FCC 47 CFR PART 15 SUBPART C
INDUSTRY (ISED) CANADA RSS-247 ISSUE 1

CERTIFICATION TEST REPORT

FOR

LED Light Bulb / Speaker with BLE and 802.11b/g/n

MODEL NUMBER: TWST-SPKR-001

FCC ID: 2AE49-TWSTSPK1
IC: 20364-TWSTSPK1

REPORT NUMBER: R11039922-E3

ISSUE DATE: 2016-11-23

Prepared for
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NVLAP LAB CODE 200246-0

Revision History

Ver.	Issue Date	Revisions	Revised By
1	2016-11-11	Initial Issue	Richard Jankovics
2	2016-11-23	Updated test setup diagrams and added prescan note to radiated spurious plots.	Richard Jankovics
3	2016-11-23	Updated device antenna gains	Richard Jankovics

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: ASTRO INC.
450 W 33RD ST.
NEW YORK, NEW YORK, 10001, USA

EUT DESCRIPTION: LED Light Bulb / Speaker with BLE and 802.11b/g/n

MODEL: TWST-SPKR-001

SERIAL NUMBER: FCC #1, FCC #2, FCC #9

DATE TESTED: 2016-10-06 – 2016-10-20

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	PASS
Industry Canada (ISED CANADA) RSS-247 Issue 1	PASS
Industry Canada (ISED CANADA) RSS-GEN Issue 4	PASS

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, any agency of the Federal Government, or any agency of any government.

Approved & Released
For UL LLC By:

Jeff Moser
EMC Program Manager
UL – Consumer Technology Division

Prepared By:

Richard Jankovics
WiSE Engineer
UL – Consumer Technology Division

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, RSS-GEN Issue 4, RSS-247 Issue 1.

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 Suite B, Perimeter Park Drive, Morrisville, NC 27560.

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

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

The onsite chambers are covered under Industry (ISED) 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
Total RF power, conducted	± 0.45 dB
RF power density, conducted	± 1.5 dB
Spurious emissions, conducted	± 2.94 dB
All emissions, radiated up to 40 GHz	± 5.36 dB
Temperature	± 0.07°C
Humidity	± 2.26% RH
DC and low frequency voltages	± 1.27%
Conducted Emissions (0.150-30MHz)	± 3.65dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an LED Light Bulb / Speaker with BLE and 802.11b/g/n.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2462	802.11b	14.66	29.24
2412 - 2462	802.11g	12.6	18.20
2412 - 2462	802.11n HT20	12.46	17.62

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes 2 trace antennas, with a maximum gain of -0.19 dBi for the Rx/Tx and 0.17 dBi for Rx diversity. Only one antenna is used for Rx/Tx; the other is Rx diversity only.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was FCC 1.0.

The test utility software used during testing was Ralink QA Test Program, version 1.0.1.0.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

Based on the baseline scan, the worst-case data rates were:

- 802.11b mode: 1 Mbps
- 802.11g mode: 54 Mbps
- 802.11n HT20 mode: MCS6 (58.5 Mbps)

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Lenovo	T440	NA	NA
Power Brick	Lenovo	ADLX65NLC2A	NA	NA

Note: Laptop and Power Brick are only used to configure sample and removed. Not present during measurements.

I/O CABLES

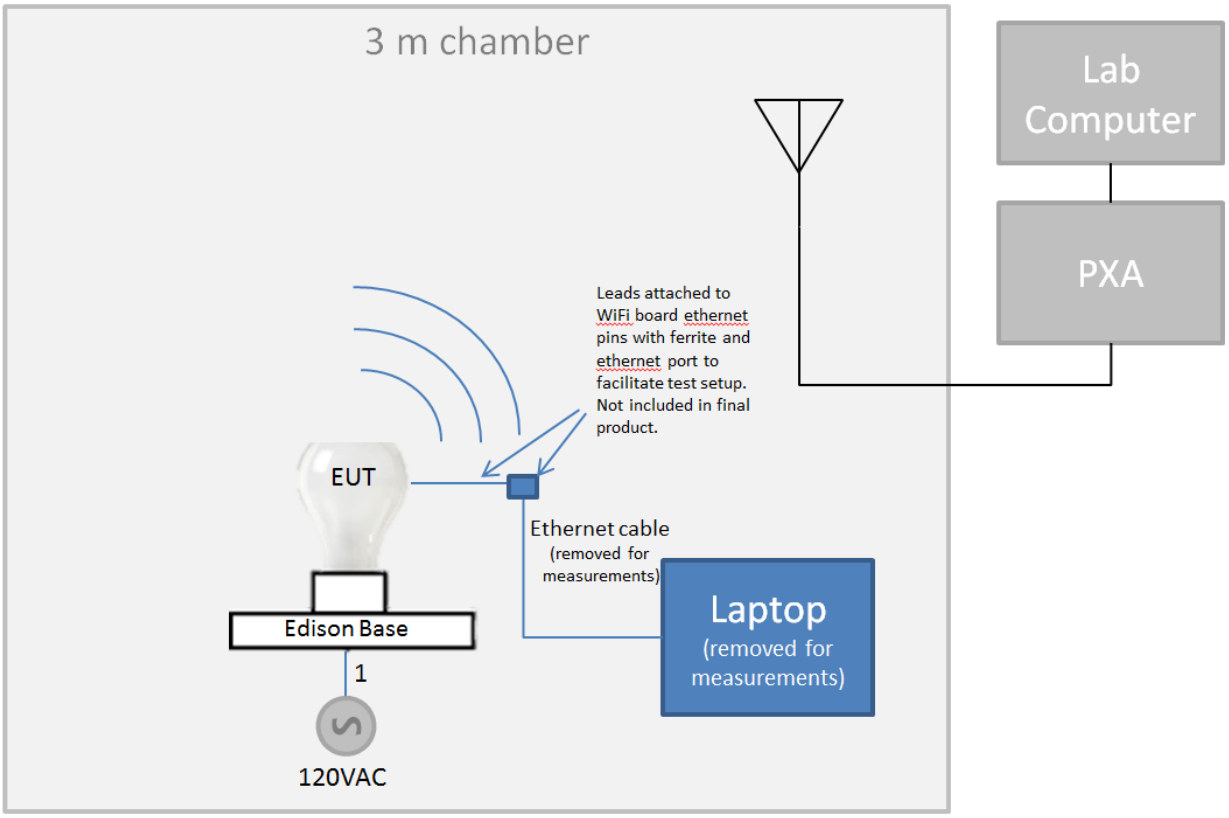
I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	1	Terminal	AC Inlet	2.95	18AWG line cord.
NA	NA	1	Ethernet	Ethernet	0.25	Configuration only. Not present during meas.
NA	Antenna	1	RF		0.3	

TEST SETUP

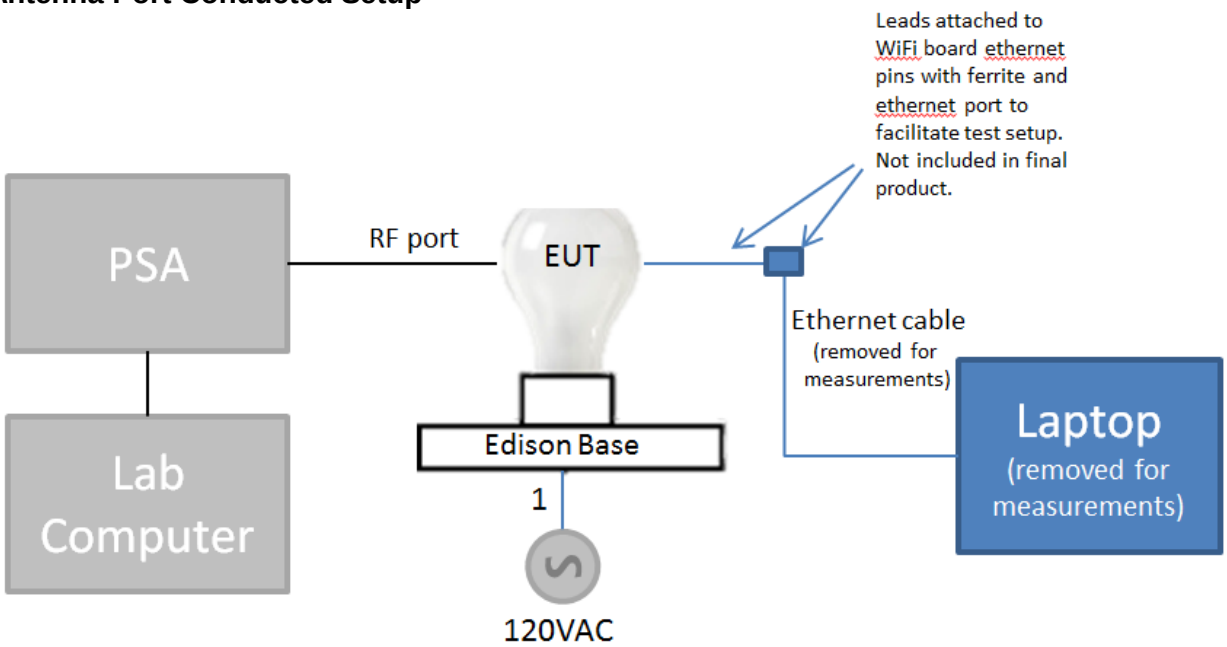
Different bulbs were provided. One unit was provided for radiated-emissions and line-conducted testing (an external Ethernet port allowed for configuring the device) and one unit was provided for conducted-port testing. Units were modified with added Ethernet port to facilitate programming the RF output for testing. Once the device was running the test mode, the ethernet cable and laptop were removed for measurements. Ports not present on finished product.

SETUP DIAGRAM FOR TESTS

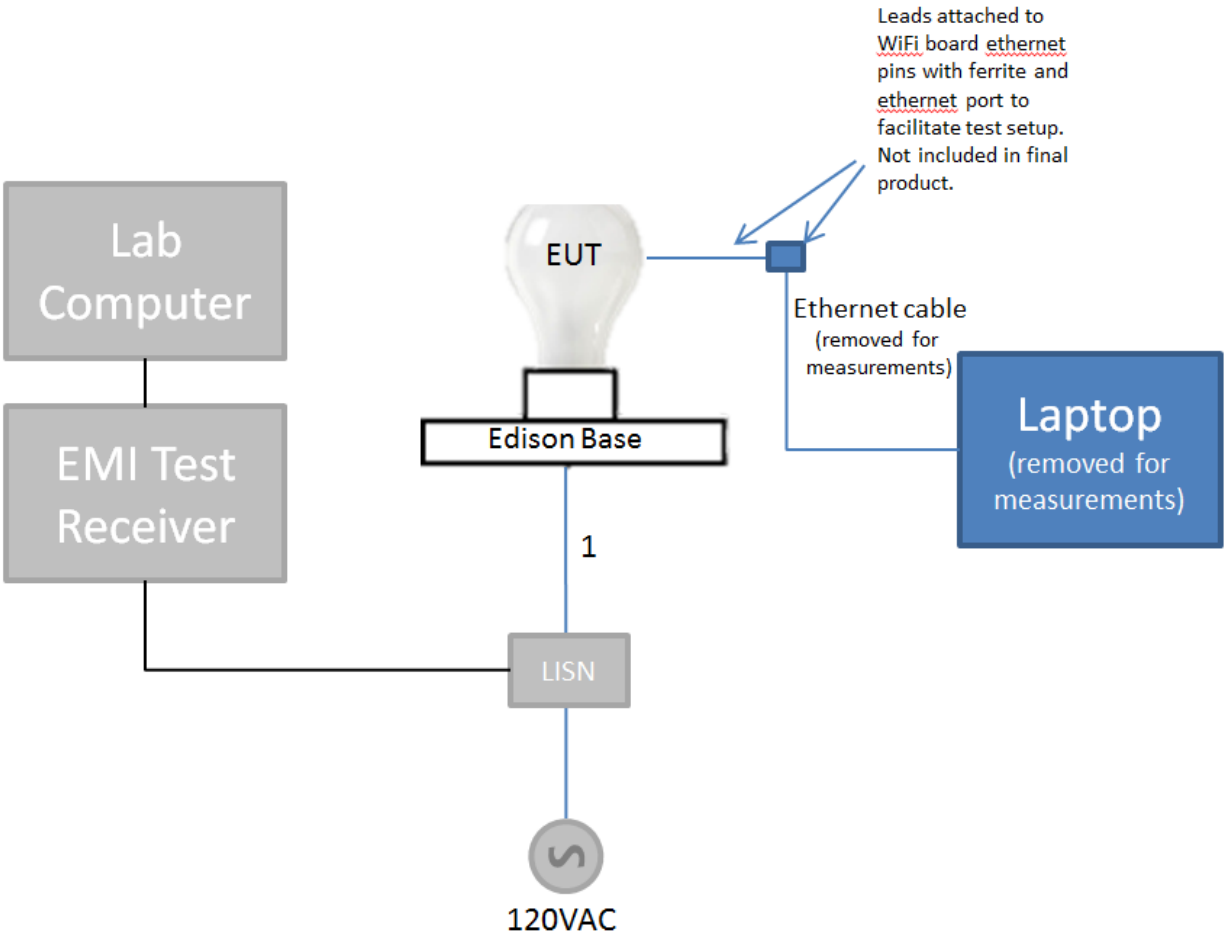
Radiated Setup



Antenna Port Conducted Setup



Line Conducted Setup



6. TEST AND MEASUREMENT EQUIPMENT

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

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

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2015-12-08	2016-12-31
AT0074	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2016-06-07	2017-06-30
AT0069	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2016-03-07	2017-03-31
AT0076	Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	2016-09-06	2017-09-30
S-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2016-10-04	2017-10-04
S-SAC02	Gain-loss string: 30-1000MHz	Various	Various	2016-06-26	2017-06-30
S-SAC03	Gain-loss string: 1-18GHz	Various	Various	2016-08-28	2017-08-28
S-SAC04	Gain-loss string: 18-40GHz	Various	Various	2016-02-29	2017-02-28
SA0025	Spectrum Analyzer	Agilent	N9030A	2016-03-17	2017-03-31
SA0026 (18-40GHz RSE)	Spectrum Analyzer	Agilent	N9030A	2016-02-24	2017-02-28
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
139843	Temp/Humid/Pressure Meter	Control Co./Fisher	14-650-118	2016-02-19	2017-02-19

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	Conducted Room 2				
SA0020	Spectrum Analyzer	Agilent Technologies	E4446A	2016-03-22	2017-03-31
PWM003	RF Power Meter	Keysight Technologies	N1911A	2016-06-21	2017-06-21
PWS001	Peak and Avg Power Sensor, 50MHz to 6GHz	Keysight Technologies	N1921A	2016-04-07	2017-04-31
UL139843	Temp/Humid/Pressure Meter	Fisher Scientific	14-650-118	2016-02-19	2017-02-19
MM0170	Multi-meter	Fluke	83V	2016-03-15	2017-03-31

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

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
CBL077	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3476-240	2016-06-15	2017-06-30
139843	Temp/Humid/Pressure Meter	Control Co./Fisher	14-650-118	2016-02-19	2017-02-19
LISN003	LISN, 50-ohm/50-uH, 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50-25-2-01-550V	2016-08-24	2017-08-24
MM0170	Multi-meter	Fluke	83V	2016-03-15	2017-03-31
PRE0101521 (75141)	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2016-08-23	2017-08-23
TL001	Transient Limiter, 0.009-30MHz	Com-Power	LIT-930A	2016-06-09	2017-06-30
PS215	AC Power Source	Elgar	CW2501M (s/n 1523A02397)	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA

7. MEASUREMENT METHODS

Duty Cycle: KDB 558074 D01 v03r05 Section 6.0

6 dB BW: KDB 558074 D01 v03r05, Section 8.1.

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

Output Power: KDB 558074 D01 v03r05, Section 9.2.3.2.

Power Spectral Density: KDB 558074 D01 v03r05, Section 10.2.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v03r05, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r05, Section 12.1.

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

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

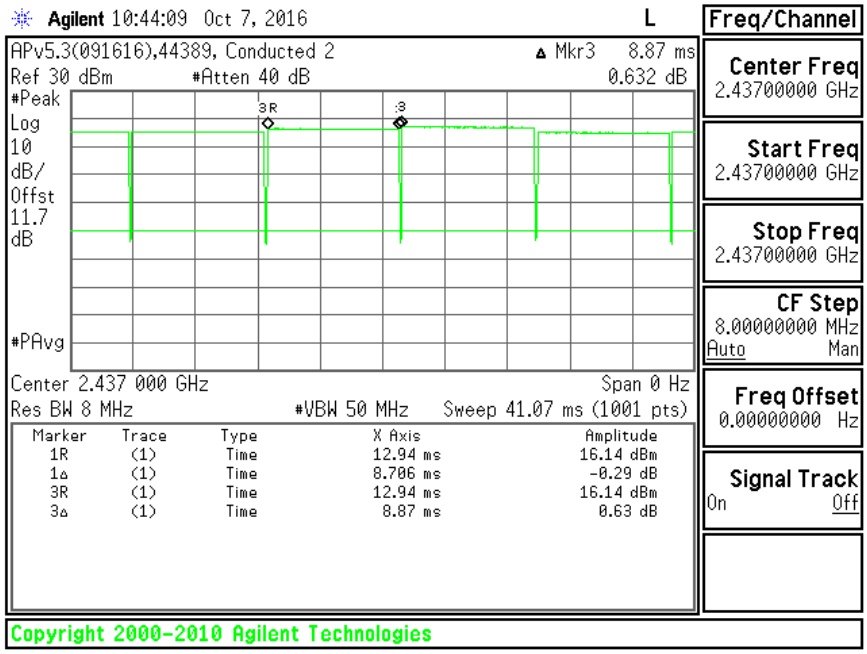
Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz Band						
802.11b 1TX	8.706	8.870	0.982	98.15%	0.00	0.010
802.11g 1TX	0.179	0.382	0.469	46.94%	3.28	5.574
802.11n HT20 1TX	0.172	0.375	0.459	45.90%	3.38	5.814

Test Performed: Niklas Haydon / Jeff Cabrera
Test Date: 2016-10-07

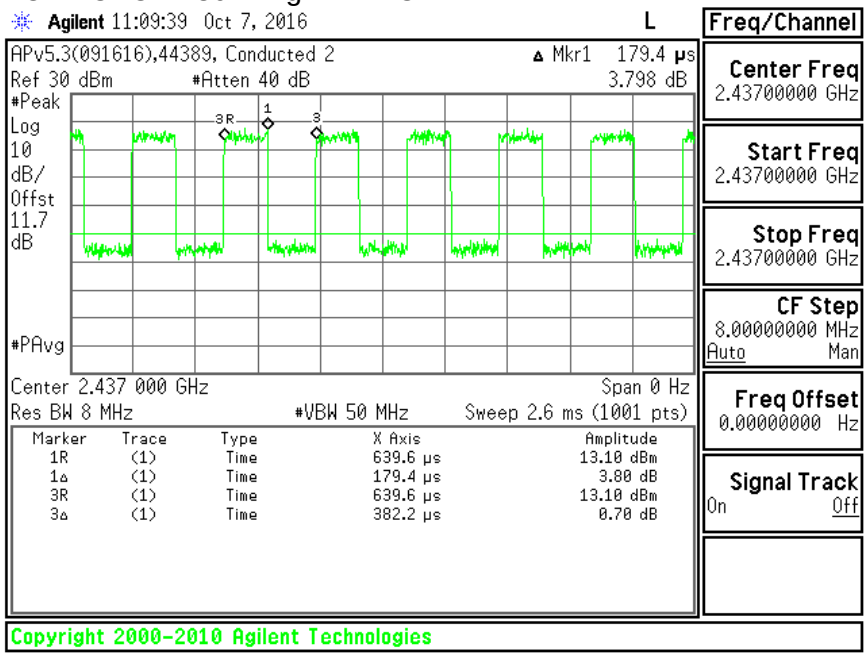
DUTY CYCLE PLOTS

2.4 GHz BAND

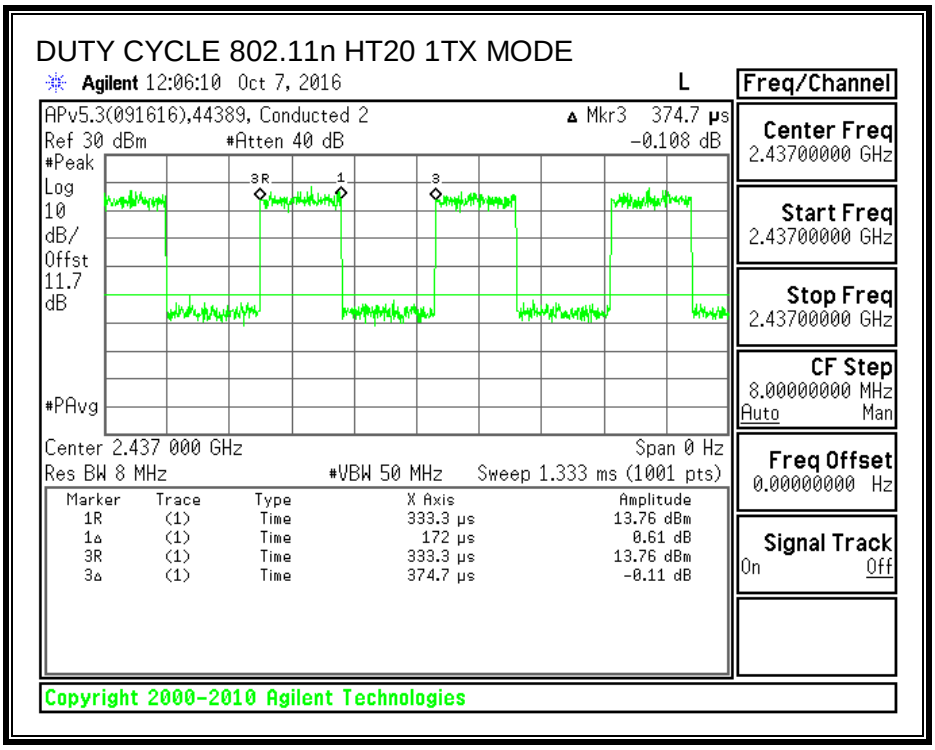
DUTY CYCLE 802.11b 1TX MODE



DUTY CYCLE 802.11g 1TX MODE



DUTY CYCLE 802.11n HT20 1TX MODE



8.2. 802.11b MODE IN THE 2.4 GHz BAND

8.2.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-247 5.2 (1)

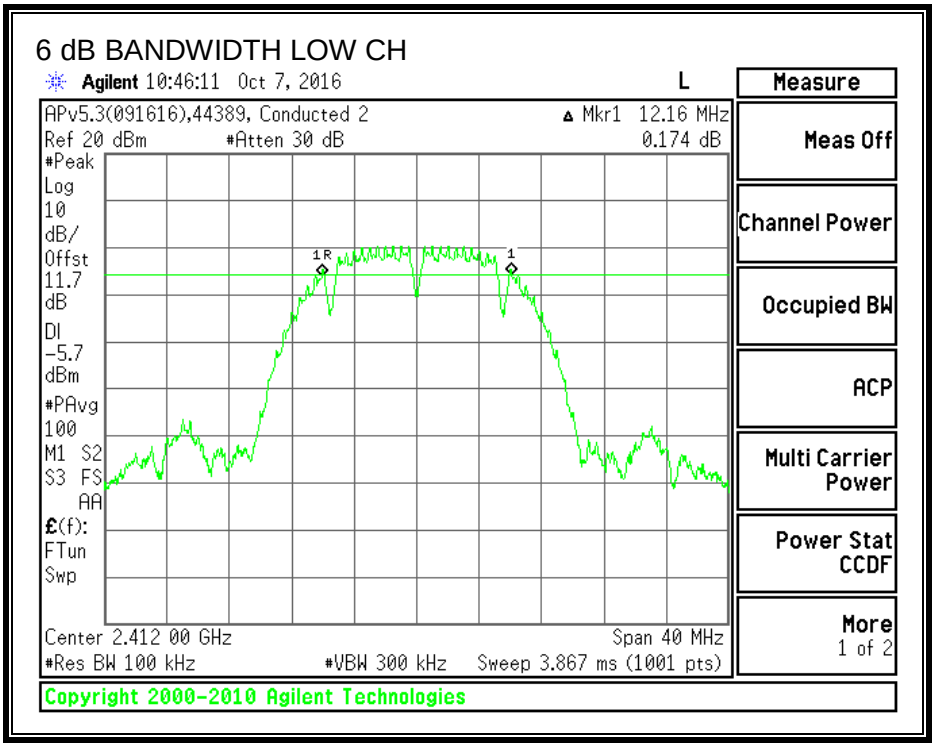
The minimum 6 dB bandwidth shall be at least 500 kHz.

