Electric Imp, Inc.

IMP004M

FCC 15.247:2017

802.11bgn SISO Radio

Report # ELIM0013

NVLAP Lab Code: 200676-0

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

CERTIFICATE OF TEST

Last Date of Test: June 6, 2017
Electric Imp, Inc.
Model: IMP004M

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2017	ANSI C63.10:2013, KDB 558074

Results

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

Deviations From Test Standards

None

Approved By:

Victor Ratinoff, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS

2017.5.15

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Element to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with ISED.

European Union

European Commission – Validated by the European Commission as a Notified Body under the R&TTE Directive. Within Element, we have a EU Notified Body validated for the EMCD and RED Directives.

Australia/New Zealand

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

Korea

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

Japan

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

Taiwan

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

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

Singapore

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

Israel

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

Hong Kong

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

Vietnam

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

SCOPE

For details on the Scopes of our Accreditations, please visit:
http://portlandcustomer.element.com/ts/scope/scope.htm
http://gsi.nist.gov/global/docs/cabs/designations.html

MEASUREMENT UNCERTAINTY

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.

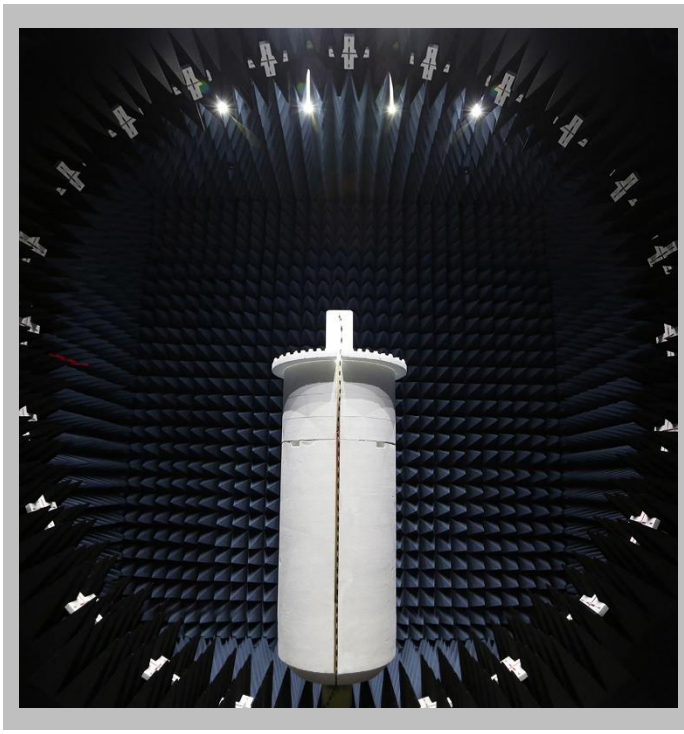
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable test description page. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

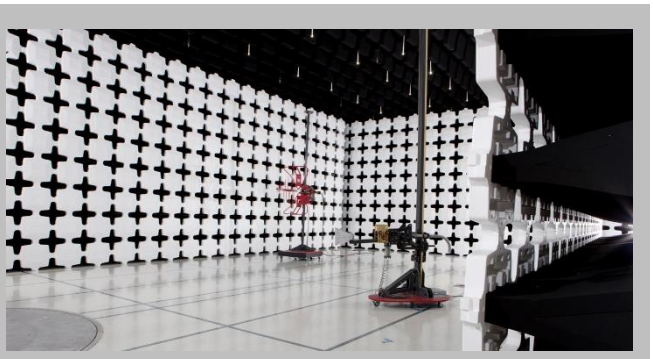
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

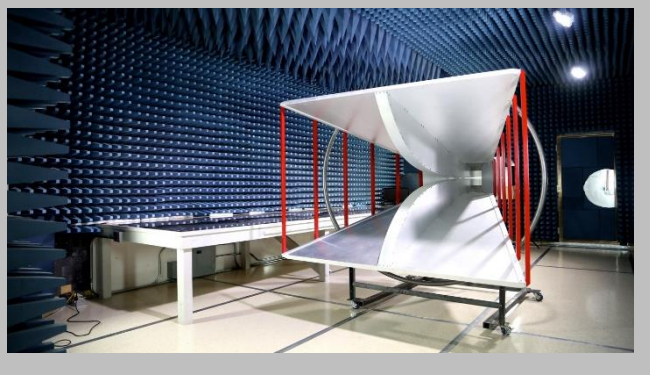
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

FACILITIES

California	Minnesota	New York	Oregon	Texas	Washington
Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Labs EV01-12 22975 NW Evergreen Pkwy 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
NVLAP					
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
Innovation, Science and Economic Development Canada					
2834B-1, 2834B-3	2834E-1	N/A	2834D-1, 2834D-*2*	2834G-1	2834F-1
BSMI					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157

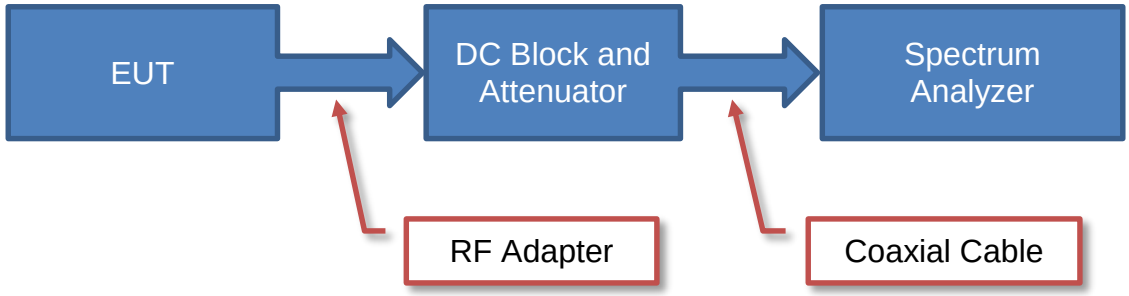




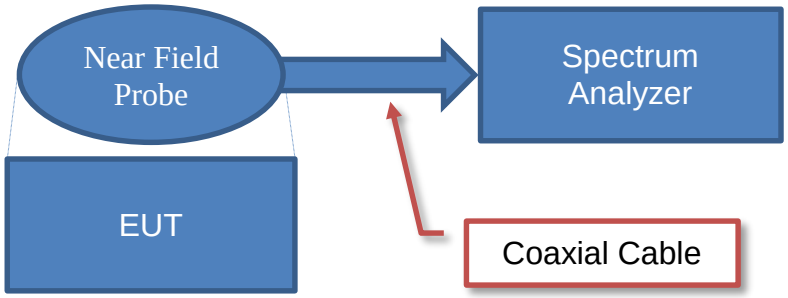


Test Setup Block Diagrams

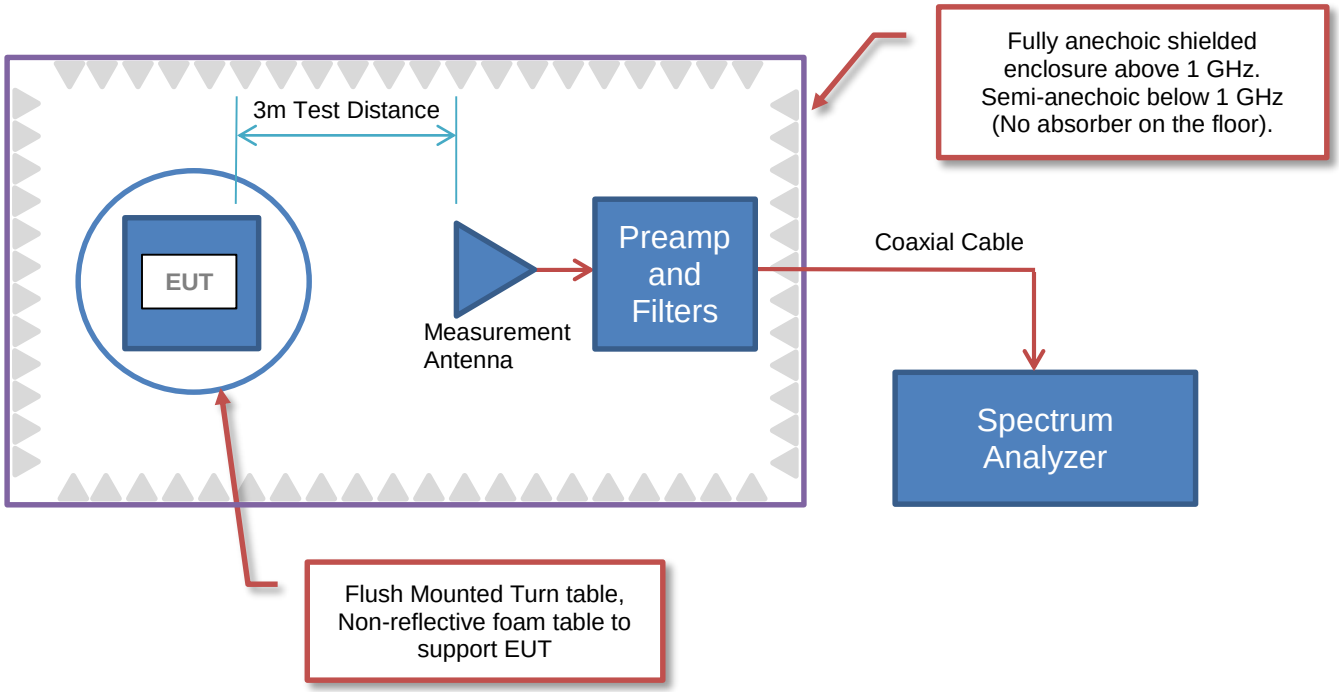
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



Spurious Radiated Emissions



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	Electric Imp, Inc.
Address:	5150 El Camino Real, Ste C-31
City, State, Zip:	Los Altos, CA 94022
Test Requested By:	Hugo Fiennes
Model:	IMP004M
First Date of Test:	May 26, 2017
Last Date of Test:	June 6, 2017
Receipt Date of Samples:	May 23, 2017
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
802.11bgn SISO radio WiFi module with added Bluetooth radio, with embedded OS that works with the Electric Imp cloud to allow internet connectivity for devices that use this WiFi/BT module.

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

CONFIGURATIONS

Configuration ELIM0013- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
WiFi Radio Module	Murata	IMP004M	IMP0107

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Host Laptop	HP	15-ba009dx	CND71420K3
Laptop Power Supply	HP	HSTNN-DA40	1WFTLD0CAR63O5H

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable	Yes	2.0m	No	USB Extension	WiFi Radio Module
AC Cable	No	1.1m	No	AC Mains	Laptop Power Supply
DC Cable	No	2.0m	No	Host Laptop	Laptop Power Supply

Configuration ELIM0013- 2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
WiFi Radio Module	Murata	IMP004M	IMP0107

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Host Laptop	HP	15-ba009dx	CND71420K3
Laptop Power Supply	HP	HSTNN-DA40	1WFTLD0CAR63O5H

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable	Yes	2.0m	No	USB Extension	WiFi Radio Module
AC Cable	No	1.1m	No	AC Mains	Laptop Power Supply
DC Cable	No	2.0m	No	Host Laptop	Laptop Power Supply
USB Extension Cable	No	2.0m	No	Host Laptop	USB Cable

CONFIGURATIONS

Configuration ELIM0013- 3

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
WiFi Radio Module	Murata	IMP004M	IMP0107

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Host Laptop	HP	15-ba009dx	CND71420K3
Laptop Power Supply	HP	HSTNN-DA40	1WFTLD0CAR63O5H
DC Power Supply	HQ Power	PS3003U	DK10103872

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable	Yes	2.0m	No	USB Extension	WiFi Radio Module
AC Cable	No	1.1m	No	AC Mains	Laptop Power Supply
DC Cable	No	2.0m	No	Host Laptop	Laptop Power Supply
AC Cable	No	1.8m	No	AC Mains	DC Power Supply
DC Cables	No	1.0m	No	WiFi Radio Module	DC Power Supply

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	5/26/2017	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	5/31/2017	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	5/31/2017	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	5/31/2017	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.
5	5/31/2017	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.
6	5/31/2017	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	5/31/2017	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.
8	6/6/2017	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

PSA-ESCI 2017.01.26

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.

MODES OF OPERATION

Transmitting 802.11(b) at Mid Ch 6-2437MHz

POWER SETTINGS INVESTIGATED

3.3VDC

CONFIGURATIONS INVESTIGATED

ELIM0013 - 3

SAMPLE CALCULATIONS

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable - Conducted Cable Assembly	Element	OCP, HFP, AWC	OCPA	3/28/2017	12 mo
LISN	Solar Electronics	9252-50-24-BNC	LIB	1/25/2017	12 mo
LISN	Solar Electronics	9252-50-24-BNC	LIA	2/17/2017	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	4/25/2017	12 mo

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

Measurements were made using the bandwidths and detectors specified. No video filter was used.

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

The EUT will be powered either directly or indirectly from the AC power line. Therefore, conducted emissions measurements were made on the AC input of the EUT, or on the AC input of the device used to power the EUT.

The EUT was transmitting at its maximum data rate. For each mode, the spectrum was scanned from 150 kHz to 30 MHz. 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.

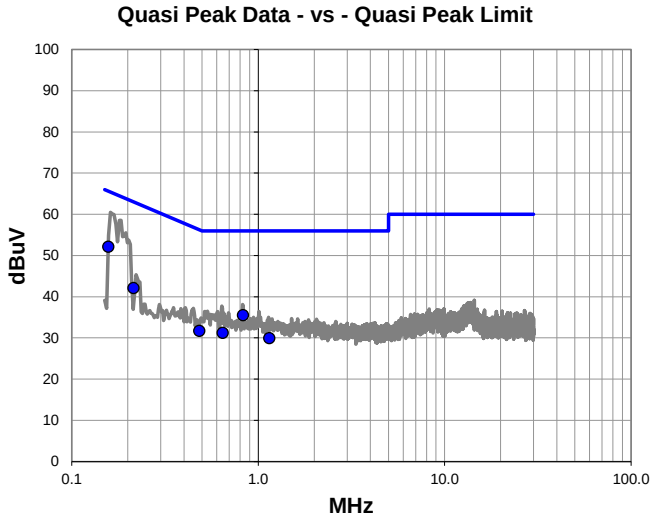
POWERLINE CONDUCTED EMISSIONS

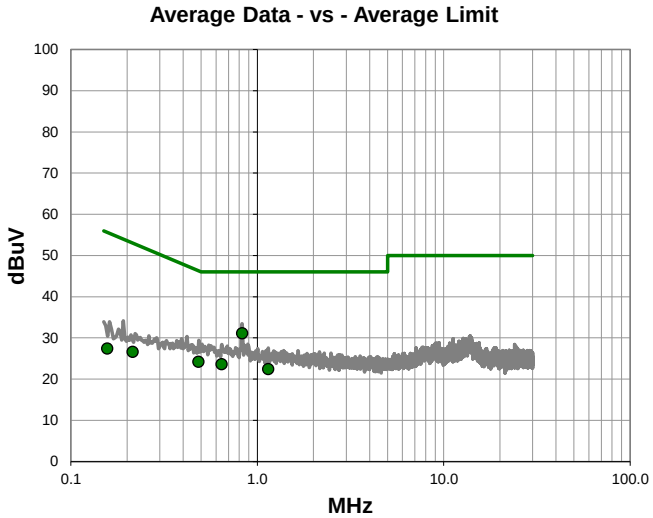
EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	ELIM0013	**Date:**	06/06/17		
Project:	None	**Temperature:**	22.6 °C		
Job Site:	OC06	**Humidity:**	48.3% RH		
Serial Number:	IMP0107	**Barometric Pres.:**	1015 mbar	**Tested by:**	Mark Baytan
EUT:	IMP004M				
Configuration:	3				
Customer:	Electric Imp, Inc.				
Attendees:	None				
EUT Power:	3.3VDC				
Operating Mode:	Transmitting 802.11(b) at Mid Ch 6-2437MHz				
Deviations:	None				
Comments:	Board powered through external DC power supply.				

Test Specifications	**Test Method**
FCC 15.207:2017	ANSI C63.10:2013

Run #	2	**Line:**	High Line	**Ext. Attenuation:**	0	**Results**	Pass





Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.157	31.9	20.2	52.1	65.6	-13.5
0.828	15.5	20.0	35.5	56.0	-20.5
0.214	22.0	20.1	42.1	63.0	-20.9
0.483	11.7	20.0	31.7	56.3	-24.6
0.644	11.2	20.0	31.2	56.0	-24.8
1.146	9.9	20.0	29.9	56.0	-26.1

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.828	11.1	20.0	31.1	46.0	-14.9
0.483	4.2	20.0	24.2	46.3	-22.1
0.644	3.6	20.0	23.6	46.0	-22.4
1.146	2.4	20.0	22.4	46.0	-23.6
0.214	6.5	20.1	26.6	53.0	-26.4
0.157	7.2	20.2	27.4	55.6	-28.2

POWERLINE CONDUCTED EMISSIONS

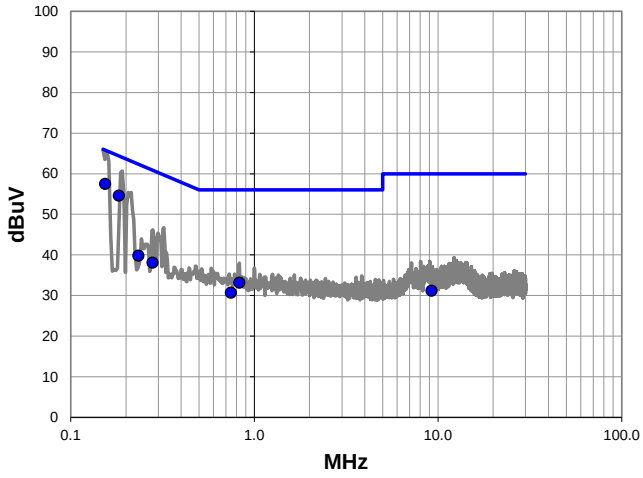
EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	ELIM0013	**Date:**	06/06/17		
Project:	None	**Temperature:**	22.6 °C		
Job Site:	OC06	**Humidity:**	48.3% RH		
Serial Number:	IMP0107	**Barometric Pres.:**	1015 mbar	**Tested by:**	Mark Baytan
EUT:	IMP004M				
Configuration:	3				
Customer:	Electric Imp, Inc.				
Attendees:	None				
EUT Power:	3.3VDC				
Operating Mode:	Transmitting 802.11(b) at Mid Ch 6-2437MHz				
Deviations:	None				
Comments:	Board powered through external DC power supply.				

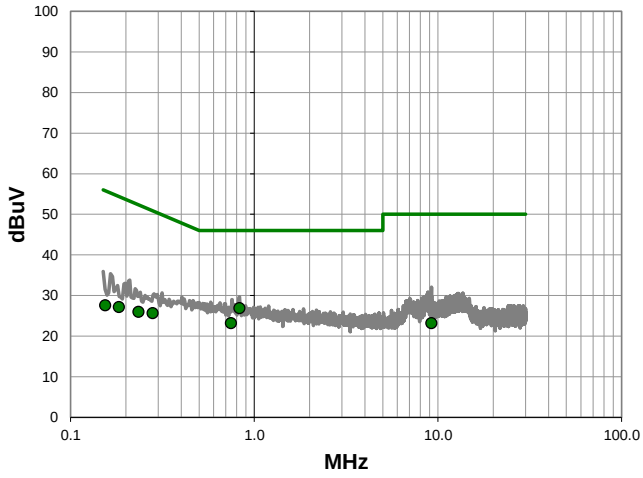
Test Specifications	**Test Method**
FCC 15.207:2017	ANSI C63.10:2013

Run #	3	**Line:**	Neutral	**Ext. Attenuation:**	0	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.154	37.3	20.2	57.5	65.8	-8.3
0.183	34.4	20.2	54.6	64.3	-9.7
0.234	19.7	20.1	39.8	62.3	-22.5
0.279	18.0	20.1	38.1	60.8	-22.7
0.828	13.2	20.0	33.2	56.0	-22.8
0.745	10.7	20.0	30.7	56.0	-25.3
9.209	10.8	20.4	31.2	60.0	-28.8

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.828	6.9	20.0	26.9	46.0	-19.1
0.745	3.2	20.0	23.2	46.0	-22.8
0.279	5.6	20.1	25.7	50.8	-25.1
0.234	5.9	20.1	26.0	52.3	-26.3
9.209	2.8	20.4	23.2	50.0	-26.8
0.183	7.0	20.2	27.2	54.3	-27.1
0.154	7.4	20.2	27.6	55.8	-28.2

SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2017.01.26

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Transmitting 802.11(b/g/n) at Low Ch 1-2412MHz, Mid Ch 6-2437MHz, High Ch 11-2462MHz

POWER SETTINGS INVESTIGATED

3.3VDC regulated down from USB 5V

CONFIGURATIONS INVESTIGATED

ELIM0013 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26500 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable	ESM Cable Corp.	8-18GHz cables	OCY	5/15/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	JSDWK42-18004000-60-5P	PAN	1/4/2017	12 mo
Cable	ESM Cable Corp.	1-8GHz cables	OCX	5/15/2017	12 mo
Cable	D-Coax	None	OC4	1/4/2017	12 mo
Antenna - Double Ridge	A.H. Systems, Inc.	SAS-574	AXV	5/3/2016	24 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVP	8/15/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVL	10/17/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVJ	8/15/2016	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIR	6/23/2016	24 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHX	NCR	0 mo
Antenna - Standard Gain	EMCO	3160-08	AHK	NCR	0 mo
Cable	ESM Cable Corp.	30-1GHz cables	OCW	5/15/2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	PAD	8/15/2016	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAY	10/25/2016	12 mo

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 at the edges of the allowable band may be presented in an alternative method as provided for in the ANSI C63.10 Marker-Delta method. This method involves performing an in-band fundamental measurement followed by a screen capture of the fundamental and out-of-band emission using reduced measurement instrumentation bandwidths. The amplitude delta measured on this screen capture is applied to the fundamental emission value to show the out-of-band emission level as applied to the limit.

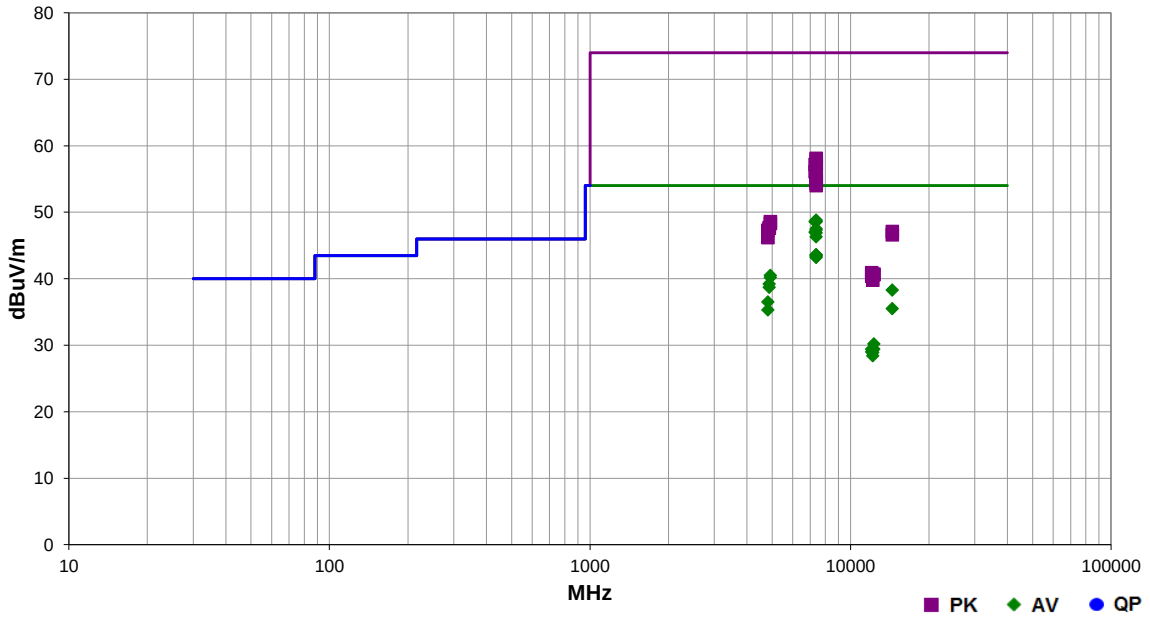
SPURIOUS RADIATED EMISSIONS

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	ELIM0013	**Date:**	05/26/17		
Project:	None	**Temperature:**	22.8 °C		
Job Site:	OC07	**Humidity:**	44.7% RH		
Serial Number:	0107	**Barometric Pres.:**	1018 mbar	**Tested by:**	Mike Tran
EUT:	IMP004M				
Configuration:	1				
Customer:	Electric Imp, Inc.				
Attendees:	Jonathan Dillon				
EUT Power:	3.3VDC regulated down from USB 5V				
Operating Mode:	Transmitting 802.11(b/g/n) at Low Ch 1-2412MHz, Mid Ch 6-2437MHz, High Ch 11-2462MHz				
Deviations:	None				
Comments:	Default TX power				

Test Specifications	**Test Method**
FCC 15.247:2017	ANSI C63.10:2013

Run #	75	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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
7385.130	37.4	11.4	1.0	216.0	3.0	0.0	Horz	AV	0.0	48.8	54.0	-5.2	EUT Hor, High Ch 11, 1Mbps
7384.930	37.2	11.4	1.0	132.0	3.0	0.0	Vert	AV	0.0	48.6	54.0	-5.4	EUT Hor, High Ch 11, 1Mbps
7385.095	37.2	11.4	1.0	353.0	3.0	0.0	Horz	AV	0.0	48.6	54.0	-5.4	EUT on Side, High Ch 11, 1Mbps
7310.185	37.8	10.8	1.0	202.0	3.0	0.0	Horz	AV	0.0	48.6	54.0	-5.4	EUT Hor, Mid Ch 6, 1Mbps
7384.980	36.1	11.4	1.0	242.0	3.0	0.0	Vert	AV	0.0	47.5	54.0	-6.5	EUT Ver, High Ch 11, 1Mbps
7385.175	35.9	11.4	1.0	194.0	3.0	0.0	Horz	AV	0.0	47.3	54.0	-6.7	EUT Hor, High Ch 11, 11Mbps
7310.090	36.2	10.8	1.1	133.0	3.0	0.0	Vert	AV	0.0	47.0	54.0	-7.0	EUT Hor, Mid Ch 6, 1Mbps
7384.995	35.5	11.4	2.8	97.0	3.0	0.0	Vert	AV	0.0	46.9	54.0	-7.1	EUT on Side, High Ch 11, 1Mbps
7384.875	34.9	11.4	1.0	78.0	3.0	0.0	Horz	AV	0.0	46.3	54.0	-7.7	EUT Ver, High Ch 11, 1Mbps
7384.905	32.2	11.4	1.0	194.0	3.0	0.0	Horz	AV	0.0	43.6	54.0	-10.4	EUT Hor, High Ch 11, 6Mbps
7386.595	32.1	11.5	1.0	194.0	3.0	0.0	Horz	AV	0.0	43.6	54.0	-10.4	EUT Hor, High Ch 11, 36Mbps
7384.680	32.1	11.4	1.0	194.0	3.0	0.0	Horz	AV	0.0	43.5	54.0	-10.5	EUT Hor, High Ch 11, 54Mbps
7384.745	31.9	11.4	1.0	194.0	3.0	0.0	Horz	AV	0.0	43.3	54.0	-10.7	EUT Hor, High Ch 11, MCS0
7385.680	31.8	11.4	1.0	194.0	3.0	0.0	Horz	AV	0.0	43.2	54.0	-10.8	EUT Hor, High Ch 11, MCS7
4923.980	36.3	4.2	1.1	306.0	3.0	0.0	Vert	AV	0.0	40.5	54.0	-13.5	EUT Hor, High Ch 11, 1Mbps
4924.040	36.0	4.2	1.1	327.0	3.0	0.0	Horz	AV	0.0	40.2	54.0	-13.8	EUT Hor, High Ch 11, 1Mbps
4873.940	35.4	3.8	1.0	324.0	3.0	0.0	Horz	AV	0.0	39.2	54.0	-14.8	EUT Hor, Mid Ch 6, 1Mbps
4873.985	34.9	3.8	1.0	307.0	3.0	0.0	Vert	AV	0.0	38.7	54.0	-15.3	EUT Hor, Mid Ch 6, 1Mbps
14471.950	34.2	4.1	1.8	294.0	3.0	0.0	Vert	AV	0.0	38.3	54.0	-15.7	EUT Hor, Low Ch 1, 1Mbps
7386.075	46.6	11.5	1.0	194.0	3.0	0.0	Horz	PK	0.0	58.1	74.0	-15.9	EUT Hor, High Ch 11, 11Mbps
7386.160	46.5	11.5	1.0	353.0	3.0	0.0	Horz	PK	0.0	58.0	74.0	-16.0	EUT on Side, High Ch 11, 1Mbps
7385.775	45.9	11.5	1.0	242.0	3.0	0.0	Vert	PK	0.0	57.4	74.0	-16.6	EUT Ver, High Ch 11, 1Mbps

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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
7385.725	45.7	11.5	1.0	216.0	3.0	0.0	Horz	PK	0.0	57.2	74.0	-16.8	EUT Hor, High Ch 11, 1Mbps
7310.595	46.4	10.8	1.0	202.0	3.0	0.0	Horz	PK	0.0	57.2	74.0	-16.8	EUT Hor, Mid Ch 6, 1Mbps
7385.750	45.5	11.5	1.0	132.0	3.0	0.0	Vert	PK	0.0	57.0	74.0	-17.0	EUT Hor, High Ch 11, 1Mbps
4824.070	32.8	3.7	3.6	311.0	3.0	0.0	Horz	AV	0.0	36.5	54.0	-17.5	EUT Hor, Low Ch 1, 1Mbps
7385.600	44.9	11.4	2.8	97.0	3.0	0.0	Vert	PK	0.0	56.3	74.0	-17.7	EUT on Side, High Ch 11, 1Mbps
7311.345	45.3	10.8	1.1	133.0	3.0	0.0	Vert	PK	0.0	56.1	74.0	-17.9	EUT Hor, Mid Ch 6, 1Mbps
7385.030	44.3	11.4	1.0	78.0	3.0	0.0	Horz	PK	0.0	55.7	74.0	-18.3	EUT Ver, High Ch 11, 1Mbps
14472.130	31.4	4.1	1.0	94.0	3.0	0.0	Horz	AV	0.0	35.5	54.0	-18.5	EUT Hor, Low Ch 1, 1Mbps
4823.930	31.6	3.7	1.0	4.0	3.0	0.0	Vert	AV	0.0	35.3	54.0	-18.7	EUT Hor, Low Ch 1, 1Mbps
7384.770	43.6	11.4	1.0	194.0	3.0	0.0	Horz	PK	0.0	55.0	74.0	-19.0	EUT Hor, High Ch 11, 54Mbps
7386.325	43.3	11.5	1.0	194.0	3.0	0.0	Horz	PK	0.0	54.8	74.0	-19.2	EUT Hor, High Ch 11, MCS0
7385.735	43.0	11.5	1.0	194.0	3.0	0.0	Horz	PK	0.0	54.5	74.0	-19.5	EUT Hor, High Ch 11, 6Mbps
7386.825	42.8	11.5	1.0	194.0	3.0	0.0	Horz	PK	0.0	54.3	74.0	-19.7	EUT Hor, High Ch 11, MCS7
7385.480	42.6	11.4	1.0	194.0	3.0	0.0	Horz	PK	0.0	54.0	74.0	-20.0	EUT Hor, High Ch 11, 36Mbps
12309.990	33.5	-3.3	1.9	269.0	3.0	0.0	Vert	AV	0.0	30.2	54.0	-23.8	EUT Hor, High Ch 11, 1Mbps
12061.390	34.3	-4.9	1.0	112.0	3.0	0.0	Horz	AV	0.0	29.4	54.0	-24.6	EUT Hor, Low Ch 1, 1Mbps
12310.200	32.7	-3.3	1.0	352.0	3.0	0.0	Horz	AV	0.0	29.4	54.0	-24.6	EUT Hor, High Ch 11, 1Mbps
12061.320	33.9	-4.9	1.0	158.0	3.0	0.0	Vert	AV	0.0	29.0	54.0	-25.0	EUT Hor, Low Ch 1, 1Mbps
12184.970	32.9	-4.0	1.5	308.0	3.0	0.0	Vert	AV	0.0	28.9	54.0	-25.1	EUT Hor, Mid Ch 6, 1Mbps
4924.235	44.4	4.2	1.1	306.0	3.0	0.0	Vert	PK	0.0	48.6	74.0	-25.4	EUT Hor, High Ch 11, 1Mbps
12185.920	32.4	-4.0	1.0	110.0	3.0	0.0	Horz	AV	0.0	28.4	54.0	-25.6	EUT Hor, Mid Ch 6, 1Mbps
4924.135	44.1	4.2	1.1	327.0	3.0	0.0	Horz	PK	0.0	48.3	74.0	-25.7	EUT Hor, High Ch 11, 1Mbps
4874.075	43.9	3.8	1.0	324.0	3.0	0.0	Horz	PK	0.0	47.7	74.0	-26.3	EUT Hor, Mid Ch 6, 1Mbps
4874.310	43.8	3.8	1.0	307.0	3.0	0.0	Vert	PK	0.0	47.6	74.0	-26.4	EUT Hor, Mid Ch 6, 1Mbps
4824.070	43.6	3.7	3.6	311.0	3.0	0.0	Horz	PK	0.0	47.3	74.0	-26.7	EUT Hor, Low Ch 1, 1Mbps
14472.790	43.0	4.1	1.8	294.0	3.0	0.0	Vert	PK	0.0	47.1	74.0	-26.9	EUT Hor, Low Ch 1, 1Mbps
14472.270	42.5	4.1	1.0	94.0	3.0	0.0	Horz	PK	0.0	46.6	74.0	-27.4	EUT Hor, Low Ch 1, 1Mbps
4825.360	42.5	3.7	1.0	4.0	3.0	0.0	Vert	PK	0.0	46.2	74.0	-27.8	EUT Hor, Low Ch 1, 1Mbps
12060.610	45.8	-4.9	1.0	158.0	3.0	0.0	Vert	PK	0.0	40.9	74.0	-33.1	EUT Hor, Low Ch 1, 1Mbps
12311.400	44.0	-3.3	1.9	269.0	3.0	0.0	Vert	PK	0.0	40.7	74.0	-33.3	EUT Hor, High Ch 11, 1Mbps
12185.610	44.6	-4.0	1.5	308.0	3.0	0.0	Vert	PK	0.0	40.6	74.0	-33.4	EUT Hor, Mid Ch 6, 1Mbps
12311.120	43.9	-3.3	1.0	352.0	3.0	0.0	Horz	PK	0.0	40.6	74.0	-33.4	EUT Hor, High Ch 11, 1Mbps
12059.310	45.4	-5.0	1.0	112.0	3.0	0.0	Horz	PK	0.0	40.4	74.0	-33.6	EUT Hor, Low Ch 1, 1Mbps
12186.150	43.8	-4.0	1.0	110.0	3.0	0.0	Horz	PK	0.0	39.8	74.0	-34.2	EUT Hor, Mid Ch 6, 1Mbps

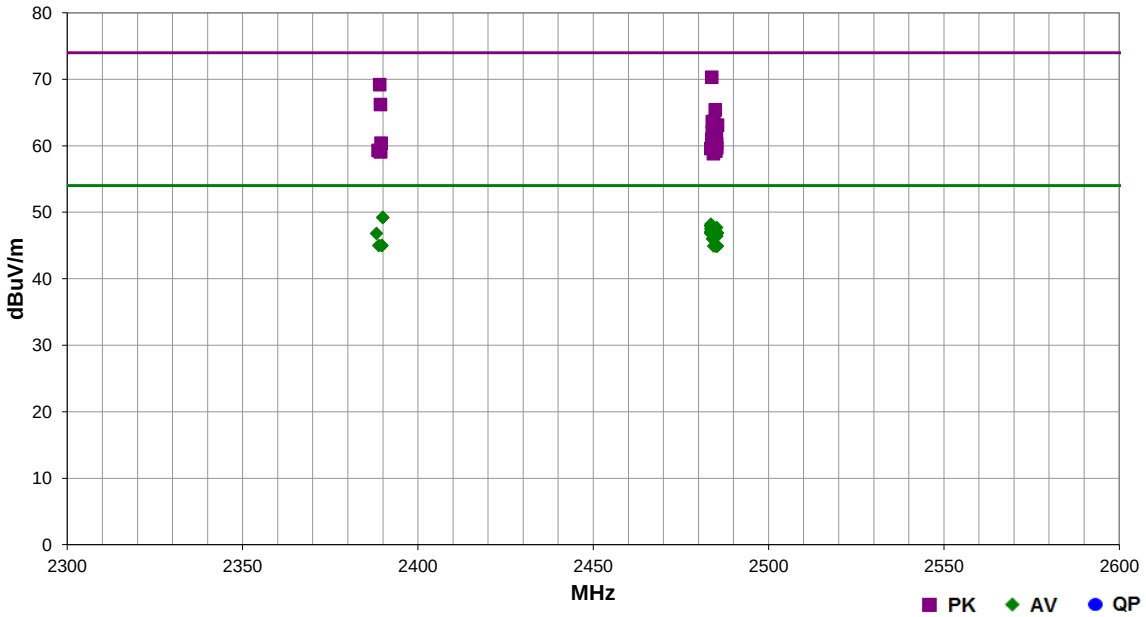
SPURIOUS RADIATED EMISSIONS

EmiR5 2017.01.25 PSA-ESCI 2017.01.26

Work Order:	ELIM0013	**Date:**	05/24/17		
Project:	None	**Temperature:**	23.7 °C		
Job Site:	OC07	**Humidity:**	45.6% RH		
Serial Number:	IMP0107	**Barometric Pres.:**	1012 mbar	**Tested by:**	Mark Baytan
EUT:	IMP004M				
Configuration:	1				
Customer:	Electric Imp, Inc.				
Attendees:	Jonathan Dillon				
EUT Power:	3.3VDC regulated down from USB 5V				
Operating Mode:	Transmitting 802.11(b/g/n) at Low Ch 1-2412MHz, High Ch 11-2462MHz				
Deviations:	None				
Comments:	Default TX power was used.				

Test Specifications	**Test Method**
FCC 15.247:2017	ANSI C63.10:2013

Run #	14	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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
2483.793	54.8	-4.5	1.0	307.0	3.0	20.0	Horz	PK	0.0	70.3	74.0	-3.7	High Ch, EUT Horz, MCS0
2389.113	54.1	-4.9	1.0	307.0	3.0	20.0	Vert	PK	0.0	69.2	74.0	-4.8	Low Ch, EUT Vert, 6Mbps
2389.967	34.1	-4.9	1.0	307.0	3.0	20.0	Vert	AV	0.0	49.2	54.0	-4.8	Low Ch, EUT Vert, 6Mbps
2390.000	34.1	-4.9	1.0	307.0	3.0	20.0	Vert	AV	0.0	49.2	54.0	-4.8	Low Ch, EUT Vert, MCS0
2483.557	32.7	-4.5	1.0	307.0	3.0	20.0	Horz	AV	0.0	48.2	54.0	-5.8	High Ch, EUT Horz, MCS0
2483.523	32.5	-4.5	1.0	307.0	3.0	20.0	Horz	AV	0.0	48.0	54.0	-6.0	High Ch, EUT Horz, 54Mbps
2483.513	32.4	-4.5	1.0	307.0	3.0	20.0	Horz	AV	0.0	47.9	54.0	-6.1	High Ch, EUT Horz, 36Mbps
2485.207	32.2	-4.5	1.0	307.0	3.0	20.0	Horz	AV	0.0	47.7	54.0	-6.3	High Ch, EUT Horz, 1Mbps
2483.500	32.0	-4.5	1.0	307.0	3.0	20.0	Horz	AV	0.0	47.5	54.0	-6.5	High Ch, EUT Horz, MCS7
2483.810	31.7	-4.5	1.0	261.0	3.0	20.0	Vert	AV	0.0	47.2	54.0	-6.8	High Ch, EUT Vert, 6Mbps
2483.567	31.6	-4.5	1.0	261.0	3.0	20.0	Vert	AV	0.0	47.1	54.0	-6.9	High Ch, EUT Vert, MCS0
2483.570	31.5	-4.5	1.0	261.0	3.0	20.0	Vert	AV	0.0	47.0	54.0	-7.0	High Ch, EUT Vert, 36Mbps
2483.540	31.5	-4.5	1.0	261.0	3.0	20.0	Vert	AV	0.0	47.0	54.0	-7.0	High Ch, EUT Vert, 54Mbps
2485.463	31.4	-4.5	1.0	307.0	3.0	20.0	Horz	AV	0.0	46.9	54.0	-7.1	High Ch, EUT Horz, 11Mbps
2483.507	31.3	-4.5	1.0	261.0	3.0	20.0	Vert	AV	0.0	46.8	54.0	-7.2	High Ch, EUT Vert, MCS7
2388.187	31.7	-4.9	1.0	307.0	3.0	20.0	Vert	AV	0.0	46.8	54.0	-7.2	Low Ch, EUT Vert, 1Mbps
2484.987	31.1	-4.5	1.0	261.0	3.0	20.0	Vert	AV	0.0	46.6	54.0	-7.4	High Ch, EUT Vert, 1Mbps
2485.253	30.9	-4.5	1.0	261.0	3.0	20.0	Vert	AV	0.0	46.4	54.0	-7.6	High Ch, EUT Vert, 1Mbps
2389.310	51.1	-4.9	1.0	307.0	3.0	20.0	Vert	PK	0.0	66.2	74.0	-7.8	Low Ch, EUT Vert, MCS0
2484.013	30.5	-4.5	1.0	261.0	3.0	20.0	Vert	AV	0.0	46.0	54.0	-8.0	High Ch, EUT Vert, 11Mbps
2484.807	49.9	-4.5	1.0	261.0	3.0	20.0	Vert	PK	0.0	65.4	74.0	-8.6	High Ch, EUT Vert, 6Mbps
2485.080	29.5	-4.5	1.0	338.0	3.0	20.0	Horz	AV	0.0	45.0	54.0	-9.0	High Ch, EUT Vert, 1Mbps

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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
2388.843	29.9	-4.9	2.4	130.0	3.0	20.0	Horz	AV	0.0	45.0	54.0	-9.0	Low Ch, EUT Horz, 1Mbps
2389.773	29.9	-4.9	2.4	130.0	3.0	20.0	Horz	AV	0.0	45.0	54.0	-9.0	Low Ch, EUT Horz, 6Mbps
2389.597	29.9	-4.9	2.4	130.0	3.0	20.0	Horz	AV	0.0	45.0	54.0	-9.0	Low Ch, EUT Horz, MCS0
2485.207	29.4	-4.5	1.0	41.0	3.0	20.0	Vert	AV	0.0	44.9	54.0	-9.1	High Ch, EUT Horz, 1Mbps
2485.443	29.4	-4.5	1.0	142.0	3.0	20.0	Horz	AV	0.0	44.9	54.0	-9.1	High Ch, EUT on Side, 1Mbps
2484.360	29.4	-4.5	1.0	96.0	3.0	20.0	Vert	AV	0.0	44.9	54.0	-9.1	High Ch, EUT on Side, 1Mbps
2484.930	29.4	-4.5	1.0	307.0	3.0	20.0	Horz	AV	0.0	44.9	54.0	-9.1	High Ch, EUT Horz, 6Mbps
2484.420	48.2	-4.5	1.0	307.0	3.0	20.0	Horz	PK	0.0	63.7	74.0	-10.3	High Ch, EUT Horz, 54Mbps
2483.960	48.1	-4.5	1.0	307.0	3.0	20.0	Horz	PK	0.0	63.6	74.0	-10.4	High Ch, EUT Horz, 36Mbps
2485.450	47.6	-4.5	1.0	307.0	3.0	20.0	Horz	PK	0.0	63.1	74.0	-10.9	High Ch, EUT Horz, MCS7
2484.097	47.6	-4.5	1.0	261.0	3.0	20.0	Vert	PK	0.0	63.1	74.0	-10.9	High Ch, EUT Vert, 36Mbps
2484.720	47.5	-4.5	1.0	261.0	3.0	20.0	Vert	PK	0.0	63.0	74.0	-11.0	High Ch, EUT Vert, MCS7
2485.020	46.9	-4.5	1.0	261.0	3.0	20.0	Vert	PK	0.0	62.4	74.0	-11.6	High Ch, EUT Vert, 54Mbps
2483.973	46.6	-4.5	1.0	261.0	3.0	20.0	Vert	PK	0.0	62.1	74.0	-11.9	High Ch, EUT Vert, MCS0
2485.117	45.8	-4.5	1.0	307.0	3.0	20.0	Horz	PK	0.0	61.3	74.0	-12.7	High Ch, EUT Horz, 1Mbps
2483.850	45.5	-4.5	1.0	307.0	3.0	20.0	Horz	PK	0.0	61.0	74.0	-13.0	High Ch, EUT Horz, 11Mbps
2389.473	45.3	-4.9	1.0	307.0	3.0	20.0	Vert	PK	0.0	60.4	74.0	-13.6	Low Ch, EUT Vert, 1Mbps
2485.173	44.8	-4.5	1.0	261.0	3.0	20.0	Vert	PK	0.0	60.3	74.0	-13.7	High Ch, EUT Vert, 1Mbps
2484.107	44.4	-4.5	1.0	307.0	3.0	20.0	Horz	PK	0.0	59.9	74.0	-14.1	High Ch, EUT Horz, 6Mbps
2485.223	44.2	-4.5	1.0	261.0	3.0	20.0	Vert	PK	0.0	59.7	74.0	-14.3	High Ch, EUT Vert, 1Mbps
2483.540	44.1	-4.5	1.0	41.0	3.0	20.0	Vert	PK	0.0	59.6	74.0	-14.4	High Ch, EUT Horz, 1Mbps
2484.717	44.1	-4.5	1.0	261.0	3.0	20.0	Vert	PK	0.0	59.6	74.0	-14.4	High Ch, EUT Vert, 11Mbps
2484.703	43.9	-4.5	1.0	96.0	3.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	High Ch, EUT on Side, 1Mbps
2388.593	44.2	-4.9	2.4	130.0	3.0	20.0	Horz	PK	0.0	59.3	74.0	-14.7	Low Ch, EUT Horz, MCS0
2484.973	43.7	-4.5	1.0	338.0	3.0	20.0	Horz	PK	0.0	59.2	74.0	-14.8	High Ch, EUT Vert, 1Mbps
2389.237	44.0	-4.9	2.4	130.0	3.0	20.0	Horz	PK	0.0	59.1	74.0	-14.9	Low Ch, EUT Horz, 1Mbps
2389.383	44.0	-4.9	2.4	130.0	3.0	20.0	Horz	PK	0.0	59.1	74.0	-14.9	Low Ch, EUT Horz, 6Mbps
2484.277	43.3	-4.5	1.0	142.0	3.0	20.0	Horz	PK	0.0	58.8	74.0	-15.2	High Ch, EUT on Side, 1Mbps

DUTY CYCLE

XMit 2017.02.08

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	2/5/2015	2/5/2018
Attenuator	Fairview Microwave	SA18E-20	TKS	3/6/2017	3/6/2018
Block - DC	Aeroflex	INMET 8535	AMO	3/27/2017	3/27/2018
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	11/2/2016	11/2/2017

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 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

TbtTx 2017.01.27 XMit 2017.02.08

EUT:	IMP004M	Work Order:	ELIM0013
Serial Number:	IMP0107	Date:	05/31/17
Customer:	Electric Imp, Inc.	Temperature:	21.3 °C
Attendees:	Jonathan Dillon	Humidity:	49% RH
Project:	None	Barometric Pres.:	1014 mbar
Tested by:	Salvador Solorzano and Johnny Candelas	Power: 3.3VDC regulated down from USB 5V	Job Site: OC13

TEST SPECIFICATIONS	Test Method
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

Total Offset 22.59dB (20dB pad + DC Block + coax cable + client provided patch cable) at 2.4GHz

DEVIATIONS FROM TEST STANDARD

None

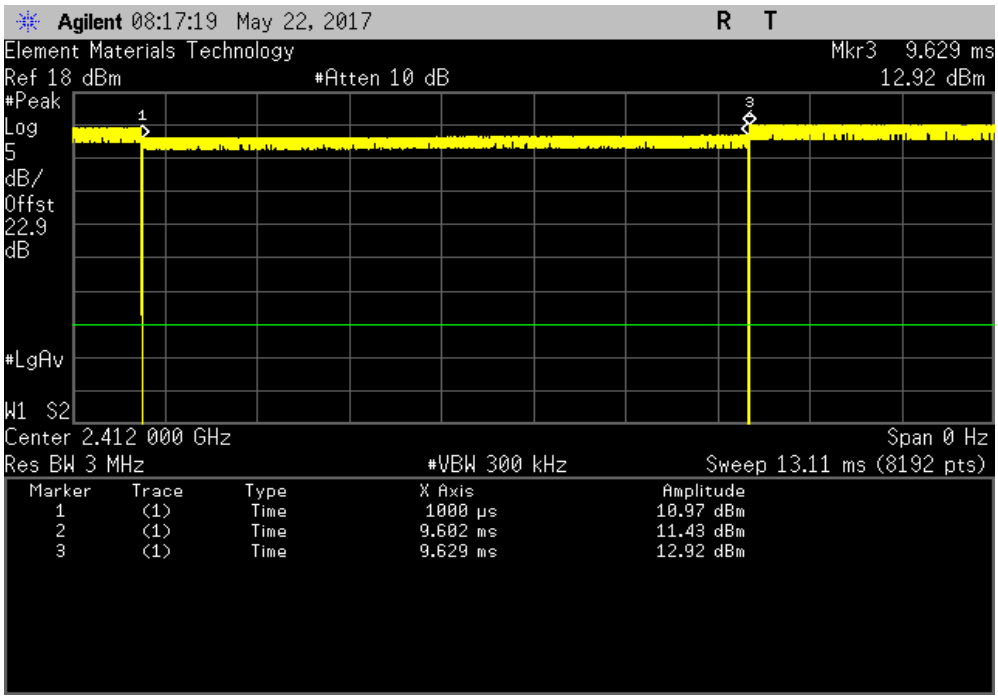
Configuration #	2	Signature

	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
2400 MHz - 2483.5 MHz Band						
802.11(b) 1 Mbps						
Low Channel 1, 2412 MHz	8.602 ms	8.629 ms	1	99.7	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	8.624 ms	8.629 ms	1	99.9	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	8.595 ms	8.629 ms	1	99.6	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	858.071 us	881.933 us	1	97.3	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	855.574 us	880.834 us	1	97.1	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	854.542 us	879.8 us	1	97.1	N/A	N/A
High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
802.11(g) 6 Mbps						
Low Channel 1, 2412 MHz	1.449 ms	1.485 ms	1	97.6	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	1.42 ms	1.447 ms	1	98.1	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	1.421 ms	1.445 ms	1	98.3	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	253.691 us	276.1 us	1	91.9	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	252.758 us	275.223 us	1	91.8	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	253.258 us	276.444 us	1	91.6	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	177.935 us	199.9 us	1	89	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	176.226 us	199.656 us	1	88.3	N/A	N/A
Mid Channel 6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
High Channel 11, 2462 MHz	177.547 us	199.756 us	1	88.9	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	1.332 ms	1.358 ms	1	98.1	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	1.332 ms	1.356 ms	1	98.2	N/A	N/A
Mid Channel 6, 2437 MHz	N/A	N/A	5	N/A	N/A	N/A
High Channel 11, 2462 MHz	1.333 ms	1.357 ms	1	98.2	N/A	N/A
High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A
802.11(n) MCS7						
Low Channel 1, 2412 MHz	165.302 us	188.7 us	1	87.6	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	165.302 us	188.556 us	1	87.7	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	165.991 us	189.244 us	1	87.7	N/A	N/A
High Channel 11, 2462 MHz	N/A	N/A	5	N/A	N/A	N/A

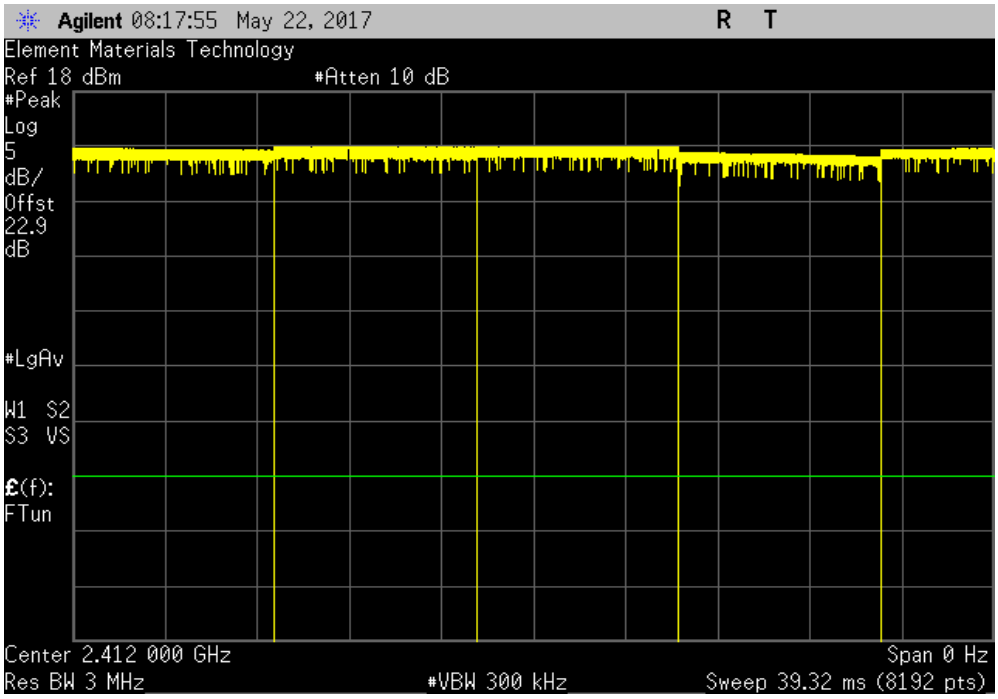
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	8.602 ms	8.629 ms	1	99.7	N/A	N/A



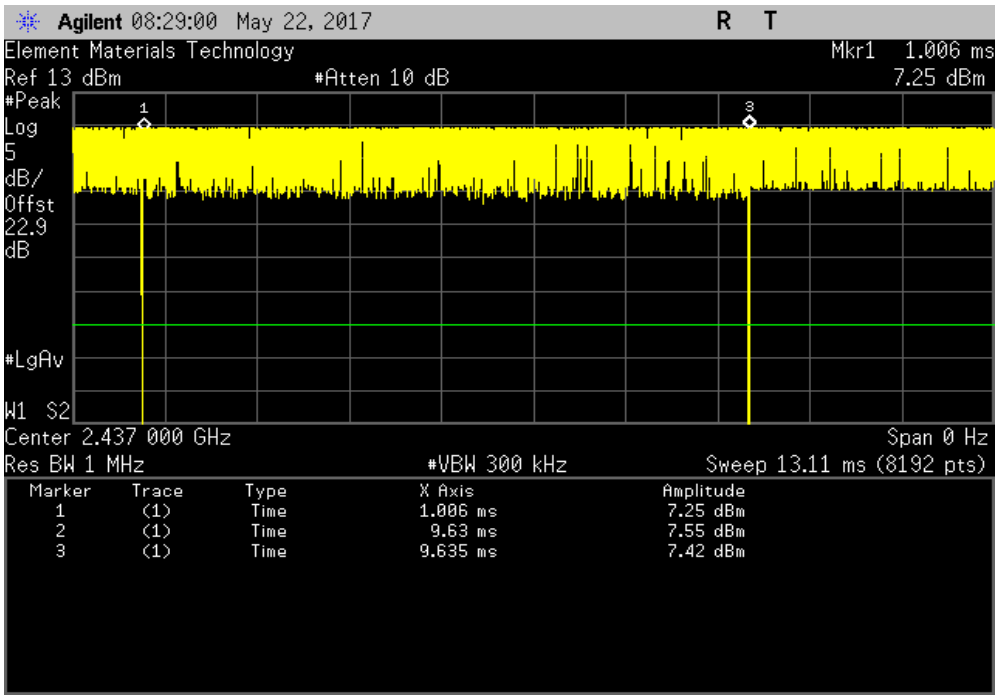
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



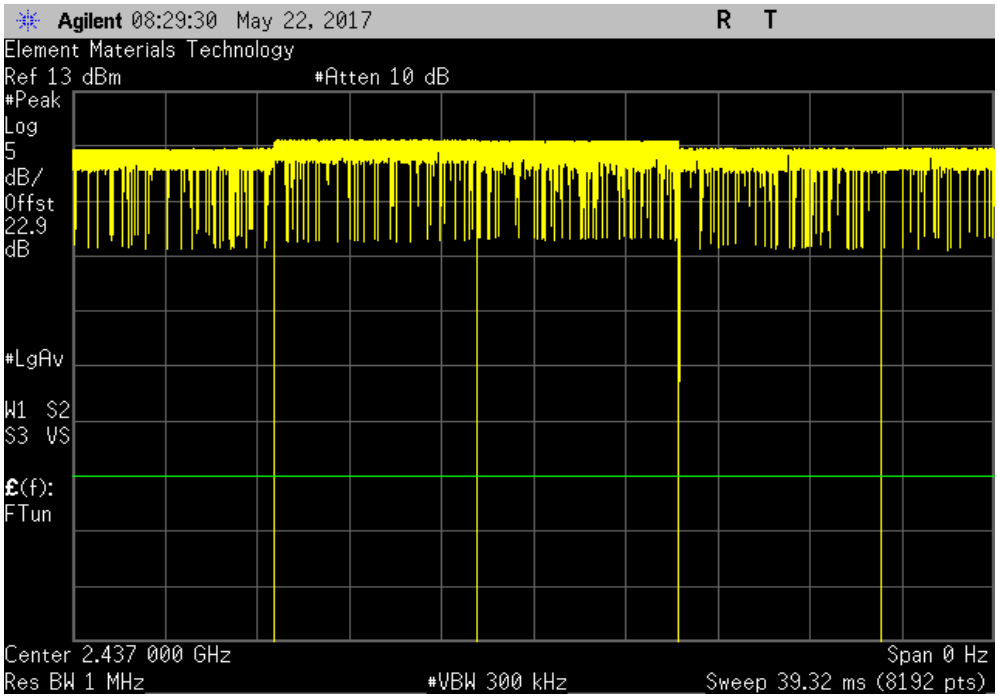
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	8.624 ms	8.629 ms	1	99.9	N/A	N/A



