



WatchGuard Video

VISTA WiFi

FCC 15.247:2018

2.4GHz Band Single Channel DTS Radio

Report # WTVD0001.1 Rev. 1



NVLAP LAB CODE: 201049-0



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CERTIFICATE OF TEST

Last Date of Test: October 12, 2018

WatchGuard Video

Model: VISTA WiFi

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2018	ANSI C63.10:2013, KDB 558074

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	No	N/A	Not required for a battery powered EUT.
6.5, 6.6 11.12.1, 11.13.2	Spurious Radiated Emissions	Yes	Pass	
11.6	Duty Cycle	Yes	Pass	
11.8.2	Occupied Bandwidth	Yes	Pass	
11.9.2.2.4	Output Power	Yes	Pass	
11.9.2.2.4	Equivalent Isotropic Radiated Power	Yes	Pass	
11.10.2	Power Spectral Density	Yes	Pass	
11.11	Band Edge Compliance	Yes	Pass	
11.11	Spurious Conducted Emissions	Yes	Pass	

Deviations From Test Standards

None

Approved By:



Jeremiah Darden, 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. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

REVISION HISTORY



Revision Number	Description	Date (yyyy-mm-dd)	Page Number
00	None		
01	Updated radio on cover page from 802.11g SISO Radio to 2.4GHz Band Single Channel DTS Radio.	2018-11-29	1
	Updated company address to 415 East Exchange Parkway Allen, TX 75002.	2018-11-29	8
	Updated functional description to, Body cam for law enforcement with single channel wireless link.	2018-11-29	8
	Updated testing objective radio from 802.11 to DTS.	2018-11-29	8

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

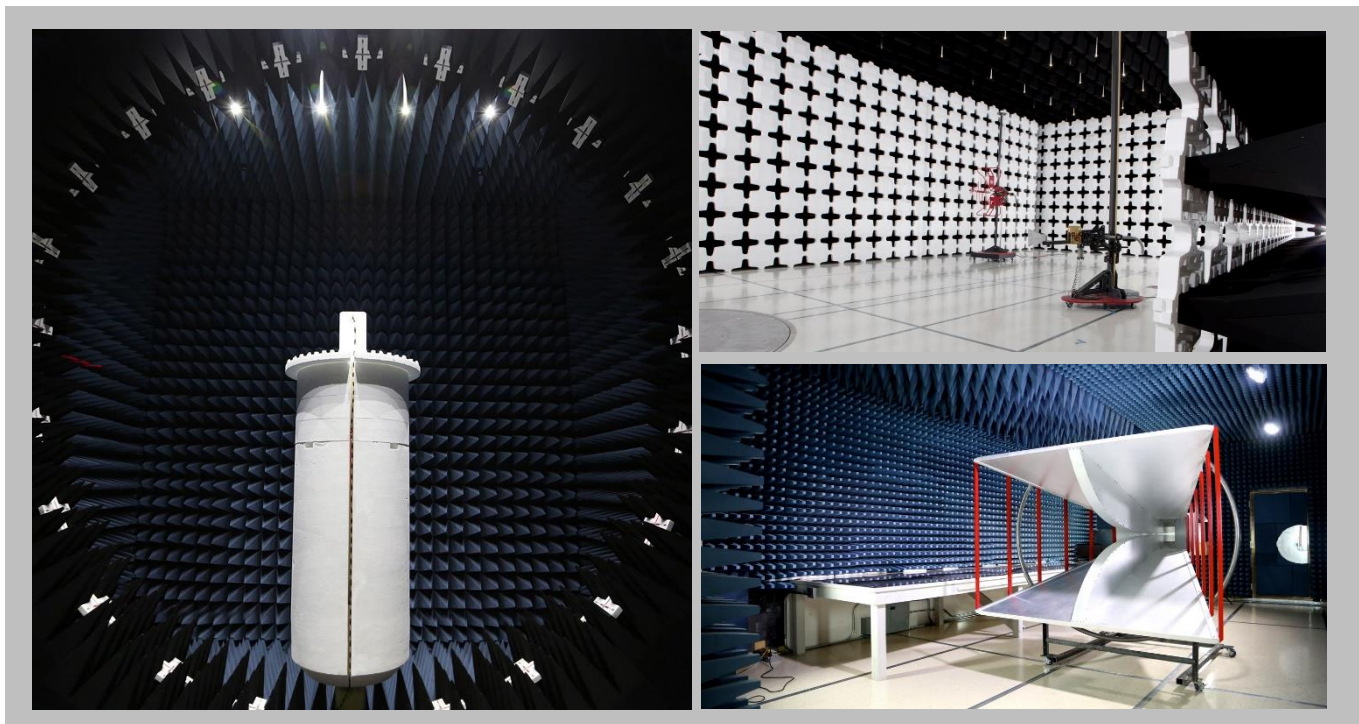
For details on the Scopes of our Accreditations, please visit:

<https://www.nwemc.com/emc-testing-accreditations>

FACILITIES



California Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Oregon Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Washington Labs NC01-05 19201 120 th 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/RRR, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157



MEASUREMENT UNCERTAINTY

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)	5.1 dB	-5.1 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

Test Setup Block Diagrams

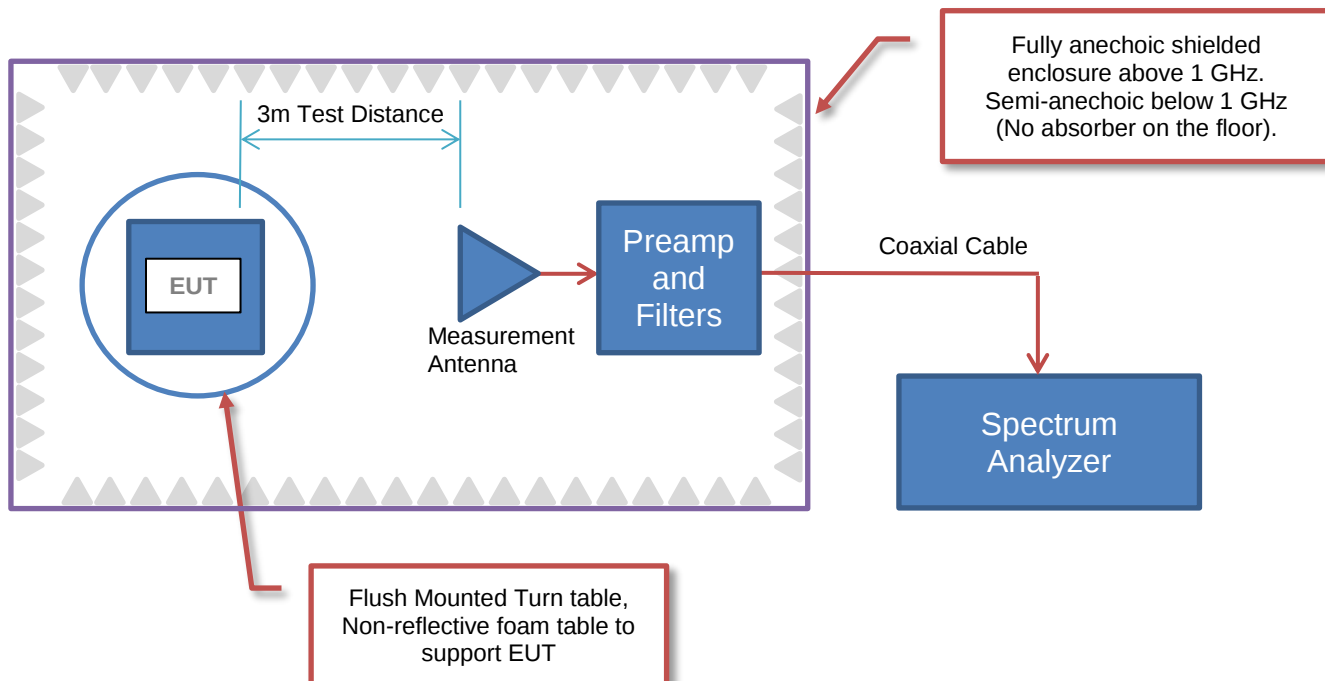
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



Spurious Radiated Emissions



PRODUCT DESCRIPTION



Client and Equipment Under Test (EUT) Information

Company Name:	WatchGuard Video
Address:	415 East Exchange Parkway
City, State, Zip:	Allen, TX 75002
Test Requested By:	Navaid Karimi
Model:	VISTA WiFi
First Date of Test:	October 11, 2018
Last Date of Test:	October 12, 2018
Receipt Date of Samples:	October 11, 2018
Equipment Design Stage:	Prototype
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

Body cam for law enforcement with single channel wireless link.

Testing Objective:

To demonstrate compliance of the single channel DTS radio under FCC 15.247 for operation in the 2.4 GHz band.

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
6 Mbps	20	6	Single Channel	2437	20000 (Max)
9 Mbps	20	6	Single Channel	2437	20000 (Max)
12 Mbps	20	6	Single Channel	2437	20000 (Max)
18 Mbps	20	6	Single Channel	2437	20000 (Max)
24 Mbps	20	6	Single Channel	2437	20000 (Max)
36 Mbps	20	6	Single Channel	2437	20000 (Max)
48 Mbps	20	6	Single Channel	2437	20000 (Max)
54 Mbps	20	6	Single Channel	2437	20000 (Max)

CONFIGURATIONS



Configuration WTVD0001- 1

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Body Camera with WiFi Link	Watchguard Video	VISTA WiFi	WFC1-039084

Configuration WTVD0001- 2

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Body Camera with Wifi Link (Direct Connect)	Watchguard Video	VISTA WiFi	WFC1-009113

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Command Console Board	Watchguard Video	WGA00341	0615413600
Charging Base	Watchguard Video	WGA00537	VHB1-05863

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop Computer	Dell	Latitude 7480	27904748150
AC/DC Power Supply (Base)	Unknown	M120100A0	None

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power (Base)	No	1.5m	No	AC/DC Power Supply (Base)	Charging Base
USB to RS-232	Yes	0.5m	No	Laptop Computer	Command Console Board

MODIFICATIONS



Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2018-10-11	Spurious Radiated 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.
2	2018-10-12	Duty Cycle	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	2018-10-12	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2018-10-12	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.
5	2018-10-12	Equivalent Isotropic Radiated 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.
6	2018-10-12	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
7	2018-10-12	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
8	2018-10-12	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2018.07.27

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

Continuously Transmitting at Single Channel 2437 MHz

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

WTVD0001 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26500 MHz
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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
Attenuator	Weinschel Corp	4H-20	AWB	16-Mar-2018	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	HHV	3-Aug-2018	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HGC	16-Mar-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	JSDWK42-18004000-60-5P	PAM	10-Oct-2018	12 mo
Antenna - Double Ridge	A.H. Systems, Inc.	SAS-574	AXW	21-Aug-2018	24 mo
Cable	Northwest EMC	18-40GHz	TXE	10-Oct-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	PAL	9-Oct-2018	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AJG	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	PAK	9-Oct-2018	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AJF	NCR	0 mo
Cable	Northwest EMC	8-18GHz	TXD	31-May-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAJ	31-May-2018	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIP	12-Jul-2018	24 mo
Cable	Northwest EMC	1-8.2 GHz	TXC	31-May-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1551	AVK	31-May-2018	12 mo
Antenna - Biconilog	ETS Lindgren	3143B	AYF	10-May-2018	24 mo
Cable	Northwest EMC	RE 9kHz - 1GHz	TXB	22-Aug-2018	12 mo
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	15-Mar-2018	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 RSS Gen). 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 $10 \cdot \text{LOG}(\text{DC})$.

SPURIOUS RADIATED EMISSIONS



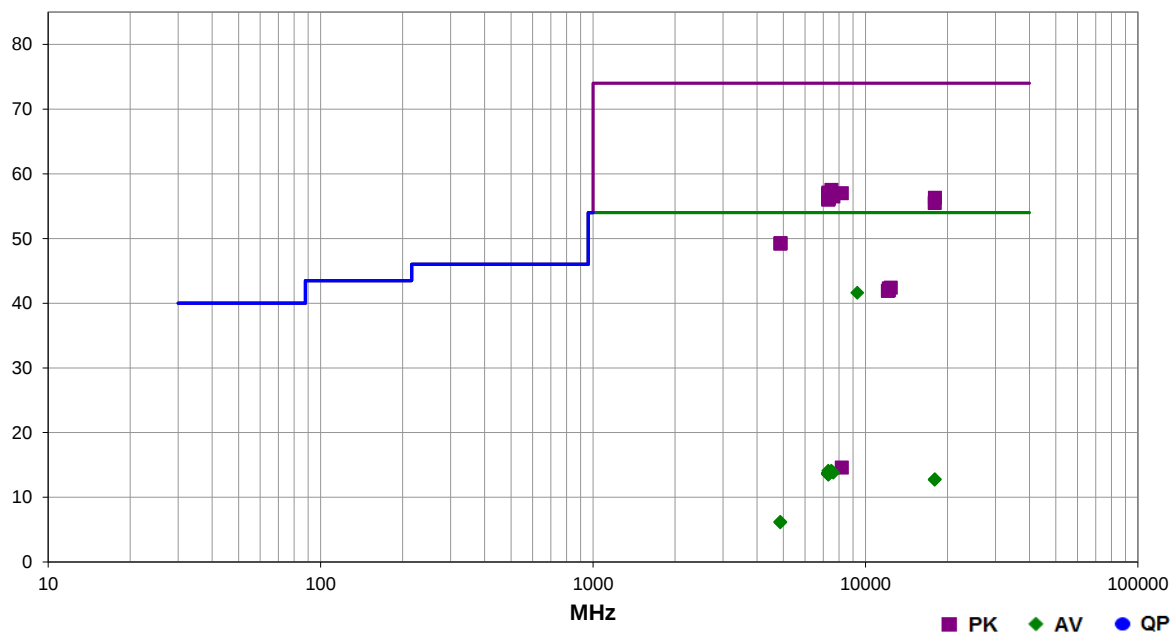
EmiRS 2018.09.26

PSA-ESCI 2018.07.27

Work Order:	WTVD0001	Date:	11-Oct-2018		
Project:	None	Temperature:	22.9 °C		
Job Site:	TX02	Humidity:	44.2% RH		
Serial Number:	WFC1-039084	Barometric Pres.:	1024 mbar	Tested by:	Jonathan Kiefer
EUT:	VISTA Wi-Fi				
Configuration:	1				
Customer:	WatchGuard Video				
Attendees:	Navaid Karimi				
EUT Power:	Battery				
Operating Mode:	Continuously Transmitting at Single Channel 2437 MHz				
Deviations:	None				
Comments:	EUT uses integral chip antenna with 2.2 dBi gain. EUT Duty Cycle < 98%, therefore upwardly corrected to 100% using 10*LOG(1/DC). Worst-case upward correction factor: 10*LOG(1/0.371) = 4.31 dB. Then downwardly corrected based on worse case duty cycle in normal use (1.7%), using 20*LOG(DC). Applied overall worst-case DCCF of -31.1 dB to average detector measurements.				

Test Specifications	FCC 15.247:2018	Test Method	ANSI C63.10:2013
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Run #	5	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7500.522	42.6	14.9	1.2	146.0	0.0	0.0	Horz	PK	0.0	57.5	74.0	-16.5	EUT Horizontal, 6 Mbps
7310.317	42.3	14.8	1.0	69.0	0.0	0.0	Horz	PK	0.0	57.1	74.0	-16.9	EUT Horizontal, 9 Mbps
8191.792	41.3	15.7	1.2	139.0	0.0	0.0	Vert	PK	0.0	57.0	74.0	-17.0	EUT Horizontal, 6 Mbps
7310.420	42.2	14.7	1.0	69.9	0.0	0.0	Horz	PK	0.0	56.9	74.0	-17.1	EUT On Side, 6 Mbps
7312.742	42.1	14.8	1.0	57.9	0.0	0.0	Horz	PK	0.0	56.9	74.0	-17.1	EUT Horizontal, 12 Mbps
7308.600	41.9	14.8	1.6	224.0	0.0	0.0	Horz	PK	0.0	56.7	74.0	-17.3	EUT Horizontal, 24 Mbps
7310.325	41.9	14.8	1.0	285.9	0.0	0.0	Horz	PK	0.0	56.7	74.0	-17.3	EUT Horizontal, 54 Mbps
7310.310	41.9	14.7	1.0	63.9	0.0	0.0	Vert	PK	0.0	56.6	74.0	-17.4	EUT On Side, 6 Mbps
7623.340	41.5	15.0	3.3	55.0	0.0	0.0	Vert	PK	0.0	56.5	74.0	-17.5	EUT Horizontal, 6 Mbps
7312.583	41.7	14.8	1.0	328.9	0.0	0.0	Horz	PK	0.0	56.5	74.0	-17.5	EUT Horizontal, 36 Mbps
7309.605	41.6	14.7	1.0	273.9	0.0	0.0	Horz	PK	0.0	56.3	74.0	-17.7	EUT Horizontal, 6 Mbps
7311.995	41.6	14.7	1.0	134.0	0.0	0.0	Vert	PK	0.0	56.3	74.0	-17.7	EUT Horizontal, 6 Mbps
17987.620	38.2	18.1	2.2	140.0	0.0	0.0	Horz	PK	0.0	56.3	74.0	-17.7	EUT Horizontal, 6 Mbps
7312.267	41.4	14.8	1.0	298.9	0.0	0.0	Horz	PK	0.0	56.2	74.0	-17.8	EUT Horizontal, 18 Mbps
7311.185	41.4	14.7	1.0	90.0	0.0	0.0	Horz	PK	0.0	56.1	74.0	-17.9	EUT Vertical, 6 Mbps
7311.758	41.3	14.8	1.0	291.0	0.0	0.0	Horz	PK	0.0	56.1	74.0	-17.9	EUT Horizontal, 48 Mbps
7311.035	41.3	14.7	1.0	316.9	0.0	0.0	Vert	PK	0.0	56.0	74.0	-18.0	EUT Vertical, 6 Mbps

