FCC 47 CFR PART 15 SUBPART C

TEST REPORT*

FOR

WIRELESS MESH ACCESS ROUTER

MODEL NUMBER: MST2H13N0, MST2H13N1**

FCC ID: Q9DMST200DFS

REPORT NUMBER: 14U16820-3, Revision A

ISSUE DATE: FEBRUARY 28, 2014

Prepared for
ARUBA NETWORKS
1344 CROSSMAN AVENUE
SUNNYVALE
CA, 94089, U.S.A.

Prepared by
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*This report covers the band of 5725-5875 MHz for Indian market
**Models differences are explained within the body of this report

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	11/15/13	Initial Issue	F. Ibrahim
A	12/13/13	Revised cover page by adding the whole band that device operates in. Revised section 5.3	F. Ibrahim

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: ARUBA NETWORKS
1344 CROSSMAN AVENUE
SUNNYVALE, CA 94089, U.S.A.

EUT DESCRIPTION: WIRELESS MESH ACCESS ROUTER

MODEL: MST2H13N0, MST2H13N1

SERIAL NUMBER: 54B02114600011

DATE TESTED: APRIL 8 to NOVEMBER 6, 2013, 2013

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 8	Pass
INDUSTRY CANADA RSS-GEN Issue 3	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:

FRANK IBRAHIM
WiSE PROGRAM MANAGER
UL Verification Services Inc.

Tested By:

Kristopher Nguyen
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, ANSI C63.10-2009, RSS-GEN Issue 3, and RSS-210 Issue 8.

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 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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Wireless Mesh Access Router.

5.2. DESCRIPTION OF MODEL(s) DIFFERENCES

Difference between the two models is:

MST2H13N0 is powered by PoE, and MST2H13N1 is powered by AC/DC adapter..

5.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Output Power (dBm)
5745 - 5825	802.11a CDD 2TX	16.81	16.80	19.82
5745 - 5825	802.11n HT20 STBC 2TX	15.74	15.90	18.83
5755 - 5795	802.11n HT40 STBC 2TX	17.96	17.28	20.64

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integral antenna with a maximum peak gain of **13 dBi**.

5.5. SOFTWARE AND FIRMWARE

The test utility software used during testing was Atheros Radio Test (ART), rev 09 Build B7.

Operating system is MeshOS_4.7.0.0

5.6. 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.

Worst-case data rates as provided by the client were:

802.11a mode: 6 Mbps
802.11n HT20mode: MCS0, 6.5 Mbps
802.11n HT40mode: MCS0, 13.5 Mbps

The EUT was attached to a pole in vertical orientation similar to how it will be oriented in the field.

The radiated band edge and harmonics testing were performed on the AC powered unit, MST2H13N1, as representative unit for the radio portion.

For radiated emissions 30-1000MHz and AC Line Conduction, testing was performed on both models; MST2H13N0, MST2H13N1.

For radiated emission testing from 18 GHz to 40 GHz, mid channel for 11a CDD mode, and was investigated at power greater than or equal to the maximum transmit power of any mode.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Lenovo	IMB Thinkpad T60	L3-V8612	N/A
AC Adapter	IBM	92P1109	11S92P1109Z1ZACU59X2M0	N/A

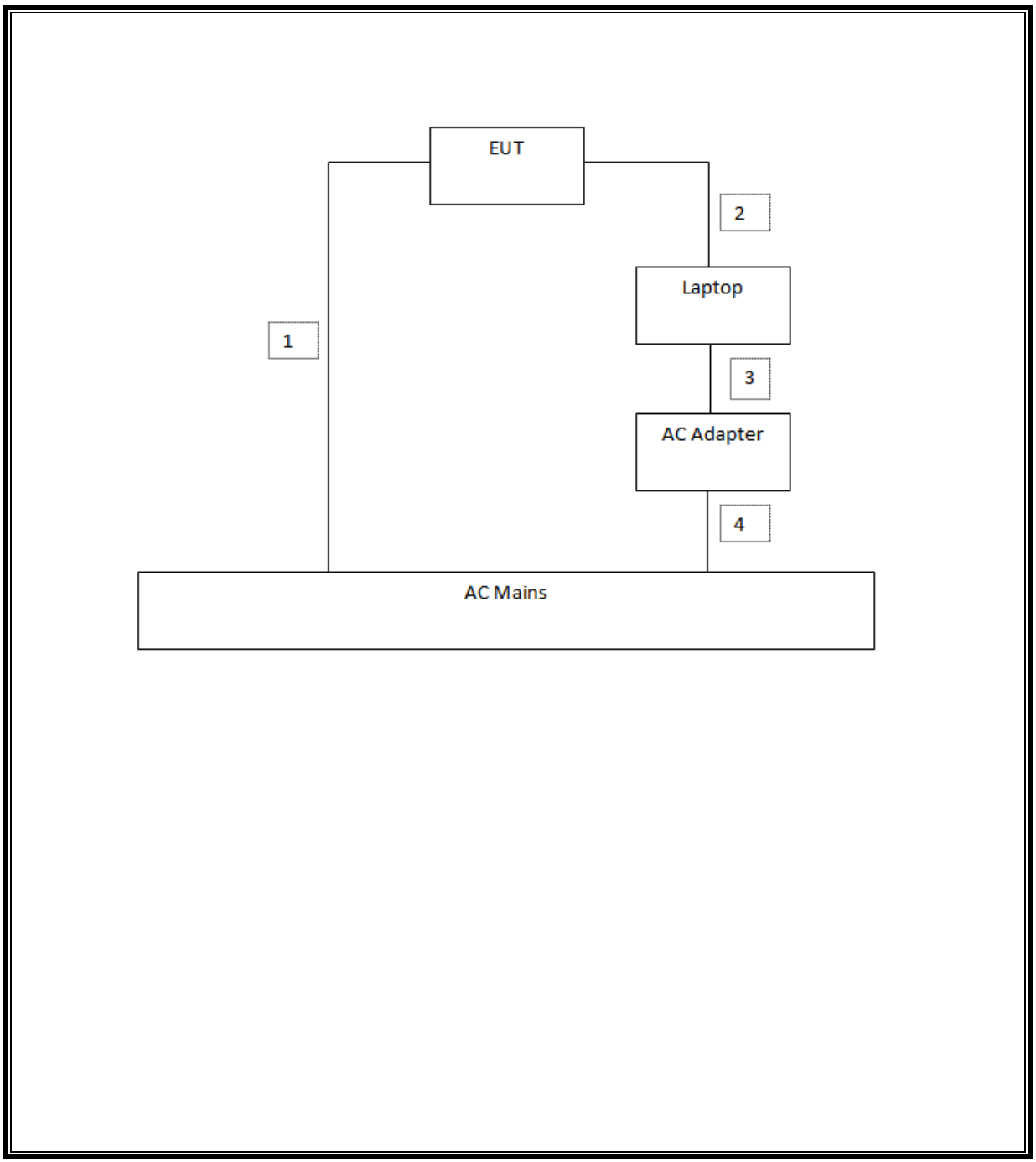
I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	1	US 115V	Un -Shielded	4.5	N/A
2	Ethernet	1	Ethernet	Shielded	2	N/A
3	AC	1	US 115V	Un -Shielded	1	N/A
4	DC	1	DC	Un -Shielded	1.8	N/A

TEST SETUP

The EUT was mounted on a tripod stand and connected through Ethernet to a host laptop computer during the tests. Test software exercised the radio card

SETUP DIAGRAM FOR 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 Date**	**Cal Due**
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01179	02/16/13	02/16/14
EMI Test Receiver, 9kHz-7GHz	R&S	ESCI 7	1000741	07/13/12	07/13/13
PXA Signal Analyzer	Agilent	N9030A	14615711	01/22/13	01/22/14
Horn Antenna, 1-18GHz	ETS Lindgren	3117	T345	02/19/13	02/19/14
Antenna, Horn, 18 GHz	EMCO	3115	C01218/1000614	01/18/13	01/18/14
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	11/14/12	11/14/13
Antenna, Horn, 40 GHz	ARA	MWH-2640/B	C00981	06/28/13	06/28/14
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	10/19/12	10/19/13
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	08/20/12	08/20/13
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	08/20/13	08/20/14
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/12	12/13/13
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C01171	02/13/13	02/13/14
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	01/16/13	01/16/14
LISN, 30 MHz	FCC	50/250-25-2	C00626	08/15/13	08/15/14
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	01/14/13	01/14/14

7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

7.1. 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/T Minimum VBW (kHz)
802.11a CDD	3.134	3.151	0.995	99.5%	0.00	0.010
802.11n HT20 STBC	2.917	2.931	0.995	99.5%	0.00	0.010
802.11n HT40 STBC	1.435	1.450	0.990	99.0%	0.00	0.010

7.2. MEASUREMENT METHODS

6 dB BW: KDB 558074 D01 v03r01, Section 8.1.

Output Power: KDB 558074 D01 v03r01, Section 9.2.2.2.

