



TSI, Incorporated

TSI Inc. OmniTrak

FCC 15.207:2023, FCC 15.247:2023

RSS-247 Issue 2:2017, RSS-Gen Issue 5:2018+A1:2019+A2:2021

Wi-Fi 802.11 b/g/n SISO Radio

Report: TSIN0196.1 Rev. 1, Issue Date: June 28, 2023



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CERTIFICATE OF TEST



Last Date of Test: March 30, 2023

TSI, Incorporated

EUT: TSI Inc. OmniTrak

Radio Equipment Testing Standards

Specification	Method
FCC 15.207:2023	ANSI C63.10:2013, FCC KDB 558074 v05r02:2019
FCC 15.247:2023	
RSS-247 Issue 2:2017	
RSS-Gen Issue 5:2018+A1:2019+A2:2021	

Results

Test Description	Result	FCC Section(s)	RSS Section(s)	ANSI C63.10 Section(s)	Comments
Band Edge Compliance	Pass	15.247(d), KDB 558074 -8.5	RSS-247 5.5	11.11	
DTS Bandwidth	Pass	15.247(a)(2), KDB 558074 -8.2	RSS-247 5.2(a)	11.8.2	
Duty Cycle	Pass	KDB 558074 -6.0	RSS-Gen 3.2	11.6	
Equivalent Isotropic Radiated Power (EIRP)	Pass	15.247(b)(3), KDB 558074 -8.3.2	RSS-247 5.4(d, f), RSS-Gen 6.12	11.9.2.2.4	
Occupied Bandwidth	Pass	KDB 558074 -2.1	RSS-Gen 6.7	6.9.3	
Output Power	Pass	15.247(b)(3), KDB 558074 -8.3.2	RSS-247 5.4(d, f), RSS-Gen 6.12	11.9.2.2.4	
Power Spectral Density	Pass	15.247(e), KDB 558074 -8.4	RSS-247 5.2(b)	11.10.2	
Powerline Conducted Emissions	Pass	15.207	RSS-Gen 8.8	6.2	
Spurious Conducted Emissions	Pass	15.247(d), KDB 558074 -8.5	RSS-247 5.5	11.11	
Spurious Radiated Emissions	Pass	15.247(d), KDB 558074 -8.6, 8.7	RSS-247 5.5, RSS-Gen 6.13, 8.10	11.12.1, 11.13.2, 6.5, 6.6	

Deviations From Test Standards

None

Approved By:

James Morris, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

REVISION HISTORY

Revision Number	Description	Date (yyyy-mm-dd)	Page Number
00	None		
01	Removed configuration 11 and powerline testing for Node	2023-06-28	13, 16-20
01	Updated Certificate of Test	2023-06-28	3

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:

[California](#)

[Minnesota](#)

[Oregon](#)

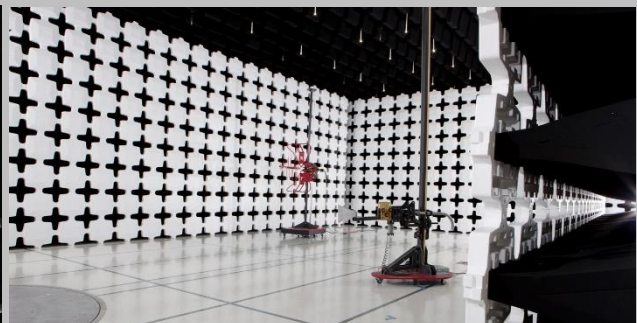
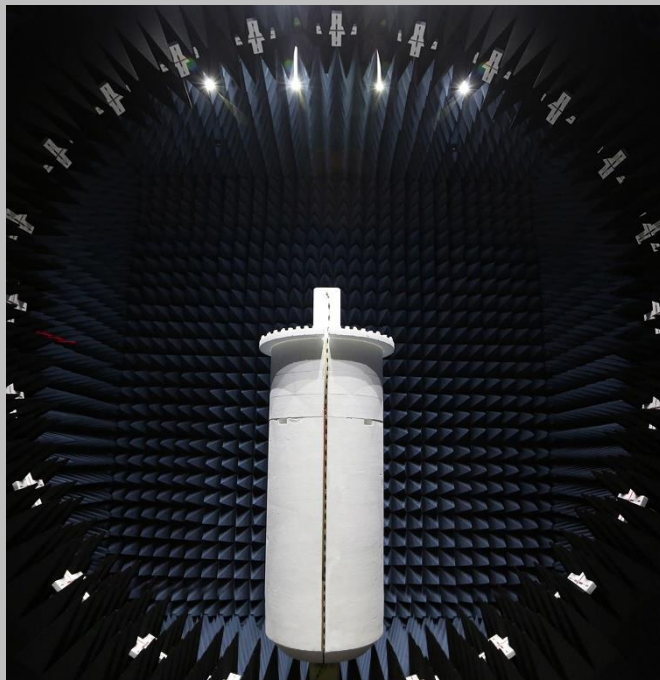
[Texas](#)

[Washington](#)

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)	3.2 dB	-3.2 dB

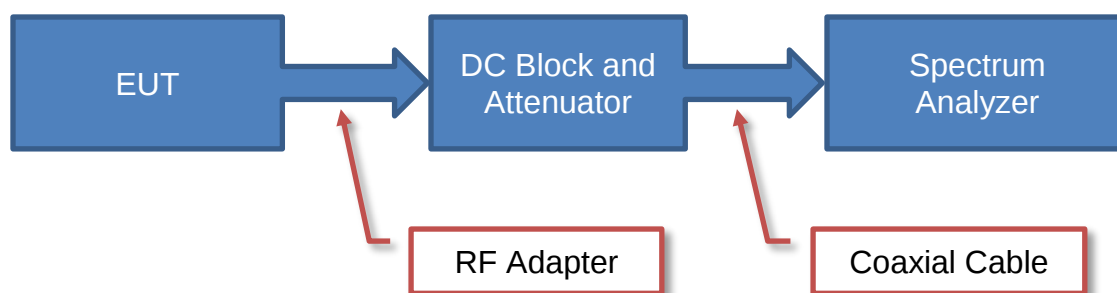
TEST SETUP BLOCK DIAGRAMS

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.

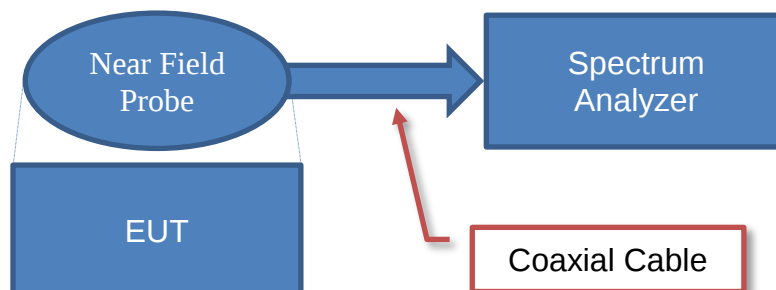
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

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

Near Field Test Fixture Measurements

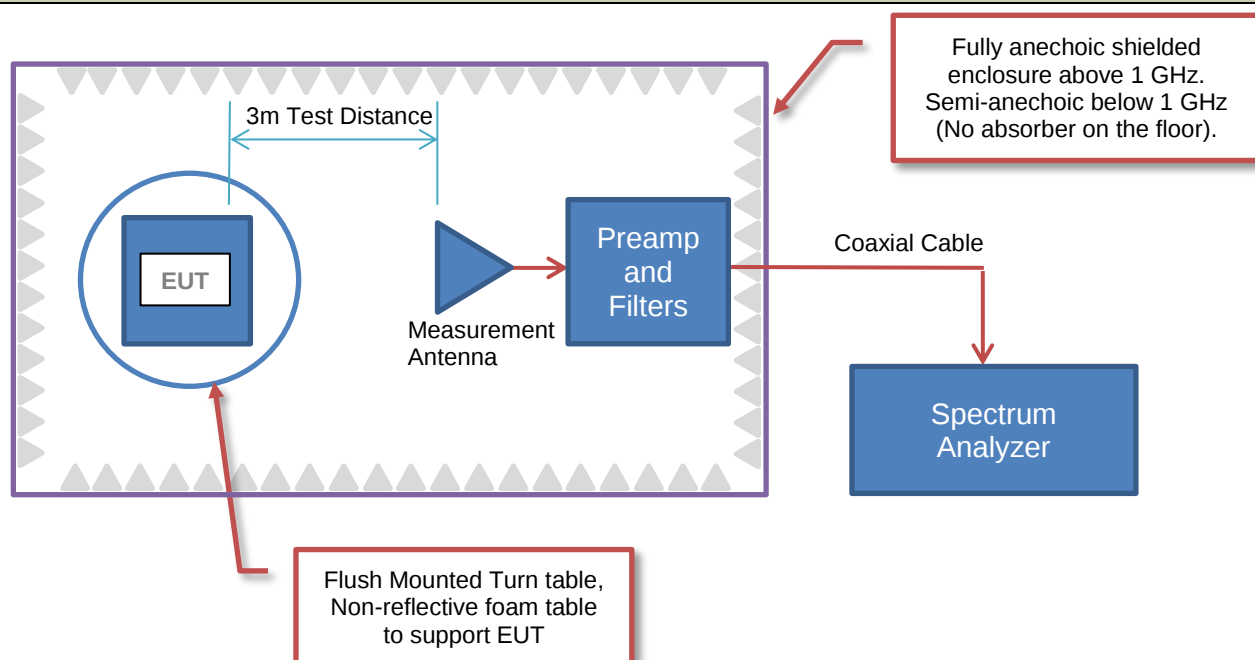


Sample Calculation (logarithmic units)

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

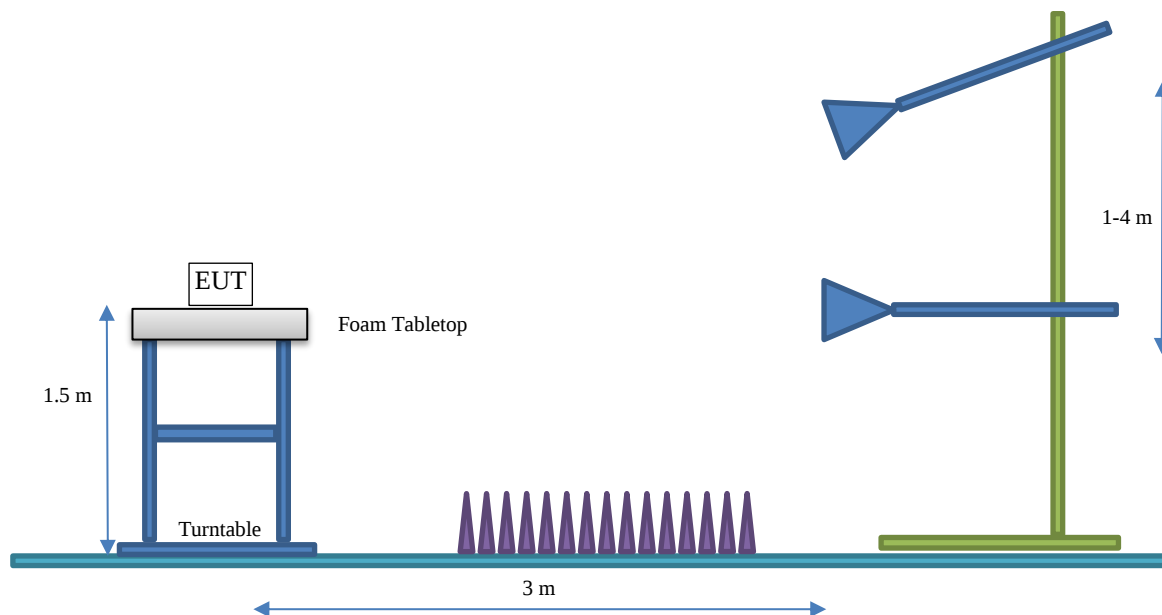
Radiated Power (ERP/EIRP) – Substitution Method:

Measured Level into Substitution Antenna (Amplitude dBm)	Substitution Antenna Factor (dBi)	EIRP to ERP (if applicable)	Measured power (dBm ERP/EIRP)
10.0	6.0	2.15	13.9/16.0

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:	TSI, Incorporated
Address:	500 Cardigan Road
City, State, Zip:	Shoreview, MN 55126
Test Requested By:	Jessica Pedersen
EUT:	TSI Inc. OmniTrak
First Date of Test:	March 14, 2023
Last Date of Test:	March 30, 2023
Receipt Date of Samples:	February 17, 2023
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Wi-Fi 802.11 b/g/n SISO radio with 1 antenna type(s) and 1 antenna port(s)
Testing Objective:
To demonstrate compliance of the Wi-Fi 802.11 b/g/n SISO radio under FCC 15.247/RSS-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. The power settings below reflect the maximum power that the EUT is allowed to transmit at during normal operation.

ANTENNA GAIN (dBi)

Type	Provided by:	Frequency Range (MHz)	Gain (dBi)
Sward ST1714A-1B2-A (Flex Antenna)	Sward	2400-2483.5	0.17

The EUT was tested using the power settings provided by the manufacturer which were based upon:

- ☐ Test software settings Test software/firmware installed on EUT: _F218_YIZHONG_SV0.0.2_20230110
☒ Rated power settings

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Types	Channel Bandwidths (MHz)	Channels	Channel Position*	Frequency Range (MHz)	Power Setting
1 Mbps, 11 Mbps	20	1, 6, 11	Low, Mid, High	2400-2483.5	15
6 Mbps, 36 Mbps, 54 Mbps	20	1, 6, 11	Low, Mid, High	2400-2483.5	15
MCS0, MCS7	20	1, 6, 11	Low, Mid, High	2400-2483.5	15
MCS0, MCS7	40	3, 6, 9	Low, Mid, High	2400-2483.5	15

CONFIGURATIONS



Configuration TSIN0196-7

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Cradle/Phone	TSI, Incorporated	TSI-5	TSI55221200061

Configuration TSIN0196-8

Software/Firmware Running During Test	
Description	Version
Firmware	Direct Test Mode

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Cradle/Phone	TSI, Incorporated	TSI-5	TSI5221200068

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop	Dell	Latitude 5400	GKJN2R2

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Programming Cable	No	1.8m	No	Laptop	Cradle

Configuration TSIN0196-12

Software/Firmware Running During Test	
Description	Version
Firmware	1.0.1 BLE Off

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Cradle/Phone	TSI, Incorporated	TSI-5	TSI55221200061

Peripherals in Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
USB Power Adapter	GlobTrek	WR9QA2000USBN23MDR6P	None

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	No	1.8m	No	Cradle/Phone	USB Power Adapter

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2023-03-14	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2023-03-22	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2023-03-22	DTS 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	2023-03-22	Equivalent Isotropic Radiated Power (EIRP)	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	2023-03-22	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	2023-03-22	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	2023-03-22	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.
8	2023-03-24	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.
9	2023-03-30	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWERLINE CONDUCTED EMISSIONS

TEST DESCRIPTION

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Receiver	Gauss Instruments	TDEMI 30M	ARS	2022-04-20	2023-04-20
LISN	Solar Electronics	9252-50-R-24-BNC	LIY	2022-04-04	2023-04-04
Cable - Conducted Cable Assembly	Northwest EMC	MNC, HGN, TYK	MNCA	2023-03-09	2024-03-09
Filter - High Pass	TTE	H97-100K-50-720B	HGN	NCR	NCR

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	1.2 dB	-1.2 dB

CONFIGURATIONS INVESTIGATED

TSIN0196-12

MODES INVESTIGATED

Transmitting 802.11(b) 1 Mbps, Mid Channel 18, 2442 MHz

POWERLINE CONDUCTED EMISSIONS

EUT:	TSI Inc. OmniTrak	Work Order:	TSIN0196
Serial Number:	TSI55221200061	Date:	2023-03-30
Customer:	TSI, Incorporated	Temperature:	21.3°C
Attendees:	Micah Larson	Relative Humidity:	18.5%
Customer Project:	None	Bar. Pressure (PMSL):	1021 mb
Tested By:	Ko Vorasarn	Job Site:	MN03
Power:	5VDC via 110VAC/60Hz	Configuration:	TSIN0196-12

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2023	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	13	Line:	High Line	Add. Ext. Attenuation (dB):	0
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COMMENTS

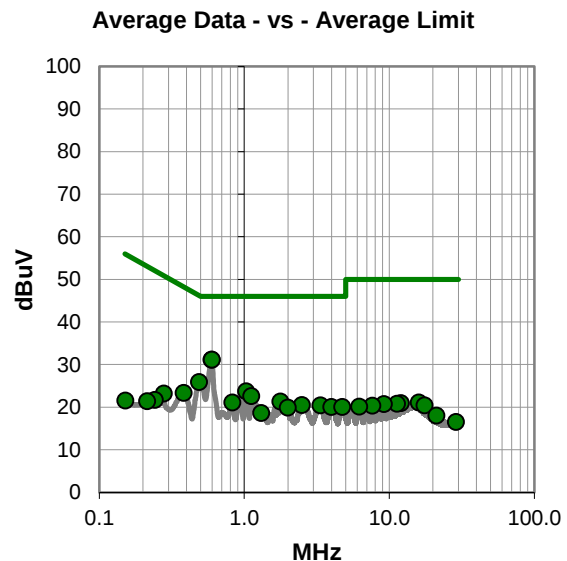
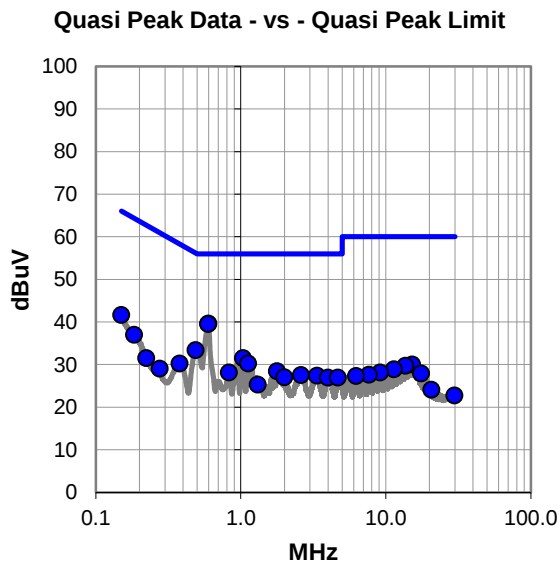
Phone AC tested

EUT OPERATING MODES

Transmitting 802.11(b) 1 Mbps, Mid Channel 18, 2442 MHz

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #13

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.597	19.5	20.1	39.6	56.0	-16.4
0.596	19.4	20.1	39.5	56.0	-16.5
0.489	13.3	20.1	33.4	56.2	-22.8
0.150	21.0	20.6	41.6	66.0	-24.4
1.036	11.4	20.1	31.5	56.0	-24.5
1.123	10.1	20.1	30.2	56.0	-25.8
0.184	16.6	20.4	37.0	64.3	-27.3
1.773	8.3	20.1	28.4	56.0	-27.6
0.829	8.0	20.1	28.1	56.0	-27.9
0.379	10.1	20.1	30.2	58.3	-28.1
2.608	7.3	20.2	27.5	56.0	-28.5
3.353	7.1	20.3	27.4	56.0	-28.6
2.001	6.9	20.1	27.0	56.0	-29.0
3.994	6.6	20.3	26.9	56.0	-29.1
4.666	6.6	20.3	26.9	56.0	-29.1
15.201	8.6	21.4	30.0	60.0	-30.0
13.658	8.5	21.2	29.7	60.0	-30.3
1.311	5.2	20.1	25.3	56.0	-30.7
11.409	7.7	21.2	28.9	60.0	-31.1
0.223	11.2	20.3	31.5	62.7	-31.2
0.277	8.9	20.1	29.0	60.9	-31.9
9.168	7.3	20.8	28.1	60.0	-31.9
17.552	6.5	21.4	27.9	60.0	-32.1
7.668	7.0	20.6	27.6	60.0	-32.4
6.239	6.8	20.5	27.3	60.0	-32.7

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.594	11.0	20.1	31.1	46.0	-14.9
0.597	11.0	20.1	31.1	46.0	-14.9
0.489	5.8	20.1	25.9	46.2	-20.3
1.032	3.6	20.1	23.7	46.0	-22.3
1.120	2.5	20.1	22.6	46.0	-23.4
1.773	1.2	20.1	21.3	46.0	-24.7
0.829	1.0	20.1	21.1	46.0	-24.9
0.382	3.2	20.1	23.3	48.2	-24.9
2.503	0.3	20.2	20.5	46.0	-25.5
3.353	0.1	20.3	20.4	46.0	-25.6
3.994	-0.3	20.3	20.0	46.0	-26.0
4.750	-0.3	20.3	20.0	46.0	-26.0
1.999	-0.2	20.1	19.9	46.0	-26.1
1.311	-1.5	20.1	18.6	46.0	-27.4
0.278	3.1	20.1	23.2	50.9	-27.7
15.977	-0.3	21.4	21.1	50.0	-28.9
12.067	-0.3	21.2	20.9	50.0	-29.1
11.322	-0.4	21.2	20.8	50.0	-29.2
9.171	-0.1	20.8	20.7	50.0	-29.3
17.508	-1.0	21.4	20.4	50.0	-29.6
7.666	-0.3	20.6	20.3	50.0	-29.7
6.229	-0.4	20.5	20.1	50.0	-29.9
0.242	1.5	20.2	21.7	52.0	-30.3
0.214	1.1	20.3	21.4	53.0	-31.6
21.197	-3.7	21.7	18.0	50.0	-32.0

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	TSI Inc. OmniTrak	Work Order:	TSIN0196
Serial Number:	TSI55221200061	Date:	2023-03-30
Customer:	TSI, Incorporated	Temperature:	21.3°C
Attendees:	Micah Larson	Relative Humidity:	18.5%
Customer Project:	None	Bar. Pressure (PMSL):	1021 mb
Tested By:	Ko Vorasarn	Job Site:	MN03
Power:	5VDC via 110VAC/60Hz	Configuration:	TSIN0196-12

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2023	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	14	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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COMMENTS

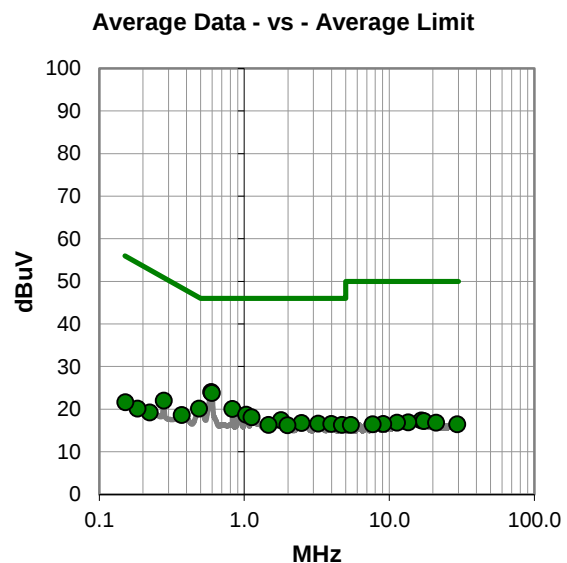
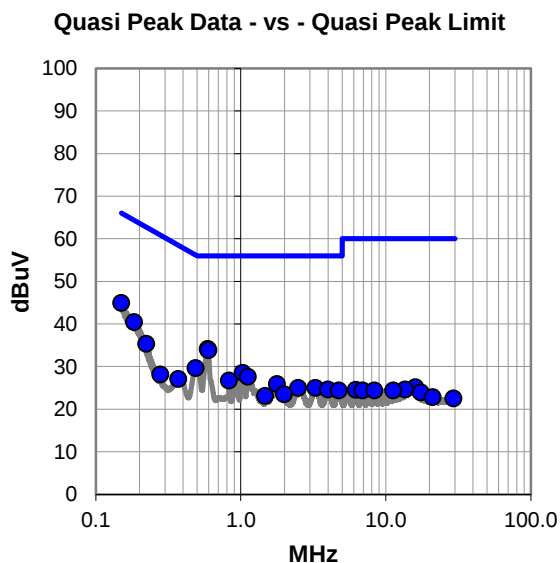
Phone AC tested

EUT OPERATING MODES

Transmitting 802.11(b) 1 Mbps, Mid Channel 18, 2442 MHz

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #14

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.150	24.3	20.6	44.9	66.0	-21.1
0.592	14.0	20.1	34.1	56.0	-21.9
0.597	13.7	20.1	33.8	56.0	-22.2
0.184	20.0	20.4	40.4	64.3	-23.9
0.489	9.5	20.1	29.6	56.2	-26.6
0.223	15.0	20.3	35.3	62.7	-27.4
1.032	8.4	20.1	28.5	56.0	-27.5
1.120	7.5	20.1	27.6	56.0	-28.4
0.829	6.6	20.1	26.7	56.0	-29.3
1.778	5.8	20.1	25.9	56.0	-30.1
2.491	4.8	20.2	25.0	56.0	-31.0
3.270	4.7	20.3	25.0	56.0	-31.0
0.371	7.0	20.1	27.1	58.5	-31.4
3.986	4.3	20.3	24.6	56.0	-31.4
4.740	4.1	20.3	24.4	56.0	-31.6
1.990	3.4	20.1	23.5	56.0	-32.5
0.278	8.0	20.1	28.1	60.9	-32.8
1.470	3.0	20.1	23.1	56.0	-32.9
16.005	3.7	21.4	25.1	60.0	-34.9
13.580	3.4	21.2	24.6	60.0	-35.4
6.221	4.0	20.5	24.5	60.0	-35.5
6.920	3.8	20.6	24.4	60.0	-35.6
8.362	3.7	20.7	24.4	60.0	-35.6
11.264	3.2	21.2	24.4	60.0	-35.6
17.413	2.5	21.4	23.9	60.0	-36.1

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.592	3.9	20.1	24.0	46.0	-22.0
0.597	3.7	20.1	23.8	46.0	-22.2
0.829	-0.1	20.1	20.0	46.0	-26.0
0.489	0.0	20.1	20.1	46.2	-26.1
1.029	-1.4	20.1	18.7	46.0	-27.3
1.123	-2.0	20.1	18.1	46.0	-27.9
1.796	-2.7	20.1	17.4	46.0	-28.6
0.278	1.9	20.1	22.0	50.9	-28.9
2.486	-3.5	20.2	16.7	46.0	-29.3
3.247	-3.7	20.3	16.6	46.0	-29.4
3.989	-3.8	20.3	16.5	46.0	-29.5
1.470	-3.8	20.1	16.3	46.0	-29.7
4.730	-4.0	20.3	16.3	46.0	-29.7
1.990	-3.9	20.1	16.2	46.0	-29.8
0.371	-1.5	20.1	18.6	48.5	-29.9
16.670	-4.1	21.4	17.3	50.0	-32.7
17.373	-4.2	21.4	17.2	50.0	-32.8
13.519	-4.3	21.2	16.9	50.0	-33.1
11.305	-4.4	21.2	16.8	50.0	-33.2
21.122	-4.9	21.7	16.8	50.0	-33.2
0.223	-1.1	20.3	19.2	52.7	-33.5
9.113	-4.3	20.8	16.5	50.0	-33.5
7.691	-4.2	20.6	16.4	50.0	-33.6
29.511	-5.9	22.3	16.4	50.0	-33.6
5.438	-4.1	20.4	16.3	50.0	-33.7

CONCLUSION

Pass



Tested By

DUTY CYCLE



XMH 2023.02.14.0

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

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

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

The test software provided for operation in a fixed, single channel mode allows the EUT to operate continuously at 100% Duty Cycle.

DTS BANDWIDTH



XMH 2023.02.14.0

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
Attenuator	Fairview Microwave	SA18H-20	UAX	2022-07-26	2023-07-26
Block - DC	Aeroflex	INMET 8535	AMO	2023-01-30	2024-01-30
Cable	Element	None	OC5	2023-01-30	2024-01-30
Generator - Signal	Agilent	E8257D	TGU	2020-11-03	2023-11-03
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2022-10-21	2023-10-21

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The EUT was set to the channels and modes listed in the datasheet.

The 6dB DTS bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

DTS BANDWIDTH



TSMTx 2022.06.03.0 XMR 2023.02.14.0

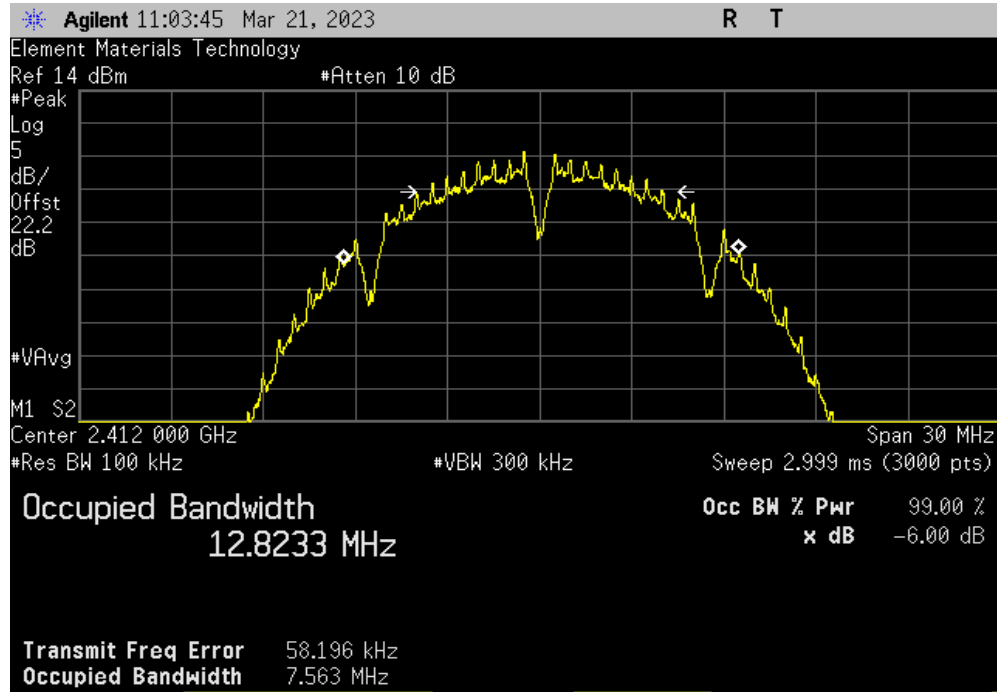
EUT: TSI Inc. OmniTrak		Work Order: TSIN0196	
Serial Number: TSI5221200068		Date: 03/22/2023	
Customer: TSI, Incorporated		Temperature: 20.8°C	
Attendees: None		Humidity: 49.7%	
Project: None		Barometric Pres.: 1018 mbar	
Tested by: Nolan De Ramos, Luis Flores		Power: 5VDC via Battery	
		Job Site: OC11	
TEST SPECIFICATIONS			
FCC 15.247:2023		Test Method	
RSS-247 Issue 2:2017		ANSI C63.10:2013	
		ANSI C63.10:2013	
COMMENTS			
Reference level offset includes measurement cable, DC block, and attenuator.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	TSIN0196-8	Signature 	
		Value	Limit (>) Result
2400 MHz - 2483.5 MHz Band			
802.11(b) 1 Mbps			
	Low Channel 1, 2412 MHz	7.563 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	7.372 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	8.308 MHz	500 kHz Pass
802.11(b) 11 Mbps			
	Low Channel 1, 2412 MHz	7.334 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	8.085 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	7.814 MHz	500 kHz Pass
802.11(g) 6 Mbps			
	Low Channel 1, 2412 MHz	16.346 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	16.375 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	16.334 MHz	500 kHz Pass
802.11(g) 36 Mbps			
	Low Channel 1, 2412 MHz	16.397 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	16.396 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	16.381 MHz	500 kHz Pass
802.11(g) 54 Mbps			
	Low Channel 1, 2412 MHz	16.371 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	16.397 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	16.406 MHz	500 kHz Pass
802.11(n20) MCS0			
	Low Channel 1, 2412 MHz	17.594 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	17.611 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	17.598 MHz	500 kHz Pass
802.11(n20) MCS7			
	Low Channel 1, 2412 MHz	17.331 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	17.675 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	17.588 MHz	500 kHz Pass
802.11(n40) MCS0			
	Low Channel 1/5, 2422 MHz	35.766 MHz	500 kHz Pass
	Mid Channel 4/8, 2437 MHz	36.333 MHz	500 kHz Pass
	High Channel 7/11, 2452 MHz	36.206 MHz	500 kHz Pass
802.11(n40) MCS7			
	Low Channel 1/5, 2422 MHz	35.522 MHz	500 kHz Pass
	Mid Channel 4/8, 2437 MHz	36.275 MHz	500 kHz Pass
	High Channel 7/11, 2452 MHz	35.36 MHz	500 kHz Pass

DTS BANDWIDTH

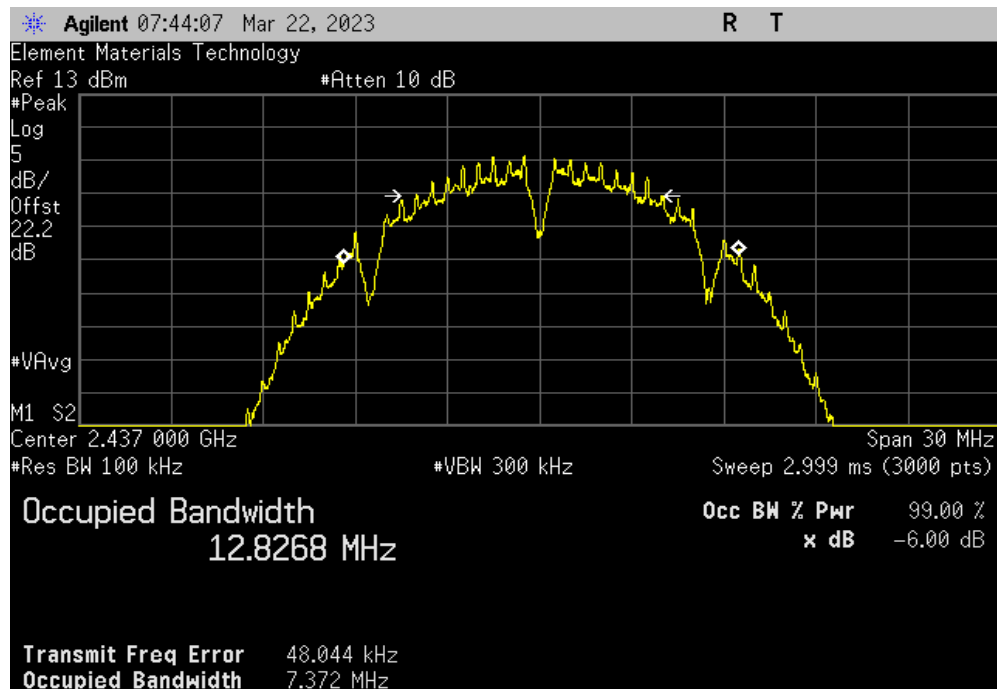


TMTx 2022.06.03.0 XMR 2023.02.14.0

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



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

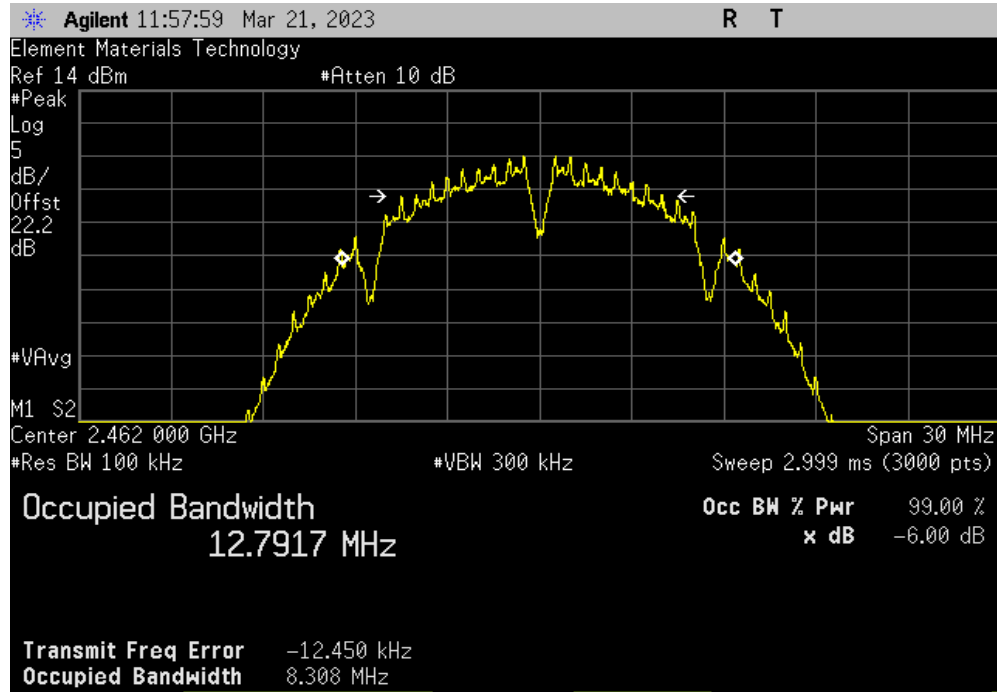


DTS BANDWIDTH

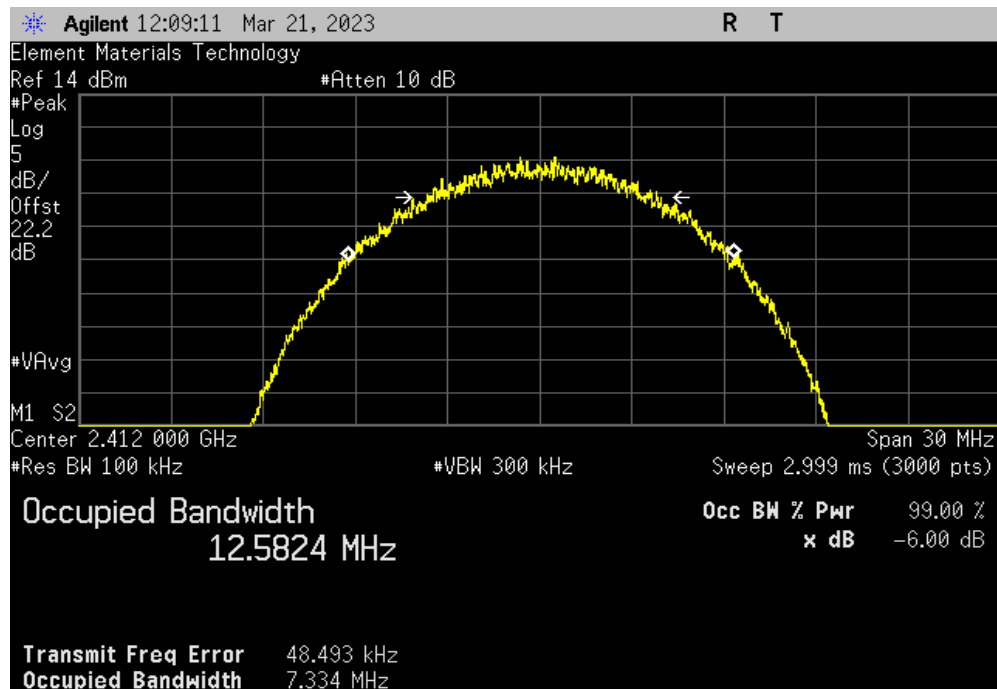


TMTx 2022.06.03.0 XMR 2023.02.14.0

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



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

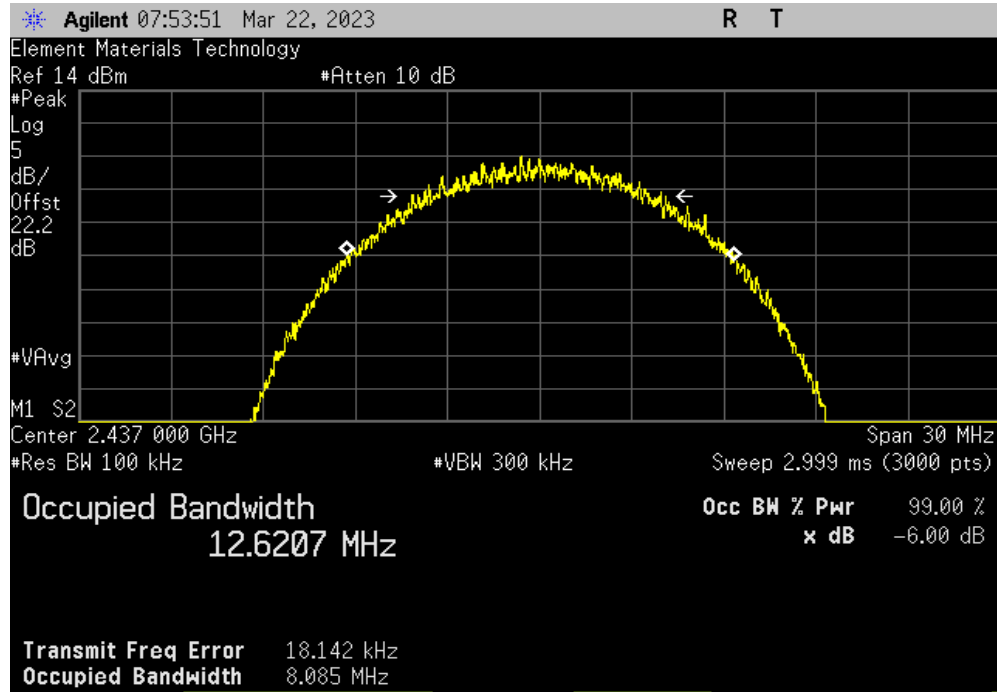


DTS BANDWIDTH

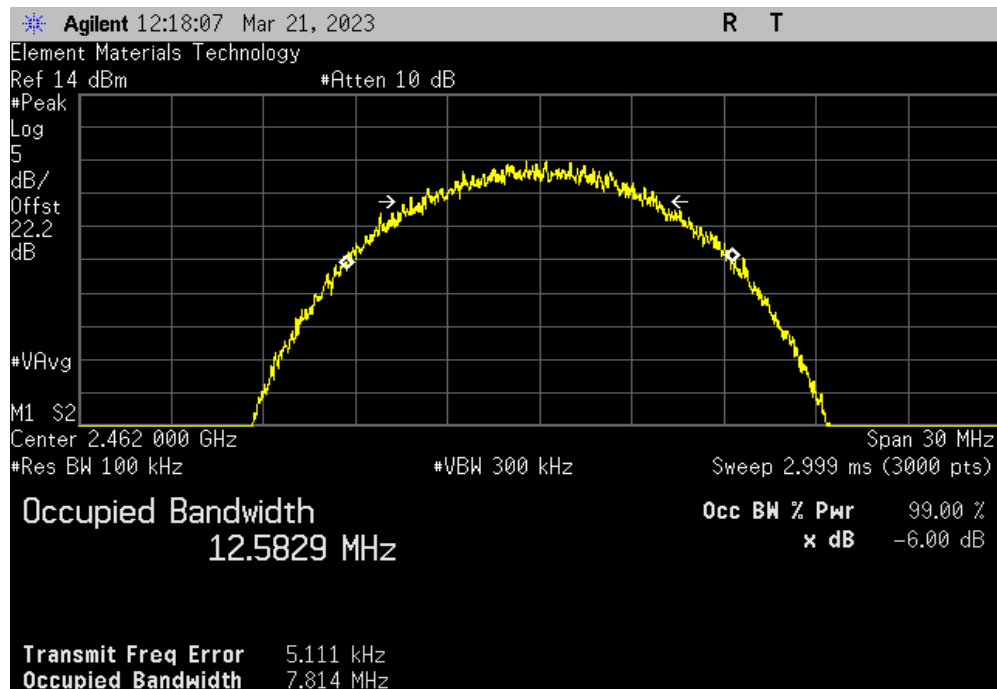


TMTx 2022.06.03.0 XMR 2023.02.14.0

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



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

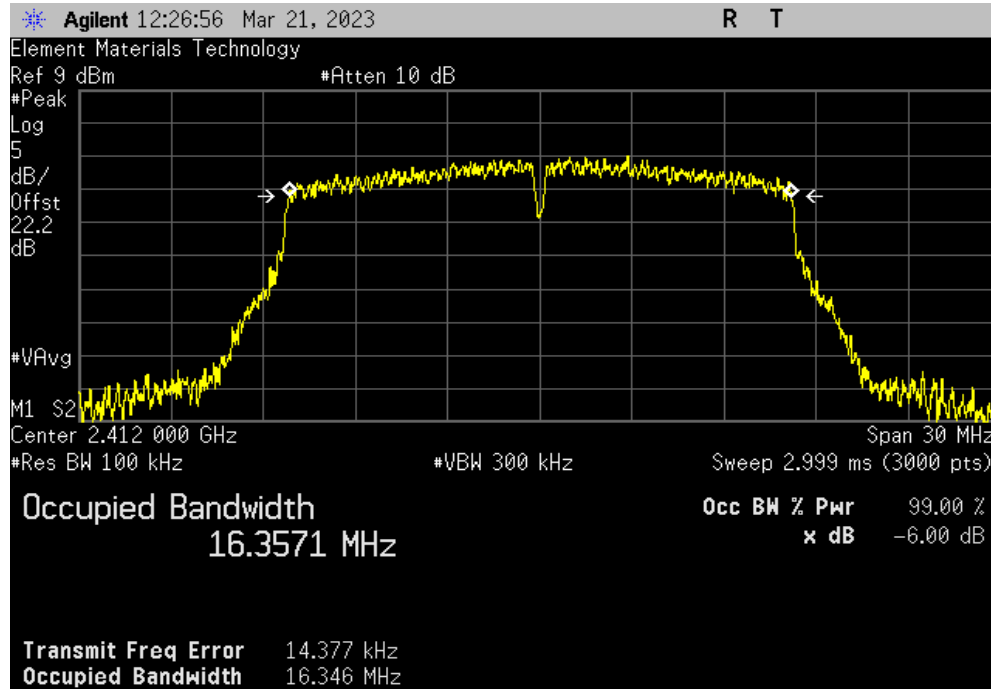


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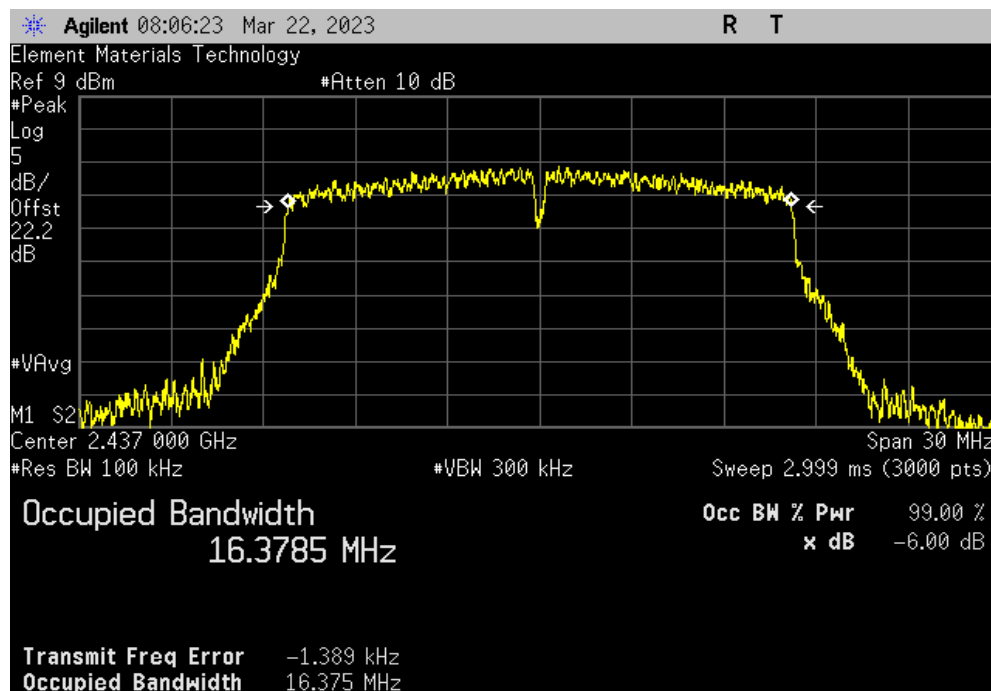


TMTx 2022.06.03.0 XMR 2023.02.14.0

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



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

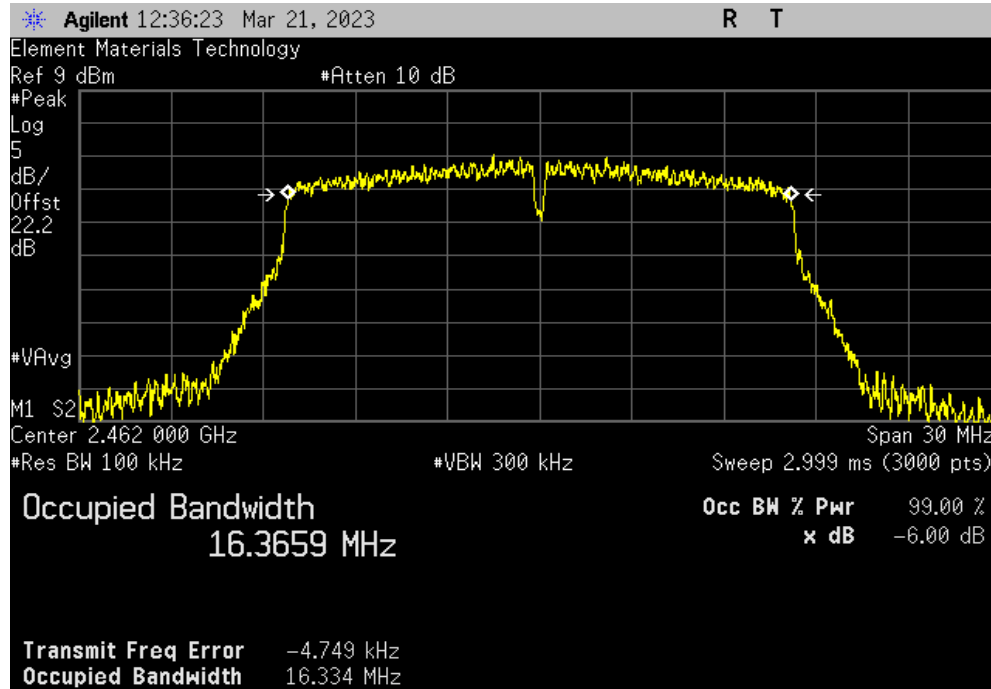


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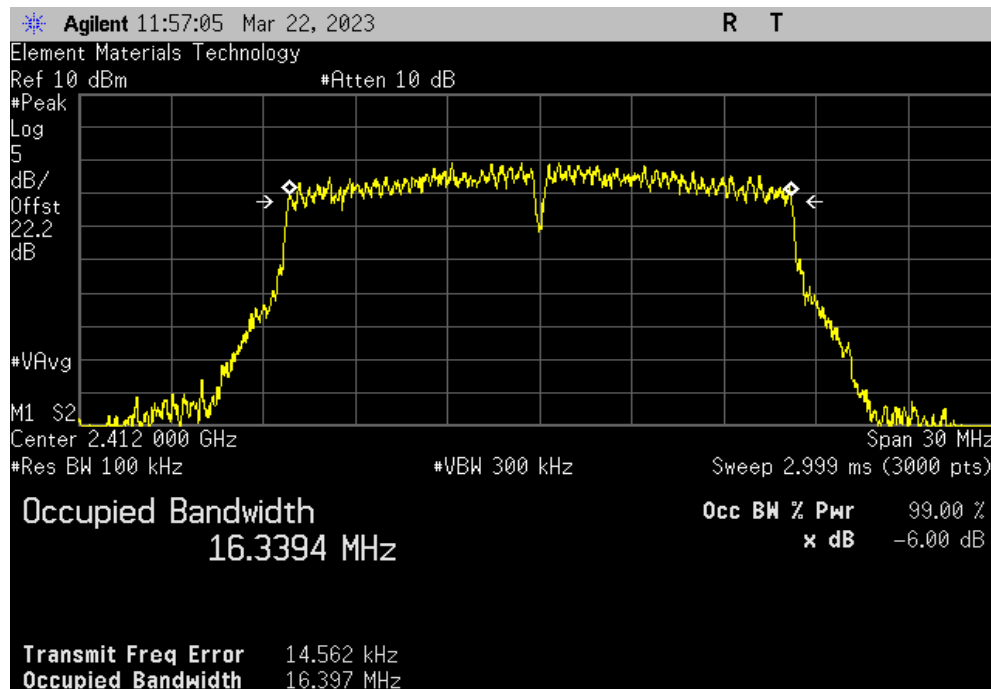


TMTx 2022.06.03.0 XMR 2023.02.14.0

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



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

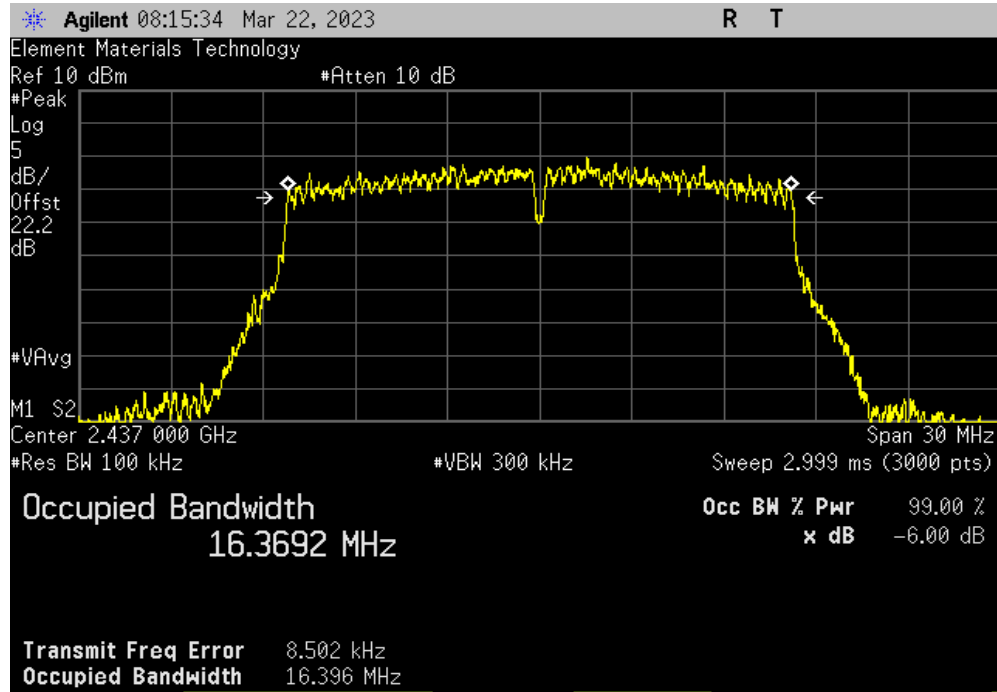


DTS BANDWIDTH

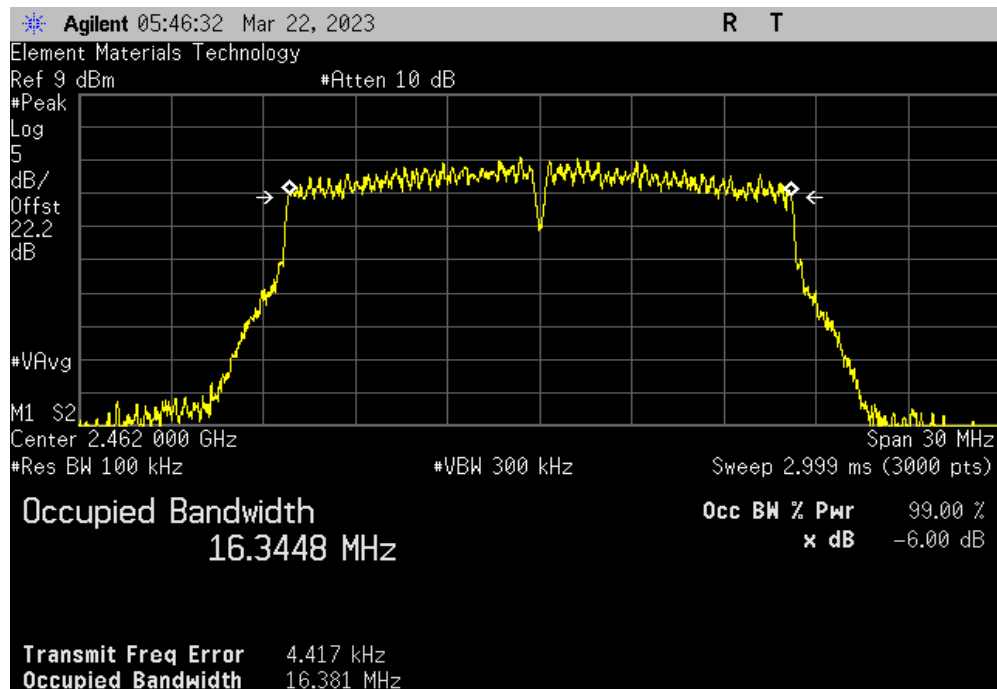


TUTx 2022.06.03.0 XMR 2023.02.14.0

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



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

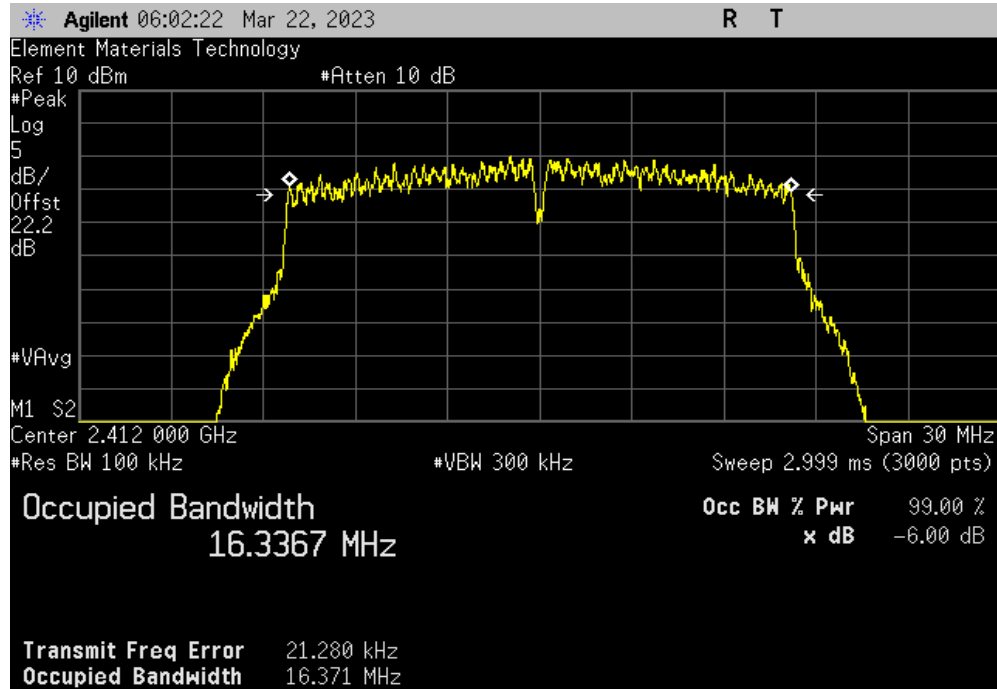


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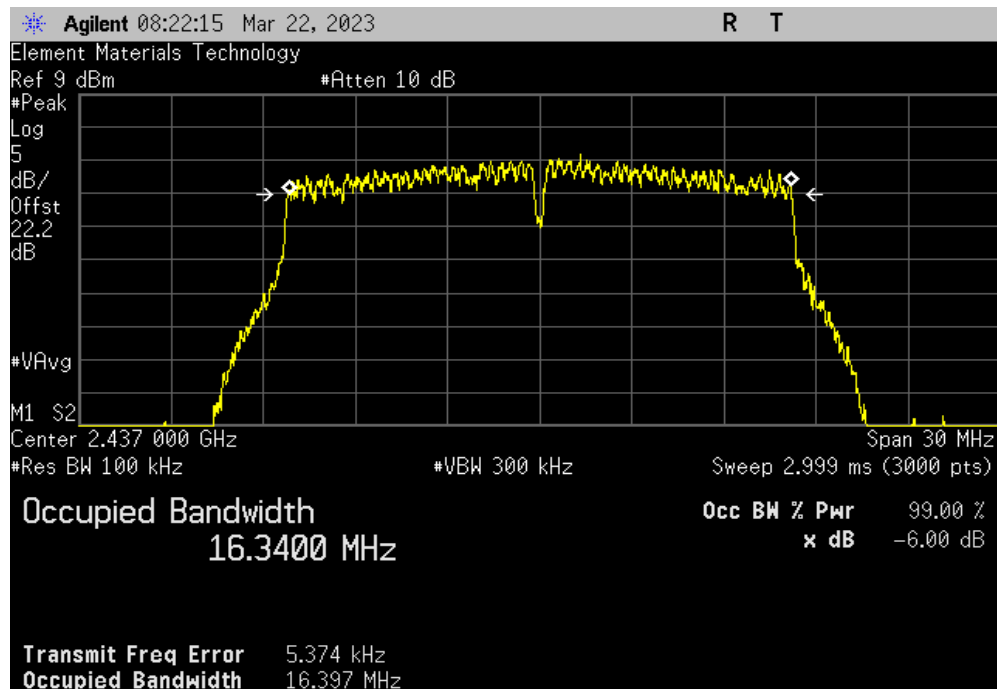


TMTx 2022.06.03.0 XMR 2023.02.14.0

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



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

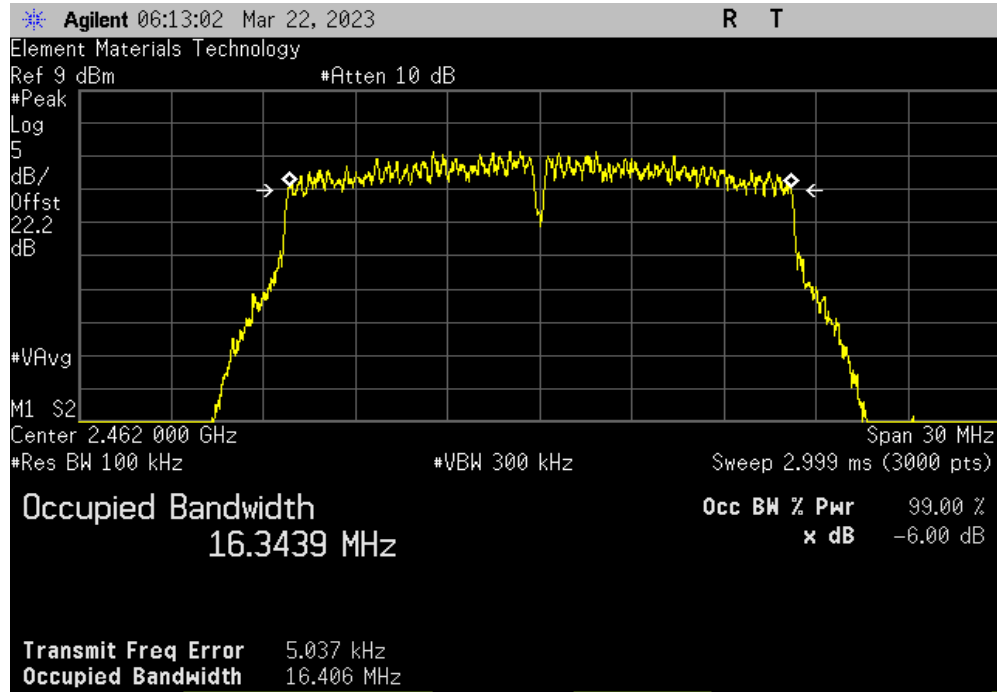


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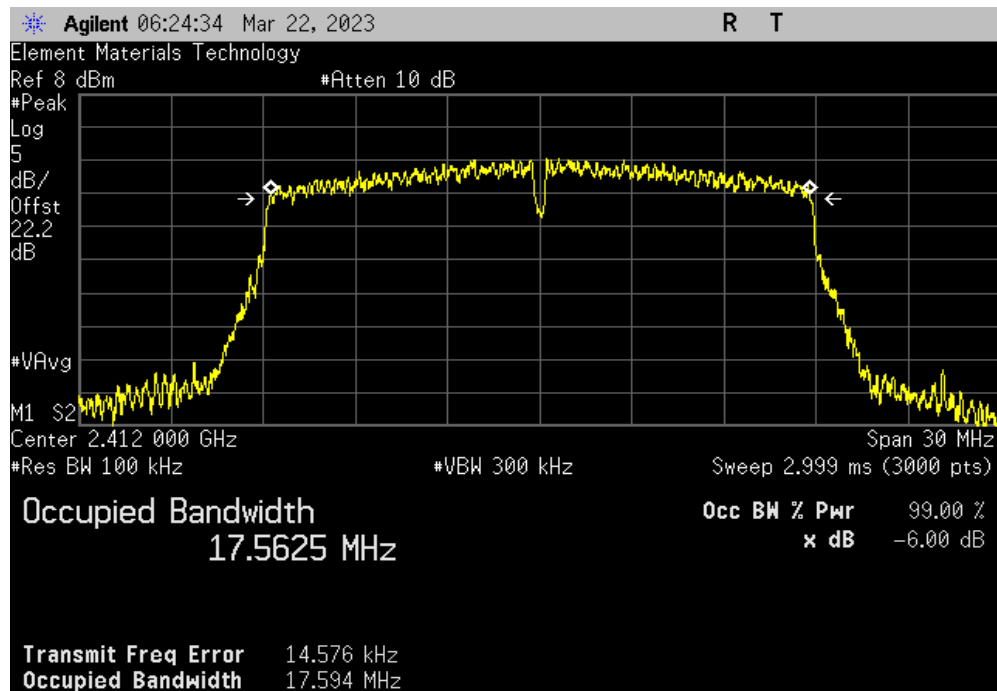


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
				Value	Limit	Result
				16.406 MHz	(>) 500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				17.594 MHz	(>) 500 kHz	Pass

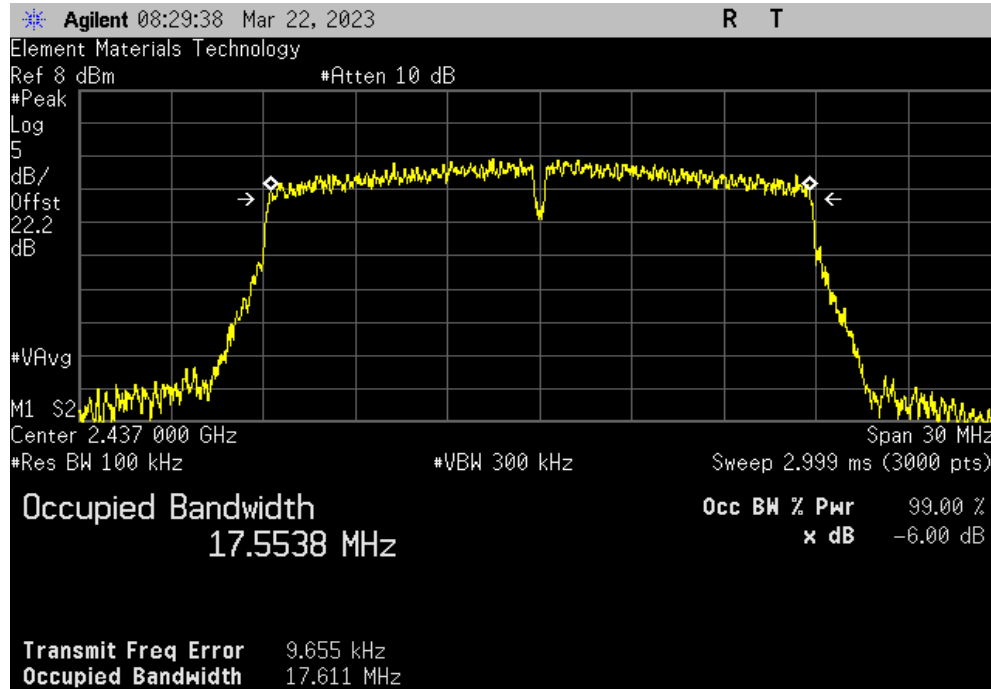


DTS BANDWIDTH

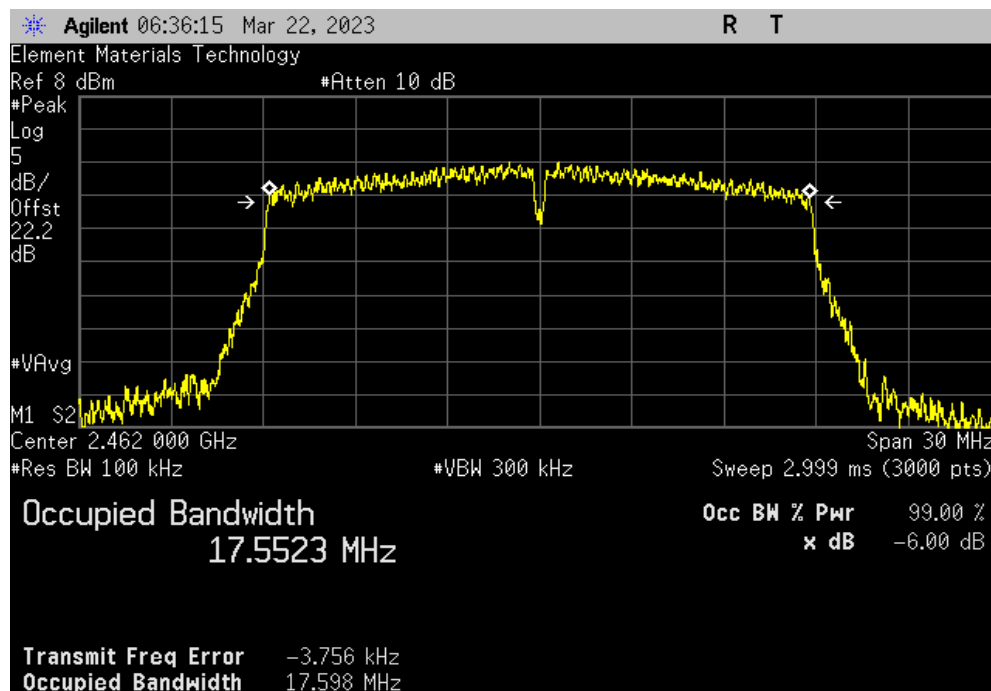


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				17.611 MHz	(>) 500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, High Channel 11, 2462 MHz						
				Value	Limit	Result
				17.598 MHz	(>) 500 kHz	Pass

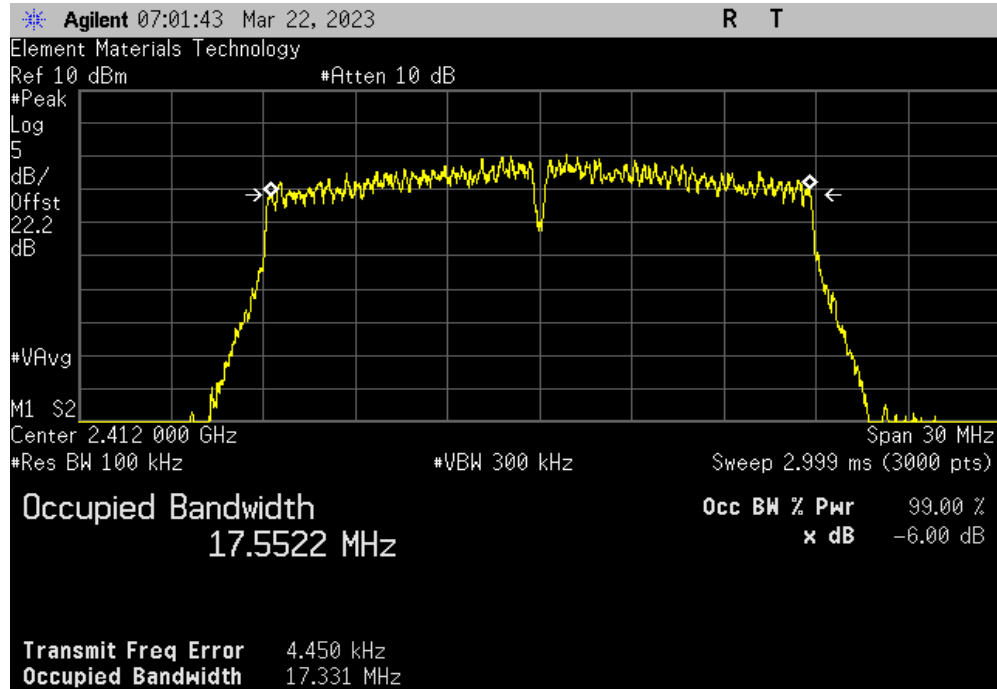


DTS BANDWIDTH

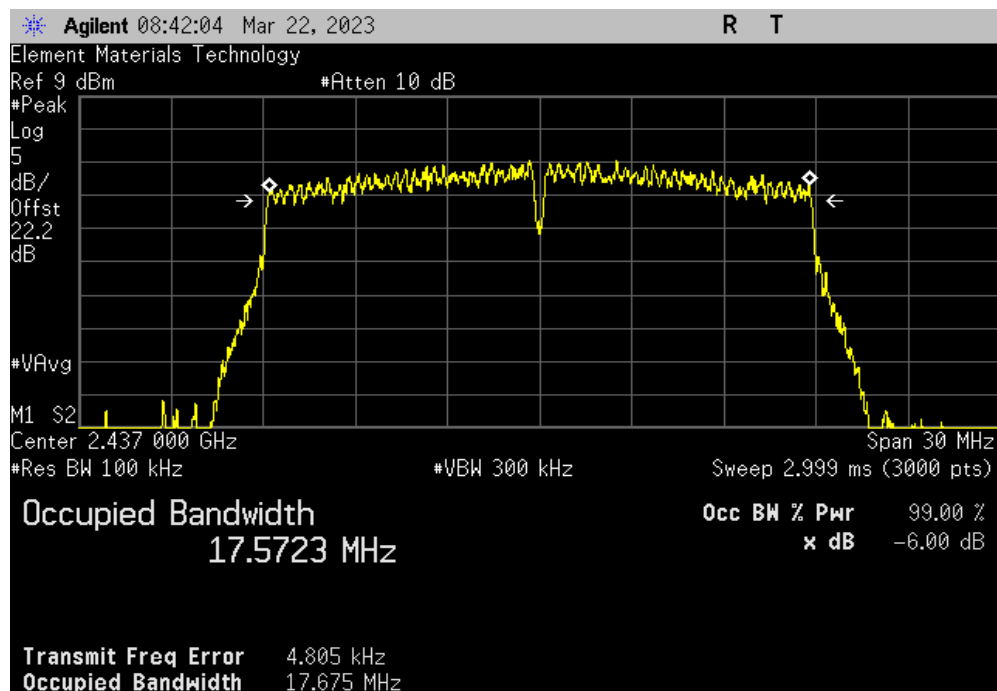


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				17.331 MHz	500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				17.675 MHz	500 kHz	Pass

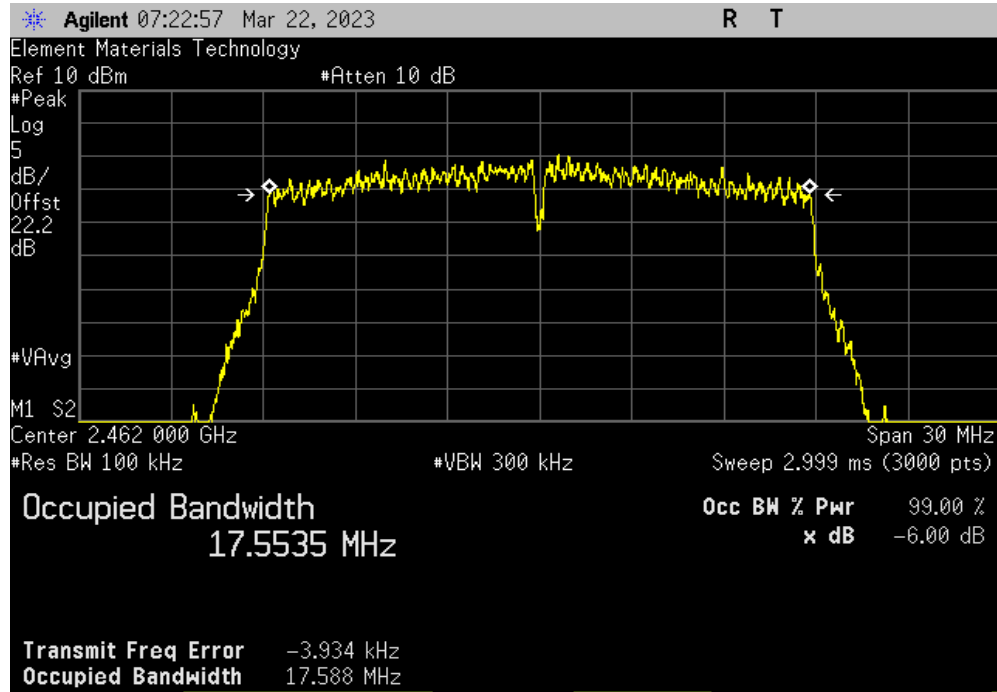


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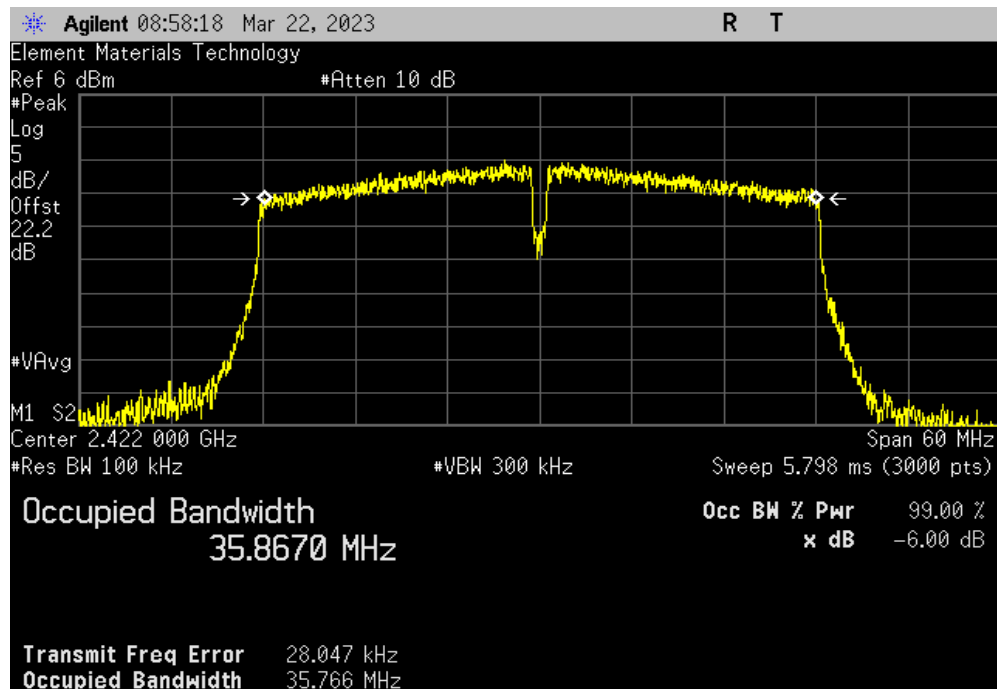


