



A-dec, Inc.

43.0536.00

FCC 15.247:2021

802.11 radio

Report: A-DE0162 Rev. 2, Issue Date: January 11, 2022



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CERTIFICATE OF TEST



Last Date of Test: January 4, 2022

A-dec, Inc.

EUT: 43.0536.00

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2021	ANSI C63.10:2013
FCC 15.247:2021	ANSI C63.10:2013, KDB 558074 D01 v05r02

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted 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	
11.12.1, 11.13.2, 6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	

Deviations From Test Standards

None

Approved By:

Kyle Holgate, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. 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
01	Updated Power Table.	2022-01-06	11
	Adding bore sighting table.	2022-01-06	9
	Updated last date of test.	2022-01-06	2, 10, 16
	Added configuration A-DE0162-8.	2022-01-06	15
	Updated with new Band Edge Compliance data.	2022-01-06	97-105
02	Corrected the date of ANSI C63.10 from 2012 to 2013. Added "D01 v05r02" to the KDB reference.	2022-01-06	2

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 - Each laboratory is accredited by A2LA to ISO / IEC 17025, and as a product certifier to ISO / IEC 17065 which allows Element to certify transmitters to FCC and IC specifications.

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

European Union

European Commission – Recognized as an EU Notified Body validated for the EMCD and RED Directives.

United Kingdom

BEIS – Recognized by the UK as an Approved Body under the UK Radio Equipment and UK EMC Regulations.

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:

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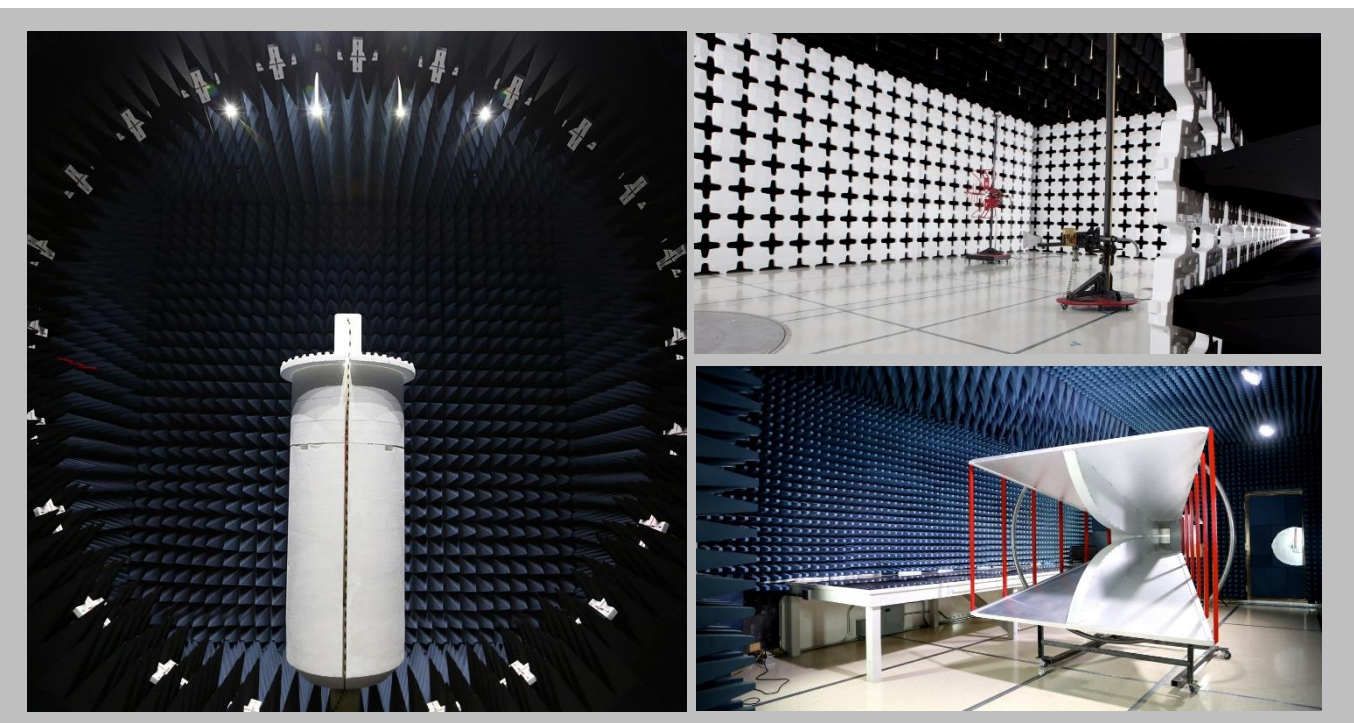
[Texas](#)

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FACILITIES



California Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-11 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	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
A2LA				
Lab Code: 3310.04	Lab Code: 3310.05	Lab Code: 3310.02	Lab Code: 3310.03	Lab Code: 3310.06
Innovation, Science and Economic Development Canada				
2834B-1, 2834B-3	2834E-1, 2834E-3	2834D-1	2834G-1	2834F-1
BSMI				
SL2-IN-E-1154R	SL2-IN-E-1152R	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI				
A-0029	A-0109	A-0108	A-0201	A-0110
Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA				
US0158	US0175	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 in the table below. A lab specific value may also be found in the applicable test description section. 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	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	1.2 dB	-1.2 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)	2.6 dB	-2.6 dB

TEST SETUP BLOCK DIAGRAMS

Measurement Bandwidths

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Unless otherwise stated, measurements were made using the bandwidths and detectors specified. No video filter was used.

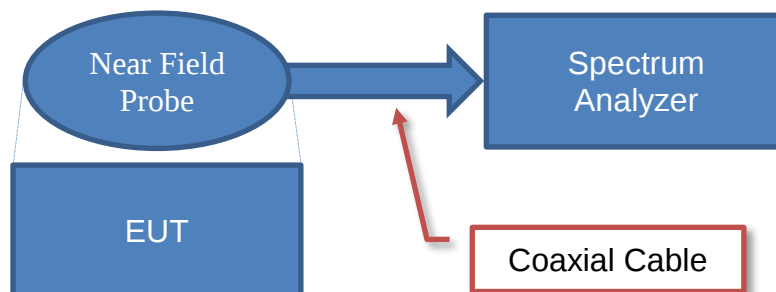
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

Near Field Test Fixture Measurements

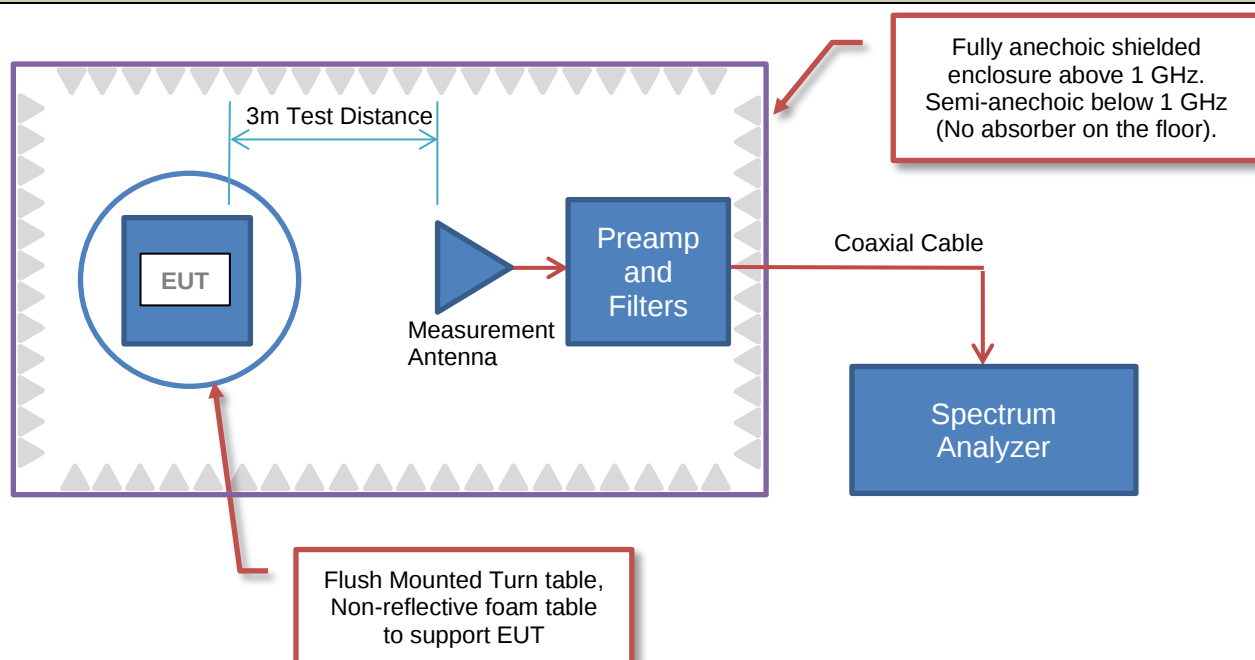


Sample Calculation (logarithmic units)

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

TEST SETUP BLOCK DIAGRAMS

Emissions Measurements



Sample Calculation (logarithmic units)

Radiated Emissions:

Measured Level (Amplitude)	Factor			Distance Adjustment Factor	External Attenuation	Field Strength
	Antenna Factor	Cable Factor	Amplifier Gain			
42.6	28.6	3.1	40.8	0.0	0.0	33.5

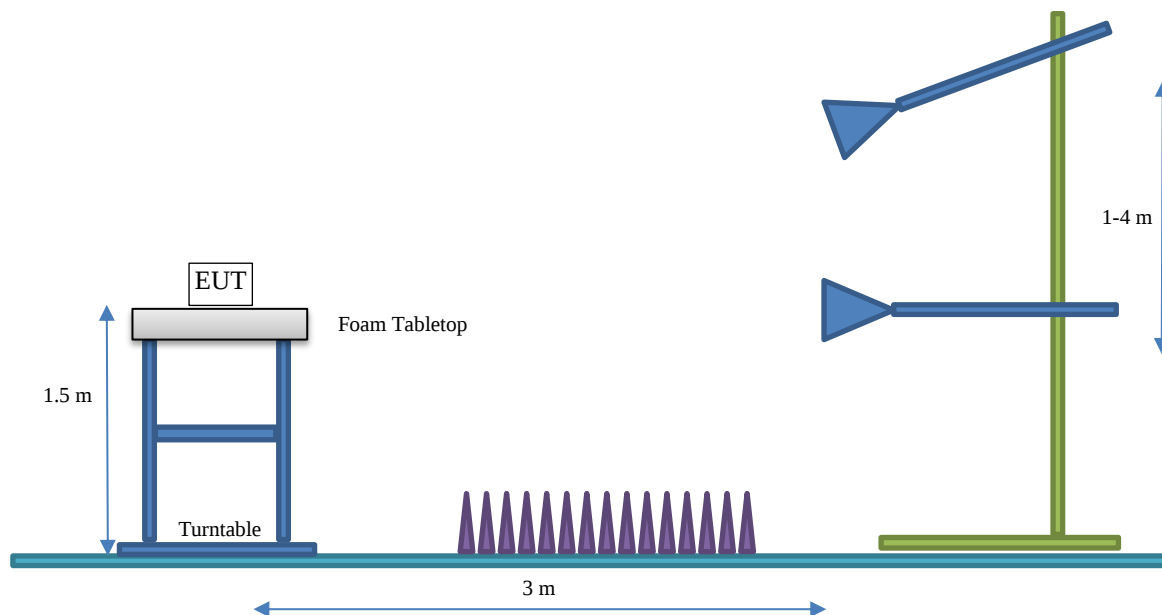
Conducted Emissions:

Measured Level (Amplitude)	Factor		External Attenuation	Adjusted Level
	Transducer Factor	Cable Factor		
26.7	0.3	0.1	20.0	47.1

TEST SETUP BLOCK DIAGRAMS

Bore Sighting (>1GHz)

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.



PRODUCT DESCRIPTION



Client and Equipment Under Test (EUT) Information

Company Name:	A-dec, Inc.
Address:	2601 Crestview Dr Building 4
City, State, Zip:	Newberg, OR 97132-9528
Test Requested By:	Russell Perkins
EUT:	43.0536.00
First Date of Test:	June 25, 2021
Last Date of Test:	January 4, 2022
Receipt Date of Samples:	June 25, 2021
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Bluetooth, Bluetooth LE and 802.11 radio module
Testing Objective:
To demonstrate compliance of the 802.11 radio under FCC 15.247 for operation in the 2.4 GHz band.

POWER SETTINGS AND ANTENNAS



The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information.

ANTENNA GAIN (dBi)

Type	Provided by:	Frequency Range (MHz)	Gain (dBi)
Ceramic Chip	Manufacturer	2400 - 2500	2.2

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

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Type	Data Rate	Channel Bandwidths	Channel	Position	Frequency (MHz)	Power Setting
802.11b DSSS/CCK	1 Mbps	20	1	Low Channel	2412	12.5
			6	Mid Channel	2437	12.5
			11	High Channel	2462	12.5
	11 Mbps	20	1	Low Channel	2412	12.5
			6	Mid Channel	2437	12.5
			11	High Channel	2462	12.5
802.11g OFDM	6 Mbps	20	1	Low Channel	2412	13
			6	Mid Channel	2437	13
			11	High Channel	2462	13
	36 Mbps	20	1	Low Channel	2412	13
			6	Mid Channel	2437	13
			11	High Channel	2462	13
	54 Mbps	20	1	Low Channel	2412	13
			6	Mid Channel	2437	13
			11	High Channel	2462	13
802.11n OFDM	MCS0	20	1	Low Channel	2412	12
			6	Mid Channel	2437	12
			11	High Channel	2462	12
	MCS7	20	1	Low Channel	2412	12
			6	Mid Channel	2437	12
			11	High Channel	2462	12

CONFIGURATIONS



Configuration A-DE0162- 1

Software/Firmware Running during test	
Description	Version
Teraterm	4.105
Murata Test Firmware	None

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Bluetooth and WiFi Module	A-dec, Inc.	43.0536.00	SN001 00003

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Switching Power Supply	Total Power	TMPU130-108 (P00B)	2015017188
Laptop	Dell	Latitude 740	7437666170
Host PCB	A-dec, Inc.	43.0528.00 Rev 2	528P068188

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power	No	0.2	No	Switching Power Supply	Host PCB
AC Power	No	2.0	No	AC Mains	Switching Power Supply
FTDI to USB	No	2.0	No	Laptop	Host PCB

CONFIGURATIONS



Configuration A-DE0162- 2

Software/Firmware Running during test					
Description				Version	
Teraterm				4.105	
Murata Test Firmware				None	

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Bluetooth and WiFi Module	A-dec, Inc.	43.0536.00	SN001 00004

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Switching Power Supply	Total Power	TMPU130-108 (P00B)	2015017188
Host PCB	A-dec, Inc.	43.0528.00 Rev 2	528P068188

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop	Dell	Latitude 740	7437666170

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	2.0	No	AC Mains	Switching Power Supply
FTDI to USB	No	2.0	No	Laptop	Host PCB
DC Power	No	2.7	No	Switching Power Supply	Host PCB

CONFIGURATIONS



Configuration A-DE0162- 7

Software/Firmware Running during test	
Description	Version
Teraterm	4.105
Murata Test Firmware	None

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Bluetooth and WiFi Module	A-dec, Inc.	43.0536.00	SN001 00004

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Host PCB	A-dec, Inc.	43.0528.00 Rev 2	528P068188

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop	Dell	Latitude 740	7437666170

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power	No	1.0	No	Host PCB	DC Mains
DC Power	No	2.7	No	Host PCB	Linear DC Power Supply

CONFIGURATIONS



Configuration A-DE0162- 8

Software/Firmware Running during test	
Description	Version
Teraterm	4.105
Murata Test Firmware	None

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Bluetooth and WiFi Module	A-dec, Inc.	43.0536.00	SN001 00001

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Host PCB	A-dec, Inc.	43.0528.00 Rev 2	528P068188
Switching Power Supply	Total Power	TMPU130-108 (P00B)	2015017188

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Desktop	Lenovo	Thinkcenter	1150B66239ZV37DZ24M0HS

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power	No	1.0	No	Host PCB	DC Power Supply
DC Power	No	2.7	No	Host PCB	Switching Power Supply
FTDI to USB	No	2.0	No	Desktop	Host PCB

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2021-06-25	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.
2	2021-06-25	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.
3	2021-06-28	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	2021-06-28	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.
5	2021-06-28	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.
6	2021-06-28	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
7	2021-07-01	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.
8	2021-10-19	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
9	2022-01-04	Band Edge Compliance	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	Gauss Instruments	TDEMI 30M	ARN	2021-04-06	2022-04-06
Cable - Conducted Cable Assembly	Northwest EMC	EVG, HHD, RKT	EVGA	2021-01-05	2022-01-05
LISN	Solar Electronics	9252-50-R-24-BNC	LIR	2021-09-10	2022-09-10
LISN	Solar Electronics	9252-50-R-24-BNC	LIN	2021-01-08	2022-01-08
Power Supply - DC	Topward	TPS-2000	TPD	NCR	NCR

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.6 dB	-2.6 dB

CONFIGURATIONS INVESTIGATED

A-DE0162-7

MODES INVESTIGATED

802.11bgn, Tx, Ch. 6 = 2437 MHz, 1 Mbps

POWERLINE CONDUCTED EMISSIONS

EUT:	43.0536.00	Work Order:	A-DE0162
Serial Number:	SN001 00004	Date:	2021-10-19
Customer:	A-dec, Inc.	Temperature:	22.8°C
Attendees:	None	Relative Humidity:	40%
Customer Project:	None	Bar. Pressure:	1013 mb
Tested By:	Jeff Alcock	Job Site:	EV07
Power:	3.3 VDC via 110VAC/60Hz	Configuration:	A-DE0162-7

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	1	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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COMMENTS

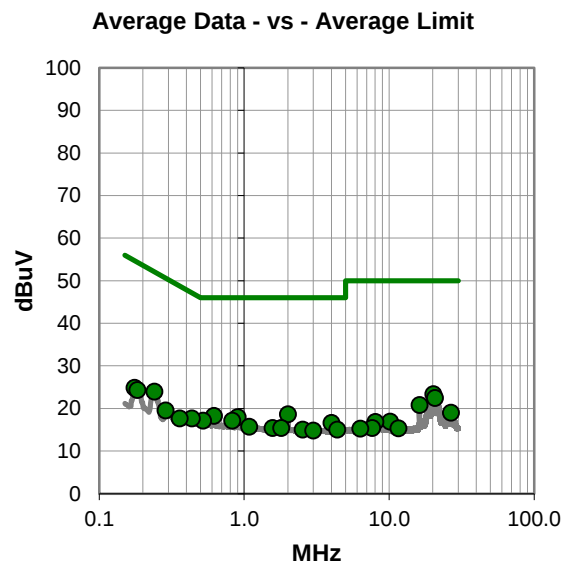
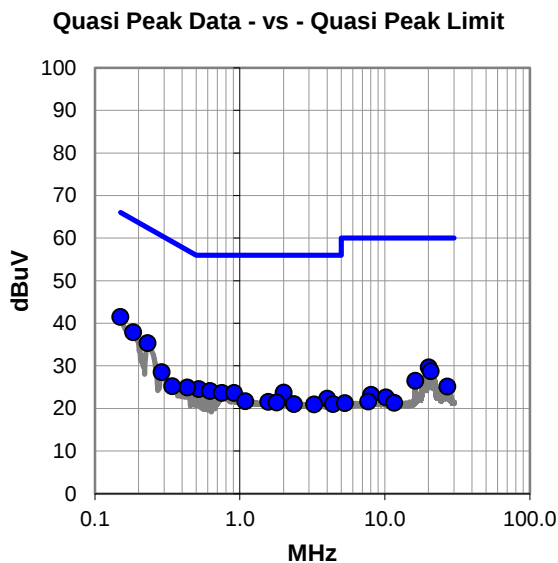
Measuring AC Mains of linear DC lab power supply.

EUT OPERATING MODES

802.11bgn, Tx, Ch. 6 = 2437 MHz, 1 Mbps

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #1

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.150	21.4	20.1	41.5	66.0	-24.5
0.184	17.8	20.1	37.9	64.3	-26.4
0.231	15.2	20.1	35.3	62.4	-27.1
20.143	8.9	20.7	29.6	60.0	-30.4
20.706	7.9	20.8	28.7	60.0	-31.3
0.521	4.5	20.0	24.5	56.0	-31.5
0.621	4.1	20.0	24.1	56.0	-31.9
0.289	8.5	20.0	28.5	60.6	-32.1
2.010	3.7	20.0	23.7	56.0	-32.3
0.434	4.9	20.0	24.9	57.2	-32.3
0.751	3.6	20.0	23.6	56.0	-32.4
0.914	3.6	20.0	23.6	56.0	-32.4
16.227	5.9	20.6	26.5	60.0	-33.5
4.021	2.3	20.0	22.3	56.0	-33.7
0.342	5.2	20.0	25.2	59.1	-33.9
1.088	1.7	20.0	21.7	56.0	-34.3
1.572	1.5	20.0	21.5	56.0	-34.5
1.798	1.4	20.0	21.4	56.0	-34.6
26.992	4.0	21.1	25.1	60.0	-34.9
2.367	1.0	20.0	21.0	56.0	-35.0
4.390	1.0	20.0	21.0	56.0	-35.0
3.264	0.9	20.0	20.9	56.0	-35.1
8.045	3.0	20.2	23.2	60.0	-36.8
10.153	2.4	20.2	22.6	60.0	-37.4
7.709	1.4	20.2	21.6	60.0	-38.4

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
20.205	2.6	20.7	23.3	50.0	-26.7
2.010	-1.4	20.0	18.6	46.0	-27.4
20.706	1.6	20.8	22.4	50.0	-27.6
0.620	-1.8	20.0	18.2	46.0	-27.8
0.902	-2.1	20.0	17.9	46.0	-28.1
0.240	3.8	20.1	23.9	52.1	-28.2
0.522	-2.9	20.0	17.1	46.0	-28.9
0.831	-2.9	20.0	17.1	46.0	-28.9
16.229	0.2	20.6	20.8	50.0	-29.2
4.021	-3.4	20.0	16.6	46.0	-29.4
0.437	-2.4	20.0	17.6	47.1	-29.5
0.176	4.7	20.1	24.8	54.7	-29.9
0.184	4.2	20.1	24.3	54.3	-30.0
1.087	-4.3	20.0	15.7	46.0	-30.3
1.572	-4.6	20.0	15.4	46.0	-30.6
1.802	-4.6	20.0	15.4	46.0	-30.6
2.542	-5.0	20.0	15.0	46.0	-31.0
4.392	-5.0	20.0	15.0	46.0	-31.0
26.772	-2.1	21.1	19.0	50.0	-31.0
0.287	-0.5	20.0	19.5	50.6	-31.1
0.359	-2.4	20.0	17.6	48.8	-31.2
2.994	-5.2	20.0	14.8	46.0	-31.2
10.153	-3.3	20.2	16.9	50.0	-33.1
8.037	-3.4	20.2	16.8	50.0	-33.2
7.640	-4.8	20.2	15.4	50.0	-34.6

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	43.0536.00	Work Order:	A-DE0162
Serial Number:	SN001 00004	Date:	2021-10-19
Customer:	A-dec, Inc.	Temperature:	22.8°C
Attendees:	None	Relative Humidity:	40%
Customer Project:	None	Bar. Pressure:	1013 mb
Tested By:	Jeff Alcock	Job Site:	EV07
Power:	3.3 VDC via 110VAC/60Hz	Configuration:	A-DE0162-7

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2021	ANSI C63.10:2013

TEST PARAMETERS

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

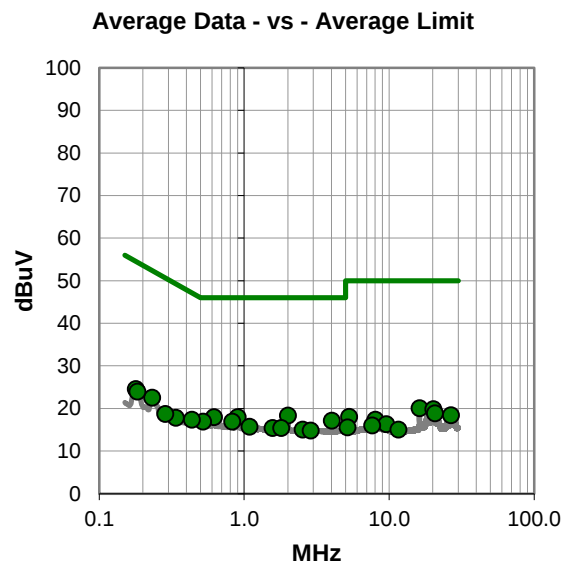
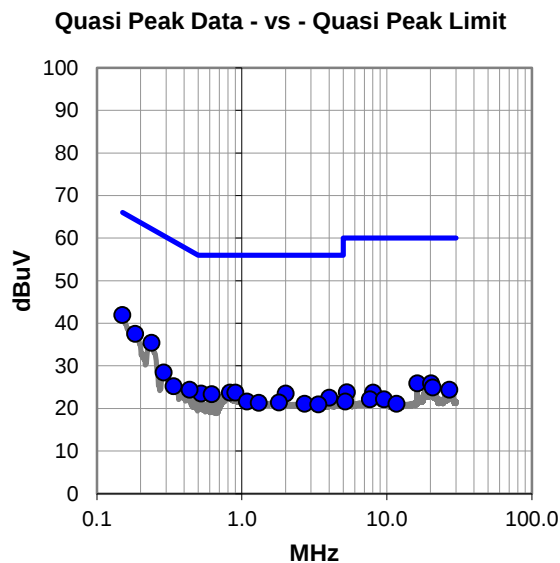
Measuring AC Mains of linear DC lab power supply.

EUT OPERATING MODES

802.11bgn, Tx, Ch. 6 = 2437 MHz, 1 Mbps

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #2

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.150	21.8	20.1	41.9	66.0	-24.1
0.238	15.3	20.1	35.4	62.1	-26.7
0.184	17.4	20.1	37.5	64.3	-26.8
0.289	8.4	20.0	28.4	60.6	-32.2
0.829	3.7	20.0	23.7	56.0	-32.3
0.902	3.7	20.0	23.7	56.0	-32.3
0.524	3.5	20.0	23.5	56.0	-32.5
2.011	3.5	20.0	23.5	56.0	-32.5
0.437	4.4	20.0	24.4	57.1	-32.7
0.620	3.3	20.0	23.3	56.0	-32.7
4.018	2.5	20.0	22.5	56.0	-33.5
0.338	5.2	20.0	25.2	59.3	-34.1
16.227	5.3	20.6	25.9	60.0	-34.1
20.205	5.2	20.7	25.9	60.0	-34.1
1.082	1.6	20.0	21.6	56.0	-34.4
1.801	1.4	20.0	21.4	56.0	-34.6
1.313	1.3	20.0	21.3	56.0	-34.7
2.706	1.1	20.0	21.1	56.0	-34.9
3.373	0.9	20.0	20.9	56.0	-35.1
20.706	4.1	20.8	24.9	60.0	-35.1
26.990	3.3	21.1	24.4	60.0	-35.6
5.300	3.6	20.2	23.8	60.0	-36.2
8.043	3.5	20.2	23.7	60.0	-36.3
7.665	1.9	20.2	22.1	60.0	-37.9
9.584	1.9	20.2	22.1	60.0	-37.9

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
2.011	-1.7	20.0	18.3	46.0	-27.7
0.620	-2.1	20.0	17.9	46.0	-28.1
0.902	-2.1	20.0	17.9	46.0	-28.1
4.022	-2.9	20.0	17.1	46.0	-28.9
0.522	-3.1	20.0	16.9	46.0	-29.1
0.831	-3.1	20.0	16.9	46.0	-29.1
0.232	2.4	20.1	22.5	52.4	-29.9
0.435	-2.7	20.0	17.3	47.2	-29.9
0.179	4.4	20.1	24.5	54.5	-30.0
16.227	-0.6	20.6	20.0	50.0	-30.0
20.205	-0.9	20.7	19.8	50.0	-30.2
1.088	-4.3	20.0	15.7	46.0	-30.3
0.184	3.8	20.1	23.9	54.3	-30.4
1.571	-4.6	20.0	15.4	46.0	-30.6
1.802	-4.6	20.0	15.4	46.0	-30.6
2.542	-5.0	20.0	15.0	46.0	-31.0
2.886	-5.2	20.0	14.8	46.0	-31.2
20.706	-2.0	20.8	18.8	50.0	-31.2
0.338	-2.2	20.0	17.8	49.3	-31.5
26.774	-2.7	21.1	18.4	50.0	-31.6
0.286	-1.3	20.0	18.7	50.6	-31.9
5.300	-2.2	20.2	18.0	50.0	-32.0
8.040	-2.9	20.2	17.3	50.0	-32.7
9.584	-3.9	20.2	16.3	50.0	-33.7
7.665	-4.2	20.2	16.0	50.0	-34.0

CONCLUSION

Pass



Tested By

DUTY CYCLE



XMIT 2020.12.30.0

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
Generator - Signal	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2021-04-08	2022-04-08

TEST DESCRIPTION

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



TSTx 2021.03.19.1 XMR 2020.12.30.0

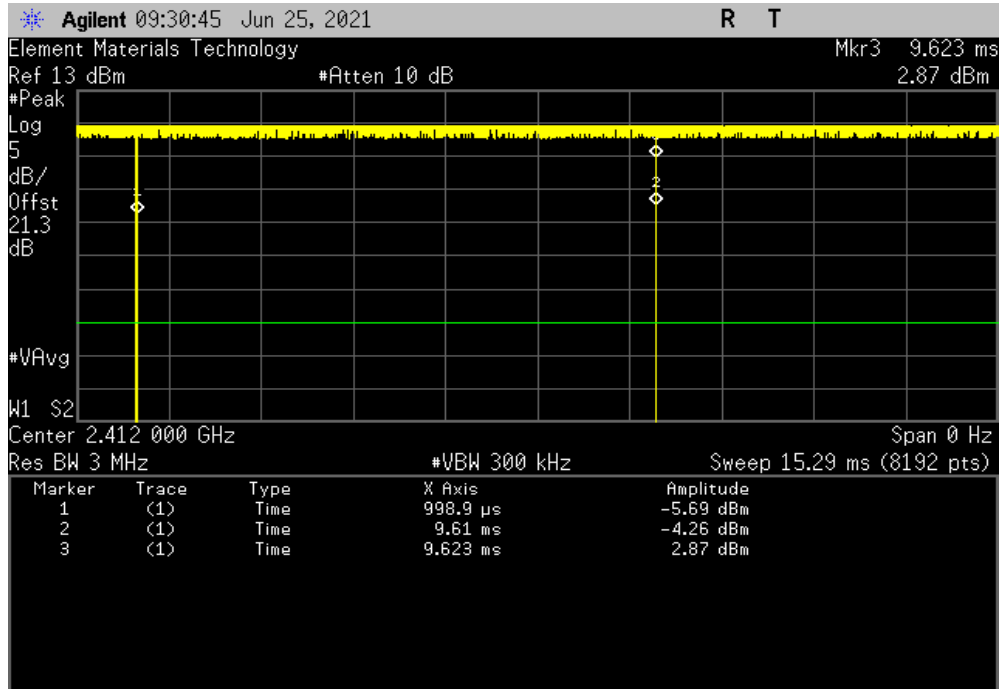
EUT: 43.0536.00			Work Order: A-DE0162				
Serial Number: SN001 00003			Date: 25-Jun-21				
Customer: A-dec, Inc.			Temperature: 24.1 °C				
Attendees: Zack Lyda and Spencer Warenke			Humidity: 48.3% RH				
Project: None			Barometric Pres.: 1008 mbar				
Tested by: Jeff Alcoke		Power: 3.3 VDC via 110VAC/60Hz	Job Site: EV06				
TEST SPECIFICATIONS		Test Method					
FCC 15.247:2021		ANSI C63.10:2013					
COMMENTS							
Reference level offset: DC Block, 20 dB attenuator, and measurement cable.							
DEVIATIONS FROM TEST STANDARD							
None							
Configuration #	1	Signature 					
		Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
2400 MHz - 2483.5 MHz Band							
20 MHz BW							
802.11(b) 1 Mbps							
	Low Channel 1, 2412 MHz	8.611 ms	8.625 ms	1	99.8	N/A	N/A
	Low Channel 1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel 6, 2437 MHz	8.625 ms	8.625 ms	1	100	N/A	N/A
	Mid Channel 6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
	High Channel 11, 2462 MHz	8.612 ms	8.625 ms	1	99.8	N/A	N/A
	High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
802.11(b) 11 Mbps							
	Low Channel 1, 2412 MHz	861.323 us	875.612 us	1	98.4	N/A	N/A
	Low Channel 1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel 6, 2437 MHz	861.152 us	875.626 us	1	98.3	N/A	N/A
	Mid Channel 6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
	High Channel 11, 2462 MHz	861.159 us	876.548 us	1	98.2	N/A	N/A
	High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
802.11(g) 6 Mbps							
	Low Channel 1, 2412 MHz	1.428 ms	1.449 ms	1	98.5	N/A	N/A
	Low Channel 1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel 6, 2437 MHz	1.429 ms	1.45 ms	1	98.5	N/A	N/A
	Mid Channel 6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
	High Channel 11, 2462 MHz	1.428 ms	1.451 ms	1	98.4	N/A	N/A
	High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
802.11(g) 36 Mbps							
	Low Channel 1, 2412 MHz	257.5 us	278.6 us	1	92.4	N/A	N/A
	Low Channel 1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel 6, 2437 MHz	257.2 us	278.5 us	1	92.4	N/A	N/A
	Mid Channel 6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
	High Channel 11, 2462 MHz	257.3 us	278.4 us	1	92.4	N/A	N/A
	High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
802.11(g) 54 Mbps							
	Low Channel 1, 2412 MHz	180.822 us	202.36 us	1	89.4	N/A	N/A
	Low Channel 1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel 6, 2437 MHz	180.955 us	202.271 us	1	89.5	N/A	N/A
	Mid Channel 6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
	High Channel 11, 2462 MHz	181.105 us	202.199 us	1	89.6	N/A	N/A
	High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
802.11(n) MCS0							
	Low Channel 1, 2412 MHz	1.337 ms	1.359 ms	1	98.4	N/A	N/A
	Low Channel 1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel 6, 2437 MHz	1.337 ms	1.358 ms	1	98.4	N/A	N/A
	Mid Channel 6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
	High Channel 11, 2462 MHz	1.337 ms	1.359 ms	1	98.4	N/A	N/A
	High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
802.11(n) MCS7							
	Low Channel 1, 2412 MHz	169.029 us	190.384 us	1	88.8	N/A	N/A
	Low Channel 1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel 6, 2437 MHz	168.851 us	190.389 us	1	88.7	N/A	N/A
	Mid Channel 6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
	High Channel 11, 2462 MHz	168.879 us	190.367 us	1	88.7	N/A	N/A
	High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A

DUTY CYCLE

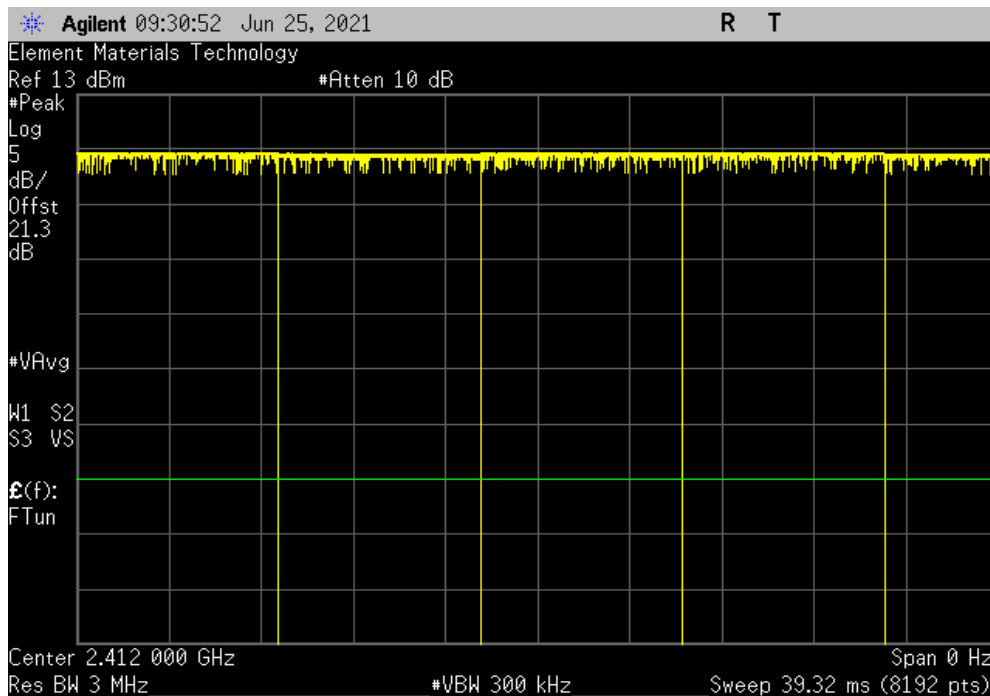


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
8.611 ms	8.625 ms	1	99.8	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

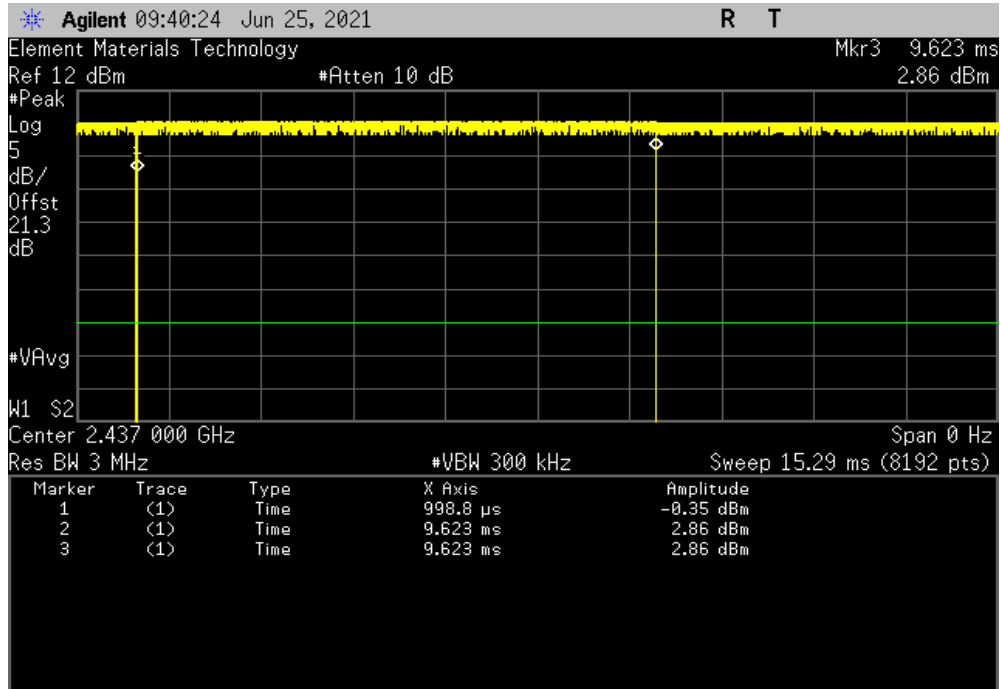


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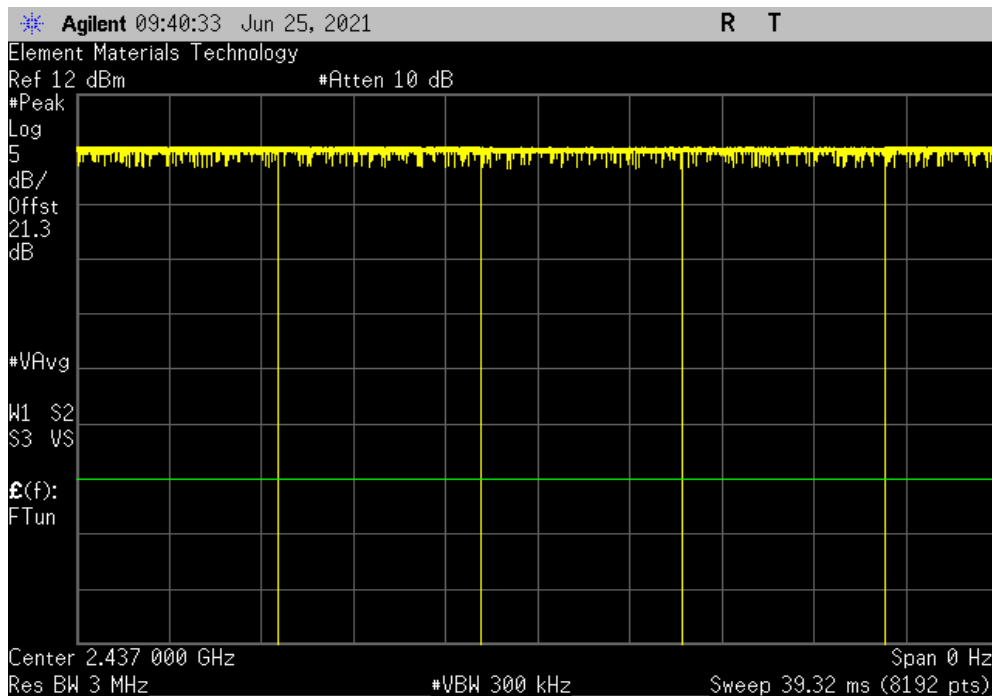


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	8.625 ms	8.625 ms	1	100	N/A	N/A



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

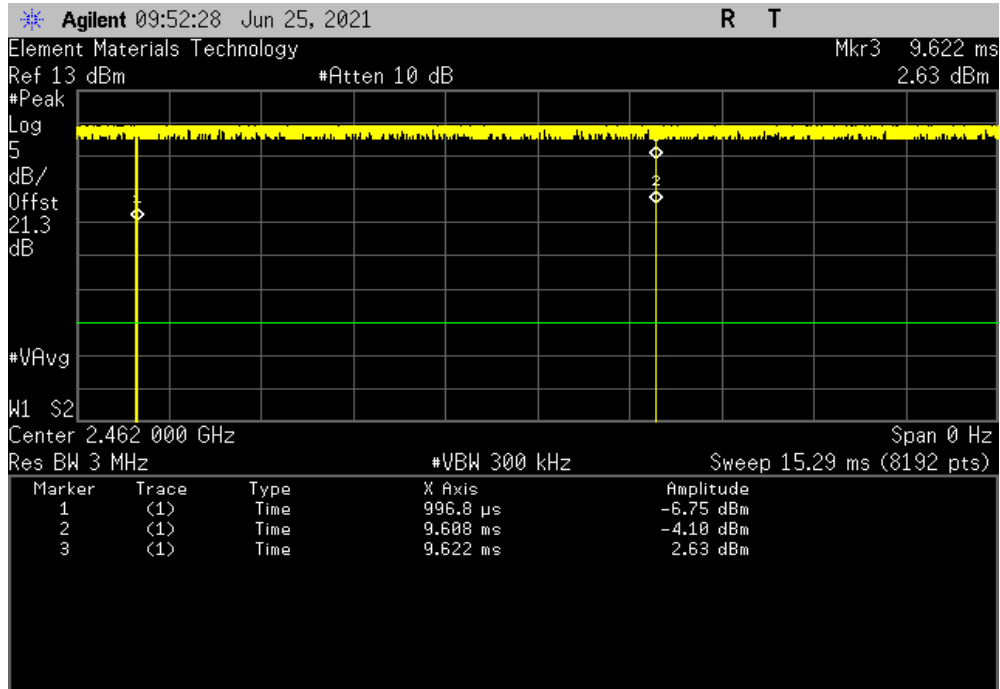


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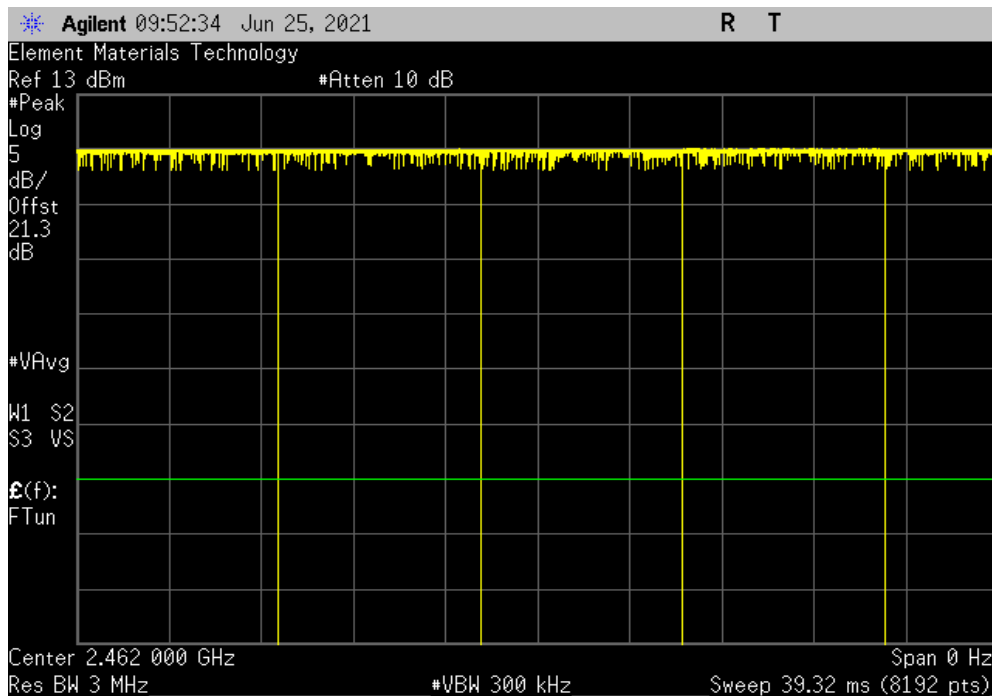


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	8.612 ms	8.625 ms	1	99.8	N/A	N/A



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

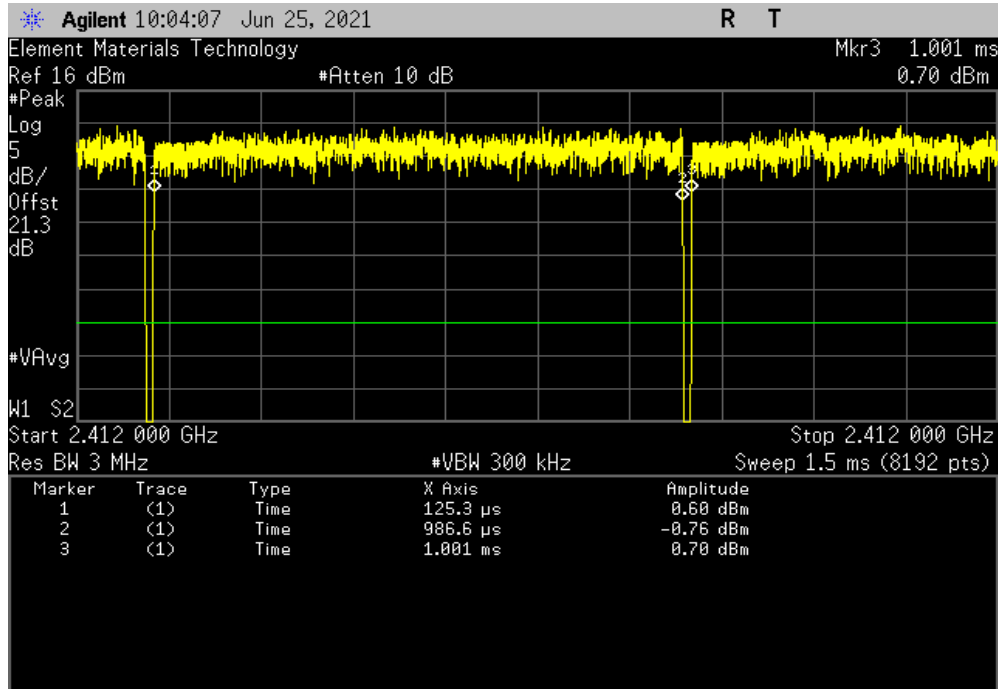


DUTY CYCLE



TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
861.323 us	875.612 us	1	98.4	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

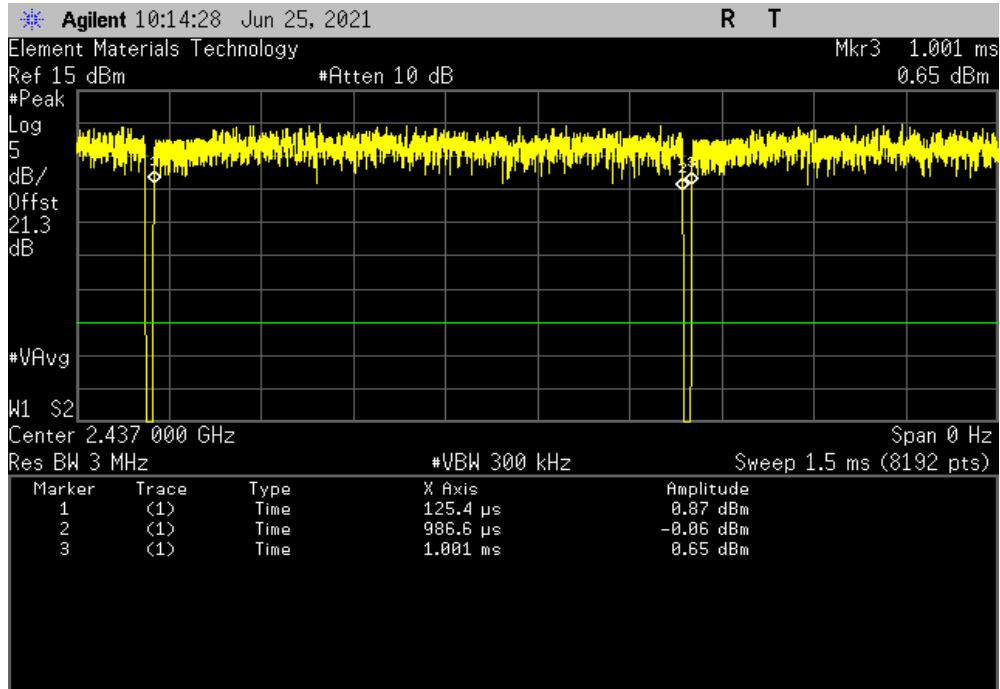


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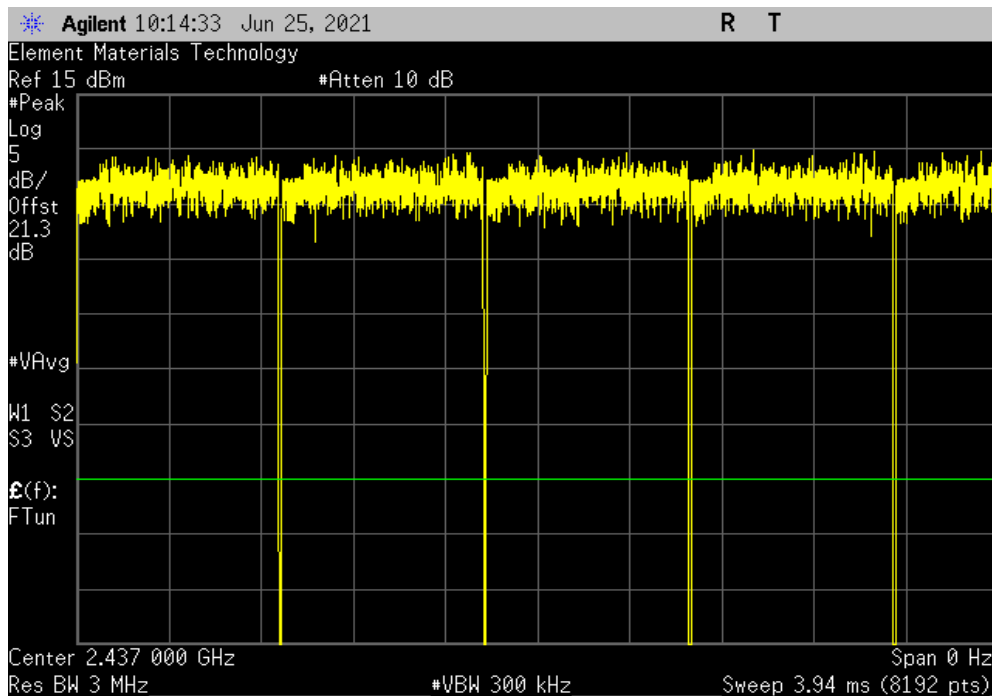


TbTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
861.152 us	875.626 us	1	98.3	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

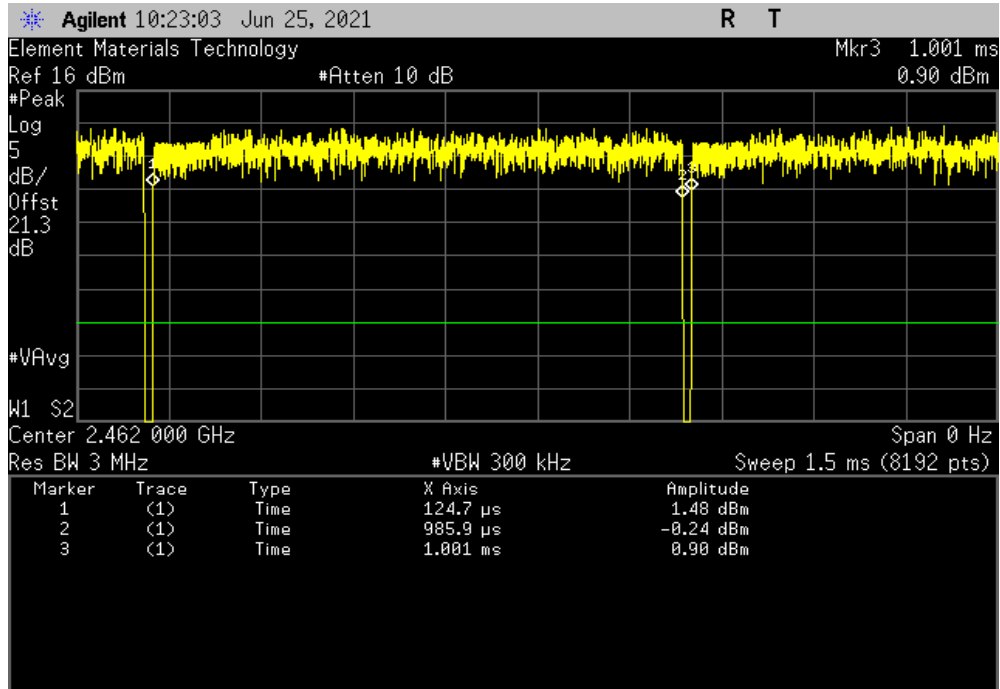


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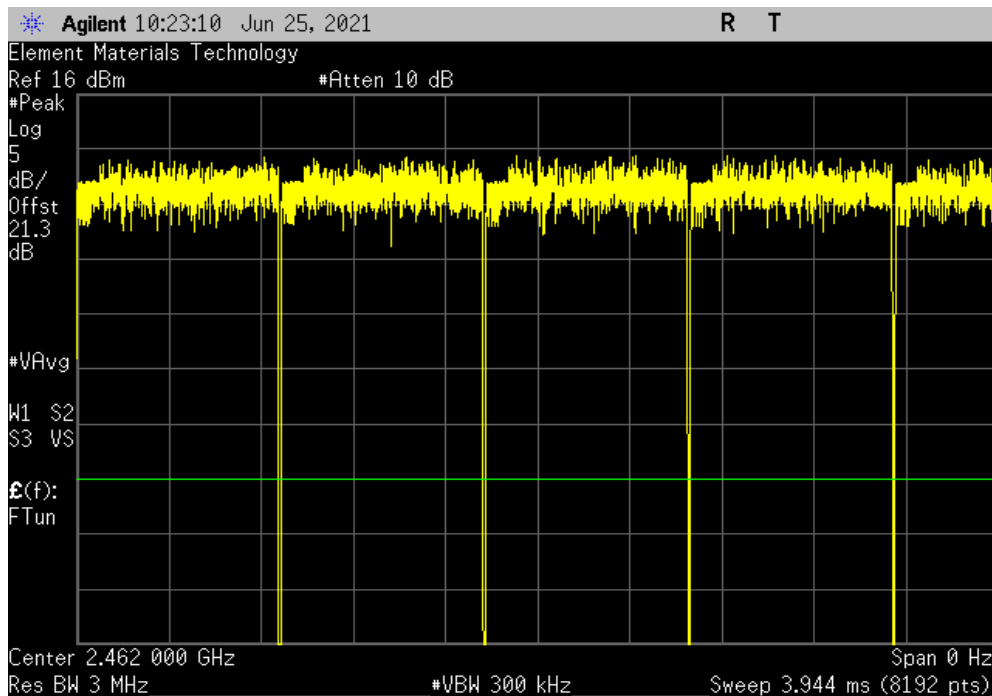


TbTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
861.159 us	876.548 us	1	98.2	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

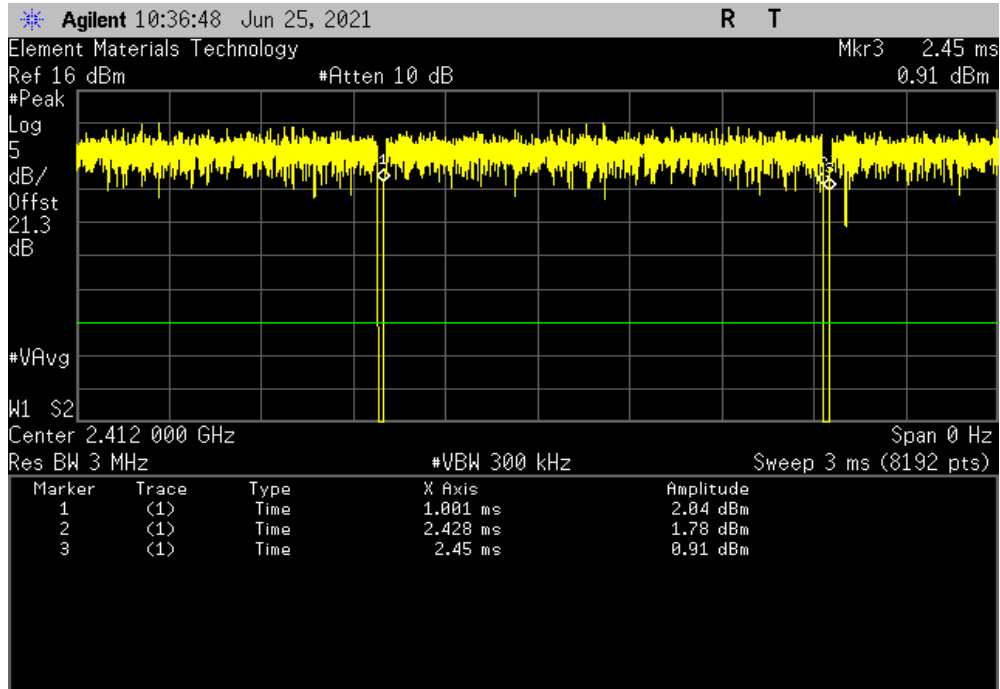


DUTY CYCLE



TMTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
1.428 ms	1.449 ms	1	98.5	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

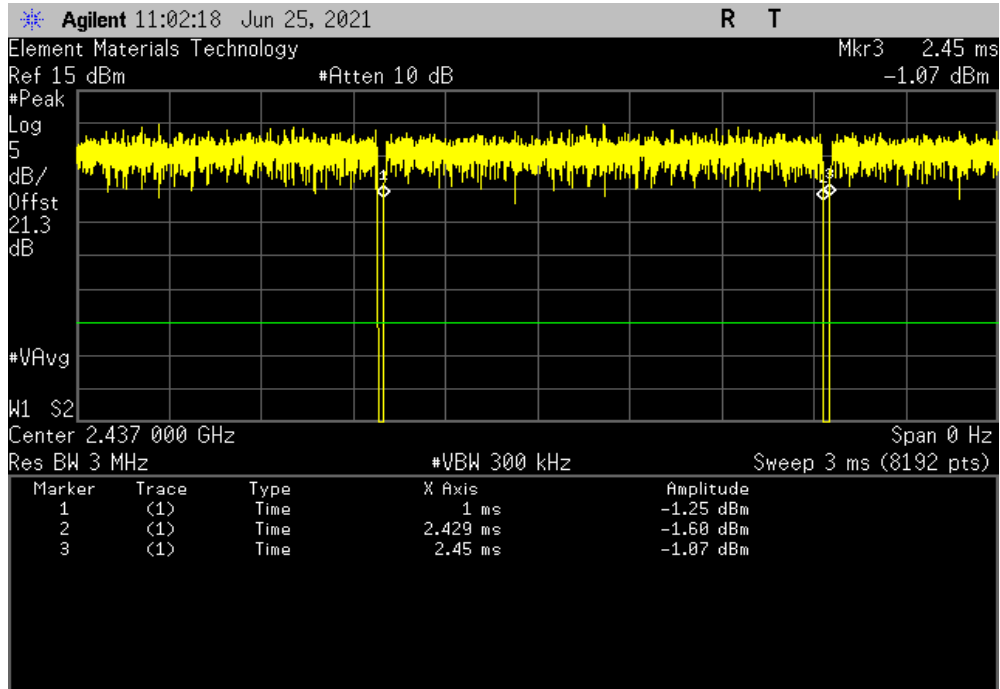


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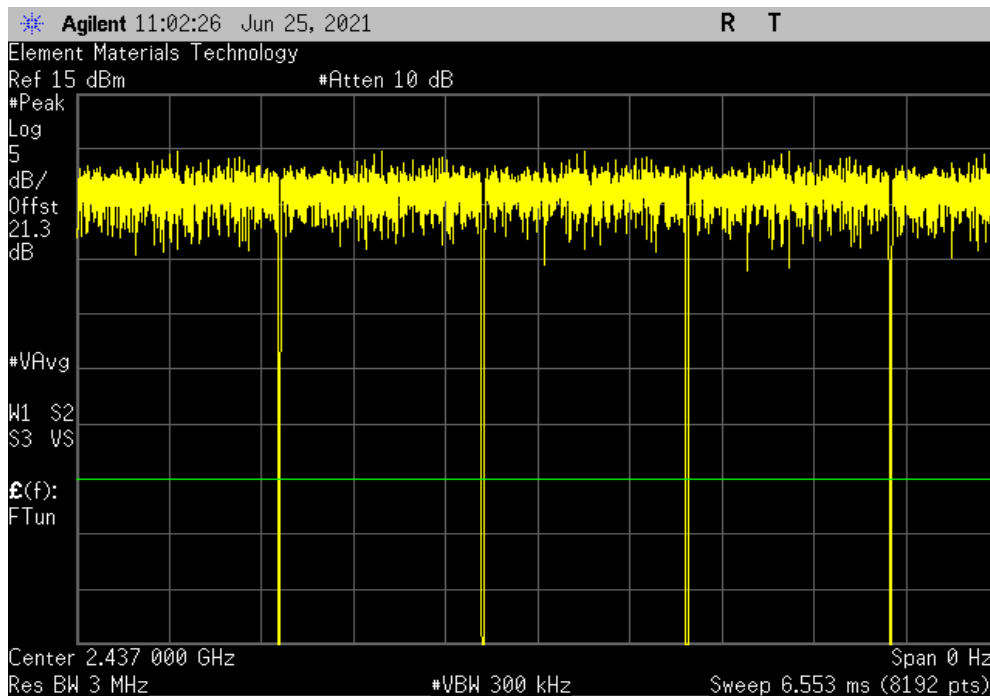


TbTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.429 ms	1.45 ms	1	98.5	N/A	N/A



