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

CERTIFICATION TEST REPORT

FOR

TABLET DEVICE

MODEL NUMBER: A1673

FCC ID: BCGA1673
IC: 579C-A1673

REPORT NUMBER: 15U22427-E3V2

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Prepared for
APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

Prepared by
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	02/04/2016	Initial Issue	C. Pang
V2	02/16/2016	Revised report to address TCB's questions	T. Chu

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS 6

2. TEST METHODOLOGY 7

3. FACILITIES AND ACCREDITATION 7

4. CALIBRATION AND UNCERTAINTY 7

4.1. MEASURING INSTRUMENT CALIBRATION 7

4.2. SAMPLE CALCULATION 7

4.3. MEASUREMENT UNCERTAINTY 8

5. EQUIPMENT UNDER TEST 9

5.1. DESCRIPTION OF EUT 9

5.2. MAXIMUM OUTPUT POWER 9

5.3. DESCRIPTION OF AVAILABLE ANTENNAS 9

5.4. SOFTWARE AND FIRMWARE 9

5.5. WORST-CASE CONFIGURATION AND MODE 10

5.6. DESCRIPTION OF TEST SETUP 11

6. TEST AND MEASUREMENT EQUIPMENT 15

7. MEASUREMENT METHODS 16

8. ANTENNA PORT TEST RESULTS 17

8.1. ON TIME AND DUTY CYCLE 17

8.2. 802.11b SISO MODE IN THE 2.4 GHz BAND (ANTENNA B) 20

8.2.1. 6 dB BANDWIDTH 20
8.2.2. 99% BANDWIDTH 24
8.2.3. AVERAGE POWER 28
8.2.4. OUTPUT POWER 29
8.2.5. POWER SPECTRAL DENSITY 31
8.2.6. OUT-OF-BAND EMISSIONS 35

8.3. 802.11b SISO MODE IN THE 2.4 GHz BAND (ANTENNA A) 42

8.3.1. 6 dB BANDWIDTH 42
8.3.2. 99% BANDWIDTH 46
8.3.3. AVERAGE POWER 50
8.3.4. OUTPUT POWER 51
8.3.5. POWER SPECTRAL DENSITY 53
8.3.6. OUT-OF-BAND EMISSIONS 57

8.4. 802.11b SISO MODE IN THE 2.4 GHz BAND (ANTENNA C) 64

8.4.1. 6 dB BANDWIDTH 64
8.4.2. 99% BANDWIDTH 68
8.4.3. AVERAGE POWER 72
8.4.4. OUTPUT POWER 73

8.4.5. POWER SPECTRAL DENSITY 75
8.4.6. OUT-OF-BAND EMISSIONS 79

8.5. 802.11g SISO MODE IN THE 2.4 GHz BAND (ANTENNA B) 86

8.6. 802.11n HT20 SISO MODE IN THE 2.4 GHz BAND (ANTENNA B) 87
8.6.1. 6 dB BANDWIDTH 87
8.6.2. 99% BANDWIDTH 91
8.6.3. AVERAGE POWER 95
8.6.4. OUTPUT POWER 96
8.6.5. POWER SPECTRAL DENSITY 98
8.6.6. OUT-OF-BAND EMISSIONS 102

8.7. 802.11g SISO MODE IN THE 2.4 GHz BAND (ANTENNA A) 110

8.8. 802.11n HT20 SISO MODE IN THE 2.4 GHz BAND (ANTENNA A) 111
8.8.1. 6 dB BANDWIDTH 111
8.8.2. 99% BANDWIDTH 115
8.8.3. AVERAGE POWER 119
8.8.4. OUTPUT POWER 120
8.8.5. POWER SPECTRAL DENSITY 122
8.8.6. OUT-OF-BAND EMISSIONS 126

8.9. 802.11g SISO MODE IN THE 2.4 GHz BAND (ANTENNA C) 134

8.10. 802.11n HT20 SISO MODE IN THE 2.4 GHz BAND (ANTENNA C) 135
8.10.1. 6 dB BANDWIDTH 135
8.10.2. 99% BANDWIDTH 139
8.10.3. AVERAGE POWER 143
8.10.4. OUTPUT POWER 144
8.10.5. POWER SPECTRAL DENSITY 146
8.10.6. OUT-OF-BAND EMISSIONS 150

8.11. 802.11g 2TX CDD MODE IN THE 2.4 GHz BAND (ANTENNA A+B) 158

8.12. 802.11n HT20 2TX CDD MODE IN THE 2.4 GHz BAND (ANTENNA A+B) 159
8.12.1. 6 dB BANDWIDTH 159
8.12.2. 99% BANDWIDTH 168
8.12.3. AVERAGE POWER 177
8.12.4. OUTPUT POWER 178
8.12.5. POWER SPECTRAL DENSITY 180
8.12.6. OUT-OF-BAND EMISSIONS 189

8.13. 802.11g 2TX CDD MODE IN THE 2.4 GHz BAND (ANTENNA A+C) 206

8.14. 802.11n HT20 2TX CDD MODE IN THE 2.4 GHz BAND (ANTENNA A+C) 207
8.14.1. 6 dB BANDWIDTH 207
8.14.2. 99% BANDWIDTH 216
8.14.3. AVERAGE POWER 225
8.14.4. OUTPUT POWER 226
8.14.5. POWER SPECTRAL DENSITY 228
8.14.6. OUT-OF-BAND EMISSIONS 237

9. RADIATED TEST RESULTS 254

9.1. LIMITS AND PROCEDURE 254

9.2. TRANSMITTER ABOVE 1 GHz 255
9.2.1. 802.11b 1Tx MODE IN THE 2.4 GHz BAND ANTENNA B 255

9.2.2. 802.11b 1Tx MODE IN THE 2.4 GHz BAND ANTENNA A 275
9.2.3. 802.11b 1Tx MODE IN THE 2.4 GHz BAND ANTENNA C 295
9.2.4. 802.11n HT20 1Tx MODE IN THE 2.4 GHz BAND ANTENNA B 315
9.2.5. 802.11n HT20 1Tx MODE IN THE 2.4 GHz BAND ANTENNA A 335
9.2.6. 802.11n HT20 1Tx MODE IN THE 2.4 GHz BAND ANTENNA C 355
9.2.7. 802.11n HT20 2TX MODE IN THE 2.4 GHz BAND (ANTENNA A+B) 375
9.2.8. 802.11n HT20 2TX MODE IN THE 2.4 GHz BAND (ANTENNA A+C) 397

9.3. WORST-CASE BELOW 1 GHz 419

9.4. WORST-CASE 18 to 26 GHz 421

10. AC POWER LINE CONDUCTED EMISSIONS 423

10.1. EUT POWERED BY AC/DC ADAPTER VIA USB CABLE 424

10.2. EUT POWERED BY HOST PC VIA USB CABLE 426

11. SETUP PHOTOS 428

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

EUT DESCRIPTION: TABLET DEVICE

MODEL: A1673

SERIAL NUMBER: RADIATED (DLXQV00RH36D); CONDUCTED (DLXQT001H35T)

DATE TESTED: NOVEMBER 17, 2015 – JANUARY 21, 2016

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	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:

MENGISTU MEKURIA
PROJECT LEADER
UL VERIFICATION SERVICES INC.

Tested By:

ERIC YU
EMC ENGINEER
UL VERIFICATION SERVICES INC.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB 558074 D01 v03r04, ANSI C63.10-2013, RSS-GEN Issue 4, and RSS-247 Issue 1.

3. FACILITIES AND ACCREDITATION

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:

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

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
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 tablet with multimedia functions (music, application support, and video), IEEE 802.11a/b/g/n/ac radio, and Bluetooth radio. The rechargeable battery is not user accessible.

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 - 2472	802.11b 1TX	19.43	87.70
2412 - 2472	802.11g 1Tx	Covered by HT20 1TX	
2412 - 2472	802.11g 2TX	Covered by HT20 2TX	
2412 - 2472	802.11n HT20 1TX	24.16	260.62
2412 - 2472	802.11n HT20 2TX	26.74	472.06

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

Frequency Band (GHz)	Antenna Gain (dBi)		
	Antenna A	Antenna B	Antenna C
2.4	-0.18	-1.75	1.06

5.4. SOFTWARE AND FIRMWARE

The software installed in the EUT during testing was 13E31820K.

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-landscape orientation was worst-case orientation. Therefore, all final radiated testing was performed with the EUT in Y-landscape 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

The following modes have the same target power and use the same modulation (OFDM). Therefore, 802.11g 1TX and 802.11g 2TX are covered by 802.11n HT20 1TX and 802.11n HT20 2TX respectively.

- 802.11g and 802.11n HT20 1TX
- 802.11g 2TX and 802.11n HT20 2TX

For simultaneous transmission of multiple channels from the same antenna in the 2.4GHz and 5GHz bands, tests were conducted for various configurations having the highest power. No noticeable new emission was found.

There are two vendors of the WiFi/Bluetooth radio modules: variant 1 and variant 2. The Wi-Fi/Bluetooth radio modules have the same mechanical outline (e.g., the same package dimension and pin-out layout), use the same on-board antenna matching circuit, have an identical antenna structure, and are built and tested to conform to the same specifications and to operate within the same tolerances.

Baseline testing was performed on the two variants to determine the worst case on all conducted power and radiated emissions.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Dell	Latitude 3540	6LNG802	N/A
Earphone	Apple	NA	NA	N/A
Macbook Air	Apple	A1466	C02P41RZG086	N/A
EUT AC/DC adapter	Apple	A1385	D293062F3WVDHLHCF	N/A

I/O CABLES (CONDUCTED TEST)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Antenna	1	SMA	Un-Shielded	0.2	To spectrum Analyzer
2	USB	1	USB	Shielded	1	N/A
3	AC	1	AC	Un-shielded	3	N/A

I/O CABLES (RADIATED ABOVE 1 GHZ)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
None						

I/O CABLES (RADAITED BELOW 1 GHZ AND AC LINE CONDUCTED: AC/DC ADAPTER)

I/O Cable List						
Cable No	Port	# of identical	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Headphones Jack	1	3.5mm Audio	Shielded	0.9	N/A
2	AC	1	AC	Un-shielded	3	N/A

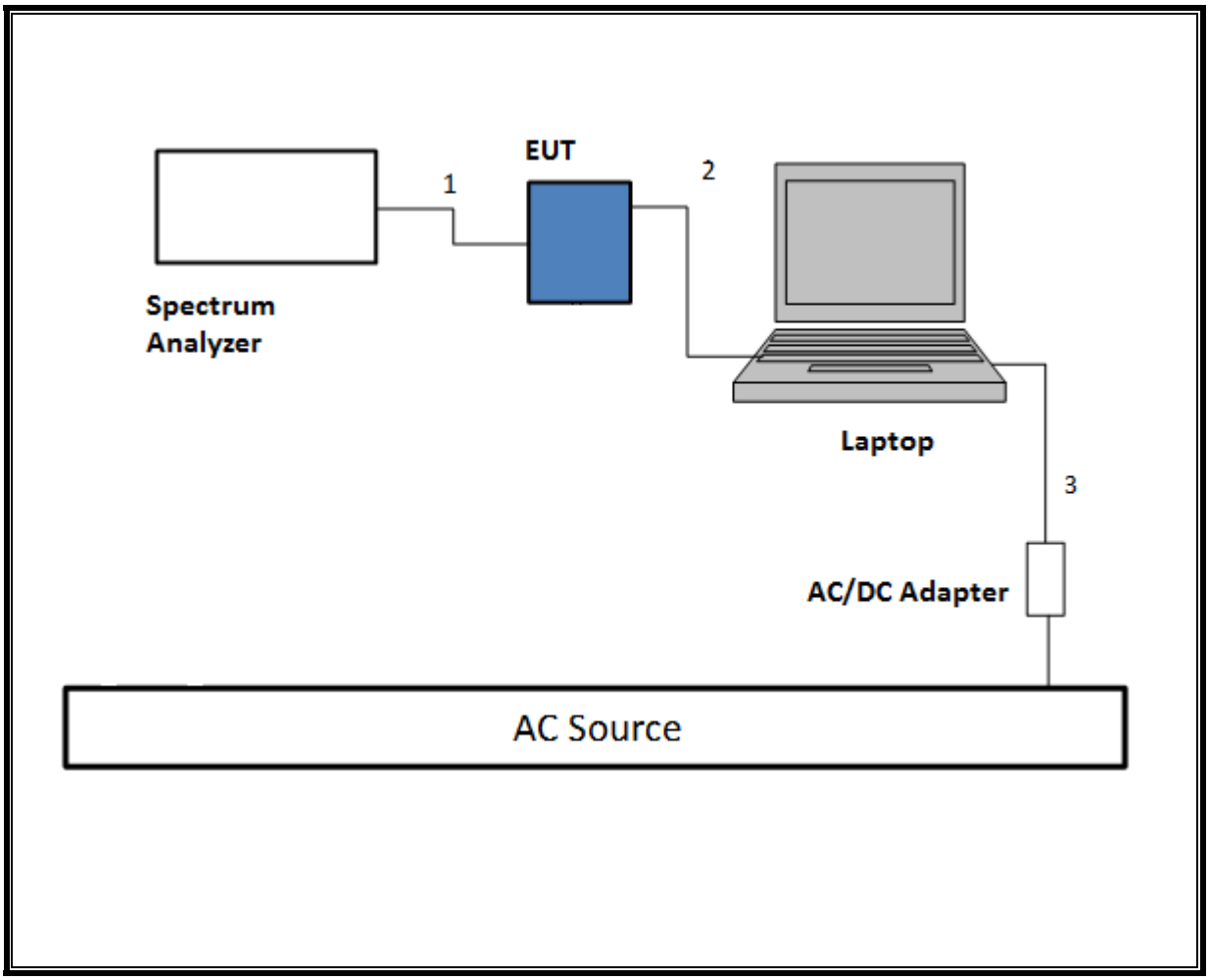
I/O CABLES (AC LINE CONDUCTED: LAPTOP CONFIGUARTION)

I/O Cable List						
Cable No	Port	# of identical	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Headphones Jack	1	3.5mm Audio	Shielded	0.9	N/A
2	USB	1	USB	Shielded	1	N/A
3	AC	1	AC	Un-shielded	3	N/A

TEST SETUP

The EUT was tested connected to a host Laptop via USB cable adapter and spectrum analyzer to antenna port. Test software exercised the EUT.

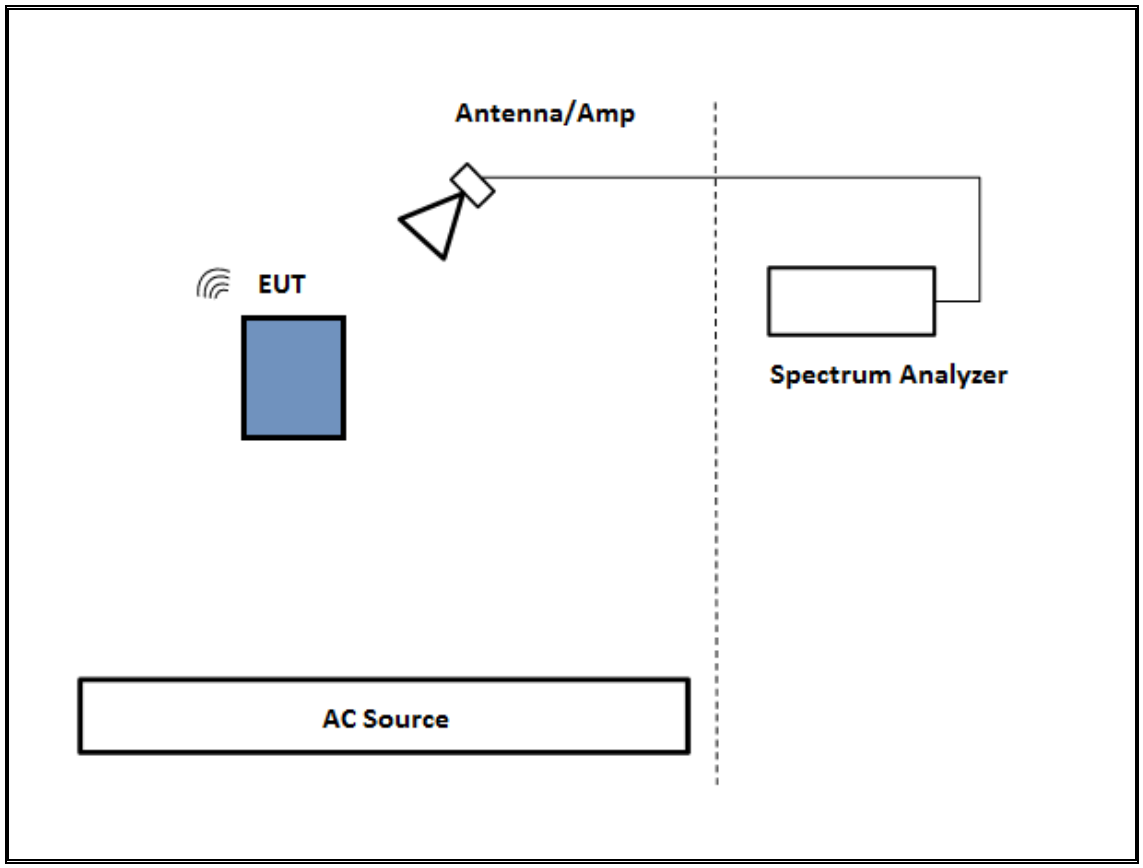
SETUP DIAGRAM



TEST SETUP- RADIATED-ABOVE 1 GHZ

The EUT was tested battery powered. Test software exercised the EUT.

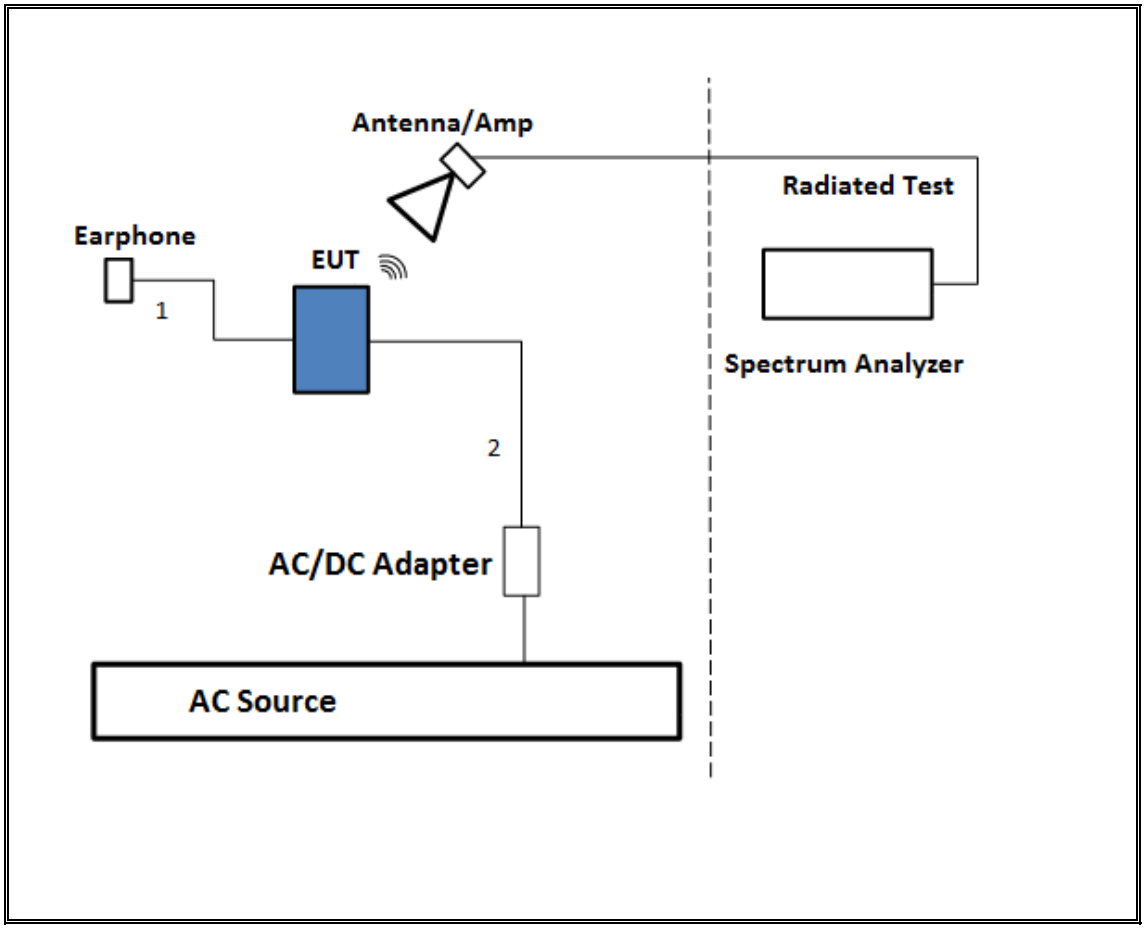
SETUP DIAGRAM



TEST SETUP- BELOW 1GHZ & AC LINE CONDUCTED TESTS

The EUT was tested with earphone connected and powered by AC adapter. Test software exercised the EUT.

SETUP DIAGRAM



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**
Antenna, Horn 1-18GHz	ETS Lindgren	3117	00143449	2/10/2016
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	A022813-2	3/5/2016
Amplifier, 1 - 18GHz	Miteq	AFS42-00101800-25-S-42	1782158	1/26/2016
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	323562	5/7/2016
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	MY53310972	3/31/2016
Antenna, Horn 1-18GHz	ETS Lindgren	3117	29310	3/26/2016
Amplifier, 1 - 18GHz	Miteq	AFS42-00101800-25-S-42	N/A	1/31/2016
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	MY51380911	10/15/2016
Antenna, Horn 1-18GHz	ETS Lindgren	3117	165318	4/10/2016
Amplifier, 1 - 18GHz	Miteq	AFS42-00101800-25-S-42	1818464	4/25/2016
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	MY53311010	5/26/2016
Power Meter, P-series single channel	Agilent	N1911A	MY53060011	4/7/2016
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Agilent	N1921A	MY53020038	3/5/2016
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826	1013	1/29/2016
Spectrum Analyzer, 40 GHz	Agilent	8564E	3943A01643	8/14/2016
Amplifier, 1 to 26.5GHz, 23.5dB Gain minimum	Agilent	8449B	3008A04710	6/29/2016
AC Line Conducted				
EMI Test Receiver 9Khz-7GHz	Rohde & Schwarz	ESCI7	100935	9/16/2016
LISN for Conducted Emissions CISPR-16	FCC	50/250-25-2	114	1/16/2016
LISN for Conducted Emissions CISPR-16	Fischer	50/250-25-2	161124	9/16/2016
Power Cable, Line Conducted Emissions	U L	PG1	7/28/2015	7/28/2016
UL SOFTWARE				
* Radiated Software	UL	UL EMC	Ver 9.5, July 22, 2014	
* Conducted Software	UL	UL EMC	Ver 2.2, March 31, 2015	
* AC Line Conducted Software	UL	UL EMC	Ver 9.5, April 3, 2015	

Note: * indicates automation software version used in the compliance certification testing

7. MEASUREMENT METHODS

6 dB BW: KDB 558074 D01 v03r04, Section 8.1.

Output Power: KDB 558074 D01 v03r04, Section 9.1.2.

