



Element Materials Technology

UltraTEV Plus2 (TRA-038936-00)

FCC 15.247:2018

FCC 15.207:2018

802.11bgn SISO Radio

Report # ELEM0066.2



NVLAP LAB CODE: 200630-0
201049-0



This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America. This Report shall not be reproduced, except in full without written approval of the laboratory.

EAR-Controlled Data - This document contains technical data whose export and reexport/retransfer is subject to control by the U.S. Department of Commerce under the Export Administration Act and the Export Administration Regulations. The Department of Commerce's prior written approval may be required for the export or re-export/retransfer of such technical data to any foreign person, foreign entity or foreign organization whether in the United States or abroad.

More: <https://www.bis.doc.gov/index.php/forms-documents/regulations-docs/14-commerce-country-chart/fileT>

CERTIFICATE OF TEST



Last Date of Test: May 30, 2018
Element Materials Technology
Model: UltraTEV Plus2 (TRA-038936-00)

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2018	
FCC 15.247:2018	ANSI C63.10:2013, KDB 558074

Results

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

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.

REVISION HISTORY



Revision Number	Description	Date	Page Number
00	None		

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:

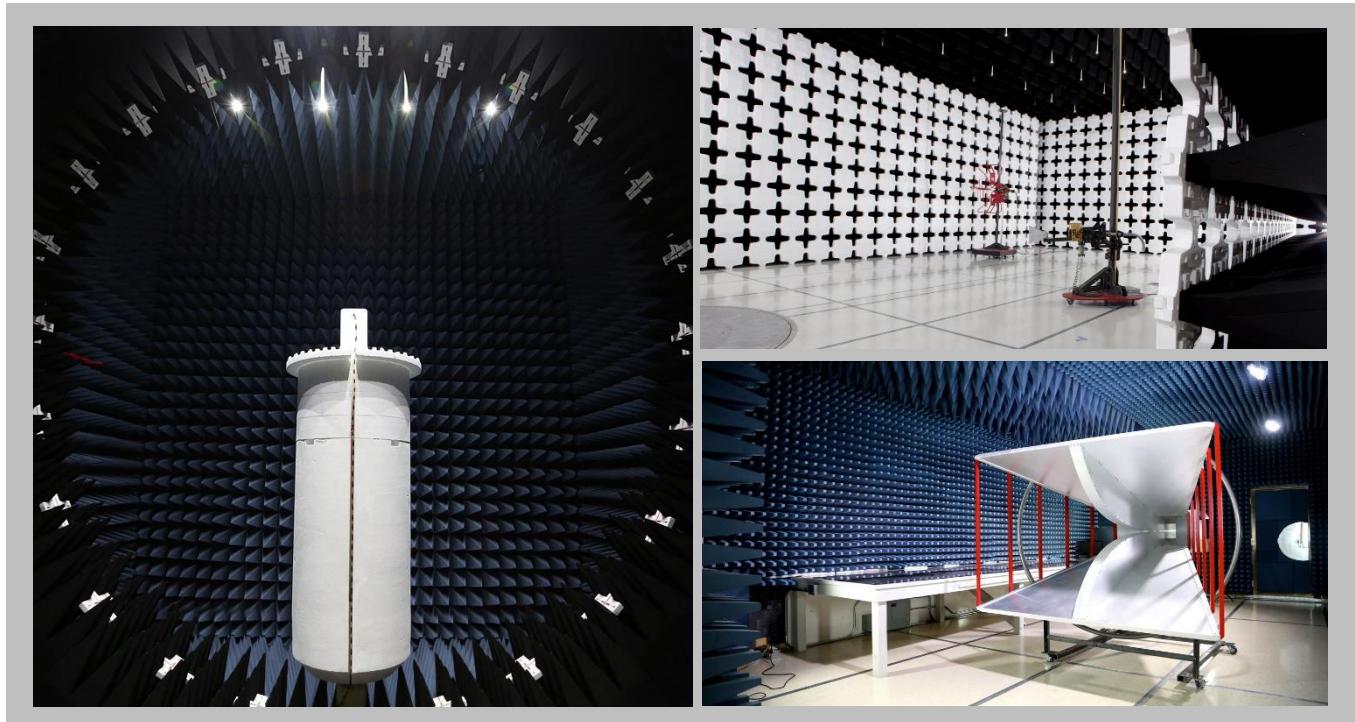
<http://portlandcustomer.element.com/ts/scope/scope.htm>

<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 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/RRA, 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)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

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.

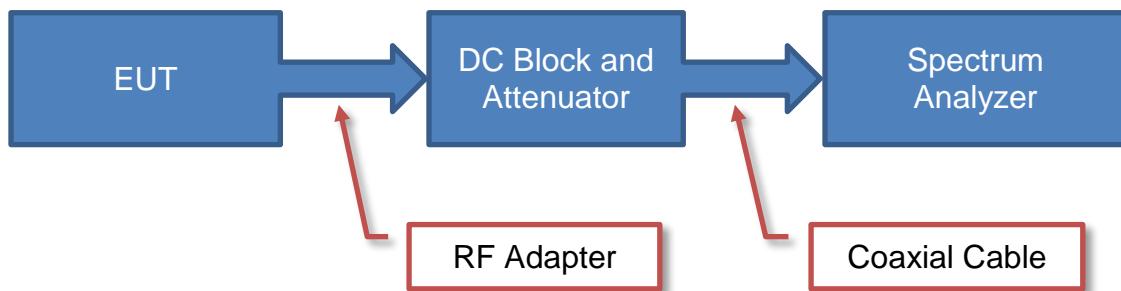
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable 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.

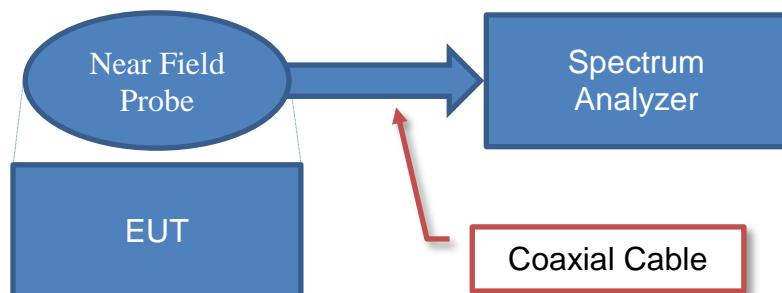
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.1 dB	-5.1 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

Test Setup Block Diagrams

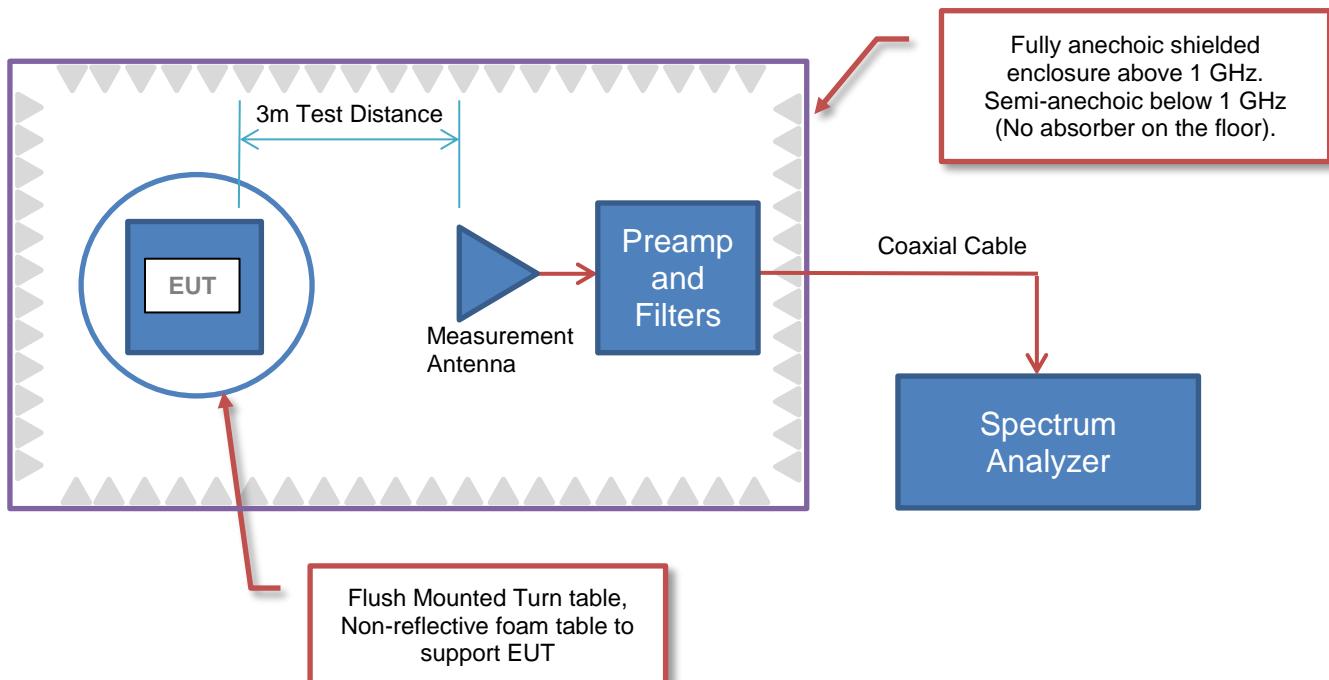
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



Spurious Radiated Emissions



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	Element Materials Technology
Address:	Unit E South Orbital Trading Park Hedon Road
City, State, Zip:	Hull, HU9 1NJ
Test Requested By:	Rich White
Model:	UltraTEV Plus2 (TRA-038936-00)
First Date of Test:	March 26, 2018
Last Date of Test:	May 30, 2018
Receipt Date of Samples:	May 14, 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:

The UTP2 is a handheld instrument for detecting and measuring Partial Discharge (PD) in electrical assets, through measurement of Transient Earth Voltages, Ultrasonic emissions and Current pulses. The UTP2 is a handheld instrument and conveys the captured information to the user both visually via the colour LCD touch screen, and audibly via optional headphones connected via the headphone jack.