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, High Channel 11, 2462 MHz						
				Value	Limit	Result
				17.588 MHz	500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Low Channel 1/5, 2422 MHz						
				Value	Limit	Result
				35.766 MHz	500 kHz	Pass

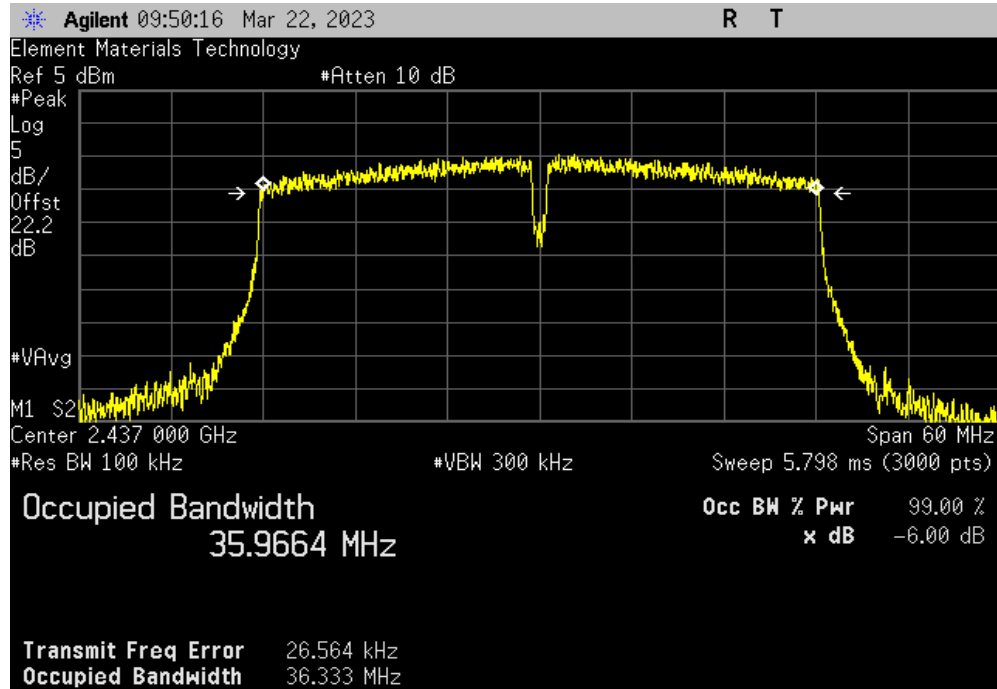


DTS BANDWIDTH

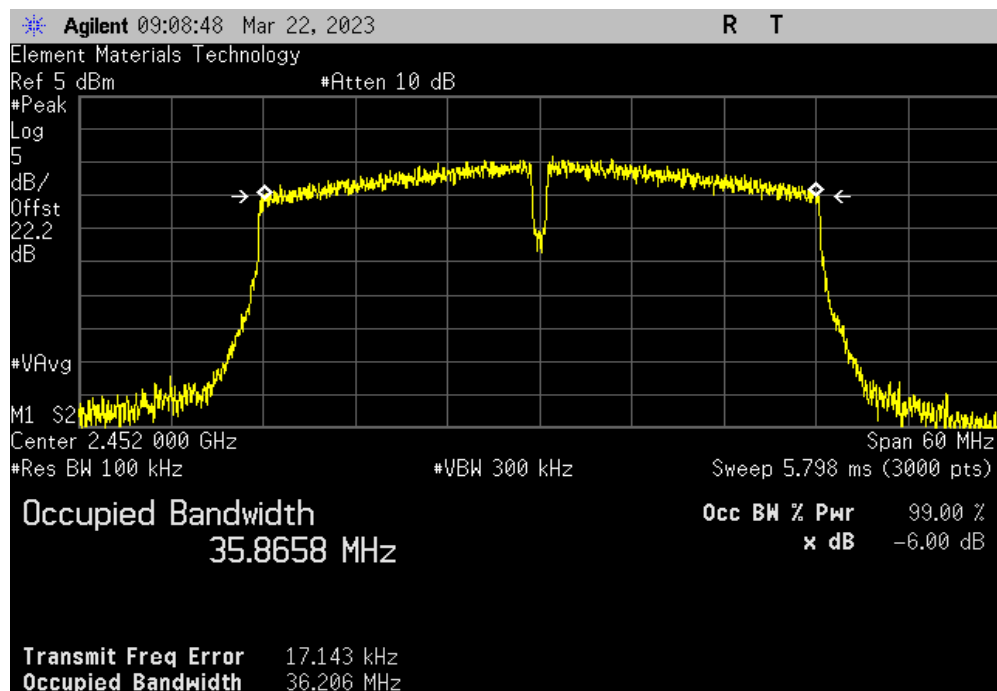


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Mid Channel 4/8, 2437 MHz						
				Value	Limit	Result
				36.333 MHz	500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, High Channel 7/11, 2452 MHz						
				Value	Limit	Result
				36.206 MHz	500 kHz	Pass

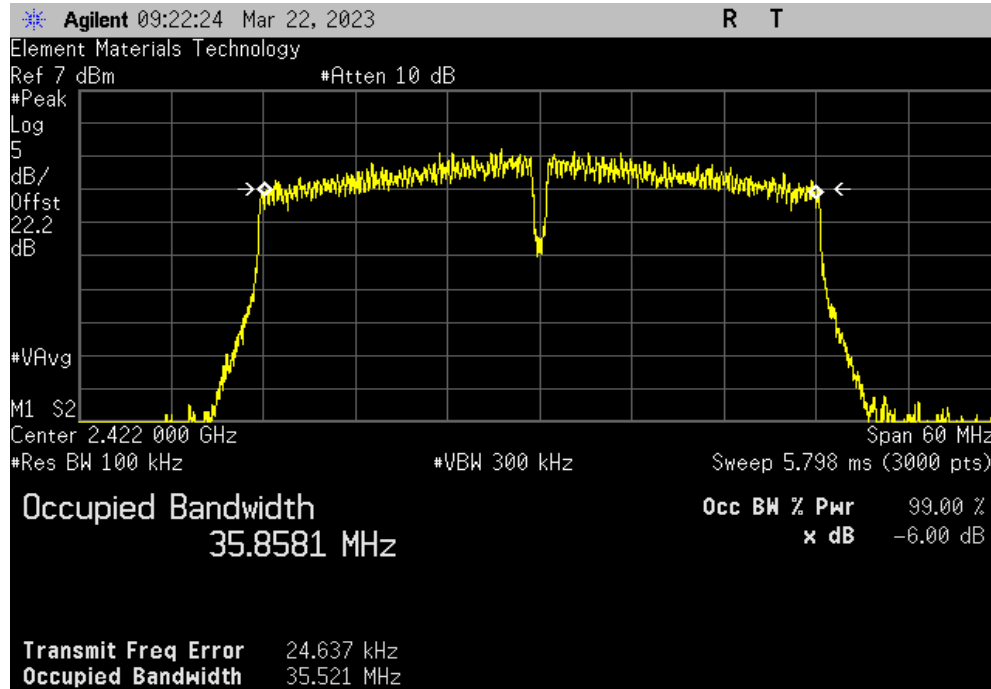


DTS BANDWIDTH

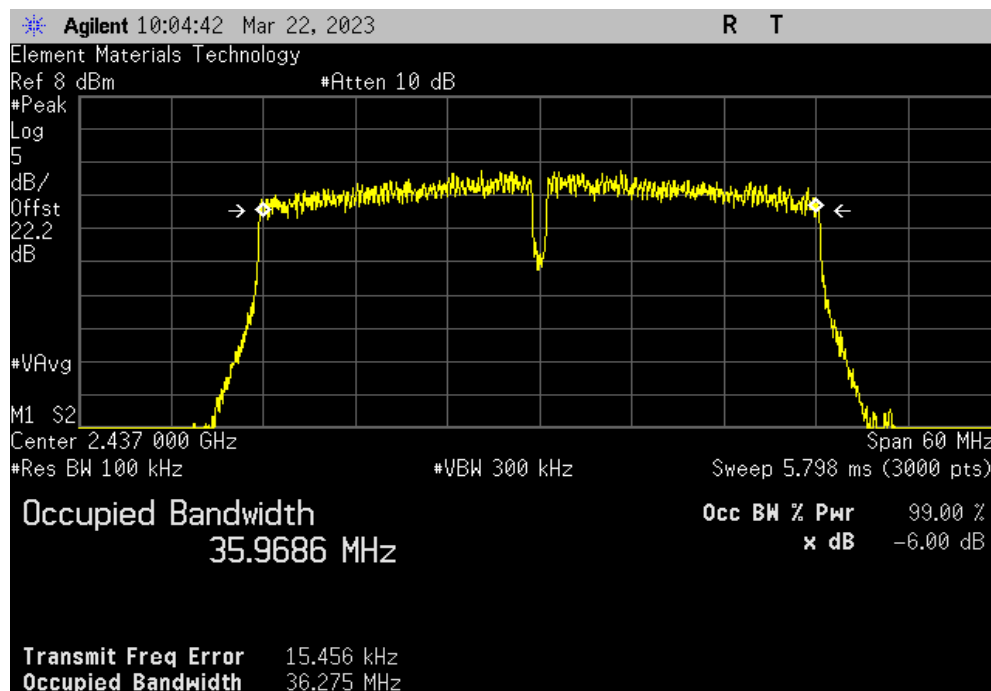


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Low Channel 1/5, 2422 MHz						
				Value	Limit	Result
				35.522 MHz	500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Mid Channel 4/8, 2437 MHz						
				Value	Limit	Result
				36.275 MHz	500 kHz	Pass

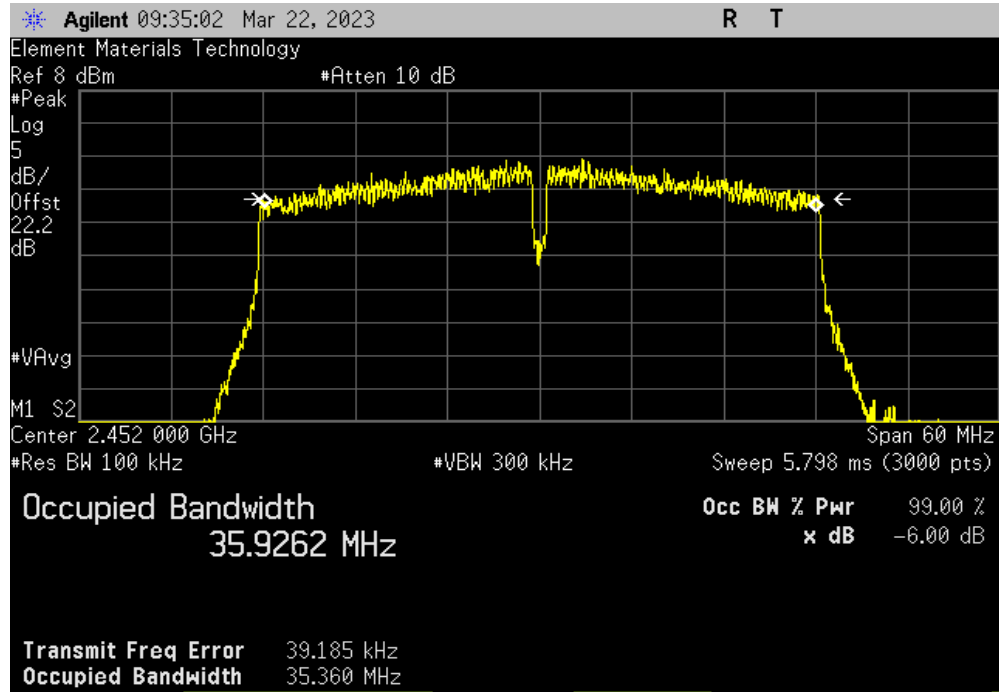


DTS BANDWIDTH



TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, High Channel 7/11, 2452 MHz						
Value				Limit	Result	
				(>)		
35.36 MHz				500 kHz	Pass	



OCCUPIED BANDWIDTH

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	Agilent	E8257D	TGU	2020-11-03	2023-11-03
Cable	Element	None	OC5	2023-01-30	2024-01-30
Block - DC	Aeroflex	INMET 8535	AMO	2023-01-30	2024-01-30
Attenuator	Fairview Microwave	SA18H-20	UAX	2022-07-26	2023-07-26
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2022-10-21	2023-10-21

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The 99% occupied bandwidth was measured with the EUT configured for continuous modulated operation.

Per ANSI C63.10:2013, 6.9.3, the spectrum analyzer was configured as follows:

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) of the spectrum analyzer was set to the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) bandwidth was set to at least 3 times the resolution bandwidth. The analyzer sweep time was set to auto to prevent video filtering or averaging. A sample detector was used unless the device was not able to be operated in a continuous transmit mode, in which case a peak detector was used.

The spectrum analyzer occupied bandwidth measurement function was used to sum the power of the transmission in linear terms to obtain the 99% bandwidth.

OCCUPIED BANDWIDTH



TSMTx 2022.06.03.0 XMR 2023.02.14.0

EUT: TSI Inc. OmniTrak		Work Order: TSIN0196	
Serial Number: TSI5221200068		Date: 03/24/2023	
Customer: TSI, Incorporated		Temperature: 20.4°C	
Attendees: None		Humidity: 44.3%	
Project: None		Barometric Pres.: 1023 mbar	
Tested by: Nolan De Ramos, Luis Flores		Power: 5VDC via Battery	
		Job Site: OC13	
TEST SPECIFICATIONS			
FCC 15.247:2023		Test Method	
RSS-Gen Issue 5:2018+A1:2019+A2:2021		ANSI C63.10:2013	
		ANSI C63.10:2013	
COMMENTS			
Reference level offset includes measurement cable, DC block, and attenuator.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	TSIN0196-8	Signature 	
		Value	Limit
2400 MHz - 2483.5 MHz Band			
802.11(b) 1 Mbps			
	Low Channel 1, 2412 MHz	12.812 MHz	N/A
	Mid Channel 6, 2437 MHz	12.849 MHz	N/A
	High Channel 11, 2462 MHz	12.807 MHz	N/A
802.11(b) 11 Mbps			
	Low Channel 1, 2412 MHz	12.604 MHz	N/A
	Mid Channel 6, 2437 MHz	12.593 MHz	N/A
	High Channel 11, 2462 MHz	12.576 MHz	N/A
802.11(g) 6 Mbps			
	Low Channel 1, 2412 MHz	16.579 MHz	N/A
	Mid Channel 6, 2437 MHz	16.548 MHz	N/A
	High Channel 11, 2462 MHz	16.666 MHz	N/A
802.11(g) 36 Mbps			
	Low Channel 1, 2412 MHz	16.554 MHz	N/A
	Mid Channel 6, 2437 MHz	16.482 MHz	N/A
	High Channel 11, 2462 MHz	16.488 MHz	N/A
802.11(g) 54 Mbps			
	Low Channel 1, 2412 MHz	16.495 MHz	N/A
	Mid Channel 6, 2437 MHz	16.54 MHz	N/A
	High Channel 11, 2462 MHz	16.504 MHz	N/A
802.11(n20) MCS0			
	Low Channel 1, 2412 MHz	17.63 MHz	N/A
	Mid Channel 6, 2437 MHz	17.699 MHz	N/A
	High Channel 11, 2462 MHz	17.695 MHz	N/A
802.11(n20) MCS7			
	Low Channel 1, 2412 MHz	17.639 MHz	N/A
	Mid Channel 6, 2437 MHz	17.689 MHz	N/A
	High Channel 11, 2462 MHz	17.61 MHz	N/A
802.11(n40) MCS0			
	Low Channel 1/5, 2422 MHz	36.16 MHz	N/A
	Mid Channel 4/8, 2437 MHz	36.265 MHz	N/A
	High Channel 7/11, 2452 MHz	36.338 MHz	N/A
802.11(n40) MCS7			
	Low Channel 1/5, 2422 MHz	36.239 MHz	N/A
	Mid Channel 4/8, 2437 MHz	36.27 MHz	N/A
	High Channel 7/11, 2452 MHz	36.164 MHz	N/A

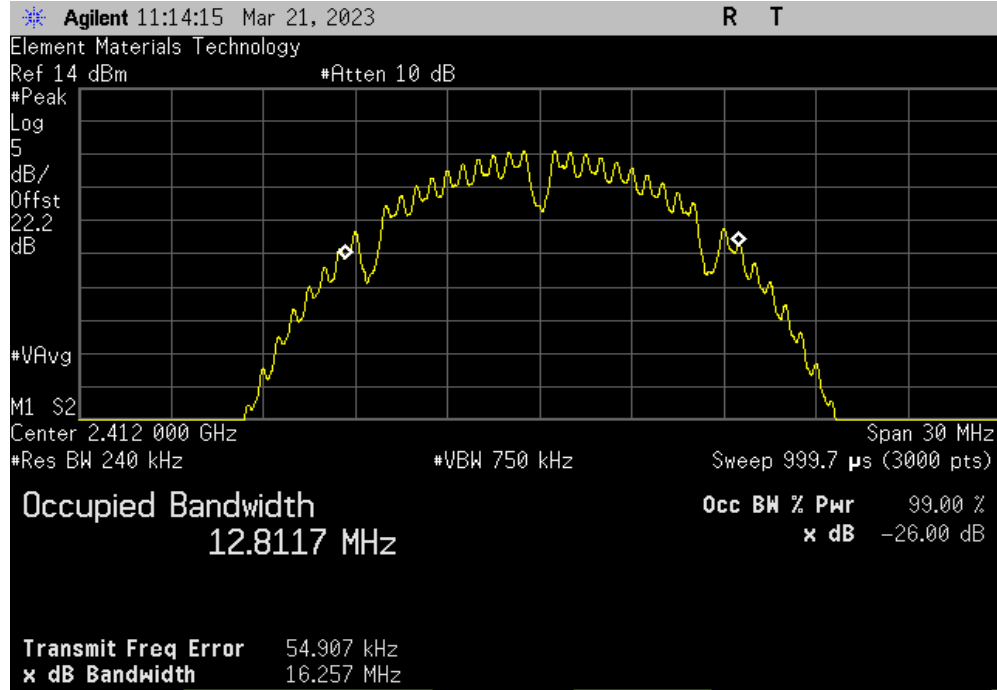
OCCUPIED BANDWIDTH



TMTx 2022.06.03.0 XMR 2023.02.14.0

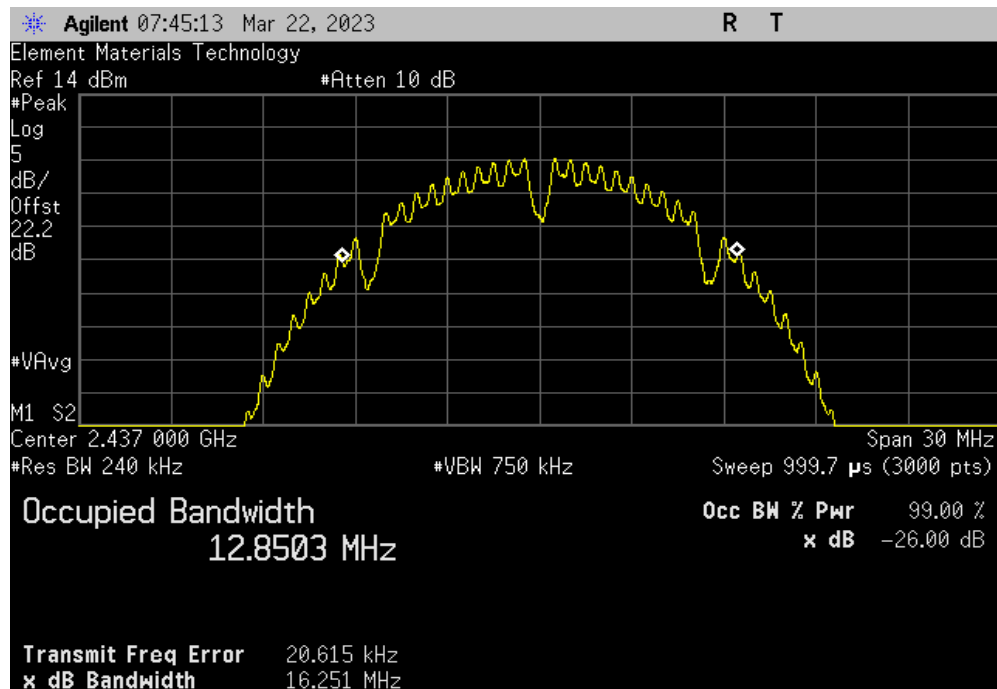
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz

				Value	Limit	Result
				12.812 MHz	N/A	N/A



2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz

				Value	Limit	Result
				12.849 MHz	N/A	N/A

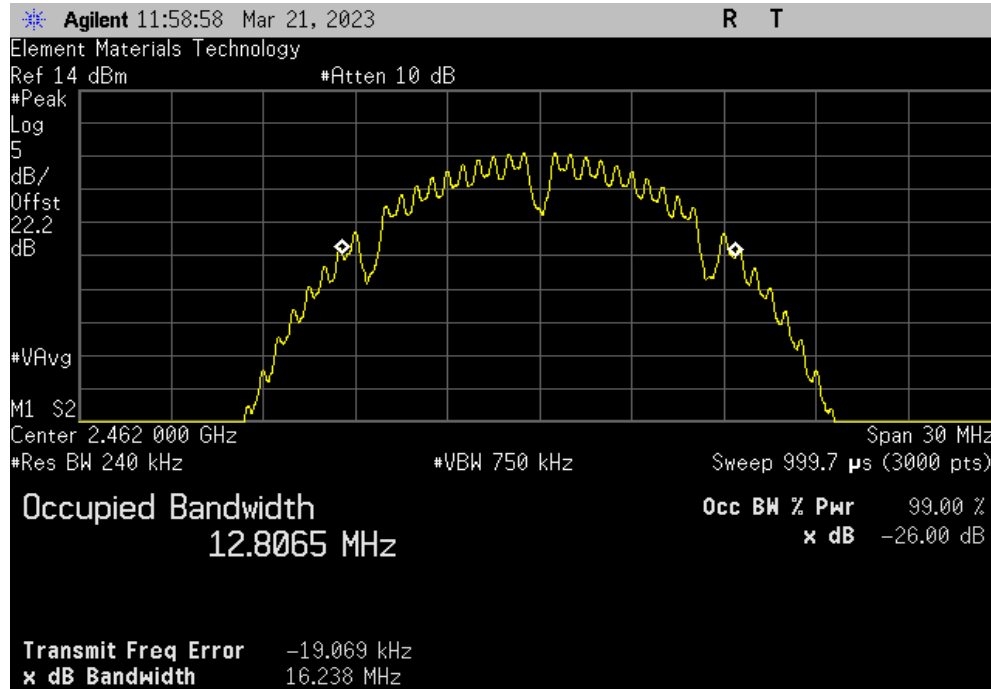


OCCUPIED BANDWIDTH

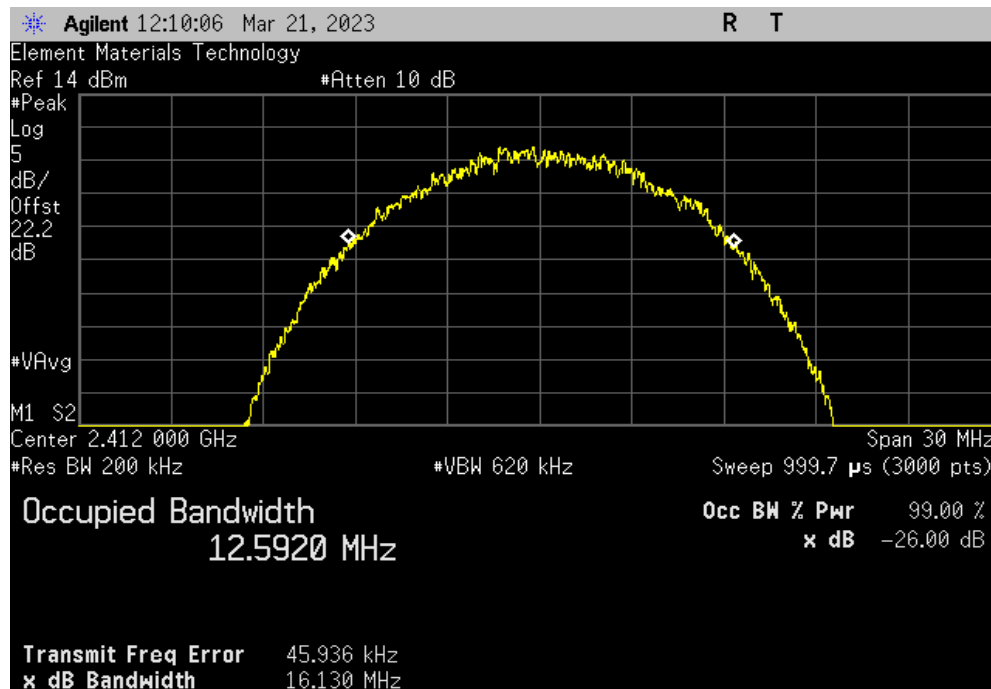


TUTTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
				Value	Limit	Result
				12.807 MHz	N/A	N/A



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				12.604 MHz	N/A	N/A

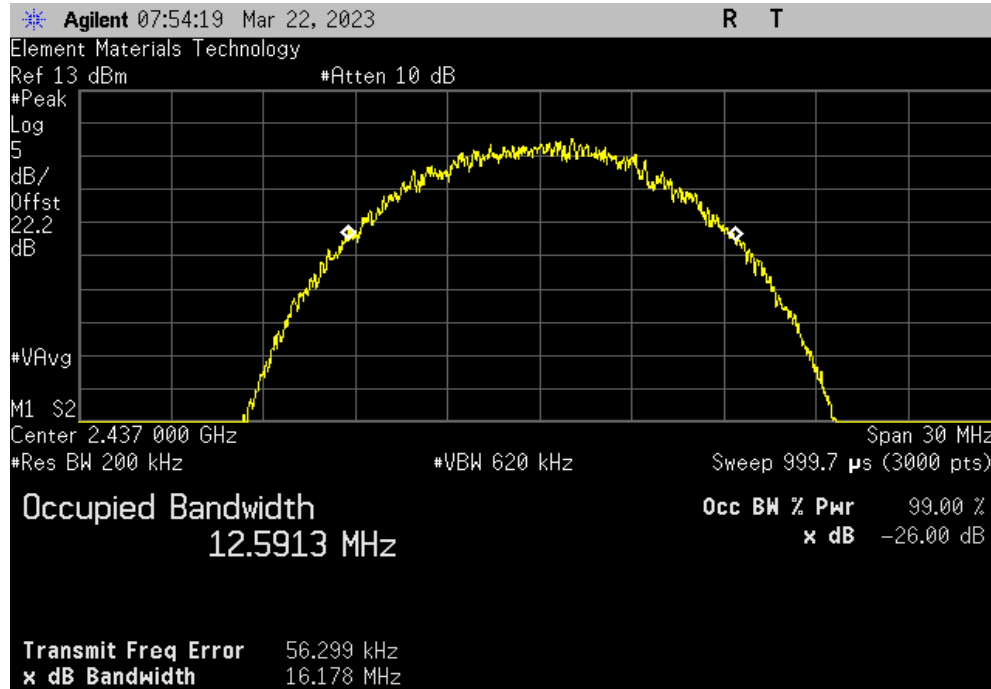


OCCUPIED BANDWIDTH

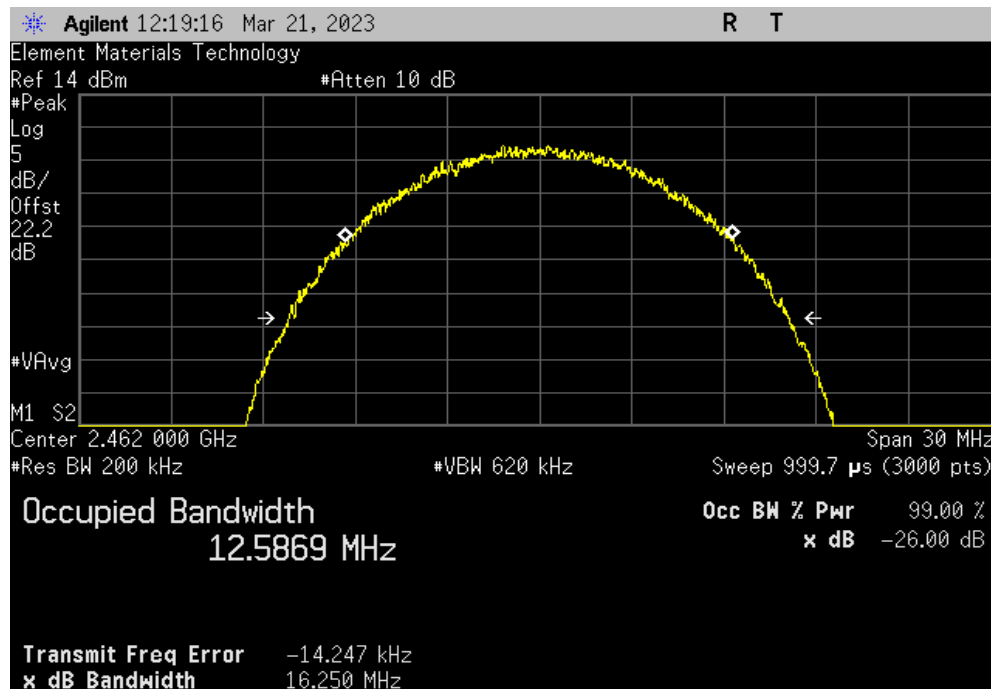


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				12.593 MHz	N/A	N/A



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
				Value	Limit	Result
				12.576 MHz	N/A	N/A



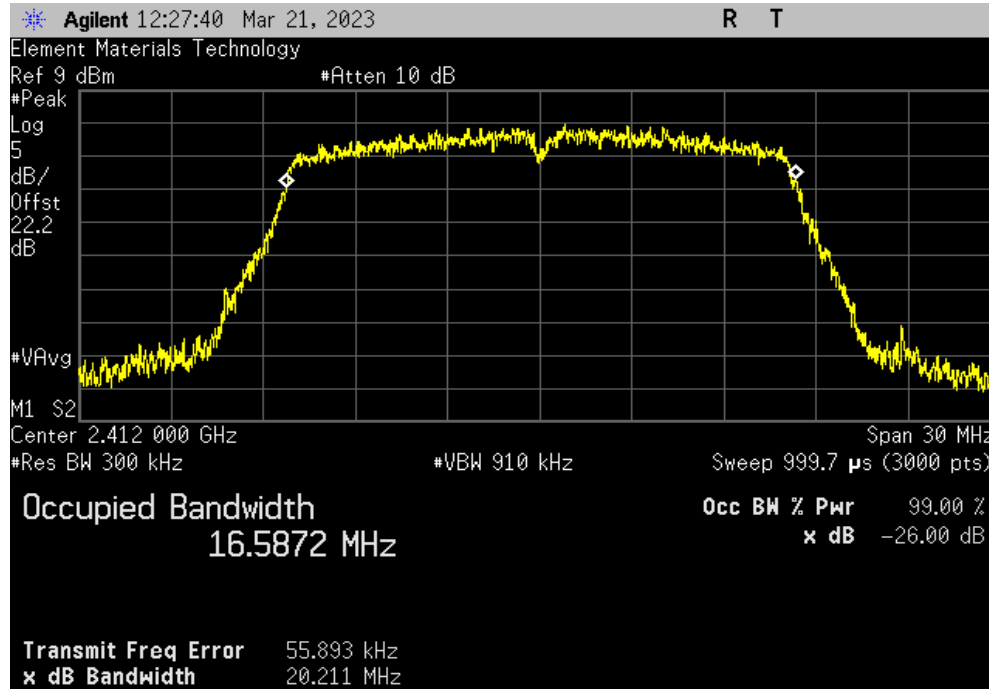
OCCUPIED BANDWIDTH



TMTx 2022.06.03.0 XMR 2023.02.14.0

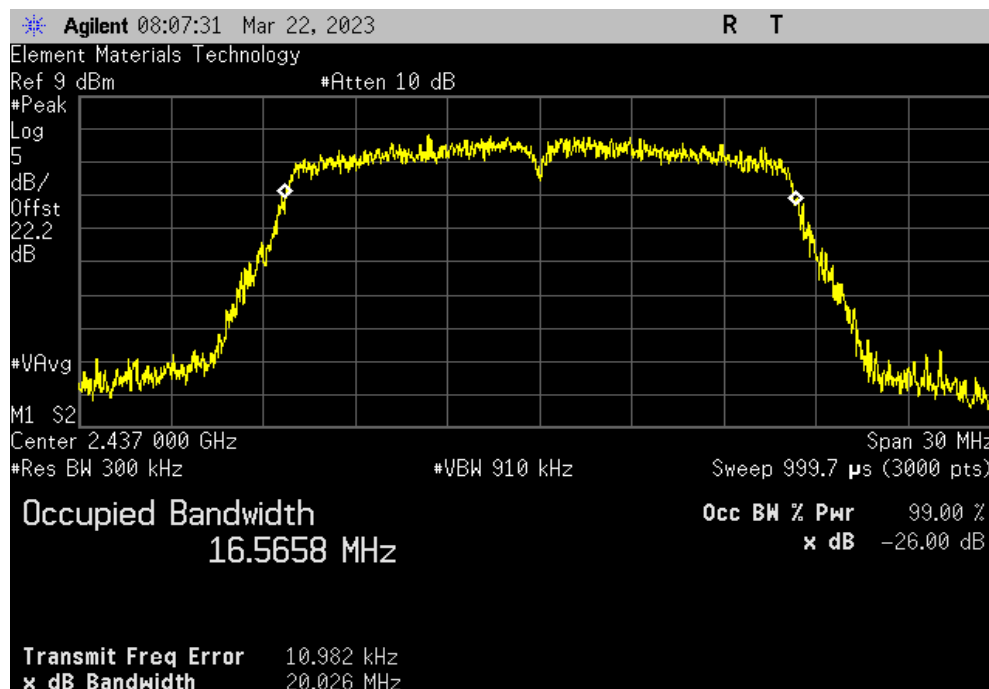
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz

	Value	Limit	Result
	16.579 MHz	N/A	N/A



2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz

	Value	Limit	Result
	16.548 MHz	N/A	N/A



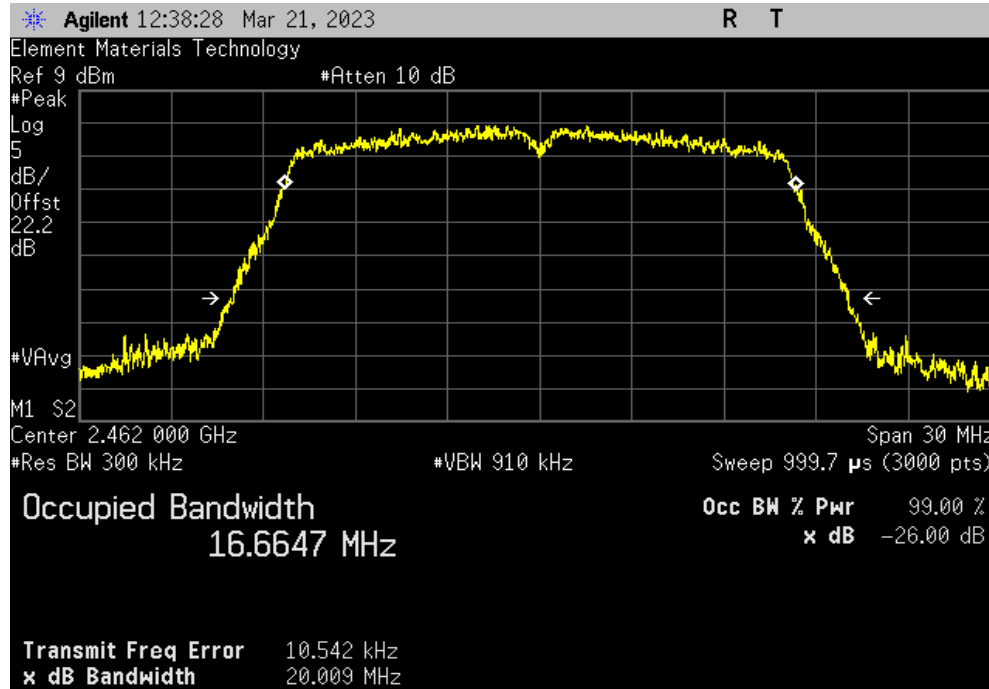
OCCUPIED BANDWIDTH



TUTTx 2022.06.03.0 XMR 2023.02.14.0

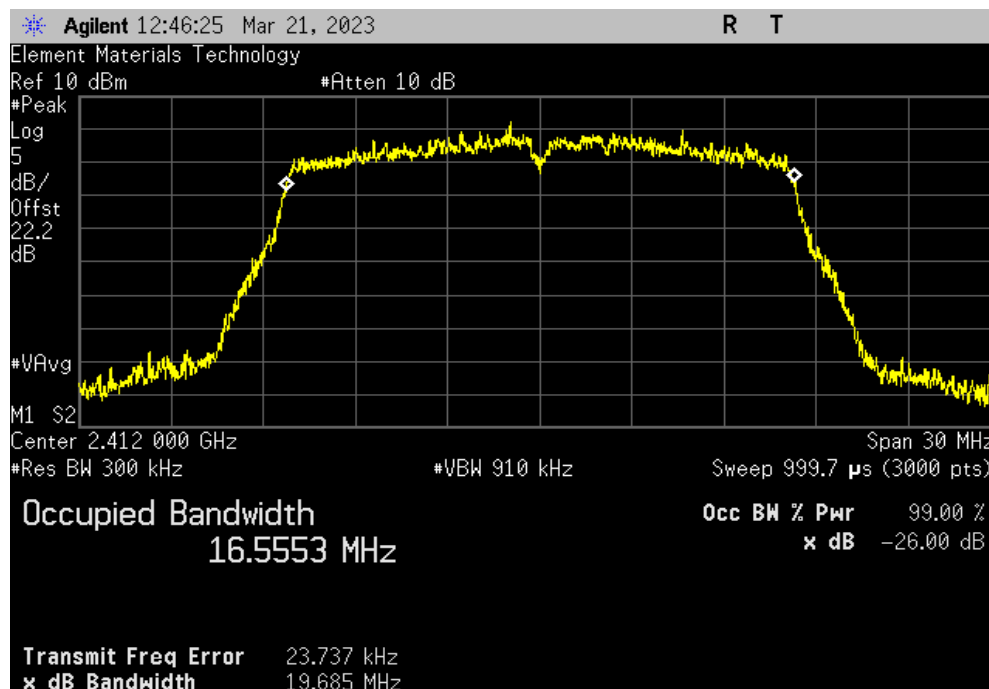
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz

				Value	Limit	Result
				16.666 MHz	N/A	N/A



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz

				Value	Limit	Result
				16.554 MHz	N/A	N/A



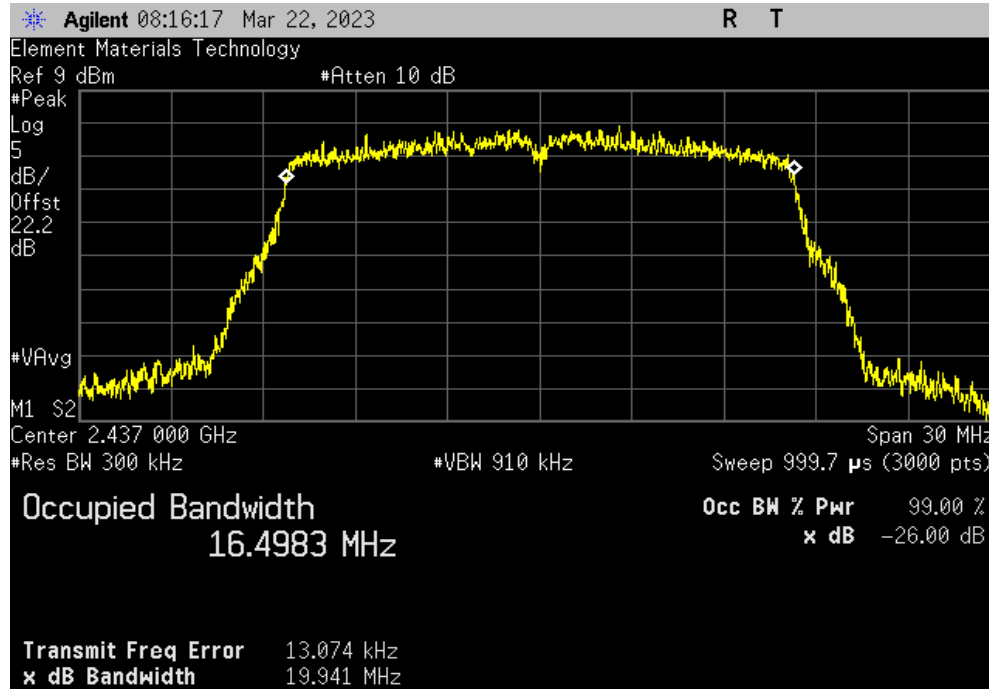
OCCUPIED BANDWIDTH



TUTTx 2022.06.03.0 XMR 2023.02.14.0

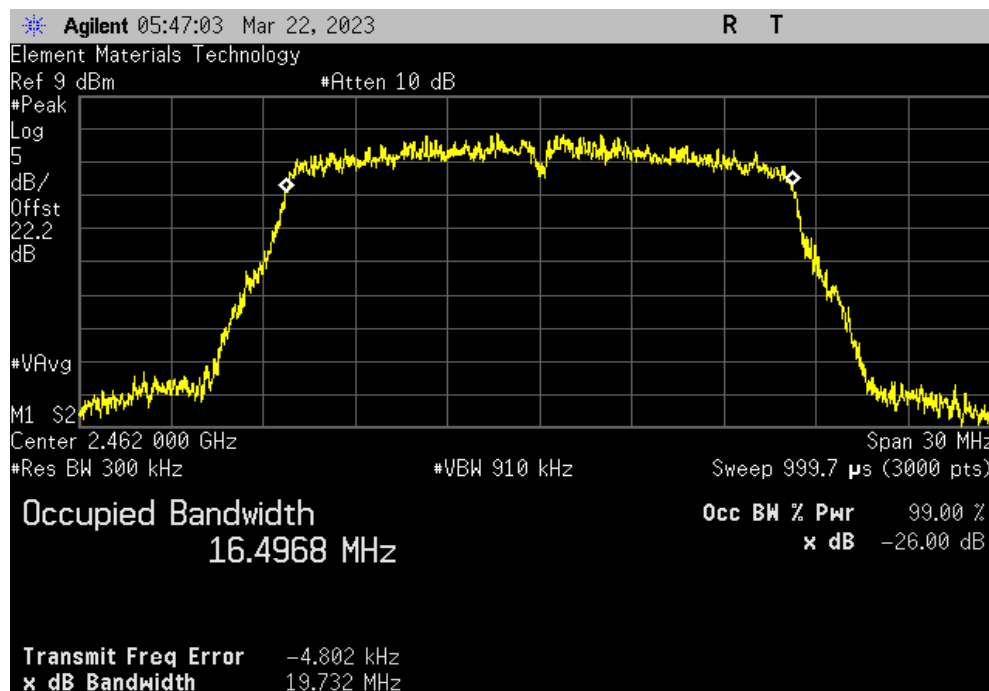
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz

	Value	Limit	Result
	16.482 MHz	N/A	N/A



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz

	Value	Limit	Result
	16.488 MHz	N/A	N/A



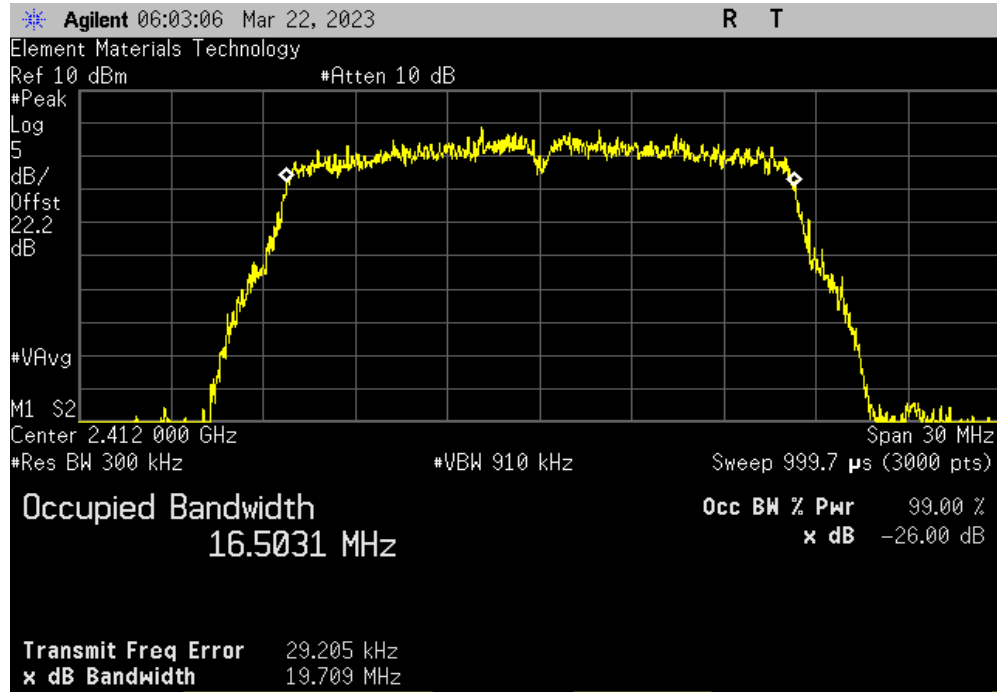
OCCUPIED BANDWIDTH



TMTx 2022.06.03.0 XMR 2023.02.14.0

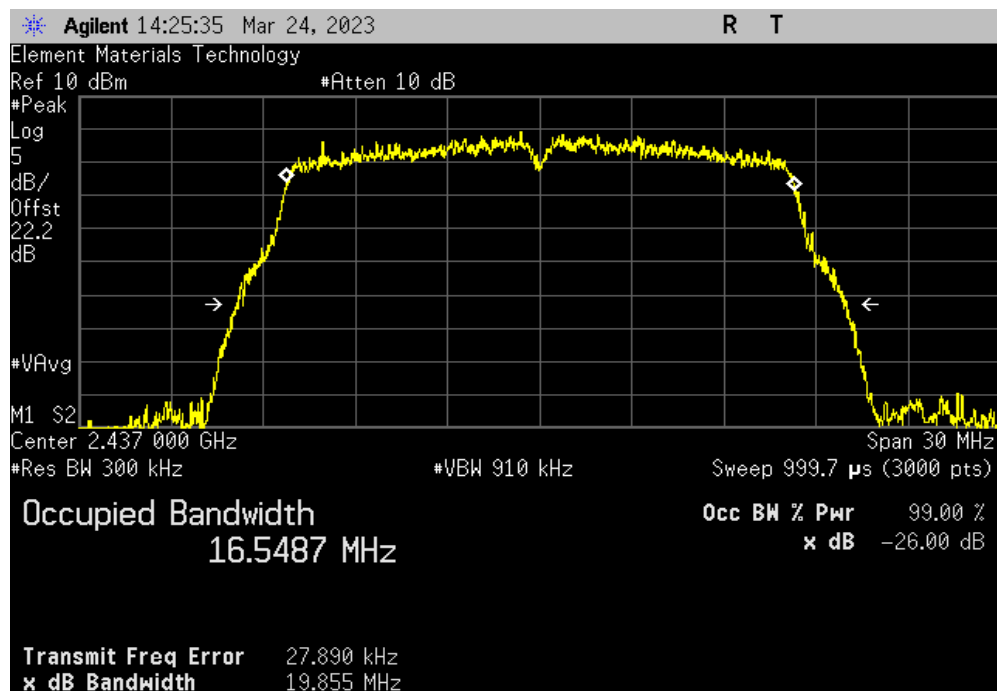
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz

	Value	Limit	Result
	16.495 MHz	N/A	N/A



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz

	Value	Limit	Result
	16.54 MHz	N/A	N/A



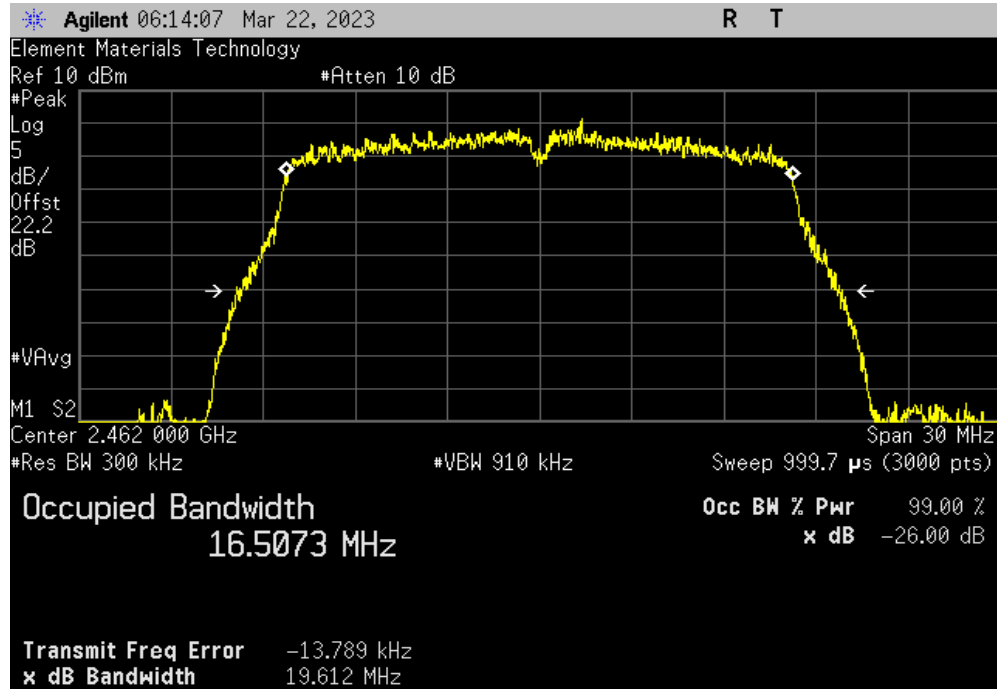
OCCUPIED BANDWIDTH



TMTx 2022.06.03.0 XMR 2023.02.14.0

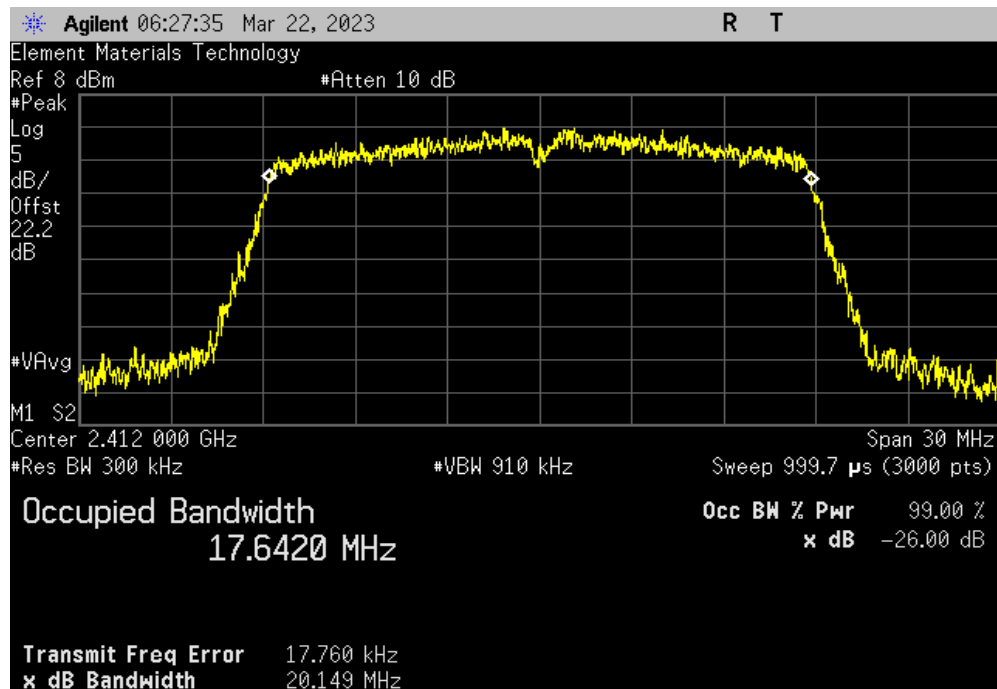
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz

	Value	Limit	Result
	16.504 MHz	N/A	N/A



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, Low Channel 1, 2412 MHz

	Value	Limit	Result
	17.63 MHz	N/A	N/A

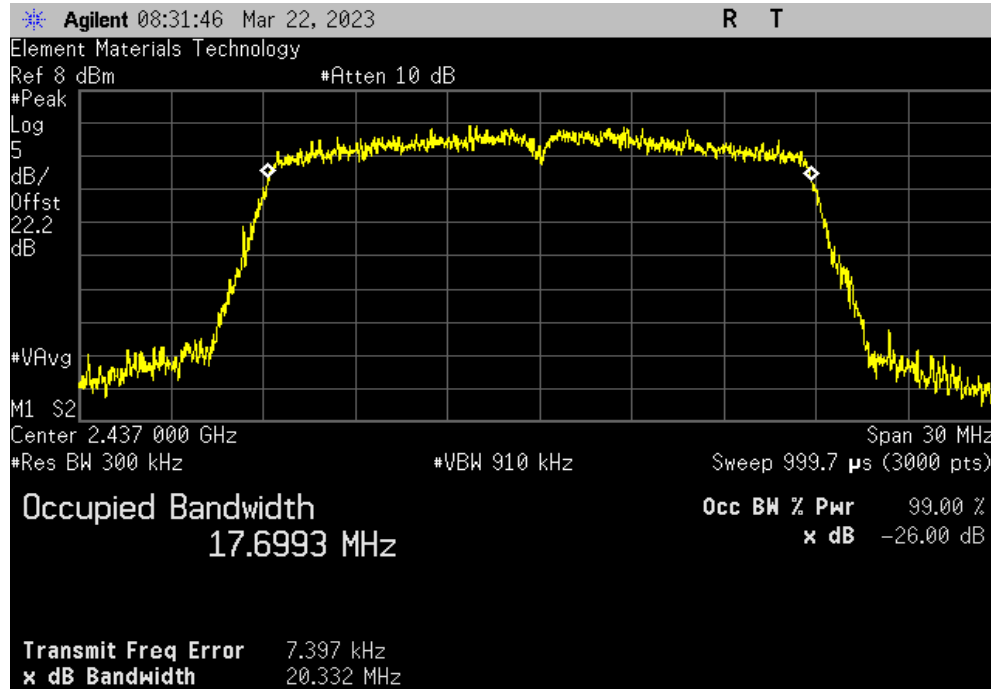


OCCUPIED BANDWIDTH

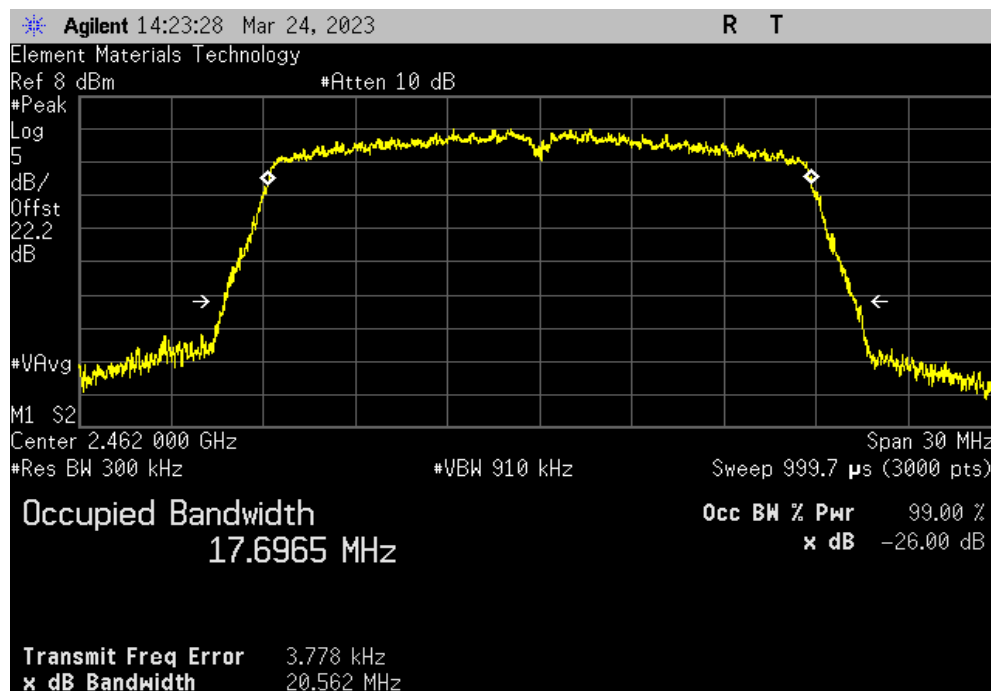


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				17.699 MHz	N/A	N/A



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, High Channel 11, 2462 MHz						
				Value	Limit	Result
				17.695 MHz	N/A	N/A



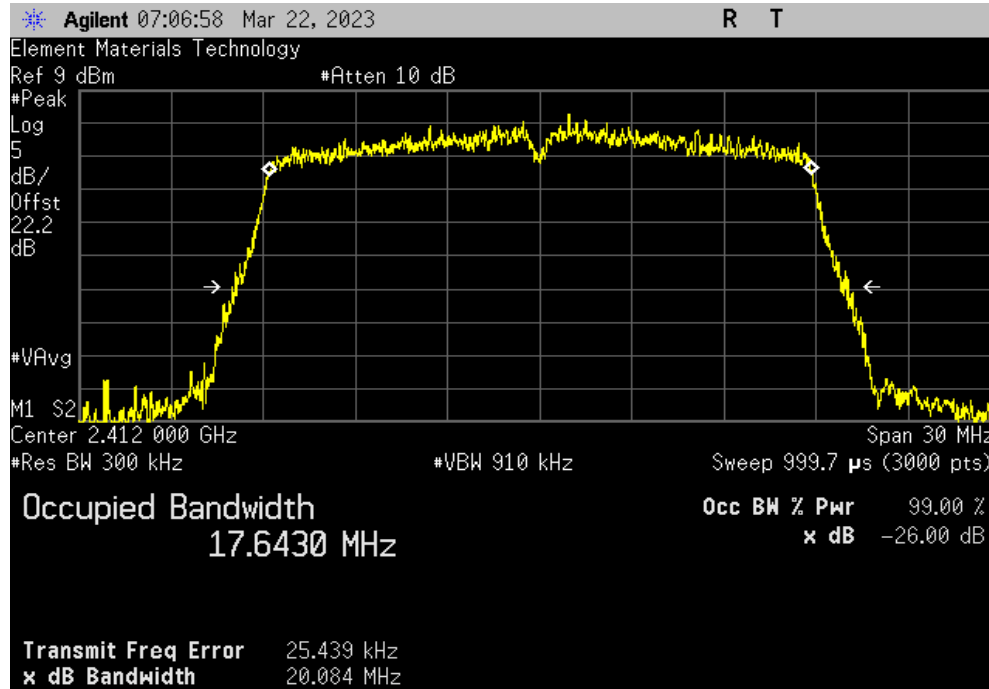
OCCUPIED BANDWIDTH



TMTx 2022.06.03.0 XMR 2023.02.14.0

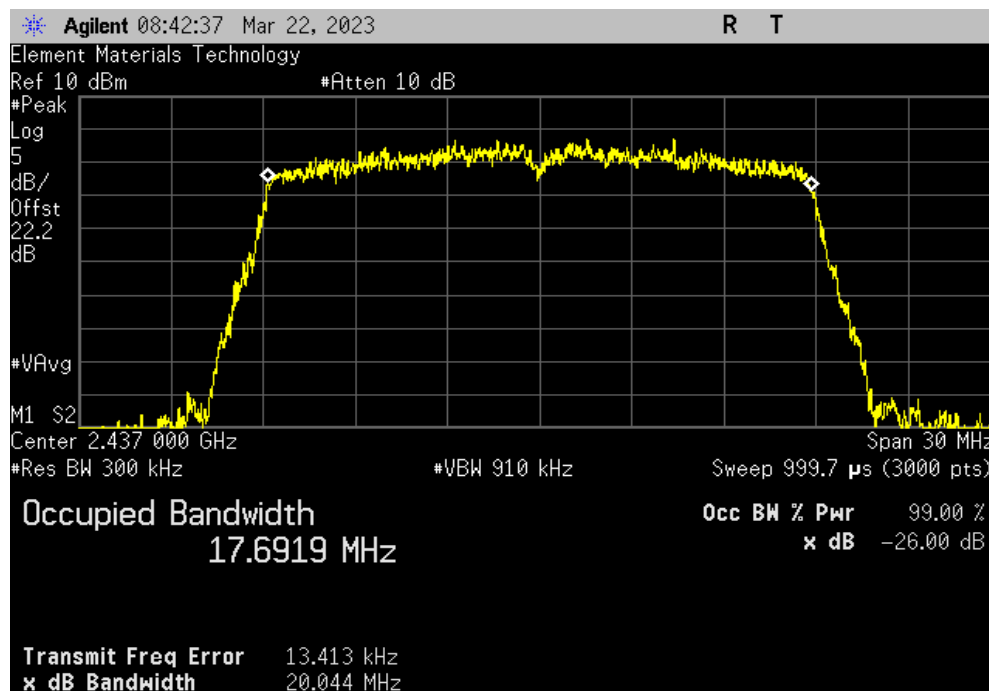
2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, Low Channel 1, 2412 MHz

	Value	Limit	Result
	17.639 MHz	N/A	N/A



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, Mid Channel 6, 2437 MHz

	Value	Limit	Result
	17.689 MHz	N/A	N/A

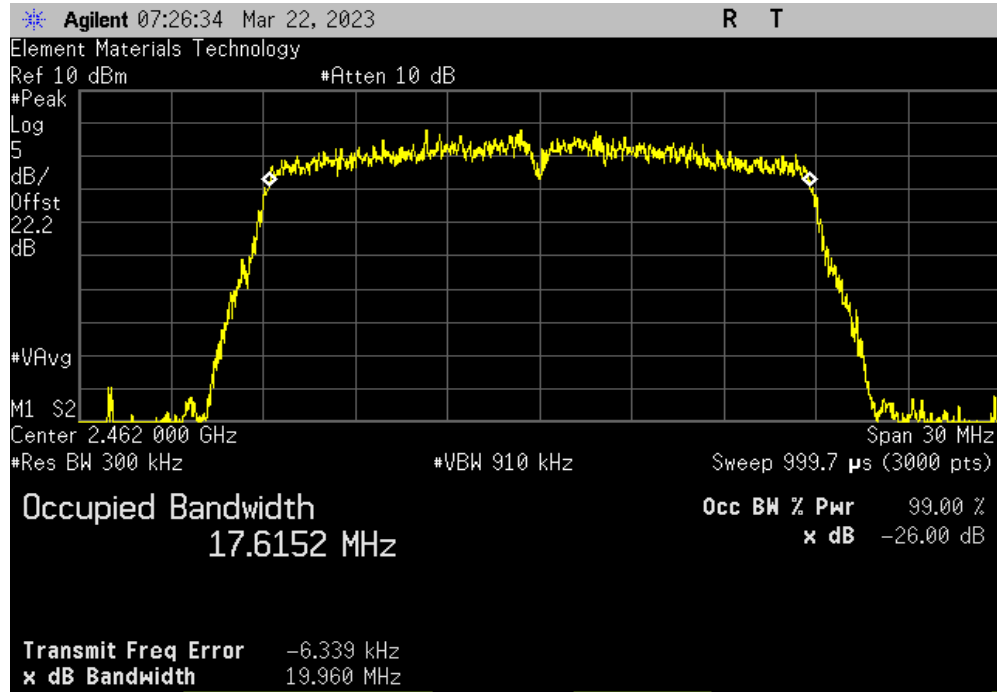


OCCUPIED BANDWIDTH

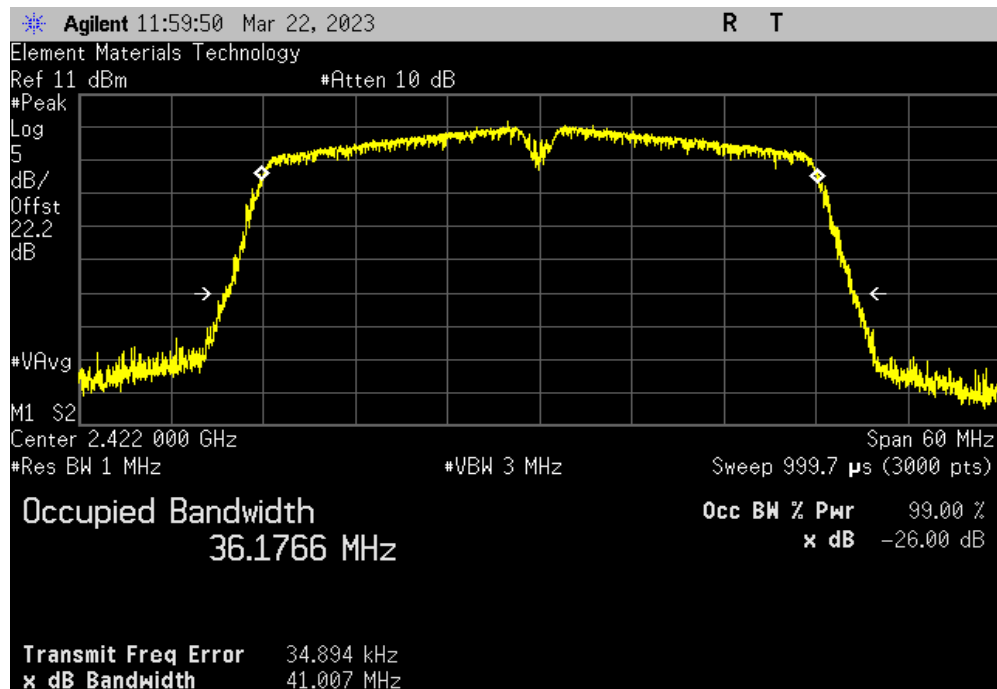


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, High Channel 11, 2462 MHz						
				Value	Limit	Result
				17.61 MHz	N/A	N/A



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Low Channel 1/5, 2422 MHz						
				Value	Limit	Result
				36.16 MHz	N/A	N/A

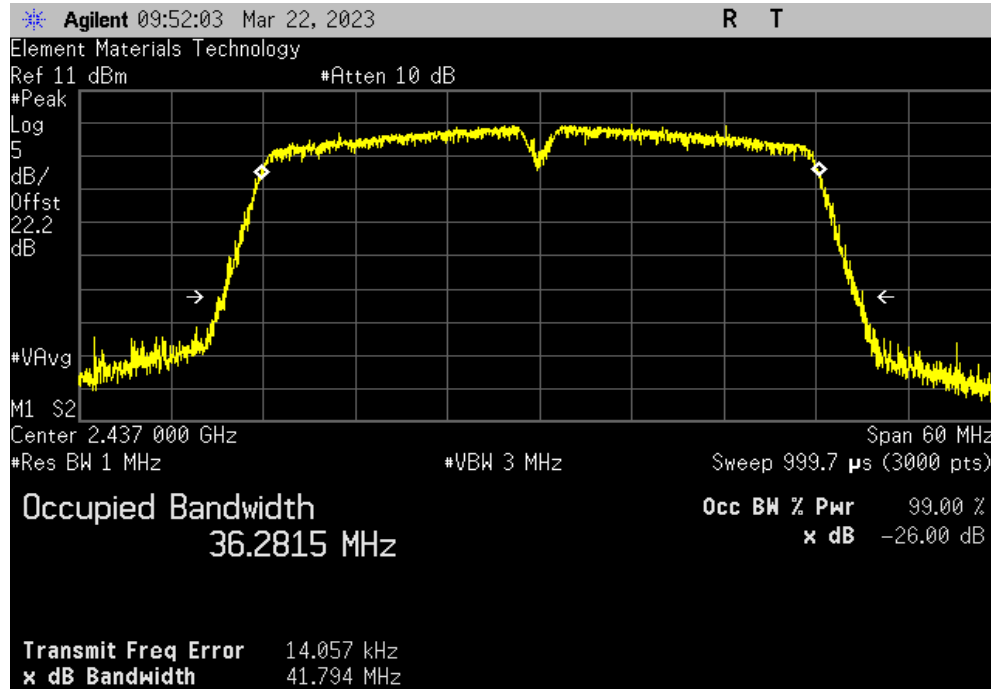


OCCUPIED BANDWIDTH

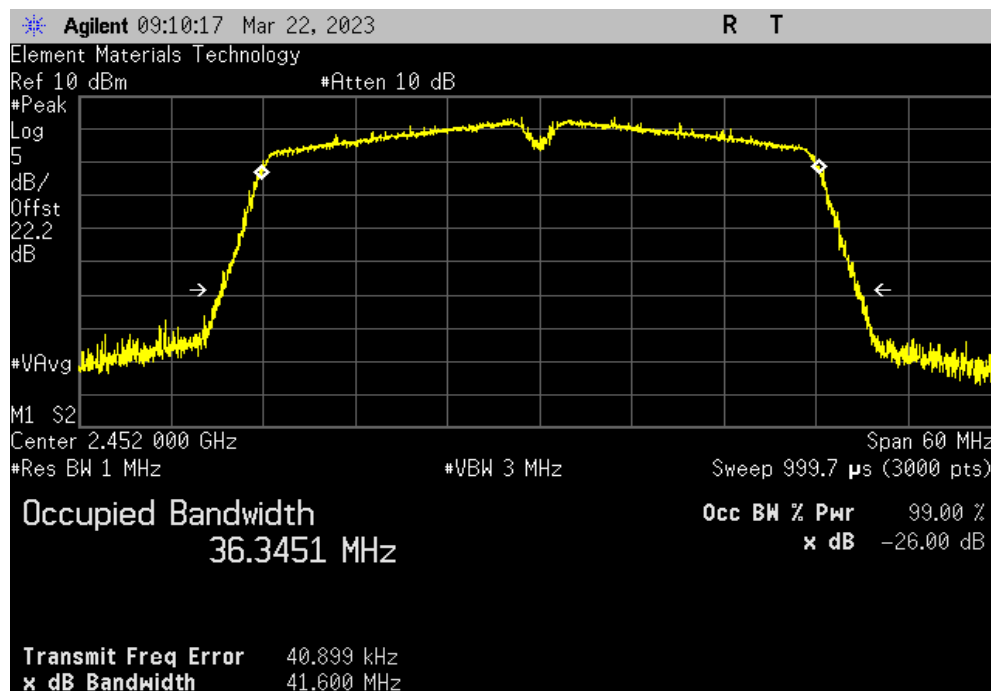


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Mid Channel 4/8, 2437 MHz						
				Value	Limit	Result
				36.265 MHz	N/A	N/A



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, High Channel 7/11, 2452 MHz						
				Value	Limit	Result
				36.338 MHz	N/A	N/A

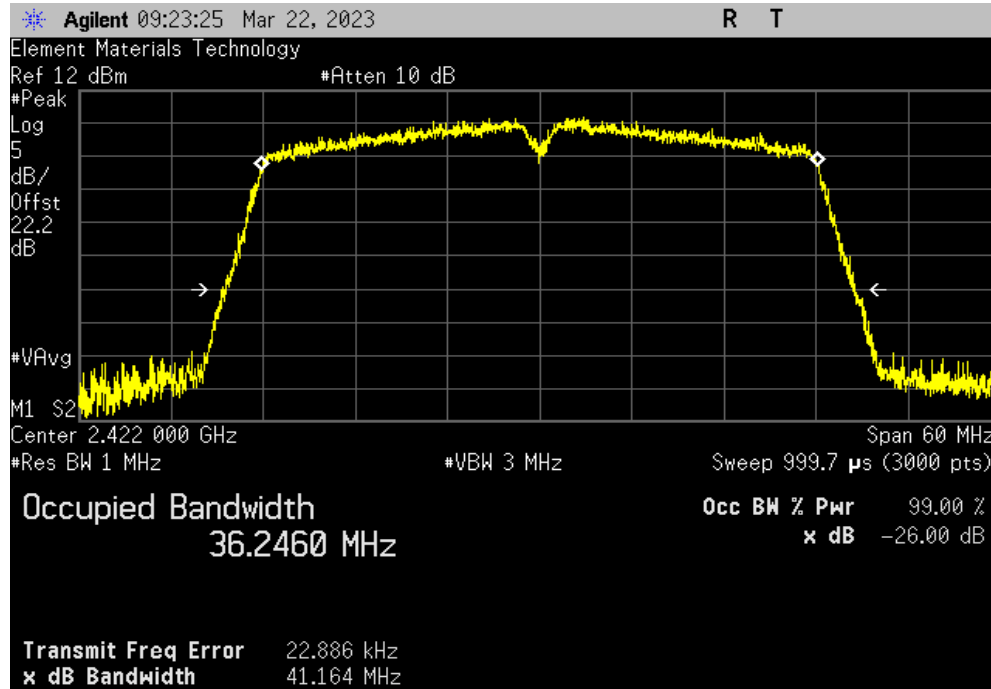


OCCUPIED BANDWIDTH

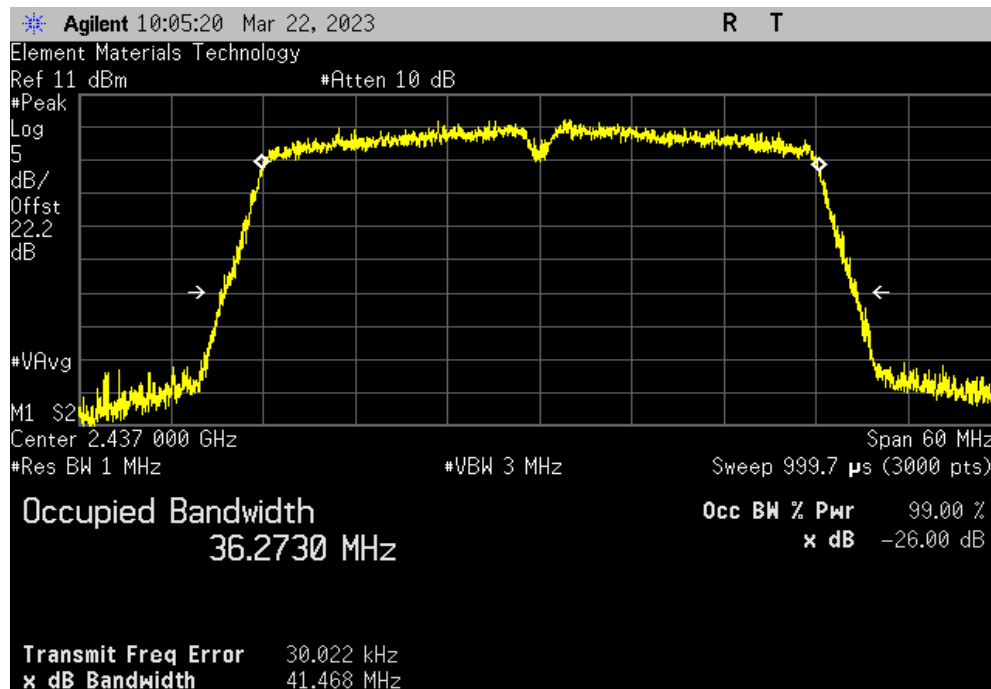


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Low Channel 1/5, 2422 MHz						
				Value	Limit	Result
				36.239 MHz	N/A	N/A



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Mid Channel 4/8, 2437 MHz						
				Value	Limit	Result
				36.27 MHz	N/A	N/A

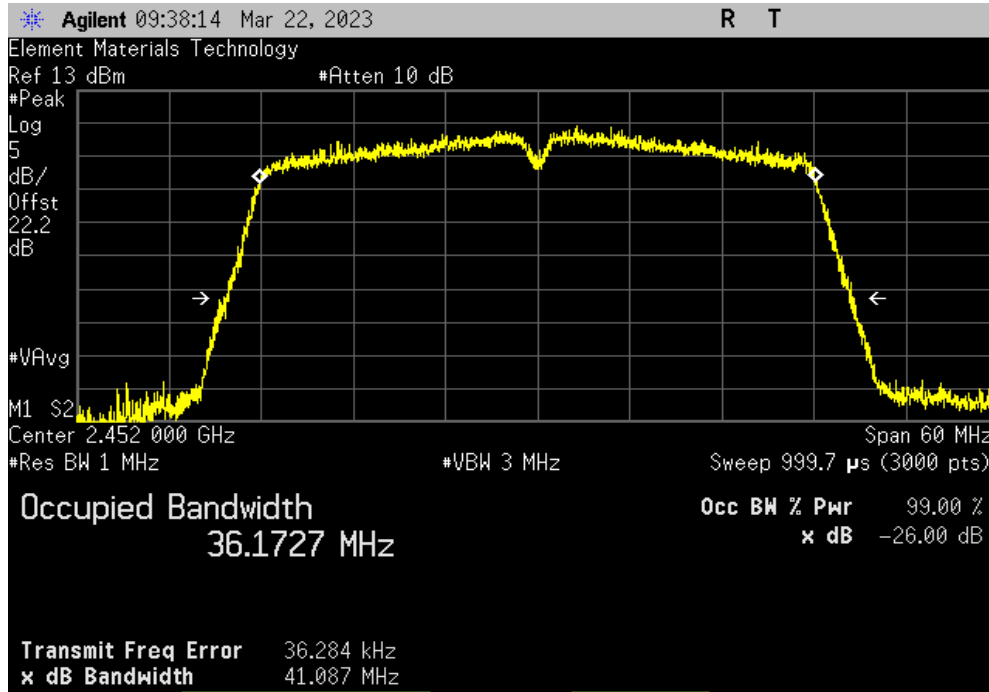


OCCUPIED BANDWIDTH



TbTx 2022.06.03.0 XbTx 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, High Channel 7/11, 2452 MHz						
				Value	Limit	Result
				36.164 MHz	N/A	N/A



OUTPUT POWER



XMH 2023.02.14.0

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
Block - DC	Aeroflex	INMET 8535	AMO	2023-01-30	2024-01-30
Attenuator	Fairview Microwave	SA18H-20	UAX	2022-07-26	2023-07-26
Cable	Element	None	OC5	2023-01-30	2024-01-30
Generator - Signal	Agilent	E8257D	TGU	2020-11-03	2023-11-03
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2022-10-21	2023-10-21

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The fundamental emission output power (maximum average conducted output power) was measured using the channels and modes as called out on the following data sheets. The transmit power was set to its default maximum.