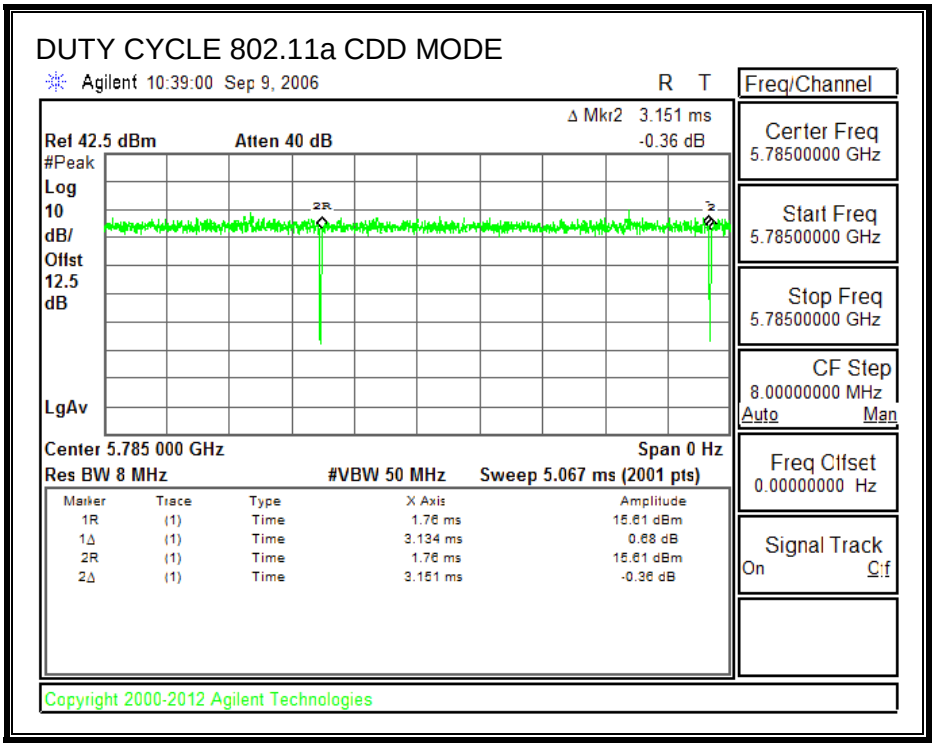
Power Spectral Density: KDB 558074 D01 v03r01, Section 10.3.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v03r01, Section 11.0.

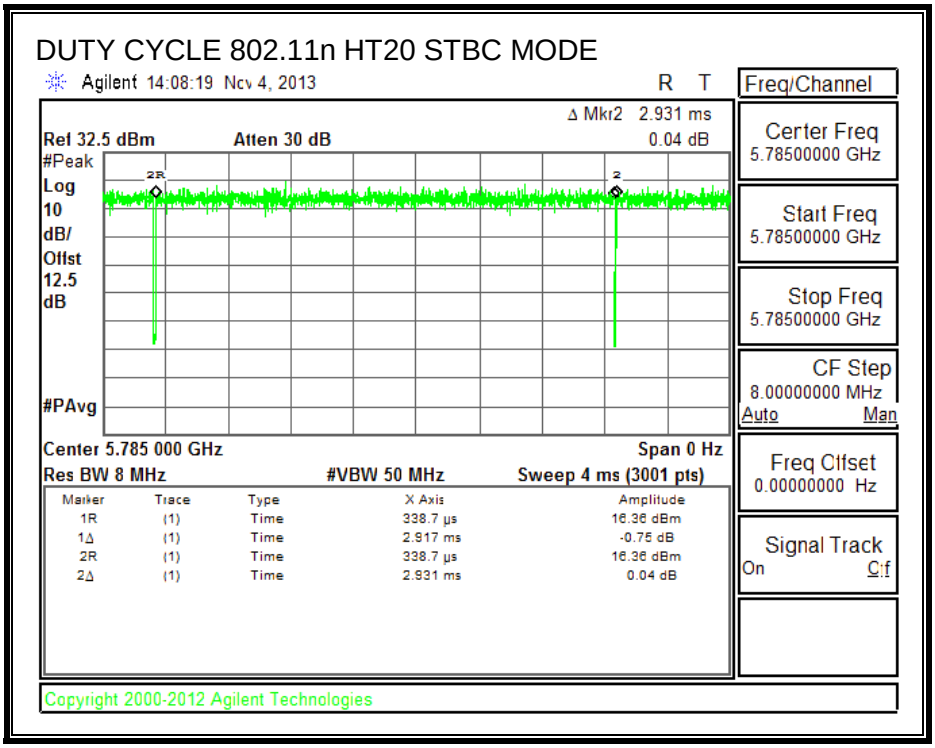
Out-of-band emissions in restricted bands: KDB 558074 D01 v03r01, Section 12.1.

7.3. DUTY CYCLE PLOTS

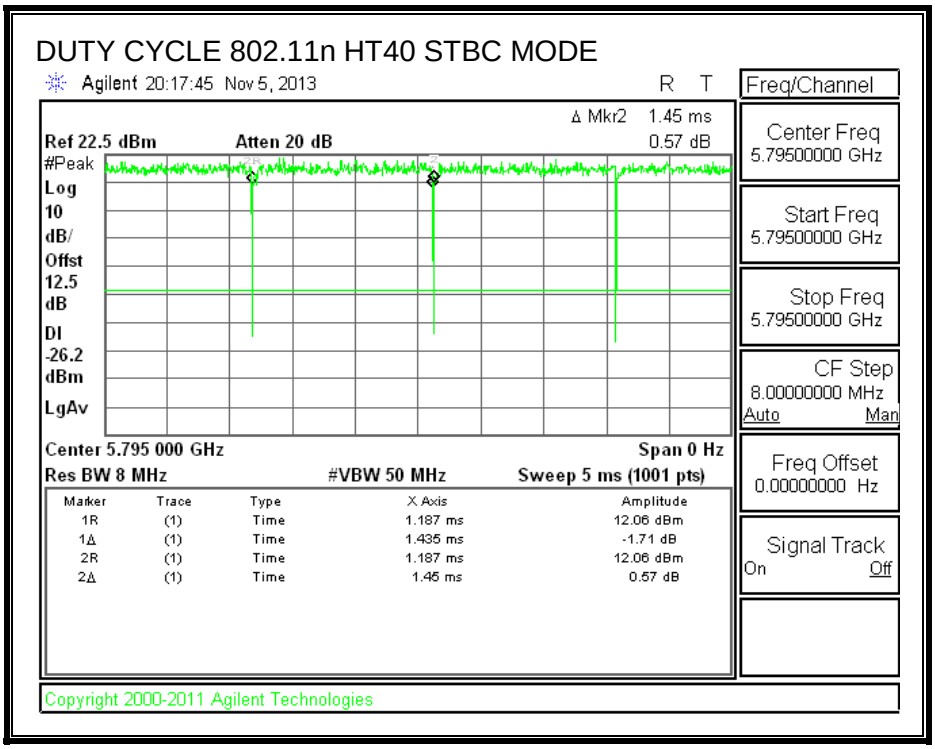
5 GHz BANDS



DUTY CYCLE 802.11n HT20 STBC MODE



DUTY CYCLE 802.11n HT40 STBC MODE



8. ANTENNA PORT TEST RESULTS

8.1. 802.11a CDD 2TX MODE IN THE 5.8 GHz BAND

8.1.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

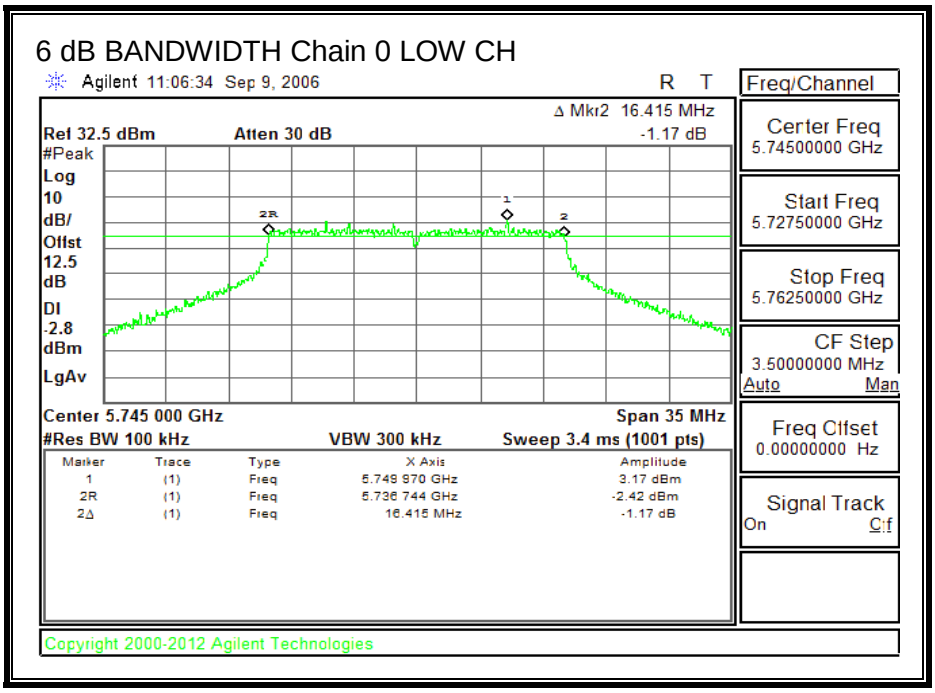
IC RSS-210 A8.2 (a)