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

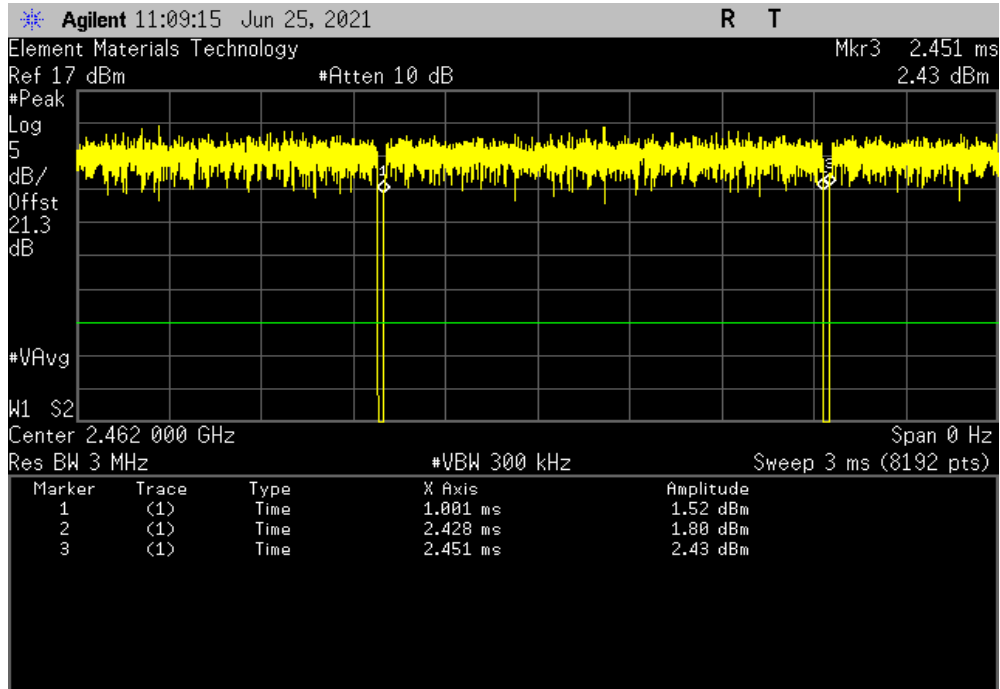


DUTY CYCLE

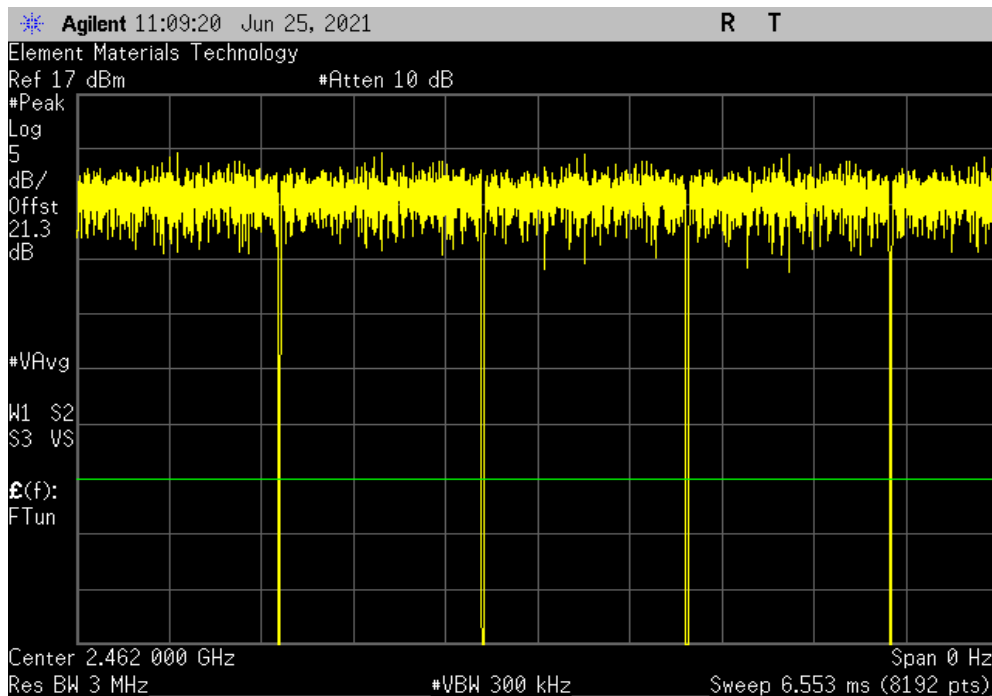


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.428 ms	1.451 ms	1	98.4	N/A	N/A



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

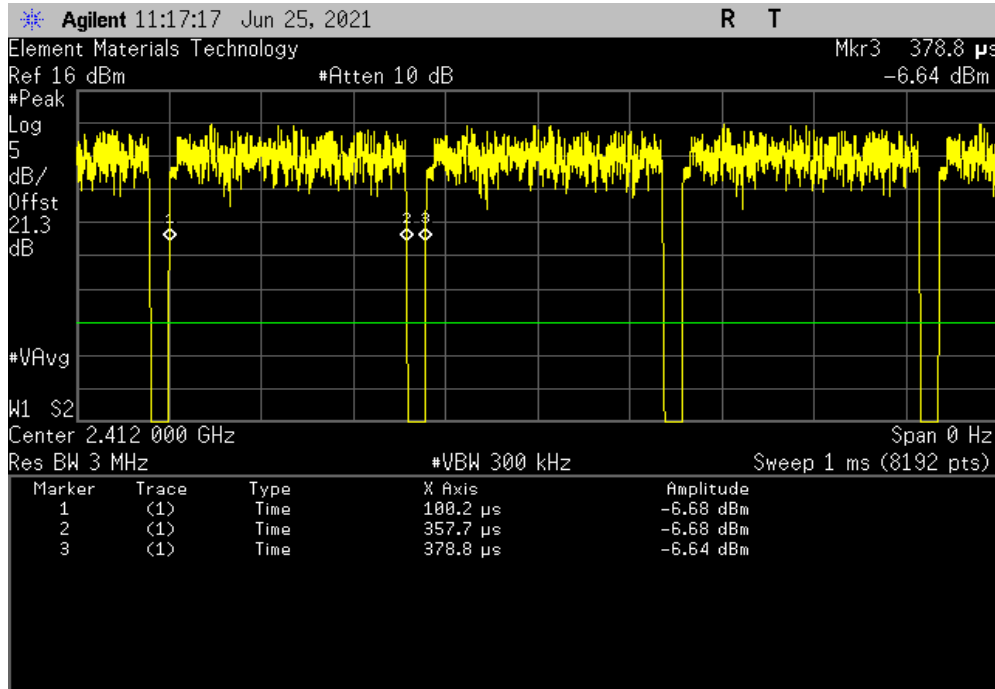


DUTY CYCLE

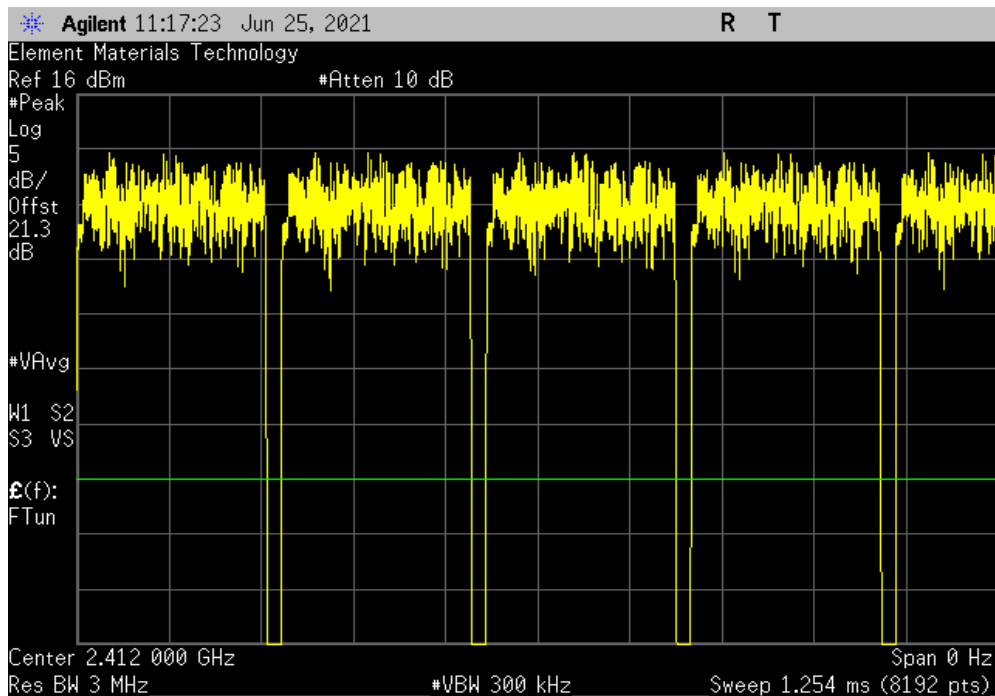


TMTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
257.5 us	278.6 us	1	92.4	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

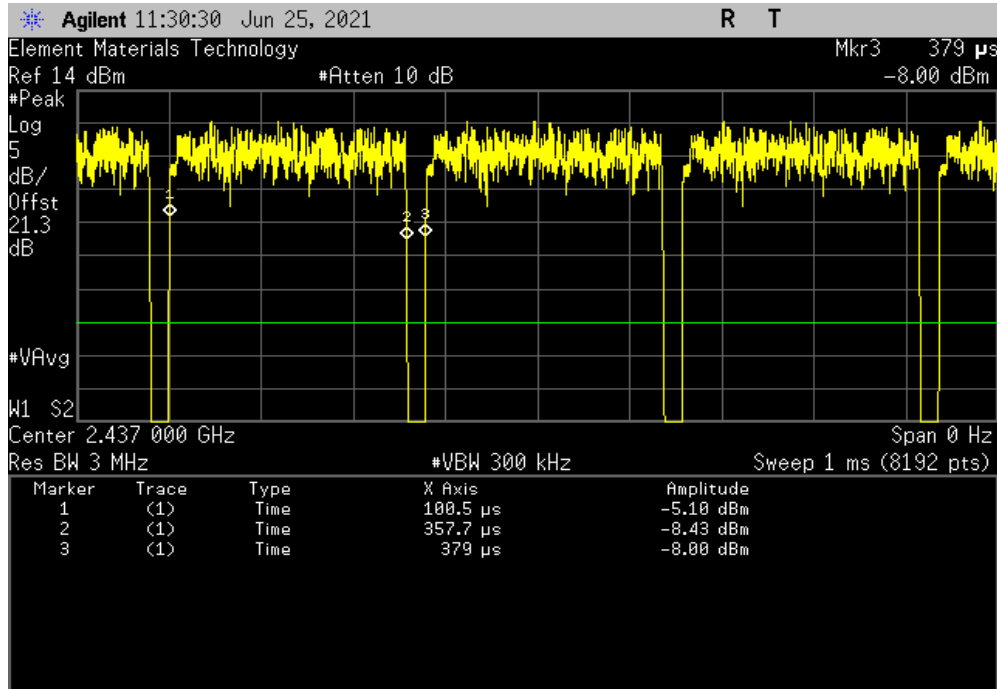


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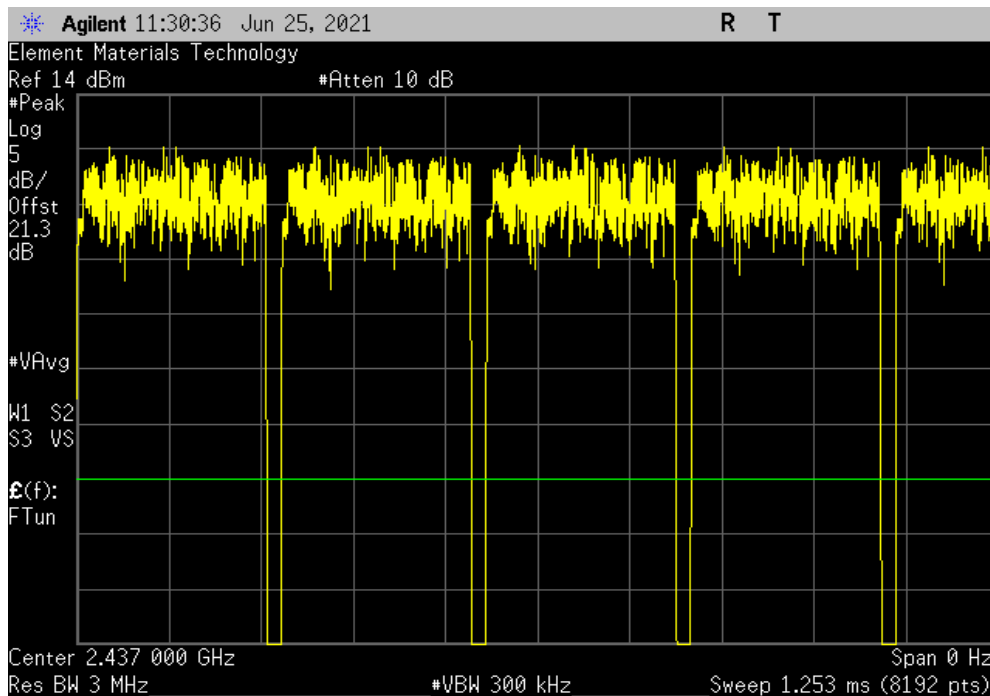


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
257.2 us	278.5 us	1	92.4	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

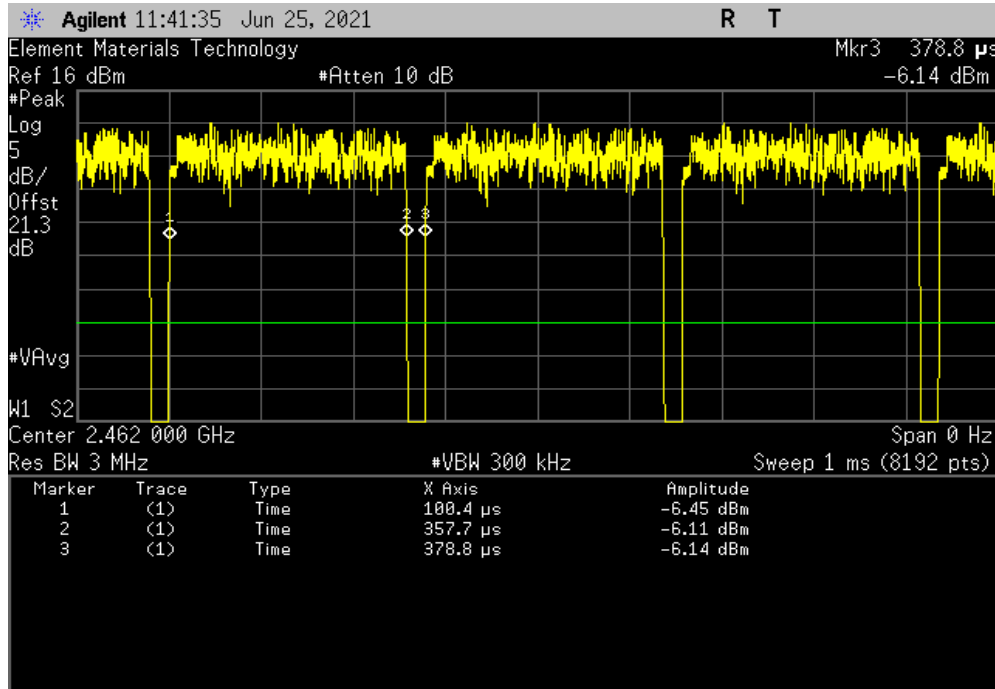


DUTY CYCLE

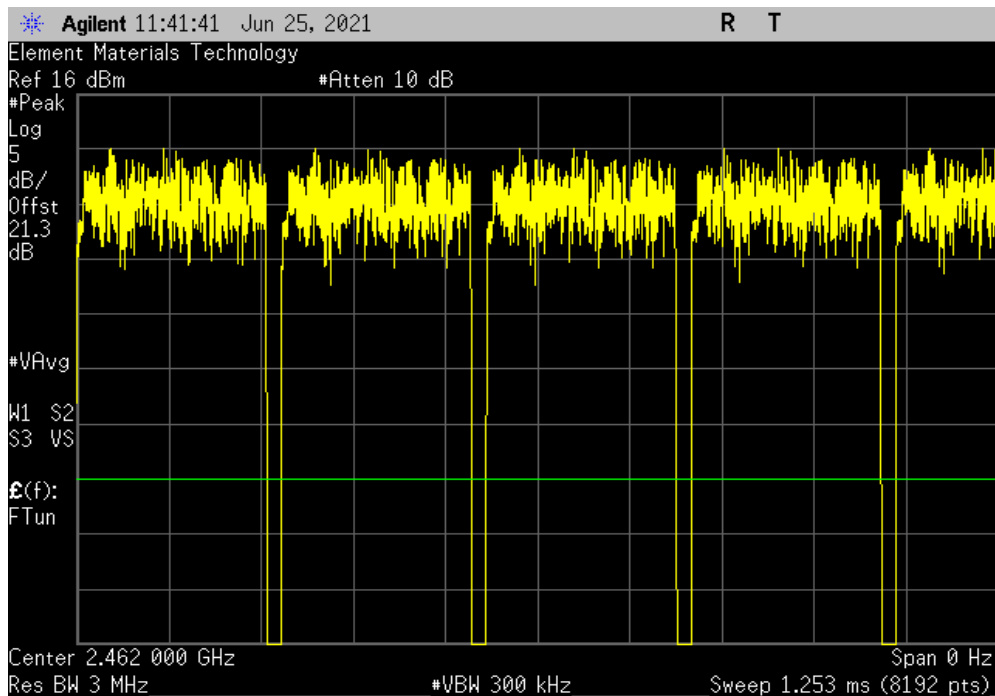


TMTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
257.3 us	278.4 us	1	92.4	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

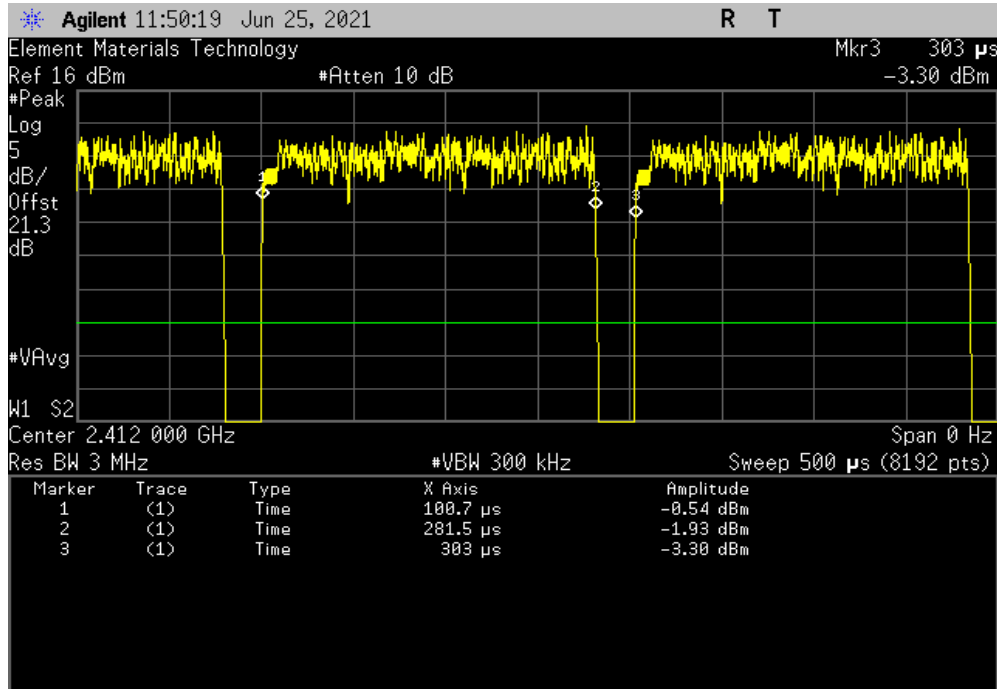


DUTY CYCLE



TMTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
180.822 us	202.36 us	1	89.4	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

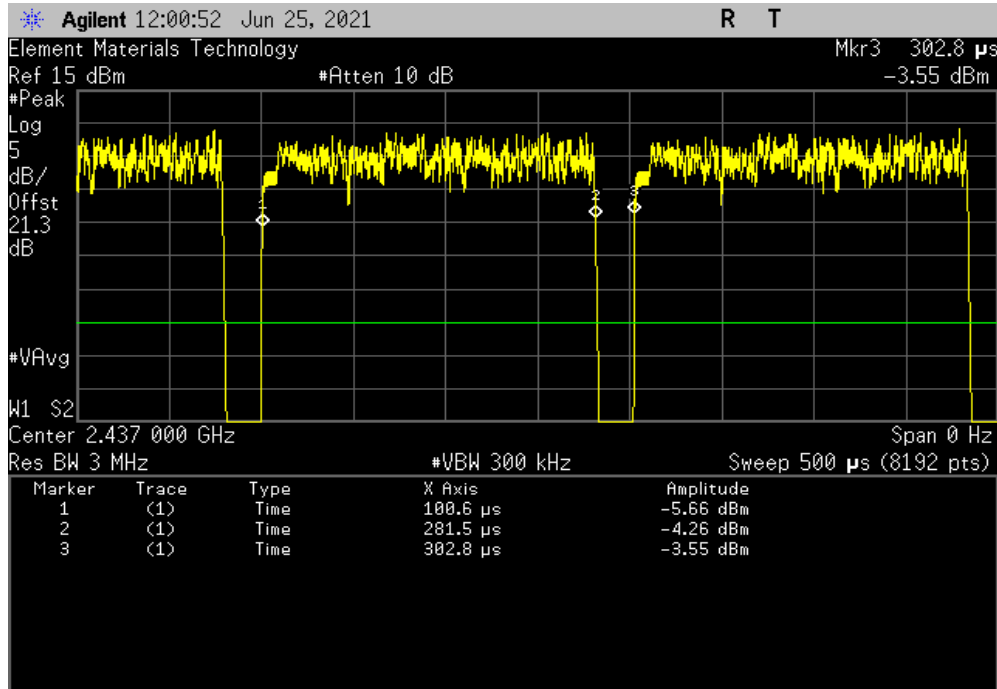


DUTY CYCLE



TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
180.955 us	202.271 us	1	89.5	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

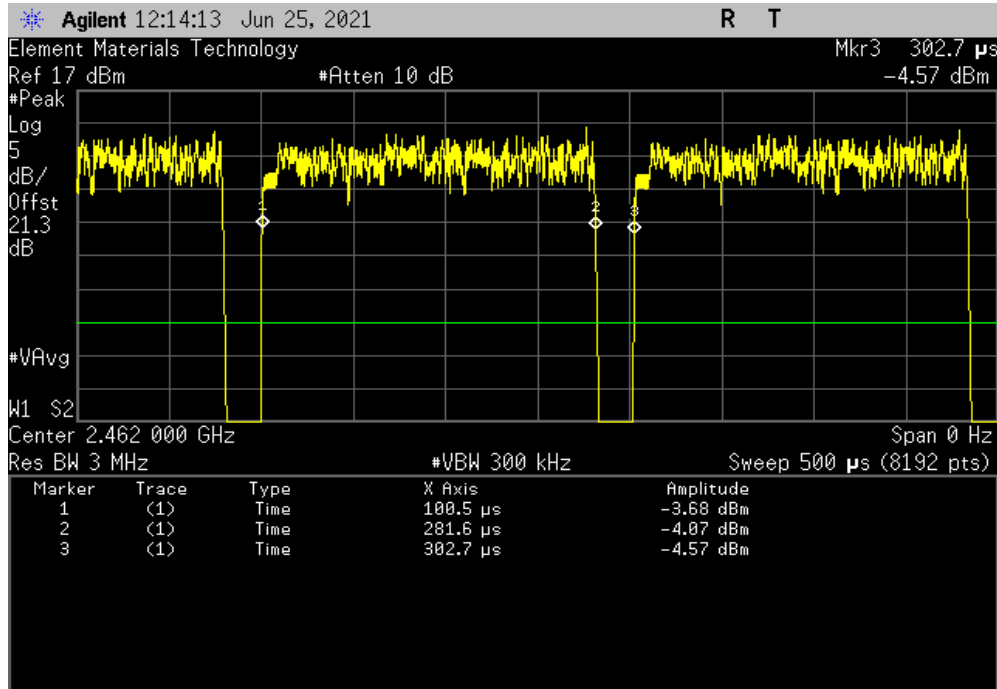


DUTY CYCLE

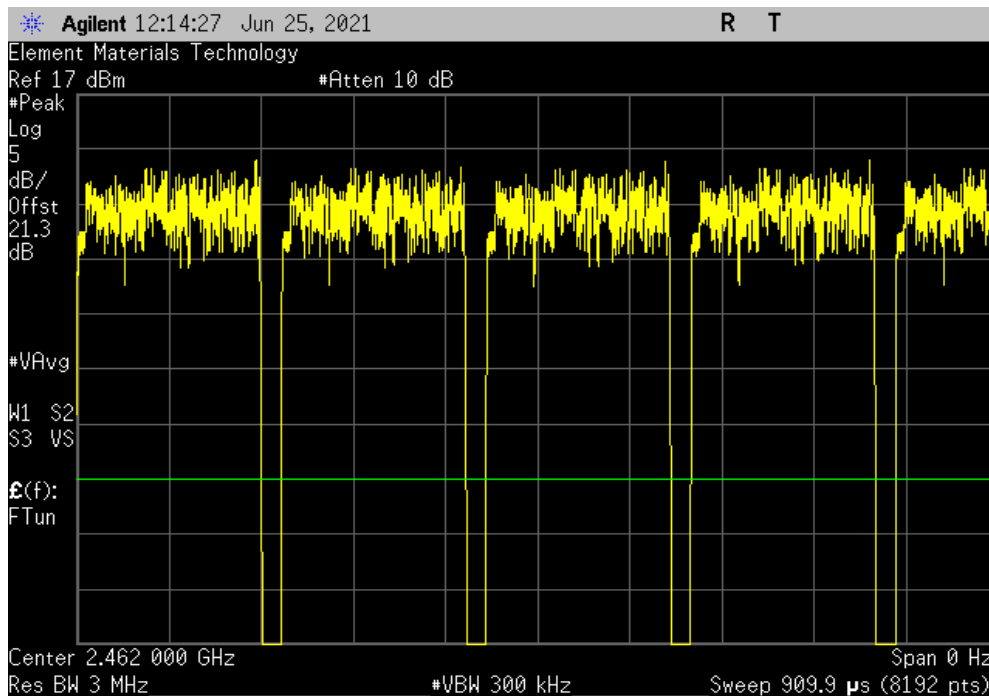


TMTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
181.105 us	202.199 us	1	89.6	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

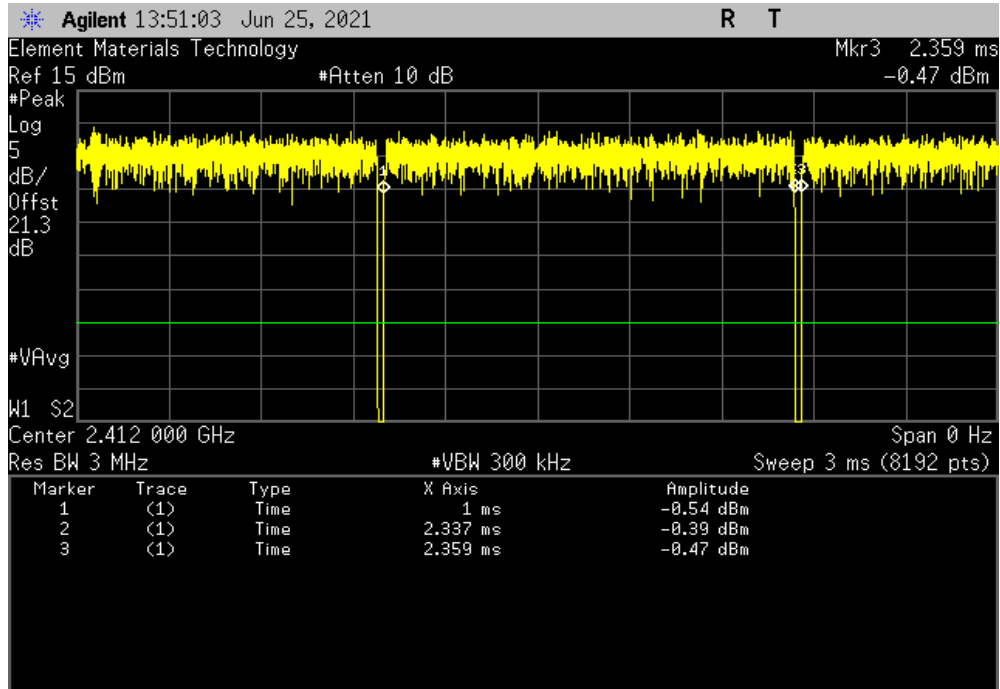


DUTY CYCLE

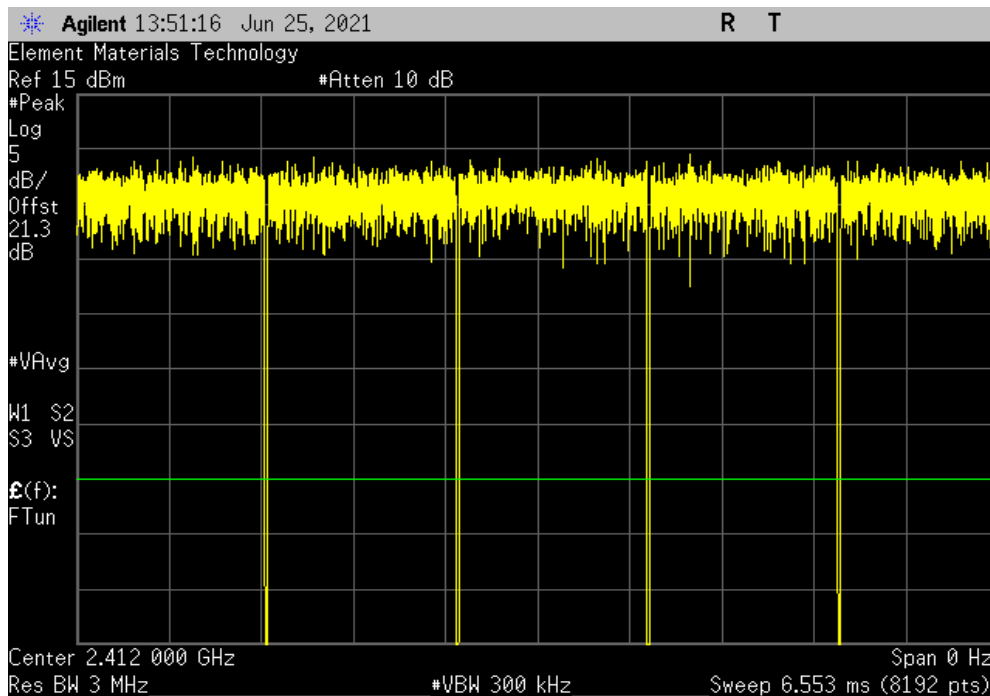


TbTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
1.337 ms	1.359 ms	1	98.4	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

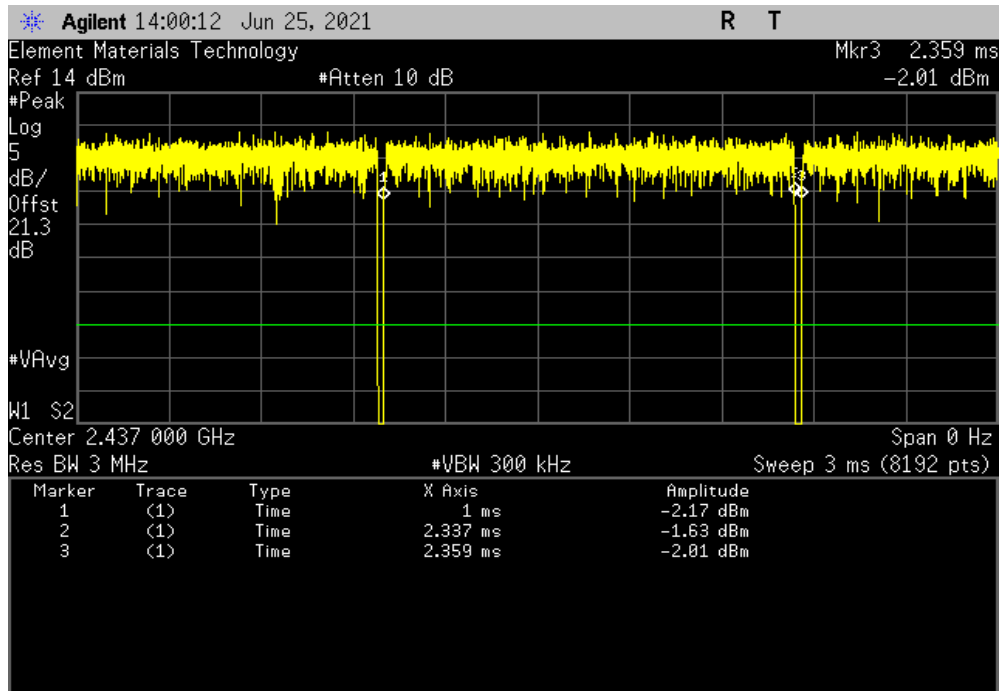


DUTY CYCLE

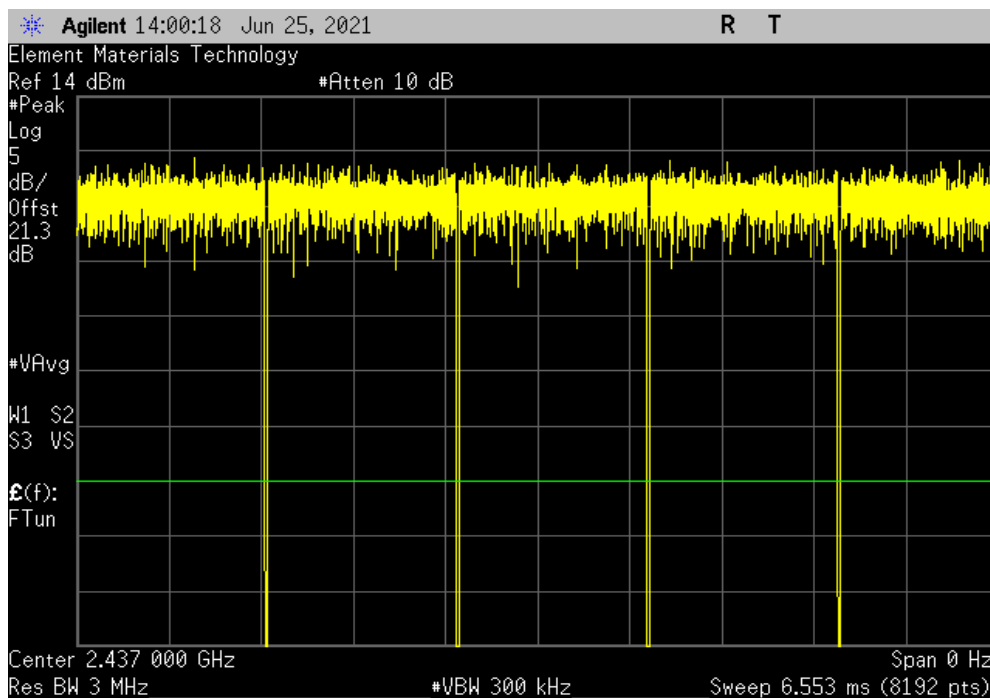


TMTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
1.337 ms	1.358 ms	1	98.4	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

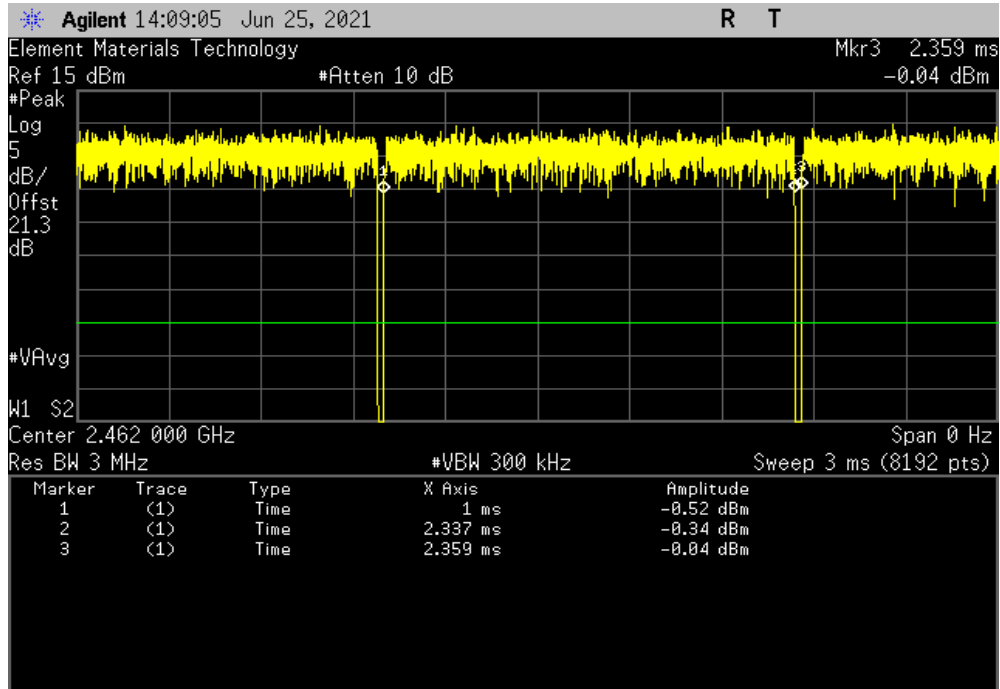


DUTY CYCLE

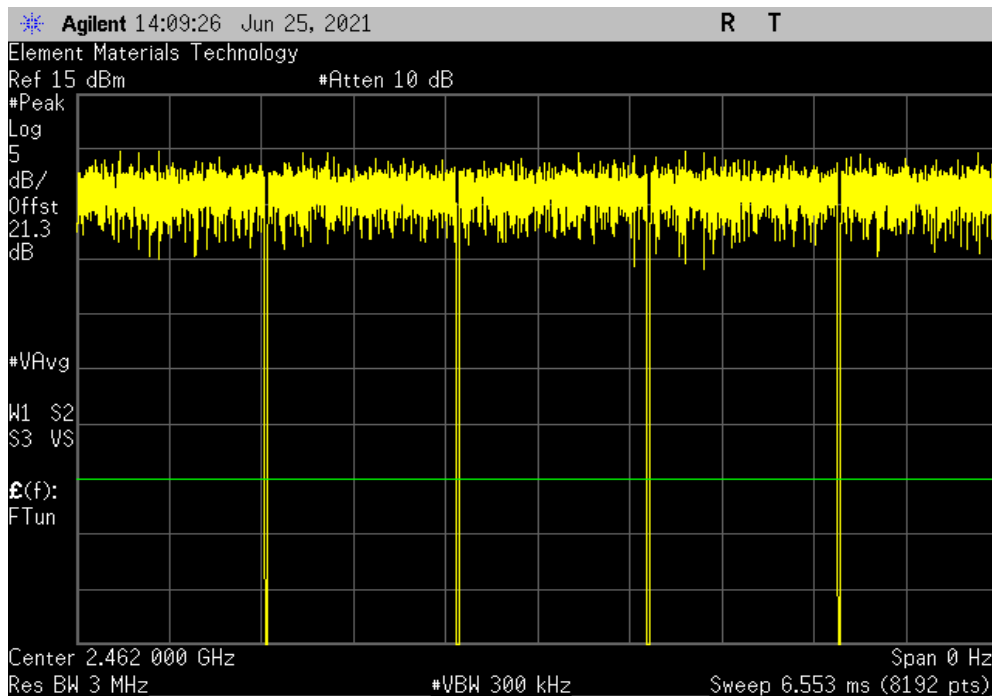


TMTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, High Channel 11, 2462 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
1.337 ms	1.359 ms	1	98.4	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, High Channel 11, 2462 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

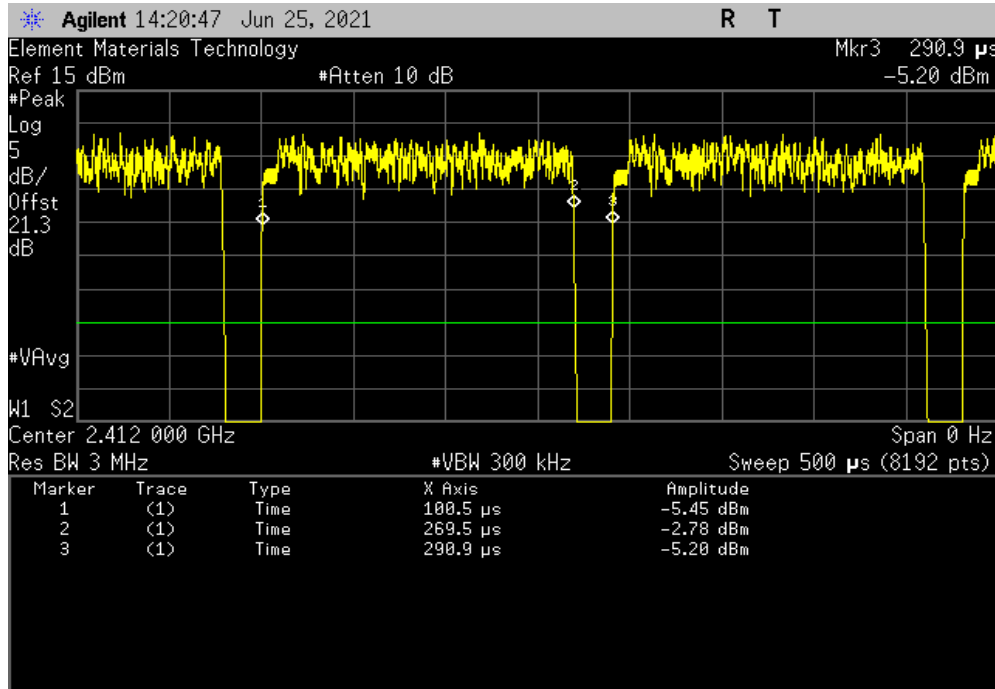


DUTY CYCLE



TMTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
169.029 us	190.384 us	1	88.8	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

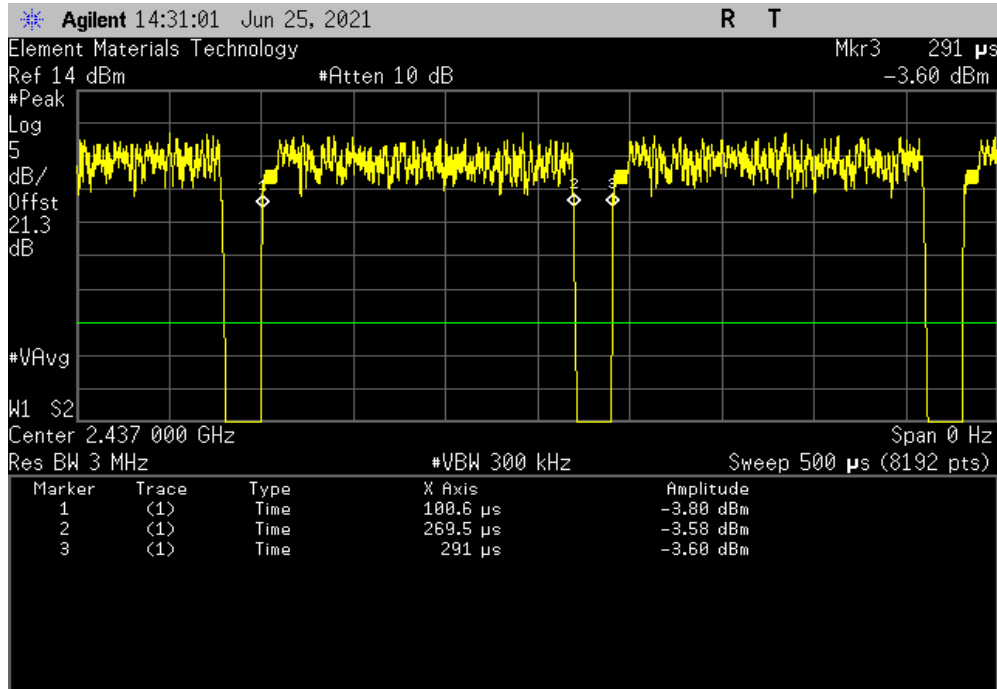


DUTY CYCLE



TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
168.851 us	190.389 us	1	88.7	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

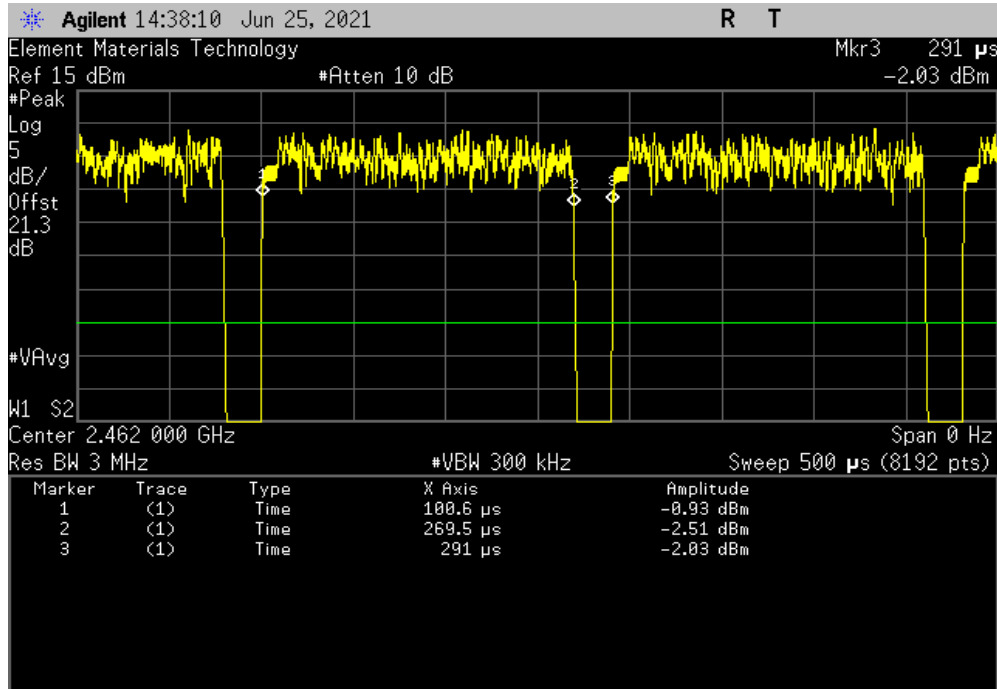


DUTY CYCLE



TMTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, High Channel 11, 2462 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
168.879 us	190.367 us	1	88.7	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, High Channel 11, 2462 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	



OCCUPIED BANDWIDTH



XMIT 2020.12.30.0

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
Generator - Signal	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2021-04-08	2022-04-08

TEST DESCRIPTION

The EUT was set to the channels 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



TSTx 2021.03.19.1 XMR 2020.12.30.0

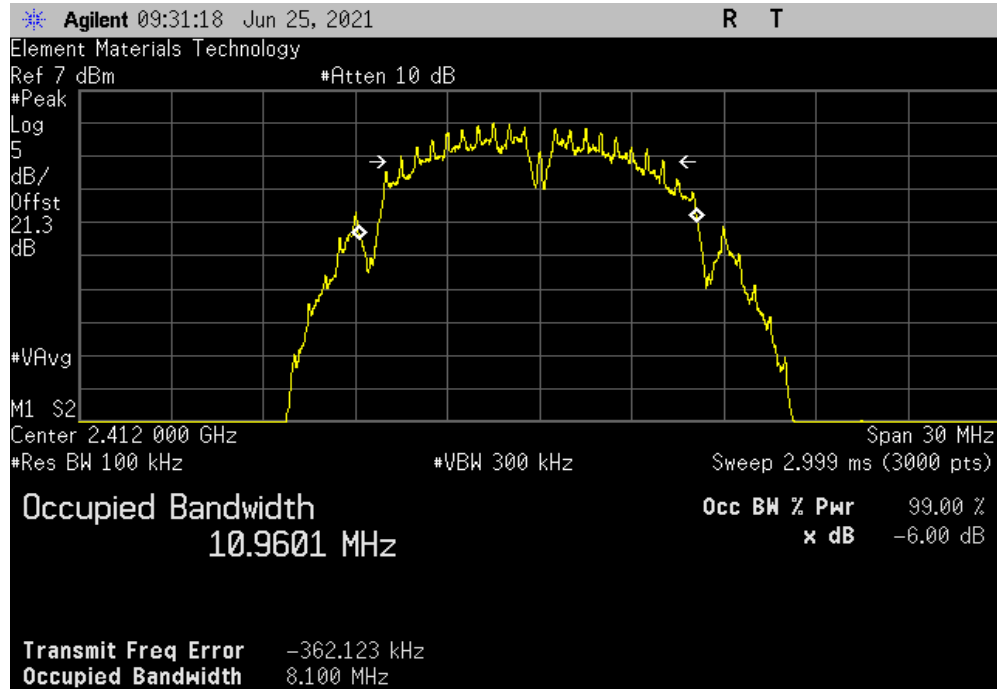
EUT: 43.0536.00		Work Order: A-DE0162	
Serial Number: SN001 00003		Date: 28-Jun-21	
Customer: A-dec, Inc.		Temperature: 24.2 °C	
Attendees: Zack Lyda and Spencer Warenke		Humidity: 48.2% RH	
Project: None		Barometric Pres.: 1008 mbar	
Tested by: Jeff Alcoke	Power: 3.3 VDC via 110VAC/60Hz	Job Site: EV06	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2021		ANSI C63.10:2013	
COMMENTS			
Reference level offset: DC Block, 20 dB attenuator, and measurement cable.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature	
		Value	Limit (>) Result
2400 MHz - 2483.5 MHz Band			
20 MHz BW			
802.11(b) 1 Mbps			
Low Channel 1, 2412 MHz		8.1 MHz	500 kHz Pass
Mid Channel 6, 2437 MHz		9.035 MHz	500 kHz Pass
High Channel 11, 2462 MHz		8.212 MHz	500 kHz Pass
802.11(b) 11 Mbps			
Low Channel 1, 2412 MHz		7.549 MHz	500 kHz Pass
Mid Channel 6, 2437 MHz		6.997 MHz	500 kHz Pass
High Channel 11, 2462 MHz		7.928 MHz	500 kHz Pass
802.11(g) 6 Mbps			
Low Channel 1, 2412 MHz		15.352 MHz	500 kHz Pass
Mid Channel 6, 2437 MHz		15.808 MHz	500 kHz Pass
High Channel 11, 2462 MHz		14.892 MHz	500 kHz Pass
802.11(g) 36 Mbps			
Low Channel 1, 2412 MHz		15.628 MHz	500 kHz Pass
Mid Channel 6, 2437 MHz		16.291 MHz	500 kHz Pass
High Channel 11, 2462 MHz		15.625 MHz	500 kHz Pass
802.11(g) 54 Mbps			
Low Channel 1, 2412 MHz		15.353 MHz	500 kHz Pass
Mid Channel 6, 2437 MHz		15.984 MHz	500 kHz Pass
High Channel 11, 2462 MHz		15.182 MHz	500 kHz Pass
802.11(n) MCS0			
Low Channel 1, 2412 MHz		15.155 MHz	500 kHz Pass
Mid Channel 6, 2437 MHz		16.725 MHz	500 kHz Pass
High Channel 11, 2462 MHz		14.872 MHz	500 kHz Pass
802.11(n) MCS7			
Low Channel 1, 2412 MHz		16.013 MHz	500 kHz Pass
Mid Channel 6, 2437 MHz		17.57 MHz	500 kHz Pass
High Channel 11, 2462 MHz		16.331 MHz	500 kHz Pass

OCCUPIED BANDWIDTH

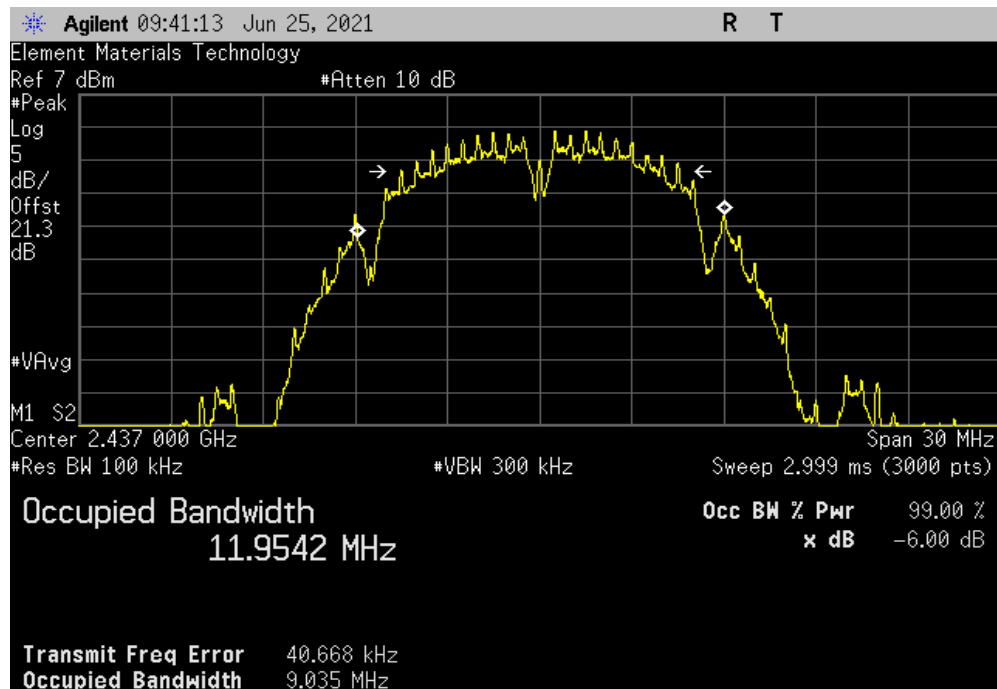


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				8.1 MHz	500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				9.035 MHz	500 kHz	Pass

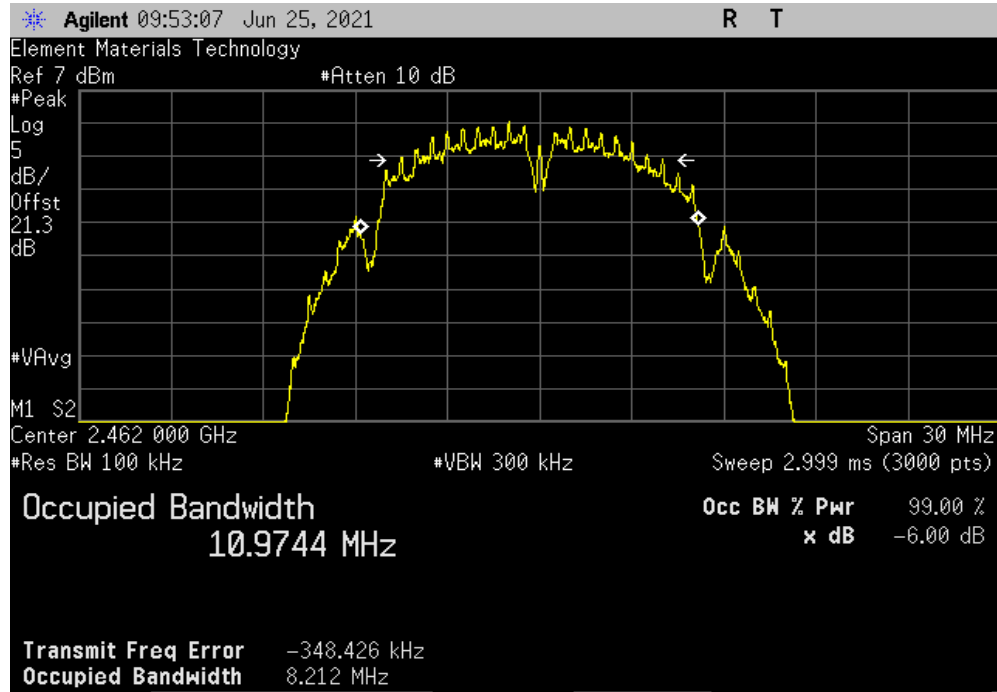


OCCUPIED BANDWIDTH

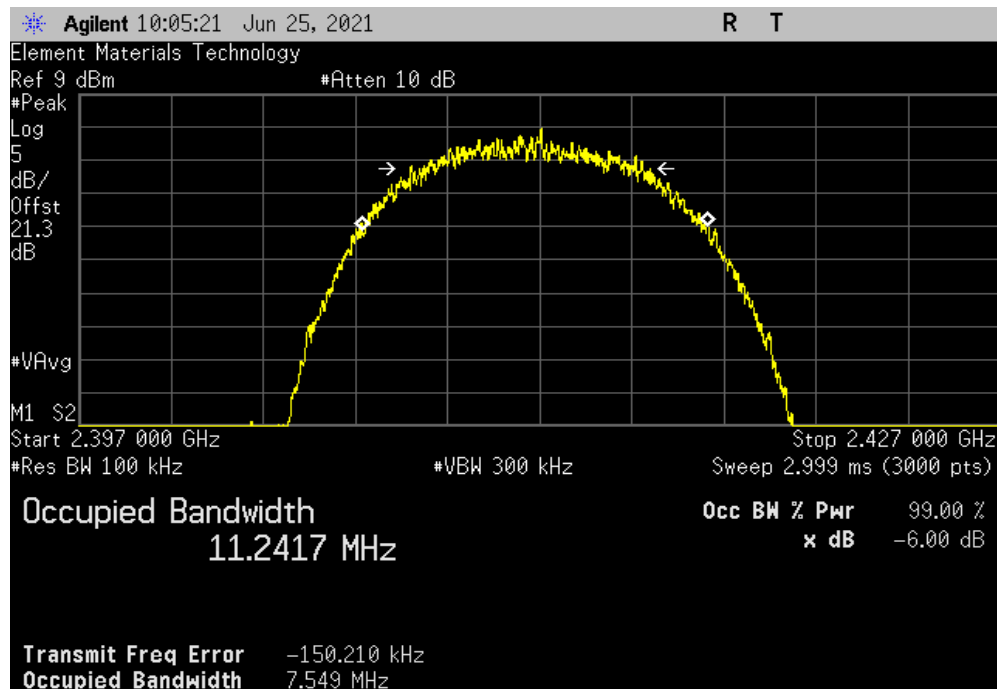


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
				Value	Limit	Result
				8.212 MHz	(>) 500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				7.549 MHz	(>) 500 kHz	Pass

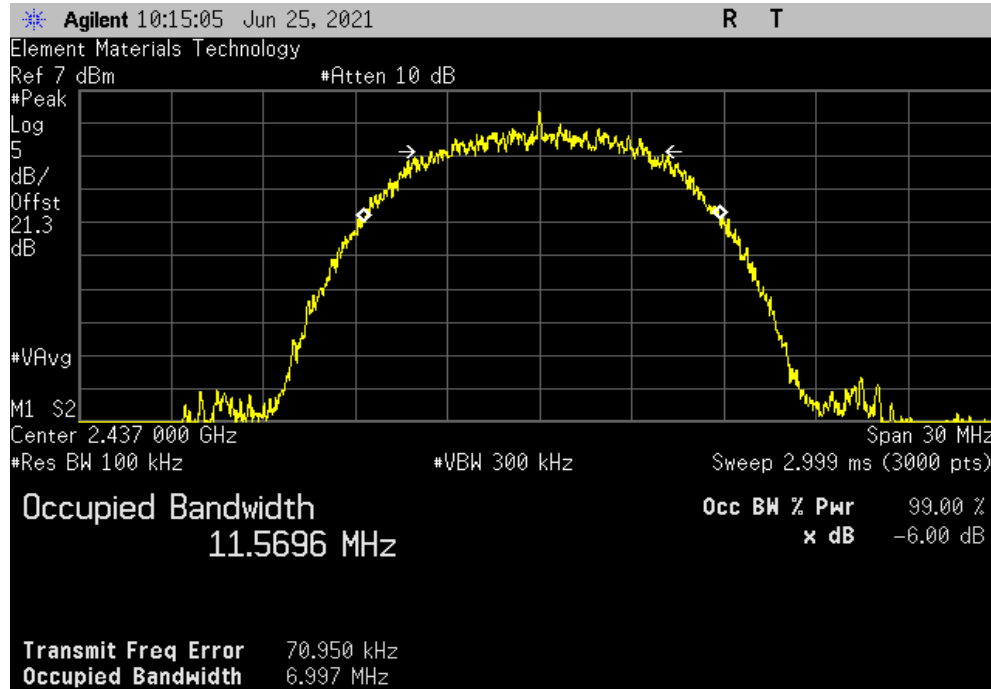


OCCUPIED BANDWIDTH

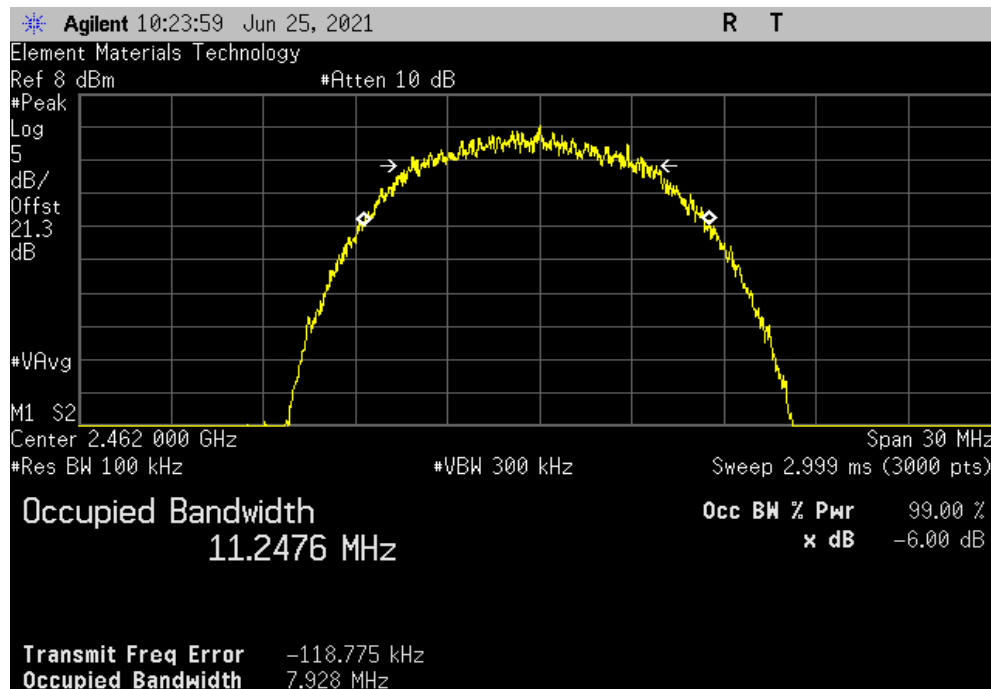


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				(>)		
				6.997 MHz	500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
				Value	Limit	Result
				(>)		
				7.928 MHz	500 kHz	Pass