Testing Objective:

To demonstrate compliance of the 802.11 radio under FCC 15.247 for operation in the 2.4 GHz band.

CONFIGURATIONS



Configuration ELEM0052- 3

Software/Firmware Running during test	
Description	Version
Blackbird	v3.1

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Partial Discharge Detector	EA Technology	UltraTEV Plus2	1203

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	Yes	1.0m	No	Partial Discharge Detector	TX09 Lab PC

CONFIGURATIONS



Configuration ELEM0066- 2

EUT				
Description	Manufacturer	Model/Part Number	Serial Number	
UltraTEV Plus2	EA Technology	TRA-038936-00	1201	

Peripherals in test setup boundary				
Description	Manufacturer	Model/Part Number	Serial Number	
Power Adapter	Stontronics	DSA-10PFP-05	None	

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	Yes	1.0m	No	Power Adapter	UltraTEV Plus2
AC Extension Cable	No	1.0m	No	Power Adapter	AC Mains

Configuration ELEM0066- 3

EUT				
Description	Manufacturer	Model/Part Number	Serial Number	
UltraTEV Plus2	EA Technology	TRA-038936-00	1201	

Peripherals in test setup boundary				
Description	Manufacturer	Model/Part Number	Serial Number	
Laptop PC	Lenovo	7510	CB17045993	
Laptop Power supply	Lenovo	PA-1400-12	None	

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power Cable	No	2.1m	No	Laptop Power supply	AC Mains
DC Power Cable	No	1.8m	Yes	Laptop Power supply	Laptop PC
USB Cable	Yes	1.8m	No	Laptop PC	UltraTEV Plus2

MODIFICATIONS



Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	3/26/2018	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT was taken home by the client following the test.
2	5/30/2018	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWERLINE CONDUCTED EMISSIONS



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	4/11/2018	4/11/2019
Cable - Conducted Cable Assembly	Northwest EMC	EVG, HHD, RKA	EVGA	4/4/2018	4/4/2019
LISN	Solar Electronics	9252-50-R-24-BNC	LIP	10/4/2016	10/4/2018

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

ELEM0066-2
ELEM0066-3

MODES INVESTIGATED

WiFi Continuous TX Test Mode, Mid Channel 2437 MHz, 1.0 Mbps. NFC radio on.

POWERLINE CONDUCTED EMISSIONS



EUT:	UltraTEV Plus2 (TRA-038936-00)	Work Order:	ELEM0066
Serial Number:	None	Date:	05/30/2018
Customer:	Element Materials Technology	Temperature:	20.9°C
Attendees:	None	Relative Humidity:	38%
Customer Project:	None	Bar. Pressure:	1019 mb
Tested By:	Jay Whitworth	Job Site:	EV07
Power:	USB from 110VAC/60Hz	Configuration:	ELEM0066-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2018	ANSI C63.10:2013

TEST PARAMETERS

Run #:	4	Line:	High Line	Add. Ext. Attenuation (dB):	0
--------	---	-------	-----------	-----------------------------	---

COMMENTS

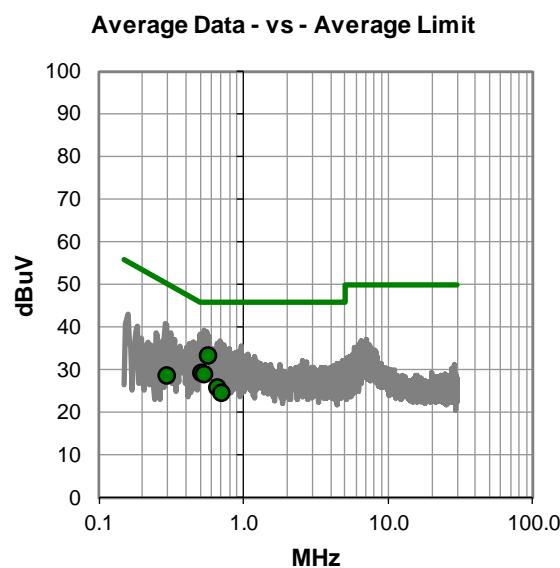
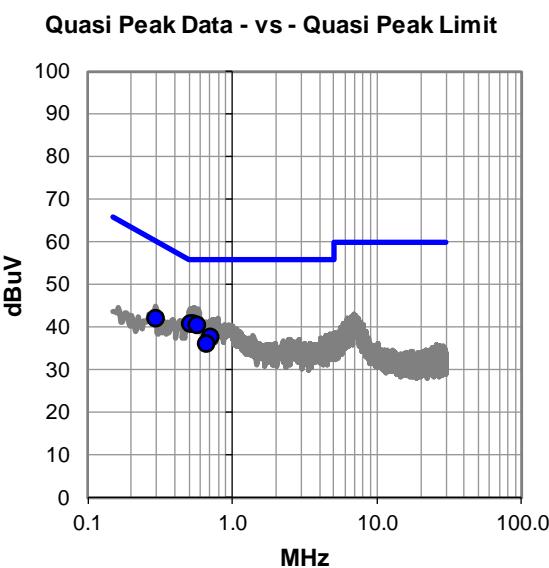
DC Power Adapter

EUT OPERATING MODES

WiFi Continuous TX Test Mode, Mid Channel 2437 MHz, 1.0 Mbps. NFC radio on.

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS



RESULTS - Run #4

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.530	21.7	19.2	40.9	56.0	-15.1
0.513	21.7	19.2	40.9	56.0	-15.1
0.569	21.2	19.2	40.4	56.0	-15.6
0.292	22.9	19.3	42.2	60.5	-18.3
0.698	18.3	19.3	37.6	56.0	-18.4
0.663	16.9	19.3	36.2	56.0	-19.8

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.569	14.3	19.2	33.5	46.0	-12.5
0.513	10.2	19.2	29.4	46.0	-16.6
0.530	9.8	19.2	29.0	46.0	-17.0
0.663	6.5	19.3	25.8	46.0	-20.2
0.698	5.2	19.3	24.5	46.0	-21.5
0.292	9.5	19.3	28.8	50.5	-21.7

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS



EUT:	UltraTEV Plus2 (TRA-038936-00)	Work Order:	ELEM0066
Serial Number:	None	Date:	05/30/2018
Customer:	Element Materials Technology	Temperature:	20.9°C
Attendees:	None	Relative Humidity:	38%
Customer Project:	None	Bar. Pressure:	1019 mb
Tested By:	Jay Whitworth	Job Site:	EV07
Power:	USB from 110VAC/60Hz	Configuration:	ELEM0066-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2018	ANSI C63.10:2013

TEST PARAMETERS

Run #:	5	Line:	Neutral	Add. Ext. Attenuation (dB):	0
--------	---	-------	---------	-----------------------------	---

COMMENTS

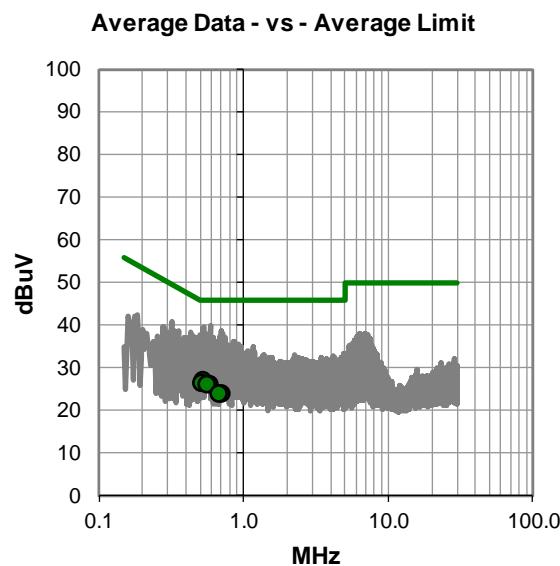
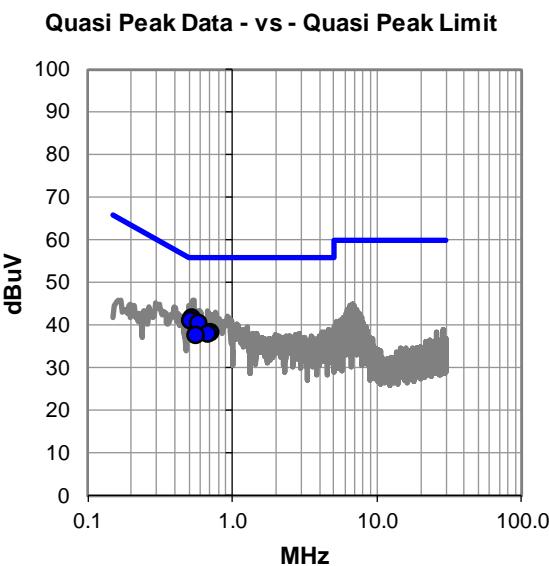
DC Power Adapter

EUT OPERATING MODES

WiFi Continuous TX Test Mode, Mid Channel 2437 MHz, 1.0 Mbps. NFC radio on.