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
17968.630	37.4	18.1	1.2	255.9	0.0	0.0	Vert	PK	0.0	55.5	74.0	-18.5	EUT Horizontal, 6 Mbps
4876.150	42.2	7.1	1.0	213.0	0.0	0.0	Vert	PK	0.0	49.3	74.0	-24.7	EUT Horizontal, 6 Mbps
4873.008	42.1	7.1	1.0	176.0	0.0	0.0	Horz	PK	0.0	49.2	74.0	-24.8	EUT Horizontal, 6 Mbps
12389.940	42.3	0.1	1.2	20.0	0.0	0.0	Vert	PK	0.0	42.4	74.0	-31.6	EUT Horizontal, 6 Mbps
12185.150	42.9	-0.6	1.0	336.0	0.0	0.0	Horz	PK	0.0	42.3	74.0	-31.7	EUT Horizontal, 6 Mbps
12186.660	42.6	-0.6	1.0	288.0	0.0	0.0	Vert	PK	0.0	42.0	74.0	-32.0	EUT Horizontal, 6 Mbps
12082.210	42.9	-1.0	1.2	82.9	0.0	0.0	Horz	PK	0.0	41.9	74.0	-32.1	EUT Horizontal, 6 Mbps
9345.212	43.8	-2.2	1.2	279.9	0.0	0.0	Vert	PK	0.0	41.6	74.0	-32.4	EUT Horizontal, 6 Mbps
8191.367	30.0	15.7	1.2	139.0	-31.1	0.0	Vert	AV	0.0	14.6	54.0	-39.4	EUT Horizontal, 6 Mbps
7499.005	30.3	14.9	1.2	146.0	-31.1	0.0	Horz	AV	0.0	14.1	54.0	-39.9	EUT Horizontal, 6 Mbps
7313.250	30.4	14.8	1.0	69.0	-31.1	0.0	Horz	AV	0.0	14.1	54.0	-39.9	EUT Horizontal, 9 Mbps
7623.407	29.9	15.0	3.3	55.0	-31.1	0.0	Vert	AV	0.0	13.8	54.0	-40.2	EUT Horizontal, 6 Mbps
7313.350	30.1	14.8	1.0	57.9	-31.1	0.0	Horz	AV	0.0	13.8	54.0	-40.2	EUT Horizontal, 12 Mbps
7313.075	30.1	14.8	1.0	298.9	-31.1	0.0	Horz	AV	0.0	13.8	54.0	-40.2	EUT Horizontal, 18 Mbps
7311.875	30.1	14.7	1.0	273.9	-31.1	0.0	Horz	AV	0.0	13.7	54.0	-40.3	EUT Horizontal, 6 Mbps
7312.120	30.1	14.7	1.0	134.0	-31.1	0.0	Vert	AV	0.0	13.7	54.0	-40.3	EUT Horizontal, 6 Mbps
7309.655	30.1	14.7	1.0	90.0	-31.1	0.0	Horz	AV	0.0	13.7	54.0	-40.3	EUT Vertical, 6 Mbps
7311.317	30.0	14.8	1.6	224.0	-31.1	0.0	Horz	AV	0.0	13.7	54.0	-40.3	EUT Horizontal, 24 Mbps
7313.317	30.0	14.8	1.0	328.9	-31.1	0.0	Horz	AV	0.0	13.7	54.0	-40.3	EUT Horizontal, 36 Mbps
7310.965	30.0	14.7	1.0	316.9	-31.1	0.0	Vert	AV	0.0	13.6	54.0	-40.4	EUT Vertical, 6 Mbps
7312.700	29.9	14.8	1.0	291.0	-31.1	0.0	Horz	AV	0.0	13.6	54.0	-40.4	EUT Horizontal, 48 Mbps
7312.608	29.9	14.8	1.0	285.9	-31.1	0.0	Horz	AV	0.0	13.6	54.0	-40.4	EUT Horizontal, 54 Mbps
7311.080	29.9	14.7	1.0	69.9	-31.1	0.0	Horz	AV	0.0	13.5	54.0	-40.5	EUT On Side, 6 Mbps
7312.095	29.9	14.7	1.0	63.9	-31.1	0.0	Vert	AV	0.0	13.5	54.0	-40.5	EUT On Side, 6 Mbps
17992.000	25.8	18.1	2.2	140.0	-31.1	0.0	Horz	AV	0.0	12.8	54.0	-41.2	EUT Horizontal, 6 Mbps
17973.300	25.7	18.1	1.2	255.9	-31.1	0.0	Vert	AV	0.0	12.7	54.0	-41.3	EUT Horizontal, 6 Mbps
4874.075	30.2	7.1	1.0	213.0	-31.1	0.0	Vert	AV	0.0	6.2	54.0	-47.8	EUT Horizontal, 6 Mbps
4873.983	30.1	7.1	1.0	176.0	-31.1	0.0	Horz	AV	0.0	6.1	54.0	-47.9	EUT Horizontal, 6 Mbps
12186.880	31.3	-0.6	1.0	336.0	-31.1	0.0	Horz	AV	0.0	-0.4	54.0	-54.4	EUT Horizontal, 6 Mbps
12182.530	31.3	-0.6	1.0	288.0	-31.1	0.0	Vert	AV	0.0	-0.4	54.0	-54.4	EUT Horizontal, 6 Mbps
12390.540	30.6	0.1	1.2	20.0	-31.1	0.0	Vert	AV	0.0	-0.4	54.0	-54.4	EUT Horizontal, 6 Mbps
12083.860	30.9	-1.0	1.2	82.9	-31.1	0.0	Horz	AV	0.0	-1.2	54.0	-55.2	EUT Horizontal, 6 Mbps
9344.803	32.0	-2.2	1.2	279.9	-31.1	0.0	Vert	AV	0.0	-1.3	54.0	-55.3	EUT Horizontal, 6 Mbps

SPURIOUS RADIATED EMISSIONS



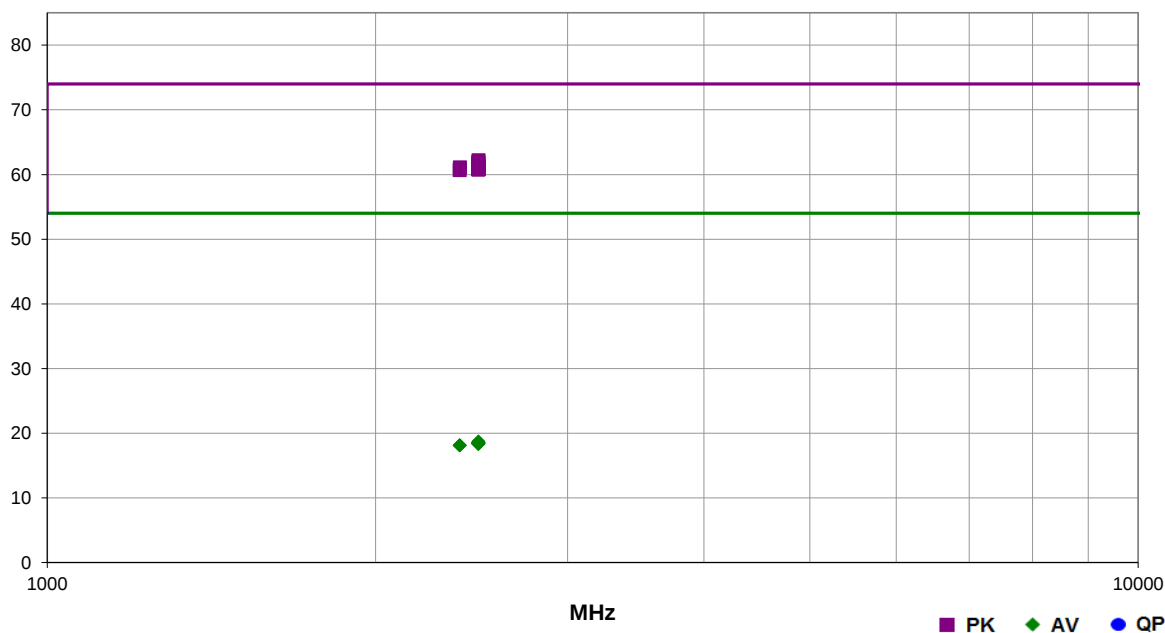
EmiRS 2018.09.26

PSA-ESCI 2018.07.27

Work Order:	WTVD0001	Date:	11-Oct-2018	
Project:	None	Temperature:	22.9 °C	
Job Site:	TX02	Humidity:	44.2% RH	
Serial Number:	WFC1-039084	Barometric Pres.:	1024 mbar	
EUT:	VISTA WiFi			
Configuration:	1			
Customer:	WatchGuard Video			
Attendees:	Navaid Karimi			
EUT Power:	Battery			
Operating Mode:	Continuously Transmitting at Single Channel 2437 MHz			
Deviations:	None			
Comments:	Transmit Band Edge. EUT uses integral chip antenna with 2.2 dBi gain. EUT Duty Cycle < 98%, therefore upwardly corrected to 100% using 10*LOG(1/DC). Worst-case upward correction factor: 10*LOG(1/0.371) = 4.31 dB. Then downwardly corrected based on worse case duty cycle in normal use (1.7%), using 20*LOG(DC). Applied overall worst-case DCCF of -31.1 dB to average detector measurements.			

Test Specifications	FCC 15.247:2018	Test Method	ANSI C63.10:2013
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Run #	18	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2484.923	45.7	-3.5	1.2	118.9	0.0	20.0	Horz	PK	0.0	62.2	74.0	-11.8	EUT Vertical, 6 Mbps
2484.647	45.4	-3.5	3.4	118.9	0.0	20.0	Vert	PK	0.0	61.9	74.0	-12.1	EUT Horizontal, 6 Mbps
2484.383	45.3	-3.5	1.2	219.0	0.0	20.0	Horz	PK	0.0	61.8	74.0	-12.2	EUT Horizontal, 54 Mbps
2485.043	44.8	-3.5	3.6	153.0	0.0	20.0	Horz	PK	0.0	61.3	74.0	-12.7	EUT On Side, 6 Mbps
2484.203	44.8	-3.5	1.2	37.0	0.0	20.0	Horz	PK	0.0	61.3	74.0	-12.7	EUT Horizontal, 36 Mbps
2485.317	44.6	-3.5	1.2	63.0	0.0	20.0	Horz	PK	0.0	61.1	74.0	-12.9	EUT Horizontal, 6 Mbps
2389.300	45.0	-3.9	1.2	283.0	0.0	20.0	Horz	PK	0.0	61.1	74.0	-12.9	EUT Horizontal, 6 Mbps
2483.757	44.6	-3.5	1.2	319.0	0.0	20.0	Horz	PK	0.0	61.1	74.0	-12.9	EUT Horizontal, 48 Mbps
2483.677	44.5	-3.5	1.2	40.9	0.0	20.0	Vert	PK	0.0	61.0	74.0	-13.0	EUT Vertical, 6 Mbps
2484.227	44.4	-3.5	1.2	55.0	0.0	20.0	Vert	PK	0.0	60.9	74.0	-13.1	EUT On Side, 6 Mbps
2484.937	44.4	-3.5	1.2	272.0	0.0	20.0	Horz	PK	0.0	60.9	74.0	-13.1	EUT Horizontal, 18 Mbps
2484.393	44.3	-3.5	1.2	43.0	0.0	20.0	Horz	PK	0.0	60.8	74.0	-13.2	EUT Horizontal, 9 Mbps
2484.363	44.3	-3.5	1.2	97.0	0.0	20.0	Horz	PK	0.0	60.8	74.0	-13.2	EUT Horizontal, 12 Mbps
2485.447	44.3	-3.5	1.2	13.0	0.0	20.0	Horz	PK	0.0	60.8	74.0	-13.2	EUT Horizontal, 24 Mbps
2388.223	44.6	-3.9	1.2	343.0	0.0	20.0	Vert	PK	0.0	60.7	74.0	-13.3	EUT Vertical, 6 Mbps
2484.770	33.3	-3.5	1.2	63.0	-31.1	20.0	Horz	AV	0.0	18.7	54.0	-35.3	EUT Horizontal, 6 Mbps
2484.367	33.1	-3.5	1.2	40.9	-31.1	20.0	Vert	AV	0.0	18.5	54.0	-35.5	EUT Vertical, 6 Mbps

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2485.017	33.1	-3.5	1.2	43.0	-31.1	20.0	Horz	AV	0.0	18.5	54.0	-35.5	EUT Horizontal, 9 Mbps
2484.773	33.1	-3.5	1.2	272.0	-31.1	20.0	Horz	AV	0.0	18.5	54.0	-35.5	EUT Horizontal, 18 Mbps
2485.280	33.1	-3.5	1.2	319.0	-31.1	20.0	Horz	AV	0.0	18.5	54.0	-35.5	EUT Horizontal, 48 Mbps
2484.370	33.0	-3.5	3.4	118.9	-31.1	20.0	Vert	AV	0.0	18.4	54.0	-35.6	EUT Horizontal, 6 Mbps
2485.010	33.0	-3.5	1.2	118.9	-31.1	20.0	Horz	AV	0.0	18.4	54.0	-35.6	EUT Vertical, 6 Mbps
2484.540	33.0	-3.5	3.6	153.0	-31.1	20.0	Horz	AV	0.0	18.4	54.0	-35.6	EUT On Side, 6 Mbps
2483.847	33.0	-3.5	1.2	97.0	-31.1	20.0	Horz	AV	0.0	18.4	54.0	-35.6	EUT Horizontal, 12 Mbps
2483.697	33.0	-3.5	1.2	13.0	-31.1	20.0	Horz	AV	0.0	18.4	54.0	-35.6	EUT Horizontal, 24 Mbps
2484.270	33.0	-3.5	1.2	37.0	-31.1	20.0	Horz	AV	0.0	18.4	54.0	-35.6	EUT Horizontal, 36 Mbps
2485.130	33.0	-3.5	1.2	219.0	-31.1	20.0	Horz	AV	0.0	18.4	54.0	-35.6	EUT Horizontal, 54 Mbps
2485.217	32.9	-3.5	1.2	55.0	-31.1	20.0	Vert	AV	0.0	18.3	54.0	-35.7	EUT On Side, 6 Mbps
2388.700	33.1	-3.9	1.2	283.0	-31.1	20.0	Horz	AV	0.0	18.1	54.0	-35.9	EUT Horizontal, 6 Mbps
2389.683	33.1	-3.9	1.2	343.0	-31.1	20.0	Vert	AV	0.0	18.1	54.0	-35.9	EUT Vertical, 6 Mbps

DUTY CYCLE



XMIT 2017.12.13

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
Attenuator	Fairview Microwave	SA4018-20	TYE	10-Oct-18	10-Oct-19
Block - DC	Fairview Microwave	SD3379	AMT	10-Oct-18	10-Oct-19
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	10-Oct-18	10-Oct-19
Generator - Signal	Agilent	N5173B	TIW	5-Jul-17	5-Jul-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-18	19-Mar-19

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

There is no compliance requirement to be met by this test, so therefore no Pass / Fail criteria.

The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum.

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

If the transmit duty cycle < 98 percent, burst gating may have been used during some of the other tests in this report to only take the measurement during the burst duration.

DUTY CYCLE



ThxTx 2018.09.13 XMt 2017.12.13

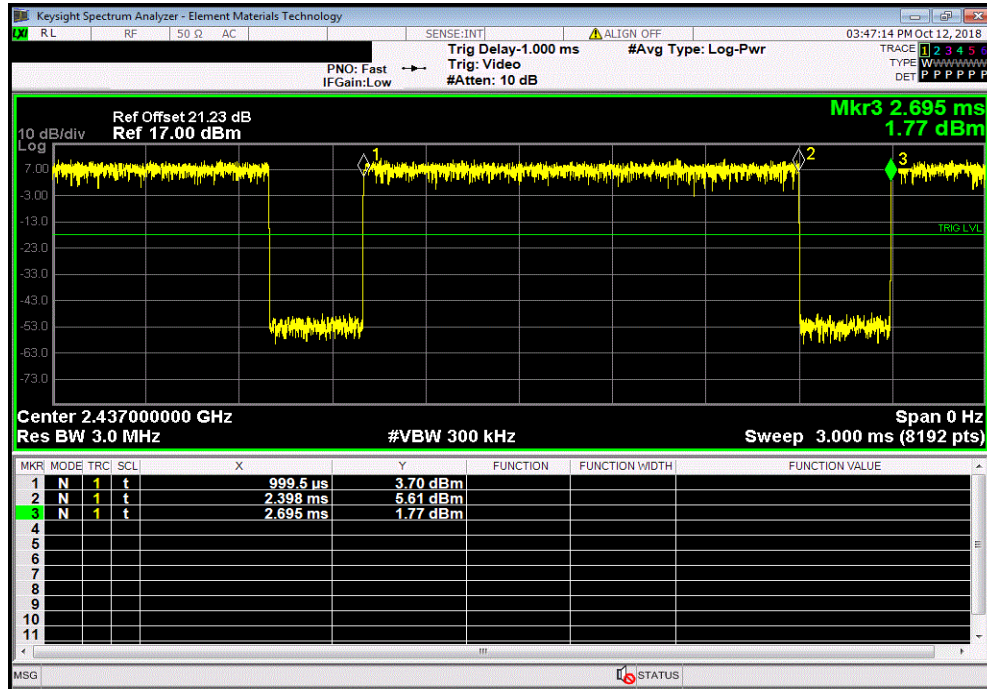
EUT: VISTA WIFI		Work Order: WTV0001	
Serial Number: WFC1-009113		Date: 12-Oct-18	
Customer: WatchGuard Video		Temperature: 22.2 °C	
Attendees: Navaid Karimi		Humidity: 50.2% RH	
Project: None		Barometric Pres.: 1017 mbar	
Tested by: Jonathan Kiefer		Power: Battery	
Job Site: TX09			
TEST SPECIFICATIONS			
FCC 15.247:2018		Test Method	
		ANSI C63.10:2013	
COMMENTS			
Reference Offset 21.23 dB (20dB attenuator+dc block+cable).			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature <i>Jonathan Kiefer</i>	
		Pulse Width	Period
		Number of Pulses	Value (%)
		Limit (%)	Results
2400 MHz - 2483.5 MHz Band			
802.11(g) 6 Mbps			
	Single Channel 6, 2437 MHz	1.399 ms	1.695 ms
	Single Channel 6, 2437 MHz	N/A	N/A
		1	82.5
		5	N/A
			N/A
802.11(g) 9 Mbps			
	Single Channel 6, 2437 MHz	936.412 us	1.245 ms
	Single Channel 6, 2437 MHz	N/A	N/A
		1	75.2
		6	N/A
			N/A
802.11(g) 12 Mbps			
	Single Channel 6, 2437 MHz	706.121 us	1.004 ms
	Single Channel 6, 2437 MHz	N/A	N/A
		1	70.4
		5	N/A
			N/A
802.11(g) 18 Mbps			
	Single Channel 6, 2437 MHz	479.1 us	775.3 us
	Single Channel 6, 2437 MHz	N/A	N/A
		1	61.8
		5	N/A
			N/A
802.11(g) 24 Mbps			
	Single Channel 6, 2437 MHz	367.2 us	663.2 us
	Single Channel 6, 2437 MHz	N/A	N/A
		1	55.4
		5	N/A
			N/A
802.11(g) 36 Mbps			
	Single Channel 6, 2437 MHz	250.9 us	547.2 us
	Single Channel 6, 2437 MHz	N/A	N/A
		1	45.9
		5	N/A
			N/A
802.11(g) 48 Mbps			
	Single Channel 6, 2437 MHz	194.7 us	491.1 us
	Single Channel 6, 2437 MHz	N/A	N/A
		1	39.6
		5	N/A
			N/A
802.11(g) 54 Mbps			
	Single Channel 6, 2437 MHz	174.8 us	471.1 us
	Single Channel 6, 2437 MHz	N/A	N/A
		1	37.1
		5	N/A
			N/A