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

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

OUTPUT POWER



TSMTx 2022.06.03.0 XMR 2023.02.14.0

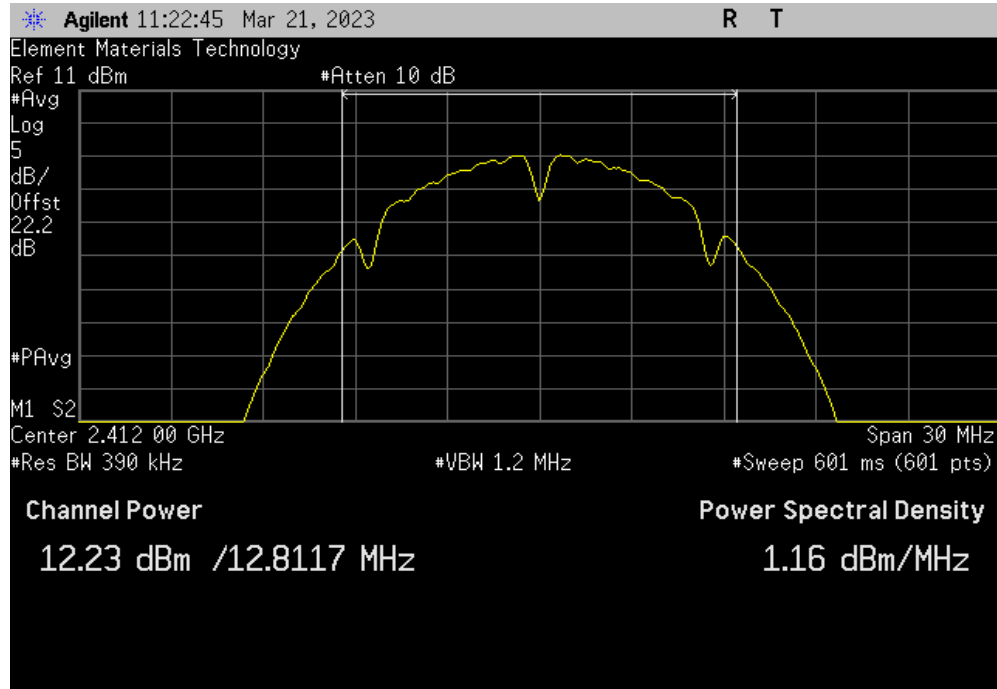
EUT: TSI Inc. OmniTrak		Work Order: TSIN0196				
Serial Number: TSI5221200068		Date: 03/22/23				
Customer: TSI, Incorporated		Temperature: 19.8°C				
Attendees: None		Humidity: 49.1%				
Project: None		Barometric Pres.: 1022 mbar				
Tested by: Nolan De Ramos, Luis Flores		Power: 5VDC via Battery				
		Job Site: OC11				
TEST SPECIFICATIONS		Test Method				
FCC 15.247:2023		ANSI C63.10:2013				
RSS-Gen Issue 5:2018+A1:2019+A2:2021		ANSI C63.10:2013				
RSS-247 Issue 2:2017		ANSI C63.10:2013				
COMMENTS						
Reference level offset includes measurement cable, DC block, and attenuator.						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	TSIN0196-8	Signature 				
		Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result
2400 MHz - 2483.5 MHz Band						
802.11(b) 1 Mbps						
	Low Channel 1, 2412 MHz	12.233	0	12.2	30	Pass
	Mid Channel 6, 2437 MHz	11.974	0	12	30	Pass
	High Channel 11, 2462 MHz	12.268	0	12.3	30	Pass
802.11(b) 11 Mbps						
	Low Channel 1, 2412 MHz	12.419	0	12.4	30	Pass
	Mid Channel 6, 2437 MHz	11.978	0	12	30	Pass
	High Channel 11, 2462 MHz	12.239	0	12.2	30	Pass
802.11(g) 6 Mbps						
	Low Channel 1, 2412 MHz	12.075	0	12.1	30	Pass
	Mid Channel 6, 2437 MHz	11.66	0	11.7	30	Pass
	High Channel 11, 2462 MHz	11.887	0	11.9	30	Pass
802.11(g) 36 Mbps						
	Low Channel 1, 2412 MHz	12.065	0	12.1	30	Pass
	Mid Channel 6, 2437 MHz	11.426	0	11.4	30	Pass
	High Channel 11, 2462 MHz	10.877	0	10.9	30	Pass
802.11(g) 54 Mbps						
	Low Channel 1, 2412 MHz	11.515	0	11.5	30	Pass
	Mid Channel 6, 2437 MHz	11.415	0	11.4	30	Pass
	High Channel 11, 2462 MHz	11.548	0	11.5	30	Pass
802.11(n20) MCS0						
	Low Channel 1, 2412 MHz	11.636	0	11.6	30	Pass
	Mid Channel 6, 2437 MHz	11.122	0	11.1	30	Pass
	High Channel 11, 2462 MHz	11.403	0	11.4	30	Pass
802.11(n20) MCS7						
	Low Channel 1, 2412 MHz	11.801	0	11.8	30	Pass
	Mid Channel 6, 2437 MHz	11.547	0	11.5	30	Pass
	High Channel 11, 2462 MHz	11.661	0	11.7	30	Pass
802.11(n40) MCS0						
	Low Channel 1/5, 2422 MHz	11.722	0	11.7	30	Pass
	Mid Channel 4/8, 2437 MHz	11.643	0	11.6	30	Pass
	High Channel 7/11, 2452 MHz	11.694	0	11.7	30	Pass
802.11(n40) MCS7						
	Low Channel 1/5, 2422 MHz	12.16	0	12.2	30	Pass
	Mid Channel 4/8, 2437 MHz	11.862	0	11.9	30	Pass
	High Channel 7/11, 2452 MHz	11.67	0	11.7	30	Pass

OUTPUT POWER

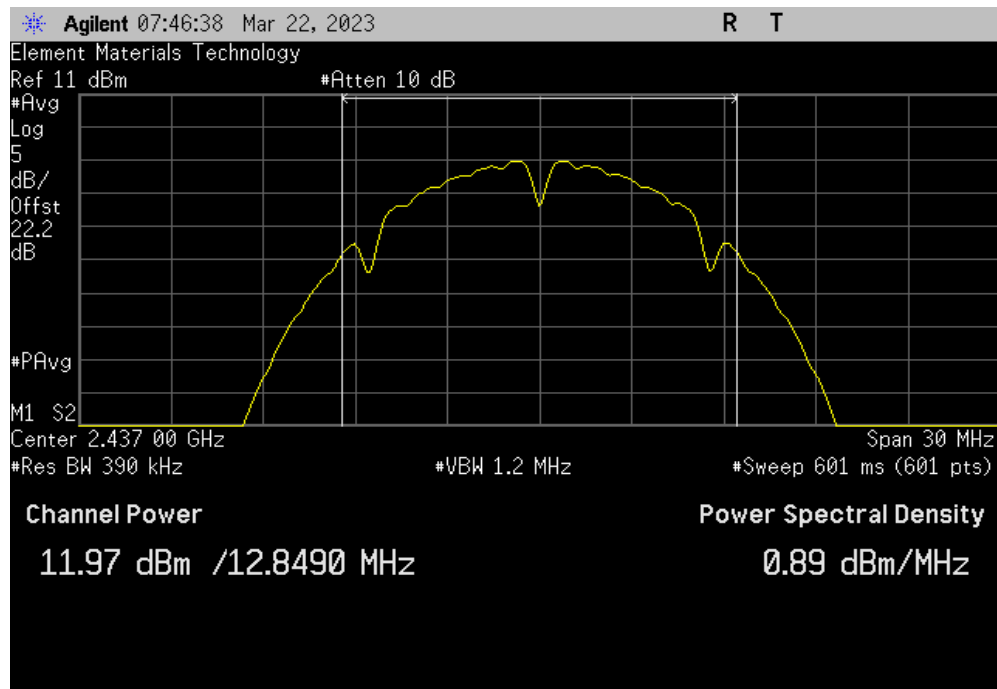


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	12.233	0	12.2	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.974	0	12	30	Pass	

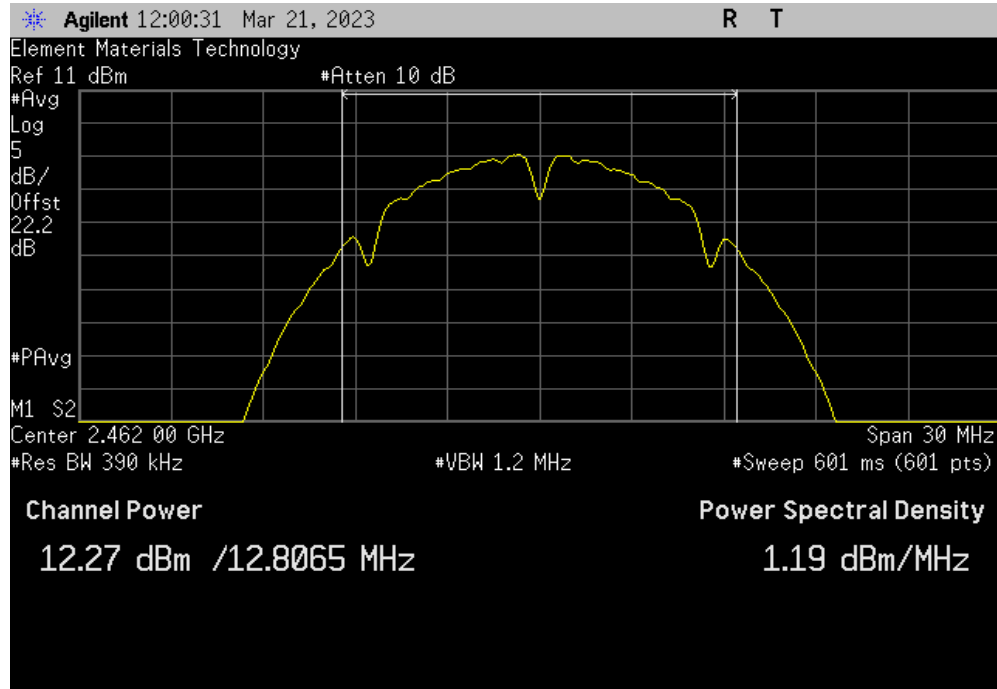


OUTPUT POWER

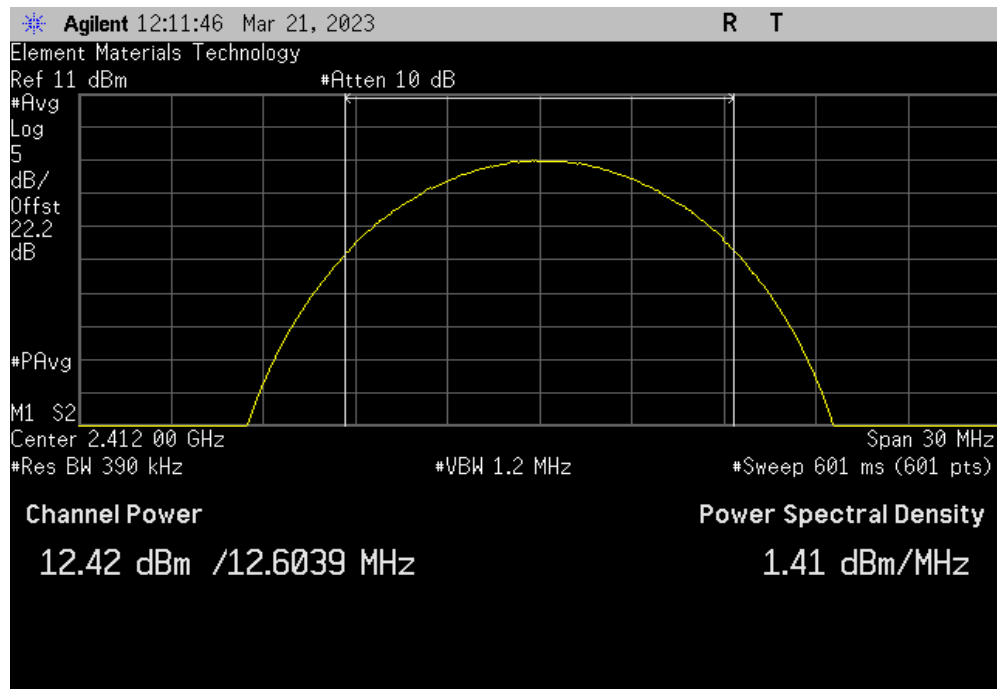


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	12.268	0	12.3	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	12.419	0	12.4	30	Pass	

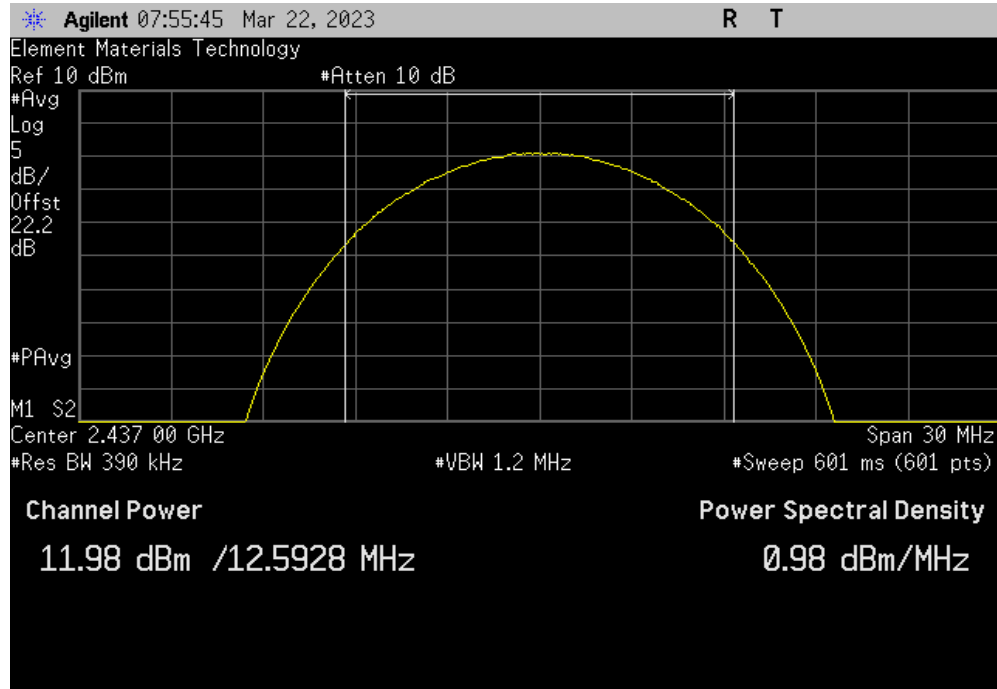


OUTPUT POWER

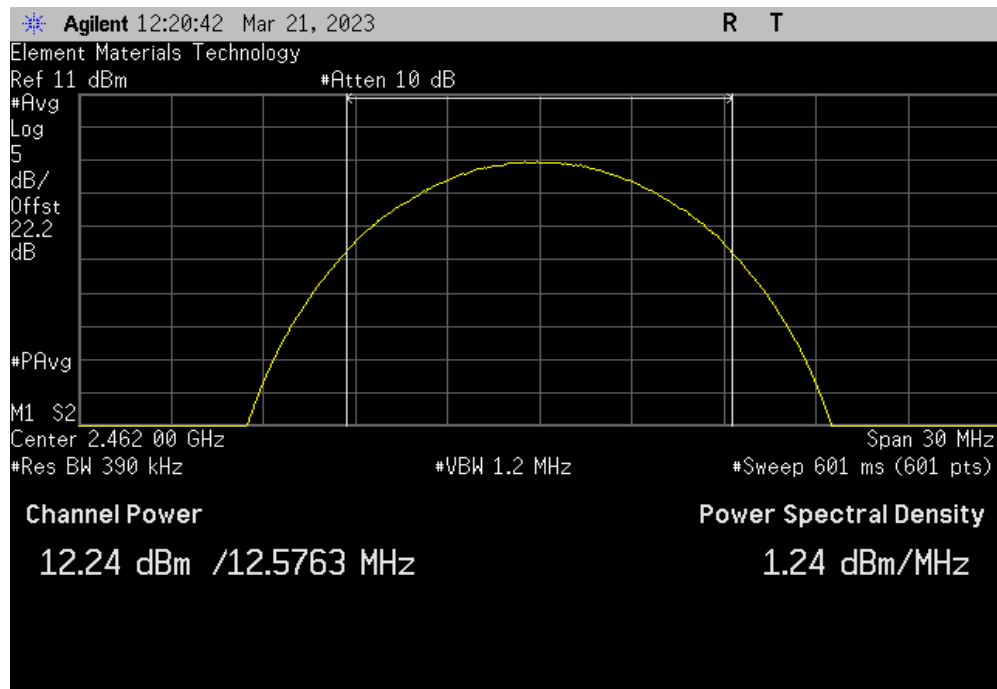


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.978	0	12	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	12.239	0	12.2	30	Pass	

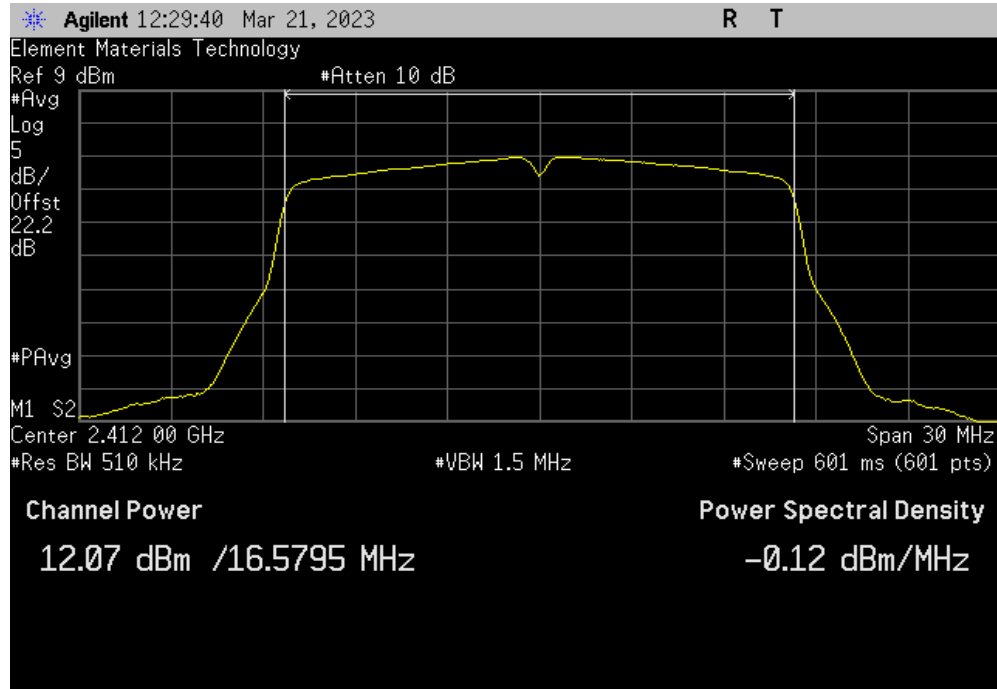


OUTPUT POWER

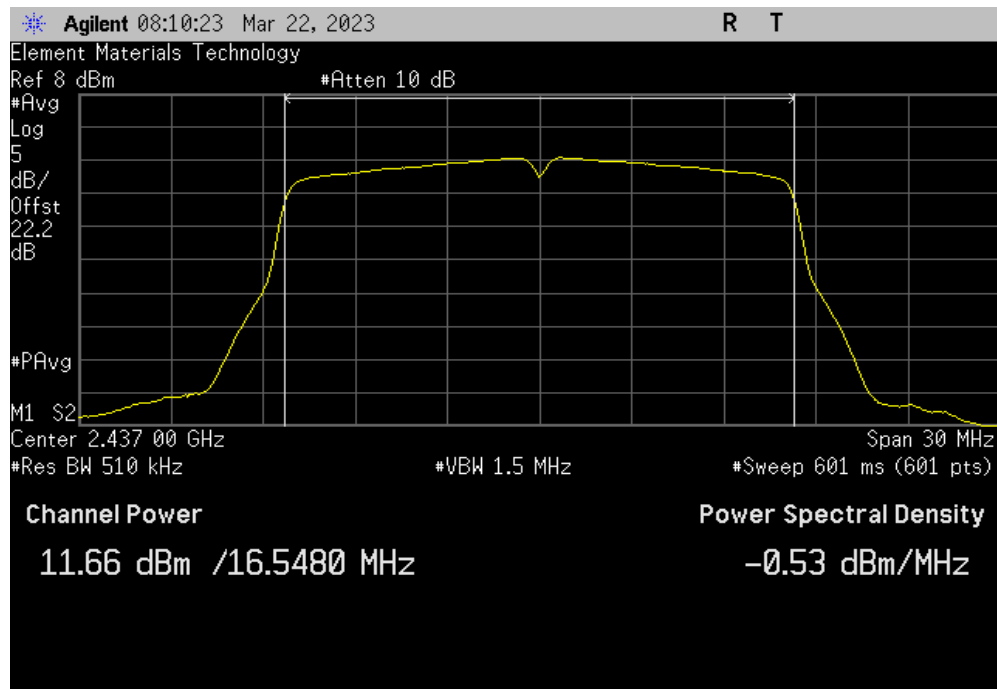


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	12.075	0	12.1	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.66	0	11.7	30	Pass	

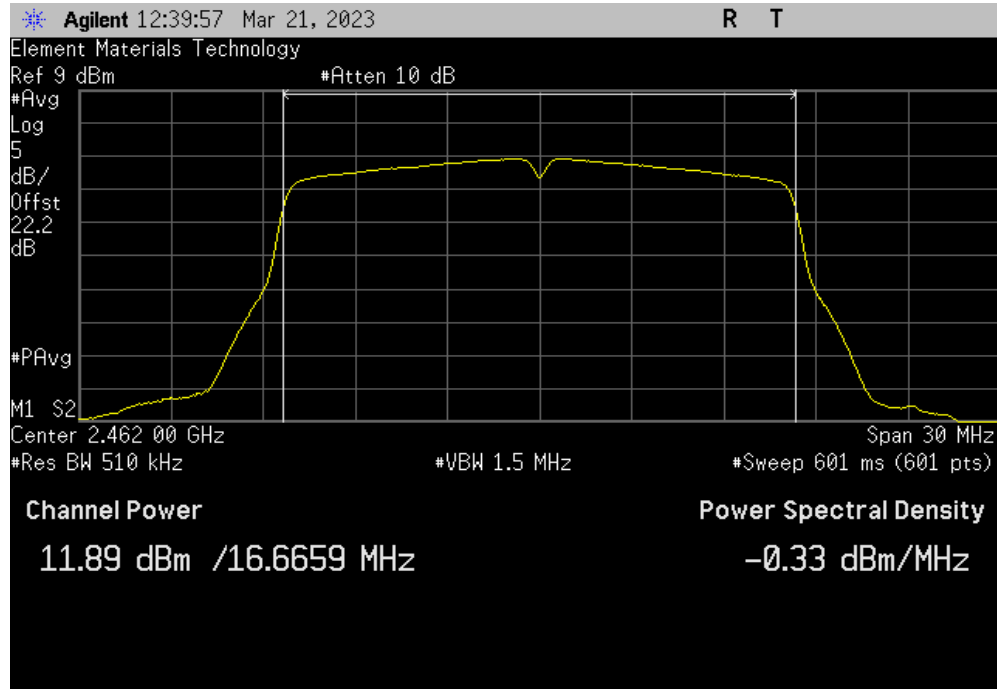


OUTPUT POWER

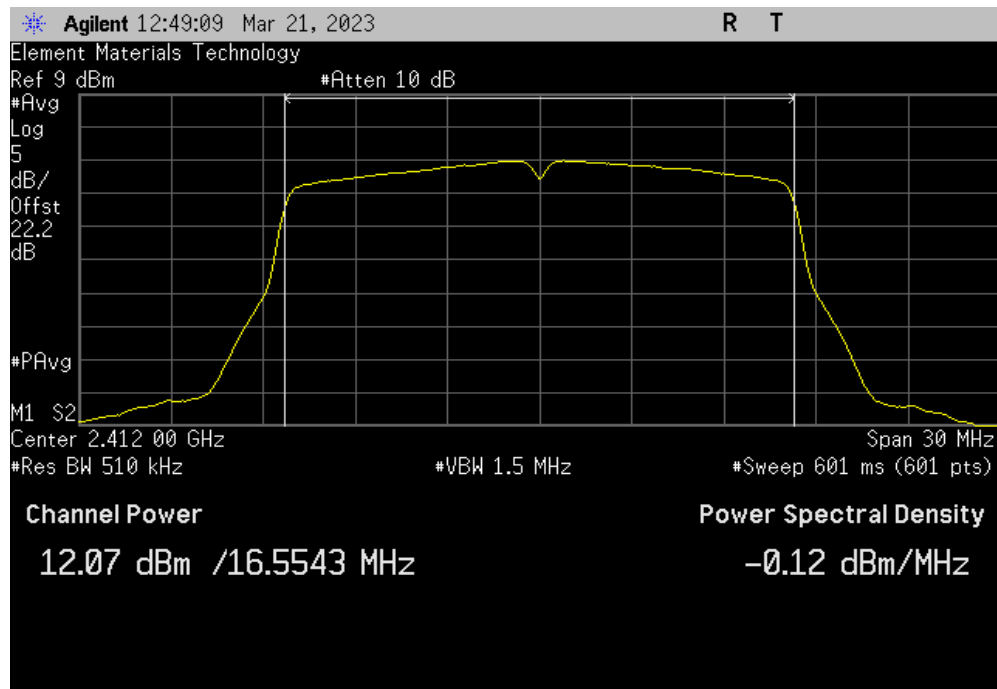


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.887	0	11.9	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	12.065	0	12.1	30	Pass	

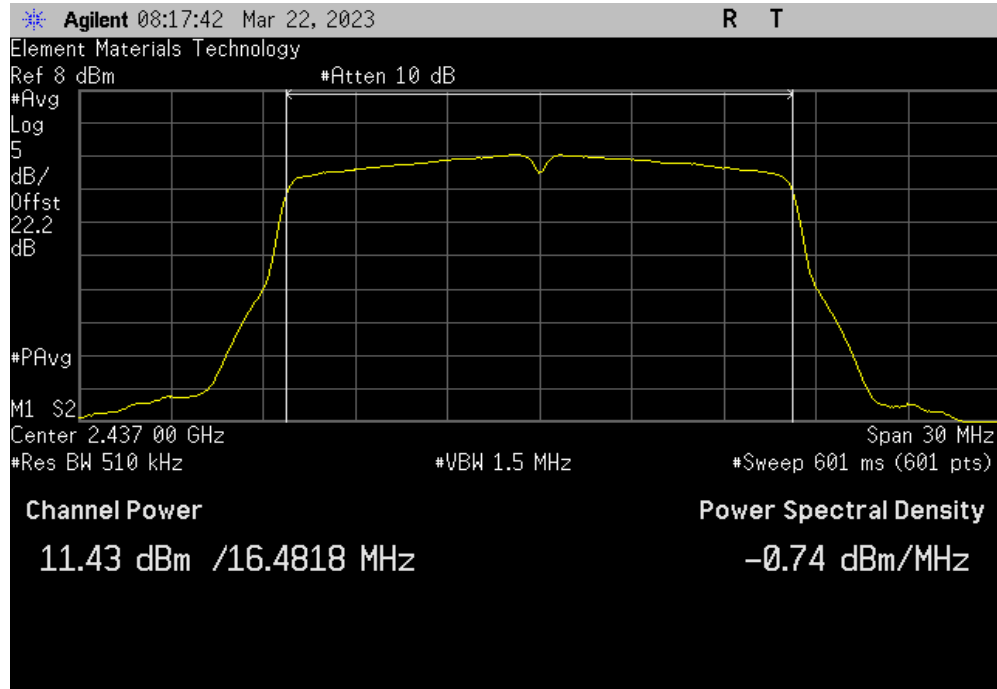


OUTPUT POWER

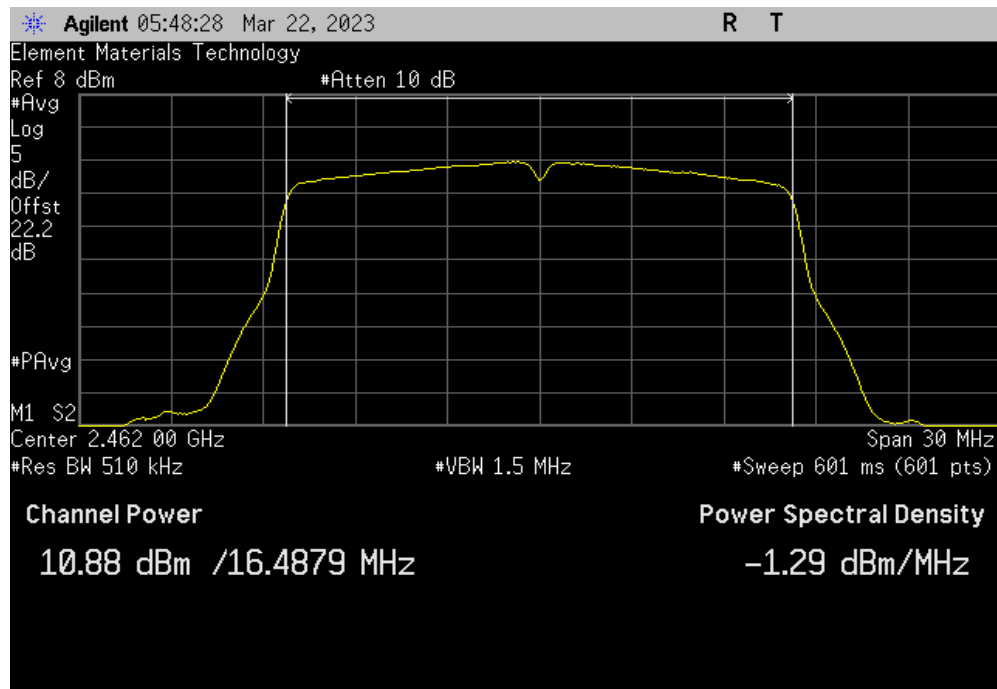


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.426	0	11.4	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	10.877	0	10.9	30	Pass	

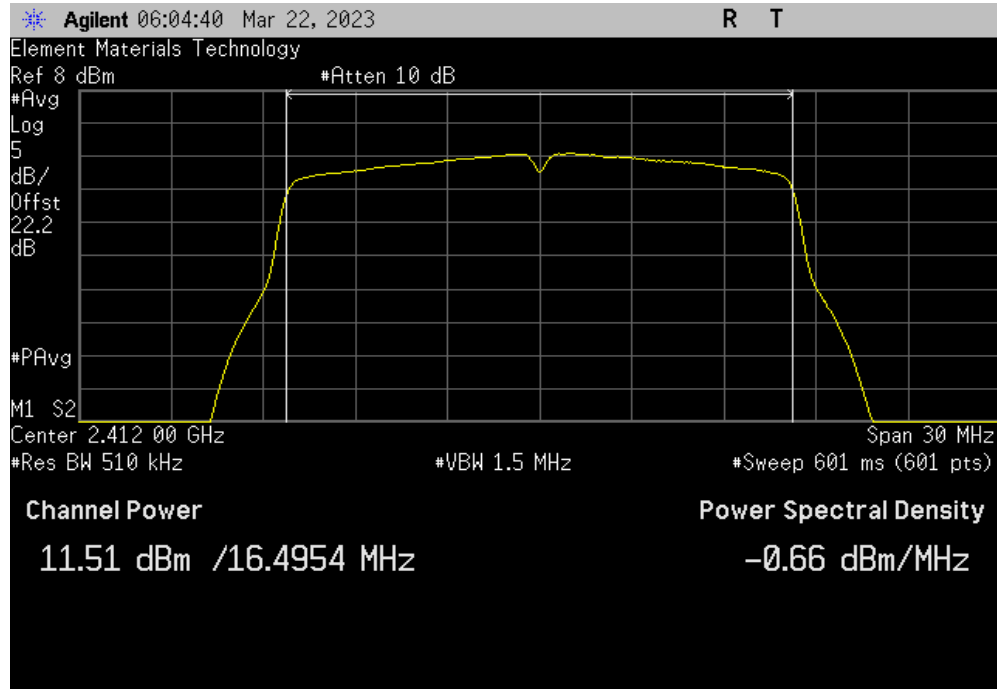


OUTPUT POWER

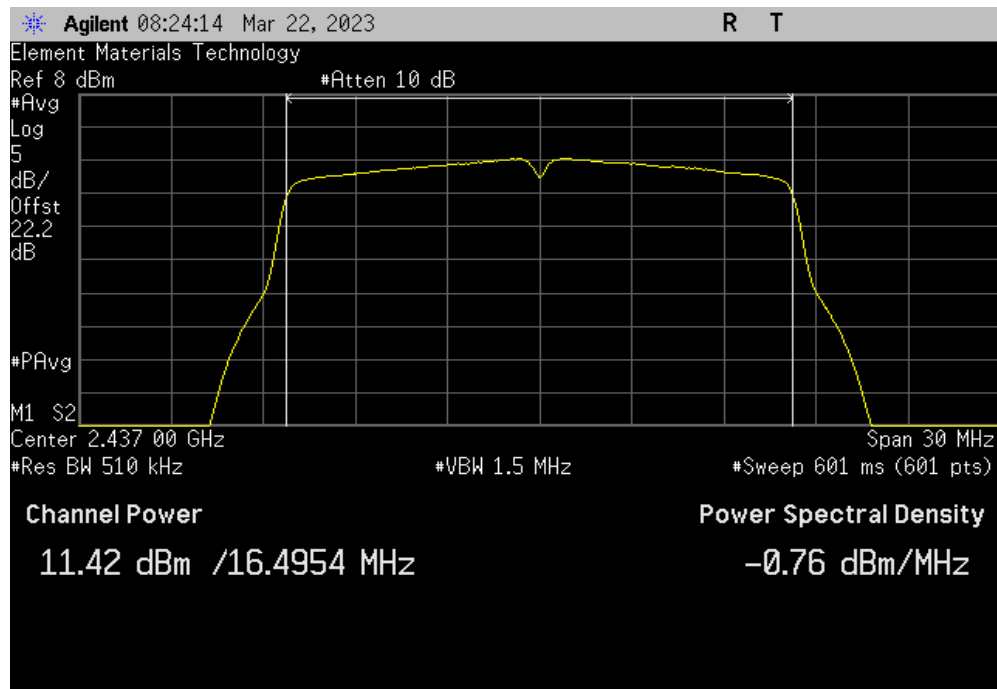


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.515	0	11.5	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.415	0	11.4	30	Pass	

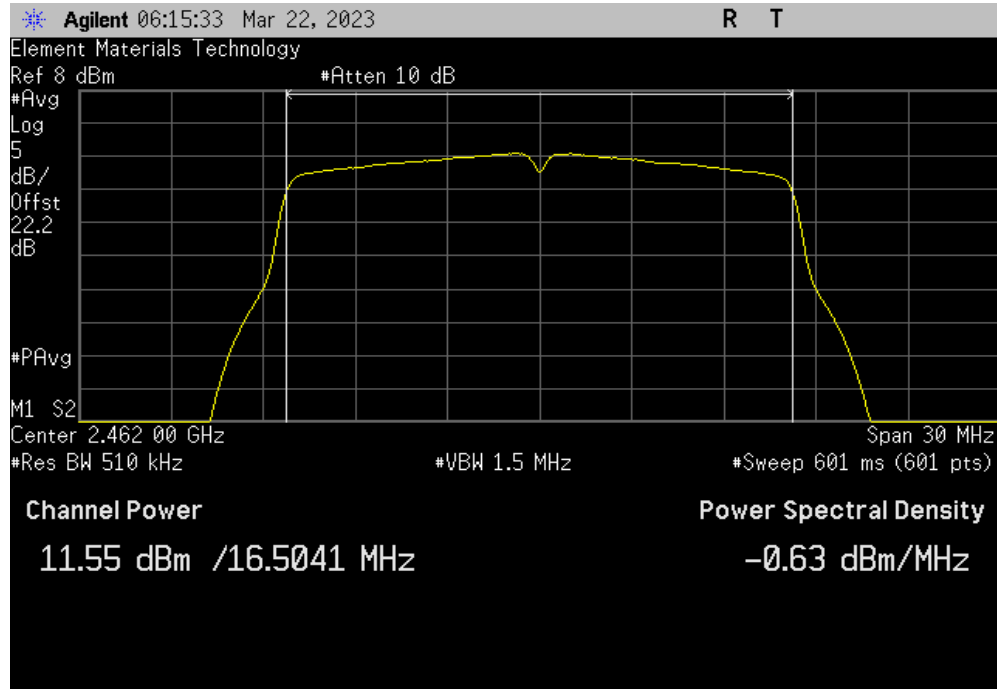


OUTPUT POWER

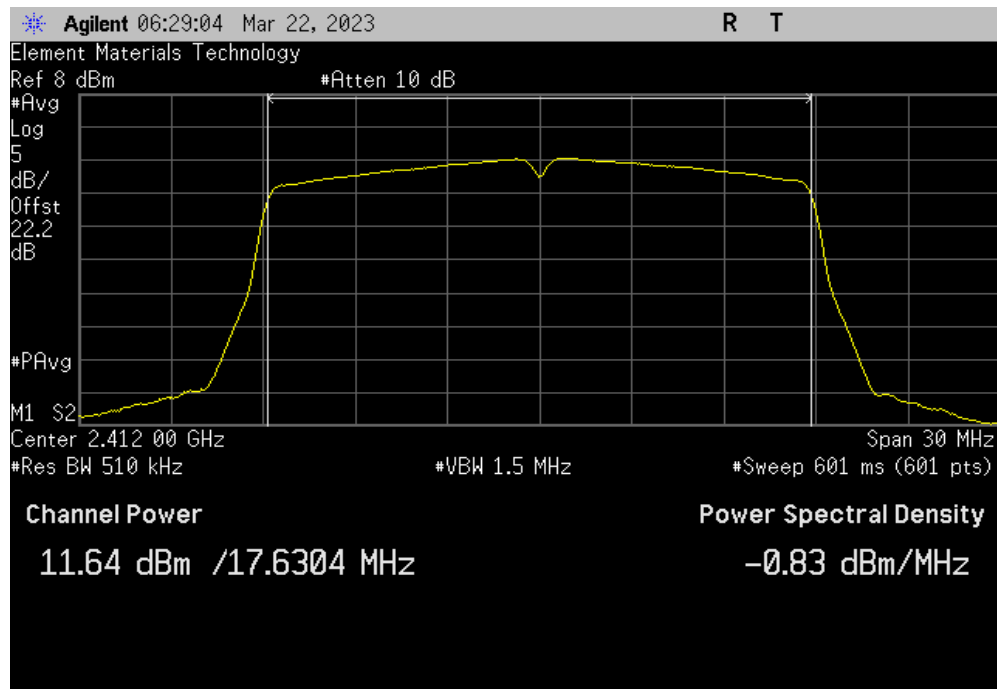


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.548	0	11.5	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.636	0	11.6	30	Pass	

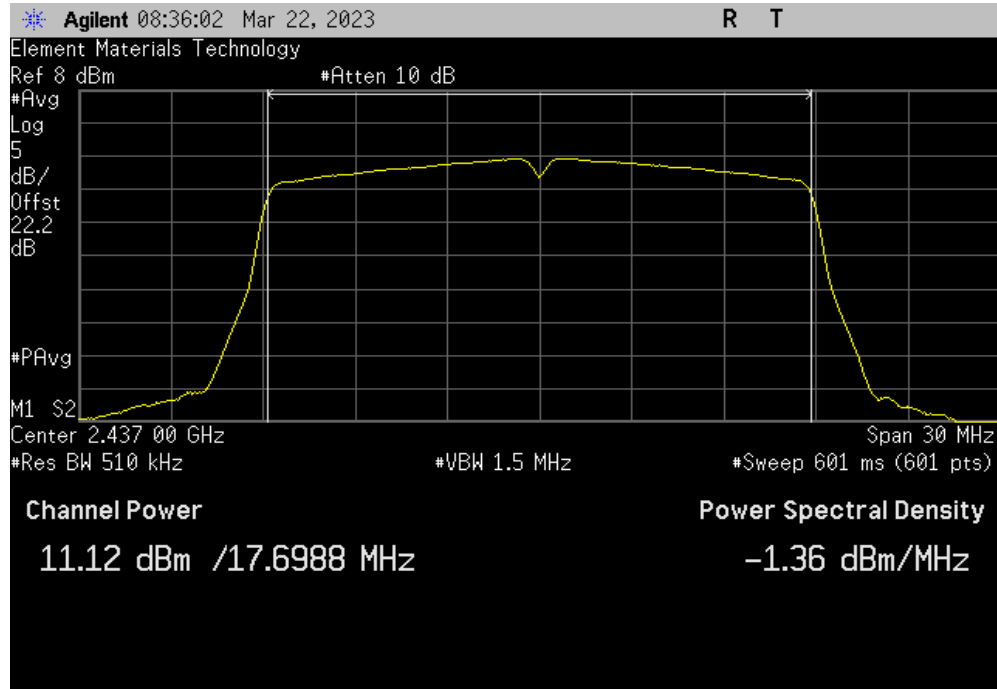


OUTPUT POWER

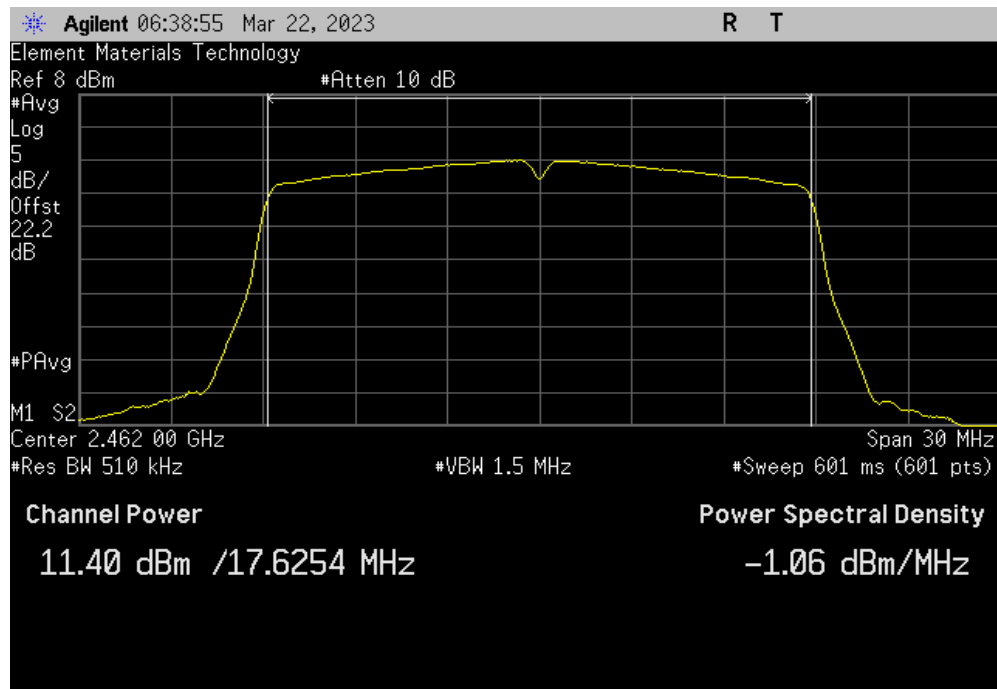


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.122	0	11.1	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.403	0	11.4	30	Pass	

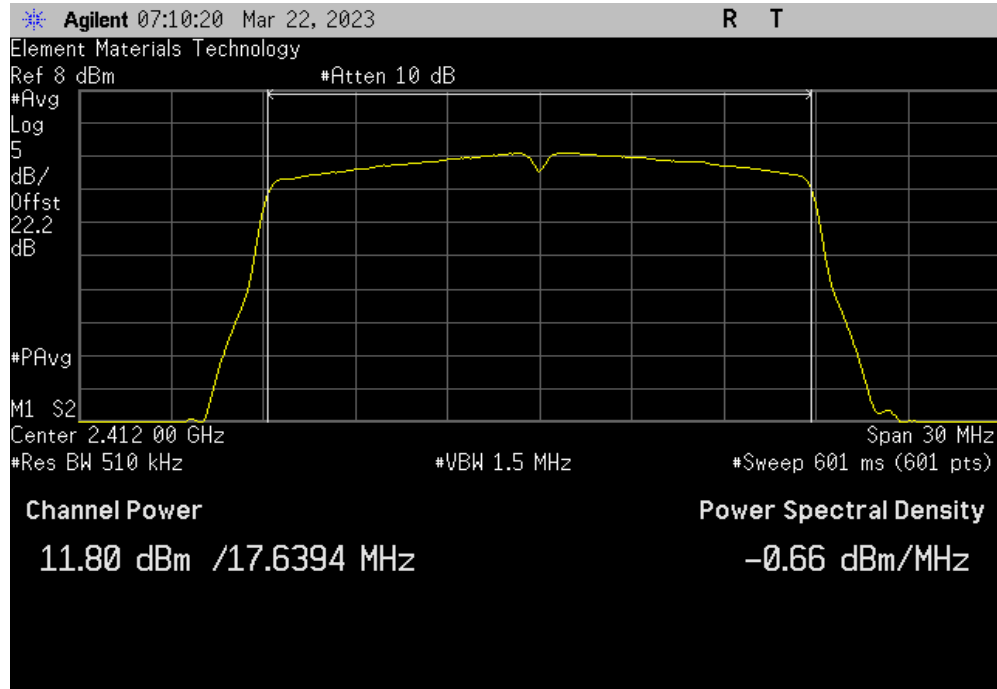


OUTPUT POWER

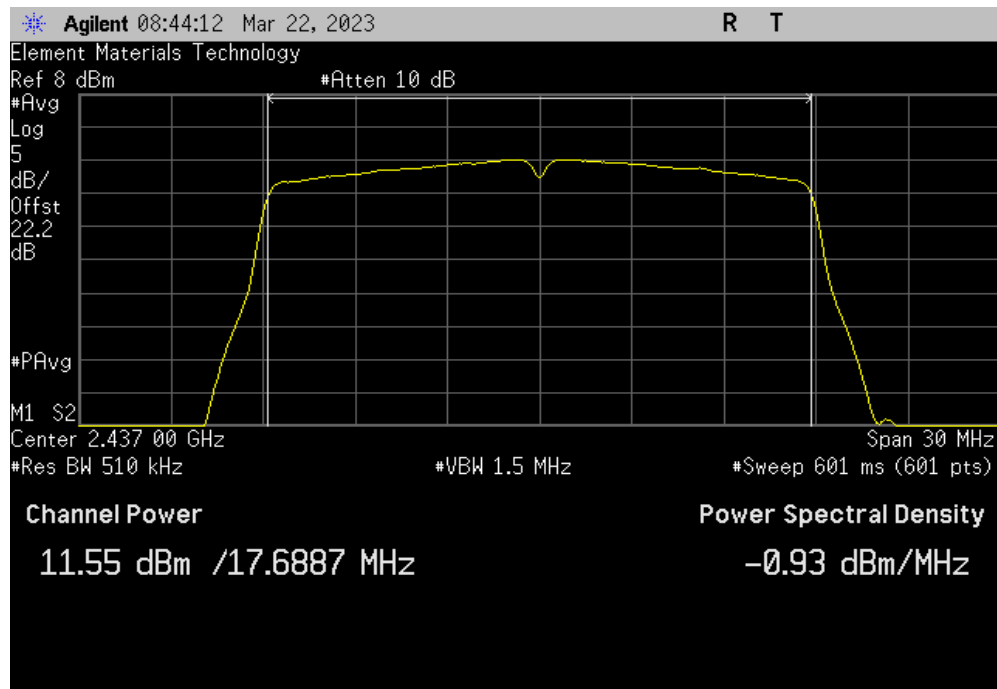


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.801	0	11.8	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.547	0	11.5	30	Pass	

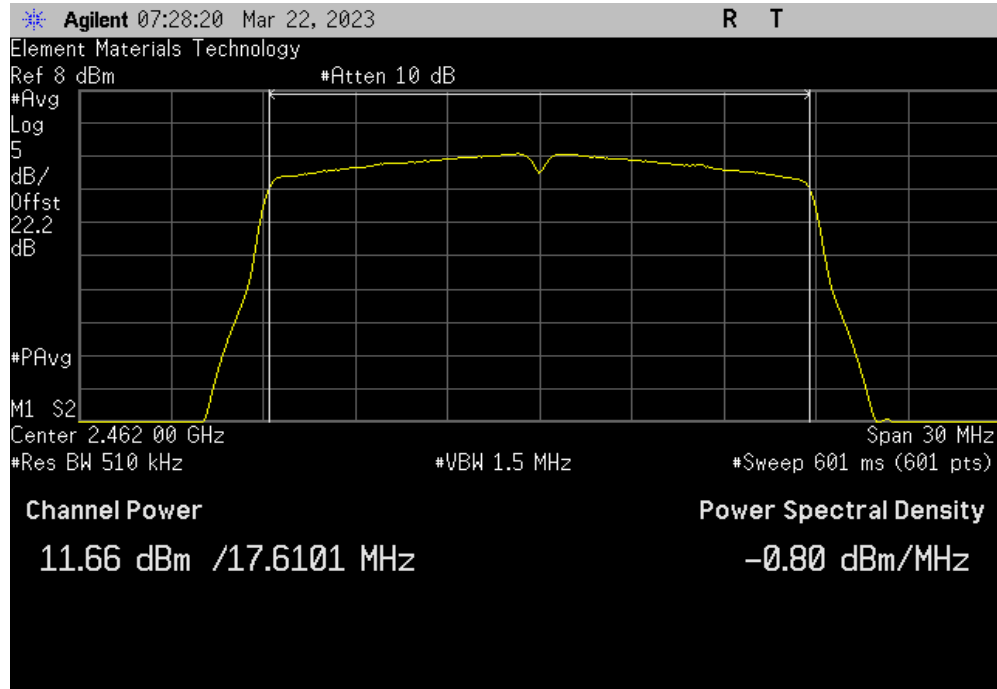


OUTPUT POWER

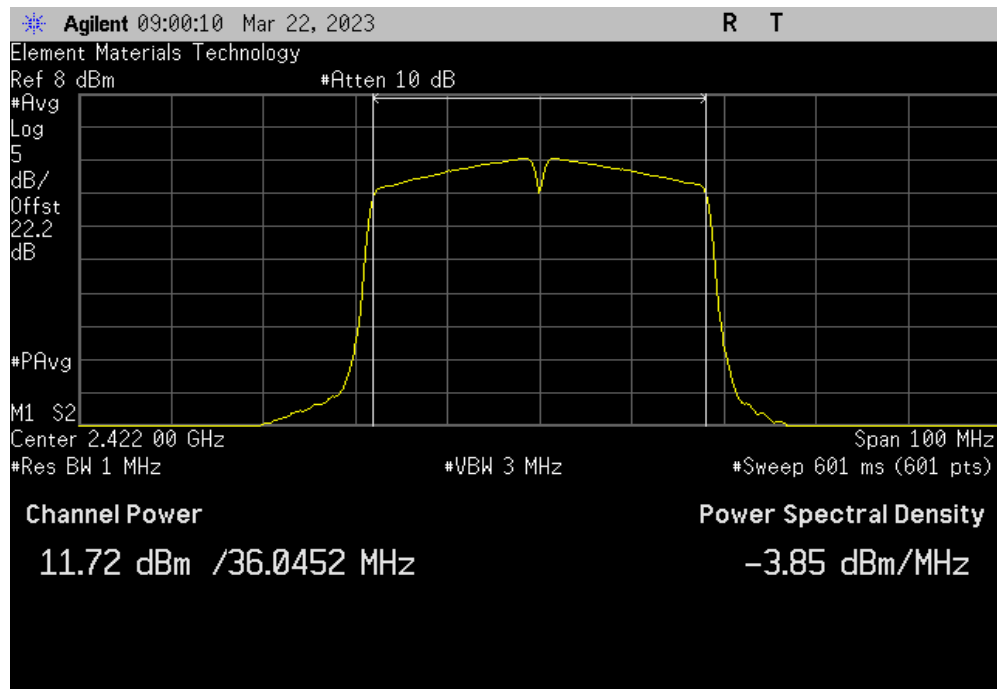


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.661	0	11.7	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Low Channel 1/5, 2422 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.722	0	11.7	30	Pass	

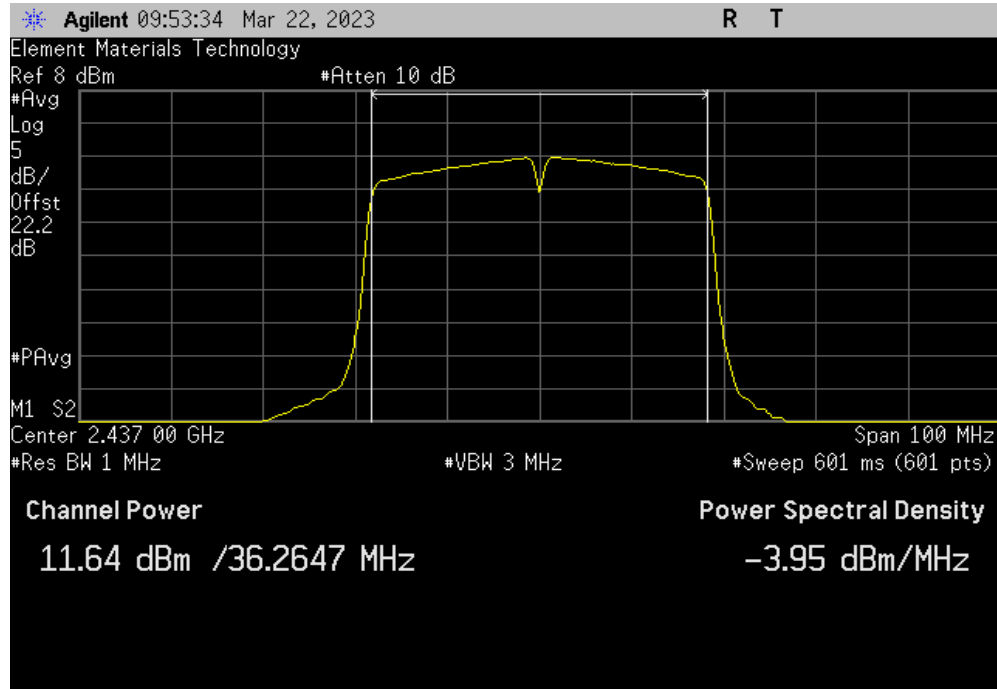


OUTPUT POWER

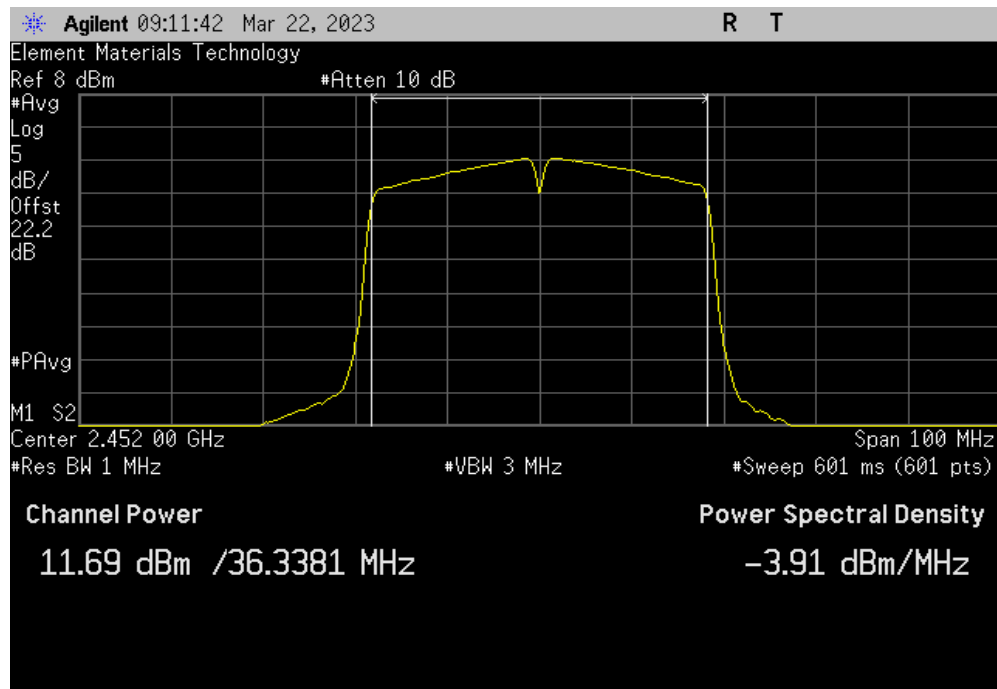


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Mid Channel 4/8, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.643	0	11.6	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, High Channel 7/11, 2452 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.694	0	11.7	30	Pass	

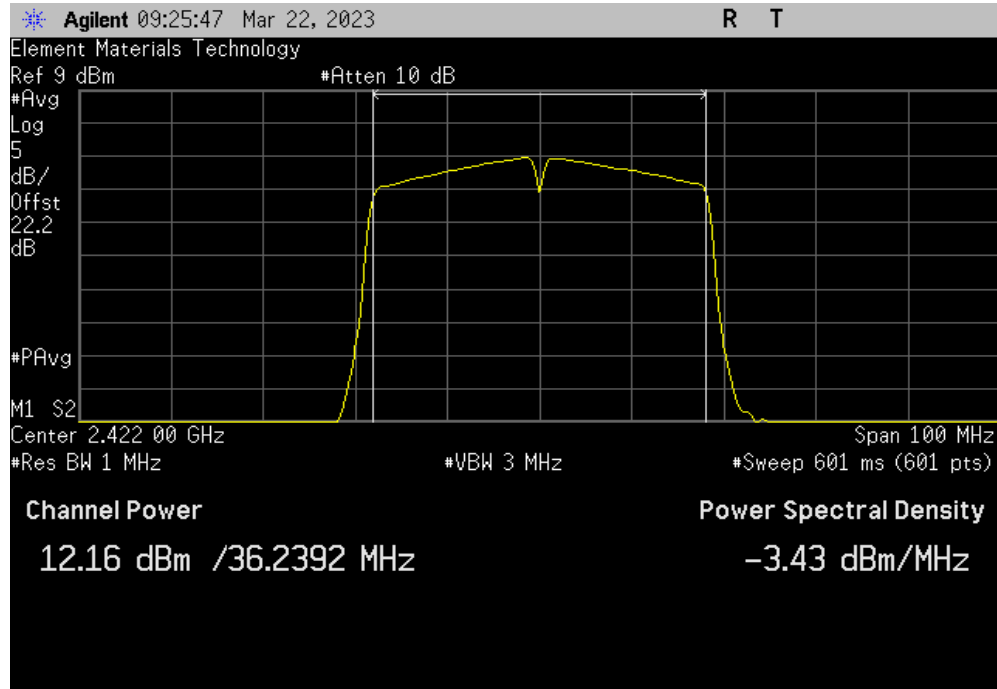


OUTPUT POWER

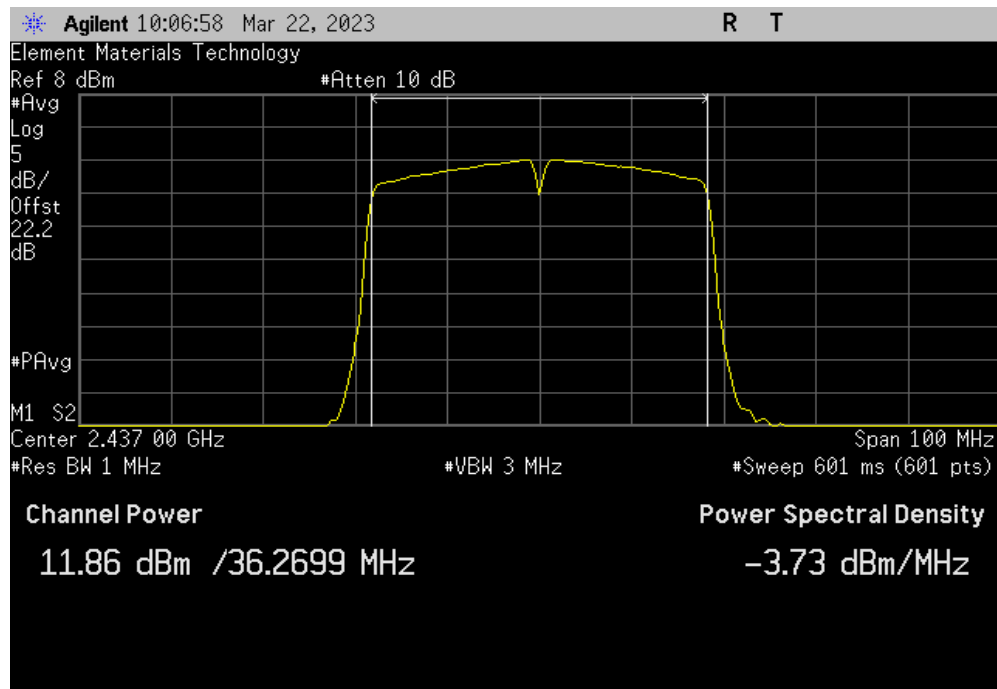


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Low Channel 1/5, 2422 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	12.16	0	12.2	30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Mid Channel 4/8, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.862	0	11.9	30	Pass	

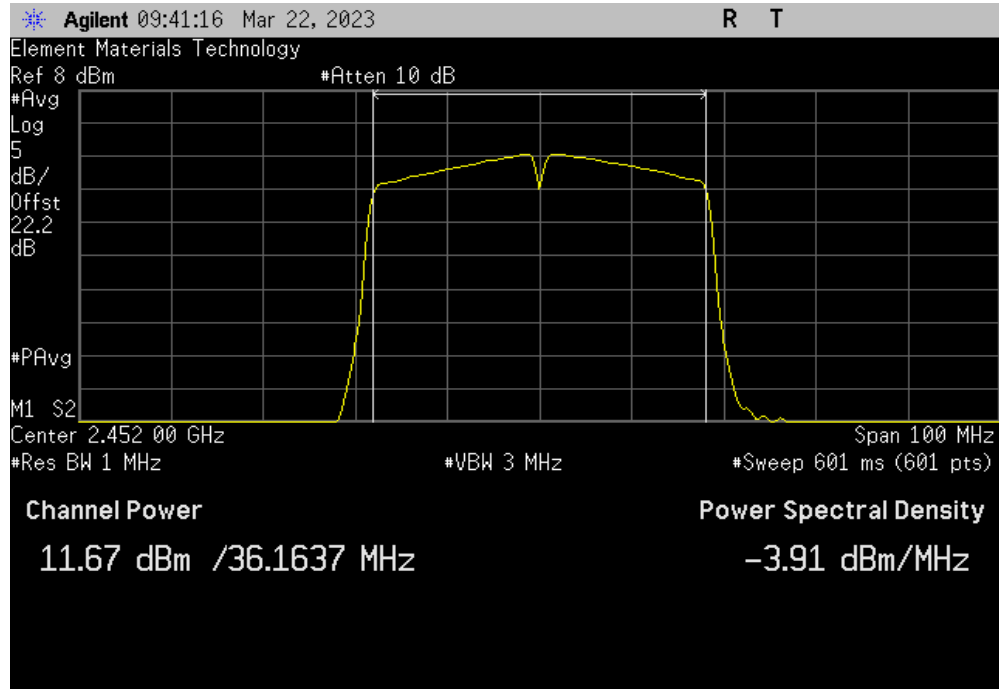


OUTPUT POWER



TbTx 2022.06.03.0 XbM 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, High Channel 7/11, 2452 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result	
	11.67	0	11.7	30	Pass	



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



XMH 2023.02.14.0

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
Block - DC	Aeroflex	INMET 8535	AMO	2023-01-30	2024-01-30
Attenuator	Fairview Microwave	SA18H-20	UAX	2022-07-26	2023-07-26
Cable	Element	None	OC5	2023-01-30	2024-01-30
Generator - Signal	Agilent	E8257D	TGU	2020-11-03	2023-11-03
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2022-10-21	2023-10-21

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The fundamental emission output power (maximum average conducted output power) was measured using the channels and modes as called out on the following data sheets. The transmit power was set to its default maximum.

