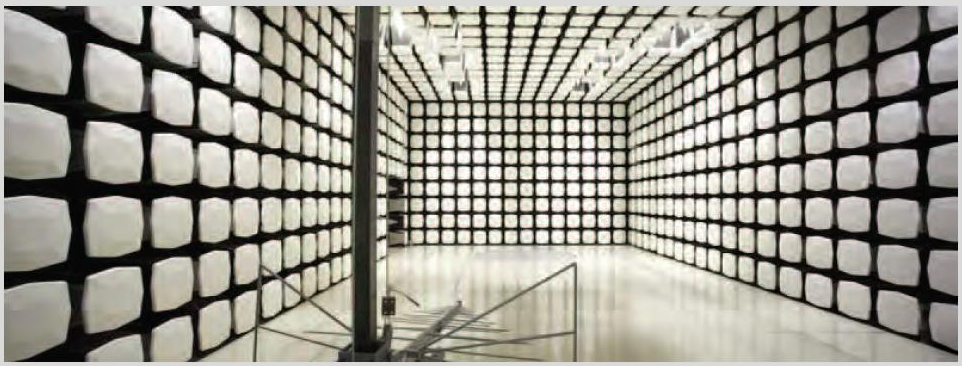
NAL Research Corporation

SHOUT sp Handheld Iridium Smartphone

FCC 15.247:2022

802.11bgn SISO Radio

Report: PCTE0003.2 Rev. 1, Issue Date: May 28, 2022



NVLAP LAB CODE: 200630-0

CERT #3310.02

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CERTIFICATE OF TEST

Last Date of Test: May 18, 2022
NAL Research Corporation
EUT: SHOUT sp Handheld Iridium Smartphone

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2022	ANSI C63.10:2013, KDB 558074
FCC 15.247:2022	

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	Yes	Pass	
11.6	Duty Cycle	Yes	Pass	
11.8.2	DTS Bandwidth	Yes	Pass	
6.9.3	99% Occupied Bandwidth	Yes	Pass	
11.9.2.2.4	Output Power	Yes	Pass	
11.9.2.2.4	Equivalent Isotropic Radiated Power (EIRP)	Yes	Pass	
11.10.2	Power Spectral Density	Yes	Pass	
11.11	Band Edge Compliance	Yes	Pass	
11.11	Spurious Conducted Emissions	Yes	Pass	
11.12.1, 11.13.2, 6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	

Deviations From Test Standards

None

Approved By:

Kyle Holgate, Operations Manager

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

REVISION HISTORY

Revision Number	Description	Date (yyyy-mm-dd)	Page Number
01	Added both accreditations bodies to the report to reflect Elements transitions to A2LA	2022-03-04	1, 4, 5
	Updated Powerline Conducted emissions Data	2022-03-04	17-21
	Added radio control software to test configurations	2022-05-18	11-14
	Added new configuration for PCTE0003-12	2022-05-18	14
	Added external antenna to configuration PCTE0003-5	2022-05-18	12
	Reduced power settings for low and high channels for the following data rates: 20 MHz Bandwidth - 6 Mbps, 36 Mbps, 54 Mbps, MCS0, MCS7.	2022-05-18	16
	Updated antenna gain value	2022-05-18	16
	Updated data for DTS Bandwidth	2022-05-18	51-66
	Added Occupied Bandwidth measurements	2022-05-18	67-82
	Band Edge Compliance data updated with PK detector settings on spectrum analyzer	2022-05-18	174-184
	Updated Output Power measurements	2022-05-18	83-98
	Updated EIRP measurements	2022-05-18	99-114
	Updated PSD measurements	2022-05-18	115-130
	Updated last date of test	2022-05-18	2, 10, 15
	Updated Modifications page to reflect new testing	2022-05-18	15
	Added DTS Bandwidth and Occupied Bandwidth line items to the Certificate of Test	2022-05-18	2
	Updated cover page now shows FCC 15.247:2022.	2022-06-02	1
	Updated block diagram to latest version.	2022-06-02	7
	Updated spec to FCC 15.247:2021	2022-06-02	23, 132, 187

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.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) 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.

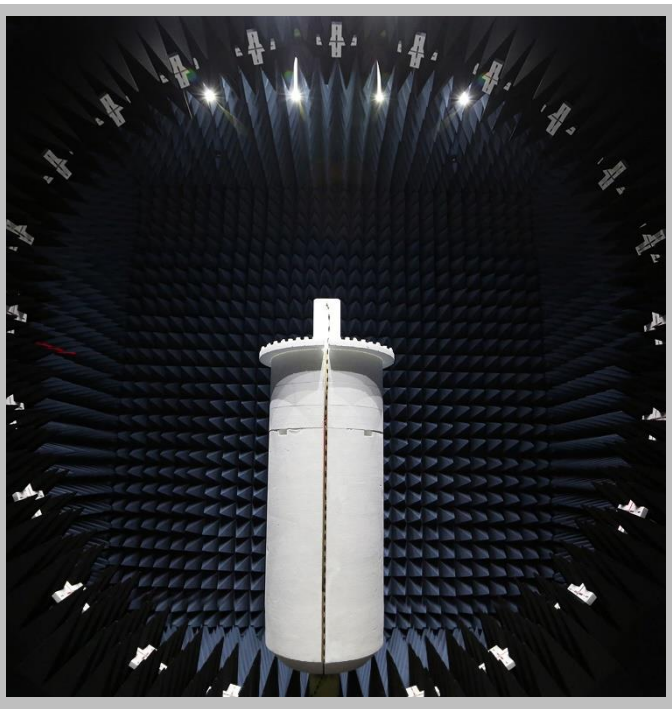
SCOPE

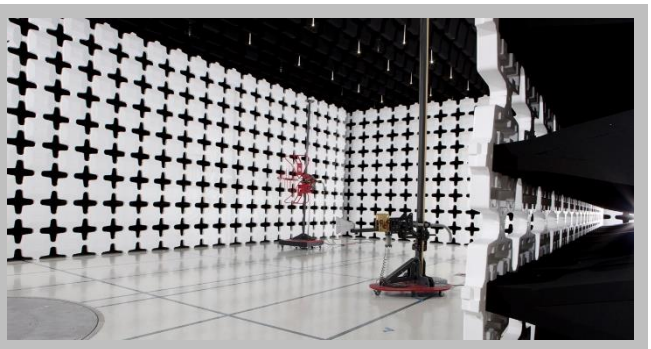
For details on the Scopes of our Accreditations, please visit:

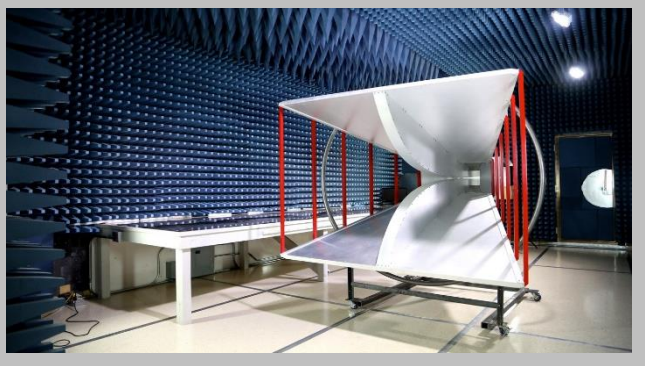
California Minnesota Oregon Texas Washington

FACILITIES

California	Minnesota	Oregon	Texas	Washington
Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-11 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th 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
NVLAP				
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
Innovation, Science and Economic Development Canada				
2834B-1, 2834B-3	2834E-1, 2834E-3	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

element
TMU.2015.07.10

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

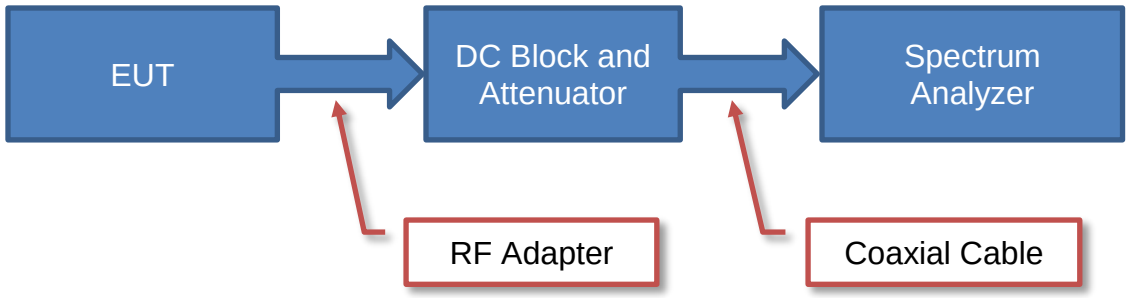
TEST SETUP BLOCK DIAGRAMS

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.

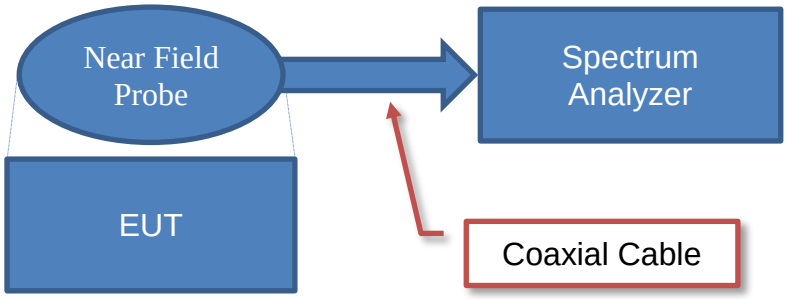
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

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

Near Field Test Fixture Measurements

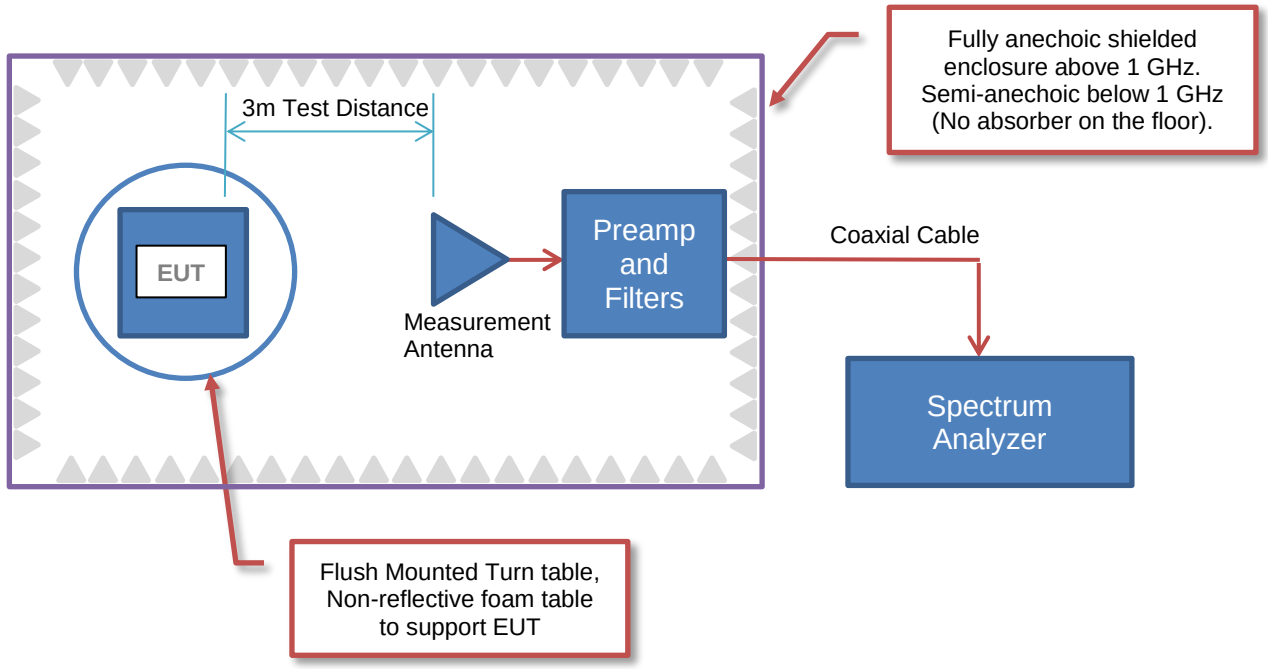


Sample Calculation (logarithmic units)

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: Antenna Factor		Factor: Cable Factor		Factor: Amplifier Gain		Distance Adjustment Factor		External Attenuation		Field Strength
42.6	+	28.6	+	3.1	-	40.8	+	0.0	+	0.0	=	**33.5**

Conducted Emissions:

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

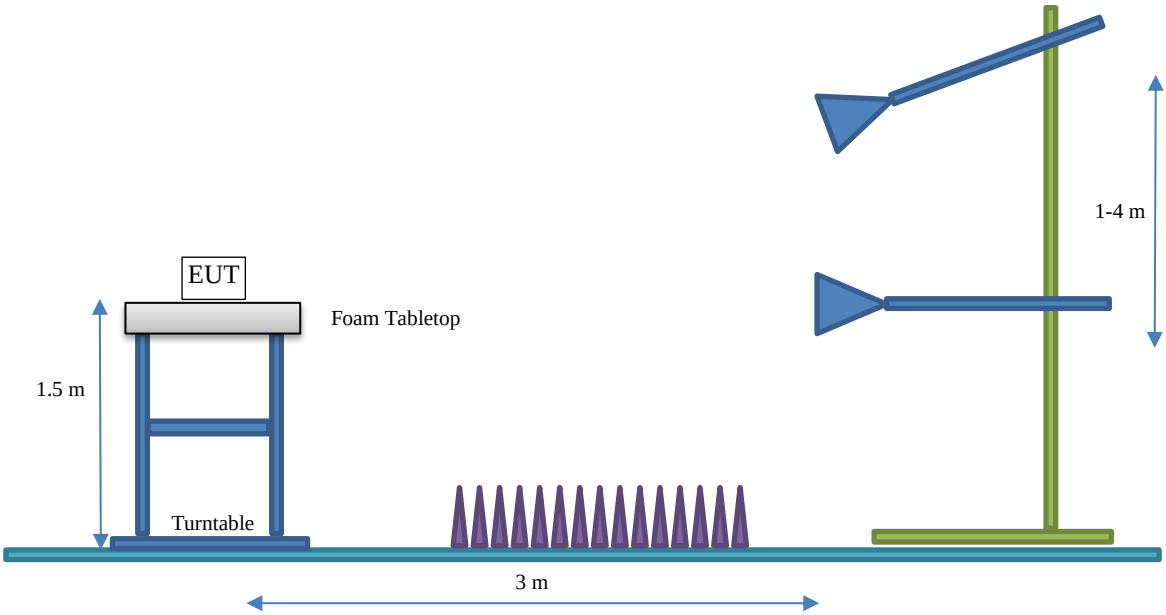
Radiated Power (ERP/EIRP):

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:	NAL Research Corporation
Address:	11100 Endeavor Ct. Suite 300 Manassas, VA 20109
City, State, Zip:	Manassas, VA 20109
Test Requested By:	Andy Shiltz
EUT:	SHOUT sp Handheld Iridium Smartphone
First Date of Test:	May 25, 2021
Last Date of Test:	May 18, 2022
Receipt Date of Samples:	May 25, 2021
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Handheld Iridium Smartphone with 1.6 GHz radio and 802.11/Bluetooth radio.

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

CONFIGURATIONS

Configuration PCTE0003- 3

Software/Firmware Running during test	
Description	**Version**
PHY Firmware	8.2.0.0.237
PLT Firmware	8.9.0.10.70

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SHOUT sp Handheld Iridium Smartphone	NAL Research Corporation	433-93281-001	FCC 1

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Inspiron	20976051206
AC/DC Adapter	Dell	LA45NM140	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable (Power)	Yes	1.0 m	No	SHOUT sp Handheld Iridium Smartphone	Laptop
AC Power	No	1.0 m	No	AC/DC Adapter	AC Power
DC Power	No	1.8 m	No	AC/DC Adapter	Laptop
USB Cable x2	Yes	1.1 m	No	SHOUT sp Handheld Iridium Smartphone	Laptop
USB Cable	Yes	1.1 m	No	SHOUT sp Handheld Iridium Smartphone	Unterminated

CONFIGURATIONS

Configuration PCTE0003- 5

Software/Firmware Running during test	
Description	**Version**
PHY Firmware	8.2.0.0.237
PLT Firmware	8.9.0.10.70

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SHOUT sp Handheld Iridium Smartphone	NAL Research Corporation	433-93281-001	FCC 2
Antenna	18942	HARRIS-NEXGEN	8960263-1

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Latitude E5450	5z9B063
Earbuds	Betron	MK23	None
AC Adapter	Dell	LA65NM130	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Extension Cable	Yes	1.1 m	No	USB Cable	Laptop
USB Cable x2	Yes	1.1 m	No	SHOUT sp Handheld Iridium Smartphone	Unterminated
USB Cable	Yes	1.1 m	No	SHOUT sp Handheld Iridium Smartphone	USB Extension Cable
Headphones	No	1.2 m	No	Earbuds	SHOUT sp Handheld Iridium Smartphone
USB Cable (Power)	Yes	1.8 m	No	SHOUT sp Handheld Iridium Smartphone	Laptop
DC Power	No	2.0 m	No	Laptop	AC Adapter
AC Power	No	1.0 m	No	AC Adapter	AC Power

CONFIGURATIONS

Configuration PCTE0003- 9

Software/Firmware Running during test	
Description	**Version**
PHY Firmware	8.2.0.0.237
PLT Firmware	8.9.0.10.70

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SHOUT sp Handheld Iridium Smartphone	NAL Research Corporation	433-93281-001	FCC 2
Antenna	18942	HARRIS-NEXGEN	8960263-1

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Latitude E5450	5z9B063
Earbuds	Betron	MK23	None
AC Adaptor	Sony	AC-UUD12	1901AQ2032484

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable x3	Yes	1.1 m	No	SHOUT sp Handheld Iridium Smartphone	Laptop
Headphones	No	1.2 m	No	Earbuds	SHOUT sp Handheld Iridium Smartphone
USB Cable (Power)	Yes	0.8m	No	AC Adaptor	SHOUT sp Handheld Iridium Smartphone

CONFIGURATIONS

Configuration PCTE0003- 12

Software/Firmware Running during test	
Description	**Version**
PHY Firmware	8.2.0.0.237
PLT Firmware	8.9.0.10.70

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SHOUT sp Handheld Iridium Smartphone	NAL Research Corporation	433-93281-001	FCC 3

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Latitude E5450	5z9B063
AC Adaptor	Sony	AC-UUD12	1901AQ2032484

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable x3	Yes	1.1 m	No	SHOUT sp Handheld Iridium Smartphone	Laptop
USB Cable (Power)	Yes	0.8m	No	AC Adaptor	SHOUT sp Handheld Iridium Smartphone

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2021-05-25	Duty Cycle	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2021-08-24	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.
3	2021-08-30	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.
4	2022-03-04	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	2022-05-18	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	2022-05-18	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.
7	2022-05-18	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.
8	2022-05-18	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.
9	2022-05-18	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.
10	2022-05-18	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWER SETTINGS AND ANTENNAS

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

ANTENNA GAIN (dBi)

Type	Provided by:	Frequency Range (MHz)	Gain (dBi)
On-ground MID Chip	Manufacturer	2400 – 2485	3.0

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

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Types	Channel Bandwidths	Channel	Position	Frequency (MHz)	Power Setting (dBm)
1 Mbps	20	1	Low Channel	2412	17.3
		6	Mid Channel	2437	17.3
		11	High Channel	2462	17.3
11 Mbps	20	1	Low Channel	2412	17.3
		6	Mid Channel	2437	17.3
		11	High Channel	2462	17.3
6 Mbps	20	1	Low Channel	2412	12.0
		6	Mid Channel	2437	17.1
		11	High Channel	2462	12.0
36 Mbps	20	1	Low Channel	2412	12.0
		6	Mid Channel	2437	15.3
		11	High Channel	2462	12.0
54 Mbps	20	1	Low Channel	2412	12.0
		6	Mid Channel	2437	13.8
		11	High Channel	2462	12.0
MCS0	20	1	Low Channel	2412	12.0
		6	Mid Channel	2437	16.1
		11	High Channel	2462	12.0
MCS7	20	1	Low Channel	2412	12.0
		6	Mid Channel	2437	12.6
		11	High Channel	2462	12.0
MCS0	40	1/5	Low Channel	2422	14.8
		4/8	Mid Channel	2437	14.8
		7/11	High Channel	2452	14.8
MCS7	40	1/5	Low Channel	2422	11.3
		4/8	Mid Channel	2437	11.3
		7/11	High Channel	2452	11.3

POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2021.12.28.2
PSA-ESCI 2022.1.12.0

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
Cable - Conducted Cable Assembly	Northwest EMC	EVG, HHD, RKT	EVGA	2022-01-04	2023-01-04
LISN	Solar Electronics	9252-50-R-24-BNC	LIP	2021-09-10	2022-09-10
Receiver	Gauss Instruments	TDEMI 30M	ARN	2021-04-06	2022-04-06

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	3.2 dB	-3.2 dB

CONFIGURATIONS INVESTIGATED

PCTE0003-9

MODES INVESTIGATED

Continuous Tx, 802.11bgn, 1 Mbps

POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2021.12.28.2
PSA-ESCI 2022.1.12.0

EUT:	SHOUT sp Handheld Iridium Smartphone	Work Order:	PCTE0003
Serial Number:	FCC 2	Date:	2022-03-04
Customer:	NAL Research Corporation	Temperature:	20.4°C
Attendees:	None	Relative Humidity:	41.7%
Customer Project:	None	Bar. Pressure (PMSL):	1020 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	PCTE0003-9

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2022	ANSI C63.10:2013

TEST PARAMETERS

Run #:	19	Line:	Neutral	Add. Ext. Attenuation (dB):	0

COMMENTS

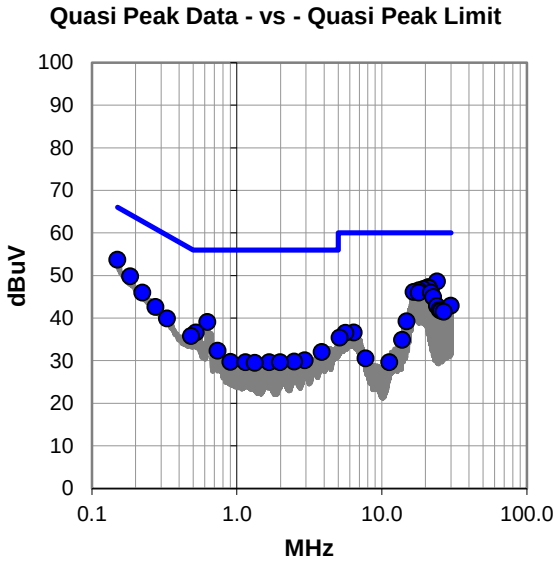
ARN, EVGA, LIP

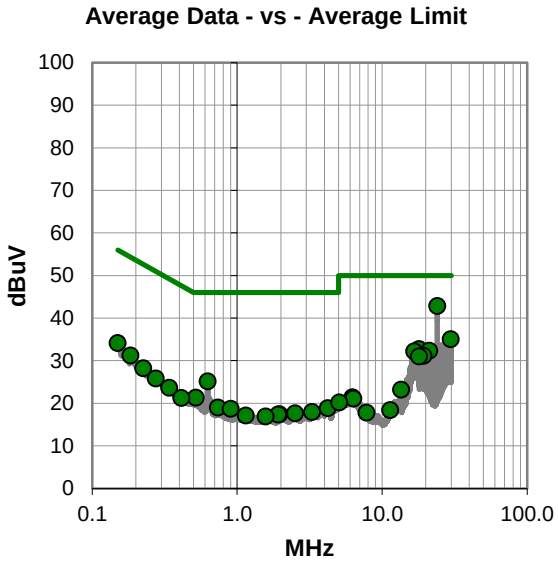
EUT OPERATING MODES

Continuous Tx, 802.11bgn, 1 Mbps

DEVIATIONS FROM TEST STANDARD

None





POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2021.12.28.2
PSA-ESCI 2022.1.12.0

RESULTS - Run #19

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
24.000	27.7	20.9	48.6	60.0	-11.4
0.150	33.6	20.1	53.7	66.0	-12.3
20.727	26.4	20.8	47.2	60.0	-12.8
20.956	26.4	20.8	47.2	60.0	-12.8
21.070	26.4	20.8	47.2	60.0	-12.8
21.185	26.2	20.8	47.0	60.0	-13.0
19.334	26.2	20.6	46.8	60.0	-13.2
17.970	25.9	20.6	46.5	60.0	-13.5
16.601	25.5	20.6	46.1	60.0	-13.9
18.002	25.4	20.6	46.0	60.0	-14.0
21.876	25.2	20.8	46.0	60.0	-14.0
0.184	29.8	20.0	49.8	64.3	-14.5
22.570	24.1	20.8	44.9	60.0	-15.1
0.223	26.0	20.0	46.0	62.7	-16.7
0.628	19.3	19.8	39.1	56.0	-16.9
29.955	21.8	21.1	42.9	60.0	-17.1
24.067	21.9	20.9	42.8	60.0	-17.2
24.989	21.0	20.9	41.9	60.0	-18.1
25.680	20.8	20.9	41.7	60.0	-18.3
0.275	22.7	19.9	42.6	61.0	-18.4
26.728	20.5	21.0	41.5	60.0	-18.5
0.521	16.8	19.8	36.6	56.0	-19.4
0.330	20.1	19.8	39.9	59.5	-19.6
0.484	16.0	19.8	35.8	56.3	-20.5
14.802	18.7	20.5	39.2	60.0	-20.8

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
24.000	21.9	20.9	42.8	50.0	-7.2
29.712	13.9	21.1	35.0	50.0	-15.0
18.002	12.1	20.6	32.7	50.0	-17.3
21.176	11.5	20.8	32.3	50.0	-17.7
16.679	11.6	20.6	32.2	50.0	-17.8
19.334	10.5	20.6	31.1	50.0	-18.9
18.035	10.4	20.6	31.0	50.0	-19.0
0.626	5.3	19.8	25.1	46.0	-20.9
0.150	14.0	20.1	34.1	56.0	-21.9
0.184	11.2	20.0	31.2	54.3	-23.1
0.225	8.2	20.0	28.2	52.6	-24.4
0.518	1.5	19.8	21.3	46.0	-24.7
0.275	5.9	19.9	25.8	51.0	-25.2
0.339	3.8	19.8	23.6	49.2	-25.6
0.412	1.4	19.8	21.2	47.6	-26.4
13.560	2.8	20.4	23.2	50.0	-26.8
0.736	-0.9	19.9	19.0	46.0	-27.0
4.219	-1.2	20.0	18.8	46.0	-27.2
0.902	-1.2	19.9	18.7	46.0	-27.3
3.281	-2.1	20.0	17.9	46.0	-28.1
2.512	-2.4	20.0	17.6	46.0	-28.4
1.954	-2.6	20.0	17.4	46.0	-28.6
6.247	1.2	20.2	21.4	50.0	-28.6
1.917	-2.7	20.0	17.3	46.0	-28.7
1.148	-2.8	19.9	17.1	46.0	-28.9

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2021.12.28.2
PSA-ESCI 2022.1.12.0

EUT:	SHOUT sp Handheld Iridium Smartphone	Work Order:	PCTE0003
Serial Number:	FCC 2	Date:	2022-03-04
Customer:	NAL Research Corporation	Temperature:	20.4°C
Attendees:	None	Relative Humidity:	41.7%
Customer Project:	None	Bar. Pressure (PMSL):	1020 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	PCTE0003-9

