



**FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-247 ISSUE 1**

CERTIFICATION TEST REPORT

FOR

WIRELESS INPUT DEVICE

MODEL NUMBER: 1708

FCC ID: C3K1708

IC: 3048A-1708

REPORT NUMBER: R11040094-E1

ISSUE DATE: 2016-06-09

Prepared for
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NVLAP Lab code: 200246-0

Revision History

<u>Ver.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
1	2016-03-23	Initial Issue	Ron Reichard
2	2016-05-10	Revised measurement method information on page 15, added duty cycle correction for above 1GHz spurious plots, added below 30 MHz data, added Line Conducted data and revised measurement equipment accordingly.	Jeff Moser
3	2016-05-19	Updated antenna gain on page 8.	Jeff Moser
4	2016-05-27	Updated antenna gain info. in Output Power results sections. Added below 30 MHz limits on page 53.	Jeff Moser
5	2016-06-9	Updated sections 5.1 and 5.4	Grace Rincand

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA, 98052, USA

EUT DESCRIPTION: WIRELESS INPUT DEVICE

MODEL: 1708

SERIAL NUMBER: Radiated: EV3-A2-973 (02980009986543)
Conducted: EV3- A2- 1016 (02980010526543)

DATE TESTED: 2015-12-21 to 2016-02-26, 2016-05-05 to 2016-05-10

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-247 Issue 1	Pass
INDUSTRY 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:



Ron Reichard
EMC Project Lead
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
<input type="checkbox"/> Chamber A
<input checked="" type="checkbox"/> Chamber C

2800 Suite B Perimeter Park Dr., Morrisville, NC 27560
<input checked="" type="checkbox"/> Chamber NORTH
<input checked="" type="checkbox"/> 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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

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
RF power density, conducted	+/- 1.50
Spurious emissions, conducted	+/- 2.94
All emissions, radiated up to 18 GHz	+/- 5.36
Temperature	+/- 0.07
Humidity	+/- 2.26
DC and low frequency voltages	+/- 1.27

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Model 1708 is a wireless input device that contains an 802.11a/g/n and Bluetooth transceiver. The EUT can be powered by battery or USB.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum average conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2462	802.11g	8.40	6.92
2412 - 2462	802.11n HT20	8.24	6.67

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integral antenna, with a maximum gain of 0 dBi.

5.4. SOFTWARE AND FIRMWARE

The HQA UART Tool version used was: Ind_SW_v.1.22

The EUT firmware used during testing was 3.1.703.0 and Radio Firmware was 1.0.107.0.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated 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 Y orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y orientation.

Worst-case data rates as provided by the manufacturer:

802.11g mode: 6 Mbps
802.11n HT20mode: MCS0

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	T440	Not available	TP00050A
AC/DC Adapter	Lenovo	ADLX65NLC2A	Not available	N/A
Laptop	Lenovo	X1 Carbon	Not available	Not available
AC/DC Adapter	Lenovo	PA-1650-71	Not available	N/A
External DC Source	Circuit Specialist	CS13005X5	Not available	N/A

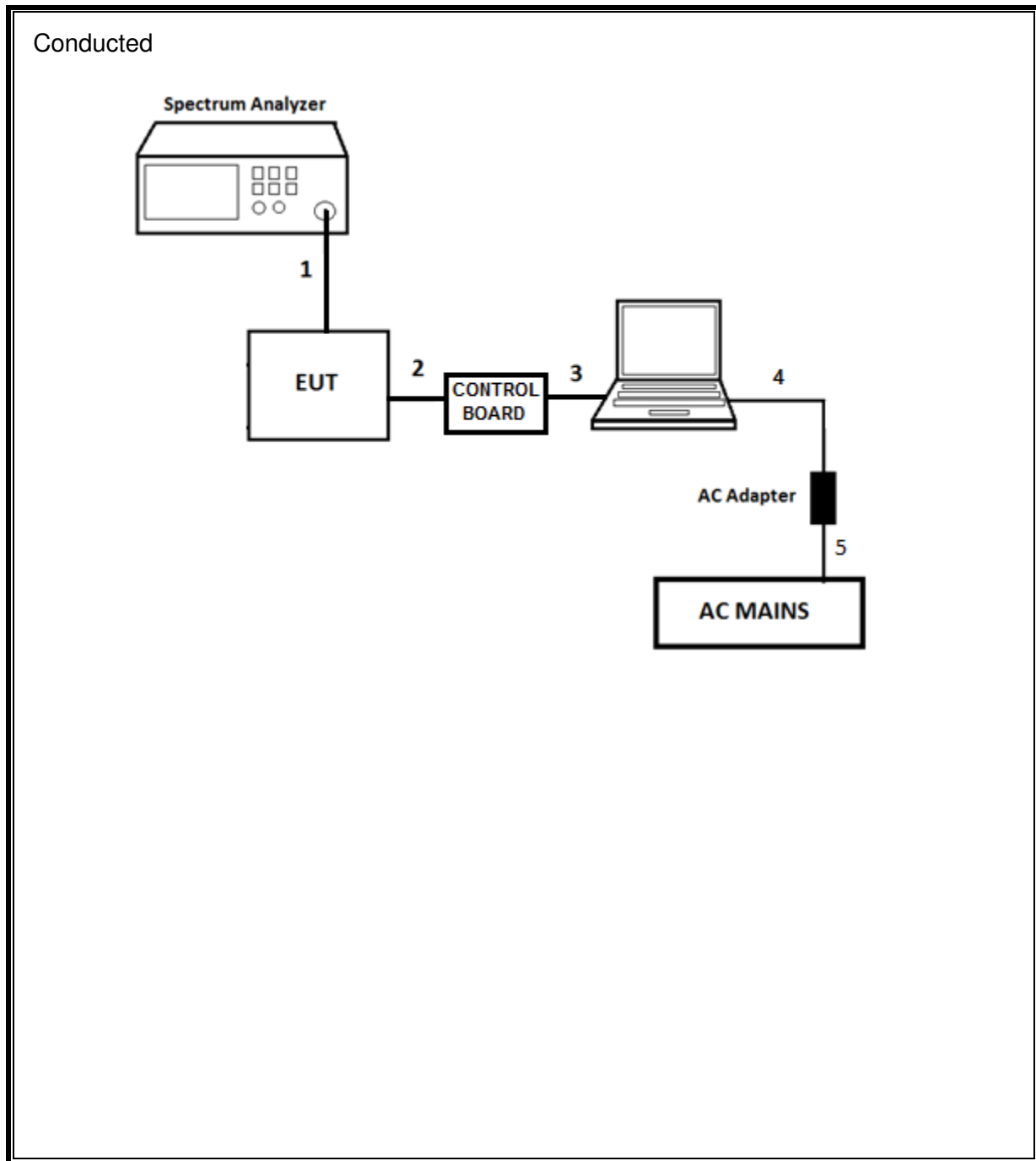
I/O CABLES

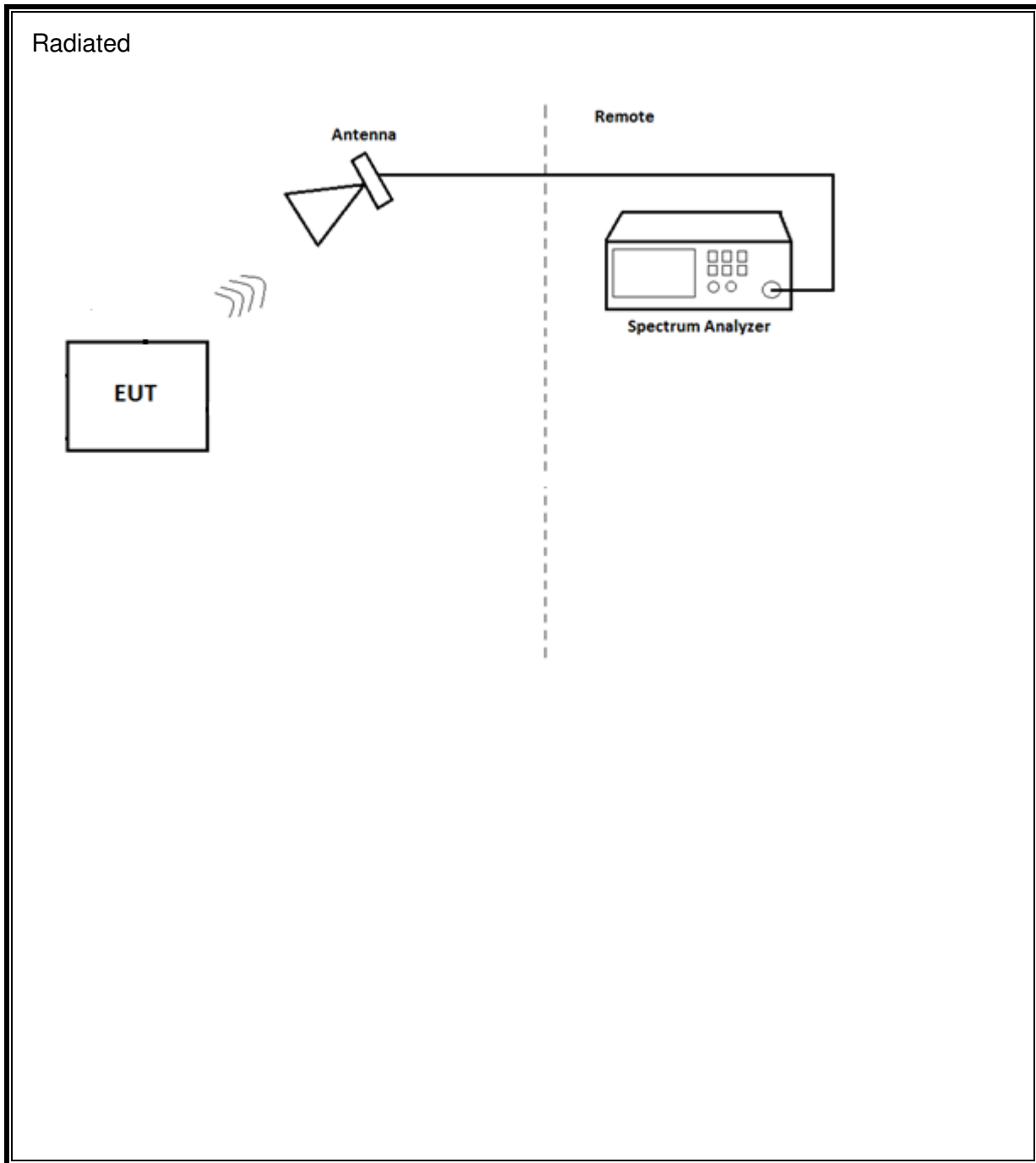
I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length	Remarks
1	Antenna	1	SMA	Un-Shielded	0.5	SMA To SMA cable.
2	EUT Data Port	1	Custom	Un-Shielded	0.2	Control Board to EUT
3	USB	1	USB to micro USB	Shielded	0.8	From PC to Control Board
4	DC	1	DC	Un-Shielded	0.8	N/A
5	AC	1	2 Prong	Un-Shielded	1.5	N/A

TEST SETUP

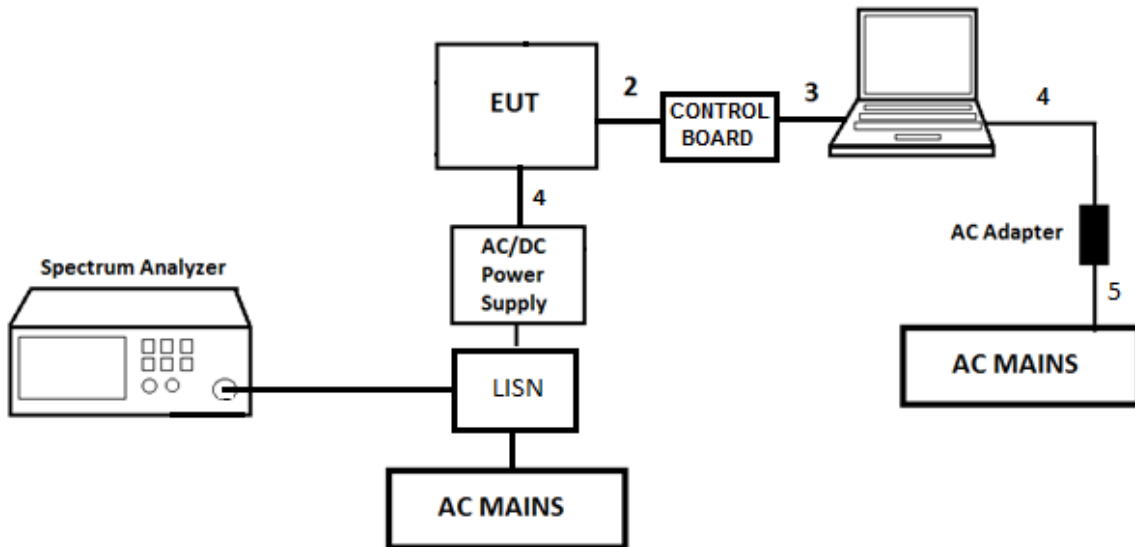
The EUT was configured as table top equipment during the tests. During Conducted Emissions testing, the EUT was connected to a laptop via a control board to change modes/channels and the EUT was powered via the control board. During Radiated testing, the EUT was tested as a stand-alone device. The EUT was set for the proper channel/mode, then the laptop was removed from the test site. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS





Line Conducted Emissions



Note – Control support gear was removed from the EUT once the EUT was set (mode/channel, etc.).

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 - North Chamber)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	30-1000 MHz Range				
AT0073	Hybrid Broadband Antenna, 30-1000MHz	Sunol Sciences Corp.	JB3	2015-06-10	2016-06-30
	1-18 GHz				
AT0072	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2015-02-17	2016-02-29
	Gain-Loss Chains				
N-SAC02	Gain-loss string: 30-1000MHz	Various	Various	2015-06-04	2016-06-30
N-SAC03	Gain-loss string: 1-18GHz	Various	Various	2015-09-29	2016-09-30
	Receiver & Software				
SA0026	Spectrum Analyzer	Agilent	N9030A	2015-03-27	2016-03-31
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
HI0079	Temp/Humid/Pressure Meter	Springfield Precision	PreciseTemp	2015-07-01	2016-07-31

Note – Testing in this chamber was performed prior to 2016-02-29.

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-Lindgren	6502	2015-12-08	2016-12-31
	Gain-Loss Chains				
S-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2015-10-07	2016-10-31
	Receiver & Software				
SA0025	Spectrum Analyzer	Agilent	N9030A	2016-03-17	2017-03-31
	Additional Equipment used				
HI0050	Temp/Humid/Pressure Meter	Cole-Parmer	99760-00	2015-07-01	2016-07-31

Test Equipment Used - Radiated Disturbance Emissions (E-field) – Chamber C

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	18-26GHz				
AT0063	Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	2015-08-27	2016-08-31
	Gain-Loss Chains				
C-SAC03	Gain-loss string: 18-40GHz	Various	Various	2015-09-27	2016-09-30
	Receiver & Software				
SA0016	Spectrum Analyzer	Agilent	PXA N9030A	2015-08-26	2016-08-31
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
	Additional Equipment used				
HI0034	Temp/Humid/Pressure Meter	Cole-Parmer	99760-00	2015-03-23	2016-03-31

Note – Testing in this chamber was performed prior to 2016-03-31.

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	Conducted Room 1				
SA0019	Spectrum Analyzer	Agilent Technologies	E4446A	2015-09-02	2016-09-30
PWM004	RF Power Meter	Keysight Technologies	N1911A	2015-06-08	2017-06-08
PWS004	Peak and Avg Power Sensor, 50MHz to 6GHz	Keysight Technologies	E9323A	2015-06-05	2016-06-05
HI0079	Temp/Humid/Pressure Meter	Springfield	PreciseTemp	2015-07-1	2016-07-31
MM0167	True RMS Multimeter	Agilent	U1232A	2015-08-17	2016-08-31
76022	DC Regulated Power Supply	CircuitSpecialists.Com	CSI3005X5	NA	NA
	Conducted Room 2				
SA0020	Spectrum Analyzer	Agilent Technologies	E4446A	2015-02-26	2016-02-29
PWM003	RF Power Meter	Keysight Technologies	N1911A	2015-06-08	2017-06-08
PWS003	Peak and Avg Power Sensor, 50MHz to 6GHz	Keysight Technologies	E9323A	2015-06-05	2016-06-05
1100502	Temp/Humid Chamber	Cincinnati Sub-Zero	ZPH-8-3.5-SCT/AC	2015-05-13	2016-05-31
43733	Temp/Humid/Pressure Meter	Cole-Parmer	99760-00	2014-03-24	2016-03-24
MM0168	True RMS Multimeter	Agilent	U1232A	2015-08-17	2016-08-31
76021	DC Regulated Power Supply	CircuitSpecialists.Com	CSI3005X5	NA	NA

Note – Testing in these rooms were performed prior to 2016-02-29.

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	2015-10-29	2016-10-31
HI0079	Temp/Humid/Pressure Meter	Springfield Precision	PreciseTemp	2015-07-01	2016-07-31
LISN003	LISN, 50-ohm/50-uH, 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50-25-2-01-550V	2015-08-24	2016-08-31
LISN008	LISN, 50-ohm/50-uH, 2-conductor, 25A (For support gear only.)	Solar Electronics	8012-50-R-24-BNC	2015-09-03	2016-09-30
MM0167	Multi-meter	Agilent	U1232A	2015-08-17	2016-08-31
PRE0101521 (75141)	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2015-08-26	2016-08-31
TL001	Transient Limiter, 0.009-30MHz	Com-Power	LIT-930A	2015-05-22	2016-05-31
PS214	AC Power Source	Elgar	CW2501M (s/n 1523A02396)	NA	NA
PS215	AC Power Source	Elgar	CW2501M (s/n 1523A02397)	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA

7. MEASUREMENT METHODS

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

Output Power: KDB 558074 D01 v03r05, Section 9.2.3.1.

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.

Band-edge: KDB 558074 D01 v03r05, Section 13.3.

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

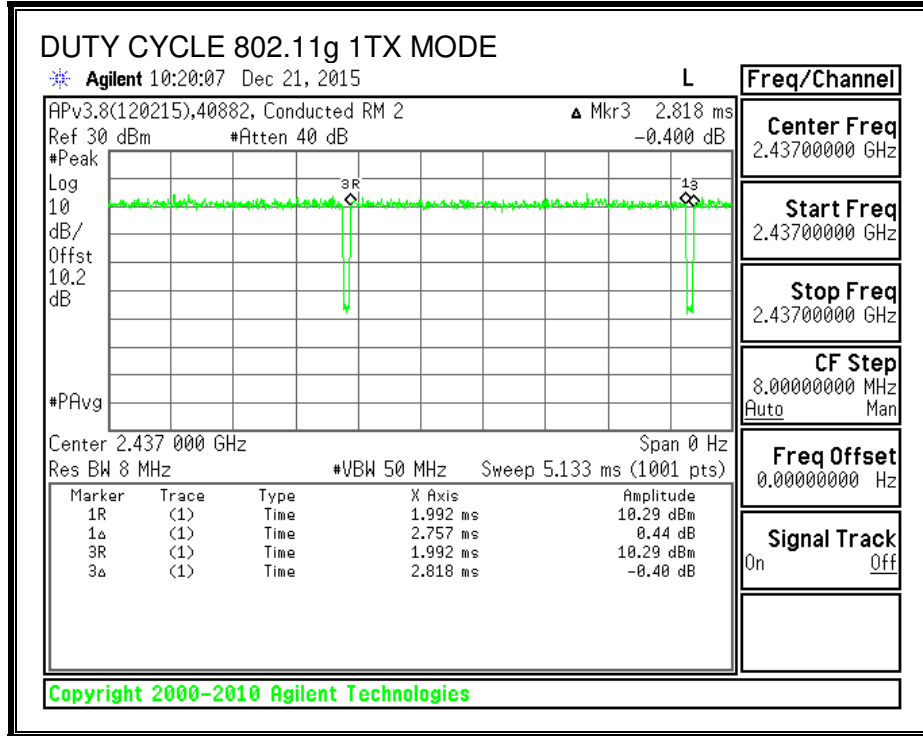
KDB 558074 Zero-Span Spectrum Analyzer Method.

