



## 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



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

### 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



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## 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

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## 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.

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## European Union

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

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## Australia/New Zealand

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

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## Korea

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

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## Japan

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

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## 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.

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## Singapore

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

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## Israel

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

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## Hong Kong

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

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## Vietnam

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

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## SCOPE

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

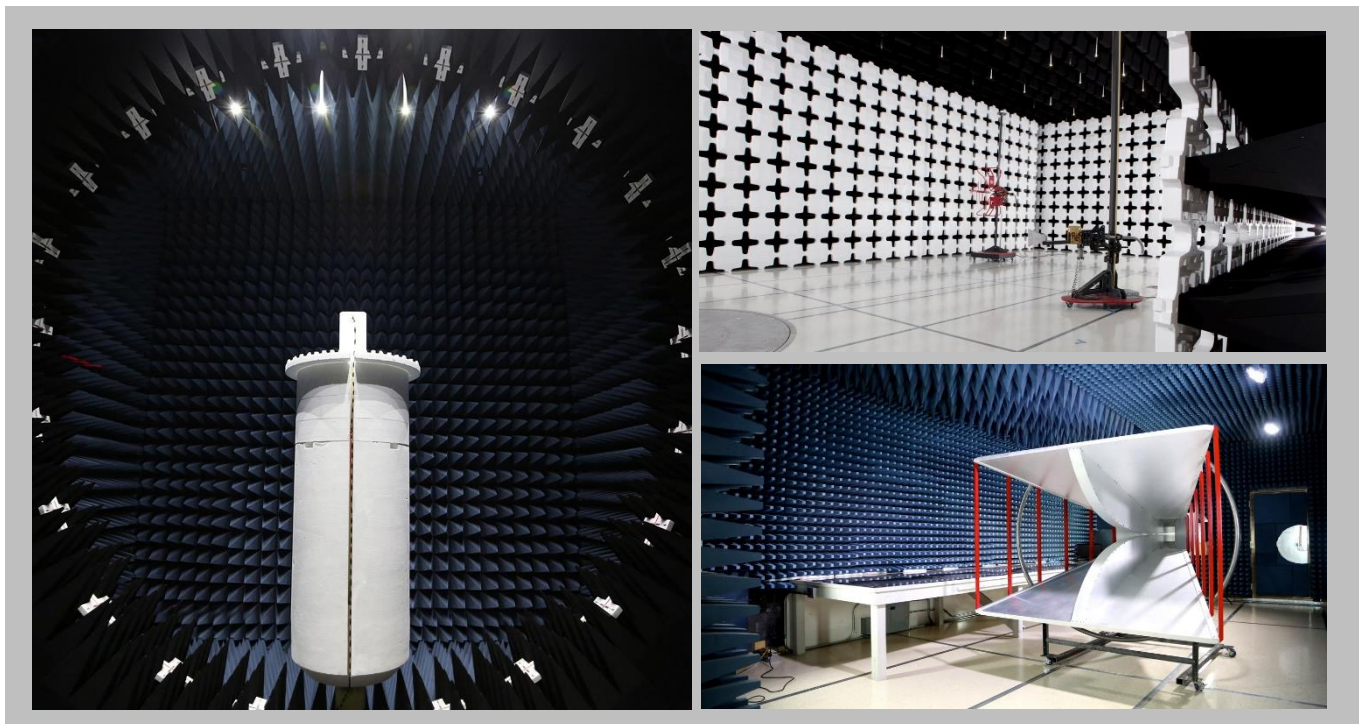
<http://portlandcustomer.element.com/ts/scope/scope.htm>

<http://gsi.nist.gov/global/docs/cabs/designations.html>

# FACILITIES



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

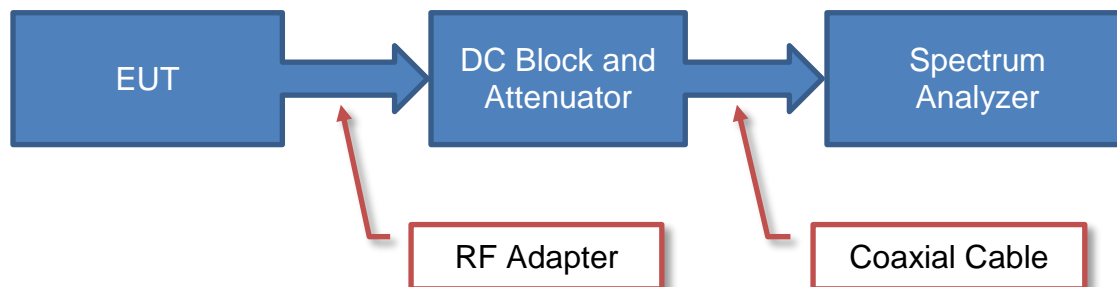
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable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

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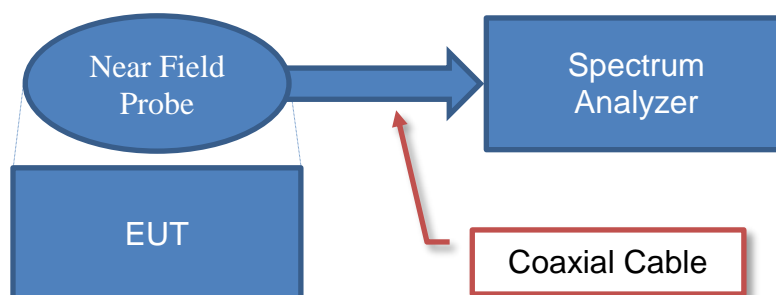
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%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

# Test Setup Block Diagrams

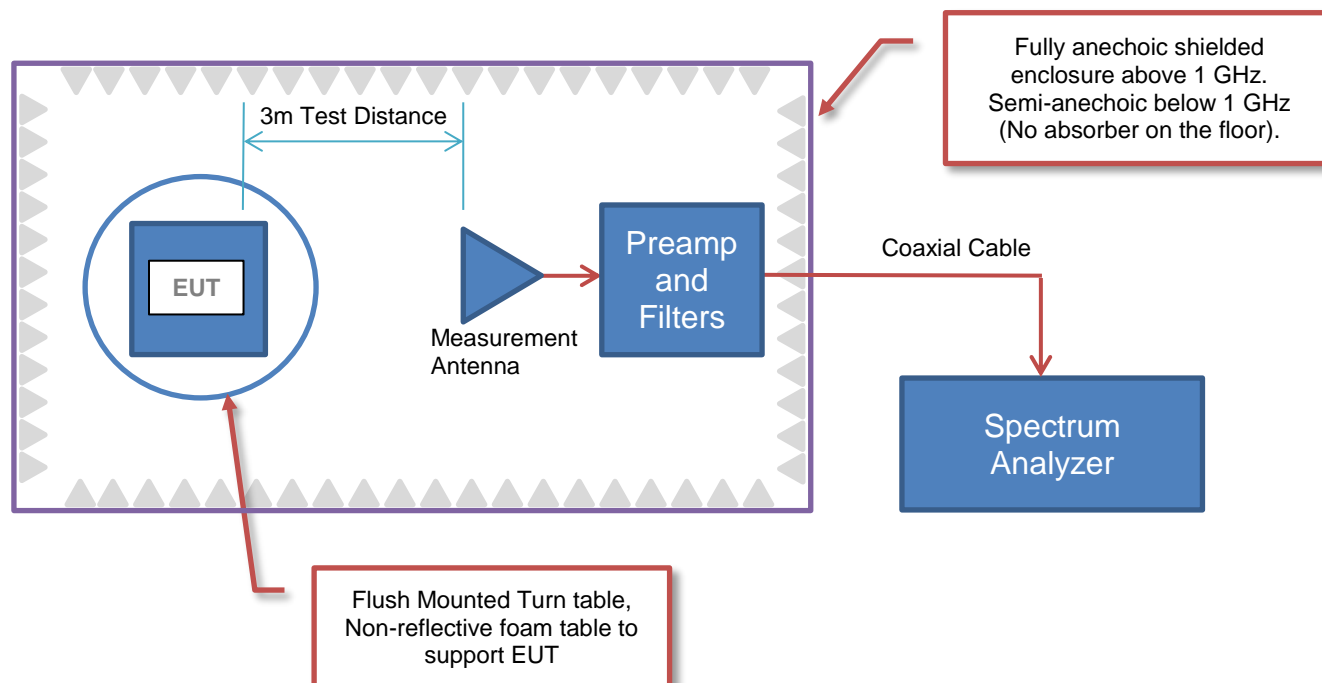
## Antenna Port Conducted Measurements



## Near Field Test Fixture Measurements



## Spurious Radiated Emissions





# PRODUCT DESCRIPTION

## Client and Equipment Under Test (EUT) Information

<b>Company Name:</b>	Element Materials Technology
<b>Address:</b>	Unit E South Orbital Trading Park Hedon Road
<b>City, State, Zip:</b>	Hull, HU9 1NJ
<b>Test Requested By:</b>	Rich White
<b>Model:</b>	UltraTEV Plus2 (TRA-038936-00)
<b>First Date of Test:</b>	March 26, 2018
<b>Last Date of Test:</b>	May 30, 2018
<b>Receipt Date of Samples:</b>	May 14, 2018
<b>Equipment Design Stage:</b>	Production
<b>Equipment Condition:</b>	No Damage
<b>Purchase Authorization:</b>	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
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## COMMENTS