DUTY CYCLE

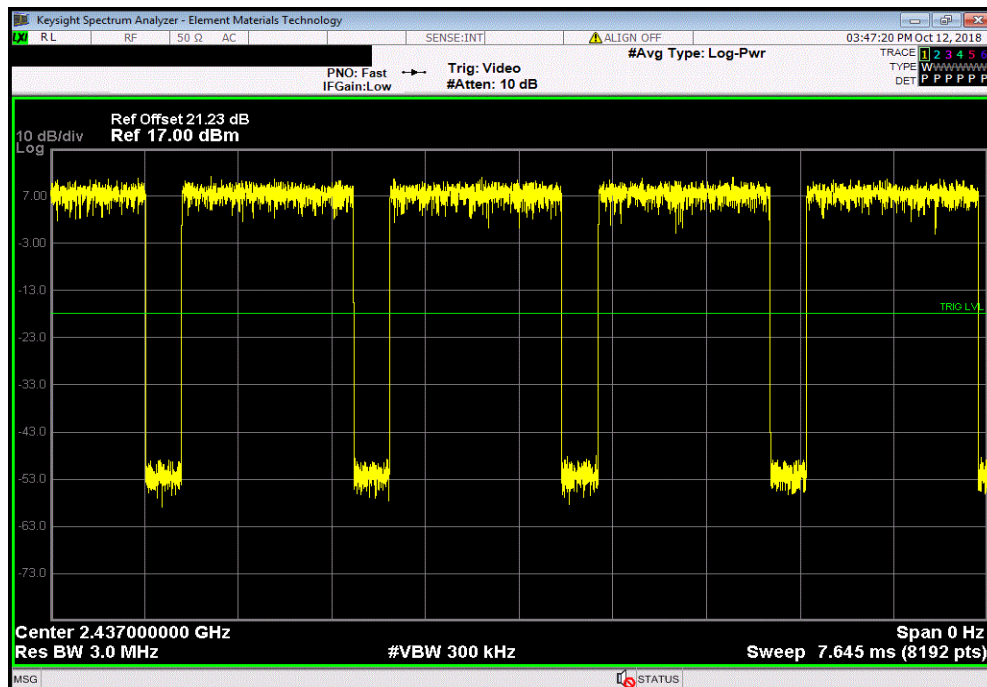


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Single Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
1.399 ms	1.695 ms	1	82.5	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Single Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

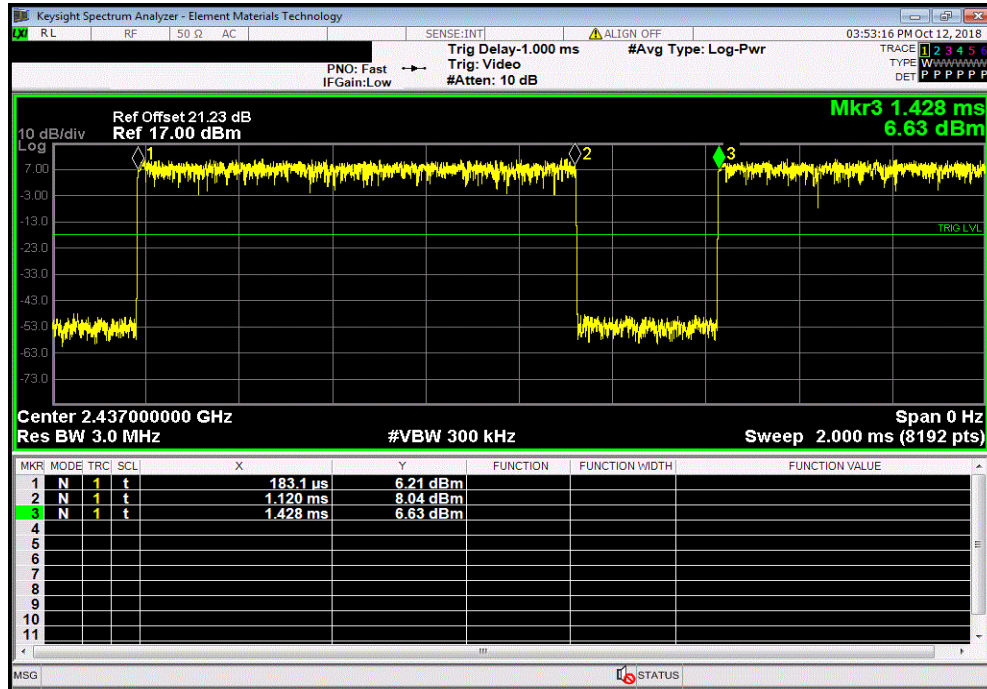


DUTY CYCLE

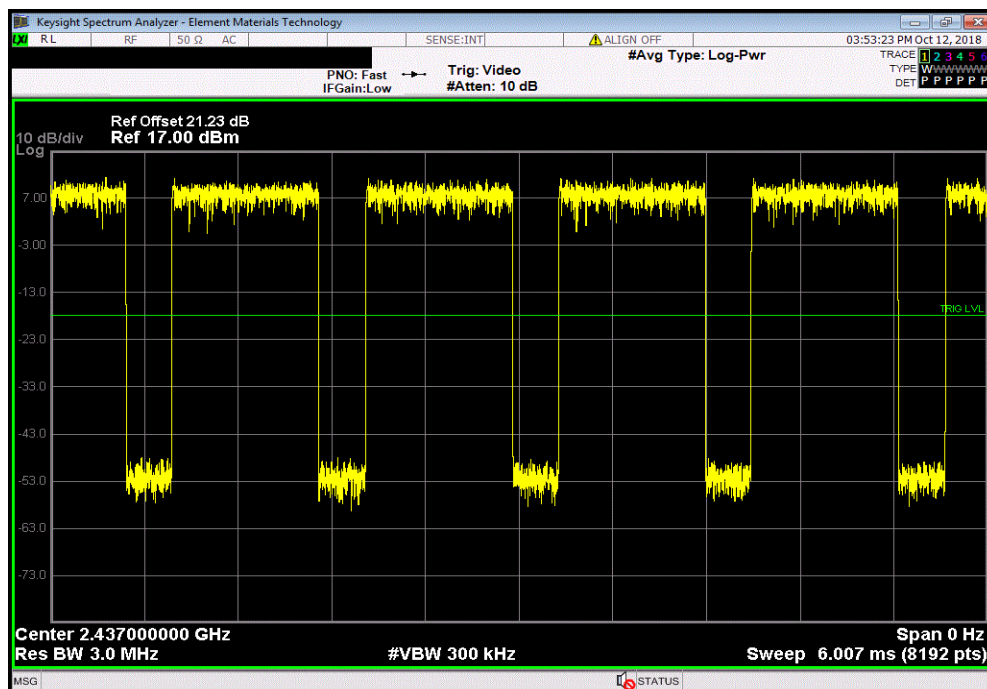


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 9 Mbps, Single Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
936.412 us	1.245 ms	1	75.2	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 802.11(g) 9 Mbps, Single Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	6	N/A	N/A	N/A	

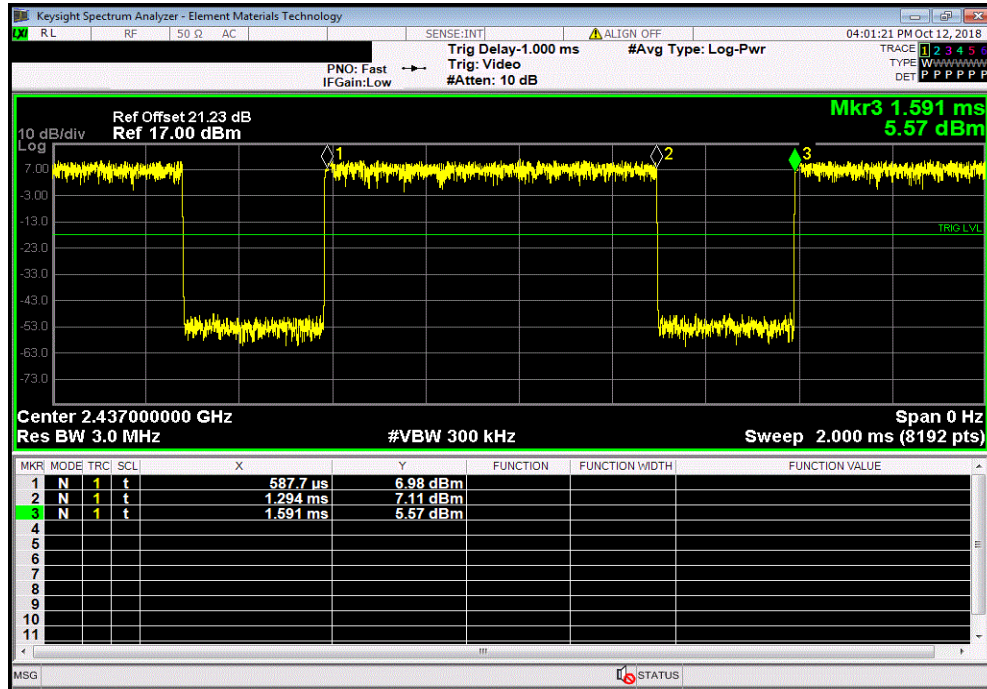


DUTY CYCLE

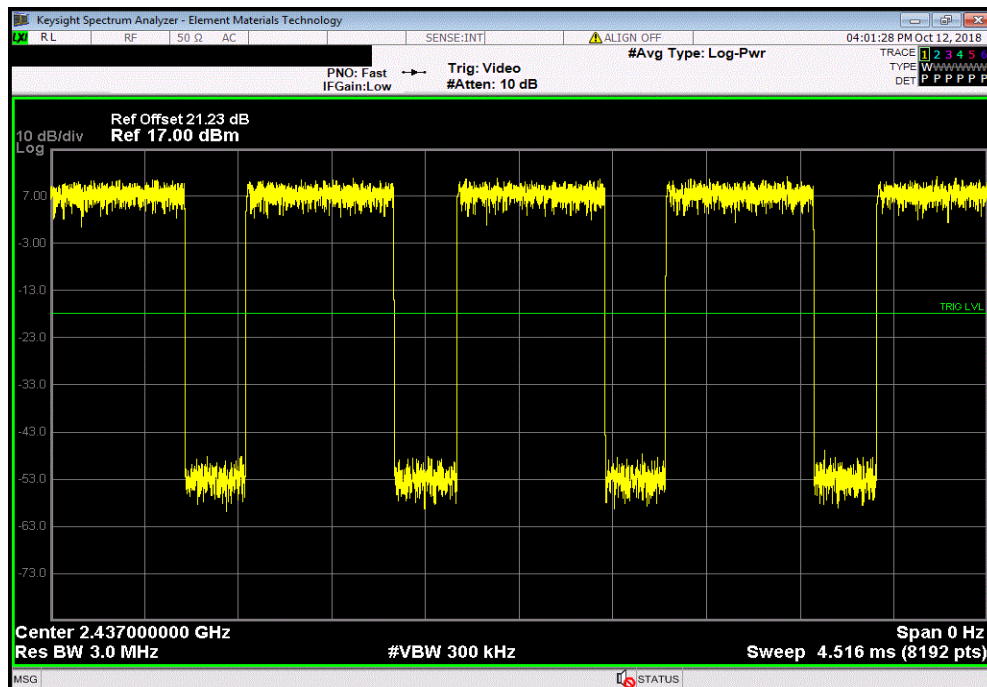


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 12 Mbps, Single Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
706.121 us	1.004 ms	1	70.4	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 802.11(g) 12 Mbps, Single Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

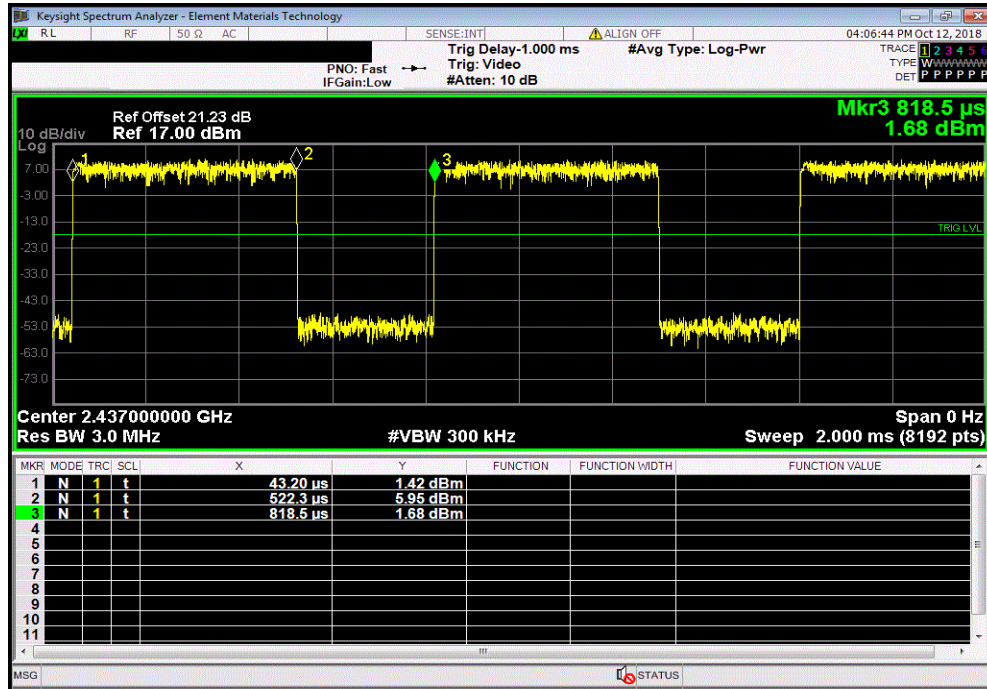


DUTY CYCLE

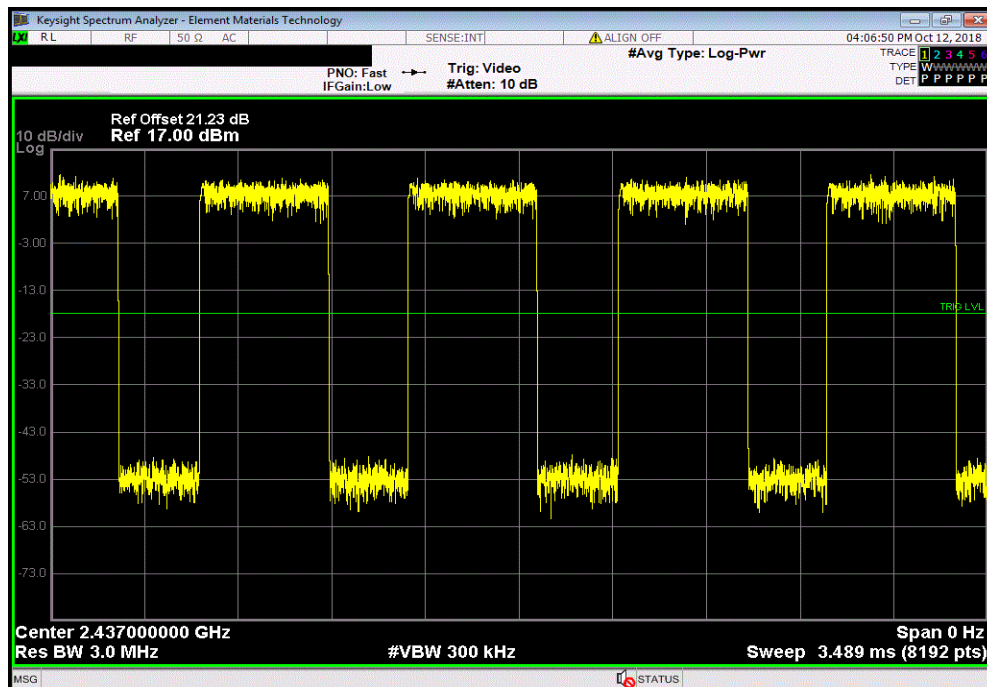


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 18 Mbps, Single Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
479.1 μ s	775.3 μ s	1	61.8	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 802.11(g) 18 Mbps, Single Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

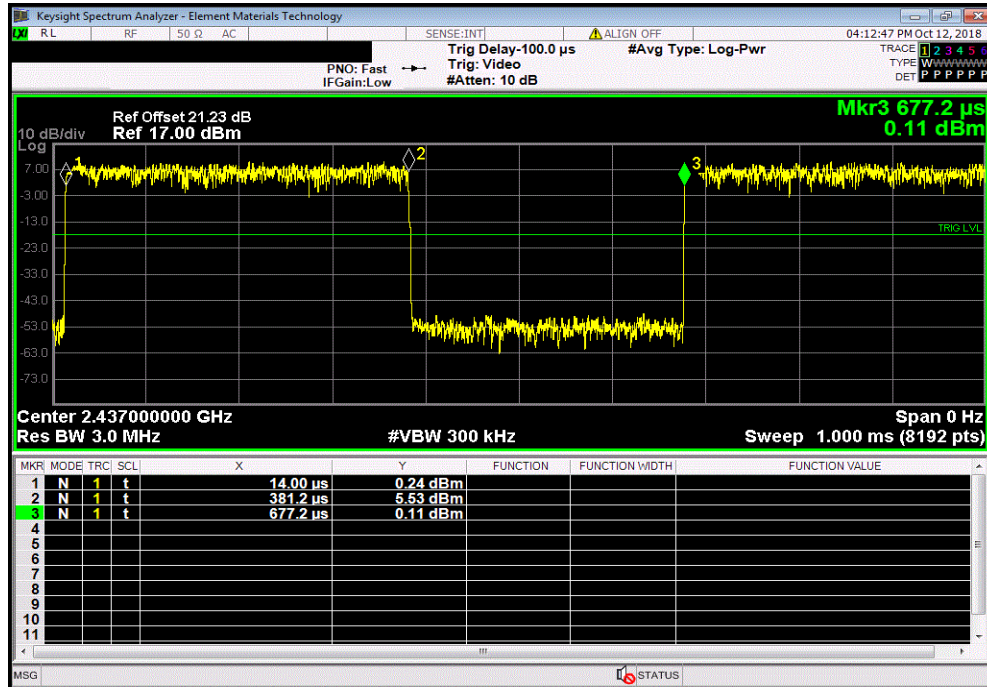


DUTY CYCLE

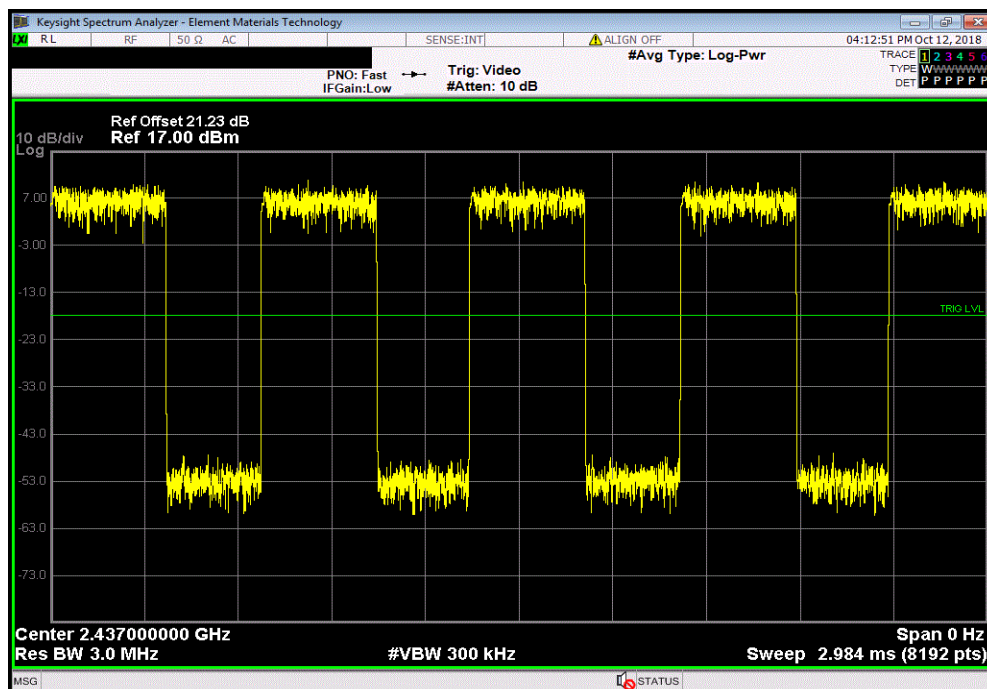


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 24 Mbps, Single Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
367.2 us	663.2 us	1	55.4	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 802.11(g) 24 Mbps, Single Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