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS



RESULTS - Run #5

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.518	22.7	19.2	41.9	56.0	-14.1
0.511	22.0	19.2	41.2	56.0	-14.8
0.584	21.1	19.3	40.4	56.0	-15.6
0.701	19.2	19.3	38.5	56.0	-17.5
0.675	18.9	19.3	38.2	56.0	-17.8
0.551	18.5	19.2	37.7	56.0	-18.3

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.518	7.9	19.2	27.1	46.0	-18.9
0.511	7.3	19.2	26.5	46.0	-19.5
0.584	6.8	19.3	26.1	46.0	-19.9
0.551	6.9	19.2	26.1	46.0	-19.9
0.701	4.8	19.3	24.1	46.0	-21.9
0.675	4.7	19.3	24.0	46.0	-22.0

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS



EUT:	UltraTEV Plus2 (TRA-038936-00)	Work Order:	ELEM0066
Serial Number:	None	Date:	05/30/2018
Customer:	Element Materials Technology	Temperature:	20.9°C
Attendees:	None	Relative Humidity:	38%
Customer Project:	None	Bar. Pressure:	1019 mb
Tested By:	Jay Whitworth	Job Site:	EV07
Power:	USB from 110VAC/60Hz	Configuration:	ELEM0066-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2018	ANSI C63.10:2013

TEST PARAMETERS

Run #:	6	Line:	High Line	Add. Ext. Attenuation (dB):	0
--------	---	-------	-----------	-----------------------------	---

COMMENTS

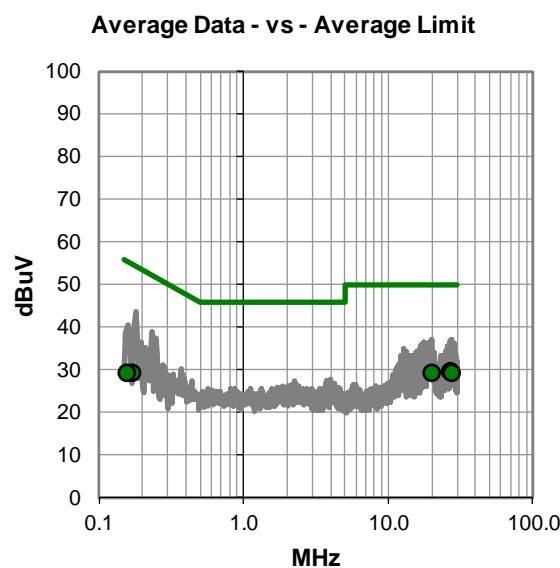
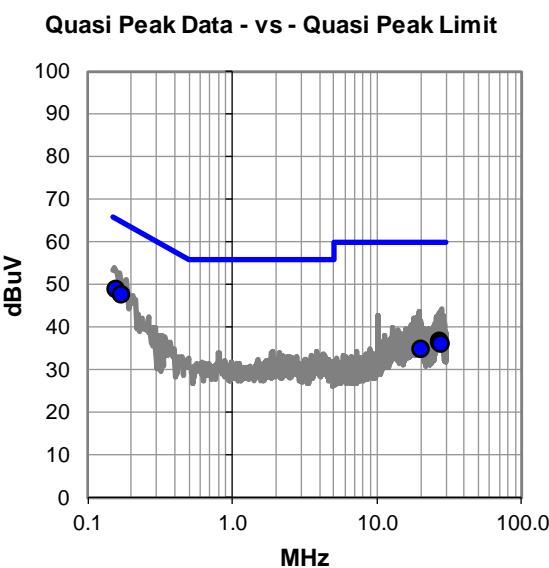
Laptop power

EUT OPERATING MODES

WiFi Continuous TX Test Mode, Mid Channel 2437 MHz, 1.0 Mbps. NFC radio on.

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS



RESULTS - Run #6

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.157	29.6	19.4	49.0	65.6	-16.6
0.171	28.3	19.3	47.6	64.9	-17.3
27.120	16.1	20.7	36.8	60.0	-23.2
27.015	15.8	20.6	36.4	60.0	-23.6
27.501	15.6	20.7	36.3	60.0	-23.7
19.926	14.6	20.2	34.8	60.0	-25.2

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
27.120	8.9	20.7	29.6	50.0	-20.4
27.015	8.9	20.6	29.5	50.0	-20.5
19.926	9.1	20.2	29.3	50.0	-20.7
27.501	8.5	20.7	29.2	50.0	-20.8
0.171	10.0	19.3	29.3	54.9	-25.6
0.157	9.8	19.4	29.2	55.6	-26.4

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS



EUT:	UltraTEV Plus2 (TRA-038936-00)	Work Order:	ELEM0066
Serial Number:	None	Date:	05/30/2018
Customer:	Element Materials Technology	Temperature:	20.9°C
Attendees:	None	Relative Humidity:	38%
Customer Project:	None	Bar. Pressure:	1019 mb
Tested By:	Jay Whitworth	Job Site:	EV07
Power:	USB from 110VAC/60Hz	Configuration:	ELEM0066-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2018	ANSI C63.10:2013

TEST PARAMETERS

Run #:	7	Line:	Neutral	Add. Ext. Attenuation (dB):	0
--------	---	-------	---------	-----------------------------	---

COMMENTS

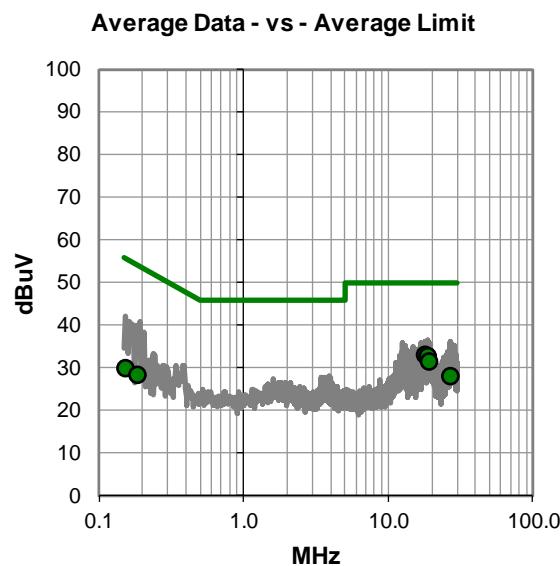
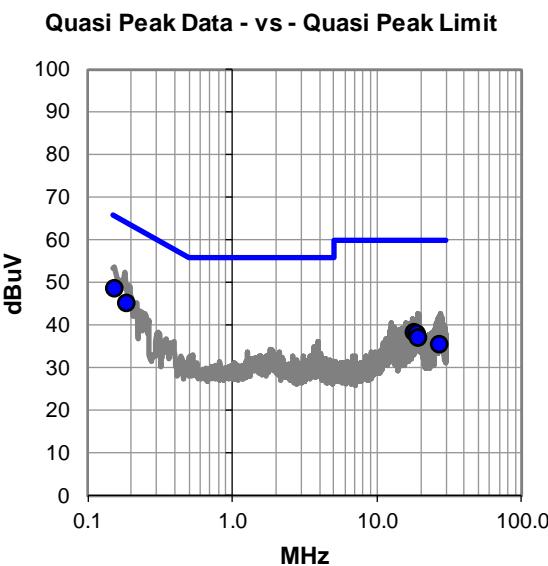
Laptop power

EUT OPERATING MODES

WiFi Continuous TX Test Mode, Mid Channel 2437 MHz, 1.0 Mbps. NFC radio on.

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS



RESULTS - Run #7

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.154	29.3	19.5	48.8	65.8	-17.0
0.186	26.0	19.3	45.3	64.2	-18.9
17.860	18.4	20.1	38.5	60.0	-21.5
18.923	18.0	20.2	38.2	60.0	-21.8
18.988	16.9	20.2	37.1	60.0	-22.9
27.108	15.1	20.6	35.7	60.0	-24.3

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
17.860	12.9	20.1	33.0	50.0	-17.0
18.923	12.5	20.2	32.7	50.0	-17.3
18.988	11.4	20.2	31.6	50.0	-18.4
27.108	7.5	20.6	28.1	50.0	-21.9
0.154	10.4	19.5	29.9	55.8	-25.9
0.186	9.0	19.3	28.3	54.2	-25.9

CONCLUSION

Pass

Tested By

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	11-Oct-17	11-Oct-18
Attenuator	Fairview Microwave	SA4018-20	TYE	17-Nov-17	17-Nov-18
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	15-Mar-18	15-Mar-19

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

Prior to measuring peak transmit power the DTS bandwidth (B) was measured.