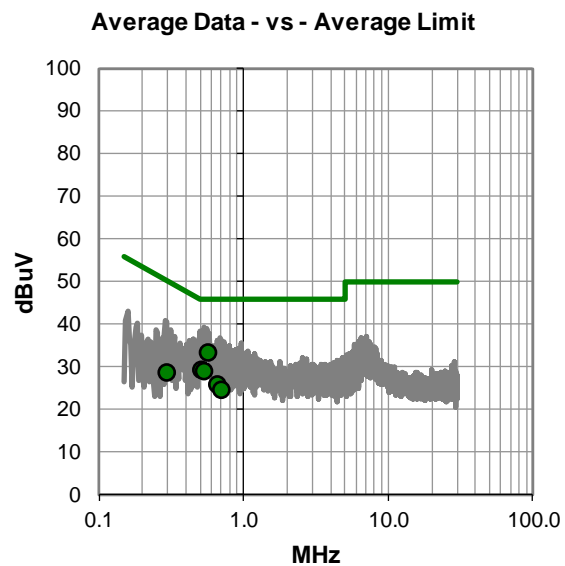
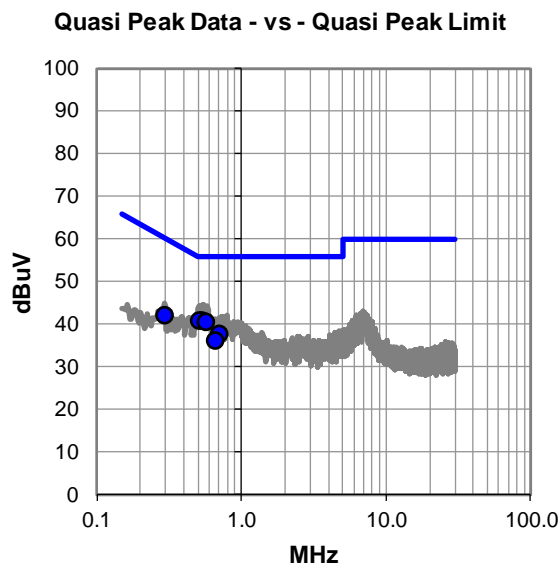
DC Power Adapter

## 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
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## COMMENTS

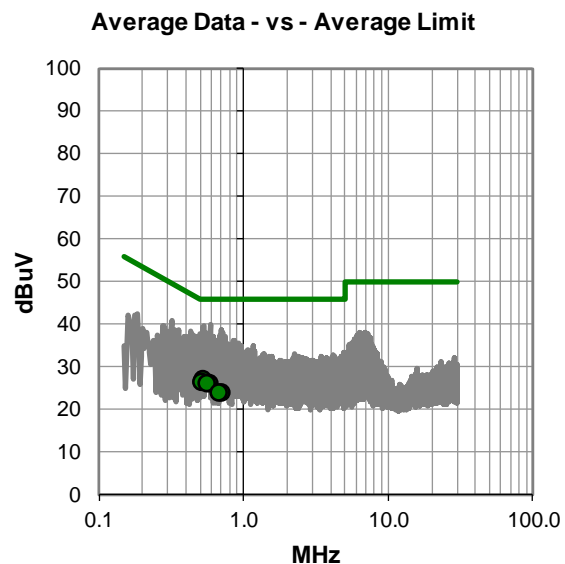
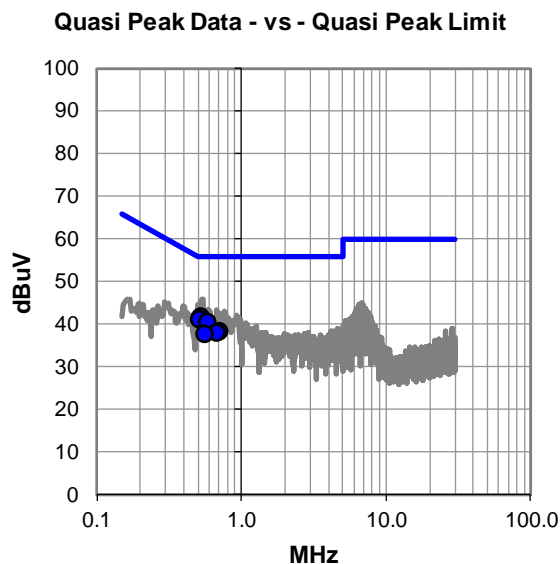
DC Power Adapter

## 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
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## COMMENTS

Laptop power

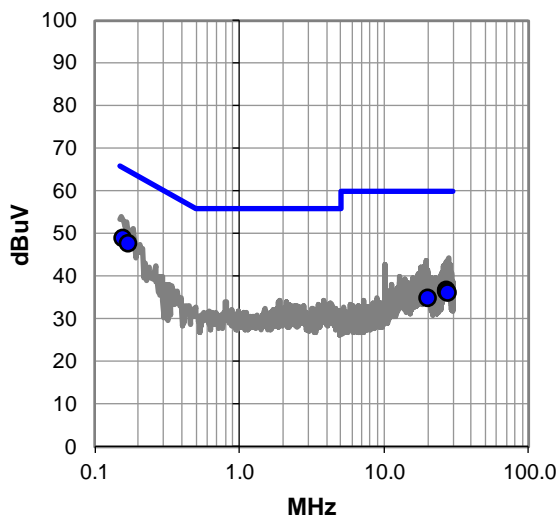
## EUT OPERATING MODES

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

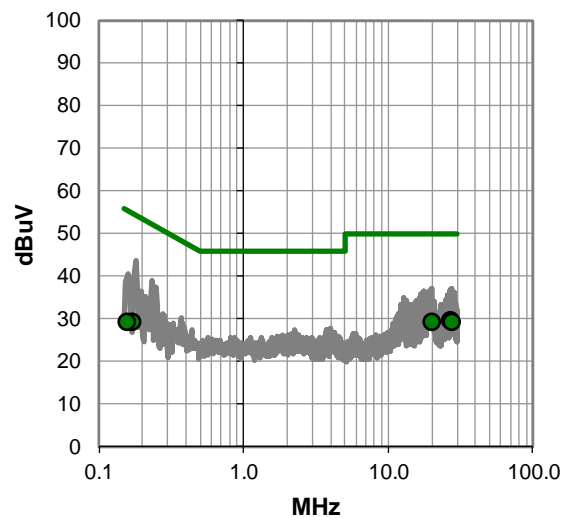
## DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