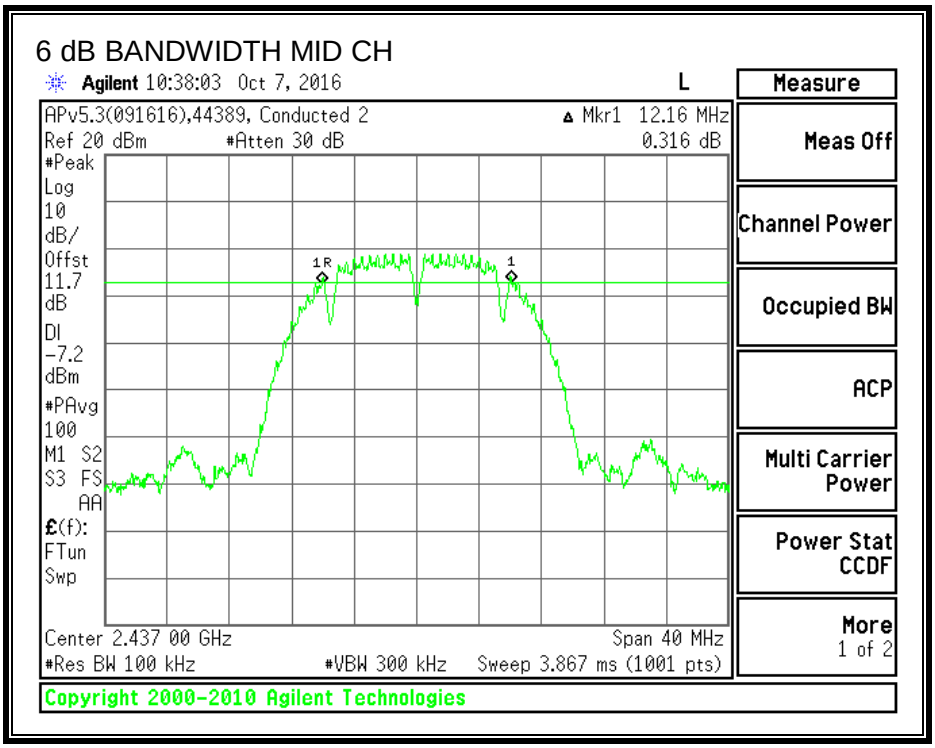
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	12.160	0.5
Mid	2437	12.160	0.5
High	2462	12.120	0.5

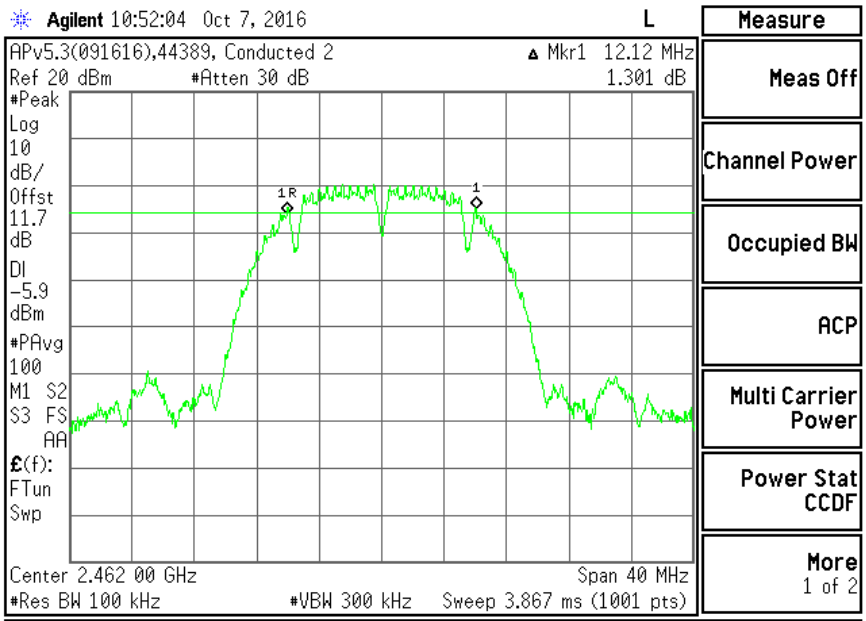
Test Performed: Niklas Haydon / Jeff Cabrera
Test Date: 2016-10-07

6 dB BANDWIDTH





6 dB BANDWIDTH HIGH CH



8.2.2. 99% BANDWIDTH

LIMITS

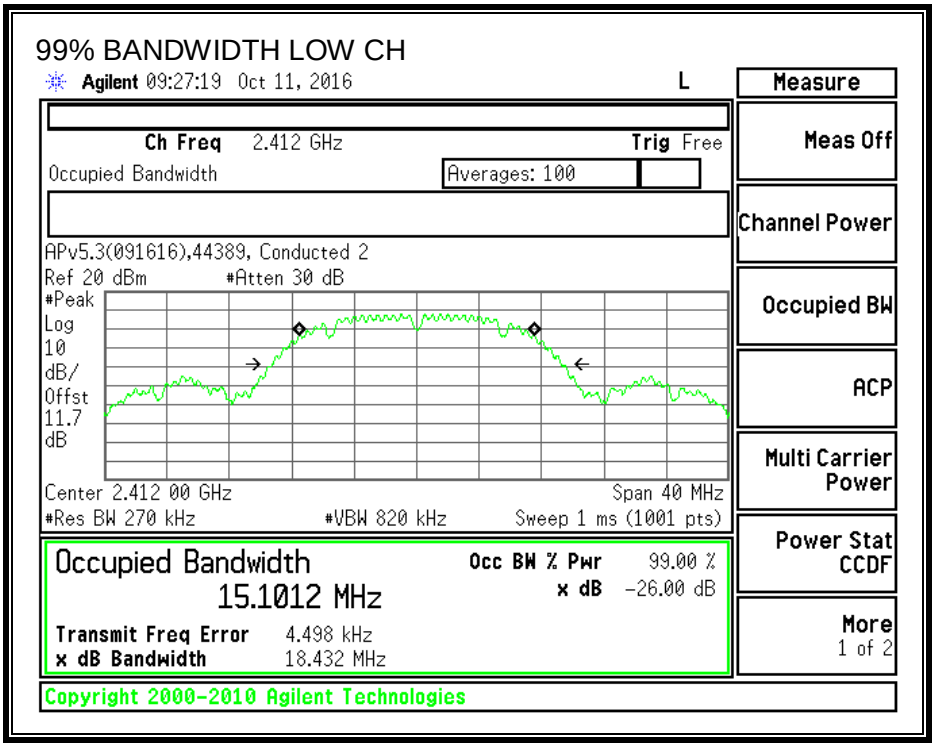
None; for reporting purposes only. Testing per RSS-Gen Clause 6.6.

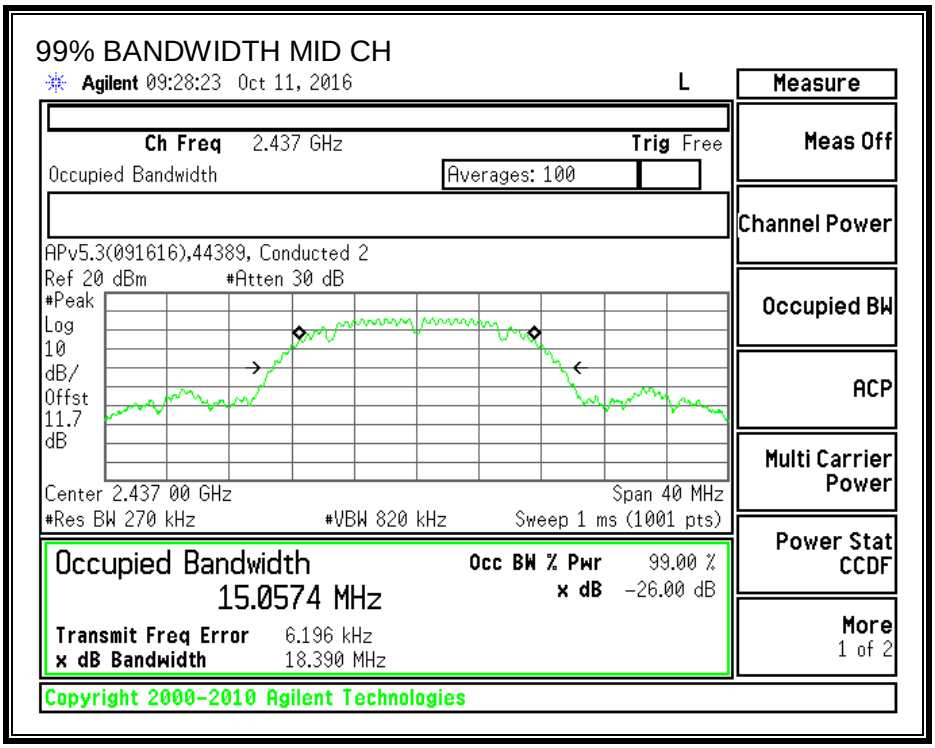
RESULTS

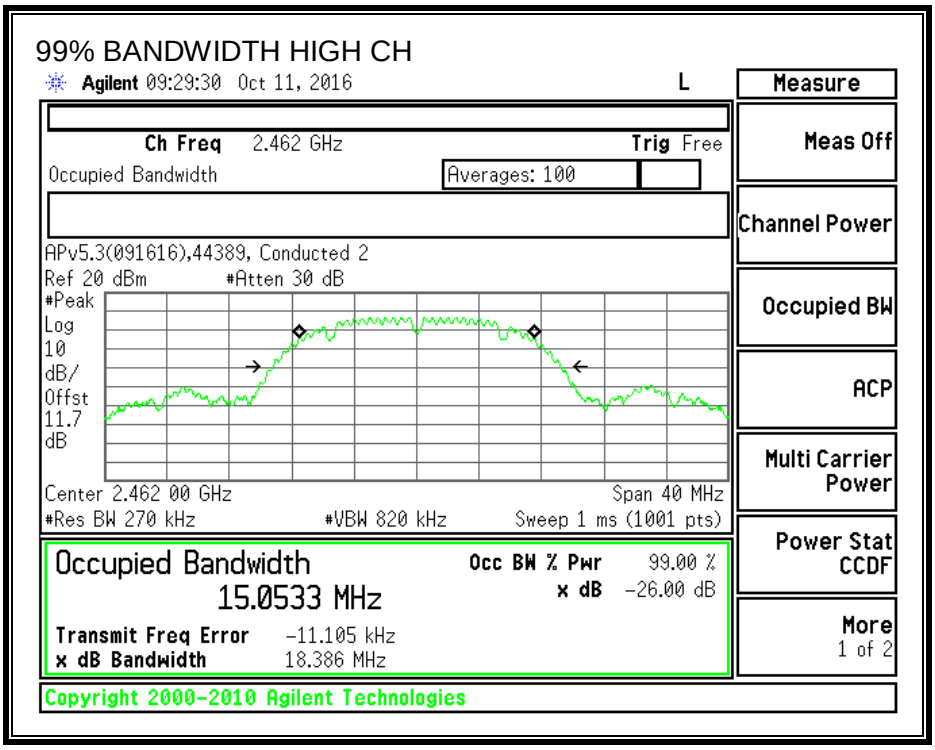
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	15.1012
Mid	2437	15.0574
High	2462	15.0533

Test Performed: Niklas Haydon / Jeff Cabrera
Test Date: 2016-10-11

99% BANDWIDTH







8.2.3. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

IC RSS-247 5.4 (4)

FCC - 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.

RSS - For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. Except as provided in Section 5.4(5), the e.i.r.p. shall not exceed 4 W.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Test Performed: Niklas Haydon / Jeff Cabrera
Test Date: 2016-10-06

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-3.00	30.00	30	36	30.00
Mid	2437	-3.00	30.00	30	36	30.00
High	2462	-3.00	30.00	30	36	30.00

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

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	14.66	14.66	30.00	-15.34
Mid	2437	14.47	14.47	30.00	-15.53
High	2462	14.30	14.30	30.00	-15.70

NOTE: Gated Measurements

8.2.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-247 5.2 (2)

RESULTS

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

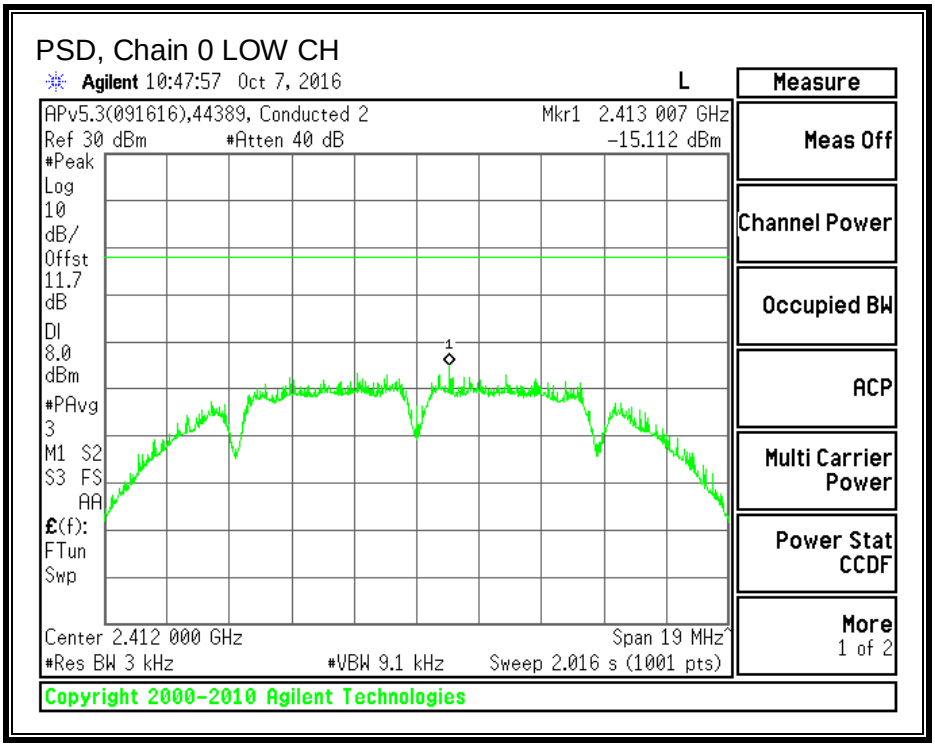
PSD Results

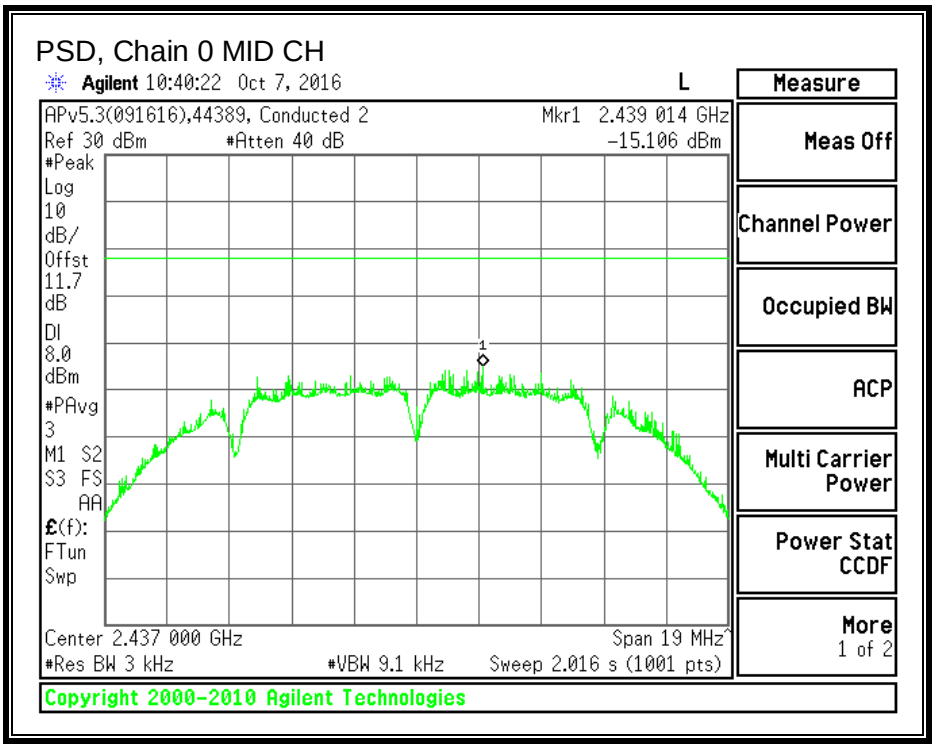
Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-15.11	-15.11	8.0	-23.1
Mid	2437	-15.11	-15.11	8.0	-23.1
High	2462	-15.82	-15.82	8.0	-23.8

NOTE: Peak Measurements

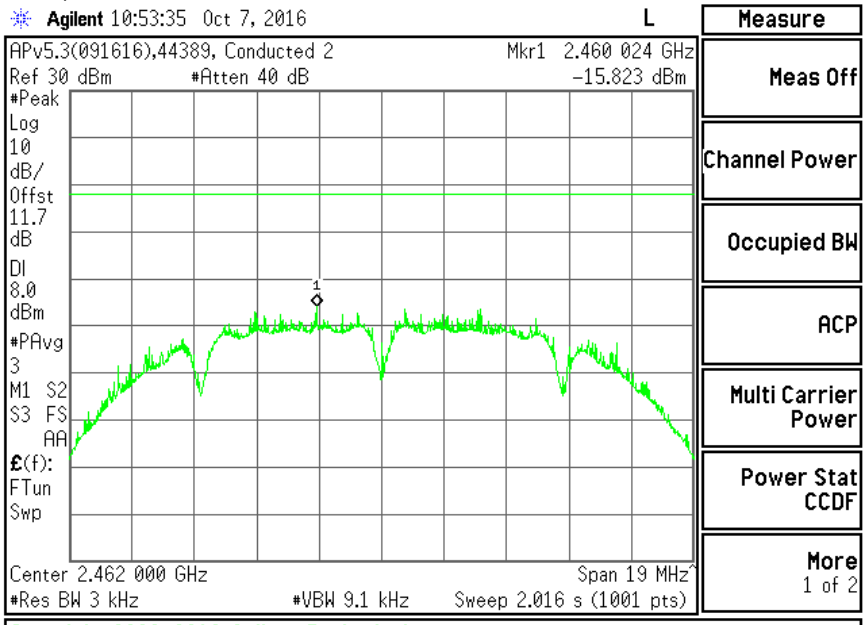
Test Performed: Niklas Haydon / Jeff Cabrera
Test Date: 2016-10-07

PSD, Chain 0





PSD, Chain 0 HIGH CH



8.2.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 5.5

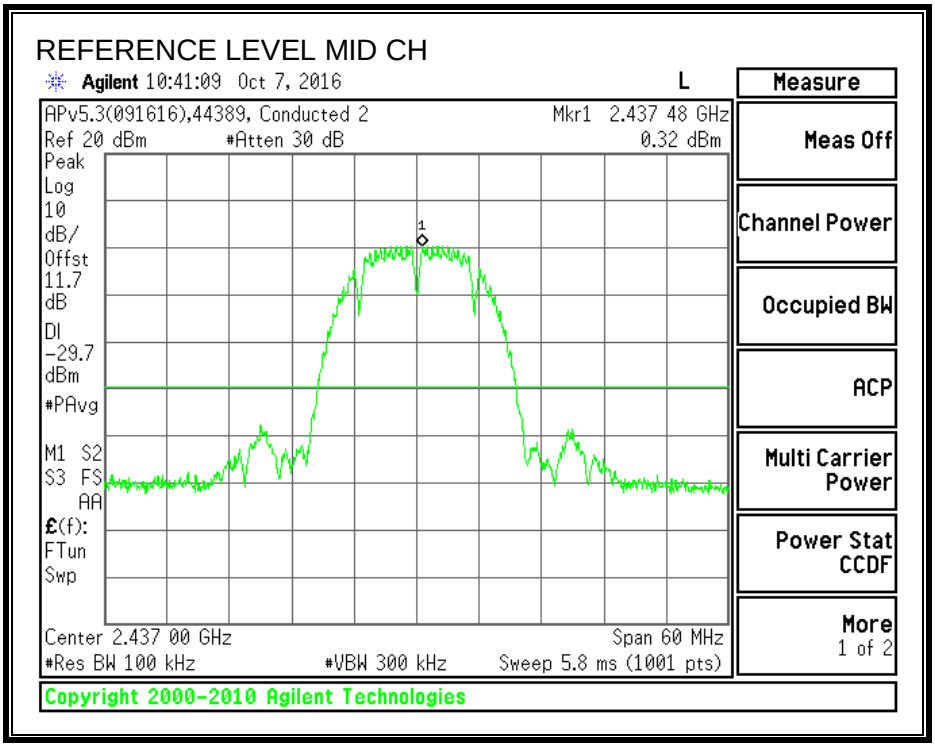
FCC - In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains 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.

RSS - In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

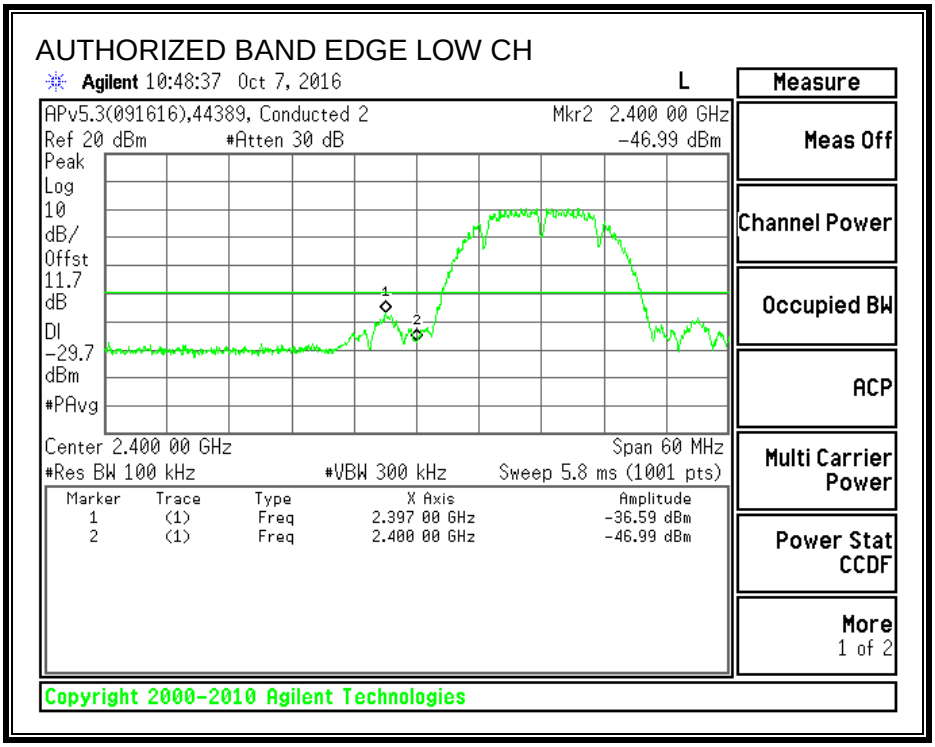
Test Performed: Niklas Haydon / Jeff Cabrera
Test Date: 2016-10-07

RESULTS

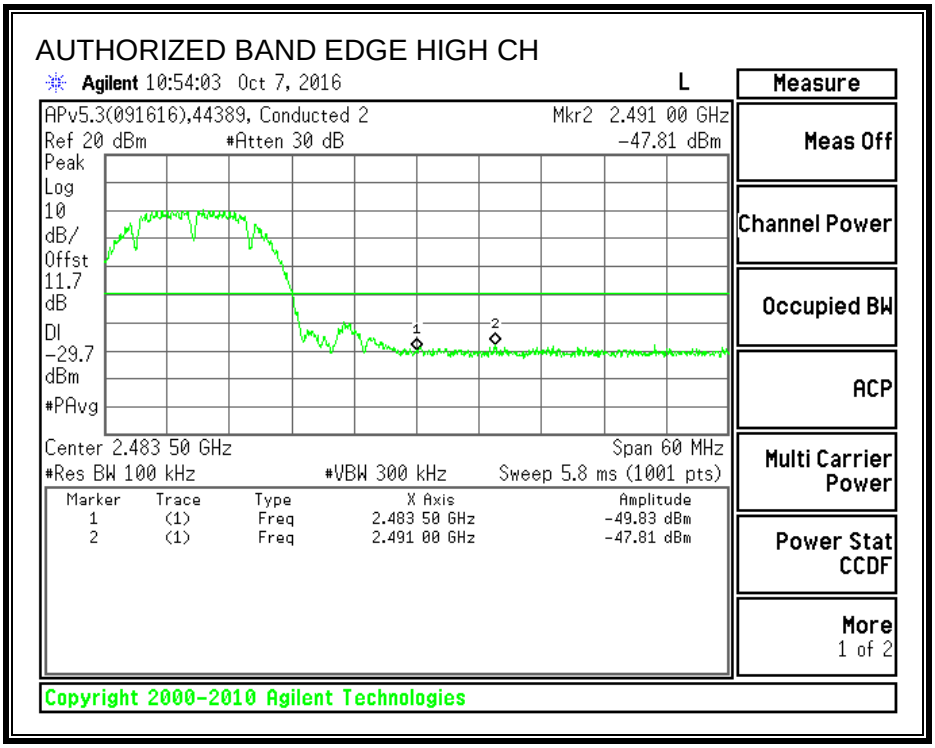
IN-BAND REFERENCE LEVEL



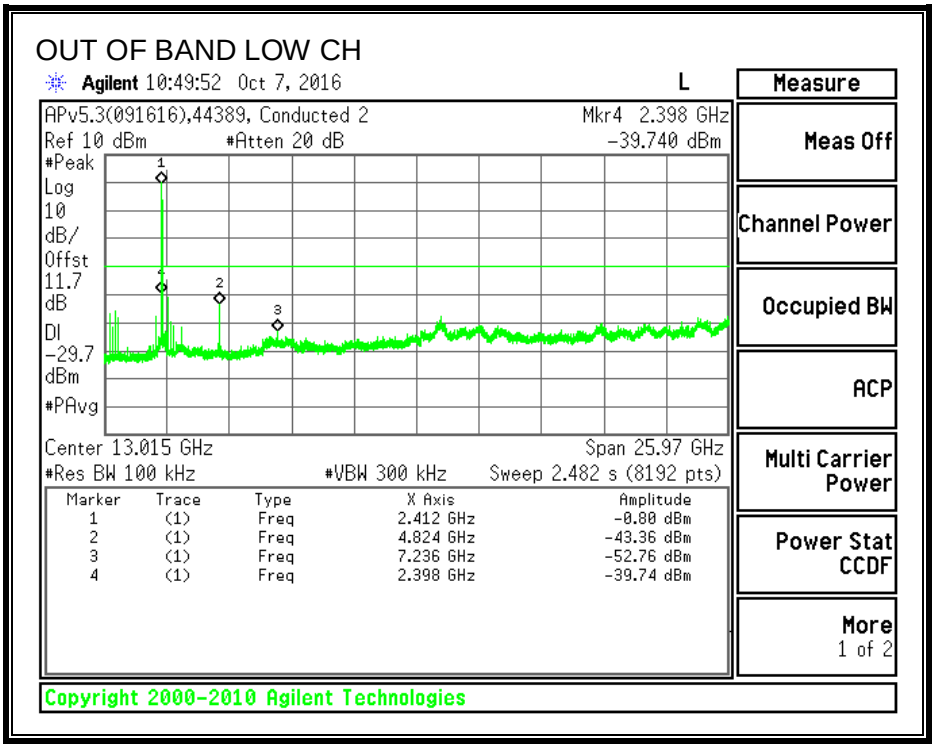
LOW CHANNEL BANDEDGE



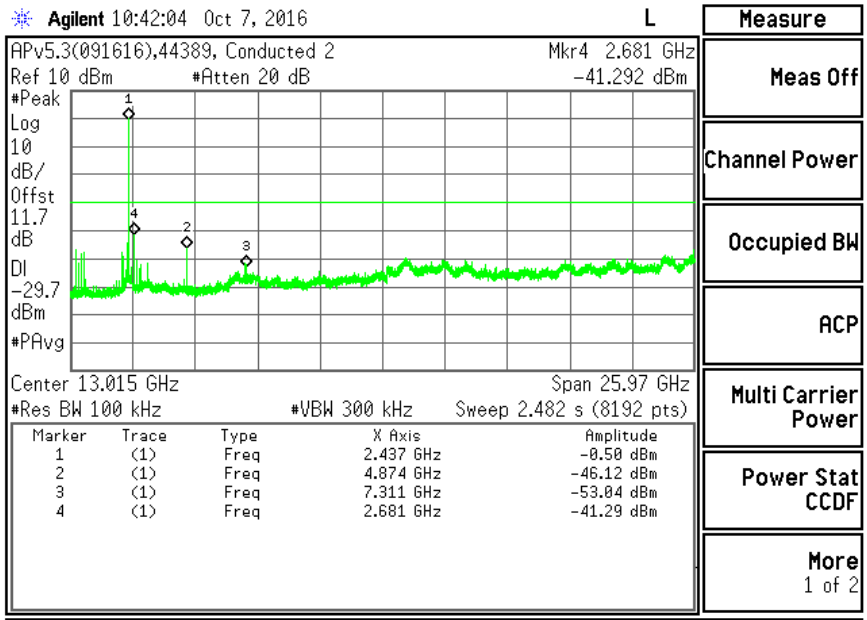
HIGH CHANNEL BANDEDGE



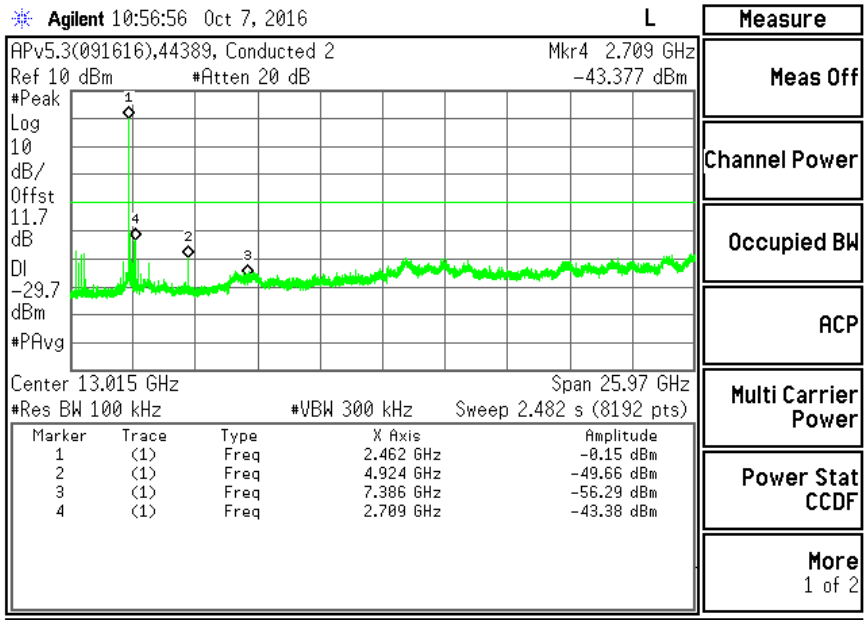
OUT-OF-BAND EMISSIONS



OUT OF BAND MID CH



OUT OF BAND 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)

IC RSS-247 5.2 (1)

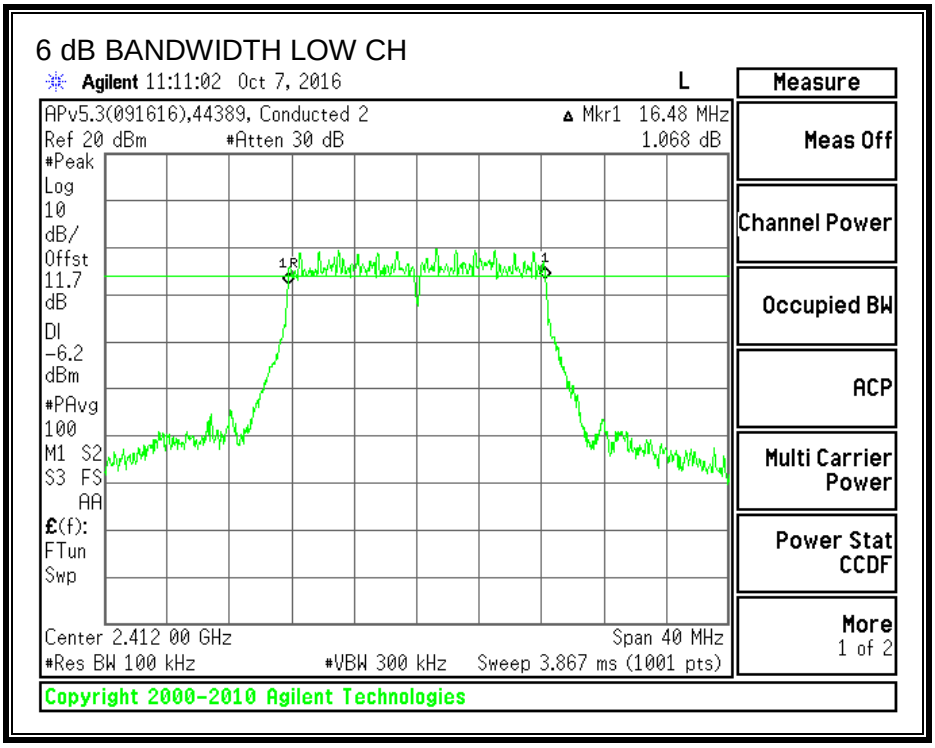
The minimum 6 dB bandwidth shall be at least 500 kHz.