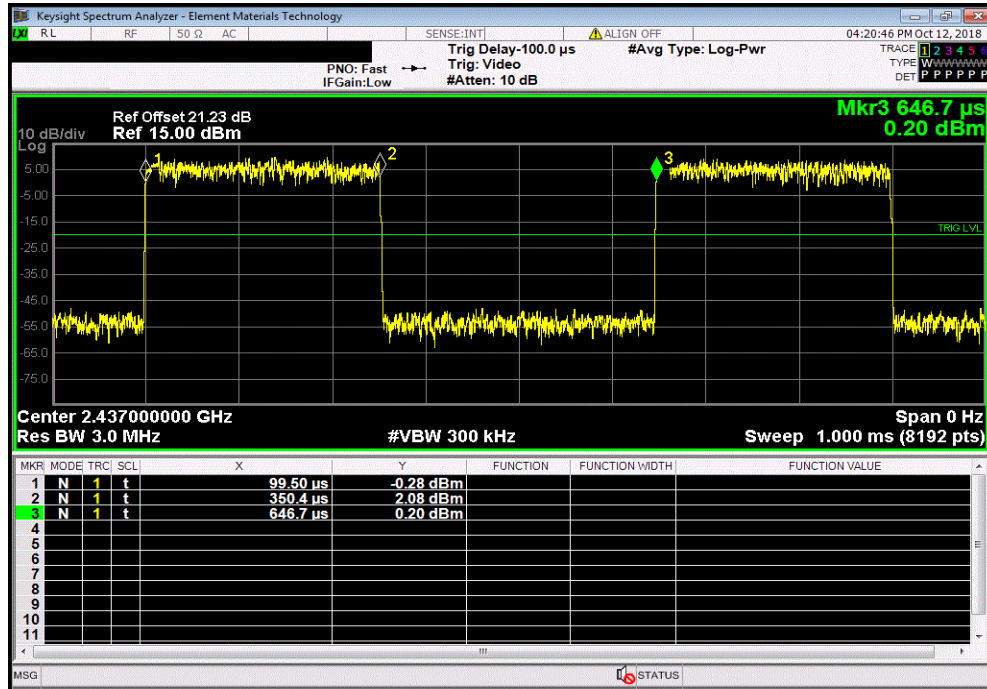


DUTY CYCLE

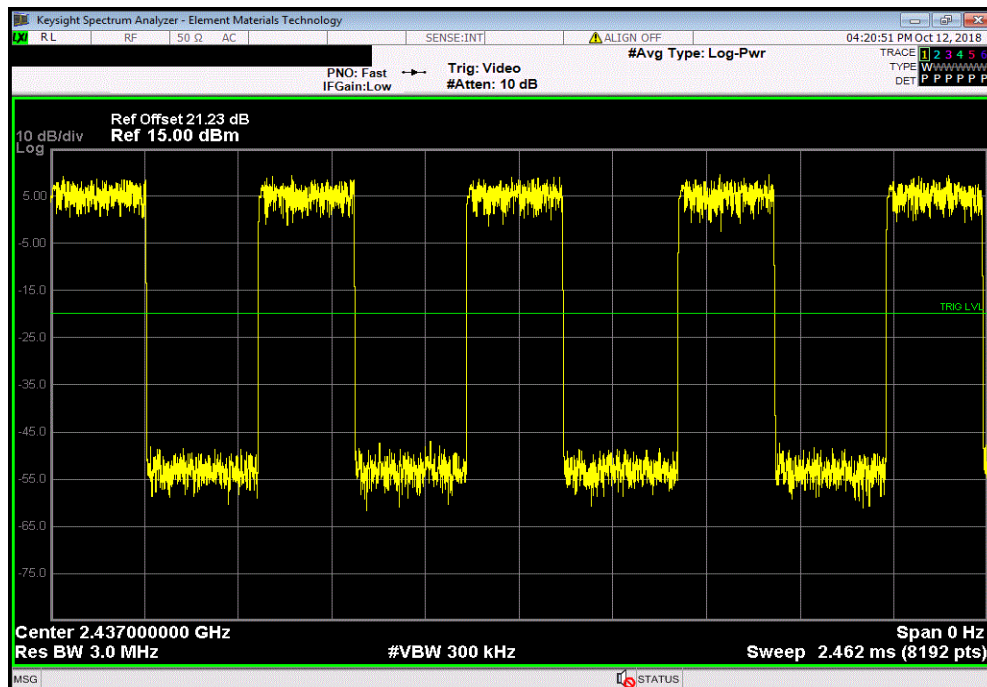


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Single Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
250.9 μ s	547.2 μ s	1	45.9	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Single Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

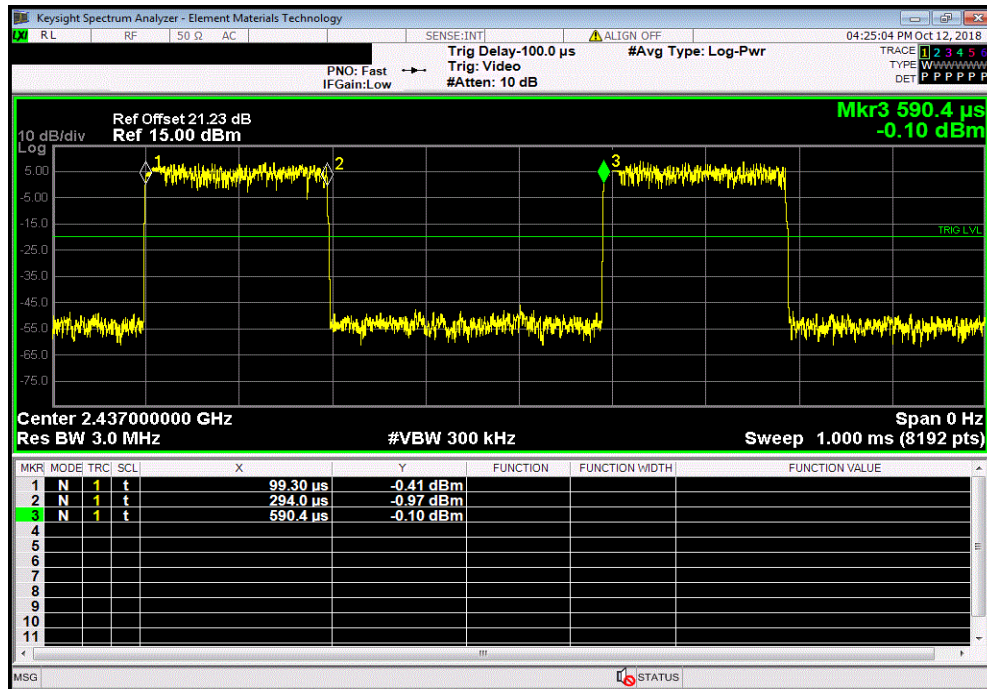


DUTY CYCLE

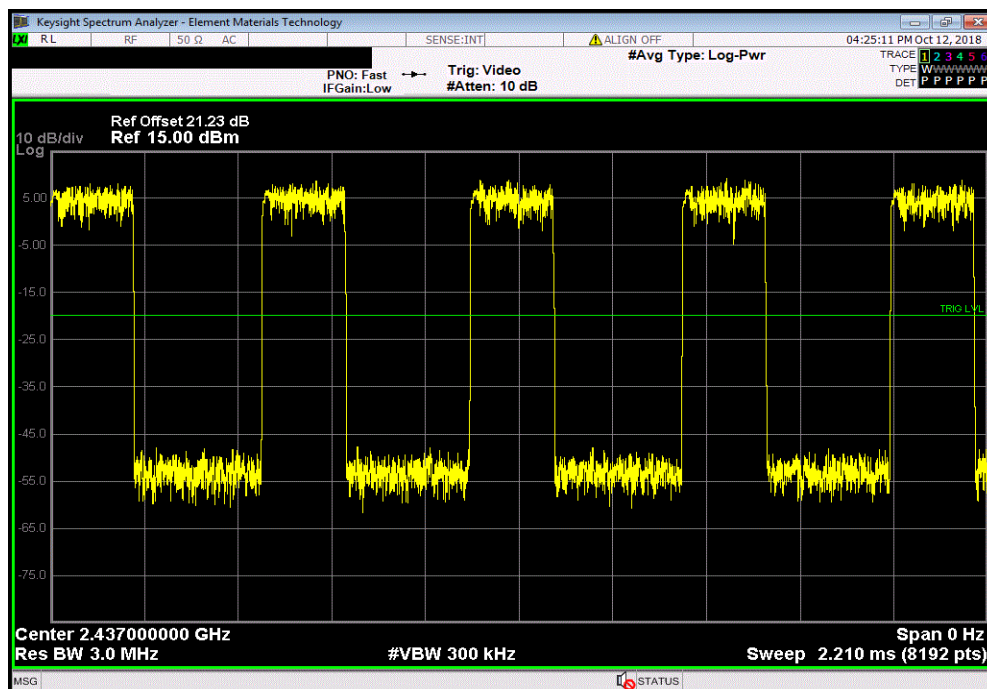


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 48 Mbps, Single Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
194.7 μ s	491.1 μ s	1	39.6	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 802.11(g) 48 Mbps, Single Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

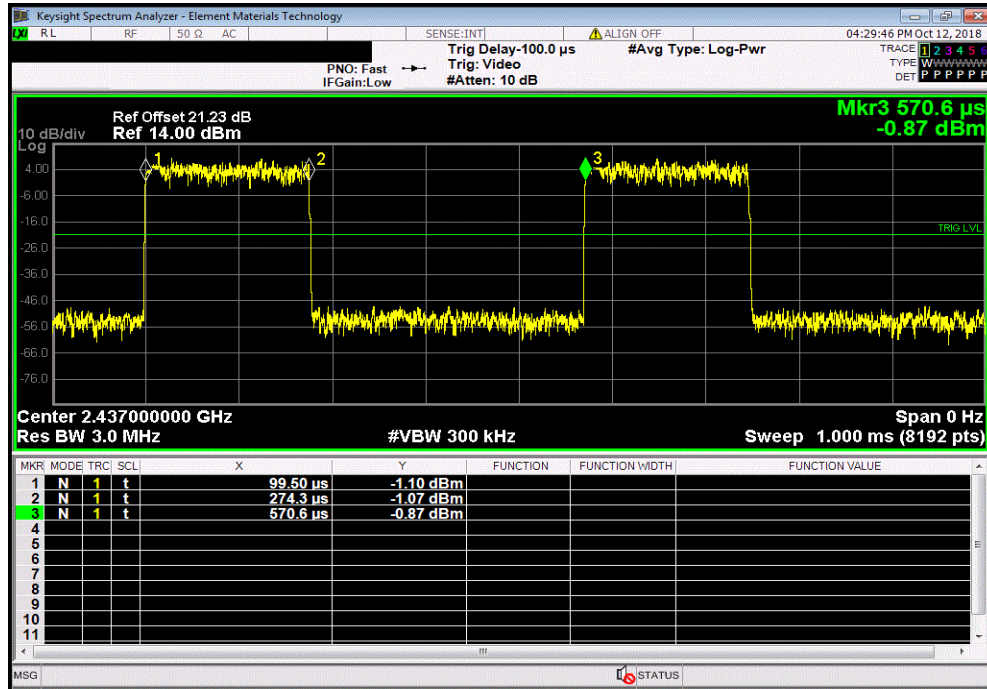


DUTY CYCLE

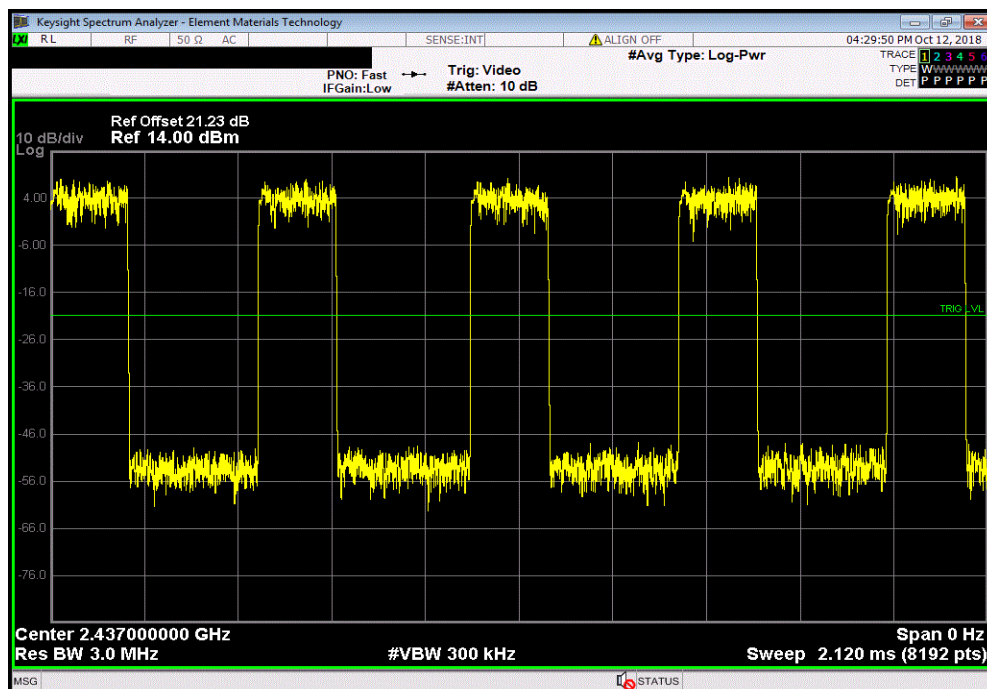


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Single Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
174.8 μ s	471.1 μ s	1	37.1	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Single Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	



OCCUPIED BANDWIDTH



XMI 2017.12.13

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
Attenuator	Fairview Microwave	SA4018-20	TYE	10-Oct-18	10-Oct-19
Block - DC	Fairview Microwave	SD3379	AMT	10-Oct-18	10-Oct-19
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	10-Oct-18	10-Oct-19
Generator - Signal	Agilent	N5173B	TIW	5-Jul-17	5-Jul-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-18	19-Mar-19

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was set to the channel and modes listed in the datasheet.

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.0% occupied bandwidth was also measured at the same time which can be needed during Output Power depending on the applicable method.

OCCUPIED BANDWIDTH



THxTx 2018.09.13 XMW 2017.12.13

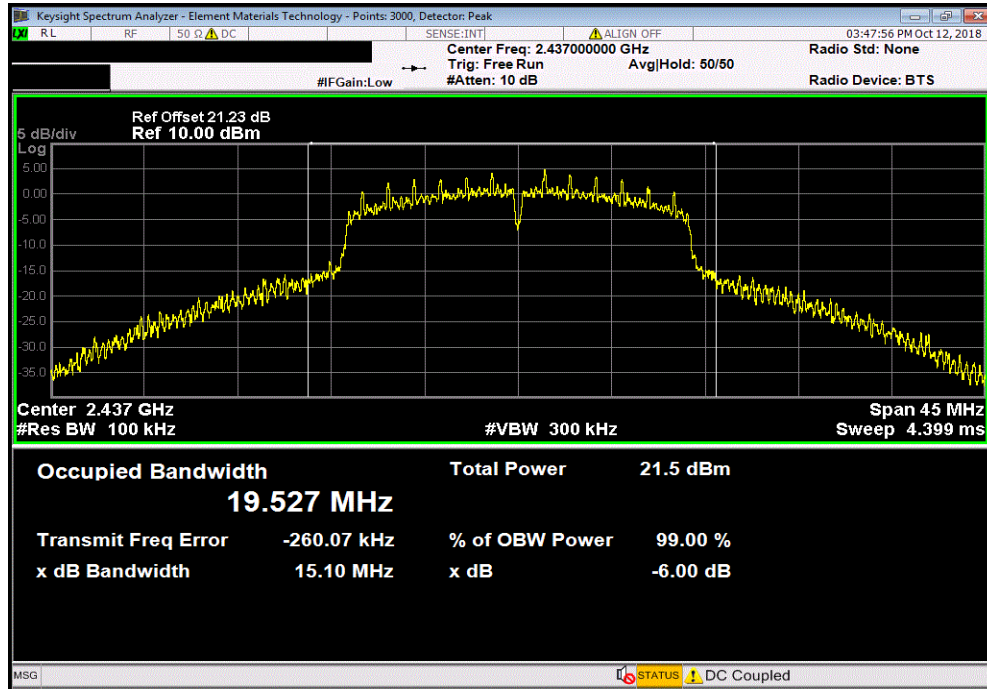
EUT: VISTA WIFI		Work Order: WTV00001	
Serial Number: WFC1-009113		Date: 12-Oct-18	
Customer: WatchGuard Video		Temperature: 22.2 °C	
Attendees: Navaid Karimi		Humidity: 50.2% RH	
Project: None		Barometric Pres.: 1017 mbar	
Tested by: Jonathan Kiefer		Power: Battery	
		Job Site: TX09	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2018		ANSI C63.10:2013	
COMMENTS			
Reference Offset 21.23 dB (20dB attenuator+dc block+cable).			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature <i>Jonathan Kiefer</i>	
		Value	Limit (>) Result
2400 MHz - 2483.5 MHz Band			
802.11(g) 6 Mbps			
Single Channel 6, 2437 MHz		15.097 MHz	500 kHz Pass
802.11(g) 9 Mbps			
Single Channel 6, 2437 MHz		15.107 MHz	500 kHz Pass
802.11(g) 12 Mbps			
Single Channel 6, 2437 MHz		15.112 MHz	500 kHz Pass
802.11(g) 18 Mbps			
Single Channel 6, 2437 MHz		15.11 MHz	500 kHz Pass
802.11(g) 24 Mbps			
Single Channel 6, 2437 MHz		15.107 MHz	500 kHz Pass
802.11(g) 36 Mbps			
Single Channel 6, 2437 MHz		15.108 MHz	500 kHz Pass
802.11(g) 48 Mbps			
Single Channel 6, 2437 MHz		15.11 MHz	500 kHz Pass
802.11(g) 54 Mbps			
Single Channel 6, 2437 MHz		15.109 MHz	500 kHz Pass

