FCC 47 CFR PART 15 SUBPART C
ISED CANADA RSS-247 ISSUE 2

CERTIFICATION TEST REPORT

FOR

MAGIC LEAP ONE – LIGHTPACK LIGHTWEAR

MODEL NUMBER: M1001/M1002

FCC ID: 2AM5NM1000
IC: 23045-M1000

REPORT NUMBER: R11694639-E5

ISSUE DATE: 2018-07-10

Prepared for
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NVLAP TESTING

NVLAP Lab code: 200246-0

Revision History

Ver.	Issue Date	Revisions	Revised By
1	2018-06-26	Initial Issue	Brian T. Kiewra
2	2018-06-27	Revised simultaneous transmission statement in Section 5.5	Brian T. Kiewra
3	2018-06-29	Corrected power in Section 8.3.3 and 5.2 and serial numbers in Section 1.	Brian T. Kiewra
4	2018-07-02	Added calibration interval note in Section 6.	Brian T. Kiewra
5	2018-07-10	Revised conducted output power 802.11g, SISO. Revised antenna gain table in Section 5.3	Brian T. Kiewra

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Magic Leap, Inc.
7500 West Sunrise Boulevard
Plantation, FL 33322, USA

EUT DESCRIPTION: Magic Leap One – Lightpack Lightwear

MODEL: M1001/M1002

SERIAL NUMBER: G321F9N03430, G321F9N03434, PB1067B00000, PB1067B00001, PB1067B00002

DATE TESTED: 2017-11-13 to 2018-06-13

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Compliant
ISED RSS-247 Issue 2	Compliant
ISED RSS-GEN Issue 5	Compliant

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Approved & Released
For UL LLC By:

Jeffrey Moser
Operations Leader
UL – Consumer Technology Division

Prepared By:

Brian T. Kiewra
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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, KDB 558074 D01 v04, KDB662911 D01 v02r01, RSS-GEN Issue 5, RSS-247 Issue 2.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Dr., Research Triangle Park, NC 27709, USA and 2800 Perimeter Park Dr., Suite B, Morrisville, NC 27560, USA.

12 Laboratory Dr., RTP, NC 27709
☐ Chamber A
☐ Chamber C

2800 Perimeter Park Dr., Suite B, Morrisville, NC 27560
☐ Chamber NORTH
☒ Chamber SOUTH

The onsite chambers are covered under Industry Canada company address code 2180C with site numbers 2180C -1 through 2180C-4, respectively.

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0. The full scope of accreditation can be viewed at http://www.nist.gov/nvlap/.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY	Required by standard
Occupied Channel Bandwidth	2.00%	±5 %
RF output power, conducted	1.3 dB	±1,5 dB
Power Spectral Density, conducted	2.47 dB	±3 dB
Unwanted Emissions, conducted	2.94 dB	±3 dB
All emissions, radiated	5.36 dB	±6 dB
Temperature	2.26 °C	±3 °C
Supply voltages	2.40%	±3 %
Time	3.39%	±5 %

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Magic Leap One - Lightpack Lightwear with BT/BLE/802.11a/b/g/n/ac. Testing covers models M1001 and M1002. The difference between the two models is the size of the headband on the Lightwear.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Module 1 SISO:

Frequency Range (MHz)	Mode	Chain 0 Output Power (dBm)	Chain 0 Output Power (mW)	Chain 1 Output Power (dBm)	Chain 1 Output Power (mW)
2412 - 2462	802.11b	15.14	32.66	15.9	38.90
2412 - 2462	802.11g	15.71	37.24	16.5	44.67
2412 - 2462	802.11n HT20	14.89	30.83	15.58	36.14

Module 1 MIMO:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2462	802.11g	19.27	84.53
2412 - 2462	802.11n HT20	17.45	55.59

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes antennas with the following maximum gains:

Band Of Operation (MHz)	Ant0 gain (dBi)	Ant1 Gain (dBi)	Ant2 gain (dBi)
2401 - 2480	1.54	0.4	-0.8
5150-5250	3.3	4.6	NA
5250-5350	3.2	4.5	NA
5500-5725	2.5	3.7	NA
5745-5850	0.6	4.5	NA

Note: WiFi transmits on antenna 0 and antenna 1

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was PEQ5.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission (<1GHz and >18GHz) and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power and PSD as worst-case scenario. 1-18GHz radiated emissions were performed with the EUT set to transmit at low, a middle, and high channels.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that for MIMO, Z orientation was worst-case orientation; therefore, all final MIMO radiated testing was performed with the EUT in Z orientation. For SISO, it was determined that Z Axis was worst-case orientation for Antenna 0 and X Axis was worst-case orientation for Antenna 1. Therefore, all final SISO testing was performed in the Z orientation for Antenna 0 and X orientation for Antenna 1.

Lowest data rated tested as worst-case. TxBF only supported by 802.11n modes.

802.11b: 1 Mbps
802.11g: 6Mbps
802.11n: MCS8

Please note, 802.11g was considered correlated and worst-case (same data stream transmitted on both chains at same time during testing). The manufacturer states they do not support 2 chain, correlated modes in 802.11n mode (MCS0-MCS7) or the same data transmitted on both chains at the same time. Therefore, only 11n MCS8-MCS15 was considered for testing. However, it should be considered that the 802.11g mode data can represent the 802.11n correlated mode.

Additionally, for 11g and 11n, the power setting and measured power per chain was the same for SISO and MIMO modes allowing the MIMO summed power to be worst-case. Therefore, all MIMO mode data represents SISO mode data, except for as follows.

For 802.11g Channel 2422 MHz, the set power was the same for SISO and MIMO modes. However, the SISO mode power measured higher by approximately 3 dB, allowing the per chain SISO power to be the

same as the summed MIMO power. Therefore, Radiated Band Edge plots were included for 802.11g, SISO, Channel 2422 MHz to show compliance.

For Transmit Beamforming (TxBF) Radiated Bandedge testing, a companion router was placed on the turn table to lock the beam and radiated bandedge testing was performed.

For TxBF Radiated Spurious Emissions testing, the router was placed on the turn table and spurious emissions was investigated at different θs around the EUT. It was determined that there was <3dB delta in position. The router was then placed behind the receiving antenna. Transmit beamforming spot check scans were taken and this showed little to no variation from 802.11n MIMO SDM spurious scans. Therefore, 802.11n MIMO SDM spurious data is used to represent 802.11nHT20 transmit beamforming.

Simultaneous transmission of the following was investigated:

- Proprietary BLE and 2.4 GHz WiFi
- Proprietary BLE and BLE
- Proprietary BLE and Bluetooth
- Proprietary BLE and 5 GHz WiFi
- 2.4GHz and 5GHz (11a)
- 2.4GHz and 5GHz (11a) and Proprietary BLE
- 2.4GHz and Bluetooth and Proprietary BLE
- 5GHz and Bluetooth
- 5GHz and Bluetooth and Proprietary BLE

The following does not simultaneously transmit and thus was not considered:

- BLE and Bluetooth

Device was found to still be compliant.

Refer to UL Document R11694639-ST1 for simultaneous transmission data.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Power Supply	Salcomp	M3002	Non-Serialized	NA

I/O CABLES

I/O Cable List						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	USB-C	1	USB-C	DC/Data	<3m	None
2	Hardwired	1	Hardwired	Data	<3m	Connects Lightwear to Lightpack

TEST SETUP

The EUT is setup as standalone equipment.

SETUP DIAGRAM FOR TESTS

Refer to UL document R11694639-EP5 for diagram.

6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Note: All equipment was within calibration interval at time of use.

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
T177	Spectrum Analyzer	Agilent Technologies	E4446A	2017-03-30	2018-03-30
SN 161024885	Environmental Meter	Fisher Scientific	15-077-963	2016-12-23	2018-12-23
72822 (SA0019)	Spectrum Analyzer	Agilent Technologies	E4446A	2017-08-21	2018-09-21
SA0020	Spectrum Analyzer	Agilent Technologies	E4446A	2017-11-06	2018-11-06
PWM001	RF Power Meter	Keysight Technologies	N1912A	2017-05-23	2018-05-23
PWS006	Peak and Avg Power Sensor, 50MHz to 6GHz	Keysight Technologies	E9323A	2017-05-18	2018-05-18
PWM003	RF Power Meter	Keysight Technologies	N1911A	2017-07-14	2018-07-14
PWS003	Peak and Avg Power Sensor, 50MHz to 6GHz	Keysight Technologies	E9323A	2017-07-14	2018-07-14
MM0168	True RMS Multimeter	Agilent	U1232A	2017-10-25	2018-10-30

Test Equipment Used - Line-Conducted Emissions – Voltage (Morrisville – Conducted 1)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
CBL076	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3476-240	2017-06-12	2018-06-12
s/n 160938893	Environmental Meter	Fisher Scientific	14-650-118	2016-11-02	2018-11-02
LISN003	LISN, 50-ohm/50-uH, 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50-25-2-01-550V	2017-08-22	2018-08-22
PRE0101521 (75141)	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2017-08-23	2018-08-23
TL001	Transient Limiter, 0.009-30MHz	Com-Power	LIT-930A	2017-06-12	2018-06-12
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - South Chamber)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
0.009-30MHz (Loop Ant.)					
AT0079	Active Loop Antenna	ETS	6502	2018-01-02	2019-01-02
30-1000 MHz					
AT0074	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2017-06-15	2018-06-30
1-18 GHz					
AT0069	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2017-04-05	2018-04-05
AT0078	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2017-09-26	2018-09-26
18-40 GHz					
AT0076	Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	2017-10-10	2018-10-10
Gain-Loss Chains					
S-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2017-09-15	2018-09-15
S-SAC02	Gain-loss string: 30-1000MHz	Various	Various	2017-06-11	2018-06-30
S-SAC03	Gain-loss string: 1-18GHz	Various	Various	2017-12-31	2018-12-31
S-SAC04	Gain-loss string: 18-40GHz	Various	Various	2017-03-03, 2018-04-02	2018-03-30, 2019-04-02
Receiver & Software					
SA0025	Spectrum Analyzer	Agilent	N9030A	2017-04-10	2018-04-10
SA0026	Spectrum Analyzer	Agilent	N9030A	2018-03-20	2019-03-20
SA0026	Spectrum Analyzer	Agilent	N9030A	2017-02-17	2018-02-28
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
Additional Equipment used					
s/n 161024887	Environmental Meter	Fisher Scientific	15-077-963	2016-12-23	2018-12-23

7. MEASUREMENT METHODS

On Time and Duty Cycle: KDB 558074 D01 v04, Section 6.0

6 dB BW: KDB 558074 D01 v04 Section 8.1

99% Occupied Bandwidth: ANSI C63.10-2013, Section 6.9.3

Output Power: KDB 558074 D01 v04, Section 9.2.3.2.

Power Spectral Density: KDB 558074 D01 v04, Section 10.2.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v04, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v04, Section 12.1.

General Radiated Emissions: ANSI C63.10:2013 Sections 6.3 – 6.6

AC Mains Line Conducted Emissions: ANSI C63.10:2013 Sections 6.2

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

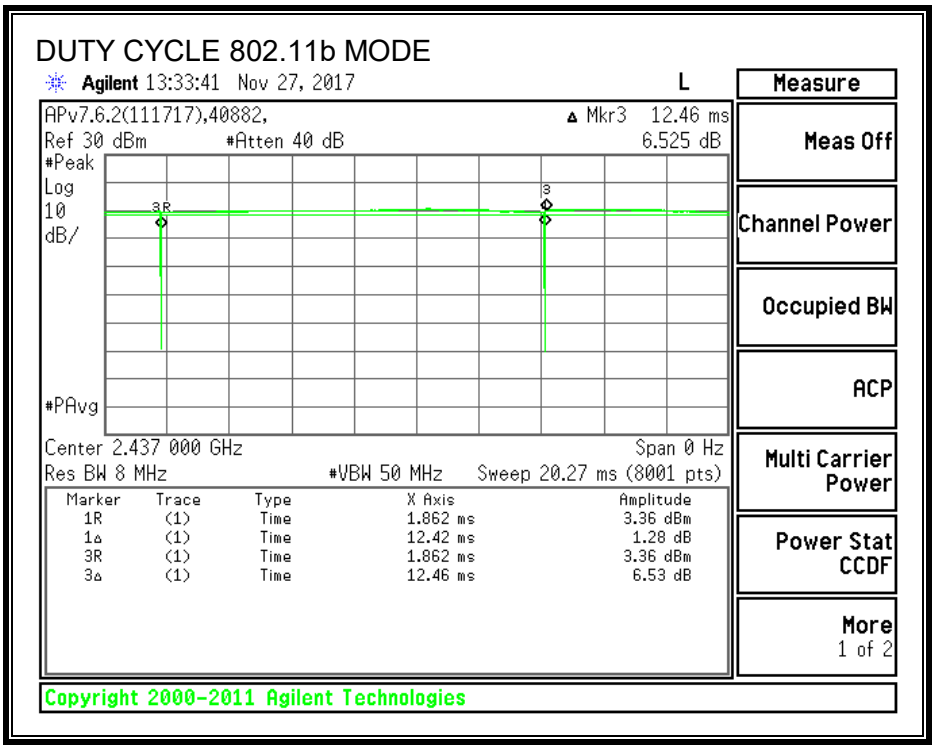
KDB 558074 Zero-Span Spectrum Analyzer Method.

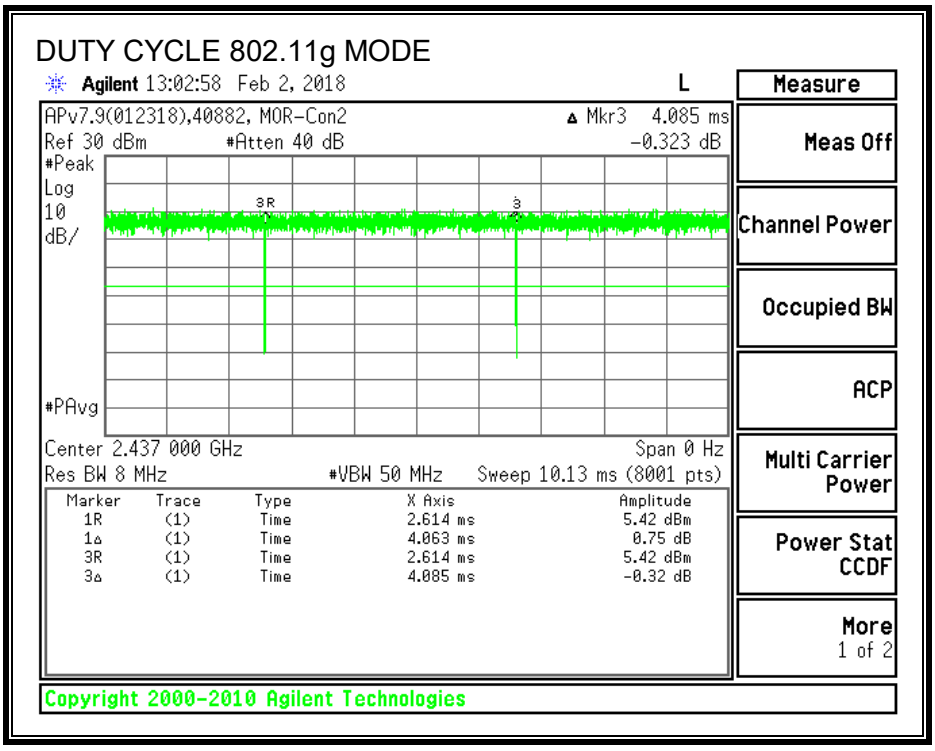
ON TIME AND DUTY CYCLE RESULTS - MODULE 1

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz Band						
802.11b	12.420	12.460	0.997	99.68%	0.00	0.010
802.11g	4.063	4.085	0.995	99.46%	0.00	0.010
802.11n HT20	1.908	1.929	0.989	98.91%	0.00	0.010
802.11n HT20 TxBF[1]	1.384					0.723

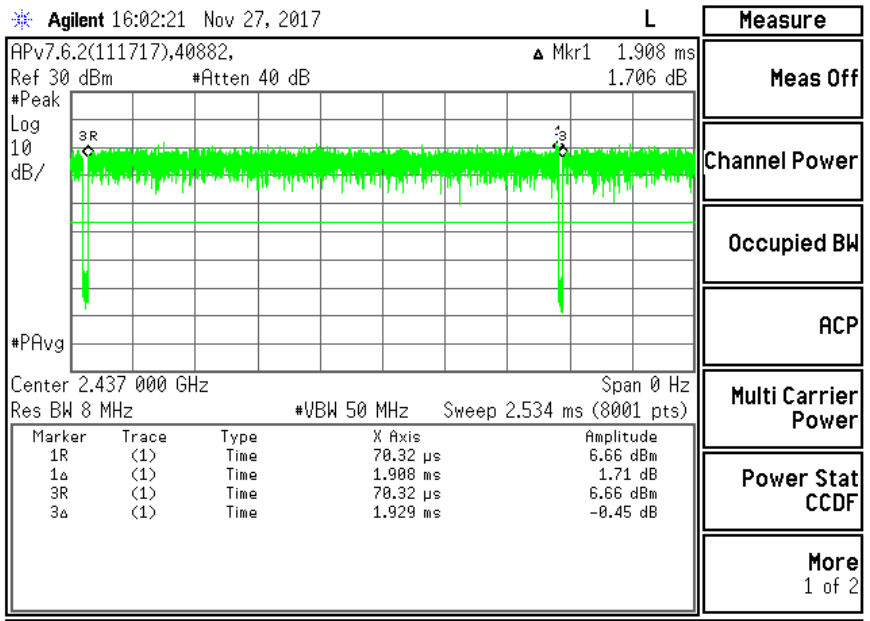
Note 1: TxBF duty cycle not constant, using worst-case on time for Ton. Used 1/Ton method to make average Radiated measurements with a VBW of 723 Hz.

DUTY CYCLE PLOTS - MODULE 1

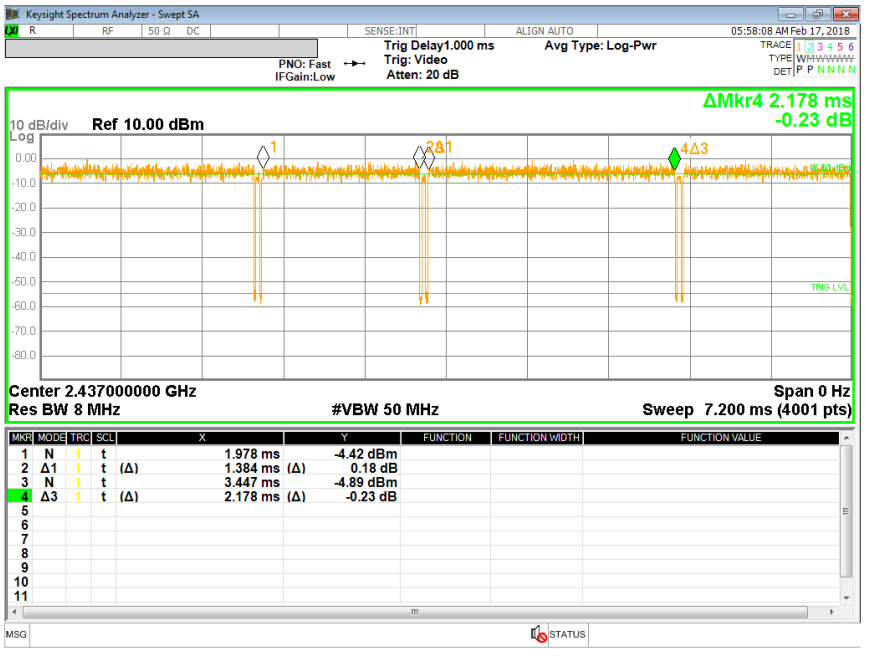




DUTY CYCLE 802.11n HT20 MODE



DUTY CYCLE 802.11n HT20 TxBF MODE



8.2. 802.11b MODE IN THE 2.4 GHz BAND

8.2.1. 6 dB BANDWIDTH LIMITS

FCC §15.247 (a) (2)

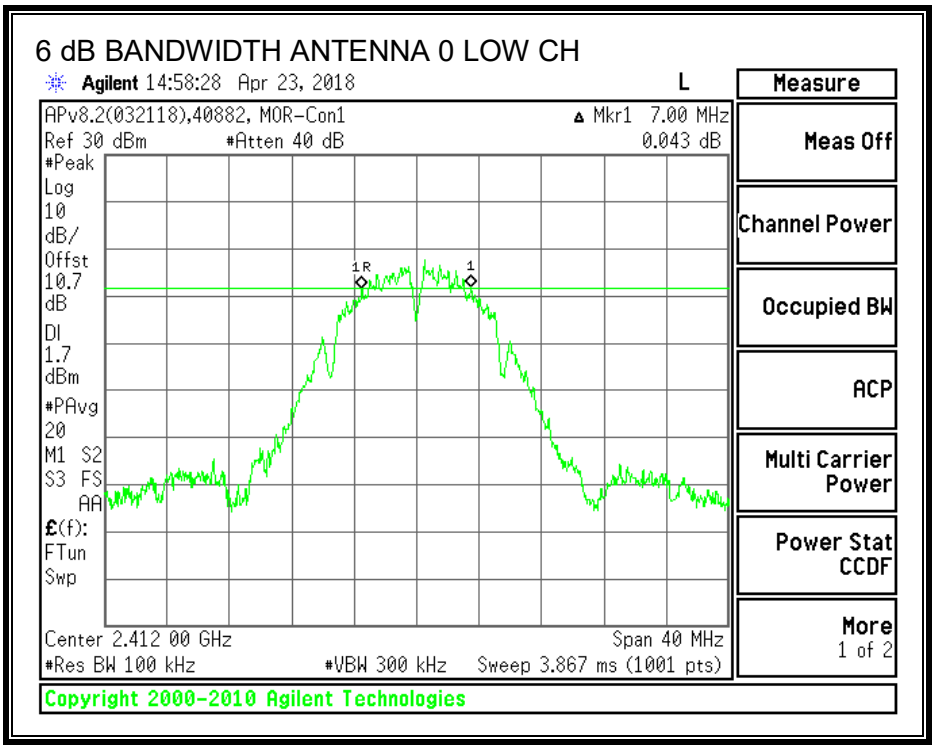
ISED RSS-247 Clause 5.2 (a)

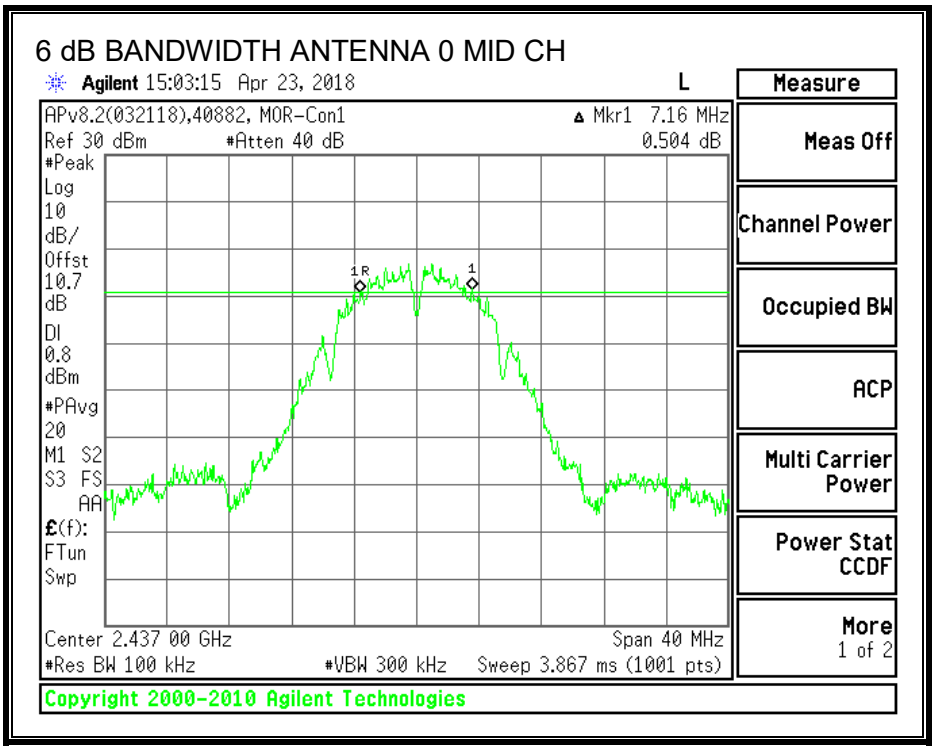
The minimum 6 dB bandwidth shall be at least 500 kHz.

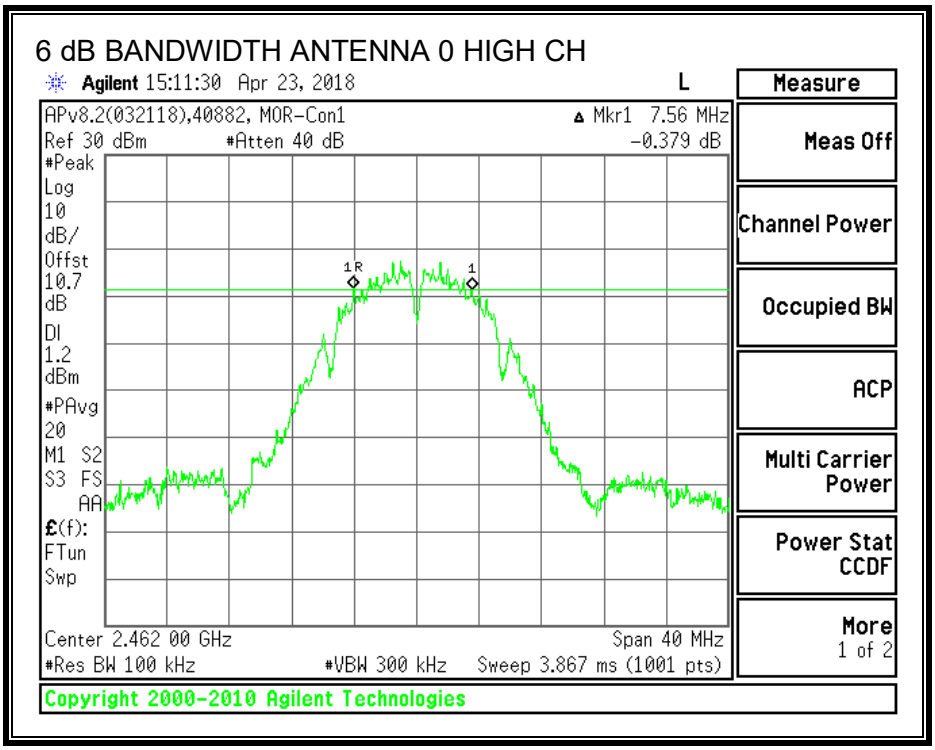
RESULTS - MODULE 1

Channel	Frequency (MHz)	6 dB BW Ant 0 (MHz)	6 dB BW Ant 1 (MHz)	Minimum Limit (MHz)
Low	2412	7.000	6.520	0.5
Mid	2437	7.160	7.120	0.5
High	2462	4.560	7.120	0.5

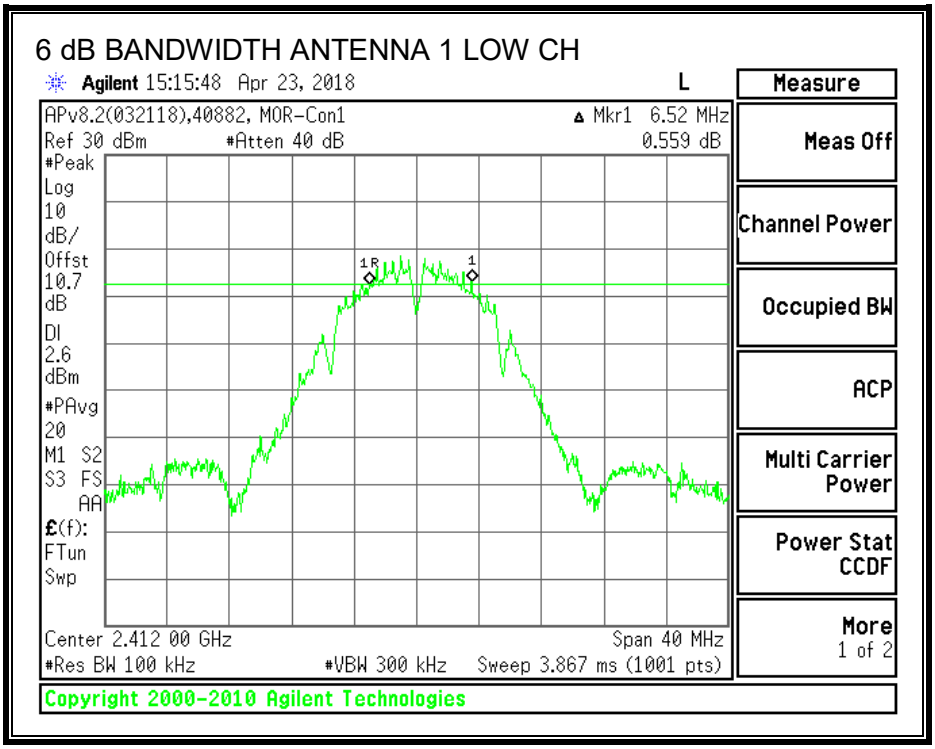
6 dB BANDWIDTH - MODULE 1, ANTENNA 0



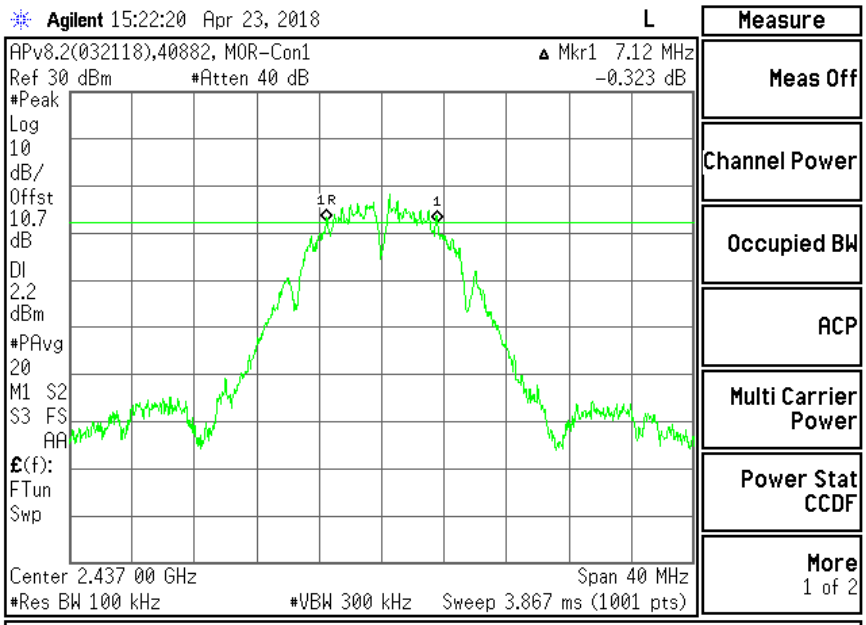




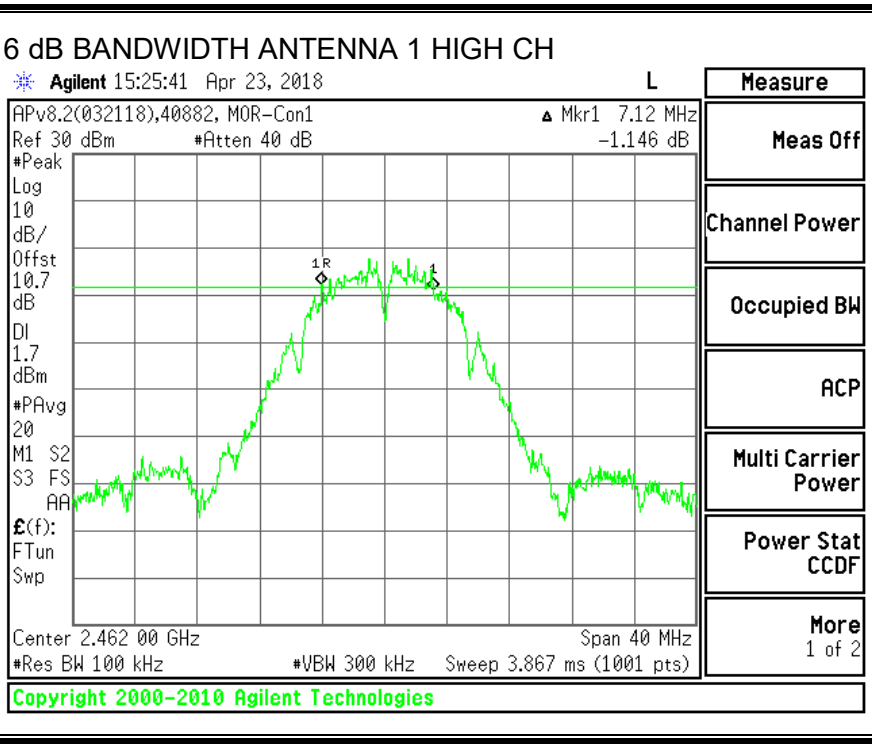
6 dB BANDWIDTH - MODULE 1, ANTENNA 1



6 dB BANDWIDTH ANTENNA 1 MID CH



6 dB BANDWIDTH ANTENNA 1 HIGH CH



8.2.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

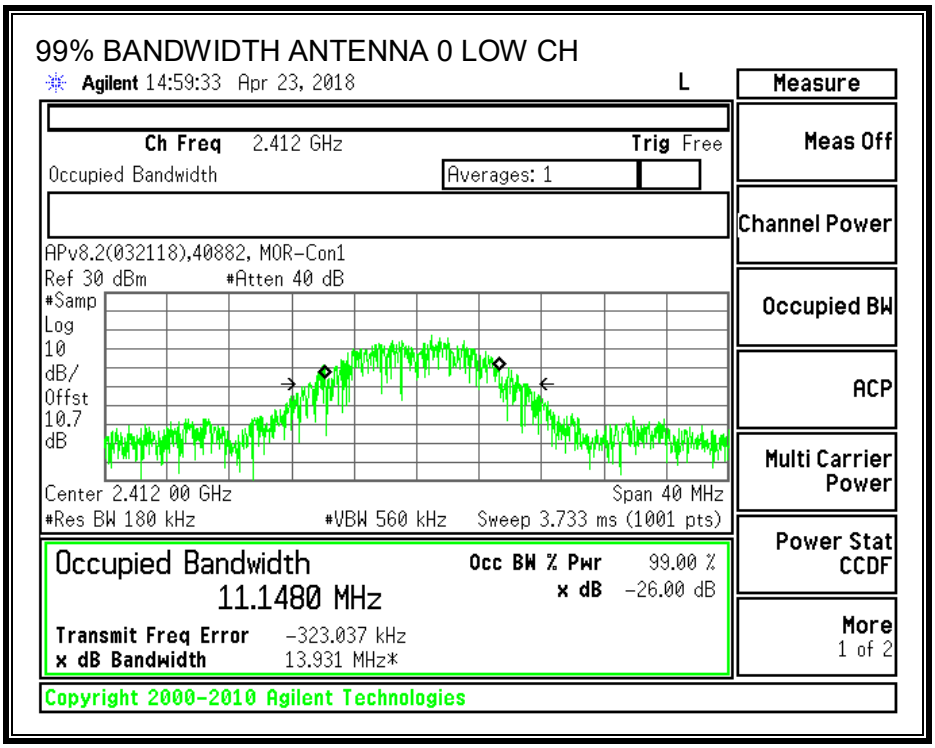
TEST PROCEDURE

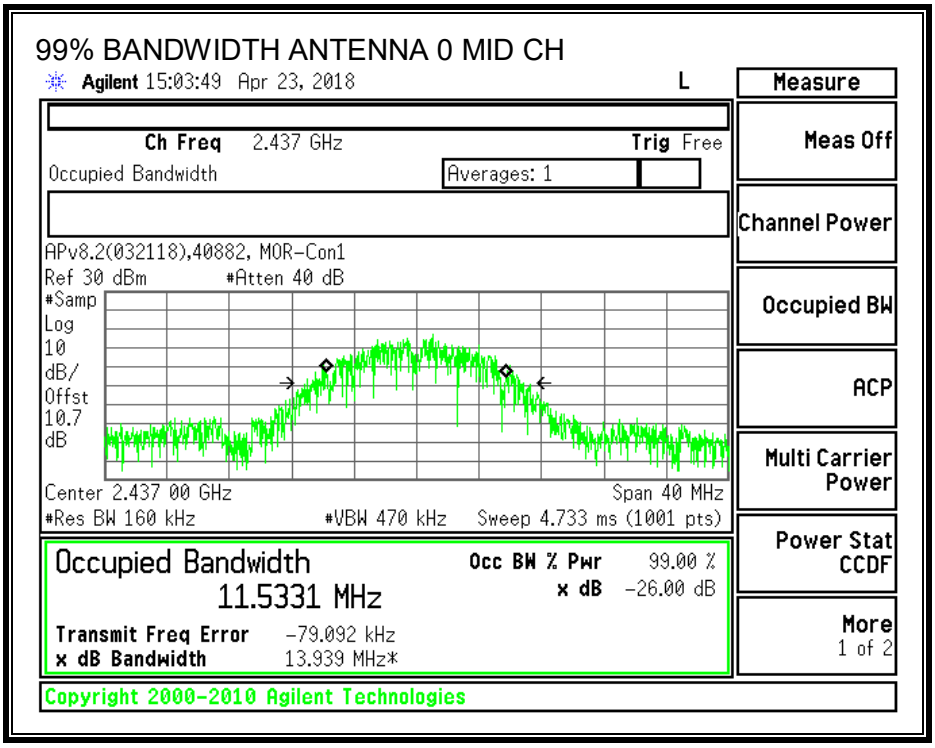
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 5% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

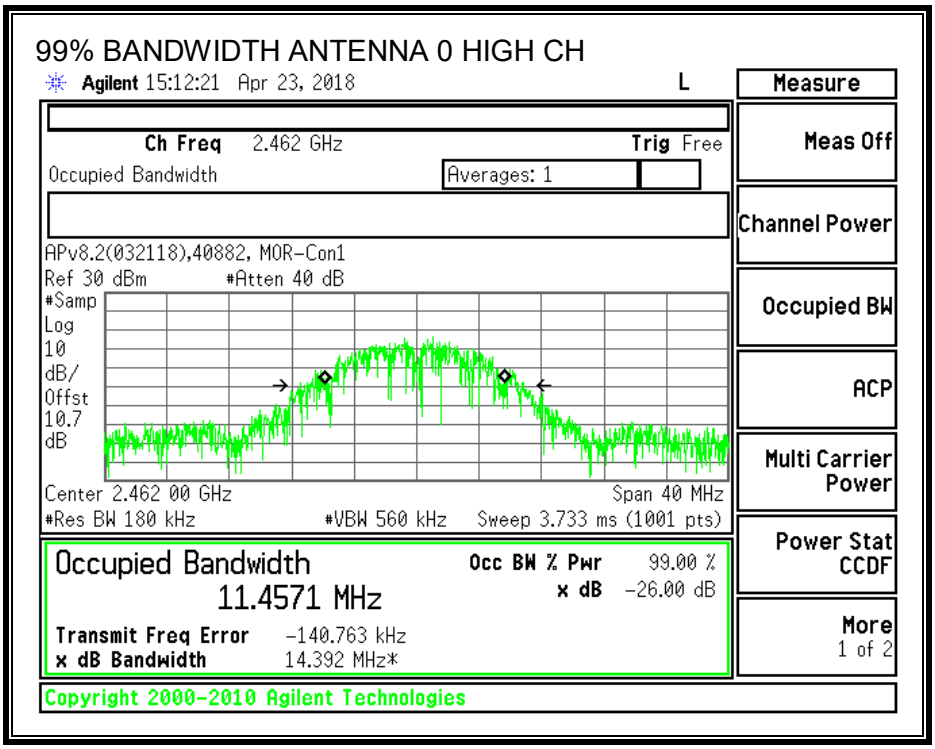
RESULTS - MODULE 1

Channel	Frequency (MHz)	99% BW Ant 0 (MHz)	99% BW Ant 1 (MHz)
Low	2412	11.148	11.720
Mid	2437	11.533	11.655
High	2462	11.457	11.827

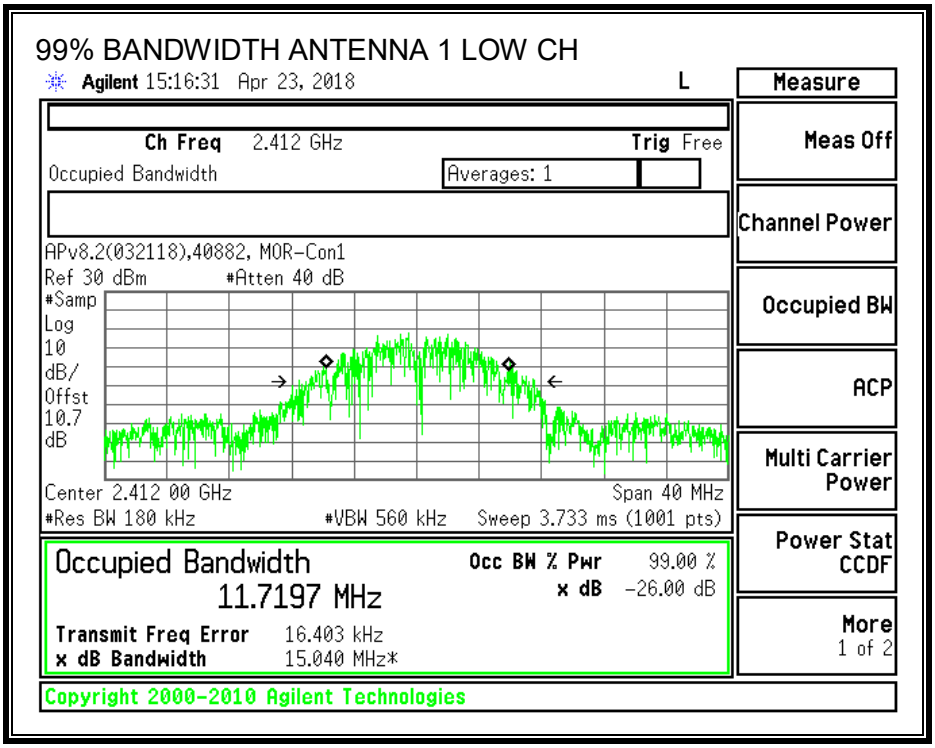
99% BANDWIDTH - MODULE 1, ANTENNA 0

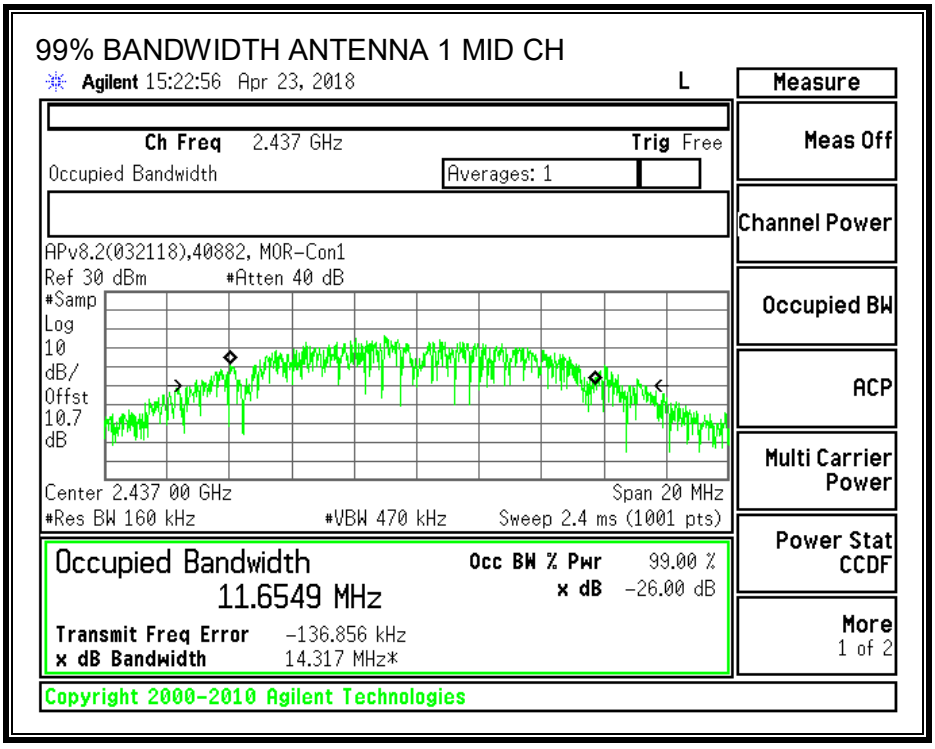


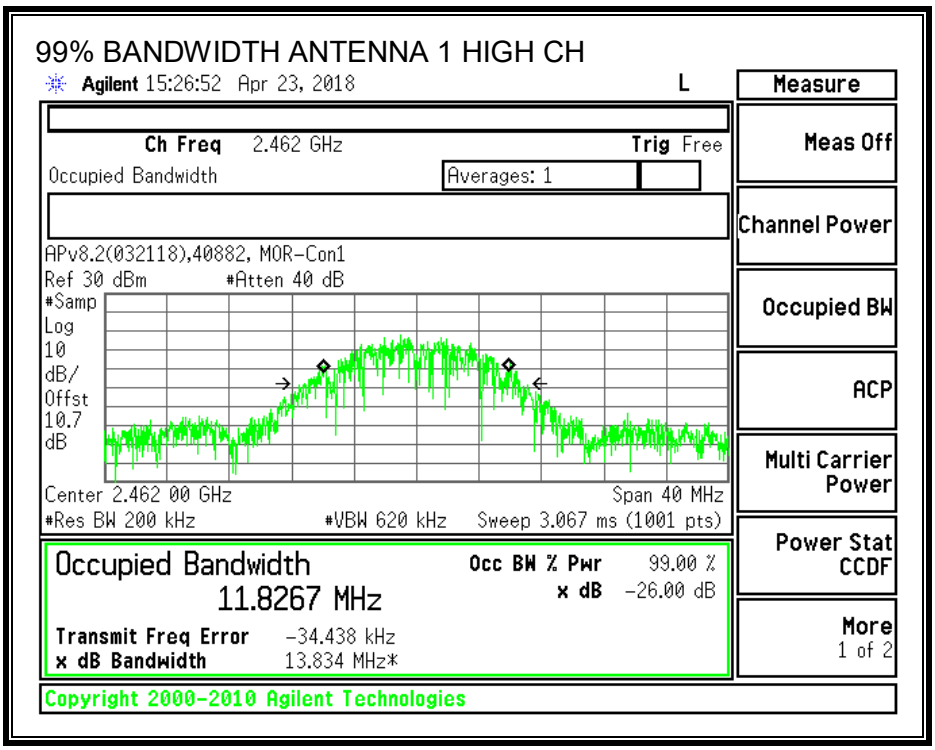




99% BANDWIDTH – MODULE 1, ANTENNA 1







8.2.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)(3)

ISED RSS-247 Clauses 5.4 (d)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain. Used worst-case gain of 1.54dBi.

RESULTS - MODULE 1

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	1.54	30.00	30	36	30.00
Mid	2437	1.54	30.00	30	36	30.00
High	2462	1.54	30.00	30	36	30.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power

Results

Channel	Frequency (MHz)	Antenna 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	15.09	15.09	30.00	-14.91
Mid	2437	15.14	15.14	30.00	-14.86
High	2462	15.00	15.00	30.00	-15.00

Results

Channel	Frequency (MHz)	Antenna 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	15.77	15.77	30.00	-14.23
Mid	2437	15.90	15.90	30.00	-14.10
High	2462	15.55	15.55	30.00	-14.45

8.2.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)
ISED RSS-247 Clause 5.2 (b)

RESULTS - MODULE 1

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

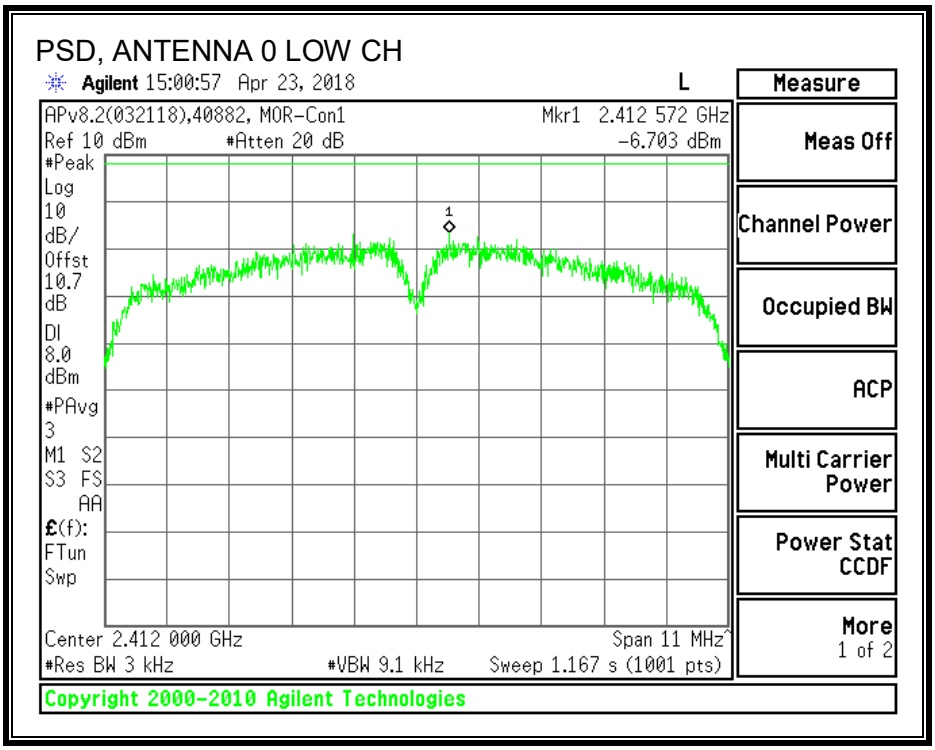
PSD Results

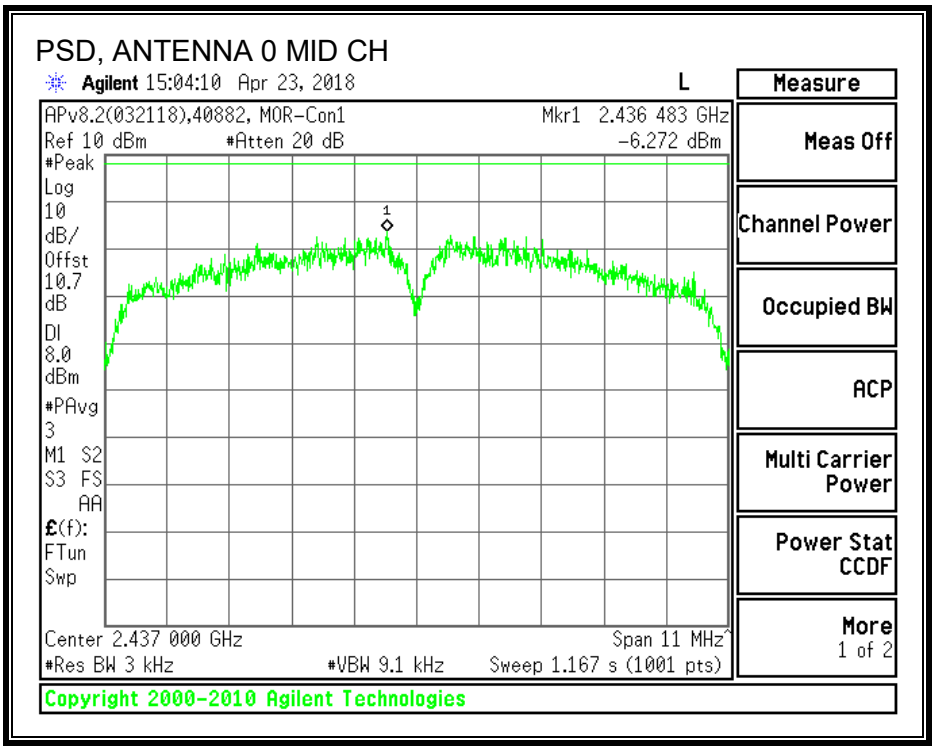
Channel	Frequency (MHz)	Antenna 0 Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-6.70	-6.70	8.0	-14.7
Mid	2437	-6.27	-6.27	8.0	-14.3
High	2462	-6.33	-6.33	8.0	-14.3

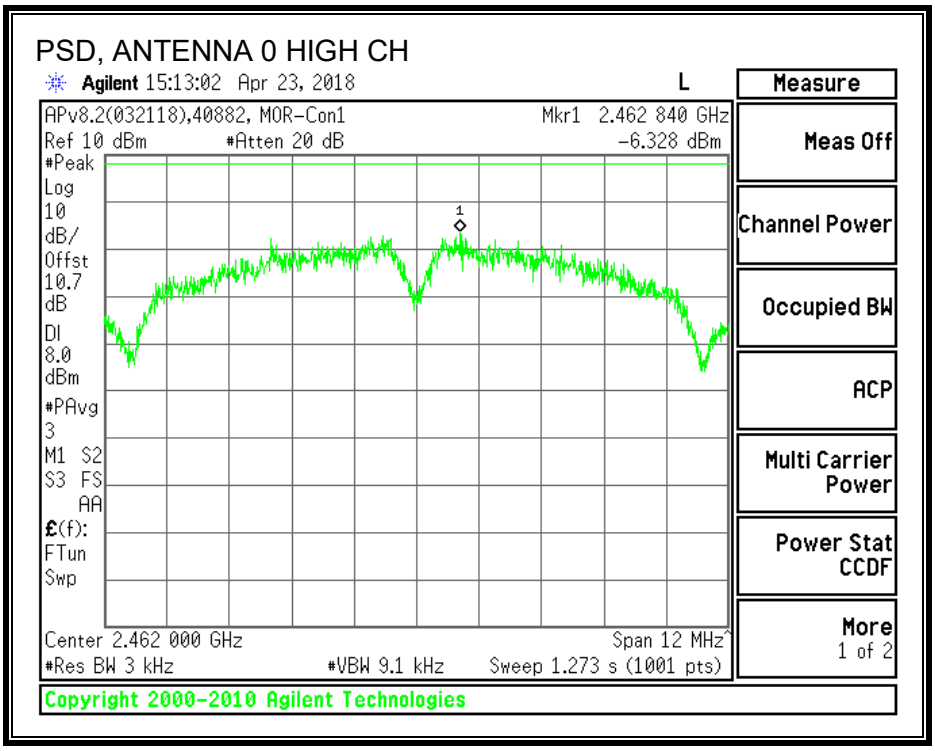
PSD Results

Channel	Frequency (MHz)	Antenna 1 Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-4.62	-4.62	8.0	-12.6
Mid	2437	-7.41	-7.41	8.0	-15.4
High	2462	-6.18	-6.18	8.0	-14.2

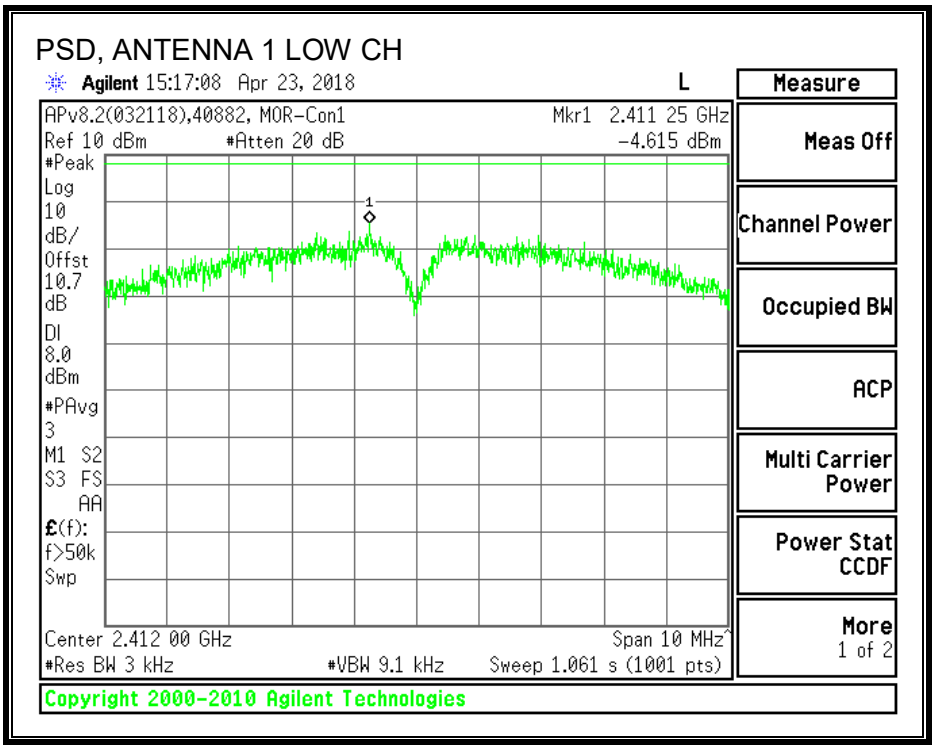
PSD - MODULE 1, ANTENNA 0



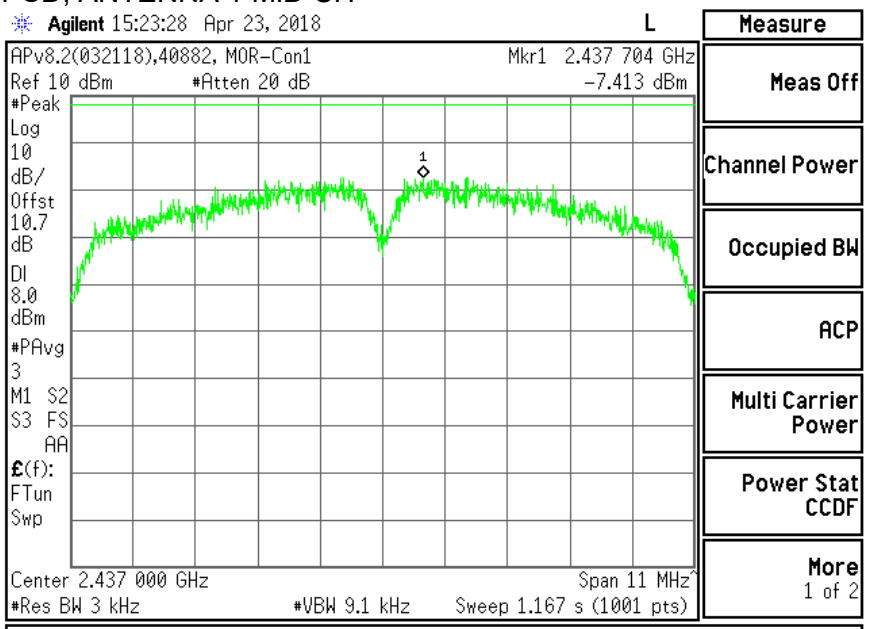




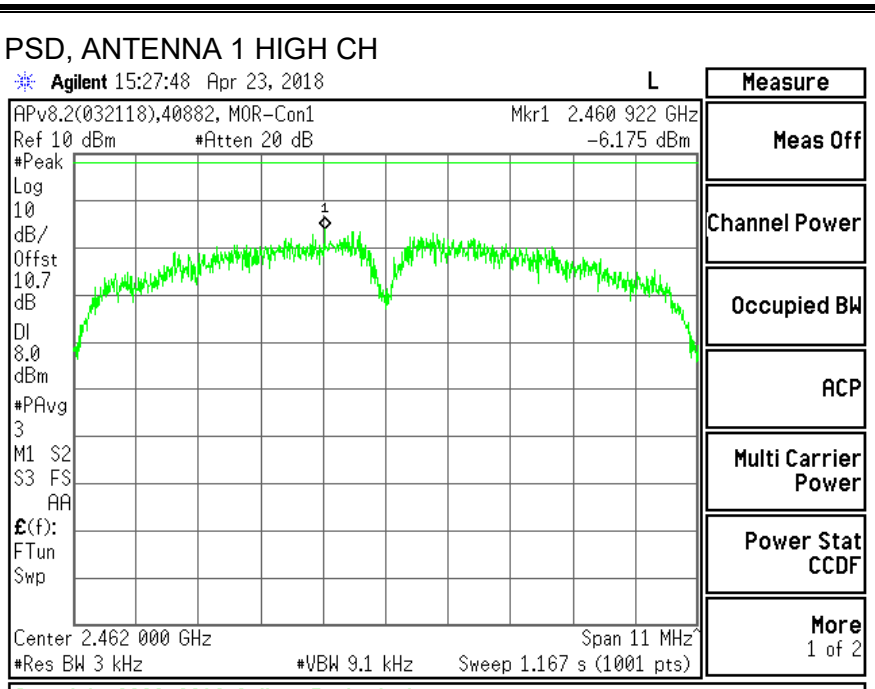
PSD - MODULE 1, ANTENNA 1



PSD, ANTENNA 1 MID CH



PSD, ANTENNA 1 HIGH CH



8.2.5. OUT-OF-BAND EMISSIONS

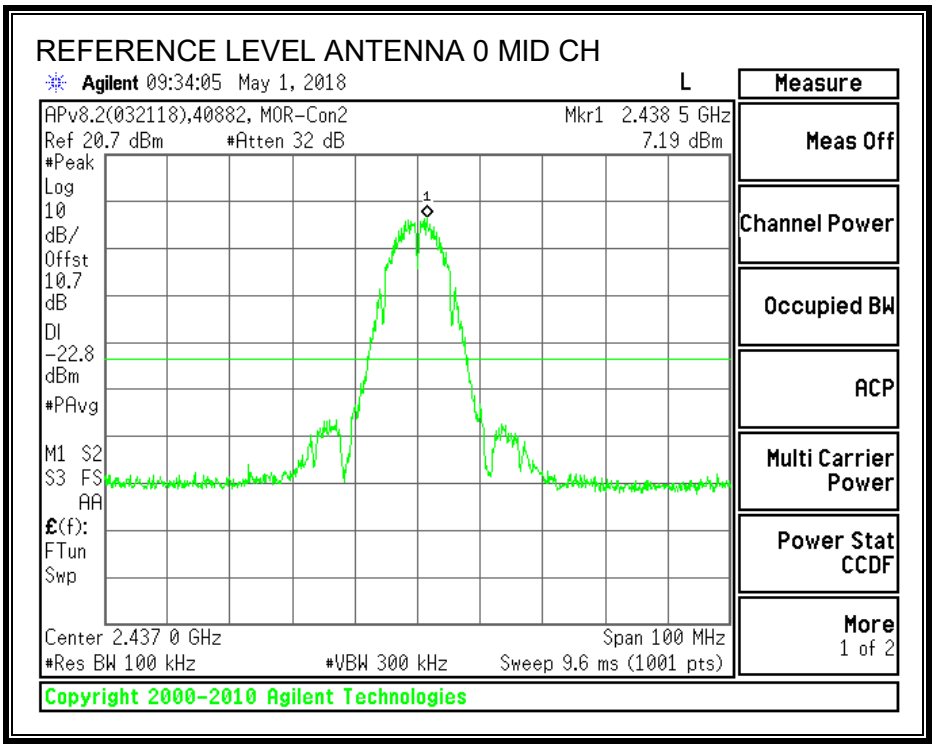
LIMITS

FCC §15.247 (d)

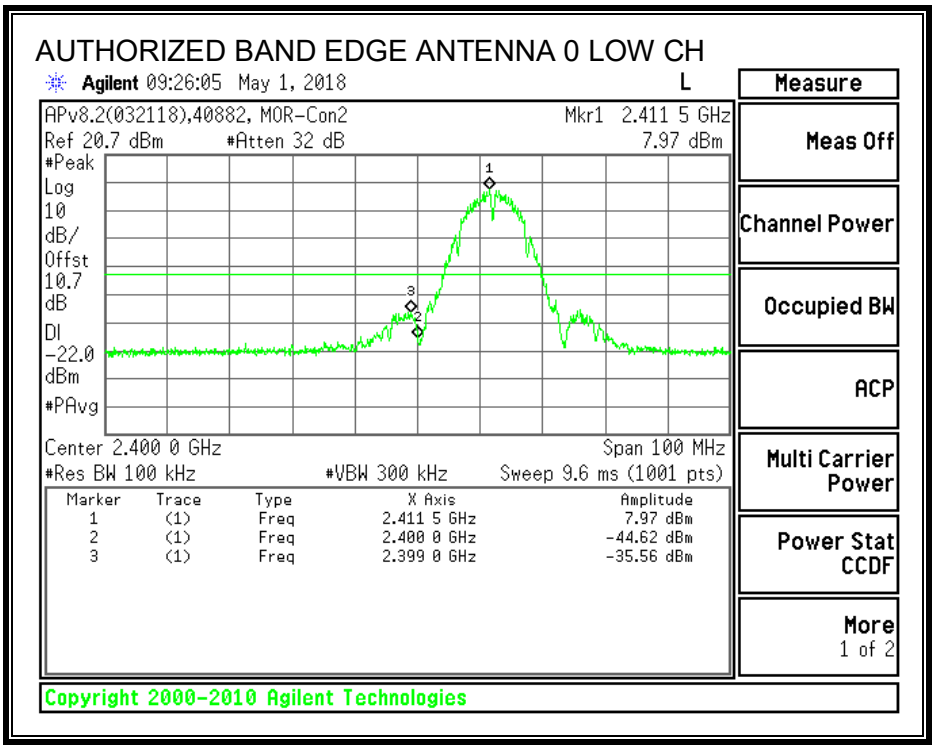
ISED RSS-247 Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