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2022	ANSI C63.10:2013

TEST PARAMETERS

Run #:	20	Line:	High Line	Add. Ext. Attenuation (dB):	0

COMMENTS

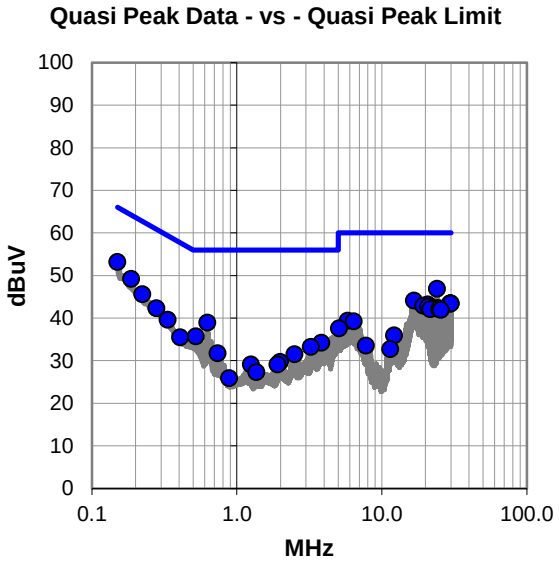
ARN, EVGA, LIP

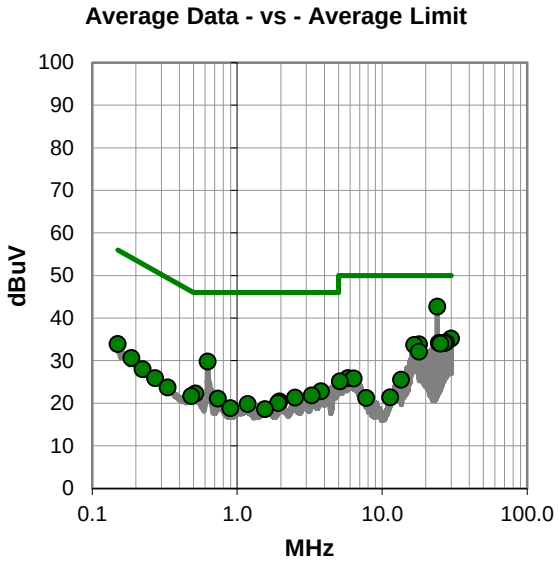
EUT OPERATING MODES

Continuous Tx, 802.11bgn, 1 Mbps

DEVIATIONS FROM TEST STANDARD

None





POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.09.21.0
EmiR5 2021.12.28.2
PSA-ESCI 2022.1.12.0

RESULTS - Run #20

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.150	33.1	20.1	53.2	66.0	-12.8
24.000	26.0	20.9	46.9	60.0	-13.1
0.187	29.2	20.0	49.2	64.2	-15.0
16.679	23.5	20.6	44.1	60.0	-15.9
29.609	22.3	21.1	43.4	60.0	-16.6
29.723	22.3	21.1	43.4	60.0	-16.6
29.839	22.3	21.1	43.4	60.0	-16.6
29.954	22.3	21.1	43.4	60.0	-16.6
20.725	22.4	20.8	43.2	60.0	-16.8
0.626	19.1	19.8	38.9	56.0	-17.1
19.334	22.3	20.6	42.9	60.0	-17.1
0.223	25.6	20.0	45.6	62.7	-17.1
20.840	21.9	20.8	42.7	60.0	-17.3
24.067	21.4	20.9	42.3	60.0	-17.7
24.758	21.4	20.9	42.3	60.0	-17.7
21.647	21.3	20.8	42.1	60.0	-17.9
24.873	21.2	20.9	42.1	60.0	-17.9
25.564	21.0	20.9	41.9	60.0	-18.1
0.278	22.4	19.9	42.3	60.9	-18.6
0.333	19.8	19.8	39.6	59.4	-19.8
0.521	15.9	19.8	35.7	56.0	-20.3
5.817	19.2	20.2	39.4	60.0	-20.6
6.407	19.0	20.2	39.2	60.0	-20.8
3.830	14.2	20.0	34.2	56.0	-21.8
0.406	15.7	19.8	35.5	57.7	-22.2

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
24.000	21.8	20.9	42.7	50.0	-7.3
29.966	14.1	21.1	35.2	50.0	-14.8
27.523	13.3	21.0	34.3	50.0	-15.7
24.632	13.2	20.9	34.1	50.0	-15.9
26.601	13.1	21.0	34.1	50.0	-15.9
26.832	13.1	21.0	34.1	50.0	-15.9
25.323	13.1	20.9	34.0	50.0	-16.0
0.626	10.0	19.8	29.8	46.0	-16.2
18.007	13.2	20.6	33.8	50.0	-16.2
16.642	13.1	20.6	33.7	50.0	-16.3
18.029	11.5	20.6	32.1	50.0	-17.9
0.150	13.8	20.1	33.9	56.0	-22.1
3.794	2.8	20.0	22.8	46.0	-23.2
0.187	10.6	20.0	30.6	54.2	-23.6
0.516	2.5	19.8	22.3	46.0	-23.7
5.817	5.7	20.2	25.9	50.0	-24.1
3.276	1.8	20.0	21.8	46.0	-24.2
6.371	5.6	20.2	25.8	50.0	-24.2
13.519	5.1	20.4	25.5	50.0	-24.5
0.484	1.9	19.8	21.7	46.3	-24.6
2.507	1.3	20.0	21.3	46.0	-24.7
0.223	8.0	20.0	28.0	52.7	-24.7
0.736	1.2	19.9	21.1	46.0	-24.9
5.116	4.9	20.2	25.1	50.0	-24.9
0.272	6.0	19.9	25.9	51.1	-25.2

CONCLUSION

Pass

Tested By

DUTY CYCLE

XMit 2020.12.30.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5181A	TIG	2020-04-16	2023-04-16
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2021-04-08	2022-04-08

TEST DESCRIPTION

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

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

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

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

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

DUTY CYCLE

element

TbtTx 2021.03.19.1 XMit 2020.12.30.0

EUT:	SHOUT sp Handheld Iridium Smartphone	Work Order:	PCTE0003
Serial Number:	FCC 1	Date:	25-May-21
Customer:	NAL Research Corporation	Temperature:	22.9 °C
Attendees:	None	Humidity:	45.8% RH
Project:	None	Barometric Pres.:	1024 mbar
Tested by:	Jeff Alcoke	Power: 5.0 VDC via USB	Job Site: EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

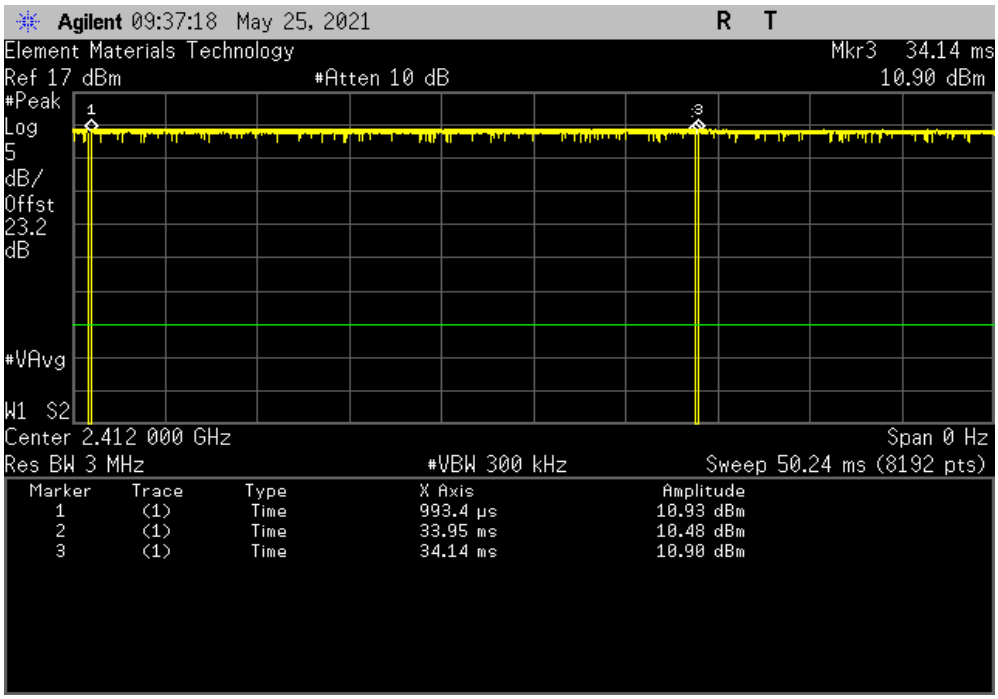
Configuration #	3	Signature

	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
2400 MHz - 2483.5 MHz Band						
20 MHz						
802.11(b) 1 Mbps						
Low Channel 1, 2412 MHz	32.953 ms	33.143 ms	1	99.4	N/A	N/A
Low Channel 1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
Mid Channel 6, 2437 MHz	32.953 ms	33.143 ms	1	99.4	N/A	N/A
Mid Channel 6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
High Channel 11, 2462 MHz	32.952 ms	33.142 ms	1	99.4	N/A	N/A
High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
802.11(b) 11 Mbps						
Low Channel 1, 2412 MHz	3.171 ms	3.39 ms	1	93.6	N/A	N/A
Low Channel 1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
Mid Channel 6, 2437 MHz	3.171 ms	3.39 ms	1	93.5	N/A	N/A
Mid Channel 6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
High Channel 11, 2462 MHz	3.171 ms	3.39 ms	1	93.6	N/A	N/A
High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
802.11(g) 6 Mbps						
Low Channel 1, 2412 MHz	5.485 ms	5.707 ms	1	96.1	N/A	N/A
Low Channel 1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
Mid Channel 6, 2437 MHz	5.484 ms	5.707 ms	1	96.1	N/A	N/A
Mid Channel 6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
High Channel 11, 2462 MHz	5.485 ms	5.707 ms	1	96.1	N/A	N/A
High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
802.11(g) 36 Mbps						
Low Channel 1, 2412 MHz	932.47 us	1.155 ms	1	80.7	N/A	N/A
Low Channel 1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
Mid Channel 6, 2437 MHz	931.701 us	1.155 ms	1	80.7	N/A	N/A
Mid Channel 6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
High Channel 11, 2462 MHz	932.117 us	1.155 ms	1	80.7	N/A	N/A
High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
802.11(g) 54 Mbps						
Low Channel 1, 2412 MHz	628.8 us	851 us	1	73.9	N/A	N/A
Low Channel 1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
Mid Channel 6, 2437 MHz	628.5 us	851 us	1	73.9	N/A	N/A
Mid Channel 6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
High Channel 11, 2462 MHz	628.8 us	851 us	1	73.9	N/A	N/A
High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
802.11(n) MCS0						
Low Channel 1, 2412 MHz	4.577 ms	4.799 ms	1	95.4	N/A	N/A
Low Channel 1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
Mid Channel 6, 2437 MHz	4.576 ms	4.799 ms	1	95.4	N/A	N/A
Mid Channel 6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
High Channel 11, 2462 MHz	4.577 ms	4.799 ms	1	95.4	N/A	N/A
High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
802.11(n) MCS7						
Low Channel 1, 2412 MHz	493.7 us	716.2 us	1	68.9	N/A	N/A
Low Channel 1, 2412 MHz	N/A	N/A	5	N/A	N/A	N/A
Mid Channel 6, 2437 MHz	493.8 us	716.2 us	1	68.9	N/A	N/A
Mid Channel 6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
High Channel 11, 2462 MHz	493.6 us	716.2 us	1	68.9	N/A	N/A
High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
40 MHz						
802.11(n) MCS0						
Low Channel 1/5, 2422 MHz	2.225 ms	2.448 ms	1	90.9	N/A	N/A
Low Channel 1/5, 2422 MHz	N/A	N/A	5	N/A	N/A	N/A
Mid Channel 4/8, 2437 MHz	2.225 ms	2.448 ms	1	90.9	N/A	N/A
Mid Channel 4/8, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
High Channel 7/11, 2452 MHz	2.225 ms	2.448 ms	1	90.9	N/A	N/A
High Channel 7/11, 2452 MHz	N/A	N/A	5	N/A	N/A	N/A
802.11(n) MCS7						
Low Channel 1/5, 2422 MHz	256 us	478.6 us	1	53.5	N/A	N/A
Low Channel 1/5, 2422 MHz	N/A	N/A	5	N/A	N/A	N/A
Mid Channel 4/8, 2437 MHz	256 us	478.6 us	1	53.5	N/A	N/A
Mid Channel 4/8, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
High Channel 7/11, 2452 MHz	256.2 us	478.6 us	1	53.5	N/A	N/A
High Channel 7/11, 2452 MHz	N/A	N/A	5	N/A	N/A	N/A

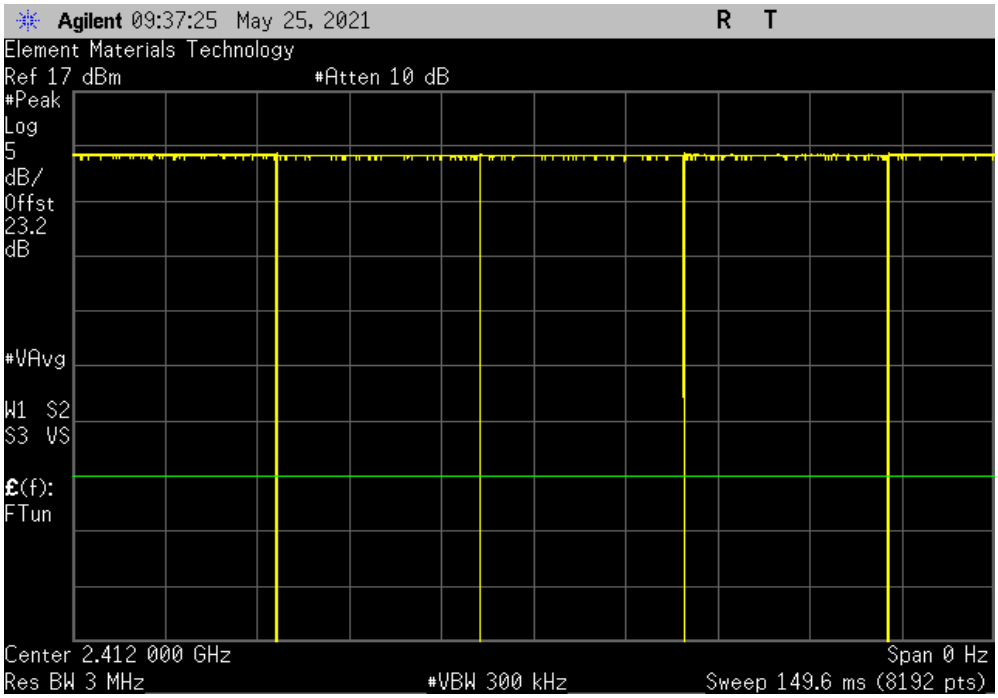
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	32.953 ms	33.143 ms	1	99.4	N/A	N/A



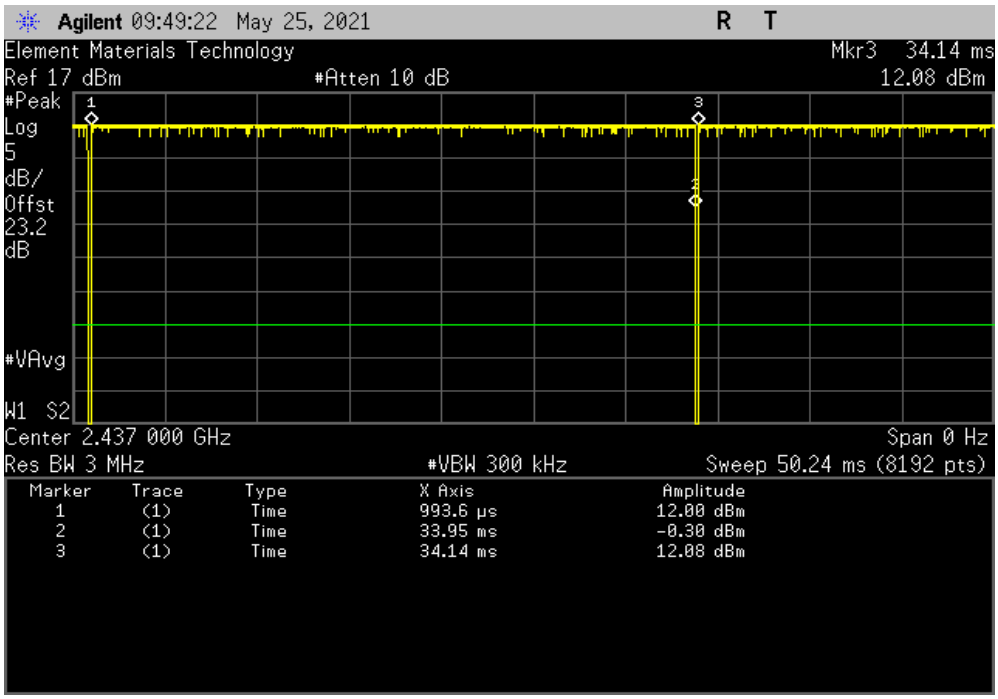
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



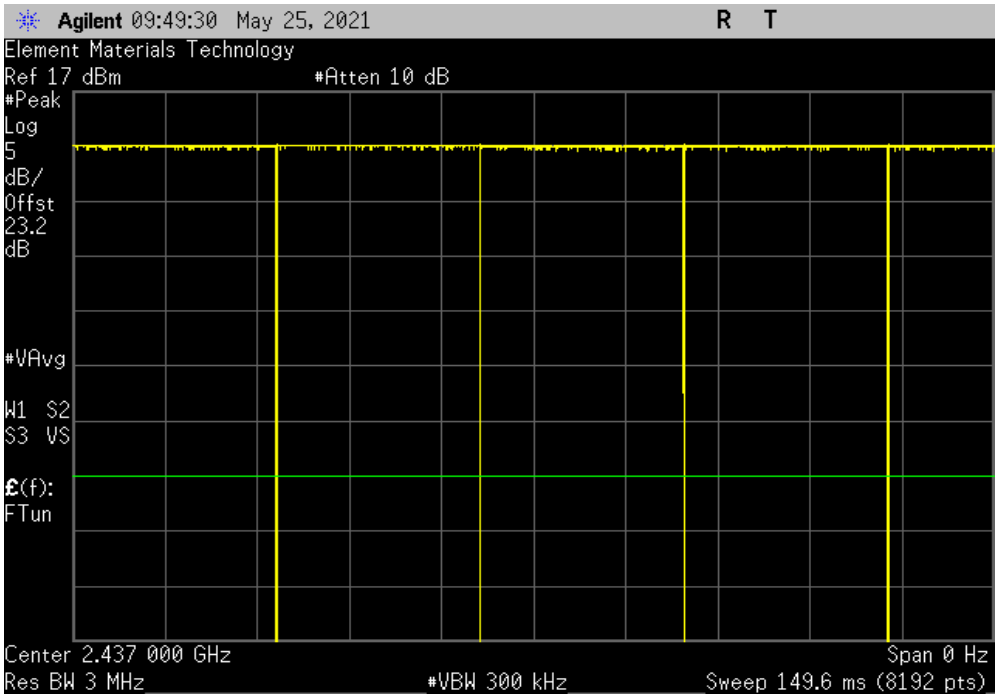
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	32.953 ms	33.143 ms	1	99.4	N/A	N/A



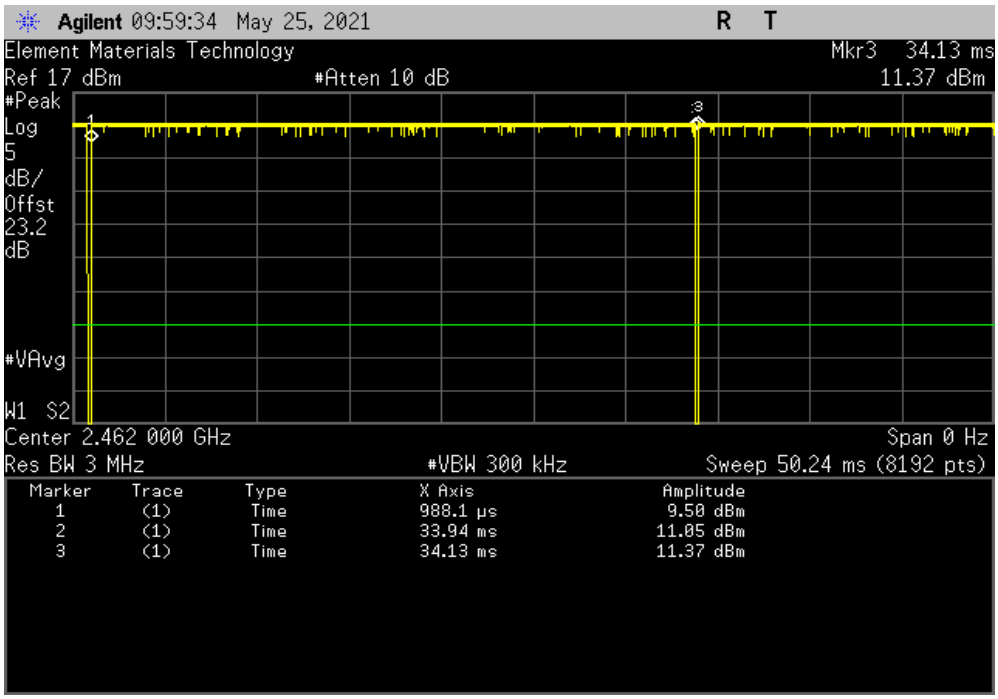
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



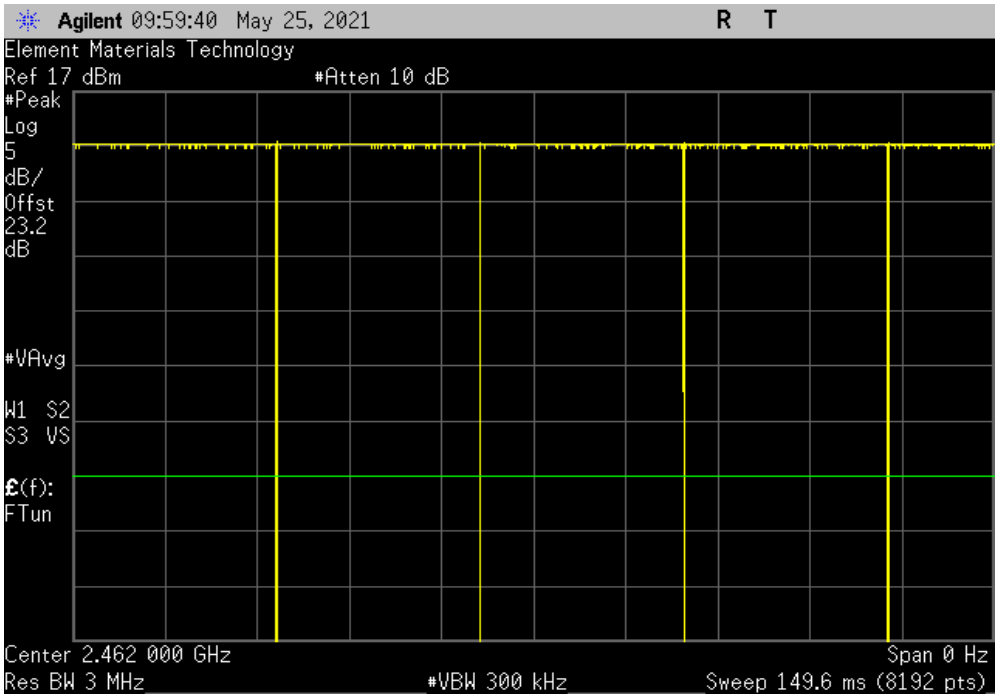
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	32.952 ms	33.142 ms	1	99.4	N/A	N/A



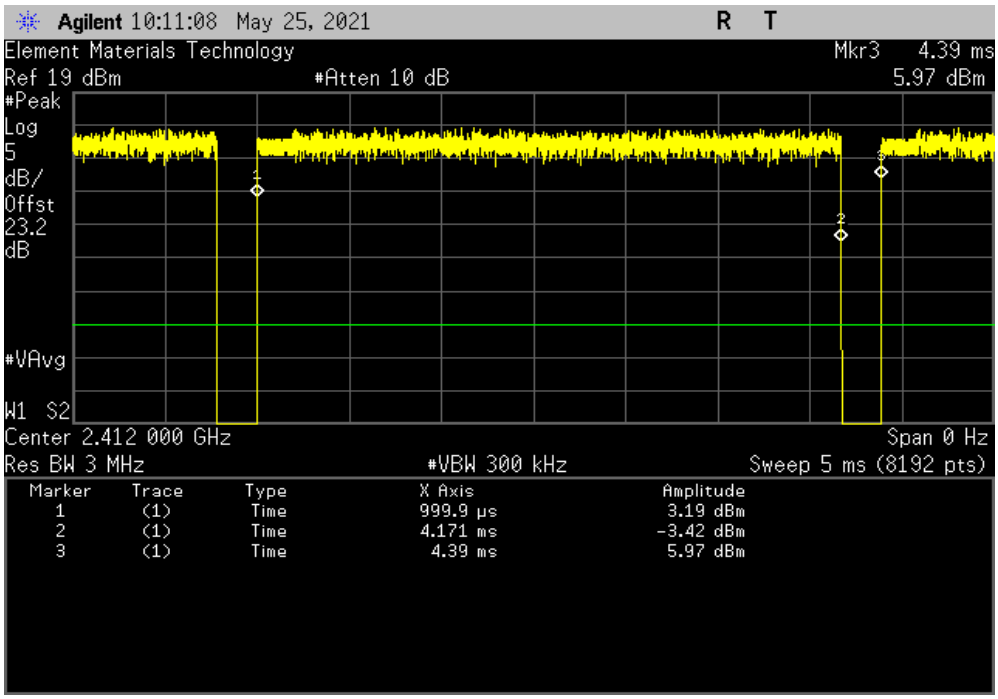
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



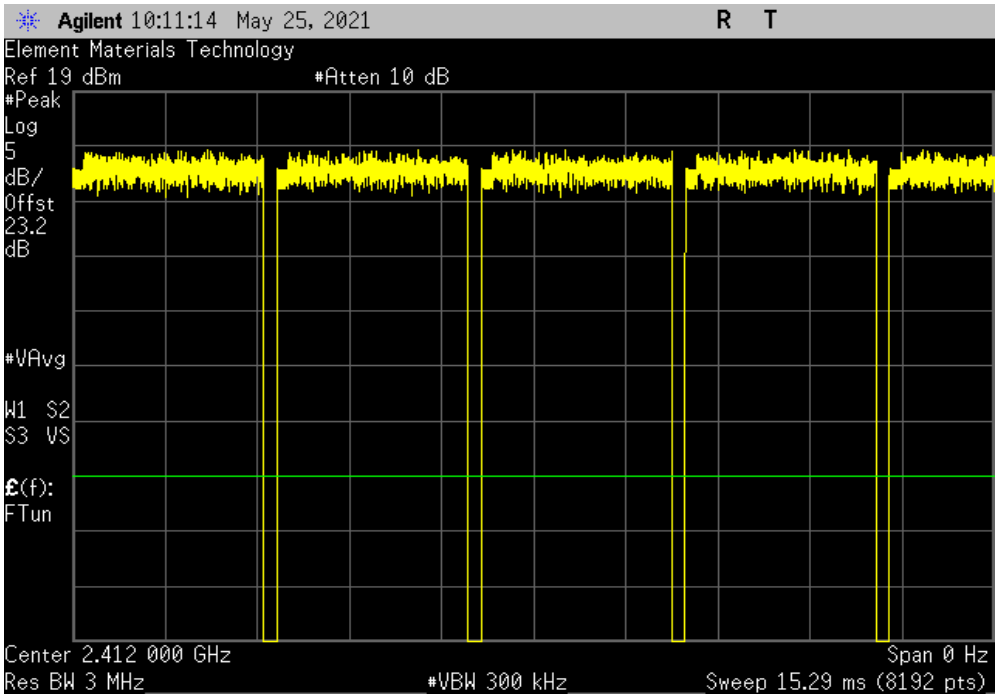
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	3.171 ms	3.39 ms	1	93.6	N/A	N/A



