



NCC LP0002

CERTIFICATION TEST REPORT

FOR

Multimedia Device with BLE, 2.4GHz and 5GHz WLAN Radios

MODEL NUMBER: NC2-6A5

FCC ID: A4RNC2-6A5

REPORT NUMBER: 15U20917-E23

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Prepared for

GOOGLE

**1600 AMPHITHEATRE PARKWAY
MOUNTAIN VIEW, CA 94043, U.S.A.**

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NVLAP LAB CODE 200065-0

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: GOOGLE
1600 AMPHITHEATRE PARKWAY
MOUNTAIN VIEW, CA 94043, U.S.A.

EUT DESCRIPTION: Multimedia Device With Ble, 2.4ghz And 5ghz Wlan Radios

MODEL: NC2-6A5

SERIAL NUMBER: 5323103ZZAJR (RADIATED) &
PROTO 1 (CONDUCTED)

DATE TESTED: May 6, 2015 – June 19, 2015

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
NCC LP0002	Pass

UL Verification Services Inc. 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 Verification Services Inc. 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.

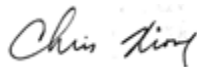
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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 Verification Services Inc. By:



FRANCISCO DE ANDA
PROJECT LEAD
UL Verification Services Inc.

Tested By:



CHRIS XIONG
EMC ENGINEER
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with NCC LP0002, ANSI C63.10-2009 for FCC and ANSI C63.10-2013 for IC, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 4, and RSS-247 Issue 1.

Testing for radiated emissions above 1GHz was performed with the EUT elevated at 1.5m instead of 0.8m. 1.5m is the required height in ANSI C63.10:2013 as referenced by RSS GEN issue 4. This test height has been permitted by FCC as discussed in FCC/TCB conference call in December 2014.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☐ Chamber A	☐ Chamber D
☐ Chamber B	☐ Chamber E
☐ Chamber C	☒ Chamber F
	☐ Chamber G
	☐ Chamber H

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

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:

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	± 3.52 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.94 dB
Radiated Disturbance, 1 to 6 GHz	± 3.86 dB
Radiated Disturbance, 6 to 18 GHz	± 4.23 dB
Radiated Disturbance, 18 to 26 GHz	± 5.30 dB
Radiated Disturbance, 26 to 40 GHz	± 5.23 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Multimedia Device with BLE, 2.4Ghz and 5GHz WLAN Radios.

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	18.98	79.07
2412 - 2462	802.11g	14.92	31.05
2412 - 2462	802.11n HT20	13.14	20.61
2422 - 2452	802.11n HT40	10.37	10.89

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes PCB antennas, with a maximum gain of 3.1dBi for antenna 1 and 2.3dBi for antenna 2.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 15.2.7.09.

The test utility software used during testing was Labtool ver 2.0.0.71

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 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 client were:

802.11b mode: 1 Mbps
802.11g mode: 6 Mbps
802.11n HT20mode: MCS0
802.11n HT40mode: MCS0

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Lenovo	ADLX65NCC2A	11545N0263Z1Z5994AH GRO	N/A
AC Adapter	Google	S005BBU0500100	Proto 1	N/A
Laptop	Lenovo	E440	PF-074E9W 15/01	N/A
USB Hub	Belkin	N10117	P11438	N/A
USB LAN Adapter	HP	538507	001	N/A

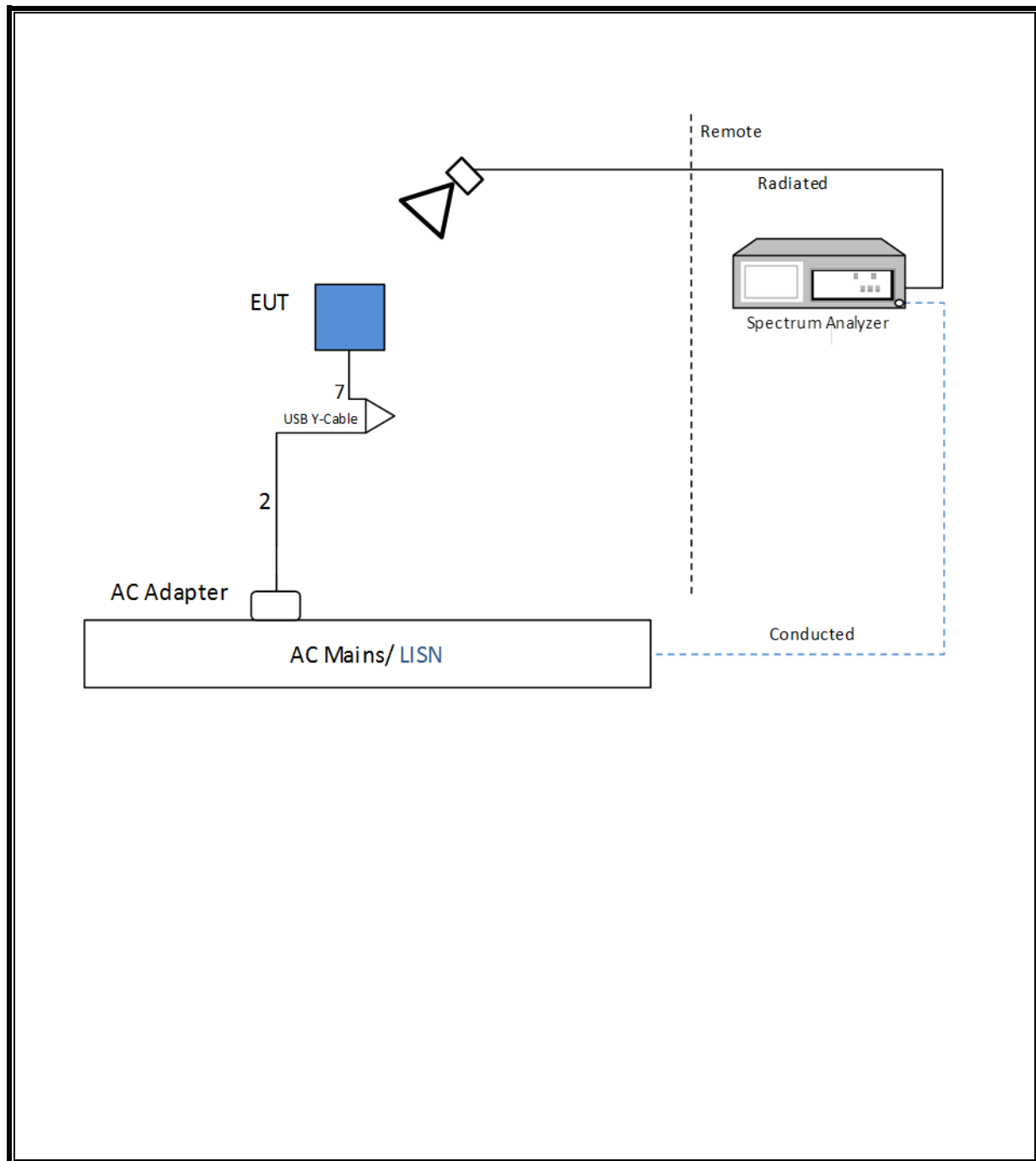
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC	1	Barrel	unshielded	0.8	
2	USB	1	USB	unshielded	1.5	Power cable
3	USB	1	USB	unshielded	2.5	
4	LAN	1	RJ45	unshielded	2.5	
5	USB	1	USB	unshielded	0.1	
6	USB	1	USB	unshielded	0.2	Data
7	USB	1	Micro USB	unshielded	0.2	Y-cable

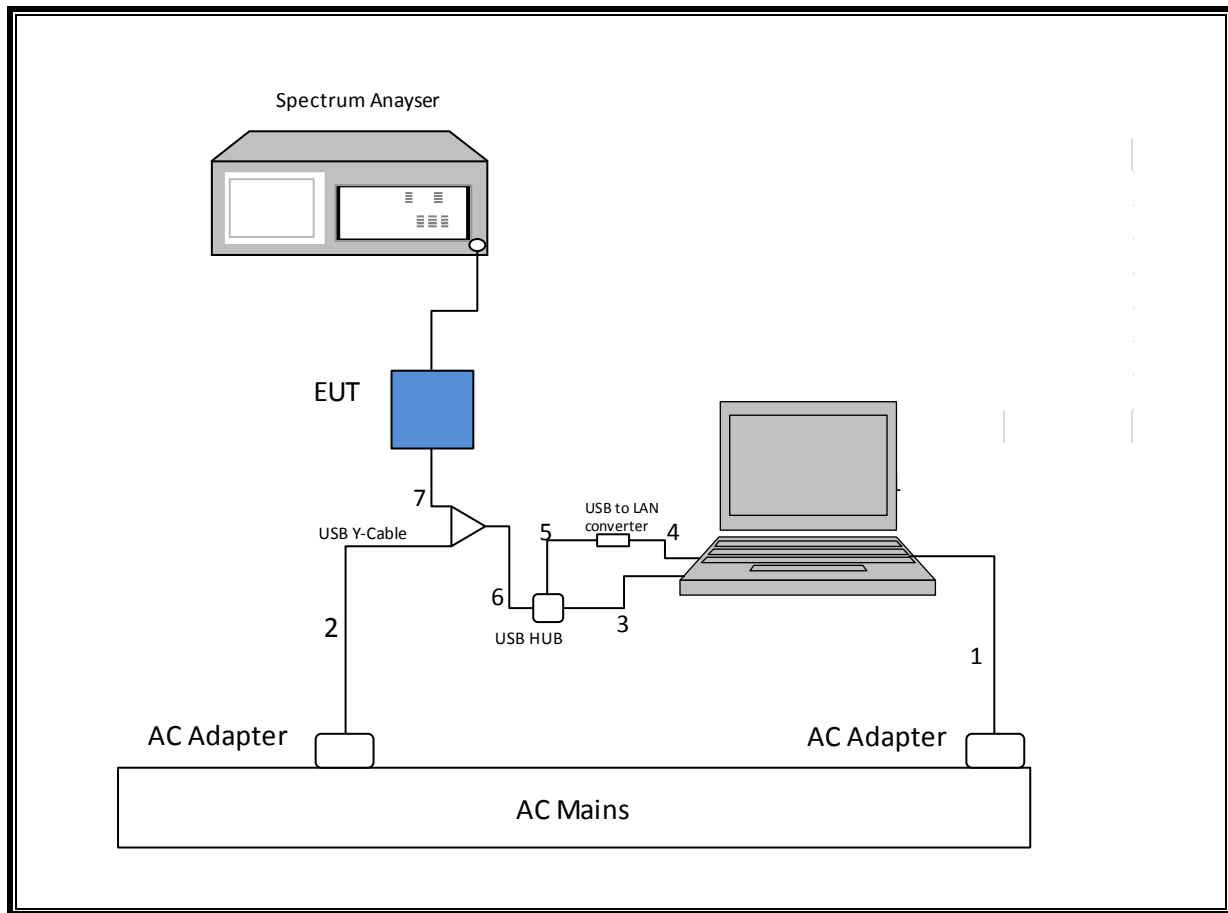
TEST SETUP

The EUT is connected to a host laptop via USB HUB and USB-to-LAN Adapter, test software exercises the radio.

SETUP DIAGRAM FOR RADIATED and AC LC TESTS



SETUP DIAGRAM FOR CONDUCTED TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List				
Description	Manufacturer	Model	Asset	Cal Due
Radiated Software	UL	UL EMC	Ver 9.5, July 22, 2014	
Conducted Software	UL	UL EMC	Ver 2.2, March 31, 2015	
Spectrum Analyzer, PXA, 3Hz to	Agilent	N9030A	341	02/20/16
Antenna, Horn 1-18GHz	ETS Lindgren	3117	120	03/26/16
Antenna, Broadband Hybrid, 30MHz	Sunol Sciences	JB1	122	02/13/16
Amplifier, 10KHz to 1GHz,	Sonoma	310N	173	06/09/16
Amplifier, 1 - 18GHz	Miteq	AFS42-	742	01/31/16
Amplifier, 26 - 40GHz	Miteq	NSP4000-SP2	88	4/7/2016
Filter, HPF 3.0GHz	Micro-Tronics	HPM17543	427	01/31/16
Filter, LPF 5.0GHz	Micro-Tronics	LPS17541	421	1/31/2016
Filter, HPF 6GHz HPF	Micro-Tronics	HPS17542	425	1/31/2016
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826	89	12/17/15
Amplifier, 1 to 26.5GHz, 23.5dB Gain	Agilent	8449B	404	04/13/16
Spectrum Analyzer, 40 GHz	Agilent	8564E	106	08/06/15
LISN, 30MHz	FCC	50/250-25-2	24	01/16/16
Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	341	02/20/16
UL EMC Software	UL	UL EMC	Rev 9.5.03	
Antenna Port Software	UL	UL RF	Ver 2.2	

7. MEASUREMENT METHODS

6 dB BW: KDB 558074 D01 v03r02, Section 8.1.

Output Power: KDB 558074 D01 v03r02, Section 9.2.2.2.

Power Spectral Density: KDB 558074 D01 v03r02, Section 10.3.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v03r02, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r02, Section 12.1.

Band-edge: KDB 558074 D01 v03r02, Section 13.2.

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

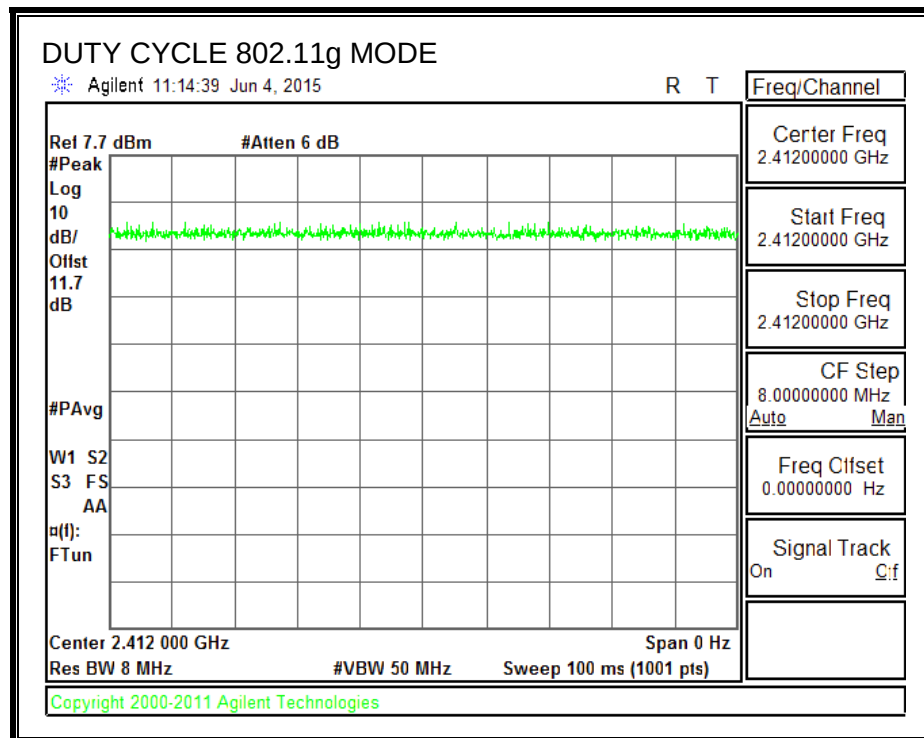
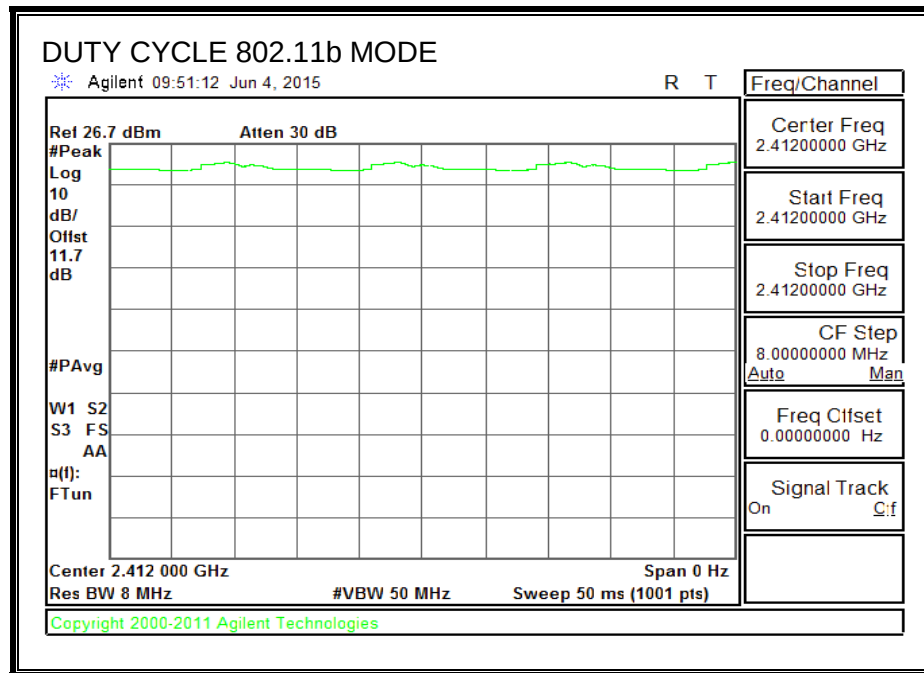
KDB 558074 Zero-Span Spectrum Analyzer Method.

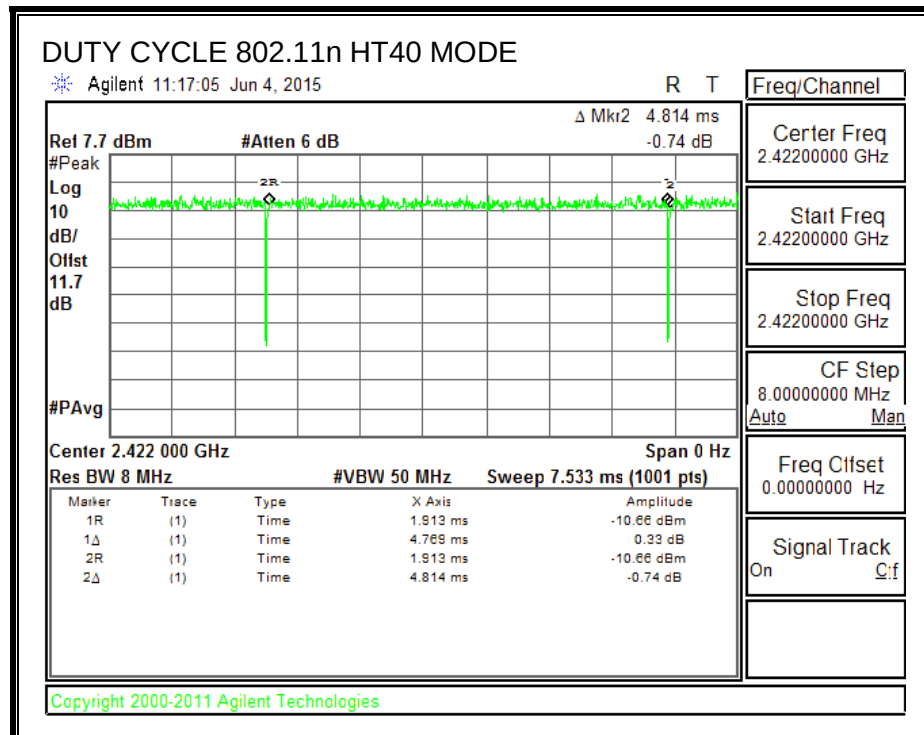
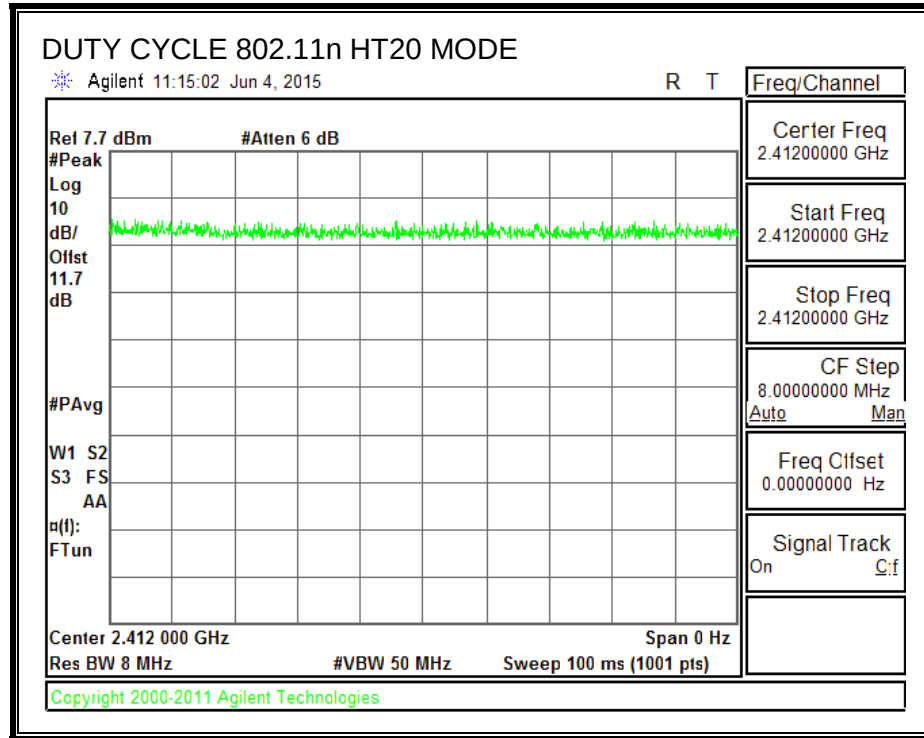
ON TIME AND DUTY CYCLE RESULTS

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	100.000	100.00	1.000	100.00%	0.00	0.010
802.11g 1TX	100.000	100.00	1.000	100.00%	0.00	0.010
802.11n HT20 1TX	100.000	100.00	1.000	100.00%	0.00	0.010
802.11n HT40 1TX	4.768	4.814	0.990	99.04%	0.00	0.010

DUTY CYCLE PLOTS

2.4 GHz BAND





8.2. 802.11b MODE IN THE 2.4 GHz BAND ANTENNA 1

8.2.1. 6 dB BANDWIDTH

LIMITS

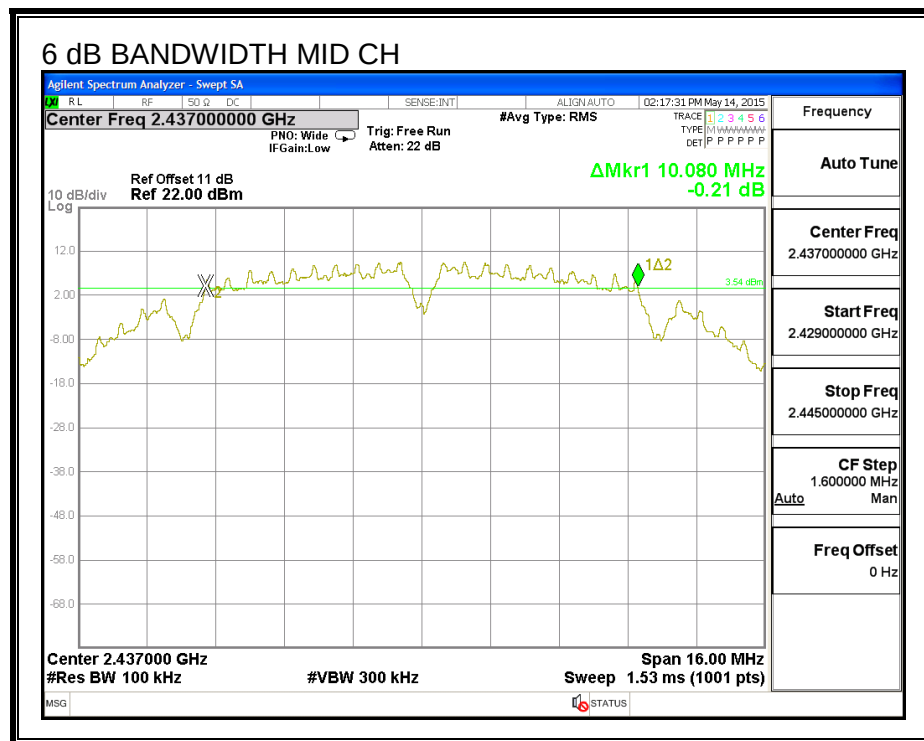
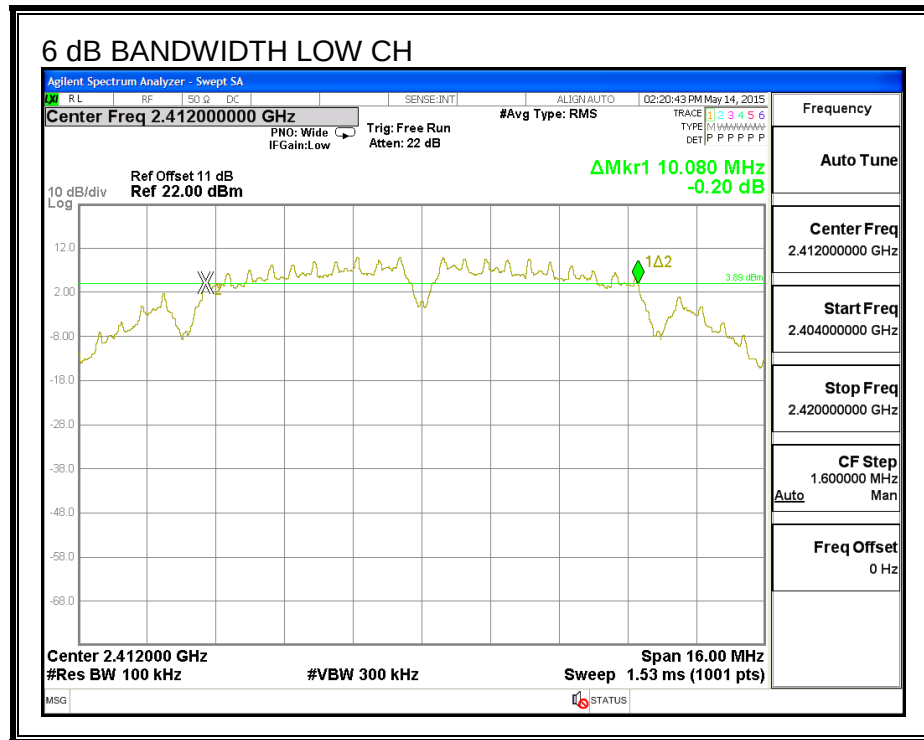
NCC LP0002 §3.10.1 (6.2.1)

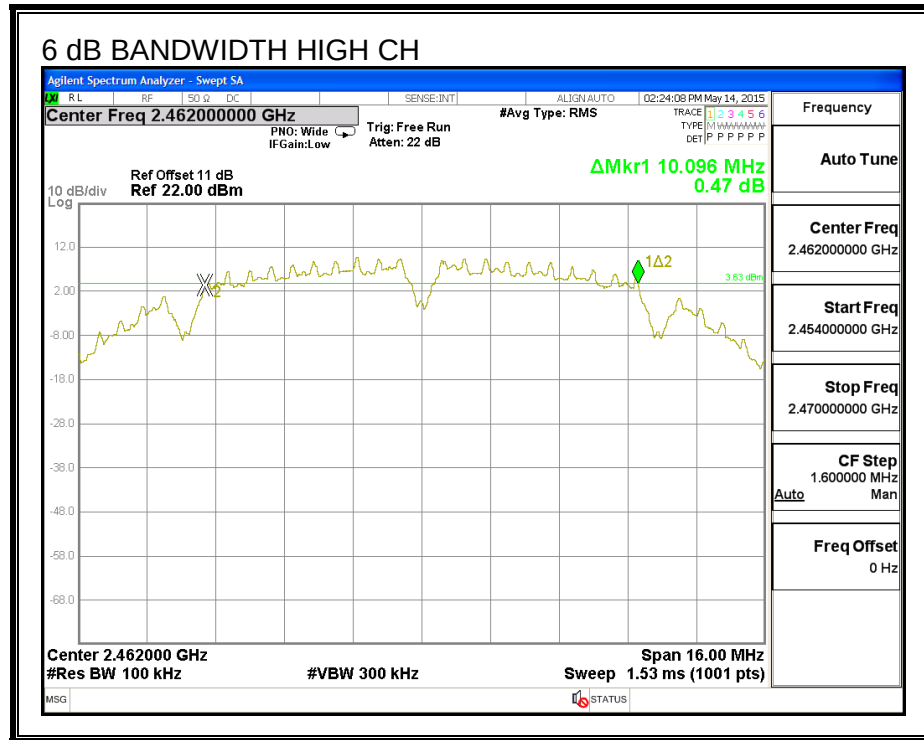
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	10.080	0.5
Mid	2437	10.080	0.5
High	2462	10.096	0.5

6 dB BANDWIDTH





8.2.2. OUTPUT POWER

LIMITS

NCC LP0002 §3.10.1

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

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	NCC Power Limit (dBm)	Max Power (dBm)
Low	2412	3.10	30.00	30.00
Mid	2437	3.10	30.00	30.00
High	2462	3.10	30.00	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	17.97	17.97	30.00	-12.03
Mid	2437	18.98	18.98	30.00	-11.02
High	2462	17.42	17.42	30.00	-12.58

8.2.3. POWER SPECTRAL DENSITY

LIMITS

NCC LP0002 §3.10.1 (6.2.2)

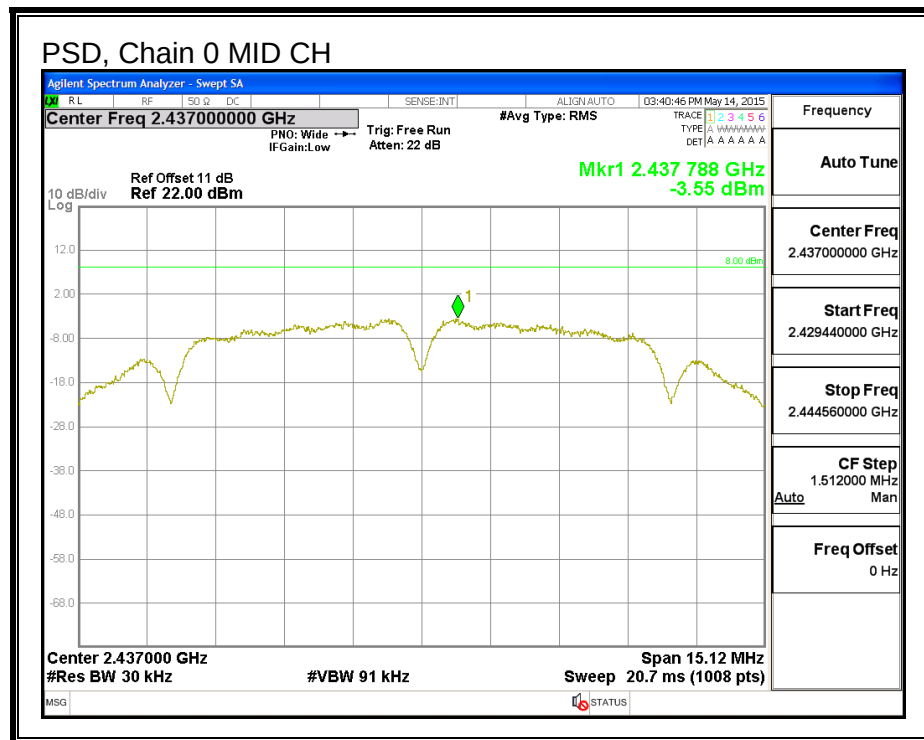
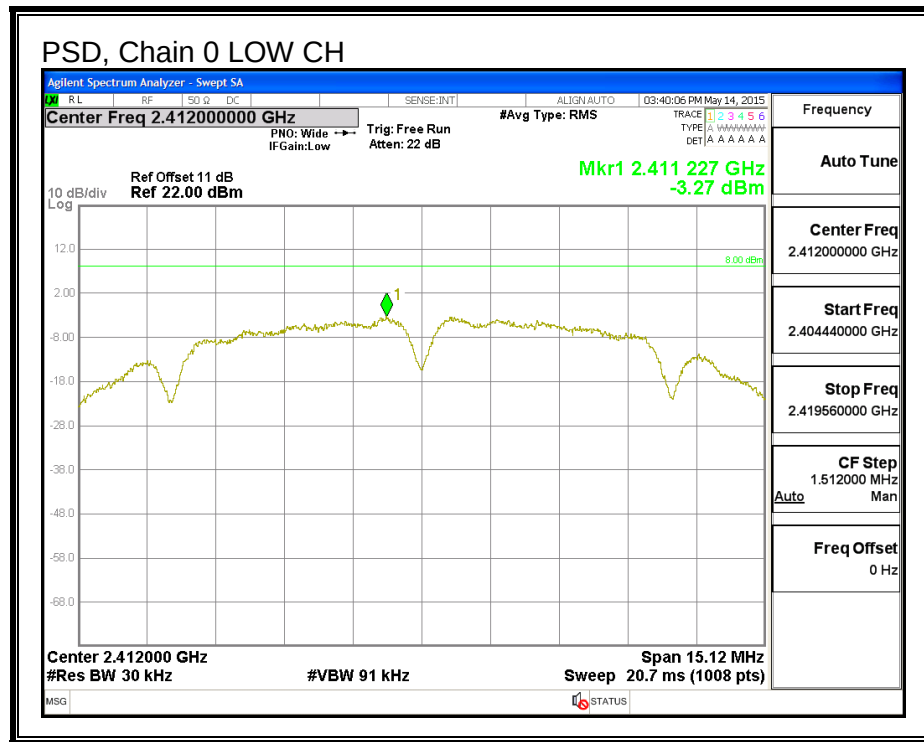
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 KHz band during any time interval of continuous transmissions.