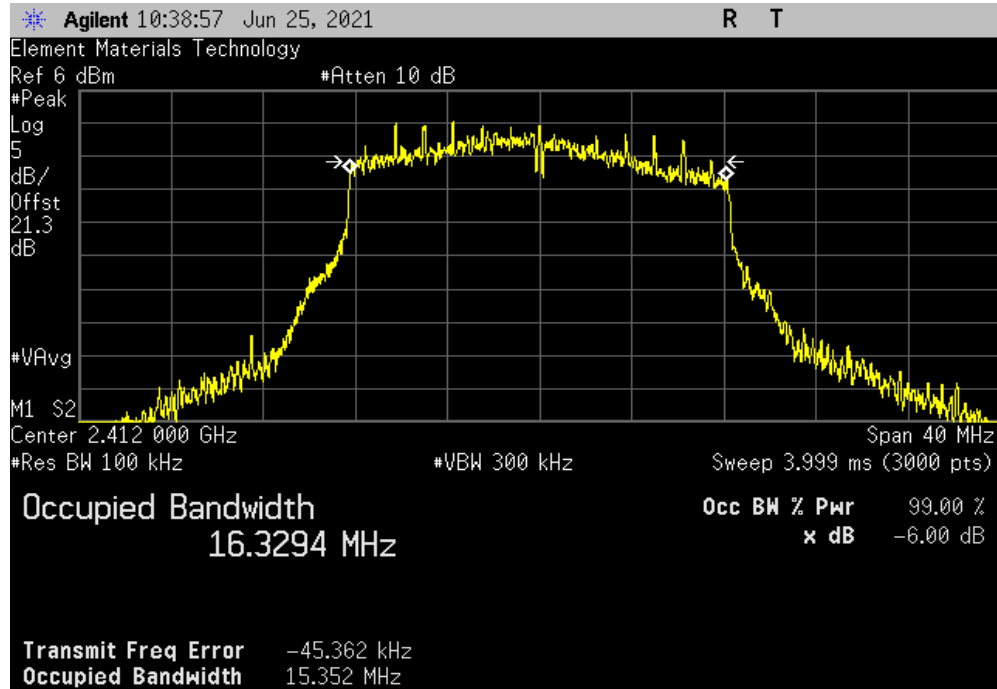


OCCUPIED BANDWIDTH

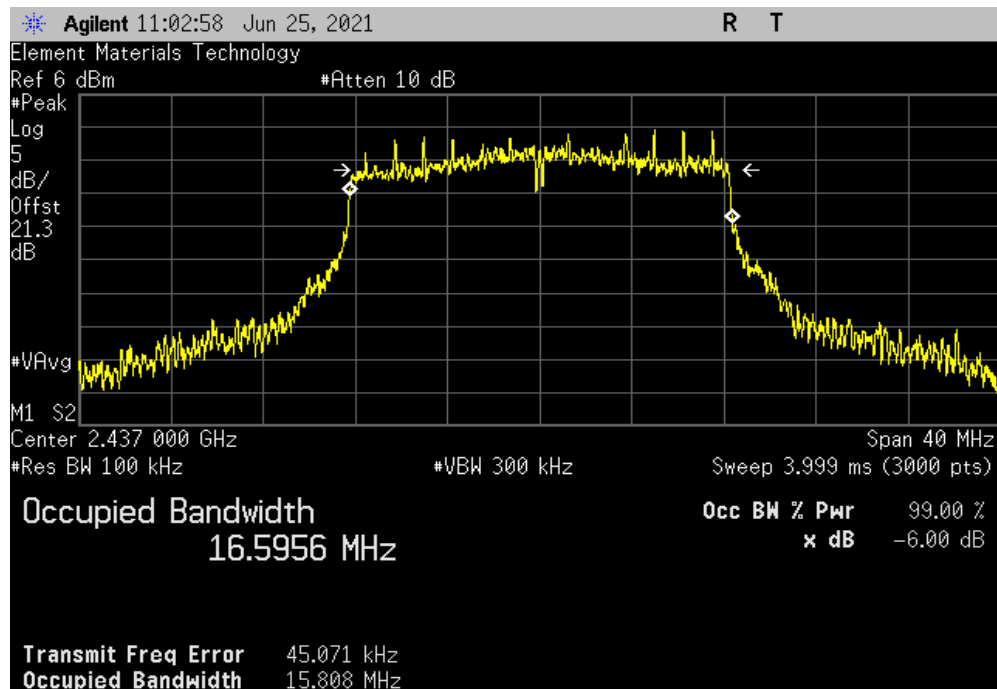


TbTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				15.352 MHz	(> 500 kHz)	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				15.808 MHz	(> 500 kHz)	Pass

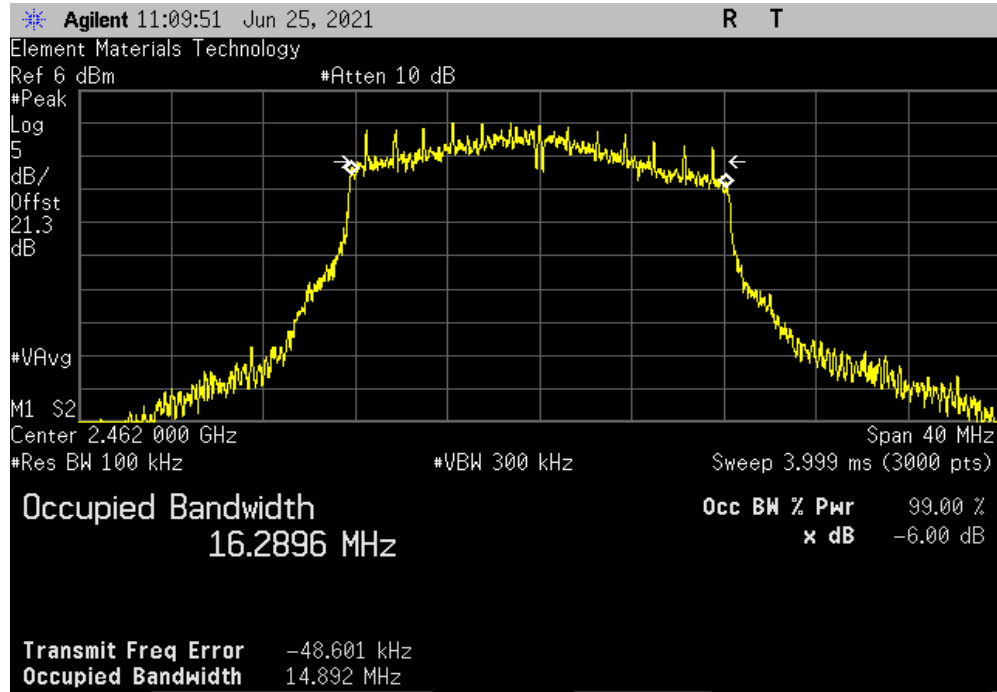


OCCUPIED BANDWIDTH

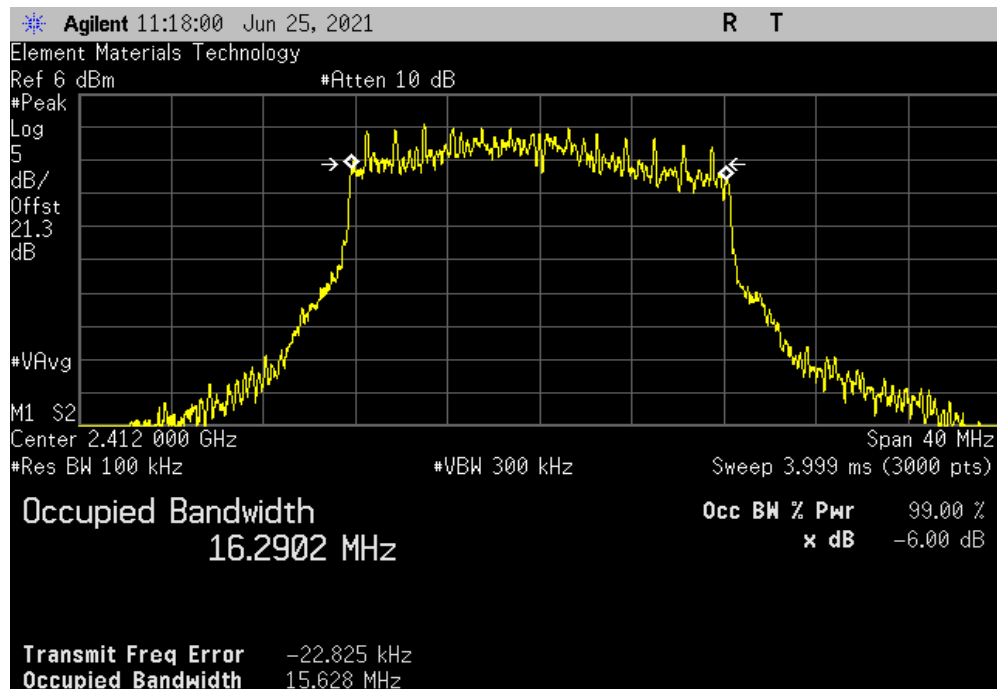


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
				Value	Limit	Result
				14.892 MHz	(> 500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				15.628 MHz	(> 500 kHz	Pass

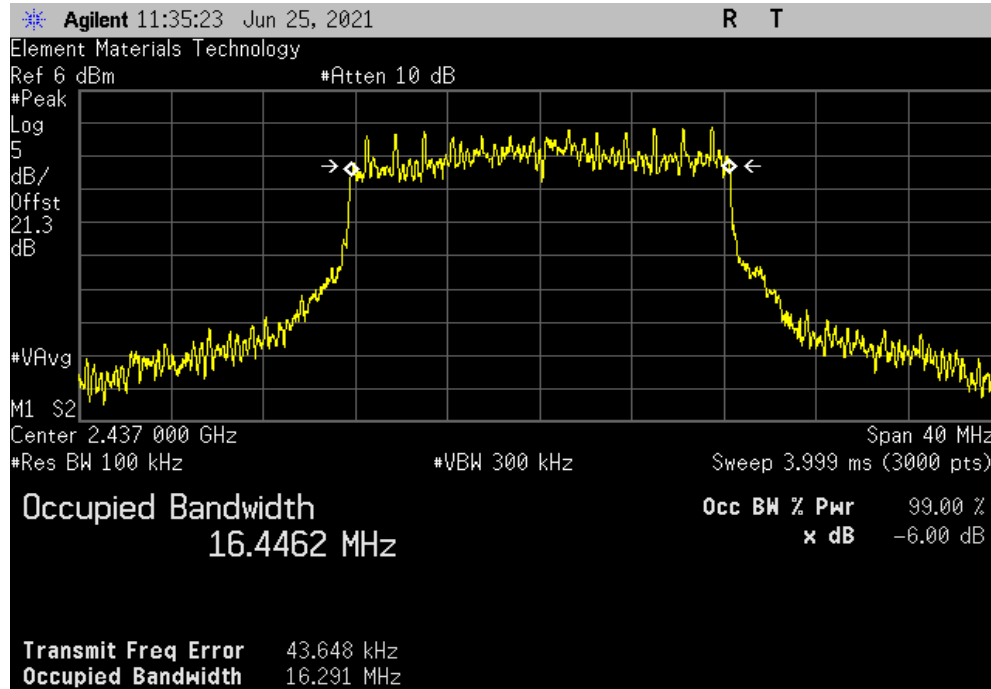


OCCUPIED BANDWIDTH

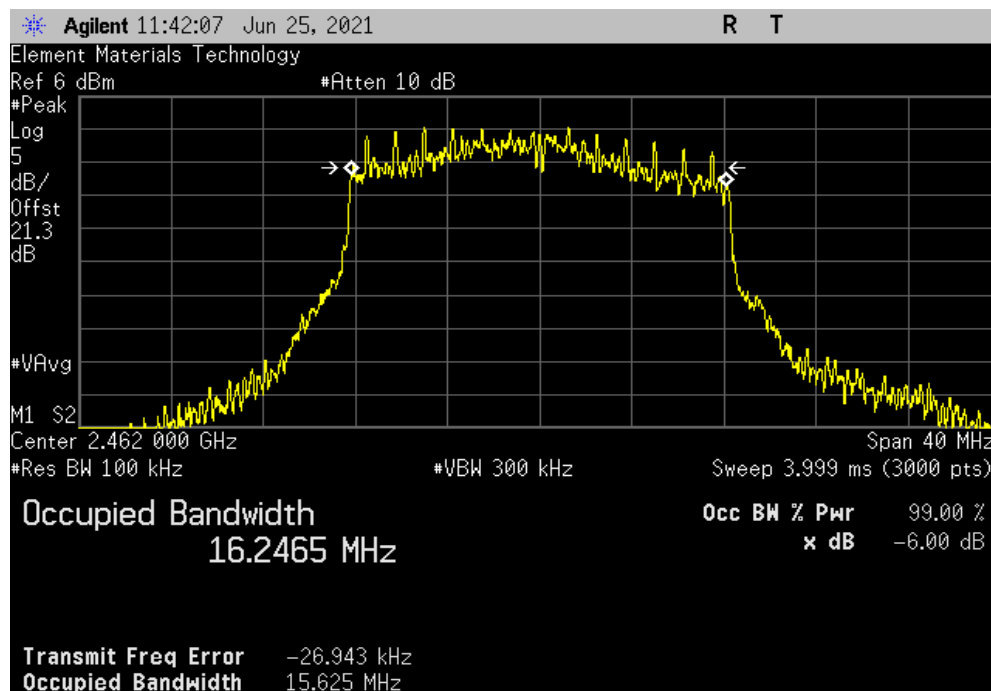


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				16.291 MHz	(>) 500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
				Value	Limit	Result
				15.625 MHz	(>) 500 kHz	Pass

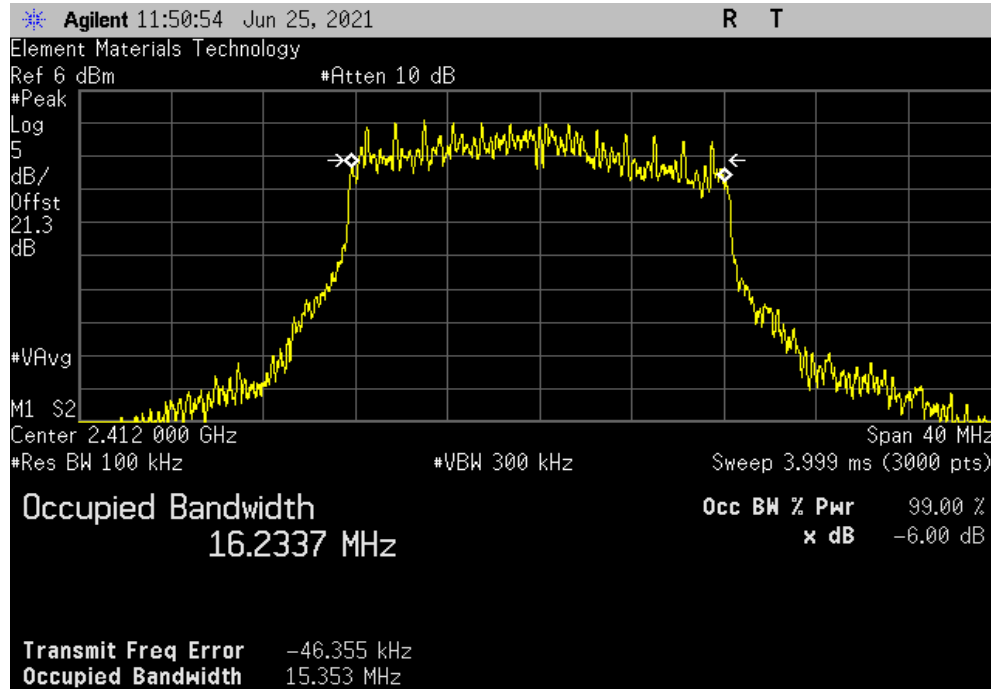


OCCUPIED BANDWIDTH

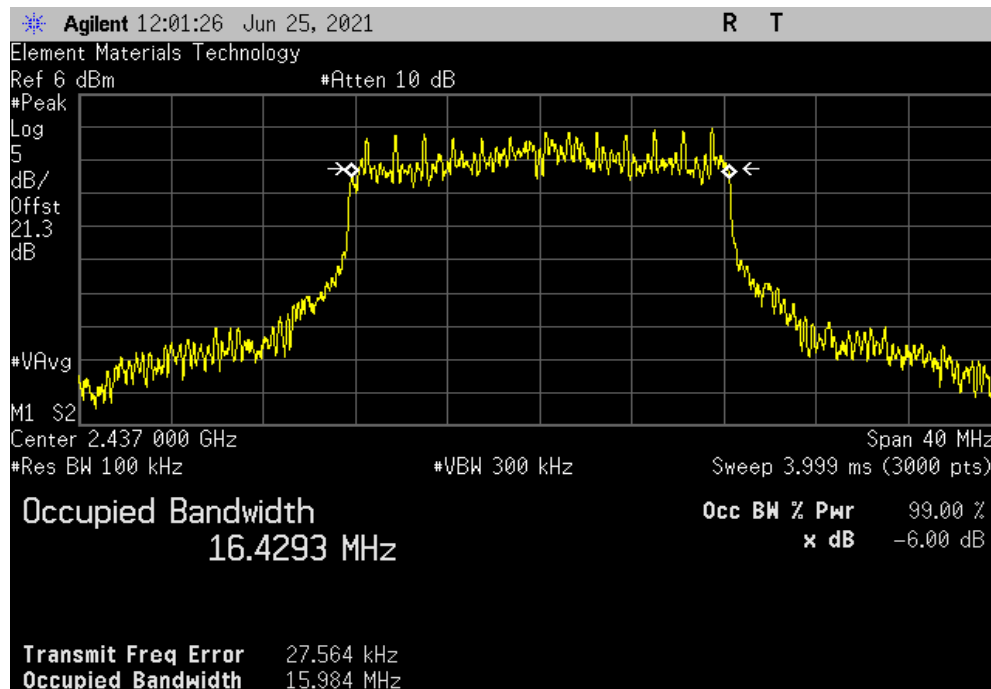


TUTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit (>)	Result
				15.353 MHz	500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit (>)	Result
				15.984 MHz	500 kHz	Pass



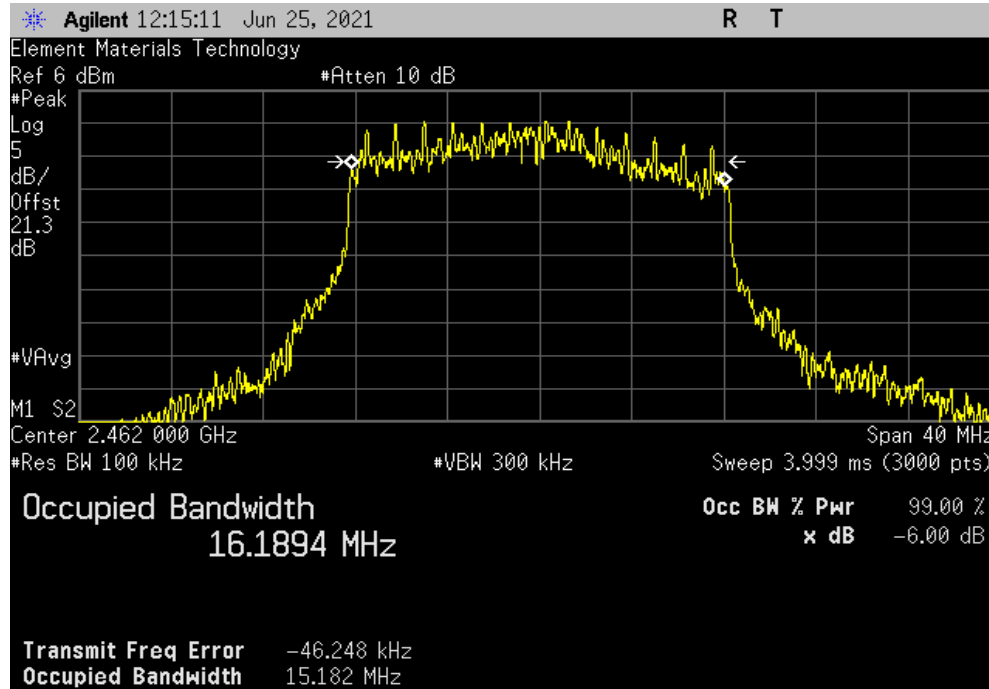
OCCUPIED BANDWIDTH



TUTx 2021.03.19.1 XMR 2020.12.30.0

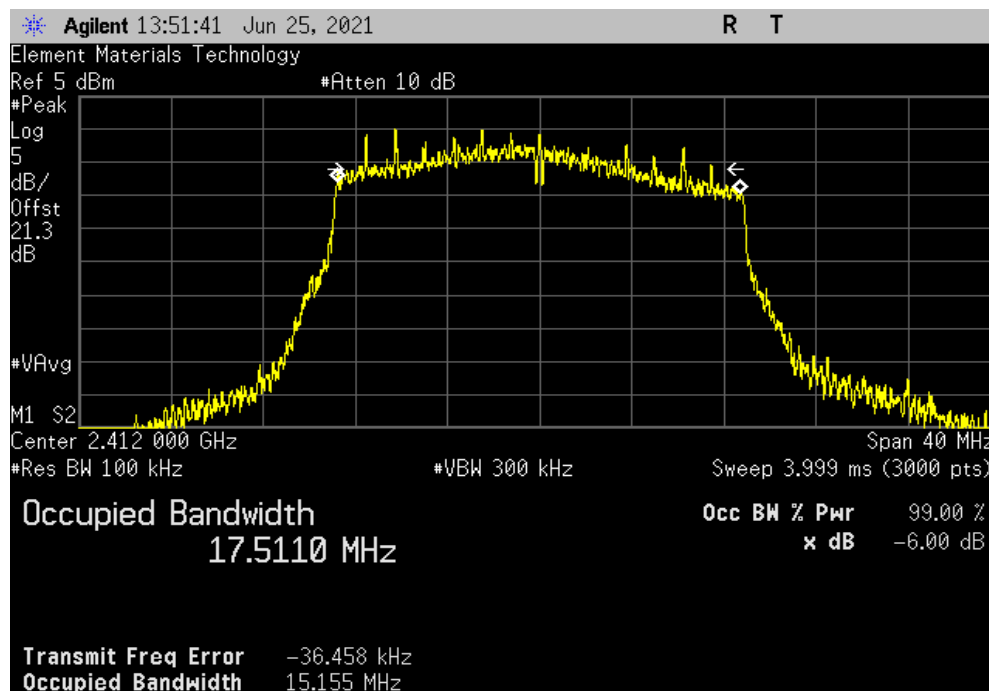
2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz

	Value	Limit (>)	Result
	15.182 MHz	500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Low Channel 1, 2412 MHz

	Value	Limit (>)	Result
	15.155 MHz	500 kHz	Pass

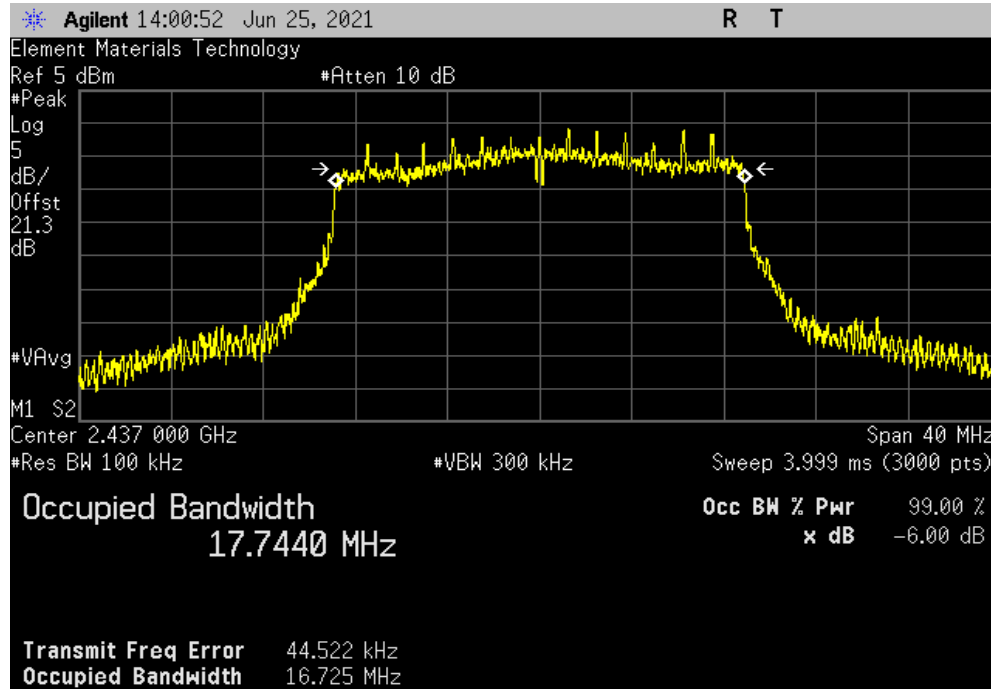


OCCUPIED BANDWIDTH

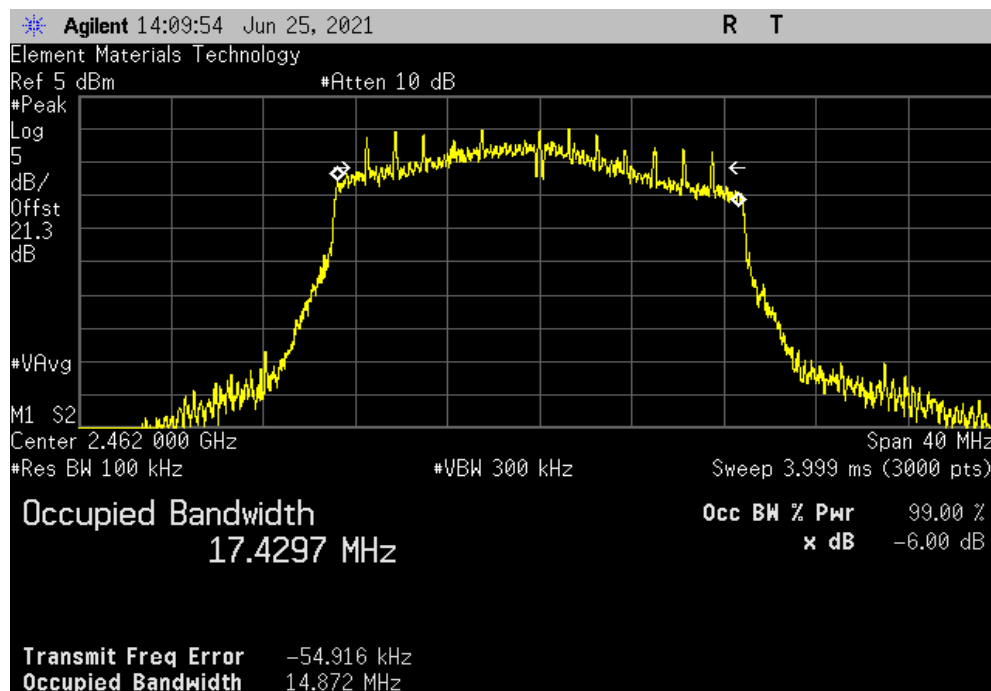


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				16.725 MHz	(>) 500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, High Channel 11, 2462 MHz						
				Value	Limit	Result
				14.872 MHz	(>) 500 kHz	Pass

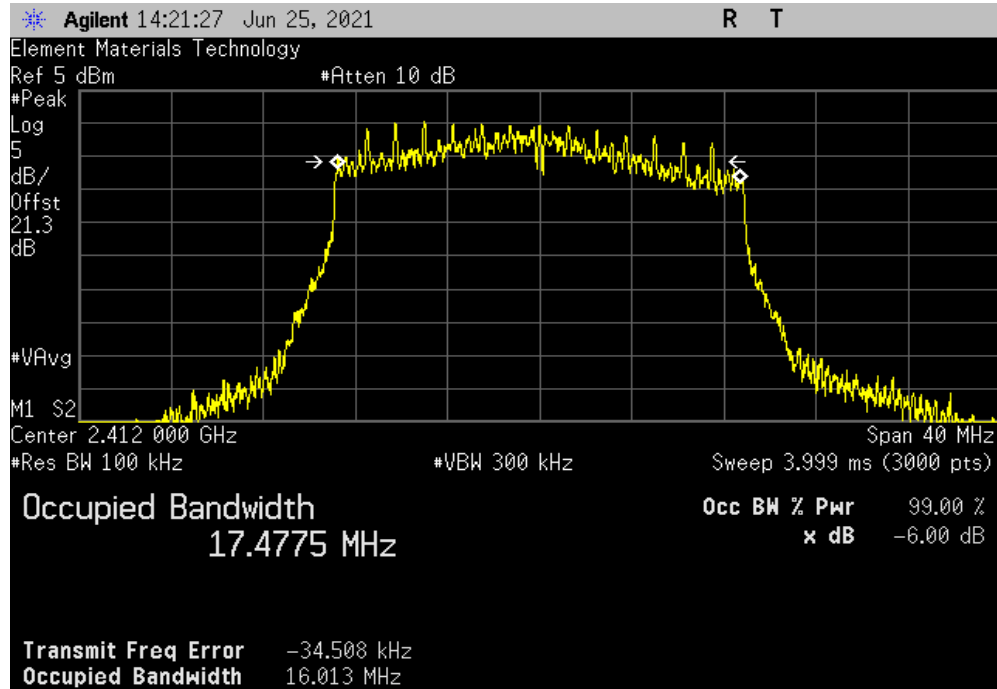


OCCUPIED BANDWIDTH

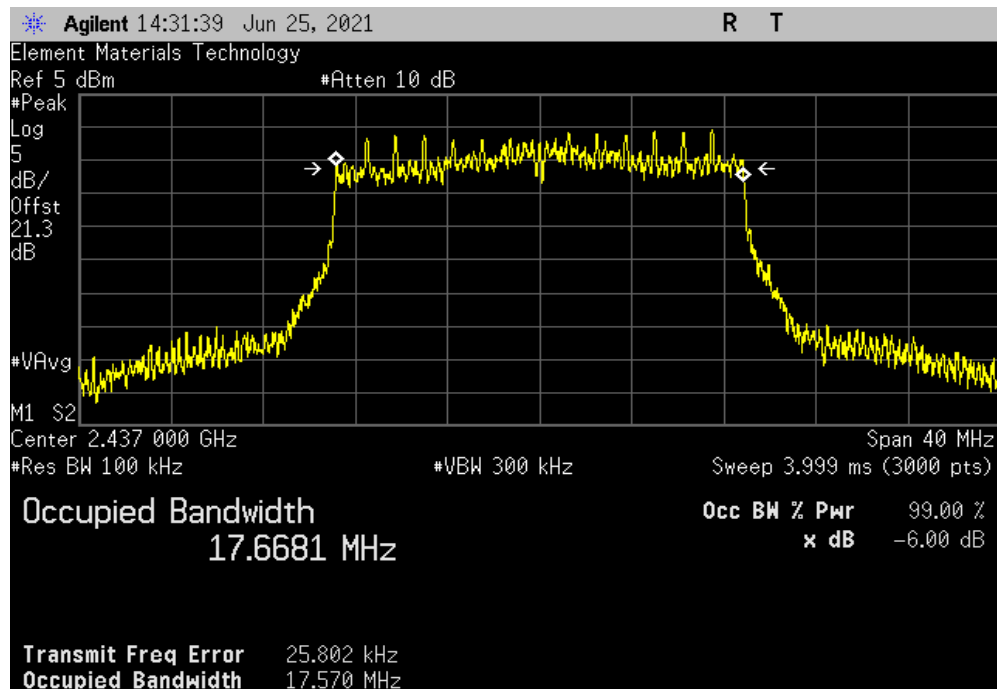


TUTTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				16.013 MHz	500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				17.57 MHz	500 kHz	Pass

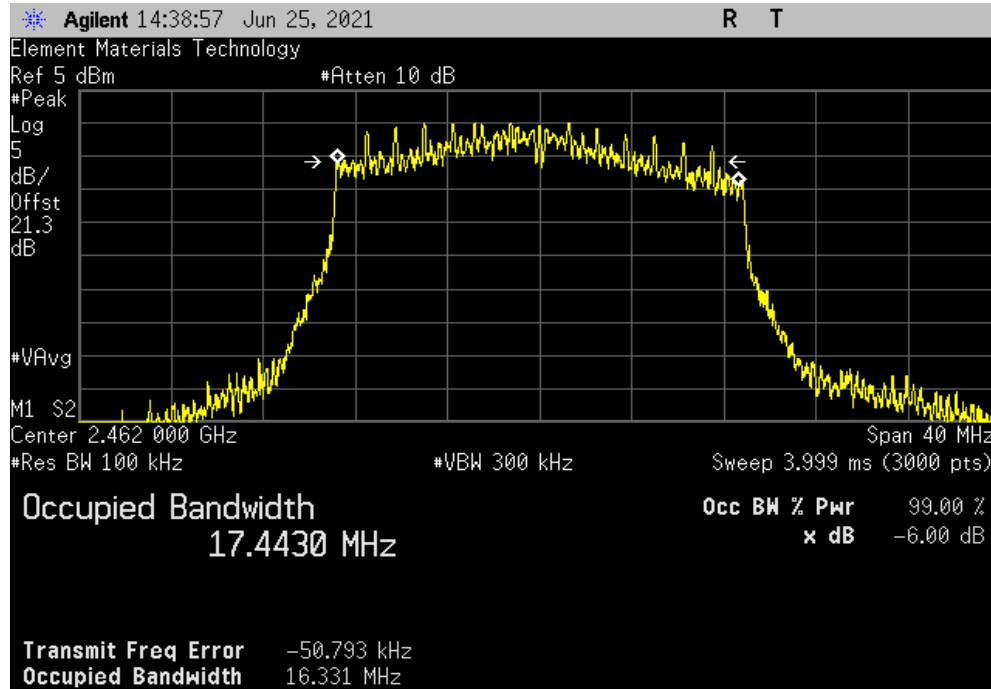


OCCUPIED BANDWIDTH



TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, High Channel 11, 2462 MHz						
Value				Limit	Result	
				(>)		
16.331 MHz				500 kHz	Pass	



OUTPUT POWER

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
Generator - Signal	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2021-04-08	2022-04-08

TEST DESCRIPTION

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



TestTx 2021.03.19.1 XMR 2020.12.30.0

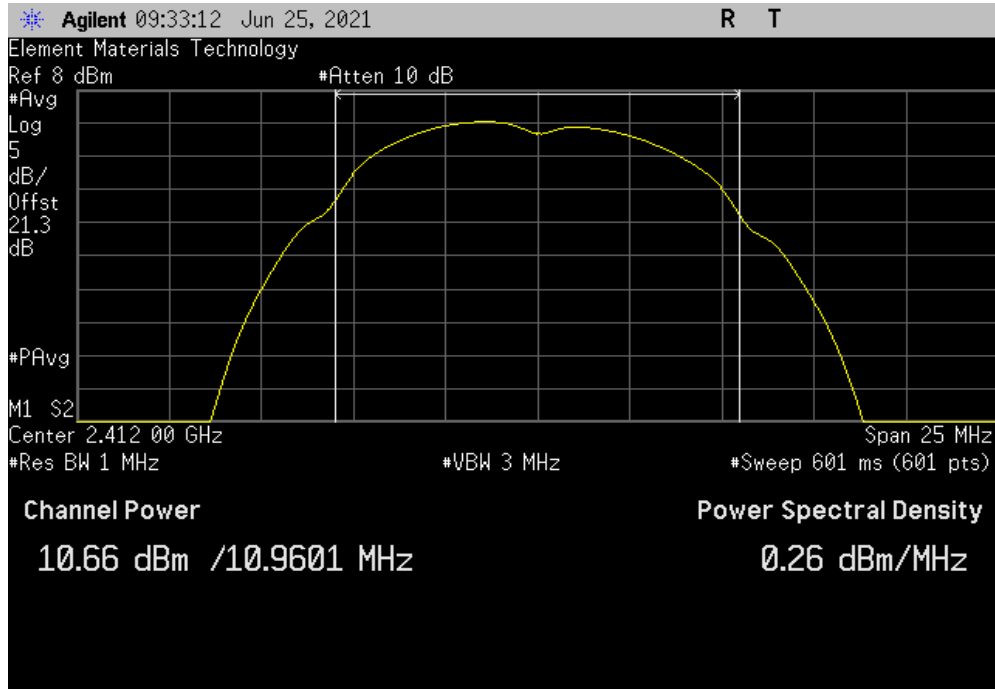
EUT: 43.0536.00		Work Order: A-DE0162	
Serial Number: SN001 00003		Date: 25-Jun-21	
Customer: A-dec, Inc.		Temperature: 24.2 °C	
Attendees: Zack Lyda and Spencer Warenke		Humidity: 48.2% RH	
Project: None		Barometric Pres.: 1008 mbar	
Tested by: Jeff Alcoke		Power: 3.3 VDC via 110VAC/60Hz	
TEST SPECIFICATIONS		Job Site: EV06	
FCC 15.247:2021		Test Method	
		ANSI C63.10:2013	
COMMENTS			
Reference level offset: DC Block, 20 dB attenuator, and measurement cable.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature 	
		Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)
		Out Pwr (dBm)	Limit (dBm)
			Result
2400 MHz - 2483.5 MHz Band			
20 MHz BW			
802.11(b) 1 Mbps			
Low Channel 1, 2412 MHz		10.661	0
Mid Channel 6, 2437 MHz		10.147	0
High Channel 11, 2462 MHz		10.665	0
802.11(b) 11 Mbps			
Low Channel 1, 2412 MHz		11.148	0.1
Mid Channel 6, 2437 MHz		10.445	0.1
High Channel 11, 2462 MHz		10.908	0.1
802.11(g) 6 Mbps			
Low Channel 1, 2412 MHz		12.124	0.1
Mid Channel 6, 2437 MHz		11.495	0.1
High Channel 11, 2462 MHz		12.216	0.1
802.11(g) 36 Mbps			
Low Channel 1, 2412 MHz		11.747	0.3
Mid Channel 6, 2437 MHz		11.009	0.3
High Channel 11, 2462 MHz		11.843	0.3
802.11(g) 54 Mbps			
Low Channel 1, 2412 MHz		11.609	0.5
Mid Channel 6, 2437 MHz		10.973	0.5
High Channel 11, 2462 MHz		11.765	0.5
802.11(n) MCS0			
Low Channel 1, 2412 MHz		10.673	0.1
Mid Channel 6, 2437 MHz		10.136	0.1
High Channel 11, 2462 MHz		10.739	0.1
802.11(n) MCS7			
Low Channel 1, 2412 MHz		10.235	0.5
Mid Channel 6, 2437 MHz		9.806	0.5
High Channel 11, 2462 MHz		10.319	0.5

OUTPUT POWER

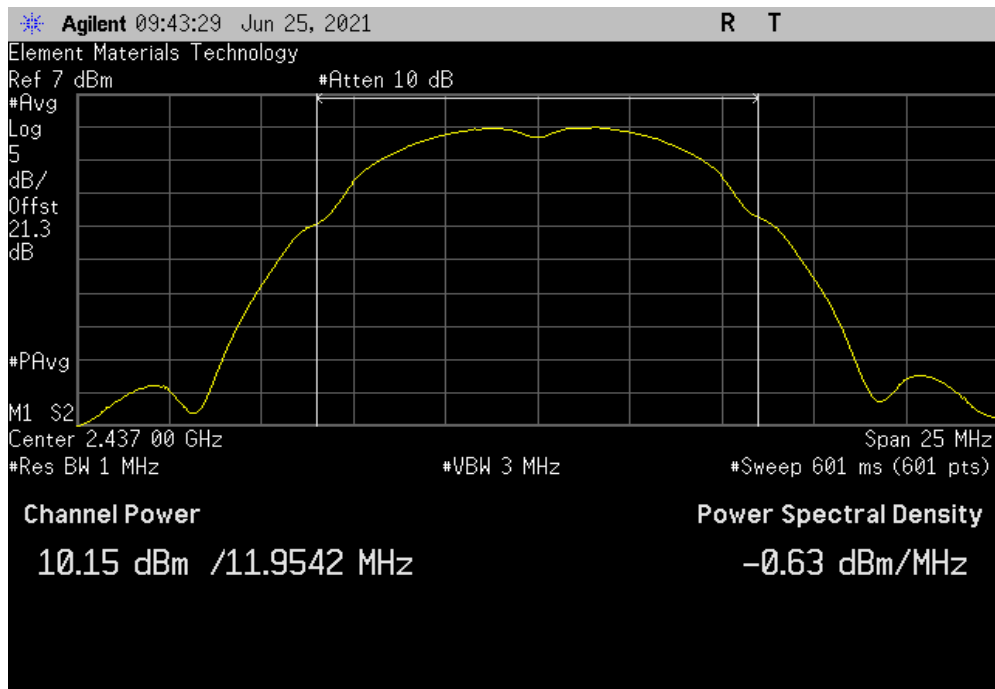


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	10.661	0	10.7	30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	10.147	0	10.1	30	Pass	

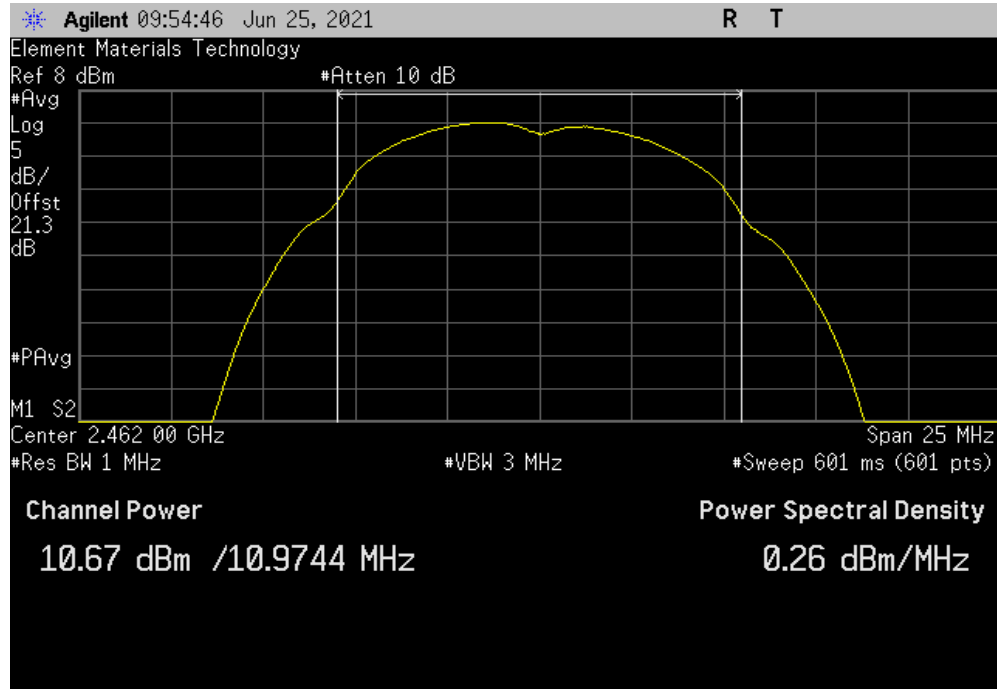


OUTPUT POWER

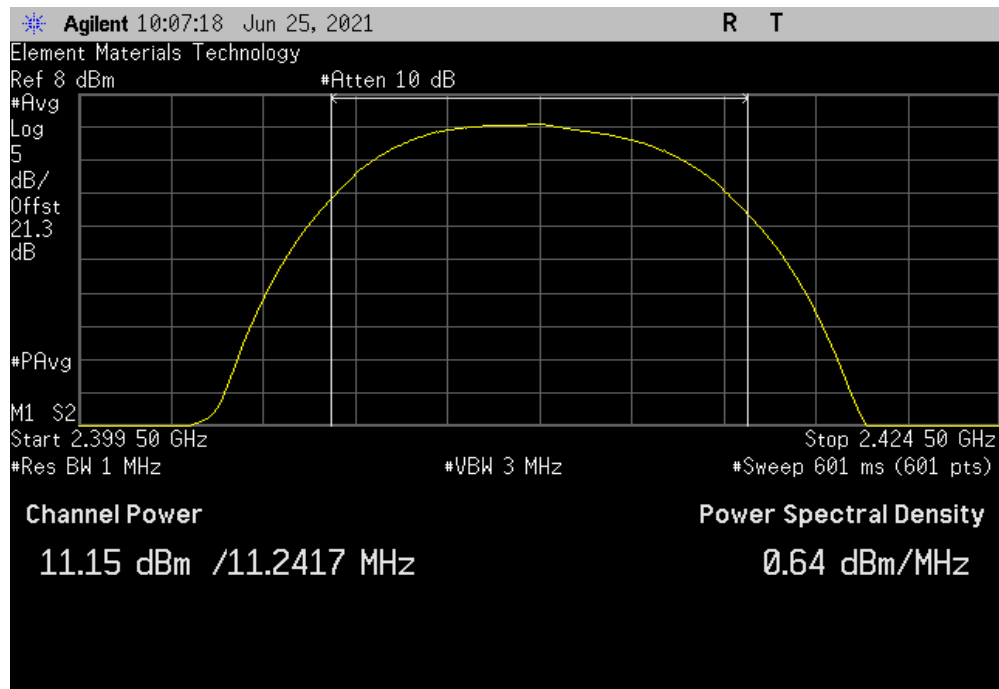


TUTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	10.665	0	10.7	30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.148	0.1	11.2	30	Pass	

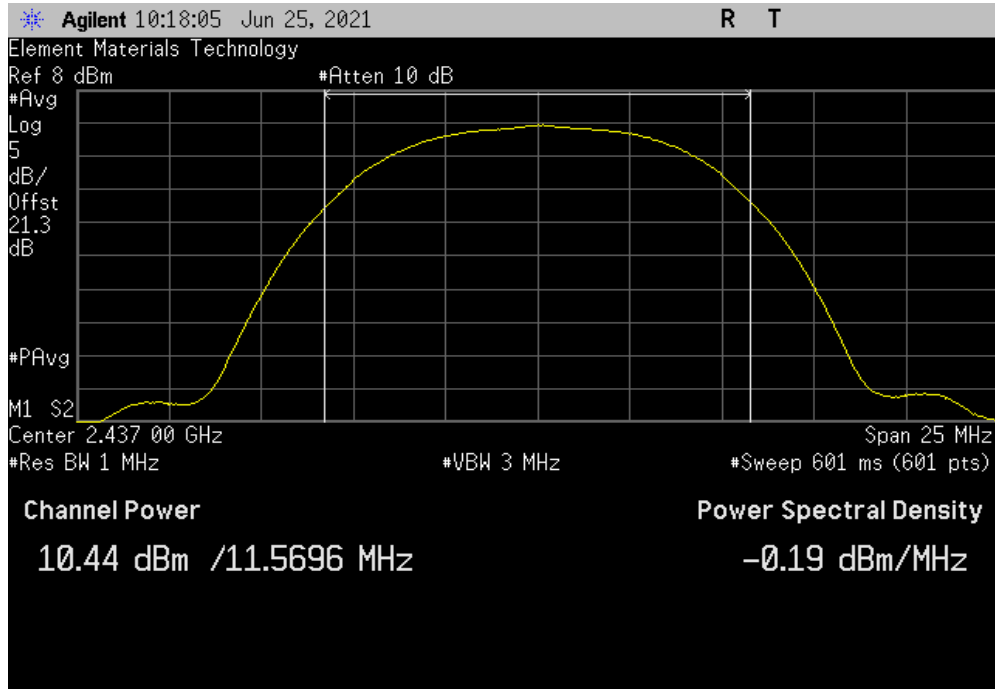


OUTPUT POWER

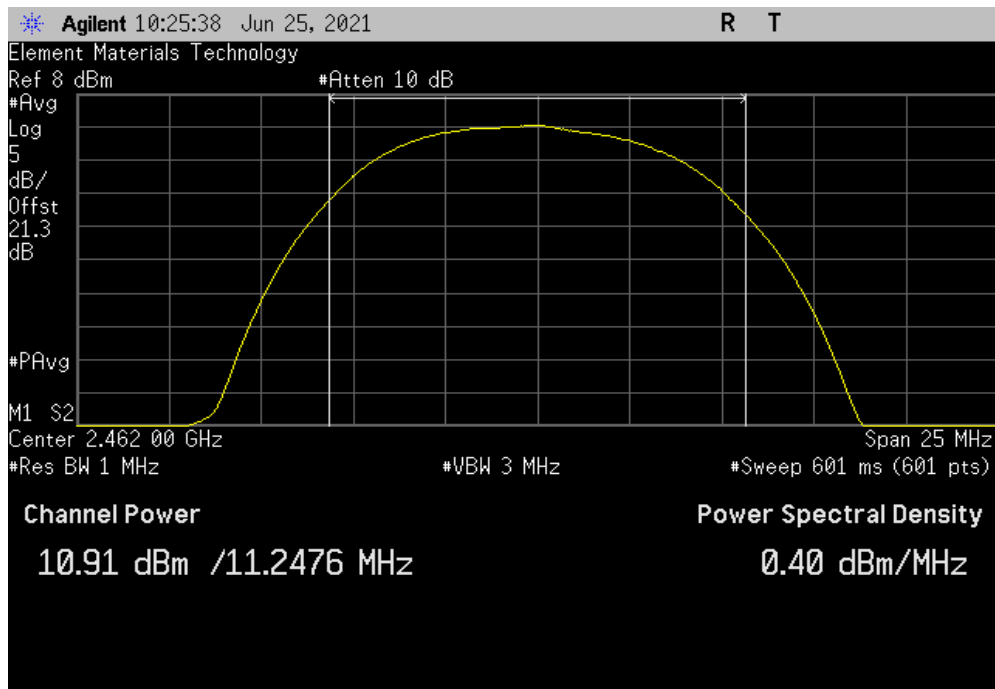


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	10.445	0.1	10.5	30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	10.908	0.1	11	30	Pass	

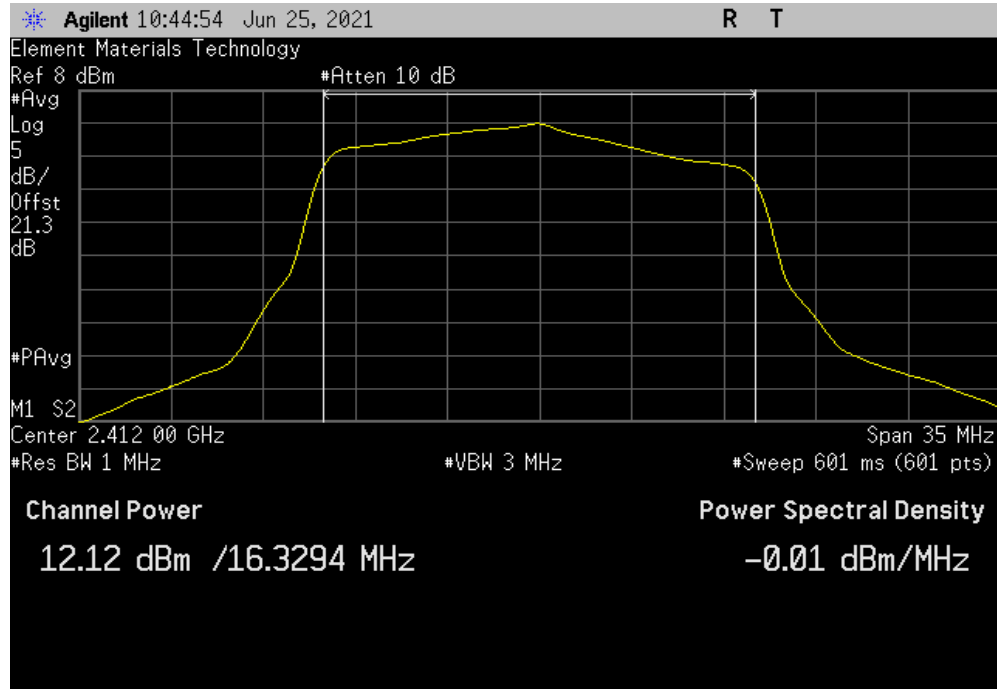


OUTPUT POWER

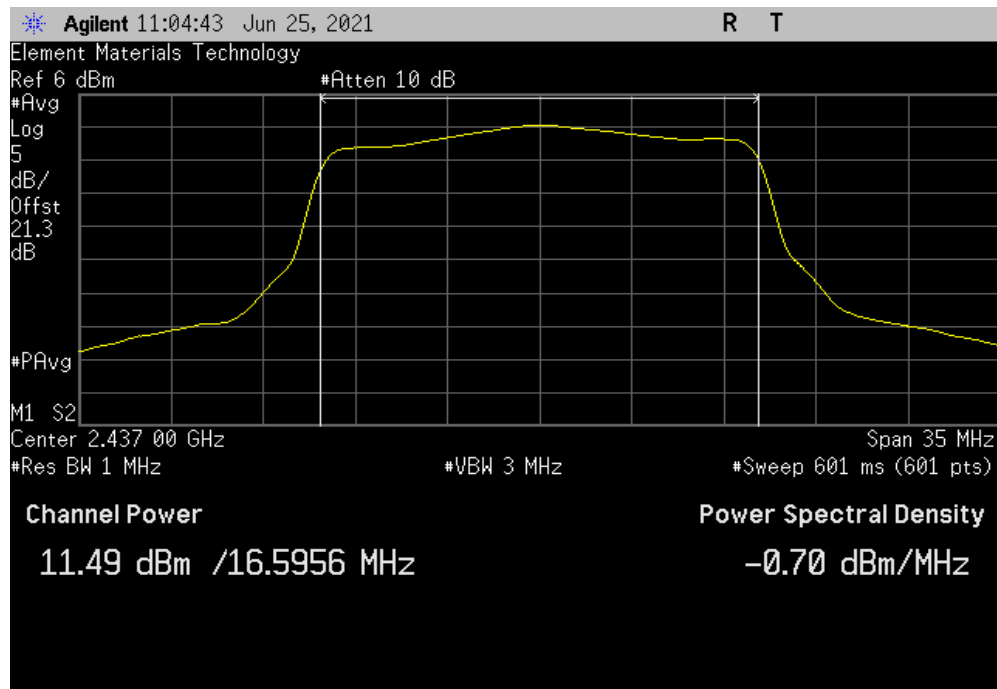


TUTx 2021.03.10.1 XM8 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	12.124	0.1	12.2	30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.495	0.1	11.6	30	Pass	

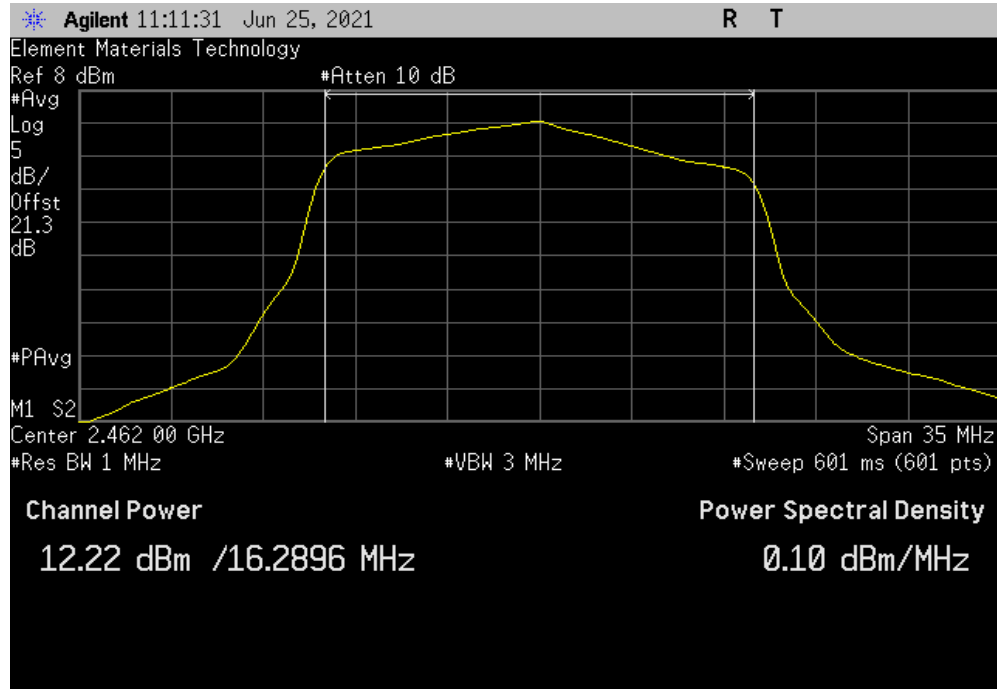


OUTPUT POWER

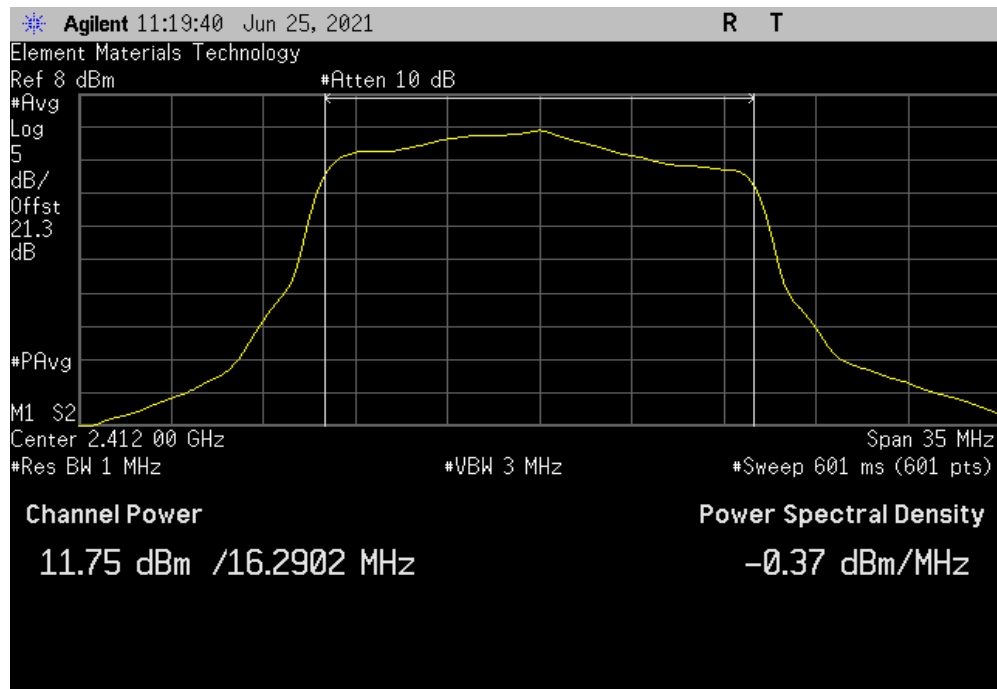


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	12.216	0.1	12.3	30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.747	0.3	12.1	30	Pass	

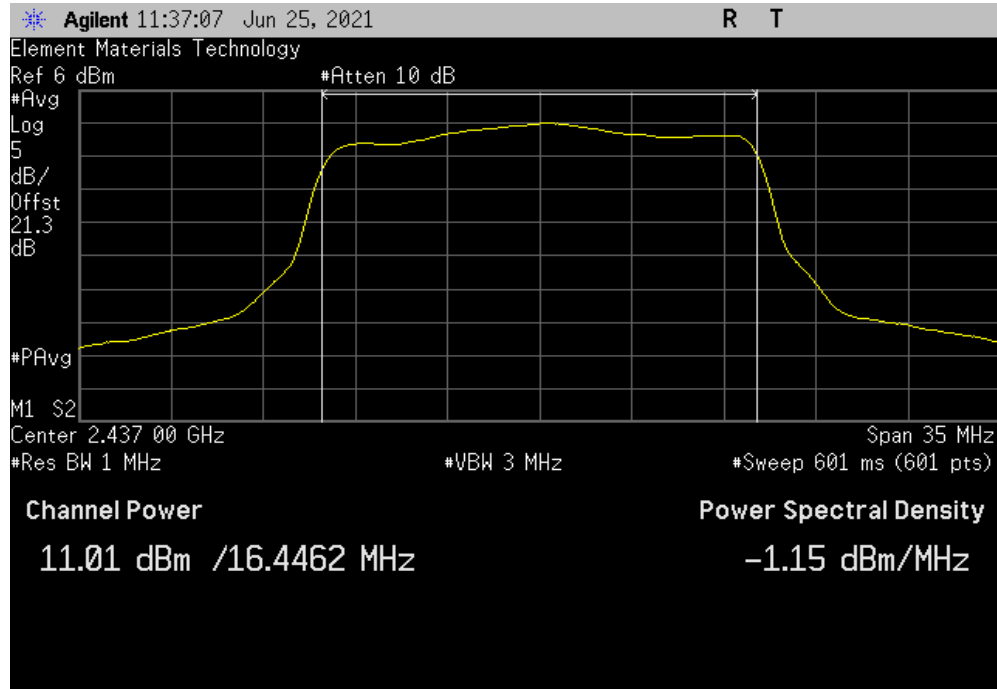


OUTPUT POWER

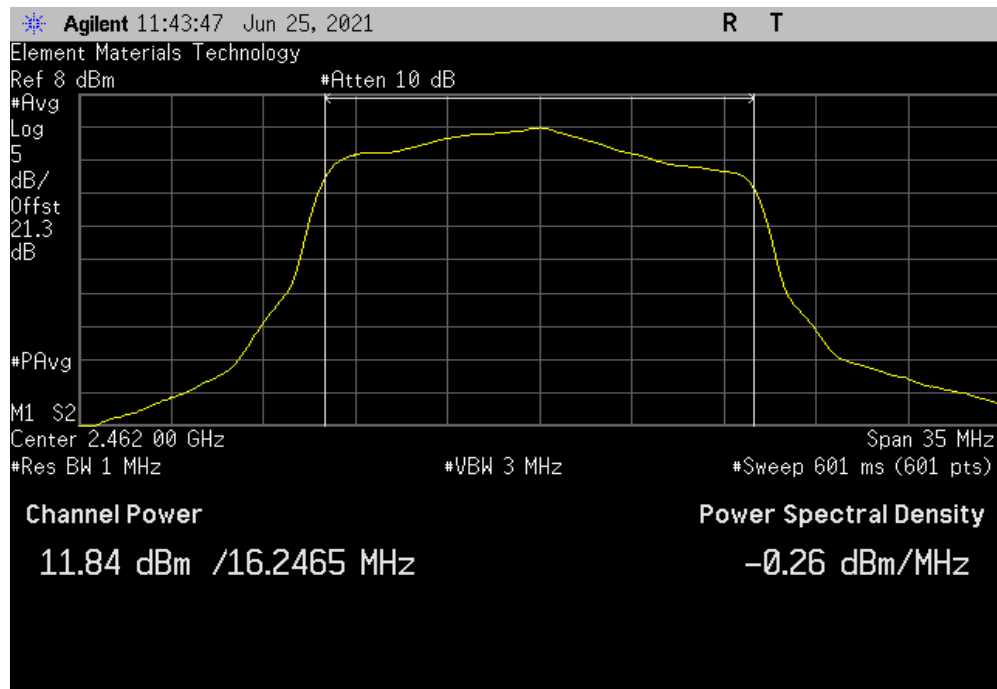


TUTx 2021.03.19.1 XM8 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.009	0.3	11.4	30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.843	0.3	12.2	30	Pass	