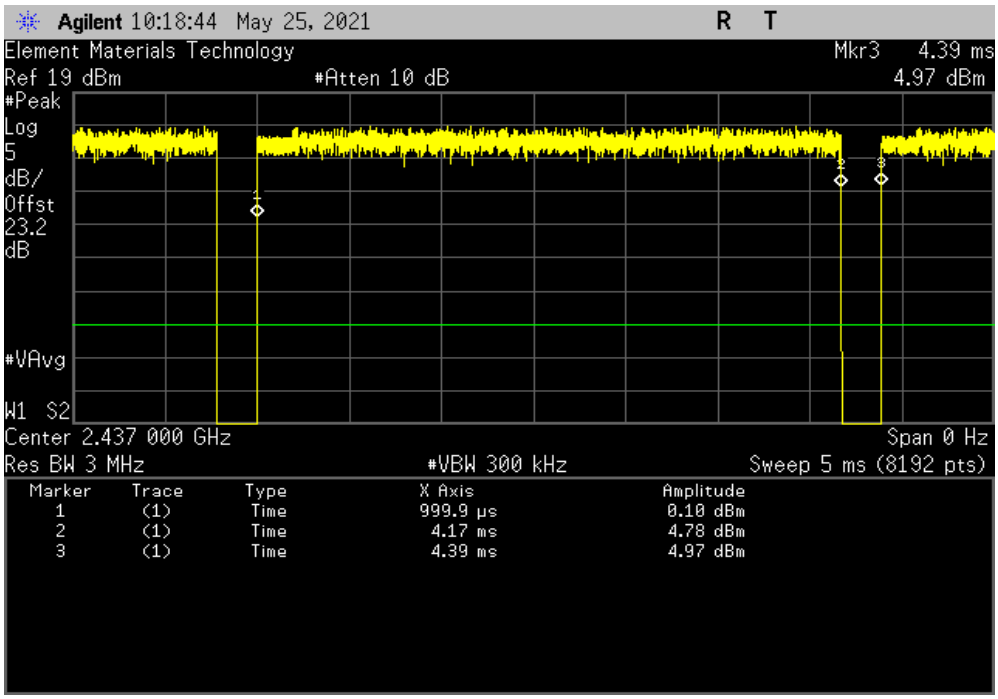
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



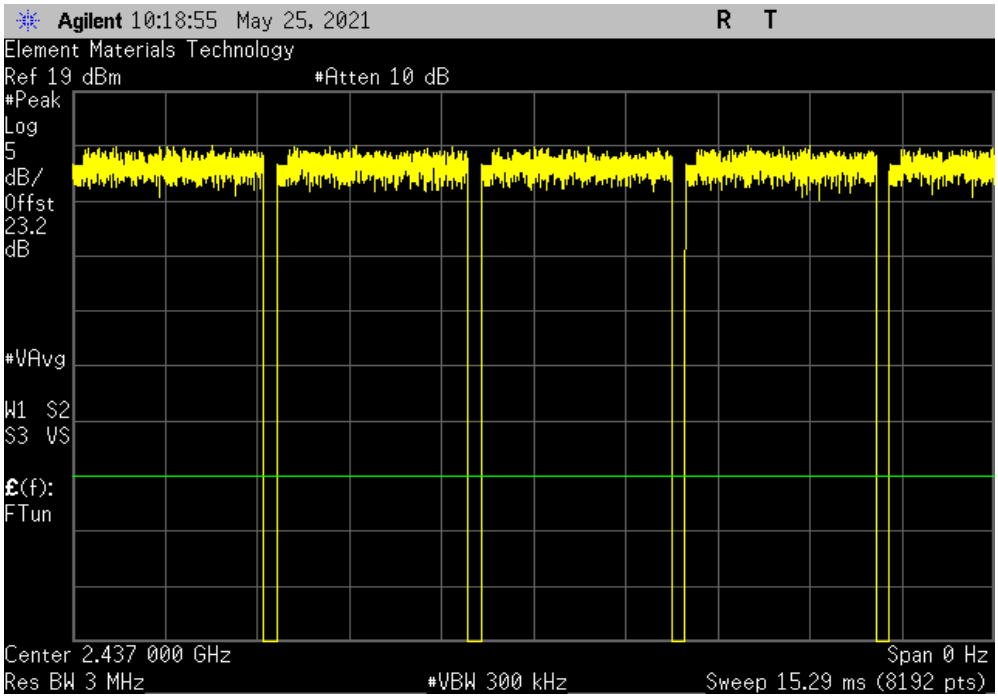
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	3.171 ms	3.39 ms	1	93.5	N/A	N/A



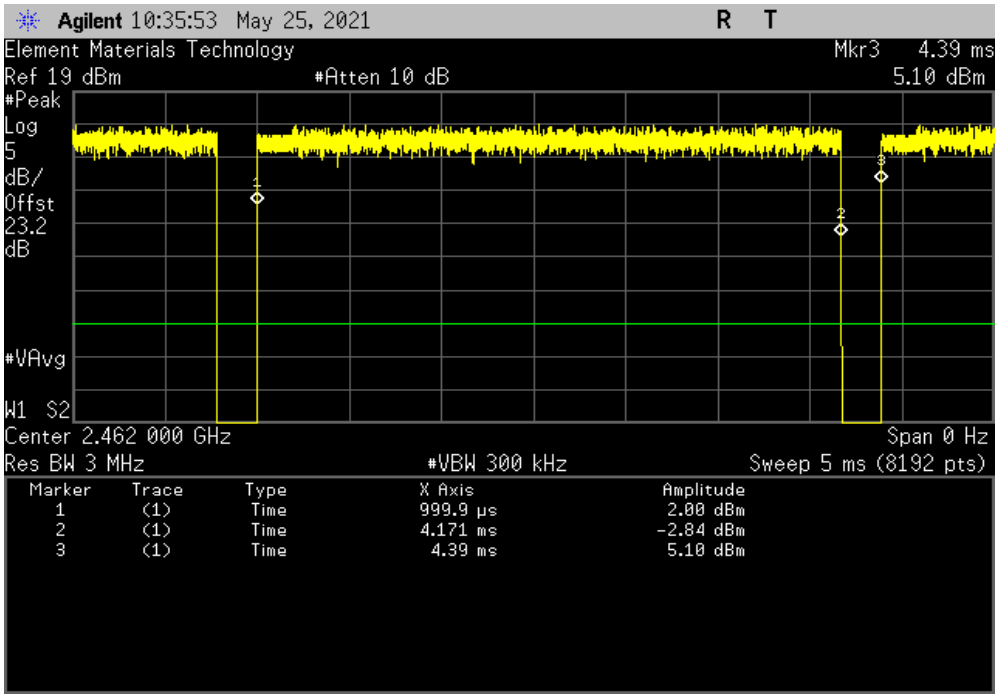
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



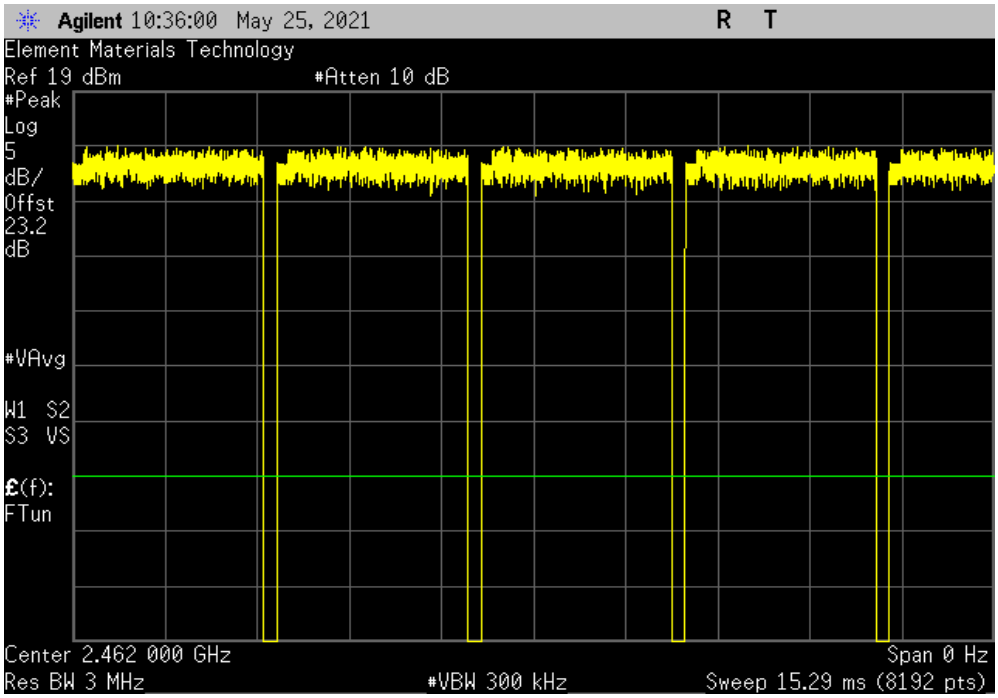
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	3.171 ms	3.39 ms	1	93.6	N/A	N/A



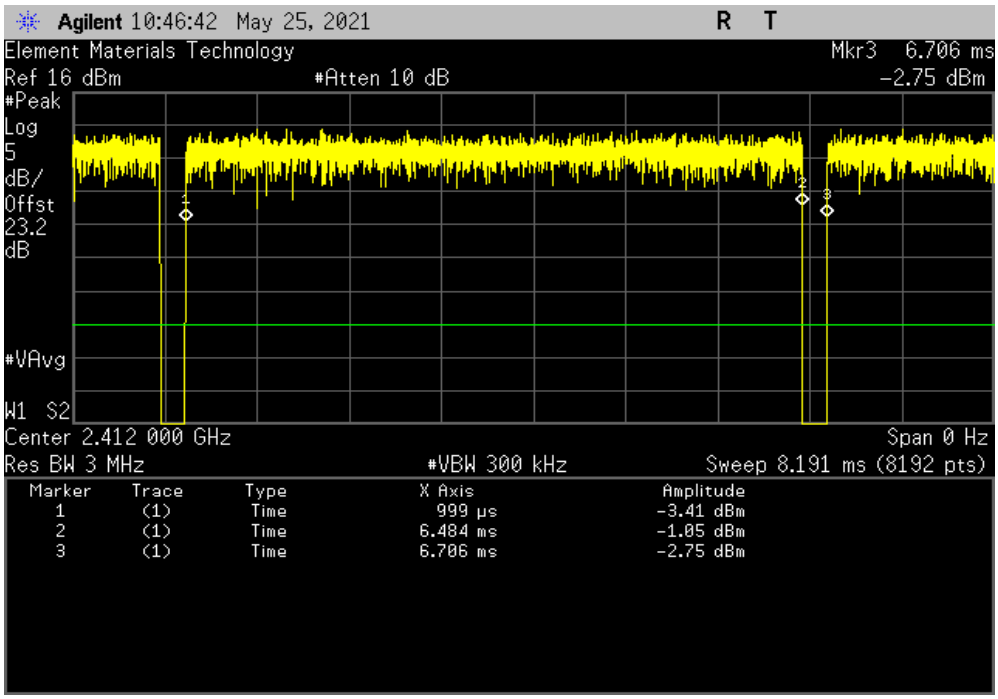
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



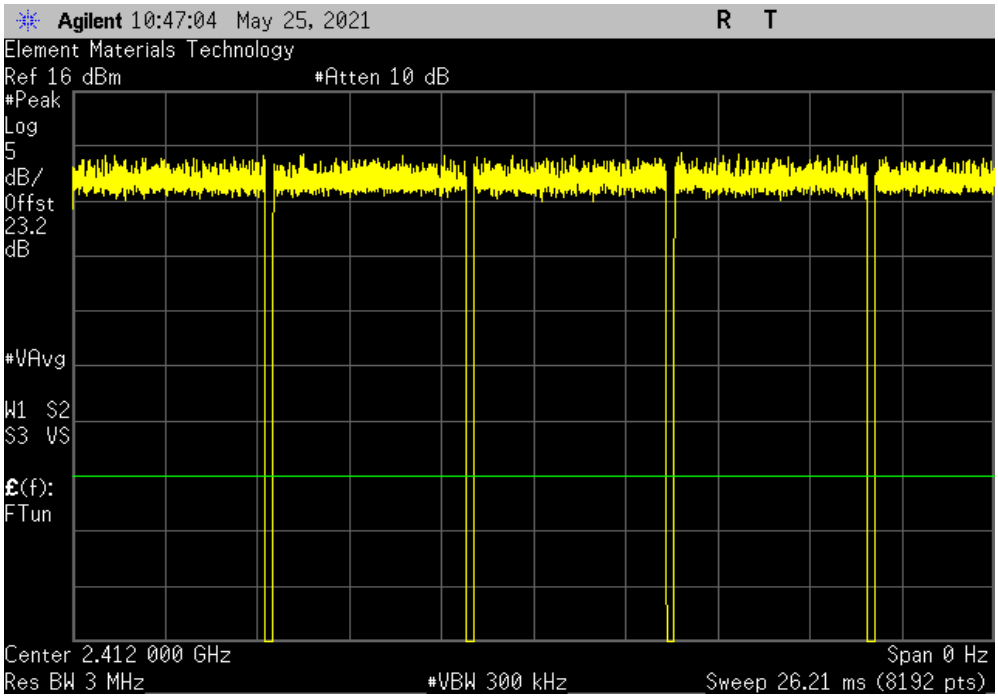
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	5.485 ms	5.707 ms	1	96.1	N/A	N/A



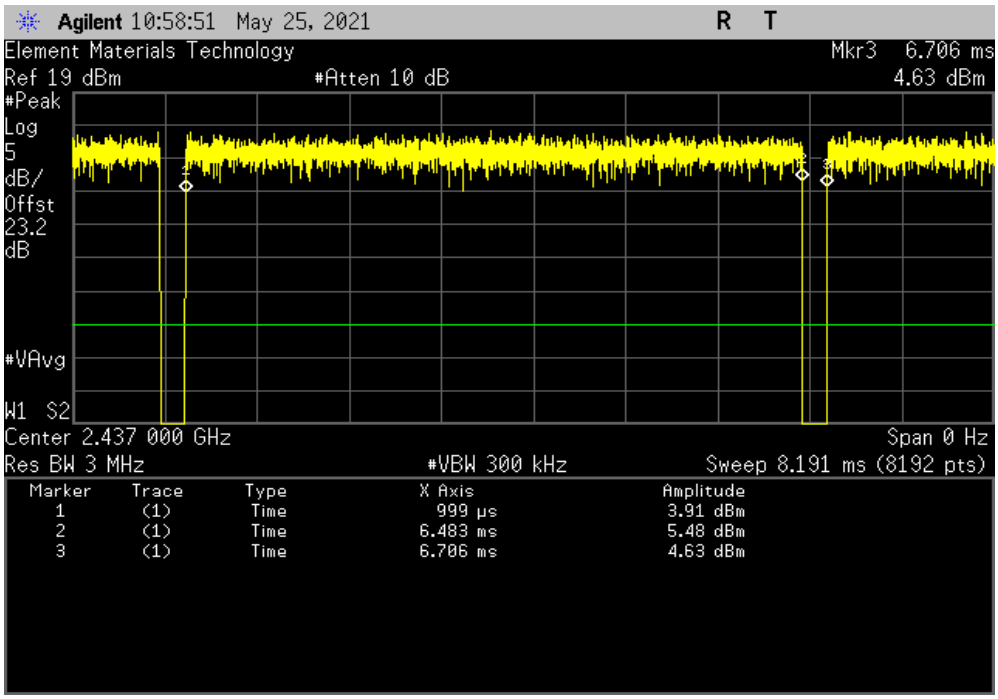
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



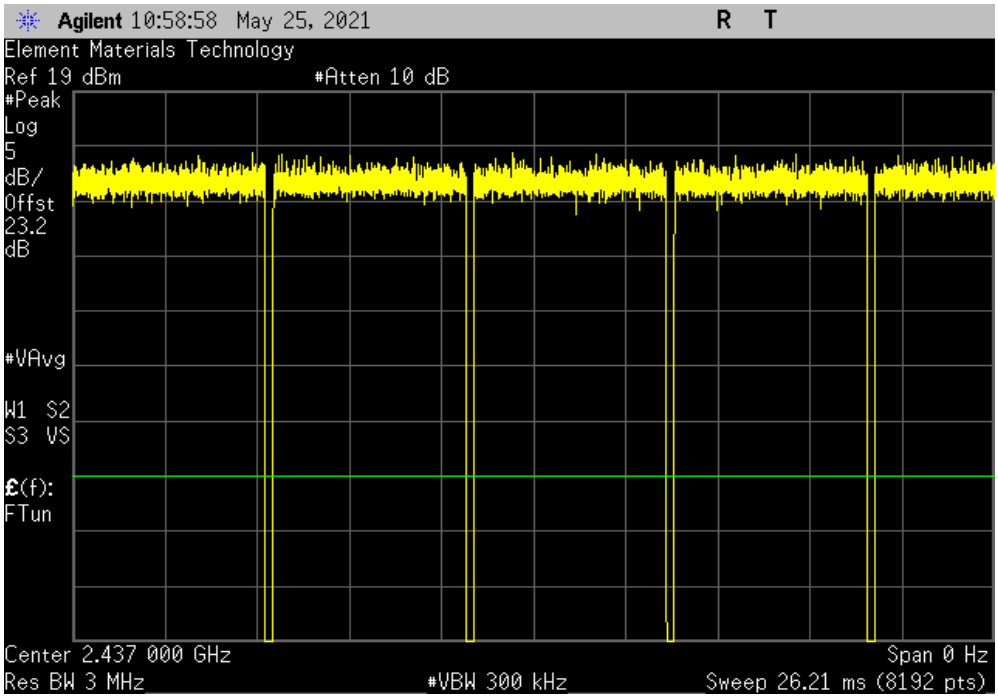
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	5.484 ms	5.707 ms	1	96.1	N/A	N/A



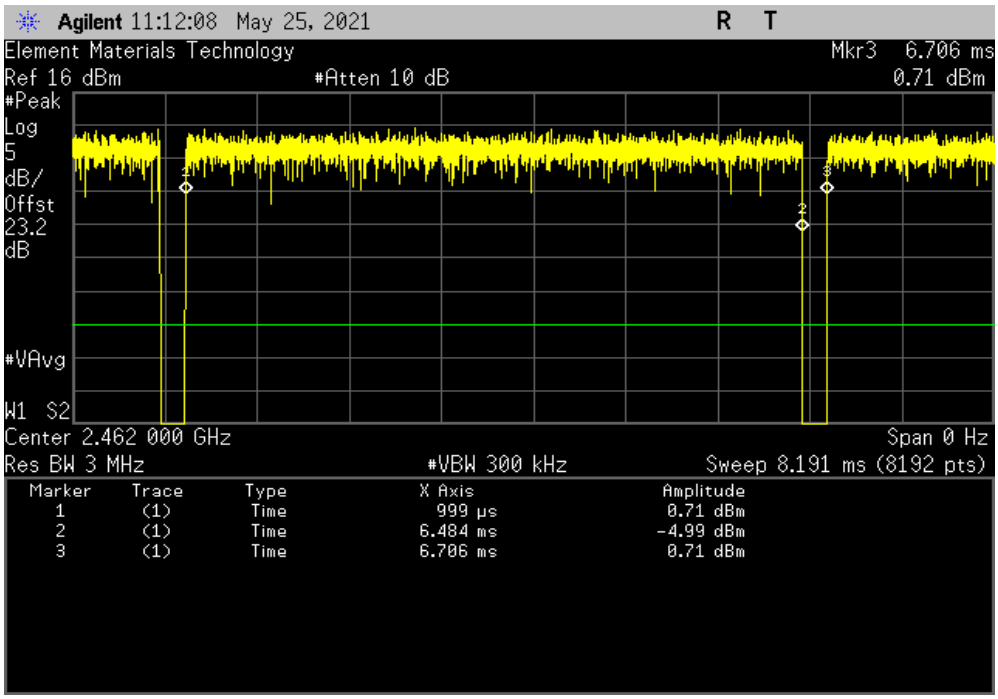
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



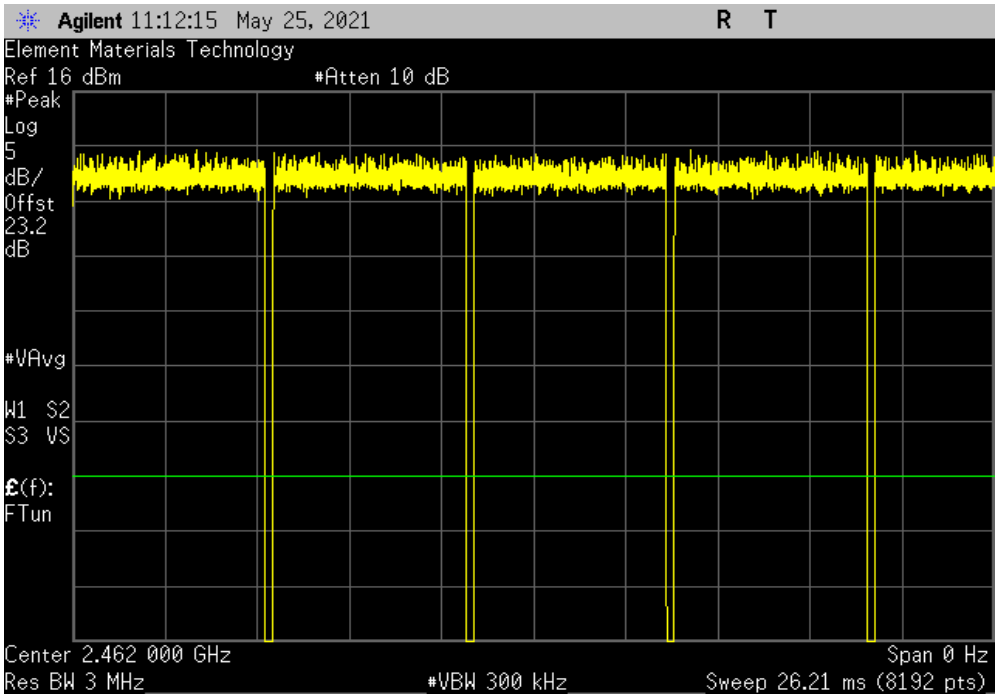
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	5.485 ms	5.707 ms	1	96.1	N/A	N/A



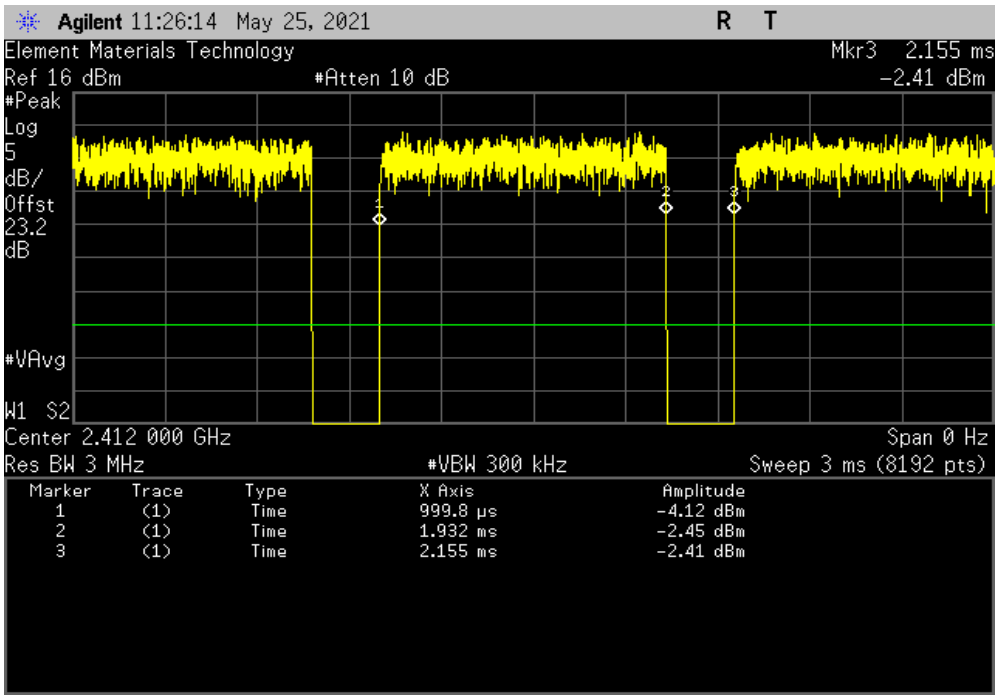
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



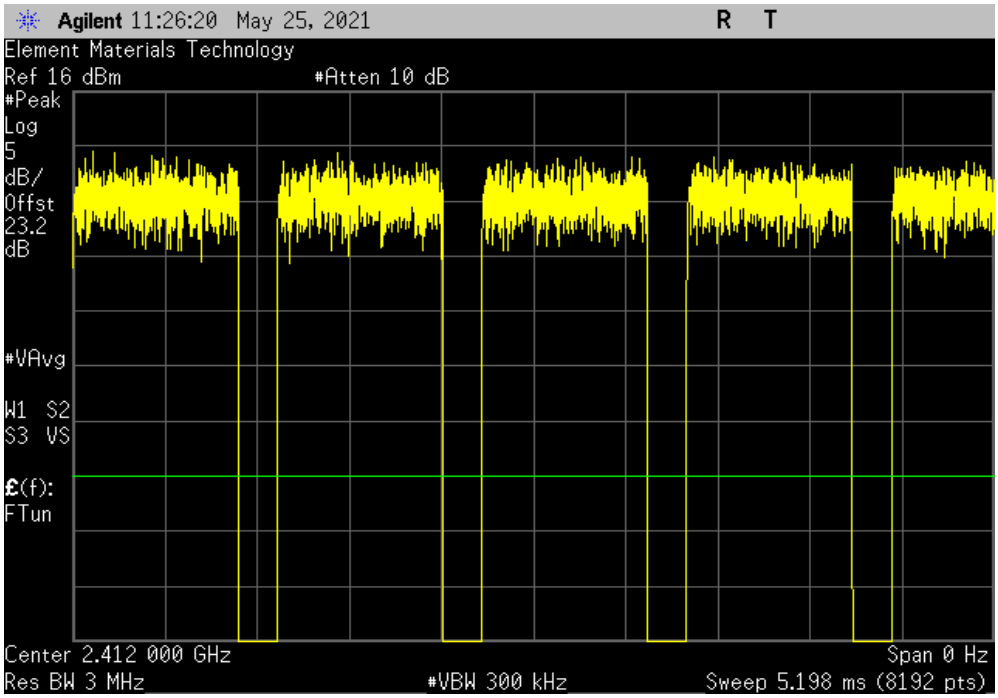
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	932.47 us	1.155 ms	1	80.7	N/A	N/A



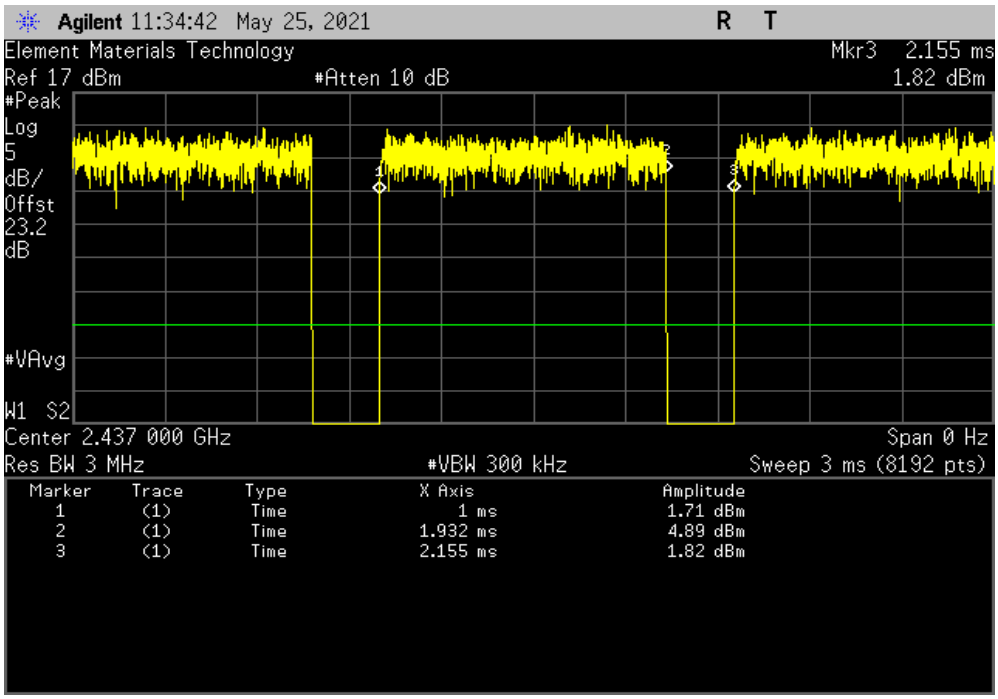
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