# 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
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## COMMENTS

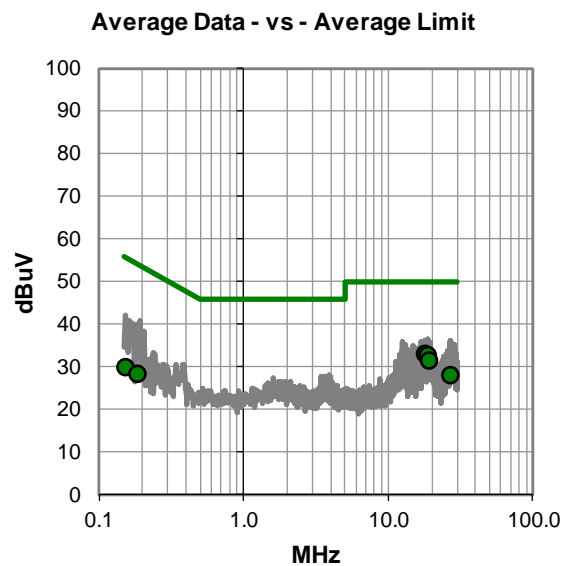
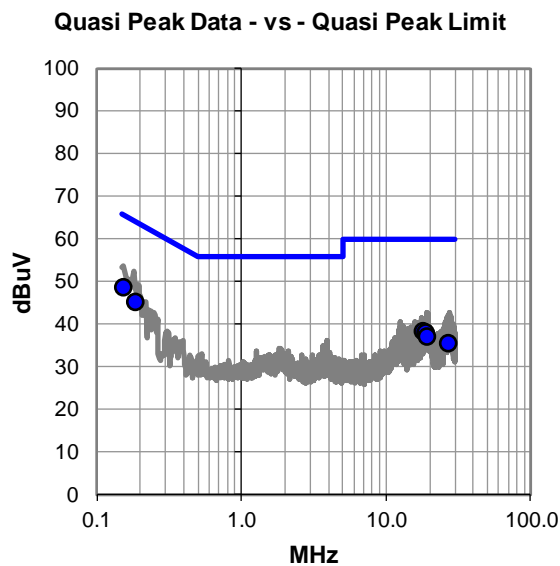
Laptop power

## 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 XMt 2017.12.13

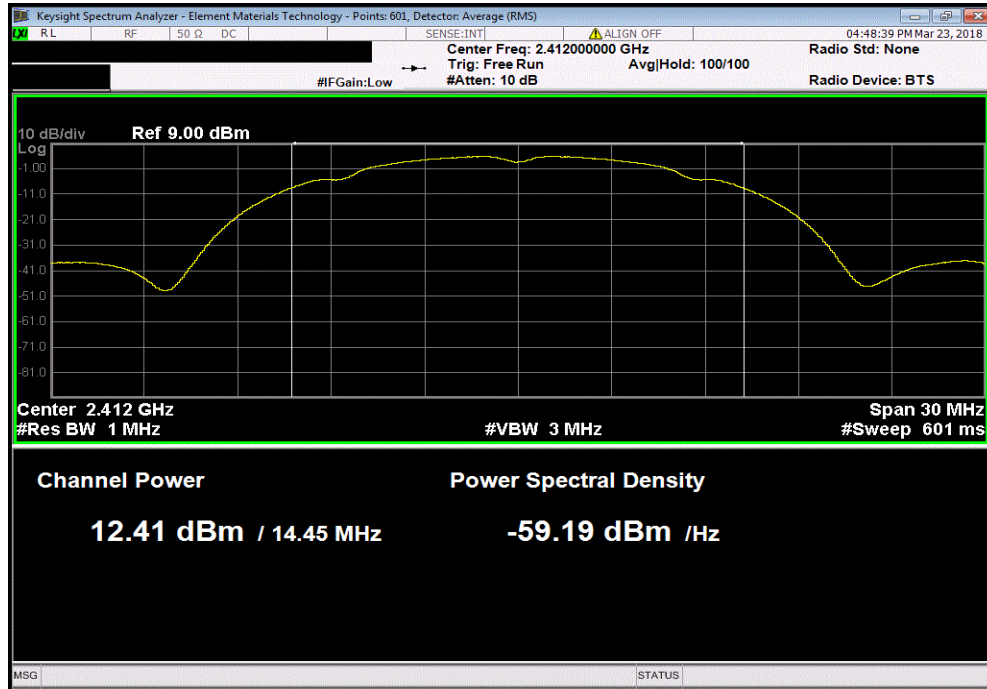
EUT: UltraTEV Plus2 (TRA-038936-00)		Work Order: ELEM0052	
Serial Number: 1201		Date: 26-Mar-18	
Customer: Element Materials Technology		Temperature: 23.3 °C	
Attendees: None		Humidity: 48% RH	
Project: None		Barometric Pres.: 1014 mbar	
Tested by: Marty Martin		Power: 110VAC/60Hz	
Job Site: TX09			
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2018		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	3	Signature <i>Marty Martin</i>	
		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
	Mid Channel 6, 2437 MHz	12.461	0.5
	High Channel 11, 2462 MHz	11.985	0.5
802.11(b) 11 Mbps			
	Low Channel 1, 2412 MHz	10.969	2.7
	Mid Channel 6, 2437 MHz	10.609	2.7
	High Channel 11, 2462 MHz	10.11	2.7
802.11(g) 6 Mbps			
	Low Channel 1, 2412 MHz	8.32	2.3
	Mid Channel 6, 2437 MHz	10.812	2.3
	High Channel 11, 2462 MHz	7.526	2.3
802.11(g) 36 Mbps			
	Low Channel 1, 2412 MHz	4.205	6.7
	Mid Channel 6, 2437 MHz	4.955	6.7
	High Channel 11, 2462 MHz	3.541	6.7
802.11(g) 54 Mbps			
	Low Channel 1, 2412 MHz	2.715	8.1
	Mid Channel 6, 2437 MHz	2.441	7.9
	High Channel 11, 2462 MHz	1.531	7.9
802.11(n) MCS0			
	Low Channel 1, 2412 MHz	8.217	2.6
	Mid Channel 6, 2437 MHz	9.805	2.5
	High Channel 11, 2462 MHz	7.501	2.5
802.11(n) MCS7			
	Low Channel 1, 2412 MHz	1.505	8
	Mid Channel 6, 2437 MHz	1.337	8.1
	High Channel 11, 2462 MHz	0.915	8.1

