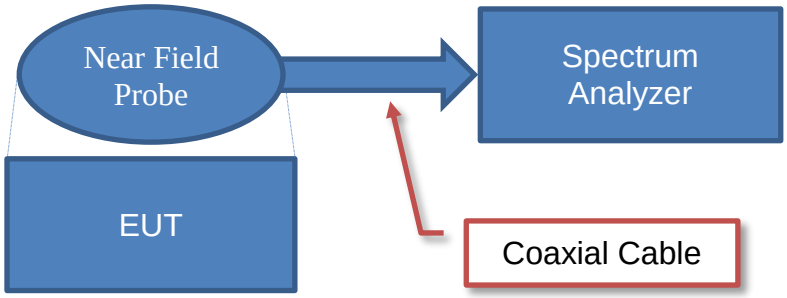
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

Test Setup Block Diagrams

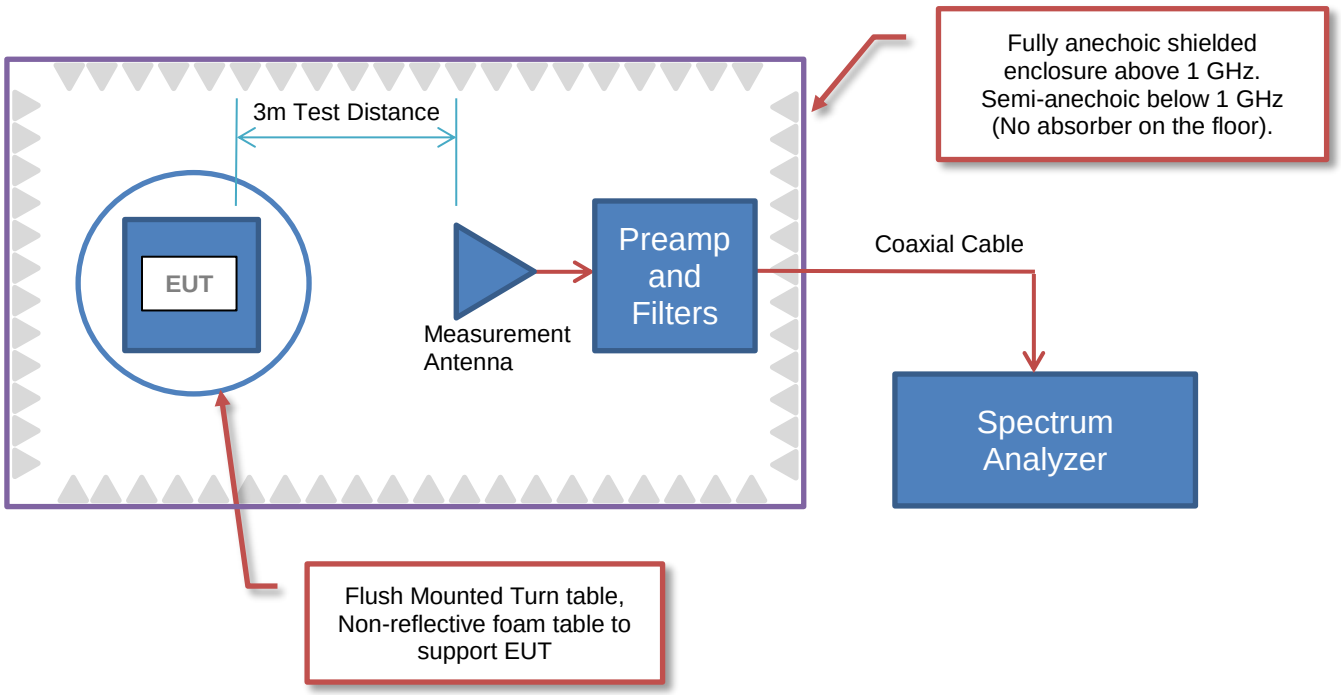
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



Spurious Radiated Emissions



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	Leviton Mfg Co, Inc
Address:	20497 SW Teton Avenue
City, State, Zip:	Tualatin, OR 97062
Test Requested By:	Mark Darula
Model:	WiFi Module
First Date of Test:	May 1, 2018
Last Date of Test:	September 30, 2018
Receipt Date of Samples:	April 30, 2018
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
802.11bgn WiFi Module originally granted under FCC ID: VPYLB1GC

Testing Objective:
To demonstrate compliance of the 802.11 radio under FCC 15.247 for operation in the 2.4 GHz band with a Class II Permissive Change due to the change to a new antenna.

CONFIGURATIONS

Configuration LEVT0129- 4

Software/Firmware Running during test	
Description	**Version**
MFG Test	B3778

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
WiFi Module	Leviton Mfg Co, Inc.	B3778 Rev 3	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Carrier Board	Leviton Mfg Co, Inc.	B2183 Rev 3	None

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	HP	ProBook	PLCNU1491FLZ
AC Adaptor	CUI Inc.	SWM6-5-NH-MUB	172400529

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB to FTDI	Yes	1.5 m	No	Laptop	Carrier Board
DC Power	No	3.2 m	No	AC Adaptor	Carrier Board

CONFIGURATIONS

Configuration LEVT0129- 5

Software/Firmware Running during test	
Description	**Version**
MFG Test	VR1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
WiFi Module	Leviton Mfg Co, Inc.	B3773 Rev. 3	1R1

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Linear DC Power Supply	Topward	TPS-2000	0074
Carrier Board	Leviton Mfg Co, Inc.	B2183 Rev 3	1R1

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Fujitsu	Lifebook AH572	R1331509

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Programming Cable	No	0.1 m	No	Carrier Board	Unterminated
DC Power	No	3.0 m	No	Carrier Board	Linear DC Power Supply

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	5/1/2018	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	9/30/2019	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	9/30/2019	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWER SETTINGS

The EUT was tested using the power settings provided by the manufacturer:

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Types	Channel Bandwidths	Channel	Position	Frequency (MHz)	Power Setting
1 Mbps, 11 Mbps, 6 Mbps, 36 Mbps, 54 Mbps, MCS0, MCS7	20	1	Low Channel	2412	14
		6	Mid Channel	2437	17
		11	High Channel	2462	17

POWERLINE CONDUCTED EMISSIONS

element
WTD.2019.4.24.1

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Receiver	Rohde & Schwarz	ESCI	ARH	2019-05-02	2020-05-02
Cable - Conducted Cable Assembly	Northwest EMC	EVG, HHD, RKT	EVGA	2019-01-07	2020-01-07
LISN	Solar Electronics	9252-50-R-24-BNC	LIR	2019-08-28	2020-08-28

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

LEVT0129-5

MODES INVESTIGATED

802.11 bgn continuous Tx, Mid Channel = 2437 MHz, 1 Mbps, Software Power Setting = 17

POWERLINE CONDUCTED EMISSIONS

element
WTD.2019.4.24.1

EUT:	WiFi Module	Work Order:	LEVT0129
Serial Number:	1R1	Date:	2019-09-30
Customer:	Leviton Mfg Co, Inc	Temperature:	22.1°C
Attendees:	Stephen Miller	Relative Humidity:	38.4%
Customer Project:	None	Bar. Pressure:	1021 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	3.3 VDC via 110VAC/60Hz	Configuration:	LEVT0129-5

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2019	ANSI C63.10:2013

TEST PARAMETERS

Run #:	2	Line:	Neutral	Add. Ext. Attenuation (dB):	0

COMMENTS

Measuring AC mains of Linear DC Power Supply.