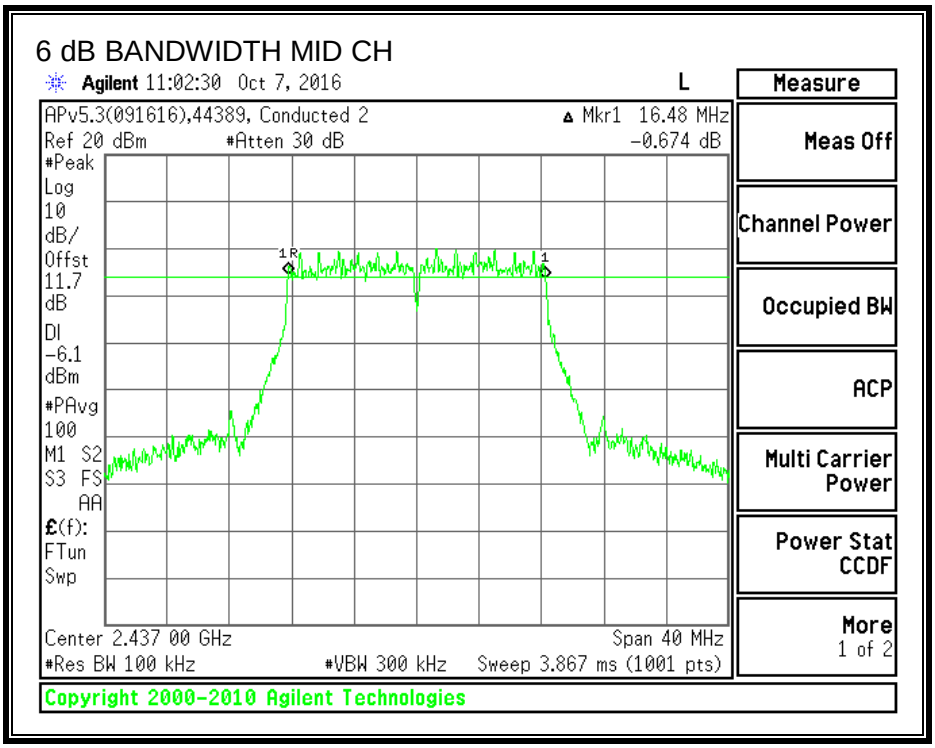
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	16.480	0.5
Mid	2437	16.480	0.5
High	2462	16.480	0.5

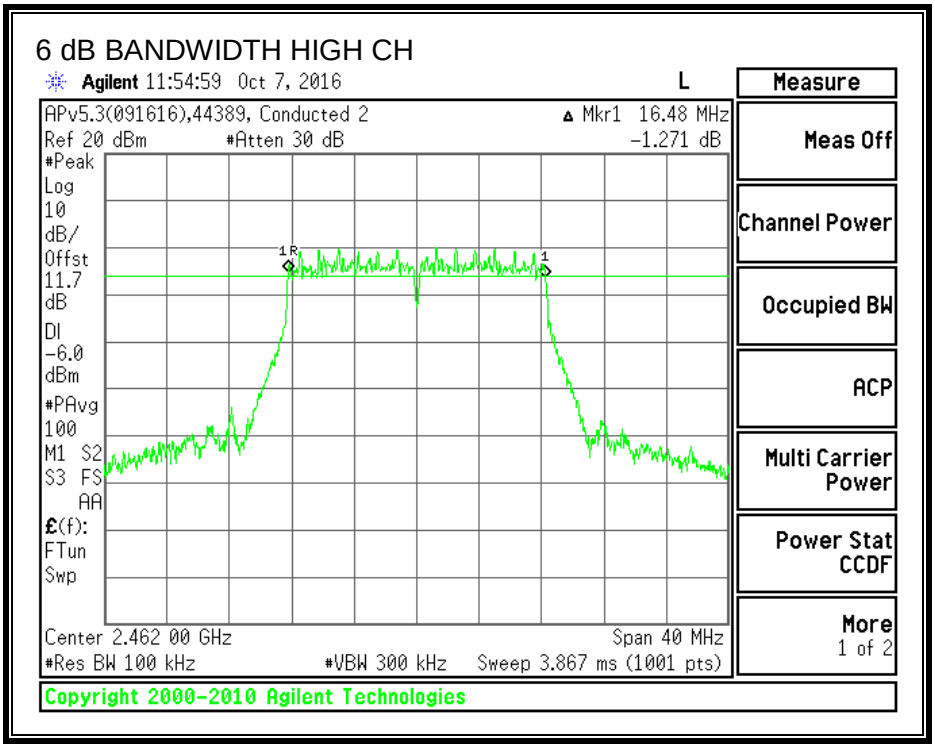
Test Performed: Niklas Haydon / Jeff Cabrera
Test Date: 2016-10-07

6 dB BANDWIDTH





6 dB BANDWIDTH HIGH CH



8.3.2. 99% BANDWIDTH

LIMITS

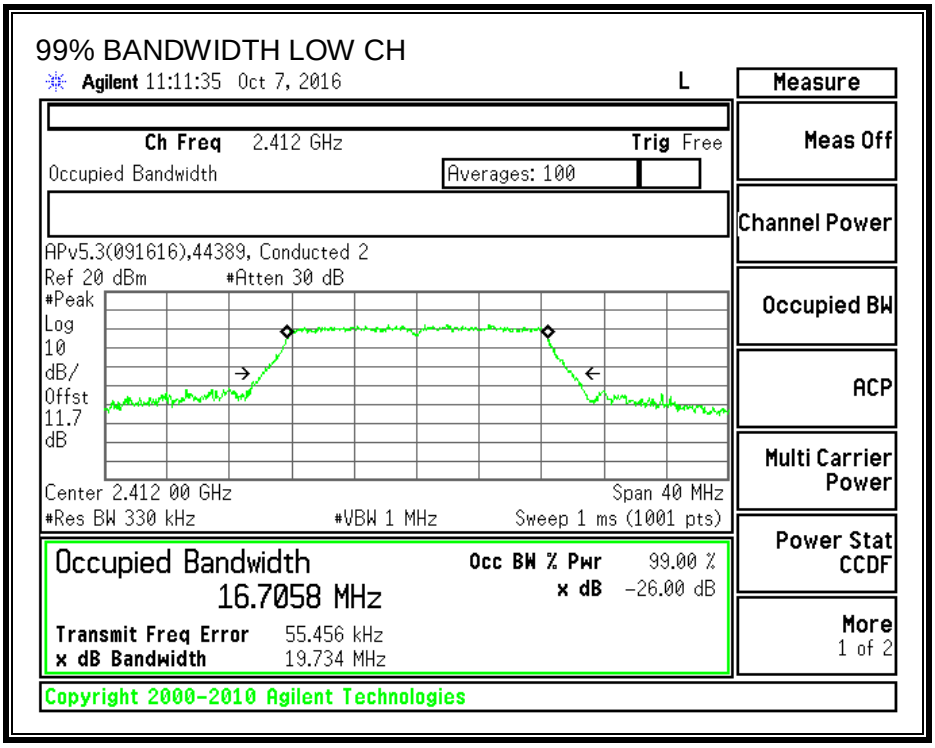
None; for reporting purposes only. Testing per RSS-Gen Clause 6.6.

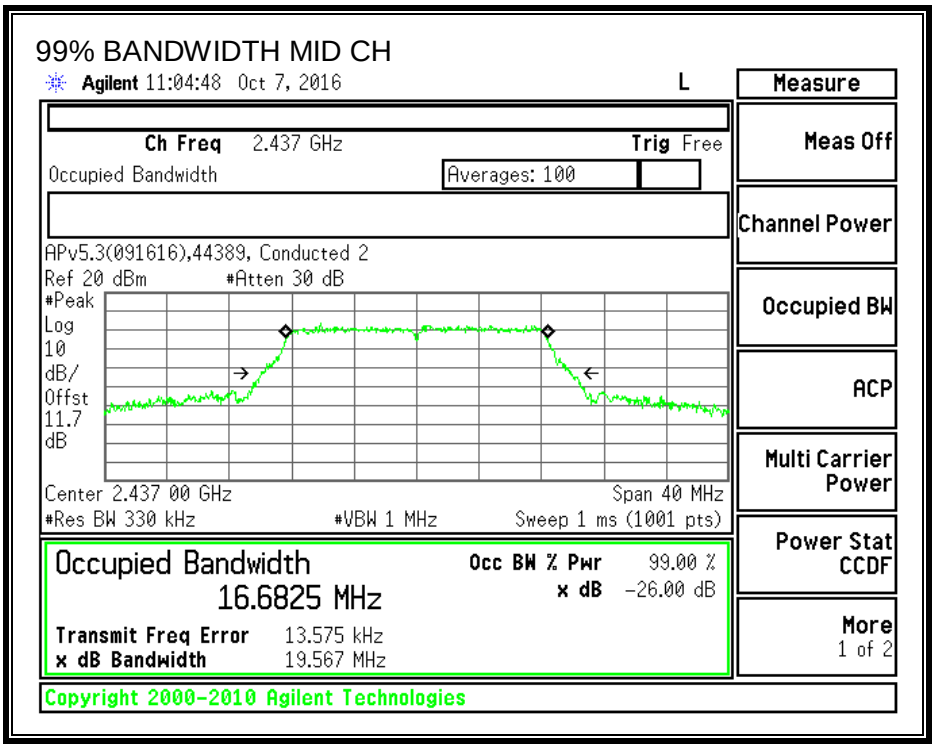
RESULTS

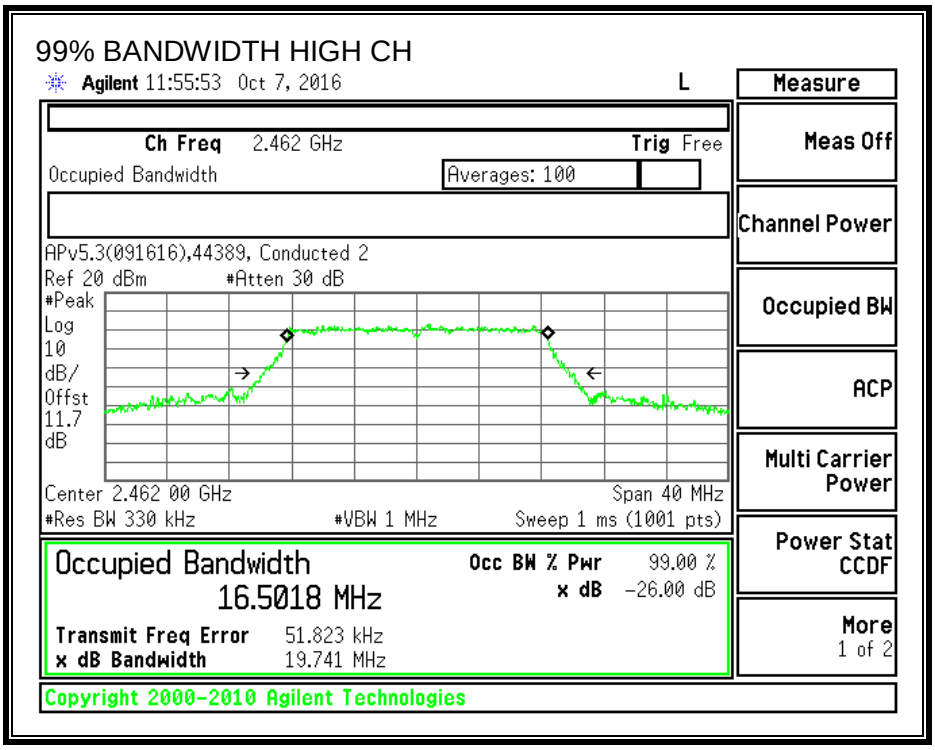
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.7058
Mid	2437	16.6825
High	2462	16.5018

Test Performed: Niklas Haydon / Jeff Cabrera
Test Date: 2016-10-07

99% BANDWIDTH







8.3.3. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

IC RSS-247 5.4 (4)

FCC - 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.

RSS - For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. Except as provided in Section 5.4(5), the e.i.r.p. shall not exceed 4 W.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-3.00	30.00	30	36	30.00
Mid	2437	-3.00	30.00	30	36	30.00
High	2462	-3.00	30.00	30	36	30.00

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

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	11.96	11.96	30.00	-18.04
Mid	2437	12.60	12.60	30.00	-17.40
High	2462	12.43	12.43	30.00	-17.57

NOTE: Gated Measurements

Test Performed: Niklas Haydon / Jeff Cabrera
Test Date: 2016-10-06

8.3.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-247 5.2 (2)

RESULTS

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

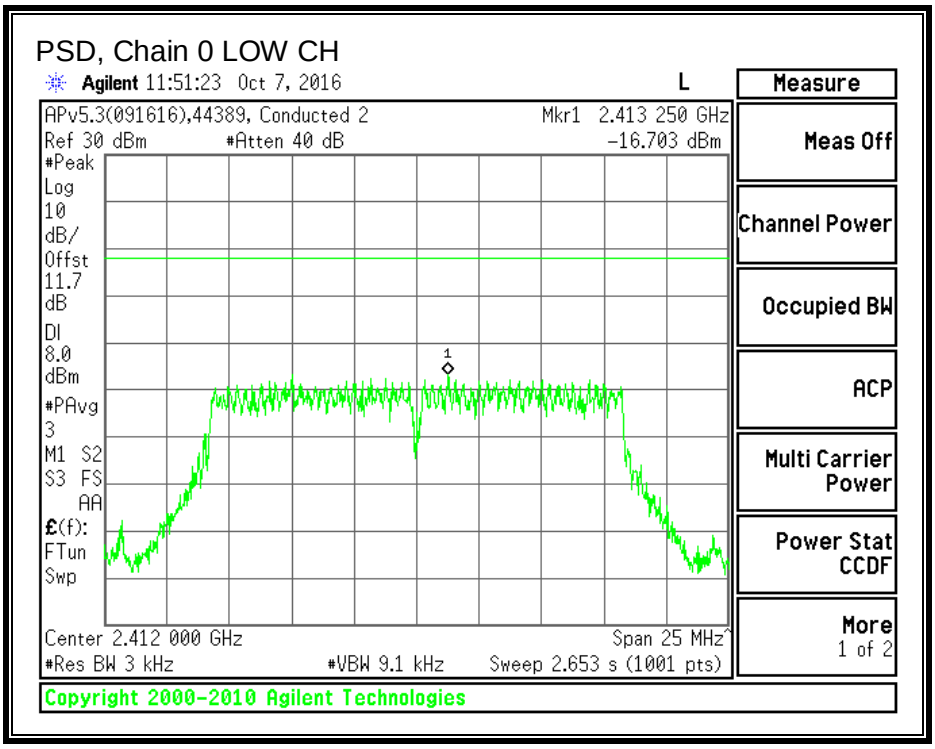
PSD Results

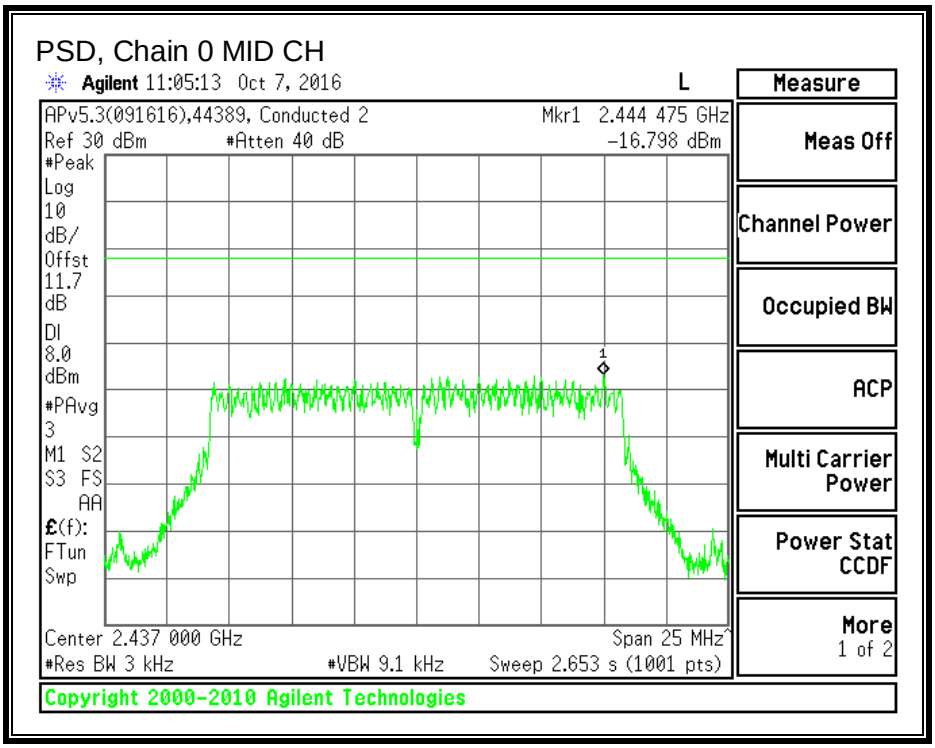
Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-16.70	-16.70	8.0	-24.7
Mid	2437	-16.80	-16.80	8.0	-24.8
High	2462	-16.16	-16.16	8.0	-24.2

NOTE: Peak Measurements

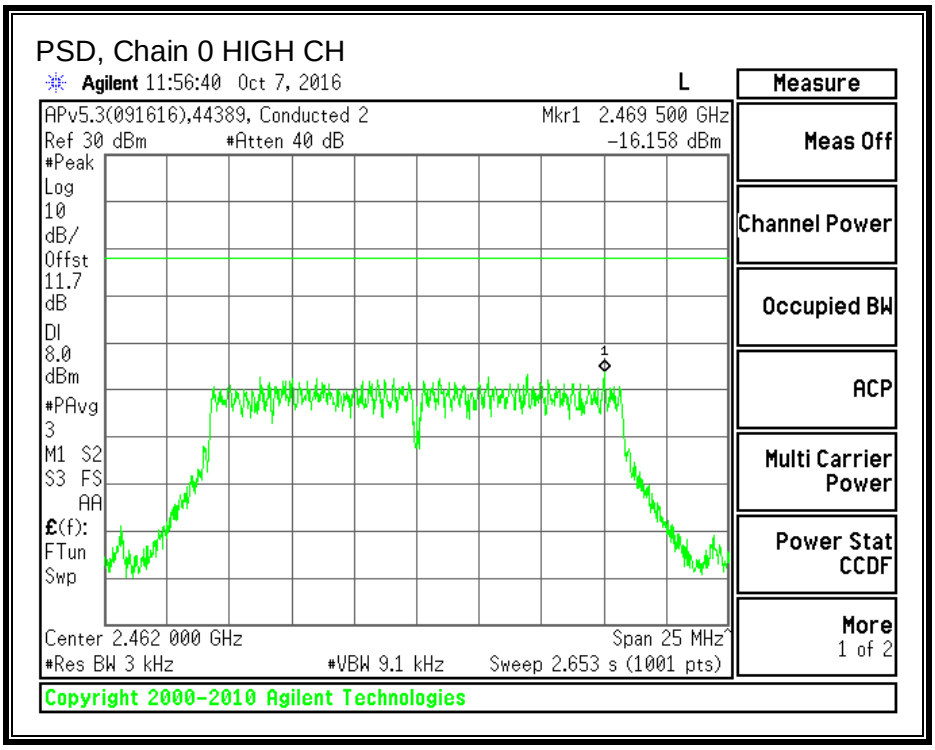
Test Performed: Niklas Haydon / Jeff Cabrera
Test Date: 2016-10-07

PSD, Chain 0





PSD, Chain 0 HIGH CH



8.3.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 5.5

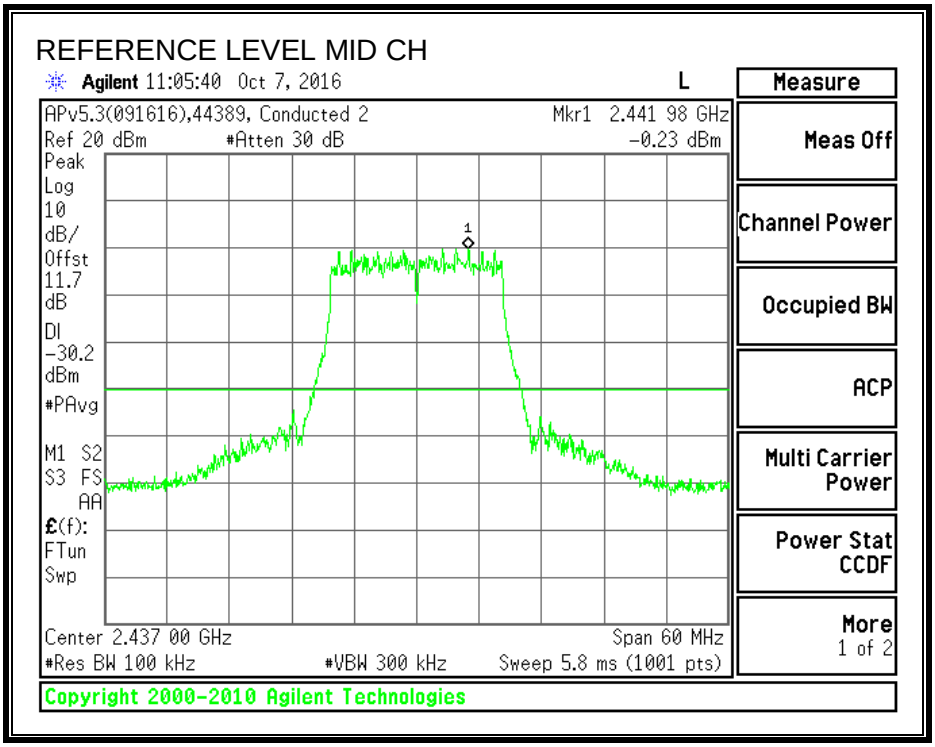
FCC - In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains 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.