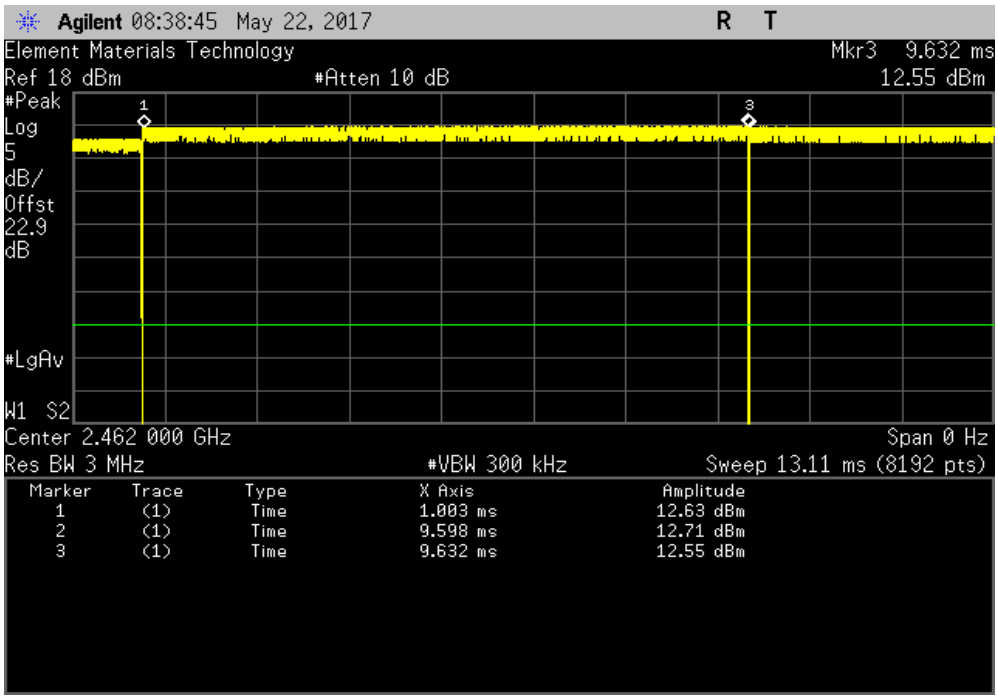
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



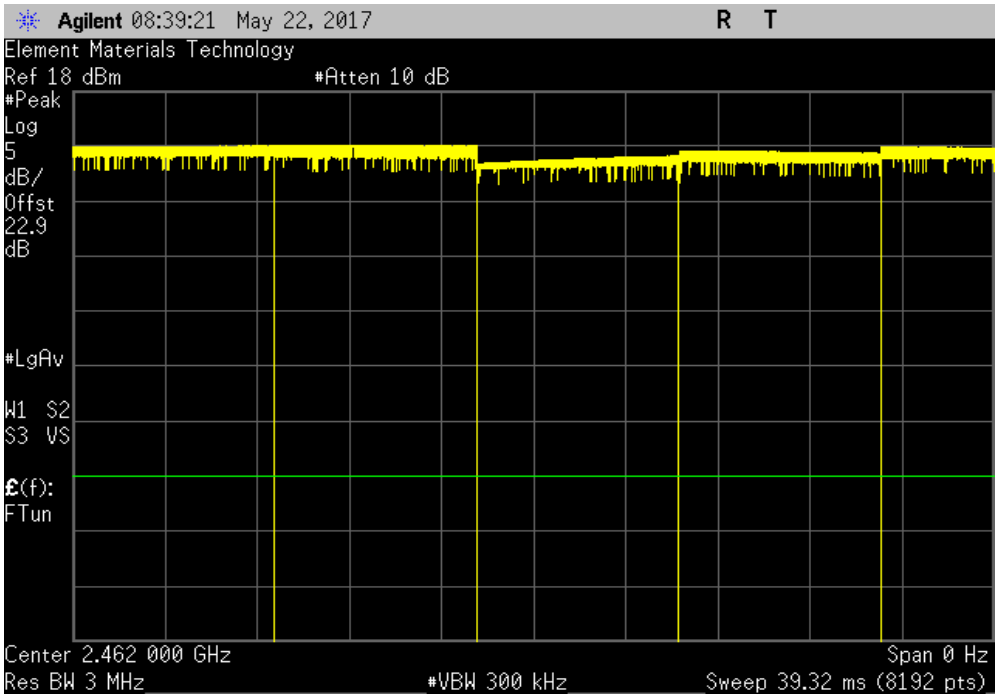
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	8.595 ms	8.629 ms	1	99.6	N/A	N/A



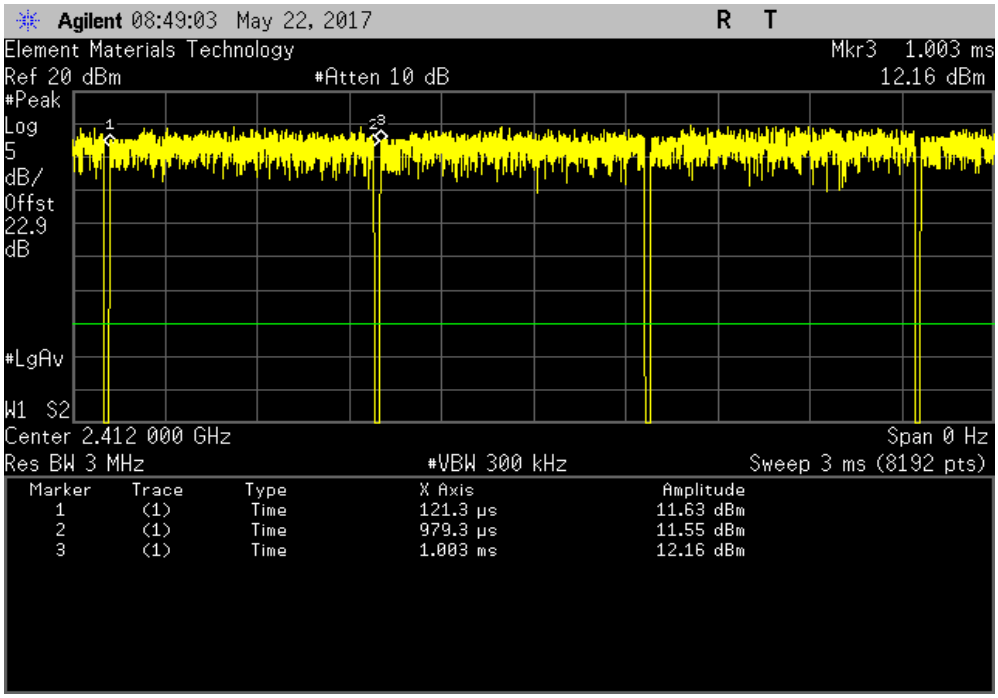
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



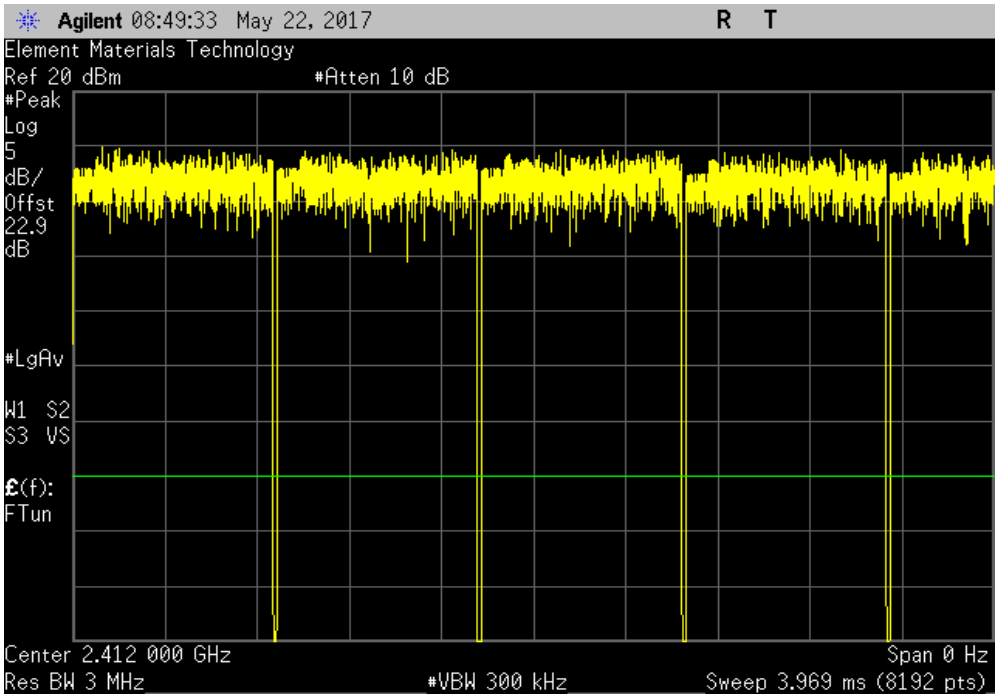
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	858.071 us	881.933 us	1	97.3	N/A	N/A



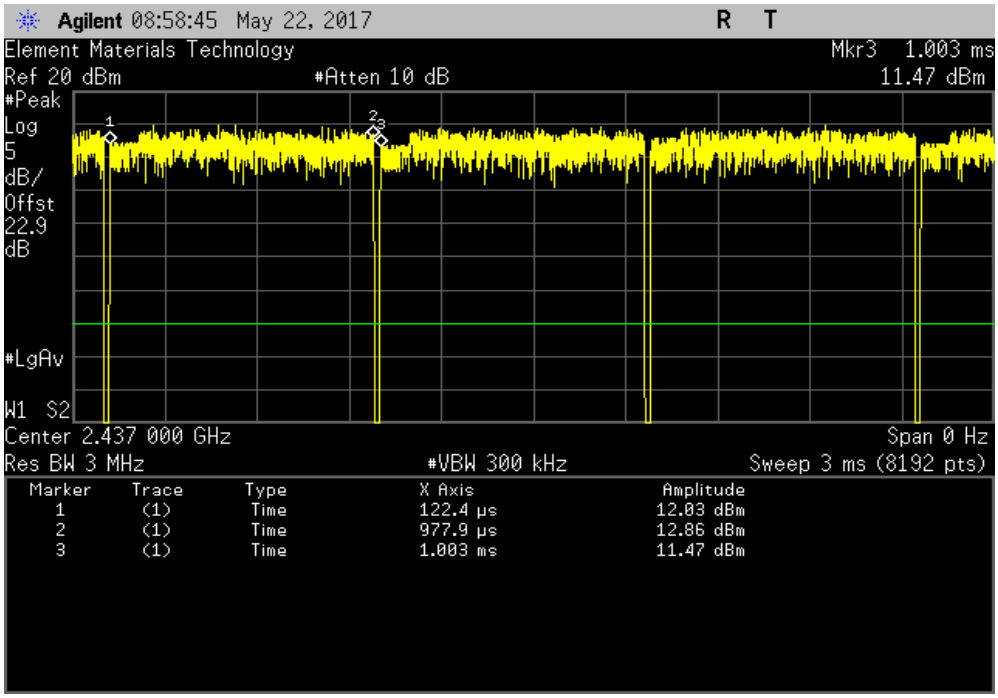
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



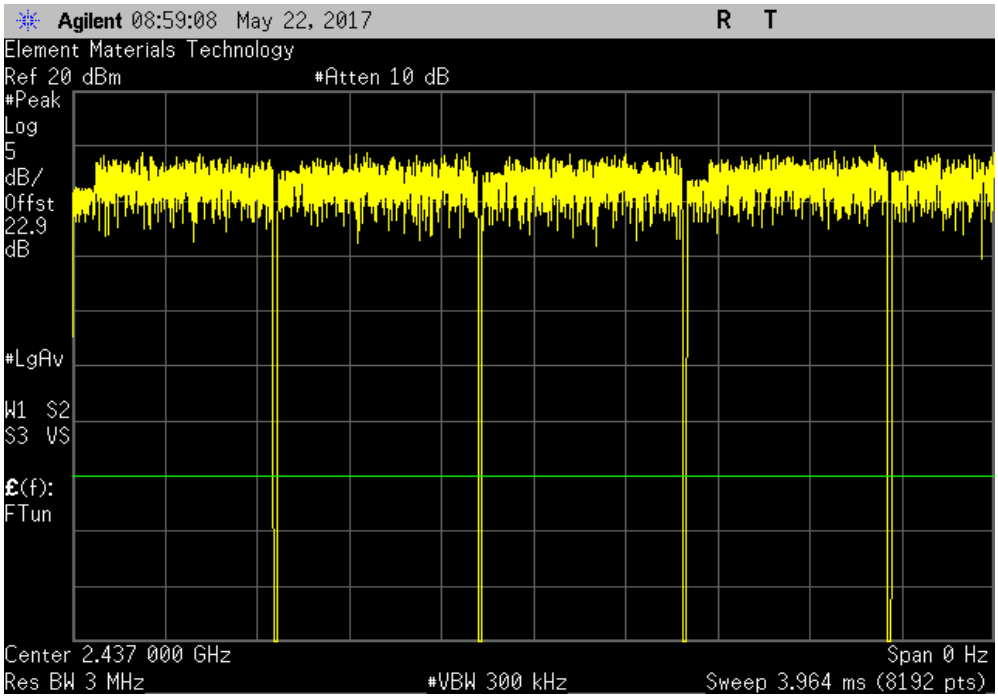
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	855.574 us	880.834 us	1	97.1	N/A	N/A



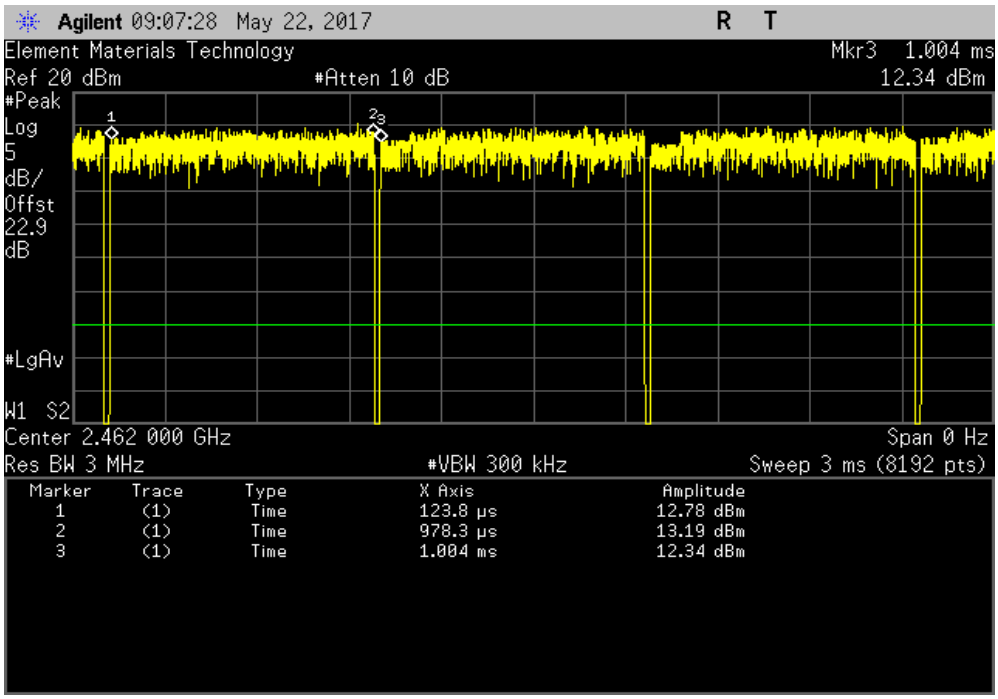
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



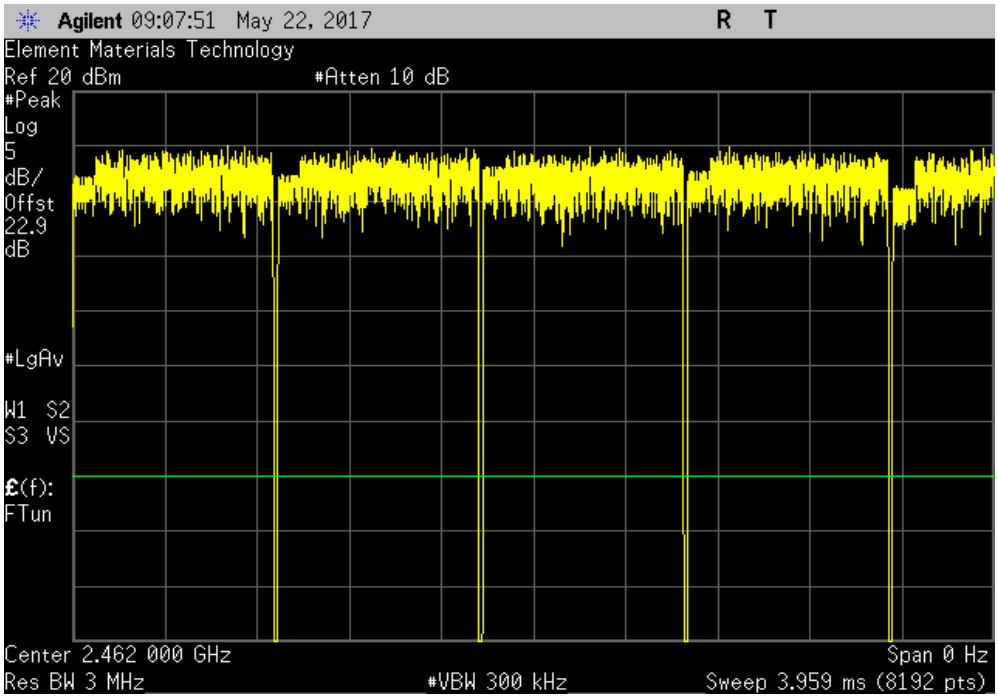
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	854.542 us	879.8 us	1	97.1	N/A	N/A



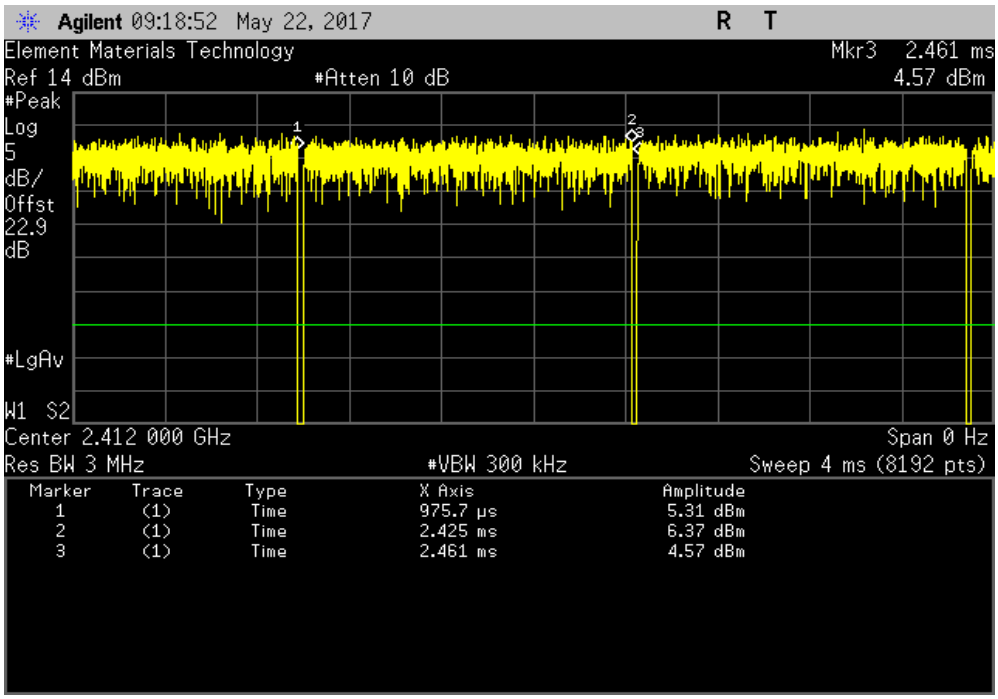
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



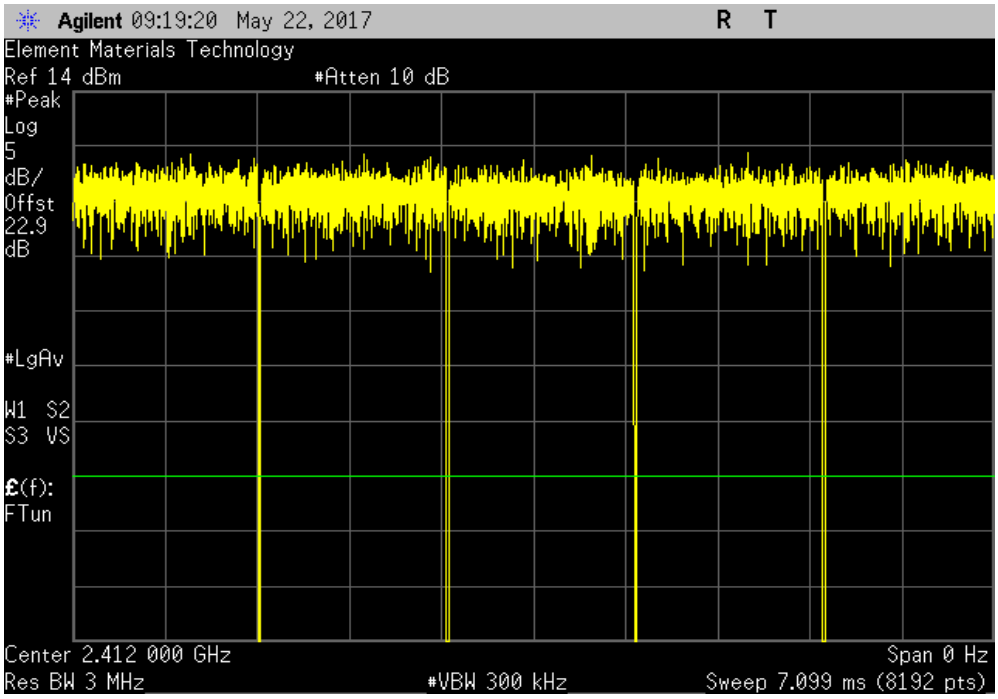
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.449 ms	1.485 ms	1	97.6	N/A	N/A



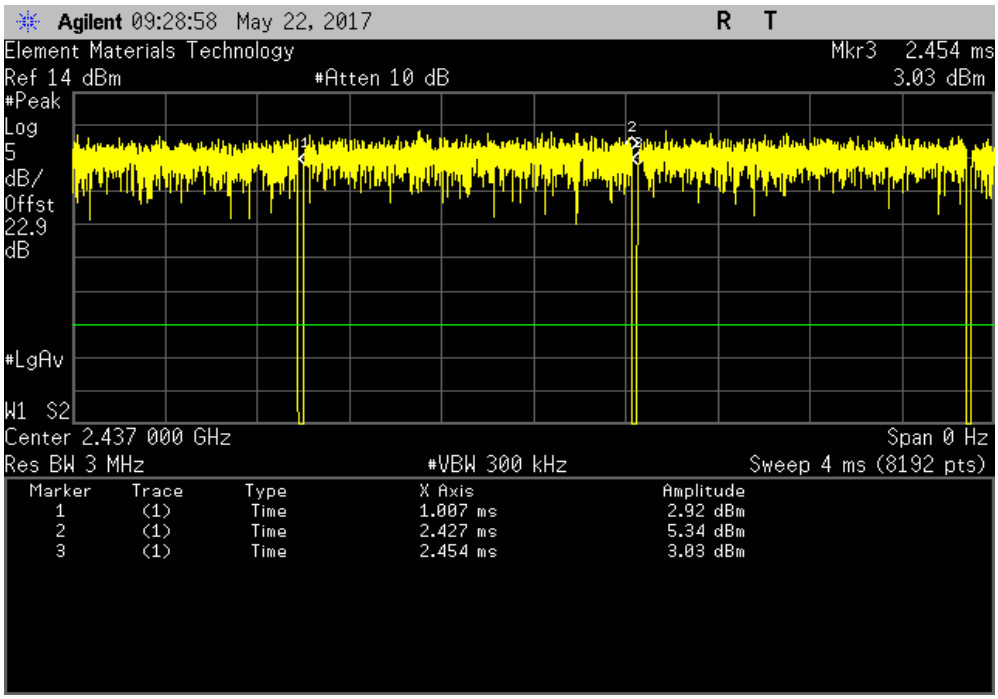
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



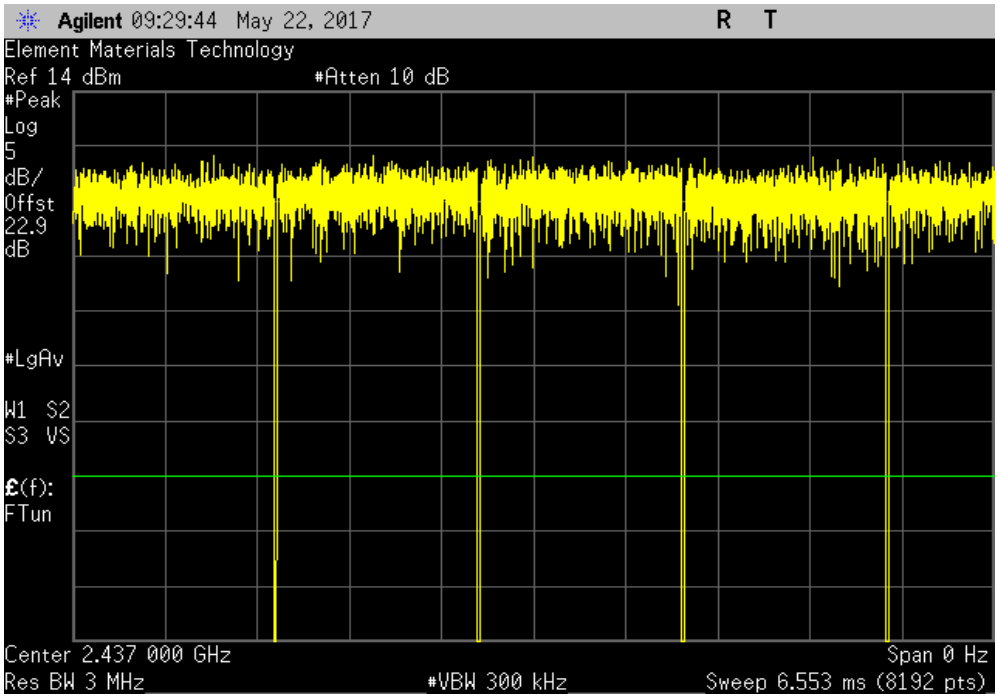
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.42 ms	1.447 ms	1	98.1	N/A	N/A



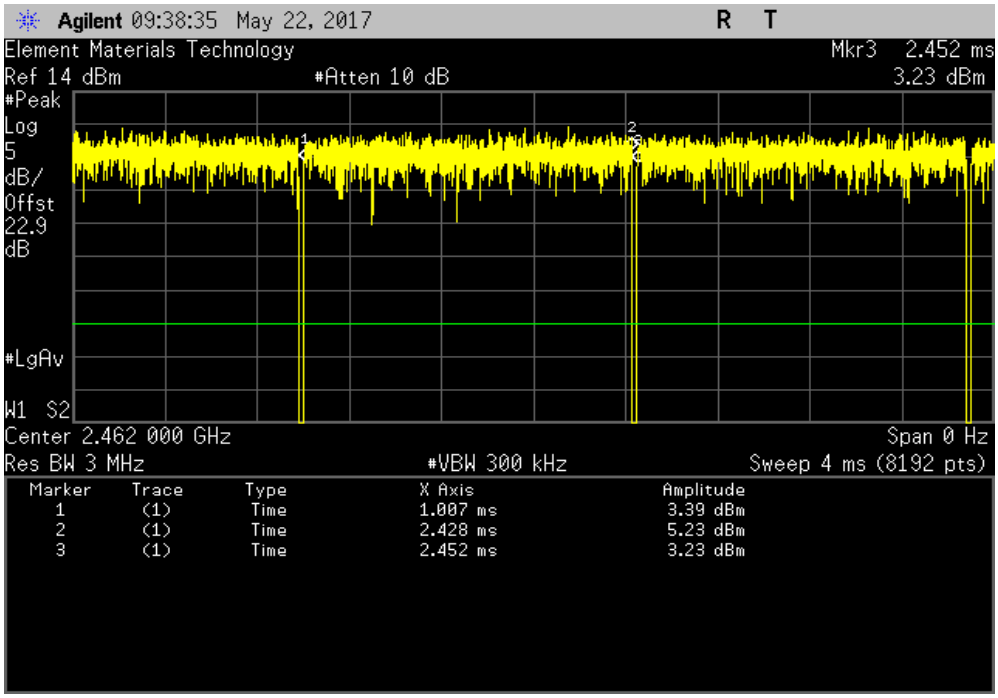
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



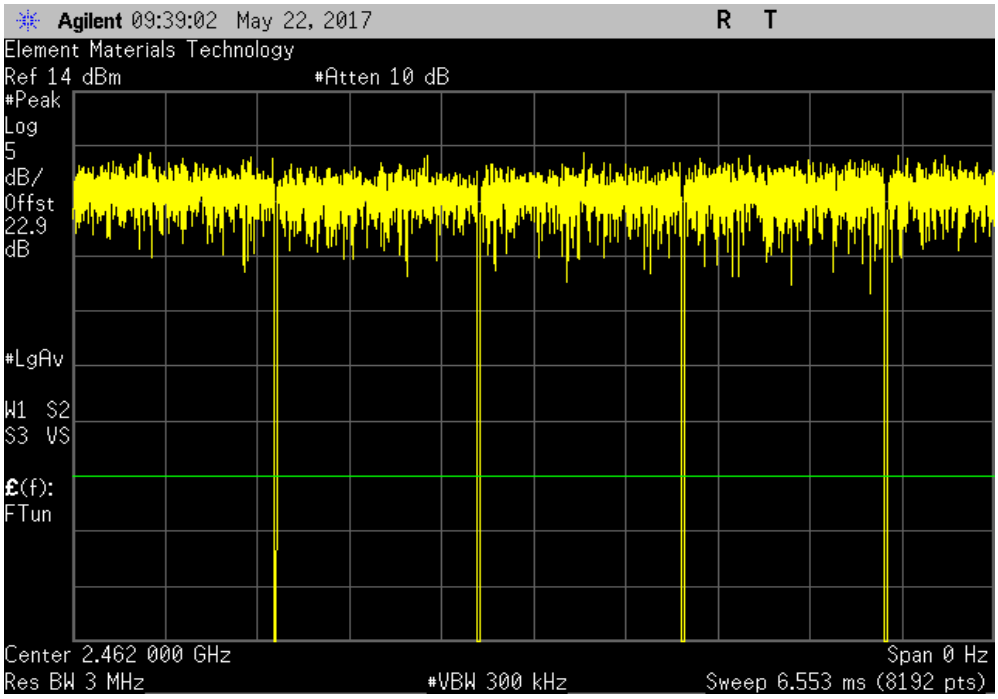
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.421 ms	1.445 ms	1	98.3	N/A	N/A



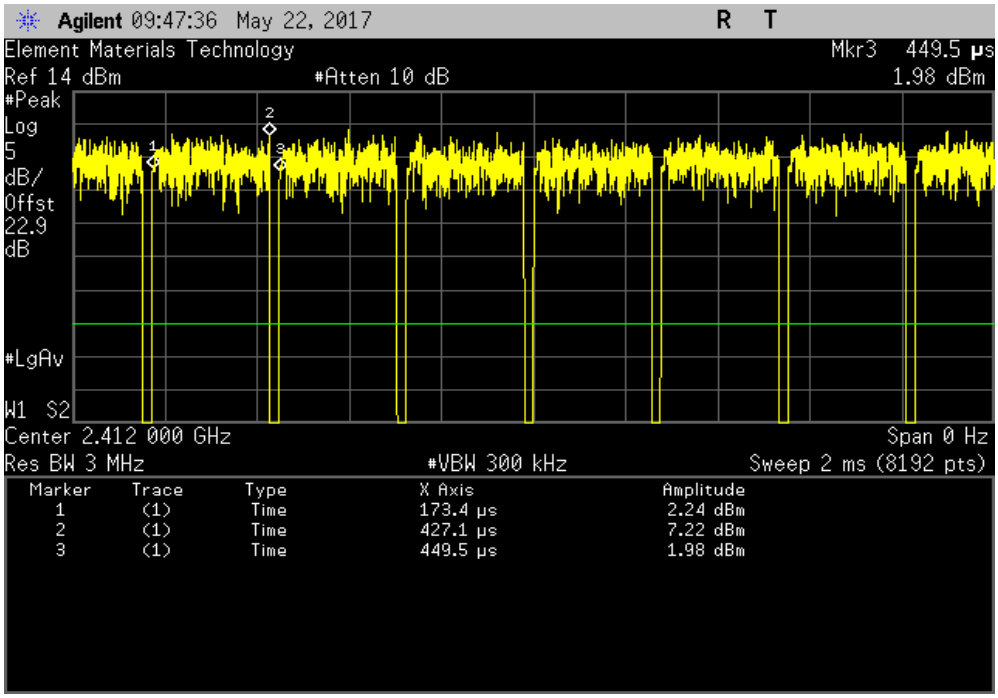
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



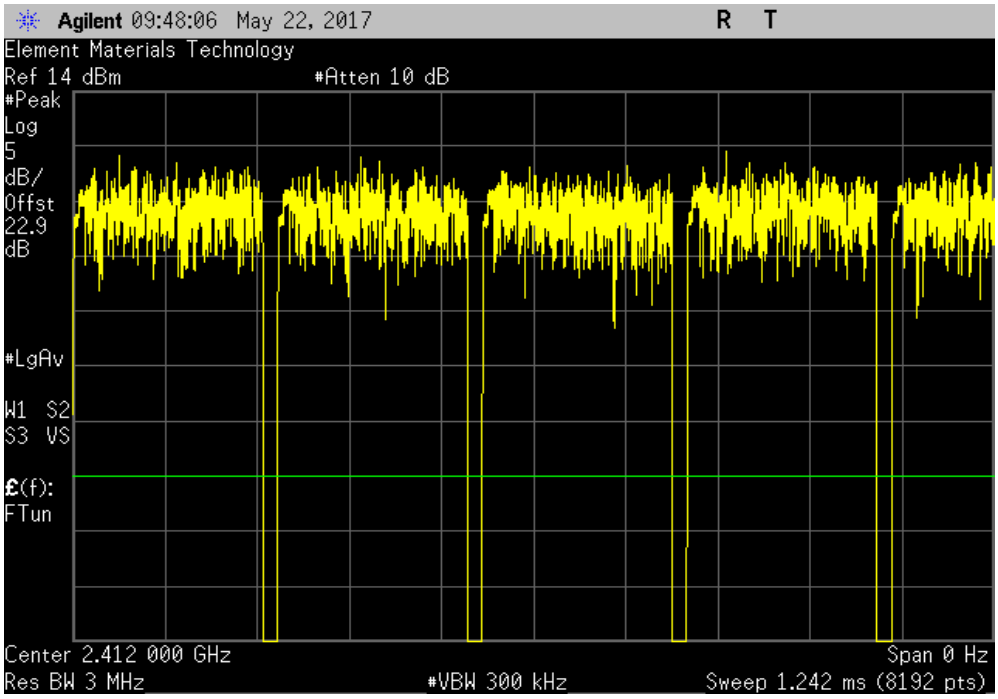
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	253.691 us	276.1 us	1	91.9	N/A	N/A



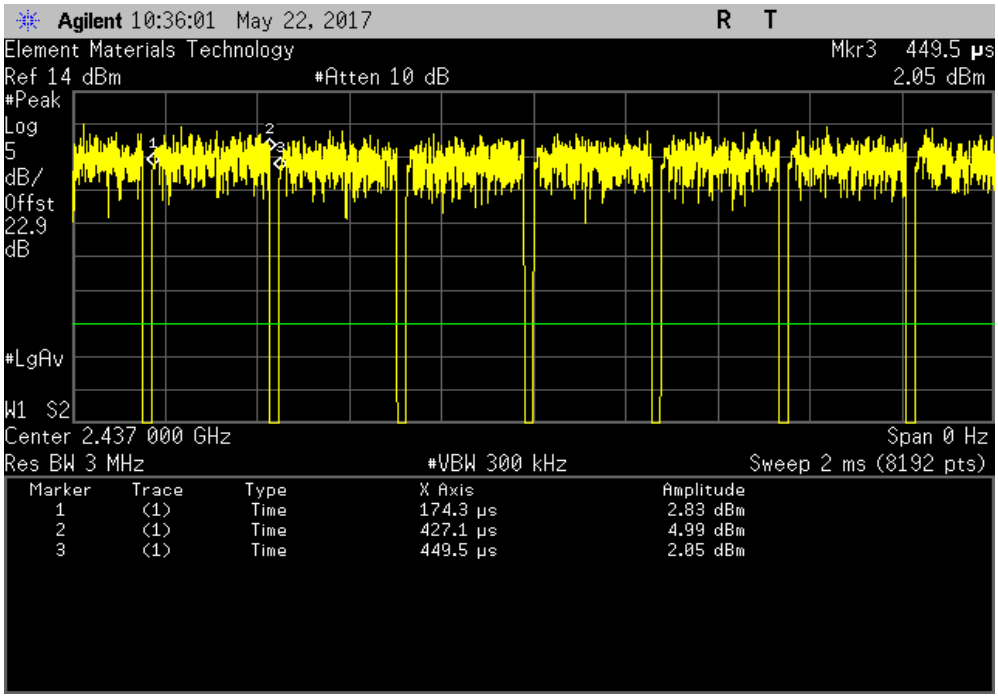
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



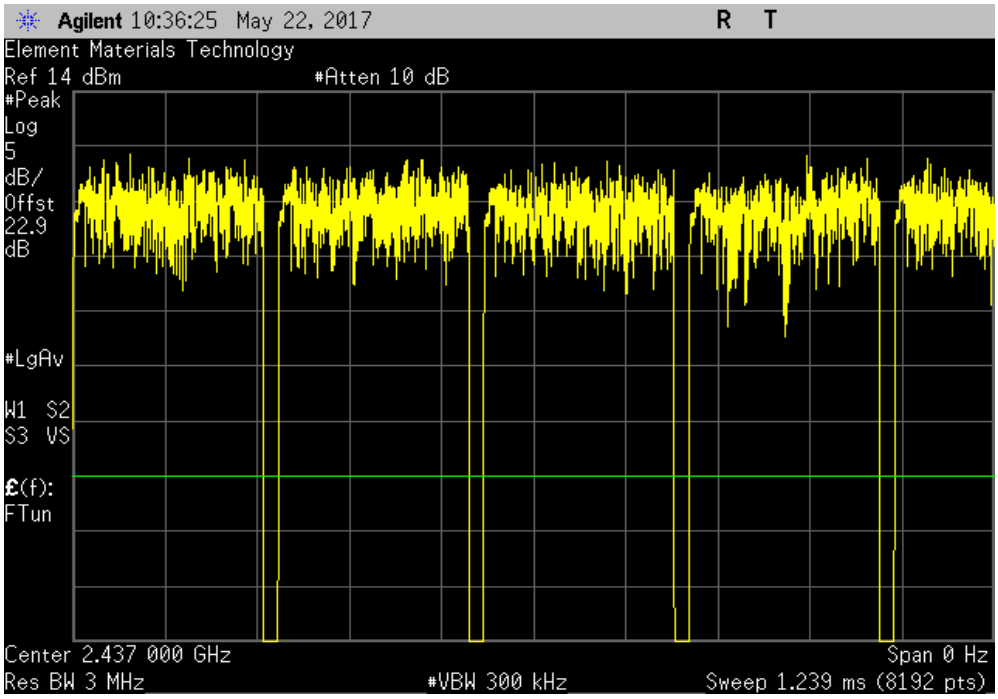
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	252.758 us	275.223 us	1	91.8	N/A	N/A

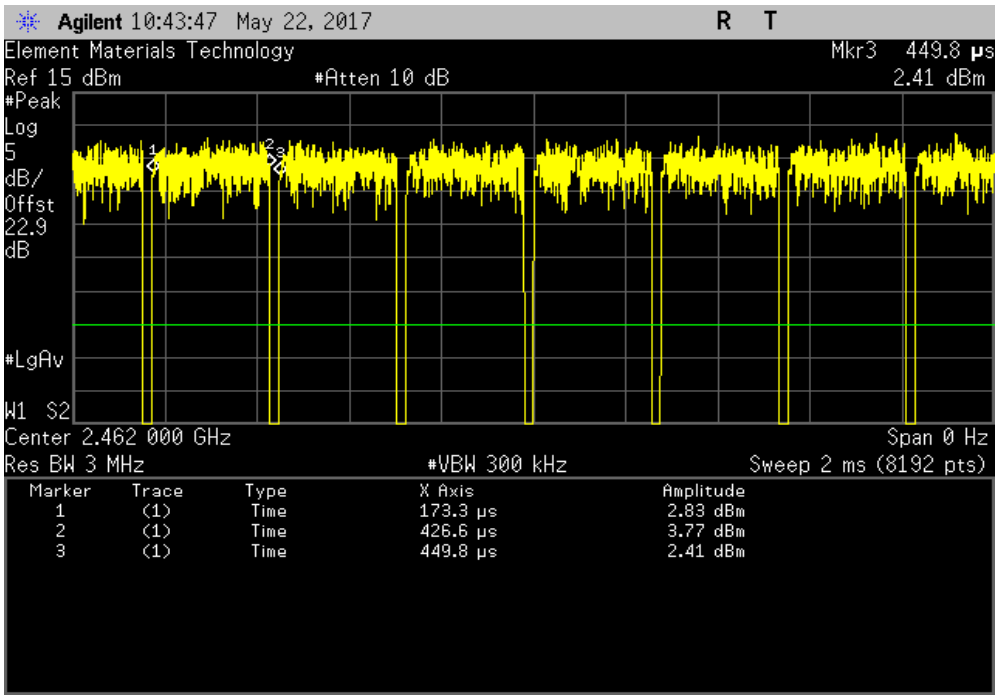


2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

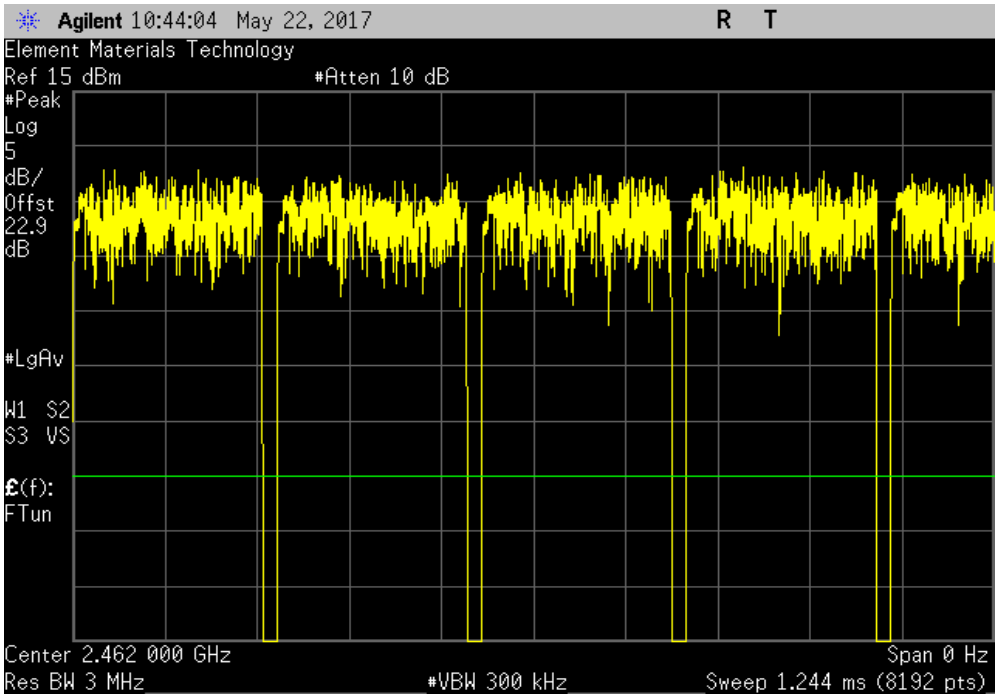


DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	253.258 us	276.444 us	1	91.6	N/A	N/A



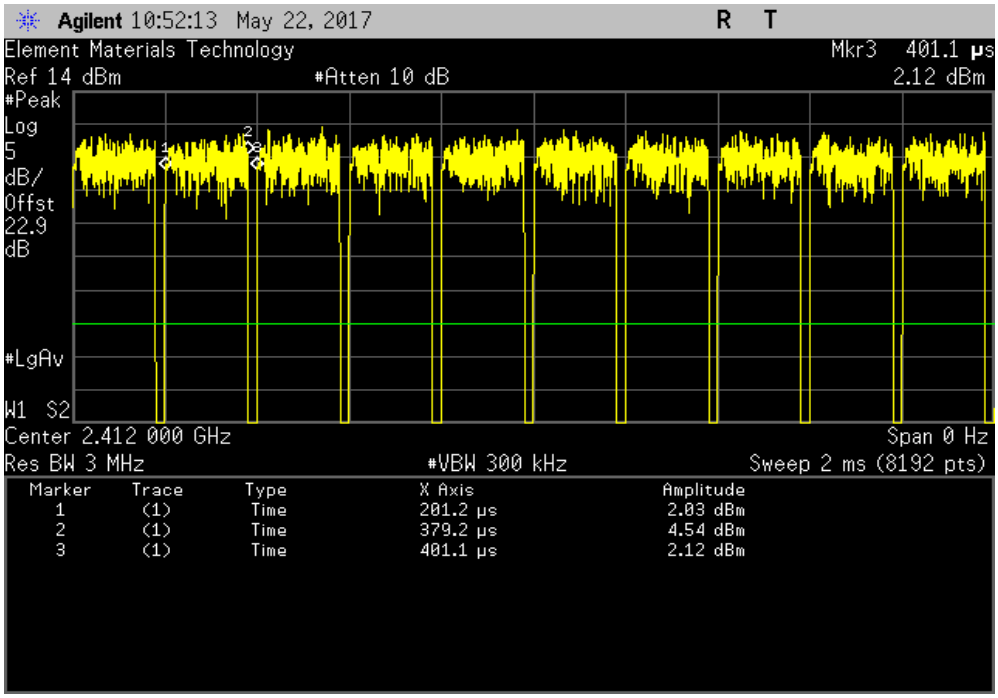
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



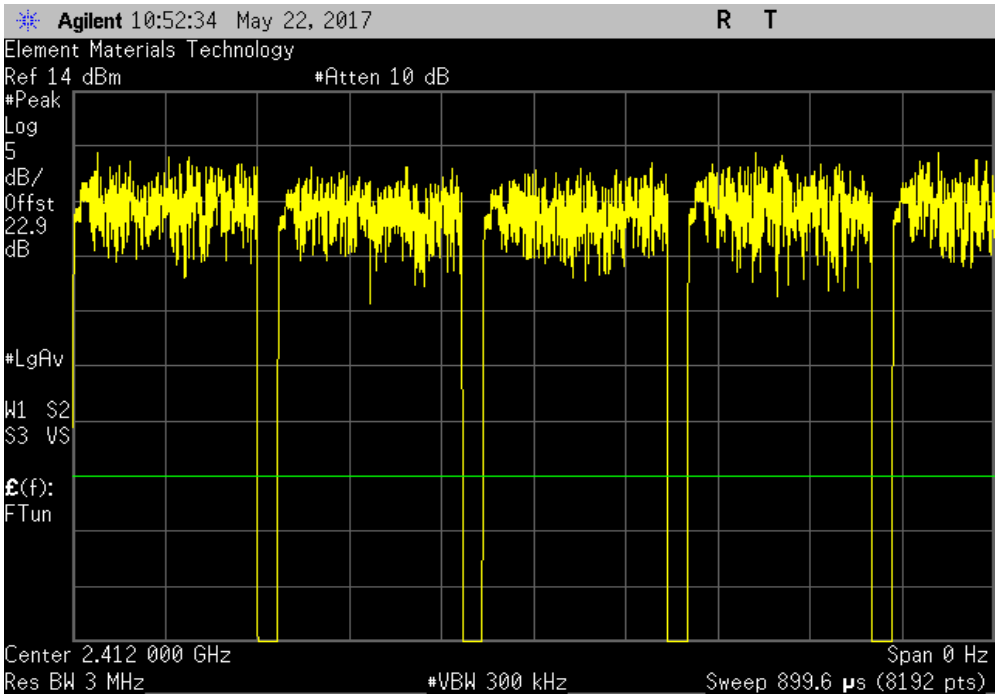
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	177.935 us	199.9 us	1	89	N/A	N/A



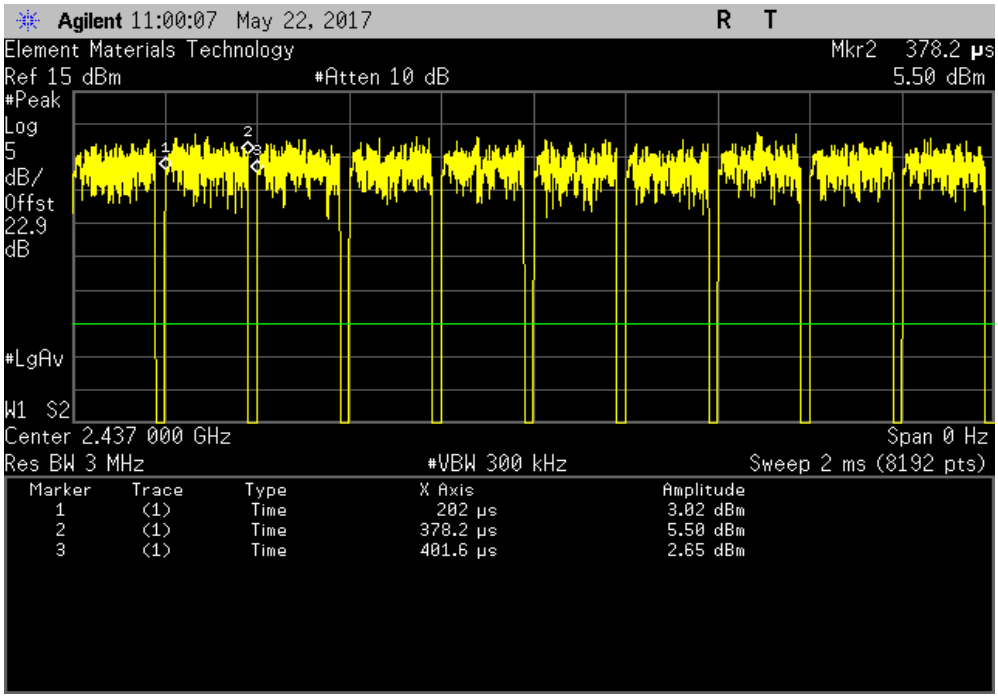
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



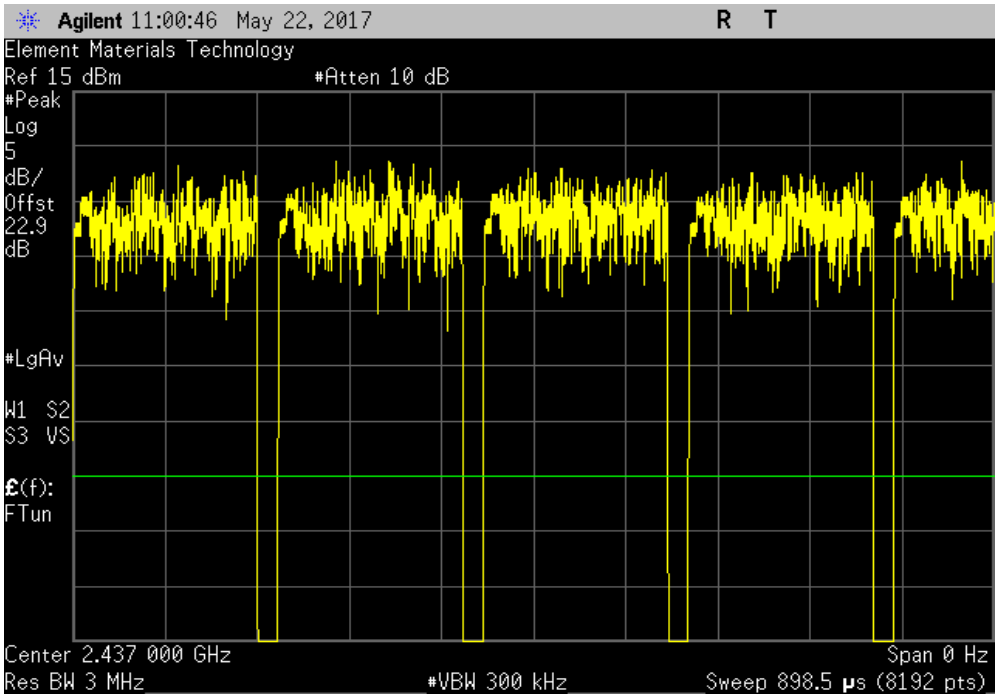
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	176.226 us	199.656 us	1	88.3	N/A	N/A



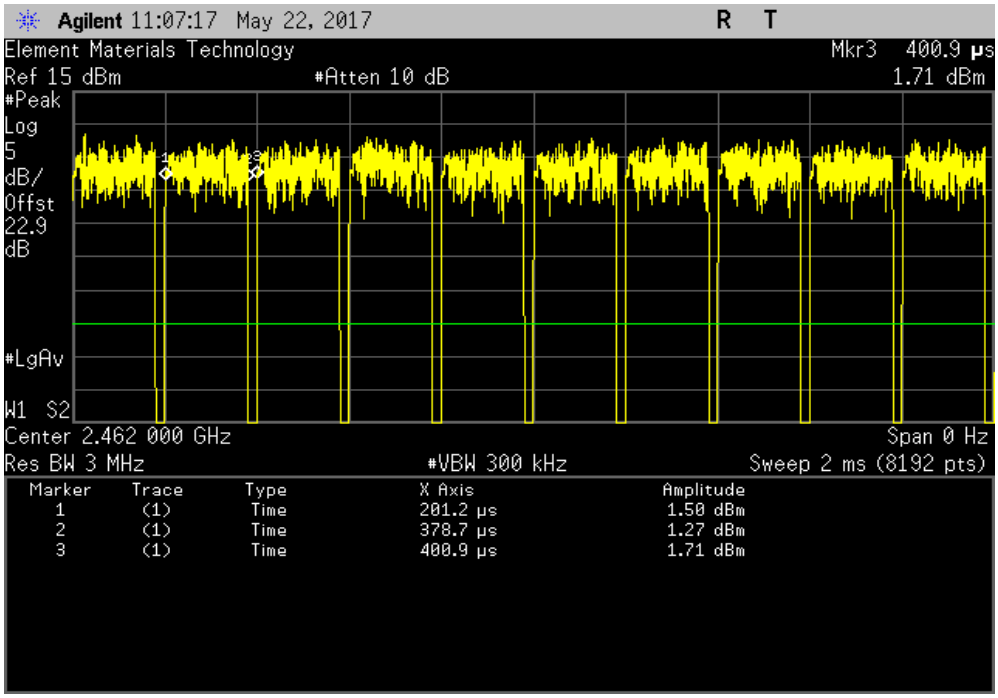
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



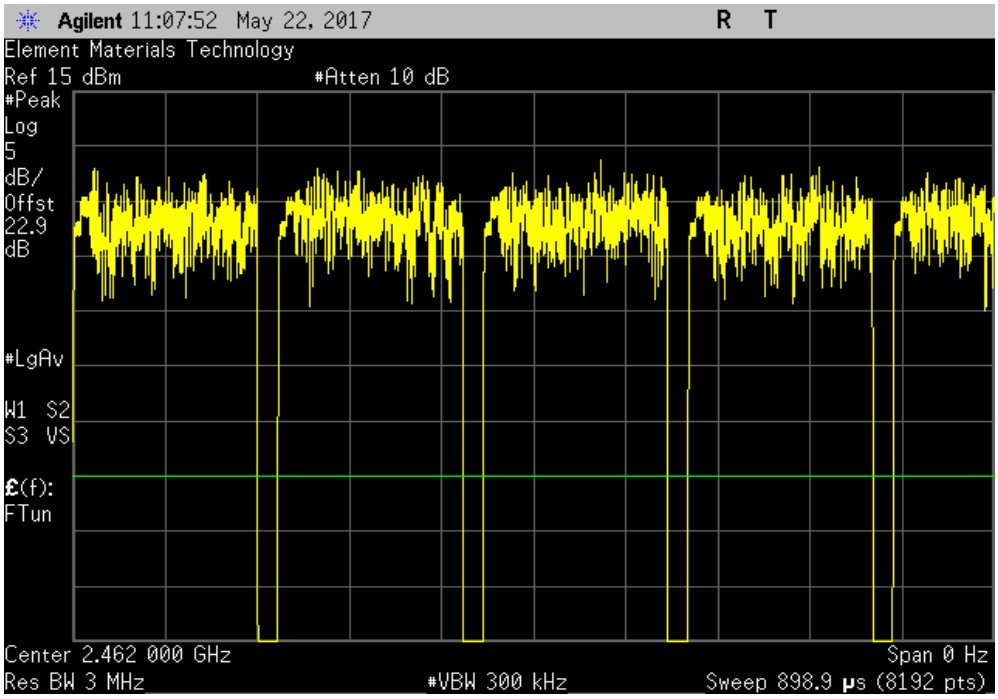
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	177.547 us	199.756 us	1	88.9	N/A	N/A



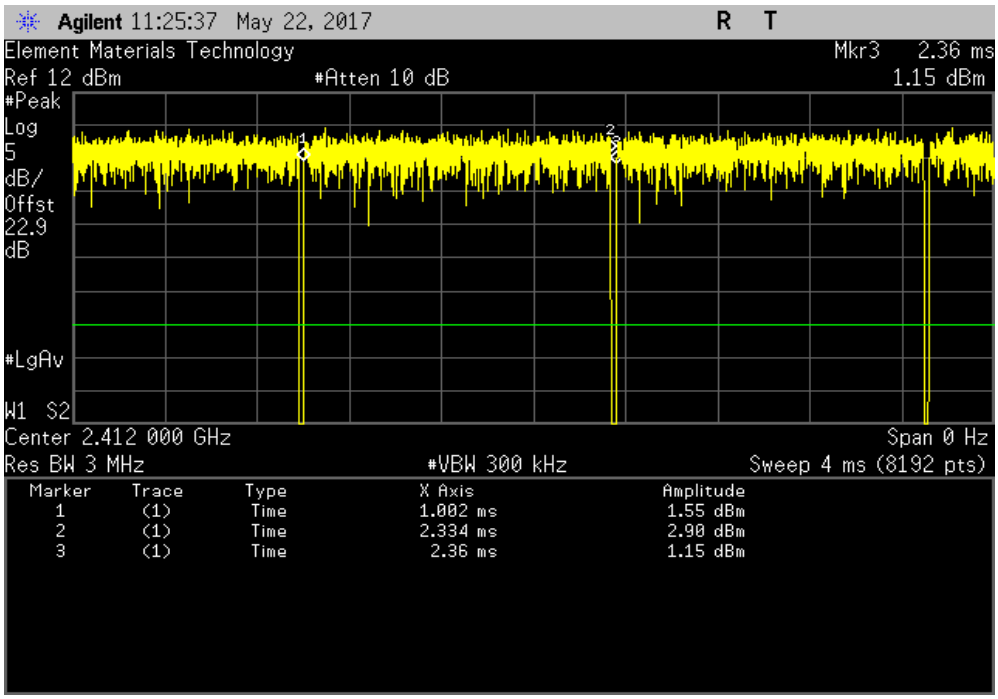
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