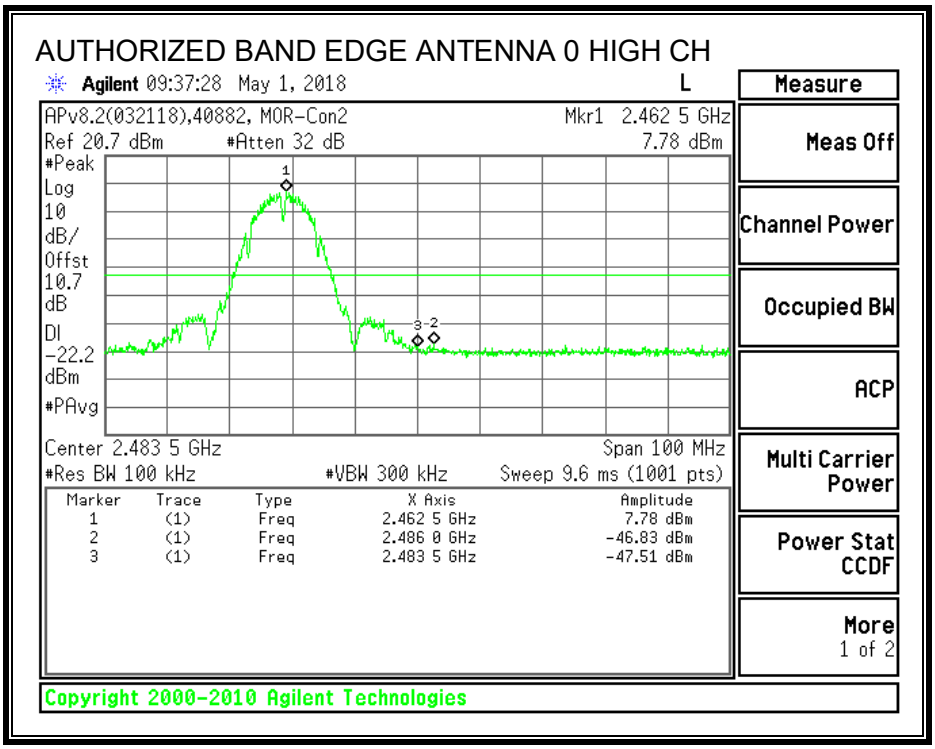
RESULTS - MODULE 1
IN-BAND REFERENCE LEVEL, ANTENNA 0



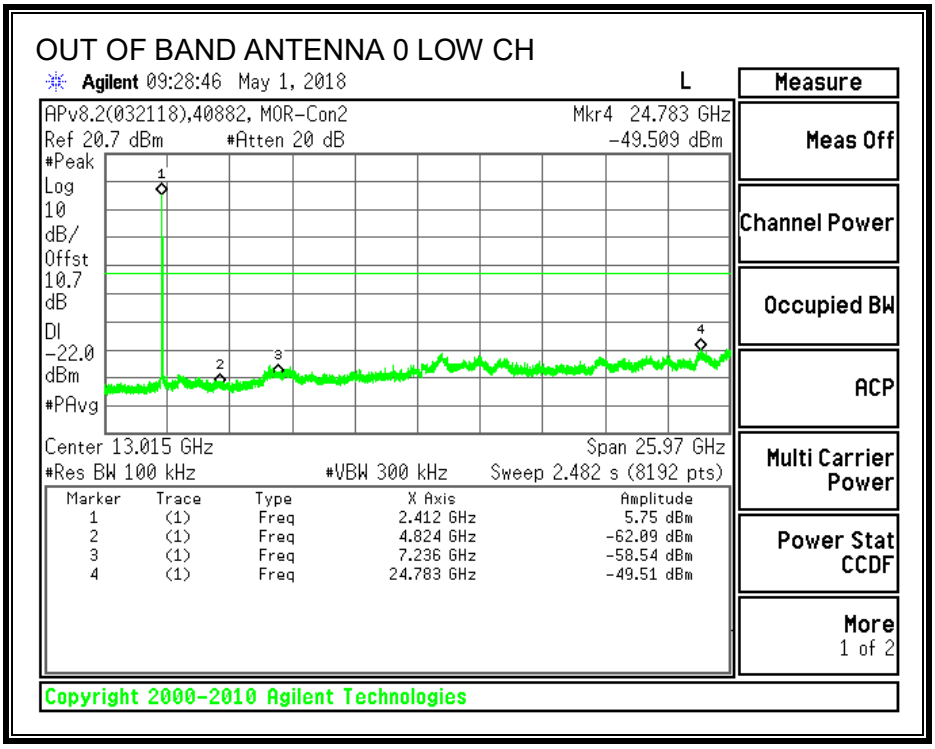
LOW CHANNEL BANDEDGE, ANTENNA 0



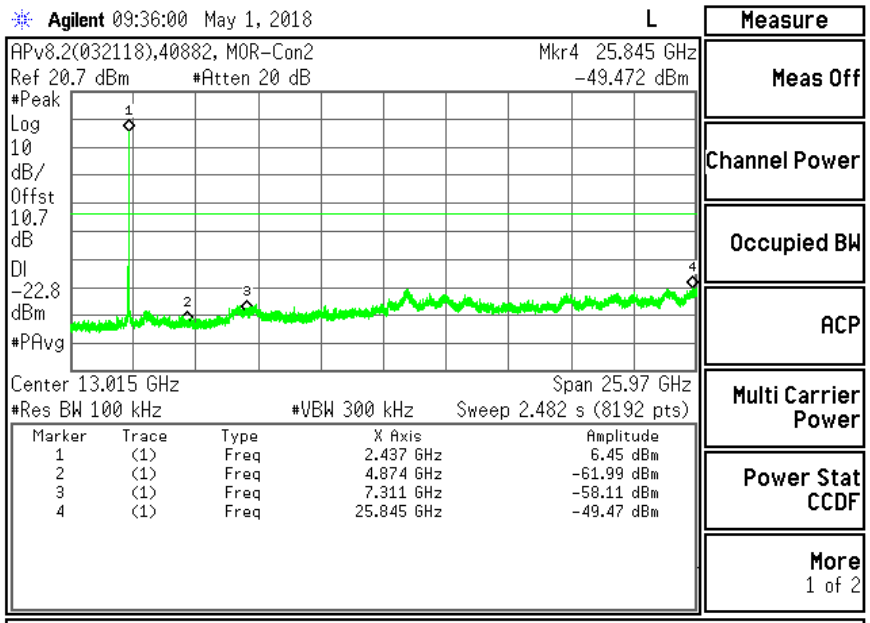
HIGH CHANNEL BANDEDGE, ANTENNA 0



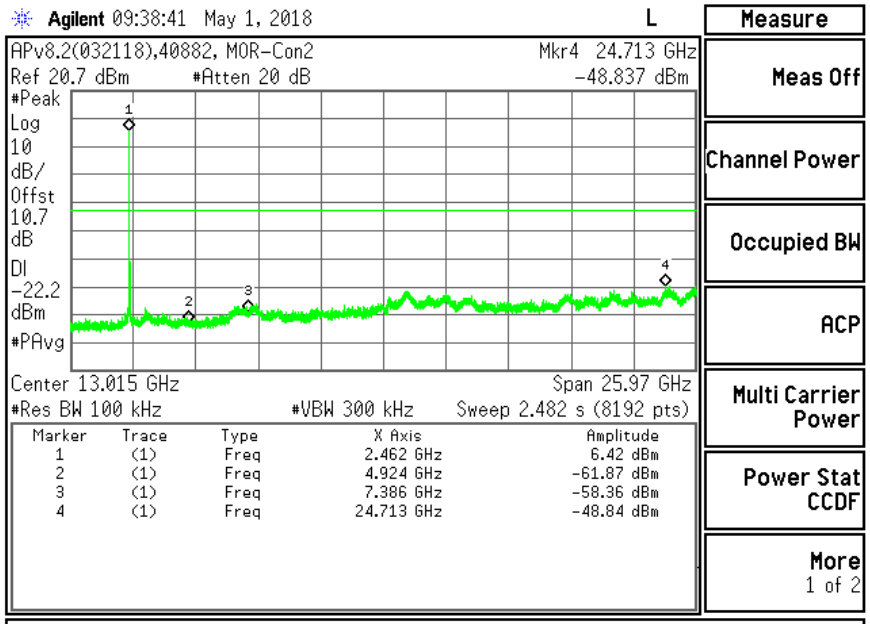
OUT-OF-BAND EMISSIONS, ANTENNA 0



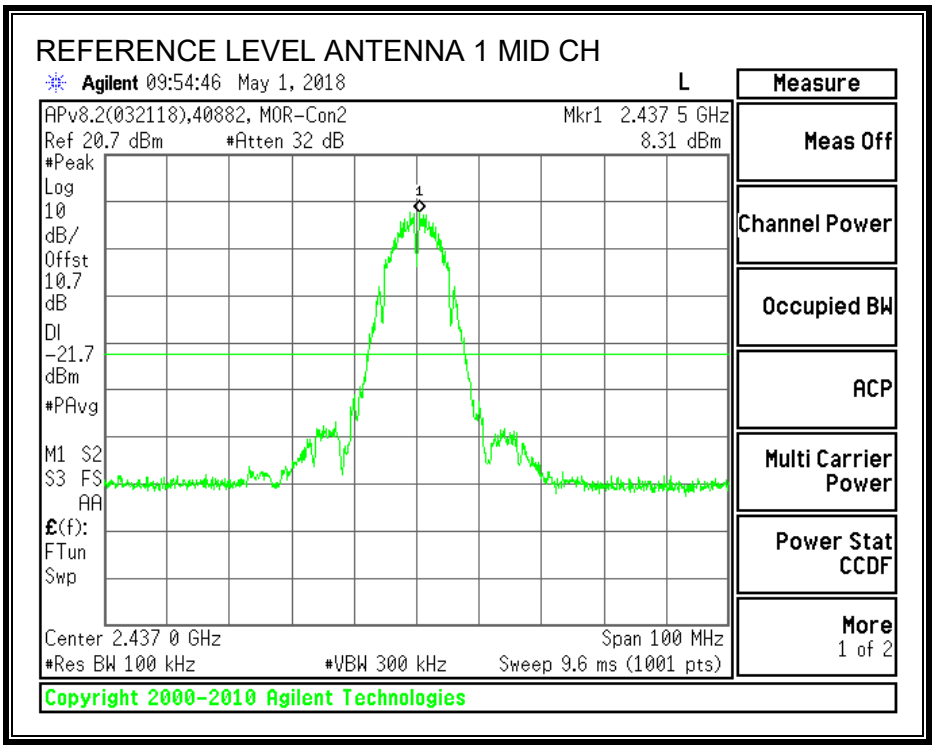
OUT OF BAND ANTENNA 0 MID CH



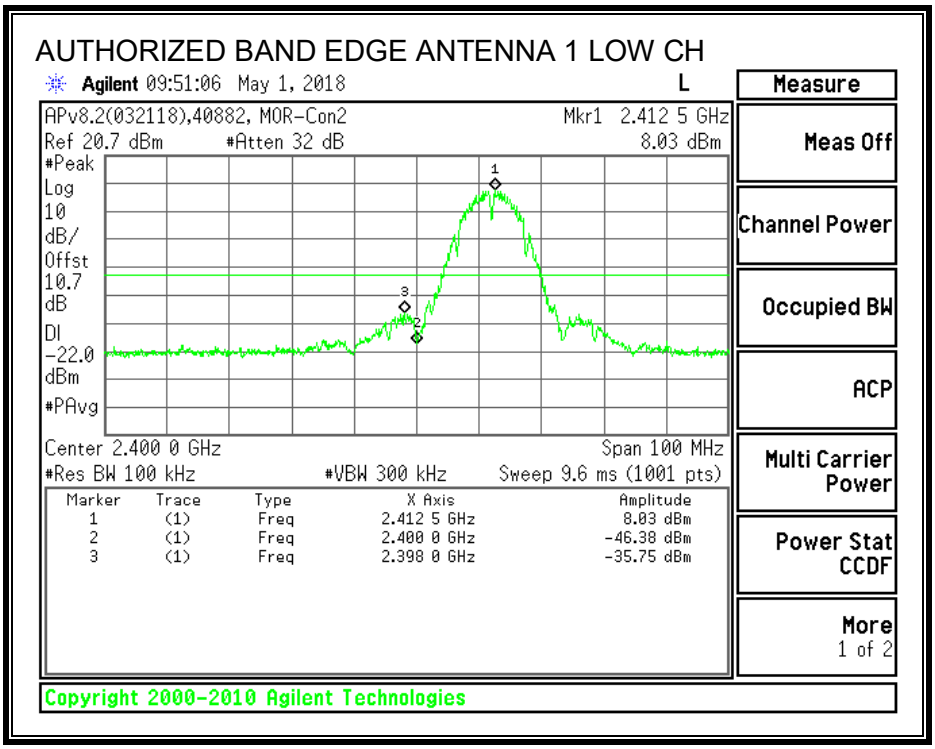
OUT OF BAND ANTENNA 0 HIGH CH



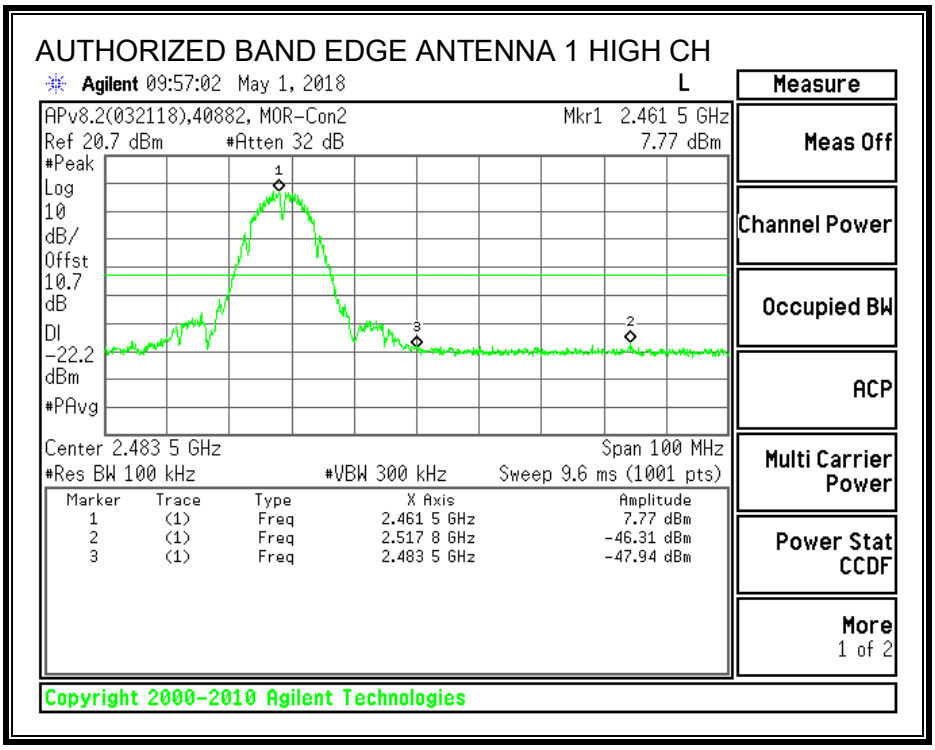
IN-BAND REFERENCE LEVEL, ANTENNA 1

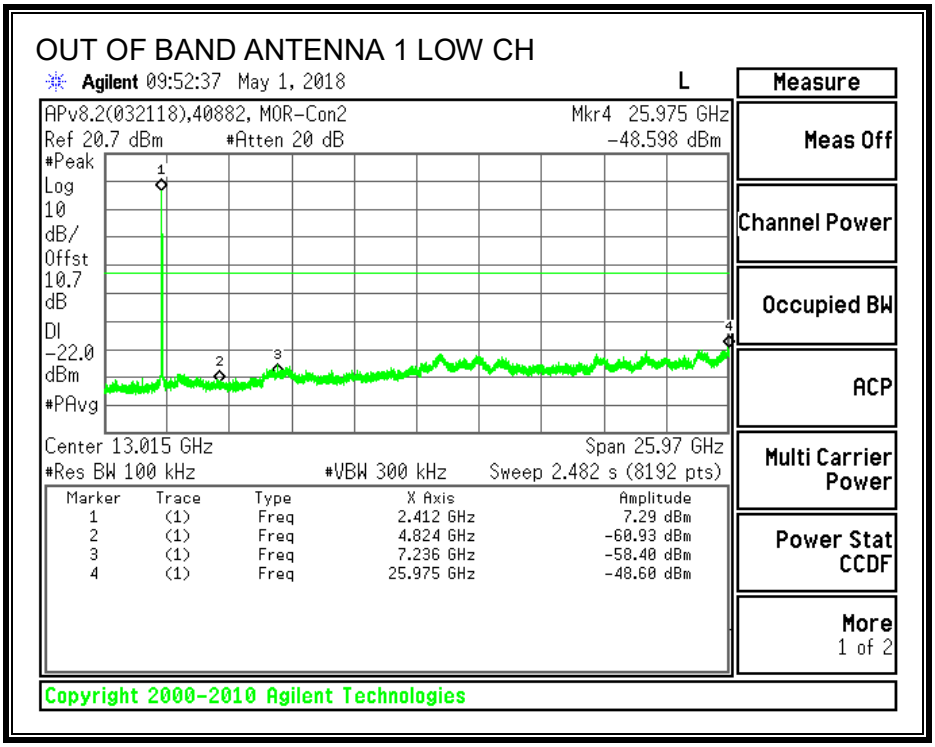


LOW CHANNEL BANDEDGE, ANTENNA 1

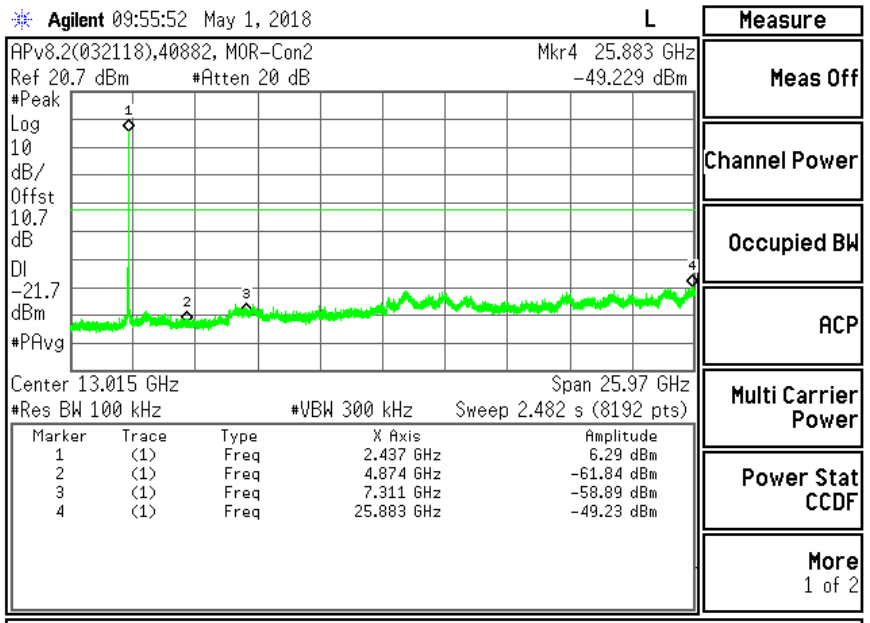


HIGH CHANNEL BANDEDGE, ANTENNA 1

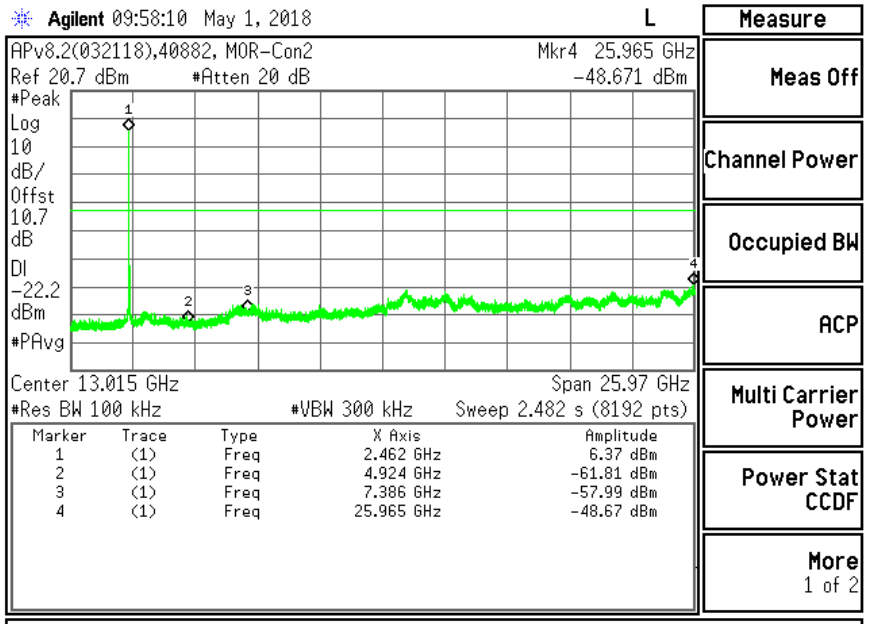




OUT OF BAND ANTENNA 1 MID CH



OUT OF BAND ANTENNA 1 HIGH CH



8.3. 802.11g MODE IN THE 2.4 GHz BAND

8.3.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

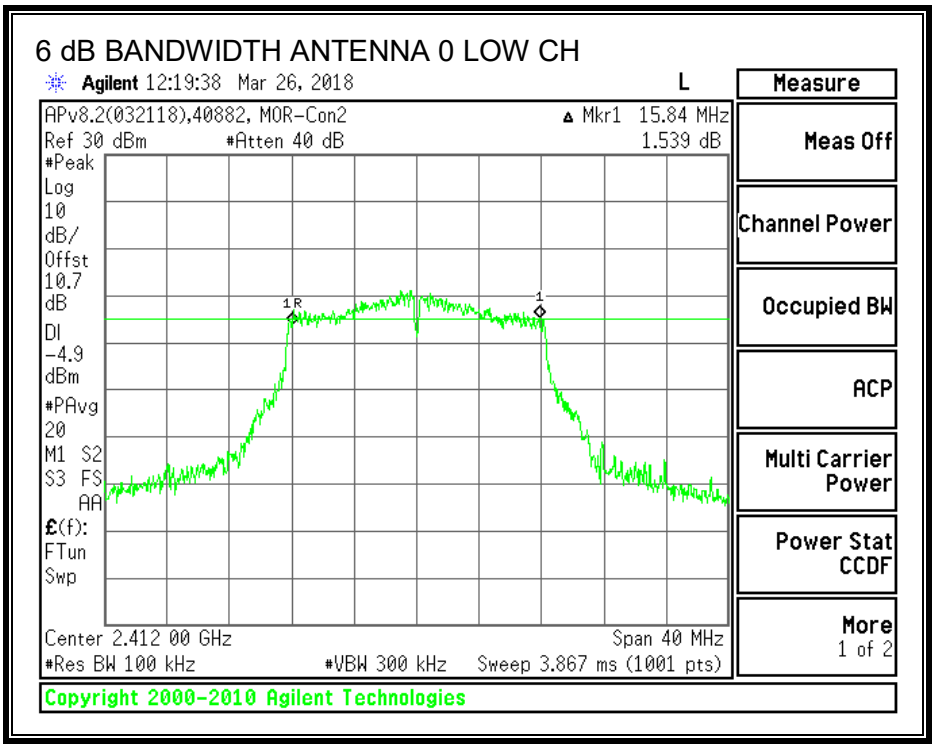
ISED RSS-247 Clause 5.2 (a)

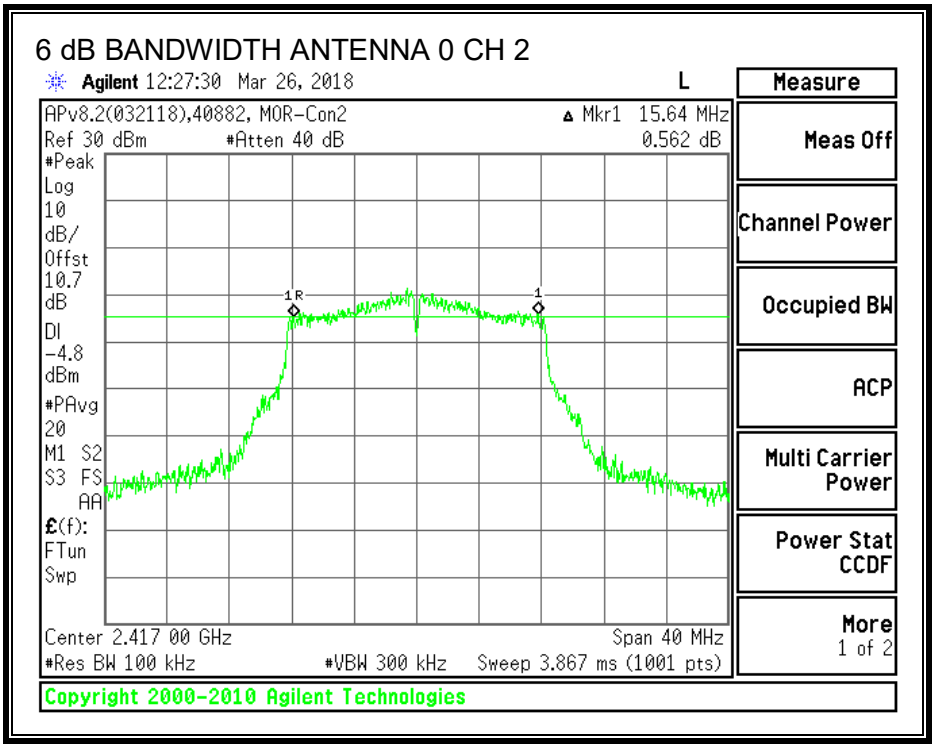
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS – MODULE 1

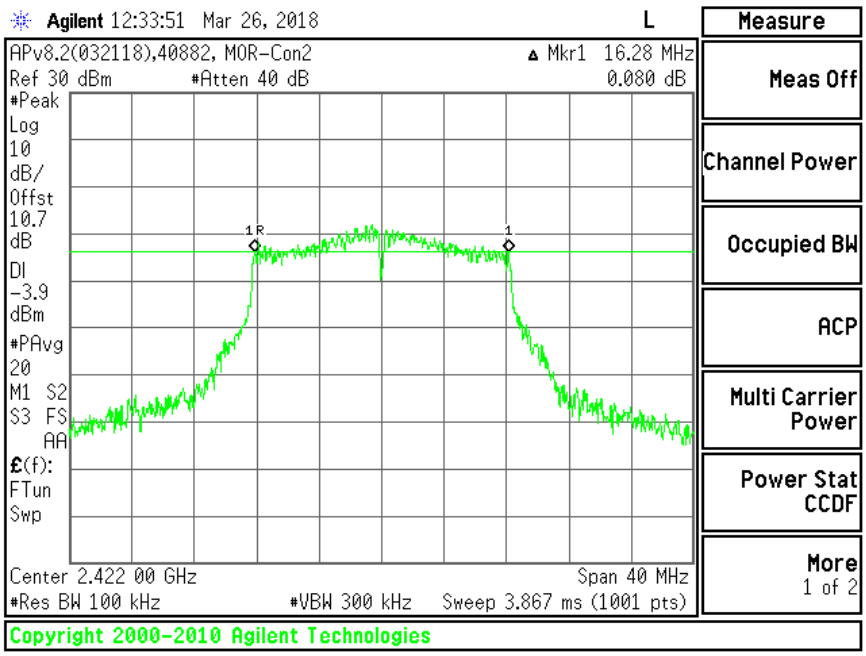
Channel	Frequency (MHz)	6 dB BW Ant 0 (MHz)	6 dB BW Ant 1 (MHz)	Minimum Limit (MHz)
Low	2412	15.840	16.040	0.5
2	2417	15.640	16.280	0.5
3	2422	16.280	16.320	0.5
Mid	2437	16.360	12.160	0.5
10	2457	16.360	16.320	0.5
High	2462	15.080	14.400	0.5

6 dB BANDWIDTH - MODULE 1, ANTENNA 0

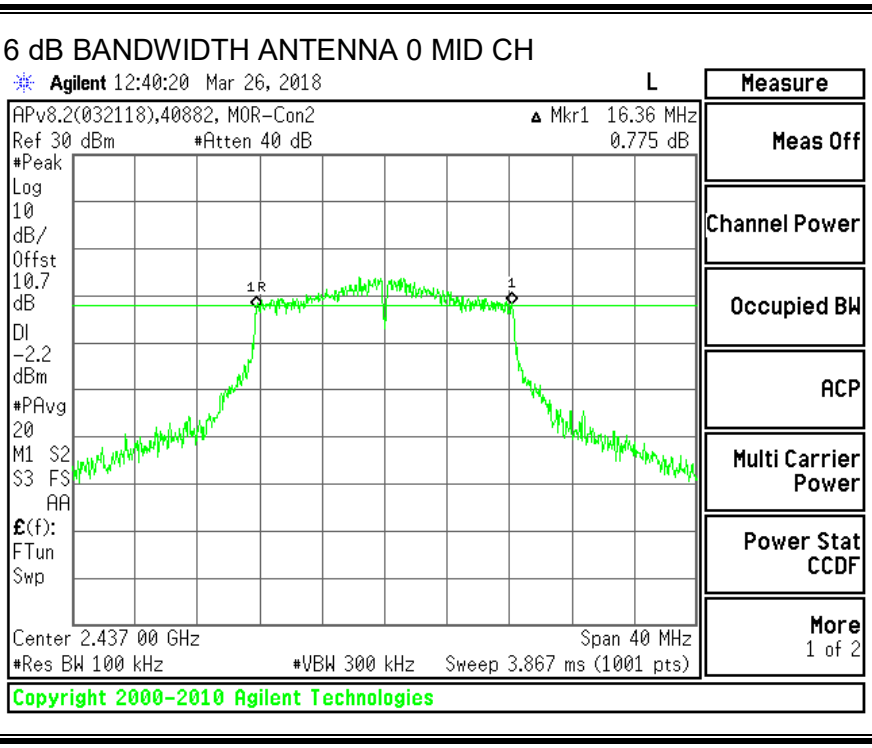




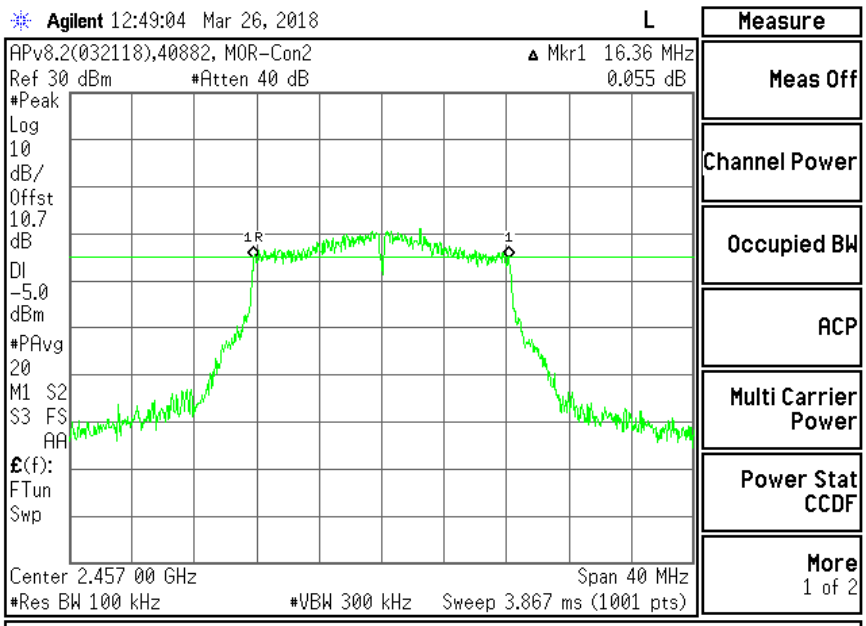
6 dB BANDWIDTH ANTENNA 0 CH 3



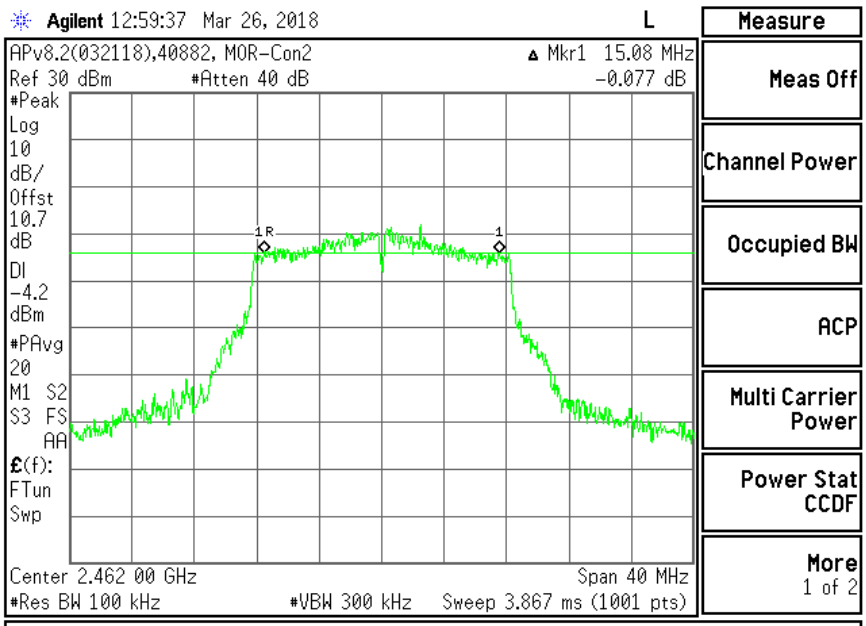
6 dB BANDWIDTH ANTENNA 0 MID CH



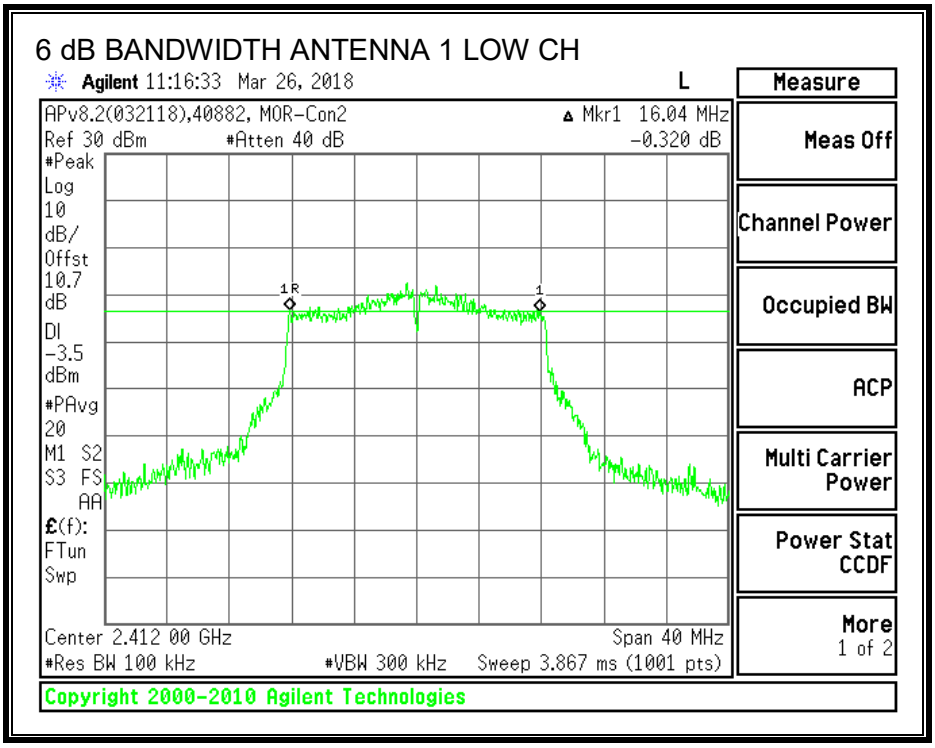
6 dB BANDWIDTH ANTENNA 0 CH 10

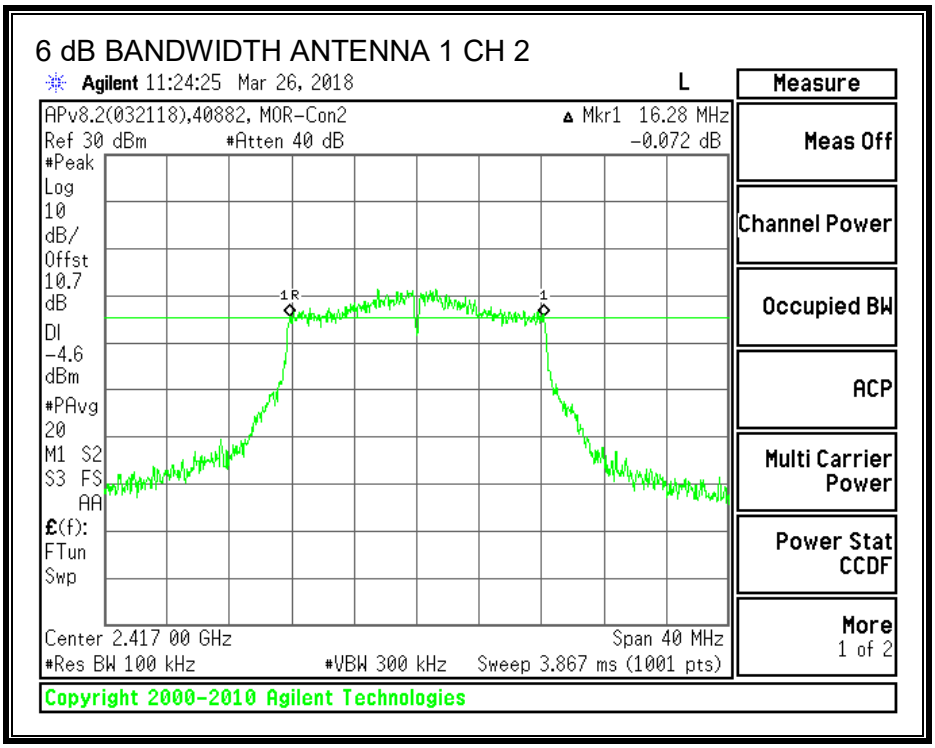


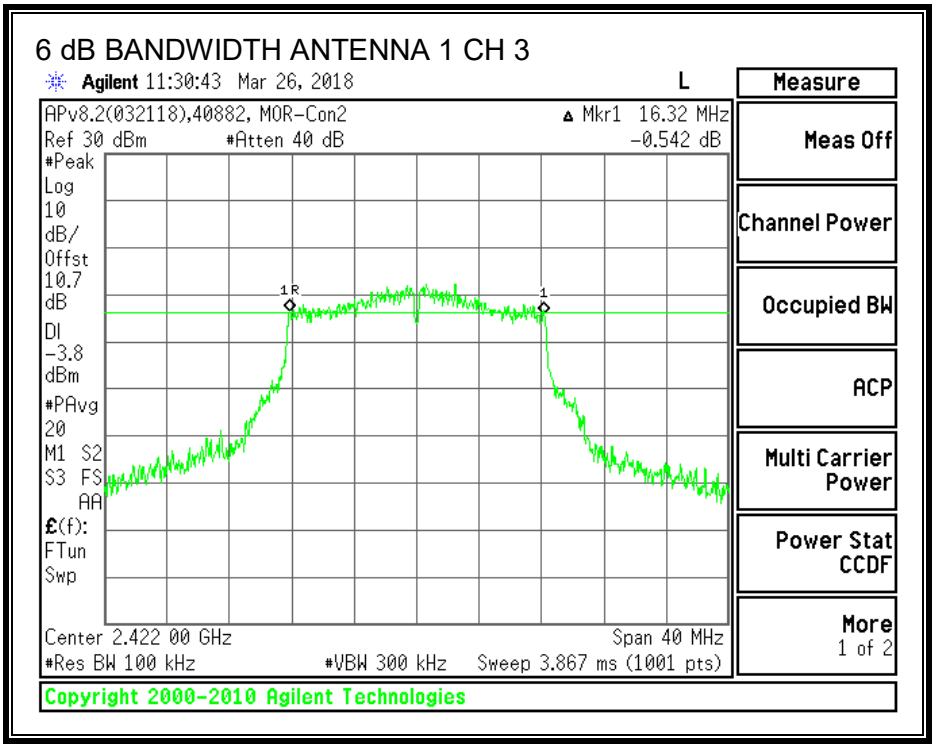
6 dB BANDWIDTH ANTENNA 0 HIGH CH

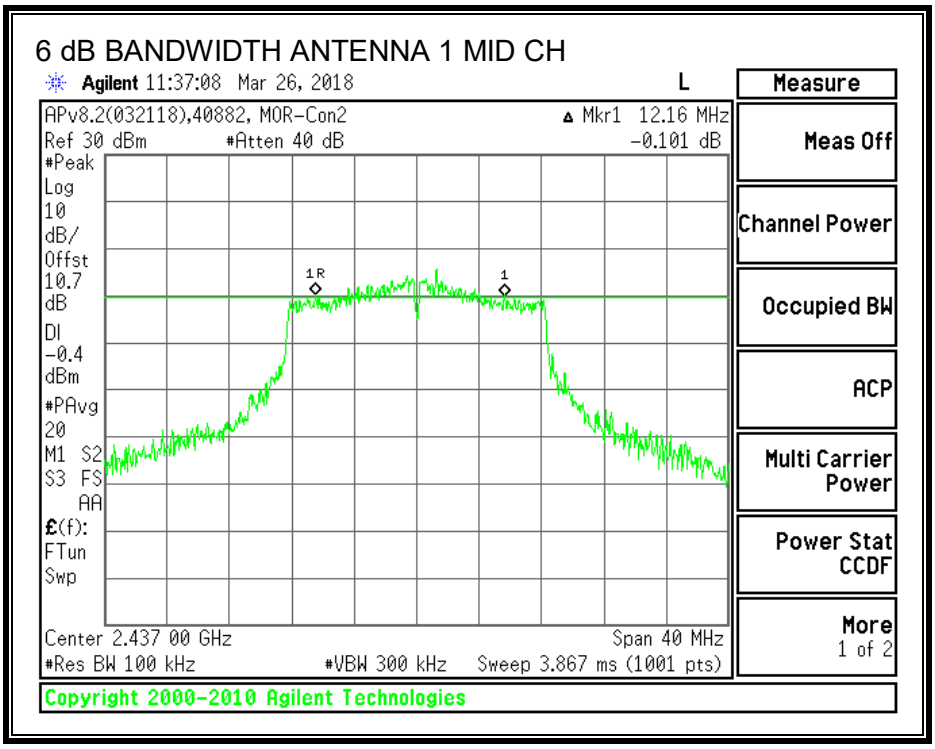


6 dB BANDWIDTH – MODULE 1, ANTENNA 1

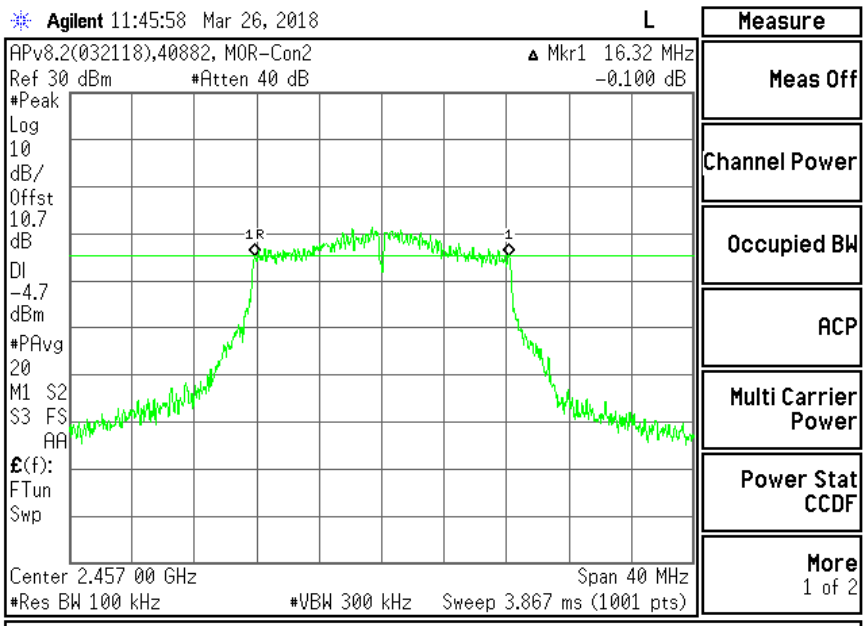




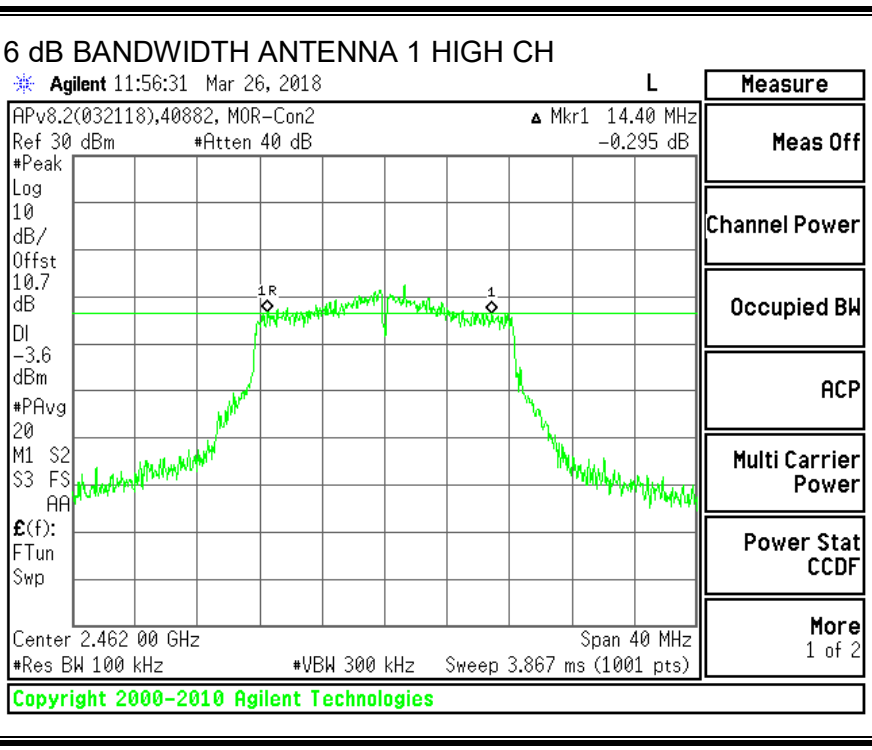




6 dB BANDWIDTH ANTENNA 1 CH 10



6 dB BANDWIDTH ANTENNA 1 HIGH CH



8.3.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

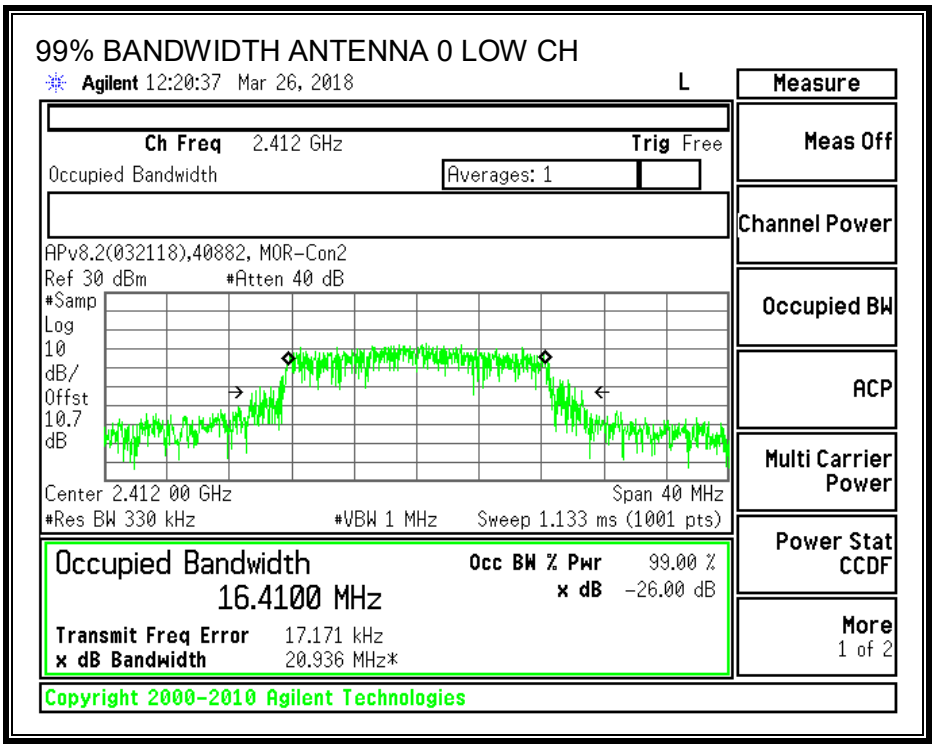
TEST PROCEDURE

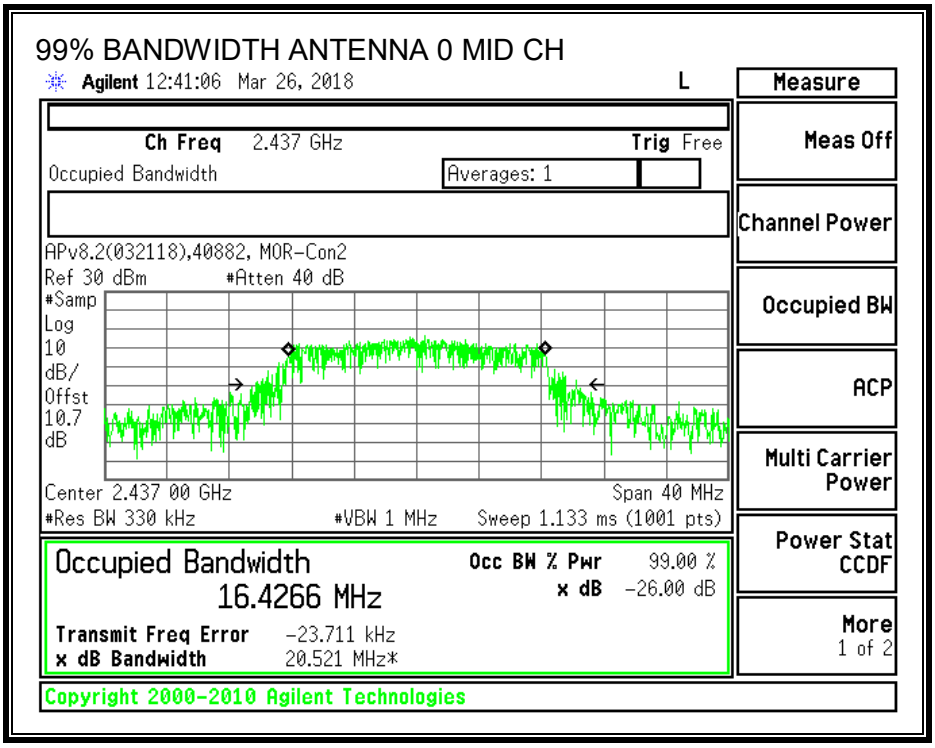
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 5% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

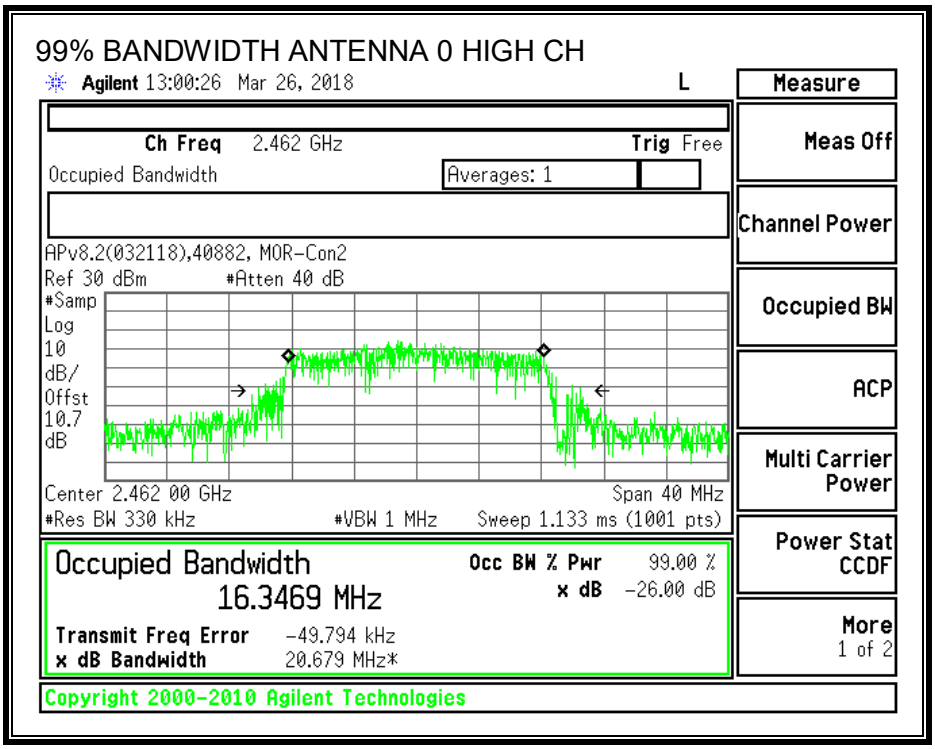
RESULTS – MODULE 1

Channel	Frequency (MHz)	99% BW Ant 0 (MHz)	99% BW Ant 1 (MHz)
Low	2412	16.410	16.353
Mid	2437	16.427	16.537
High	2462	16.347	16.408

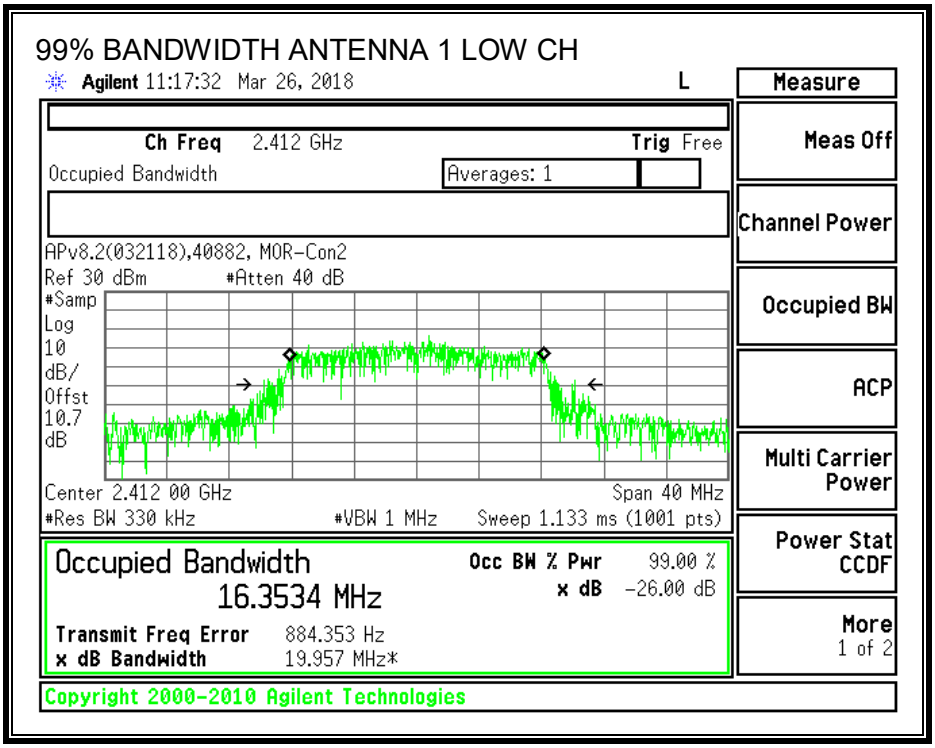
99% BANDWIDTH - MODULE 1, ANTENNA 0

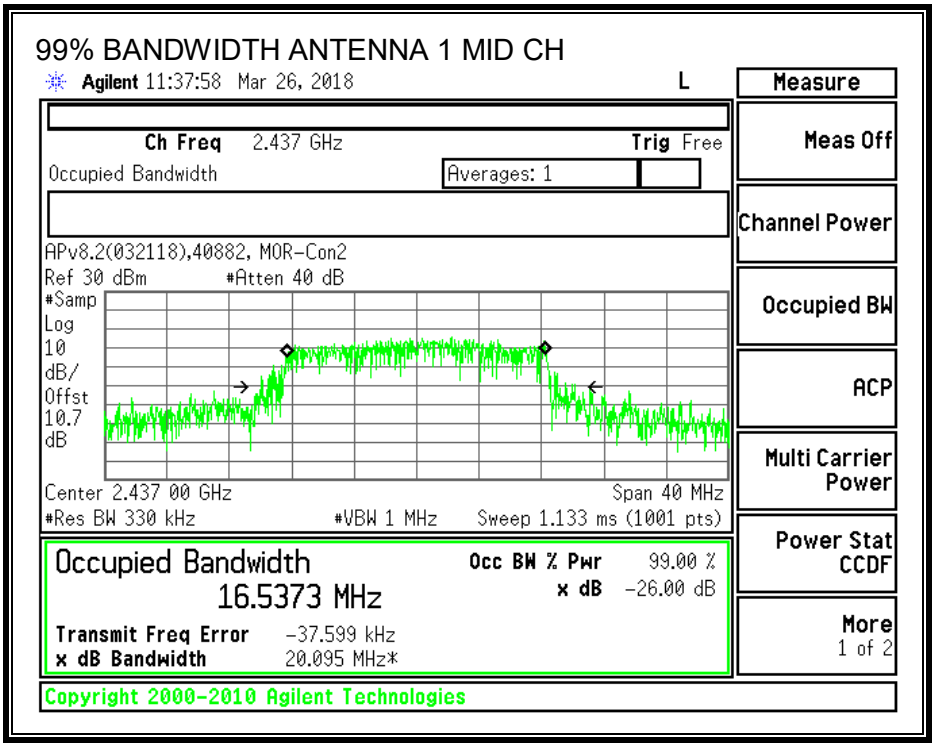


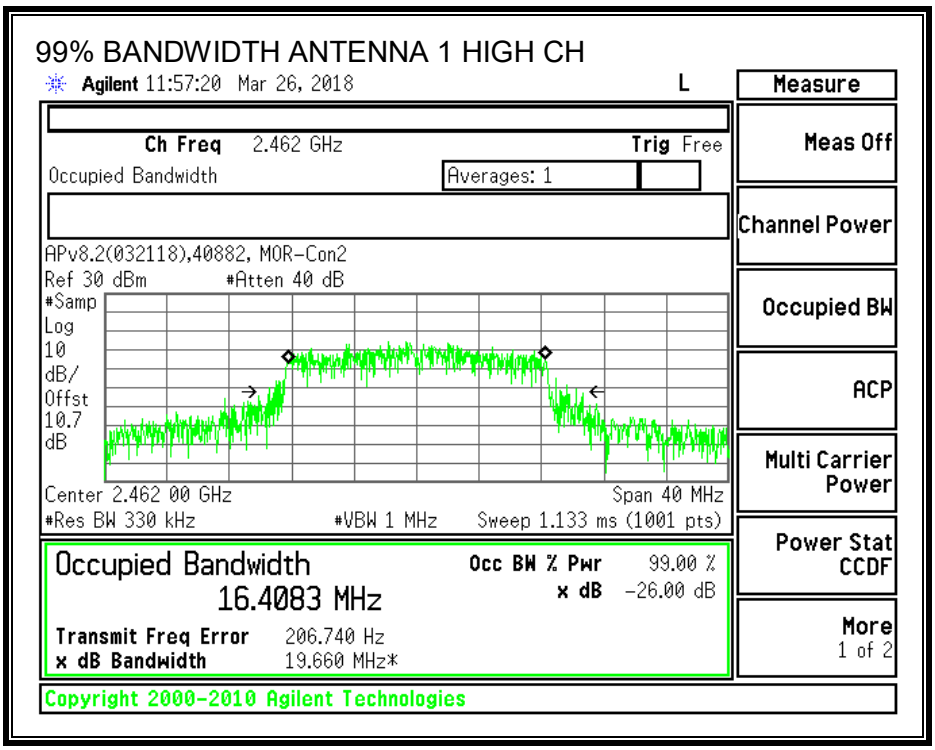




99% BANDWIDTH - MODULE 1, ANTENNA 1







8.3.3. OUTPUT POWER – MODULE 1

LIMITS

FCC §15.247 (b) (3)

ISED RSS-247 Clauses 5.4 (d)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RESULTS - SISO

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain. Used worst-case gain of 1.54dBi.

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	1.54	30.00	30	36	30.00
Mid	2437	1.54	30.00	30	36	30.00
High	2462	1.54	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Antenna 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	11.81	11.81	30.00	-18.19
2	2417	12.01	12.01	30.00	-17.99
3	2422	15.54	15.54	30.00	-14.46
Mid	2437	15.71	15.71	30.00	-14.29
9	2452	15.62	15.62	30.00	-14.38
10	2457	11.94	11.94	30.00	-18.06
High	2462	12.11	12.11	30.00	-17.89

Results

Channel	Frequency (MHz)	Antenna 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	13.50	13.50	30.00	-16.50
2	2417	13.34	13.34	30.00	-16.66
3	2422	16.50	16.50	30.00	-13.50
Mid	2437	16.36	16.36	30.00	-13.64
9	2452	16.45	16.45	30.00	-13.55
10	2457	13.28	13.28	30.00	-16.72
High	2462	13.18	13.18	30.00	-16.82

RESULTS – MIMO CDD

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
1.54	0.40	4.00

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	4.00	30.00	30	36	30.00
Mid	2437	4.00	30.00	30	36	30.00
High	2462	4.00	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margi (dB)
Low	2412	12.52	13.22	15.89	30.00	-14.11
2	2417	12.47	13.29	15.91	30.00	-14.09
3	2422	13.44	13.95	16.71	30.00	-13.29
4	2427	15.94	16.27	19.12	30.00	-10.88
Mid	2437	16.00	16.51	19.27	30.00	-10.73
9	2452	16.02	16.38	19.21	30.00	-10.79
10	2457	12.32	13.13	15.75	30.00	-14.25
High	2462	12.38	13.08	15.75	30.00	-14.25

8.3.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

ISED RSS-247 Clause 5.2 (b)

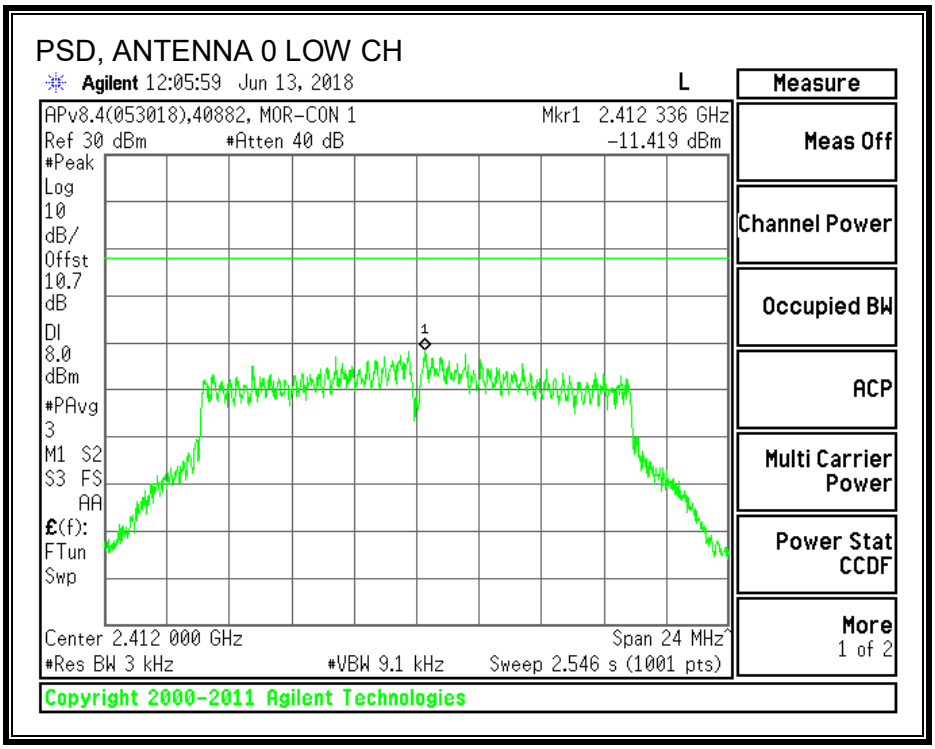
RESULTS - MODULE 1

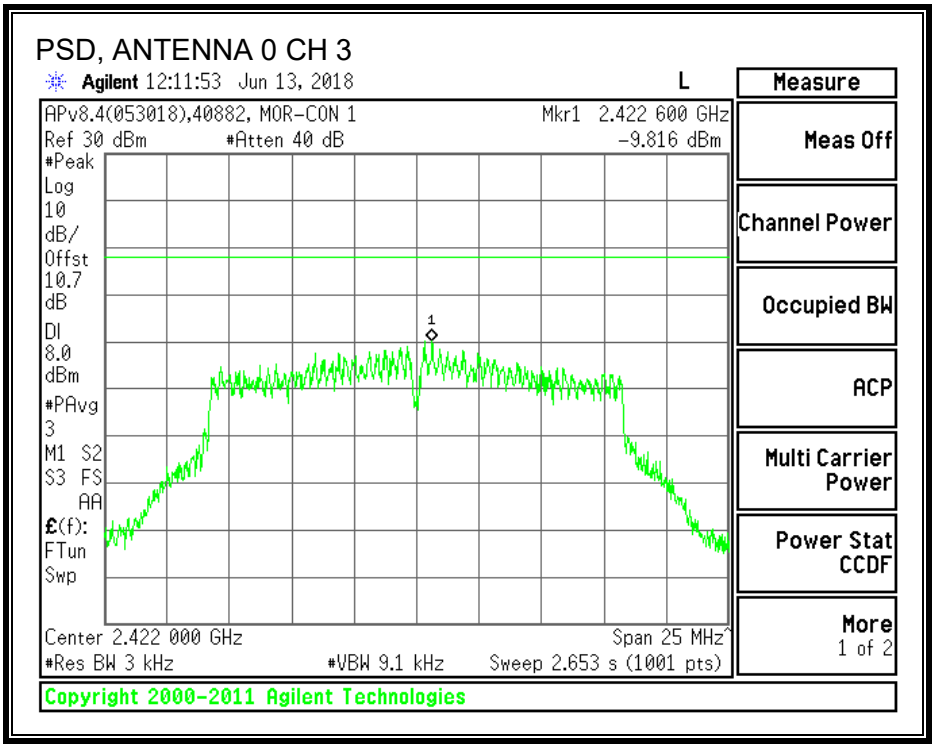
PSD Results

Channel	Frequency (MHz)	Ant 0 Meas (dBm)	Ant 1 Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-11.42	-10.04	-7.66	8.0	-15.7
3	2417	-9.82	-9.70	-6.75	8.0	-14.7
4	2422	-7.19	-6.92	-4.04	8.0	-12.0
Mid	2437	-7.20	-6.82	-3.99	8.0	-12.0

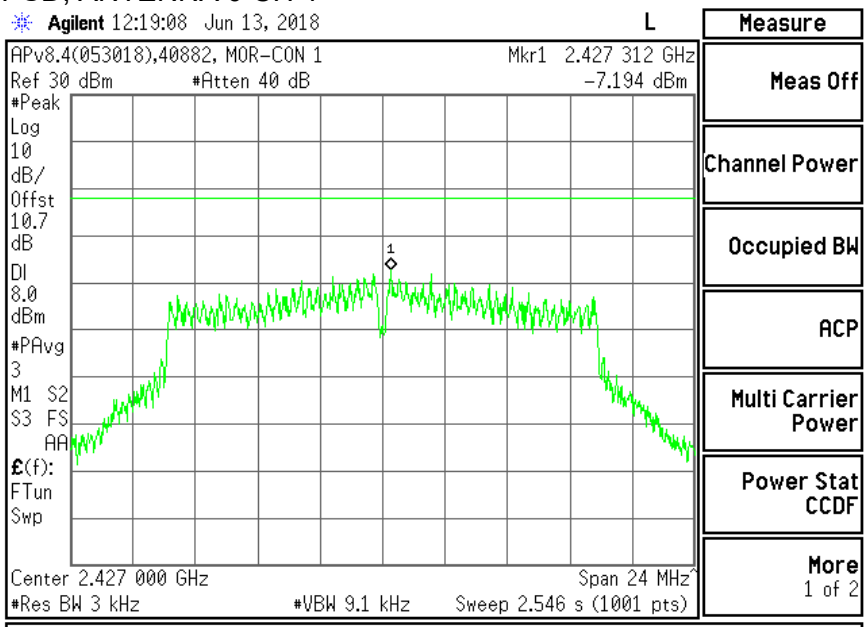
Note – This testing was performed in MIMO CDD mode since the per chain power is the same whether in SISO or MIMO modes.