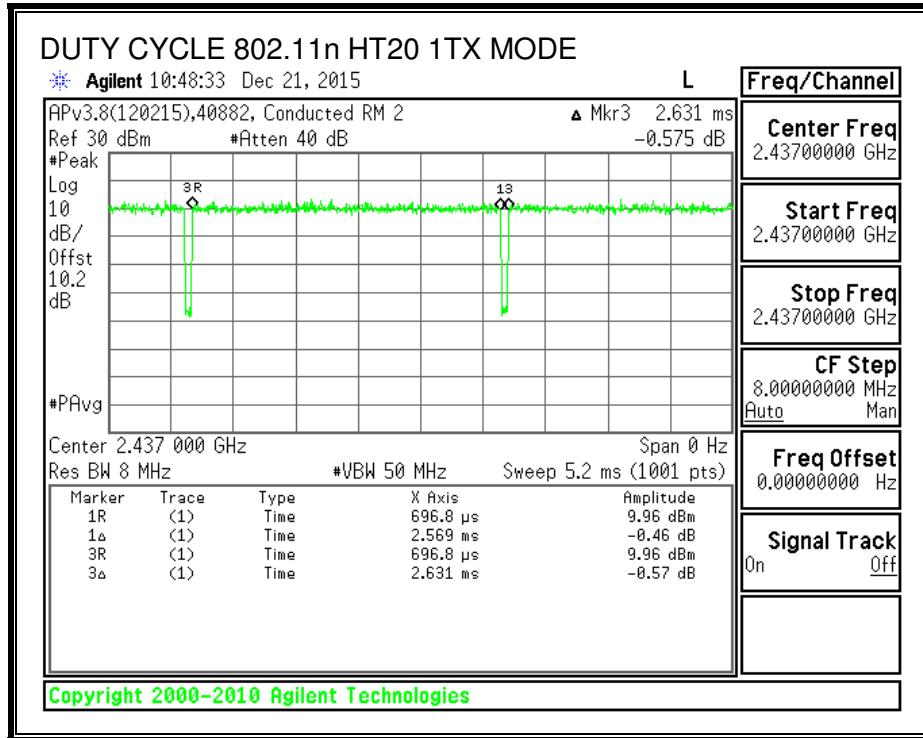
ON TIME AND DUTY CYCLE RESULTS

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						
802.11g 1TX	2.757	2.818	0.978	97.84%	0.10	0.363
802.11n HT20 1TX	2.569	2.631	0.976	97.64%	0.10	0.389

DUTY CYCLE PLOTS

2.4 GHz BAND





8.2. 802.11g MODE IN THE 2.4 GHz BAND

8.2.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

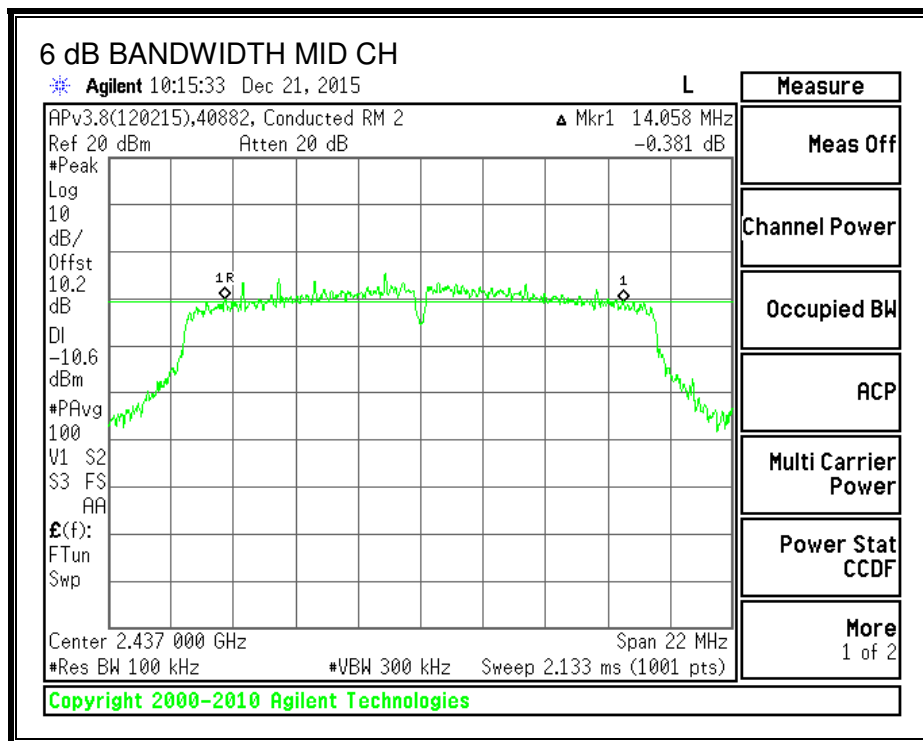
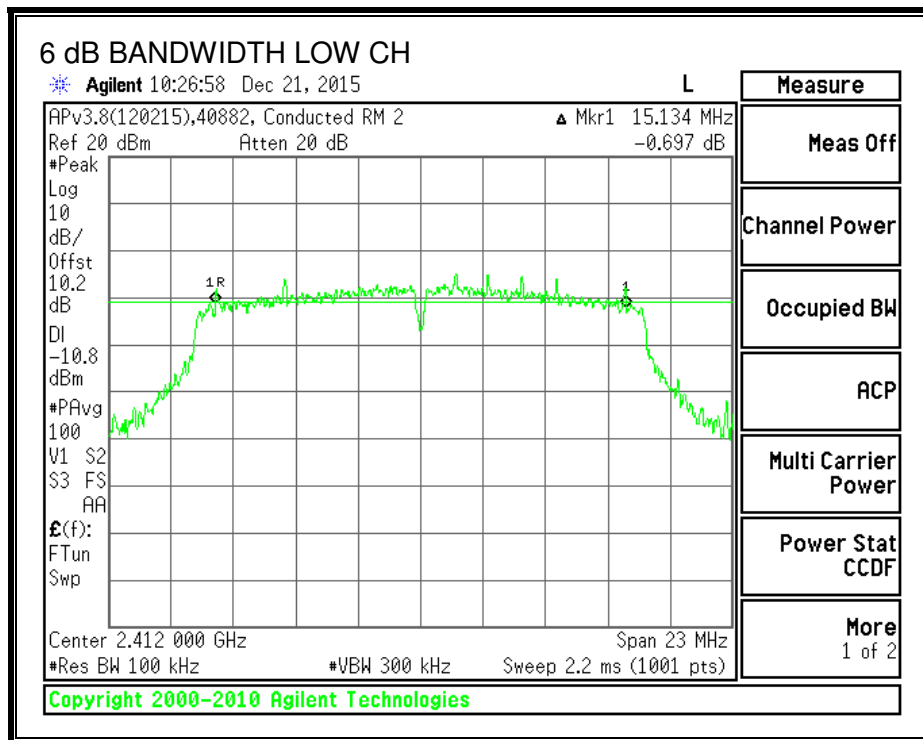
IC RSS-247 5.2 (1)

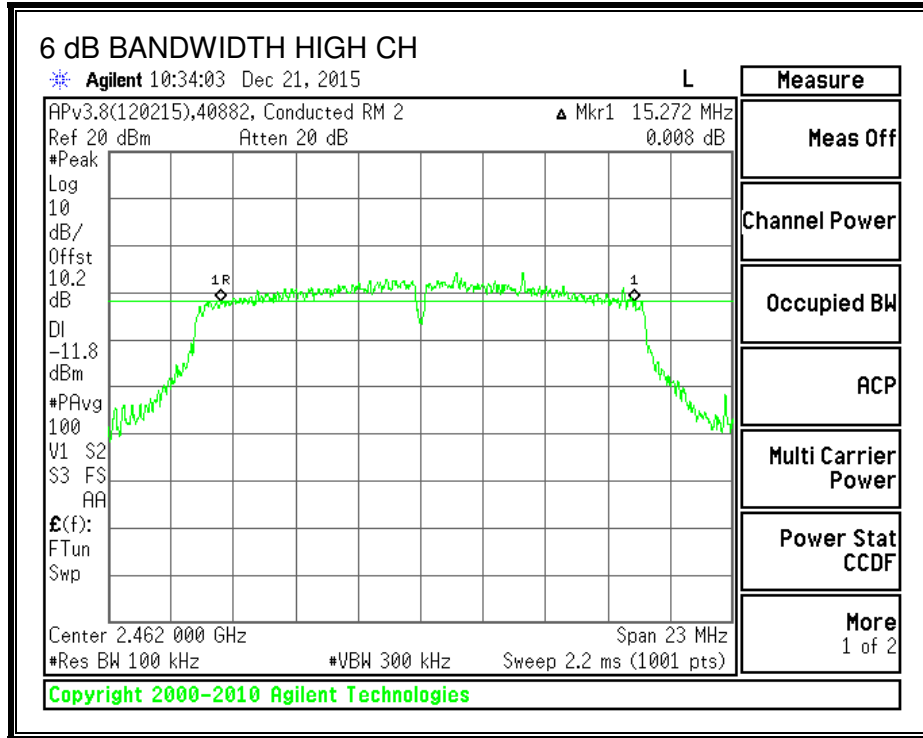
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.134	0.5
Mid	2437	14.058	0.5
High	2462	15.272	0.5

6 dB BANDWIDTH





8.2.2. 99% BANDWIDTH

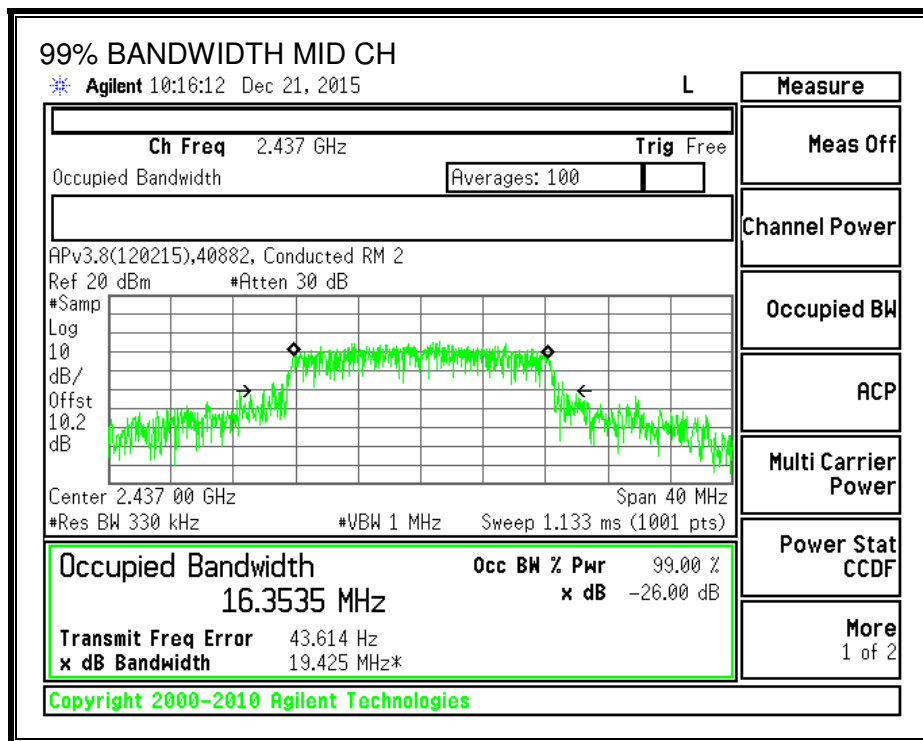
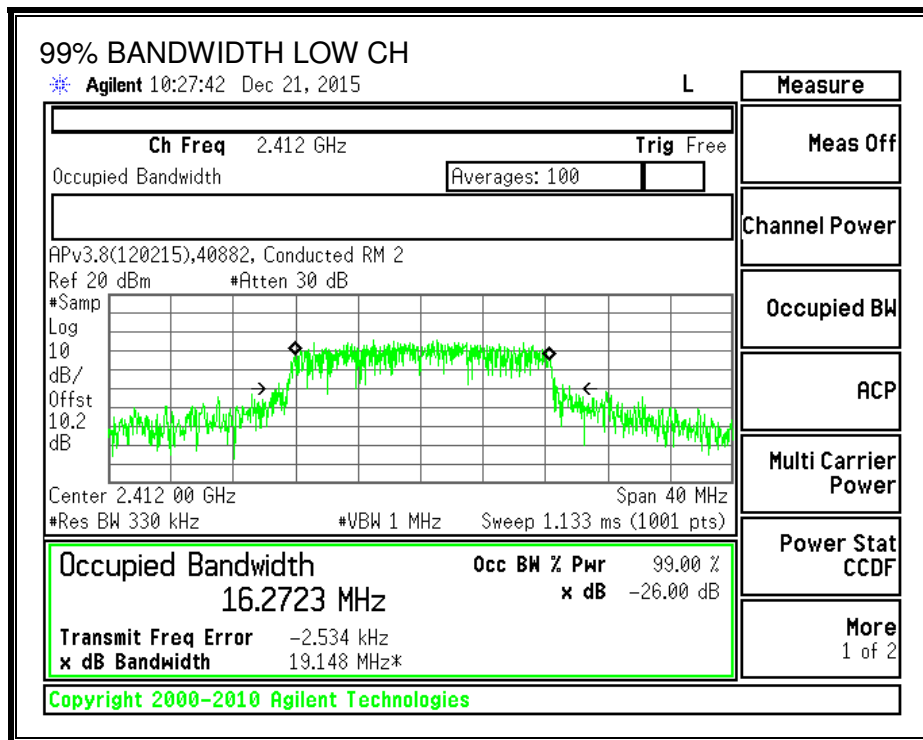
LIMITS

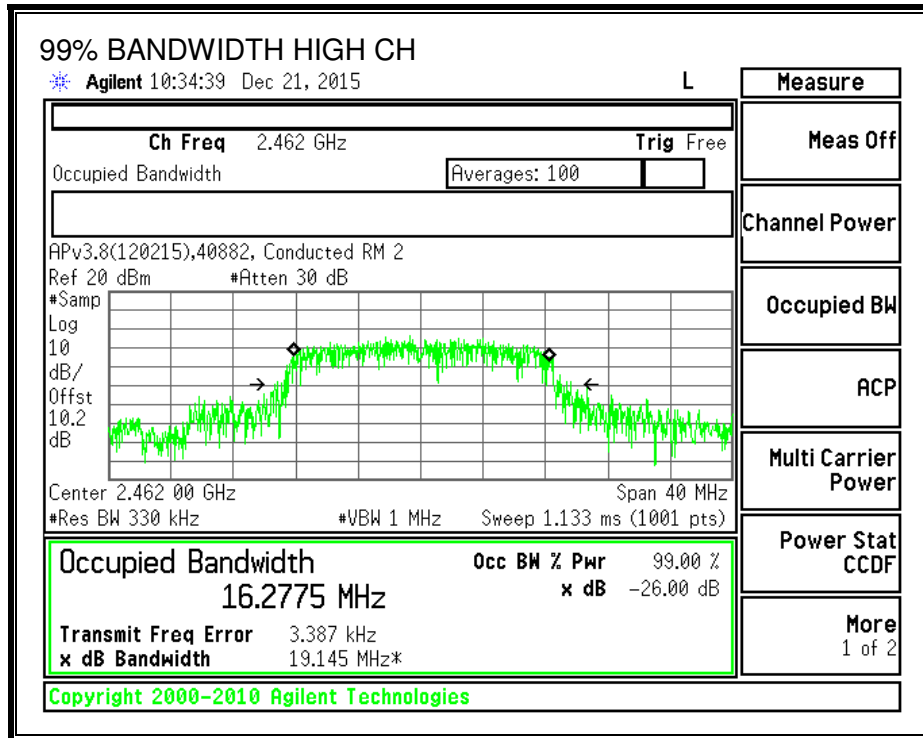
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.2723
Mid	2437	16.3535
High	2462	16.2775

99% BANDWIDTH





8.2.3. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-247 5.4 (4)

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.

RESULTS

Note – The following are average power measurements.

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	0.00	30.00	30	36	30.00
Mid	2437	0.00	30.00	30	36	30.00
High	2462	0.00	30.00	30	36	30.00

Duty Cycle CF (dB)	0.10	Included in Calculations of Corr'd Power
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Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	8.03	8.13	30.00	-21.87
Mid	2437	8.30	8.40	30.00	-21.60
High	2462	8.03	8.13	30.00	-21.87

8.2.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247

IC RSS-247 5.2 (2)

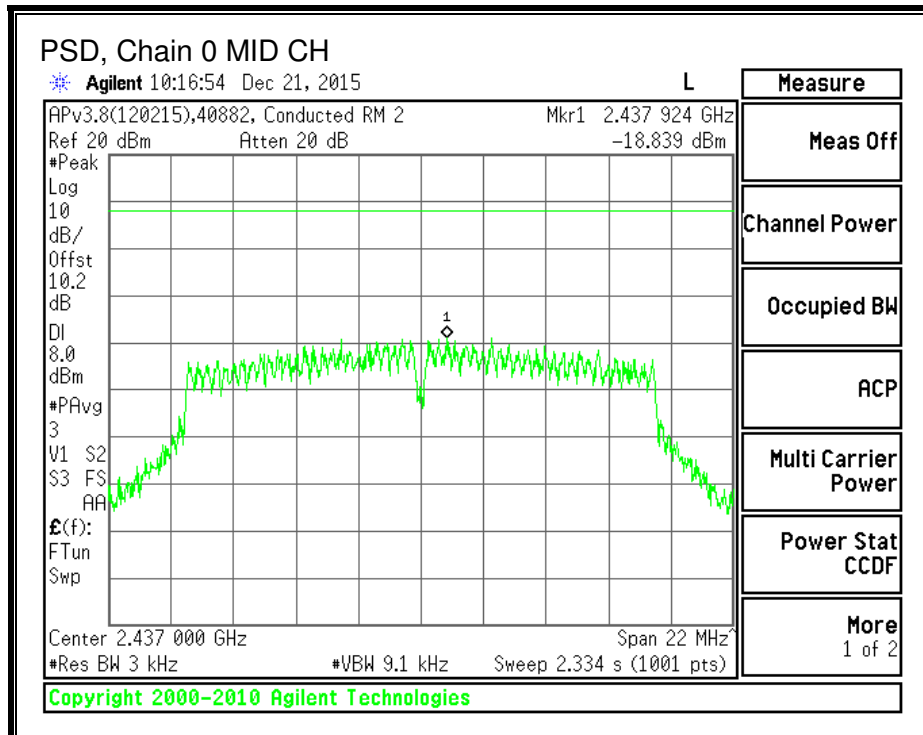
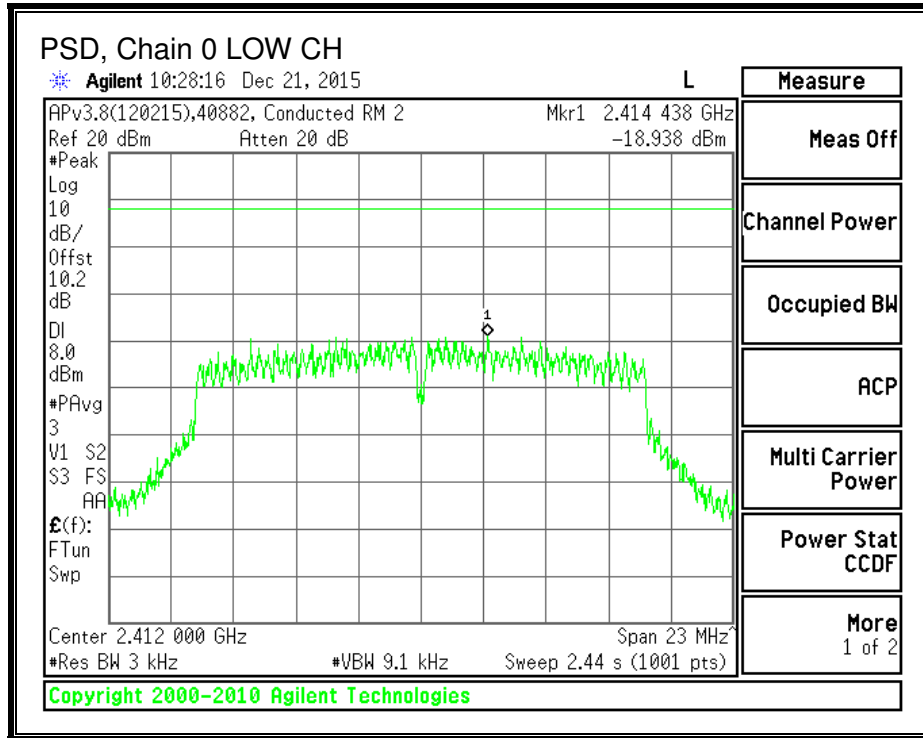
RESULTS