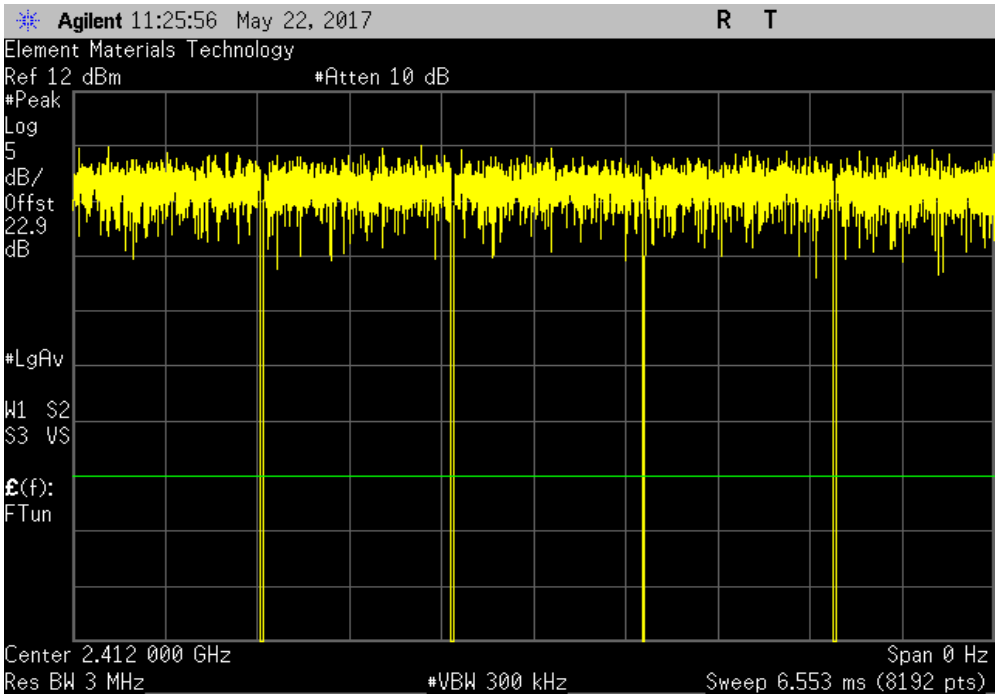
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.332 ms	1.358 ms	1	98.1	N/A	N/A



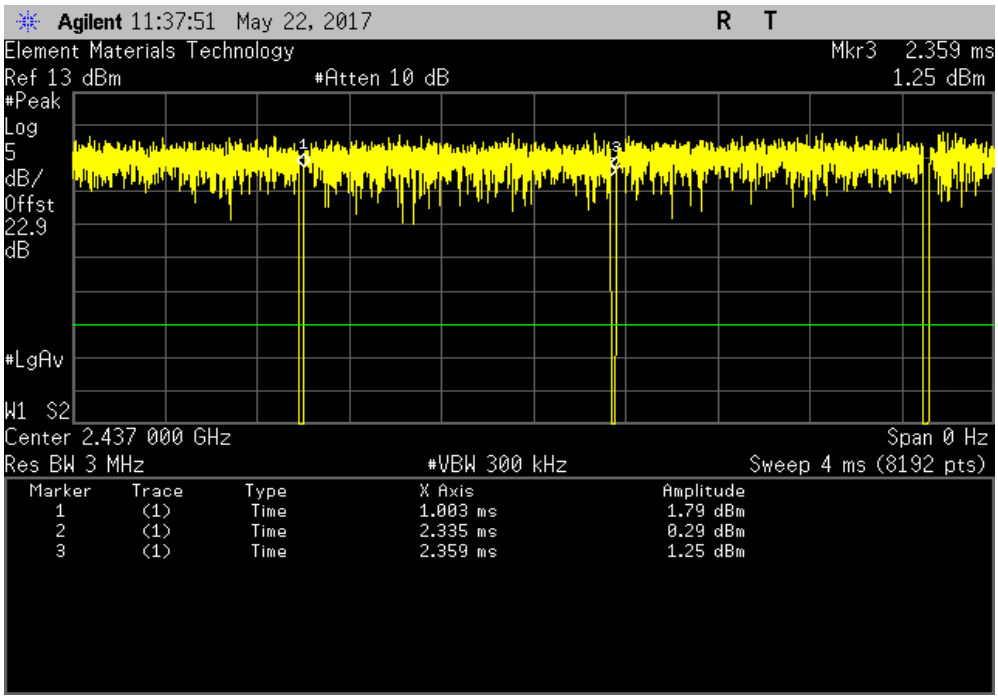
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



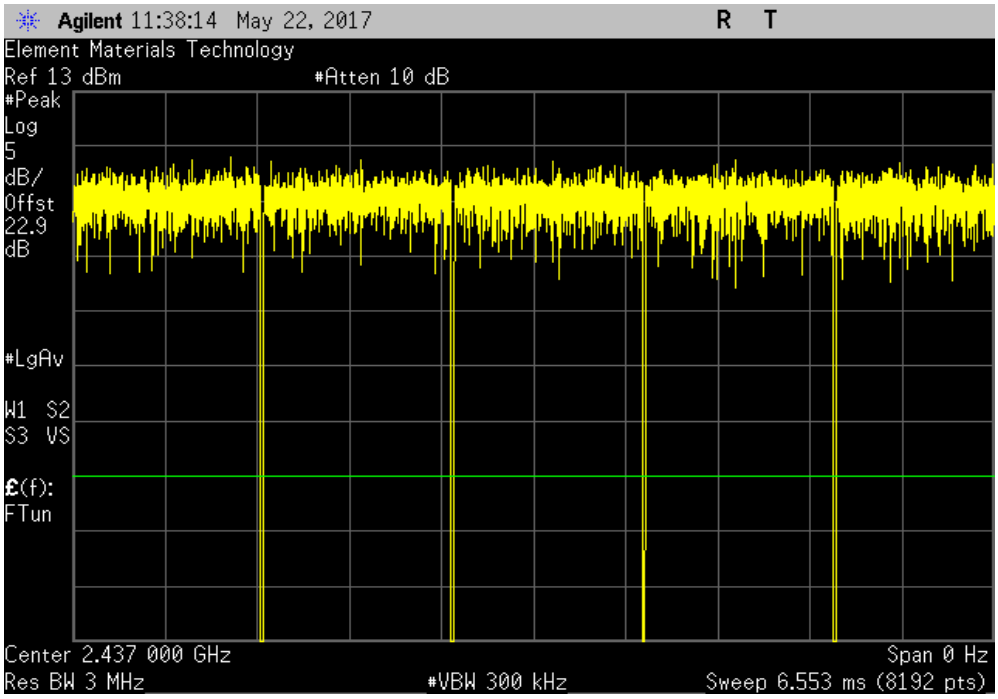
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.332 ms	1.356 ms	1	98.2	N/A	N/A



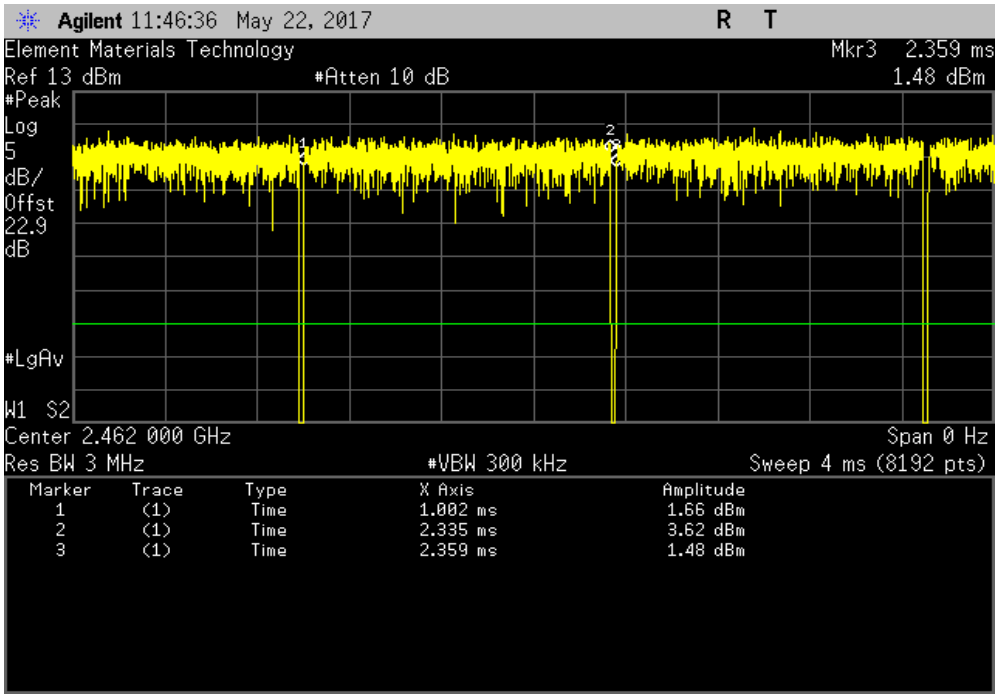
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



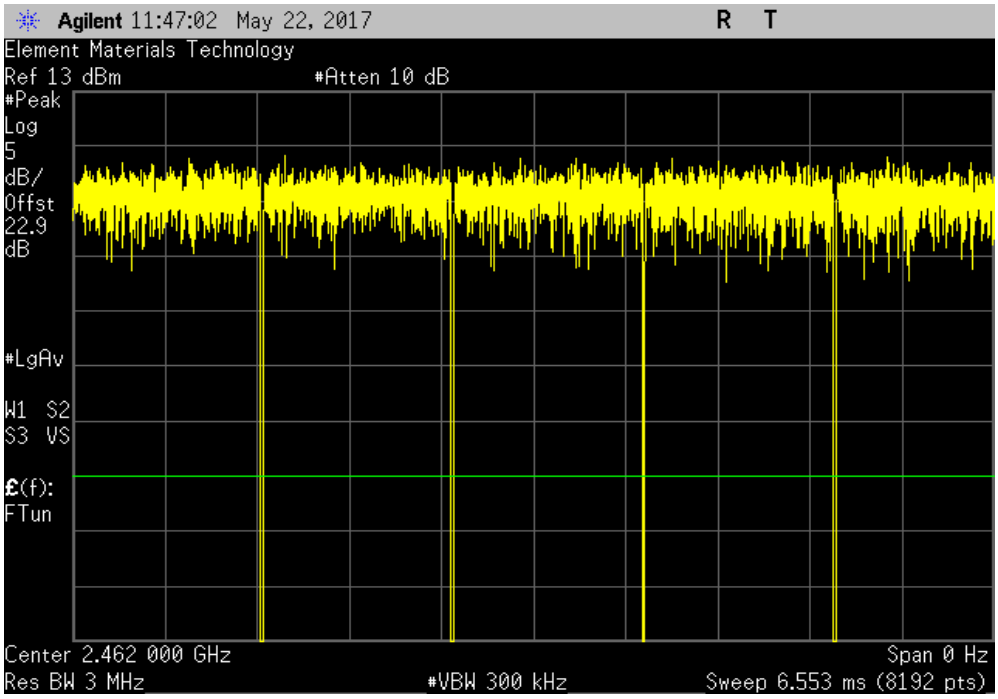
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.333 ms	1.357 ms	1	98.2	N/A	N/A



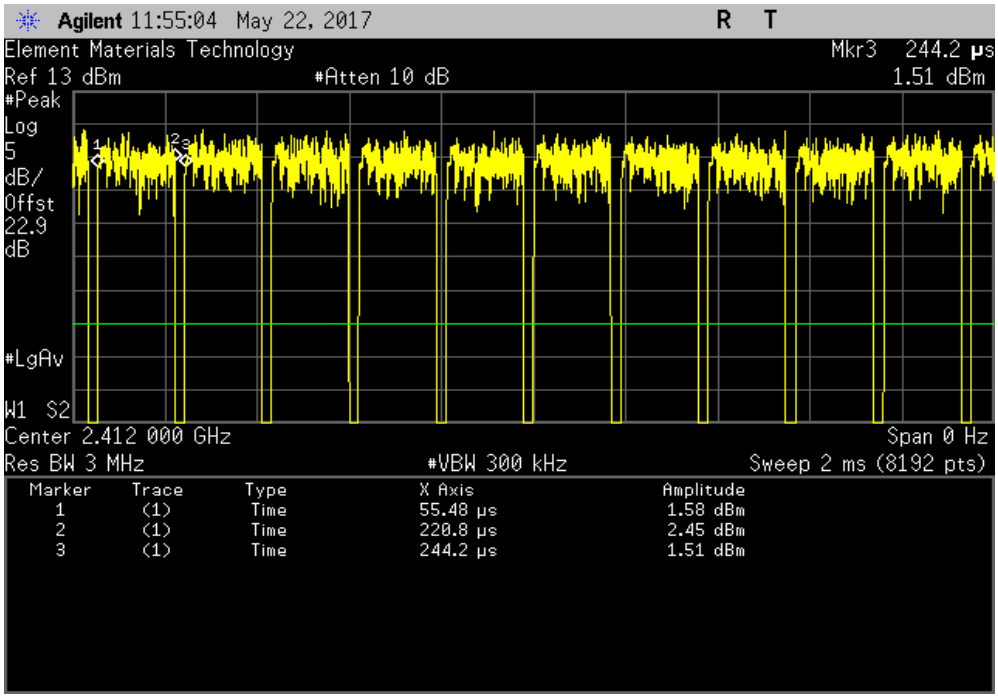
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



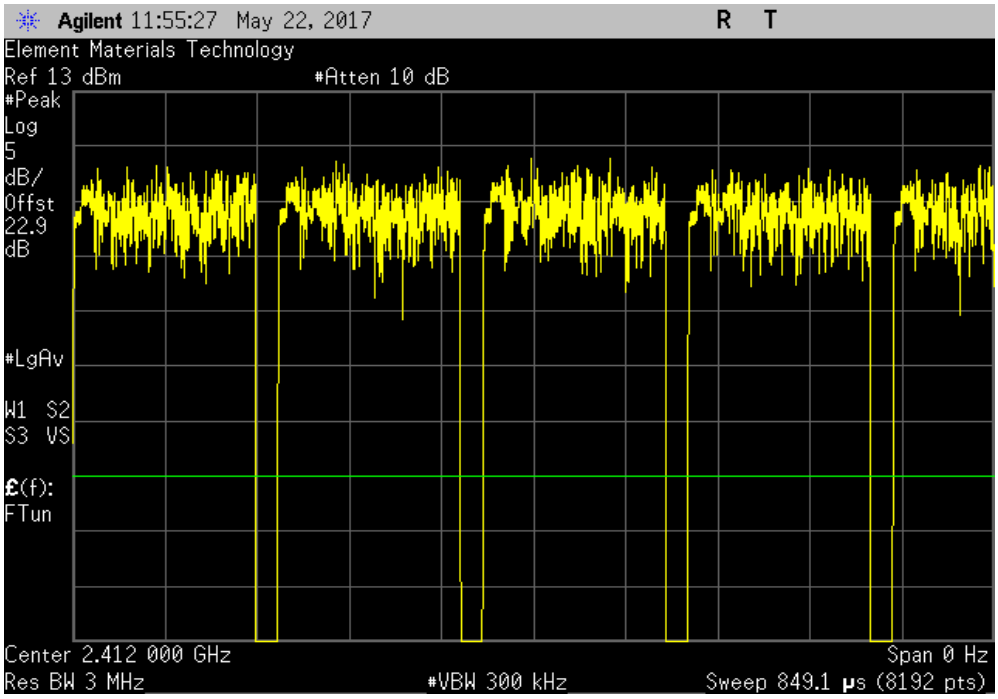
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	165.302 us	188.7 us	1	87.6	N/A	N/A



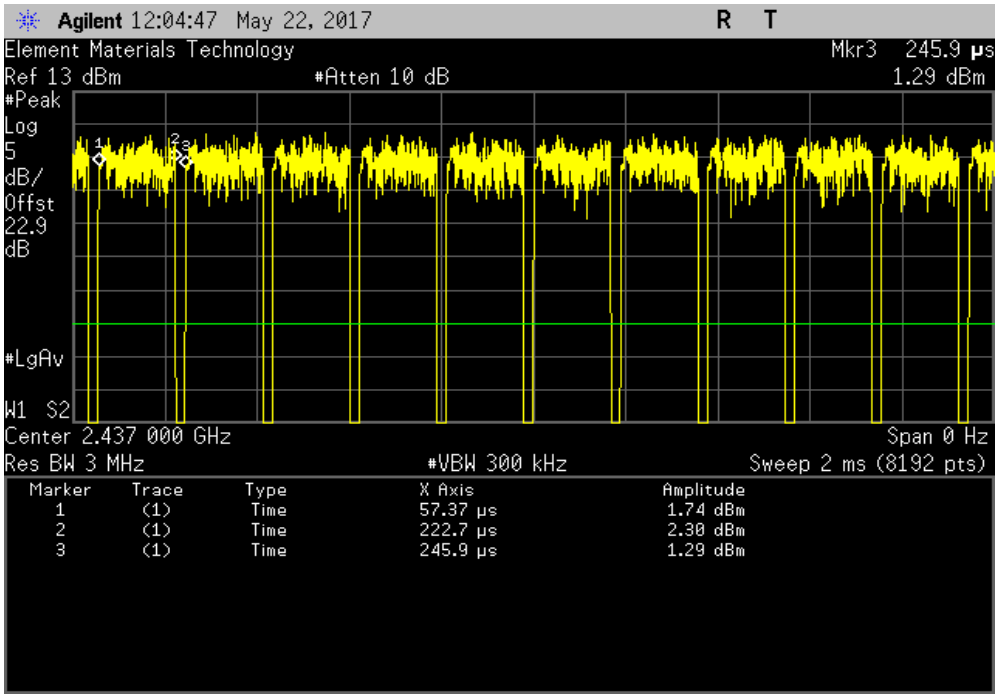
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



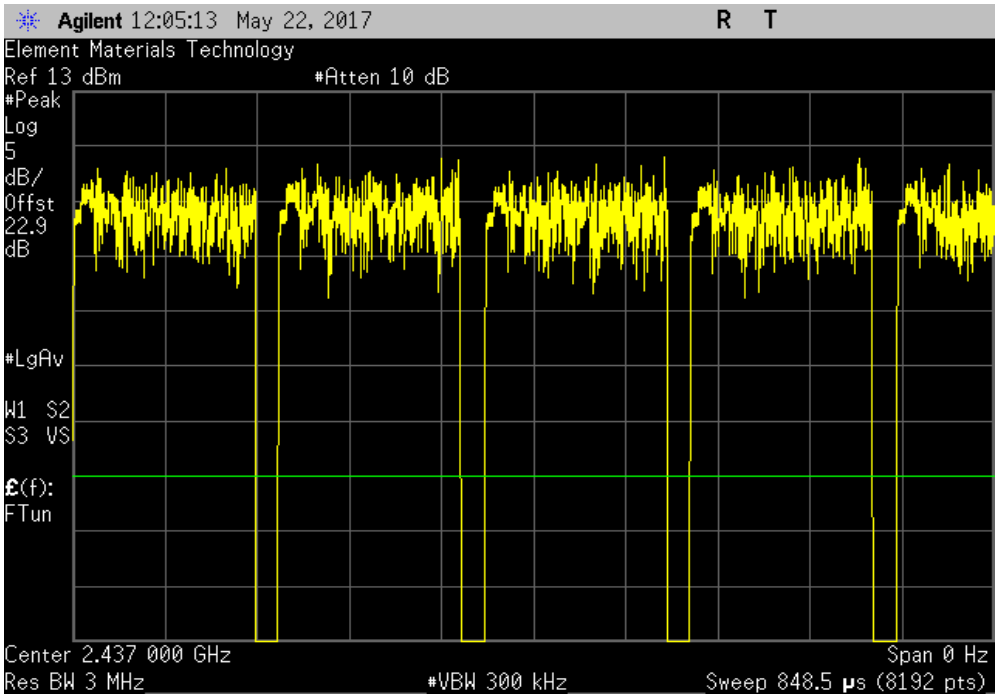
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	165.302 us	188.556 us	1	87.7	N/A	N/A



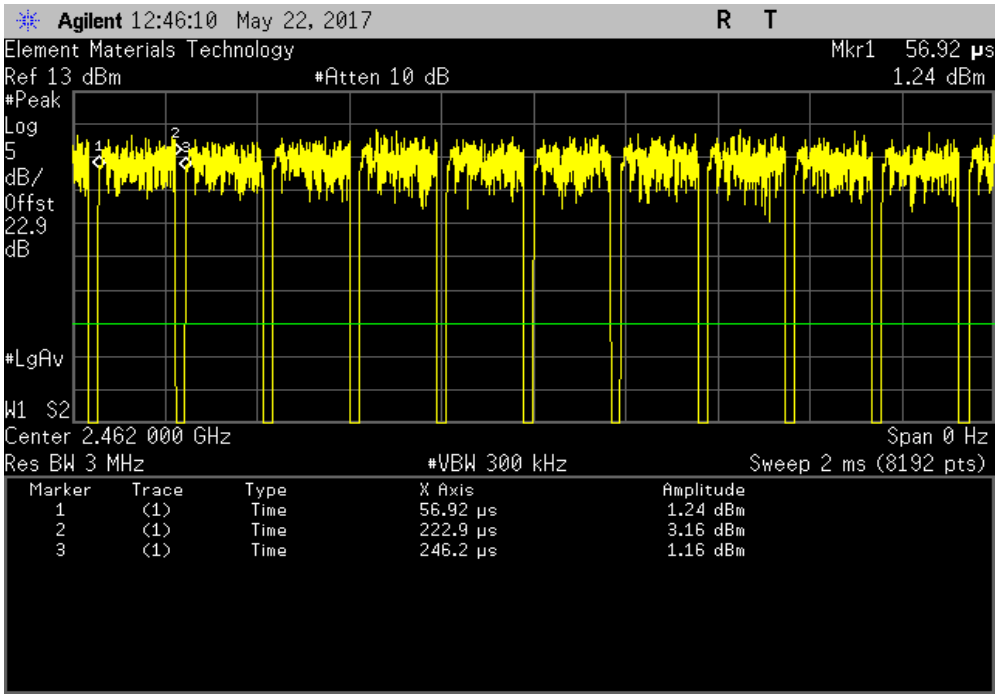
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



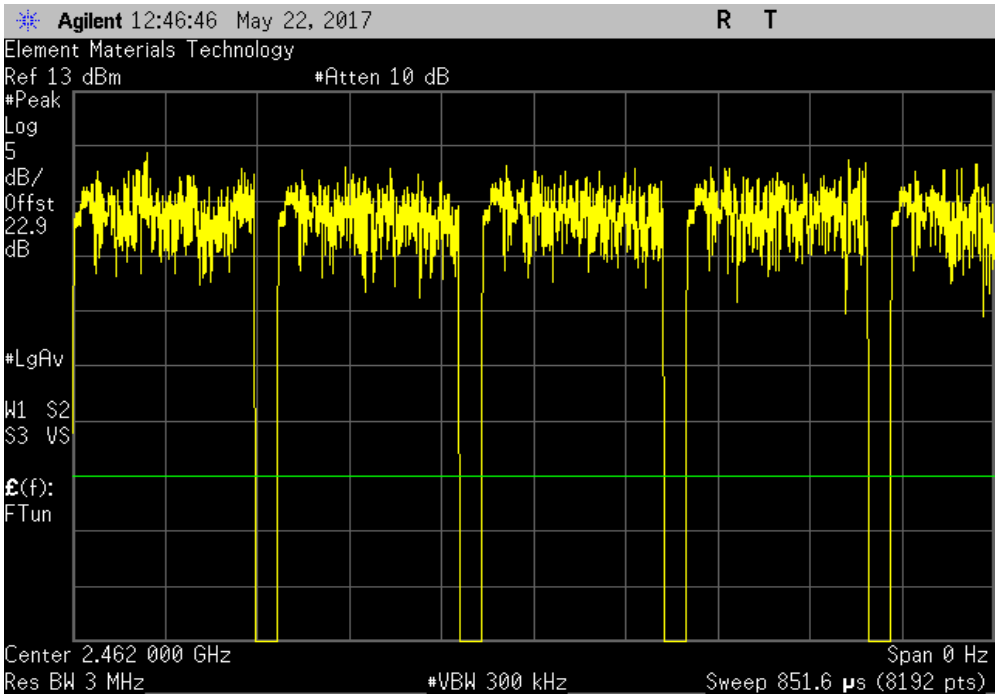
DUTY CYCLE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	165.991 us	189.244 us	1	87.7	N/A	N/A



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



OCCUPIED BANDWIDTH

XMit 2017.02.08

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	2/5/2015	2/5/2018
Attenuator	Fairview Microwave	SA18E-20	TKS	3/6/2017	3/6/2018
Block - DC	Aeroflex	INMET 8535	AMO	3/27/2017	3/27/2018
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	11/2/2016	11/2/2017

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 occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.0% occupied bandwidth was also measured at the same time which can be needed during Output Power depending on the applicable method.

OCCUPIED BANDWIDTH

TbtTx 2017.01.27 XMit 2017.02.08

EUT:	IMP004M	Work Order:	ELIM0013
Serial Number:	IMP0107	Date:	05/31/17
Customer:	Electric Imp, Inc.	Temperature:	21.3 °C
Attendees:	Jonathan Dillon	Humidity:	49% RH
Project:	None	Barometric Pres.:	1014 mbar
Tested by:	Salvador Solorzano and Johnny Candelas	Power: 3.3VDC regulated down from USB 5V	Job Site: OC13

TEST SPECIFICATIONS	Test Method
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

Total Offset 22.59dB (20dB pad + DC Block + coax cable + client provided patch cable) at 2.4GHz

DEVIATIONS FROM TEST STANDARD

None

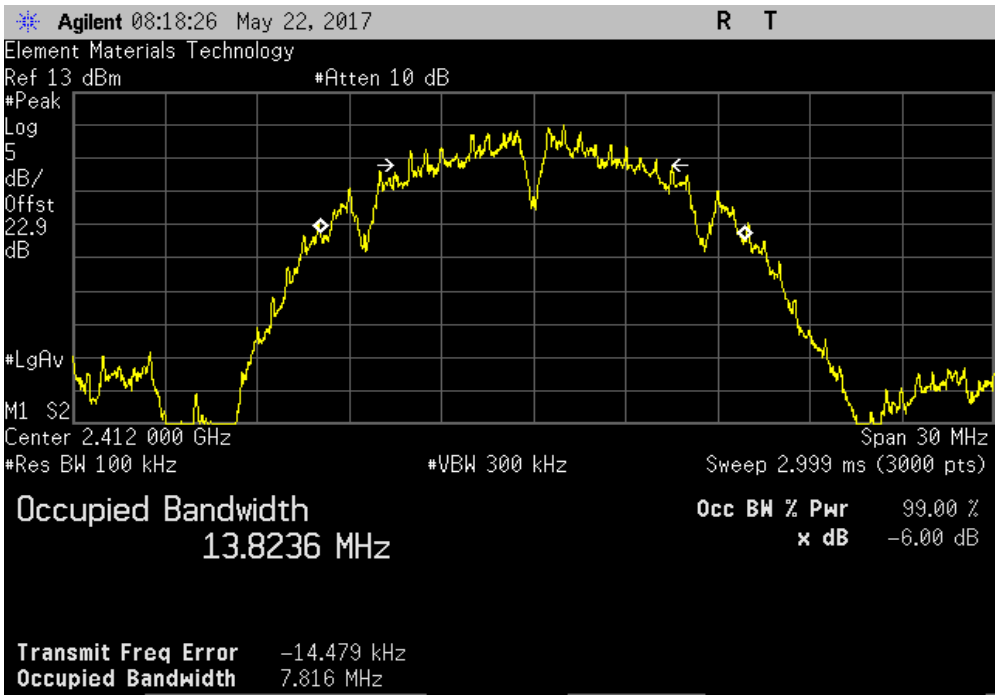
Configuration #	2	Signature

	Value	Limit (>)	Result
2400 MHz - 2483.5 MHz Band			
802.11(b) 1 Mbps			
Low Channel 1, 2412 MHz	7.816 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	7.85 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	8.539 MHz	500 kHz	Pass
802.11(b) 11 Mbps			
Low Channel 1, 2412 MHz	8.174 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	7.698 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	8.986 MHz	500 kHz	Pass
802.11(g) 6 Mbps			
Low Channel 1, 2412 MHz	15.771 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	16.054 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	16.282 MHz	500 kHz	Pass
802.11(g) 36 Mbps			
Low Channel 1, 2412 MHz	16.225 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	16.307 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	15.904 MHz	500 kHz	Pass
802.11(g) 54 Mbps			
Low Channel 1, 2412 MHz	16.059 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	16.127 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	16.008 MHz	500 kHz	Pass
802.11(n) MCS0			
Low Channel 1, 2412 MHz	15.698 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	15.078 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	16.128 MHz	500 kHz	Pass
802.11(n) MCS7			
Low Channel 1, 2412 MHz	17.171 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	17.321 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	16.62 MHz	500 kHz	Pass

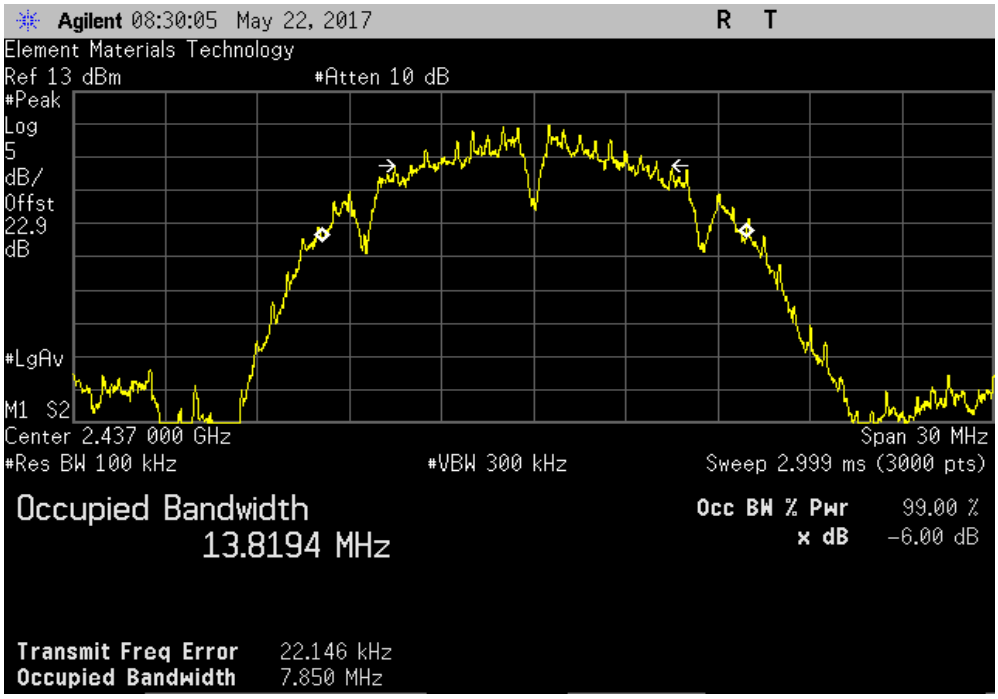
OCCUPIED BANDWIDTH

TbtTx 2017.01.27 XMit 2017.02.08

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

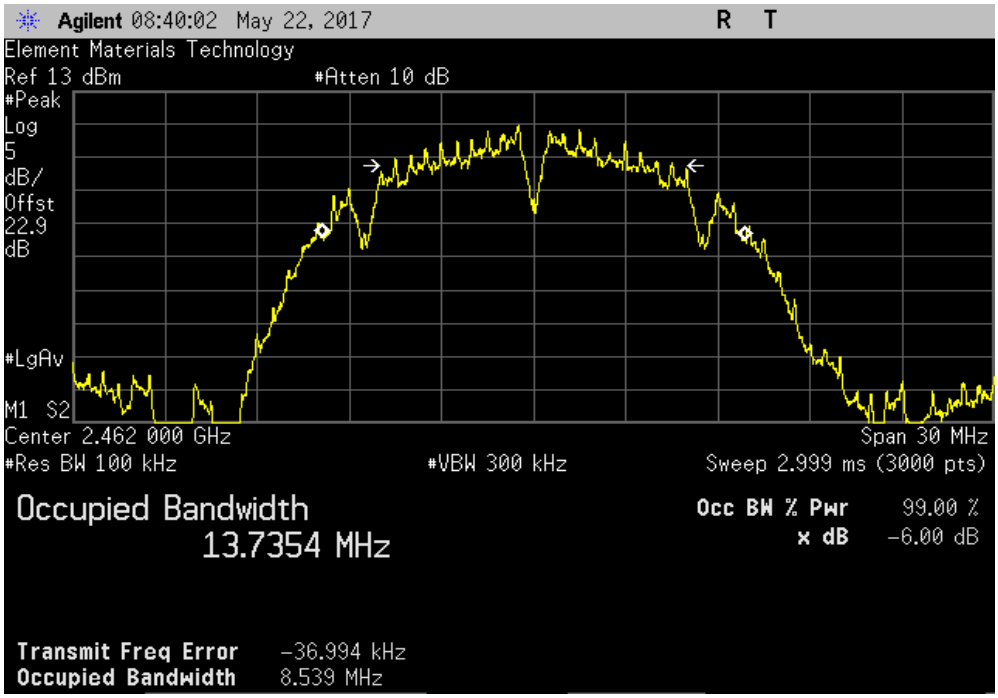


2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit (>)	Result
				7.85 MHz	500 kHz	Pass

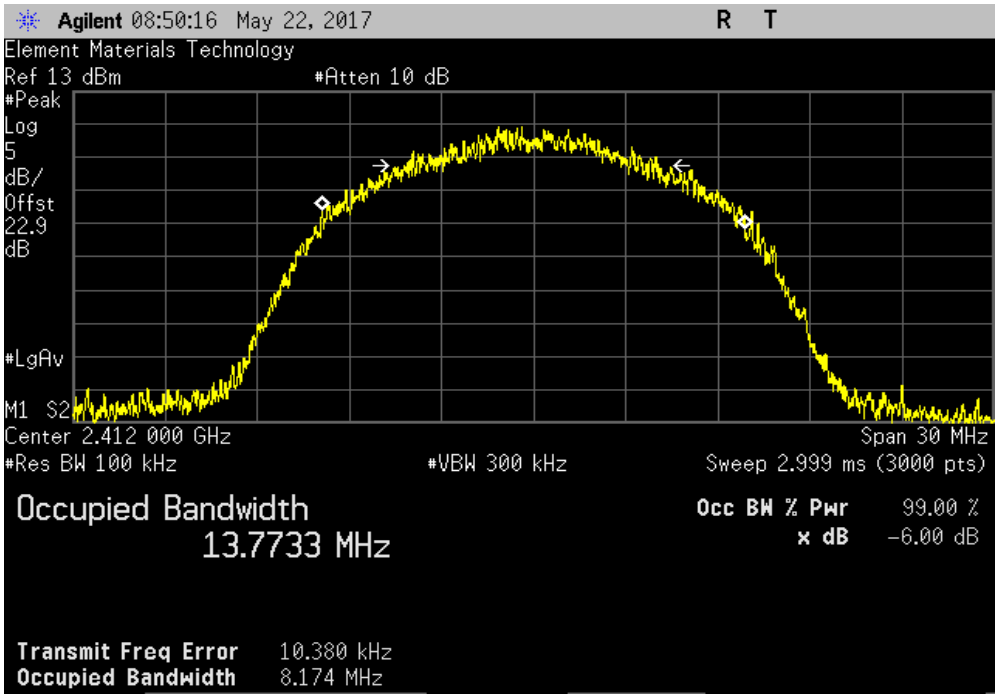


OCCUPIED BANDWIDTH

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



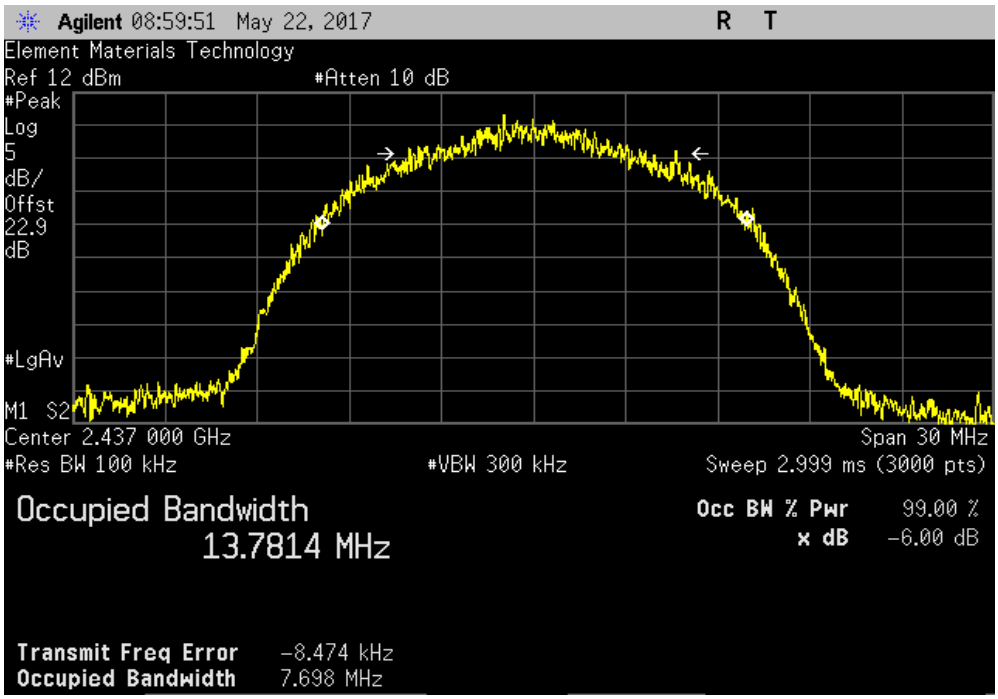
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit (>)	Result
				8.174 MHz	500 kHz	Pass



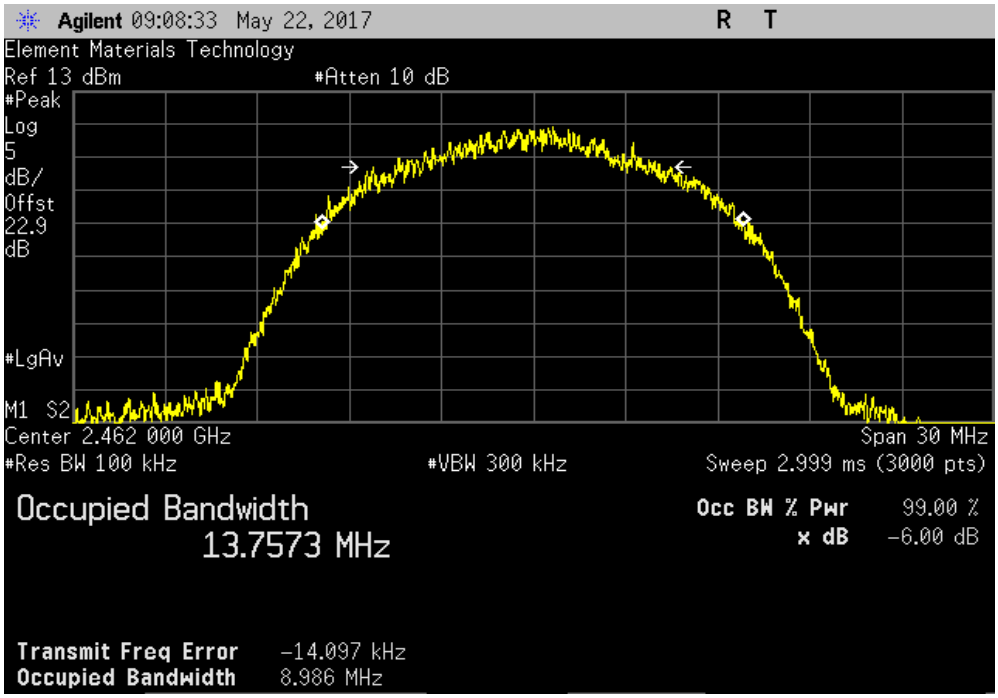
OCCUPIED BANDWIDTH

TbtTx 2017.01.27 XMit 2017.02.08

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



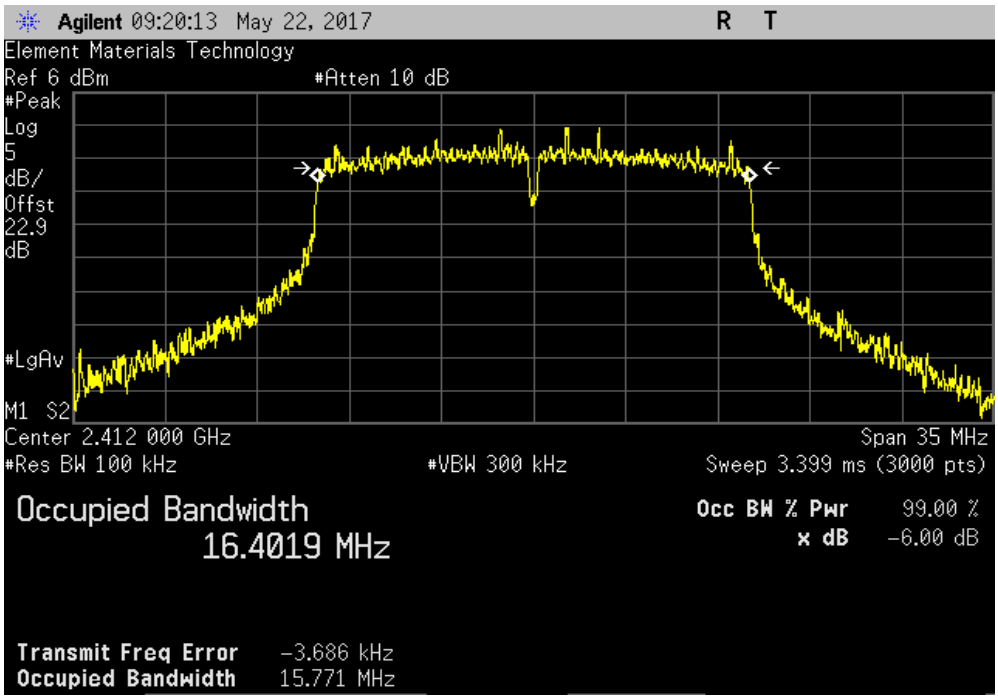
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
				Value	Limit (>)	Result
				8.986 MHz	500 kHz	Pass



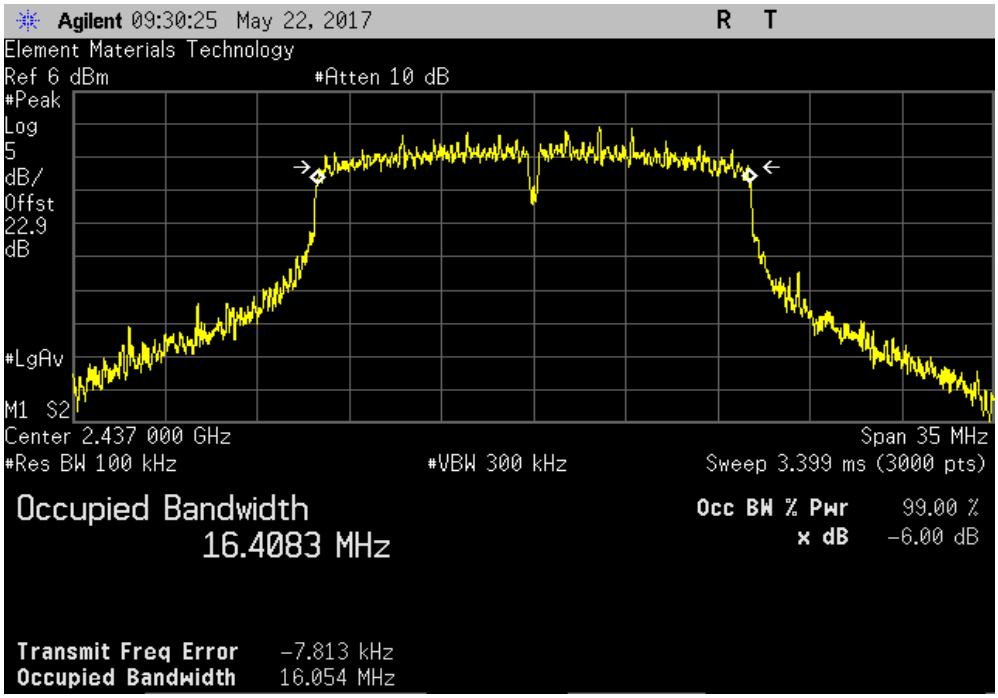
OCCUPIED BANDWIDTH

TbtTx 2017.01.27 XMit 2017.02.08

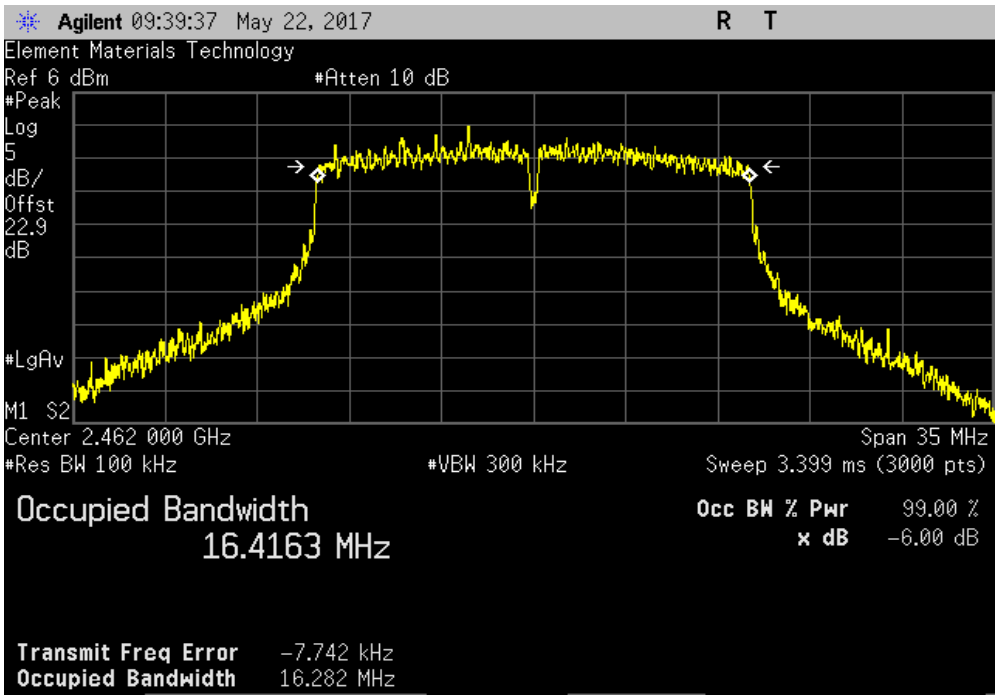
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit (>)	Result
				15.771 MHz	500 kHz	Pass



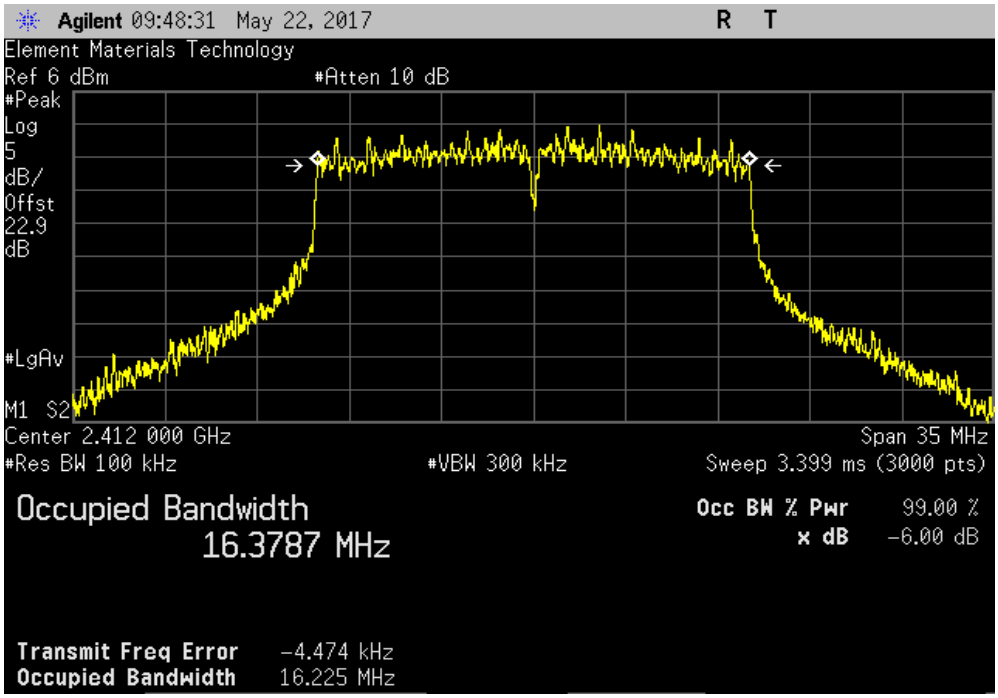
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit (>)	Result
				16.054 MHz	500 kHz	Pass



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



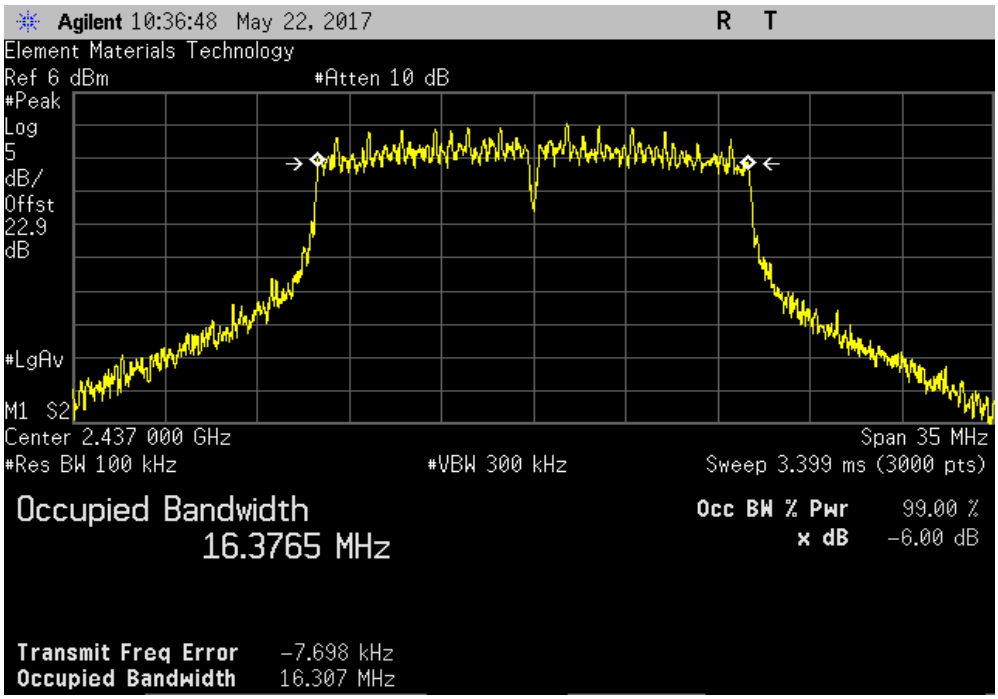
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit (>)	Result
				16.225 MHz	500 kHz	Pass



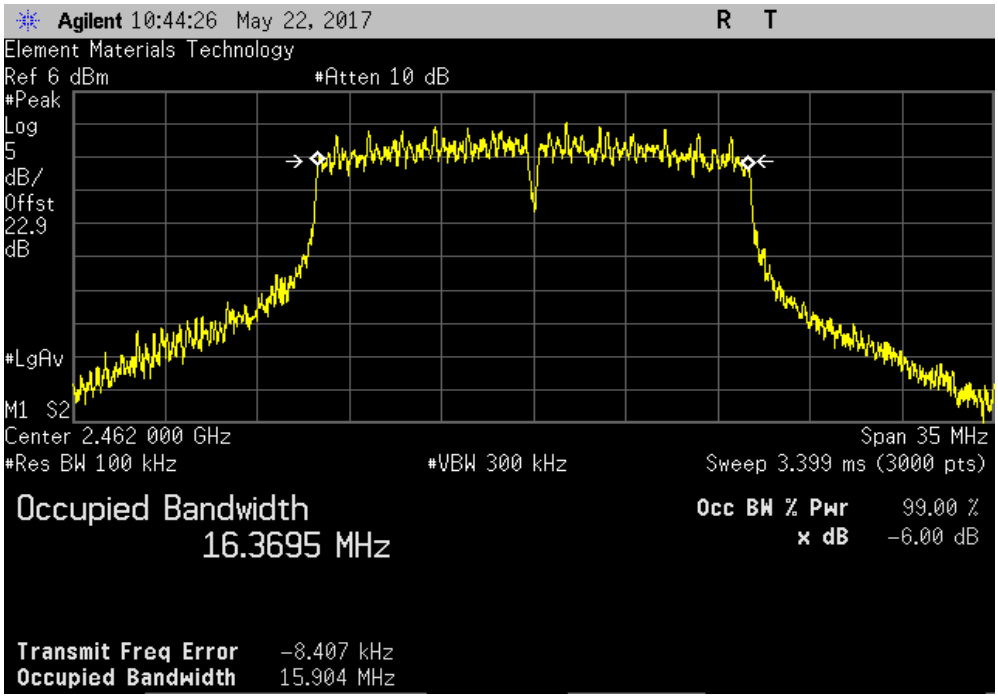
OCCUPIED BANDWIDTH

TbtTx 2017.01.27 XMit 2017.02.08

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



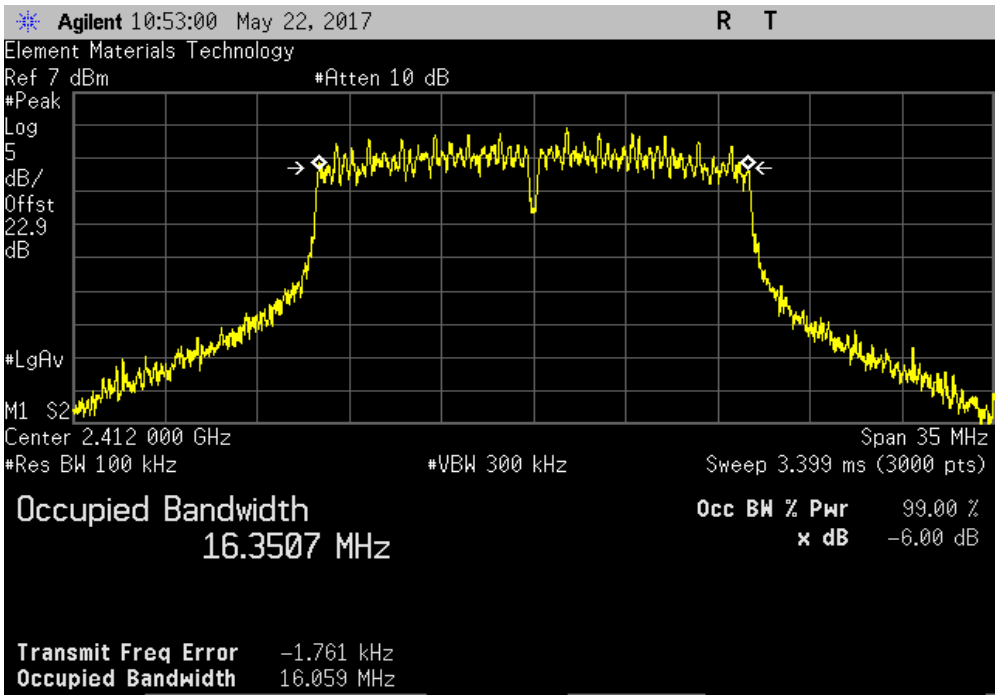
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
				Value	Limit (>)	Result
				15.904 MHz	500 kHz	Pass