PSD - MODULE 1, ANTENNA 0

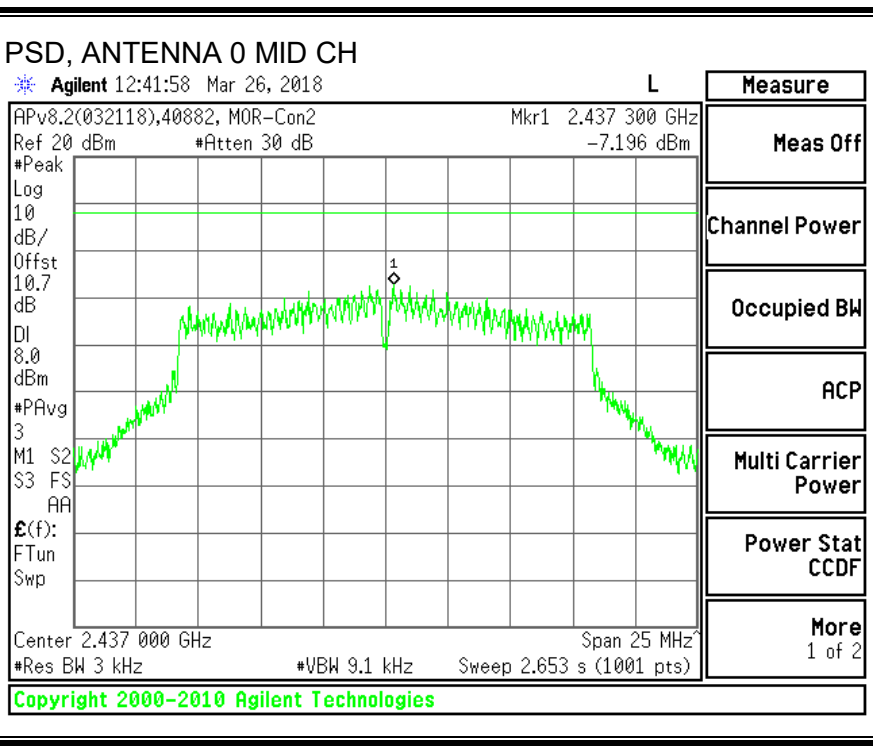




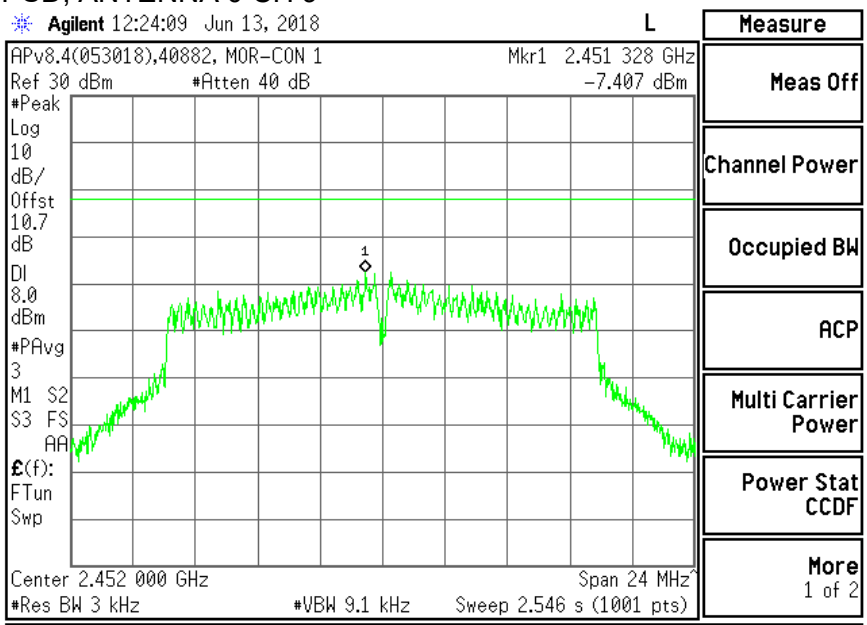
PSD, ANTENNA 0 CH 4



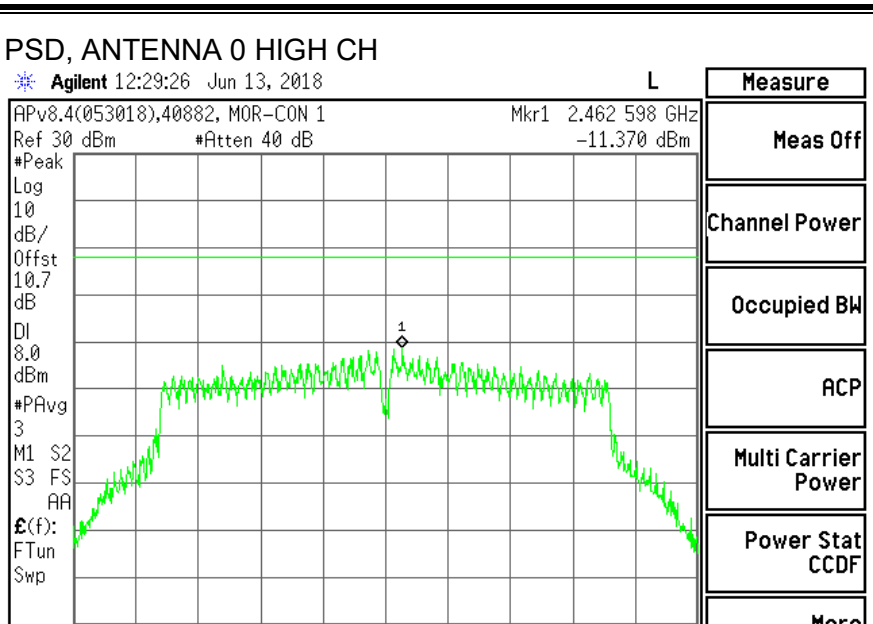
PSD, ANTENNA 0 MID CH



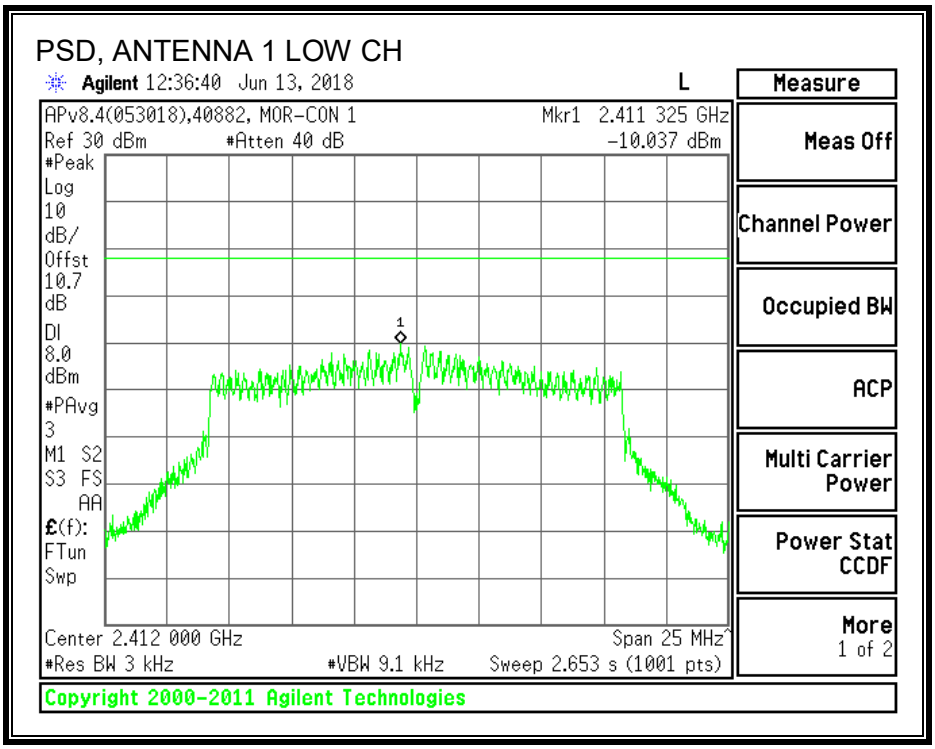
PSD, ANTENNA 0 CH 9

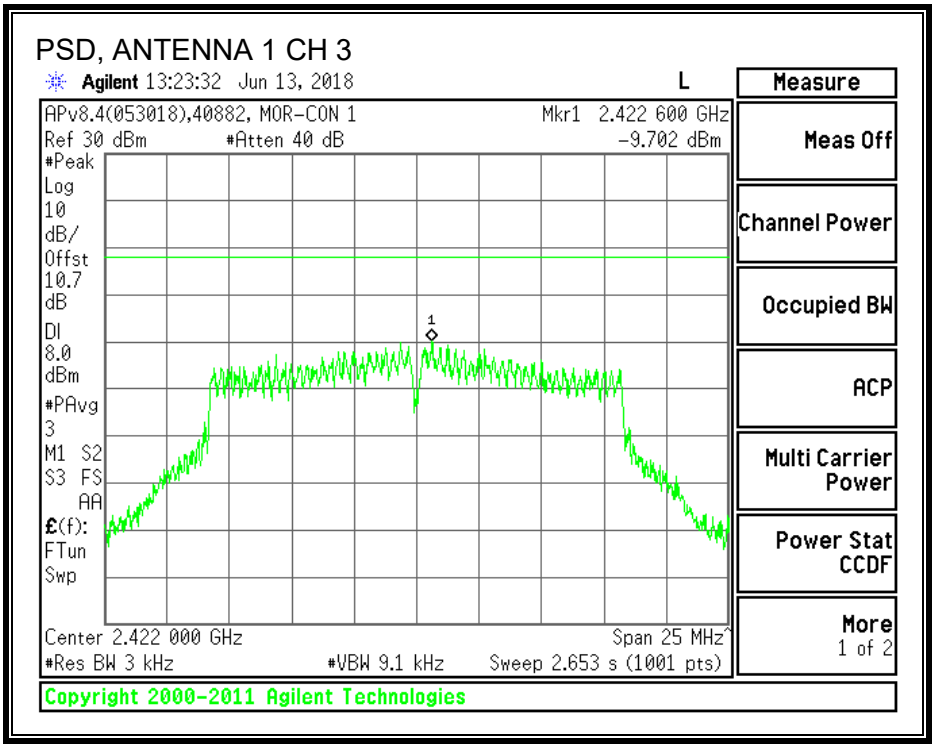


PSD, ANTENNA 0 HIGH CH

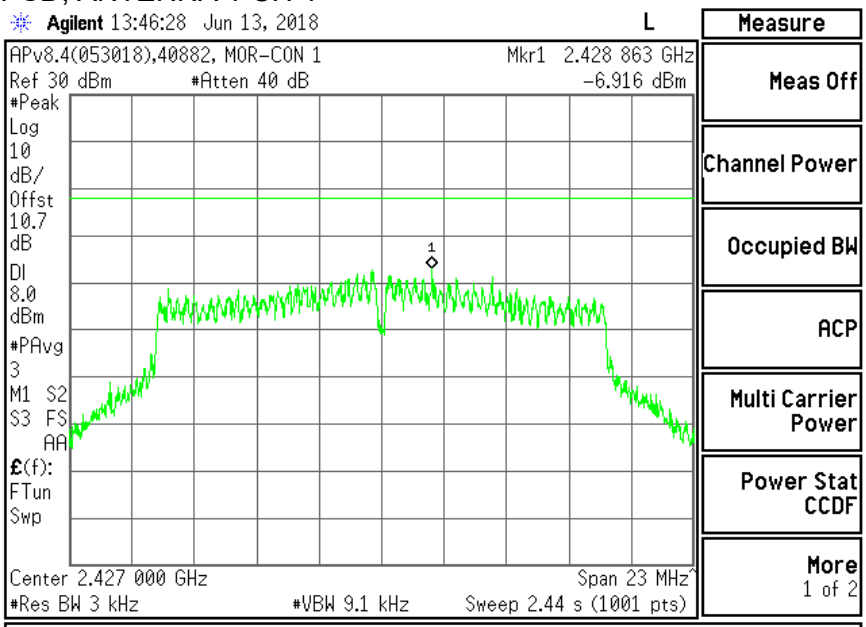


PSD - MODULE 1, ANTENNA 1

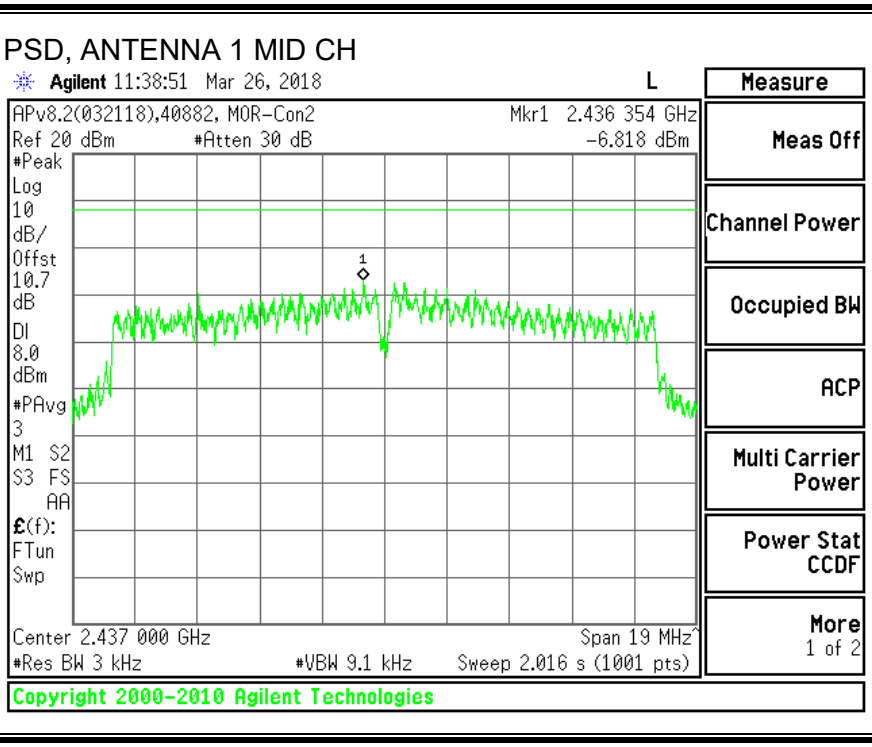




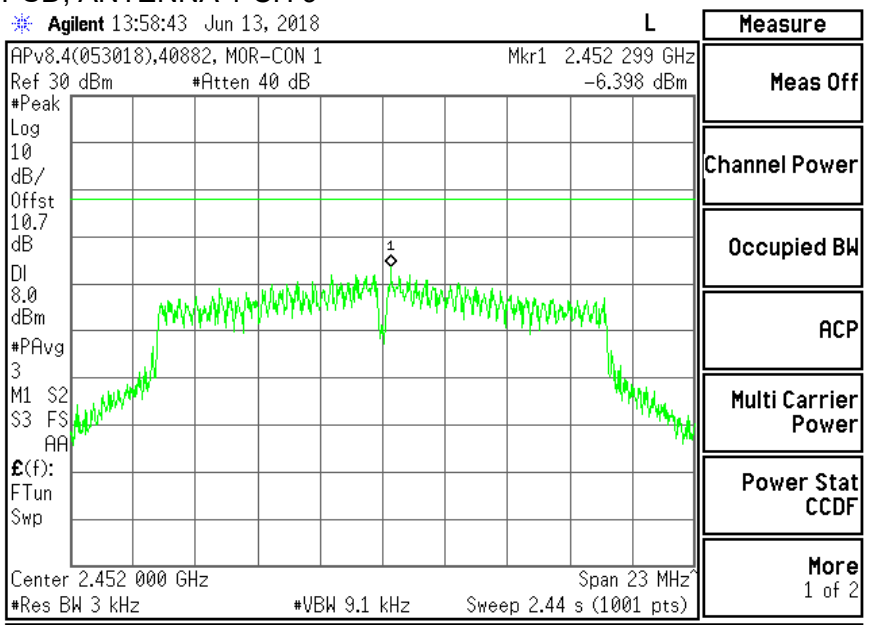
PSD, ANTENNA 1 CH 4



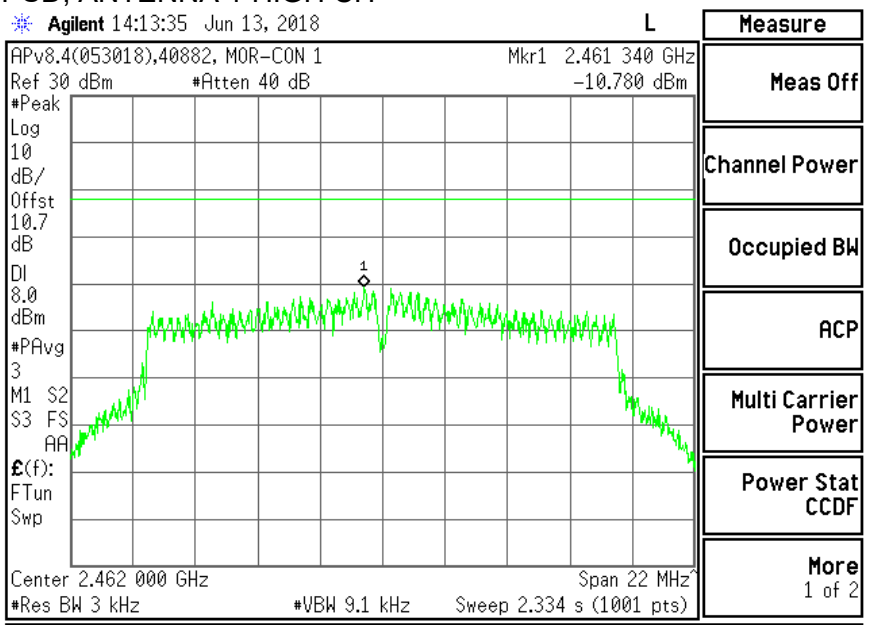
PSD, ANTENNA 1 MID CH



PSD, ANTENNA 1 CH 9



PSD, ANTENNA 1 HIGH CH



8.3.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

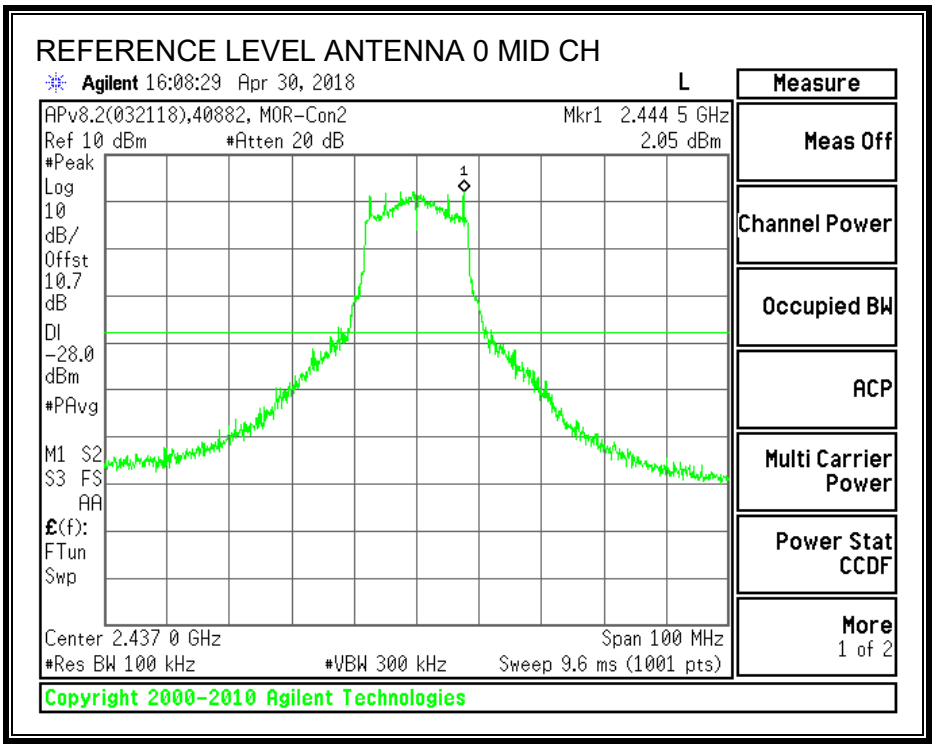
ISED RSS-247 Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

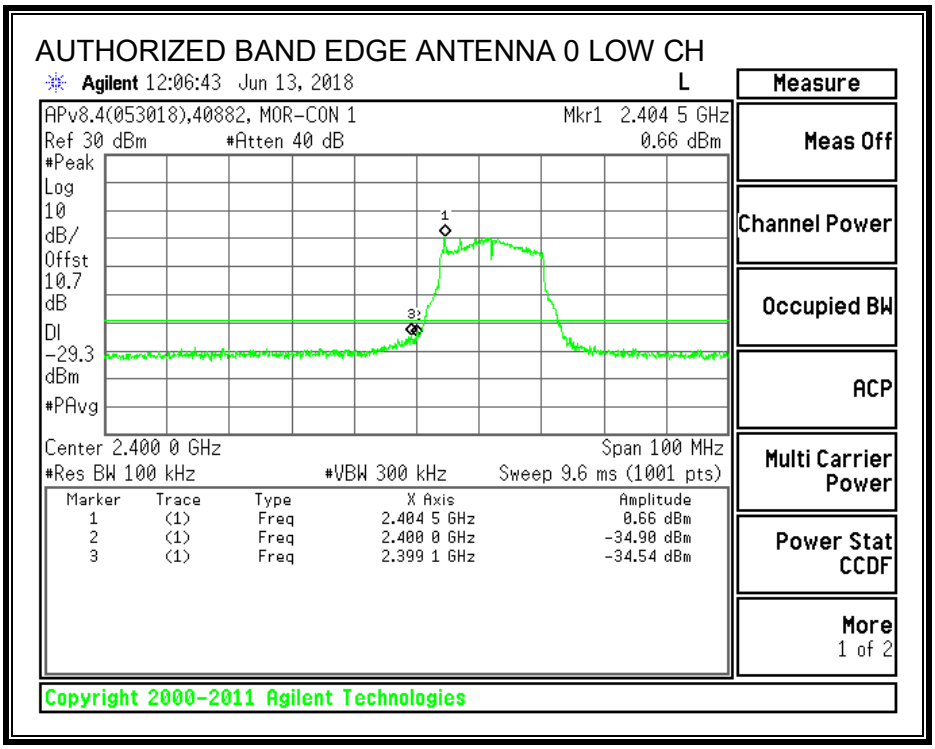
Note - The following testing was performed in MIMO CDD mode since the per chain power is the same whether in SISO or MIMO modes.

RESULTS - MODULE 1

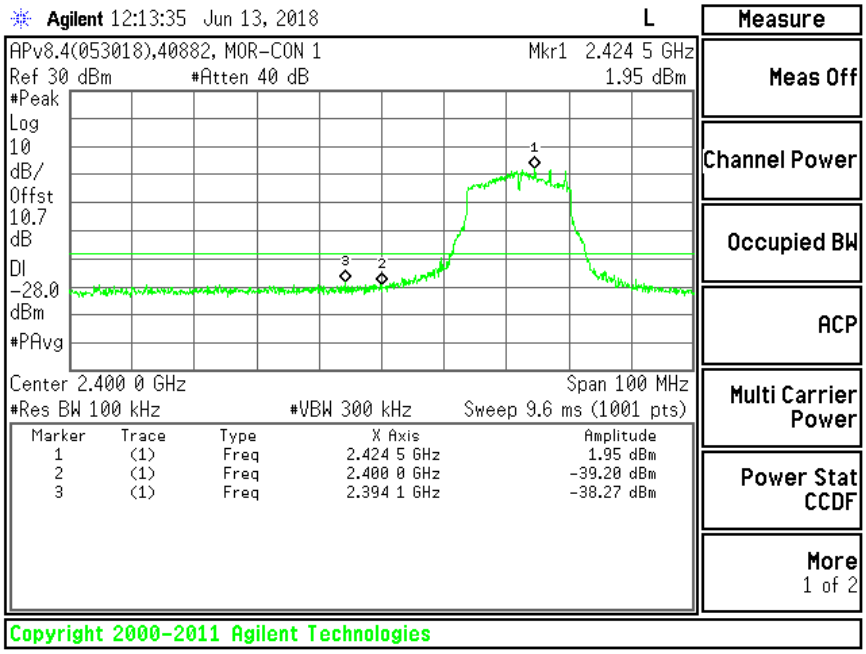
IN-BAND REFERENCE LEVEL, ANTENNA 0



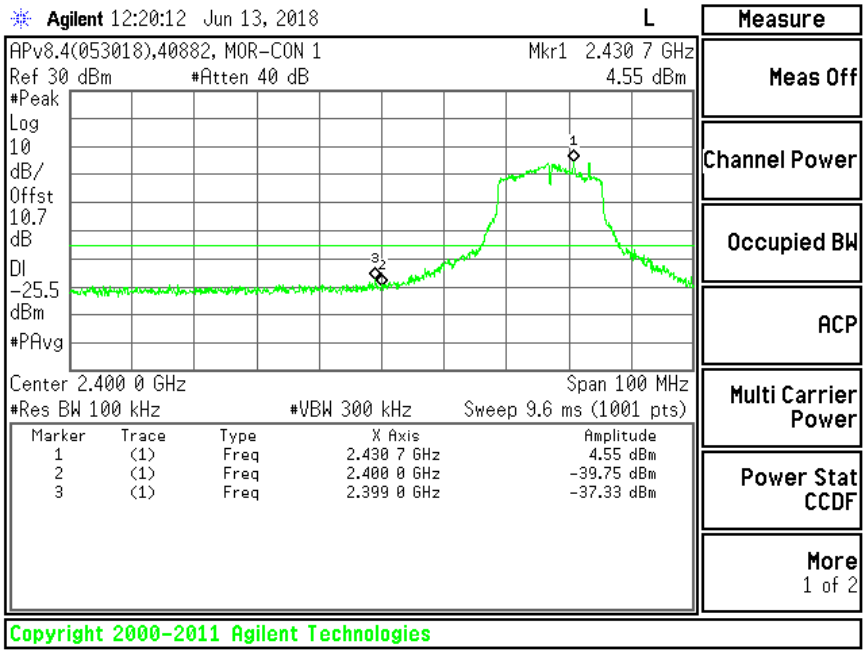
LOW BANDEDGE, ANTENNA 0



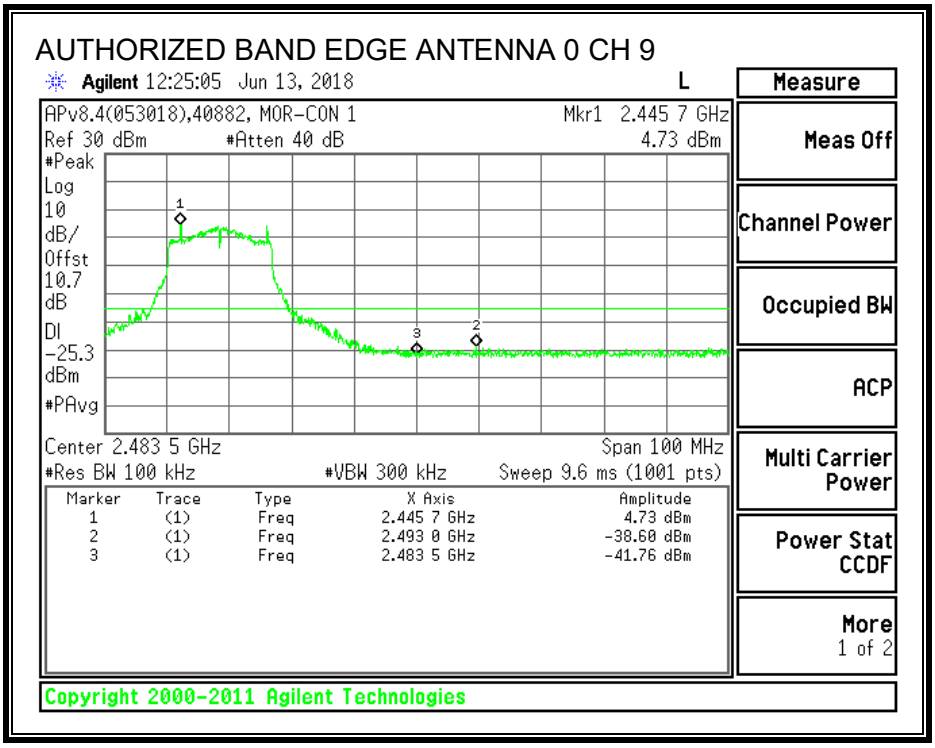
AUTHORIZED BAND EDGE ANTENNA 0 CH 3

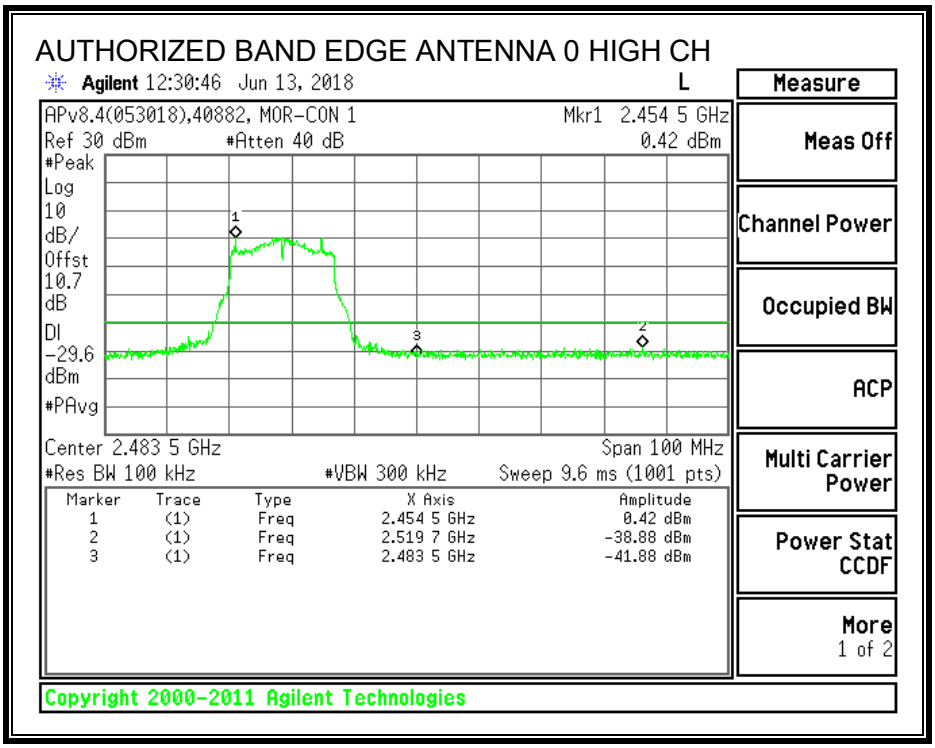


AUTHORIZED BAND EDGE ANTENNA 0 CH 4

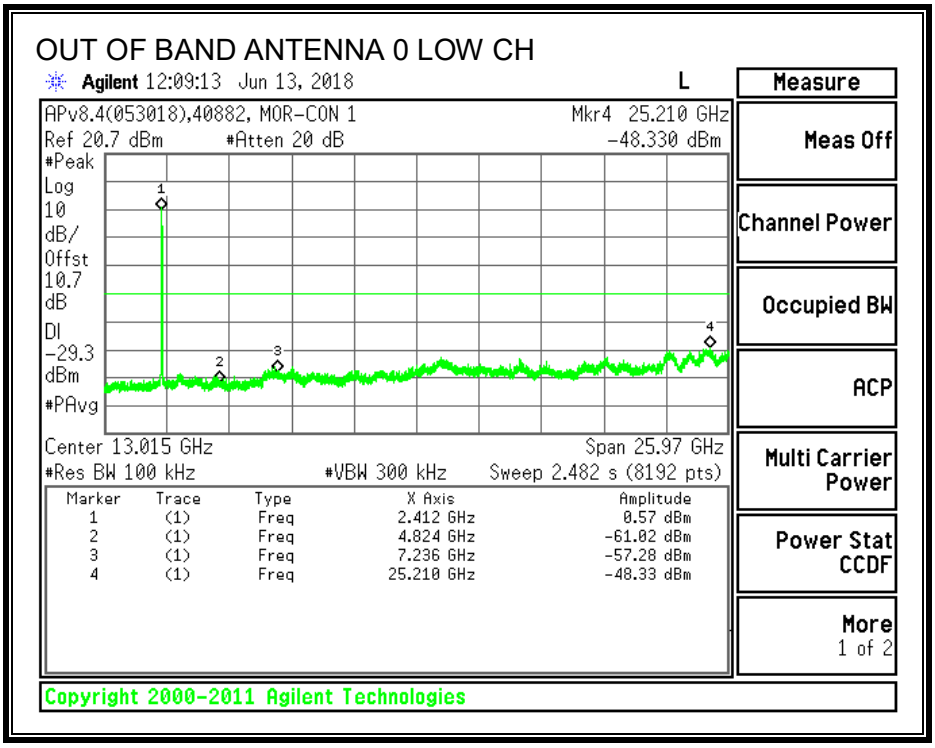


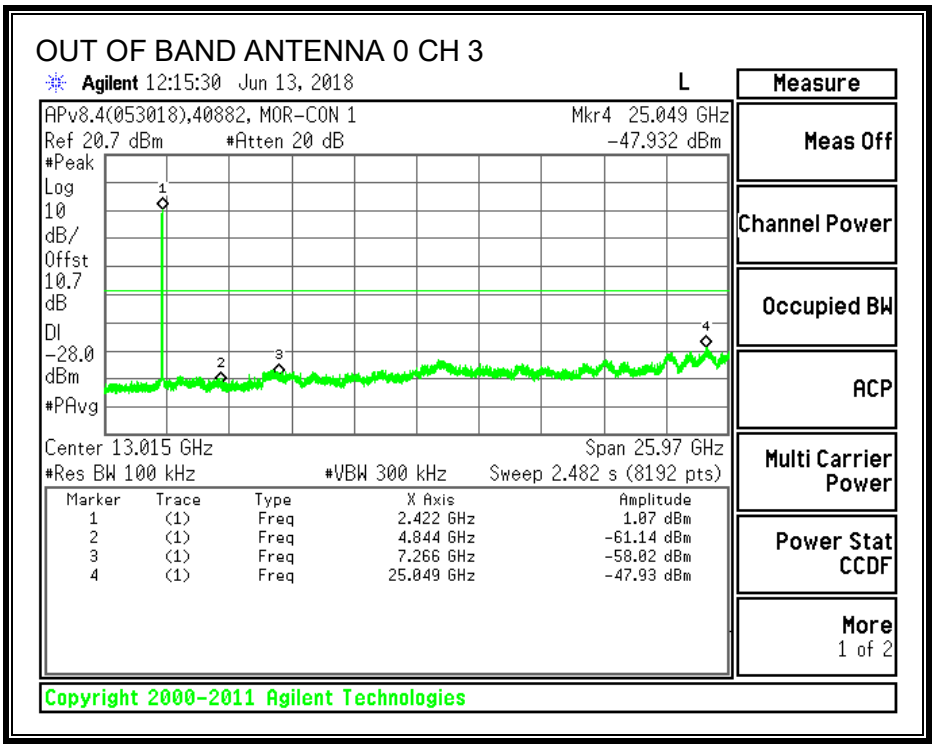
HIGH BANDEDGE, ANTENNA 0



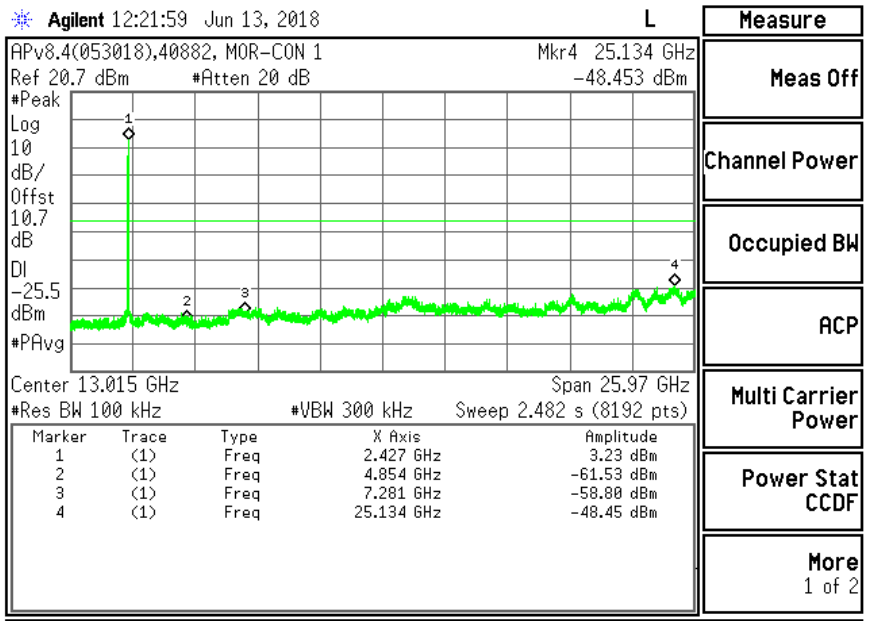


OUT-OF-BAND EMISSIONS, ANTENNA 0

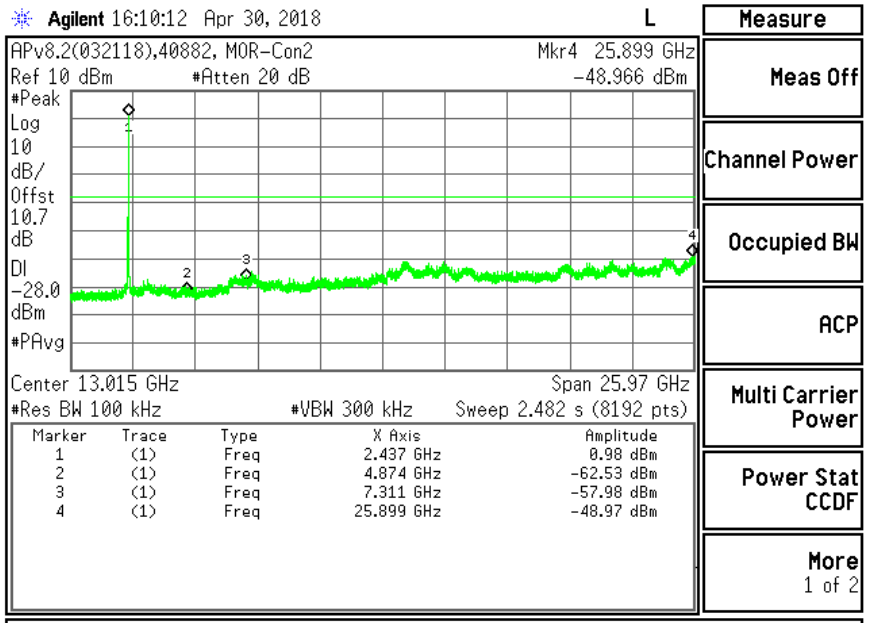




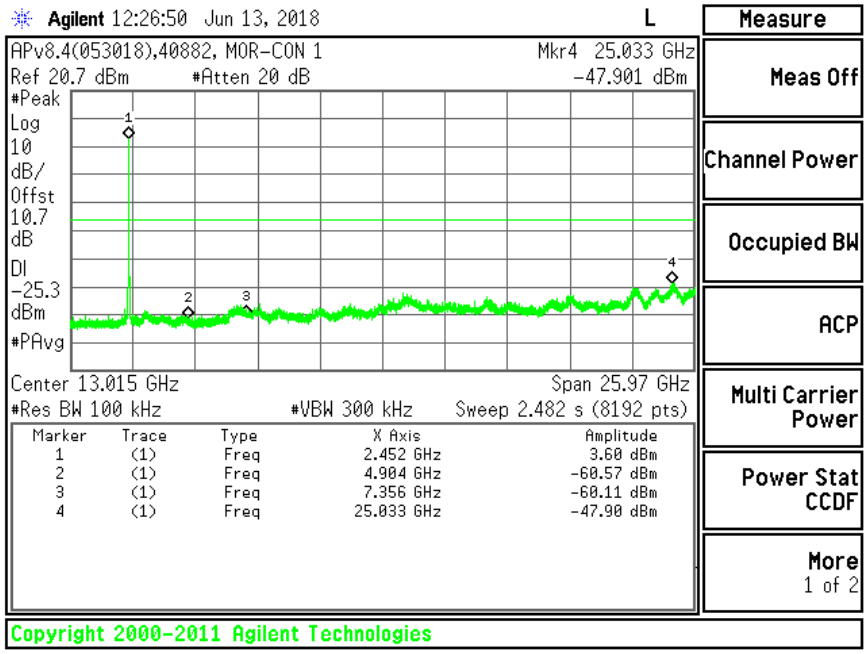
OUT OF BAND ANTENNA 0 CH 4



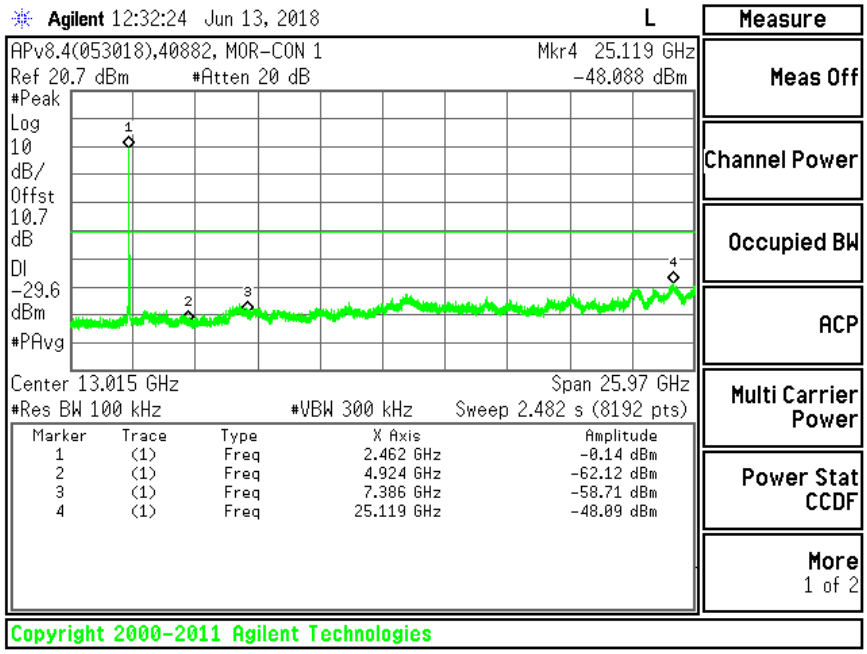
OUT OF BAND ANTENNA 0 MID CH



OUT OF BAND ANTENNA 0 CH 9

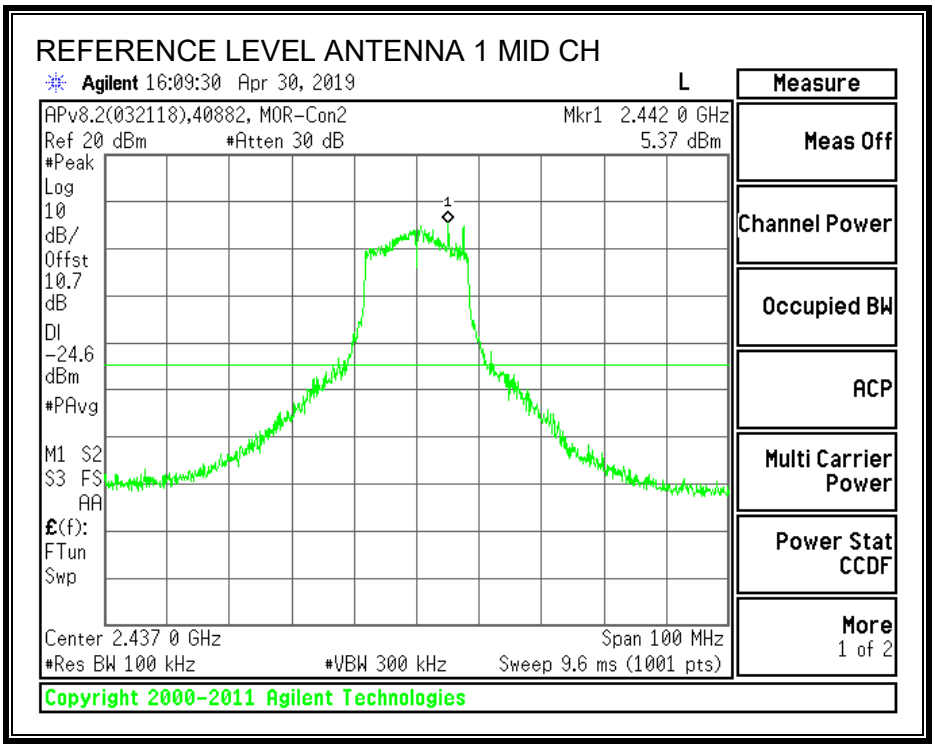


OUT OF BAND ANTENNA 0 HIGH CH

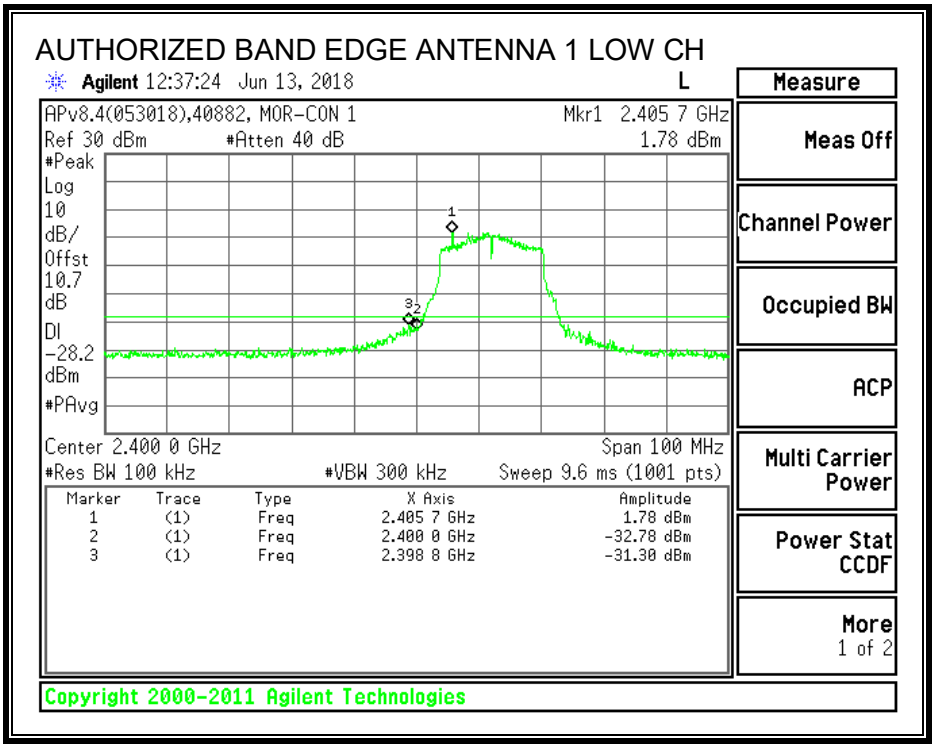


IN-BAND REFERENCE LEVEL, ANTENNA 1

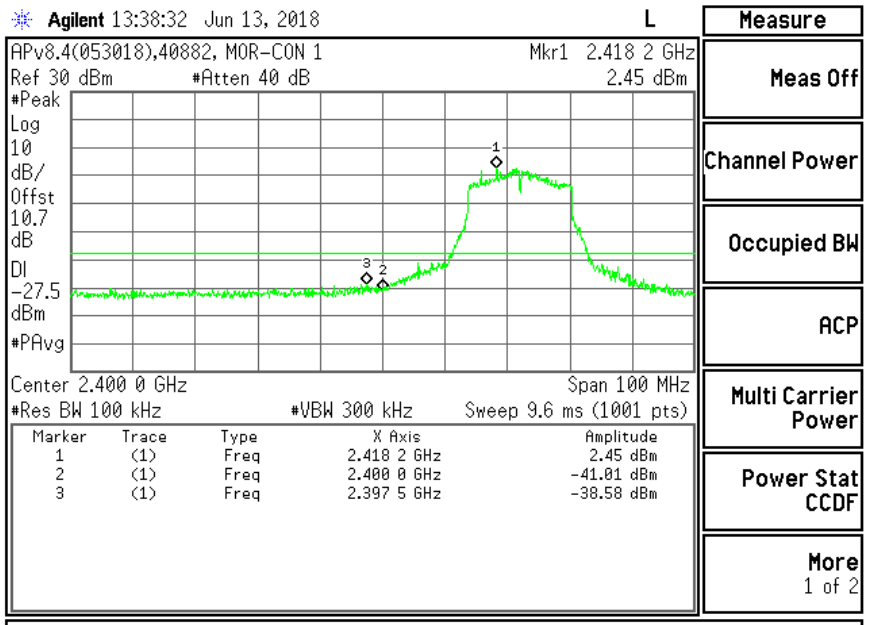
Note: Date should be Apr 30, 2018.



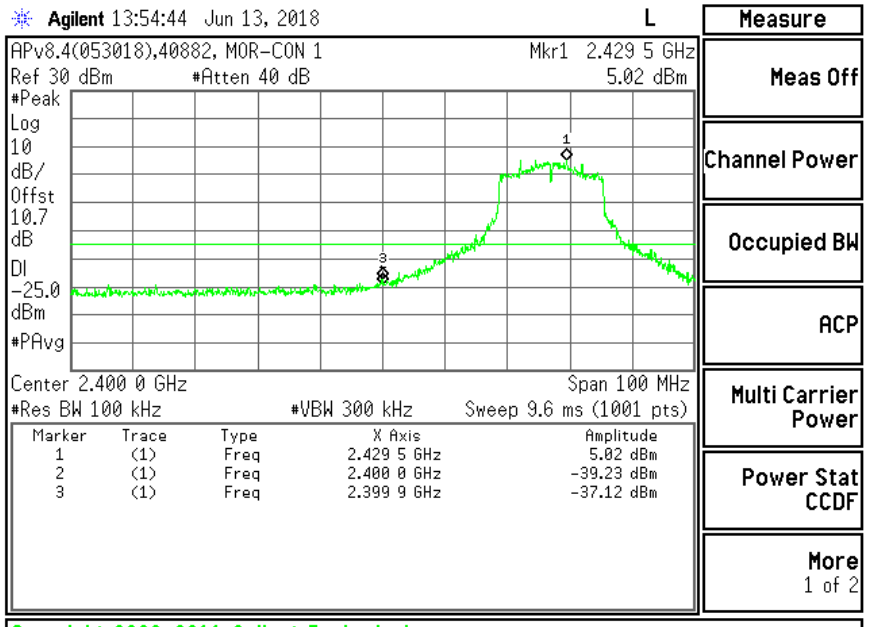
LOW BANDEDGE, ANTENNA 1



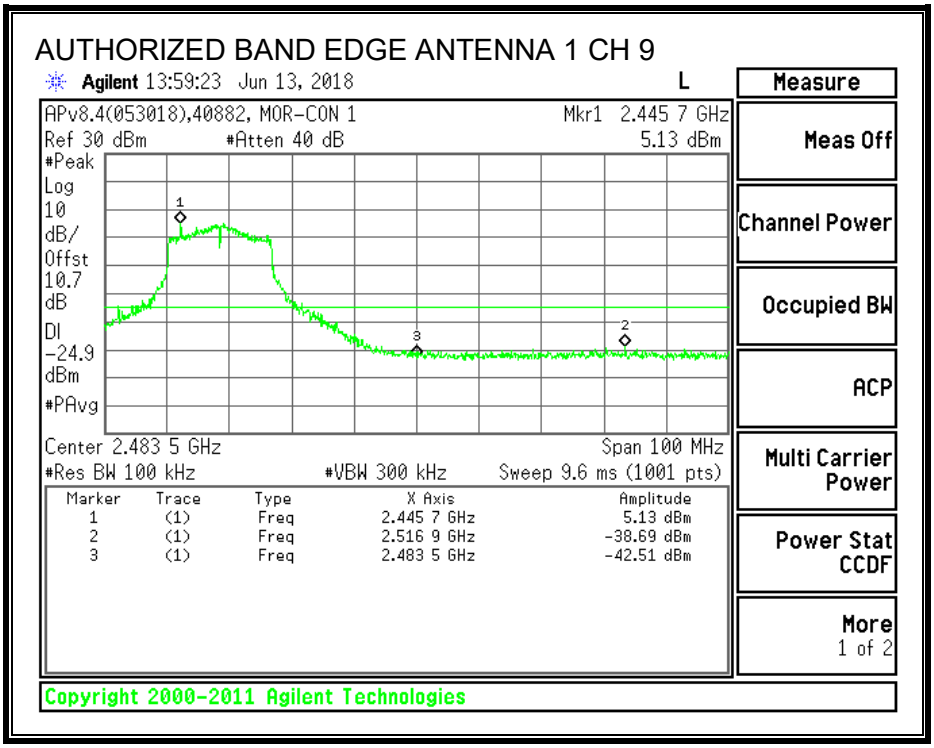
AUTHORIZED BAND EDGE ANTENNA 1 CH 3

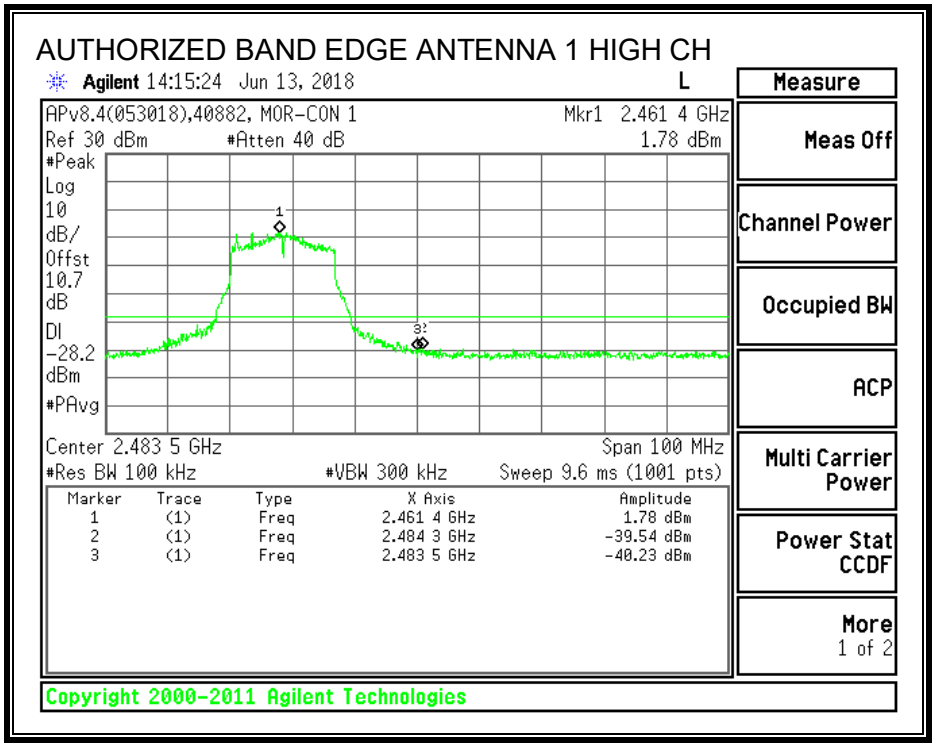


AUTHORIZED BAND EDGE ANTENNA 1 CH 4



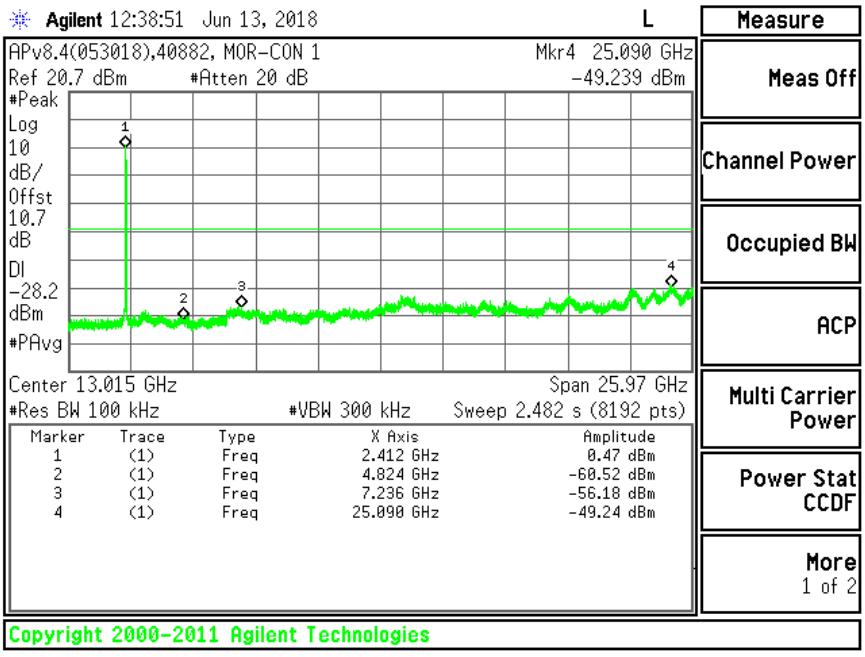
HIGH BANDEDGE, ANTENNA 1



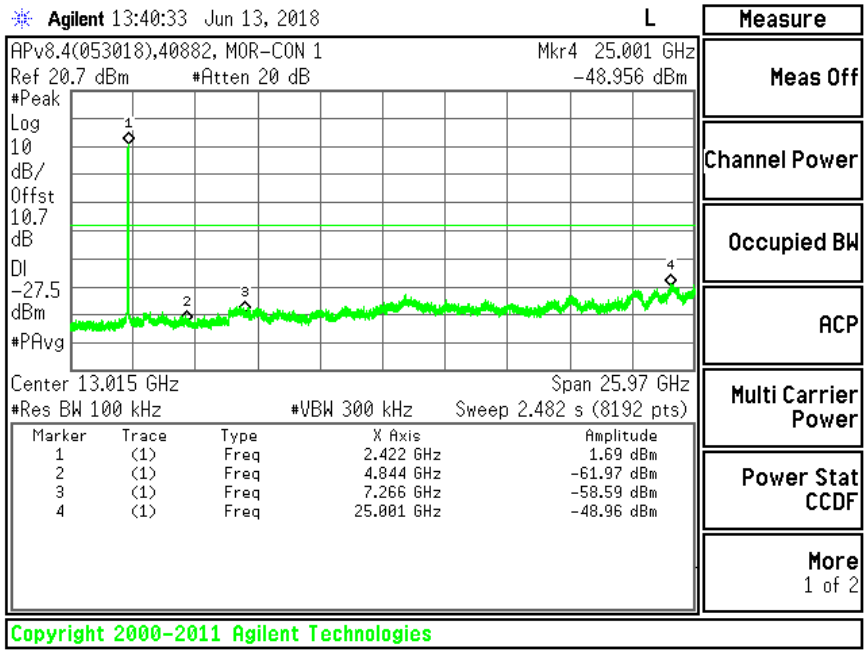


OUT-OF-BAND EMISSIONS, ANTENNA 1

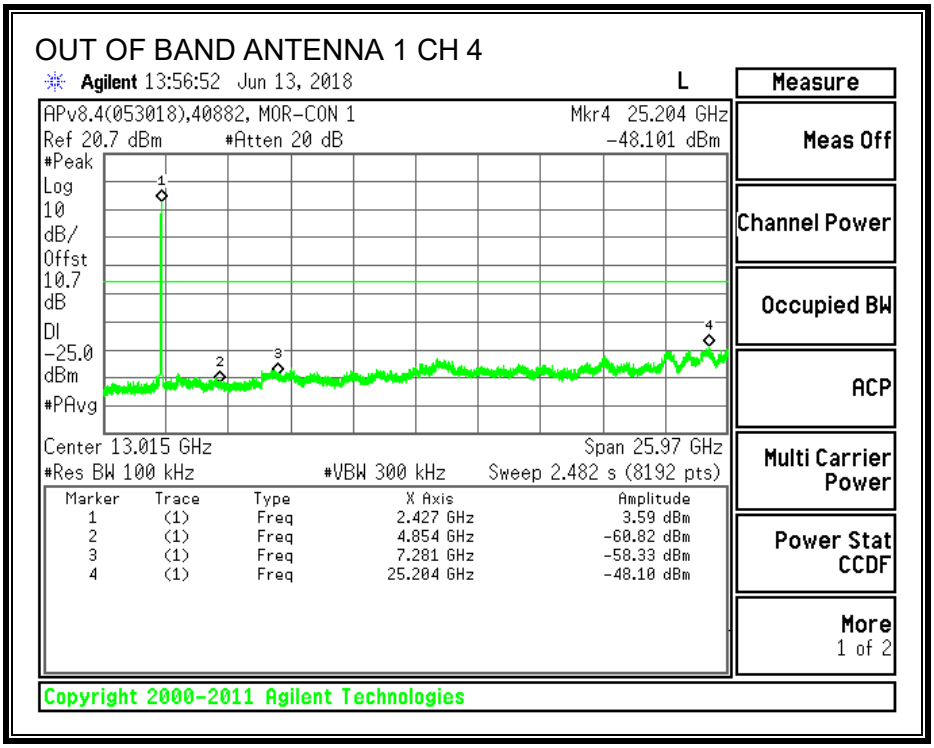
OUT OF BAND ANTENNA 1 LOW CH



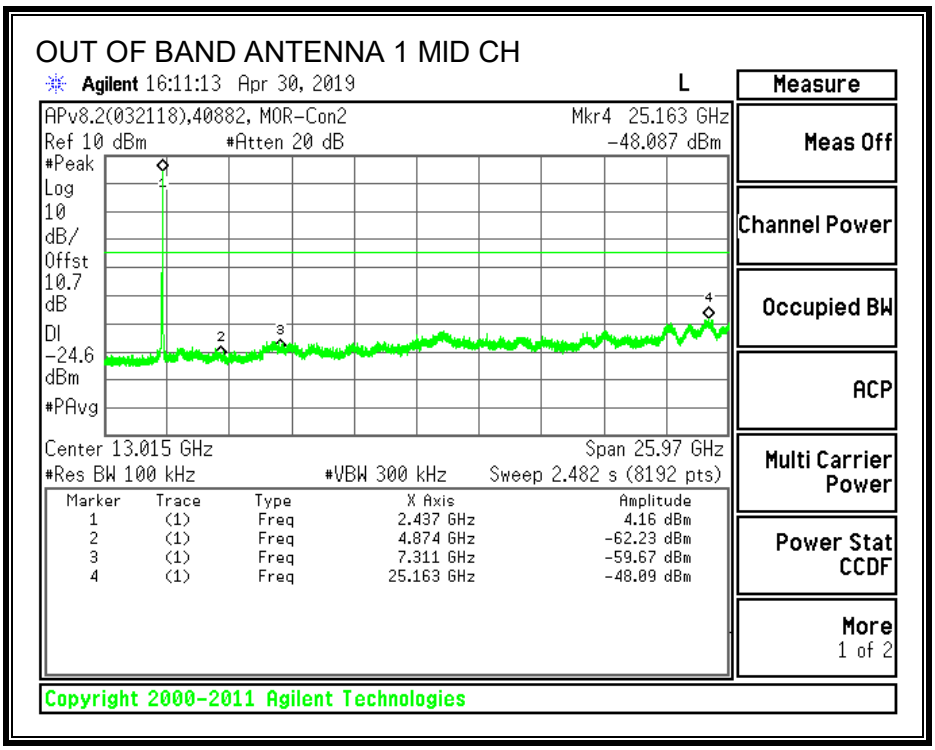
OUT OF BAND ANTENNA 1 CH 3



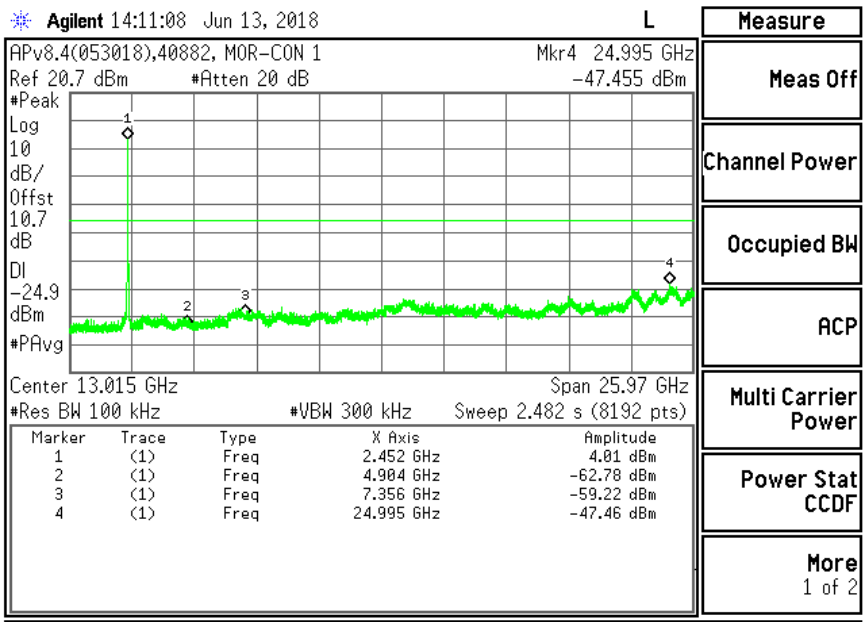
OUT OF BAND ANTENNA 1 CH 4



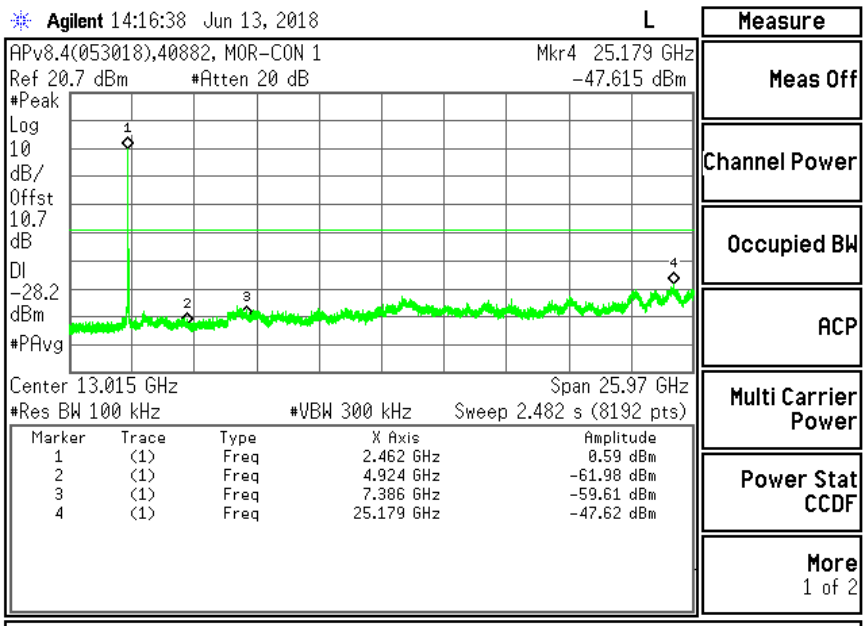
OUT OF BAND ANTENNA 1 MID CH



OUT OF BAND ANTENNA 1 CH 9



OUT OF BAND ANTENNA 1 HIGH CH



8.4. 802.11n HT20 MODE IN THE 2.4 GHz BAND

8.4.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

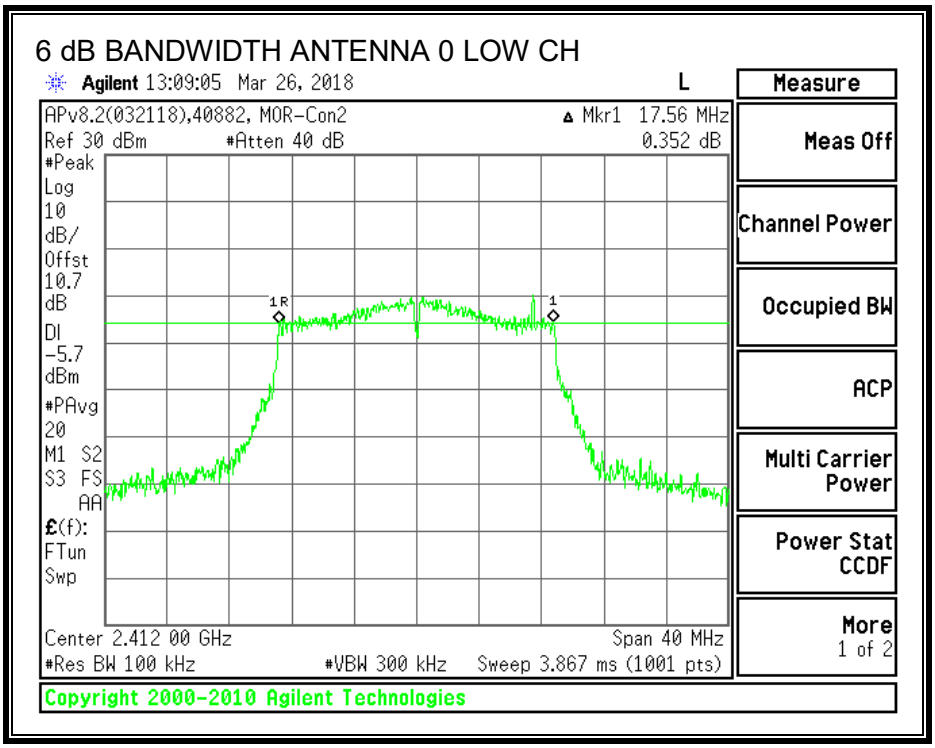
ISED RSS-247 Clause 5.2 (a)

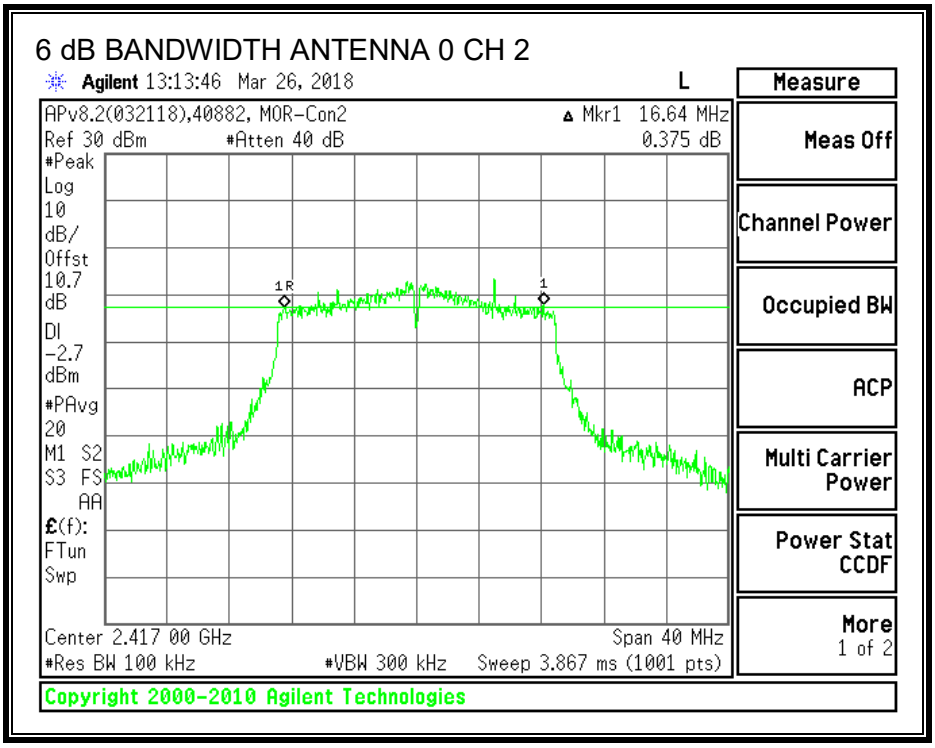
The minimum 6 dB bandwidth shall be at least 500 kHz.