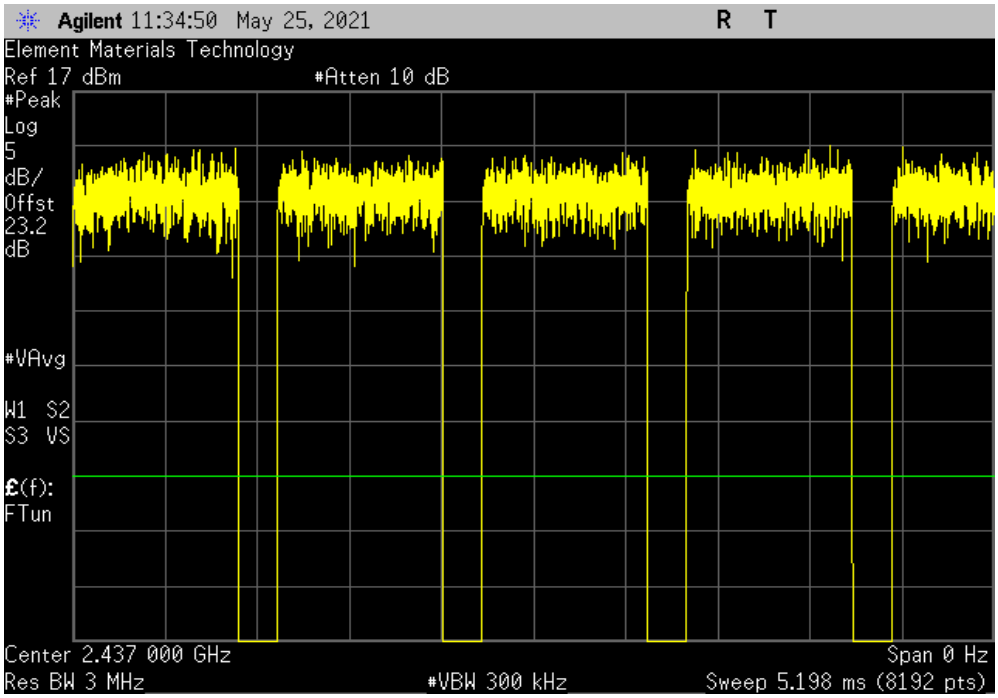
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	931.701 us	1.155 ms	1	80.7	N/A	N/A



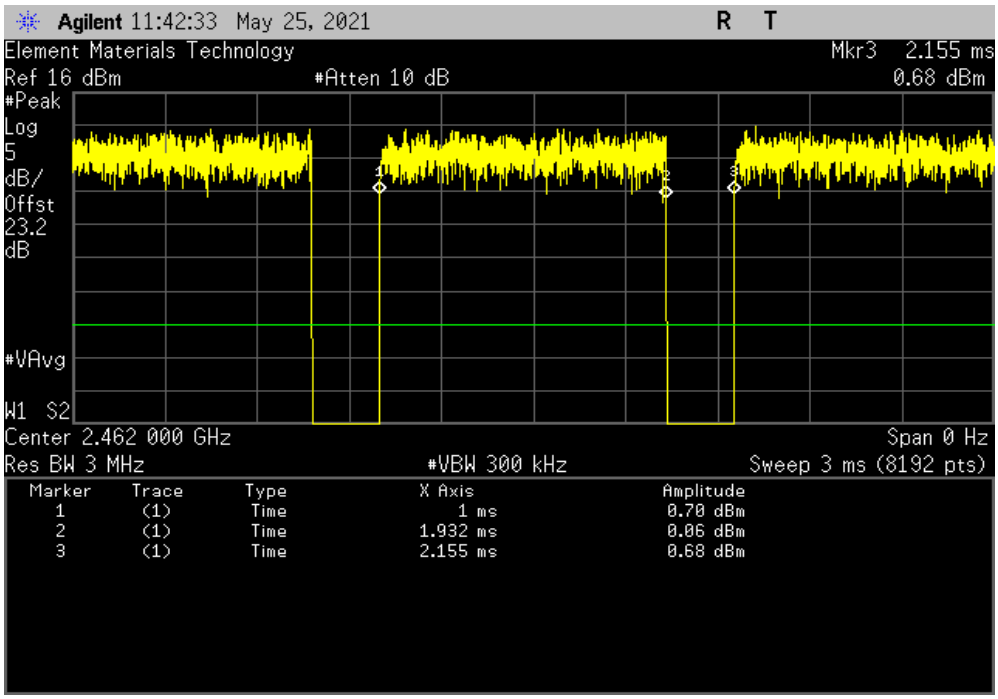
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



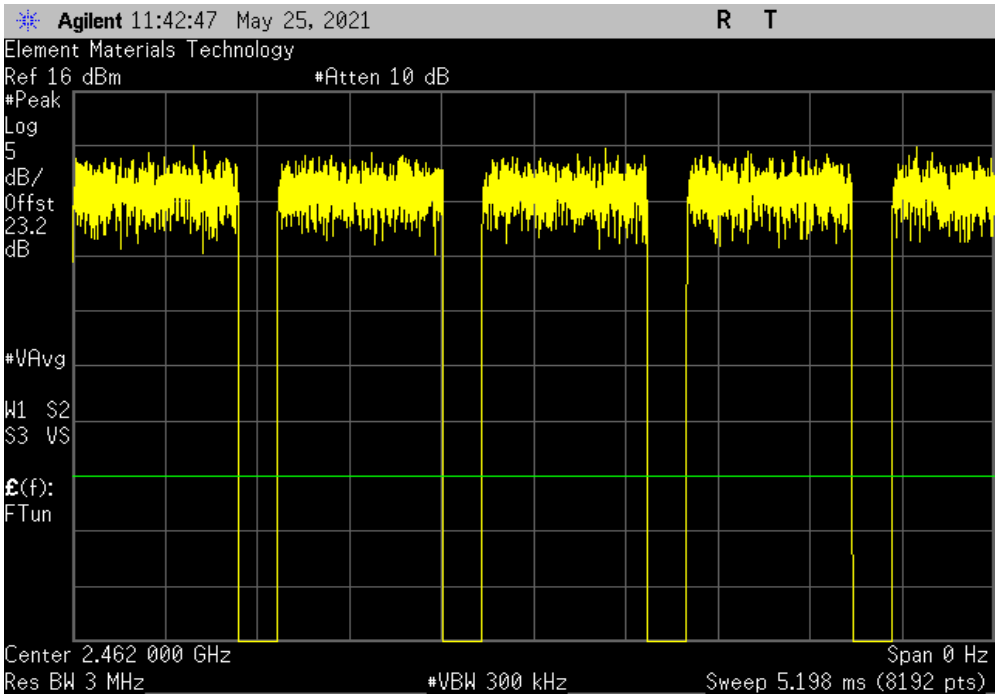
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	932.117 us	1.155 ms	1	80.7	N/A	N/A

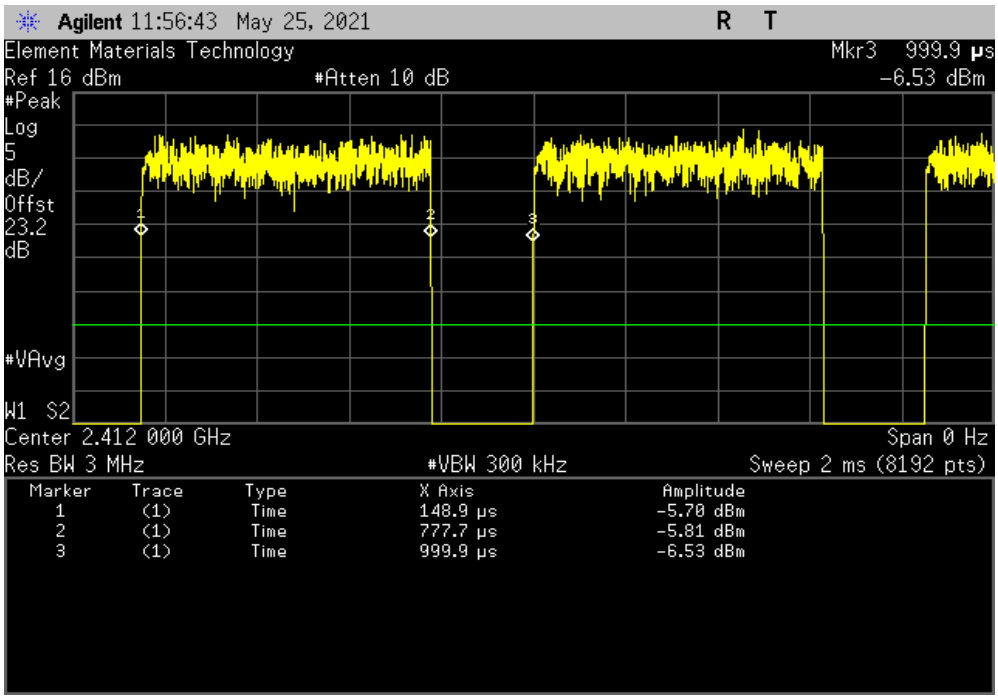


2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

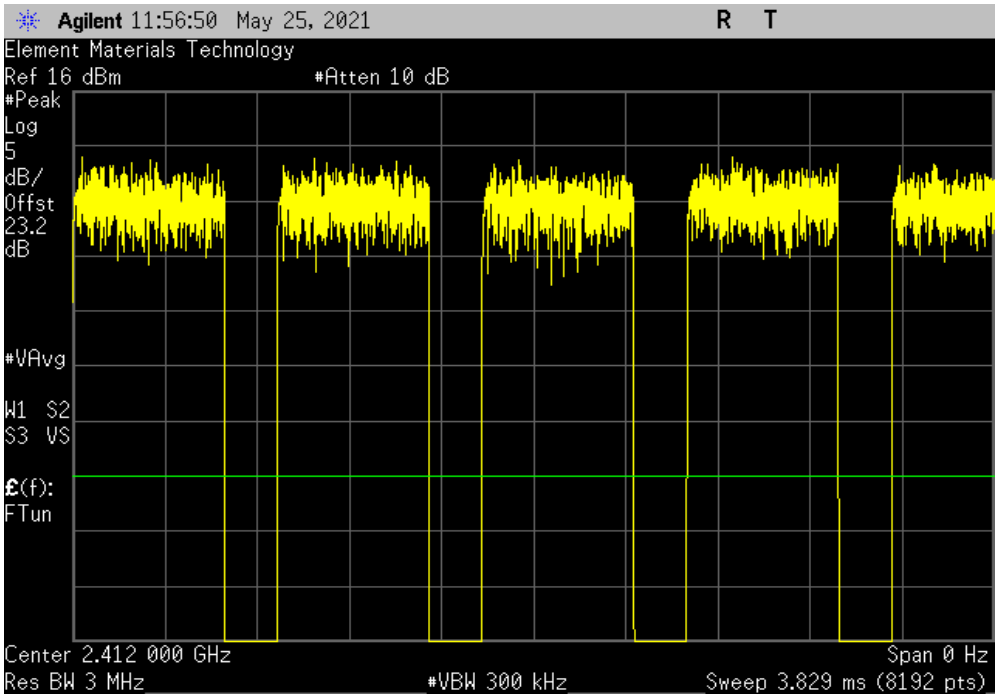


DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	628.8 us	851 us	1	73.9	N/A	N/A



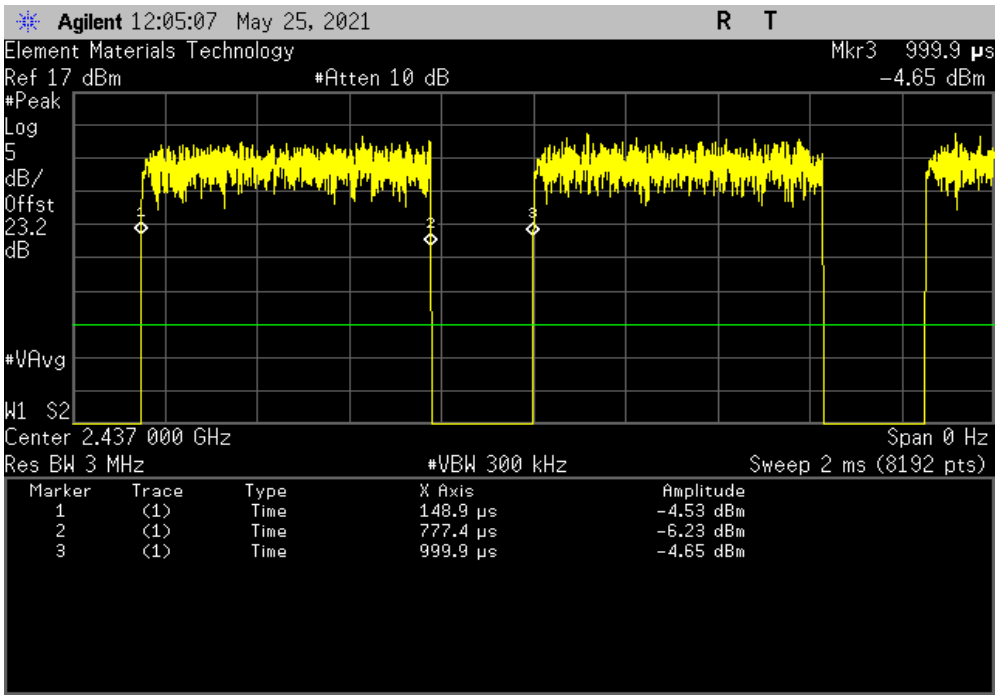
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



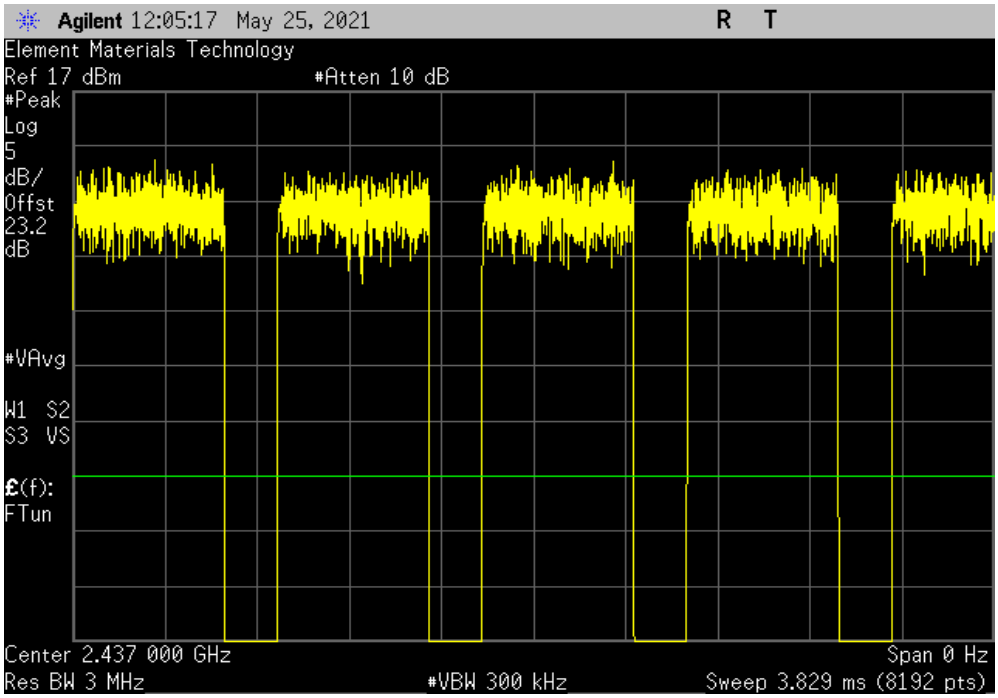
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	628.5 us	851 us	1	73.9	N/A	N/A



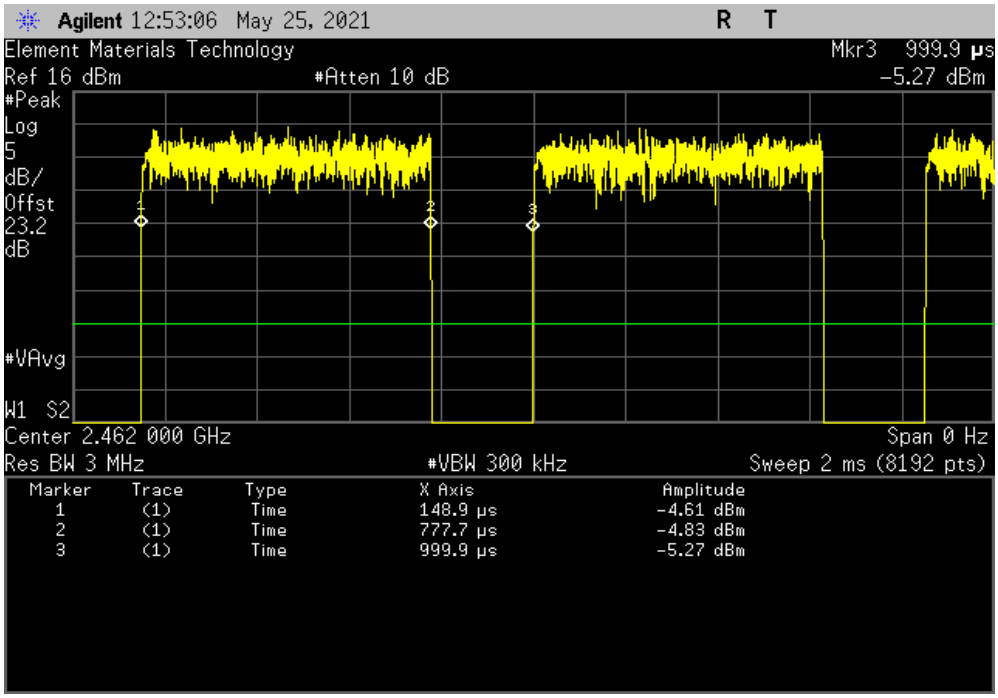
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



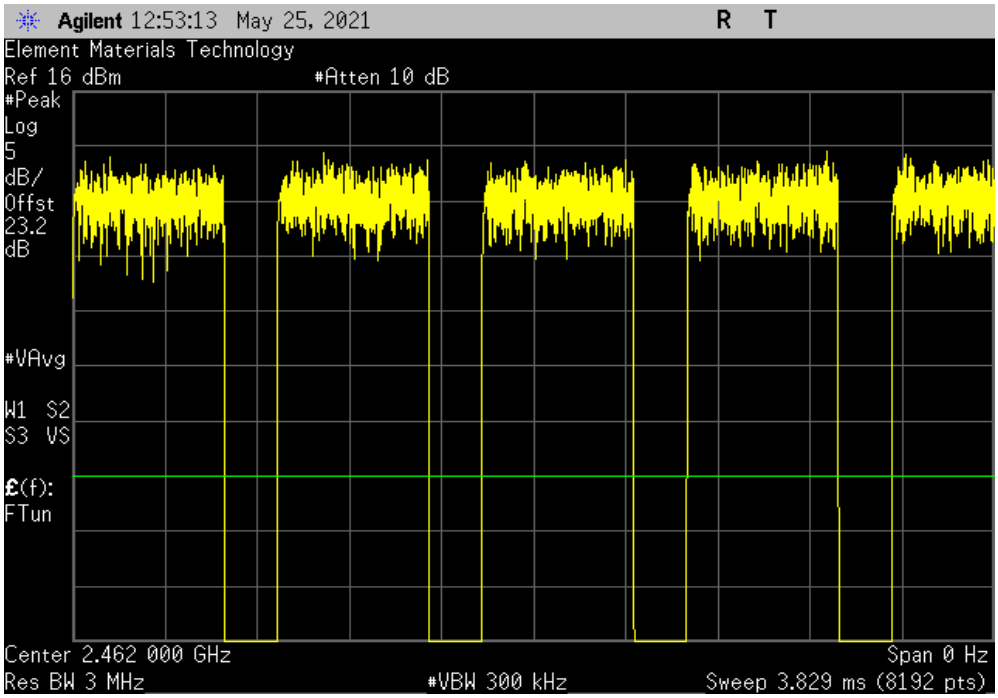
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	628.8 us	851 us	1	73.9	N/A	N/A



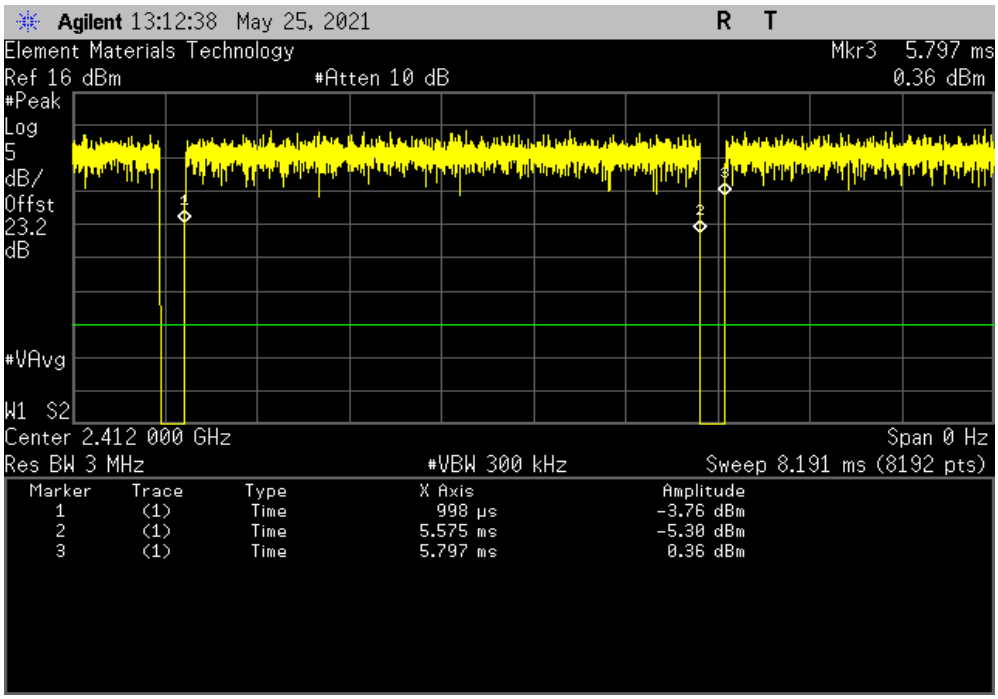
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



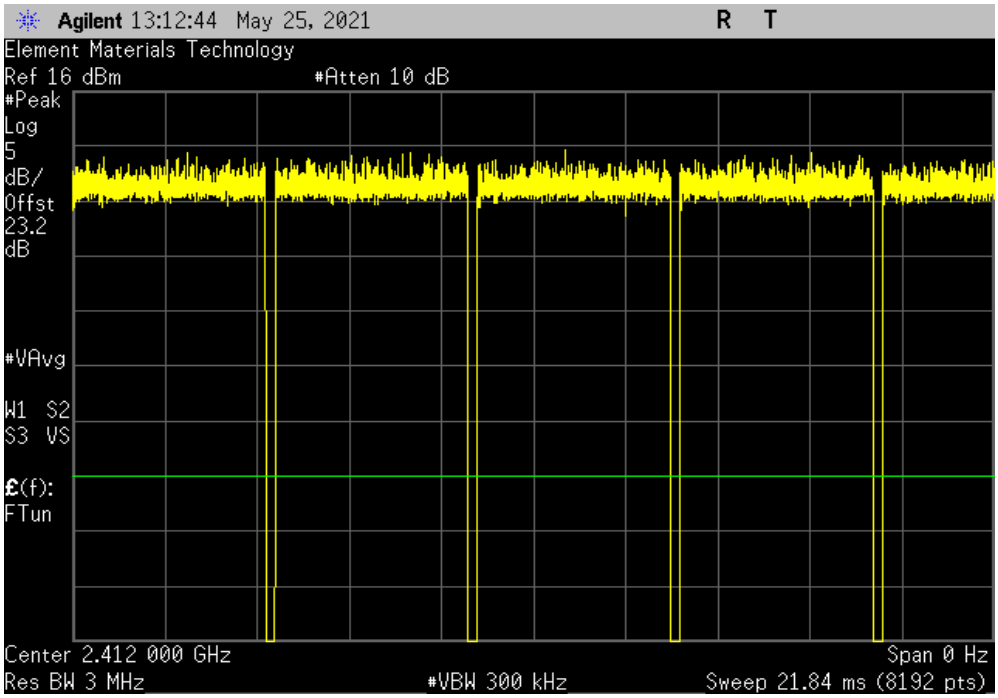
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	4.577 ms	4.799 ms	1	95.4	N/A	N/A



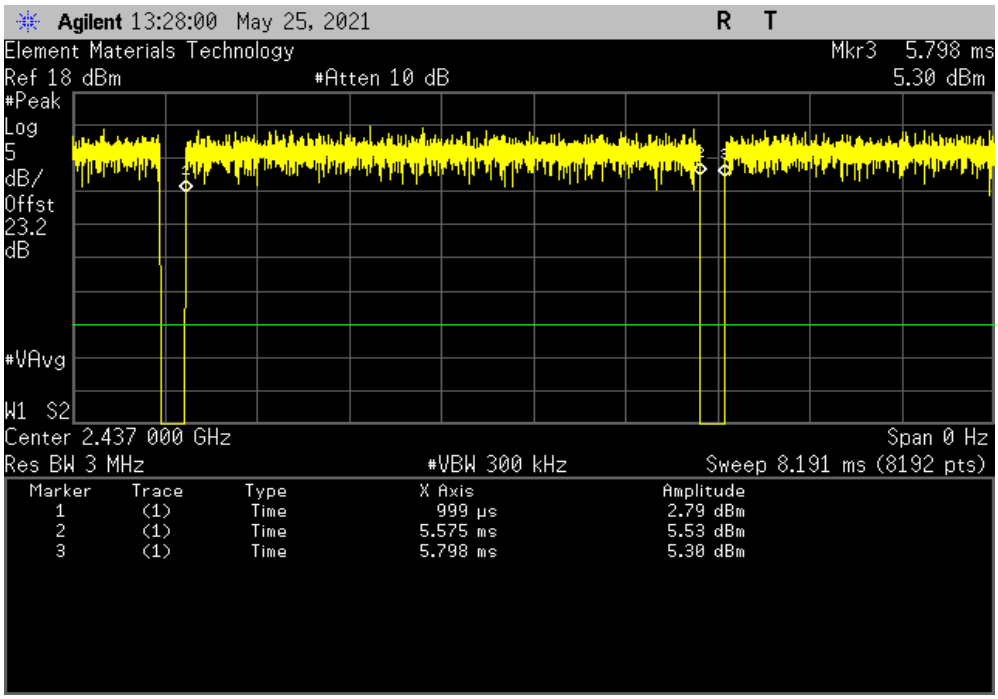
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