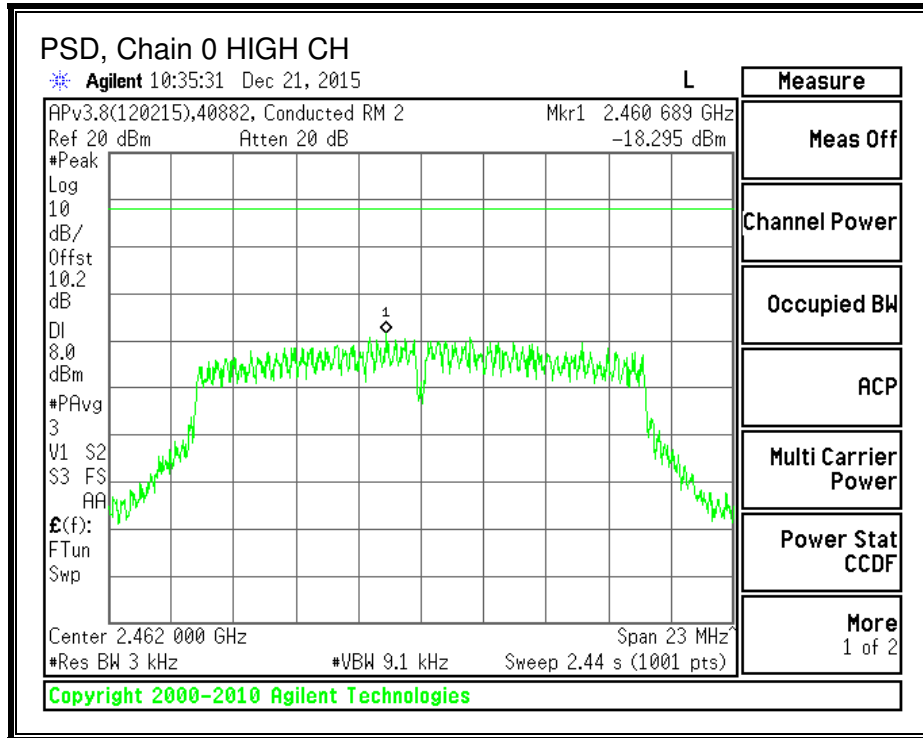
Duty Cycle CF (dB)	0.10	Included in Calculations of Corr'd PSD
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PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-18.94	-18.84	8.0	-26.8
Mid	2437	-18.84	-18.74	8.0	-26.7
High	2462	-18.30	-18.20	8.0	-26.2

PSD, Chain 0





8.2.5. OUT-OF-BAND EMISSIONS

LIMITS

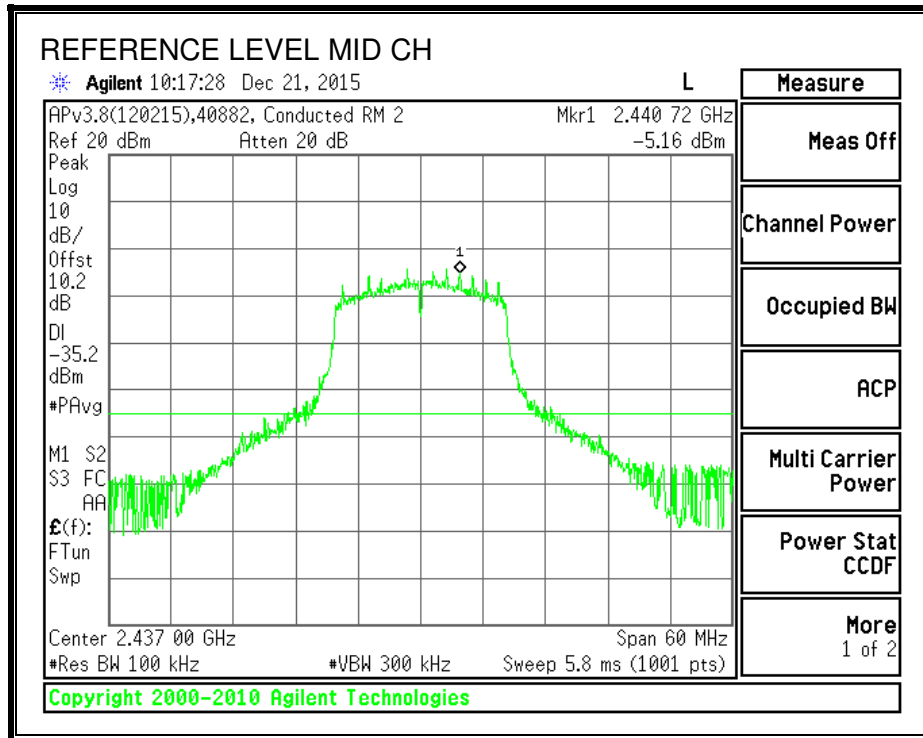
FCC §15.247 (d)

IC RSS-247 5.5

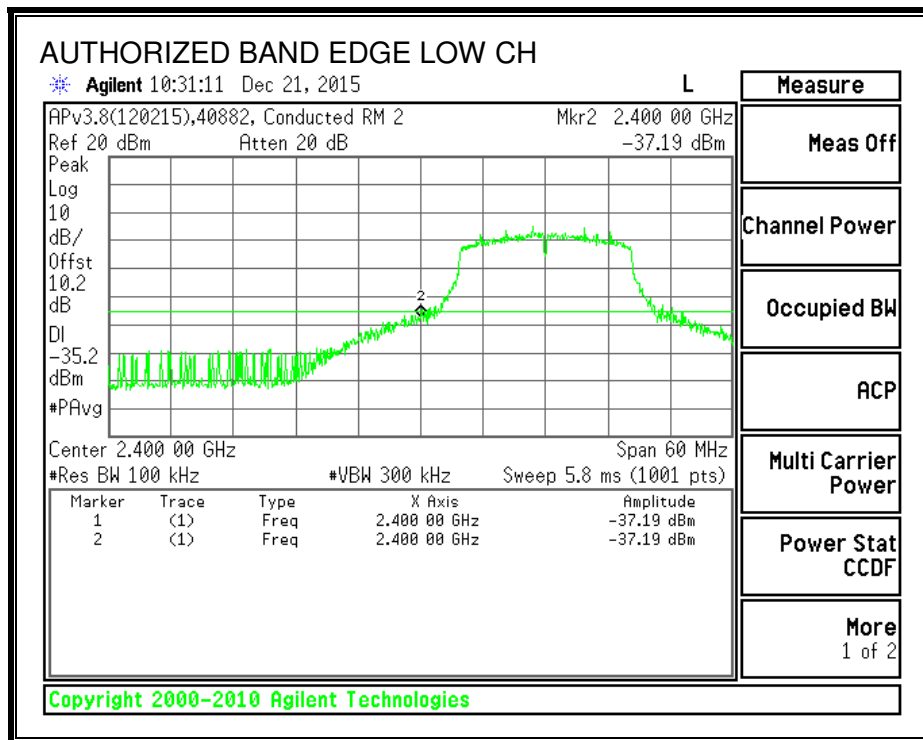
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

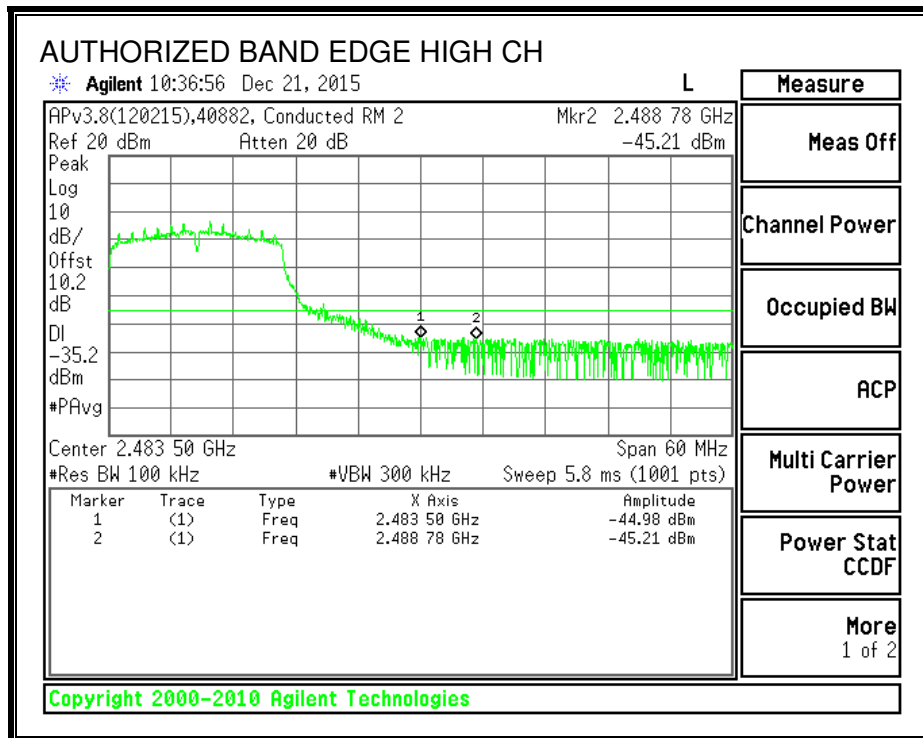
IN-BAND REFERENCE LEVEL



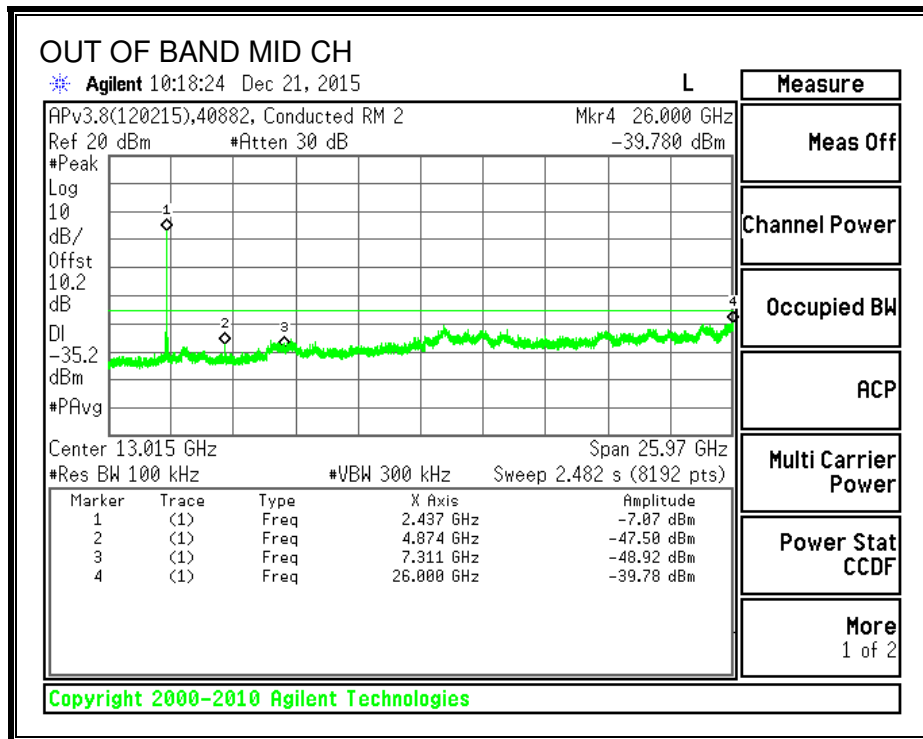
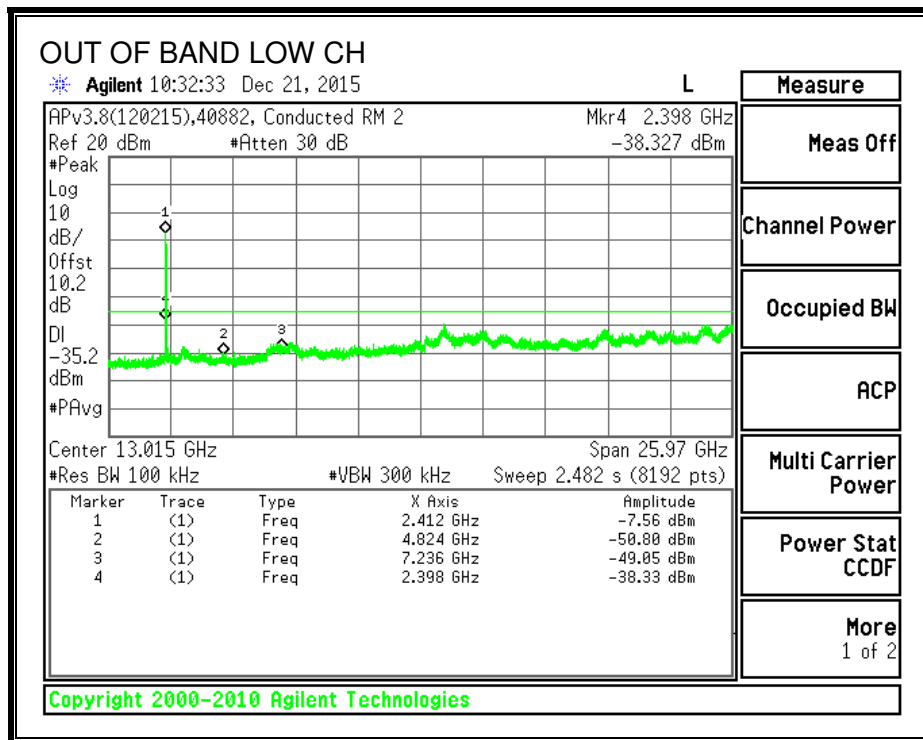
LOW CHANNEL BANDEDGE

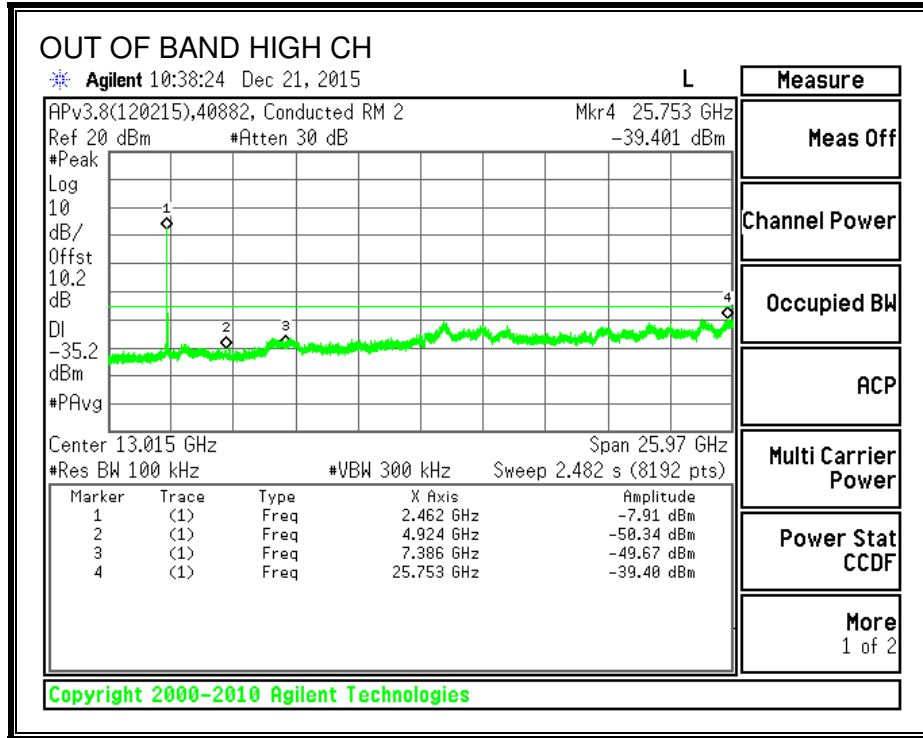


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS





8.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

8.3.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

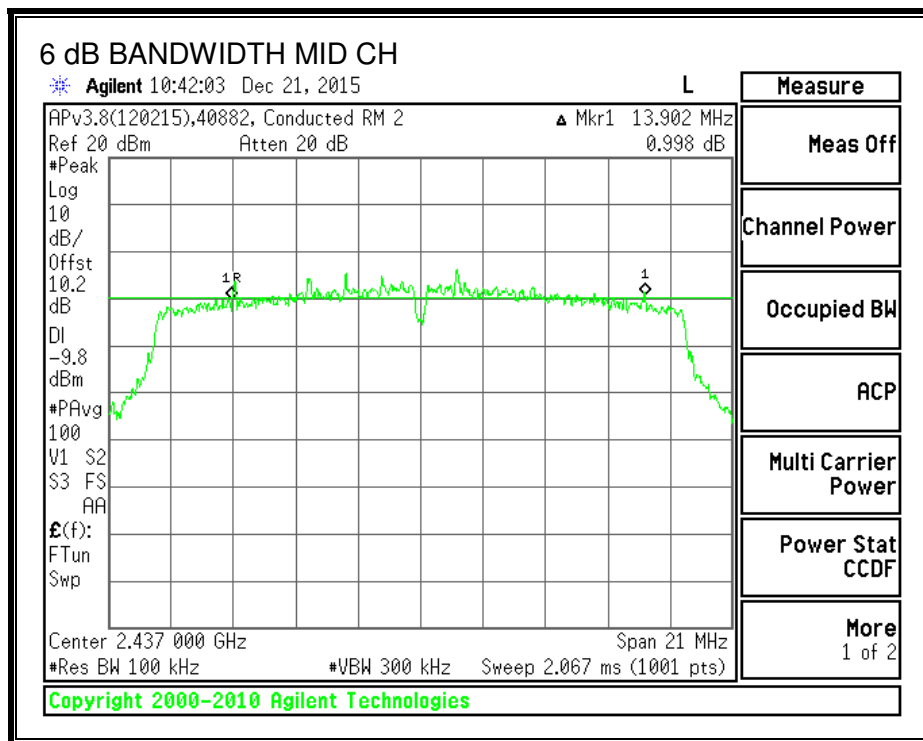
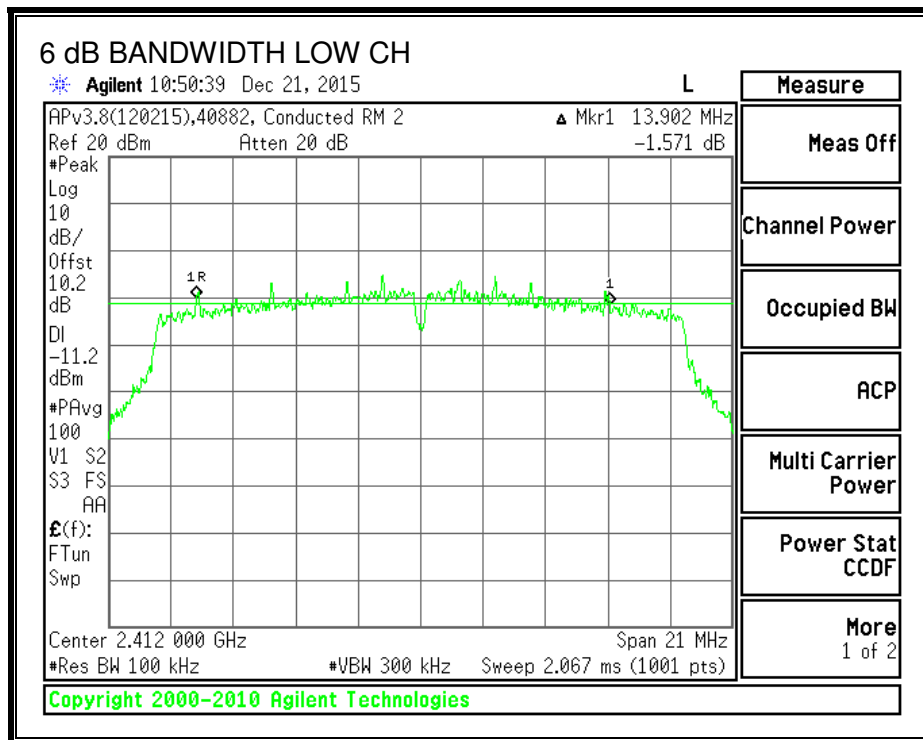
IC RSS-247 5.2 (1)