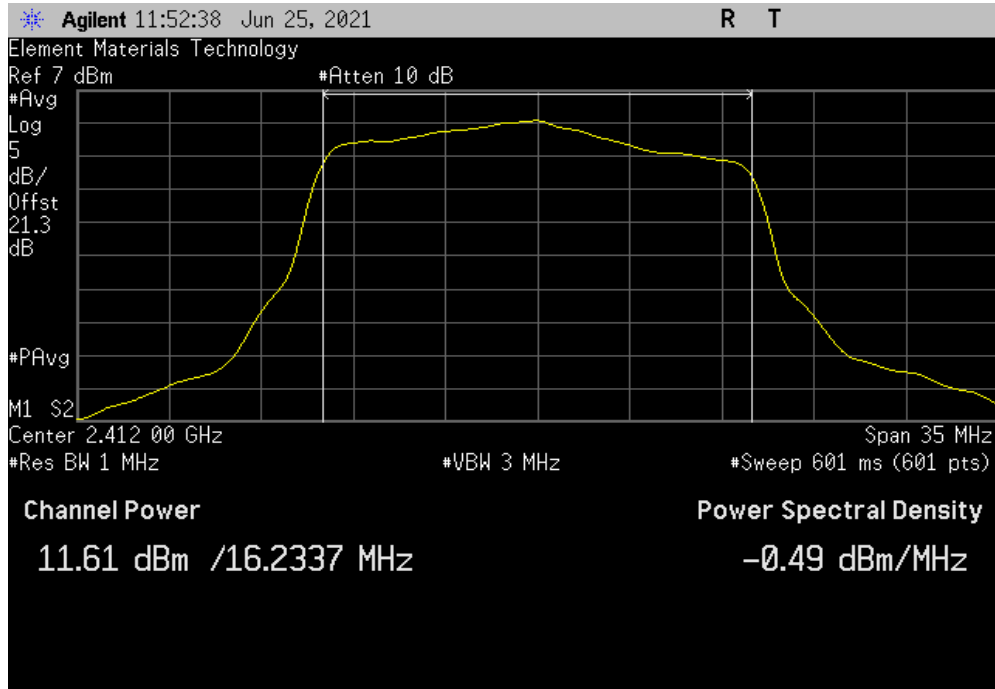


OUTPUT POWER

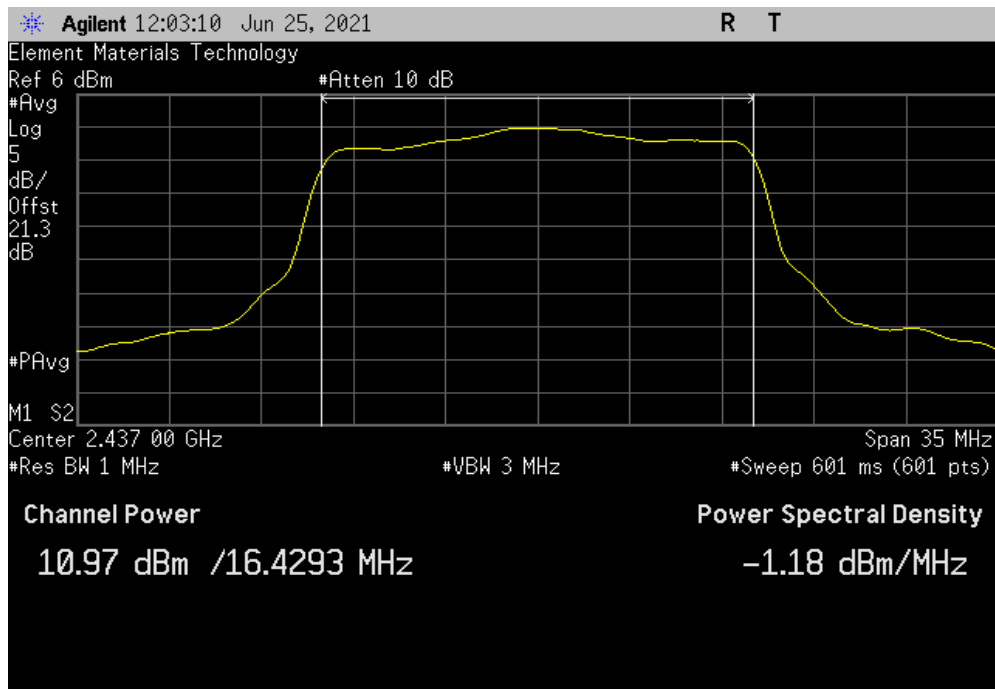


TUTx 2021.03.19.1 XM8 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.609	0.5	12.1	30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	10.973	0.5	11.5	30	Pass	

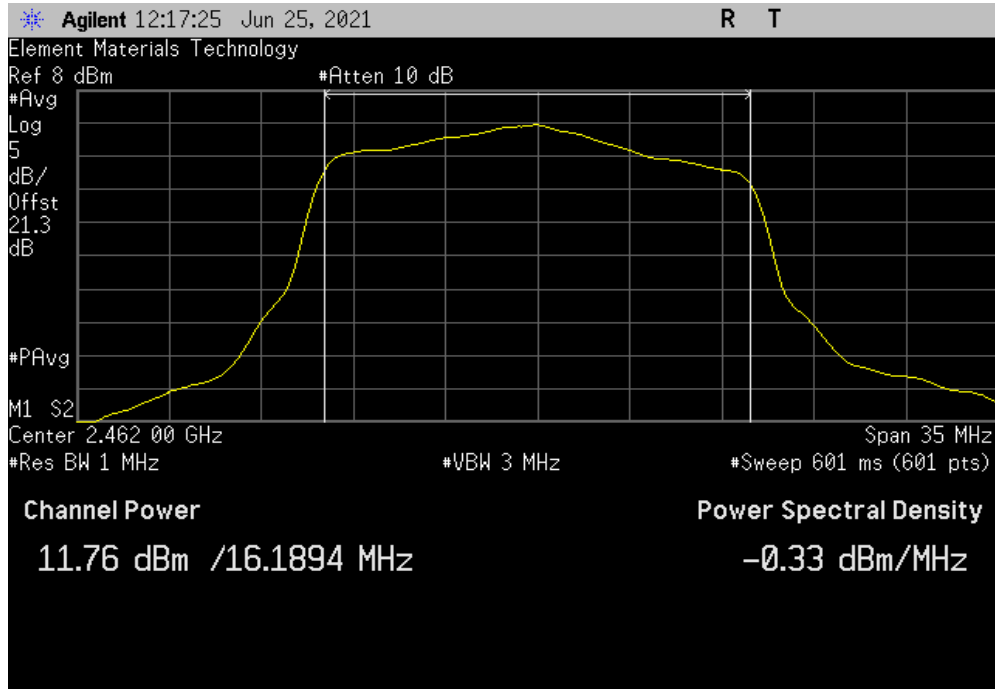


OUTPUT POWER

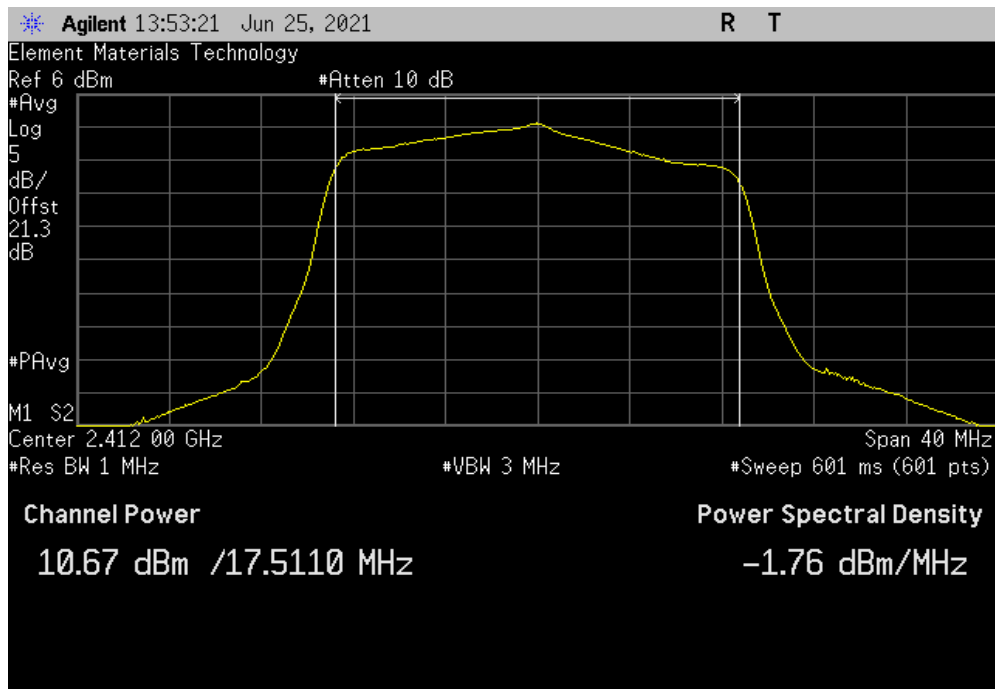


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.765	0.5	12.2	30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	10.673	0.1	10.7	30	Pass	

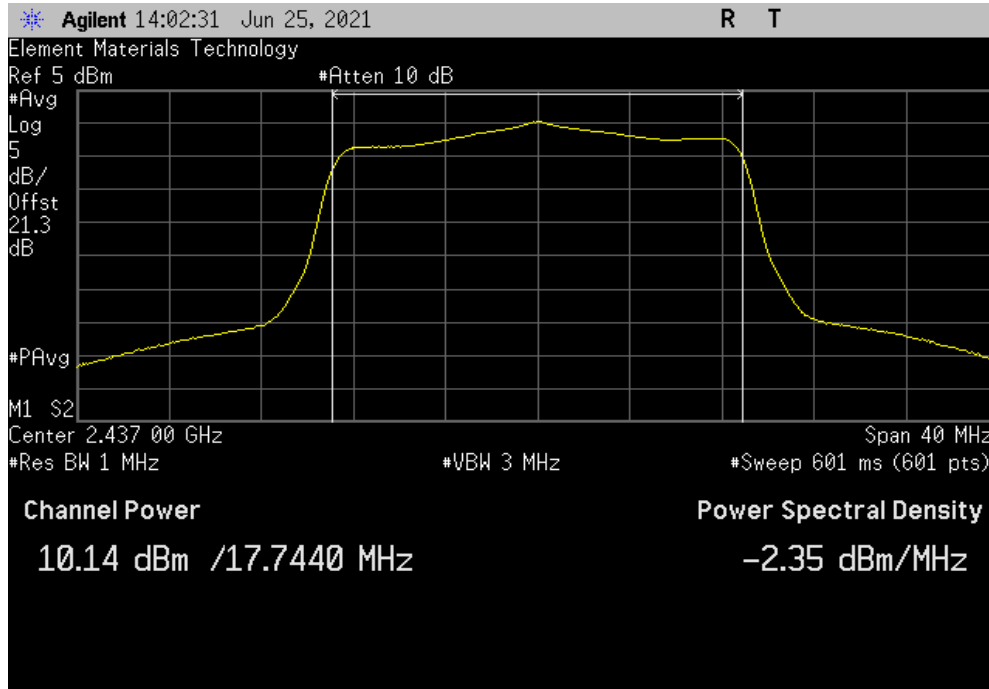


OUTPUT POWER

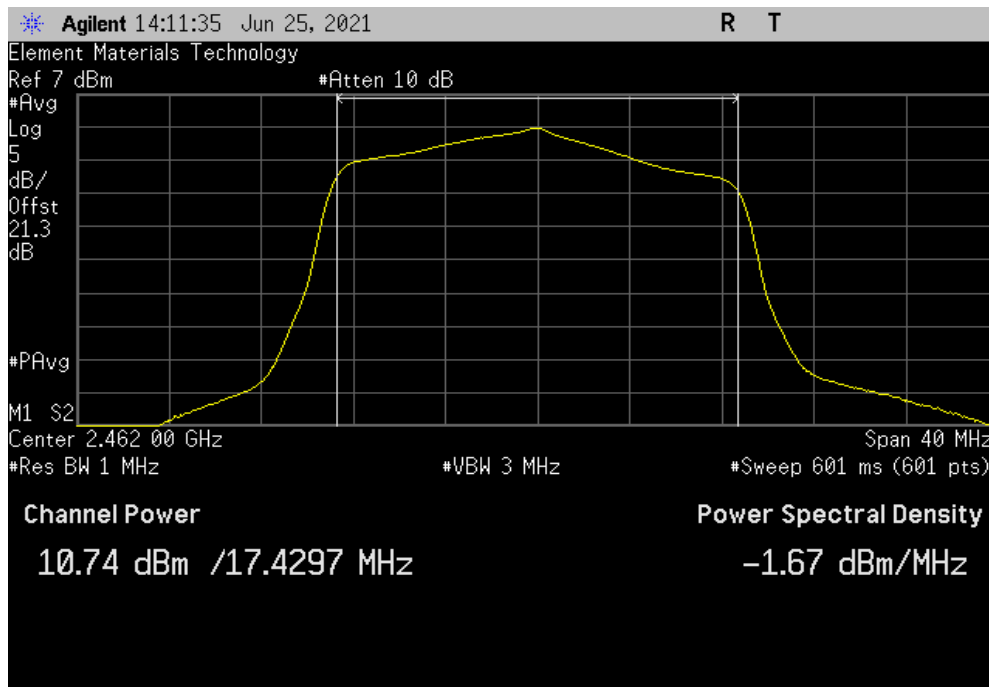


TUTx 2021.03.10.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	10.136	0.1	10.2	30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	10.739	0.1	10.8	30	Pass	

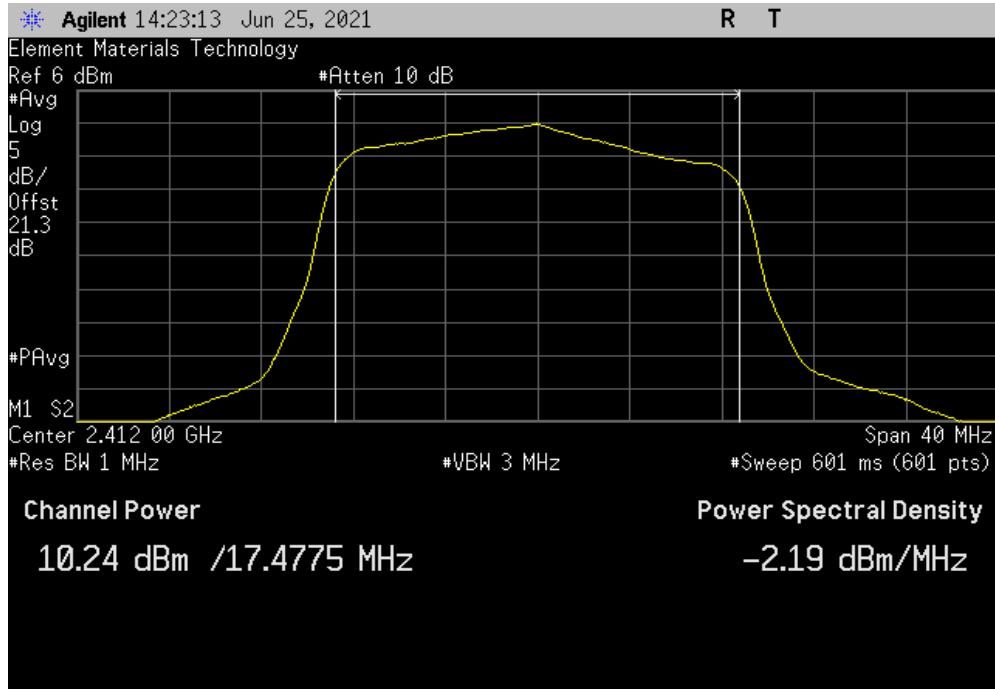


OUTPUT POWER

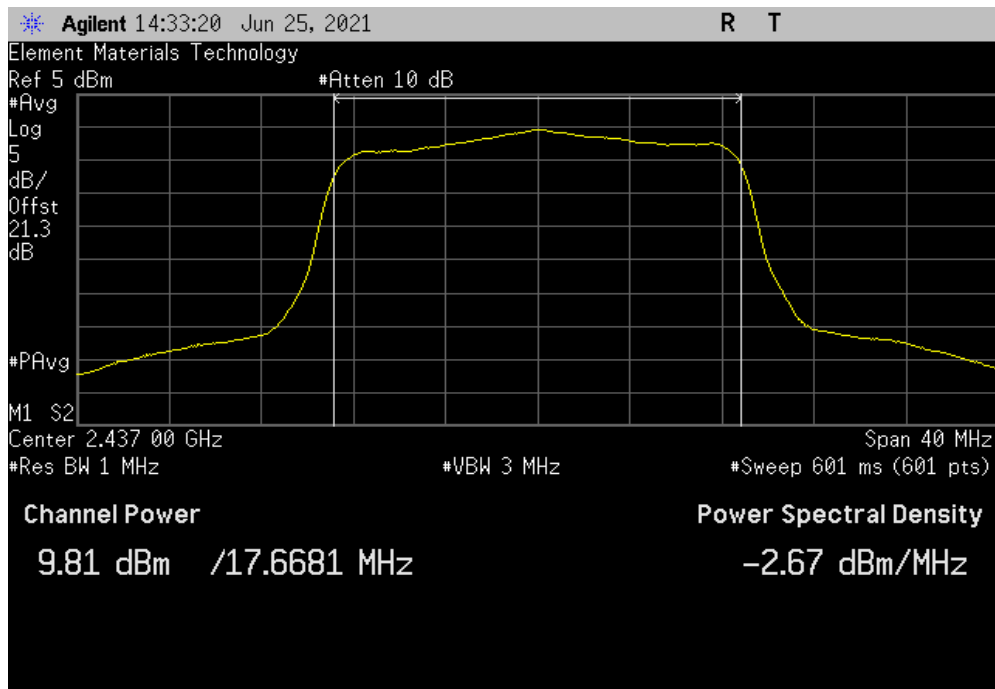


TMTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	10.235	0.5	10.8	30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	9.806	0.5	10.3	30	Pass	

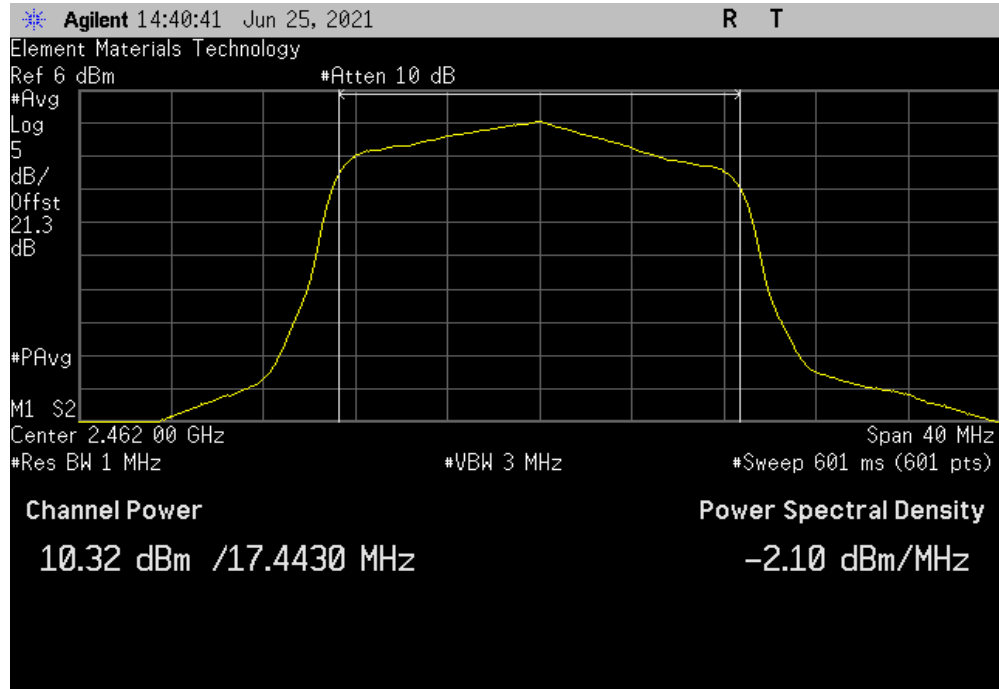


OUTPUT POWER



TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	10.319	0.5	10.8	30	Pass	



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



XMIT 2020.12.30.0

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
Generator - Signal	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2021-04-08	2022-04-08

TEST DESCRIPTION

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.

Equivalent Isotropic Radiated Power (EIRP) = Max Measured Power + Antenna gain (dBi)

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



TWTx 2021.03.19.1 XMR 2020.12.30.0

EUT: 43.0536.00

Serial Number: SN001 00003

Customer: A-dec, Inc.

Attendees: Zack Lyda and Spencer Warenke

Project: None

Tested by: Jeff Alcoke

Work Order: A-DE0162

Date: 28-Jun-21

Temperature: 24.1 °C

Humidity: 48% RH

Barometric Pres.: 1008 mbar

Job Site: EV06

TEST SPECIFICATIONS

FCC 15.247:2021

TEST METHOD

ANSI C63.10:2013

COMMENTS

Reference level offset: DC Block, 20 dB attenuator, and measurement cable.

DEVIATIONS FROM TEST STANDARD

None

Configuration #

1

Signature



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

20 MHz BW

802.11(b) 1 Mbps

Low Channel 1, 2412 MHz

10.661

0

10.7

2.2

12.9

36

Pass

Mid Channel 6, 2437 MHz

10.147

0

10.1

2.2

12.3

36

Pass

High Channel 11, 2462 MHz

10.665

0

10.7

2.2

12.9

36

Pass

802.11(b) 11 Mbps

Low Channel 1, 2412 MHz

11.148

0.1

11.2

2.2

13.4

36

Pass

Mid Channel 6, 2437 MHz

10.445

0.1

10.5

2.2

12.7

36

Pass

High Channel 11, 2462 MHz

10.908

0.1

11

2.2

13.2

36

Pass

802.11(g) 6 Mbps

Low Channel 1, 2412 MHz

12.124

0.1

12.2

2.2

14.4

36

Pass

Mid Channel 6, 2437 MHz

11.495

0.1

11.6

2.2

13.8

36

Pass

High Channel 11, 2462 MHz

12.216

0.1

12.3

2.2

14.5

36

Pass

802.11(g) 36 Mbps

Low Channel 1, 2412 MHz

11.747

0.3

12.1

2.2

14.3

36

Pass

Mid Channel 6, 2437 MHz

11.009

0.3

11.4

2.2

13.6

36

Pass

High Channel 11, 2462 MHz

11.843

0.3

12.2

2.2

14.4

36

Pass

802.11(g) 54 Mbps

Low Channel 1, 2412 MHz

11.609

0.5

12.1

2.2

14.3

36

Pass

Mid Channel 6, 2437 MHz

10.973

0.5

11.5

2.2

13.7

36

Pass

High Channel 11, 2462 MHz

11.765

0.5

12.2

2.2

14.4

36

Pass

802.11(n) MCS0

Low Channel 1, 2412 MHz

10.673

0.1

10.7

2.2

12.9

36

Pass

Mid Channel 6, 2437 MHz

10.136

0.1

10.2

2.2

12.4

36

Pass

High Channel 11, 2462 MHz

10.739

0.1

10.8

2.2

13

36

Pass

802.11(n) MCS7

Low Channel 1, 2412 MHz

10.235

0.5

10.8

2.2

13

36

Pass

Mid Channel 6, 2437 MHz

9.806

0.5

10.3

2.2

12.5

36

Pass

High Channel 11, 2462 MHz

10.319

0.5

10.8

2.2

13

36

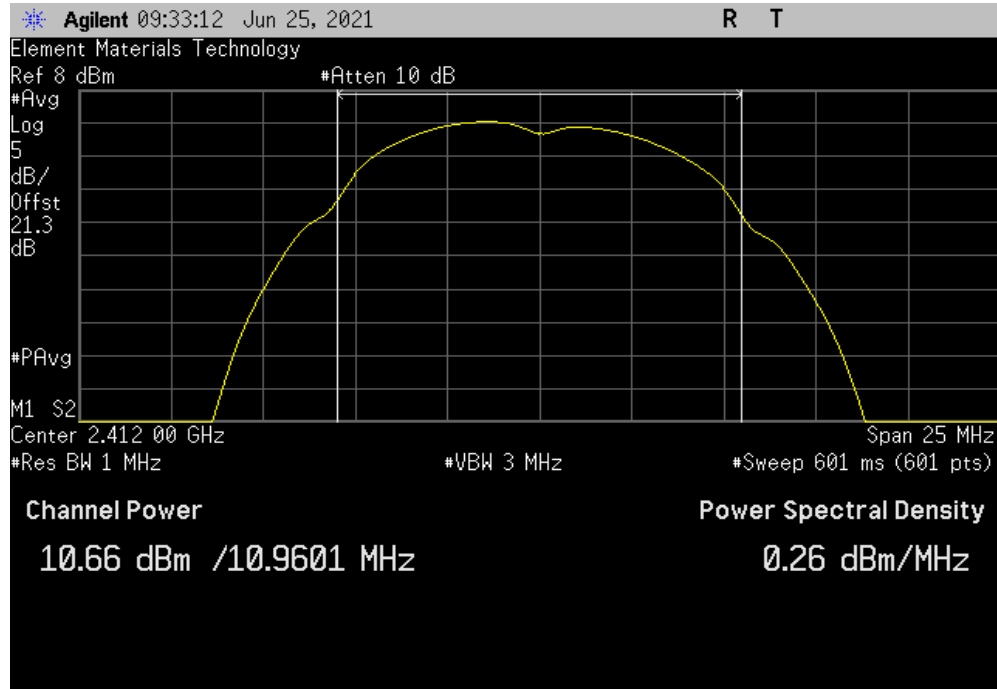
Pass

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

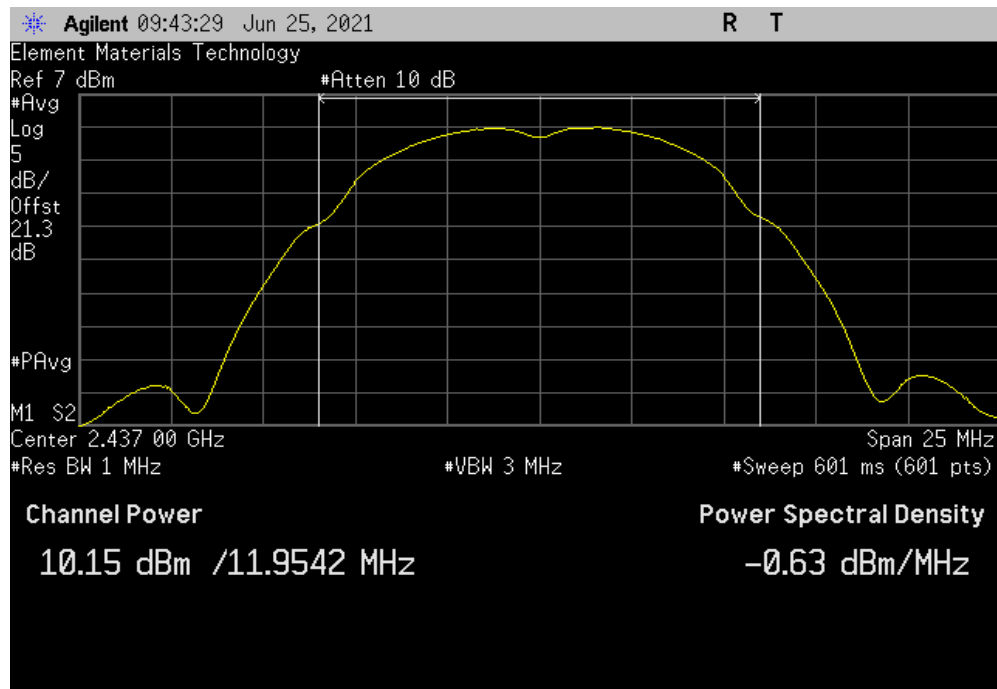


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
10.661	0	10.7	2.2	12.9	36	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
10.147	0	10.1	2.2	12.3	36	Pass

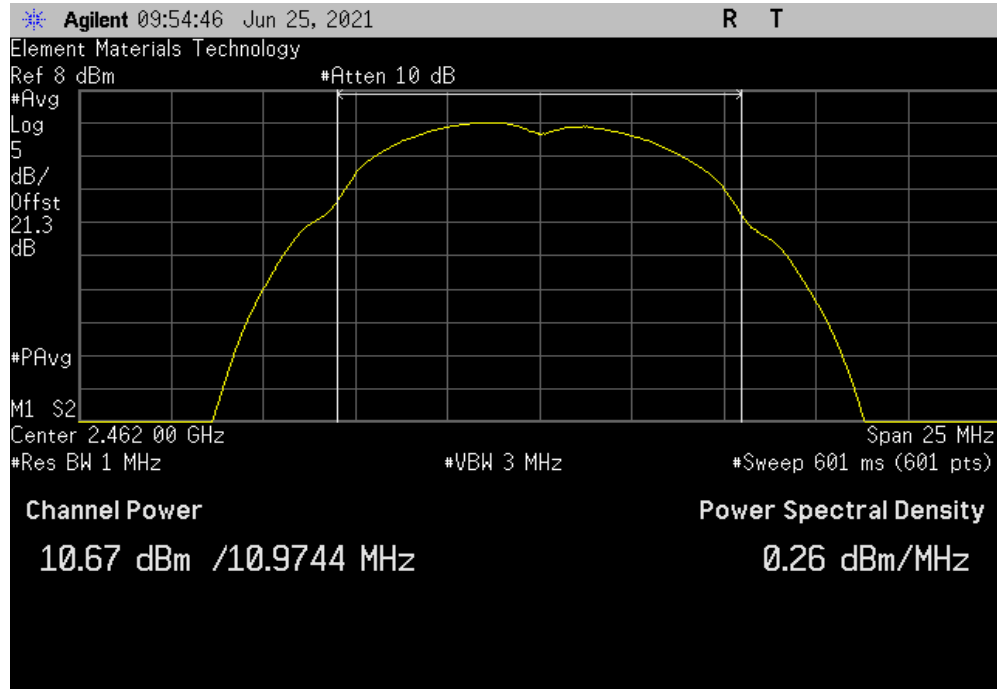


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

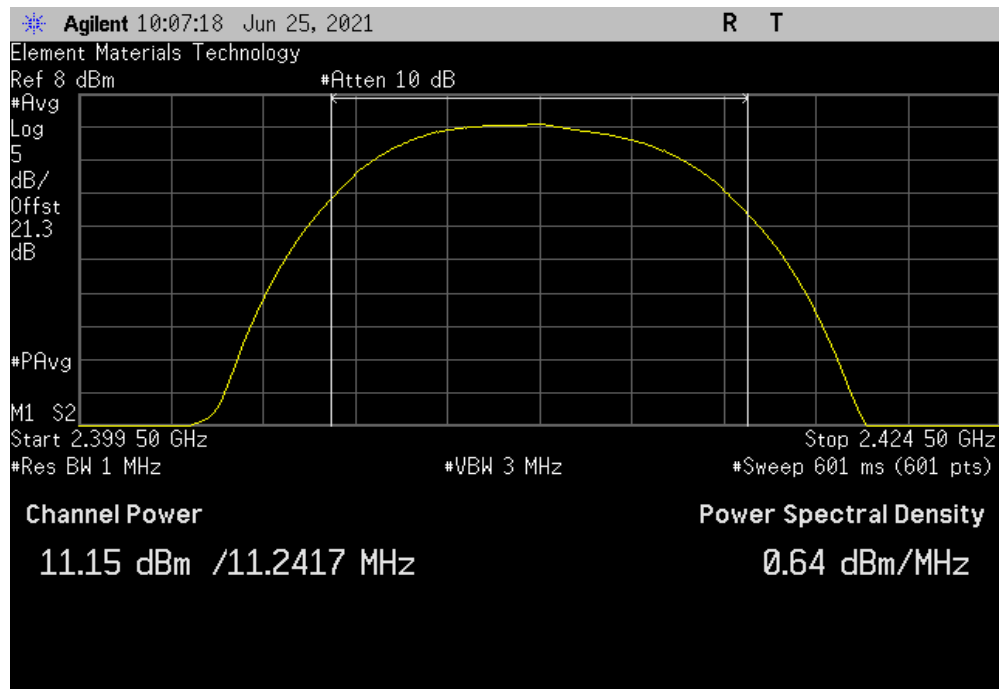


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
10.665	0	10.7	2.2	12.9	36	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
11.148	0.1	11.2	2.2	13.4	36	Pass

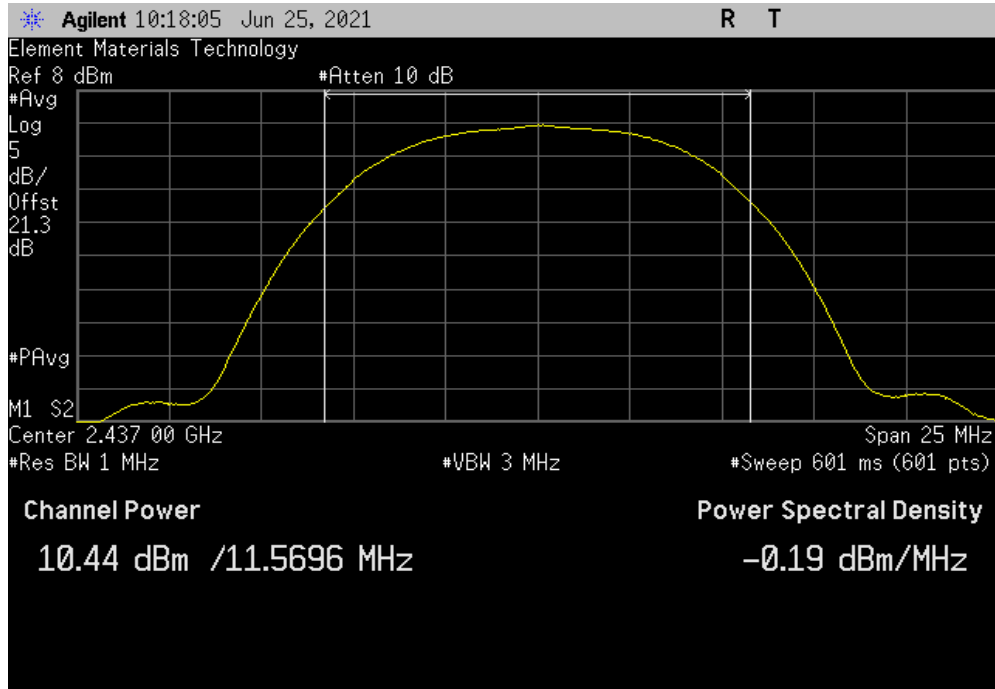


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

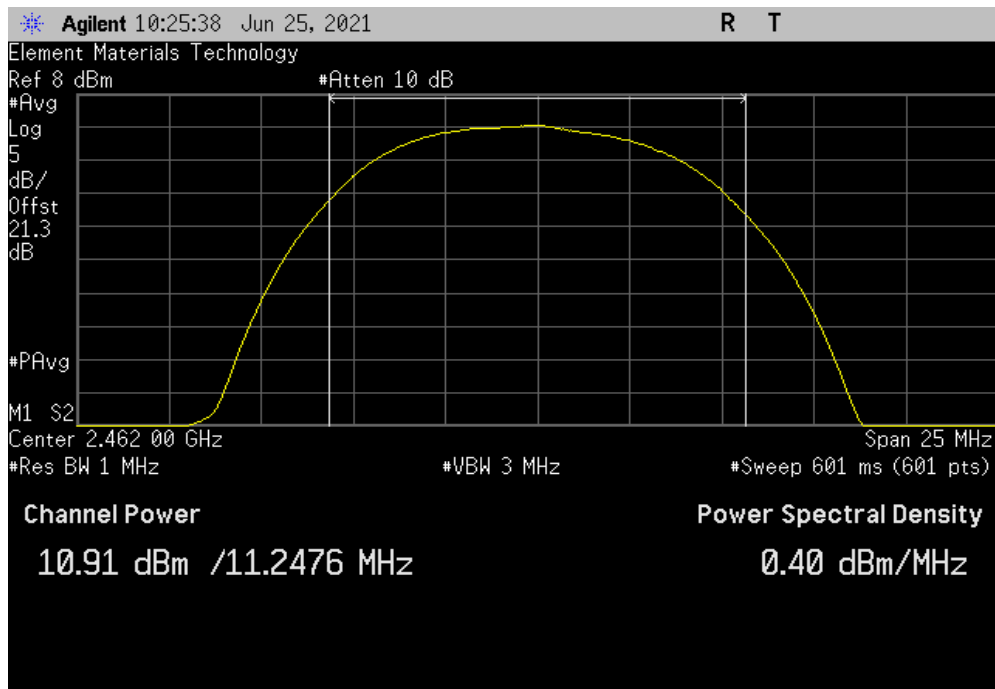


TUTx 2021.03.19.1 XM8 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
10.445	0.1	10.5	2.2	12.7	36	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
10.908	0.1	11	2.2	13.2	36	Pass

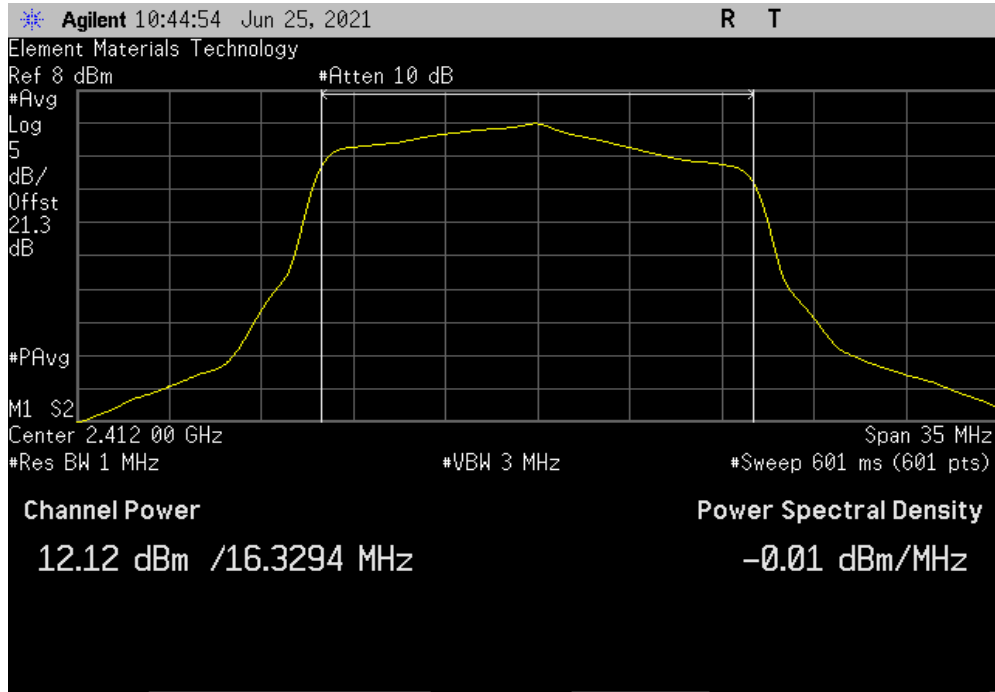


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

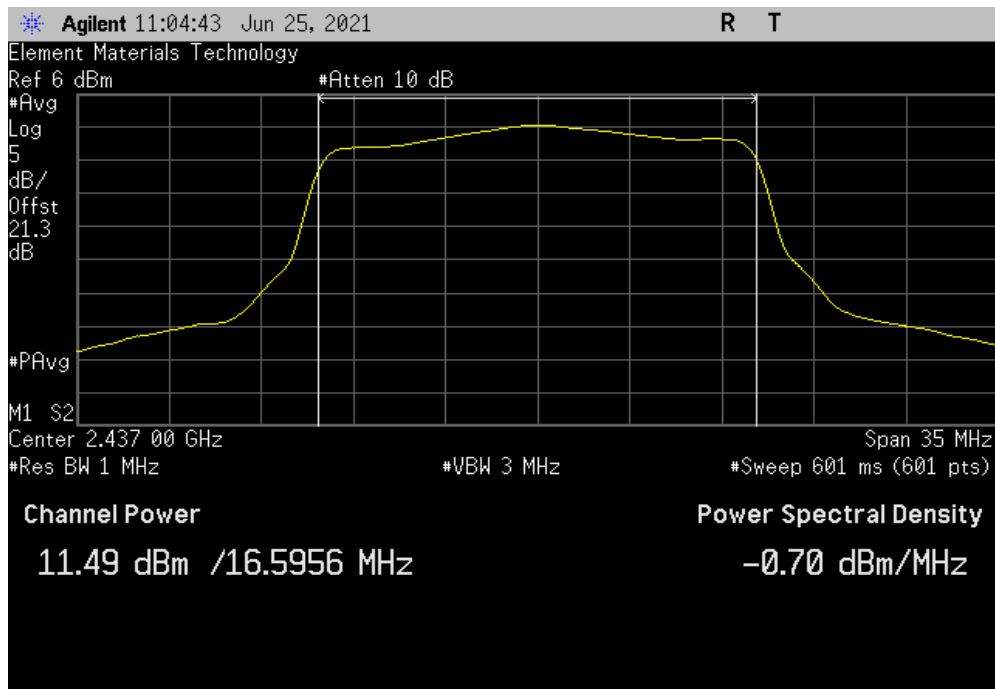


TUTx 2021.03.19.1 XM8 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
12.124	0.1	12.2	2.2	14.4	36	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
11.495	0.1	11.6	2.2	13.8	36	Pass

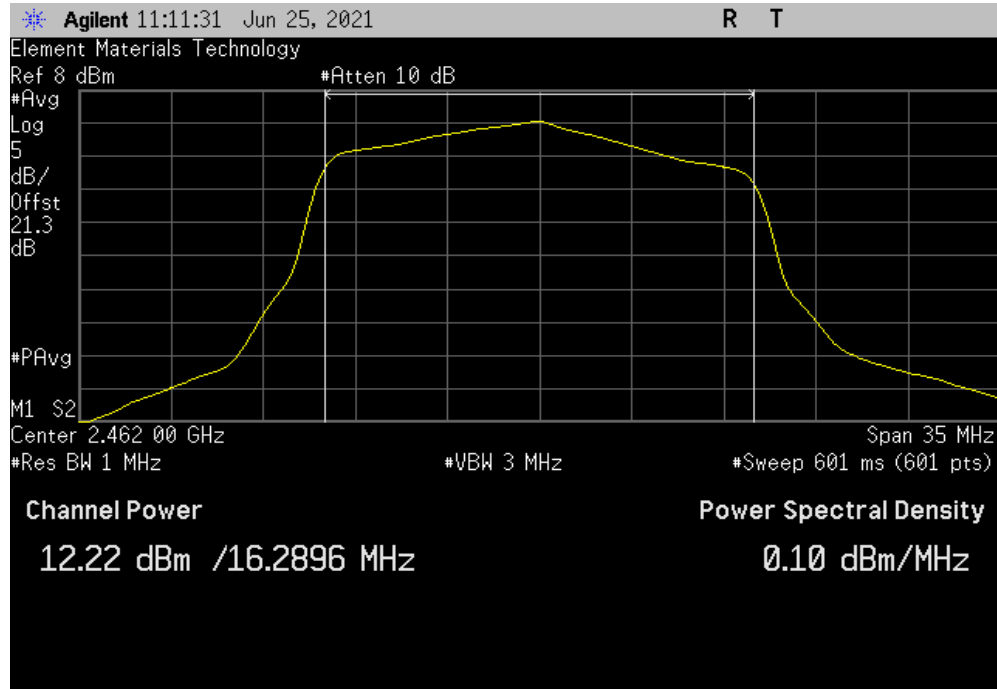


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

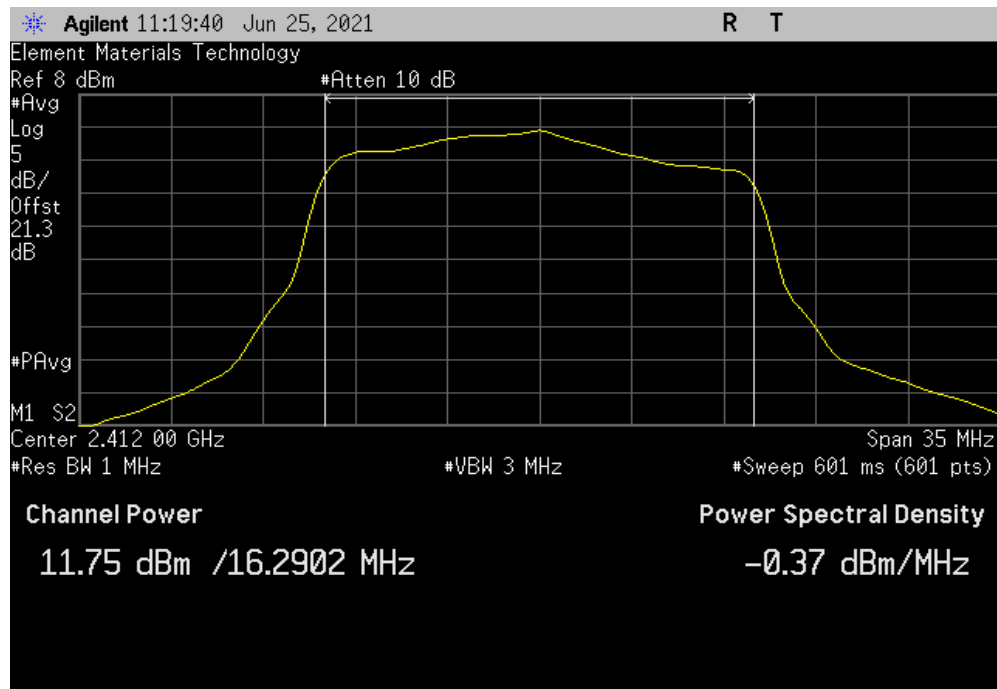


TUTx 2021.03.10.1 XM8 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
12.216	0.1	12.3	2.2	14.5	36	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
11.747	0.3	12.1	2.2	14.3	36	Pass

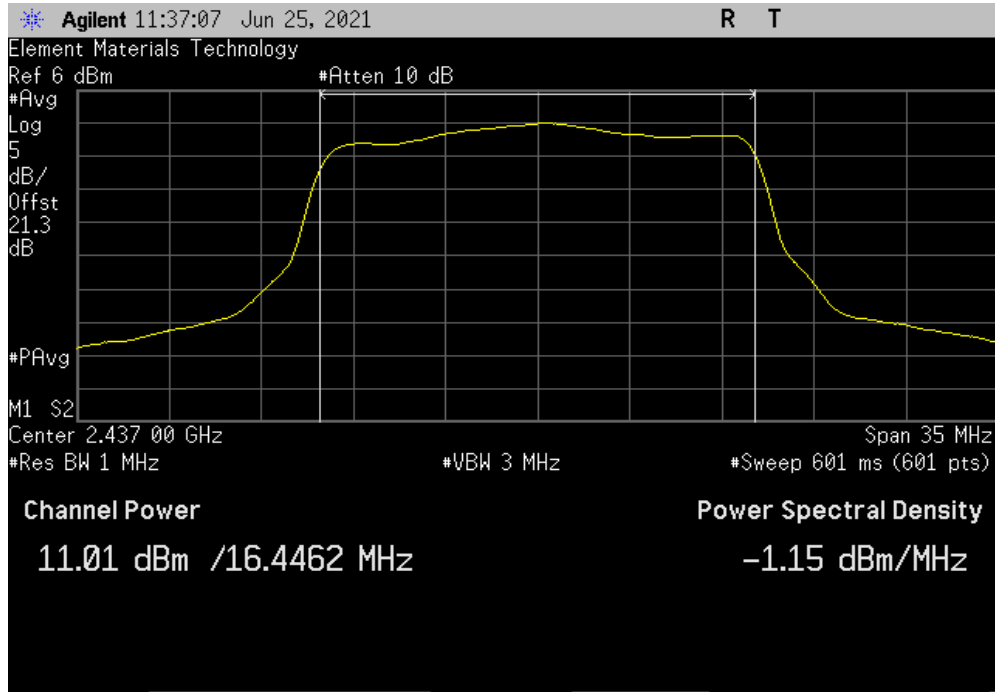


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

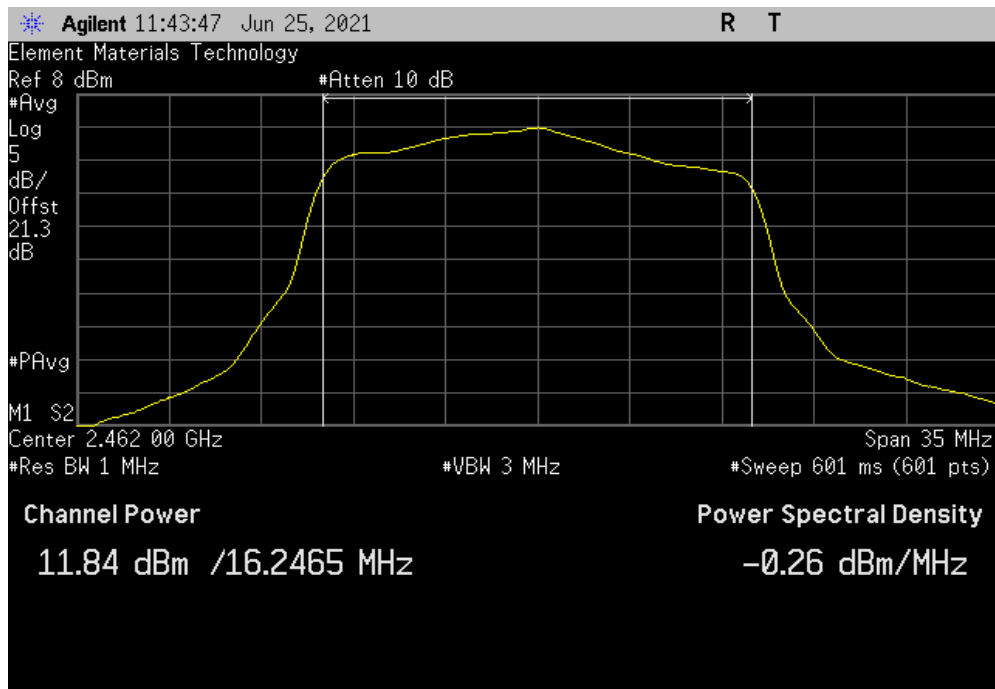


TUTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
11.009	0.3	11.4	2.2	13.6	36	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
11.843	0.3	12.2	2.2	14.4	36	Pass

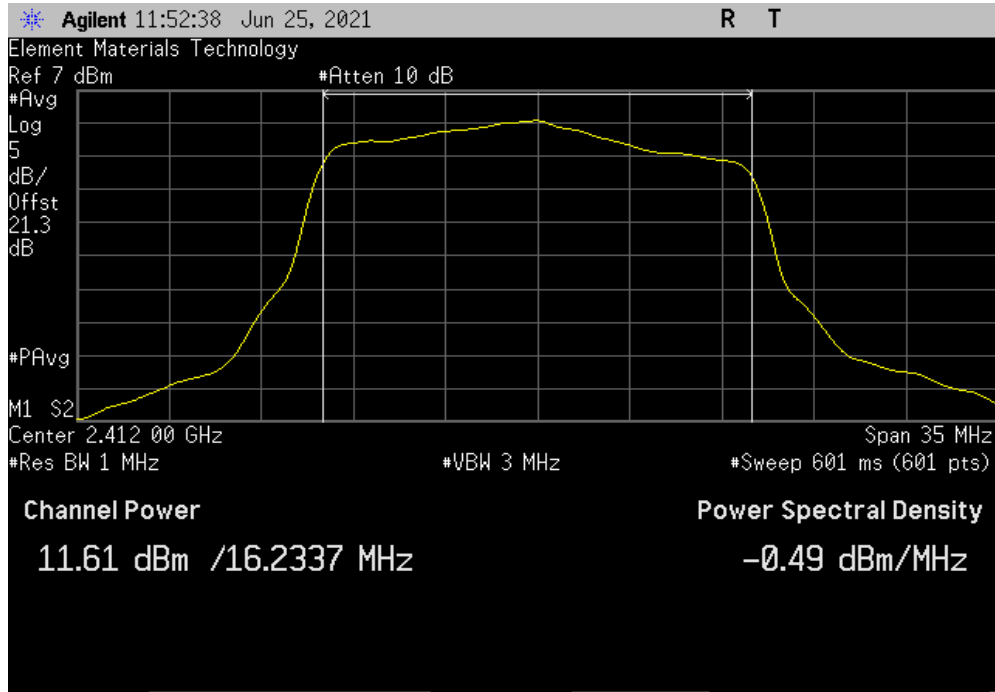


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

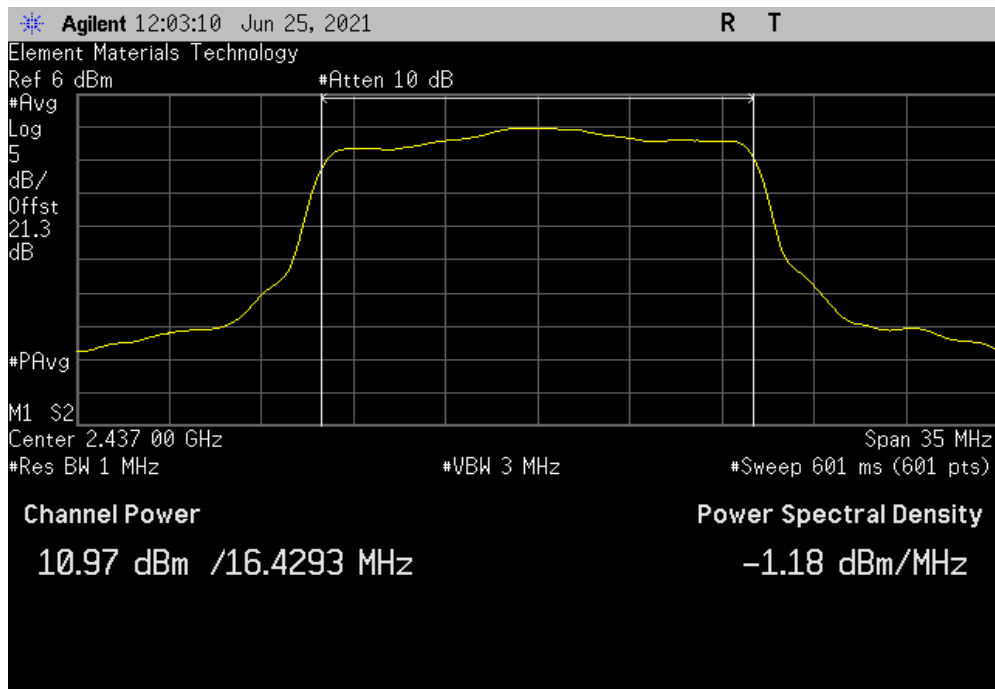


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
11.609	0.5	12.1	2.2	14.3	36	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
10.973	0.5	11.5	2.2	13.7	36	Pass

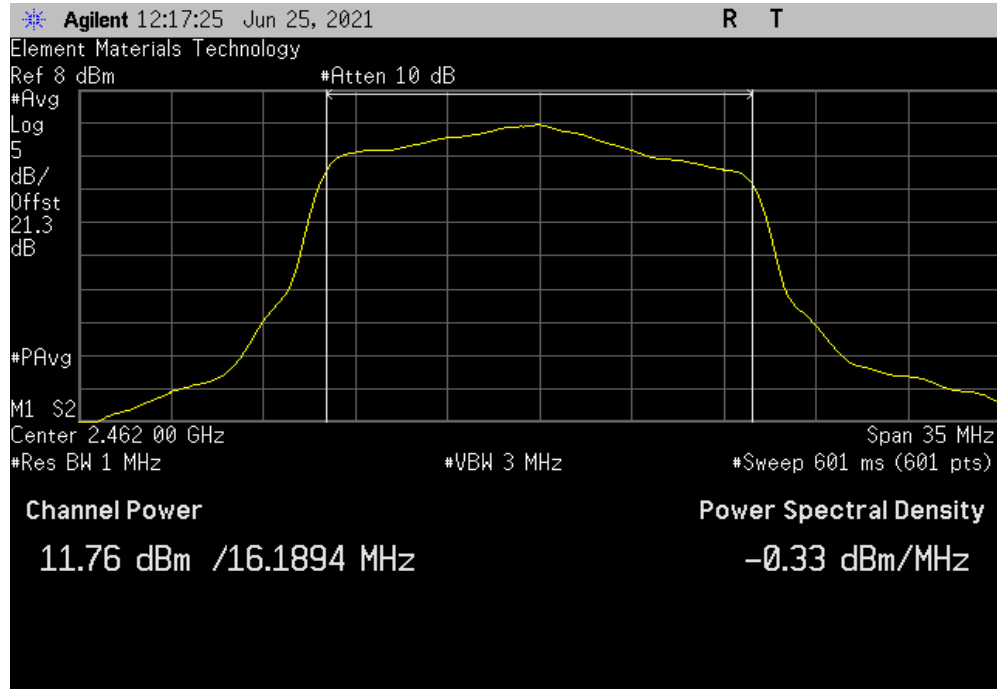


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

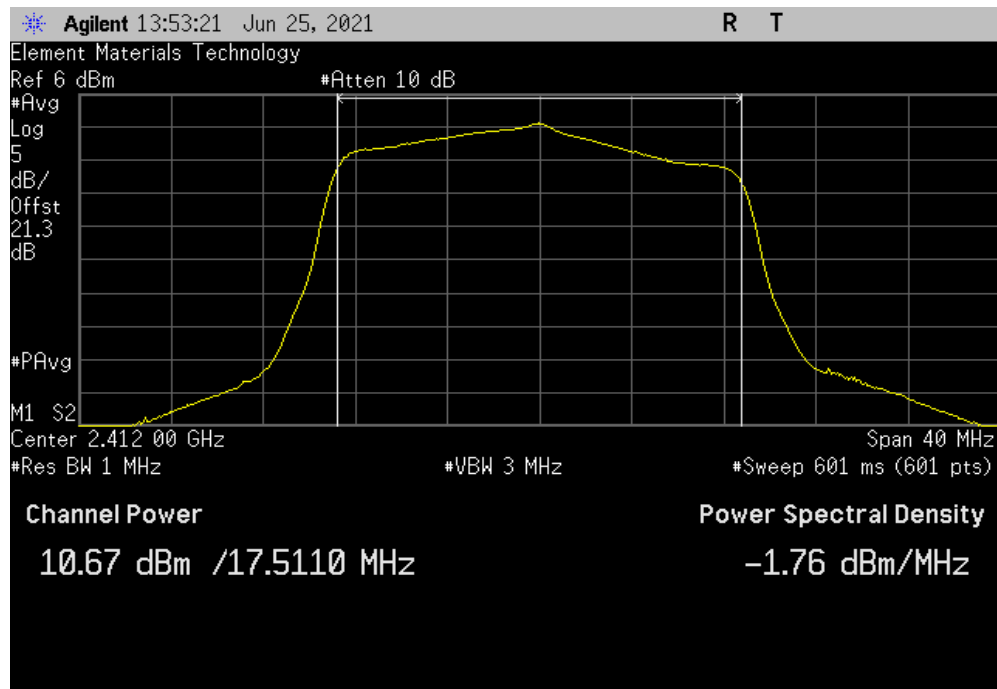


TUTx 2021.03.10.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
11.765	0.5	12.2	2.2	14.4	36	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
10.673	0.1	10.7	2.2	12.9	36	Pass

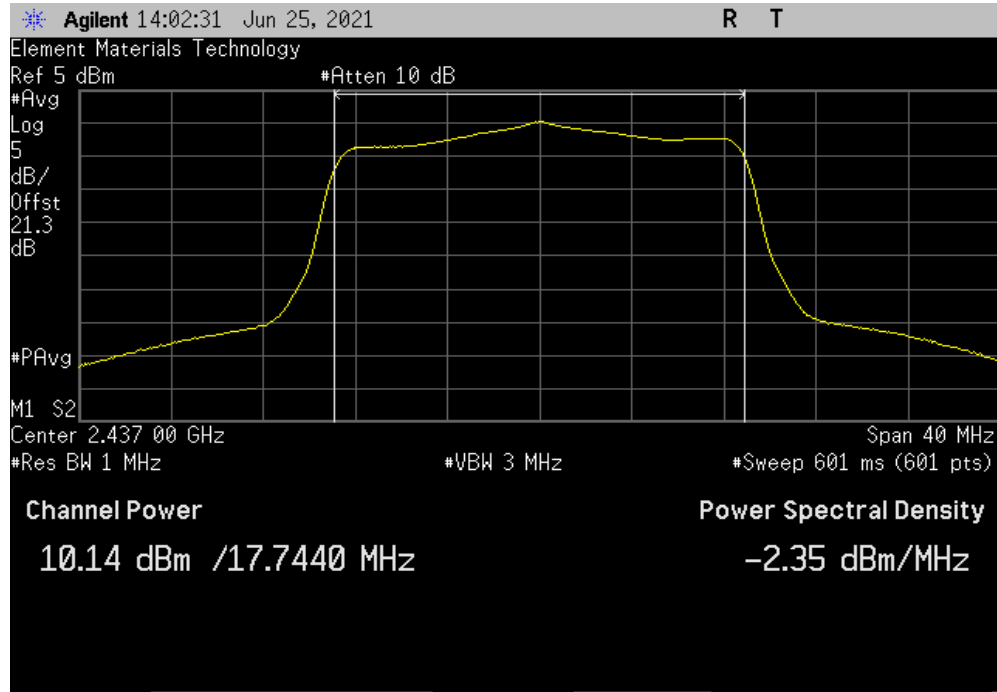


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

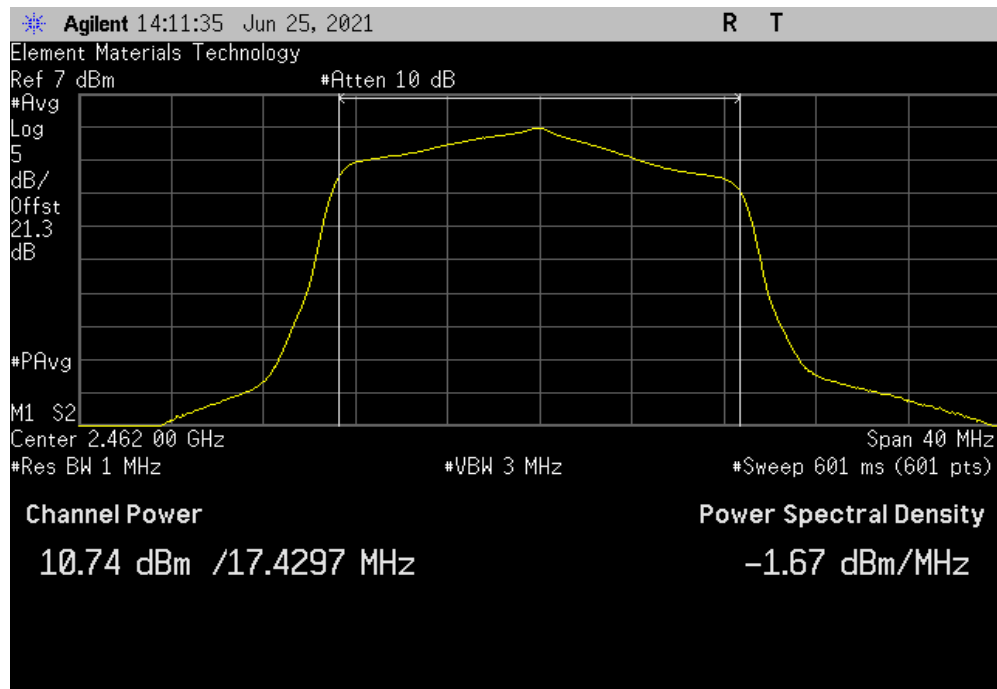


TUTx 2021.03.10.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
10.136	0.1	10.2	2.2	12.4	36	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, High Channel 11, 2462 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
10.739	0.1	10.8	2.2	13	36	Pass

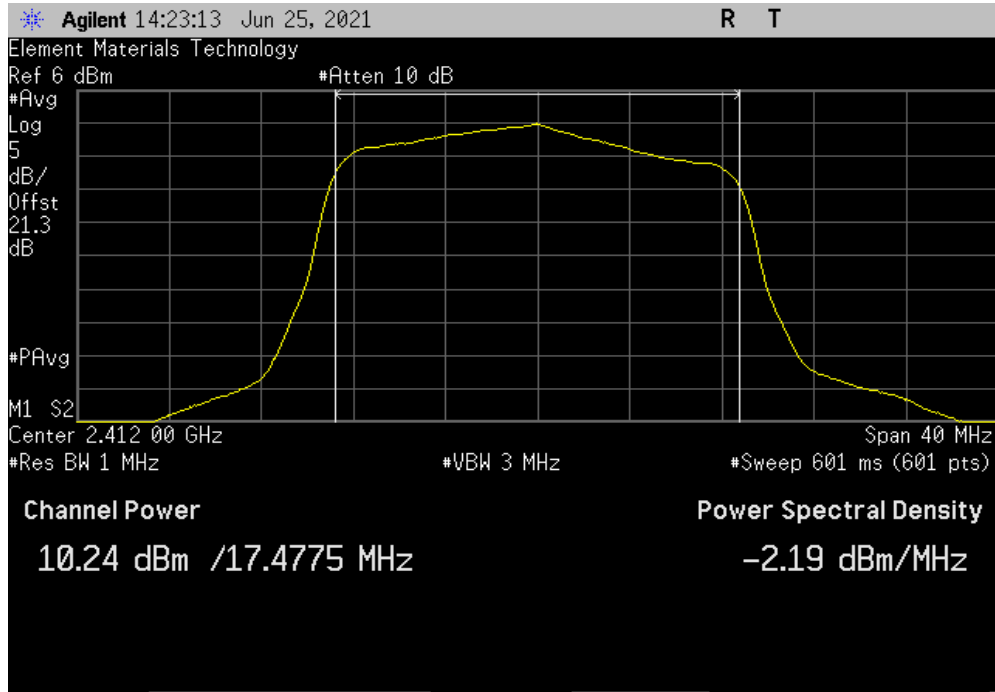


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

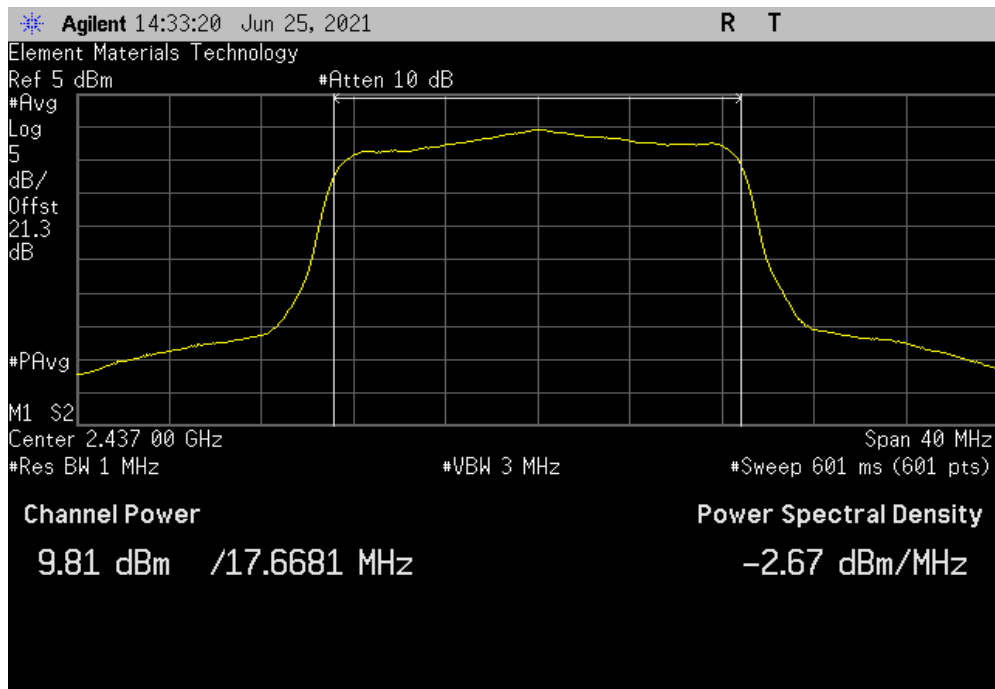


TUTx 2021.03.19.1 XM8 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
10.235	0.5	10.8	2.2	13	36	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
9.806	0.5	10.3	2.2	12.5	36	Pass

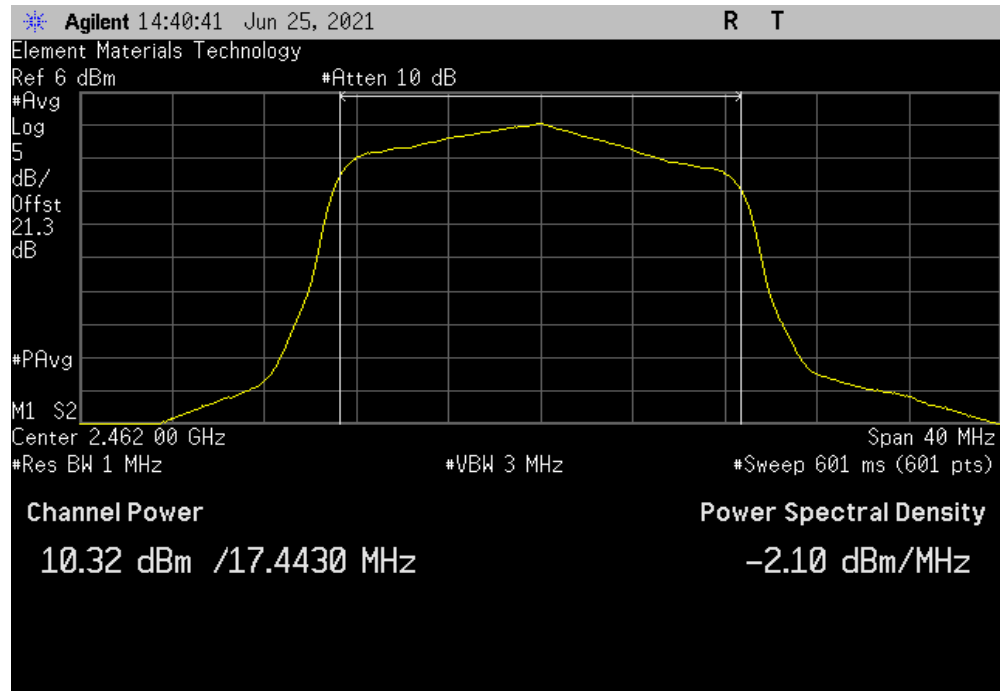


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



TUTTx 2021.03.19.1 XM8 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, High Channel 11, 2462 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
10.319	0.5	10.8	2.2	13	36	Pass



POWER SPECTRAL DENSITY



XMIT 2020.12.30.0

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
Generator - Signal	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2021-04-08	2022-04-08

TEST DESCRIPTION

The maximum power spectral density measurements was measured using the channels and modes as called out on the following data sheets.