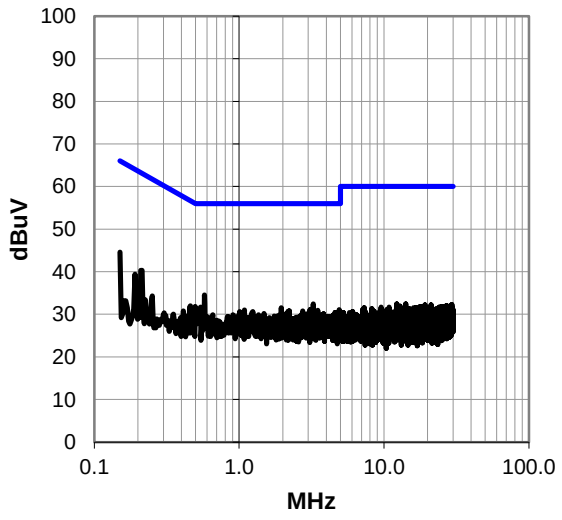
EUT OPERATING MODES

802.11 bgn continuous Tx, Mid Channel = 2437 MHz, 1 Mbps, Software Power Setting = 17

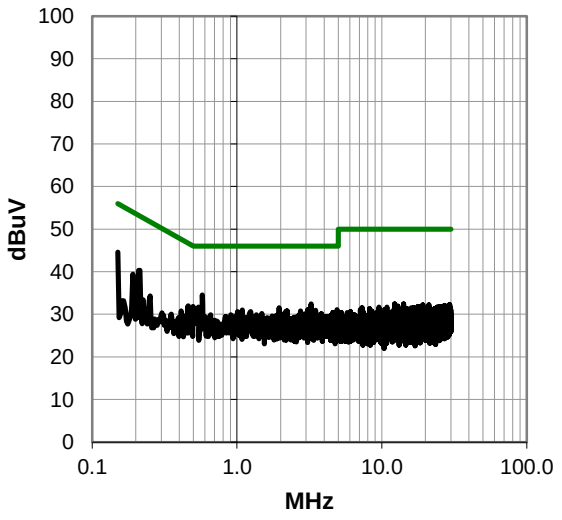
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2019.4.24.1

RESULTS - Run #2

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.150	24.5	20.1	44.6	66.0	-21.4
0.575	14.6	19.9	34.5	56.0	-21.5
0.210	20.3	20.0	40.3	63.2	-22.9
3.243	12.3	20.1	32.4	56.0	-23.6
0.497	12.0	19.8	31.8	56.1	-24.3
0.542	11.8	19.9	31.7	56.0	-24.3
1.956	11.5	20.0	31.5	56.0	-24.5
0.191	19.4	20.0	39.4	64.0	-24.6
0.460	12.2	19.8	32.0	56.7	-24.7
3.086	11.0	20.1	31.1	56.0	-24.9
4.914	10.9	20.2	31.1	56.0	-24.9
1.086	11.1	19.9	31.0	56.0	-25.0
3.482	10.8	20.1	30.9	56.0	-25.1
2.217	10.8	20.0	30.8	56.0	-25.2
2.739	10.8	20.0	30.8	56.0	-25.2
2.168	10.7	20.0	30.7	56.0	-25.3
1.008	10.7	19.9	30.6	56.0	-25.4
1.243	10.7	19.9	30.6	56.0	-25.4
3.213	10.3	20.1	30.4	56.0	-25.6
4.586	10.2	20.2	30.4	56.0	-25.6
4.735	10.2	20.2	30.4	56.0	-25.6
1.068	10.4	19.9	30.3	56.0	-25.7
1.221	10.4	19.9	30.3	56.0	-25.7
1.486	10.3	19.9	30.2	56.0	-25.8
2.952	10.1	20.0	30.1	56.0	-25.9
3.821	9.9	20.2	30.1	56.0	-25.9

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.150	24.5	20.1	44.6	56.0	-11.4
0.575	14.6	19.9	34.5	46.0	-11.5
0.210	20.3	20.0	40.3	53.2	-12.9
3.243	12.3	20.1	32.4	46.0	-13.6
0.497	12.0	19.8	31.8	46.1	-14.3
0.542	11.8	19.9	31.7	46.0	-14.3
1.956	11.5	20.0	31.5	46.0	-14.5
0.191	19.4	20.0	39.4	54.0	-14.6
0.460	12.2	19.8	32.0	46.7	-14.7
3.086	11.0	20.1	31.1	46.0	-14.9
4.914	10.9	20.2	31.1	46.0	-14.9
1.086	11.1	19.9	31.0	46.0	-15.0
3.482	10.8	20.1	30.9	46.0	-15.1
2.217	10.8	20.0	30.8	46.0	-15.2
2.739	10.8	20.0	30.8	46.0	-15.2
2.168	10.7	20.0	30.7	46.0	-15.3
1.008	10.7	19.9	30.6	46.0	-15.4
1.243	10.7	19.9	30.6	46.0	-15.4
3.213	10.3	20.1	30.4	46.0	-15.6
4.586	10.2	20.2	30.4	46.0	-15.6
4.735	10.2	20.2	30.4	46.0	-15.6
1.068	10.4	19.9	30.3	46.0	-15.7
1.221	10.4	19.9	30.3	46.0	-15.7
1.486	10.3	19.9	30.2	46.0	-15.8
2.952	10.1	20.0	30.1	46.0	-15.9
3.821	9.9	20.2	30.1	46.0	-15.9

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2019.4.24.1

EUT:	WiFi Module	Work Order:	LEVT0129
Serial Number:	1R1	Date:	2019-09-30
Customer:	Leviton Mfg Co, Inc	Temperature:	22.1°C
Attendees:	Stephen Miller	Relative Humidity:	38.4%
Customer Project:	None	Bar. Pressure:	1021 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	3.3 VDC via 110VAC/60Hz	Configuration:	LEVT0129-5

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2019	ANSI C63.10:2013

TEST PARAMETERS

Run #:	3	Line:	High Line	Add. Ext. Attenuation (dB):	0

COMMENTS

Measuring AC mains of Linear DC Power Supply.

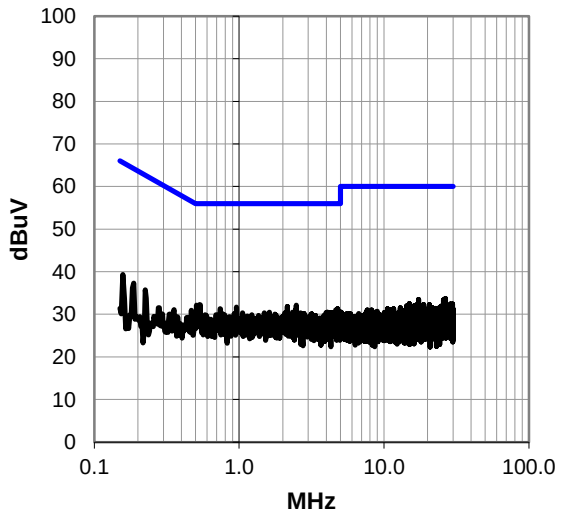
EUT OPERATING MODES

802.11 bgn continuous Tx, Mid Channel = 2437 MHz, 1 Mbps, Software Power Setting = 17

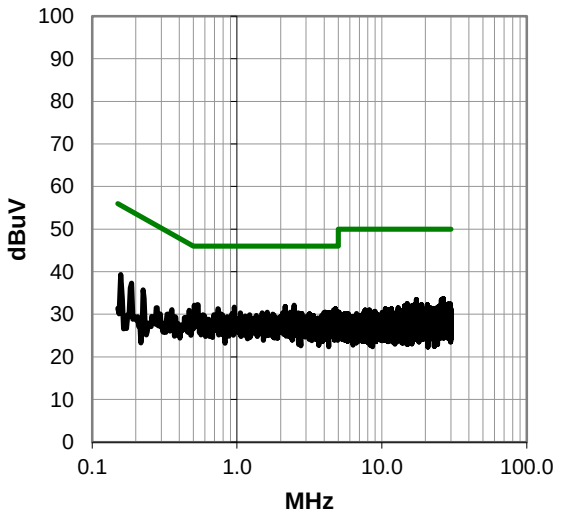
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2019.4.24.1

RESULTS - Run #3

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.534	12.4	19.9	32.3	56.0	-23.7
0.508	12.3	19.8	32.1	56.0	-23.9
2.474	12.1	20.0	32.1	56.0	-23.9
2.150	11.8	20.0	31.8	56.0	-24.2
0.960	11.8	19.9	31.7	56.0	-24.3
0.739	11.4	19.9	31.3	56.0	-24.7
4.784	11.1	20.2	31.3	56.0	-24.7
2.459	11.1	20.0	31.1	56.0	-24.9
4.646	10.8	20.2	31.0	56.0	-25.0
4.914	10.5	20.2	30.7	56.0	-25.3
1.620	10.5	20.0	30.5	56.0	-25.5
2.336	10.5	20.0	30.5	56.0	-25.5
4.056	10.3	20.2	30.5	56.0	-25.5
3.989	10.2	20.2	30.4	56.0	-25.6
4.347	10.2	20.2	30.4	56.0	-25.6
1.057	10.4	19.9	30.3	56.0	-25.7
1.489	10.4	19.9	30.3	56.0	-25.7
2.060	10.3	20.0	30.3	56.0	-25.7
2.646	10.3	20.0	30.3	56.0	-25.7
4.213	10.1	20.2	30.3	56.0	-25.7
0.467	11.1	19.8	30.9	56.6	-25.7
0.922	10.3	19.9	30.2	56.0	-25.8
2.799	10.2	20.0	30.2	56.0	-25.8
0.769	10.2	19.9	30.1	56.0	-25.9
3.164	10.0	20.1	30.1	56.0	-25.9
1.579	10.0	20.0	30.0	56.0	-26.0