Power Spectral Density: KDB 558074 D01 v03r04, Section 10.2.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v03r04, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r04, Section 12.1.

Band-edge: KDB 558074 D01 v03r04, Section 12.1.

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	5.000	5.000	1.000	100.00%	0.00	0.010
802.11n HT20 1TX	1.920	1.940	0.990	98.97%	0.00	0.010
802.11n HT20 CDD	1.917	1.941	0.988	98.76%	0.00	0.010

DUTY CYCLE PLOTS

2.4 GHz BAND

DUTY CYCLE 802.11b 1TX MODE

DUTY CYCLE 802.11n HT20 1TX MODE

DUTY CYCLE 802.11n HT20 CDD MODE

8.2. 802.11b SISO MODE IN THE 2.4 GHz BAND (ANTENNA B)

8.2.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-247 (5.2) (1)

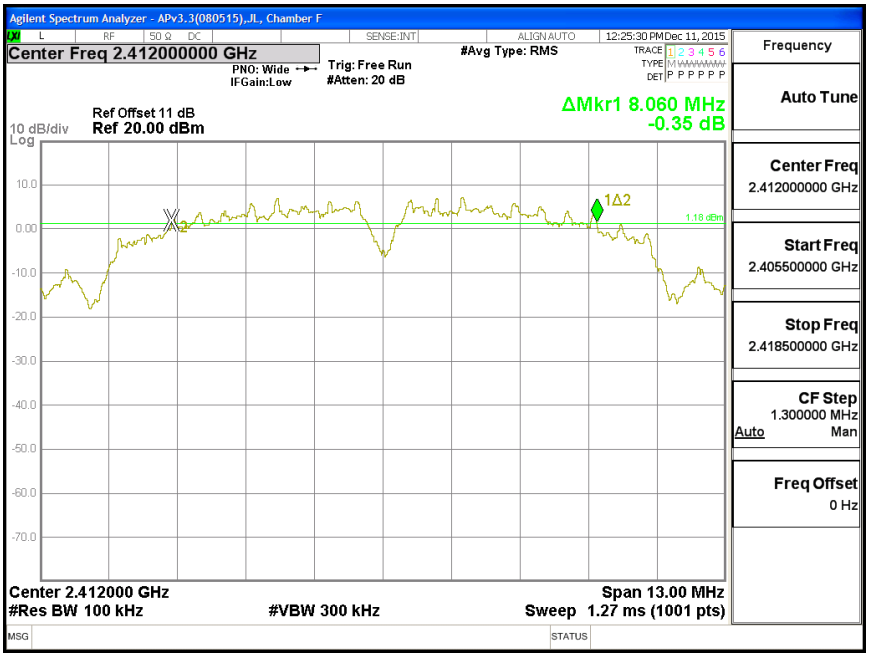
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

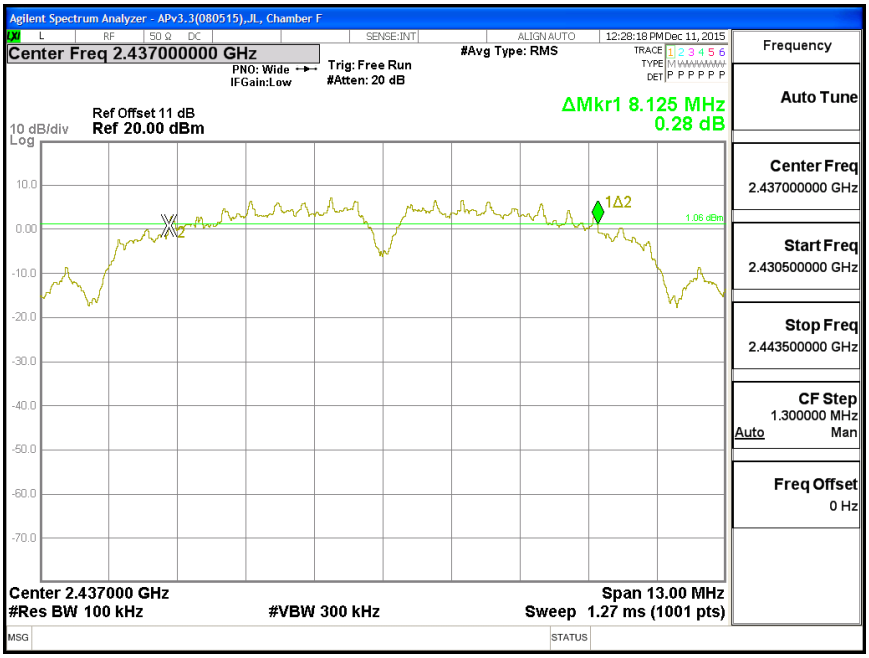
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	8.060	0.5
Mid	2437	8.125	0.5
High_11	2462	8.073	0.5
High_12	2467	8.099	0.5
High_13	2472	8.554	0.5

6 dB BANDWIDTH

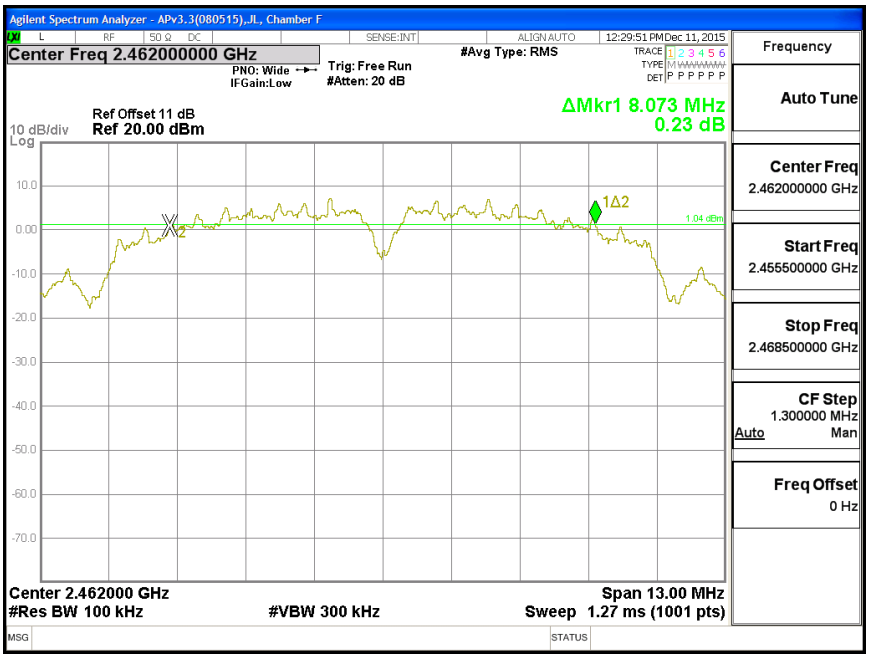
6 dB BANDWIDTH LOW CH



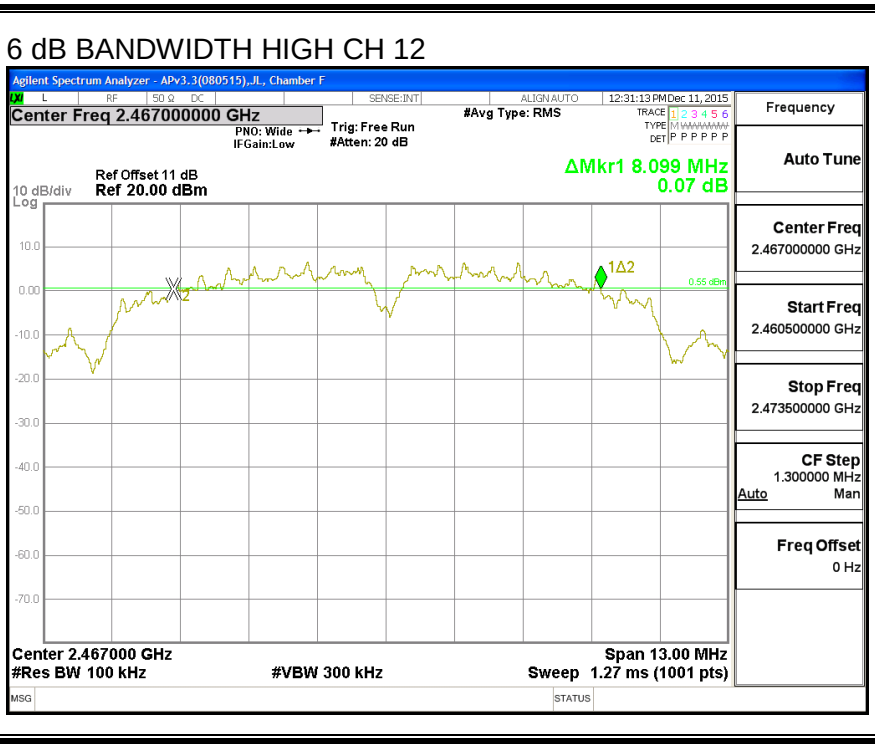
6 dB BANDWIDTH MID CH



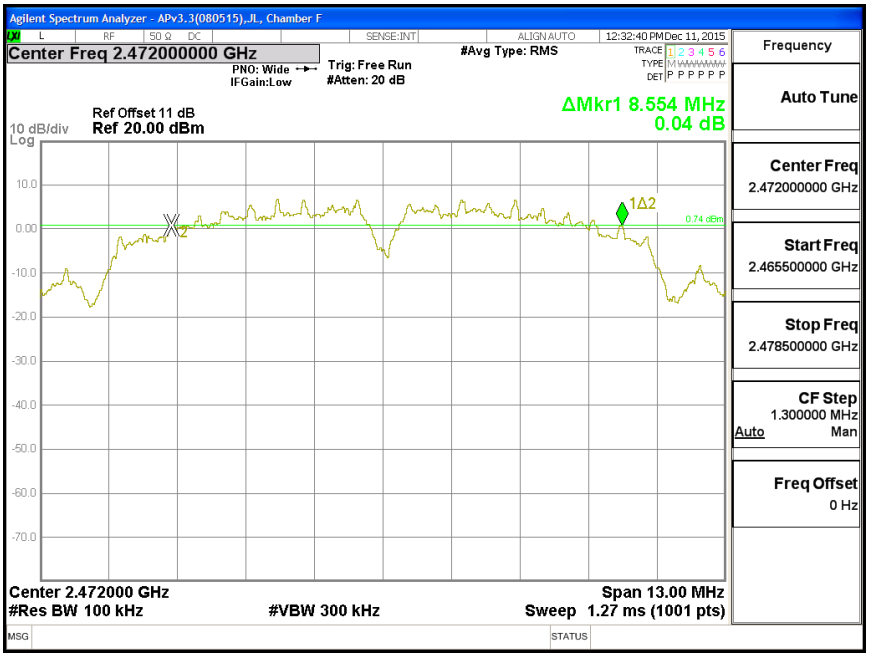
6 dB BANDWIDTH HIGH CH 11



6 dB BANDWIDTH HIGH CH 12



6 dB BANDWIDTH HIGH CH 13



8.2.2. 99% BANDWIDTH

LIMITS

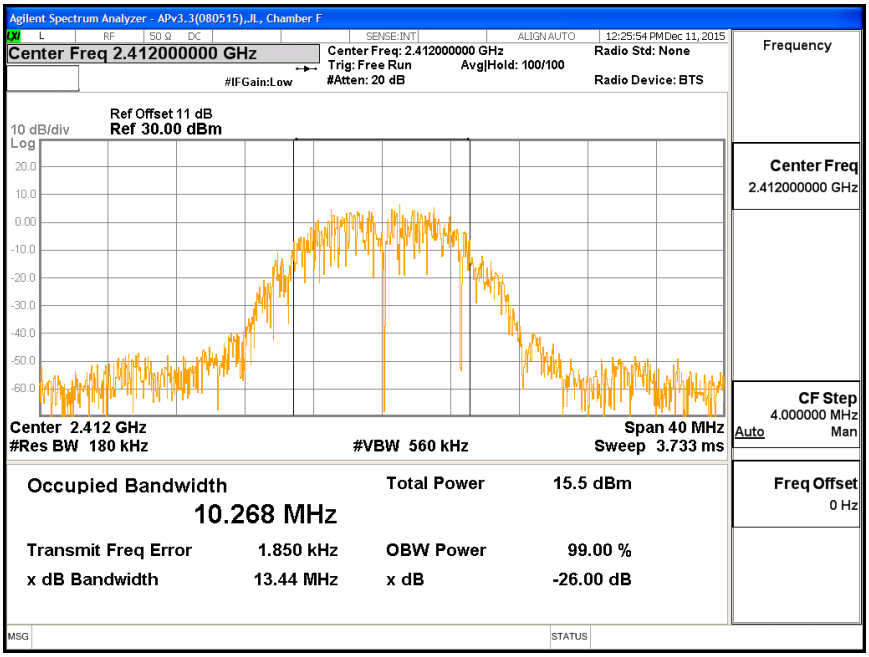
None; for reporting purposes only.

RESULTS

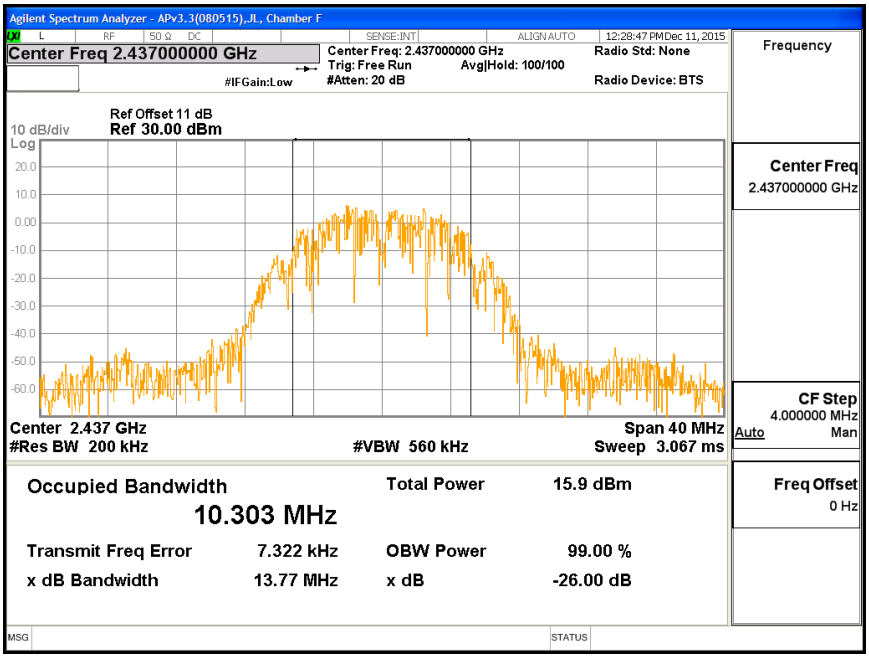
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	10.268
Mid	2437	10.303
High_11	2462	10.515
High_12	2467	10.445
High_13	2472	10.415

99% BANDWIDTH

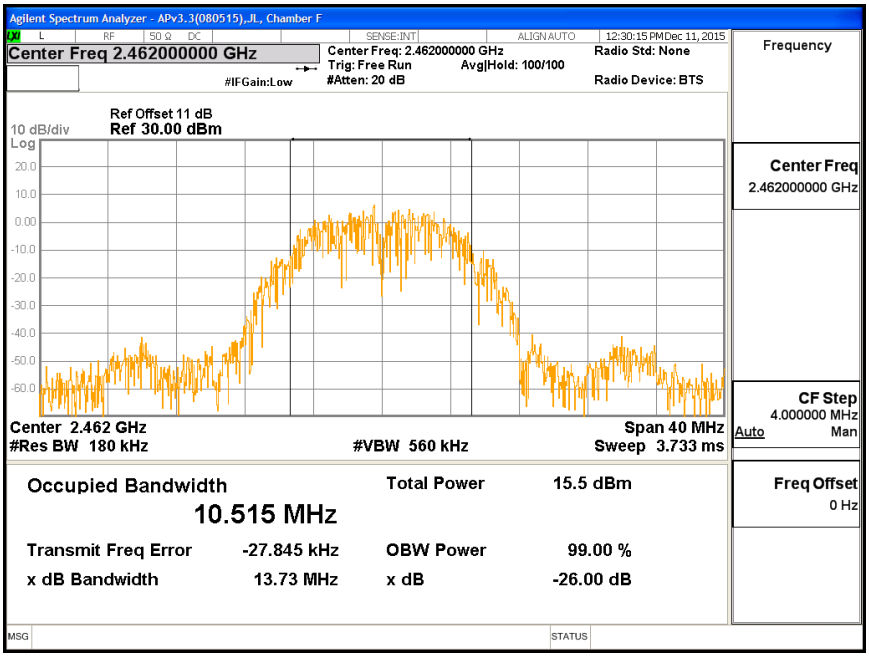
BANDWIDTH LOW CH



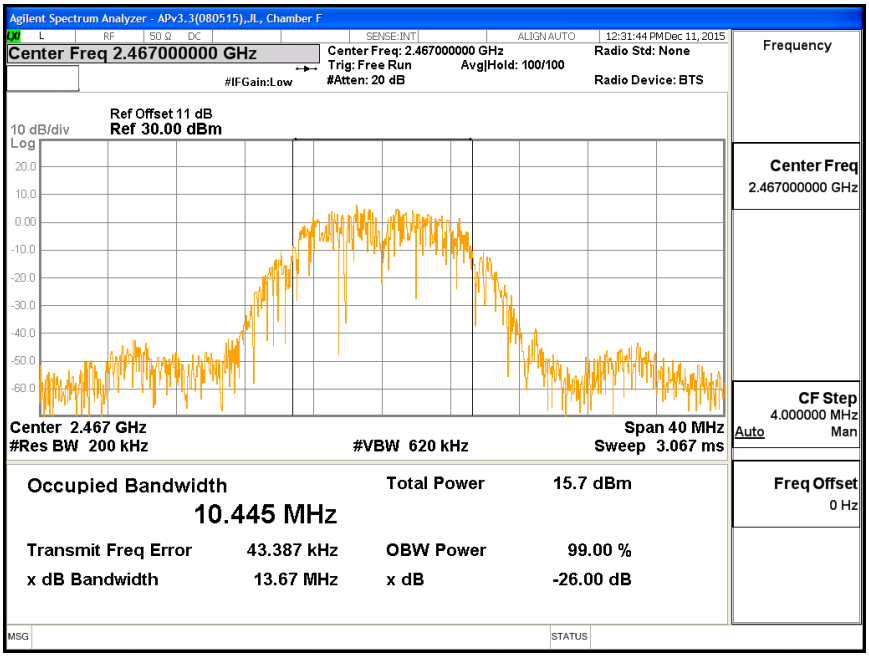
BANDWIDTH MID CH



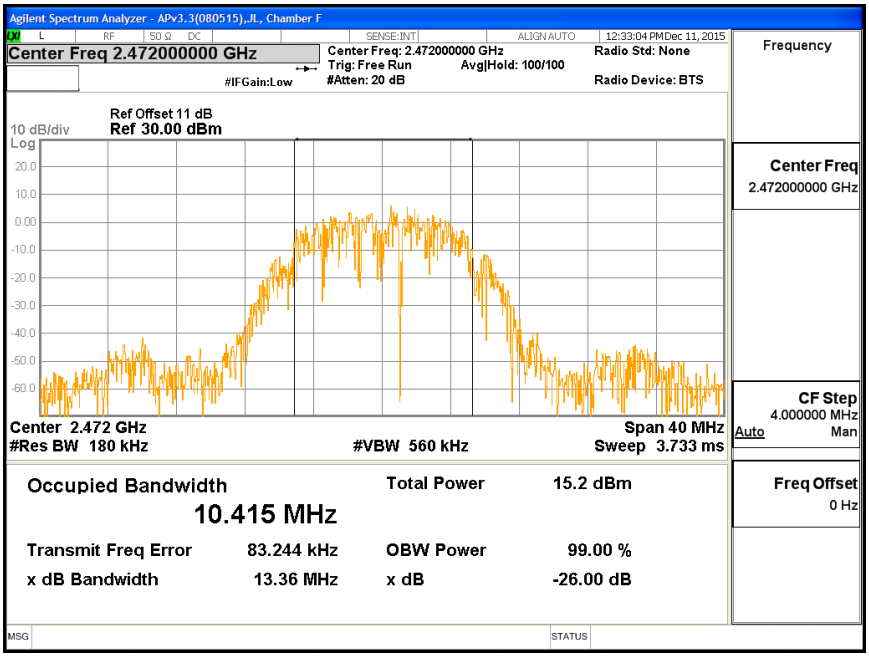
BANDWIDTH HIGH CH11



BANDWIDTH HIGH CH12



BANDWIDTH HIGH CH 13



8.2.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
Low	2412	15.86
Mid	2437	15.92
High_11	2462	15.98
High_12	2467	15.83
High_13	2472	13.91

8.2.4. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-247 (5.4) (4)

For systems using digital modulation in the 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)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-1.75	30.00	30	36	30.00
Mid	2437	-1.75	30.00	30	36	30.00
High_11	2462	-1.75	30.00	30	36	30.00
High_12	2467	-1.75	30.00	30	36	30.00
High_13	2472	-1.75	30.00	30	36	30.00

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

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	18.73	18.73	30.00	-11.27
Mid	2437	18.95	18.95	30.00	-11.05
High_11	2462	18.97	18.97	30.00	-11.03
High_12	2467	18.71	18.71	30.00	-11.29
High_13	2472	16.75	16.75	30.00	-13.25

8.2.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247

IC RSS-247 (5.2) (2)

For digitally modulated systems, the power spectral density conducted form 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

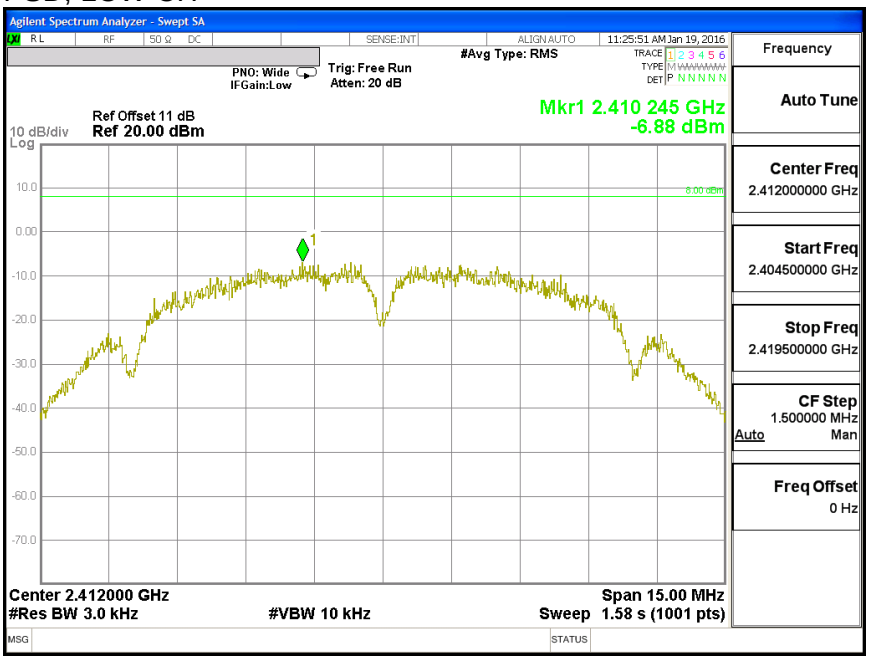
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