# OUTPUT POWER

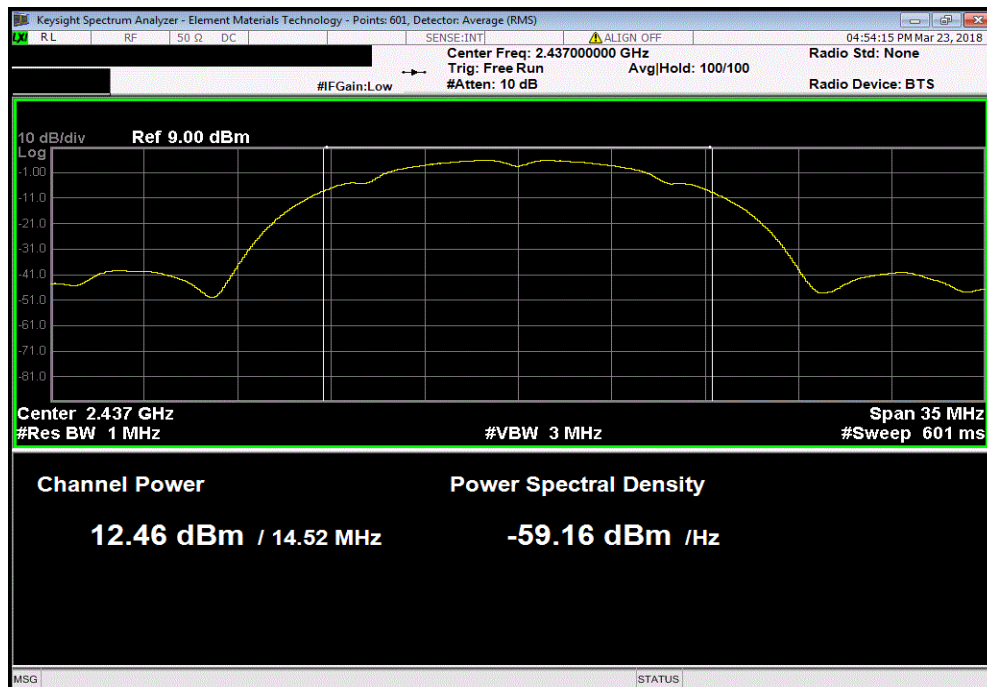


TMTx 2017.12.14 XMI 2017.12.13

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		

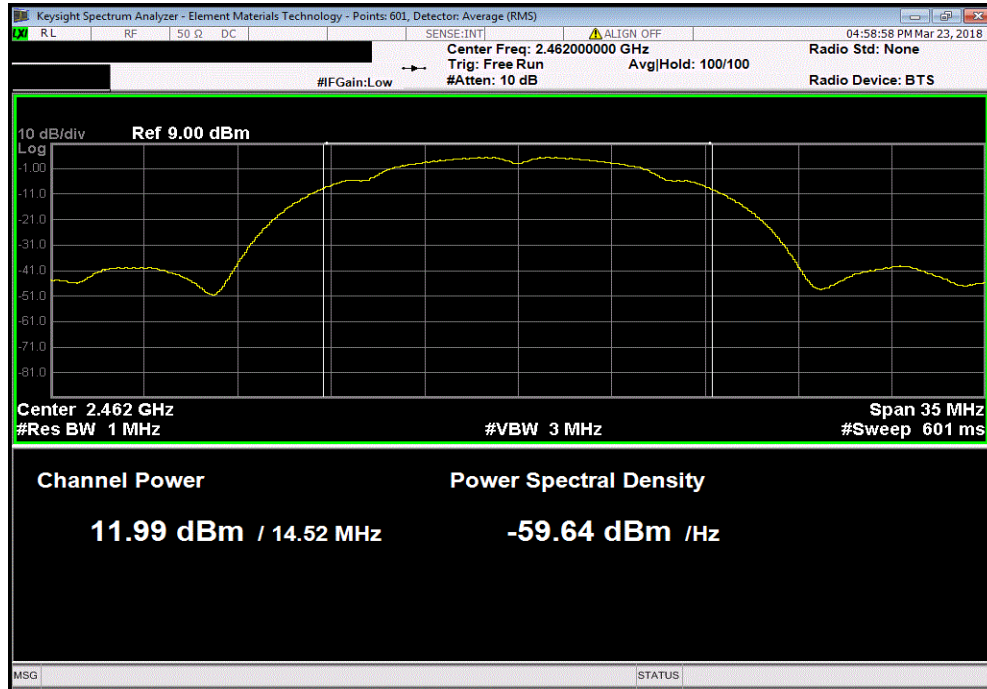


# OUTPUT POWER

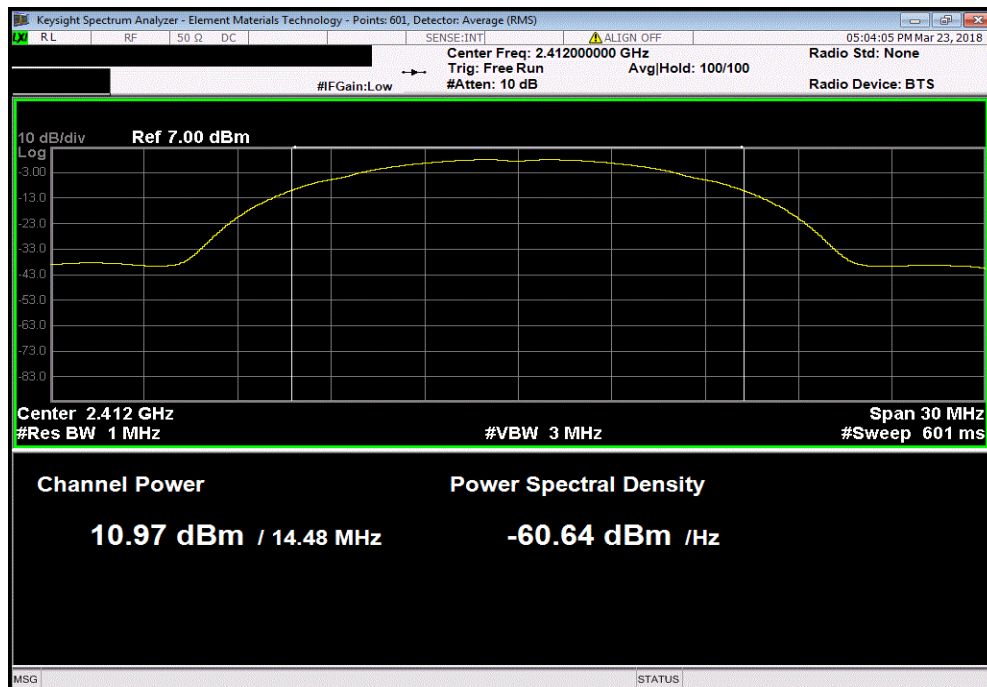


TMTx 2017.12.14 XMI 2017.12.13

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	

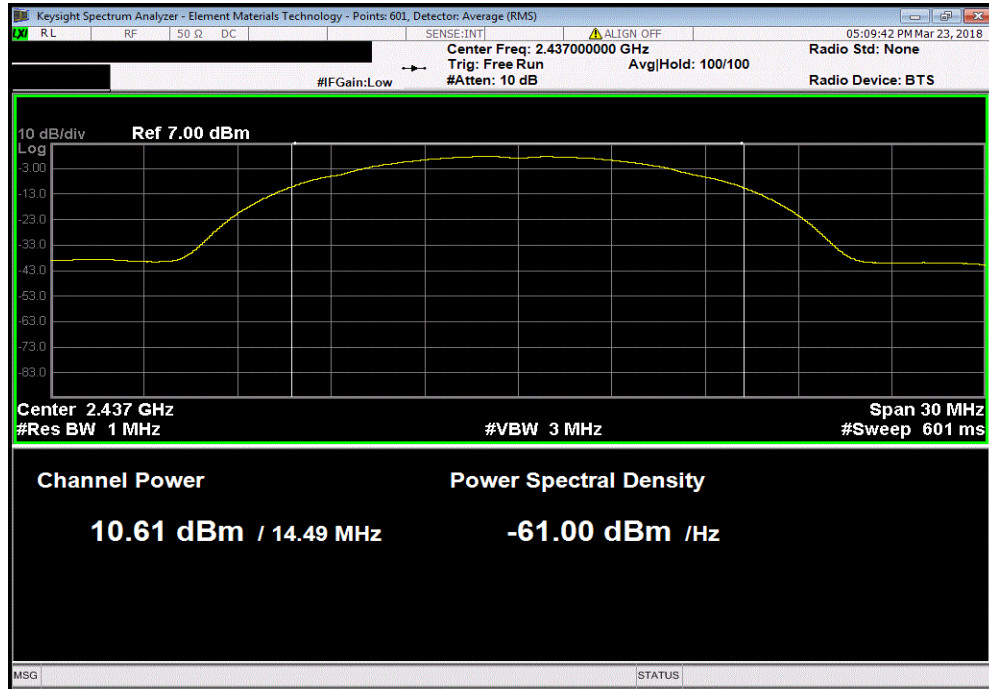


# OUTPUT POWER

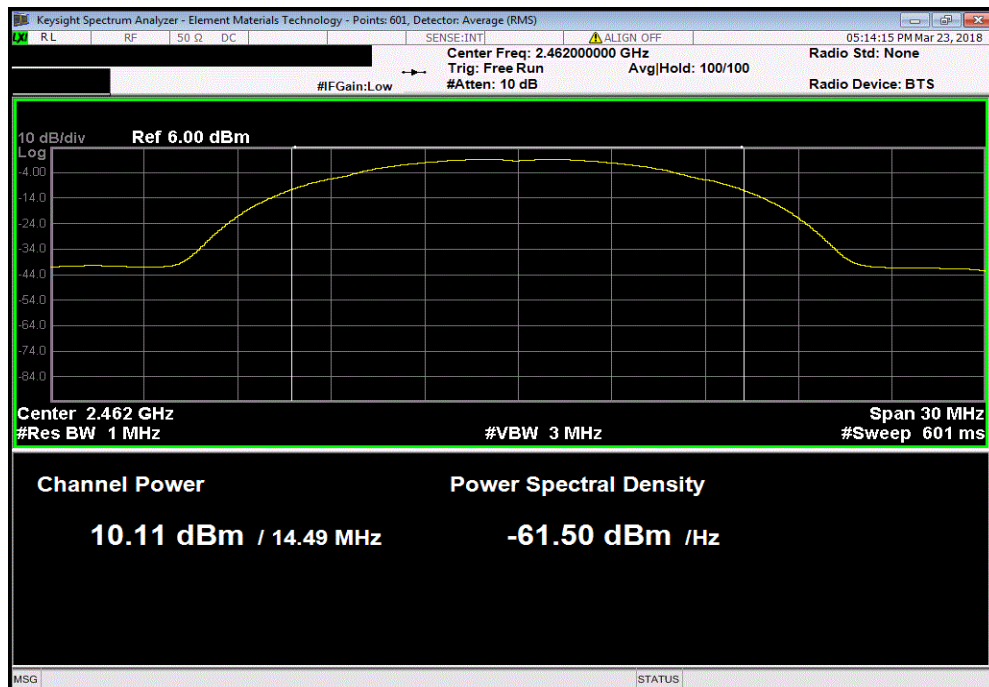


TMTx 2017.12.14 XMI 2017.12.13

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	

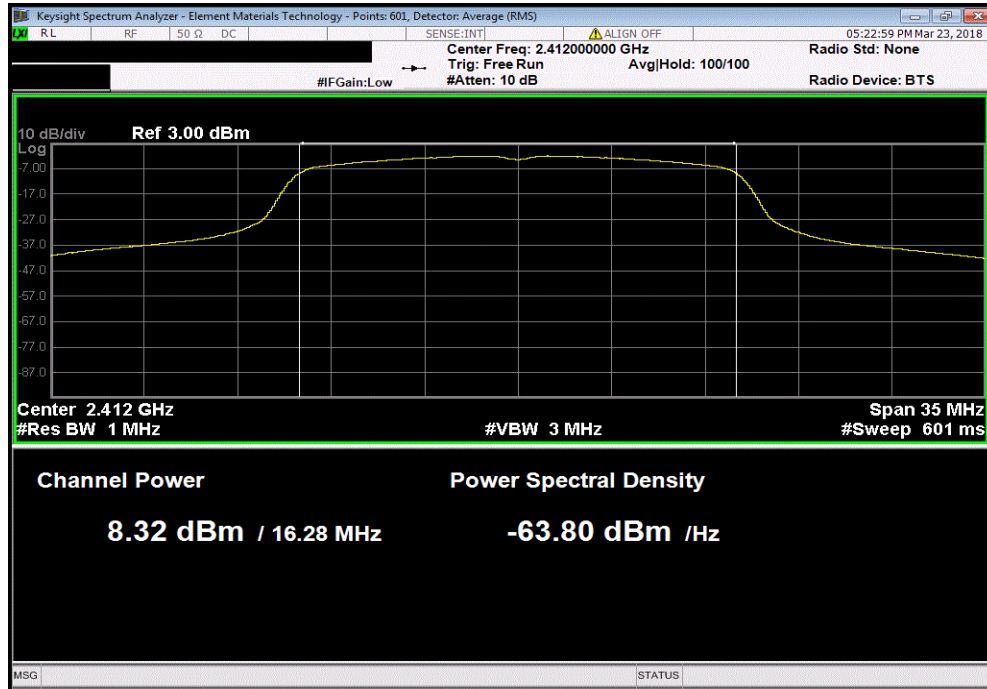