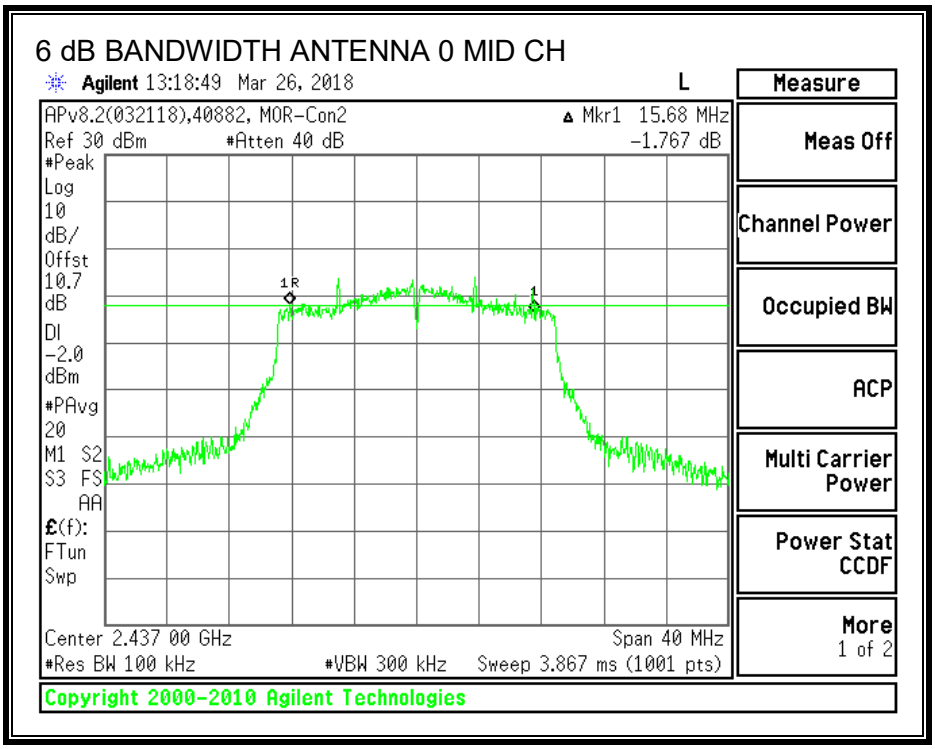
RESULTS - MODULE 1

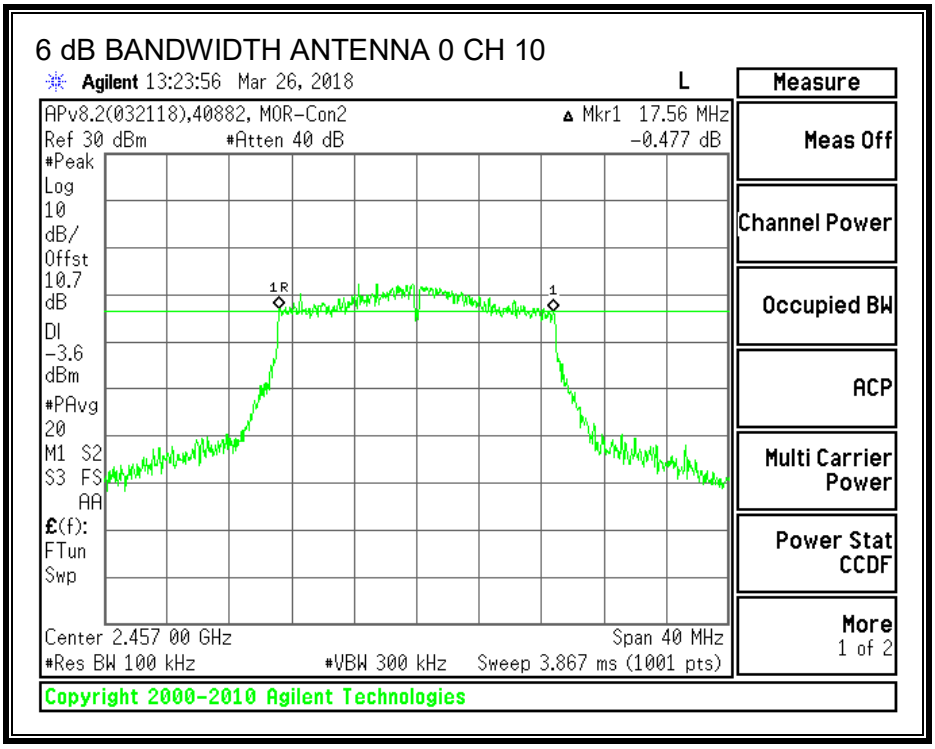
Channel	Frequency (MHz)	6 dB BW Ant 0 (MHz)	6 dB BW Ant 1 (MHz)	Minimum Limit (MHz)
Low	2412	17.560	16.720	0.5
2	2417	16.640	15.040	0.5
Mid	2437	15.680	15.400	0.5
10	2457	17.560	16.960	0.5
High	2462	16.120	16.320	0.5

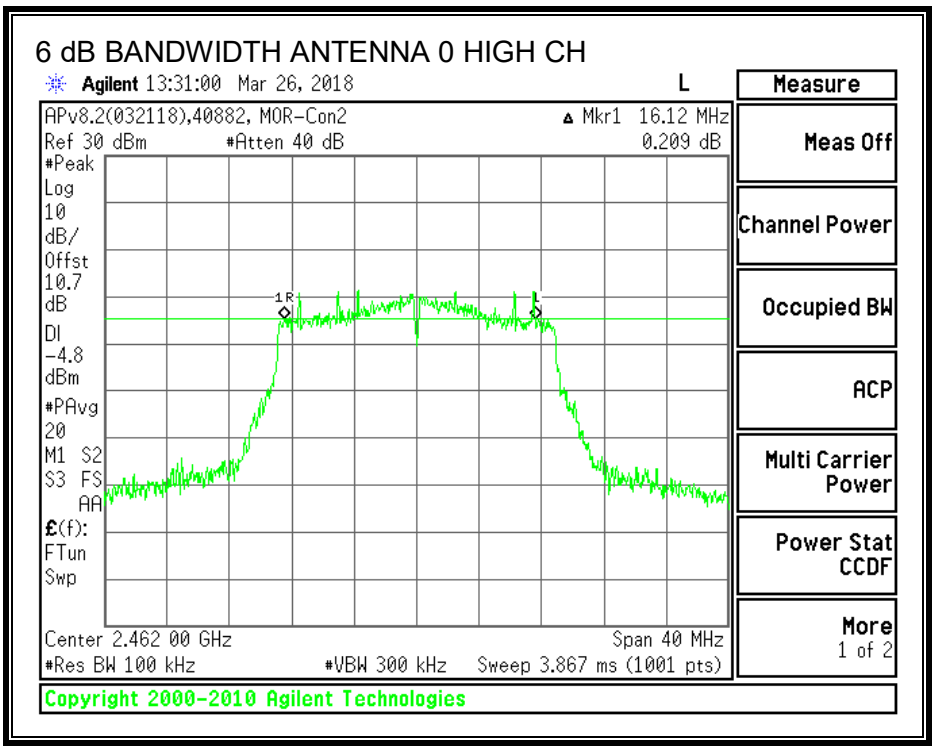
6 dB BANDWIDTH - MODULE 1, ANTENNA 0



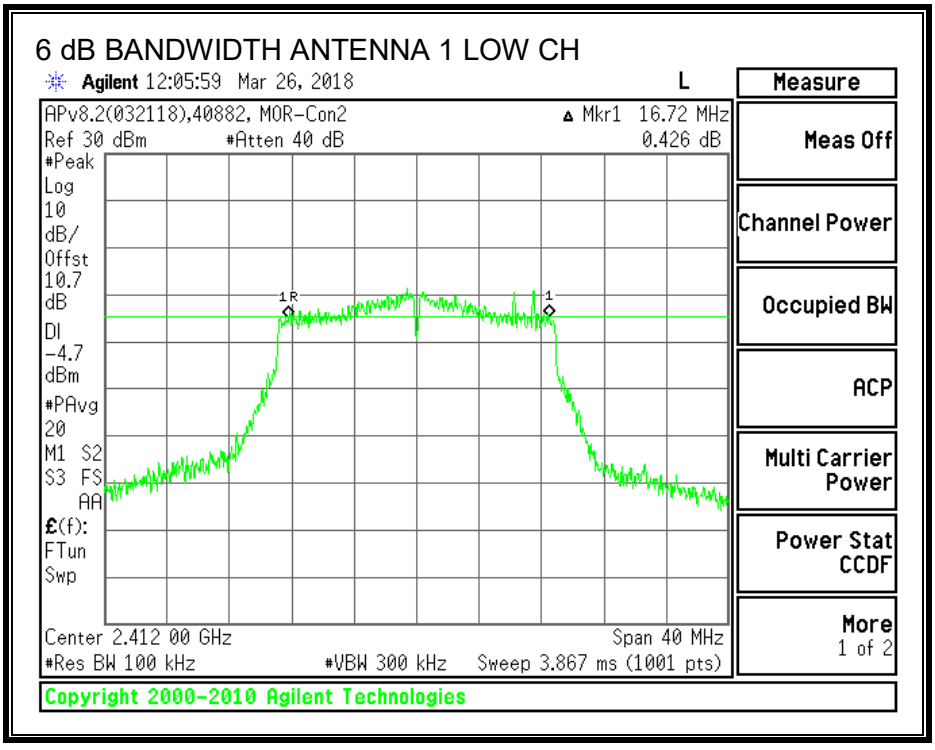




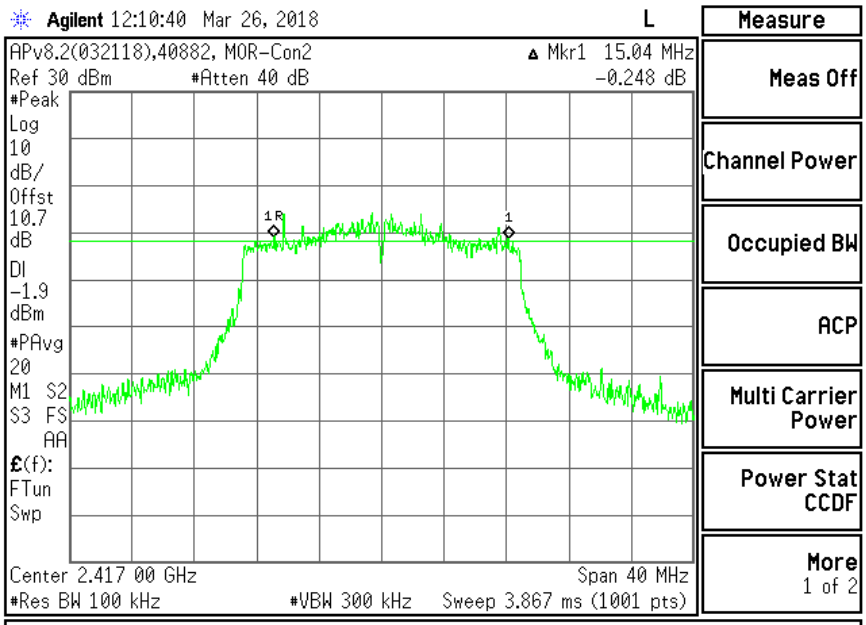




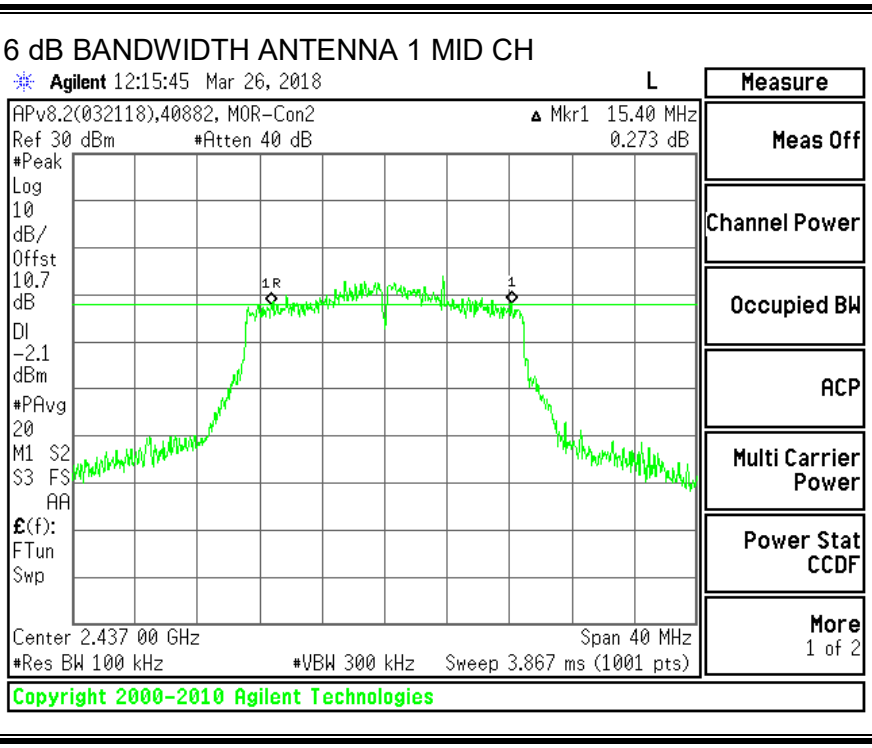
6 dB BANDWIDTH - MODULE 1, ANTENNA 1



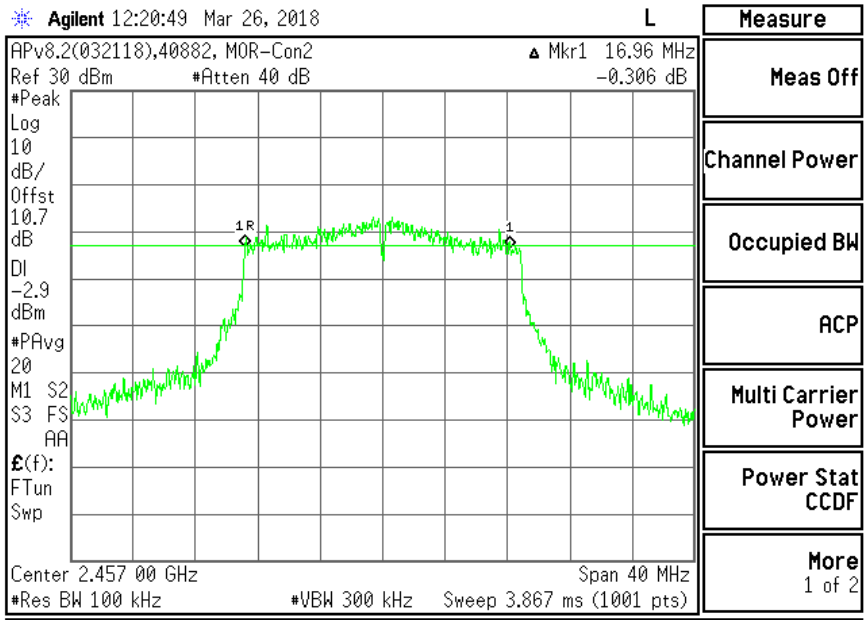
6 dB BANDWIDTH ANTENNA 1 CH 2



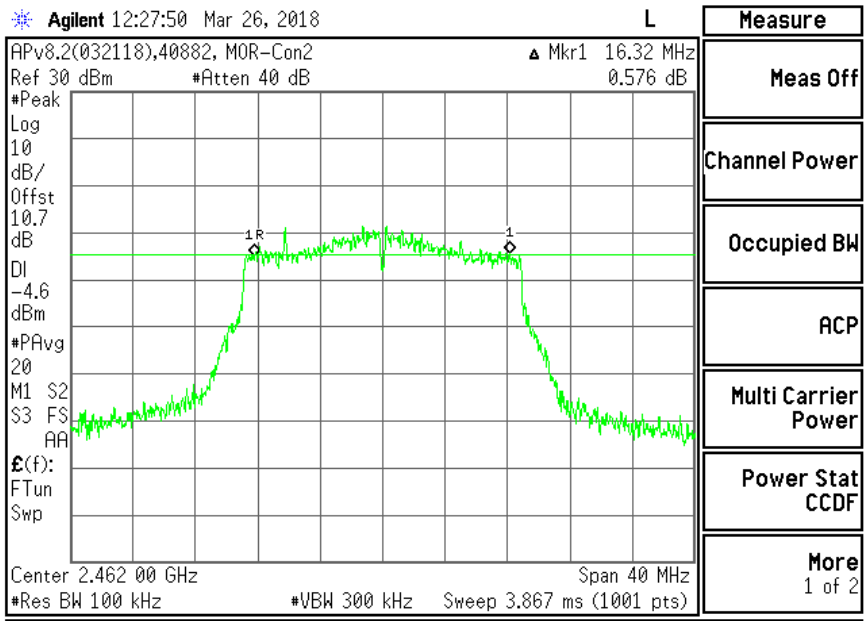
6 dB BANDWIDTH ANTENNA 1 MID CH



6 dB BANDWIDTH ANTENNA 1 CH 10



6 dB BANDWIDTH ANTENNA 1 HIGH CH



8.4.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

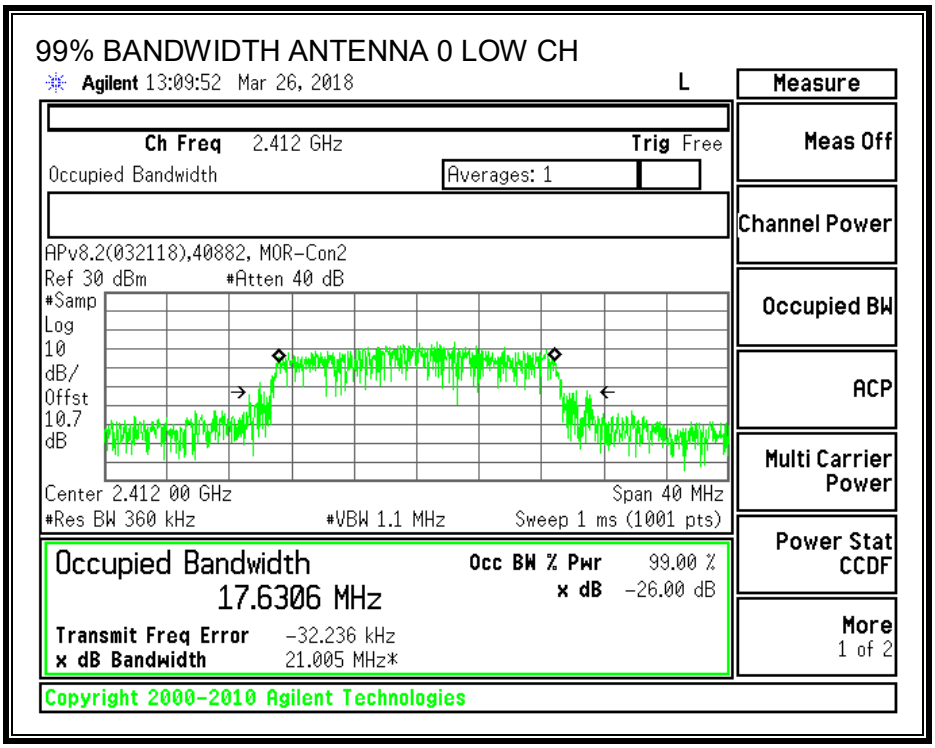
TEST PROCEDURE

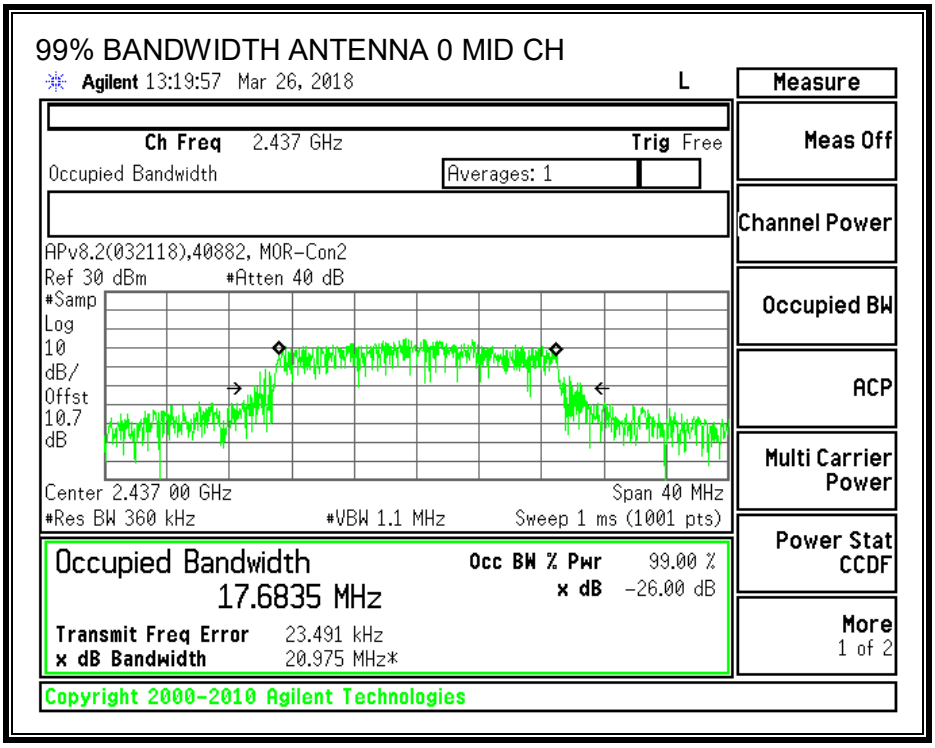
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 5% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

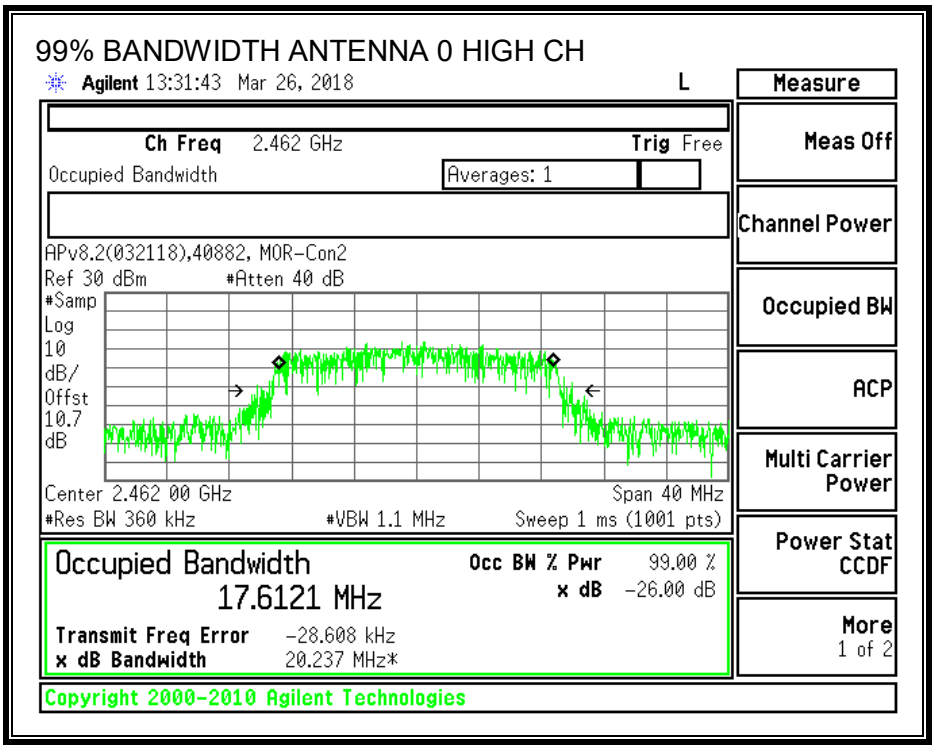
RESULTS – MODULE 1

Channel	Frequency (MHz)	99% BW Ant 0 (MHz)	99% BW Ant 1 (MHz)
Low	2412	17.631	17.559
Mid	2437	17.684	17.604
High	2462	17.612	17.631

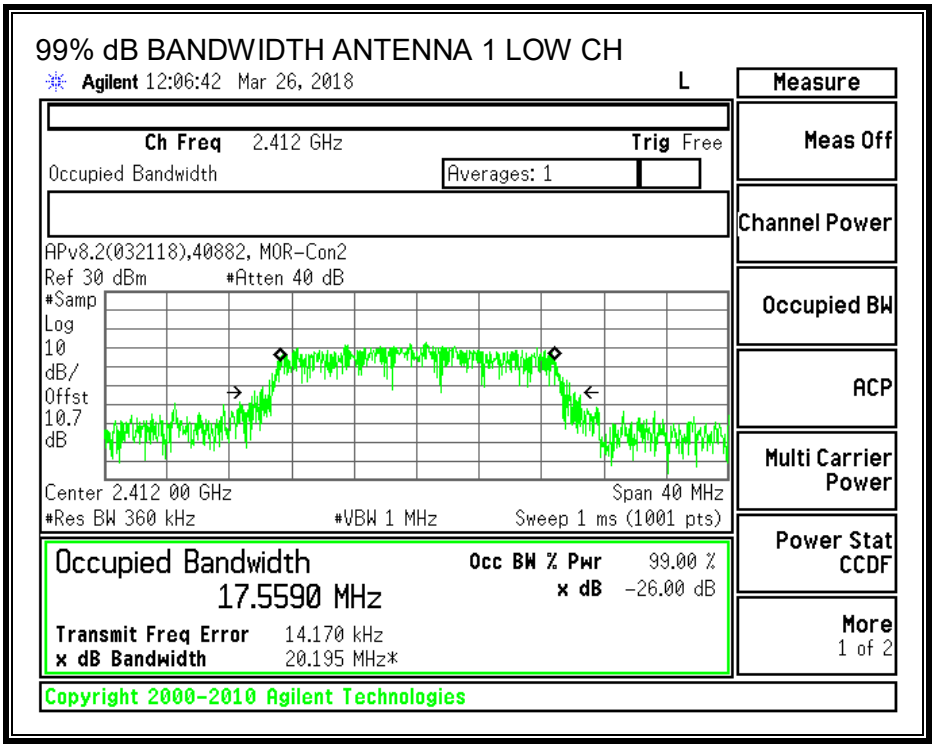
99% BANDWIDTH - MODULE 1, ANTENNA 0

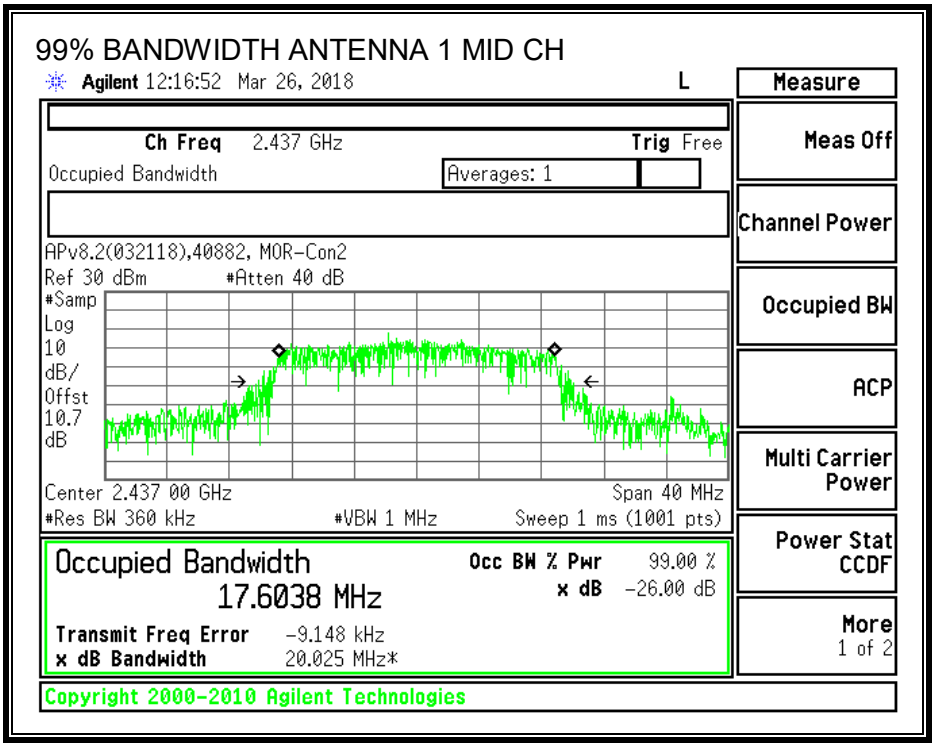


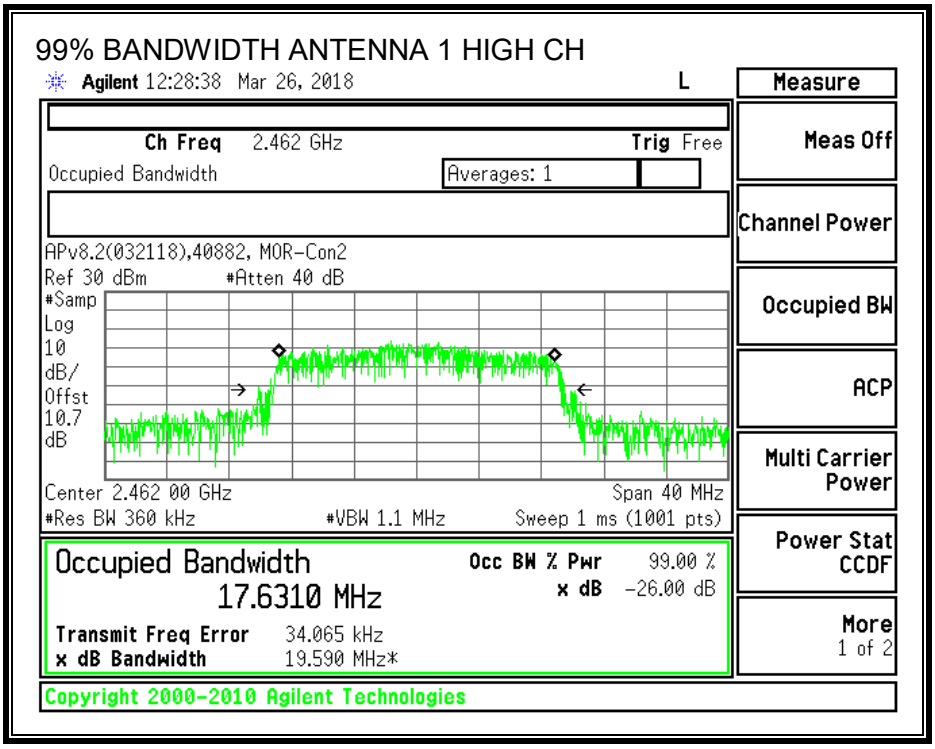




99% BANDWIDTH - MODULE 1, ANTENNA 1







8.4.3. OUTPUT POWER - MODULE 1

LIMITS

FCC §15.247 (b) (3)

ISED RSS-247 Clauses 5.4 (d)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RESULTS - SISO

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain. Used worst-case gain of 1.54dBi.

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	1.54	30.00	30	36	30.00
Mid	2437	1.54	30.00	30	36	30.00
High	2462	1.54	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Antenna 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	11.27	11.27	30.00	-18.73
2	2417	11.28	11.28	30.00	-18.72
3	2422	14.60	14.60	30.00	-15.40
Mid	2437	14.89	14.89	30.00	-15.11
9	2452	14.88	14.88	30.00	-15.12
10	2457	11.31	11.31	30.00	-18.69
High	2462	11.46	11.46	30.00	-18.54

Results

Channel	Frequency (MHz)	Antenna 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	12.72	12.72	30.00	-17.28
2	2417	12.69	12.69	30.00	-17.31
3	2422	15.58	15.58	30.00	-14.42
Mid	2437	15.56	15.56	30.00	-14.44
9	2452	15.51	15.51	30.00	-14.49
10	2457	12.45	12.45	30.00	-17.55
High	2462	12.48	12.48	30.00	-17.52

RESULTS – MIMO SDM/TxBF

DIRECTIONAL ANTENNA GAIN

Ant 1 Antenna Gain (dBi)	Ant 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
1.54	0.40	4.00

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	4.00	30.00	30	36	30.00
Mid	2437	4.00	30.00	30	36	30.00
High	2462	4.00	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Ant 0 Meas Power (dBm)	Ant 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margi (dB)
Low	2412	11.75	12.65	15.23	30.00	-14.77
2	2417	14.04	14.81	17.45	30.00	-12.55
3	2422	14.11	14.71	17.43	30.00	-12.57
Mid	2437	14.24	14.54	17.40	30.00	-12.60
9	2452	14.26	14.56	17.42	30.00	-12.58
10	2457	14.16	14.67	17.43	30.00	-12.57
High	2462	11.73	12.37	15.07	30.00	-14.93

8.4.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

ISED RSS-247 Clause 5.2 (b)

RESULTS - MODULE 1

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

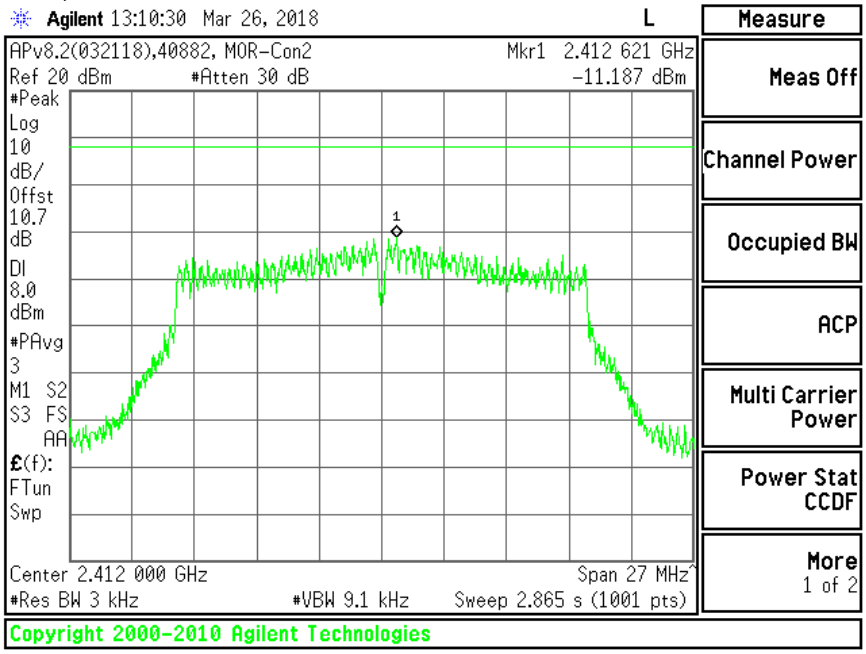
PSD Results

Channel	Frequency (MHz)	Ant 0 Meas (dBm)	Ant 1 Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-11.19	-11.38	-8.27	8.0	-16.3
2	2417	-8.42	-8.79	-5.59	8.0	-13.6
Mid	2437	-8.69	-9.26	-5.95	8.0	-14.0
10	2457	-8.22	-7.89	-5.04	8.0	-13.0
High	2462	-11.61	-10.47	-7.99	8.0	-16.0

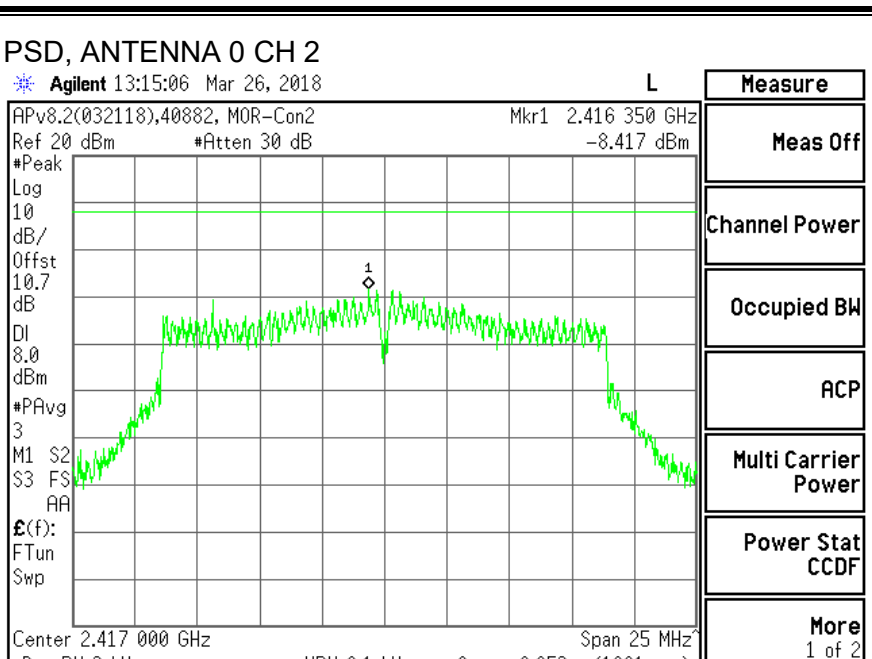
Note – This testing was performed in MIMO SDM mode since the per chain power is the same whether in SISO or MIMO modes.

PSD - MODULE 1, ANTENNA 0

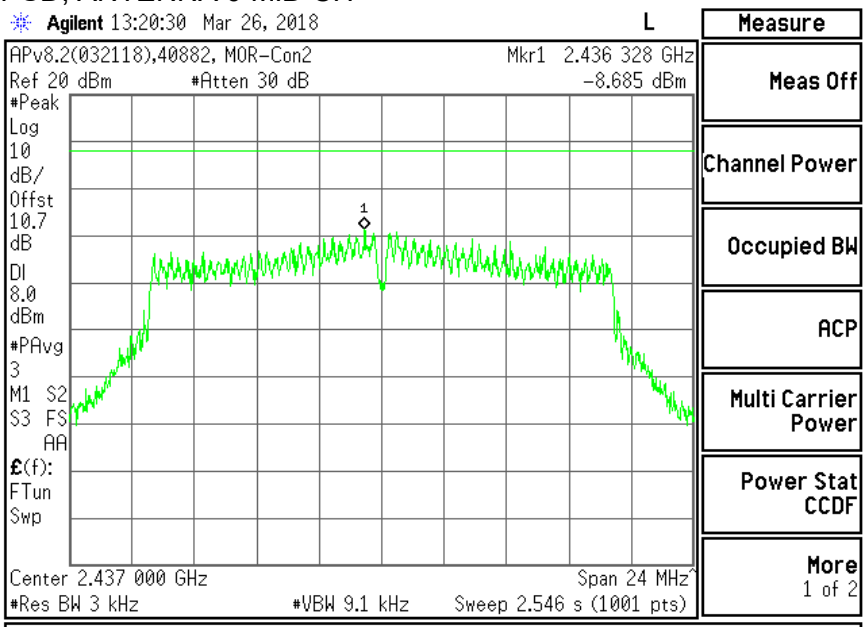
PSD, ANTENNA 0 LOW CH



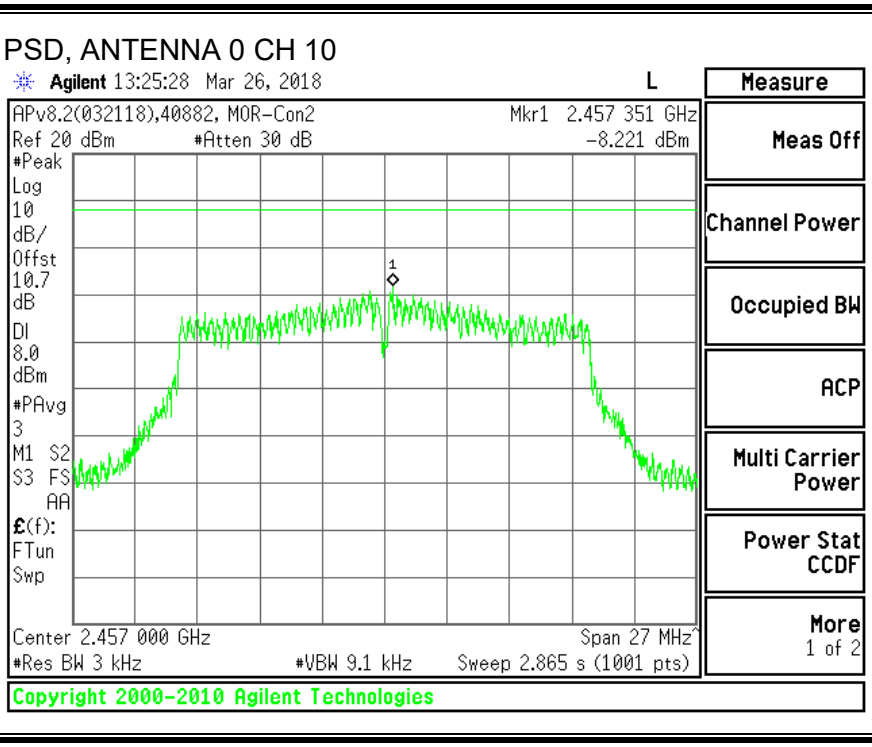
PSD, ANTENNA 0 CH 2

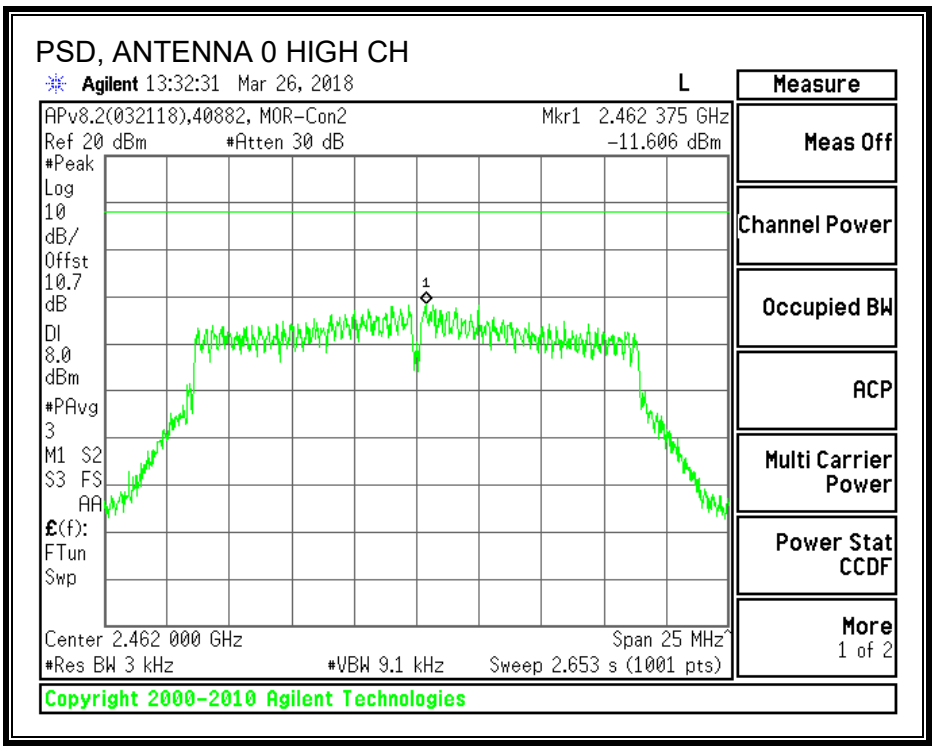


PSD, ANTENNA 0 MID CH

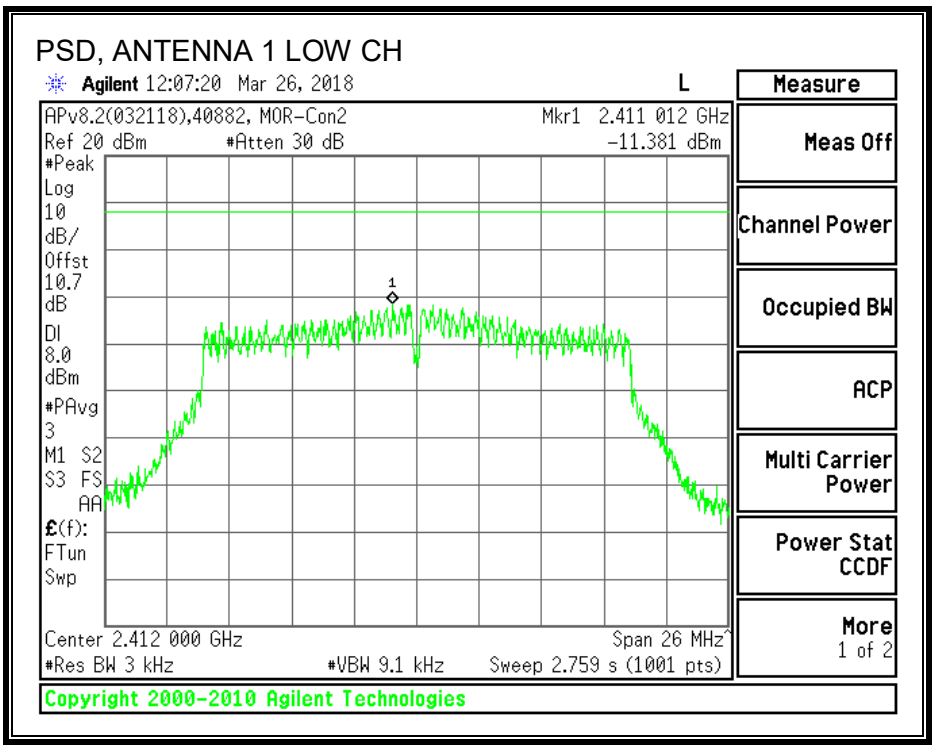


PSD, ANTENNA 0 CH 10

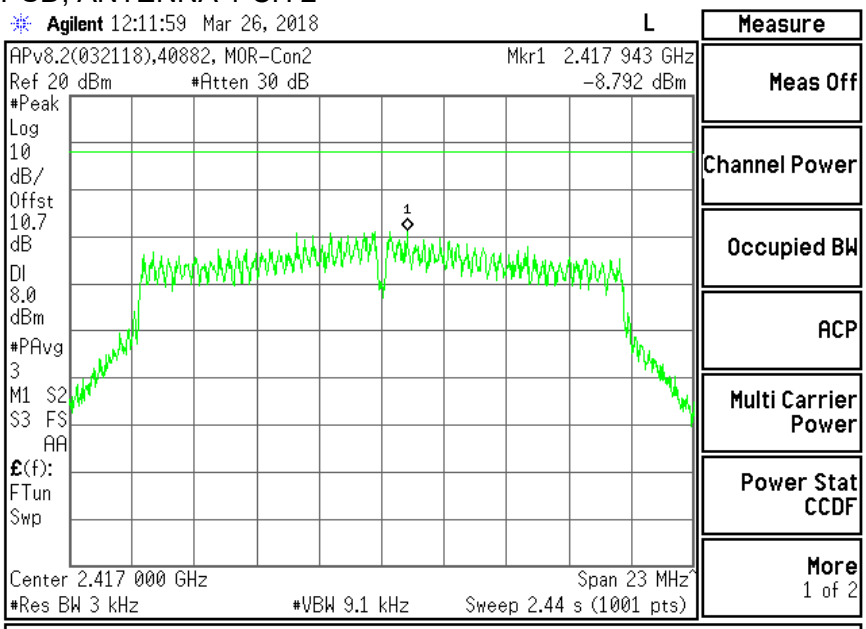




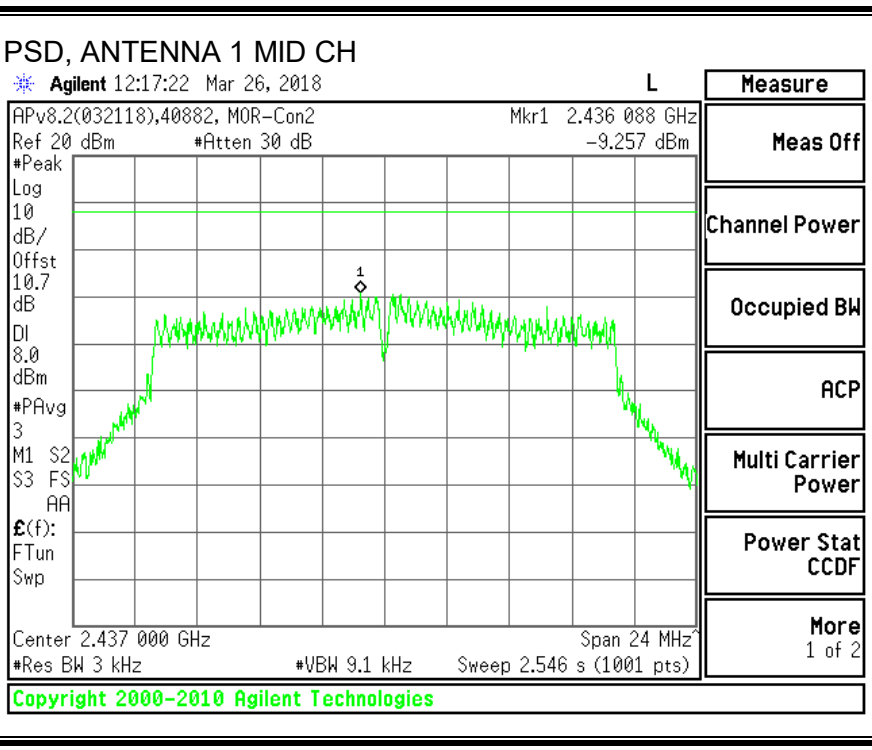
PSD, ANTENNA 1



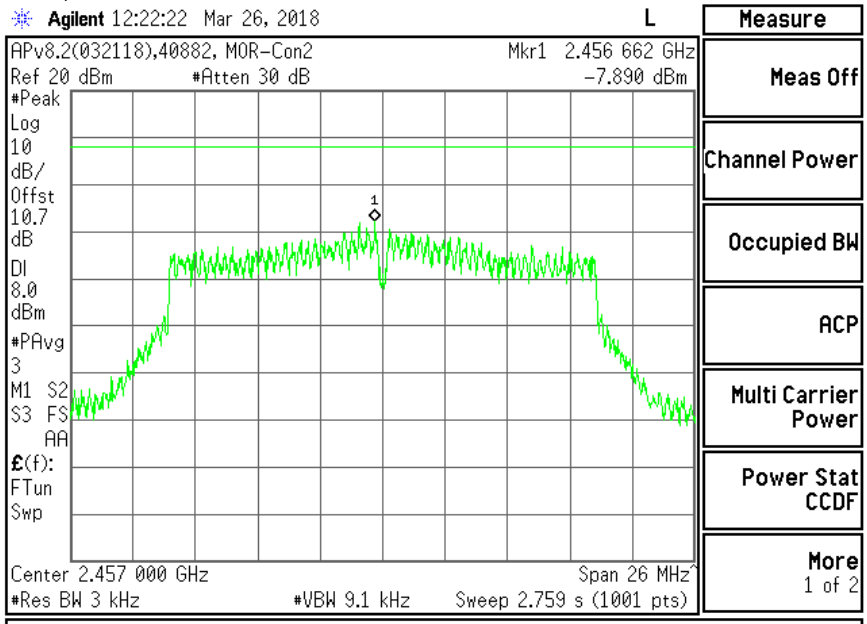
PSD, ANTENNA 1 CH 2



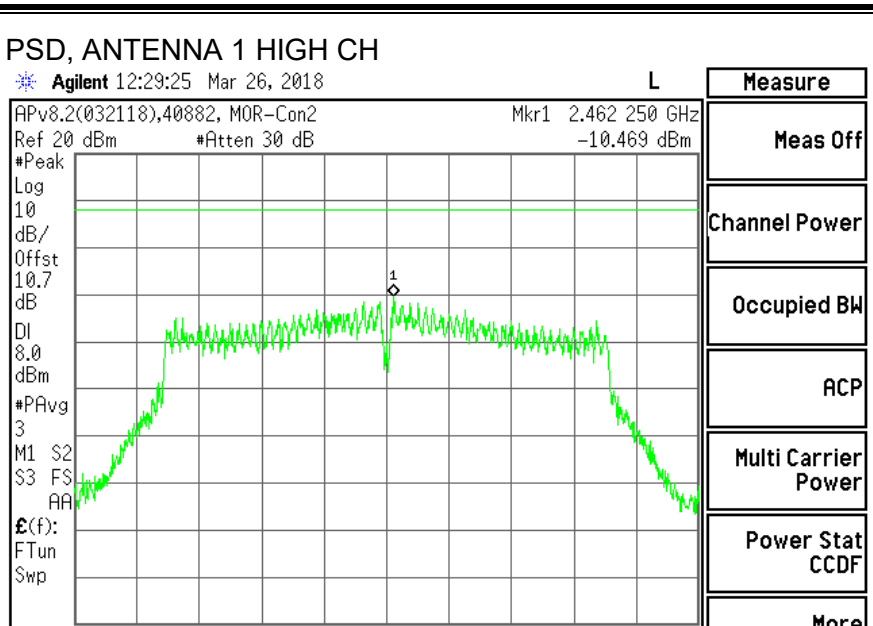
PSD, ANTENNA 1 MID CH



PSD, ANTENNA 1 CH 10



PSD, ANTENNA 1 HIGH CH



8.4.5. OUT-OF-BAND EMISSIONS

LIMITS

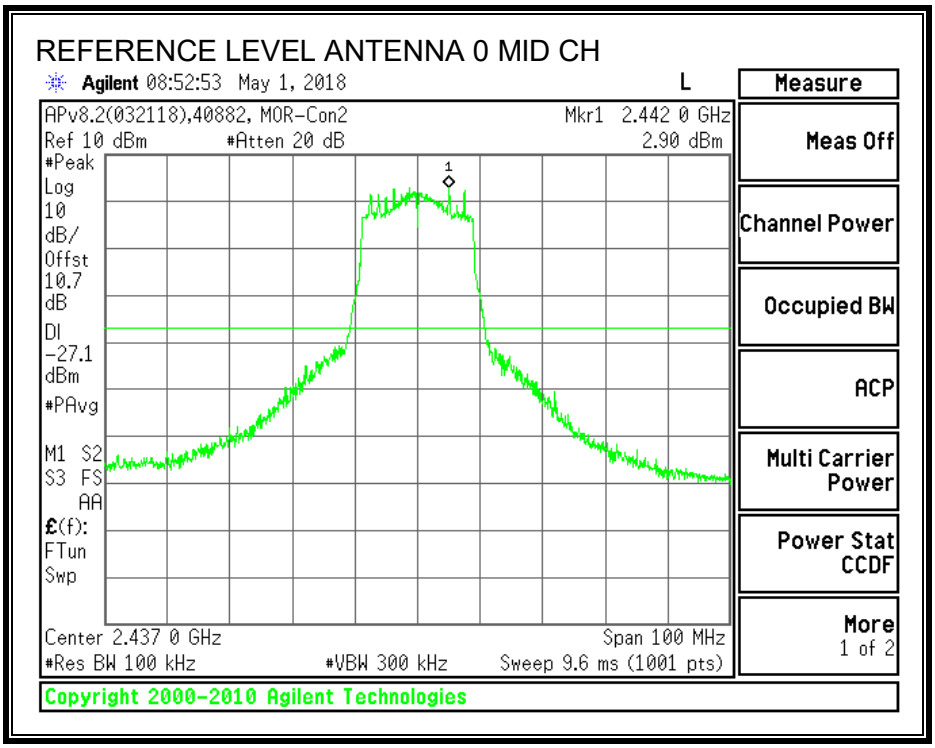
FCC §15.247 (d)

ISED RSS-247 Clause 5.5

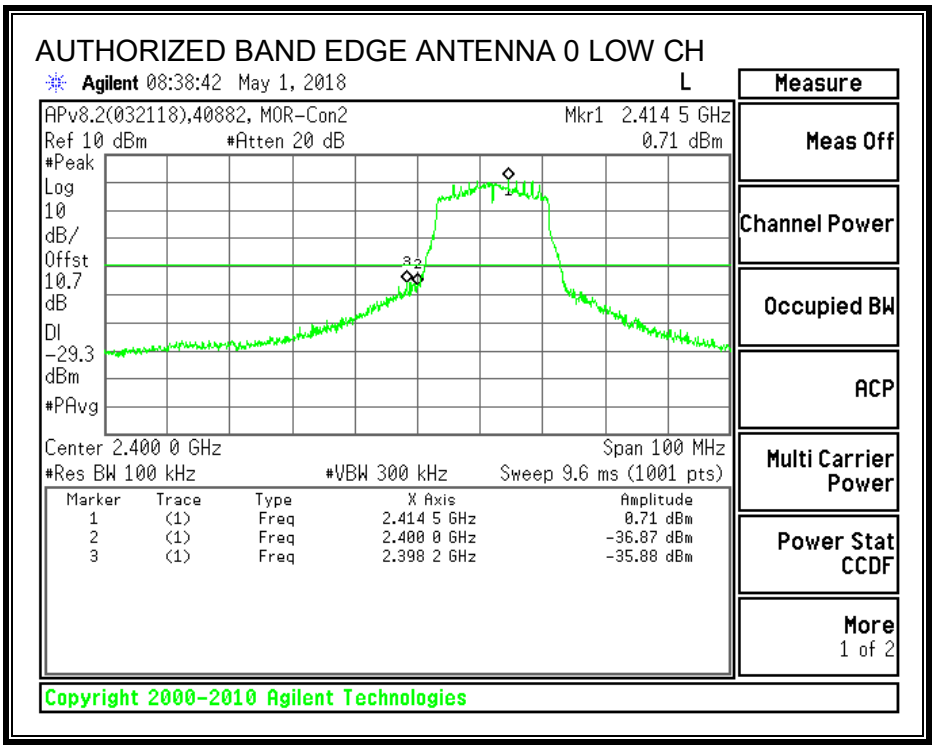
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

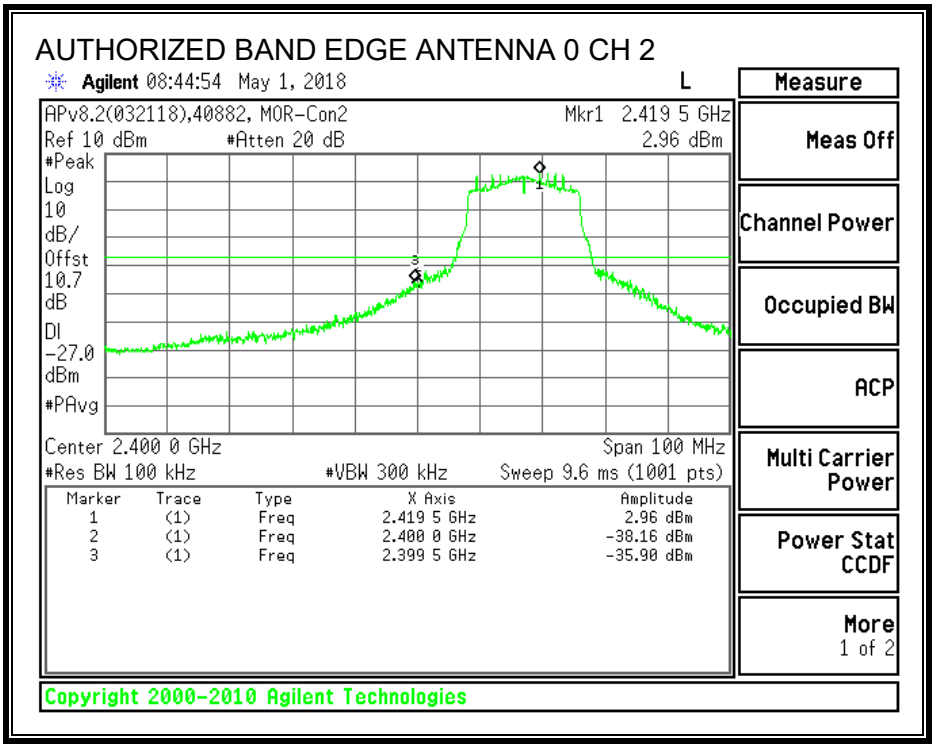
Note – The following testing was performed in MIMO SDM mode since the per chain power is the same whether in SISO or MIMO modes.