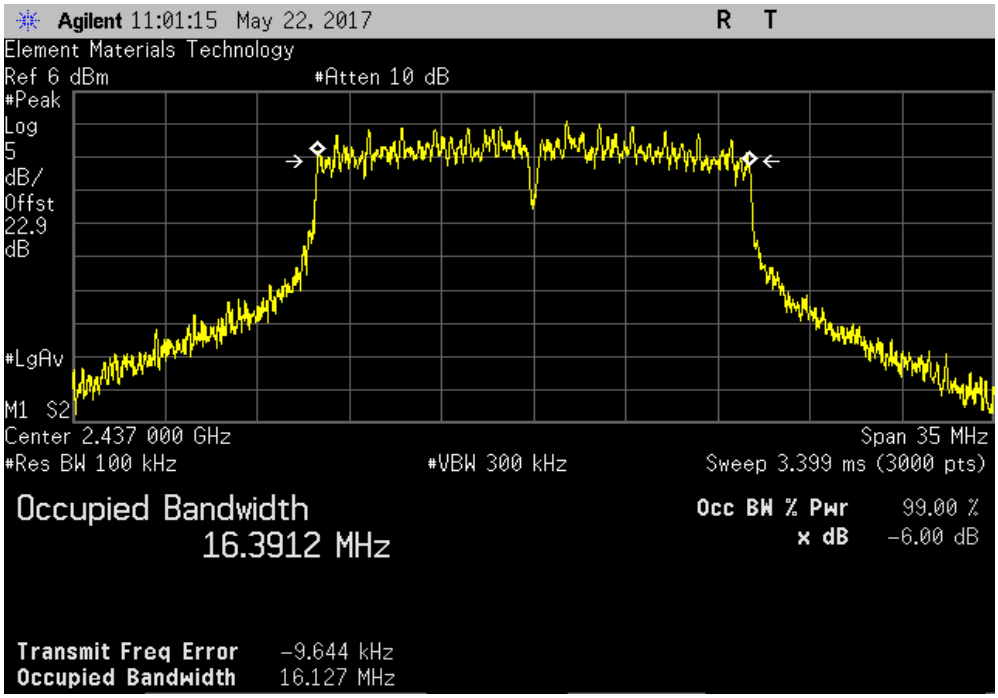
OCCUPIED BANDWIDTH

TbtTx 2017.01.27 XMit 2017.02.08

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



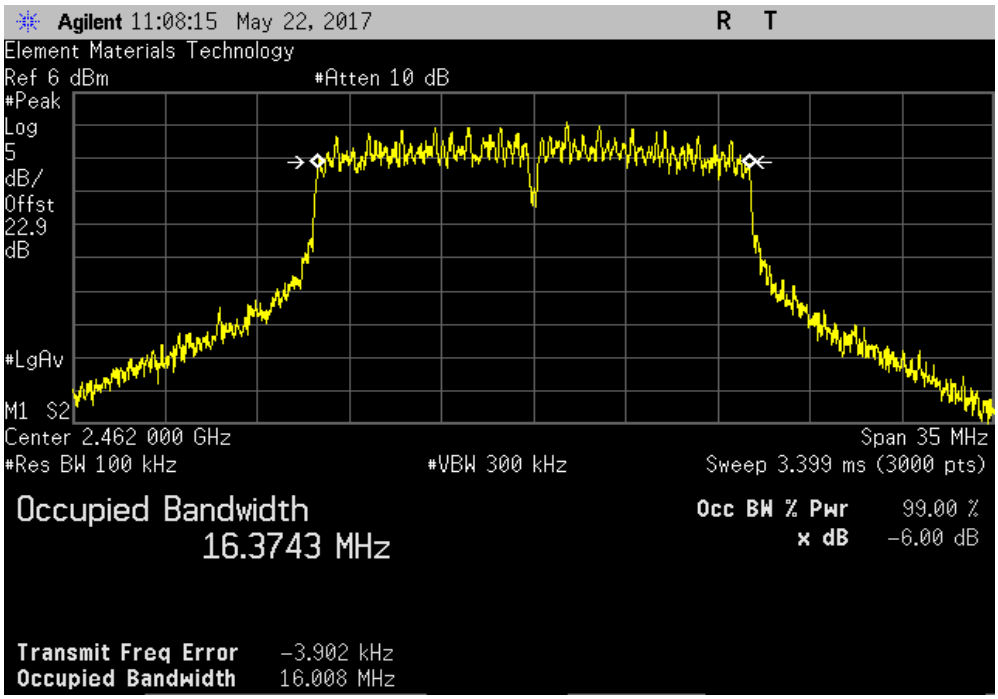
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit (>)	Result
				16.127 MHz	500 kHz	Pass



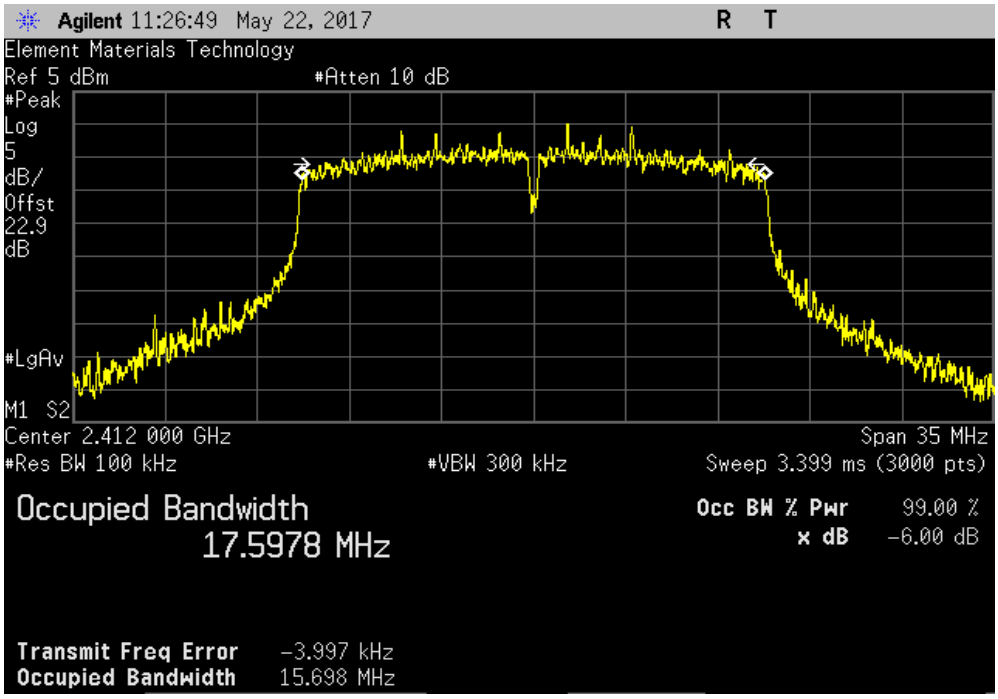
OCCUPIED BANDWIDTH

TbtTx 2017.01.27 XMit 2017.02.08

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



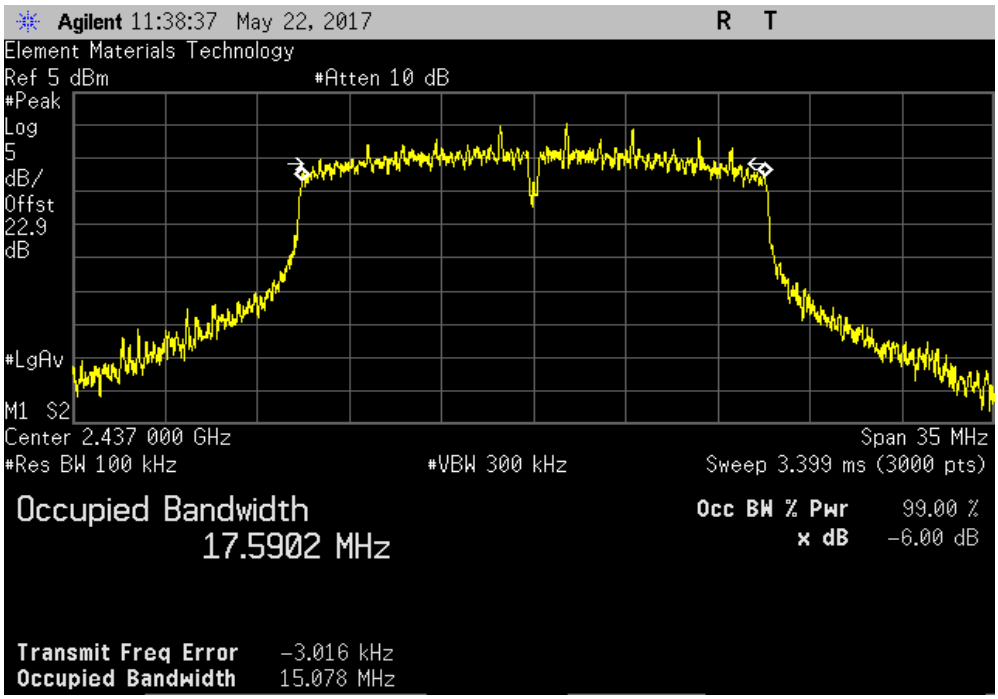
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
				Value	Limit (>)	Result
				15.698 MHz	500 kHz	Pass



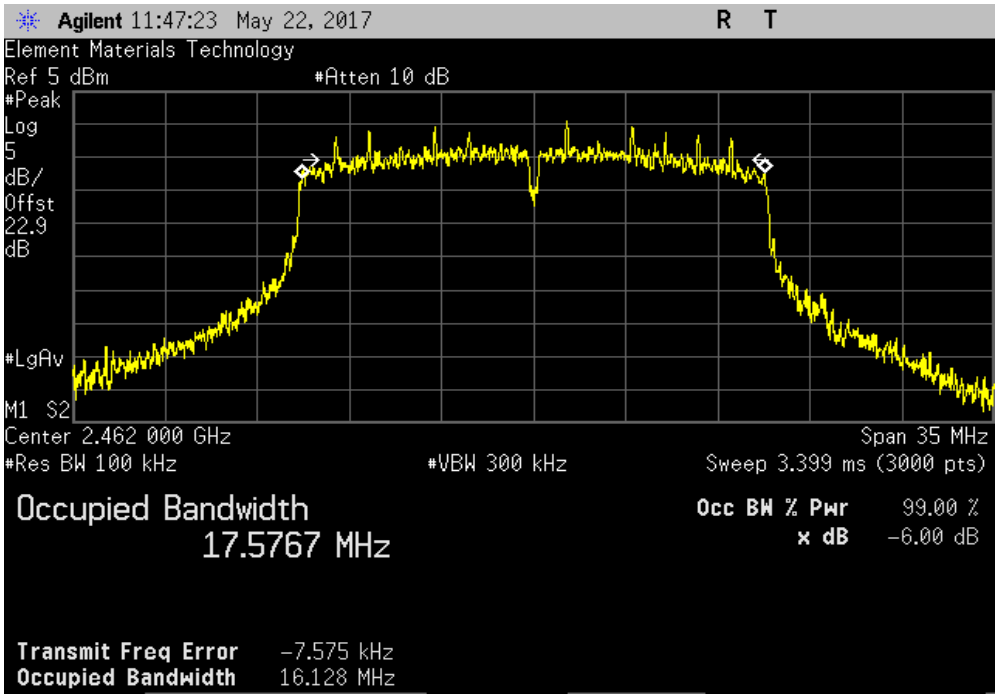
OCCUPIED BANDWIDTH

TbtTx 2017.01.27 XMit 2017.02.08

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



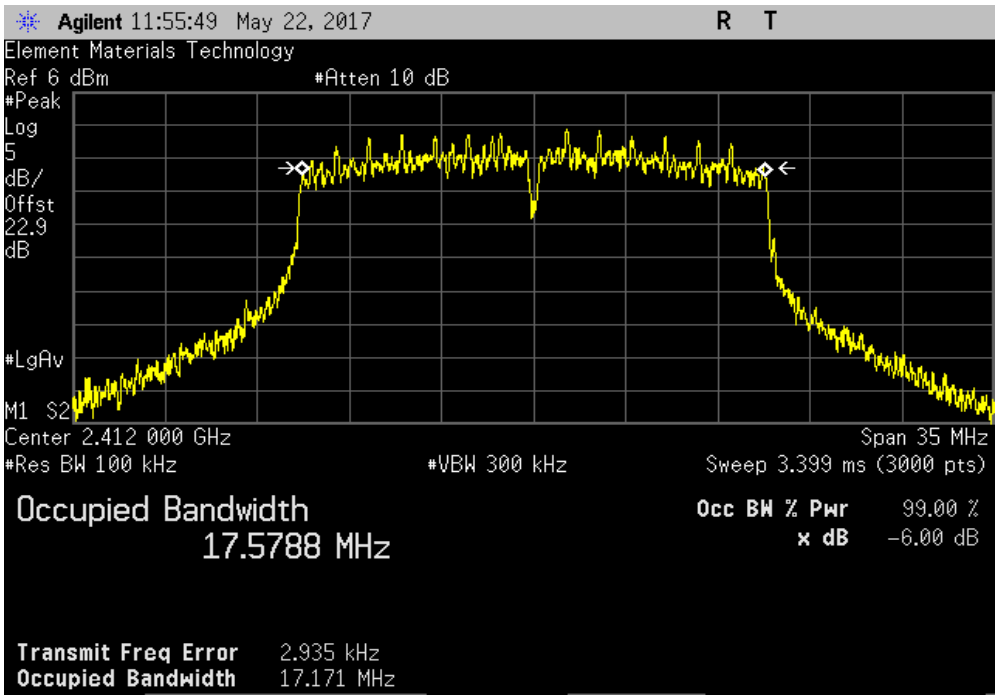
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
				Value	Limit (>)	Result
				16.128 MHz	500 kHz	Pass



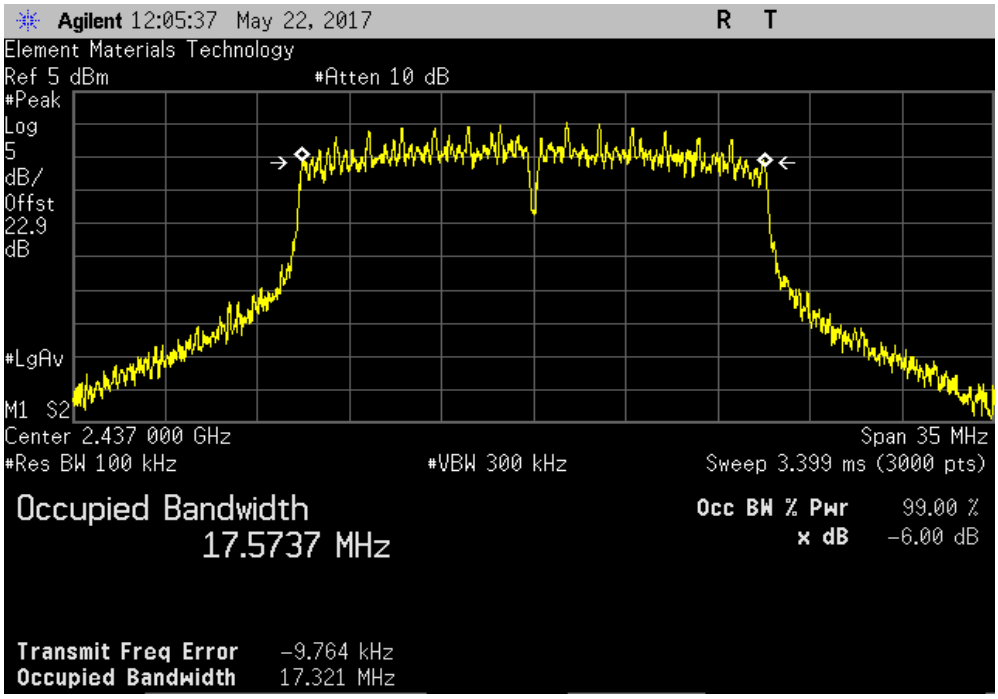
OCCUPIED BANDWIDTH

TbtTx 2017.01.27 XMit 2017.02.08

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



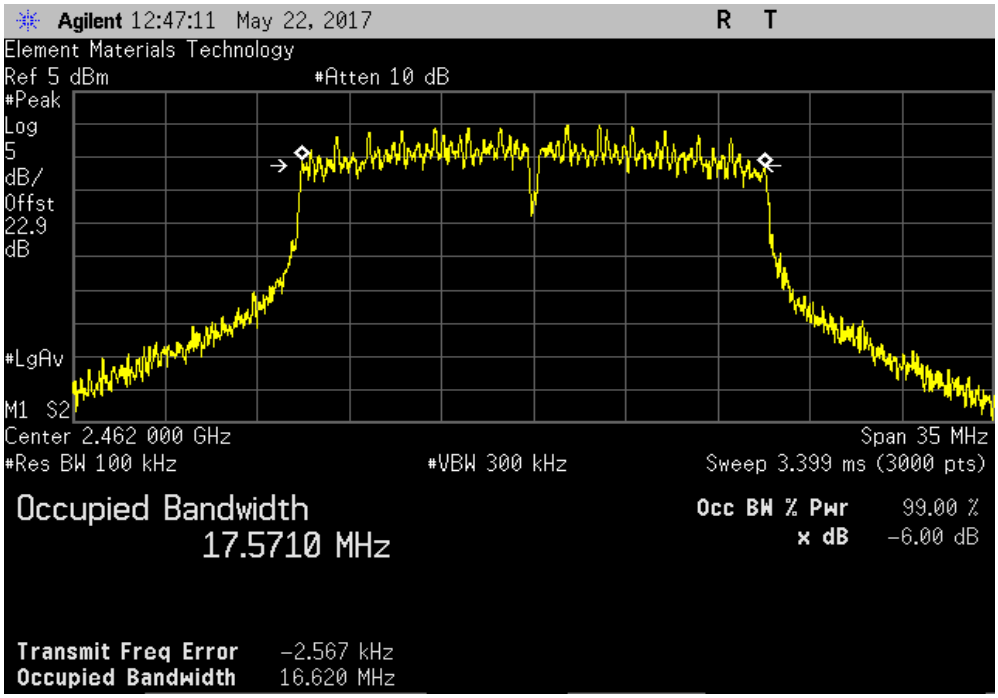
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
				Value	Limit (>)	Result
				17.321 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

TbtTx 2017.01.27 XMit 2017.02.08

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



OUTPUT POWER

XMit 2017.02.08

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	2/5/2015	2/5/2018
Attenuator	Fairview Microwave	SA18E-20	TKS	3/6/2017	3/6/2018
Block - DC	Aeroflex	INMET 8535	AMO	3/27/2017	3/27/2018
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	11/2/2016	11/2/2017

TEST DESCRIPTION

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

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

The method found in ANSI C63.10:2013 Section 11.9.2.2.4 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

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

OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

EUT:	IMP004M	Work Order:	ELIM0013
Serial Number:	IMP0107	Date:	05/31/17
Customer:	Electric Imp, Inc.	Temperature:	21.3 °C
Attendees:	Jonathan Dillon	Humidity:	49% RH
Project:	None	Barometric Pres.:	1014 mbar
Tested by:	Salvador Solorzano and Johnny Candelas	Job Site:	OC13
Power:	3.3VDC regulated down from USB 5V		

TEST SPECIFICATIONS	Test Method
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

Total Offset 22.59dB (20dB pad + DC Block + coax cable + client provided patch cable) at 2.4GHz

DEVIATIONS FROM TEST STANDARD

None

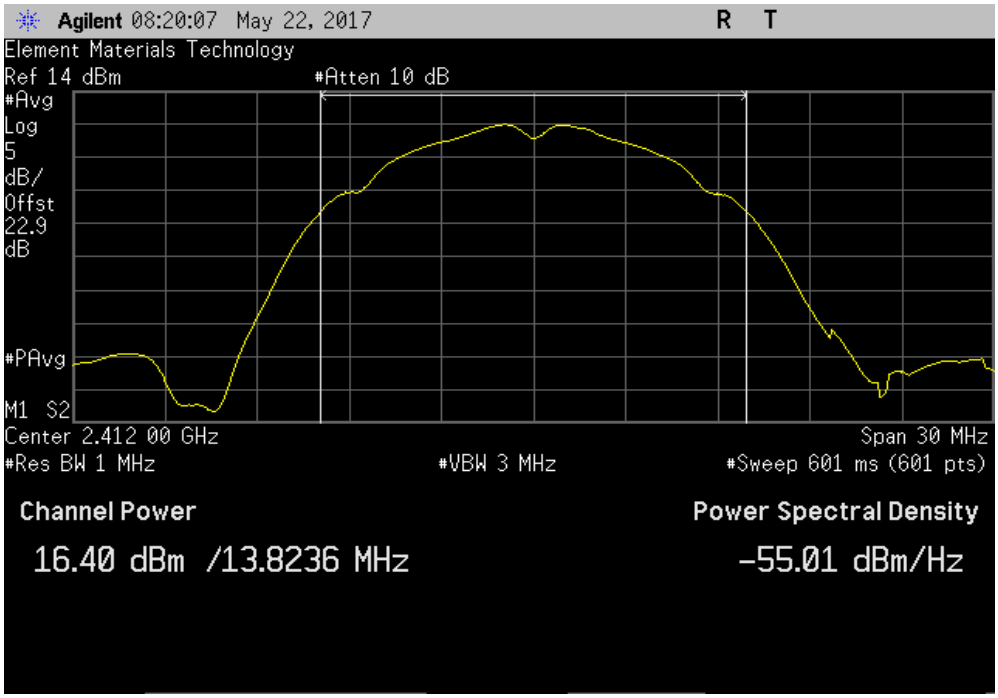
Configuration #	2	Signature

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Value (dBm)	Limit (dBm)	Results
2400 MHz - 2483.5 MHz Band					
802.11(b) 1 Mbps					
Low Channel 1, 2412 MHz	16.398	0	16.4	30	Pass
Mid Channel 6, 2437 MHz	16.256	0	16.3	30	Pass
High Channel 11, 2462 MHz	16.485	0	16.5	30	Pass
802.11(b) 11 Mbps					
Low Channel 1, 2412 MHz	16.284	0.1	16.4	30	Pass
Mid Channel 6, 2437 MHz	16.213	0.1	16.3	30	Pass
High Channel 11, 2462 MHz	16.481	0.1	16.6	30	Pass
802.11(g) 6 Mbps					
Low Channel 1, 2412 MHz	11.885	0.1	12	30	Pass
Mid Channel 6, 2437 MHz	11.918	0.1	12	30	Pass
High Channel 11, 2462 MHz	12.047	0.1	12.1	30	Pass
802.11(g) 36 Mbps					
Low Channel 1, 2412 MHz	11.355	0.4	11.7	30	Pass
Mid Channel 6, 2437 MHz	11.646	0.4	12	30	Pass
High Channel 11, 2462 MHz	11.845	0.4	12.2	30	Pass
802.11(g) 54 Mbps					
Low Channel 1, 2412 MHz	11.425	0.5	11.9	30	Pass
Mid Channel 6, 2437 MHz	11.491	0.5	12	30	Pass
High Channel 11, 2462 MHz	11.508	0.5	12	30	Pass
802.11(n) MCS0					
Low Channel 1, 2412 MHz	10.758	0.1	10.8	30	Pass
Mid Channel 6, 2437 MHz	10.79	0.1	10.9	30	Pass
High Channel 11, 2462 MHz	10.95	0.1	11	30	Pass
802.11(n) MCS7					
Low Channel 1, 2412 MHz	10.586	0.6	11.2	30	Pass
Mid Channel 6, 2437 MHz	10.317	0.6	10.9	30	Pass
High Channel 11, 2462 MHz	10.321	0.6	10.9	30	Pass

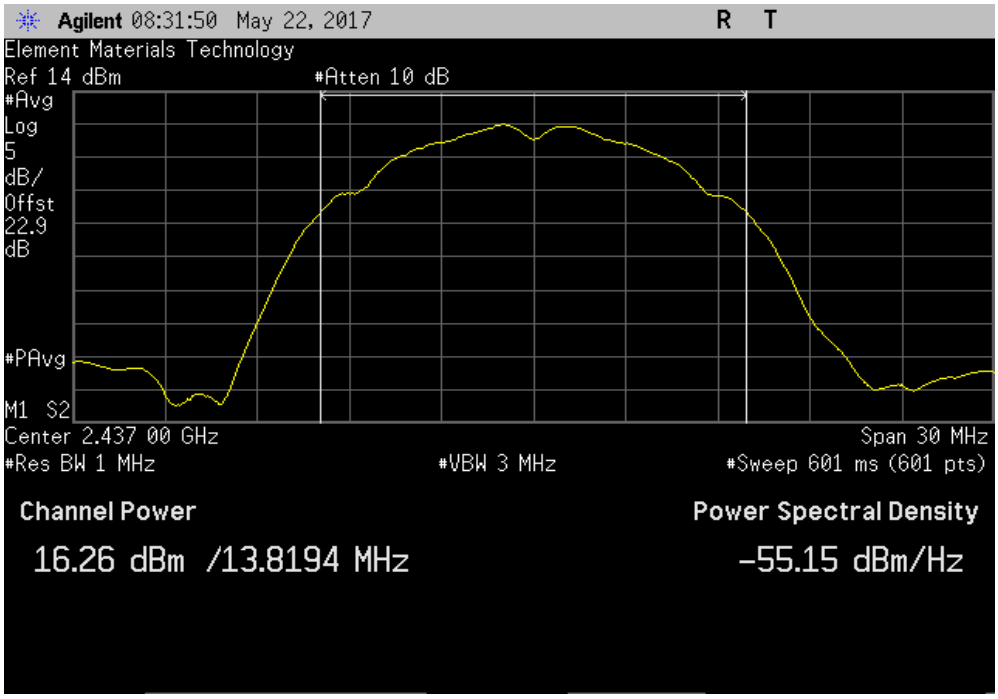
OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

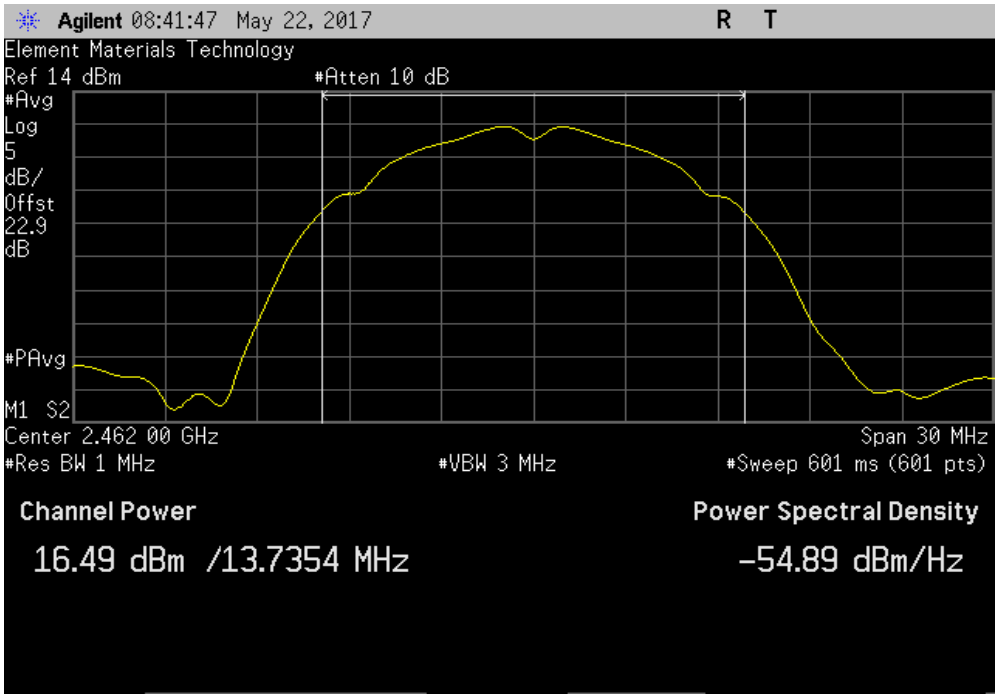
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	16.398	0		16.4	30	Pass



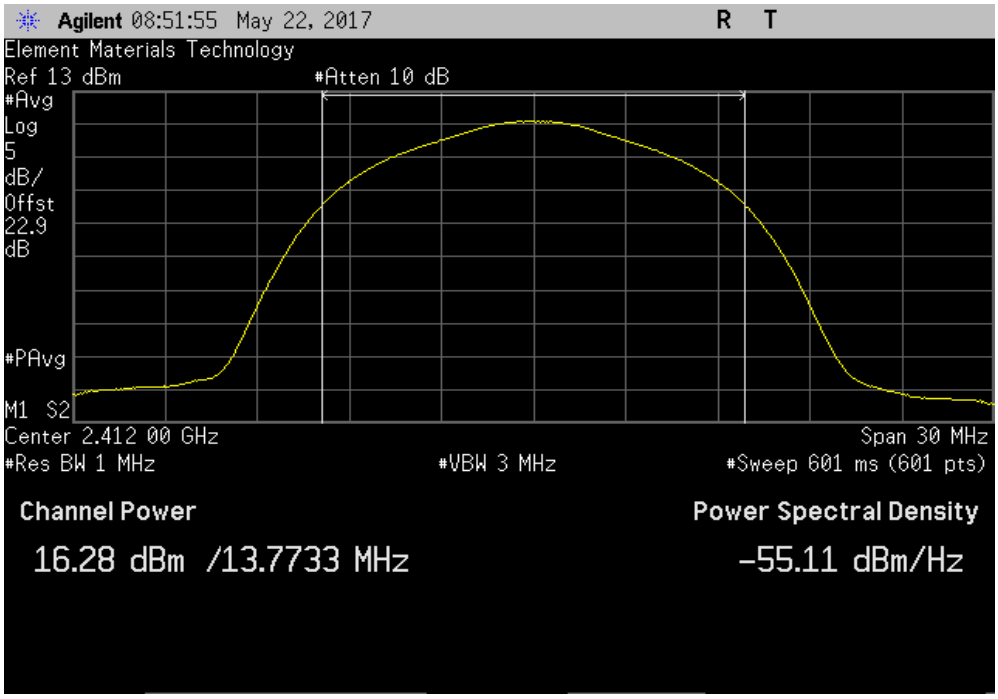
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	16.256	0		16.3	30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	16.485	0		16.5	30	Pass



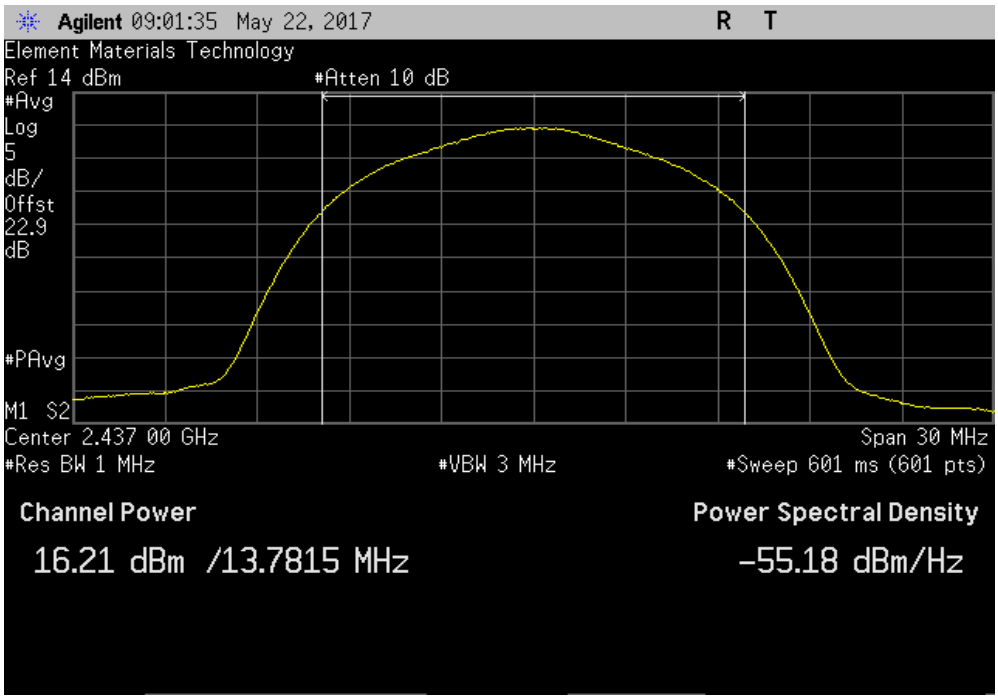
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	16.284	0.1		16.4	30	Pass



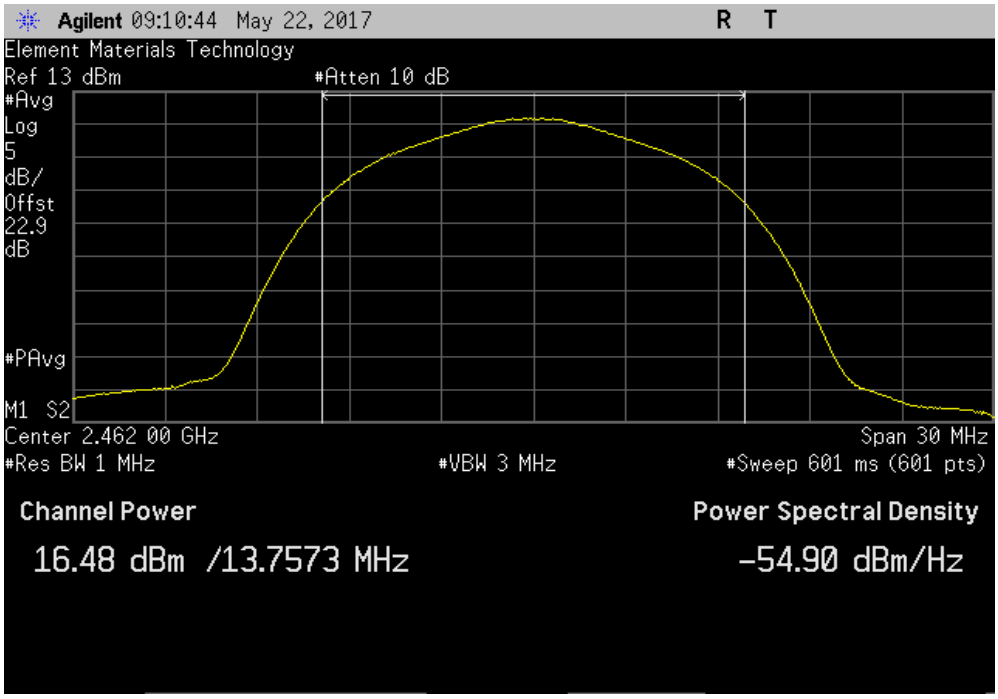
OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	16.213	0.1		16.3	30	Pass



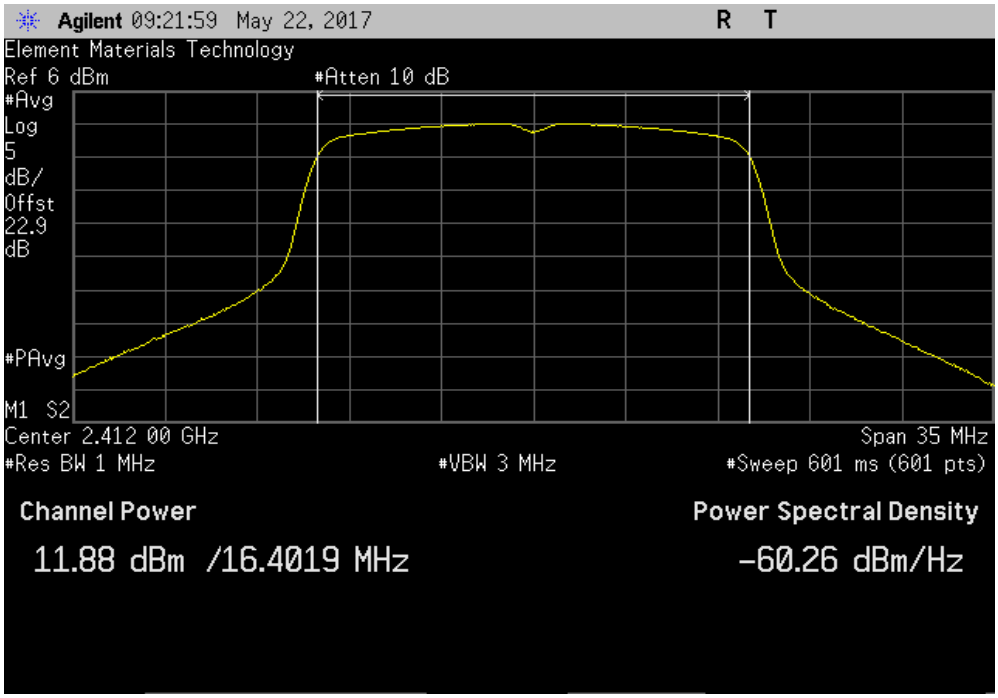
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	16.481	0.1		16.6	30	Pass



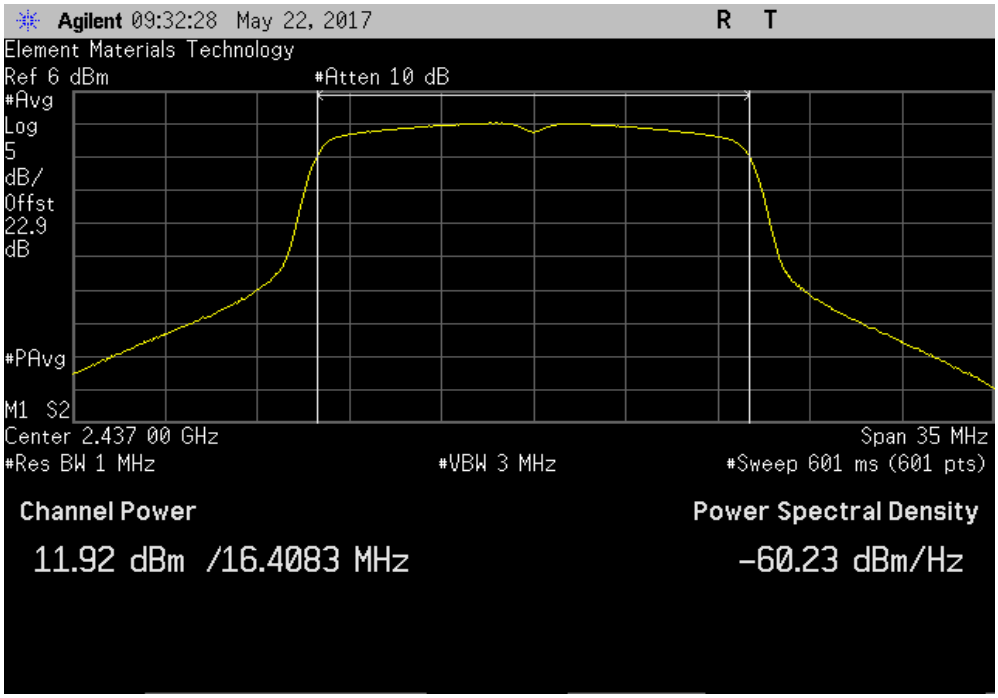
OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	11.885	0.1		12	30	Pass



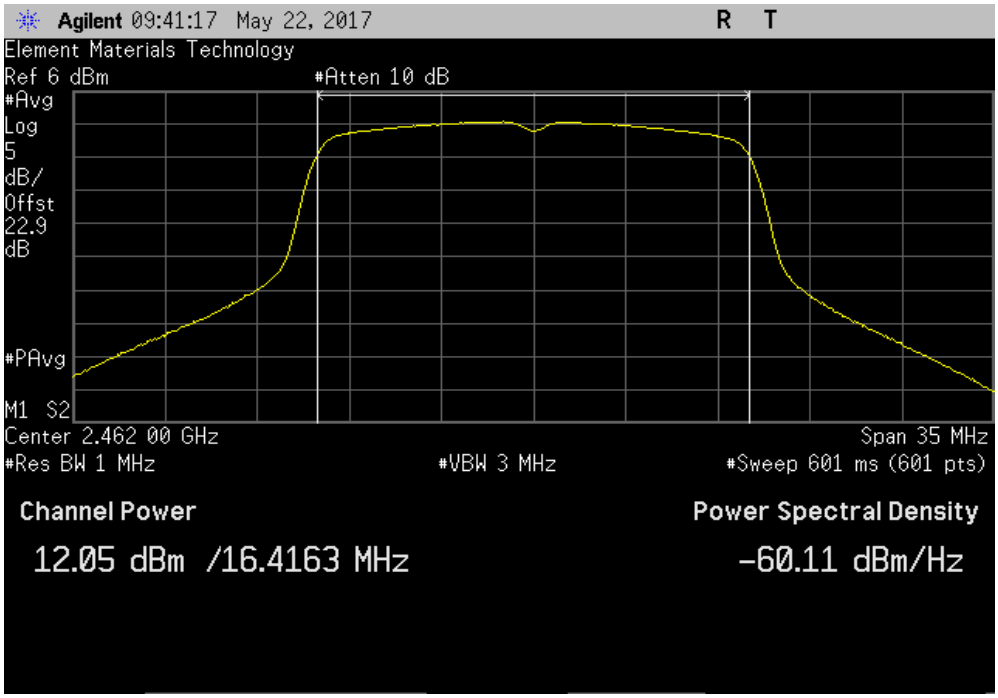
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	11.918	0.1		12	30	Pass



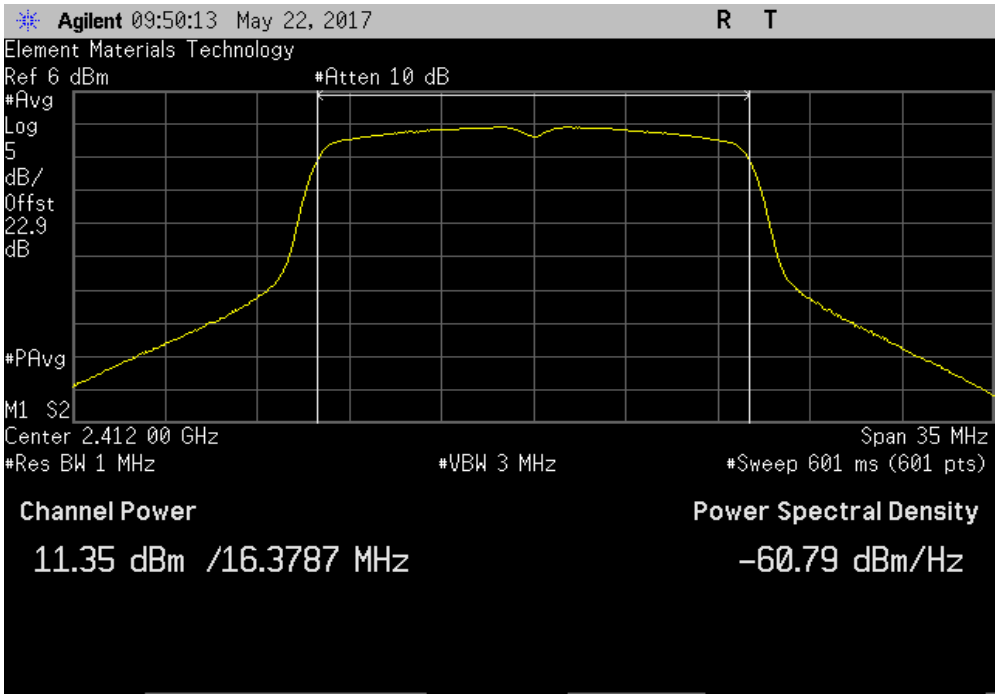
OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	12.047	0.1		12.1	30	Pass



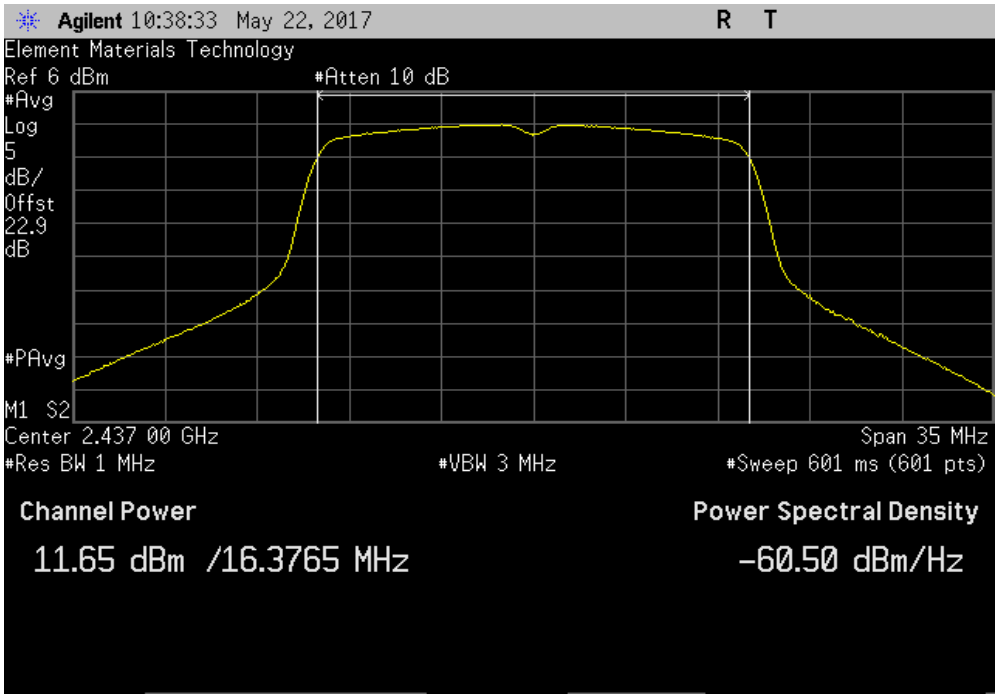
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	11.355	0.4		11.7	30	Pass



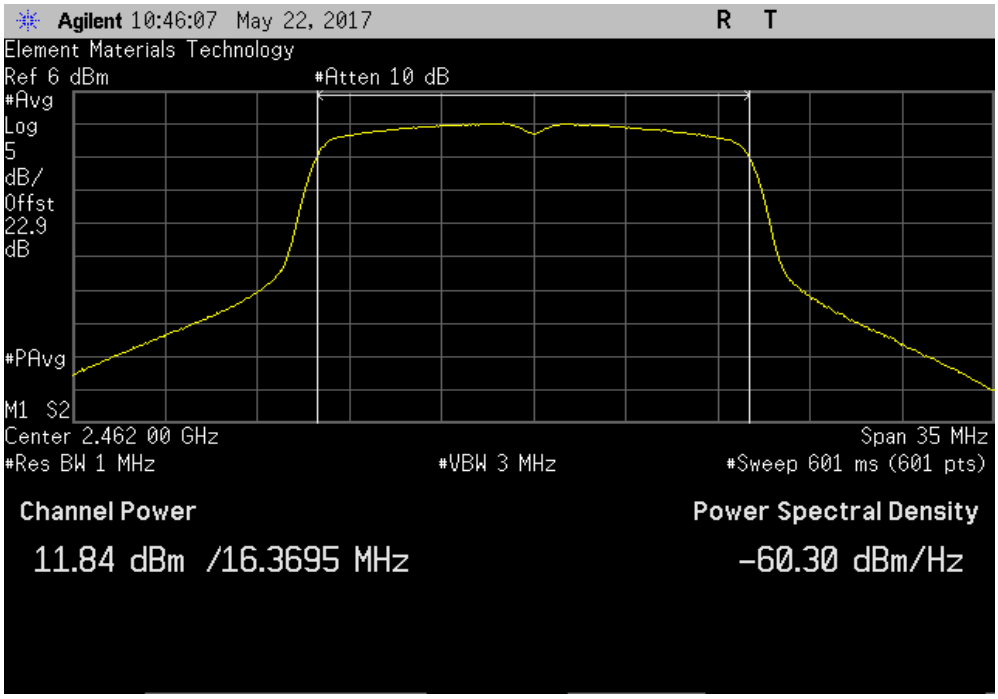
OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	11.646	0.4		12	30	Pass



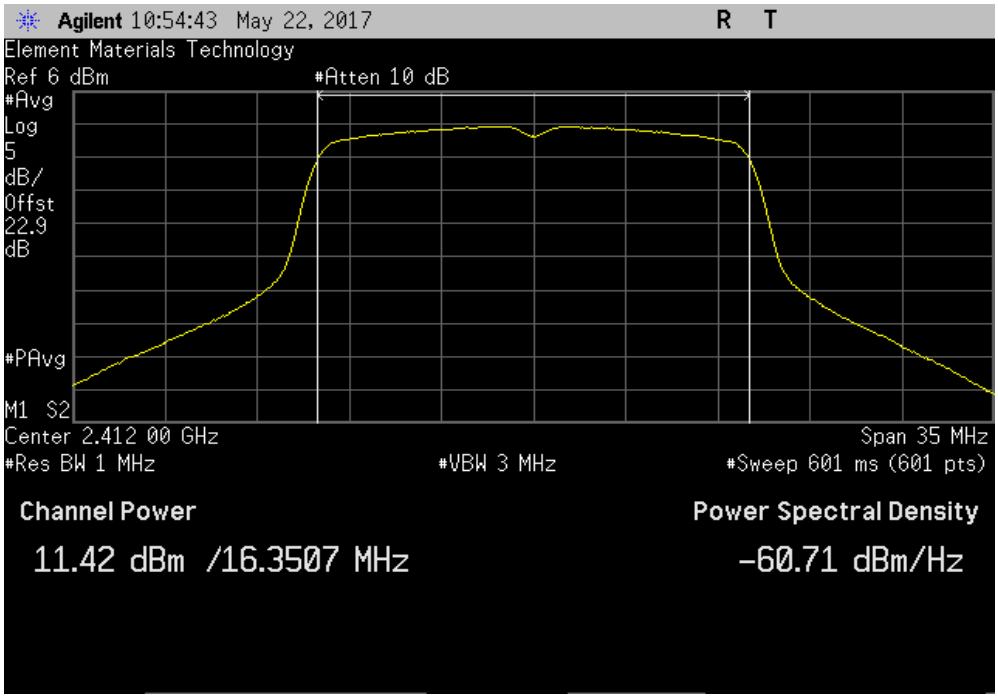
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	11.845	0.4		12.2	30	Pass



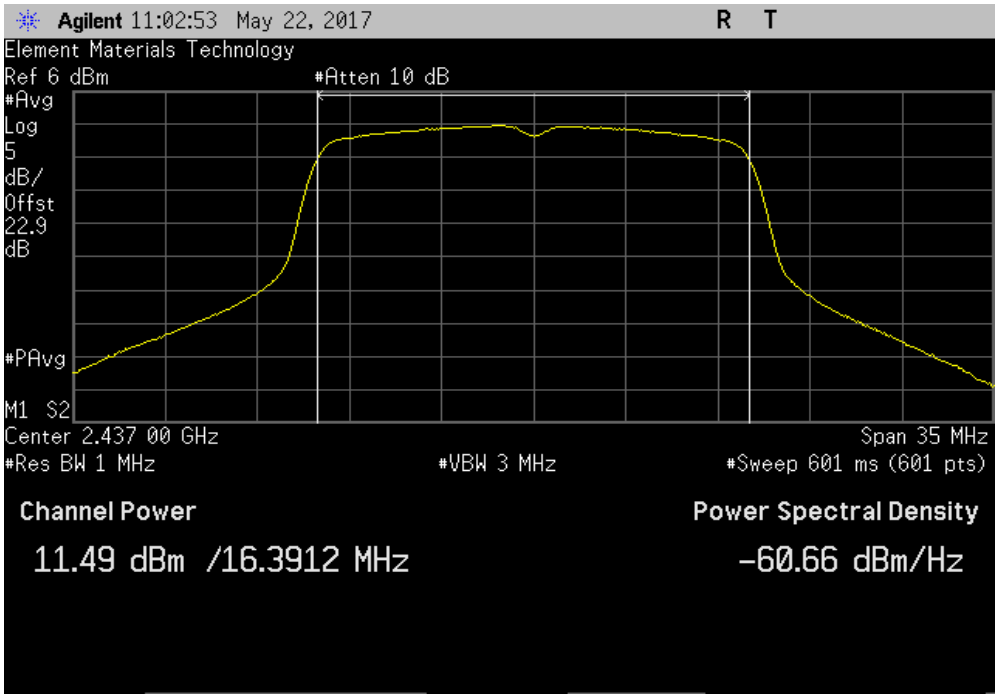
OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	11.425	0.5		11.9	30	Pass



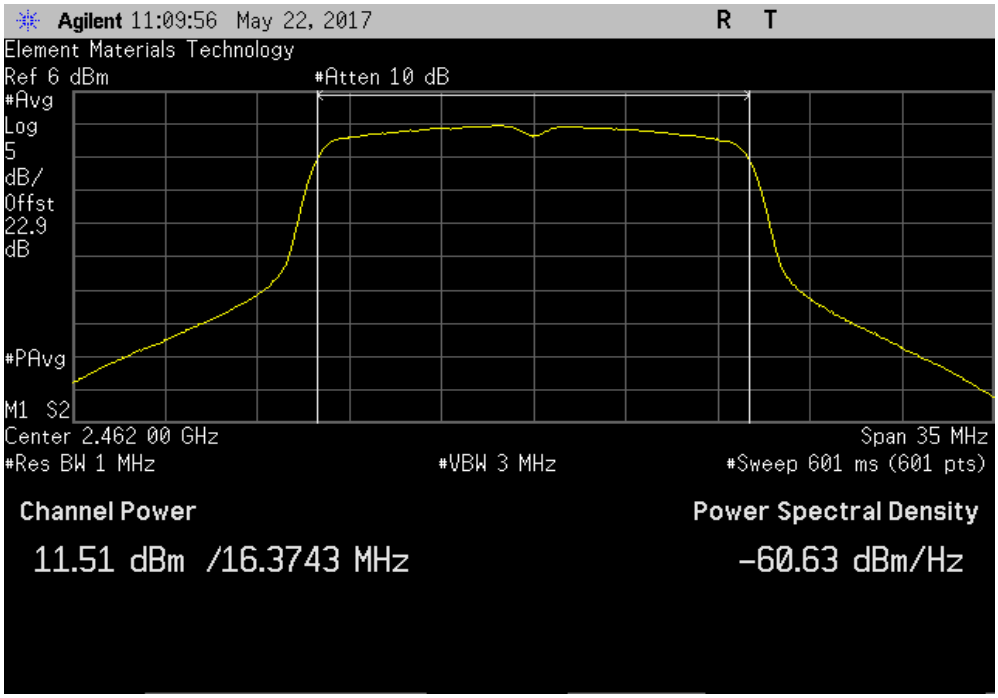
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	11.491	0.5		12	30	Pass



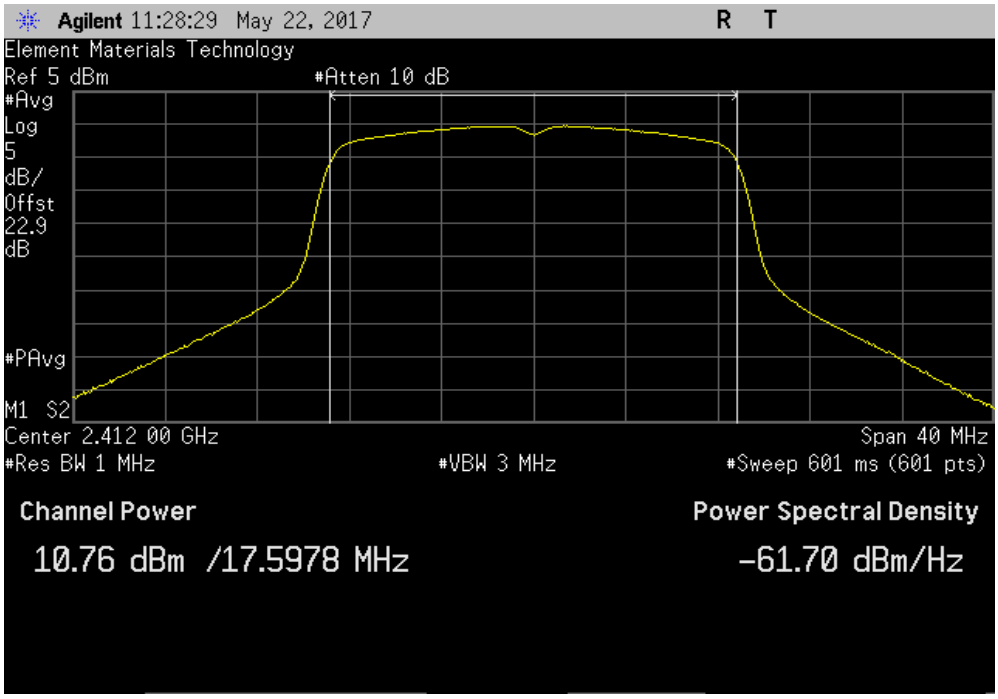
OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	11.508	0.5		12	30	Pass



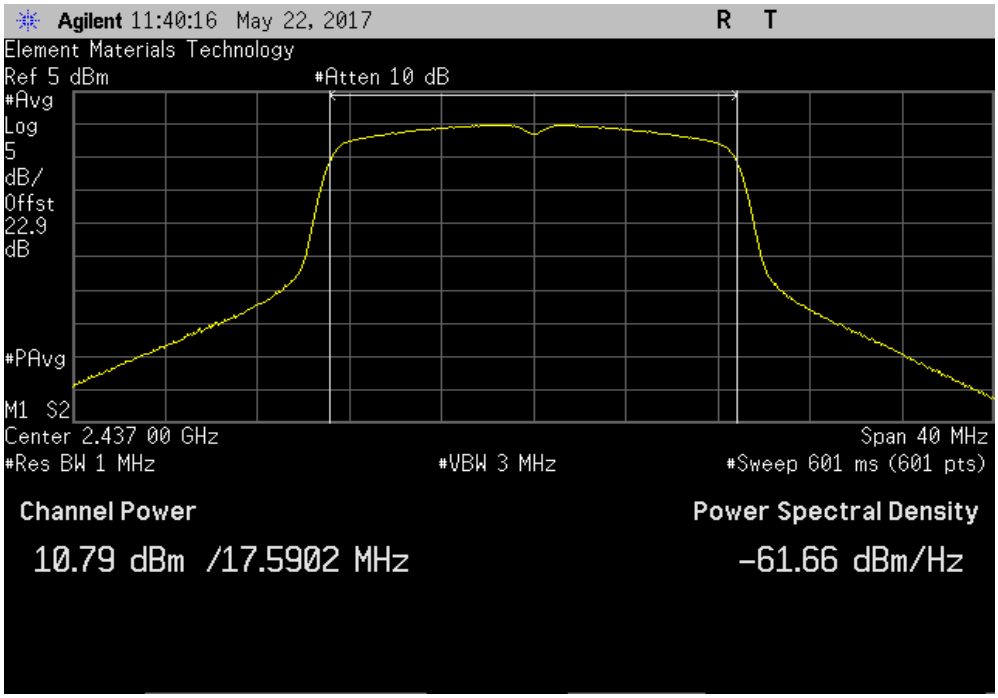
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	10.758	0.1		10.8	30	Pass



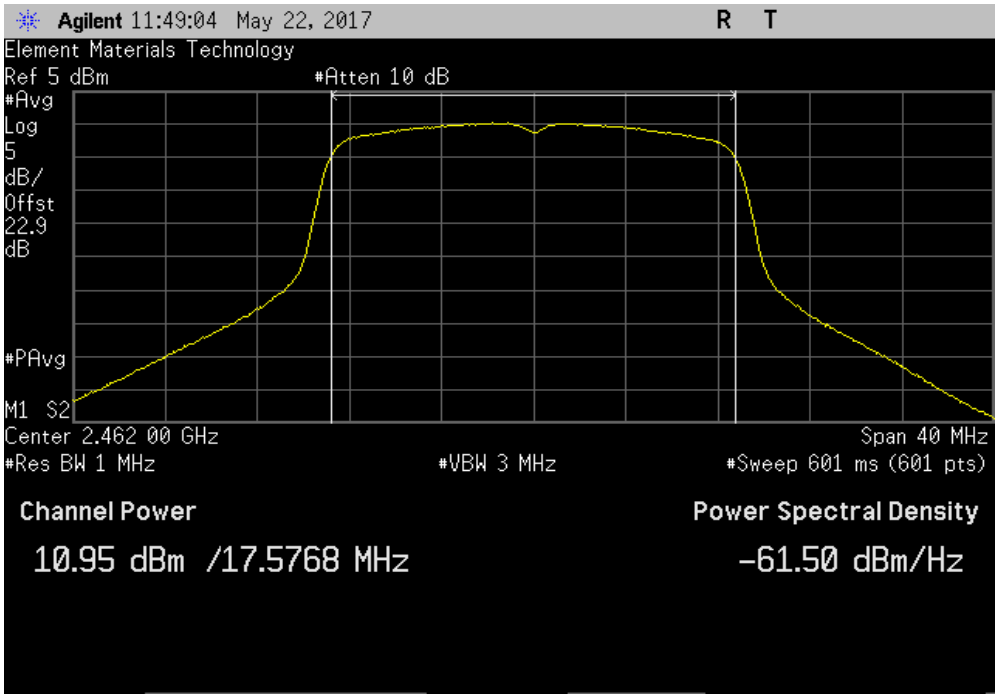
OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	10.79	0.1		10.9	30	Pass



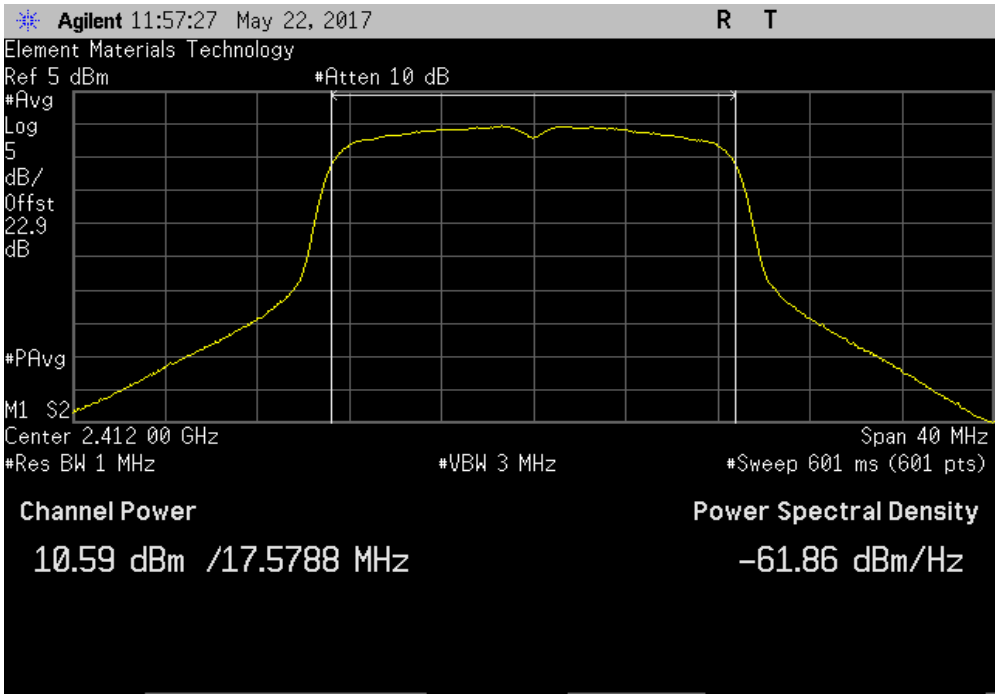
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	10.95	0.1		11	30	Pass



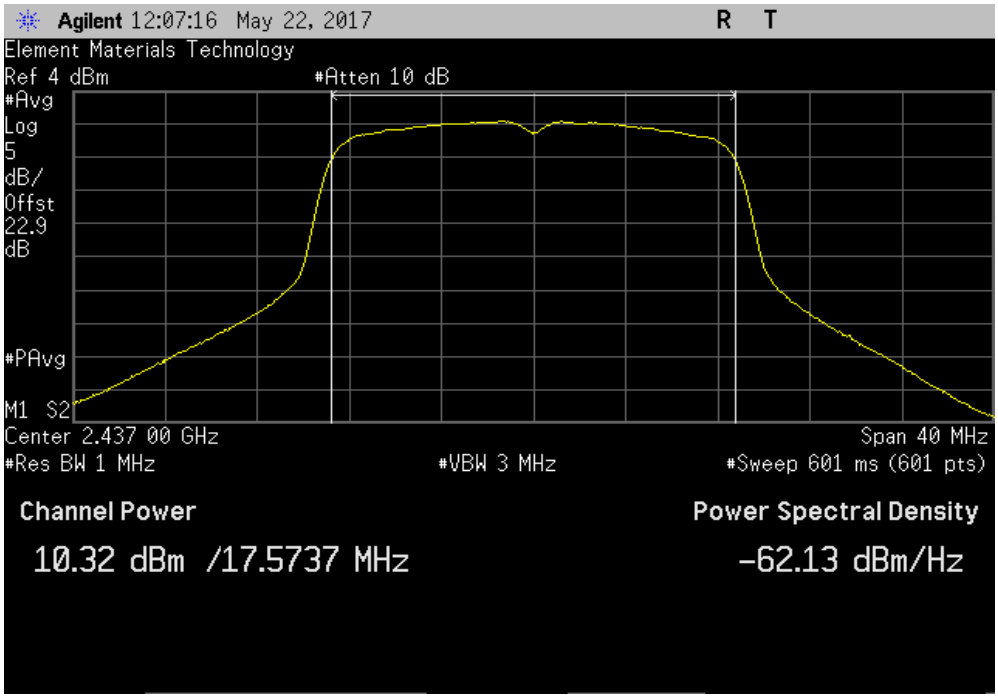
OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	10.586	0.6		11.2	30	Pass



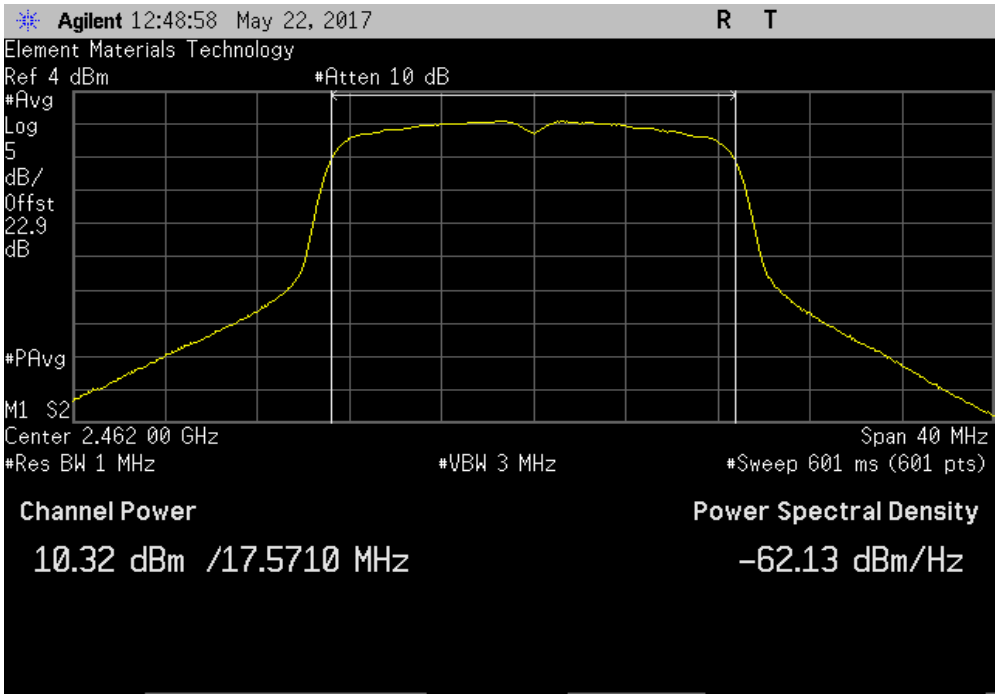
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	10.317	0.6		10.9	30	Pass



OUTPUT POWER

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)		Value (dBm)	Limit (dBm)	Results
	10.321	0.6		10.9	30	Pass



POWER SPECTRAL DENSITY

XMit 2017.02.08

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	2/5/2015	2/5/2018
Attenuator	Fairview Microwave	SA18E-20	TKS	3/6/2017	3/6/2018
Block - DC	Aeroflex	INMET 8535	AMO	3/27/2017	3/27/2018
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	11/2/2016	11/2/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The maximum power spectral density measurements was measured using the channels and modes as called out on the following data sheets.