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.534	12.4	19.9	32.3	46.0	-13.7
0.508	12.3	19.8	32.1	46.0	-13.9
2.474	12.1	20.0	32.1	46.0	-13.9
2.150	11.8	20.0	31.8	46.0	-14.2
0.960	11.8	19.9	31.7	46.0	-14.3
0.739	11.4	19.9	31.3	46.0	-14.7
4.784	11.1	20.2	31.3	46.0	-14.7
2.459	11.1	20.0	31.1	46.0	-14.9
4.646	10.8	20.2	31.0	46.0	-15.0
4.914	10.5	20.2	30.7	46.0	-15.3
1.620	10.5	20.0	30.5	46.0	-15.5
2.336	10.5	20.0	30.5	46.0	-15.5
4.056	10.3	20.2	30.5	46.0	-15.5
3.989	10.2	20.2	30.4	46.0	-15.6
4.347	10.2	20.2	30.4	46.0	-15.6
1.057	10.4	19.9	30.3	46.0	-15.7
1.489	10.4	19.9	30.3	46.0	-15.7
2.060	10.3	20.0	30.3	46.0	-15.7
2.646	10.3	20.0	30.3	46.0	-15.7
4.213	10.1	20.2	30.3	46.0	-15.7
0.467	11.1	19.8	30.9	46.6	-15.7
0.922	10.3	19.9	30.2	46.0	-15.8
2.799	10.2	20.0	30.2	46.0	-15.8
0.769	10.2	19.9	30.1	46.0	-15.9
3.164	10.0	20.1	30.1	46.0	-15.9
1.579	10.0	20.0	30.0	46.0	-16.0

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2019.05.10

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

802.11 bgn continuous Tx, Low Channel = 2412 MHz, Mid Channel = 2437 MHz, High Channel = 2462 MHz.

POWER SETTINGS INVESTIGATED

3.3 VDC

CONFIGURATIONS INVESTIGATED

LEVT0129 - 5

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26.5 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Filter - High Pass	Micro-Tronics	HPM50111	HFO	11-Dec-2018	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFD	15-Feb-2019	12 mo
Attenuator	Coaxicom	3910-20	AXZ	15-Feb-2019	12 mo
Cable	ESM Cable Corp.	TTBJ141-KMKM-72	EVY	31-Jul-2019	12 mo
Cable	None	Standard Gain Horns Cable	EVF	24-Nov-2018	12 mo
Cable	N/A	Double Ridge Horn Cables	EVB	24-Nov-2018	12 mo
Cable	N/A	Bilog Cables	EVA	24-Nov-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	31-Jul-2019	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	24-Nov-2018	12 mo
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	24-Nov-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	24-Nov-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	24-Nov-2018	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AIV	NCR	0 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AHV	NCR	0 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	0 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	7-Feb-2018	24 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	2-Oct-2018	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	24-Mar-2019	12 mo

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These “pre-scans” are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements at the edges of the allowable band may be presented in an alternative method as provided for in the ANSI C63.10 Marker-Delta method. This method involves performing an in-band fundamental measurement followed by a screen capture of the fundamental and out-of-band emission using reduced measurement instrumentation bandwidths. The amplitude delta measured on this screen capture is applied to the fundamental emission value to show the out-of-band emission level as applied to the limit.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of 10*LOG(dc).

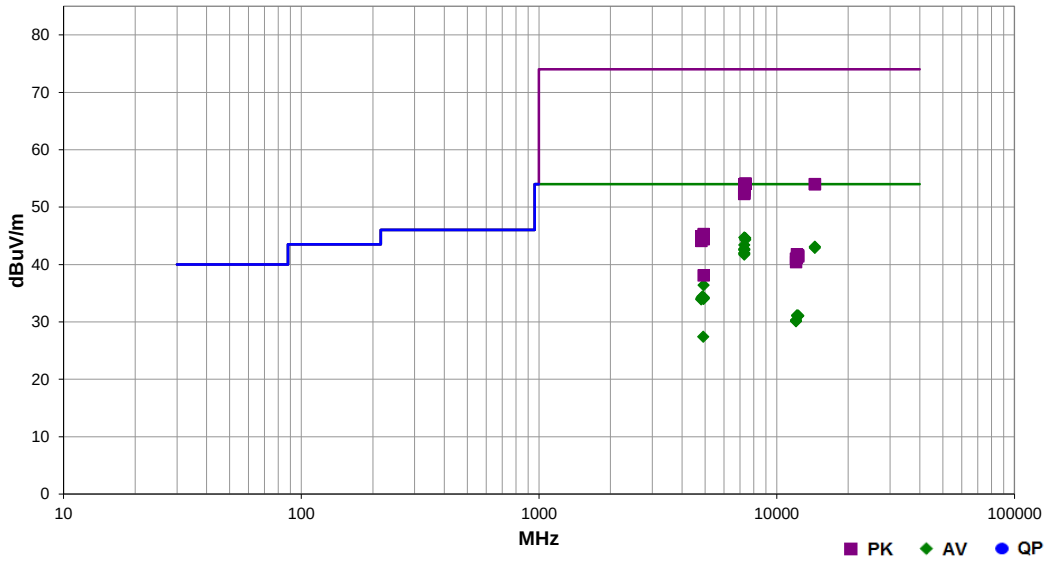
SPURIOUS RADIATED EMISSIONS

EmiR5 2019.08.01 PSA-ESCI 2019.05.10

Work Order:	LEVT0129	**Date:**	30-Sep-2019		
Project:	None	**Temperature:**	20.6 °C		
Job Site:	EV01	**Humidity:**	38.9% RH		
Serial Number:	1R1	**Barometric Pres.:**	1020 mbar	**Tested by:**	Jeff Alcoke
EUT:	WiFi Module				
Configuration:	5				
Customer:	Leviton Mfg Co, Inc				
Attendees:	Stephen Miller				
EUT Power:	3.3 VDC				
Operating Mode:	802.11 bgn continuous Tx, Low Channel = 2412 MHz, Mid Channel = 2437 MHz, High Channel = 2462 MHz.				
Deviations:	None				
Comments:	See comments below for Channel, Data Rate, EUT orientation, and software power setting.				