RSS - In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

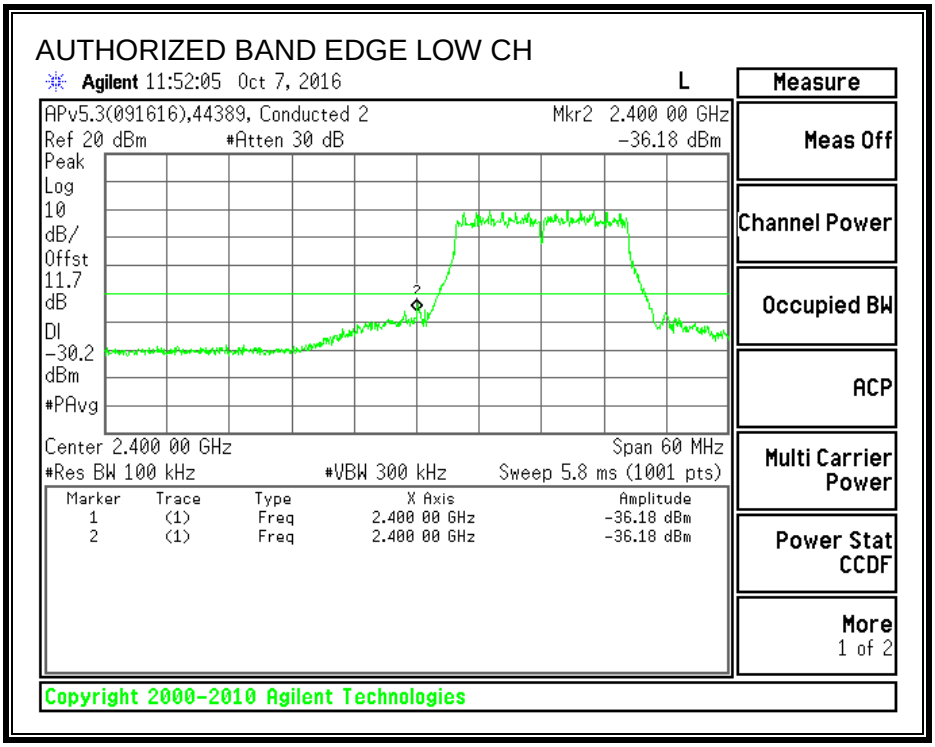
Test Performed: Niklas Haydon / Jeff Cabrera
Test Date: 2016-10-07

RESULTS

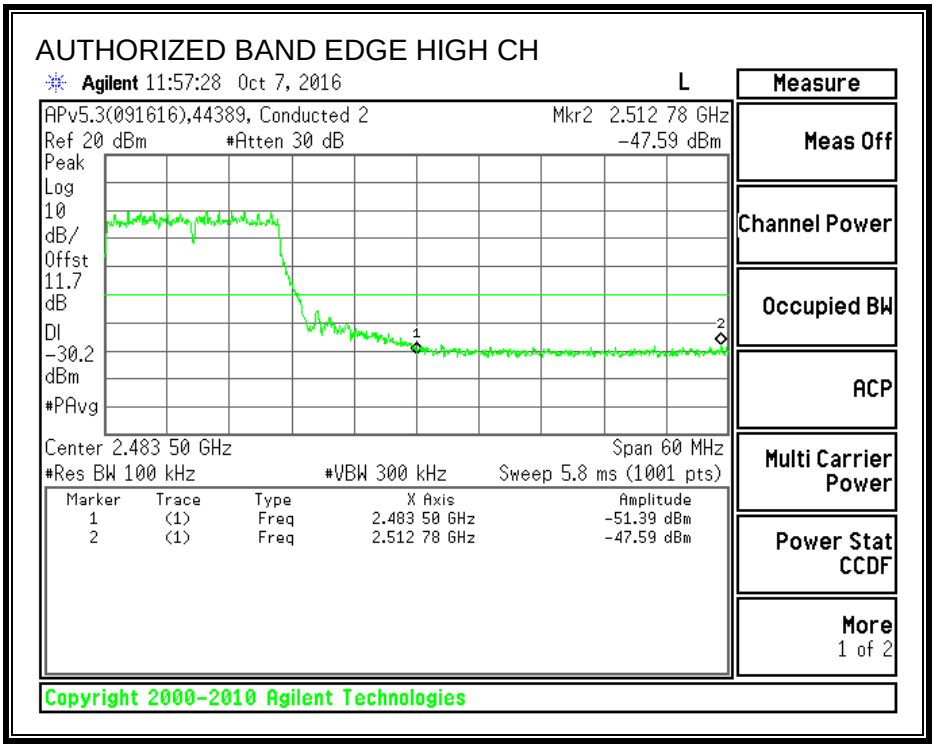
IN-BAND REFERENCE LEVEL



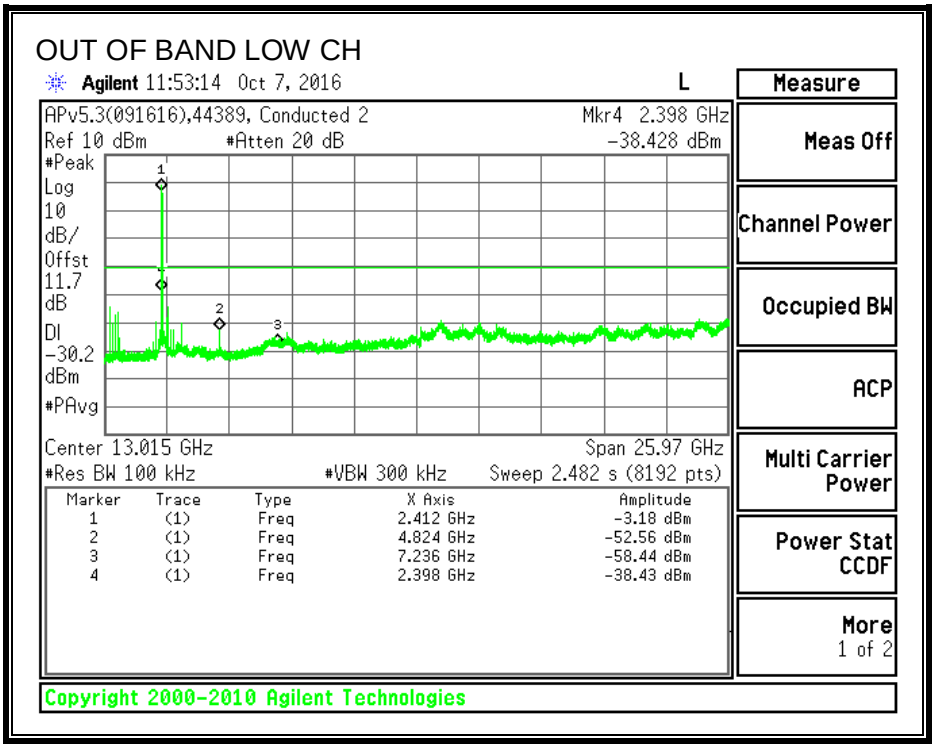
LOW CHANNEL BANDEDGE



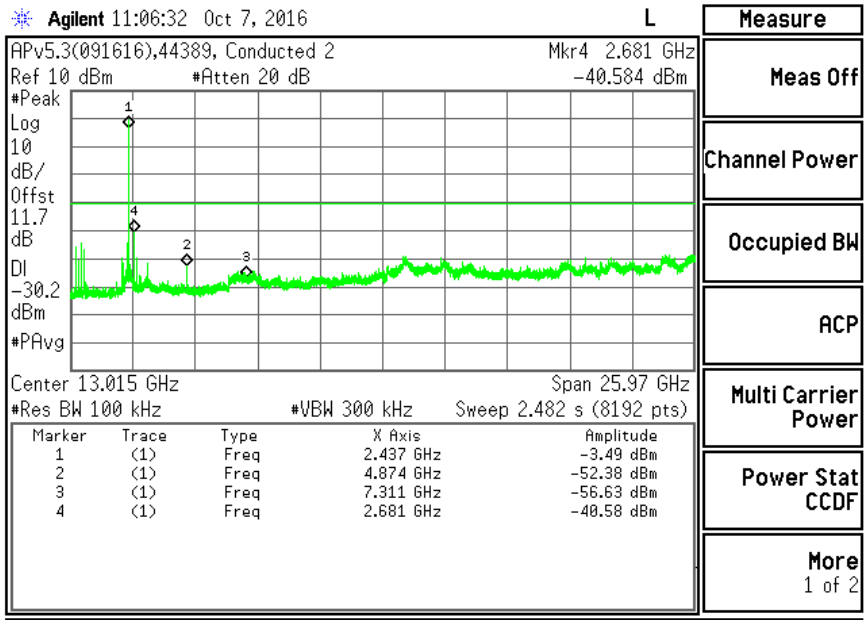
HIGH CHANNEL BANDEDGE



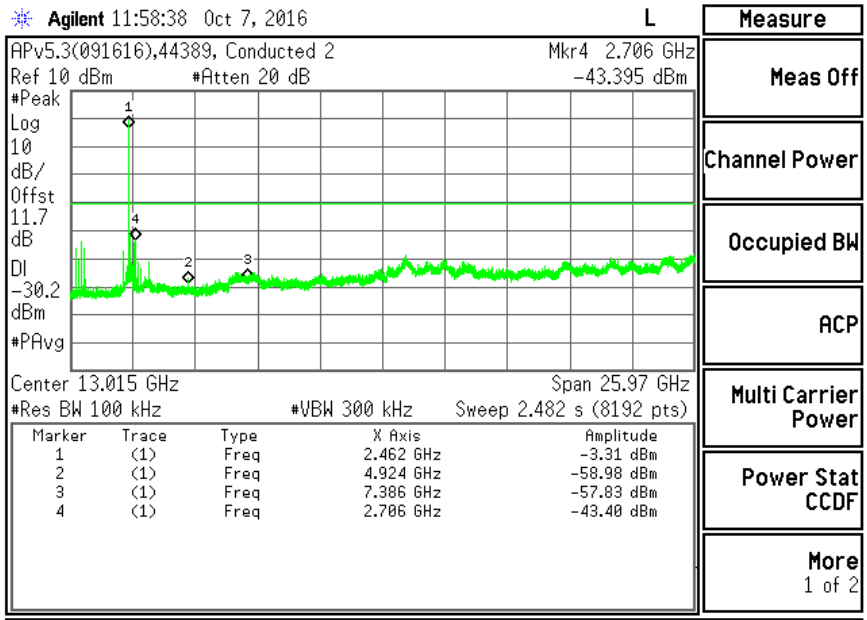
OUT-OF-BAND EMISSIONS



OUT OF BAND MID CH



OUT OF BAND 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)

IC RSS-247 5.2 (1)

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

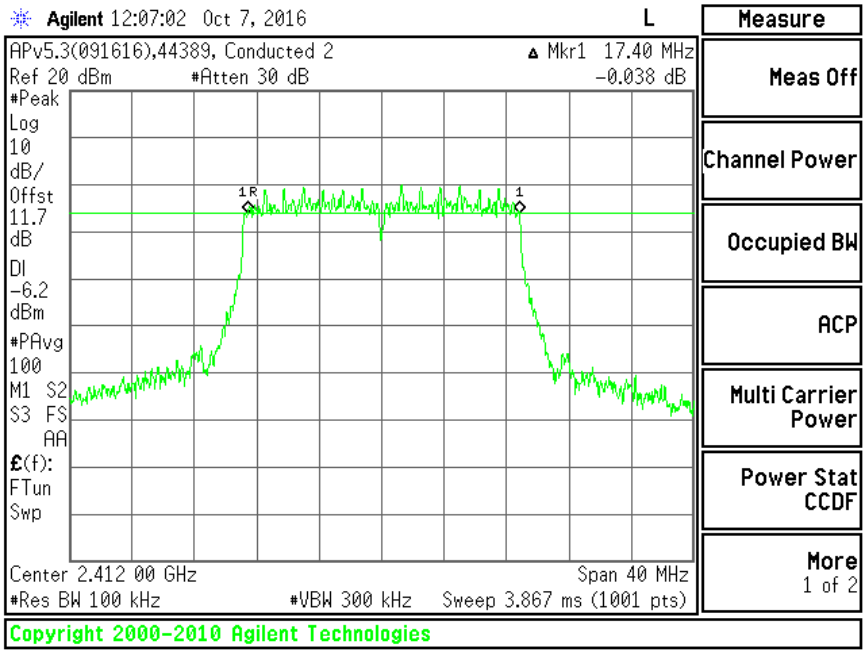
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	17.400	0.5
Mid	2437	17.560	0.5
High	2462	17.520	0.5

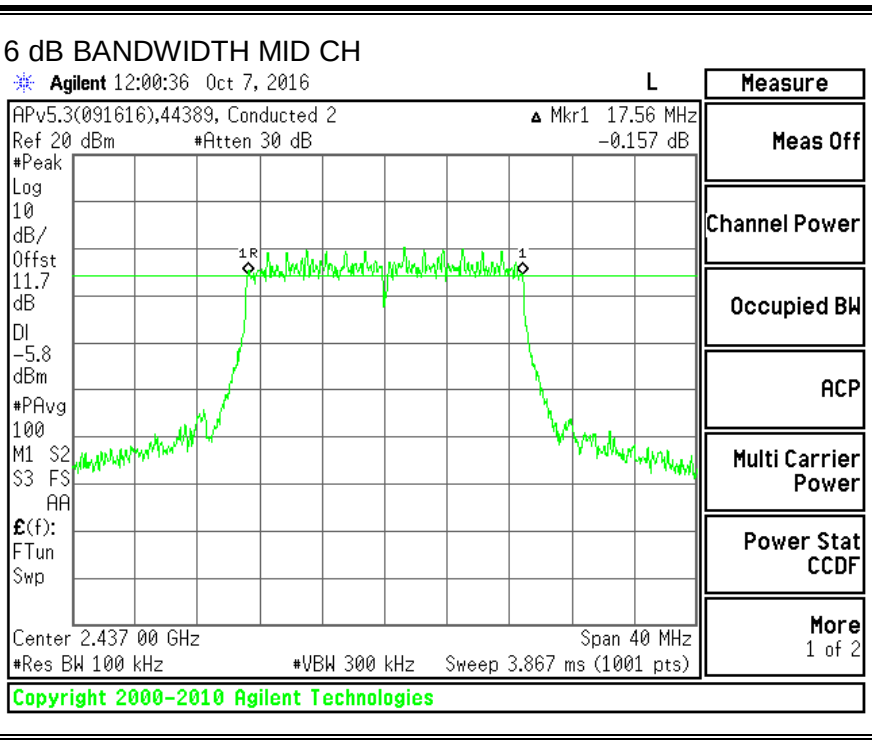
Test Performed: Niklas Haydon / Jeff Cabrera
Test Date: 2016-10-07

6 dB BANDWIDTH

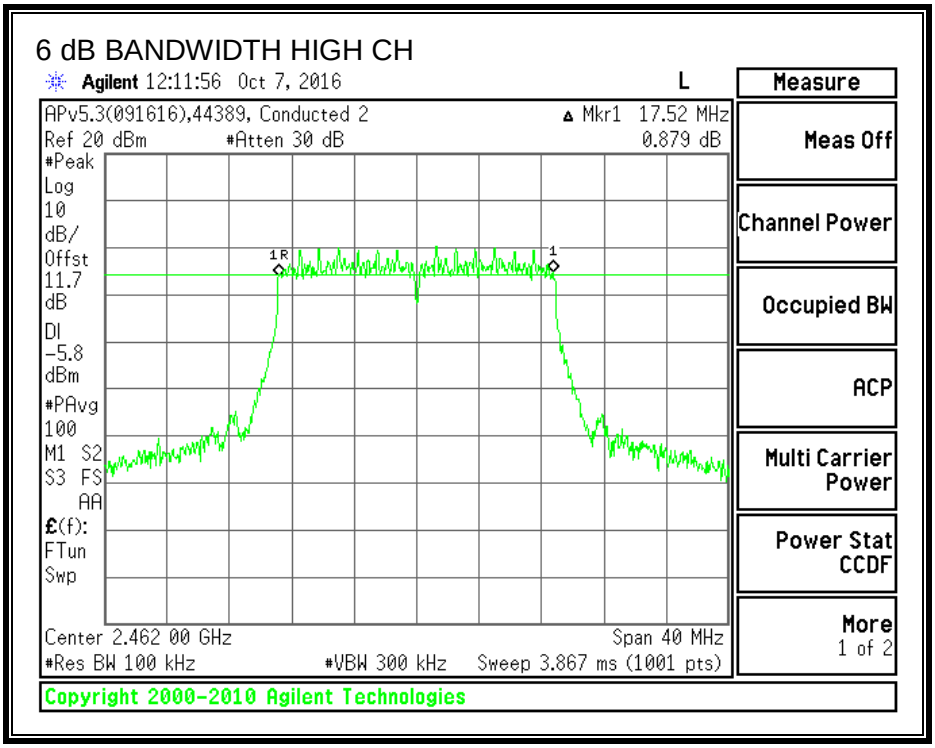
6 dB BANDWIDTH LOW CH



6 dB BANDWIDTH MID CH



6 dB BANDWIDTH HIGH CH



8.4.2. 99% BANDWIDTH

LIMITS

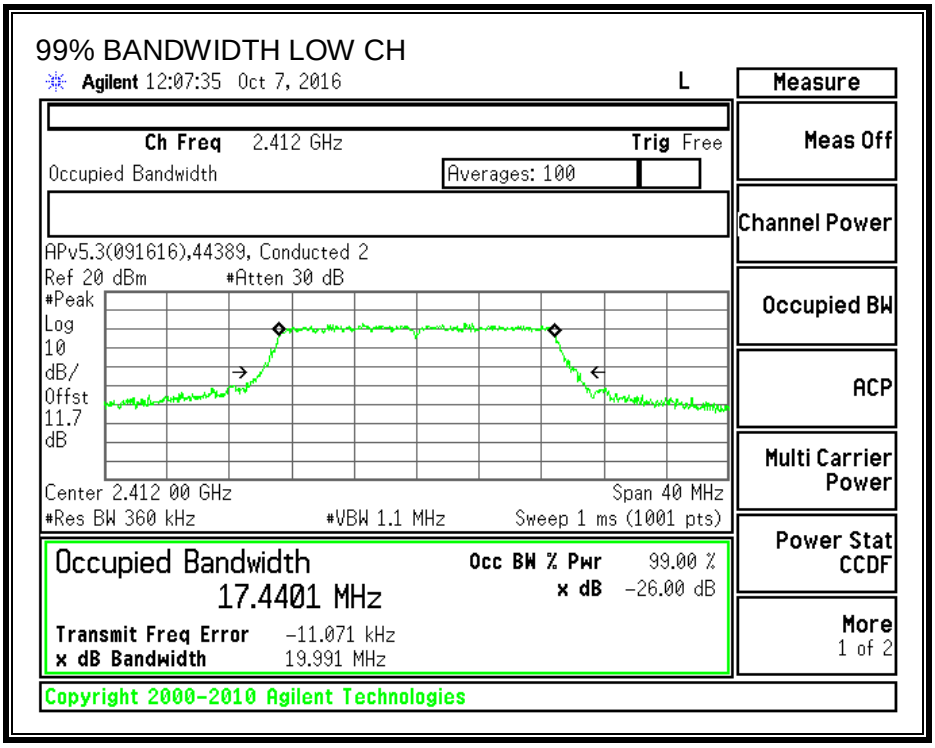
None; for reporting purposes only. Testing per RSS-Gen Clause 6.6.

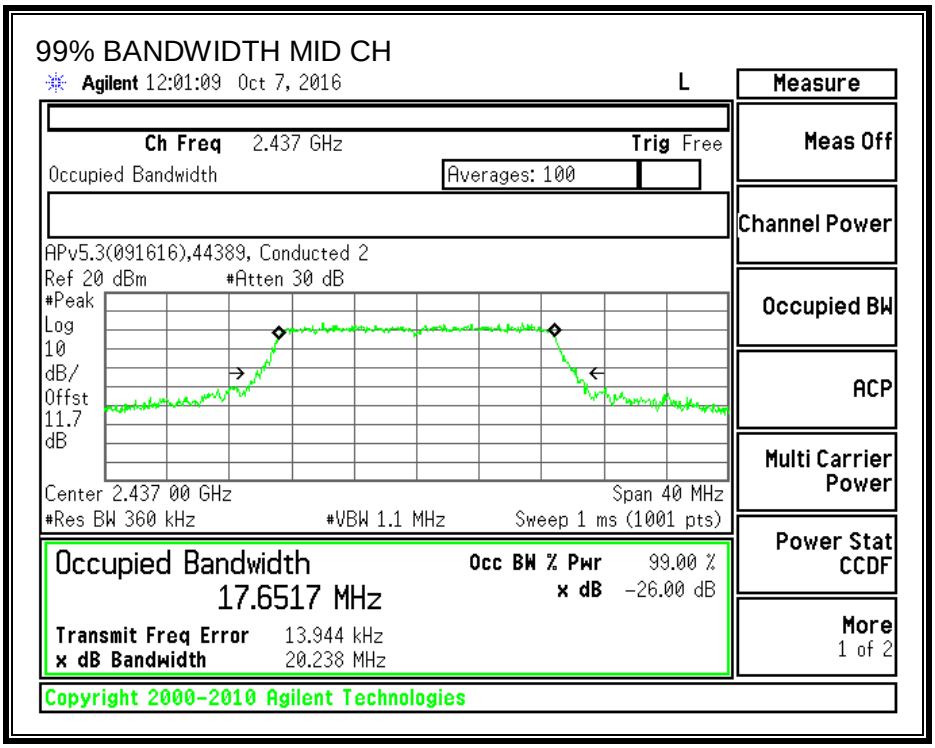
RESULTS

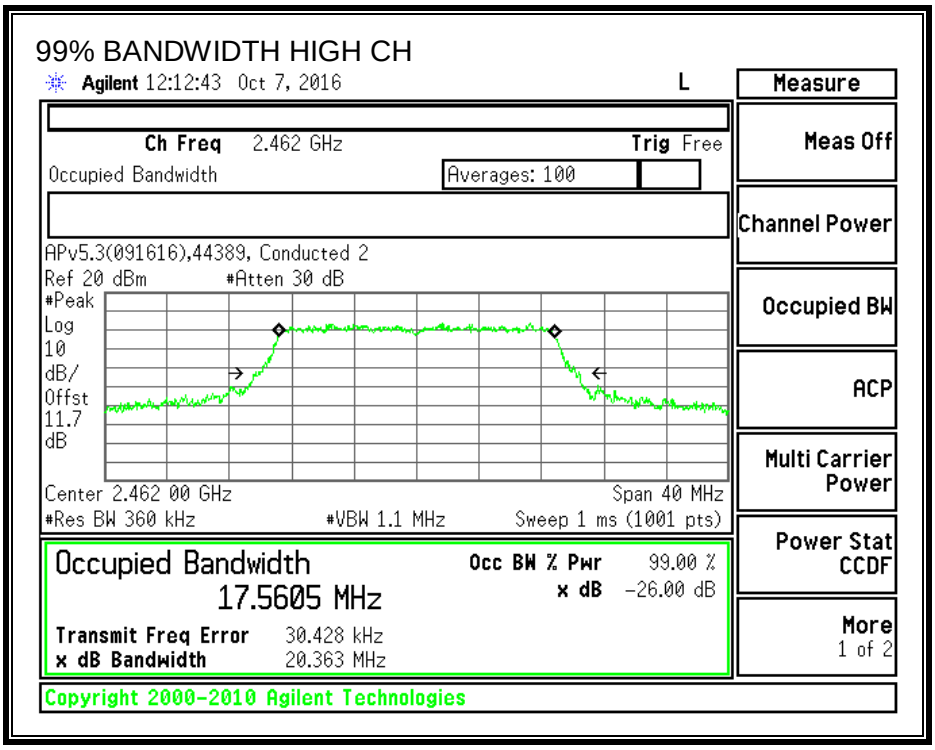
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	17.4401
Mid	2437	17.6517
High	2462	17.5605

Test Performed: Niklas Haydon / Jeff Cabrera
Test Date: 2016-10-07

99% BANDWIDTH







8.4.3. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

IC RSS-247 5.4 (4)

FCC - 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.

RSS - For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. Except as provided in Section 5.4(5), the e.i.r.p. shall not exceed 4 W.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-3.00	30.00	30	36	30.00
Mid	2437	-3.00	30.00	30	36	30.00
High	2462	-3.00	30.00	30	36	30.00

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

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	12.43	12.43	30.00	-17.57
Mid	2437	12.40	12.40	30.00	-17.60
High	2462	12.46	12.46	30.00	-17.54

NOTE: Gated Measurements

Test Performed: Niklas Haydon / Jeff Cabrera
Test Date: 2016-10-06

8.4.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-247 5.2 (2)

RESULTS

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

PSD Results

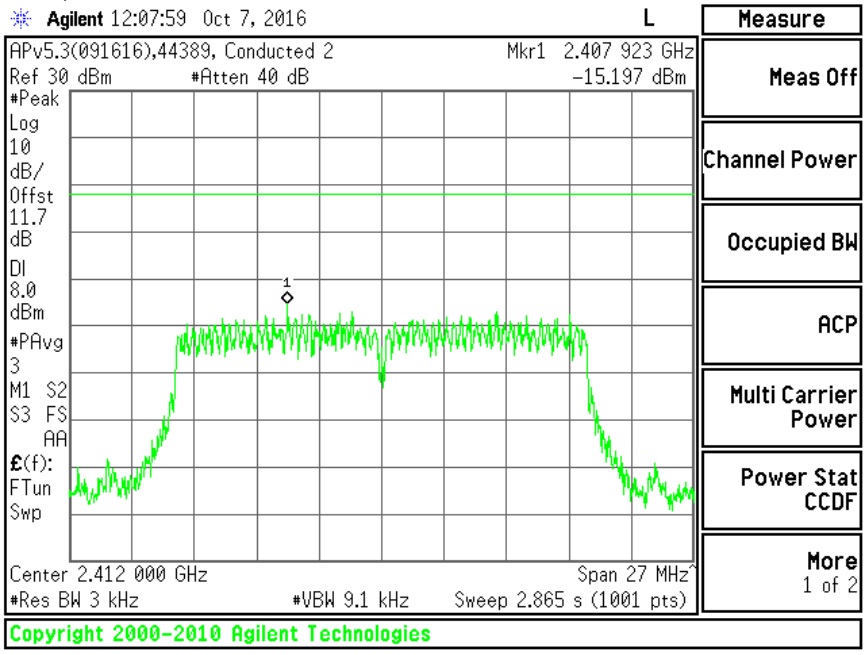
Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-15.20	-15.20	8.0	-23.2
Mid	2437	-15.05	-15.05	8.0	-23.0
High	2462	-16.06	-16.06	8.0	-24.1

NOTE Peak Measurements

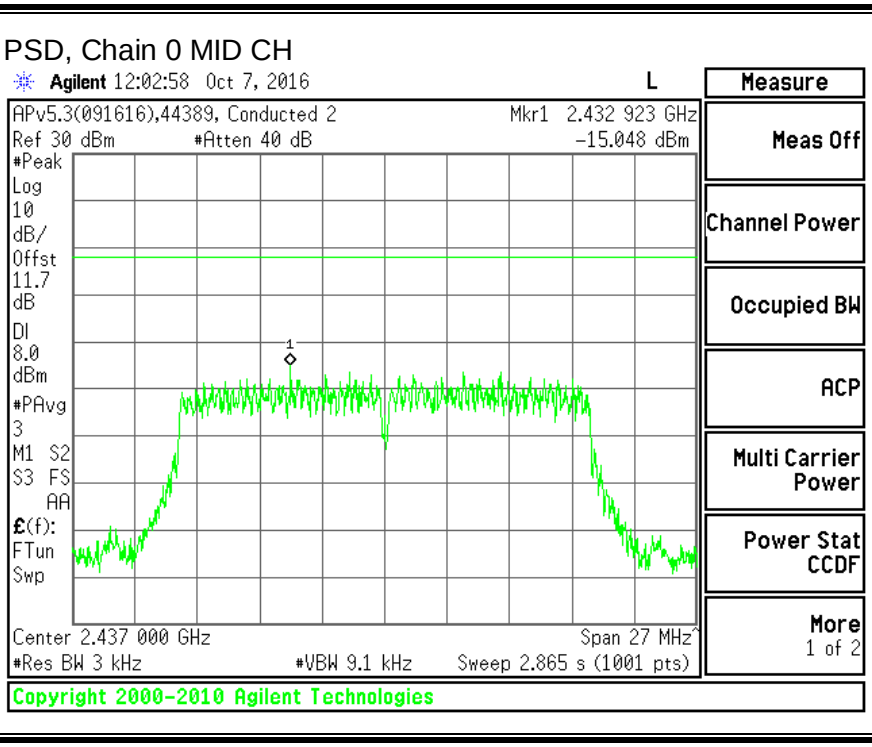
Test Performed: Niklas Haydon / Jeff Cabrera
Test Date: 2016-10-07

PSD, Chain 0

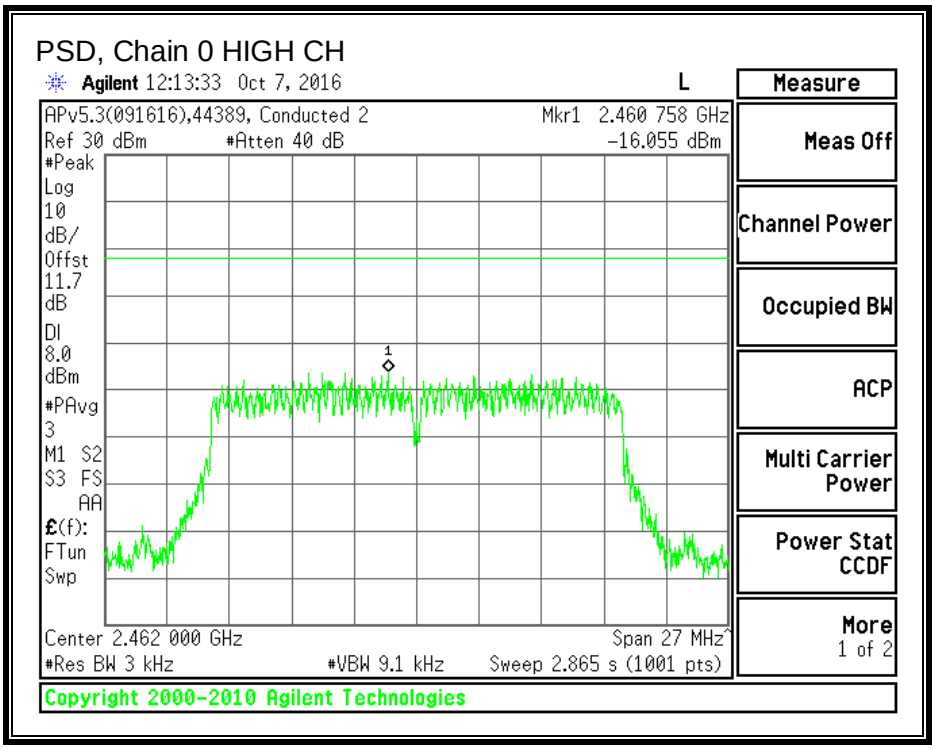
PSD, Chain 0 LOW CH



PSD, Chain 0 MID CH



PSD, Chain 0 HIGH CH



8.4.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 5.5

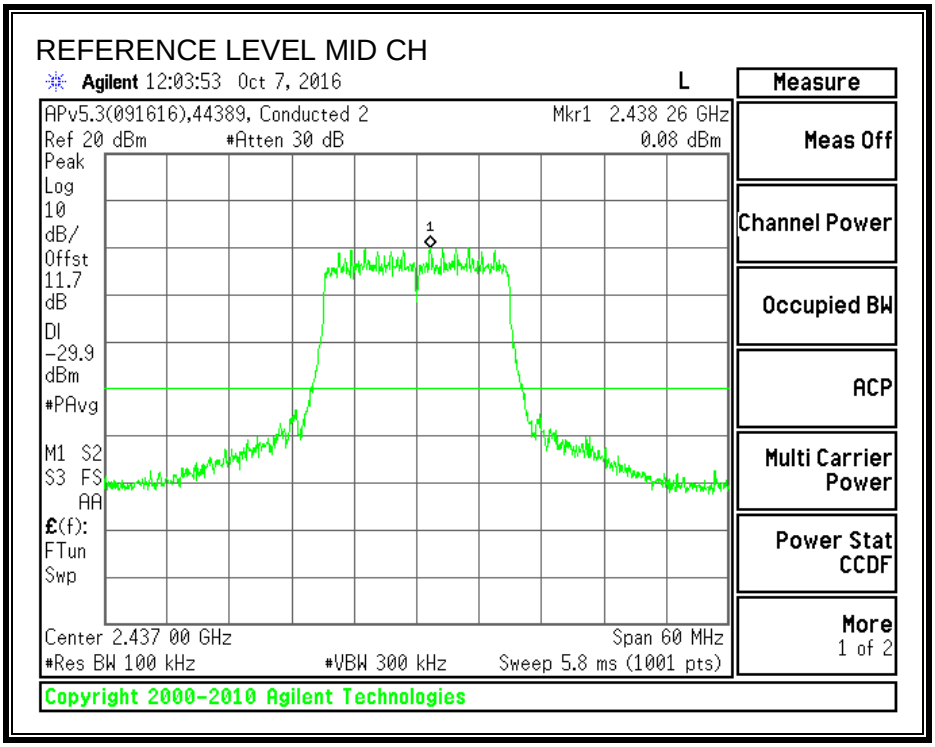
FCC - In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains 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.