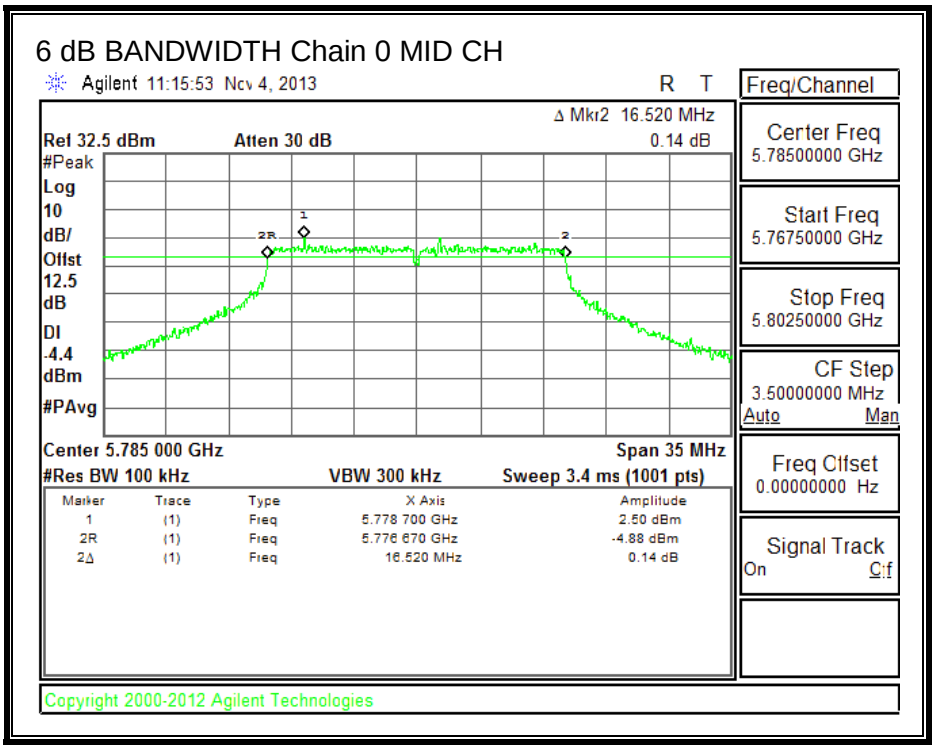
The minimum 6 dB bandwidth shall be at least 500 kHz.

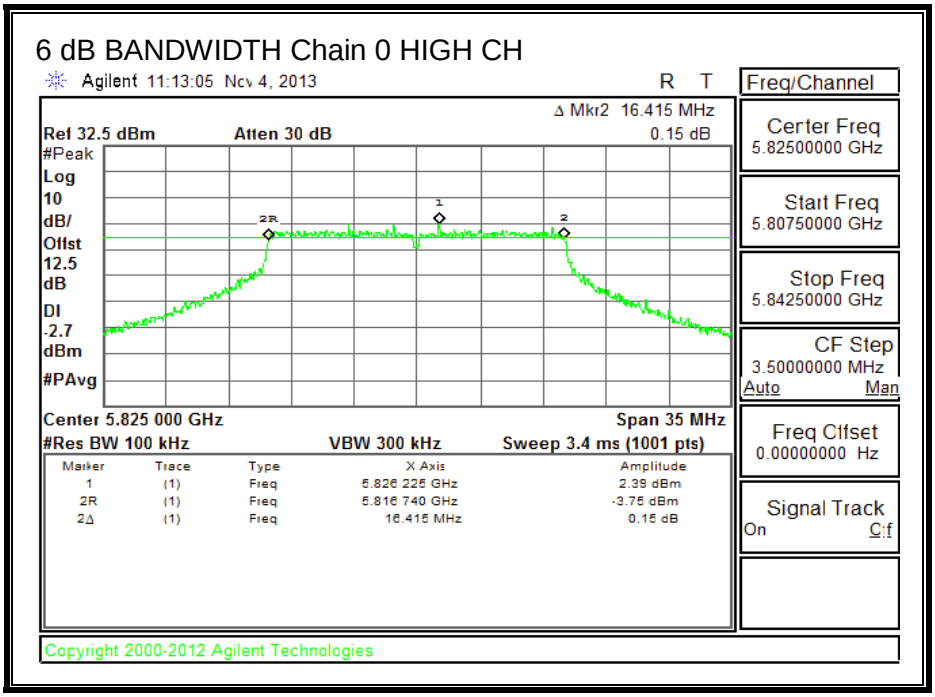
RESULTS

Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	5745	16.415	16.485	0.5
Mid	5785	16.520	16.450	0.5
High	5825	16.415	16.485	0.5