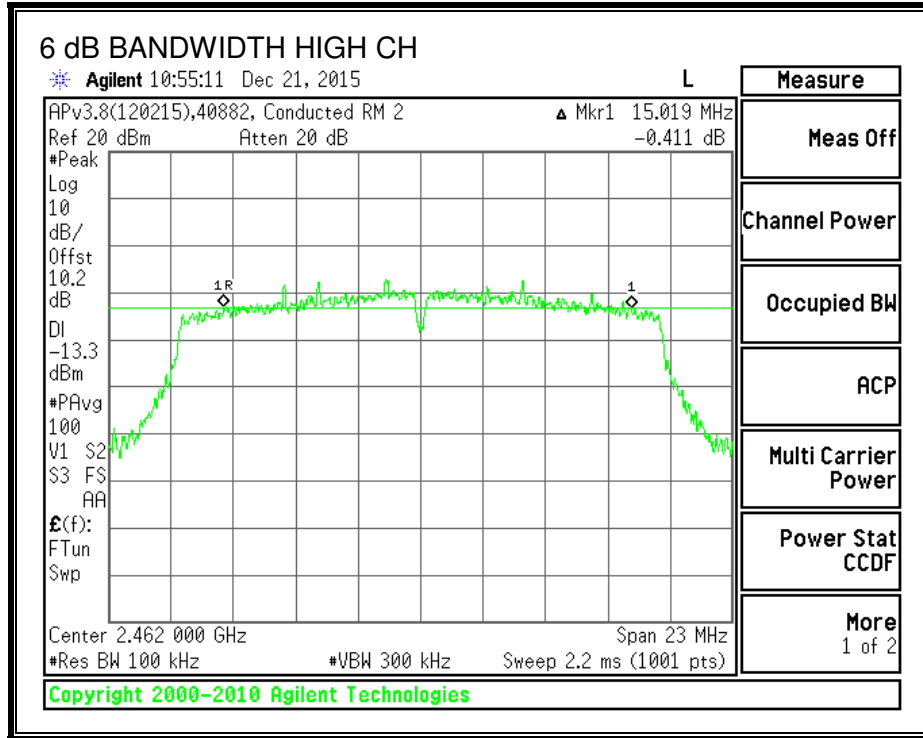
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	13.902	0.5
Mid	2437	13.902	0.5
High	2462	15.019	0.5

6 dB BANDWIDTH





8.3.2. 99% BANDWIDTH

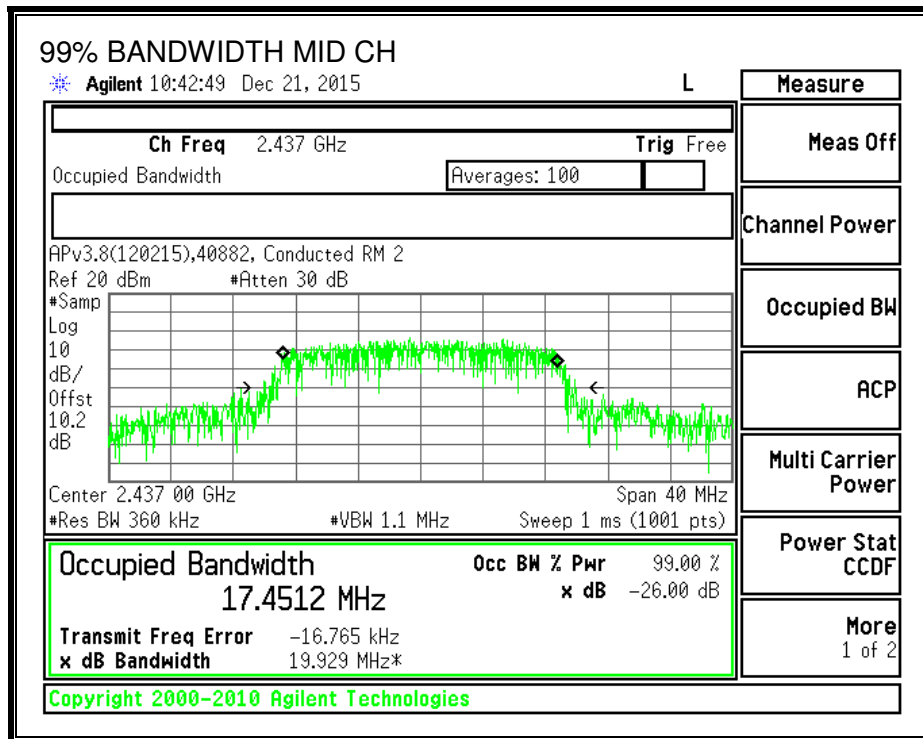
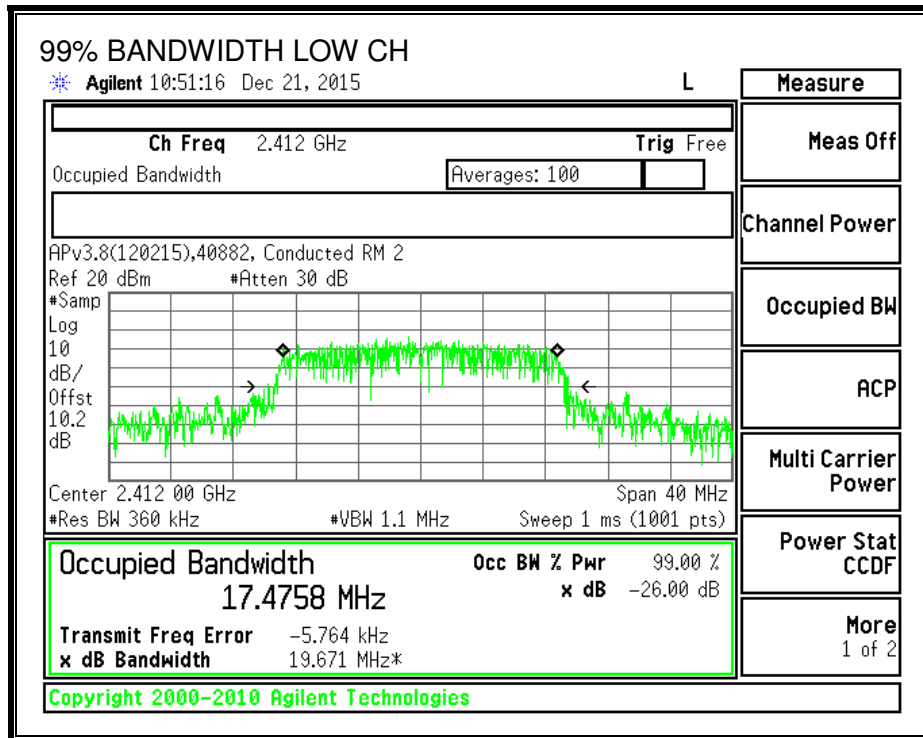
LIMITS

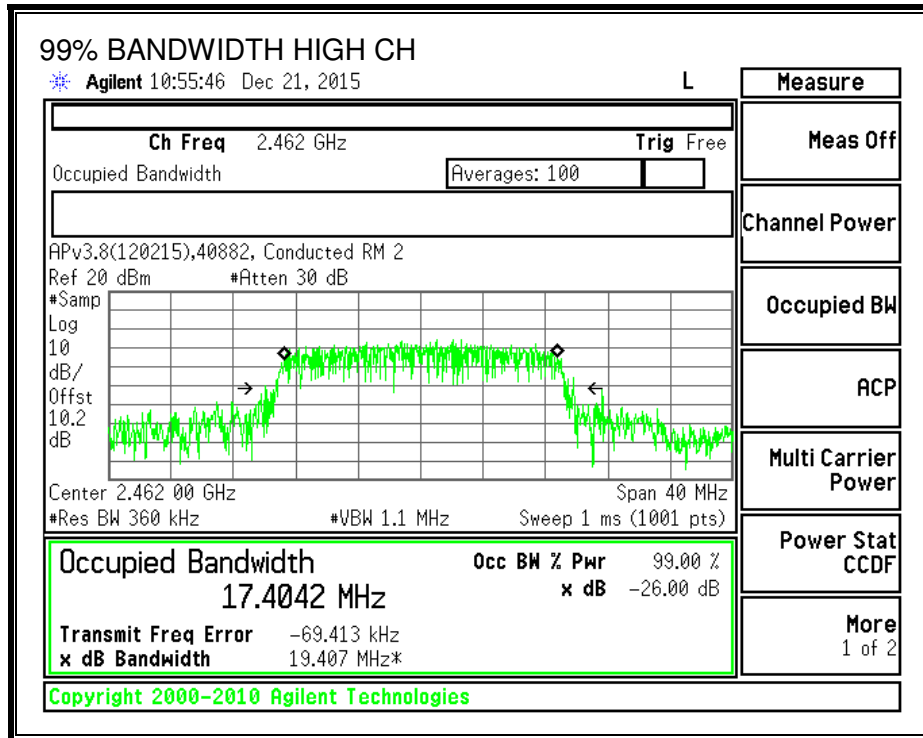
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	17.4758
Mid	2437	17.4512
High	2462	17.4042

99% BANDWIDTH





8.3.3. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-247 5.4 (4)

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.

RESULTS

Note – The following are average measurements.

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	0.00	30.00	30	36	30.00
Mid	2437	0.00	30.00	30	36	30.00
High	2462	0.00	30.00	30	36	30.00

Duty Cycle CF (dB)	0.10	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	7.88	7.98	30.00	-22.02
Mid	2437	8.14	8.24	30.00	-21.76
High	2462	7.86	7.96	30.00	-22.04

8.3.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247

IC RSS-247 5.2 (2)

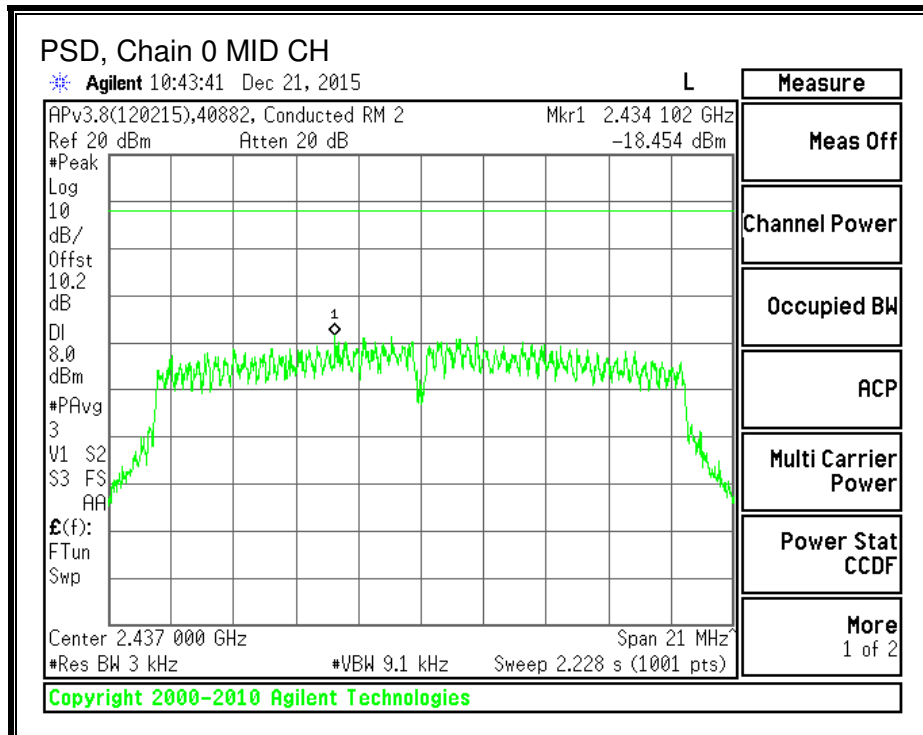
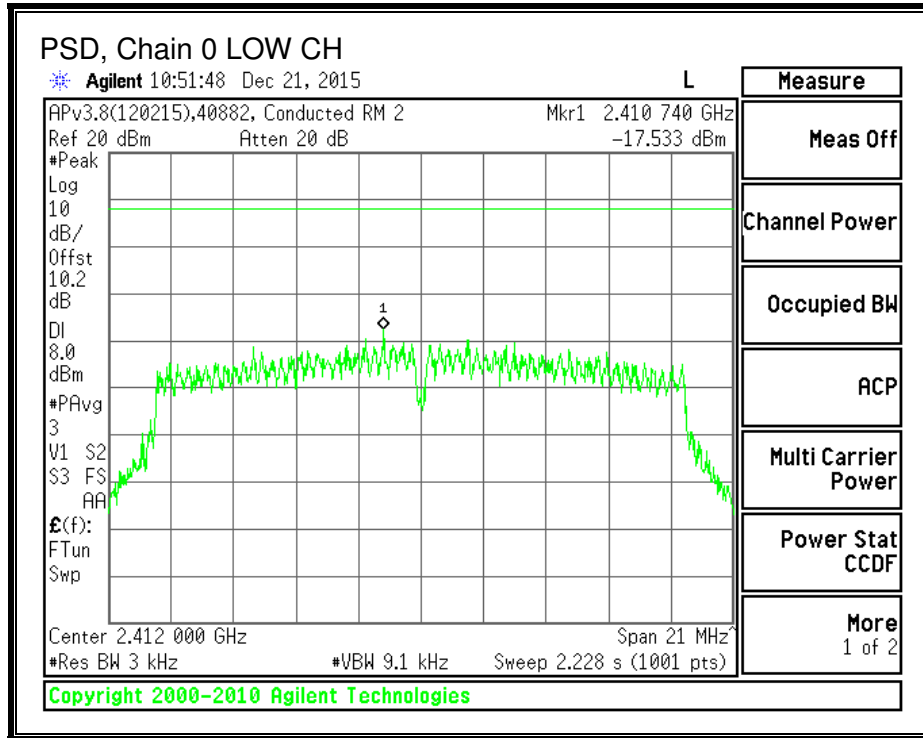
RESULTS

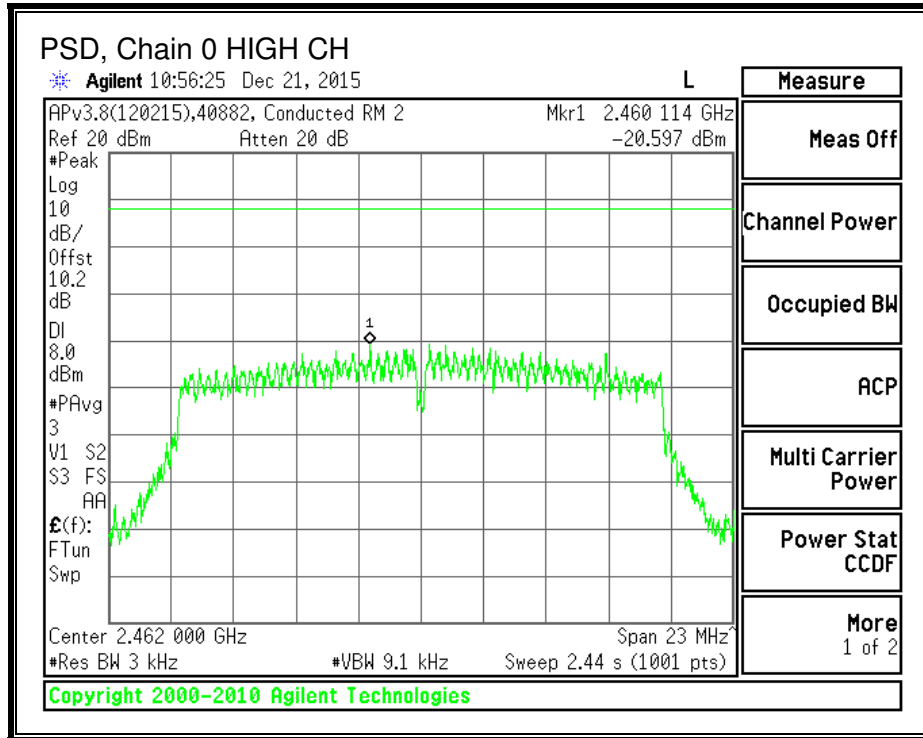
Duty Cycle CF (dB)	0.10	Included in Calculations of Corr'd PSD
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PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-17.53	-17.43	8.0	-25.4
Mid	2437	-18.45	-18.35	8.0	-26.4
High	2462	-20.60	-20.50	8.0	-28.5

PSD, Chain 0





8.3.5. OUT-OF-BAND EMISSIONS

LIMITS

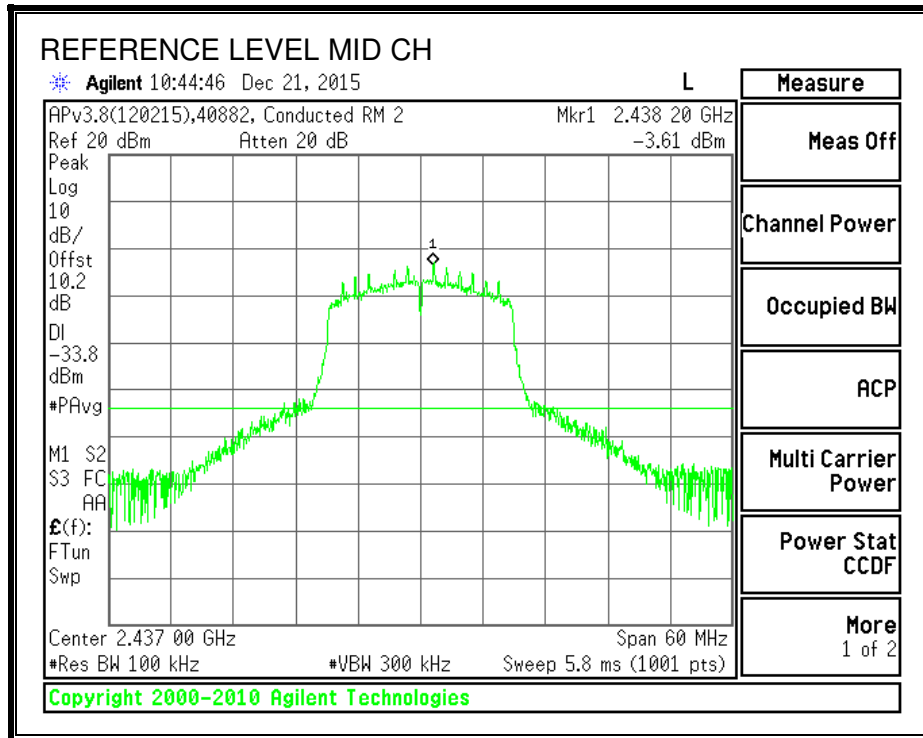
FCC §15.247 (d)