RESULTS - MODULE 1
IN-BAND REFERENCE LEVEL, ANTENNA 0

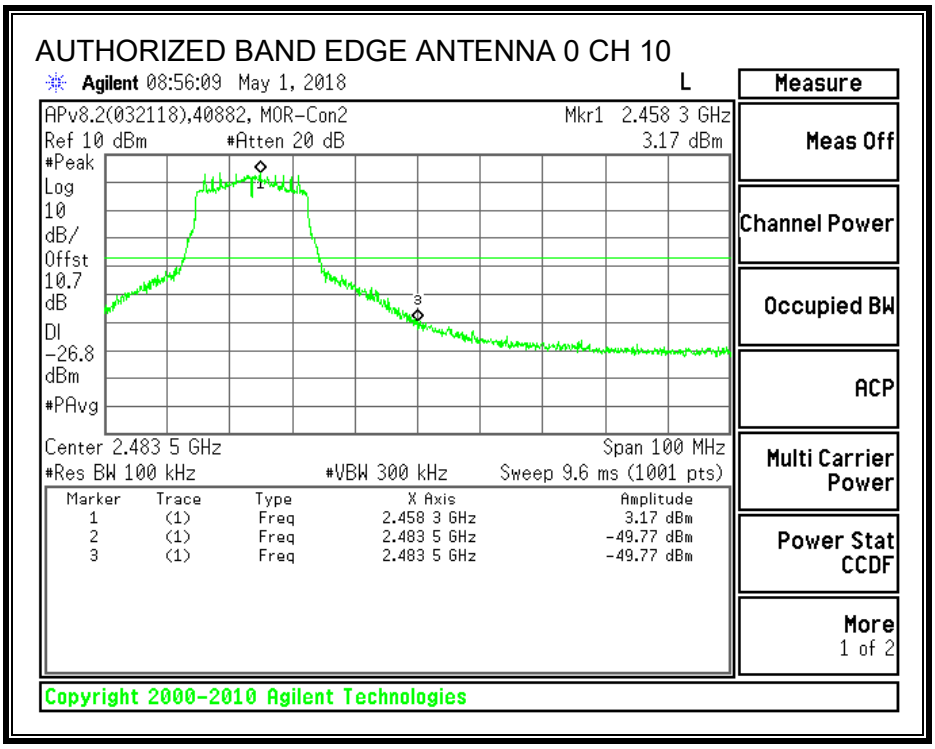


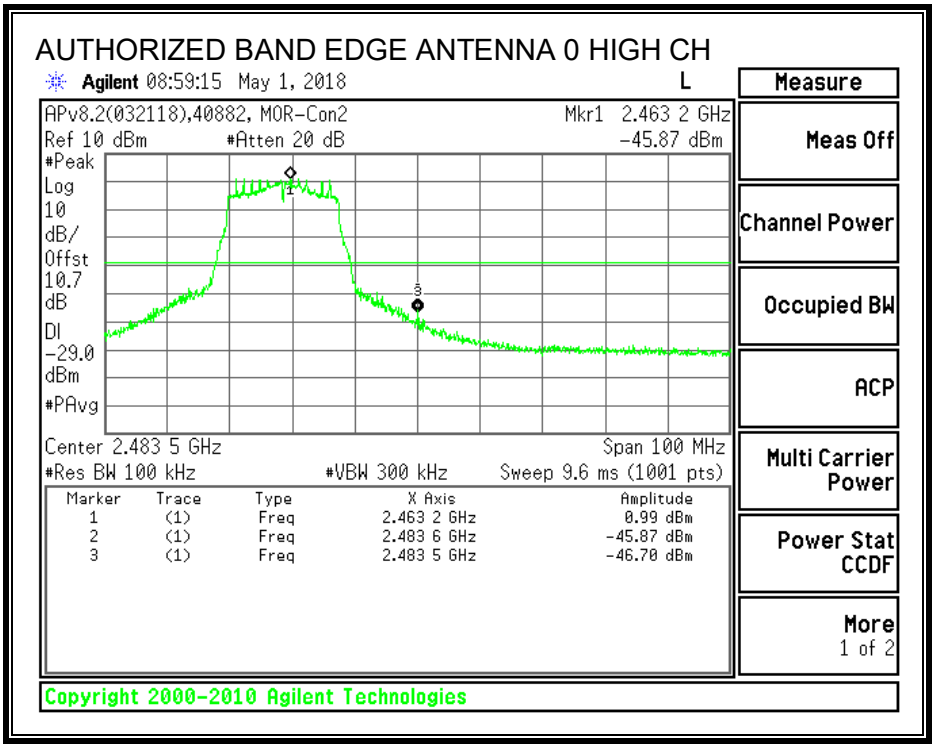
LOW BANDEDGE, ANTENNA 0



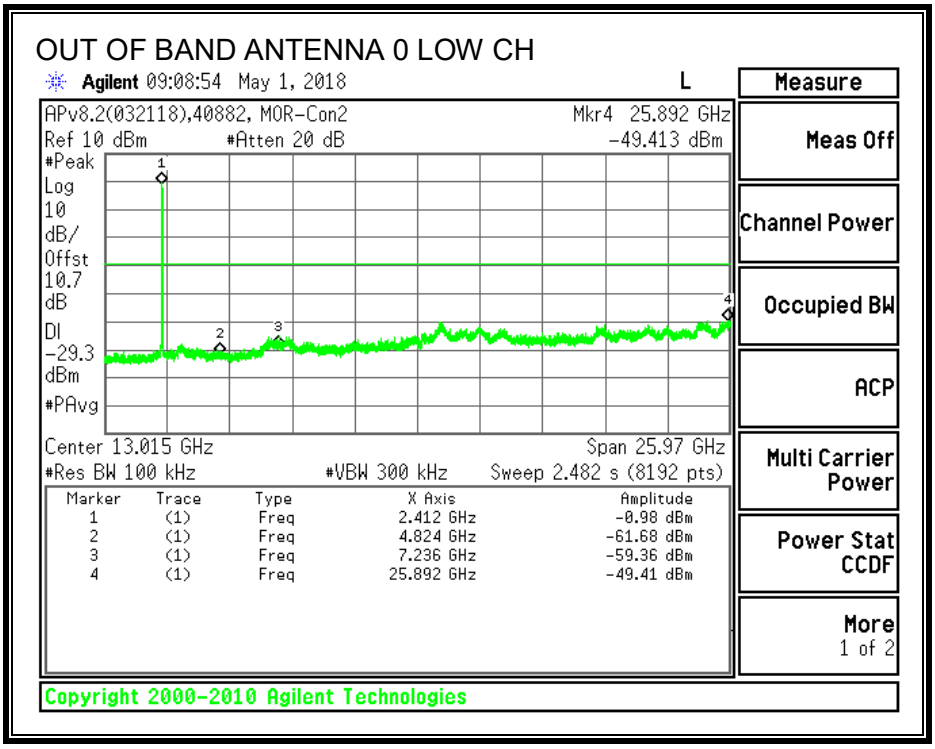


HIGH BANDEDGE, ANTENNA 0

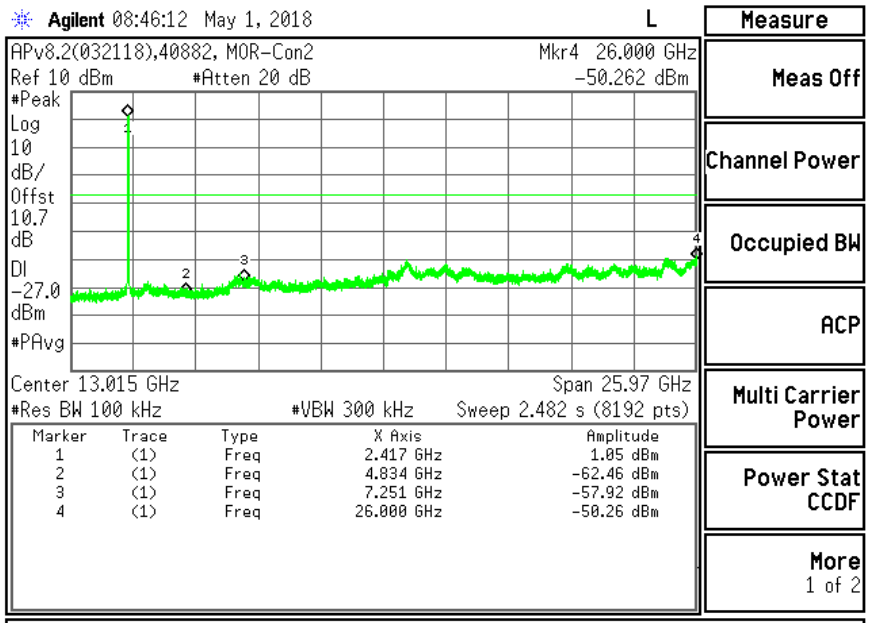




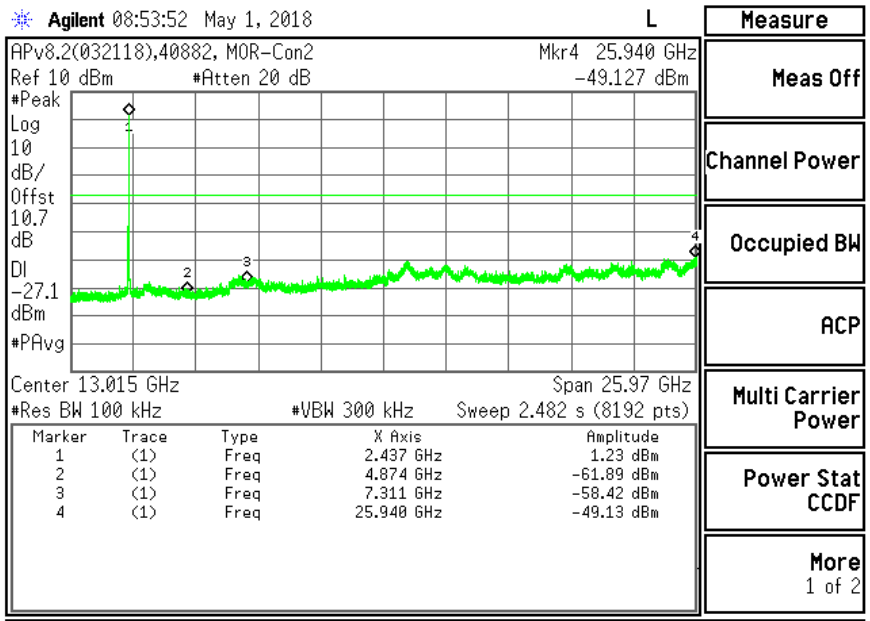
OUT-OF-BAND EMISSIONS, ANTENNA 0



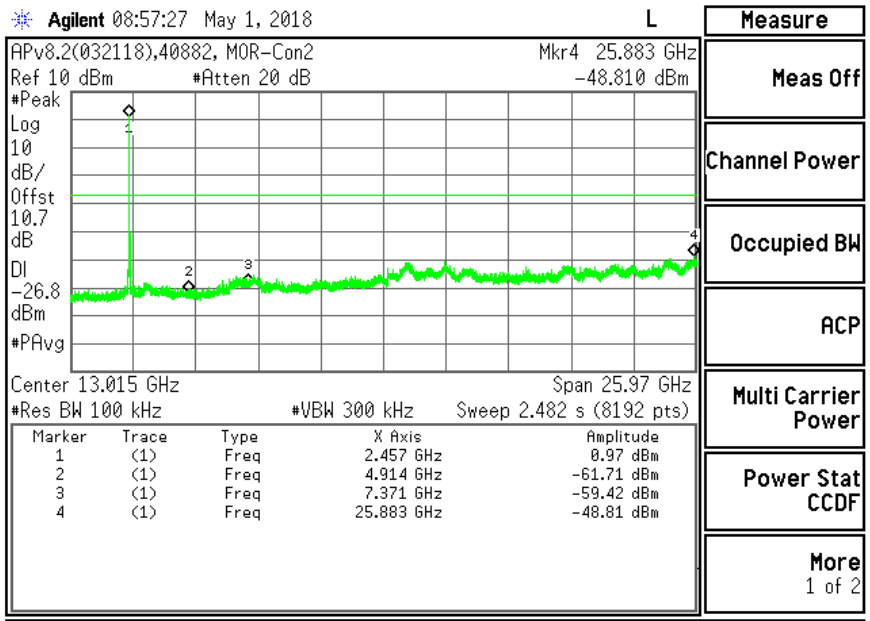
OUT OF BAND ANTENNA 0 CH 2



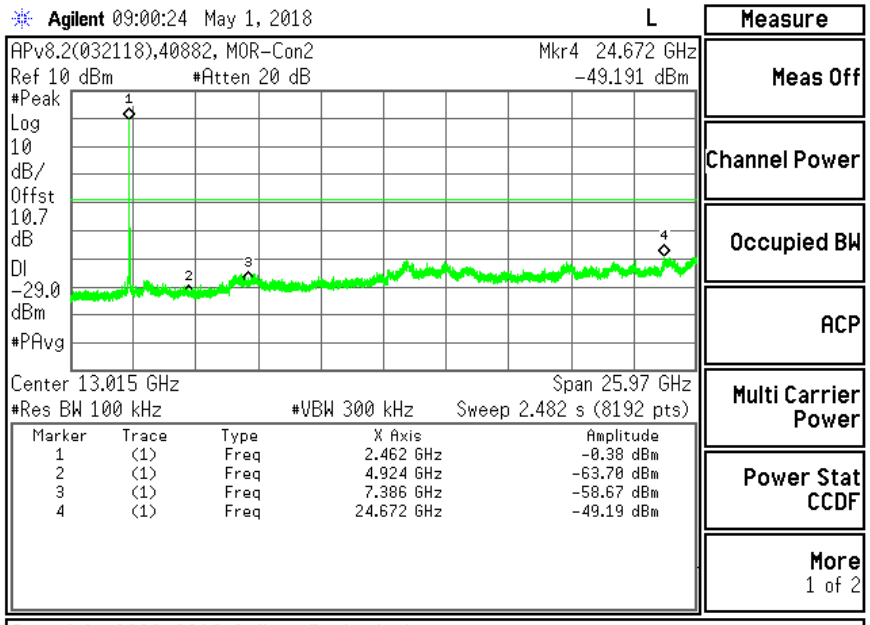
OUT OF BAND ANTENNA 0 MID CH



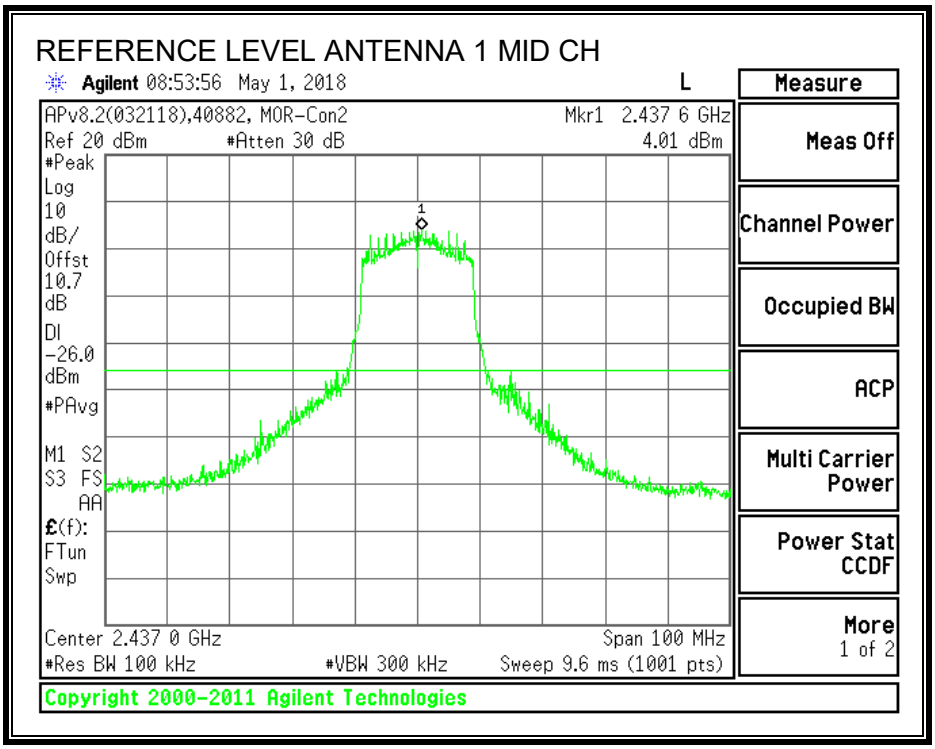
OUT OF BAND ANTENNA 0 CH 10



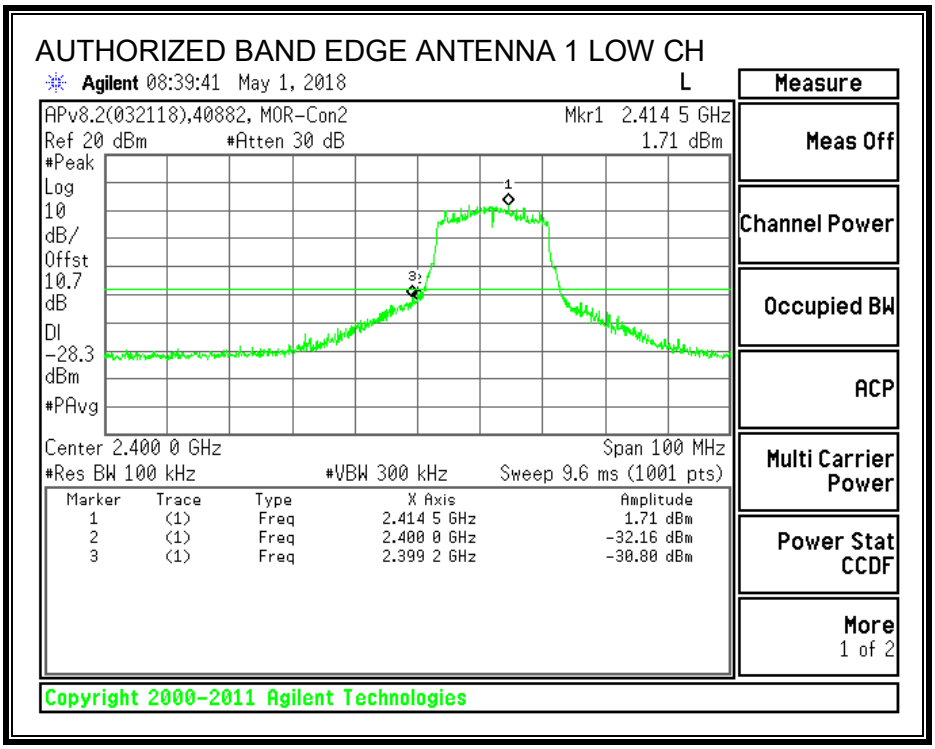
OUT OF BAND ANTENNA 0 HIGH CH

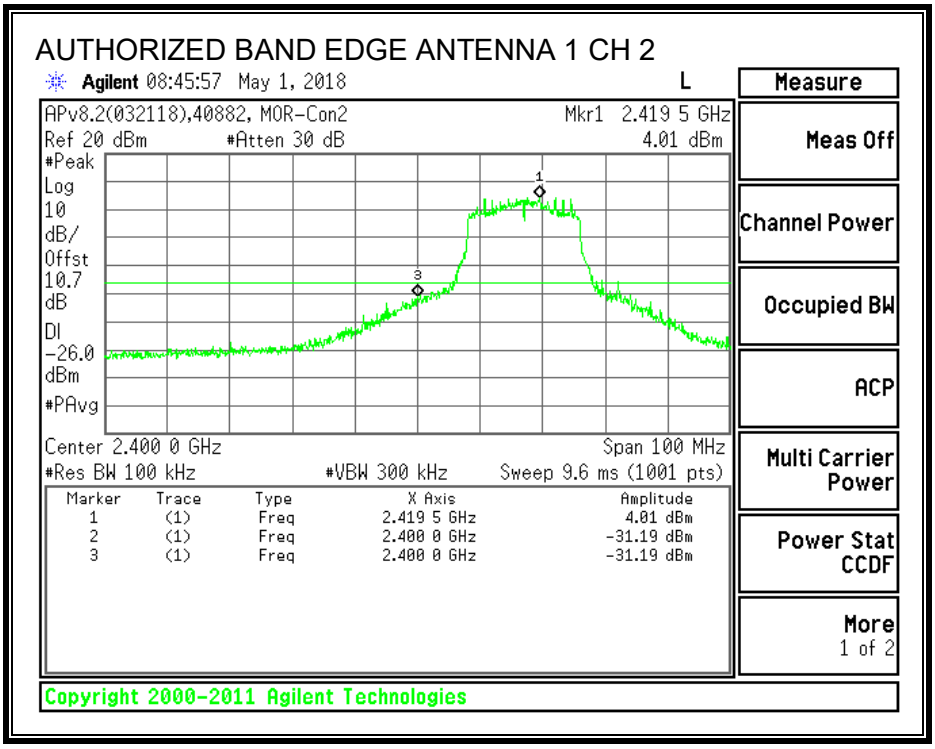


IN-BAND REFERENCE LEVEL, ANTENNA 1

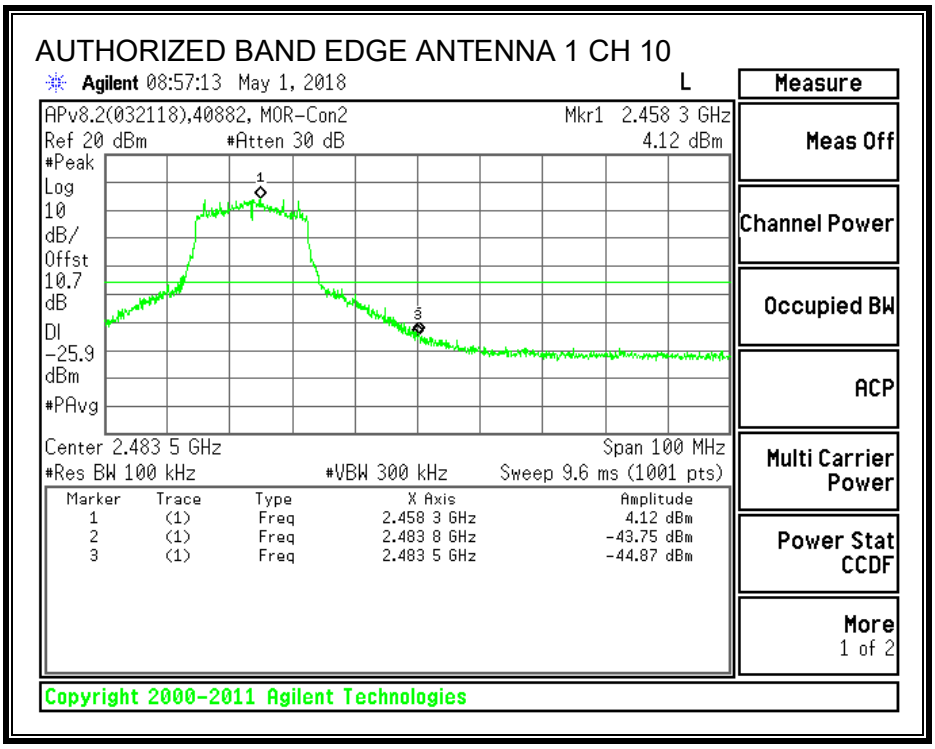


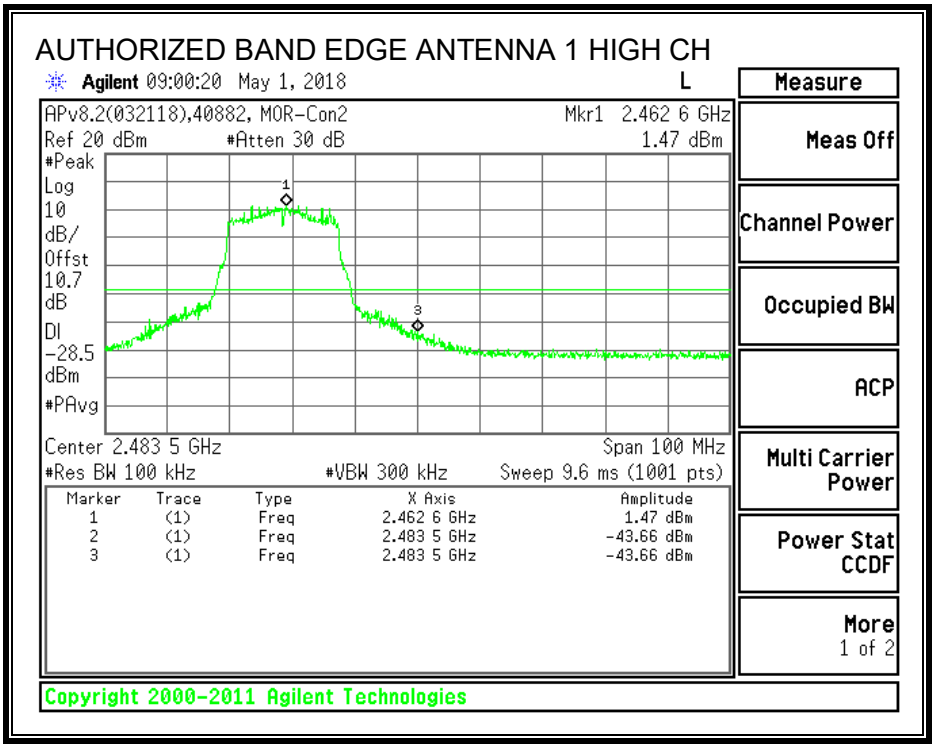
LOW CHANNEL BANDEDGE, ANTENNA 1



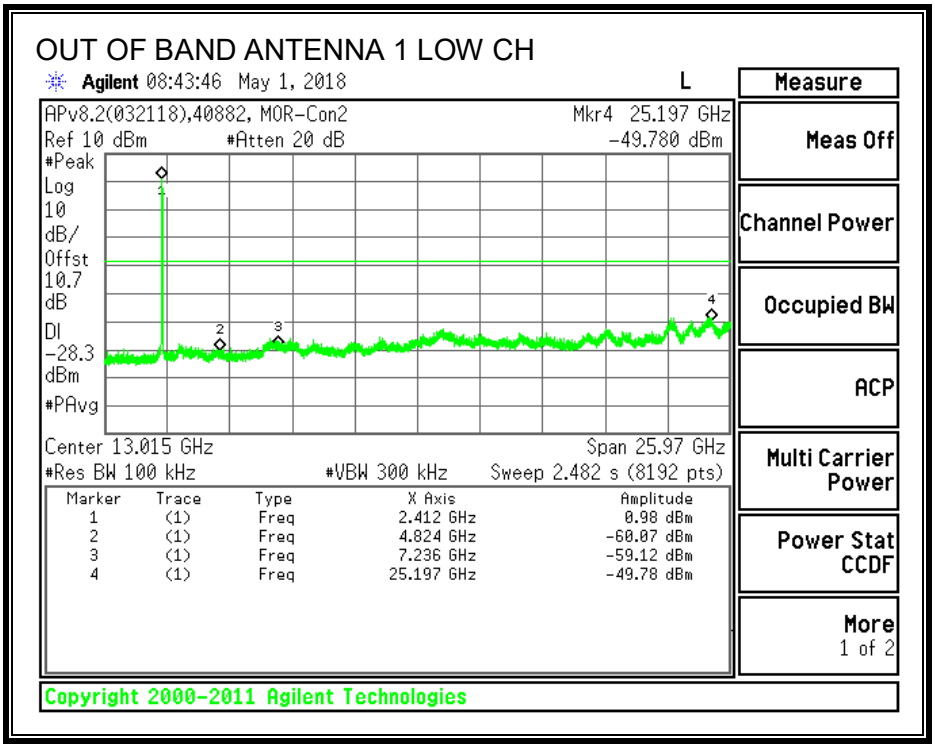


HIGH CHANNEL BANDEDGE, ANTENNA 1

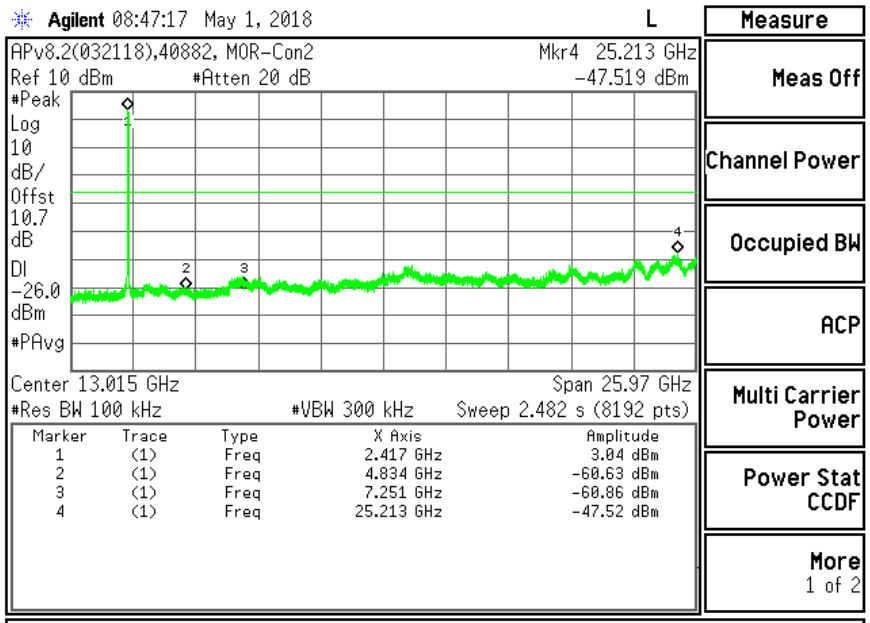




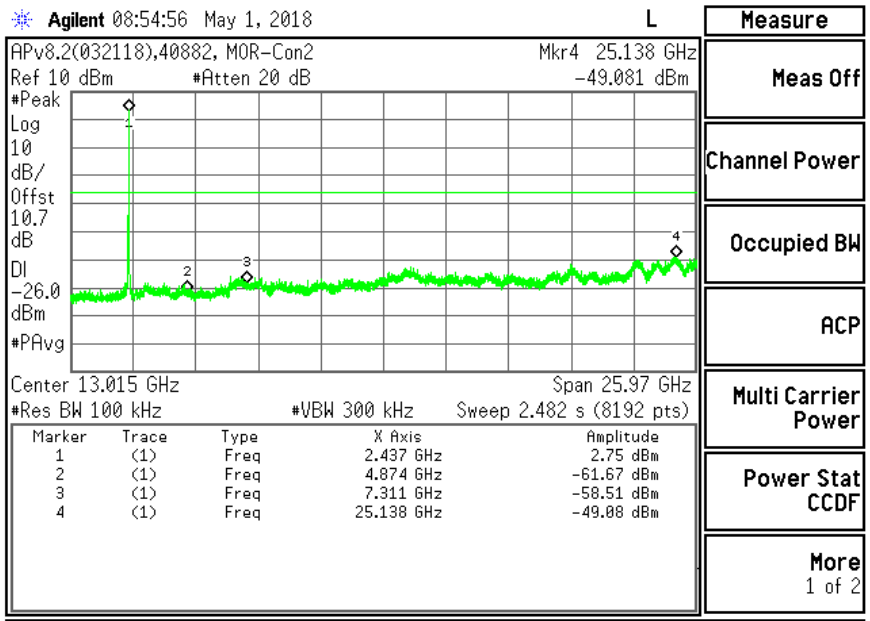
OUT-OF-BAND EMISSIONS, ANTENNA 1



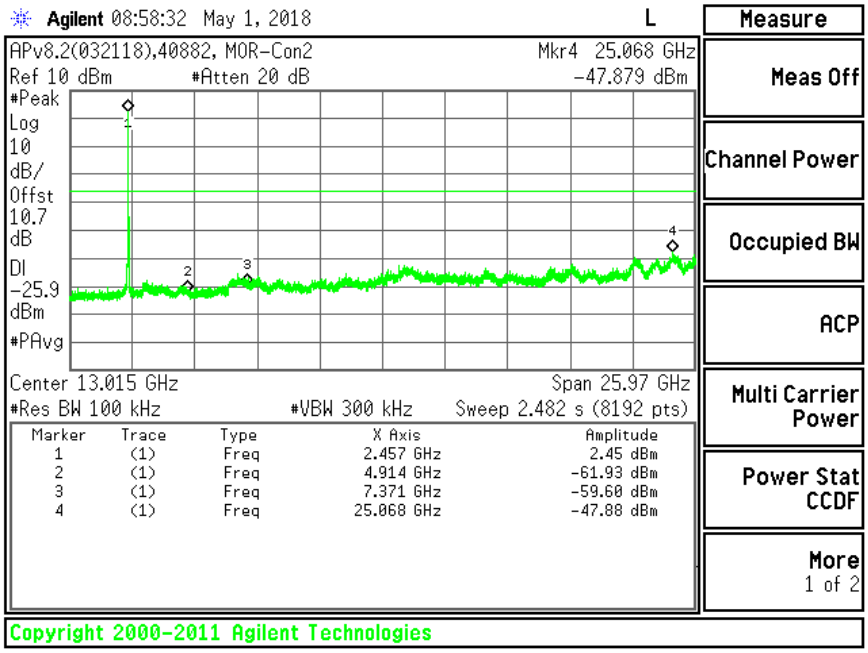
OUT OF BAND ANTENNA 1 CH 2



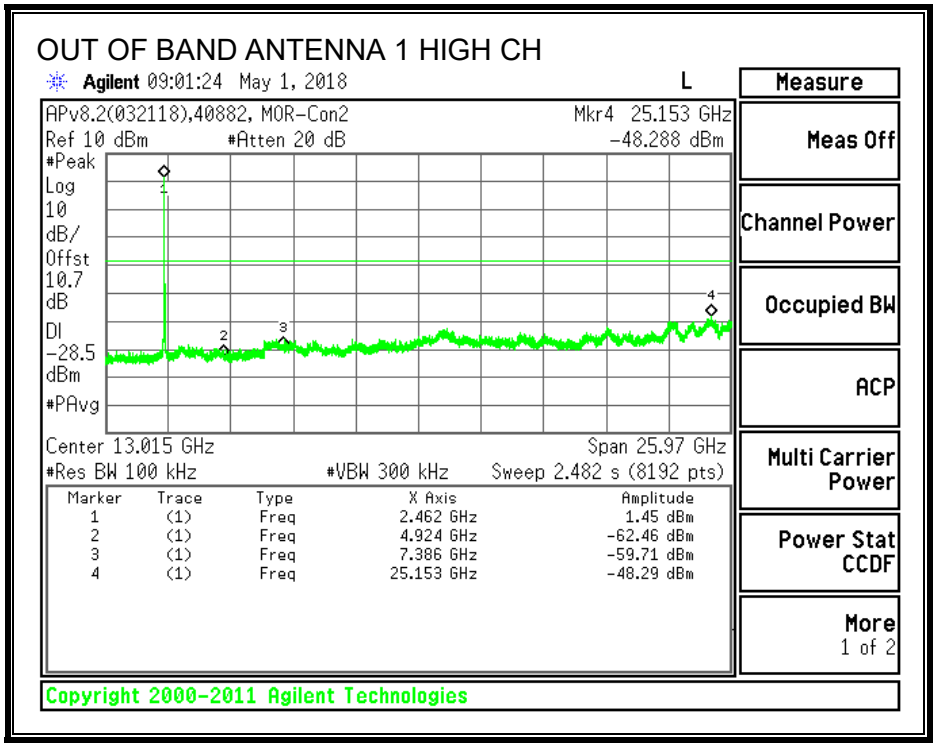
OUT OF BAND ANTENNA 1 MID CH



OUT OF BAND ANTENNA 1 CH 10



OUT OF BAND ANTENNA 1 HIGH CH



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209
IC RSS-GEN Clause 8.9 (Transmitter)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz measurements and 1.5 m above the ground plane for above 1GHz measurements. The antenna to EUT distance is 3 meters.

For measurements below 1 GHz the resolution bandwidth is set to 120 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements for the 30-1000 MHz range, 9 kHz for peak detection measurements or 9 kHz for quasi-peak detection measurements for the 0.15-30 MHz range and 200 Hz for peak detection measurements or 200 Hz for quasi-peak detection measurements for the 9 to 150 kHz range. Peak detection is used unless otherwise noted as quasi-peak.

For peak measurements above 1 GHz, the resolution bandwidth is set to 1 MHz and the video bandwidth is set to 3 MHz. For average measurements above 1GHz, the resolution bandwidth and video bandwidth are set as described in ANSI C63.10:2013 for the applicable measurement. The particular averaging method used for this test program was reduced VBW = 1/Ton for TxBF mode, for all other modes, RMS.

The spectrum from 1 to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. For 9kHz to 1000 MHz and 18 to 26 GHz investigation, the worst-case channel was selected.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

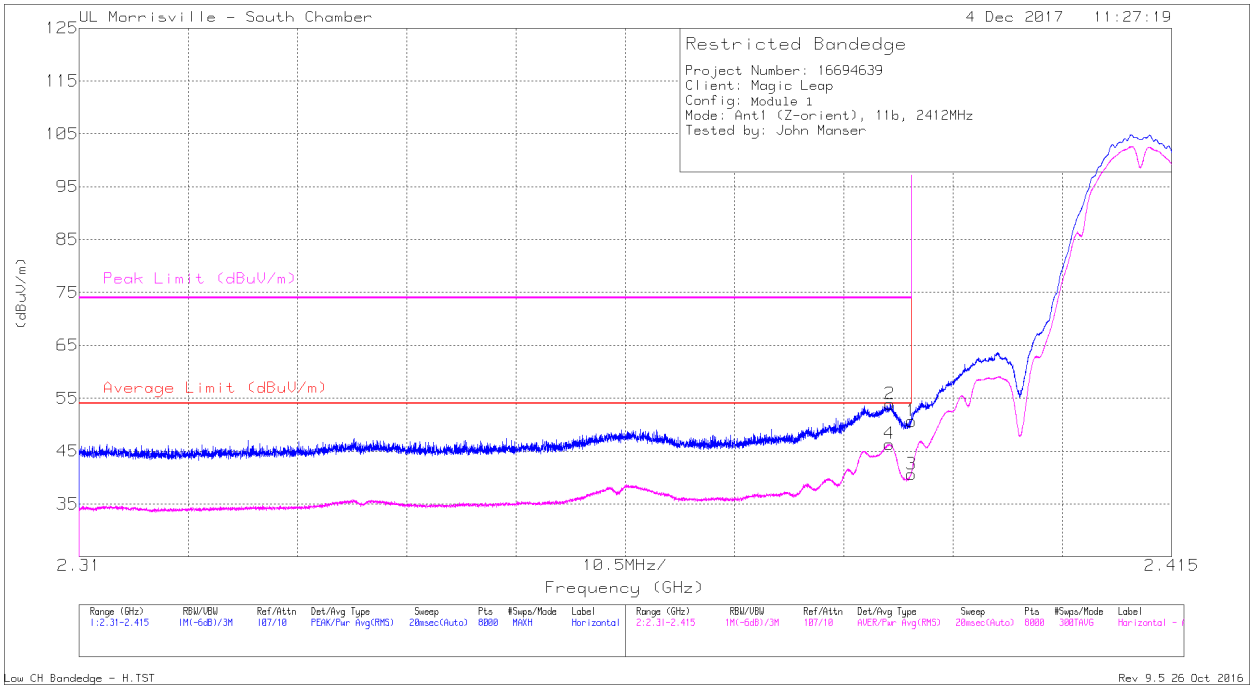
For Transmit Beamforming (TxBF) Radiated Bandedge testing, a companion router was placed on the turn table to lock the beam and radiated bandedge testing was performed.

For TxBF Radiated Spurious Emissions testing, the router was placed on the turn table and spurious emissions was investigated at different θs around the EUT. It was determined that there was <3dB delta in position. The router was then placed behind the receiving antenna. Transmit beamforming spot check scans were taken and this showed little to no variation from 802.11n MIMO SDM spurious scans. Therefore, 802.11n MIMO SDM spurious data is used to represent 802.11nHT20 transmit beamforming.

9.2. TRANSMITTER ABOVE 1 GHz

9.2.1. TX ABOVE 1 GHz 802.11b MODE – MODULE 1 SISO ANTENNA 0

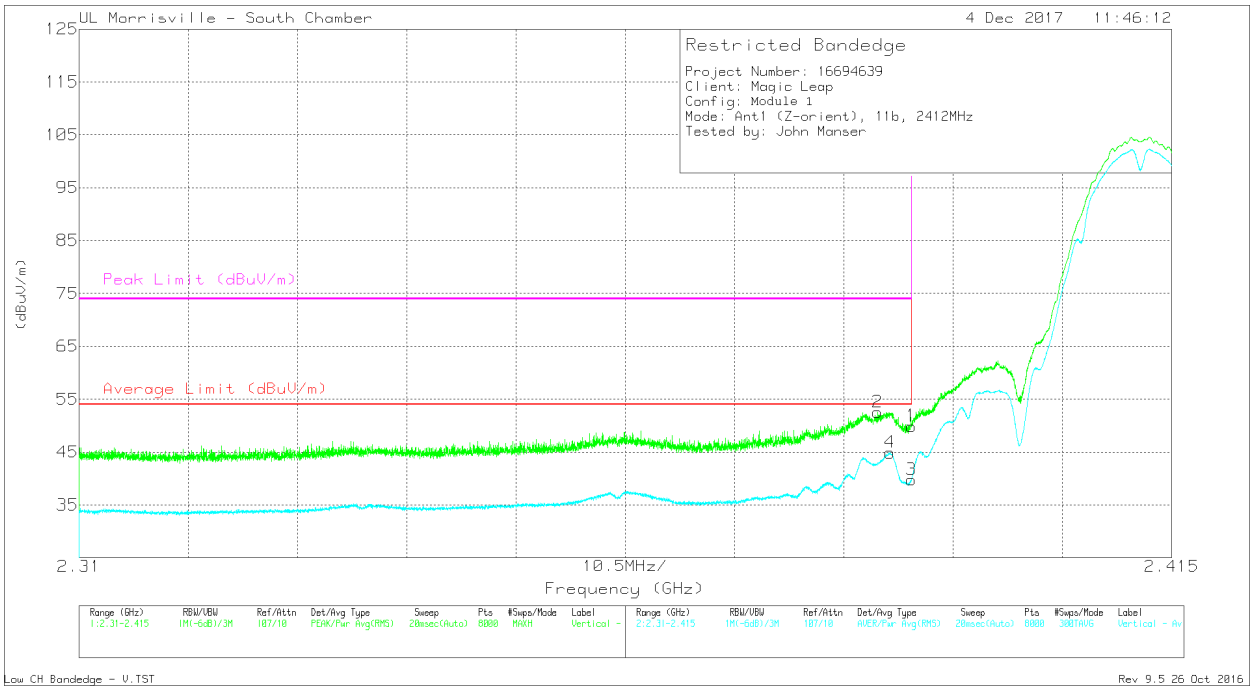
RESTRICTED BANDEDGE (LOW CHANNEL) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	42.66	Pk	31.9	-23.9	50.66	-	-	74	-23.34	235	179	H
2	* 2.388	45.91	Pk	31.9	-23.9	53.91	-	-	74	-20.09	235	179	H
3	* 2.39	32.64	RMS	31.9	-23.9	40.64	54	-13.36	-	-	235	179	H
4	* 2.388	38.35	RMS	31.9	-23.9	46.35	54	-7.65	-	-	235	179	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

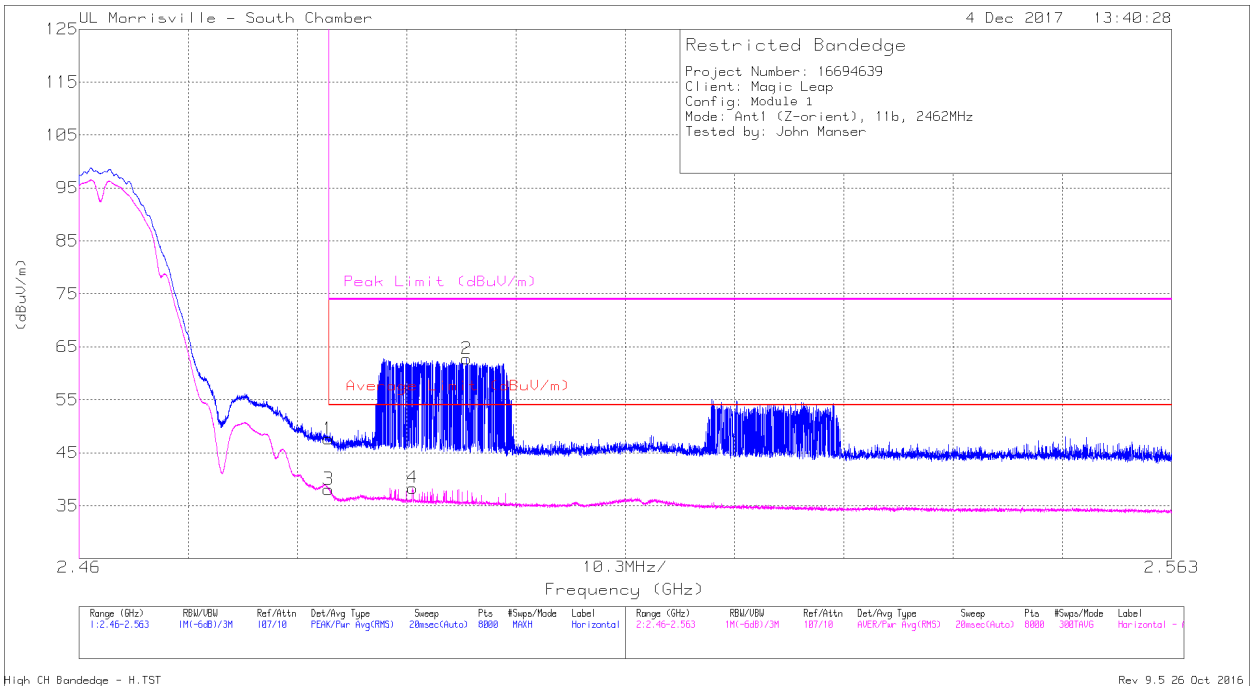
RESTRICTED BANDEDGE (LOW CHANNEL) VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	41.89	Pk	31.9	-23.9	49.89	-	-	74	-24.11	193	118	V
2	* 2.387	44.53	Pk	31.9	-23.9	52.53	-	-	74	-21.47	193	118	V
3	* 2.39	31.78	RMS	31.9	-23.9	39.78	54	-14.22	-	-	193	118	V
4	* 2.388	36.89	RMS	31.9	-23.9	44.89	54	-9.11	-	-	193	118	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

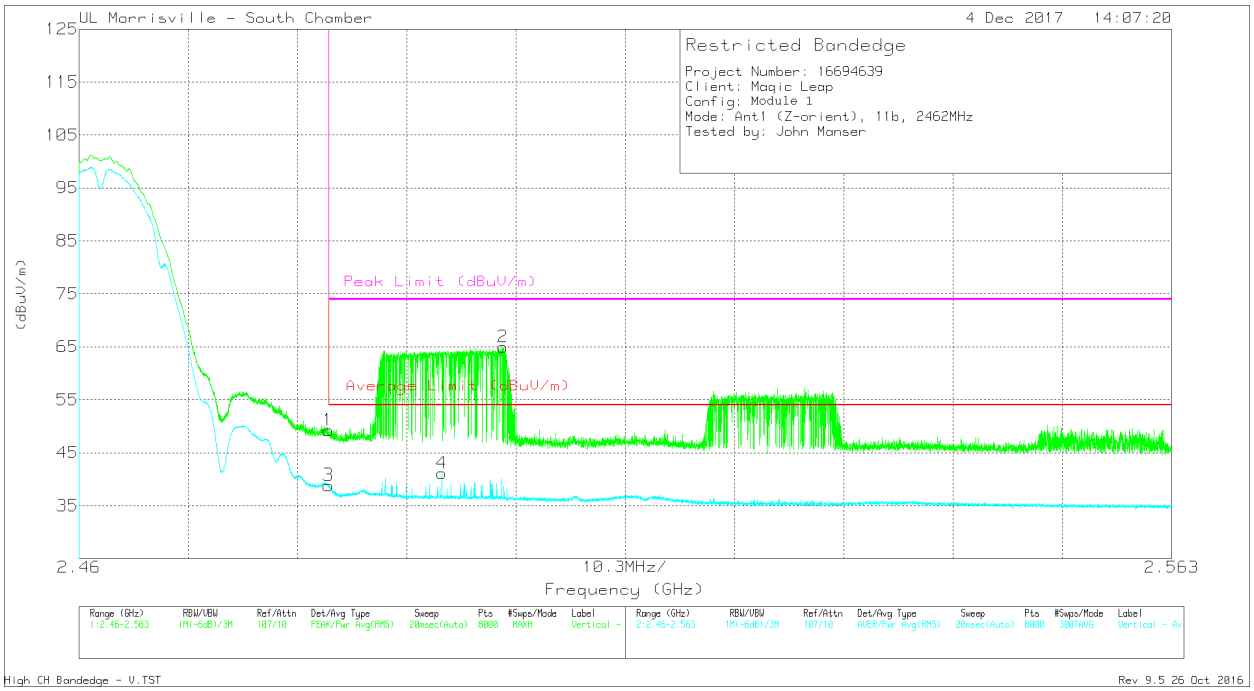
RESTRICTED BANDEDGE (HIGH CHANNEL) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	39.66	Pk	32.4	-24.4	47.66	-	-	74	-26.34	167	115	H
2	* 2.497	54.86	Pk	32.3	-24.4	62.76	-	-	74	-11.24	167	115	H
3	* 2.484	30.09	RMS	32.4	-24.4	38.09	54	-15.91	-	-	167	115	H
4	* 2.491	30.36	RMS	32.4	-24.4	38.36	54	-15.64	-	-	167	115	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

RESTRICTED BANDEDGE (HIGH CHANNEL) VERTICAL

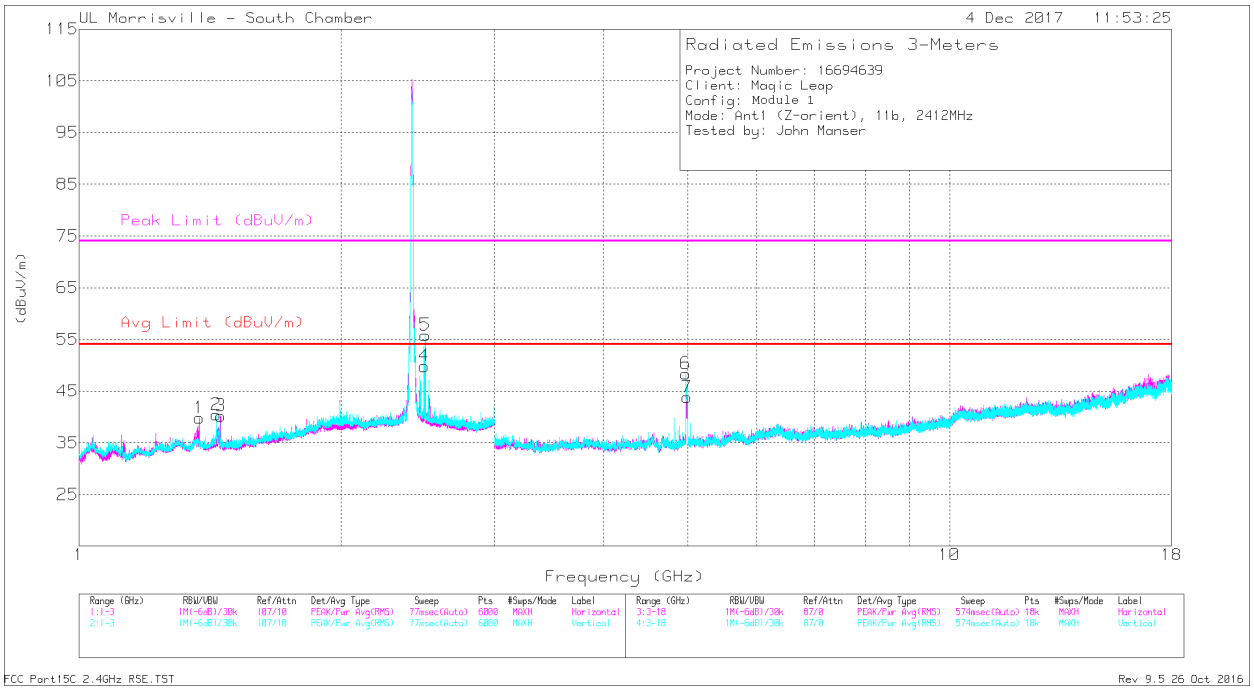


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41.21	Pk	32.4	-24.4	49.21	-	-	74	-24.79	167	184	V
2	* 2.5	57.15	Pk	32.3	-24.5	64.95	-	-	74	-9.05	167	184	V
3	* 2.484	30.83	RMS	32.4	-24.4	38.83	54	-15.17	-	-	167	184	V
4	* 2.494	33.12	RMS	32.4	-24.4	41.12	54	-12.88	-	-	167	184	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

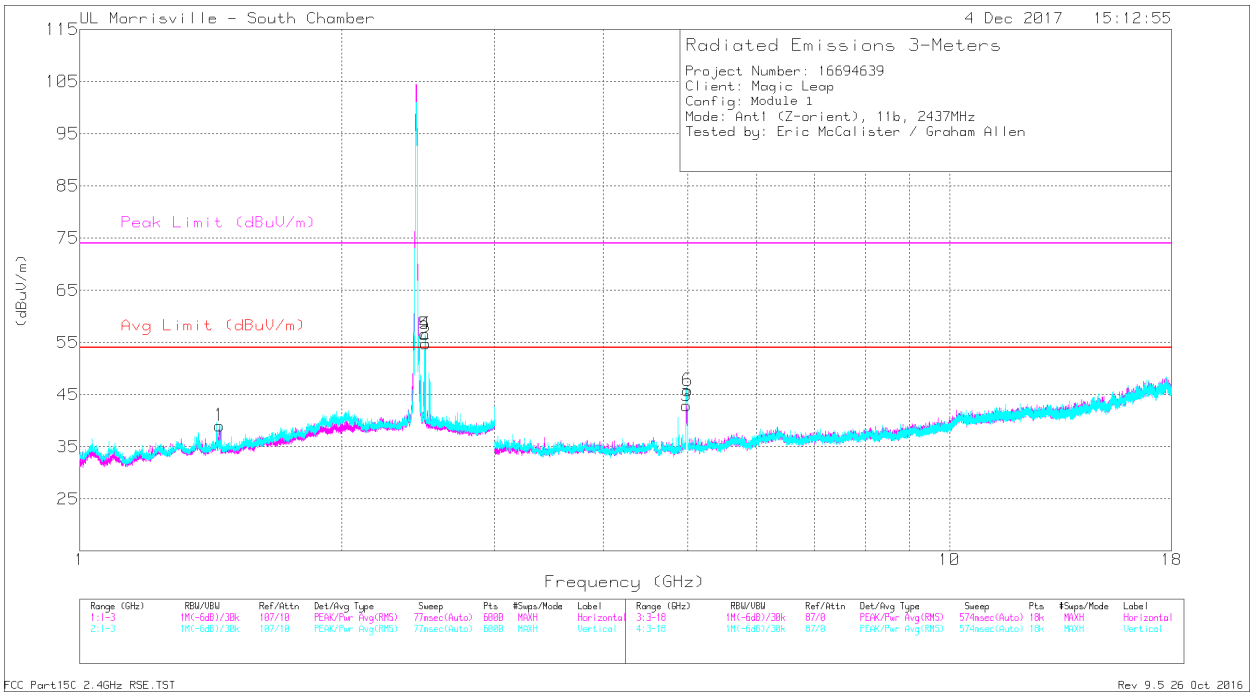
LOW CHANNEL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.374	40.07	PK2	28.9	-22.9	46.07	-	-	74	-27.93	286	400	H
	* 1.37	24.04	MAv1	28.9	-22.9	30.04	54	-23.96	-	-	286	400	H
3	* 1.455	39.6	PK2	28.6	-22.6	45.6	-	-	74	-28.4	316	162	H
	* 1.455	23.52	MAv1	28.6	-22.6	29.52	54	-24.48	-	-	316	162	H
4	* 2.494	52.2	PK2	32.4	-24.4	60.2	-	-	74	-13.8	124	254	H
	* 2.494	27.43	MAv1	32.4	-24.4	35.43	54	-18.57	-	-	124	254	H
2	* 1.437	42.19	PK2	28.7	-22.6	48.29	-	-	74	-25.71	7	167	V
	* 1.437	23.99	MAv1	28.7	-22.6	30.09	54	-23.91	-	-	7	167	V
5	* 2.498	54.96	PK2	32.3	-24.4	62.86	-	-	74	-11.14	185	196	V
	* 2.497	32.97	MAv1	32.3	-24.4	40.87	54	-13.13	-	-	185	196	V
7	* 4.999	49.18	PK2	34	-31.3	51.88	-	-	74	-22.12	256	179	H
	* 4.998	32.92	MAv1	34	-31.3	35.62	54	-18.38	-	-	256	179	H
6	* 4.98	51.89	PK2	34	-31.2	54.69	-	-	74	-19.31	193	241	V
	* 4.978	36.18	MAv1	34	-31.2	38.98	54	-15.02	-	-	193	241	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

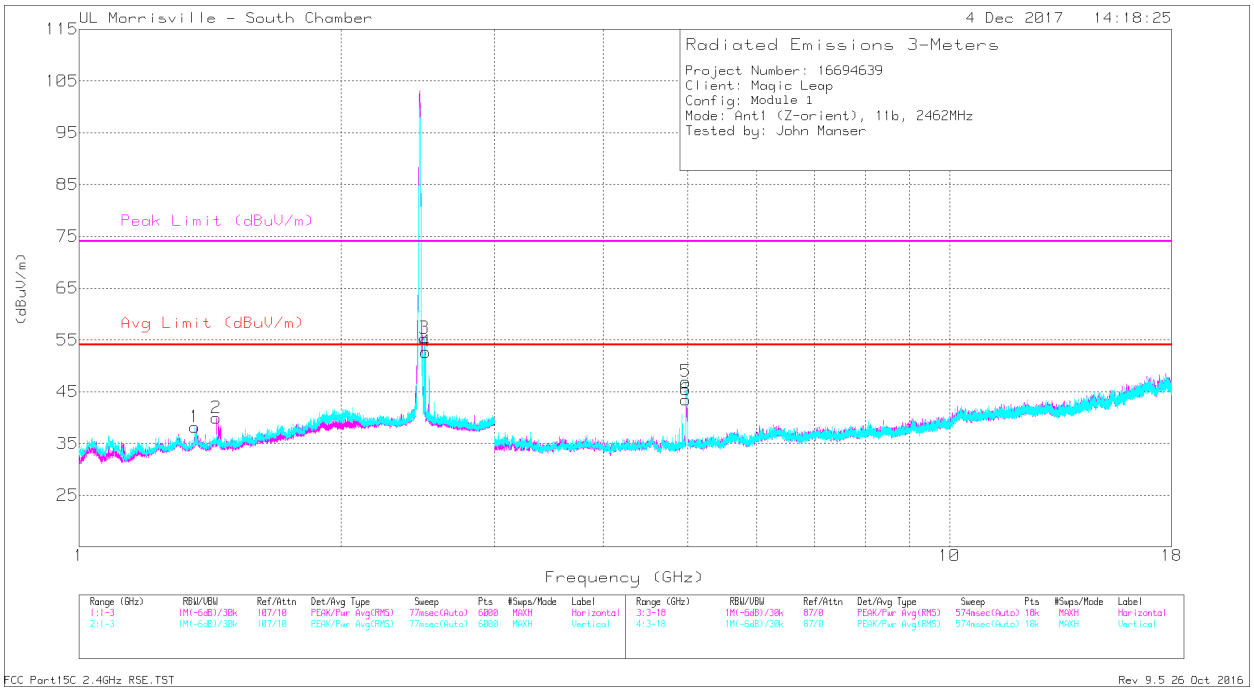
MID CHANNEL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.45	41.16	PK2	28.7	-22.6	47.26	-	-	74	-26.74	91	103	H
	* 1.448	23.61	MAv1	28.7	-22.6	29.71	54	-24.29	-	-	91	103	H
2	* 2.499	49.78	PK2	32.3	-24.5	57.58	-	-	74	-16.42	0	382	H
	* 2.498	27.59	MAv1	32.3	-24.4	35.49	54	-18.51	-	-	0	382	H
4	* 2.498	57.07	PK2	32.3	-24.4	64.97	-	-	74	-9.03	158	282	V
	* 2.497	31.03	MAv1	32.3	-24.4	38.93	54	-15.07	-	-	158	282	V
5	* 2.489	56.3	PK2	32.4	-24.4	64.3	-	-	74	-9.7	338	278	V
	* 2.49	30.28	MAv1	32.4	-24.4	38.28	54	-15.72	-	-	338	278	V
3	* 4.978	48.58	PK2	34	-31.2	51.38	-	-	74	-22.62	256	141	H
	* 4.978	32.62	MAv1	34	-31.2	35.42	54	-18.58	-	-	256	141	H
6	* 4.997	52.09	PK2	34	-31.3	54.79	-	-	74	-19.21	197	132	V
	* 4.996	36.25	MAv1	34	-31.3	38.95	54	-15.05	-	-	197	132	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