The method found in ANSI C63.10:2013 Section 11.9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

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

OUTPUT POWER



TbTx 2017.12.14

XMi 2017.12.13

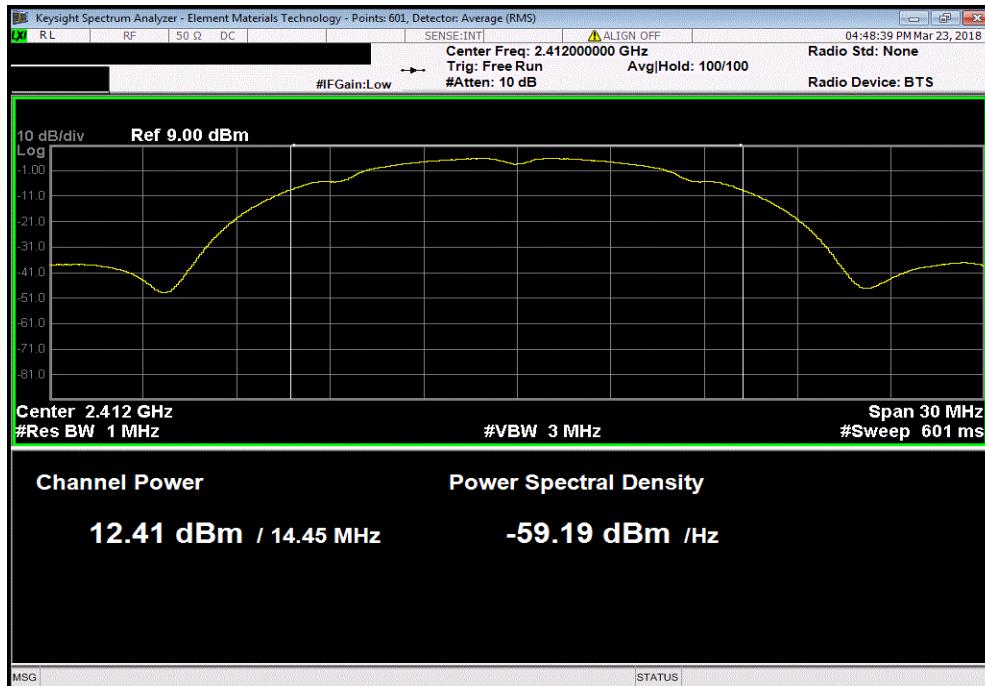
EUT:	UltraTEV Plus2 (TRA-038936-00)	Work Order:	ELEM0052			
Serial Number:	1201	Date:	26-Mar-18			
Customer:	Element Materials Technology	Temperature:	23.3 °C			
Attendees:	None	Humidity:	48% RH			
Project:	None	Barometric Pres.:	1014 mbar			
Tested by:	Marty Martin	Power:	110VAC/60Hz			
TEST SPECIFICATIONS		Test Method	ANSI C63.10:2013			
FCC 15.247:2018						
COMMENTS	None					
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	3	Signature				
		Marty	Marty			
		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	12.41	0.5	12.9	30	Pass	
Mid Channel 6, 2437 MHz	12.461	0.5	12.9	30	Pass	
High Channel 11, 2462 MHz	11.985	0.5	12.4	30	Pass	
802.11(b) 11 Mbps						
Low Channel 1, 2412 MHz	10.969	2.7	13.7	30	Pass	
Mid Channel 6, 2437 MHz	10.609	2.7	13.3	30	Pass	
High Channel 11, 2462 MHz	10.11	2.7	12.8	30	Pass	
802.11(g) 6 Mbps						
Low Channel 1, 2412 MHz	8.32	2.3	10.6	30	Pass	
Mid Channel 6, 2437 MHz	10.812	2.3	13.1	30	Pass	
High Channel 11, 2462 MHz	7.526	2.3	9.8	30	Pass	
802.11(g) 36 Mbps						
Low Channel 1, 2412 MHz	4.205	6.7	10.9	30	Pass	
Mid Channel 6, 2437 MHz	4.955	6.7	11.7	30	Pass	
High Channel 11, 2462 MHz	3.541	6.7	10.2	30	Pass	
802.11(g) 54 Mbps						
Low Channel 1, 2412 MHz	2.715	8.1	10.8	30	Pass	
Mid Channel 6, 2437 MHz	2.441	7.9	10.3	30	Pass	
High Channel 11, 2462 MHz	1.531	7.9	9.5	30	Pass	
802.11(n) MCS0						
Low Channel 1, 2412 MHz	8.217	2.6	10.8	30	Pass	
Mid Channel 6, 2437 MHz	9.805	2.5	12.4	30	Pass	
High Channel 11, 2462 MHz	7.501	2.5	10.1	30	Pass	
802.11(n) MCS7						
Low Channel 1, 2412 MHz	1.505	8	9.5	30	Pass	
Mid Channel 6, 2437 MHz	1.337	8.1	9.5	30	Pass	
High Channel 11, 2462 MHz	0.915	8.1	9	30	Pass	

OUTPUT POWER



TbTx 2017-12-14 XMII 2017-12-13

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
12.41	0.5	12.9	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
12.461	0.5	12.9	30	Pass	

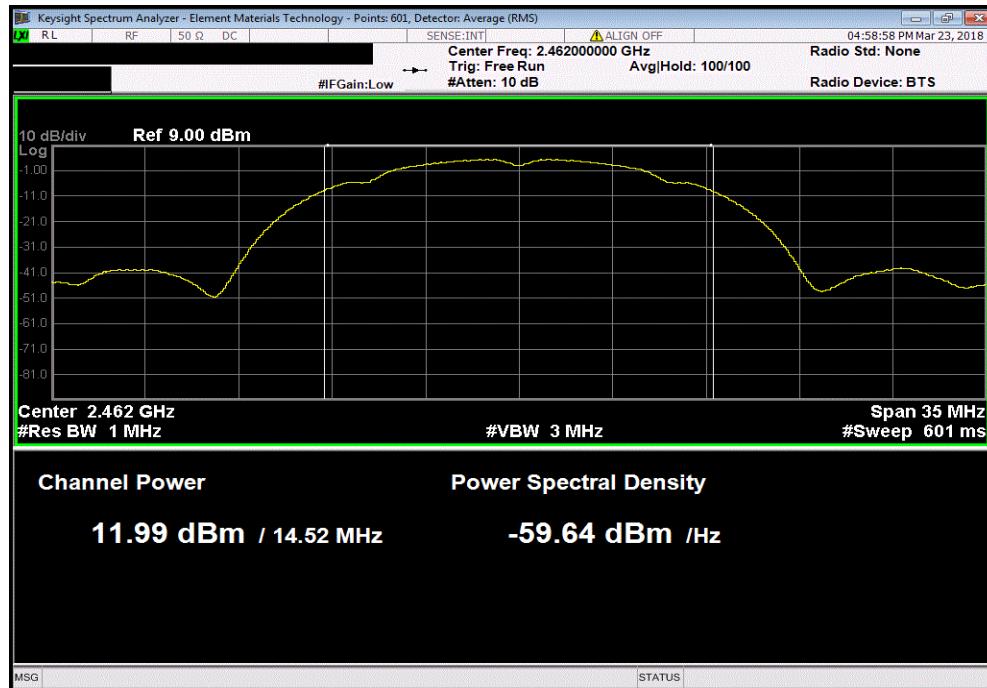


OUTPUT POWER



TbTx 2017-12-14 XMII 2017-12-13

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
11.985	0.5	12.4	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
10.969	2.7	13.7	30	Pass	