PSD Results

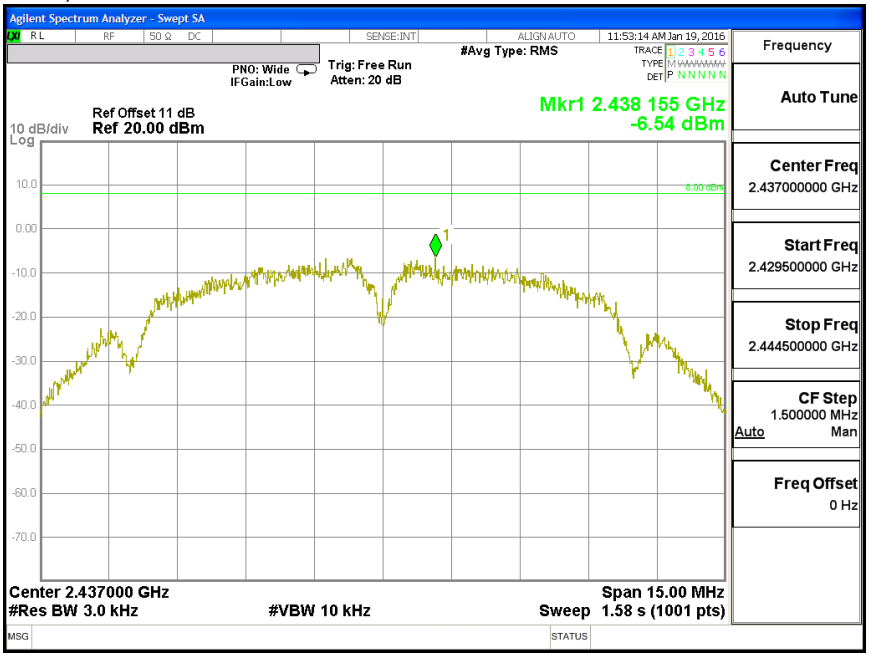
Channel	Frequency (MHz)	Antenna B Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-6.88	-6.88	8.0	-14.9
Mid	2437	-6.54	-6.54	8.0	-14.5
High_11	2462	-5.92	-5.92	8.0	-13.9
High_12	2467	-6.76	-6.76	8.0	-14.8
High_13	2472	-8.22	-8.22	8.0	-16.2

PSD

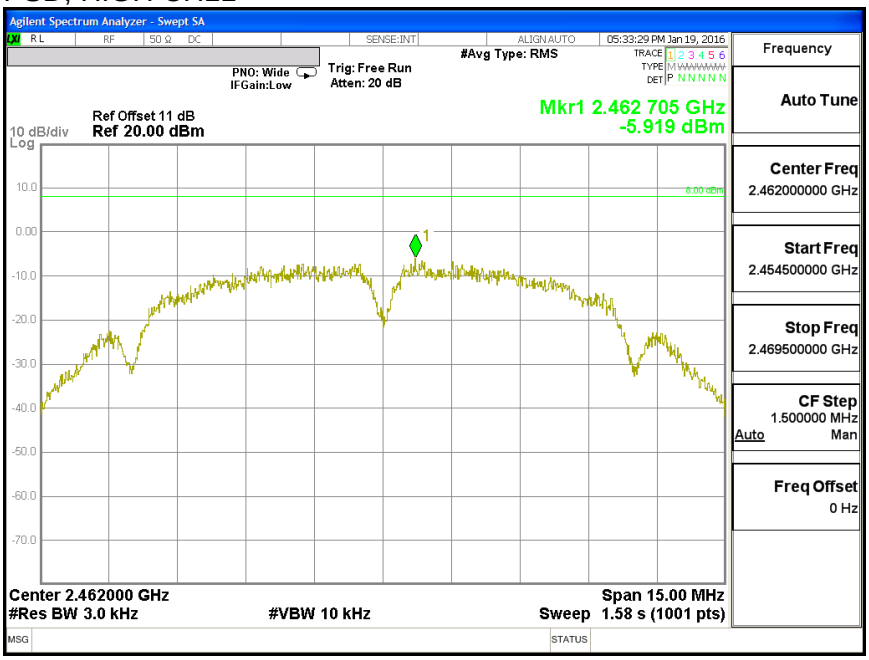
PSD, LOW CH



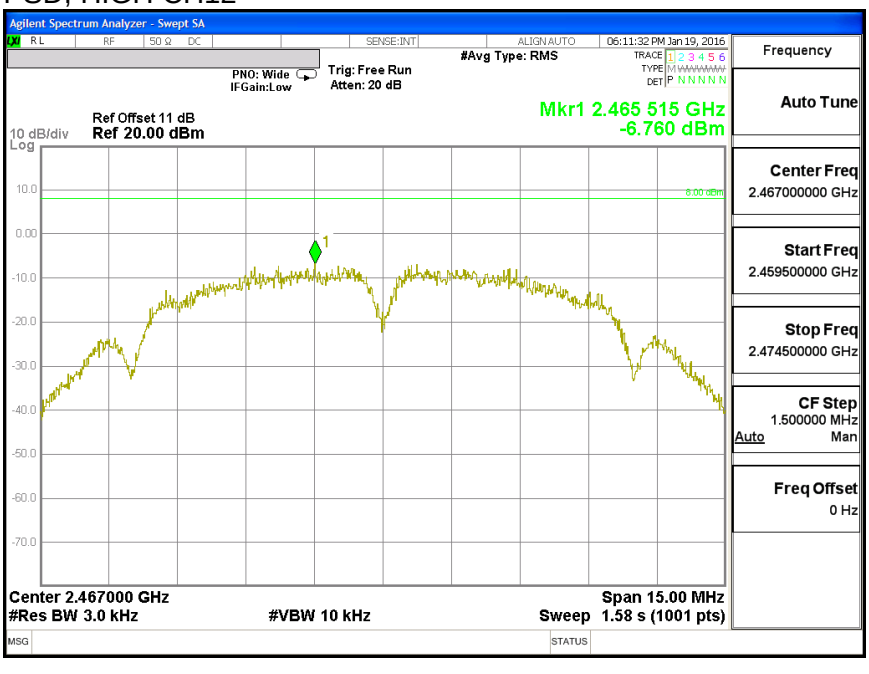
PSD, MID CH



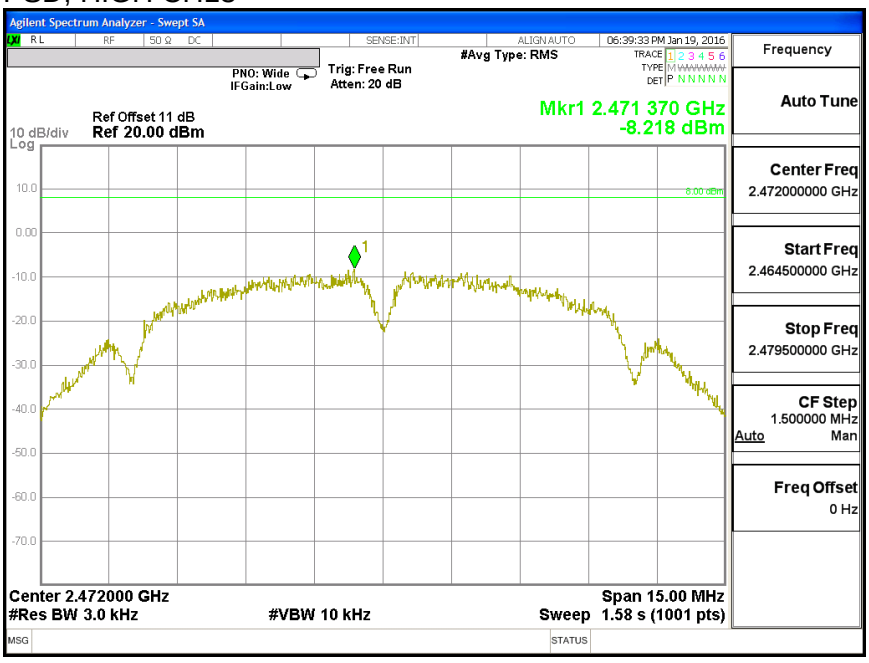
PSD, HIGH CH11



PSD, HIGH CH12



PSD, HIGH CH13



8.2.6. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

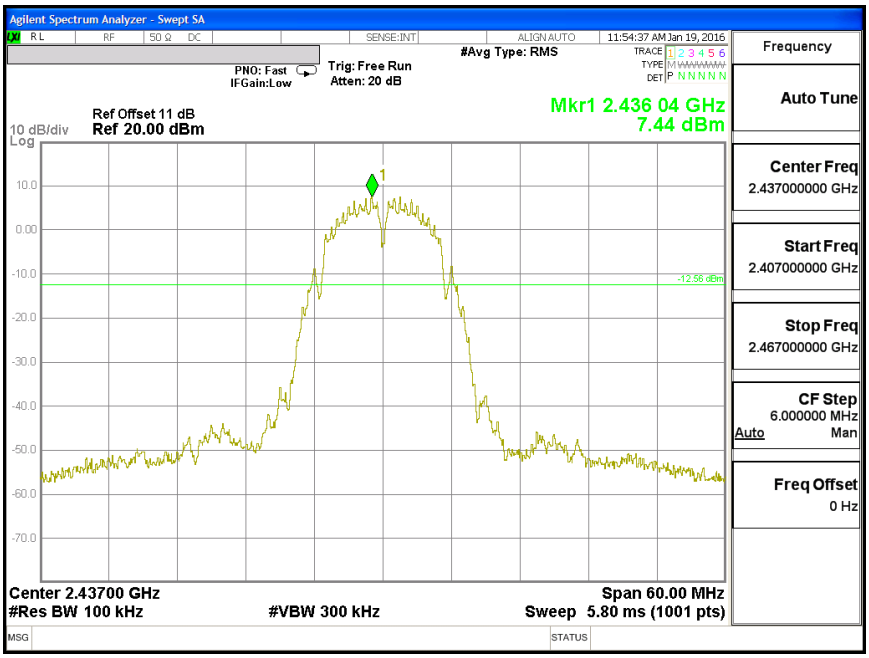
IC RSS-247 (5.5)