Per the procedure outlined in ANSI C63.10 the peak power spectral density was measured in a 3 kHz RBW.

POWER SPECTRAL DENSITY



TSTx 2021.03.19.1 XMR 2020.12.30.0

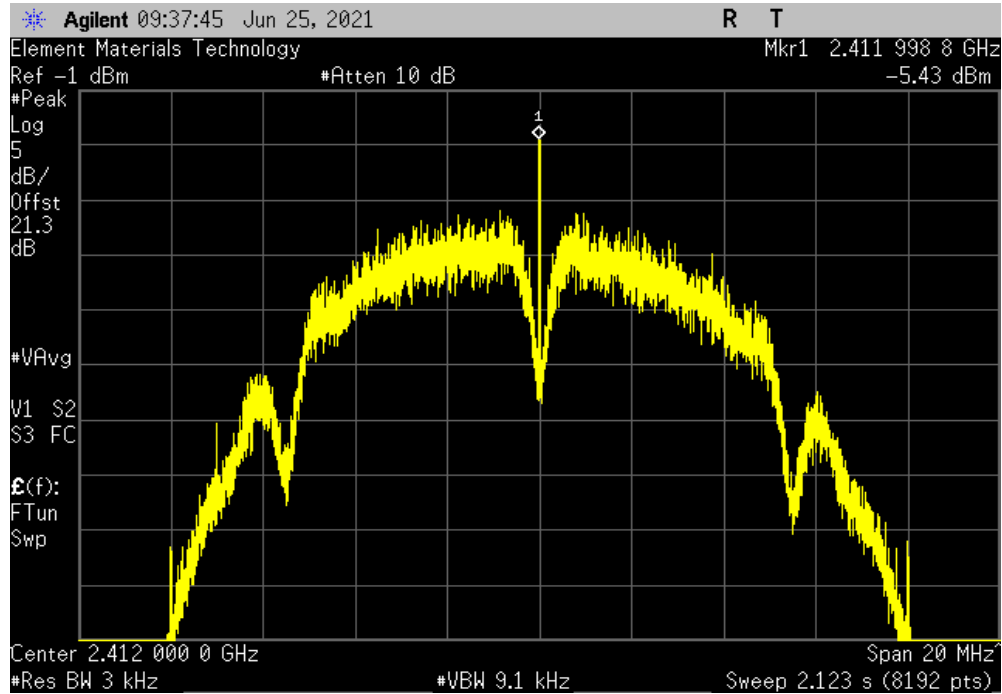
EUT: 43.0536.00		Work Order: A-DE0162	
Serial Number: SN001 00003		Date: 28-Jun-21	
Customer: A-dec, Inc.		Temperature: 24.1 °C	
Attendees: Zack Lyda and Spencer Warenke		Humidity: 48.2% RH	
Project: None		Barometric Pres.: 1008 mbar	
Tested by: Jeff Alcoke		Power: 3.3 VDC via 110VAC/60Hz	
Job Site: EV06			
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2021		ANSI C63.10:2013	
COMMENTS			
Reference level offset: DC Block, 20 dB attenuator, and measurement cable.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature 	
		Value dBm/3kHz	Limit < dBm/3kHz
		Results	
2400 MHz - 2483.5 MHz Band			
20 MHz BW			
802.11(b) 1 Mbps			
Low Channel 1, 2412 MHz		-5.435	8
Mid Channel 6, 2437 MHz		-6.374	8
High Channel 11, 2462 MHz		-5.067	8
802.11(b) 11 Mbps			
Low Channel 1, 2412 MHz		-4.284	8
Mid Channel 6, 2437 MHz		-5.905	8
High Channel 11, 2462 MHz		-4.496	8
802.11(g) 6 Mbps			
Low Channel 1, 2412 MHz		-1.385	8
Mid Channel 6, 2437 MHz		-4.775	8
High Channel 11, 2462 MHz		-1.465	8
802.11(g) 36 Mbps			
Low Channel 1, 2412 MHz		-2.35	8
Mid Channel 6, 2437 MHz		-6.074	8
High Channel 11, 2462 MHz		-2.494	8
802.11(g) 54 Mbps			
Low Channel 1, 2412 MHz		-2.434	8
Mid Channel 6, 2437 MHz		-6.117	8
High Channel 11, 2462 MHz		-2.963	8
802.11(n) MCS0			
Low Channel 1, 2412 MHz		-2.903	8
Mid Channel 6, 2437 MHz		-4.5	8
High Channel 11, 2462 MHz		-2.501	8
802.11(n) MCS7			
Low Channel 1, 2412 MHz		-4.523	8
Mid Channel 6, 2437 MHz		-5.951	8
High Channel 11, 2462 MHz		-3.749	8

POWER SPECTRAL DENSITY

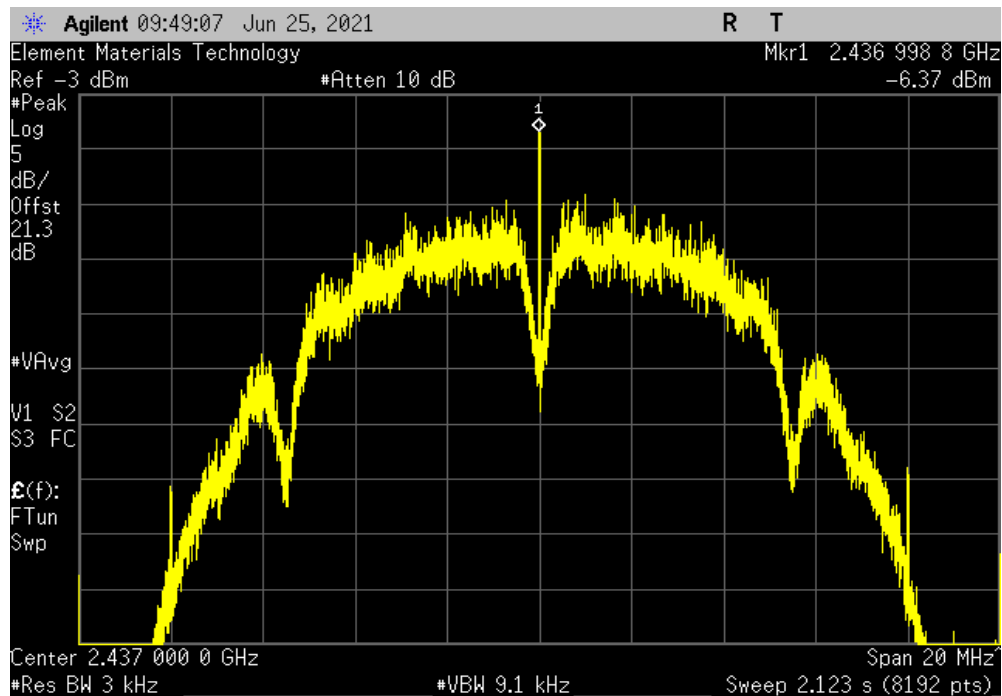


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-5.435	8	Pass			



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-6.374	8	Pass			

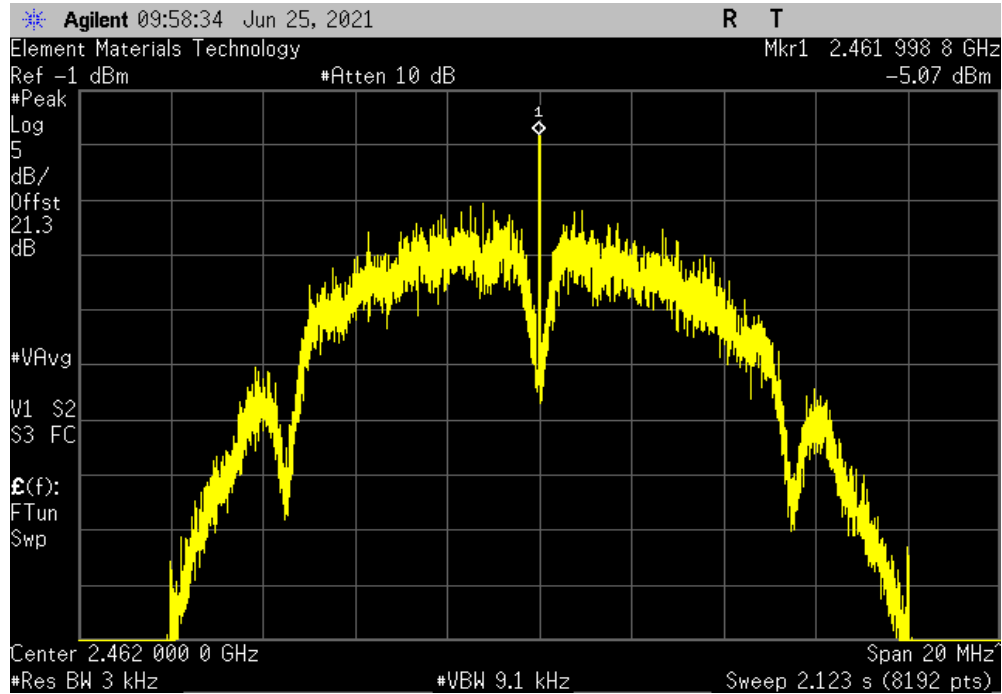


POWER SPECTRAL DENSITY

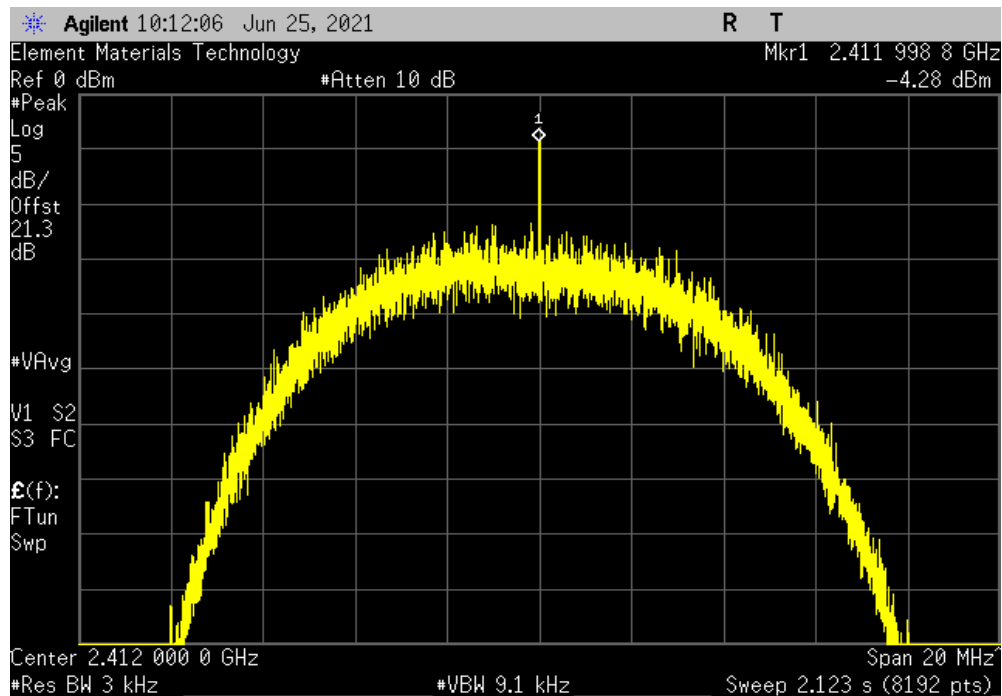


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-5.067	8	Pass			



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-4.284	8	Pass			

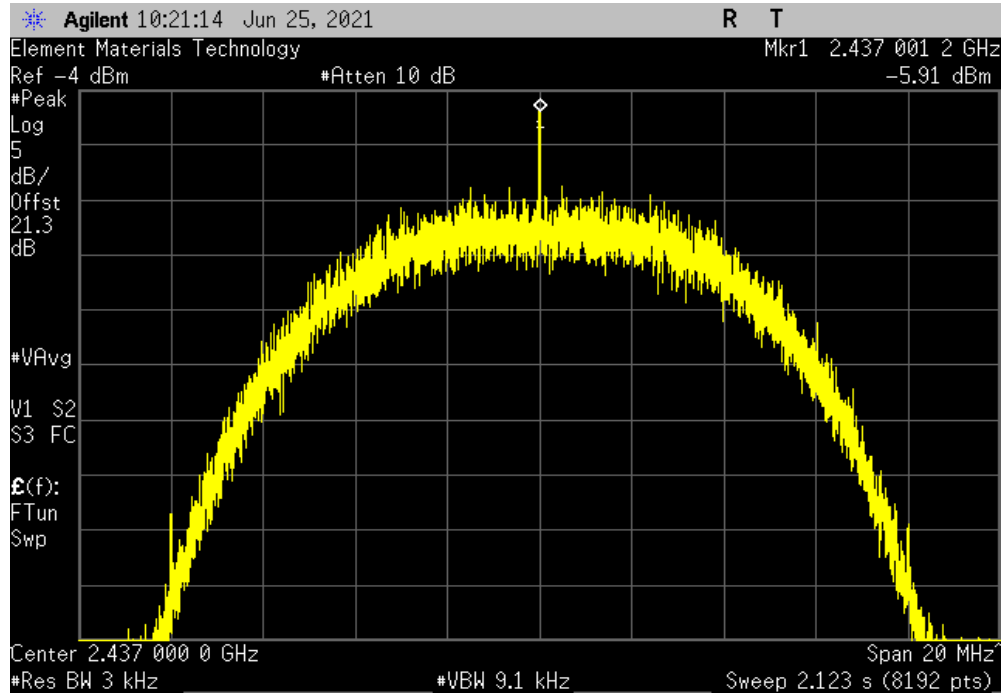


POWER SPECTRAL DENSITY

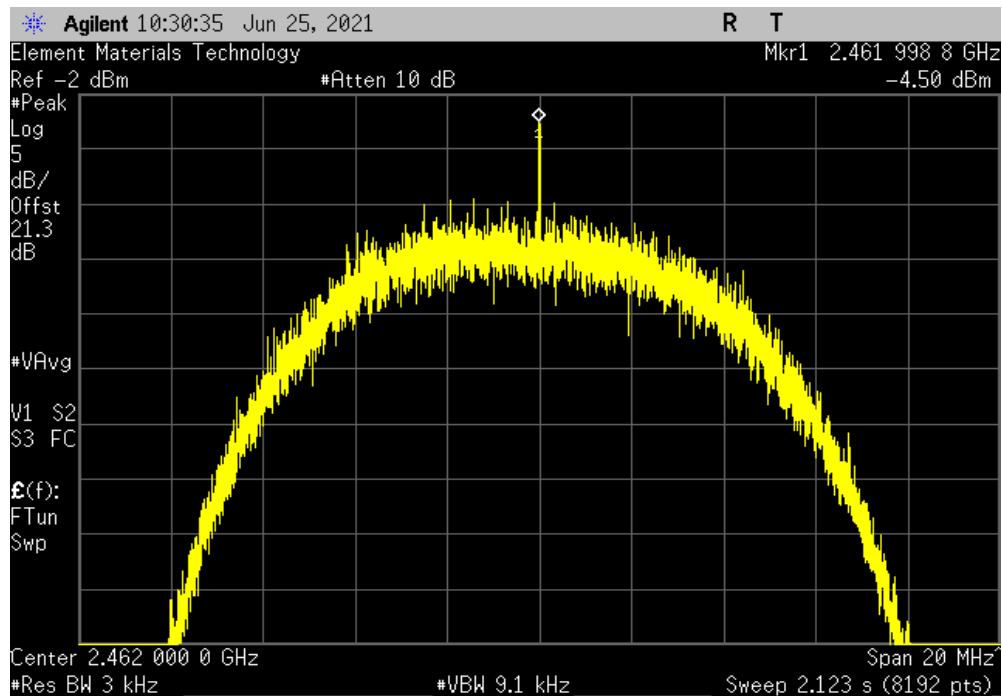


TbTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-5.905	8	Pass			



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-4.496	8	Pass			

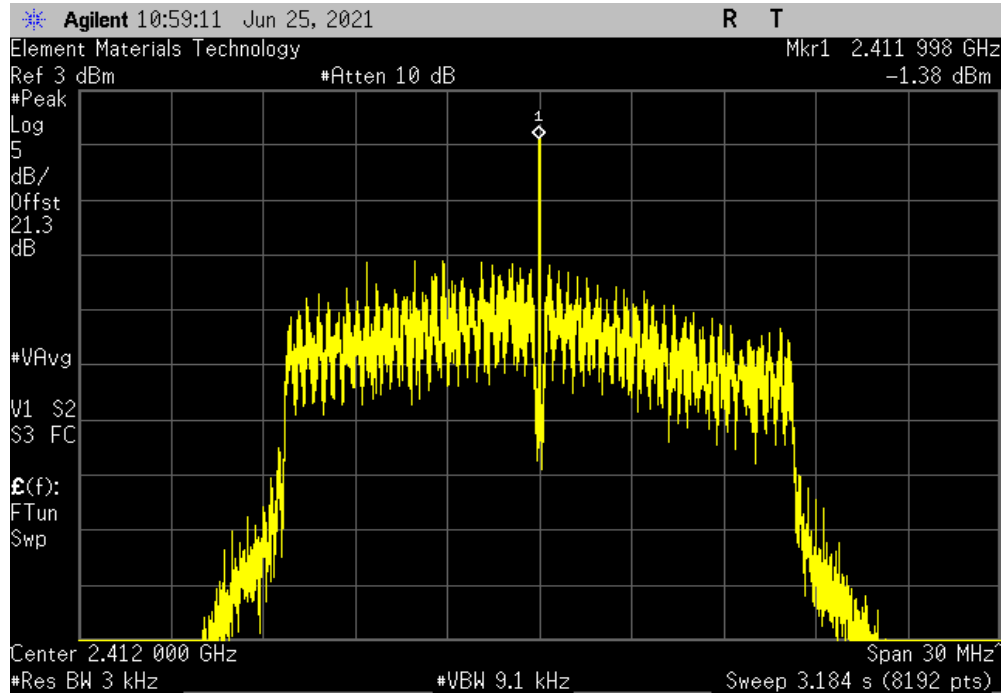


POWER SPECTRAL DENSITY

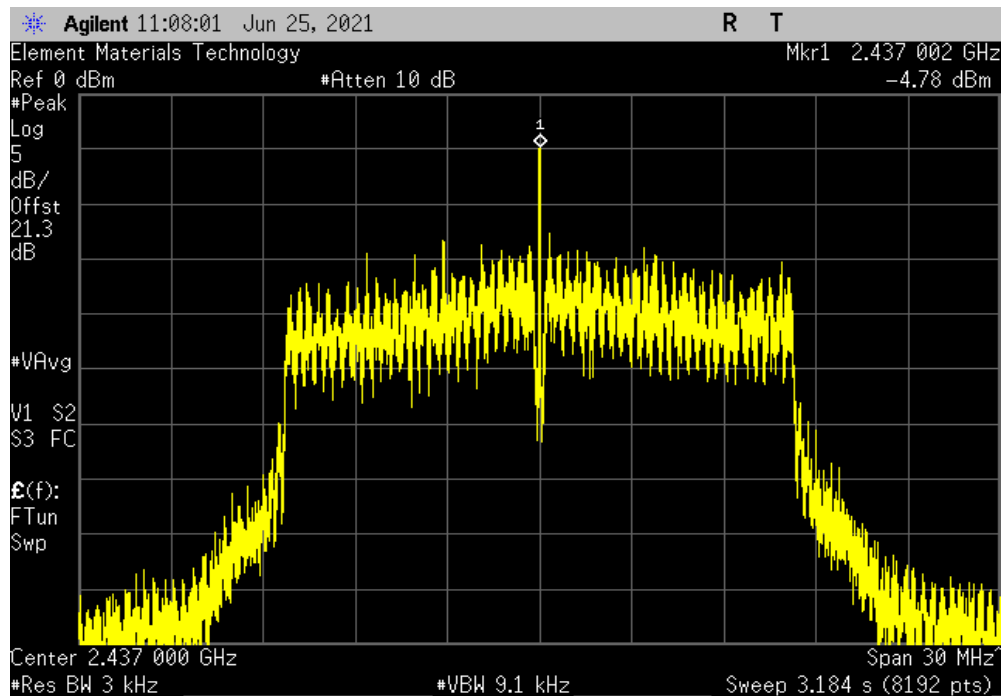


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-1.385	8	Pass			



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-4.775	8	Pass			

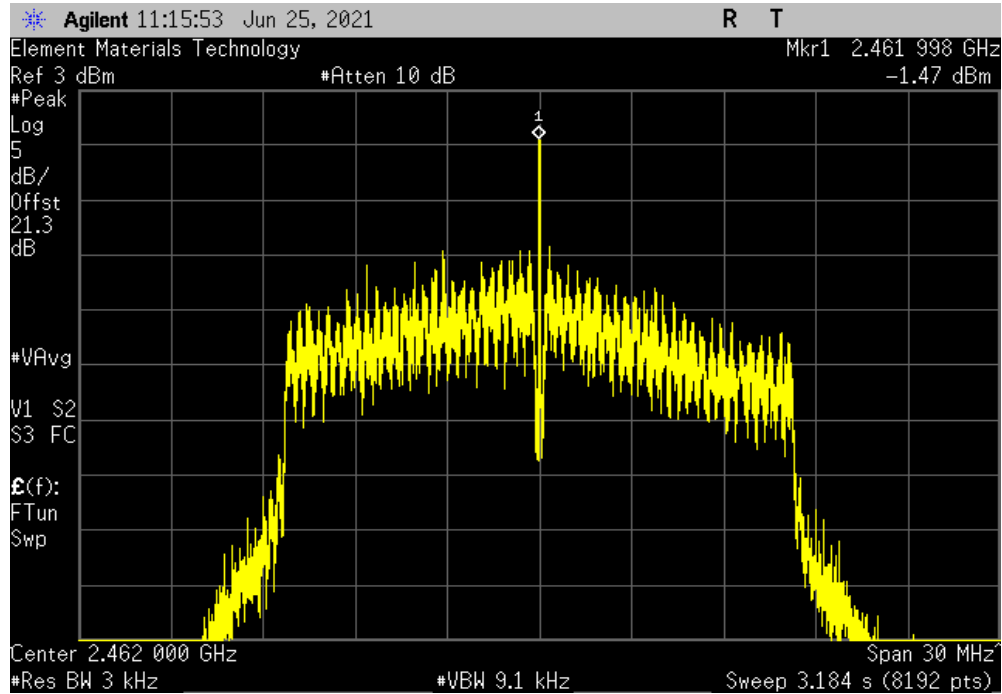


POWER SPECTRAL DENSITY

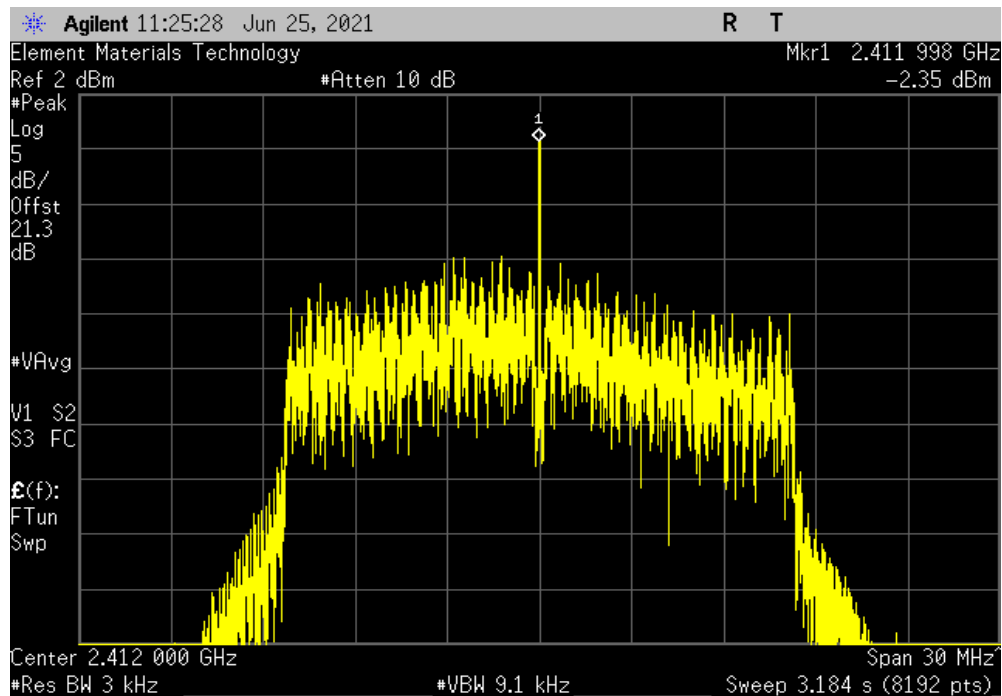


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-1.465	8	Pass			



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-2.35	8	Pass			

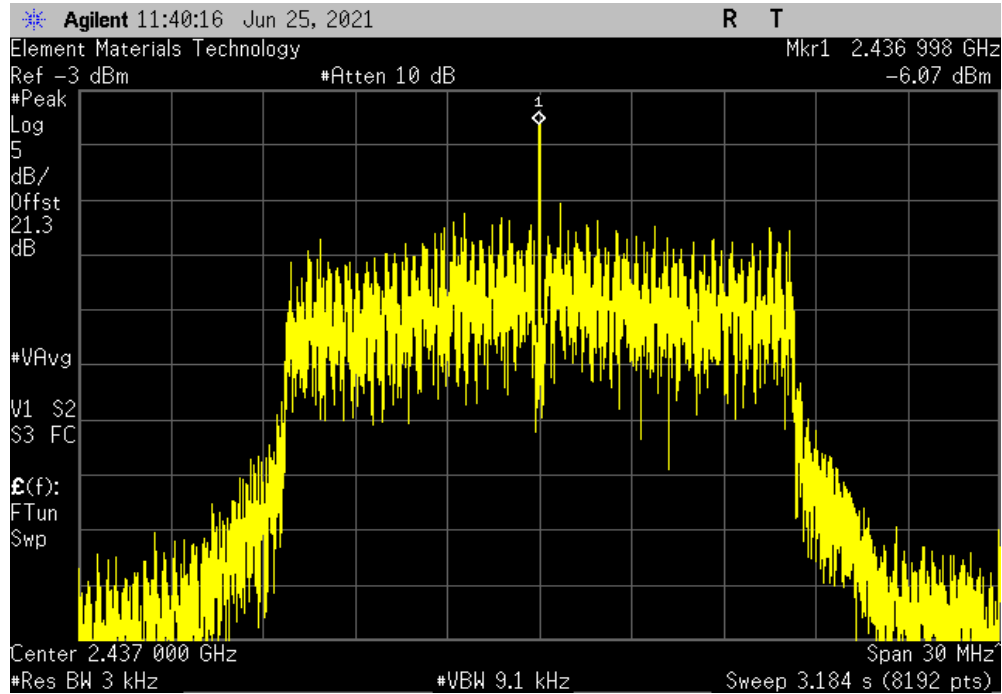


POWER SPECTRAL DENSITY

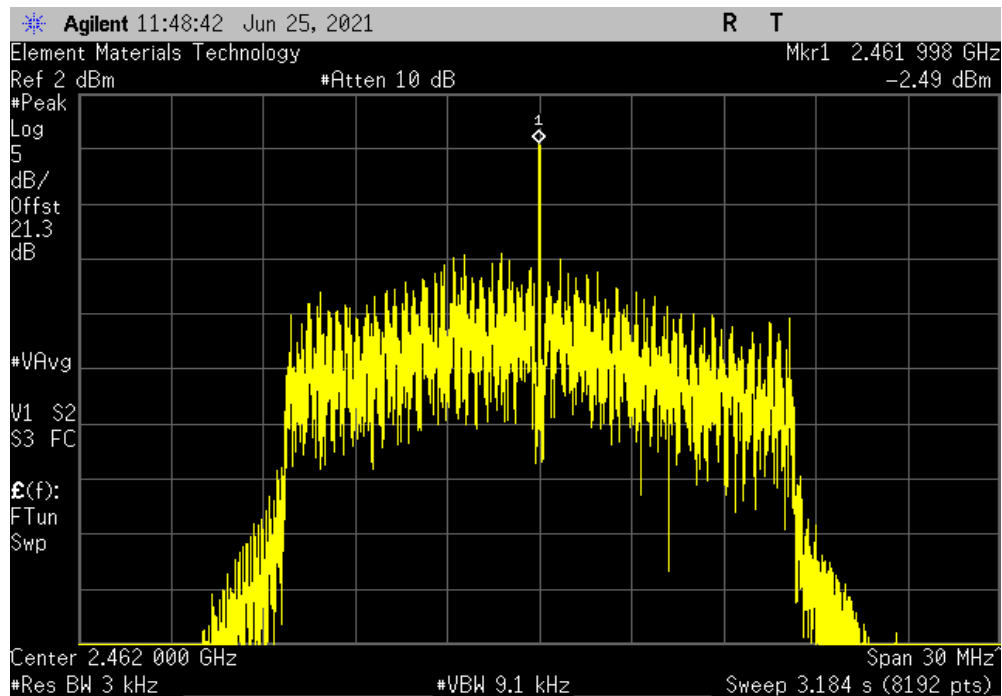


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-6.074	8	Pass			



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-2.494	8	Pass			

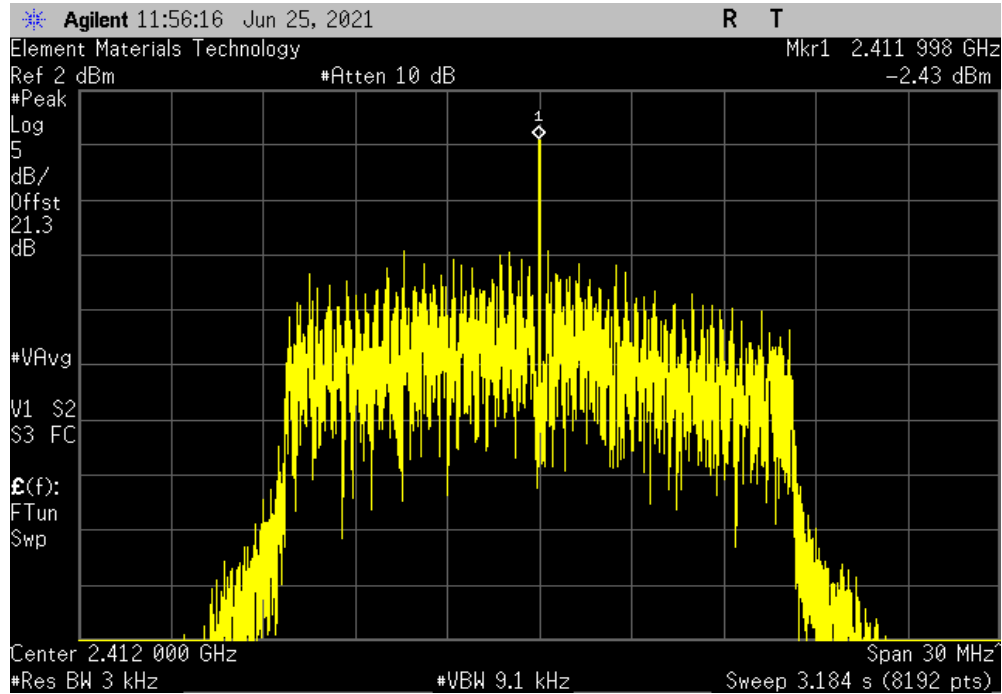


POWER SPECTRAL DENSITY

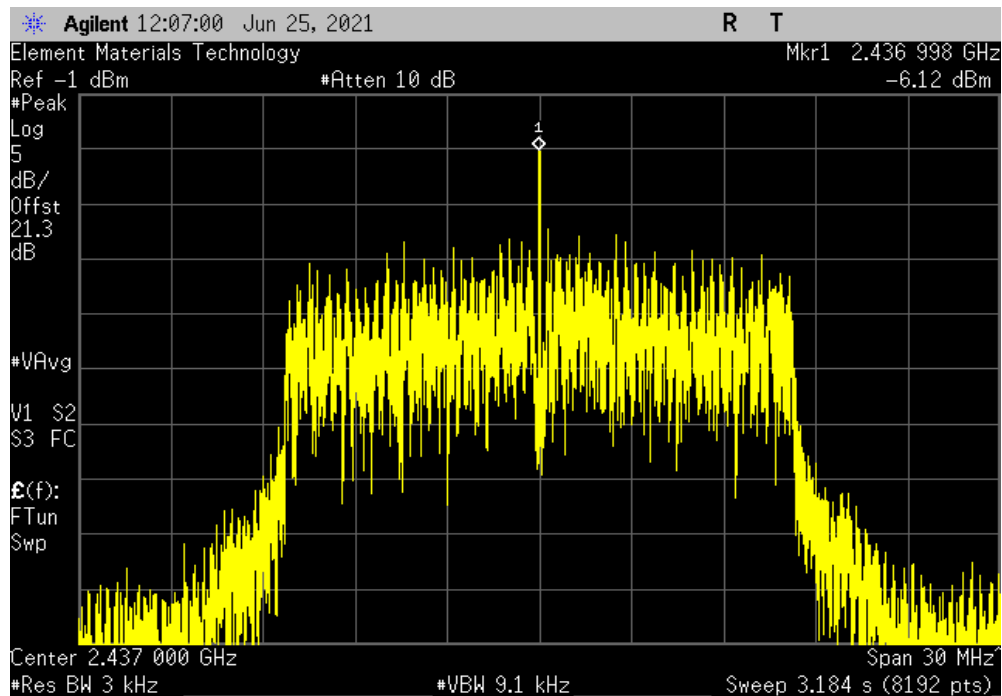


TUTx 2021.03.19.1 XM8 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-2.434	8	Pass			



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-6.117	8	Pass			

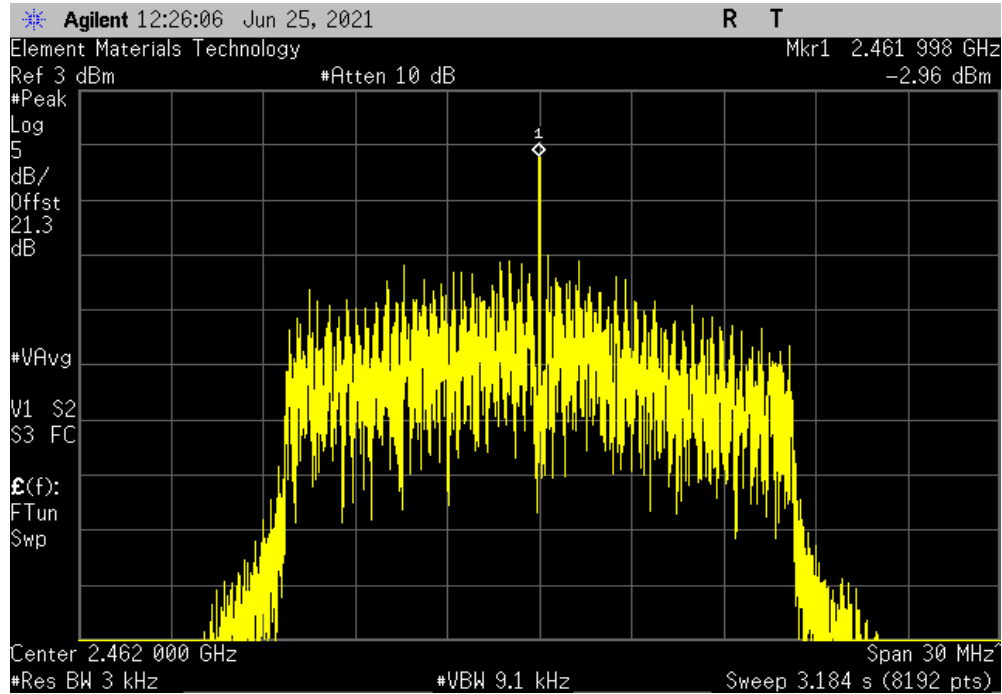


POWER SPECTRAL DENSITY

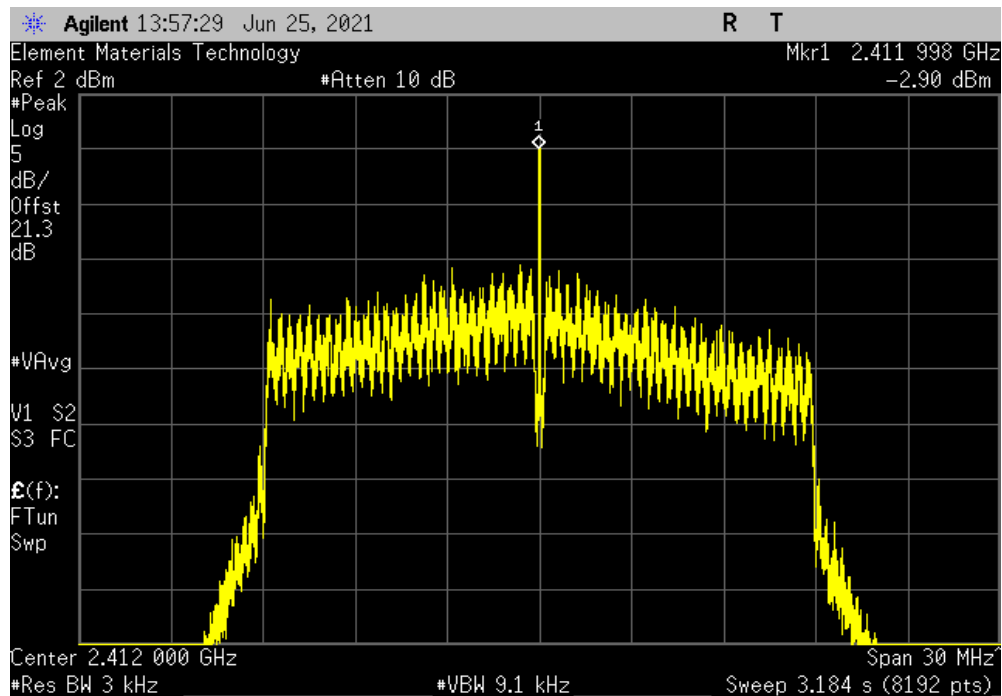


TMTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-2.963	8	Pass			



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-2.903	8	Pass			

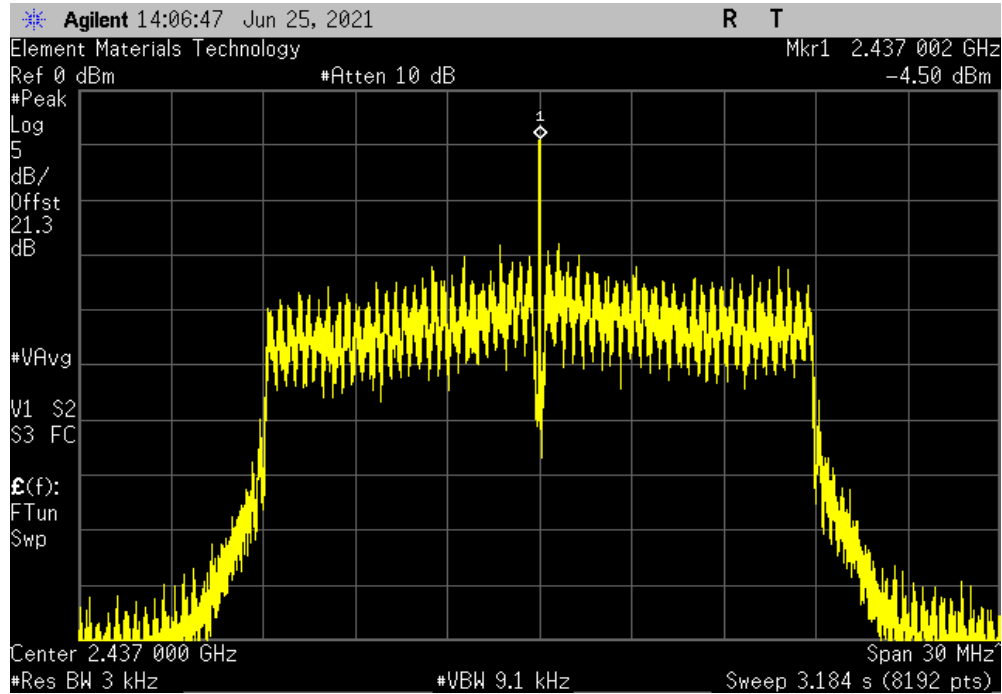


POWER SPECTRAL DENSITY

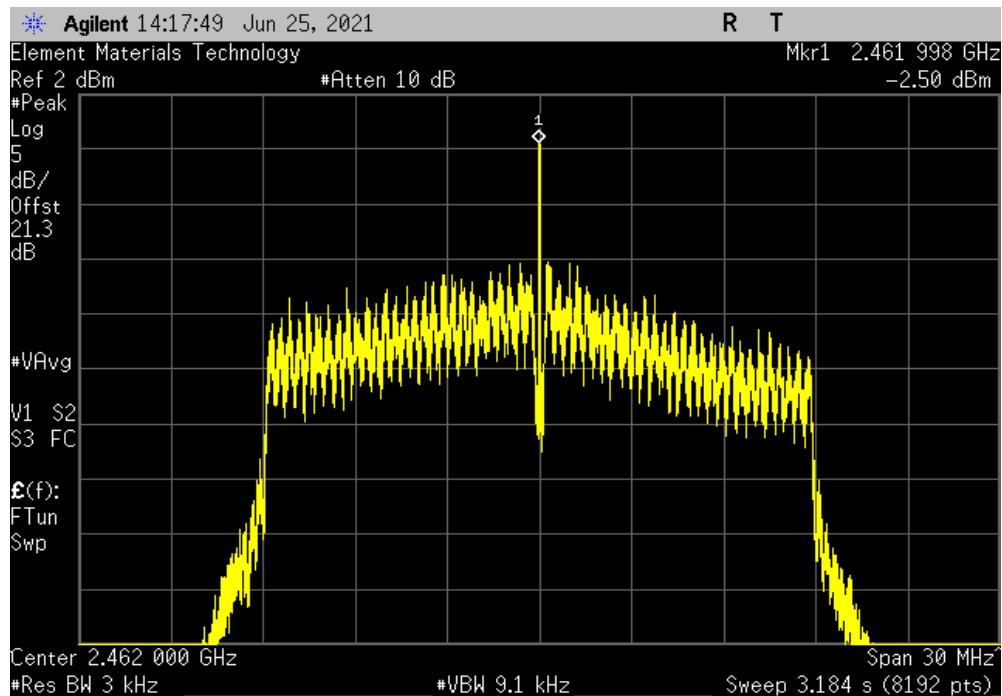


TMTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-4.5	8	Pass			



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, High Channel 11, 2462 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-2.501	8	Pass			

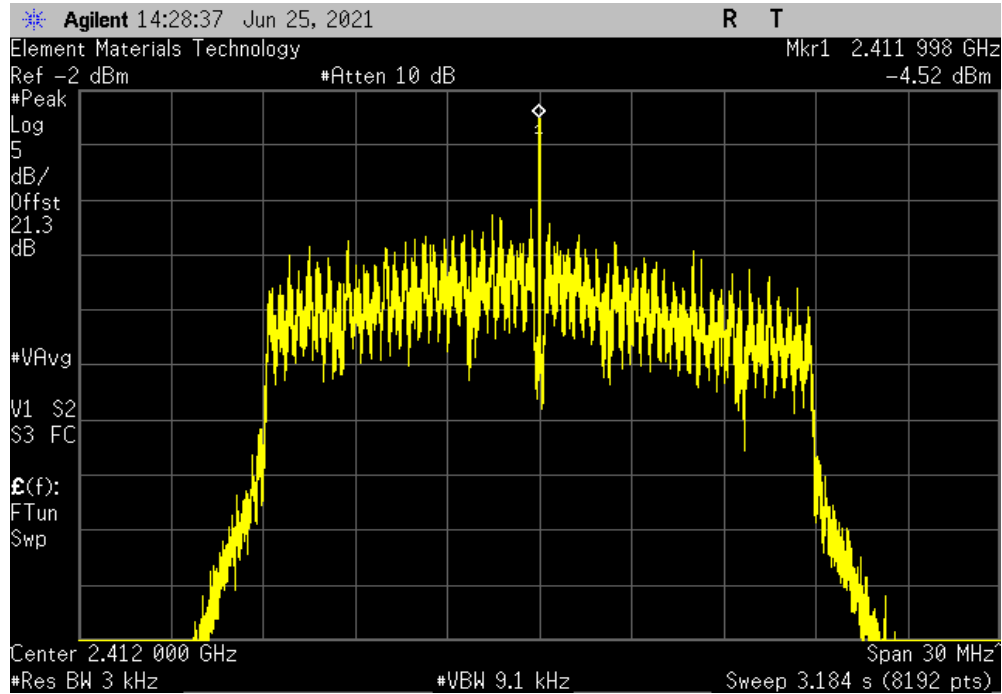


POWER SPECTRAL DENSITY

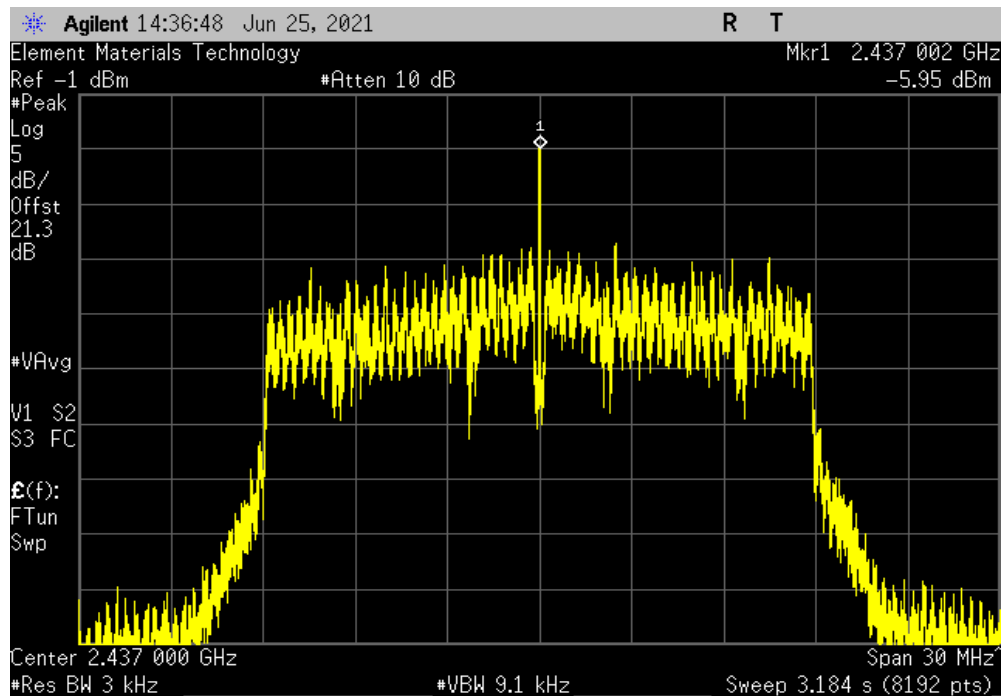


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-4.523	8	Pass			



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-5.951	8	Pass			

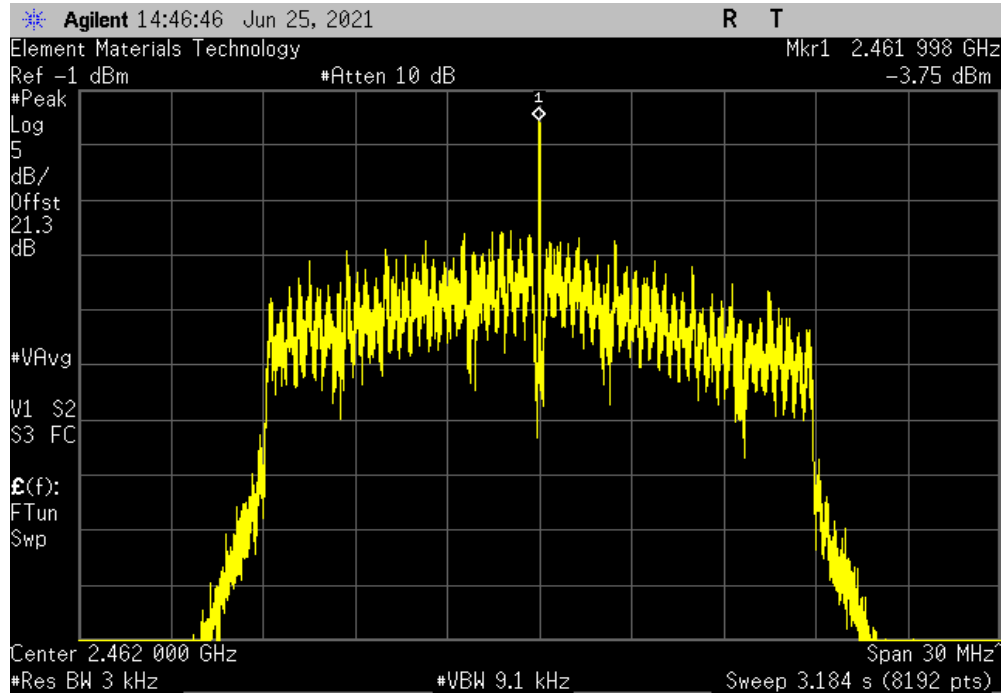


POWER SPECTRAL DENSITY



TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, High Channel 11, 2462 MHz						
Value			Limit		Results	
dBm/3kHz			< dBm/3kHz			
-3.749			8		Pass	



BAND EDGE COMPLIANCE



XMIT 2020.12.30.0

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
Power Supply - DC	Dr. Meter	PS-305DM	TZZ	NCR	NCR
Generator - Signal	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2021-07-06	2022-07-06

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

BAND EDGE COMPLIANCE



TMTx 2021.03.19.1 XMR 2020.12.30.0

EUT: 43.0536.00		Work Order: A-DE0162	
Serial Number: SN001 00001		Date: 4-Jan-22	
Customer: A-dec, Inc.		Temperature: 18.7 °C	
Attendees: None		Humidity: 37.8% RH	
Project: None		Barometric Pres.: 1020 mbar	
Tested by: Jeff Alcoke		Power: 3.3 VDC via 110VAC/60Hz	
		Job Site: EV05	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2021		ANSI C63.10:2013	
COMMENTS			
Reference level offset includes: DC block, 20 dB attenuator, and measurement cable.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	8	Signature 	
		Value (dBc)	Limit ≤ (dBc) Result
2400 MHz - 2483.5 MHz Band			
20 MHz BW			
802.11(b) 1 Mbps			
Low Channel 1, 2412 MHz		-51	-30 Pass
High Channel 11, 2462 MHz		-58.63	-30 Pass
802.11(b) 11 Mbps			
Low Channel 1, 2412 MHz		-51.09	-30 Pass
High Channel 11, 2462 MHz		-59.33	-30 Pass
802.11(g) 6 Mbps			
Low Channel 1, 2412 MHz		-32.41	-30 Pass
High Channel 11, 2462 MHz		-44.11	-30 Pass
802.11(g) 36 Mbps			
Low Channel 1, 2412 MHz		-35.54	-30 Pass
High Channel 11, 2462 MHz		-45.11	-30 Pass
802.11(g) 54 Mbps			
Low Channel 1, 2412 MHz		-36.68	-30 Pass
High Channel 11, 2462 MHz		-47.86	-30 Pass
802.11(n) MCS0			
Low Channel 1, 2412 MHz		-34.62	-30 Pass
High Channel 11, 2462 MHz		-42.36	-30 Pass
802.11(n) MCS7			
Low Channel 1, 2412 MHz		-35.37	-30 Pass
High Channel 11, 2462 MHz		-43.67	-30 Pass

BAND EDGE COMPLIANCE

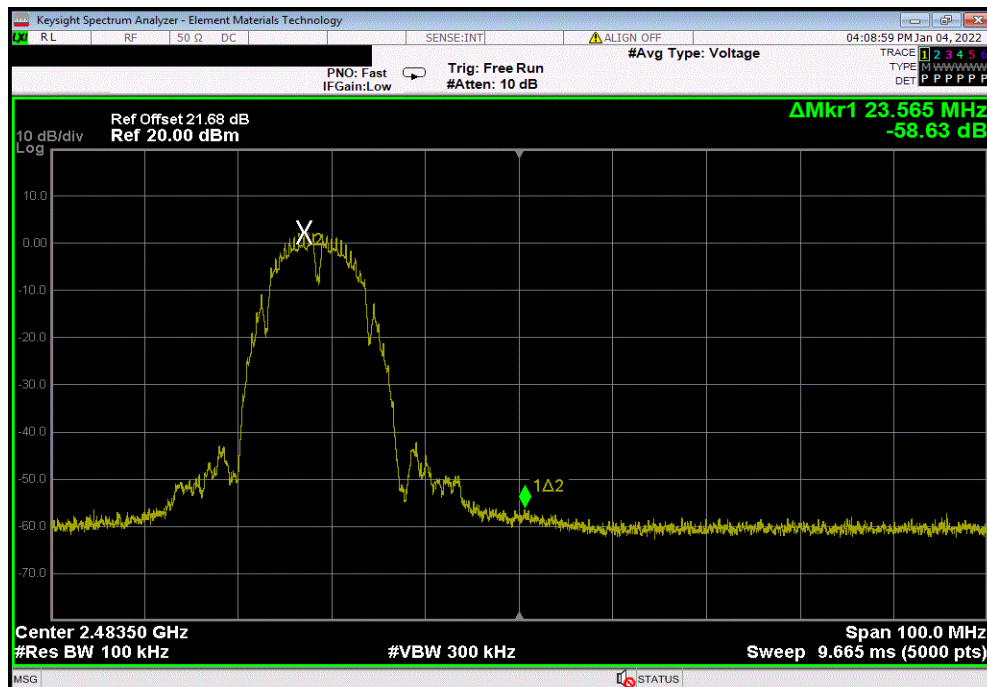


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
	Value (dBc)	Limit ≤ (dBc)	Result			
	-51	-30	Pass			



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
	Value (dBc)	Limit ≤ (dBc)	Result			
	-58.63	-30	Pass			

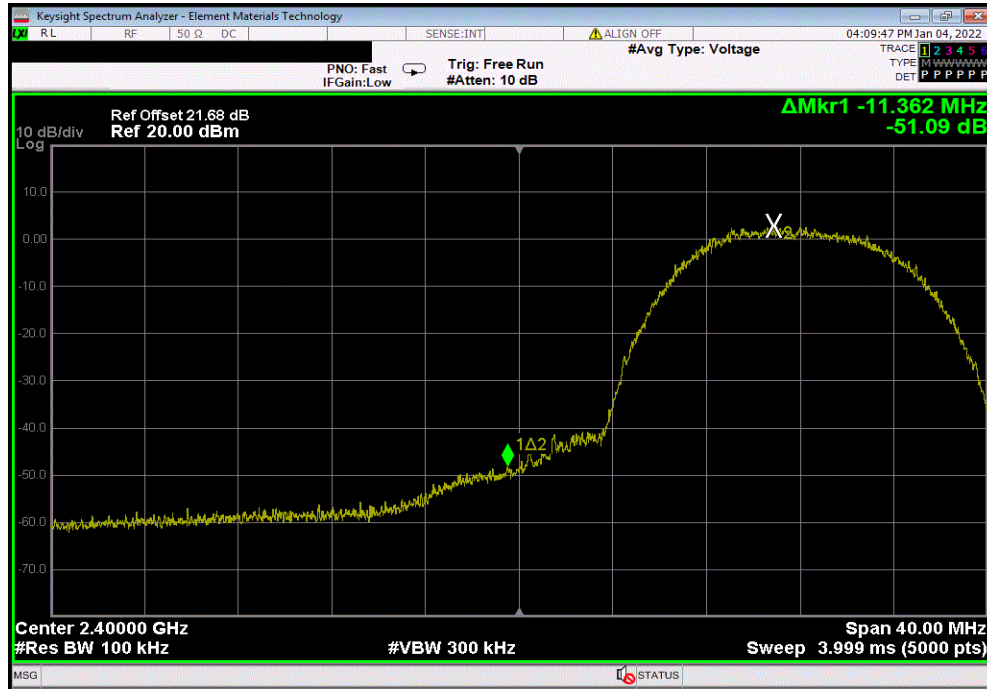


BAND EDGE COMPLIANCE

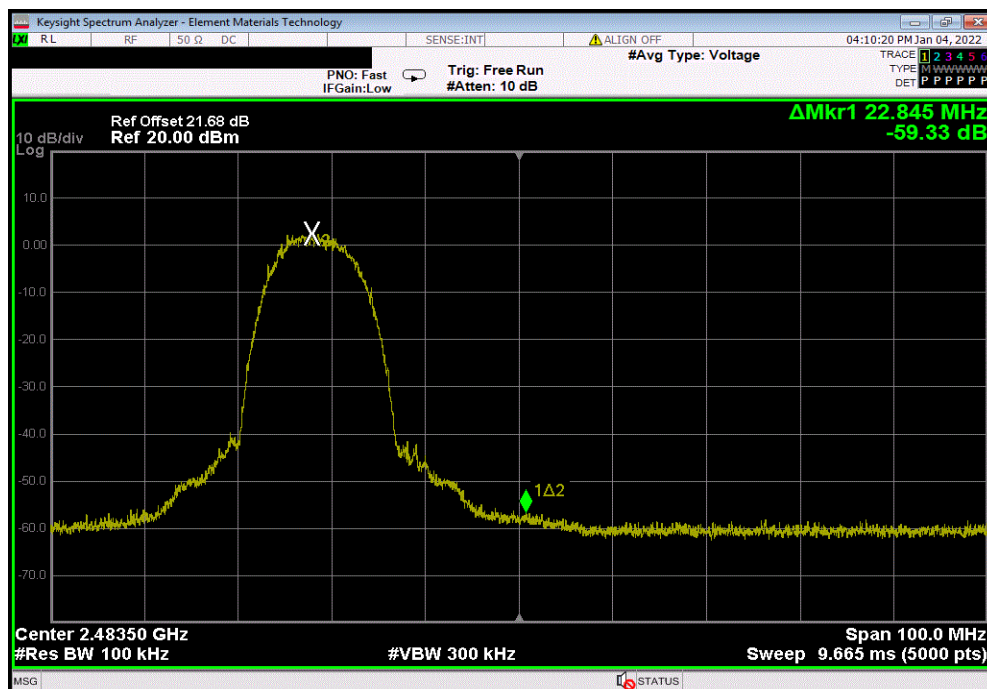


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
	Value (dBc)	Limit ≤ (dBc)	Result			
	-51.09	-30	Pass			



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
	Value (dBc)	Limit ≤ (dBc)	Result			
	-59.33	-30	Pass			