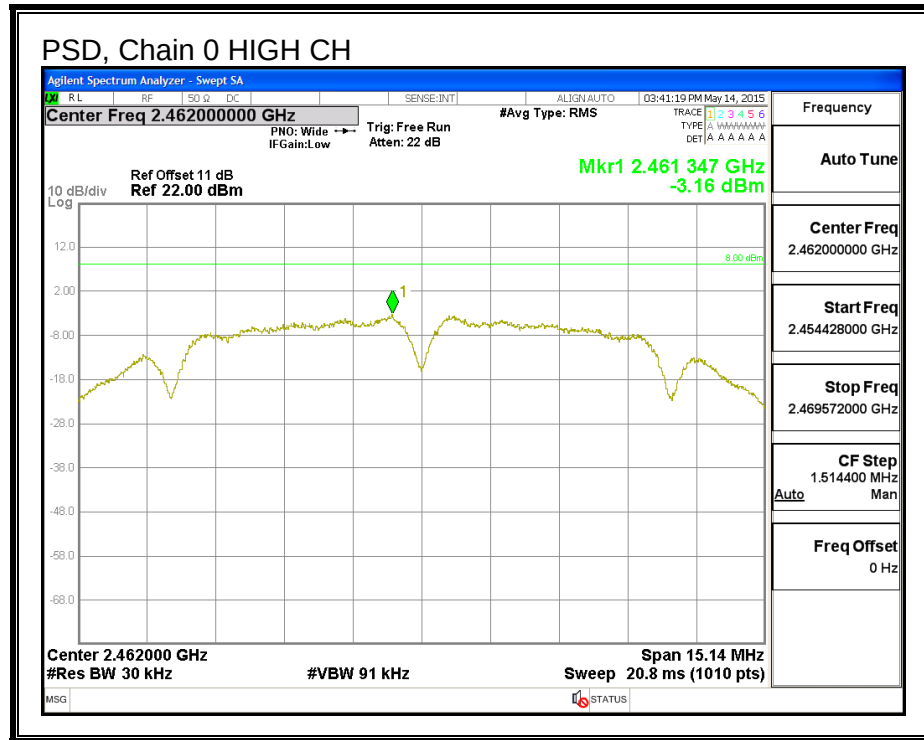
RESULTS

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-3.27	8.0	-11.3
Mid	2437	-3.55	8.0	-11.6
High	2462	-3.16	8.0	-11.2

PSD, Chain 0





8.2.4. OUT-OF-BAND EMISSIONS

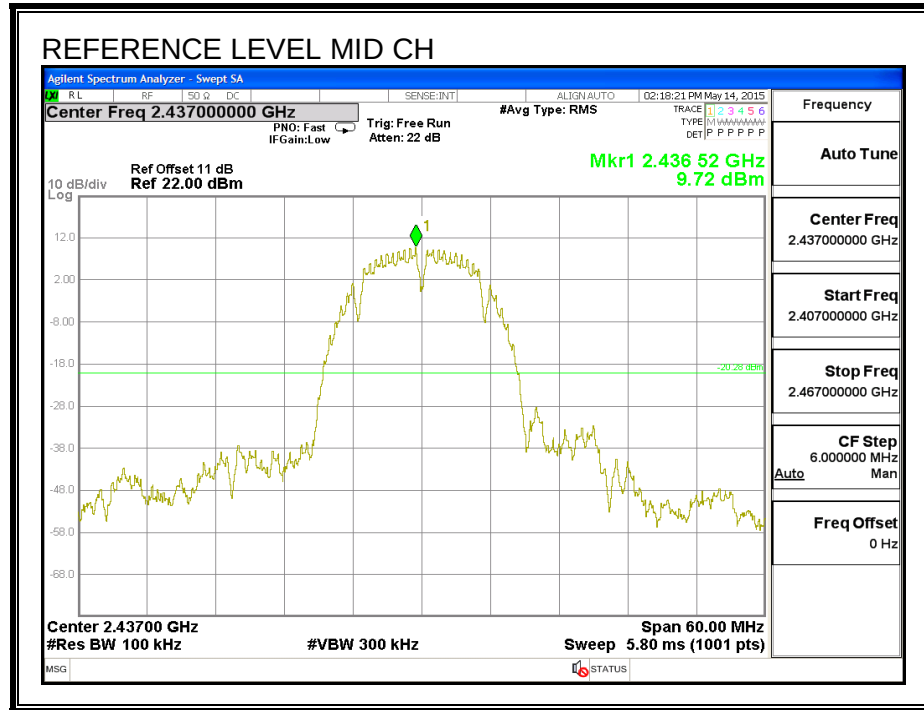
LIMITS

NCC LP0002 §3.10.1 (5.1)

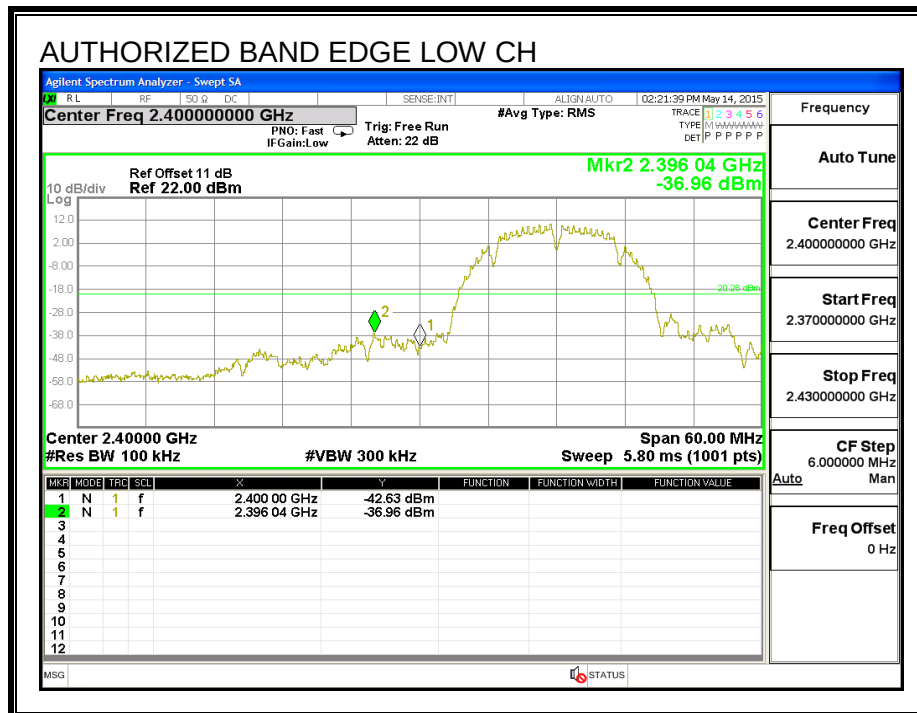
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

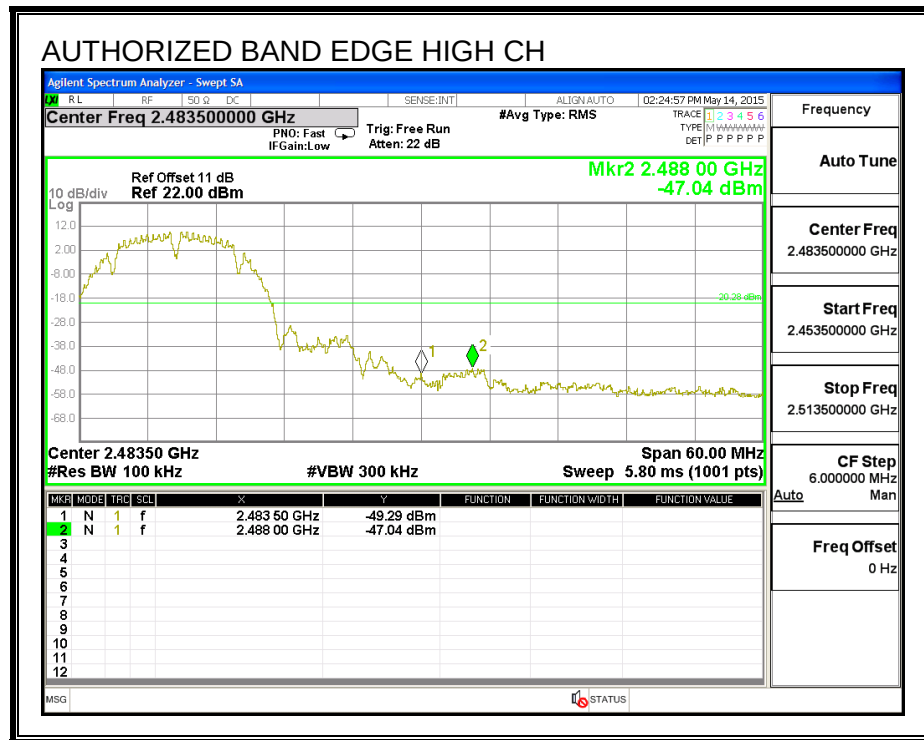
IN-BAND REFERENCE LEVEL



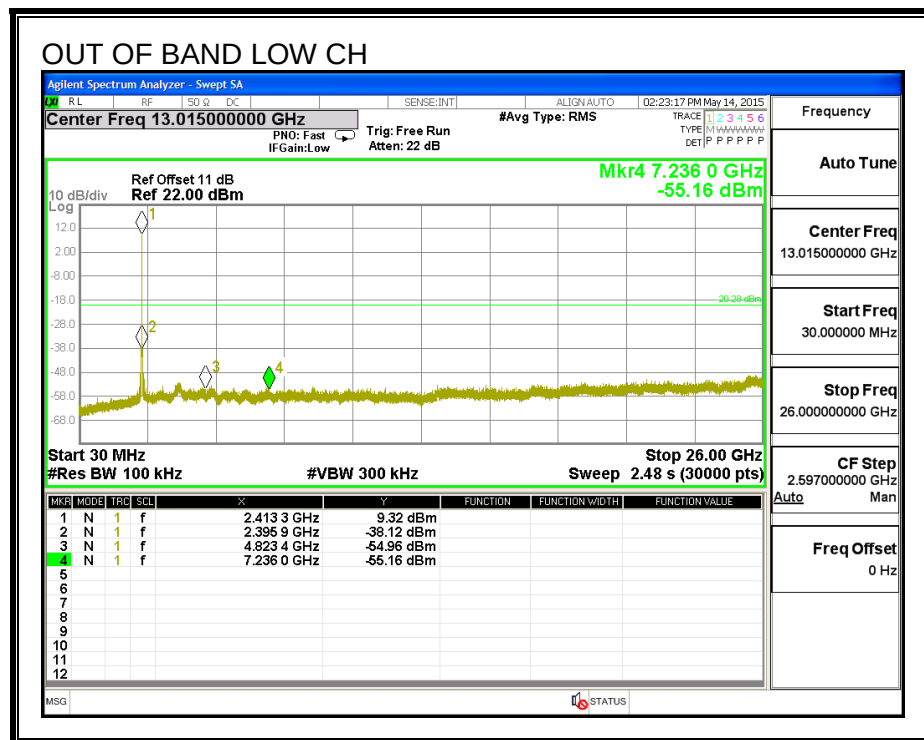
LOW CHANNEL BANDEDGE

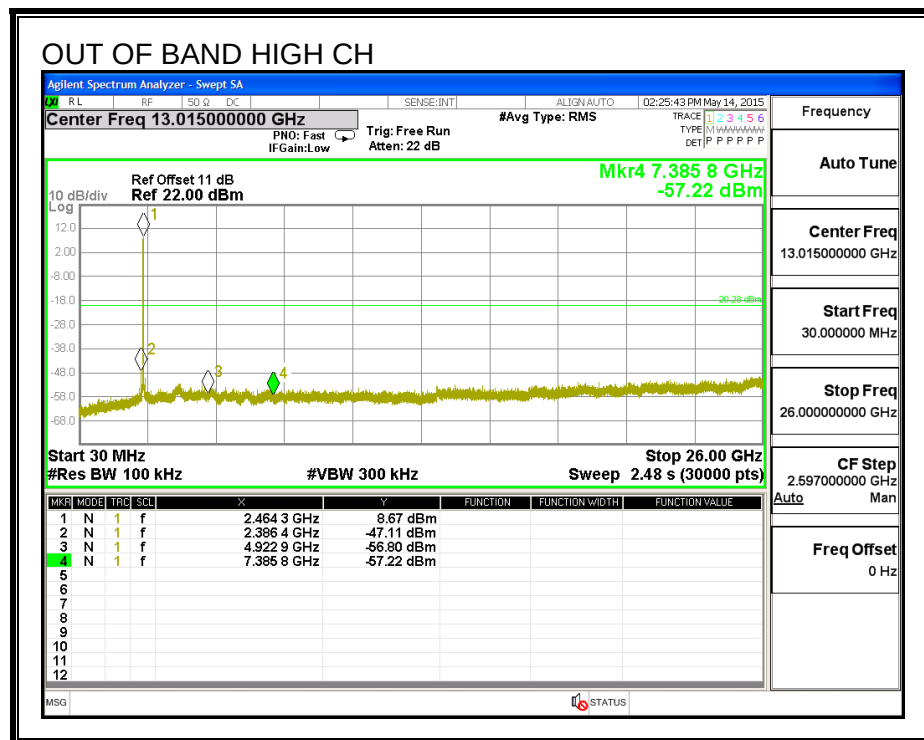
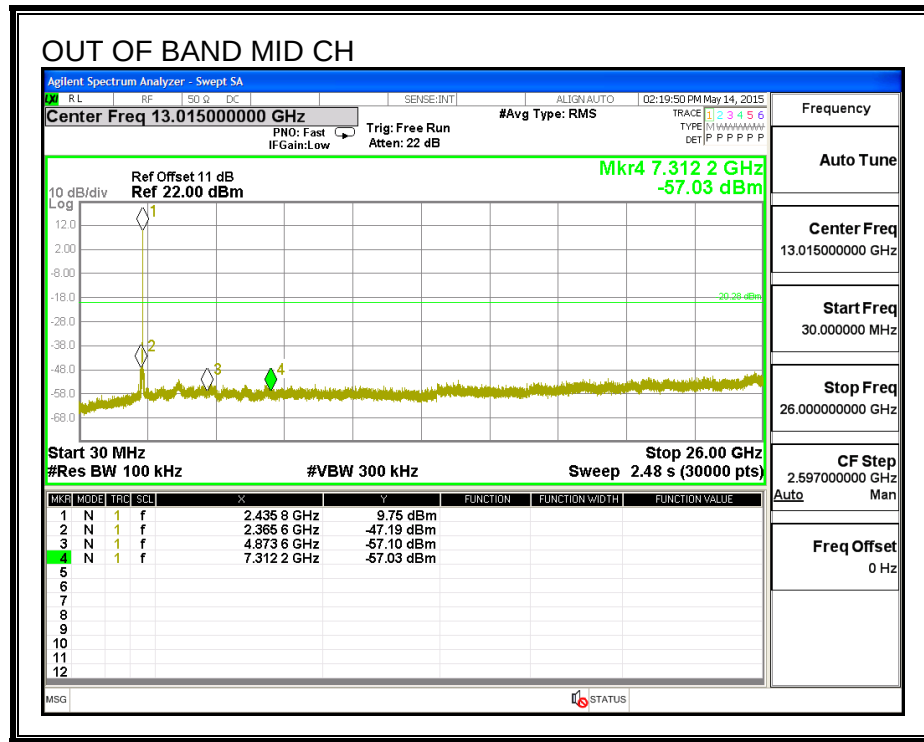


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS





8.3. 802.11b MODE IN THE 2.4 GHz BAND ANTENNA 2

8.3.1. 6 dB BANDWIDTH

LIMITS

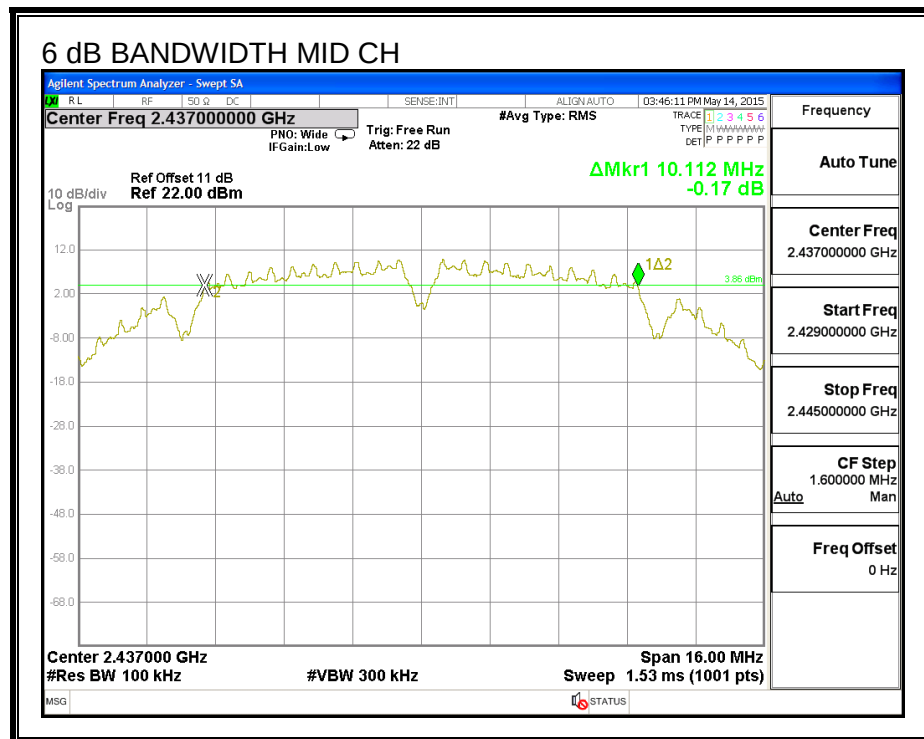
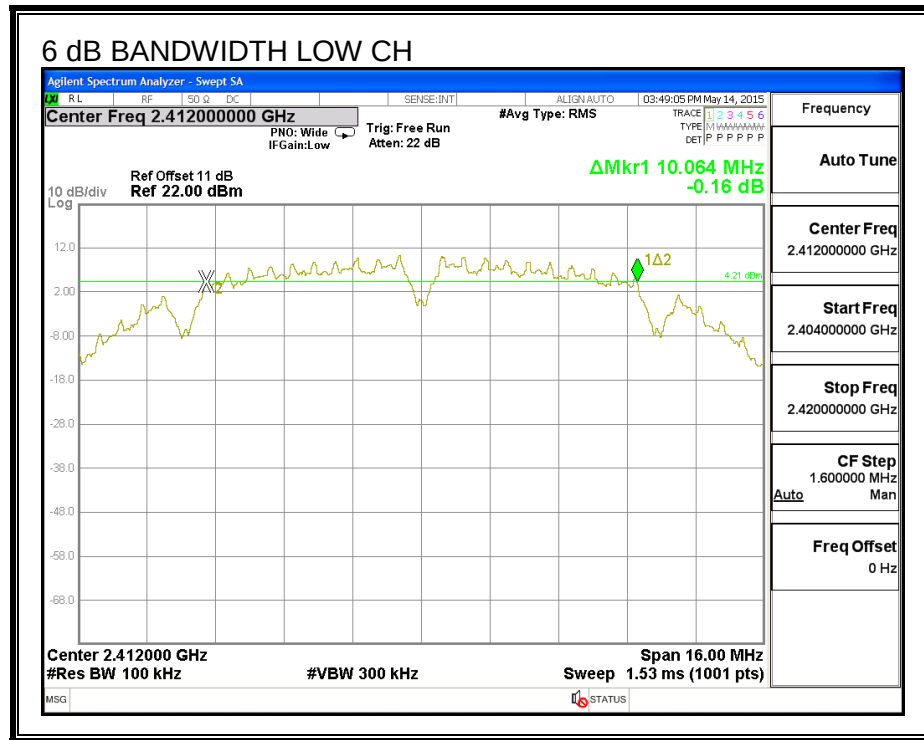
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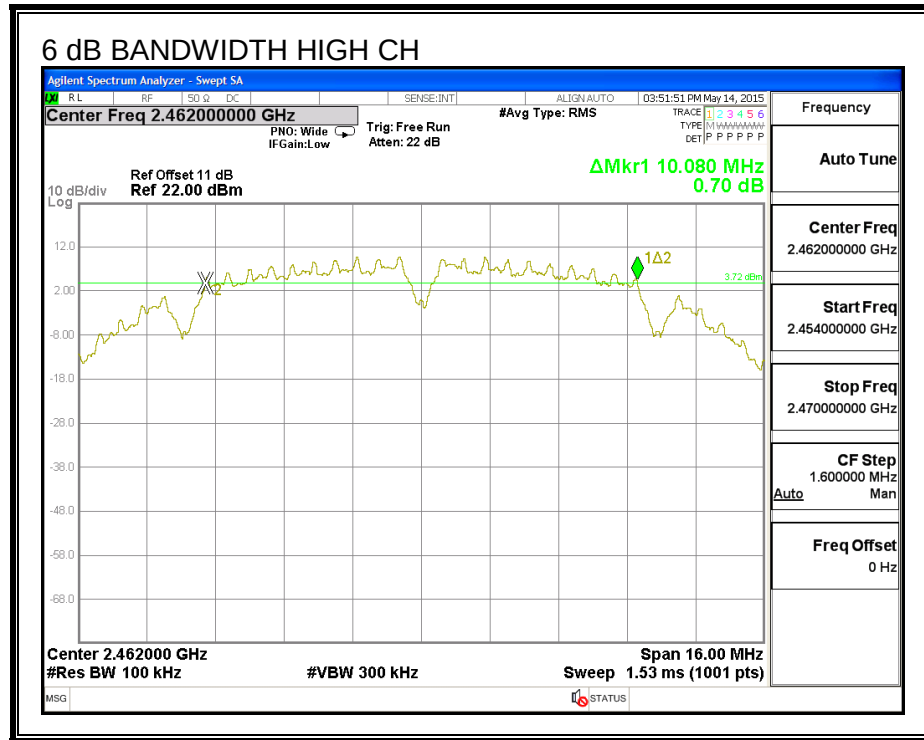
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	10.064	0.5
Mid	2437	10.112	0.5
High	2462	10.080	0.5

6 dB BANDWIDTH





8.3.2. OUTPUT POWER

LIMITS

NCC LP0002 §3.10.1

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

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	NCC Power Limit (dBm)	Max Power (dBm)
Low	2412	2.30	30.00	30.00
Mid	2437	2.30	30.00	30.00
High	2462	2.30	30.00	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	15.92	15.92	30.00	-14.08
Mid	2437	16.02	16.02	30.00	-13.98
High	2462	16.12	16.12	30.00	-13.88

8.3.3. POWER SPECTRAL DENSITY

LIMITS

NCC LP0002 §3.10.1 (6.2.2)

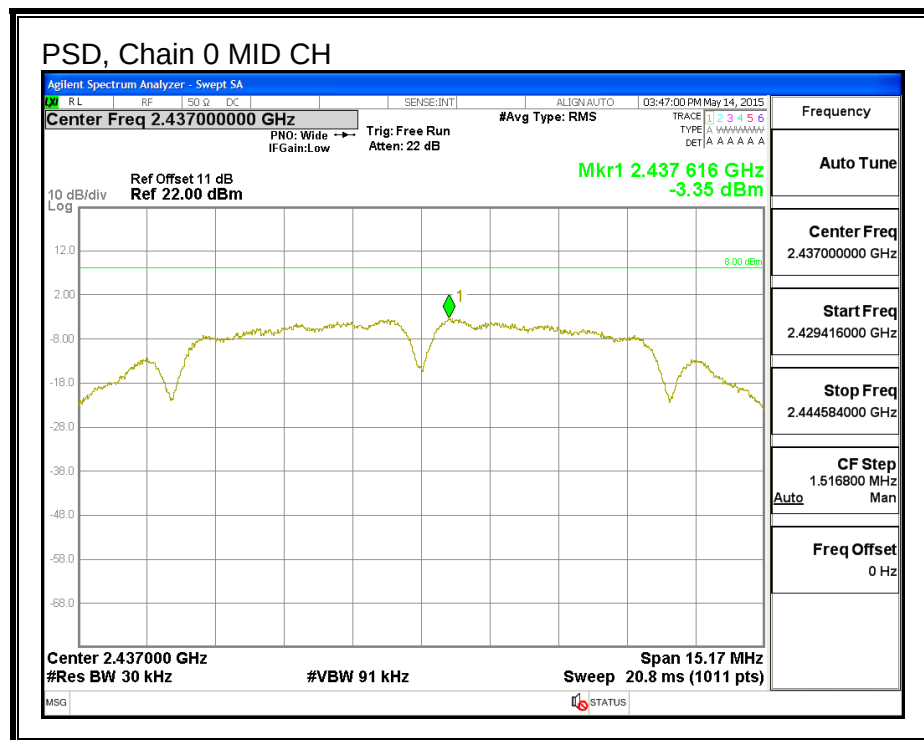
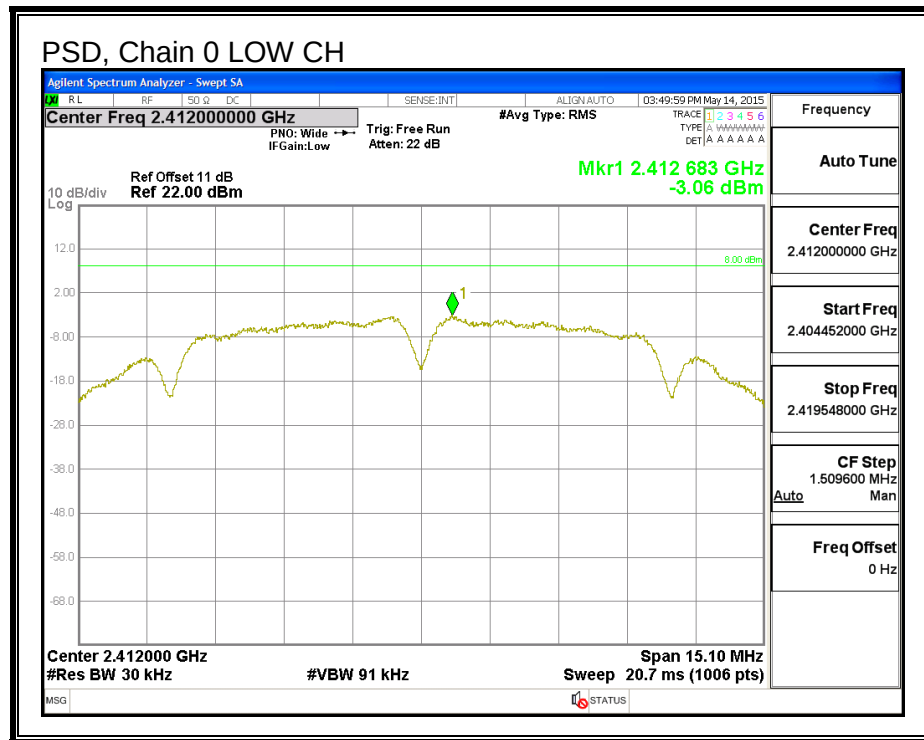
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 KHz band during any time interval of continuous transmissions.

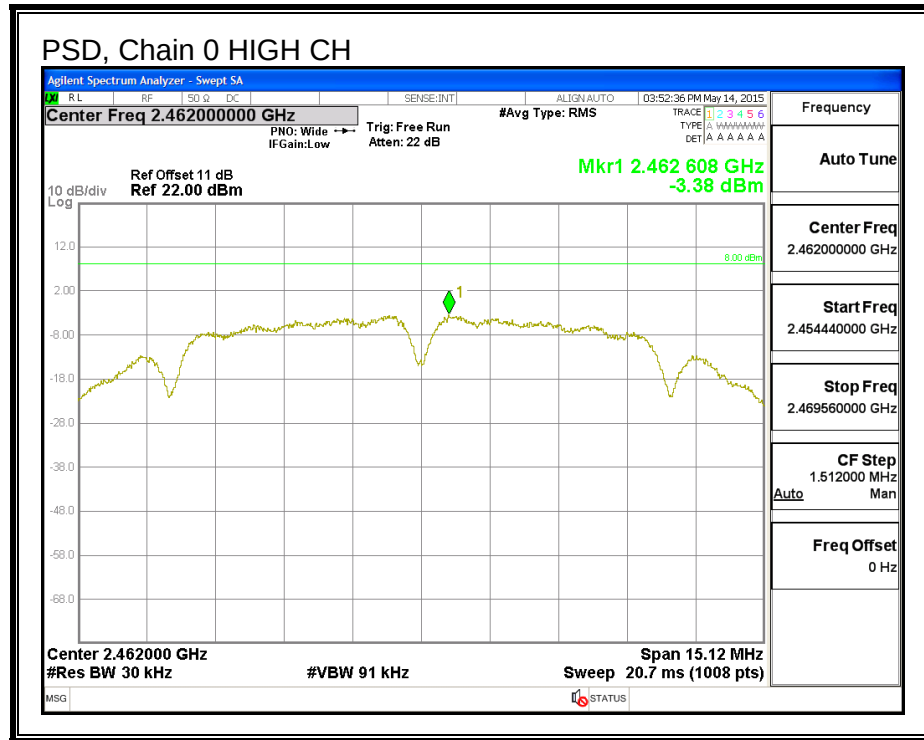
RESULTS

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-3.06	8.0	-11.1
Mid	2437	-3.35	8.0	-11.4
High	2462	-3.38	8.0	-11.4

PSD, Chain 0





8.3.4. OUT-OF-BAND EMISSIONS

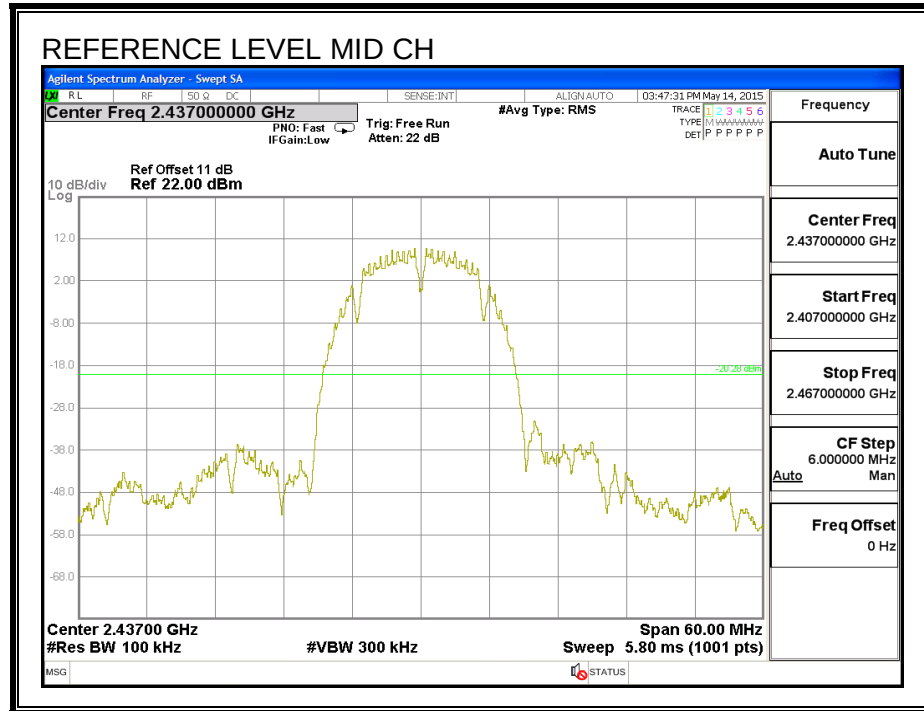
LIMITS

NCC LP0002 §3.10.1 (5.1)

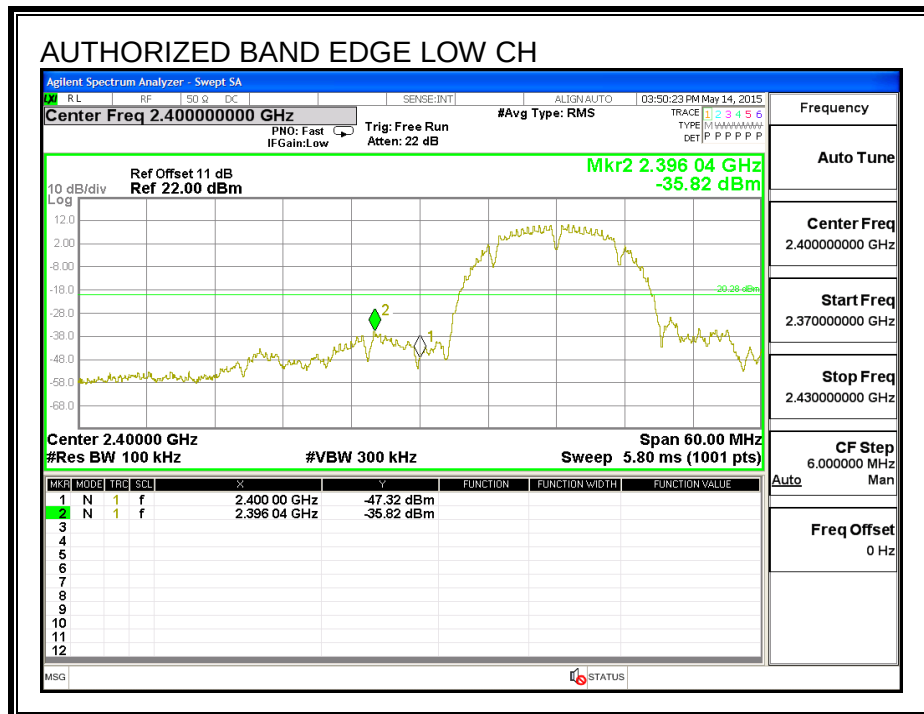
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

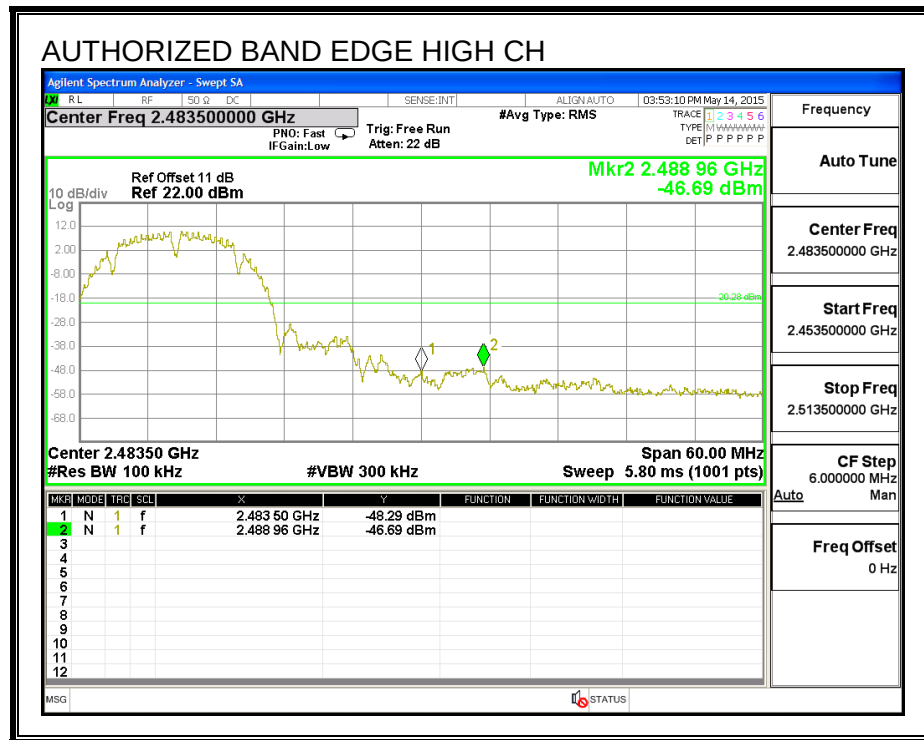
IN-BAND REFERENCE LEVEL



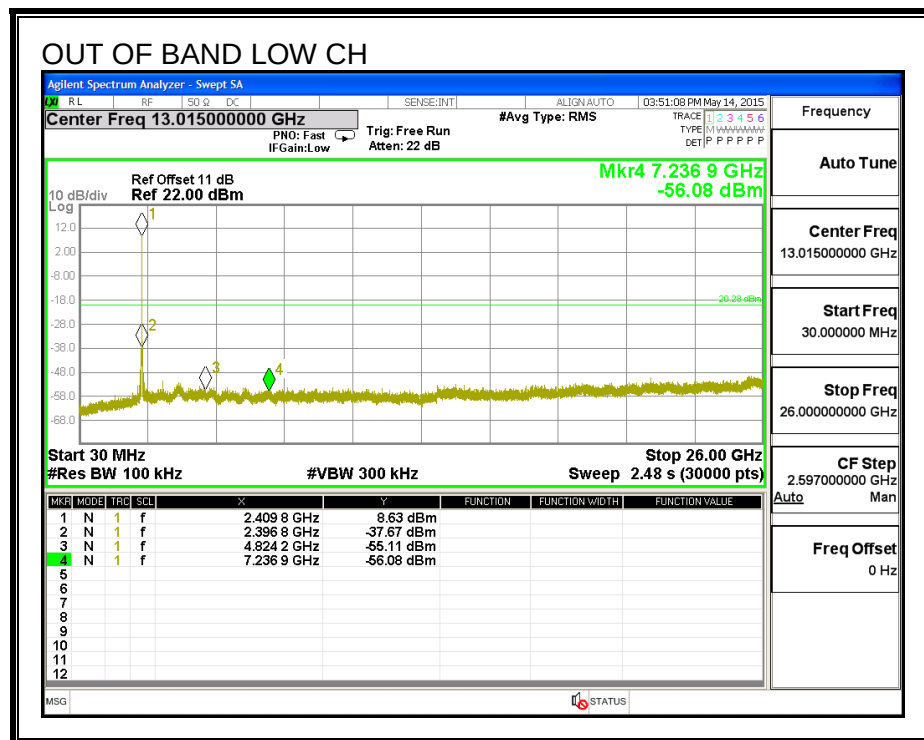
LOW CHANNEL BANDEDGE

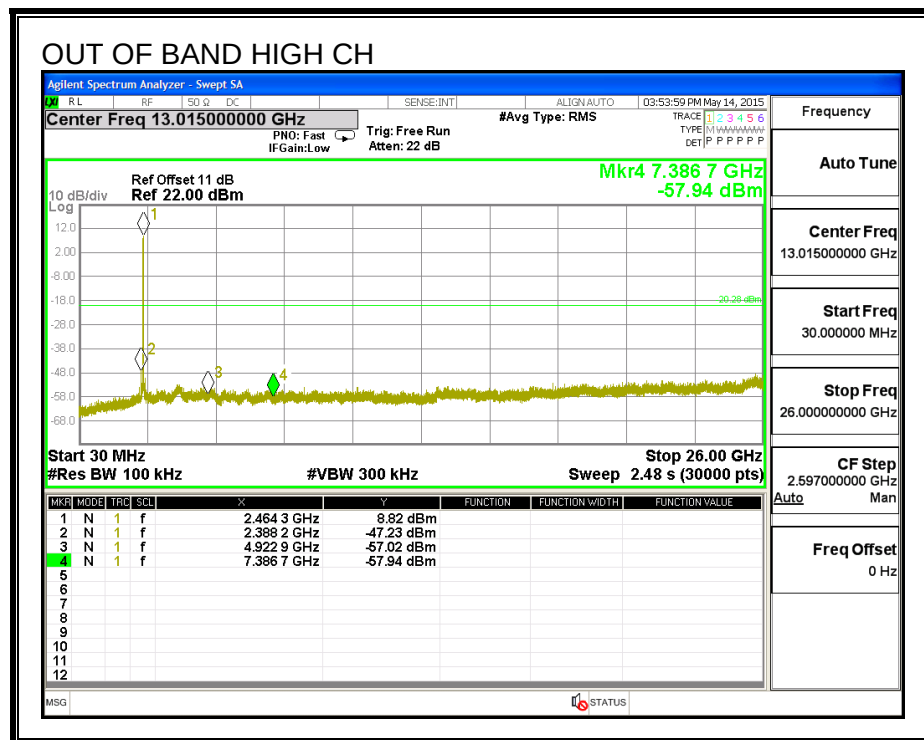
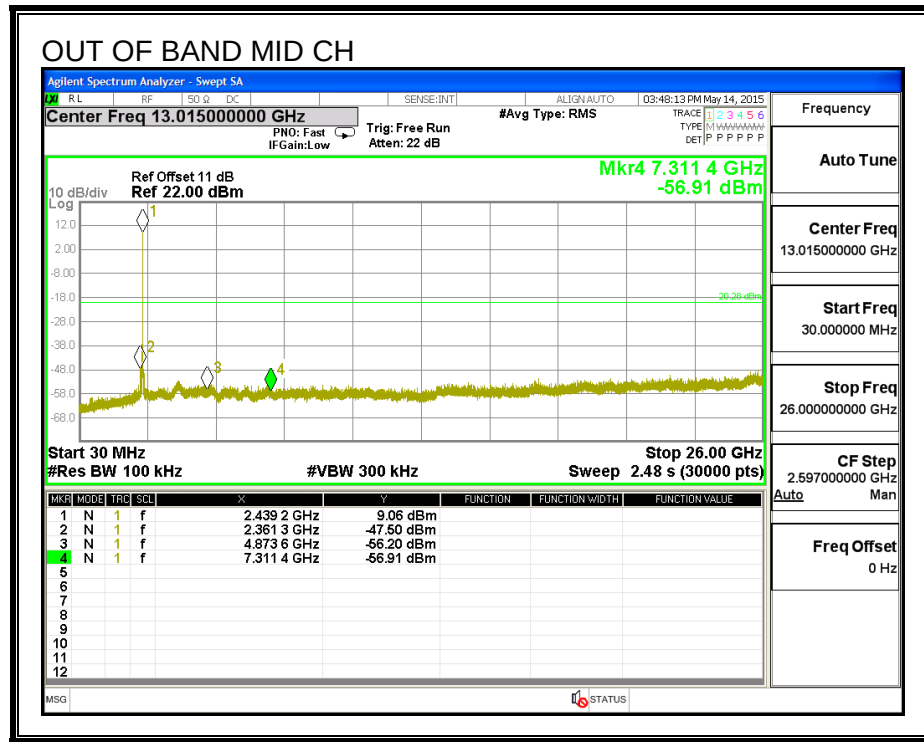