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

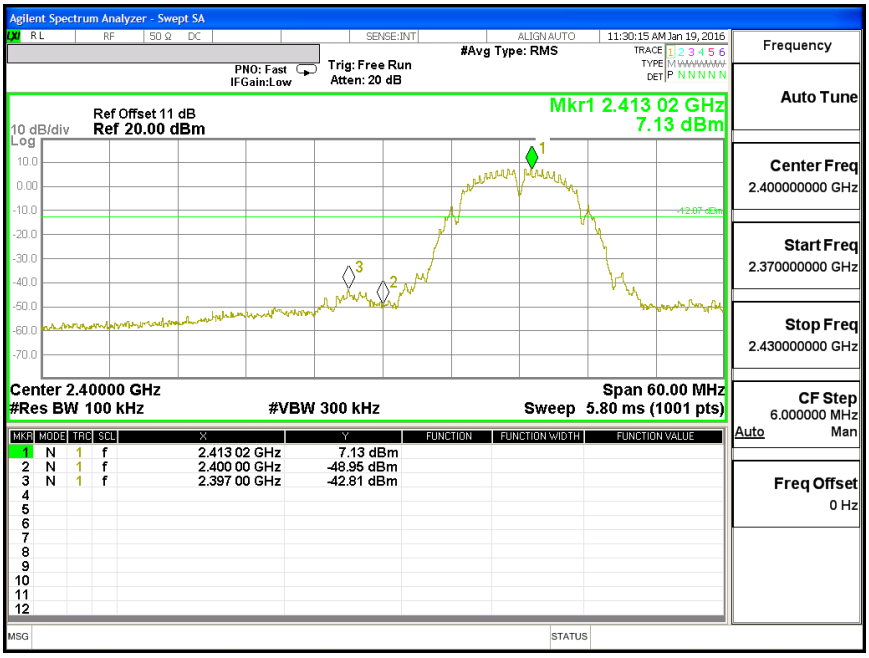
IN-BAND REFERENCE LEVEL

REFERENCE LEVEL MID CH



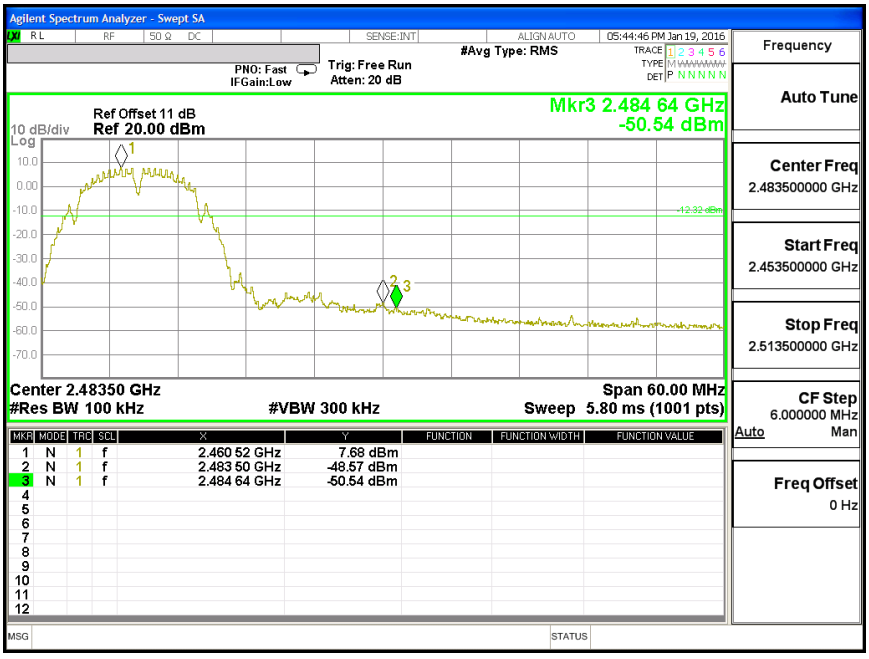
LOW CHANNEL BANDEDGE

AUTHORIZED BAND EDGE LOW CH

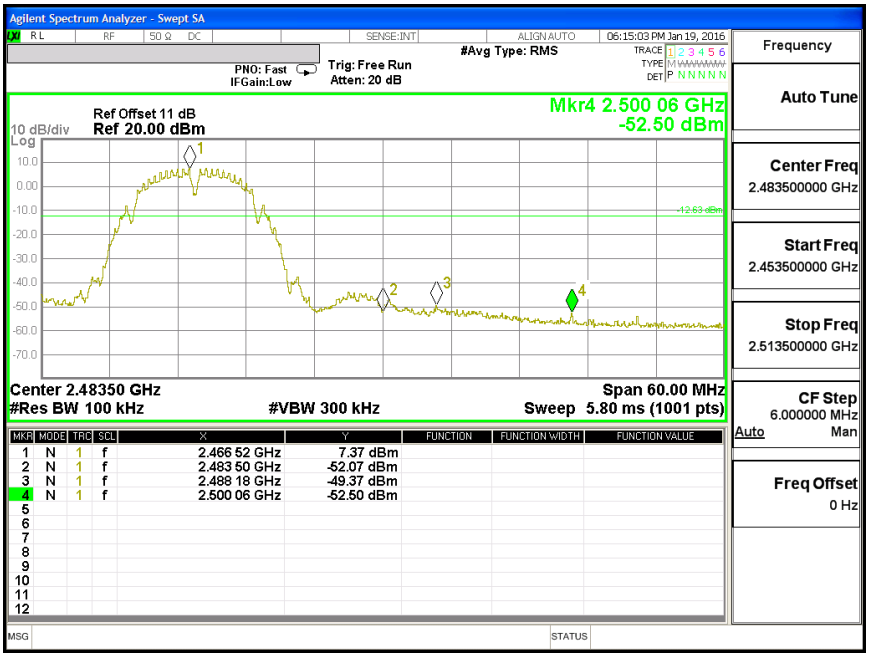


HIGH CHANNEL BANDEDGE

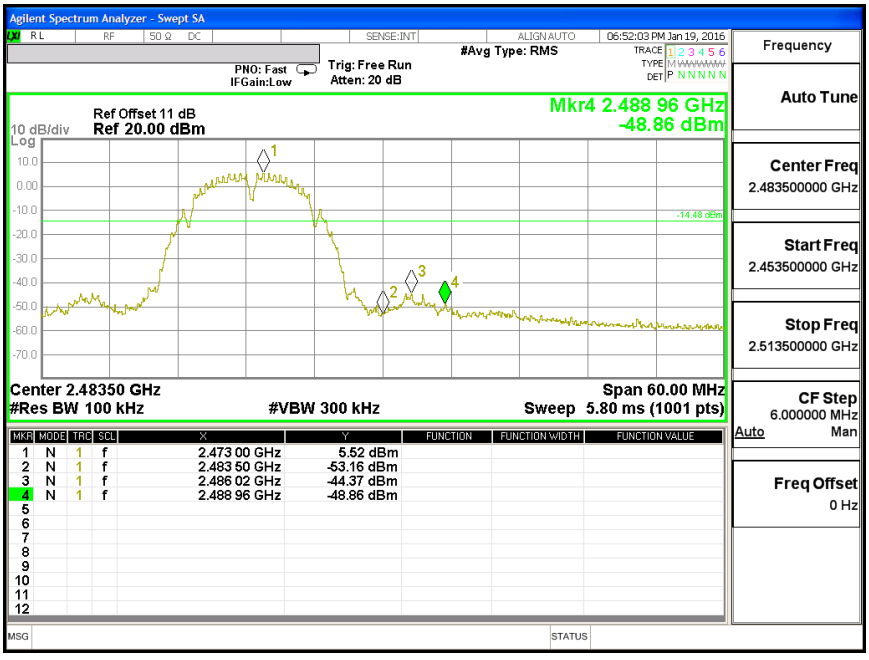
AUTHORIZED BAND EDGE HIGH CH11



AUTHORIZED BAND EDGE HIGH CH12

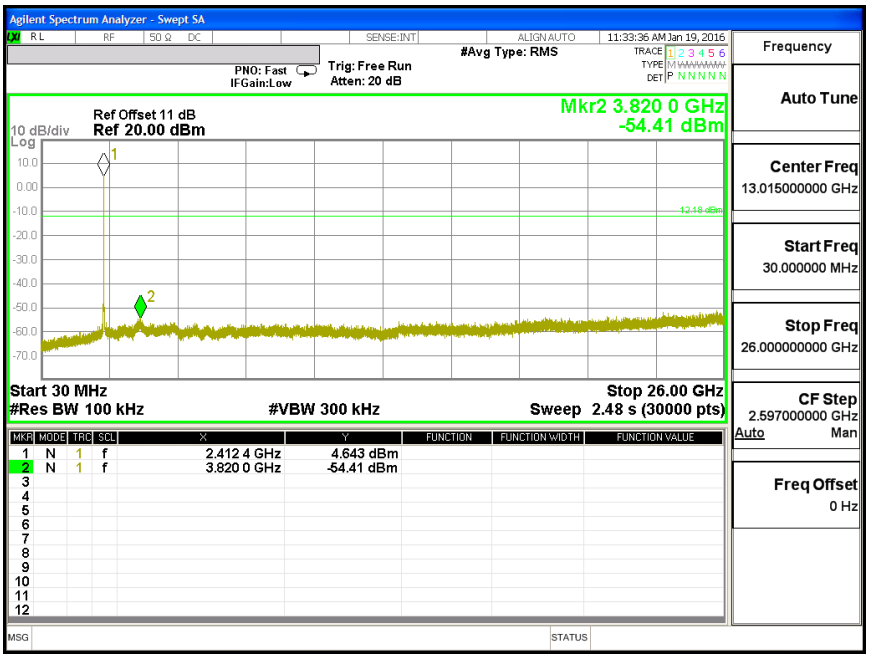


AUTHORIZED BAND EDGE HIGH CH13

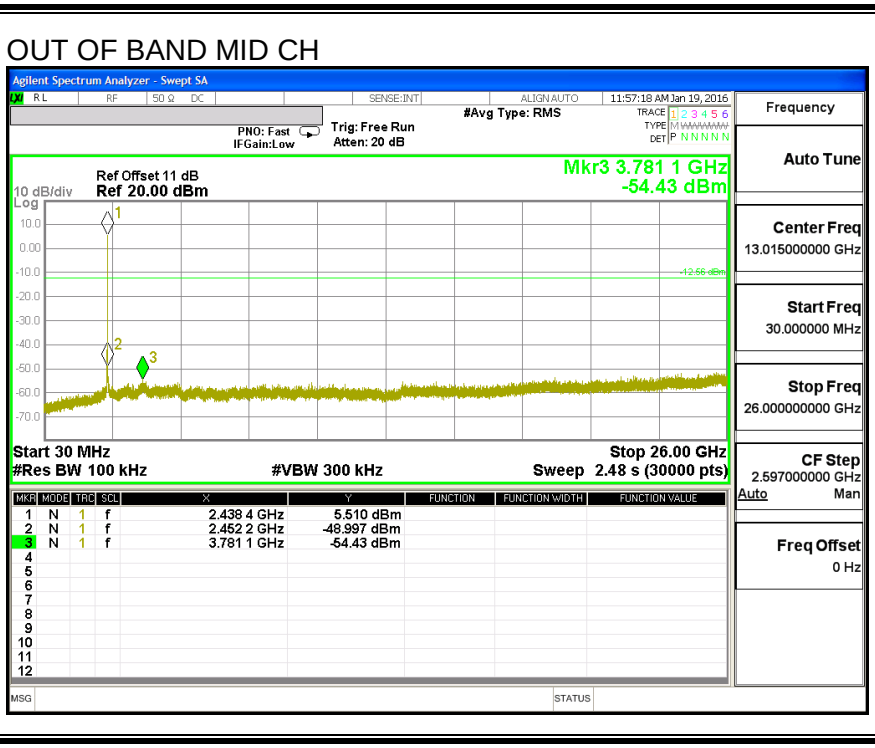


OUT-OF-BAND EMISSIONS

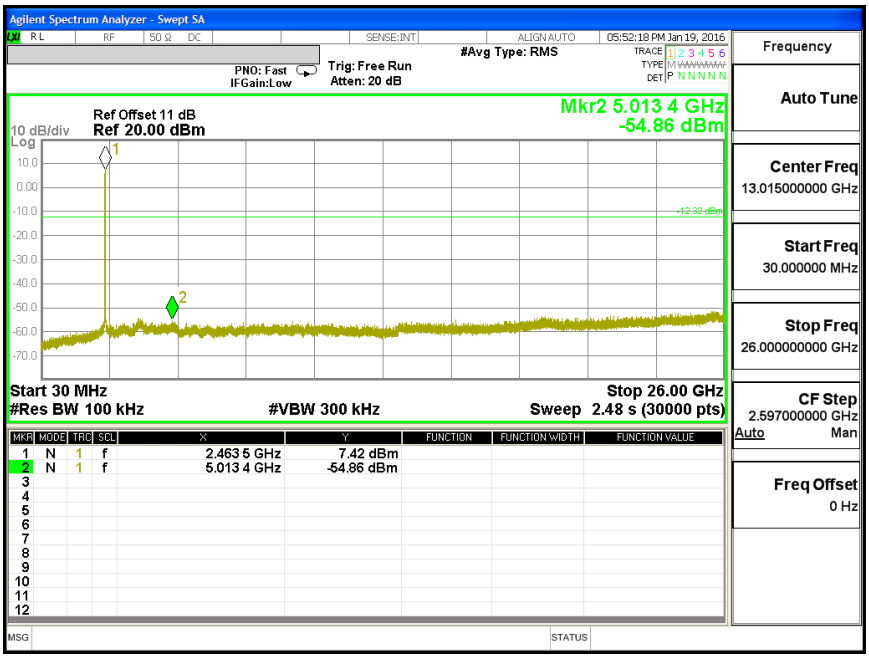
OUT OF BAND LOW CH



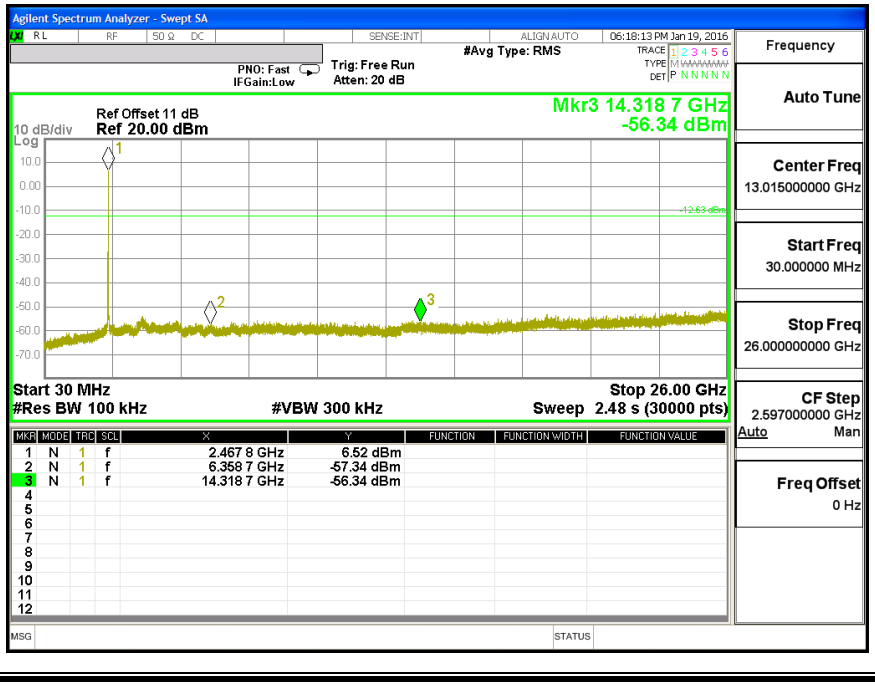
OUT OF BAND MID CH



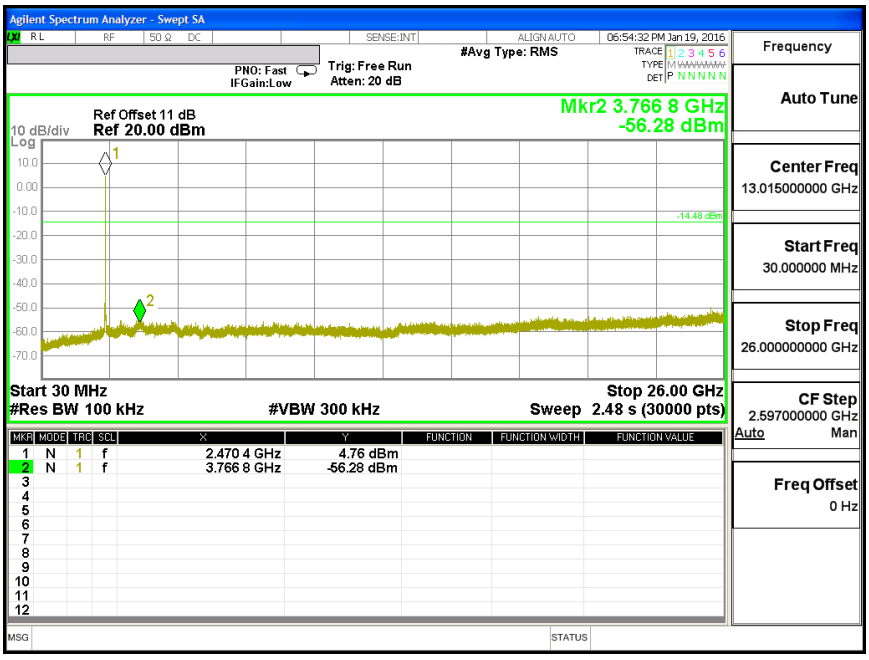
OUT OF BAND HIGH CH11



OUT OF BAND HIGH CH12



OUT OF BAND HIGH CH13



8.3. 802.11b SISO MODE IN THE 2.4 GHz BAND (ANTENNA A)

8.3.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-247 (5.2) (1)

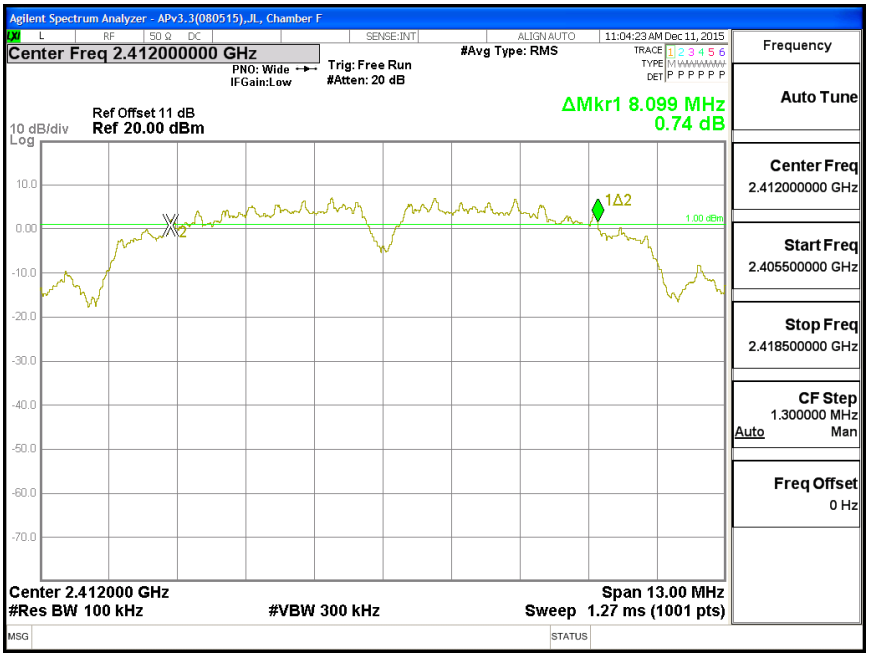
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

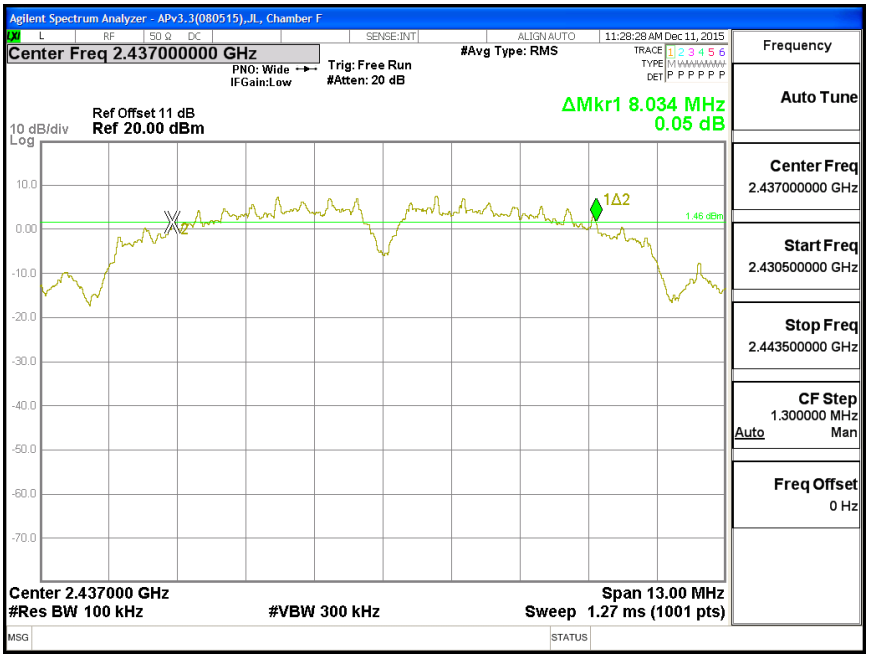
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	8.099	0.5
Mid	2437	8.034	0.5
High_11	2462	8.086	0.5
High_12	2467	8.528	0.5
High_13	2472	8.086	0.5

6 dB BANDWIDTH

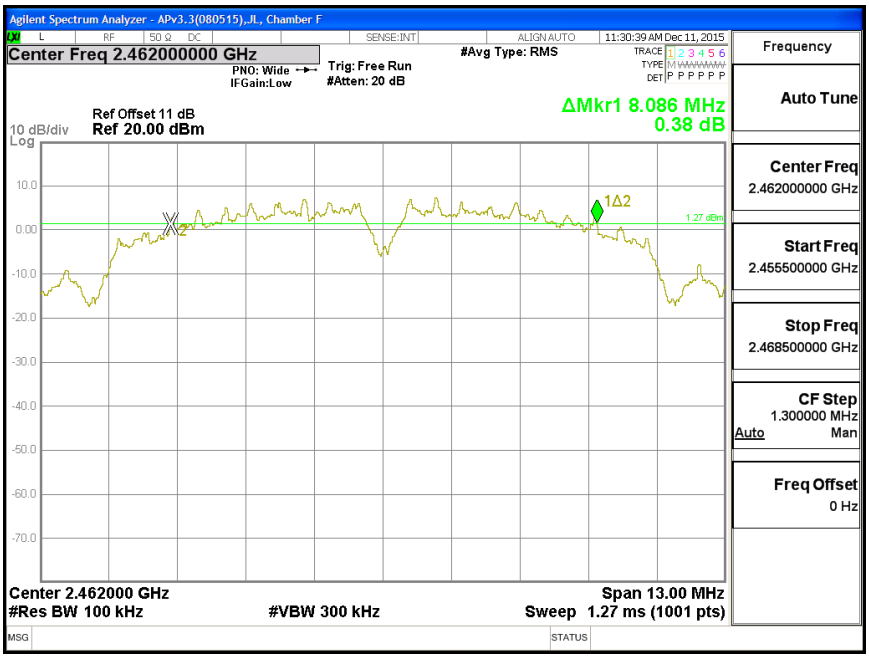
6 dB BANDWIDTH LOW CH



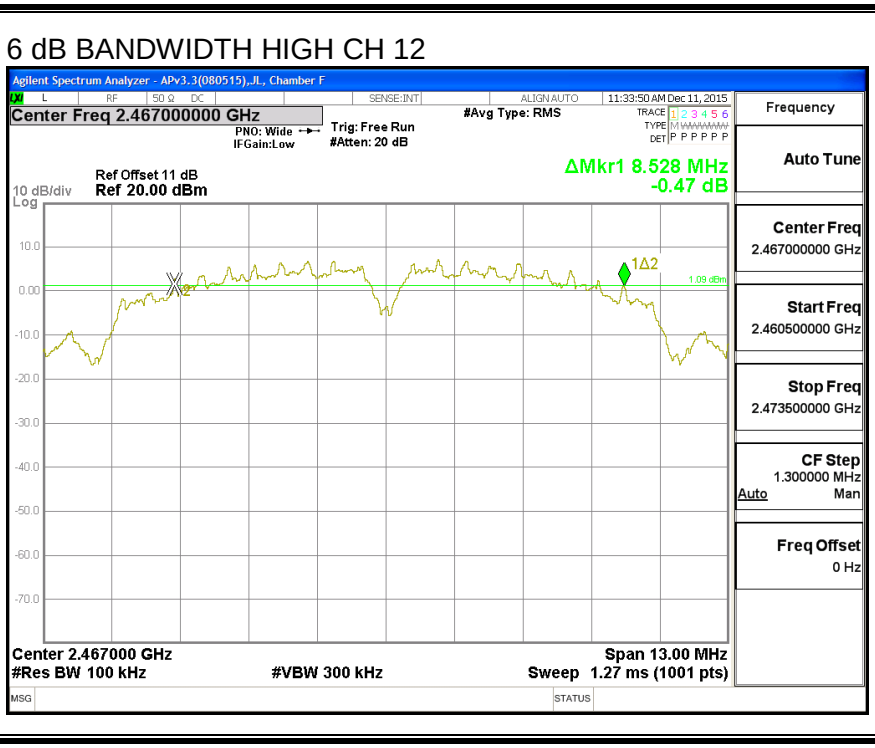
6 dB BANDWIDTH MID CH



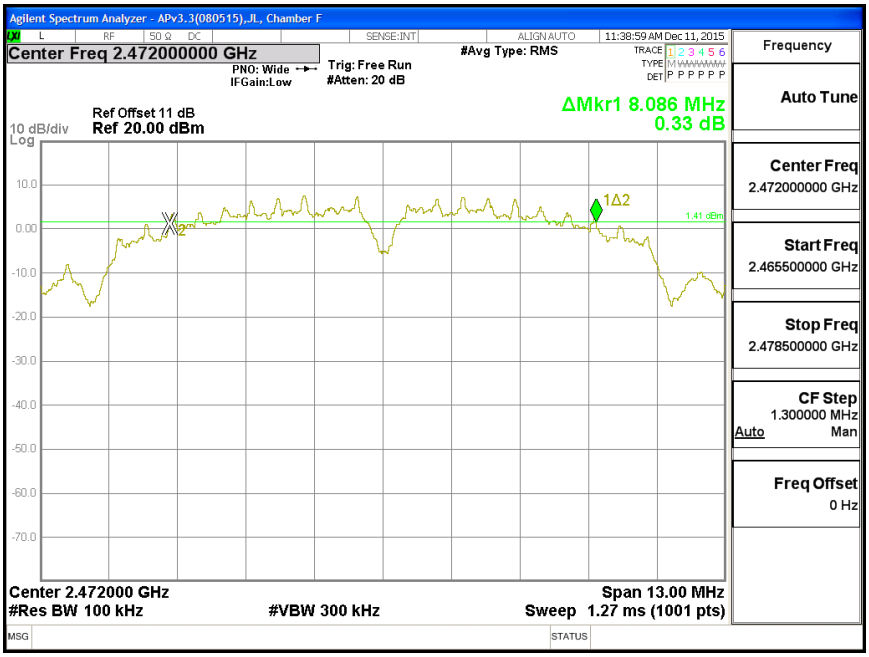
6 dB BANDWIDTH HIGH CH 11



6 dB BANDWIDTH HIGH CH 12



6 dB BANDWIDTH HIGH CH 13



8.3.2. 99% BANDWIDTH

LIMITS

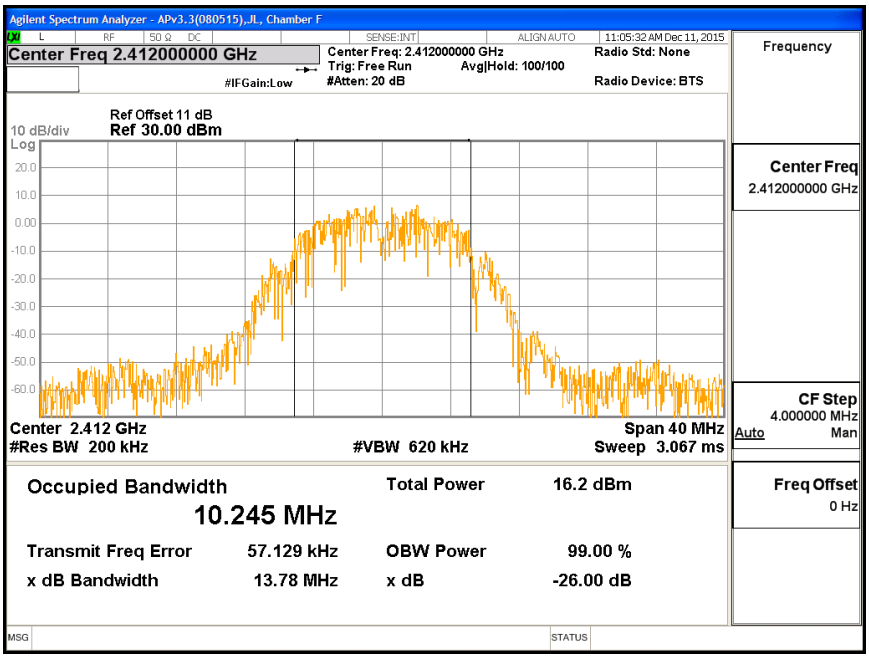
None; for reporting purposes only.

RESULTS

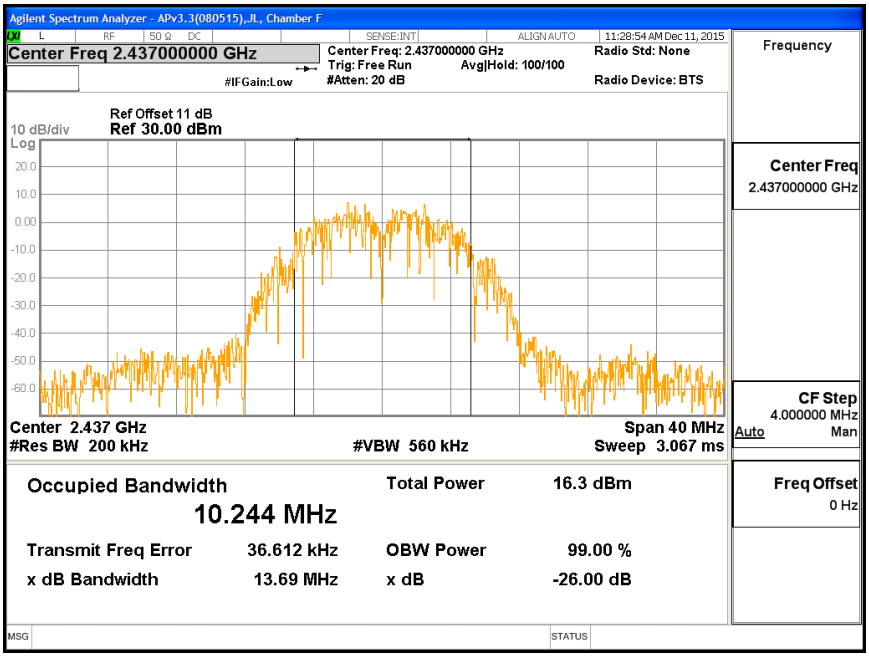
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	10.245
Mid	2437	10.244
High_11	2462	10.234
High_12	2467	10.301
High_13	2472	10.231

99% BANDWIDTH

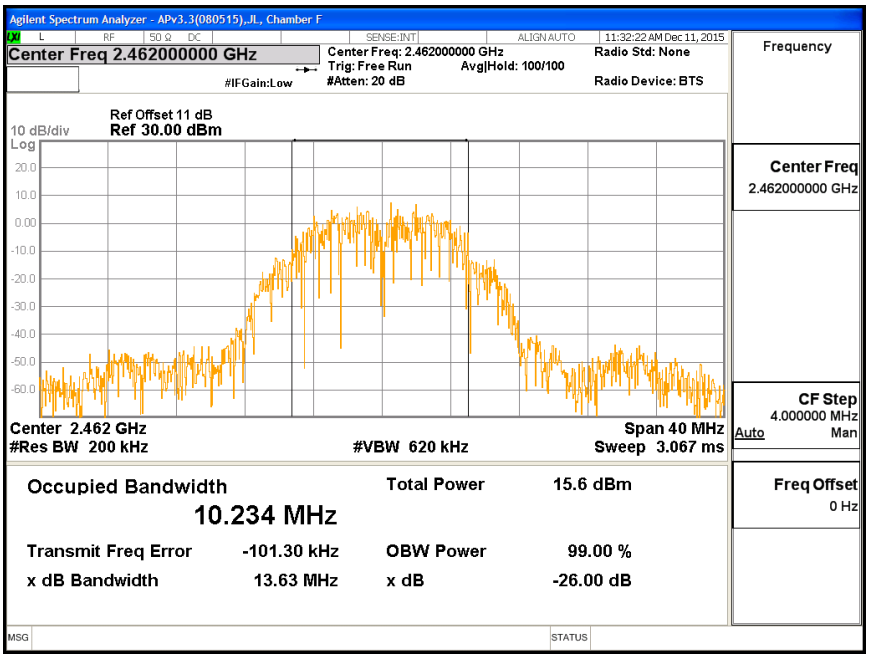
BANDWIDTH LOW CH



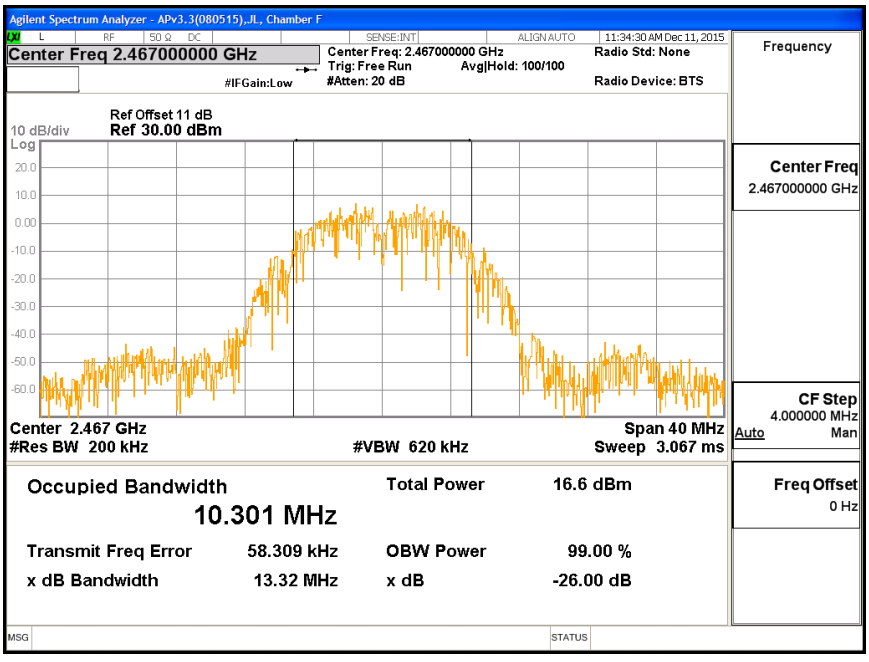
BANDWIDTH MID CH



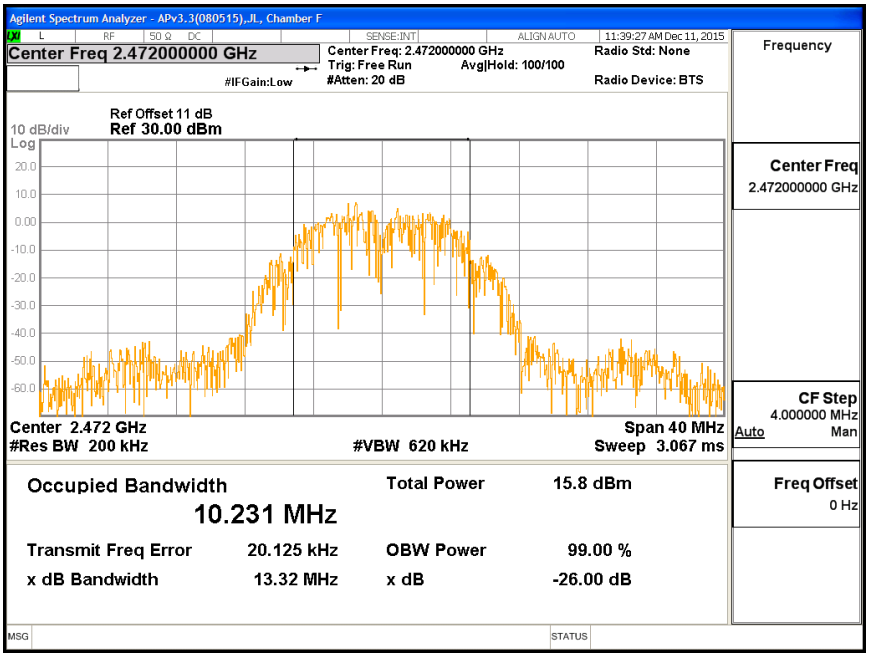
BANDWIDTH HIGH CH11



BANDWIDTH HIGH CH12



BANDWIDTH HIGH CH 13



8.3.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
Low	2412	16.31
Mid	2437	16.47
High_11	2462	16.49
High_12	2467	16.50
High_13	2472	13.90