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

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

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

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



TSTx 2022.06.03.0 XMR 2023.02.14.0

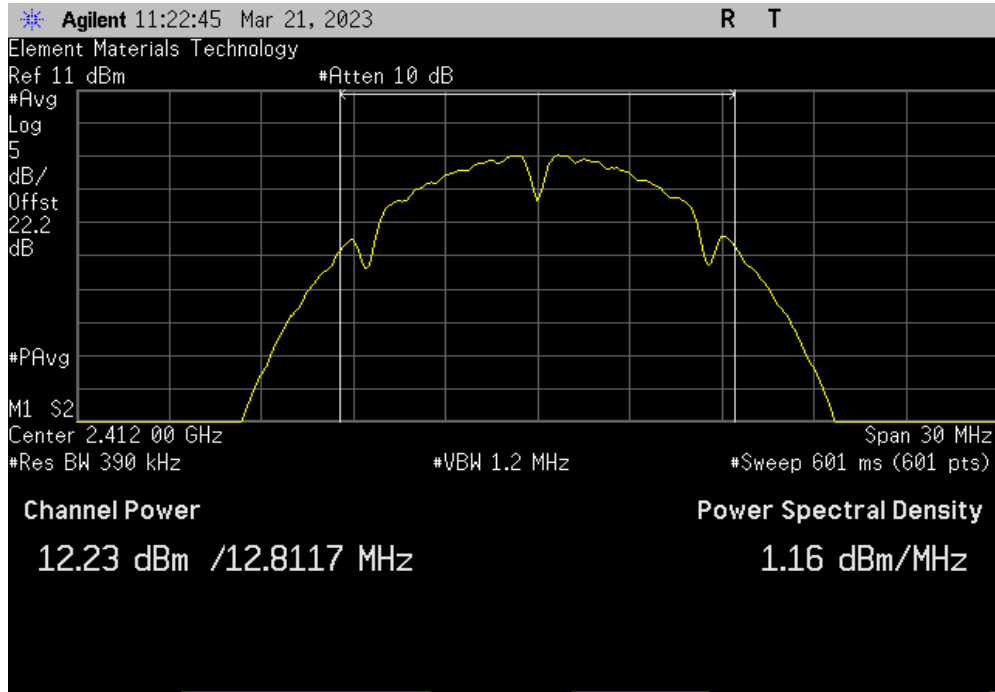
EUT: TSI Inc. OmniTrak				Work Order: TSIN0196						
Serial Number: TSI5221200068				Date: 03/22/23						
Customer: TSI, Incorporated				Temperature: 19.9°C						
Attendees: None				Humidity: 48.9%						
Project: None				Barometric Pres.: 1022 mbar						
Tested by: Nolan De Ramos, Luis Flores			Power: 5VDC via Battery		Job Site: OC11					
TEST SPECIFICATIONS				Test Method						
FCC 15.247:2023				ANSI C63.10:2013						
RSS-Gen Issue 5:2018+A1:2019+A2:2021				ANSI C63.10:2013						
RSS-247 Issue 2:2017				ANSI C63.10:2013						
COMMENTS										
Reference level offset includes measurement cable, DC block, and attenuator.										
DEVIATIONS FROM TEST STANDARD										
None										
Configuration #		TSIN0196-8		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										
802.11(b) 1 Mbps										
		Low Channel 1, 2412 MHz	12.233	0	12.2	0.17	12.4	36	Pass	
		Mid Channel 6, 2437 MHz	11.974	0	12	0.17	12.1	36	Pass	
		High Channel 11, 2462 MHz	12.268	0	12.3	0.17	12.4	36	Pass	
802.11(b) 11 Mbps										
		Low Channel 1, 2412 MHz	12.419	0	12.4	0.17	12.6	36	Pass	
		Mid Channel 6, 2437 MHz	11.978	0	12	0.17	12.1	36	Pass	
		High Channel 11, 2462 MHz	12.239	0	12.2	0.17	12.4	36	Pass	
802.11(g) 6 Mbps										
		Low Channel 1, 2412 MHz	12.075	0	12.1	0.17	12.2	36	Pass	
		Mid Channel 6, 2437 MHz	11.66	0	11.7	0.17	11.8	36	Pass	
		High Channel 11, 2462 MHz	11.887	0	11.9	0.17	12.1	36	Pass	
802.11(g) 36 Mbps										
		Low Channel 1, 2412 MHz	12.065	0	12.1	0.17	12.2	36	Pass	
		Mid Channel 6, 2437 MHz	11.426	0	11.4	0.17	11.6	36	Pass	
		High Channel 11, 2462 MHz	10.877	0	10.9	0.17	11	36	Pass	
802.11(g) 54 Mbps										
		Low Channel 1, 2412 MHz	11.515	0	11.5	0.17	11.7	36	Pass	
		Mid Channel 6, 2437 MHz	11.415	0	11.4	0.17	11.6	36	Pass	
		High Channel 11, 2462 MHz	11.548	0	11.5	0.17	11.7	36	Pass	
802.11(n20) MCS0										
		Low Channel 1, 2412 MHz	11.636	0	11.6	0.17	11.8	36	Pass	
		Mid Channel 6, 2437 MHz	11.122	0	11.1	0.17	11.3	36	Pass	
		High Channel 11, 2462 MHz	11.403	0	11.4	0.17	11.6	36	Pass	
802.11(n20) MCS7										
		Low Channel 1, 2412 MHz	11.801	0	11.8	0.17	12	36	Pass	
		Mid Channel 6, 2437 MHz	11.547	0	11.5	0.17	11.7	36	Pass	
		High Channel 11, 2462 MHz	11.661	0	11.7	0.17	11.8	36	Pass	
802.11(n40) MCS0										
		Low Channel 1/5, 2422 MHz	11.722	0	11.7	0.17	11.9	36	Pass	
		Mid Channel 4/8, 2437 MHz	11.643	0	11.6	0.17	11.8	36	Pass	
		High Channel 7/11, 2452 MHz	11.694	0	11.7	0.17	11.9	36	Pass	
802.11(n40) MCS7										
		Low Channel 1/5, 2422 MHz	12.16	0	12.2	0.17	12.3	36	Pass	
		Mid Channel 4/8, 2437 MHz	11.862	0	11.9	0.17	12	36	Pass	
		High Channel 7/11, 2452 MHz	11.67	0	11.7	0.17	11.8	36	Pass	

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

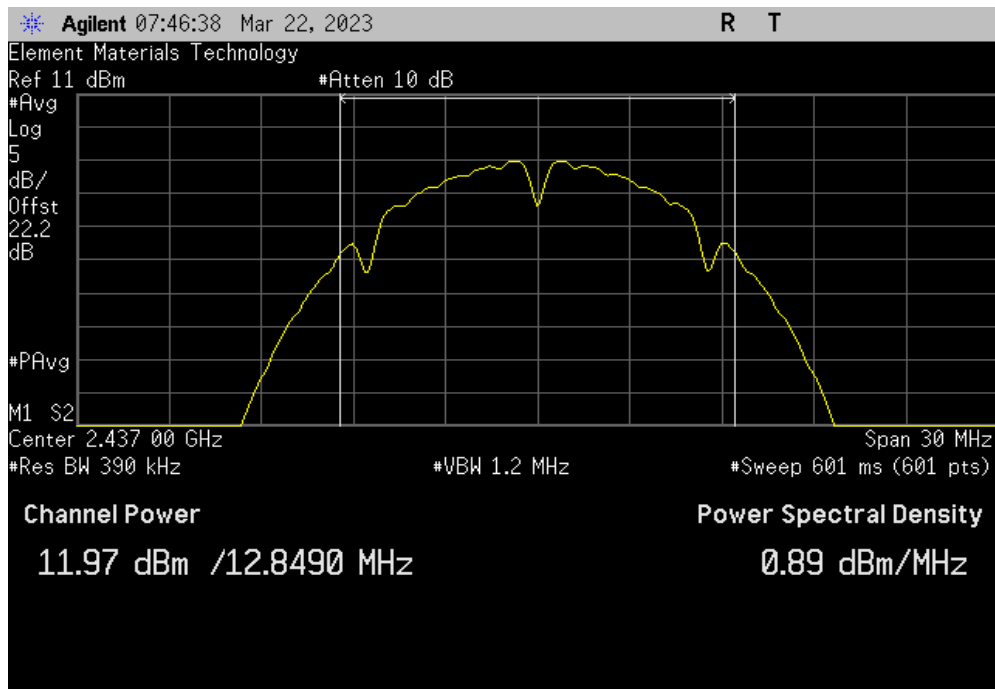


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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
12.233	0	12.2	0.17	12.4	36	Pass



2400 MHz - 2483.5 MHz Band, 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
11.974	0	12	0.17	12.1	36	Pass

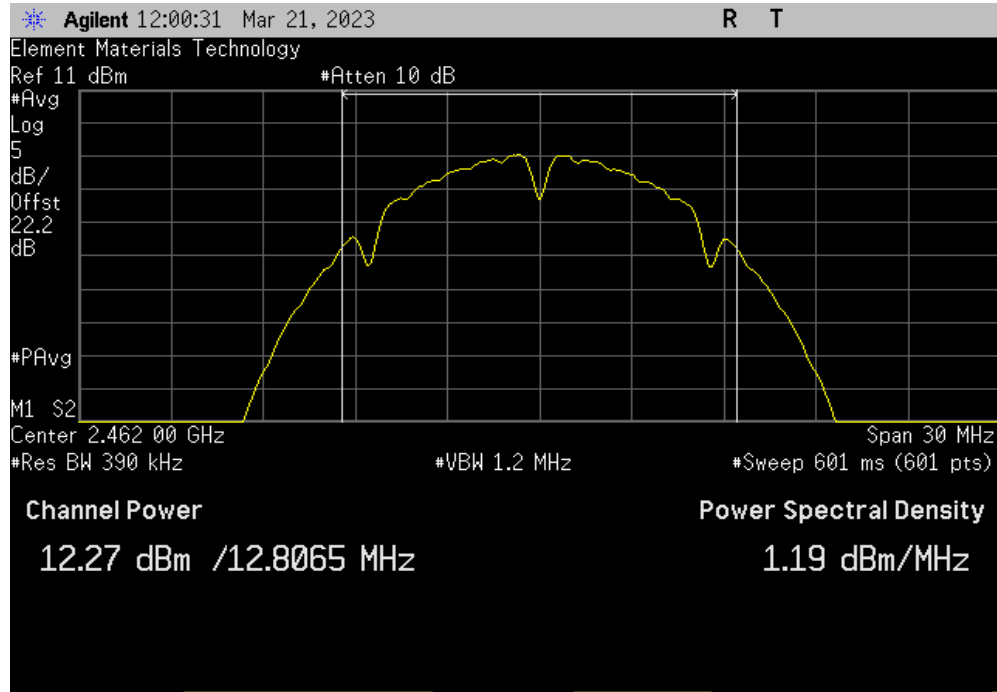


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

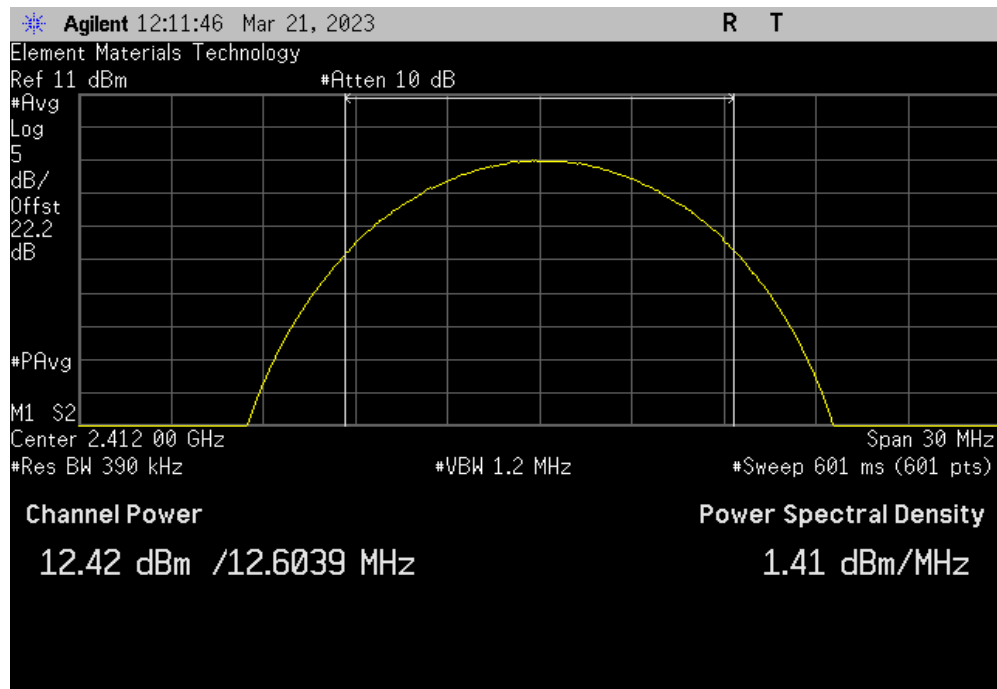


TUTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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
12.268	0	12.3	0.17	12.4	36	Pass



2400 MHz - 2483.5 MHz Band, 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
12.419	0	12.4	0.17	12.6	36	Pass

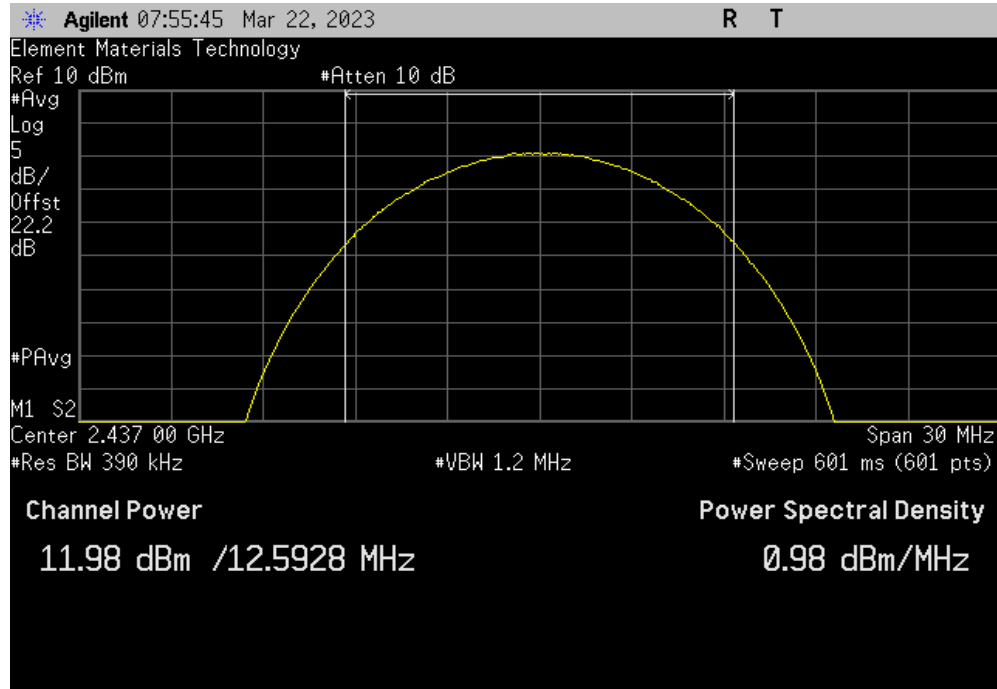


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

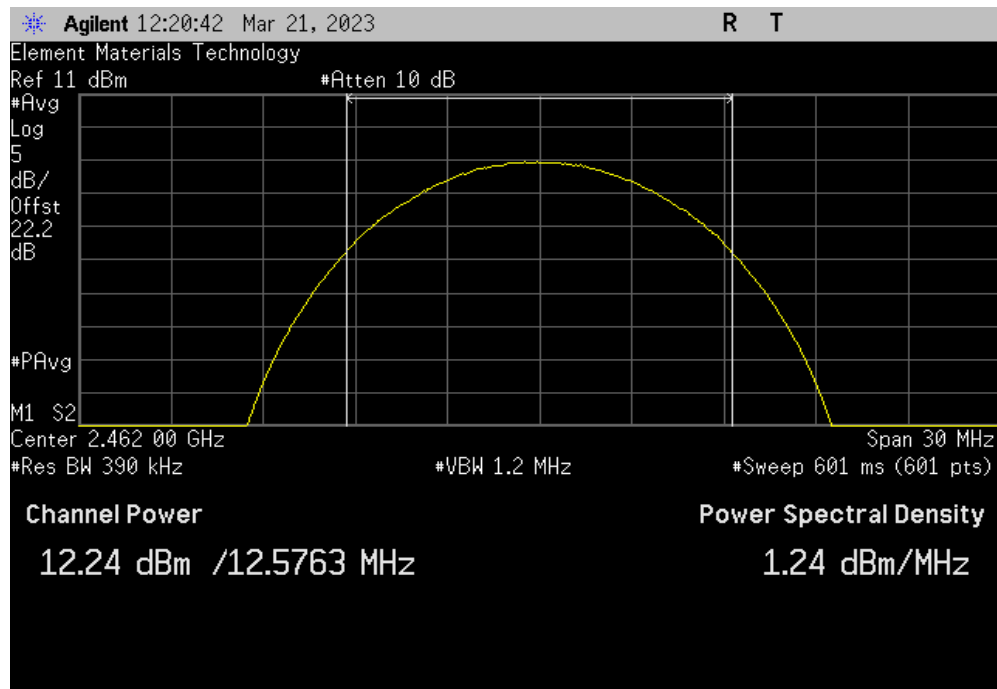


TUTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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
11.978	0	12	0.17	12.1	36	Pass



2400 MHz - 2483.5 MHz Band, 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
12.239	0	12.2	0.17	12.4	36	Pass

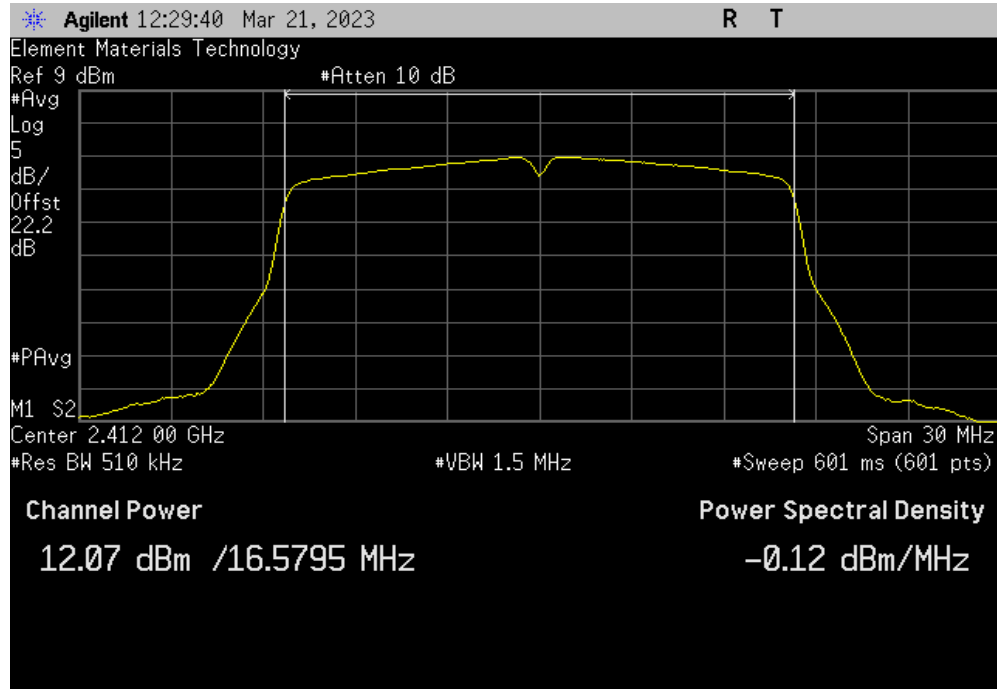


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

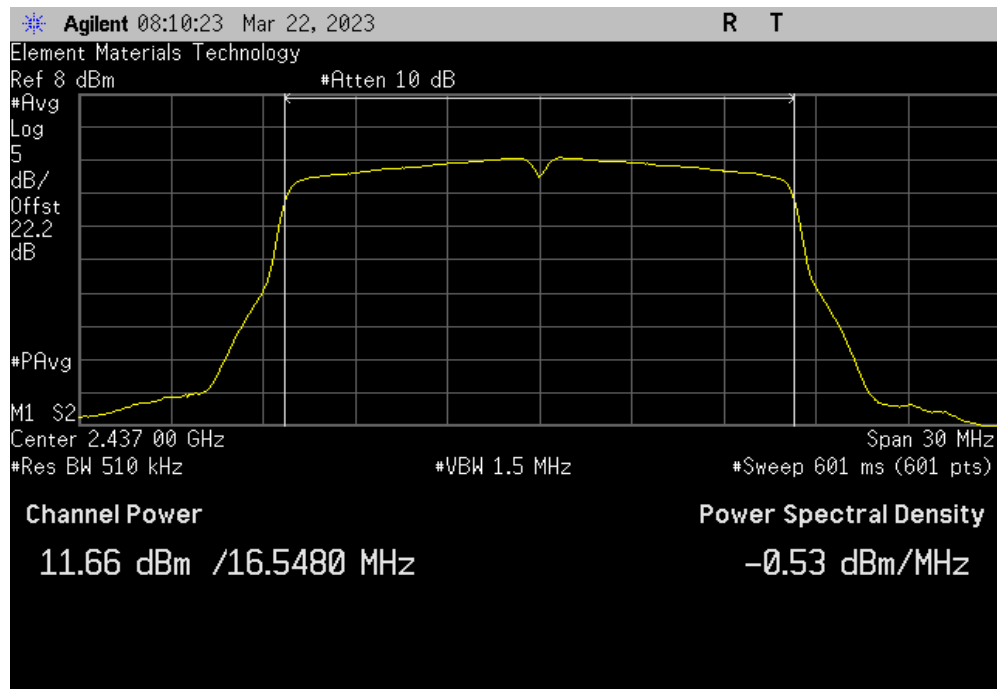


TUTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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
12.075	0	12.1	0.17	12.2	36	Pass



2400 MHz - 2483.5 MHz Band, 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
11.66	0	11.7	0.17	11.8	36	Pass

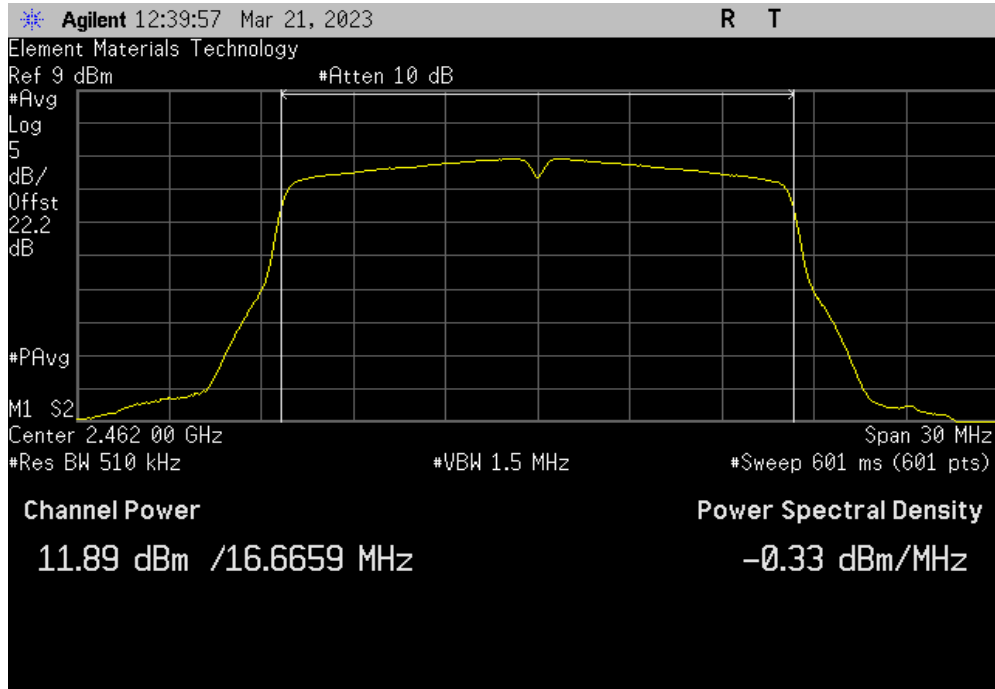


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

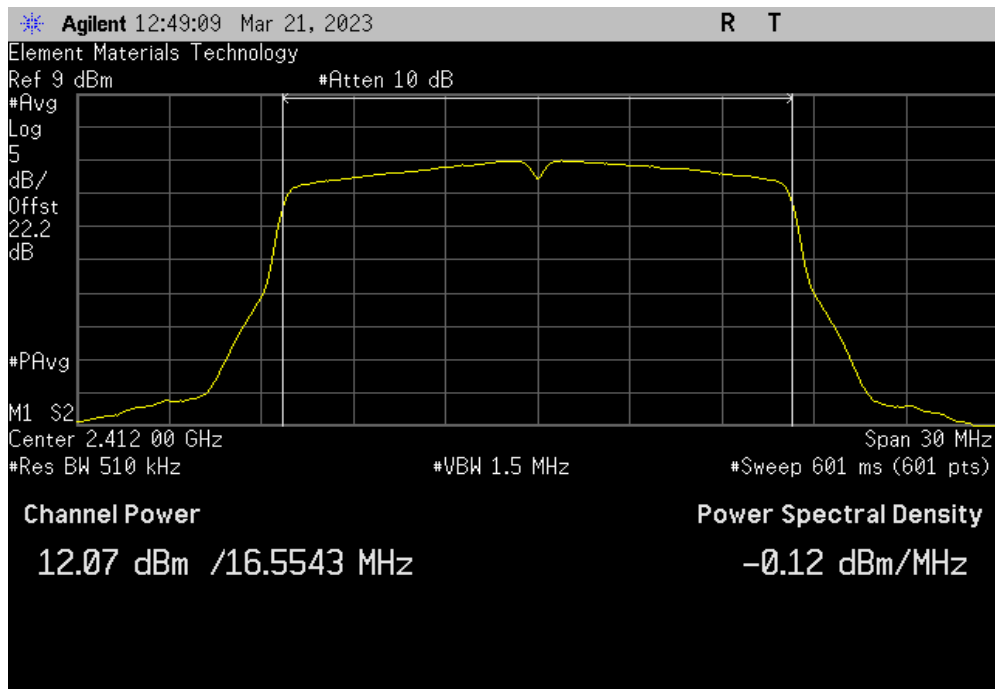


TUTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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
11.887	0	11.9	0.17	12.1	36	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
12.065	0	12.1	0.17	12.2	36	Pass

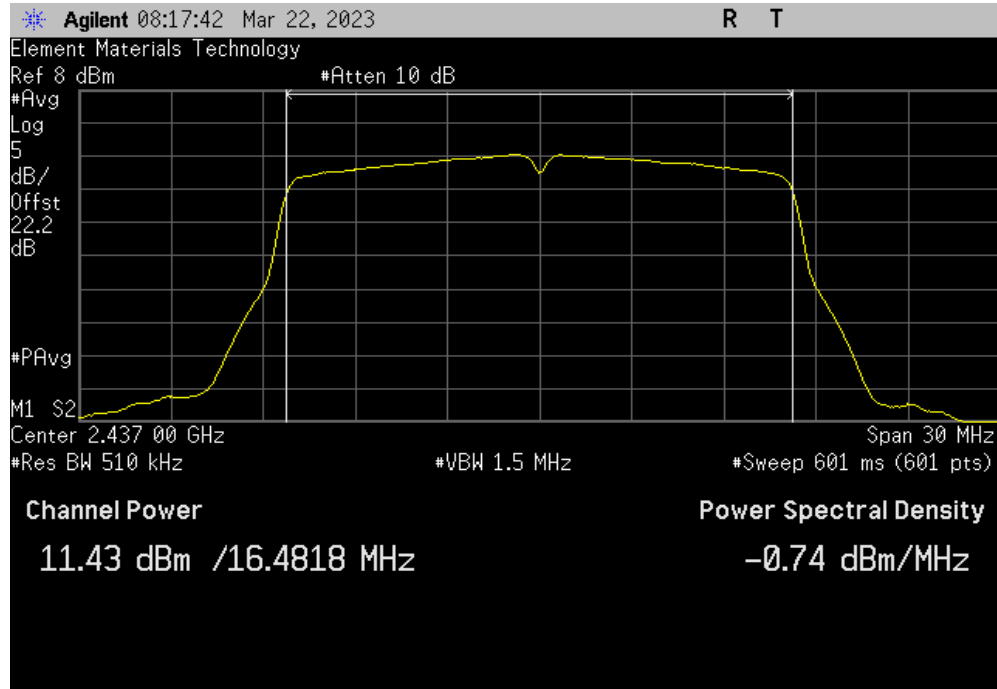


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

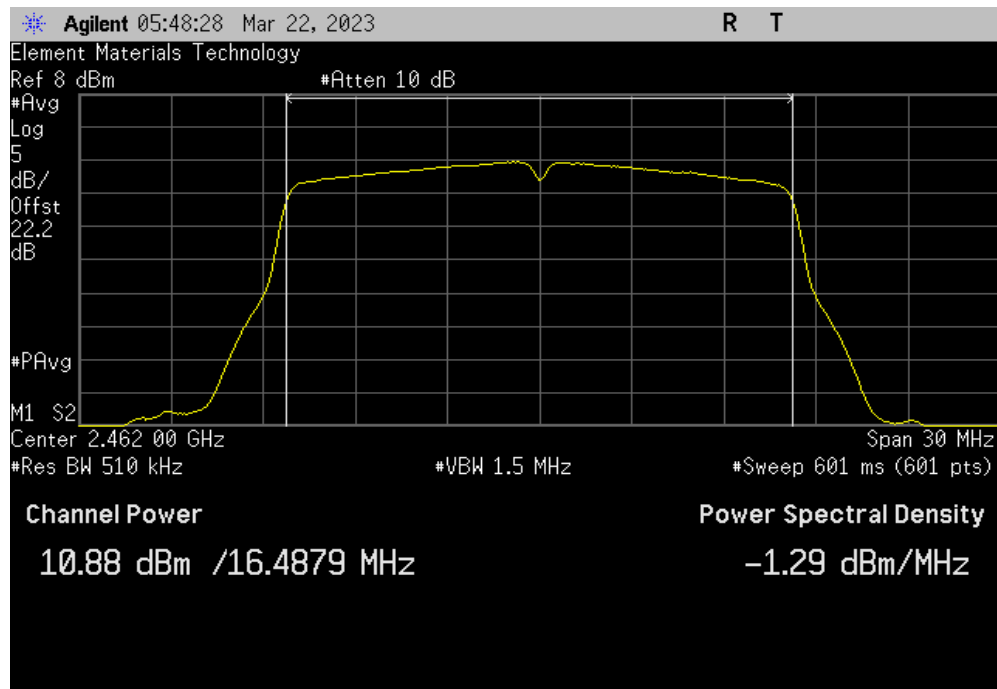


TUTx 2022.06.03.0 XMt 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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
11.426	0	11.4	0.17	11.6	36	Pass



2400 MHz - 2483.5 MHz Band, 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
10.877	0	10.9	0.17	11	36	Pass

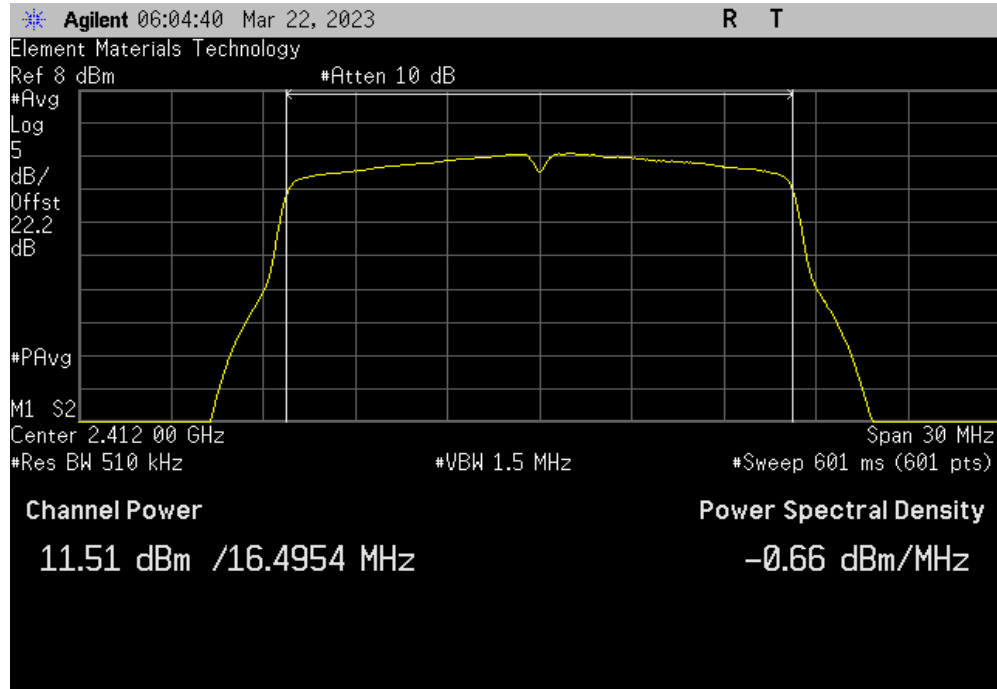


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

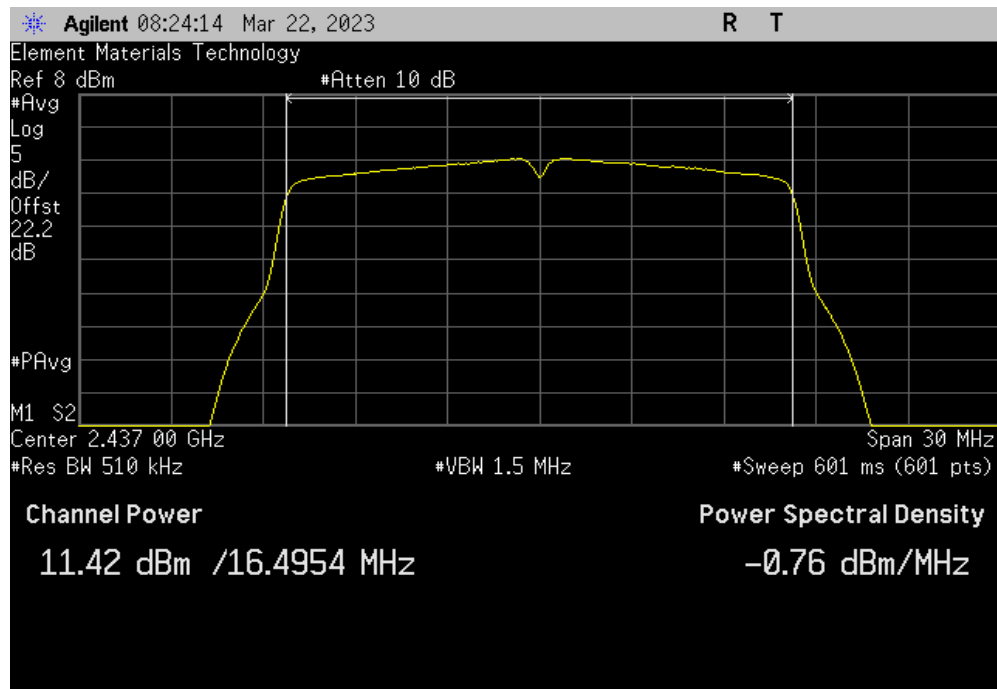


TUTTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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
11.515	0	11.5	0.17	11.7	36	Pass



2400 MHz - 2483.5 MHz Band, 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
11.415	0	11.4	0.17	11.6	36	Pass

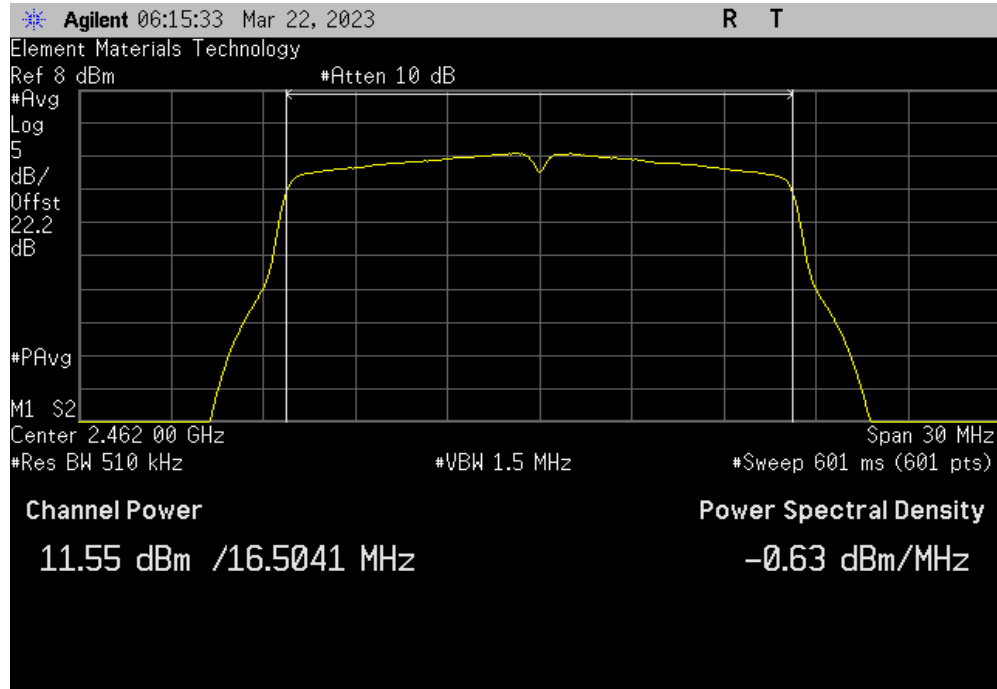


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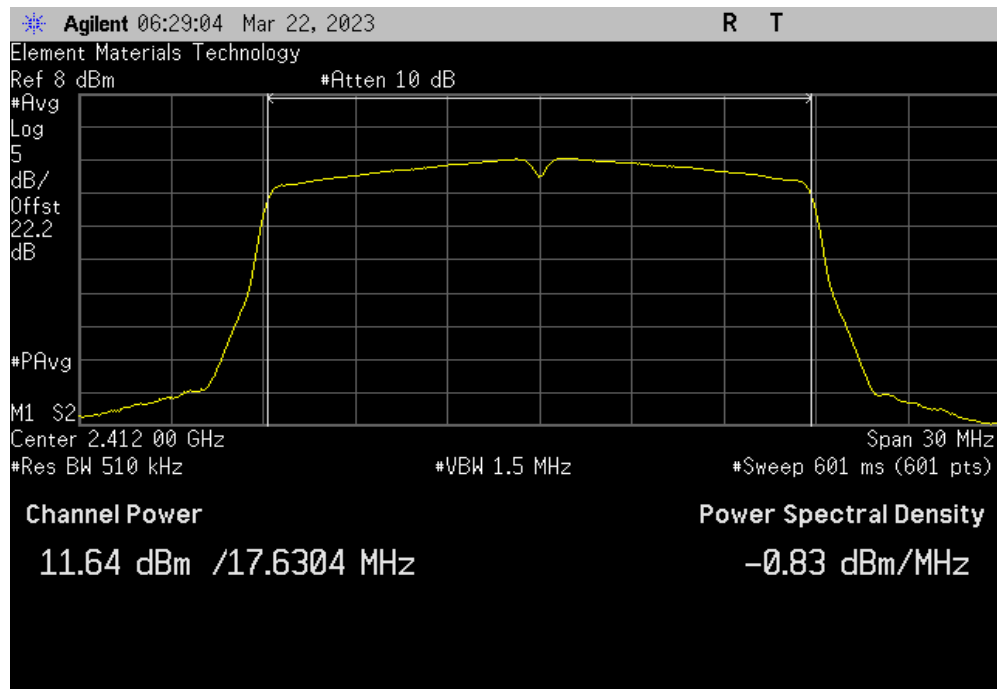


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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
11.548	0	11.5	0.17	11.7	36	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n20) 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
11.636	0	11.6	0.17	11.8	36	Pass

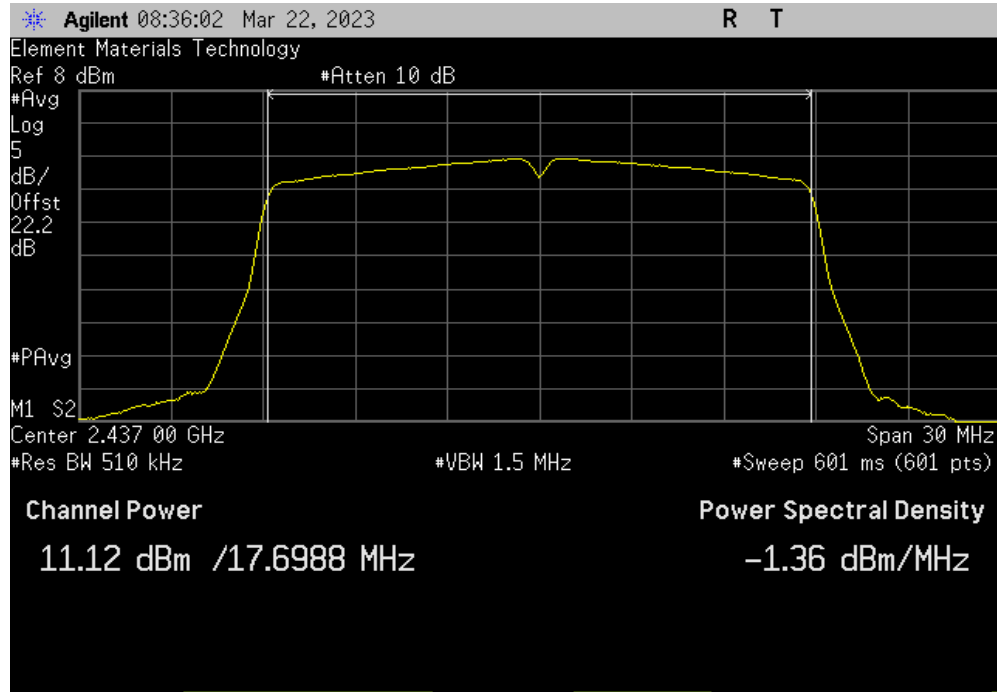


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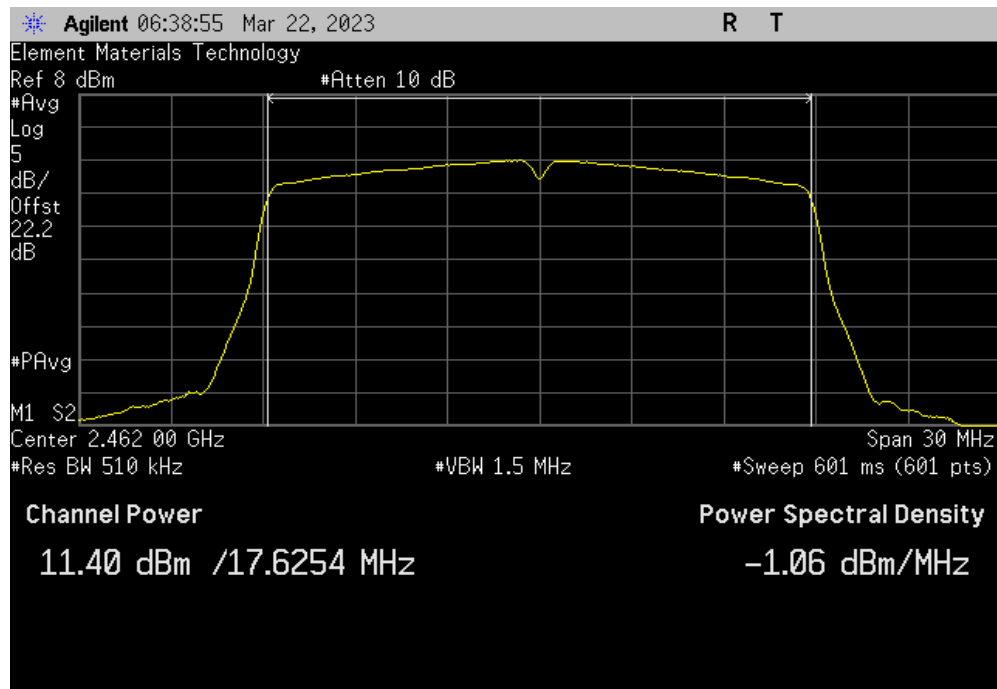


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) 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
11.122	0	11.1	0.17	11.3	36	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n20) 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
11.403	0	11.4	0.17	11.6	36	Pass

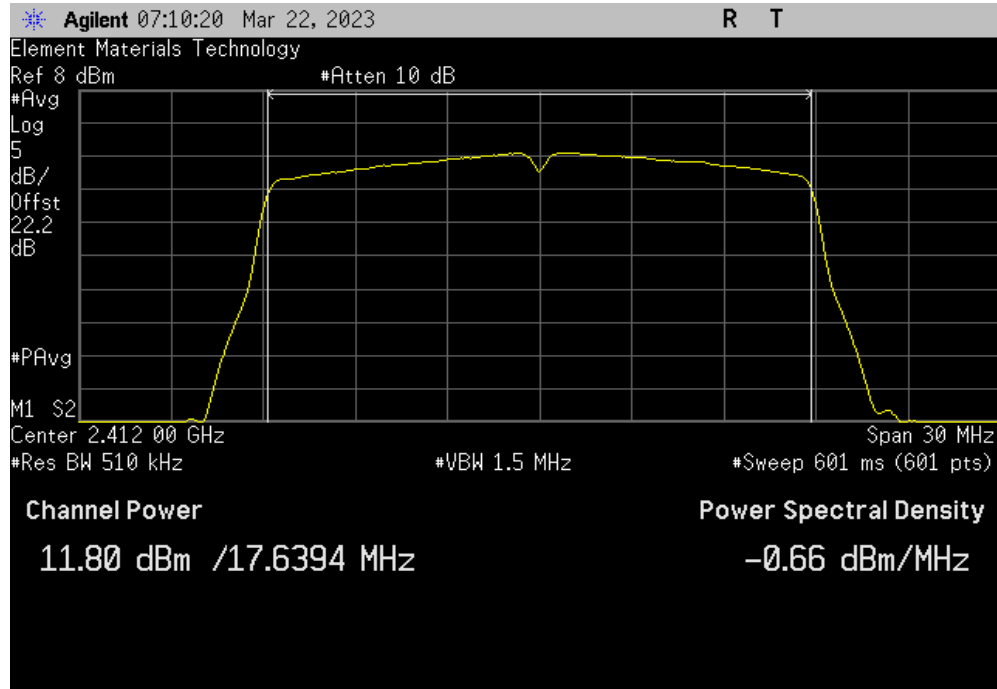


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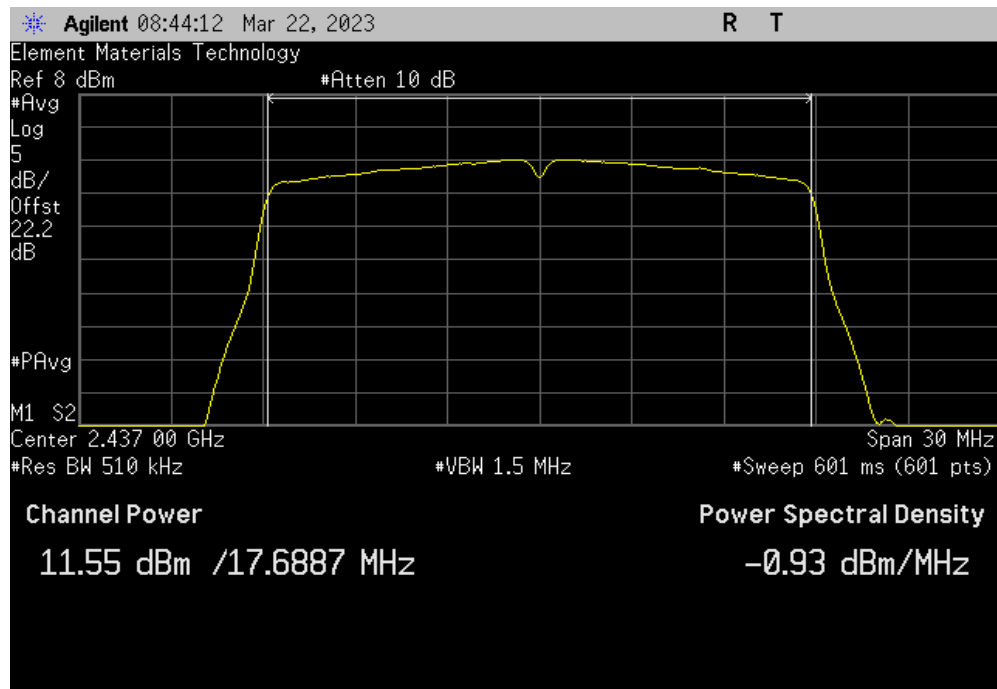


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) 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
11.801	0	11.8	0.17	12	36	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n20) 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
11.547	0	11.5	0.17	11.7	36	Pass

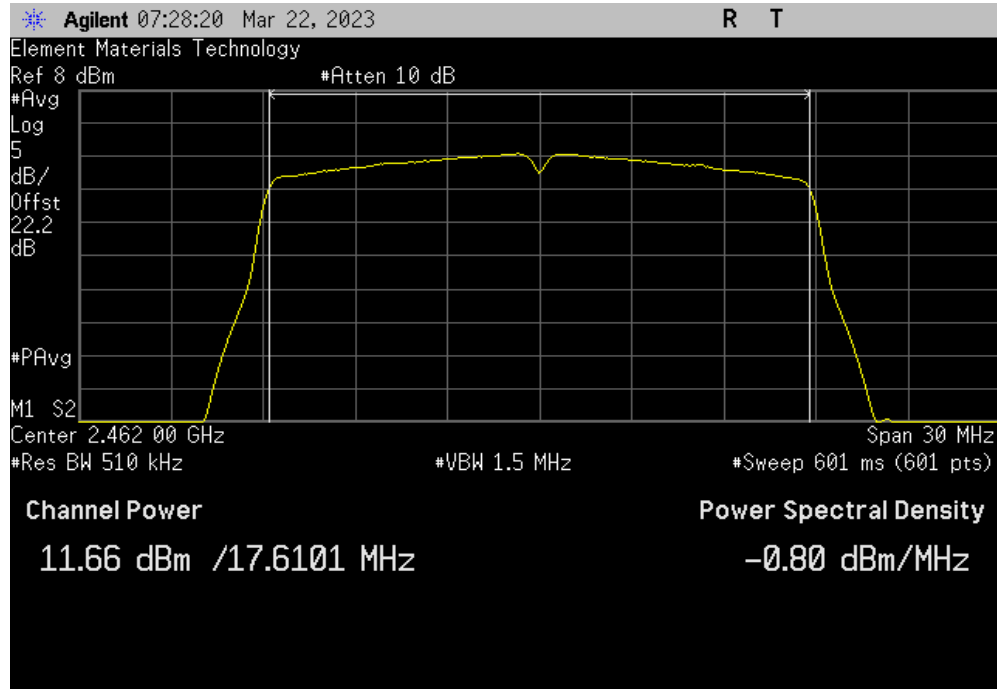


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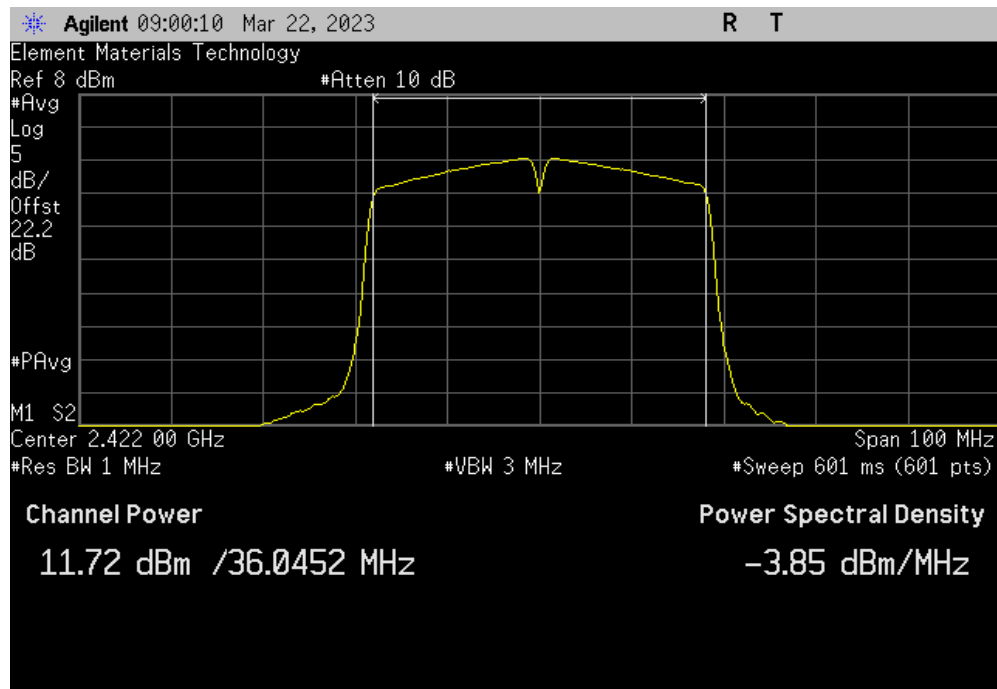


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) 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
11.661	0	11.7	0.17	11.8	36	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Low Channel 1/5, 2422 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
11.722	0	11.7	0.17	11.9	36	Pass

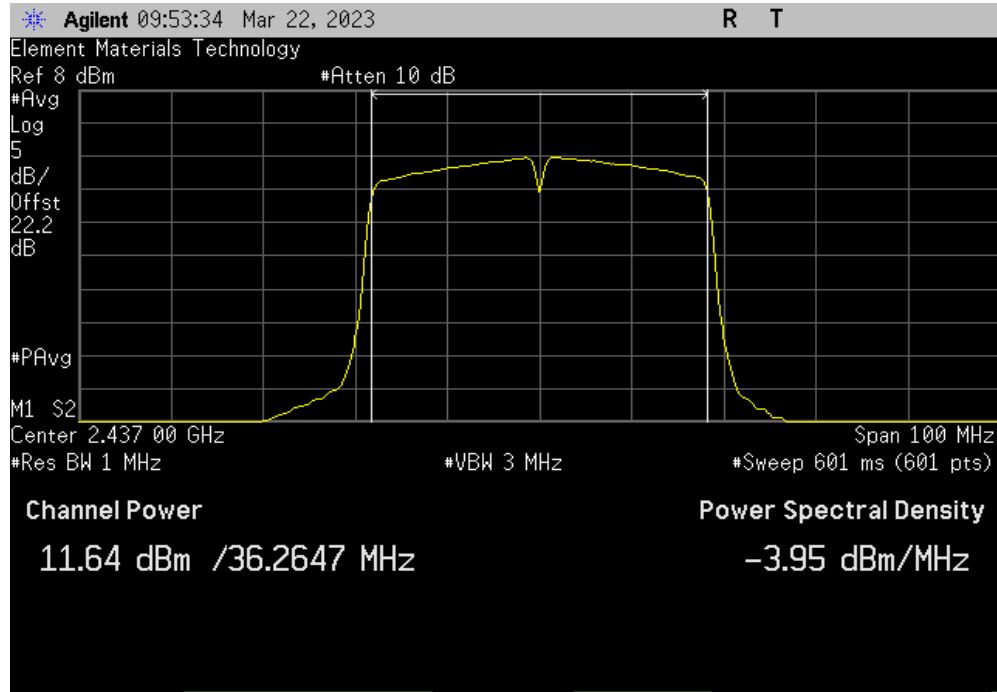


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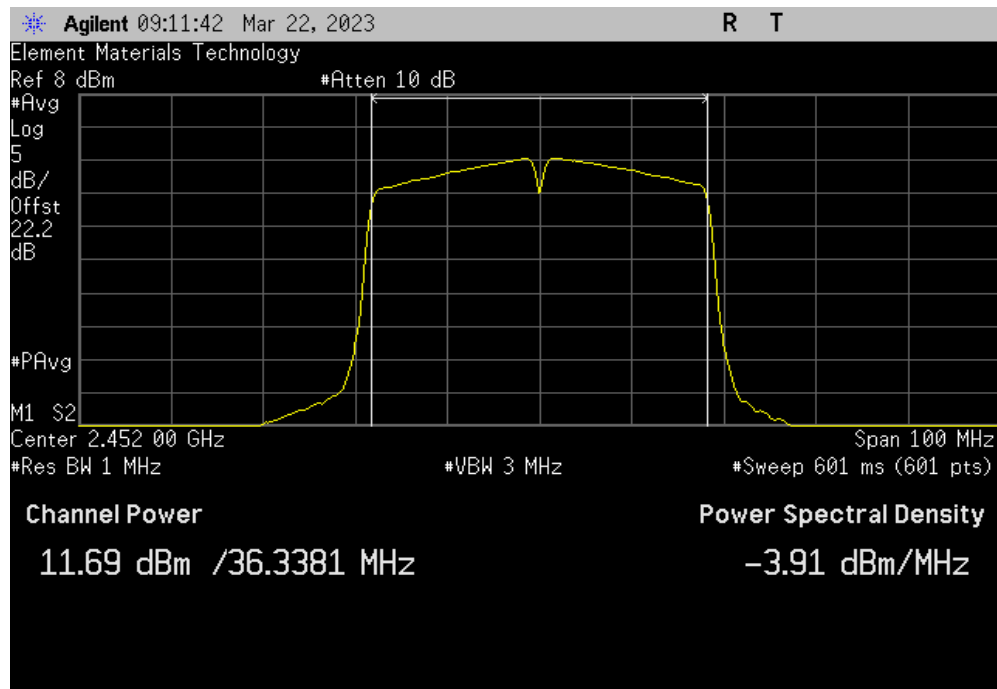


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Mid Channel 4/8, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
11.643	0	11.6	0.17	11.8	36	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, High Channel 7/11, 2452 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
11.694	0	11.7	0.17	11.9	36	Pass

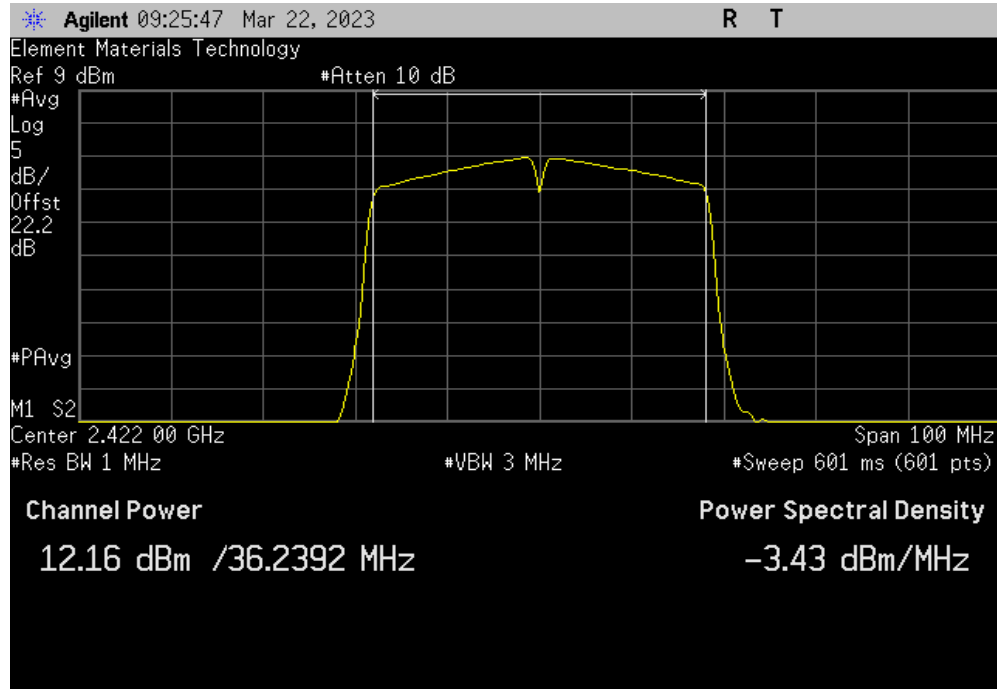


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

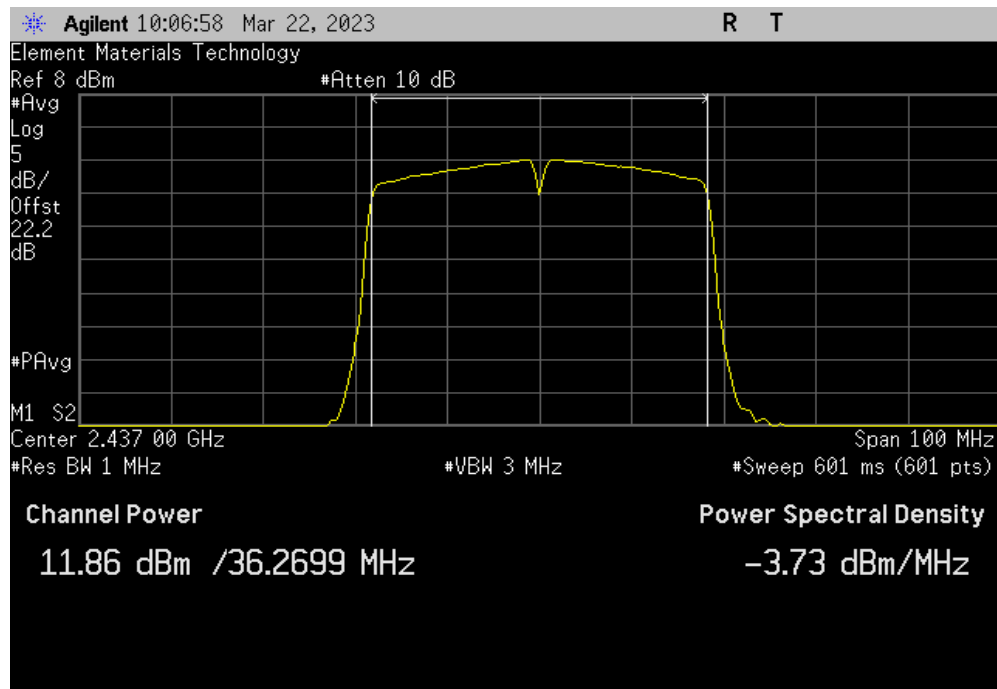


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Low Channel 1/5, 2422 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
12.16	0	12.2	0.17	12.3	36	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Mid Channel 4/8, 2437 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
11.862	0	11.9	0.17	12	36	Pass

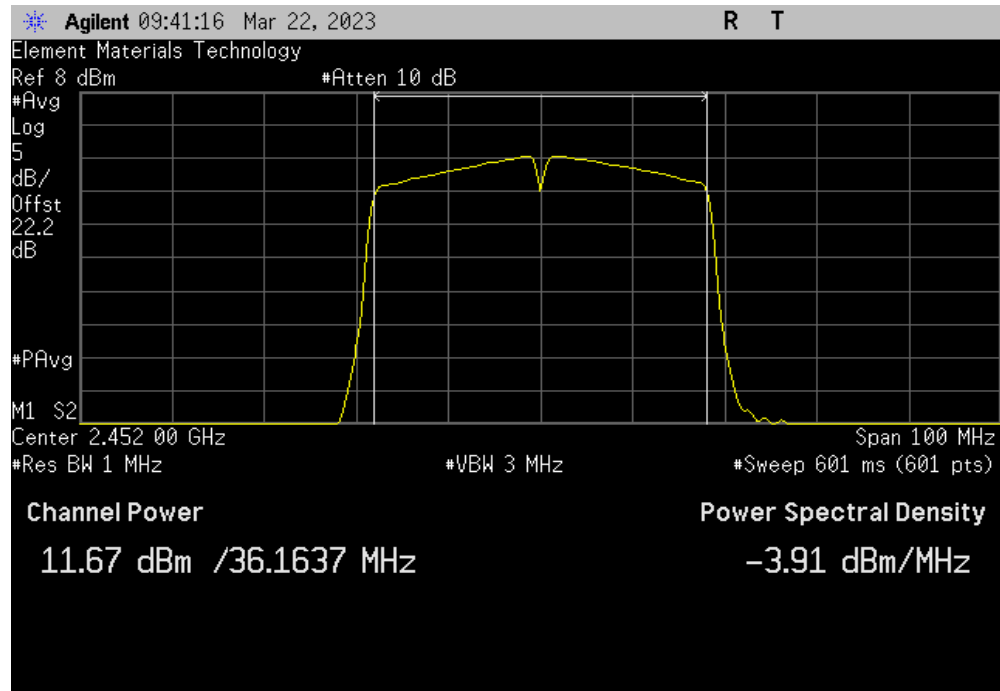


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



TbTx 2022.06.03.0 XMt 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, High Channel 7/11, 2452 MHz						
Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
11.67	0	11.7	0.17	11.8	36	Pass



POWER SPECTRAL DENSITY

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Aeroflex	INMET 8535	AMO	2023-01-30	2024-01-30
Attenuator	Fairview Microwave	SA18H-20	UAX	2022-07-26	2023-07-26
Cable	Element	None	OC5	2023-01-30	2024-01-30
Generator - Signal	Agilent	E8257D	TGU	2020-11-03	2023-11-03
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2022-10-21	2023-10-21

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

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

The method AVGPSD-2 in clause 11.10.5 of ANSI C63.10:2013 was used to make the measurement. This method uses trace averaging and RMS detection across the ON and OFF times of the transmission. The analyzer was configured to the following settings:

Span = at least 1.5 * OBW
 RBW = 100 kHz
 VBW = 300 kHz
 Detector = RMS
 Sweep = 601 mS
 Points = 601

POWER SPECTRAL DENSITY



TSMTx 2022.06.03.0 XMR 2023.02.14.0

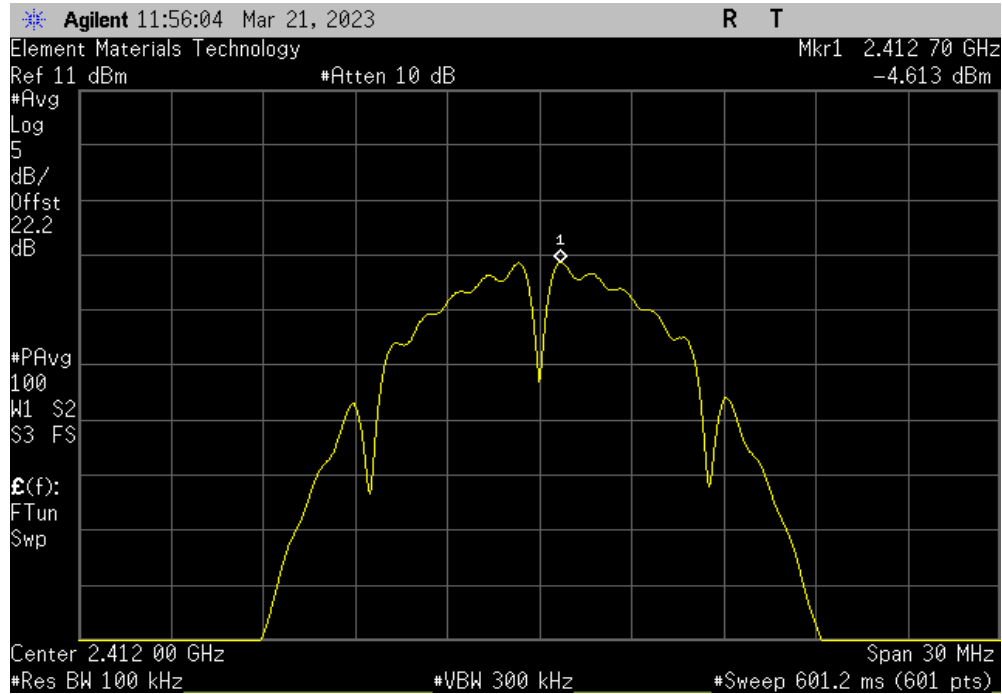
EUT: TSI Inc. OmniTrak			Work Order: TSIN0196				
Serial Number: TSI5221200068			Date: 03/22/2023				
Customer: TSI, Incorporated			Temperature: 19.8°C				
Attendees: None			Humidity: 49.3%				
Project: None			Barometric Pres.: 1022 mbar				
Tested by: Nolan De Ramos, Luis Flores		Power: 5VDC via Battery	Job Site: OC11				
TEST SPECIFICATIONS			Test Method				
FCC 15.247:2023			ANSI C63.10:2013				
RSS-247 Issue 2:2017			ANSI C63.10:2013				
COMMENTS							
Reference level offset includes measurement cable, DC block, and attenuator.							
DEVIATIONS FROM TEST STANDARD							
None							
Configuration #	TSIN0196-8	Signature 					
		Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Duty Cycle Factor (dB)	Value dBm/3kHz	Limit ≤ (dBm/3kHz)	Results
2400 MHz - 2483.5 MHz Band							
802.11(b) 1 Mbps							
Low Channel 1, 2412 MHz		-4.613	-15.2	0	-19.8	8	Pass
Mid Channel 6, 2437 MHz		-4.9	-15.2	0	-20.1	8	Pass
High Channel 11, 2462 MHz		-4.581	-15.2	0	-19.8	8	Pass
802.11(b) 11 Mbps							
Low Channel 1, 2412 MHz		-5.357	-15.2	0	-20.6	8	Pass
Mid Channel 6, 2437 MHz		-5.849	-15.2	0	-21	8	Pass
High Channel 11, 2462 MHz		-5.539	-15.2	0	-20.7	8	Pass
802.11(g) 6 Mbps							
Low Channel 1, 2412 MHz		-7.393	-15.2	0	-22.6	8	Pass
Mid Channel 6, 2437 MHz		-7.906	-15.2	0	-23.1	8	Pass
High Channel 11, 2462 MHz		-7.618	-15.2	0	-22.8	8	Pass
802.11(g) 36 Mbps							
Low Channel 1, 2412 MHz		-7.395	-15.2	0	-22.6	8	Pass
Mid Channel 6, 2437 MHz		-8.128	-15.2	0	-23.3	8	Pass
High Channel 11, 2462 MHz		-9.743	-15.2	0	-24.9	8	Pass
802.11(g) 54 Mbps							
Low Channel 1, 2412 MHz		-8.019	-15.2	0	-23.2	8	Pass
Mid Channel 6, 2437 MHz		-8.132	-15.2	0	-23.3	8	Pass
High Channel 11, 2462 MHz		-7.929	-15.2	0	-23.1	8	Pass
802.11(n20) MCS0							
Low Channel 1, 2412 MHz		-8.023	-15.2	0	-23.2	8	Pass
Mid Channel 6, 2437 MHz		-8.643	-15.2	0	-23.8	8	Pass
High Channel 11, 2462 MHz		-8.314	-15.2	0	-23.5	8	Pass
802.11(n20) MCS7							
Low Channel 1, 2412 MHz		-7.821	-15.2	0	-23	8	Pass
Mid Channel 6, 2437 MHz		-8.123	-15.2	0	-23.3	8	Pass
High Channel 11, 2462 MHz		-7.951	-15.2	0	-23.2	8	Pass
802.11(n40) MCS0							
Low Channel 1/5, 2422 MHz		-10.733	-15.2	0	-25.9	8	Pass
Mid Channel 4/8, 2437 MHz		-11.216	-15.2	0	-26.4	8	Pass
High Channel 7/11, 2452 MHz		-10.737	-15.2	0	-25.9	8	Pass
802.11(n40) MCS7							
Low Channel 1/5, 2422 MHz		-10.285	-15.2	0	-25.5	8	Pass
Mid Channel 4/8, 2437 MHz		-10.905	-15.2	0	-26.1	8	Pass
High Channel 7/11, 2452 MHz		-10.682	-15.2	0	-25.9	8	Pass

POWER SPECTRAL DENSITY

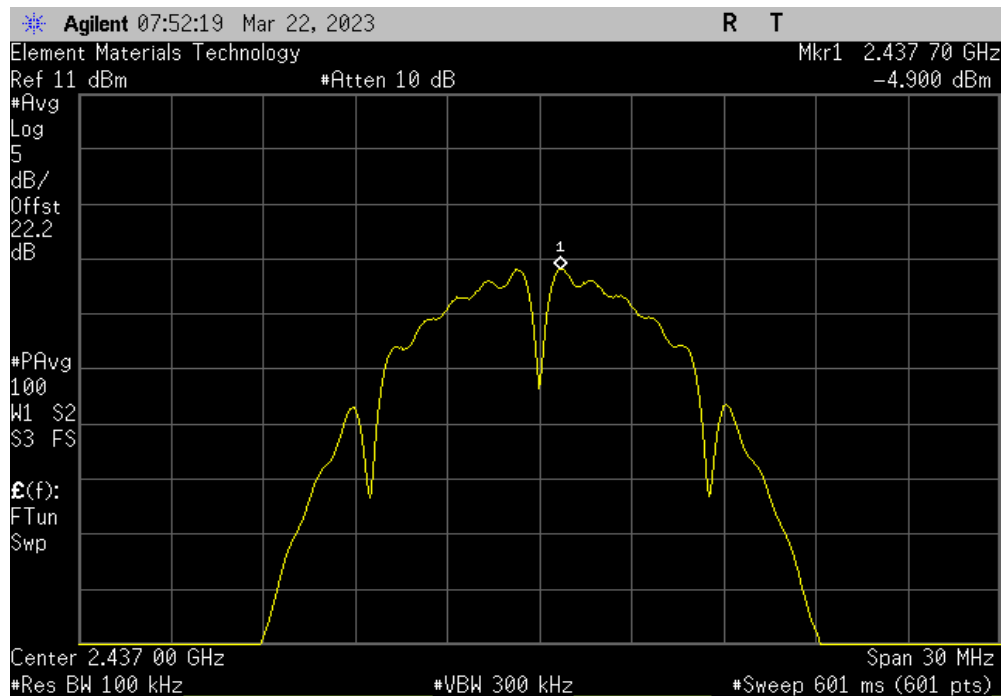


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
	-4.613	-15.2	0	-19.8	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
	-4.9	-15.2	0	-20.1	8	Pass

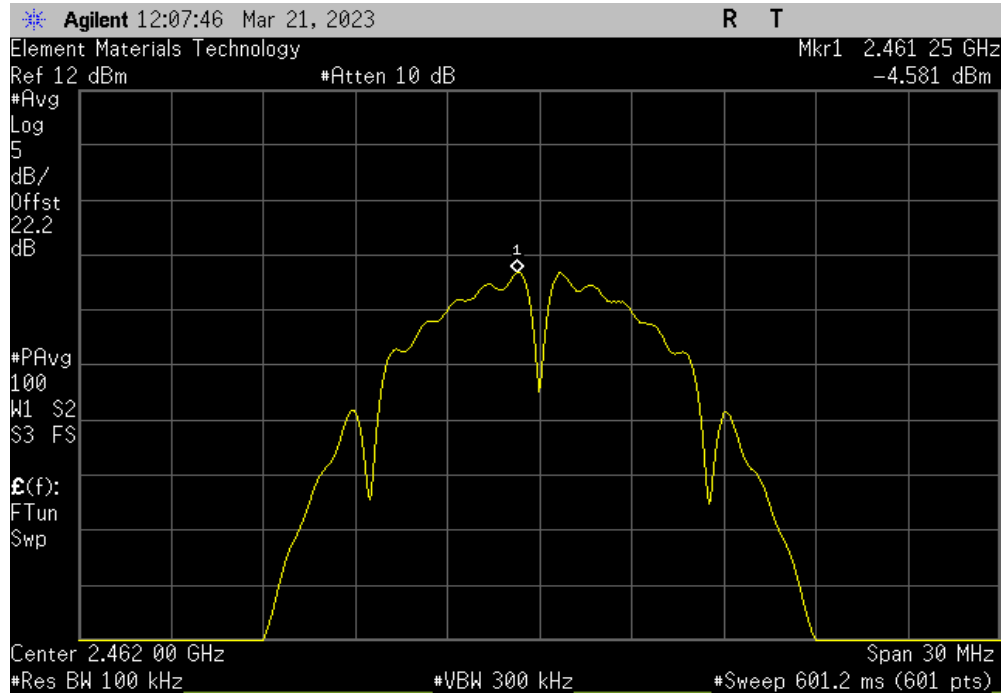


POWER SPECTRAL DENSITY

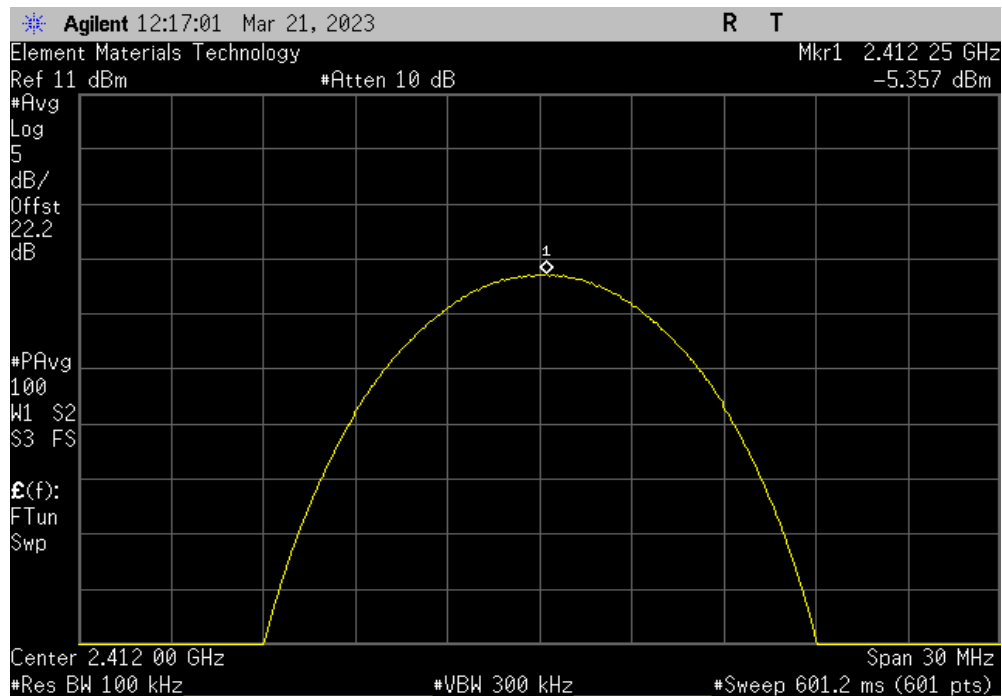


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
	-4.581	-15.2	0	-19.8	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
	-5.357	-15.2	0	-20.6	8	Pass

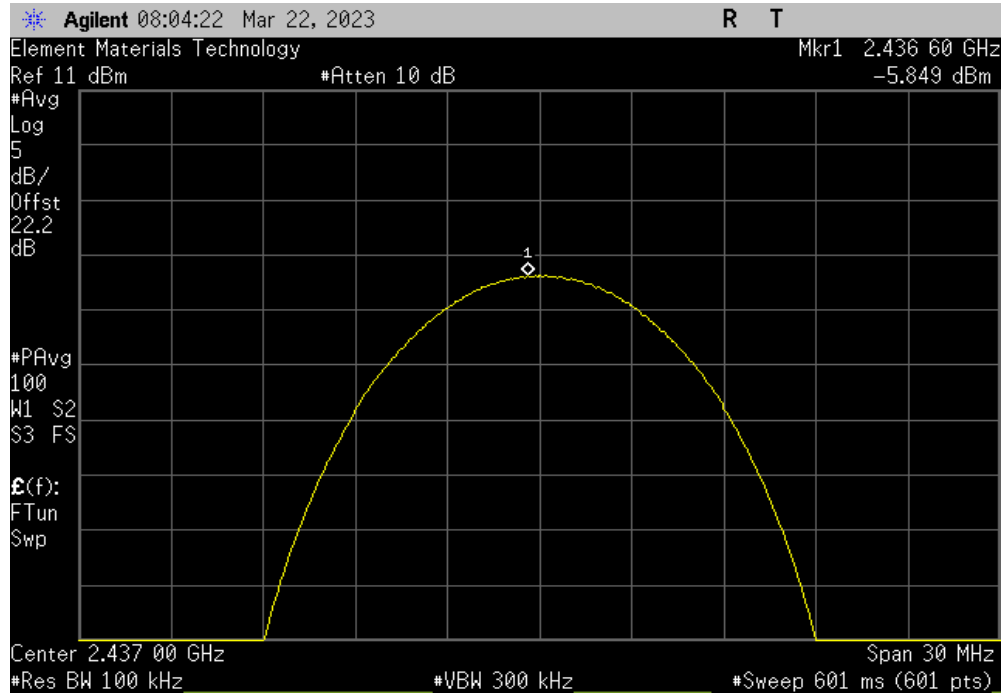


POWER SPECTRAL DENSITY

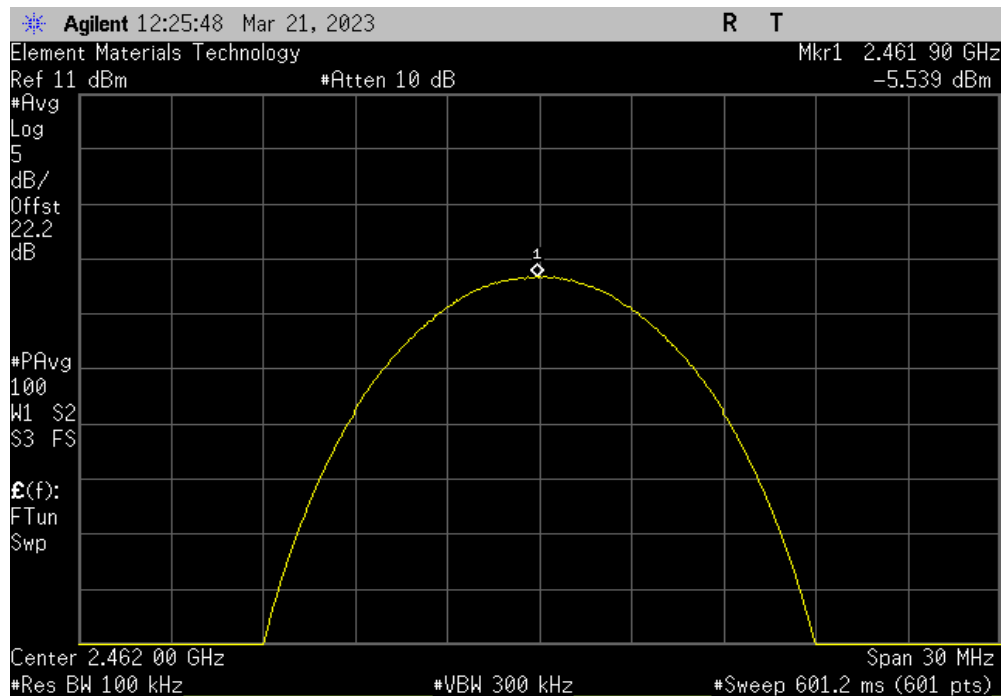


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
	To dBm/3kHz	Factor (dB)		≤ (dBm/3kHz)		
	-5.849	-15.2	0	-21	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
	To dBm/3kHz	Factor (dB)		≤ (dBm/3kHz)		
	-5.539	-15.2	0	-20.7	8	Pass

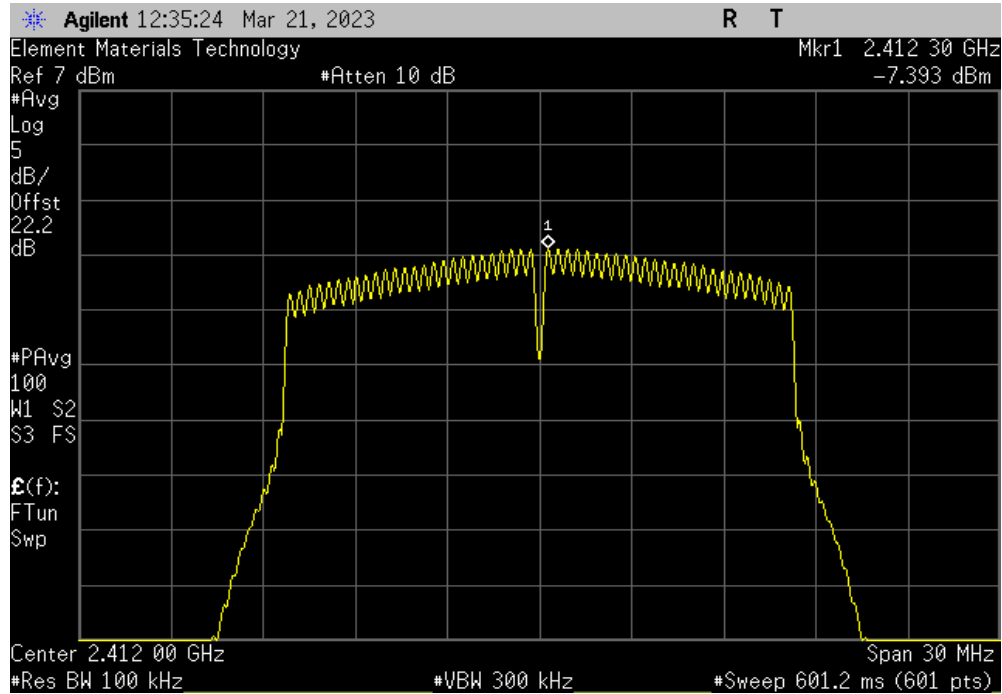


POWER SPECTRAL DENSITY

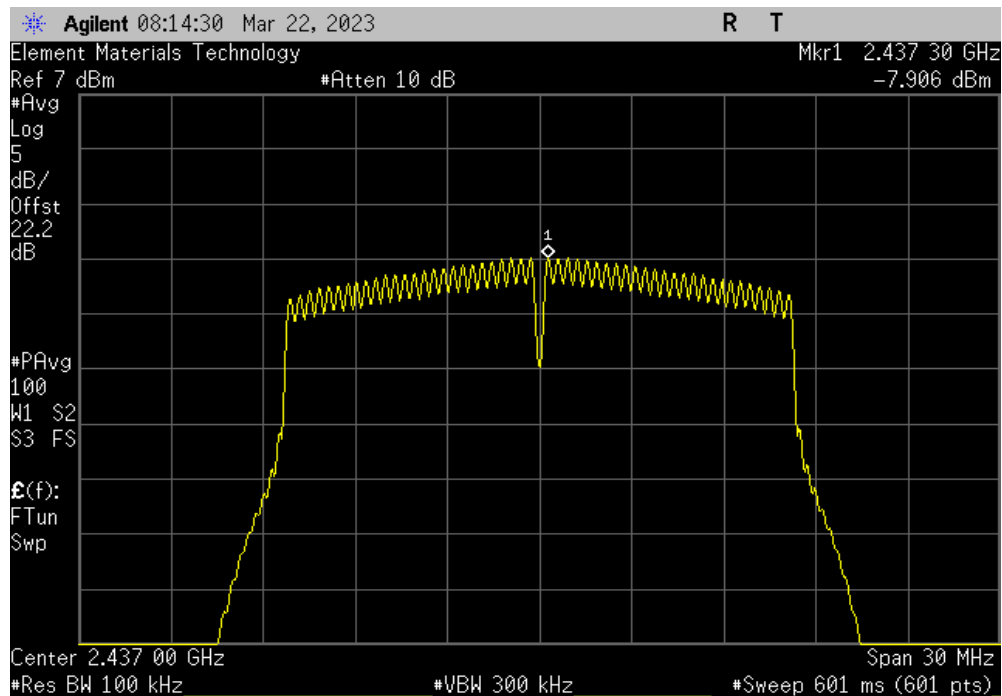


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
	To dBm/3kHz	Factor (dB)		≤ (dBm/3kHz)		
	-7.393	-15.2	0	-22.6	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
	To dBm/3kHz	Factor (dB)		≤ (dBm/3kHz)		
	-7.906	-15.2	0	-23.1	8	Pass