RSS - In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

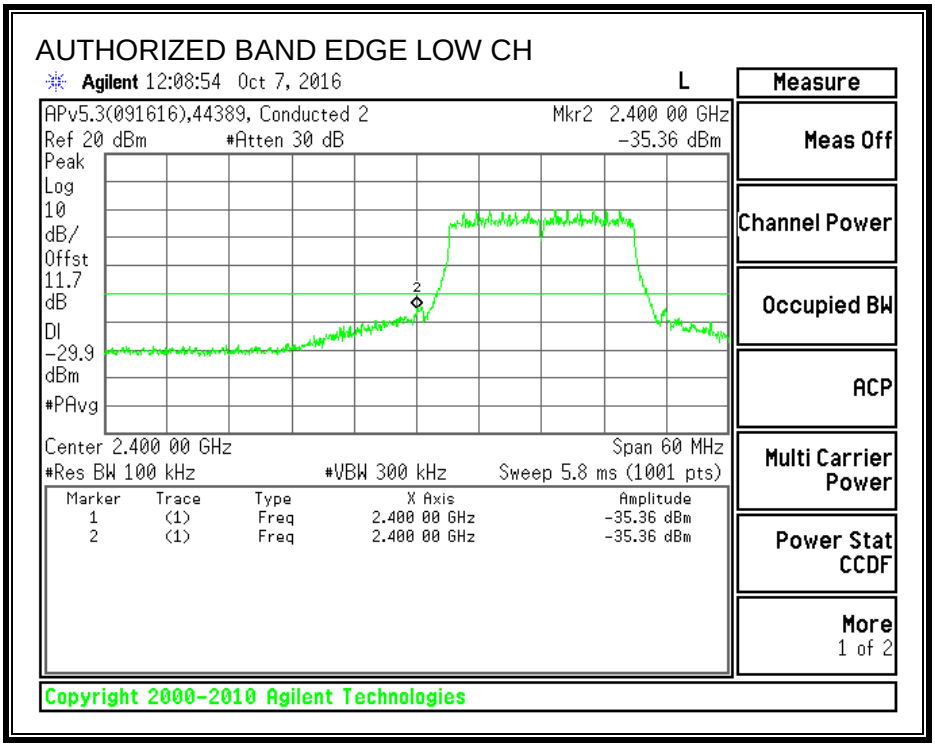
Test Performed: Niklas Haydon / Jeff Cabrera
Test Date: 2016-10-07

RESULTS

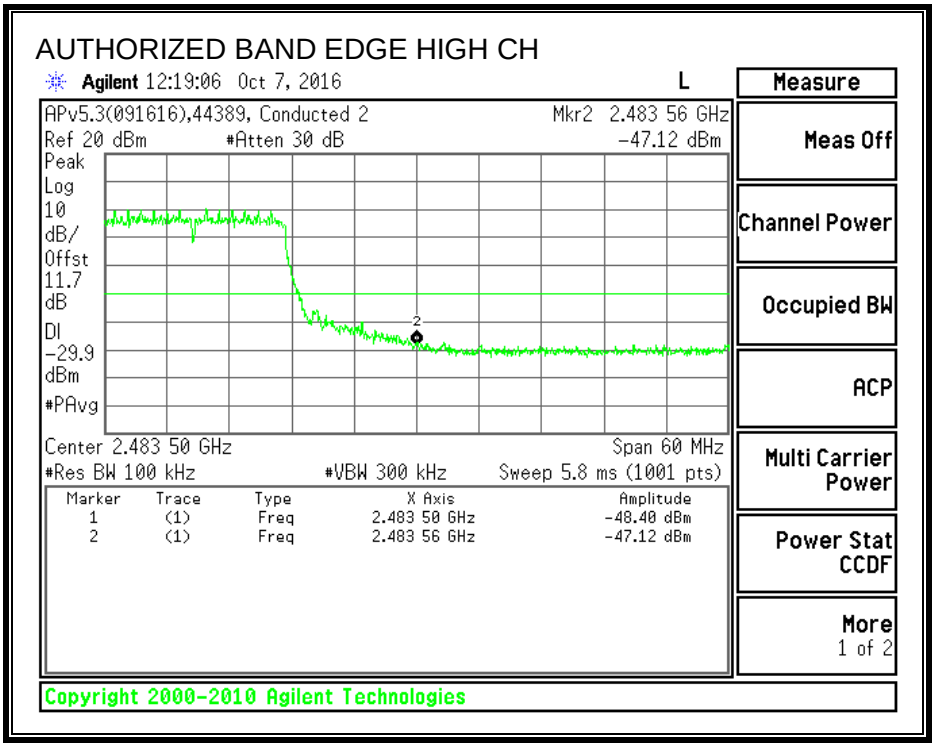
IN-BAND REFERENCE LEVEL



LOW CHANNEL BANDEDGE

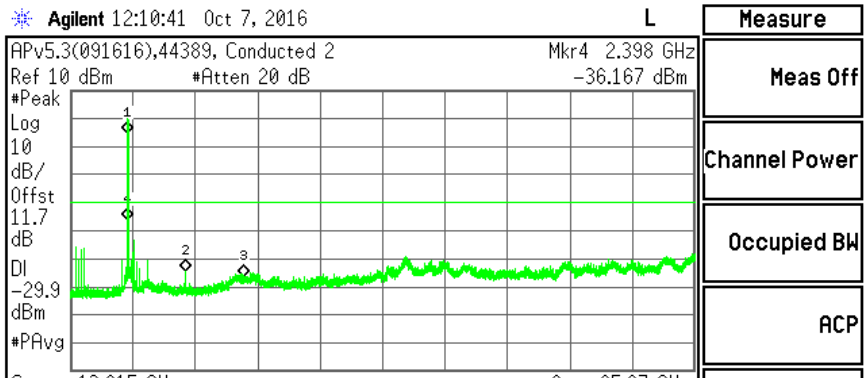


HIGH CHANNEL BANDEDGE

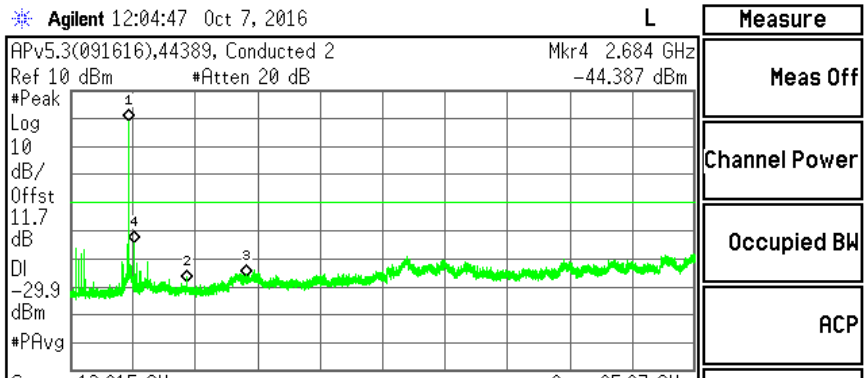


OUT-OF-BAND EMISSIONS

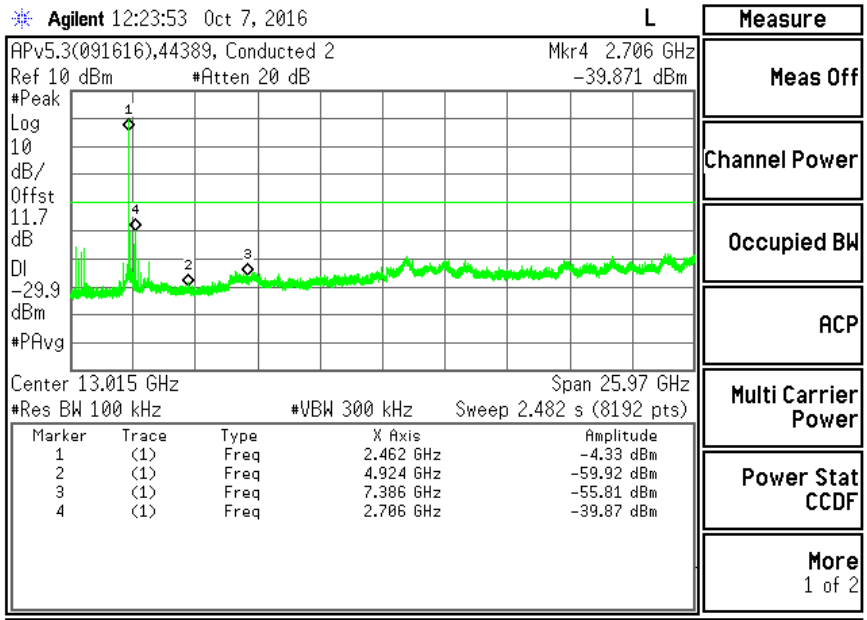
OUT OF BAND LOW CH



OUT OF BAND MID CH



OUT OF BAND HIGH CH



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205, §15.209, §15.247 (d)

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) (at 300 m)	-
0.490-1.705	24000/f(kHz) (at 30 m)	-
1.705-30.0	30 (at 30 m)	-
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. For this evaluation, RMS Power Averaging was used and the resolution/video bandwidth settings were 1MHz/3MHz.

The spectrum from 9 kHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

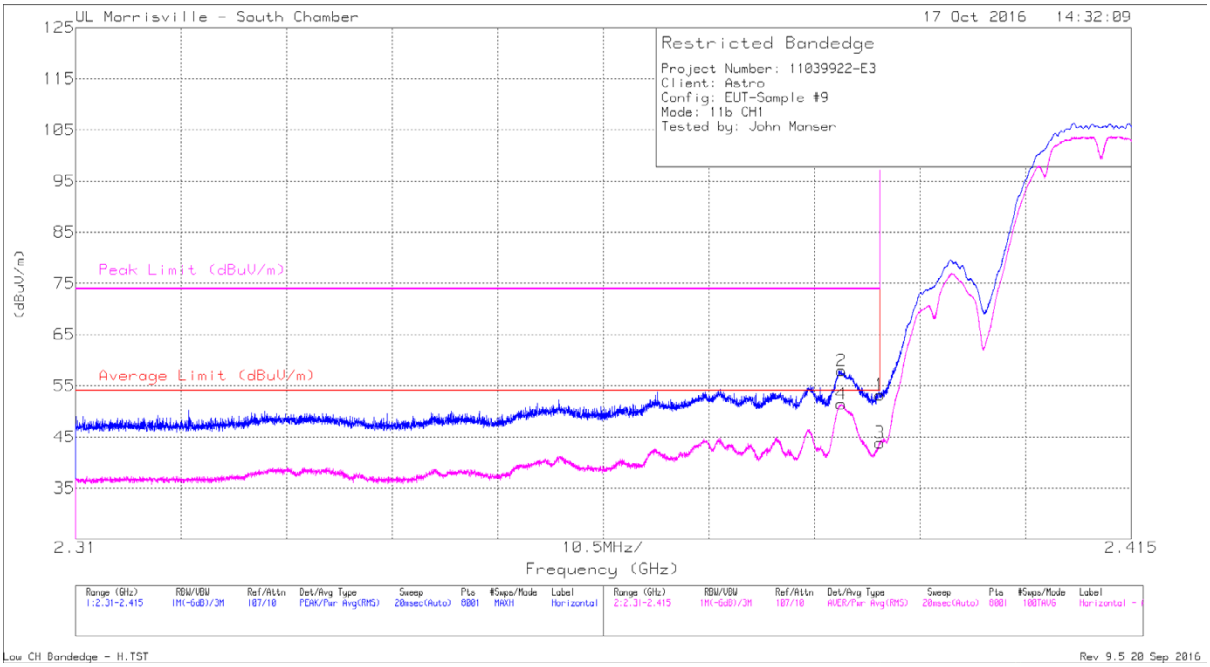
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

9.2. TRANSMITTER ABOVE 1 GHz

9.2.1. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

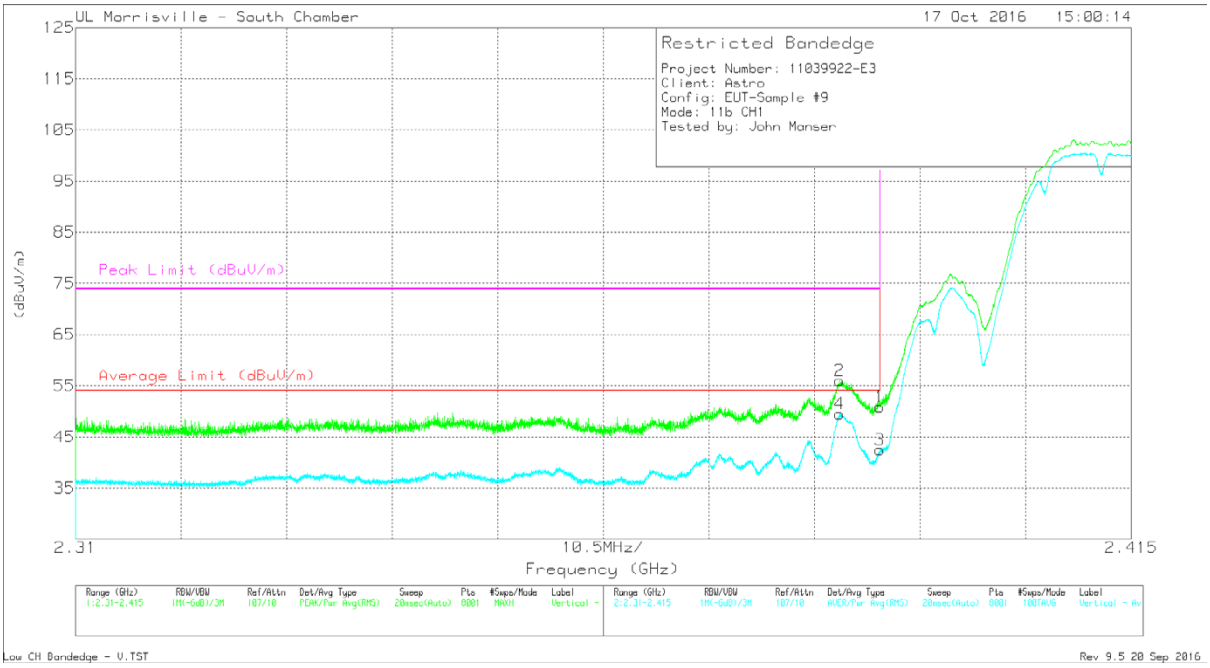
HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/Fltr /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	45.13	Pk	32.2	-24.1	0	53.23	-	-	74	-20.77	71	206	H
2	* 2.386	49.85	Pk	32.2	-24.1	0	57.95	-	-	74	-16.05	71	206	H
3	* 2.39	35.76	RMS	32.2	-24.1	0	43.86	54	-10.14	-	-	71	206	H
4	* 2.386	43.34	RMS	32.2	-24.1	0	51.44	54	-2.56	-	-	71	206	H

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

VERTICAL

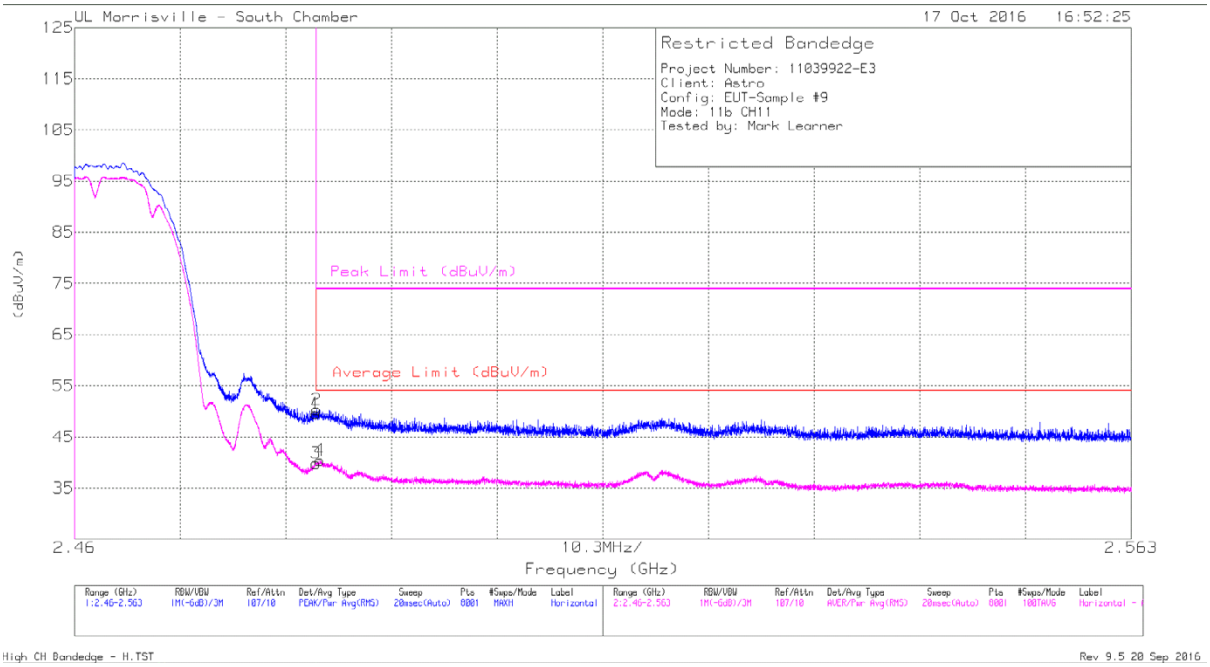


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/Fltr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	42.78	Pk	32.2	-24.1	0	50.88	-	-	74	-23.12	129	357	V
2	* 2.386	47.76	Pk	32.2	-24	0	55.96	-	-	74	-18.04	129	357	V
3	* 2.39	34.4	RMS	32.2	-24.1	0	42.5	54	-11.5	-	-	129	357	V
4	* 2.386	41.32	RMS	32.2	-24	0	49.52	54	-4.48	-	-	129	357	V

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

AUTHORIZED BANDEDGE (HIGH CHANNEL)

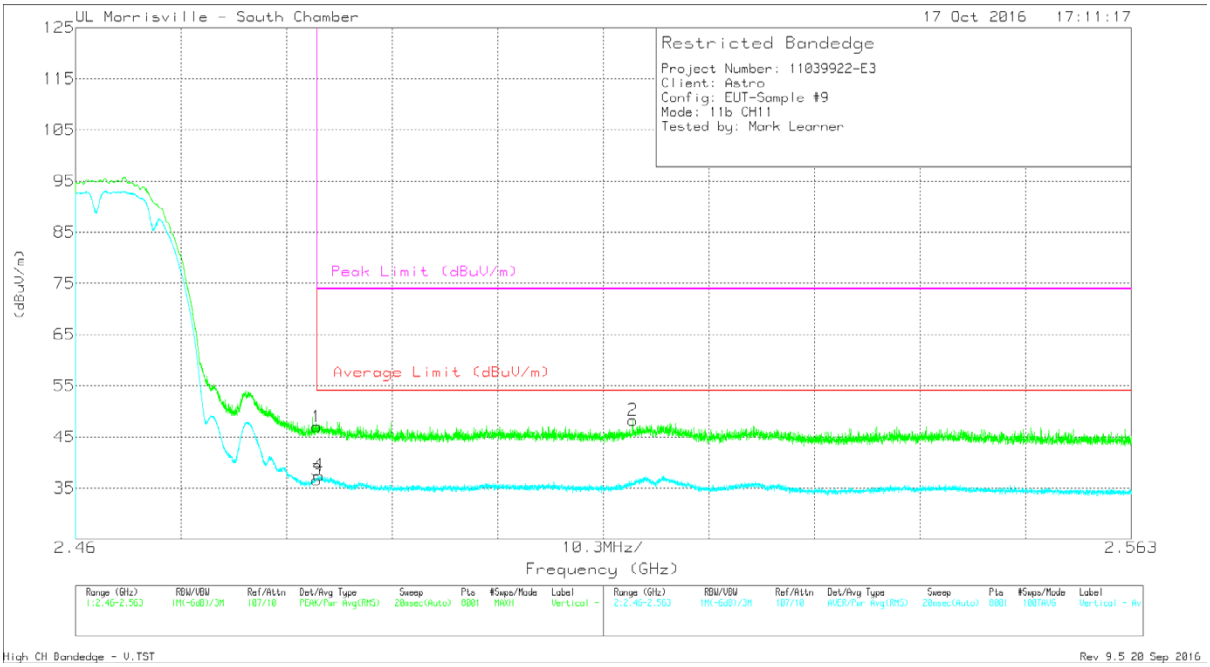
HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/Fltr/ 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	41.82	Pk	32.4	-24.6	0	49.62	-	-	74	-24.38	85	200	H
2	* 2.484	42.53	Pk	32.4	-24.6	0	50.33	-	-	74	-23.67	85	200	H
3	* 2.484	32.04	RMS	32.4	-24.6	0	39.84	54	-14.16	-	-	85	200	H
4	* 2.484	32.63	RMS	32.4	-24.6	0	40.43	54	-13.57	-	-	85	200	H

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

VERTICAL

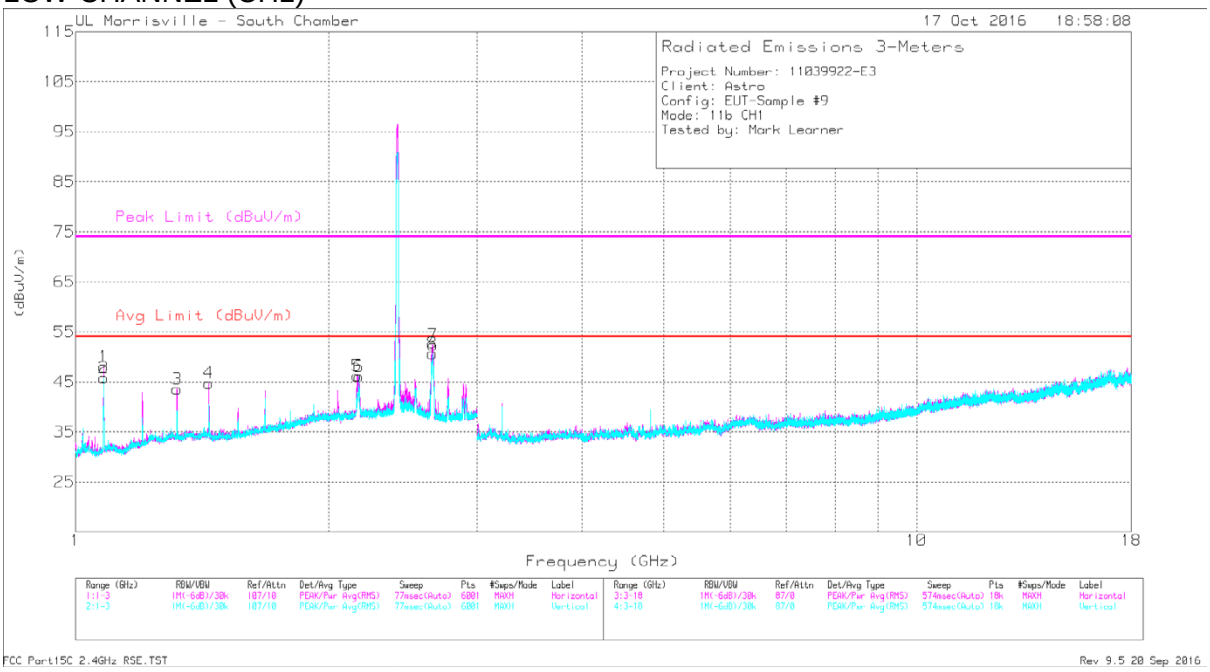


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/Fltr/ Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	39.24	Pk	32.4	-24.6	0	47.04	-	-	74	-26.96	125	355	V
3	* 2.484	28.75	RMS	32.4	-24.6	0	36.55	54	-17.45	-	-	125	355	V
4	* 2.484	29.68	RMS	32.4	-24.6	0	37.48	54	-16.52	-	-	125	355	V
2	2.514	40.59	Pk	32.5	-24.8	0	48.29	-	-	74	-25.71	125	355	V

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

HARMONICS AND SPURIOUS EMISSIONS

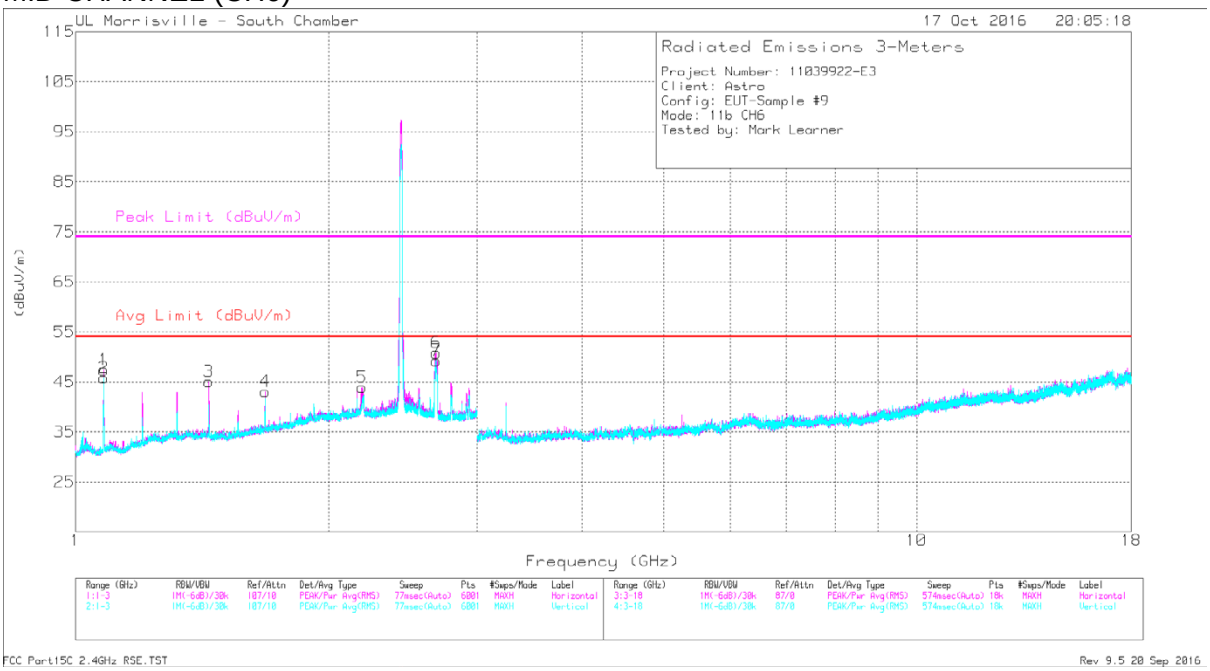
LOW CHANNEL (CH1)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (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
1	* 1.08	48.49	PK2	27.5	-24.4	0	51.59	-	-	74	-22.41	13	302	H
	* 1.08	45.9	MAv1	27.5	-24.4	0	49	54	-5	-	-	13	302	H
3	* 1.32	42.7	PK2	28.8	-23.1	0	48.4	-	-	74	-25.6	17	166	H
	* 1.32	37.56	MAv1	28.8	-23.1	0	43.26	54	-10.74	-	-	17	166	H
4	* 1.44	43.03	PK2	28.4	-22.7	0	48.73	-	-	74	-25.27	2	102	H
	* 1.44	37.55	MAv1	28.4	-22.7	0	43.25	54	-10.75	-	-	2	102	H
7	* 2.66	49.1	PK2	32.5	-25.6	0	56	-	-	74	-18	80	152	H
	* 2.657	38.19	MAv1	32.5	-25.6	0	45.09	54	-8.91	-	-	80	152	H
2	* 1.08	44.9	PK2	27.5	-24.4	0	48	-	-	74	-26	18	202	V
	* 1.08	41.43	MAv1	27.5	-24.4	0	44.53	54	-9.47	-	-	18	202	V
8	* 2.656	51.33	PK2	32.5	-25.6	0	58.23	-	-	74	-15.77	141	274	V
	* 2.655	40.57	MAv1	32.5	-25.6	0	47.47	54	-6.53	-	-	141	274	V
5	2.16	37.63	Pk	31.7	-23.1	0	46.23	-	-	-	-	0-360	199	H
6	2.171	37.36	Pk	31.8	-23.1	0	46.06	-	-	-	-	0-360	199	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
PK2 - Maximum Peak
MAv1 - Maximum RMS Average
Note: Plot above represents a prescan. All final measurements were made at RBW/VBW = 1MHz/3MHz.