8.3.4. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-247 (5.4) (4)

For systems using digital modulation in the 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)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-0.18	30.00	30	36	30.00
Mid	2437	-0.18	30.00	30	36	30.00
High_11	2462	-0.18	30.00	30	36	30.00
High_12	2467	-0.18	30.00	30	36	30.00
High_13	2472	-0.18	30.00	30	36	30.00

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

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	19.33	19.33	30.00	-10.67
Mid	2437	19.36	19.36	30.00	-10.64
High_11	2462	19.43	19.43	30.00	-10.57
High_12	2467	19.40	19.40	30.00	-10.60
High_13	2472	16.79	16.79	30.00	-13.21

8.3.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247

IC RSS-247 (5.2) (2)

For digitally modulated systems, the power spectral density conducted form 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

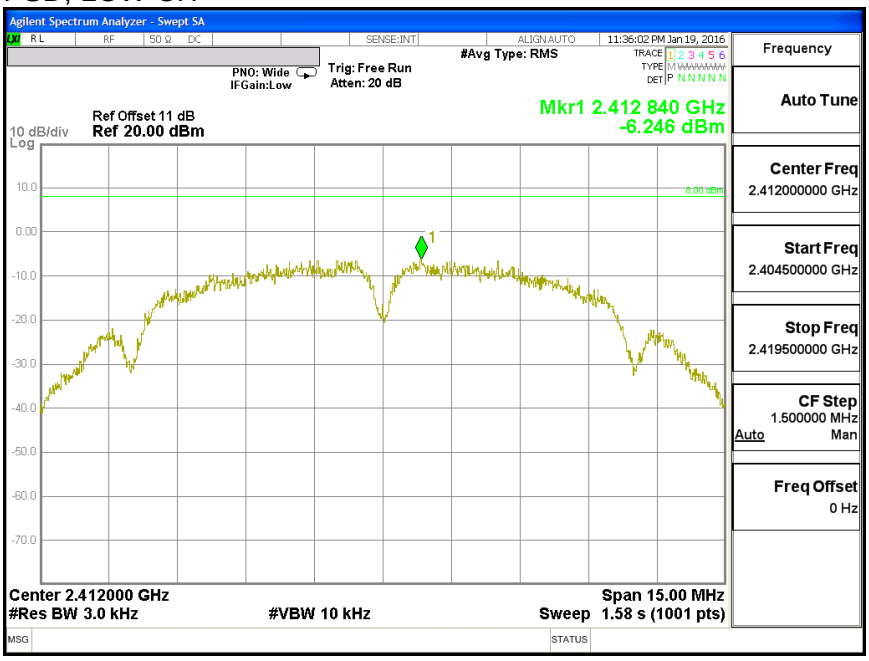
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

PSD Results

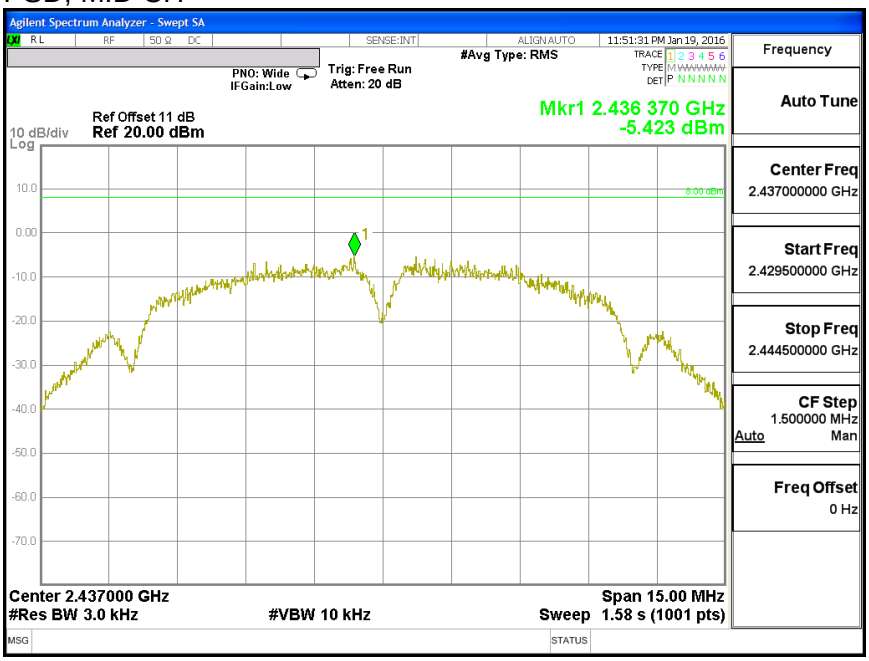
Channel	Frequency (MHz)	Antenna A Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-6.246	-6.25	8.0	-14.2
Mid	2437	-5.423	-5.42	8.0	-13.4
High_11	2462	-5.558	-5.56	8.0	-13.6
High_12	2467	-5.463	-5.46	8.0	-13.5
High_13	2472	-9.181	-9.18	8.0	-17.2

PSD

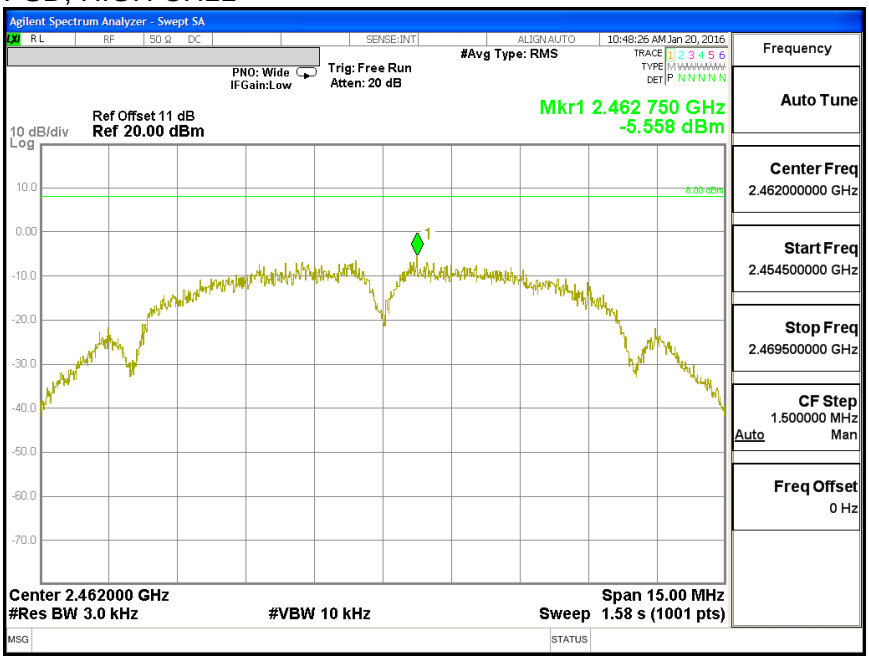
PSD, LOW CH



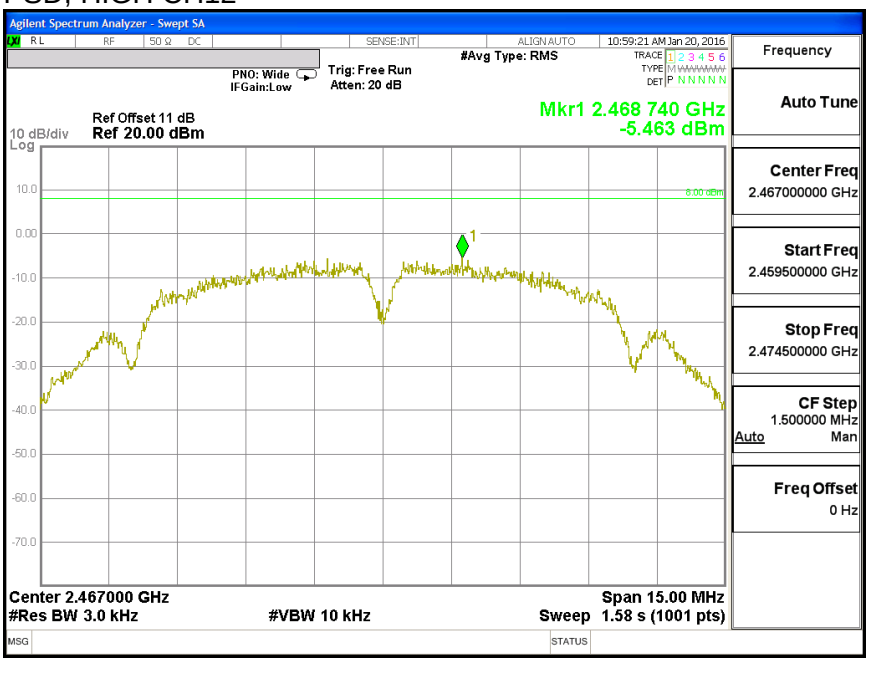
PSD, MID CH



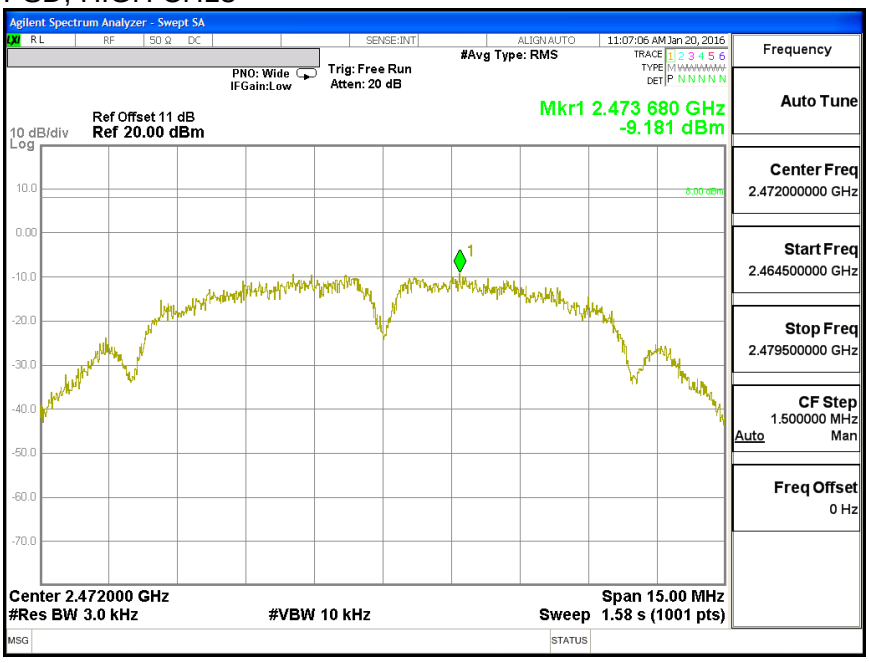
PSD, HIGH CH11



PSD, HIGH CH12



PSD, HIGH CH13



8.3.6. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

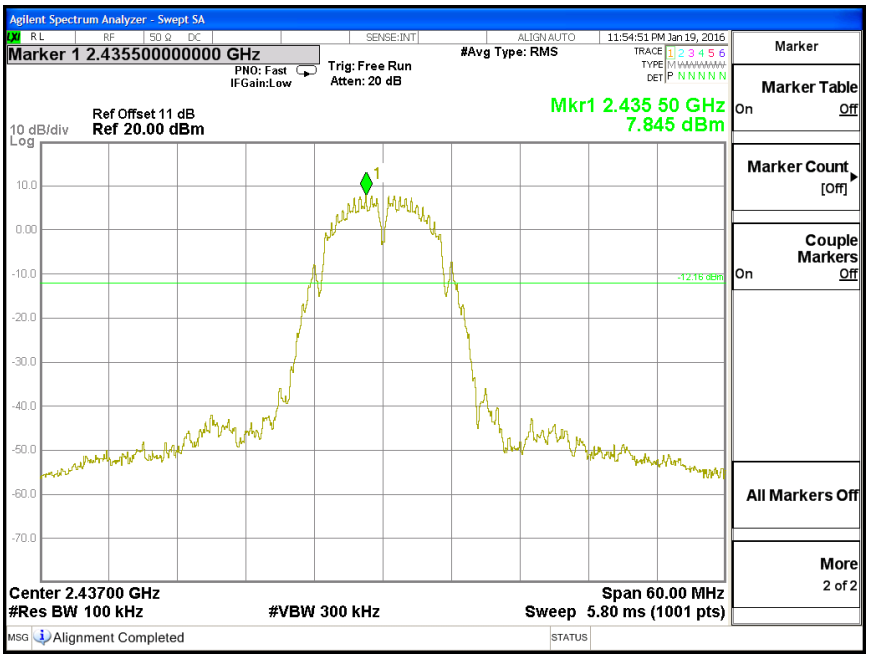
IC RSS-247 (5.5)