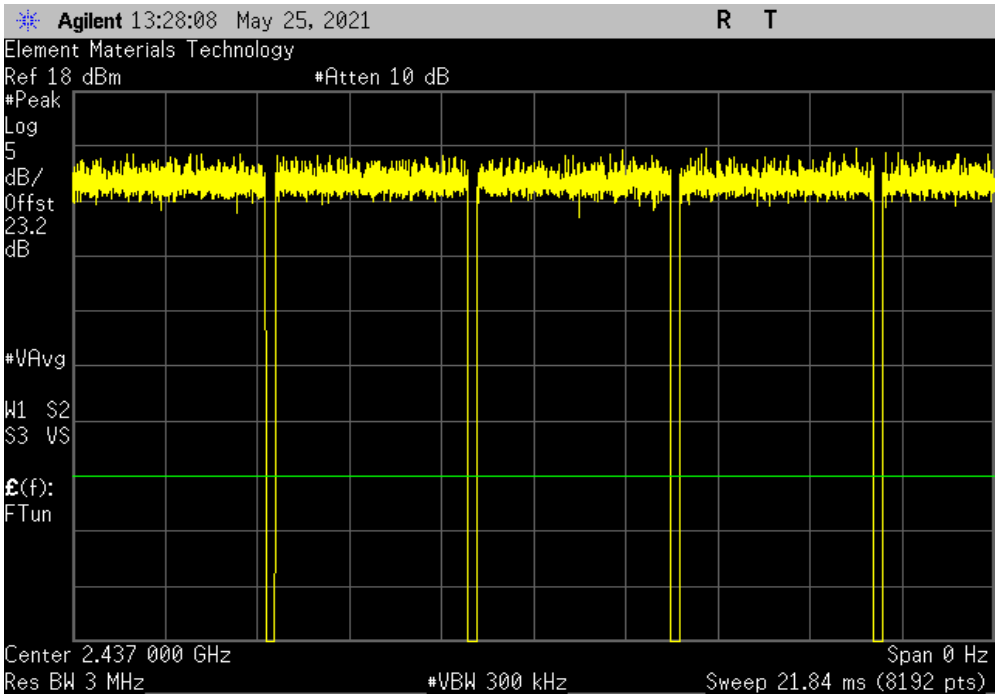
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	4.576 ms	4.799 ms	1	95.4	N/A	N/A



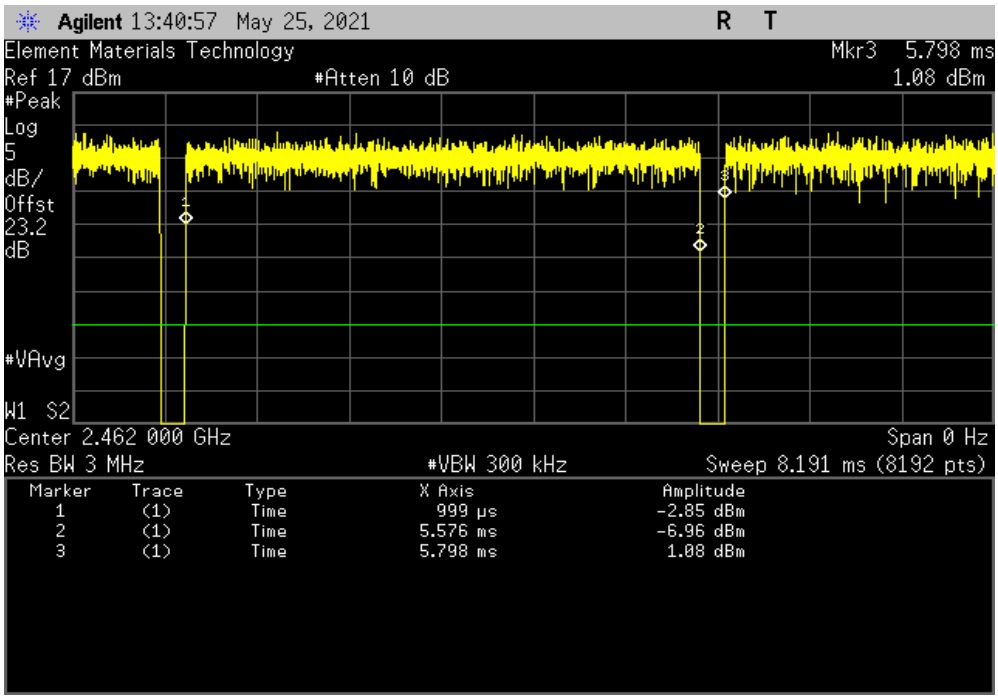
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



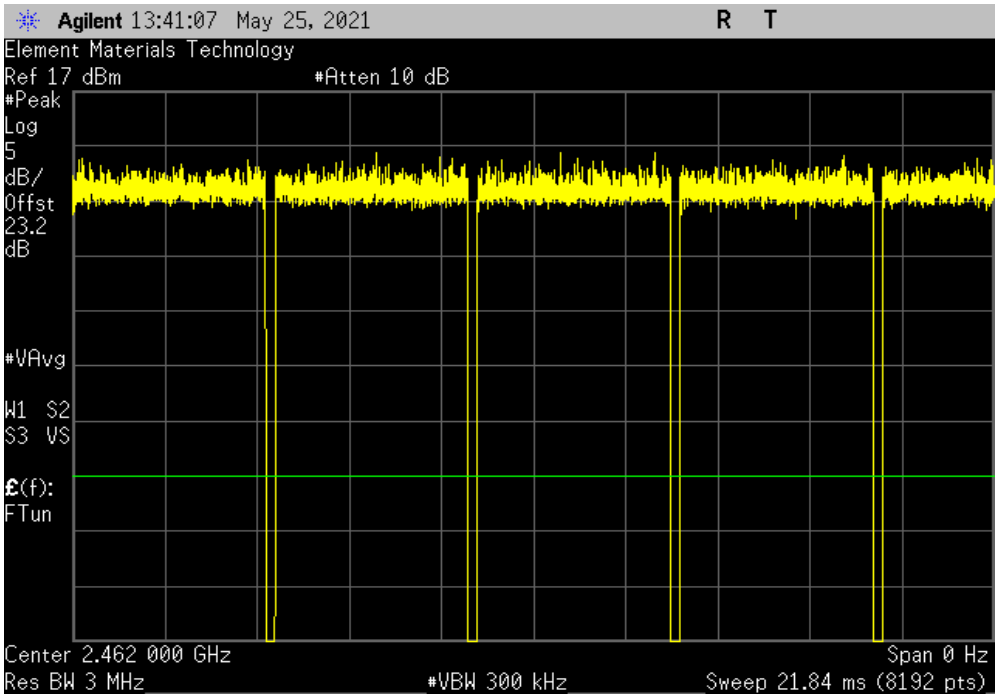
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS0, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	4.577 ms	4.799 ms	1	95.4	N/A	N/A



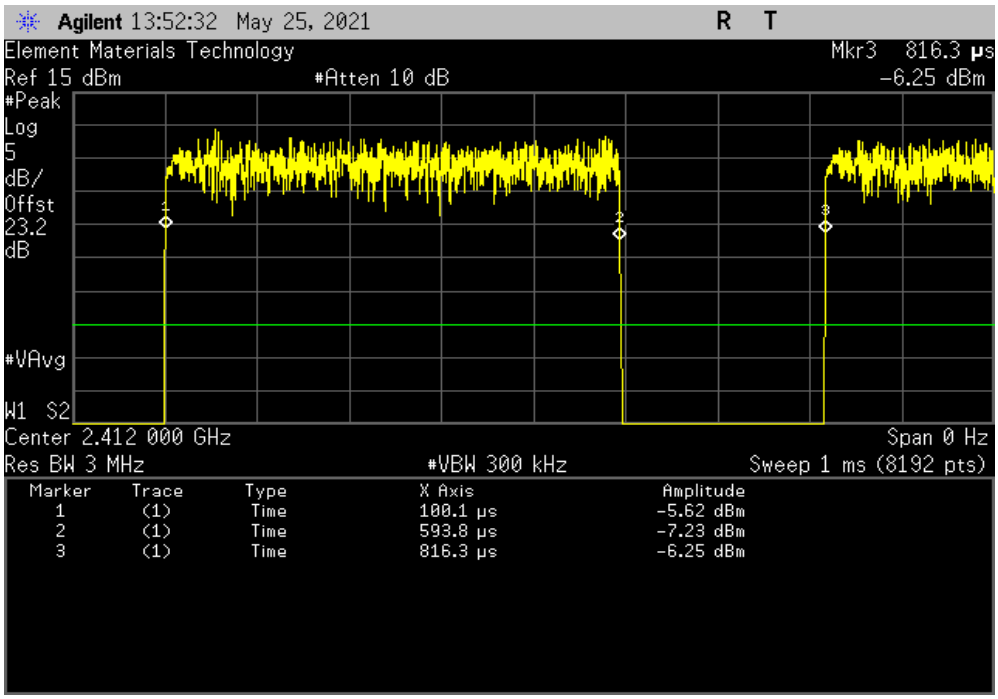
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS0, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



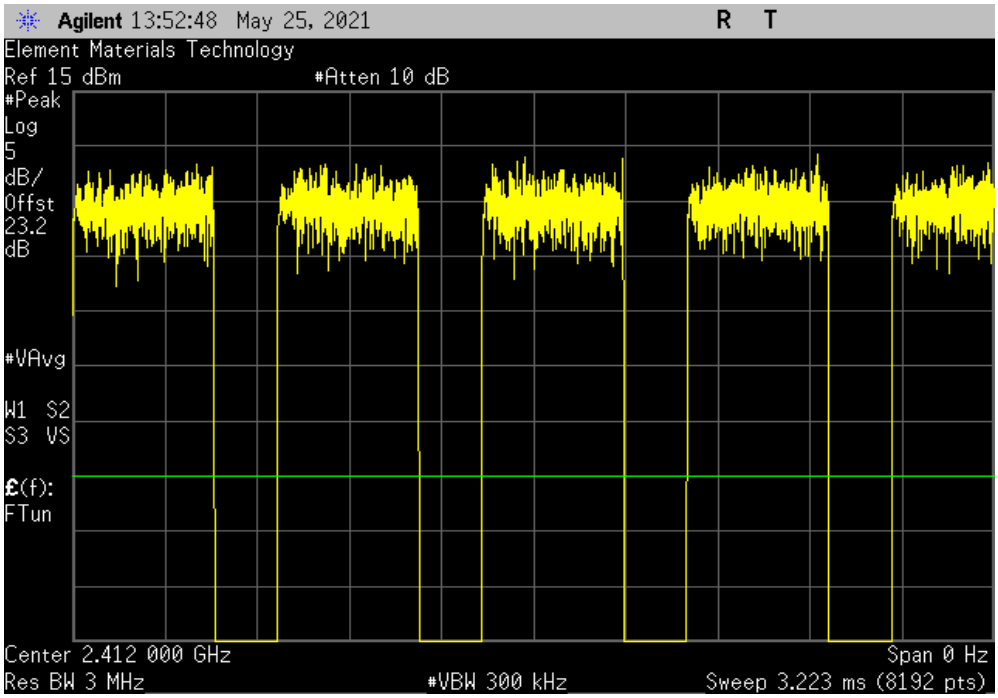
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	493.7 us	716.2 us	1	68.9	N/A	N/A



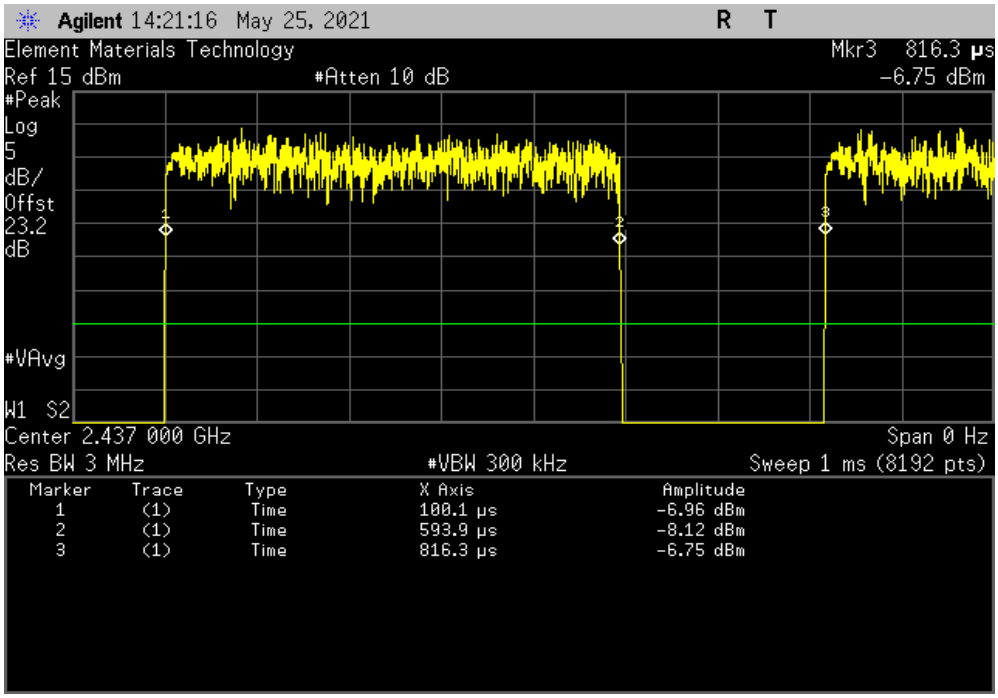
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



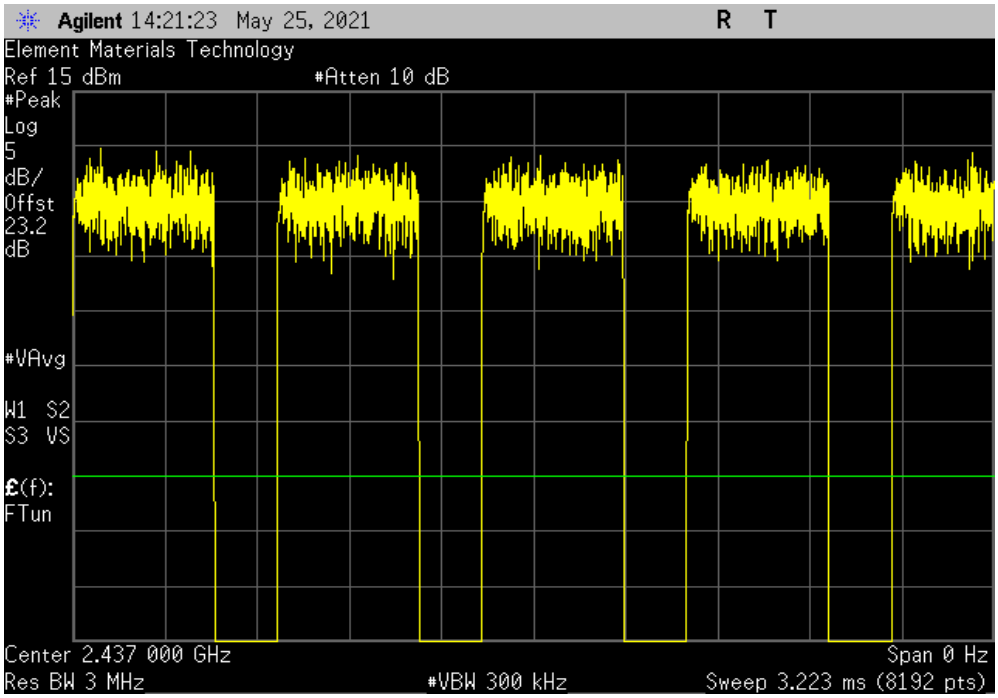
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	493.8 us	716.2 us	1	68.9	N/A	N/A



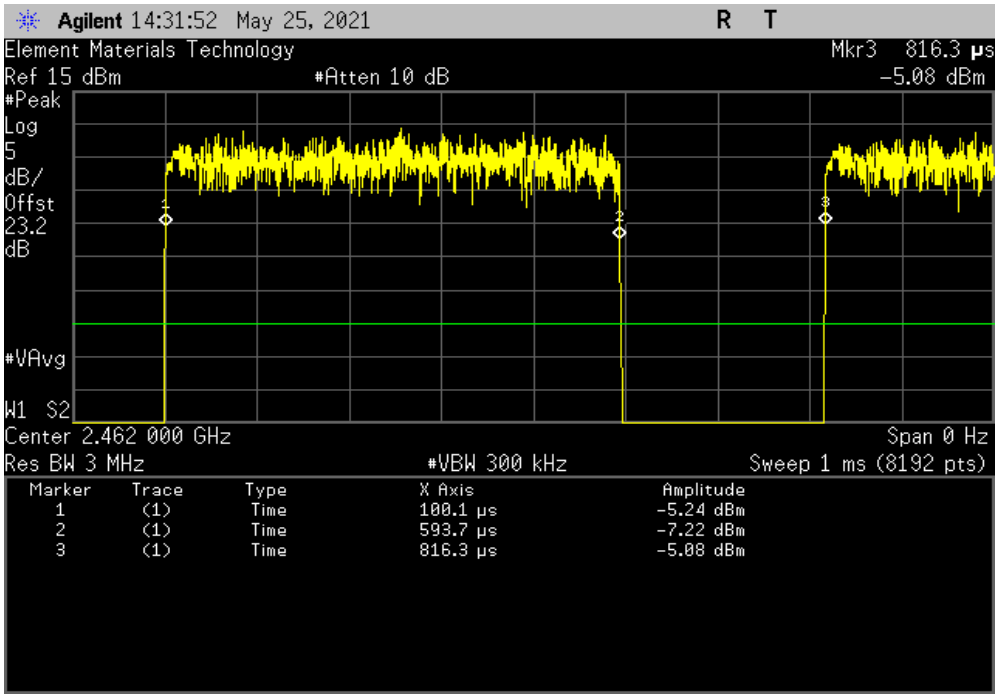
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



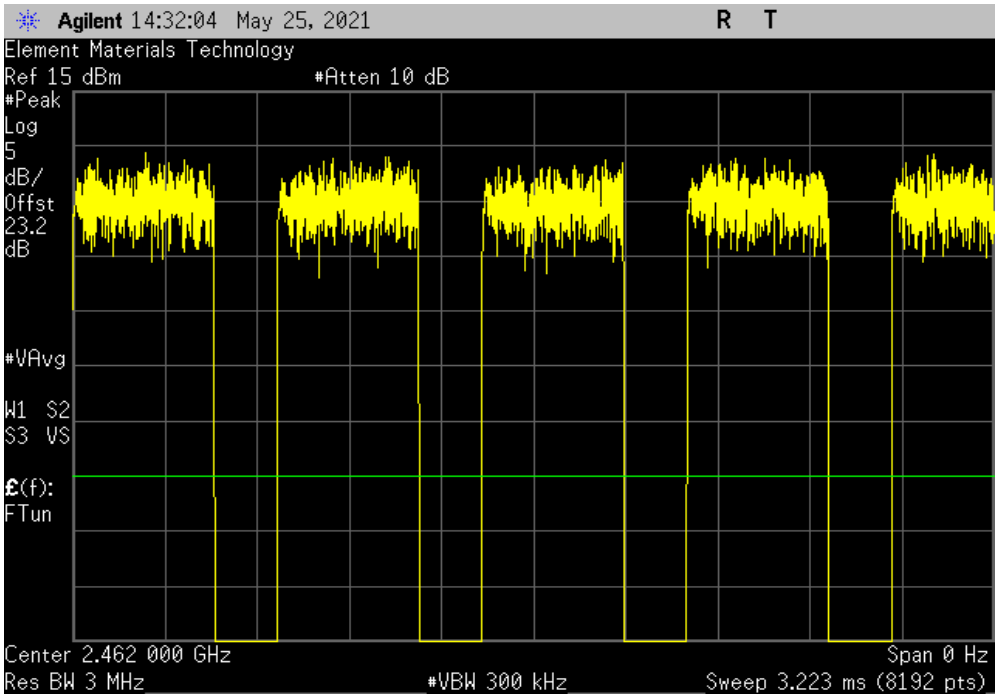
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS7, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	493.6 us	716.2 us	1	68.9	N/A	N/A



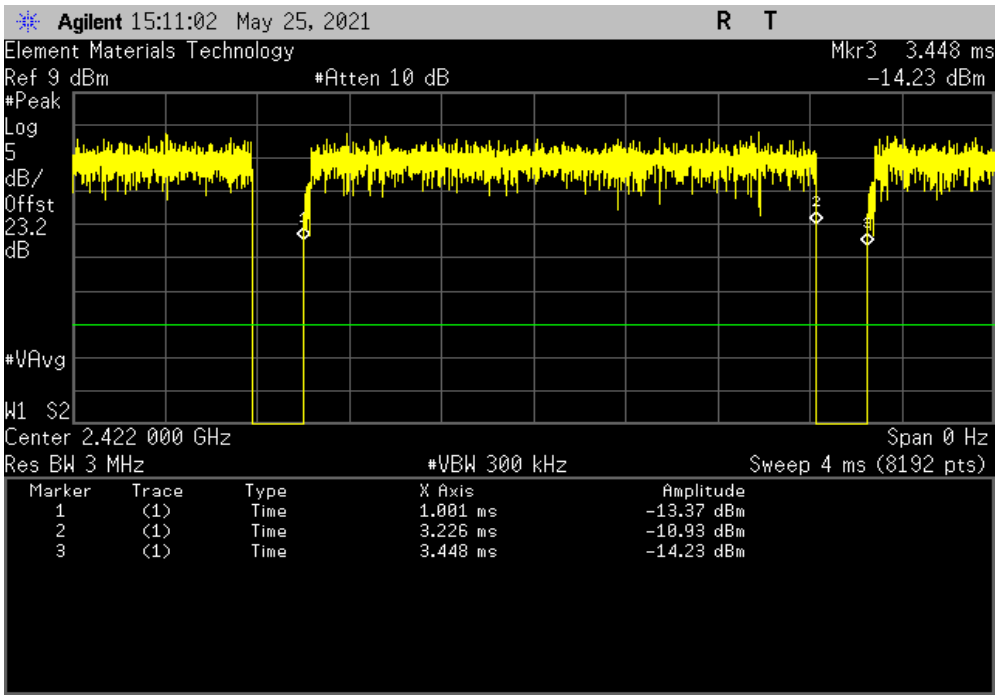
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS7, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



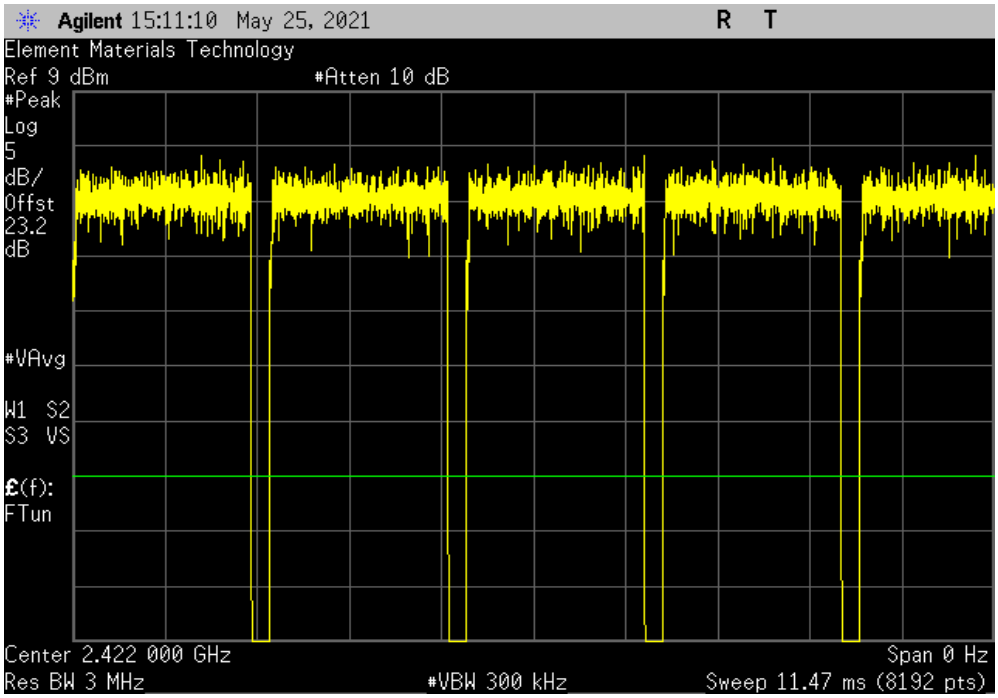
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS0 , Low Channel 1/5, 2422 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	2.225 ms	2.448 ms	1	90.9	N/A	N/A

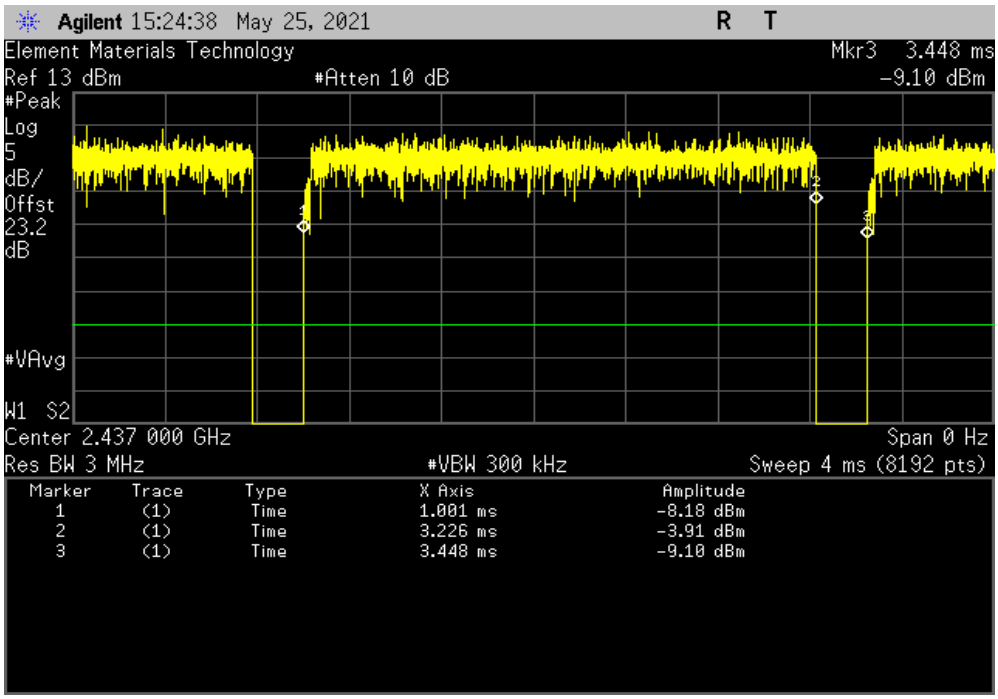


2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS0 , Low Channel 1/5, 2422 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

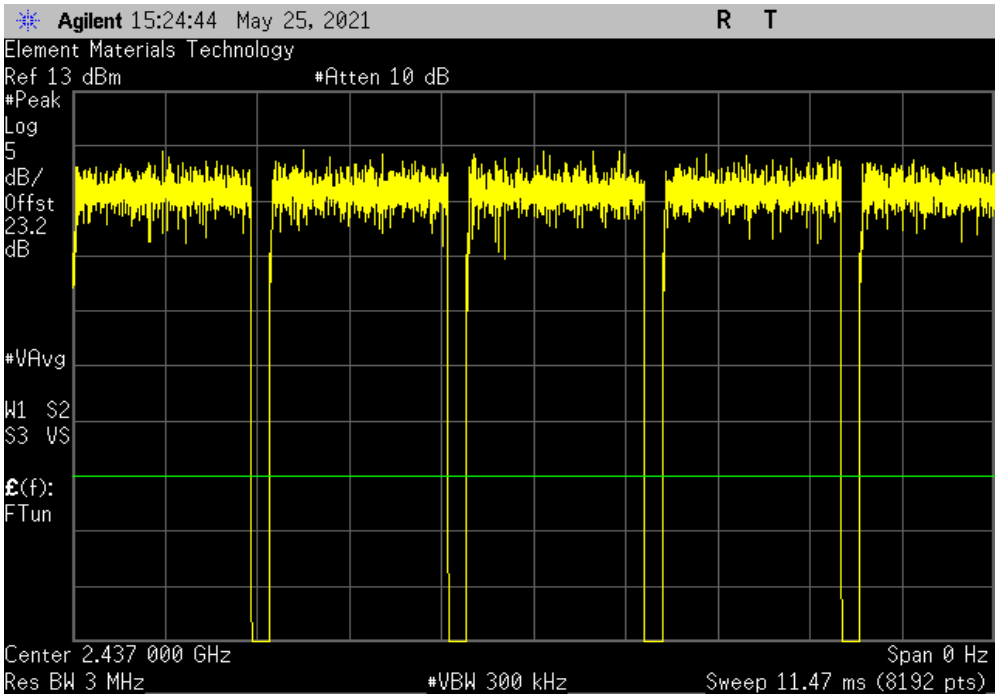


DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS0 , Mid Channel 4/8, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	2.225 ms	2.448 ms	1	90.9	N/A	N/A