IC RSS-247 5.5

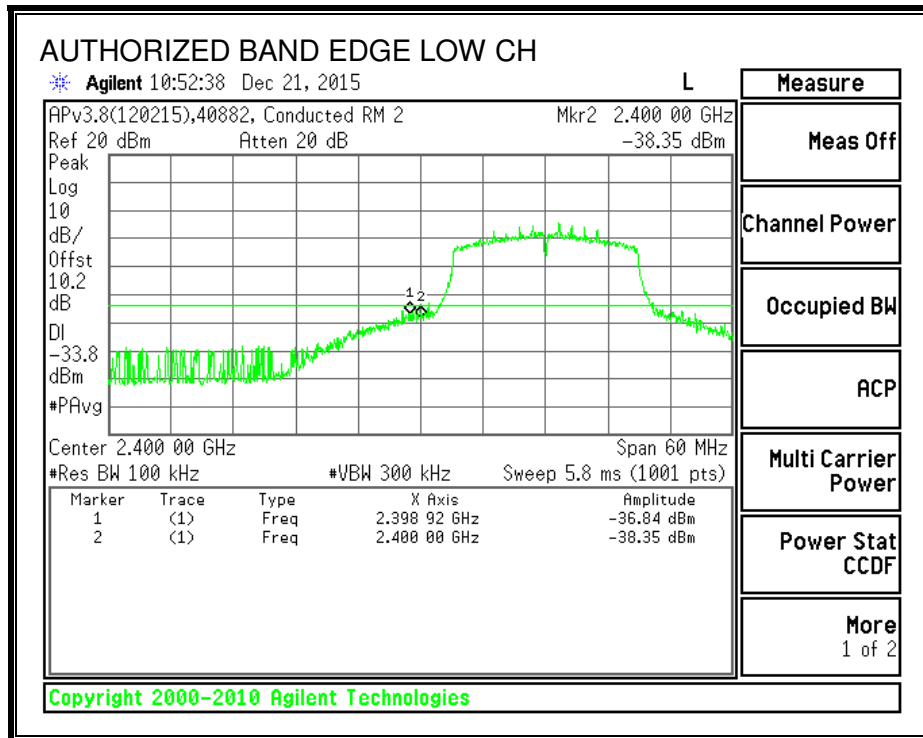
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

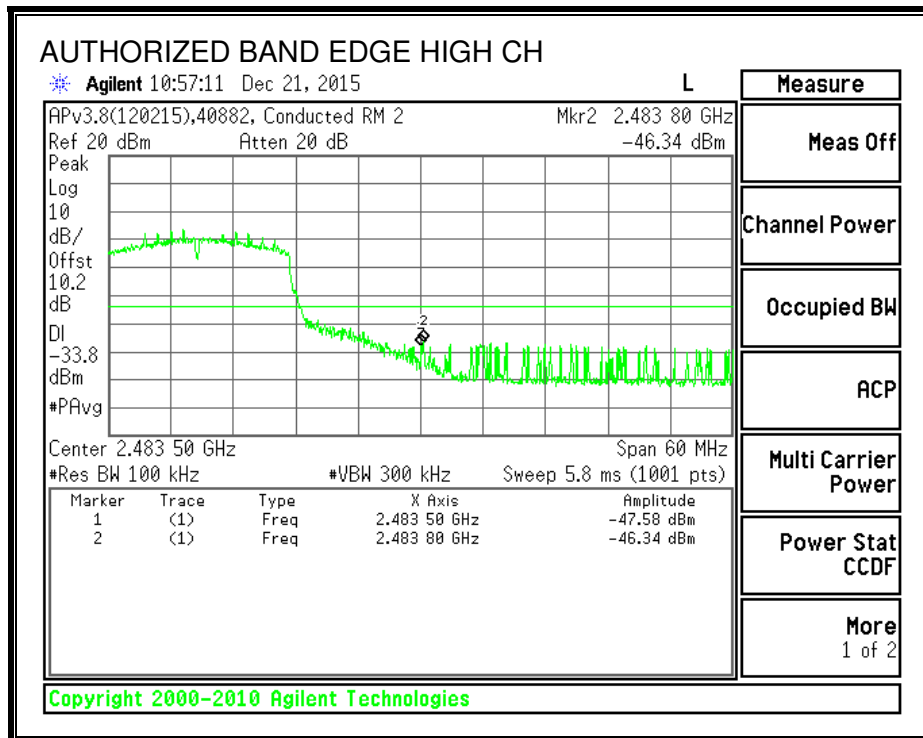
IN-BAND REFERENCE LEVEL



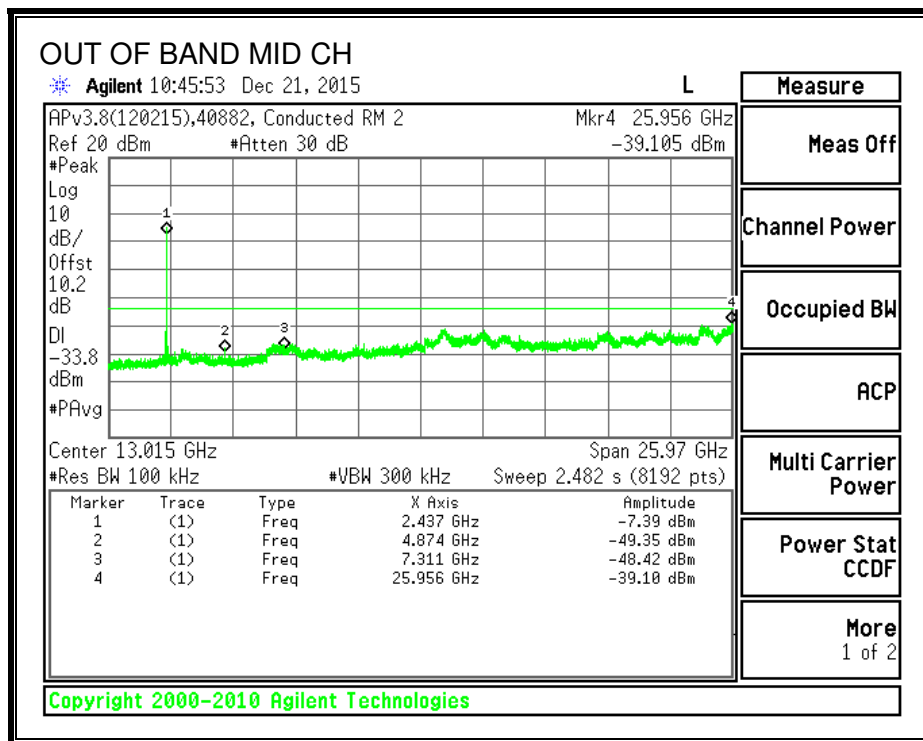
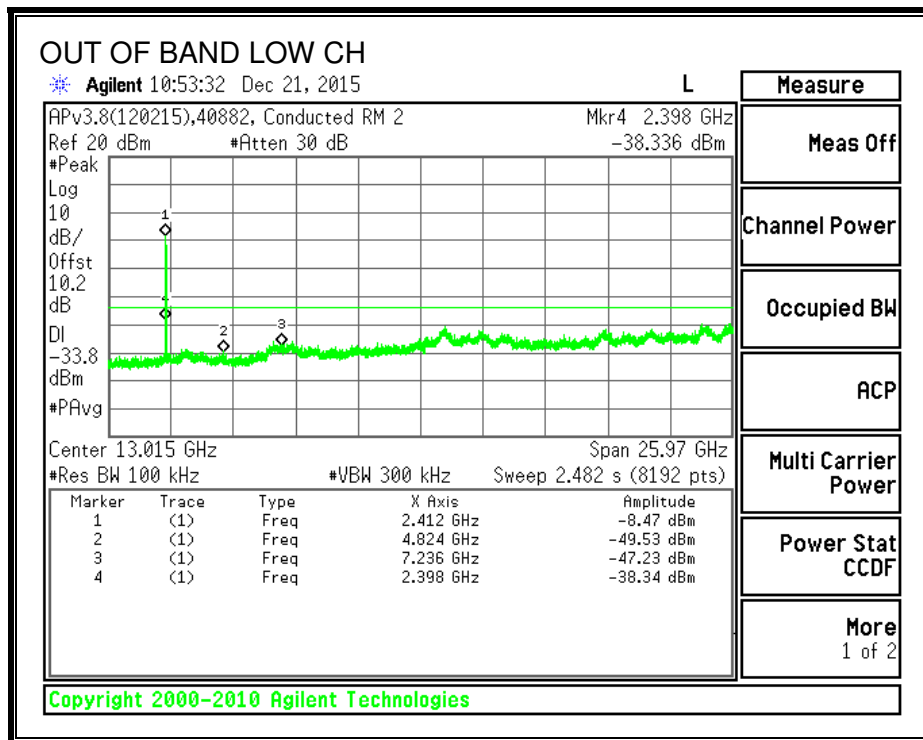
LOW CHANNEL BANDEDGE

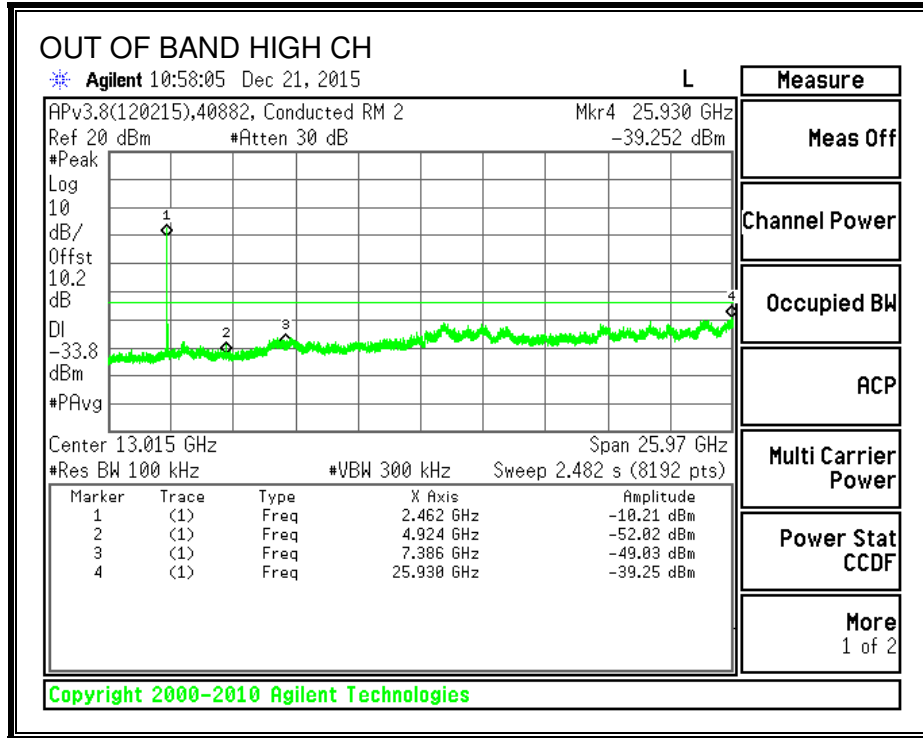


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS





9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN Clause 8.9 (Transmitter)

IC RSS-GEN Clause 7.1.2 (Receiver)

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 measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements. For this investigation, RMS power averaging was used with resolution/video bandwidth settings of 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.

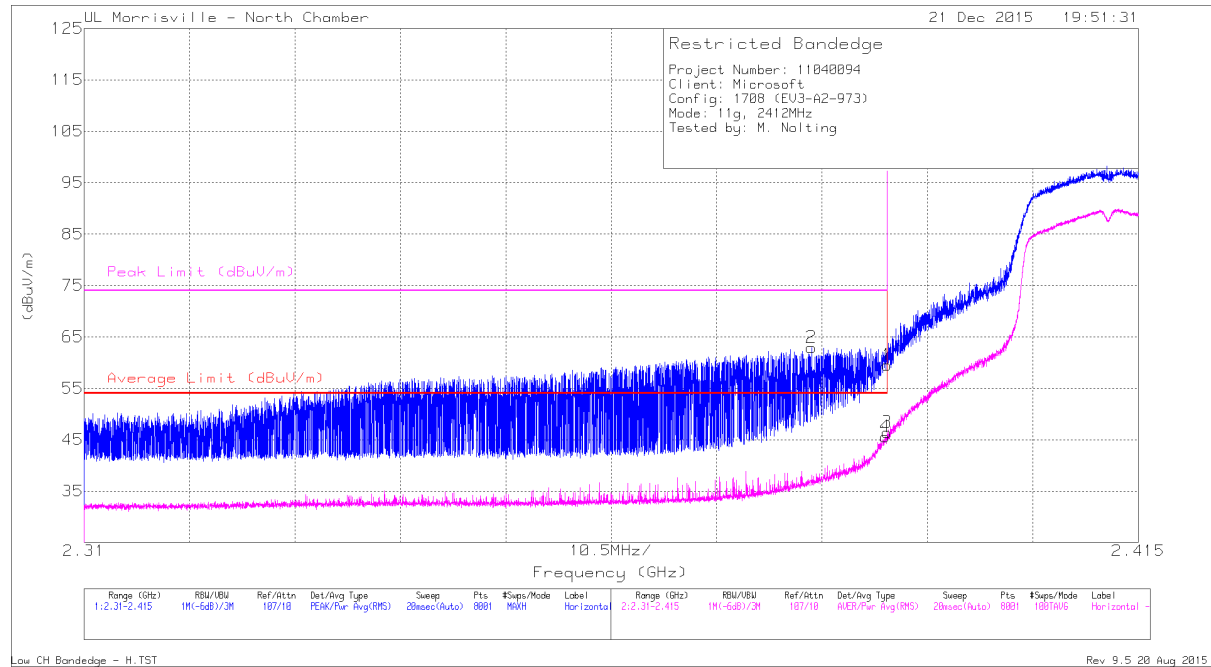
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

9.2. TRANSMITTER 1-18 GHz

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

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, HORIZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0072 (dB/m)	Amp/Cbl/Fitr/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
2	* 2.382	55.85	Pk	31.9	-24.8	0	62.95	-	-	74	-11.05	264	112	H
1	* 2.39	52.45	Pk	31.9	-24.8	0	59.55	-	-	74	-14.45	264	112	H
3	* 2.39	39.25	RMS	31.9	-24.8	.1	46.45	54	-7.55	-	-	264	112	H
4	* 2.39	38.41	RMS	31.9	-24.8	.1	45.61	54	-8.39	-	-	264	112	H

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

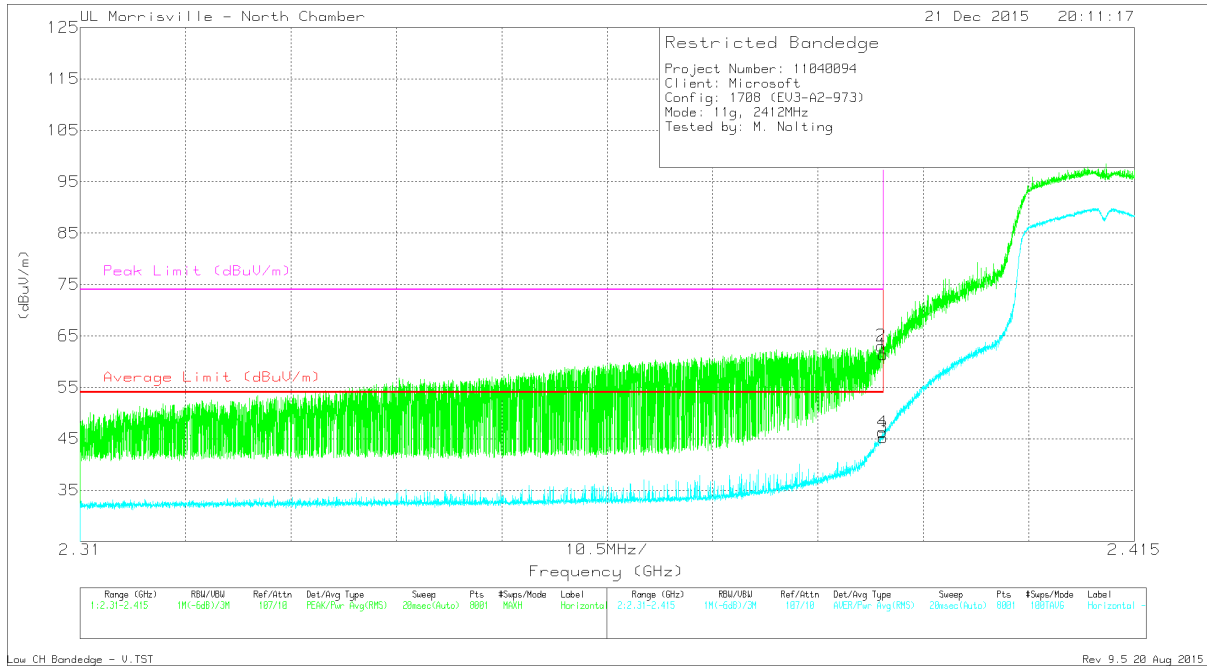
Pk - Peak detector

RMS - RMS detection

Low CH Bandedge - H.TST

Rev 9.5 20 Aug 2015

LOW CHANNEL RESTRICTED, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0072 (dB/m)	Amp/Cbl/Filtr/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	54.29	Pk	31.9	-24.8	0	61.39	-	-	74	-12.61	38	162	V
2	* 2.39	55.97	Pk	31.9	-24.8	0	63.07	-	-	74	-10.93	38	162	V
3	* 2.39	38.06	RMS	31.9	-24.8	.1	45.26	54	-8.74	-	-	38	162	V
4	* 2.39	39.06	RMS	31.9	-24.8	.1	46.26	54	-7.74	-	-	38	162	V