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

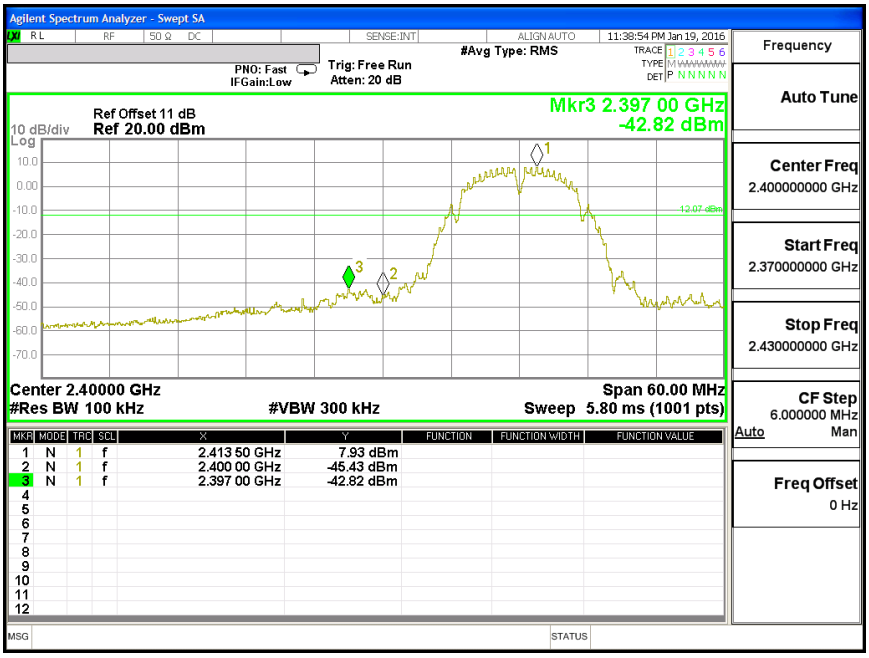
IN-BAND REFERENCE LEVEL

REFERENCE LEVEL MID CH



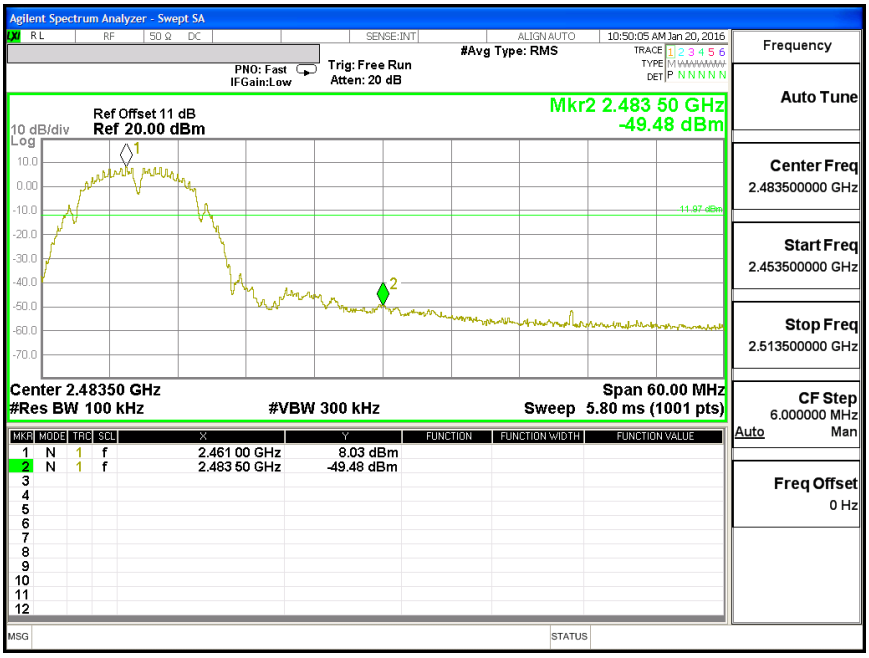
LOW CHANNEL BANDEDGE

AUTHORIZED BAND EDGE LOW CH

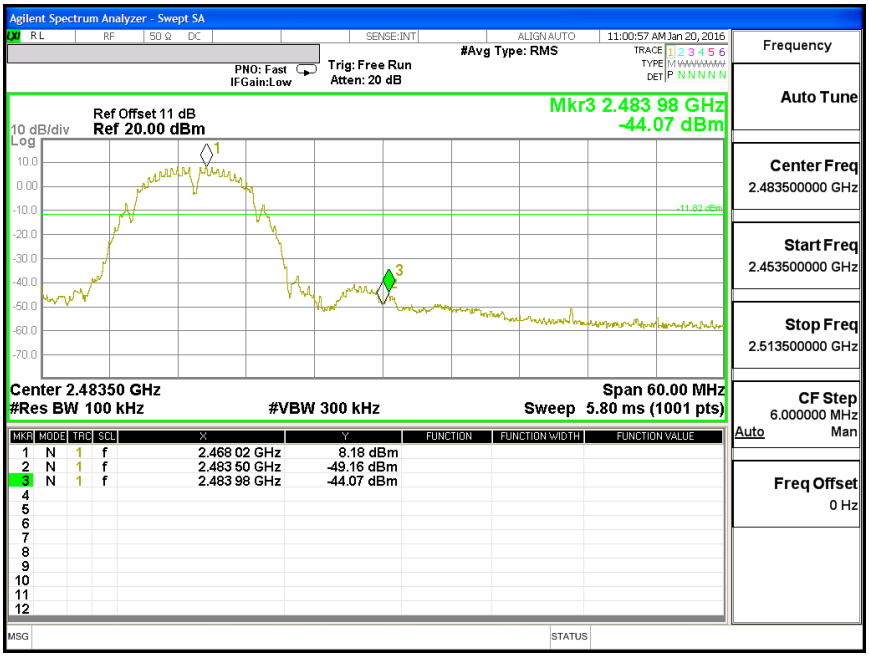


HIGH CHANNEL BANDEDGE

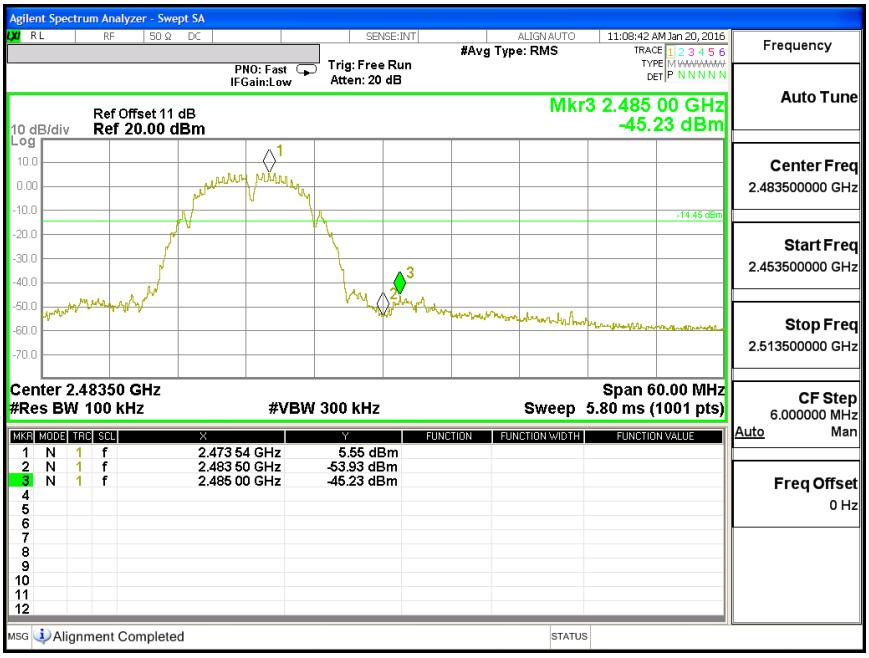
AUTHORIZED BAND EDGE HIGH CH11



AUTHORIZED BAND EDGE HIGH CH12

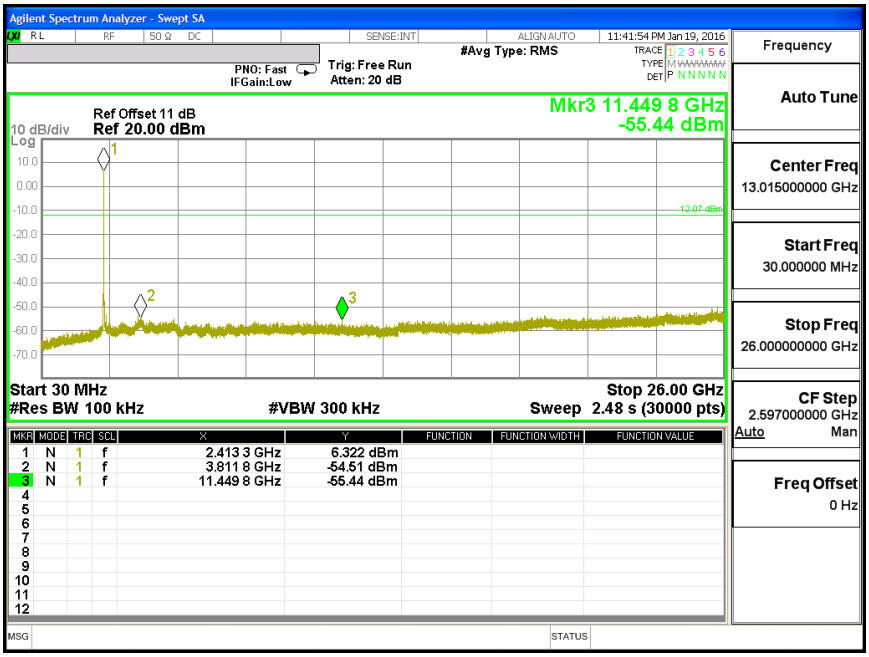


AUTHORIZED BAND EDGE HIGH CH13

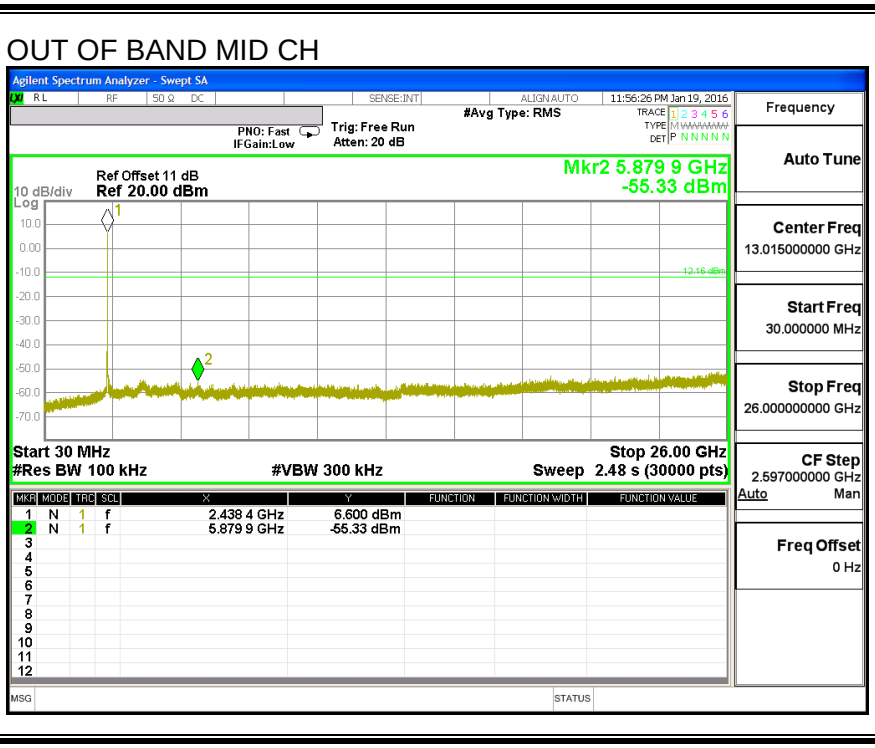


OUT-OF-BAND EMISSIONS

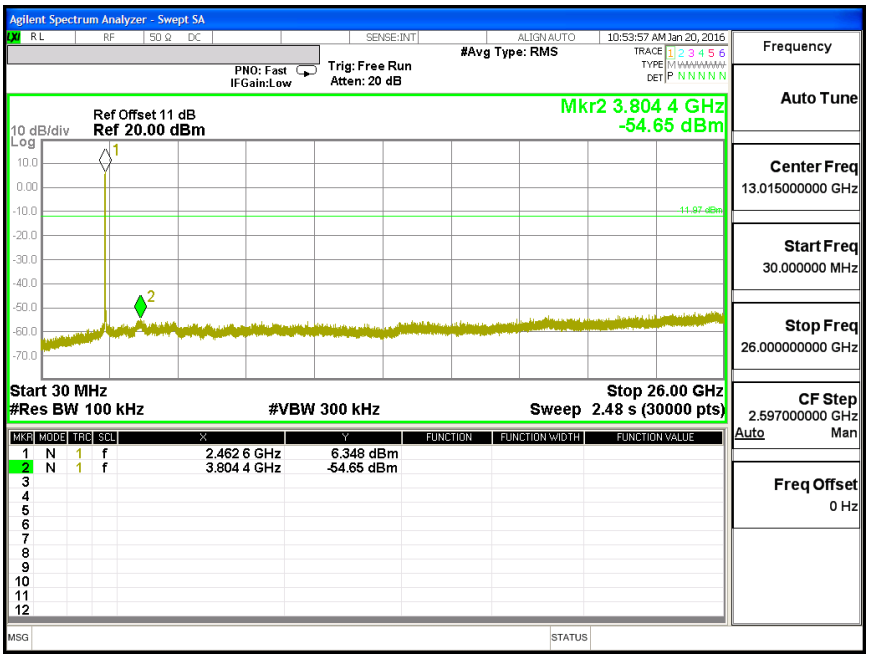
OUT OF BAND LOW CH



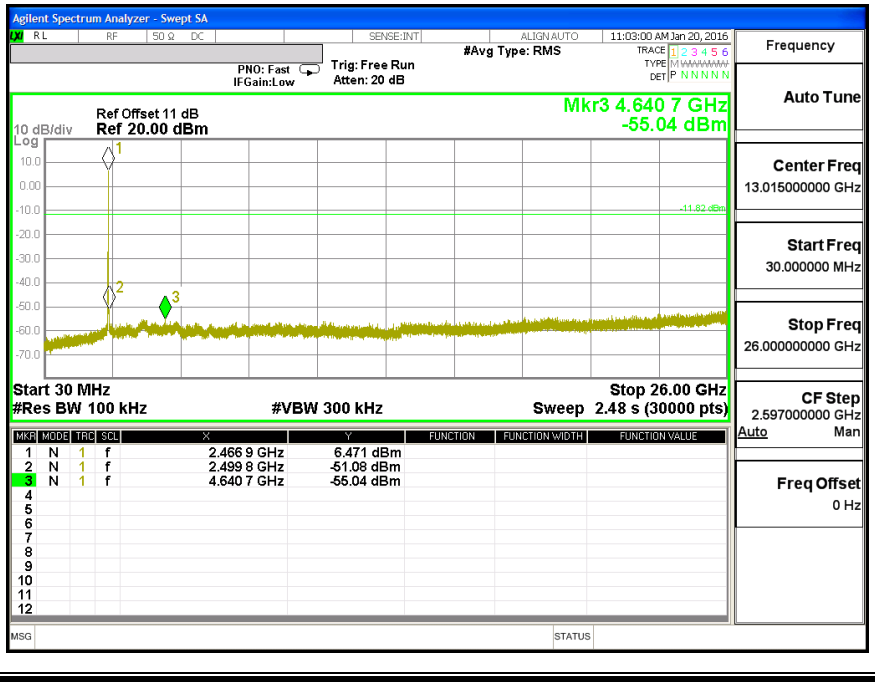
OUT OF BAND MID CH



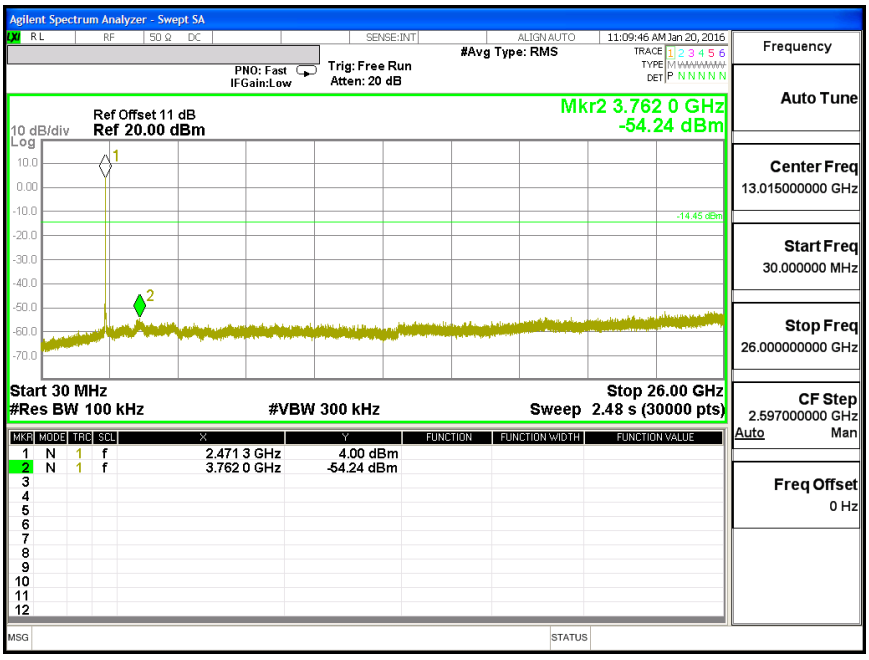
OUT OF BAND HIGH CH11



OUT OF BAND HIGH CH12



OUT OF BAND HIGH CH13



8.4. 802.11b SISO MODE IN THE 2.4 GHz BAND (ANTENNA C)

8.4.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-247 (5.2) (1)

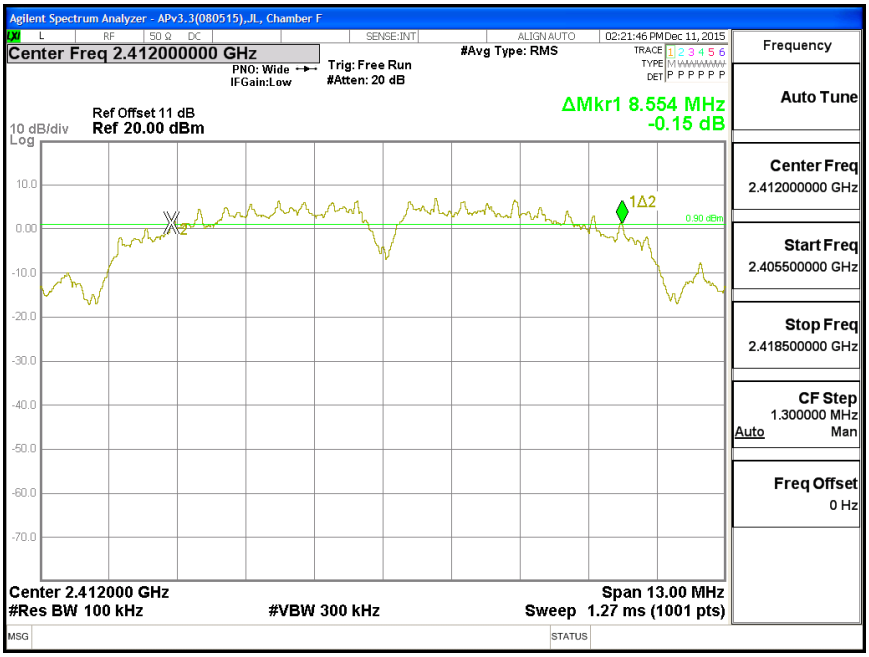
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

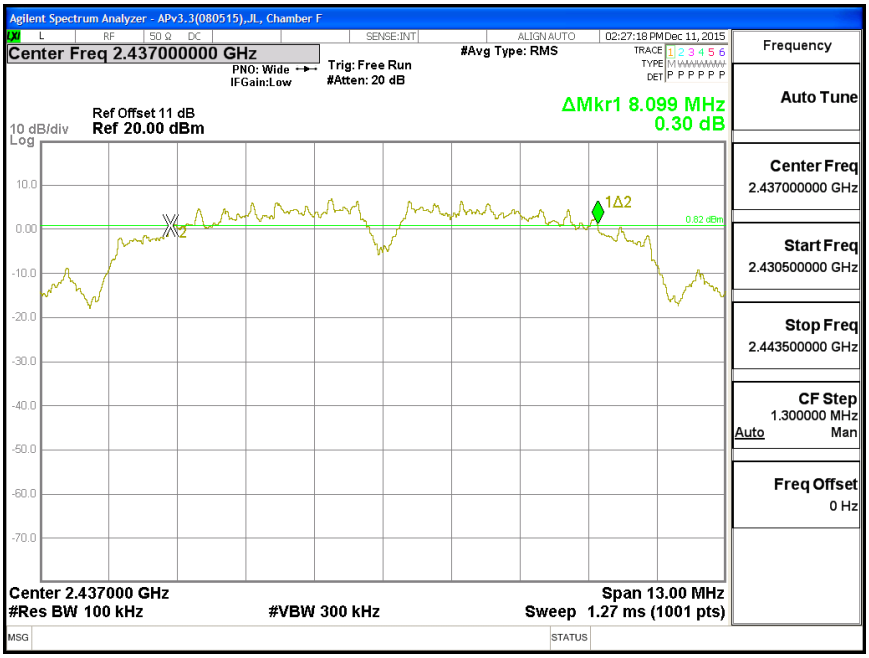
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	8.554	0.5
Mid	2437	8.099	0.5
High_11	2462	8.099	0.5
High_12	2467	8.099	0.5
High_13	2472	8.047	0.5

6 dB BANDWIDTH

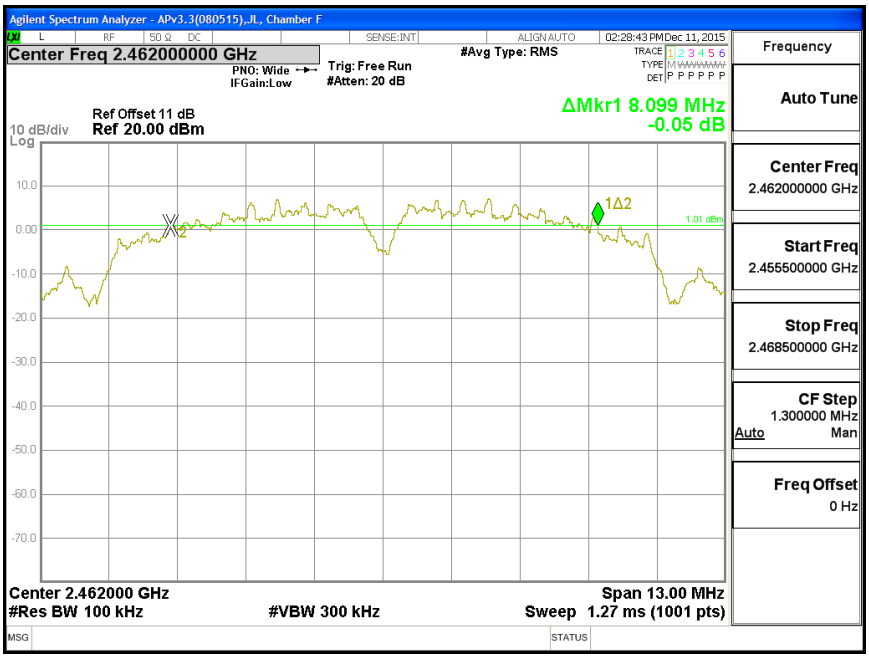
6 dB BANDWIDTH LOW CH



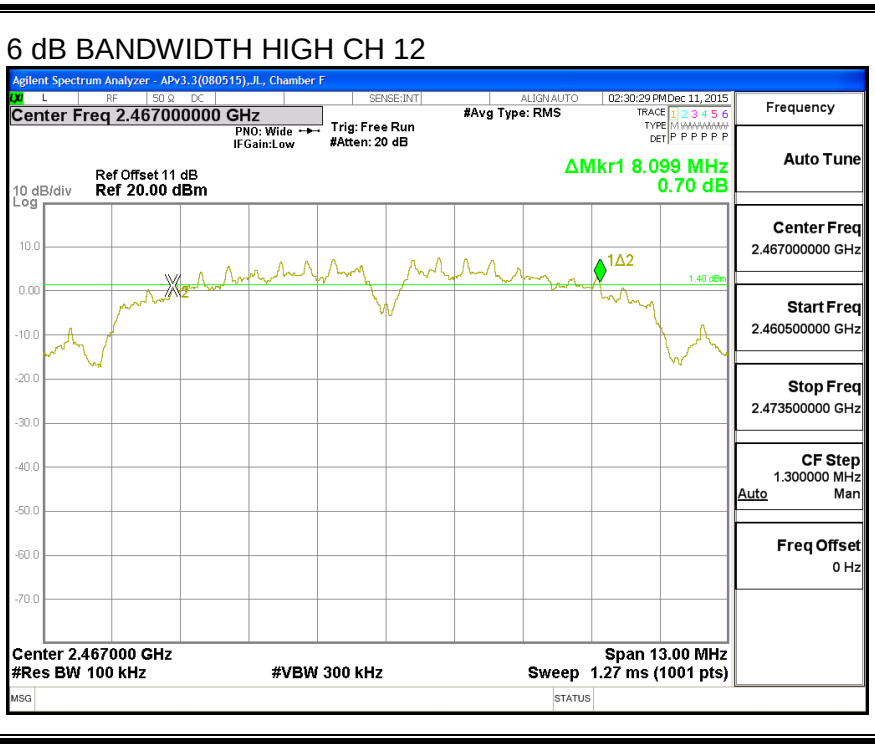
6 dB BANDWIDTH MID CH



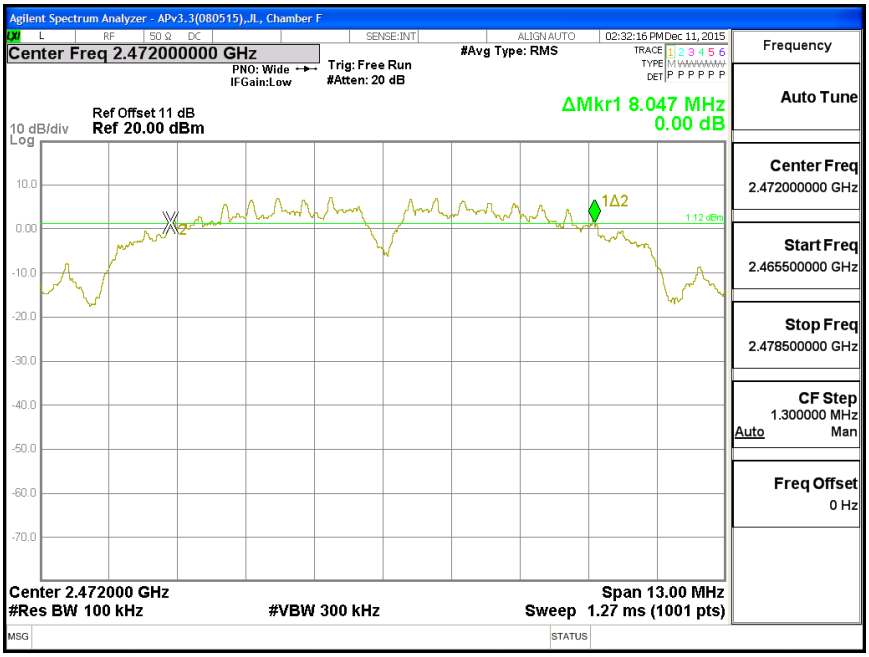
6 dB BANDWIDTH HIGH CH 11



6 dB BANDWIDTH HIGH CH 12



6 dB BANDWIDTH HIGH CH 13



8.4.2. 99% BANDWIDTH

LIMITS

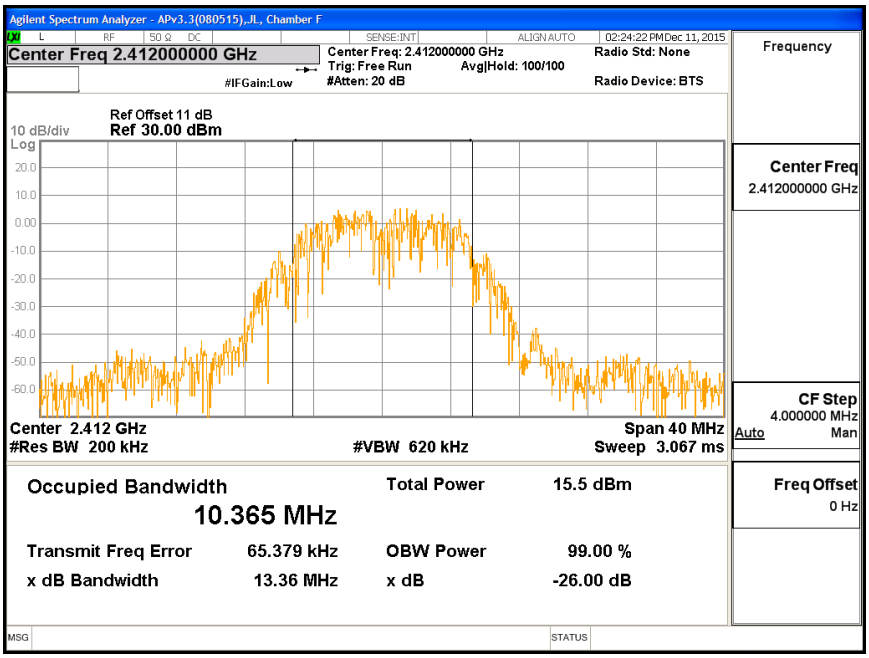
None; for reporting purposes only.