# OUTPUT POWER

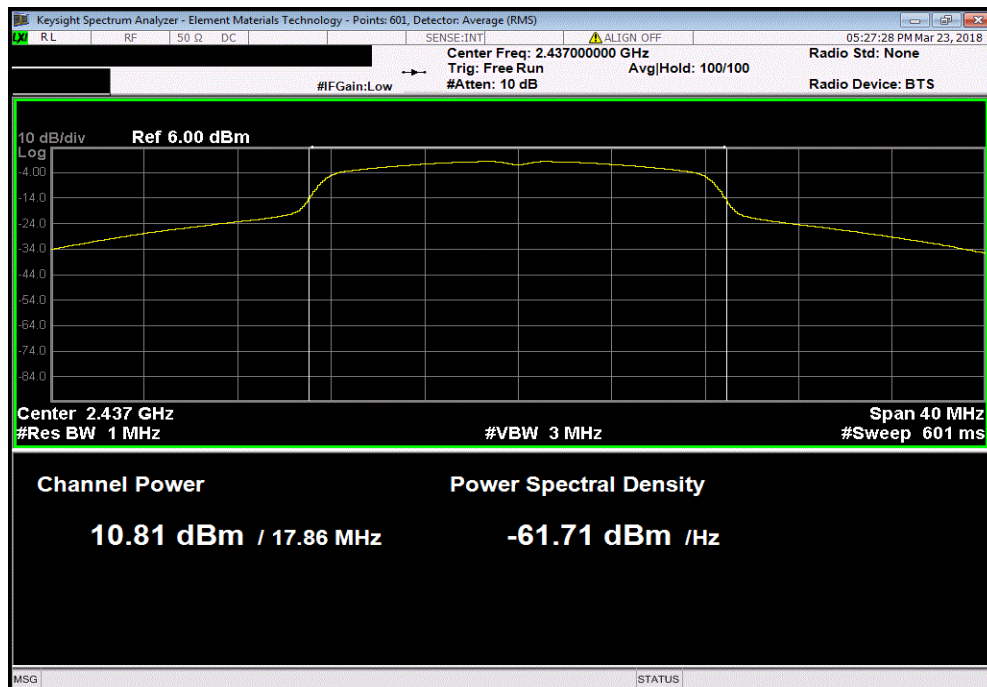


TMTx 2017.12.14 XMI 2017.12.13

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	

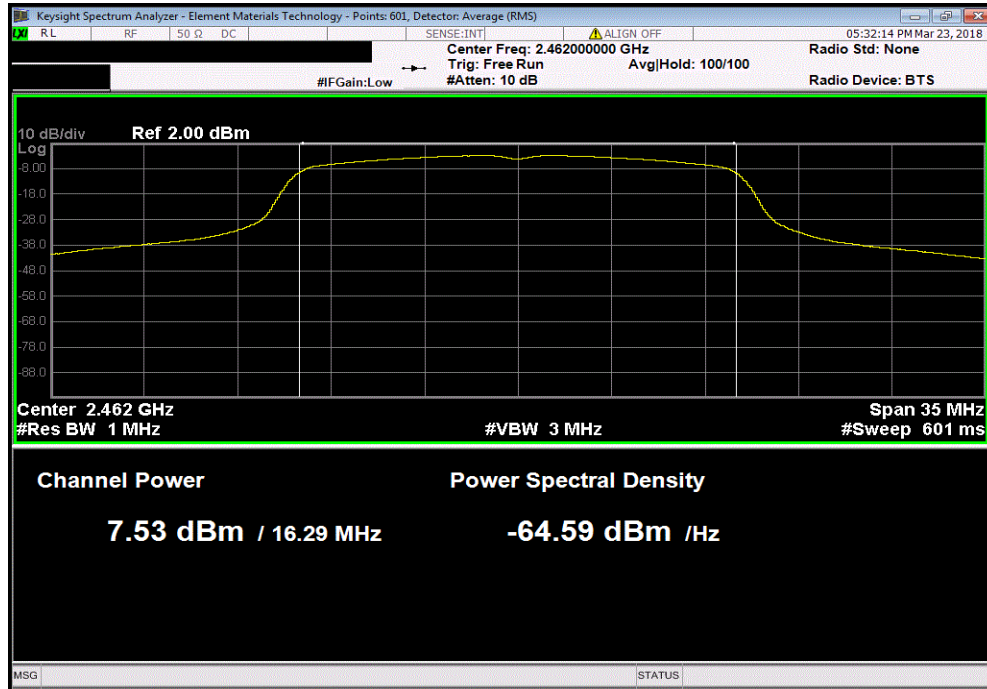


# OUTPUT POWER

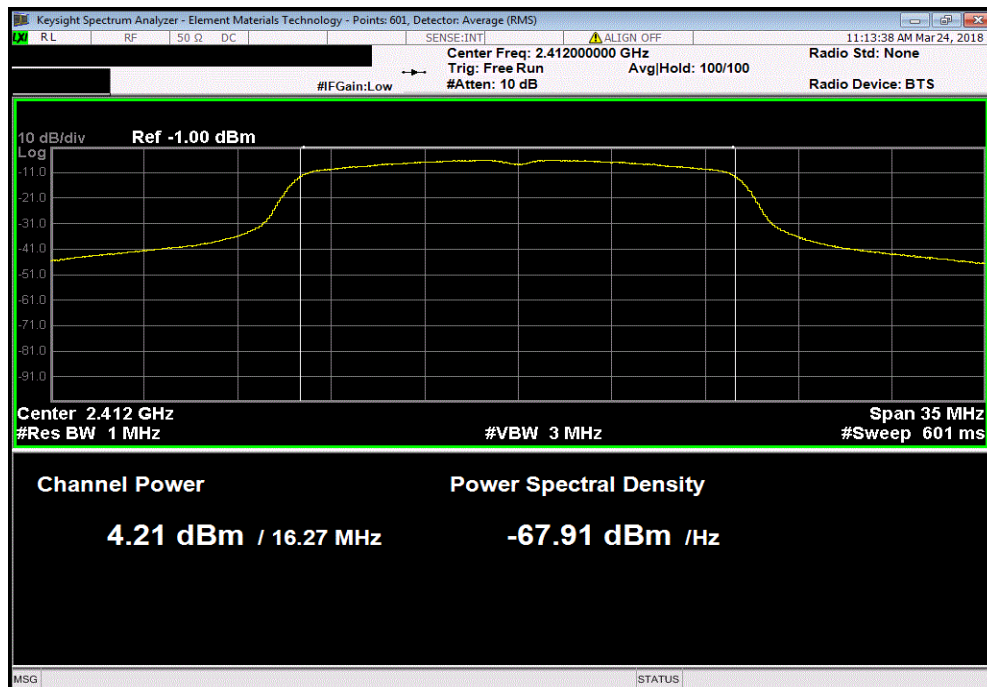


TMTx 2017.12.14 XMI 2017.12.13

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
Avg Cond	Duty Cycle		Value	Limit	Results	
Pwr (dBm)	Factor (dB)		(dBm)	(dBm)		
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	Duty Cycle		Value	Limit	Results	
Pwr (dBm)	Factor (dB)		(dBm)	(dBm)		
4.205	6.7		10.9	30	Pass	