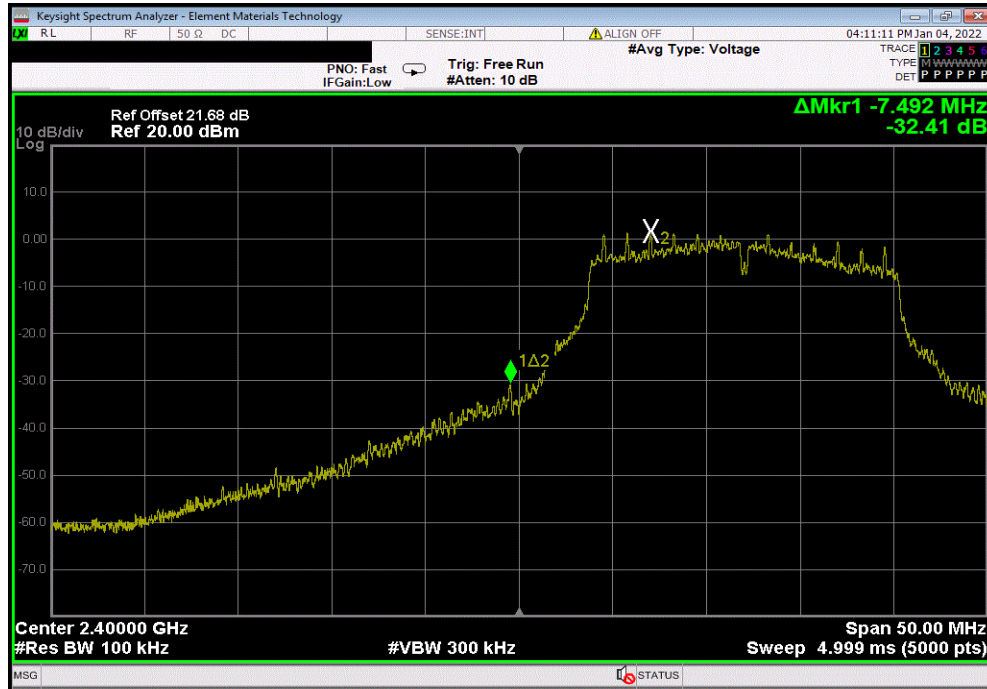


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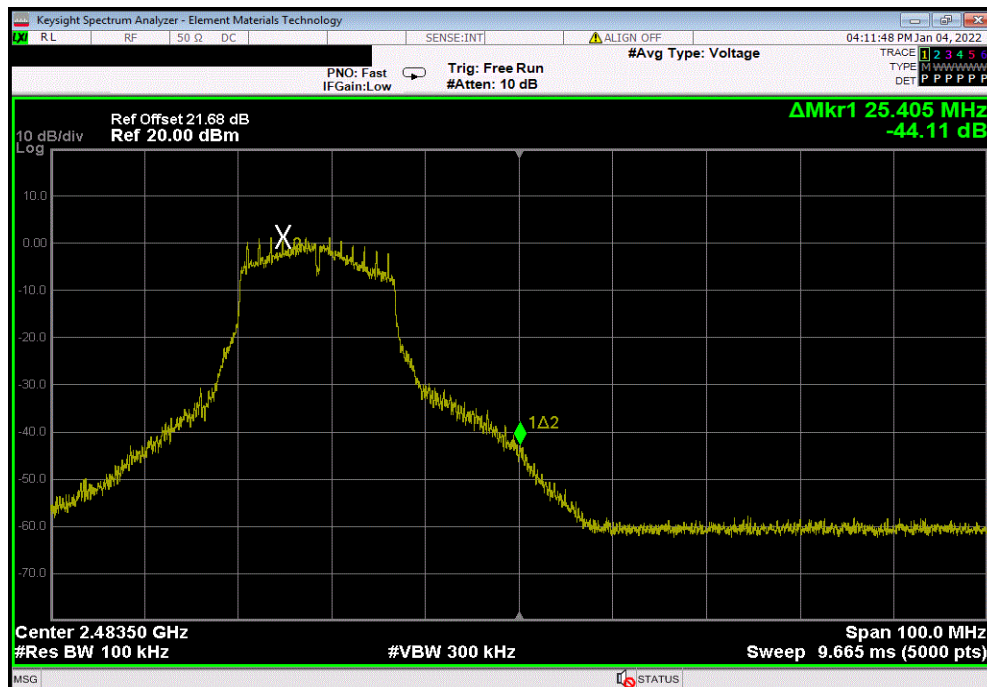


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
	Value (dBc)	Limit ≤ (dBc)	Result			
	-32.41	-30	Pass			



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Value (dBc)	Limit ≤ (dBc)	Result			
	-44.11	-30	Pass			

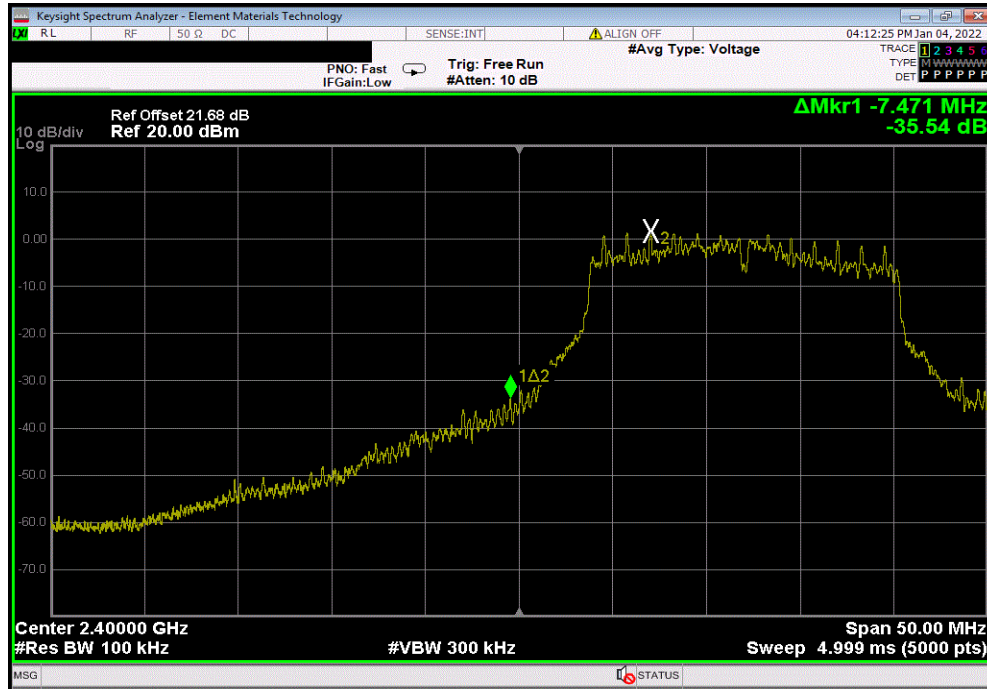


BAND EDGE COMPLIANCE

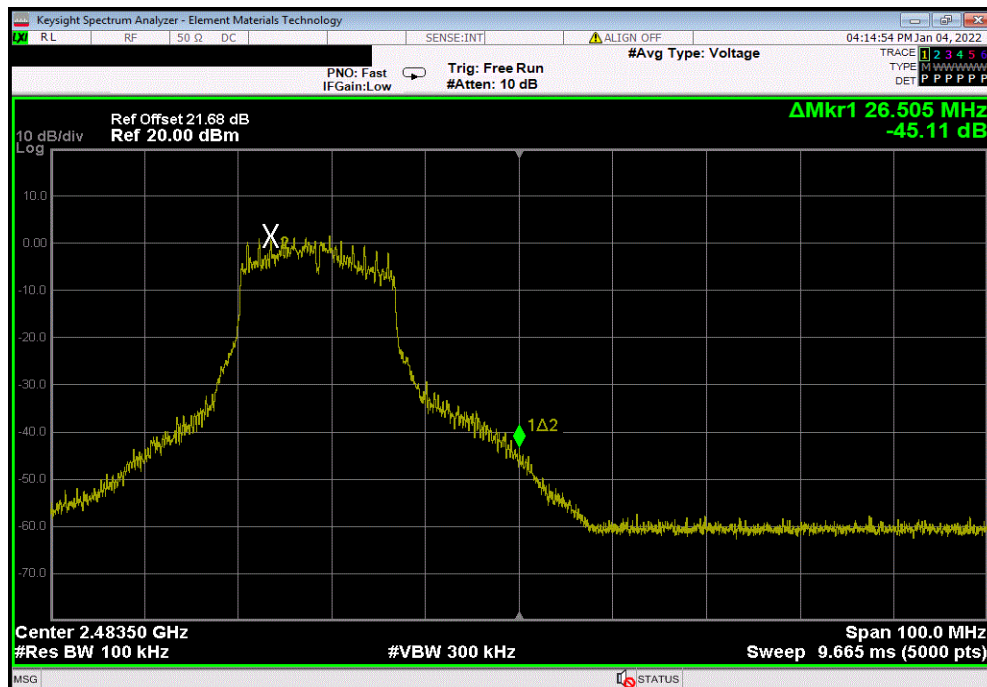


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
	Value (dBc)	Limit ≤ (dBc)	Result			
	-35.54	-30	Pass			



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
	Value (dBc)	Limit ≤ (dBc)	Result			
	-45.11	-30	Pass			

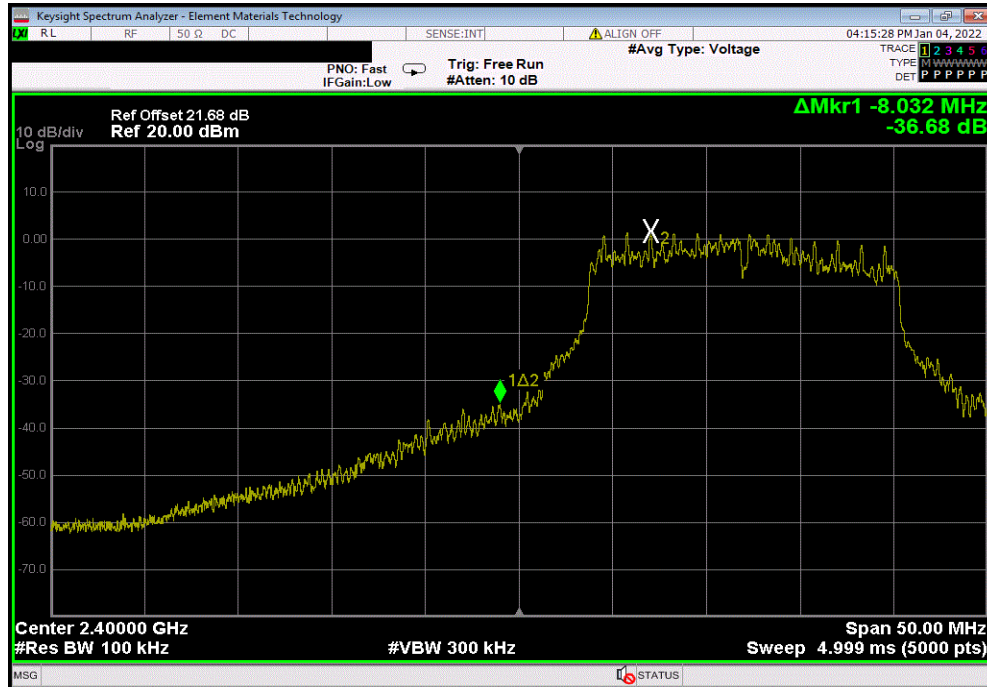


BAND EDGE COMPLIANCE

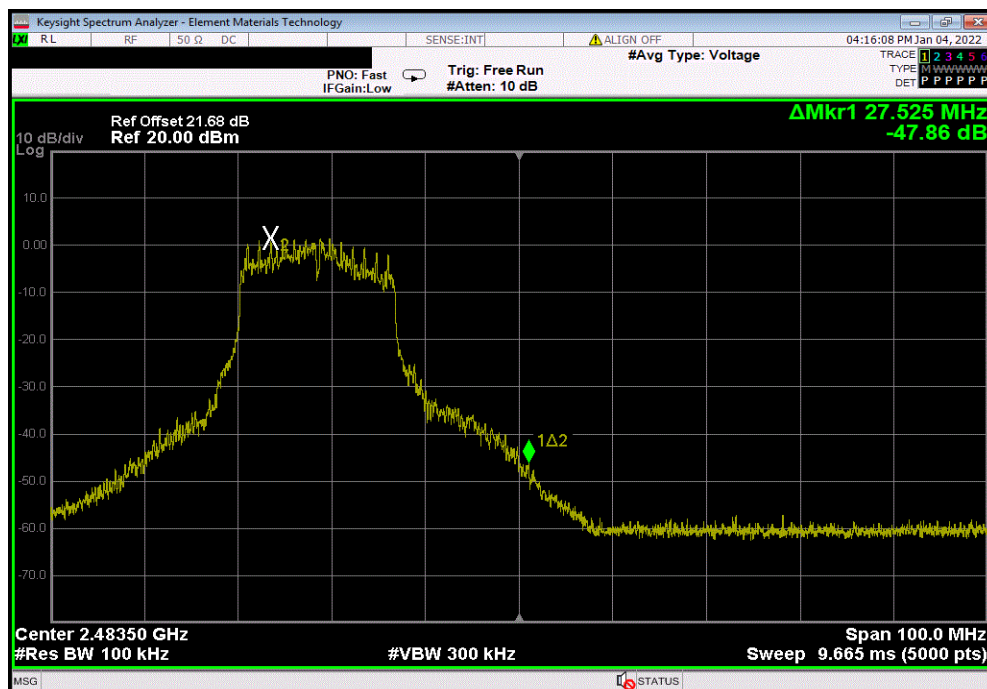


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
	Value (dBc)	Limit ≤ (dBc)	Result			
	-36.68	-30	Pass			



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
	Value (dBc)	Limit ≤ (dBc)	Result			
	-47.86	-30	Pass			

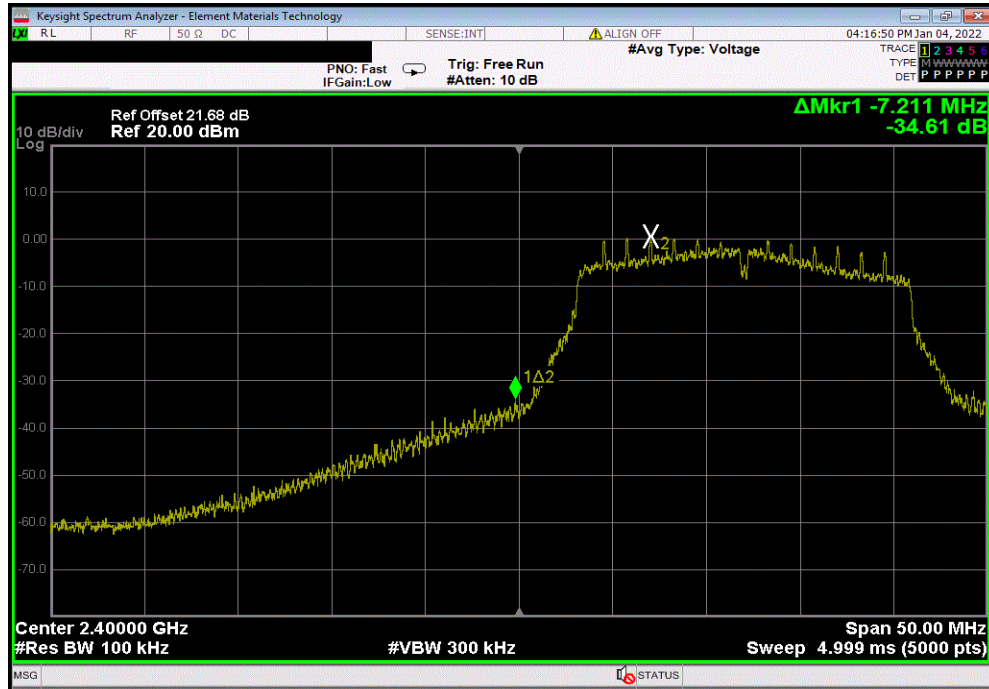


BAND EDGE COMPLIANCE

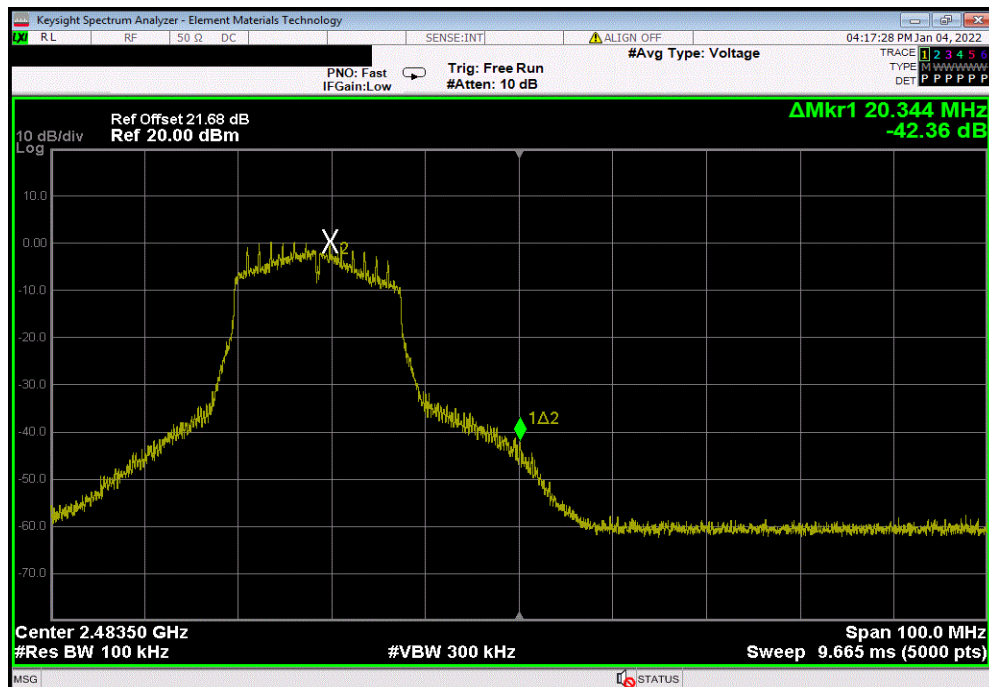


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-34.62	-30	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-42.36	-30	Pass

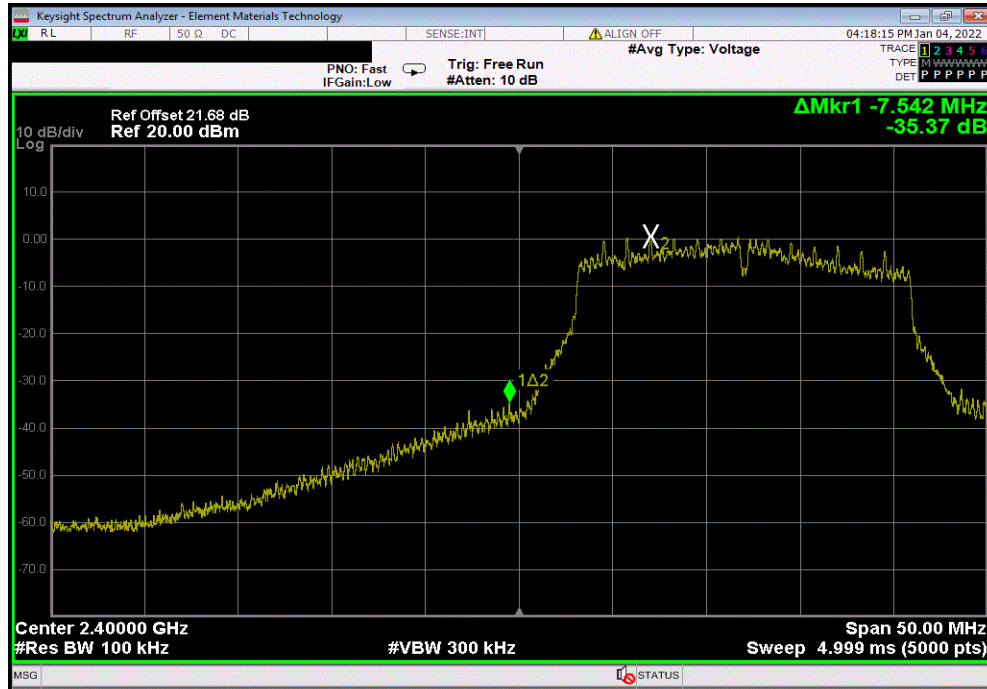


BAND EDGE COMPLIANCE

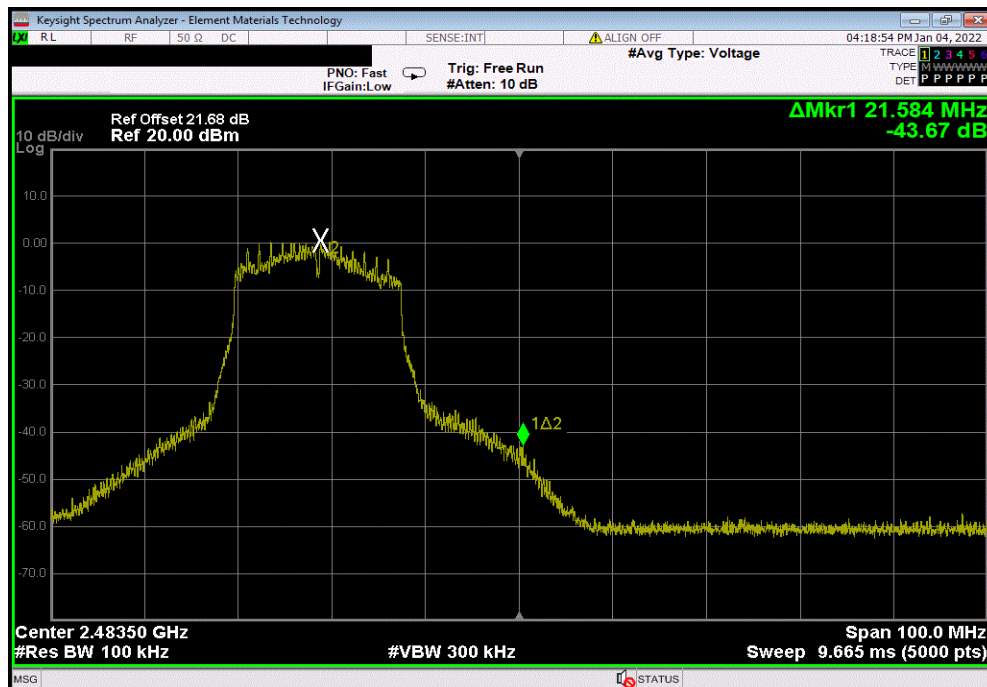


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-35.37	-30	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-43.67	-30	Pass



SPURIOUS CONDUCTED EMISSIONS

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
Generator - Signal	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2021-04-08	2022-04-08

TEST DESCRIPTION

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the fundamental was measured with a 100 kHz resolution bandwidth and the highest value was recorded. The rest of the spectrum was then measured with a 100 kHz resolution bandwidth and the highest value was found. The difference between the value found on the fundamental and the rest of the spectrum was compared against the limit to determine compliance.

SPURIOUS CONDUCTED EMISSIONS



TSTx 2021.03.19.1 XMR 2020.12.30.0

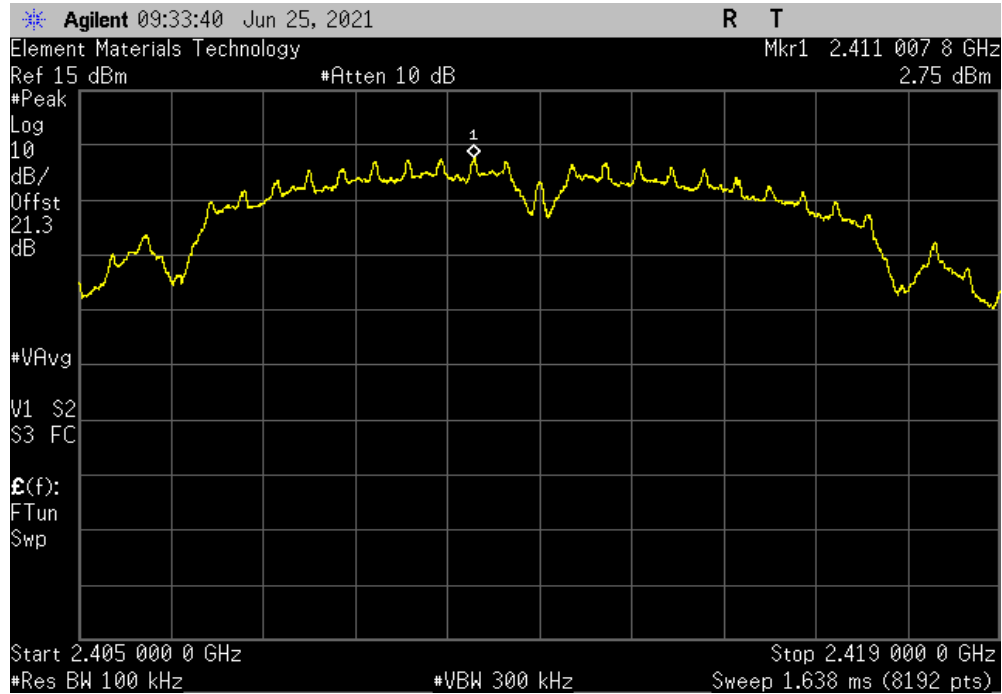
EUT: 43.0536.00		Work Order: A-DE0162				
Serial Number: SN001 00003		Date: 28-Jun-21				
Customer: A-dec, Inc.		Temperature: 24.1 °C				
Attendees: Zack Lyda and Spencer Warenke		Humidity: 48.2% RH				
Project: None		Barometric Pres.: 1008 mbar				
Tested by: Jeff Alcoke		Job Site: EV06				
Power: 3.3 VDC via 110VAC/60Hz						
TEST SPECIFICATIONS		Test Method				
FCC 15.247:2021		ANSI C63.10:2013				
COMMENTS						
Reference level offset: DC Block, 20 dB attenuator, and measurement cable.						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	1	Signature 				
		Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
2400 MHz - 2483.5 MHz Band						
20 MHz BW						
802.11(b) 1 Mbps						
		Low Channel 1, 2412 MHz	Fundamental	2411.01	N/A	N/A
		Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	7736.4	-59.59	-30 Pass
		Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	24824.5	-55.92	-30 Pass
		Mid Channel 6, 2437 MHz	Fundamental	2438.51	N/A	N/A
		Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	7712	-58.53	-30 Pass
		Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	24835.2	-54.81	-30 Pass
		High Channel 11, 2462 MHz	Fundamental	2462.5	N/A	N/A
		High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	8016.5	-59.08	-30 Pass
		High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	24932.9	-55.07	-30 Pass
802.11(b) 11 Mbps						
		Low Channel 1, 2412 MHz	Fundamental	2412.01	N/A	N/A
		Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	7573.5	-59.58	-30 Pass
		Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	24842.8	-56.42	-30 Pass
		Mid Channel 6, 2437 MHz	Fundamental	2436.45	N/A	N/A
		Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	12497	-59.98	-30 Pass
		Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	24844.3	-56.46	-30 Pass
		High Channel 11, 2462 MHz	Fundamental	2461.98	N/A	N/A
		High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	7480.6	-60.23	-30 Pass
		High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	23605.2	-57.81	-30 Pass
802.11(g) 6 Mbps						
		Low Channel 1, 2412 MHz	Fundamental	2407	N/A	N/A
		Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	2386.7	-54.73	-30 Pass
		Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	23538	-54.86	-30 Pass
		Mid Channel 6, 2437 MHz	Fundamental	2444.51	N/A	N/A
		Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	9609	-57.67	-30 Pass
		Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	24172.9	-53.97	-30 Pass
		High Channel 11, 2462 MHz	Fundamental	2457.01	N/A	N/A
		High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	7823.2	-57.05	-30 Pass
		High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	24914.5	-53.81	-30 Pass
802.11(g) 36 Mbps						
		Low Channel 1, 2412 MHz	Fundamental	2406.99	N/A	N/A
		Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	2386.7	-54.88	-30 Pass
		Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	23965.3	-54.9	-30 Pass
		Mid Channel 6, 2437 MHz	Fundamental	2444.49	N/A	N/A
		Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	7447.1	-57.61	-30 Pass
		Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	24777.2	-53.23	-30 Pass
		High Channel 11, 2462 MHz	Fundamental	2457	N/A	N/A
		High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	9878.4	-58.36	-30 Pass
		High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	24806.2	-54.91	-30 Pass
802.11(g) 54 Mbps						
		Low Channel 1, 2412 MHz	Fundamental	2407	N/A	N/A
		Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	2386.7	-56.26	-30 Pass
		Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	24821.5	-55.14	-30 Pass
		Mid Channel 6, 2437 MHz	Fundamental	2444.49	N/A	N/A
		Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	7521.7	-57.15	-30 Pass
		Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	24795.5	-53.8	-30 Pass
		High Channel 11, 2462 MHz	Fundamental	2462.27	N/A	N/A
		High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	7639	-57.52	-30 Pass
		High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	24192.7	-54.43	-30 Pass
802.11(n) MCS0						
		Low Channel 1, 2412 MHz	Fundamental	2406.99	N/A	N/A
		Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	2386.7	-55.09	-30 Pass
		Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	23400.7	-53.69	-30 Pass
		Mid Channel 6, 2437 MHz	Fundamental	2444.51	N/A	N/A
		Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	12353.8	-56.65	-30 Pass
		Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	24398.7	-53.22	-30 Pass
		High Channel 11, 2462 MHz	Fundamental	2462	N/A	N/A
		High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	9272.5	-56.89	-30 Pass
		High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	24865.7	-53.85	-30 Pass
802.11(n) MCS7						
		Low Channel 1, 2412 MHz	Fundamental	2412.02	N/A	N/A
		Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	2386.7	-54.8	-30 Pass
		Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	24974.1	-52.53	-30 Pass
		Mid Channel 6, 2437 MHz	Fundamental	2444.5	N/A	N/A
		Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	7421.3	-56.35	-30 Pass
		Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	24401.8	-53.1	-30 Pass
		High Channel 11, 2462 MHz	Fundamental	2463.27	N/A	N/A
		High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	7975.4	-56.54	-30 Pass
		High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	24160.7	-53.42	-30 Pass

SPURIOUS CONDUCTED EMISSIONS

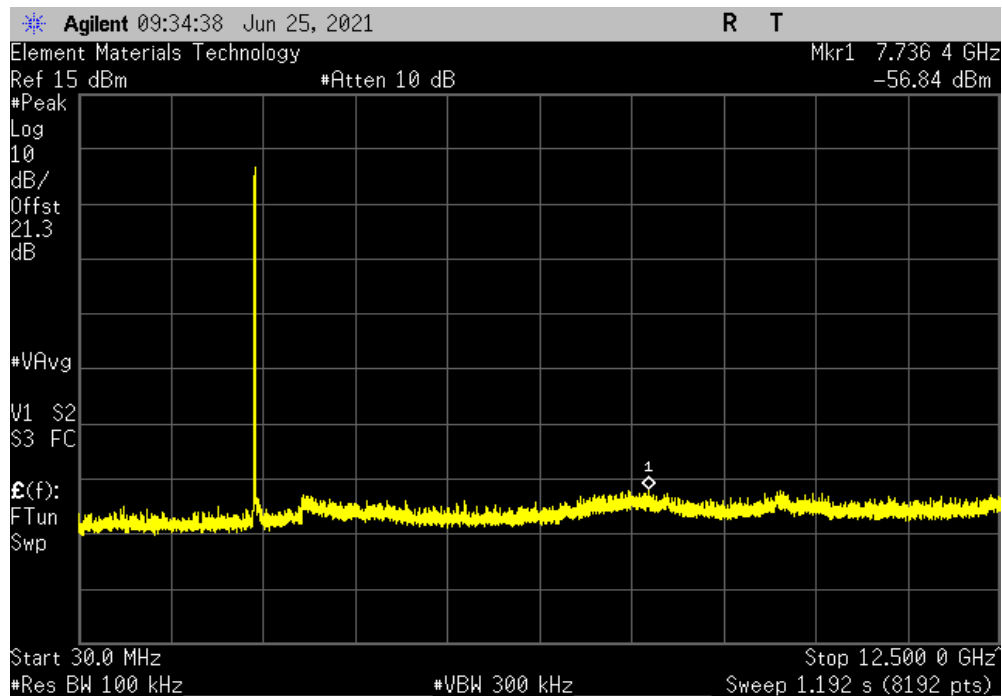


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental		2411.01	N/A	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz		7736.4	-59.59	-30	Pass	

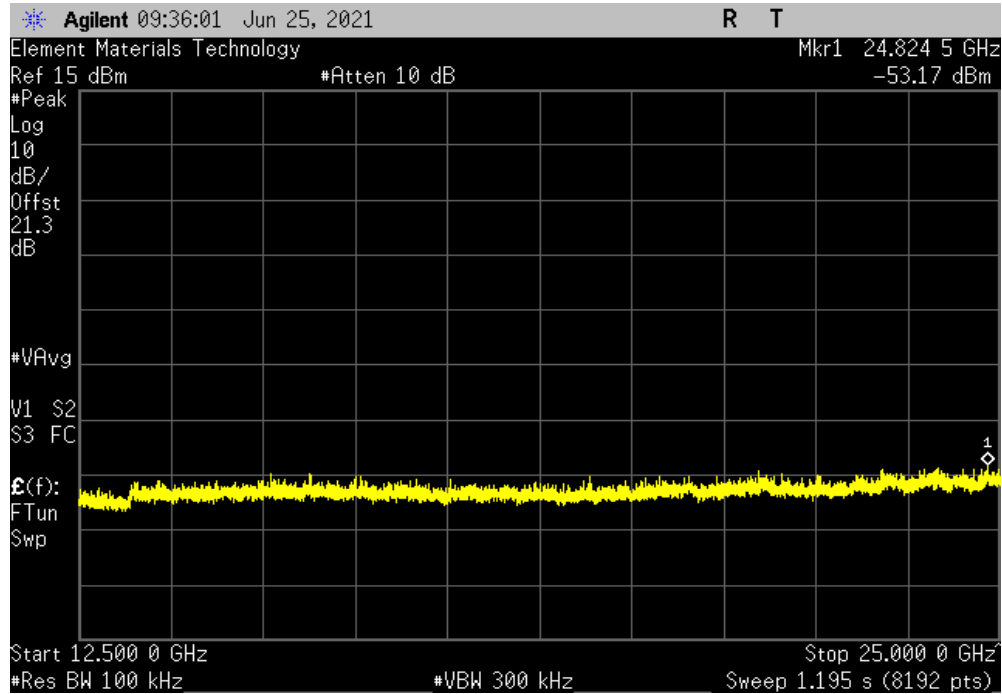


SPURIOUS CONDUCTED EMISSIONS

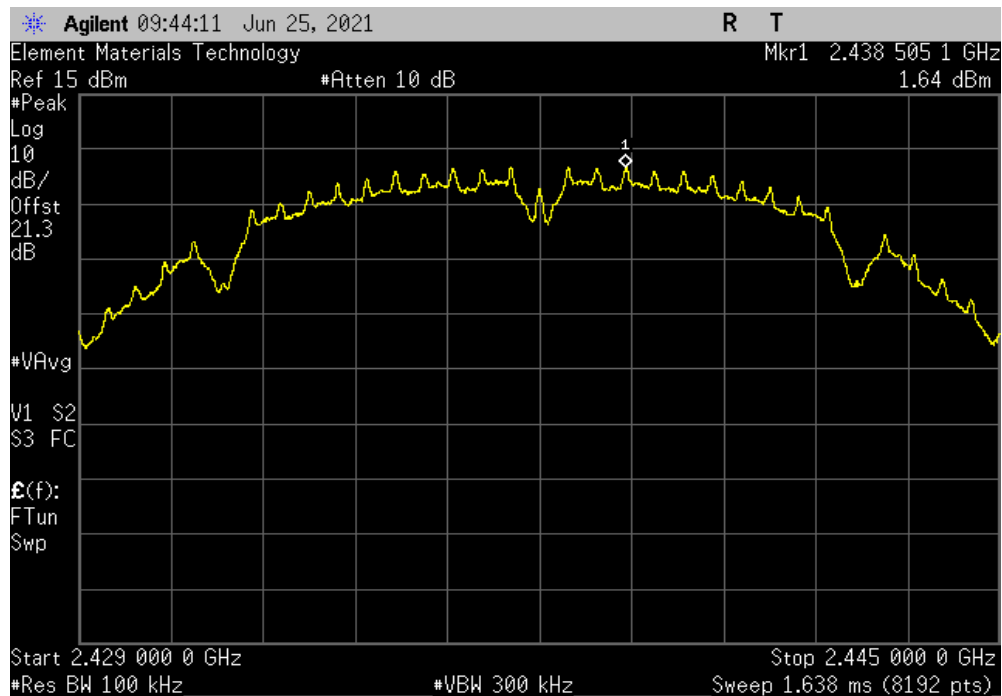


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24824.5	-55.92	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2438.51	N/A	N/A	N/A	

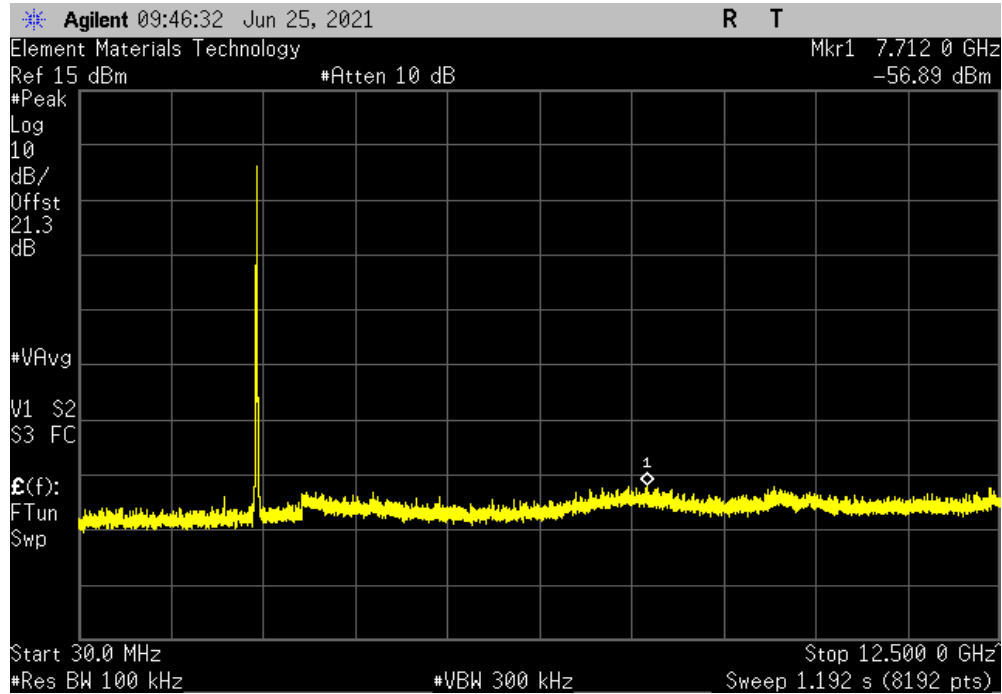


SPURIOUS CONDUCTED EMISSIONS

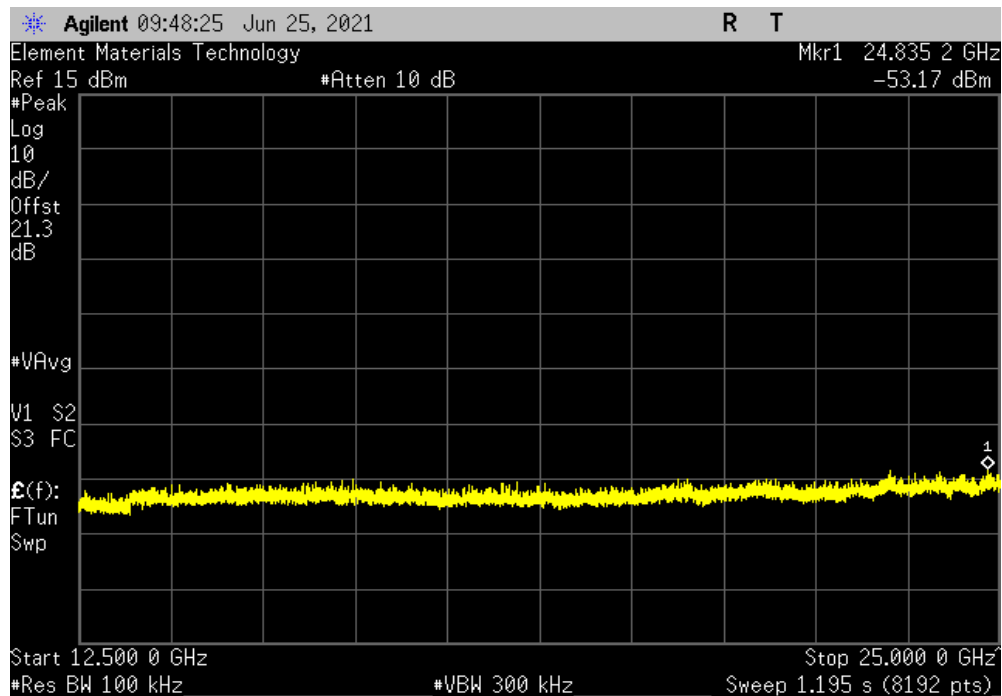


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	7712	-58.53	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24835.2	-54.81	-30	Pass	

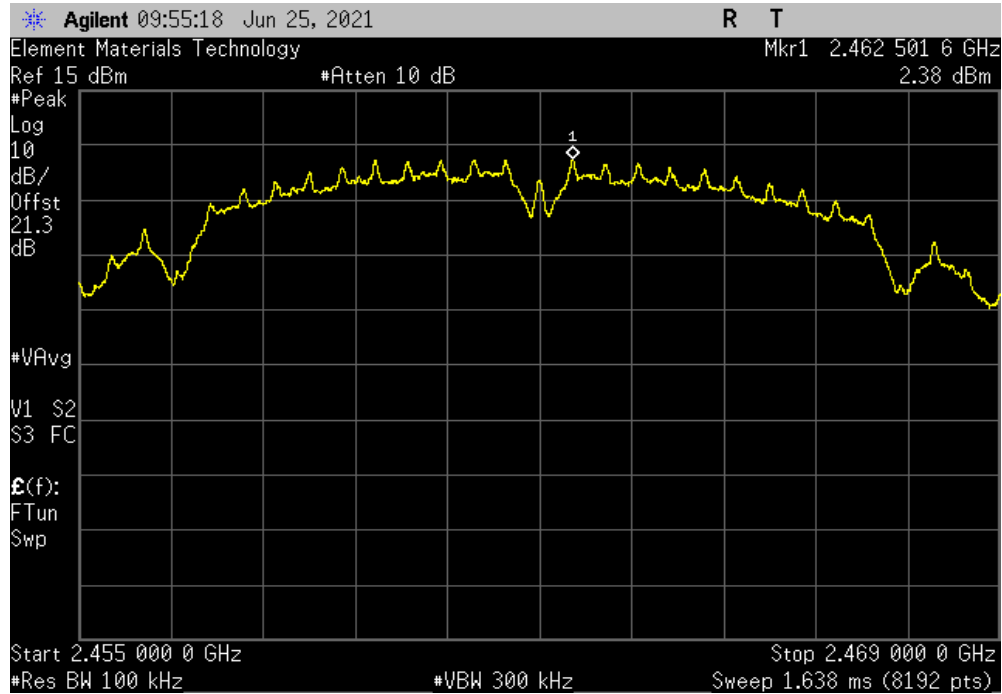


SPURIOUS CONDUCTED EMISSIONS

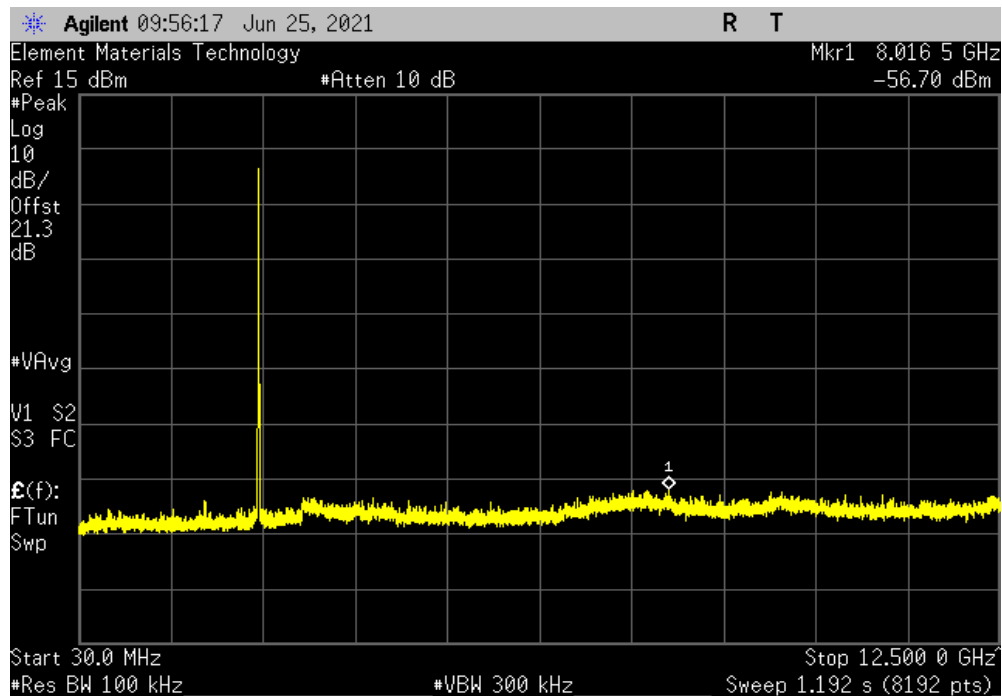


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental		2462.5	N/A	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz		8016.5	-59.08	-30	Pass	

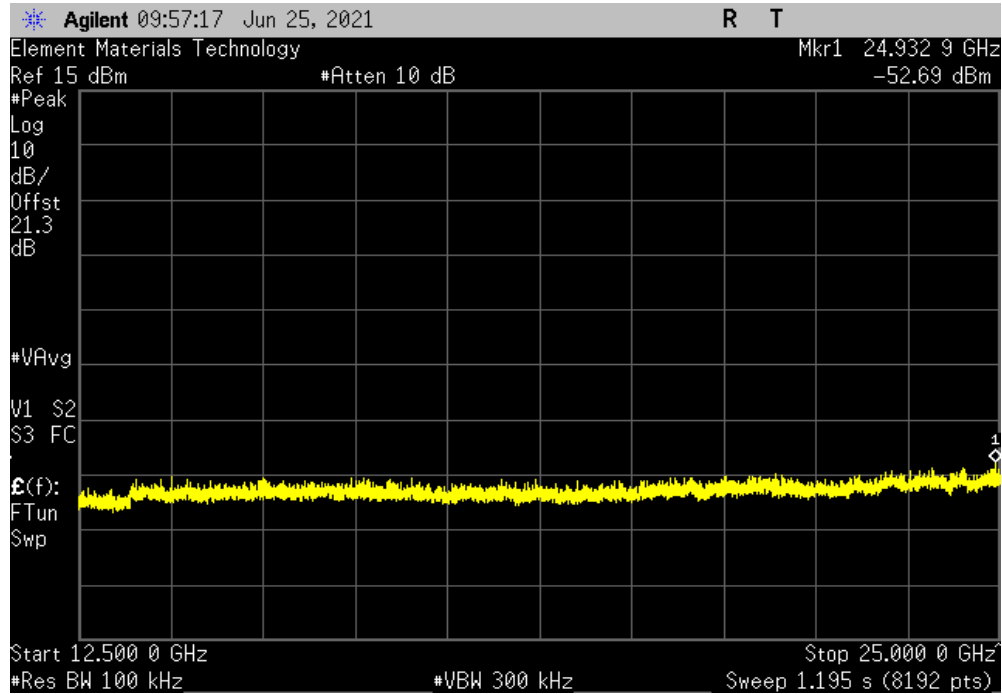


SPURIOUS CONDUCTED EMISSIONS

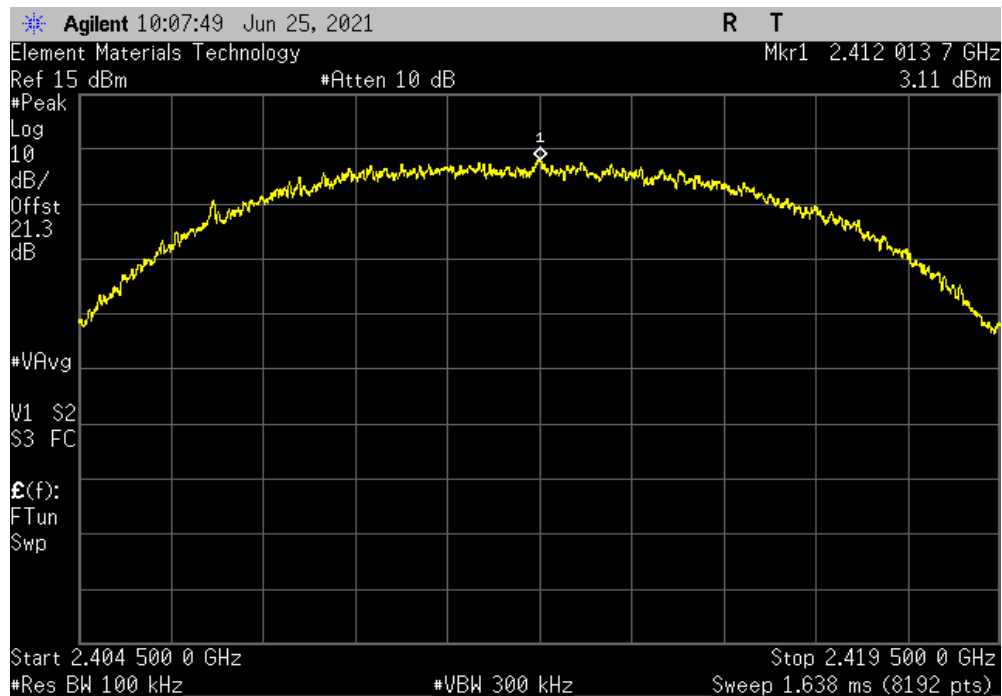


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24932.9	-55.07	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2412.01	N/A	N/A	N/A	

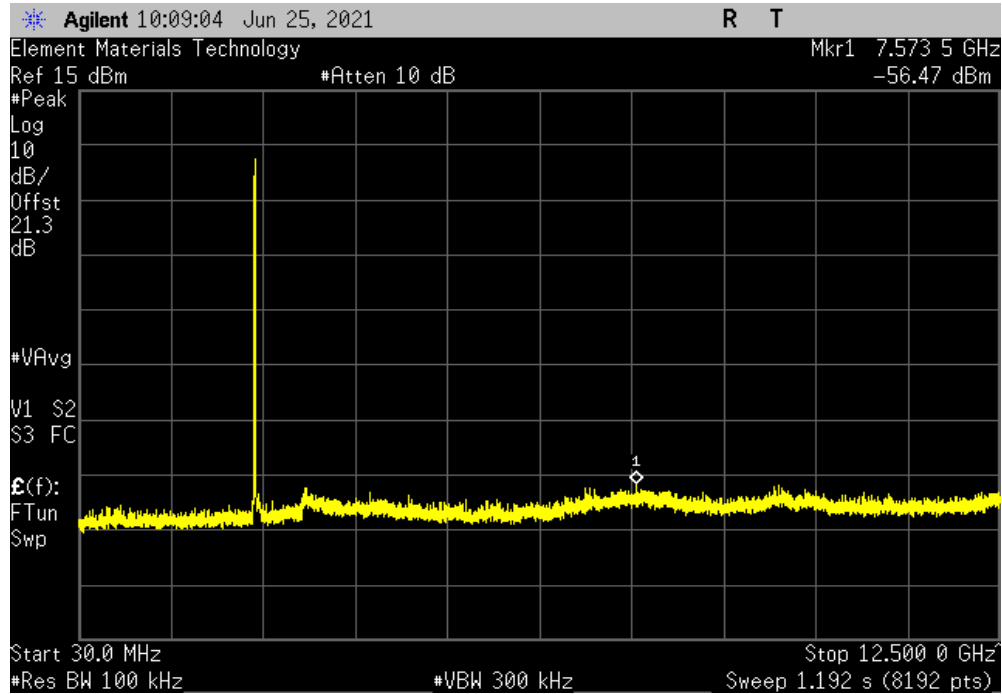


SPURIOUS CONDUCTED EMISSIONS

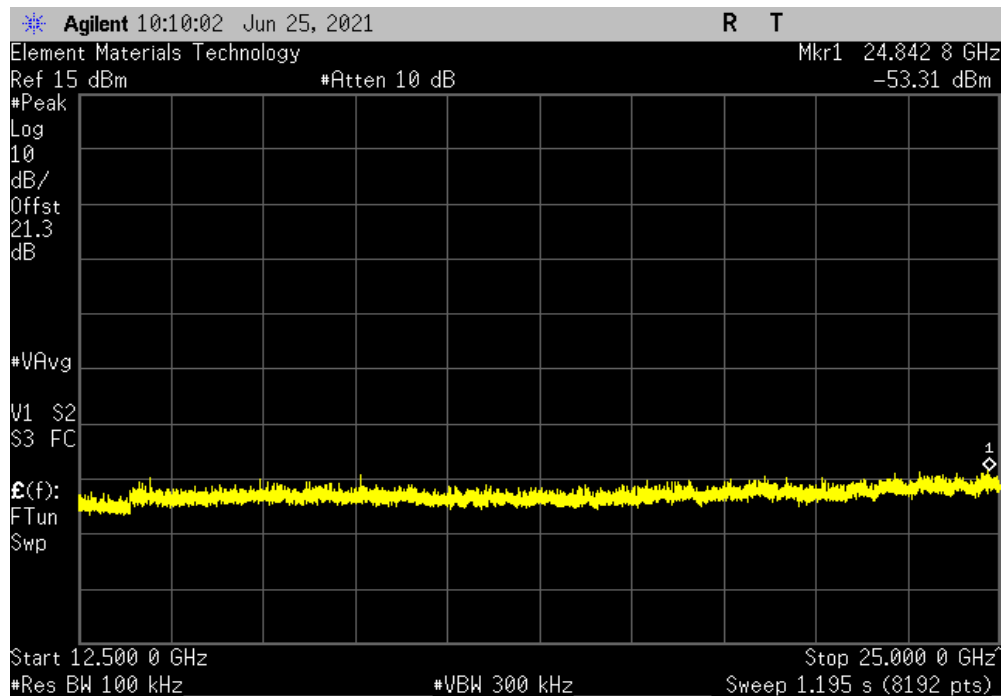


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	7573.5	-59.58	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24842.8	-56.42	-30	Pass	

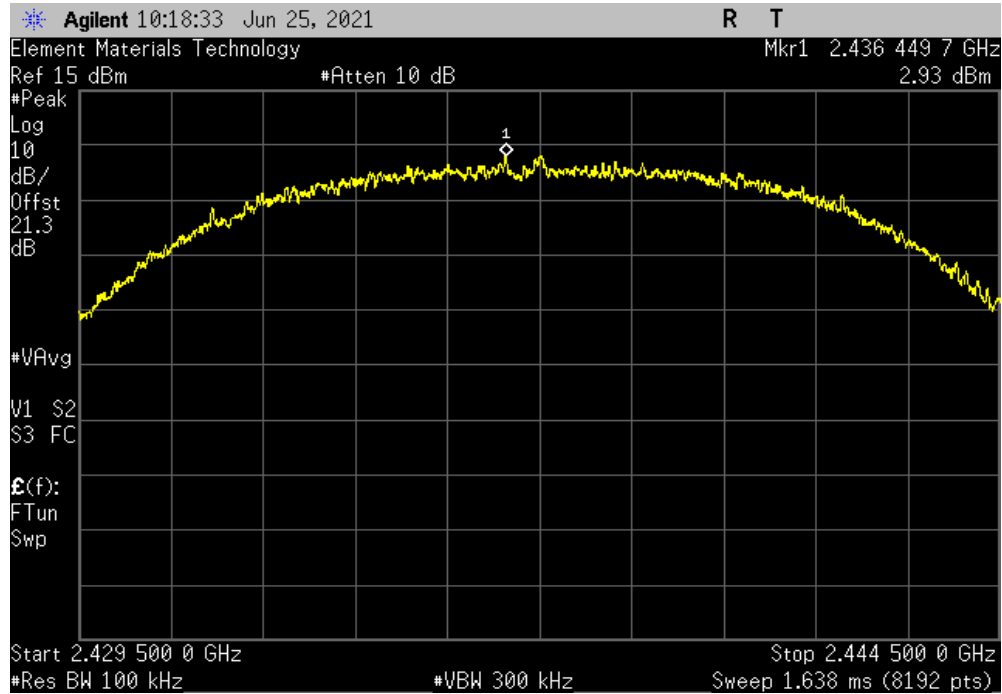


SPURIOUS CONDUCTED EMISSIONS

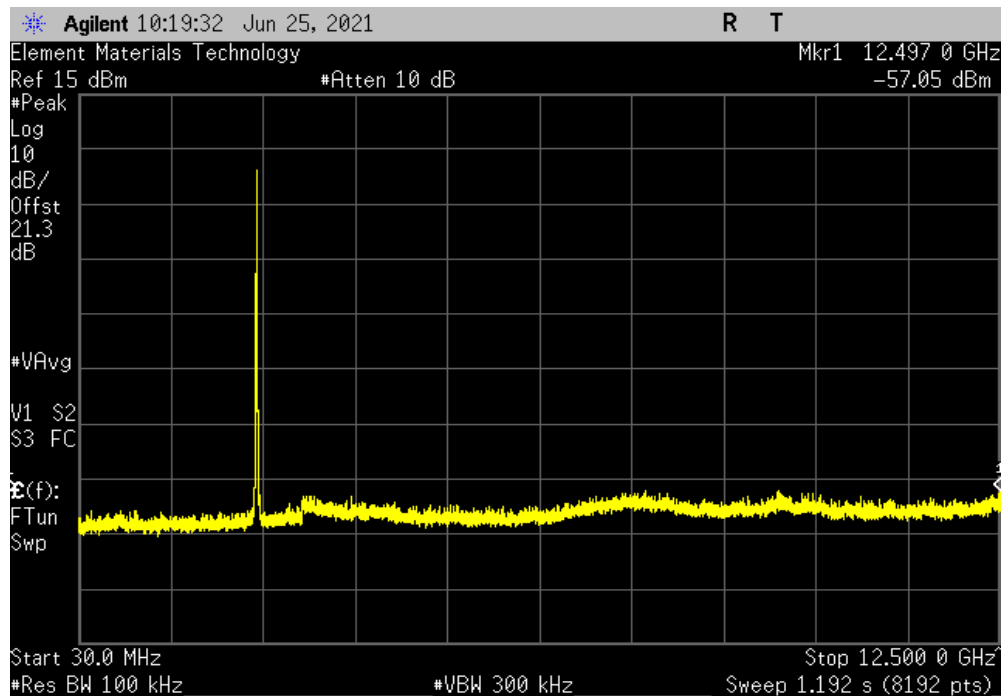


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental		2436.45	N/A	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz		12497	-59.98	-30	Pass	

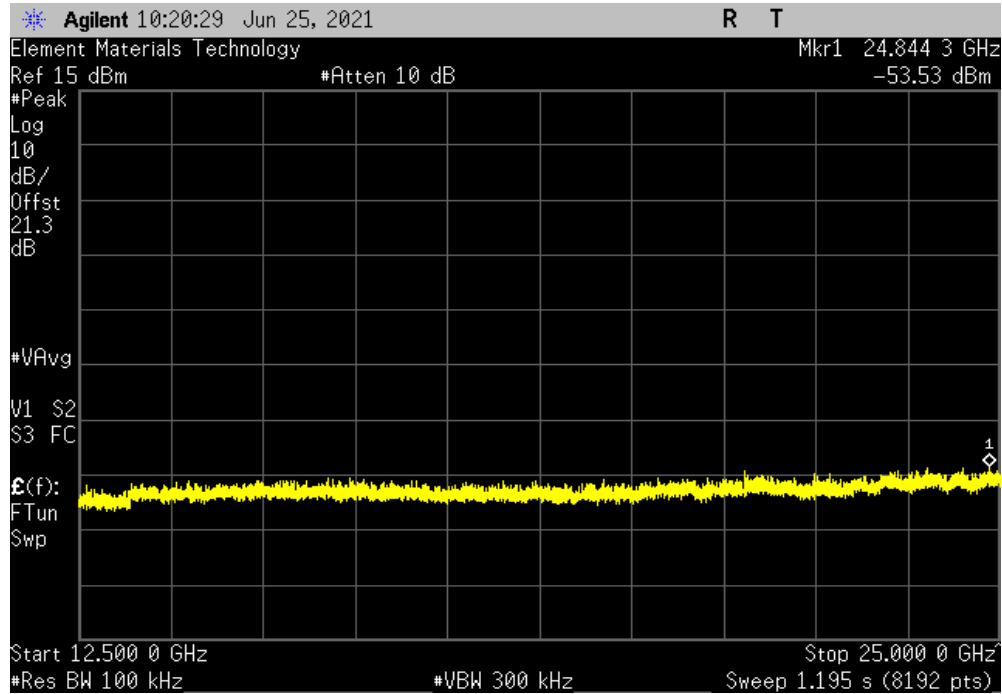


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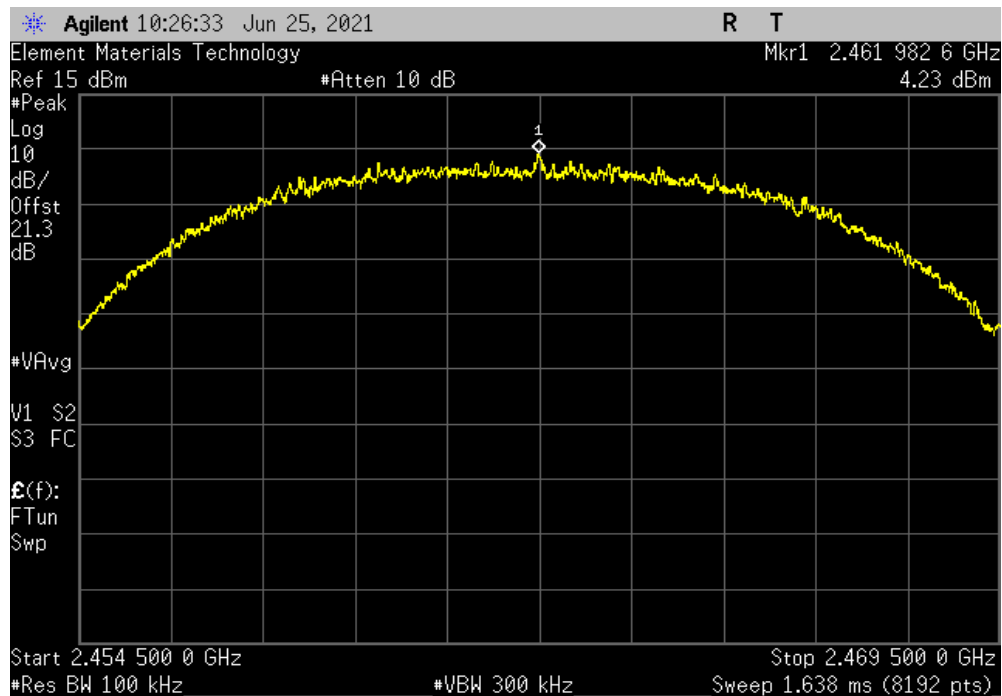


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24844.3	-56.46	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2461.98	N/A	N/A	N/A	