Test Specifications	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

Run #	33	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7309.670	31.7	13.0	1.0	238.0	3.0	0.0	Horz	AV	0.0	44.7	54.0	-9.3	Mid Ch, 1 Mbps, EUT on Side, Power Setting = 17
7384.790	30.6	14.0	3.33	273.0	3.0	0.0	Horz	AV	0.0	44.6	54.0	-9.4	High Ch, 1 Mbps, EUT on Side, Power Setting = 17
7387.210	30.2	14.1	1.96	274.0	3.0	0.0	Vert	AV	0.0	44.3	54.0	-9.7	High Ch, 1 Mbps, EUT Vert, Power Setting = 17
7310.080	30.4	13.0	1.64	233.0	3.0	0.0	Horz	AV	0.0	43.4	54.0	-10.6	Mid Ch, 11 Mbps, EUT on Side, Power Setting = 17
14472.100	27.1	16.0	1.5	296.0	3.0	0.0	Vert	AV	0.0	43.1	54.0	-10.9	Low Ch, 1 Mbps, EUT Vert, Power Setting = 14
14472.360	26.9	16.0	2.98	340.0	3.0	0.0	Horz	AV	0.0	42.9	54.0	-11.1	Low Ch, 1 Mbps, EUT on Side, Power Setting = 14
7308.250	29.7	13.0	1.89	285.0	3.0	0.0	Horz	AV	0.0	42.7	54.0	-11.3	Mid Ch, 6 Mbps, EUT on Side, Power Setting = 17
7308.920	29.6	13.0	1.5	208.0	3.0	0.0	Vert	AV	0.0	42.6	54.0	-11.4	Mid Ch, 1 Mbps, EUT Vert, Power Setting = 17
7308.210	29.5	13.0	1.5	227.0	3.0	0.0	Horz	AV	0.0	42.5	54.0	-11.5	Mid Ch, MCS0, EUT on Side, Power Setting = 17
7307.540	29.0	13.0	3.54	271.0	3.0	0.0	Horz	AV	0.0	42.0	54.0	-12.0	Mid Ch, 54 Mbps, EUT on Side, Power Setting = 17
7306.750	28.9	13.0	1.5	222.0	3.0	0.0	Horz	AV	0.0	41.9	54.0	-12.1	Mid Ch, MCS7, EUT on Side, Power Setting = 17
7310.580	28.7	13.0	1.5	197.0	3.0	0.0	Horz	AV	0.0	41.7	54.0	-12.3	Mid Ch, 36 Mbps, EUT on Side, Power Setting = 17
4924.040	30.9	5.5	3.05	223.0	3.0	0.0	Horz	AV	0.0	36.4	54.0	-17.6	High Ch, 1 Mbps, EUT on Side, Power Setting = 17
4874.040	29.1	5.3	3.29	218.0	3.0	0.0	Vert	AV	0.0	34.4	54.0	-19.6	Mid Ch, 1 Mbps, EUT Vert, Power Setting = 17
4927.120	28.7	5.6	1.5	138.0	3.0	0.0	Vert	AV	0.0	34.3	54.0	-19.7	High Ch, 1 Mbps, EUT Vert, Power Setting = 17
4928.540	28.6	5.6	1.5	217.0	3.0	0.0	Horz	AV	0.0	34.2	54.0	-19.8	High Ch, 1 Mbps, EUT Hiorz, Power Setting = 17
7387.210	40.0	14.1	1.96	274.0	3.0	0.0	Vert	PK	0.0	54.1	74.0	-19.9	High Ch, 1 Mbps, EUT Vert, Power Setting = 17
4926.920	28.5	5.6	1.5	123.0	3.0	0.0	Vert	AV	0.0	34.1	54.0	-19.9	High Ch, 1 Mbps, EUT on Side, Power Setting = 17
7388.750	39.9	14.2	3.33	273.0	3.0	0.0	Horz	PK	0.0	54.1	74.0	-19.9	High Ch, 1 Mbps, EUT on Side, Power Setting = 17
4927.250	28.5	5.6	1.5	320.0	3.0	0.0	Vert	AV	0.0	34.1	54.0	-19.9	High Ch, 1 Mbps, EUT Horz, Power Setting = 17
4824.120	29.2	4.9	1.5	354.0	3.0	0.0	Horz	AV	0.0	34.1	54.0	-19.9	Low Ch, 1 Mbps, EUT on Side, Power Setting = 14
4874.040	28.8	5.3	1.39	250.0	3.0	0.0	Horz	AV	0.0	34.1	54.0	-19.9	Mid Ch, 1 Mbps, EUT on Side, Power Setting = 17
4924.420	28.5	5.5	1.5	240.0	3.0	0.0	Horz	AV	0.0	34.0	54.0	-20.0	High Ch, 1 Mbps, EUT Horz, Power Setting = 17
14473.000	38.0	16.0	2.98	340.0	3.0	0.0	Horz	PK	0.0	54.0	74.0	-20.0	Low Ch, 1 Mbps, EUT on Side, Power Setting = 14
14471.470	38.0	16.0	1.5	296.0	3.0	0.0	Vert	PK	0.0	54.0	74.0	-20.0	Low Ch, 1 Mbps, EUT Vert, Power Setting = 14
7309.920	41.0	13.0	1.0	238.0	3.0	0.0	Horz	PK	0.0	54.0	74.0	-20.0	Mid Ch, 1 Mbps, EUT on Side, Power Setting = 17
4818.960	29.1	4.8	1.8	78.0	3.0	0.0	Vert	AV	0.0	33.9	54.0	-20.1	Low Ch, 1 Mbps, EUT Vert, Power Setting = 14
7310.540	40.6	13.0	1.64	233.0	3.0	0.0	Horz	PK	0.0	53.6	74.0	-20.4	Mid Ch, 11 Mbps, EUT on Side, Power Setting = 17
7307.420	40.1	13.0	1.89	285.0	3.0	0.0	Horz	PK	0.0	53.1	74.0	-20.9	Mid Ch, 6 Mbps, EUT on Side, Power Setting = 17
7307.620	39.9	13.0	1.5	227.0	3.0	0.0	Horz	PK	0.0	52.9	74.0	-21.1	Mid Ch, MCS0, EUT on Side, Power Setting = 17
7308.250	39.9	13.0	1.5	222.0	3.0	0.0	Horz	PK	0.0	52.9	74.0	-21.1	Mid Ch, MCS7, EUT on Side, Power Setting = 17

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7297.670	39.5	13.0	1.5	197.0	3.0	0.0	Horz	PK	0.0	52.5	74.0	-21.5	Mid Ch, 36 Mbps, EUT on Side, Power Setting = 17
7304.540	39.4	13.0	3.54	271.0	3.0	0.0	Horz	PK	0.0	52.4	74.0	-21.6	Mid Ch, 54 Mbps, EUT on Side, Power Setting = 17
7301.080	39.3	13.0	1.5	208.0	3.0	0.0	Vert	PK	0.0	52.3	74.0	-21.7	Mid Ch, 1 Mbps, EUT Vert, Power Setting = 17
12332.330	29.1	2.0	1.38	68.0	3.0	0.0	Horz	AV	0.0	31.1	54.0	-22.9	High Ch, 1 Mbps, EUT on Side, Power Setting = 17
12184.920	29.4	1.7	3.07	351.0	3.0	0.0	Horz	AV	0.0	31.1	54.0	-22.9	Mid Ch, 1 Mbps, EUT on Side, Power Setting = 17
12189.290	29.5	1.6	1.5	328.0	3.0	0.0	Vert	AV	0.0	31.1	54.0	-22.9	Mid Ch, 1 Mbps, EUT Vert, Power Setting = 17
12322.000	29.0	2.0	2.32	122.0	3.0	0.0	Vert	AV	0.0	31.0	54.0	-23.0	High Ch, 1 Mbps, EUT Vert, Power Setting = 17
12059.830	29.2	1.1	3.61	224.0	3.0	0.0	Horz	AV	0.0	30.3	54.0	-23.7	Low Ch, 1 Mbps, EUT on Side, Power Setting = 14
12063.420	29.0	1.1	1.5	117.0	3.0	0.0	Vert	AV	0.0	30.1	54.0	-23.9	Low Ch, 1 Mbps, EUT Vert, Power Setting = 14
4912.620	21.9	5.5	1.5	341.0	3.0	0.0	Horz	AV	0.0	27.4	54.0	-26.6	High Ch, 1 Mbps, EUT Vert, Power Setting = 17
4931.380	39.7	5.6	1.5	217.0	3.0	0.0	Horz	PK	0.0	45.3	74.0	-28.7	High Ch, 1 Mbps, EUT Hiorz, Power Setting = 17
4926.750	39.5	5.6	1.5	320.0	3.0	0.0	Vert	PK	0.0	45.1	74.0	-28.9	High Ch, 1 Mbps, EUT Horz, Power Setting = 17
4926.080	39.3	5.6	1.5	138.0	3.0	0.0	Vert	PK	0.0	44.9	74.0	-29.1	High Ch, 1 Mbps, EUT Vert, Power Setting = 17
4924.500	39.4	5.5	3.05	223.0	3.0	0.0	Horz	PK	0.0	44.9	74.0	-29.1	High Ch, 1 Mbps, EUT on Side, Power Setting = 17
4925.250	39.3	5.6	1.5	123.0	3.0	0.0	Vert	PK	0.0	44.9	74.0	-29.1	High Ch, 1 Mbps, EUT on Side, Power Setting = 17
4823.620	40.0	4.9	1.8	78.0	3.0	0.0	Vert	PK	0.0	44.9	74.0	-29.1	Low Ch, 1 Mbps, EUT Vert, Power Setting = 14
4868.620	39.3	5.3	3.29	218.0	3.0	0.0	Vert	PK	0.0	44.6	74.0	-29.4	Mid Ch, 1 Mbps, EUT Vert, Power Setting = 17
4867.250	39.3	5.3	1.39	250.0	3.0	0.0	Horz	PK	0.0	44.6	74.0	-29.4	Mid Ch, 1 Mbps, EUT on Side, Power Setting = 17
4929.620	38.8	5.6	1.5	240.0	3.0	0.0	Horz	PK	0.0	44.4	74.0	-29.6	High Ch, 1 Mbps, EUT Horz, Power Setting = 17
4823.290	39.2	4.9	1.5	354.0	3.0	0.0	Horz	PK	0.0	44.1	74.0	-29.9	Low Ch, 1 Mbps, EUT on Side, Power Setting = 14
12173.790	40.2	1.6	3.07	351.0	3.0	0.0	Horz	PK	0.0	41.8	74.0	-32.2	Mid Ch, 1 Mbps, EUT on Side, Power Setting = 17
12311.420	39.6	2.0	2.32	122.0	3.0	0.0	Vert	PK	0.0	41.6	74.0	-32.4	High Ch, 1 Mbps, EUT Vert, Power Setting = 17
12328.710	39.4	2.0	1.38	68.0	3.0	0.0	Horz	PK	0.0	41.4	74.0	-32.6	High Ch, 1 Mbps, EUT on Side, Power Setting = 17
12170.420	39.6	1.6	1.5	328.0	3.0	0.0	Vert	PK	0.0	41.2	74.0	-32.8	Mid Ch, 1 Mbps, EUT Vert, Power Setting = 17
12048.750	40.0	1.0	3.61	224.0	3.0	0.0	Horz	PK	0.0	41.0	74.0	-33.0	Low Ch, 1 Mbps, EUT on Side, Power Setting = 14
12061.250	39.3	1.1	1.5	117.0	3.0	0.0	Vert	PK	0.0	40.4	74.0	-33.6	Low Ch, 1 Mbps, EUT Vert, Power Setting = 14
4925.670	32.5	5.6	1.5	341.0	3.0	0.0	Horz	PK	0.0	38.1	74.0	-35.9	High Ch, 1 Mbps, EUT Vert, Power Setting = 17