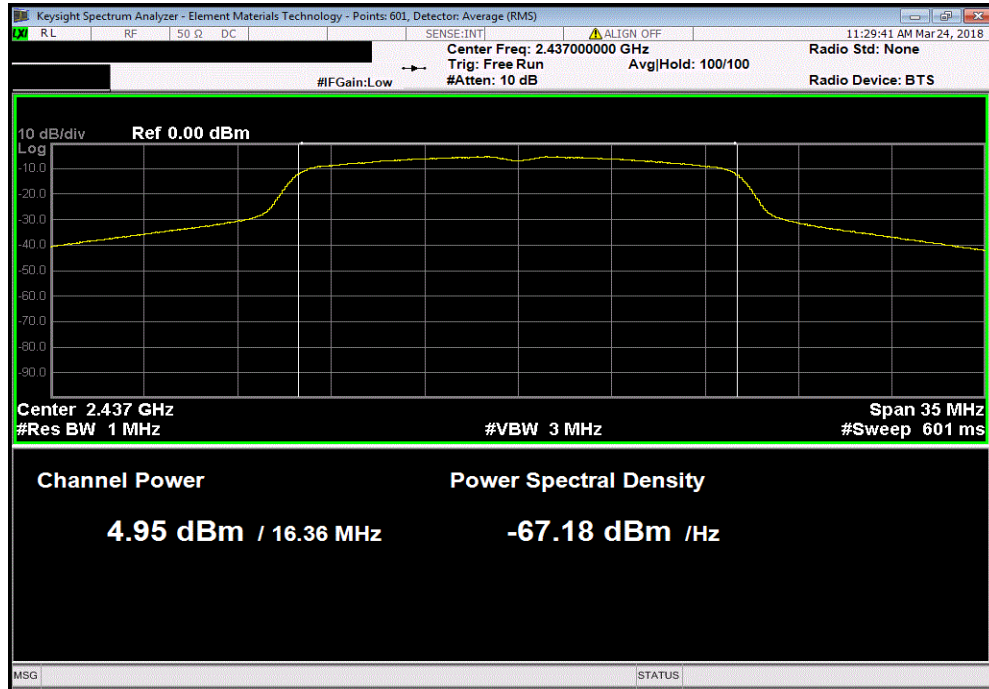


# OUTPUT POWER

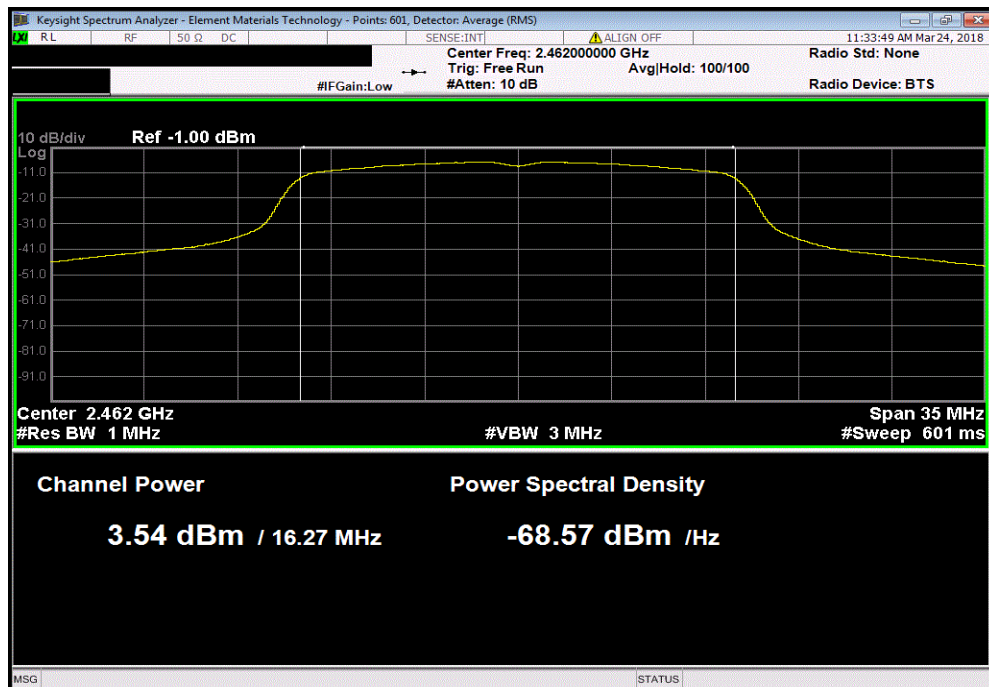


TMTx 2017.12.14 XMI 2017.12.13

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	



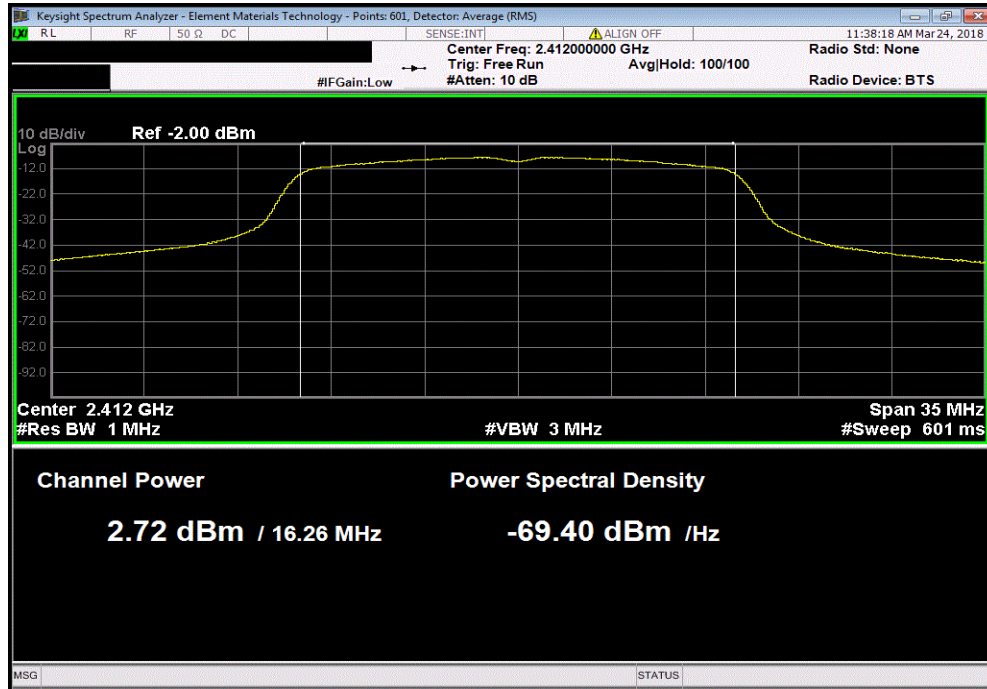


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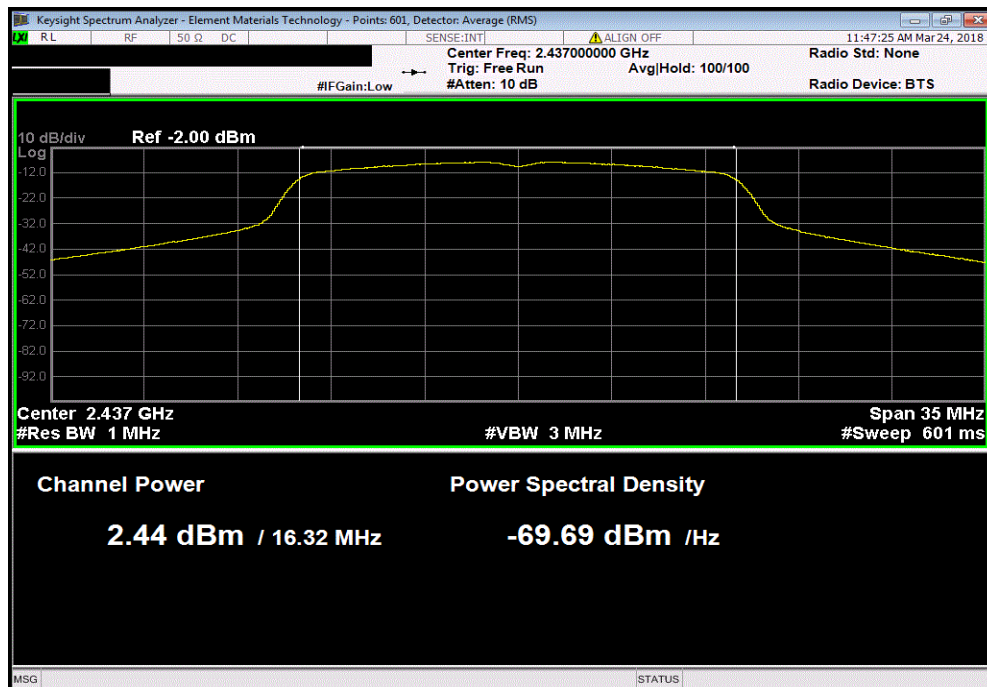