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

POWER SPECTRAL DENSITY

TbtTx 2017.01.27 XMit 2017.02.08

EUT:	IMP004M	Work Order:	ELIM0013
Serial Number:	IMP0107	Date:	05/31/17
Customer:	Electric Imp, Inc.	Temperature:	21.3 °C
Attendees:	Jonathan Dillon	Humidity:	49% RH
Project:	None	Barometric Pres.:	1014 mbar
Tested by:	Salvador Solorzano and Johnny Candelas	Job Site:	OC13
Power:	3.3VDC regulated down from USB 5V		

TEST SPECIFICATIONS	Test Method
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

Total Offset 22.59dB (20dB pad + DC Block + coax cable + client provided patch cable) at 2.4GHz

DEVIATIONS FROM TEST STANDARD

None

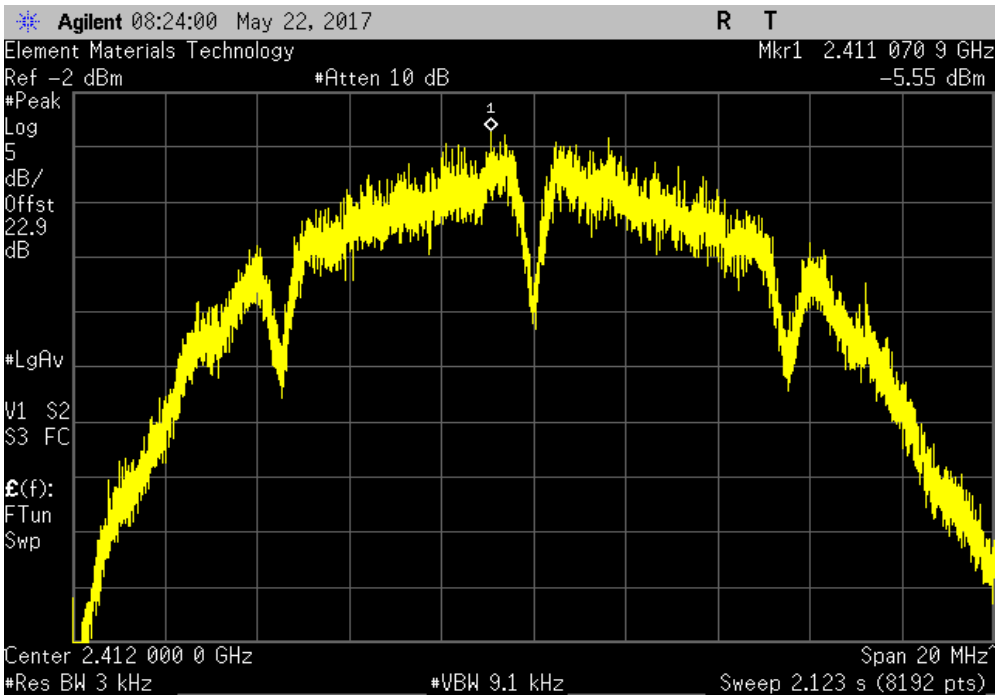
Configuration #	2	Signature

	Value dBm/3kHz	Limit < dBm/3kHz	Results
2400 MHz - 2483.5 MHz Band			
802.11(b) 1 Mbps			
Low Channel 1, 2412 MHz	-5.55	8	Pass
Mid Channel 6, 2437 MHz	-6.407	8	Pass
High Channel 11, 2462 MHz	-5.718	8	Pass
802.11(b) 11 Mbps			
Low Channel 1, 2412 MHz	-6.434	8	Pass
Mid Channel 6, 2437 MHz	-6.289	8	Pass
High Channel 11, 2462 MHz	-6.196	8	Pass
802.11(g) 6 Mbps			
Low Channel 1, 2412 MHz	-11.827	8	Pass
Mid Channel 6, 2437 MHz	-12.955	8	Pass
High Channel 11, 2462 MHz	-12.515	8	Pass
802.11(g) 36 Mbps			
Low Channel 1, 2412 MHz	-11.447	8	Pass
Mid Channel 6, 2437 MHz	-13.013	8	Pass
High Channel 11, 2462 MHz	-11.814	8	Pass
802.11(g) 54 Mbps			
Low Channel 1, 2412 MHz	-12.413	8	Pass
Mid Channel 6, 2437 MHz	-12.722	8	Pass
High Channel 11, 2462 MHz	-11.872	8	Pass
802.11(n) MCS0			
Low Channel 1, 2412 MHz	-14.118	8	Pass
Mid Channel 6, 2437 MHz	-13.681	8	Pass
High Channel 11, 2462 MHz	-13.364	8	Pass
802.11(n) MCS7			
Low Channel 1, 2412 MHz	-13.006	8	Pass
Mid Channel 6, 2437 MHz	-14.033	8	Pass
High Channel 11, 2462 MHz	-11.738	8	Pass

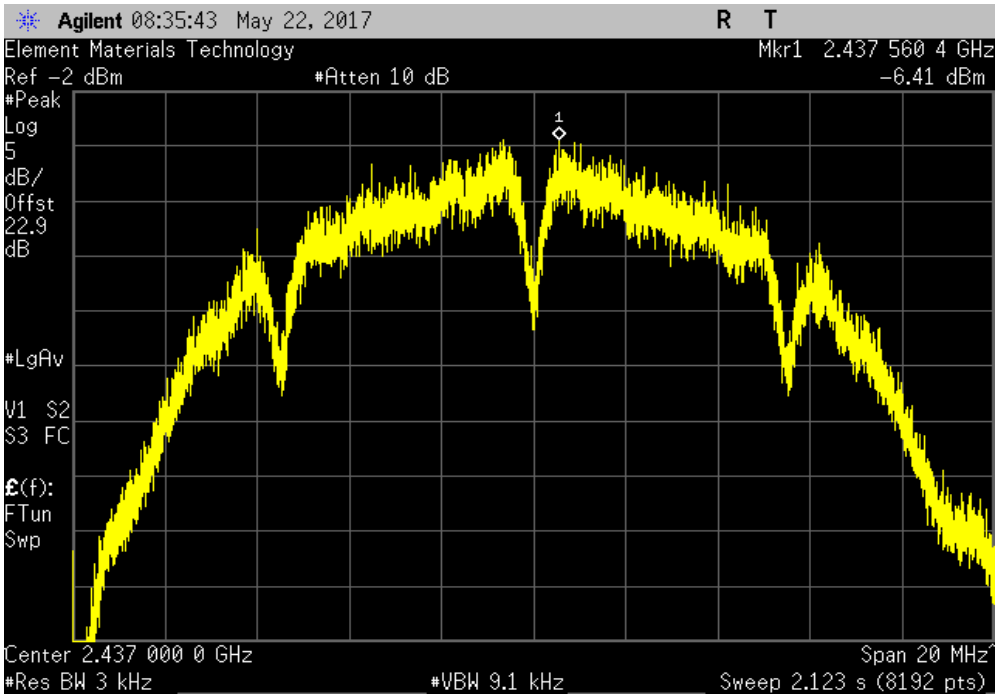
POWER SPECTRAL DENSITY

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-5.55	8	Pass



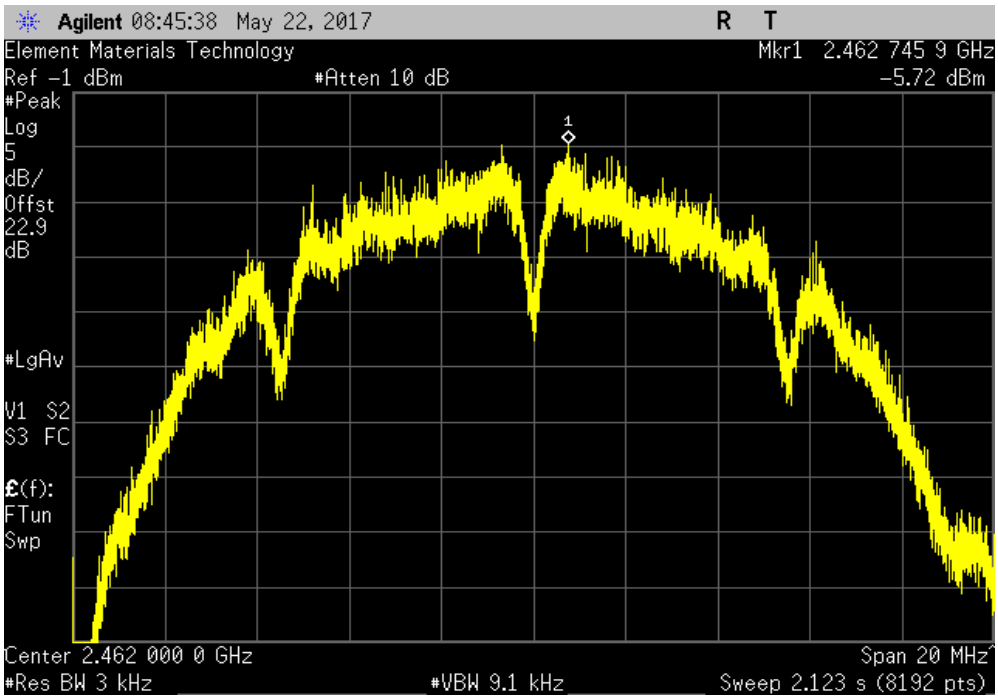
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-6.407	8	Pass



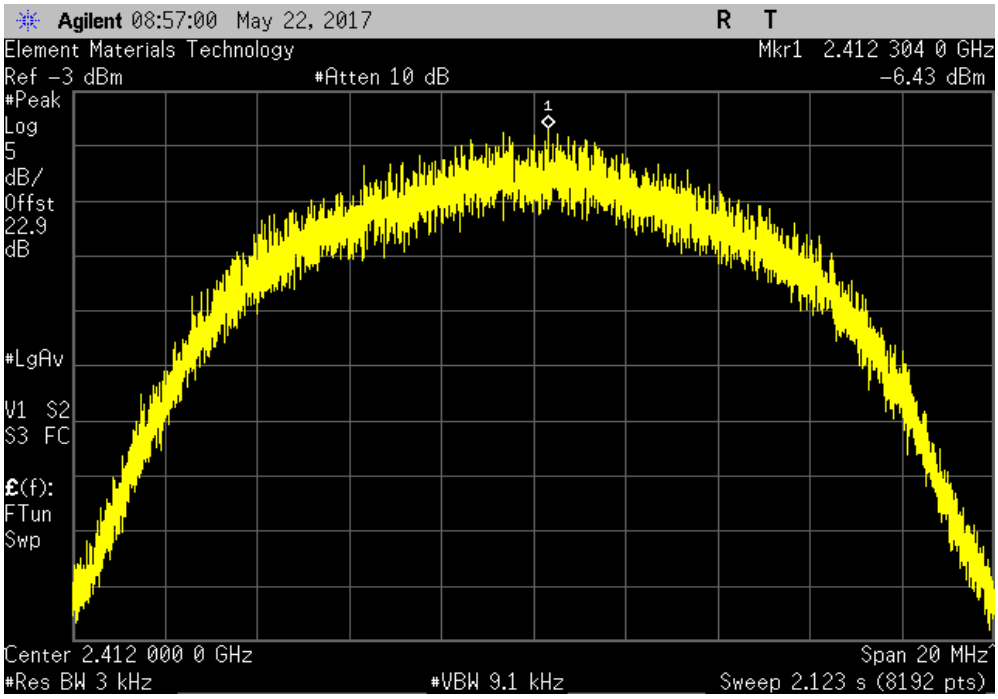
POWER SPECTRAL DENSITY

TbtTx 2017.01.27 XMit 2017.02.08

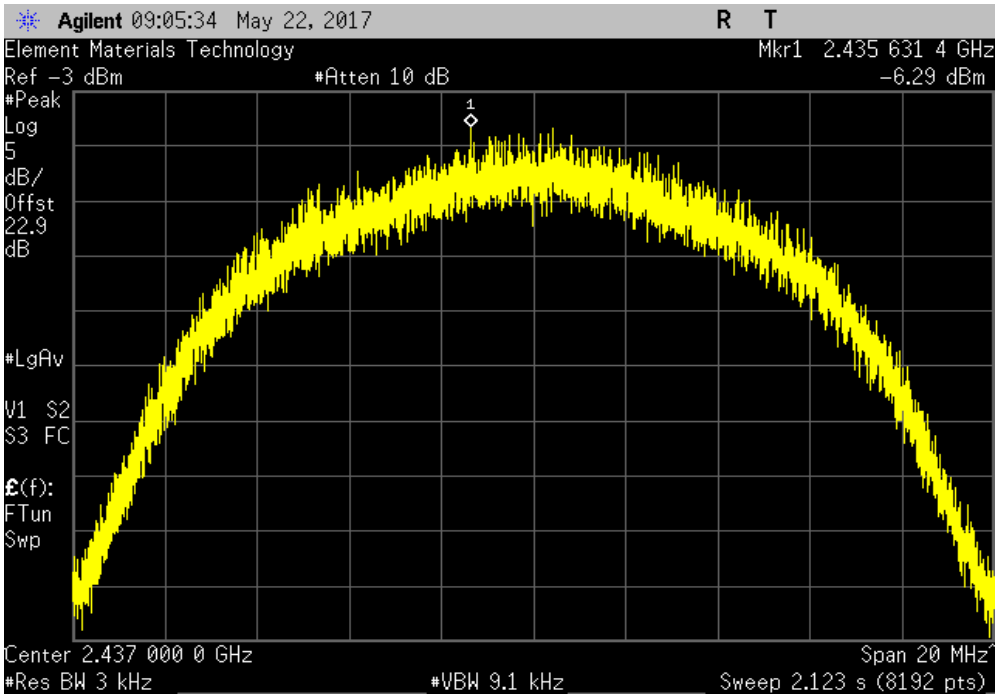
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-5.718	8	Pass



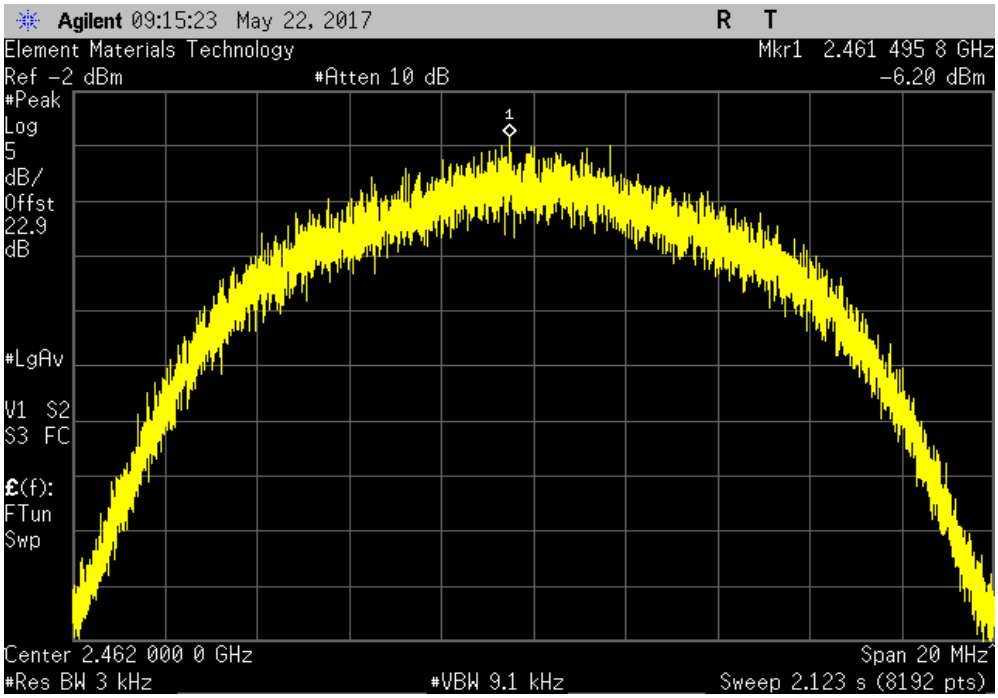
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-6.434	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-6.289	8	Pass



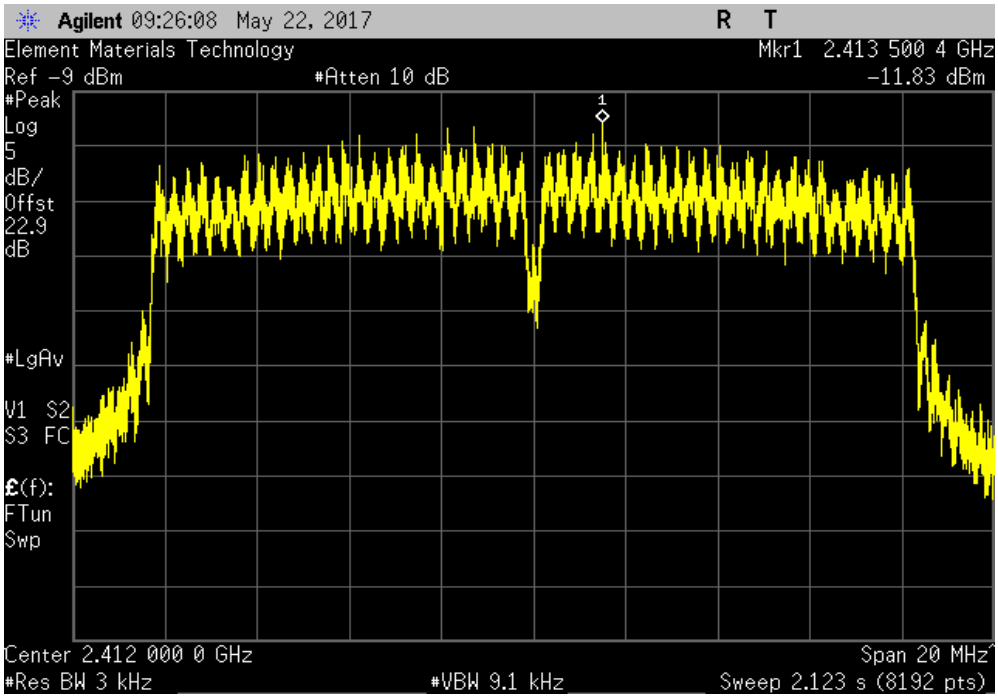
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-6.196	8	Pass



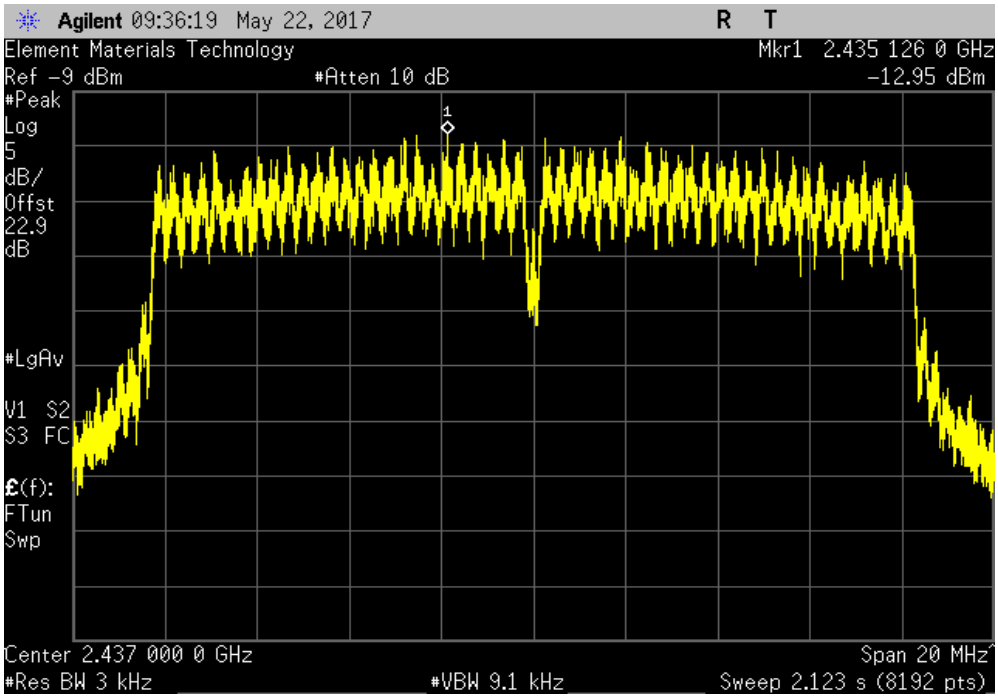
POWER SPECTRAL DENSITY

TbtTx 2017.01.27 XMit 2017.02.08

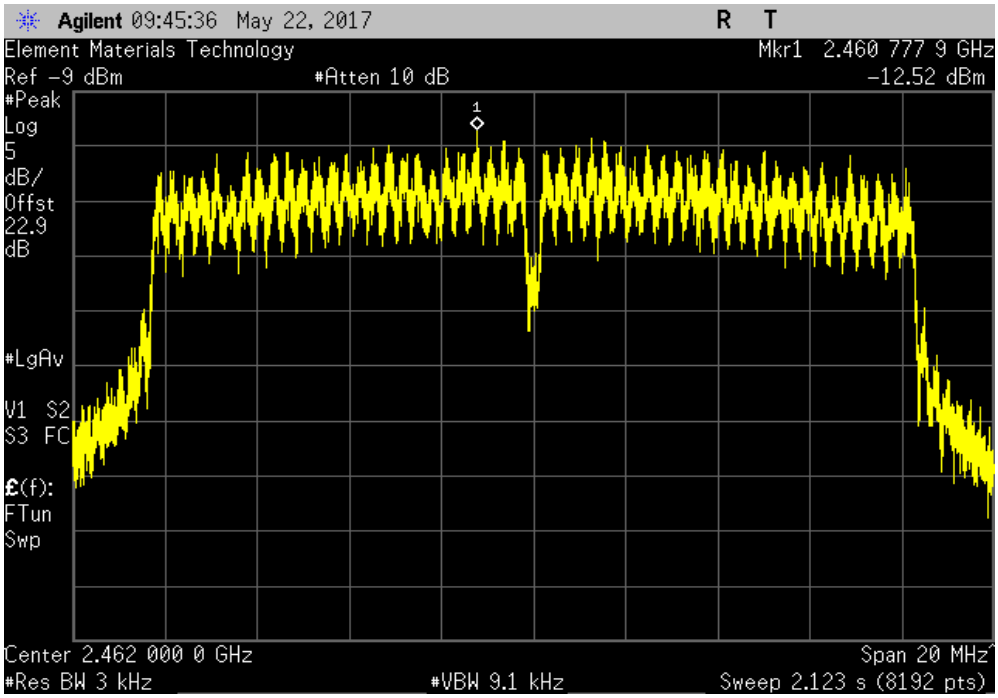
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-11.827	8	Pass



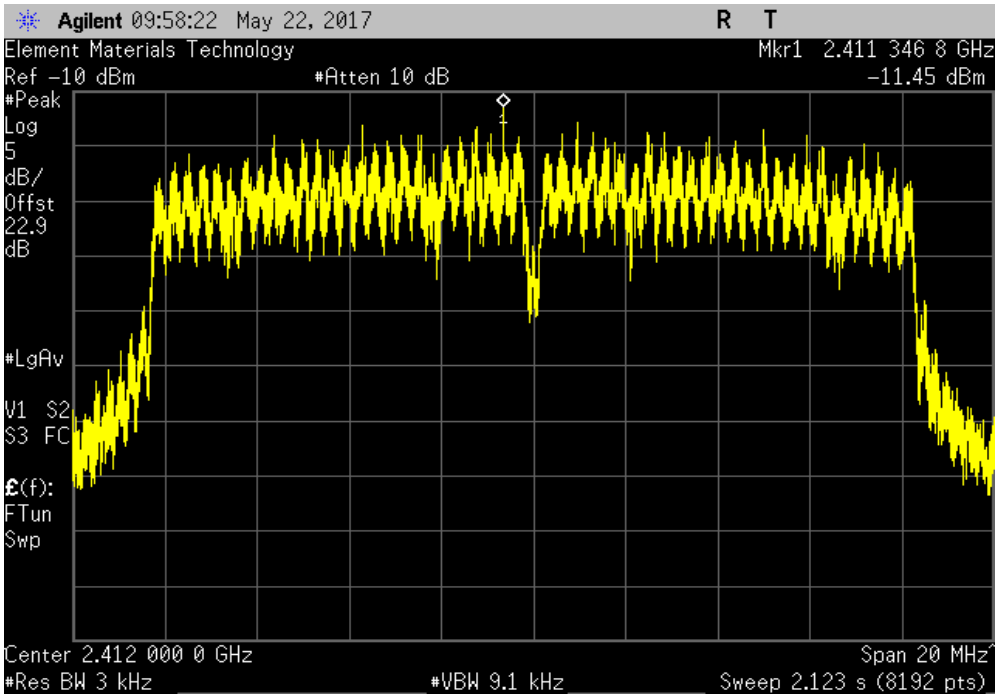
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-12.955	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-12.515	8	Pass



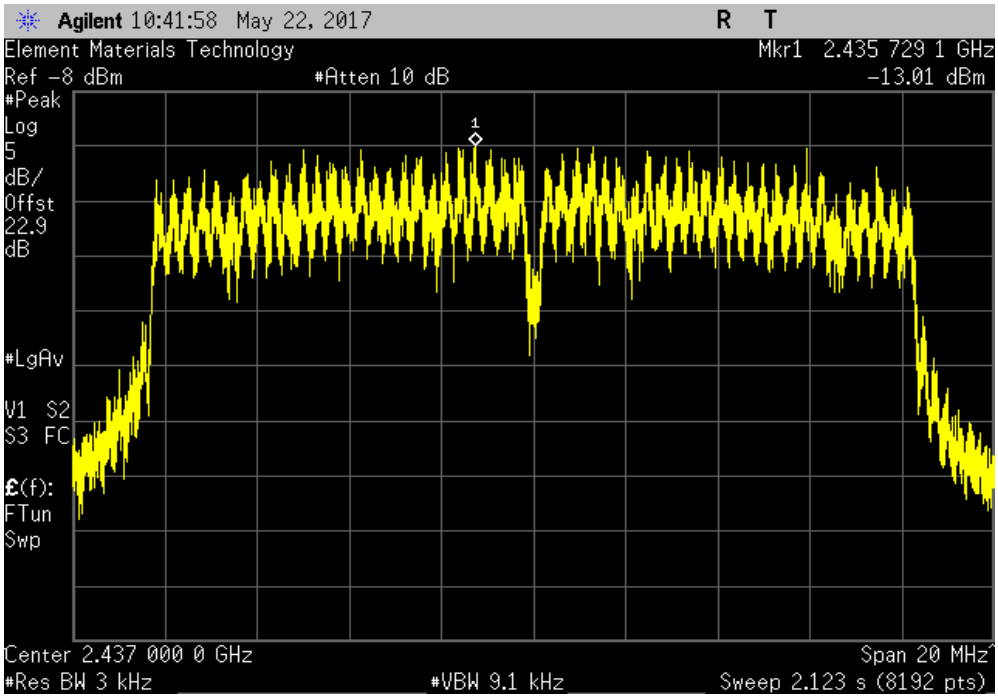
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-11.447	8	Pass



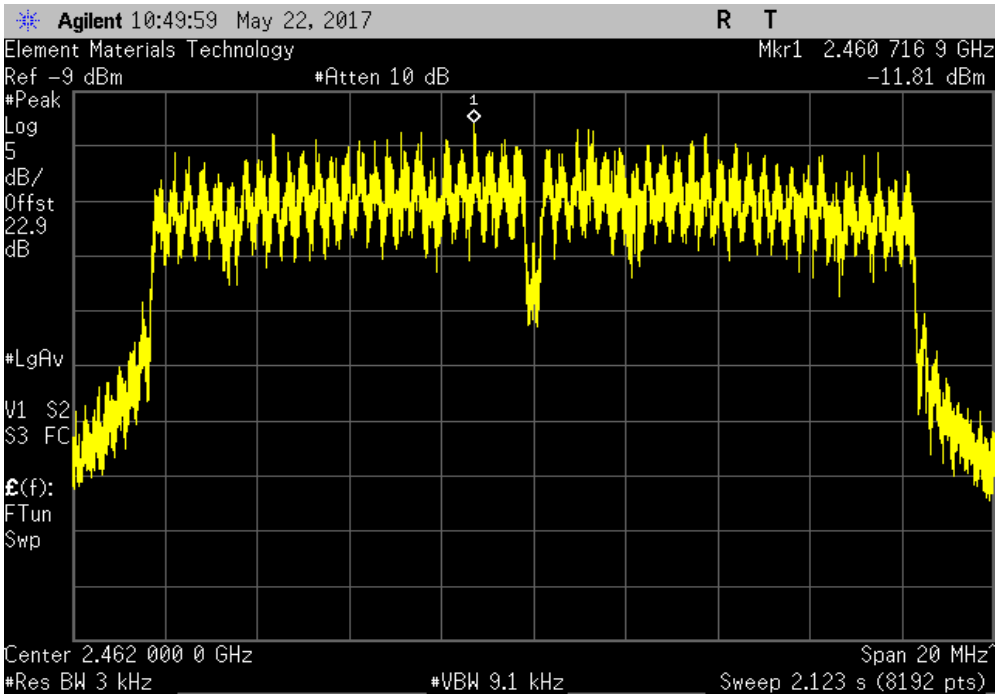
POWER SPECTRAL DENSITY

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-13.013	8	Pass



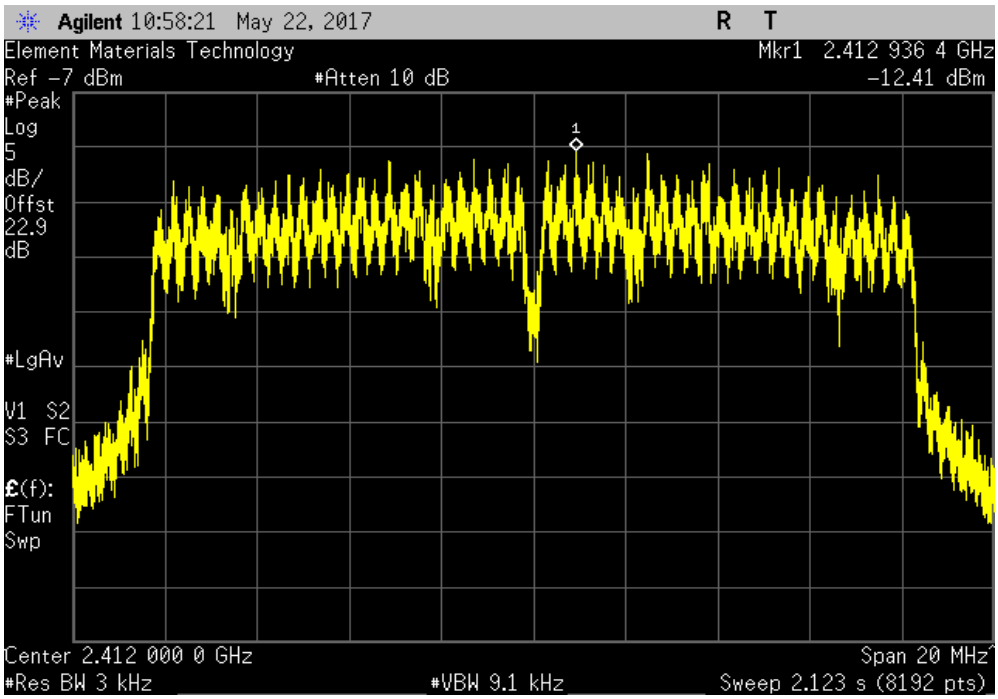
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-11.814	8	Pass



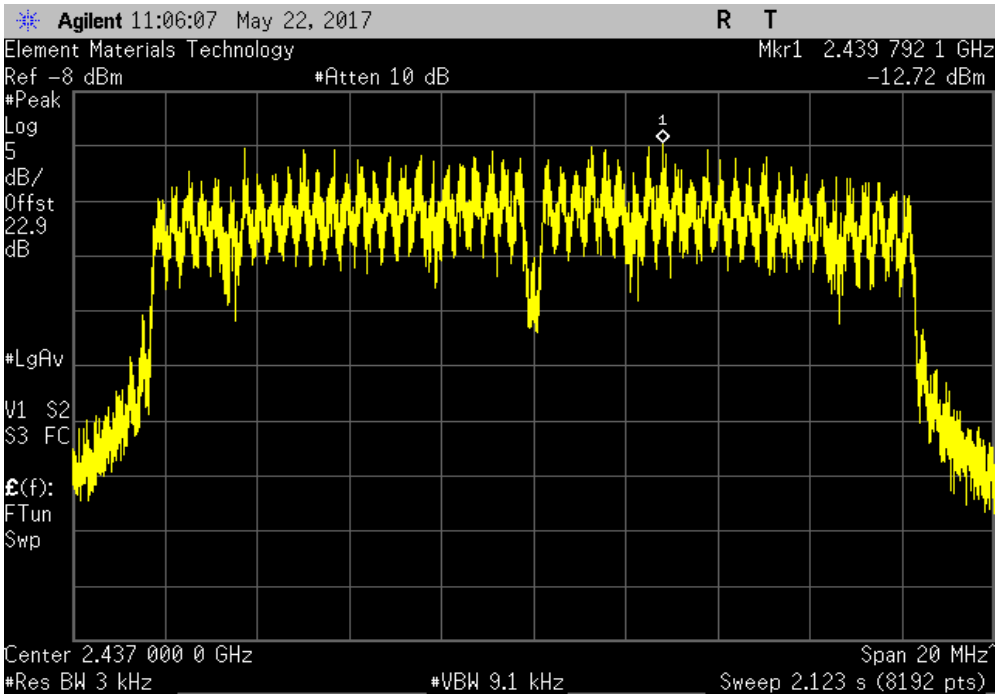
POWER SPECTRAL DENSITY

TbtTx 2017.01.27 XMit 2017.02.08

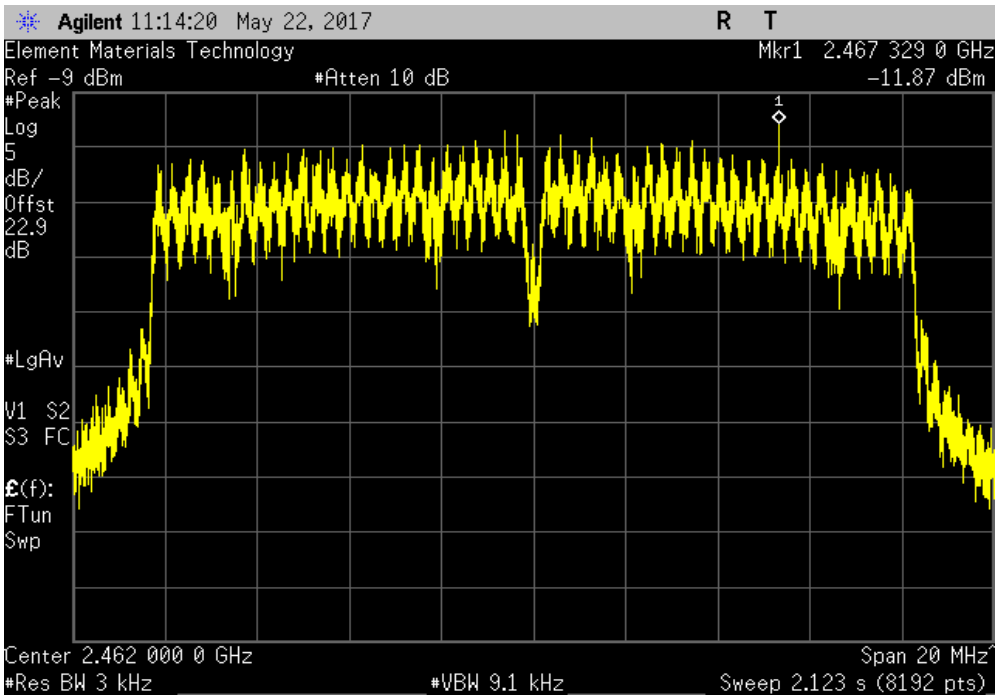
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-12.413	8	Pass



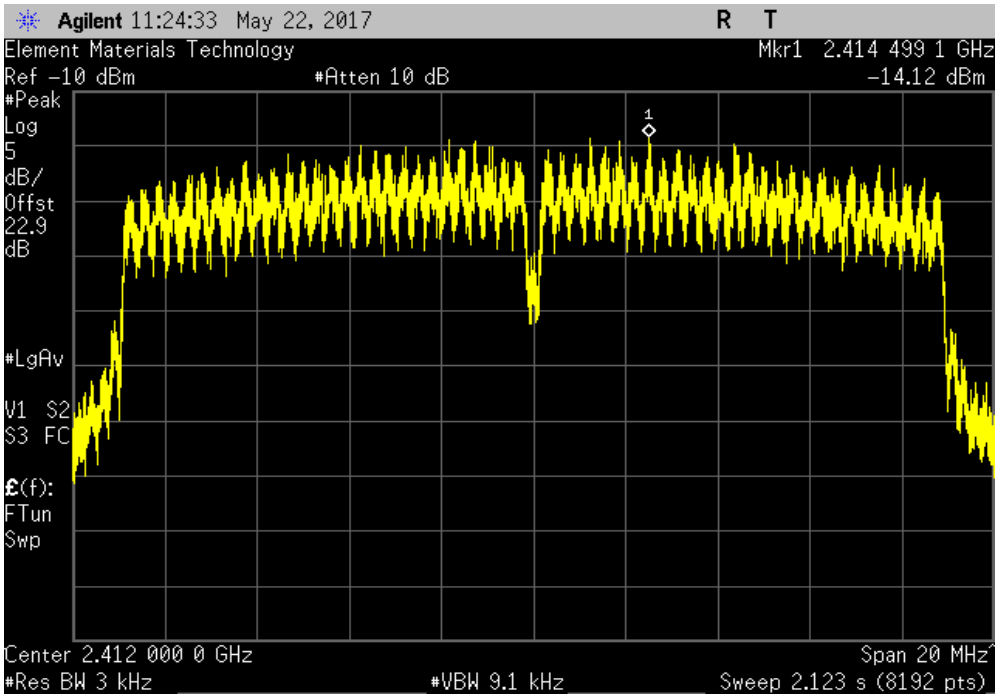
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-12.722	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-11.872	8	Pass



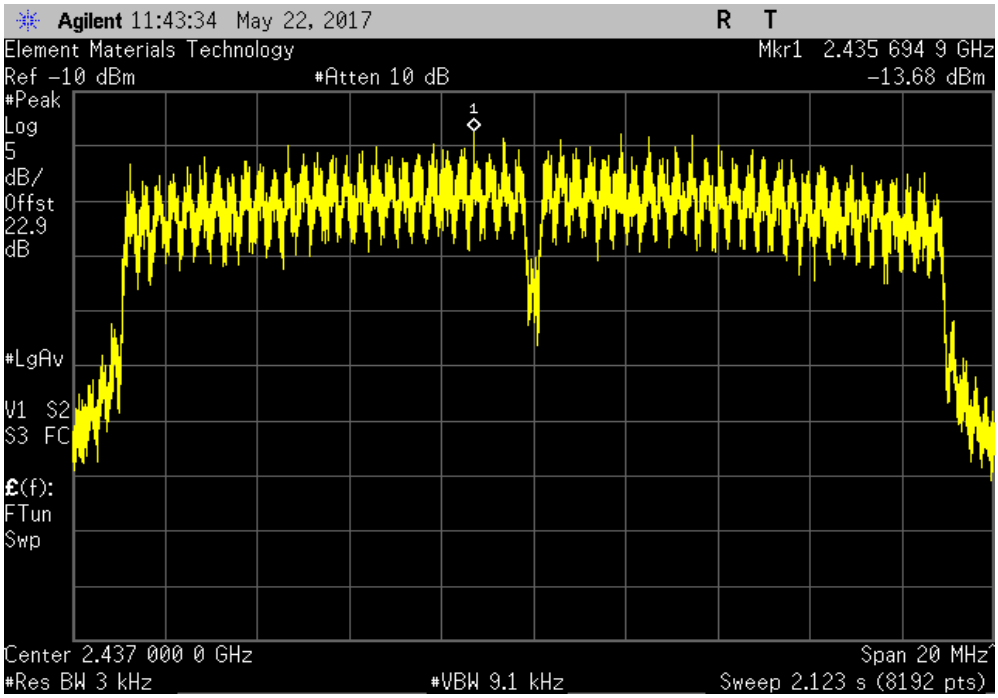
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-14.118	8	Pass



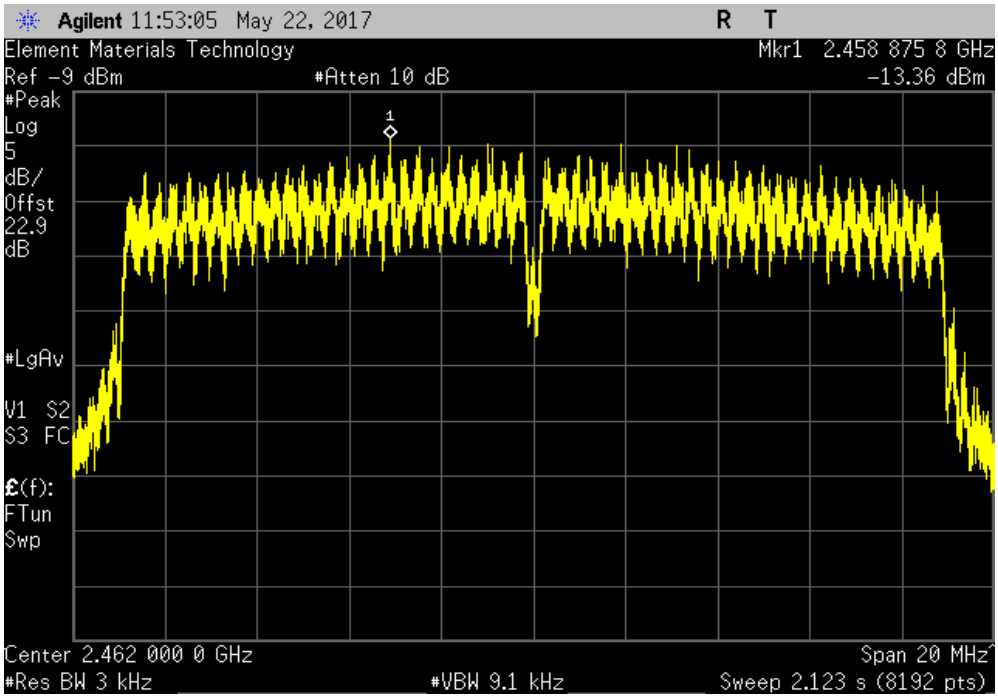
POWER SPECTRAL DENSITY

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-13.681	8	Pass



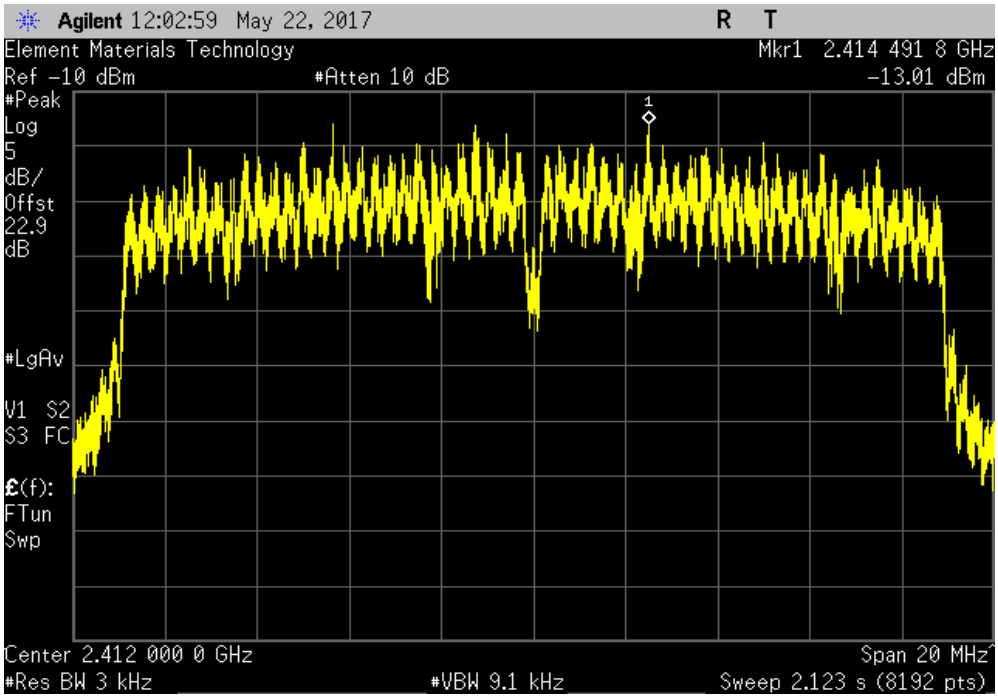
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-13.364	8	Pass



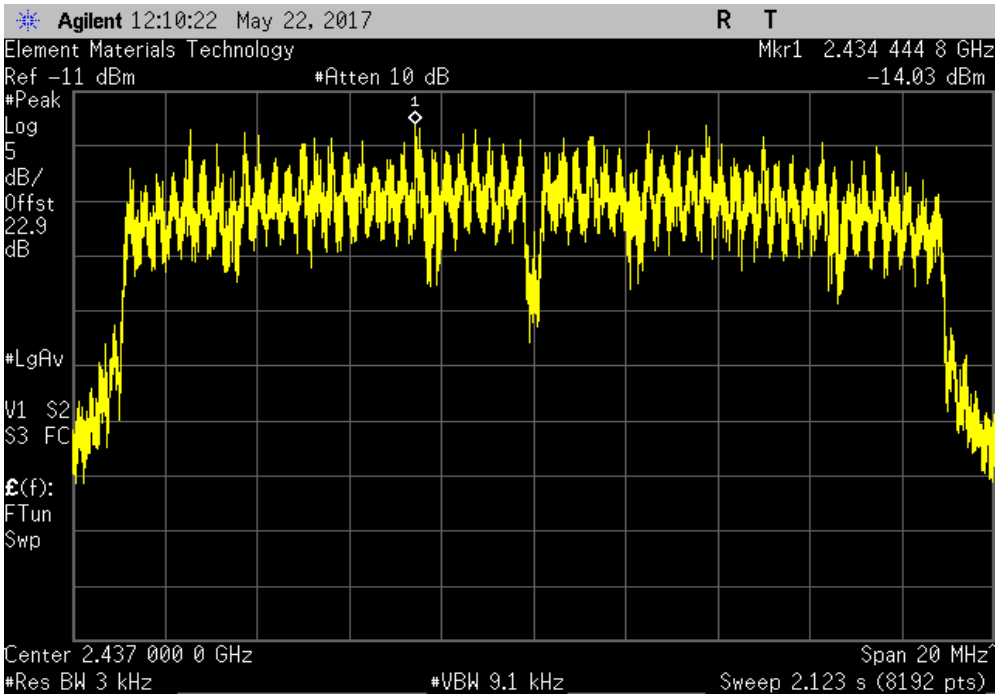
POWER SPECTRAL DENSITY

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-13.006	8	Pass



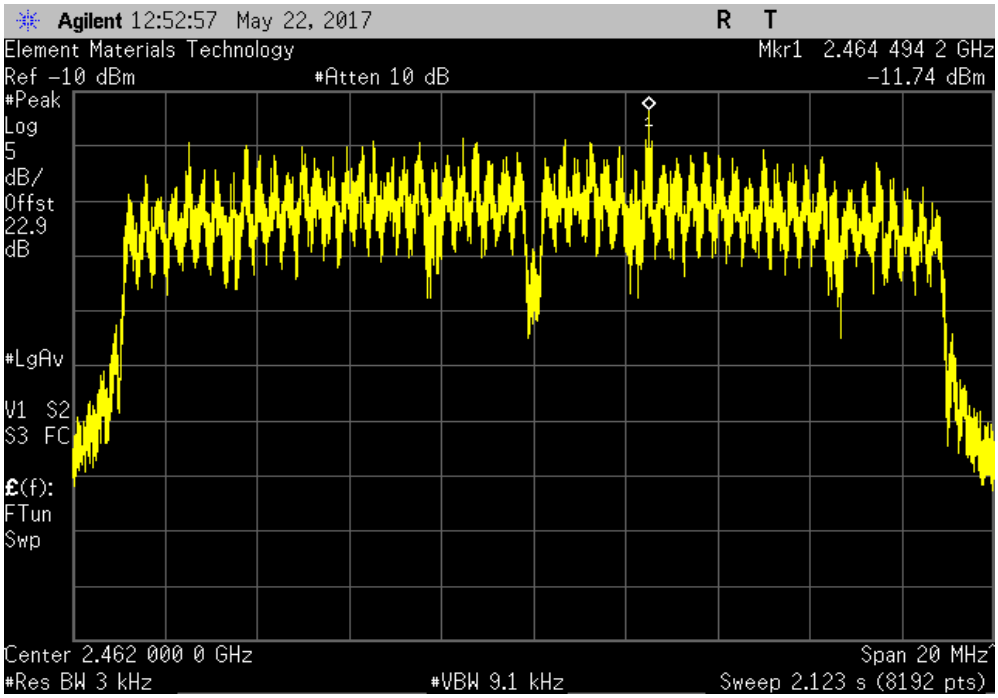
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-14.033	8	Pass



POWER SPECTRAL DENSITY

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
				Value dBm/3kHz	**Limit < dBm/3kHz**	**Results**
				-11.738	8	Pass



BAND EDGE COMPLIANCE

XMit 2017.02.08

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	2/5/2015	2/5/2018
Attenuator	Fairview Microwave	SA18E-20	TKS	3/6/2017	3/6/2018
Block - DC	Aeroflex	INMET 8535	AMO	3/27/2017	3/27/2018
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	11/2/2016	11/2/2017

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

TbtTx 2017.01.27 XMit 2017.02.08

EUT:	IMP004M	Work Order:	ELIM0013
Serial Number:	IMP0107	Date:	05/31/17
Customer:	Electric Imp, Inc.	Temperature:	21.3 °C
Attendees:	Jonathan Dillon	Humidity:	49% RH
Project:	None	Barometric Pres.:	1014 mbar
Tested by:	Salvador Solorzano and Johnny Candelas	Job Site:	OC13
Power:	3.3VDC regulated down from USB 5V		

TEST SPECIFICATIONS	Test Method
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

Total Offset 22.59dB (20dB pad + DC Block + coax cable + client provided patch cable) at 2.4GHz