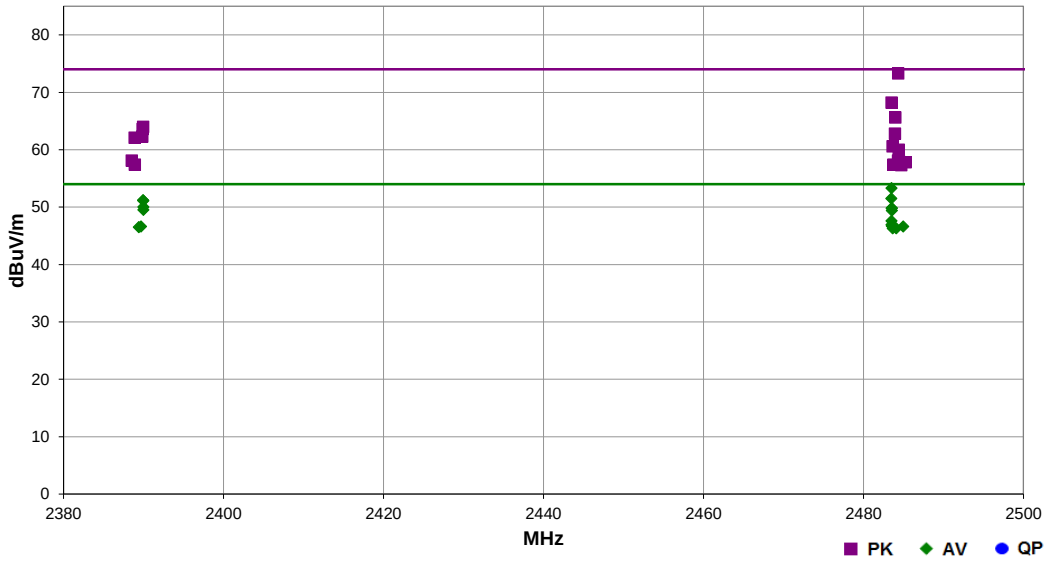
SPURIOUS RADIATED EMISSIONS

EmiR5 2019.08.01 PSA-ESCI 2019.05.10

Work Order:	LEVT0129	**Date:**	30-Sep-2019		
Project:	None	**Temperature:**	20.6 °C		
Job Site:	EV01	**Humidity:**	38.9% RH		
Serial Number:	1R1	**Barometric Pres.:**	1020 mbar	**Tested by:**	Jeff Alcoke
EUT:	WiFi Module				
Configuration:	5				
Customer:	Leviton Mfg Co, Inc				
Attendees:	Stephen Miller				
EUT Power:	3.3 VDC				
Operating Mode:	802.11 bgn continuous Tx, Low Channel = 2412 MHz, Mid Channel = 2437 MHz, High Channel = 2462 MHz.				
Deviations:	None				
Comments:	See comments below for Channel, Data Rate, and EUT orientation.				

Test Specifications	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

Run #	35	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2484.347	58.1	-4.8	3.28	47.0	3.0	20.0	Horz	PK	0.0	73.3	74.0	-0.7	High Ch, MCS0, EUT Horz, Power Setting = 17
2483.520	38.2	-4.9	3.28	47.0	3.0	20.0	Horz	AV	0.0	53.3	54.0	-0.7	High Ch, MCS0, EUT Horz, Power Setting = 17
2483.500	36.4	-4.9	1.04	41.0	3.0	20.0	Horz	AV	0.0	51.5	54.0	-2.5	High Ch, 6 Mbps, EUT Horz, Power Setting = 17
2389.940	36.3	-5.1	1.0	34.0	3.0	20.0	Horz	AV	0.0	51.2	54.0	-2.8	Low Ch, 36 Mbps, EUT Horz, Power Setting = 14
2389.983	36.2	-5.1	2.5	37.0	3.0	20.0	Horz	AV	0.0	51.1	54.0	-2.9	Low Ch, 6 Mbps, EUT Horz, Power Setting = 14
2389.983	35.1	-5.1	1.5	296.0	3.0	20.0	Vert	AV	0.0	50.0	54.0	-4.0	Low Ch, 6 Mbps, EUT on Side, Power Setting = 14
2483.527	34.7	-4.9	2.21	204.0	3.0	20.0	Horz	AV	0.0	49.8	54.0	-4.2	High Ch, 36 Mbps, EUT Horz, Power Setting = 17
2483.553	34.7	-4.9	4.0	47.0	3.0	20.0	Horz	AV	0.0	49.8	54.0	-4.2	High Ch, MCS7, EUT Horz, Power Setting = 17
2389.990	34.6	-5.1	1.44	292.0	3.0	20.0	Vert	AV	0.0	49.5	54.0	-4.5	Low Ch, 36 Mbps, EUT on Side, Power Setting = 14
2483.553	34.3	-4.9	2.2	203.0	3.0	20.0	Horz	AV	0.0	49.4	54.0	-4.6	High Ch, 54 Mbps, EUT Horz, Power Setting = 17
2483.510	53.1	-4.9	1.04	41.0	3.0	20.0	Horz	PK	0.0	68.2	74.0	-5.8	High Ch, 6 Mbps, EUT Horz, Power Setting = 17
2483.513	32.5	-4.9	2.82	14.0	3.0	20.0	Horz	AV	0.0	47.6	54.0	-6.4	High Ch, 1 Mbps, EUT Horz, Powre Setting = 17
2483.520	31.8	-4.9	1.5	196.0	3.0	20.0	Vert	AV	0.0	46.9	54.0	-7.1	High Ch, 1 Mbps, EUT on Side, Power Setting = 17
2483.610	31.7	-4.9	1.82	99.0	3.0	20.0	Vert	AV	0.0	46.8	54.0	-7.2	High Ch, 1 Mbps, EUT Vert, Power Setting = 17
2483.550	31.6	-4.9	3.88	207.0	3.0	20.0	Horz	AV	0.0	46.7	54.0	-7.3	High Ch, 11 Mbps, EUT Horz, Power Setting = 17
2484.970	31.4	-4.8	2.09	7.0	3.0	20.0	Horz	AV	0.0	46.6	54.0	-7.4	High Ch, 1 Mbps, EUT Vert, Power Setting = 17
2389.700	31.7	-5.1	1.5	353.0	3.0	20.0	Vert	AV	0.0	46.6	54.0	-7.4	Low Ch, 1 Mbps, EUT on Side, Power Setting = 14
2389.423	31.6	-5.1	1.5	80.0	3.0	20.0	Horz	AV	0.0	46.5	54.0	-7.5	Low Ch, 1 Mbps, EUT Horz, Power Setting = 14
2483.653	31.2	-4.9	1.5	32.0	3.0	20.0	Horz	AV	0.0	46.3	54.0	-7.7	High Ch, 1 Mbps, EUT on Side, Power Setting = 17
2484.113	31.2	-4.9	3.1	201.0	3.0	20.0	Vert	AV	0.0	46.3	54.0	-7.7	High Ch, 1 Mbps, EUT Horz, Powre Setting = 17
2483.970	50.5	-4.9	4.0	47.0	3.0	20.0	Horz	PK	0.0	65.6	74.0	-8.4	High Ch, MCS7, EUT Horz, Power Setting = 17
2389.947	49.1	-5.1	1.0	34.0	3.0	20.0	Horz	PK	0.0	64.0	74.0	-10.0	Low Ch, 36 Mbps, EUT Horz, Power Setting = 14
2389.893	48.7	-5.1	2.5	37.0	3.0	20.0	Horz	PK	0.0	63.6	74.0	-10.4	Low Ch, 6 Mbps, EUT Horz, Power Setting = 14
2483.927	47.7	-4.9	2.21	204.0	3.0	20.0	Horz	PK	0.0	62.8	74.0	-11.2	High Ch, 36 Mbps, EUT Horz, Power Setting = 17
2389.843	47.4	-5.1	1.44	292.0	3.0	20.0	Vert	PK	0.0	62.3	74.0	-11.7	Low Ch, 36 Mbps, EUT on Side, Power Setting = 14
2388.890	47.2	-5.1	1.5	296.0	3.0	20.0	Vert	PK	0.0	62.1	74.0	-11.9	Low Ch, 6 Mbps, EUT on Side, Power Setting = 14
2483.640	45.5	-4.9	2.2	203.0	3.0	20.0	Horz	PK	0.0	60.6	74.0	-13.4	High Ch, 54 Mbps, EUT Horz, Power Setting = 17
2484.400	44.8	-4.8	2.82	14.0	3.0	20.0	Horz	PK	0.0	60.0	74.0	-14.0	High Ch, 1 Mbps, EUT Horz, Powre Setting = 17
2484.307	42.9	-4.8	1.5	196.0	3.0	20.0	Vert	PK	0.0	58.1	74.0	-15.9	High Ch, 1 Mbps, EUT on Side, Power Setting = 17
2388.517	43.2	-5.1	1.5	353.0	3.0	20.0	Vert	PK	0.0	58.1	74.0	-15.9	Low Ch, 1 Mbps, EUT on Side, Power Setting = 14
2484.413	42.9	-4.8	3.88	207.0	3.0	20.0	Horz	PK	0.0	58.1	74.0	-15.9	High Ch, 11 Mbps, EUT Horz, Power Setting = 17