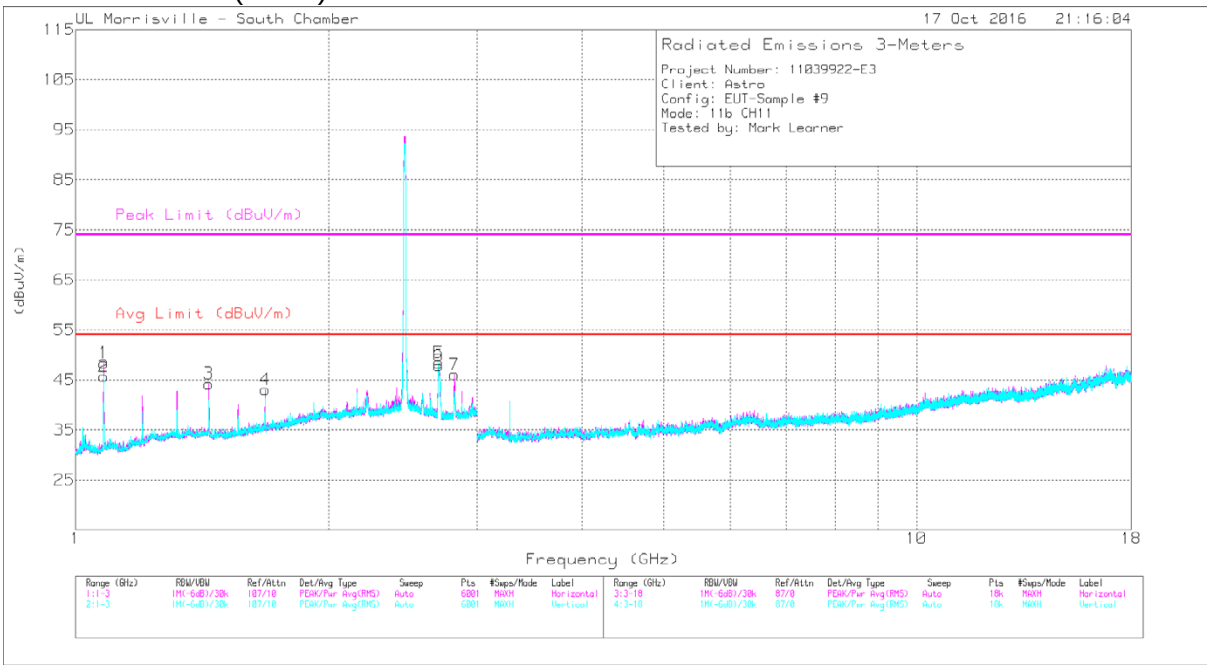
MID CHANNEL (CH6)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (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
1	* 1.08	48.99	PK2	27.5	-24.4	0	52.09	-	-	74	-21.91	20	301	H
	* 1.08	45.94	MAv1	27.5	-24.4	0	49.04	54	-4.96	-	-	20	301	H
3	* 1.44	42.26	PK2	28.4	-22.7	0	47.96	-	-	74	-26.04	16	283	H
	* 1.44	37.05	MAv1	28.4	-22.7	0	42.75	54	-11.25	-	-	16	283	H
4	* 1.68	40.98	PK2	28.9	-22.1	0	47.78	-	-	74	-26.22	10	143	H
	* 1.68	34.72	MAv1	28.9	-22.1	0	41.52	54	-12.48	-	-	10	143	H
6	* 2.681	48.24	PK2	32.4	-25.7	0	54.94	-	-	74	-19.06	311	165	H
	* 2.681	38.21	MAv1	32.4	-25.7	0	44.91	54	-9.09	-	-	311	165	H
2	* 1.08	44.88	PK2	27.5	-24.4	0	47.98	-	-	74	-26.02	311	312	V
	* 1.08	41.3	MAv1	27.5	-24.4	0	44.4	54	-9.6	-	-	311	312	V
7	* 2.684	46.09	PK2	32.4	-25.7	0	52.79	-	-	74	-21.21	144	391	V
	* 2.683	35.77	MAv1	32.4	-25.7	0	42.47	54	-11.53	-	-	144	391	V
5	2.19	35.31	Pk	31.9	-23.3	0	43.91	-	-	-	-	0-360	199	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
PK2 - Maximum Peak
MAv1 - Maximum RMS Average
Note: Plot above represents a prescan. All final measurements were made at RBW/VBW = 1MHz/3MHz.

HIGH CHANNEL (CH11)



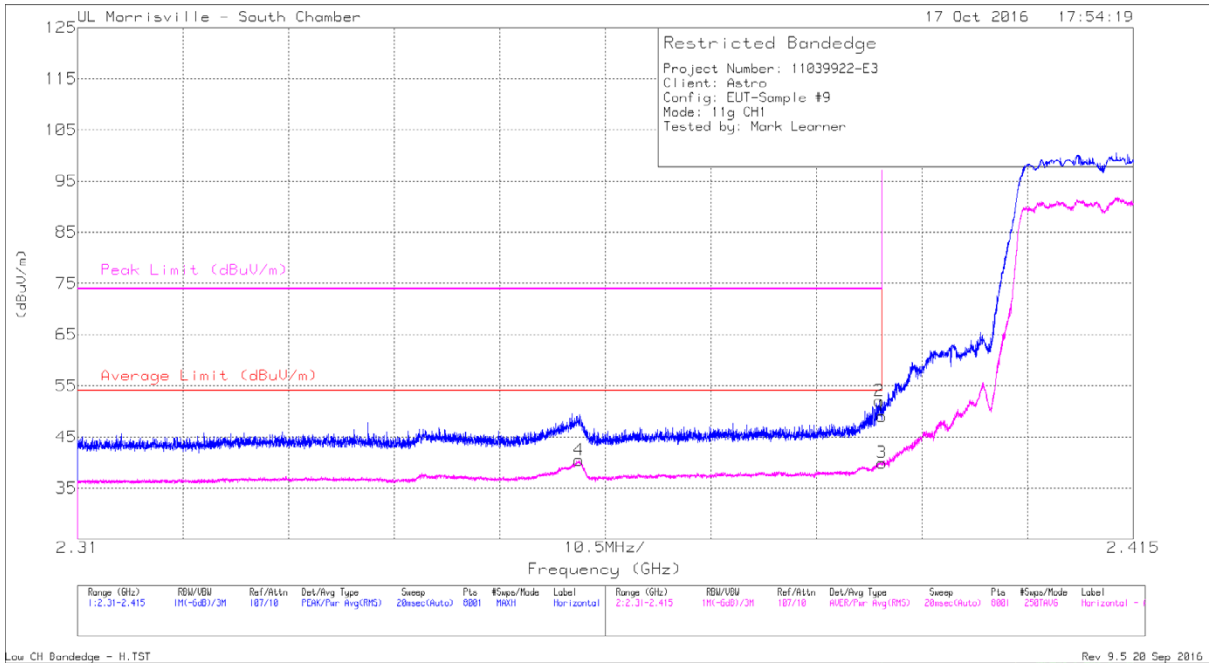
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/Fltr/ Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.08	48.51	PK2	27.5	-24.4	0	51.61	-	-	74	-22.39	26	302	H
	* 1.08	45.81	MAv1	27.5	-24.4	0	48.91	54	-5.09	-	-	26	302	H
3	* 1.44	43.2	PK2	28.4	-22.7	0	48.9	-	-	74	-25.1	2	103	H
	* 1.44	37.56	MAv1	28.4	-22.7	0	43.26	54	-10.74	-	-	2	103	H
4	* 1.68	40.86	PK2	28.9	-22.1	0	47.66	-	-	74	-26.34	32	106	H
	* 1.68	34.36	MAv1	28.9	-22.1	0	41.16	54	-12.84	-	-	32	106	H
6	* 2.702	50.96	PK2	32.3	-25.8	0	57.46	-	-	74	-16.54	118	182	H
	* 2.705	40.12	MAv1	32.3	-25.8	0	46.62	54	-7.38	-	-	118	182	H
7	* 2.822	47.74	PK2	32.7	-26	0	54.44	-	-	74	-19.56	101	223	H
	* 2.821	35.55	MAv1	32.6	-26	0	42.15	54	-11.85	-	-	101	223	H
2	* 1.08	45.21	PK2	27.5	-24.4	0	48.31	-	-	74	-25.69	282	106	V
	* 1.08	41.7	MAv1	27.5	-24.4	0	44.8	54	-9.2	-	-	282	106	V
5	* 2.701	49.09	PK2	32.3	-25.8	0	55.59	-	-	74	-18.41	146	210	V
	* 2.705	38.69	MAv1	32.3	-25.8	0	45.19	54	-8.81	-	-	146	210	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
PK2 - Maximum Peak
MAv1 - Maximum RMS Average
Note: Plot above represents a prescan. All final measurements were made at RBW/VBW = 1MHz/3MHz.

9.2.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

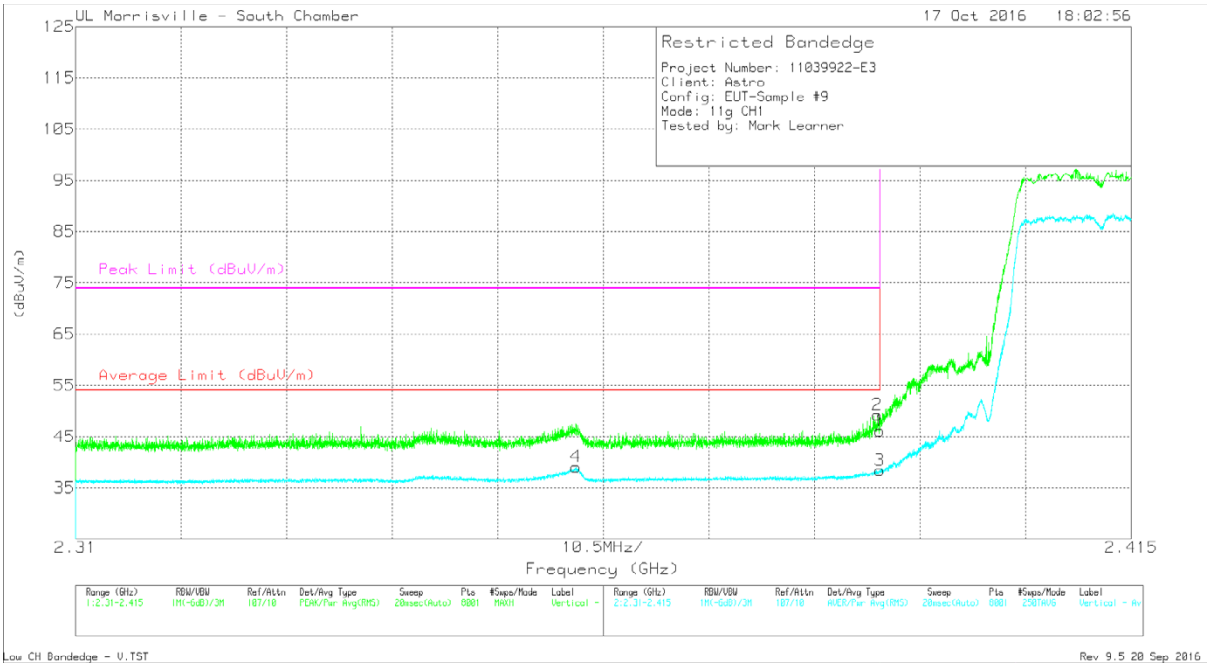
HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fltr/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	40.96	Pk	32.2	-24.1	0	49.06	-	-	74	-24.94	74	186	H
2	* 2.39	43.92	Pk	32.2	-24.1	0	52.02	-	-	74	-21.98	74	186	H
3	* 2.39	28.58	RMS	32.2	-24.1	3.28	39.96	54	-14.04	-	-	74	186	H
4	* 2.36	29.08	RMS	31.9	-23.8	3.28	40.46	54	-13.54	-	-	74	186	H

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

VERTICAL

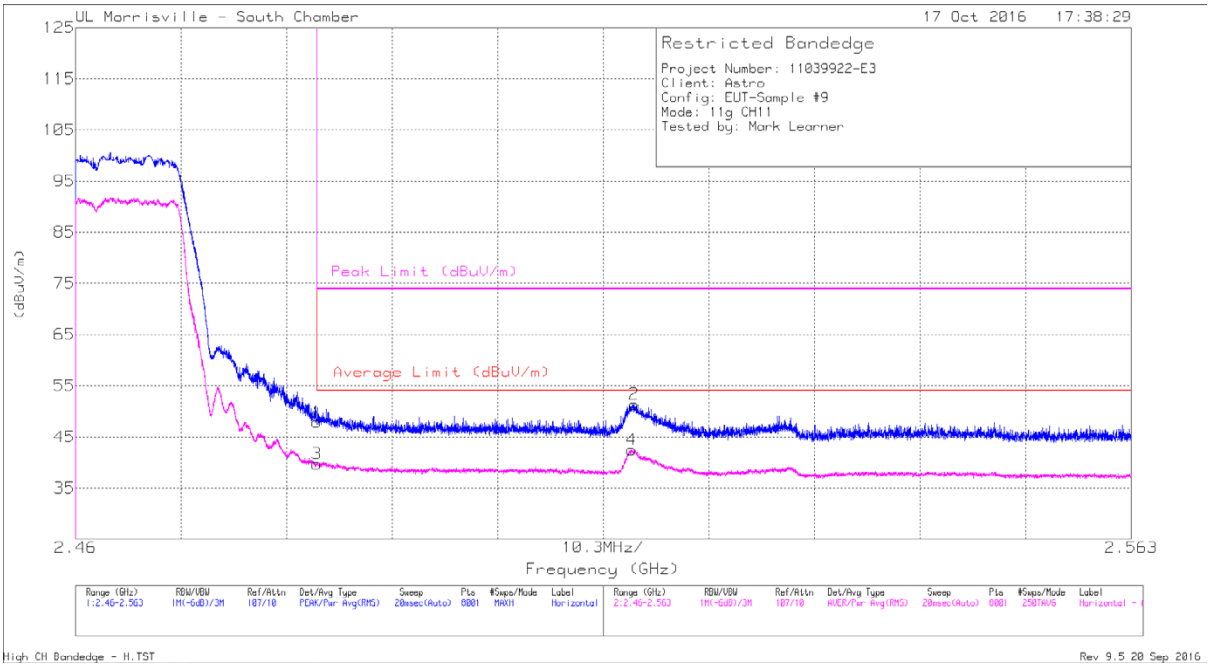


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	38.02	Pk	32.2	-24.1	0	46.12	-	-	74	-27.88	119	358	V
2	* 2.39	41.13	Pk	32.2	-24.1	0	49.23	-	-	74	-24.77	119	358	V
3	* 2.39	27.06	RMS	32.2	-24.1	3.28	38.44	54	-15.56	-	-	119	358	V
4	* 2.36	27.72	RMS	31.9	-23.8	3.28	39.1	54	-14.9	-	-	119	358	V

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

AUTHORIZED BANDEDGE (HIGH CHANNEL)

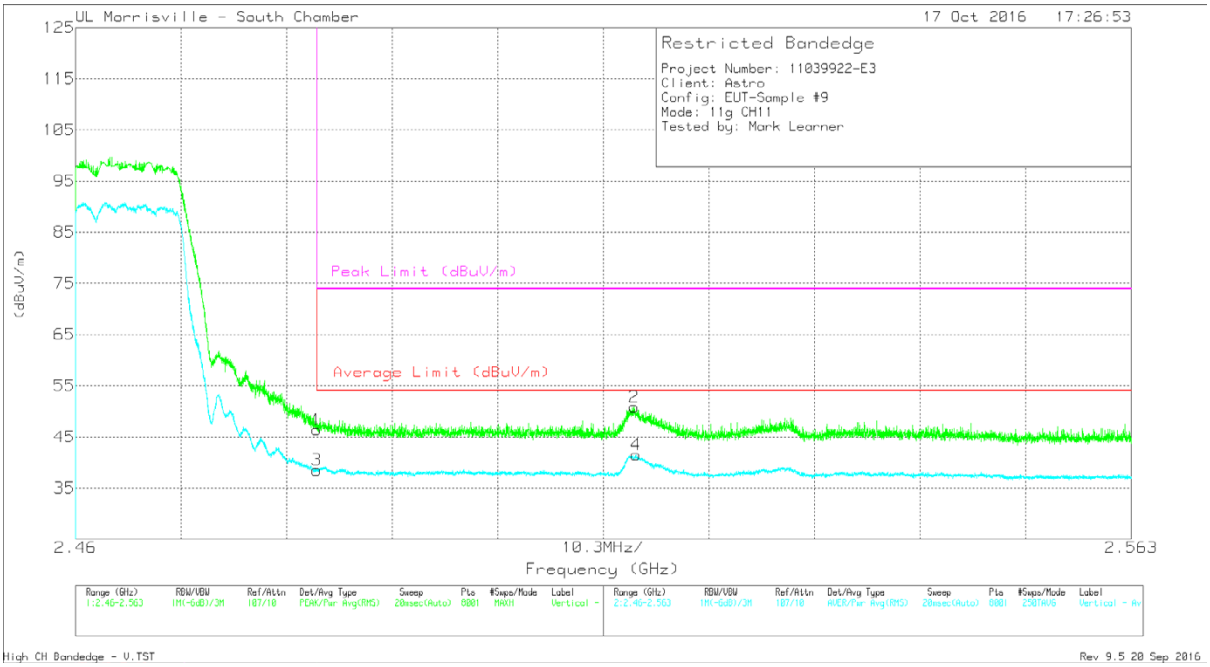
HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fltr/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	40.11	Pk	32.4	-24.6	0	47.91	-	-	74	-26.09	102	248	H
3	* 2.484	28.64	RMS	32.4	-24.6	3.28	39.72	54	-14.28	-	-	102	248	H
4	2.514	31.51	RMS	32.5	-24.8	3.28	42.49	54	-11.51	-	-	102	248	H
2	2.515	43.68	Pk	32.5	-24.8	0	51.38	-	-	74	-22.62	102	248	H

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

VERTICAL

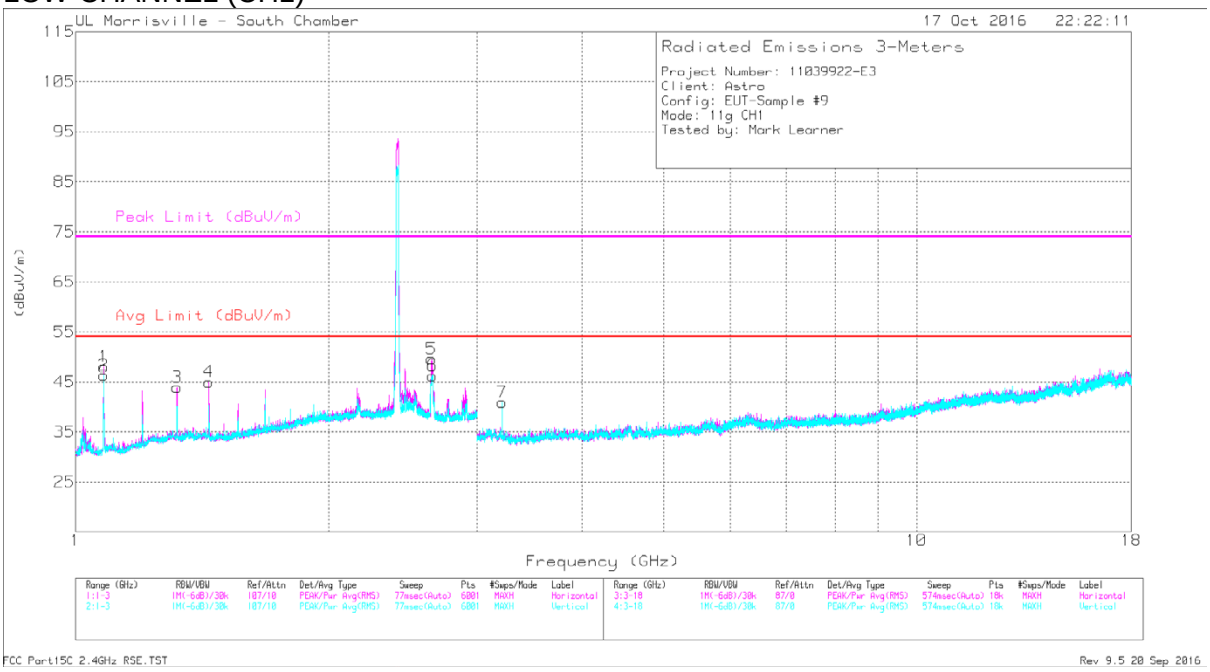


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	38.63	Pk	32.4	-24.6	0	46.43	-	-	74	-27.57	135	346	V
3	* 2.484	27.42	RMS	32.4	-24.6	3.28	38.5	54	-15.5	-	-	135	346	V
2	2.515	43.13	Pk	32.5	-24.8	0	50.83	-	-	74	-23.17	135	346	V
4	2.515	30.5	RMS	32.5	-24.8	3.28	41.48	54	-12.52	-	-	135	346	V

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

HARMONICS AND SPURIOUS EMISSIONS

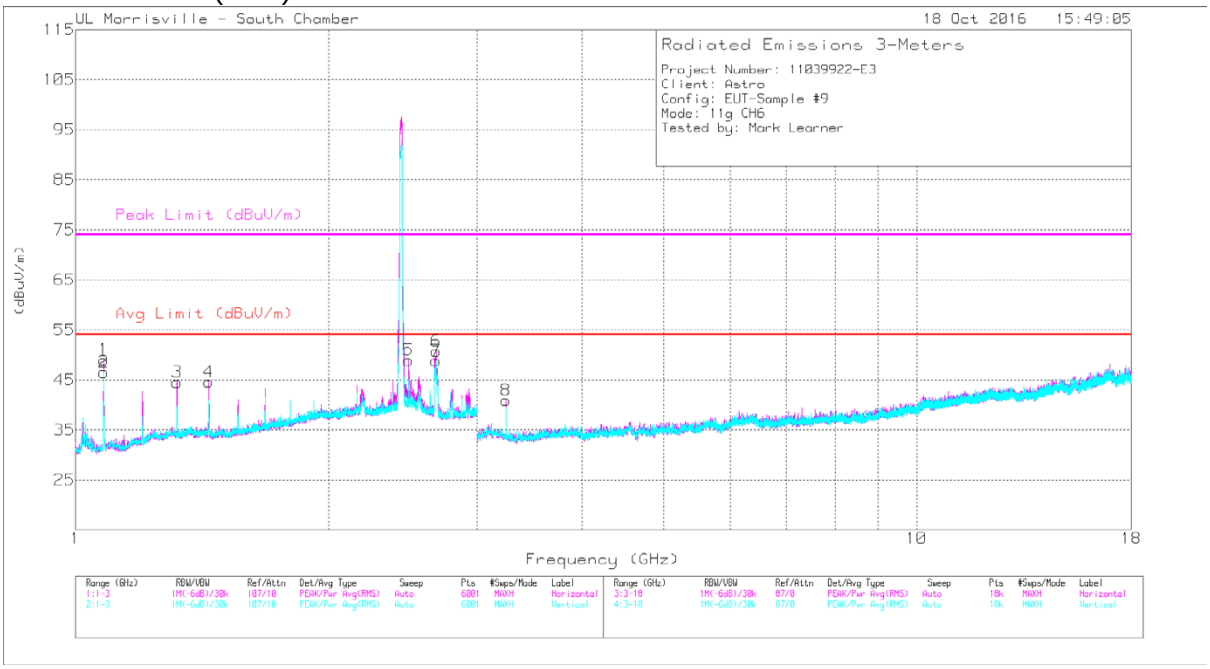
LOW CHANNEL (CH1)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (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
1	* 1.08	48.73	PK2	27.5	-24.4	0	51.83	-	-	74	-22.17	10	190	H
	* 1.08	45.51	MAv1	27.5	-24.4	3.28	51.89	54	-2.11	-	-	10	190	H
3	* 1.32	43.05	PK2	28.8	-23.1	0	48.75	-	-	74	-25.25	14	170	H
	* 1.32	38.23	MAv1	28.8	-23.1	3.28	47.21	54	-6.79	-	-	14	170	H
4	* 1.44	42.63	PK2	28.4	-22.7	0	48.33	-	-	74	-25.67	4	152	H
	* 1.44	37.38	MAv1	28.4	-22.7	3.28	46.36	54	-7.64	-	-	4	152	H
2	* 1.08	45.72	PK2	27.5	-24.4	0	48.82	-	-	74	-25.18	281	104	V
	* 1.08	42.22	MAv1	27.5	-24.4	3.28	48.6	54	-5.4	-	-	281	104	V
6	* 2.657	49.67	PK2	32.5	-25.6	0	56.57	-	-	74	-17.43	150	262	V
	* 2.656	33.65	MAv1	32.5	-25.6	3.28	43.83	54	-10.17	-	-	150	262	V
5	2.649	42.7	Pk	32.5	-25.6	0	49.6	-	-	-	-	0-360	101	H
7	3.216	40.65	Pk	33.3	-33	0	40.95	-	-	-	-	0-360	199	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
PK2 - Maximum Peak
MAv1 - Maximum RMS Average
Note: Plot above represents a prescan. All final measurements were made at RBW/VBW = 1MHz/3MHz.