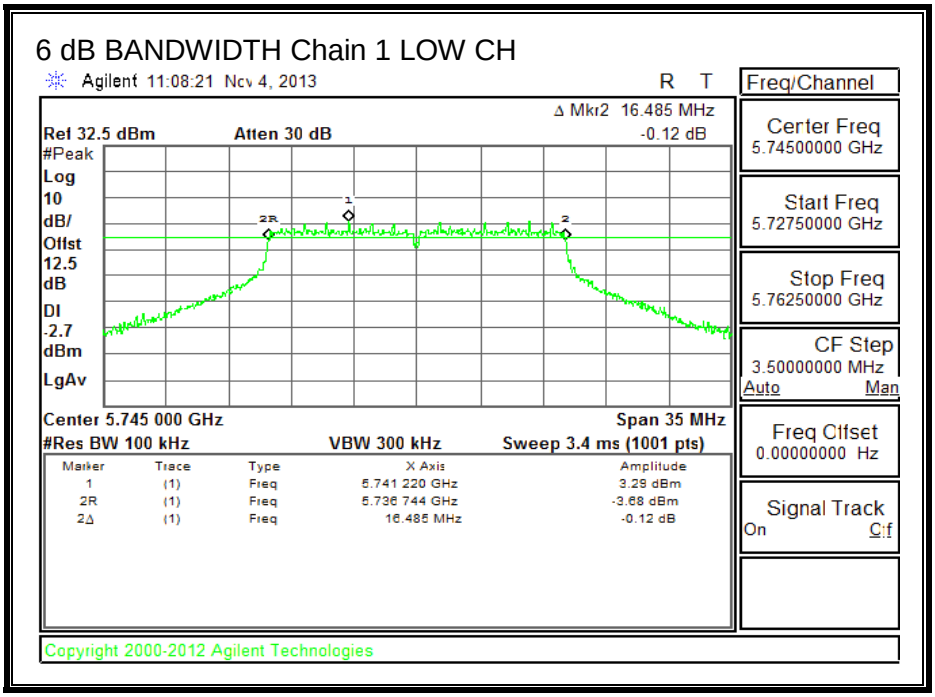
6 dB BANDWIDTH, Chain 0

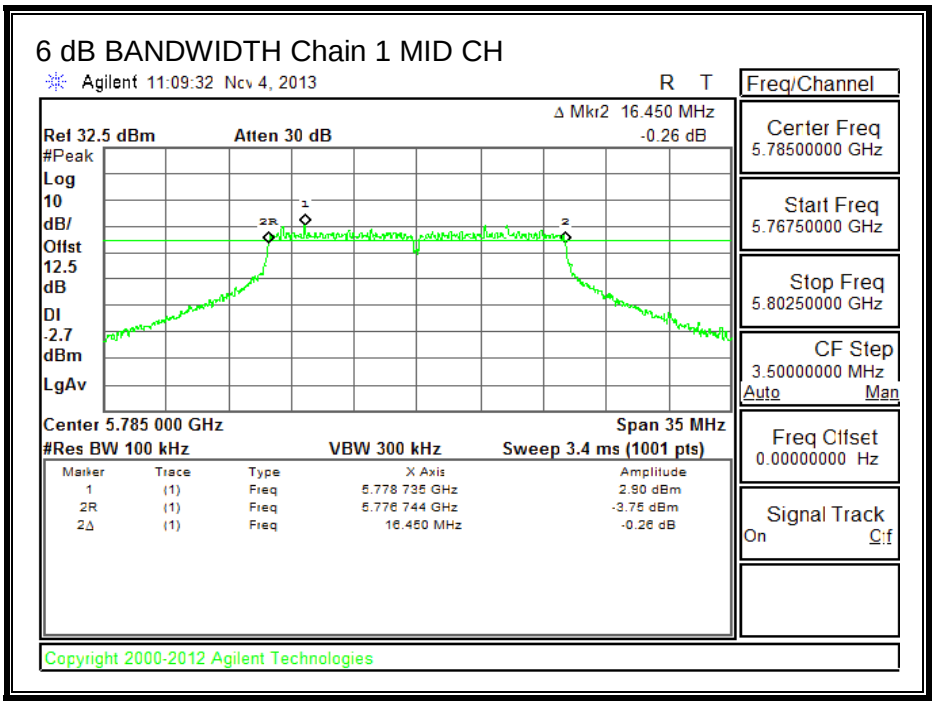


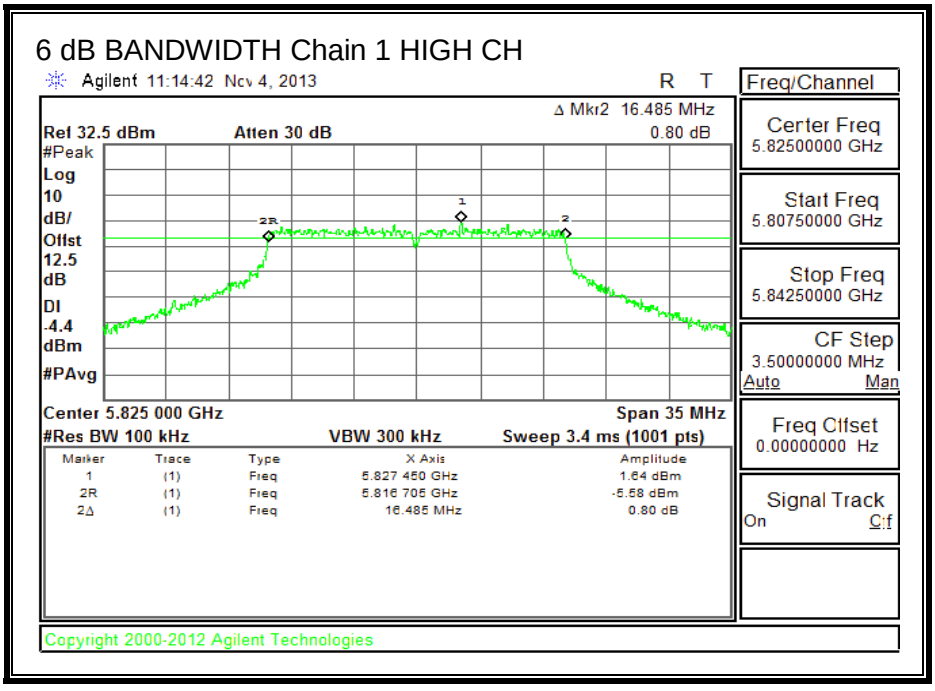




6 dB BANDWIDTH, Chain 1







8.1.2. 26 dB BANDWIDTH

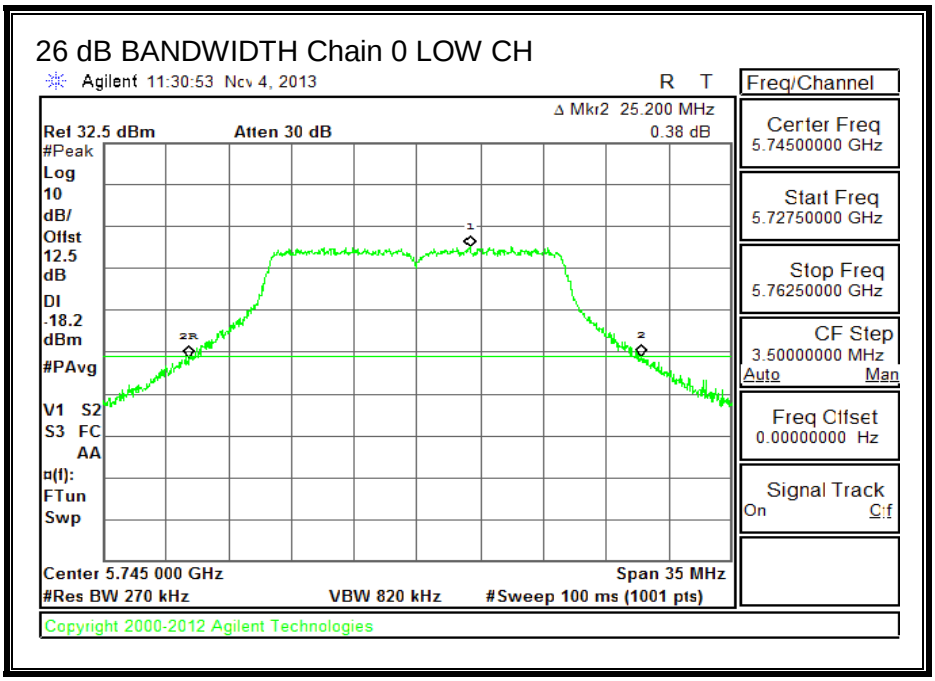
LIMITS

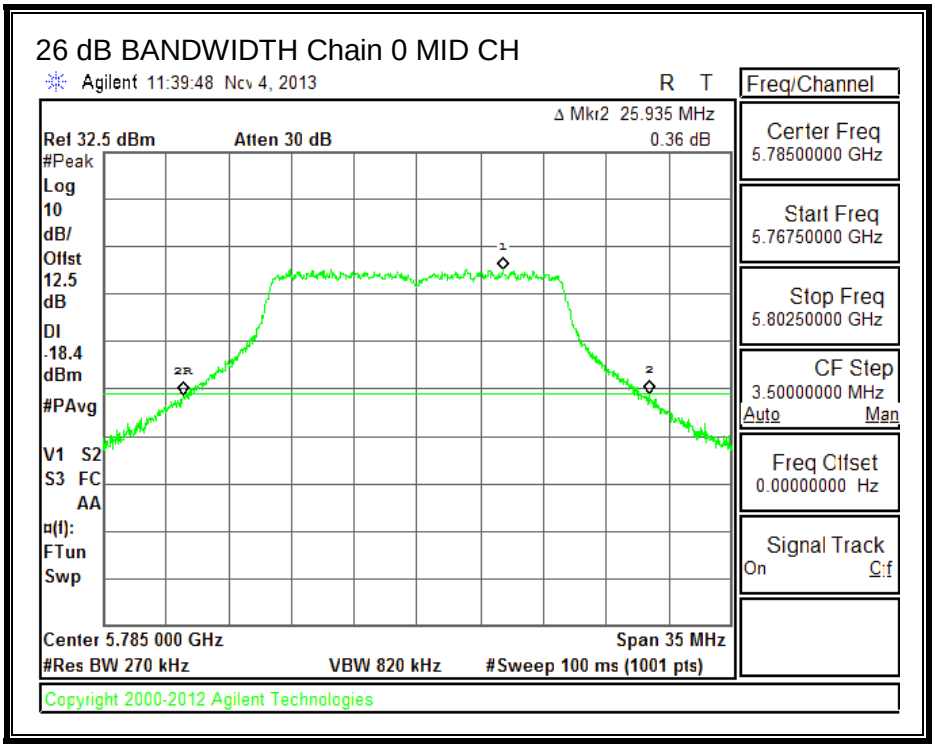
For reporting purposes.

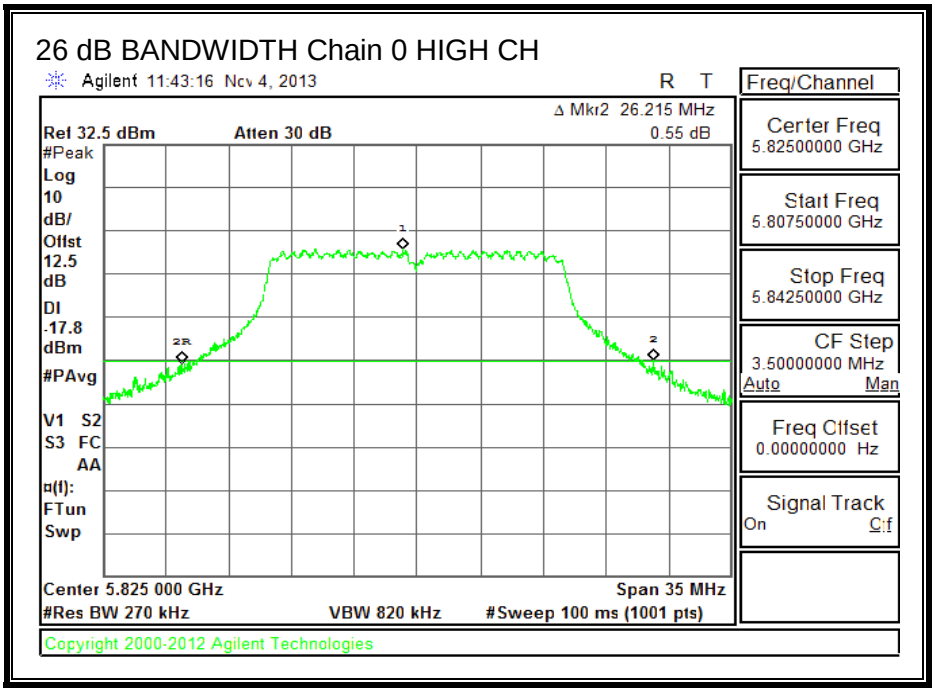
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5745	25.200	25.690
Mid	5785	25.935	25.410
High	5825	26.215	25.515