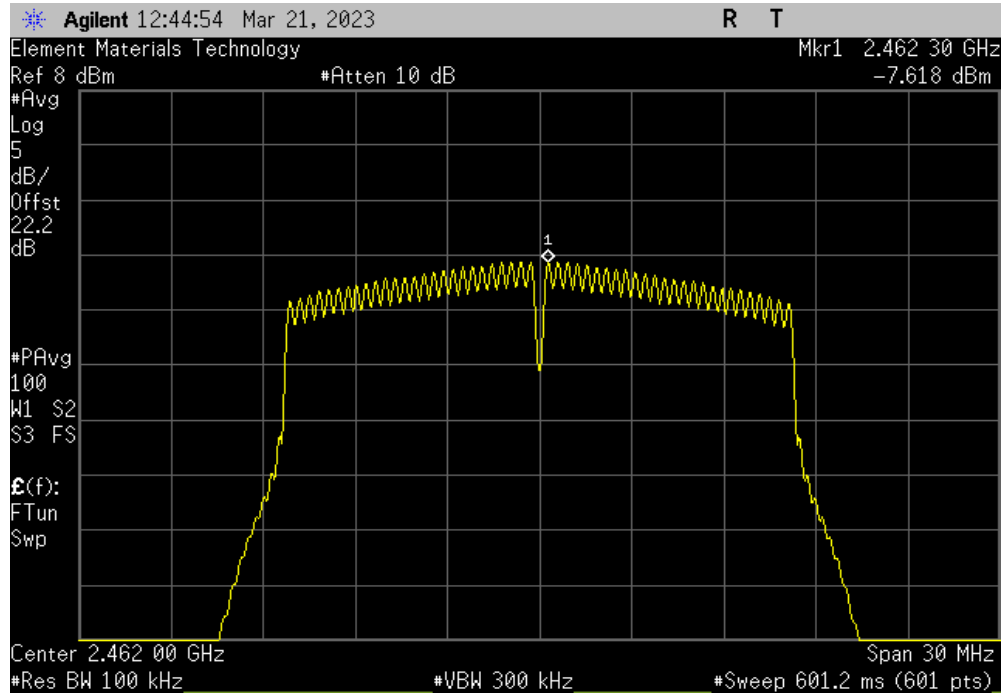


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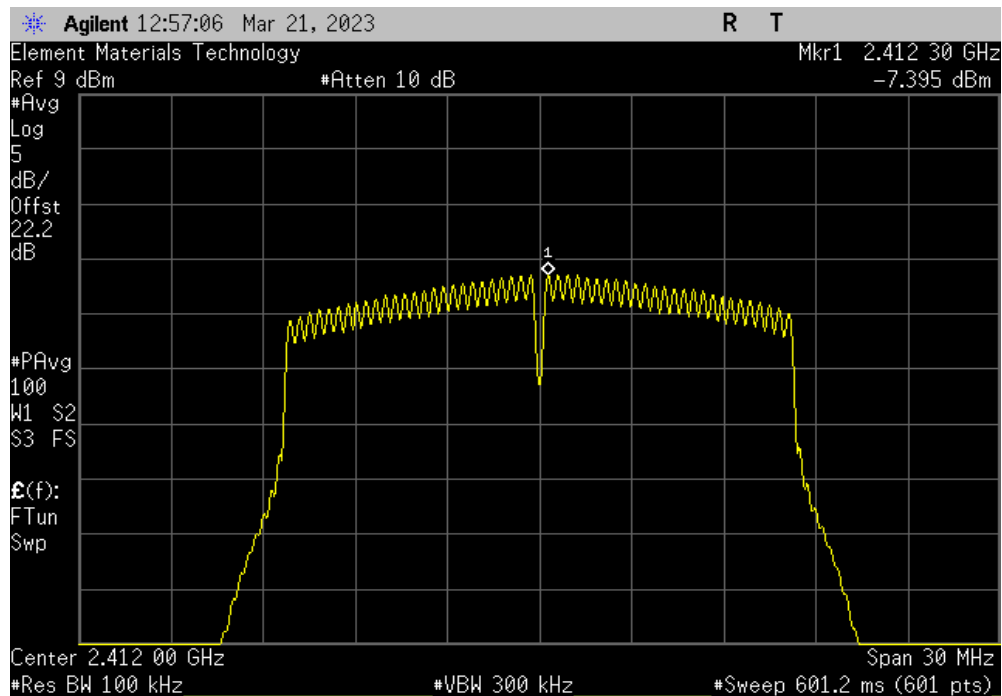


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
-7.618	-15.2	0	-22.8	8	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
-7.395	-15.2	0	-22.6	8	Pass	

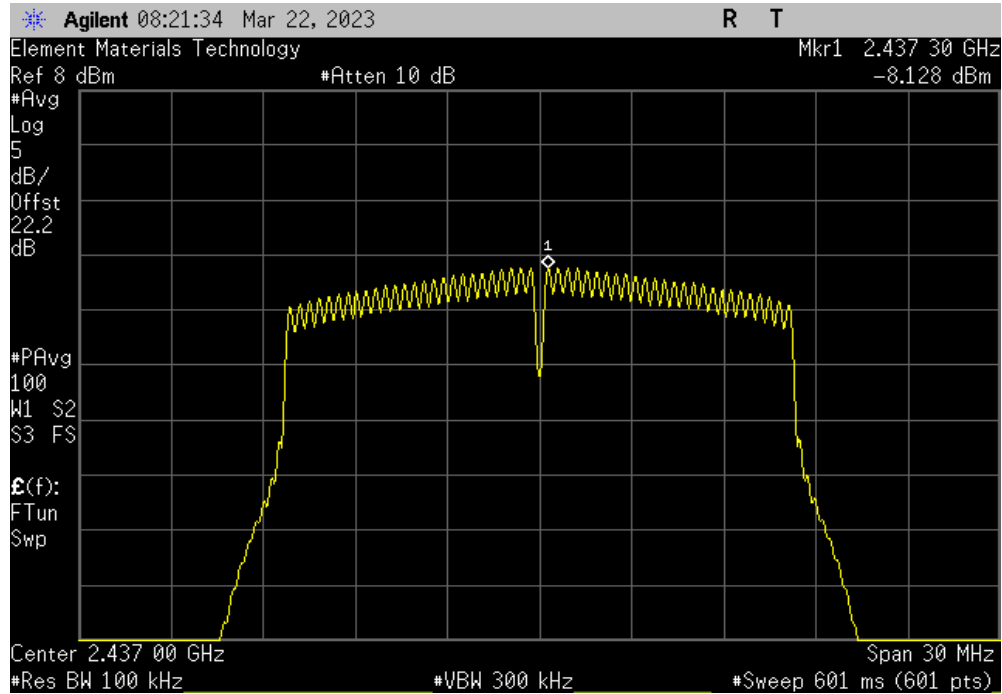


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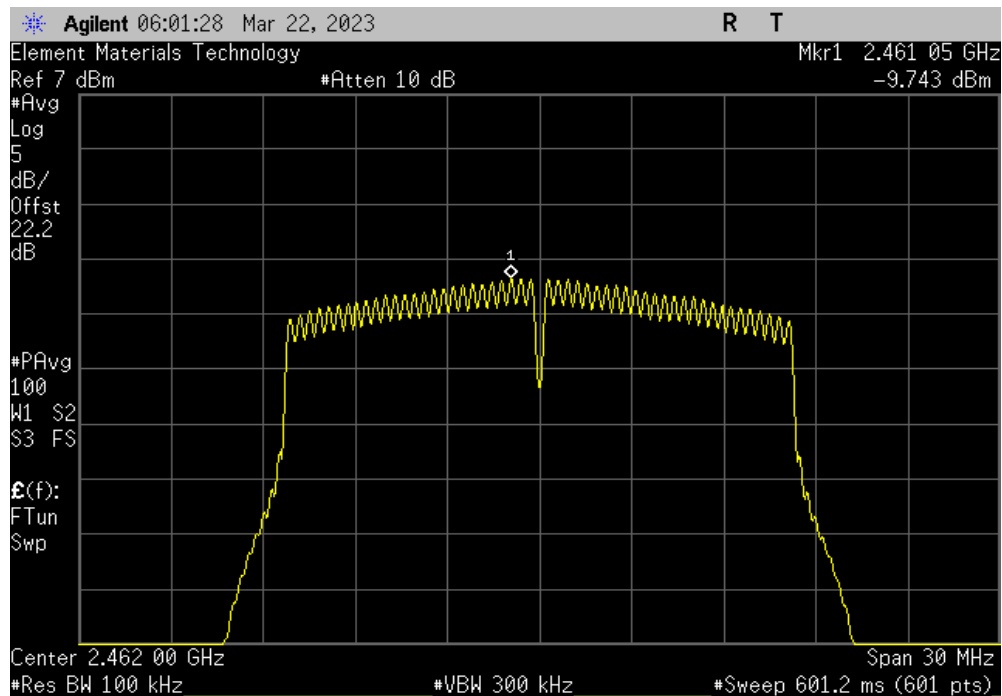


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
	-8.128	-15.2	0	-23.3	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
	-9.743	-15.2	0	-24.9	8	Pass

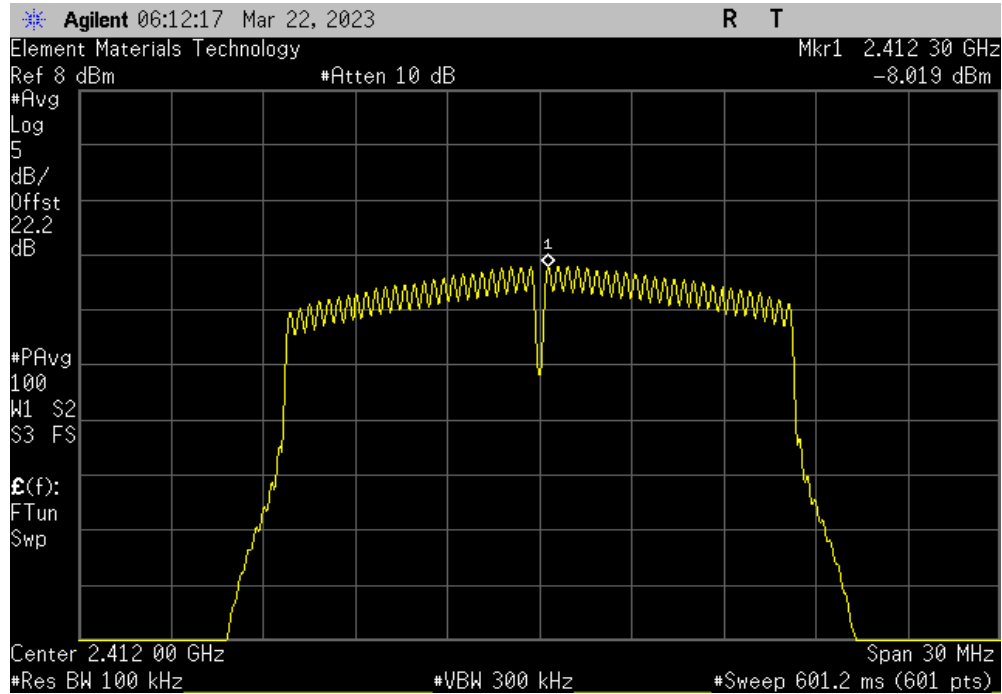


POWER SPECTRAL DENSITY

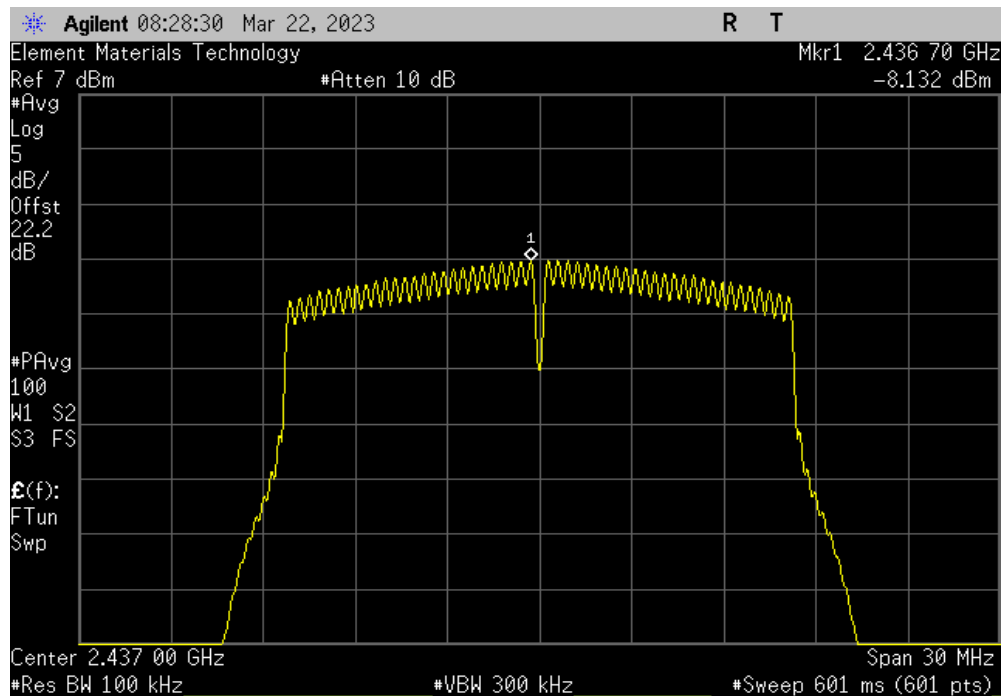


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
	-8.019	-15.2	0	-23.2	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
	-8.132	-15.2	0	-23.3	8	Pass

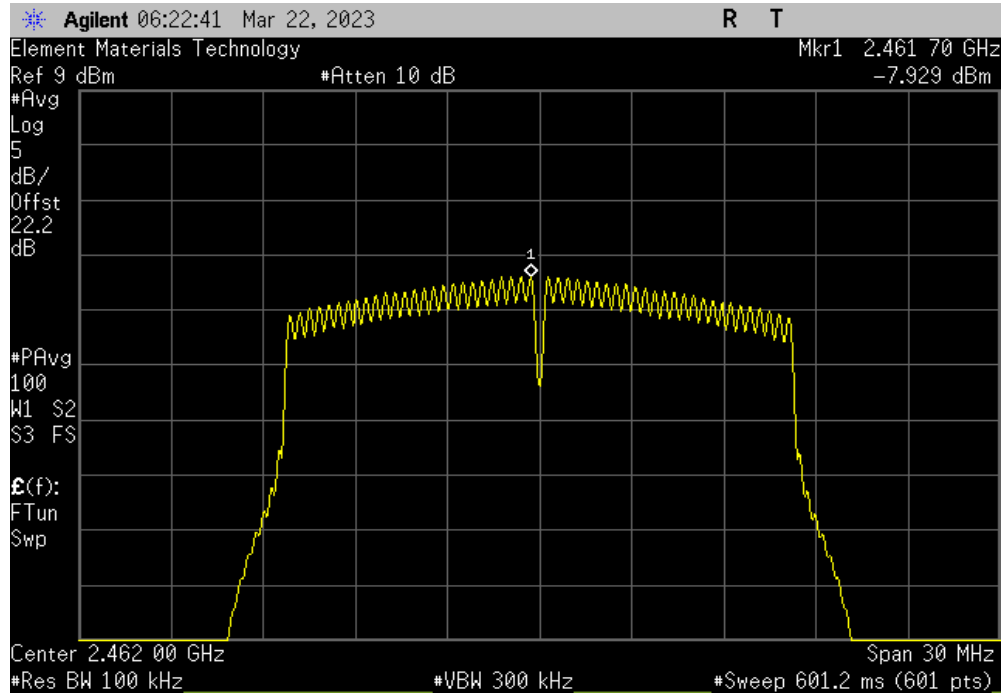


POWER SPECTRAL DENSITY

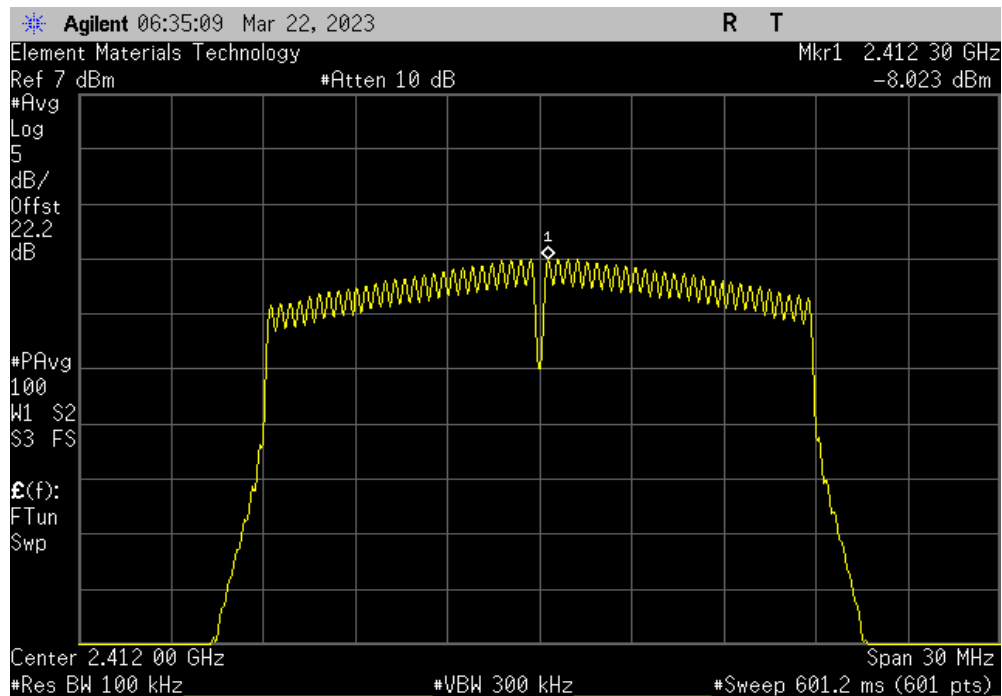


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
	-7.929	-15.2	0	-23.1	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, Low Channel 1, 2412 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
	-8.023	-15.2	0	-23.2	8	Pass

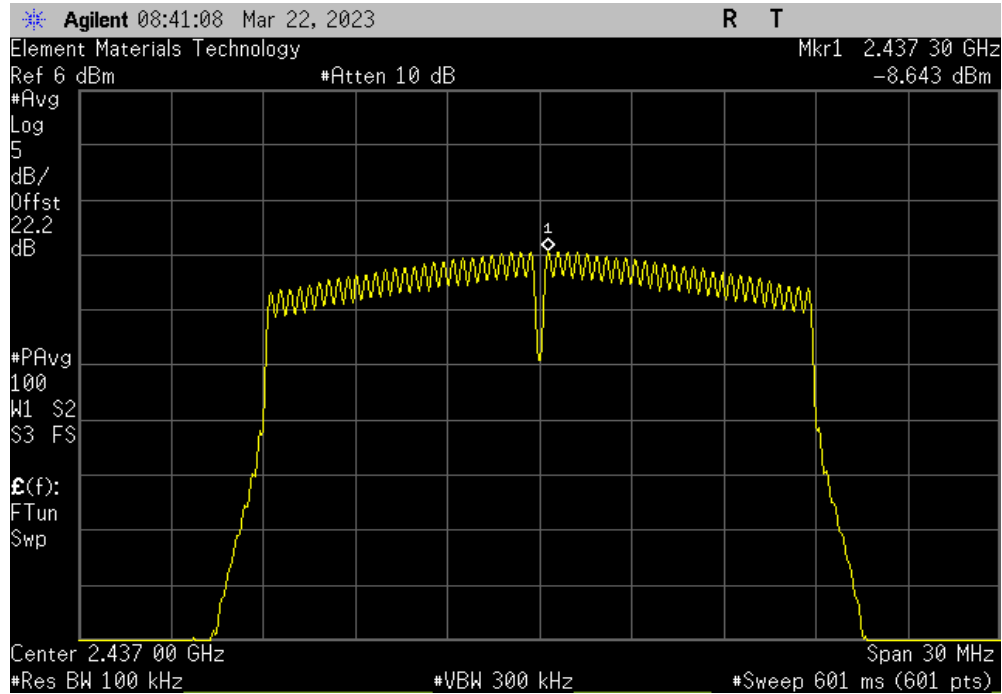


POWER SPECTRAL DENSITY

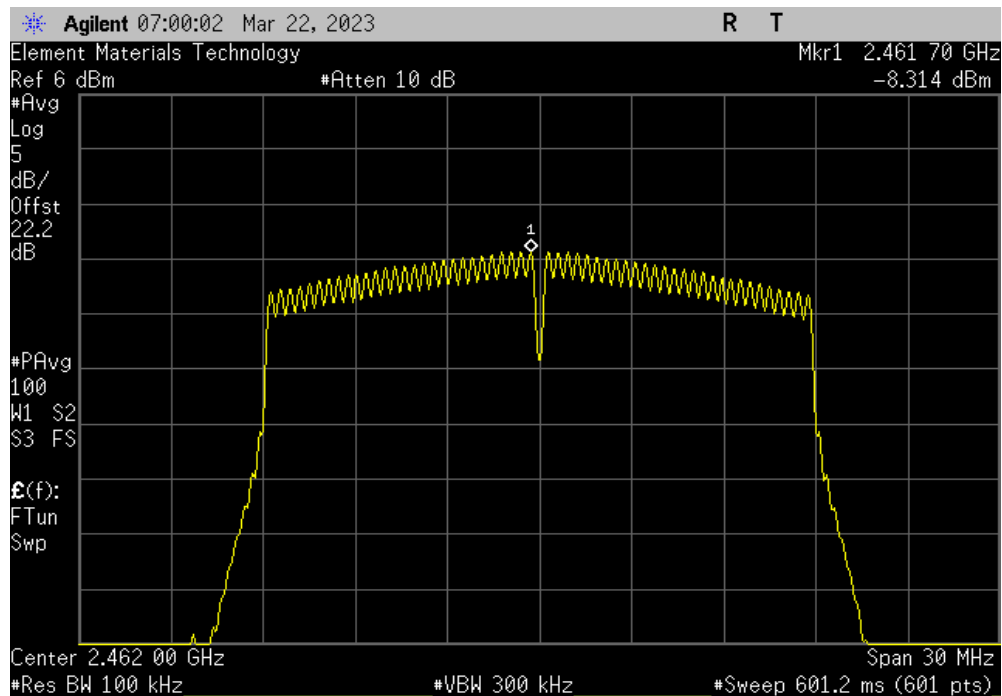


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, Mid Channel 6, 2437 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
	-8.643	-15.2	0	-23.8	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, High Channel 11, 2462 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
	-8.314	-15.2	0	-23.5	8	Pass

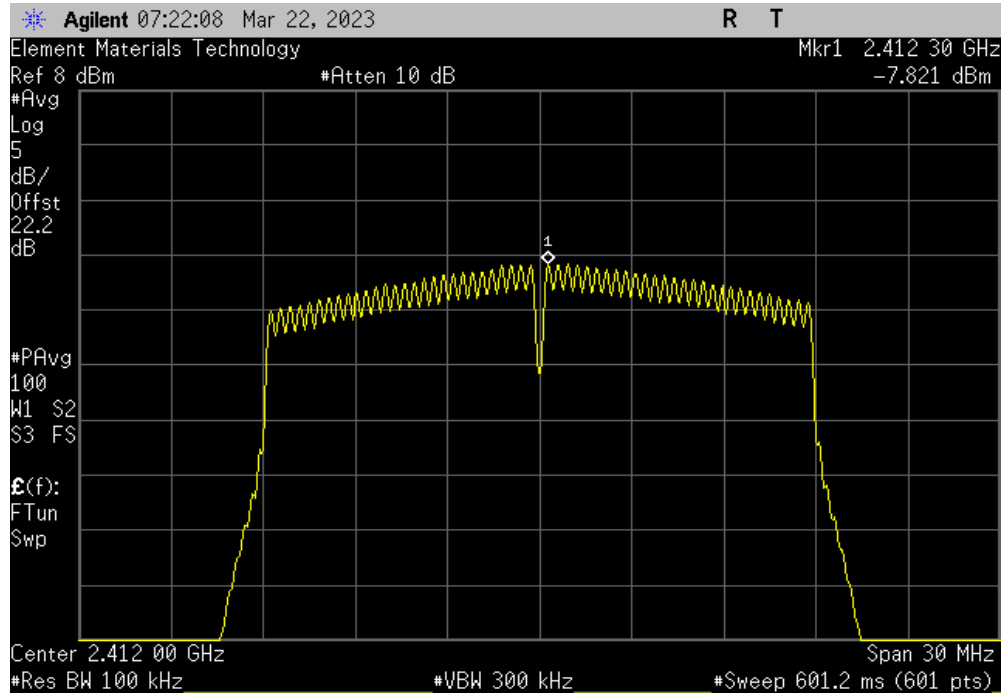


POWER SPECTRAL DENSITY

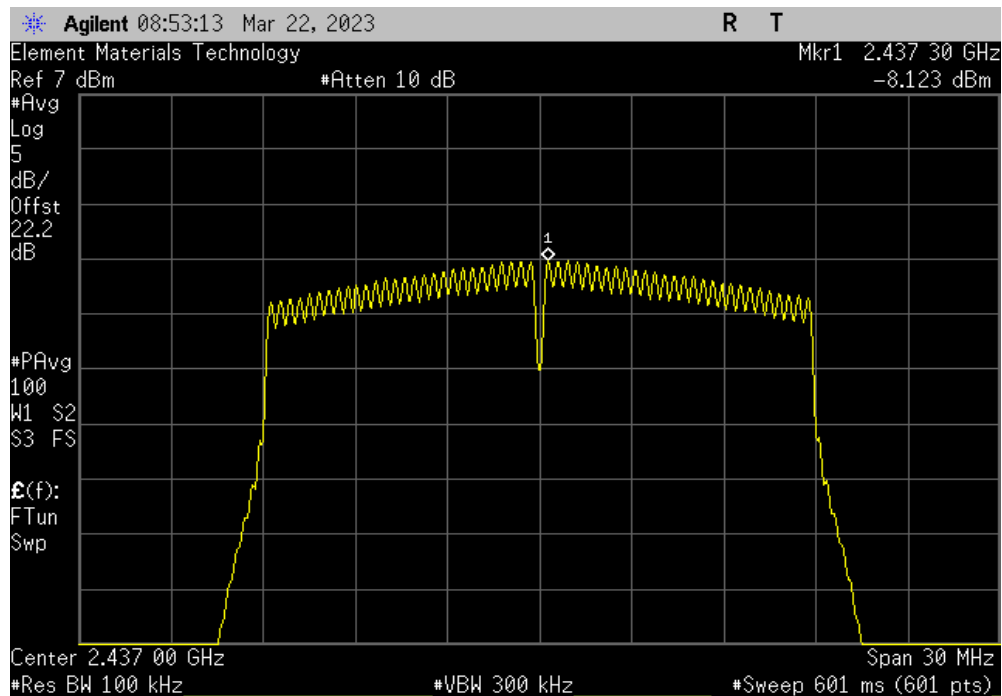


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, Low Channel 1, 2412 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
	To dBm/3kHz	Factor (dB)		≤ (dBm/3kHz)		
	-7.821	0	-23	8	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, Mid Channel 6, 2437 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
	To dBm/3kHz	Factor (dB)		≤ (dBm/3kHz)		
	-8.123	0	-23.3	8	Pass	

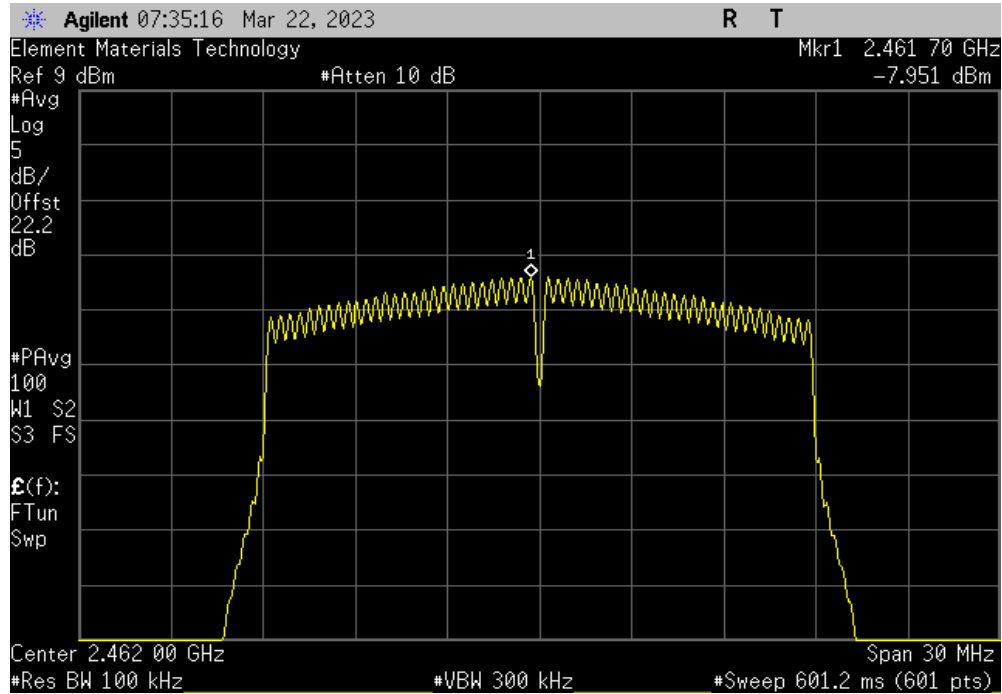


POWER SPECTRAL DENSITY

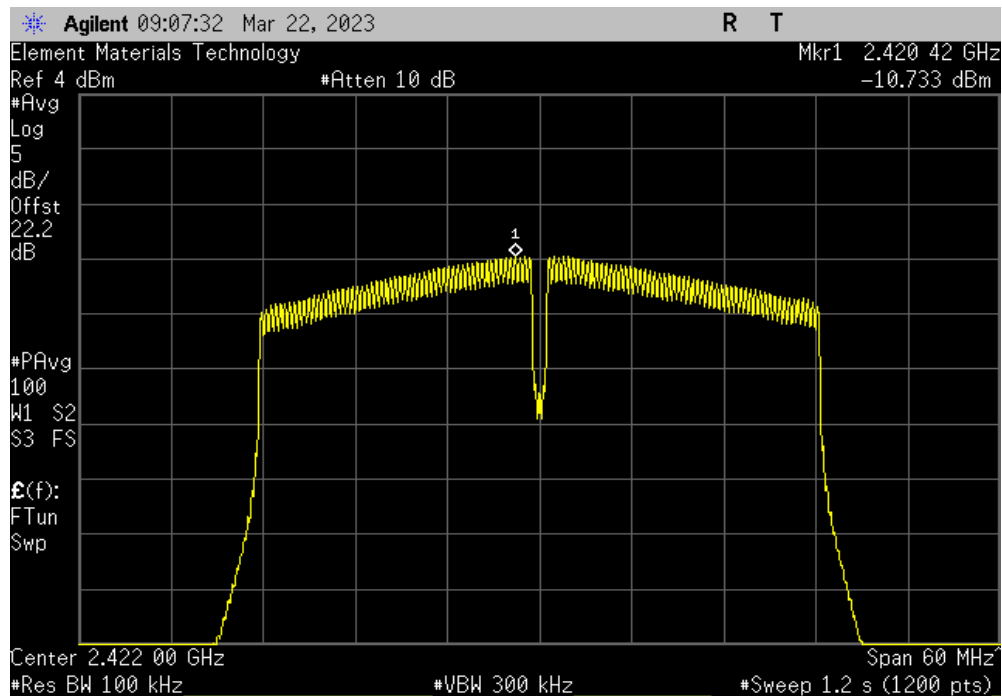


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, High Channel 11, 2462 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
	-7.951	-15.2	0	-23.2	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Low Channel 1/5, 2422 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
	-10.733	-15.2	0	-25.9	8	Pass

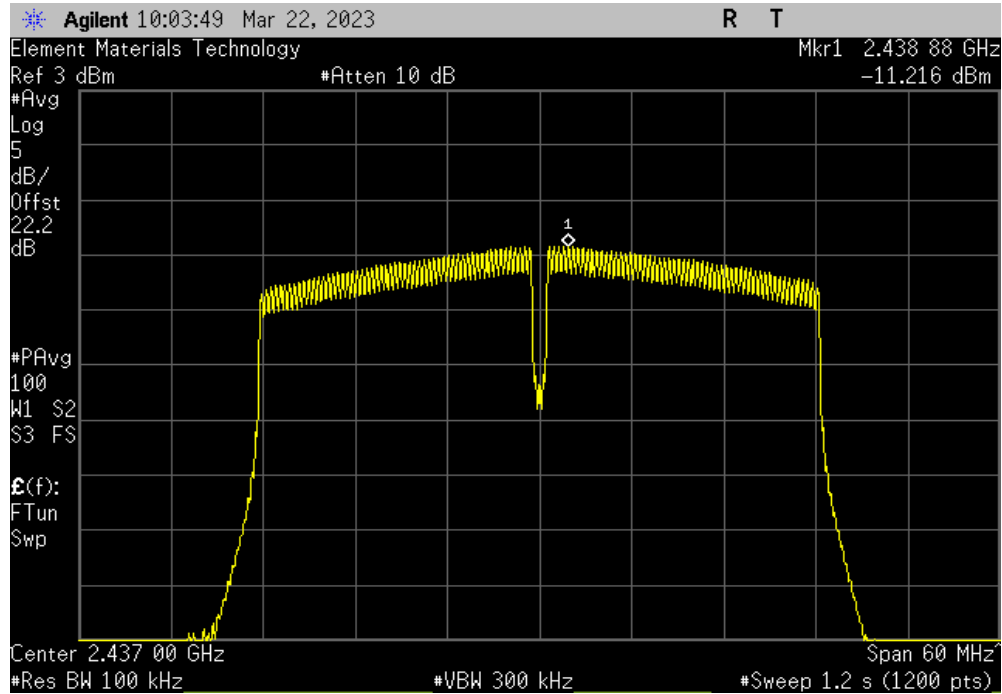


POWER SPECTRAL DENSITY

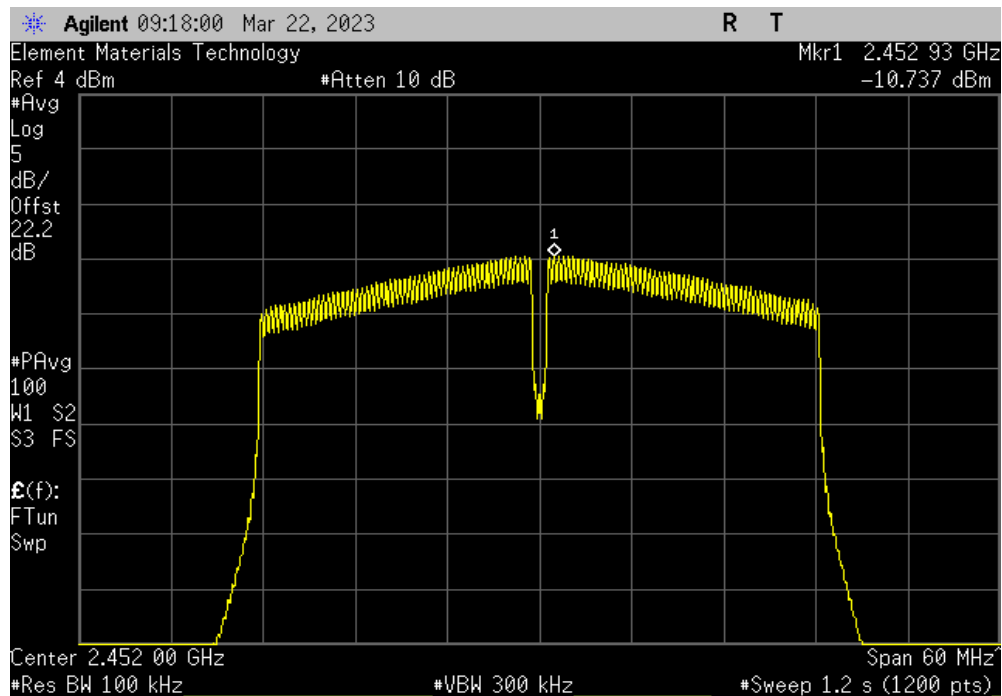


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Mid Channel 4/8, 2437 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
-11.216	-15.2	0	-26.4	8	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, High Channel 7/11, 2452 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
-10.737	-15.2	0	-25.9	8	Pass	

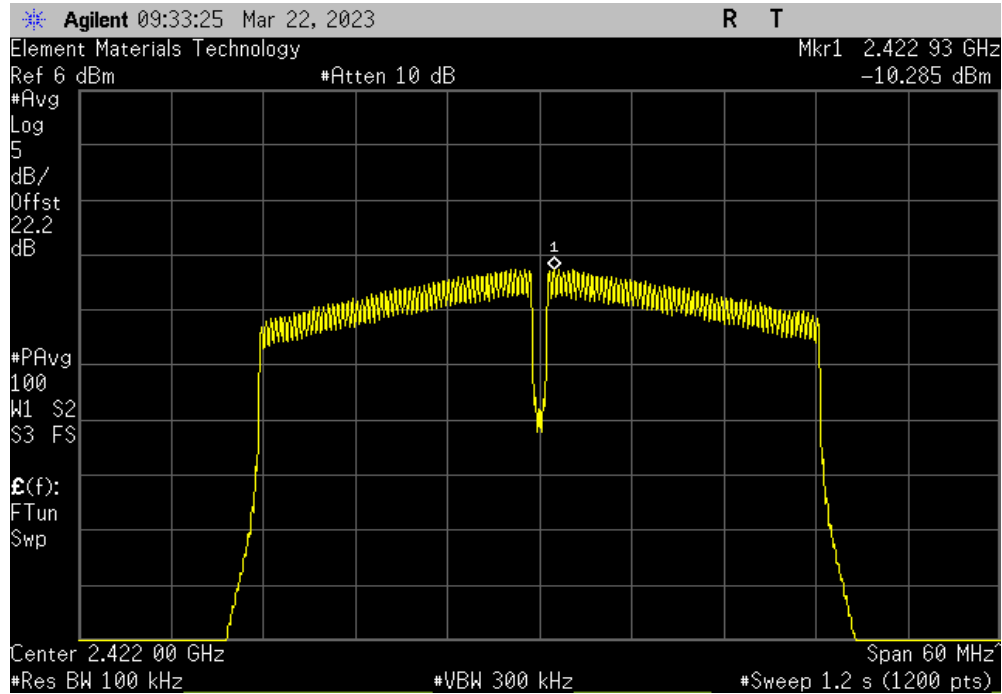


POWER SPECTRAL DENSITY

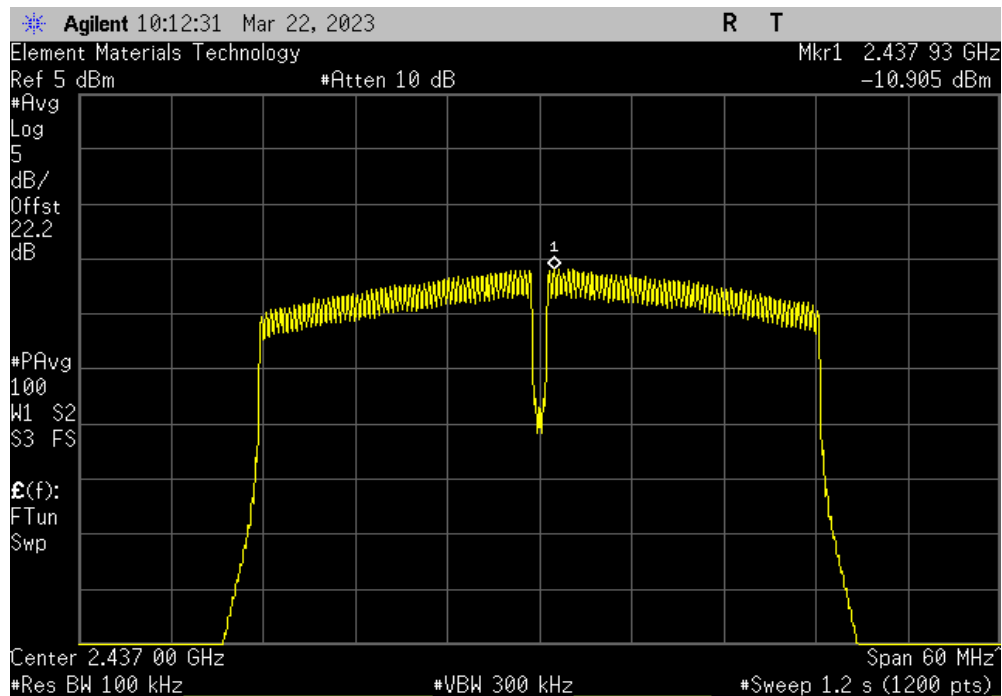


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Low Channel 1/5, 2422 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
-10.285	-15.2	0	-25.5	8	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Mid Channel 4/8, 2437 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
dBm/100kHz	To dBm/3kHz	Factor (dB)	dBm/3kHz	≤ (dBm/3kHz)		
-10.905	-15.2	0	-26.1	8	Pass	

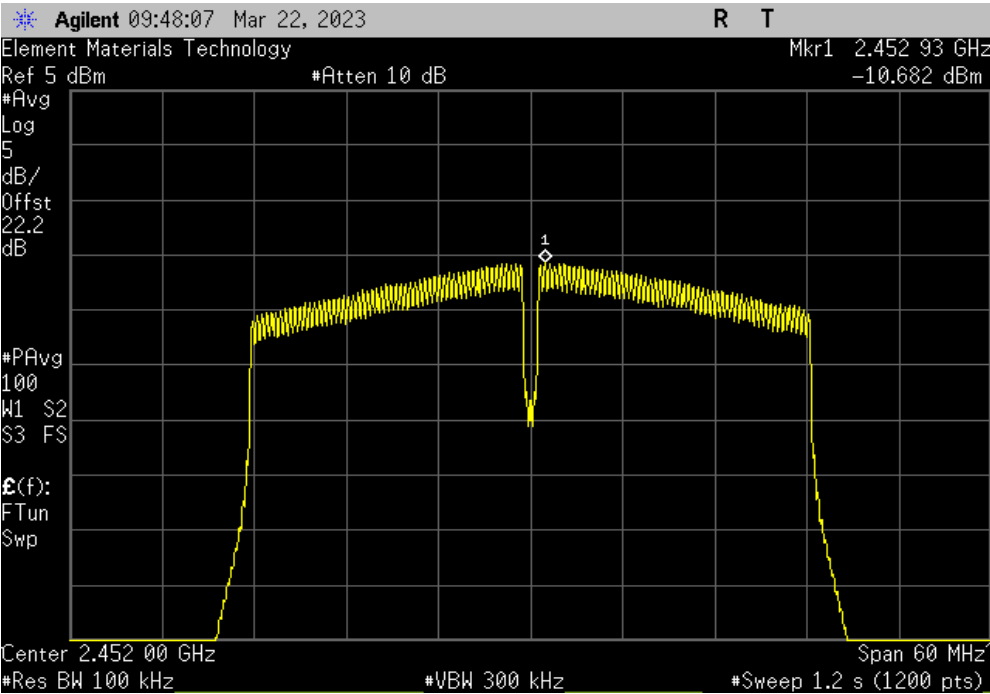


POWER SPECTRAL DENSITY



TbTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, High Channel 7/11, 2452 MHz						
Value	dBm/100kHz	Duty Cycle	Value	Limit	Results	
	To dBm/3kHz	Factor (dB)		≤ (dBm/3kHz)		
	-10.682	0	-25.9	8	Pass	



BAND EDGE COMPLIANCE



XMH 2023.02.14.0

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	Agilent	E8257D	TGU	2020-11-03	2023-11-03
Cable	Element	None	OC5	2023-01-30	2024-01-30
Block - DC	Aeroflex	INMET 8535	AMO	2023-01-30	2024-01-30
Attenuator	Fairview Microwave	SA18H-20	UAX	2022-07-26	2023-07-26
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2022-10-21	2023-10-21

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

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



TSMTx 2022.06.03.0 XMR 2023.02.14.0

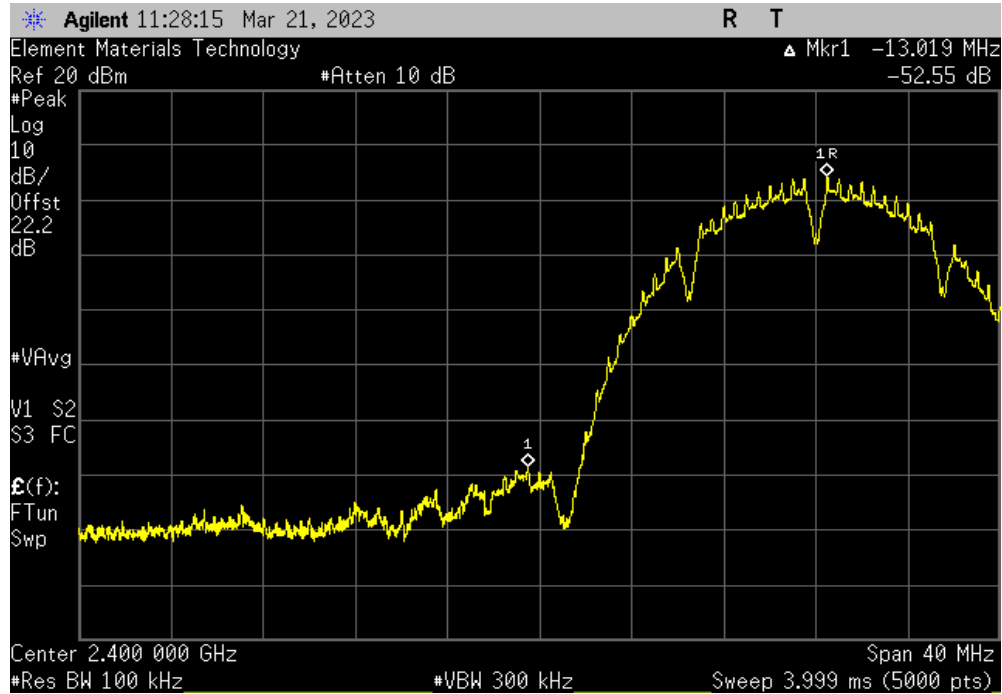
EUT: TSI Inc. OmniTrak		Work Order: TSIN0196	
Serial Number: TSI5221200068		Date: 03/22/2023	
Customer: TSI, Incorporated		Temperature: 20.6°C	
Attendees: None		Humidity: 49.7%	
Project: None		Barometric Pres.: 1018 mbar	
Tested by: Nolan De Ramos, Luis Flores		Power: 5VDC via Battery	
		Job Site: OC11	
TEST SPECIFICATIONS			
FCC 15.247:2023		Test Method	
RSS-247 Issue 2:2017		ANSI C63.10:2013	
		ANSI C63.10:2013	
COMMENTS			
Reference level offset includes measurement cable, DC block, and attenuator.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	TSIN0196-8	Signature 	
		Value (dBc)	Limit ≤ (dBc) Result
2400 MHz - 2483.5 MHz Band			
802.11(b) 1 Mbps			
Low Channel 1, 2412 MHz		-52.55	-30 Pass
High Channel 11, 2462 MHz		-59.62	-30 Pass
802.11(b) 11 Mbps			
Low Channel 1, 2412 MHz		-52.74	-30 Pass
High Channel 11, 2462 MHz		-60.19	-30 Pass
802.11(g) 6 Mbps			
Low Channel 1, 2412 MHz		-31.79	-30 Pass
High Channel 11, 2462 MHz		-47.81	-30 Pass
802.11(g) 36 Mbps			
Low Channel 1, 2412 MHz		-36.16	-30 Pass
High Channel 11, 2462 MHz		-50.14	-30 Pass
802.11(g) 54 Mbps			
Low Channel 1, 2412 MHz		-41.58	-30 Pass
High Channel 11, 2462 MHz		-46.05	-30 Pass
802.11(n20) MCS0			
Low Channel 1, 2412 MHz		-32.31	-30 Pass
High Channel 11, 2462 MHz		-47.72	-30 Pass
802.11(n20) MCS7			
Low Channel 1, 2412 MHz		-37.48	-30 Pass
High Channel 11, 2462 MHz		-46.56	-30 Pass
802.11(n40) MCS0			
Low Channel 1/5, 2422 MHz		-33.64	-30 Pass
High Channel 7/11, 2452 MHz		-37.28	-30 Pass
802.11(n40) MCS7			
Low Channel 1/5, 2422 MHz		-38.3	-30 Pass
High Channel 7/11, 2452 MHz		-39.26	-30 Pass

BAND EDGE COMPLIANCE

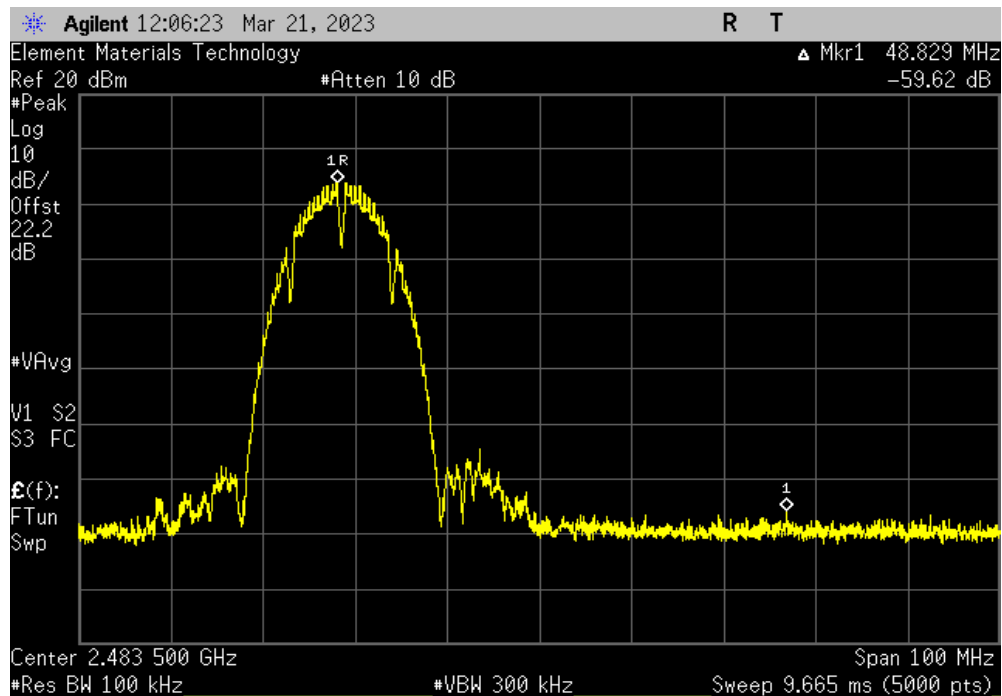


TbTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-52.55	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-59.62	-30	Pass

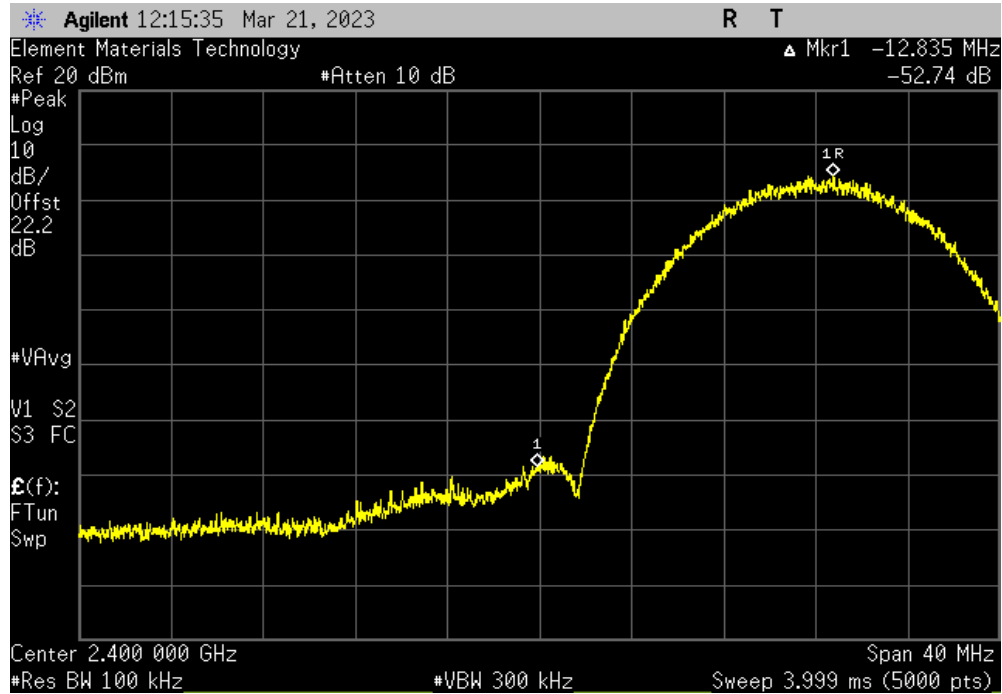


BAND EDGE COMPLIANCE

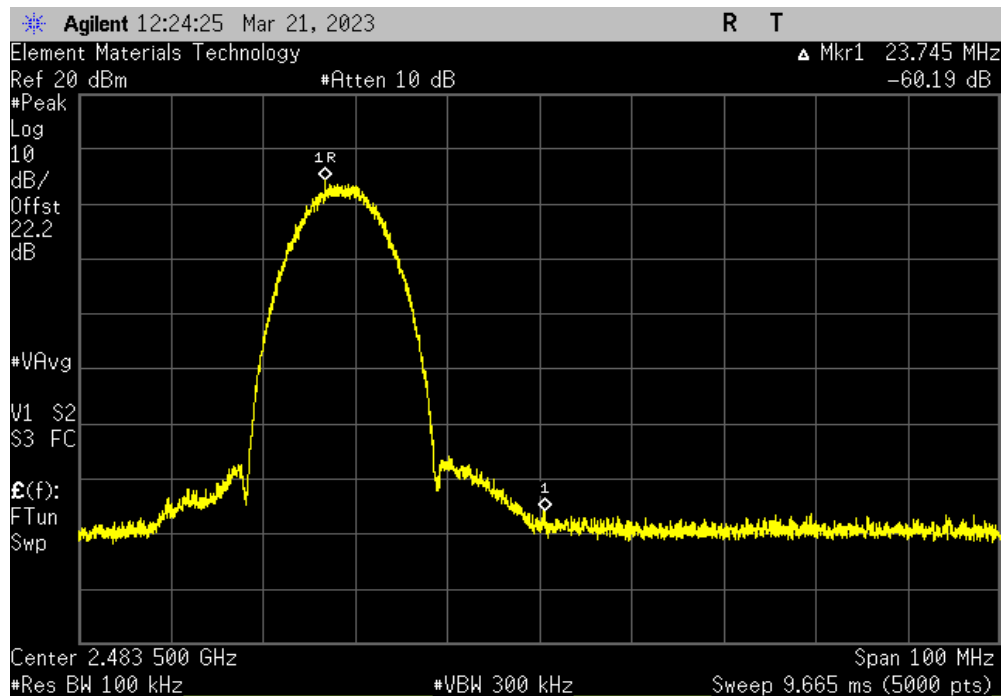


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-52.74	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-60.19	-30	Pass

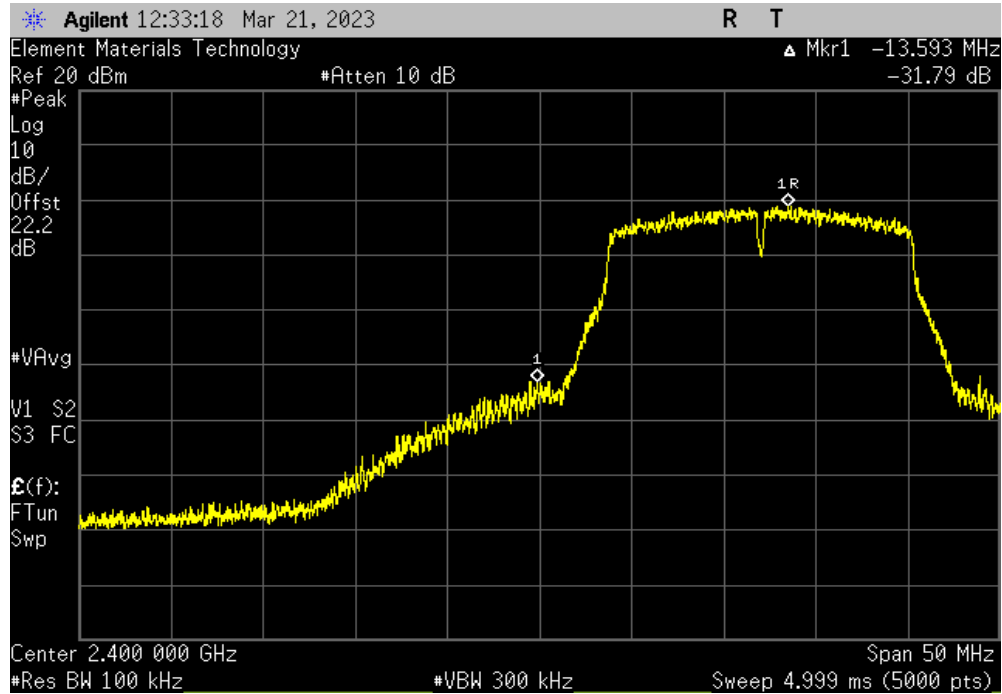


BAND EDGE COMPLIANCE

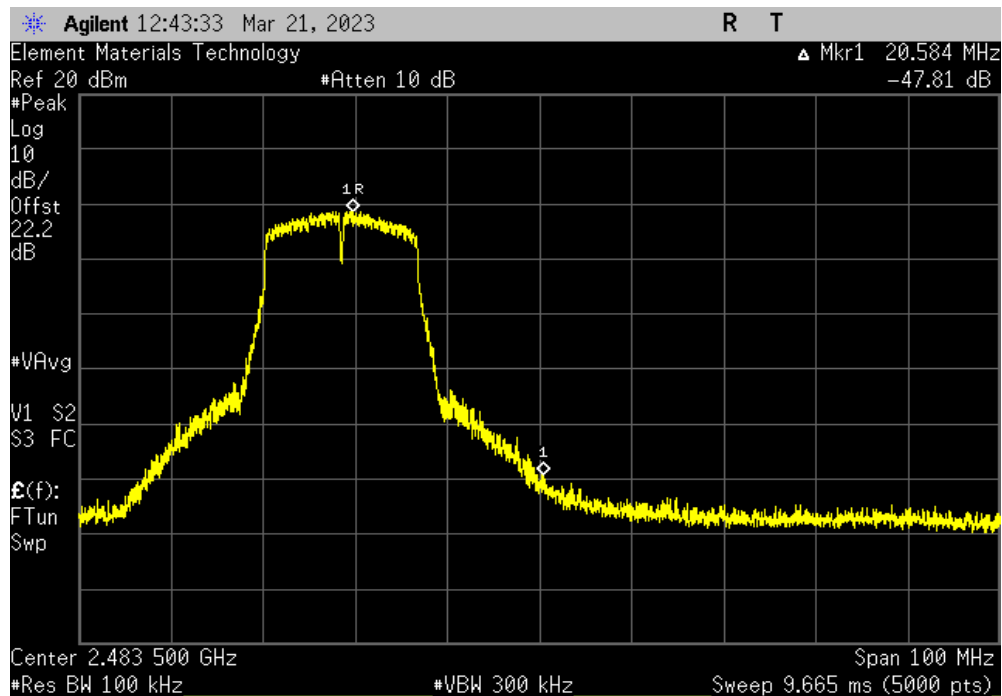


TbTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-31.79	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-47.81	-30	Pass

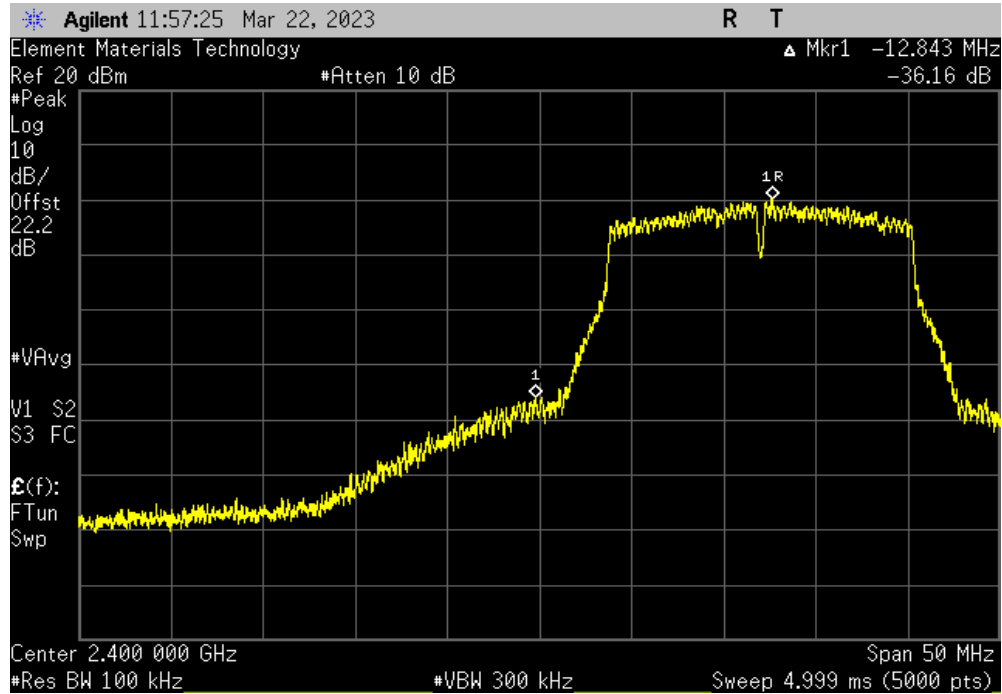


BAND EDGE COMPLIANCE

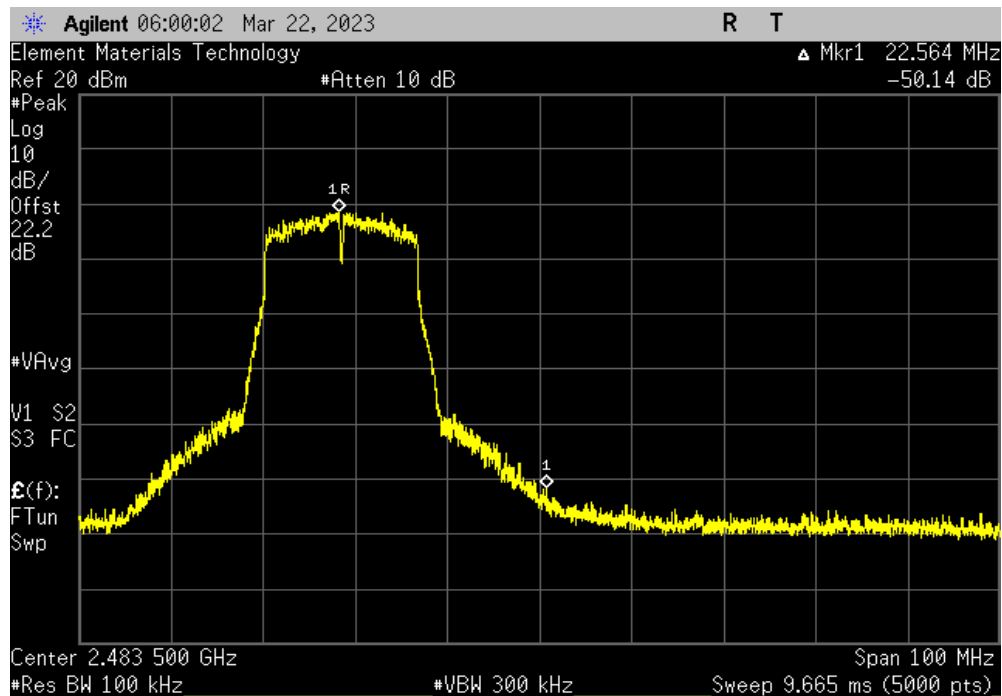


TbTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-36.16	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-50.14	-30	Pass

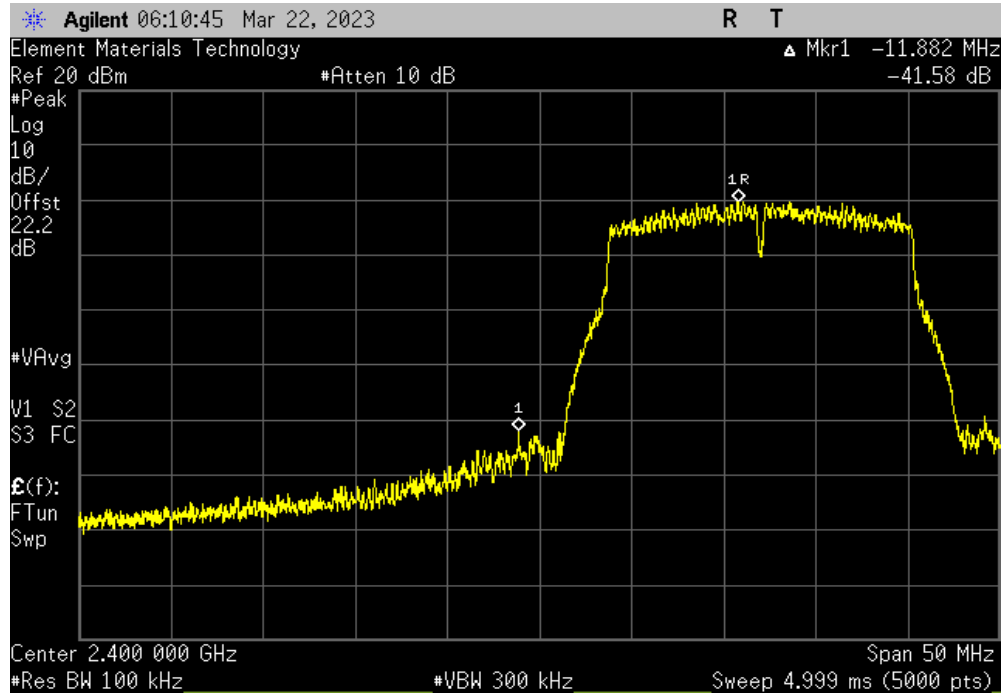


BAND EDGE COMPLIANCE

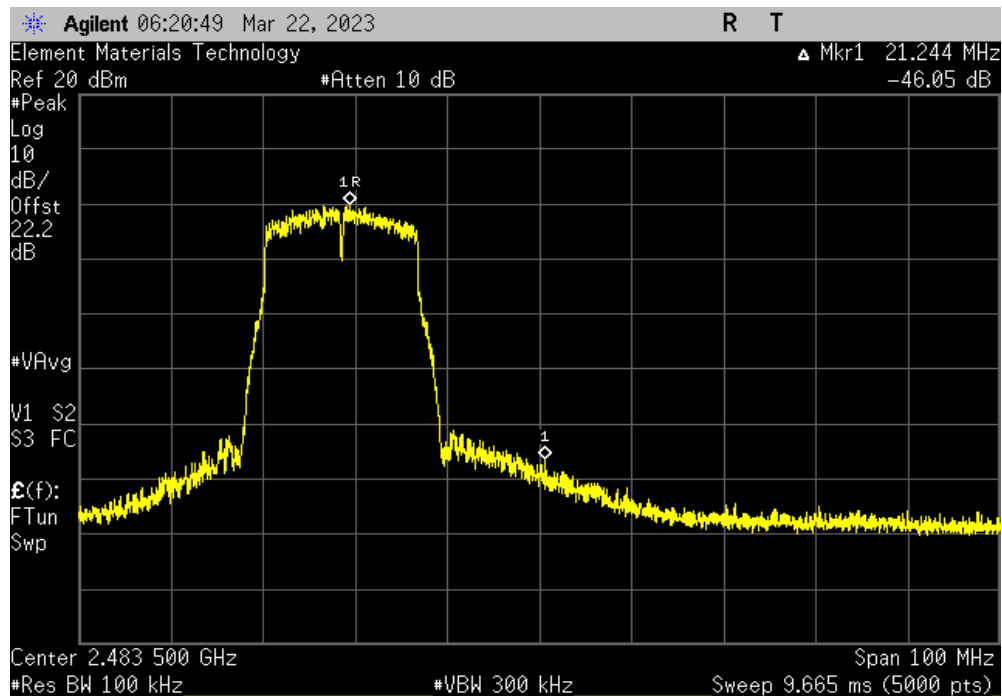


TbTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-41.58	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-46.05	-30	Pass

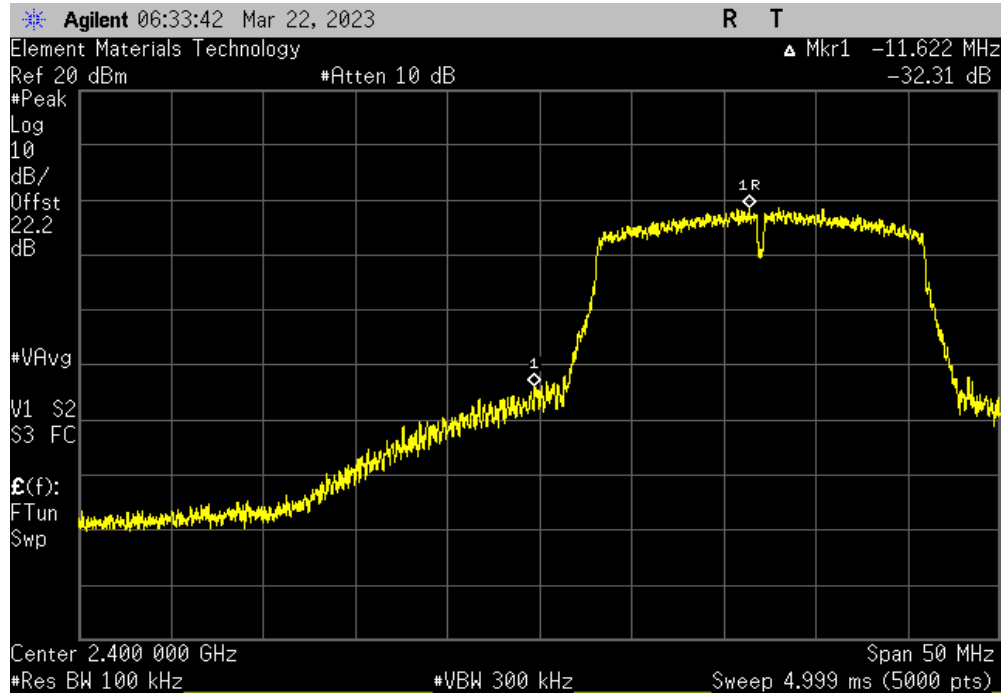


BAND EDGE COMPLIANCE

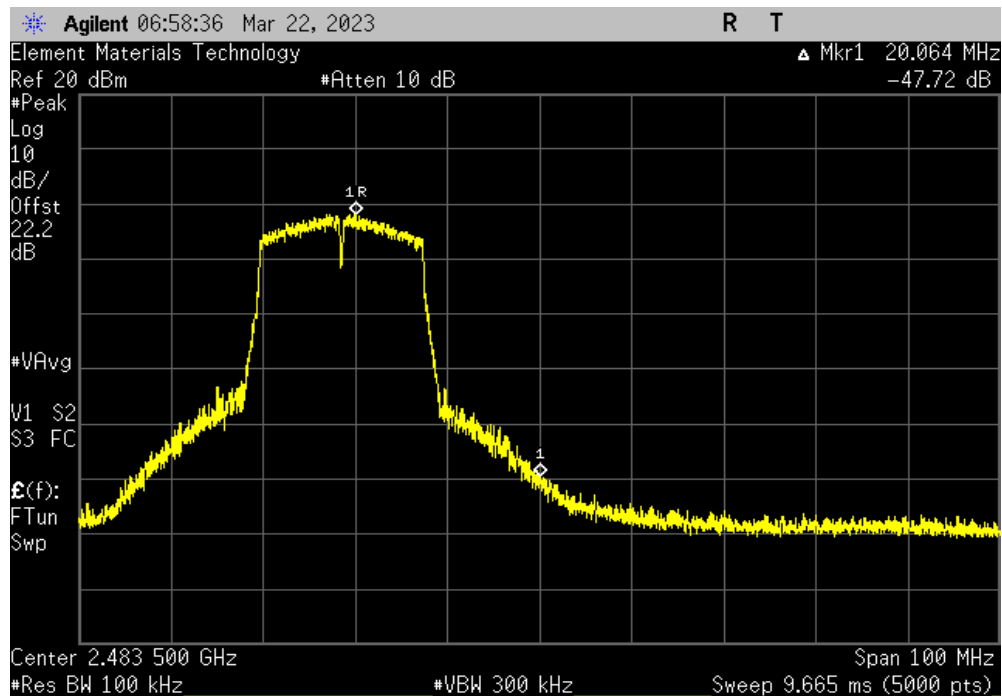


TbTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-32.31	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-47.72	-30	Pass

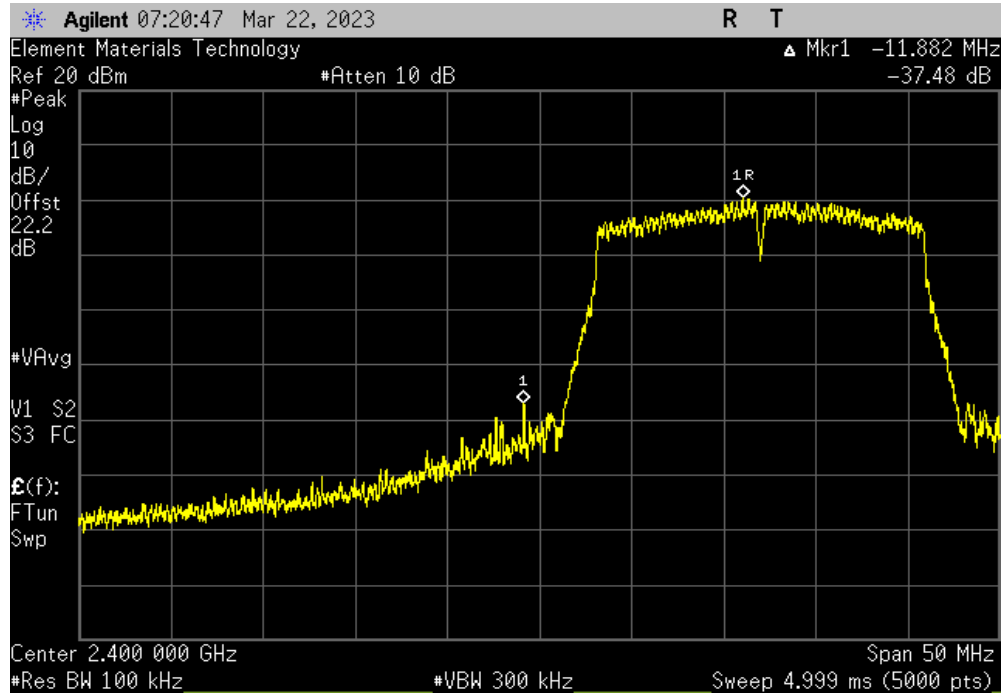


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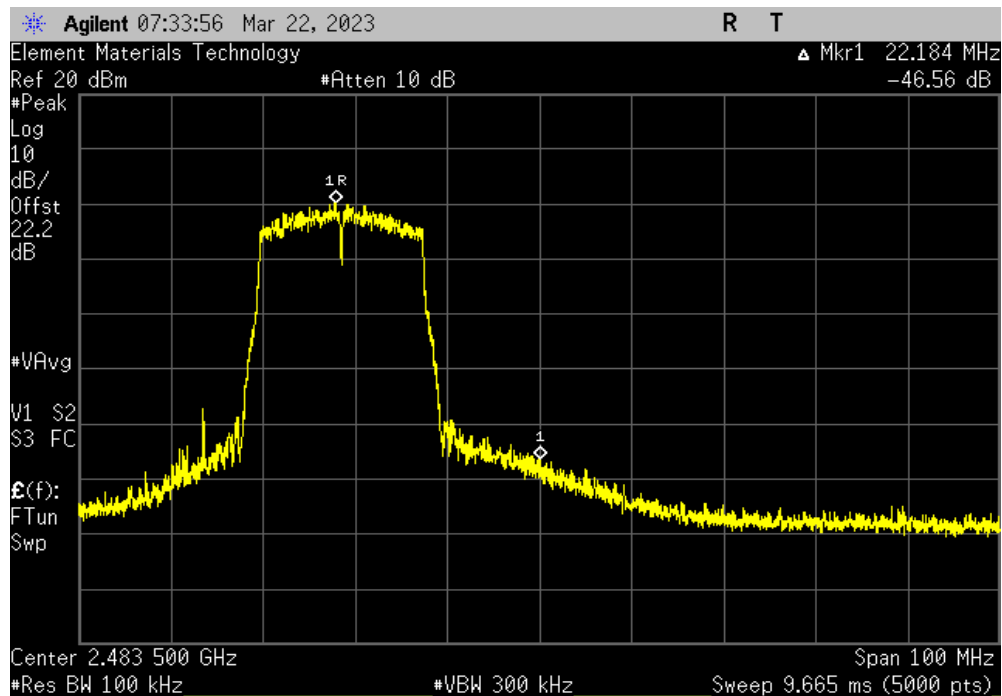


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-37.48	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-46.56	-30	Pass

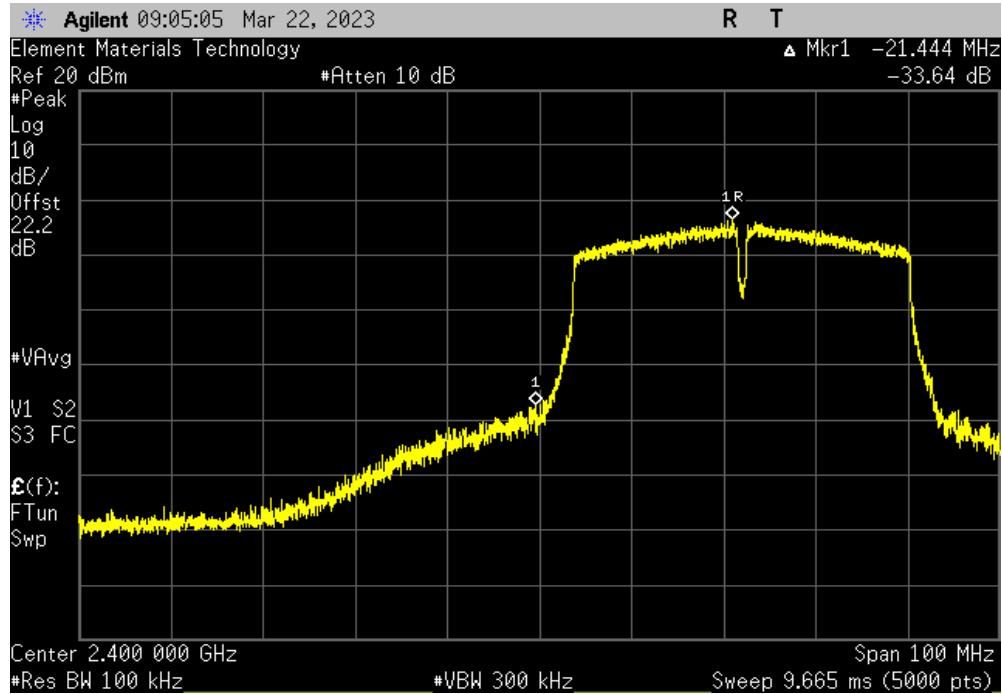


BAND EDGE COMPLIANCE

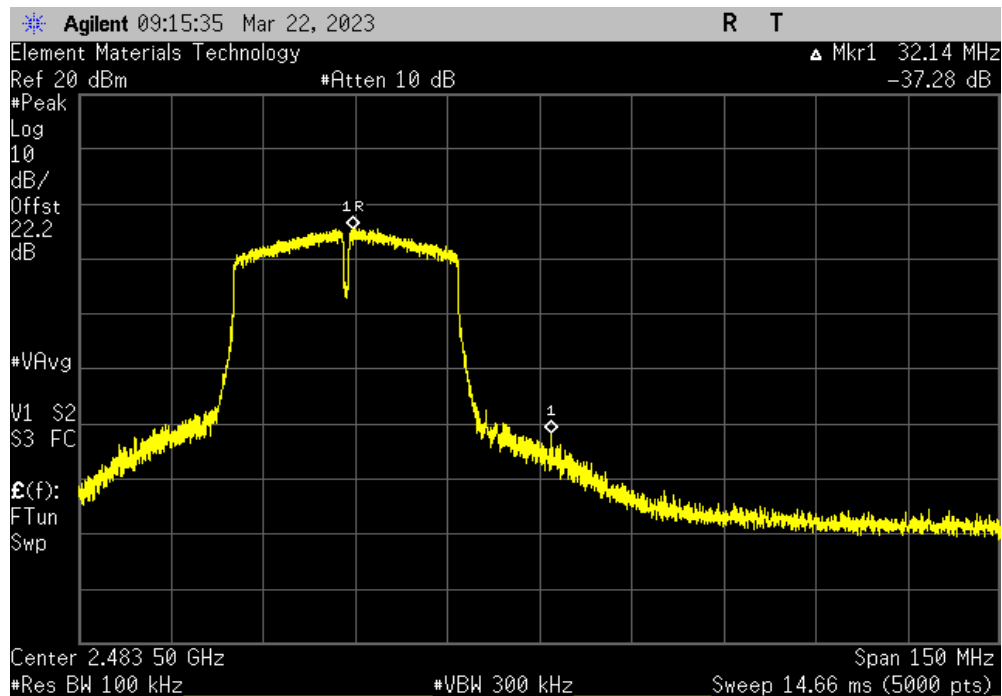


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Low Channel 1/5, 2422 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-33.64	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, High Channel 7/11, 2452 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-37.28	-30	Pass

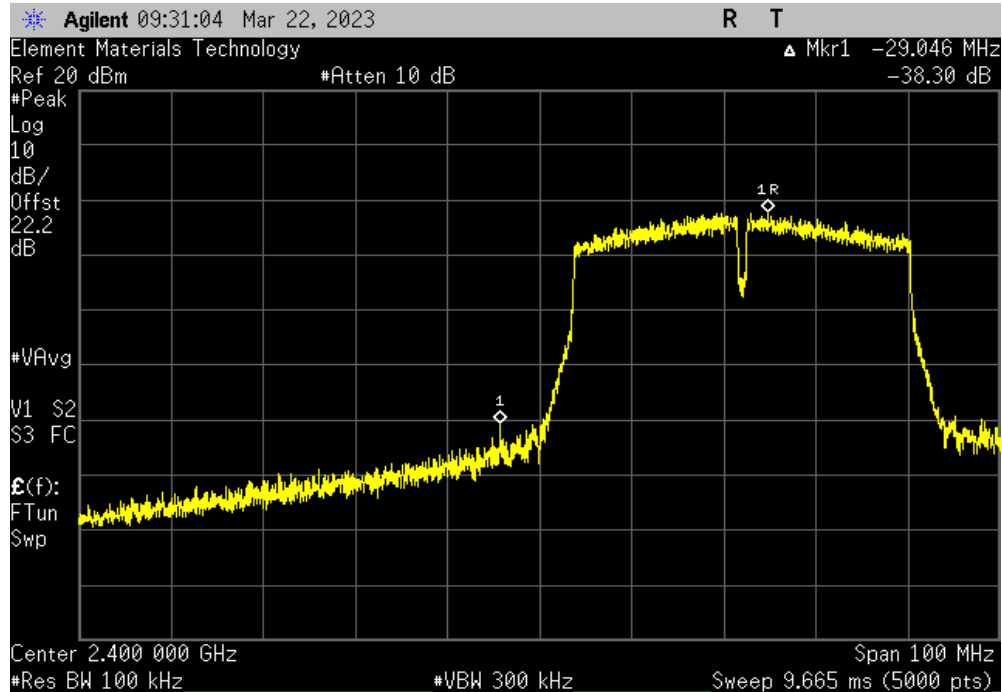


BAND EDGE COMPLIANCE

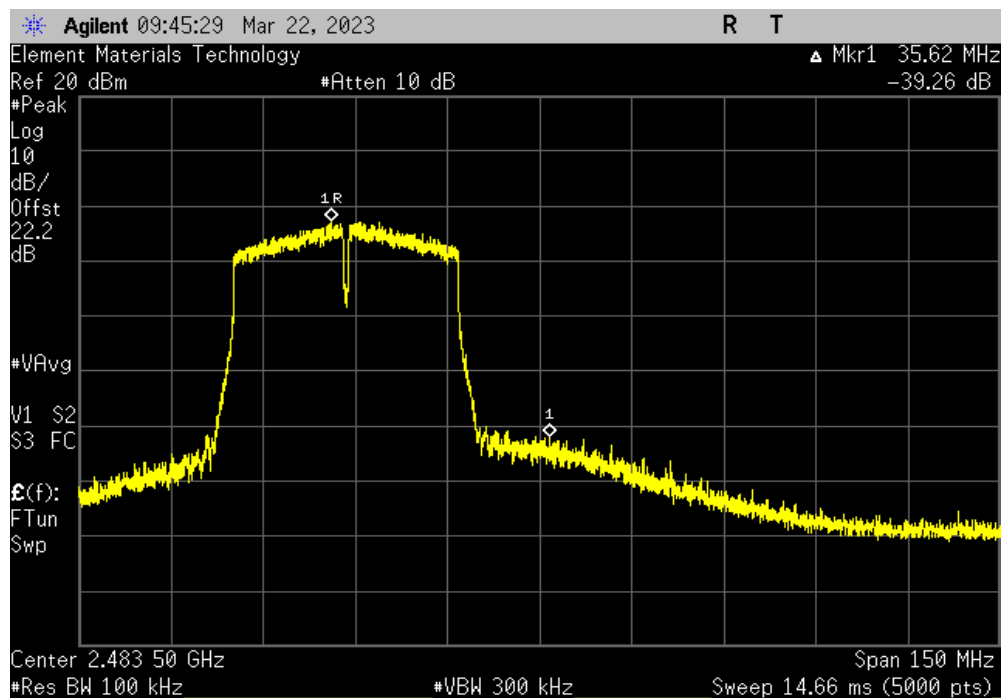


TbTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Low Channel 1/5, 2422 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-38.3	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, High Channel 7/11, 2452 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-39.26	-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
Block - DC	Aeroflex	INMET 8535	AMO	2023-01-30	2024-01-30
Attenuator	Fairview Microwave	SA18H-20	UAX	2022-07-26	2023-07-26
Cable	Element	None	OC5	2023-01-30	2024-01-30
Generator - Signal	Agilent	E8257D	TGU	2020-11-03	2023-11-03
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	2022-10-21	2023-10-21

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

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.