MID CHANNEL (CH6)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (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
1	* 1.08	50.01	PK2	27.5	-24.4	0	53.11	-	-	74	-20.89	28	302	H
	* 1.08	47.04	MAv1	27.5	-24.4	3.28	53.42	54	-.58	-	-	28	302	H
3	* 1.32	43.66	PK2	28.8	-23.1	0	49.36	-	-	74	-24.64	11	165	H
	* 1.32	38.55	MAv1	28.8	-23.1	3.28	47.53	54	-6.47	-	-	11	165	H
4	* 1.44	43.26	PK2	28.4	-22.7	0	48.96	-	-	74	-25.04	2	148	H
	* 1.44	37.52	MAv1	28.4	-22.7	3.28	46.5	54	-7.5	-	-	2	148	H
5	* 2.49	47.44	PK2	32.4	-24.6	0	55.24	-	-	74	-18.76	87	216	H
	* 2.489	34.86	MAv1	32.4	-24.6	3.28	45.94	54	-8.06	-	-	87	216	H
6	* 2.676	51.65	PK2	32.4	-25.7	0	58.35	-	-	74	-15.65	109	212	H
	* 2.681	36.34	MAv1	32.4	-25.7	3.28	46.32	54	-7.68	-	-	109	212	H
2	* 1.08	45.76	PK2	27.5	-24.4	0	48.86	-	-	74	-25.14	17	199	V
	* 1.08	41.88	MAv1	27.5	-24.4	3.28	48.26	54	-5.74	-	-	17	199	V
7	* 2.68	50.41	PK2	32.4	-25.7	0	57.11	-	-	74	-16.89	123	231	V
	* 2.684	35.43	MAv1	32.4	-25.7	3.28	45.41	54	-8.59	-	-	123	231	V
8	3.249	40.9	Pk	33.2	-33.2	0	40.9	-	-	-	-	0-360	101	H

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

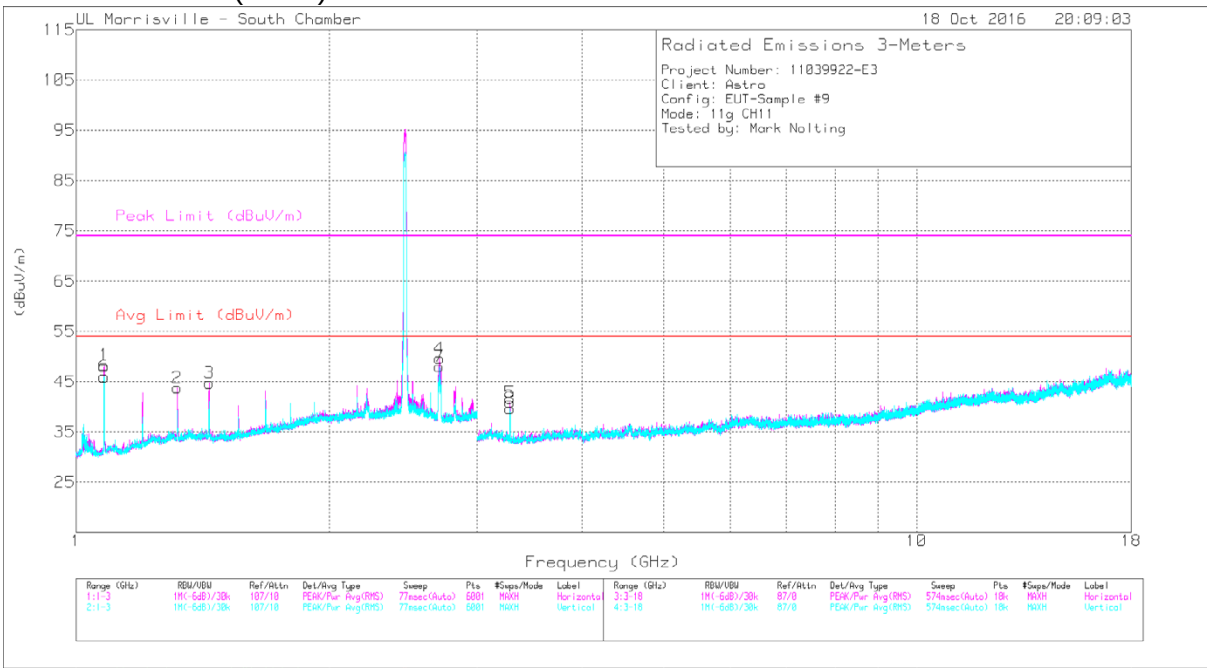
Pk - Peak detector

PK2 - Maximum Peak

MAv1 - Maximum RMS Average

Note: Plot above represents a prescan. All final measurements were made at RBW/VBW = 1MHz/3MHz.

HIGH CHANNEL (CH11)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (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
1	* 1.08	49.93	PK2	27.5	-24.4	0	53.03	-	-	74	-20.97	25	303	H
	* 1.08	46.9	MAv1	27.5	-24.4	3.28	53.28	54	-.72	-	-	25	303	H
2	* 1.32	43.86	PK2	28.8	-23.1	0	49.56	-	-	74	-24.44	11	166	H
	* 1.32	38.75	MAv1	28.8	-23.1	3.28	47.73	54	-6.27	-	-	11	166	H
3	* 1.44	43.04	PK2	28.4	-22.7	0	48.74	-	-	74	-25.26	3	149	H
	* 1.44	37.52	MAv1	28.4	-22.7	3.28	46.5	54	-7.5	-	-	3	149	H
4	* 2.697	51.07	PK2	32.3	-25.8	0	57.57	-	-	74	-16.43	117	191	H
	* 2.704	36.49	MAv1	32.3	-25.8	3.28	46.27	54	-7.73	-	-	117	191	H
6	* 1.08	45.59	PK2	27.5	-24.4	0	48.69	-	-	74	-25.31	18	197	V
	* 1.08	41.64	MAv1	27.5	-24.4	3.28	48.02	54	-5.98	-	-	18	197	V
7	* 2.709	51.25	PK2	32.3	-25.9	0	57.65	-	-	74	-16.35	143	259	V
	* 2.706	36.23	MAv1	32.3	-25.8	3.28	46.01	54	-7.99	-	-	143	259	V
5	3.282	41.18	Pk	32.9	-33.2	0	40.88	-	-	-	-	0-360	199	H
8	3.282	39.97	Pk	32.9	-33.2	0	39.67	-	-	-	-	0-360	199	V

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

Pk - Peak detector

PK2 - Maximum Peak

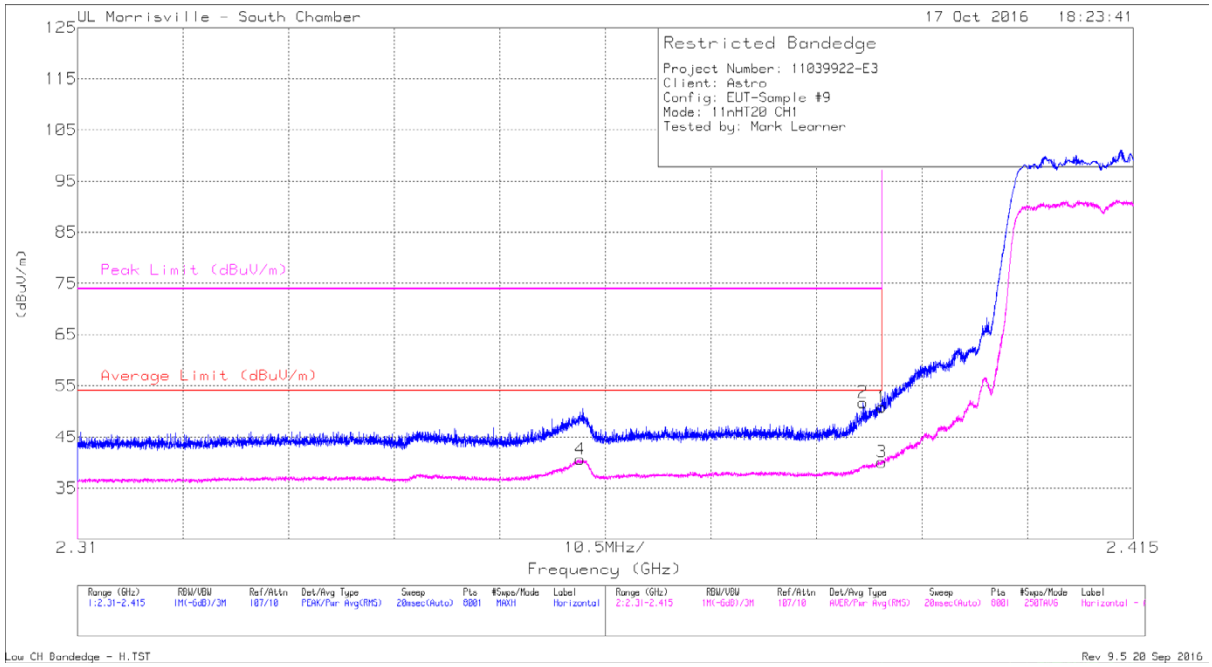
MAv1 - Maximum RMS Average

Note: Plot above represents a prescan. All final measurements were made at RBW/VBW = 1MHz/3MHz.

9.2.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

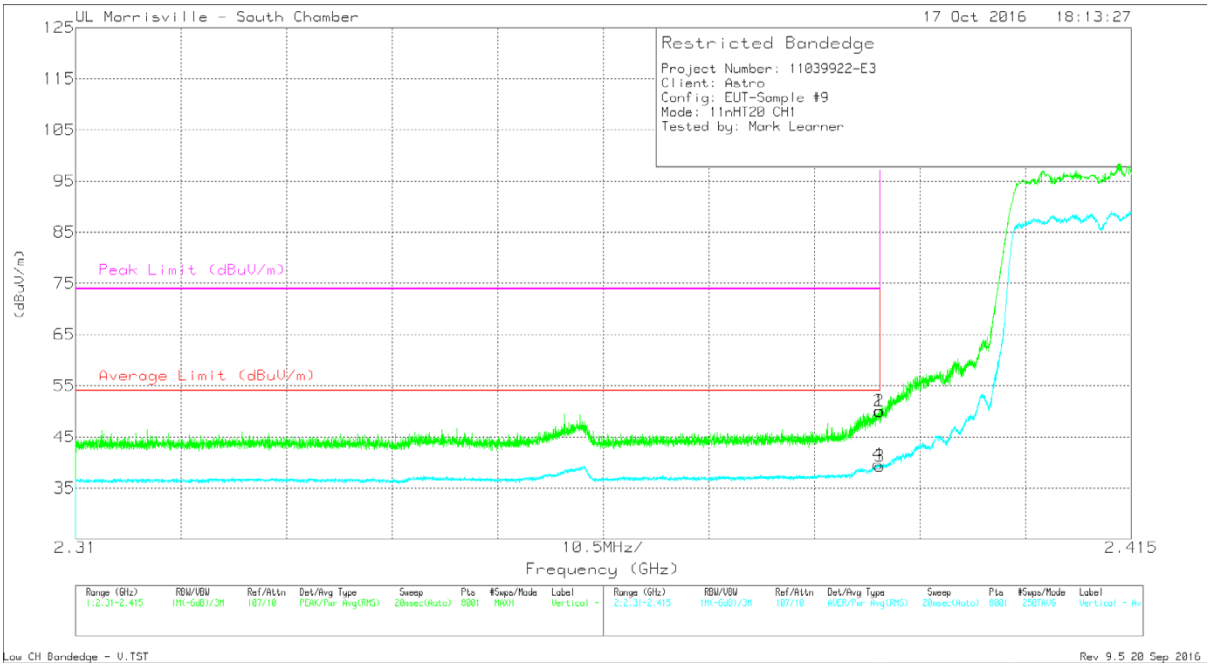
HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fltr/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	42.71	Pk	32.2	-24.1	0	50.81	-	-	74	-23.19	70	204	H
2	* 2.388	43.65	Pk	32.2	-24.1	0	51.75	-	-	74	-22.25	70	204	H
3	* 2.39	28.61	RMS	32.2	-24.1	3.38	40.09	54	-13.91	-	-	70	204	H
4	* 2.36	29.14	RMS	31.9	-23.8	3.38	40.62	54	-13.38	-	-	70	204	H

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

VERTICAL

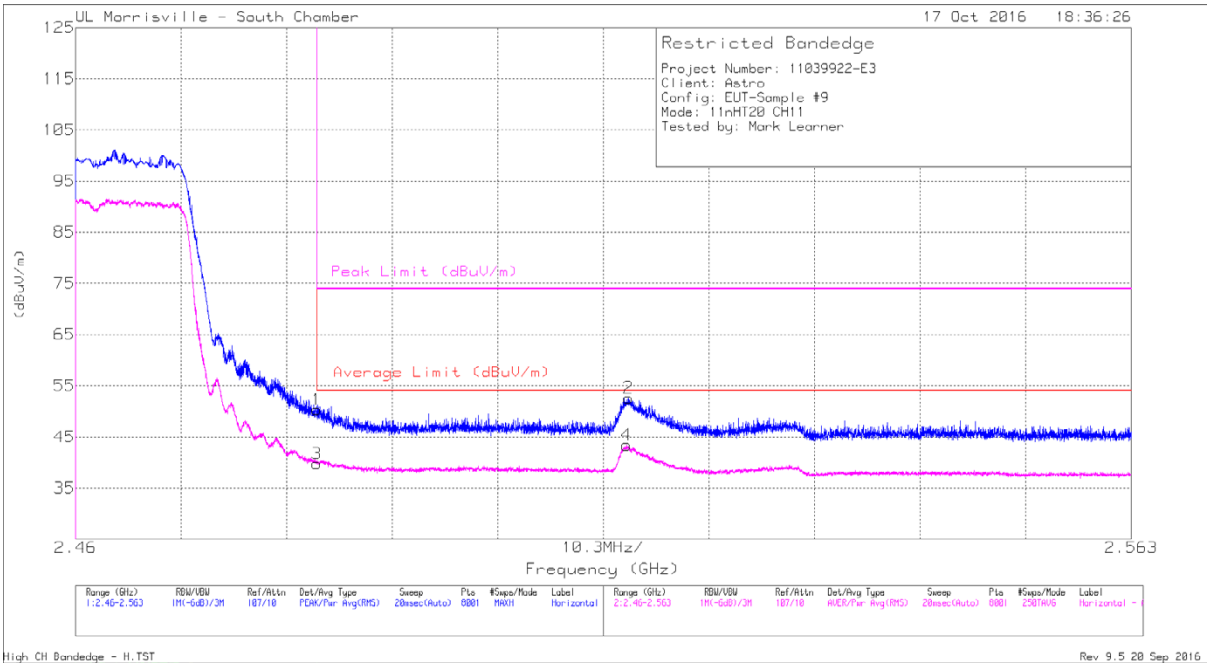


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	41.96	Pk	32.2	-24.1	0	50.06	-	-	74	-23.94	128	286	V
2	* 2.39	41.95	Pk	32.2	-24.1	0	50.05	-	-	74	-23.95	128	286	V
3	* 2.39	27.82	RMS	32.2	-24.1	3.38	39.3	54	-14.7	-	-	128	286	V
4	* 2.39	28.2	RMS	32.2	-24.1	3.38	39.68	54	-14.32	-	-	128	286	V

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

AUTHORIZED BANDEDGE (HIGH CHANNEL)

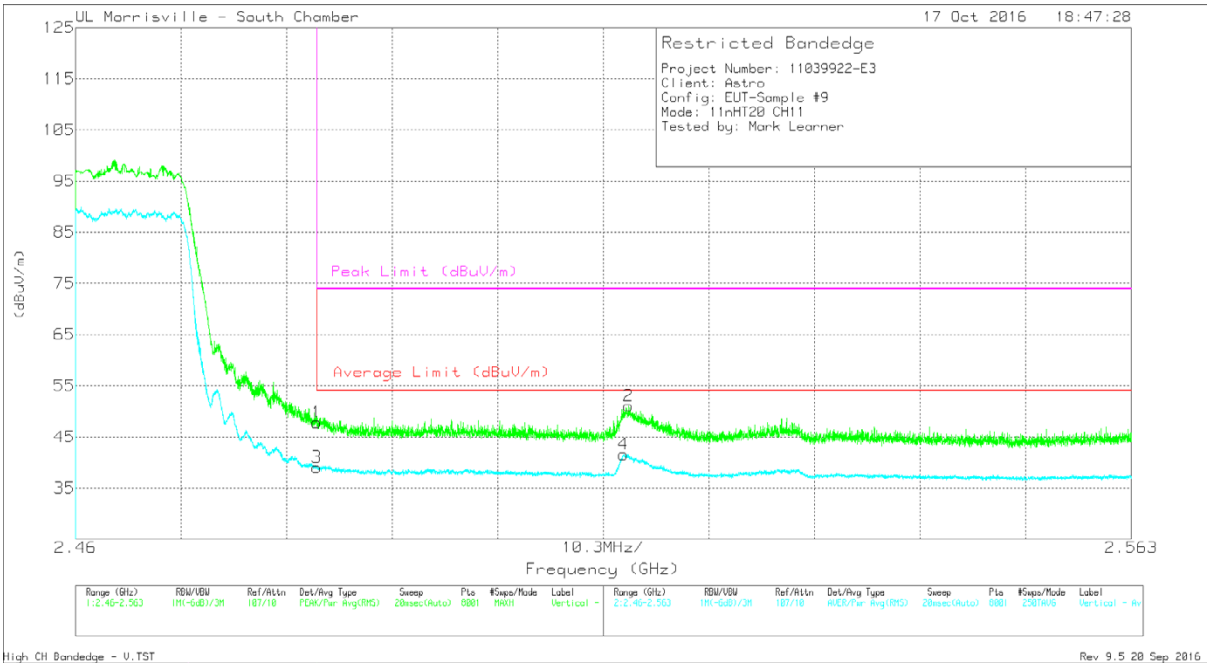
HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fltr/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	42.53	Pk	32.4	-24.6	0	50.33	-	-	74	-23.67	90	251	H
3	* 2.484	28.6	RMS	32.4	-24.6	3.38	39.78	54	-14.22	-	-	90	251	H
2	2.514	44.9	Pk	32.5	-24.8	0	52.6	-	-	74	-21.4	90	251	H
4	2.514	32.33	RMS	32.5	-24.8	3.38	43.41	54	-10.59	-	-	90	251	H

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

VERTICAL

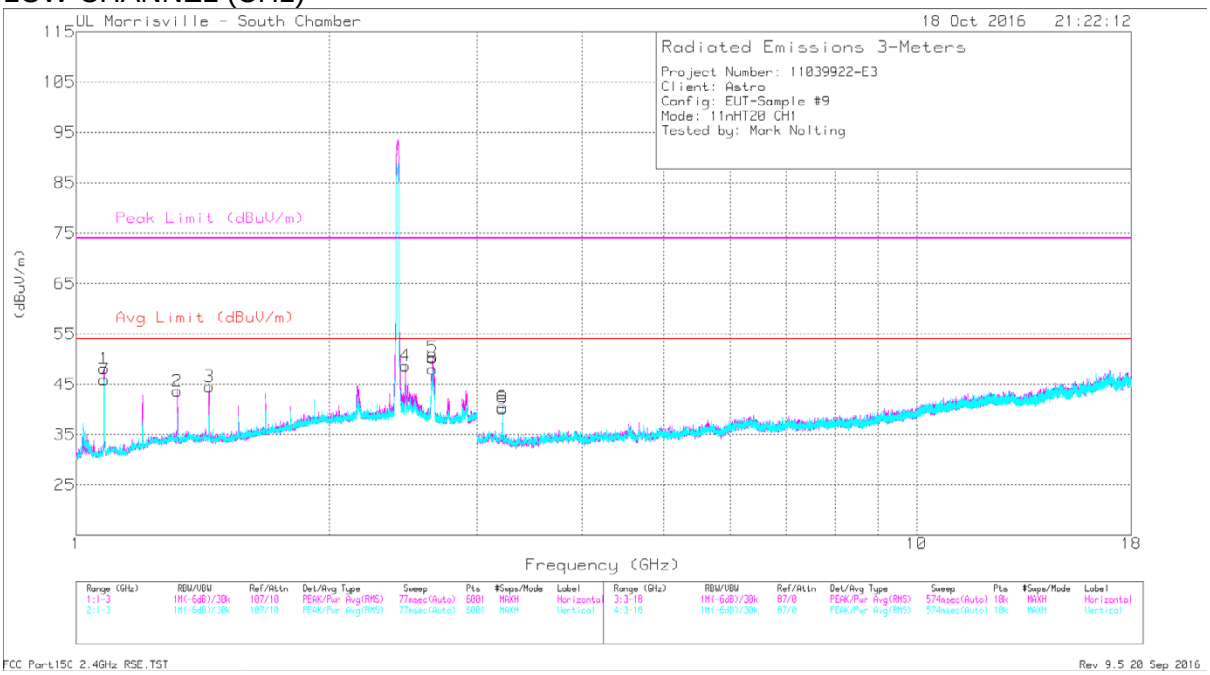


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.03	Pk	32.4	-24.6	0	47.83	-	-	74	-26.17	159	339	V
3	* 2.484	27.89	RMS	32.4	-24.6	3.38	39.07	54	-14.93	-	-	159	339	V
4	2.513	30.48	RMS	32.5	-24.8	3.38	41.56	54	-12.44	-	-	159	339	V
2	2.514	43.35	Pk	32.5	-24.8	0	51.05	-	-	74	-22.95	159	339	V

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

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL (CH1)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (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
1	* 1.08	49.91	PK2	27.5	-24.4	0	53.01	-	-	74	-20.99	27	304	H
	* 1.08	46.85	MAv1	27.5	-24.4	3.38	53.33	54	-.67	-	-	27	304	H
2	* 1.32	43.86	PK2	28.8	-23.1	0	49.56	-	-	74	-24.44	11	166	H
	* 1.32	38.71	MAv1	28.8	-23.1	3.38	47.79	54	-6.21	-	-	11	166	H
3	* 1.44	42.77	PK2	28.4	-22.7	0	48.47	-	-	74	-25.53	2	148	H
	* 1.44	37.49	MAv1	28.4	-22.7	3.38	46.57	54	-7.43	-	-	2	148	H
5	* 2.658	50.24	PK2	32.5	-25.6	0	57.14	-	-	74	-16.86	97	210	H
	* 2.656	35.13	MAv1	32.5	-25.6	3.38	45.41	54	-8.59	-	-	97	210	H
7	* 1.08	45.8	PK2	27.5	-24.4	0	48.9	-	-	74	-25.1	18	199	V
	* 1.08	41.72	MAv1	27.5	-24.4	3.38	48.2	54	-5.8	-	-	18	199	V
8	* 2.657	50.68	PK2	32.5	-25.6	0	57.58	-	-	74	-16.42	128	240	V
	* 2.656	35.24	MAv1	32.5	-25.6	3.38	45.52	54	-8.48	-	-	128	240	V
4	2.464	40.88	Pk	32.3	-24.5	0	48.68	-	-	-	-	0-360	199	H
6	3.216	40.19	Pk	33.3	-33	0	40.49	-	-	-	-	0-360	101	H
9	3.216	39.88	Pk	33.3	-33	0	40.18	-	-	-	-	0-360	199	V

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

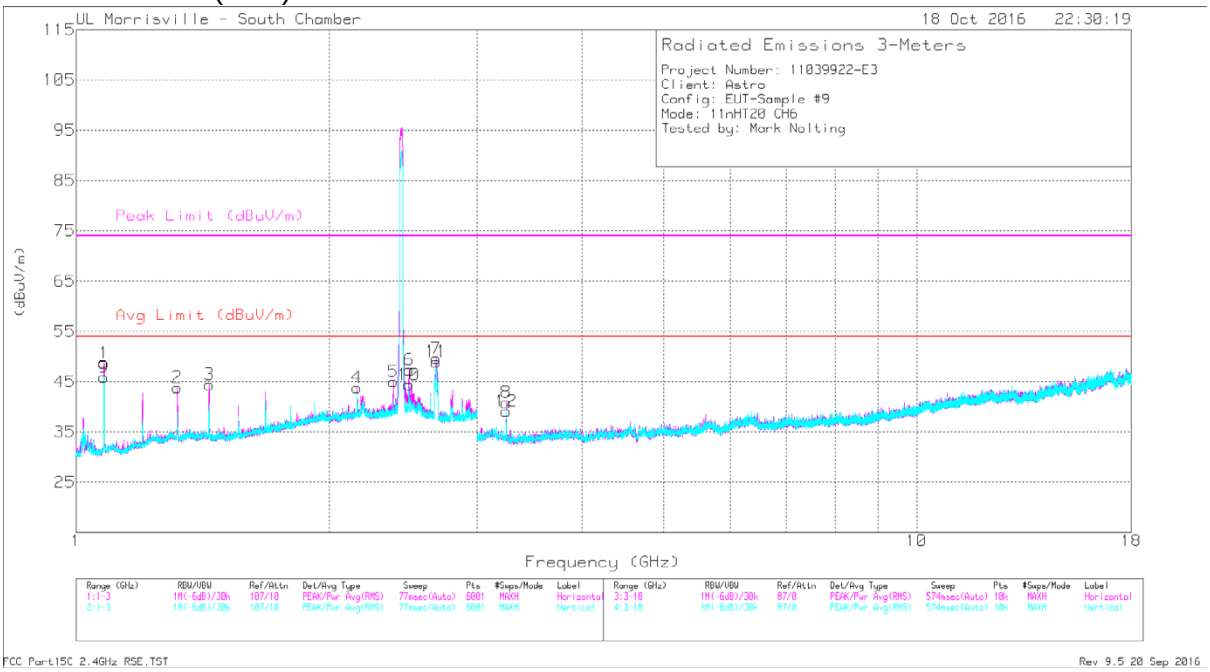
Pk - Peak detector

PK2 - Maximum Peak

MAv1 - Maximum RMS Average

Note: Plot above represents a prescan. All final measurements were made at RBW/VBW = 1MHz/3MHz.