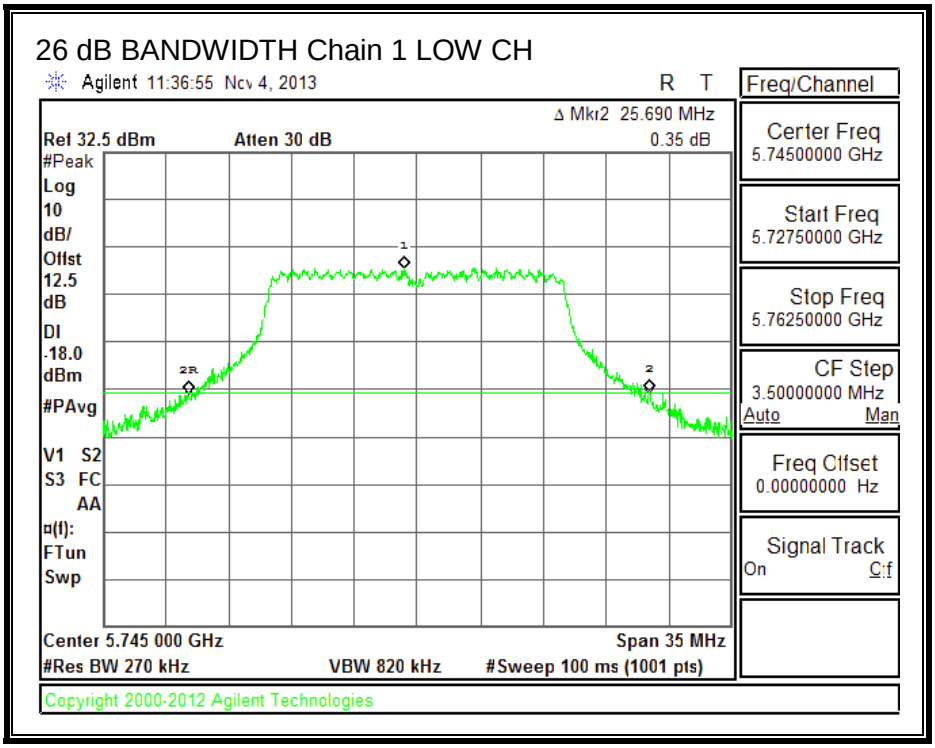
26 dB BANDWIDTH, Chain 0

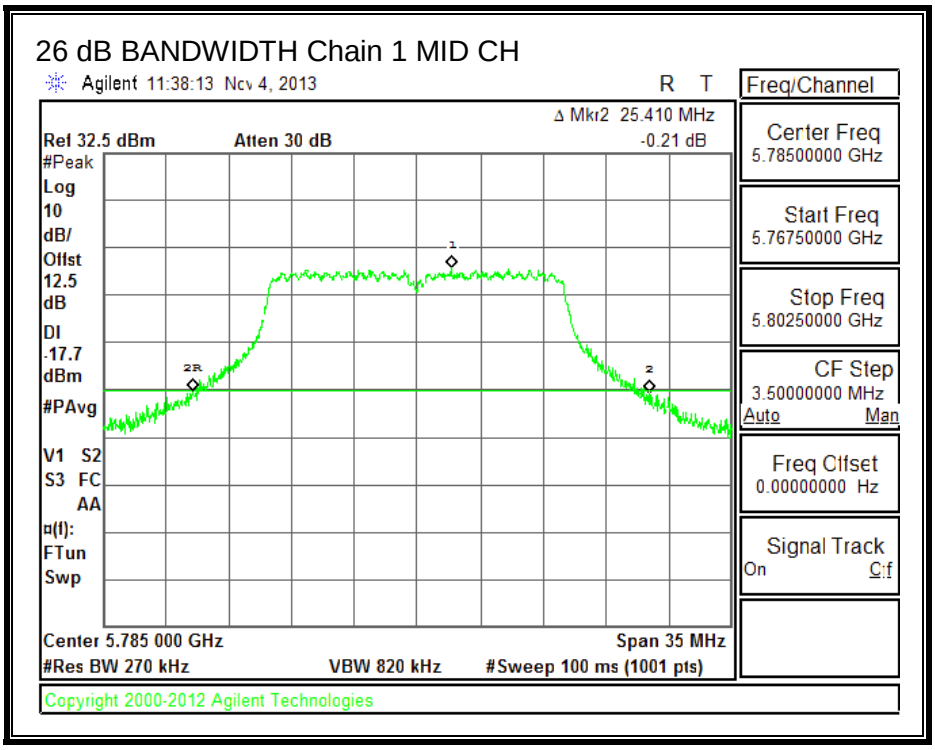


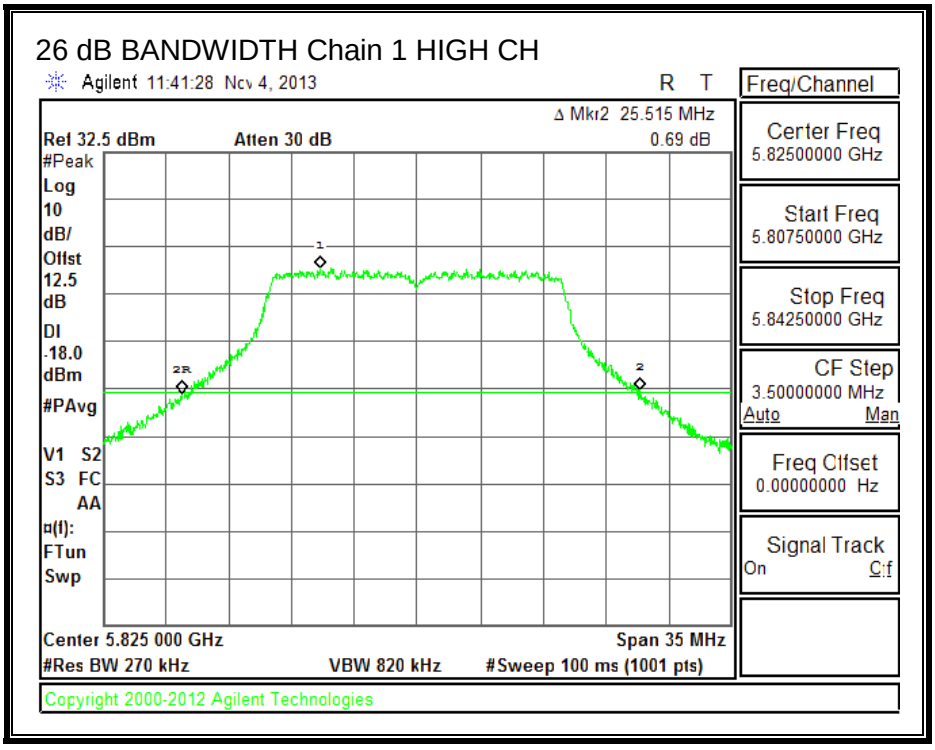




26 dB BANDWIDTH, Chain 1







8.1.3. 99% BANDWIDTH

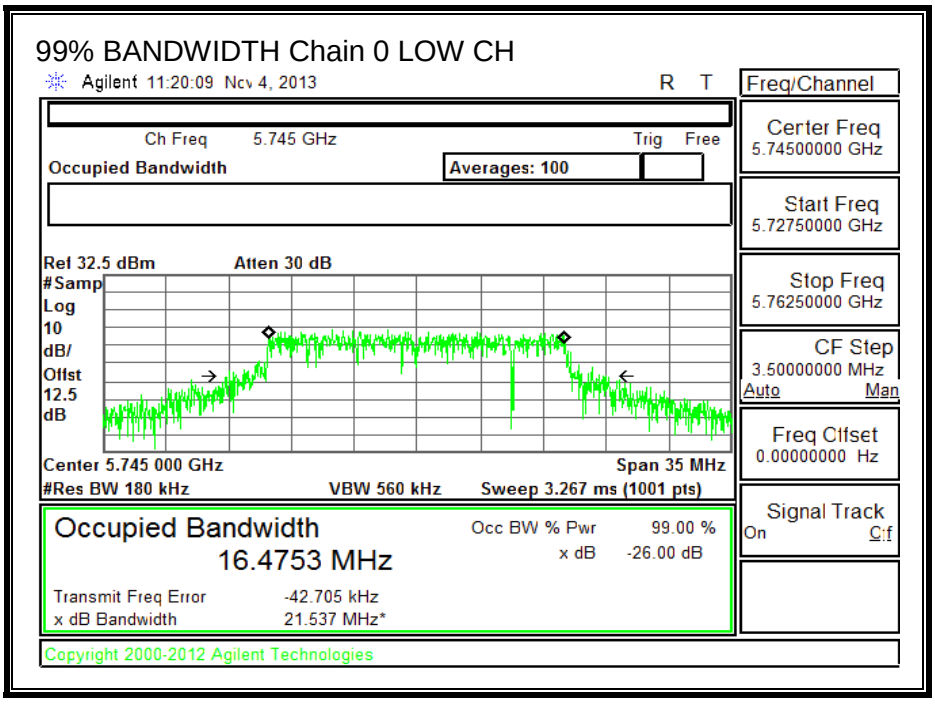
LIMITS

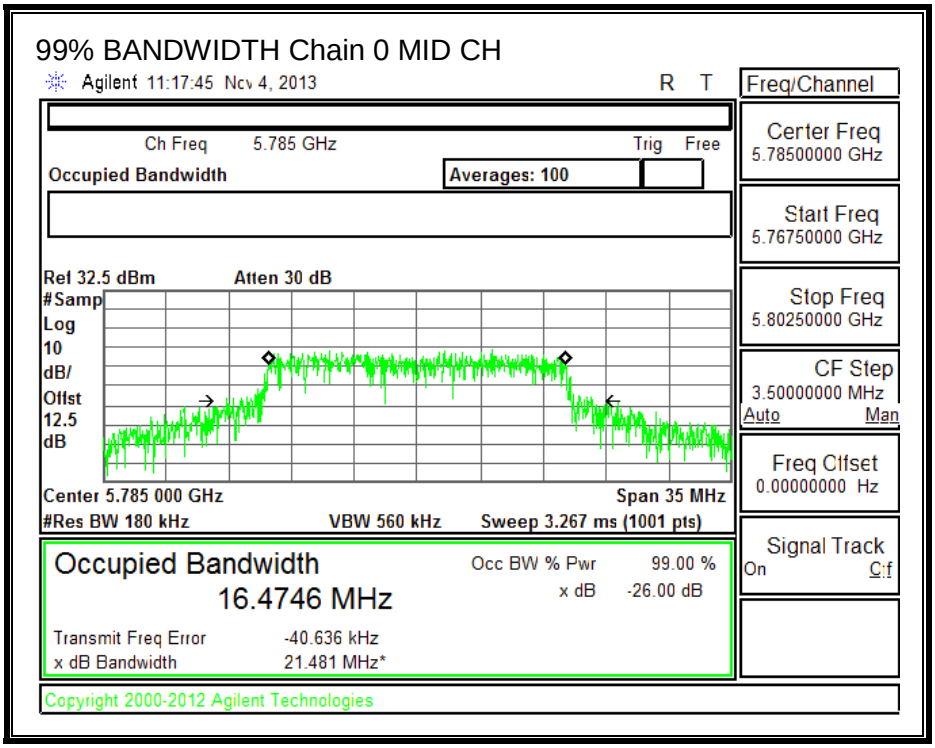
None; for reporting purposes only.