TMTx 2017.12.14 XMI 2017.12.13

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	

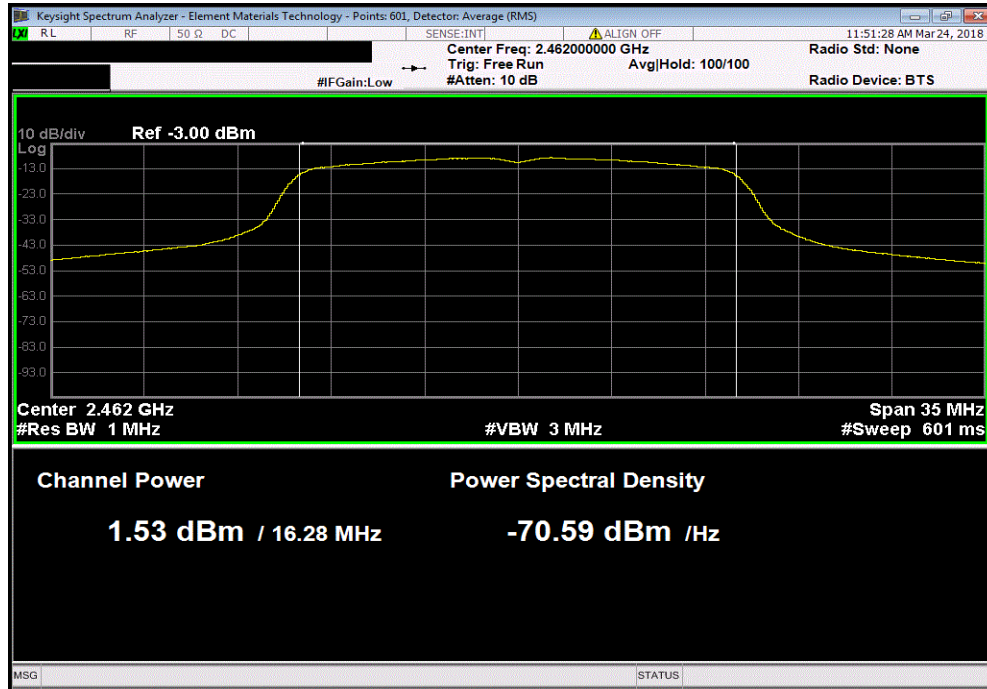


# OUTPUT POWER

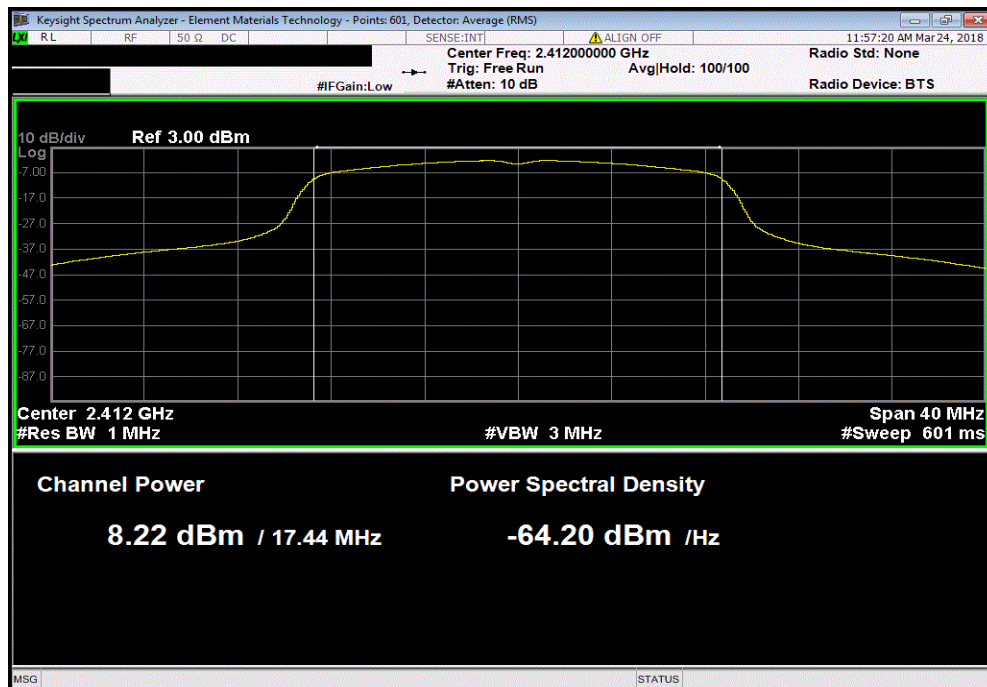


TMTx 2017.12.14 XMI 2017.12.13

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	

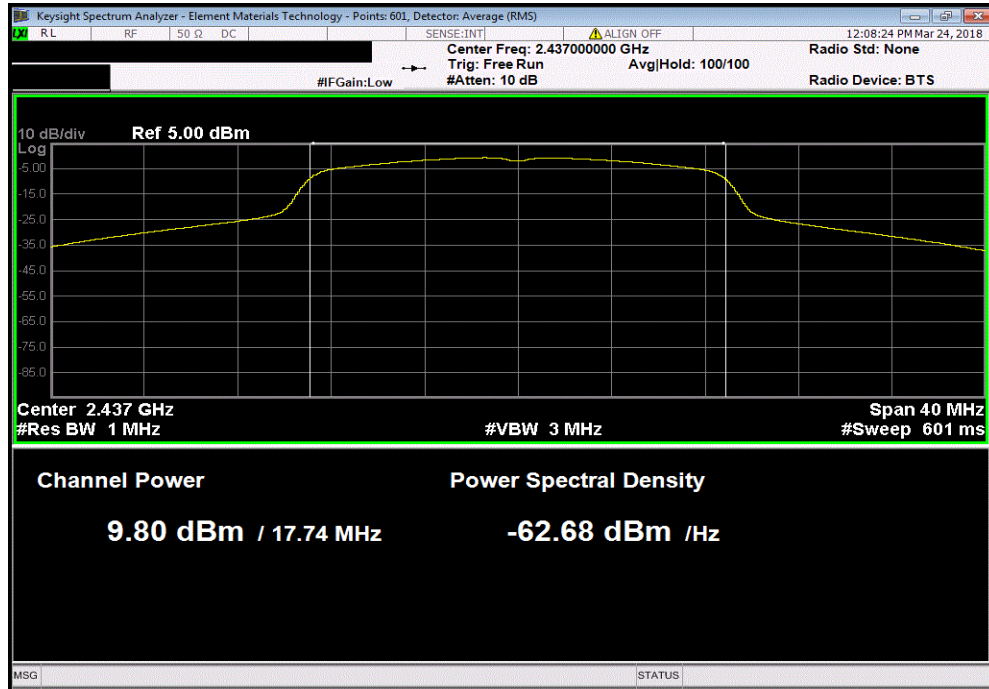


# OUTPUT POWER

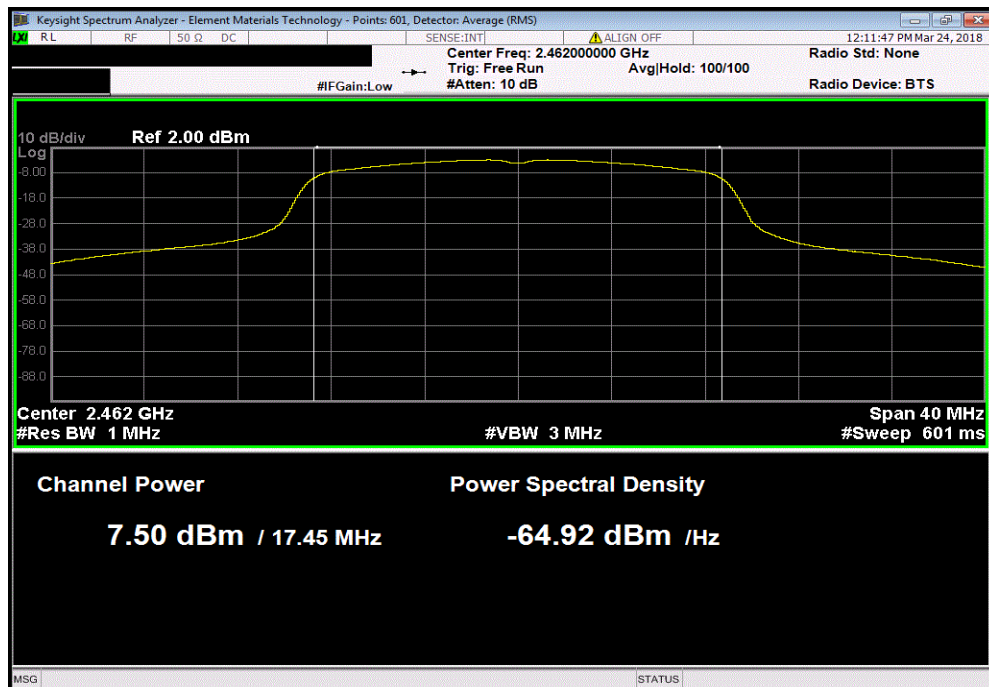