MID CHANNEL (CH6)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (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
1	* 1.08	49.89	PK2	27.5	-24.4	0	52.99	-	-	74	-21.01	26	302	H
	* 1.08	46.85	MAv1	27.5	-24.4	3.38	53.33	54	-.67	-	-	26	302	H
2	* 1.32	43.75	PK2	28.8	-23.1	0	49.45	-	-	74	-24.55	11	167	H
	* 1.32	38.77	MAv1	28.8	-23.1	3.38	47.85	54	-6.15	-	-	11	167	H
3	* 1.44	43.23	PK2	28.4	-22.7	0	48.93	-	-	74	-25.07	2	149	H
	* 1.44	37.58	MAv1	28.4	-22.7	3.38	46.66	54	-7.34	-	-	2	149	H
5	* 2.385	45.1	PK2	32.2	-24	0	53.3	-	-	74	-20.7	71	233	H
	* 2.385	31.24	MAv1	32.2	-24	3.38	42.82	54	-11.18	-	-	71	233	H
6	* 2.488	47.97	PK2	32.4	-24.6	0	55.77	-	-	74	-18.23	84	215	H
	* 2.489	34.92	MAv1	32.4	-24.6	3.38	46.1	54	-7.9	-	-	84	215	H
7	* 2.676	50.03	PK2	32.4	-25.7	0	56.73	-	-	74	-17.27	106	215	H
	* 2.68	34.75	MAv1	32.4	-25.7	3.38	44.83	54	-9.17	-	-	106	215	H
9	* 1.08	45.95	PK2	27.5	-24.4	0	49.05	-	-	74	-24.95	17	200	V
	* 1.08	41.83	MAv1	27.5	-24.4	3.38	48.31	54	-5.69	-	-	17	200	V
10	* 2.489	46.1	PK2	32.4	-24.6	0	53.9	-	-	74	-20.1	136	297	V
	* 2.489	33.82	MAv1	32.4	-24.6	3.38	45	54	-9	-	-	136	297	V
11	* 2.682	50.67	PK2	32.4	-25.7	0	57.37	-	-	74	-16.63	147	290	V
	* 2.681	34.61	MAv1	32.4	-25.7	3.38	44.69	54	-9.31	-	-	147	290	V
4	2.16	35.22	Pk	31.7	-23.1	0	43.82	-	-	-	-	0-360	199	H
8	3.249	40.86	Pk	33.2	-33.2	0	40.86	-	-	-	-	0-360	101	H
12	3.249	39.14	Pk	33.2	-33.2	0	39.14	-	-	-	-	0-360	199	V

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

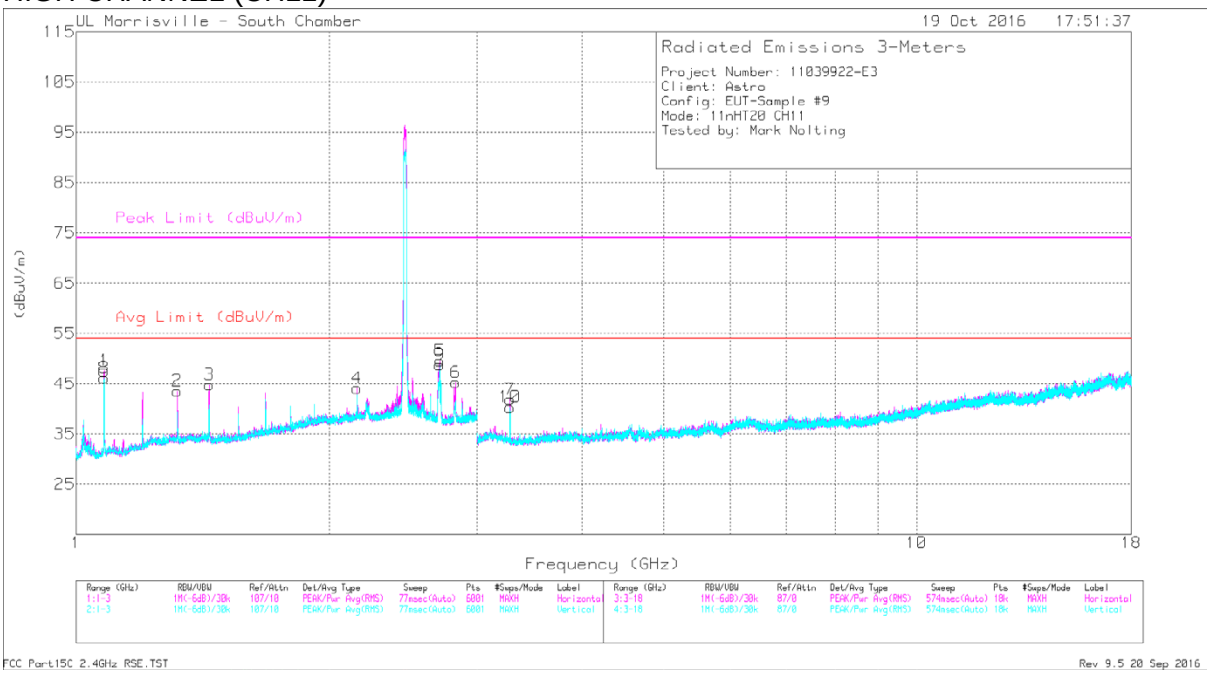
Pk - Peak detector

PK2 - Maximum Peak

MAv1 - Maximum RMS Average

Note: Plot above represents a prescan. All final measurements were made at RBW/VBW = 1MHz/3MHz.

HIGH CHANNEL (CH11)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (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
1	* 1.08	49.74	PK2	27.5	-24.4	0	52.84	-	-	74	-21.16	26	302	H
	* 1.08	46.46	MAv1	27.5	-24.4	3.38	52.94	54	-1.06	-	-	26	302	H
2	* 1.32	43.52	PK2	28.8	-23.1	0	49.22	-	-	74	-24.78	12	167	H
	* 1.32	38.47	MAv1	28.8	-23.1	3.38	47.55	54	-6.45	-	-	12	167	H
3	* 1.44	43.43	PK2	28.4	-22.7	0	49.13	-	-	74	-24.87	4	148	H
	* 1.44	38	MAv1	28.4	-22.7	3.38	47.08	54	-6.92	-	-	4	148	H
5	* 2.71	52.05	PK2	32.3	-25.9	0	58.45	-	-	74	-15.55	105	208	H
	* 2.706	36.28	MAv1	32.3	-25.8	3.38	46.16	54	-7.84	-	-	105	208	H
6	* 2.819	46.27	PK2	32.6	-26	0	52.87	-	-	74	-21.13	98	198	H
	* 2.826	31.05	MAv1	32.7	-26	3.38	41.13	54	-12.87	-	-	98	198	H
8	* 1.08	45.92	PK2	27.5	-24.4	0	49.02	-	-	74	-24.98	22	201	V
	* 1.08	41.82	MAv1	27.5	-24.4	3.38	48.3	54	-5.7	-	-	22	201	V
9	* 2.703	49.96	PK2	32.3	-25.8	0	56.46	-	-	74	-17.54	155	286	V
	* 2.704	34.43	MAv1	32.3	-25.8	3.38	44.31	54	-9.69	-	-	155	286	V
4	2.16	35.5	Pk	31.7	-23.1	0	44.1	-	-	-	-	0-360	199	H
7	3.282	42.19	Pk	32.9	-33.2	0	41.89	-	-	-	-	0-360	199	H
10	3.282	40.65	Pk	32.9	-33.2	0	40.35	-	-	-	-	0-360	199	V

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

Pk - Peak detector

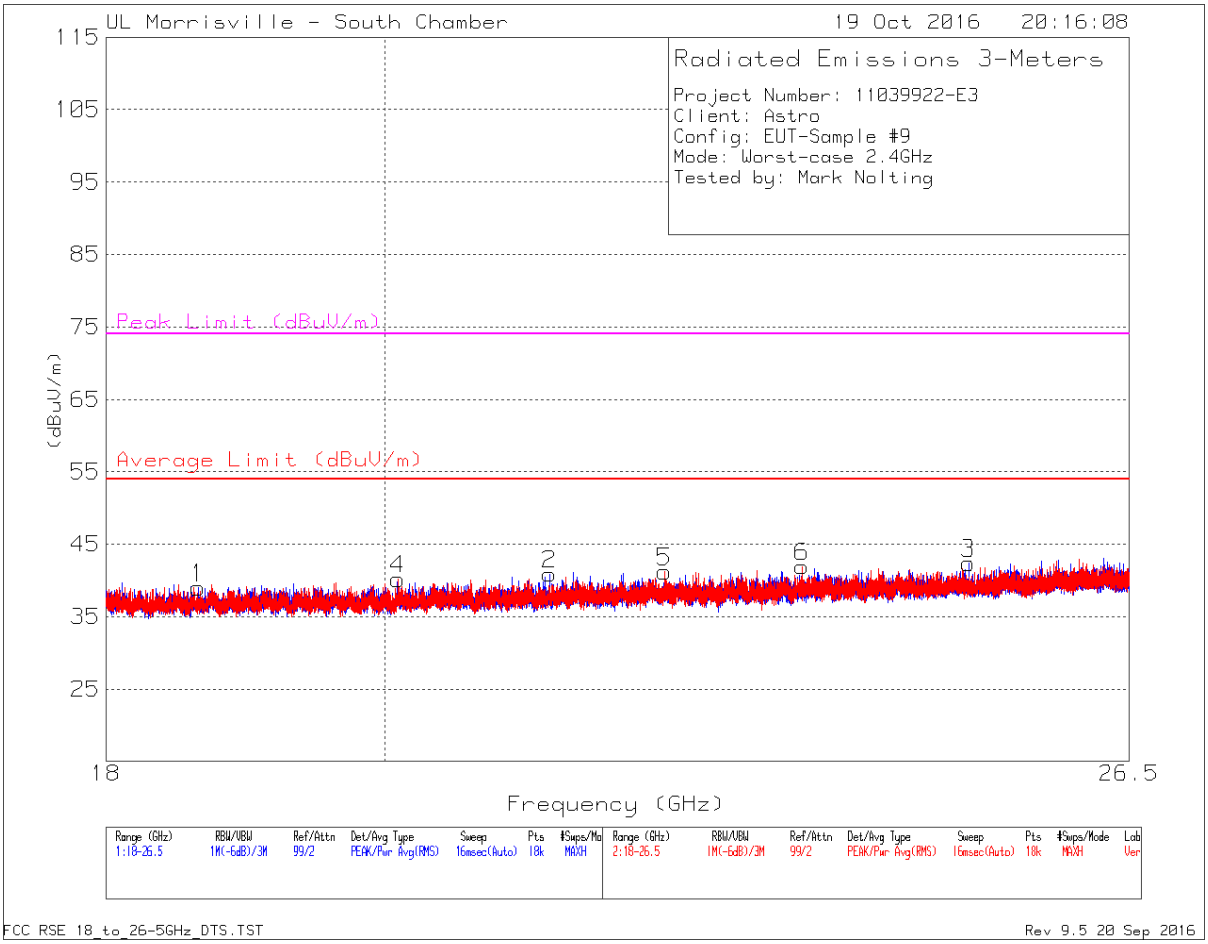
PK2 - Maximum Peak

MAv1 - Maximum RMS Average

Note: Plot above represents a prescan. All final measurements were made at RBW/VBW = 1MHz/3MHz.

9.3. WORST-CASE ABOVE 18GHz

SPURIOUS EMISSIONS 18-26GHz (WORST-CASE CONFIGURATION)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0076 (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	* 18.64	47.19	Pk	32.7	-40.9	38.99	54	-15.01	74	-35.01	0-360	102	H
2	* 21.286	47.9	Pk	33.1	-40.1	40.9	54	-13.1	74	-33.1	0-360	249	H
4	* 20.101	47.49	Pk	33	-40.3	40.19	54	-13.81	74	-33.81	0-360	101	V
5	* 22.231	47.39	Pk	33.4	-39.6	41.19	54	-12.81	74	-32.81	0-360	101	V
6	23.418	47.14	Pk	34.1	-39.3	41.94	54	-12.06	74	-32.06	0-360	251	V
3	24.94	46.58	Pk	34.3	-38.5	42.38	54	-11.62	74	-31.62	0-360	102	H

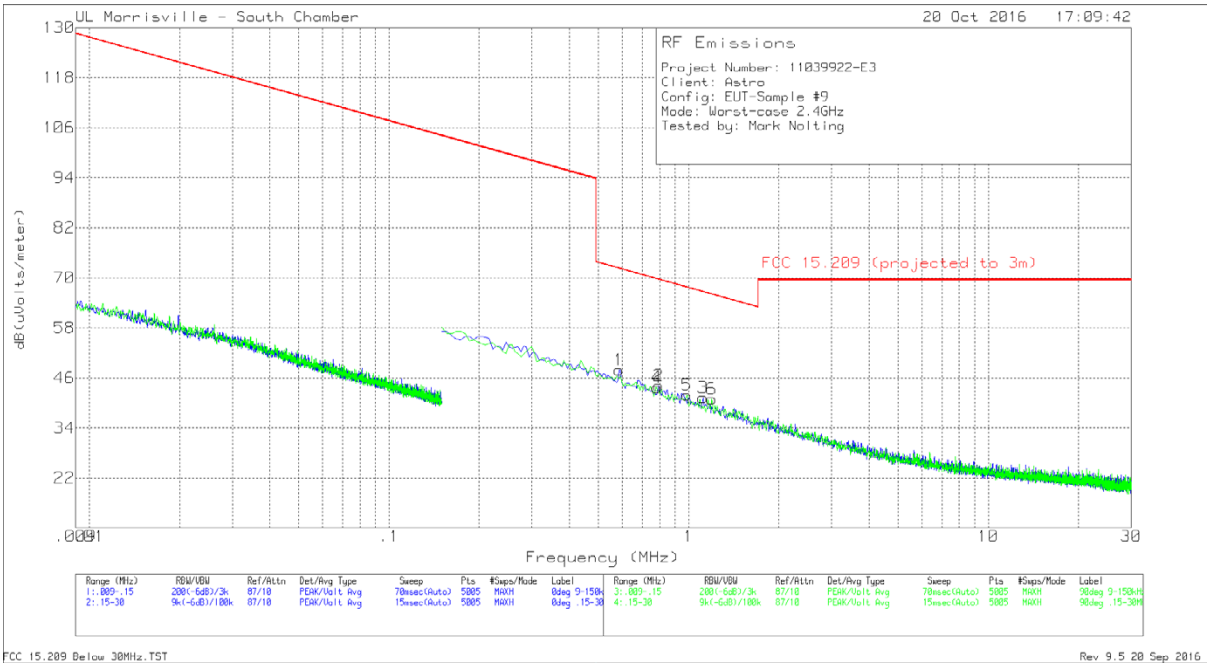
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

9.4. WORST-CASE BELOW 1 GHz

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 30 m 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 937606.

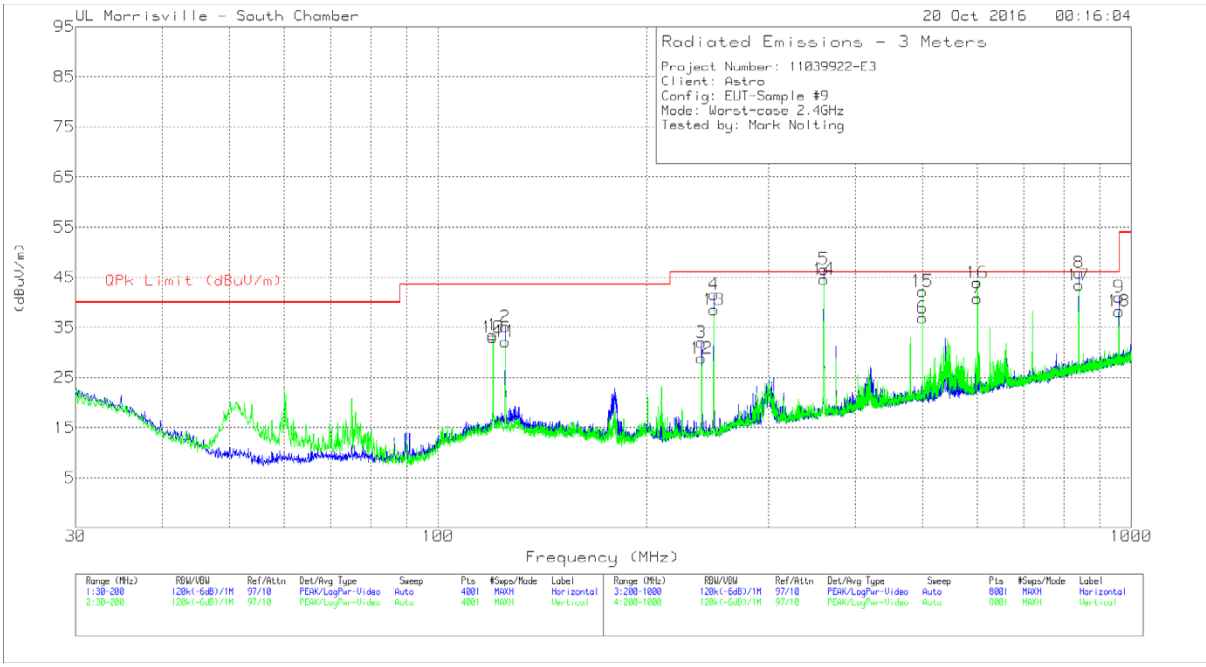
SPURIOUS EMISSIONS 9kHz to 30 MHz (WORST-CASE CONFIGURATION)



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 AF (dB/m)	Cbl (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.209 (projected to 3m)	Margin (dB)	Azimuth (Degs)
1	.58545	35.89	Pk	11.9	.1	47.89	72.25	-24.36	0-360
4	.78229	31.74	Pk	11.9	.1	43.74	69.74	-26	0-360
2	.79422	32.17	Pk	11.9	.1	44.17	69.61	-25.44	0-360
5	.9851	29.77	Pk	11.9	.2	41.87	67.73	-25.86	0-360
3	1.11633	29.19	Pk	11.9	.2	41.29	66.65	-25.36	0-360
6	1.19388	28.84	Pk	11.9	.2	40.94	66.07	-25.13	0-360

Pk - Peak detector

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



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 120.015	46.26	Pk	18	-30.8	33.46	43.52	-10.06	0-360	298	H
2	* 124.9875	47.76	Pk	18.2	-30.8	35.16	43.52	-8.36	0-360	298	H
10	* 120.015	45.76	Pk	18	-30.8	32.96	43.52	-10.56	0-360	102	V
11	* 124.9875	44.77	Pk	18.2	-30.8	32.17	43.52	-11.35	0-360	102	V
4	* 249.9997	56.31	Qp	16.1	-29.9	42.51	46.02	-3.51	214	131	H
13	* 250	52.32	Pk	16.1	-29.9	38.52	46.02	-7.5	0-360	102	V
9	* 960.0018	39.24	Qp	27.5	-26.3	40.44	53.97	-13.53	258	102	H
18	*960	37.02	Pk	27.5	-26.3	38.22	46.02	-7.8	0-360	201	V
3	240	45.68	Pk	16.2	-29.9	31.98	-	-	0-360	102	H
12	240	42.51	Pk	16.2	-29.9	28.81	-	-	0-360	102	V
5	360	56.42	Pk	19.6	-29.4	46.62	-	-	0-360	102	H
14	360	54.39	Pk	19.6	-29.4	44.59	-	-	0-360	102	V
6	500	43.63	Pk	22.1	-28.8	36.93	-	-	0-360	198	H
15	500	48.91	Pk	22.1	-28.8	42.21	-	-	0-360	102	V
7	600	46.06	Pk	23.3	-28.6	40.76	-	-	0-360	298	H
16	600	49.23	Pk	23.3	-28.6	43.93	-	-	0-360	102	V
8	840	47.19	Pk	26.4	-27.7	45.89	-	-	0-360	102	H
17	840	44.7	Pk	26.4	-27.7	43.4	-	-	0-360	102	V

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

Pk - Peak detector

Qp - Quasi-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

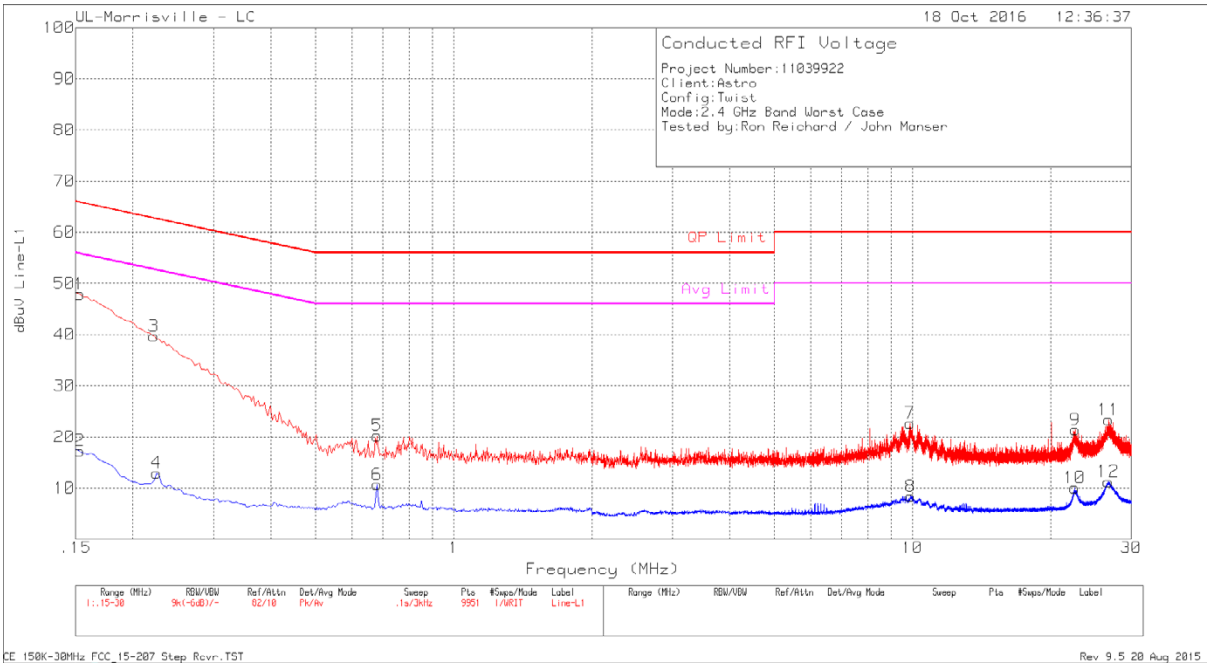
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10

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 NEUTRAL and HOT lines.

RESULTS (Worst-case Mode)

LINE 1

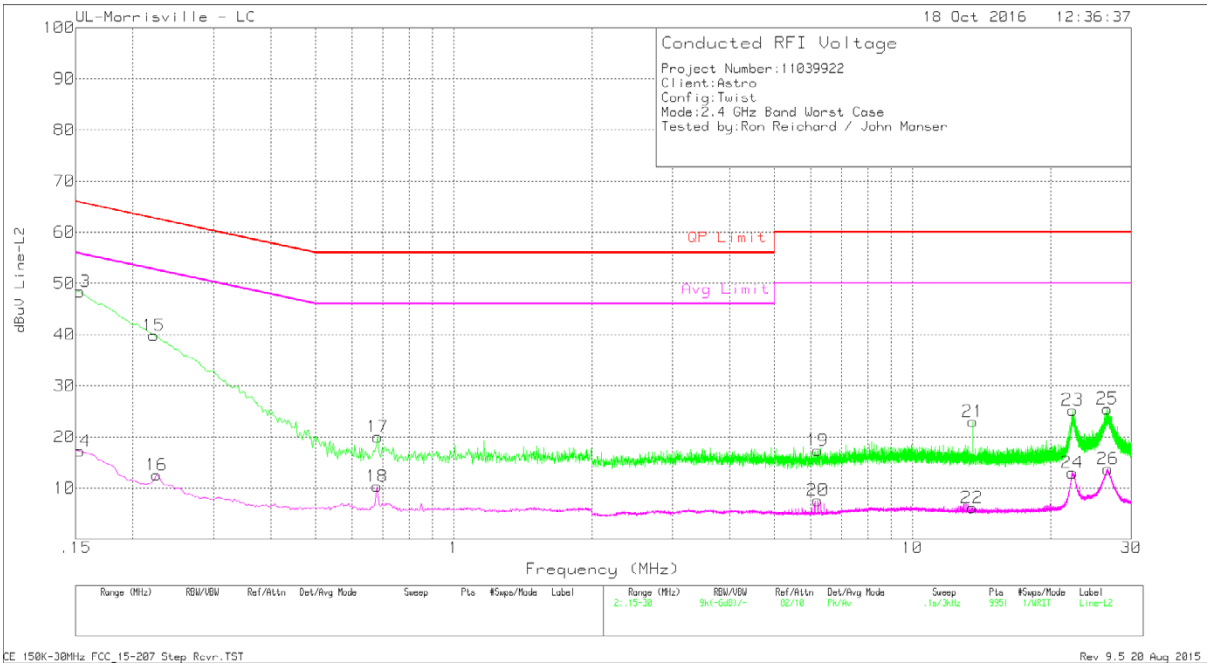


Line-L1										
Marker	**Frequency (MHz)**	**Meter Reading (dBuV)**	**Det**	**LISN VCF (dB)**	**Cbl/Limiter (dB)**	**Corrected Reading dBuV**	**QP Limit**	**Margin (dB)**	**Avg Limit**	**Margin (dB)**
1	.153	37.71	Pk	.2	10	47.91	65.84	-17.93	-	-
2	.153	7.09	Av	.2	10	17.29	-	-	55.84	-38.55
3	.222	29.65	Pk	.1	10	39.75	62.74	-22.99	-	-
4	.225	2.88	Av	.1	10	12.98	-	-	52.63	-39.65
5	.681	10.25	Pk	0	10	20.25	56	-35.75	-	-
6	.681	.7	Av	0	10	10.7	-	-	46	-35.3
7	9.885	12.27	Pk	.1	10.3	22.67	60	-37.33	-	-
8	9.906	-2	Av	.1	10.3	8.4	-	-	50	-41.6
9	22.659	10.57	Pk	.2	10.6	21.37	60	-38.63	-	-
10	22.581	-.75	Av	.2	10.6	10.05	-	-	50	-39.95
11	26.79	12.38	Pk	.3	10.7	23.38	60	-36.62	-	-
12	26.733	.26	Av	.3	10.7	11.26	-	-	50	-38.74

Pk - Peak detector

Av - Average detection

LINE 2



Line-L2										
Marker	**Frequency (MHz)**	**Meter Reading (dBuV)**	**Det**	**LISN VCF (dB)**	**Cbl/Limiter (dB)**	**Corrected Reading dBuV**	**QP Limit**	**Margin (dB)**	**Avg Limit**	**Margin (dB)**
13	.153	38.2	Pk	.2	10	48.4	65.84	-17.44	-	-
14	.153	7.02	Av	.2	10	17.22	-	-	55.84	-38.62
15	.222	29.74	Pk	.1	10	39.84	62.74	-22.9	-	-
16	.225	2.48	Av	.1	10	12.58	-	-	52.63	-40.05
17	.684	10.01	Pk	0	10	20.01	56	-35.99	-	-
18	.681	.32	Av	0	10	10.32	-	-	46	-35.68
19	6.219	7.06	Pk	.1	10.2	17.36	60	-42.64	-	-
20	6.222	-2.7	Av	.1	10.2	7.6	-	-	50	-42.4
21	13.56	12.54	Pk	.1	10.4	23.04	60	-36.96	-	-
22	13.485	-4.36	Av	.1	10.4	6.14	-	-	50	-43.86
23	22.341	14.47	Pk	.2	10.6	25.27	60	-34.73	-	-
24	22.326	2.2	Av	.2	10.6	13	-	-	50	-37
25	26.586	14.5	Pk	.3	10.7	25.5	60	-34.5	-	-
26	26.685	2.74	Av	.3	10.7	13.74	-	-	50	-36.26

Pk - Peak detector

Av - Average detection