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

Pk - Peak detector

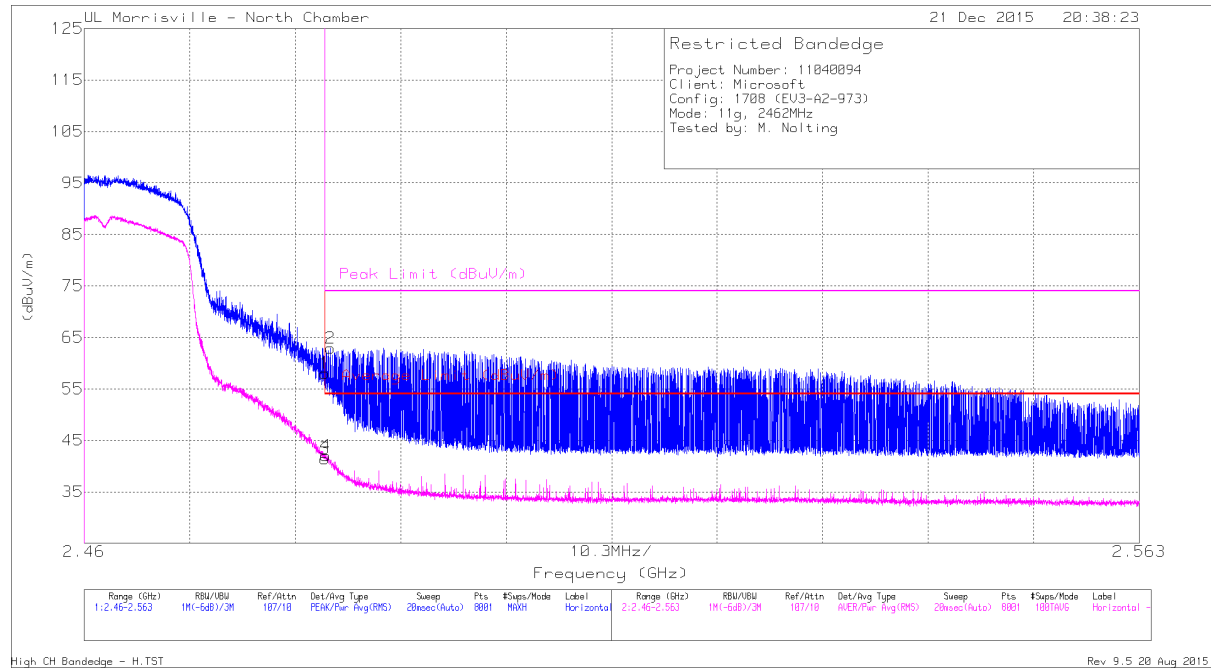
RMS - RMS detection

Low CH Bandedge - V.TST

Rev 9.5 20 Aug 2015

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, HORIZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0072 (dB/m)	Amp/Cbl/Filtr/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	50.71	Pk	32.1	-24.8	0	58.01	-	-	74	-15.99	267	101	H
2	* 2.484	55.6	Pk	32.1	-24.8	0	62.9	-	-	74	-11.1	267	101	H
3	* 2.484	34.13	RMS	32.1	-24.8	.1	41.53	54	-12.47	-	-	267	101	H
4	* 2.484	34.72	RMS	32.1	-24.8	.1	42.12	54	-11.88	-	-	267	101	H

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

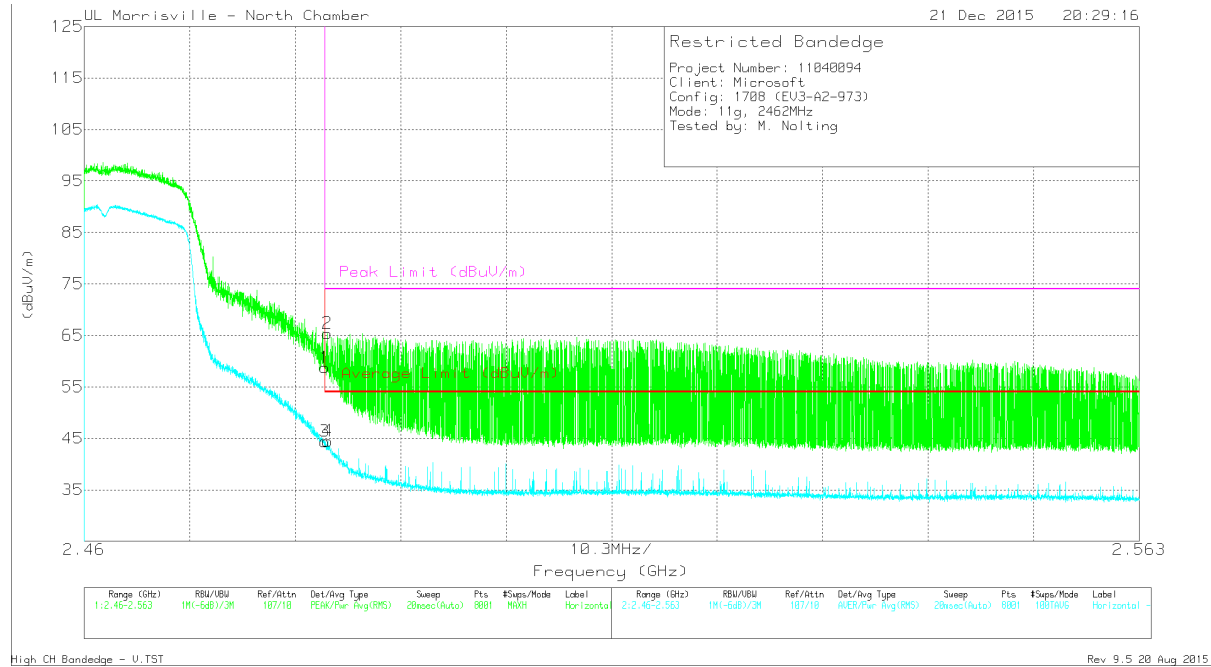
Pk - Peak detector

RMS - RMS detection

High CH Bandedge - H.TST

Rev 9.5 20 Aug 2015

HIGH CHANNEL BANDEDGE, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0072 (dB/m)	Amp/Cbl/Ftr/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	51.43	Pk	32.1	-24.8	0	58.73	-	-	74	-15.27	59	150	V
2	* 2.484	58.09	Pk	32.1	-24.8	0	65.39	-	-	74	-8.61	59	150	V
3	* 2.484	37.11	RMS	32.1	-24.8	.1	44.51	54	-9.49	-	-	59	150	V
4	* 2.484	37.19	RMS	32.1	-24.8	.1	44.59	54	-9.41	-	-	59	150	V

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

Pk - Peak detector

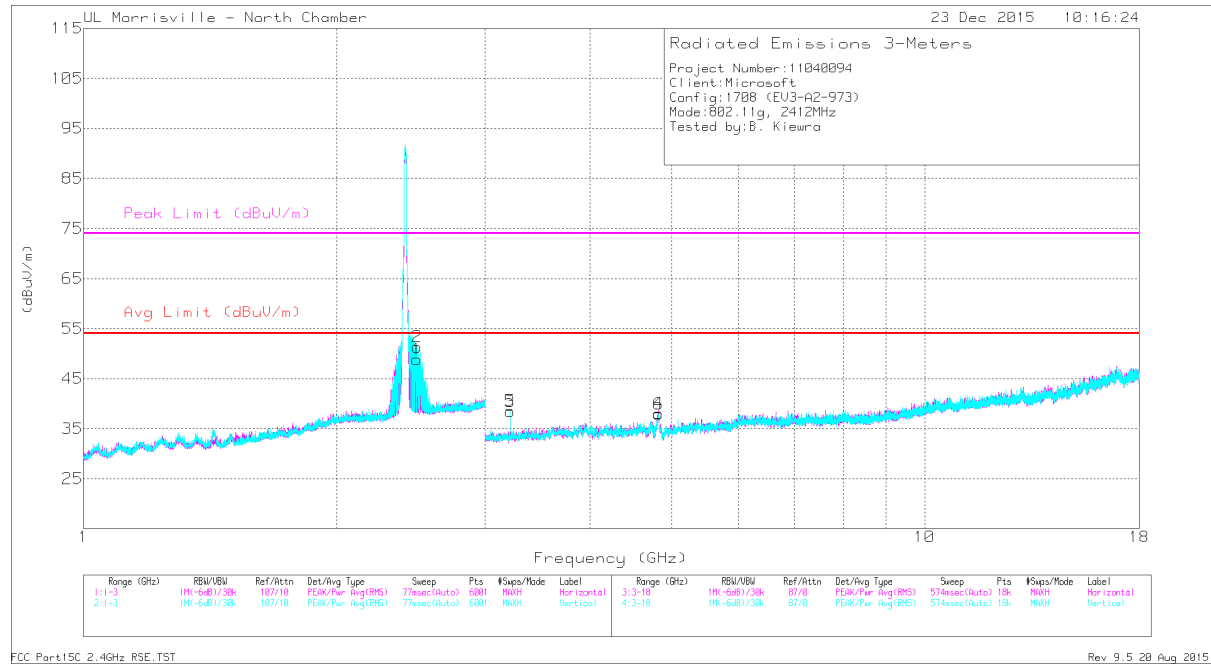
RMS - RMS detection

High CH Bandedge - V.TST

Rev 9.5 20 Aug 2015

HARMONICS AND SPURIOUS EMISSIONS

Low Channel



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0072 (dB/m)	Amp/Cbl /Fitr/Pa d (dB)	DC Corr	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.486	52.8	PK2	32.1	-24.8	0	60.1	-	-	74	-13.9	123	104	H
	* 2.487	27.13	MAv1	32.1	-24.8	.1	34.53	54	-19.47	-	-	123	104	H
2	* 2.488	54.53	PK2	32.1	-24.8	0	61.83	-	-	74	-12.17	21	192	V
	* 2.487	27.93	MAv1	32.1	-24.8	.1	35.33	54	-18.67	-	-	21	192	V
4	* 4.832	42.6	PK2	34.1	-32.1	0	44.6	-	-	74	-29.4	88	102	H
	* 4.824	31.53	MAv1	34.1	-32.2	.1	33.53	54	-20.47	-	-	88	102	H
6	* 4.823	42.8	PK2	34.1	-32.2	0	44.7	-	-	74	-29.3	207	115	V
	* 4.823	31.42	MAv1	34.1	-32.2	.1	33.42	54	-20.58	-	-	207	115	V
3	3.216	38.98	Pk	32.8	-33.4	0	38.38	-	-	-	-	0-360	200	H
5	3.216	39.09	Pk	32.8	-33.4	0	38.49	-	-	-	-	0-360	101	V

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

Pk - Peak detector

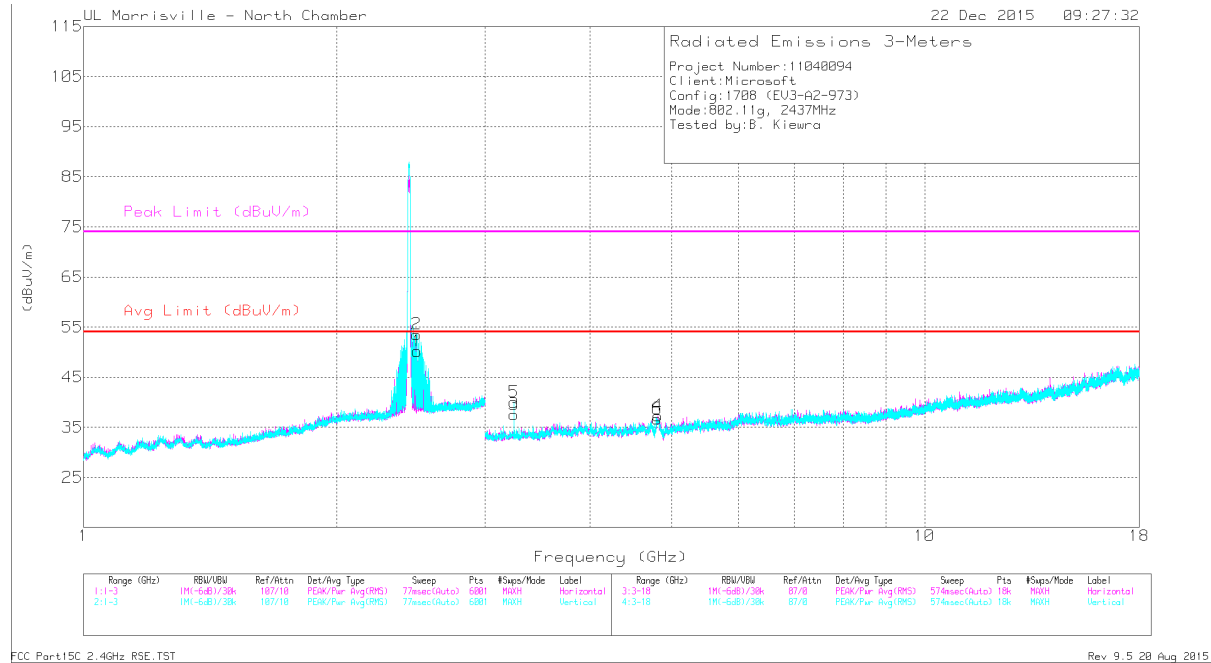
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15C 2.4GHz RSE.TST

Rev 9.5 20 Aug 2015

Mid Channel



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0072 (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	* 2.49	53.85	PK2	32.1	-24.8	0	61.15	-	-	74	-12.85	136	102	H
	* 2.492	27.3	MAv1	32.1	-24.8	0.1	34.7	54	-19.3	-	-	136	102	H
2	* 2.484	56.71	PK2	32.1	-24.8	0	64.01	-	-	74	-9.99	25	108	V
	* 2.484	28.36	MAv1	32.1	-24.8	0.1	35.76	54	-18.24	-	-	25	108	V
4	* 4.821	41.15	PK2	34.1	-32.2	0	43.05	-	-	74	-30.95	80	258	H
	* 4.812	29.81	MAv1	34.1	-32.3	0.1	31.71	54	-22.29	-	-	80	258	H
6	* 4.809	41.09	PK2	34.1	-32.3	0	42.89	-	-	74	-31.11	25	373	V
	* 4.811	29.98	MAv1	34.1	-32.3	0.1	31.88	54	-22.12	-	-	25	373	V
3	3.249	37.99	Pk	32.9	-33.3	0	37.59	-	-	-	-	0-360	101	H
5	3.249	40.41	Pk	32.9	-33.3	0	40.01	-	-	-	-	0-360	101	V

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

Pk - Peak detector

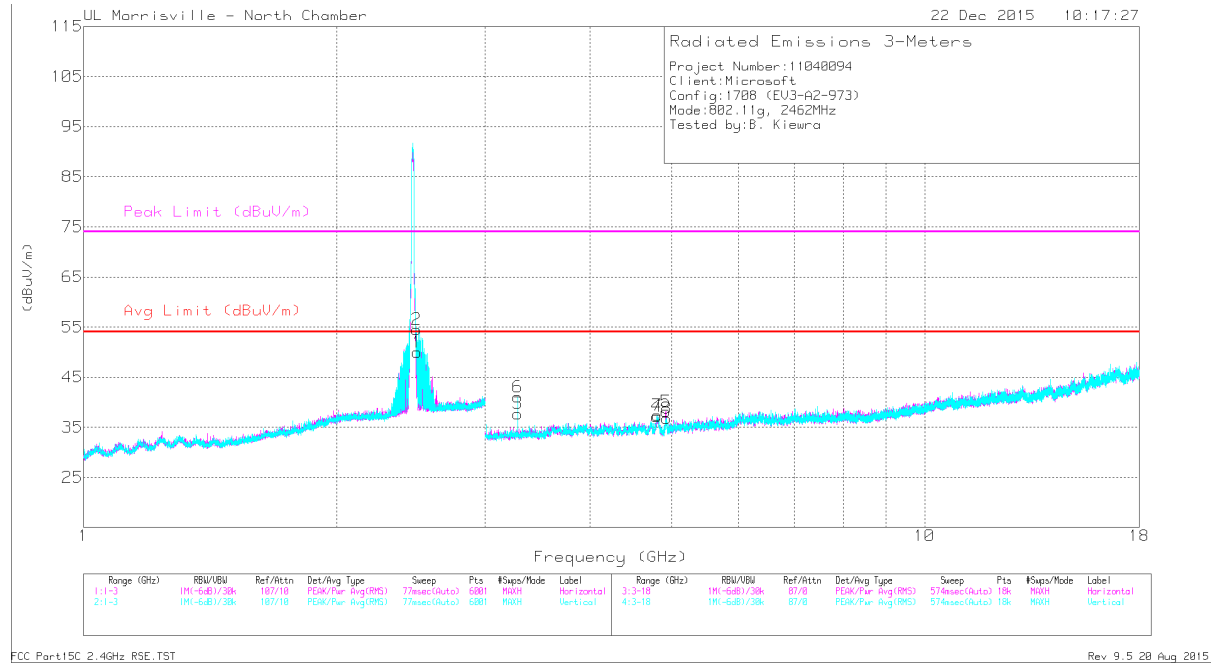
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15C 2.4GHz RSE.TST

Rev 9.5 20 Aug 2015

High Channel



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0072 (dB/m)	Amp/Cbl/ Ftr/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	* 2.495	53.66	PK2	32.1	-24.7	0	61.06	-	-	74	-12.94	6	229	H
	* 2.487	28.73	MAv1	32.1	-24.8	0.1	36.13	54	-17.87	-	-	6	229	H
2	* 2.489	56.85	PK2	32.1	-24.8	0	64.15	-	-	74	-9.85	23	134	V
	* 2.488	30.3	MAv1	32.1	-24.8	0.1	37.7	54	-16.3	-	-	23	134	V
4	* 4.812	40.37	PK2	34.1	-32.3	0	42.17	-	-	74	-31.83	184	195	H
	* 4.813	29.51	MAv1	34.1	-32.3	0.1	31.41	54	-22.59	-	-	184	195	H
5	* 4.92	42.72	PK2	34.1	-32.4	0	44.42	-	-	74	-29.58	102	117	H
	* 4.924	31.51	MAv1	34.1	-32.5	0.1	33.21	54	-20.79	-	-	102	117	H
7	* 4.818	41.4	PK2	34.1	-32.2	0	43.3	-	-	74	-30.7	71	380	V
	* 4.814	29.88	MAv1	34.1	-32.2	0.1	31.88	54	-22.12	-	-	71	380	V
8	* 4.922	42.05	PK2	34.1	-32.5	0	43.65	-	-	74	-30.35	201	117	V
	* 4.924	30.56	MAv1	34.1	-32.5	0.1	32.26	54	-21.74	-	-	201	117	V
3	3.282	38.33	Pk	32.9	-33.5	0	37.73	-	-	-	-	0-360	101	H
6	3.282	41.62	Pk	32.9	-33.5	0	41.02	-	-	-	-	0-360	101	V

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

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

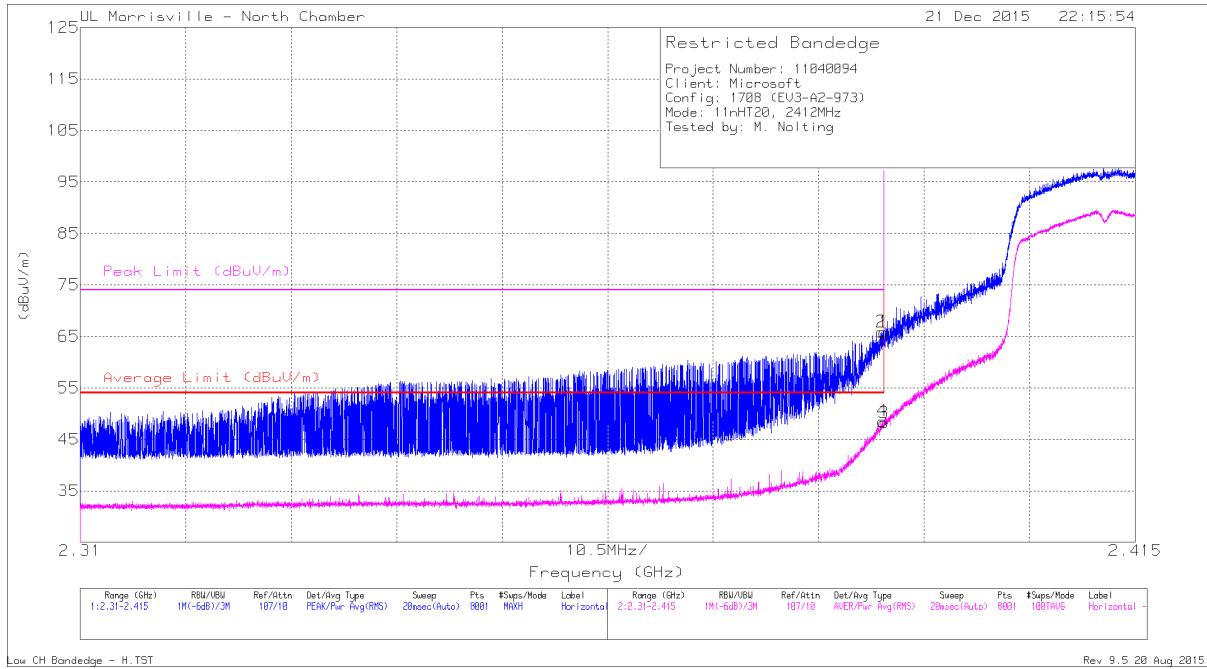
FCC Part15C 2.4GHz RSE, TST

Rev 9.5 20 Aug 2015

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

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, HORIZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0072 (dB/m)	Amp/Cbl/Filtr/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	58.69	Pk	31.9	-24.8	0	65.79	-	-	74	-8.21	264	112	H
2	* 2.39	58.76	Pk	31.9	-24.8	0	65.86	-	-	74	-8.14	264	112	H
3	* 2.39	41.04	RMS	31.9	-24.8	.1	48.24	54	-5.76	-	-	264	112	H
4	* 2.39	41.35	RMS	31.9	-24.8	.1	48.55	54	-5.45	-	-	264	112	H