DEVIATIONS FROM TEST STANDARD

None

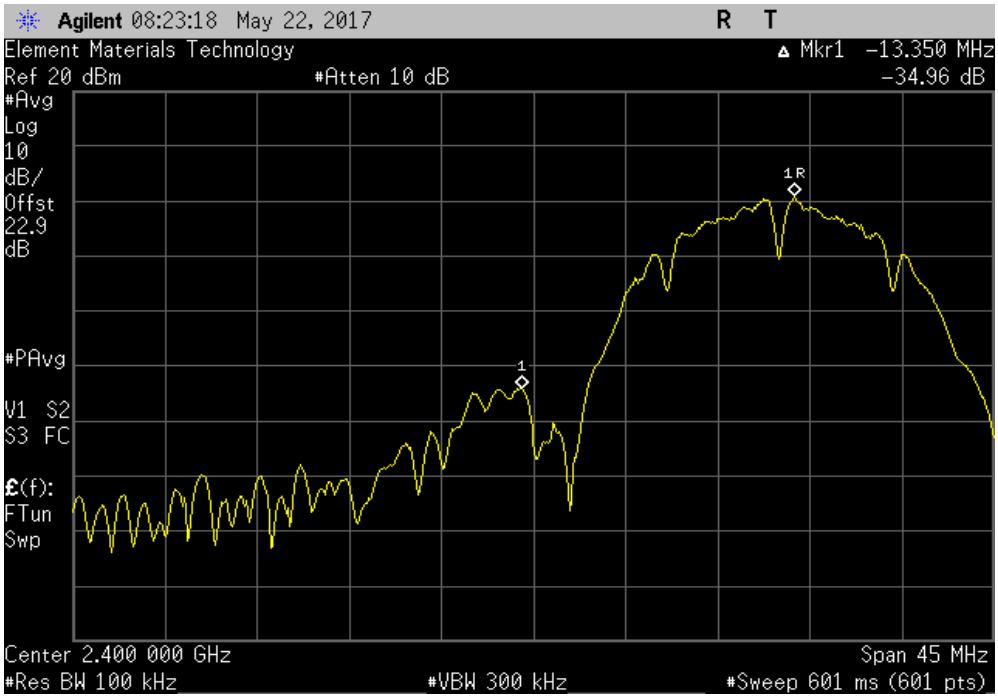
Configuration #	2	Signature

	Value (dBc)	Limit ≤ (dBc)	Result
2400 MHz - 2483.5 MHz Band			
802.11(b) 1 Mbps			
Low Channel 1, 2412 MHz	-34.96	-30	Pass
High Channel 11, 2462 MHz	-51.04	-30	Pass
802.11(b) 11 Mbps			
Low Channel 1, 2412 MHz	-39.64	-30	Pass
High Channel 11, 2462 MHz	-57.58	-30	Pass
802.11(g) 6 Mbps			
Low Channel 1, 2412 MHz	-30.09	-30	Pass
High Channel 11, 2462 MHz	-49.17	-30	Pass
802.11(g) 36 Mbps			
Low Channel 1, 2412 MHz	-30.95	-30	Pass
High Channel 11, 2462 MHz	-48.86	-30	Pass
802.11(g) 54 Mbps			
Low Channel 1, 2412 MHz	-31.38	-30	Pass
High Channel 11, 2462 MHz	-49.83	-30	Pass
802.11(n) MCS0			
Low Channel 1, 2412 MHz	-30.21	-30	Pass
High Channel 11, 2462 MHz	-47.52	-30	Pass
802.11(n) MCS7			
Low Channel 1, 2412 MHz	-31.99	-30	Pass
High Channel 11, 2462 MHz	-47.64	-30	Pass

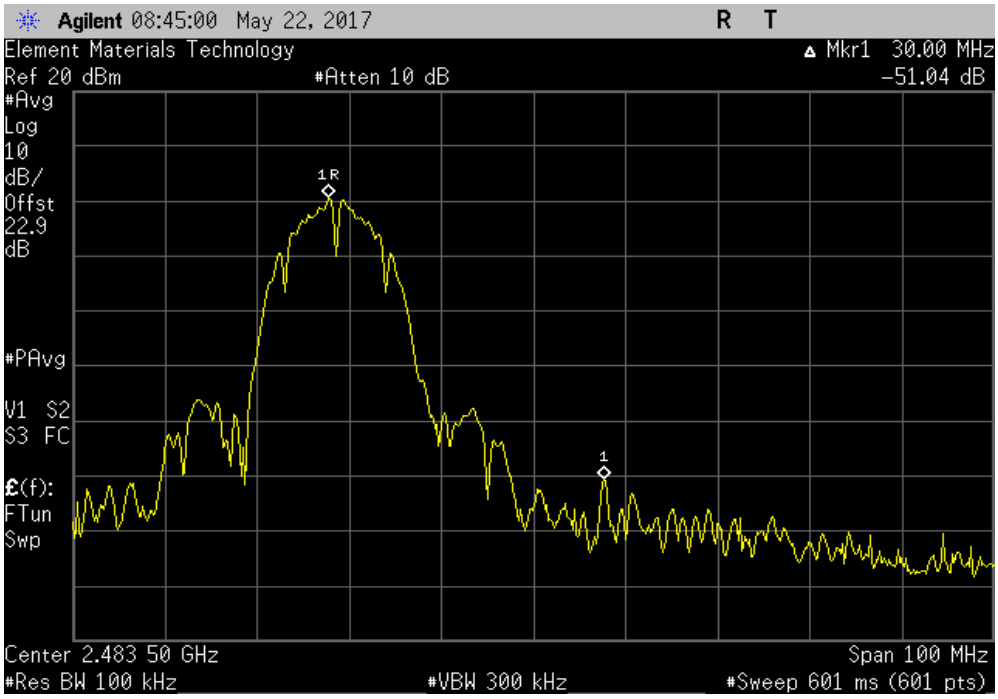
BAND EDGE COMPLIANCE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-34.96	-30	Pass



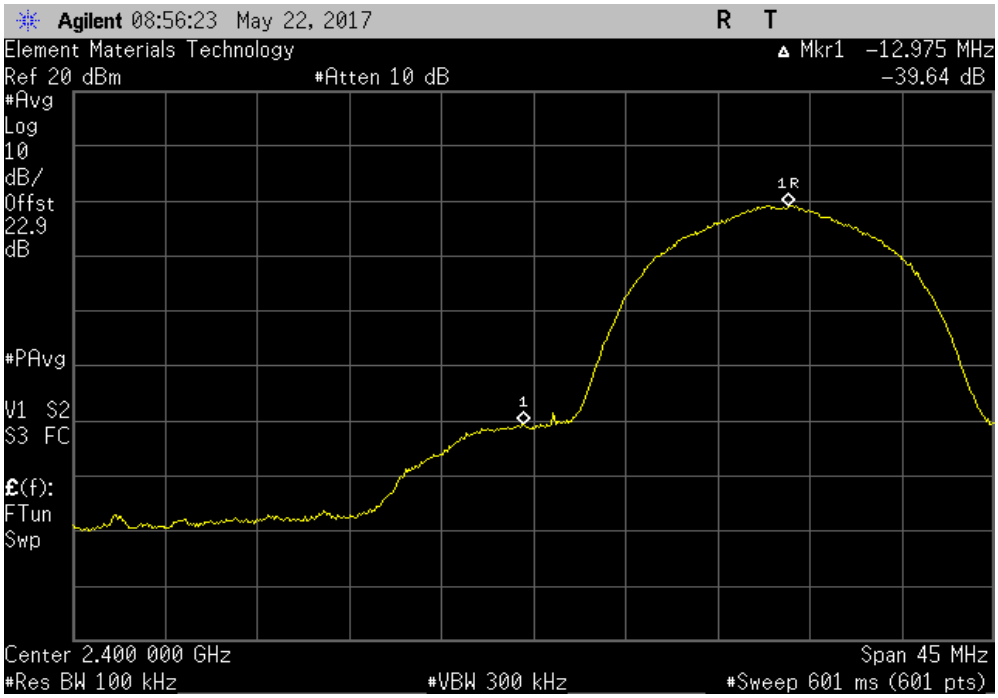
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-51.04	-30	Pass



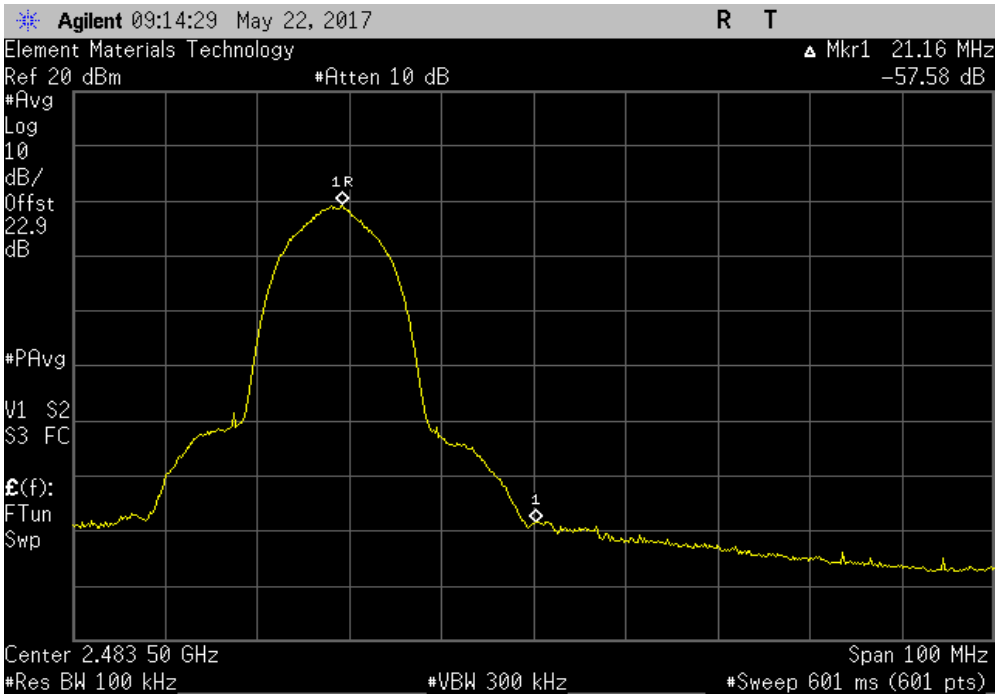
BAND EDGE COMPLIANCE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-39.64	-30	Pass



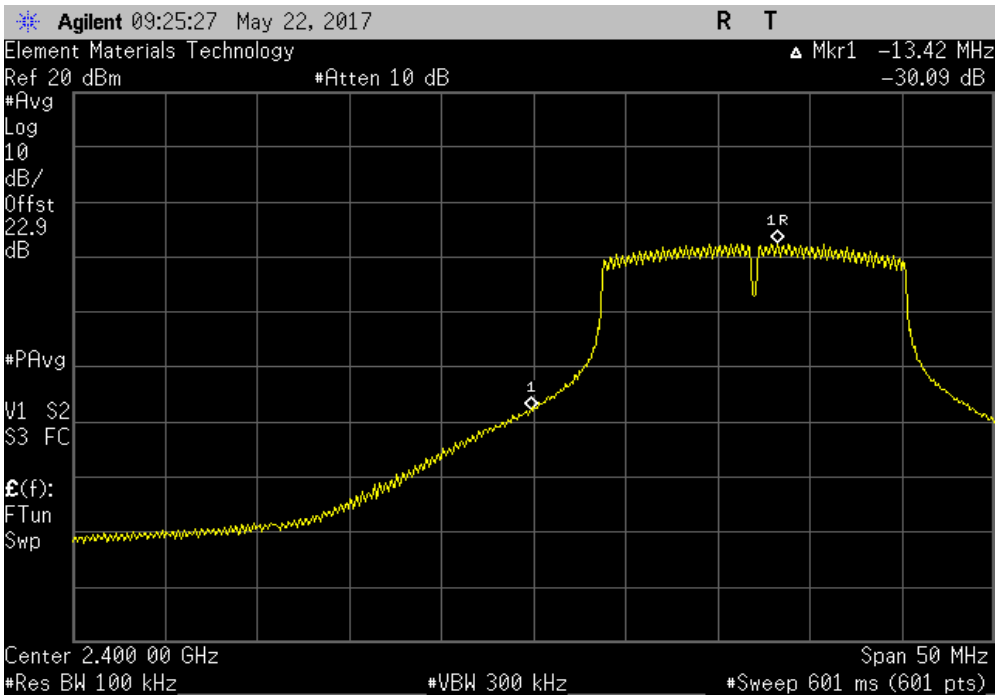
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-57.58	-30	Pass



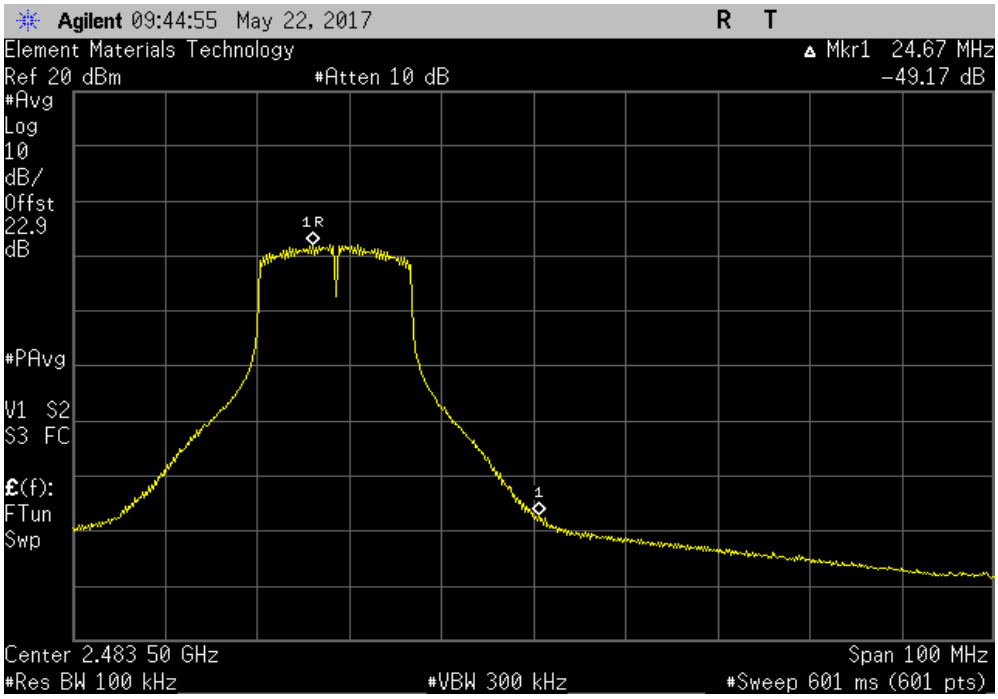
BAND EDGE COMPLIANCE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-30.09	-30	Pass



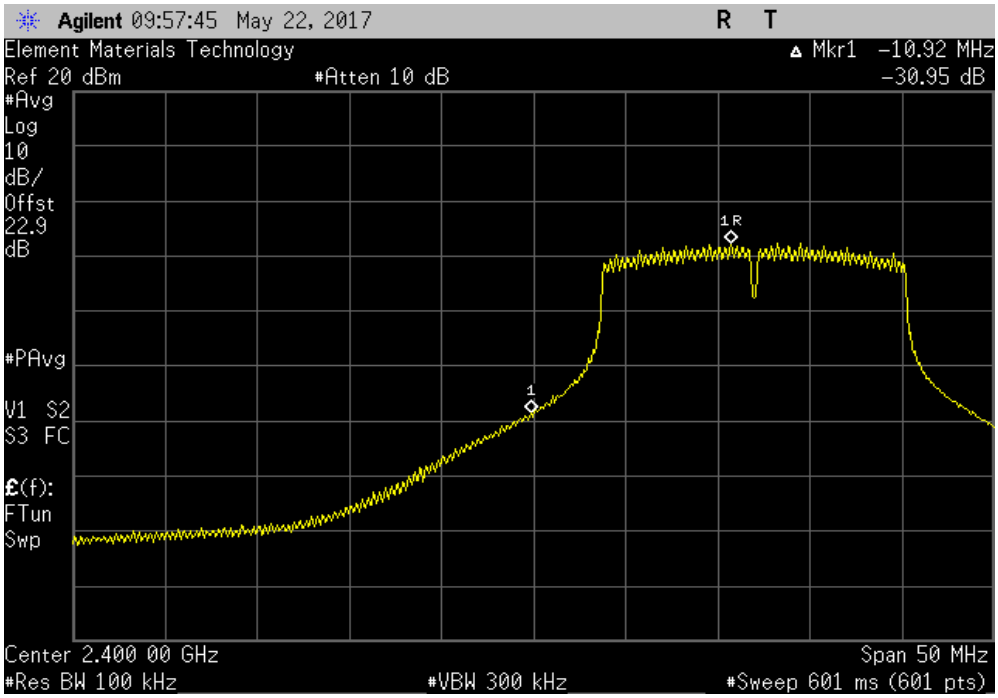
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-49.17	-30	Pass



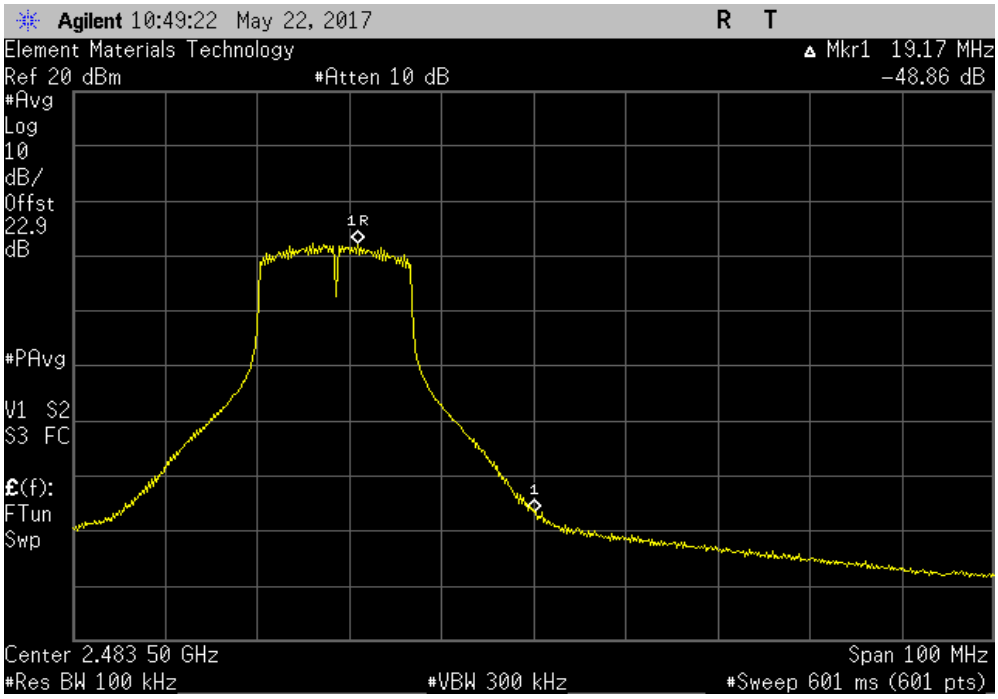
BAND EDGE COMPLIANCE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-30.95	-30	Pass

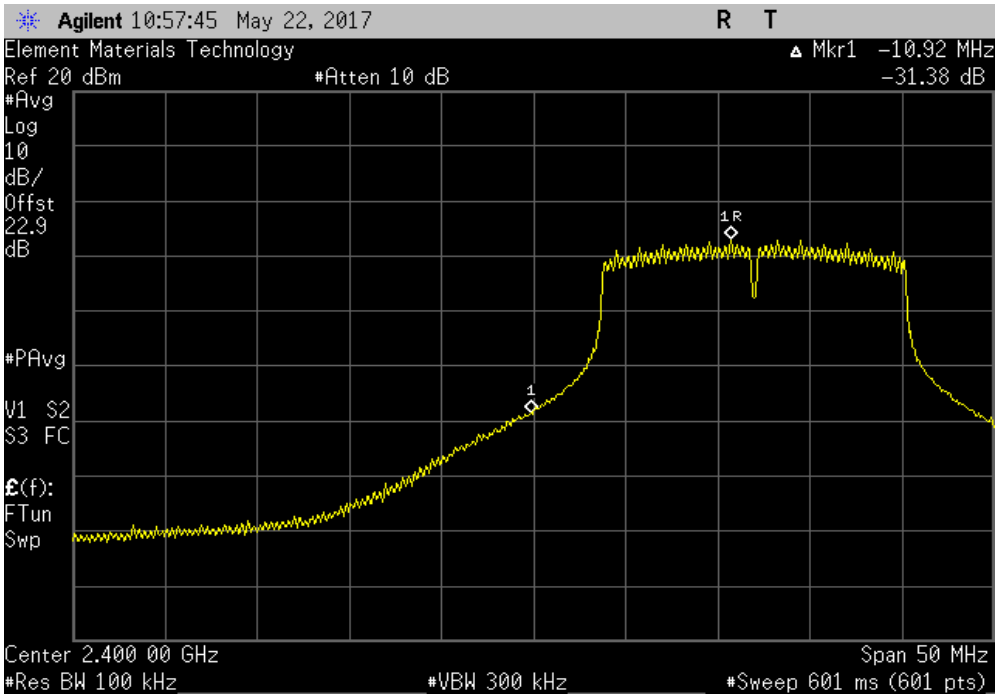


2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-48.86	-30	Pass

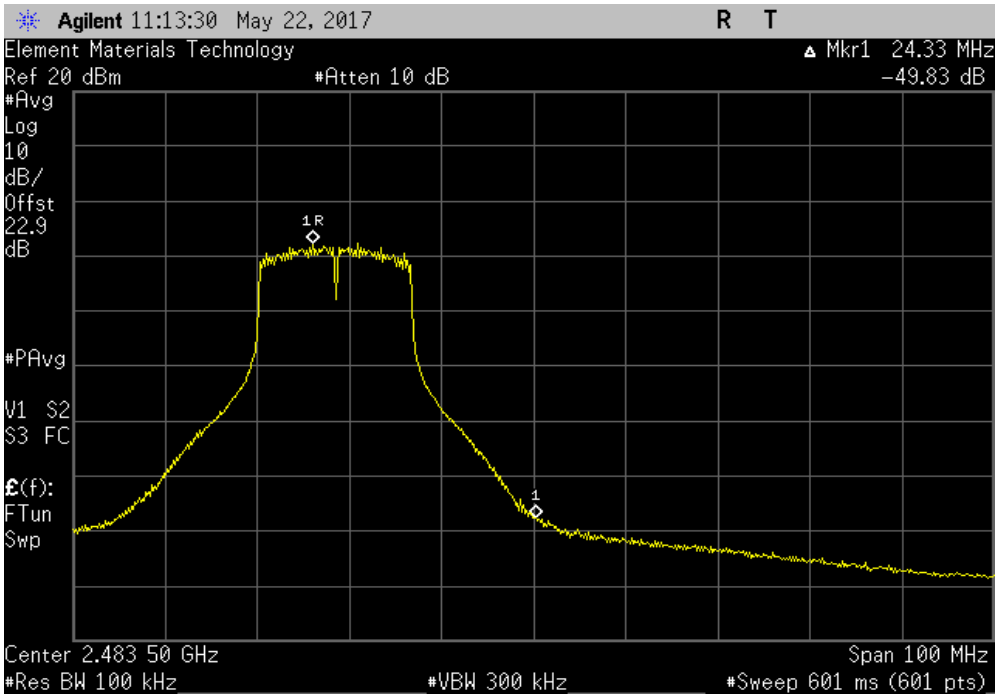


BAND EDGE COMPLIANCE

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-31.38	-30	Pass



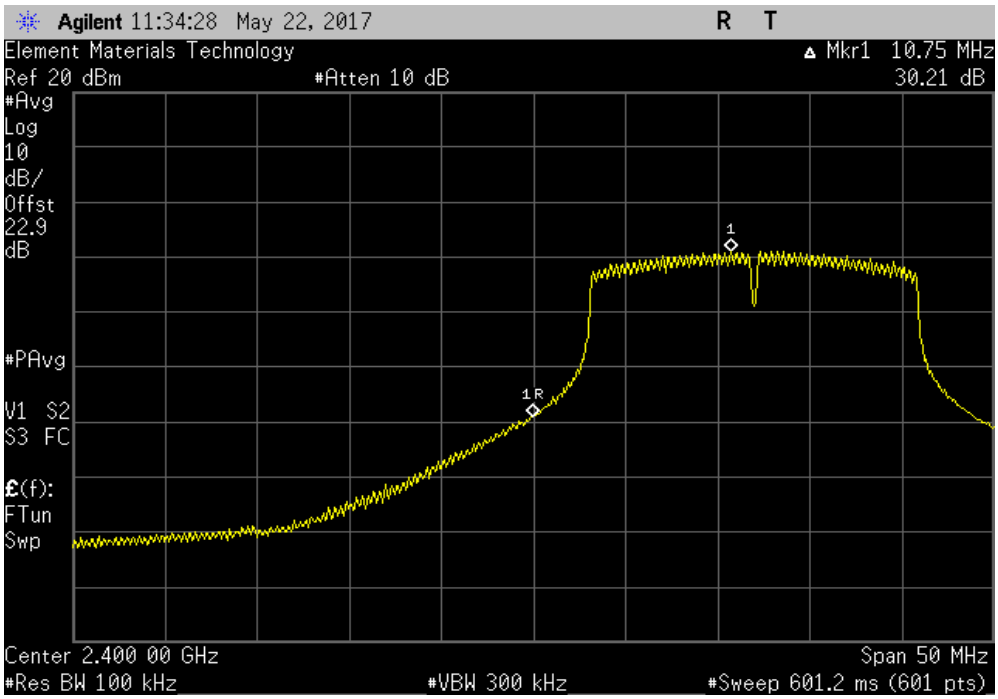
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-49.83	-30	Pass



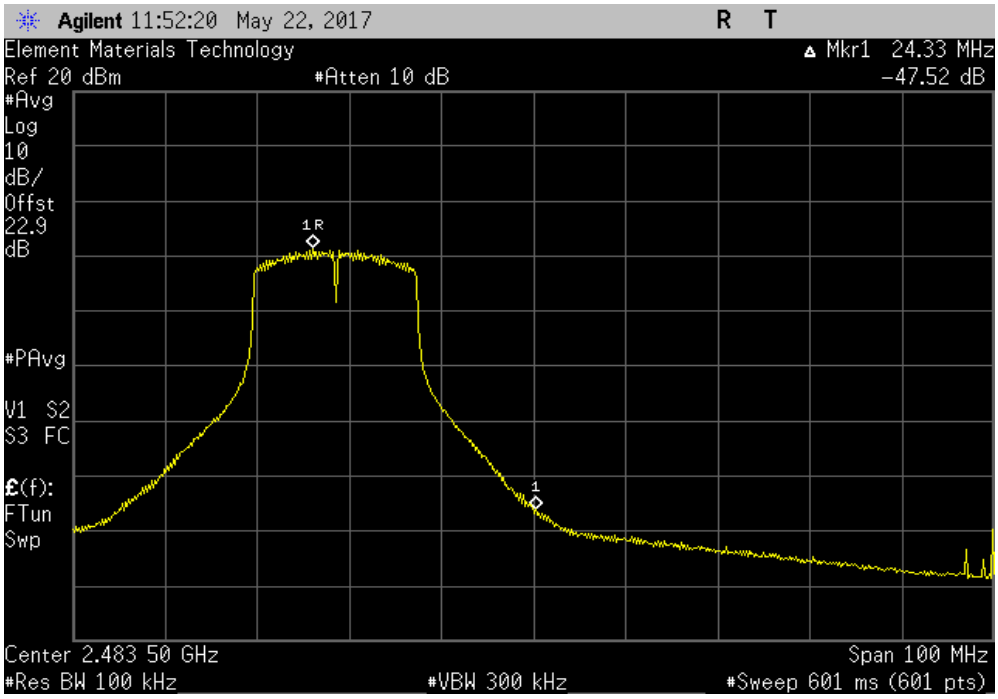
BAND EDGE COMPLIANCE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-30.21	-30	Pass



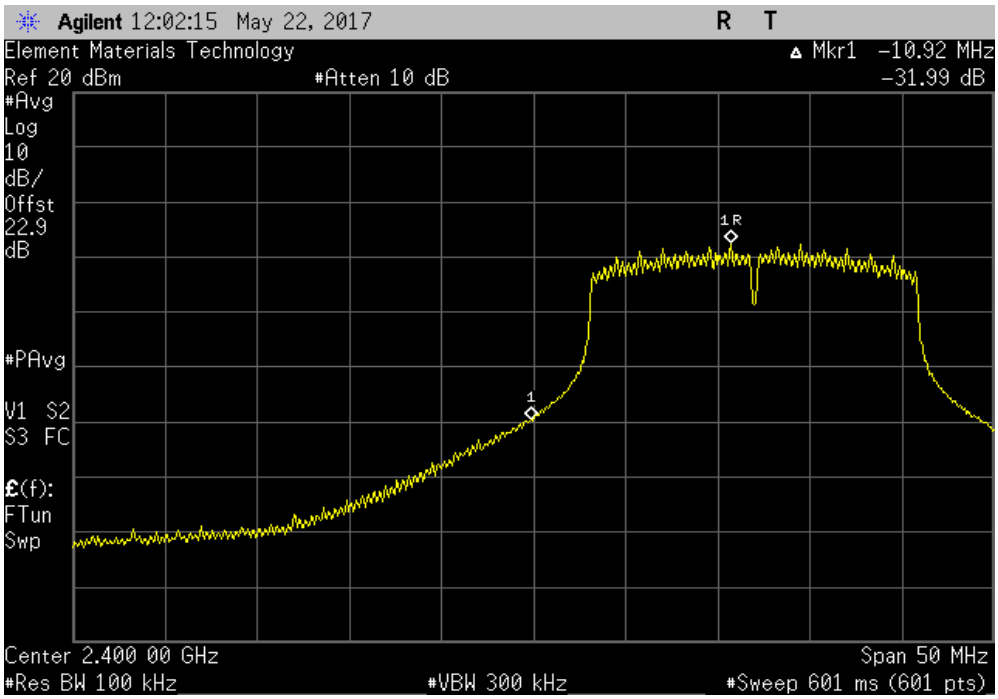
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-47.52	-30	Pass



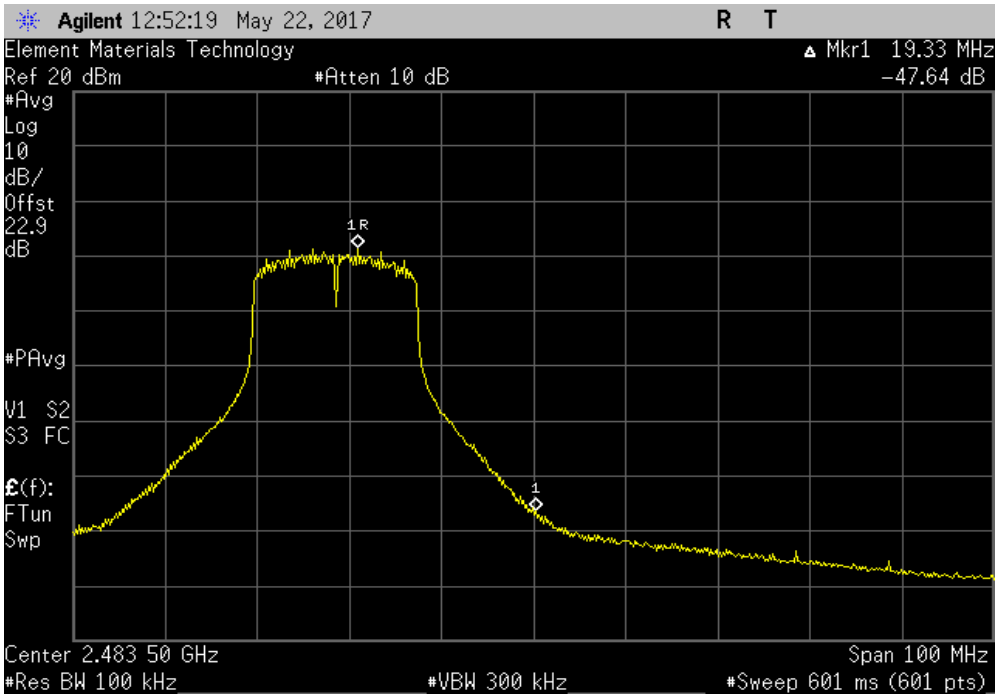
BAND EDGE COMPLIANCE

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-31.99	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-47.64	-30	Pass



SPURIOUS CONDUCTED EMISSIONS

XMit 2017.02.08

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	2/5/2015	2/5/2018
Attenuator	Fairview Microwave	SA18E-20	TKS	3/6/2017	3/6/2018
Block - DC	Aeroflex	INMET 8535	AMO	3/27/2017	3/27/2018
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	11/2/2016	11/2/2017

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 spectrum was scanned throughout the specified frequency range.

SPURIOUS CONDUCTED EMISSIONS

TbtTx 2017.01.27 XMit 2017.02.08

EUT:	IMP004M	Work Order:	ELIM0013
Serial Number:	IMP0107	Date:	05/31/17
Customer:	Electric Imp, Inc.	Temperature:	21.3 °C
Attendees:	Jonathan Dillon	Humidity:	49% RH
Project:	None	Barometric Pres.:	1014 mbar
Tested by:	Salvador Solorzano and Johnny Candelas	Job Site:	OC13
Power:	3.3VDC regulated down from USB 5V		

TEST SPECIFICATIONS	Test Method
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

Total Offset 22.59dB (20dB pad + DC Block + coax cable + client provided patch cable) at 2.4GHz

DEVIATIONS FROM TEST STANDARD

None

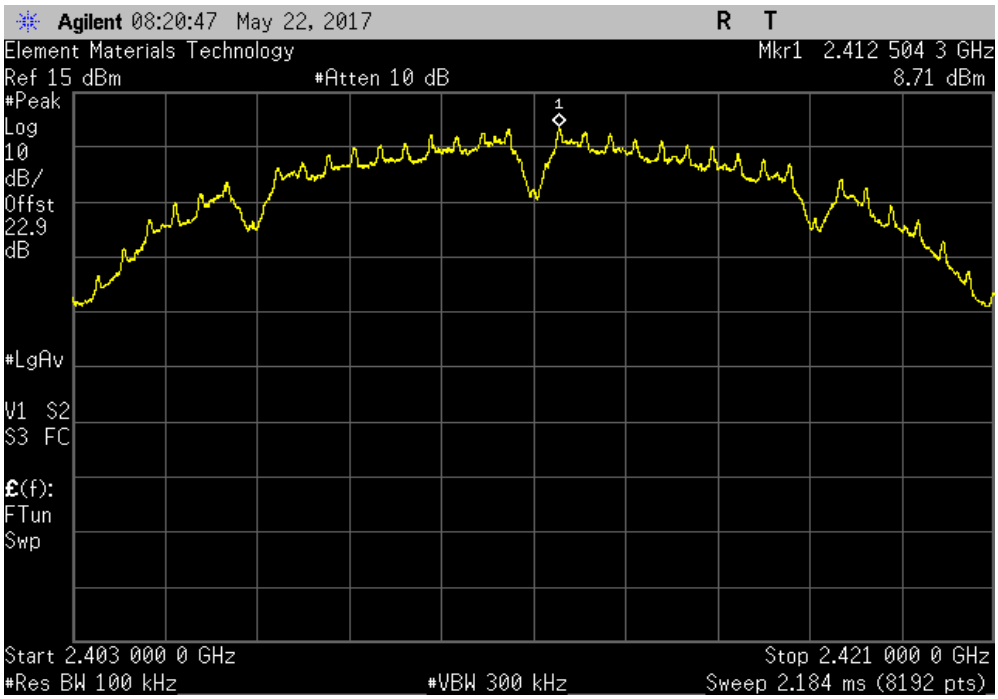
Configuration #	2	Signature

	Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result
2400 MHz - 2483.5 MHz Band				
802.11(b) 1 Mbps				
Low Channel 1, 2412 MHz	Fundamental	N/A	N/A	N/A
Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	-50.05	-30	Pass
Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	-60.27	-30	Pass
Mid Channel 6, 2437 MHz	Fundamental	N/A	N/A	N/A
Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	-58.43	-30	Pass
Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	-60.49	-30	Pass
High Channel 11, 2462 MHz	Fundamental	N/A	N/A	N/A
High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	-58.8	-30	Pass
High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	-61.18	-30	Pass
802.11(b) 11 Mbps				
Low Channel 1, 2412 MHz	Fundamental	N/A	N/A	N/A
Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	-54.53	-30	Pass
Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	-59.53	-30	Pass
Mid Channel 6, 2437 MHz	Fundamental	N/A	N/A	N/A
Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	-59.25	-30	Pass
Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	-60.28	-30	Pass
High Channel 11, 2462 MHz	Fundamental	N/A	N/A	N/A
High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	-59.23	-30	Pass
High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	-62.02	-30	Pass
802.11(g) 6 Mbps				
Low Channel 1, 2412 MHz	Fundamental	N/A	N/A	N/A
Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	-51.45	-30	Pass
Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	-52.9	-30	Pass
Mid Channel 6, 2437 MHz	Fundamental	N/A	N/A	N/A
Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	-31.04	-30	Pass
Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	-52.98	-30	Pass
High Channel 11, 2462 MHz	Fundamental	N/A	N/A	N/A
High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	-50.61	-30	Pass
High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	-52.58	-30	Pass
802.11(g) 36 Mbps				
Low Channel 1, 2412 MHz	Fundamental	N/A	N/A	N/A
Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	-48.12	-30	Pass
Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	-53.13	-30	Pass
Mid Channel 6, 2437 MHz	Fundamental	N/A	N/A	N/A
Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	-51.62	-30	Pass
Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	-53.54	-30	Pass
High Channel 11, 2462 MHz	Fundamental	N/A	N/A	N/A
High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	-50.63	-30	Pass
High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	-52.51	-30	Pass
802.11(g) 54 Mbps				
Low Channel 1, 2412 MHz	Fundamental	N/A	N/A	N/A
Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	-51.2	-30	Pass
Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	-52.29	-30	Pass
Mid Channel 6, 2437 MHz	Fundamental	N/A	N/A	N/A
Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	-51.74	-30	Pass
Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	-53.33	-30	Pass
High Channel 11, 2462 MHz	Fundamental	N/A	N/A	N/A
High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	-49.51	-30	Pass
High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	-53.16	-30	Pass
802.11(n) MCS0				
Low Channel 1, 2412 MHz	Fundamental	N/A	N/A	N/A
Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	-48.9	-30	Pass
Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	-51.84	-30	Pass
Mid Channel 6, 2437 MHz	Fundamental	N/A	N/A	N/A
Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	-43.36	-30	Pass
Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	-51.65	-30	Pass
High Channel 11, 2462 MHz	Fundamental	N/A	N/A	N/A
High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	-49.15	-30	Pass
High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	-51.68	-30	Pass
802.11(n) MCS7				
Low Channel 1, 2412 MHz	Fundamental	N/A	N/A	N/A
Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	-48.6	-30	Pass
Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	-51.87	-30	Pass
Mid Channel 6, 2437 MHz	Fundamental	N/A	N/A	N/A
Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	-50.29	-30	Pass
Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	-52.34	-30	Pass
High Channel 11, 2462 MHz	Fundamental	N/A	N/A	N/A
High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	-49.49	-30	Pass
High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	-52.63	-30	Pass

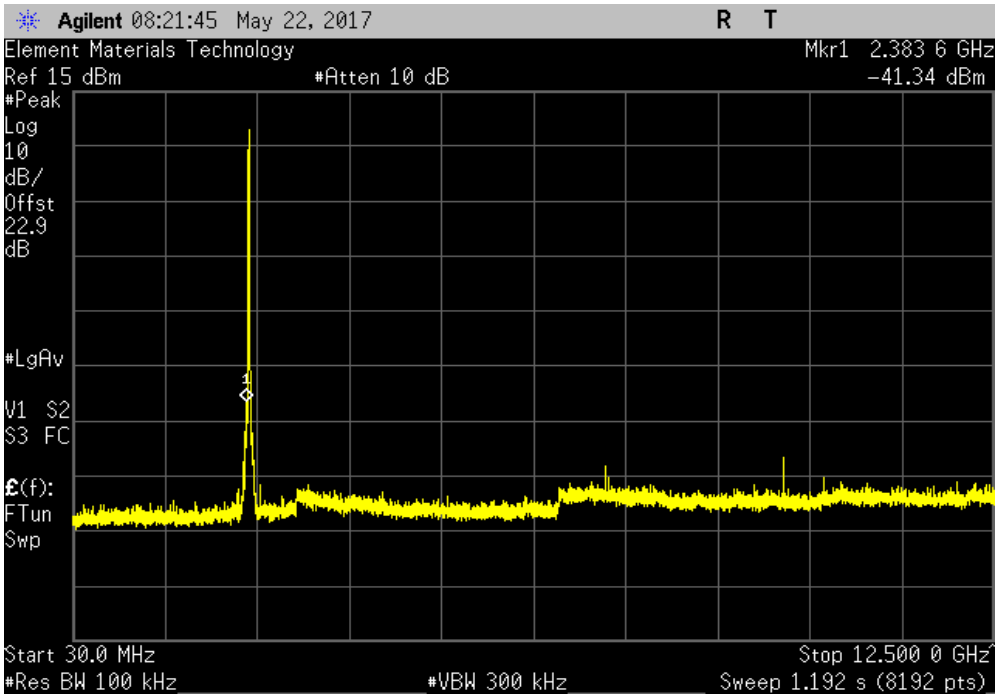
SPURIOUS CONDUCTED EMISSIONS

TbtTx 2017.01.27 XMit 2017.02.08

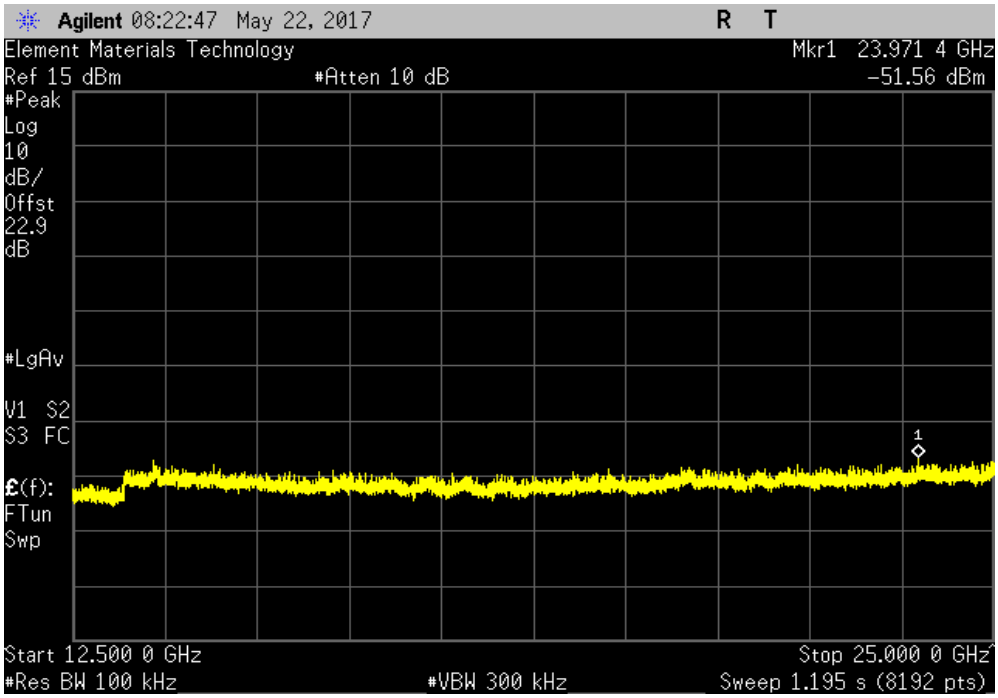
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
	Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



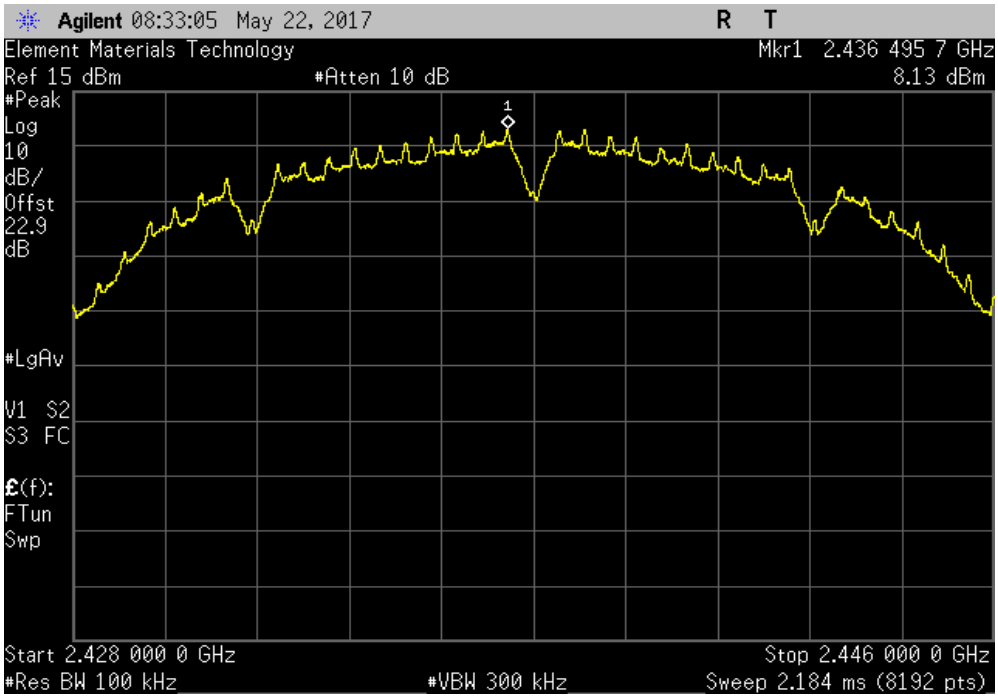
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz				
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz		-50.05	-30	Pass



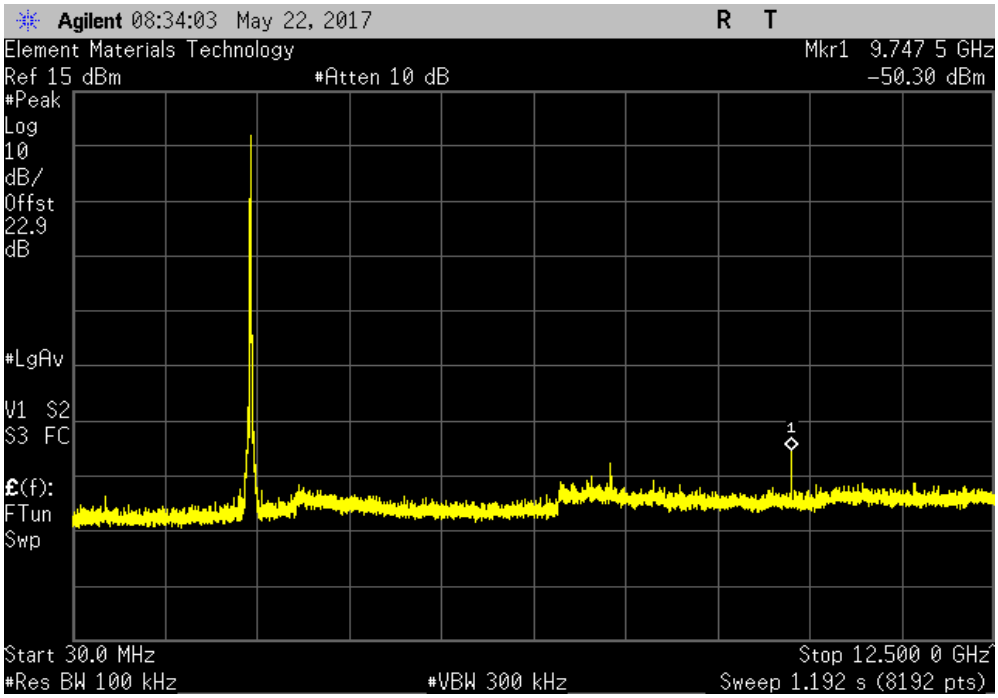
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-60.27	-30	Pass



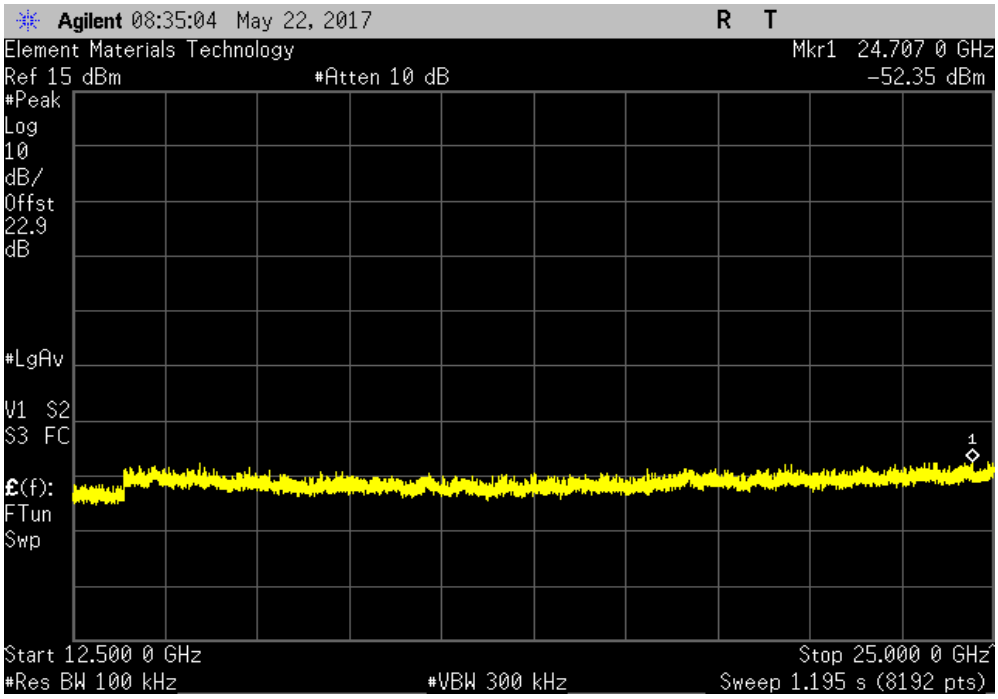
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
Frequency Range				**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
	Fundamental			N/A	N/A	N/A



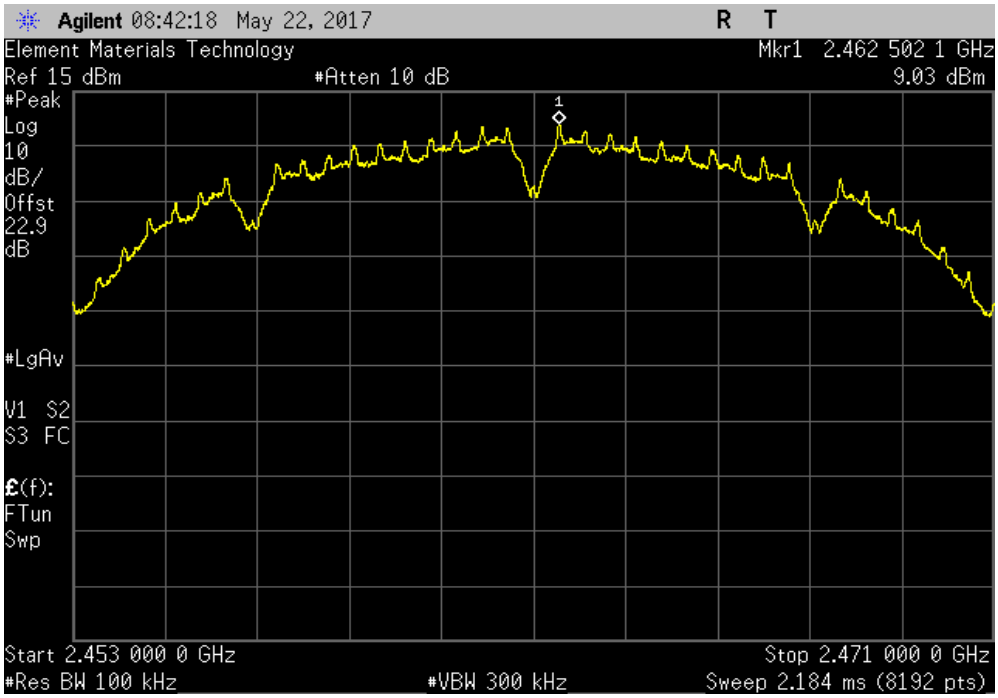
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-58.43	-30	Pass



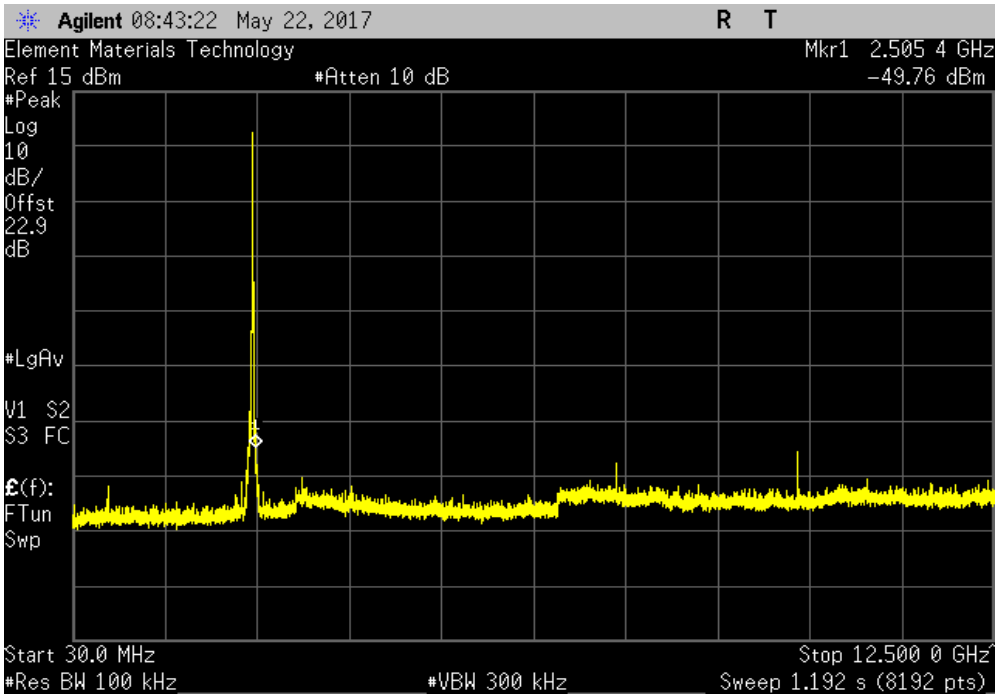
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-60.49	-30	Pass



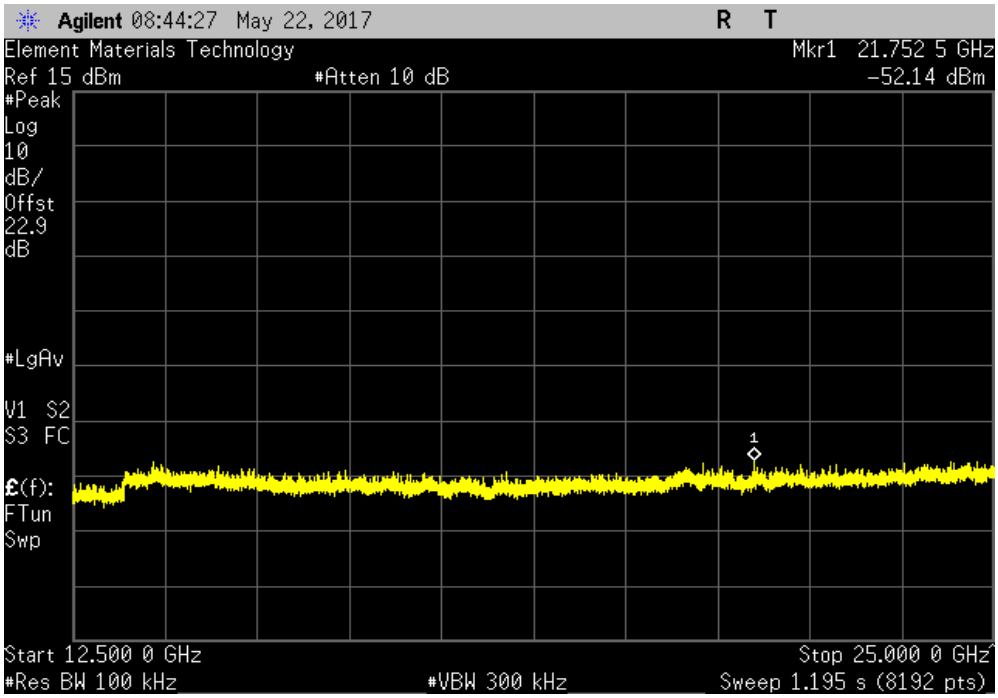
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
	Frequency Range			**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
	Fundamental			N/A	N/A	N/A



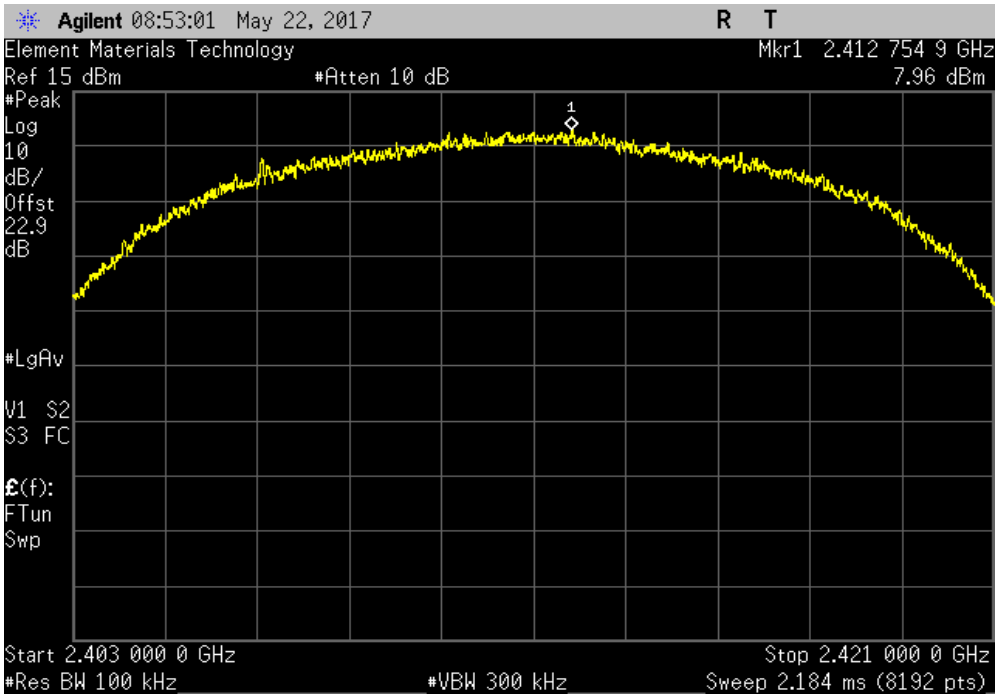
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-58.8	-30	Pass