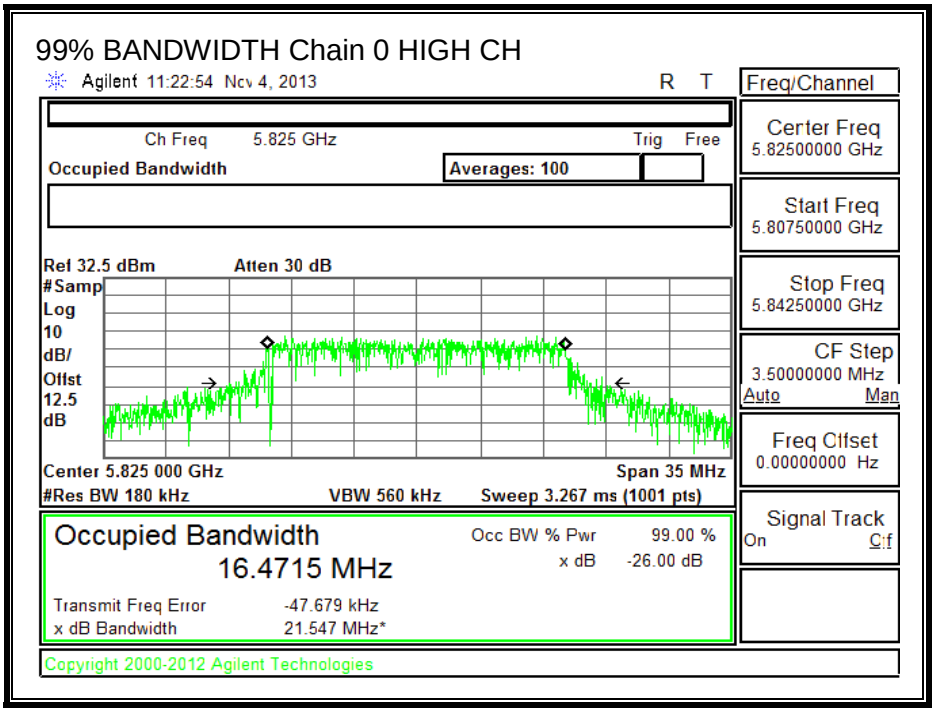
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5745	16.4753	16.4672
Mid	5785	16.4746	16.4763
High	5825	16.4715	16.4779

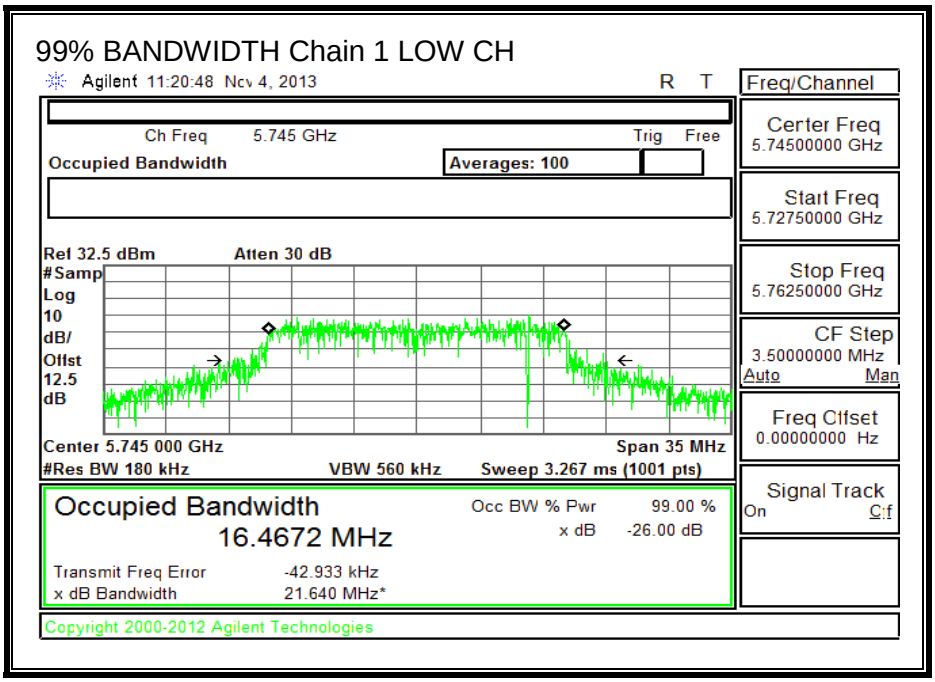
99% BANDWIDTH, Chain 0



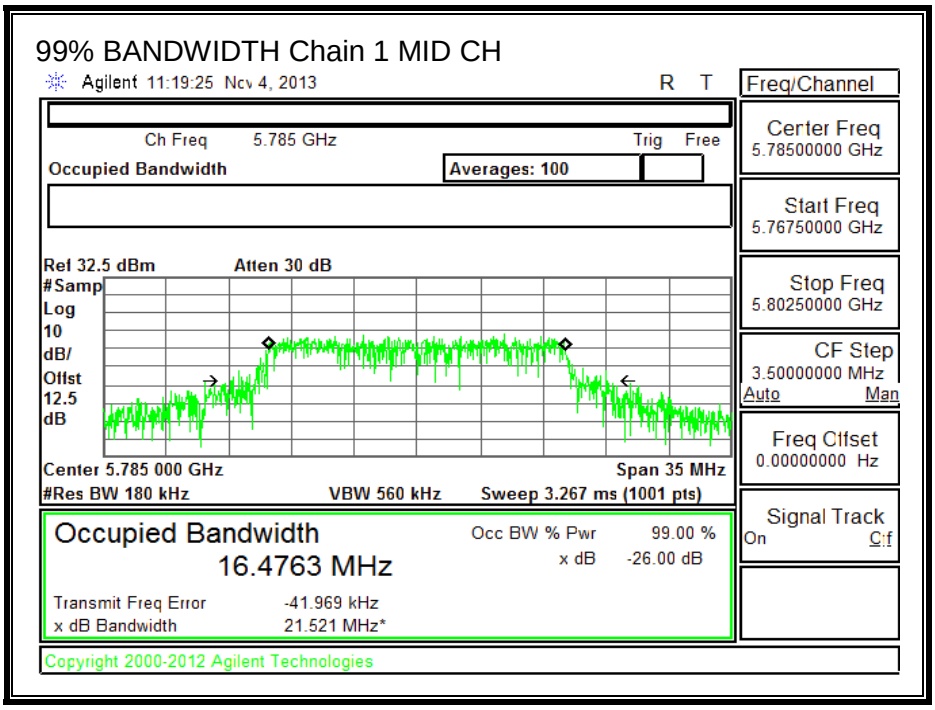




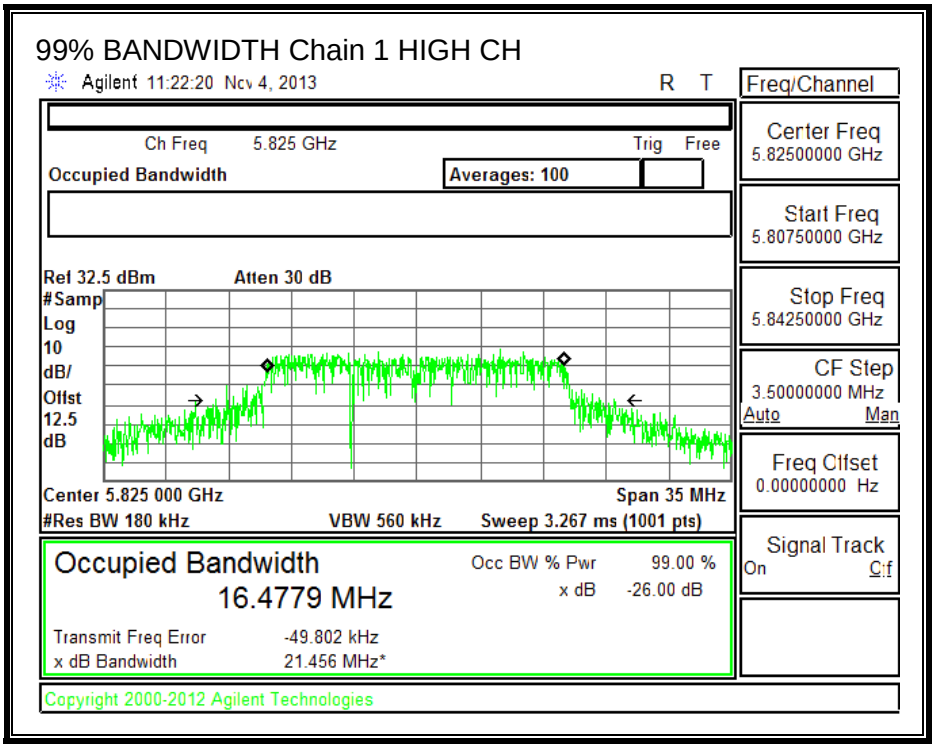
99% BANDWIDTH, Chain 1



99% BANDWIDTH Chain 1 MID CH



99% BANDWIDTH Chain 1 HIGH CH



8.1.4. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

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

DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is the same for each chain. The directional gain is equal to the antenna gain.