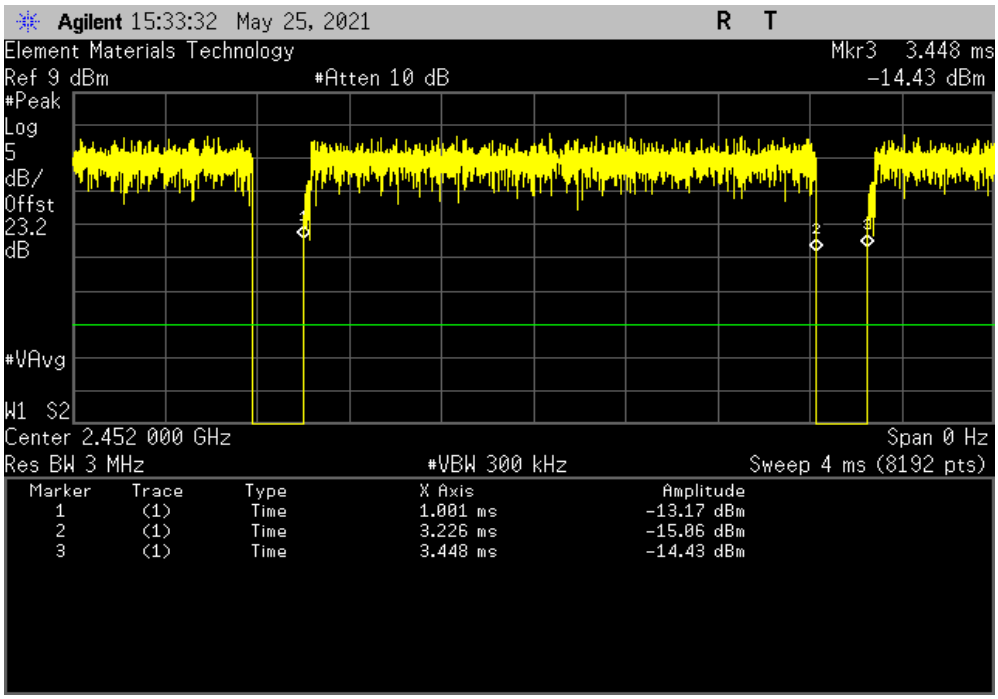
2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS0 , Mid Channel 4/8, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



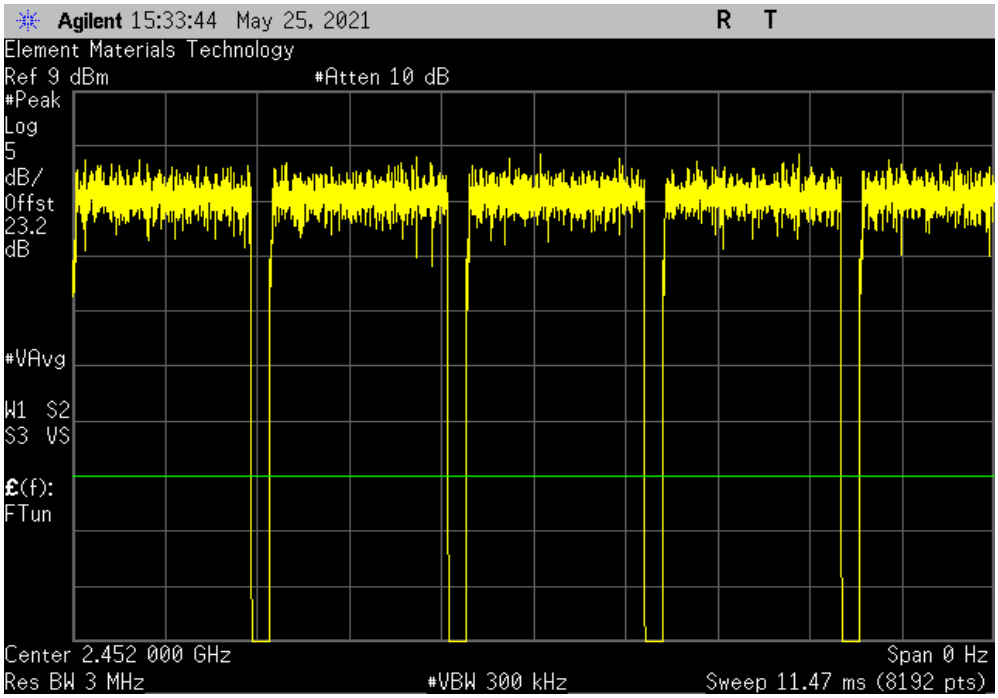
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS0 , High Channel 7/11, 2452 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	2.225 ms	2.448 ms	1	90.9	N/A	N/A



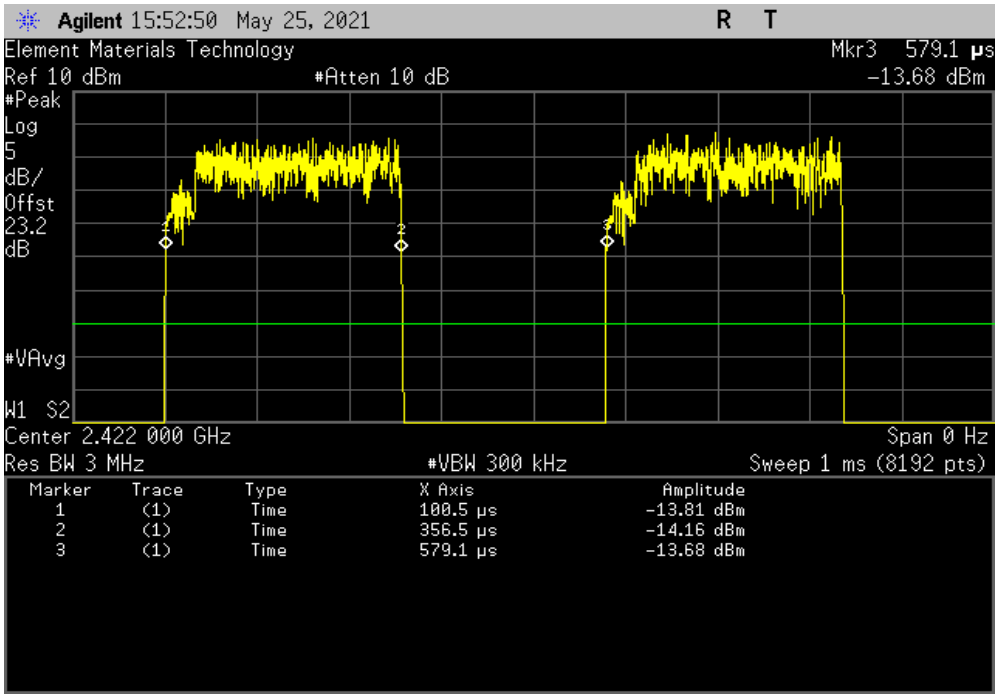
2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS0 , High Channel 7/11, 2452 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



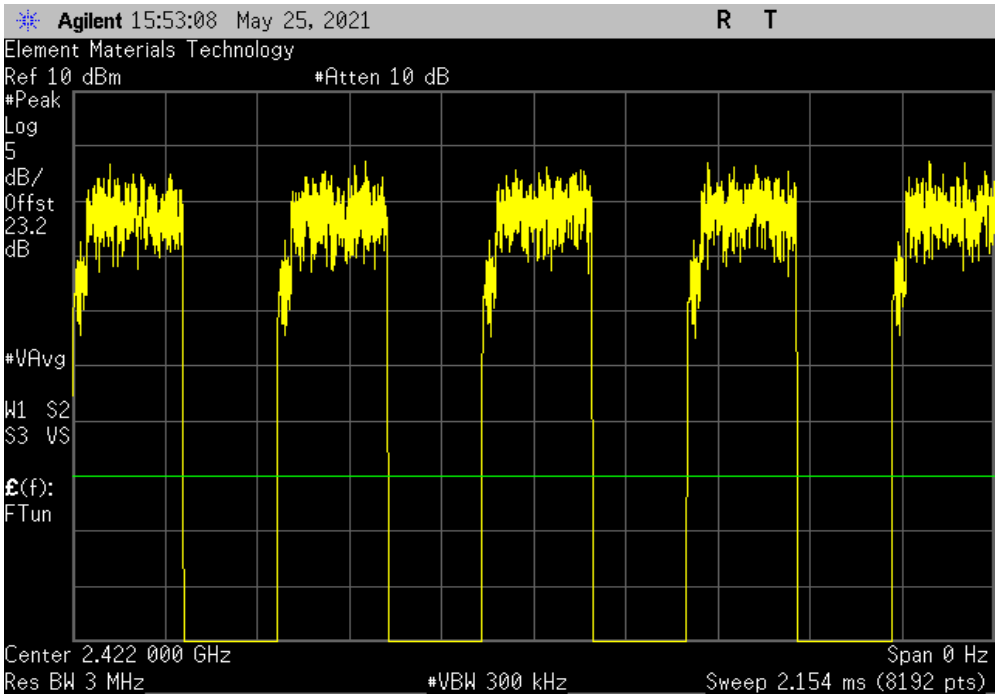
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS7 , Low Channel 1/5, 2422 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	256 us	478.6 us	1	53.5	N/A	N/A



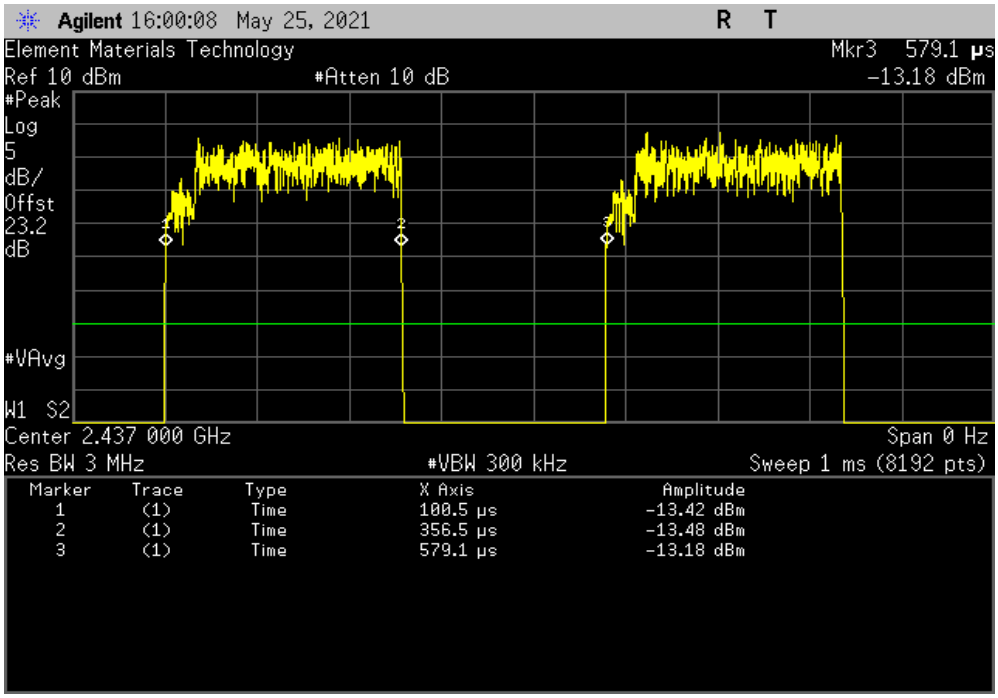
2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS7 , Low Channel 1/5, 2422 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



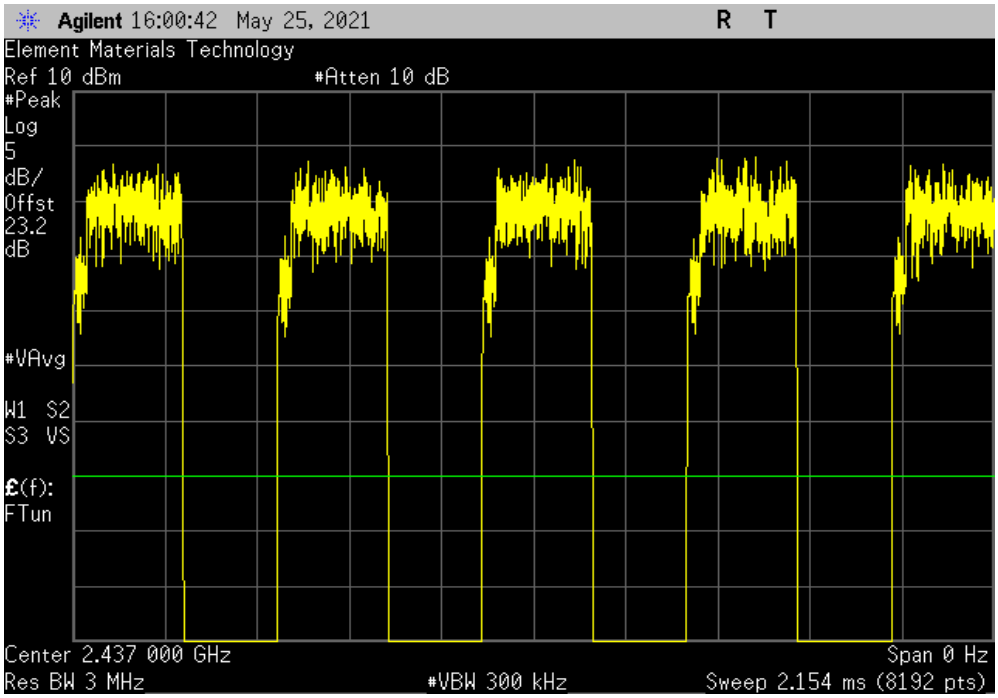
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS7 , Mid Channel 4/8, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	256 us	478.6 us	1	53.5	N/A	N/A



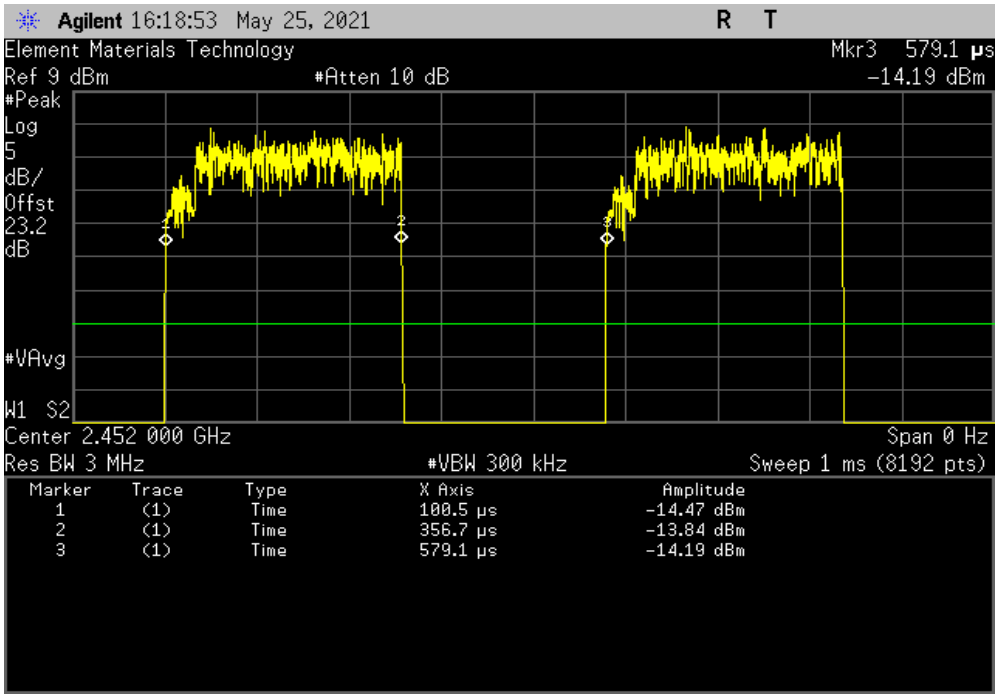
2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS7 , Mid Channel 4/8, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



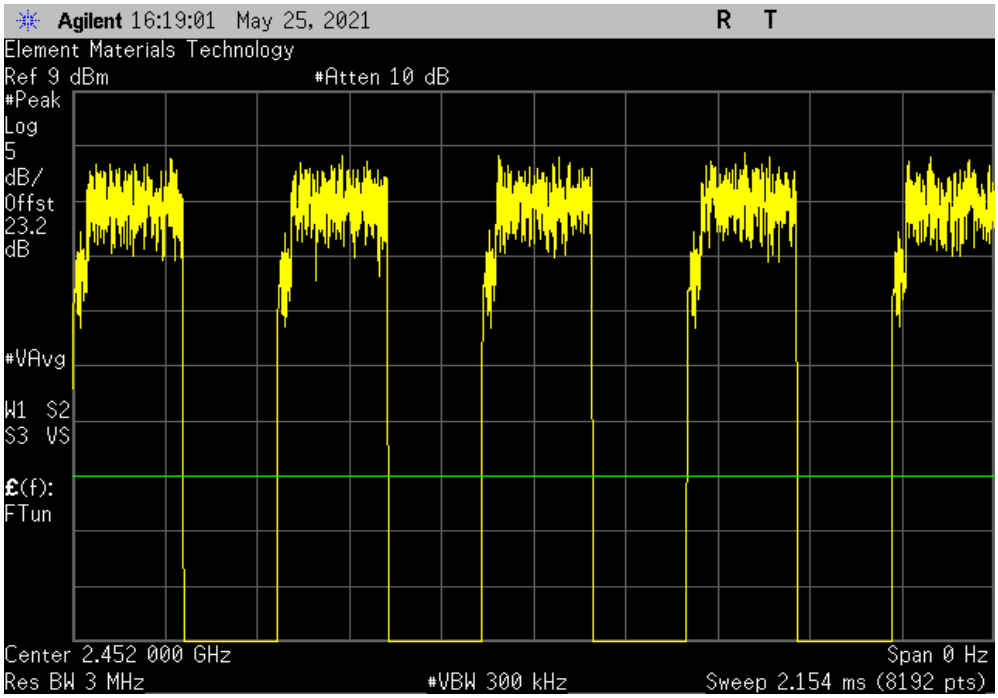
DUTY CYCLE

TbtTx 2021.03.19.1 XMit 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS7 , High Channel 7/11, 2452 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	256.2 us	478.6 us	1	53.5	N/A	N/A



2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS7 , High Channel 7/11, 2452 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



DTS BANDWIDTH

XMit 2022.02.07.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5182B	TFU	2020-11-20	2022-11-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2022-03-14	2023-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2022-03-15	2023-03-15
Block - DC	Fairview Microwave	SD3379	AMW	2022-03-14	2023-03-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2021-07-06	2022-07-06

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

TbtTx 2021.12.14.1 XMit 2022.02.07.0

EUT:	SHOUT sp Handheld Iridium Smartphone	Work Order:	PCTE0003
Serial Number:	FCC3	Date:	18-May-22
Customer:	NAL Research Corporation	Temperature:	22.6 °C
Attendees:	None	Humidity:	43.3% RH
Project:	None	Barometric Pres.:	1025 mbar
Tested by:	Jeff Alcoke	Power: 5.0 VDC via USB	Job Site: EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2022	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

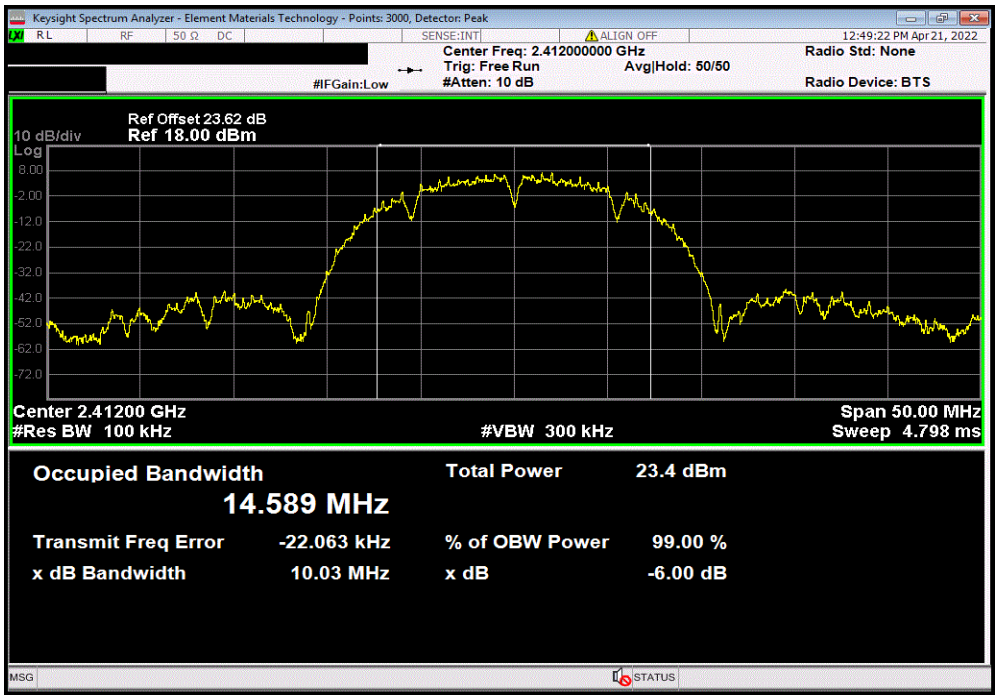
Configuration #	12	Signature

	Value	Limit (>)	Result
2400 MHz - 2483.5 MHz Band			
20 MHz			
802.11(b) 1 Mbps			
Low Channel 1, 2412 MHz	10.03 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	10.028 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	10.028 MHz	500 kHz	Pass
802.11(b) 11 Mbps			
Low Channel 1, 2412 MHz	10.219 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	9.89 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	9.632 MHz	500 kHz	Pass
802.11(g) 6 Mbps			
Low Channel 1, 2412 MHz	16.304 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	16.303 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	16.036 MHz	500 kHz	Pass
802.11(g) 36 Mbps			
Low Channel 1, 2412 MHz	15.002 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	14.813 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	15.055 MHz	500 kHz	Pass
802.11(g) 54 Mbps			
Low Channel 1, 2412 MHz	15.109 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	15.324 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	14.42 MHz	500 kHz	Pass
802.11(n) MCS0			
Low Channel 1, 2412 MHz	15.508 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	16.835 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	16.122 MHz	500 kHz	Pass
802.11(n) MCS7			
Low Channel 1, 2412 MHz	13.58 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	15.399 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	13.275 MHz	500 kHz	Pass
40 MHz			
802.11(n) MCS0			
Low Channel 1/5, 2422 MHz	33.818 MHz	500 kHz	Pass
Mid Channel 4/8, 2437 MHz	26.983 MHz	500 kHz	Pass
High Channel 7/11, 2452 MHz	33.788 MHz	500 kHz	Pass
802.11(n) MCS7			
Low Channel 1/5, 2422 MHz	33.815 MHz	500 kHz	Pass
Mid Channel 4/8, 2437 MHz	35.049 MHz	500 kHz	Pass
High Channel 7/11, 2452 MHz	32.605 MHz	500 kHz	Pass

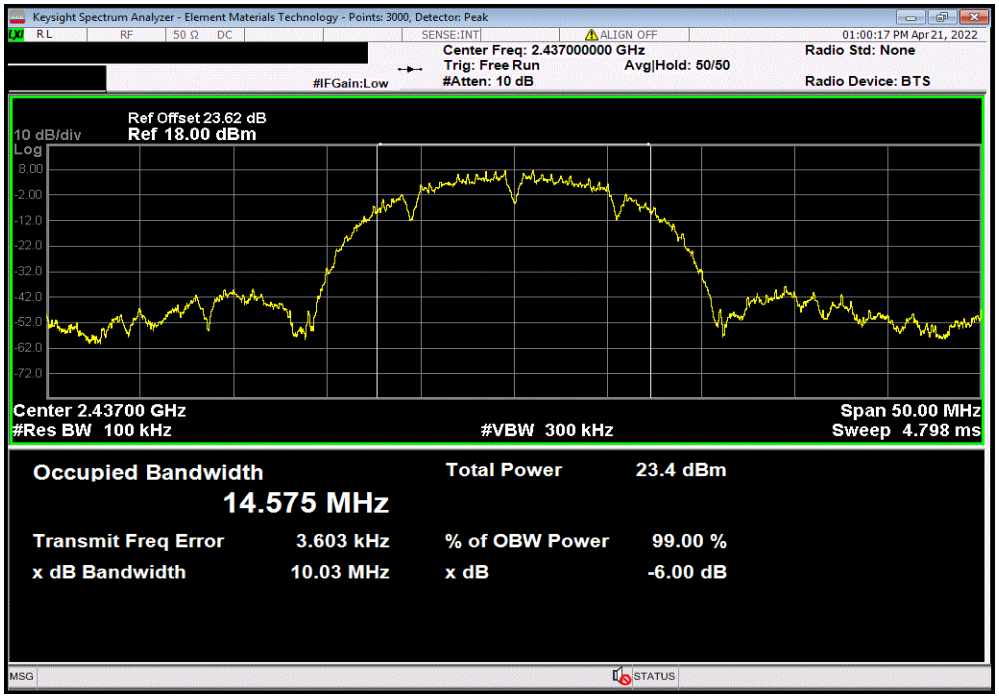
DTS BANDWIDTH

TbtTx 2021.12.14.1 XMit 2022.02.07.0

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



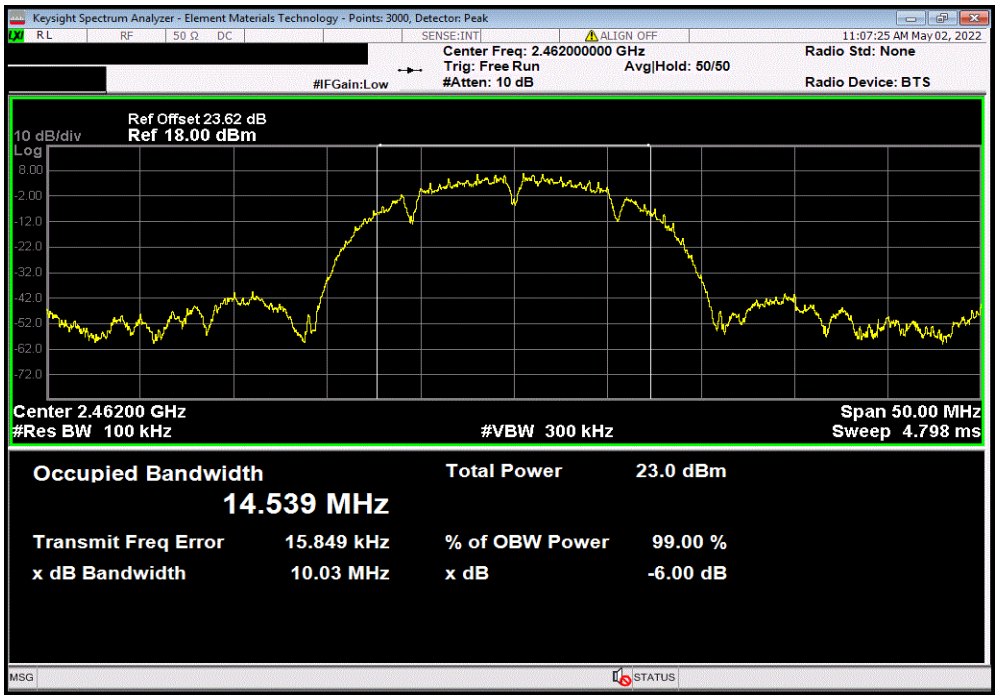
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit (>)	Result
				10.028 MHz	500 kHz	Pass