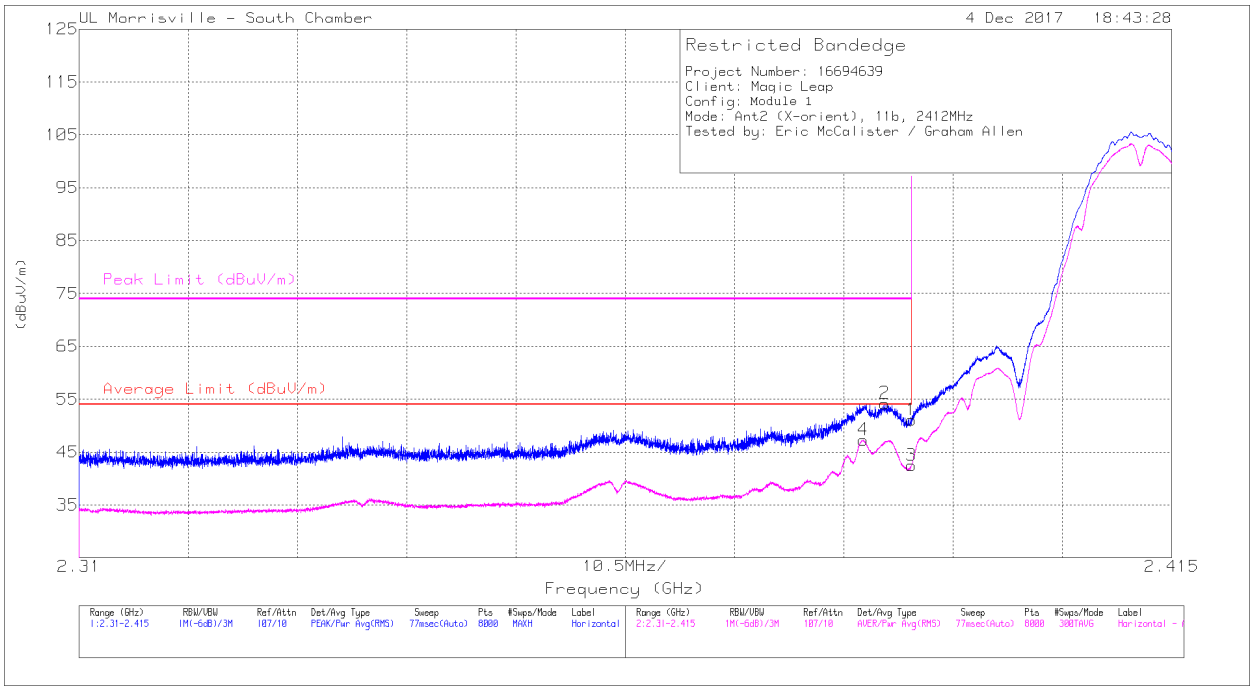
HIGH CHANNEL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 1.437	43.15	PK2	28.7	-22.6	0	49.25	-	-	74	-24.75	80	193	H
	* 1.437	24.04	MAv1	28.7	-22.6	0	30.14	54	-23.86	-	-	80	193	H
4	* 2.499	49.49	PK2	32.3	-24.5	0	57.29	-	-	74	-16.71	128	209	H
	* 2.499	29.61	MAv1	32.3	-24.5	0	37.41	54	-16.59	-	-	128	209	H
1	* 1.357	40.01	PK2	28.7	-22.9	0	45.81	-	-	74	-28.19	26	125	V
	* 1.358	23.97	MAv1	28.7	-22.9	0	29.77	54	-24.23	-	-	26	125	V
3	* 2.493	56.98	PK2	32.4	-24.4	0	64.98	-	-	74	-9.02	169	202	V
	* 2.492	31.25	MAv1	32.4	-24.4	0	39.25	54	-14.75	-	-	169	202	V
6	* 4.977	47.57	PK2	34	-31.2	0	50.37	-	-	74	-23.63	259	225	H
	* 4.976	32.47	MAv1	34	-31.2	0	35.27	54	-18.73	-	-	259	225	H
5	* 4.976	53.24	PK2	34	-31.2	0	56.04	-	-	74	-17.96	197	137	V
	* 4.976	36.78	MAv1	34	-31.2	0	39.58	54	-14.42	-	-	197	137	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

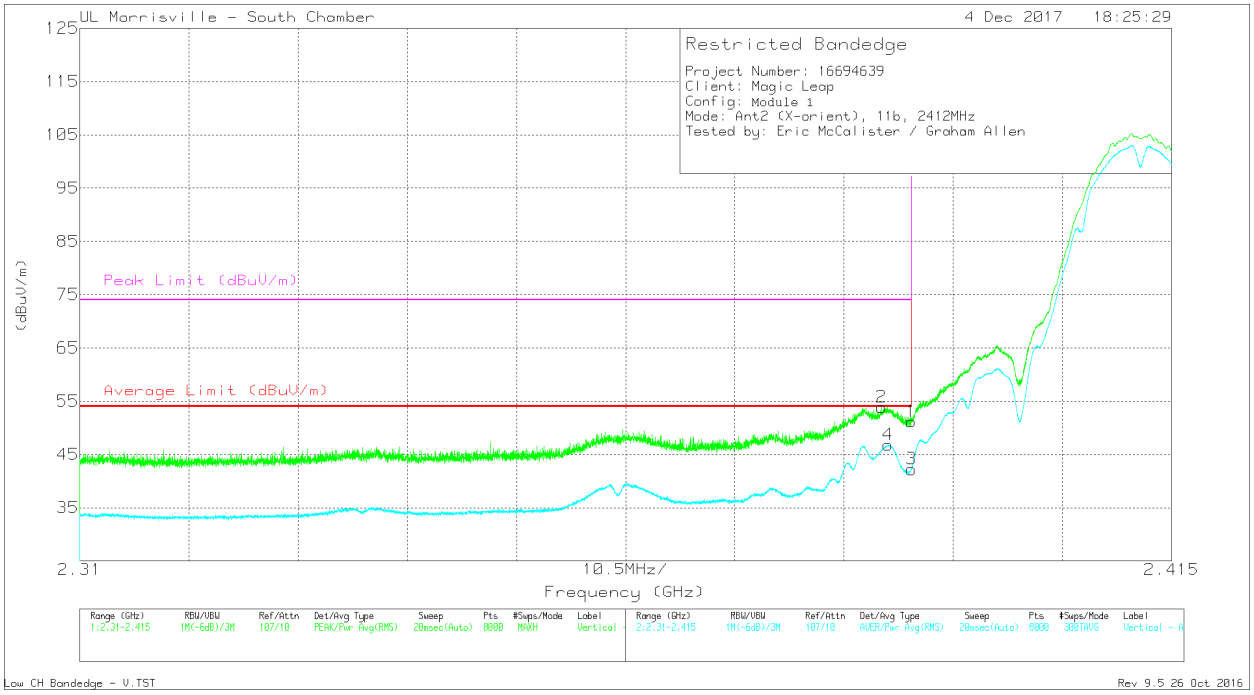
9.2.2. TX ABOVE 1 GHz 802.11b MODE – MODULE 1 SISO ANTENNA 1 RESTRICTED BANDEDGE (LOW CHANNEL) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	43.07	Pk	31.9	-23.9	51.07	-	-	74	-22.93	59	104	H
2	* 2.387	46.2	Pk	31.9	-23.9	54.2	-	-	74	-19.8	59	104	H
3	* 2.39	34.48	RMS	31.9	-23.9	42.48	54	-11.52	-	-	59	104	H
4	* 2.385	39.31	RMS	31.9	-23.9	47.31	54	-6.69	-	-	59	104	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

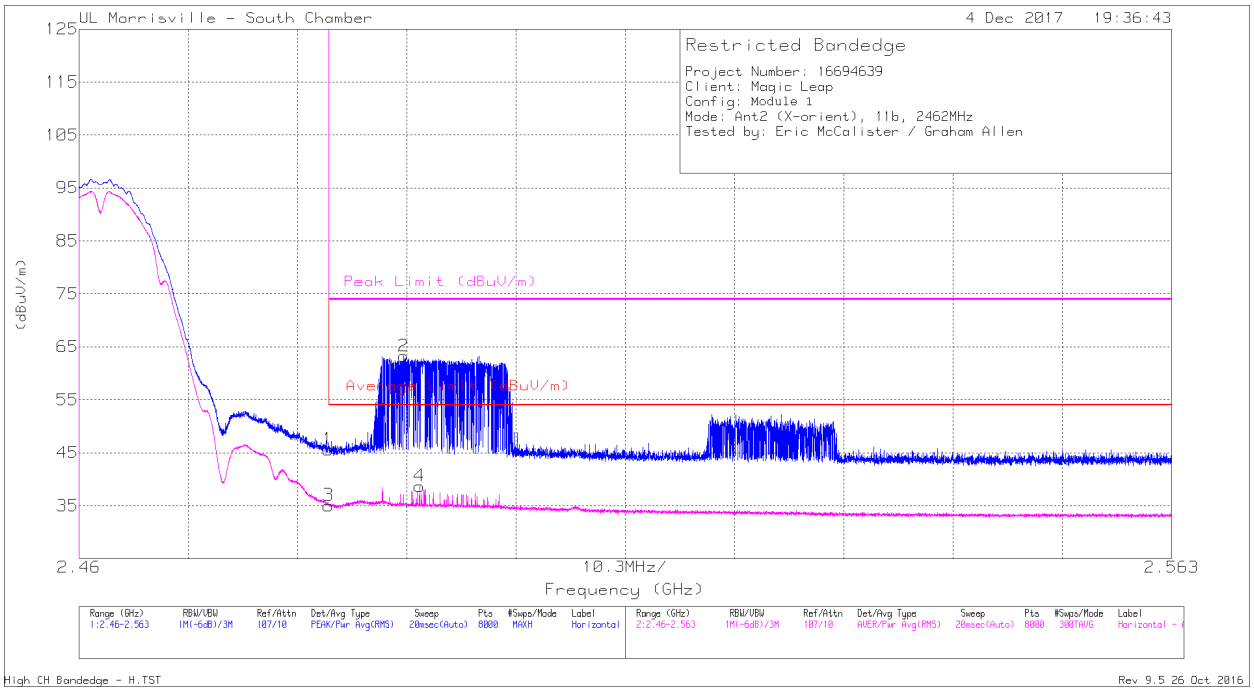
RESTRICTED BANDEDGE (LOW CHANNEL) VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	43.17	Pk	31.9	-23.9	51.17	-	-	74	-22.83	268	296	V
2	* 2.387	45.84	Pk	31.9	-23.9	53.84	-	-	74	-20.16	268	296	V
3	* 2.39	34.22	RMS	31.9	-23.9	42.22	54	-11.78	-	-	268	296	V
4	* 2.388	38.77	RMS	31.9	-23.9	46.77	54	-7.23	-	-	268	296	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

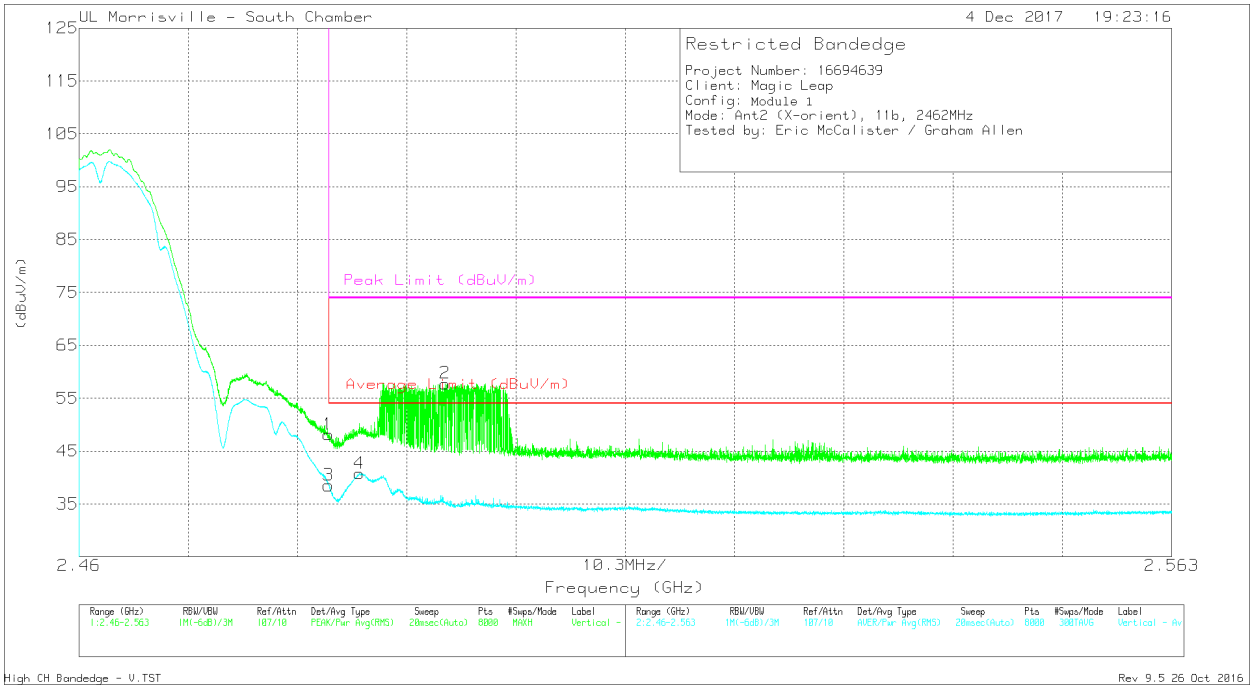
AUTHORIZED BANDEDGE (HIGH CHANNEL) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	37.63	Pk	32.4	-24.4	45.63	-	-	74	-28.37	196	358	H
2	* 2.491	55.23	Pk	32.4	-24.4	63.23	-	-	74	-10.77	196	358	H
3	* 2.484	27.03	RMS	32.4	-24.4	35.03	54	-18.97	-	-	196	358	H
4	* 2.492	30.7	RMS	32.4	-24.4	38.7	54	-15.3	-	-	196	358	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL) VERTICAL

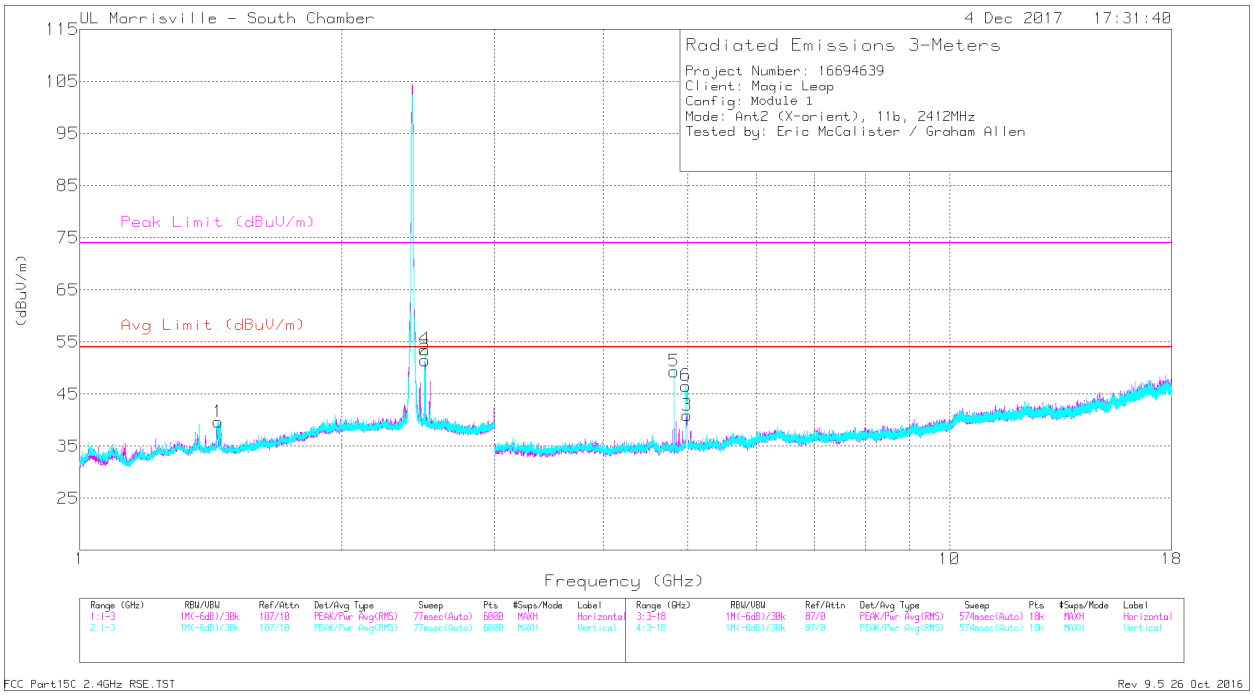


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.15	Pk	32.4	-24.4	48.15	-	-	74	-25.85	130	352	V
2	* 2.494	49.78	Pk	32.4	-24.4	57.78	-	-	74	-16.22	130	352	V
3	* 2.484	30.5	RMS	32.4	-24.4	38.5	54	-15.5	-	-	130	352	V
4	* 2.486	32.75	RMS	32.4	-24.4	40.75	54	-13.25	-	-	130	352	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

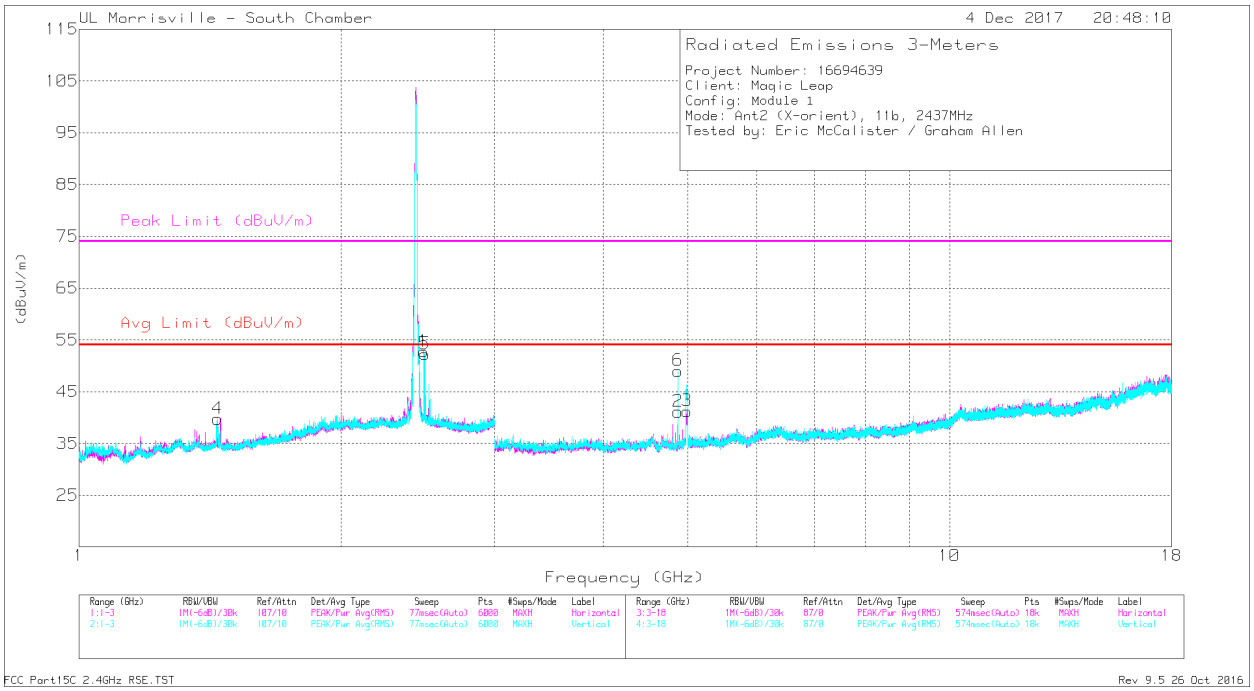
LOW CHANNEL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.447	41.7	PK2	28.7	-22.6	47.8	-	-	74	-26.2	95	255	H
	* 1.445	23.68	MAv1	28.7	-22.6	29.78	54	-24.22	-	-	95	255	H
2	* 2.489	56.17	PK2	32.4	-24.4	64.17	-	-	74	-9.83	48	347	H
	* 2.489	29.93	MAv1	32.4	-24.4	37.93	54	-16.07	-	-	48	347	H
4	* 2.498	53.34	PK2	32.3	-24.4	61.24	-	-	74	-12.76	312	140	V
	* 2.497	28.85	MAv1	32.3	-24.4	36.75	54	-17.25	-	-	312	140	V
3	* 4.986	46.7	PK2	34	-31.3	49.4	-	-	74	-24.6	98	109	H
	* 4.987	31.9	MAv1	34	-31.3	34.6	54	-19.4	-	-	98	109	H
5	* 4.824	48.62	PK2	34	-30.9	51.72	-	-	74	-22.28	315	104	V
	* 4.824	46.02	MAv1	34	-30.9	49.12	54	-4.88	-	-	315	104	V
6	* 4.977	51.31	PK2	34	-31.2	54.11	-	-	74	-19.89	184	224	V
	* 4.978	35.2	MAv1	34	-31.2	38	54	-16	-	-	184	224	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

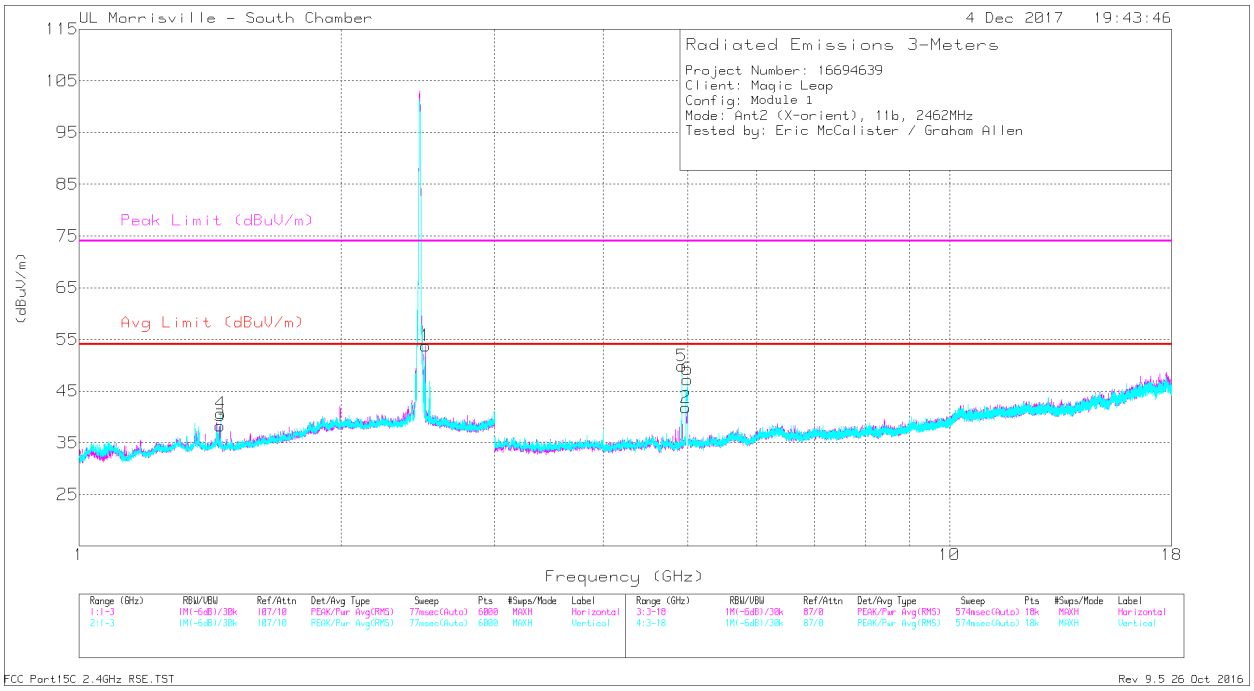
MID CHANNEL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.492	54.83	PK2	32.4	-24.4	62.83	-	-	74	-11.17	196	153	H
	* 2.489	30.29	MAv1	32.4	-24.4	38.29	54	-15.71	-	-	196	153	H
4	* 1.442	40.86	PK2	28.7	-22.6	46.96	-	-	74	-27.04	357	151	V
	* 1.442	23.59	MAv1	28.7	-22.6	29.69	54	-24.31	-	-	357	151	V
5	* 2.492	53.62	PK2	32.4	-24.4	61.62	-	-	74	-12.38	172	134	V
	* 2.492	28.08	MAv1	32.4	-24.4	36.08	54	-17.92	-	-	172	134	V
2	* 4.874	43.04	PK2	34	-30.8	46.24	-	-	74	-27.76	157	180	H
	* 4.874	38.13	MAv1	34	-30.8	41.33	54	-12.67	-	-	157	180	H
3	* 5	47.65	PK2	34	-31.3	50.35	-	-	74	-23.65	94	104	H
	* 4.996	32.43	MAv1	34	-31.3	35.13	54	-18.87	-	-	94	104	H
6	* 4.874	48.16	PK2	34	-30.8	51.36	-	-	74	-22.64	314	104	V
	* 4.874	45.68	MAv1	34	-30.8	48.88	54	-5.12	-	-	314	104	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

HIGH CHANNEL

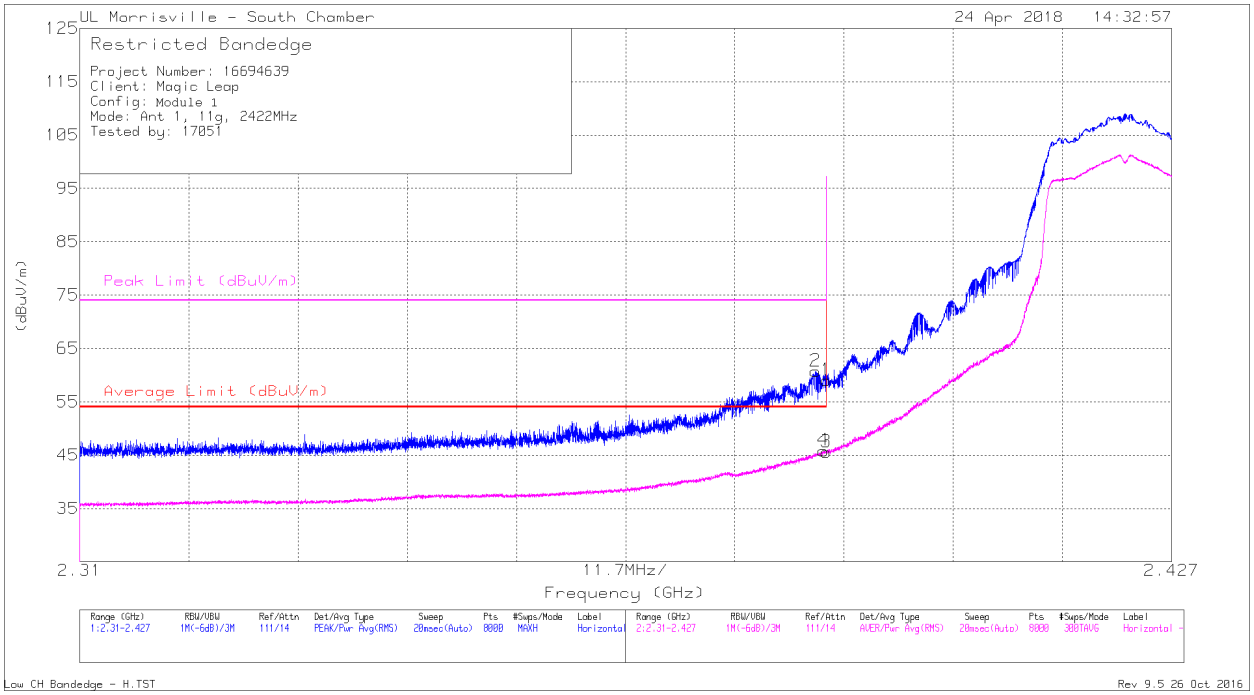


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.498	53.1	PK2	32.3	-24.4	61	-	-	74	-13	2	108	H
	* 2.498	27.98	MAv1	32.3	-24.4	35.88	54	-18.12	-	-	2	108	H
3	* 1.455	43.06	PK2	28.6	-22.6	49.06	-	-	74	-24.94	87	332	H
	* 1.454	23.3	MAv1	28.6	-22.6	29.3	54	-24.7	-	-	87	332	H
4	* 1.455	38.93	PK2	28.6	-22.6	44.93	-	-	74	-29.07	332	134	V
	* 1.453	23.36	MAv1	28.6	-22.6	29.36	54	-24.64	-	-	332	134	V
2	* 4.976	48.01	PK2	34	-31.2	50.81	-	-	74	-23.19	95	108	H
	* 4.979	32.74	MAv1	34	-31.2	35.54	54	-18.46	-	-	95	108	H
5	* 4.924	49.02	PK2	34	-30.8	52.22	-	-	74	-21.78	314	102	V
	* 4.924	46.2	MAv1	34	-30.8	49.4	54	-4.6	-	-	314	102	V
6	* 4.994	52.09	PK2	34	-31.3	54.79	-	-	74	-19.21	194	153	V
	* 4.997	36.21	MAv1	34	-31.3	38.91	54	-15.09	-	-	194	153	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

9.2.3. TX ABOVE 1 GHz 802.11g MODE – MODULE 1 SISO ANTENNA 0 RESTRICTED BANDEDGE (CHANNEL 3) HORIZONTAL

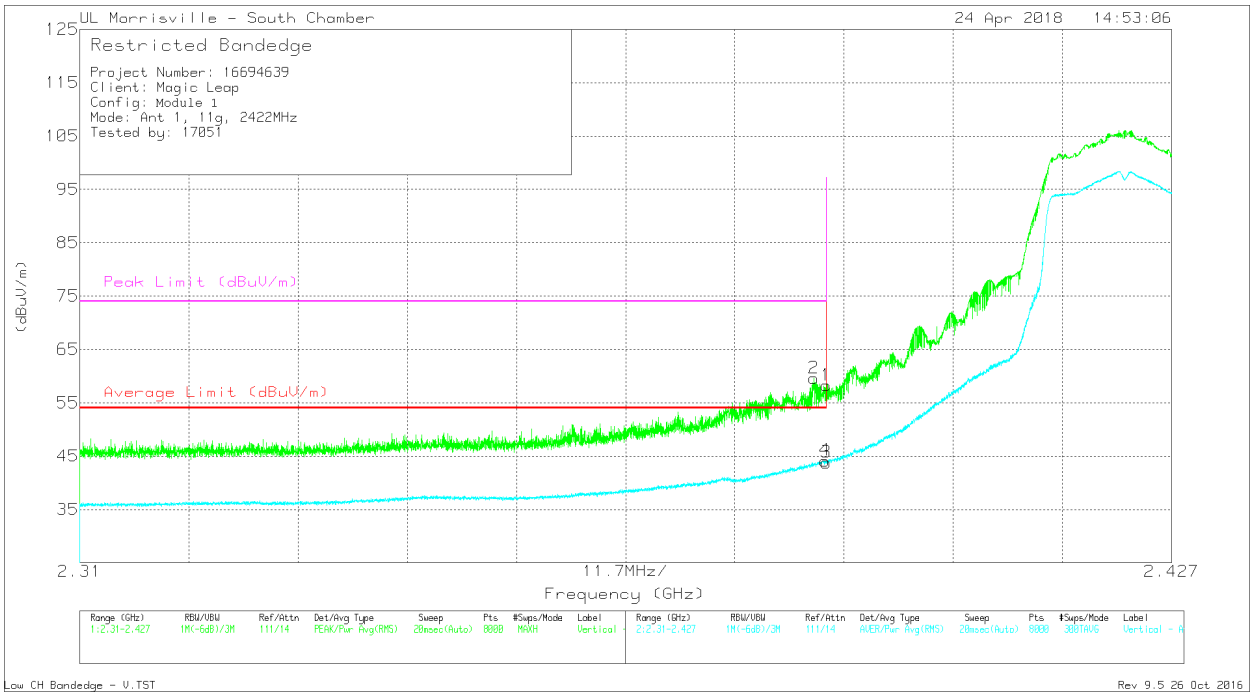
Note - For 802.11g Channel 2422 MHz, the set power was the same for SISO and MIMO modes. However, the SISO mode power measured higher by approximately 3 dB, allowing the per chain SISO power (15.54 and 16.56 dBm) to be almost the same as the summed MIMO power (16.71 dBm). Therefore, Radiated Band Edge plots were included for 802.11g, SISO, Channel 2422 MHz to show compliance.



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	51.34	Pk	31.8	-24.1	59.04	-	-	74	-14.96	244	183	H
2	* 2.389	53.06	Pk	31.8	-24.1	60.76	-	-	74	-13.24	244	183	H
3	* 2.39	37.91	RMS	31.8	-24.1	45.61	54	-8.39	-	-	244	183	H
4	* 2.39	38.17	RMS	31.8	-24.1	45.87	54	-8.13	-	-	244	183	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

RESTRICTED BANDEDGE (CHANNEL 3) VERTICAL

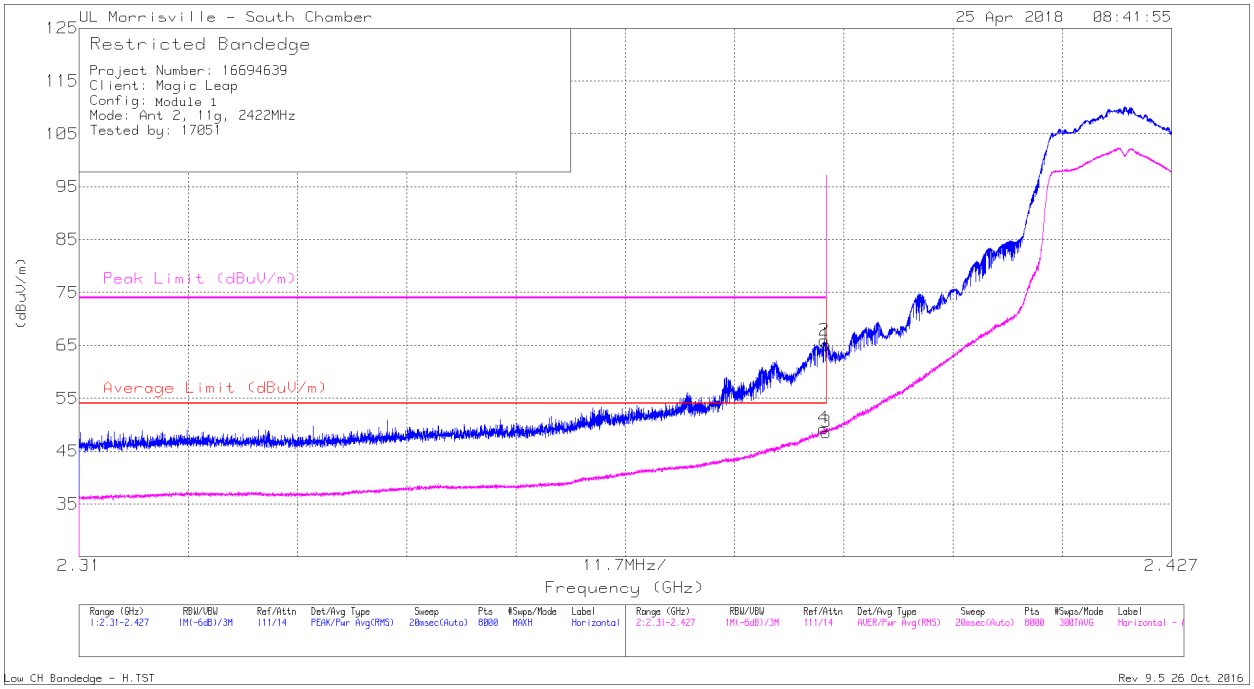


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.389	51.92	Pk	31.8	-24.1	59.62	-	-	74	-14.38	247	152	V
1	* 2.39	50.57	Pk	31.8	-24.1	58.27	-	-	74	-15.73	247	152	V
3	* 2.39	36.1	RMS	31.8	-24.1	43.8	54	-10.2	-	-	247	152	V
4	* 2.39	36.46	RMS	31.8	-24.1	44.16	54	-9.84	-	-	247	152	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

9.2.4. TX ABOVE 1 GHz 802.11g MODE – MODULE 1 SISO ANTENNA 1 RESTRICTED BANDEDGE (CHANNEL 3) HORIZONTAL

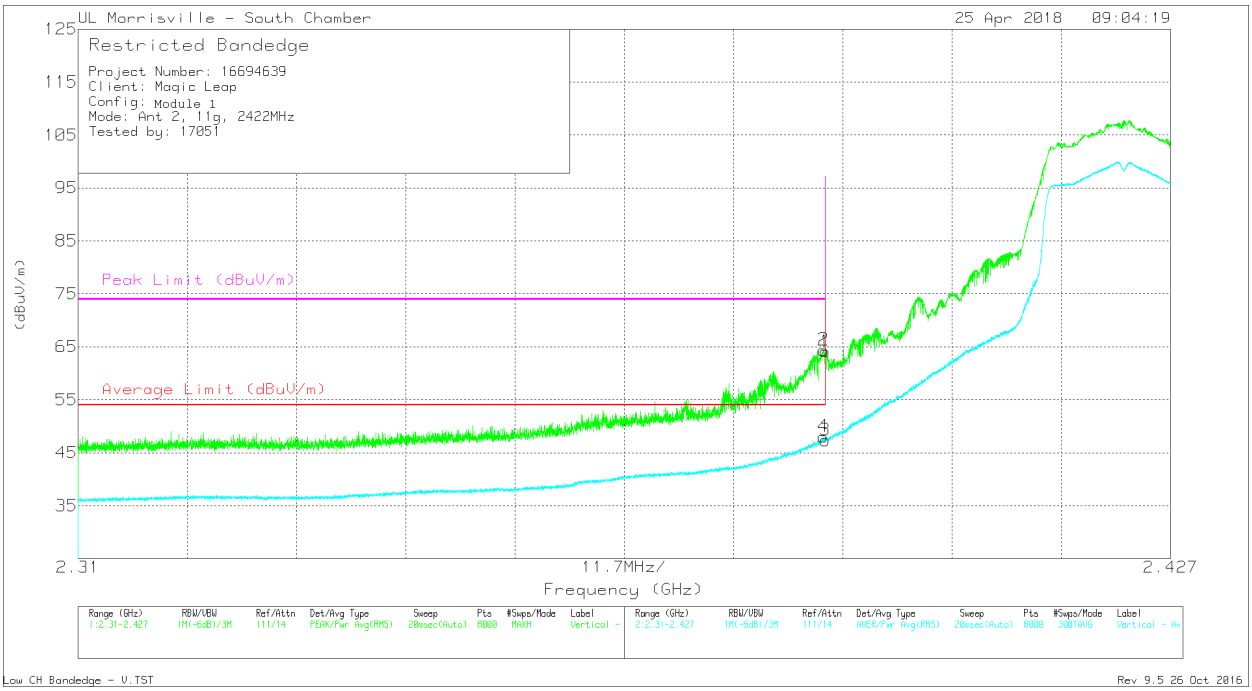
Note - For 802.11g Channel 2422 MHz, the set power was the same for SISO and MIMO modes. However, the SISO mode power measured higher by approximately 3 dB, allowing the per chain SISO power (15.54 and 16.56 dBm) to be almost the same as the summed MIMO power (16.71 dBm). Therefore, Radiated Band Edge plots were included for 802.11g, SISO, Channel 2422 MHz to show compliance.



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	57.44	Pk	31.8	-24.1	65.14	-	-	74	-8.86	62	114	H
2	* 2.39	58.2	Pk	31.8	-24.1	65.9	-	-	74	-8.1	62	114	H
3	* 2.39	40.86	RMS	31.8	-24.1	48.56	54	-5.44	-	-	62	114	H
4	* 2.39	41.6	RMS	31.8	-24.1	49.3	54	-4.7	-	-	62	114	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

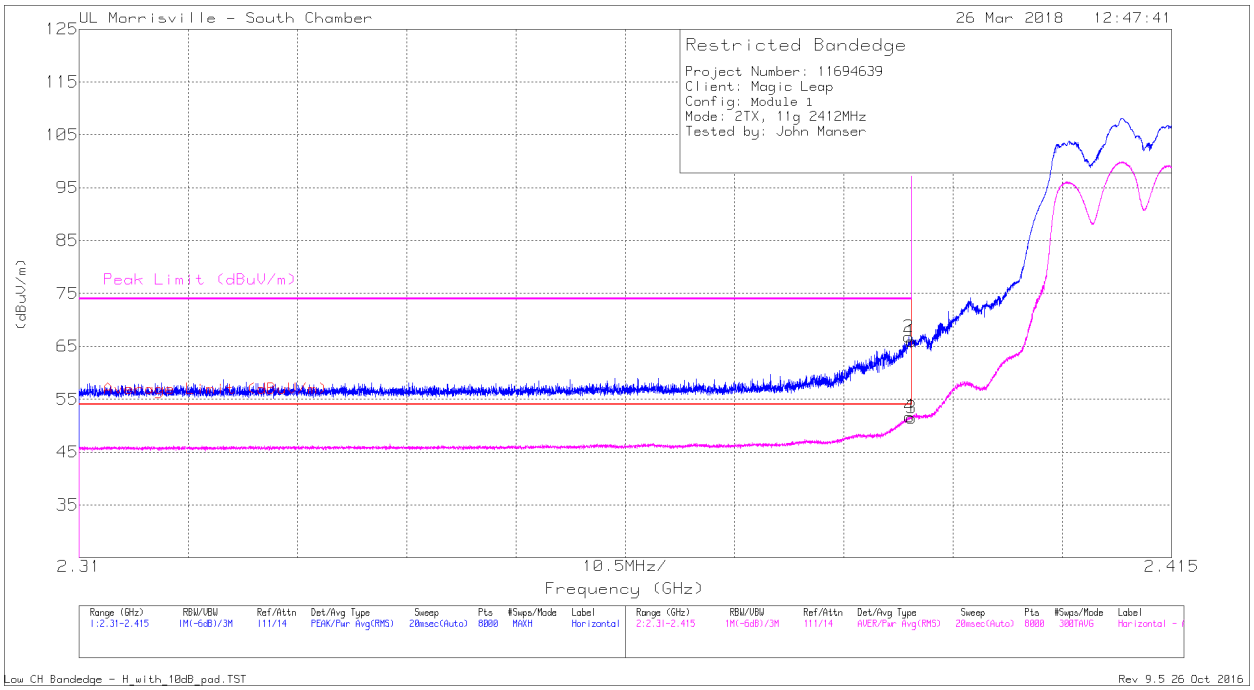
RESTRICTED BANDEDGE (CHANNEL 3) VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0078 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	56.4	Pk	31.8	-24.1	64.1	-	-	74	-9.9	246	205	V
2	* 2.39	56.71	Pk	31.8	-24.1	64.41	-	-	74	-9.59	246	205	V
3	* 2.39	39.65	RMS	31.8	-24.1	47.35	54	-6.65	-	-	246	205	V
4	* 2.39	40.35	RMS	31.8	-24.1	48.05	54	-5.95	-	-	246	205	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

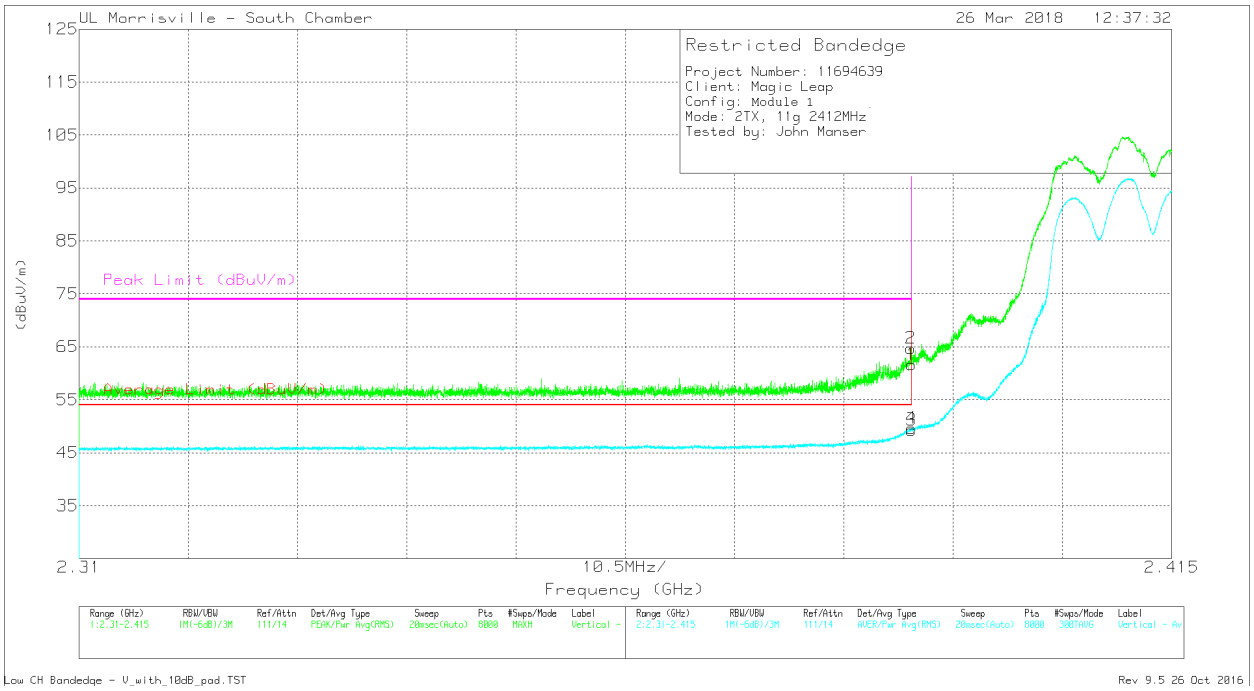
9.2.5. TX ABOVE 1 GHz 802.11g MODE – MODULE 1 MIMO SDM
RESTRICTED BANDEDGE (LOW CHANNEL) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	48.13	Pk	31.9	-24.1	10	65.93	-	-	74	-8.07	268	345	H
2	* 2.39	49.02	Pk	31.9	-24.1	10	66.82	-	-	74	-7.18	268	345	H
3	* 2.39	33.68	RMS	31.9	-24.1	10	51.48	54	-2.52	-	-	268	345	H
4	* 2.39	33.94	RMS	31.9	-24.1	10	51.74	54	-2.26	-	-	268	345	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

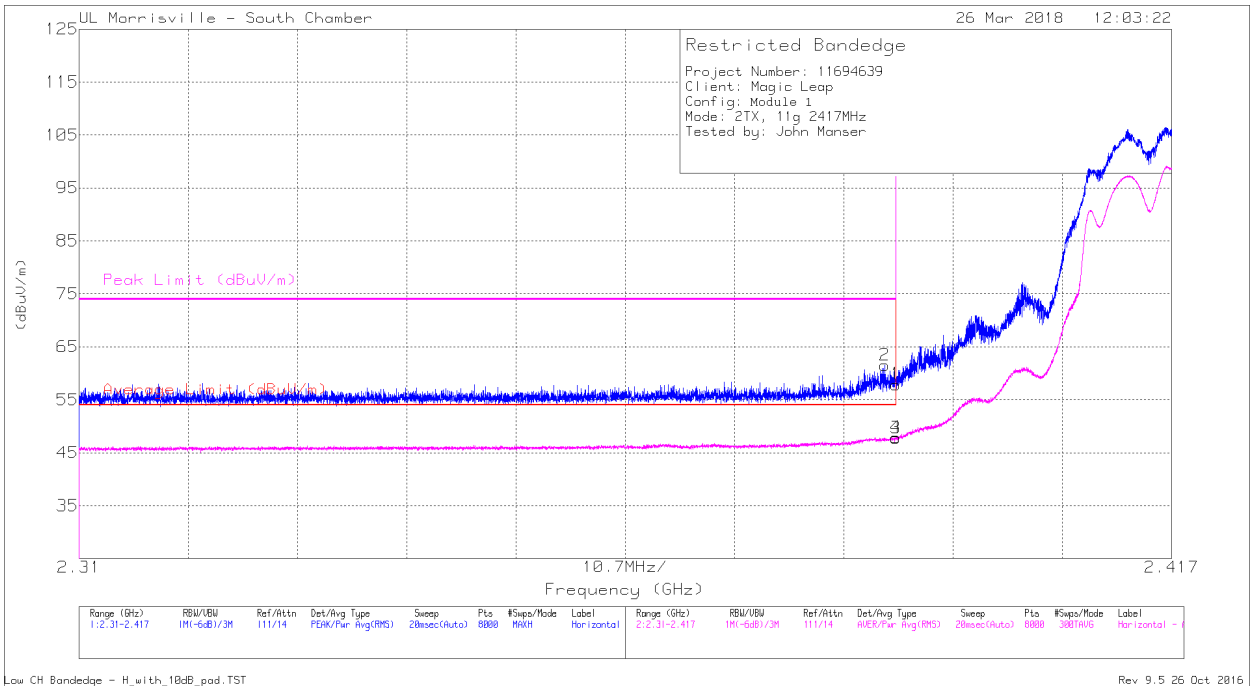
RESTRICTED BANDEDGE (LOW CHANNEL) VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	43.87	Pk	31.9	-24.1	10	61.67	-	-	74	-12.33	314	317	V
2	* 2.39	46.93	Pk	31.9	-24.1	10	64.73	-	-	74	-9.27	314	317	V
3	* 2.39	31.47	RMS	31.9	-24.1	10	49.27	54	-4.73	-	-	314	317	V
4	* 2.39	31.77	RMS	31.9	-24.1	10	49.57	54	-4.43	-	-	314	317	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

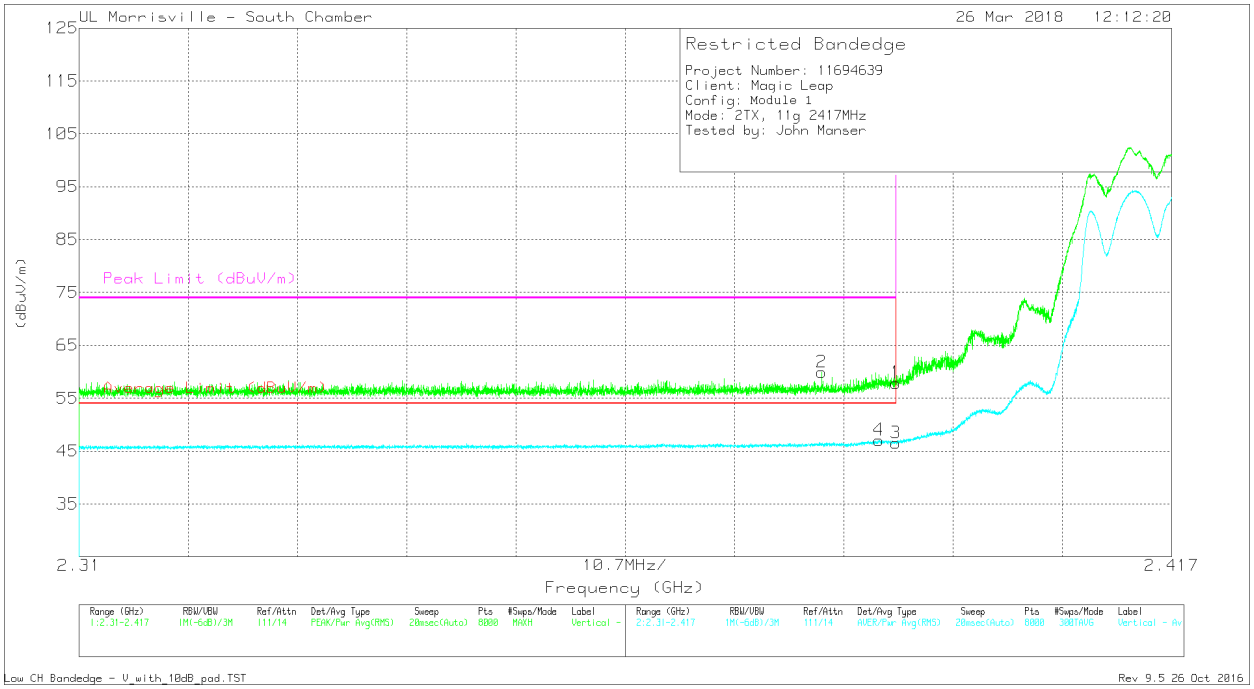
RESTRICTED BANDEDGE (CHANNEL 2) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.1	Pk	31.9	-24.1	10	57.9	-	-	74	-16.1	269	348	H
2	* 2.389	43.69	Pk	31.9	-24.1	10	61.49	-	-	74	-12.51	269	348	H
3	* 2.39	29.96	RMS	31.9	-24.1	10	47.76	54	-6.24	-	-	269	348	H
4	* 2.39	30.09	RMS	31.9	-24.1	10	47.89	54	-6.11	-	-	269	348	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

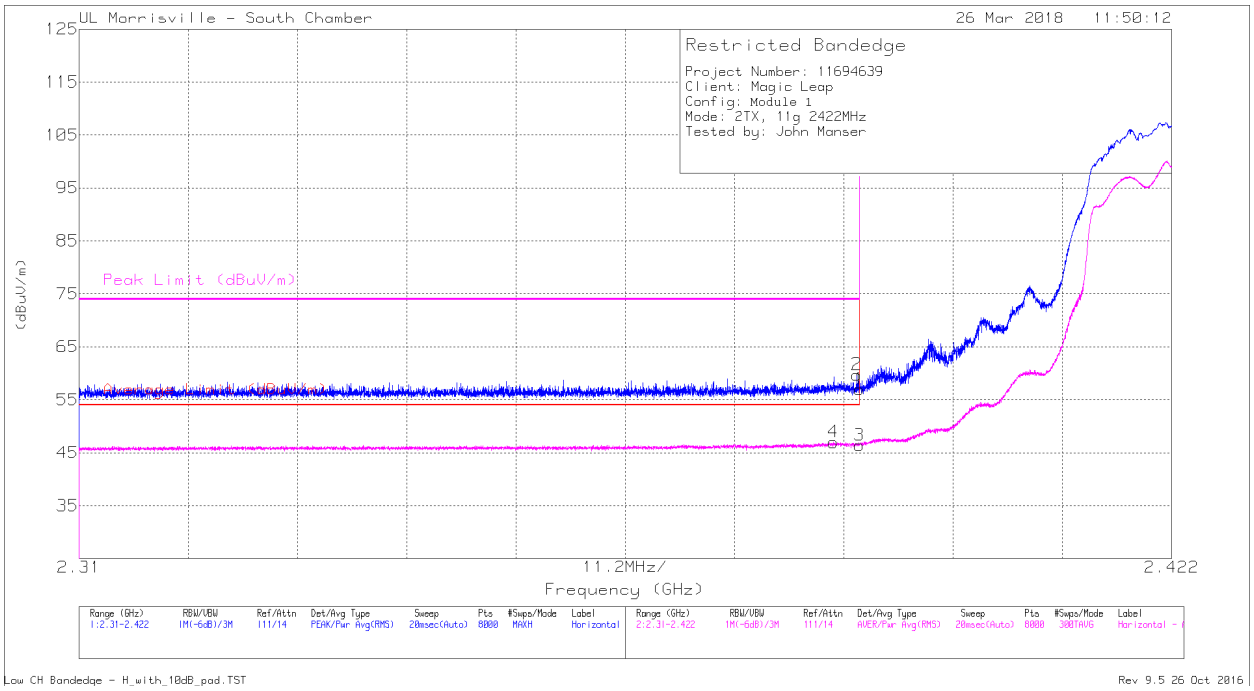
RESTRICTED BANDEDGE (CHANNEL 2) VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.08	Pk	31.9	-24.1	10	57.88	-	-	74	-16.12	304	320	V
2	* 2.383	42.09	Pk	31.9	-24.1	10	59.89	-	-	74	-14.11	304	320	V
3	* 2.39	28.75	RMS	31.9	-24.1	10	46.55	54	-7.45	-	-	304	320	V
4	* 2.388	29.27	RMS	31.9	-24.1	10	47.07	54	-6.93	-	-	304	320	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

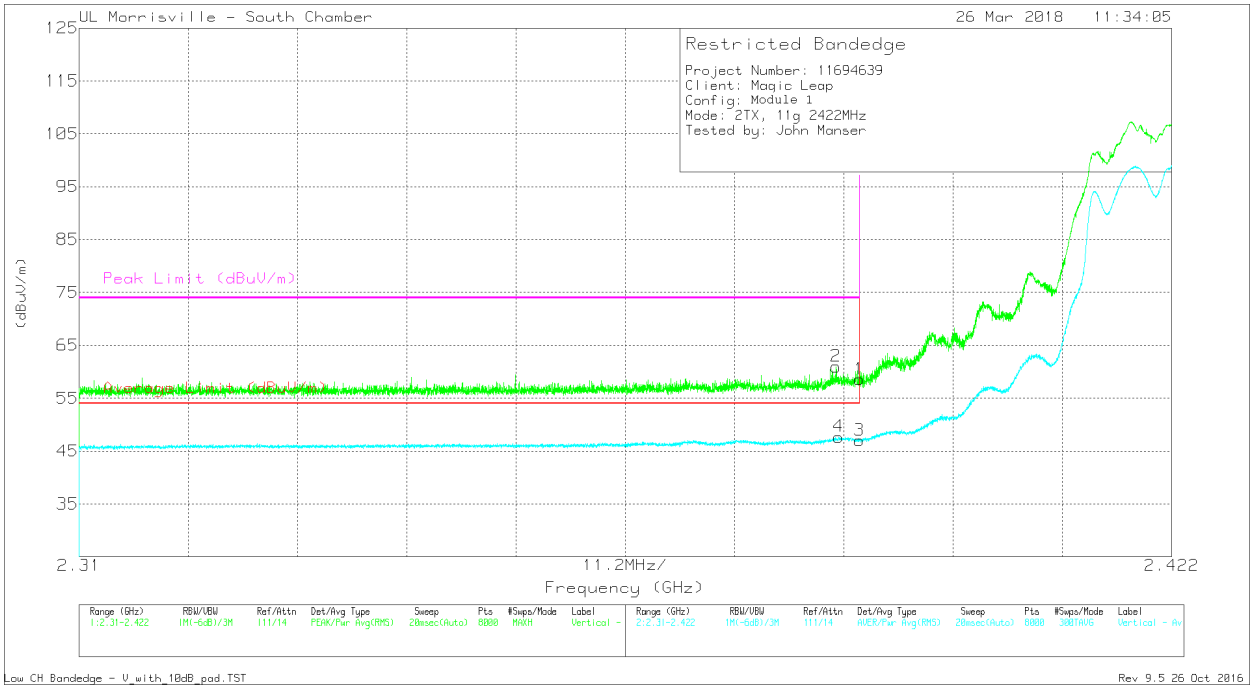
RESTRICTED BANDEDGE (CHANNEL 3) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	39.14	Pk	31.9	-24.1	10	56.94	-	-	74	-17.06	288	388	H
2	* 2.39	41.93	Pk	31.9	-24.1	10	59.73	-	-	74	-14.27	288	388	H
3	* 2.39	28.58	RMS	31.9	-24.1	10	46.38	54	-7.62	-	-	288	388	H
4	* 2.387	29.18	RMS	31.9	-24.1	10	46.98	54	-7.02	-	-	288	388	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

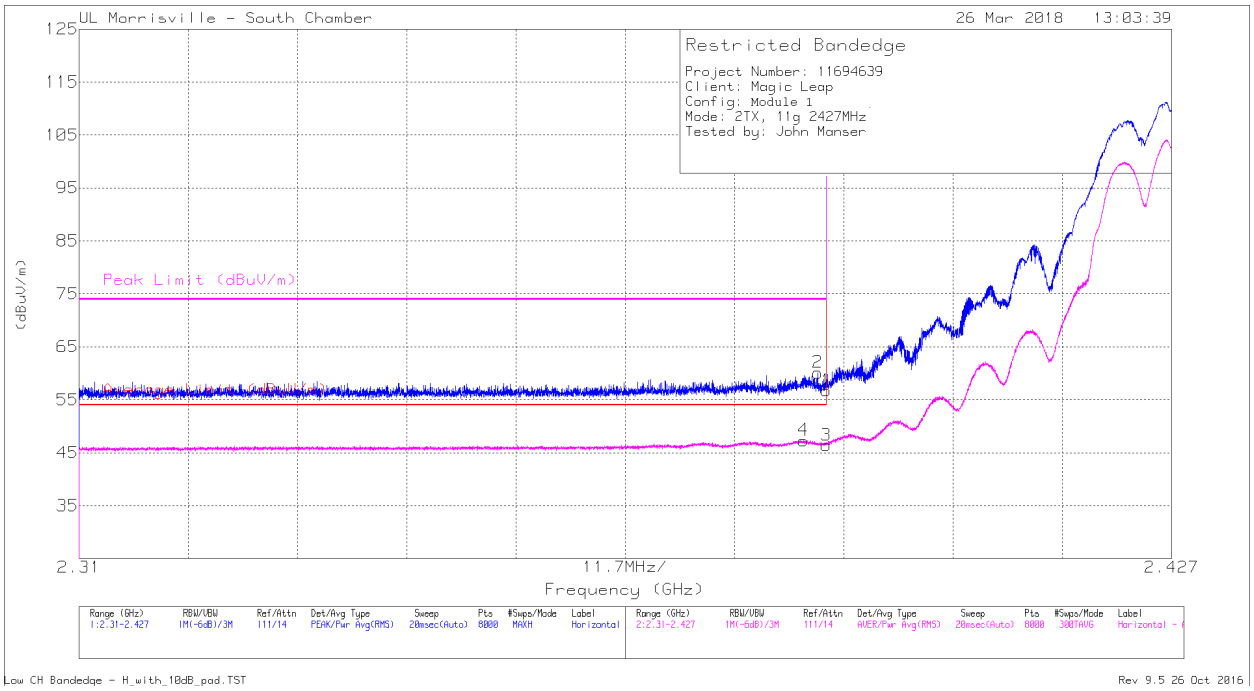
RESTRICTED BANDEDGE (CHANNEL 3) VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.75	Pk	31.9	-24.1	10	0	58.55	-	-	74	-15.45	173	136	V
2	* 2.388	43.18	Pk	31.9	-24.1	10	0	60.98	-	-	74	-13.02	173	136	V
3	* 2.39	29.19	RMS	31.9	-24.1	10	0	46.99	54	-7.01	-	-	173	136	V
4	* 2.388	29.9	RMS	31.9	-24.1	10	0	47.7	54	-6.3	-	-	173	136	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

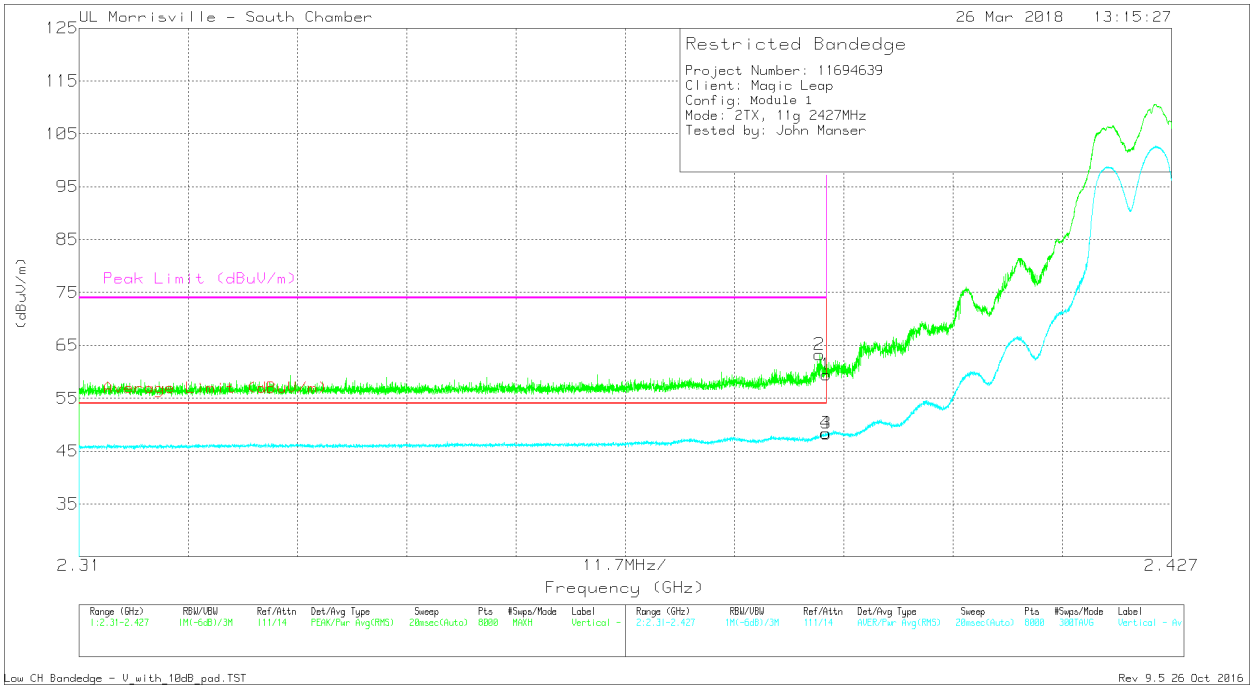
RESTRICTED BANDEDGE (CHANNEL 4) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	38.9	Pk	31.9	-24.1	10	0	56.7	-	-	74	-17.3	202	257	H
2	* 2.389	42.32	Pk	31.9	-24.1	10	0	60.12	-	-	74	-13.88	202	257	H
3	* 2.39	28.58	RMS	31.9	-24.1	10	0	46.38	54	-7.62	-	-	202	257	H
4	* 2.388	29.52	RMS	31.9	-24.1	10	0	47.32	54	-6.68	-	-	202	257	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

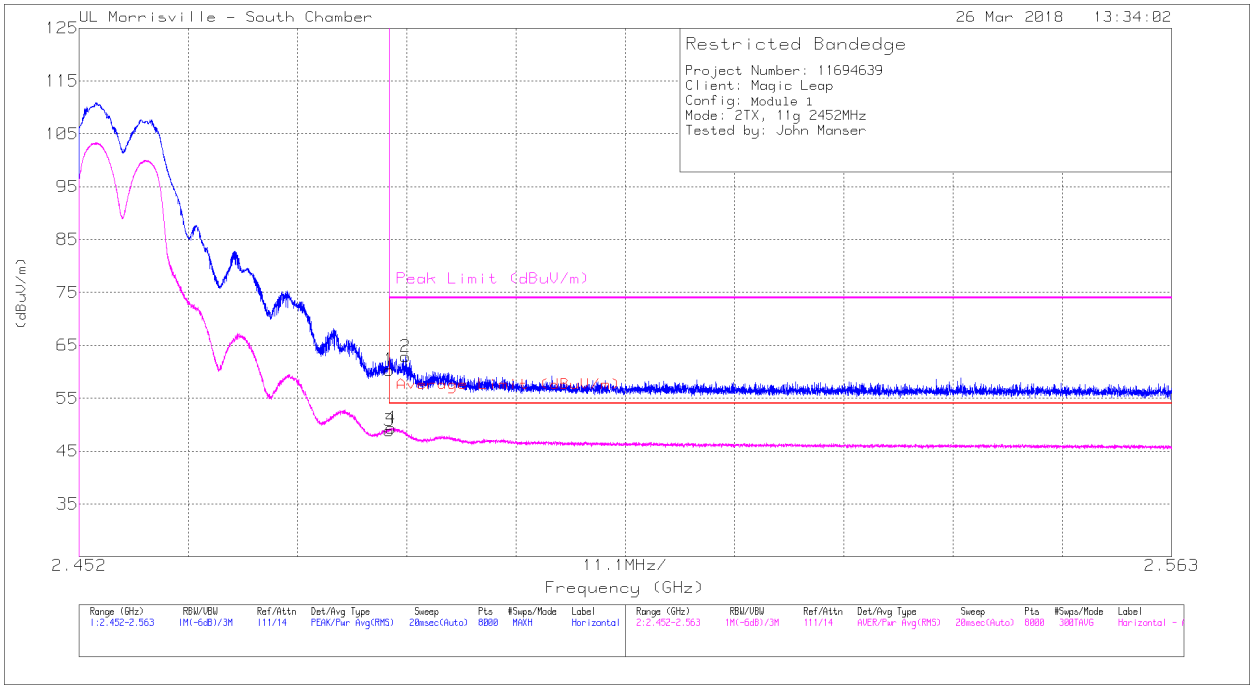
RESTRICTED BANDEDGE (CHANNEL 4) VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	41.61	Pk	31.9	-24.1	10	0	59.41	-	-	74	-14.59	163	137	V
2	* 2.389	45.46	Pk	31.9	-24.1	10	0	63.26	-	-	74	-10.74	163	137	V
3	* 2.39	30.52	RMS	31.9	-24.1	10	0	48.32	54	-5.68	-	-	163	137	V
4	* 2.39	30.56	RMS	31.9	-24.1	10	0	48.36	54	-5.64	-	-	163	137	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