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

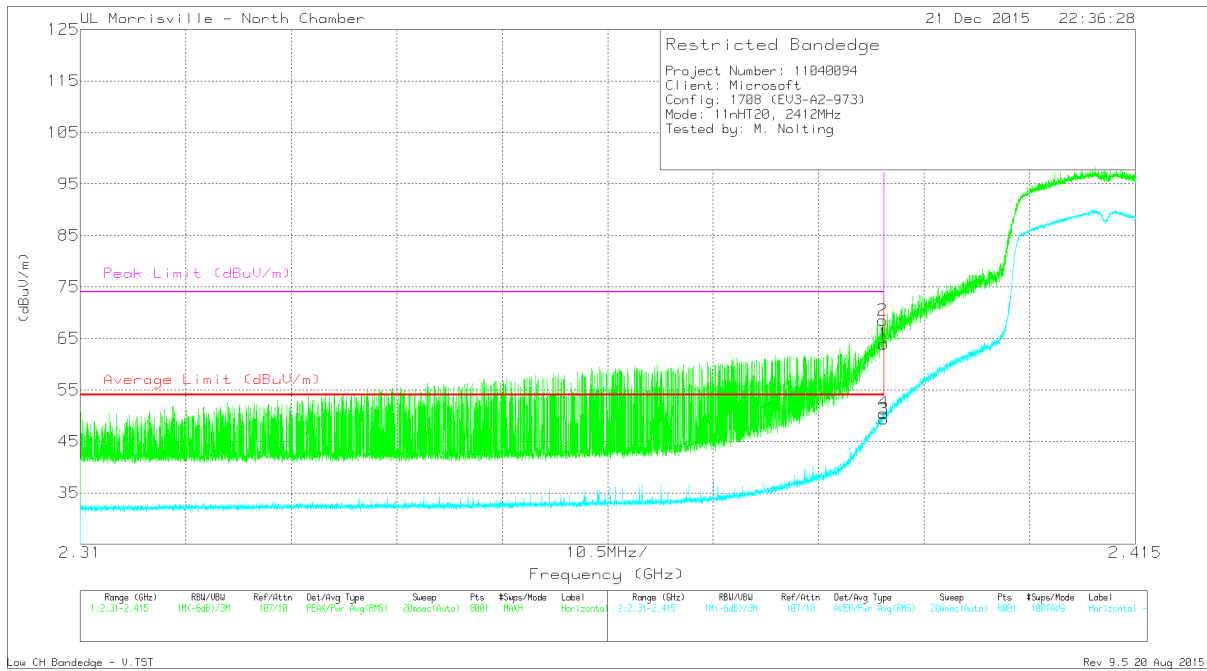
Pk - Peak detector

RMS - RMS detection

Low CH Bandedge - H.TST

Rev 9.5.20 Aug 2015

LOW CHANNEL RESTRICTED, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0072 (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	56.86	Pk	31.9	-24.8	0	63.96	-	-	74	-10.04	64	161	V
2	* 2.39	61.44	Pk	31.9	-24.8	0	68.54	-	-	74	-5.46	64	161	V
3	* 2.39	42.14	RMS	31.9	-24.8	.1	49.34	54	-4.66	-	-	64	161	V
4	* 2.39	43.31	RMS	31.9	-24.8	.1	50.51	54	-3.49	-	-	64	161	V

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

Pk - Peak detector

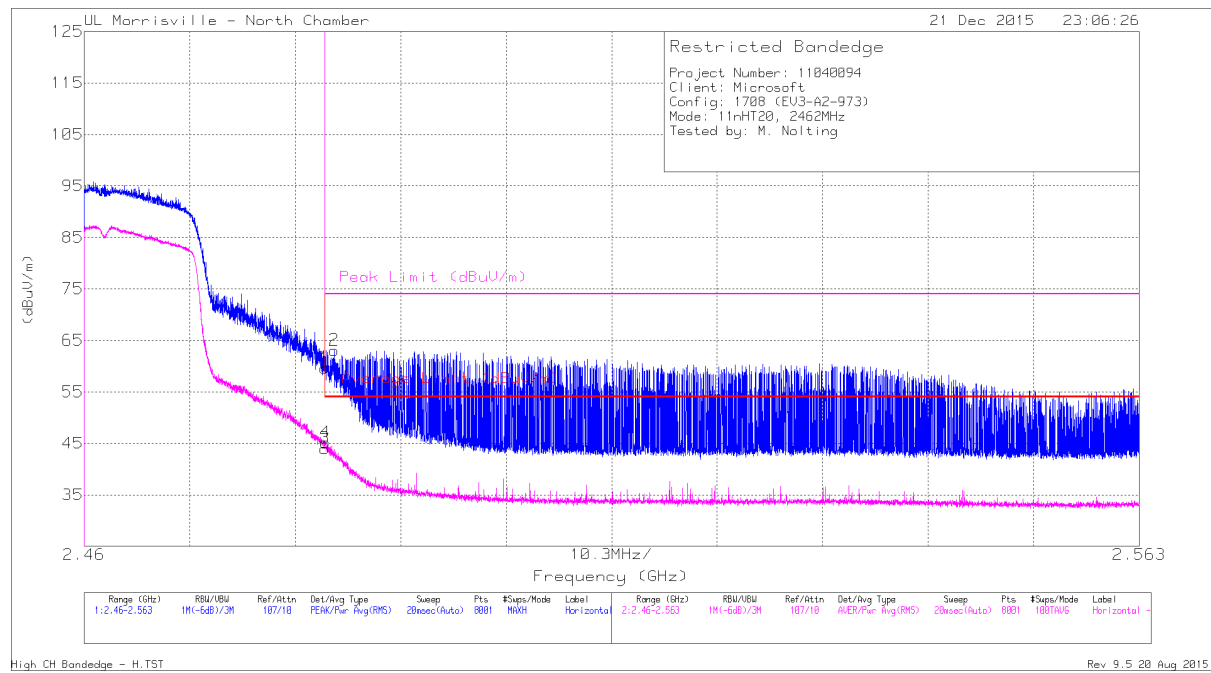
RMS - RMS detection

Low CH Bandedge - V.TST

Rev 9.5.20 Aug 2015

RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, HORIZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0072 (dB/m)	Amp/Cbl/Fitr/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	52.35	Pk	32.1	-24.8	0	59.65	-	-	74	-14.35	132	101	H
2	* 2.484	55.78	Pk	32.1	-24.8	0	63.08	-	-	74	-10.92	132	101	H
3	* 2.484	36.63	RMS	32.1	-24.8	.1	44.03	54	-9.97	-	-	132	101	H
4	* 2.484	37.76	RMS	32.1	-24.8	.1	45.16	54	-8.84	-	-	132	101	H

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

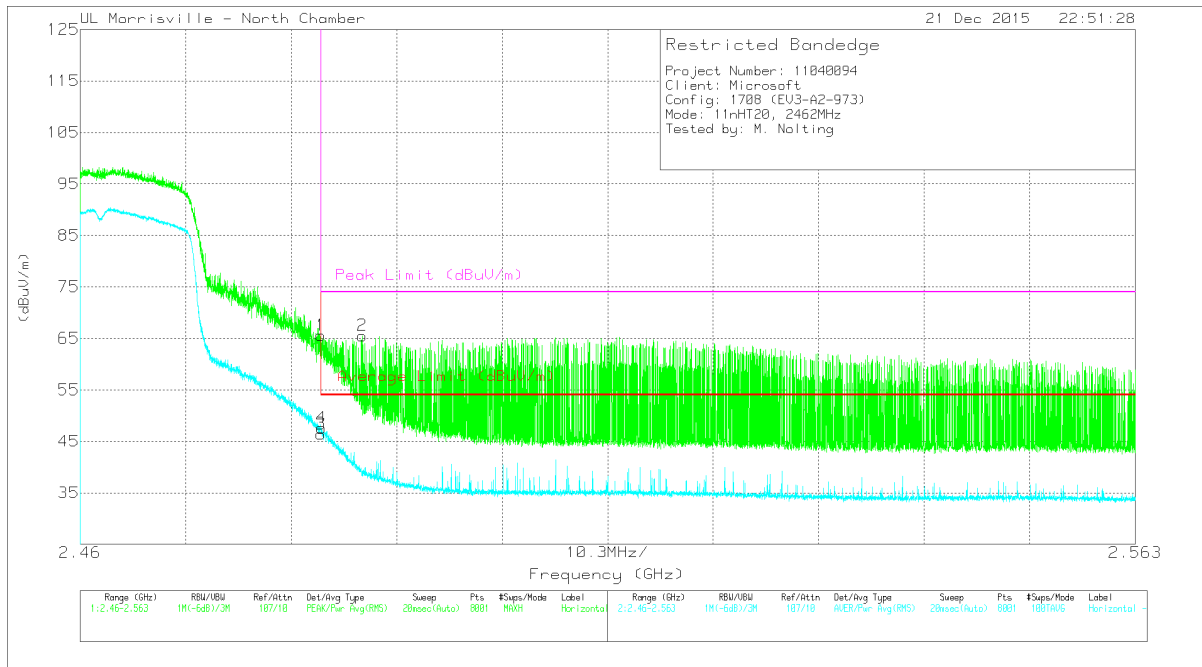
Pk - Peak detector

RMS - RMS detection

High CH Bandedge - H.TST

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HIGH CHANNEL BANDEDGE, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0072 (dB/m)	Amp/Cbl/Filtr/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	58.28	Pk	32.1	-24.8	0	65.58	-	-	74	-8.42	28	125	V
2	* 2.488	58.24	Pk	32.1	-24.8	0	65.54	-	-	74	-8.46	28	125	V
3	* 2.484	39.06	RMS	32.1	-24.8	.1	46.46	54	-7.54	-	-	28	125	V
4	* 2.484	40.2	RMS	32.1	-24.8	.1	47.6	54	-6.4	-	-	28	125	V

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

Pk - Peak detector

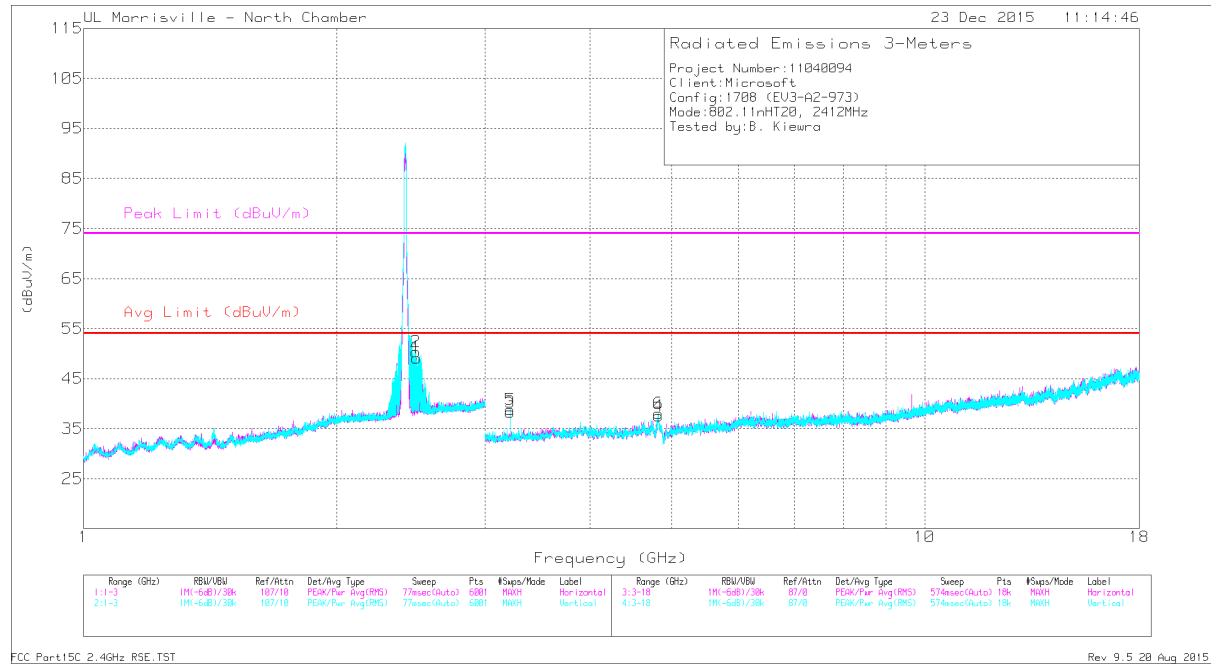
RMS - RMS detection

High CH Bandedge - V.TST

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HARMONICS AND SPURIOUS EMISSIONS (1-18 GHz)

Low Channel



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0072 (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	* 2.484	51.09	PK2	32.1	-24.8	0	58.39	-	-	74	-15.61	142	144	H
	* 2.484	26.35	MAv1	32.1	-24.8	.1	33.75	54	-20.25	-	-	142	144	H
2	* 2.485	54.17	PK2	32.1	-24.8	0	61.47	-	-	74	-12.53	63	110	V
	* 2.487	27.68	MAv1	32.1	-24.8	.1	35.08	54	-18.92	-	-	63	110	V
4	* 4.823	43.05	PK2	34.1	-32.2	0	44.95	-	-	74	-29.05	194	283	H
	* 4.824	31.99	MAv1	34.1	-32.2	.1	33.99	54	-20.01	-	-	194	283	H
6	* 4.823	43.18	PK2	34.1	-32.2	0	45.08	-	-	74	-28.92	196	101	V
	* 4.823	31.69	MAv1	34.1	-32.2	.1	33.69	54	-20.31	-	-	196	101	V
3	3.216	38.92	Pk	32.8	-33.4	0	38.32	-	-	-	-	0-360	200	H
5	3.216	39.38	Pk	32.8	-33.4	0	38.78	-	-	-	-	0-360	101	V

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

Pk - Peak detector

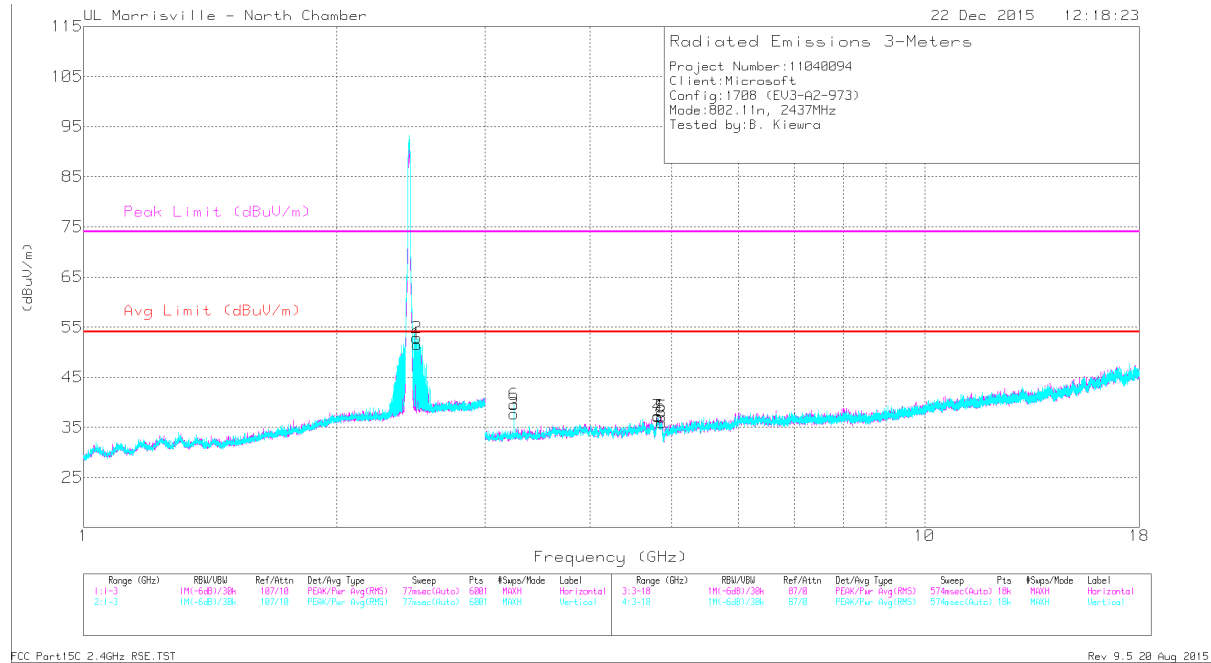
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15C 2.4GHz RSE.TST

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Mid Channel



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0072 (dB/m)	Amp/Cb/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	* 2.496	53.43	PK2	32.1	-24.7	0	60.83	-	-	74	-13.17	135	124	H
	* 2.496	27.41	MAv1	32.1	-24.7	.1	34.91	54	-19.09	-	-	135	124	H
2	* 2.486	56.19	PK2	32.1	-24.8	0	63.49	-	-	74	-10.51	30	170	V
	* 2.487	28.18	MAv1	32.1	-24.8	.1	35.58	54	-18.42	-	-	30	170	V
4	* 4.82	40.98	PK2	34.1	-32.2	0	42.88	-	-	74	-31.12	107	391	H
	* 4.809	29.74	MAv1	34.1	-32.3	.1	31.64	54	-22.36	-	-	107	391	H
5	* 4.869	42.6	PK2	34.1	-32	0	44.7	-	-	74	-29.3	214	343	H
	* 4.874	30.49	MAv1	34.1	-32.2	.1	32.49	54	-21.51	-	-	214	343	H
7	* 4.81	40.85	PK2	34.1	-32.3	0	42.65	-	-	74	-31.35	289	197	V
	* 4.81	29.44	MAv1	34.1	-32.3	.1	31.34	54	-22.66	-	-	289	197	V
8	* 4.867	42.05	PK2	34.1	-31.9	0	44.25	-	-	74	-29.75	195	105	V
	* 4.874	30.68	MAv1	34.1	-32.2	.1	32.68	54	-21.32	-	-	195	105	V
3	3.249	38.08	Pk	32.9	-33.3	0	37.68	-	-	-	-	0-360	200	H
6	3.249	39.93	Pk	32.9	-33.3	0	39.53	-	-	-	-	0-360	101	V