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS





8.4. 802.11g MODE IN THE 2.4 GHz BAND ANTENNA 1

8.4.1. 6 dB BANDWIDTH

LIMITS

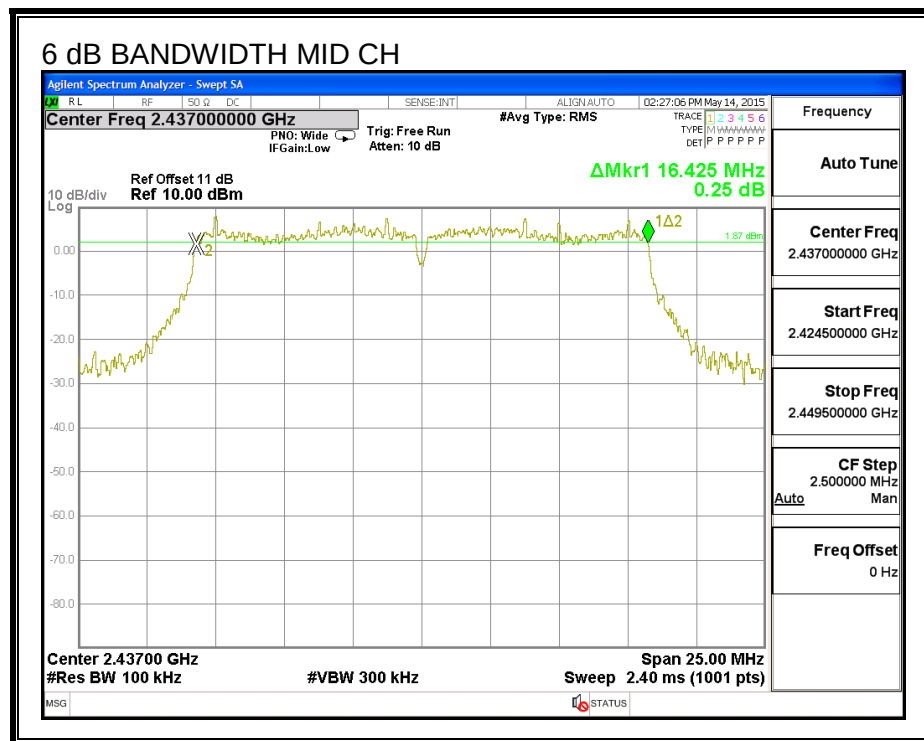
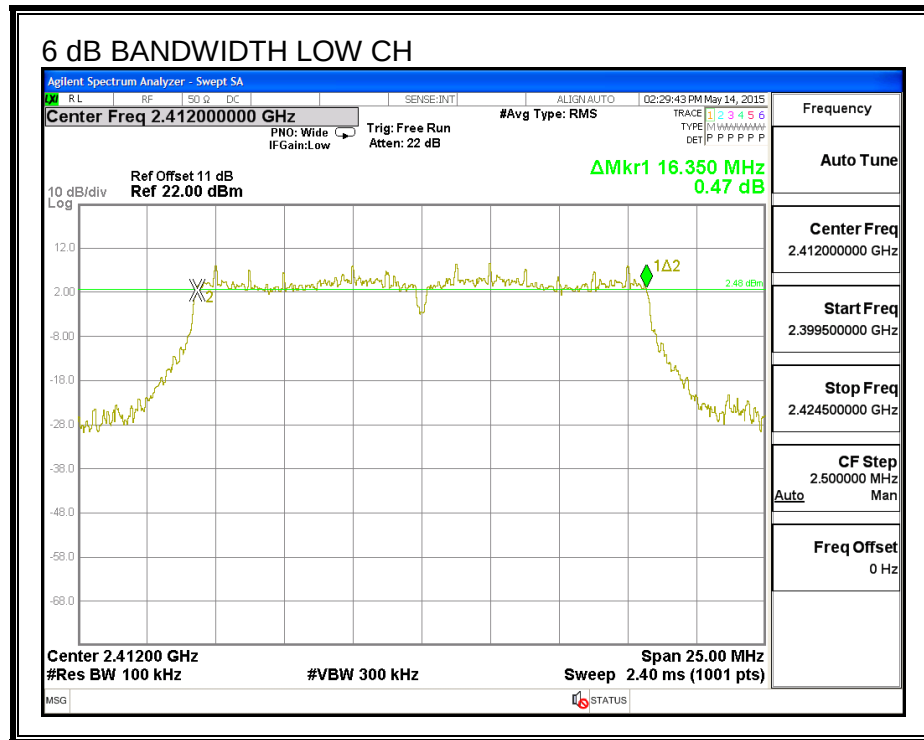
NCC LP0002 §3.10.1 (6.2.1)

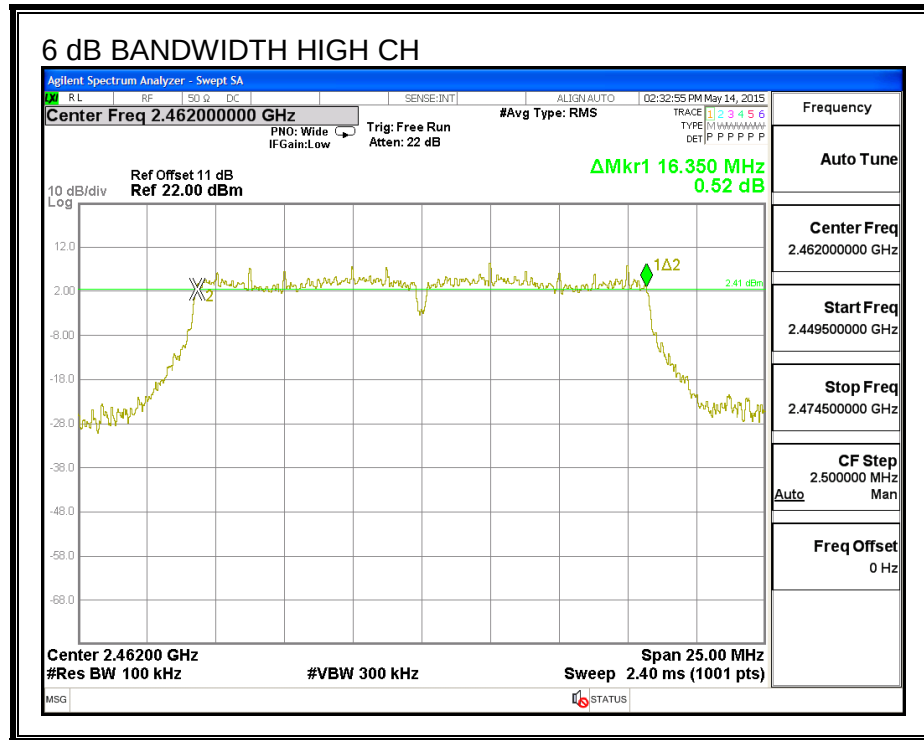
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	16.350	0.5
Mid	2437	16.425	0.5
High	2462	16.350	0.5

6 dB BANDWIDTH





8.4.2. OUTPUT POWER

LIMITS

NCC LP0002 §3.10.1

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

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	NCC Power Limit (dBm)	Max Power (dBm)
Low	2412	3.10	30.00	30.00
Mid	2437	3.10	30.00	30.00
High	2462	3.10	30.00	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	10.82	10.82	30.00	-19.18
Mid	2437	14.92	14.92	30.00	-15.08
High	2462	12.53	12.53	30.00	-17.47

8.4.3. POWER SPECTRAL DENSITY

LIMITS

NCC LP0002 §3.10.1 (6.2.2)

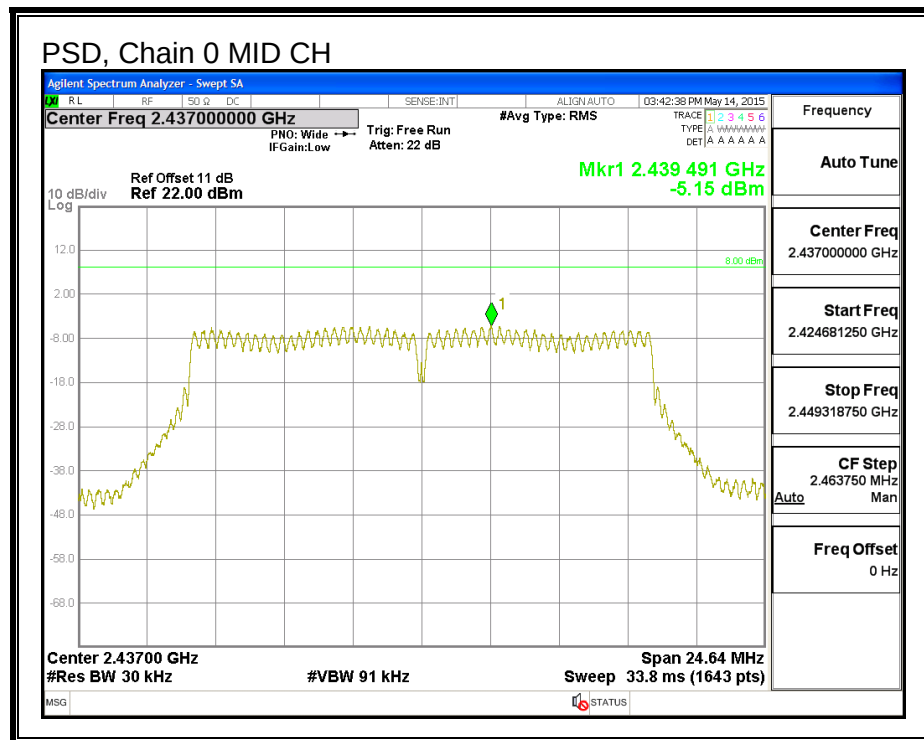
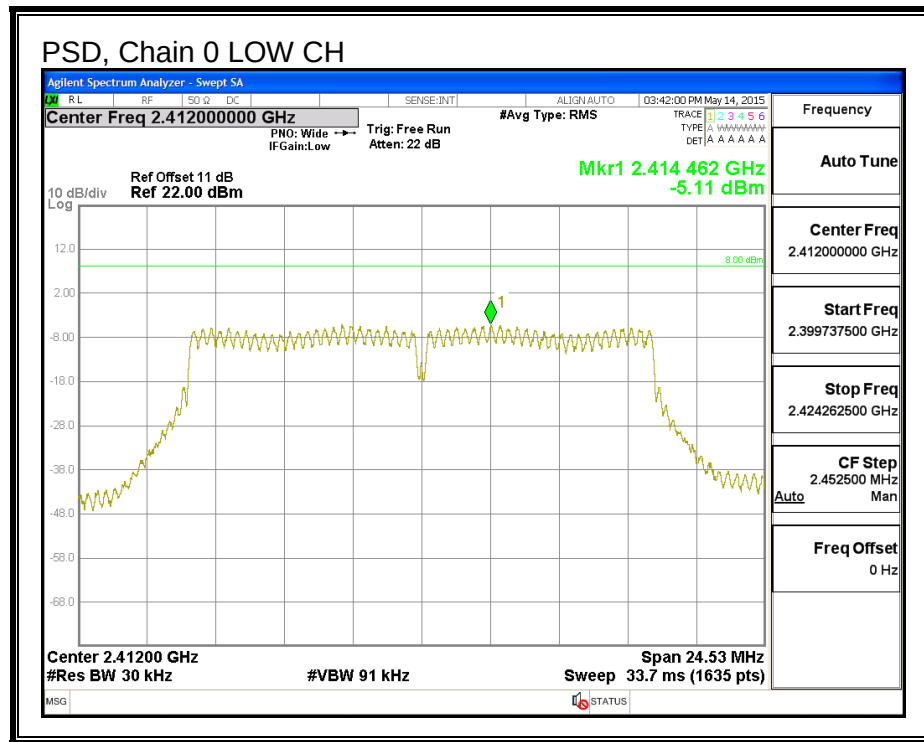
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 KHz band during any time interval of continuous transmissions.

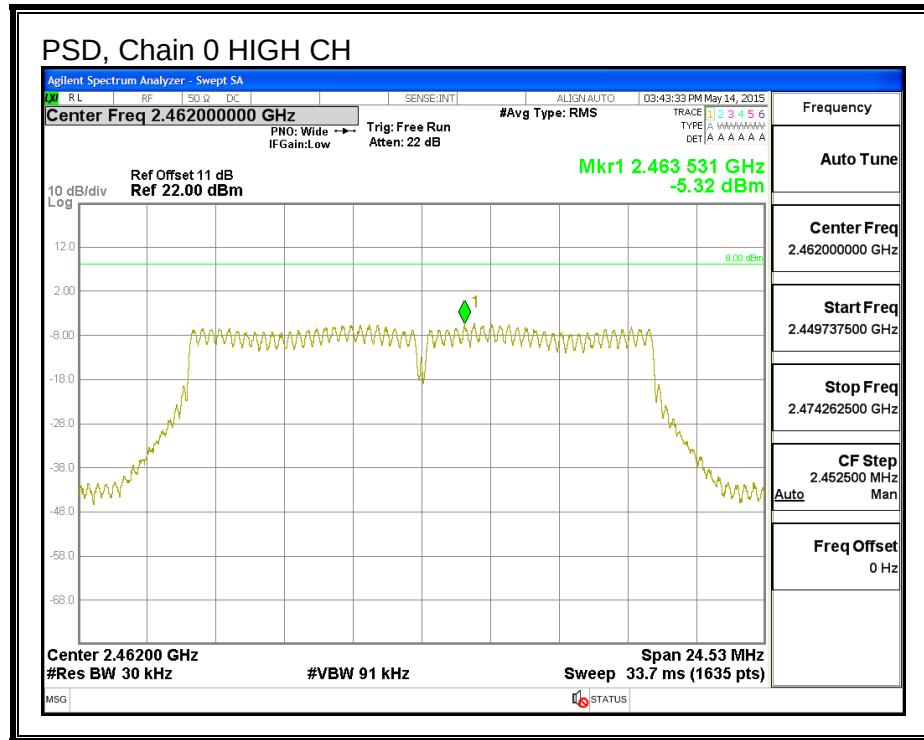
RESULTS

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-5.11	8.0	-13.1
Mid	2437	-5.15	8.0	-13.2
High	2462	-5.32	8.0	-13.3

PSD, Chain 0





8.4.4. OUT-OF-BAND EMISSIONS

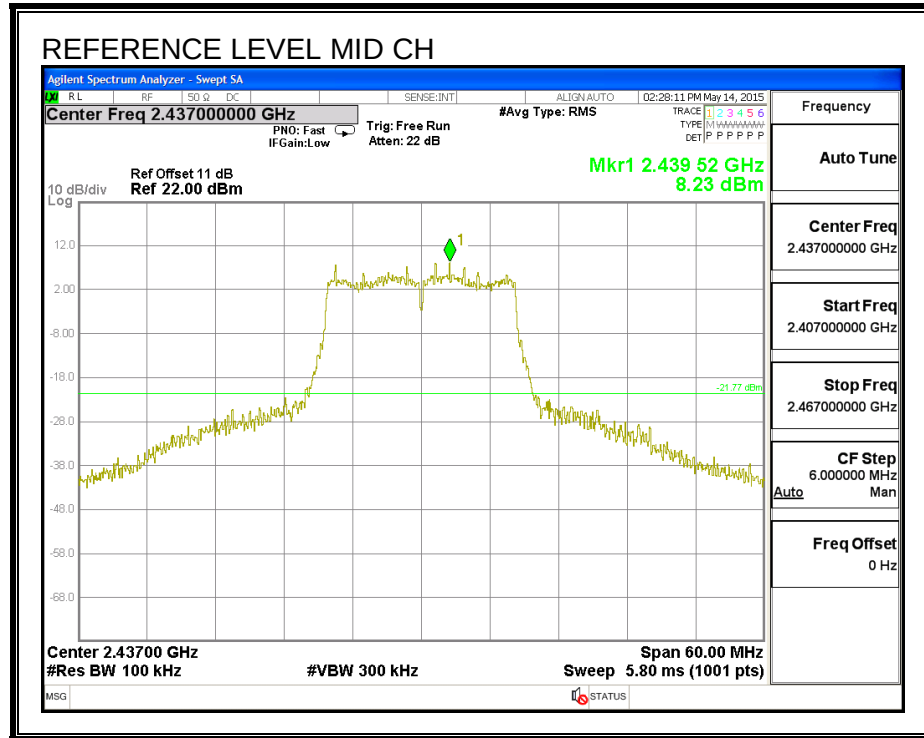
LIMITS

NCC LP0002 §3.10.1 (5.1)

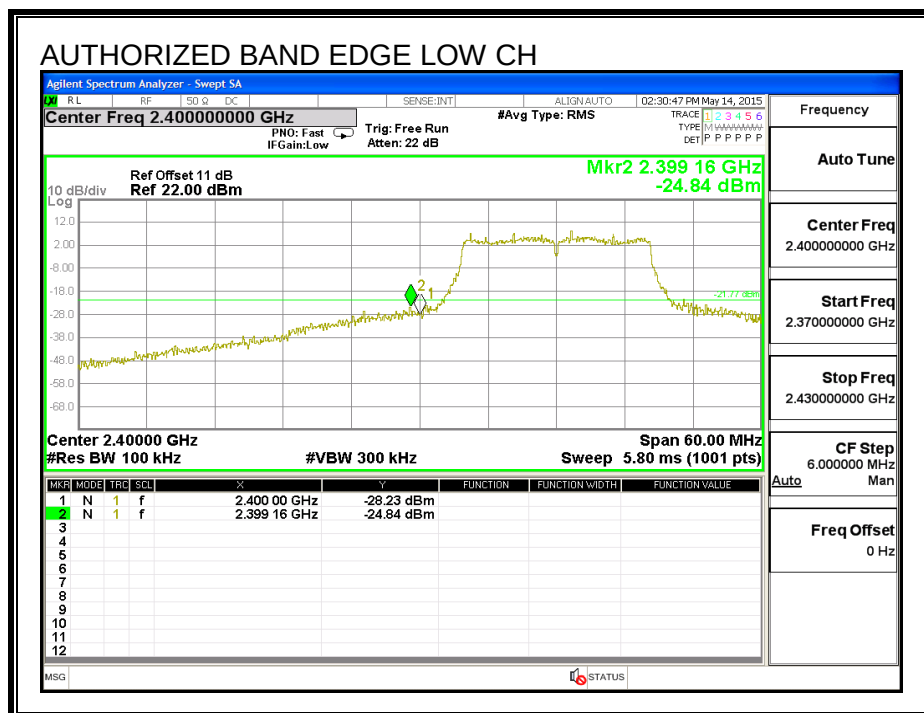
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

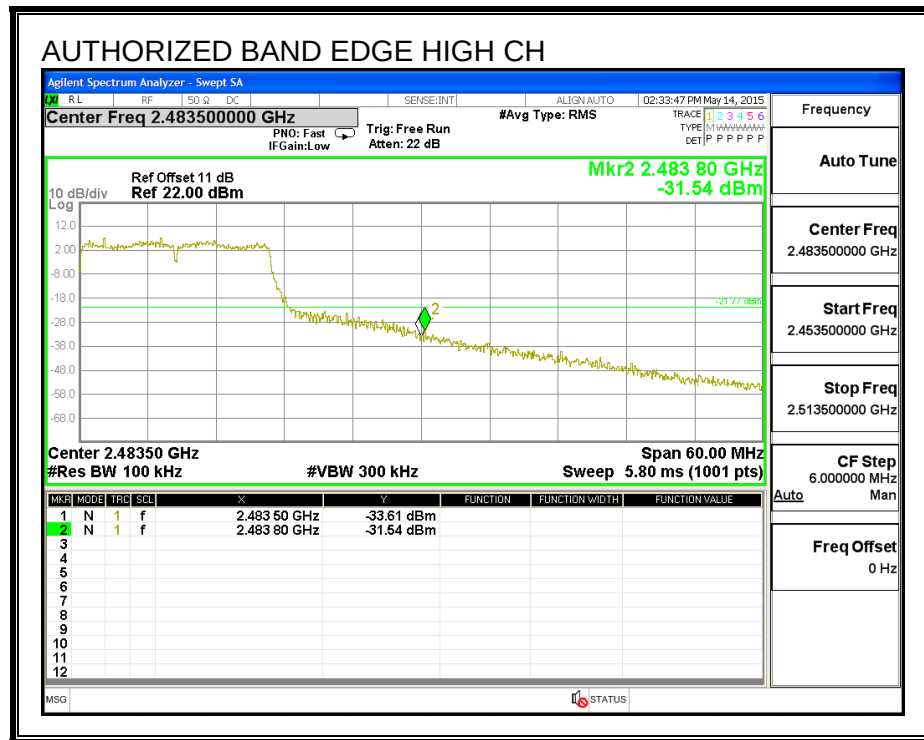
IN-BAND REFERENCE LEVEL



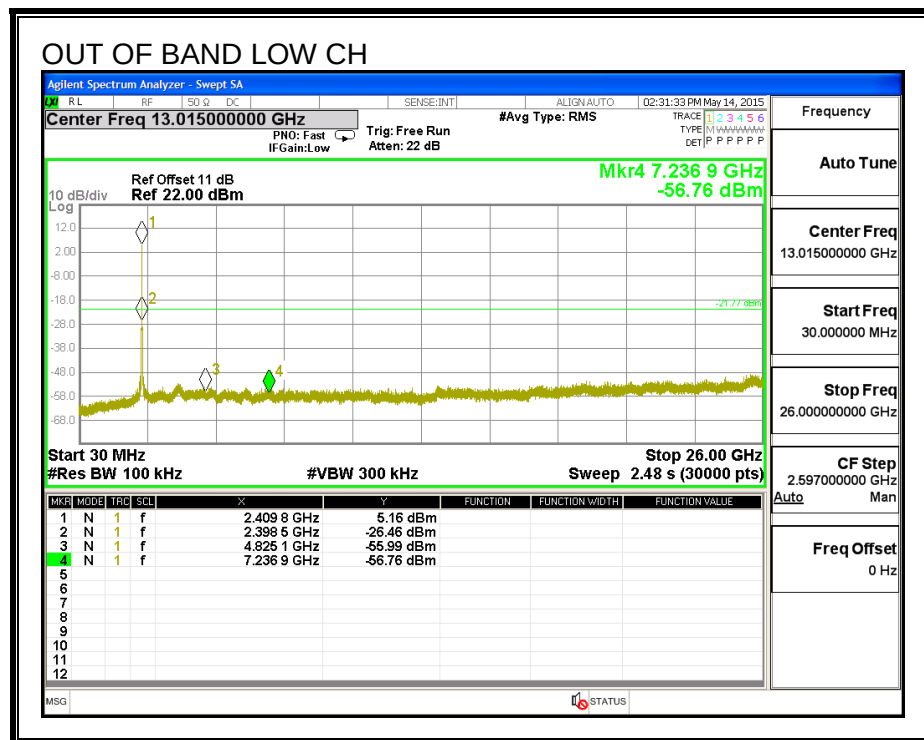
LOW CHANNEL BANDEDGE

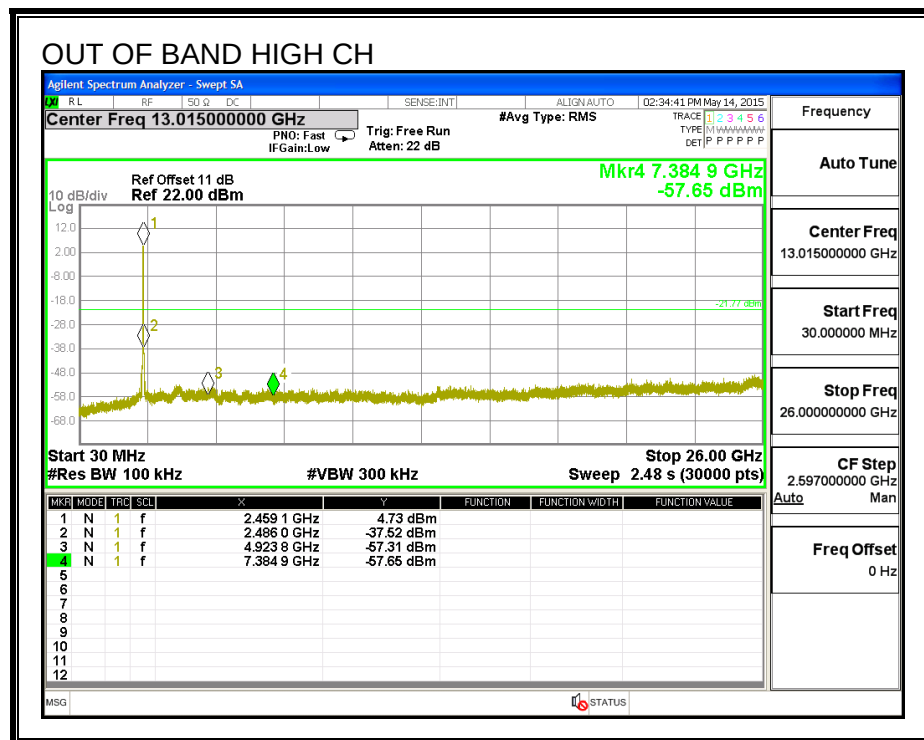
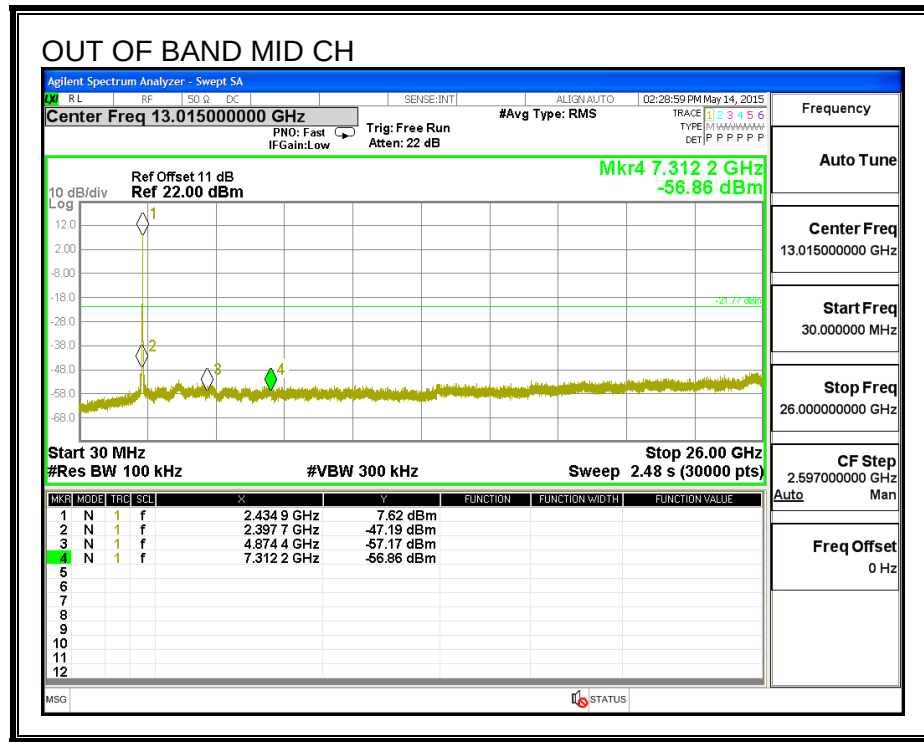


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS





8.5. 802.11g MODE IN THE 2.4 GHz BAND ANTENNA 2

8.5.1. 6 dB BANDWIDTH

LIMITS

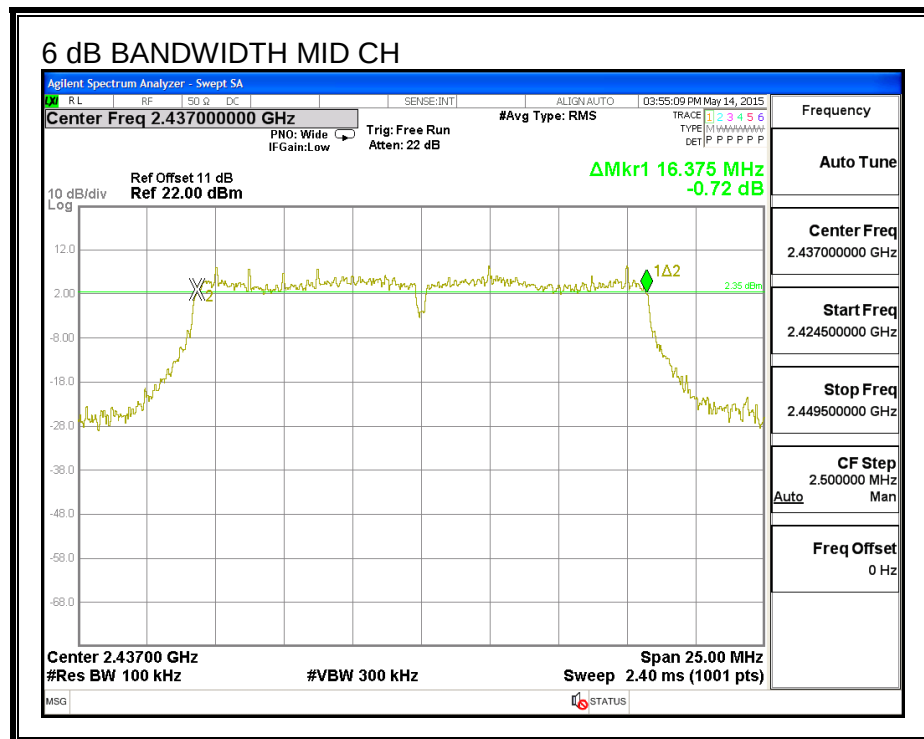
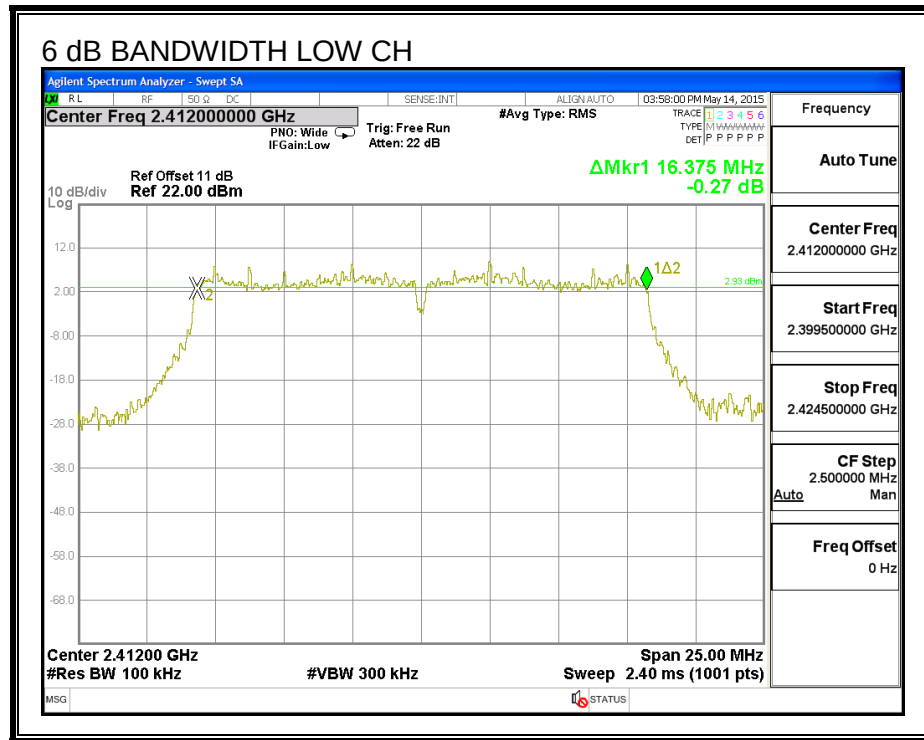
NCC LP0002 §3.10.1 (6.2.1)