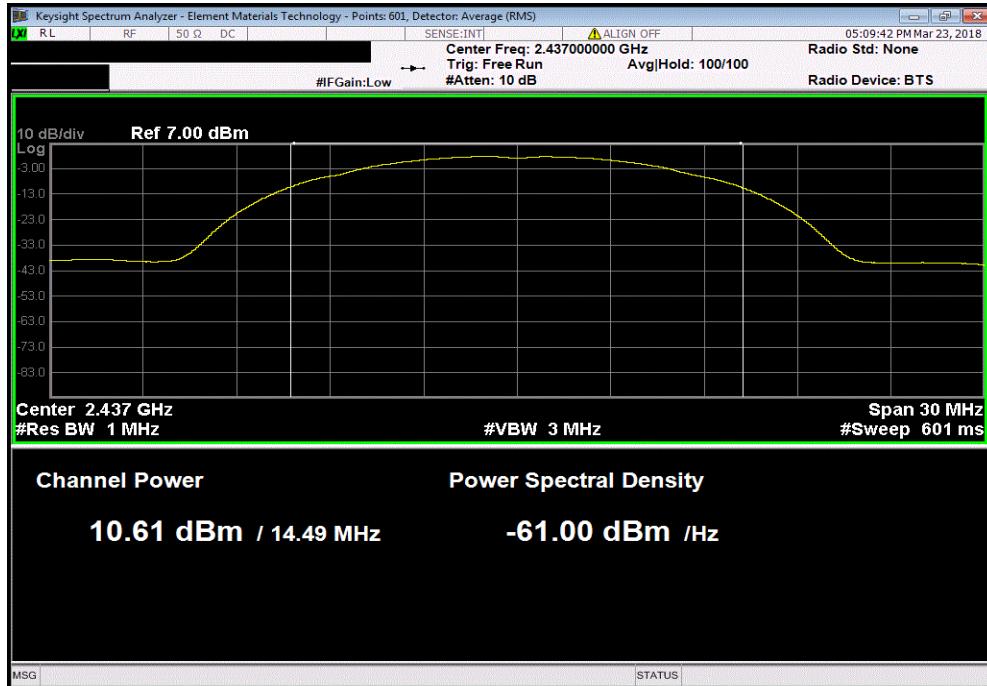


OUTPUT POWER

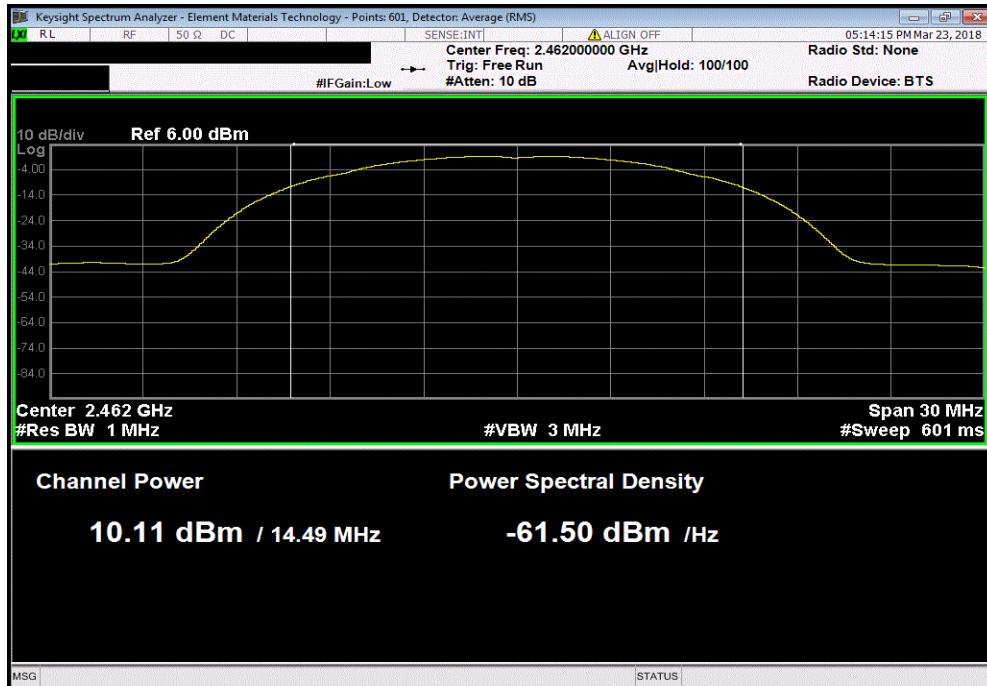


TbTx 2017.12.14 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
10.609	2.7	13.3	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
10.11	2.7	12.8	30	Pass	

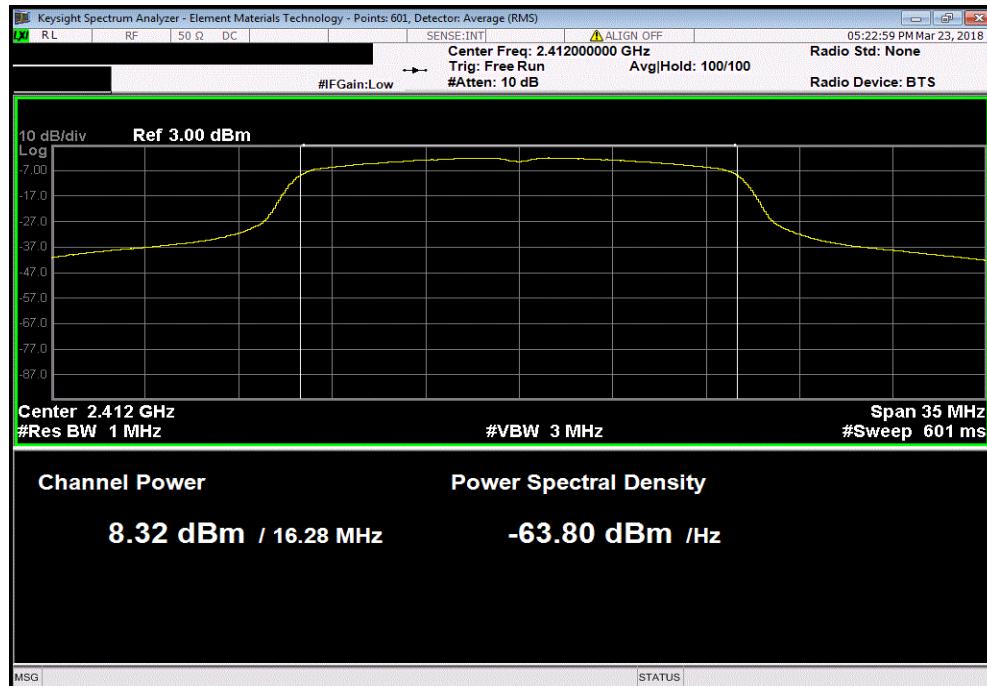


OUTPUT POWER

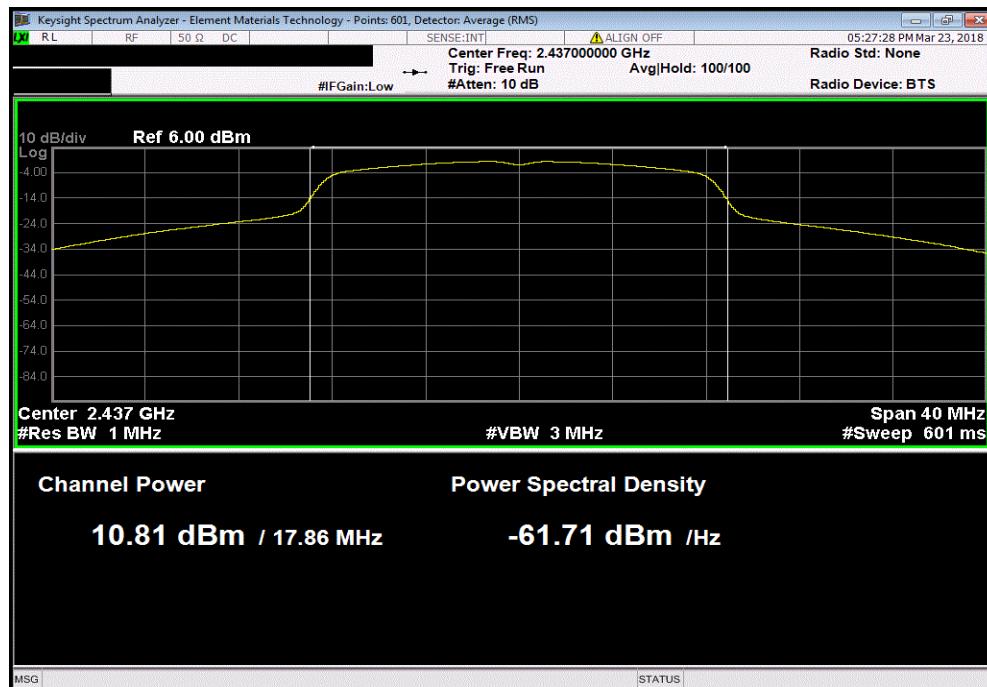


TbTx 2017-12-14 XMII 2017-12-13

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
8.32	2.3	10.6	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
10.812	2.3	13.1	30	Pass	