RESULTS

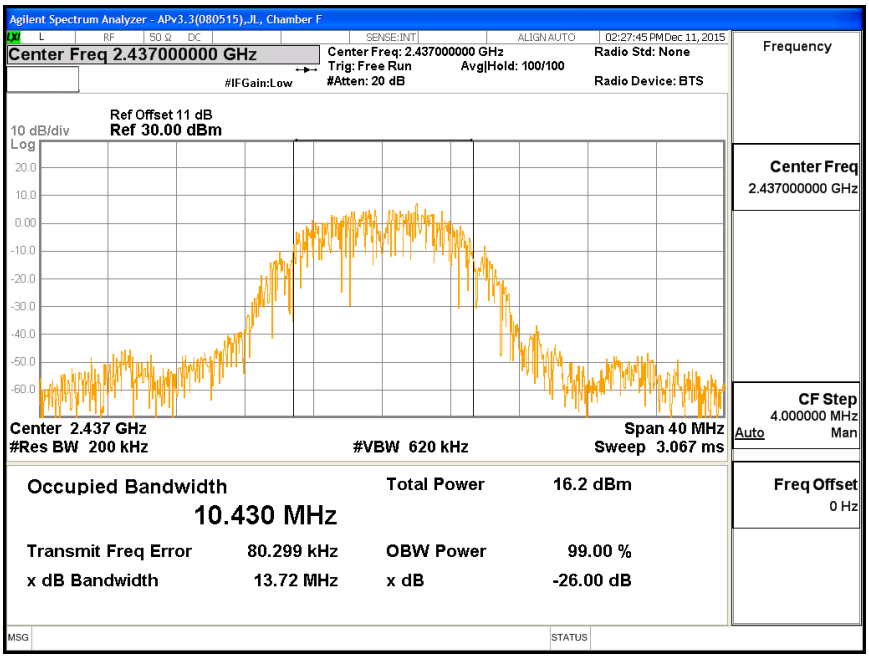
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	10.365
Mid	2437	10.430
High_11	2462	10.373
High_12	2467	10.512
High_13	2472	10.263

99% BANDWIDTH

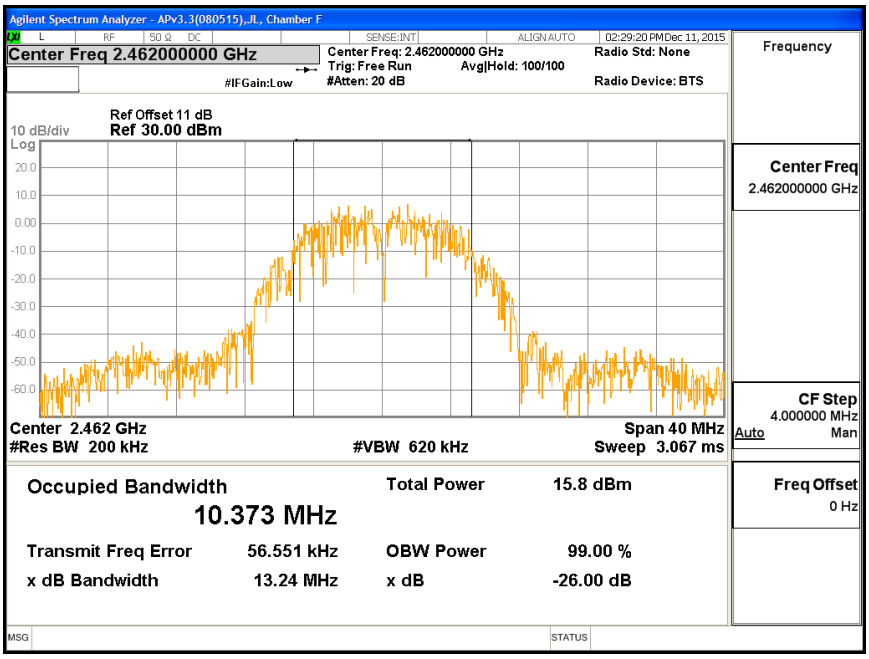
BANDWIDTH LOW CH



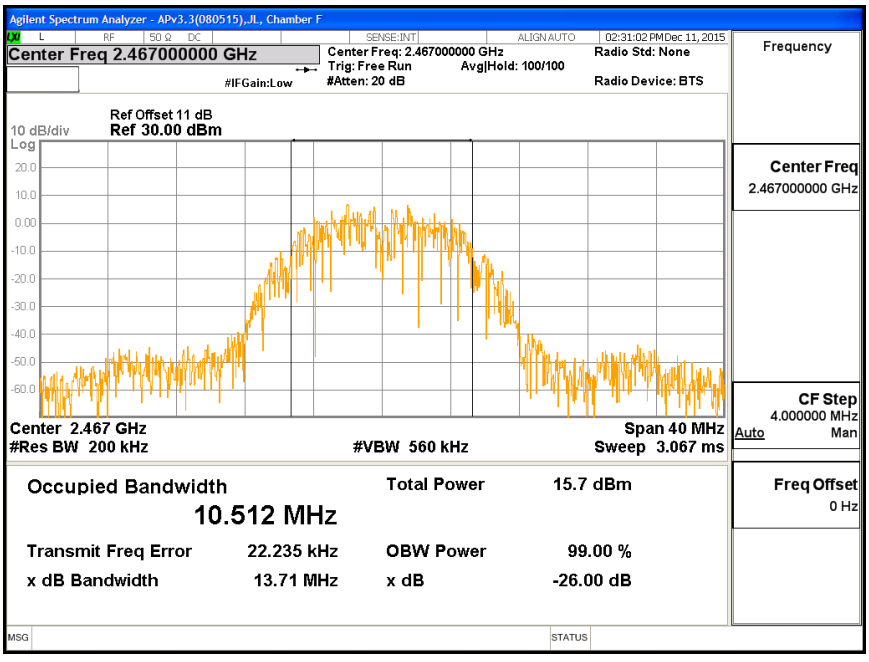
BANDWIDTH MID CH



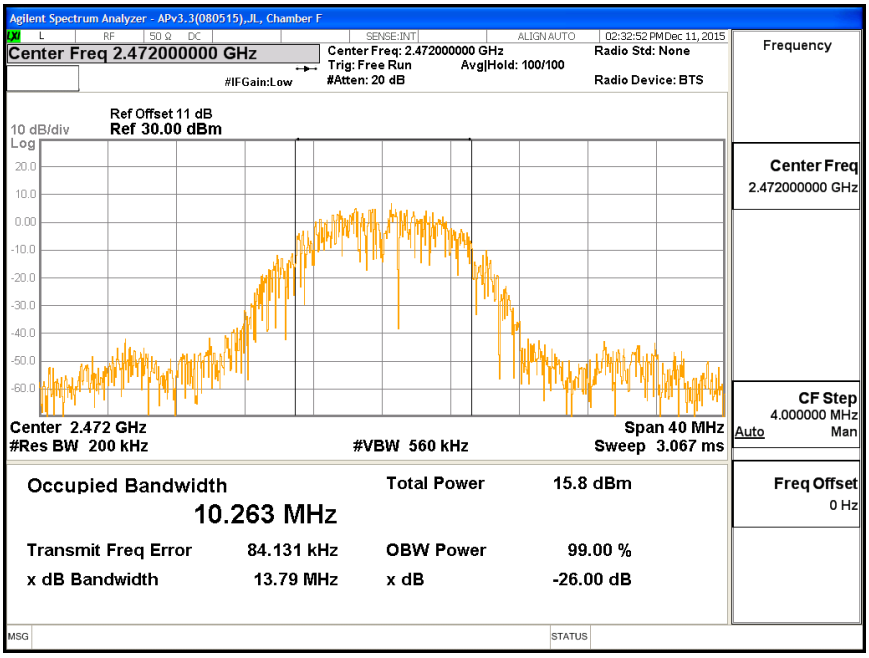
BANDWIDTH HIGH CH11



BANDWIDTH HIGH CH12



BANDWIDTH HIGH CH 13



8.4.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
Low	2412	14.98
Mid	2437	14.96
High_11	2462	14.86
High_12	2467	14.94
High_13	2472	13.98

8.4.4. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-247 (5.4) (4)

For systems using digital modulation in the 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)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	1.06	30.00	30	36	30.00
Mid	2437	1.06	30.00	30	36	30.00
High_11	2462	1.06	30.00	30	36	30.00
High_12	2467	1.06	30.00	30	36	30.00
High_13	2472	1.06	30.00	30	36	30.00

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

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	17.86	17.86	30.00	-12.14
Mid	2437	18.02	18.02	30.00	-11.98
High_11	2462	17.85	17.85	30.00	-12.15
High_12	2467	17.83	17.83	30.00	-12.17
High_13	2472	16.93	16.93	30.00	-13.07

8.4.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247

IC RSS-247 (5.2) (2)

For digitally modulated systems, the power spectral density conducted form 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

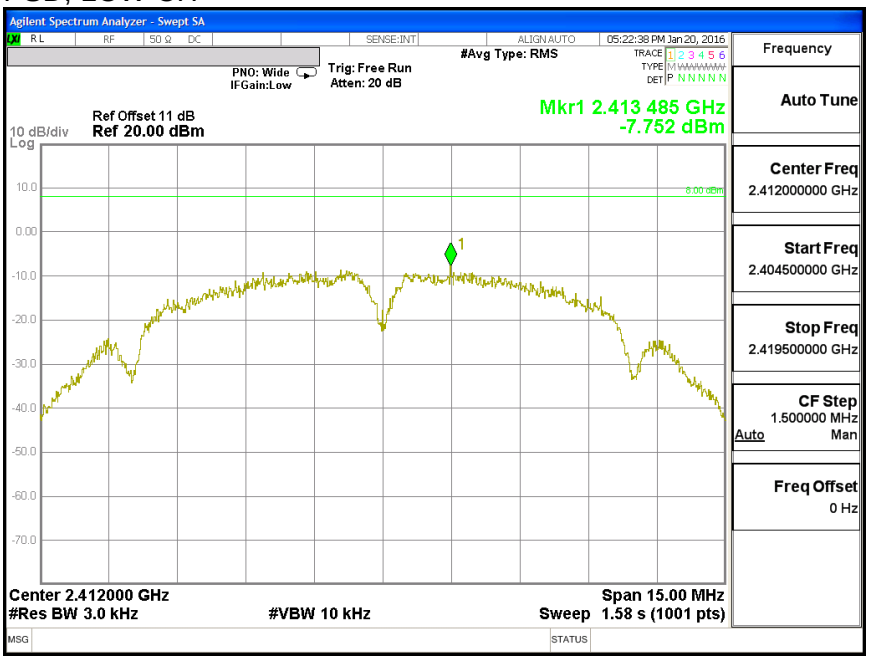
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

PSD Results

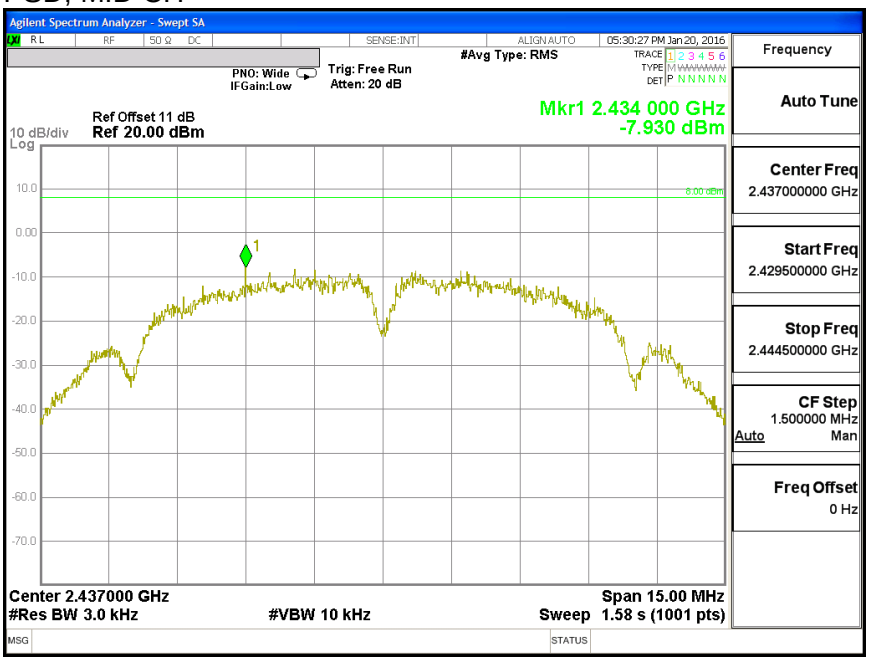
Channel	Frequency (MHz)	Antenna C Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-7.75	-7.75	8.0	-15.8
Mid	2437	-7.93	-7.93	8.0	-15.9
High_11	2462	-8.17	-8.17	8.0	-16.2
High_12	2467	-8.16	-8.16	8.0	-16.2
High_13	2472	-9.77	-9.77	8.0	-17.8

PSD

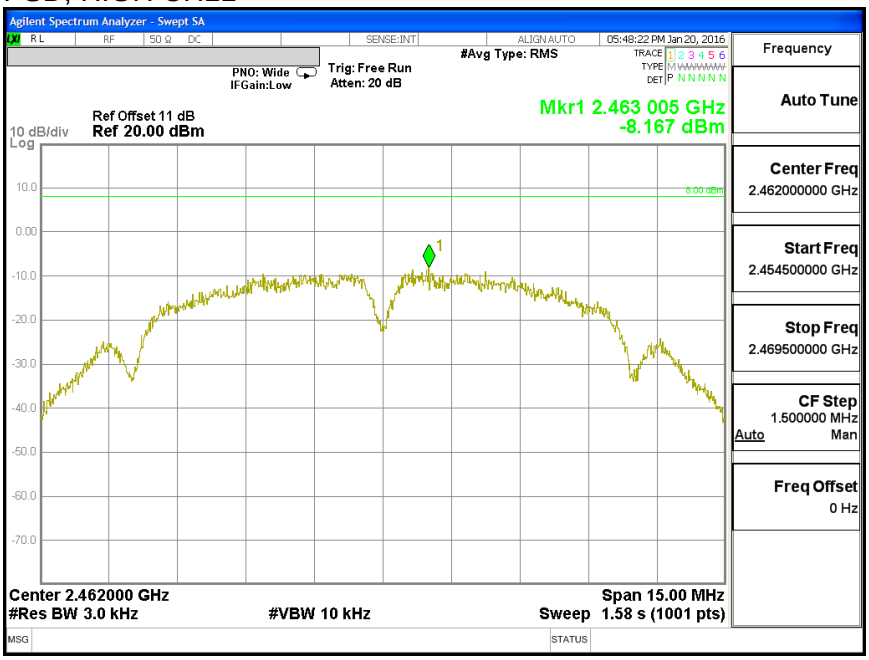
PSD, LOW CH



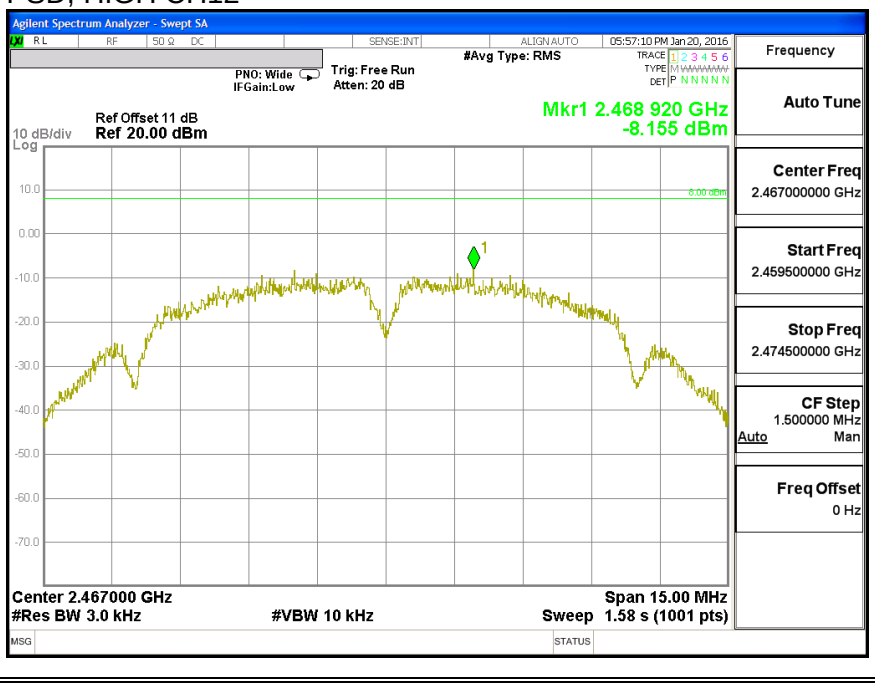
PSD, MID CH



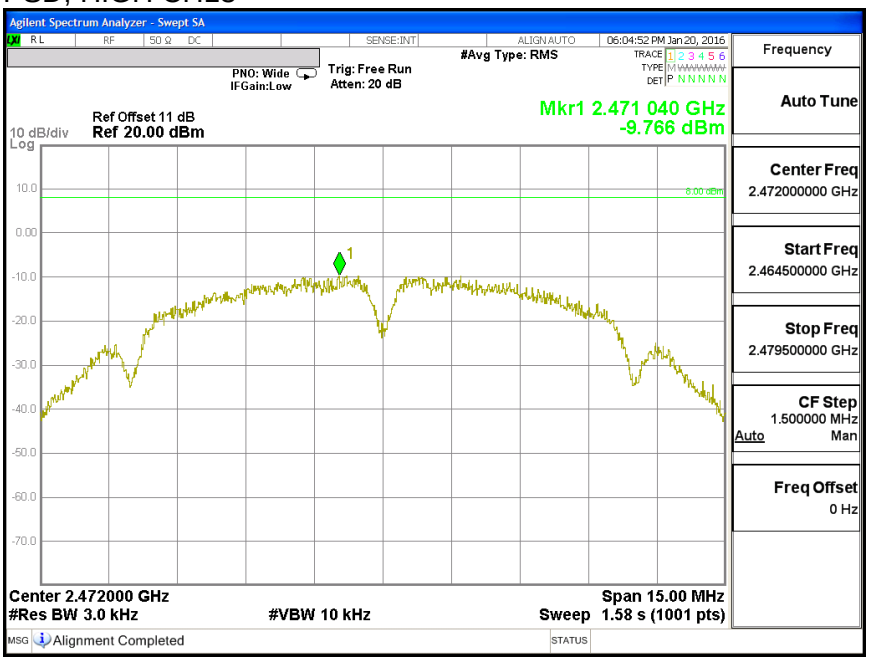
PSD, HIGH CH11



PSD, HIGH CH12



PSD, HIGH CH13



8.4.6. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

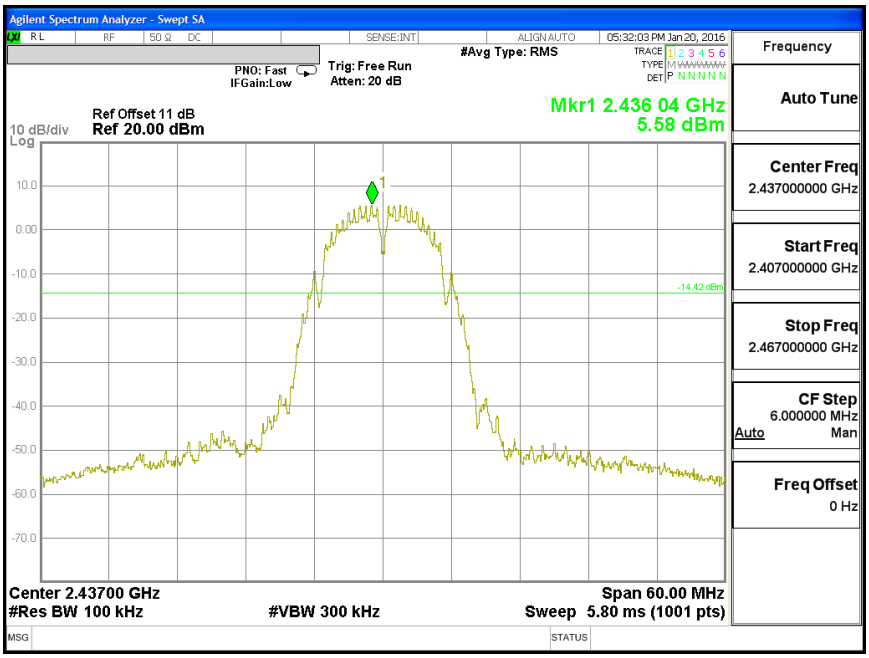
IC RSS-247 (5.5)