The reference level offset for the fundamental screen capture was based on a measured value of the loss between the spectrum analyzer and the EUT which was verified at the time of test. The remaining screen capture(s) use an internal transducer factor on the analyzer to correct the displayed trace based on the cable loss over frequency. The reference level offset for the additional screen capture(s) is then based on the expected attenuator value and any other losses.

Fundamental Offset = Ref Lvl Offset showing measured composite factor of all losses

Remaining Screen capture(s) Offset = "Internal" cable loss factor not shown on screen capture + Ref Lvl Offset showing expected attenuator value and any other losses

SPURIOUS CONDUCTED EMISSIONS



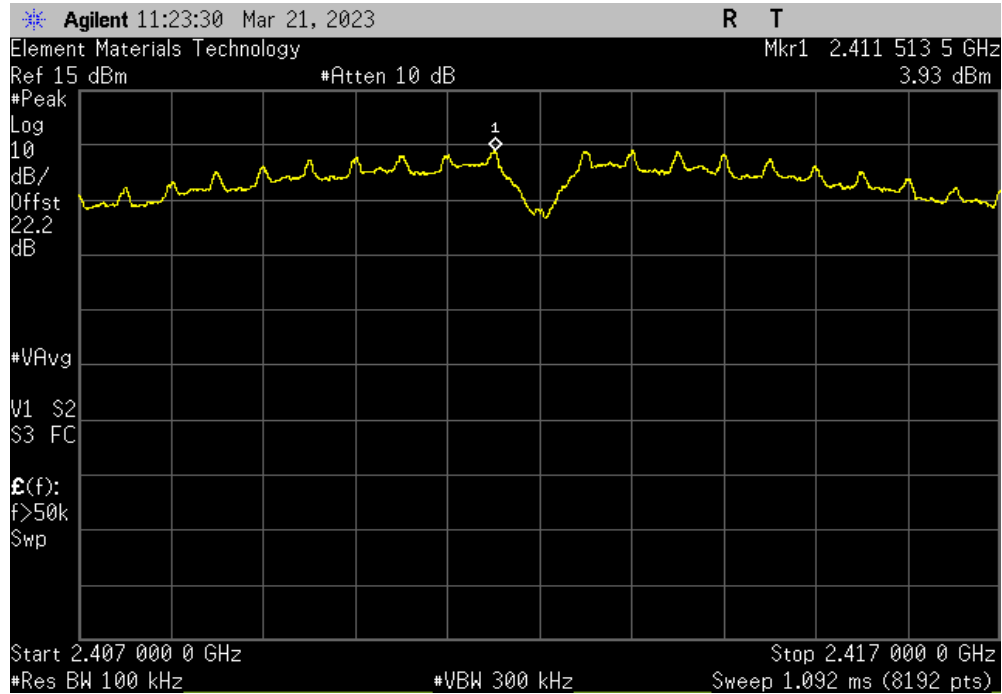
EUT: TSI Inc. OmniTrak		Work Order: TSIN0196				
Serial Number: TSI5221200068		Date: 03/22/23				
Customer: TSI, Incorporated		Temperature: 19.8°C				
Attendees: None		Humidity: 49.1%				
Project: None		Barometric Pres.: 1022 mbar				
Tested by: Nolan De Ramos, Luis Flores		Job Site: OC11				
Power: 5VDC via Battery						
TEST SPECIFICATIONS		Test Method				
FCC 15.247-2023		ANSI C63.10:2013				
RSS-247 Issue 2:2017		ANSI C63.10:2013				
COMMENTS						
Reference level offset includes measurement cable, DC block, and attenuator.						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	TSIN0196-8	Signature 				
		Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
2400 MHz - 2483.5 MHz Band						
802.11(b) 1 Mbps						
	Low Channel 1, 2412 MHz	Fundamental	2411.51	N/A	N/A	N/A
	Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	4824	-48.94	-30	Pass
	Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	23973	-57.53	-30	Pass
	Mid Channel 6, 2437 MHz	Fundamental	2438	N/A	N/A	N/A
	Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	4874.3	-49.2	-30	Pass
	Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	24630.7	-56.67	-30	Pass
	High Channel 11, 2462 MHz	Fundamental	2461.49	N/A	N/A	N/A
	High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	4924.5	-50.12	-30	Pass
	High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	23733.4	-57.69	-30	Pass
802.11(b) 11 Mbps						
	Low Channel 1, 2412 MHz	Fundamental	2412.24	N/A	N/A	N/A
	Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	4824	-58.22	-30	Pass
	Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	13723.9	-57.3	-30	Pass
	Mid Channel 6, 2437 MHz	Fundamental	2435.83	N/A	N/A	N/A
	Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	4872.8	-58.37	-30	Pass
	Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	21537.4	-57.86	-30	Pass
	High Channel 11, 2462 MHz	Fundamental	2461.48	N/A	N/A	N/A
	High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	5757.3	-57.88	-30	Pass
	High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	23628.1	-57.79	-30	Pass
802.11(g) 6 Mbps						
	Low Channel 1, 2412 MHz	Fundamental	2412.89	N/A	N/A	N/A
	Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	2383.6	-54.32	-30	Pass
	Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	24992.4	-51.45	-30	Pass
	Mid Channel 6, 2437 MHz	Fundamental	2435.5	N/A	N/A	N/A
	Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	5758.8	-49.15	-30	Pass
	Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	23567	-51.72	-30	Pass
	High Channel 11, 2462 MHz	Fundamental	2459.76	N/A	N/A	N/A
	High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	2548.1	-53.94	-30	Pass
	High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	14340.4	-51.97	-30	Pass
802.11(g) 36 Mbps						
	Low Channel 1, 2412 MHz	Fundamental	2412.7	N/A	N/A	N/A
	Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	1748.8	-55.48	-30	Pass
	Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	13612.5	-53.44	-30	Pass
	Mid Channel 6, 2437 MHz	Fundamental	2439.8	N/A	N/A	N/A
	Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	2525.2	-56.81	-30	Pass
	Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	24150	-52.84	-30	Pass
	High Channel 11, 2462 MHz	Fundamental	2461.7	N/A	N/A	N/A
	High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	2514.6	-55.62	-30	Pass
	High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	24972.5	-52.08	-30	Pass
802.11(g) 54 Mbps						
	Low Channel 1, 2412 MHz	Fundamental	2411.69	N/A	N/A	N/A
	Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	2385.2	-55.85	-30	Pass
	Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	23852.4	-54.15	-30	Pass
	Mid Channel 6, 2437 MHz	Fundamental	2438.28	N/A	N/A	N/A
	Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	4880.4	-55.34	-30	Pass
	Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	24940.5	-53.02	-30	Pass
	High Channel 11, 2462 MHz	Fundamental	2461.67	N/A	N/A	N/A
	High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	5760.3	-55.75	-30	Pass
	High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	24624.6	-53.88	-30	Pass
802.11(n20) MCS0						
	Low Channel 1, 2412 MHz	Fundamental	2411.02	N/A	N/A	N/A
	Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	2386.7	-53.01	-30	Pass
	Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	13205	-51.64	-30	Pass
	Mid Channel 6, 2437 MHz	Fundamental	2437.63	N/A	N/A	N/A
	Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	5766.4	-54.2	-30	Pass
	Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	24574.2	-51.21	-30	Pass
	High Channel 11, 2462 MHz	Fundamental	2462.63	N/A	N/A	N/A
	High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	5766.4	-45.64	-30	Pass
	High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	22628.5	-51.67	-30	Pass
802.11(n20) MCS7						
	Low Channel 1, 2412 MHz	Fundamental	2412.93	N/A	N/A	N/A
	Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	2386.7	-54.54	-30	Pass
	Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	24972.5	-53.62	-30	Pass
	Mid Channel 6, 2437 MHz	Fundamental	2436.64	N/A	N/A	N/A
	Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	4871.2	-55.45	-30	Pass
	Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	24942	-52.45	-30	Pass
	High Channel 11, 2462 MHz	Fundamental	2462.93	N/A	N/A	N/A
	High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	5766.4	-49.31	-30	Pass
	High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	25000	-53.63	-30	Pass
802.11(n40) MCS0						
	Low Channel 1/5, 2422 MHz	Fundamental	2423.62	N/A	N/A	N/A
	Low Channel 1/5, 2422 MHz	30 MHz - 12.5 GHz	2377.5	-49.21	-30	Pass
	Low Channel 1/5, 2422 MHz	12.5 GHz - 25 GHz	24034	-50.98	-30	Pass
	Mid Channel 4/8, 2437 MHz	Fundamental	2438.51	N/A	N/A	N/A
	Mid Channel 4/8, 2437 MHz	30 MHz - 12.5 GHz	5769.5	-52.13	-30	Pass
	Mid Channel 4/8, 2437 MHz	12.5 GHz - 25 GHz	24284.3	-51.43	-30	Pass
	High Channel 7/11, 2452 MHz	Fundamental	2450.39	N/A	N/A	N/A
	High Channel 7/11, 2452 MHz	30 MHz - 12.5 GHz	2519.1	-54.12	-30	Pass
	High Channel 7/11, 2452 MHz	12.5 GHz - 25 GHz	21096.3	-51.05	-30	Pass
802.11(n40) MCS7						
	Low Channel 1/5, 2422 MHz	Fundamental	2421.07	N/A	N/A	N/A
	Low Channel 1/5, 2422 MHz	30 MHz - 12.5 GHz	2377.5	-50.26	-30	Pass
	Low Channel 1/5, 2422 MHz	12.5 GHz - 25 GHz	23441.9	-52.98	-30	Pass
	Mid Channel 4/8, 2437 MHz	Fundamental	2436.05	N/A	N/A	N/A
	Mid Channel 4/8, 2437 MHz	30 MHz - 12.5 GHz	5769.5	-51.59	-30	Pass
	Mid Channel 4/8, 2437 MHz	12.5 GHz - 25 GHz	24984.7	-53.14	-30	Pass
	High Channel 7/11, 2452 MHz	Fundamental	2454.82	N/A	N/A	N/A
	High Channel 7/11, 2452 MHz	30 MHz - 12.5 GHz	2516.1	-52.78	-30	Pass
	High Channel 7/11, 2452 MHz	12.5 GHz - 25 GHz	24932.9	-52.53	-30	Pass

SPURIOUS CONDUCTED EMISSIONS

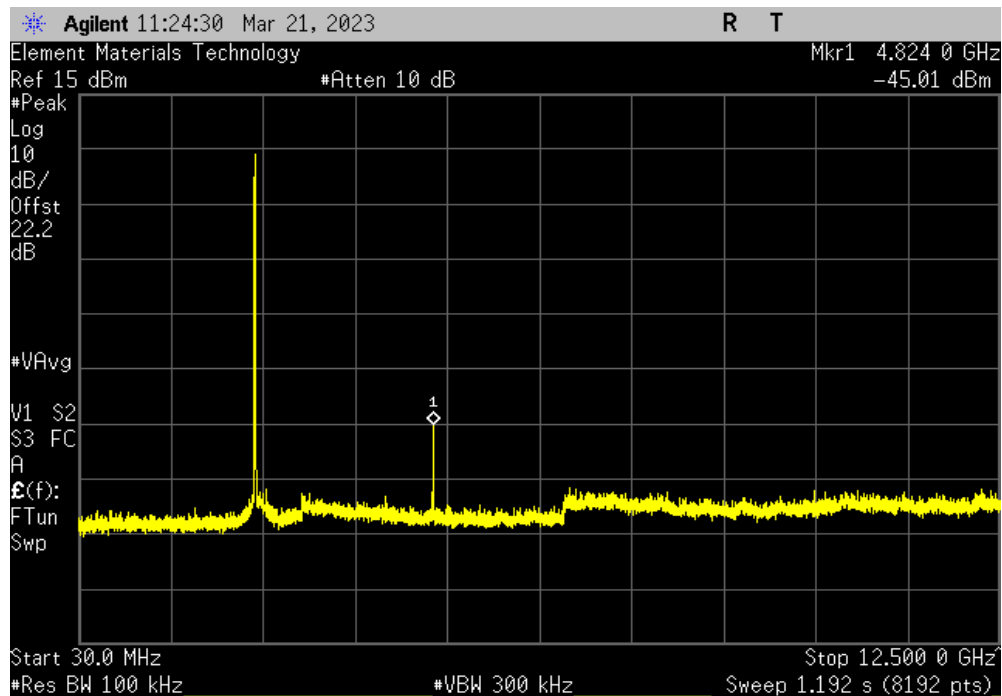


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental		2411.51	N/A	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 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		4824	-48.94	-30	Pass	

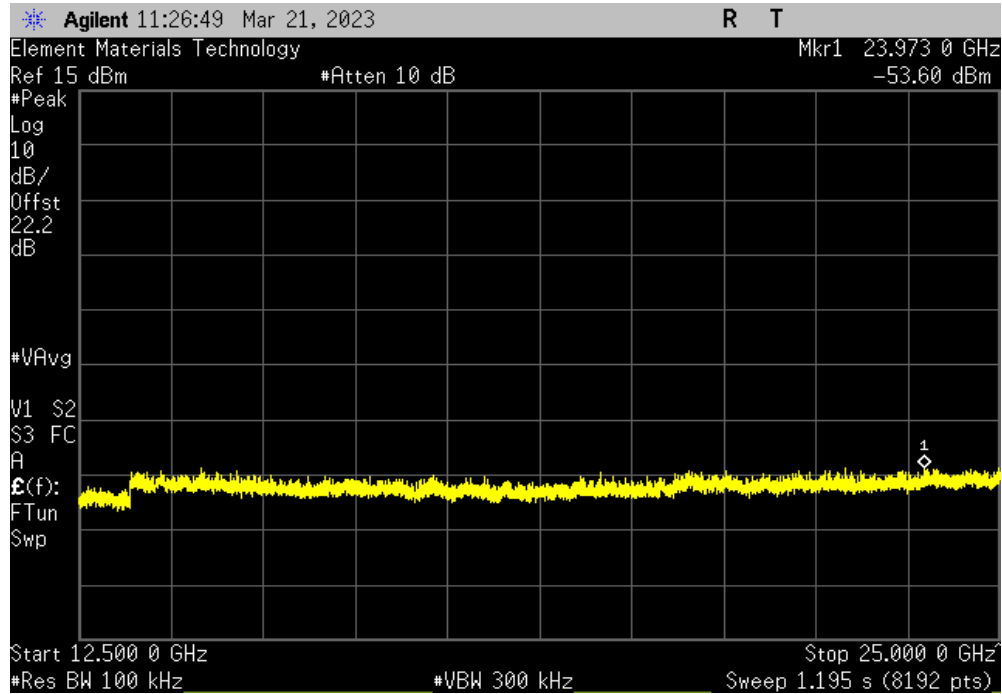


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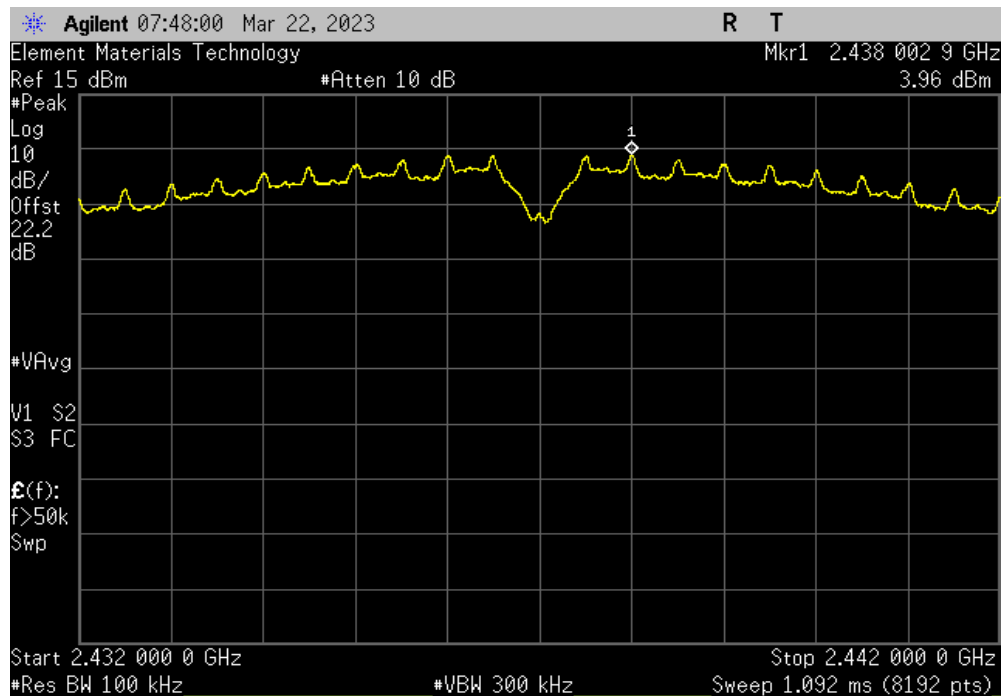


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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	23973	-57.53	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2438	N/A	N/A	N/A	

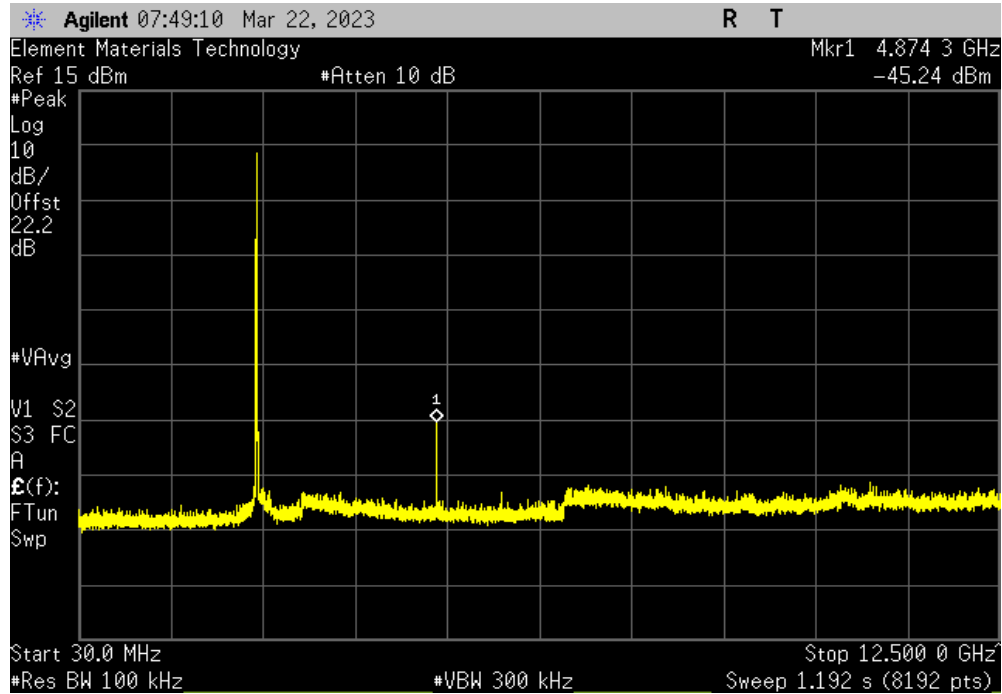


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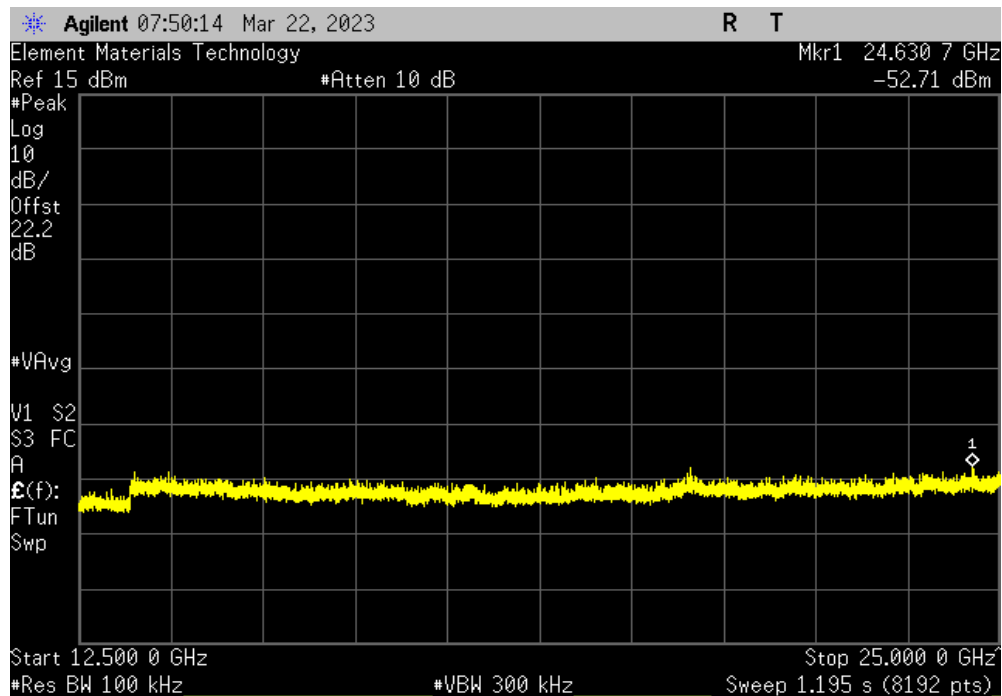


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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	4874.3	-49.2	-30	Pass	



2400 MHz - 2483.5 MHz Band, 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	24630.7	-56.67	-30	Pass	

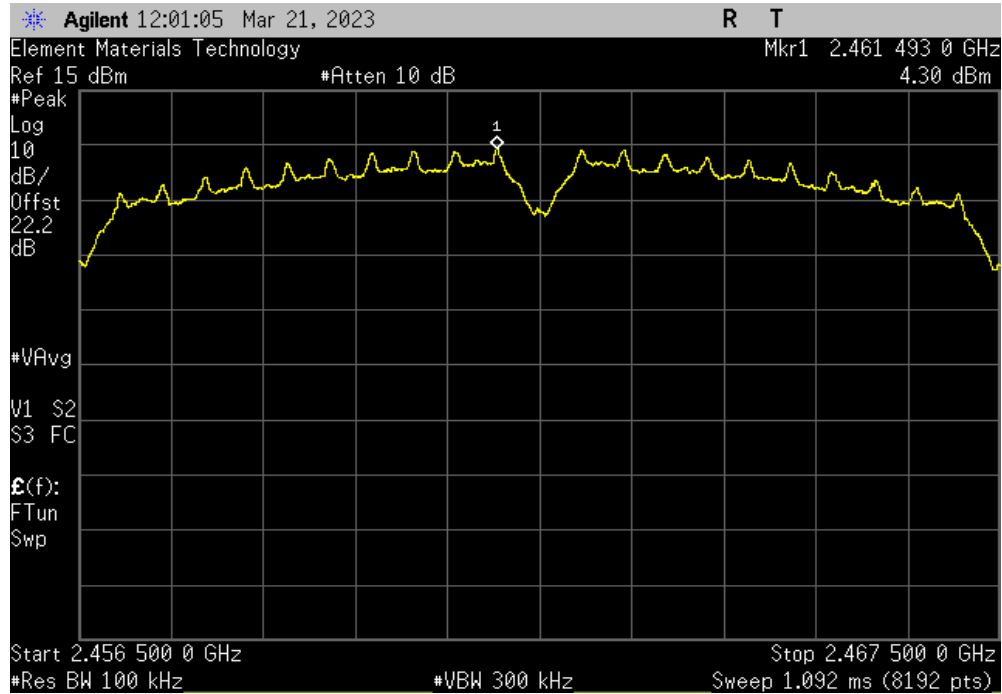


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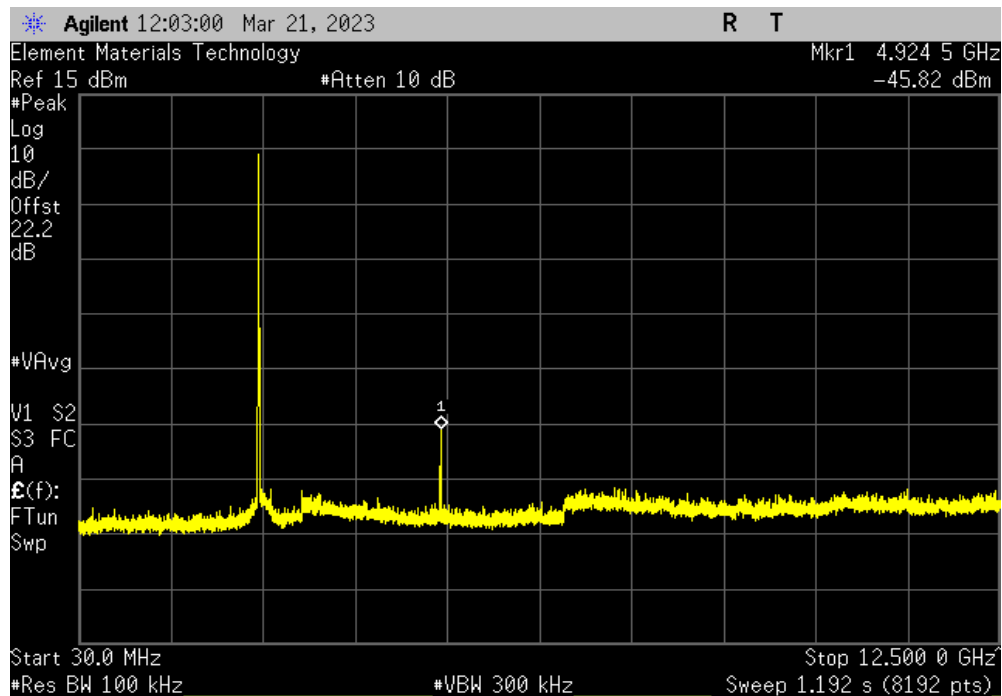


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2461.49	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 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	4924.5	-50.12	-30	Pass		

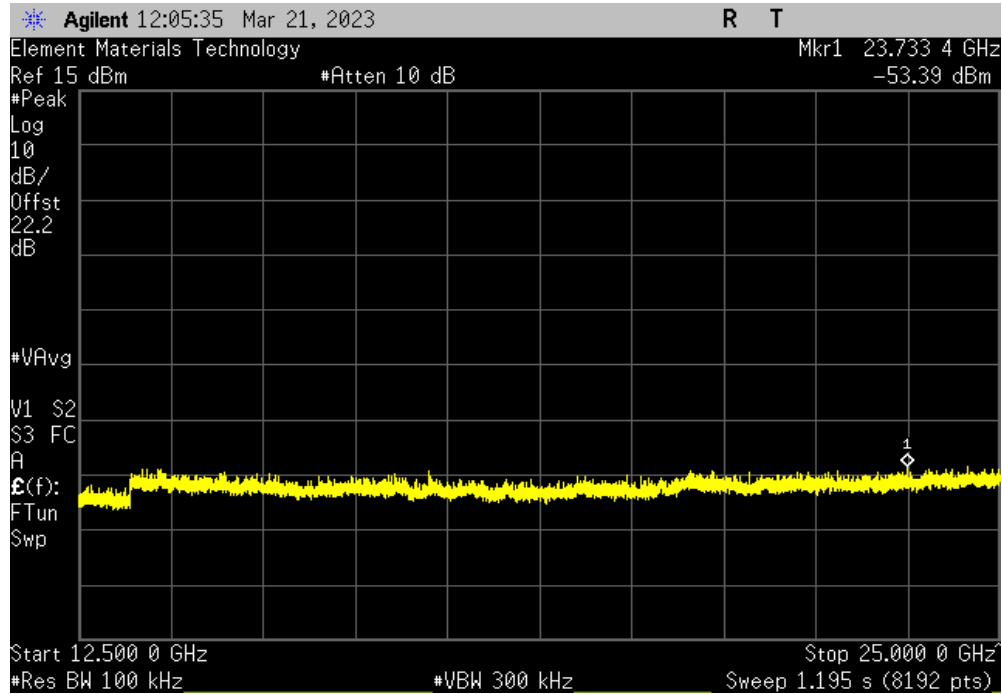


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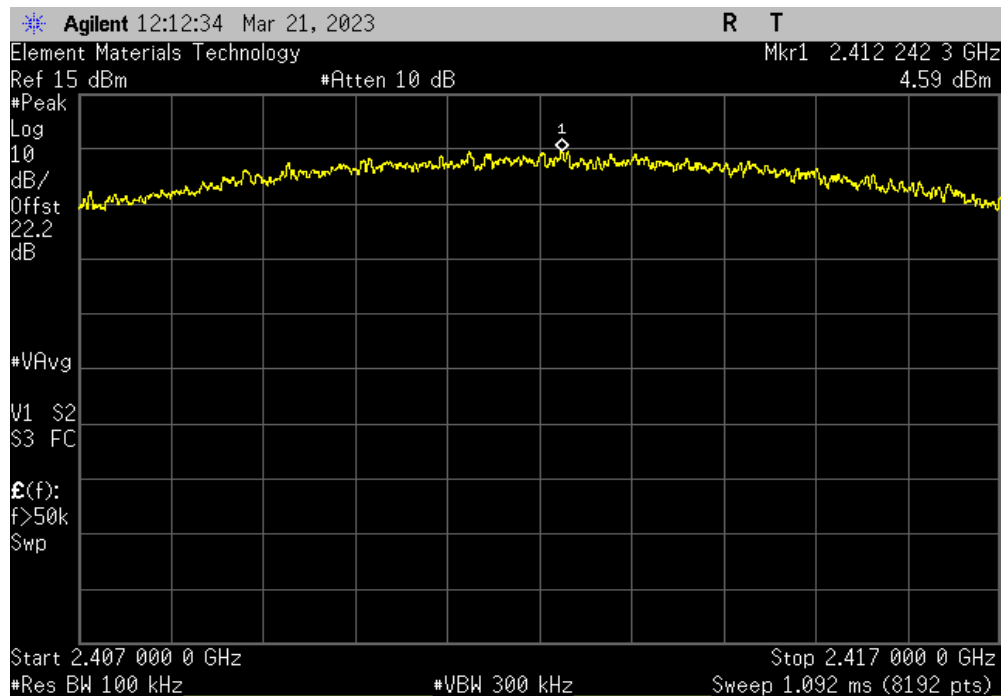


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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	23733.4	-57.69	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2412.24	N/A	N/A	N/A	

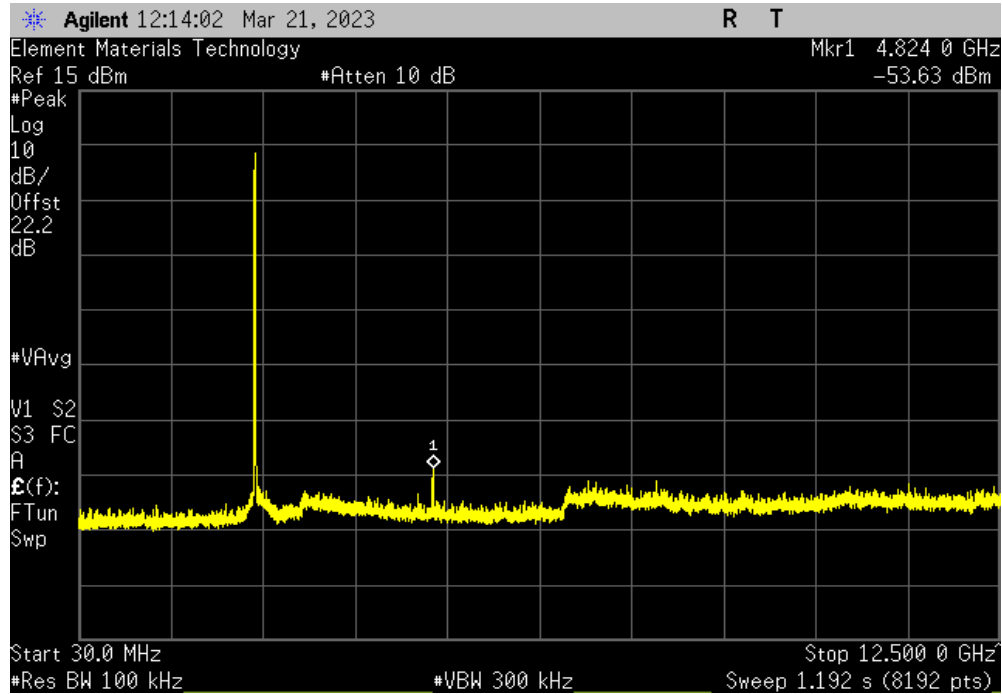


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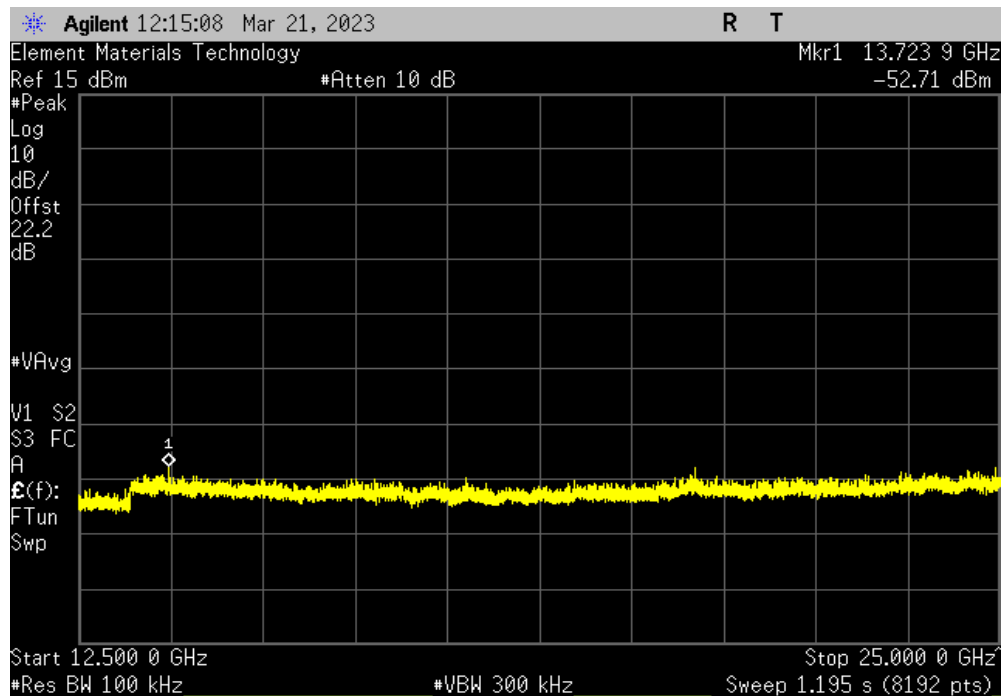


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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	4824	-58.22	-30	Pass	



2400 MHz - 2483.5 MHz Band, 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	13723.9	-57.3	-30	Pass	

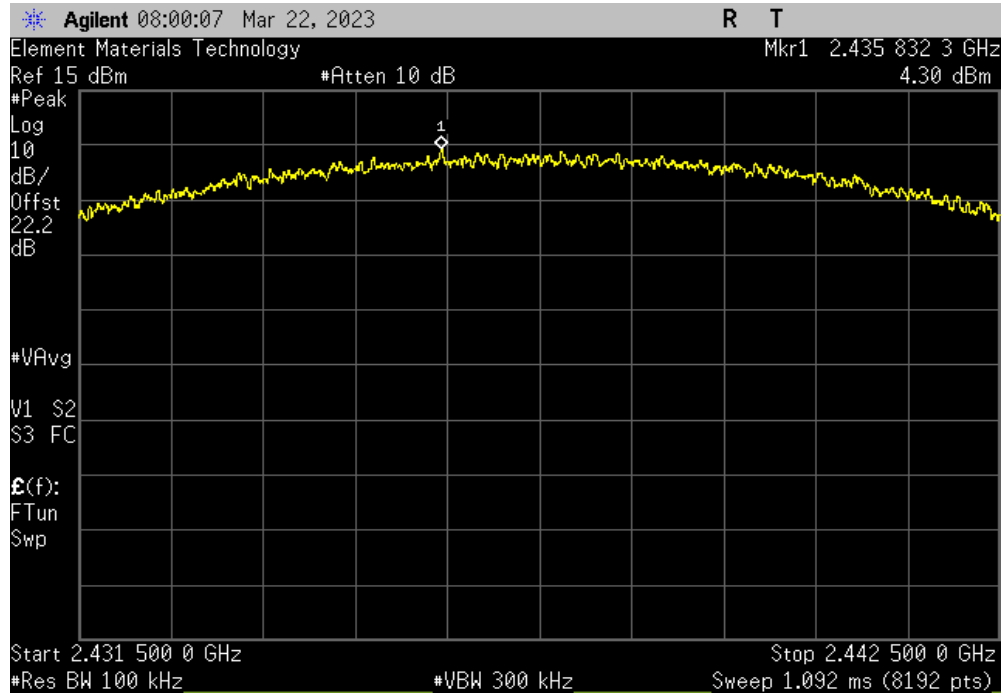


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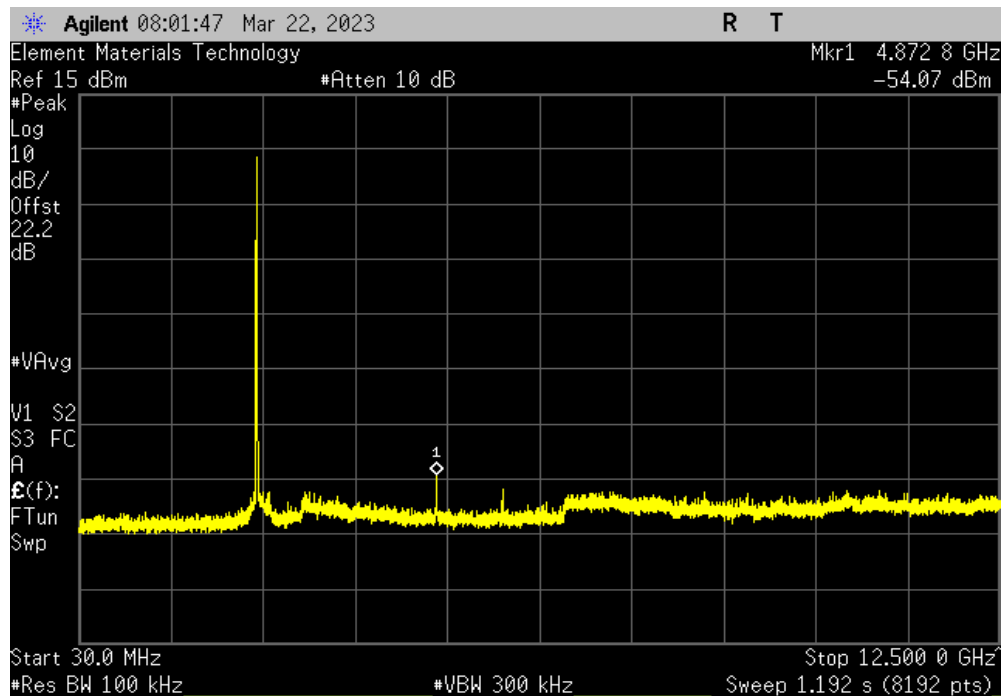


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2435.83	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 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	4872.8	-58.37	-30	Pass		

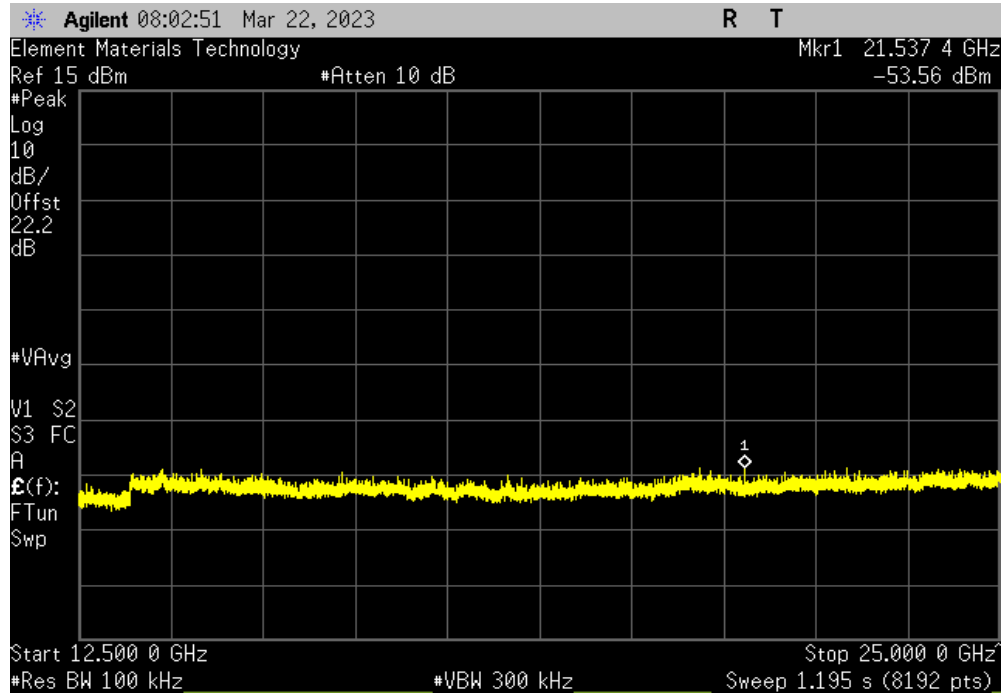


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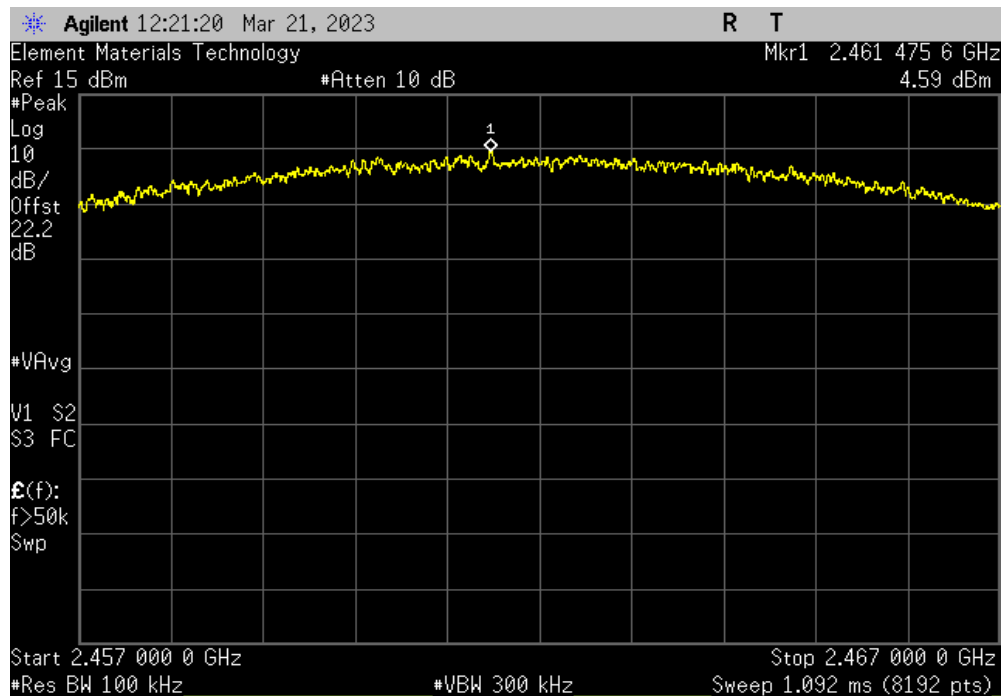


TbTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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	21537.4	-57.86	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2461.48	N/A	N/A	N/A	

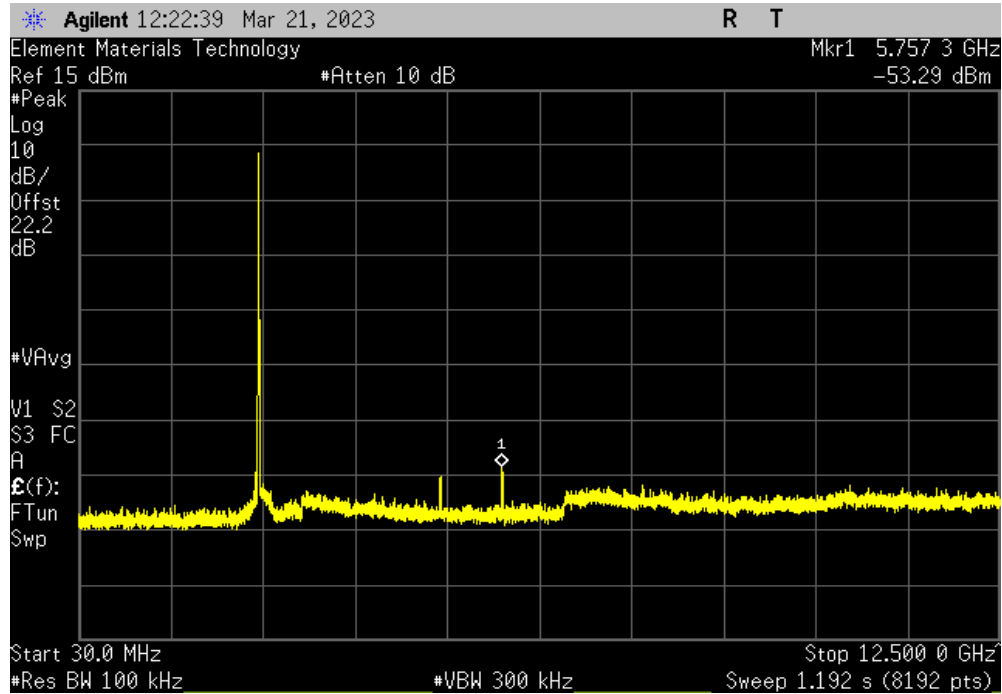


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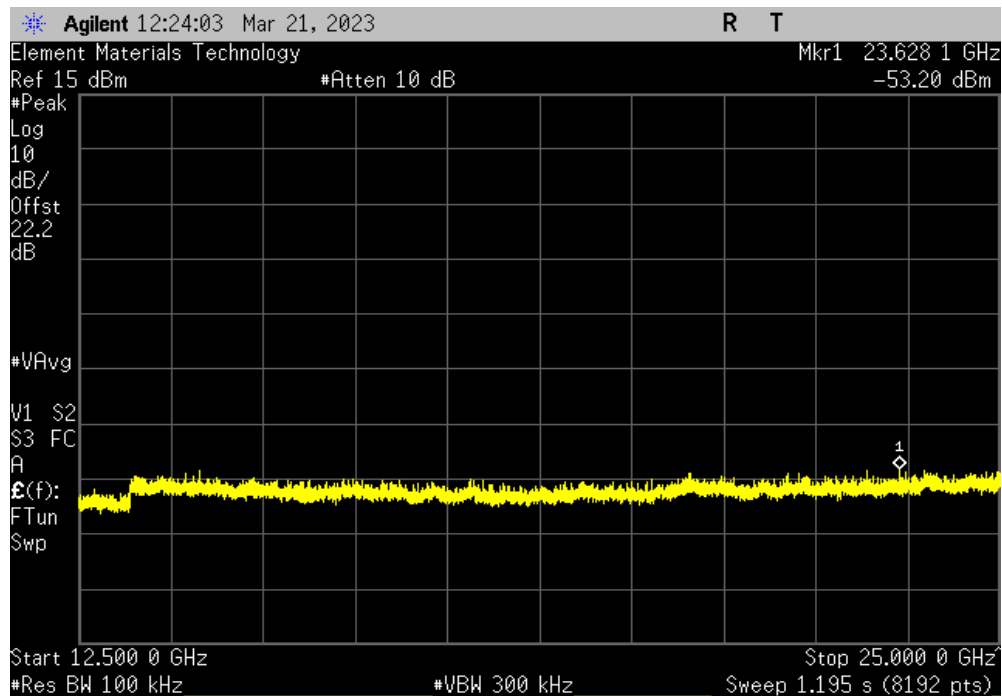


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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	5757.3	-57.88	-30	Pass	



2400 MHz - 2483.5 MHz Band, 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	23628.1	-57.79	-30	Pass	

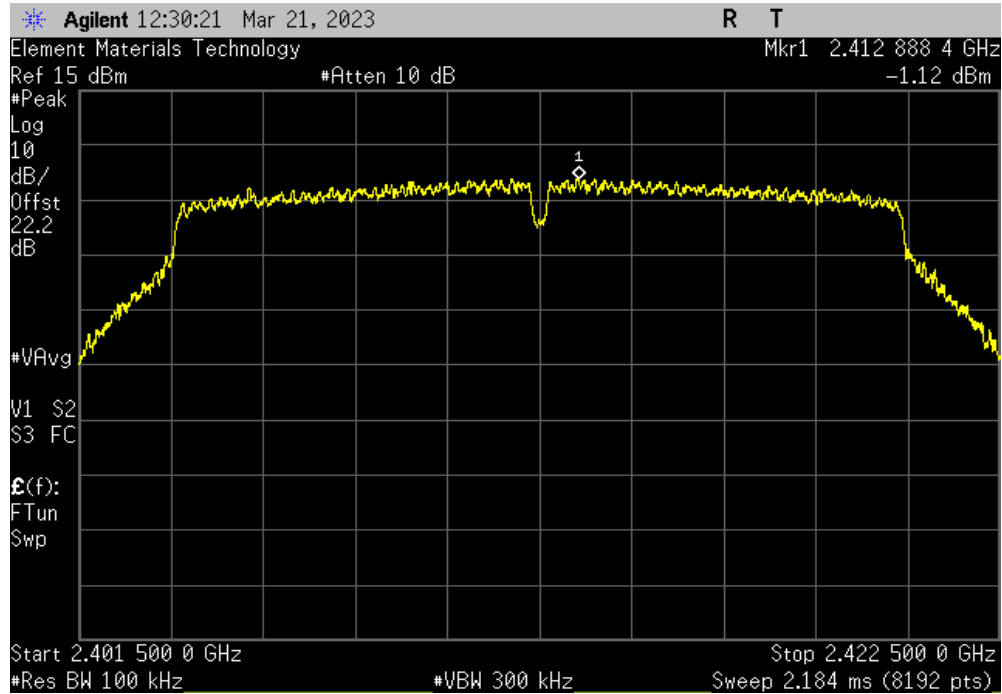


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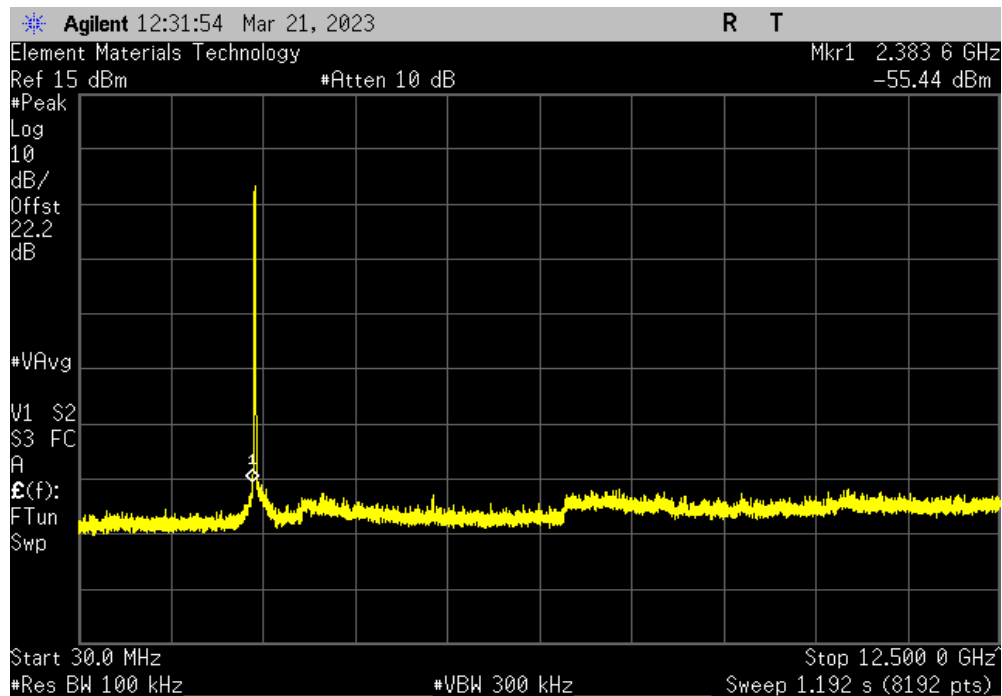


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental		2412.89	N/A	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 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		2383.6	-54.32	-30	Pass	

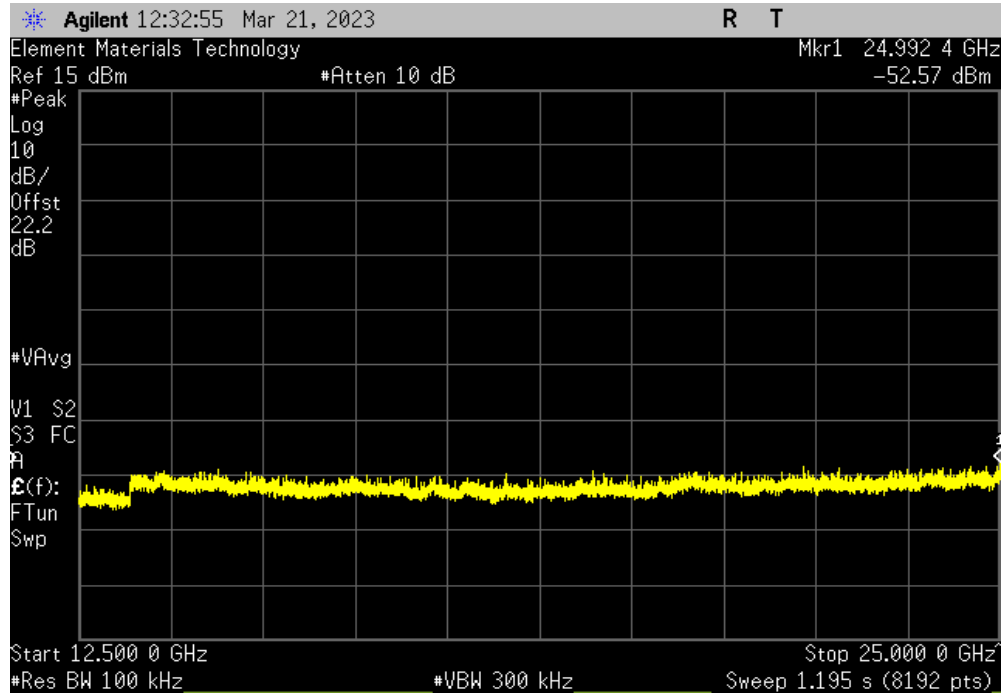


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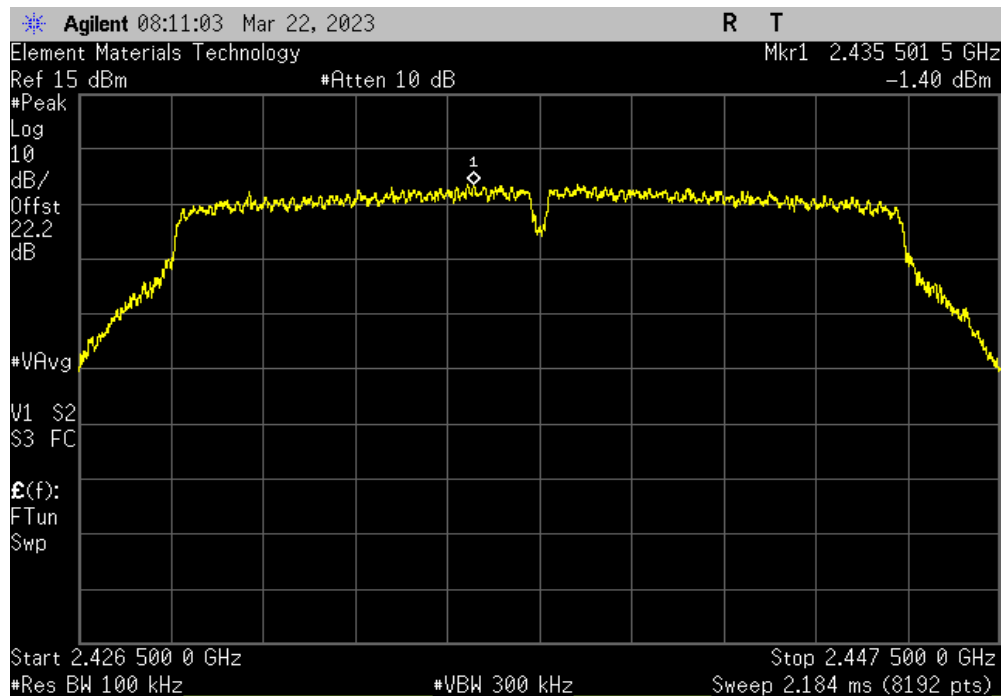


TUTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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	24992.4	-51.45	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2435.5	N/A	N/A	N/A	

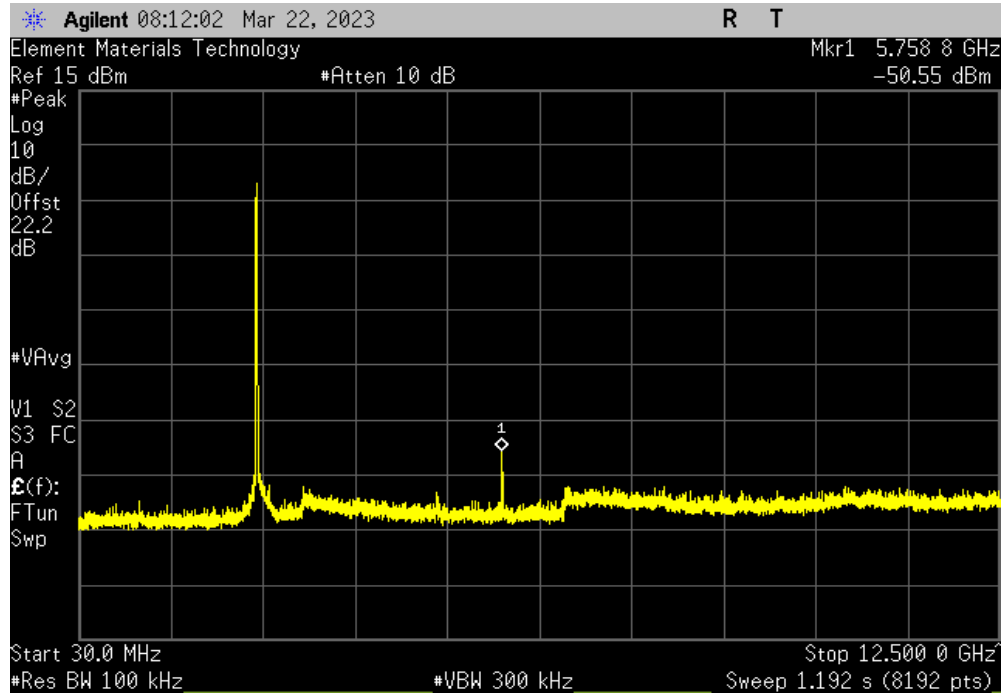


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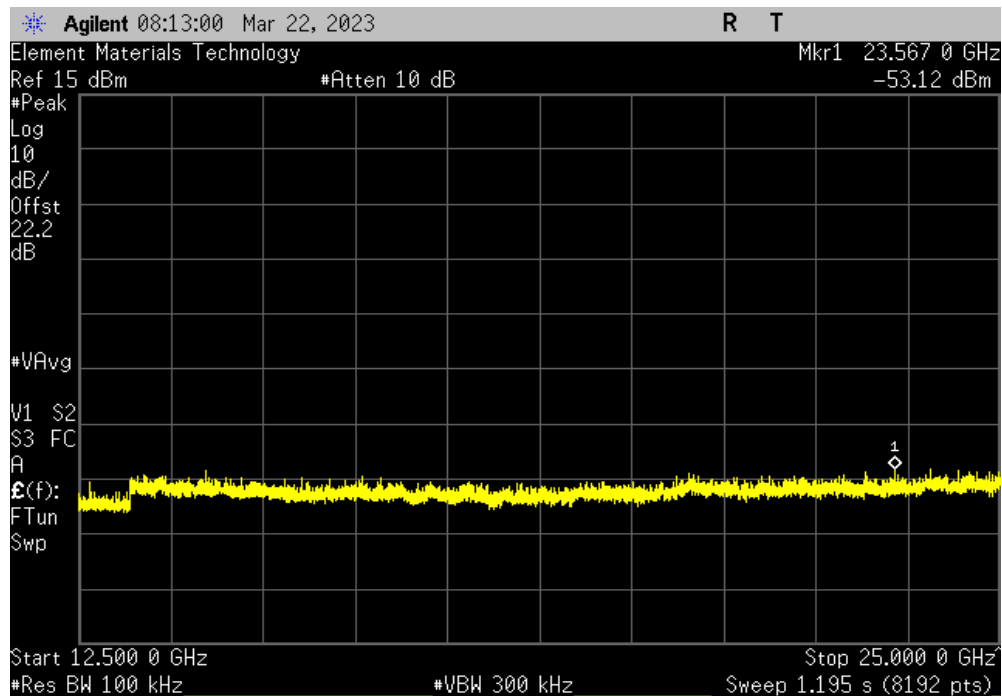


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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	5758.8	-49.15	-30	Pass	



2400 MHz - 2483.5 MHz Band, 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	23567	-51.72	-30	Pass	

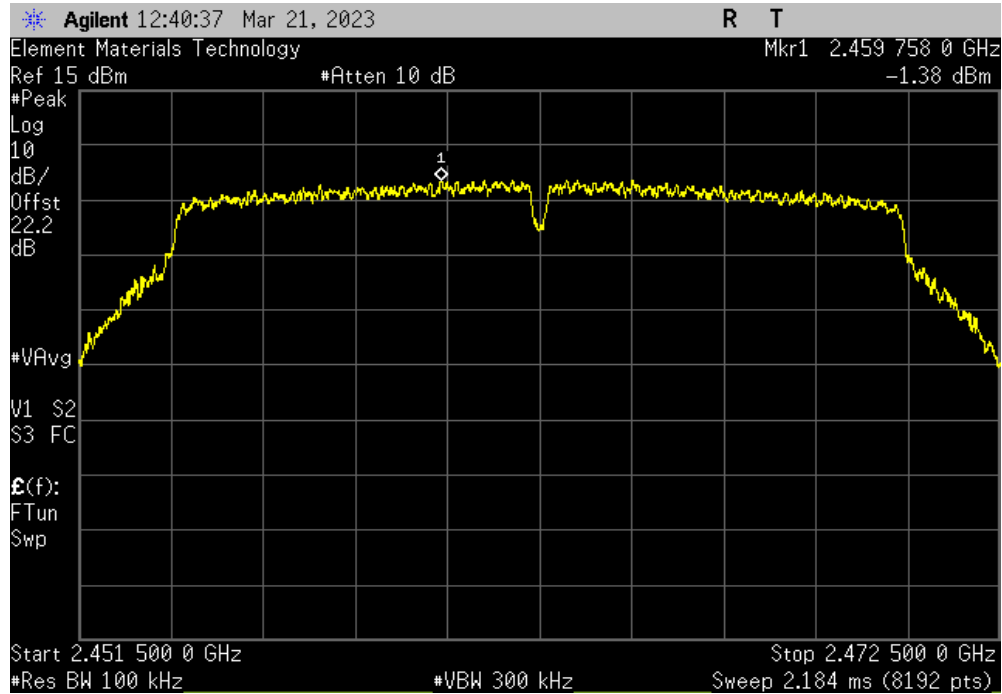


SPURIOUS CONDUCTED EMISSIONS

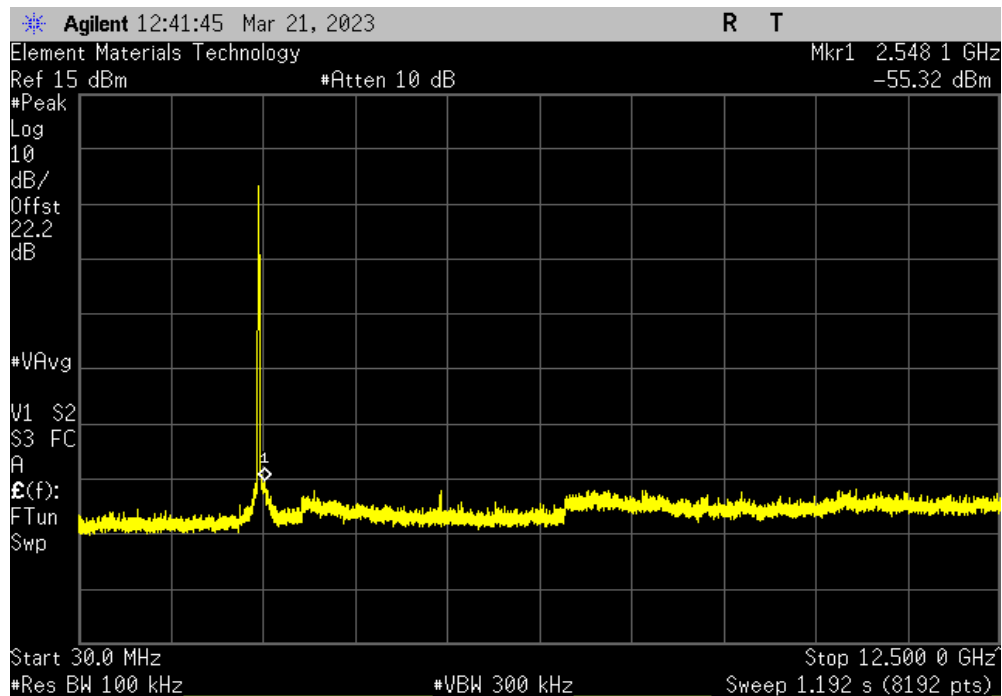


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2459.76	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 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	2548.1	-53.94	-30	Pass		