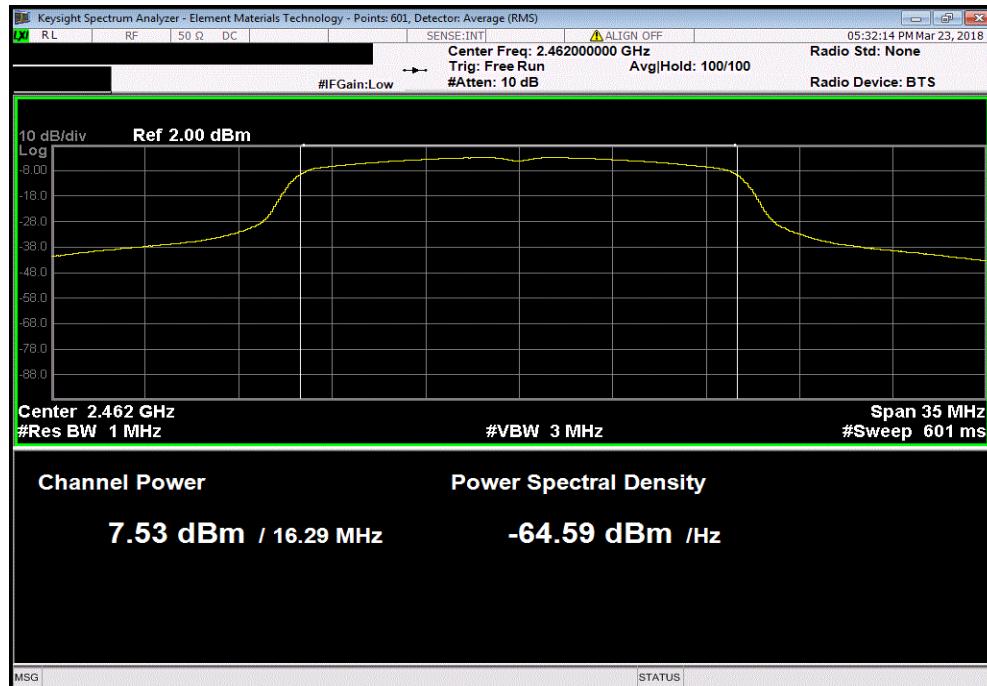


OUTPUT POWER

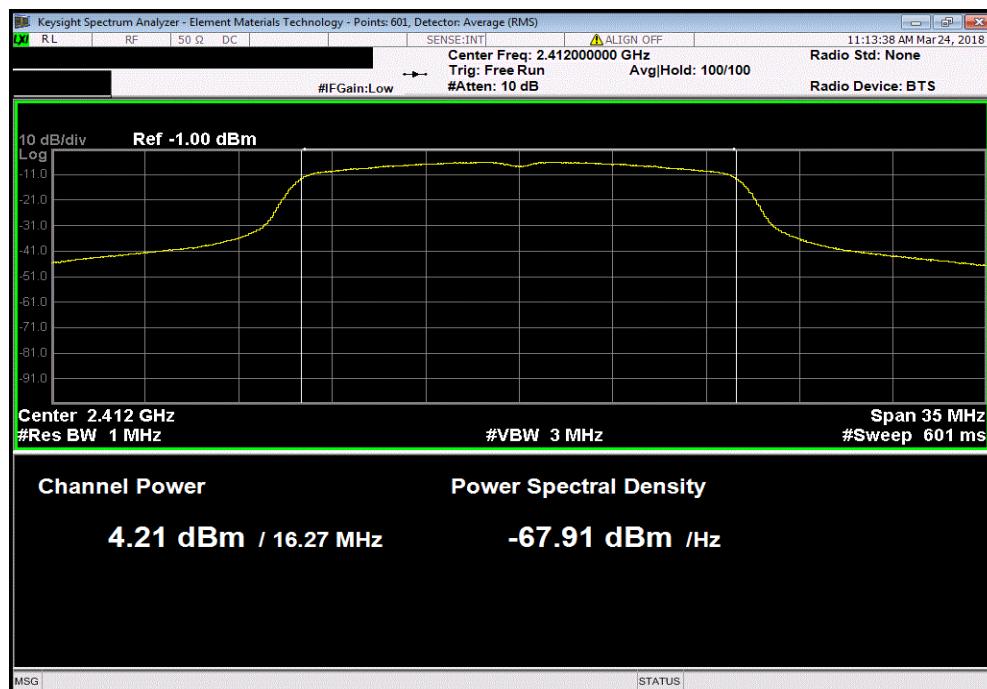


TbTx 2017-12-14 XMII 2017-12-13

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz					
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Value (dBm)	Limit (dBm)	Results	
7.526	2.3	9.8	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz					
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Value (dBm)	Limit (dBm)	Results	
4.205	6.7	10.9	30	Pass	

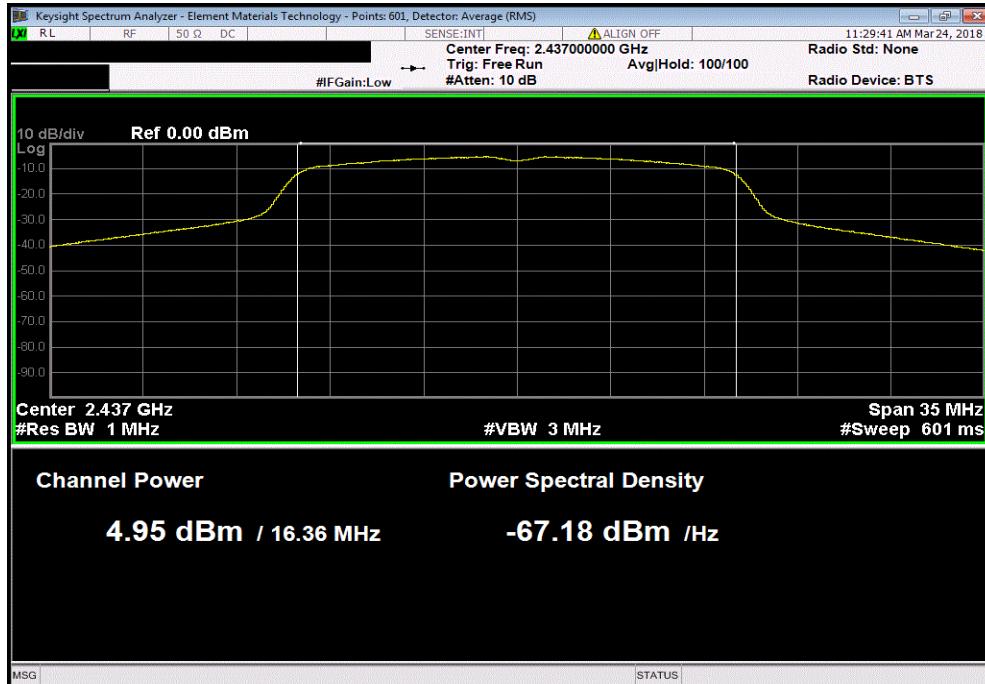


OUTPUT POWER

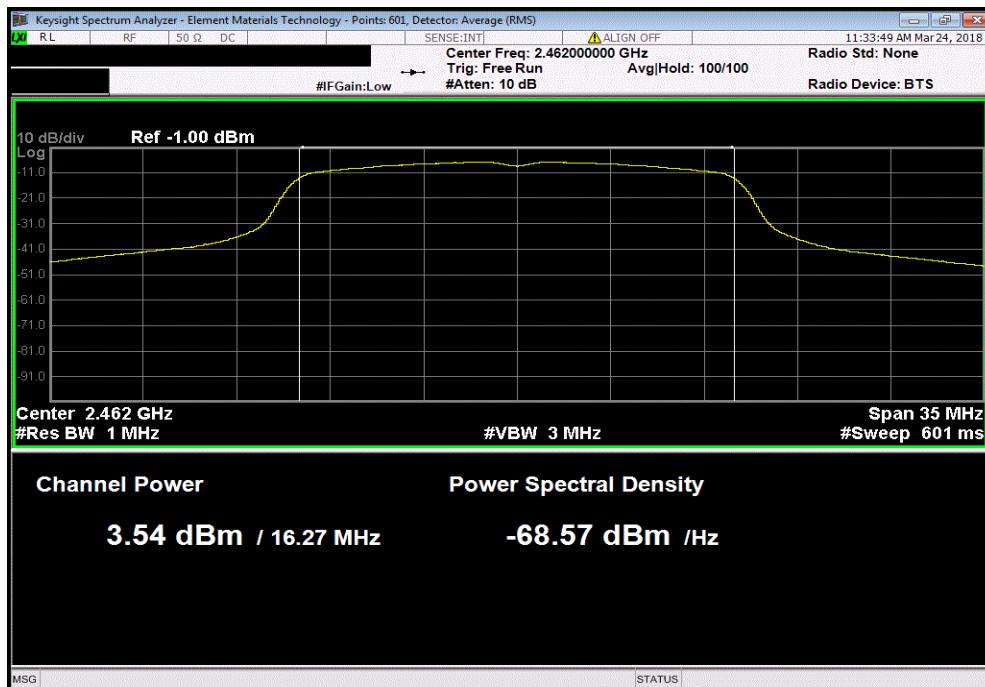


TbTx 2017.12.14 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
4.955	6.7	11.7	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
3.541	6.7	10.2	30	Pass	