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

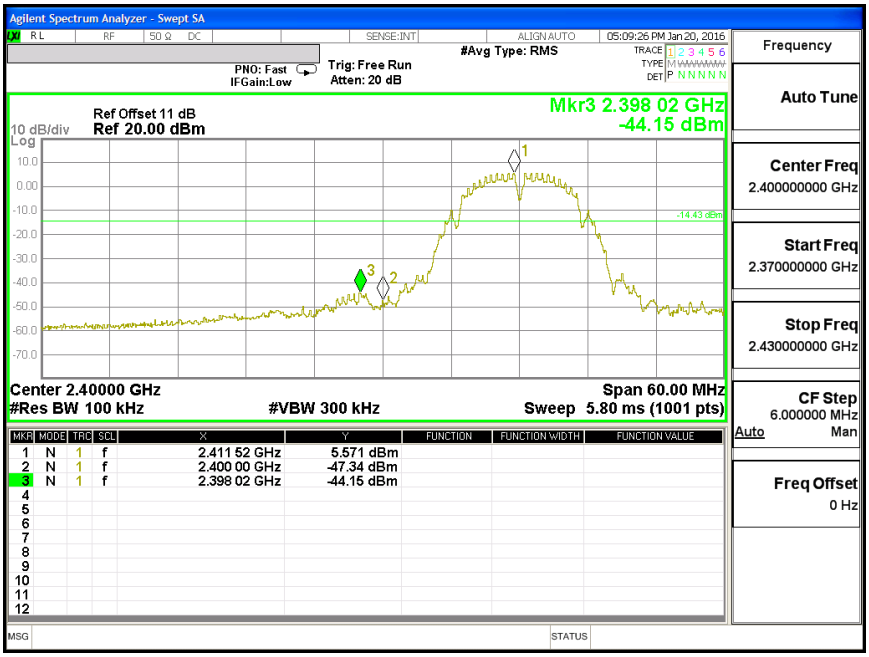
IN-BAND REFERENCE LEVEL

REFERENCE LEVEL MID CH



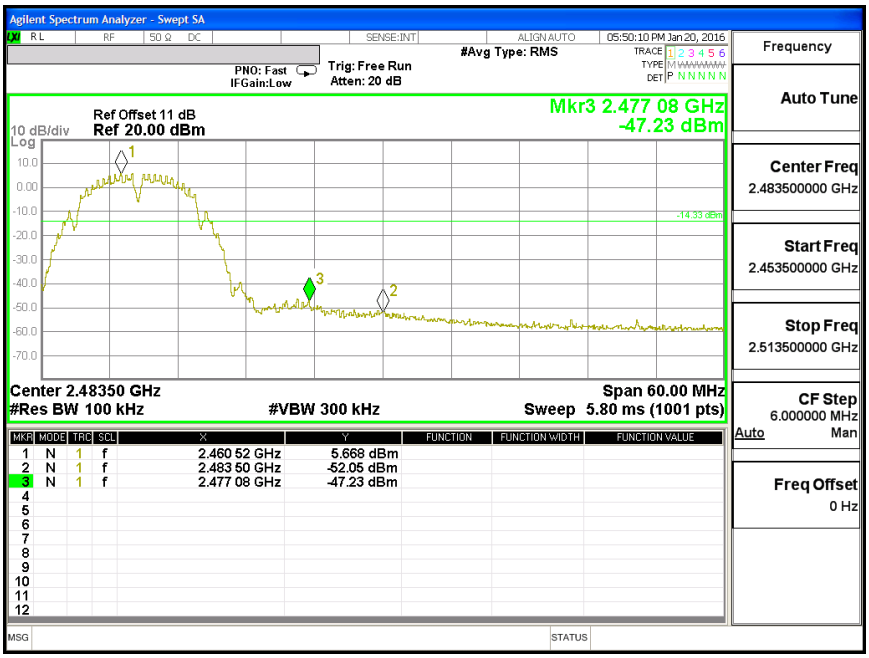
LOW CHANNEL BANDEDGE

AUTHORIZED BAND EDGE LOW CH

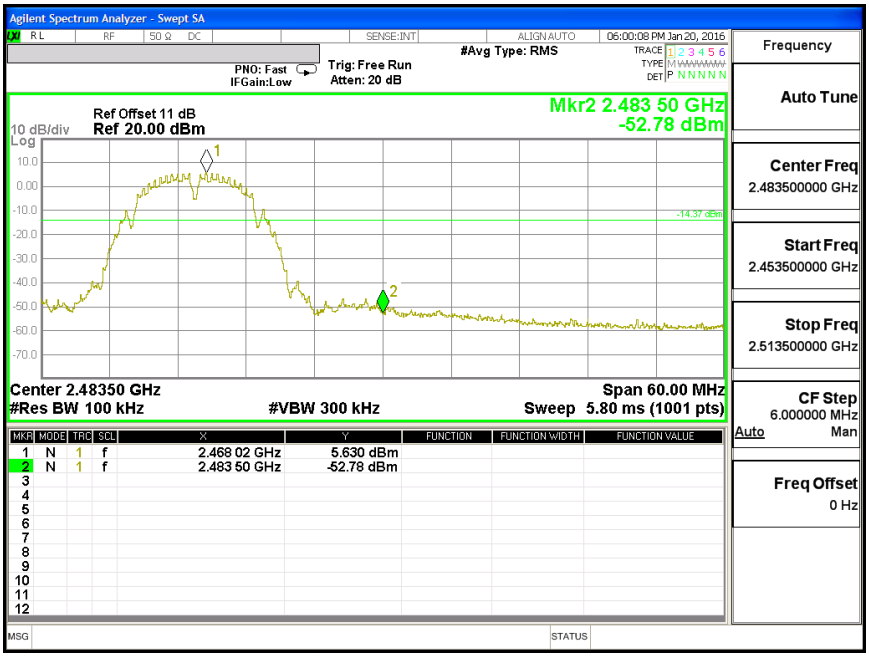


HIGH CHANNEL BANDEDGE

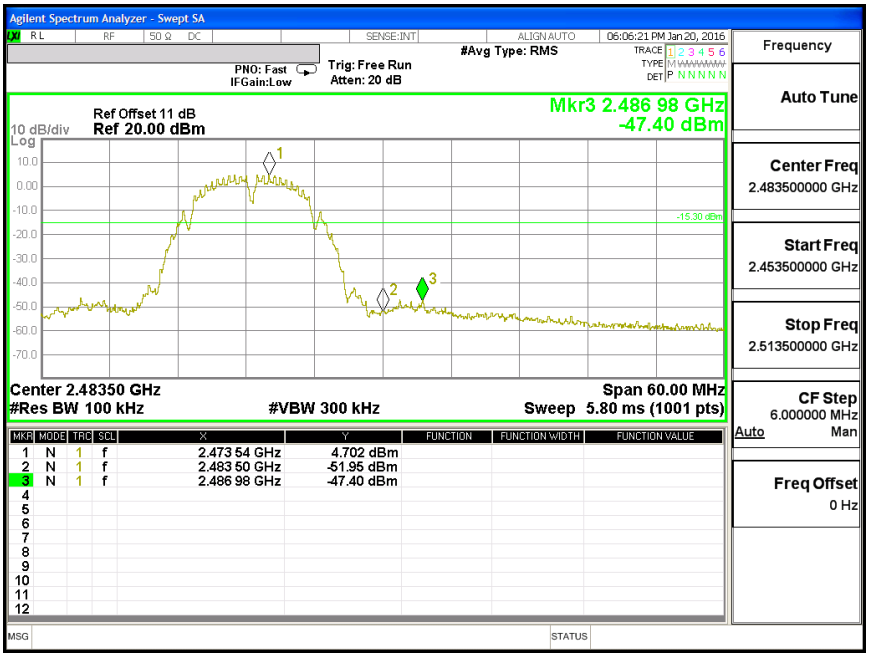
AUTHORIZED BAND EDGE HIGH CH11



AUTHORIZED BAND EDGE HIGH CH12

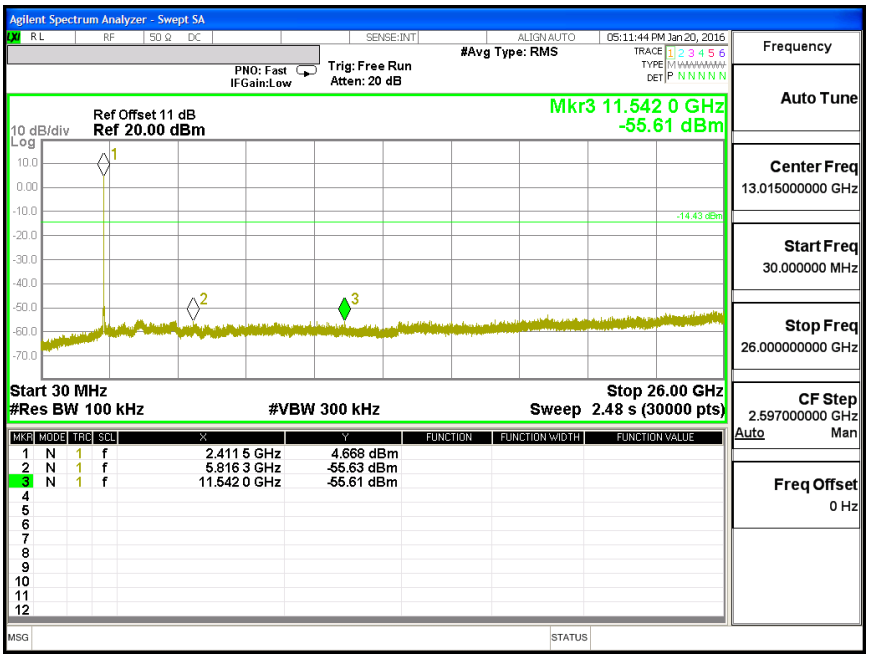


AUTHORIZED BAND EDGE HIGH CH13

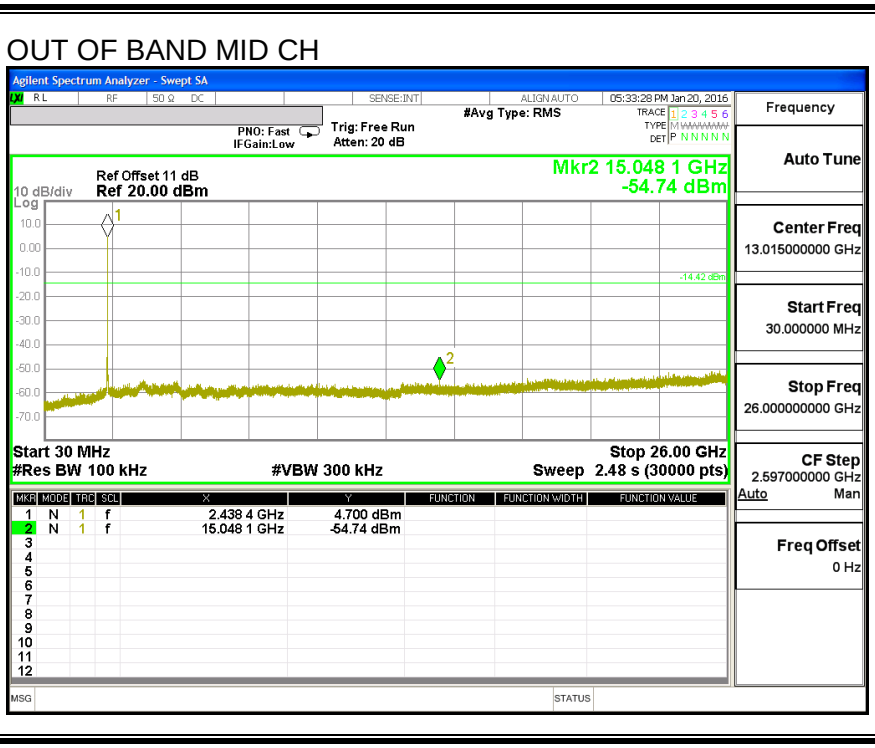


OUT-OF-BAND EMISSIONS

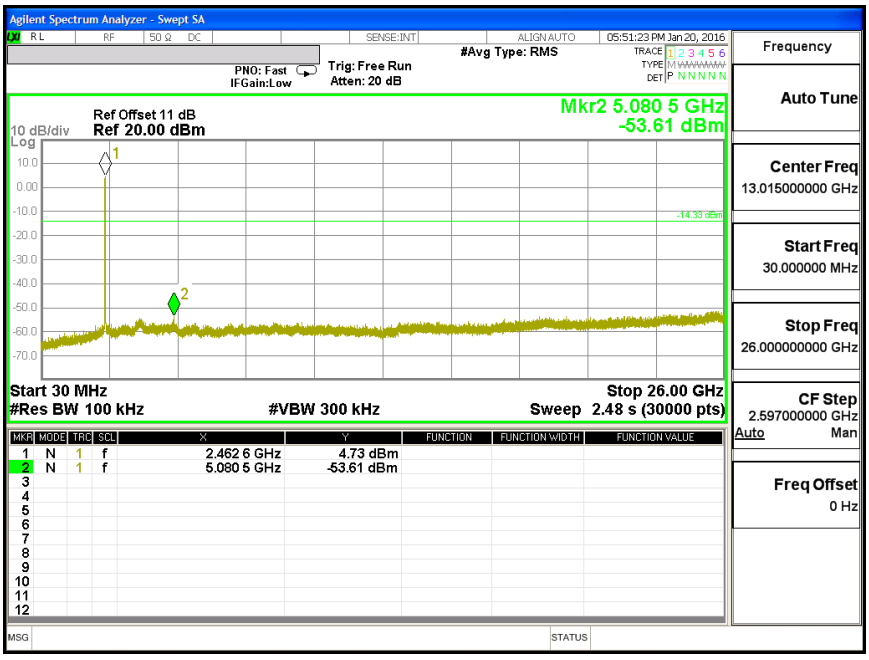
OUT OF BAND LOW CH



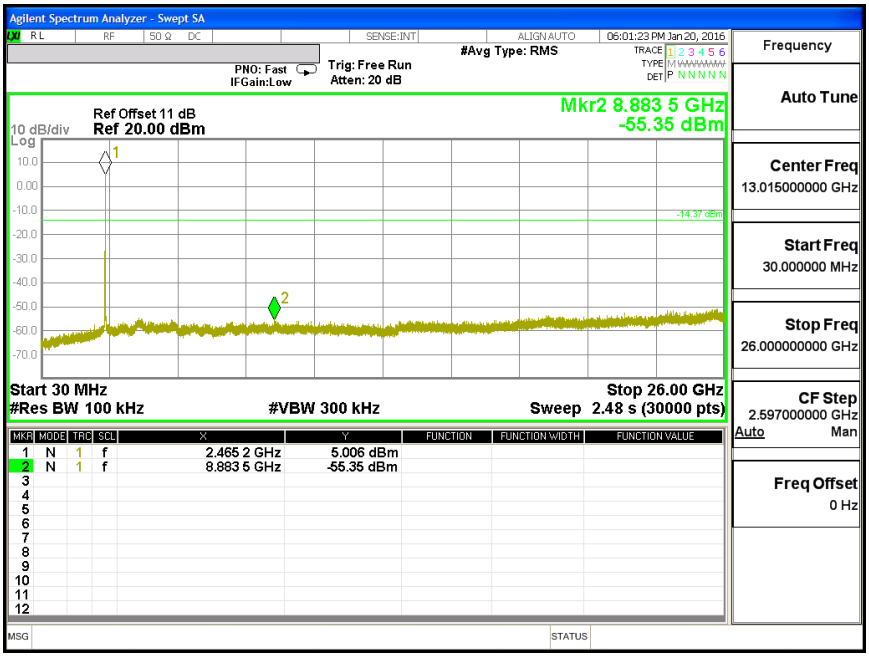
OUT OF BAND MID CH



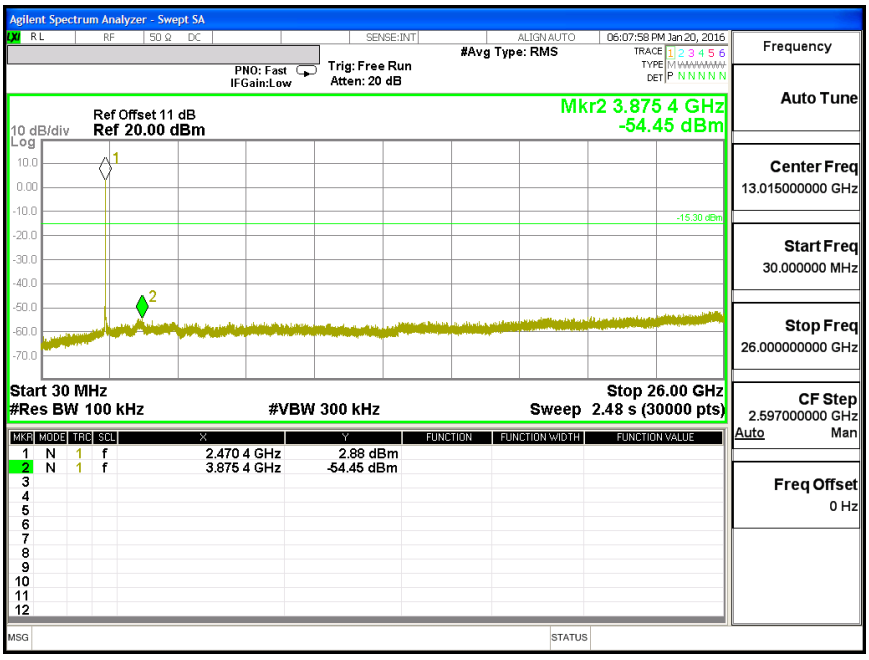
OUT OF BAND HIGH CH11



OUT OF BAND HIGH CH12



OUT OF BAND HIGH CH13



8.5. 802.11g SISO MODE IN THE 2.4 GHz BAND (ANTENNA B)

Noted: Covered by 802.11n HT20 SISO MODE IN THE 2.4 GHz BAND (ANTENNA B)

8.6. 802.11n HT20 SISO MODE IN THE 2.4 GHz BAND (ANTENNA B)

8.6.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-247 (5.2) (1)

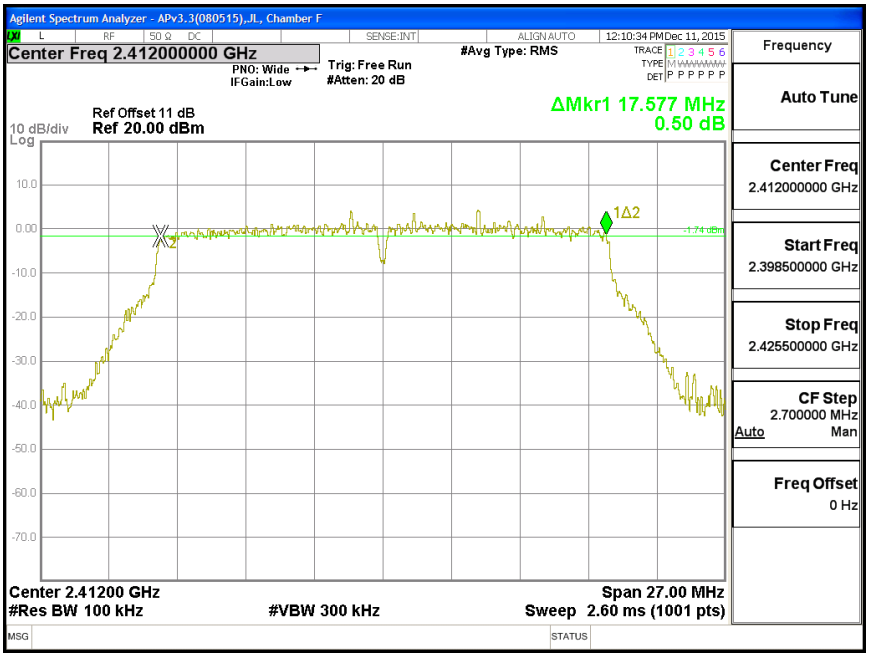
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

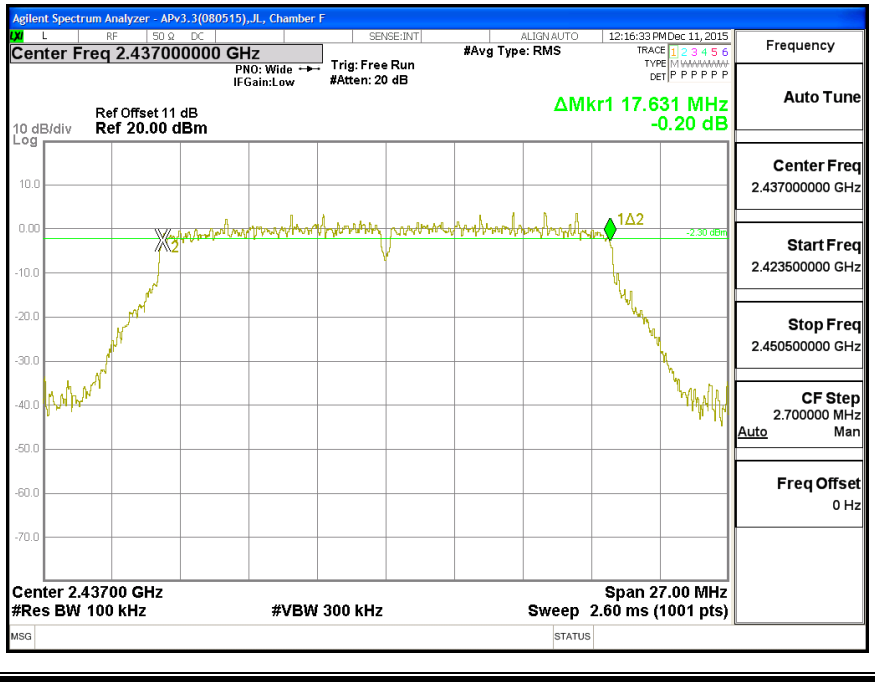
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	17.58	0.5
Mid	2437	17.63	0.5
High_10	2457	17.58	0.5
High_11	2462	17.42	0.5
High_12	2467	17.63	0.5
High_13	2472	17.55	0.5

6 dB BANDWIDTH

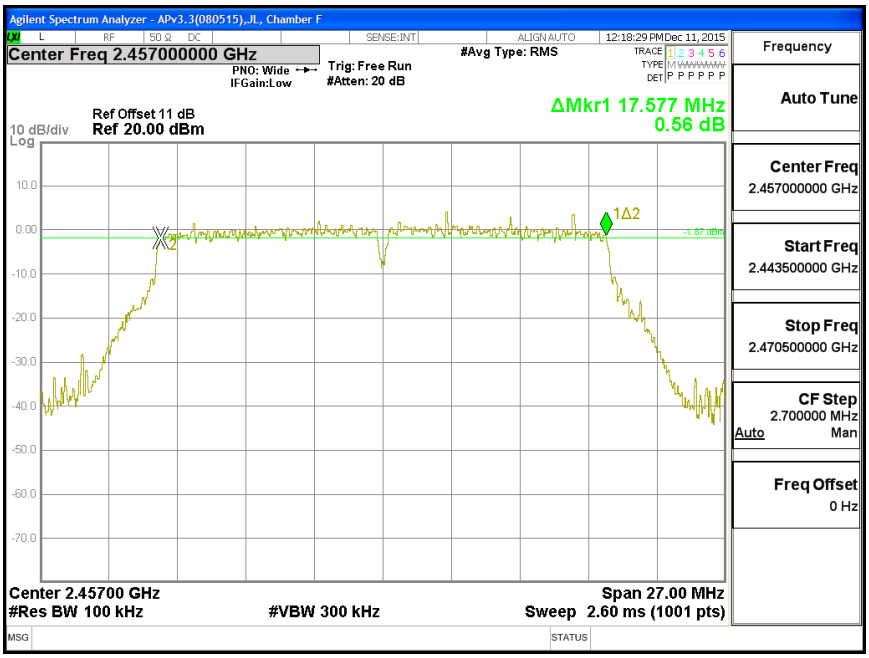
6 dB BANDWIDTH LOW CH



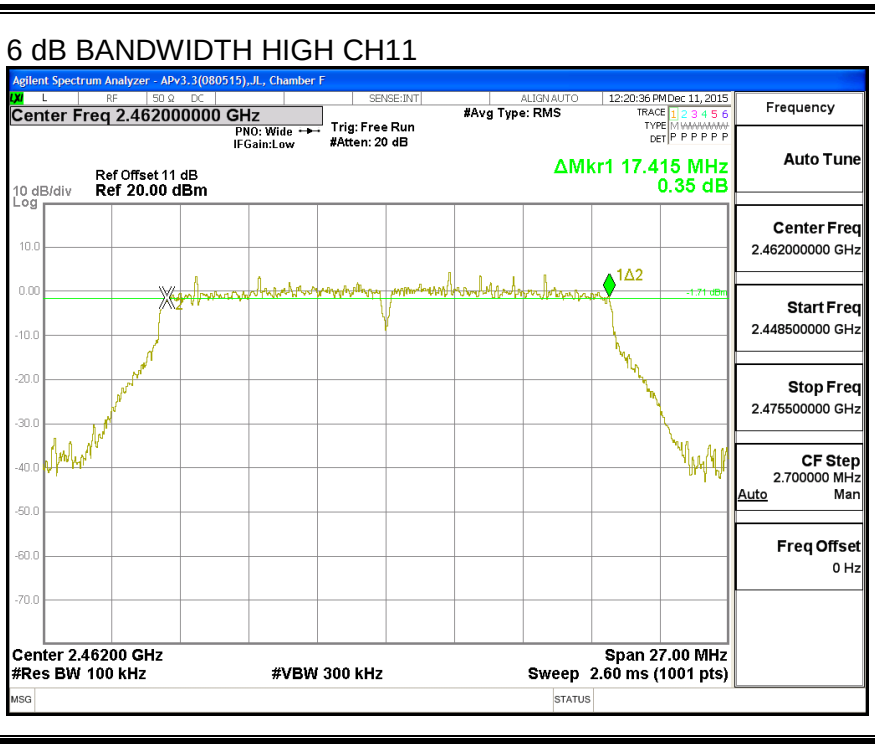
6 dB BANDWIDTH MID CH



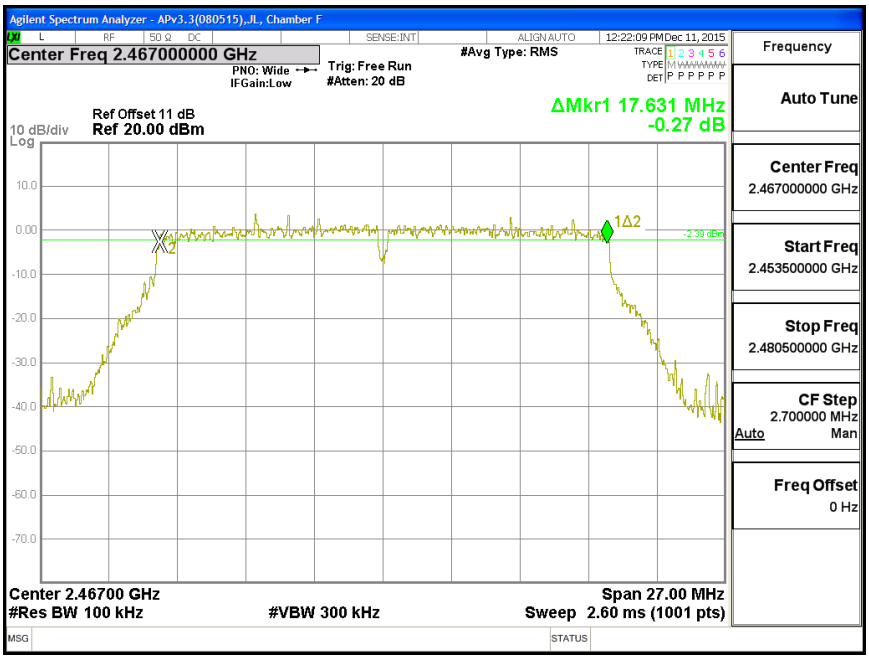
6 dB BANDWIDTH HIGH CH10



6 dB BANDWIDTH HIGH CH11



6 dB BANDWIDTH HIGH CH12



6 dB BANDWIDTH HIGH CH13