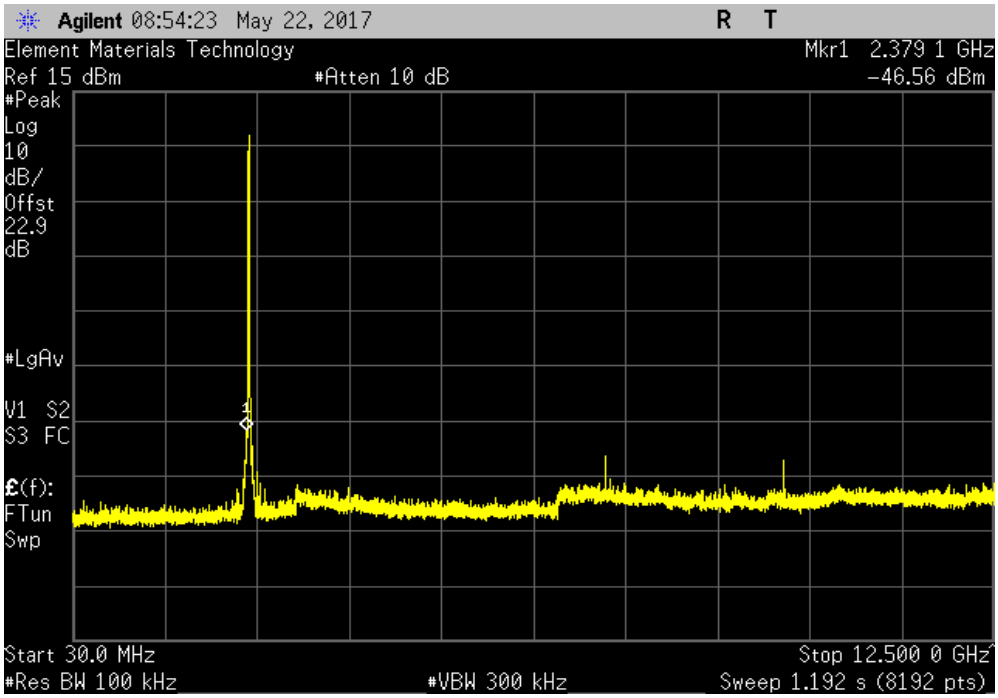
2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-61.18	-30	Pass



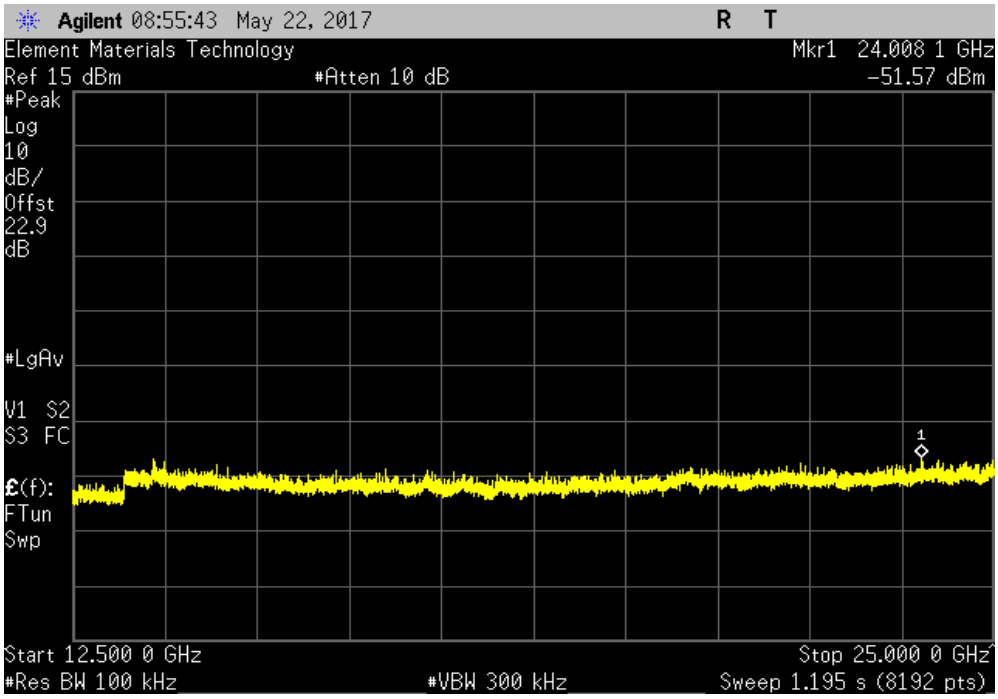
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
Fundamental		N/A	N/A	N/A



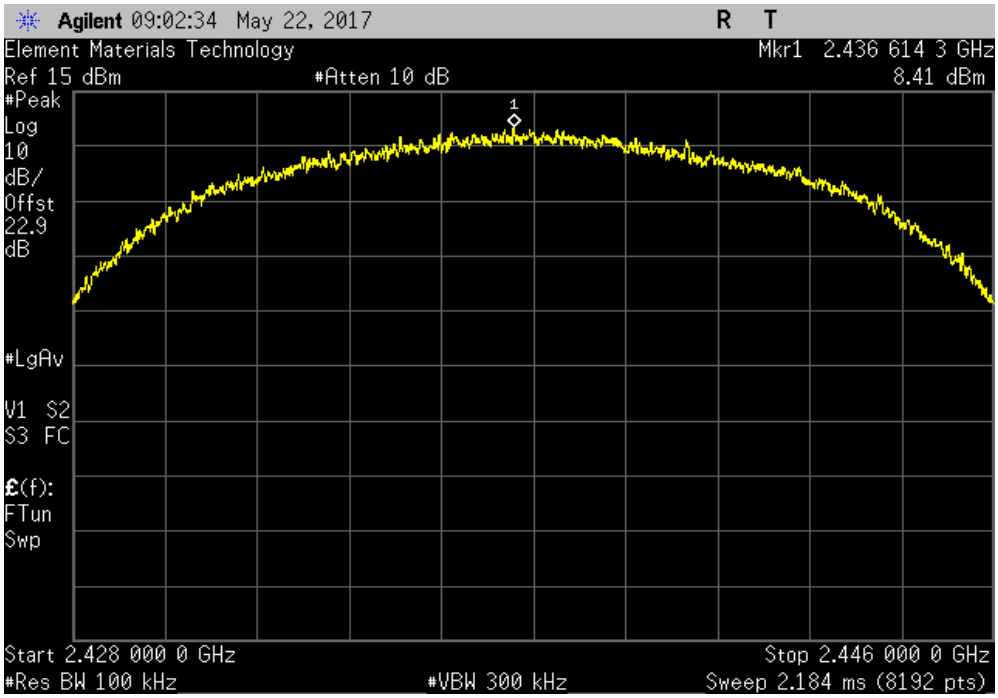
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-54.53	-30	Pass



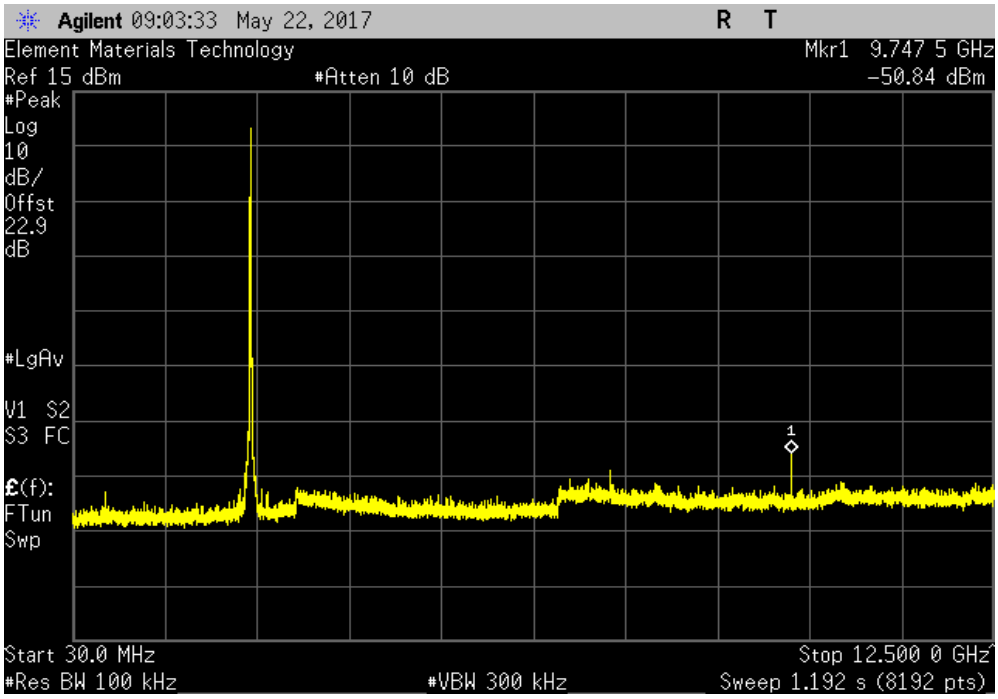
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-59.53	-30	Pass



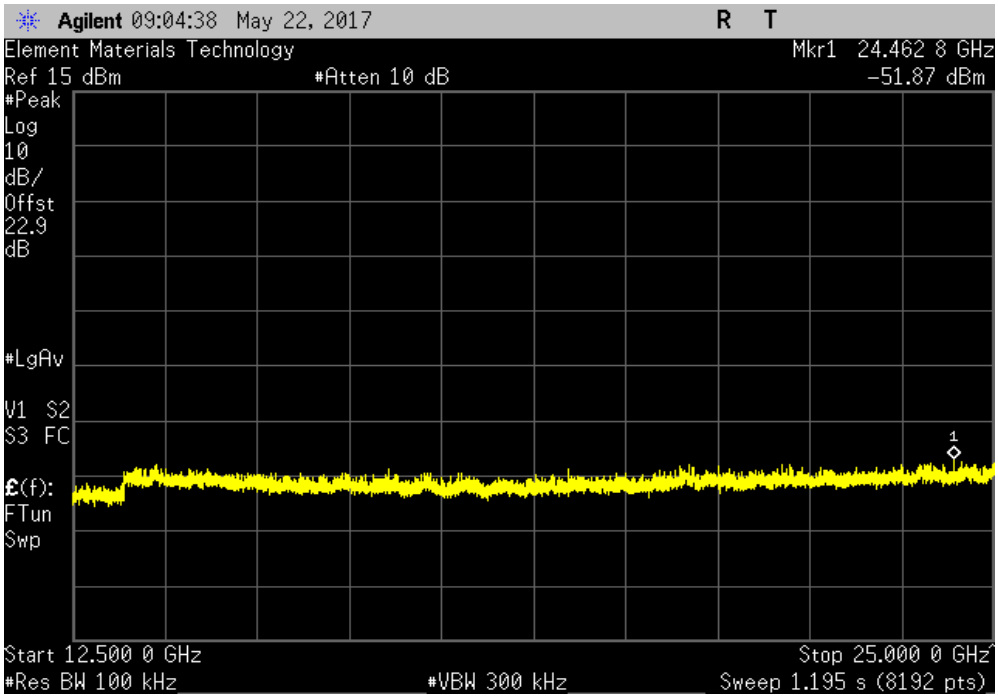
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
	Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



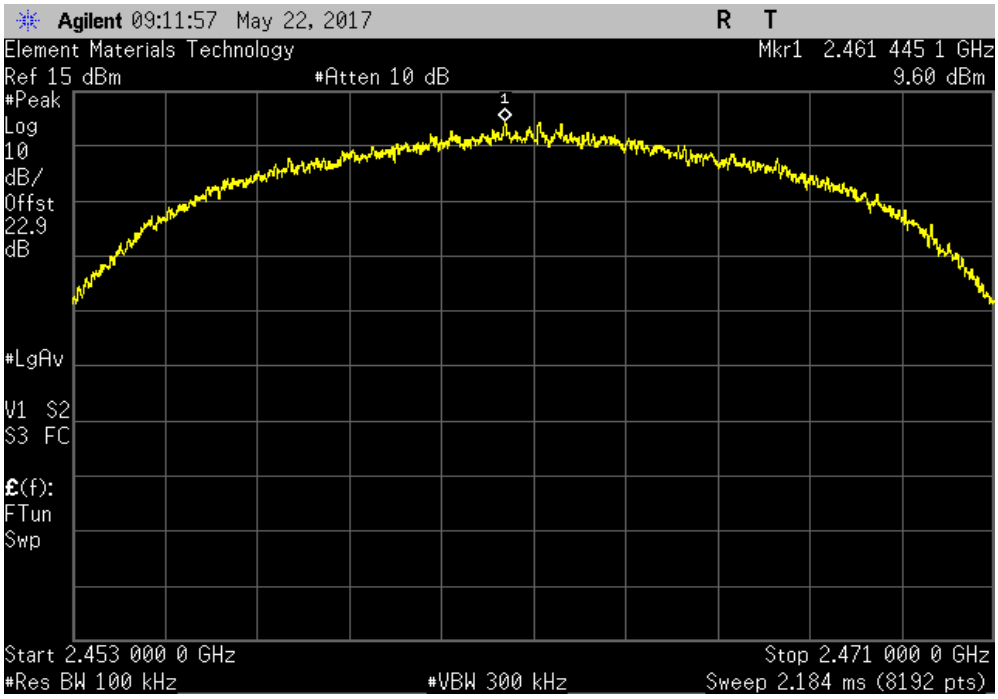
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz		-59.25	-30	Pass



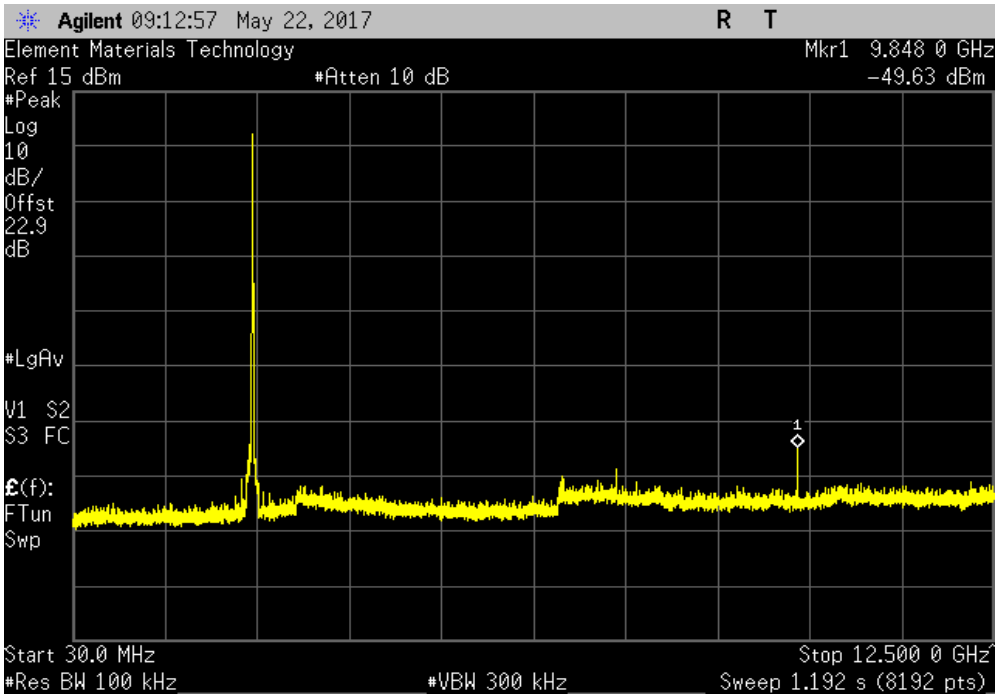
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-60.28	-30	Pass



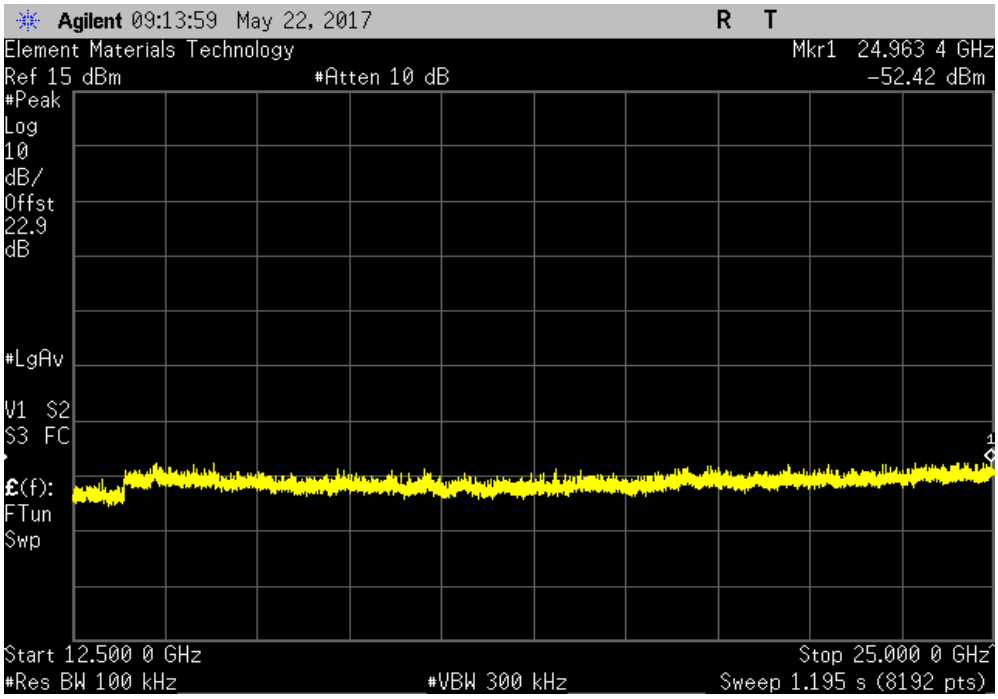
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
Frequency Range				**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
	Fundamental			N/A	N/A	N/A



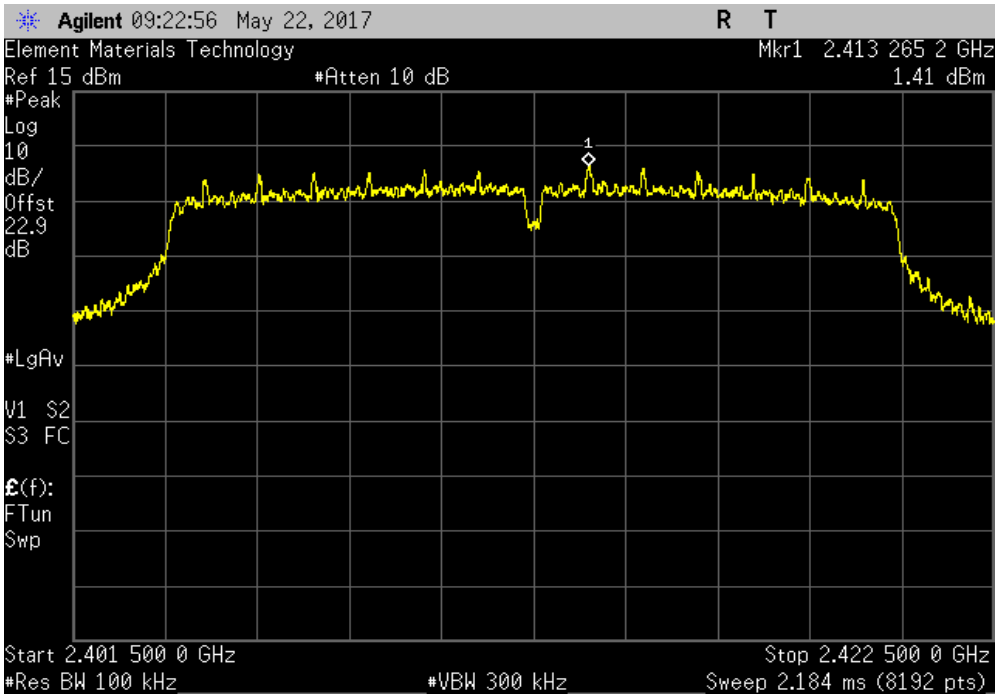
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-59.23	-30	Pass



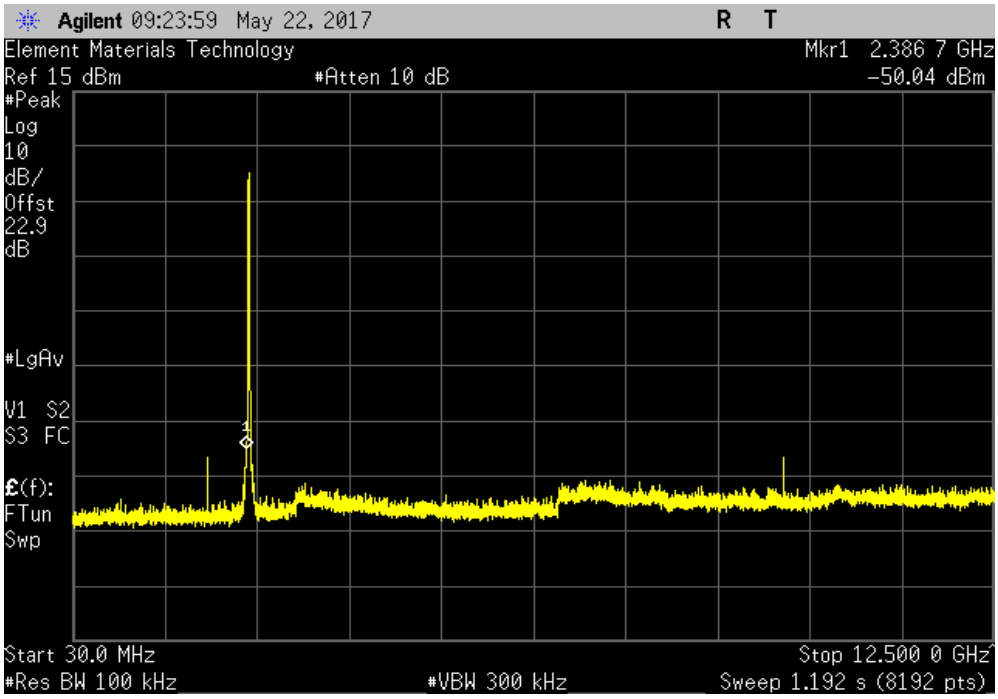
2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-62.02	-30	Pass



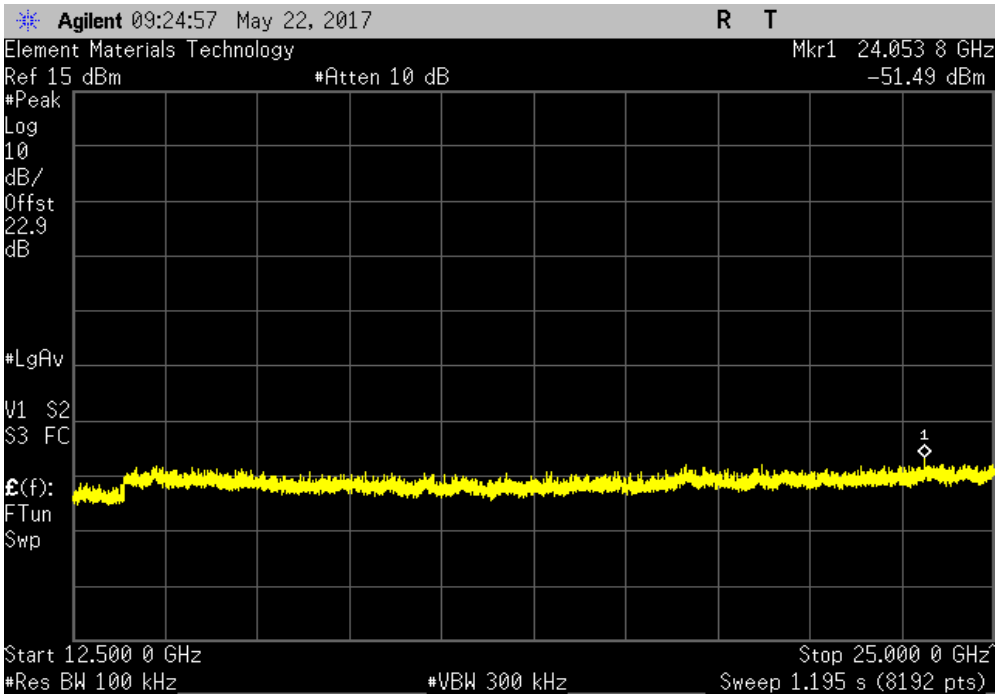
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
	Frequency Range			**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
	Fundamental			N/A	N/A	N/A



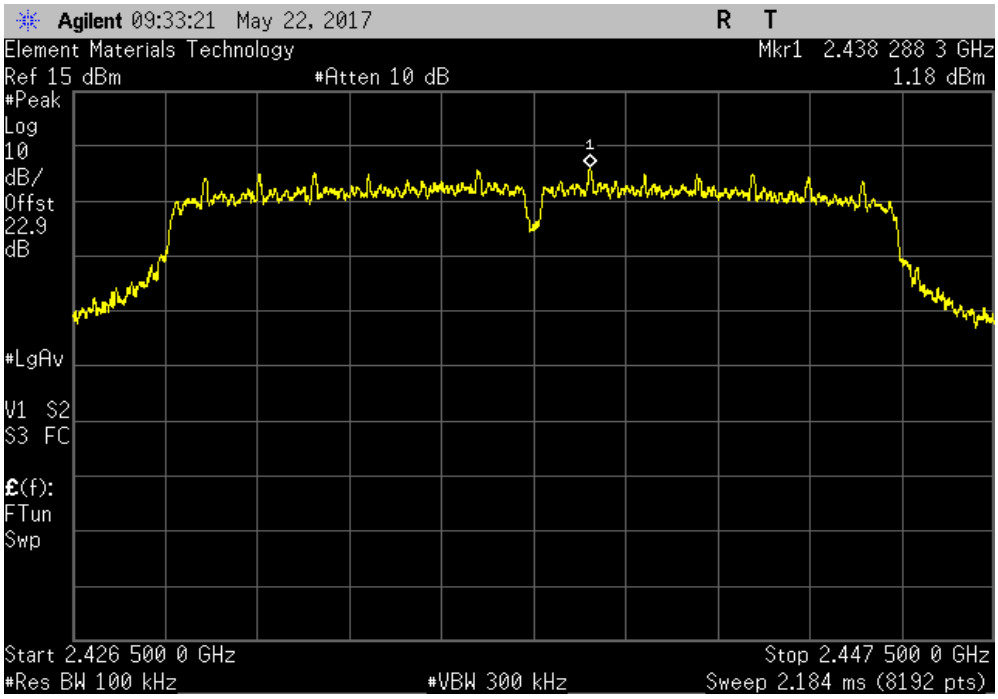
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-51.45	-30	Pass



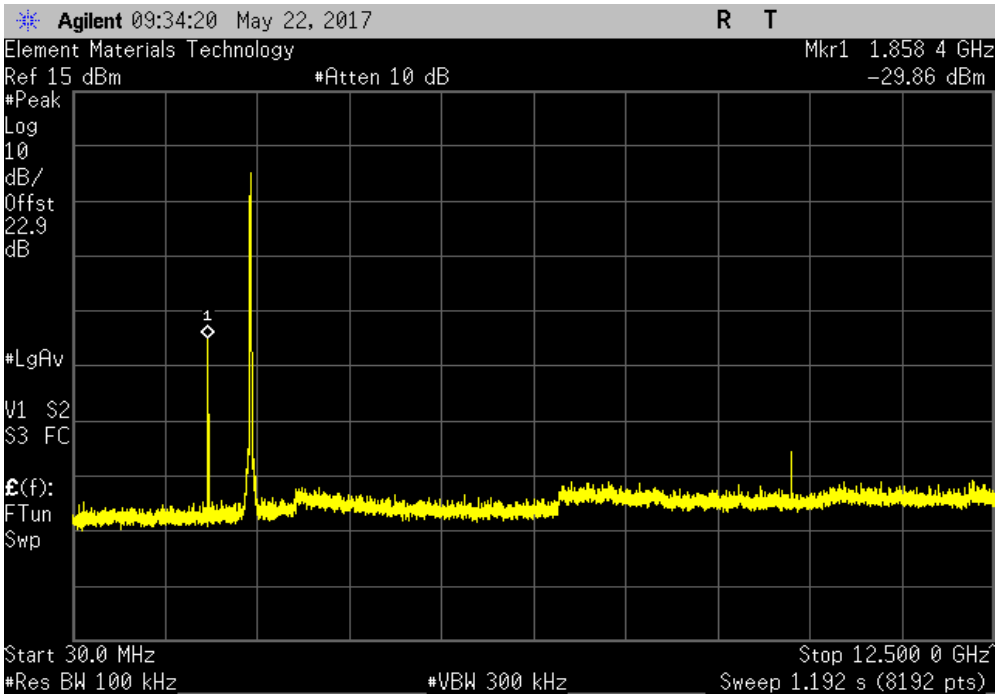
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-52.9	-30	Pass



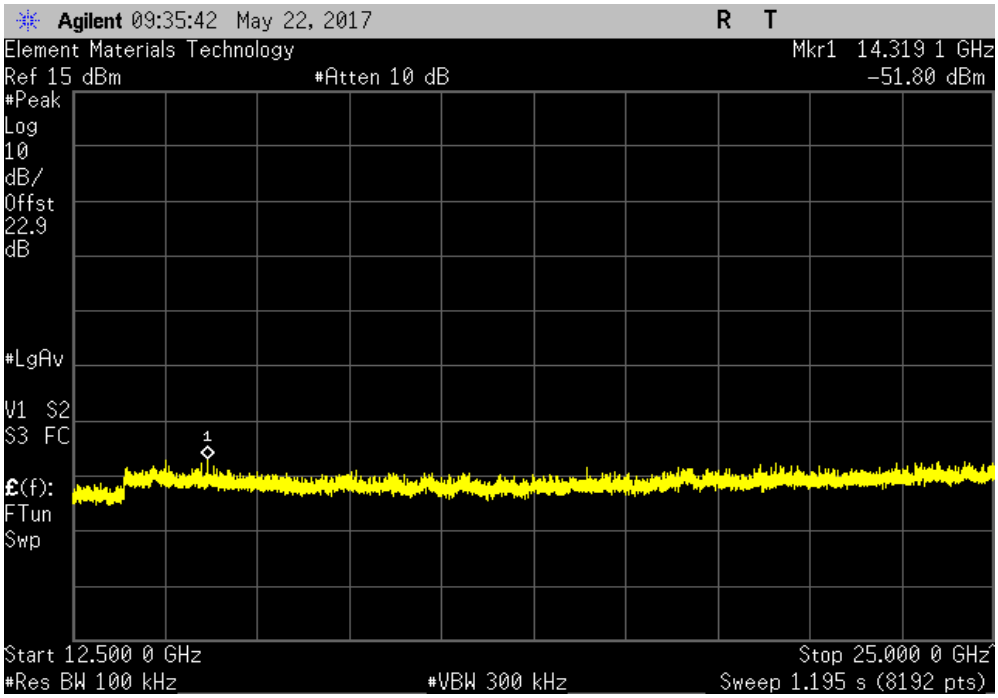
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
Frequency Range				**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
	Fundamental			N/A	N/A	N/A



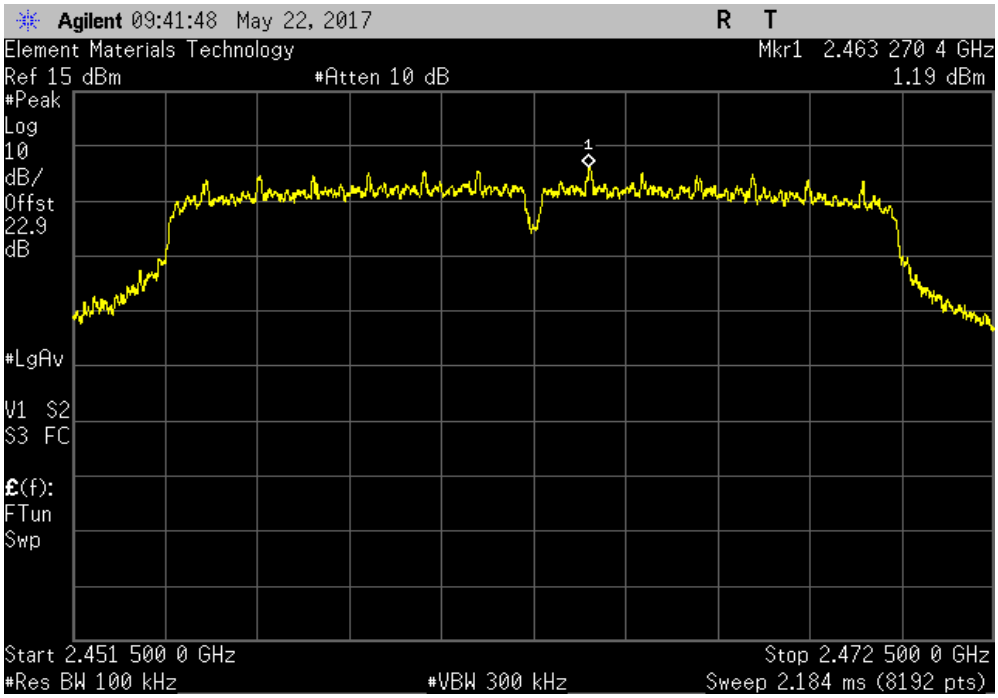
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-31.04	-30	Pass



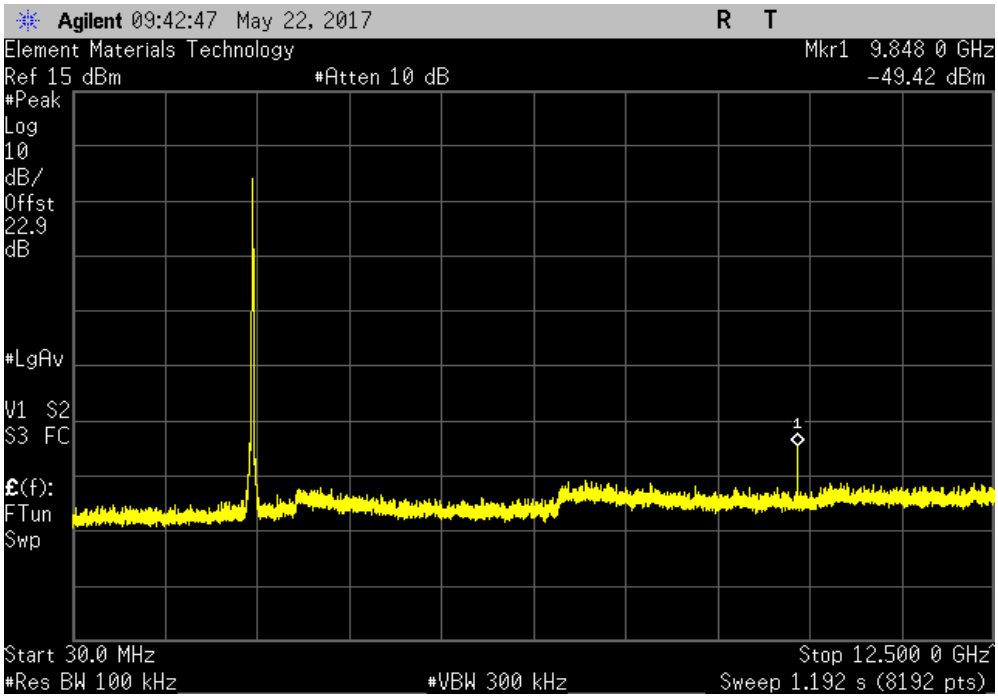
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-52.98	-30	Pass



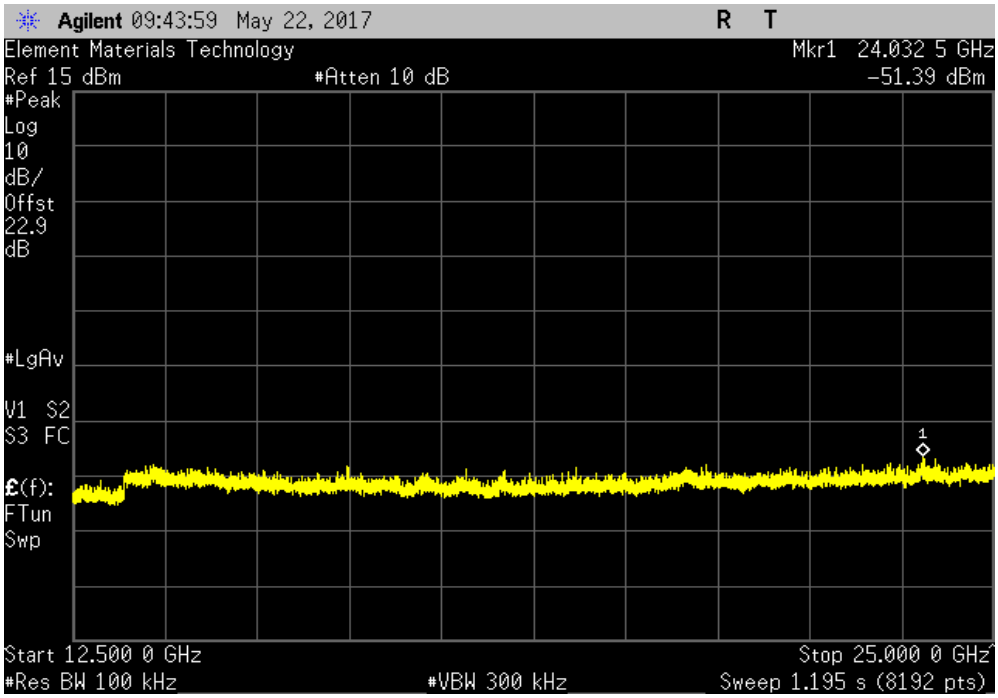
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Frequency Range			**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
	Fundamental			N/A	N/A	N/A



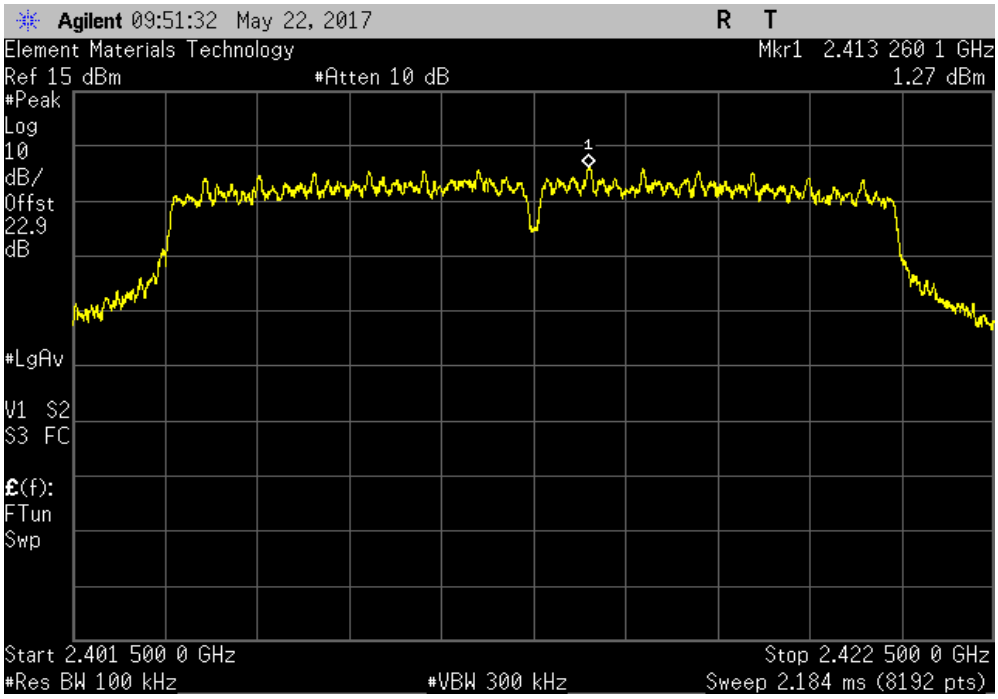
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-50.61	-30	Pass



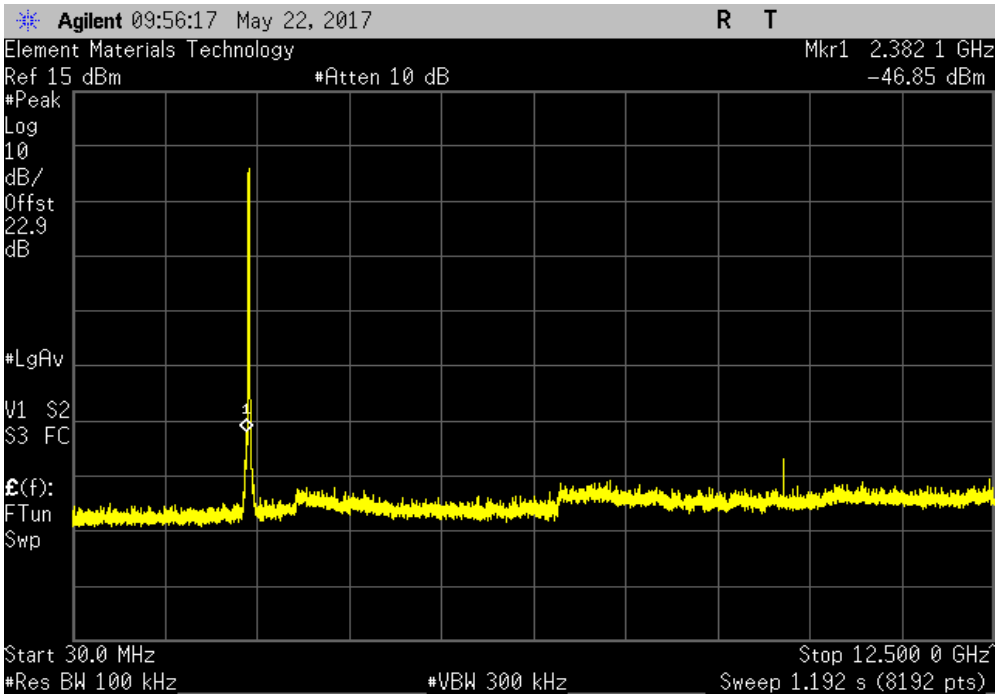
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz				
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz		-52.58	-30	Pass



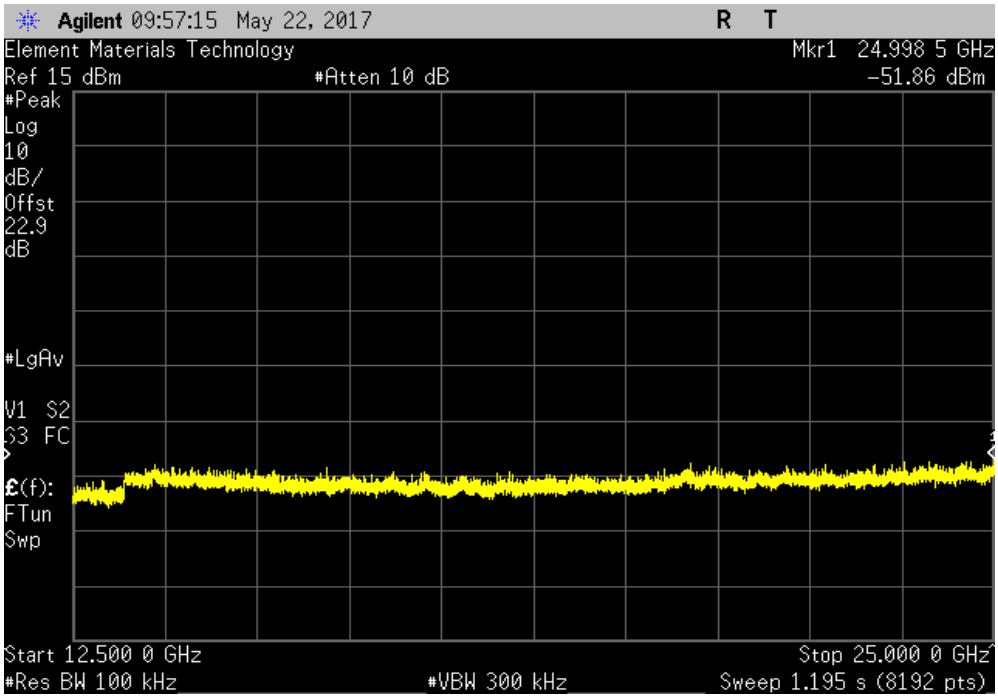
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
Frequency Range				Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



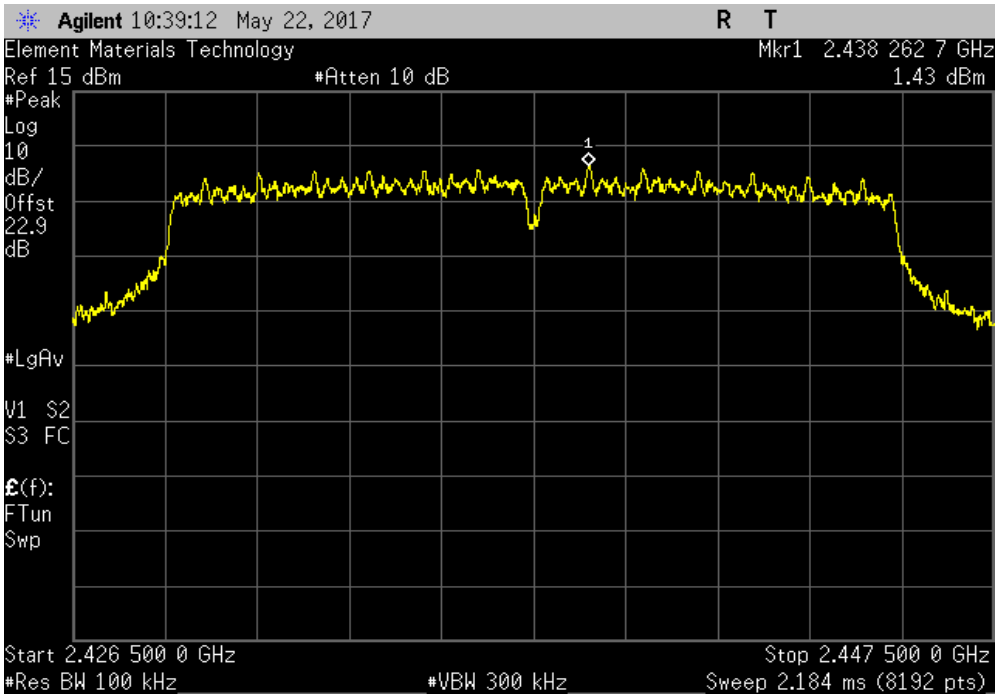
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-48.12	-30	Pass



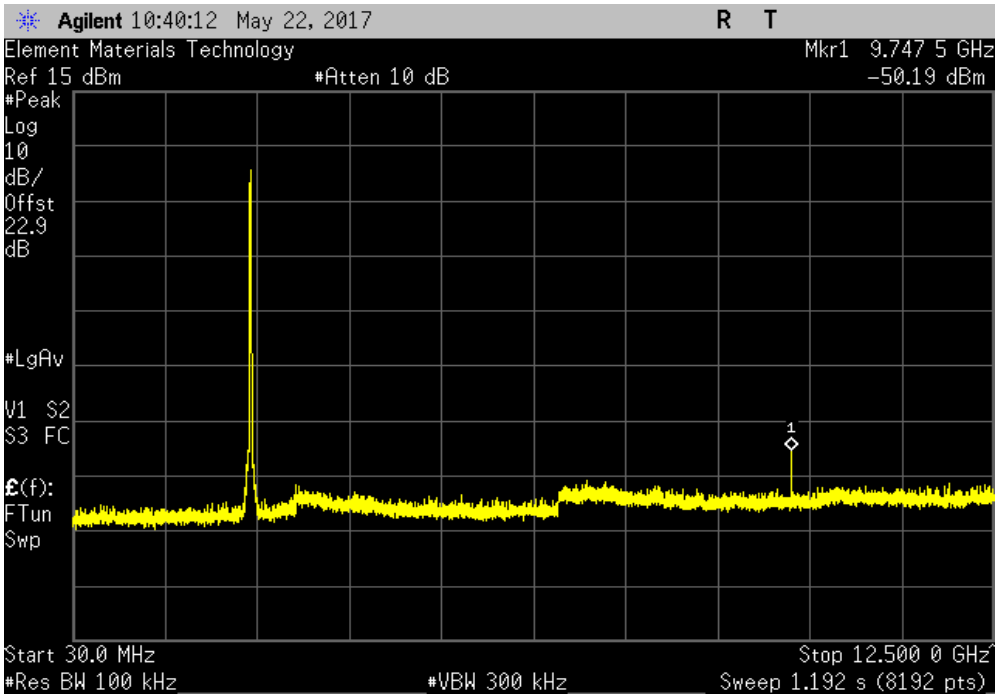
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-53.13	-30	Pass



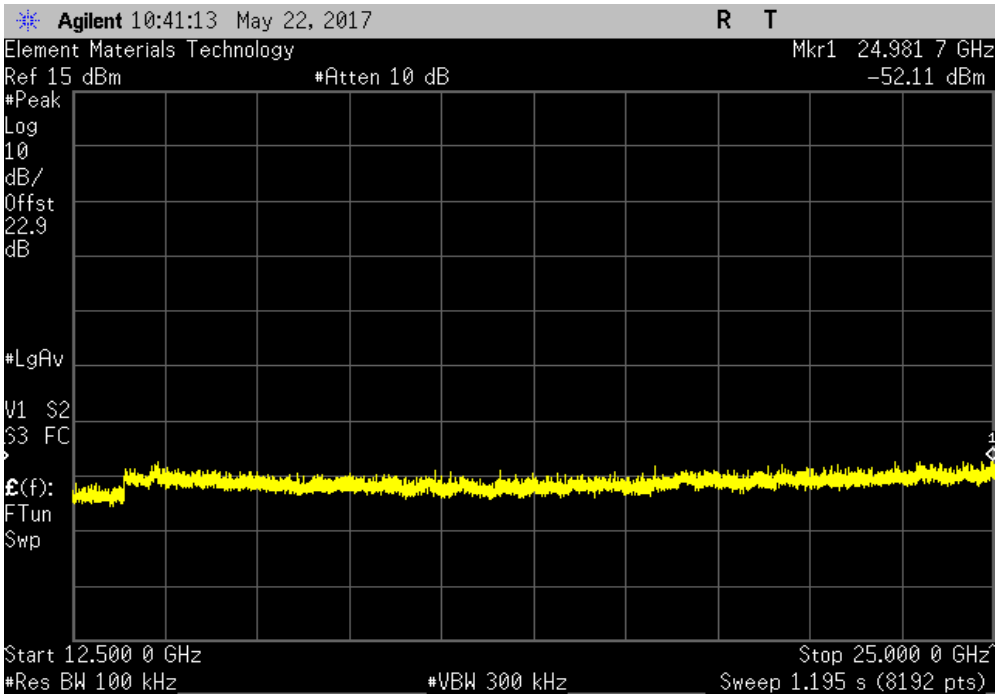
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
	Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



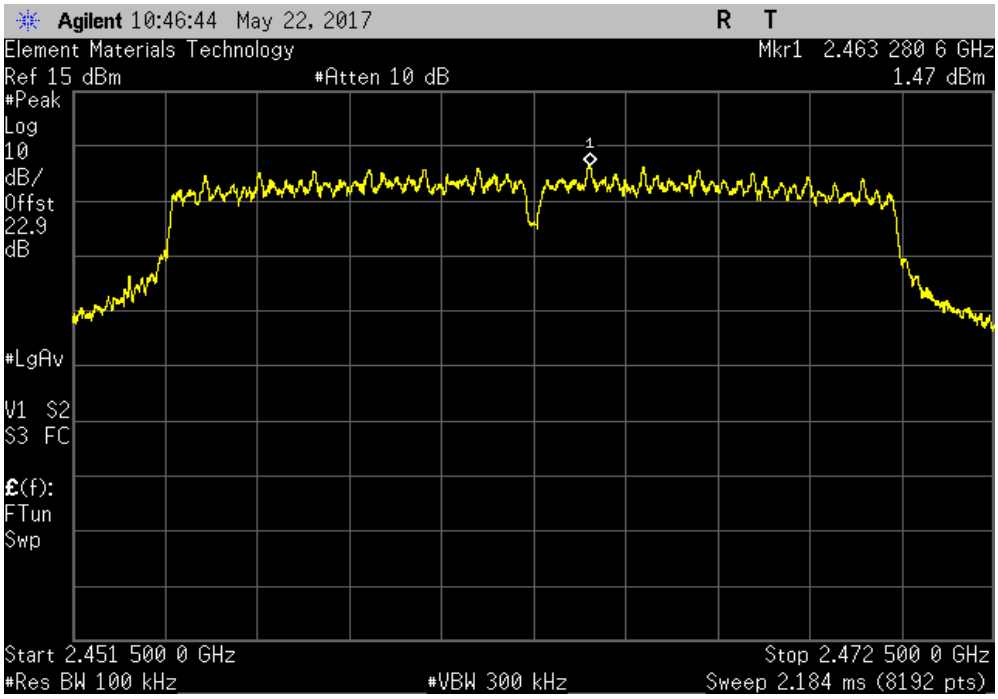
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz		-51.62	-30	Pass



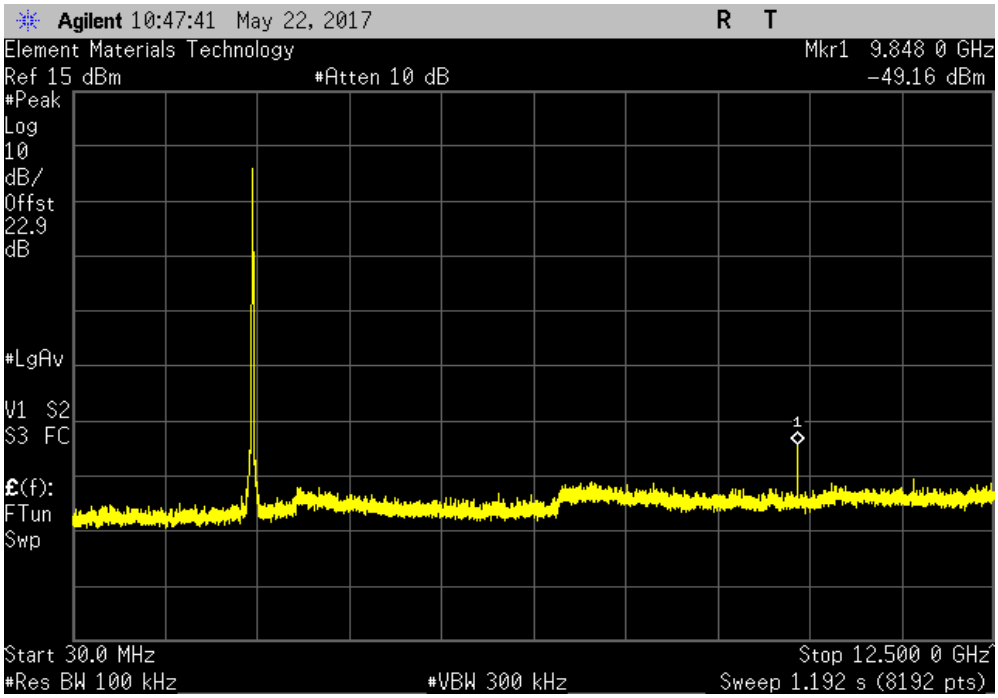
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-53.54	-30	Pass



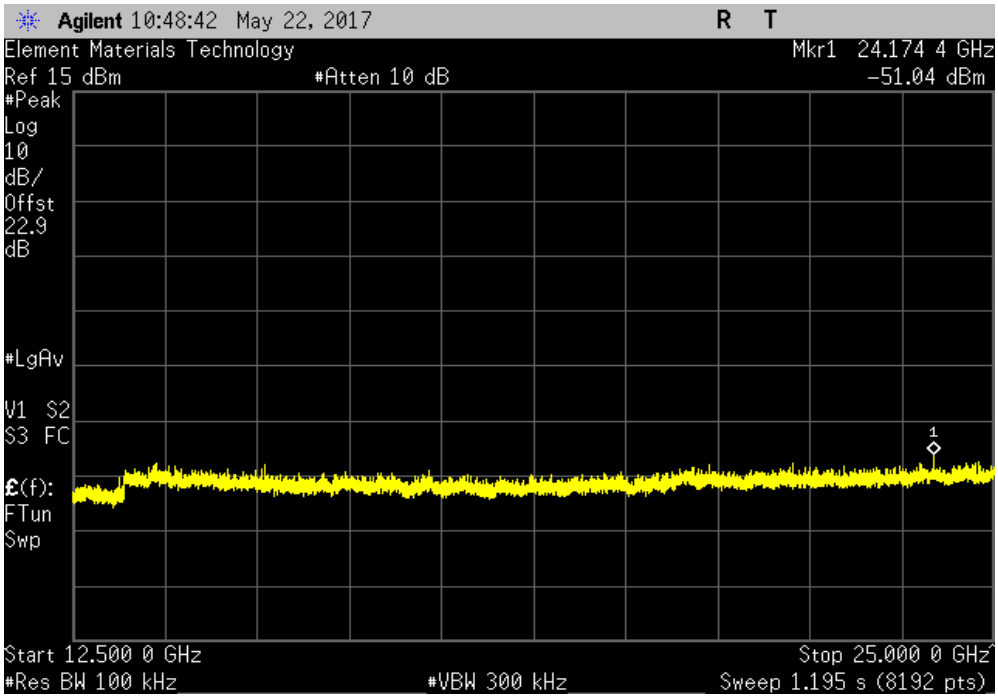
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
Frequency Range				**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
	Fundamental			N/A	N/A	N/A



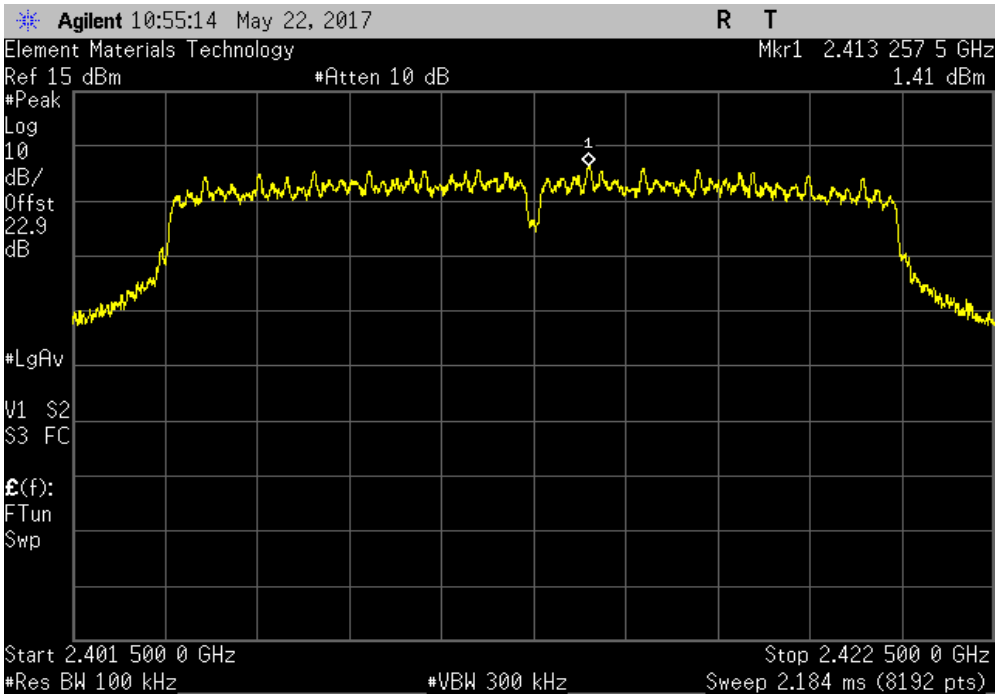
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-50.63	-30	Pass