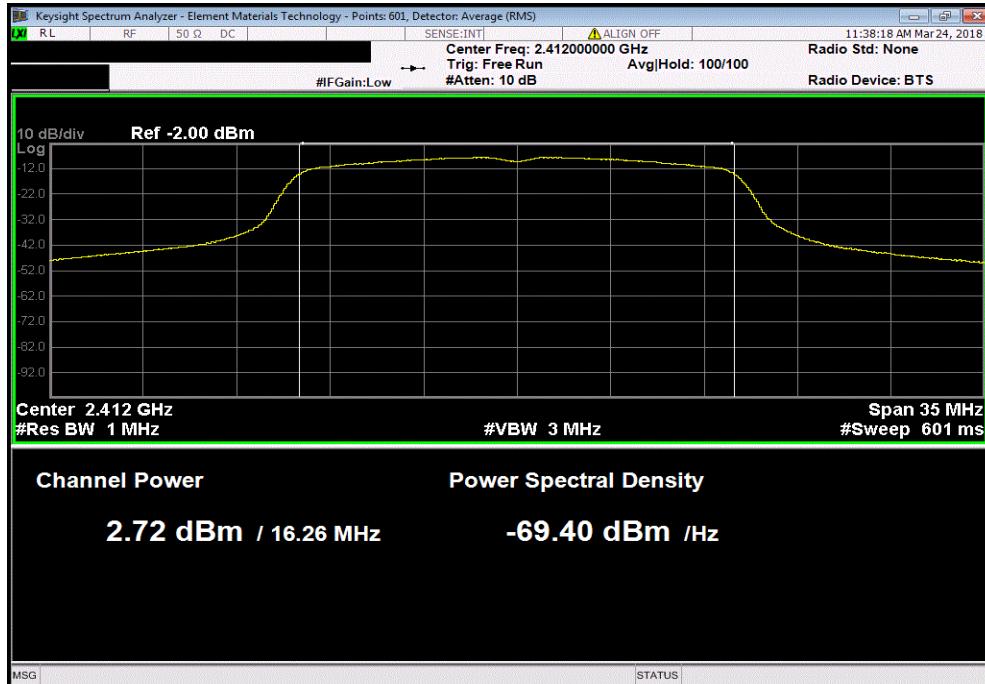


OUTPUT POWER

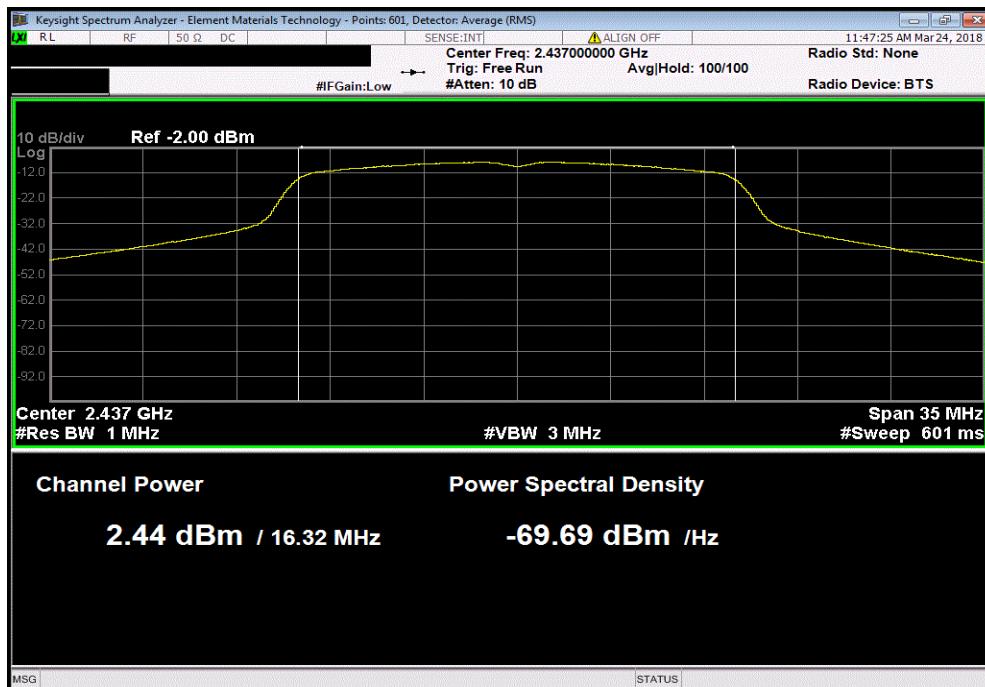


TbTx 2017.12.14 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
2.715	8.1	10.8	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
2.441	7.9	10.3	30	Pass	

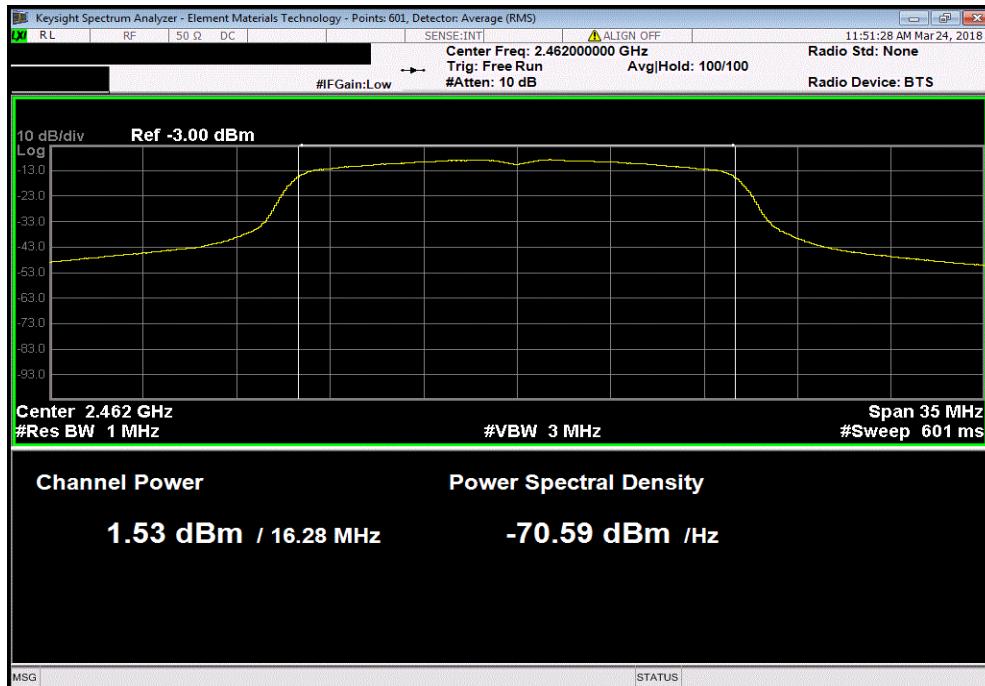


OUTPUT POWER

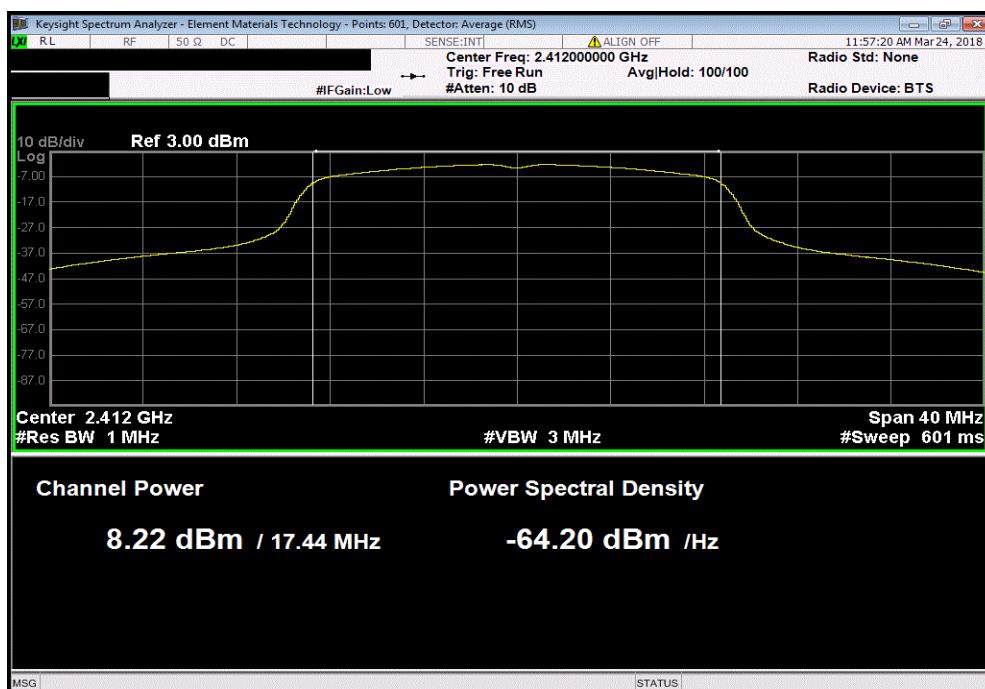


TbTx 2017.12.14 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
1.531	7.9	9.5	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
8.217	2.6	10.8	30	Pass	