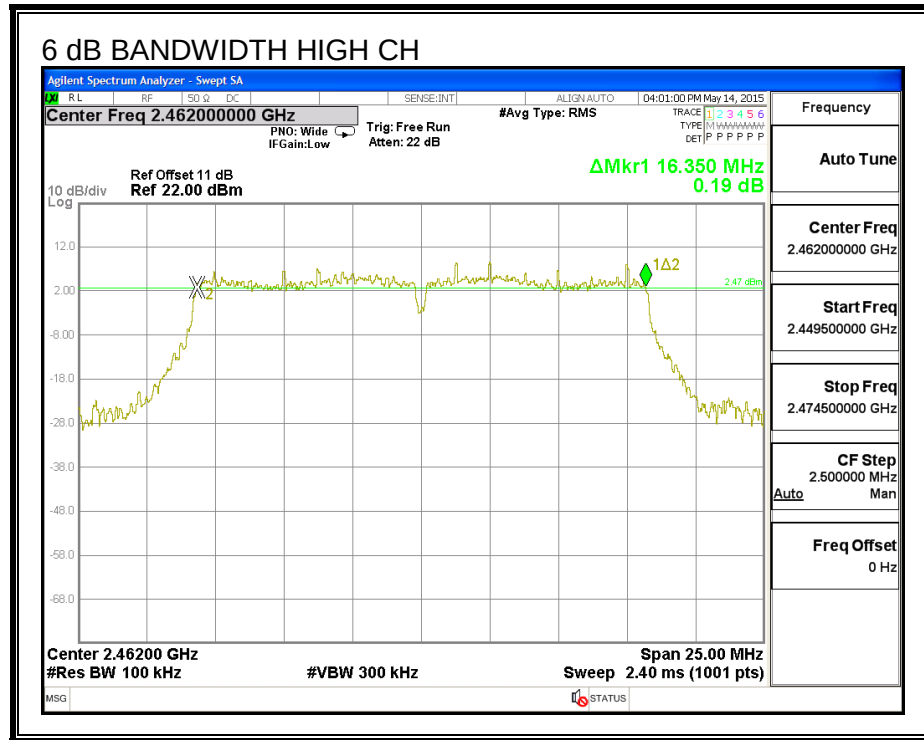
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	16.375	0.5
Mid	2437	16.375	0.5
High	2462	16.350	0.5

6 dB BANDWIDTH





8.5.2. OUTPUT POWER

LIMITS

NCC LP0002 §3.10.1

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

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	NCC Power Limit (dBm)	Max Power (dBm)
Low	2412	2.30	30.00	30.00
Mid	2437	2.30	30.00	30.00
High	2462	2.30	30.00	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	11.17	11.17	30.00	-18.83
Mid	2437	14.73	14.73	30.00	-15.27
High	2462	13.02	13.02	30.00	-16.98

8.5.3. POWER SPECTRAL DENSITY

LIMITS

NCC LP0002 §3.10.1 (6.2.2)

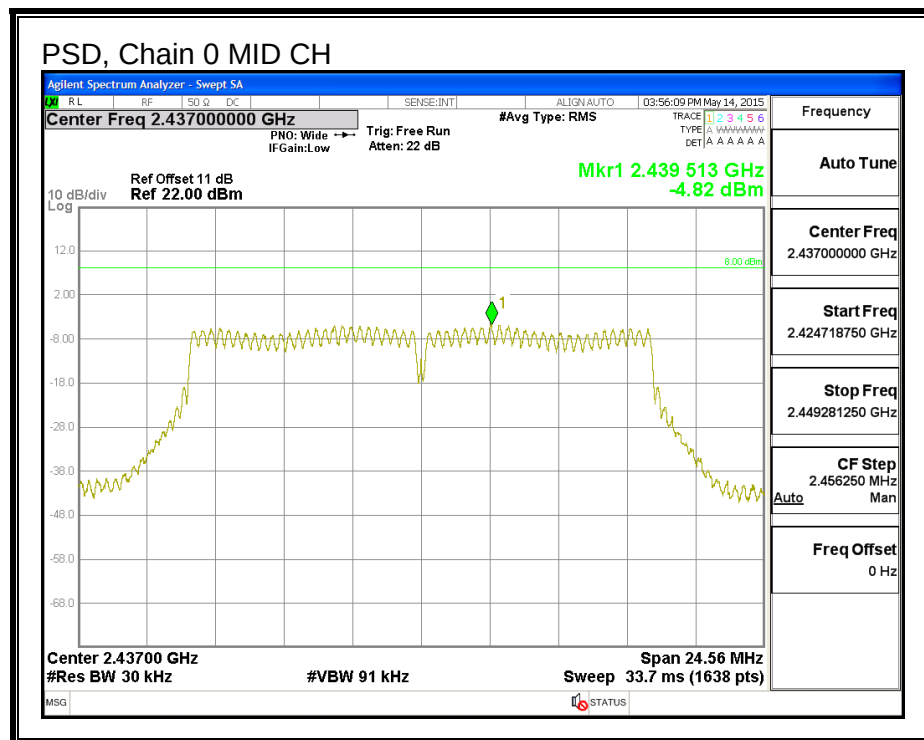
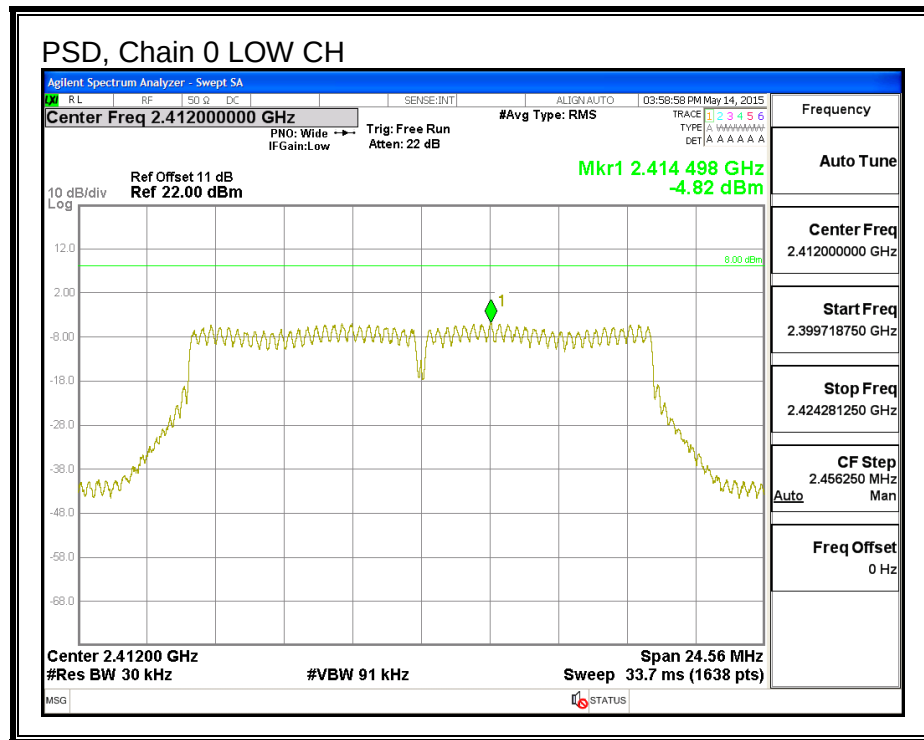
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 KHz band during any time interval of continuous transmissions.

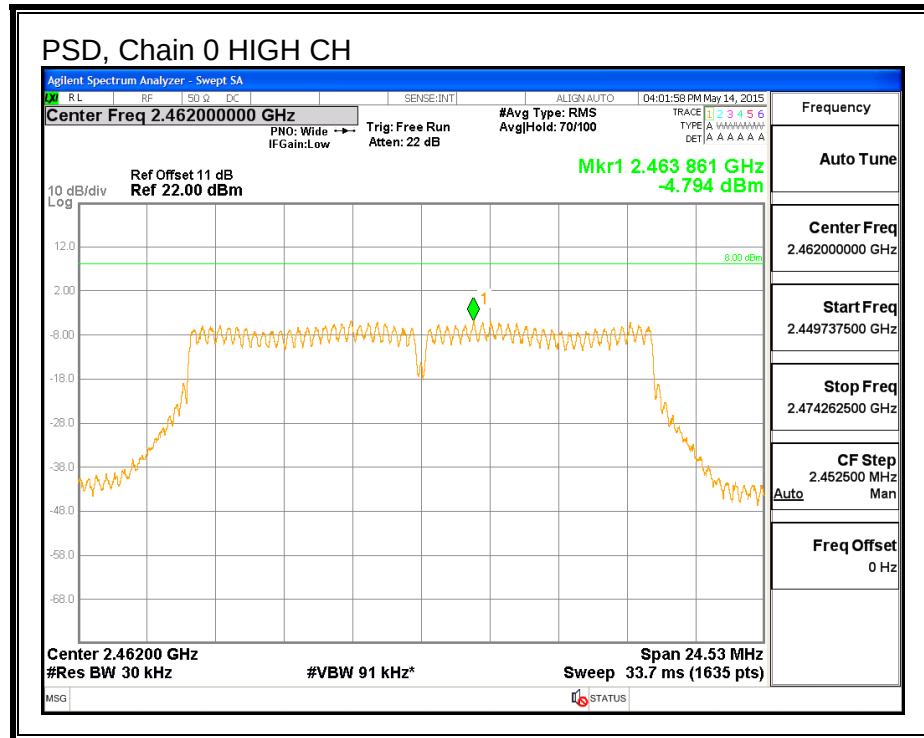
RESULTS

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-4.82	8.0	-12.8
Mid	2437	-4.82	8.0	-12.8
High	2462	-4.79	8.0	-12.8

PSD, Chain 0





8.5.4. OUT-OF-BAND EMISSIONS

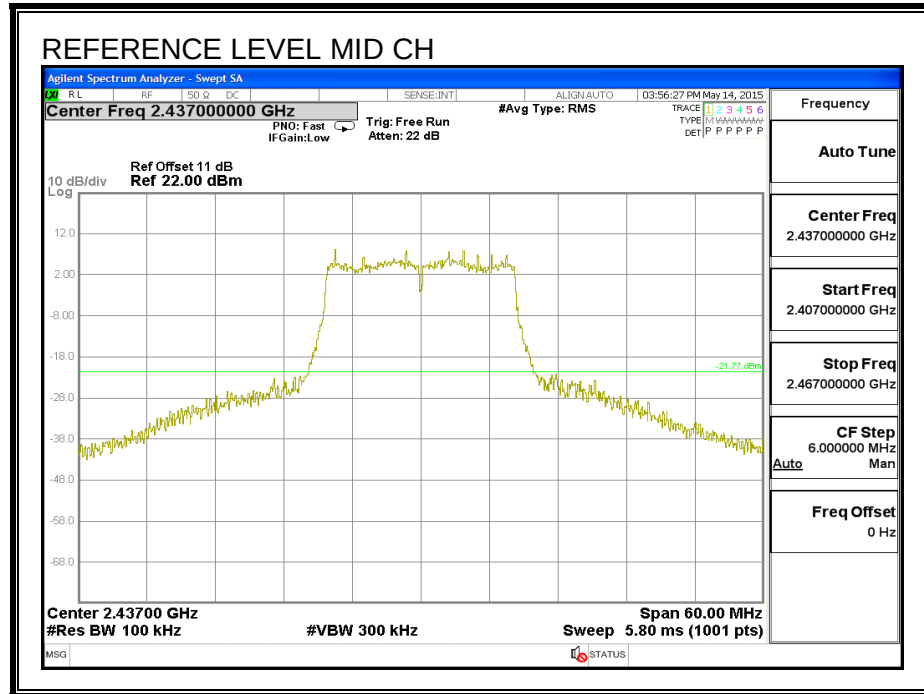
LIMITS

NCC LP0002 §3.10.1 (5.1)

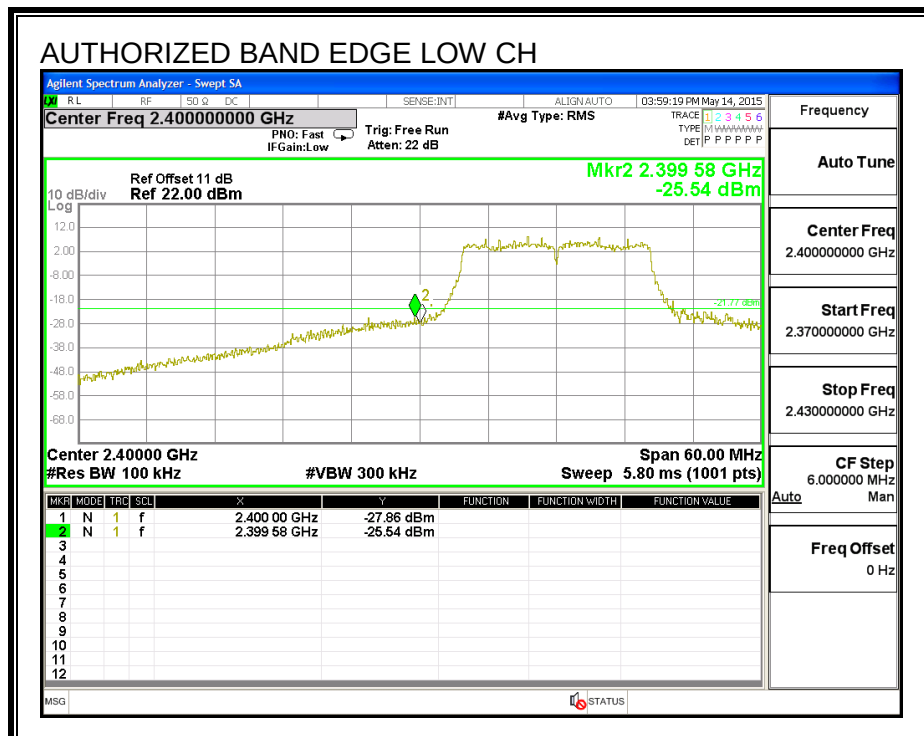
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

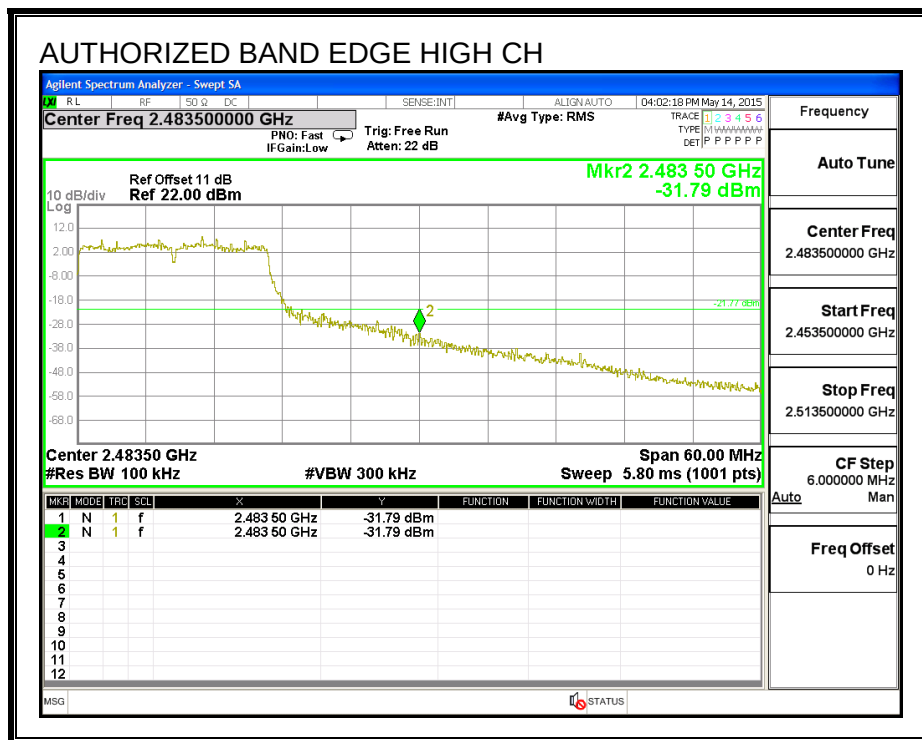
IN-BAND REFERENCE LEVEL



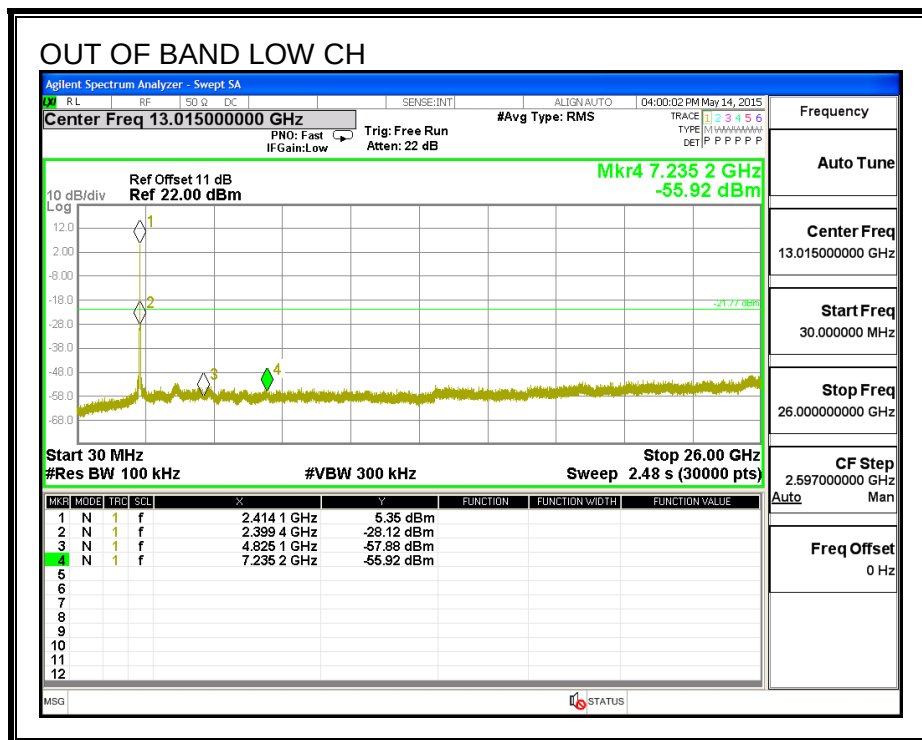
LOW CHANNEL BANDEDGE

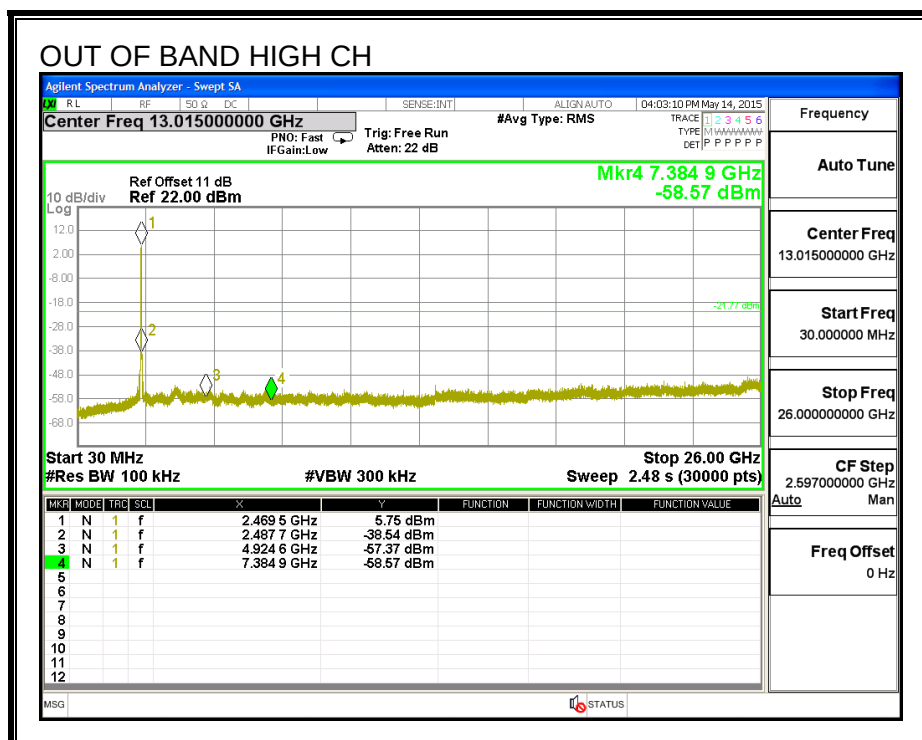
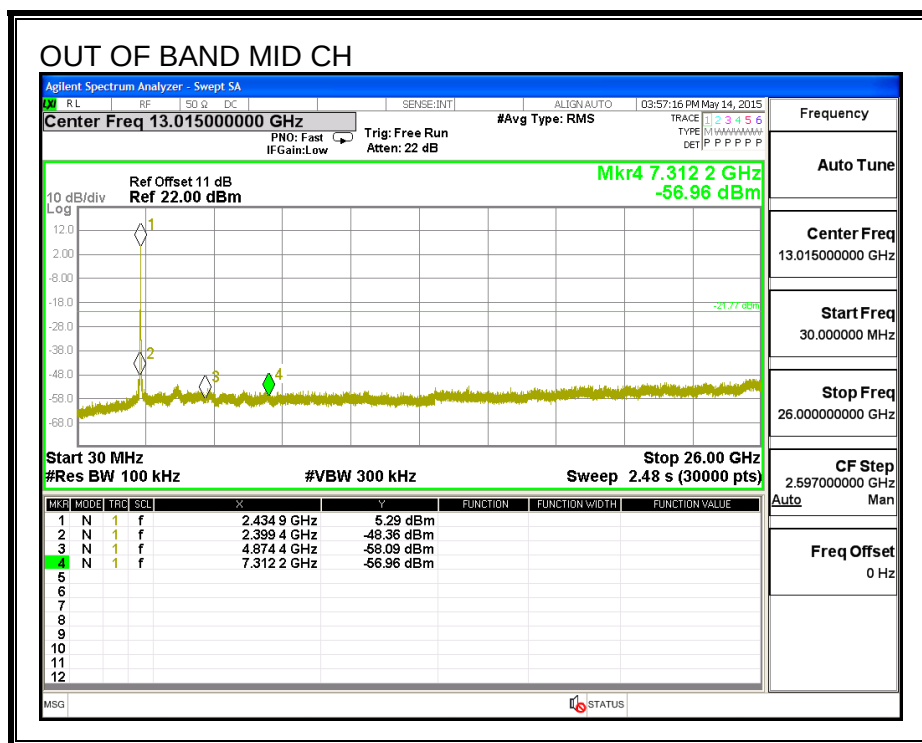


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS





8.6. 802.11n HT20 MODE IN THE 2.4 GHz BAND ANTENNA 1

8.6.1. 6 dB BANDWIDTH

LIMITS

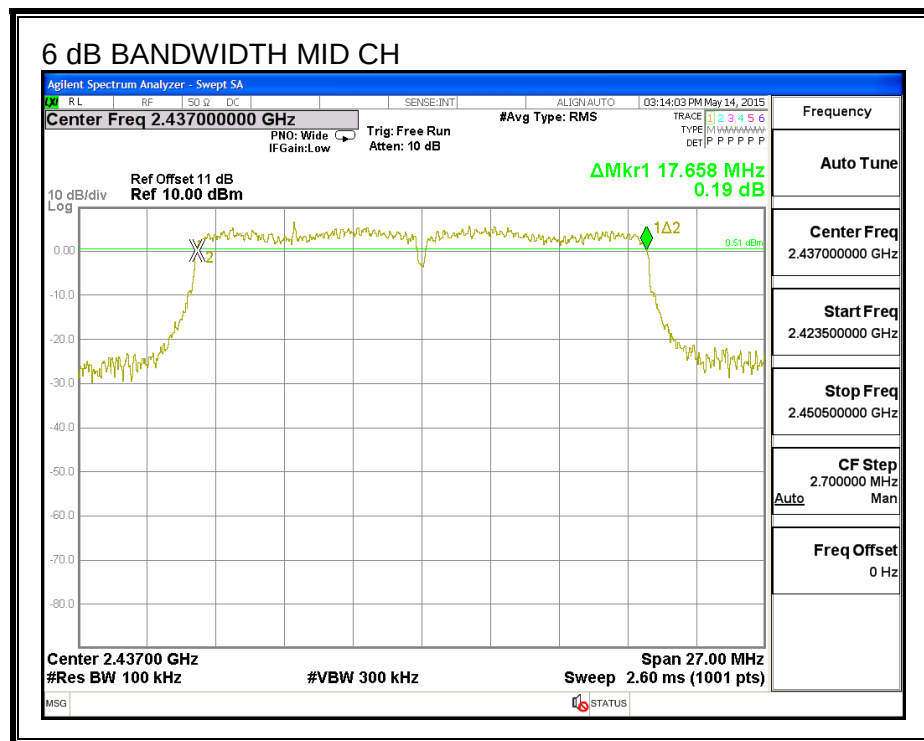
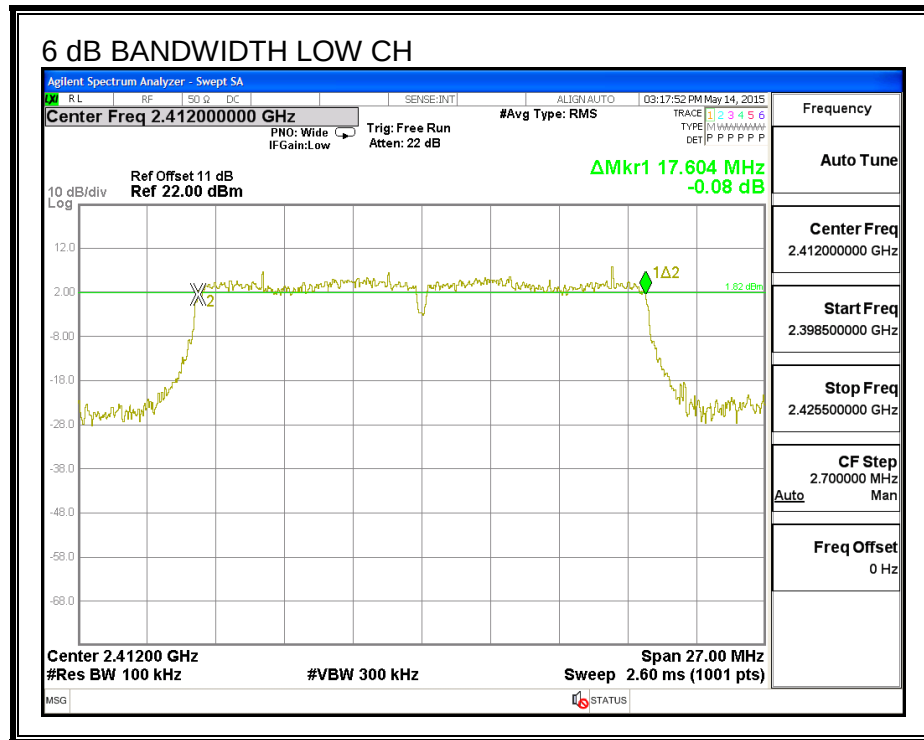
NCC LP0002 §3.10.1 (6.2.1)

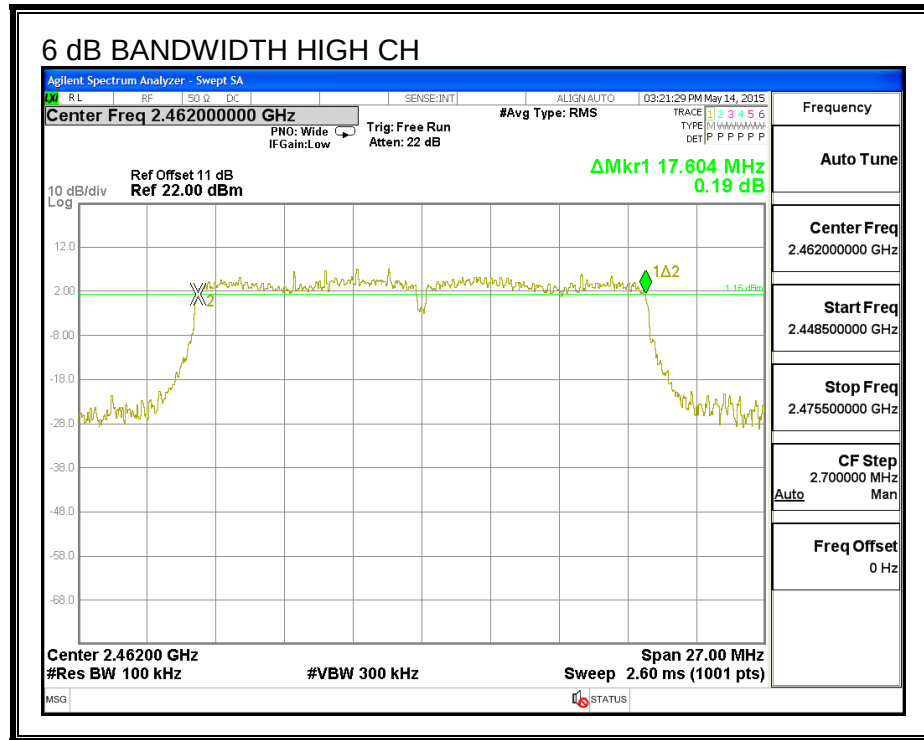
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	17.604	0.5
Mid	2437	17.658	0.5
High	2462	17.604	0.5

6 dB BANDWIDTH





8.6.2. OUTPUT POWER

LIMITS

NCC LP0002 §3.10.1

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

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	NCC Power Limit (dBm)	Max Power (dBm)
Low	2412	3.10	30.00	30.00
Mid	2437	3.10	30.00	30.00
High	2462	3.10	30.00	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	9.73	9.73	30.00	-20.27
Mid	2437	12.57	12.57	30.00	-17.43
High	2462	11.53	11.53	30.00	-18.47

8.6.3. POWER SPECTRAL DENSITY

LIMITS

NCC LP0002 §3.10.1 (6.2.2)

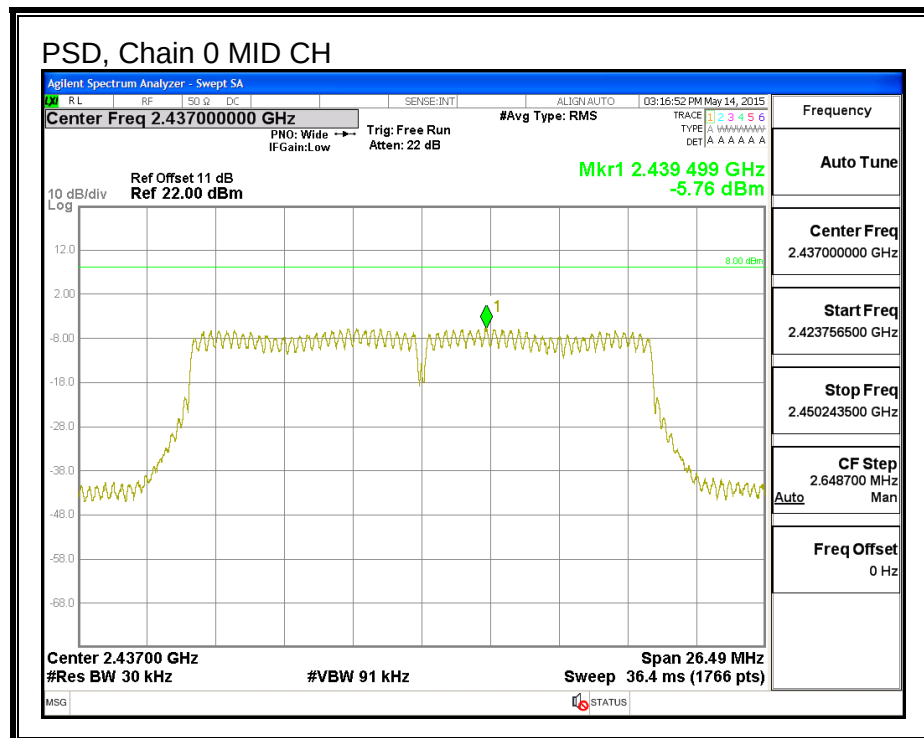
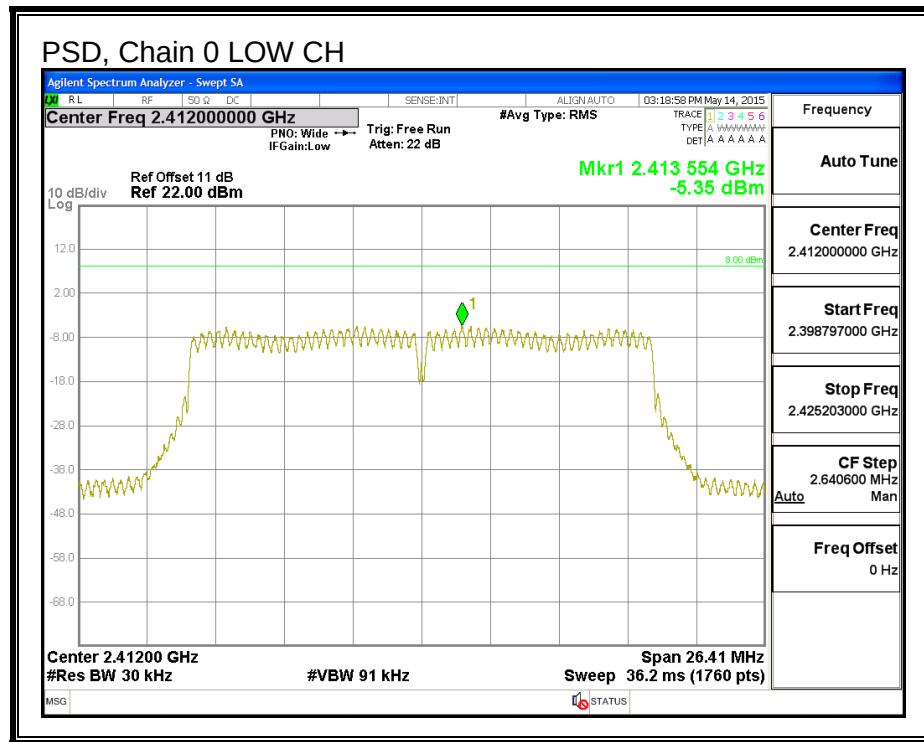
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 KHz band during any time interval of continuous transmissions.