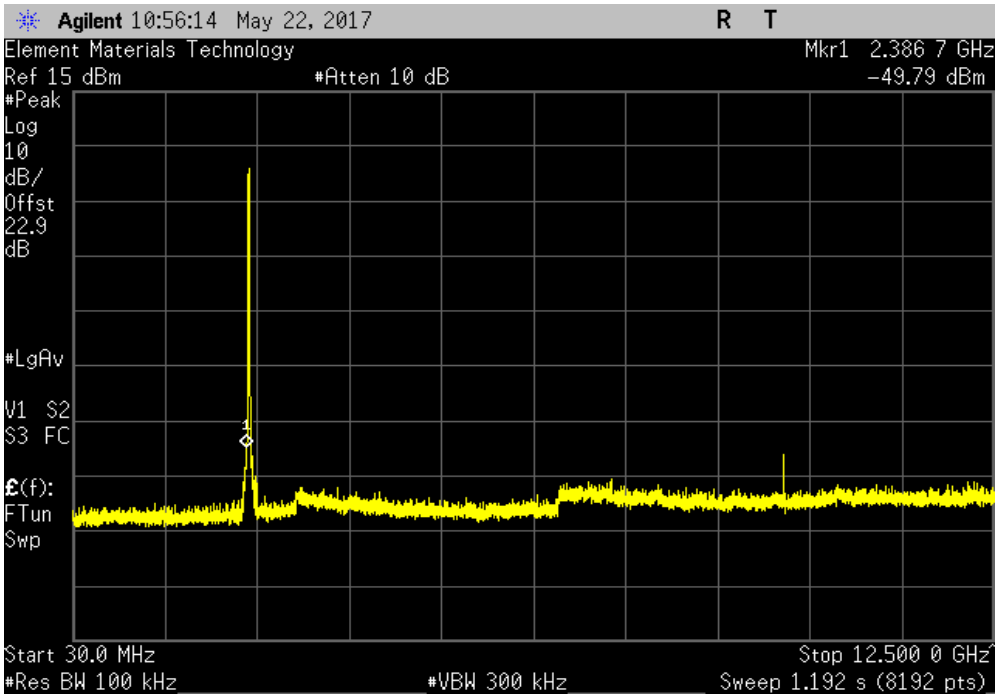
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-52.51	-30	Pass



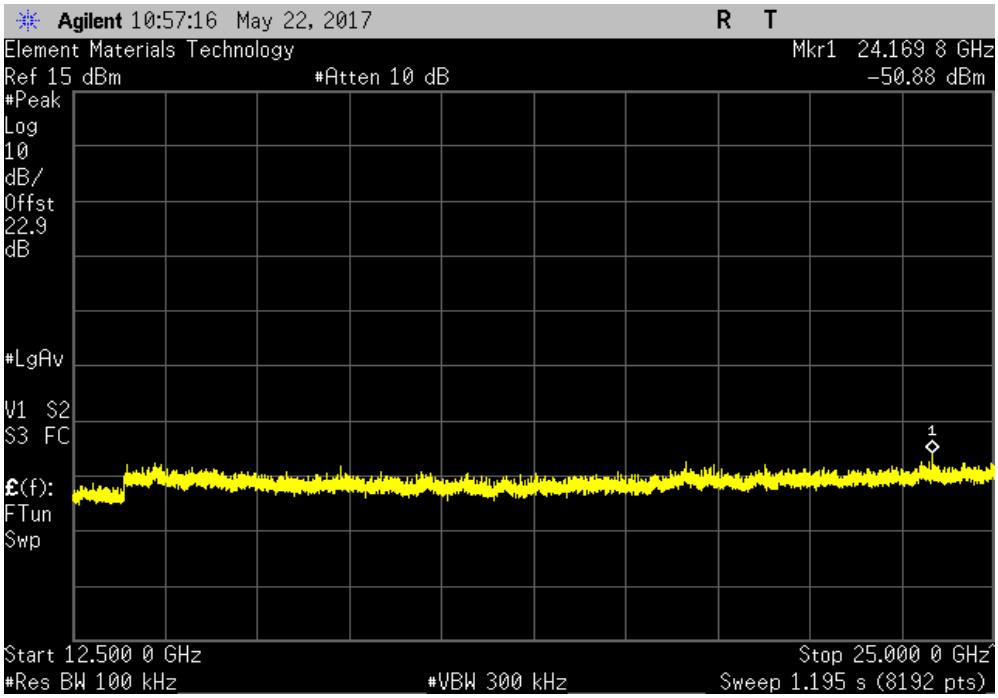
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
	Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



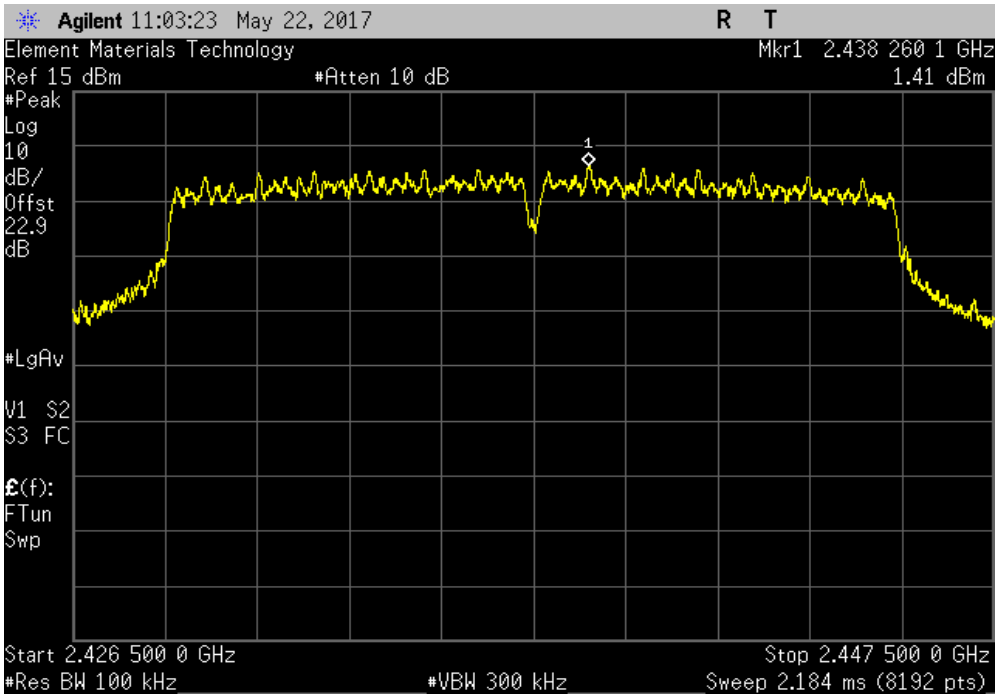
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz				
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz		-51.2	-30	Pass



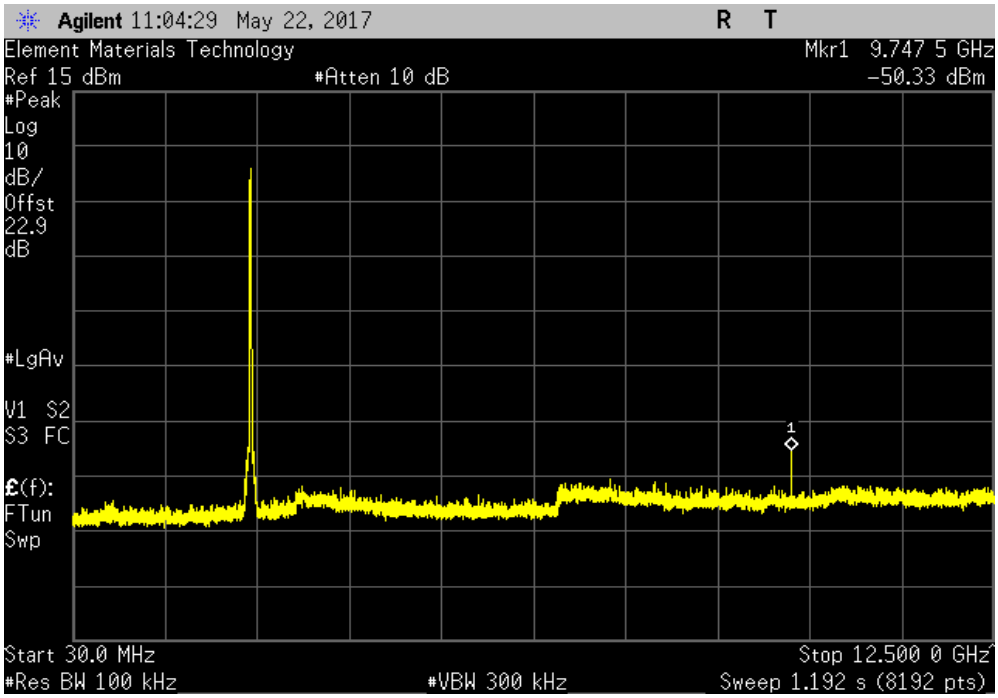
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-52.29	-30	Pass



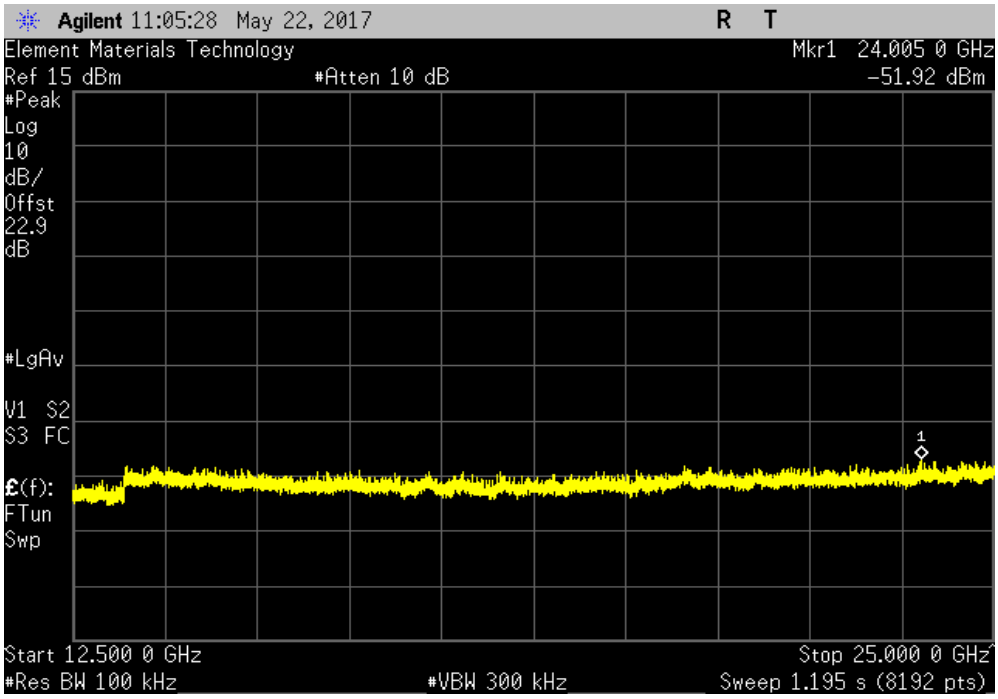
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
Fundamental		N/A	N/A	N/A



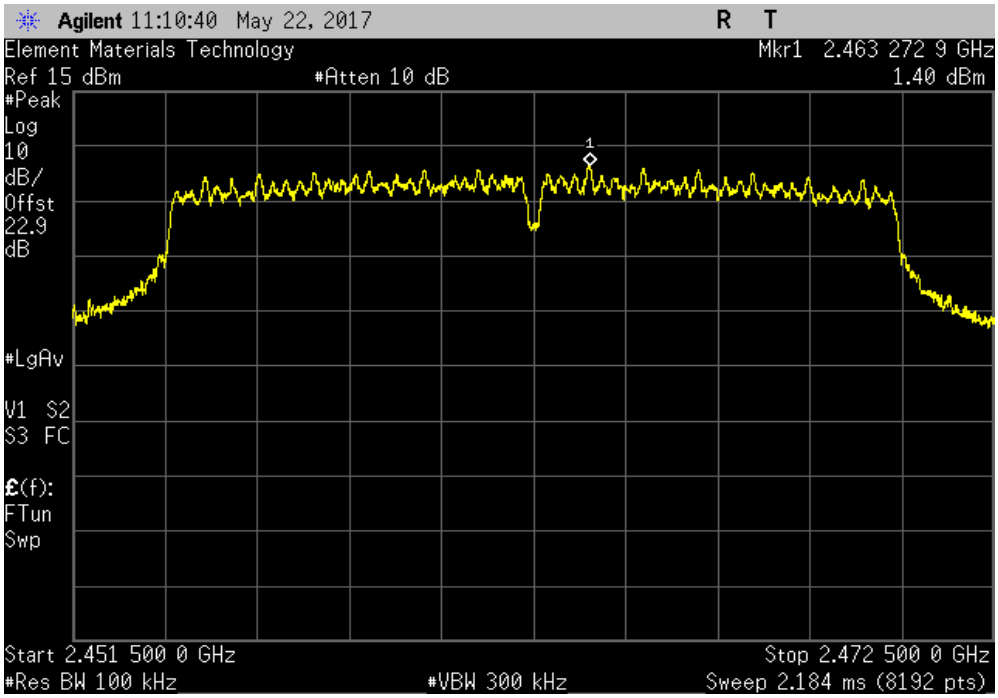
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-51.74	-30	Pass



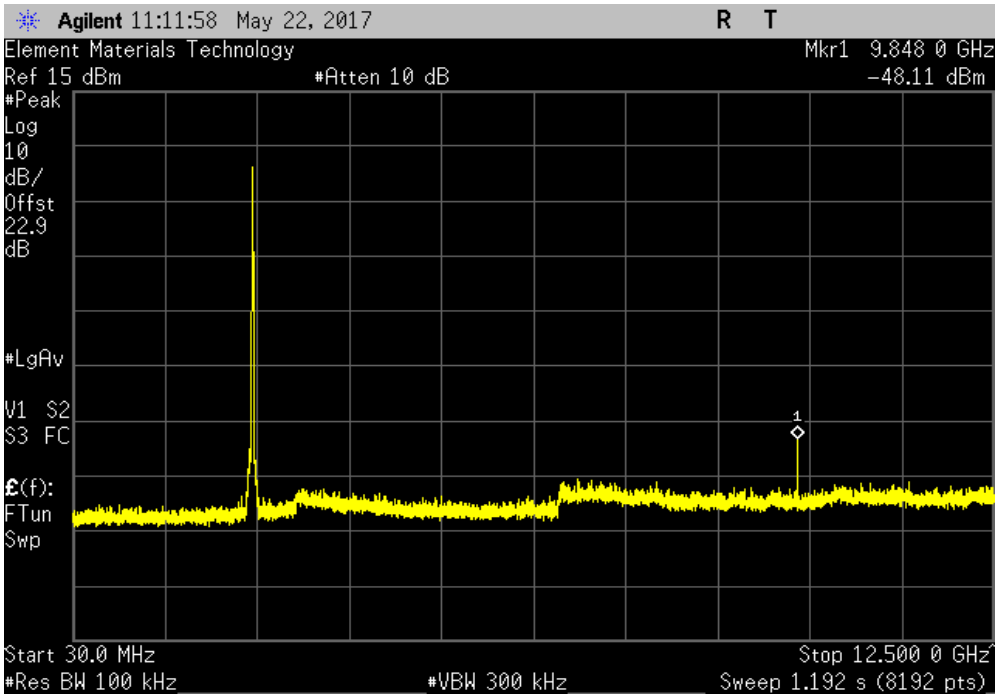
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-53.33	-30	Pass



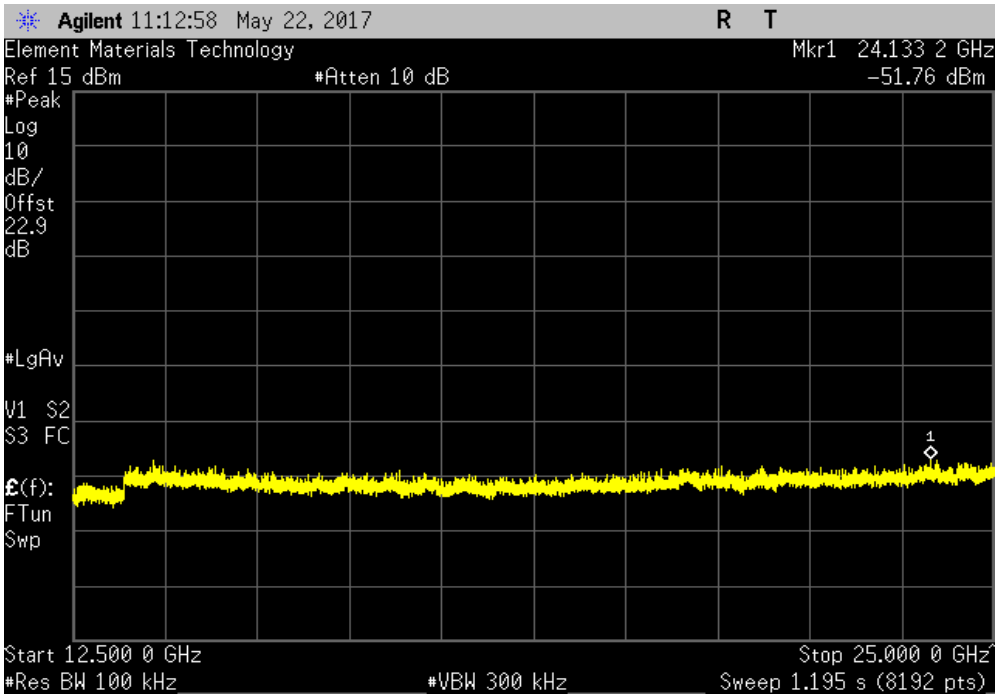
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
	Frequency Range			**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
	Fundamental			N/A	N/A	N/A



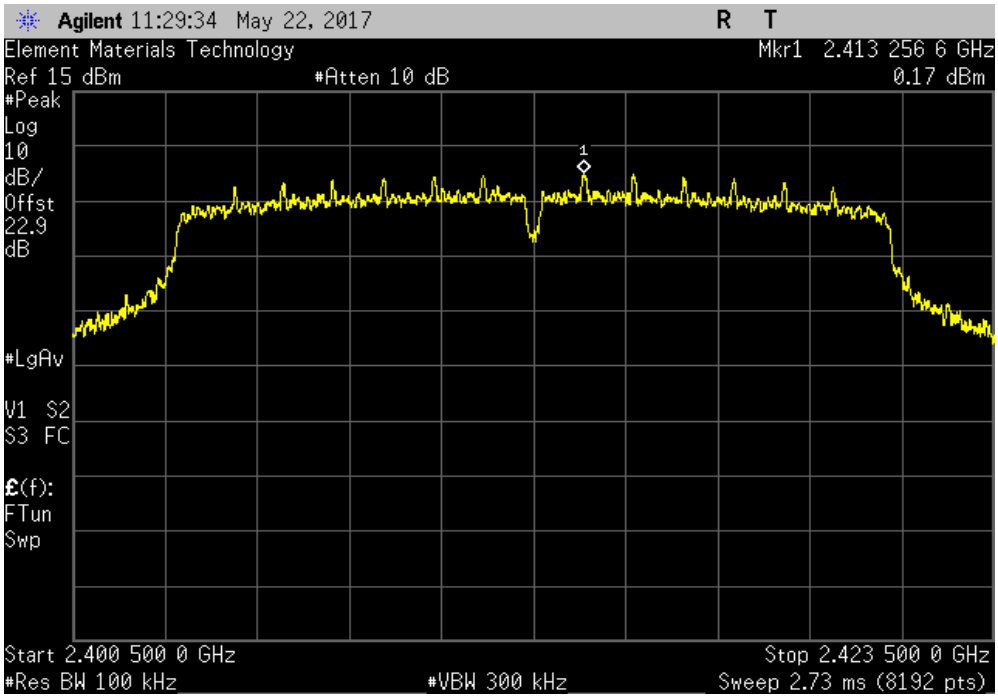
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-49.51	-30	Pass



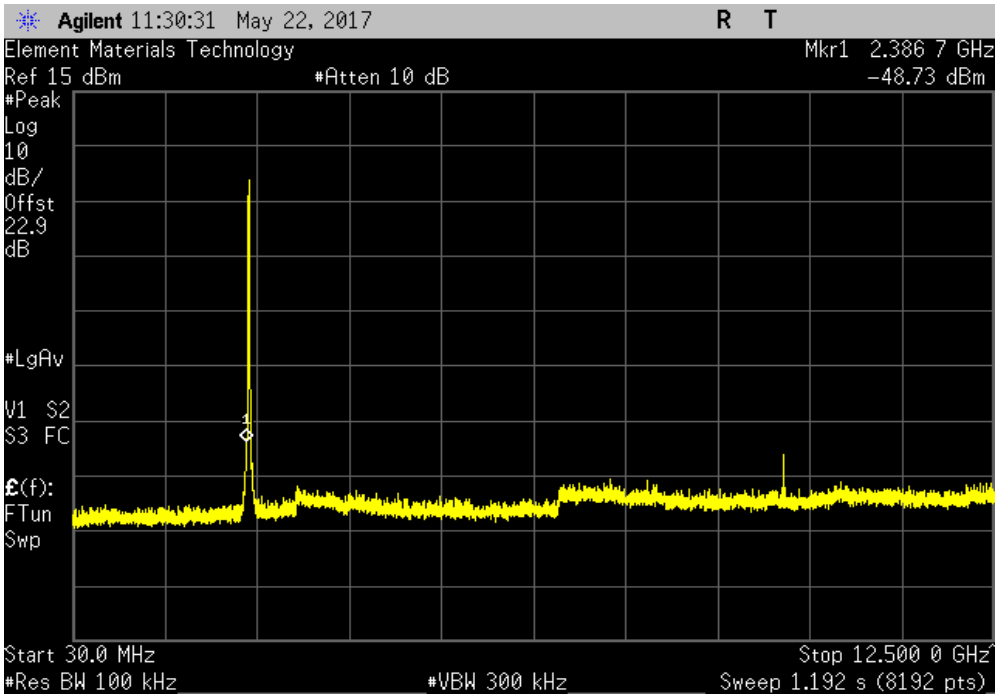
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-53.16	-30	Pass



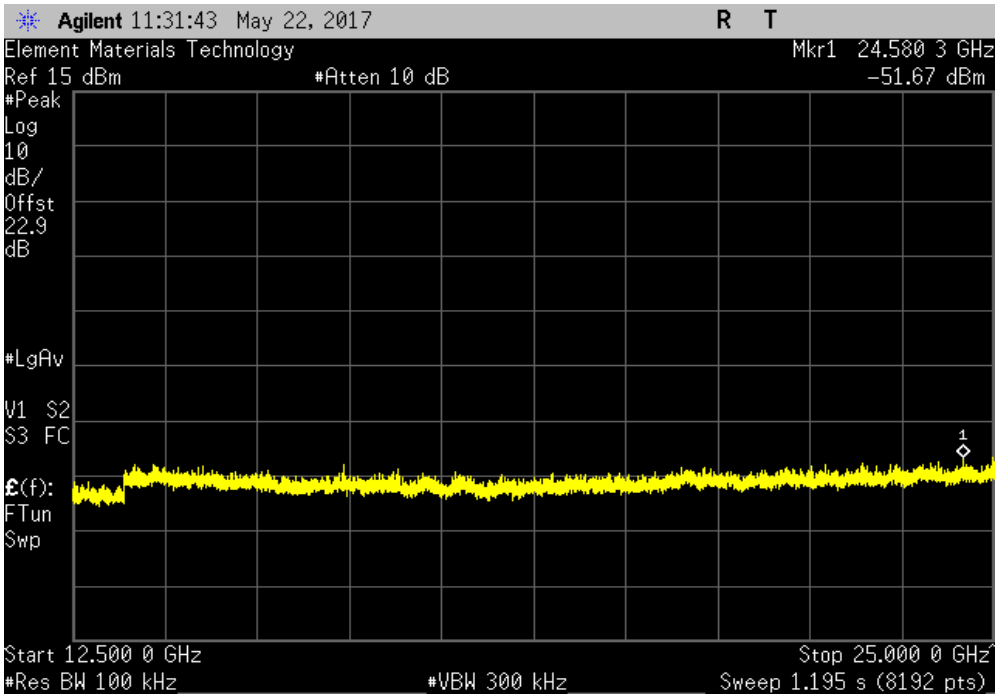
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
Fundamental		N/A	N/A	N/A



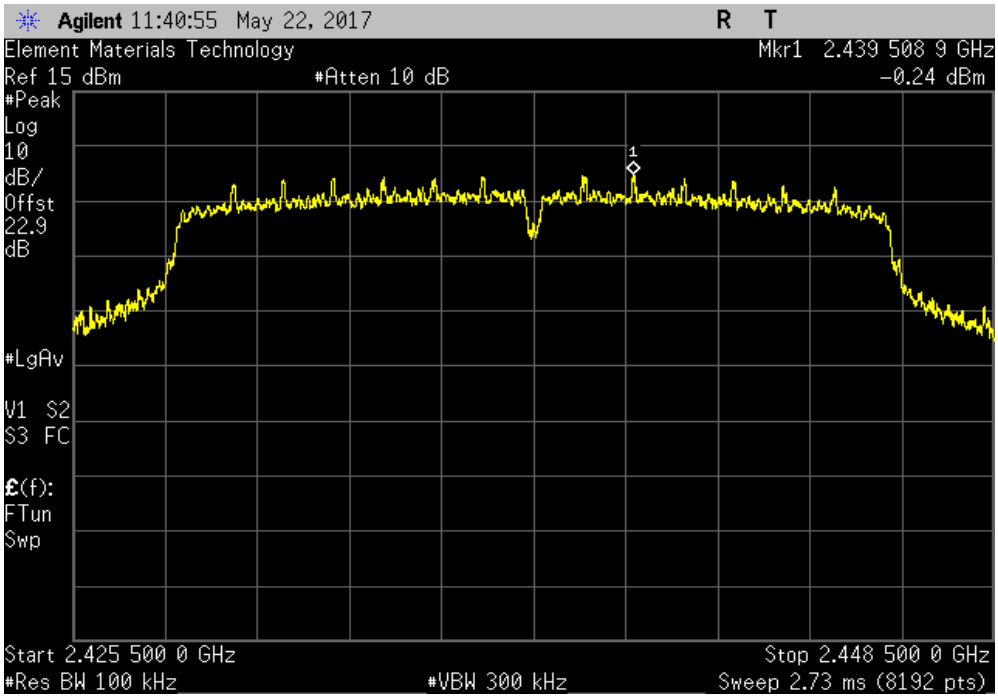
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-48.9	-30	Pass



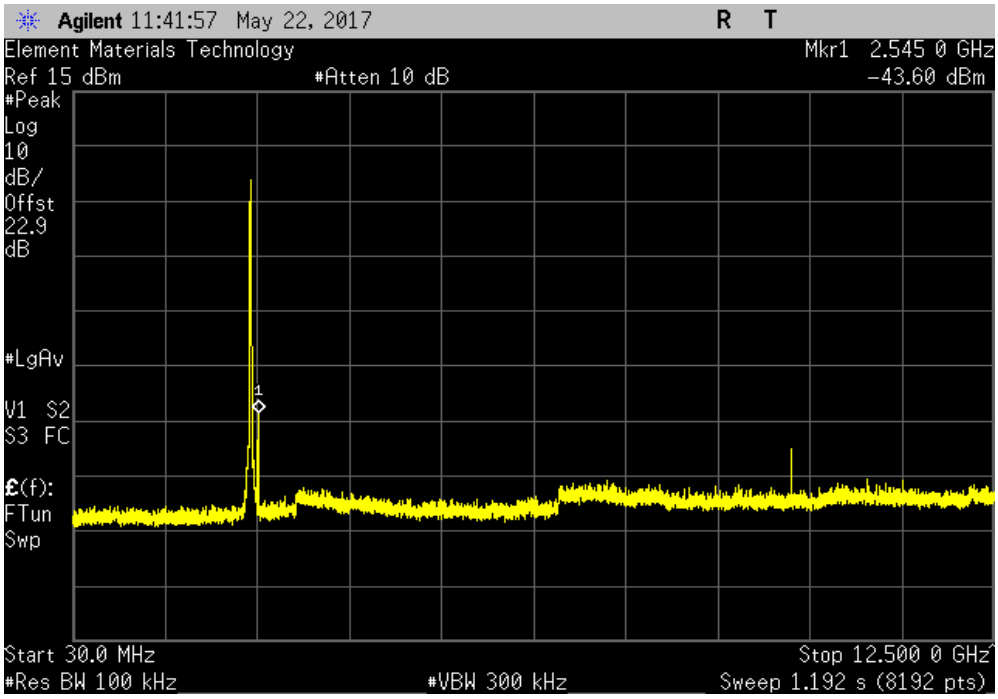
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-51.84	-30	Pass



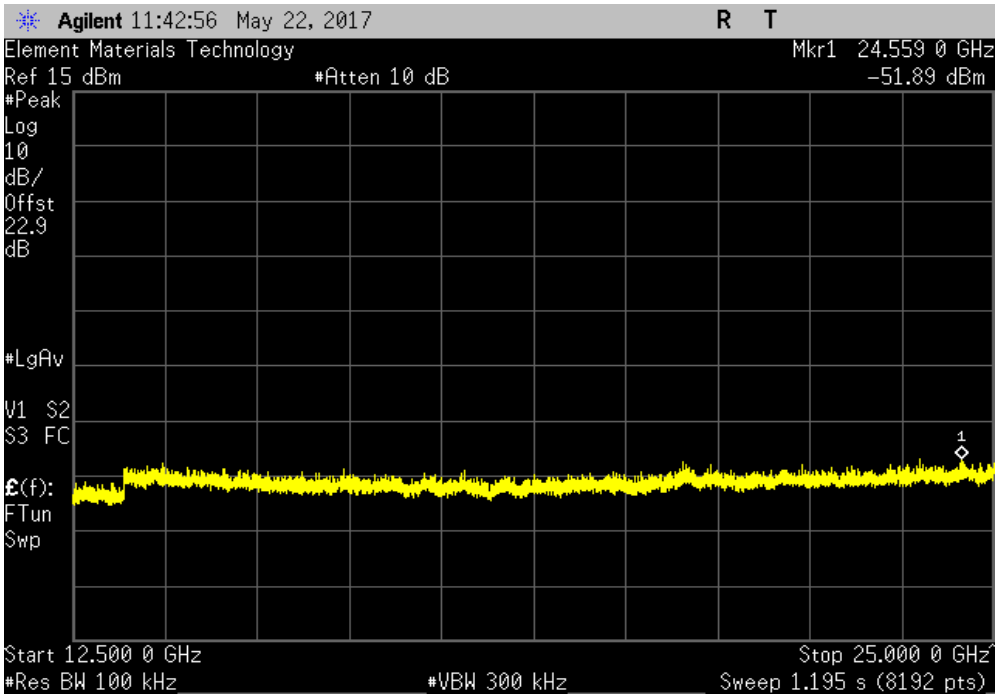
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
	Frequency Range			**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
	Fundamental			N/A	N/A	N/A



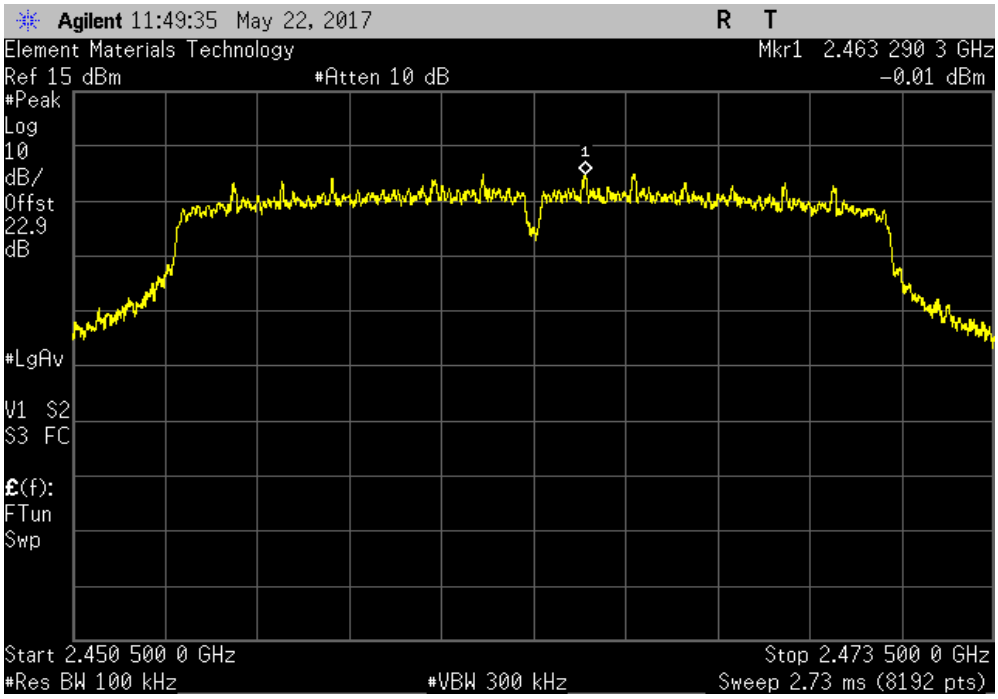
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-43.36	-30	Pass



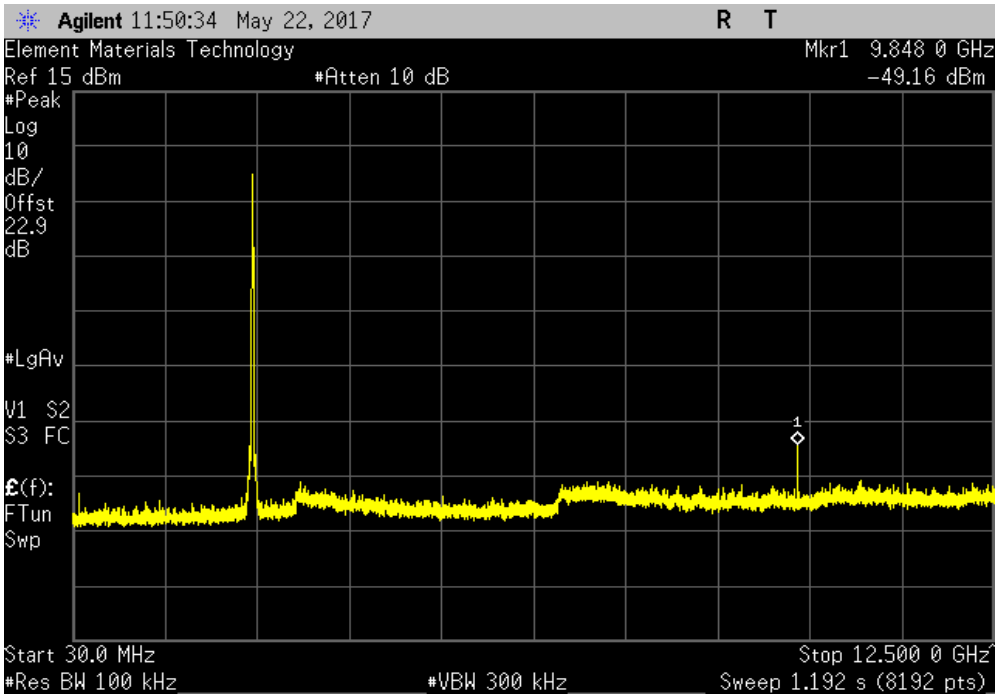
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-51.65	-30	Pass



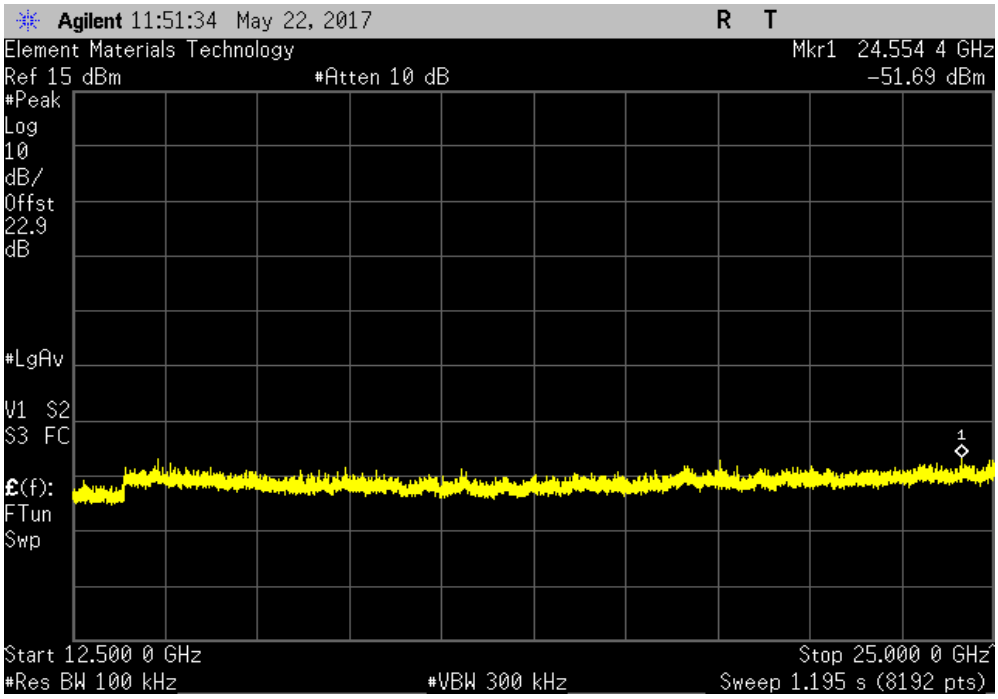
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
Fundamental		N/A	N/A	N/A



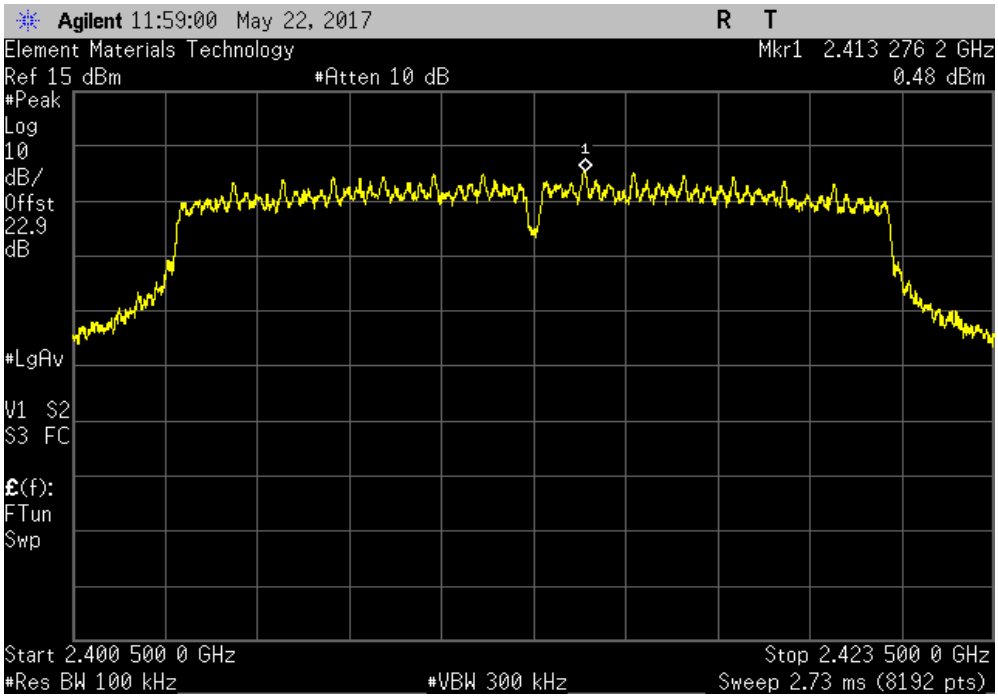
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-49.15	-30	Pass



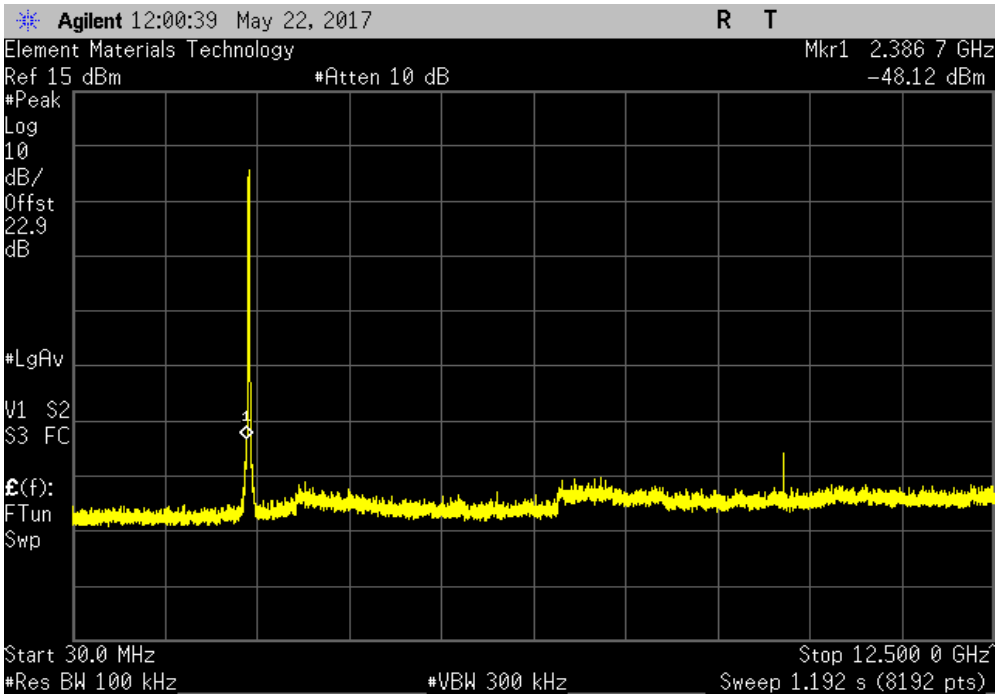
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-51.68	-30	Pass



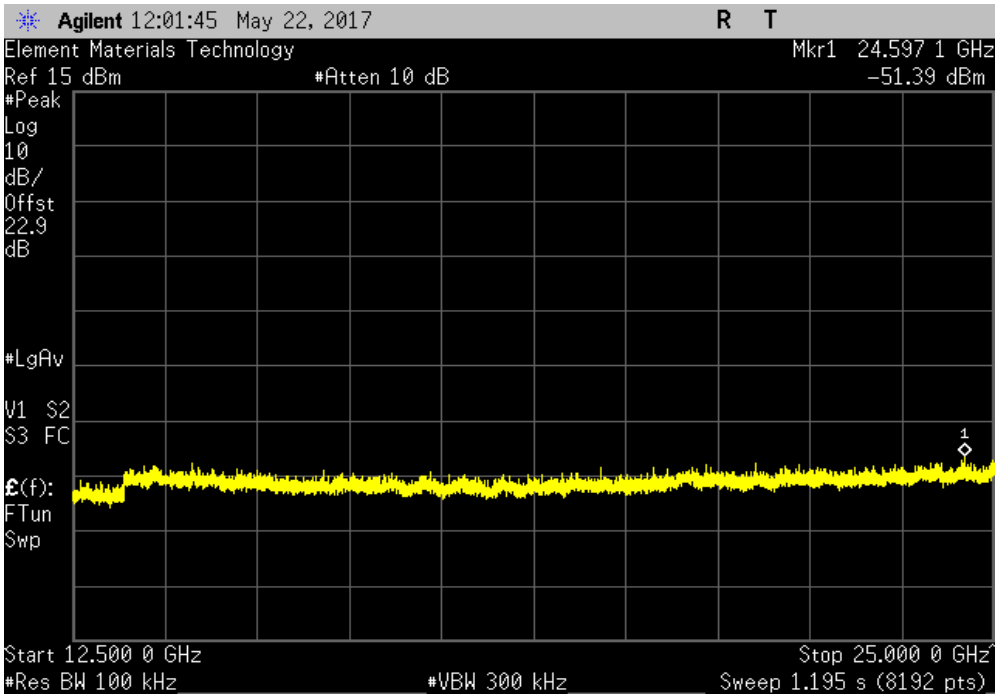
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
	Frequency Range			**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
	Fundamental			N/A	N/A	N/A



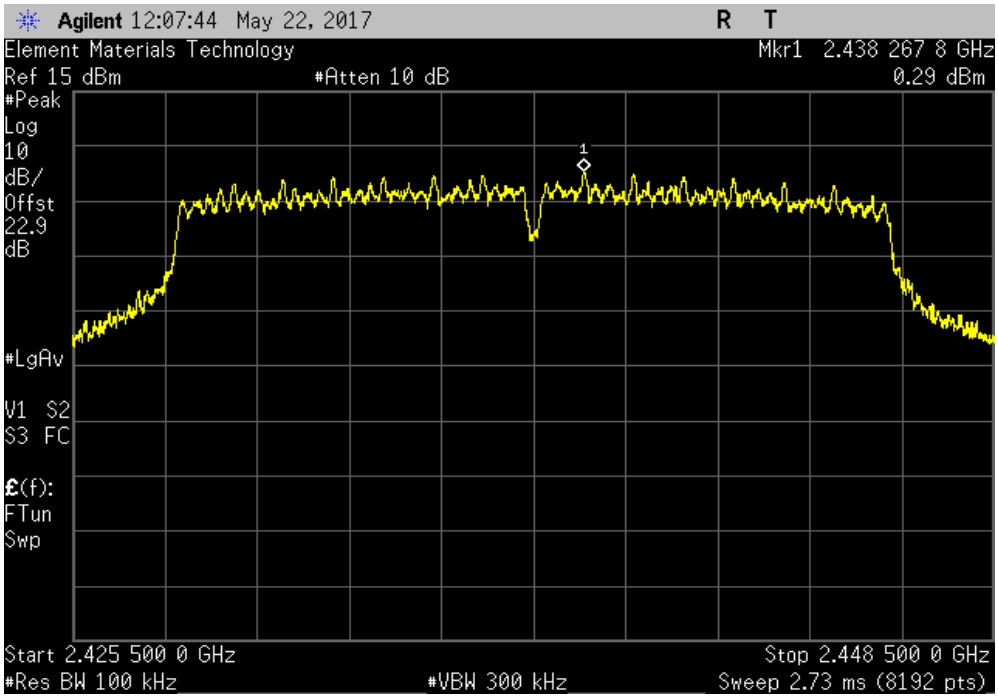
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-48.6	-30	Pass



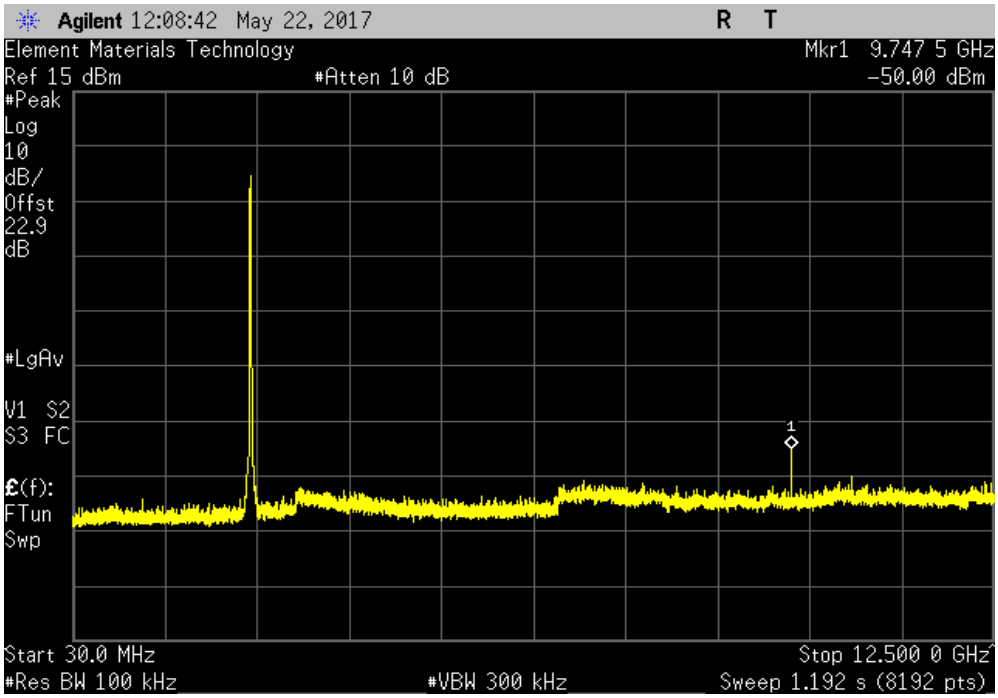
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-51.87	-30	Pass



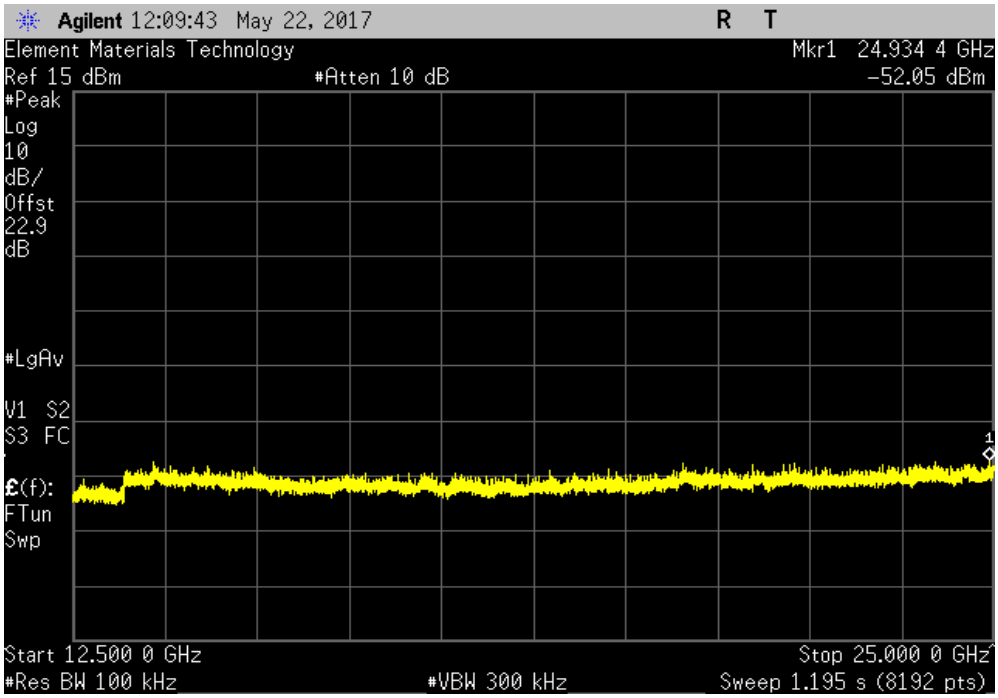
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
	Fundamental	N/A	N/A	N/A



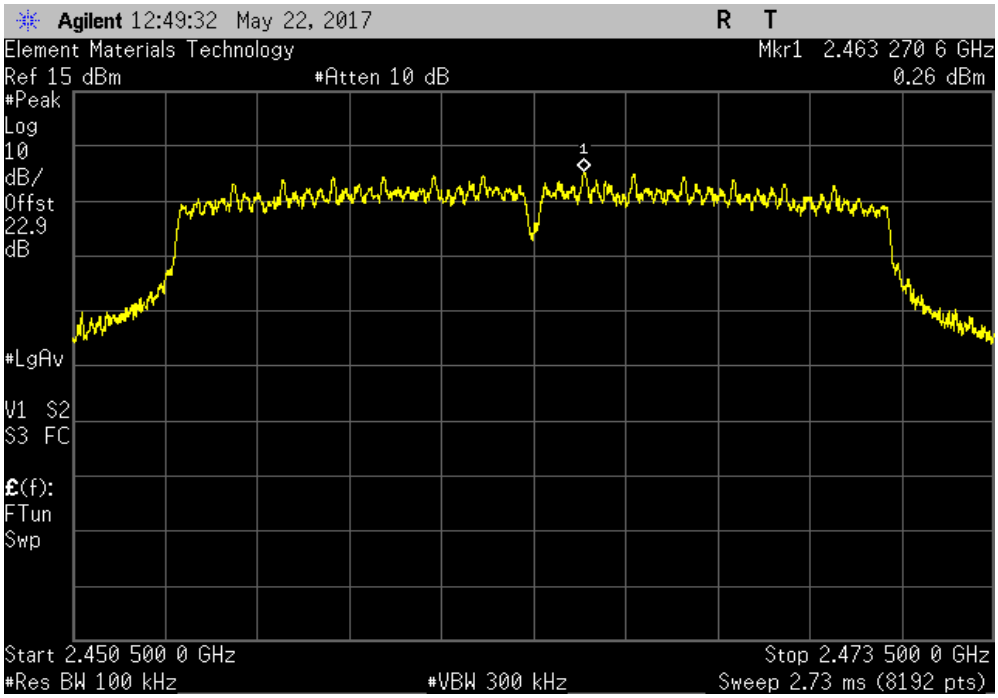
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-50.29	-30	Pass



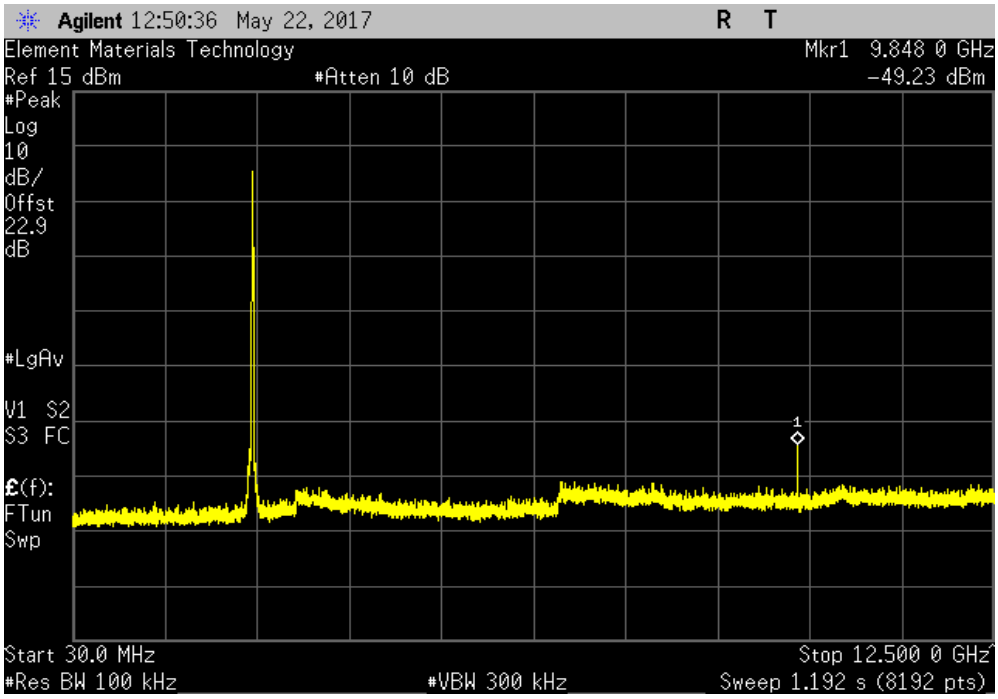
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-52.34	-30	Pass



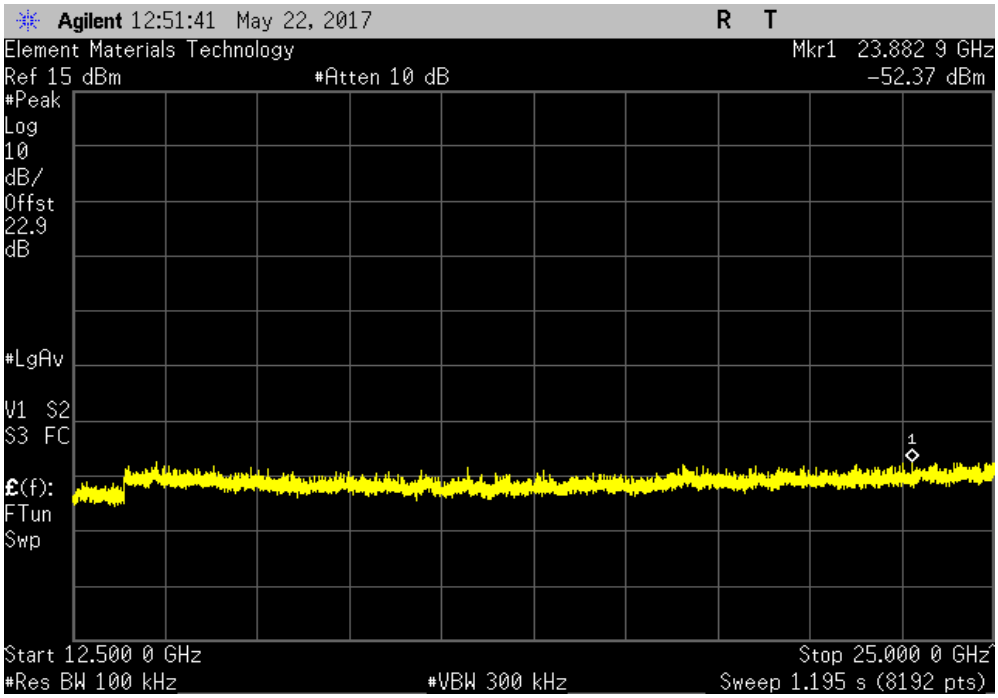
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
	Frequency Range			**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
	Fundamental			N/A	N/A	N/A



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-49.49	-30	Pass



SPURIOUS CONDUCTED EMISSIONS

TbtTx 2017.01.27 XMit 2017.02.08

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-52.63	-30	Pass