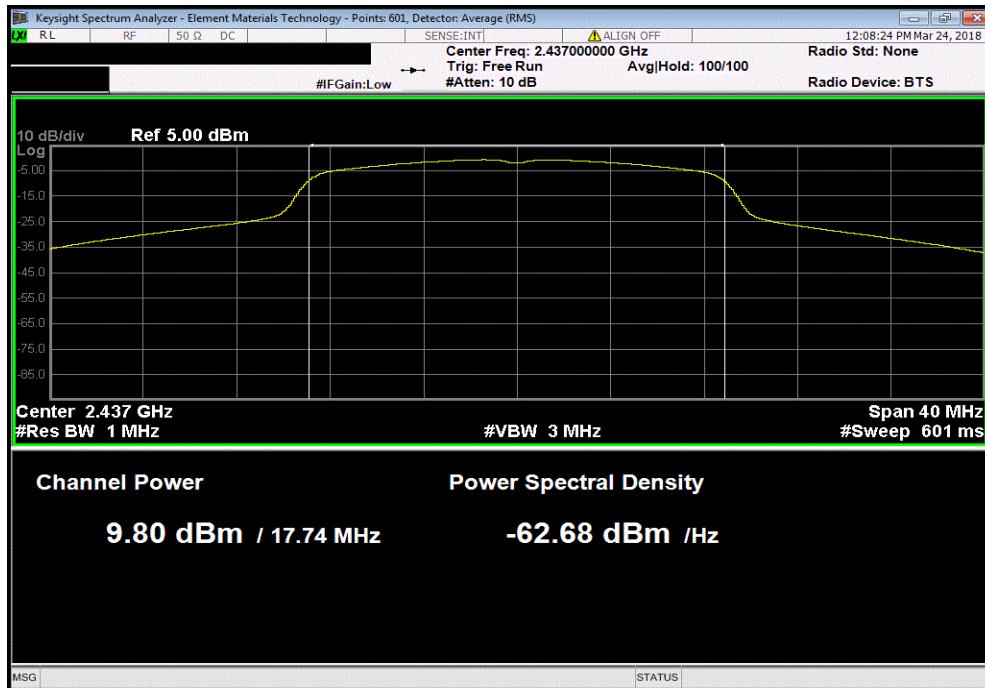


OUTPUT POWER

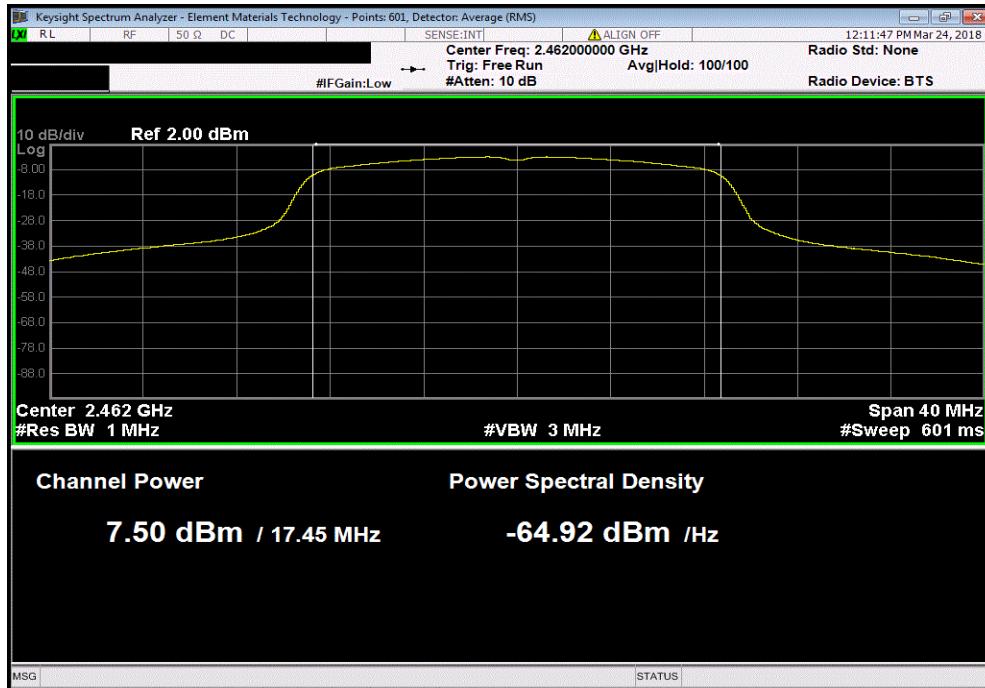


TbTx 2017.12.14 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
9.805	2.5	12.4	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
7.501	2.5	10.1	30	Pass	

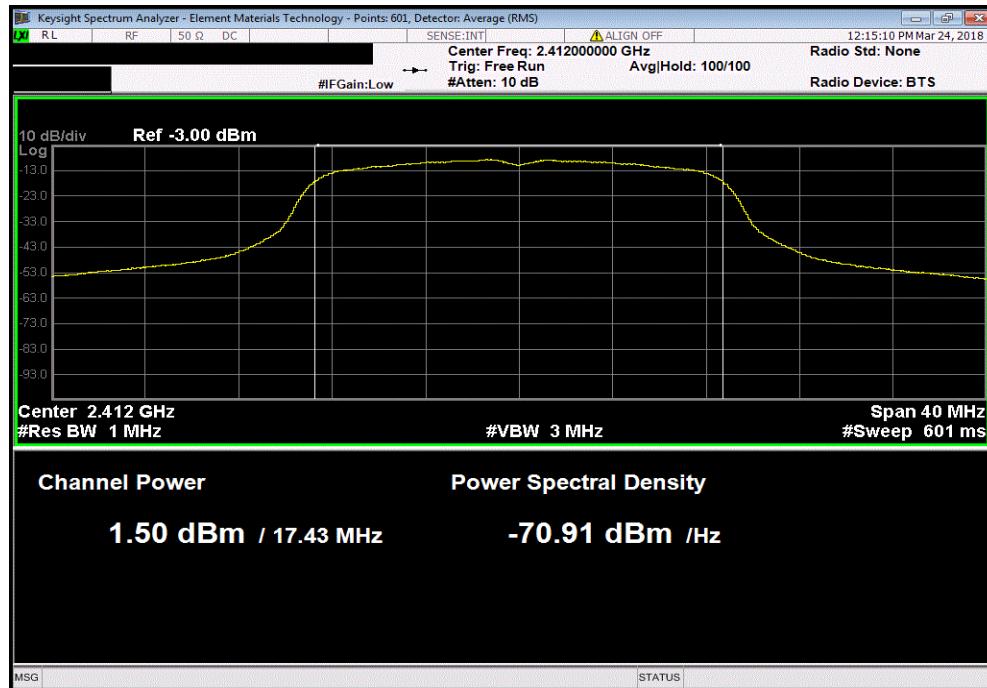


OUTPUT POWER

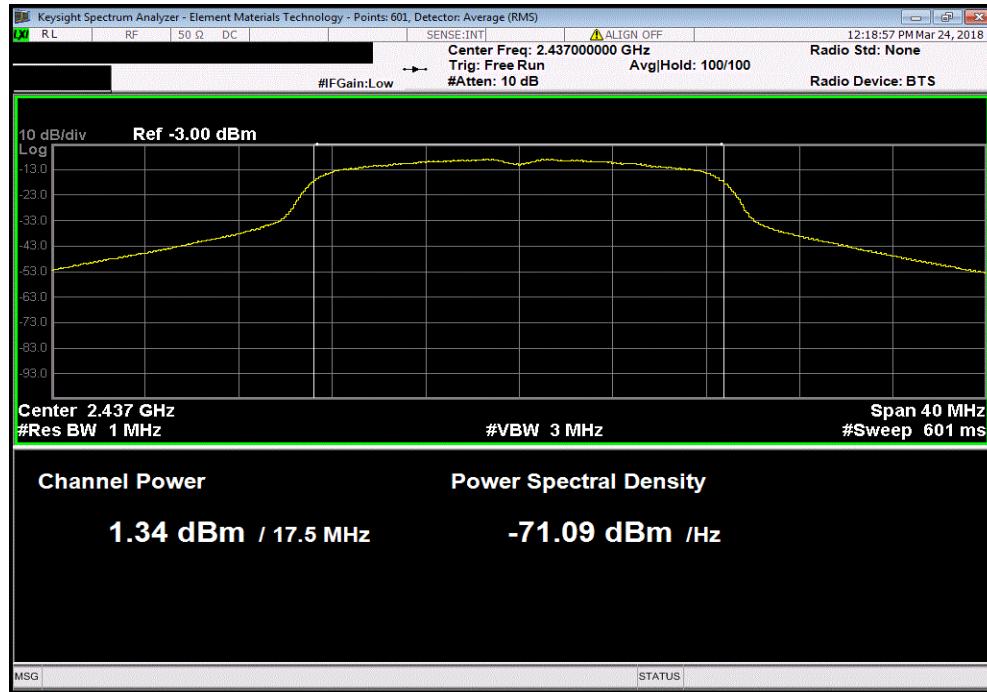


TbTx 2017.12.14 XM1 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz					
Avg Cond	Duty Cycle	Value	Limit		Results
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
1.505	8	9.5	30		Pass



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz					
Avg Cond	Duty Cycle	Value	Limit		Results
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
1.337	8.1	9.5	30		Pass



OUTPUT POWER



TbTx 2017.12.14 XMII 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz					
Avg Cond	Duty Cycle	Value	Limit	Results	
Pwr (dBm)	Factor (dB)	(dBm)	(dBm)		
0.915	8.1	9	30	Pass	