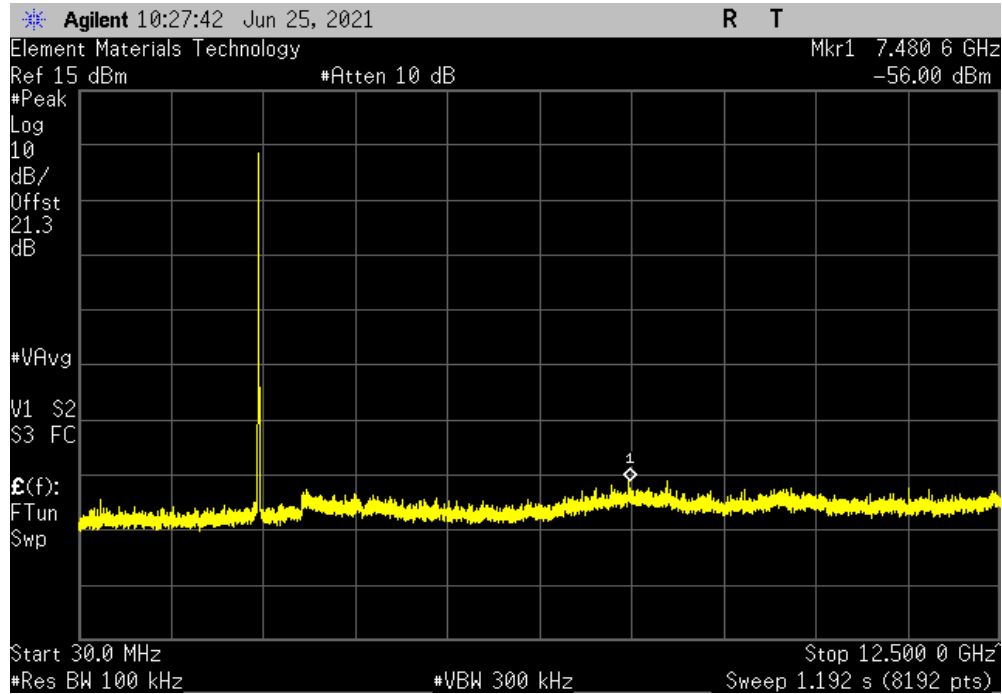


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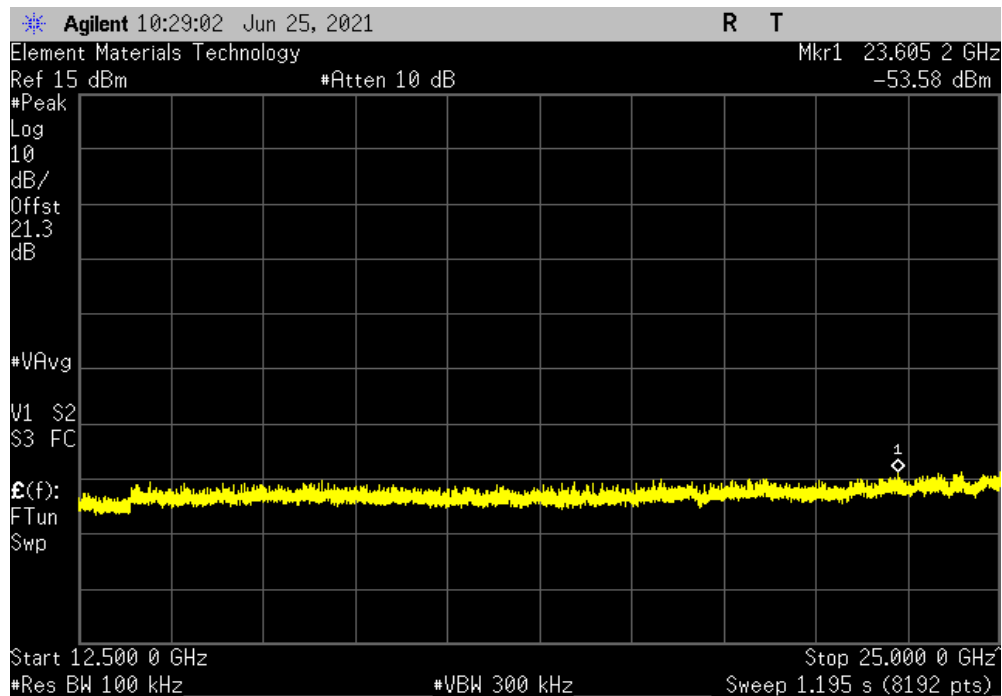


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	7480.6	-60.23	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	23605.2	-57.81	-30	Pass	

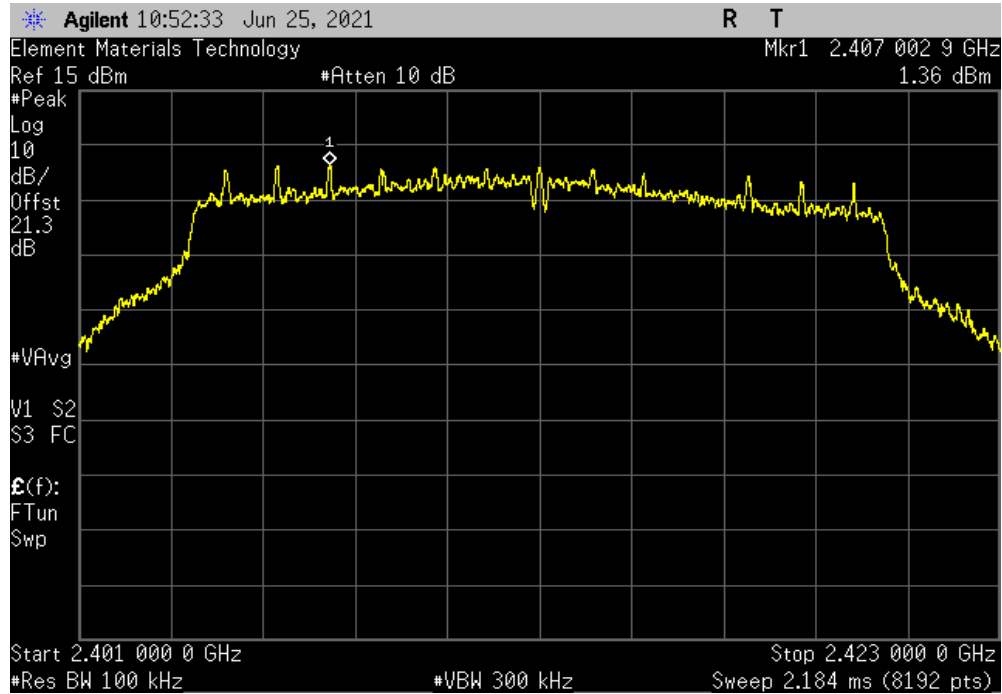


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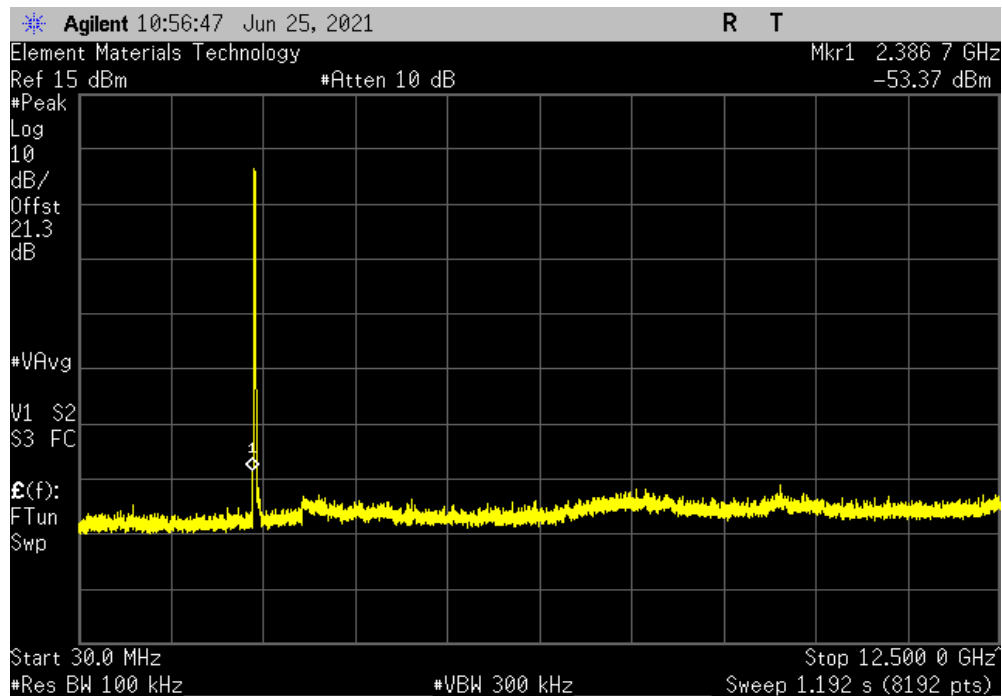


TUTTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2407	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	2386.7	-54.73	-30	Pass		

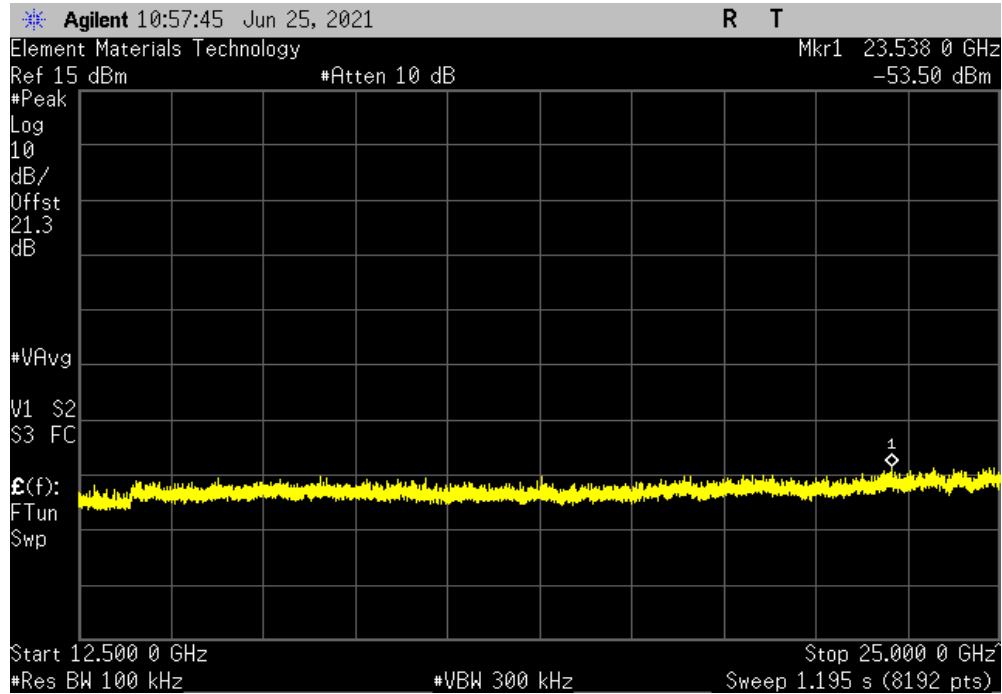


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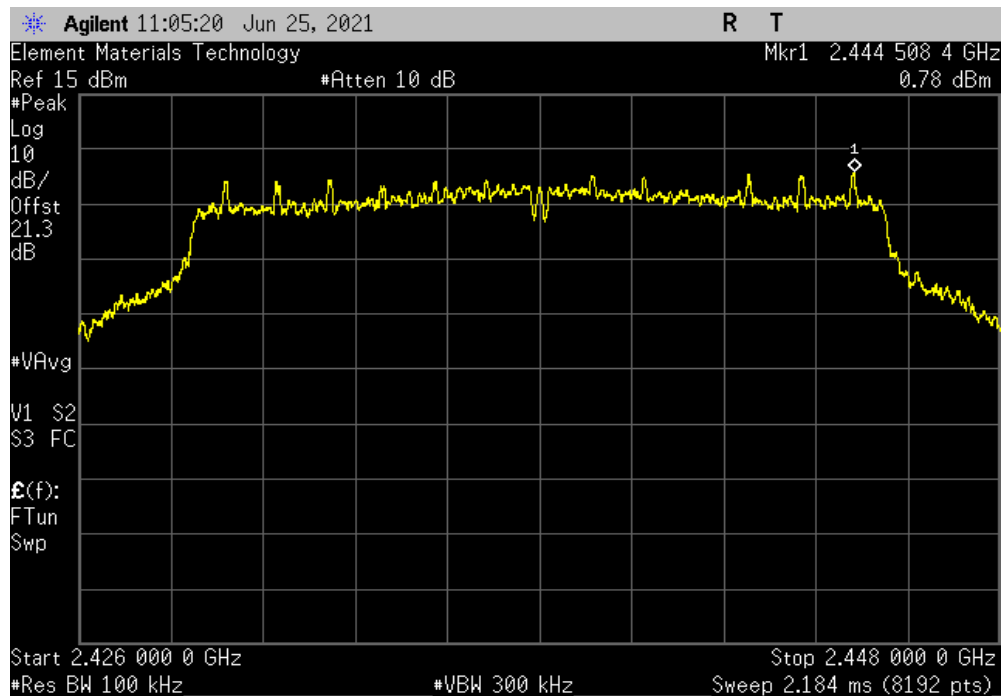


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	23538	-54.86	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2444.51	N/A	N/A	N/A	

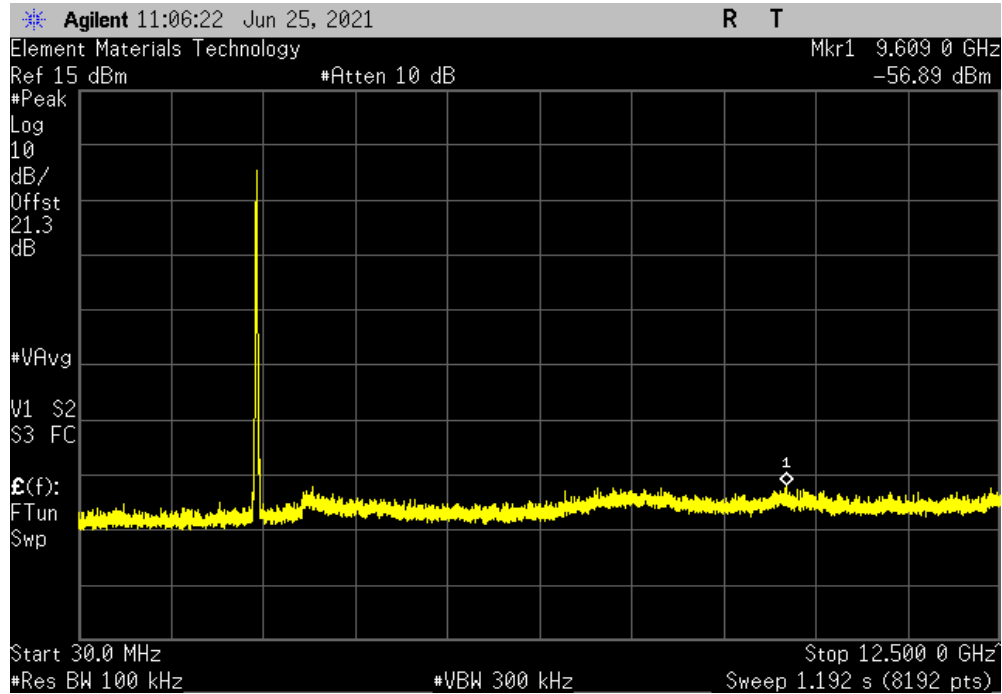


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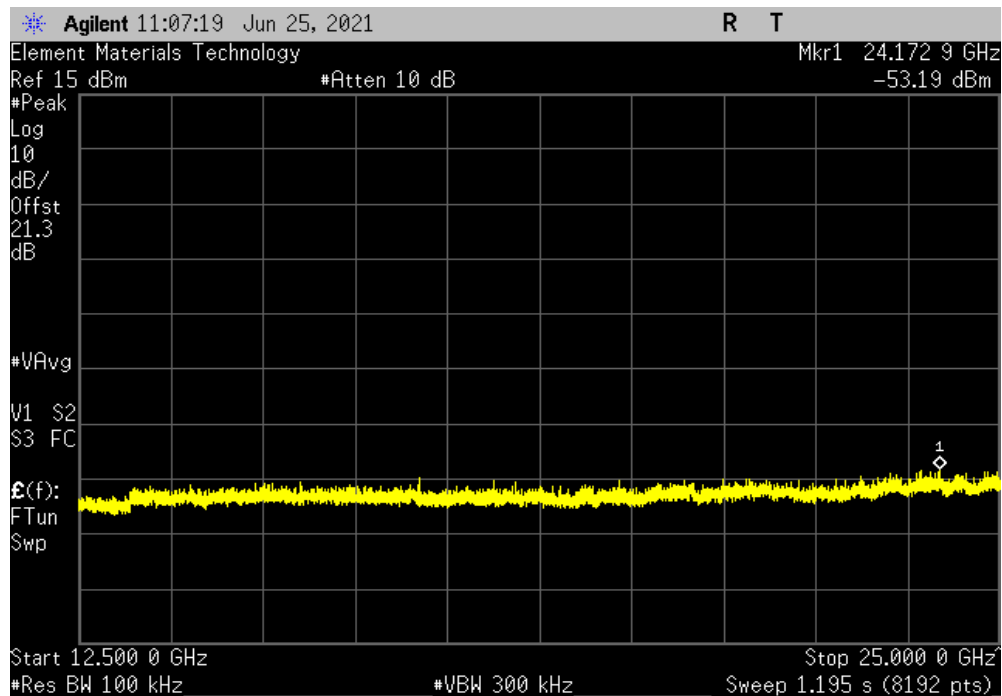


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	9609	-57.67	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24172.9	-53.97	-30	Pass	

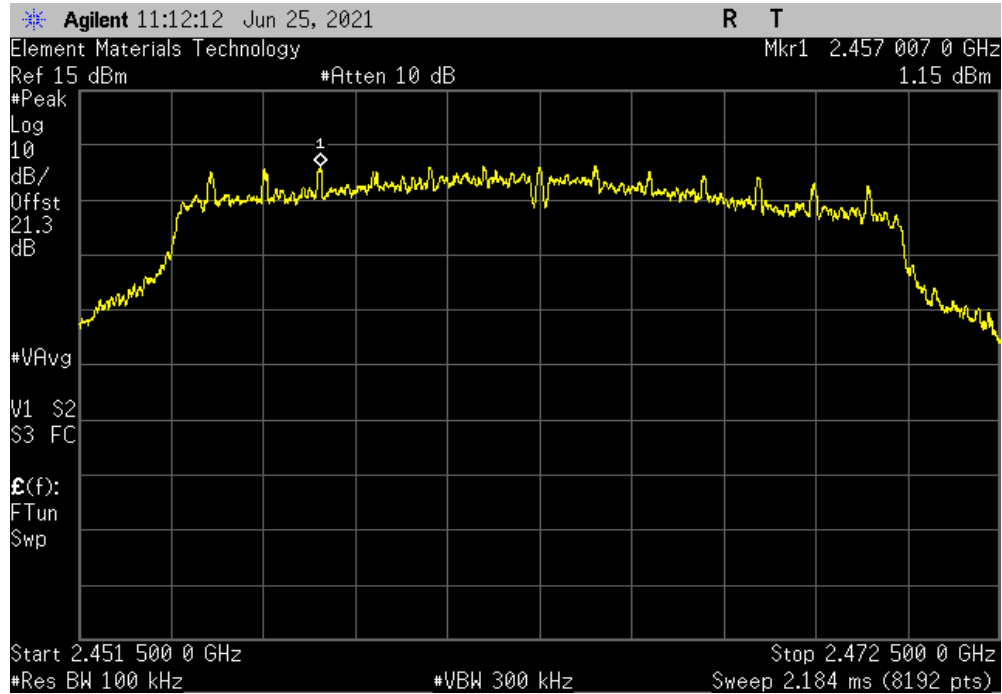


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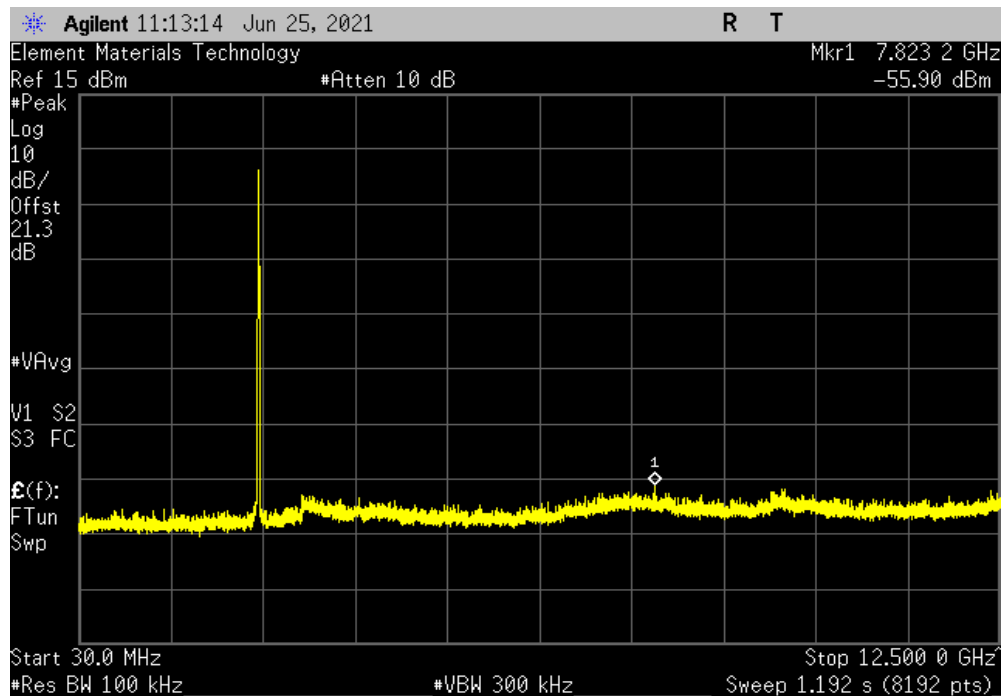


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2457.01	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	7823.2	-57.05	-30	Pass		

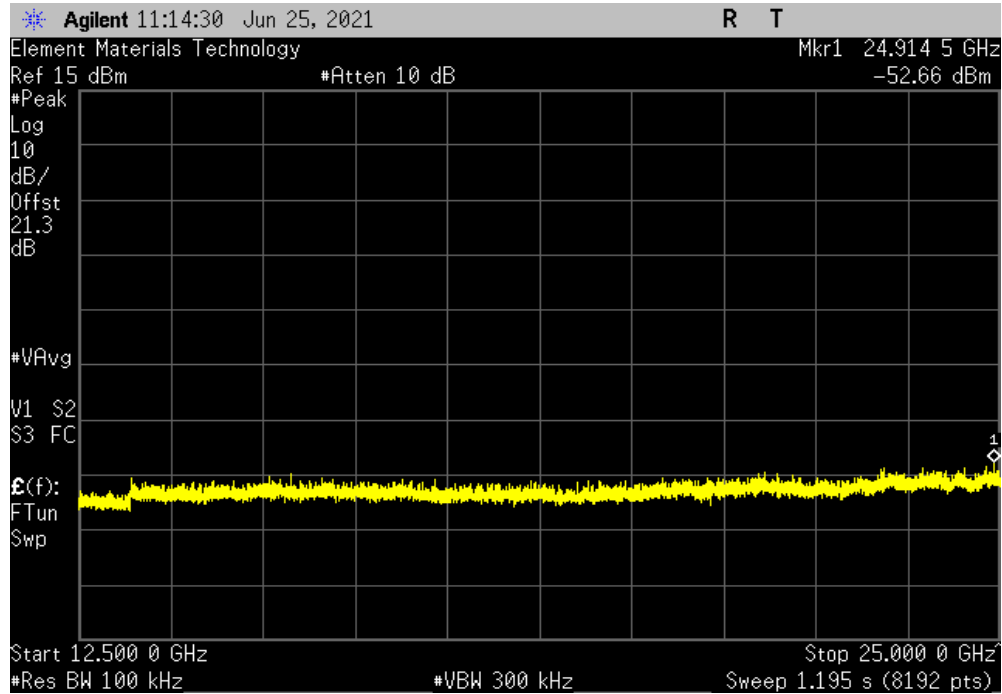


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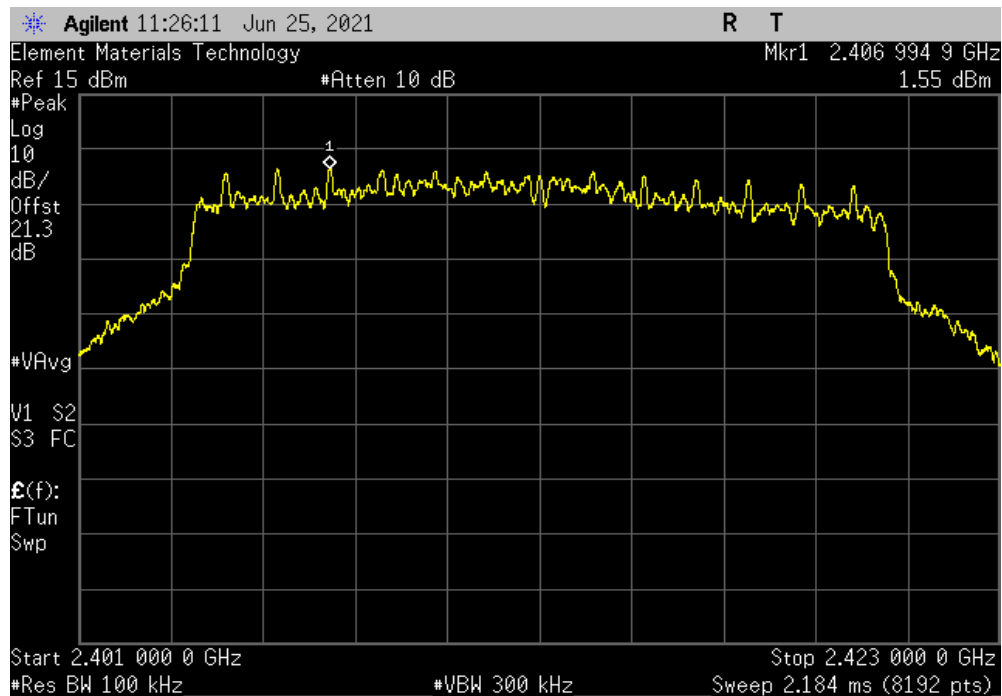


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24914.5	-53.81	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2406.99	N/A	N/A	N/A	

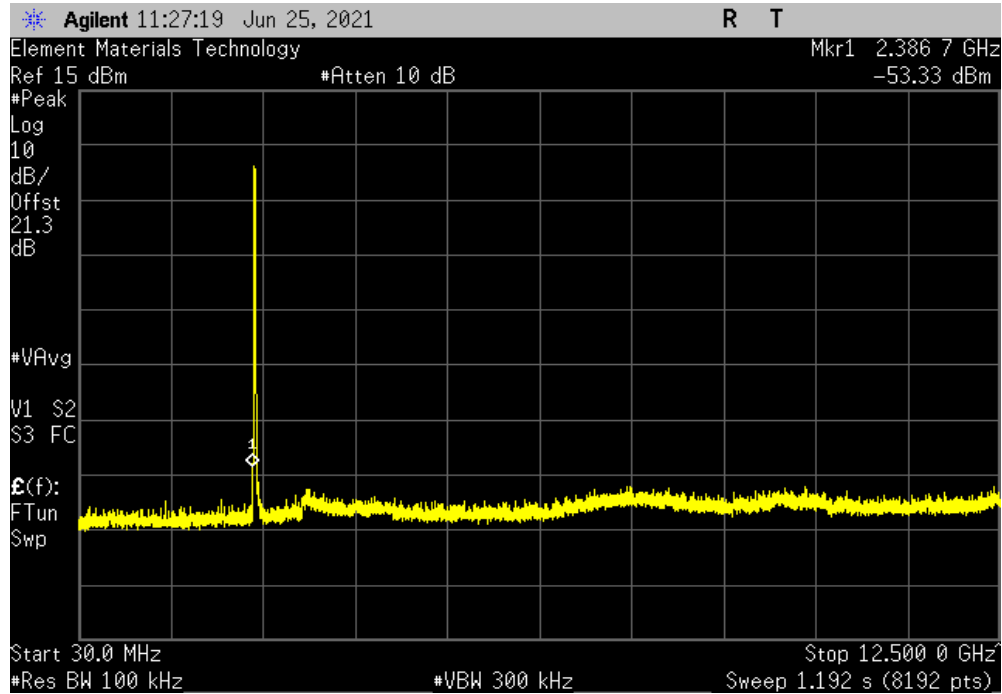


SPURIOUS CONDUCTED EMISSIONS

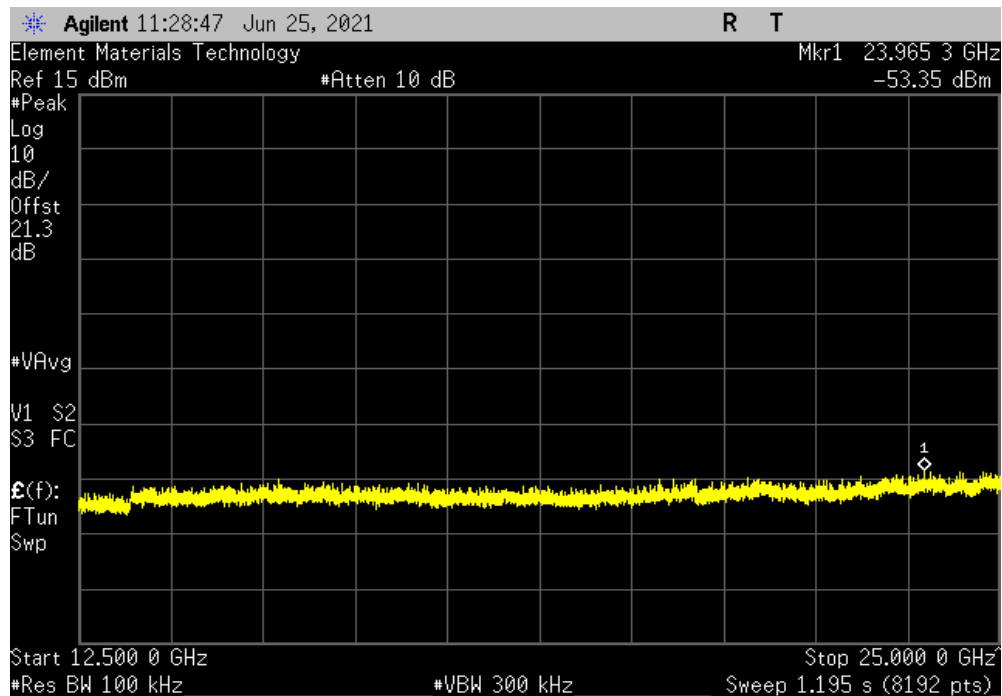


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	2386.7	-54.88	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	23965.3	-54.9	-30	Pass	

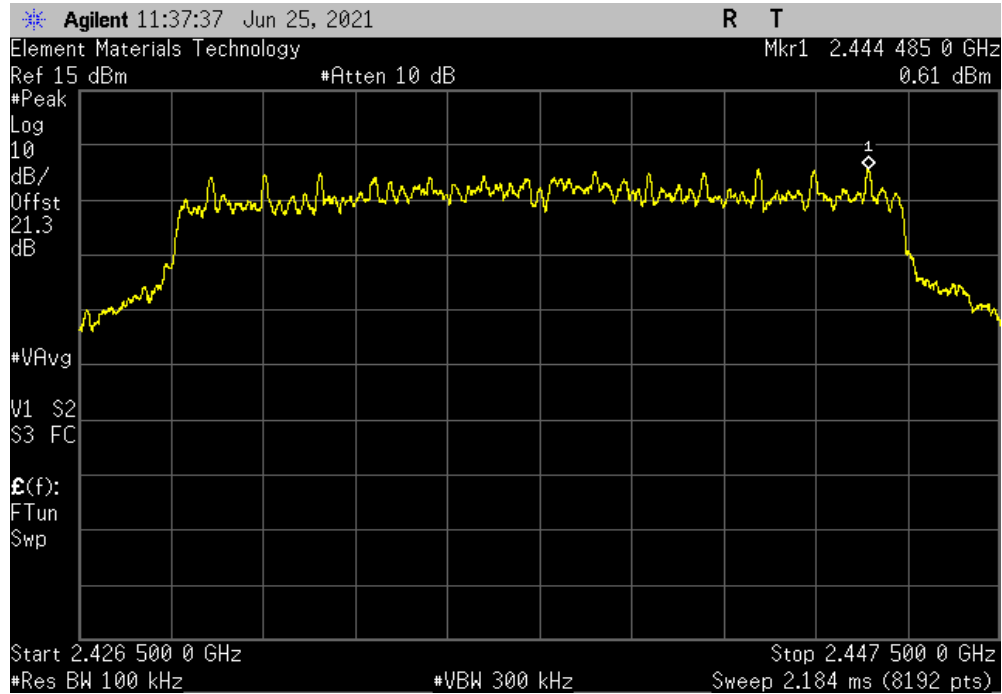


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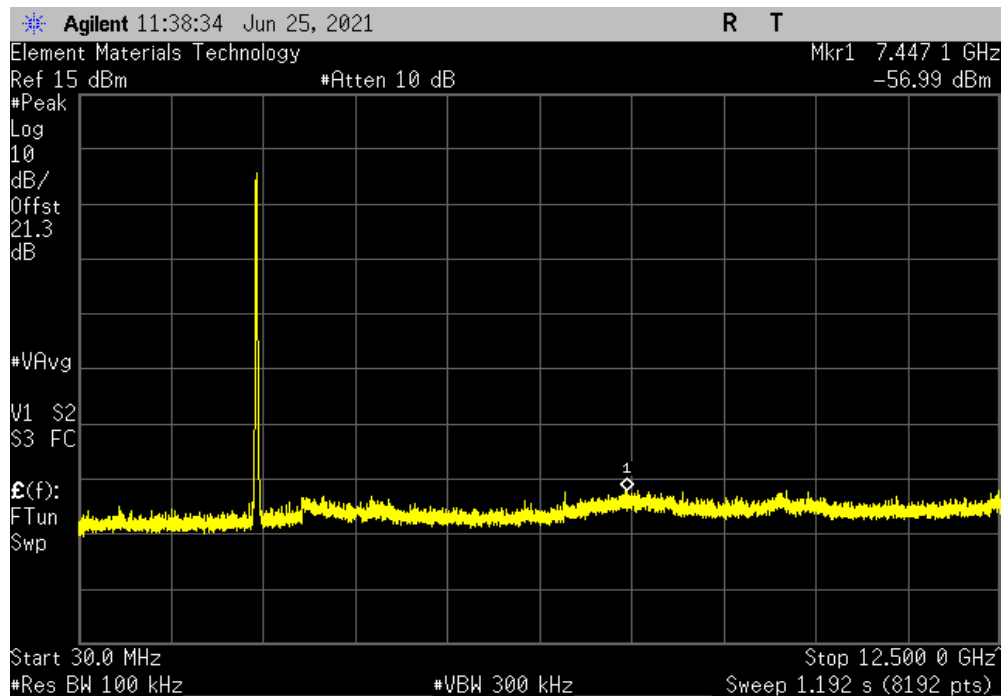


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2444.49	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	7447.1	-57.61	-30	Pass		

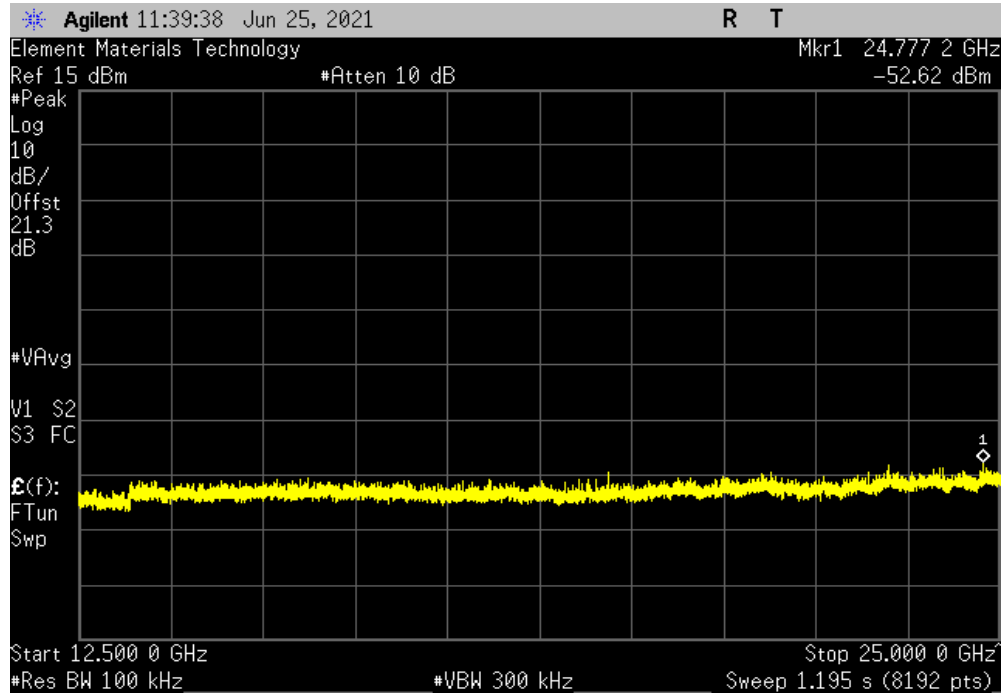


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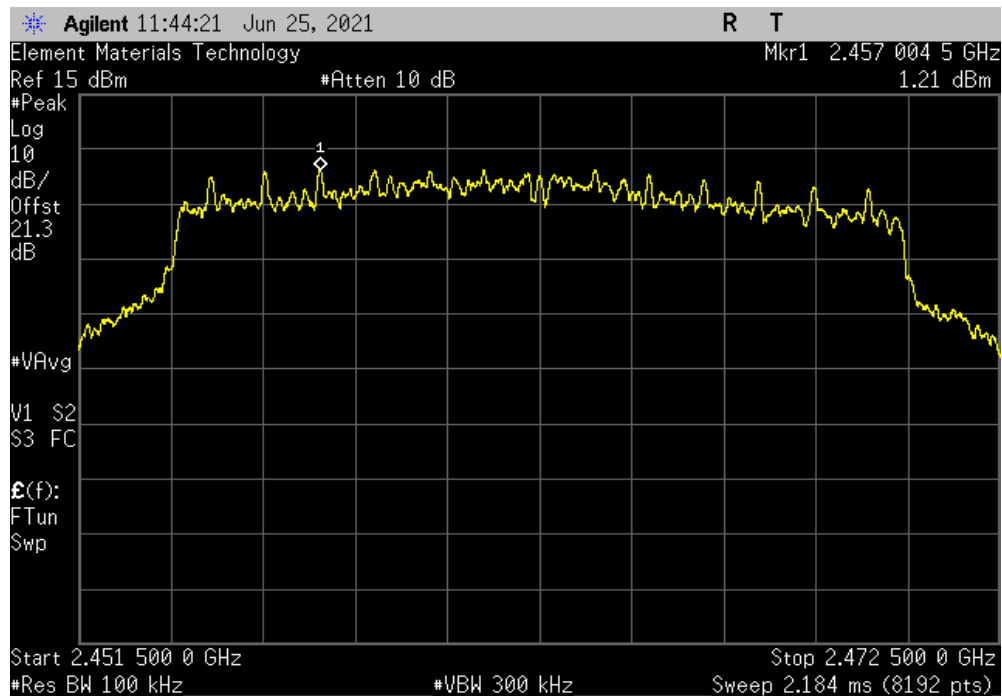


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24777.2	-53.23	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2457	N/A	N/A	N/A	

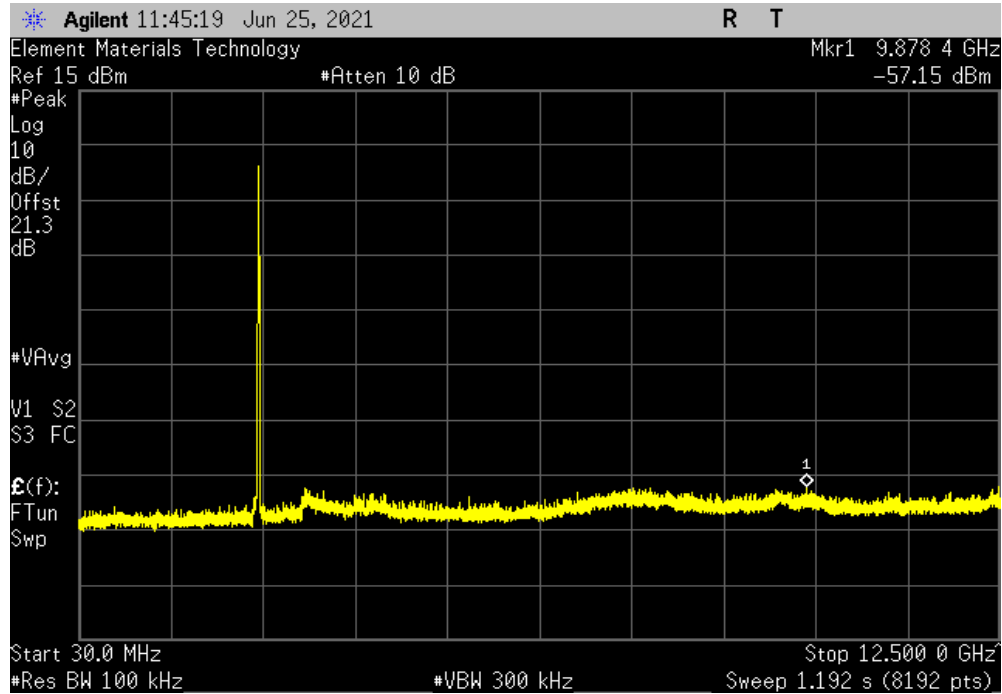


SPURIOUS CONDUCTED EMISSIONS

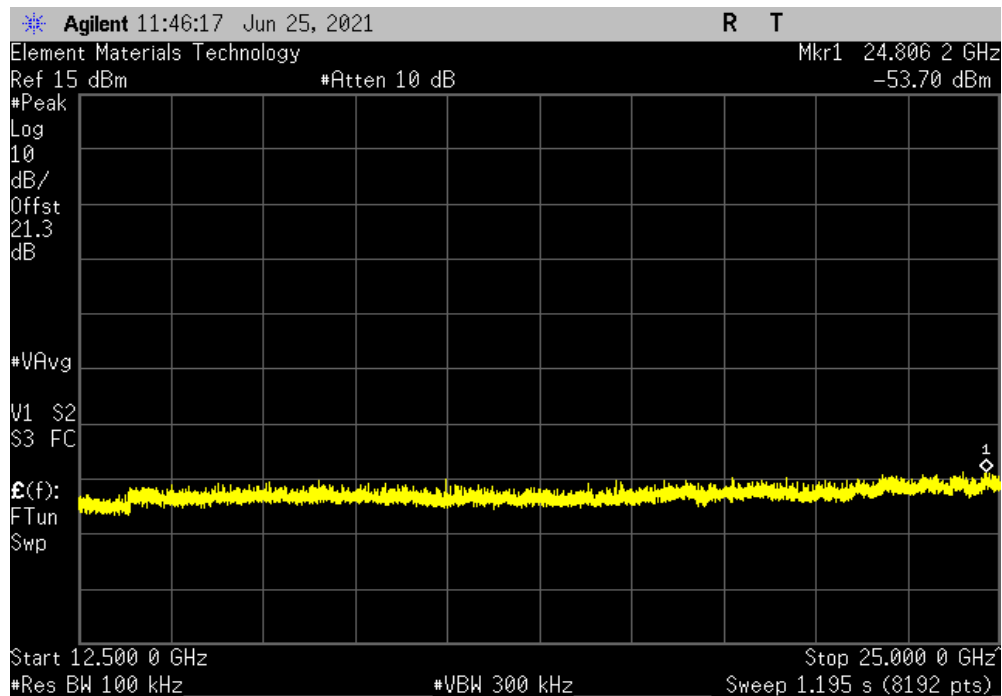


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	9878.4	-58.36	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24806.2	-54.91	-30	Pass	

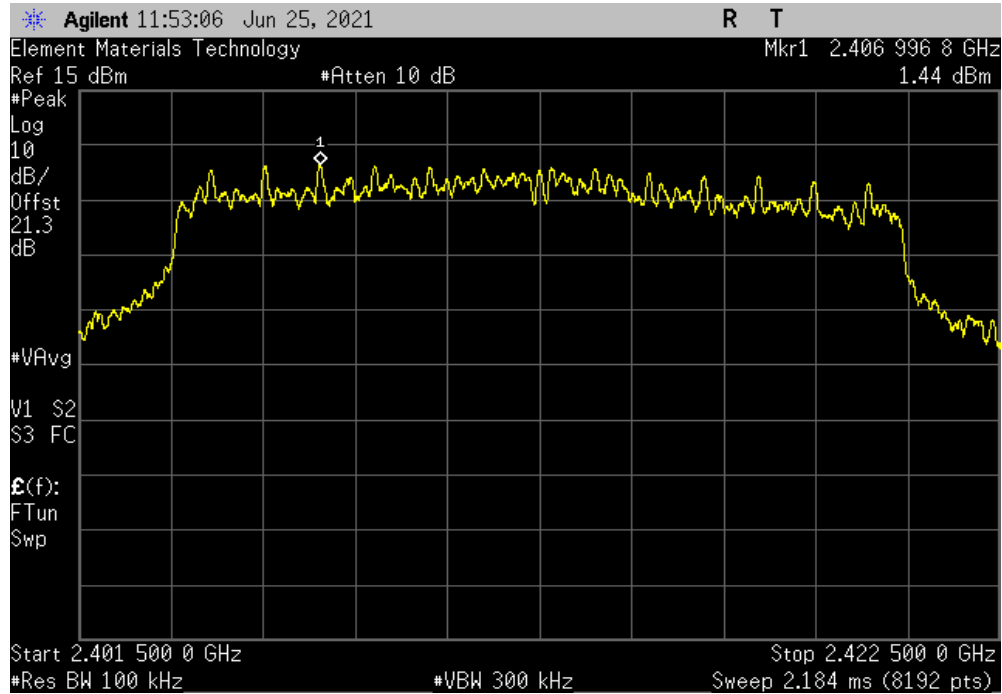


SPURIOUS CONDUCTED EMISSIONS

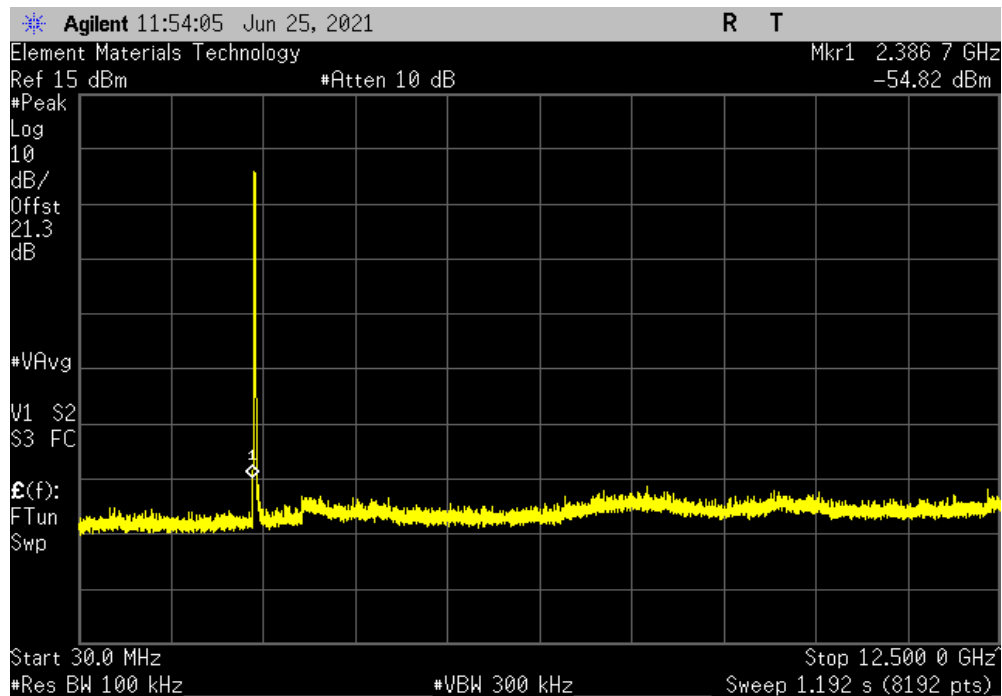


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental		2407	N/A	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz		2386.7	-56.26	-30	Pass	

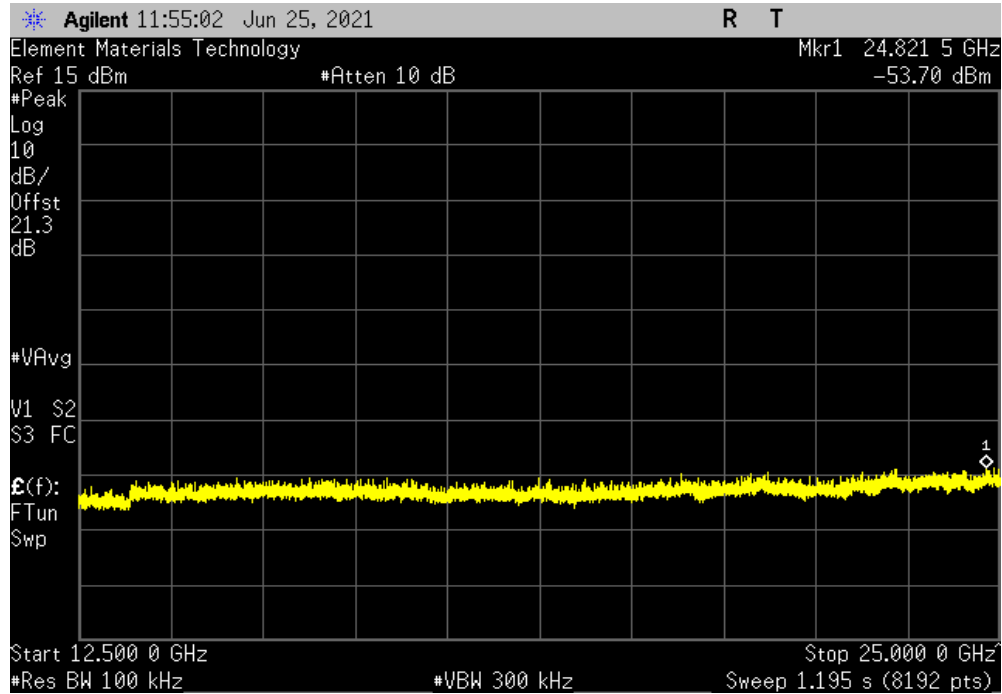


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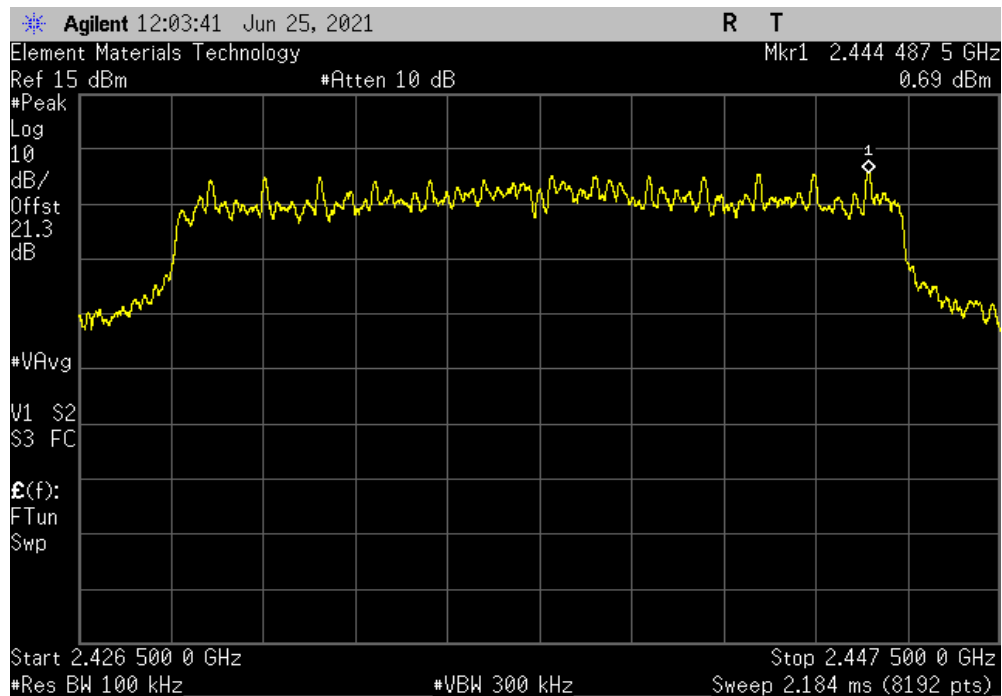


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24821.5	-55.14	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2444.49	N/A	N/A	N/A	

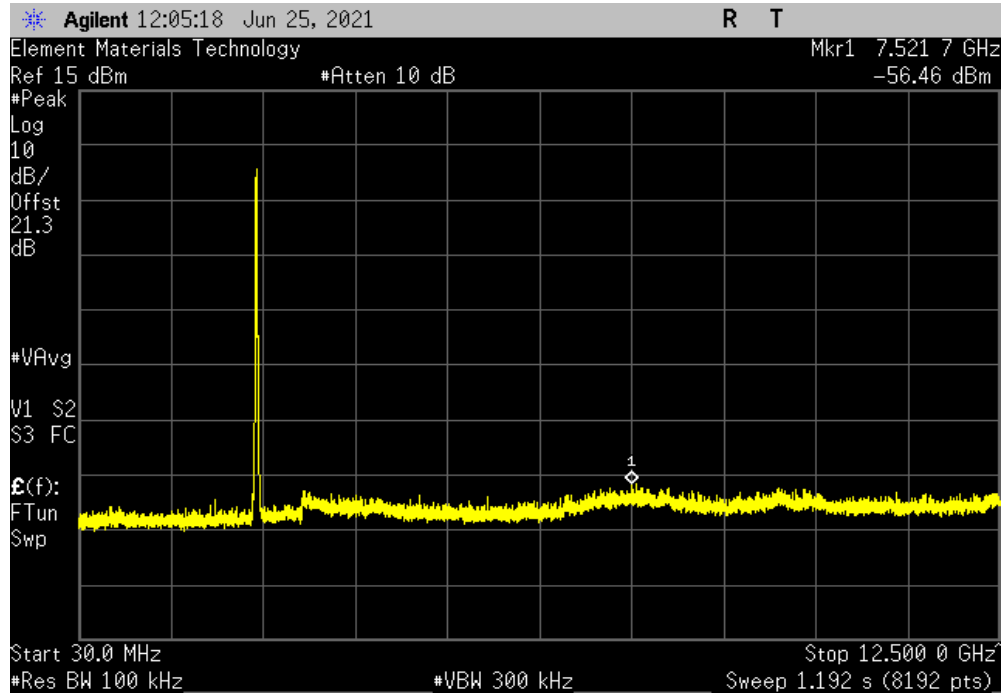


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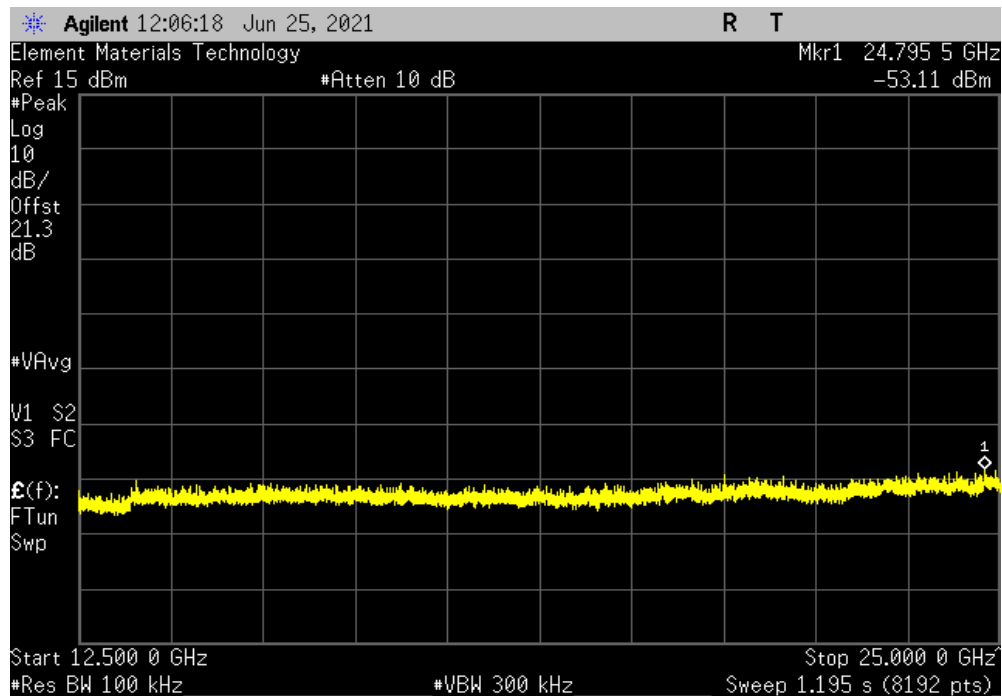


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	7521.7	-57.15	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24795.5	-53.8	-30	Pass	

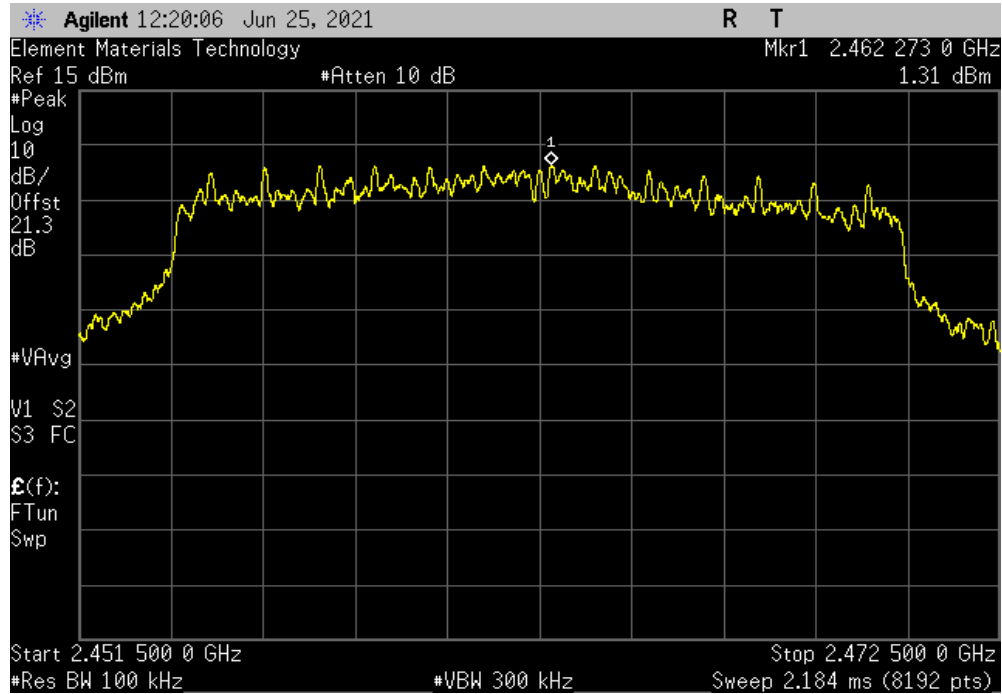


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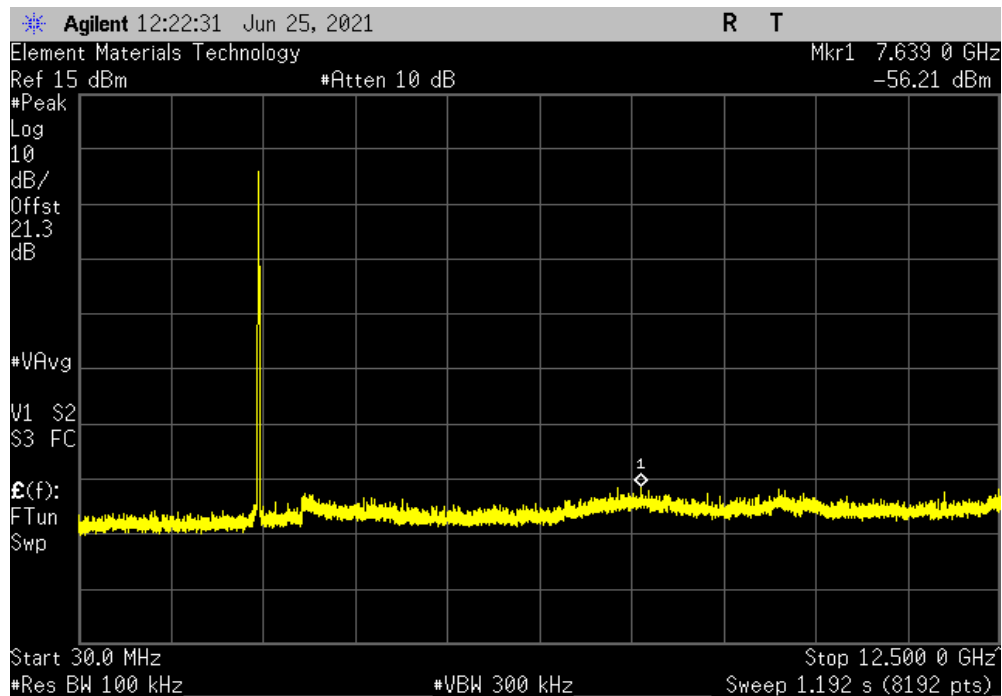


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental		2462.27	N/A	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz		7639	-57.52	-30	Pass	

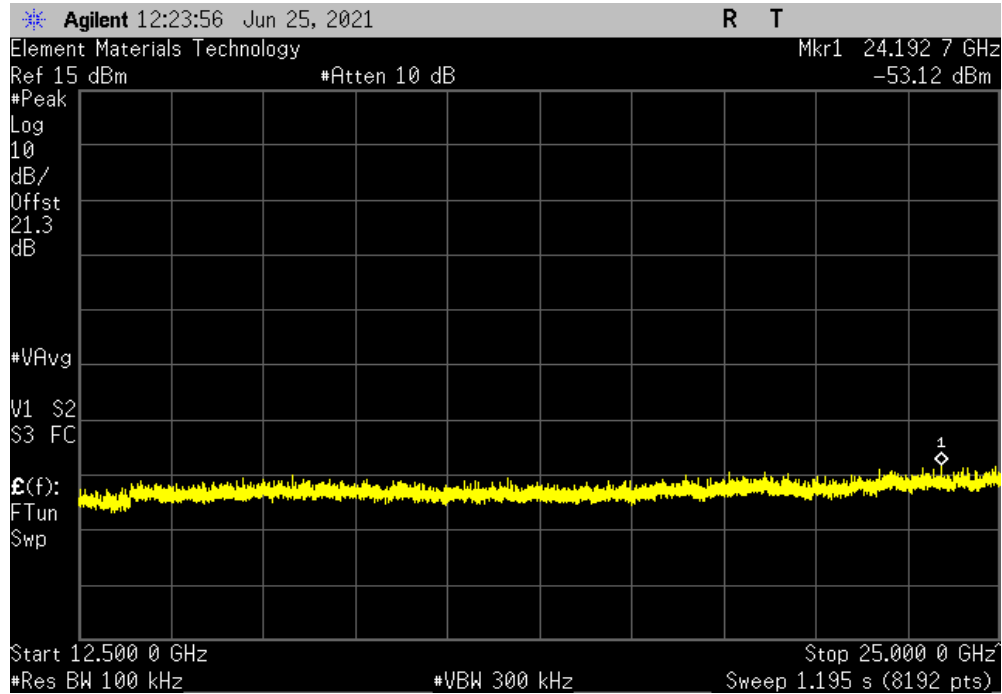


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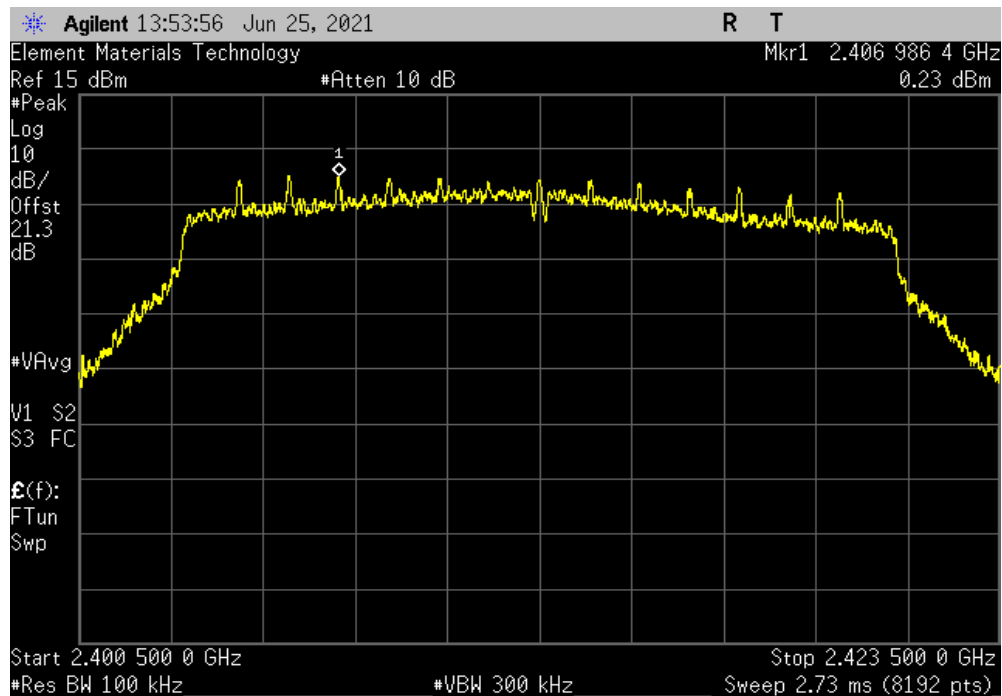