OCCUPIED BANDWIDTH

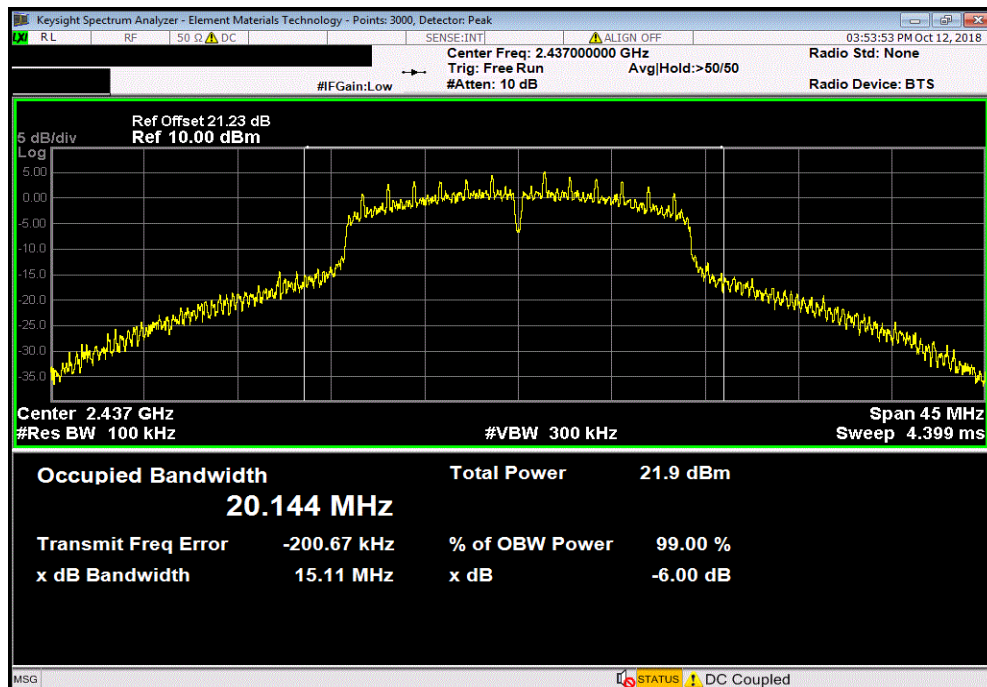


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Single Channel 6, 2437 MHz						
				Value	Limit	Result
				15.097 MHz	500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 9 Mbps, Single Channel 6, 2437 MHz						
				Value	Limit	Result
				15.107 MHz	500 kHz	Pass

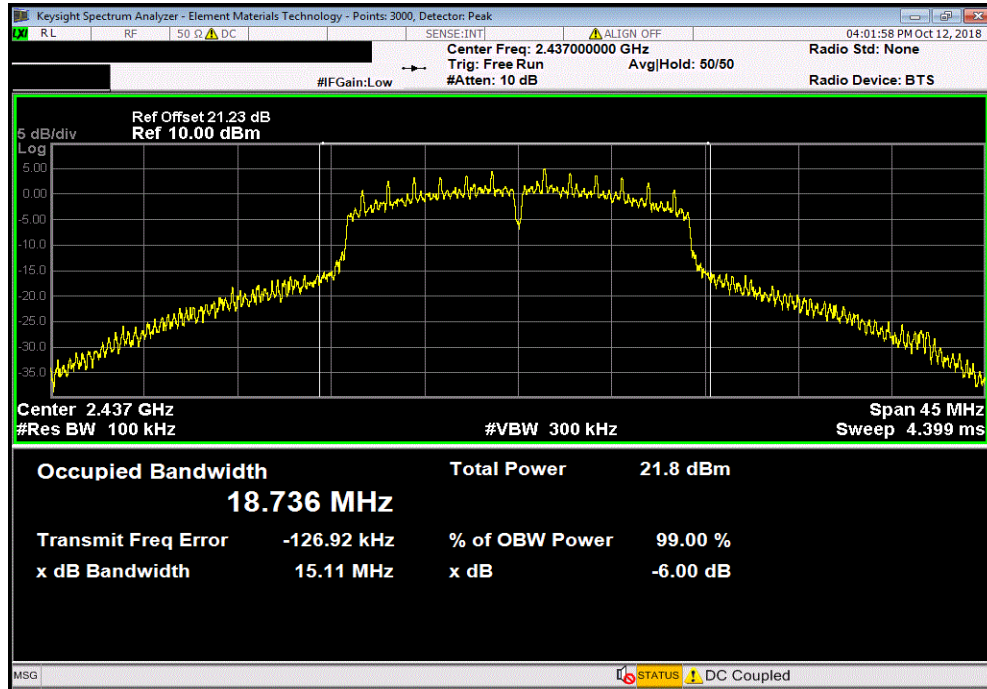


OCCUPIED BANDWIDTH

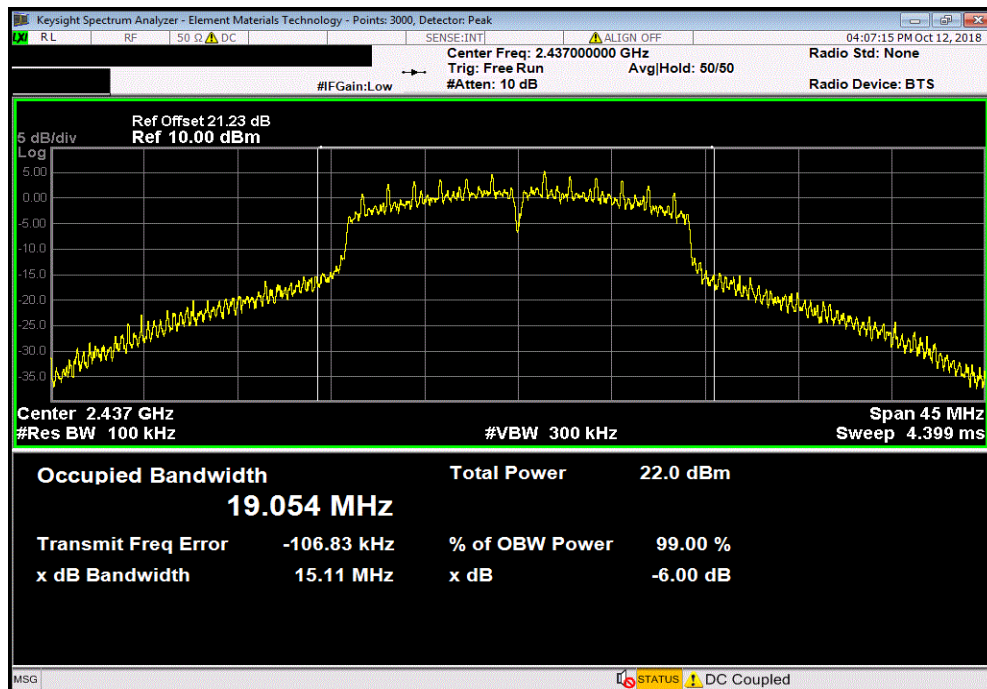


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 12 Mbps, Single Channel 6, 2437 MHz						
				Value	Limit	Result
				15.112 MHz	(>) 500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 18 Mbps, Single Channel 6, 2437 MHz						
				Value	Limit	Result
				15.11 MHz	(>) 500 kHz	Pass

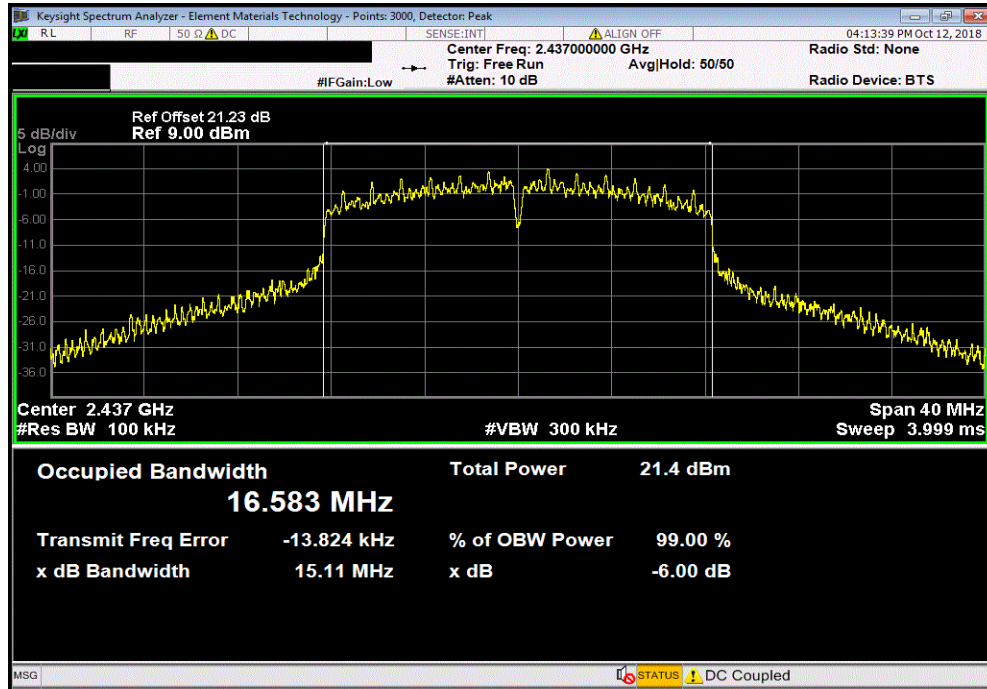


OCCUPIED BANDWIDTH

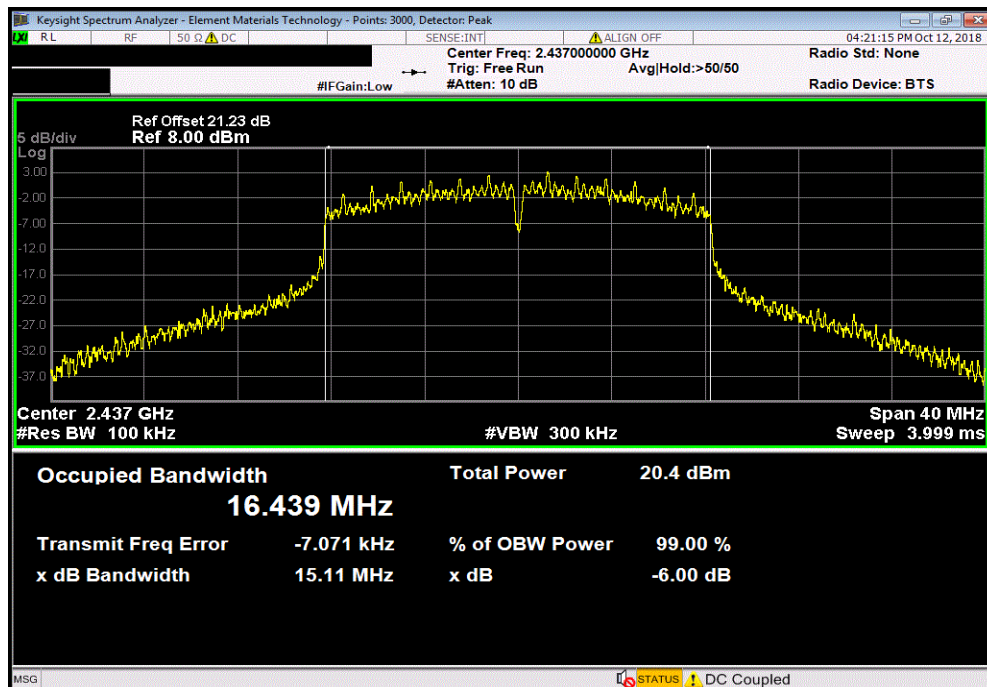


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 24 Mbps, Single Channel 6, 2437 MHz						
				Value	Limit	Result
				15.107 MHz	500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Single Channel 6, 2437 MHz						
				Value	Limit	Result
				15.108 MHz	500 kHz	Pass

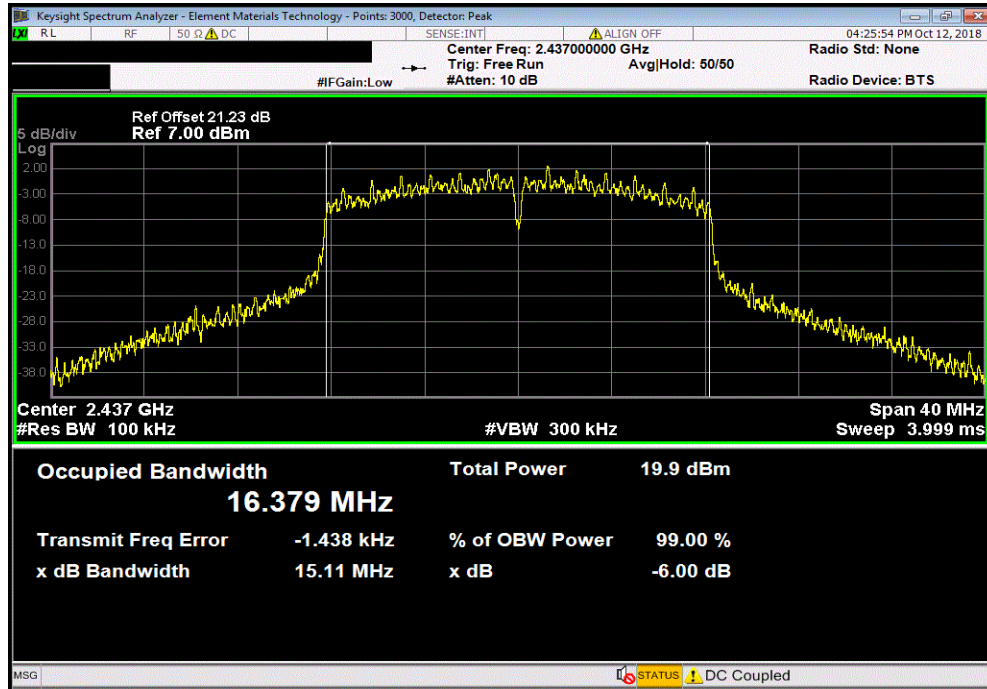


OCCUPIED BANDWIDTH

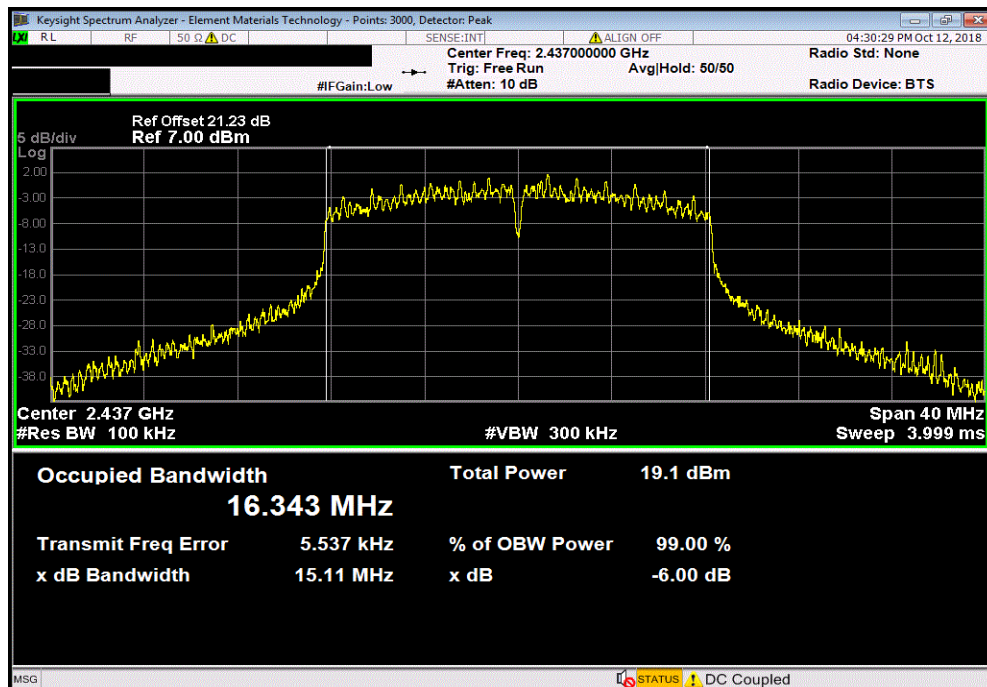


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 48 Mbps, Single Channel 6, 2437 MHz						
				Value	Limit	Result
				15.11 MHz	500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Single Channel 6, 2437 MHz						
				Value	Limit	Result
				15.109 MHz	500 kHz	Pass



OUTPUT POWER



XMIT 2017.12.13

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
Block - DC	Fairview Microwave	SD3379	AMT	10-Oct-18	10-Oct-19
Attenuator	Fairview Microwave	SA4018-20	TYE	10-Oct-18	10-Oct-19
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	10-Oct-18	10-Oct-19
Generator - Signal	Agilent	N5173B	TIW	5-Jul-17	5-Jul-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-18	19-Mar-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.