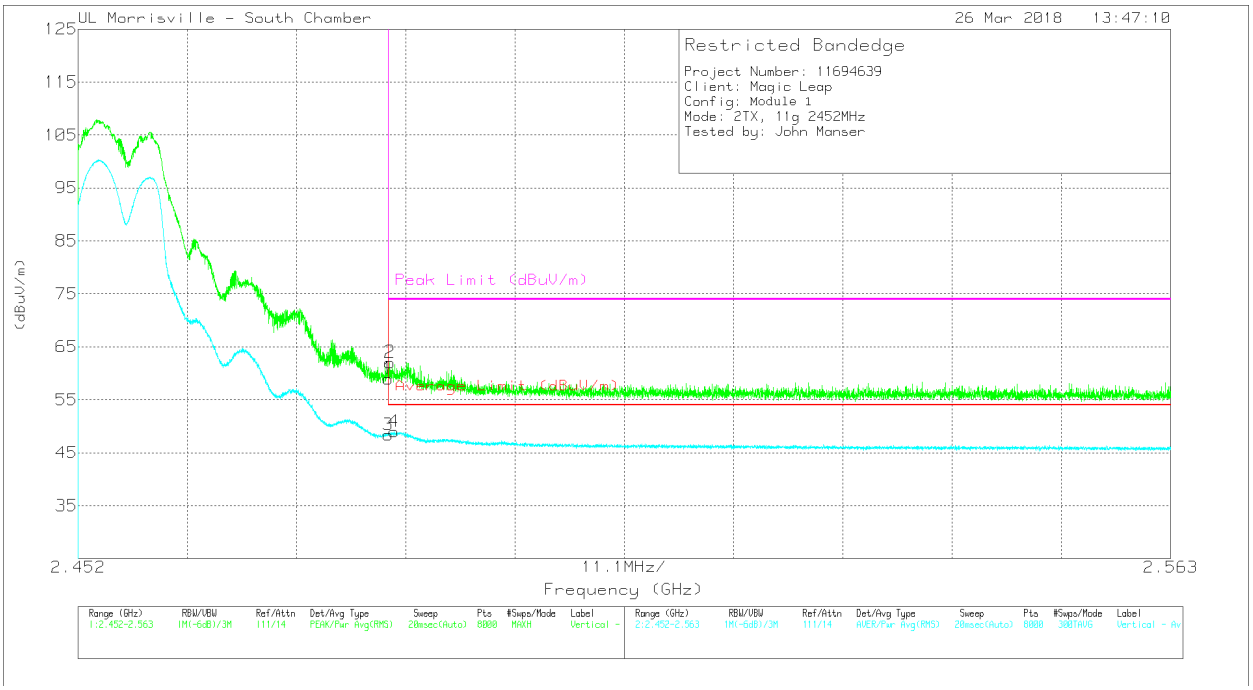
AUTHORIZED BANDEDGE (CHANNEL 9) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	42.56	Pk	32.4	-24.6	10	0	60.36	-	-	74	-13.64	187	253	H
2	* 2.485	45.05	Pk	32.4	-24.6	10	0	62.85	-	-	74	-11.15	187	253	H
3	* 2.484	31.08	RMS	32.4	-24.6	10	0	48.88	54	-5.12	-	-	187	253	H
4	* 2.484	31.59	RMS	32.4	-24.6	10	0	49.39	54	-4.61	-	-	187	253	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

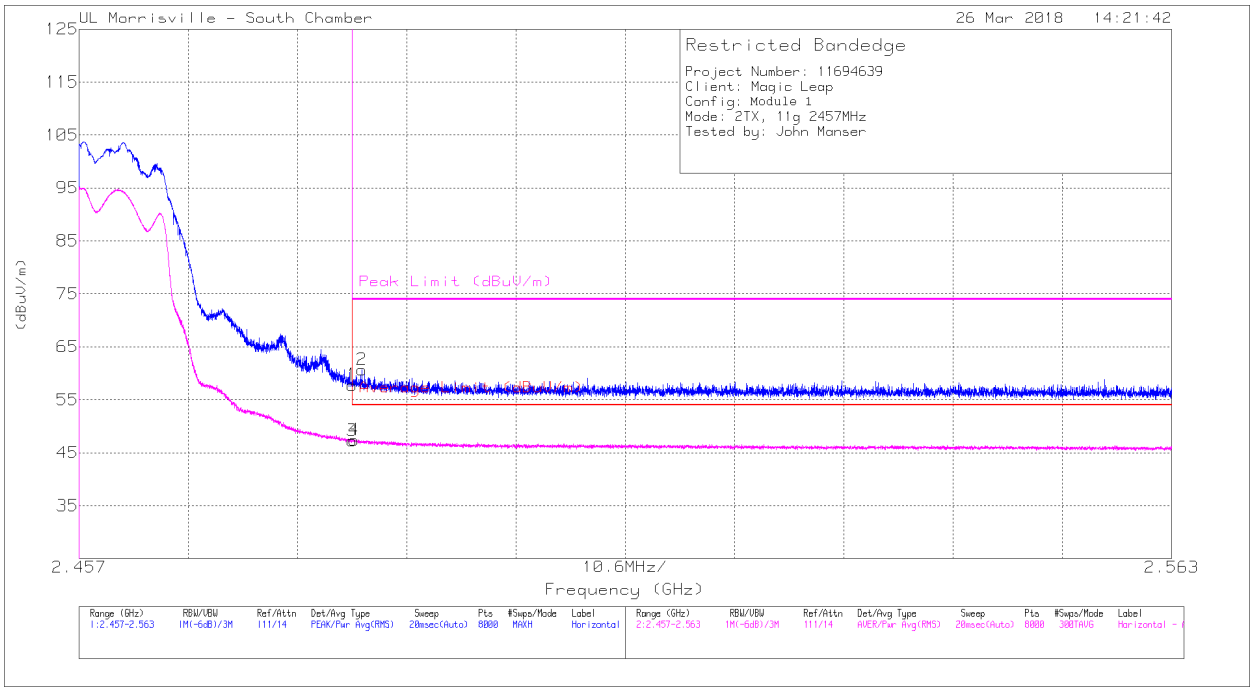
AUTHORIZED BANDEDGE (CHANNEL 9) VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41.19	Pk	32.4	-24.6	10	0	58.99	-	-	74	-15.01	210	175	V
2	* 2.484	44.25	Pk	32.4	-24.6	10	0	62.05	-	-	74	-11.95	210	175	V
3	* 2.484	30.59	RMS	32.4	-24.6	10	0	48.39	54	-5.61	-	-	210	175	V
4	* 2.484	31.16	RMS	32.4	-24.6	10	0	48.96	54	-5.04	-	-	210	175	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

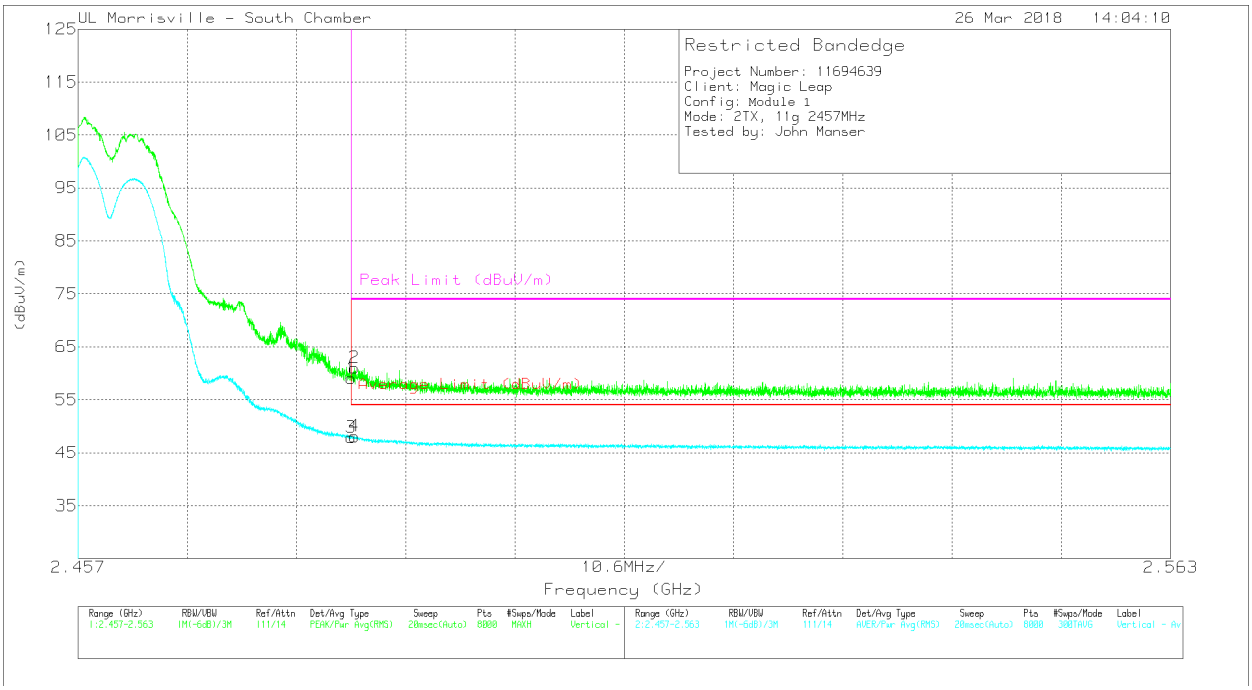
AUTHORIZED BANDEDGE (CHANNEL 10) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	39.98	Pk	32.4	-24.6	10	0	57.78	-	-	74	-16.22	241	234	H
2	* 2.484	42.88	Pk	32.4	-24.6	10	0	60.68	-	-	74	-13.32	241	234	H
3	* 2.484	29.44	RMS	32.4	-24.6	10	0	47.24	54	-6.76	-	-	241	234	H
4	* 2.484	29.62	RMS	32.4	-24.6	10	0	47.42	54	-6.58	-	-	241	234	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

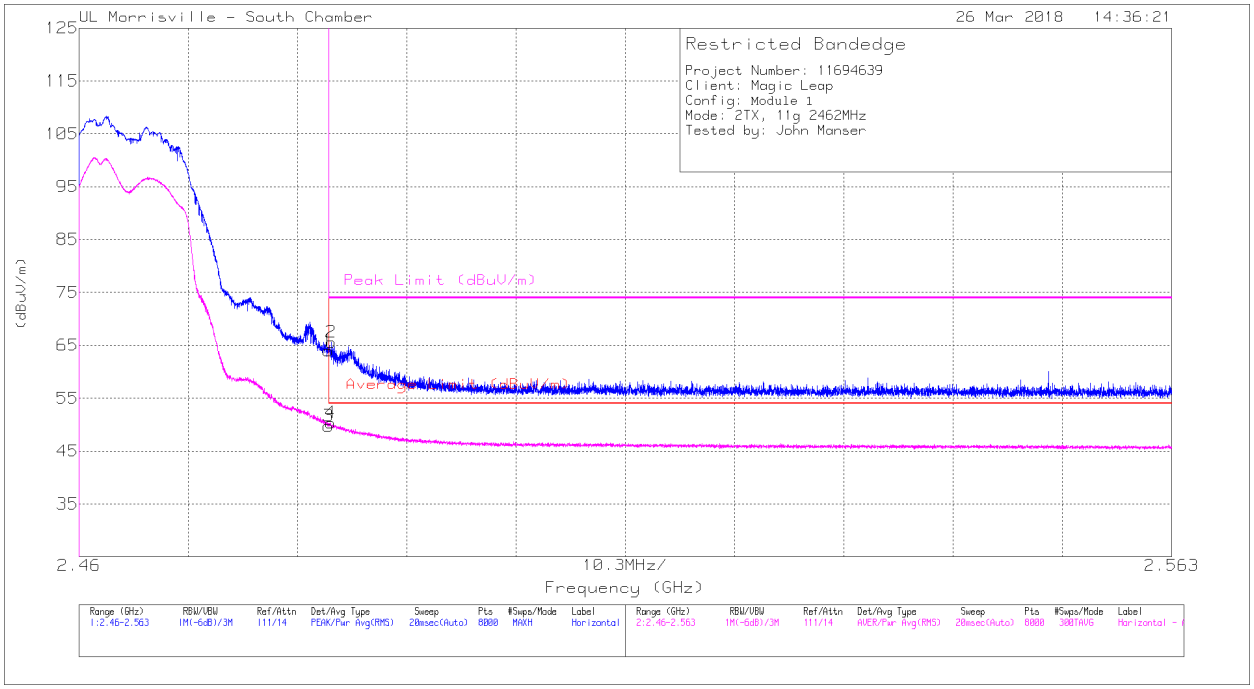
AUTHORIZED BANDEDGE (CHANNEL 10) VERTICAL



Marker	Frequency(GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41.3	Pk	32.4	-24.6	10	0	59.1	-	-	74	-14.9	166	195	V
2	* 2.484	43.23	Pk	32.4	-24.6	10	0	61.03	-	-	74	-12.97	166	195	V
3	* 2.484	30.08	RMS	32.4	-24.6	10	0	47.88	54	-6.12	-	-	166	195	V
4	* 2.484	30.28	RMS	32.4	-24.6	10	0	48.08	54	-5.92	-	-	166	195	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

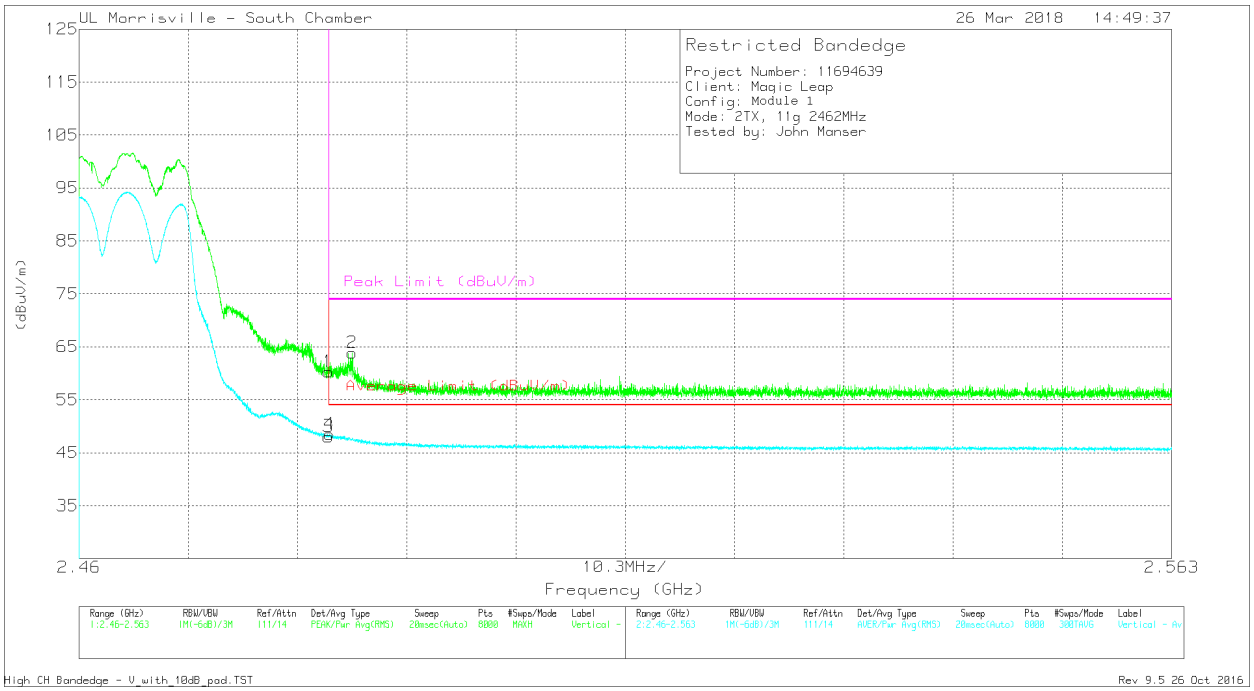
AUTHORIZED BANDEDGE (HIGH CHANNEL) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	46.16	Pk	32.4	-24.6	10	0	63.96	-	-	74	-10.04	201	364	H
2	* 2.484	47.78	Pk	32.4	-24.6	10	0	65.58	-	-	74	-8.42	201	364	H
3	* 2.484	31.94	RMS	32.4	-24.6	10	0	49.74	54	-4.26	-	-	201	364	H
4	* 2.484	32.53	RMS	32.4	-24.6	10	0	50.33	54	-3.67	-	-	201	364	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

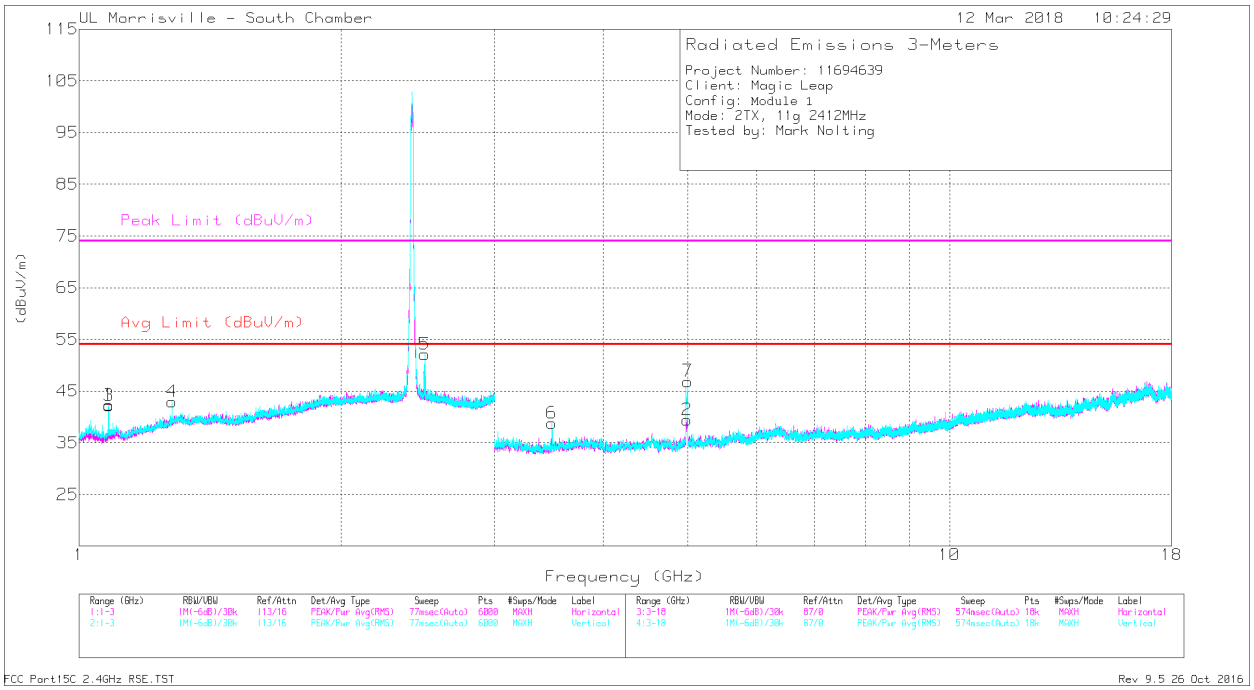
AUTHORIZED BANDEDGE (HIGH CHANNEL) VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	42.52	Pk	32.4	-24.6	10	60.32	-	-	74	-13.68	327	364	V
2	* 2.486	46.05	Pk	32.4	-24.6	10	63.85	-	-	74	-10.15	327	364	V
3	* 2.484	30.25	RMS	32.4	-24.6	10	48.05	54	-5.95	-	-	327	364	V
4	* 2.484	30.67	RMS	32.4	-24.6	10	48.47	54	-5.53	-	-	327	364	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

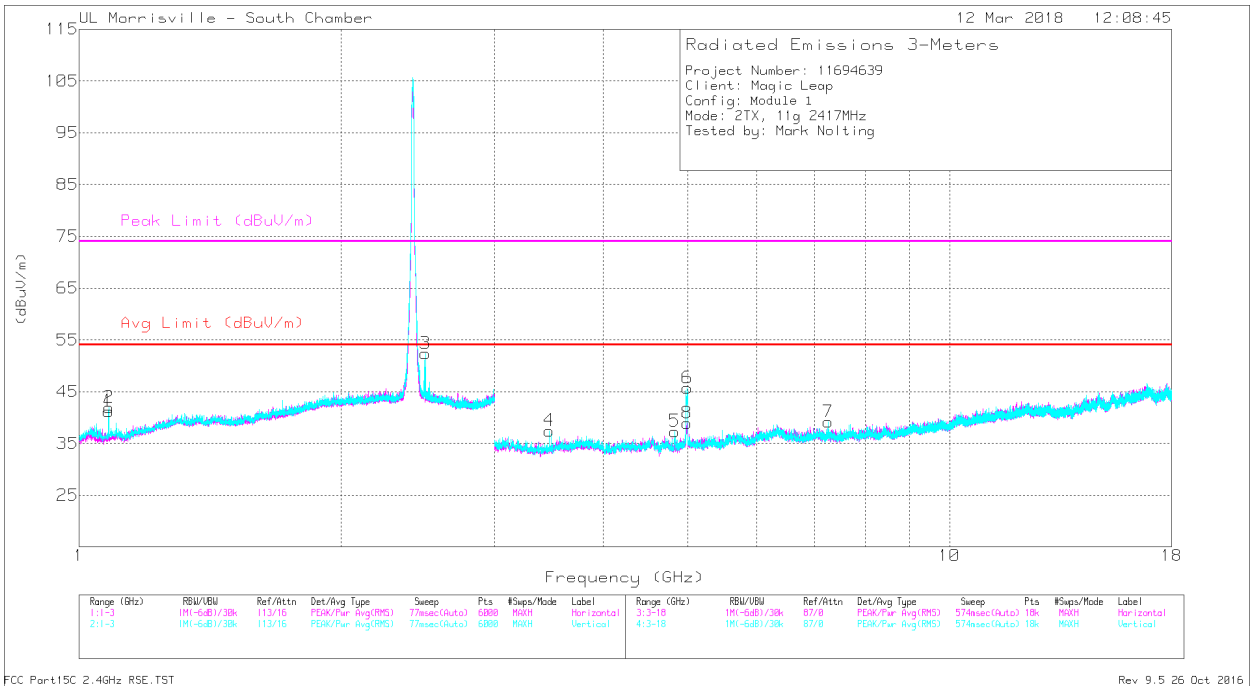
HARMONICS AND SPURIOUS EMISSIONS
LOW CHANNEL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.081	45.1	PK2	27.2	-24.4	47.9	-	-	74	-26.1	164	190	H
	* 1.081	37.33	MAv1	27.2	-24.4	40.13	54	-13.87	-	-	164	190	H
3	* 1.081	45.21	PK2	27.2	-24.4	48.01	-	-	74	-25.99	140	142	V
	* 1.081	38.71	MAv1	27.2	-24.4	41.51	54	-12.49	-	-	140	142	V
4	* 1.278	43.37	PK2	29	-23.3	49.07	-	-	74	-24.93	141	100	V
	* 1.278	34.97	MAv1	29	-23.3	40.67	54	-13.33	-	-	141	100	V
5	* 2.49	56.23	PK2	32.4	-24.7	63.93	-	-	74	-10.07	85	147	V
	* 2.489	32.02	MAv1	32.4	-24.6	39.82	54	-14.18	-	-	85	147	V
2	* 5	46.01	PK2	34	-31.5	48.51	-	-	74	-25.49	245	100	H
	* 4.977	31.05	MAv1	34	-31.3	33.75	54	-20.25	-	-	245	100	H
7	* 4.976	51.59	PK2	34	-31.3	54.29	-	-	74	-19.71	136	109	V
	* 4.994	35.55	MAv1	34	-31.5	38.05	54	-15.95	-	-	136	109	V
6	3.494	39.27	Pk	32.7	-33.2	38.77	-	-	-	-	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

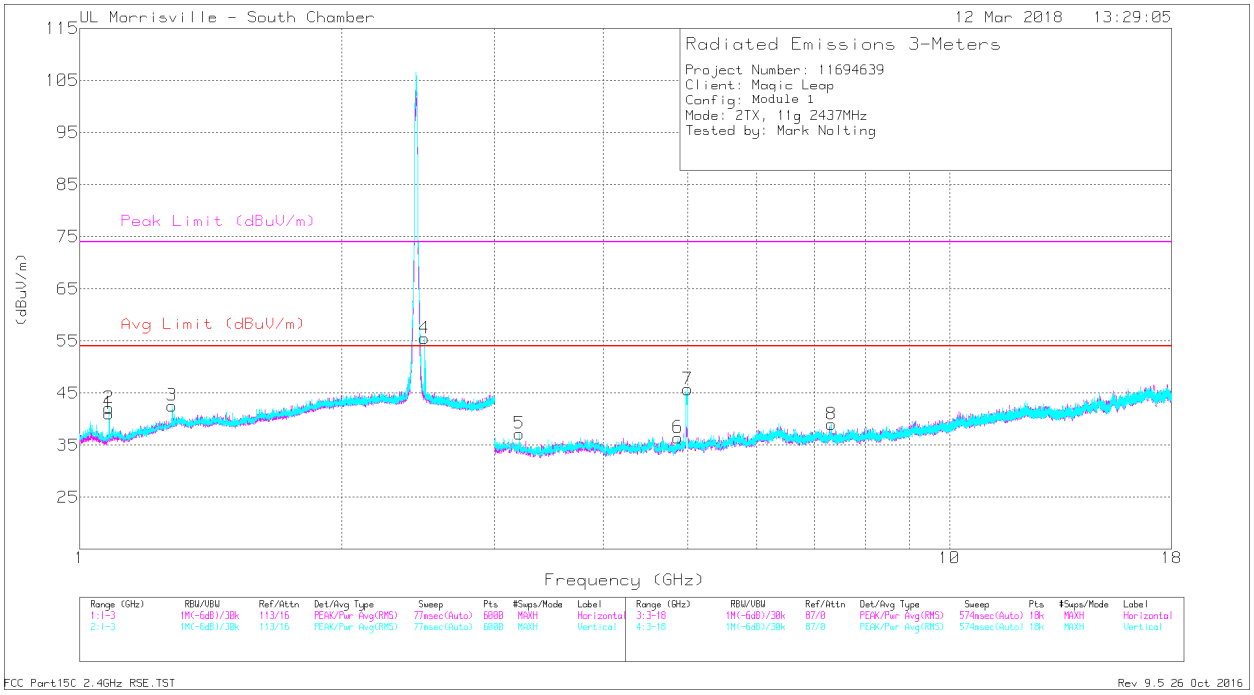
CHANNEL 2



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.082	45.07	PK2	27.2	-24.4	47.87	-	-	74	-26.13	166	189	H
	* 1.081	37.26	MAv1	27.2	-24.4	40.06	54	-13.94	-	-	166	189	H
2	* 1.081	45.06	PK2	27.2	-24.4	47.86	-	-	74	-26.14	152	138	V
	* 1.081	37.76	MAv1	27.2	-24.4	40.56	54	-13.44	-	-	152	138	V
3	* 2.5	56.26	PK2	32.3	-24.8	63.76	-	-	74	-10.24	93	163	V
	* 2.489	31.97	MAv1	32.4	-24.6	39.77	54	-14.23	-	-	93	163	V
8	* 4.996	48.04	PK2	34	-31.5	50.54	-	-	74	-23.46	246	101	H
	* 4.977	34.96	MAv1	34	-31.3	37.66	54	-16.34	-	-	246	101	H
5	* 4.829	42.71	PK2	34	-31	45.71	-	-	74	-28.29	280	101	V
	* 4.834	30.89	MAv1	34	-31.1	33.79	54	-20.21	-	-	280	101	V
6	* 4.987	52.02	PK2	34	-31.5	54.52	-	-	74	-19.48	310	105	V
	* 4.977	37.22	MAv1	34	-31.3	39.92	54	-14.08	-	-	310	105	V
7	* 7.252	38.95	PK2	35.5	-28	46.45	-	-	74	-27.55	227	185	V
	* 7.253	27.6	MAv1	35.5	-28	35.1	54	-18.9	-	-	227	185	V
4	3.467	37.77	Pk	32.7	-33	37.47	-	-	-	-	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

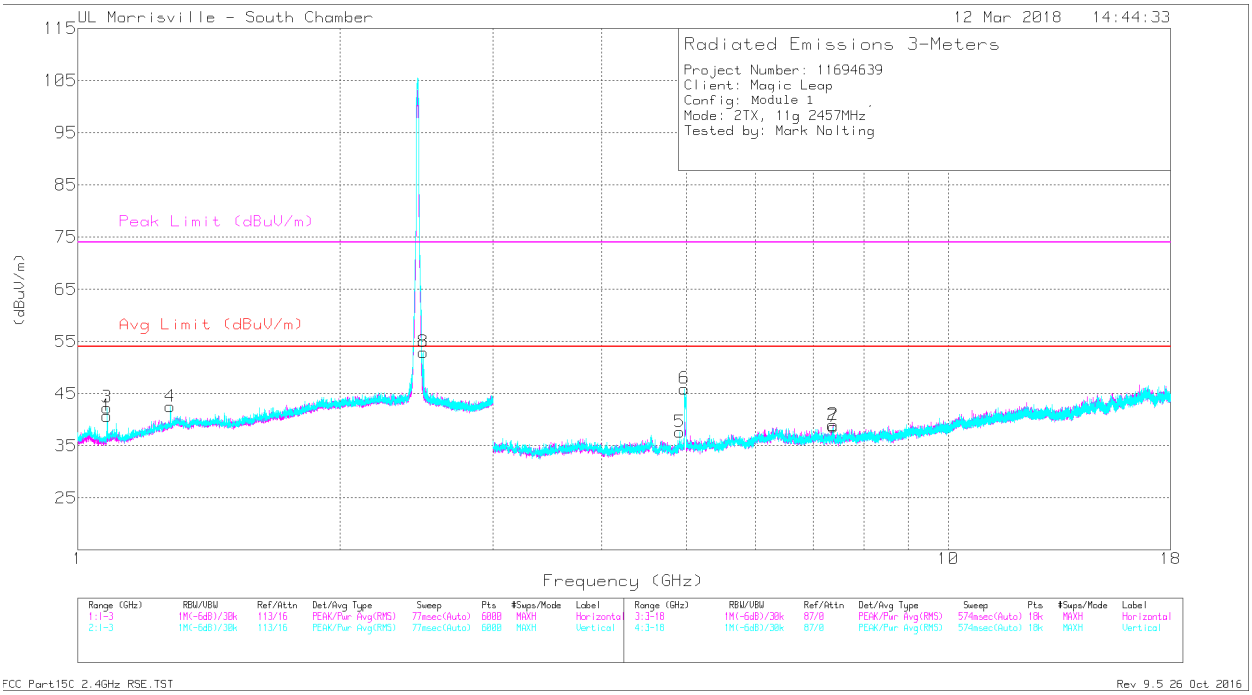
MID CHANNEL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.081	45.03	PK2	27.2	-24.4	47.83	-	-	74	-26.17	169	190	H
	* 1.081	36.9	MAv1	27.2	-24.4	39.7	54	-14.3	-	-	169	190	H
2	* 1.081	45.45	PK2	27.2	-24.4	48.25	-	-	74	-25.75	149	142	V
	* 1.081	38.49	MAv1	27.2	-24.4	41.29	54	-12.71	-	-	149	142	V
3	* 1.278	43.84	PK2	29	-23.3	49.54	-	-	74	-24.46	141	101	V
	* 1.278	35.07	MAv1	29	-23.3	40.77	54	-13.23	-	-	141	101	V
4	* 2.492	57.04	PK2	32.4	-24.7	64.74	-	-	74	-9.26	84	147	V
	* 2.491	32.58	MAv1	32.4	-24.7	40.28	54	-13.72	-	-	84	147	V
6	* 4.877	39.67	PK2	34	-30.8	42.87	-	-	74	-31.13	253	198	V
	* 4.874	28.17	MAv1	34	-30.8	31.37	54	-22.63	-	-	253	198	V
7	* 4.979	52.27	PK2	34	-31.4	54.87	-	-	74	-19.13	307	105	V
	* 4.995	35.79	MAv1	34	-31.5	38.29	54	-15.71	-	-	307	105	V
8	* 7.308	40.24	PK2	35.5	-27.8	47.94	-	-	74	-26.06	230	201	V
	* 7.308	28.07	MAv1	35.5	-27.8	35.77	54	-18.23	-	-	230	201	V
5	3.2	37.02	Pk	33	-32.8	37.22	-	-	-	-	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

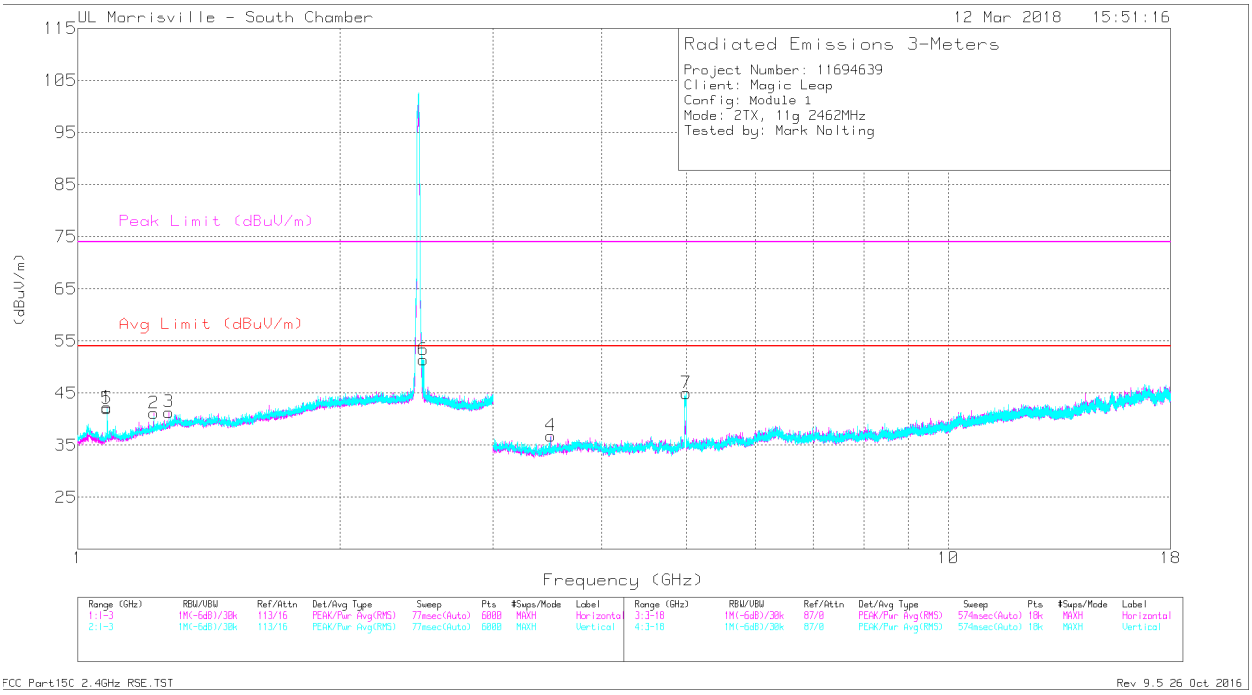
CHANNEL 10



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.081	44.61	PK2	27.2	-24.4	47.41	-	-	74	-26.59	170	190	H
	* 1.081	37.13	MAv1	27.2	-24.4	39.93	54	-14.07	-	-	170	190	H
3	* 1.081	45.38	PK2	27.2	-24.4	48.18	-	-	74	-25.82	150	140	V
	* 1.081	38.6	MAv1	27.2	-24.4	41.4	54	-12.6	-	-	150	140	V
4	* 1.278	43.12	PK2	29	-23.3	48.82	-	-	74	-25.18	141	101	V
	* 1.278	35.14	MAv1	29	-23.3	40.84	54	-13.16	-	-	141	101	V
8	* 2.493	57.27	PK2	32.4	-24.7	64.97	-	-	74	-9.03	86	147	V
	* 2.49	34.16	MAv1	32.4	-24.6	41.96	54	-12.04	-	-	86	147	V
2	* 7.378	39.5	PK2	35.5	-27.9	47.1	-	-	74	-26.9	154	101	H
	* 7.373	27.57	MAv1	35.5	-27.9	35.17	54	-18.83	-	-	154	101	H
5	* 4.914	41.25	PK2	34	-30.9	44.35	-	-	74	-29.65	289	101	V
	* 4.914	29.7	MAv1	34	-30.9	32.8	54	-21.2	-	-	289	101	V
6	* 4.976	51.53	PK2	34	-31.3	54.23	-	-	74	-19.77	311	101	V
	* 4.98	35.36	MAv1	34	-31.4	37.96	54	-16.04	-	-	311	101	V
7	* 7.368	41	PK2	35.5	-27.9	48.6	-	-	74	-25.4	235	206	V
	* 7.373	28.96	MAv1	35.5	-27.9	36.56	54	-17.44	-	-	235	206	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

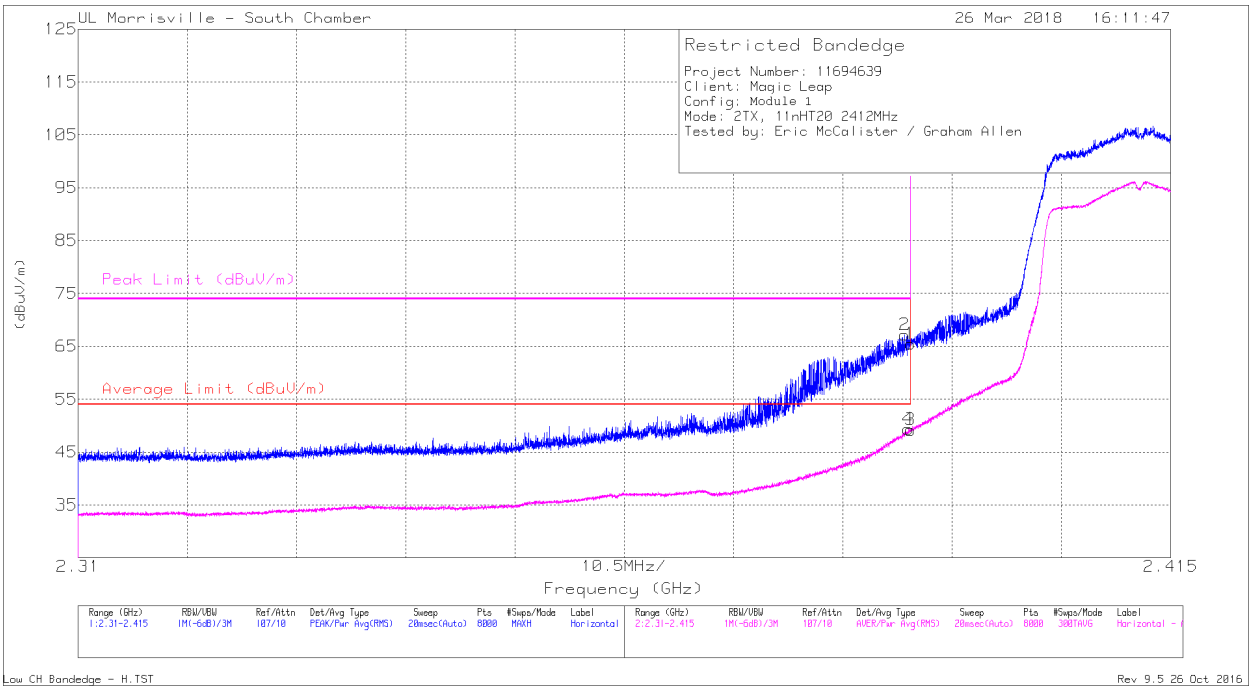
HIGH CHANNEL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.081	44.79	PK2	27.2	-24.4	47.59	-	-	74	-26.41	166	189	H
	* 1.081	37.01	MAv1	27.2	-24.4	39.81	54	-14.19	-	-	166	189	H
2	* 1.224	42.01	PK2	28.3	-23.6	46.71	-	-	74	-27.29	132	164	H
	* 1.224	32.24	MAv1	28.3	-23.6	36.94	54	-17.06	-	-	132	164	H
3	* 1.272	42.07	PK2	29	-23.3	47.77	-	-	74	-26.23	159	125	H
	* 1.272	30.86	MAv1	29	-23.3	36.56	54	-17.44	-	-	159	125	H
5	* 1.081	45.15	PK2	27.2	-24.4	47.95	-	-	74	-26.05	152	136	V
	* 1.081	37.3	MAv1	27.2	-24.4	40.1	54	-13.9	-	-	152	136	V
6	* 2.493	55.51	PK2	32.4	-24.7	63.21	-	-	74	-10.79	85	147	V
	* 2.49	33.16	MAv1	32.4	-24.6	40.96	54	-13.04	-	-	85	147	V
7	* 4.987	51.55	PK2	34	-31.5	54.05	-	-	74	-19.95	310	105	V
	* 4.993	35.66	MAv1	34	-31.5	38.16	54	-15.84	-	-	310	105	V
4	3.495	37.32	Pk	32.7	-33.2	36.82	-	-	-	-	0-360	102	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

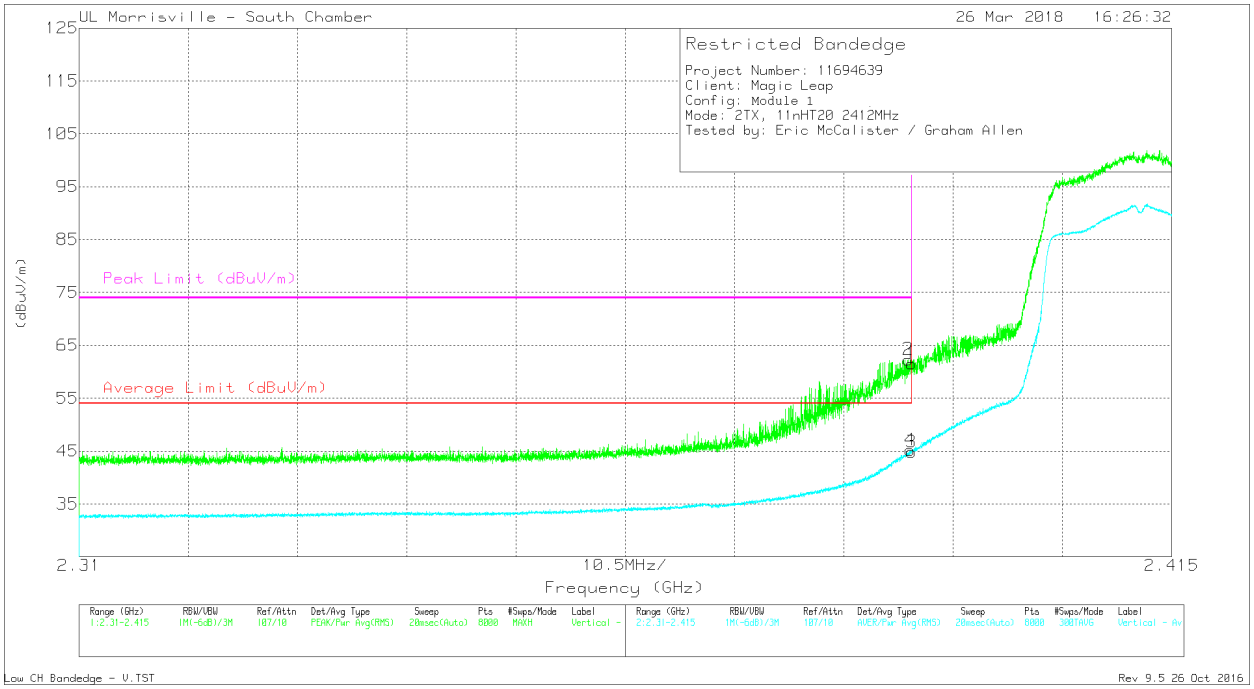
9.2.6. TX ABOVE 1 GHz 802.11n HT20 MODE – MODULE 1 MIMO SDM RESTRICTED BANDEDGE (LOW CHANNEL) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	57.67	Pk	31.9	-24.1	65.47	-	-	74	-8.53	204	346	H
2	* 2.389	59.35	Pk	31.9	-24.1	67.15	-	-	74	-6.85	204	346	H
3	* 2.39	41.39	RMS	31.9	-24.1	49.19	54	-4.81	-	-	204	346	H
4	* 2.39	41.53	RMS	31.9	-24.1	49.33	54	-4.67	-	-	204	346	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

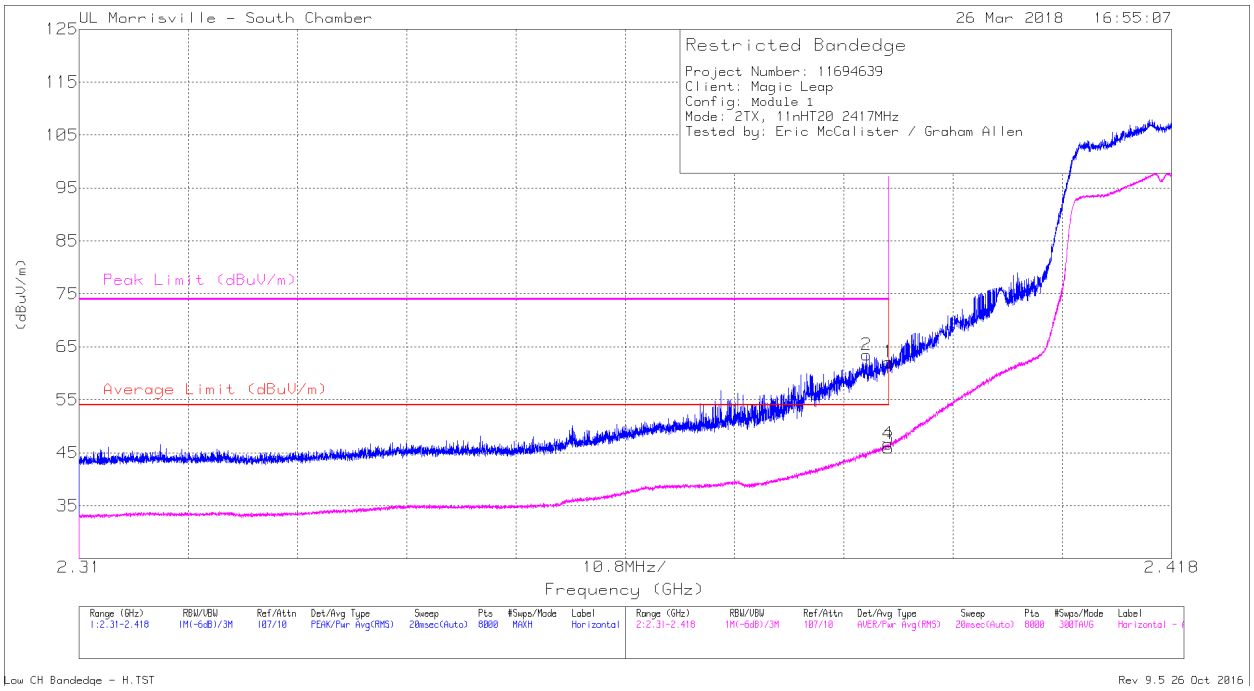
RESTRICTED BANDEDGE (LOW CHANNEL) VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	53.73	Pk	31.9	-24.1	61.53	-	-	74	-12.47	150	338	V
2	* 2.39	54.5	Pk	31.9	-24.1	62.3	-	-	74	-11.7	150	338	V
3	* 2.39	37	RMS	31.9	-24.1	44.8	54	-9.2	-	-	150	338	V
4	* 2.39	37.41	RMS	31.9	-24.1	45.21	54	-8.79	-	-	150	338	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

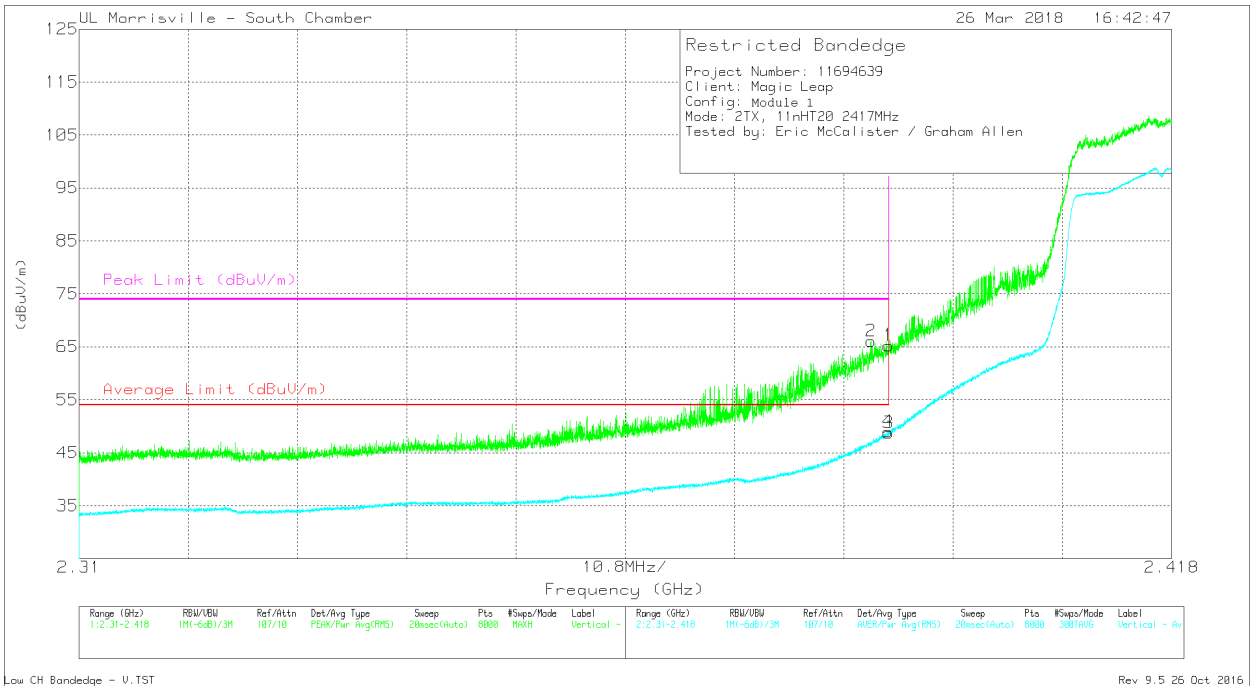
RESTRICTED BANDEDGE (CHANNEL 2) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	54.31	Pk	31.9	-24.1	62.11	-	-	74	-11.89	199	209	H
2	* 2.388	55.68	Pk	31.9	-24.1	63.48	-	-	74	-10.52	199	209	H
3	* 2.39	38.15	RMS	31.9	-24.1	45.95	54	-8.05	-	-	199	209	H
4	* 2.39	38.89	RMS	31.9	-24.1	46.69	54	-7.31	-	-	199	209	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

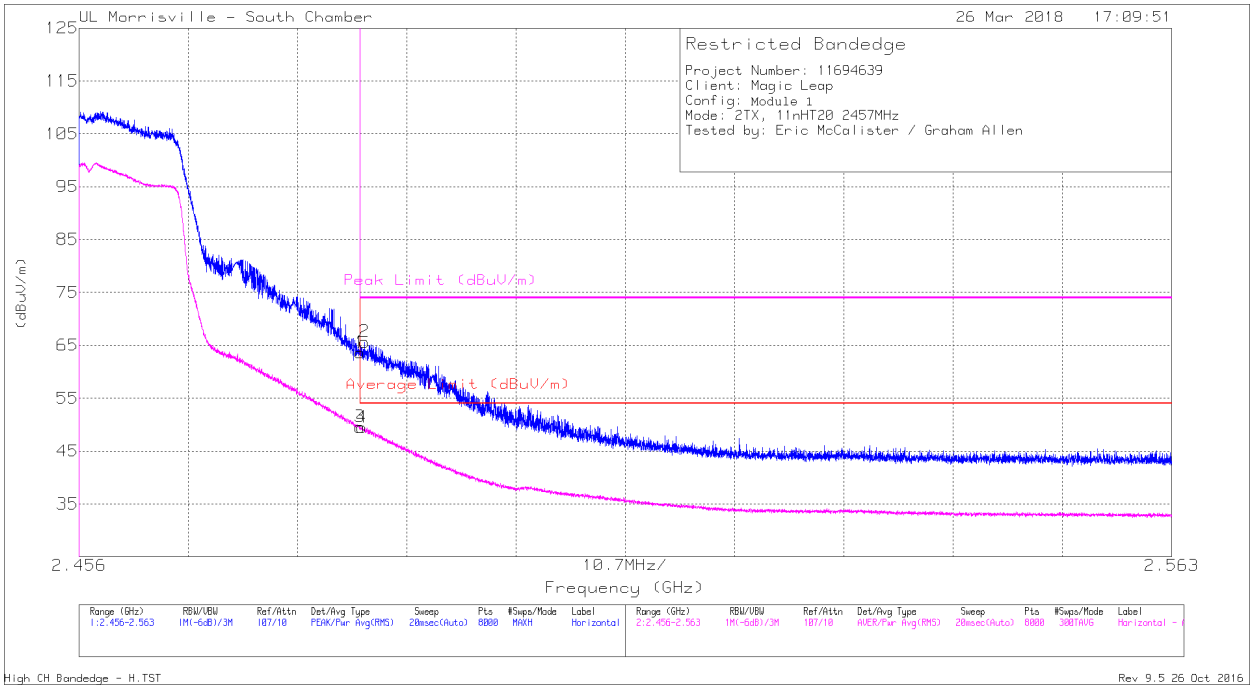
RESTRICTED BANDEDGE (CHANNEL 2) VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	57.45	Pk	31.9	-24.1	65.25	-	-	74	-8.75	80	118	V
2	* 2.388	58.3	Pk	31.9	-24.1	66.1	-	-	74	-7.9	80	118	V
3	* 2.39	40.91	RMS	31.9	-24.1	48.71	54	-5.29	-	-	80	118	V
4	* 2.39	41.16	RMS	31.9	-24.1	48.96	54	-5.04	-	-	80	118	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

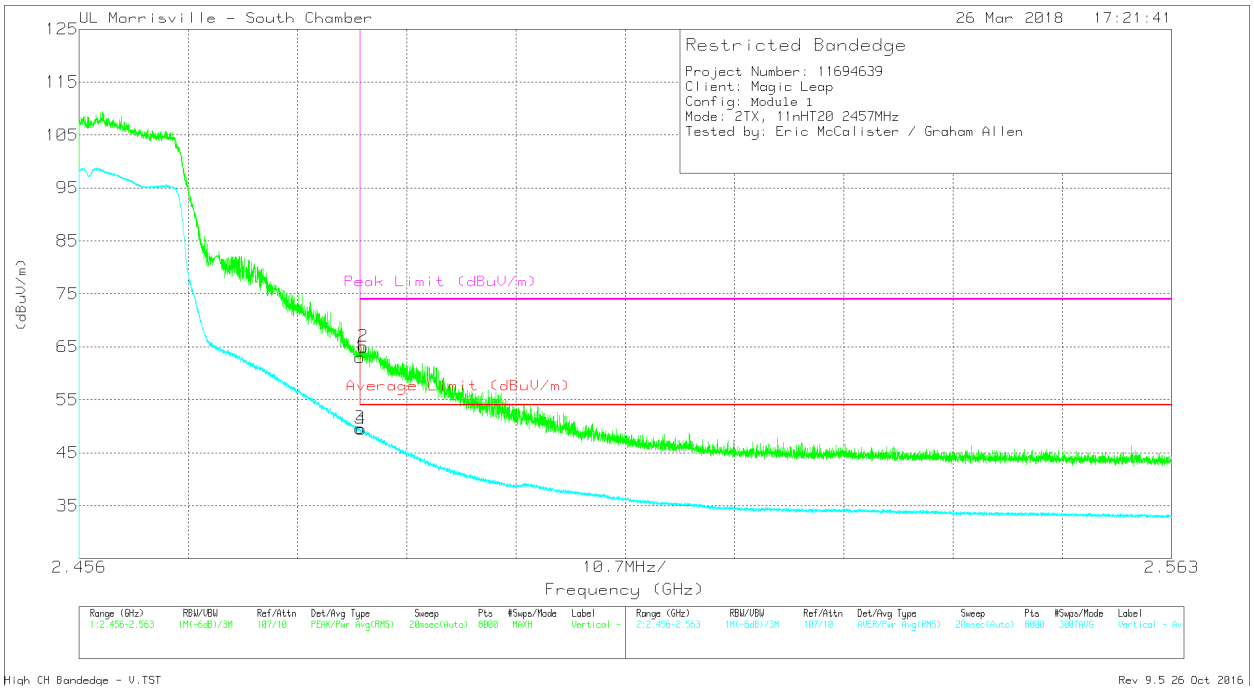
AUTHORIZED BANDEDGE (CHANNEL 10) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	55.78	Pk	32.4	-24.6	63.58	-	-	74	-10.42	197	313	H
2	* 2.484	57.85	Pk	32.4	-24.6	65.65	-	-	74	-8.35	197	313	H
3	* 2.484	41.76	RMS	32.4	-24.6	49.56	54	-4.44	-	-	197	313	H
4	* 2.484	41.65	RMS	32.4	-24.6	49.45	54	-4.55	-	-	197	313	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

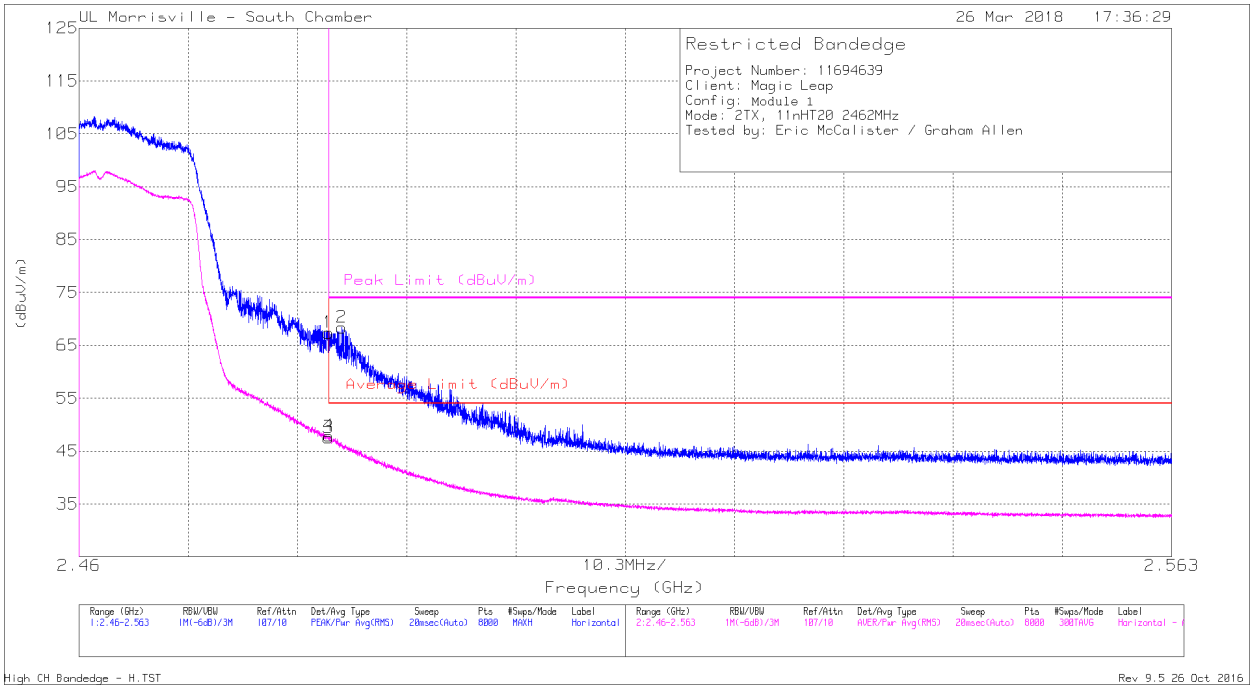
AUTHORIZED BANDEDGE (CHANNEL 10) VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	55.19	Pk	32.4	-24.6	62.99	-	-	74	-11.01	156	208	V
2	* 2.484	57.25	Pk	32.4	-24.6	65.05	-	-	74	-8.95	156	208	V
3	* 2.484	41.86	RMS	32.4	-24.6	49.66	54	-4.34	-	-	156	208	V
4	* 2.484	41.71	RMS	32.4	-24.6	49.51	54	-4.49	-	-	156	208	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

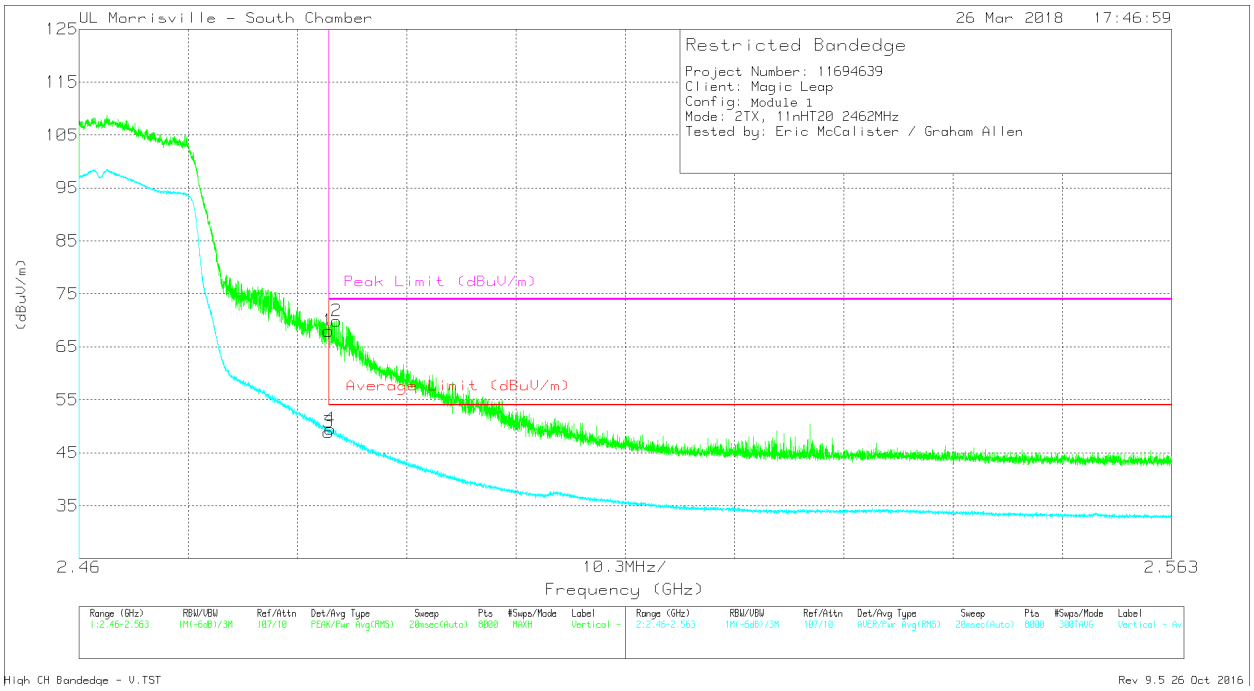
AUTHORIZED BANDEDGE (HIGH CHANNEL) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	59.58	Pk	32.4	-24.6	67.38	-	-	74	-6.62	198	278	H
2	* 2.485	60.56	Pk	32.4	-24.6	68.36	-	-	74	-5.64	198	278	H
3	* 2.484	39.77	RMS	32.4	-24.6	47.57	54	-6.43	-	-	198	278	H
4	* 2.484	40.11	RMS	32.4	-24.6	47.91	54	-6.09	-	-	198	278	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL) VERTICAL