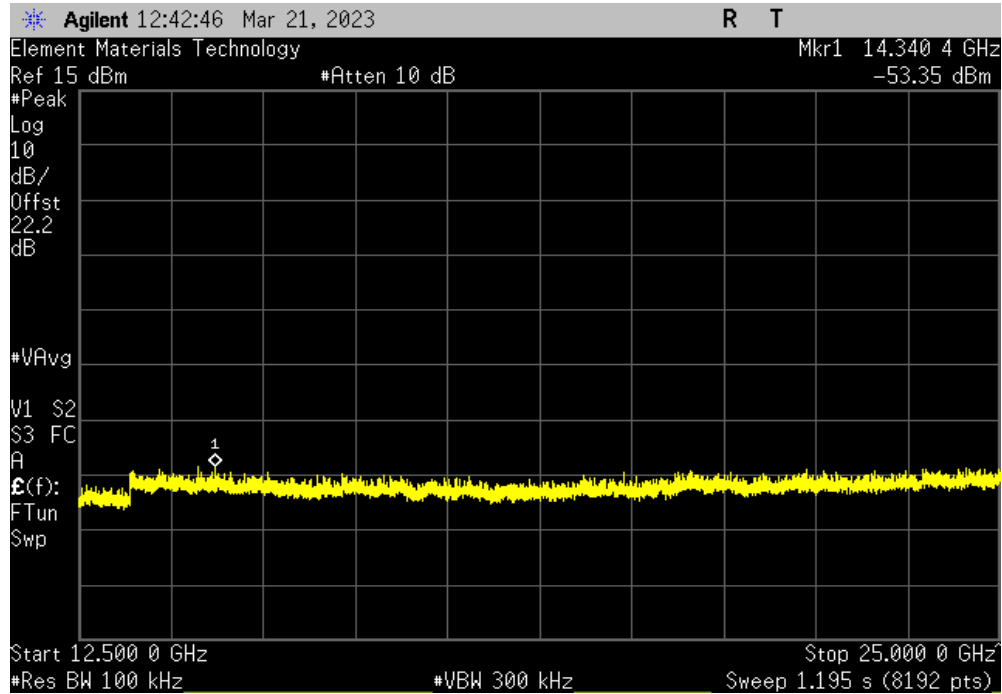


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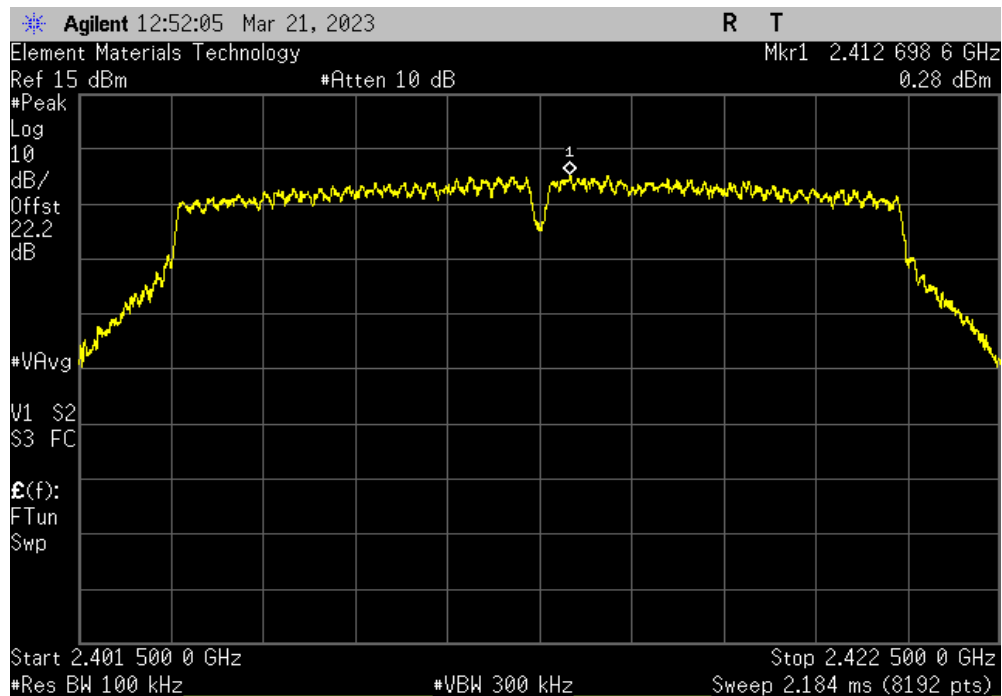


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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	14340.4	-51.97	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2412.7	N/A	N/A	N/A	

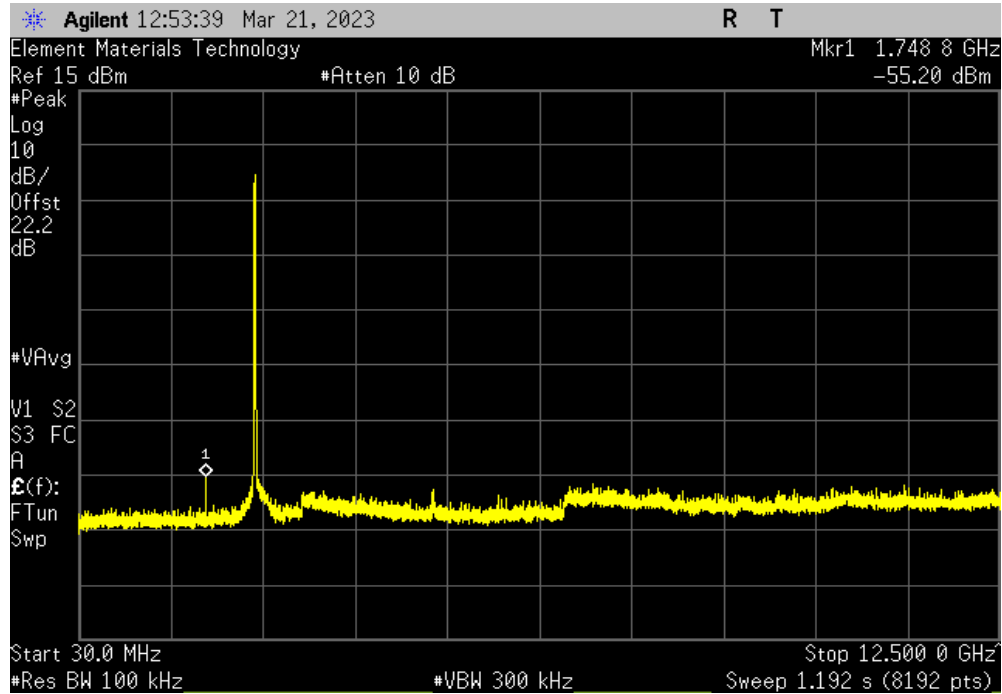


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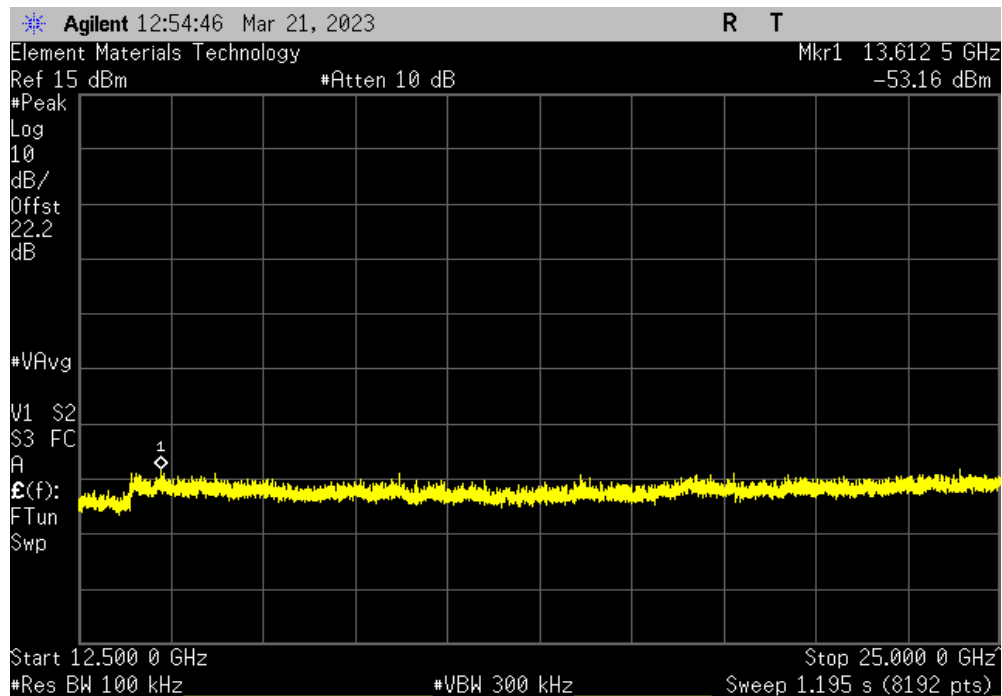


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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	1748.8	-55.48	-30	Pass	



2400 MHz - 2483.5 MHz Band, 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	13612.5	-53.44	-30	Pass	

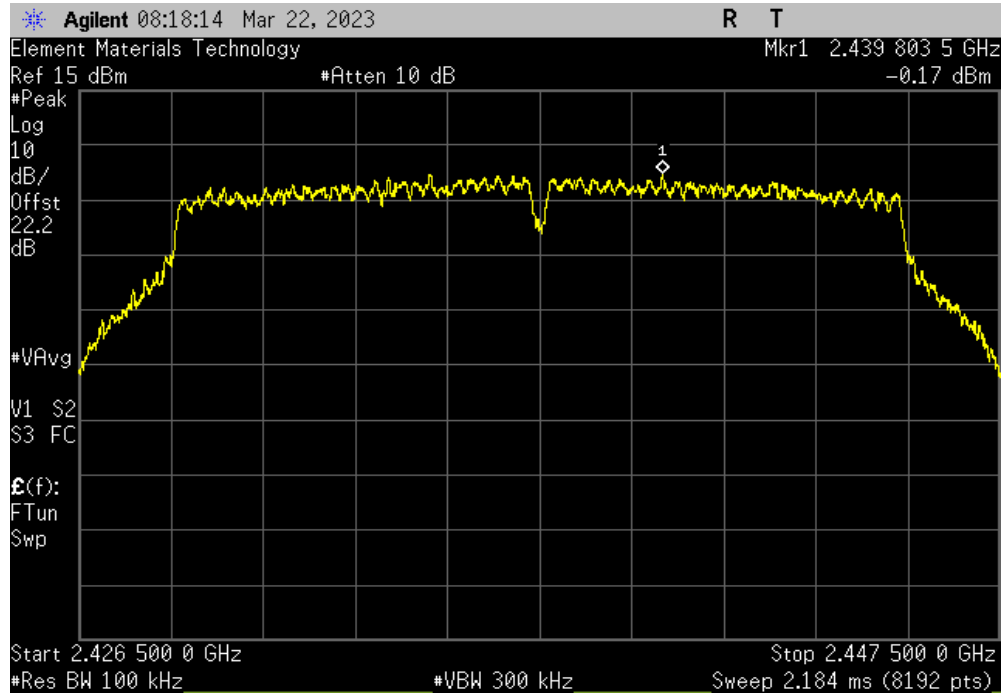


SPURIOUS CONDUCTED EMISSIONS

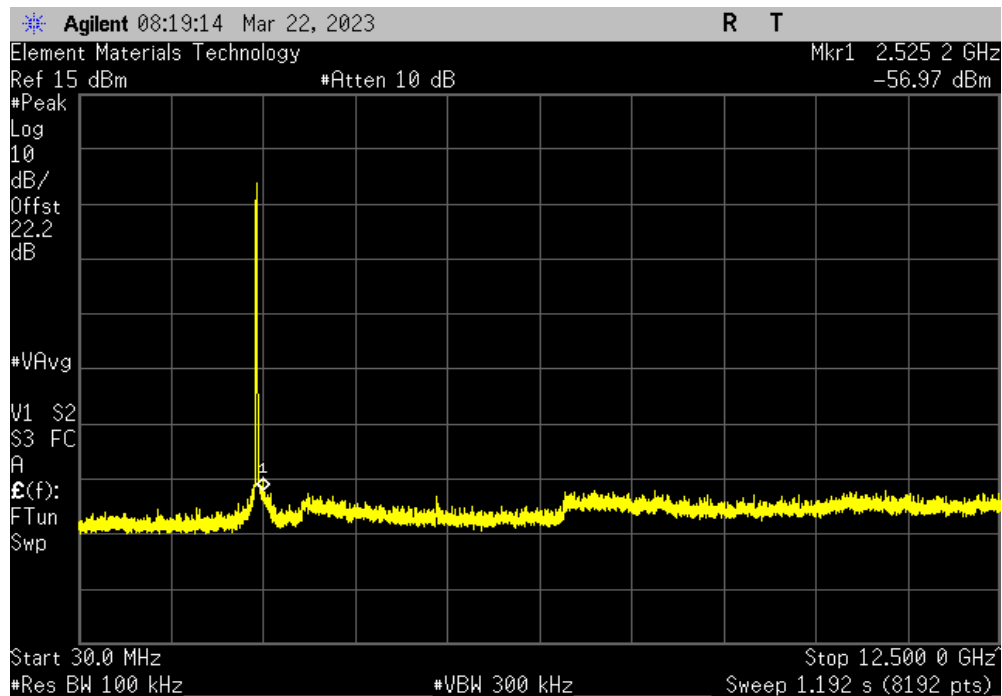


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2439.8	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 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	2525.2	-56.81	-30	Pass		

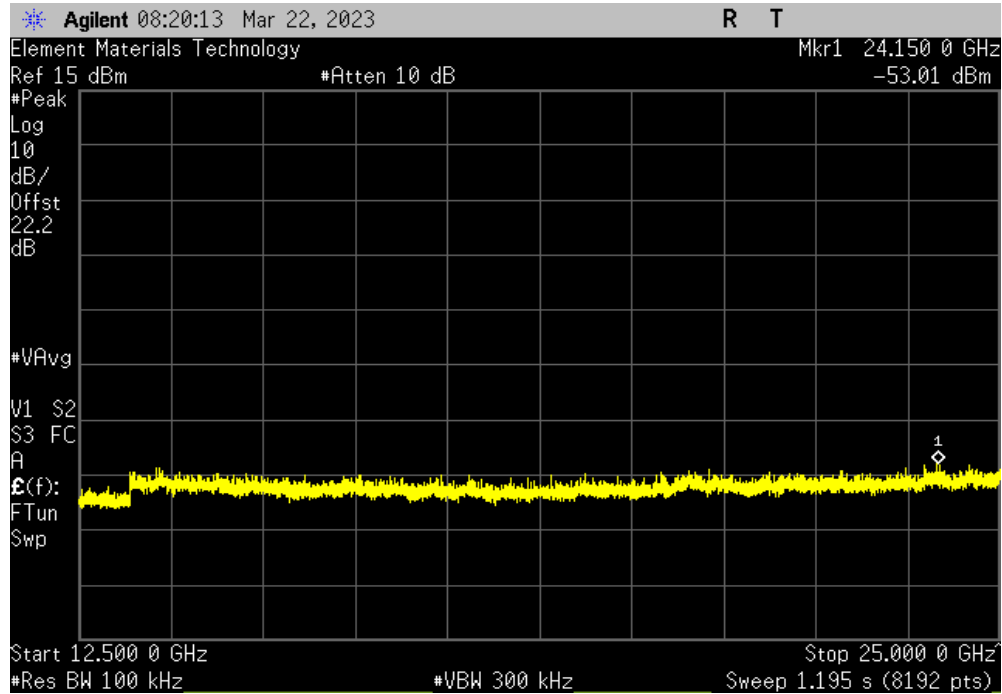


SPURIOUS CONDUCTED EMISSIONS

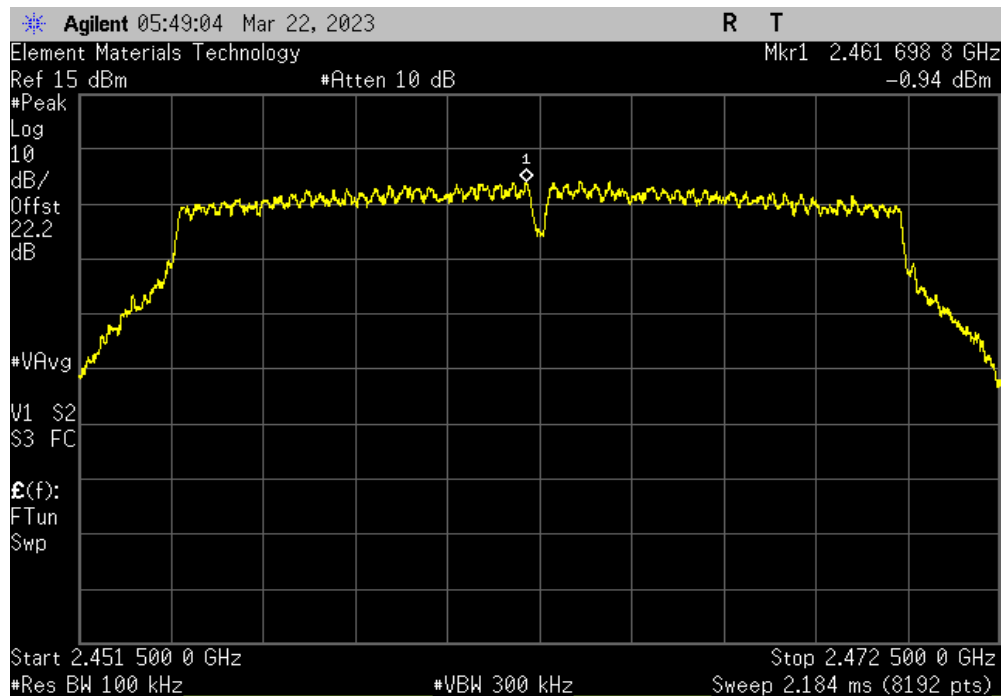


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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	24150	-52.84	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2461.7	N/A	N/A	N/A	

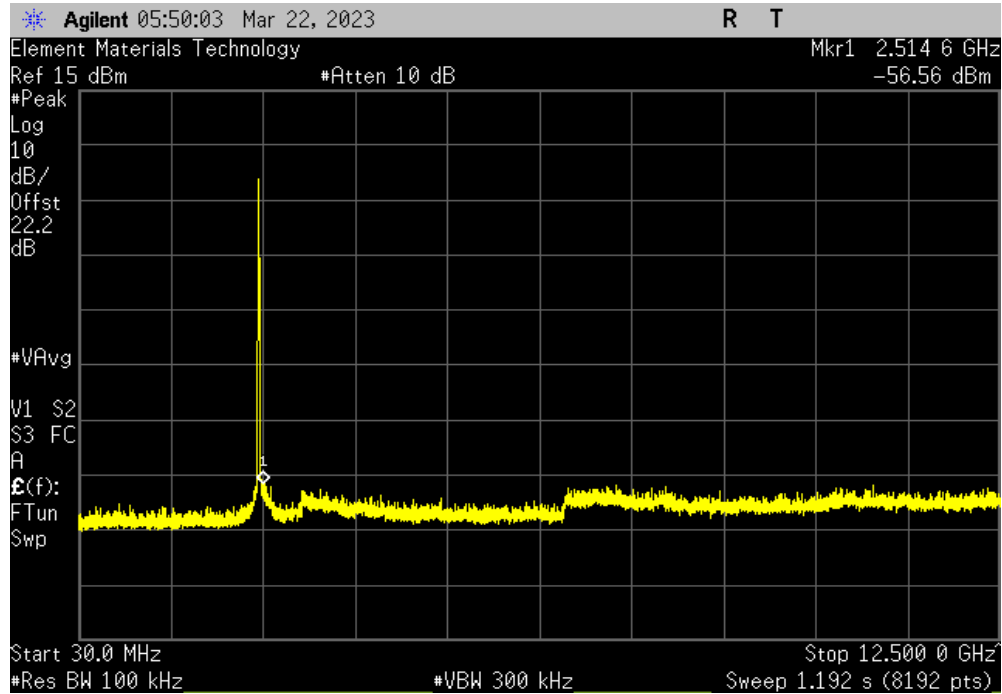


SPURIOUS CONDUCTED EMISSIONS

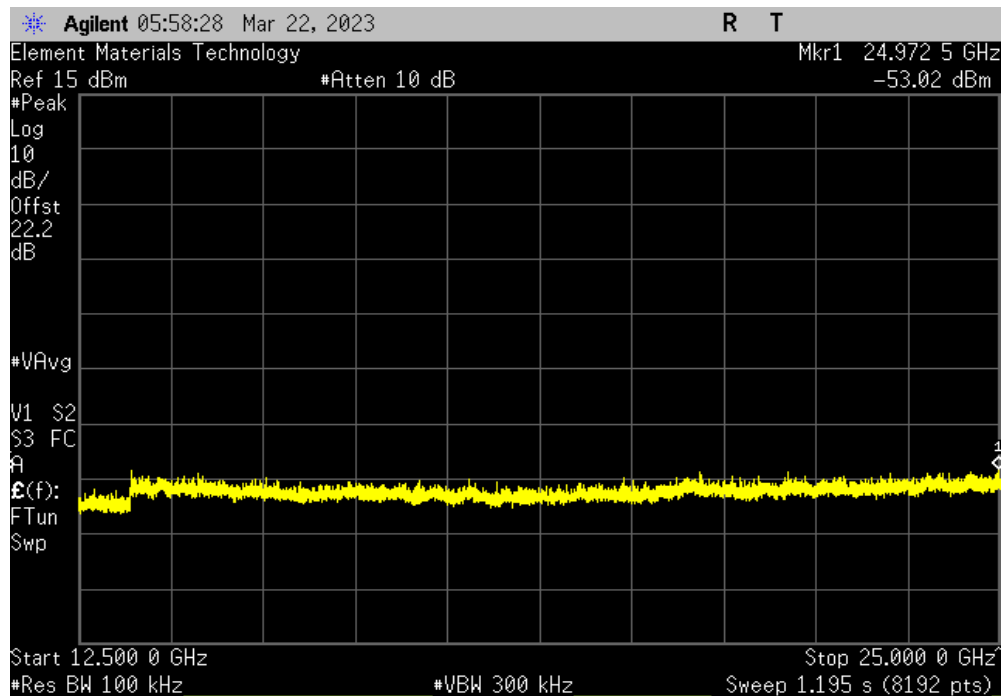


TUTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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	2514.6	-55.62	-30	Pass	



2400 MHz - 2483.5 MHz Band, 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	24972.5	-52.08	-30	Pass	

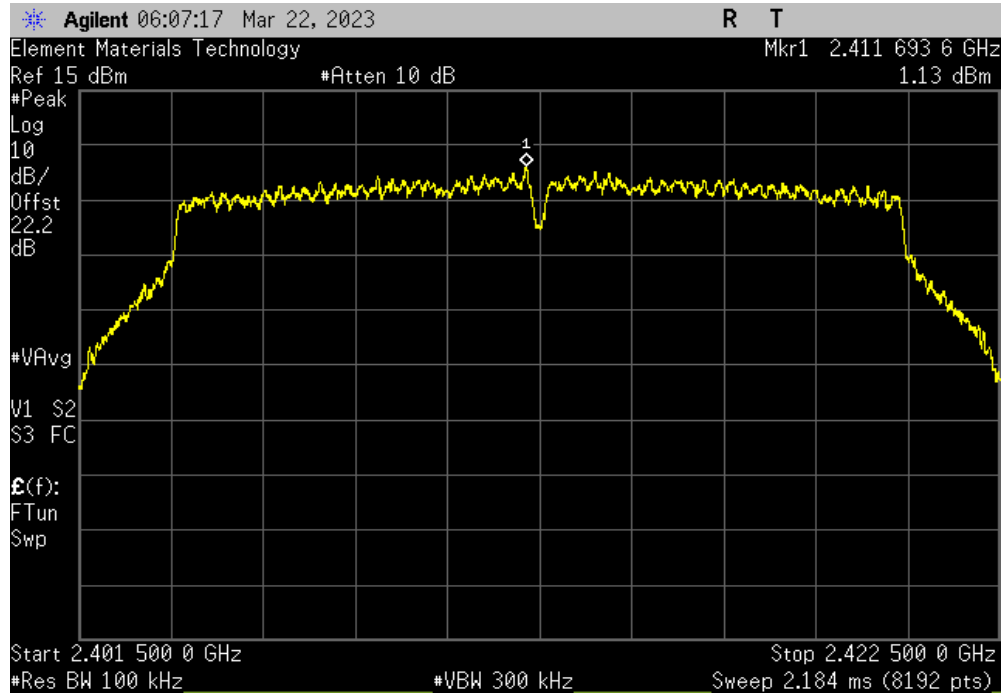


SPURIOUS CONDUCTED EMISSIONS

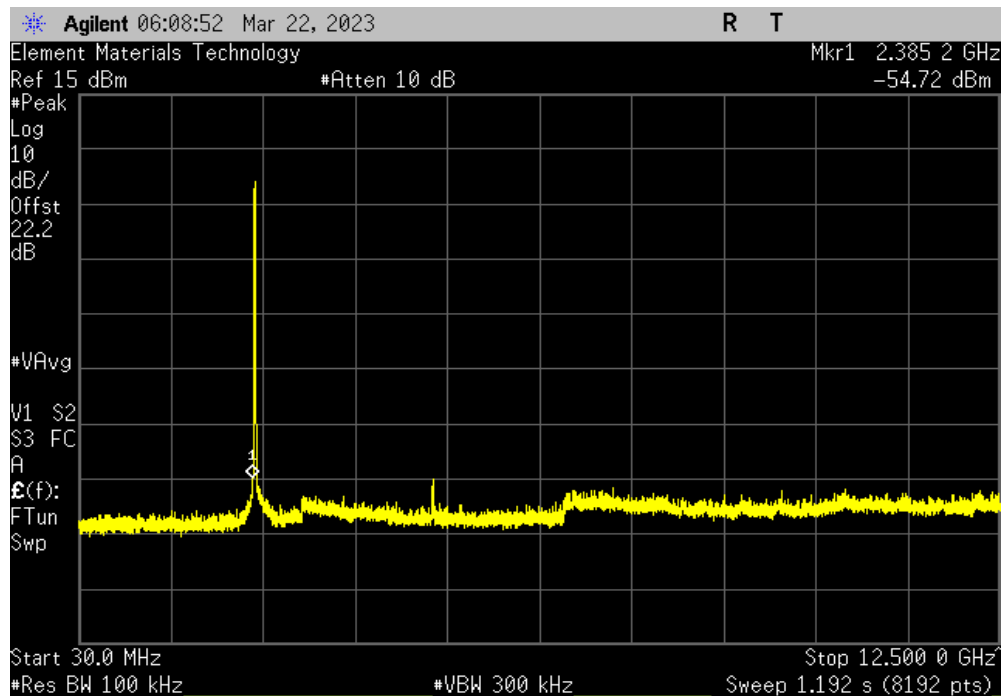


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2411.69	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 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	2385.2	-55.85	-30	Pass		

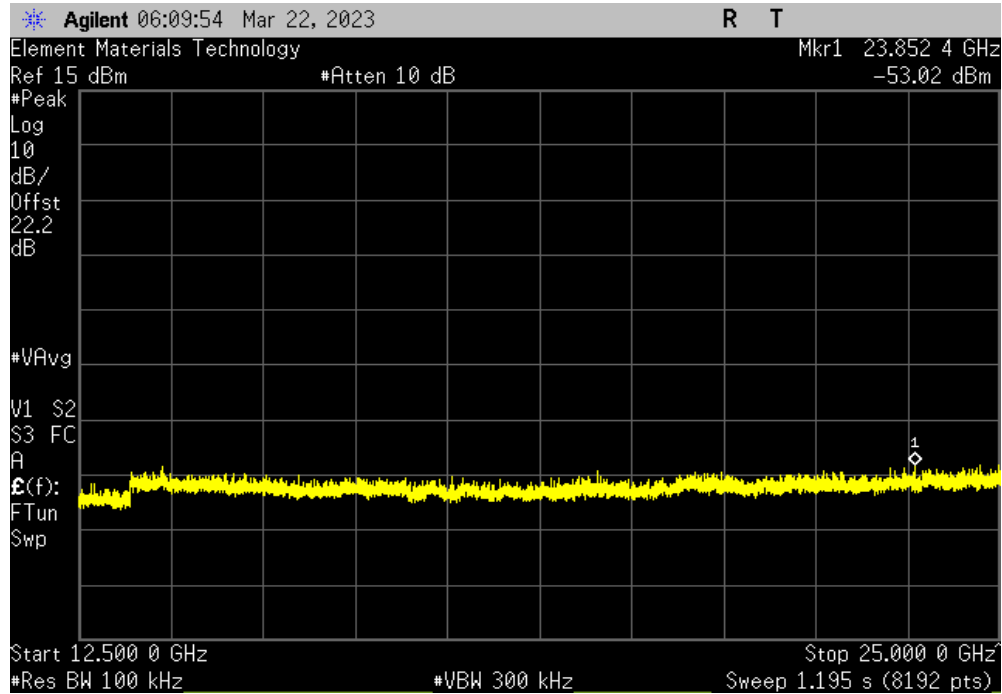


SPURIOUS CONDUCTED EMISSIONS

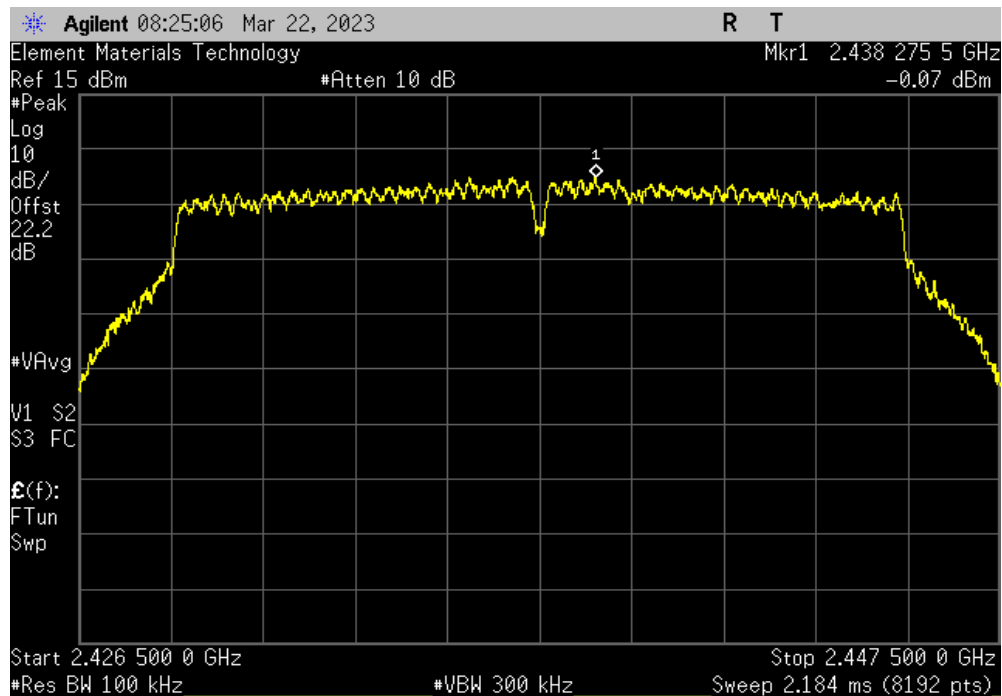


TUTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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	23852.4	-54.15	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2438.28	N/A	N/A	N/A	

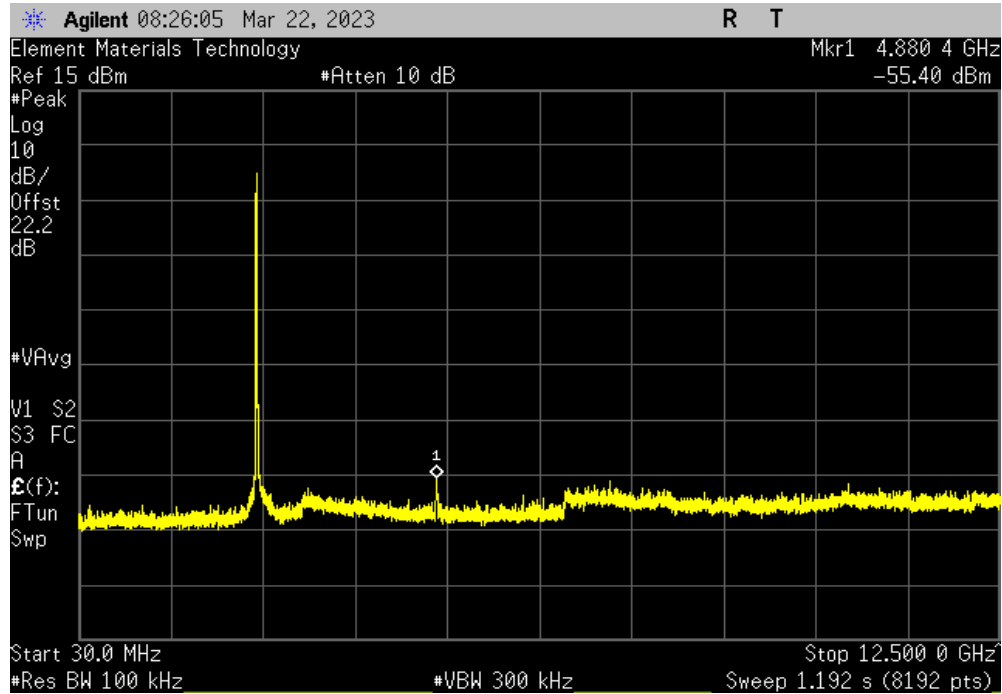


SPURIOUS CONDUCTED EMISSIONS

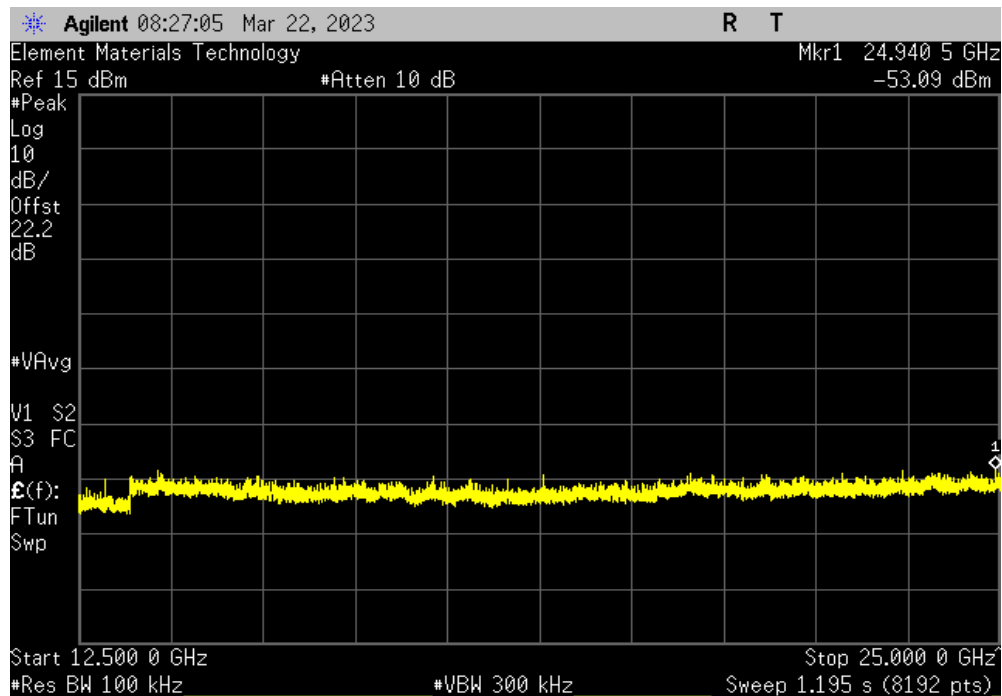


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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	4880.4	-55.34	-30	Pass	



2400 MHz - 2483.5 MHz Band, 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	24940.5	-53.02	-30	Pass	

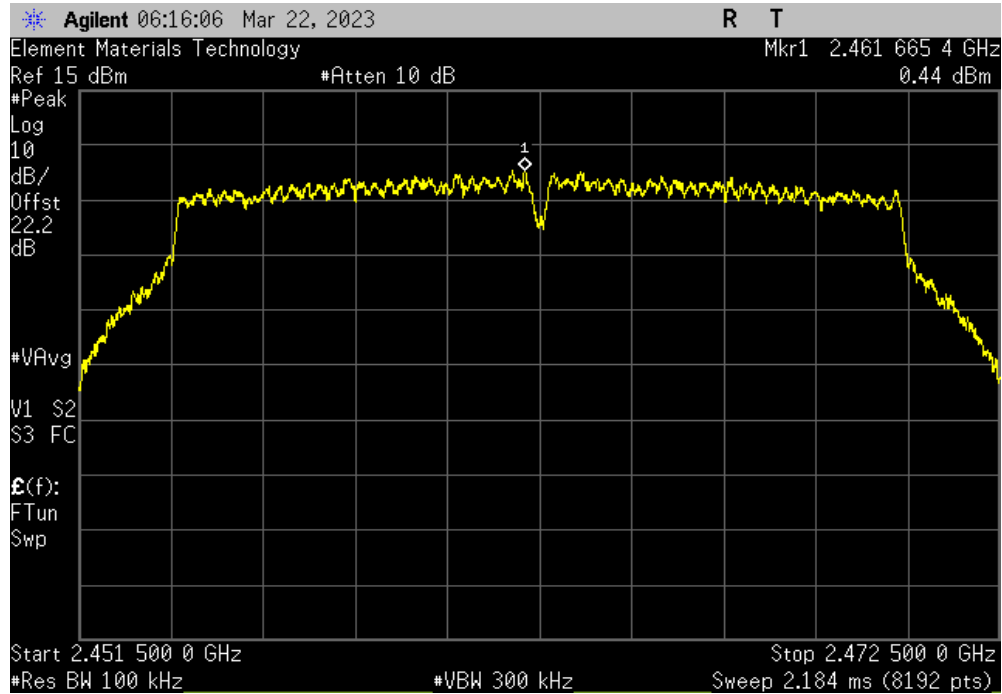


SPURIOUS CONDUCTED EMISSIONS

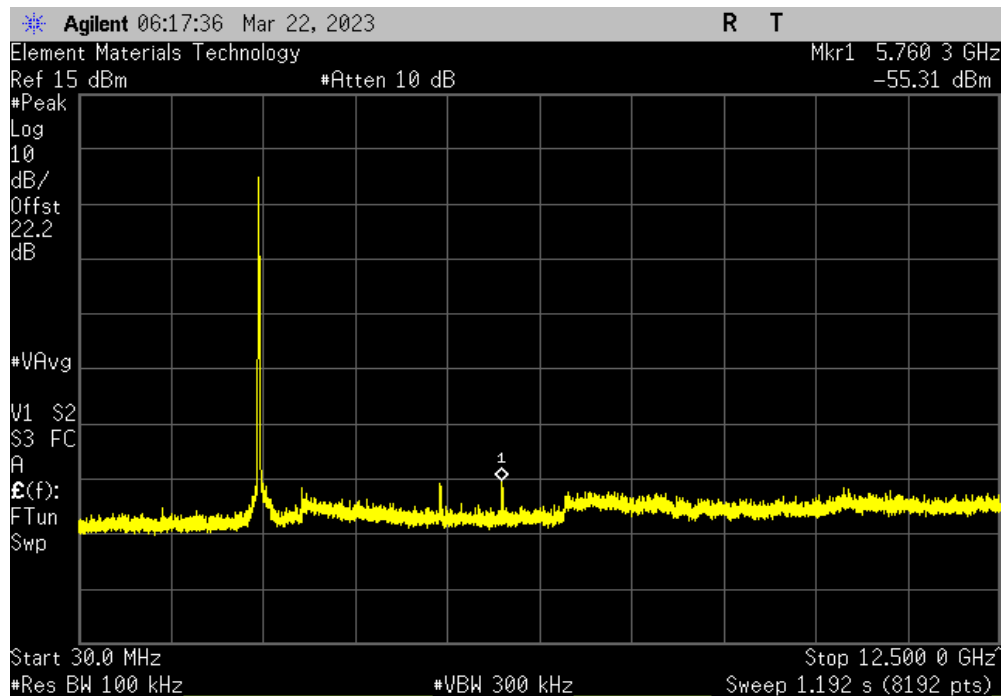


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental		2461.67	N/A	N/A	N/A	



2400 MHz - 2483.5 MHz Band, 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		5760.3	-55.75	-30	Pass	

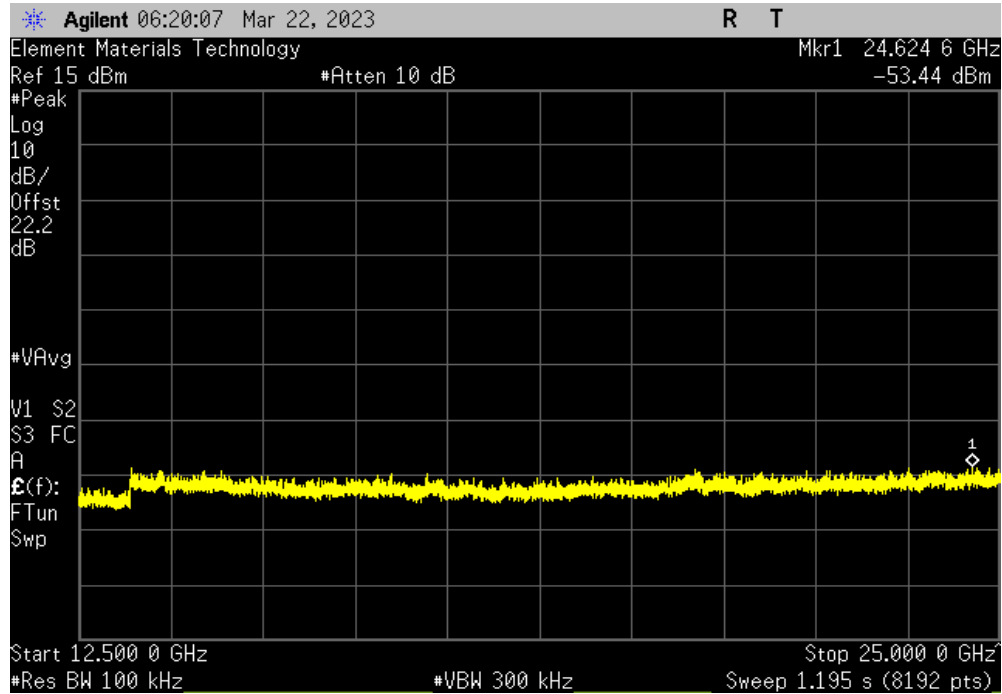


SPURIOUS CONDUCTED EMISSIONS

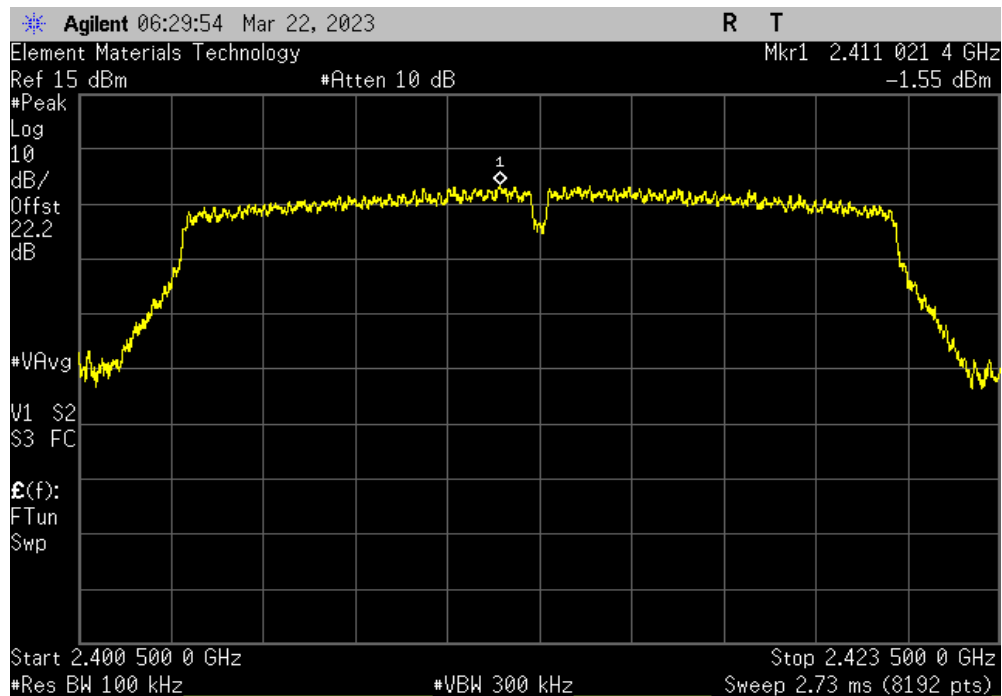


TbTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 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	24624.6	-53.88	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2411.02	N/A	N/A	N/A	

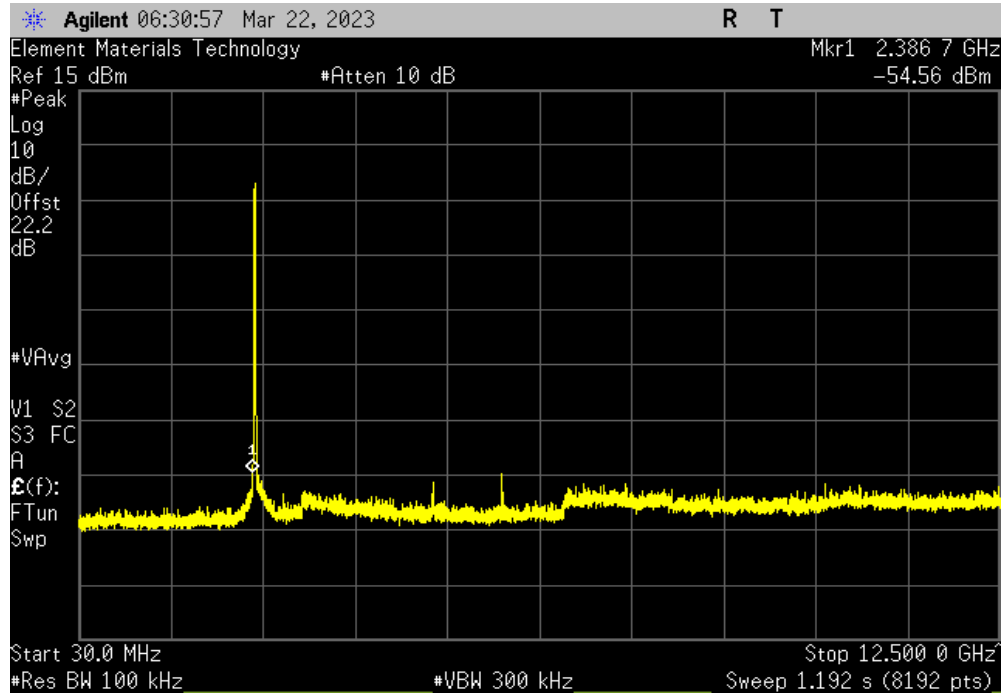


SPURIOUS CONDUCTED EMISSIONS

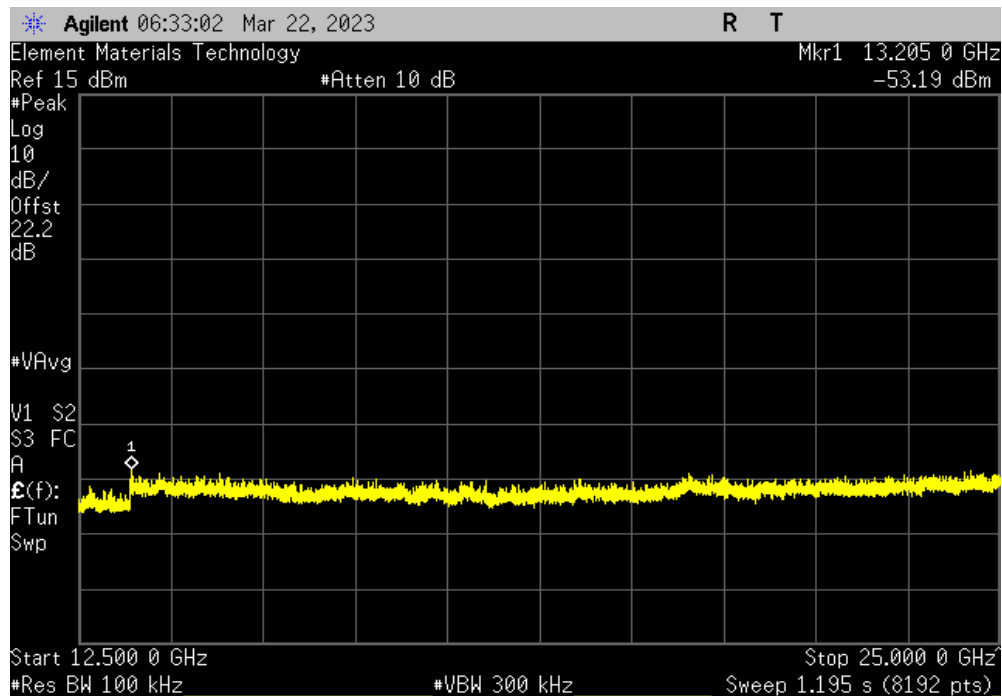


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	2386.7	-53.01	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	13205	-51.64	-30	Pass	

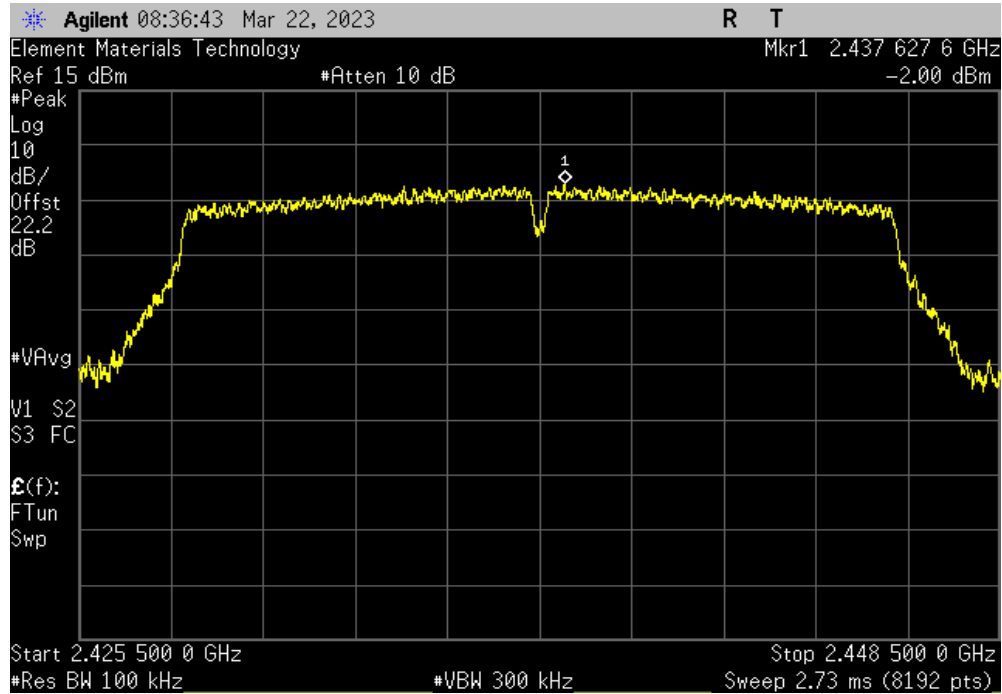


SPURIOUS CONDUCTED EMISSIONS

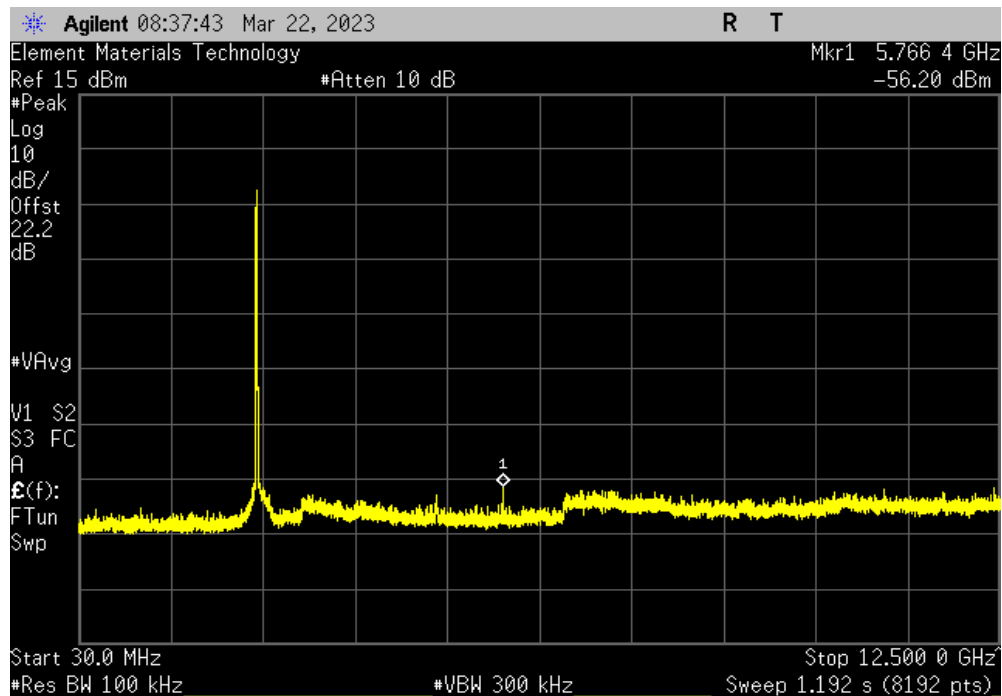


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, Mid Channel 6, 2437 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2437.63	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, Mid Channel 6, 2437 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	5766.4	-54.2	-30	Pass		

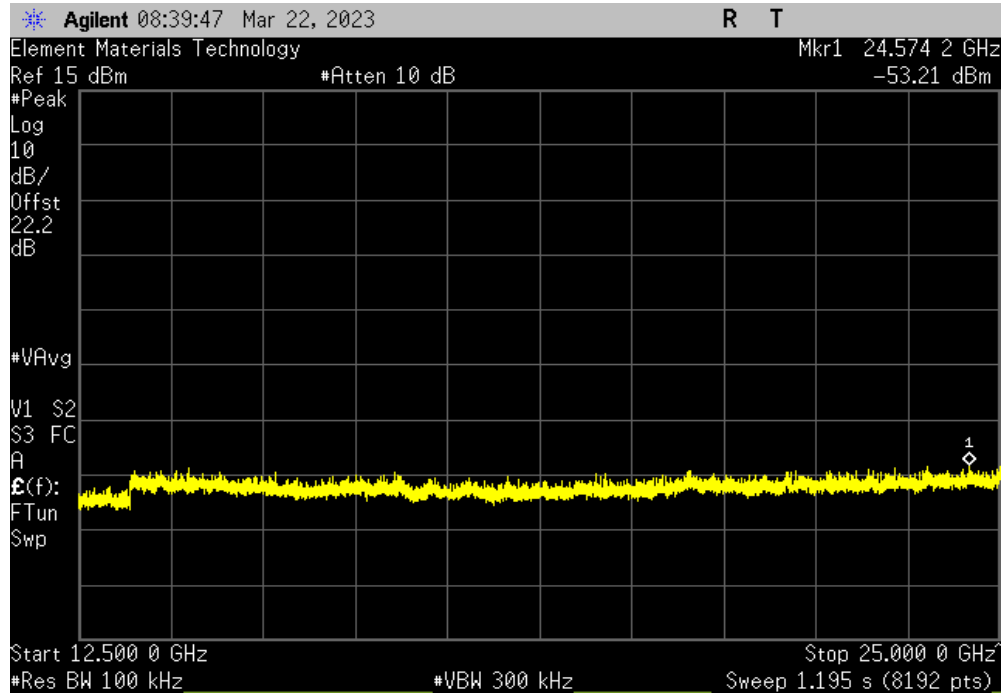


SPURIOUS CONDUCTED EMISSIONS

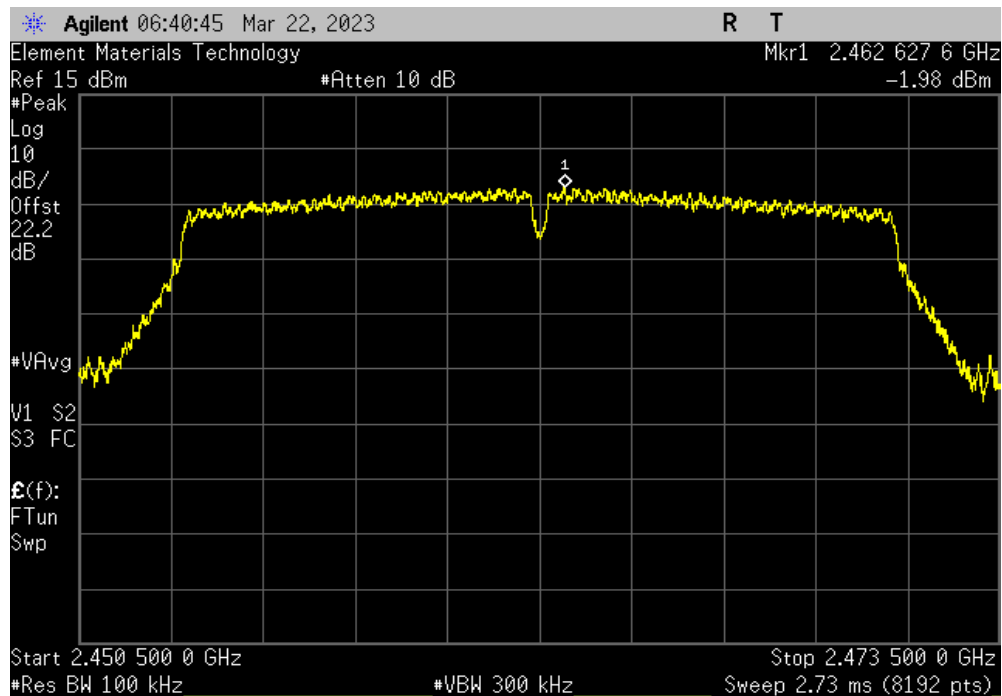


TbTx 2022.06.03.0 XMI 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24574.2	-51.21	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2462.63	N/A	N/A	N/A	

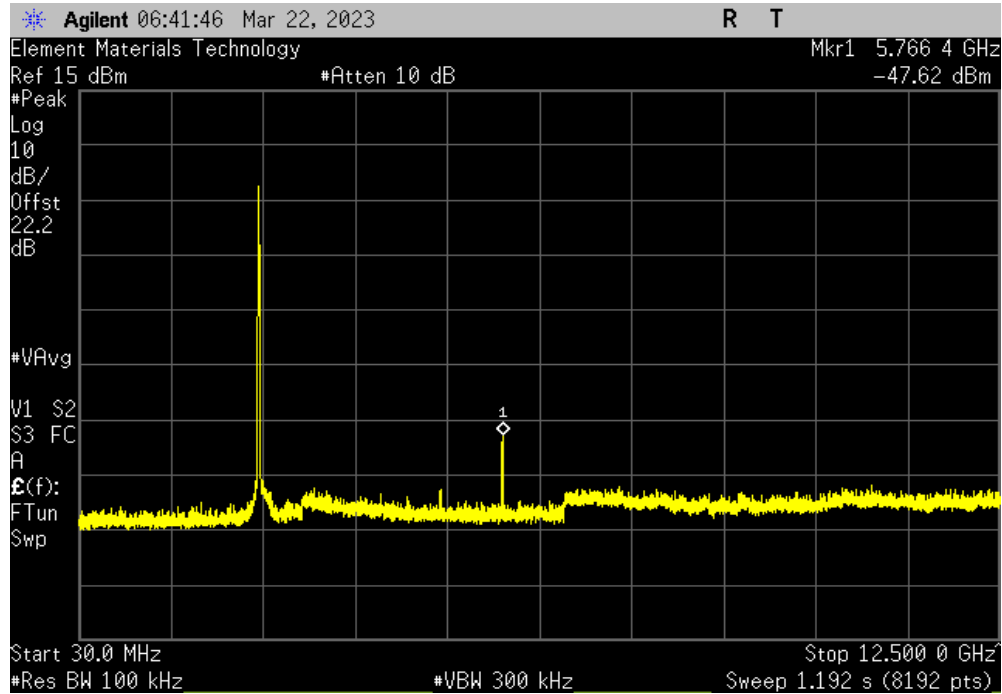


SPURIOUS CONDUCTED EMISSIONS

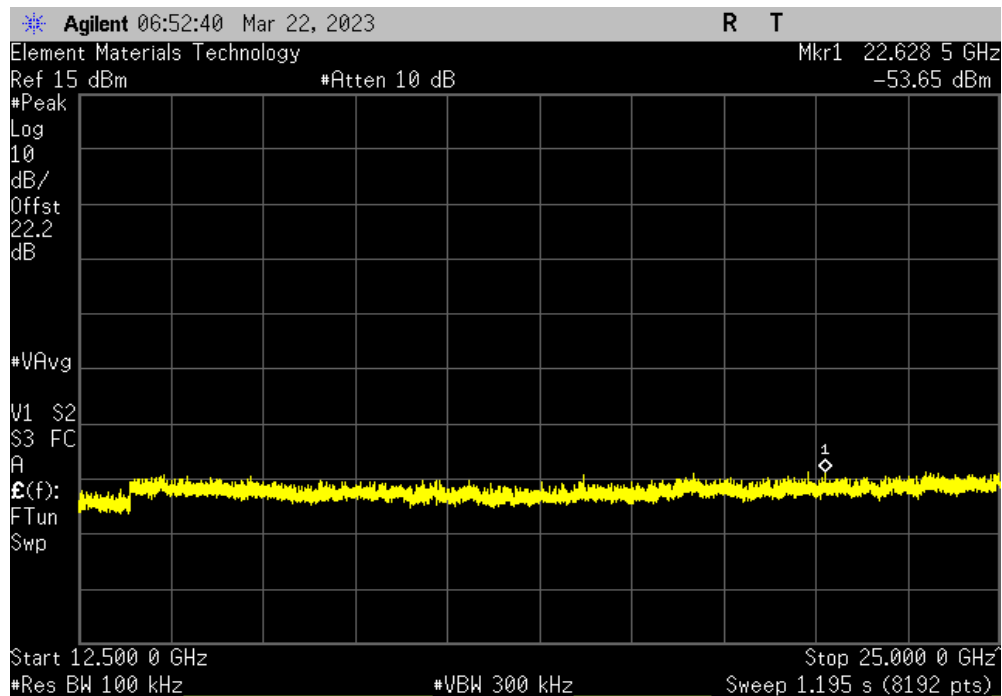


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	5766.4	-45.64	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS0, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	22628.5	-51.67	-30	Pass	

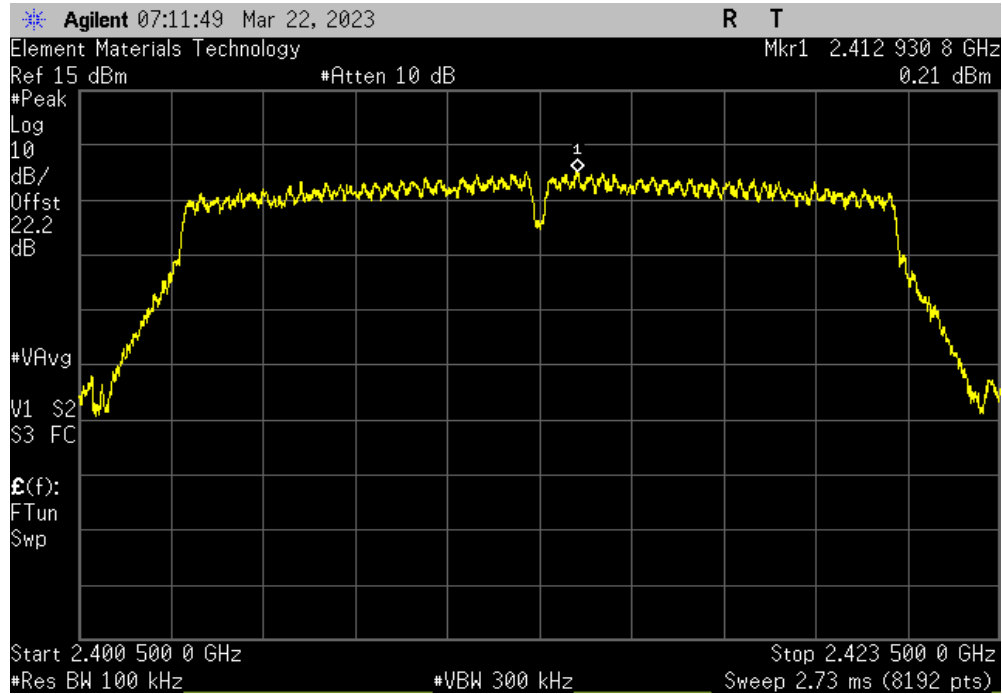


SPURIOUS CONDUCTED EMISSIONS

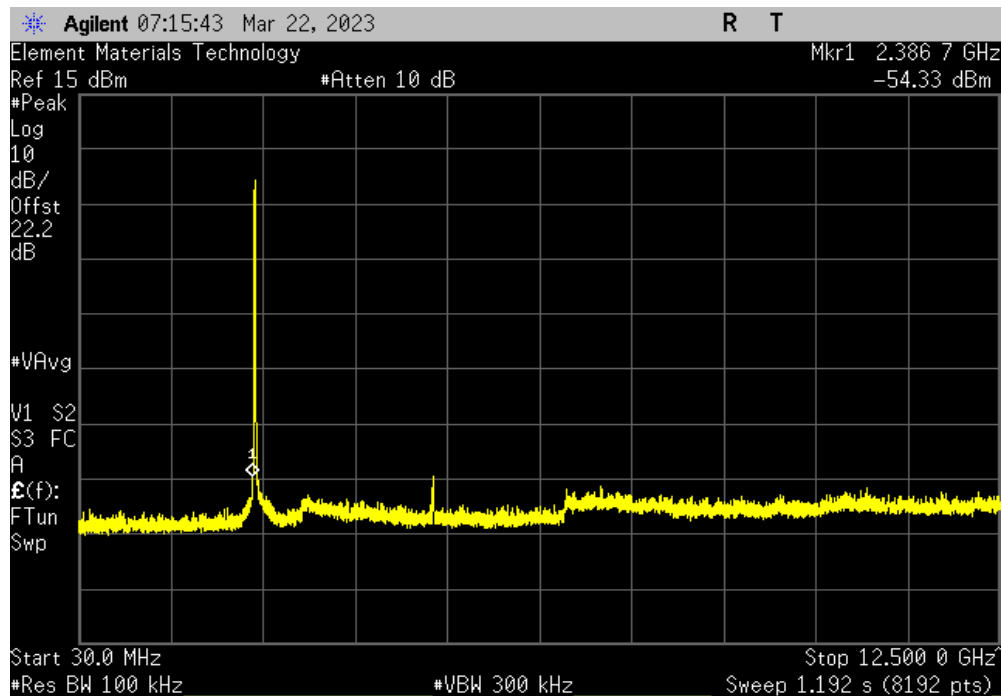


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, Low Channel 1, 2412 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2412.93	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, Low Channel 1, 2412 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	2386.7	-54.54	-30	Pass		

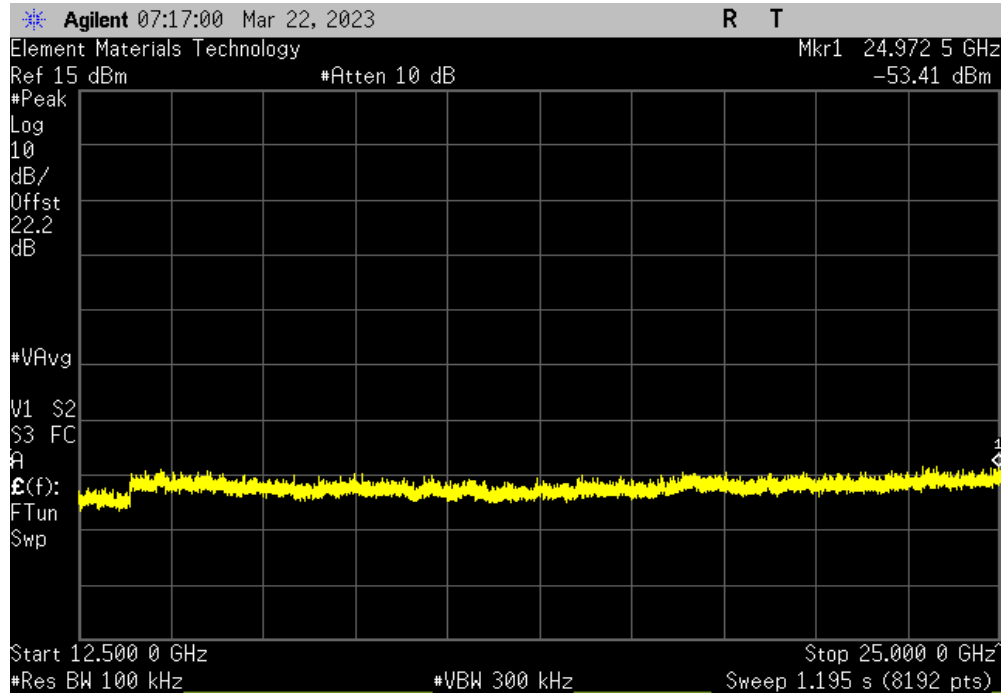


SPURIOUS CONDUCTED EMISSIONS

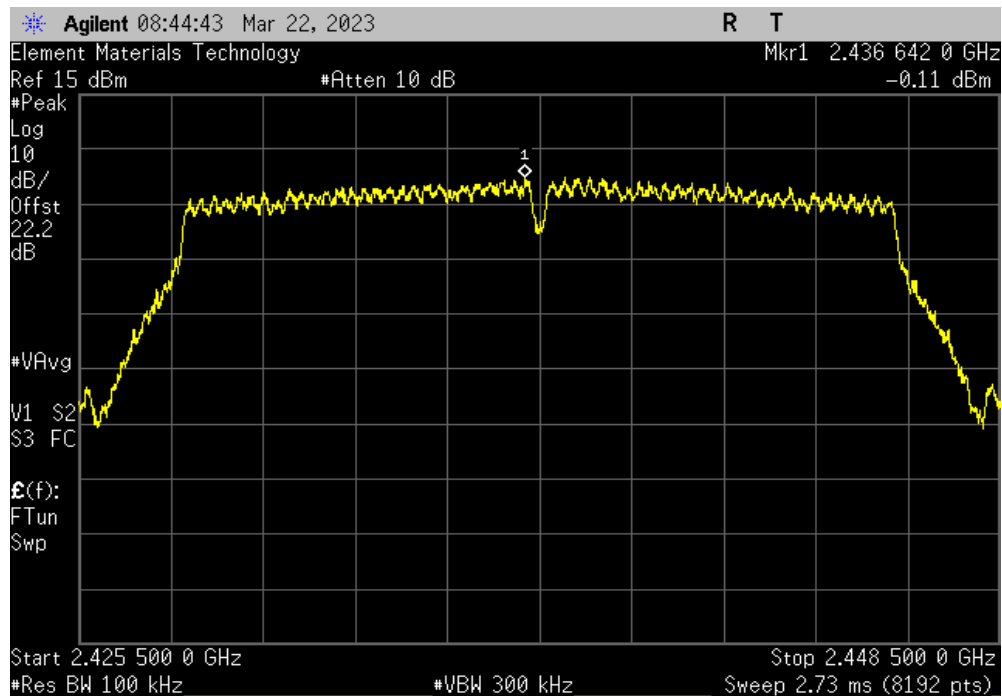


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, Low Channel 1, 2412 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24972.5	-53.62	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2436.64	N/A	N/A	N/A	

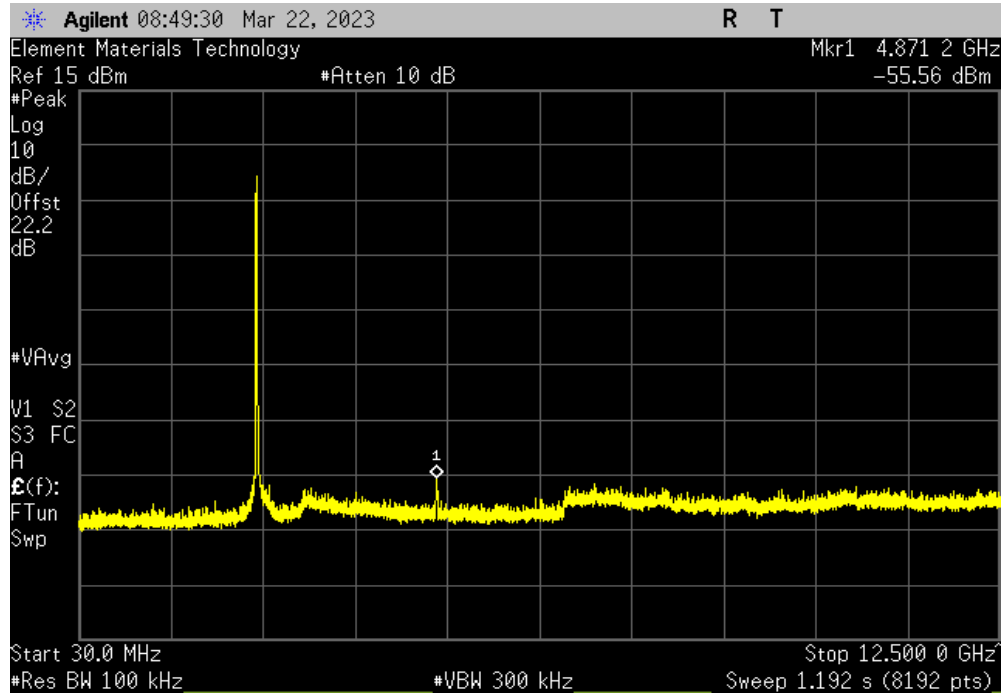


SPURIOUS CONDUCTED EMISSIONS

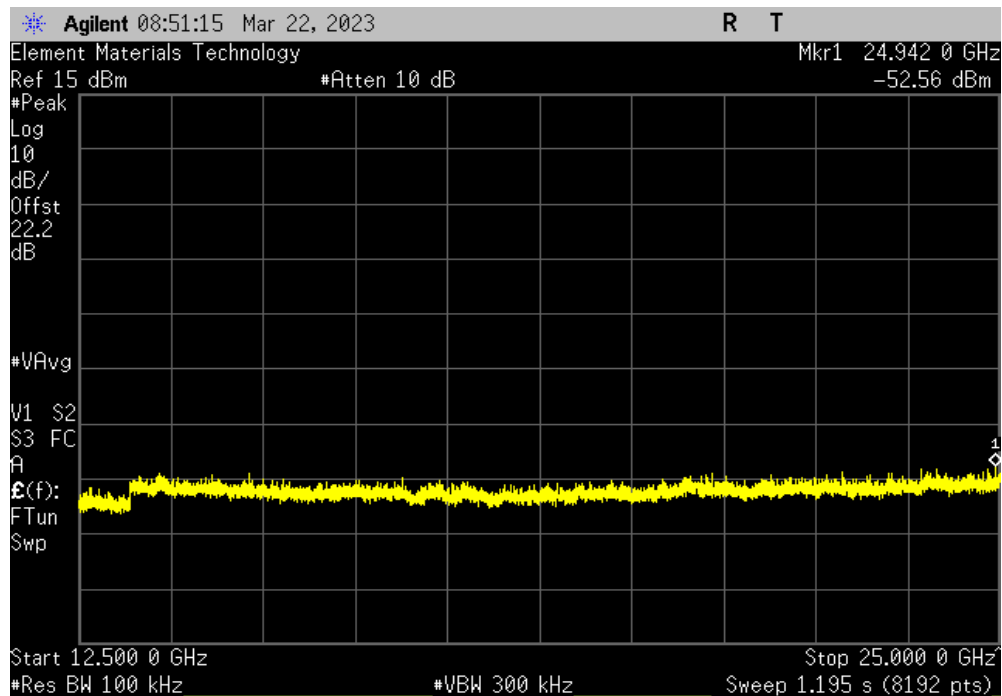


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	4871.2	-55.45	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, Mid Channel 6, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24942	-52.45	-30	Pass	