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2484.570	42.6	-4.8	2.09	7.0	3.0	20.0	Horz	PK	0.0	57.8	74.0	-16.2	High Ch, 1 Mbps, EUT Vert, Power Setting = 17
2485.280	42.6	-4.8	1.82	99.0	3.0	20.0	Vert	PK	0.0	57.8	74.0	-16.2	High Ch, 1 Mbps, EUT Vert, Power Setting = 17
2483.743	42.3	-4.9	1.5	32.0	3.0	20.0	Horz	PK	0.0	57.4	74.0	-16.6	High Ch, 1 Mbps, EUT on Side, Power Setting = 17
2388.910	42.5	-5.1	1.5	80.0	3.0	20.0	Horz	PK	0.0	57.4	74.0	-16.6	Low Ch, 1 Mbps, EUT Horz, Power Setting = 14
2484.710	42.1	-4.8	3.1	201.0	3.0	20.0	Vert	PK	0.0	57.3	74.0	-16.7	High Ch, 1 Mbps, EUT Horz, Powre Setting = 17

OUTPUT POWER

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Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFI	12-Jan-18	12-Jan-19
Generator - Signal	Keysight	N5182B	TFU	27-Oct-15	27-Oct-18
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	23-Apr-18	23-Apr-19
Attenuator	Fairview Microwave	18B5W-26	RFZ	6-Sep-17	6-Sep-18
Block - DC	Fairview Microwave	SD3379	AMX	23-Apr-18	23-Apr-19

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The fundamental emission output power (maximum average conducted output power) was measured using the channels and modes as called out on the following data sheets. The transmit power was set to its default maximum.

Prior to measuring output power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring Maximum Conducted Output Power. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

The method AVGSA-2 in section 11.9.2.2.4 of ANSI C63.10:2013 was used to make the measurement. This method uses trace averaging across ON and OFF times of the EUT transmissions in the spectrum analyzer channel power function using an RMS detector. Following the measurement a duty cycle correction was applied by adding [10 log (1 / D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times.

De Facto EIRP Limit: The EUT meets the de facto EIRP limit of +36 dBm.

OUTPUT POWER

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EUT:	**WiFi Module**			**Work Order:**	**LEVT0129**
Serial Number:	**B3778**			**Date:**	**1-May-18**
Customer:	**Leviton Mfg Co, Inc**			**Temperature:**	**21.9 °C**
Attendees:	**Vikas Asthana**			**Humidity:**	**40.6% RH**
Project:	**None**			**Barometric Pres.:**	**1022 mbar**
Tested by:	**Jeff Alcoke**	**Power:**	**5.0 VDC via 110VAC/60Hz**	**Job Site:**	**EV06**
TEST SPECIFICATIONS		**Test Method**			
FCC 15.247:2019		ANSI C63.10:2013			

COMMENTS

Reference level offset includes the following: attenuator, cable, and simi-rigid coax cable.

DEVIATIONS FROM TEST STANDARD

None

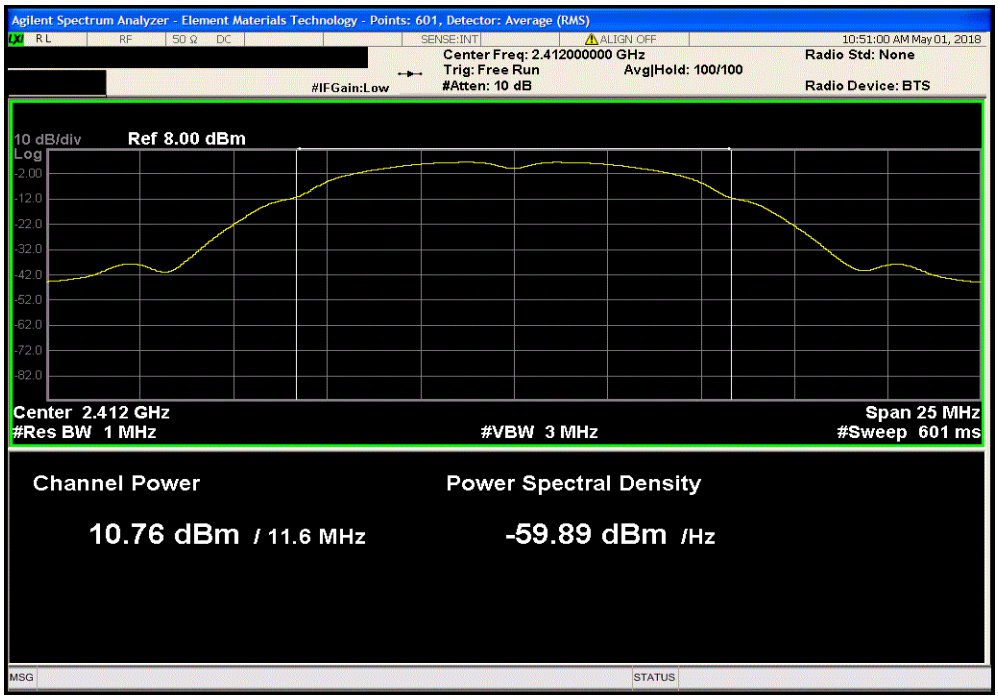
Configuration #	**4**	*Signature*

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Value (dBm)	Limit (dBm)	Results
2400 MHz - 2483.5 MHz Band					
802.11(b) 1 Mbps					
Low Channel 1, 2412 MHz, Power Setting = 14	10.759	0	10.8	30	Pass
Mid Channel 6, 2437 MHz, Power Setting = 17	13.395	0	13.4	30	Pass
High Channel 11, 2462 MHz, Power Setting = 17	12.963	0	13	30	Pass
802.11(g) 6 Mbps					
Low Channel 1, 2412 MHz, Power Setting = 14	10.818	0.1	10.9	30	Pass
Mid Channel 6, 2437 MHz, Power Setting = 17	12.093	0.1	12.2	30	Pass
High Channel 11, 2462 MHz, Power Setting = 17	11.628	0.1	11.8	30	Pass
802.11(n) MCS0					
Low Channel 1, 2412 MHz, Power Setting = 14	10.87	0.1	11	30	Pass
Mid Channel 6, 2437 MHz, Power Setting = 17	12.033	0.1	12.2	30	Pass
High Channel 11, 2462 MHz, Power Setting = 17	11.346	0.1	11.5	30	Pass