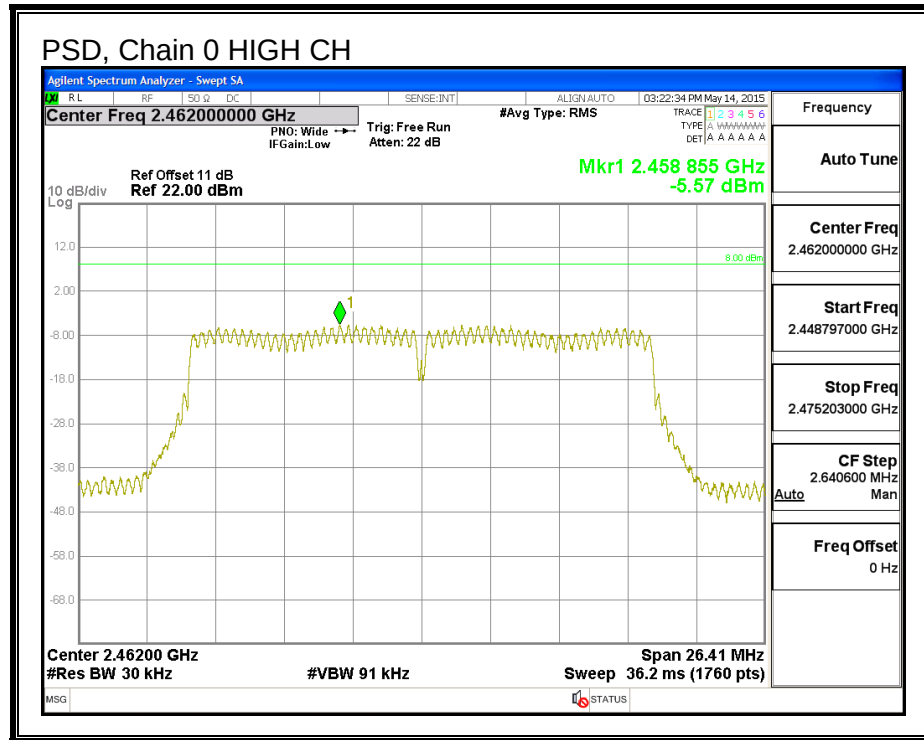
RESULTS

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-5.35	8.0	-13.4
Mid	2437	-5.76	8.0	-13.8
High	2462	-5.57	8.0	-13.6

PSD, Chain 0





8.6.4. OUT-OF-BAND EMISSIONS

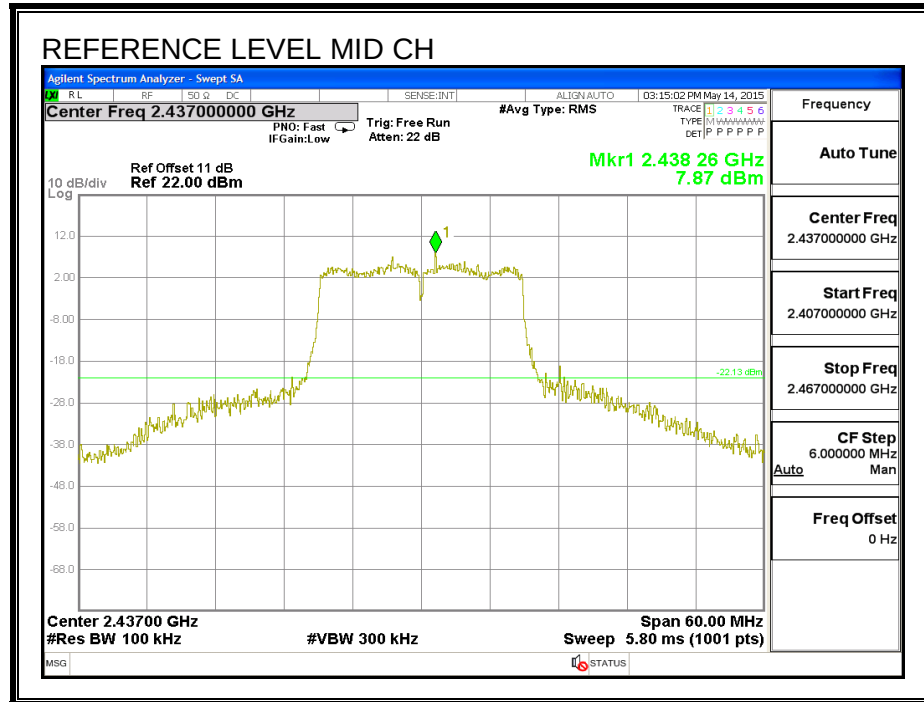
LIMITS

NCC LP0002 §3.10.1 (5.1)

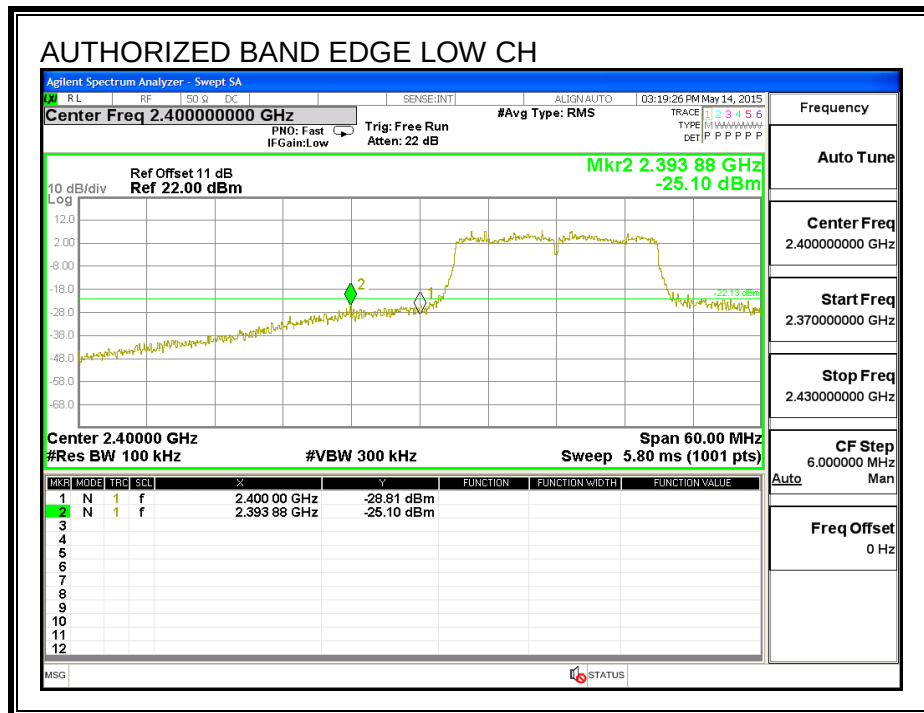
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

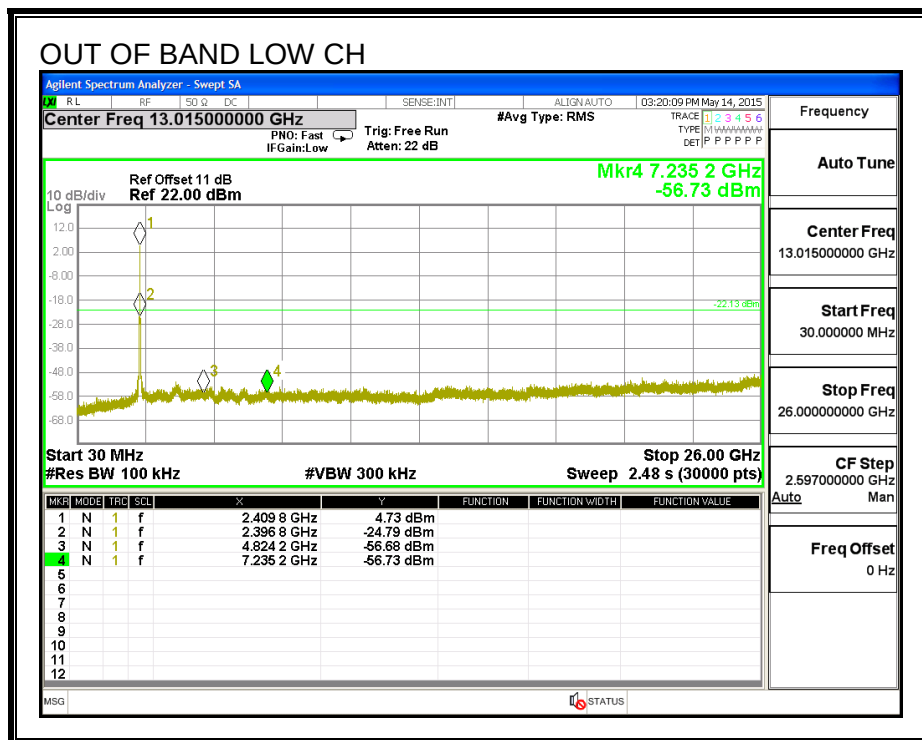
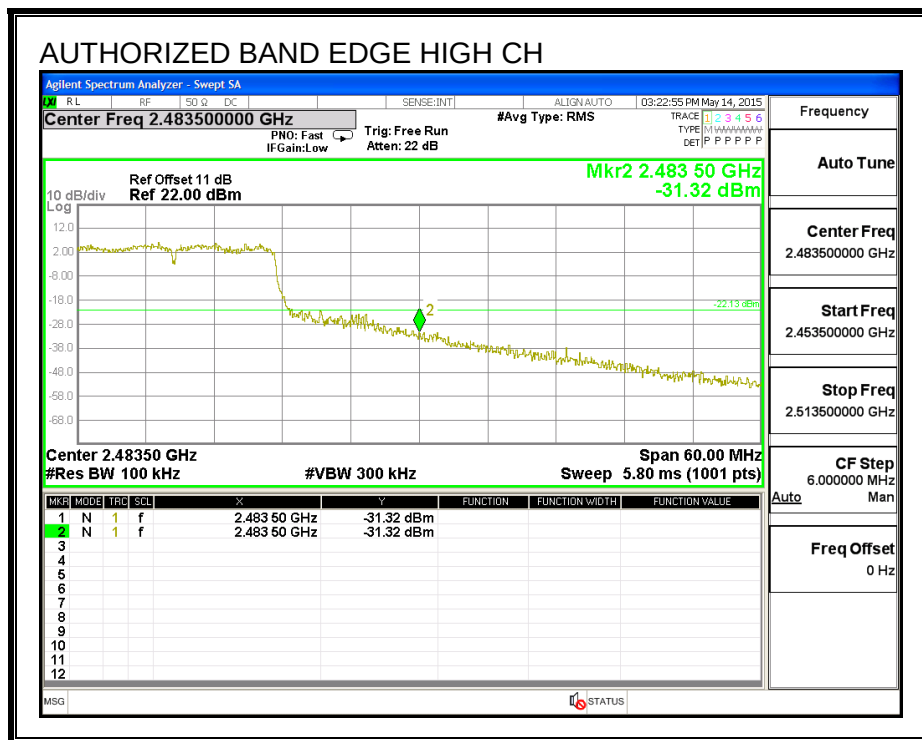
RESULTS

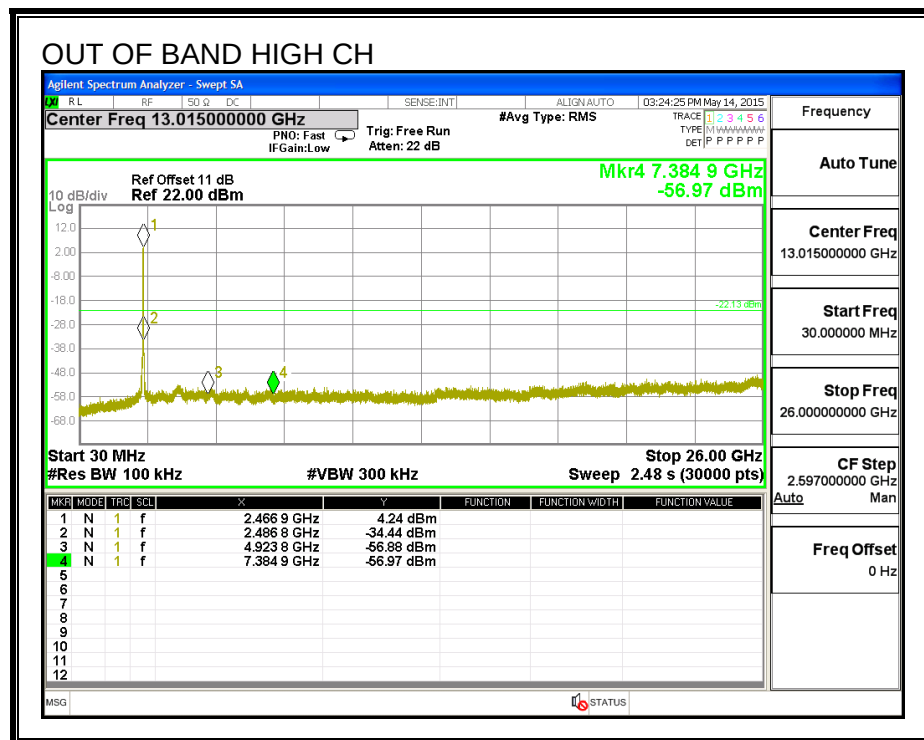
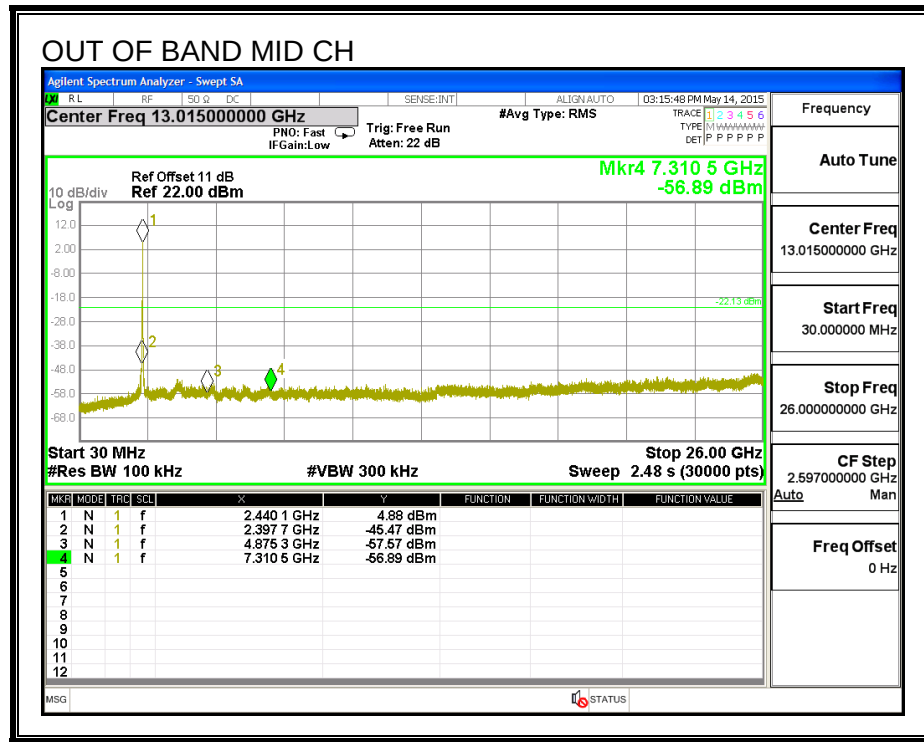
IN-BAND REFERENCE LEVEL



LOW CHANNEL BANDEDGE







8.7. 802.11n HT20 MODE IN THE 2.4 GHz BAND ANTENNA 2

8.7.1. 6 dB BANDWIDTH

LIMITS

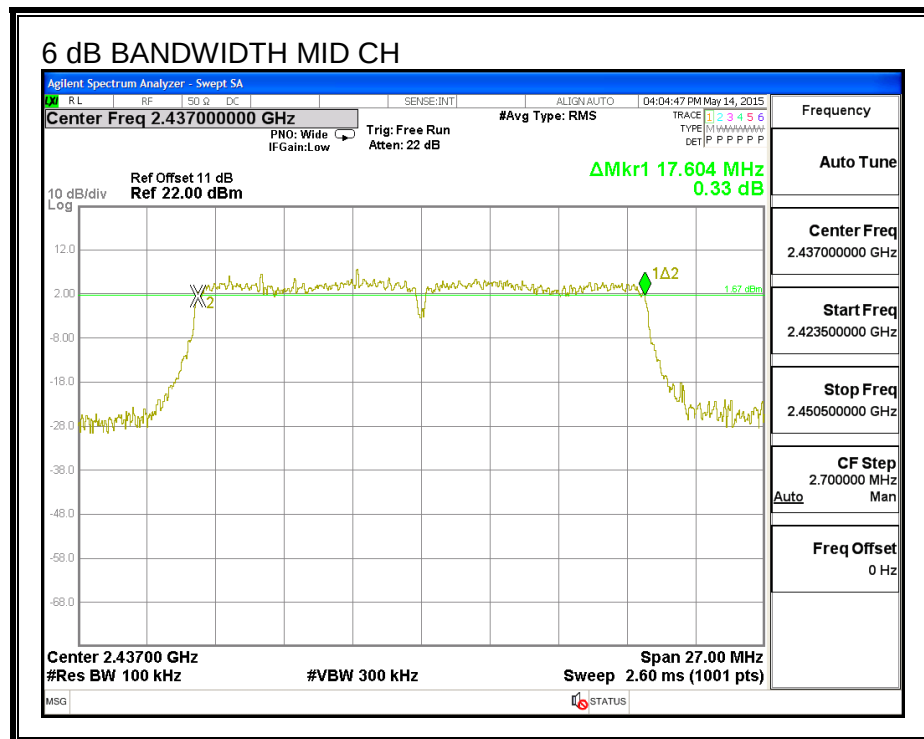
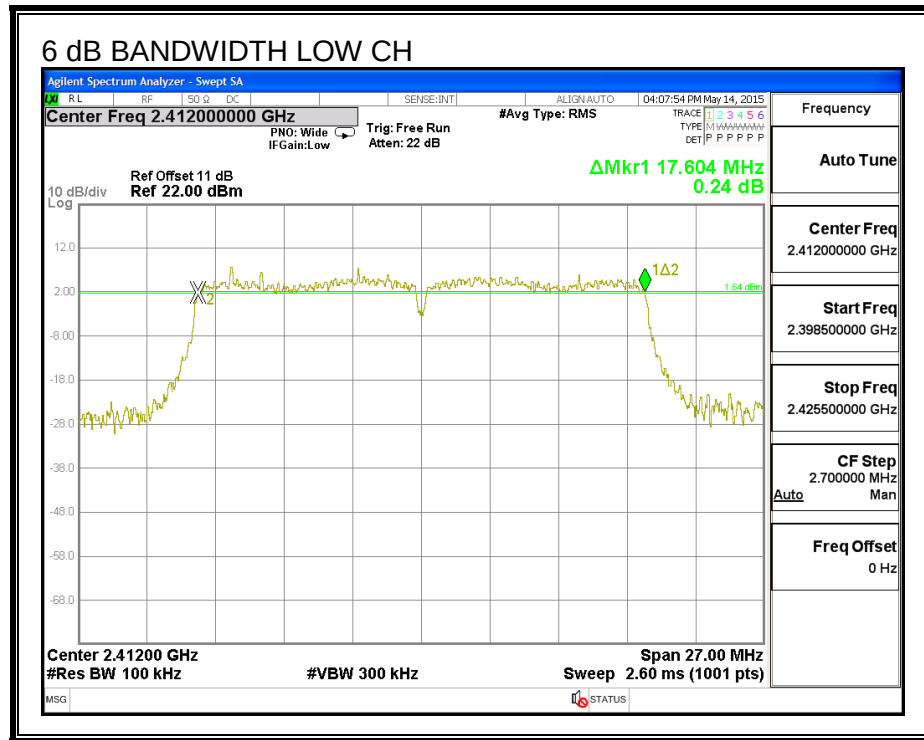
NCC LP0002 §3.10.1 (6.2.1)

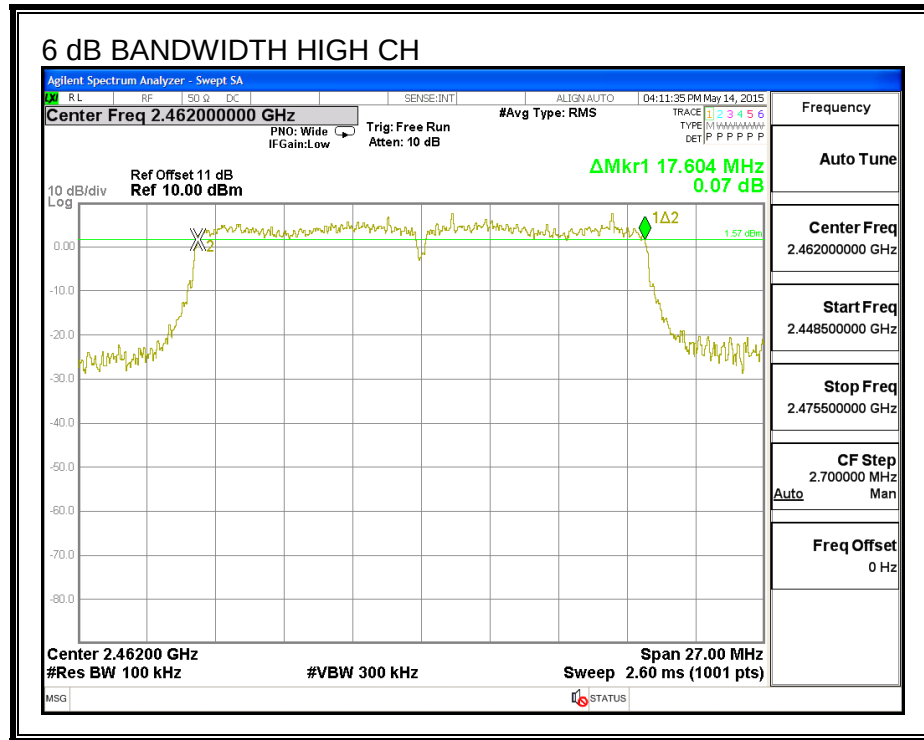
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	17.604	0.5
Mid	2437	17.604	0.5
High	2462	17.604	0.5

6 dB BANDWIDTH





8.7.2. OUTPUT POWER

LIMITS

NCC LP0002 §3.10.1

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

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	NCC Power Limit (dBm)	Max Power (dBm)
Low	2412	2.30	30.00	30.00
Mid	2437	2.30	30.00	30.00
High	2462	2.30	30.00	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	10.01	10.01	30.00	-19.99
Mid	2437	13.14	13.14	30.00	-16.86
High	2462	12.29	12.29	30.00	-17.71

8.7.3. POWER SPECTRAL DENSITY

LIMITS

NCC LP0002 §3.10.1 (6.2.2)

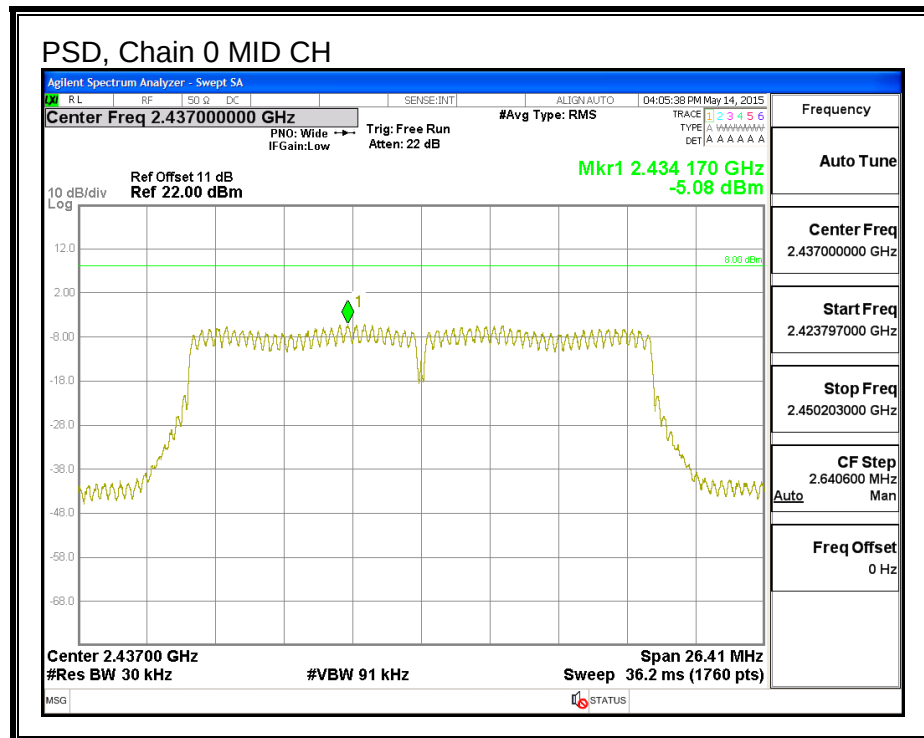
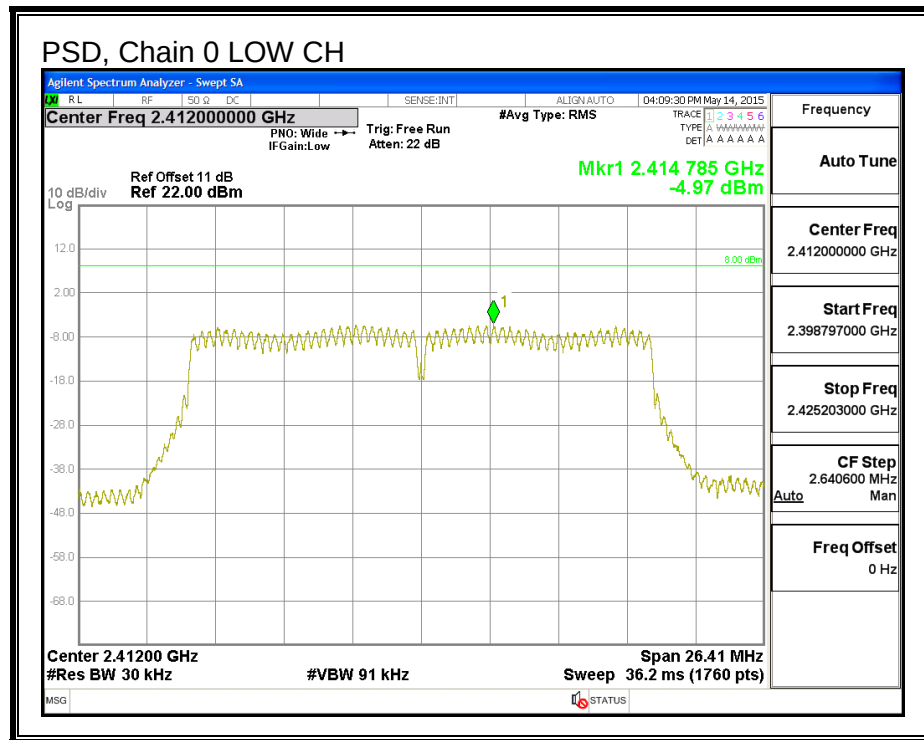
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 KHz band during any time interval of continuous transmissions.

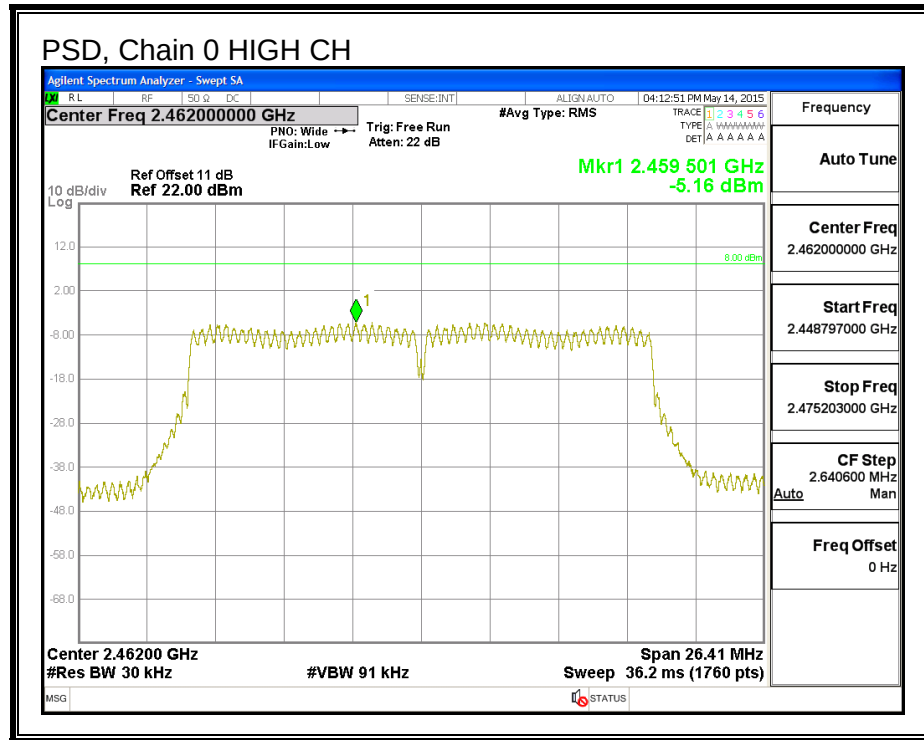
RESULTS

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-4.97	8.0	-13.0
Mid	2437	-5.08	8.0	-13.1
High	2462	-5.16	8.0	-13.2

PSD, Chain 0





8.7.4. OUT-OF-BAND EMISSIONS

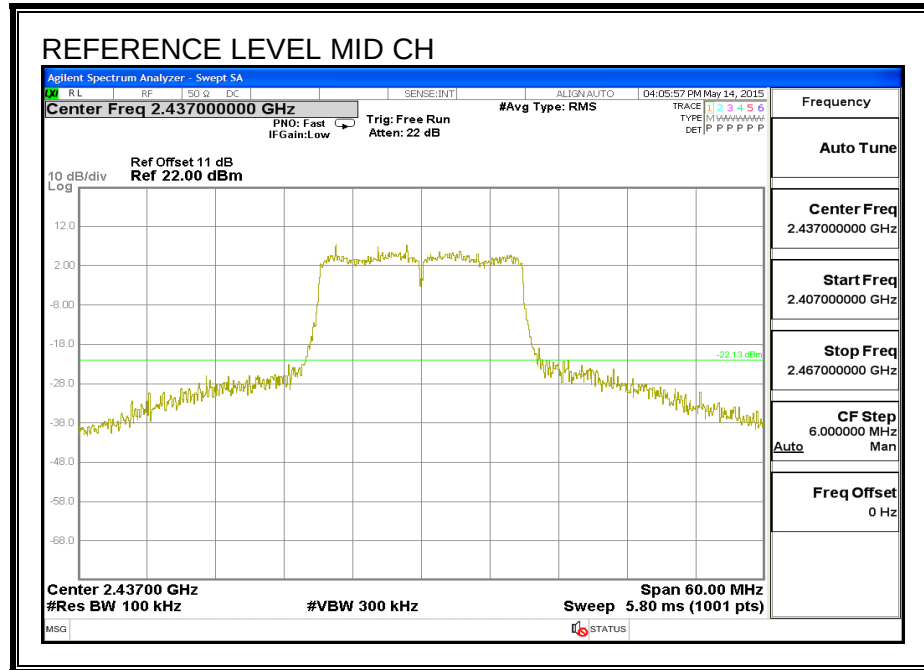
LIMITS

NCC LP0002 §3.10.1 (5.1)

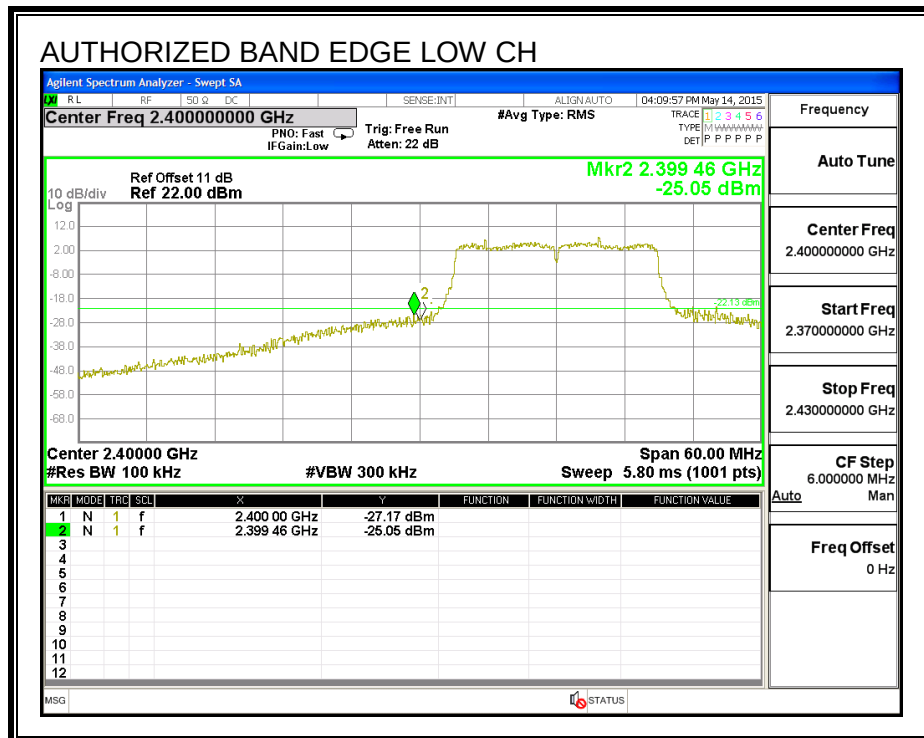
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

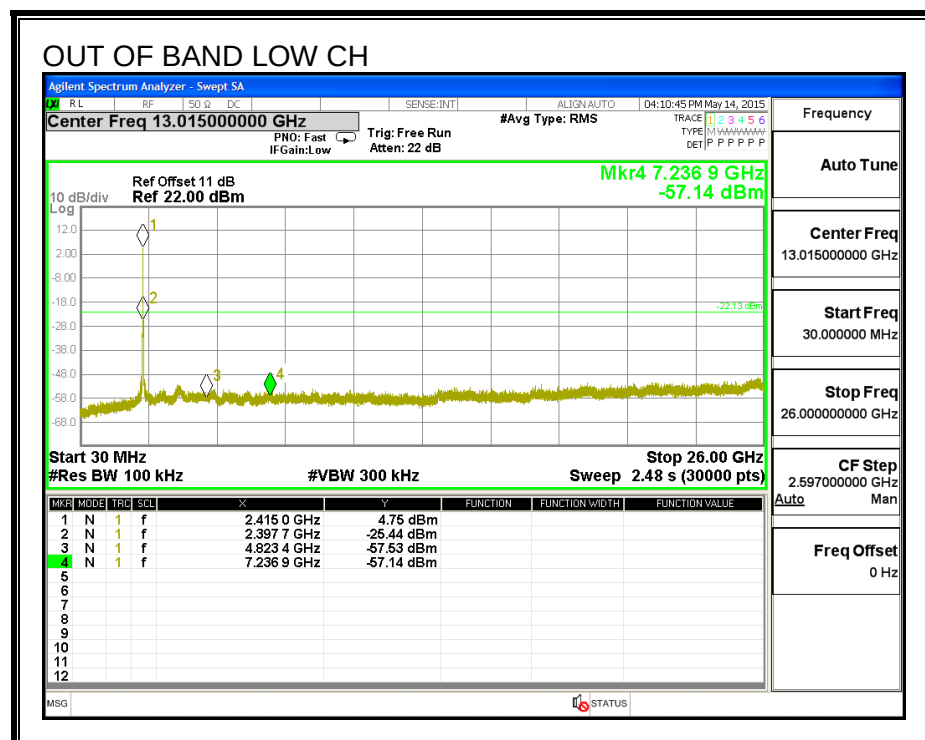
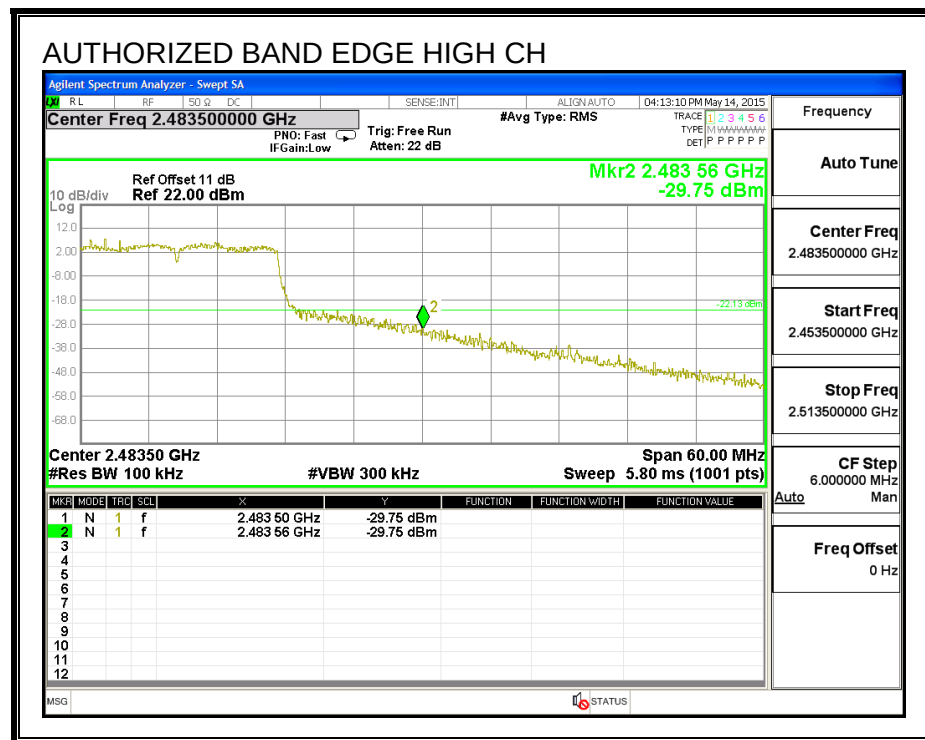
RESULTS