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24192.7	-54.43	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2406.99	N/A	N/A	N/A	

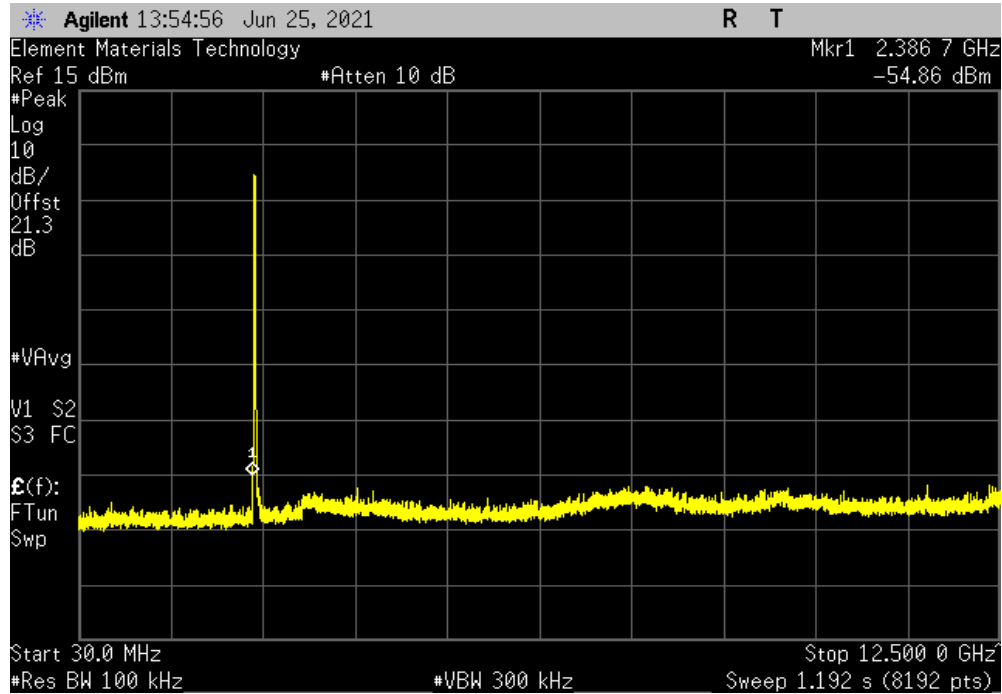


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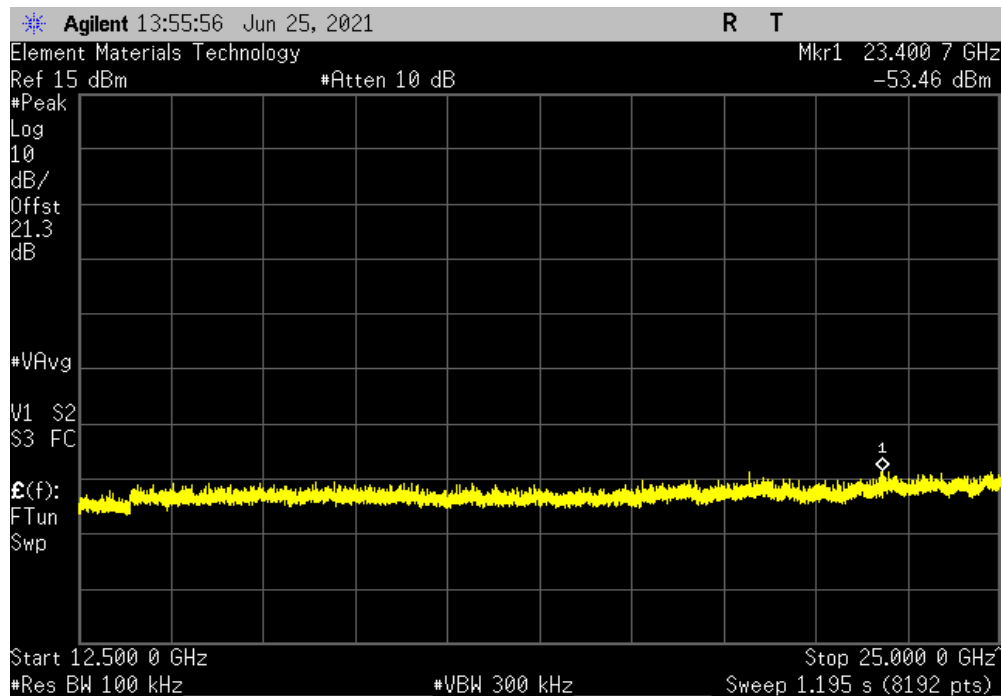


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	2386.7	-55.09	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	23400.7	-53.69	-30	Pass	

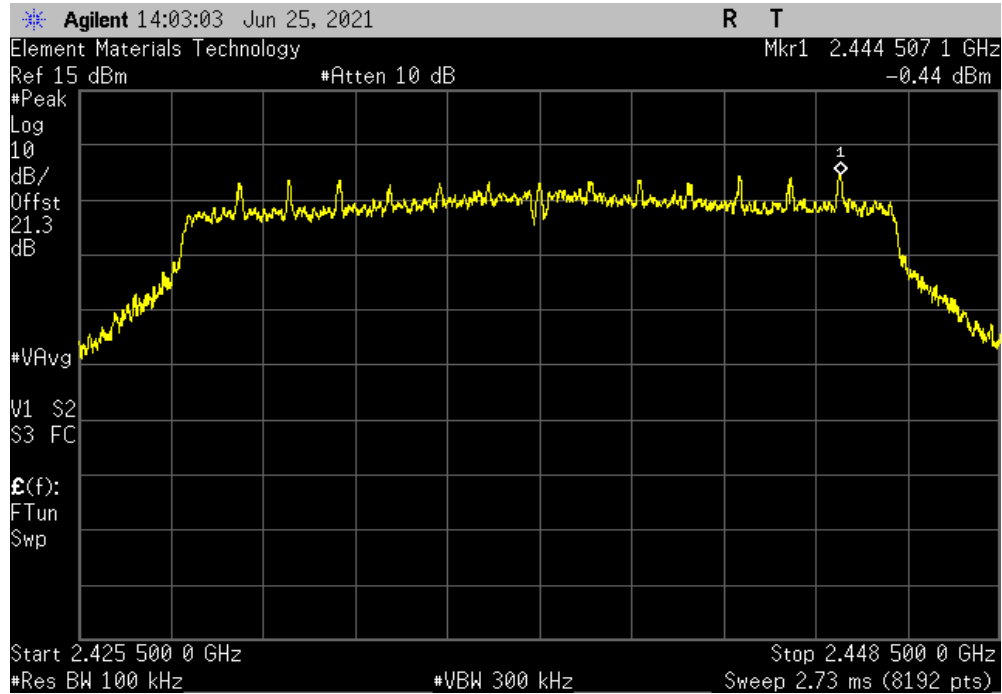


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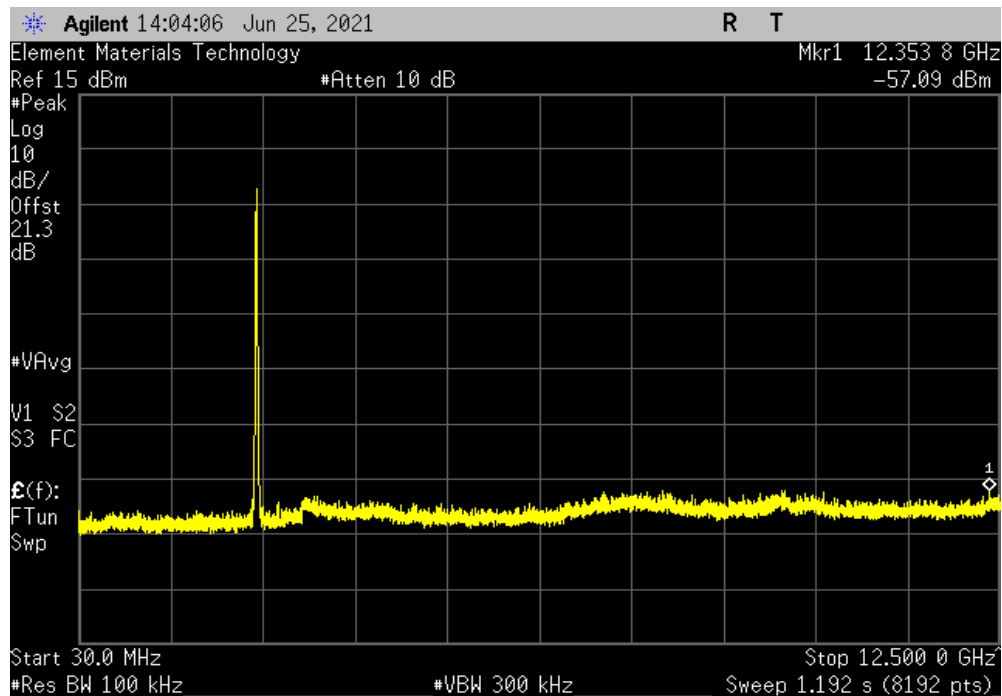


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2444.51	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	12353.8	-56.65	-30	Pass		

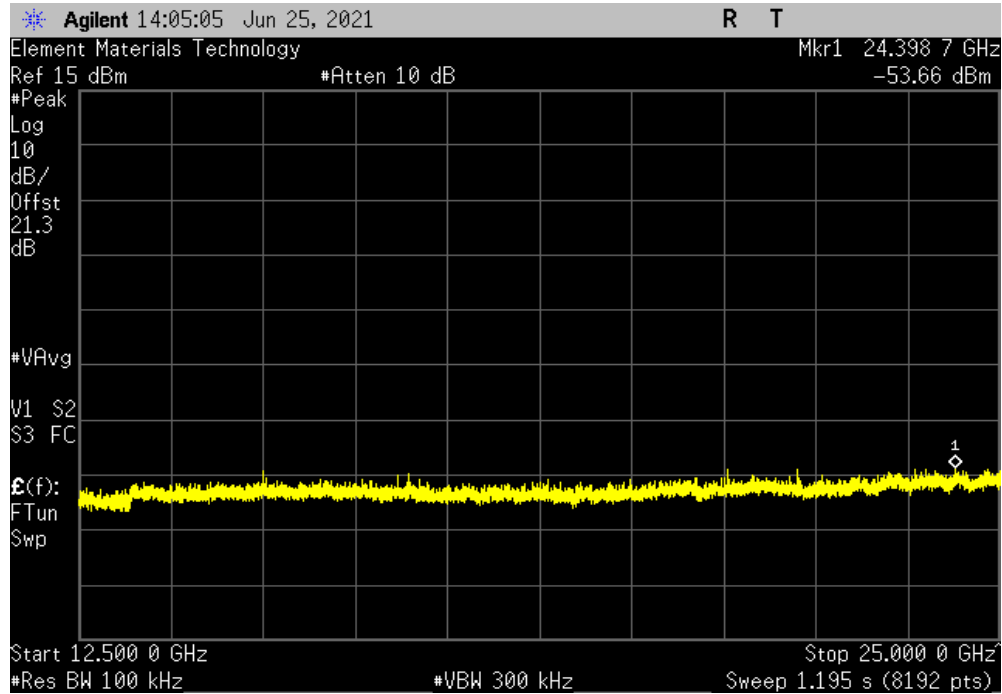


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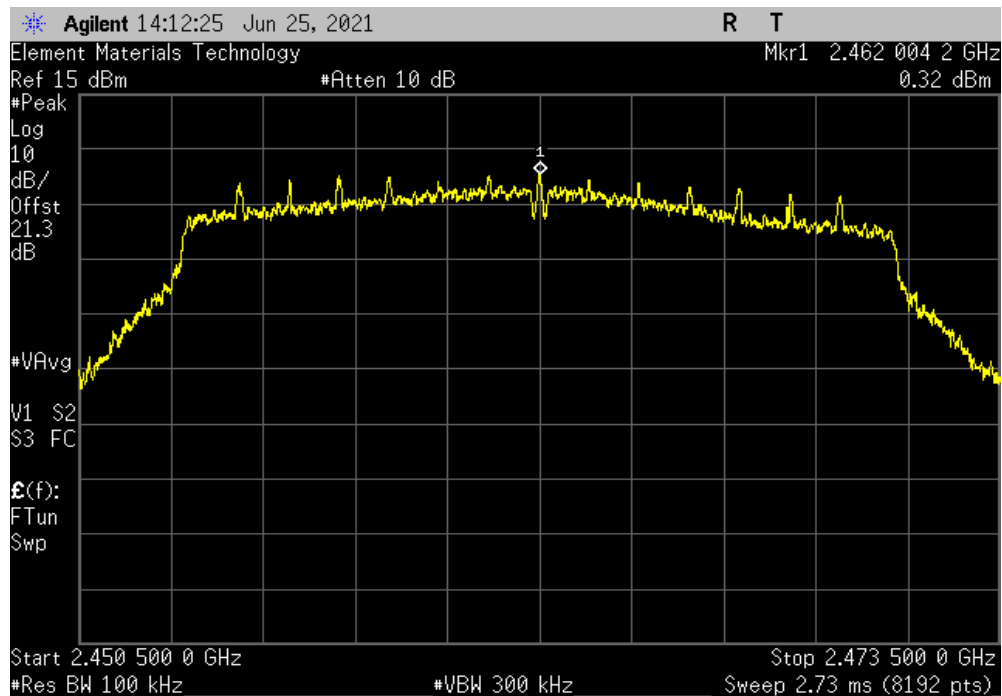


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24398.7	-53.22	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2462	N/A	N/A	N/A	

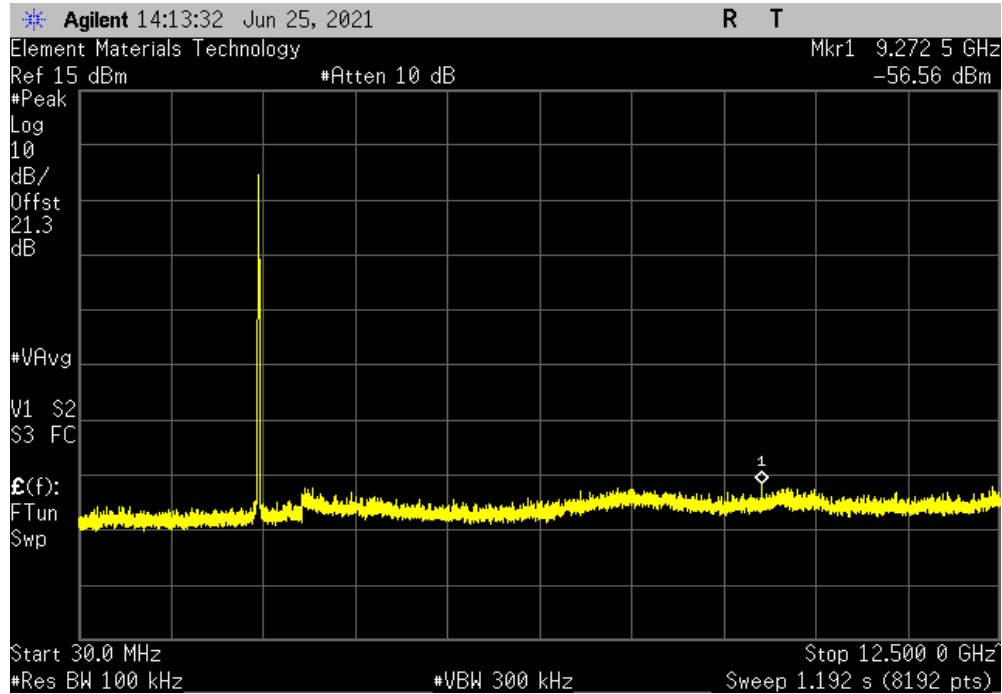


SPURIOUS CONDUCTED EMISSIONS

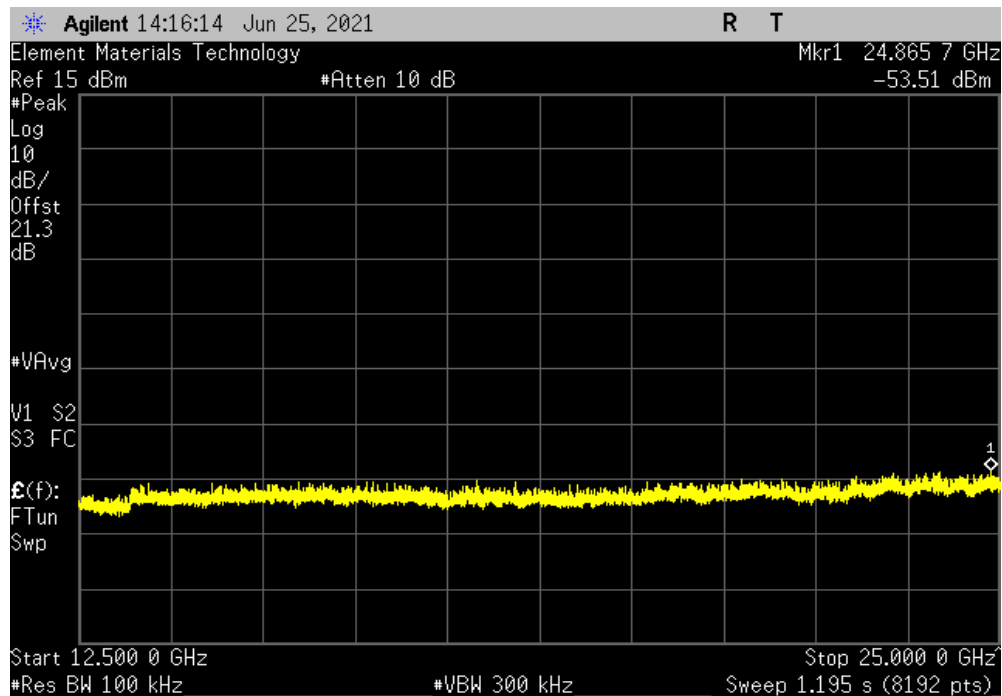


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	9272.5	-56.89	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS0, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24865.7	-53.85	-30	Pass	

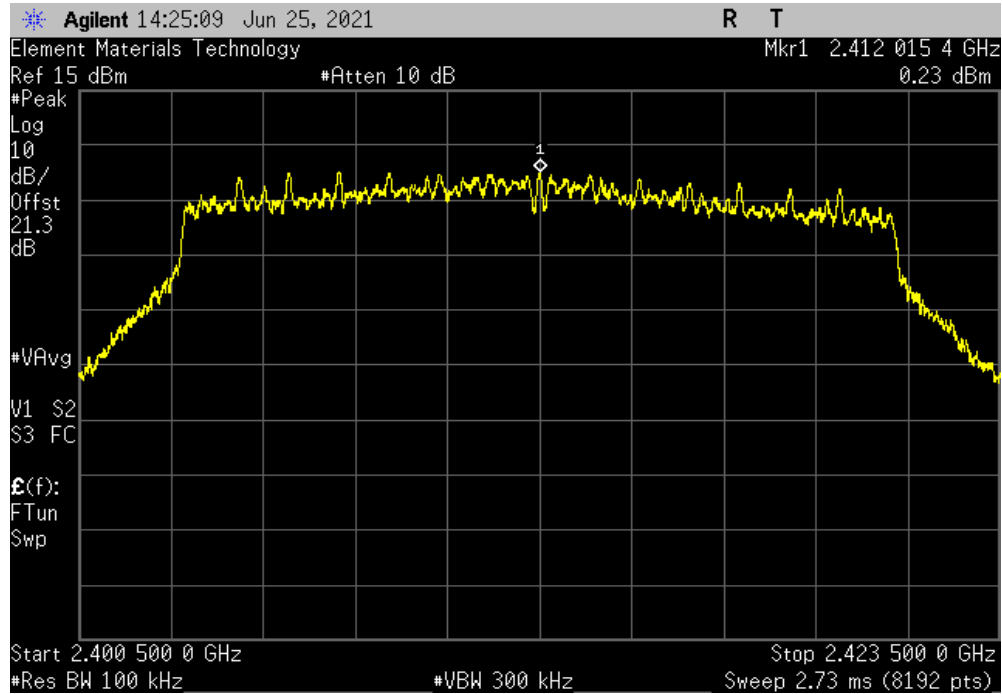


SPURIOUS CONDUCTED EMISSIONS

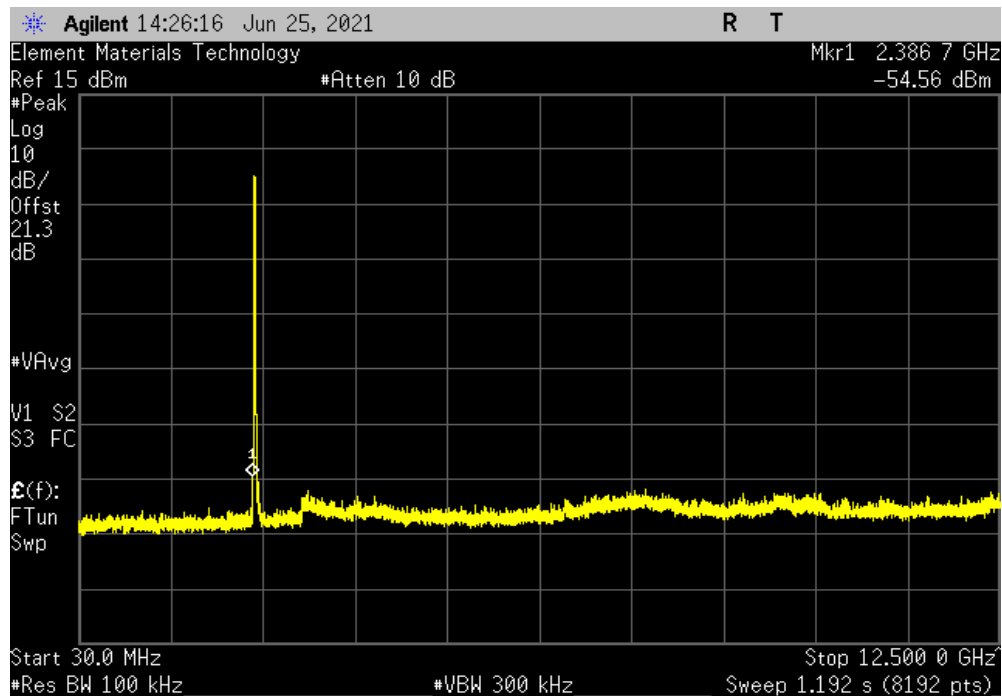


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2412.02	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	2386.7	-54.8	-30	Pass		

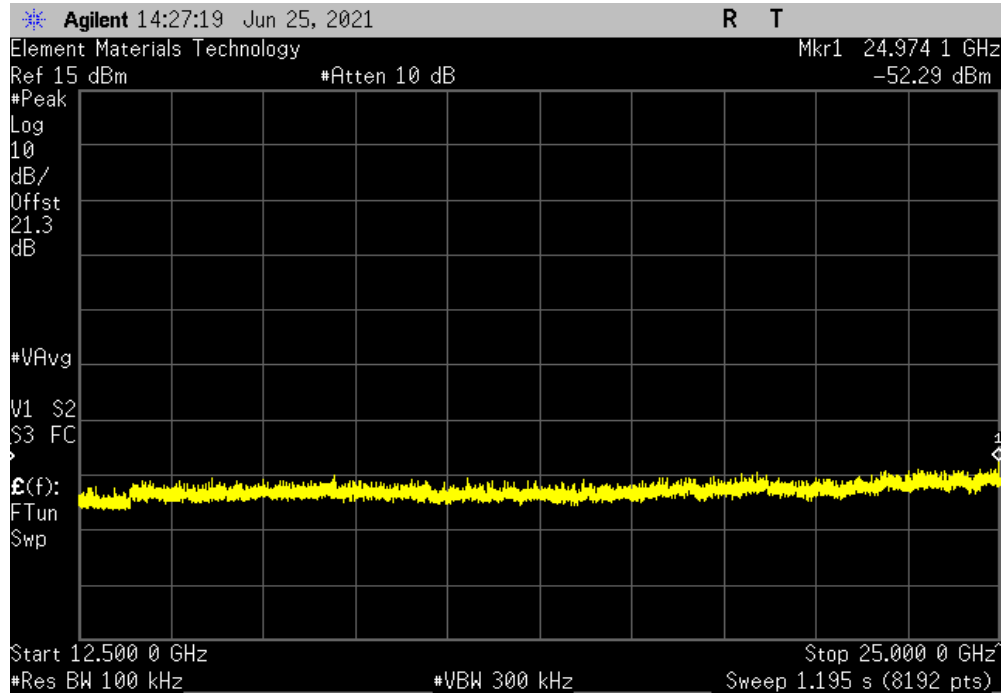


SPURIOUS CONDUCTED EMISSIONS

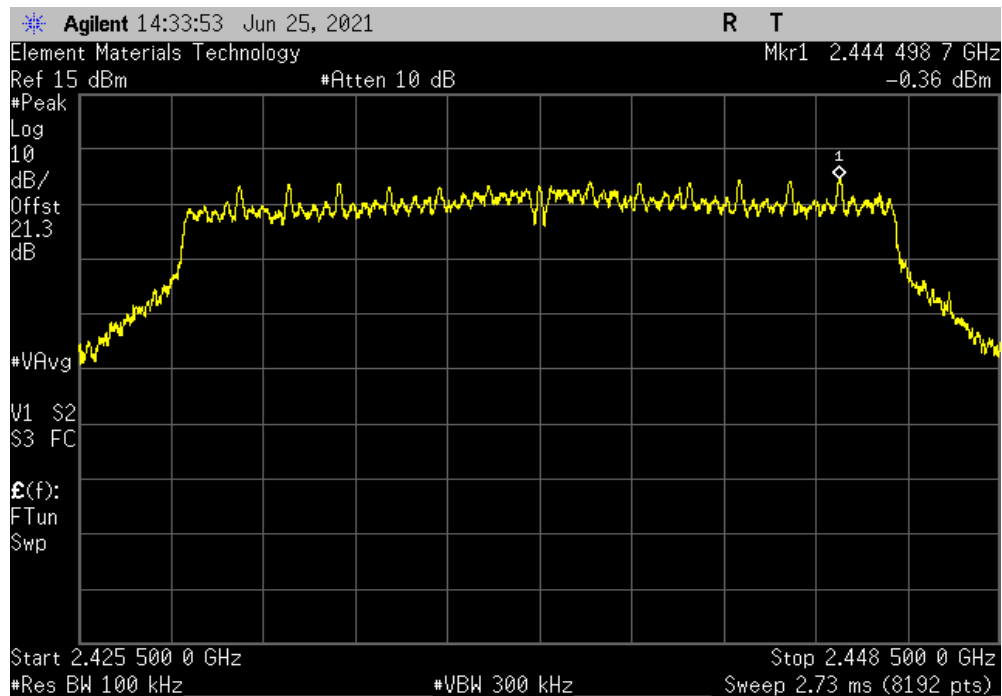


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24974.1	-52.53	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2444.5	N/A	N/A	N/A	

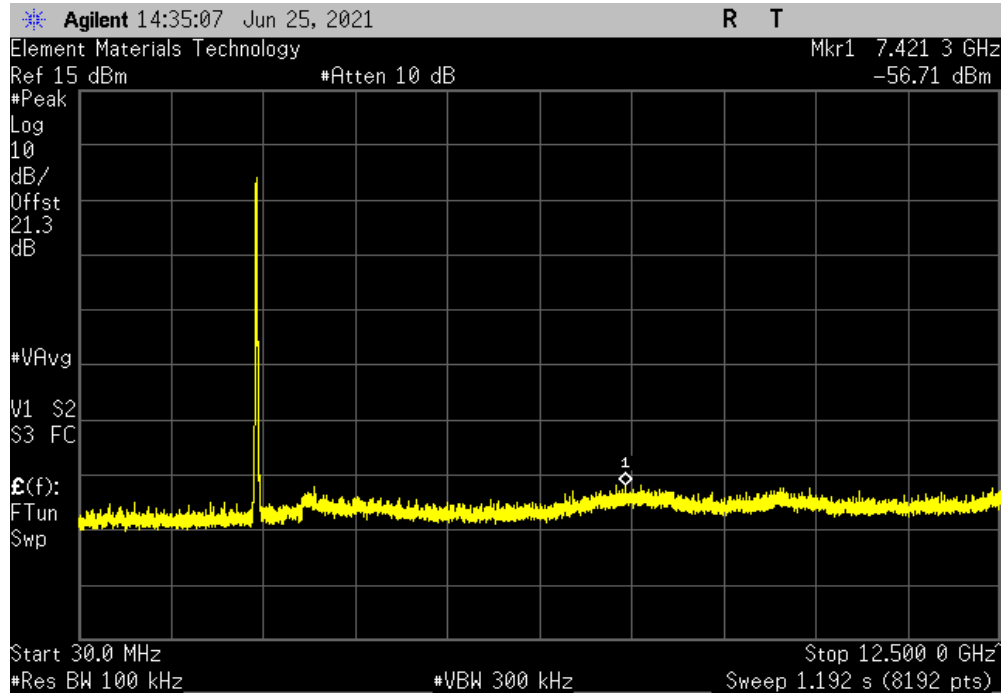


SPURIOUS CONDUCTED EMISSIONS

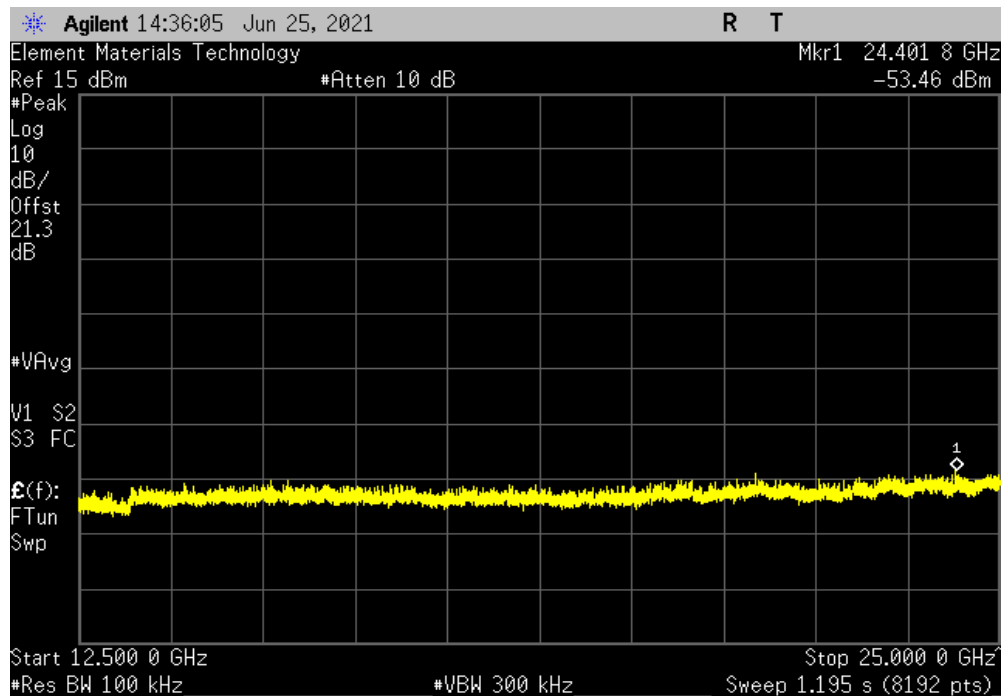


TbTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	7421.3	-56.35	-30	Pass	



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24401.8	-53.1	-30	Pass	

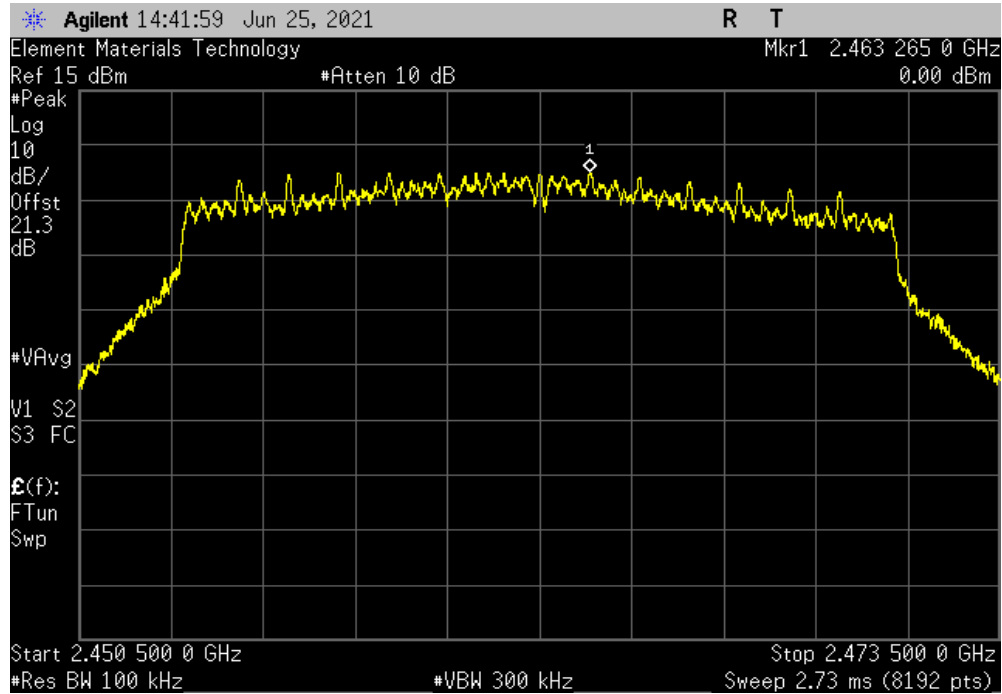


SPURIOUS CONDUCTED EMISSIONS

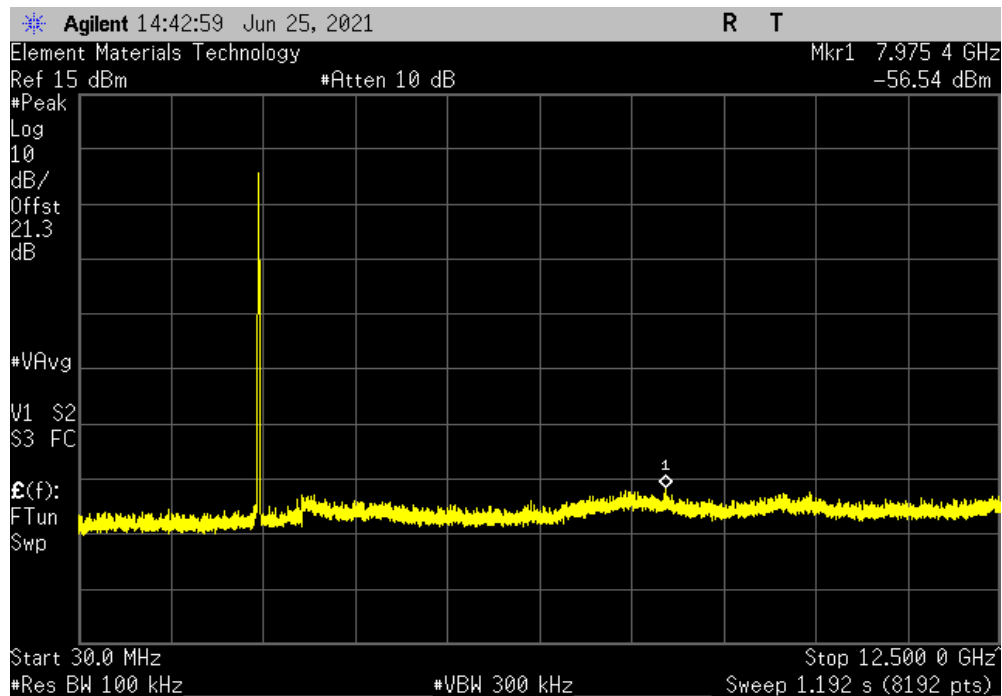


TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, High Channel 11, 2462 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2463.27	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, High Channel 11, 2462 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	7975.4	-56.54	-30	Pass		

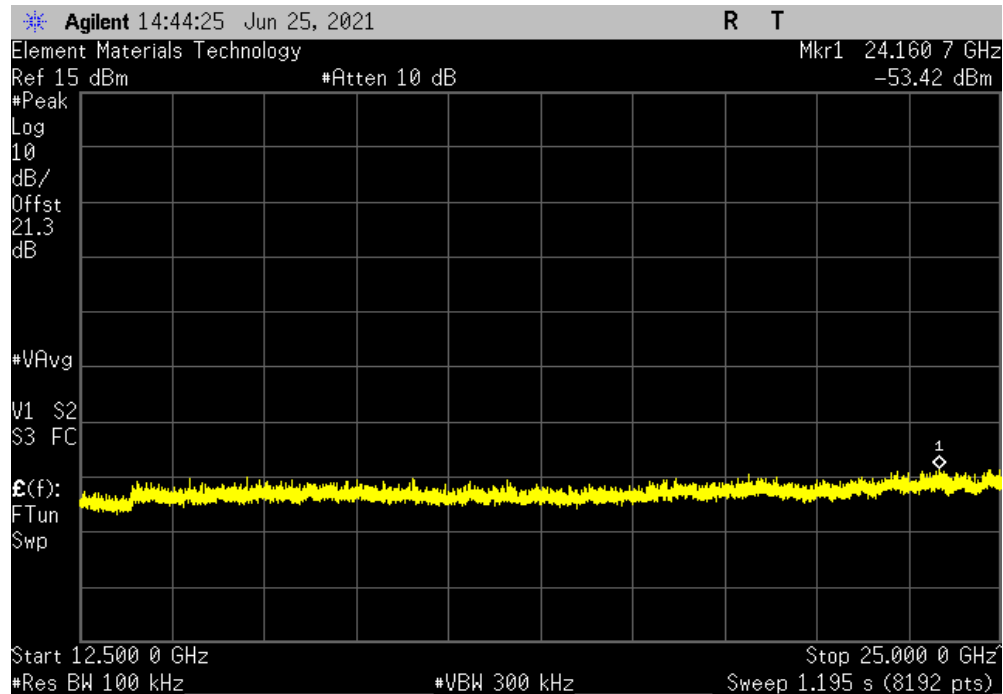


SPURIOUS CONDUCTED EMISSIONS



TUTx 2021.03.19.1 XMR 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz BW, 802.11(n) MCS7, High Channel 11, 2462 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24160.7	-53.42	-30	Pass



SPURIOUS RADIATED EMISSIONS

TEST DESCRIPTION

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

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

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

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

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

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

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

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

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 $10 \cdot \log(1/dc)$.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAW	2020-12-16	2021-12-16
Antenna - Biconilog	EMCO	3141	AXG	2019-07-23	2021-07-23
Antenna - Double Ridge	EMCO	3115	AHC	2020-07-01	2022-07-01
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	NCR
Antenna - Standard Gain	ETS Lindgren	3160-08	AHV	NCR	NCR
Antenna - Standard Gain	ETS Lindgren	3160-09	AIV	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	2020-11-17	2021-11-17
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	2020-11-17	2021-11-17
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	2020-11-18	2021-11-18
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2020-11-18	2021-11-18
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	2020-07-25	2021-07-25
Cable	N/A	Bilog Cables	EVA	2020-11-17	2021-11-17
Cable	N/A	Double Ridge Horn Cables	EVB	2020-11-17	2021-11-17
Cable	None	Standard Gain Horns Cable	EVF	2020-11-18	2021-11-18

SPURIOUS RADIATED EMISSIONS

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Cable	ESM Cable Corp.	TTBJ141-KMKM-72	EVY	2020-07-25	2021-07-25
Attenuator	Coaxicom	3910-20	AXZ	2021-02-15	2022-02-15
Filter - Low Pass	Micro-Tronics	LPM50004	LFD	2021-02-15	2022-02-15
Filter - High Pass	Micro-Tronics	HPM50111	HFO	2020-11-17	2021-11-17

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	5.2 dB	-5.2 dB

FREQUENCY RANGE INVESTIGATED

30 MHz TO 26.5 GHz

POWER INVESTIGATED

3.3 VDC via 110VAC/60Hz

CONFIGURATIONS INVESTIGATED

A-DE0162-2

MODES INVESTIGATED

802.11bgn - Low Channel 1 = 2412 MHz, Mid Channel 6 = 2437 MHz, High Channel 11 = 2462 MHz

SPURIOUS RADIATED EMISSIONS

EUT:	43.0536.00	Work Order:	A-DE0162
Serial Number:	SN001 00004	Date:	2021-07-01
Customer:	A-dec, Inc.	Temperature:	23.2°C
Attendees:	Zack Lyda	Relative Humidity:	47.4%
Customer Project:	None	Bar. Pressure:	1018 mb
Tested By:	Jeff Alcock	Job Site:	EV01
Power:	3.3 VDC via 110VAC/60Hz	Configuration:	A-DE0162-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	55	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

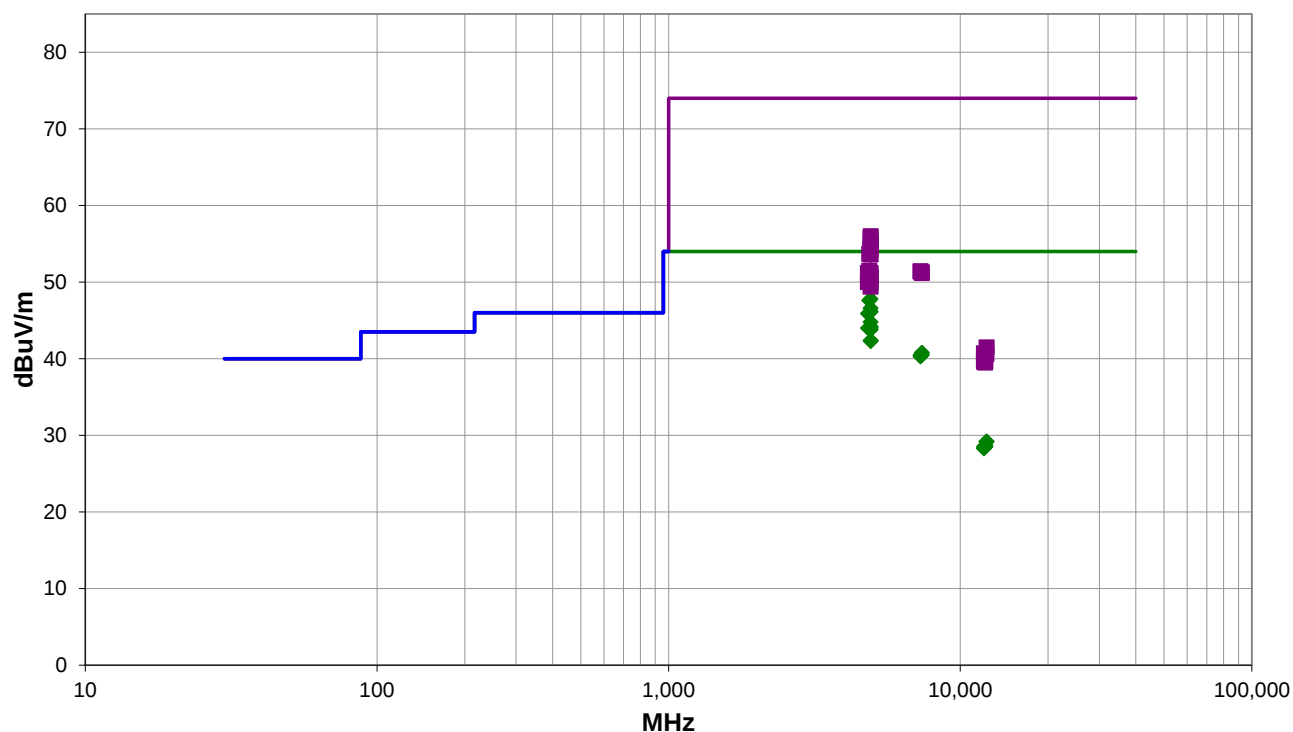
Please reference data comments below for channel, data rate, and EUT orientation.

EUT OPERATING MODES

802.11bgn - Low Channel 1 = 2412 MHz, Mid Channel 6 = 2437 MHz, High Channel 11 = 2462 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 55

■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

RESULTS - Run #55

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (%)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4924.000	45.6	6.0	2.2	239.0	0.0	0.0	Horz	AV	0.0	51.6	54.0	-2.4	Ch. 11, 1 Mbps, EUT on Side
4873.960	44.5	6.0	2.1	239.0	0.0	0.0	Horz	AV	0.0	50.5	54.0	-3.5	Ch. 6, 1 Mbps, EUT on Side
4924.000	41.8	6.0	2.7	273.0	0.0	0.0	Vert	AV	0.0	47.8	54.0	-6.2	Ch. 11, 1 Mbps, EUT Horz
4874.000	41.6	6.0	3.5	272.0	0.0	0.0	Vert	AV	0.0	47.6	54.0	-6.4	Ch. 6, 1 Mbps, EUT Horz
4924.000	40.6	6.0	2.1	241.0	0.0	0.0	Horz	AV	0.0	46.6	54.0	-7.4	Ch. 11, 1 Mbps, EUT Vert
4924.000	40.2	6.0	2.4	304.0	0.0	0.0	Horz	AV	0.0	46.2	54.0	-7.8	Ch. 11, 1 Mbps, EUT Horz
4923.880	40.0	6.0	2.2	238.0	0.1	0.0	Horz	AV	0.0	46.1	54.0	-7.9	Ch. 11, 11 Mbps, EUT on Side
4824.007	40.5	5.4	2.3	236.0	0.0	0.0	Horz	AV	0.0	45.9	54.0	-8.1	Ch. 1, 1 Mbps, EUT on Side
4923.920	38.8	6.0	3.5	149.0	0.0	0.0	Vert	AV	0.0	44.8	54.0	-9.2	Ch. 11, 1 Mbps, EUT Vert
4929.920	37.7	6.0	2.2	238.0	0.5	0.0	Horz	AV	0.0	44.2	54.0	-9.8	Ch. 11, 54 Mbps, EUT on Side
4925.670	38.0	6.0	2.2	238.0	0.1	0.0	Horz	AV	0.0	44.1	54.0	-9.9	Ch. 11, 6 Mbps, EUT on Side
4823.980	38.6	5.4	3.3	285.0	0.0	0.0	Vert	AV	0.0	44.0	54.0	-10.0	Ch. 1, 1 Mbps, EUT Horz
4924.040	37.9	6.0	1.1	187.0	0.0	0.0	Vert	AV	0.0	43.9	54.0	-10.1	Ch. 11, 1 Mbps, EUT on Side
4928.710	37.5	6.0	2.2	238.0	0.3	0.0	Horz	AV	0.0	43.8	54.0	-10.2	Ch. 11, 36 Mbps, EUT on Side
4930.670	36.3	6.0	2.2	238.0	0.1	0.0	Horz	AV	0.0	42.4	54.0	-11.6	Ch. 11, MCS0, EUT on side
4930.920	35.8	6.0	2.2	238.0	0.5	0.0	Horz	AV	0.0	42.3	54.0	-11.7	Ch. 11, MCS7, EUT on Side
7385.975	28.5	12.3	1.5	312.0	0.0	0.0	Vert	AV	0.0	40.8	54.0	-13.2	Ch. 11, 1 Mbps, EUT Horz
7384.808	28.3	12.2	1.5	276.0	0.0	0.0	Horz	AV	0.0	40.5	54.0	-13.5	Ch. 11, 1 Mbps, EUT on Side
7310.960	28.9	11.6	1.8	150.0	0.0	0.0	Horz	AV	0.0	40.5	54.0	-13.5	Ch. 6, 1 Mbps, EUT on Side
7303.290	28.8	11.5	2.4	356.0	0.0	0.0	Vert	AV	0.0	40.3	54.0	-13.7	Ch. 6, 1 Mbps, EUT Horz
4929.880	50.0	6.0	2.2	238.0	0.0	0.0	Horz	PK	0.0	56.0	74.0	-18.0	Ch. 11, 6 Mbps, EUT on Side
4927.580	49.8	6.0	2.2	238.0	0.0	0.0	Horz	PK	0.0	55.8	74.0	-18.2	Ch. 11, 36 Mbps, EUT on Side
4931.670	49.2	6.0	2.2	238.0	0.0	0.0	Horz	PK	0.0	55.2	74.0	-18.8	Ch. 11, 54 Mbps, EUT on Side
4929.540	48.6	6.0	2.2	238.0	0.0	0.0	Horz	PK	0.0	54.6	74.0	-19.4	Ch. 11, MCS7, EUT on Side
4924.250	48.4	6.0	2.2	239.0	0.0	0.0	Horz	PK	0.0	54.4	74.0	-19.6	Ch. 11, 1 Mbps, EUT on Side
4924.040	48.2	6.0	2.2	238.0	0.0	0.0	Horz	PK	0.0	54.2	74.0	-19.8	Ch. 11, 11 Mbps, EUT on Side
4873.880	47.7	6.0	2.1	239.0	0.0	0.0	Horz	PK	0.0	53.7	74.0	-20.3	Ch. 6, 1 Mbps, EUT on Side
4926.920	47.6	6.0	2.2	238.0	0.0	0.0	Horz	PK	0.0	53.6	74.0	-20.4	Ch. 11, MCS0, EUT on side
4874.040	45.5	6.0	3.5	272.0	0.0	0.0	Vert	PK	0.0	51.5	74.0	-22.5	Ch. 6, 1 Mbps, EUT Horz
7305.540	39.9	11.5	2.4	356.0	0.0	0.0	Vert	PK	0.0	51.4	74.0	-22.6	Ch. 6, 1 Mbps, EUT Horz
7306.540	39.8	11.6	1.8	150.0	0.0	0.0	Horz	PK	0.0	51.4	74.0	-22.6	Ch. 6, 1 Mbps, EUT on Side
7385.408	39.0	12.3	1.5	276.0	0.0	0.0	Horz	PK	0.0	51.3	74.0	-22.7	Ch. 11, 1 Mbps, EUT on Side
4923.960	45.2	6.0	2.7	273.0	0.0	0.0	Vert	PK	0.0	51.2	74.0	-22.8	Ch. 11, 1 Mbps, EUT Horz
7384.758	39.0	12.2	1.5	312.0	0.0	0.0	Vert	PK	0.0	51.2	74.0	-22.8	Ch. 11, 1 Mbps, EUT Horz
4824.217	45.8	5.4	2.3	236.0	0.0	0.0	Horz	PK	0.0	51.2	74.0	-22.8	Ch. 1, 1 Mbps, EUT on Side
4923.750	44.7	6.0	2.1	241.0	0.0	0.0	Horz	PK	0.0	50.7	74.0	-23.3	Ch. 11, 1 Mbps, EUT Vert
4924.040	44.6	6.0	2.4	304.0	0.0	0.0	Horz	PK	0.0	50.6	74.0	-23.4	Ch. 11, 1 Mbps, EUT Horz
4924.120	44.0	6.0	3.5	149.0	0.0	0.0	Vert	PK	0.0	50.0	74.0	-24.0	Ch. 11, 1 Mbps, EUT Vert
4824.053	44.6	5.4	3.3	285.0	0.0	0.0	Vert	PK	0.0	50.0	74.0	-24.0	Ch. 1, 1 Mbps, EUT Horz
4924.330	43.4	6.0	1.1	187.0	0.0	0.0	Vert	PK	0.0	49.4	74.0	-24.6	Ch. 11, 1 Mbps, EUT on Side

SPURIOUS RADIATED EMISSIONS

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (%)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12321.170	27.8	1.4	1.5	0.0	0.0	0.0	Horz	AV	0.0	29.2	54.0	-24.8	Ch. 11, 1 Mbps, EUT on Side
12299.540	27.8	1.4	1.5	360.0	0.0	0.0	Vert	AV	0.0	29.2	54.0	-24.8	Ch. 11, 1 Mbps, EUT Horz
12197.210	27.8	0.9	1.5	0.0	0.0	0.0	Horz	AV	0.0	28.7	54.0	-25.3	Ch 6, 1 Mbps, EUT on Side
12049.580	27.3	1.2	1.5	360.0	0.0	0.0	Vert	AV	0.0	28.5	54.0	-25.5	Ch 1, 1 Mbps, EUT Horz
12193.120	27.6	0.9	1.5	360.0	0.0	0.0	Vert	AV	0.0	28.5	54.0	-25.5	Ch 6, 1 Mbps, EUT Horz
12049.250	27.1	1.2	1.5	0.0	0.0	0.0	Horz	AV	0.0	28.3	54.0	-25.7	Ch 1, 1 Mbps, EUT on Side
12310.830	40.1	1.4	1.5	360.0	0.0	0.0	Vert	PK	0.0	41.5	74.0	-32.5	Ch.11, 1 Mbps, EUT Horz
12057.580	39.4	1.3	1.5	0.0	0.0	0.0	Horz	PK	0.0	40.7	74.0	-33.3	Ch 1, 1 Mbps, EUT on Side
12298.620	39.2	1.4	1.5	0.0	0.0	0.0	Horz	PK	0.0	40.6	74.0	-33.4	Ch.11, 1 Mbps, EUT on Side
12182.210	38.7	1.0	1.5	360.0	0.0	0.0	Vert	PK	0.0	39.7	74.0	-34.3	Ch 6, 1 Mbps, EUT Horz
12052.620	38.3	1.3	1.5	360.0	0.0	0.0	Vert	PK	0.0	39.6	74.0	-34.4	Ch 1, 1 Mbps, EUT Horz
12174.580	38.5	1.0	1.5	0.0	0.0	0.0	Horz	PK	0.0	39.5	74.0	-34.5	Ch 6, 1 Mbps, EUT on Side

CONCLUSION

Pass



Tested By

SPURIOUS RADIATED EMISSIONS

EUT:	43.0536.00	Work Order:	A-DE0162
Serial Number:	SN001 00004	Date:	2021-07-01
Customer:	A-dec, Inc.	Temperature:	23.2°C
Attendees:	Zack Lyda	Relative Humidity:	47.4%
Customer Project:	None	Bar. Pressure:	1018 mb
Tested By:	Jeff Alcock	Job Site:	EV01
Power:	3.3 VDC via 110VAC/60Hz	Configuration:	A-DE0162-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	57	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

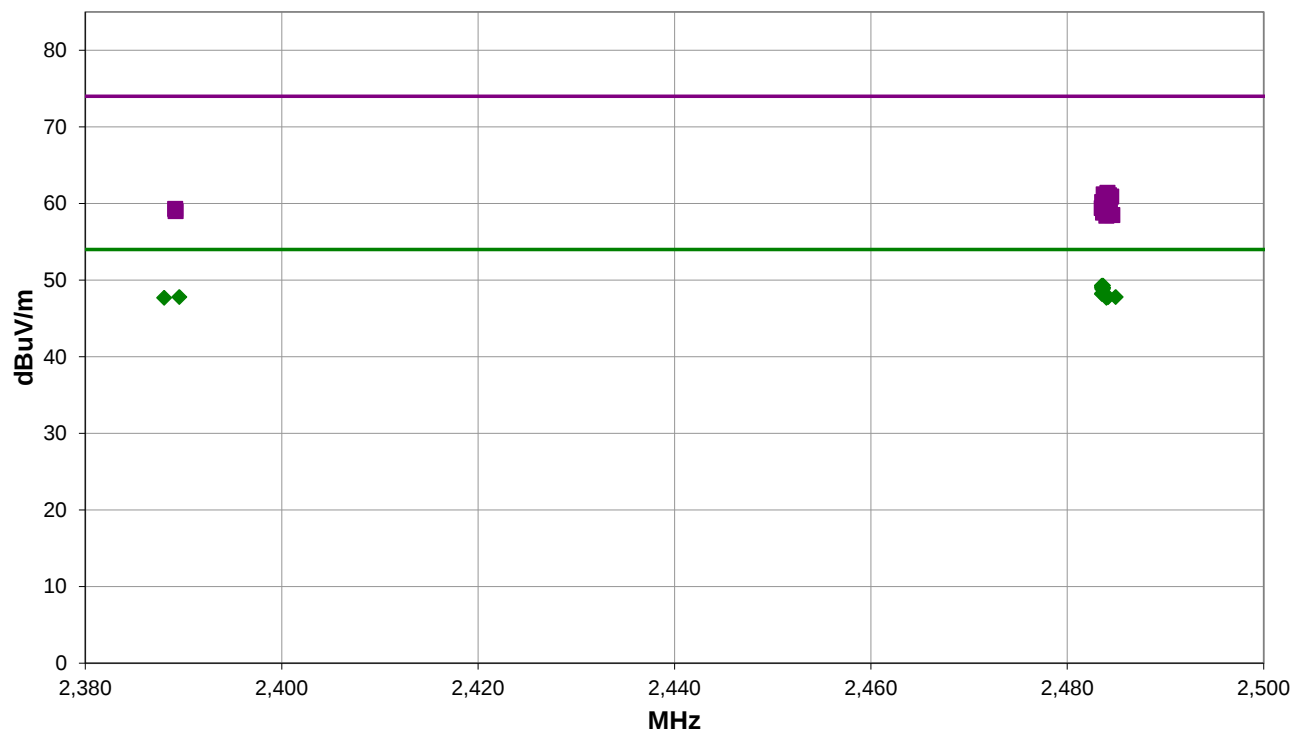
Please reference data comments below for channel, data rate, and EUT orientation.

EUT OPERATING MODES

802.11bgn - Low Channel 1 = 2412 MHz, Mid Channel 6 = 2437 MHz, High Channel 11 = 2462 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 57

■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

RESULTS - Run #57

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	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
2483.630	32.6	-3.6	2.7	226.0	0.3	20.0	Horz	AV	0.0	49.3	54.0	-4.7	Ch. 11, 36 Mbps, EUT Vert
2483.530	32.4	-3.6	2.7	226.0	0.5	20.0	Horz	AV	0.0	49.3	54.0	-4.7	Ch. 11, 54 Mbps, EUT Vert
2483.523	32.6	-3.6	2.7	226.0	0.1	20.0	Horz	AV	0.0	49.1	54.0	-4.9	Ch. 11, 6 Mbps, EUT Vert
2483.650	32.5	-3.6	3.5	166.0	0.1	20.0	Vert	AV	0.0	49.0	54.0	-5.0	Ch. 11, 6 Mbps, EUT on Side
2483.610	32.5	-3.6	2.7	226.0	0.1	20.0	Horz	AV	0.0	49.0	54.0	-5.0	Ch. 11, MCS0, EUT Vert
2483.567	32.4	-3.6	2.7	226.0	0.1	20.0	Horz	AV	0.0	48.9	54.0	-5.1	Ch. 11, MCS7, EUT Vert
2483.600	32.3	-3.6	1.5	250.0	0.1	20.0	Horz	AV	0.0	48.8	54.0	-5.2	Ch. 11, 6 Mbps, EUT on Side
2483.573	31.8	-3.6	1.5	111.0	0.1	20.0	Vert	AV	0.0	48.3	54.0	-5.7	Ch. 11, 6 Mbps, EUT Horz
2483.523	31.7	-3.6	1.5	141.0	0.1	20.0	Horz	AV	0.0	48.2	54.0	-5.8	Ch. 11, 6 Mbps, EUT Horz
2484.927	31.3	-3.6	1.5	105.0	0.1	20.0	Vert	AV	0.0	47.8	54.0	-6.2	Ch. 11, 6 Mbps, EUT Vert
2484.167	31.3	-3.6	2.7	226.0	0.1	20.0	Horz	AV	0.0	47.8	54.0	-6.2	Ch. 11, 11 Mbps, EUT Vert
2389.567	31.2	-3.5	2.7	66.0	0.1	20.0	Horz	AV	0.0	47.8	54.0	-6.2	Ch. 1, 6 Mbps, EUT Vert
2483.987	31.3	-3.6	2.7	226.0	0.0	20.0	Horz	AV	0.0	47.7	54.0	-6.3	Ch. 11, 1 Mbps, EUT Vert
2388.023	31.2	-3.5	2.7	66.0	0.0	20.0	Horz	AV	0.0	47.7	54.0	-6.3	Ch. 1, 1 Mbps, EUT Vert
2484.093	45.0	-3.6	2.7	226.0	0.0	20.0	Horz	PK	0.0	61.4	74.0	-12.6	Ch. 11, MCS0, EUT Vert
2483.700	44.8	-3.6	2.7	226.0	0.0	20.0	Horz	PK	0.0	61.2	74.0	-12.8	Ch. 11, MCS7, EUT Vert
2484.260	44.7	-3.6	3.5	166.0	0.0	20.0	Vert	PK	0.0	61.1	74.0	-12.9	Ch. 11, 6 Mbps, EUT on Side
2484.470	44.5	-3.6	1.5	141.0	0.0	20.0	Horz	PK	0.0	60.9	74.0	-13.1	Ch. 11, 6 Mbps, EUT Horz
2483.793	44.3	-3.6	2.7	226.0	0.0	20.0	Horz	PK	0.0	60.7	74.0	-13.3	Ch. 11, 6 Mbps, EUT Vert
2483.543	43.8	-3.6	2.7	226.0	0.0	20.0	Horz	PK	0.0	60.2	74.0	-13.8	Ch. 11, 54 Mbps, EUT Vert
2483.643	43.7	-3.6	2.7	226.0	0.0	20.0	Horz	PK	0.0	60.1	74.0	-13.9	Ch. 11, 36 Mbps, EUT Vert
2484.347	43.4	-3.6	1.5	250.0	0.0	20.0	Horz	PK	0.0	59.8	74.0	-14.2	Ch. 11, 6 Mbps, EUT on Side
2483.500	43.0	-3.6	1.5	111.0	0.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	Ch. 11, 6 Mbps, EUT Horz
2389.147	42.8	-3.5	2.7	66.0	0.0	20.0	Horz	PK	0.0	59.3	74.0	-14.7	Ch. 1, 1 Mbps, EUT Vert
2389.197	42.5	-3.5	2.7	66.0	0.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	Ch. 1, 6 Mbps, EUT Vert
2483.650	42.4	-3.6	1.5	105.0	0.0	20.0	Vert	PK	0.0	58.8	74.0	-15.2	Ch. 11, 6 Mbps, EUT Vert
2484.593	42.1	-3.6	2.7	226.0	0.0	20.0	Horz	PK	0.0	58.5	74.0	-15.5	Ch. 11, 11 Mbps, EUT Vert
2483.977	42.0	-3.6	2.7	226.0	0.0	20.0	Horz	PK	0.0	58.4	74.0	-15.6	Ch. 11, 1 Mbps, EUT Vert

CONCLUSION

Pass



Tested By

End of Test Report