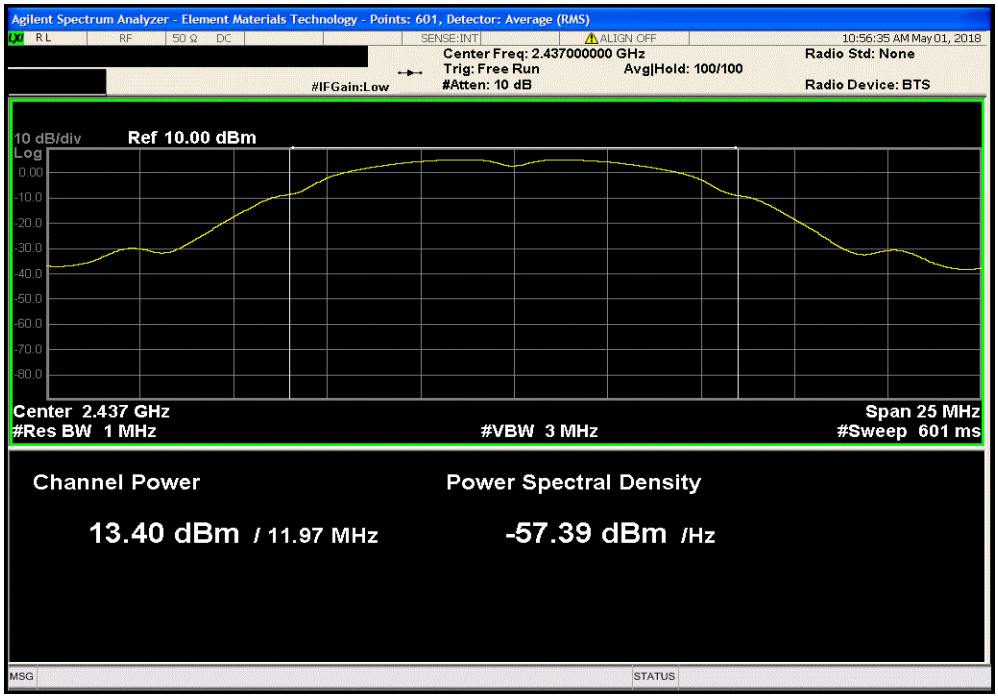
OUTPUT POWER

TbtTx 2017.12.14 XMit 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz, Power Setting = 14						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	10.759	0		10.8	30	Pass



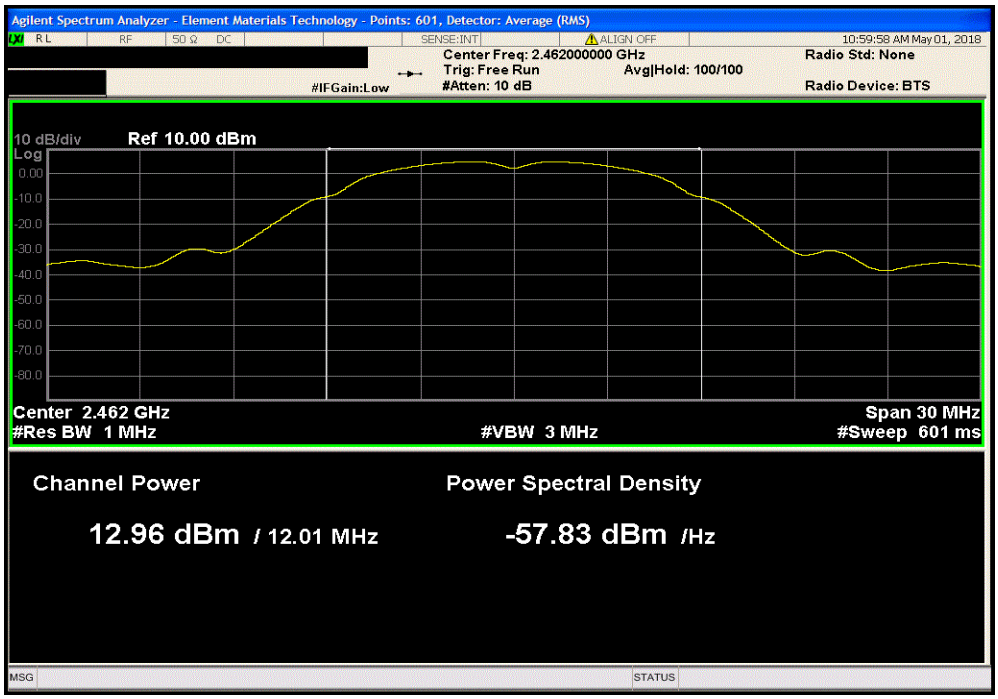
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz, Power Setting = 17						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	13.395	0		13.4	30	Pass



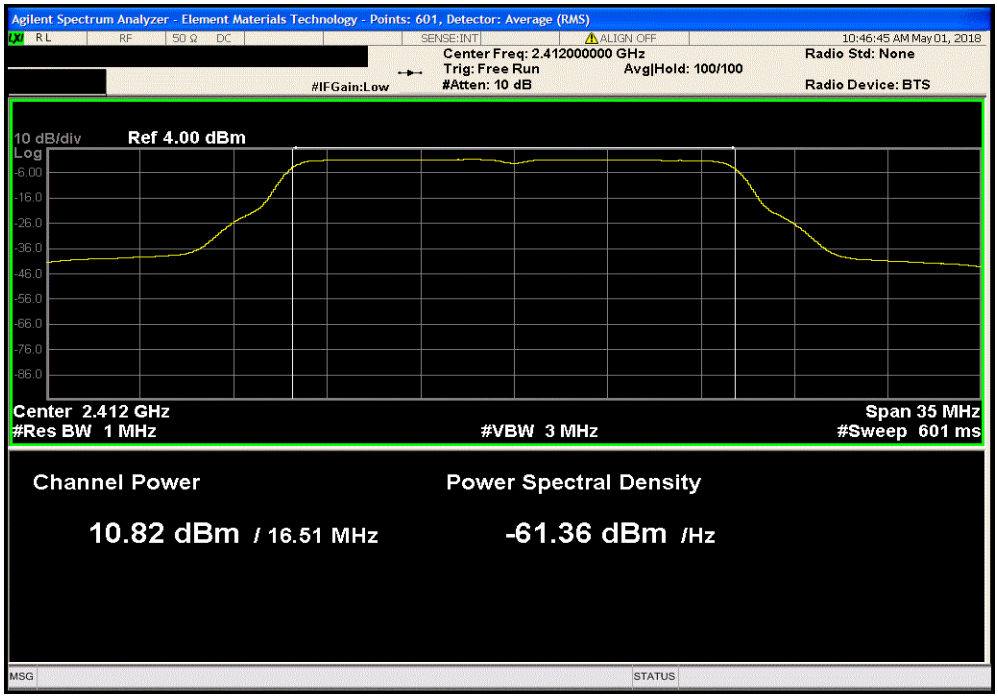
OUTPUT POWER

TbtTx 2017.12.14 XMit 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz, Power Setting = 17						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	12.963	0		13	30	Pass