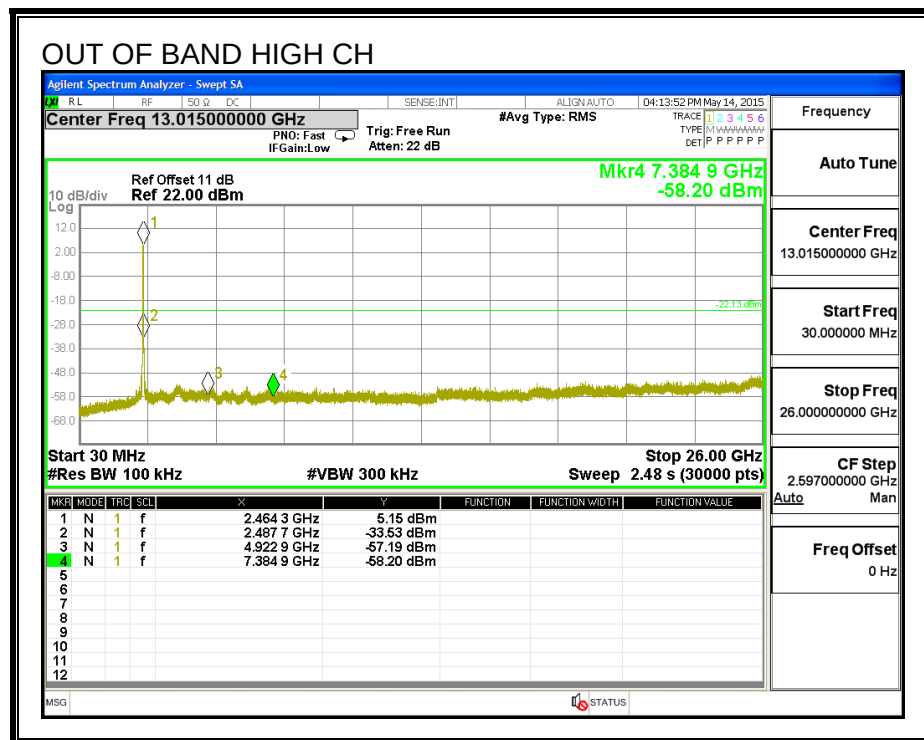
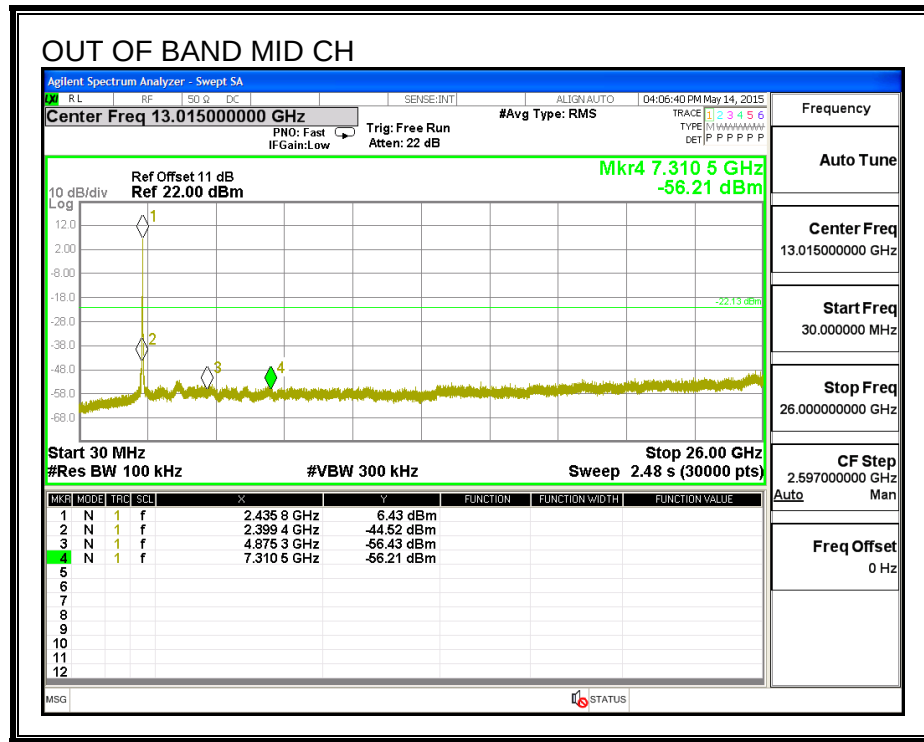
IN-BAND REFERENCE LEVEL



LOW CHANNEL BANDEDGE







8.8. 802.11n HT40 MODE IN THE 2.4 GHz BAND ANTENNA 1

8.8.1. 6 dB BANDWIDTH

LIMITS

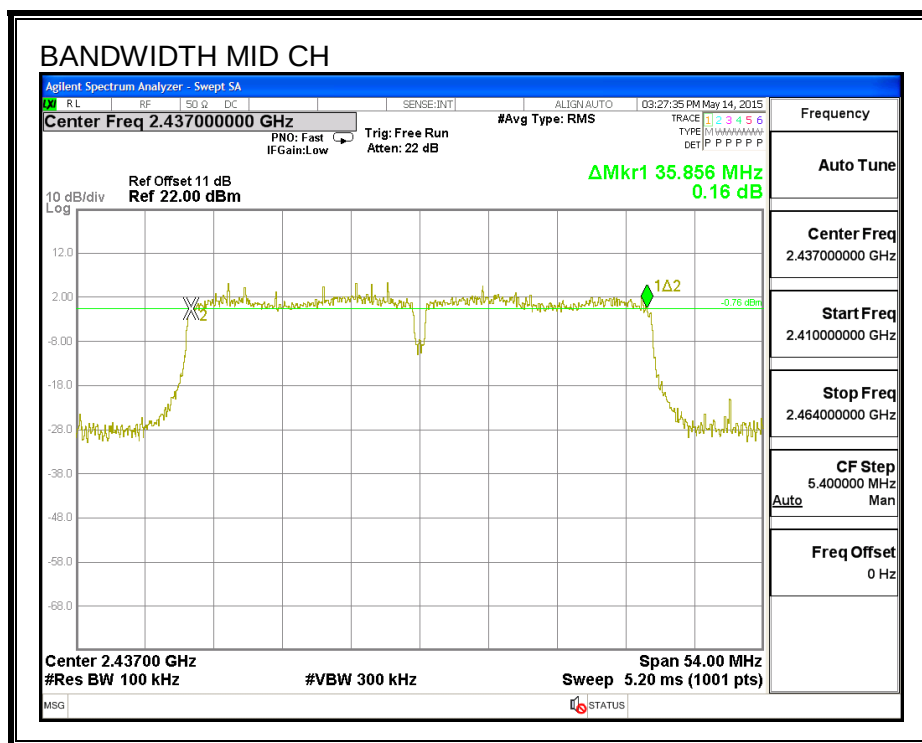
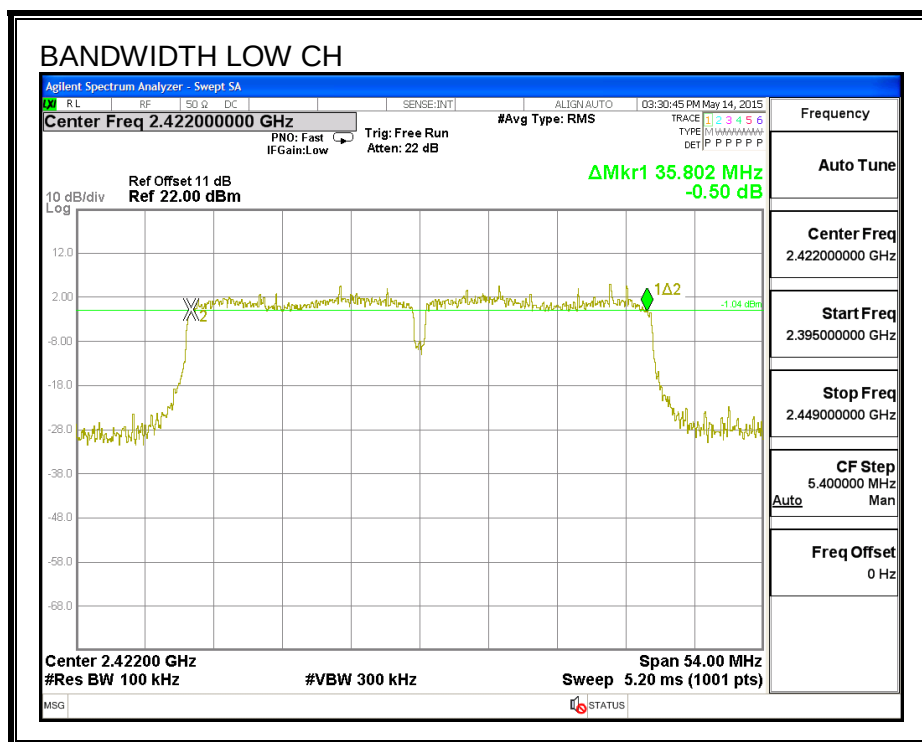
NCC LP0002 §3.10.1 (6.2.1)

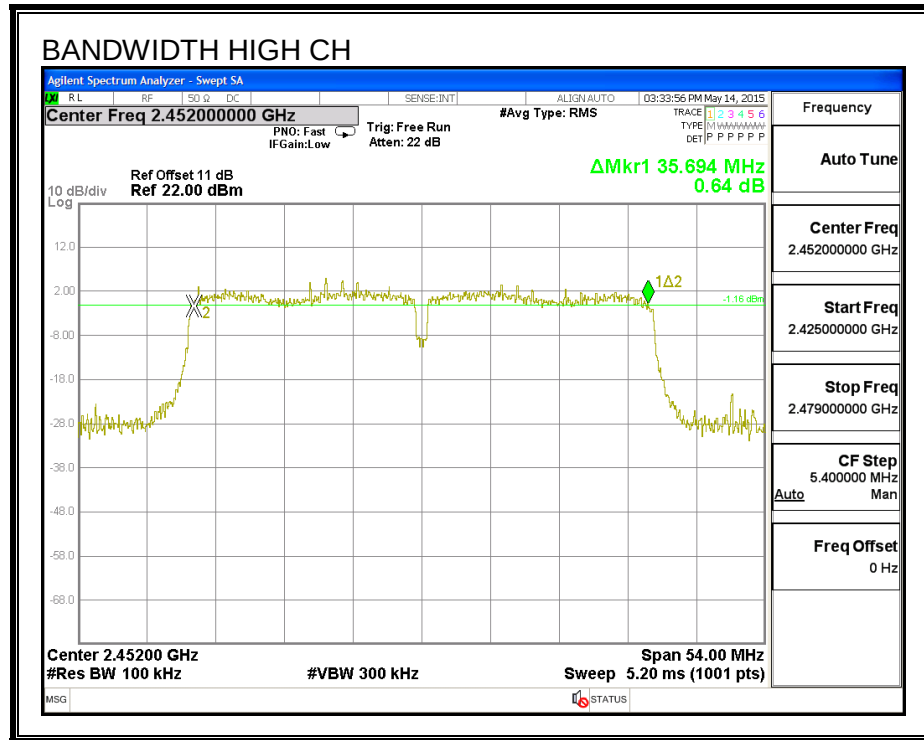
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2422	35.802	0.5
Mid	2437	35.856	0.5
High	2452	35.694	0.5

6 dB BANDWIDTH





8.8.2. OUTPUT POWER

LIMITS

NCC LP0002 §3.10.1

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

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	NCC Power Limit (dBm)	Max Power (dBm)
Low	2422	3.10	30.00	30.00
Mid	2437	3.10	30.00	30.00
High	2452	3.10	30.00	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2422	7.95	7.95	30.00	-22.05
Mid	2437	9.27	9.27	30.00	-20.73
High	2452	9.50	9.50	30.00	-20.50

8.8.3. POWER SPECTRAL DENSITY

LIMITS

NCC LP0002 §3.10.1 (6.2.2)

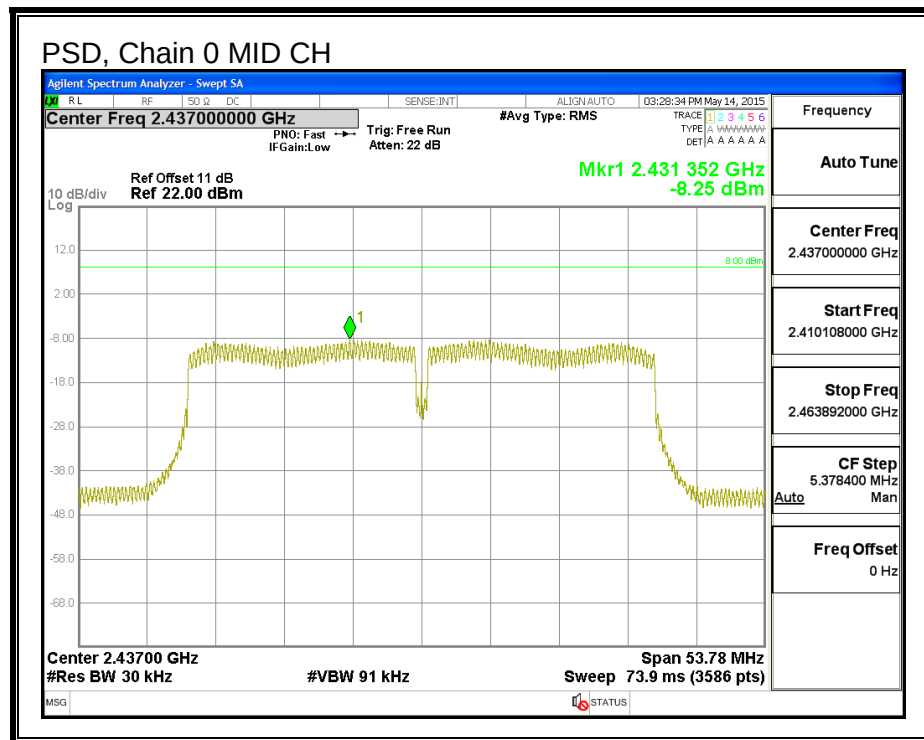
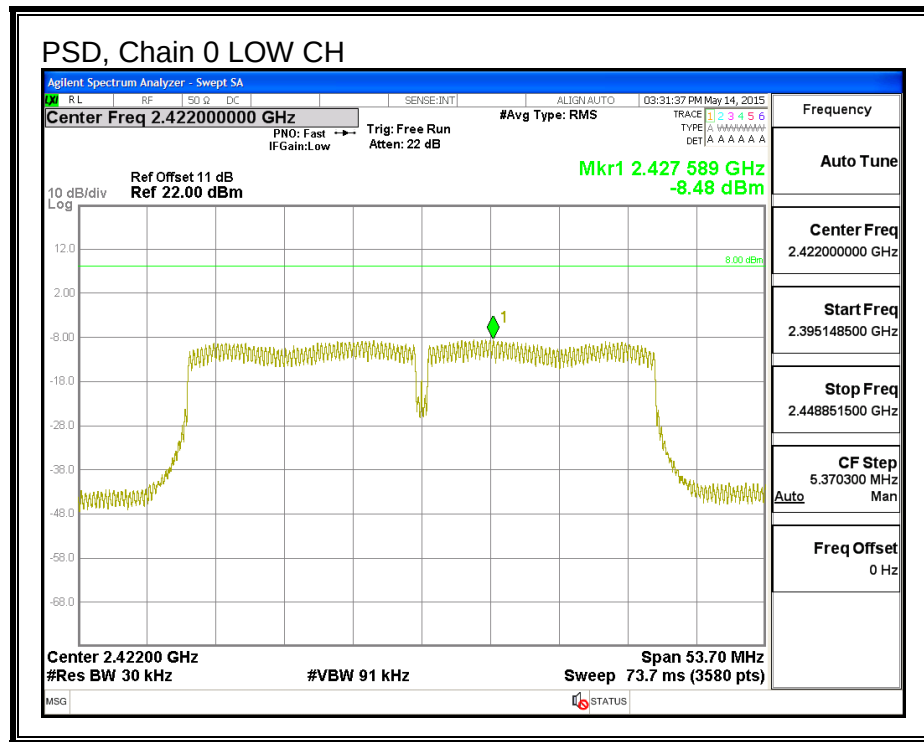
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 KHz band during any time interval of continuous transmissions.

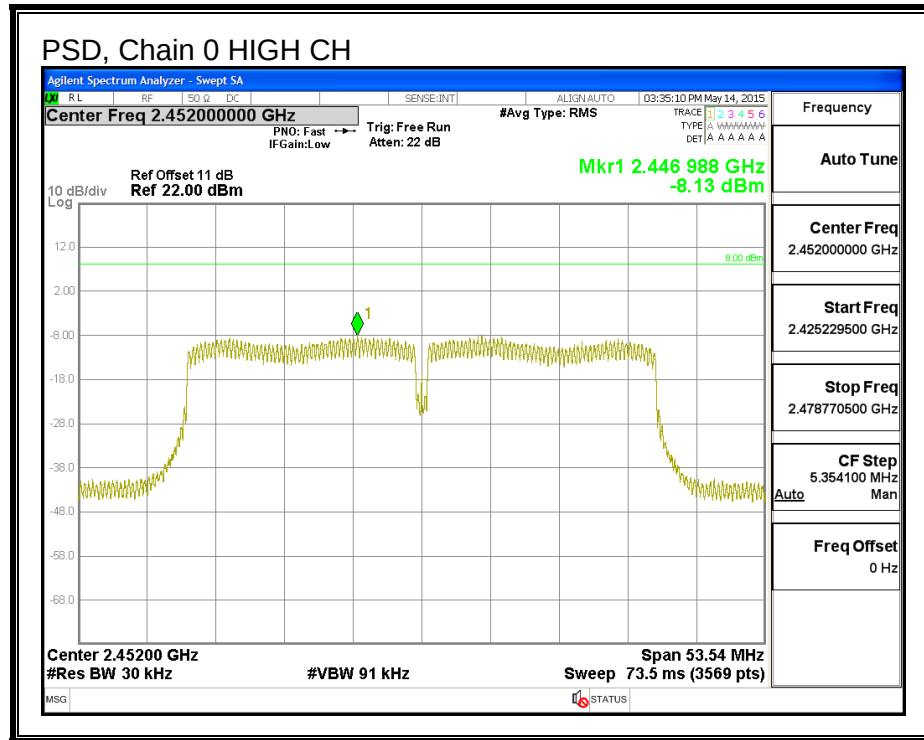
RESULTS

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2422	-8.48	-8.48	8.0	-16.5
Mid	2437	-8.25	-8.25	8.0	-16.3
High	2452	-8.13	-8.13	8.0	-16.1

PSD, Chain 0





8.8.4. OUT-OF-BAND EMISSIONS

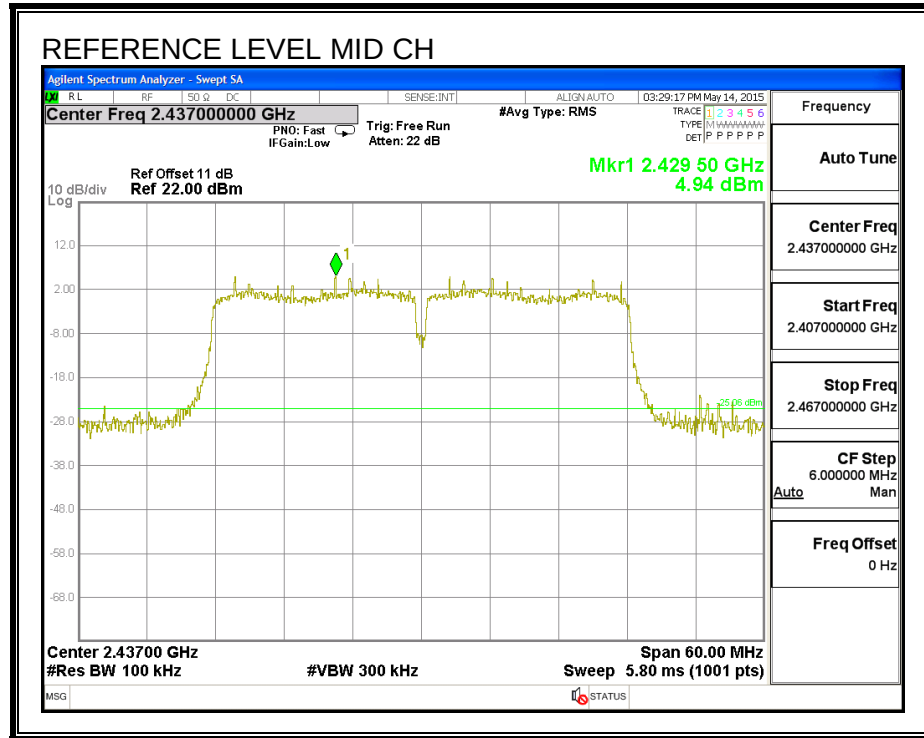
LIMITS

IC RSS-247 (5.5)

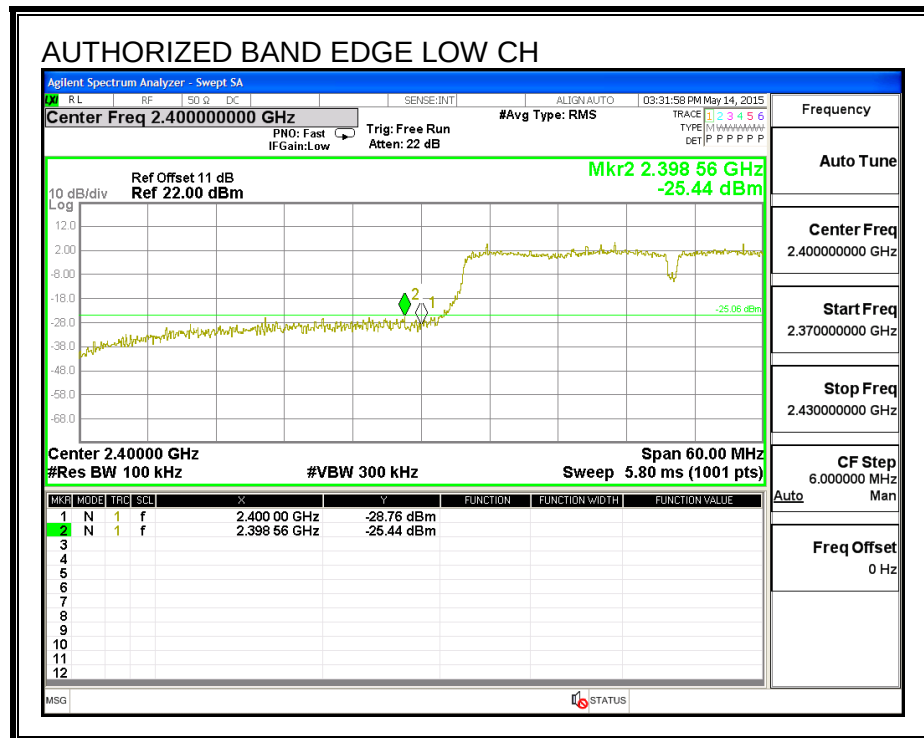
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

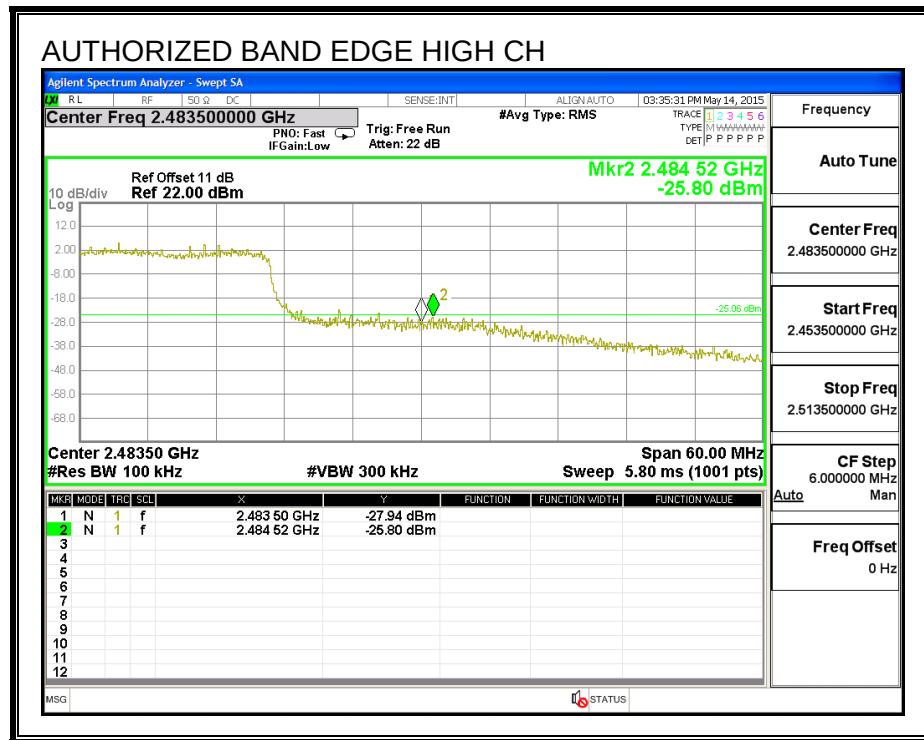
IN-BAND REFERENCE LEVEL



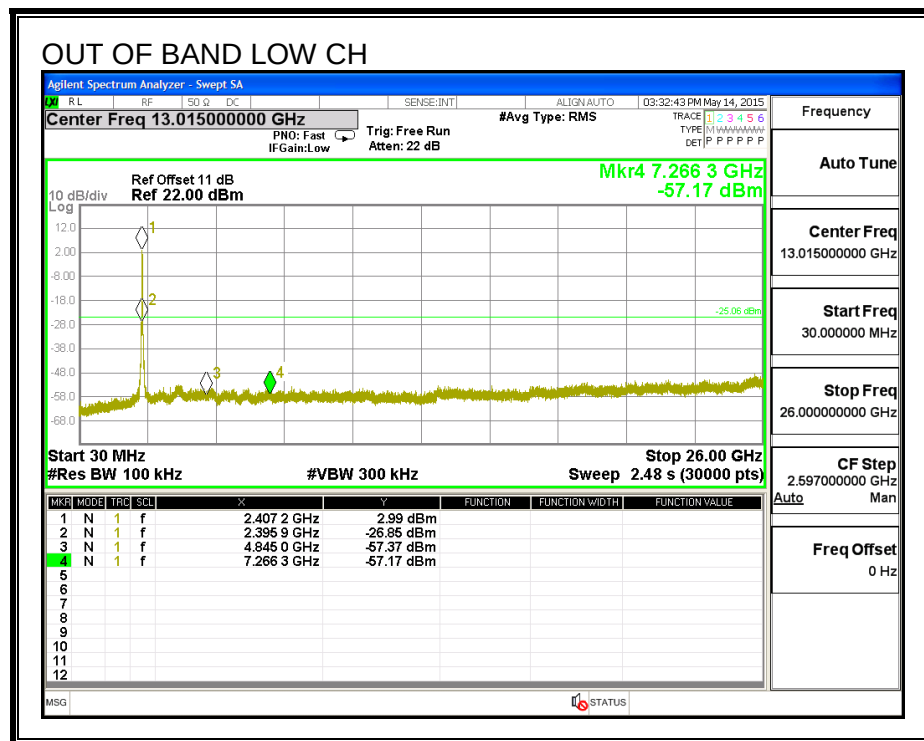
LOW CHANNEL BANDEDGE

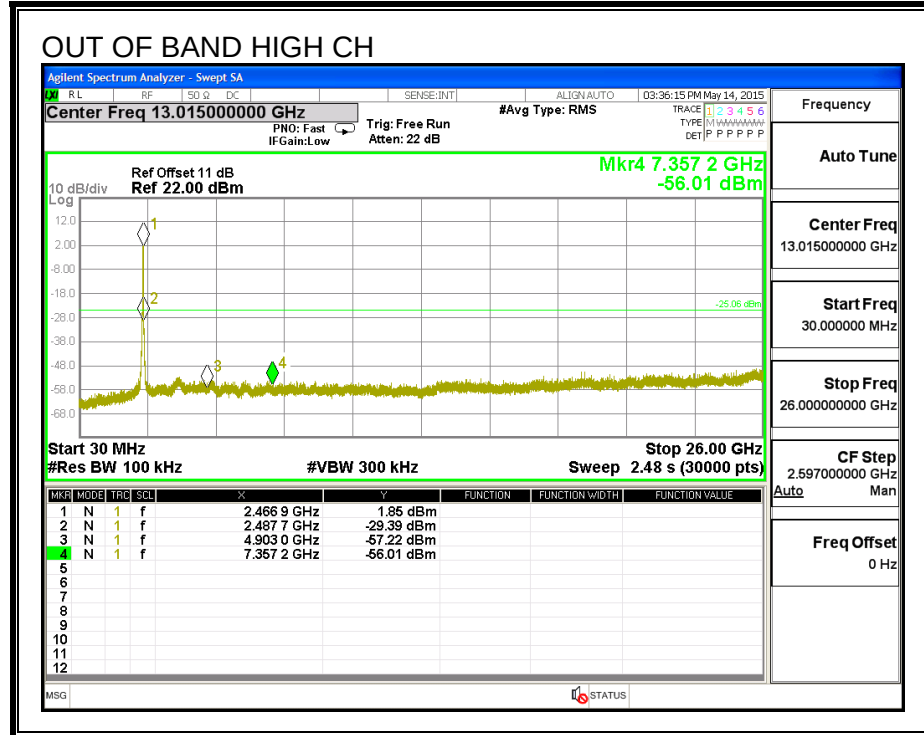
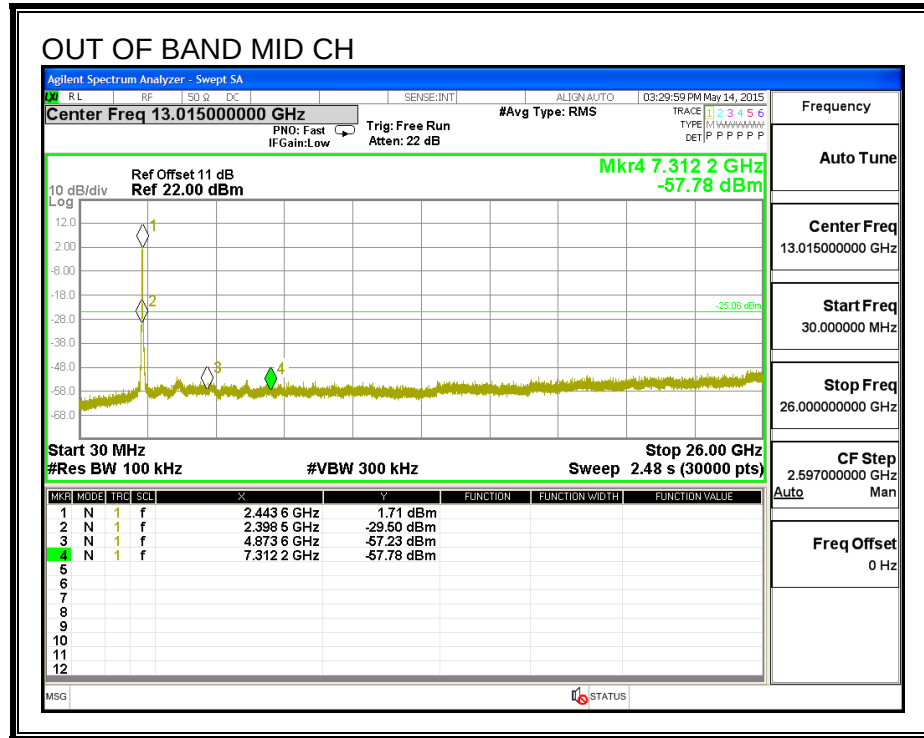


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS





8.9. 802.11n HT40 MODE IN THE 2.4 GHz BAND ANTENNA 2

8.9.1. 6 dB BANDWIDTH

LIMITS

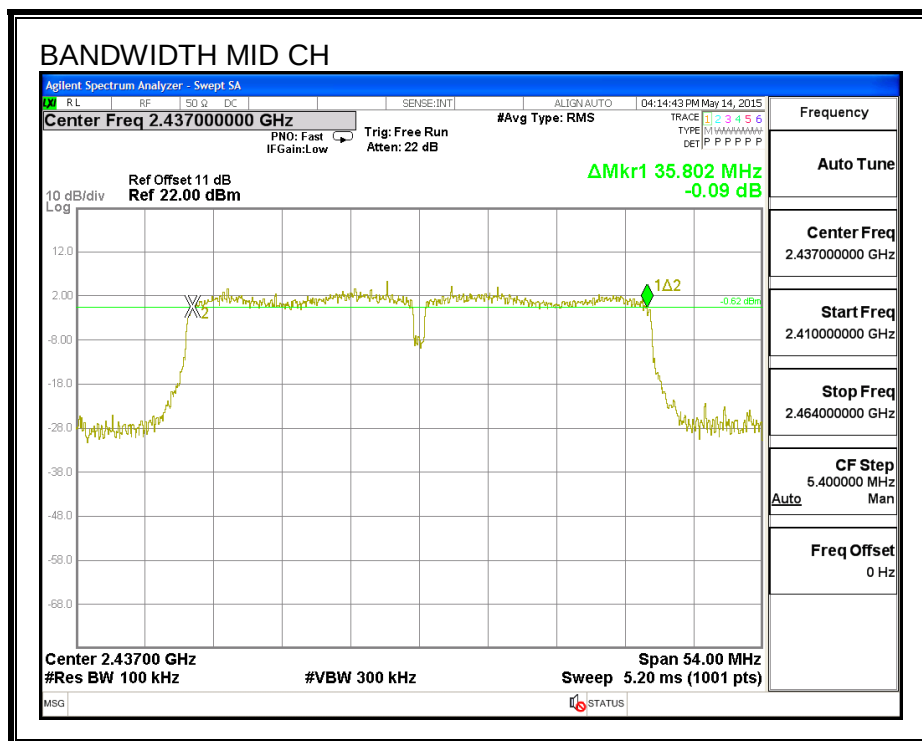
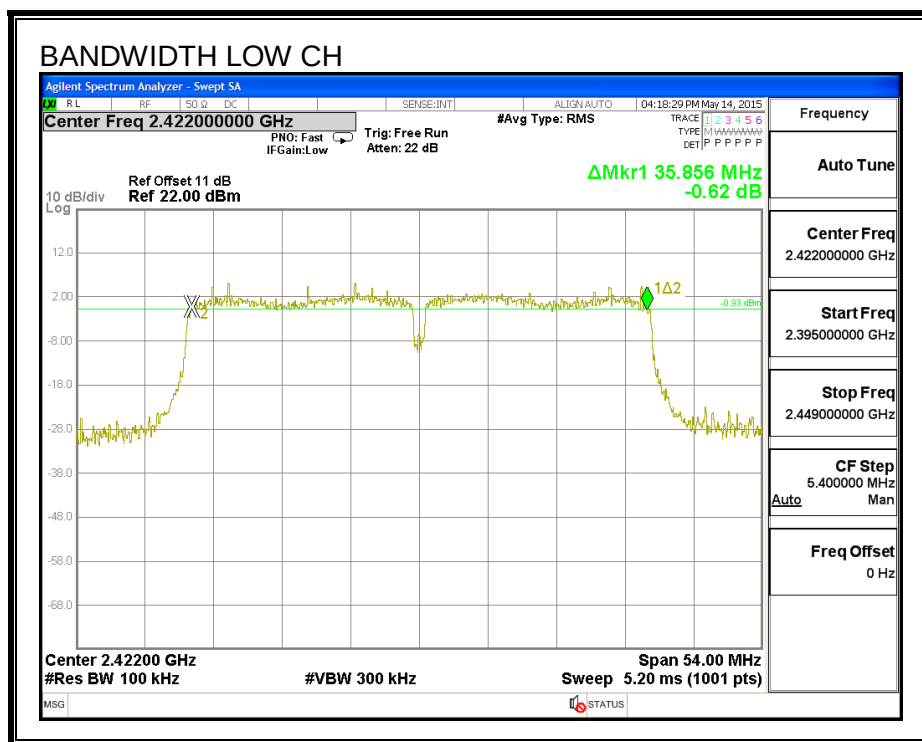
NCC LP0002 §3.10.1 (6.2.1)

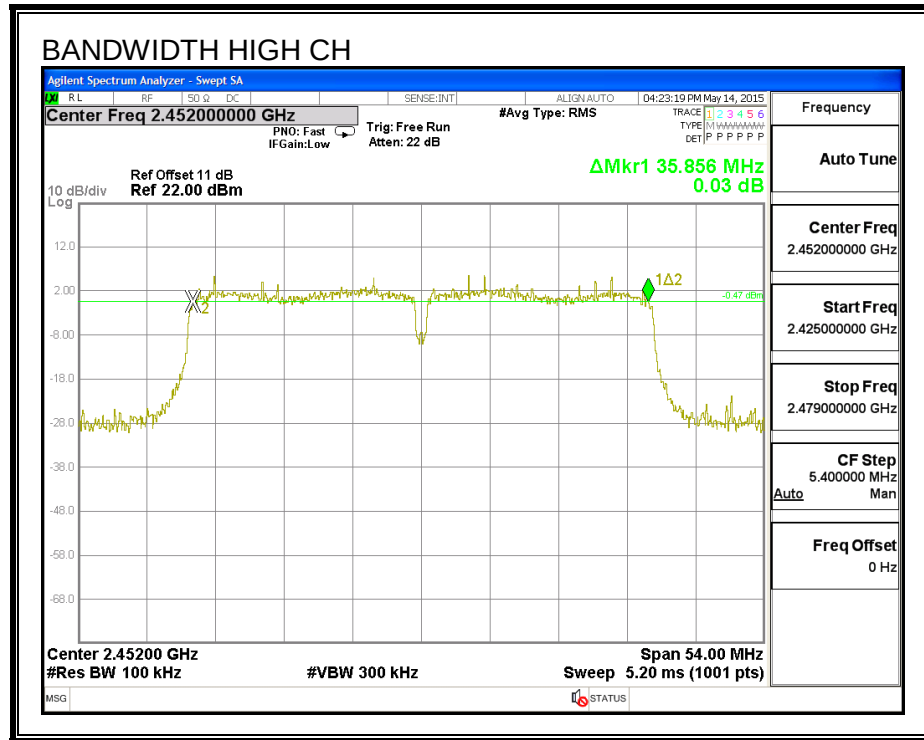
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2422	35.856	0.5
Mid	2437	35.802	0.5
High	2452	35.856	0.5