OUTPUT POWER



ThxTx 2018.09.13 XMM 2017.12.13

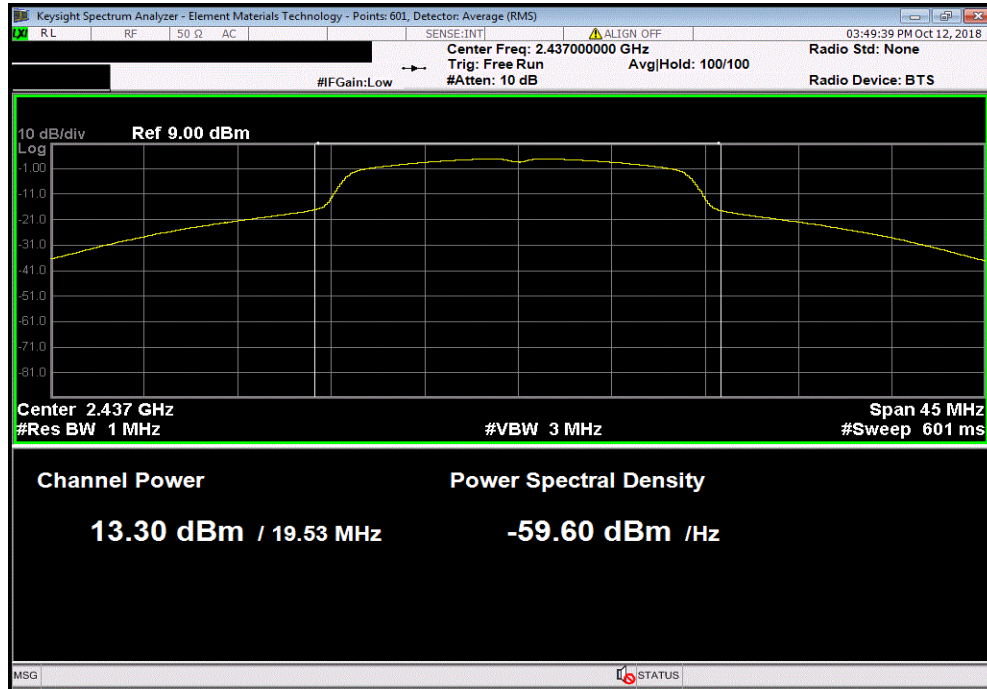
EUT: VISTA WIFI		Work Order: WTVD0001	
Serial Number: WFC1-009113		Date: 12-Oct-18	
Customer: WatchGuard Video		Temperature: 22.2 °C	
Attendees: Navaid Karimi		Humidity: 50.2% RH	
Project: None		Barometric Pres.: 1017 mbar	
Tested by: Jonathan Kiefer		Power: Battery	
Job Site: TX09			
TEST SPECIFICATIONS			
FCC 15.247:2018		Test Method	
		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature <i>Jonathan Kiefer</i>	
		Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)
		Out Pwr (dBm)	Limit (dBm)
			Result
2400 MHz - 2483.5 MHz Band			
802.11(g) 6 Mbps			
	Single Channel 6, 2437 MHz	13.303	0.8
		14.1	30
			Pass
802.11(g) 9 Mbps			
	Single Channel 6, 2437 MHz	13.324	1.2
		14.6	30
			Pass
802.11(g) 12 Mbps			
	Single Channel 6, 2437 MHz	12.941	1.5
		14.5	30
			Pass
802.11(g) 18 Mbps			
	Single Channel 6, 2437 MHz	12.549	2.1
		14.6	30
			Pass
802.11(g) 24 Mbps			
	Single Channel 6, 2437 MHz	10.998	2.6
		13.6	30
			Pass
802.11(g) 36 Mbps			
	Single Channel 6, 2437 MHz	9.347	3.4
		12.7	30
			Pass
802.11(g) 48 Mbps			
	Single Channel 6, 2437 MHz	8.131	4
		12.2	30
			Pass
802.11(g) 54 Mbps			
	Single Channel 6, 2437 MHz	7.135	4.3
		11.4	30
			Pass

OUTPUT POWER

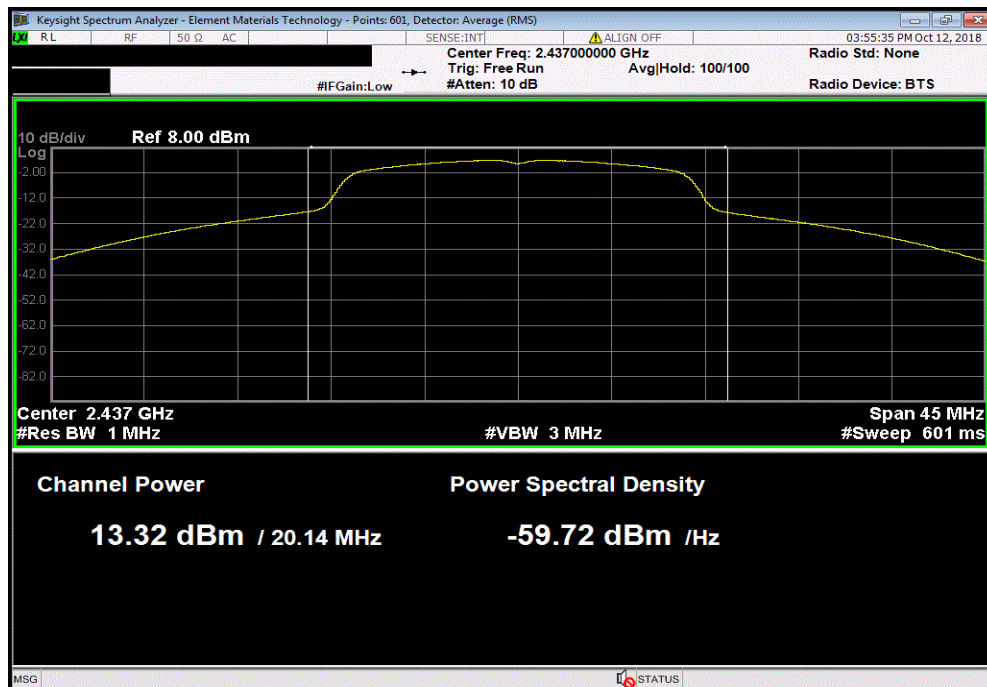


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Single Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	13.303	0.8	14.1	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 9 Mbps, Single Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	13.324	1.2	14.6	30	Pass	

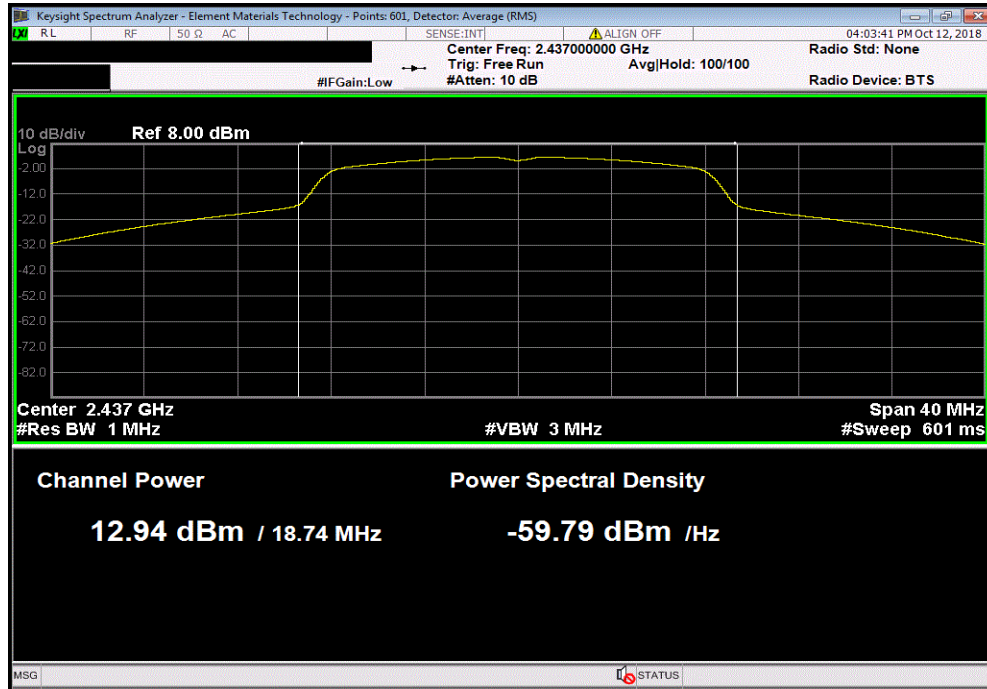


OUTPUT POWER

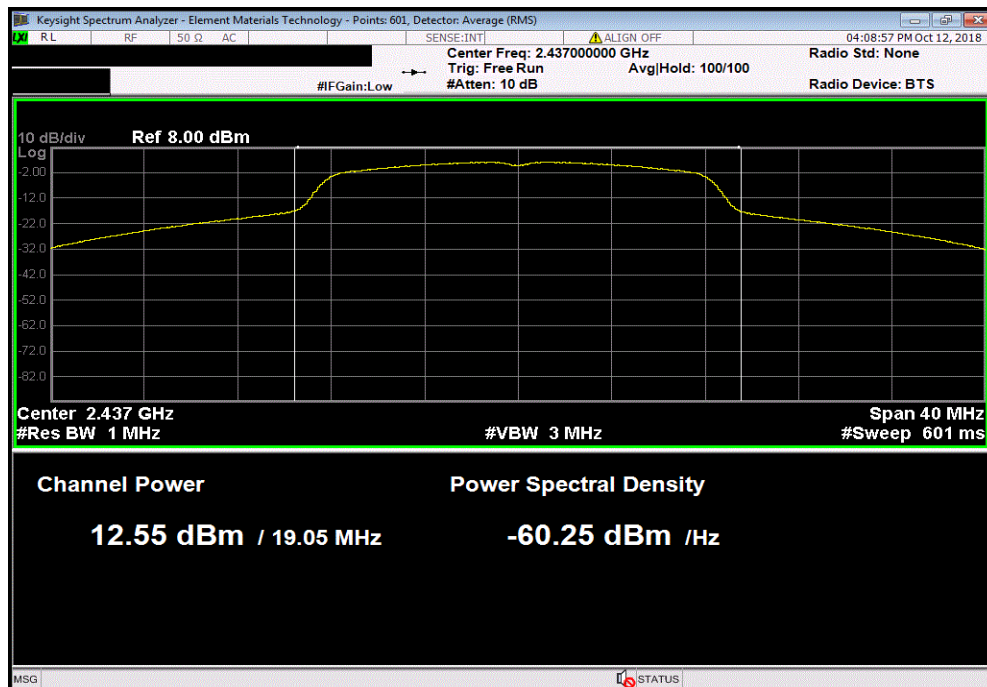


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 12 Mbps, Single Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	12.941	1.5	14.5	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 18 Mbps, Single Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	12.549	2.1	14.6	30	Pass	

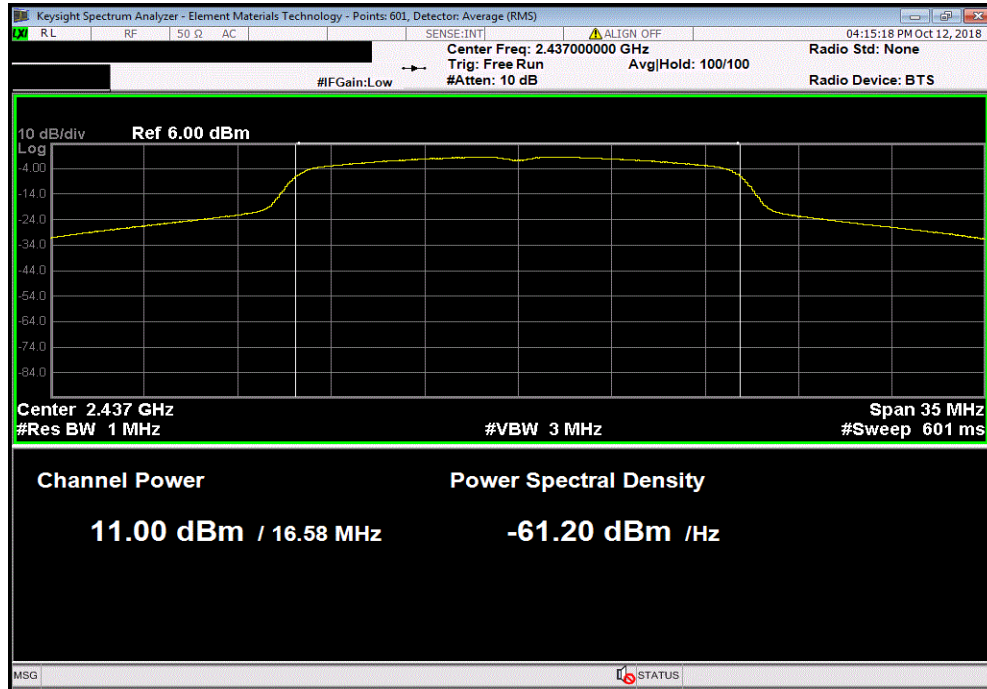


OUTPUT POWER

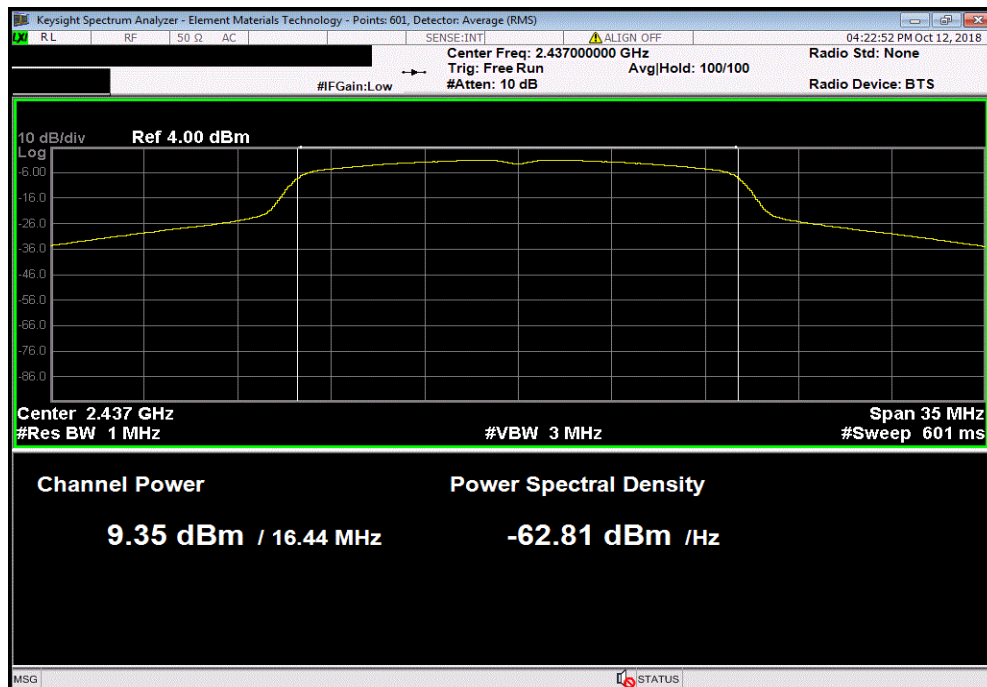


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 24 Mbps, Single Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	10.998	2.6	13.6	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Single Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	9.347	3.4	12.7	30	Pass	

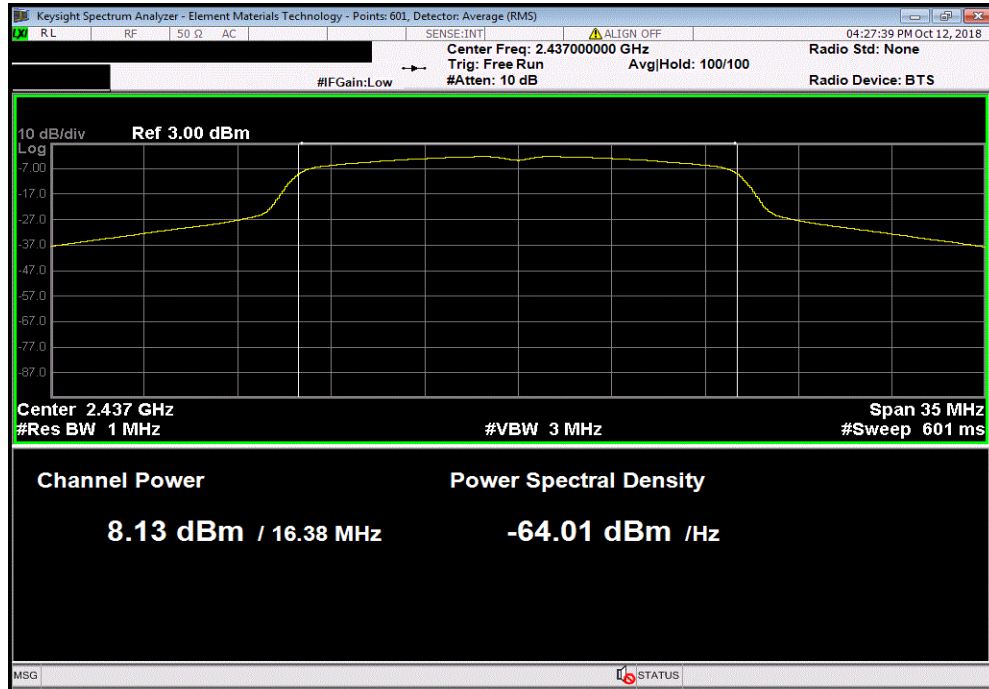


OUTPUT POWER

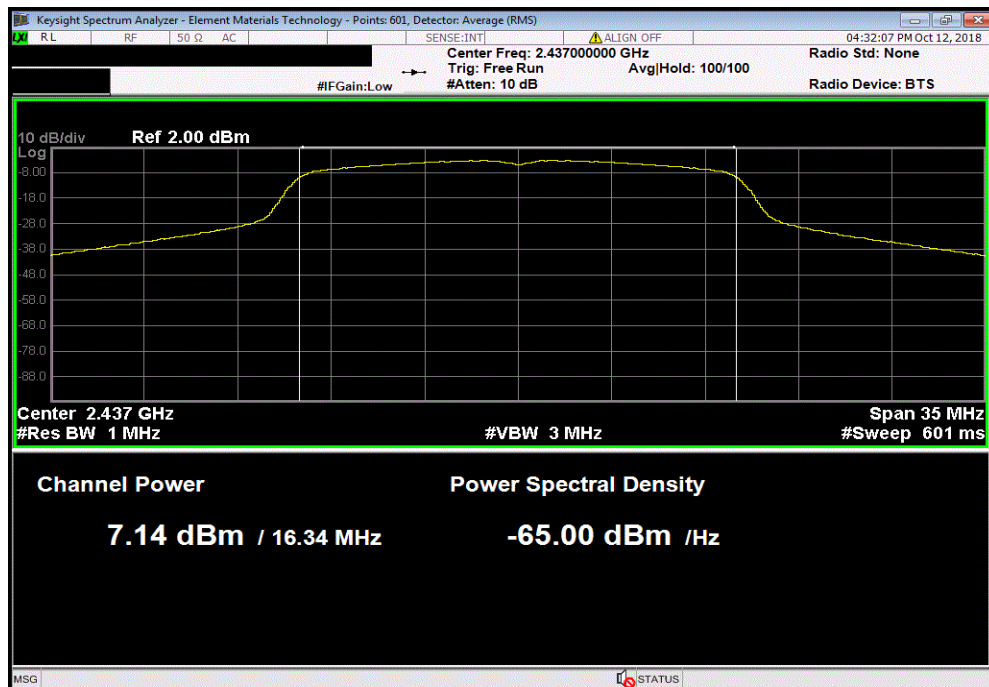


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 48 Mbps, Single Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	8.131	4	12.2	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Single Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	7.135	4.3	11.4	30	Pass	



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



XMIT 2017.12.13

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
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	10-Oct-18	10-Oct-19
Block - DC	Fairview Microwave	SD3379	AMM	29-Mar-18	29-Mar-19
Attenuator	Fairview Microwave	SA4018-20	TYE	10-Oct-18	10-Oct-19
Generator - Signal	Agilent	N5173B	TIW	5-Jul-17	5-Jul-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-18	19-Mar-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.

The gain of the antenna was added to the output power measurement. This value must not exceed 4 Watts, which is the same as 36 dBm.