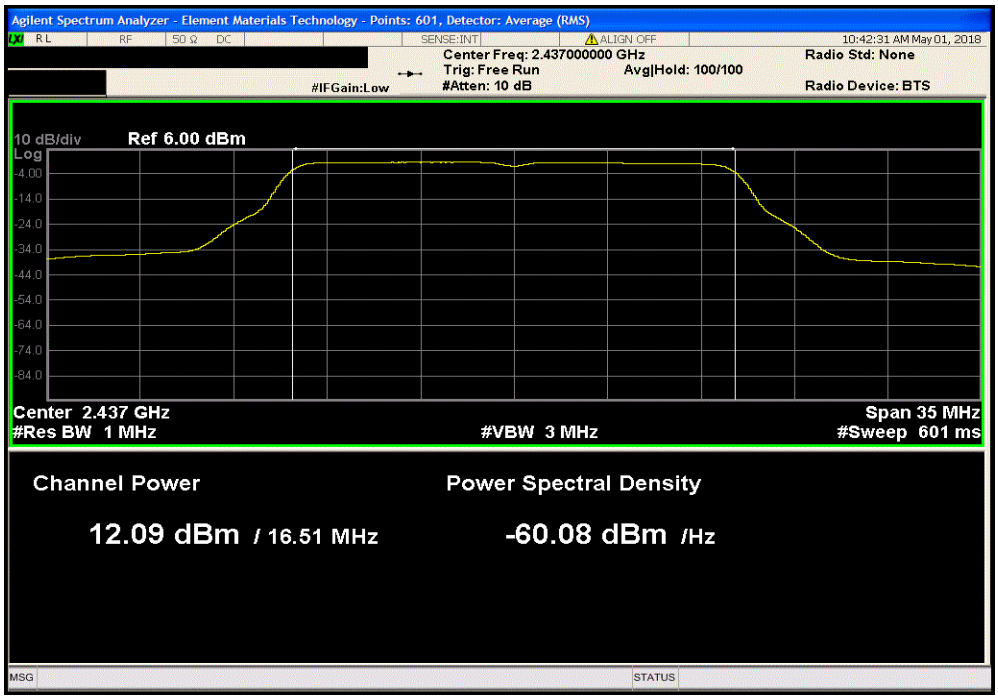
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz, Power Setting = 14						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	10.818	0.1		10.9	30	Pass



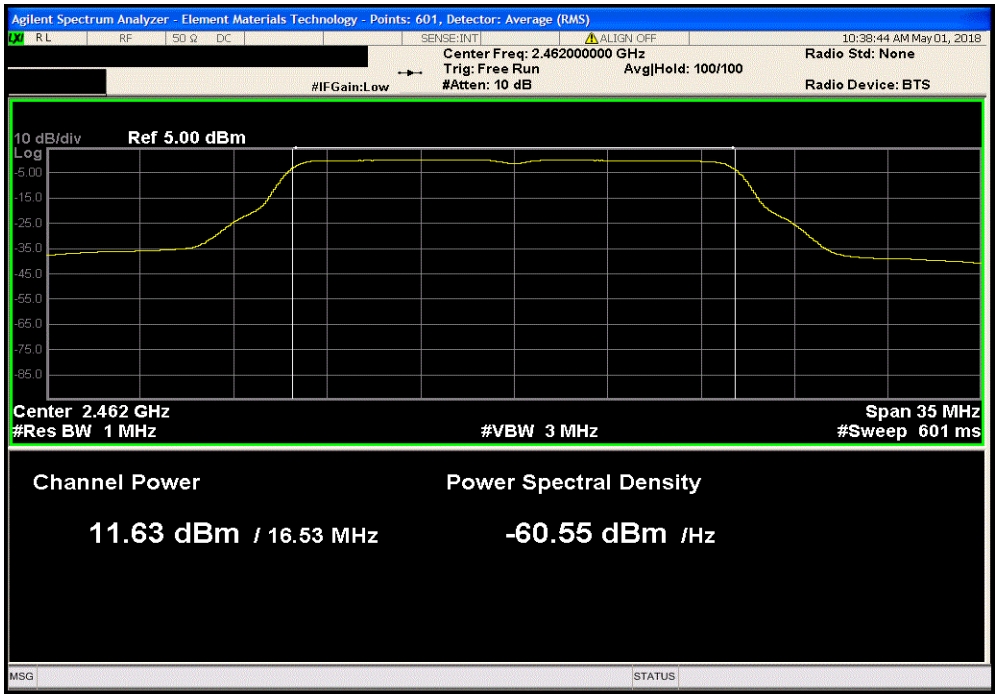
OUTPUT POWER

TbtTx 2017.12.14 XMit 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz, Power Setting = 17						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	12.093	0.1		12.2	30	Pass



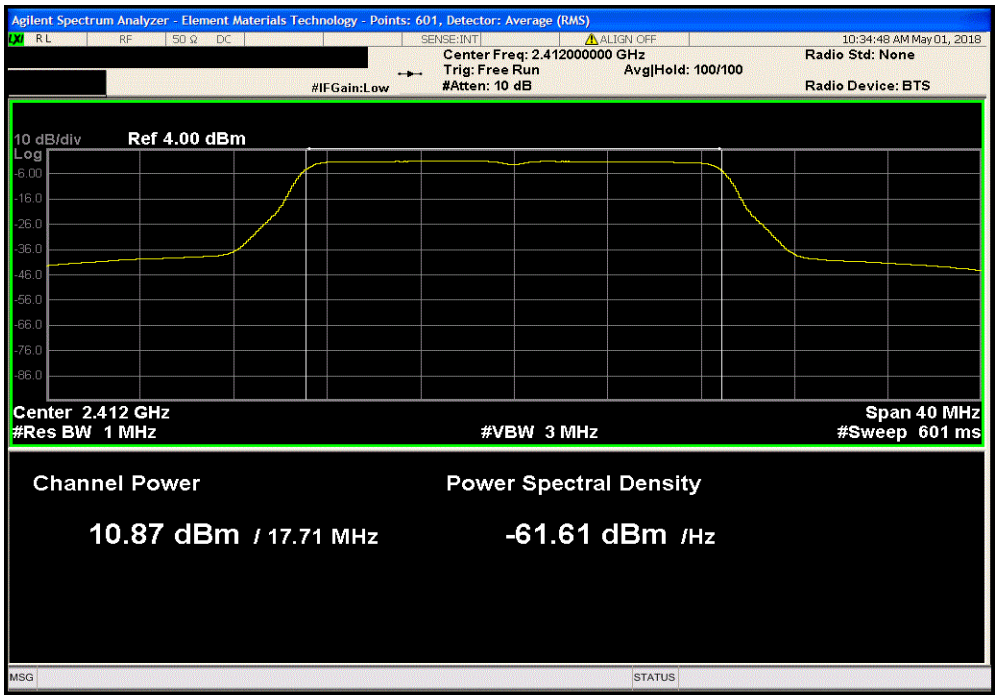
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz, Power Setting = 17						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	11.628	0.1		11.8	30	Pass



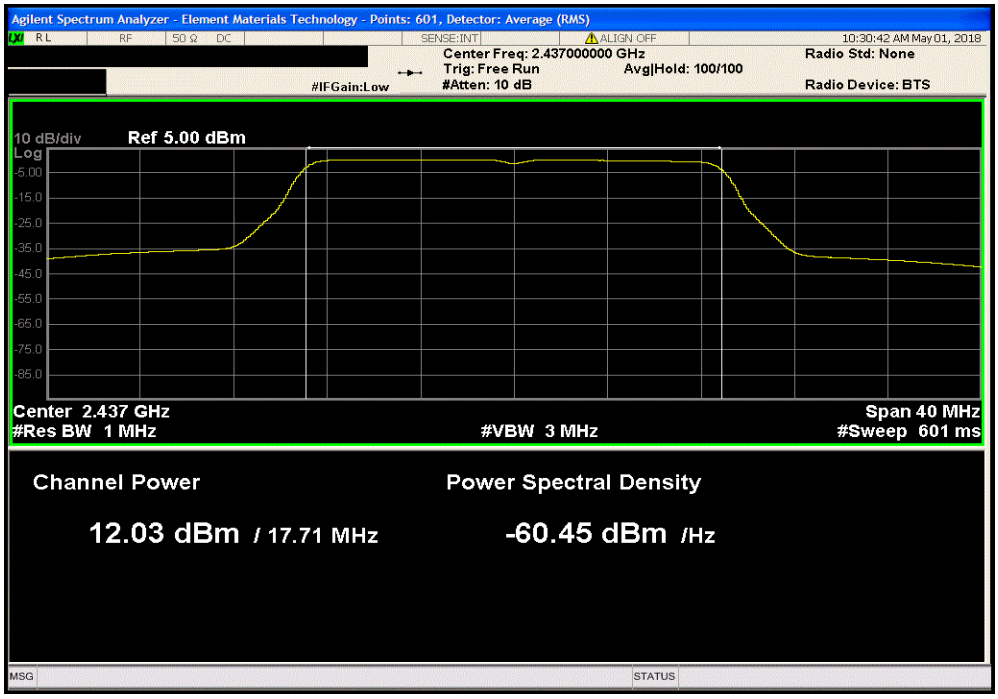
OUTPUT POWER

TbtTx 2017.12.14 XMit 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz, Power Setting = 14						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	10.87	0.1		11	30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz, Power Setting = 17						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	12.033	0.1		12.2	30	Pass



OUTPUT POWER

TbtTx 2017.12.14 XMit 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz, Power Setting = 17						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	11.346	0.1		11.5	30	Pass