RESULTS

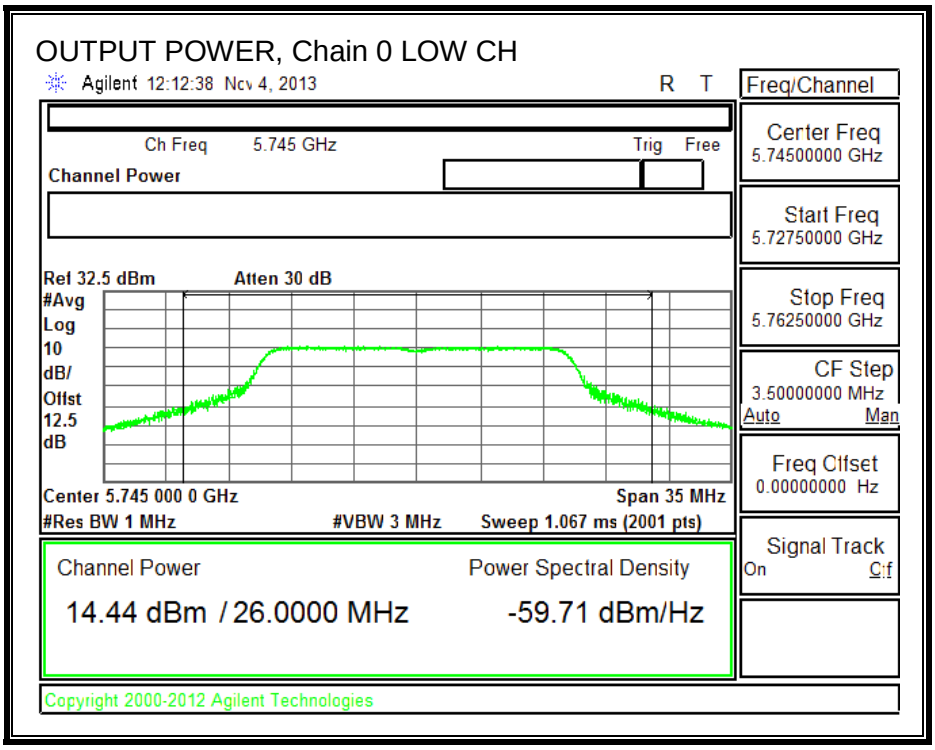
Limits

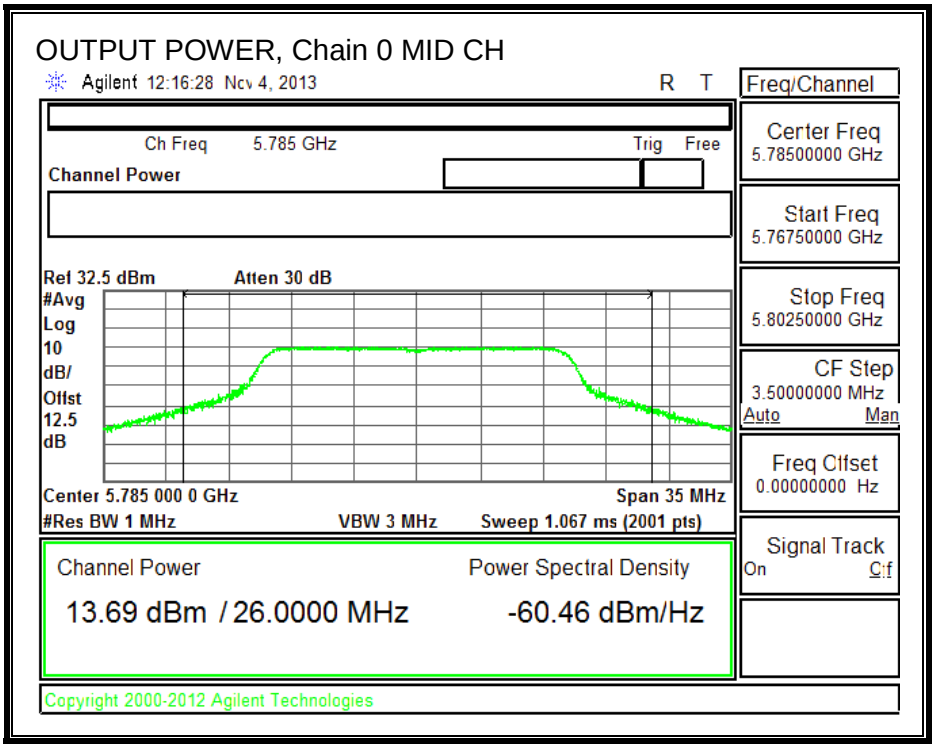
Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	5745	13.00	23.00	30	36	23.00
Mid	5785	13.00	23.00	30	36	23.00
High	5825	13.00	23.00	30	36	23.00

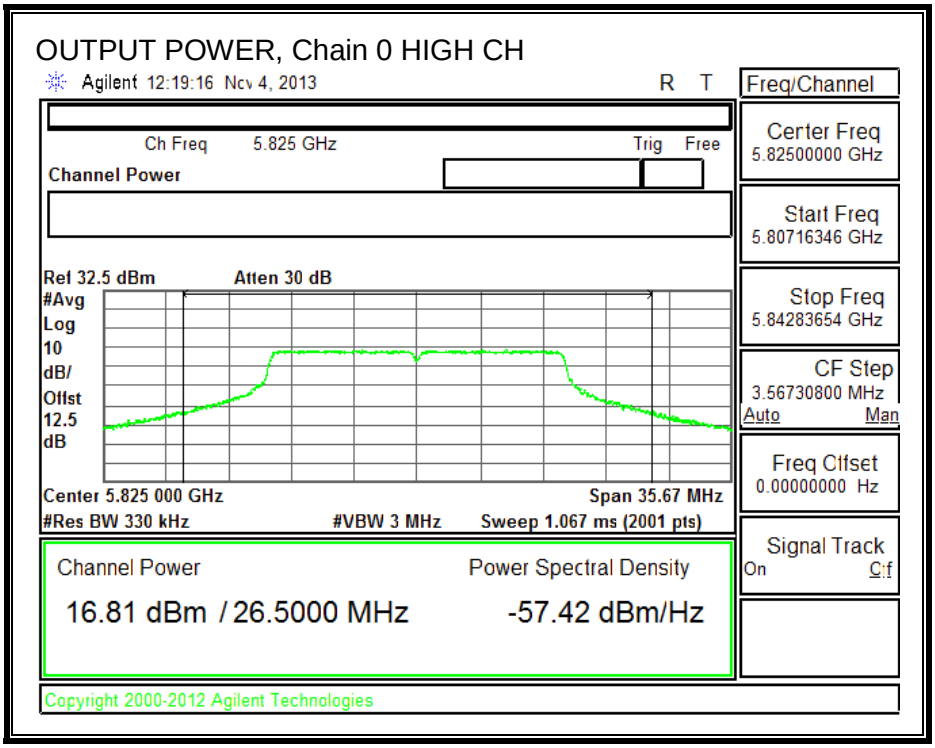
Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	5745	14.44	15.32	17.91	23.00	-5.09
Mid	5785	13.69	13.39	16.55	23.00	-6.45
High	5825	16.81	16.80	19.82	23.00	-3.18