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

Pk - Peak detector

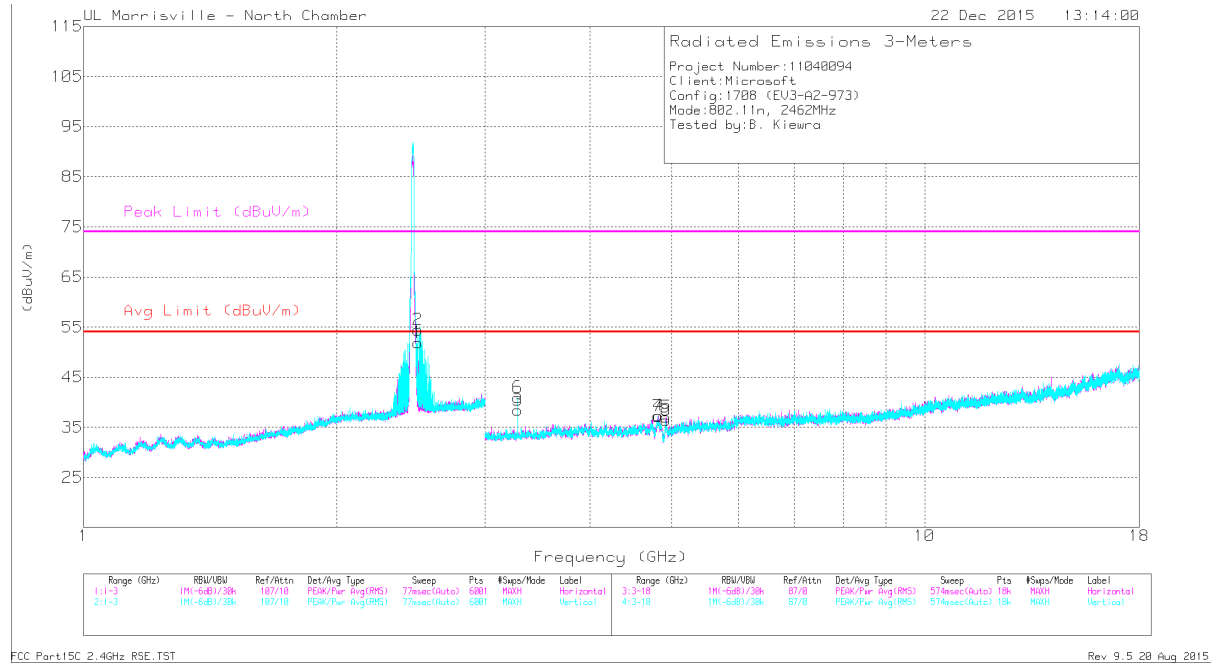
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15C 2.4GHz RSE.TST

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High Channel



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0072 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Avg Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.498	54.31	PK2	32.1	-24.7	0	61.71	-	-	74	-12.29	131	123	H
	* 2.484	35.13	MAv1	32.1	-24.8	.1	42.53	54	-11.47	-	-	131	123	H
2	* 2.484	58.23	PK2	32.1	-24.8	0	65.53	-	-	74	-8.47	61	151	V
	* 2.484	38.91	MAv1	32.1	-24.8	.1	46.31	54	-7.69	-	-	61	151	V
4	* 4.824	40.6	PK2	34.1	-32.2	0	42.5	-	-	74	-31.5	303	228	H
	* 4.824	29.37	MAv1	34.1	-32.2	.1	31.37	54	-22.63	-	-	303	228	H
5	* 4.923	42.56	PK2	34.1	-32.5	0	44.16	-	-	74	-29.84	168	127	H
	* 4.926	30.98	MAv1	34.1	-32.6	.1	32.58	54	-21.42	-	-	168	127	H
7	* 4.819	41.06	PK2	34.1	-32.2	0	42.96	-	-	74	-31.04	17	400	V
	* 4.815	29.97	MAv1	34.1	-32.2	.1	31.97	54	-22.03	-	-	17	400	V
8	* 4.929	41.24	PK2	34.1	-32.6	0	42.74	-	-	74	-31.26	187	114	V
	* 4.927	29.96	MAv1	34.1	-32.6	.1	31.56	54	-22.44	-	-	187	114	V
3	3.282	39.01	PK	32.9	-33.5	0	38.41	-	-	-	-	0-360	199	H
6	3.282	41.57	PK	32.9	-33.5	0	40.97	-	-	-	-	0-360	101	V

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

PK - Peak detector

PK2 - KDB558074 Method: Maximum Peak

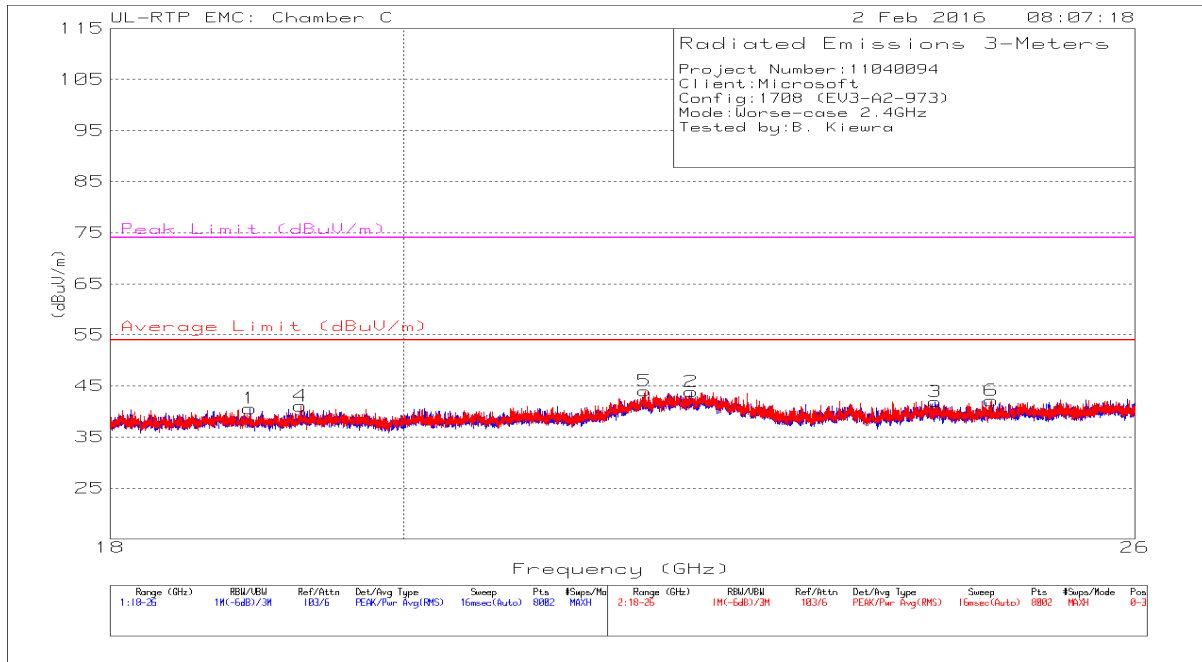
MAv1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15C 2.4GHz RSE.TST

Rev 9.5 20 Aug 2015

9.3. WORST-CASE 18-26GHz

9.3.1. SPURIOUS EMISSIONS 18 TO 26GHz (2.4GHz BAND)



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF (dB/m)	Amp/Cbl (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 18.925	48.1	PK2	32.4	-40.8	0	39.7	54	-14.3	74	-34.3	140	101	H
2	* 22.173	48.37	PK2	36.2	-40.6	0	43.97	54	-10.03	74	-30.03	32	244	H
4	* 19.271	48.85	PK2	32.6	-40.6	0	40.85	54	-13.15	74	-33.15	20	347	V
3	24.202	47.62	Pk	33.5	-39.2	0	41.92	-	-	-	-	0-360	200	H
5	21.807	49.22	Pk	35.6	-40.8	0	44.02	-	-	-	-	0-360	125	V
6	24.694	47.15	Pk	33.7	-38.7	0	42.15	-	-	-	-	0-360	175	V

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

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

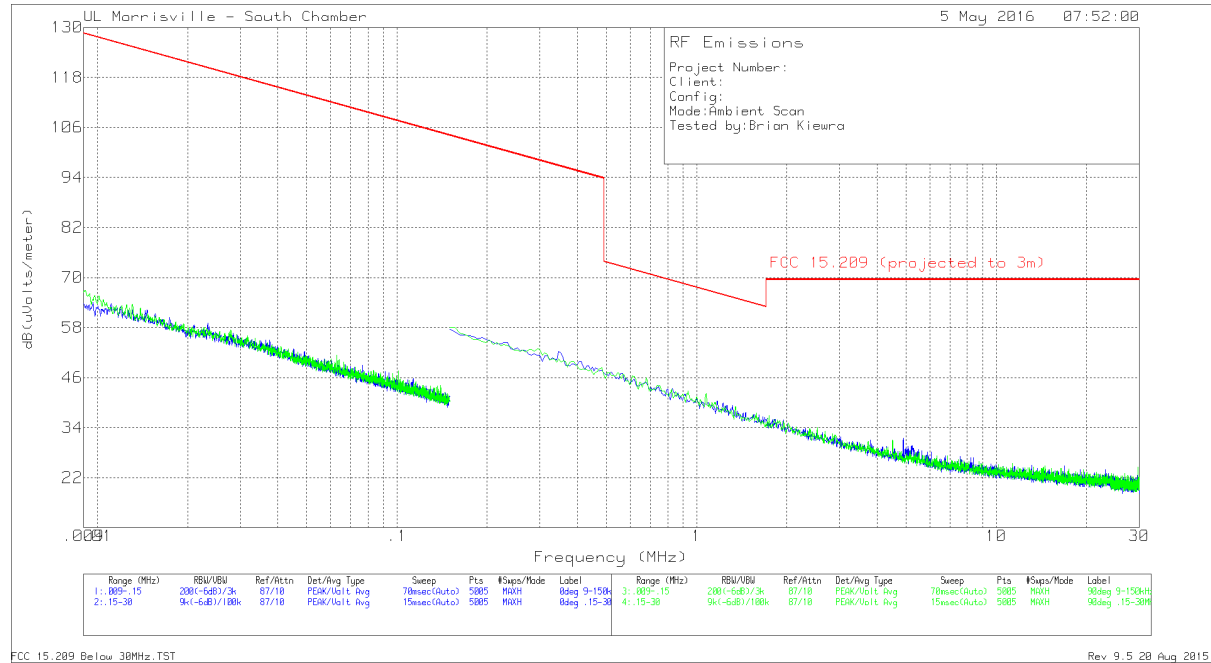
MAv1 - KDB558074 Option 1 Maximum RMS Average

9.4. WORST-CASE BELOW 1 GHz

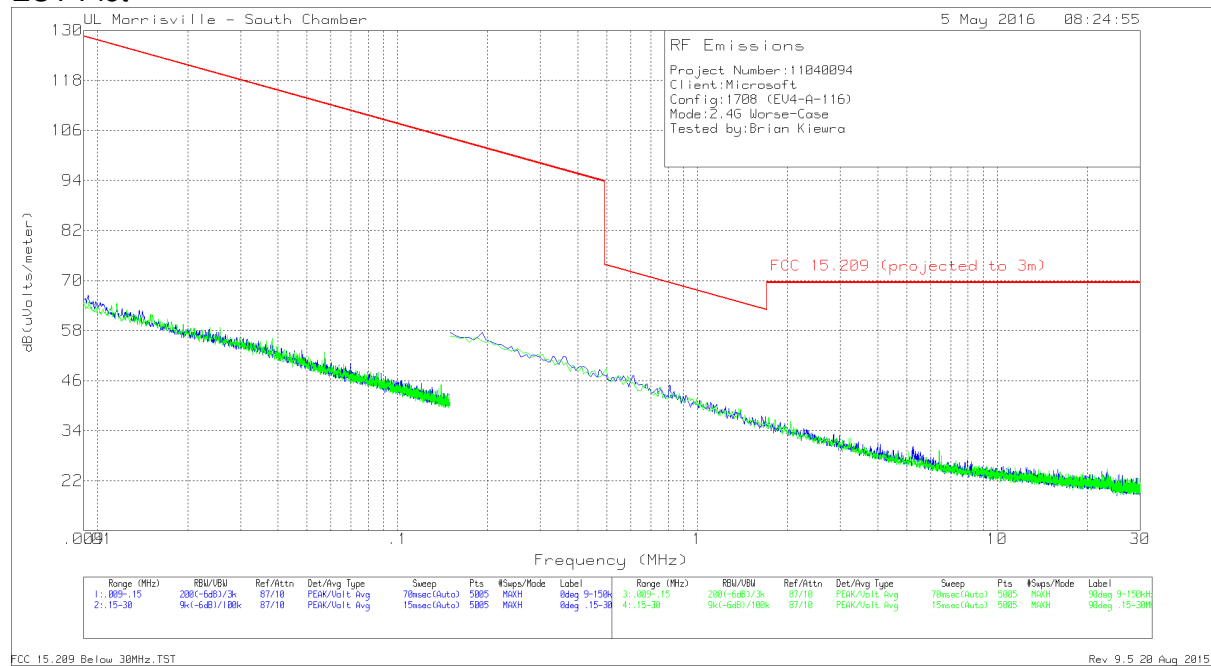
9.4.1. SPURIOUS EMISSIONS 9kHz-30 MHz (WORST-CASE CONFIGURATION)

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 $40 \cdot \text{Log}(\text{specification distance} / \text{test distance})$.

Ambient Scan

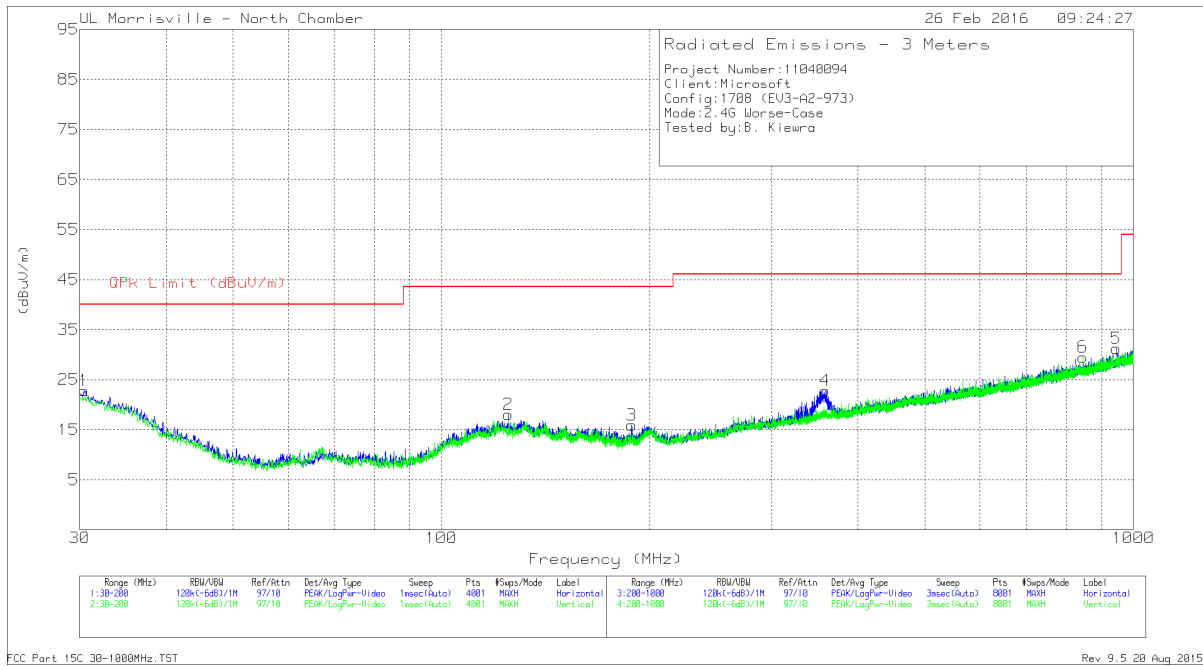


EUT Plot



The above plots demonstrate there were no EUT-related emissions of interest relative to the FCC 15.209 limit below 30MHz.

9.4.2. SPURIOUS EMISSIONS 30 TO 1000 MHz (2.4GHz BAND)



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0073 AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 124.8806	23.3	Qp	18.2	-30.6	10.9	43.52	-32.62	190	340	H
1	30.425	28.62	Pk	25.8	-31.6	22.82	40	-17.18	0-360	100	H
3	188.3975	30.27	Pk	15.8	-30.2	15.87	43.52	-27.65	0-360	200	H
4	358.3	32.38	Pk	19.6	-29.2	22.78	46.02	-23.24	0-360	102	H
5	943.9	29.84	Pk	27.5	-26.1	31.24	46.02	-14.78	0-360	400	H
6	844.5	30.33	Pk	26.3	-27.1	29.53	46.02	-16.49	0-360	199	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

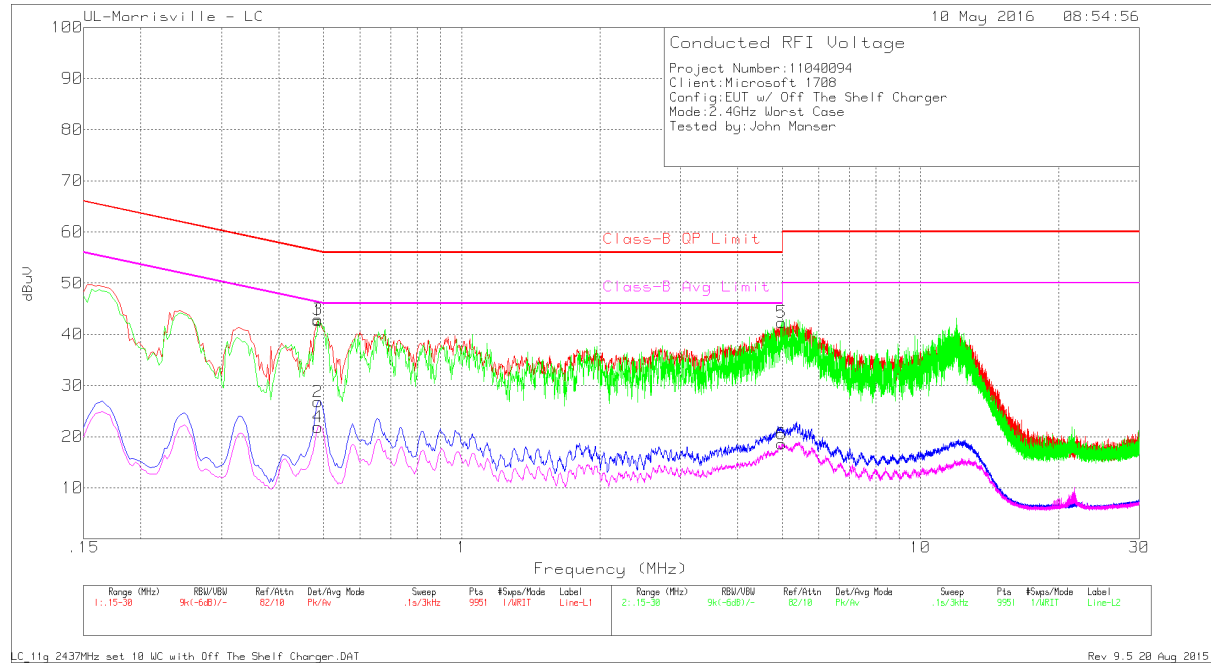
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

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

LINE 1 and 2 RESULTS



6 WORST EMISSIONS

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF [dB]	Cbl/Limiter (dB)	Corrected Reading dBuV	Class-B QP Limit	Margin (dB)	Class-B Avg Limit	Margin (dB)
1	.486	32.57	Pk	.1	10	42.67	56.24	-13.57	-	-
2	.486	16.73	Av	.1	10	26.83	-	-	46.24	-19.41
3	.486	32.81	Pk	.1	10	42.91	56.24	-13.33	-	-
4	.486	11.75	Av	.1	10	21.85	-	-	46.24	-24.39
5	4.989	32.04	Pk	.1	10.2	42.34	56	-13.66	-	-
6	4.989	8.27	Av	.1	10.2	18.57	-	-	46	-27.43

Pk - Peak detector

Av - Average detection

LC_11g 2437MHz set 10 WC with Off The Shelf Charger.DAT

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