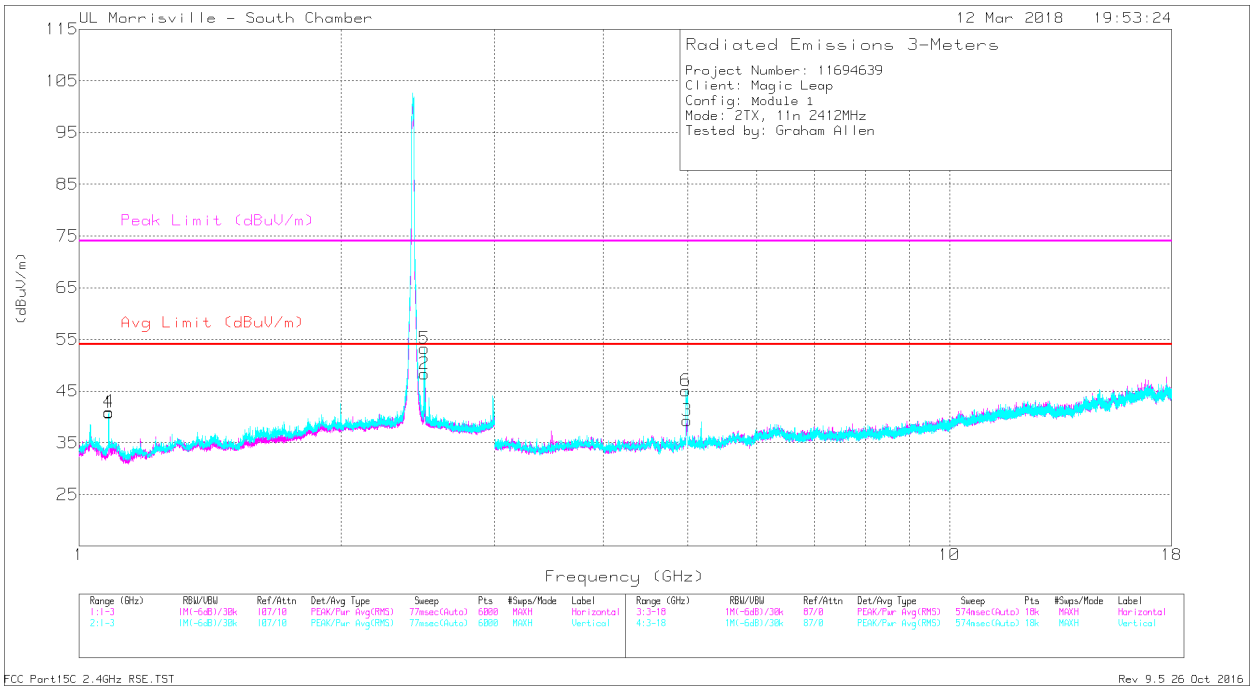


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	60.2	Pk	32.4	-24.6	68	-	-	74	-6	81	100	V
2	* 2.484	62.09	Pk	32.4	-24.6	69.89	-	-	74	-4.11	81	100	V
3	* 2.484	41.04	RMS	32.4	-24.6	48.84	54	-5.16	-	-	81	100	V
4	* 2.484	41.67	RMS	32.4	-24.6	49.47	54	-4.53	-	-	81	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

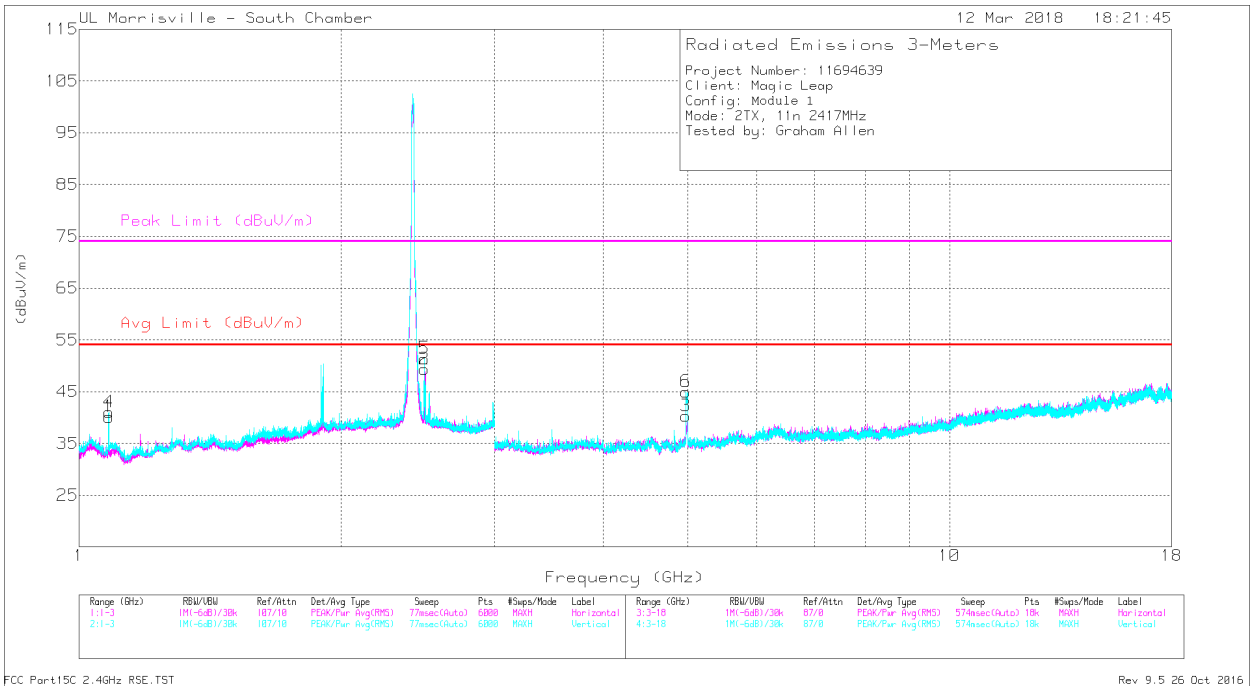
LOW CHANNEL



Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.081	43.45	PK2	27.2	-24.4	46.25	-	-	74	-27.75	165	189	H
	* 1.081	36.66	MAv1	27.2	-24.4	39.46	54	-14.54	-	-	165	189	H
2	* 2.489	50.12	PK2	32.4	-24.6	57.92	-	-	74	-16.08	157	144	H
	* 2.489	27.54	MAv1	32.4	-24.6	35.34	54	-18.66	-	-	157	144	H
4	* 1.081	43.56	PK2	27.2	-24.4	46.36	-	-	74	-27.64	152	102	V
	* 1.081	36.93	MAv1	27.2	-24.4	39.73	54	-14.27	-	-	152	102	V
5	* 2.491	54.05	PK2	32.4	-24.7	61.75	-	-	74	-12.25	59	201	V
	* 2.491	29.06	MAv1	32.4	-24.7	36.76	54	-17.24	-	-	59	201	V
3	* 4.99	46.09	PK2	34	-31.5	48.59	-	-	74	-25.41	254	199	H
	* 4.99	30.79	MAv1	34	-31.5	33.29	54	-20.71	-	-	254	199	H
6	*4.978	51.55	PK2	34	-31.4	54.15	-	-	74	-19.85	137	159	V
	* 4.978	35.5	MAv1	34	-31.4	38.1	54	-15.9	-	-	137	159	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

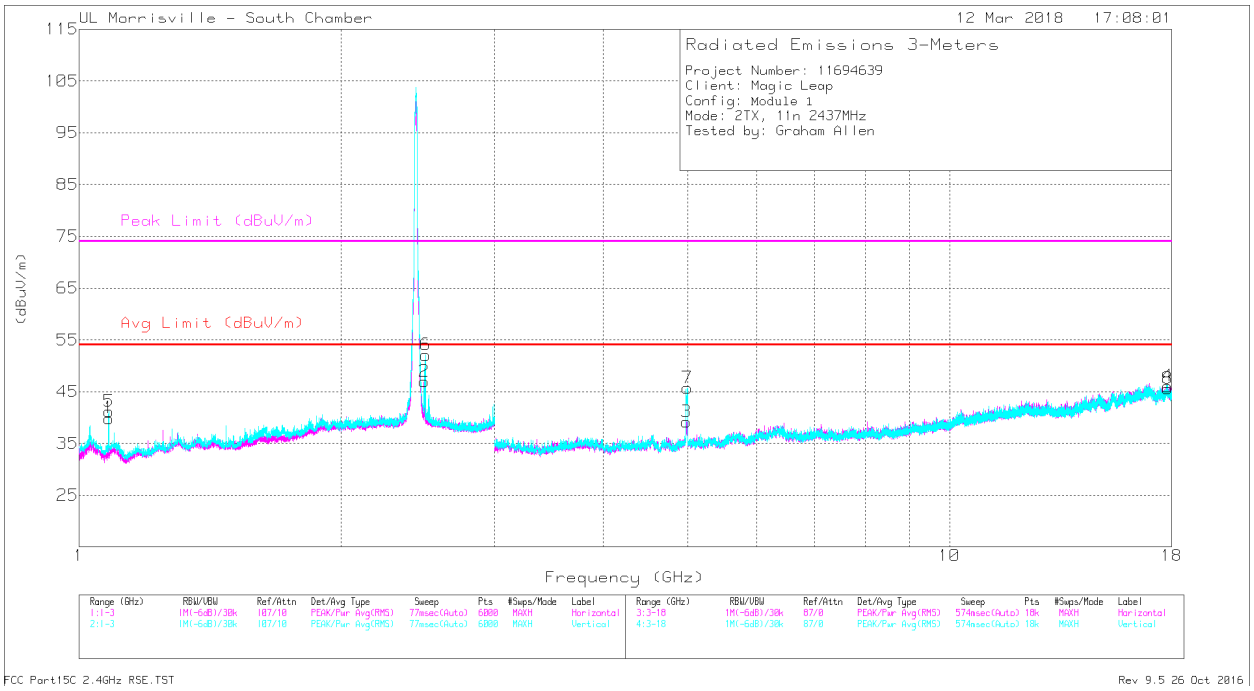
CHANNEL 2



Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.081	43.53	PK2	27.2	-24.4	46.33	-	-	74	-27.67	173	191	H
	* 1.081	36.24	MAv1	27.2	-24.4	39.04	54	-14.96	-	-	173	191	H
2	* 2.493	46.7	PK2	32.4	-24.7	54.4	-	-	74	-19.6	360	194	H
	* 2.493	26.88	MAv1	32.4	-24.7	34.58	54	-19.42	-	-	360	194	H
4	* 1.081	43.84	PK2	27.2	-24.4	46.64	-	-	74	-27.36	156	135	V
	* 1.081	37.28	MAv1	27.2	-24.4	40.08	54	-13.92	-	-	156	135	V
5	* 2.495	53.05	PK2	32.4	-24.7	60.75	-	-	74	-13.25	182	174	V
	* 2.495	28.72	MAv1	32.4	-24.7	36.42	54	-17.58	-	-	182	174	V
3	* 4.979	46.78	PK2	34	-31.4	49.38	-	-	74	-24.62	243	217	H
	* 4.979	30.48	MAv1	34	-31.4	33.08	54	-20.92	-	-	243	217	H
6	* 4.978	51.52	PK2	34	-31.4	54.12	-	-	74	-19.88	308	101	V
	* 4.978	35.22	MAv1	34	-31.4	37.82	54	-16.18	-	-	308	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

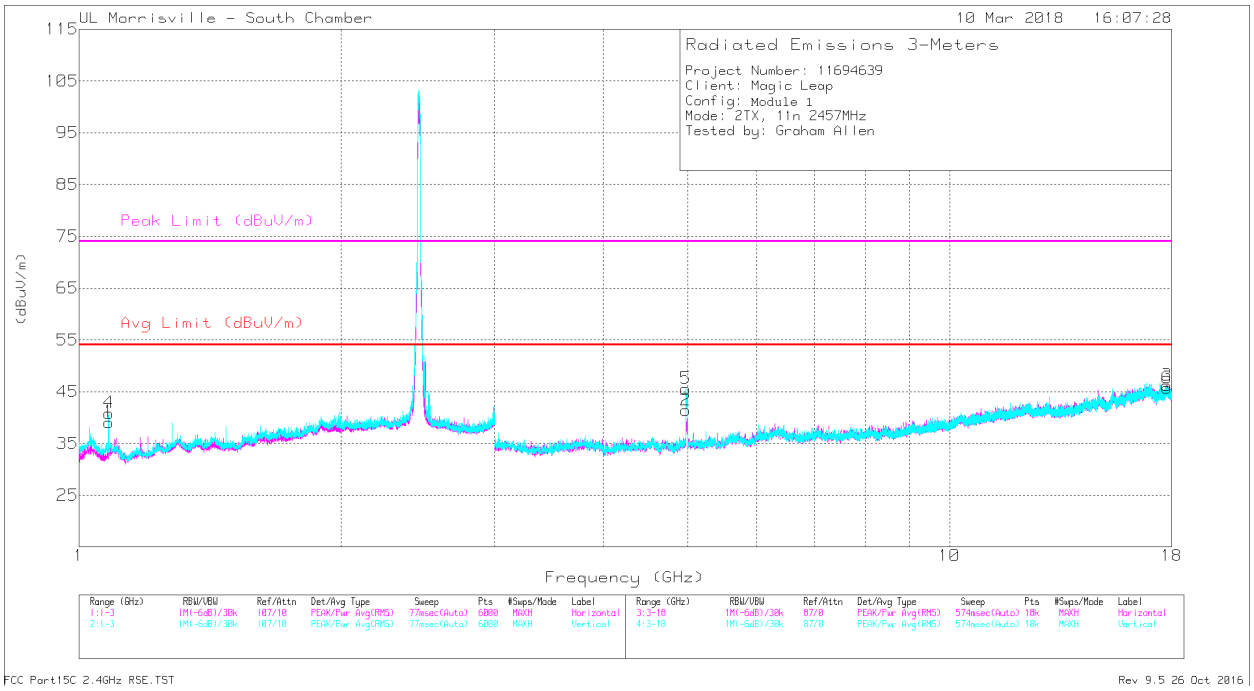
MID CHANNEL



Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.081	43.61	PK2	27.2	-24.4	46.41	-	-	74	-27.59	171	188	H
	* 1.081	36.6	MAv1	27.2	-24.4	39.4	54	-14.6	-	-	171	188	H
2	* 2.491	48.26	PK2	32.4	-24.7	55.96	-	-	74	-18.04	137	124	H
	* 2.491	27.03	MAv1	32.4	-24.7	34.73	54	-19.27	-	-	137	124	H
5	* 1.081	43.95	PK2	27.2	-24.4	46.75	-	-	74	-27.25	151	139	V
	* 1.081	37.28	MAv1	27.2	-24.4	40.08	54	-13.92	-	-	151	139	V
6	* 2.498	53.87	PK2	32.3	-24.8	61.37	-	-	74	-12.63	79	137	V
	* 2.498	28.56	MAv1	32.3	-24.8	36.06	54	-17.94	-	-	79	137	V
3	* 4.989	45.4	PK2	34	-31.5	47.9	-	-	74	-26.1	331	127	H
	* 4.989	30.14	MAv1	34	-31.5	32.64	54	-21.36	-	-	331	127	H
4	* 17.811	33.35	PK2	40.8	-22	52.15	-	-	74	-21.85	124	176	H
	* 17.811	21.57	MAv1	40.8	-22	40.37	54	-13.63	-	-	124	176	H
7	* 4.998	52.39	PK2	34	-31.5	54.89	-	-	74	-19.11	307	104	V
	* 4.998	35.44	MAv1	34	-31.5	37.94	54	-16.06	-	-	307	104	V
8	* 17.808	33.68	PK2	40.8	-21.9	52.58	-	-	74	-21.42	247	133	V
	* 17.808	21.71	MAv1	40.8	-21.9	40.61	54	-13.39	-	-	247	133	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

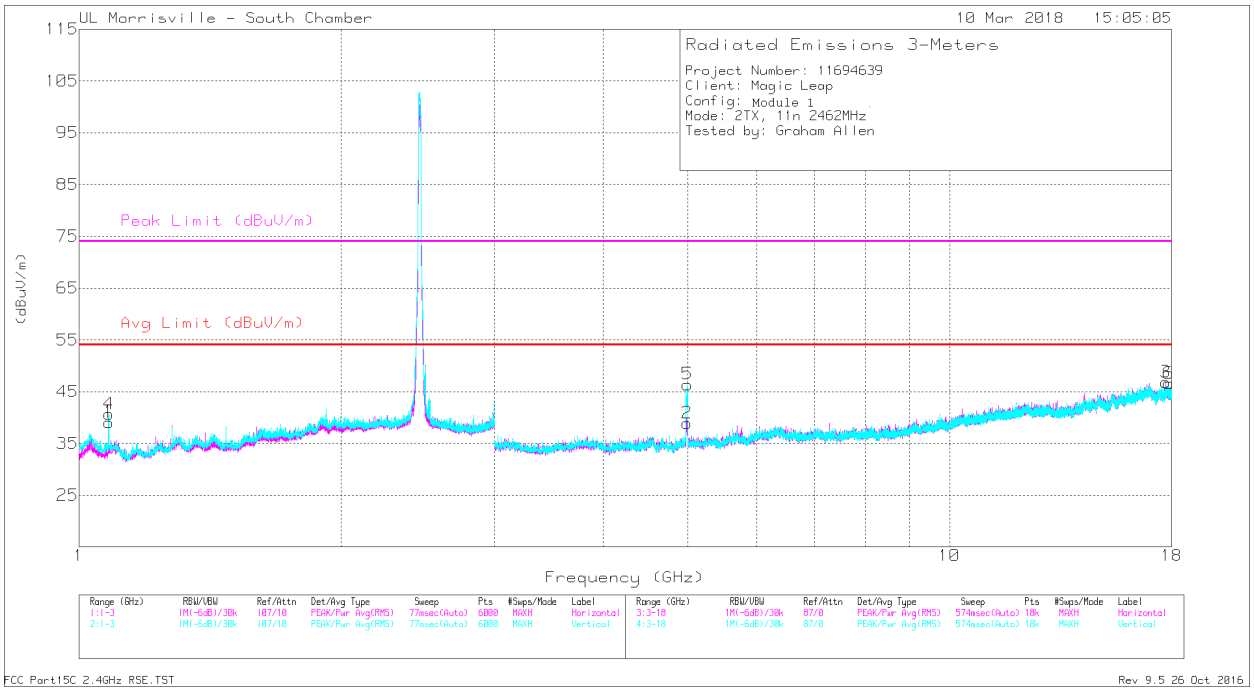
CHANNEL 10



Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.081	41.62	PK2	27.2	-24.4	44.42	-	-	74	-29.58	174	106	H
	* 1.081	34.5	MAv1	27.2	-24.4	37.3	54	-16.7	-	-	174	106	H
4	* 1.081	44.82	PK2	27.2	-24.4	47.62	-	-	74	-26.38	151	166	V
	* 1.081	38.88	MAv1	27.2	-24.4	41.68	54	-12.32	-	-	151	166	V
2	* 4.978	48.14	PK2	34	-31.3	50.84	-	-	74	-23.16	249	153	H
	* 4.978	31.3	MAv1	34	-31.3	34	54	-20	-	-	249	153	H
3	* 17.768	34.82	PK2	40.8	-22.2	53.42	-	-	74	-20.58	55	153	H
	* 17.768	22.11	MAv1	40.8	-22.2	40.71	54	-13.29	-	-	55	153	H
5	* 4.976	39.6	PK2	34	-31.3	42.3	-	-	74	-31.7	132	102	V
	* 4.976	27.75	MAv1	34	-31.3	30.45	54	-23.55	-	-	132	102	V
6	* 17.776	34.32	PK2	40.8	-22.1	53.02	-	-	74	-20.98	338	353	V
	* 17.776	22	MAv1	40.8	-22.1	40.7	54	-13.3	-	-	338	353	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

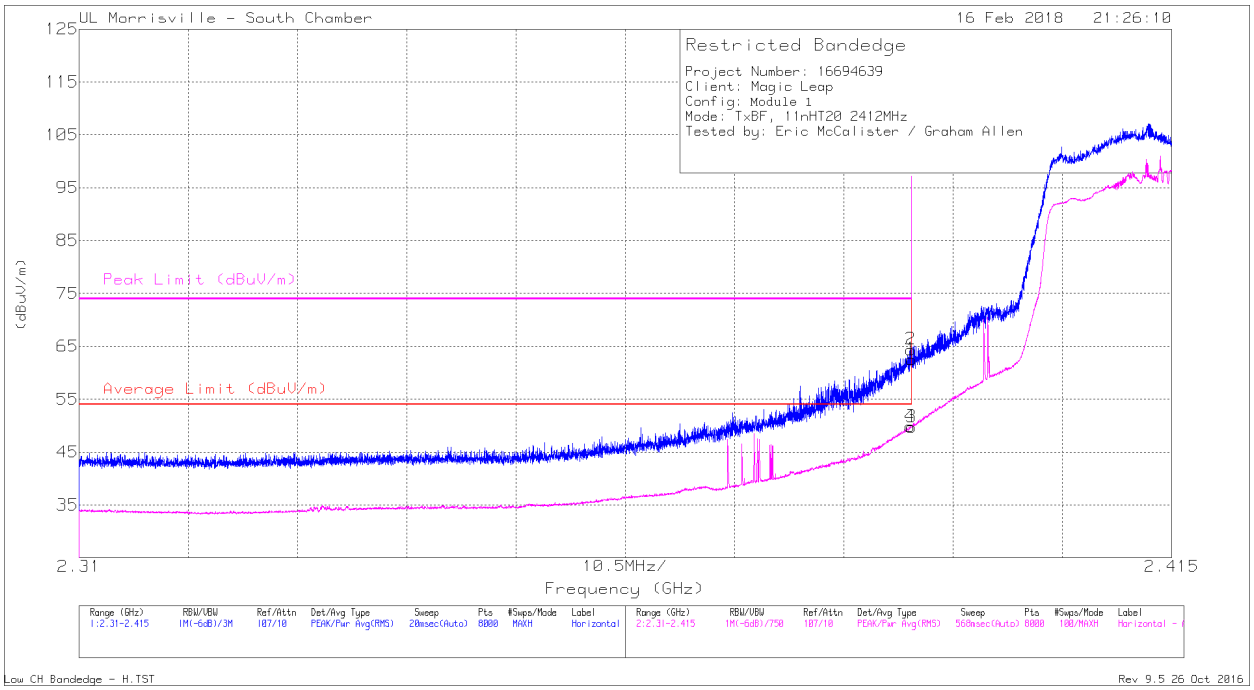
HIGH CHANNEL



Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.081	42.61	PK2	27.2	-24.4	45.41	-	-	74	-28.59	19	204	H
	* 1.081	34.85	MAv1	27.2	-24.4	37.65	54	-16.35	-	-	19	204	H
4	* 1.081	43.01	PK2	27.2	-24.4	45.81	-	-	74	-28.19	8	111	V
	* 1.081	35.17	MAv1	27.2	-24.4	37.97	54	-16.03	-	-	8	111	V
3	* 4.999	47	PK2	34	-31.5	49.5	-	-	74	-24.5	241	157	H
	* 4.999	31.19	MAv1	34	-31.5	33.69	54	-20.31	-	-	241	157	H
6	* 17.73	34.03	PK2	40.9	-22.6	52.33	-	-	74	-21.67	312	385	H
	* 17.73	22.43	MAv1	40.9	-22.6	40.73	54	-13.27	-	-	312	385	H
2	* 4.998	53.44	PK2	34	-31.5	55.94	-	-	74	-18.06	132	135	V
	* 4.998	36.08	MAv1	34	-31.5	38.58	54	-15.42	-	-	132	135	V
5	* 17.857	33.69	PK2	40.8	-22.3	52.19	-	-	74	-21.81	355	131	V
	* 17.857	21.83	MAv1	40.8	-22.3	40.33	54	-13.67	-	-	355	131	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - Maximum Peak
MAv1 - Maximum RMS Average

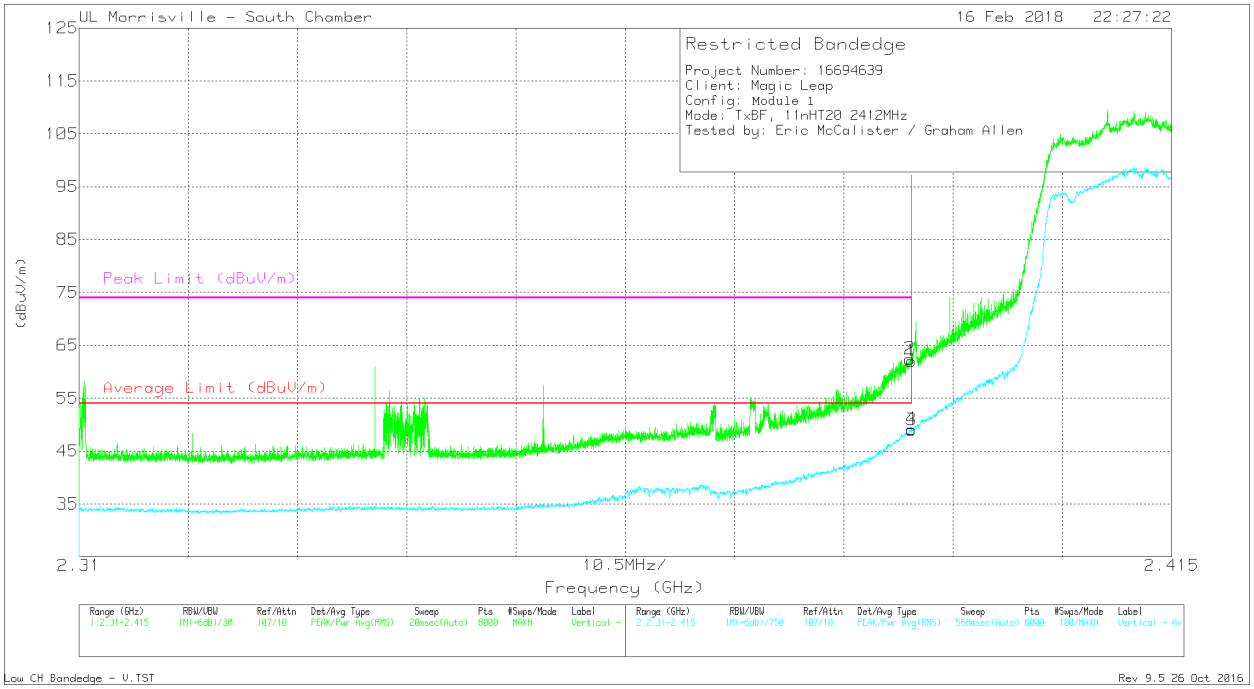
9.2.7. TX ABOVE 1 GHz 802.11n HT20 MODE – MODULE 1 MIMO TxBF RESTRICTED BANDEDGE (LOW CHANNEL) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	54.75	Pk	31.9	-24.1	62.55	-	-	74	-11.45	43	361	H
2	* 2.39	56.62	Pk	31.9	-24.1	64.42	-	-	74	-9.58	43	361	H
3	* 2.39	41.98	V1TR	31.9	-24.1	49.78	54	-4.22	-	-	43	361	H
4	* 2.39	42.03	V1TR	31.9	-24.1	49.83	54	-4.17	-	-	43	361	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
V1TR - VB=1/Ton, where: Ton is packet duration

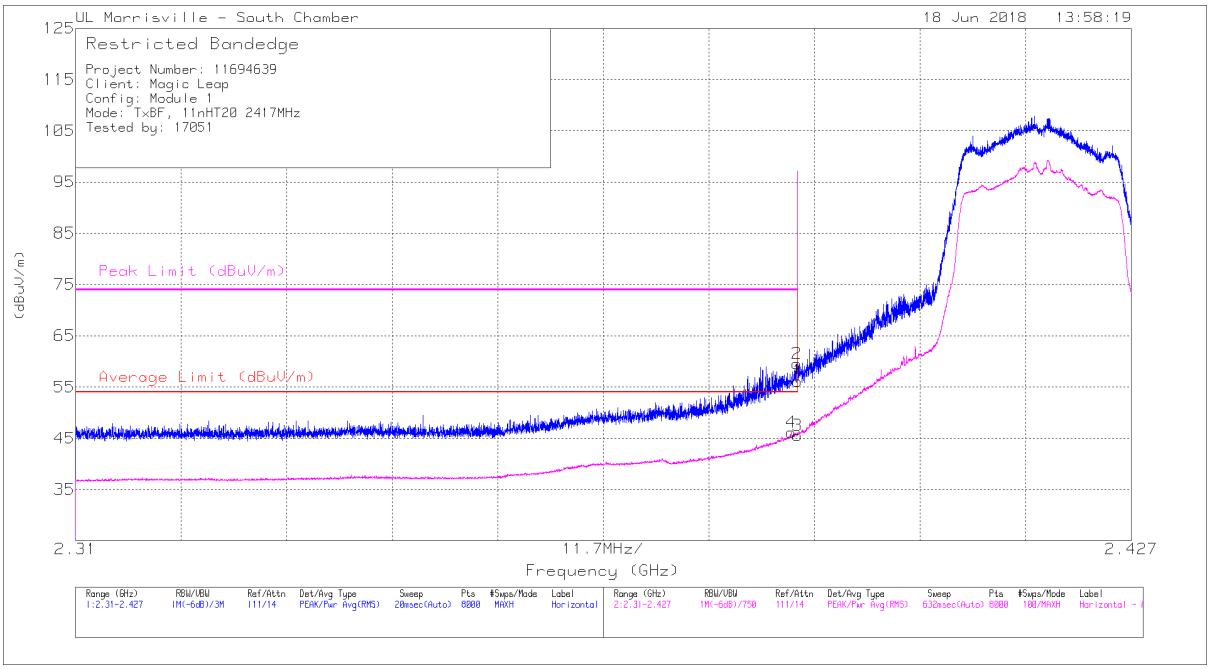
RESTRICTED BANDEDGE (LOW CHANNEL) VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	54.2	Pk	31.9	-24.1	62	-	-	74	-12	237	173	V
2	* 2.39	54.63	Pk	31.9	-24.1	62.43	-	-	74	-11.57	237	173	V
3	* 2.39	41.17	V1TR	31.9	-24.1	48.97	54	-5.03	-	-	237	173	V
4	* 2.39	41.35	V1TR	31.9	-24.1	49.15	54	-4.85	-	-	237	173	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
V1TR - VB=1/Ton, where: Ton is packet duration

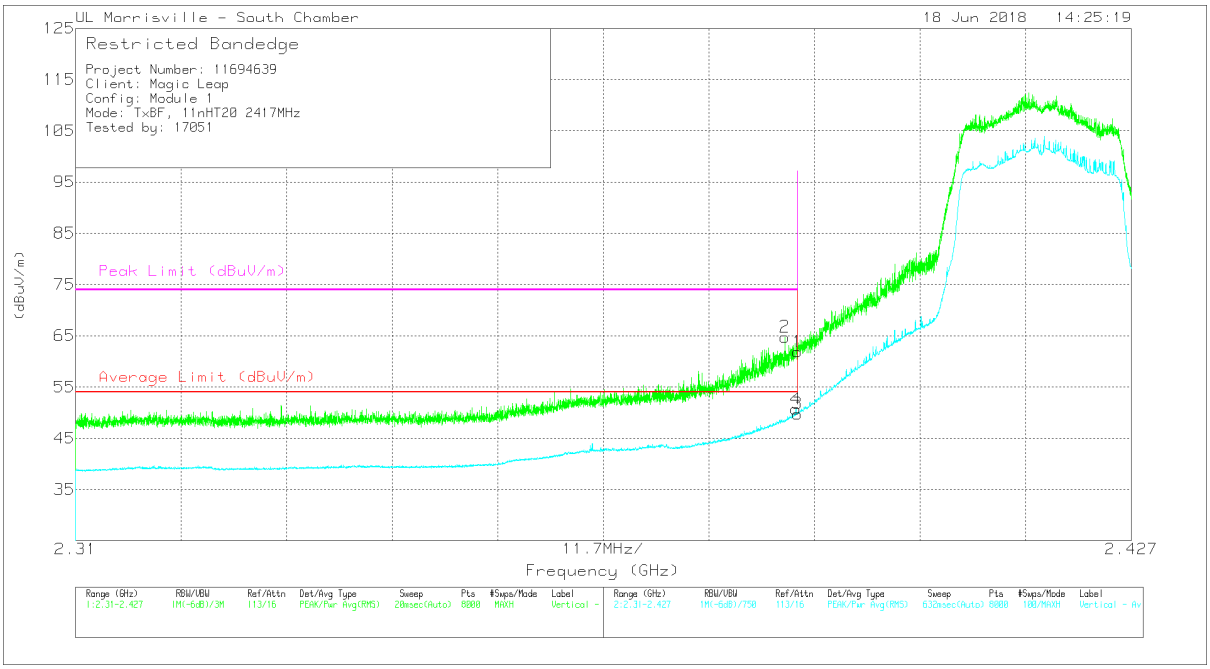
RESTRICTED BANDEDGE (2417MHz) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 2.389	38.28	V1TR	32	-24.1	46.18	54	-7.82	-	-	160	114	H
1	* 2.39	48.26	Pk	32	-24.1	56.16	-	-	74	-17.84	160	114	H
2	* 2.39	51.67	Pk	32	-24.1	59.57	-	-	74	-14.43	160	114	H
3	* 2.39	37.68	V1TR	32	-24.1	45.58	54	-8.42	-	-	160	114	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
V1TR: VB=1/Ton, RMS Average where: Ton is packet duration

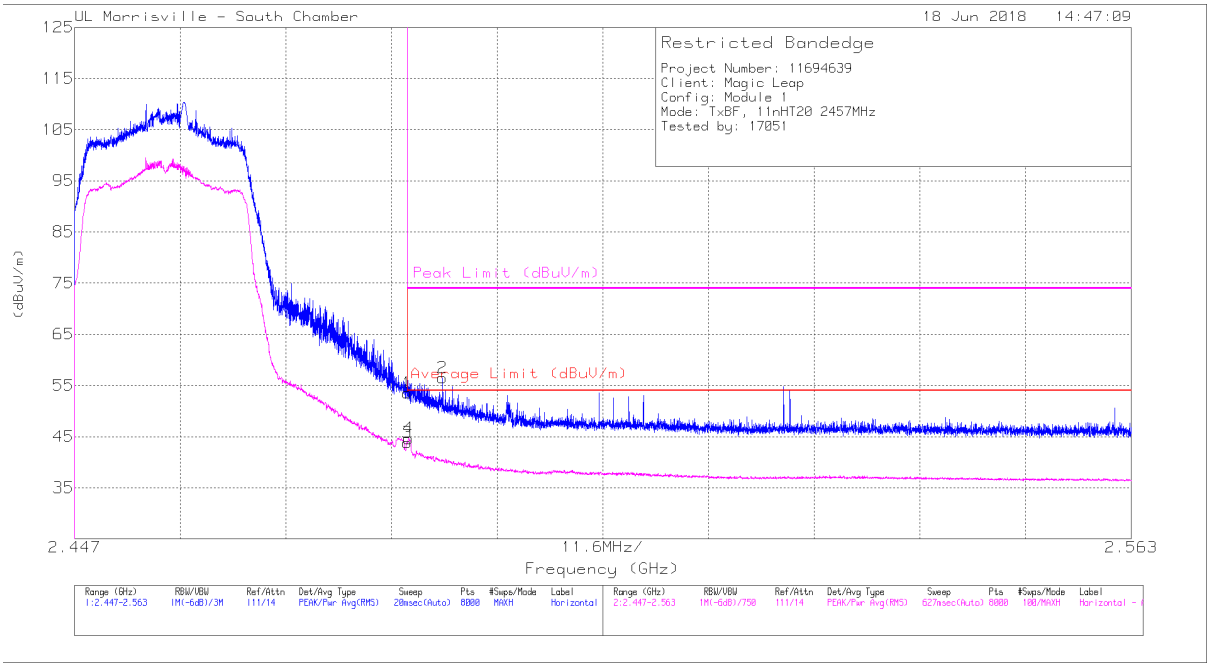
RESTRICTED BANDEDGE (2417MHz) VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.389	56.88	Pk	32	-24.1	64.78	-	-	74	-9.22	316	238	V
1	* 2.39	53.96	Pk	32	-24.1	61.86	-	-	74	-12.14	316	238	V
3	* 2.39	41.89	V1TR	32	-24.1	49.79	54	-4.21	-	-	316	238	V
4	* 2.39	42.78	V1TR	32	-24.1	50.68	54	-3.32	-	-	316	238	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
V1TR: VB=1/Ton, RMS Average where: Ton is packet duration

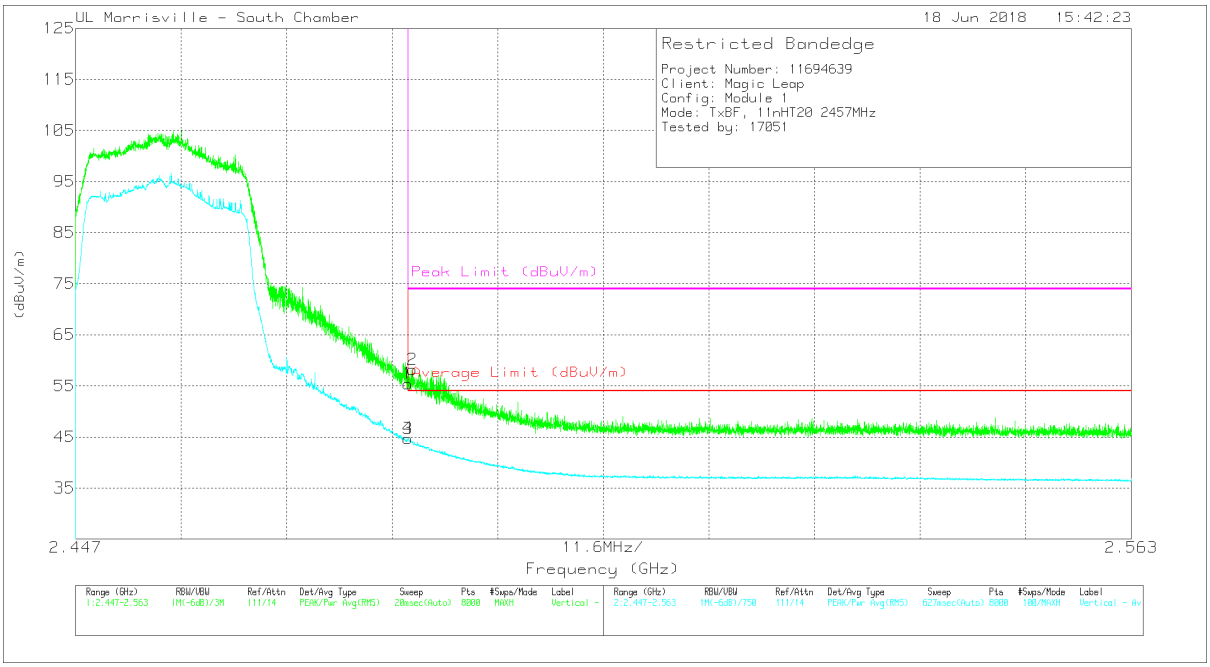
AUTHORIZED BANDEDGE (2457MHz) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	45.74	Pk	32.4	-24.6	53.54	-	-	74	-20.46	248	109	H
3	* 2.484	35.99	V1TR	32.4	-24.6	43.79	54	-10.21	-	-	248	109	H
4	* 2.484	36.84	V1TR	32.4	-24.6	44.64	54	-9.36	-	-	248	109	H
2	* 2.487	48.71	Pk	32.4	-24.6	56.51	-	-	74	-17.49	248	109	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
V1TR: VB=1/Ton, RMS Average where: Ton is packet duration

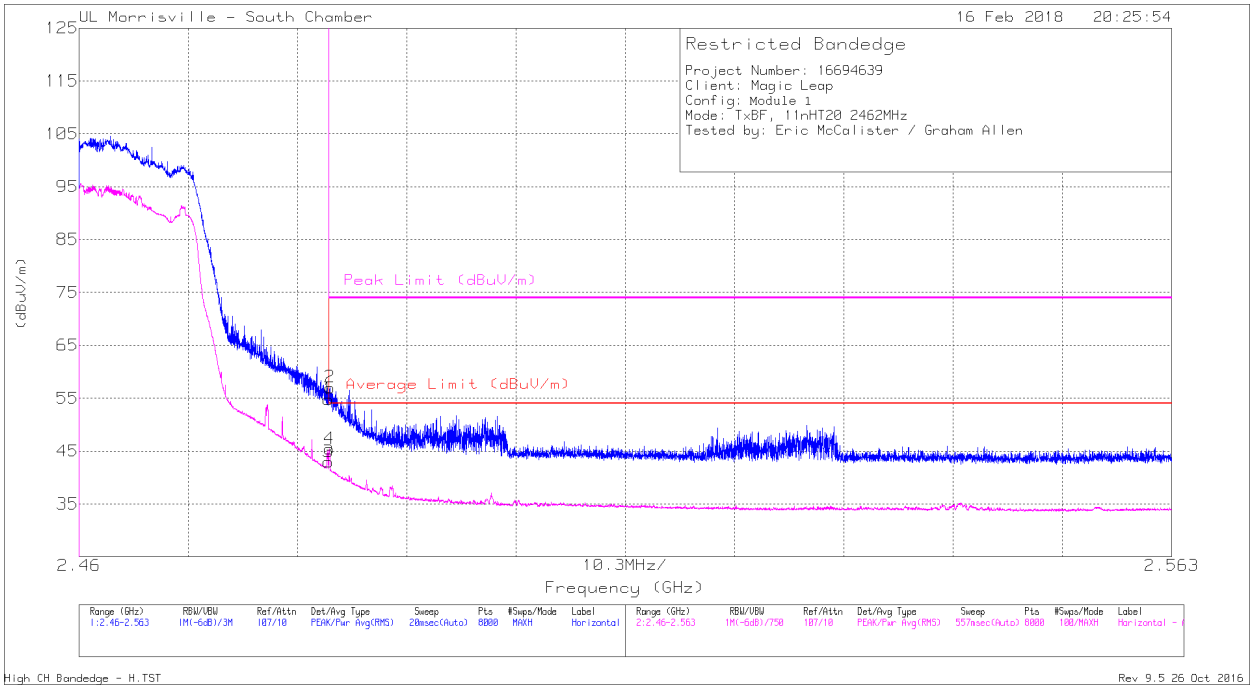
AUTHORIZED BANDEDGE (2457MHz) VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	47.64	Pk	32.4	-24.6	55.44	-	-	74	-18.56	54	326	V
2	* 2.484	50.37	Pk	32.4	-24.6	58.17	-	-	74	-15.83	54	326	V
3	* 2.484	36.88	V1TR	32.4	-24.6	44.68	54	-9.32	-	-	54	325	V
4	* 2.484	36.94	V1TR	32.4	-24.6	44.74	54	-9.26	-	-	54	325	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
V1TR: VB=1/Ton, RMS Average where: Ton is packet duration

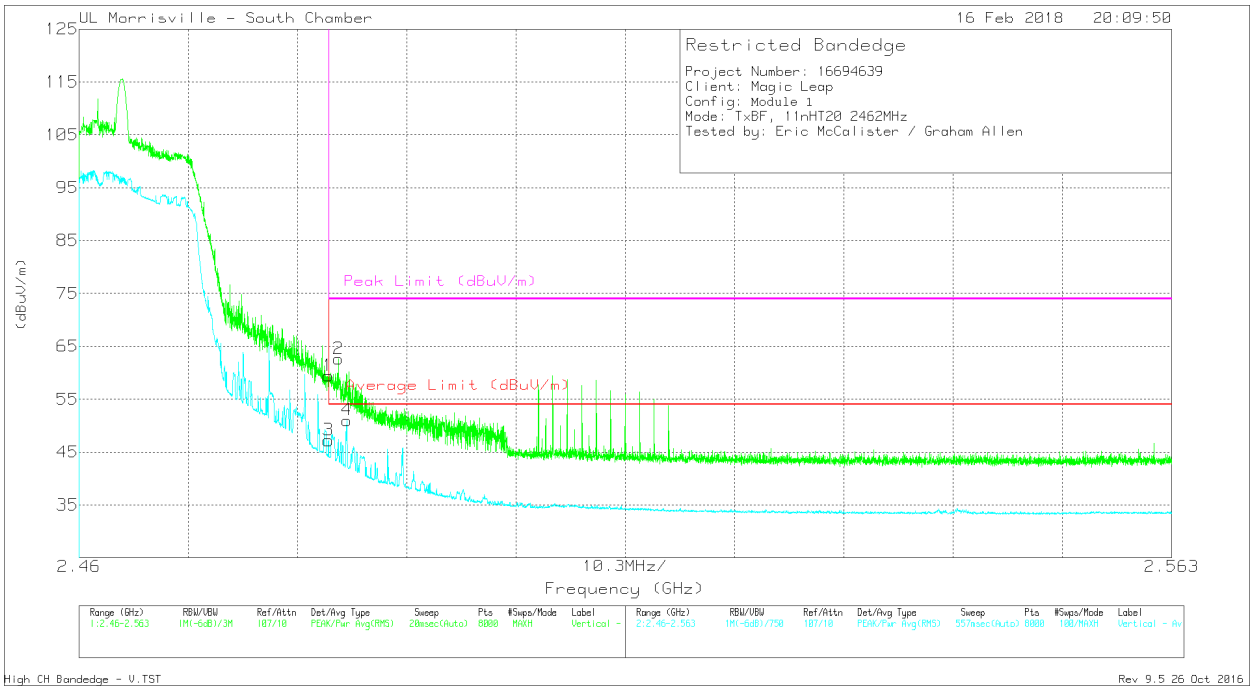
AUTHORIZED BANDEDGE (HIGH CHANNEL) HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	47.01	Pk	32.4	-24.6	54.81	-	-	74	-19.19	32	312	H
2	* 2.484	49.24	Pk	32.4	-24.6	57.04	-	-	74	-16.96	32	312	H
3	* 2.484	35.19	V1TR	32.4	-24.6	42.99	54	-11.01	-	-	32	312	H
4	* 2.484	37.6	V1TR	32.4	-24.6	45.4	54	-8.6	-	-	32	312	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
V1TR - VB=1/Ton, where: Ton is packet duration

AUTHORIZED BANDEDGE (HIGH CHANNEL) VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0069 AF (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	51.6	Pk	32.4	-24.6	59.4	-	-	74	-14.6	273	370	V
2	* 2.484	54.85	Pk	32.4	-24.6	62.65	-	-	74	-11.35	273	370	V
3	* 2.484	39.42	V1TR	32.4	-24.6	47.22	54	-6.78	-	-	273	370	V
4	* 2.485	43.22	V1TR	32.4	-24.6	51.02	54	-2.98	-	-	273	370	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
V1TR - VB=1/Ton, where: Ton is packet duration

HARMONICS AND SPURIOUS EMISSIONS

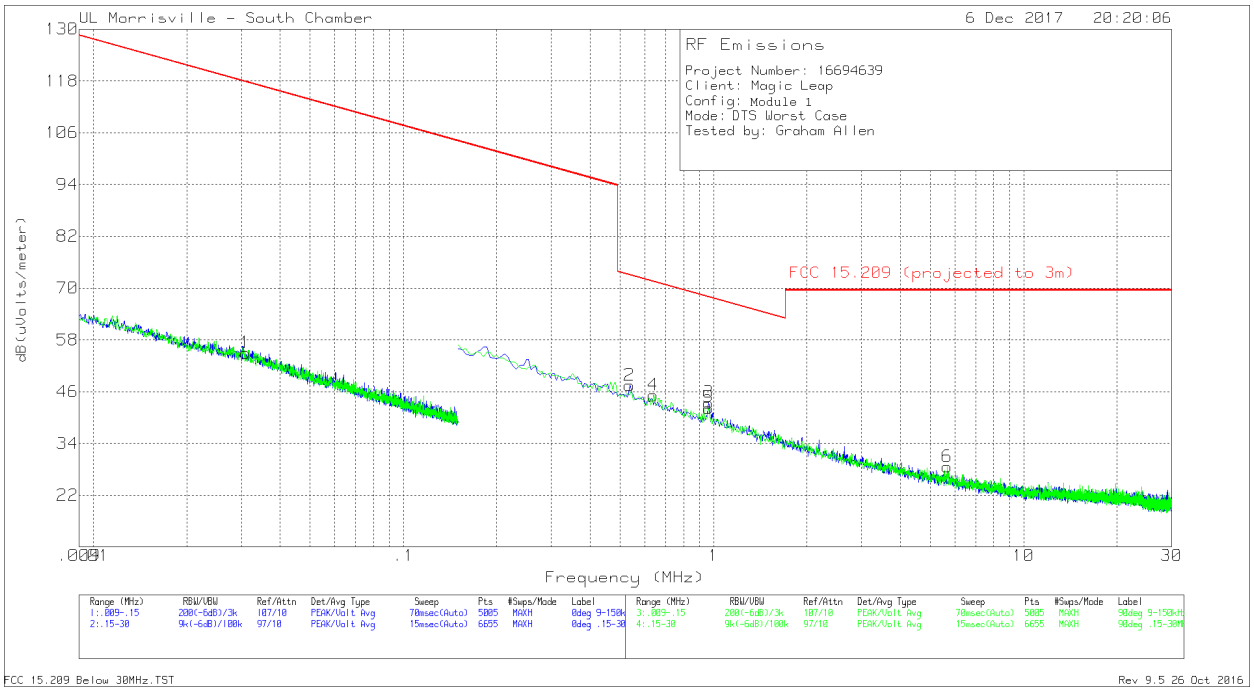
The router was investigated at different θs around the EUT. It was determined that there was <3dB delta in position. The router was then placed behind the receiving antenna. Transmit beamforming spot check scans were taken and this showed little to no variation from 802.11n MIMO SDM spurious scans. Therefore, 802.11n MIMO SDM spurious data is used to represent 802.11nHT20 transmit beamforming.

9.3. RADIATED WORST-CASE
SPURIOUS EMISSIONS 9 TO 30 MHz (WORST-CASE CONFIGURATION)

Note: All measurements were made at a test distance of 3 m. The limits in the plots and tabular data are the FCC/IC limits extrapolated from the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to the measurement distance to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were 40*Log (specification distance / test distance).

Although these tests were performed at a test site other than an open area test site, adequate comparison measurements were confirmed against an open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

MODULE 1

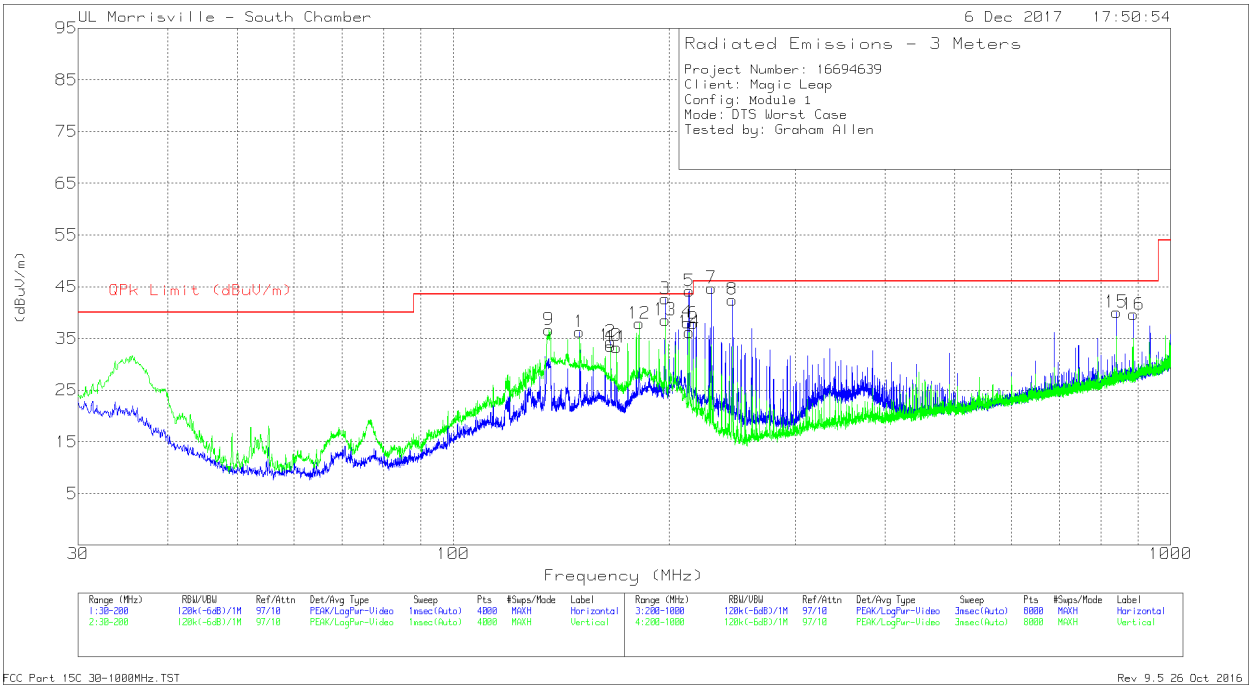


Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 AF (dB/m)	Cbl (dB)	Corrected Reading dB(uV/m)	FCC 15.209 QP Limit (projected to 3m)	QP Margin (dB)	FCC 15.209 AV Limit (projected to 3m)	AV Margin (dB)	FCC 15.209 PK Limit (projected to 3m)	PK Margin (dB)	Azimuth (Degs)
1	.03092	41.44	Pk	13.4	.1	54.94	-	-	117.8	-62.86	137.8	-82.86	0-360
2	.5358	36.57	Pk	10.8	.1	47.47	73.02	-25.55	-	-	-	-	0-360
4	.63897	34.24	Pk	10.8	.1	45.14	71.49	-26.35	-	-	-	-	0-360
3	.96197	32.46	Pk	10.9	.1	43.46	67.94	-24.48	-	-	-	-	0-360
5	.96197	31.25	Pk	10.9	.1	42.25	67.94	-25.69	-	-	-	-	0-360
6	5.67227	17.28	Pk	10.9	.4	28.58	69.54	-40.96	-	-	-	-	0-360

Pk - Peak detector

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)

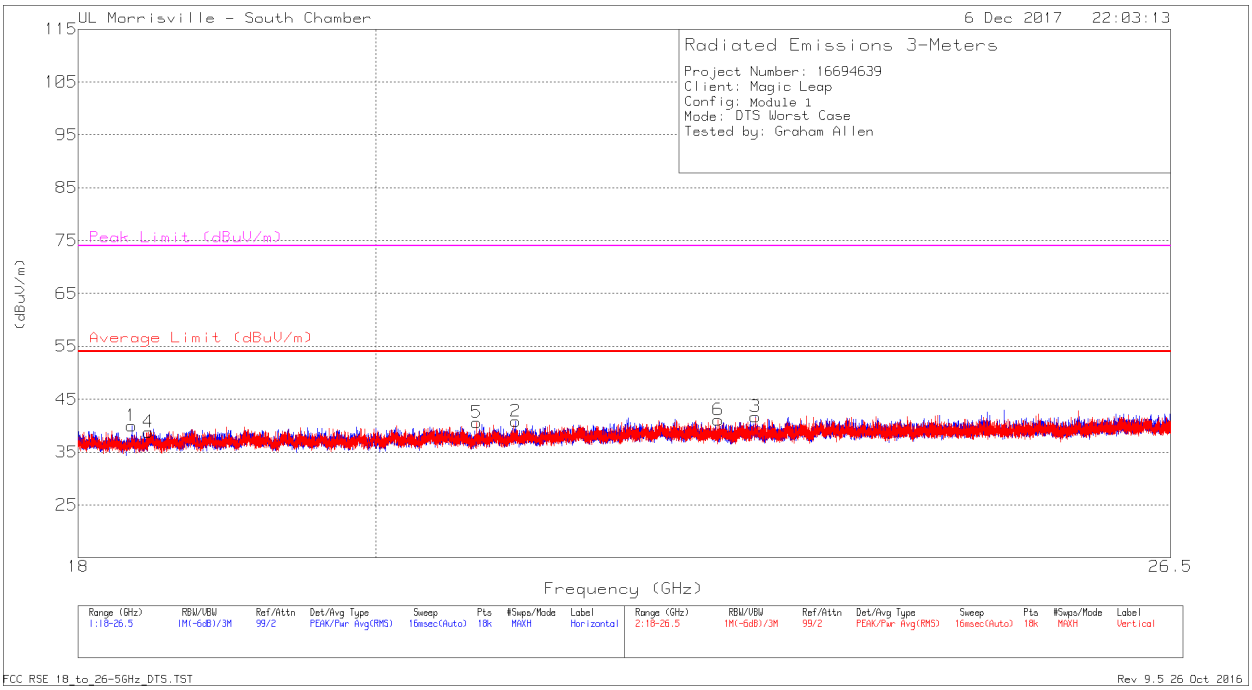
MODULE 1



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 150.0014	46.22	Qp	16.9	-30.6	32.52	43.52	-11	343	174	H
2	* 165.7964	45.76	Qp	16.6	-30.4	31.96	43.52	-11.56	89	152	H
8	* 244.7413	54.24	Qp	16.3	-29.9	40.64	46.02	-5.38	317	135	H
9	* 135.9302	46.23	Qp	17.9	-30.7	33.43	43.52	-10.09	83	104	V
10	* 165.7887	40.51	Qp	16.6	-30.4	26.71	43.52	-16.81	340	125	V
11	* 168.9767	45.44	Qp	16.4	-30.4	31.44	43.52	-12.08	359	102	V
3	197.3658	55.77	Pk	17.2	-30.3	42.67	-	-	0-360	99	H
4	212.0016	52.99	Pk	15.3	-30.2	38.09	-	-	0-360	102	H
5	213.2017	59.06	Pk	15.3	-30.2	44.16	-	-	0-360	198	H
6	216.0021	52.6	Pk	15.4	-30.1	37.9	-	-	0-360	102	H
7	228.9038	58.92	Pk	15.8	-30	44.72	-	-	0-360	102	H
15	839.9832	41.17	Pk	26.4	-27.5	40.07	-	-	0-360	102	H
16	887.9894	40.28	Pk	26.6	-27.2	39.68	-	-	0-360	102	H
12	181.5517	52.53	Pk	15.7	-30.3	37.93	-	-	0-360	101	V
13	197.3658	51.67	Pk	17.2	-30.3	38.57	-	-	0-360	101	V
14	213.2017	51.11	Pk	15.3	-30.2	36.21	-	-	0-360	102	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
Qp - Quasi-Peak detector
Note: Markers not within restricted bands not applied to limit.

SPURIOUS EMISSIONS 18 TO 26 GHz (WORST-CASE CONFIGURATION)
MODULE 1



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0076 AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 18.344	47.94	Pk	32.3	-40.3	39.94	54	-14.06	74	-34.06	0-360	299	H
2	* 21.014	47.31	Pk	33.2	-39.7	40.81	54	-13.19	74	-33.19	0-360	149	H
3	* 22.877	46.99	Pk	33.7	-39	41.69	54	-12.31	74	-32.31	0-360	299	H
4	* 18.453	46.78	Pk	32.4	-40.4	38.78	54	-15.22	74	-35.22	0-360	101	V
5	* 20.727	47.4	Pk	32.9	-39.7	40.6	54	-13.4	74	-33.4	0-360	151	V
6	* 22.578	46.56	Pk	33.6	-39.1	41.06	54	-12.94	74	-32.94	0-360	251	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

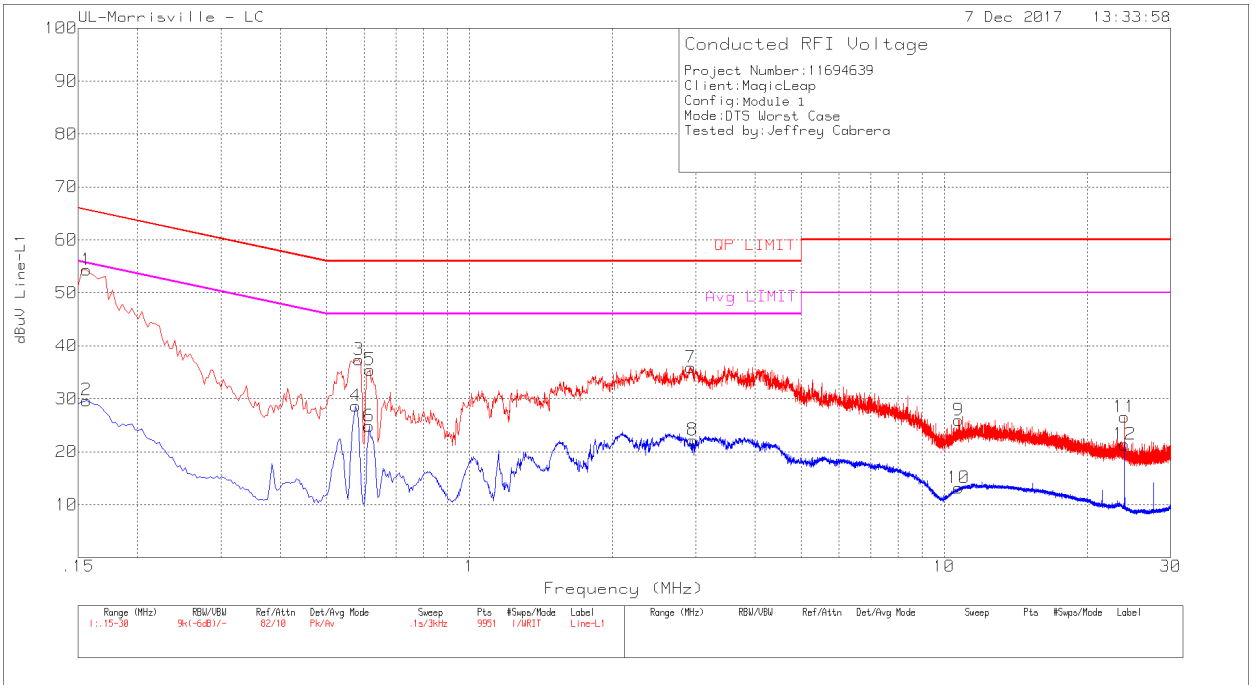
TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

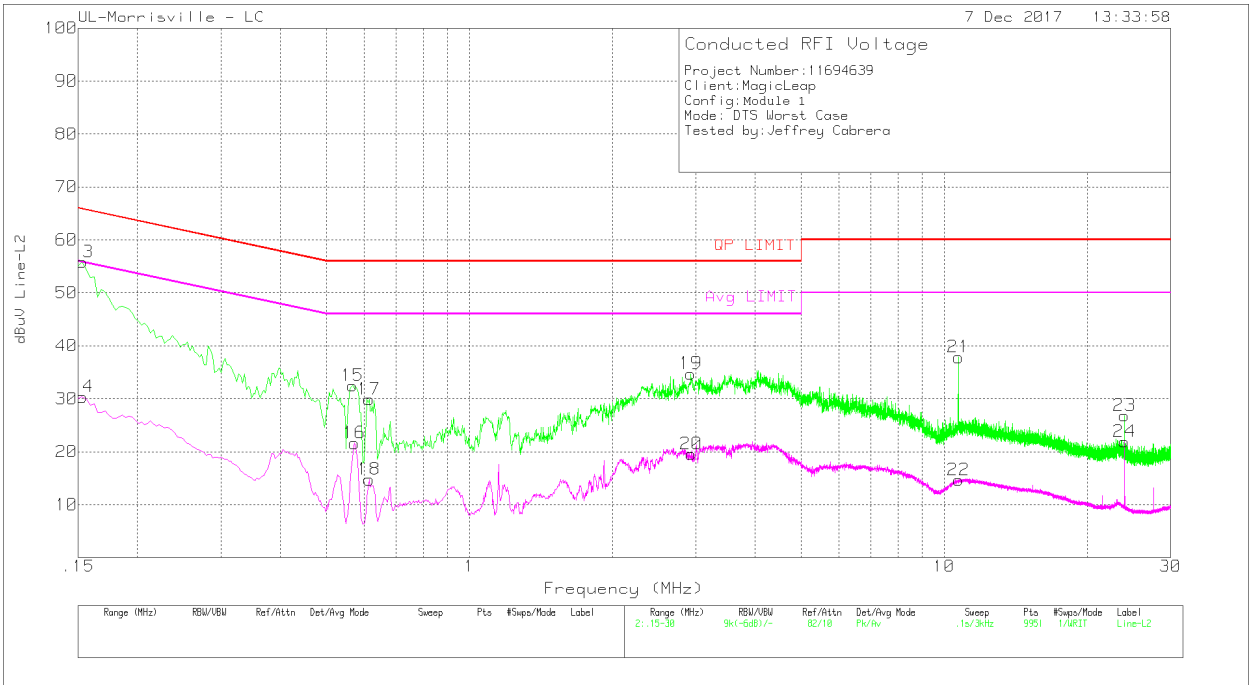
Line conducted data is recorded for both lines.

LINE 1 RESULTS - MODULE 1



Range 1: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Avg Limit (dBuV)	Margin (dB)
1	.156	44.17	Pk	.2	10	54.37	65.67	-11.3	-	-
2	.156	19.51	Av	.2	10	29.71	-	-	55.67	-25.96
3	.585	27.48	Pk	0	9.9	37.38	56	-18.62	-	-
4	.576	18.76	Av	0	9.9	28.66	-	-	46	-17.34
5	.618	25.57	Pk	0	9.9	35.47	56	-20.53	-	-
6	.615	14.98	Av	0	9.9	24.88	-	-	46	-21.12
7	2.928	25.94	Pk	0	10	35.94	56	-20.06	-	-
8	2.949	12.19	Av	0	10	22.19	-	-	46	-23.81
9	10.716	15.72	Pk	.1	10.1	25.92	60	-34.08	-	-
10	10.716	2.97	Av	.1	10.1	13.17	-	-	50	-36.83
11	24	16.2	Pk	.2	10.2	26.6	60	-33.4	-	-
12	24	10.96	Av	.2	10.2	21.36	-	-	50	-28.64

LINE 2 RESULTS - MODULE 1



Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Avg Limit (dBuV)	Margin (dB)
13	.153	45.59	Pk	.2	10	55.79	65.84	-10.05	-	-
14	.153	20.14	Av	.2	10	30.34	-	-	55.84	-25.5
15	.567	22.56	Pk	0	9.9	32.46	56	-23.54	-	-
16	.573	11.71	Av	0	9.9	21.61	-	-	46	-24.39
17	.615	19.97	Pk	0	9.9	29.87	56	-26.13	-	-
18	.615	4.83	Av	0	9.9	14.73	-	-	46	-31.27
19	2.928	24.74	Pk	0	10	34.74	56	-21.26	-	-
20	2.934	9.56	Av	0	10	19.56	-	-	46	-26.44
21	10.716	27.63	Pk	.1	10.1	37.83	60	-22.17	-	-
22	10.716	4.47	Av	.1	10.1	14.67	-	-	50	-35.33
23	24	16.4	Pk	.2	10.2	26.8	60	-33.2	-	-
24	24	11.5	Av	.2	10.2	21.9	-	-	50	-28.1

Pk - Peak detector
Av - Average detection

11. SETUP PHOTOS

Refer to UL document R11694639-EP5 for photos.

END OF REPORT