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



ThxTx 2018.09.13 XMM 2017.12.13

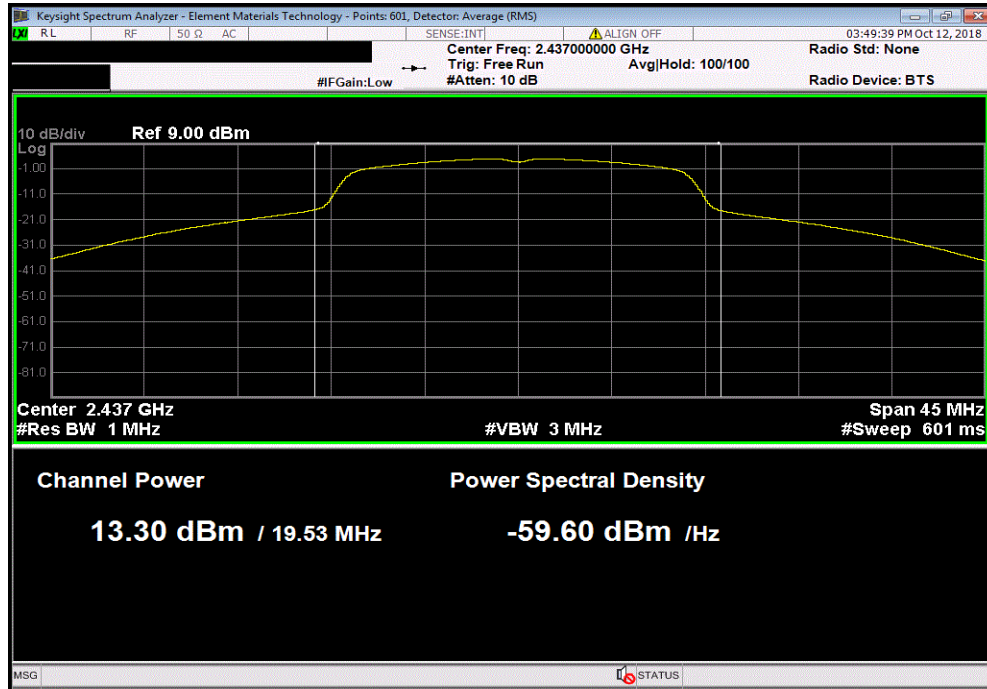
EUT: VISTA WIFI		Work Order: WTV0001	
Serial Number: WFC1-009113		Date: 12-Oct-18	
Customer: WatchGuard Video		Temperature: 22 °C	
Attendees: Navaid Karimi		Humidity: 49.6% RH	
Project: None		Barometric Pres.: 1018 mbar	
Tested by: Jonathan Kiefer		Power: Battery	
Job Site: TX09			
TEST SPECIFICATIONS			
FCC 15.247:2018		Test Method	
		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature <i>Jonathan Kiefer</i>	
		Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)
		Out Pwr (dBm)	Antenna Gain (dBi)
		EIRP (dBm)	EIRP Limit (dBm)
			Result
2400 MHz - 2483.5 MHz Band			
802.11(g) 6 Mbps			
	Single Channel 6, 2437 MHz	13.303	0.8
		14.1	2.2
		16.3	36
			Pass
802.11(g) 9 Mbps			
	Single Channel 6, 2437 MHz	13.324	1.2
		14.6	2.2
		16.8	36
			Pass
802.11(g) 12 Mbps			
	Single Channel 6, 2437 MHz	12.941	1.5
		14.5	2.2
		16.7	36
			Pass
802.11(g) 18 Mbps			
	Single Channel 6, 2437 MHz	12.549	2.1
		14.6	2.2
		16.8	36
			Pass
802.11(g) 24 Mbps			
	Single Channel 6, 2437 MHz	10.998	2.6
		13.6	2.2
		15.8	36
			Pass
802.11(g) 36 Mbps			
	Single Channel 6, 2437 MHz	9.347	3.4
		12.7	2.2
		14.9	36
			Pass
802.11(g) 48 Mbps			
	Single Channel 6, 2437 MHz	8.131	4
		12.2	2.2
		14.4	36
			Pass
802.11(g) 54 Mbps			
	Single Channel 6, 2437 MHz	7.135	4.3
		11.4	2.2
		13.6	36
			Pass

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

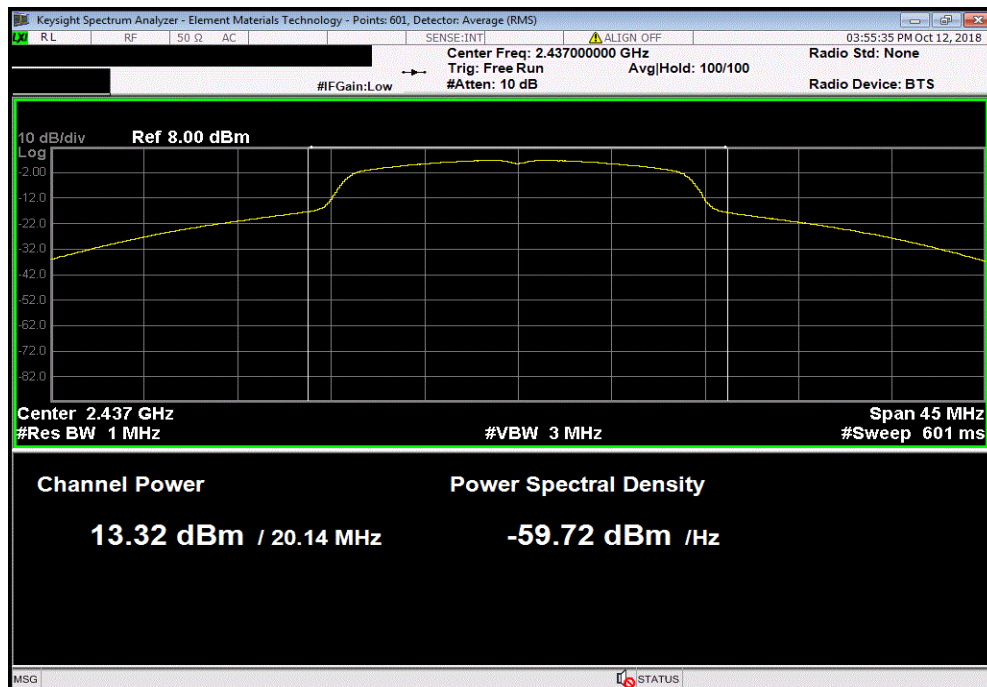


TMTx 2018.09.13 XMM 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Single Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
13.303	0.8	14.1	2.2	16.3	36	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 9 Mbps, Single Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
13.324	1.2	14.6	2.2	16.8	36	Pass

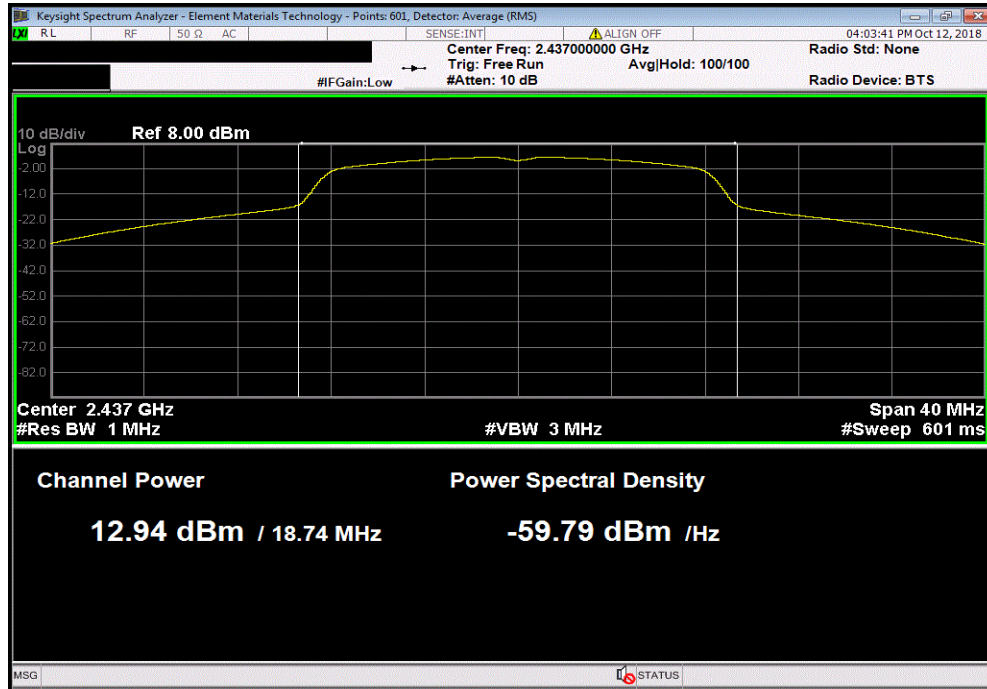


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

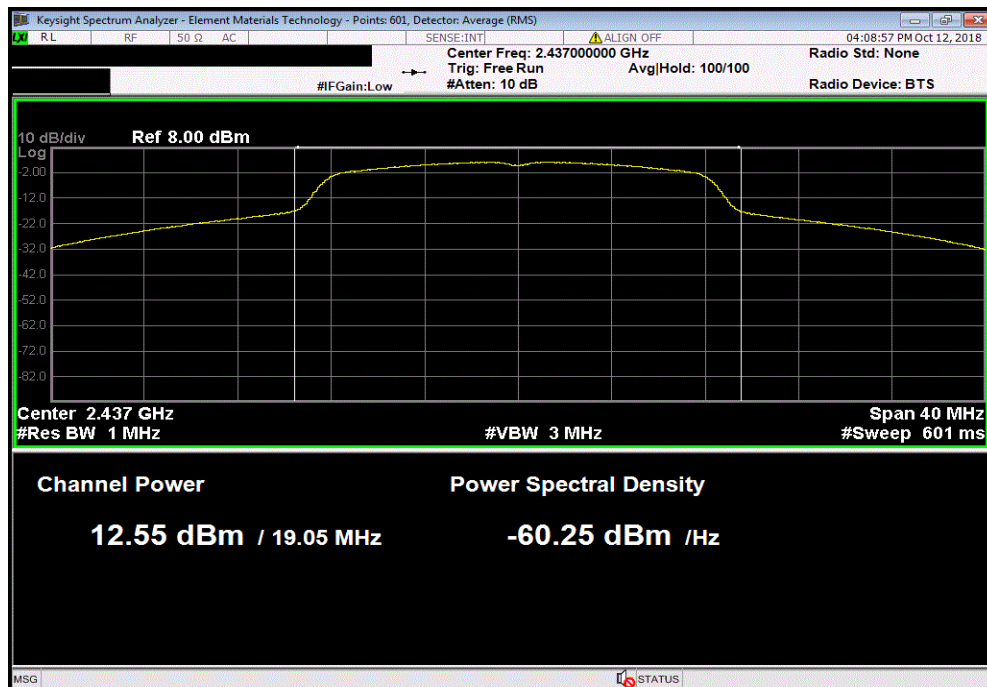


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 12 Mbps, Single Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
12.941	1.5	14.5	2.2	16.7	36	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 18 Mbps, Single Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
12.549	2.1	14.6	2.2	16.8	36	Pass

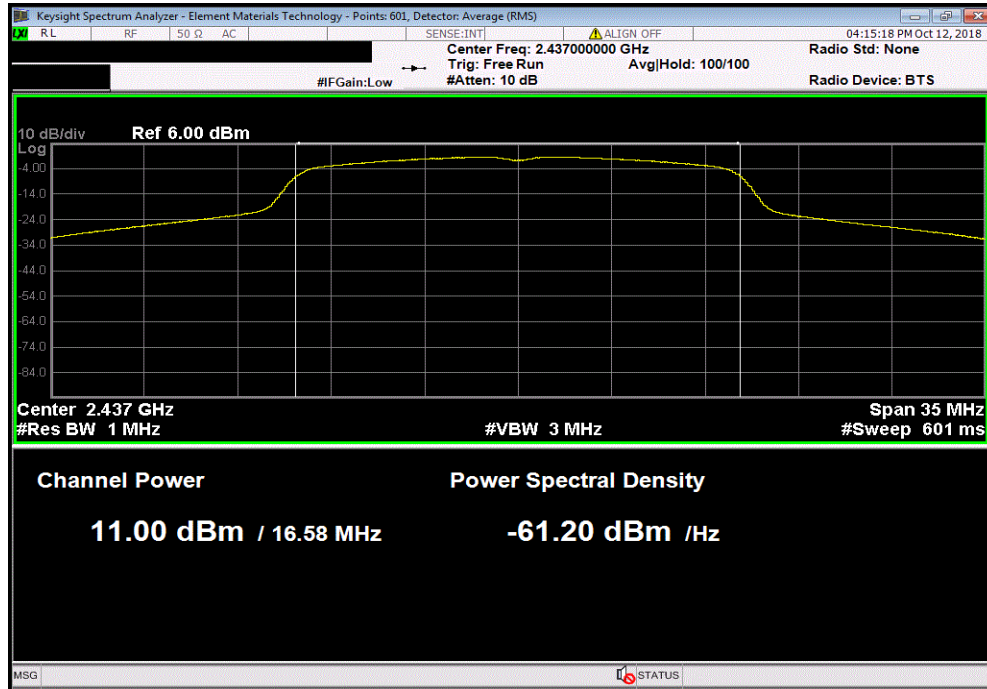


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

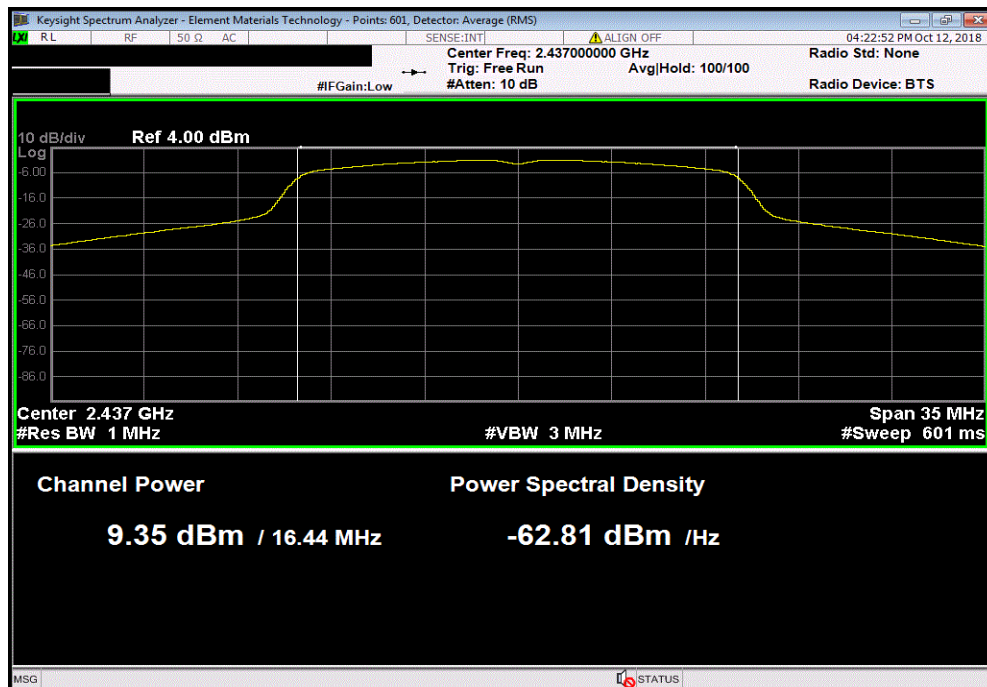


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 24 Mbps, Single Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
10.998	2.6	13.6	2.2	15.8	36	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Single Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
9.347	3.4	12.7	2.2	14.9	36	Pass

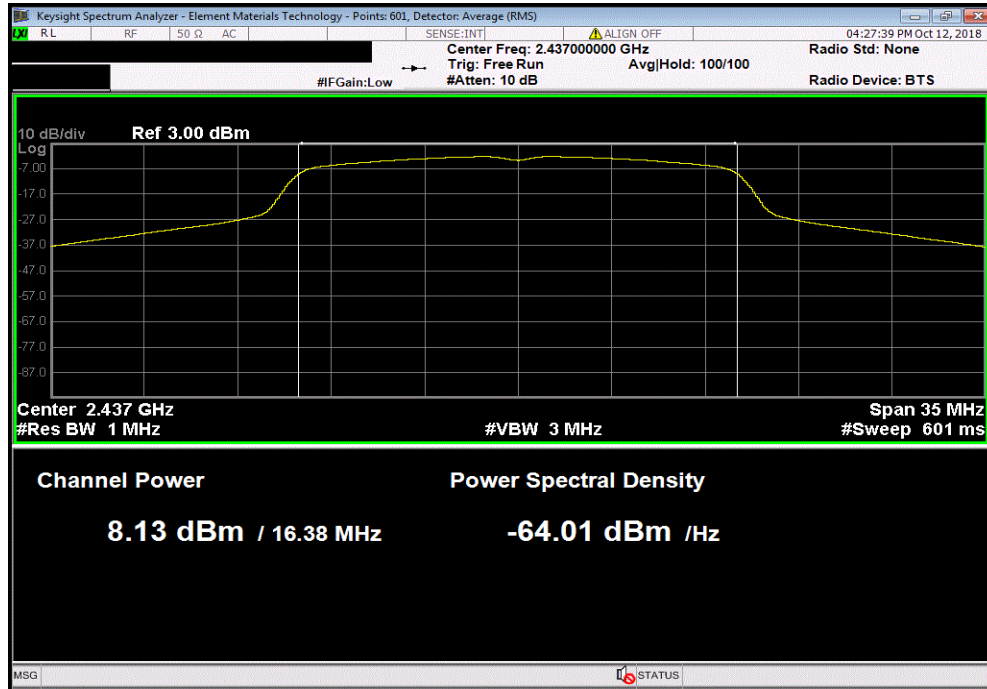


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

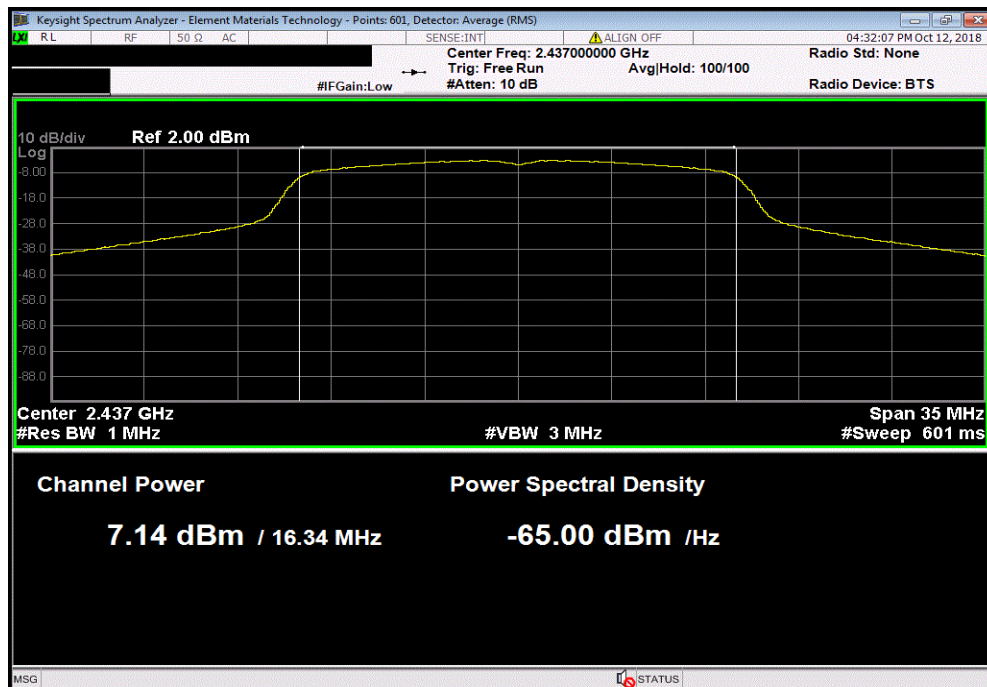


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 48 Mbps, Single Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
8.131	4	12.2	2.2	14.4	36	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Single Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
7.135	4.3	11.4	2.2	13.6	36	Pass



POWER SPECTRAL DENSITY



XMIT 2017.12.13

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
Block - DC	Fairview Microwave	SD3379	AMT	10-Oct-18	10-Oct-19
Attenuator	Fairview Microwave	SA4018-20	TYE	10-Oct-18	10-Oct-19
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	10-Oct-18	10-Oct-19
Generator - Signal	Agilent	N5173B	TIW	5-Jul-17	5-Jul-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-18	19-Mar-19

TEST DESCRIPTION

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

The method AVGPDS-1 in section 11.10.3 of ANSI C63.10:2013 was used to make the measurement. This method uses trace averaging and RMS detection across the full power of the burst. This method is allowed as the same method has been used to determine the conducted output power.