6 dB BANDWIDTH





8.9.2. OUTPUT POWER

LIMITS

NCC LP0002 §3.10.1

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

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	NCC Power Limit (dBm)	Max Power (dBm)
Low	2422	2.30	30.00	30.00
Mid	2437	2.30	30.00	30.00
High	2452	2.30	30.00	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2422	8.43	8.43	30.00	-21.57
Mid	2437	10.37	10.37	30.00	-19.63
High	2452	10.29	10.29	30.00	-19.71

8.9.3. POWER SPECTRAL DENSITY

LIMITS

NCC LP0002 §3.10.1 (6.2.2)

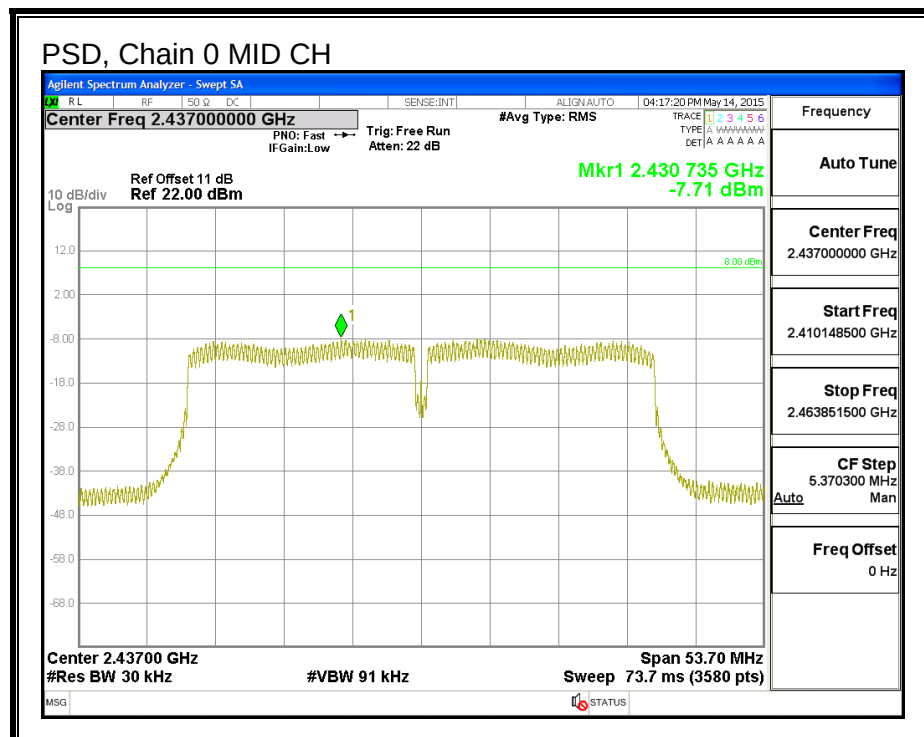
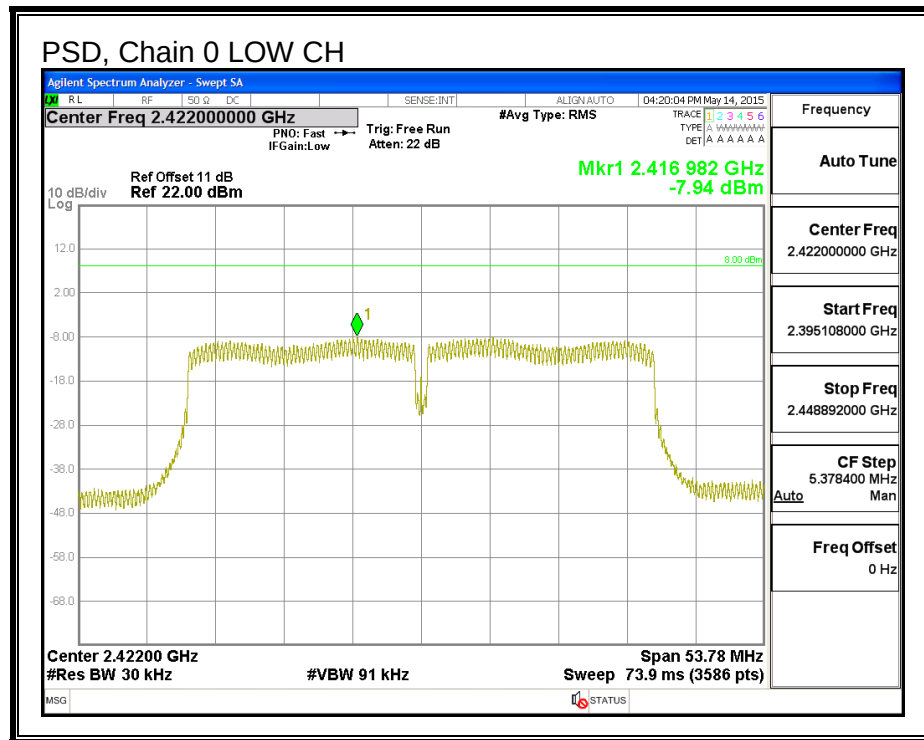
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 KHz band during any time interval of continuous transmissions.

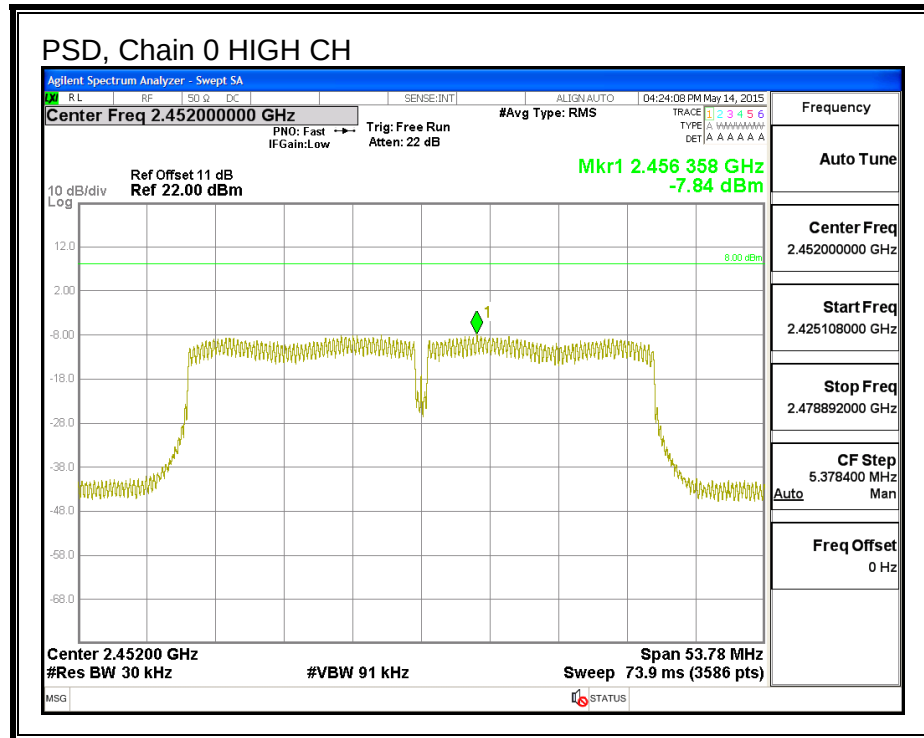
RESULTS

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2422	-7.94	-7.94	8.0	-15.9
Mid	2437	-7.71	-7.71	8.0	-15.7
High	2452	-7.84	-7.84	8.0	-15.8

PSD, Chain 0





8.9.4. OUT-OF-BAND EMISSIONS

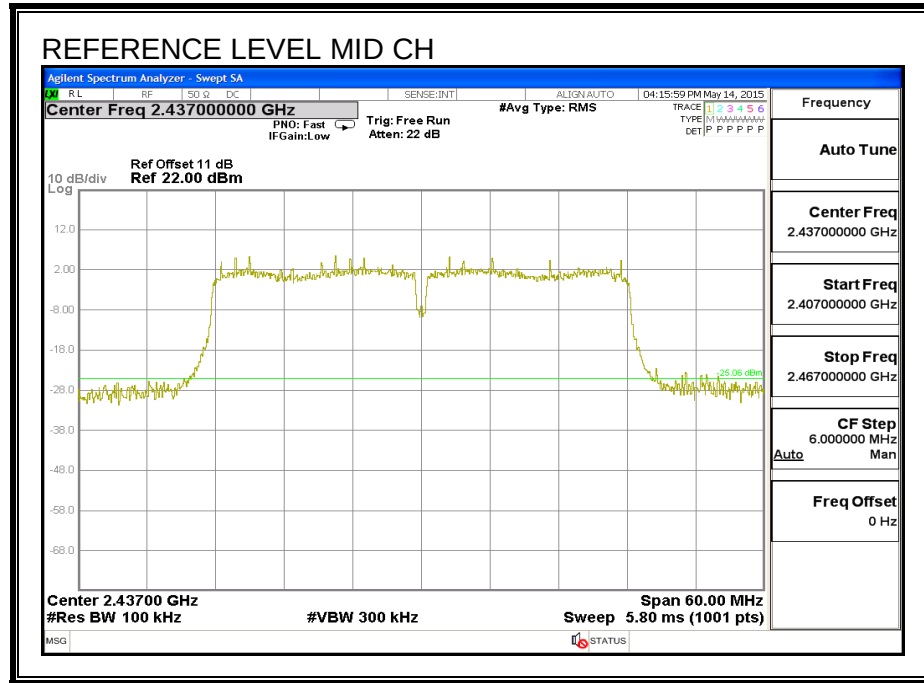
LIMITS

NCC LP0002 §3.10.1 (5.1)

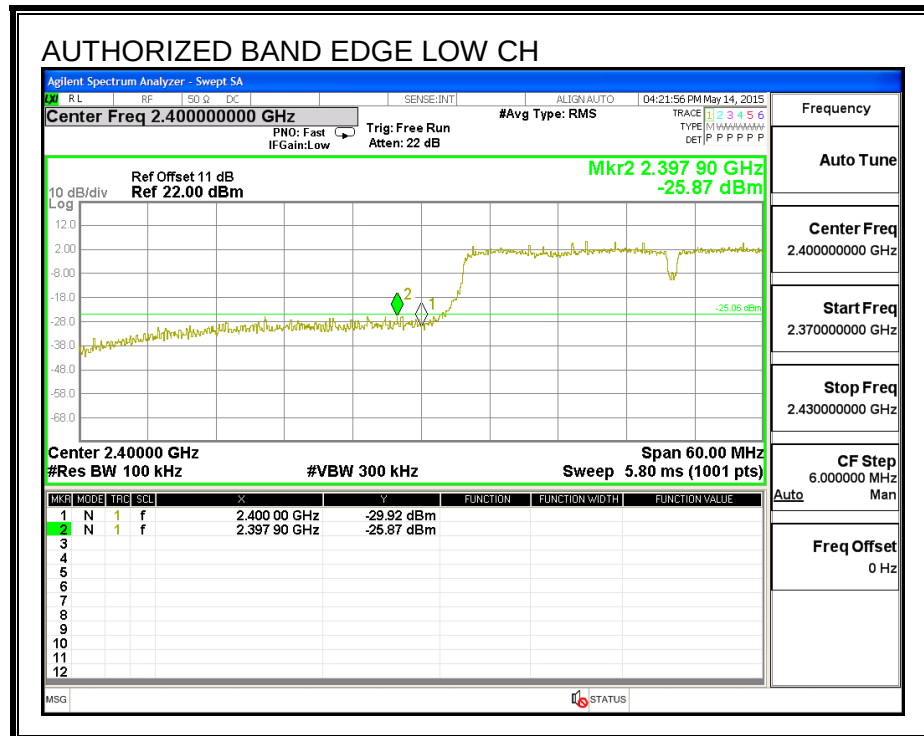
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

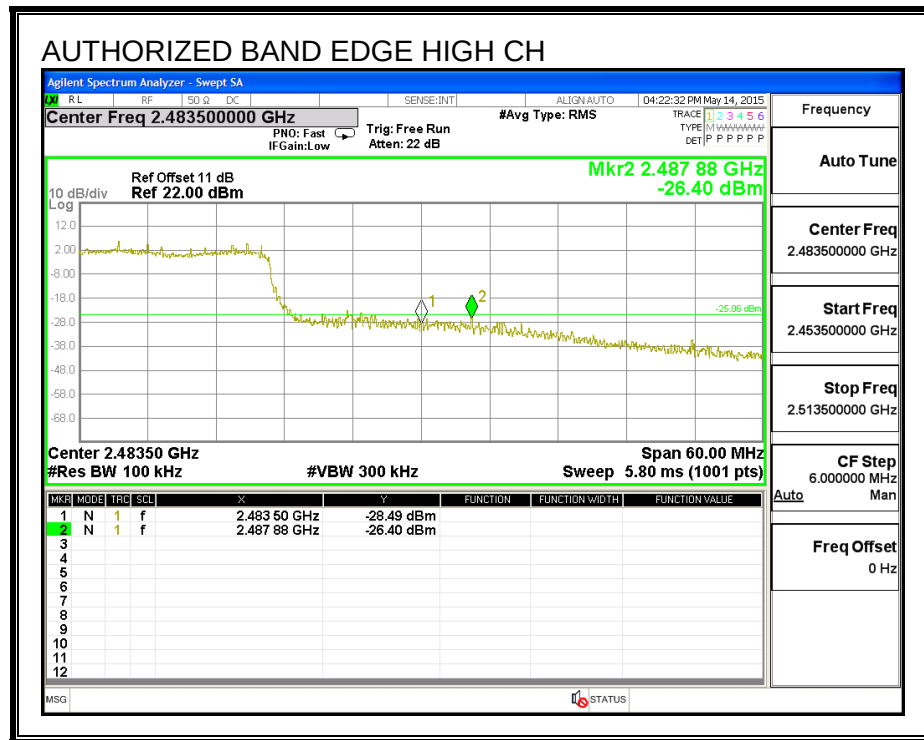
IN-BAND REFERENCE LEVEL



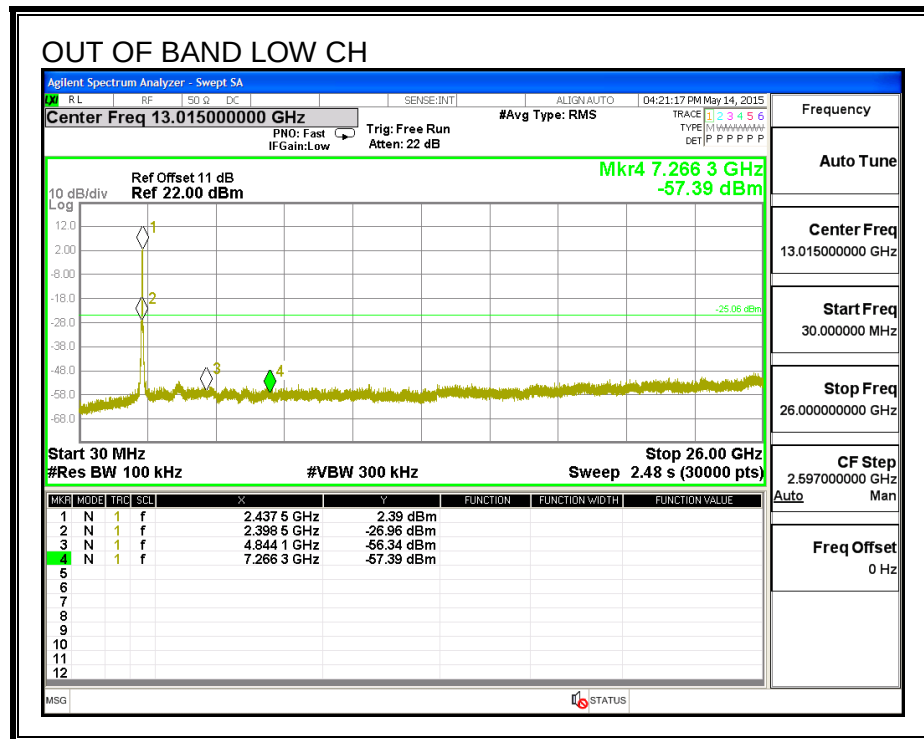
LOW CHANNEL BANDEDGE

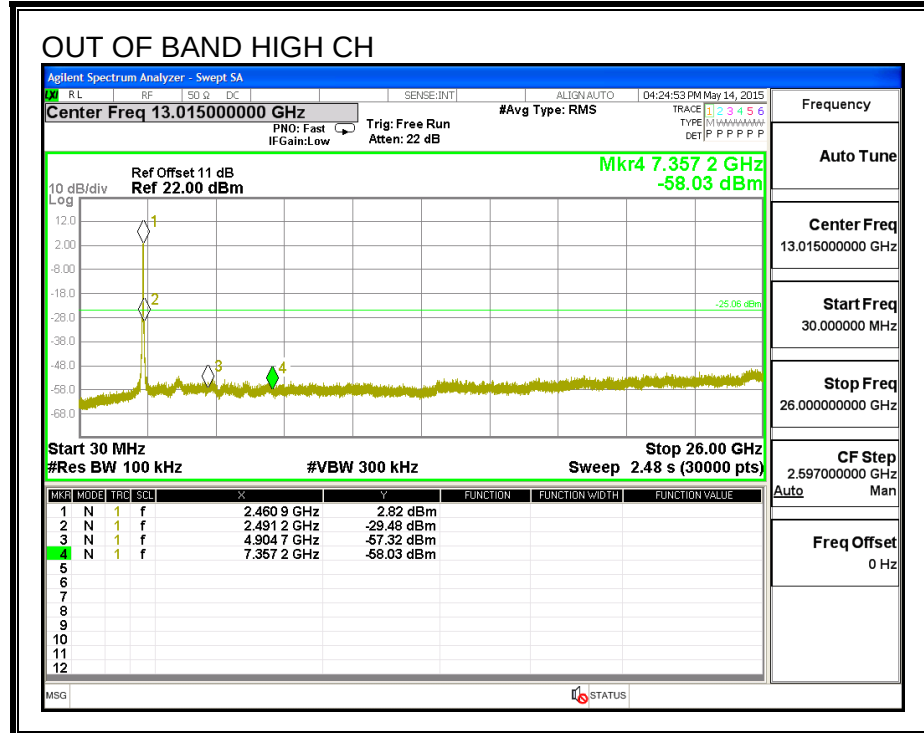
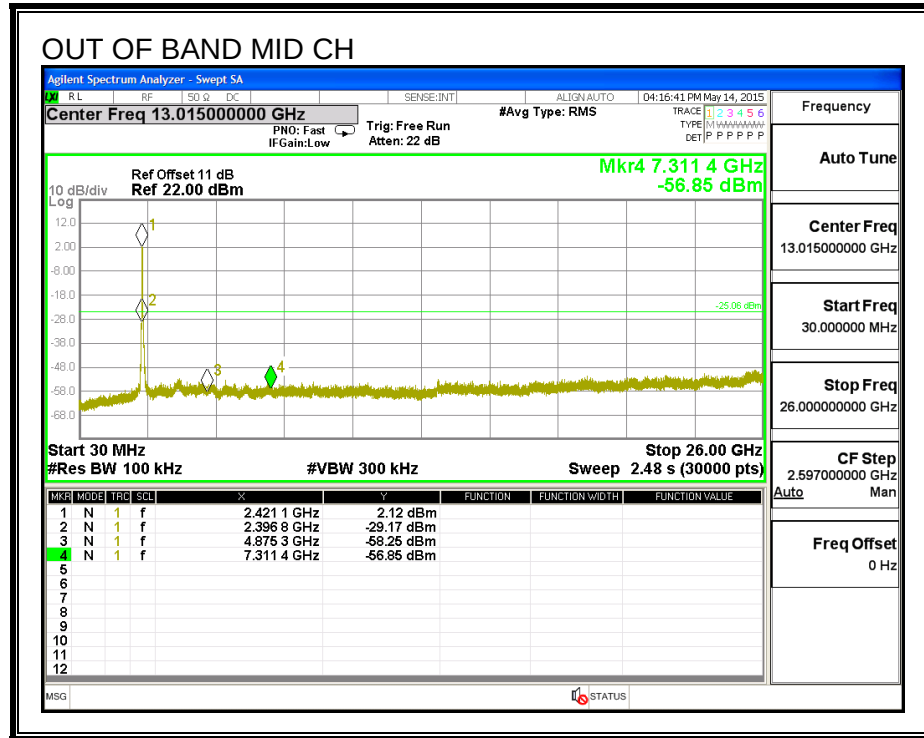


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS





9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

NCC LP0002 §2.7 and §2.8

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 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. The antenna to EUT distance is 3 meters.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. 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 1 MHz for peak measurements and as applicable for average measurements.

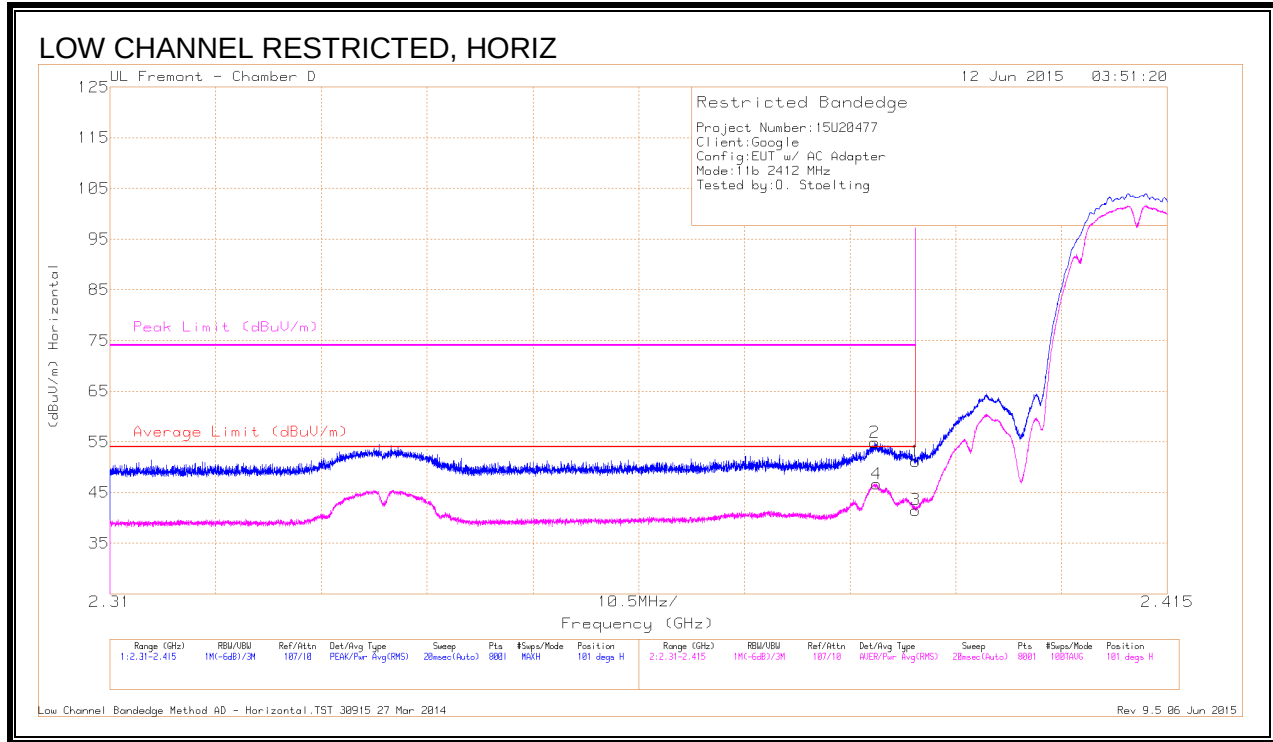
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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 IN THE 2.4 GHz BAND ANTENNA 1

RESTRICTED BANDEDGE (LOW CHANNEL)

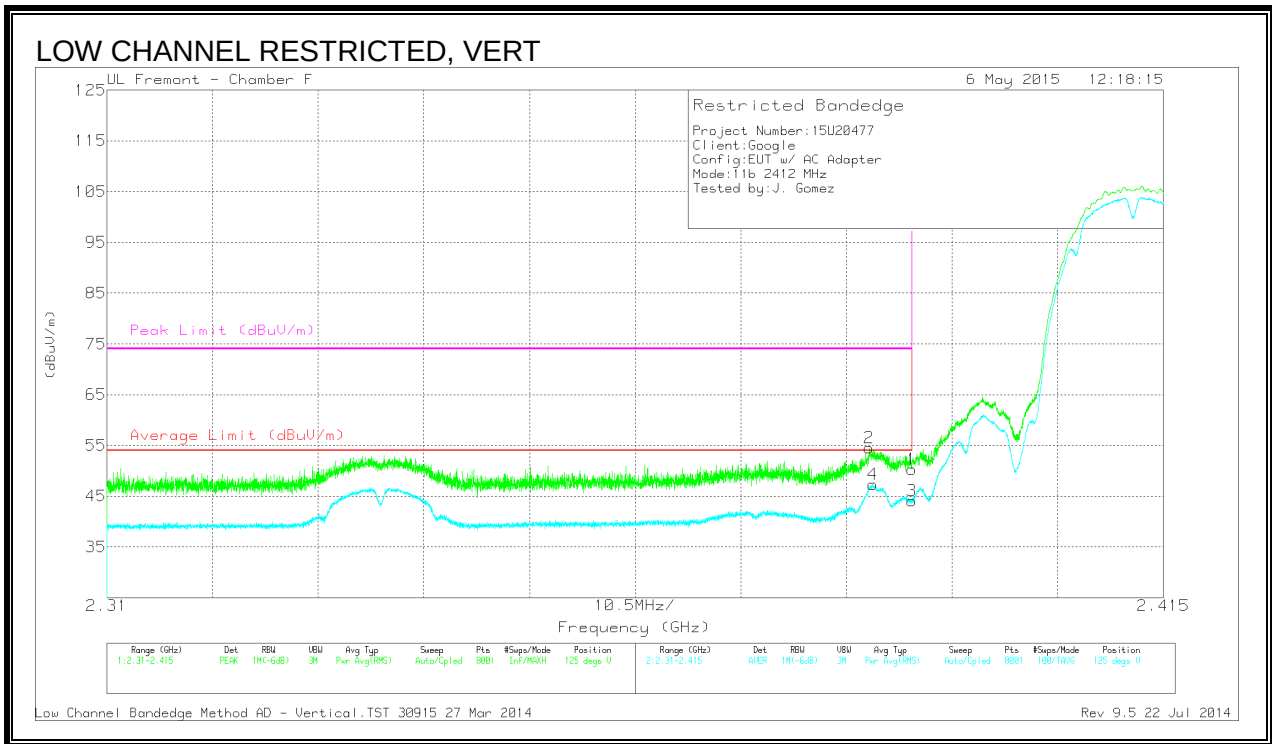


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	39.8	Pk	32.1	-20.7	51.2	-	-	74	-22.8	101	173	H
2	* 2.386	43.57	Pk	32.1	-20.8	54.87	-	-	74	-19.13	101	173	H
3	* 2.39	30.14	RMS	32.1	-20.7	41.54	54	-12.46	-	-	101	173	H
4	* 2.386	35.38	RMS	32.1	-20.8	46.68	54	-7.32	-	-	101	173	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection



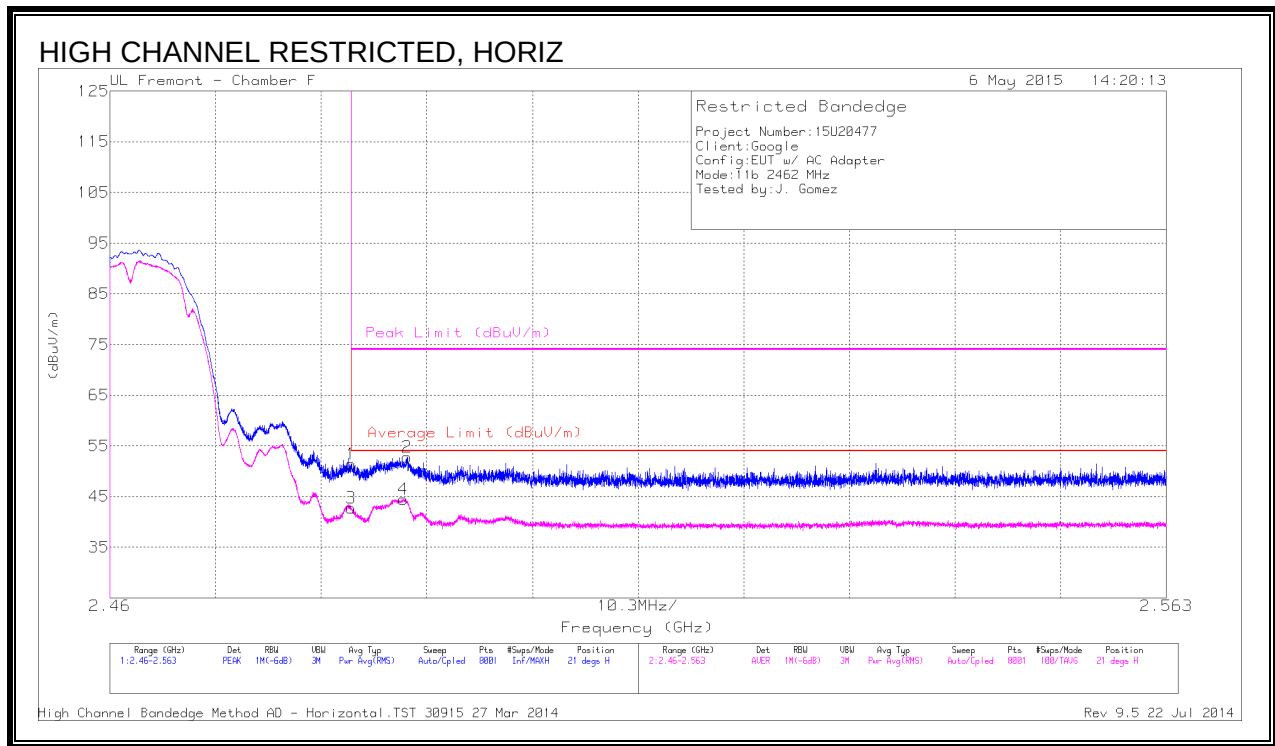
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	39.3	PK	31.9	-20.9	50.3	-	-	74	-23.7	125	104	V
2	* 2.386	43.54	PK	31.9	-20.9	54.54	-	-	74	-19.46	125	104	V
3	* 2.39	33.06	RMS	31.9	-20.9	44.06	54	-9.94	-	-	125	104	V
4	* 2.386	36.26	RMS	31.9	-20.9	47.26	54	-6.74	-	-	125	104	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

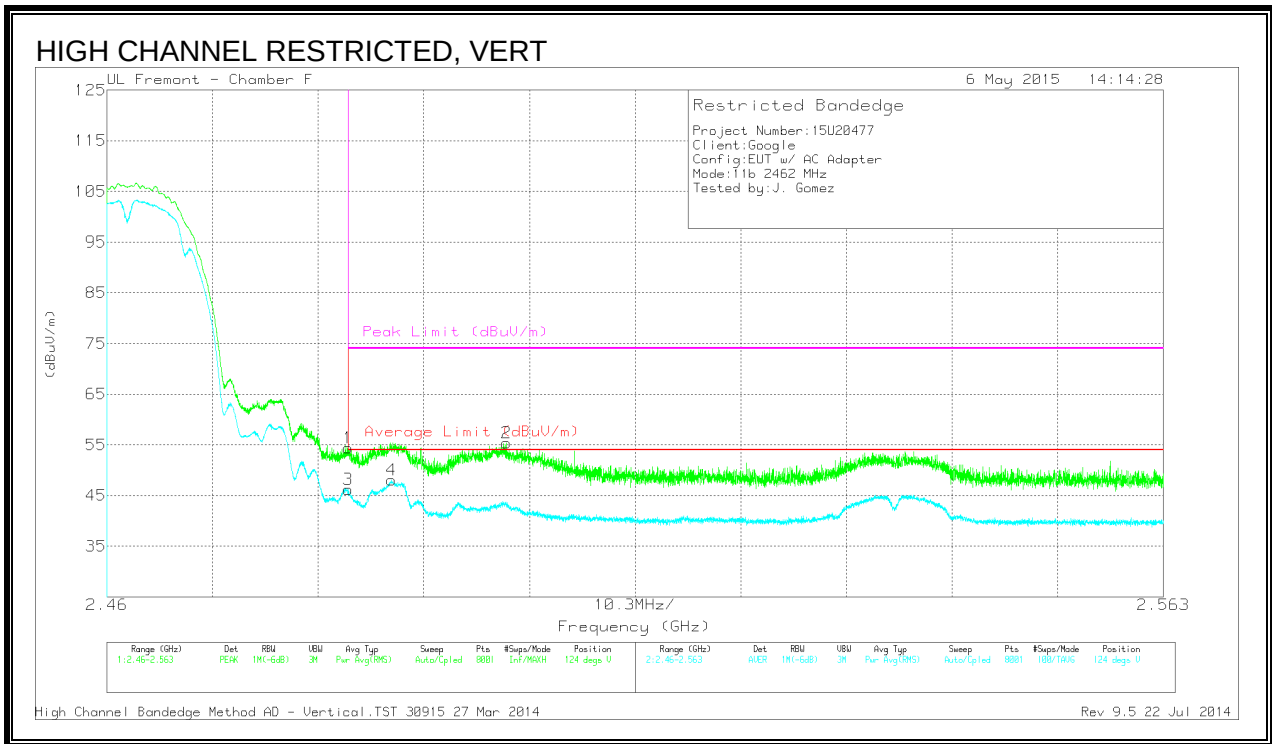


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.15	PK	32.2	-20.9	51.45	-	-	74	-22.55	21	110	H
2	* 2.489	41.43	PK	32.2	-20.9	52.73	-	-	74	-21.27	21	110	H
3	* 2.484	31.44	RMS	32.2	-20.9	42.74	54	-11.26	-	-	21	110	H
4	* 2.489	33.17	RMS	32.2	-20.9	44.47	54	-9.53	-	-	21	110	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	43.14	PK	32.2	-20.9	54.44	-	-	74	-19.56	124	110	V
2	* 2.499	44.02	PK	32.3	-20.9	55.42	-	-	74	-18.58	124	110	V
3	* 2.484	34.93	RMS	32.2	-20.9	46.23	54	-7.77	-	-	124	110	V
4	* 2.488	36.75	RMS	32.2	-20.9	48.05	54	-5.95	-	-	124	110	V