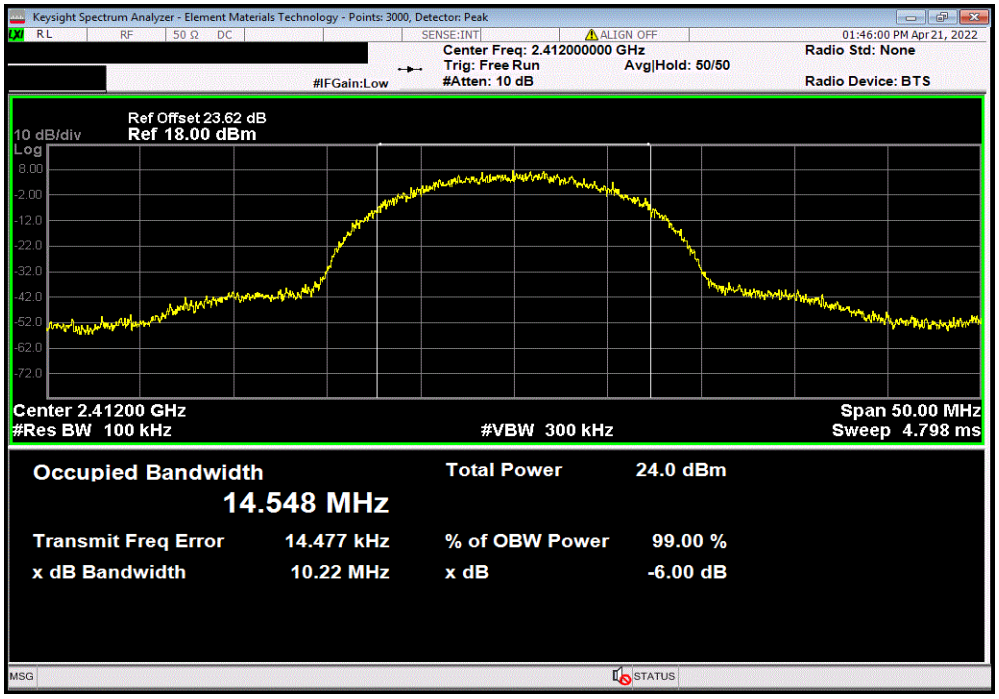
DTS BANDWIDTH

TbtTx 2021.12.14.1 XMit 2022.02.07.0

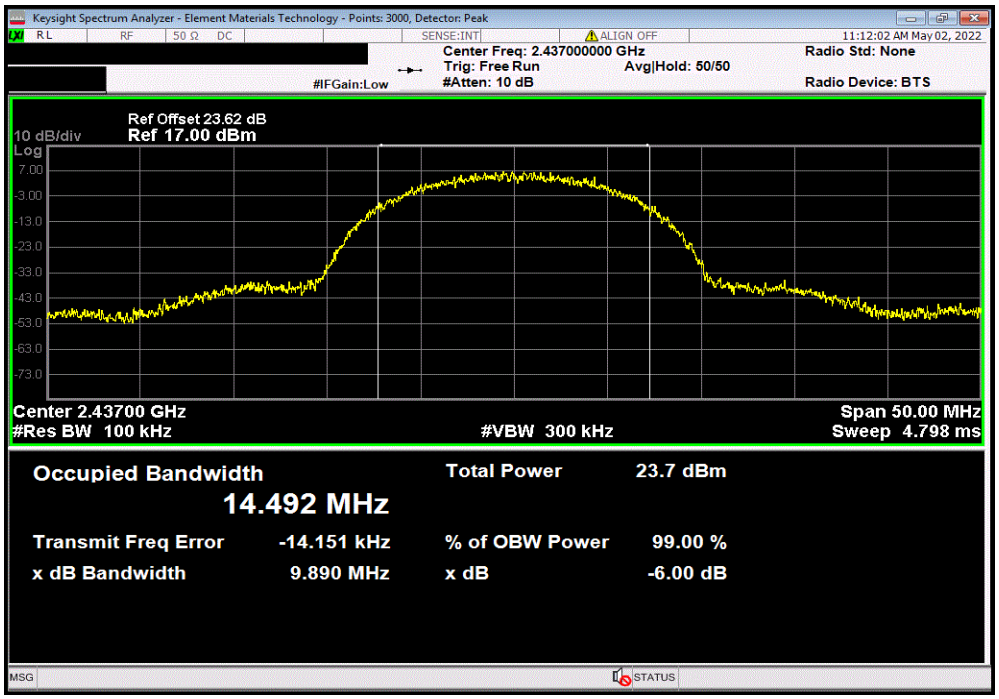
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
				Value	Limit (>)	Result
				10.028 MHz	500 kHz	Pass



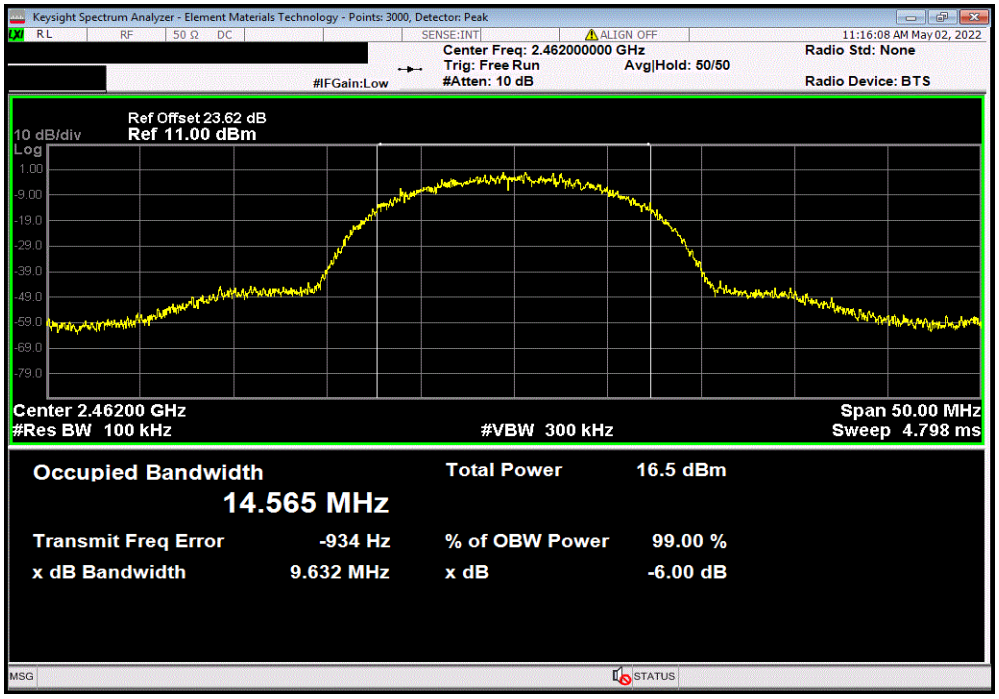
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit (>)	Result
				10.219 MHz	500 kHz	Pass



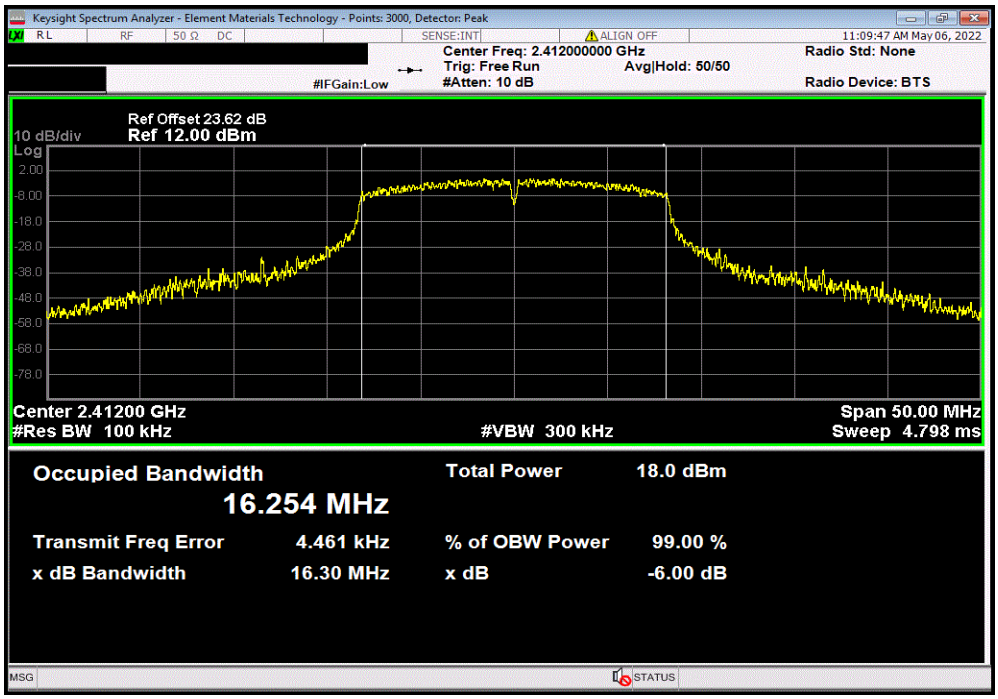
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit (>)	Result
				9.89 MHz	500 kHz	Pass



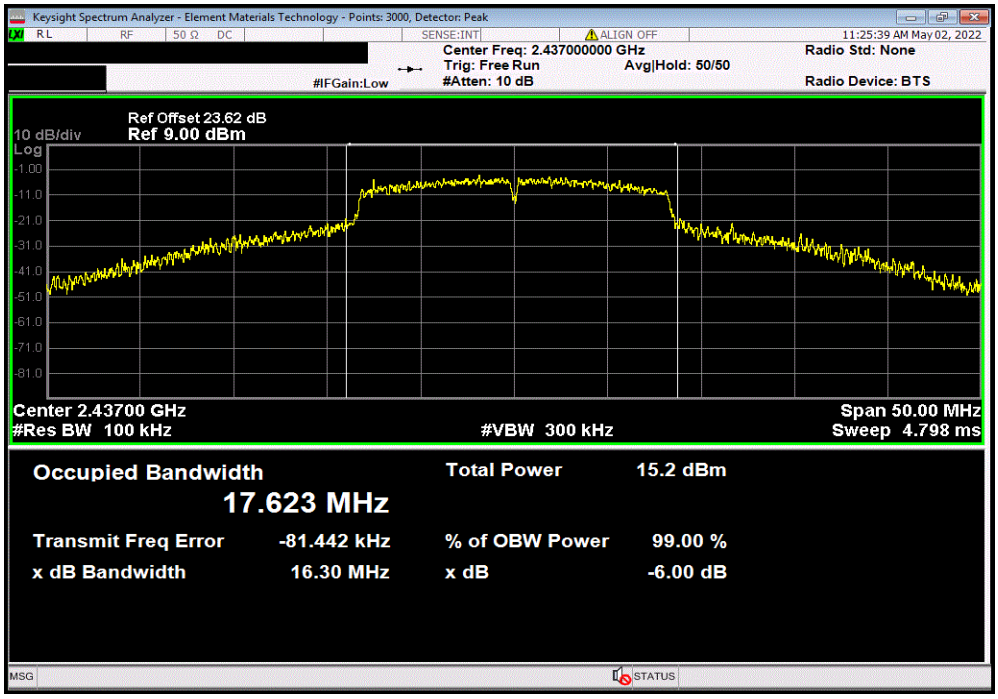
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
				Value	Limit (>)	Result
				9.632 MHz	500 kHz	Pass



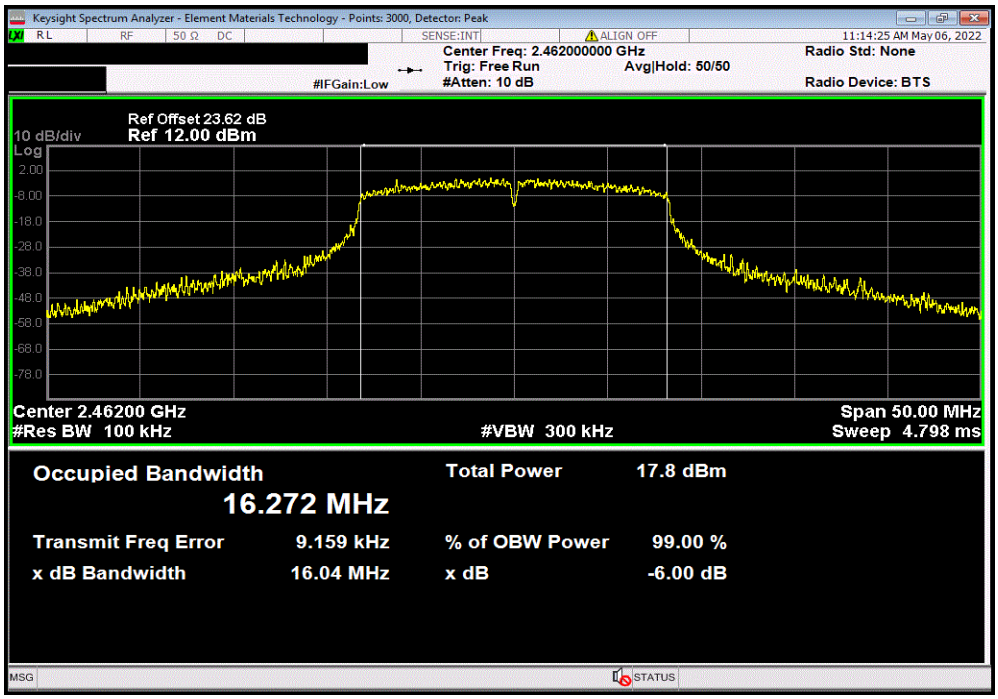
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit (>)	Result
				16.304 MHz	500 kHz	Pass



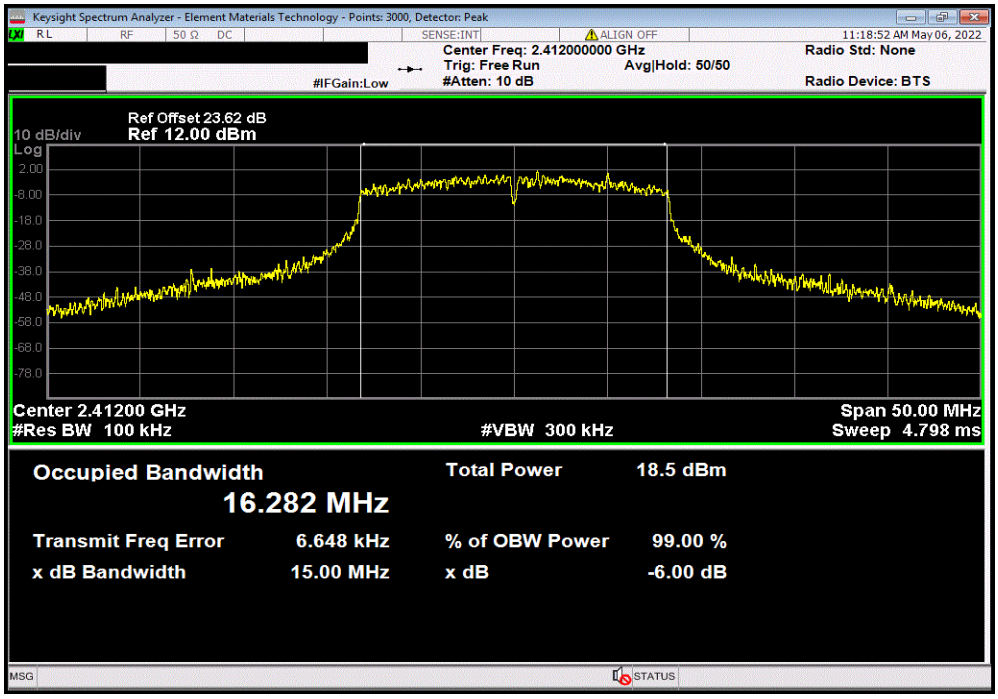
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit (>)	Result
				16.303 MHz	500 kHz	Pass



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



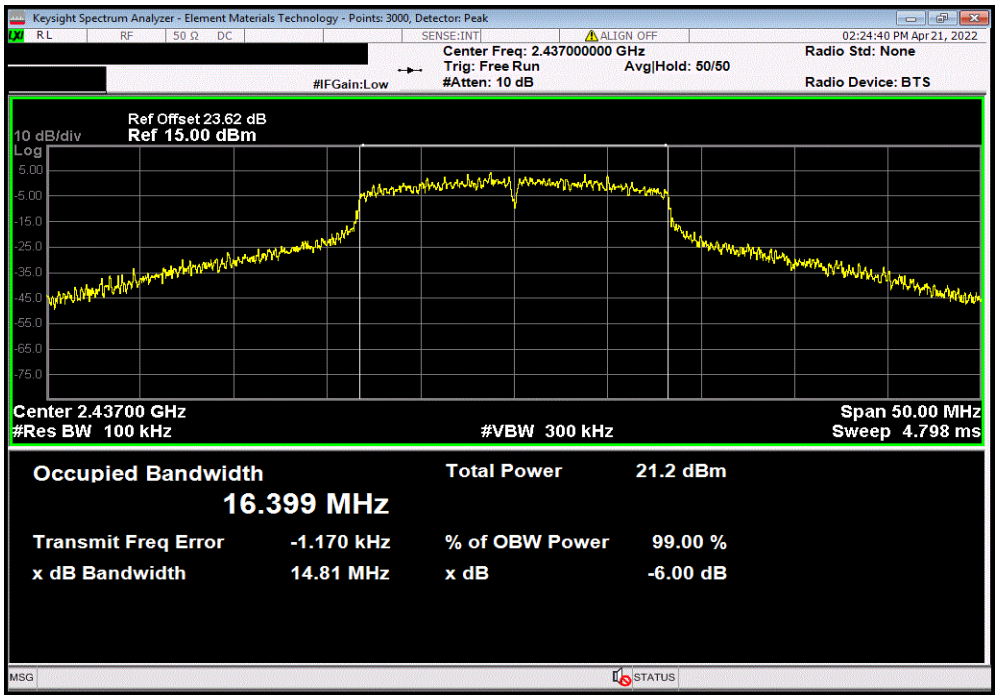
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit (>)	Result
				15.002 MHz	500 kHz	Pass



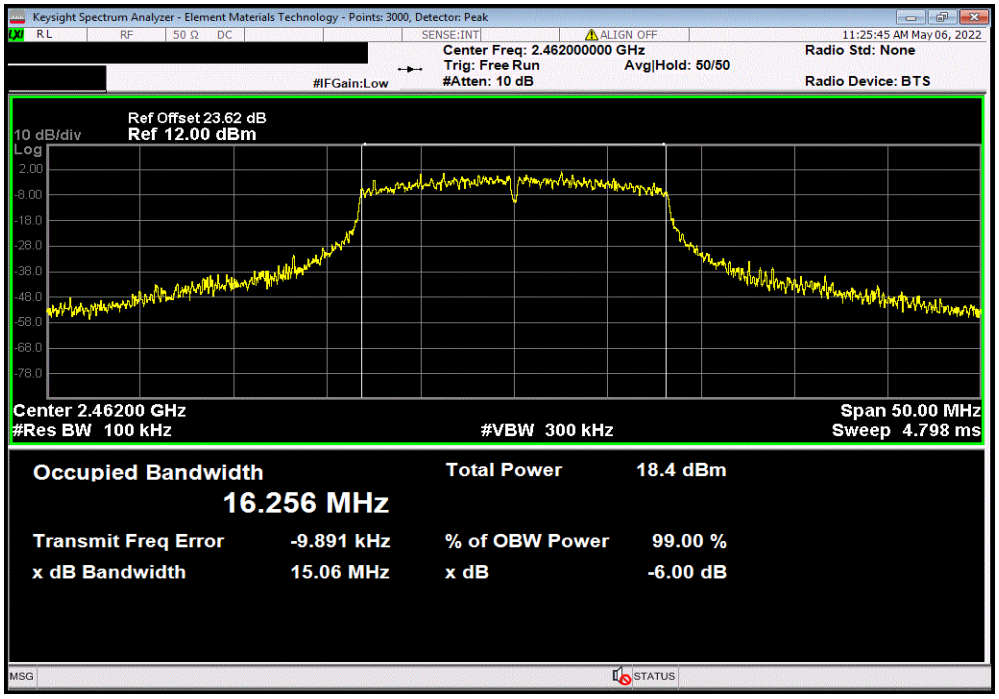
DTS BANDWIDTH

TbtTx 2021.12.14.1 XMit 2022.02.07.0

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



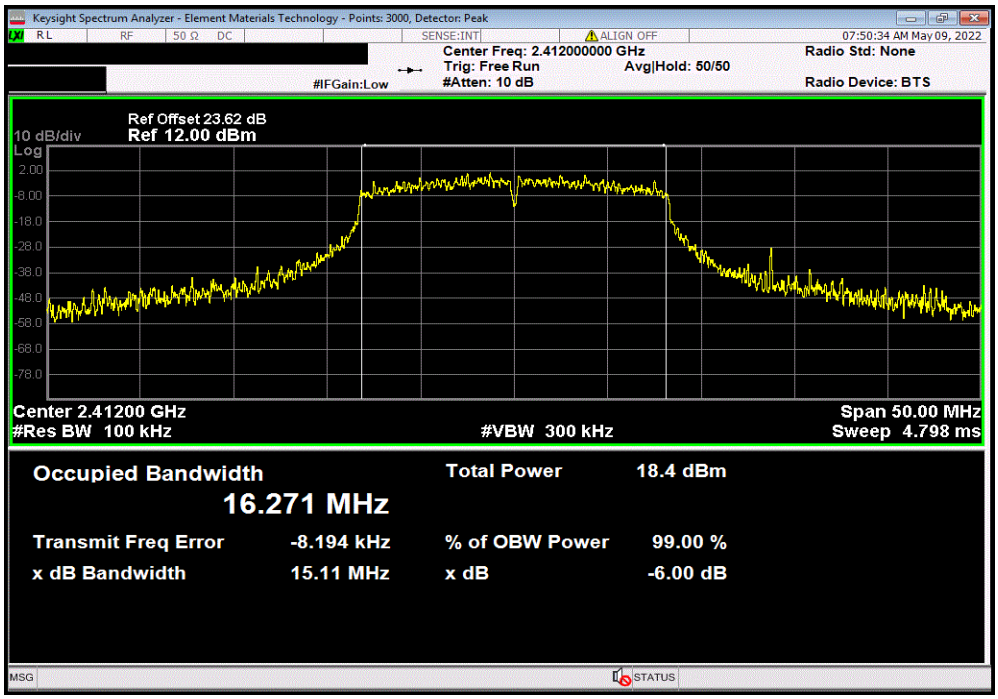
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
				Value	Limit (>)	Result
				15.055 MHz	500 kHz	Pass



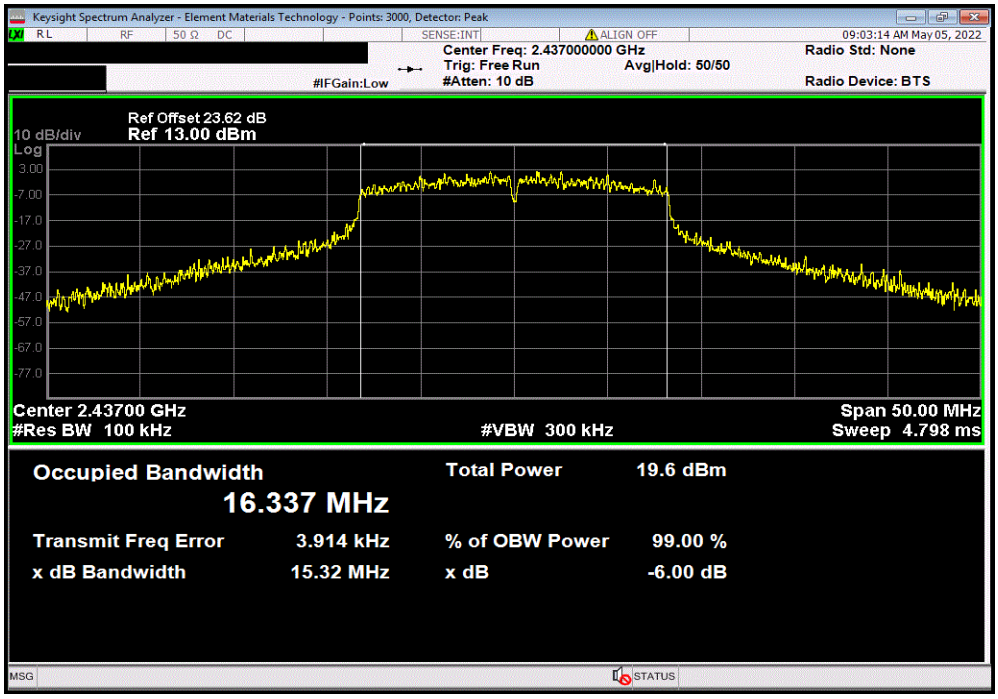
DTS BANDWIDTH

TbtTx 2021.12.14.1 XMit 2022.02.07.0

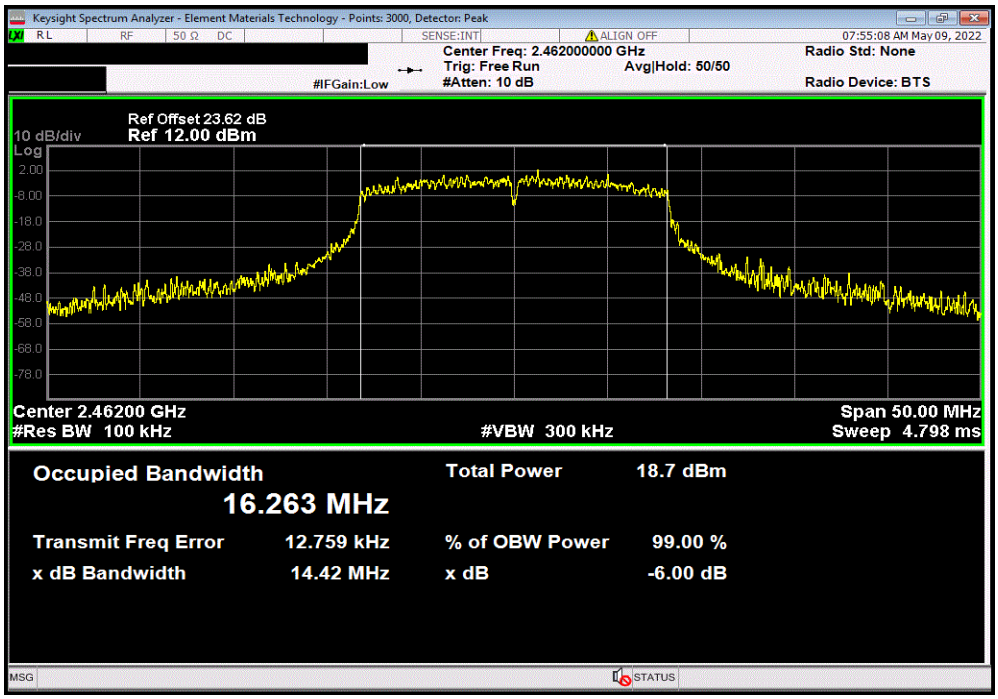
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit (>)	Result
				15.109 MHz	500 kHz	Pass