POWER SPECTRAL DENSITY



TMTx 2018.09.13 XMM 2017.12.13

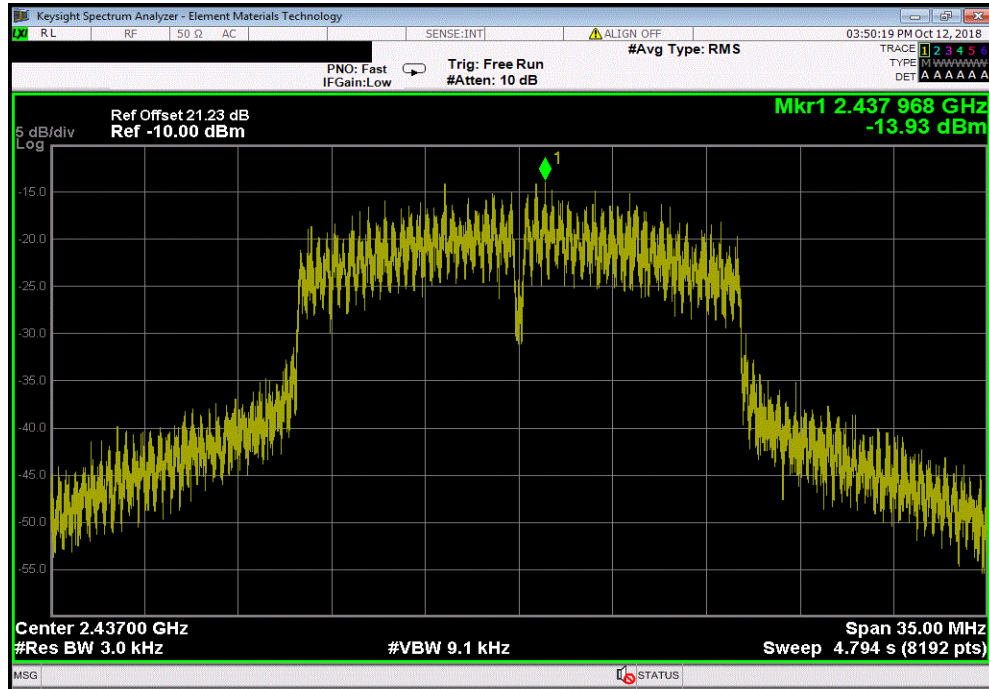
EUT: VISTA WIFI		Work Order: WTV0001	
Serial Number: WFC1-009113		Date: 12-Oct-18	
Customer: WatchGuard Video		Temperature: 22.2 °C	
Attendees: Navaid Karimi		Humidity: 50.2% RH	
Project: None		Barometric Pres.: 1017 mbar	
Tested by: Jonathan Kiefer		Power: Battery	
		Job Site: TX09	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2018		ANSI C63.10:2013	
COMMENTS			
Reference Offset 21.23 dB (20dB attenuator+dc block+cable).			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature <i>Jonathan Kiefer</i>	
		Value dBm/3kHz	Limit < dBm/3kHz
2400 MHz - 2483.5 MHz Band			
802.11(g) 6 Mbps			
Single Channel 6, 2437 MHz		-13.931	8
802.11(g) 9 Mbps			
Single Channel 6, 2437 MHz		-13.993	8
802.11(g) 12 Mbps			
Single Channel 6, 2437 MHz		-12.098	8
802.11(g) 18 Mbps			
Single Channel 6, 2437 MHz		-13.416	8
802.11(g) 24 Mbps			
Single Channel 6, 2437 MHz		-14.418	8
802.11(g) 36 Mbps			
Single Channel 6, 2437 MHz		-16.066	8
802.11(g) 48 Mbps			
Single Channel 6, 2437 MHz		-16.331	8
802.11(g) 54 Mbps			
Single Channel 6, 2437 MHz		-18.499	8

POWER SPECTRAL DENSITY

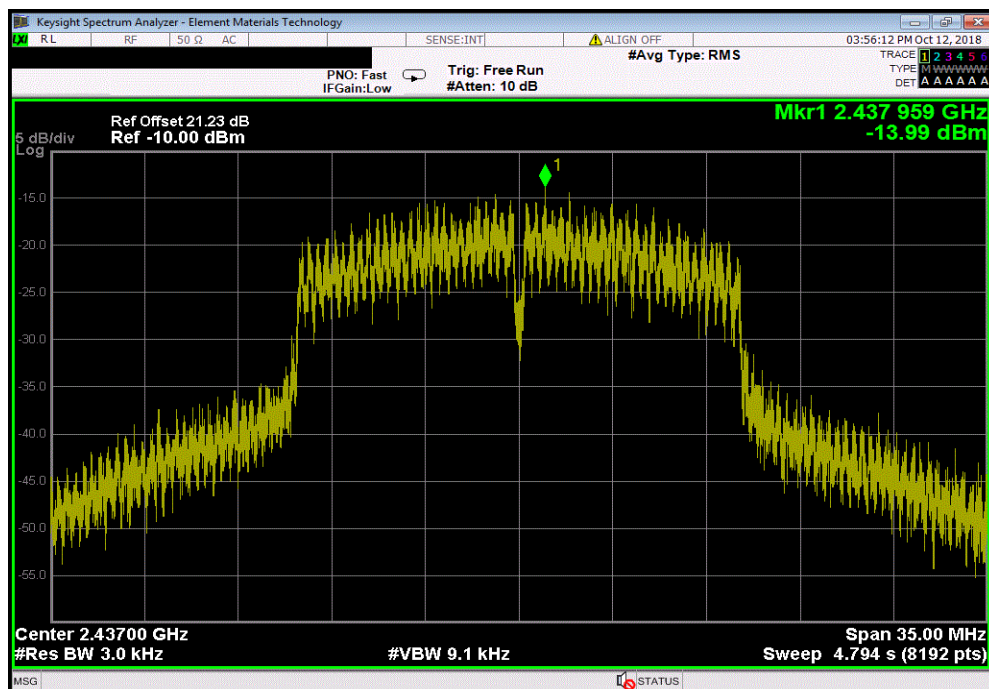


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Single Channel 6, 2437 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-13.931	8	Pass			



2400 MHz - 2483.5 MHz Band, 802.11(g) 9 Mbps, Single Channel 6, 2437 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-13.993	8	Pass			

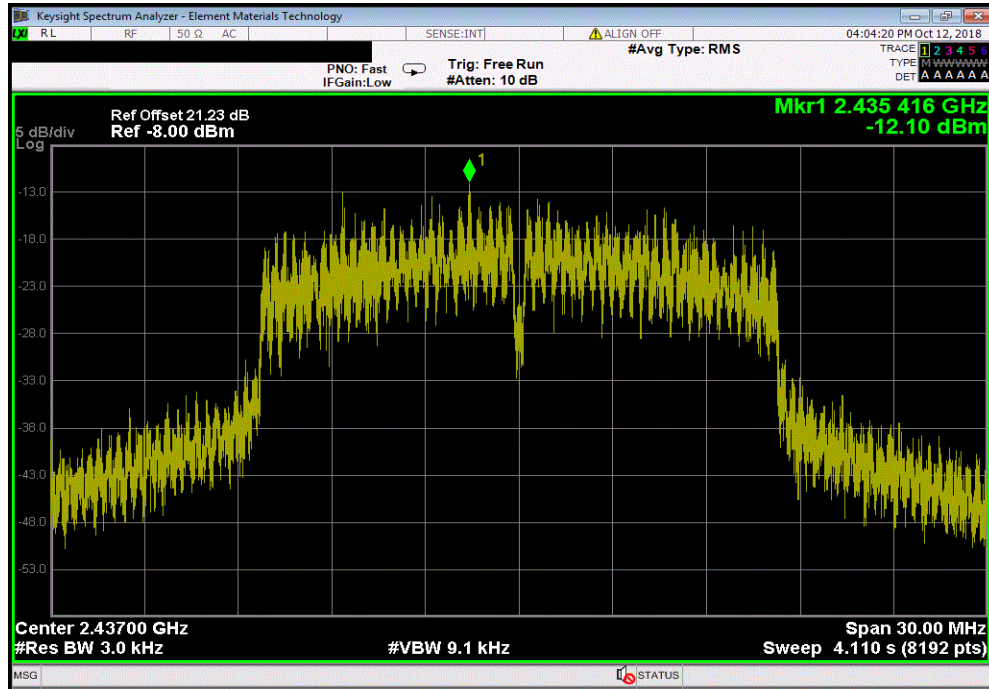


POWER SPECTRAL DENSITY

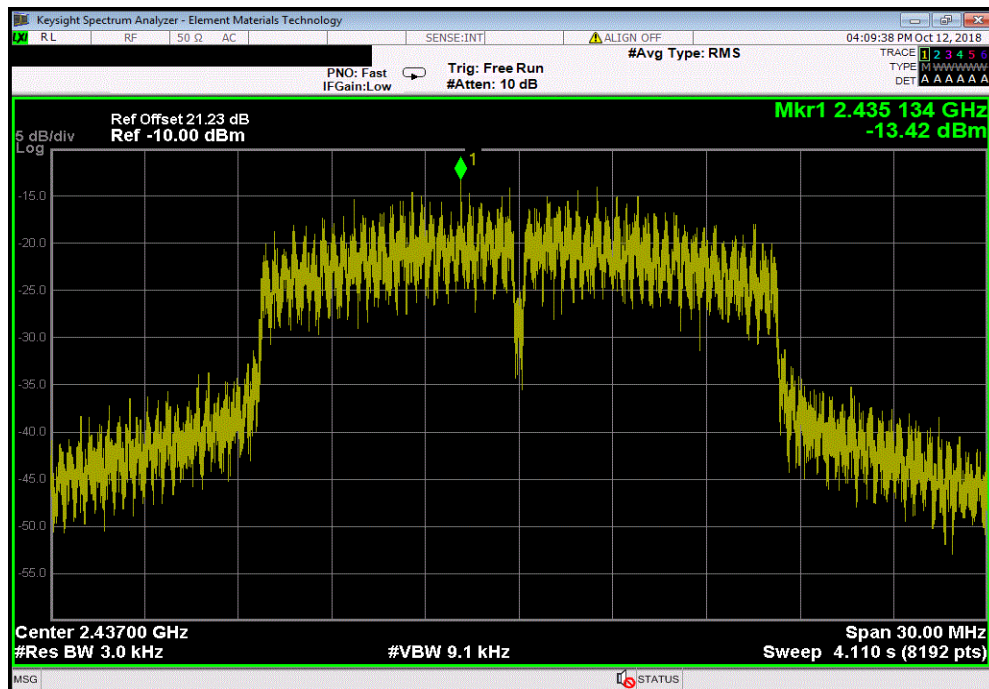


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 12 Mbps, Single Channel 6, 2437 MHz						
Value				Limit	Results	
dBm/3kHz				< dBm/3kHz		
				-12.098	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 18 Mbps, Single Channel 6, 2437 MHz						
Value				Limit	Results	
dBm/3kHz				< dBm/3kHz		
				-13.416	8	Pass

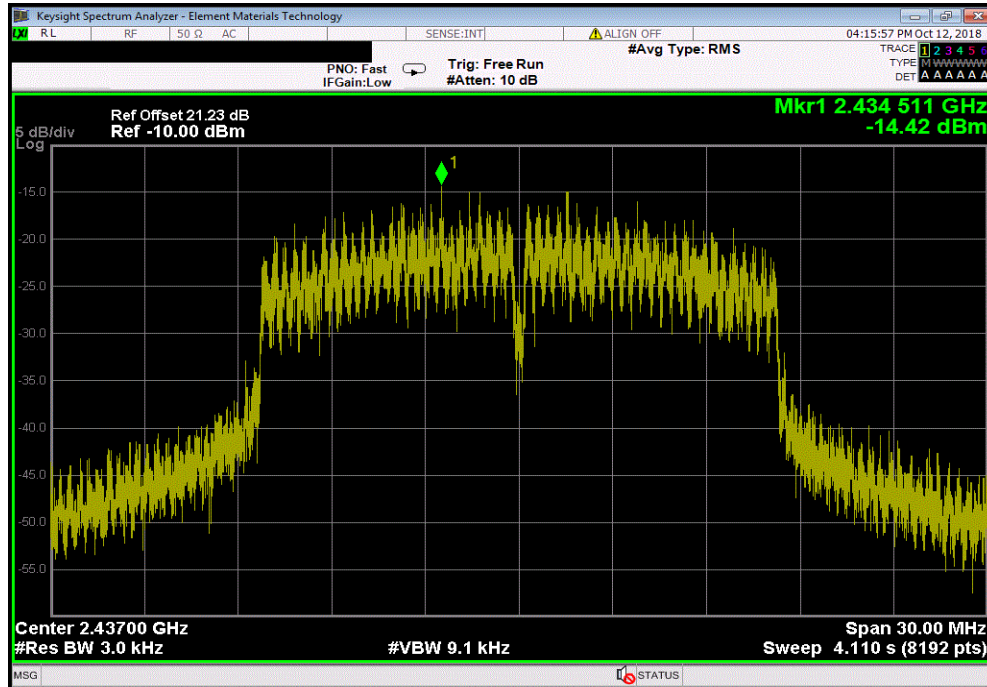


POWER SPECTRAL DENSITY

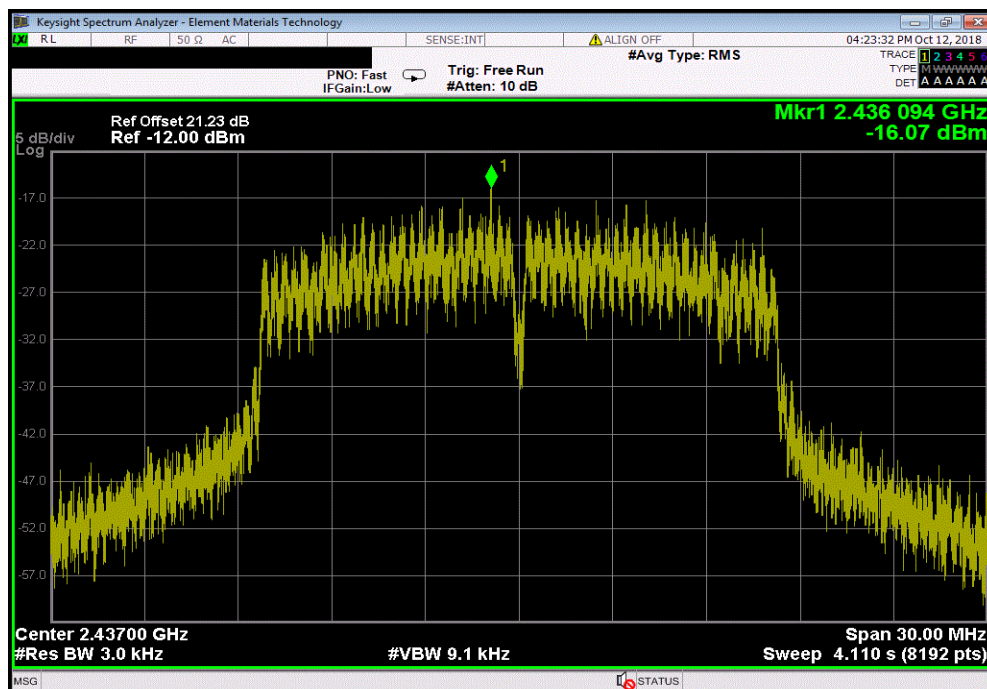


TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 24 Mbps, Single Channel 6, 2437 MHz						
Value				Limit	Results	
dBm/3kHz				< dBm/3kHz		
				-14.418	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Single Channel 6, 2437 MHz						
Value				Limit	Results	
dBm/3kHz				< dBm/3kHz		
				-16.066	8	Pass

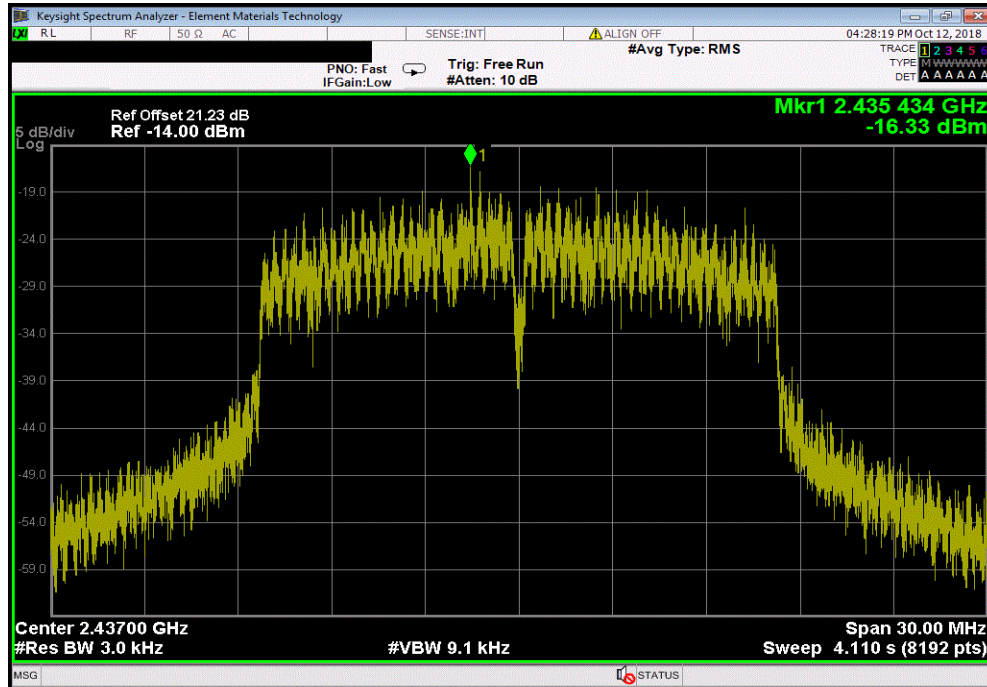


POWER SPECTRAL DENSITY



TMTx 2018.09.13 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 48 Mbps, Single Channel 6, 2437 MHz						
Value				Limit	Results	
dBm/3kHz				< dBm/3kHz		
				-16.331	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Single Channel 6, 2437 MHz						
Value				Limit	Results	
dBm/3kHz				< dBm/3kHz		
				-18.499	8	Pass