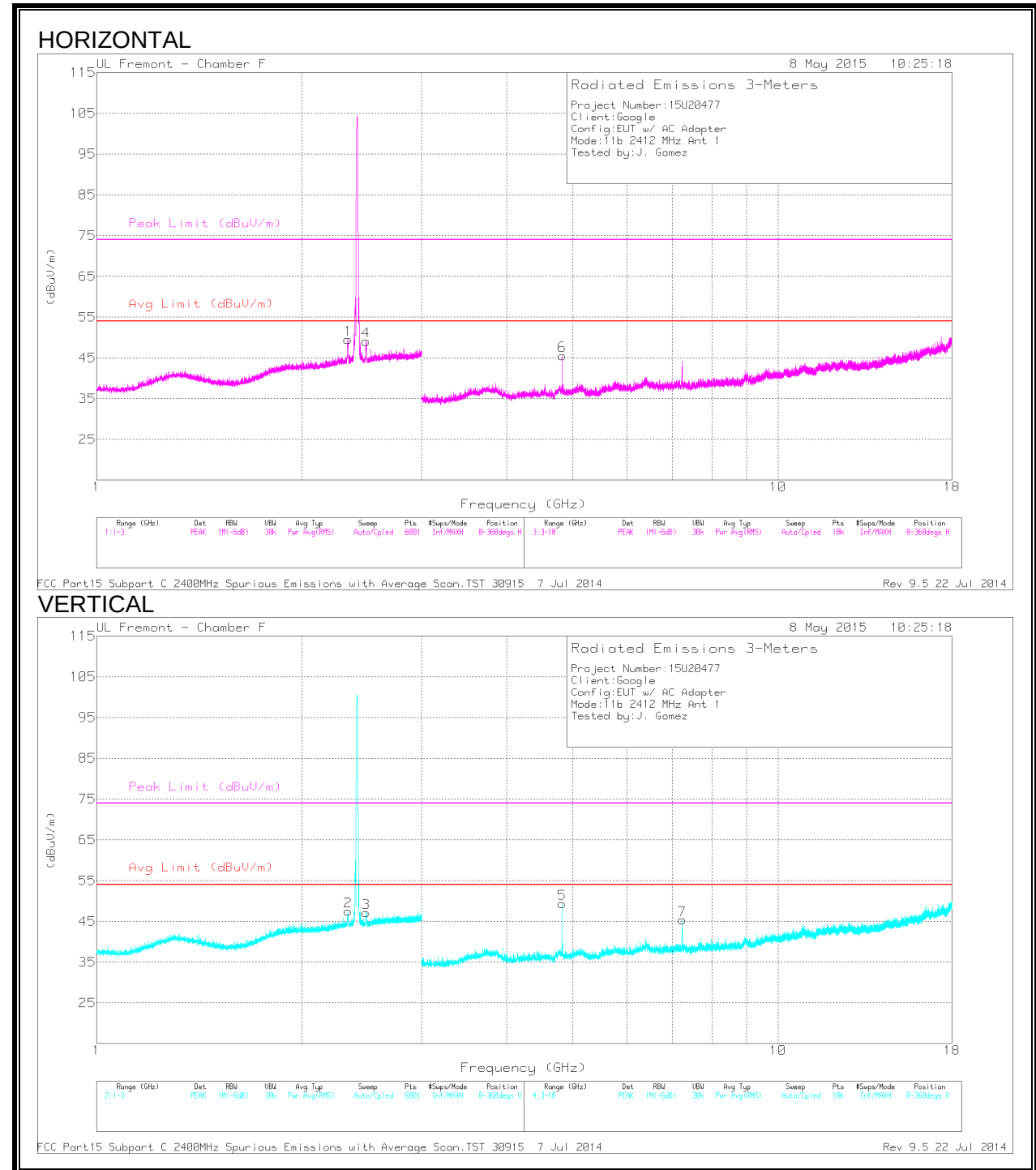
* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.339	38.73	PK	31.8	-21	49.53	-	-	74	-24.47	0-360	100	H
4	* 2.486	37.8	PK	32.2	-20.9	49.1	-	-	74	-24.9	0-360	100	H
2	* 2.34	36.73	PK	31.8	-21	47.53	-	-	74	-26.47	0-360	101	V
3	* 2.486	35.84	PK	32.2	-20.9	47.14	-	-	74	-26.86	0-360	201	V
6	* 4.824	39.05	PK	34.1	-27.6	45.55	-	-	74	-28.45	0-360	201	H
5	* 4.824	42.87	PK	34.1	-27.6	49.37	-	-	74	-24.63	0-360	101	V
7	7.237	36.21	PK	35.6	-26.4	45.41	-	-	-	-	0-360	201	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

Radiated Emissions

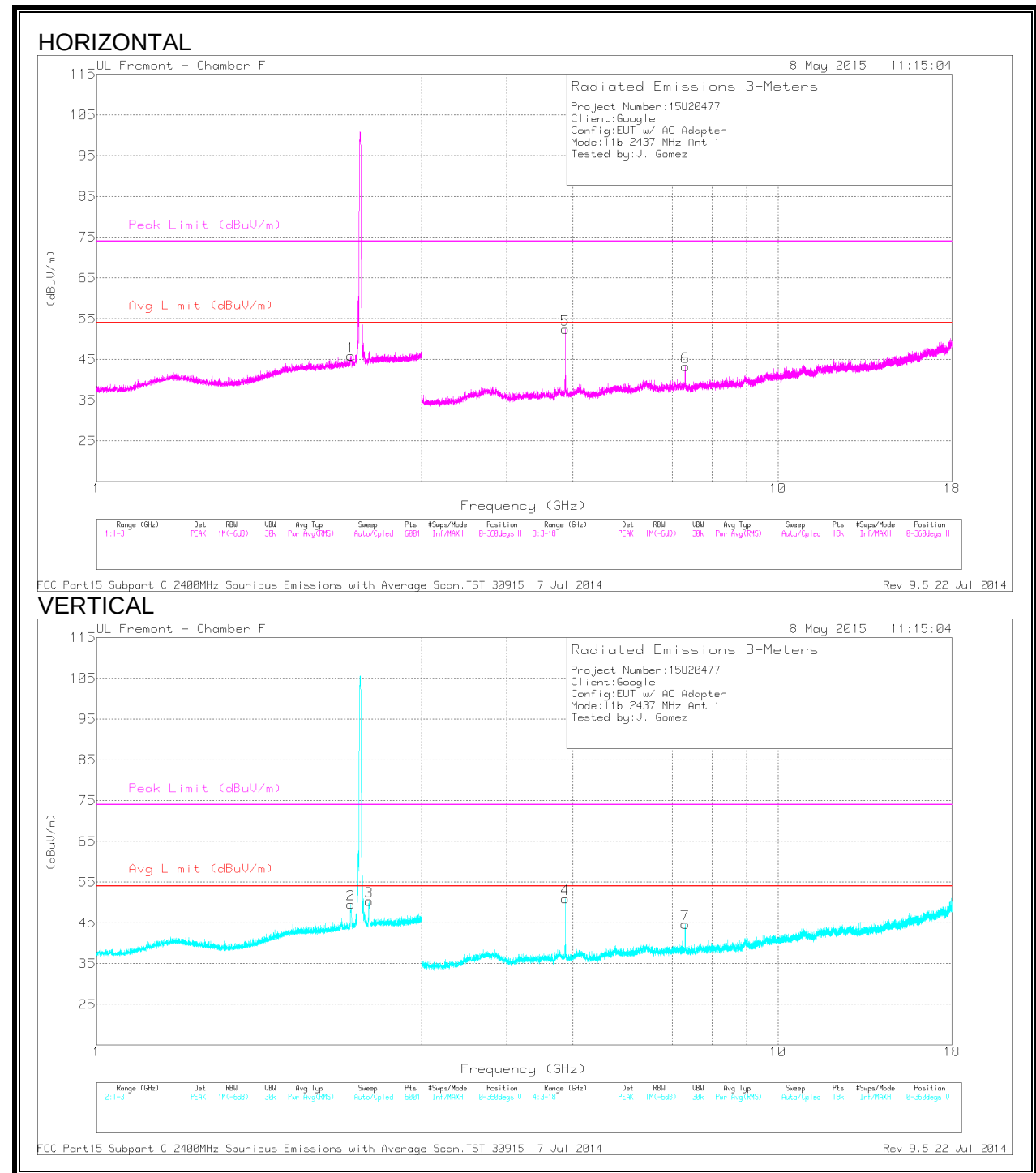
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.488	45.59	PK2	32.2	-20.9	56.89	-	-	74	-17.11	298	226	H
* 2.488	37.38	MAV1	32.2	-20.9	48.68	54	-5.32	-	-	298	226	H
* 2.339	45.77	PK2	31.8	-21	56.57	-	-	74	-17.43	179	100	H
* 2.339	37.12	MAV1	31.8	-21	47.92	54	-6.08	-	-	179	100	H
* 2.489	44.65	PK2	32.2	-20.9	55.95	-	-	74	-18.05	46	399	V
* 2.488	35.08	MAV1	32.2	-20.9	46.38	54	-7.62	-	-	46	399	V
* 2.337	45.26	PK2	31.8	-21	56.06	-	-	74	-17.94	22	388	V
* 2.336	35.55	MAV1	31.8	-21	46.35	54	-7.65	-	-	22	388	V
* 4.824	43.97	PK2	34.1	-27.6	50.47	-	-	74	-23.53	76	280	H
* 4.824	38.89	MAV1	34.1	-27.6	45.39	54	-8.61	-	-	76	280	H
* 4.824	46.66	PK2	34.1	-27.6	53.16	-	-	74	-20.84	335	234	V
* 4.824	43.11	MAV1	34.1	-27.6	49.61	54	-4.39	-	-	335	234	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.361	34.85	PK	31.9	-20.9	45.85	-	-	74	-28.15	0-360	201	H
2	* 2.361	38.59	PK	31.9	-20.9	49.59	-	-	74	-24.41	0-360	101	V
3	2.514	39.04	PK	32.3	-21	50.34	-	-	-	-	0-360	101	V
5	* 4.874	46.12	PK	34.1	-27.8	52.42	-	-	74	-21.58	0-360	201	H
6	* 7.313	33.9	PK	35.7	-26.3	43.3	-	-	74	-30.7	0-360	201	H
4	* 4.874	44.62	PK	34.1	-27.8	50.92	-	-	74	-23.08	0-360	201	V
7	* 7.311	35.31	PK	35.7	-26.3	44.71	-	-	74	-29.29	0-360	101	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

Radiated Emissions

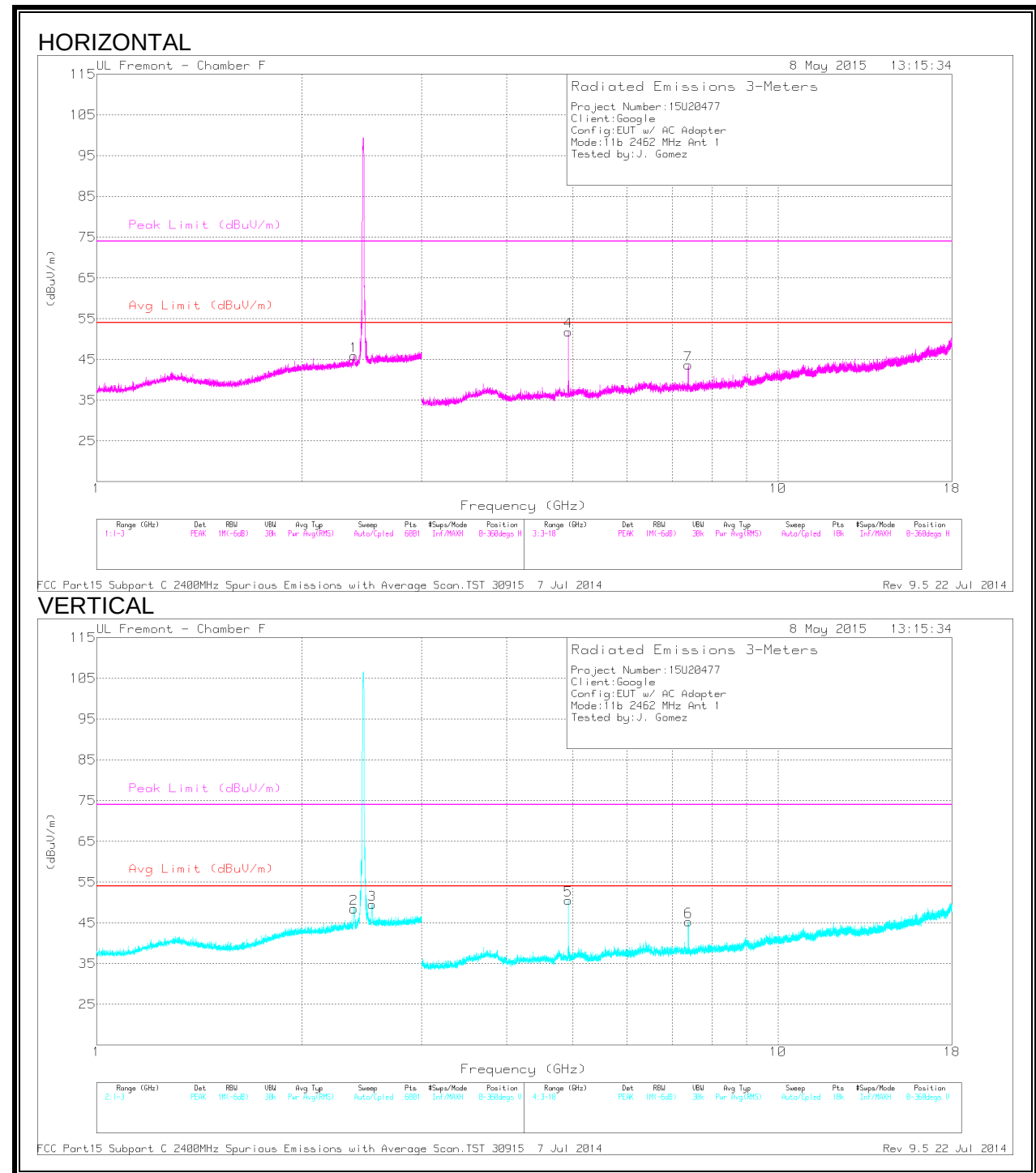
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.365	43.74	PK2	31.9	-20.9	54.74	-	-	74	-19.26	287	117	H
* 2.363	33.45	MAV1	31.9	-20.9	44.45	54	-9.55	-	-	287	117	H
* 2.361	45.89	PK2	31.9	-20.9	56.89	-	-	74	-17.11	315	103	V
* 2.361	37.53	MAV1	31.9	-20.9	48.53	54	-5.47	-	-	315	103	V
* 4.874	48.97	PK2	34.1	-27.8	55.27	-	-	74	-18.73	339	251	H
* 4.874	46.34	MAV1	34.1	-27.8	52.64	54	-1.36	-	-	339	251	H
* 7.313	42.44	PK2	35.7	-26.3	51.84	-	-	74	-22.16	119	286	H
* 7.312	35.3	MAV1	35.7	-26.3	44.7	54	-9.3	-	-	119	286	H
* 4.874	47.26	PK2	34.1	-27.8	53.56	-	-	74	-20.44	226	169	V
* 4.874	44.3	MAV1	34.1	-27.8	50.6	54	-3.4	-	-	226	169	V
* 7.31	42.36	PK2	35.7	-26.3	51.76	-	-	74	-22.24	102	101	V
* 7.312	35.01	MAV1	35.7	-26.3	44.41	54	-9.59	-	-	102	101	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.385	34.89	PK	31.9	-20.9	45.89	-	-	74	-28.11	0-360	201	H
2	* 2.385	37.48	PK	31.9	-20.9	48.48	-	-	74	-25.52	0-360	101	V
3	2.538	38.02	PK	32.4	-20.9	49.52	-	-	-	-	0-360	101	V
4	* 4.924	46.33	PK	34.1	-28.6	51.83	-	-	74	-22.17	0-360	201	H
7	* 7.385	33.63	PK	35.7	-25.7	43.63	-	-	74	-30.37	0-360	201	H
5	* 4.924	45.05	PK	34.1	-28.6	50.55	-	-	74	-23.45	0-360	201	V
6	* 7.387	35.33	PK	35.7	-25.7	45.33	-	-	74	-28.67	0-360	101	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.385	43.63	PK2	31.9	-20.9	54.63	-	-	74	-19.37	191	205	H
* 2.389	32.68	MAV1	31.9	-20.9	43.68	54	-10.32	-	-	191	205	H
* 2.39	45.9	PK2	31.9	-20.9	56.9	-	-	74	-17.1	175	105	V
* 2.389	37.15	MAV1	31.9	-20.9	48.15	54	-5.85	-	-	175	105	V
* 4.924	48.44	PK2	34.1	-28.6	53.94	-	-	74	-20.06	334	270	H
* 4.924	44.92	MAV1	34.1	-28.6	50.42	54	-3.58	-	-	334	270	H
* 7.385	40.74	PK2	35.7	-25.7	50.74	-	-	74	-23.26	96	187	H
* 7.387	33.49	MAV1	35.7	-25.7	43.49	54	-10.51	-	-	96	187	H
* 4.924	48.21	PK2	34.1	-28.6	53.71	-	-	74	-20.29	220	189	V
* 4.924	44.24	MAV1	34.1	-28.6	49.74	54	-4.26	-	-	220	189	V
* 7.388	42.32	PK2	35.7	-25.7	52.32	-	-	74	-21.68	222	220	V
* 7.387	35.23	MAV1	35.7	-25.7	45.23	54	-8.77	-	-	222	220	V

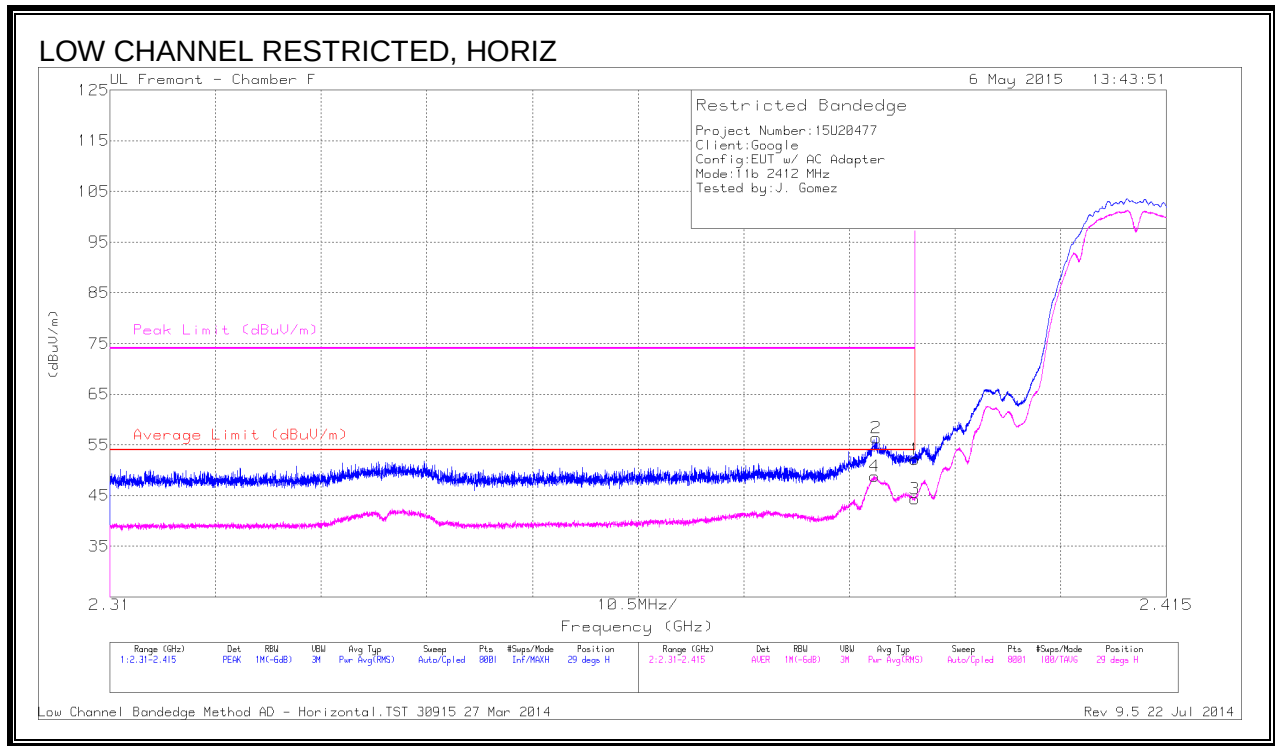
* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

9.2.2. TX ABOVE 1 GHz 802.11b IN THE 2.4 GHz BAND ANTENNA 2

RESTRICTED BANDEDGE (LOW CHANNEL)

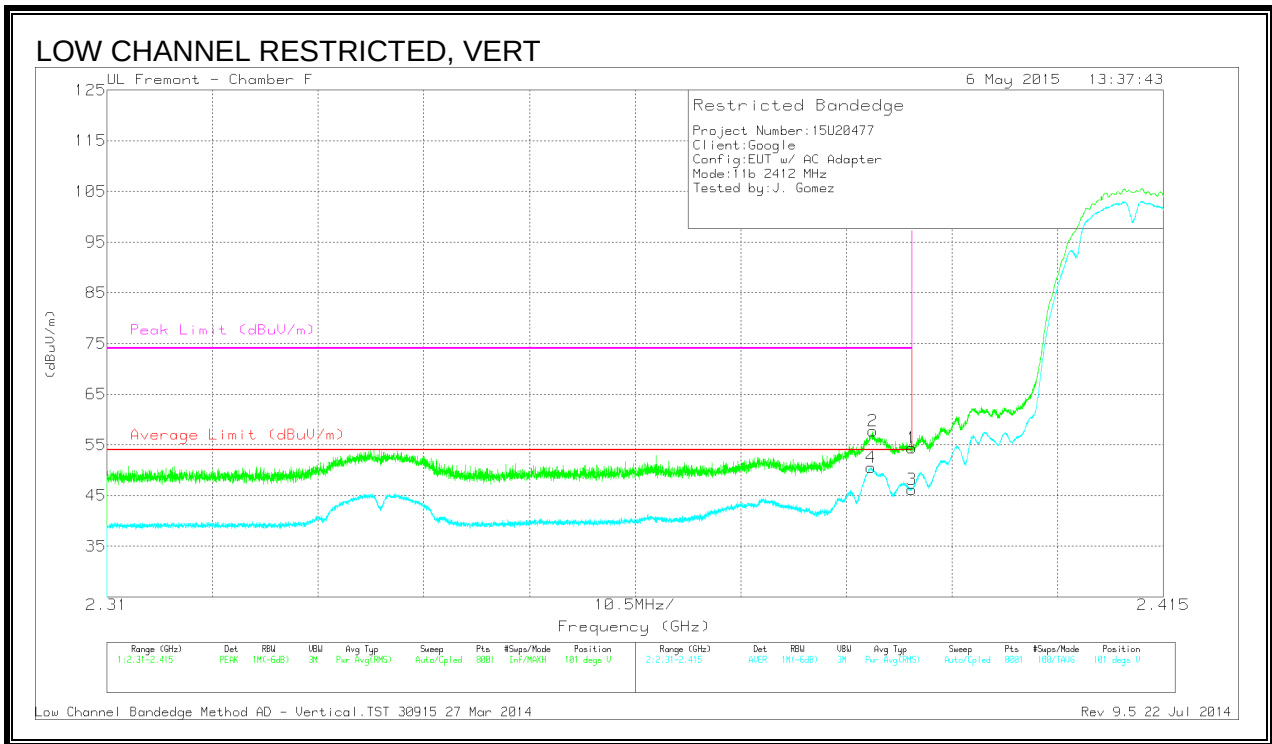


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	41.14	PK	31.9	-20.9	52.14	-	-	74	-21.86	29	173	H
2	* 2.386	45.35	PK	31.9	-20.9	56.35	-	-	74	-17.65	29	173	H
3	* 2.39	33.31	RMS	31.9	-20.9	44.31	54	-9.69	-	-	29	173	H
4	* 2.386	37.77	RMS	31.9	-20.9	48.77	54	-5.23	-	-	29	173	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection



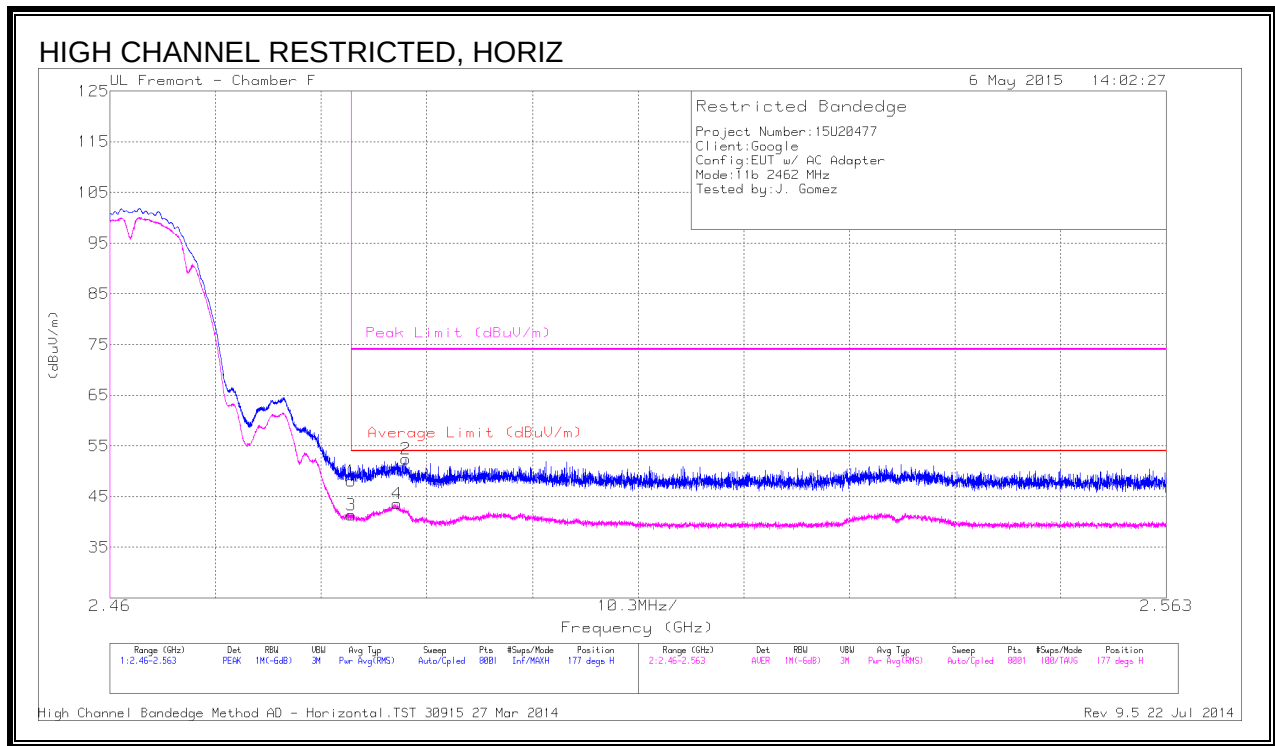
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	43.44	PK	31.9	-20.9	54.44	-	-	74	-19.56	101	102	V
2	* 2.386	46.76	PK	31.9	-20.9	57.76	-	-	74	-16.24	101	102	V
3	* 2.39	35.24	RMS	31.9	-20.9	46.24	54	-7.76	-	-	101	102	V
4	* 2.386	39.53	RMS	31.9	-20.9	50.53	54	-3.47	-	-	101	102	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

AUTHORIZED BANDEGE (HIGH CHANNEL)

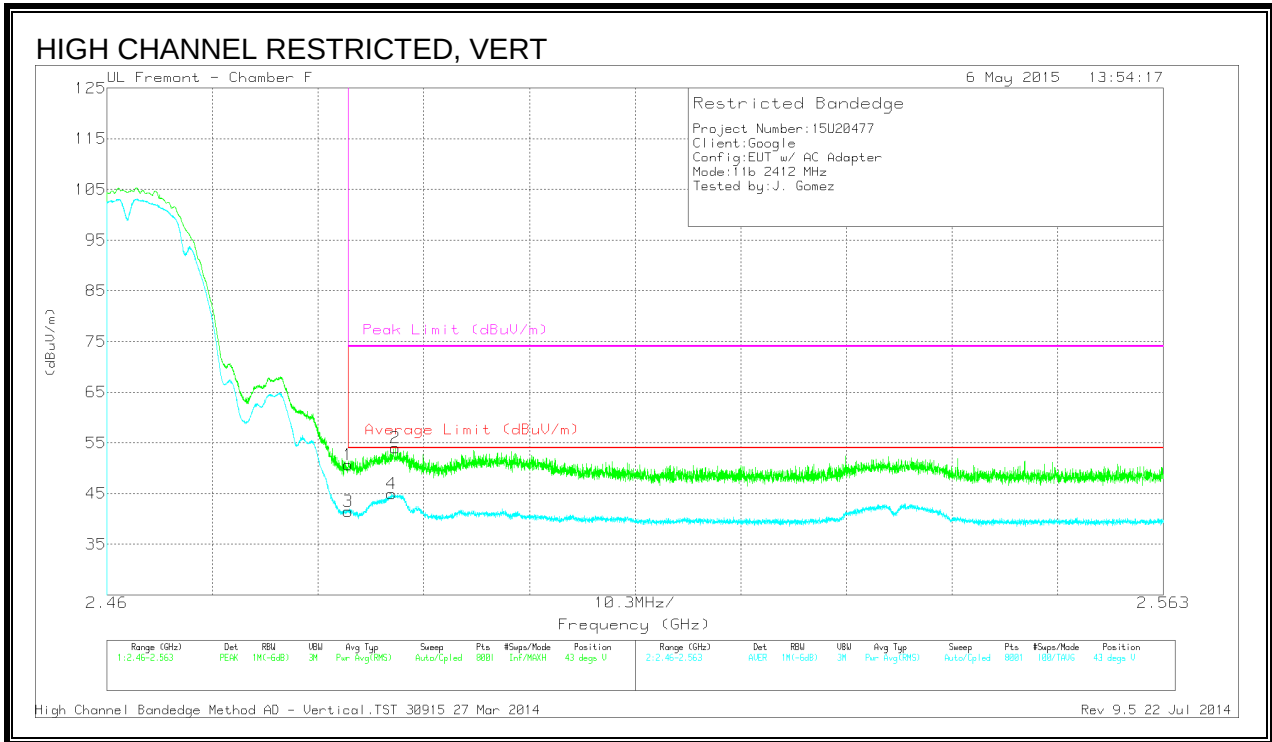


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	36.76	PK	32.2	-20.9	48.06	-	-	74	-25.94	177	198	H
2	* 2.489	41.12	PK	32.2	-20.9	52.42	-	-	74	-21.58	177	198	H
3	* 2.484	30.01	RMS	32.2	-20.9	41.31	54	-12.69	-	-	177	198	H
4	* 2.488	32.24	RMS	32.2	-20.9	43.54	54	-10.46	-	-	177	198	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	39.38	PK	32.2	-20.9	50.68	-	-	74	-23.32	43	159	V
2	* 2.488	42.7	PK	32.2	-20.9	54	-	-	74	-20	43	159	V
3	* 2.484	30.14	RMS	32.2	-20.9	41.44	54	-12.56	-	-	43	159	V
4	* 2.488	33.63	RMS	32.2	-20.9	44.93	54	-9.07	-	-	43	159	V

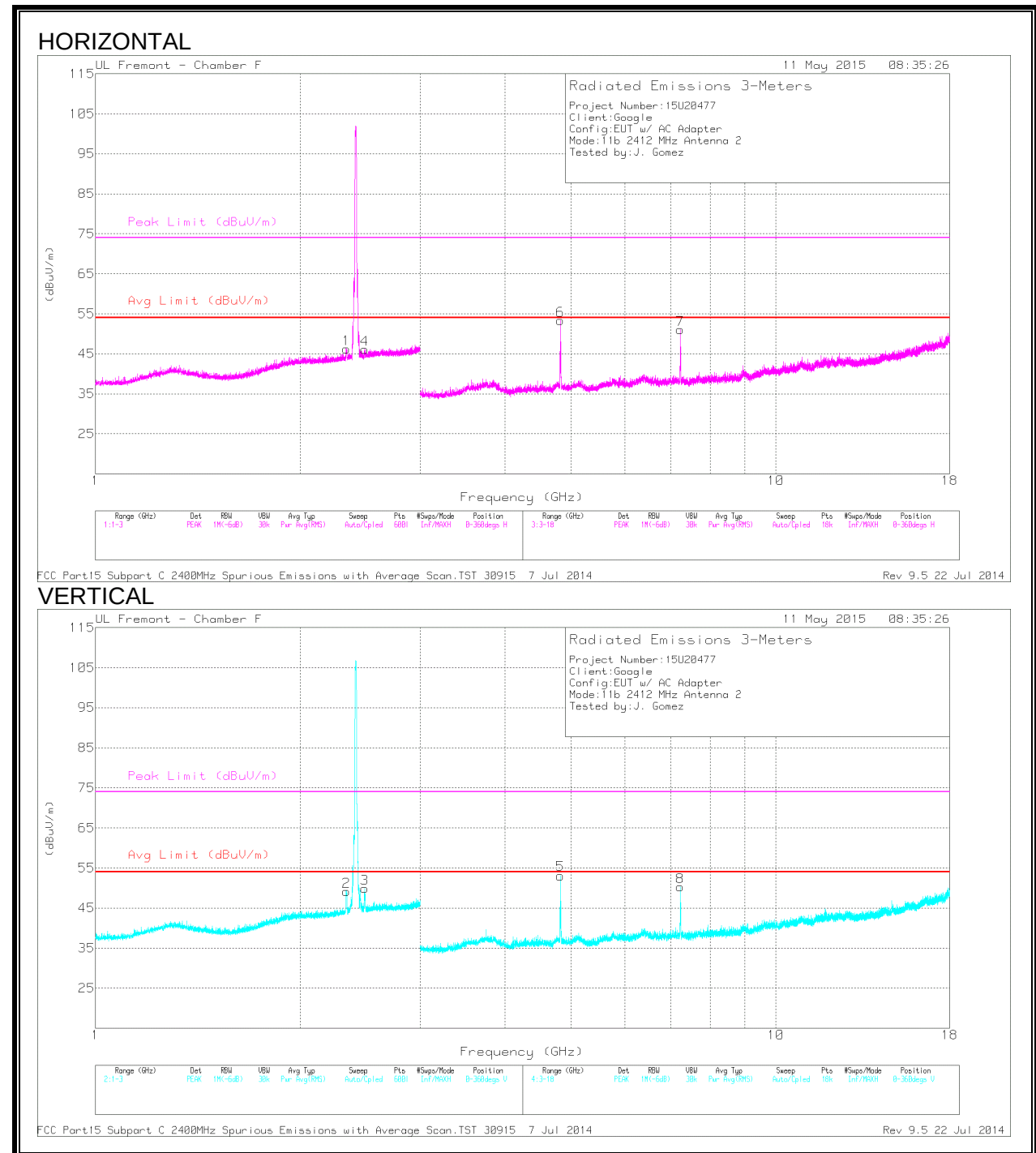
* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.34	35.47	PK	31.8	-21	46.27	-	-	74	-27.73	0-360	201	H
4	* 2.486	34.81	PK	32.2	-20.9	46.11	-	-	74	-27.89	0-360	101	H
2	* 2.338	38.4	PK	31.8	-21	49.2	-	-	74	-24.8	0-360	101	V
3	* 2.486	38.67	PK	32.2	-20.9	49.97	-	-	74	-24.03	0-360	101	V
6	* 4.824	52.59	PK	34.1	-27.6	55.09	-	-	74	-18.91	0-360	100	H
7	7.236	41.81	PK	35.6	-26.4	51.01	-	-	-	-	0-360	100	H
5	* 4.824	51.96	PK	34.1	-27.6	53.46	-	-	74	-20.54	0-360	201	V
8	7.236	41.11	PK	35.6	-26.4	50.31	-	-	-	-	0-360	101	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.339	44.32	PK2	31.8	-21	55.12	-	-	74	-18.88	211	258	H
* 2.339	33.46	MAV1	31.8	-21	44.26	54	-9.74	-	-	211	258	H
* 2.498	43.31	PK2	32.3	-20.9	54.71	-	-	74	-19.29	209	224	H
* 2.485	31.89	MAV1	32.2	-20.9	43.19	54	-10.81	-	-	209	224	H
* 2.336	46.3	PK2	31.8	-21	57.1	-	-	74	-16.9	194	105	V
* 2.338	37.65	MAV1	31.8	-21	48.45	54	-5.55	-	-	194	105	V
* 2.487	45.2	PK2	32.2	-20.9	56.5	-	-	74	-17.5	189	170	V
* 2.488	36.46	MAV1	32.2	-20.9	47.76	54	-6.24	-	-	189	170	V
* 4.824	48.64	PK2	34.1	-27.6	55.14	-	-	74	-18.86	106	154	H
* 4.824	43.92	MAV1	34.1	-27.6	50.42	54	-3.58	-	-	106	154	H
* 4.824	47.12	PK2	34.1	-27.6	53.62	-	-	74	-20.38	212	202	V
* 4.824	41.72	MAV1	34.1	-27.6	48.22	54	-5.78	-	-	212	202	V

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL