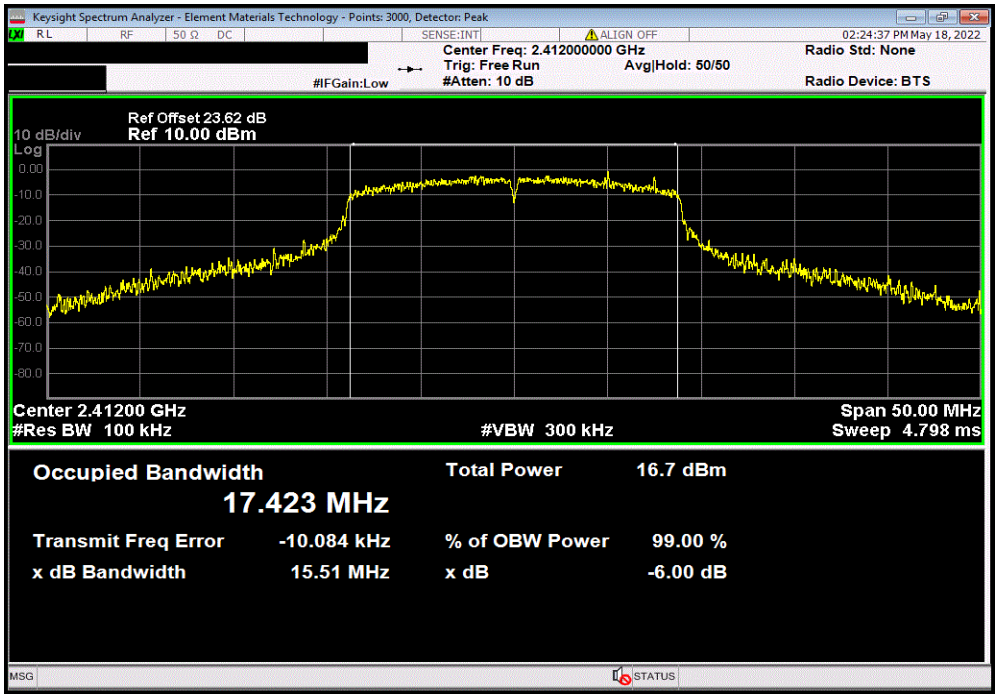
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit (>)	Result
				15.324 MHz	500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
				Value	Limit (>)	Result
				14.42 MHz	500 kHz	Pass

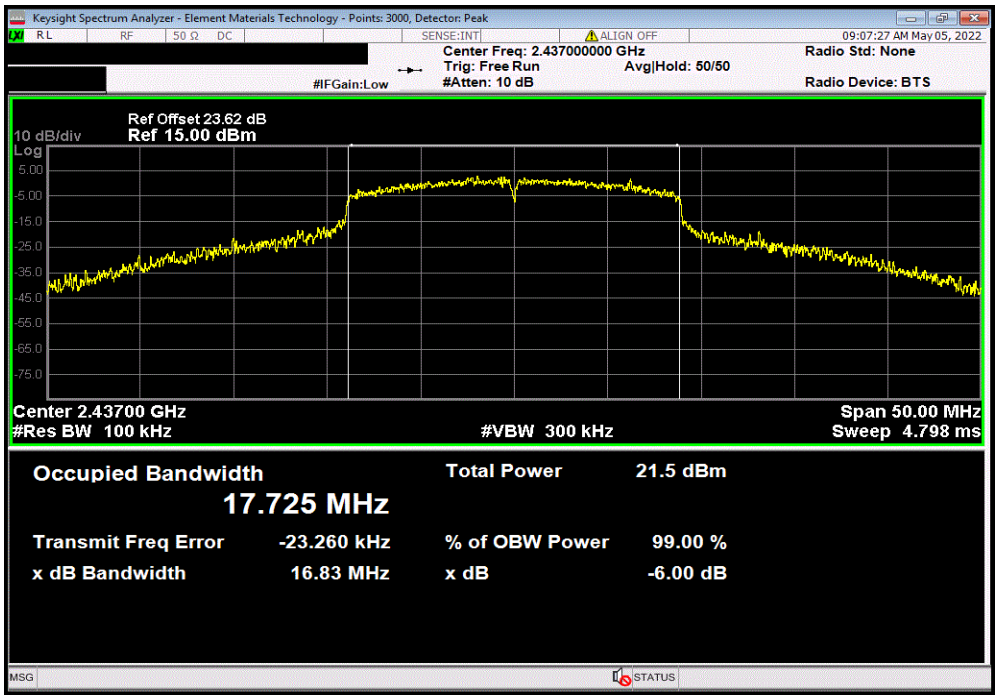


2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
				Value	Limit (>)	Result
				15.508 MHz	500 kHz	Pass

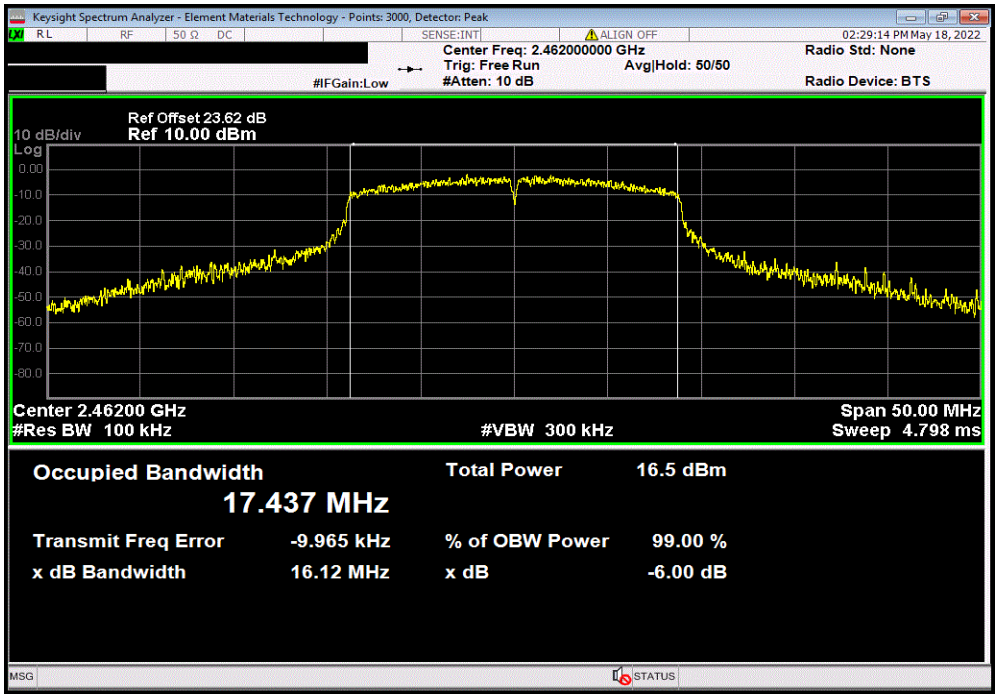


DTS BANDWIDTH

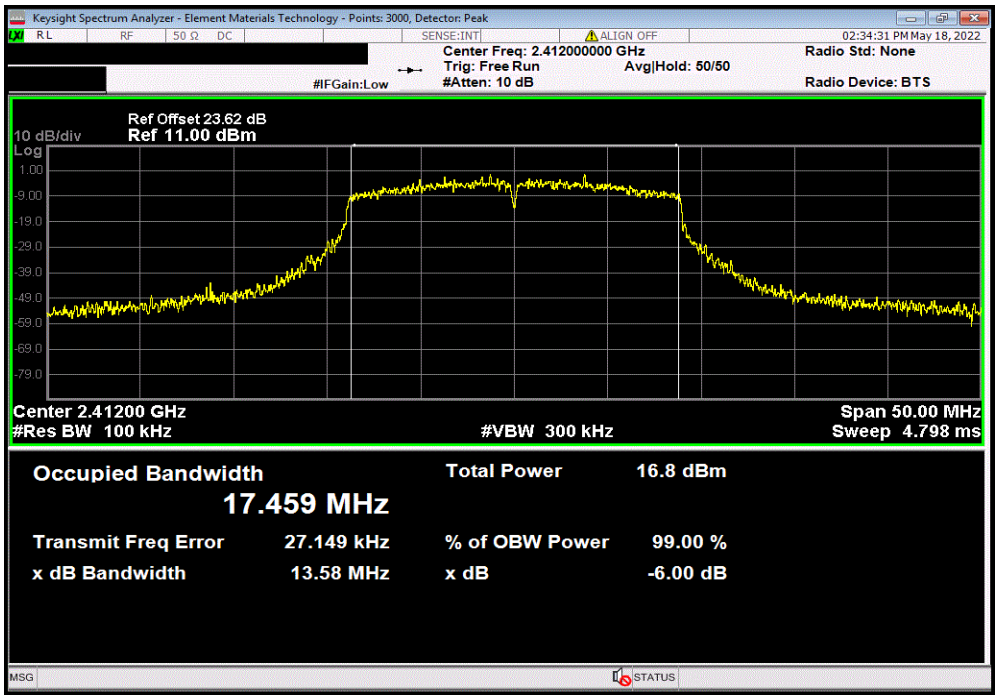
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
				Value	Limit (>)	Result
				16.835 MHz	500 kHz	Pass



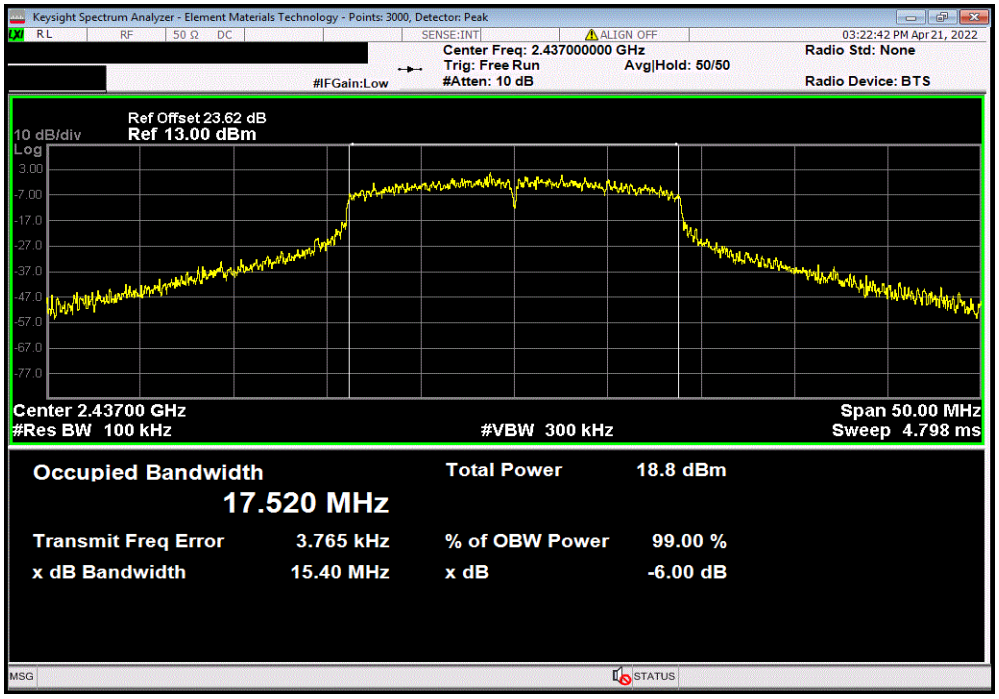
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS0, High Channel 11, 2462 MHz						
				Value	Limit (>)	Result
				16.122 MHz	500 kHz	Pass



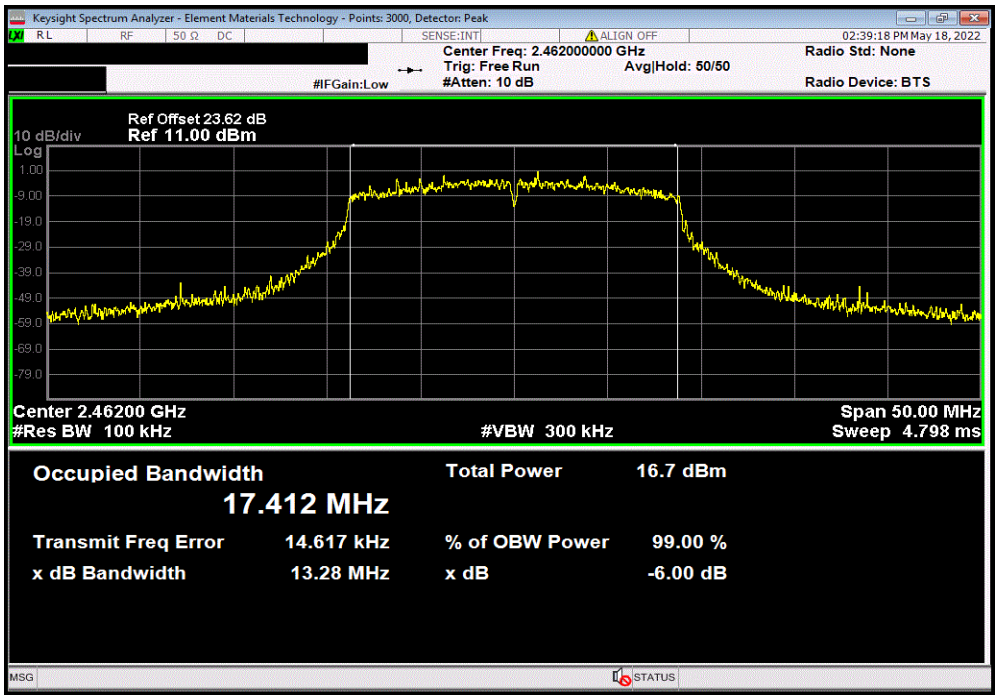
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
				Value	Limit (>)	Result
				13.58 MHz	500 kHz	Pass



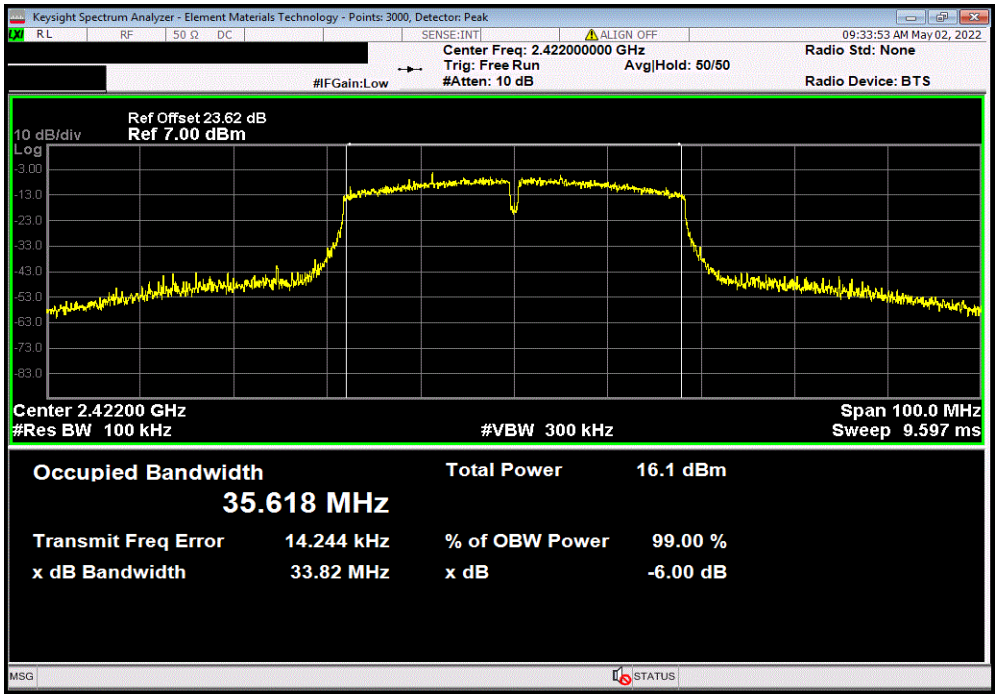
2400 MHz - 2483.5 MHz Band, 20 MHz, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
				Value	Limit (>)	Result
				15.399 MHz	500 kHz	Pass



2400 MHz - 483.5 MHz Band, 20 MHz, 802.11(n) MCS7, High Channel 11, 2462 MHz						
				Value	Limit (>)	Result
				13.275 MHz	500 kHz	Pass

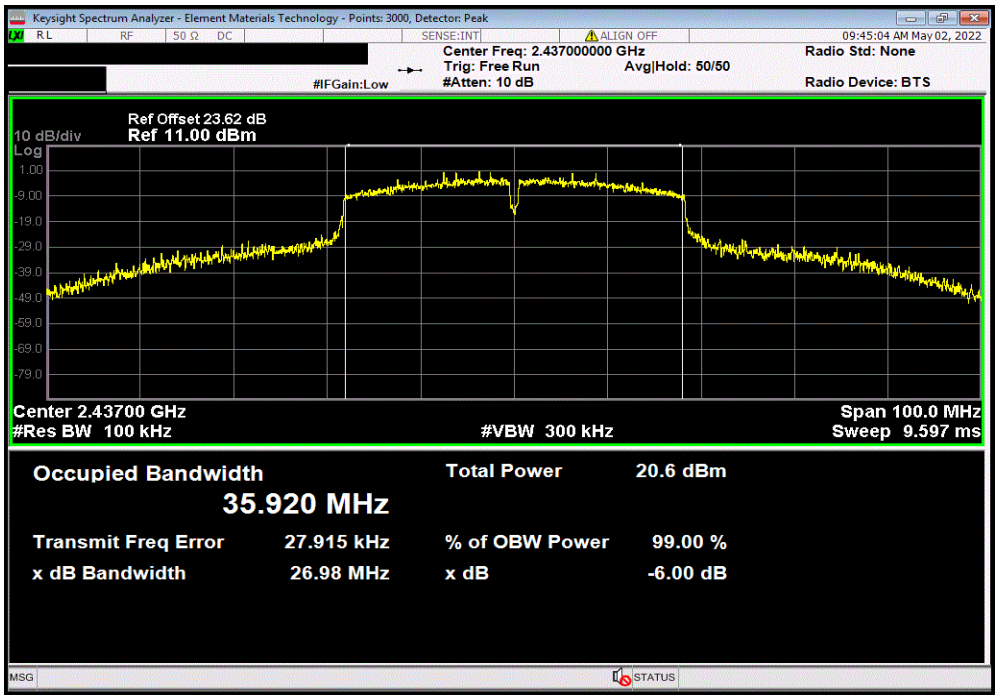


2400 MHz - 483.5 MHz Band, 40 MHz, 802.11(n) MCS0 , Low Channel 1/5, 2422 MHz						
				Value	Limit (>)	Result
				33.818 MHz	500 kHz	Pass

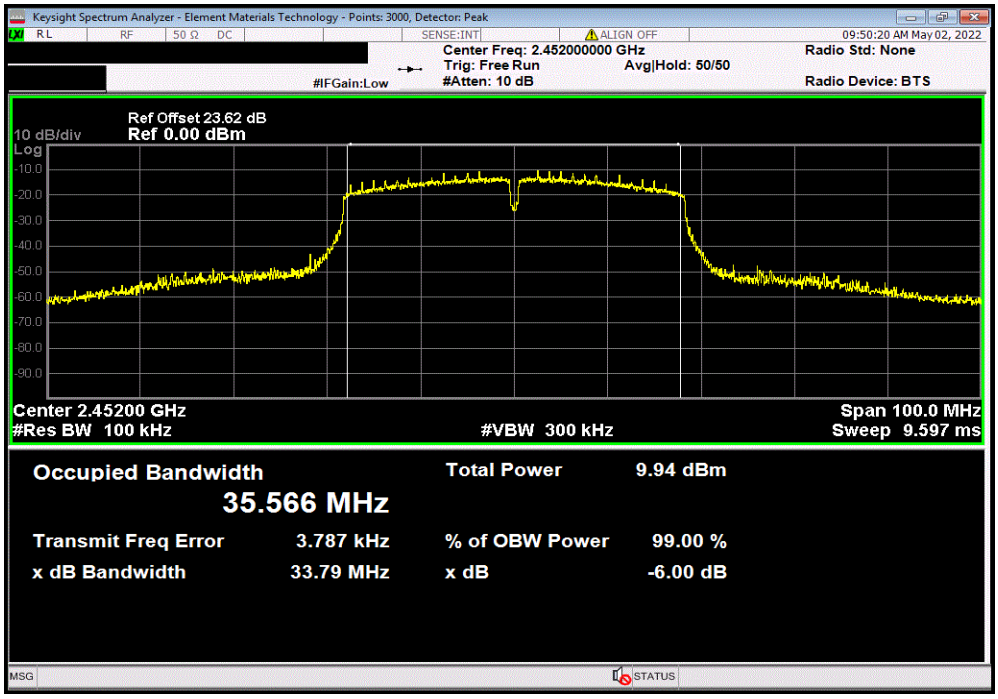


DTS BANDWIDTH

2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS0 , Mid Channel 4/8, 2437 MHz						
				Value	Limit (>)	Result
				26.983 MHz	500 kHz	Pass



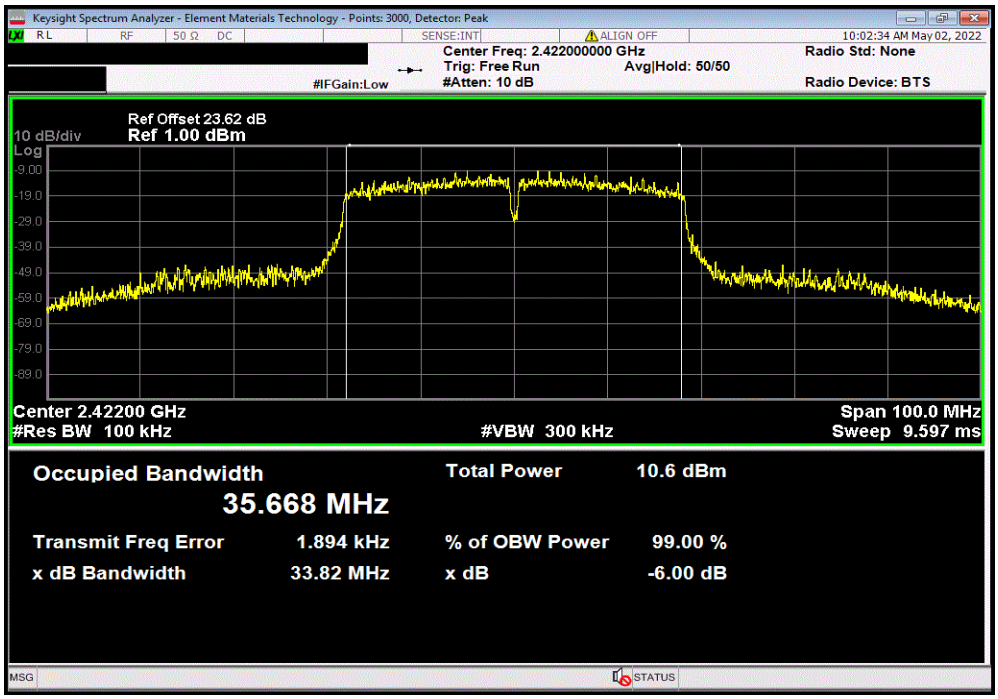
2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS0 , High Channel 7/11, 2452 MHz						
				Value	Limit (>)	Result
				33.788 MHz	500 kHz	Pass



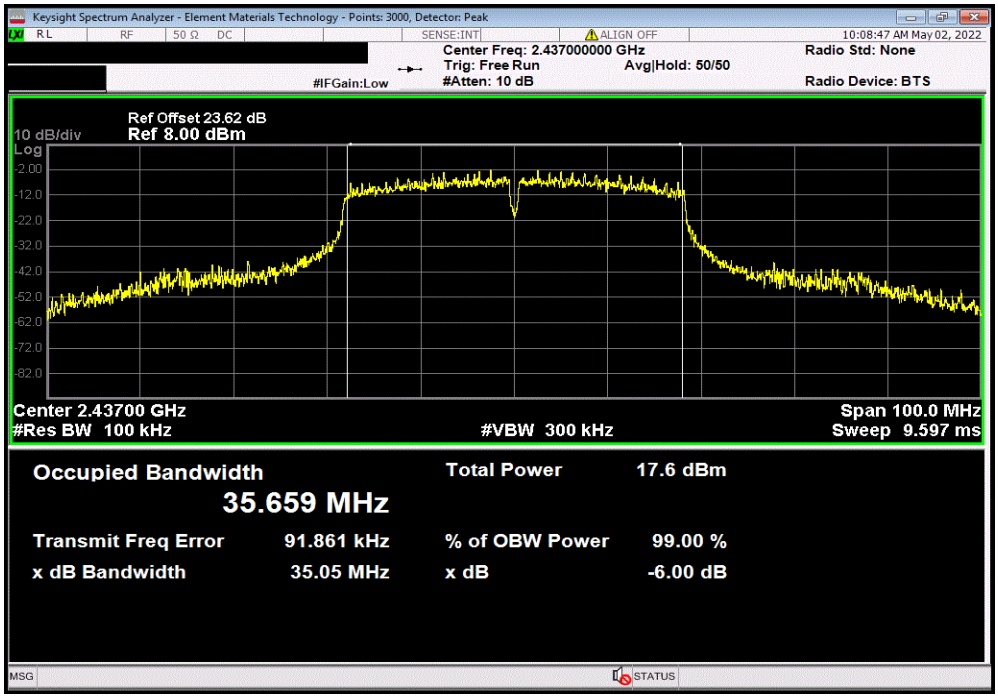
DTS BANDWIDTH

TbtTx 2021.12.14.1 XMit 2022.02.07.0

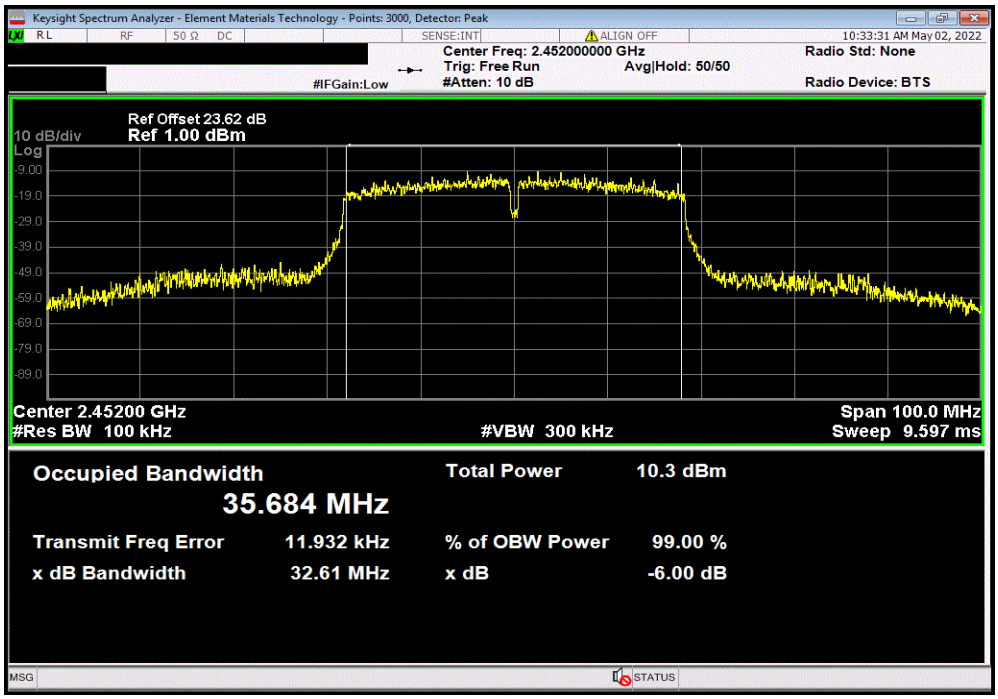
2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS7 , Low Channel 1/5, 2422 MHz						
				Value	Limit (>)	Result
				33.815 MHz	500 kHz	Pass



2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS7 , Mid Channel 4/8, 2437 MHz						
				Value	Limit (>)	Result
				35.049 MHz	500 kHz	Pass



DTS BANDWIDTH

TbtTx 2021.12.14.1 XMit 2022.02.07.0

2400 MHz - 2483.5 MHz Band, 40 MHz, 802.11(n) MCS7 , High Channel 7/11, 2452 MHz						
				Value	Limit (>)	Result
				32.605 MHz	500 kHz	Pass