TMTx 2017.12.14 XMI 2017.12.13

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	

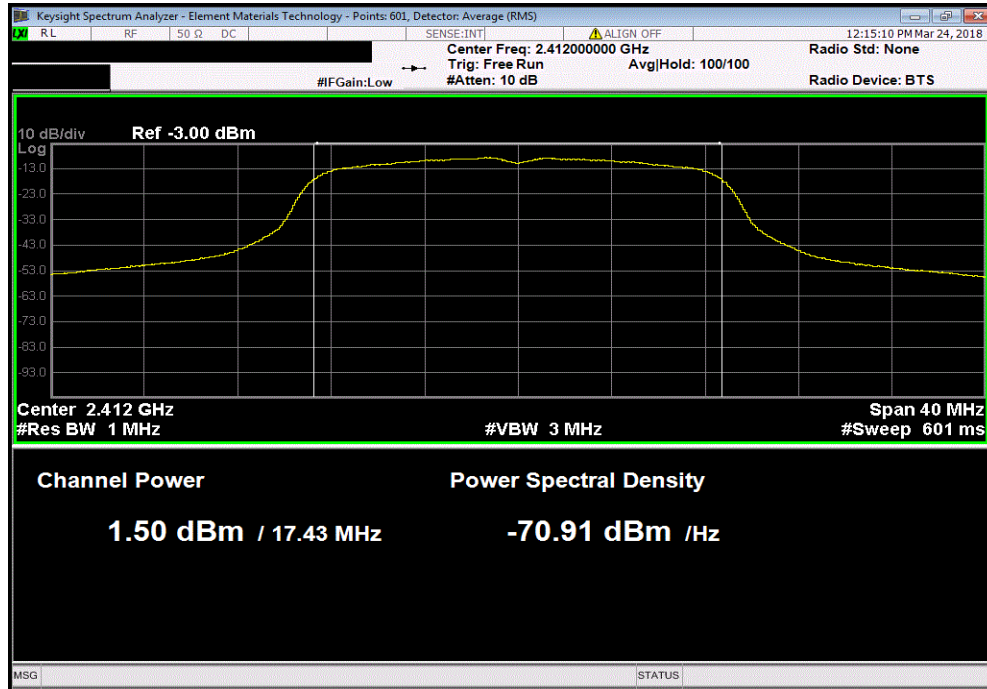


# OUTPUT POWER

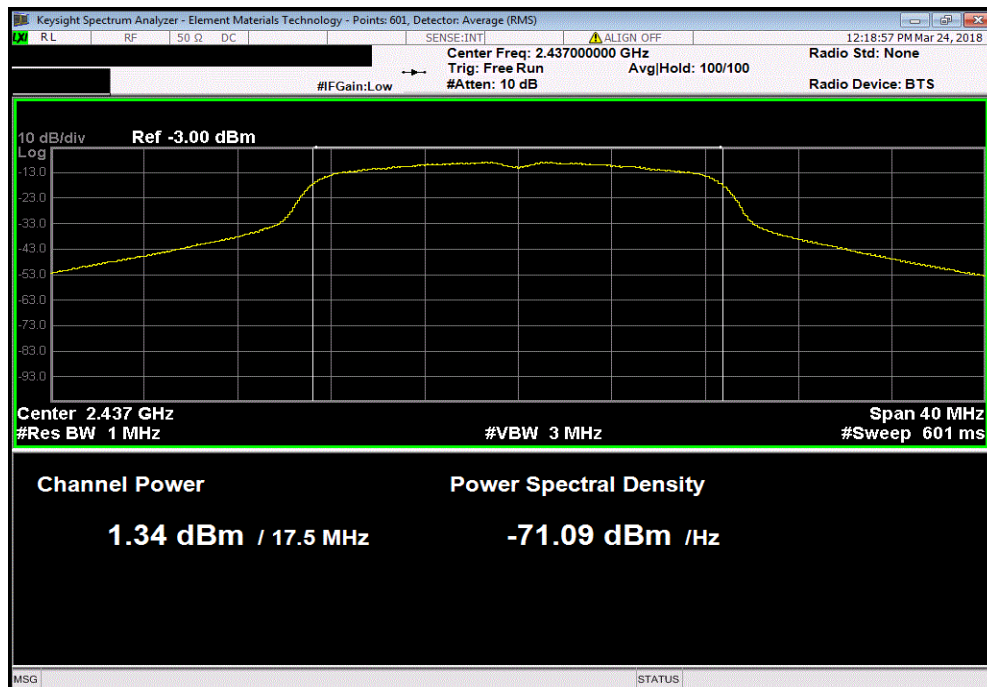


TMTx 2017.12.14 XMI 2017.12.13

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



TMTx 2017.12.14 XMI 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		