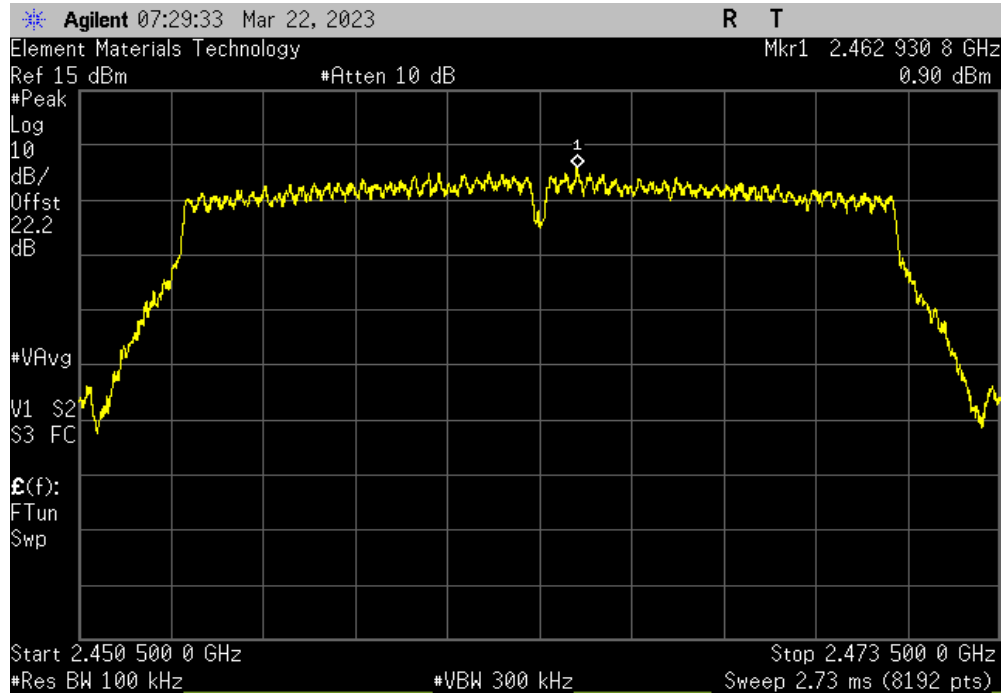


SPURIOUS CONDUCTED EMISSIONS

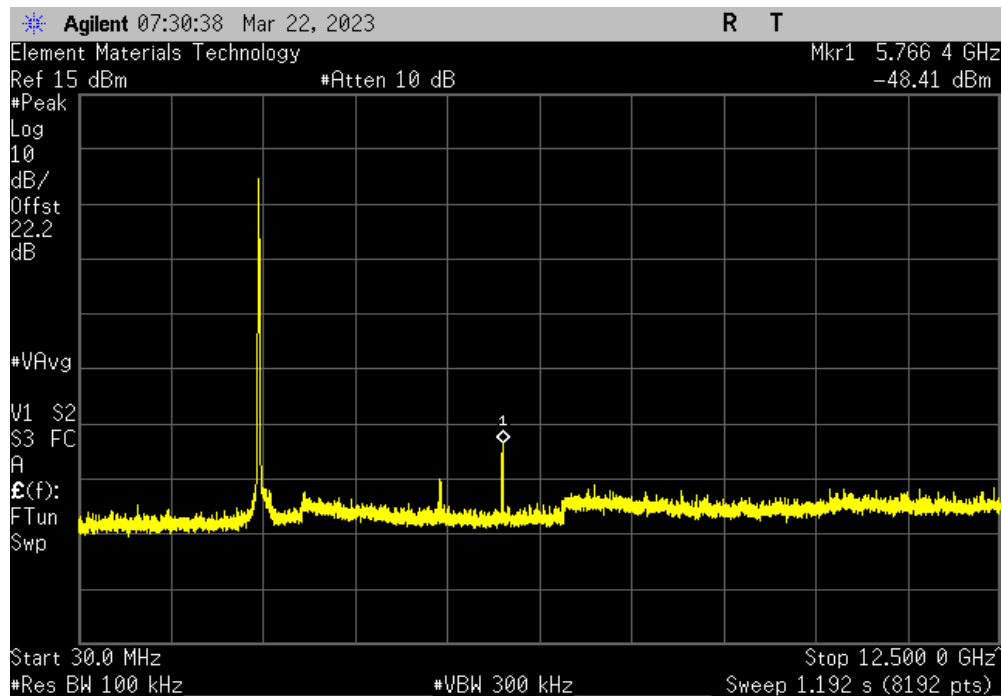


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, High Channel 11, 2462 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2462.93	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, High Channel 11, 2462 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	5766.4	-49.31	-30	Pass		

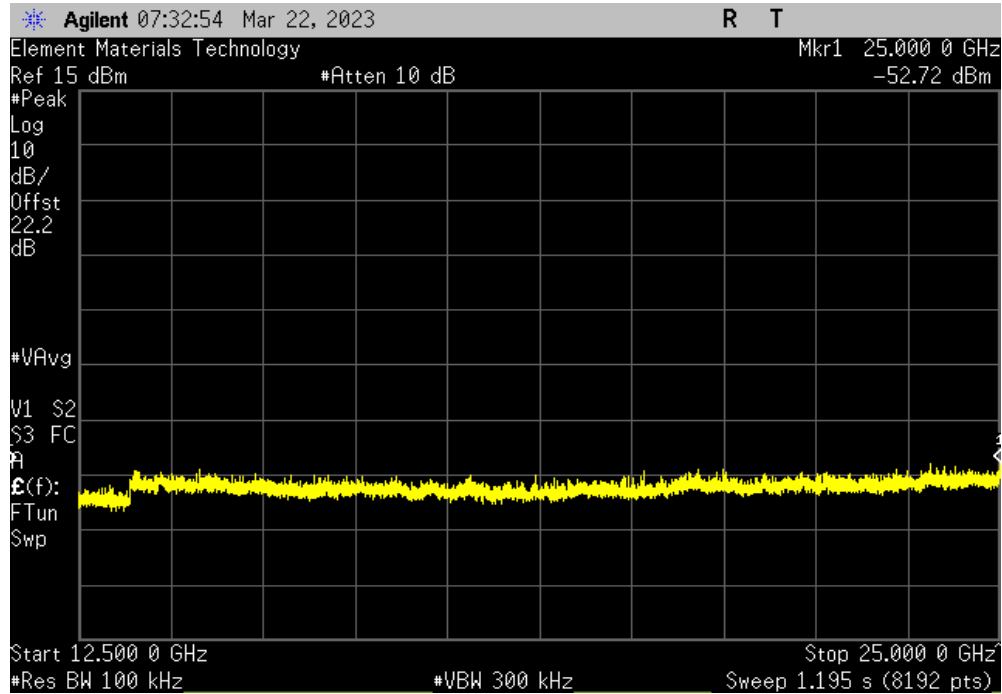


SPURIOUS CONDUCTED EMISSIONS

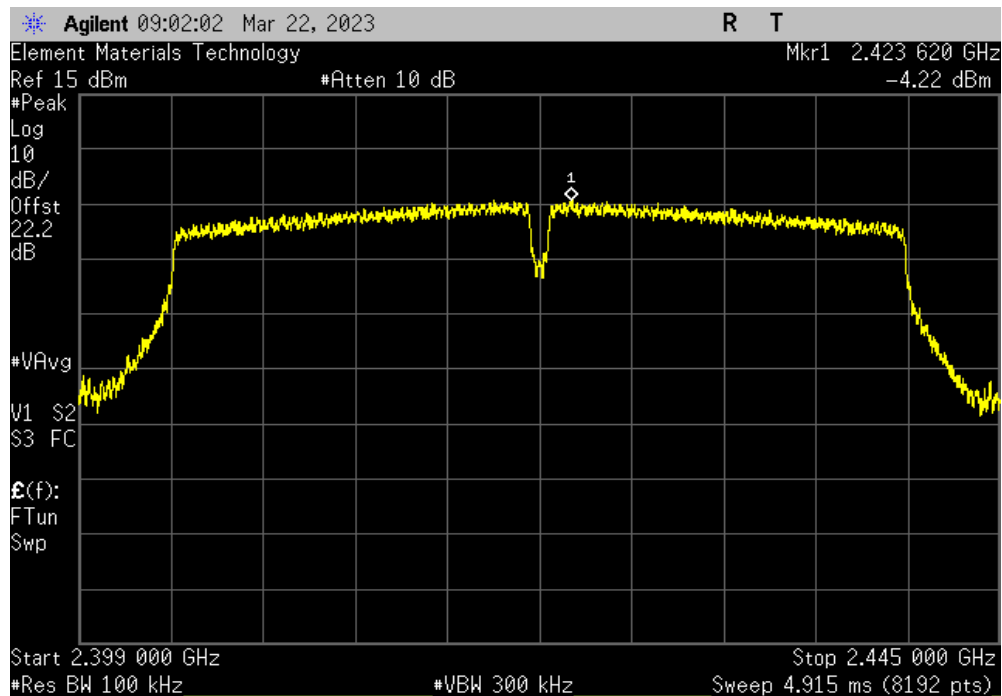


TbTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n20) MCS7, High Channel 11, 2462 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	25000	-53.63	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Low Channel 1/5, 2422 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2423.62	N/A	N/A	N/A	

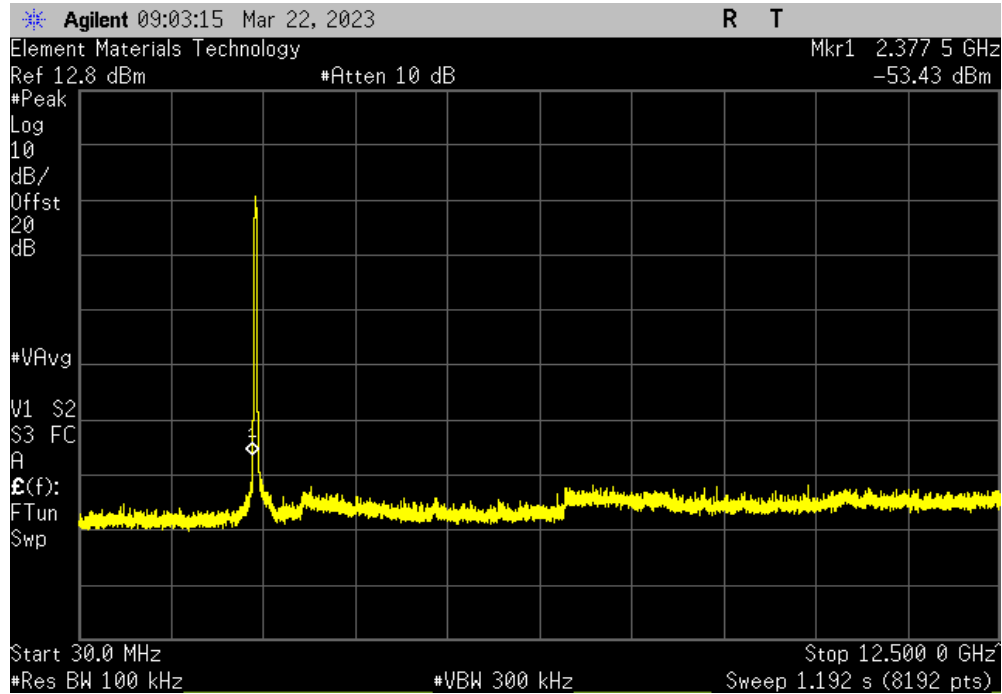


SPURIOUS CONDUCTED EMISSIONS

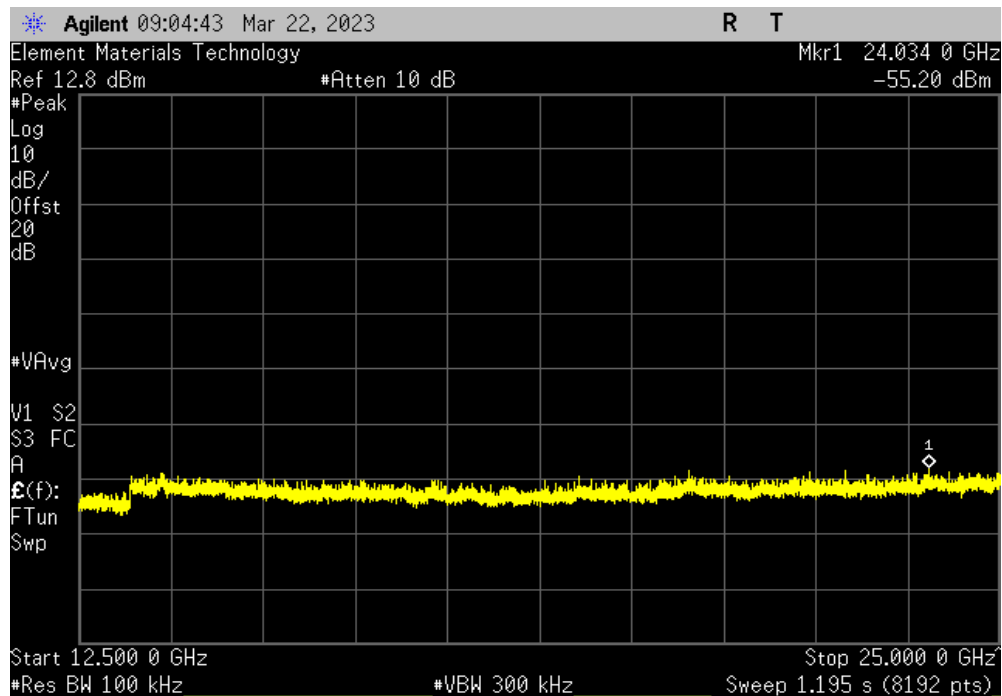


TbTx 2022.06.03.0 XMI 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Low Channel 1/5, 2422 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	2377.5	-49.21	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Low Channel 1/5, 2422 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24034	-50.98	-30	Pass	

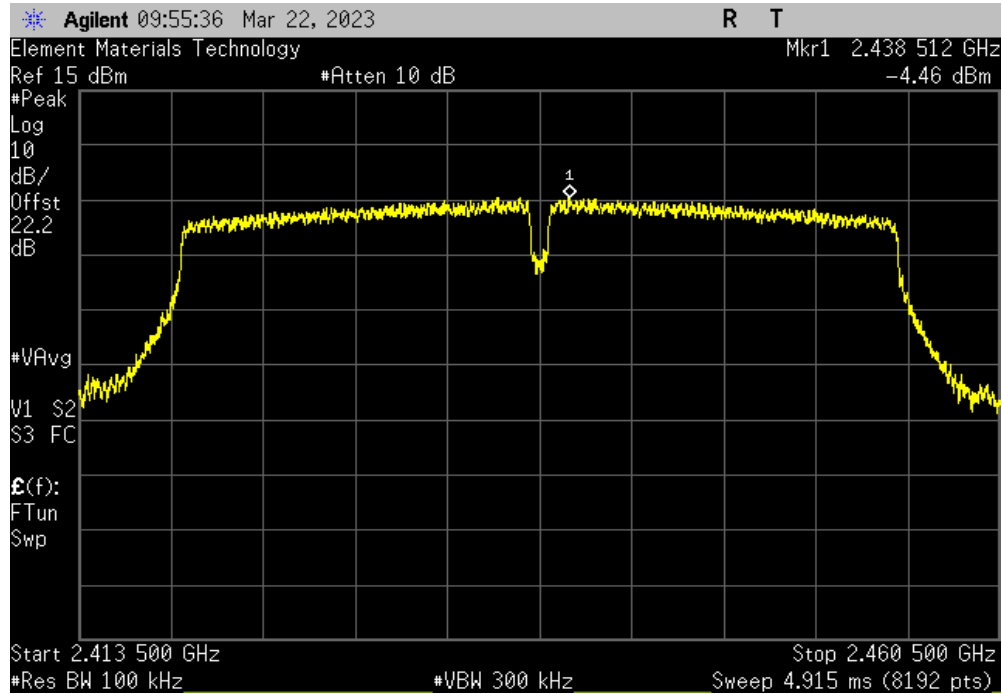


SPURIOUS CONDUCTED EMISSIONS

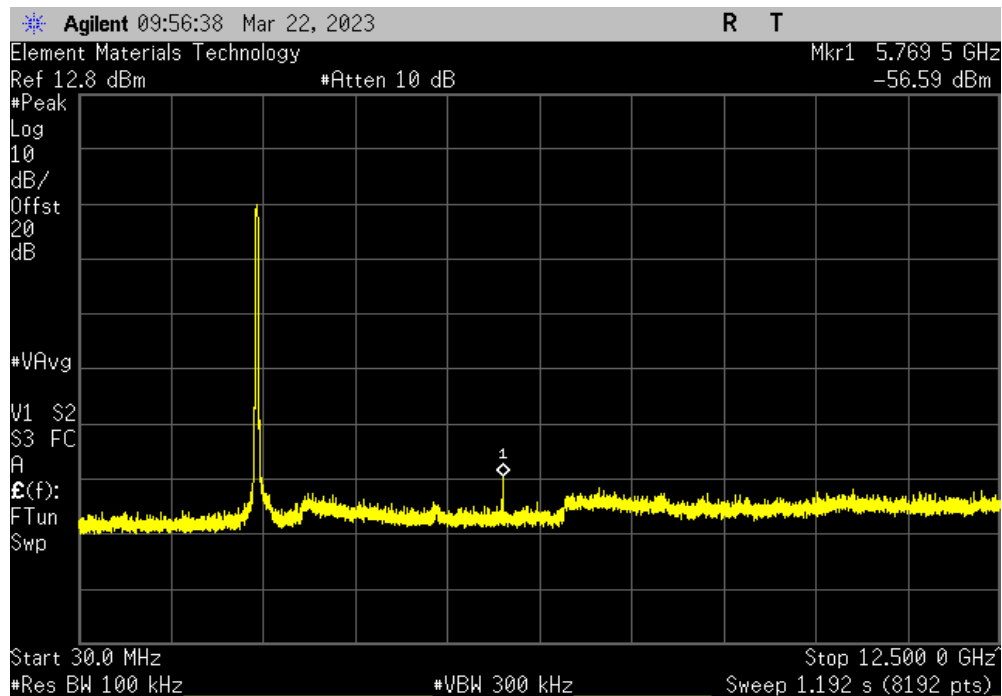


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Mid Channel 4/8, 2437 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2438.51	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Mid Channel 4/8, 2437 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	5769.5	-52.13	-30	Pass		

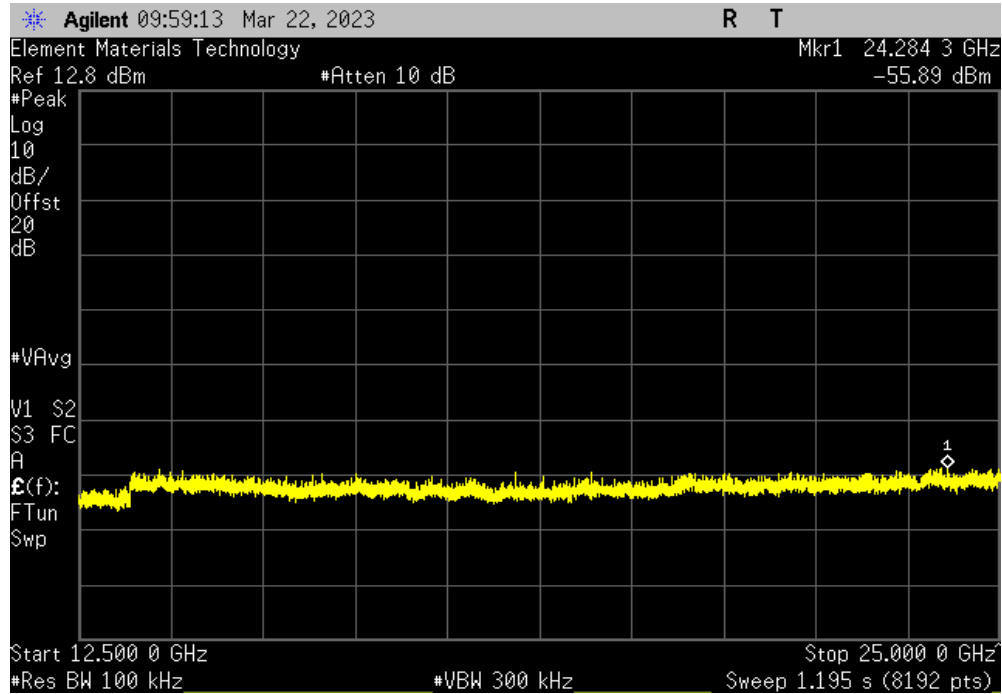


SPURIOUS CONDUCTED EMISSIONS

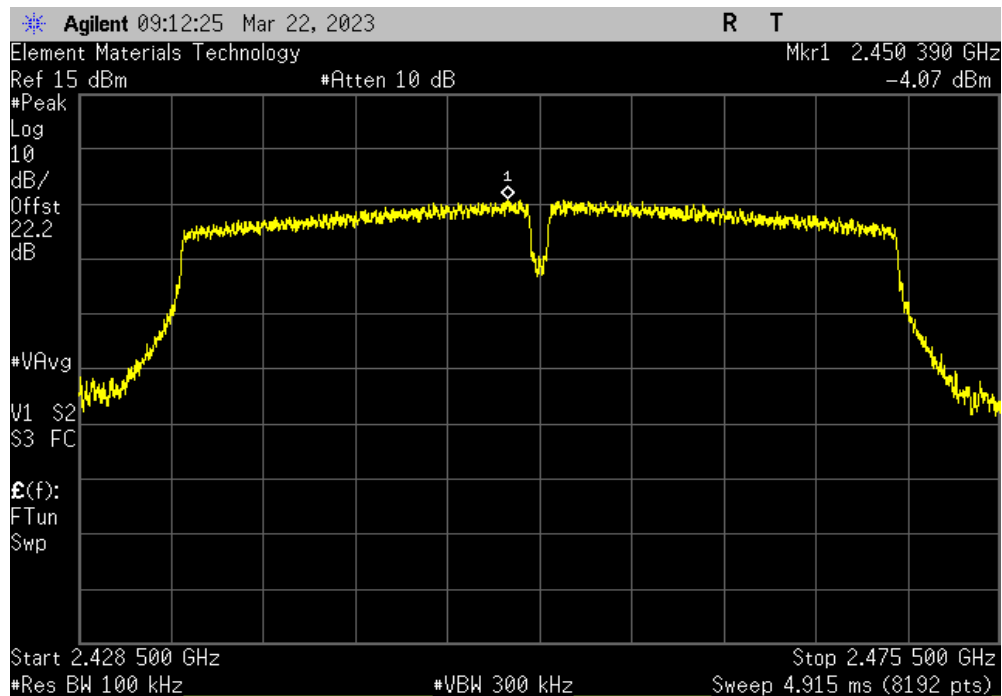


TUTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, Mid Channel 4/8, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24284.3	-51.43	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, High Channel 7/11, 2452 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2450.39	N/A	N/A	N/A	

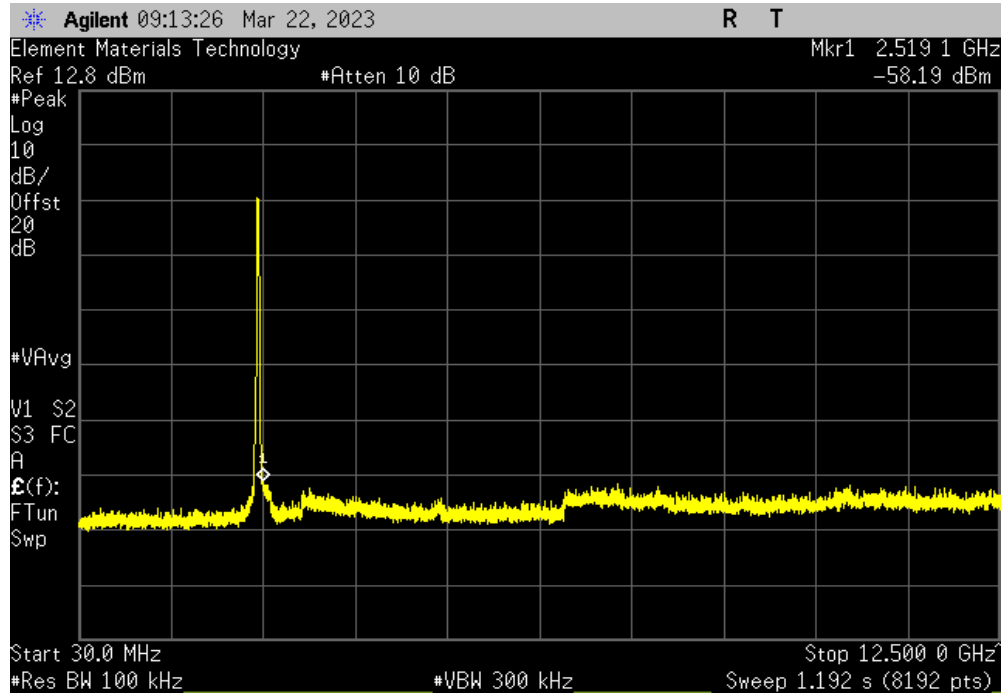


SPURIOUS CONDUCTED EMISSIONS

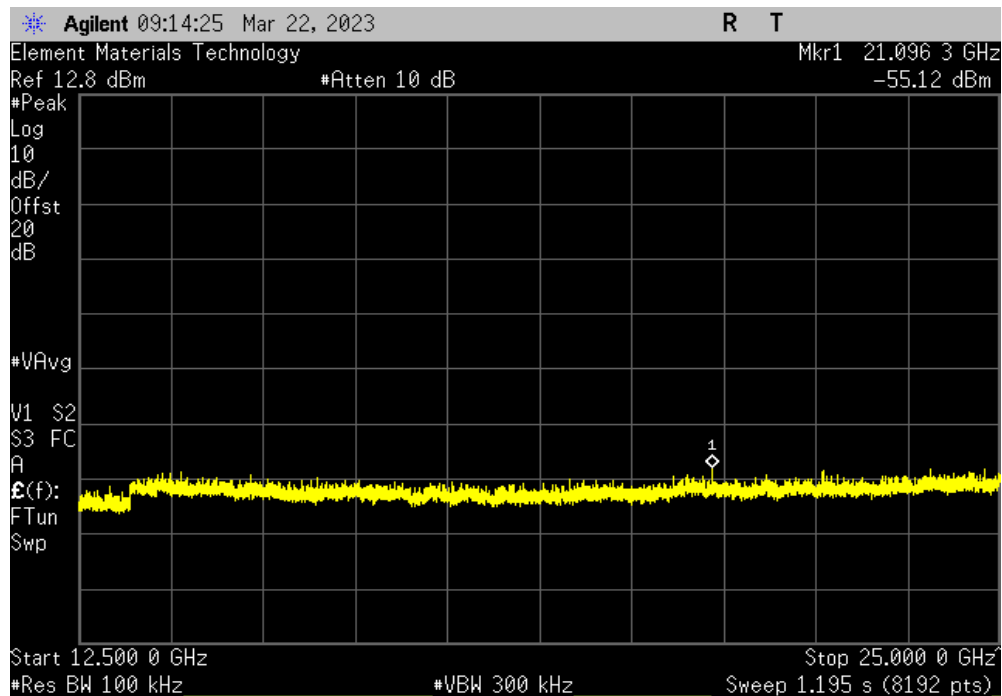


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, High Channel 7/11, 2452 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	2519.1	-54.12	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS0, High Channel 7/11, 2452 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	21096.3	-51.05	-30	Pass	

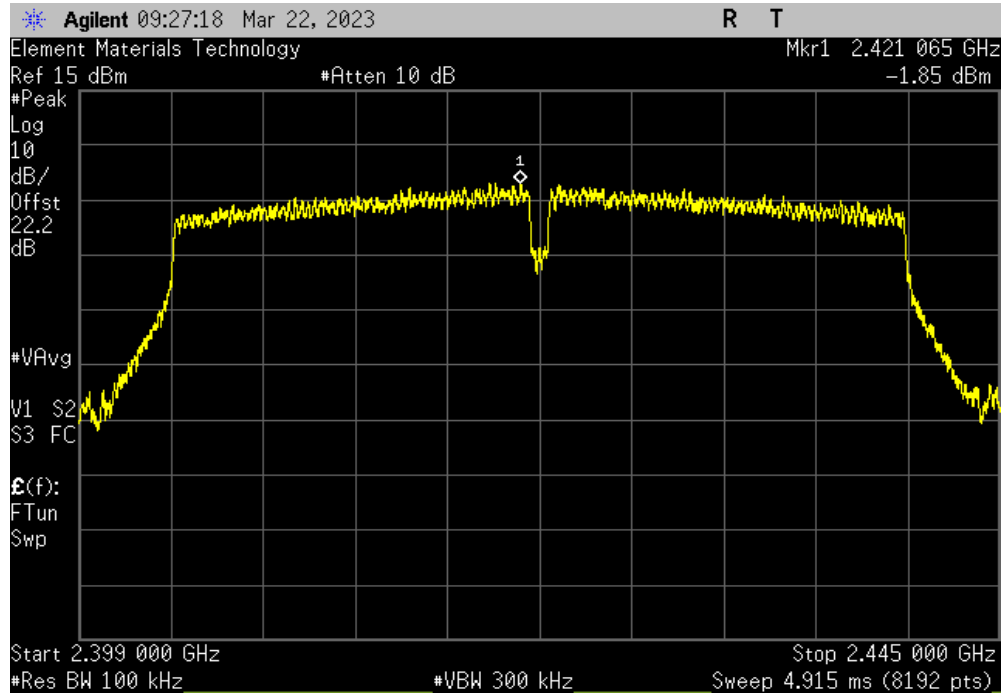


SPURIOUS CONDUCTED EMISSIONS

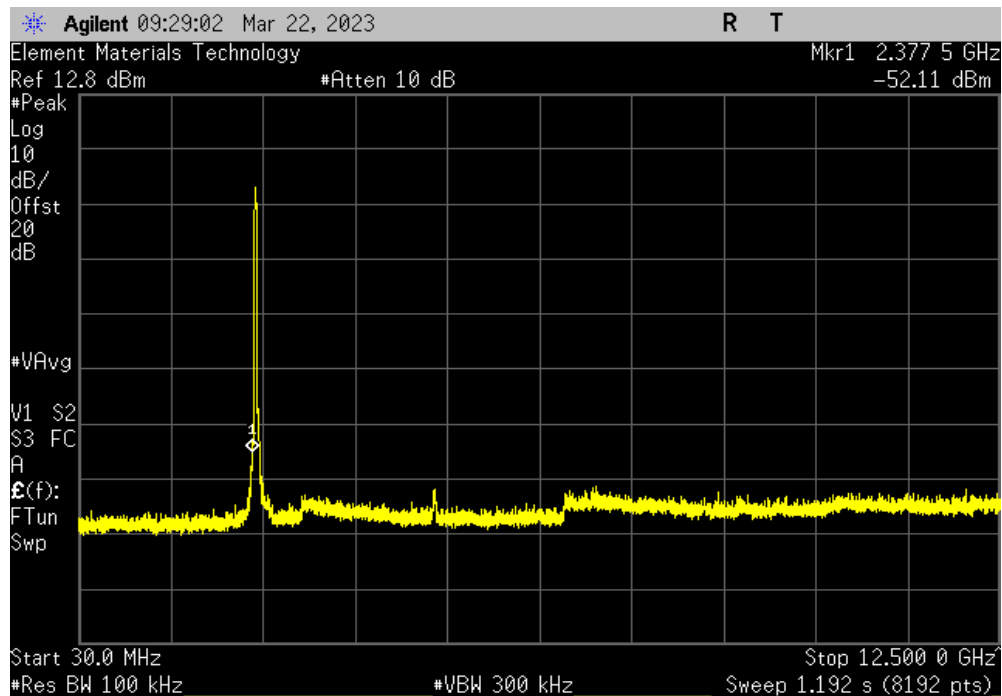


TbTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Low Channel 1/5, 2422 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2421.07	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Low Channel 1/5, 2422 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	2377.5	-50.26	-30	Pass		

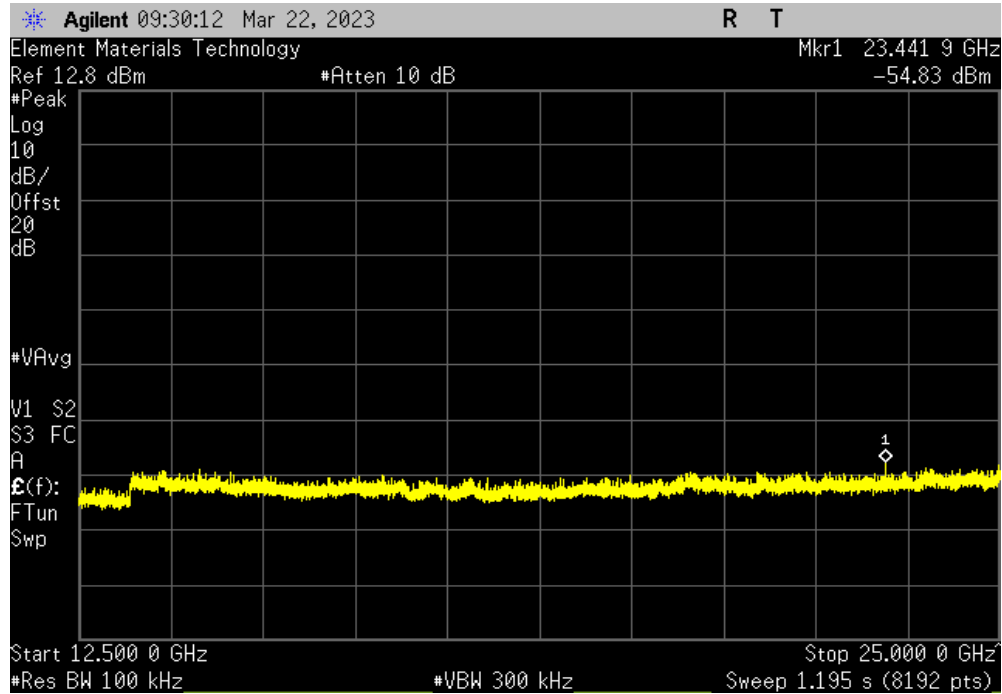


SPURIOUS CONDUCTED EMISSIONS

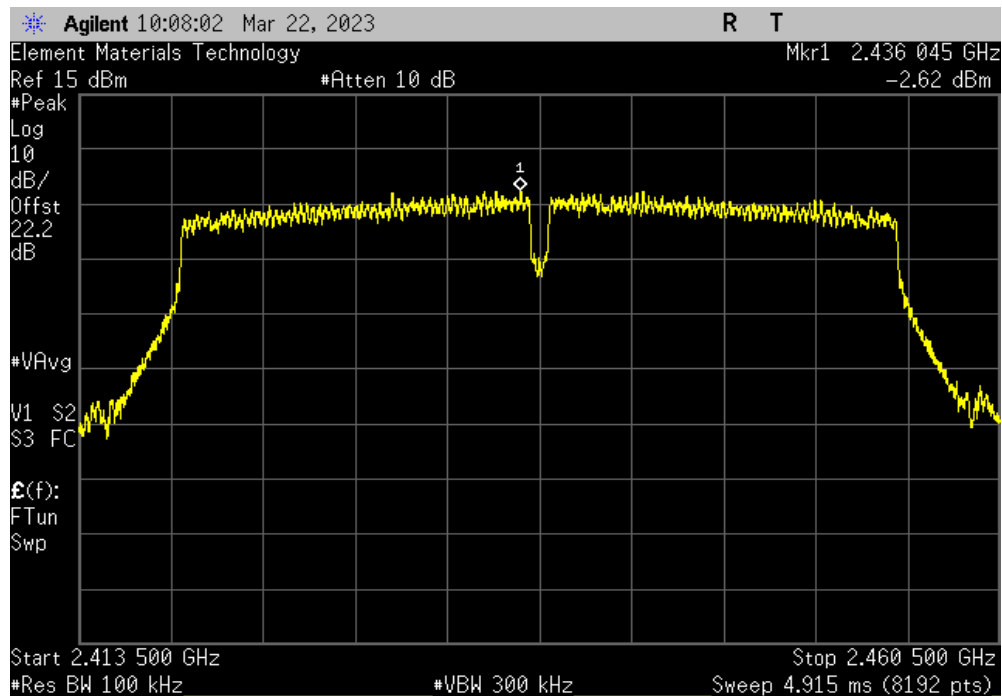


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Low Channel 1/5, 2422 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	23441.9	-52.98	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Mid Channel 4/8, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2436.05	N/A	N/A	N/A	

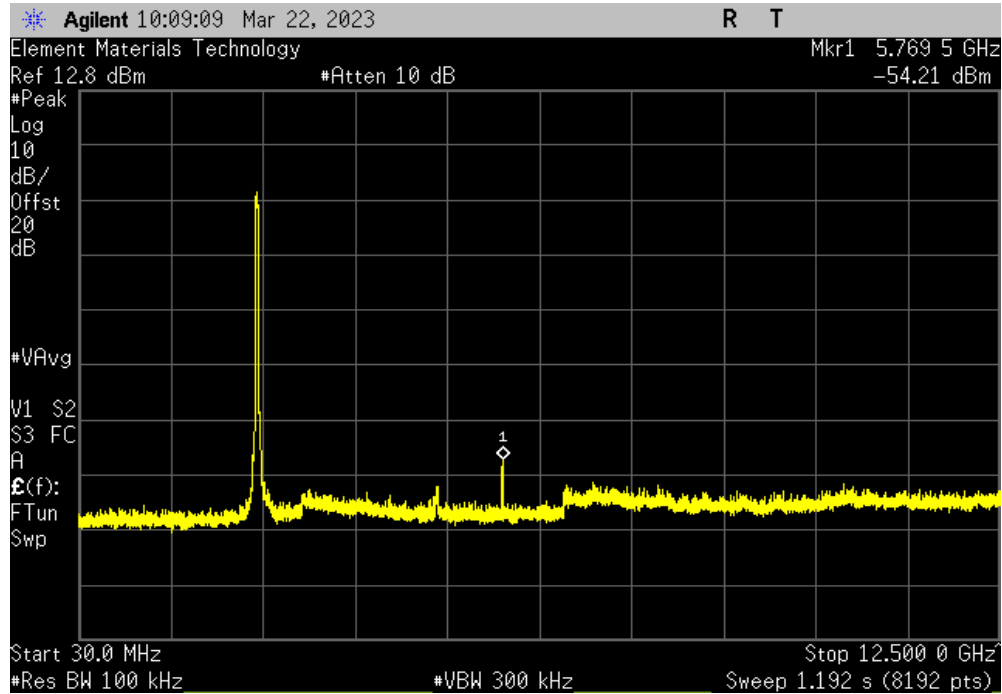


SPURIOUS CONDUCTED EMISSIONS

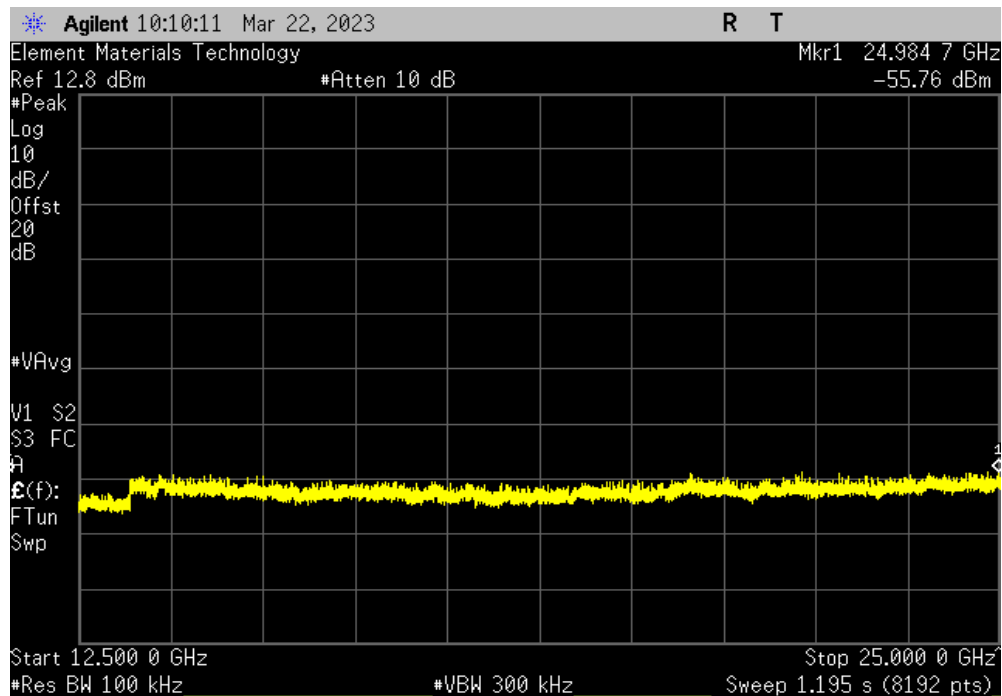


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Mid Channel 4/8, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	5769.5	-51.59	-30	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, Mid Channel 4/8, 2437 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24984.7	-53.14	-30	Pass	

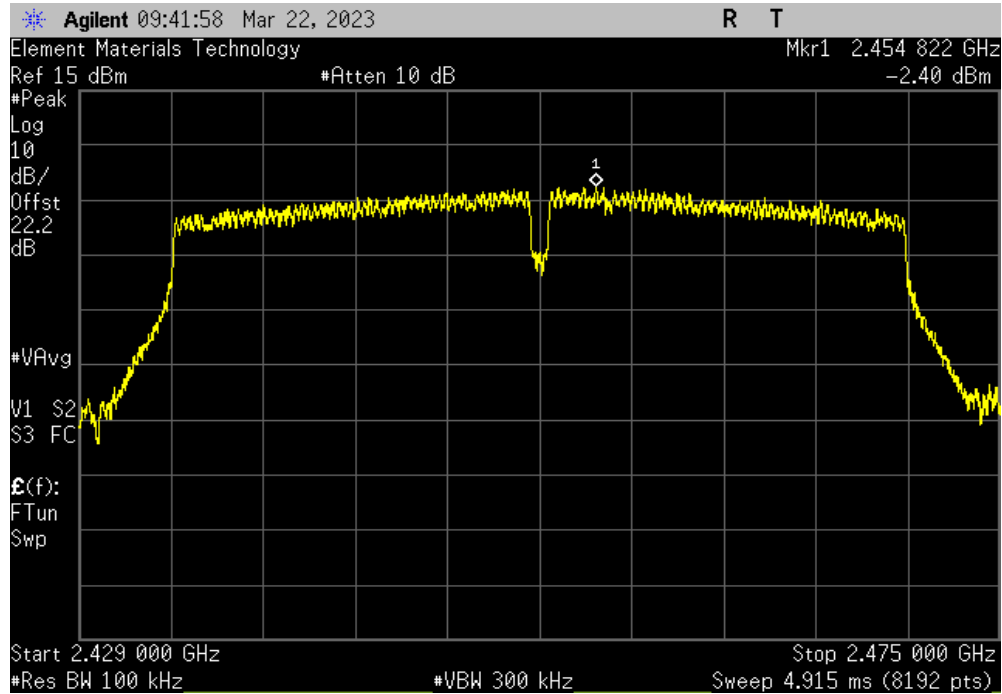


SPURIOUS CONDUCTED EMISSIONS

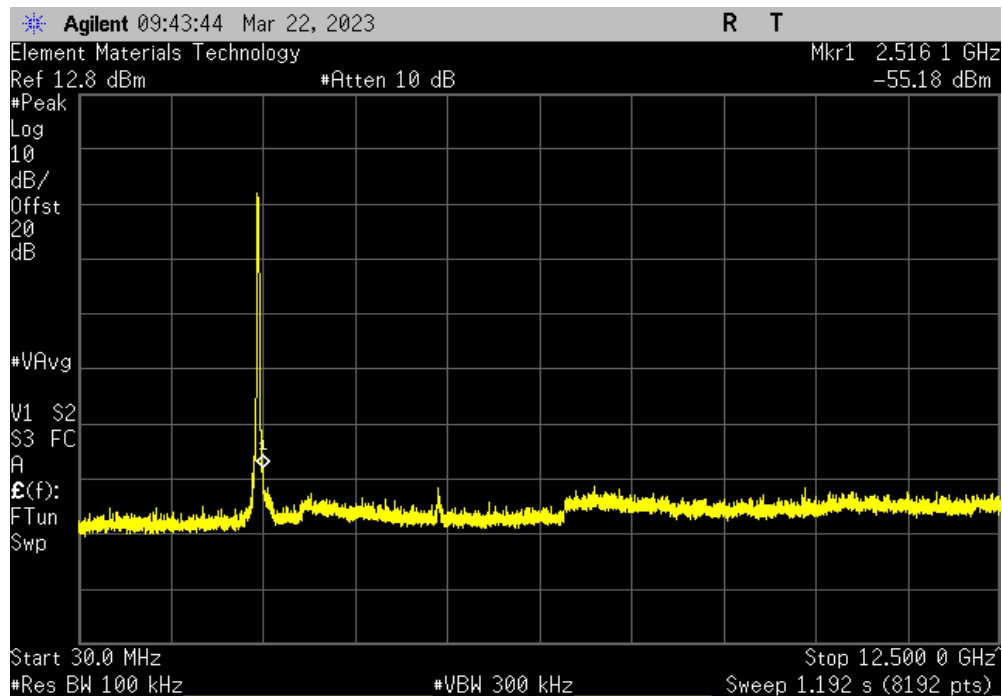


TMTx 2022.06.03.0 XMR 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, High Channel 7/11, 2452 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2454.82	N/A	N/A	N/A		



2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, High Channel 7/11, 2452 MHz						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	2516.1	-52.78	-30	Pass		

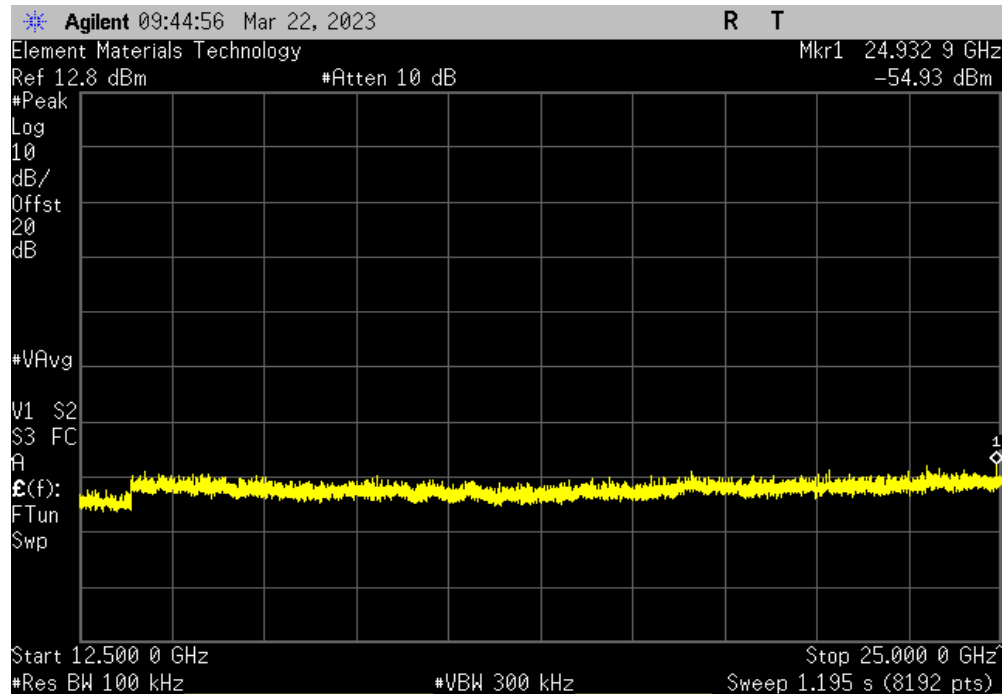


SPURIOUS CONDUCTED EMISSIONS



TUTx 2022.06.03.0 XMt 2023.02.14.0

2400 MHz - 2483.5 MHz Band, 802.11(n40) MCS7, High Channel 7/11, 2452 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24932.9	-52.53	-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
Antenna - Double Ridge	ETS Lindgren	3115	AIP	2022-07-20	2024-07-20
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVT	2023-01-14	2024-01-14
Attenuator	Fairview Microwave	SA18E-20	TWZ	2022-08-27	2023-08-27
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	2023-02-06	2024-02-06
Filter - High Pass	Micro-Tronics	HPM50111	LFN	2022-08-27	2023-08-27
Antenna - Standard Gain	ETS Lindgren	3160-07	AXP	NCR	NCR
Cable	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	2023-01-14	2024-01-14
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	2023-01-14	2024-01-14
Antenna - Standard Gain	ETS Lindgren	3160-08	AIQ	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVW	2023-01-14	2024-01-14
Antenna - Biconilog	ETS Lindgren	3142D	AXO	2021-09-14	2023-09-14
Cable	ESM Cable Corp.	Bilog Cables	MNH	2022-10-08	2023-10-08
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AVO	2022-10-08	2023-10-08
Filter - Low Pass	Micro-Tronics	LPM50004	LFK	2022-08-27	2023-08-27
Antenna - Standard Gain	ETS Lindgren	3160-09	AHG	NCR	NCR
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNP	2022-09-10	2023-09-10
Amplifier - Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	2022-09-10	2023-09-10
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFG	2022-05-18	2023-05-18

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	5.2 dB	-5.2 dB

SPURIOUS RADIATED EMISSIONS

FREQUENCY RANGE INVESTIGATED

30 MHz TO 26500 MHz

POWER INVESTIGATED

5VDC via Battery

CONFIGURATIONS INVESTIGATED

TSIN0196-7

MODES INVESTIGATED

Transmitting 802.11(b) Low, Mid and High Channel (2412, 2437, 2462 MHz) 1 Mbps, 6 Mbps, 11 Mbps, 36 Mbps, 54 Mbps, MCS0 and MCS7, 20 MHz bw. MCS0 and MCS7, 40 MHz bw. Modulated. Power 15
Transmitting 802.11(b) Low and High Channel (2412, 2462 MHz) 1 Mbps, 6 Mbps, 11 Mbps, 36 Mbps, 54 Mbps, MCS0 and MCS7, 20 MHz bw. MCS0 and MCS7, 40 MHz bw. Modulated. Power 15

SPURIOUS RADIATED EMISSIONS

EUT:	TSI Inc. OmniTrak	Work Order:	TSIN0196
Serial Number:	TSI55221200061	Date:	2023-03-14
Customer:	TSI, Incorporated	Temperature:	22.8°C
Attendees:	Andrew Bentley	Relative Humidity:	22.3%
Customer Project:	None	Bar. Pressure (PMSL):	1025 mb
Tested By:	Marcelo Aguayo	Job Site:	MN05
Power:	5VDC via Battery	Configuration:	TSIN0196-7

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2023	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	

TEST PARAMETERS

Run #:	52	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

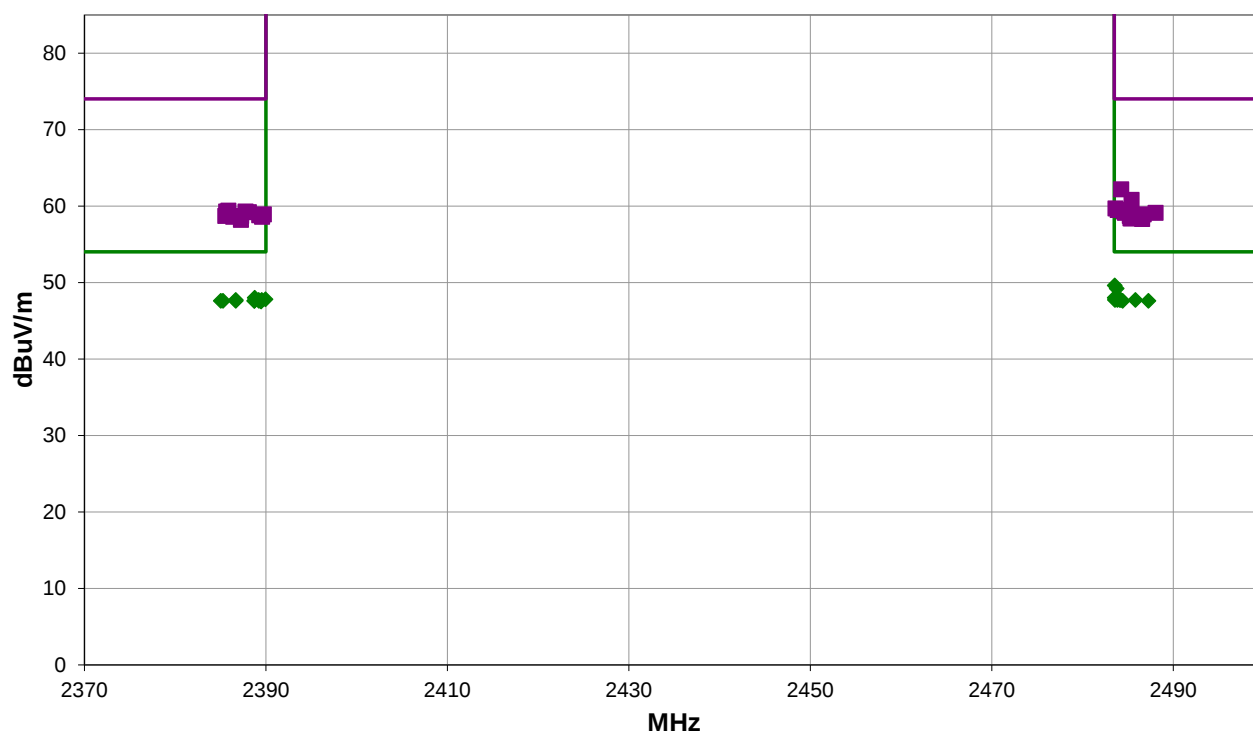
100 % DC, hence no DCCF needed

EUT OPERATING MODES

Transmitting 802.11(b) Low and High Channel (2412, 2462 MHz) 1 Mbps, 6 Mbps, 11 Mbps, 36 Mbps, 54 Mbps, MCS0 and MCS7, 20 MHz bw. MCS0 and MCS7, 40 MHz bw. Modulated. Power 15

DEVIATIONS FROM TEST STANDARD

None



Run #: 52

PK AV QP

SPURIOUS RADIATED EMISSIONS

RESULTS - Run #52

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.575	33.8	-4.2	1.0	81.9	3.0	20.0	Vert	AV	0.0	49.6	54.0	-4.4	EUT Vert, High Ch MCS7
2483.783	33.4	-4.2	1.1	87.0	3.0	20.0	Vert	AV	0.0	49.2	54.0	-4.8	EUT Vert, High Ch 54 Mbps
2483.558	32.2	-4.2	2.6	66.0	3.0	20.0	Vert	AV	0.0	48.0	54.0	-6.0	EUT Vert, High Ch 6 Mbps
2388.775	32.3	-4.3	1.5	281.0	3.0	20.0	Horz	AV	0.0	48.0	54.0	-6.0	EUT Vert, Low Ch MCS7
2484.108	32.0	-4.2	1.5	45.9	3.0	20.0	Horz	AV	0.0	47.8	54.0	-6.2	EUT Horz, High Ch 6 Mbps
2483.933	32.0	-4.2	1.5	346.0	3.0	20.0	Horz	AV	0.0	47.8	54.0	-6.2	EUT On Side, High Ch 6 Mbps
2483.633	32.0	-4.2	1.3	178.9	3.0	20.0	Vert	AV	0.0	47.8	54.0	-6.2	EUT Vert, High Ch MCS0
2389.975	32.1	-4.3	1.5	66.0	3.0	20.0	Horz	AV	0.0	47.8	54.0	-6.2	EUT Vert, Low Ch 6 Mbps
2484.258	31.9	-4.2	1.5	247.9	3.0	20.0	Vert	AV	0.0	47.7	54.0	-6.3	EUT Horz, High Ch 6 Mbps
2483.850	31.9	-4.2	1.5	342.0	3.0	20.0	Horz	AV	0.0	47.7	54.0	-6.3	EUT Vert, High Ch 6 Mbps
2485.858	31.9	-4.2	1.5	70.0	3.0	20.0	Vert	AV	0.0	47.7	54.0	-6.3	EUT Vert, High Ch 1 Mbps
2484.117	31.9	-4.2	1.5	81.0	3.0	20.0	Vert	AV	0.0	47.7	54.0	-6.3	EUT Vert, High Ch 11 Mbps
2483.600	31.9	-4.2	1.5	121.9	3.0	20.0	Vert	AV	0.0	47.7	54.0	-6.3	EUT Vert, High Ch 36 Mbps
2389.558	32.0	-4.3	1.3	23.9	3.0	20.0	Horz	AV	0.0	47.7	54.0	-6.3	EUT Vert, Low Ch 1 Mbps
2386.700	32.0	-4.3	1.5	221.9	3.0	20.0	Horz	AV	0.0	47.7	54.0	-6.3	EUT Horz, Low Ch 1 Mbps
2389.225	32.0	-4.3	3.1	216.0	3.0	20.0	Horz	AV	0.0	47.7	54.0	-6.3	EUT Vert, Low Ch 54 Mbps
2484.450	31.8	-4.2	1.5	245.0	3.0	20.0	Vert	AV	0.0	47.6	54.0	-6.4	EUT On Side, High Ch 6 Mbps
2385.292	31.9	-4.3	1.5	167.9	3.0	20.0	Vert	AV	0.0	47.6	54.0	-6.4	EUT Vert, Low Ch 1 Mbps
2386.683	31.9	-4.3	1.5	84.9	3.0	20.0	Horz	AV	0.0	47.6	54.0	-6.4	EUT On Side, Low Ch 1 Mbps
2385.050	31.9	-4.3	1.5	178.0	3.0	20.0	Vert	AV	0.0	47.6	54.0	-6.4	EUT On Side, Low Ch 1 Mbps
2389.250	31.9	-4.3	1.5	329.0	3.0	20.0	Vert	AV	0.0	47.6	54.0	-6.4	EUT Horz, Low Ch 1 Mbps
2388.758	31.9	-4.3	1.2	243.9	3.0	20.0	Horz	AV	0.0	47.6	54.0	-6.4	EUT Vert, Low Ch 11 Mbps
2388.725	31.9	-4.3	1.5	0.0	3.0	20.0	Horz	AV	0.0	47.6	54.0	-6.4	EUT Vert, Low Ch 36 Mbps
2487.292	31.8	-4.2	1.5	192.0	3.0	20.0	Vert	AV	0.0	47.6	54.0	-6.4	EUT Vert, High Ch MCS7 40 MHz bw
2389.492	31.8	-4.3	1.5	257.0	3.0	20.0	Horz	AV	0.0	47.5	54.0	-6.5	EUT Vert, Low Ch MCS0
2484.275	46.4	-4.2	1.0	81.9	3.0	20.0	Vert	PK	0.0	62.2	74.0	-11.8	EUT Vert, High Ch MCS7
2485.400	45.0	-4.2	1.1	87.0	3.0	20.0	Vert	PK	0.0	60.8	74.0	-13.2	EUT Vert, High Ch 54 Mbps
2483.642	43.9	-4.2	1.5	346.0	3.0	20.0	Horz	PK	0.0	59.7	74.0	-14.3	EUT On Side, High Ch 6 Mbps
2483.875	43.7	-4.2	1.5	245.0	3.0	20.0	Vert	PK	0.0	59.5	74.0	-14.5	EUT On Side, High Ch 6 Mbps
2385.858	43.7	-4.3	1.5	329.0	3.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	EUT Horz, Low Ch 1 Mbps
2484.575	43.5	-4.2	1.3	178.9	3.0	20.0	Vert	PK	0.0	59.3	74.0	-14.7	EUT Vert, High Ch MCS0
2385.625	43.6	-4.3	3.1	216.0	3.0	20.0	Horz	PK	0.0	59.3	74.0	-14.7	EUT Vert, Low Ch 54 Mbps
2387.767	43.6	-4.3	1.5	281.0	3.0	20.0	Horz	PK	0.0	59.3	74.0	-14.7	EUT Vert, Low Ch MCS7
2388.133	43.5	-4.3	1.2	243.9	3.0	20.0	Horz	PK	0.0	59.2	74.0	-14.8	EUT Vert, Low Ch 11 Mbps
2488.067	43.2	-4.1	1.5	45.9	3.0	20.0	Horz	PK	0.0	59.1	74.0	-14.9	EUT Horz, High Ch 6 Mbps
2484.692	43.3	-4.2	1.5	247.9	3.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	EUT Horz, High Ch 6 Mbps
2485.367	43.2	-4.2	2.6	66.0	3.0	20.0	Vert	PK	0.0	59.0	74.0	-15.0	EUT Vert, High Ch 6 Mbps
2486.758	43.1	-4.2	1.5	81.0	3.0	20.0	Vert	PK	0.0	58.9	74.0	-15.1	EUT Vert, High Ch 11 Mbps
2389.775	43.2	-4.3	1.5	66.0	3.0	20.0	Horz	PK	0.0	58.9	74.0	-15.1	EUT Vert, Low Ch 6 Mbps
2389.275	43.1	-4.3	1.5	257.0	3.0	20.0	Horz	PK	0.0	58.8	74.0	-15.2	EUT Vert, Low Ch MCS0

SPURIOUS RADIATED EMISSIONS

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2485.225	42.9	-4.2	1.5	121.9	3.0	20.0	Vert	PK	0.0	58.7	74.0	-15.3	EUT Vert, High Ch 36 Mbps
2385.517	43.0	-4.3	1.5	178.0	3.0	20.0	Vert	PK	0.0	58.7	74.0	-15.3	EUT On Side, Low Ch 1 Mbps
2387.283	43.0	-4.3	1.5	221.9	3.0	20.0	Horz	PK	0.0	58.7	74.0	-15.3	EUT Horz, Low Ch 1 Mbps
2386.850	43.0	-4.3	1.5	0.0	3.0	20.0	Horz	PK	0.0	58.7	74.0	-15.3	EUT Vert, Low Ch 36 Mbps
2389.592	42.9	-4.3	1.3	23.9	3.0	20.0	Horz	PK	0.0	58.6	74.0	-15.4	EUT Vert, Low Ch 1 Mbps
2386.392	42.9	-4.3	1.5	84.9	3.0	20.0	Horz	PK	0.0	58.6	74.0	-15.4	EUT On Side, Low Ch 1 Mbps
2485.300	42.6	-4.2	1.5	342.0	3.0	20.0	Horz	PK	0.0	58.4	74.0	-15.6	EUT Vert, High Ch 6 Mbps
2485.358	42.6	-4.2	1.5	192.0	3.0	20.0	Vert	PK	0.0	58.4	74.0	-15.6	EUT Vert, High Ch MCS7 40 MHz bw
2486.567	42.5	-4.2	1.5	70.0	3.0	20.0	Vert	PK	0.0	58.3	74.0	-15.7	EUT Vert, High Ch 1 Mbps
2387.242	42.5	-4.3	1.5	167.9	3.0	20.0	Vert	PK	0.0	58.2	74.0	-15.8	EUT Vert, Low Ch 1 Mbps

CONCLUSION

Pass



Tested By

SPURIOUS RADIATED EMISSIONS

EUT:	TSI Inc. OmniTrak	Work Order:	TSIN0196
Serial Number:	TSI55221200061	Date:	2023-03-13
Customer:	TSI, Incorporated	Temperature:	22.8°C
Attendees:	Andrew Bentley	Relative Humidity:	22.3%
Customer Project:	None	Bar. Pressure (PMSL):	1025 mb
Tested By:	Marcelo Aguayo	Job Site:	MN05
Power:	5VDC via Battery	Configuration:	TSIN0196-7

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2023	ANSI C63.10:2013
RSS-247 Issue 2:2017	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	

TEST PARAMETERS

Run #:	40	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

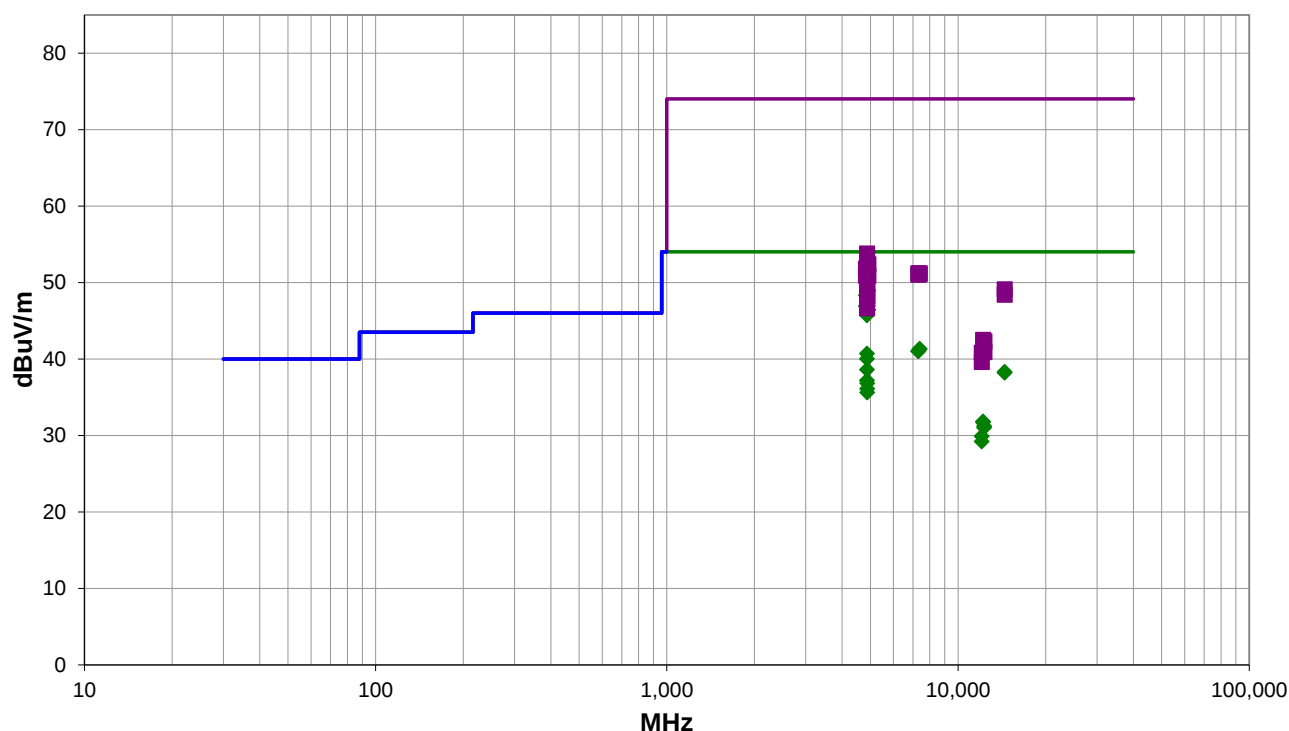
100 % DC, hence no DCCF needed

EUT OPERATING MODES

Transmitting 802.11(b) Low, Mid and High Channel (2412, 2437, 2462 MHz) 1 Mbps, 6 Mbps, 11 Mbps, 36 Mbps, 54 Mbps, MCS0 and MCS7, 20 MHz bw. MCS0 and MCS7, 40 MHz bw. Modulated. Power 15

DEVIATIONS FROM TEST STANDARD

None



Run #: 40

PK AV QP

SPURIOUS RADIATED EMISSIONS

RESULTS - Run #40

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4874.008	47.2	3.4	2.2	73.9	3.0	0.0	Horz	AV	0.0	50.6	54.0	-3.4	EUT Vert, Mid Ch 1 Mbps
4874.025	47.1	3.4	3.6	16.0	3.0	0.0	Horz	AV	0.0	50.5	54.0	-3.5	EUT On Side, Mid Ch 1 Mbps
4874.025	46.5	3.4	3.3	336.9	3.0	0.0	Horz	AV	0.0	49.9	54.0	-4.1	EUT Horz, Mid Ch, 1 Mbps
4924.033	45.5	3.4	2.3	88.9	3.0	0.0	Horz	AV	0.0	48.9	54.0	-5.1	EUT Vert, High Ch 1 Mbps
4874.017	45.1	3.4	2.3	14.0	3.0	0.0	Vert	AV	0.0	48.5	54.0	-5.5	EUT Vert, Mid Ch 1 Mbps
4823.992	45.0	3.3	3.5	81.0	3.0	0.0	Horz	AV	0.0	48.3	54.0	-5.7	EUT Vert, Low Ch 1 Mbps
4824.000	43.6	3.3	2.9	108.0	3.0	0.0	Vert	AV	0.0	46.9	54.0	-7.1	EUT Vert, Low Ch 1 Mbps
4874.033	43.0	3.4	1.5	42.9	3.0	0.0	Vert	AV	0.0	46.4	54.0	-7.6	EUT Horz, Mid Ch, 1 Mbps
4924.000	43.0	3.4	1.5	51.0	3.0	0.0	Vert	AV	0.0	46.4	54.0	-7.6	EUT Vert, High Ch 1 Mbps
4871.500	43.0	3.4	1.5	84.0	3.0	0.0	Horz	AV	0.0	46.4	54.0	-7.6	EUT Vert, Mid Ch 54 Mbps
4873.958	42.3	3.4	1.5	52.0	3.0	0.0	Vert	AV	0.0	45.7	54.0	-8.3	EUT On Side, Mid Ch 1 Mbps
7388.408	29.4	11.9	2.6	69.0	3.0	0.0	Horz	AV	0.0	41.3	54.0	-12.7	EUT Vert, High Ch 1 Mbps
7388.333	29.4	11.9	1.5	113.0	3.0	0.0	Vert	AV	0.0	41.3	54.0	-12.7	EUT Vert, High Ch 1 Mbps
7311.650	29.3	11.7	3.6	66.0	3.0	0.0	Horz	AV	0.0	41.0	54.0	-13.0	EUT Vert, Mid Ch 1 Mbps
7309.425	29.3	11.7	1.5	350.0	3.0	0.0	Vert	AV	0.0	41.0	54.0	-13.0	EUT Vert, Mid Ch 1 Mbps
4874.083	37.3	3.4	1.5	84.0	3.0	0.0	Horz	AV	0.0	40.7	54.0	-13.3	EUT Vert, Mid Ch 11 Mbps
4873.767	36.6	3.4	1.5	83.0	3.0	0.0	Horz	AV	0.0	40.0	54.0	-14.0	EUT Vert, Mid Ch MCS7
4873.433	35.2	3.4	2.6	174.9	3.0	0.0	Horz	AV	0.0	38.6	54.0	-15.4	EUT Vert, Mid Ch MCS7 40 MHz bw
14474.090	28.0	10.3	1.5	142.0	3.0	0.0	Horz	AV	0.0	38.3	54.0	-15.7	EUT Vert, Low Ch 1 Mbps
14473.950	27.9	10.3	1.6	261.9	3.0	0.0	Vert	AV	0.0	38.2	54.0	-15.8	EUT Vert, Low Ch 1 Mbps
4872.517	33.8	3.4	3.4	81.9	3.0	0.0	Horz	AV	0.0	37.2	54.0	-16.8	EUT Vert, Mid Ch 6 Mbps
4875.050	33.4	3.4	1.5	84.0	3.0	0.0	Horz	AV	0.0	36.8	54.0	-17.2	EUT Vert, Mid Ch MCS0
4875.192	32.7	3.4	1.2	85.9	3.0	0.0	Horz	AV	0.0	36.1	54.0	-17.9	EUT Vert, Mid Ch 36 Mbps
4874.533	32.2	3.4	3.3	351.0	3.0	0.0	Horz	AV	0.0	35.6	54.0	-18.4	EUT Vert, Mid Ch MCS0 40 MHz bw
4874.050	50.4	3.4	2.2	73.9	3.0	0.0	Horz	PK	0.0	53.8	74.0	-20.2	EUT Vert, Mid Ch 1 Mbps
4874.008	50.0	3.4	3.6	16.0	3.0	0.0	Horz	PK	0.0	53.4	74.0	-20.6	EUT On Side, Mid Ch 1 Mbps
4873.975	49.8	3.4	3.3	336.9	3.0	0.0	Horz	PK	0.0	53.2	74.0	-20.8	EUT Horz, Mid Ch, 1 Mbps
4924.008	49.0	3.4	2.3	88.9	3.0	0.0	Horz	PK	0.0	52.4	74.0	-21.6	EUT Vert, High Ch 1 Mbps
4873.917	48.6	3.4	2.3	14.0	3.0	0.0	Vert	PK	0.0	52.0	74.0	-22.0	EUT On Side, Mid Ch 1 Mbps
12183.960	30.2	1.6	1.5	49.9	3.0	0.0	Vert	AV	0.0	31.8	54.0	-22.2	EUT Vert, Mid Ch 1 Mbps
4823.917	48.5	3.3	3.5	81.0	3.0	0.0	Horz	PK	0.0	51.8	74.0	-22.2	EUT Vert, Low Ch 1 Mbps
12183.170	30.1	1.6	3.0	70.0	3.0	0.0	Horz	AV	0.0	31.7	54.0	-22.3	EUT Vert, Mid Ch 1 Mbps
4873.192	47.9	3.4	1.5	83.0	3.0	0.0	Horz	PK	0.0	51.3	74.0	-22.7	EUT Vert, Mid Ch MCS7
7309.142	39.5	11.7	1.5	350.0	3.0	0.0	Vert	PK	0.0	51.2	74.0	-22.8	EUT Vert, Mid Ch 1 Mbps
7384.233	39.4	11.8	2.6	69.0	3.0	0.0	Horz	PK	0.0	51.2	74.0	-22.8	EUT Vert, High Ch 1 Mbps
12308.020	29.7	1.5	1.5	142.0	3.0	0.0	Vert	AV	0.0	31.2	54.0	-22.8	EUT Vert, High Ch 1 Mbps
7386.033	39.3	11.8	1.5	113.0	3.0	0.0	Vert	PK	0.0	51.1	74.0	-22.9	EUT Vert, High Ch 1 Mbps
7308.825	39.3	11.7	3.6	66.0	3.0	0.0	Horz	PK	0.0	51.0	74.0	-23.0	EUT Vert, Mid Ch 1 Mbps
12308.880	29.5	1.5	3.1	11.0	3.0	0.0	Horz	AV	0.0	31.0	54.0	-23.0	EUT Vert, High Ch 1 Mbps
4824.017	47.6	3.3	2.9	108.0	3.0	0.0	Vert	PK	0.0	50.9	74.0	-23.1	EUT Vert, Low Ch 1 Mbps

SPURIOUS RADIATED EMISSIONS

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4924.108	47.5	3.4	1.5	51.0	3.0	0.0	Vert	PK	0.0	50.9	74.0	-23.1	EUT Vert, High Ch 1 Mbps
4873.983	47.3	3.4	1.5	84.0	3.0	0.0	Horz	PK	0.0	50.7	74.0	-23.3	EUT Vert, Mid Ch 11 Mbps
4874.192	46.8	3.4	1.5	42.9	3.0	0.0	Vert	PK	0.0	50.2	74.0	-23.8	EUT Horz, Mid Ch, 1 Mbps
4875.442	46.6	3.4	1.5	84.0	3.0	0.0	Horz	PK	0.0	50.0	74.0	-24.0	EUT Vert, Mid Ch 54 Mbps
4874.192	46.5	3.4	1.5	52.0	3.0	0.0	Vert	PK	0.0	49.9	74.0	-24.1	EUT Vert, Mid Ch 1 Mbps
12062.500	29.4	0.5	1.5	271.9	3.0	0.0	Vert	AV	0.0	29.9	54.0	-24.1	EUT Vert, Low Ch 1 Mbps
12062.250	28.7	0.5	2.7	290.9	3.0	0.0	Horz	AV	0.0	29.2	54.0	-24.8	EUT Vert, Low Ch 1 Mbps
14472.320	38.8	10.3	1.6	261.9	3.0	0.0	Vert	PK	0.0	49.1	74.0	-24.9	EUT Vert, Low Ch 1 Mbps
4872.408	45.7	3.4	2.6	174.9	3.0	0.0	Horz	PK	0.0	49.1	74.0	-24.9	EUT Vert, Mid Ch MCS7 40 MHz bw
14472.170	38.1	10.3	1.5	142.0	3.0	0.0	Horz	PK	0.0	48.4	74.0	-25.6	EUT Vert, Low Ch 1 Mbps
4874.550	44.8	3.4	3.4	81.9	3.0	0.0	Horz	PK	0.0	48.2	74.0	-25.8	EUT Vert, Mid Ch 6 Mbps
4874.683	44.4	3.4	1.2	85.9	3.0	0.0	Horz	PK	0.0	47.8	74.0	-26.2	EUT Vert, Mid Ch 36 Mbps
4873.275	44.4	3.4	1.5	84.0	3.0	0.0	Horz	PK	0.0	47.8	74.0	-26.2	EUT Vert, Mid Ch MCS0
4872.517	43.2	3.4	3.3	351.0	3.0	0.0	Horz	PK	0.0	46.6	74.0	-27.4	EUT Vert, Mid Ch MCS0 40 MHz bw
12184.310	40.9	1.6	3.0	70.0	3.0	0.0	Horz	PK	0.0	42.5	74.0	-31.5	EUT Vert, Mid Ch 1 Mbps
12310.620	40.8	1.5	1.5	142.0	3.0	0.0	Vert	PK	0.0	42.3	74.0	-31.7	EUT Vert, High Ch 1 Mbps
12184.410	40.1	1.6	1.5	49.9	3.0	0.0	Vert	PK	0.0	41.7	74.0	-32.3	EUT Vert, Mid Ch 1 Mbps
12311.430	39.4	1.5	3.1	11.0	3.0	0.0	Horz	PK	0.0	40.9	74.0	-33.1	EUT Vert, High Ch 1 Mbps
12060.490	40.3	0.5	1.5	271.9	3.0	0.0	Vert	PK	0.0	40.8	74.0	-33.2	EUT Vert, Low Ch 1 Mbps
12059.680	39.1	0.5	2.7	290.9	3.0	0.0	Horz	PK	0.0	39.6	74.0	-34.4	EUT Vert, Low Ch 1 Mbps

CONCLUSION

Pass



Tested By

End of Test Report