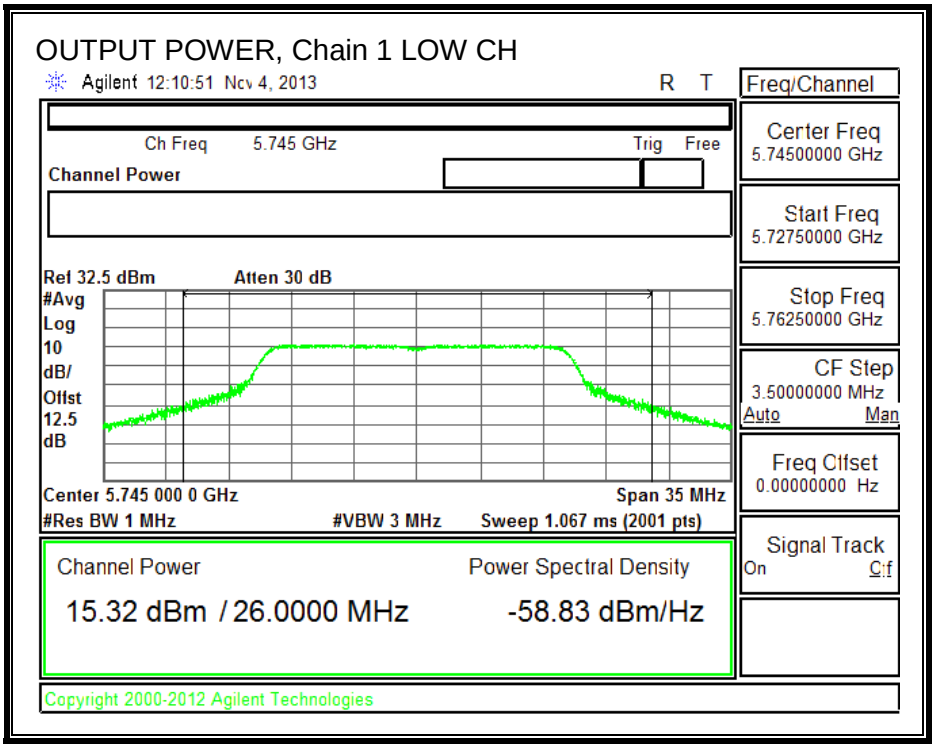
OUTPUT POWER, Chain 0



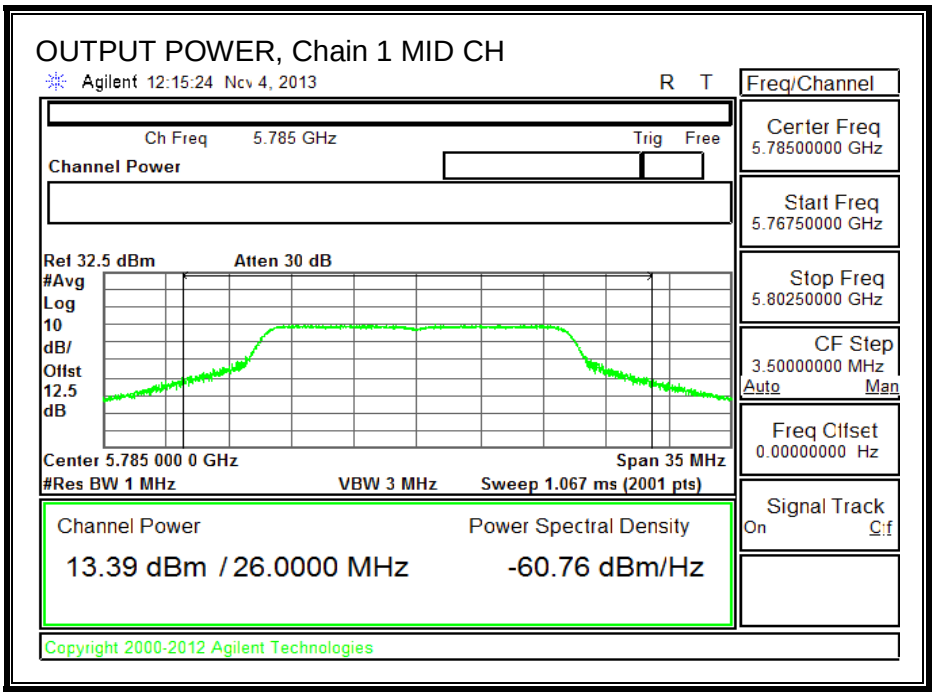




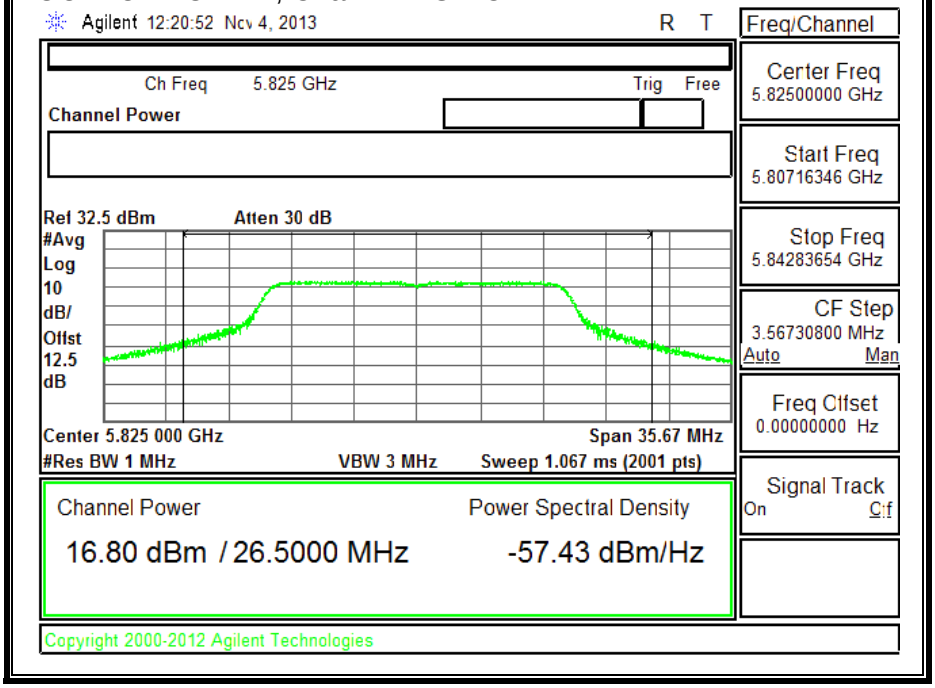
OUTPUT POWER, Chain 1



OUTPUT POWER, Chain 1 MID CH



OUTPUT POWER, Chain 1 HIGH CH



8.1.5. PSD

LIMITS

FCC §15.247

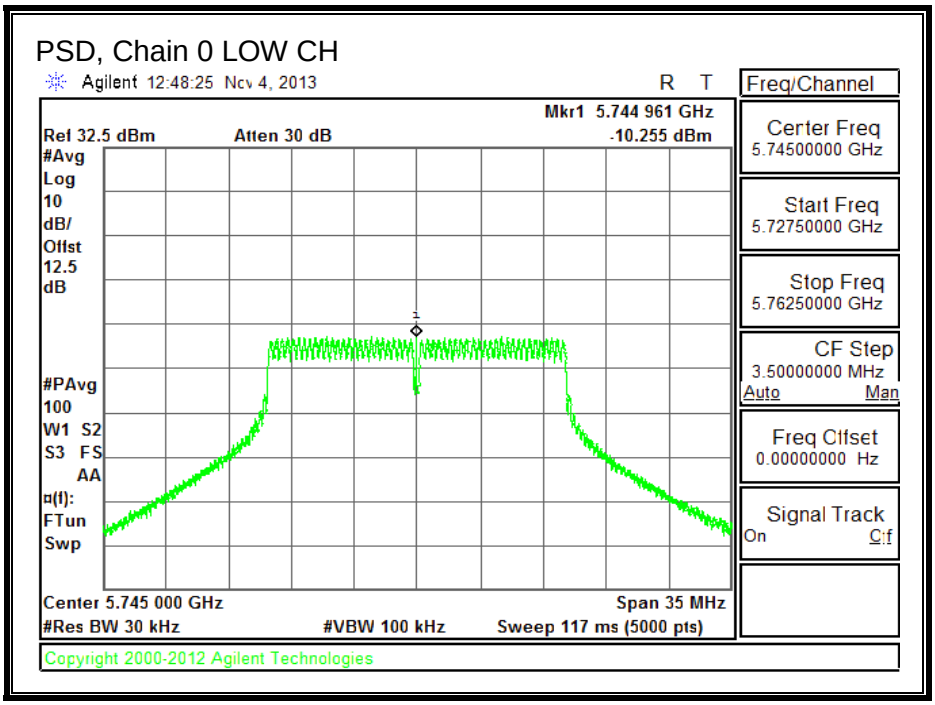
IC RSS-210 A8.2

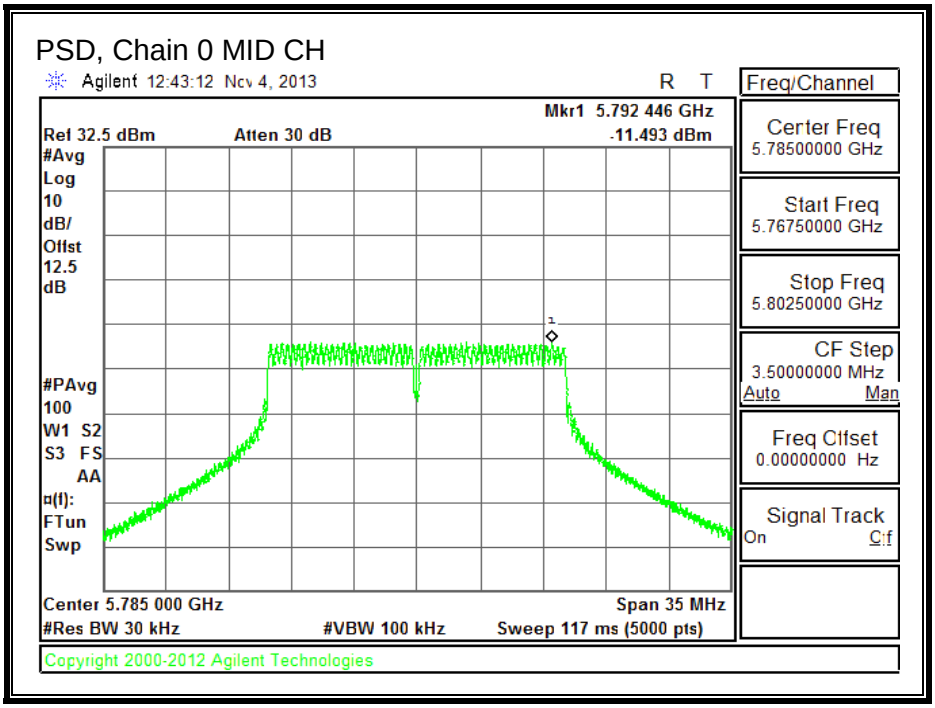
RESULTS

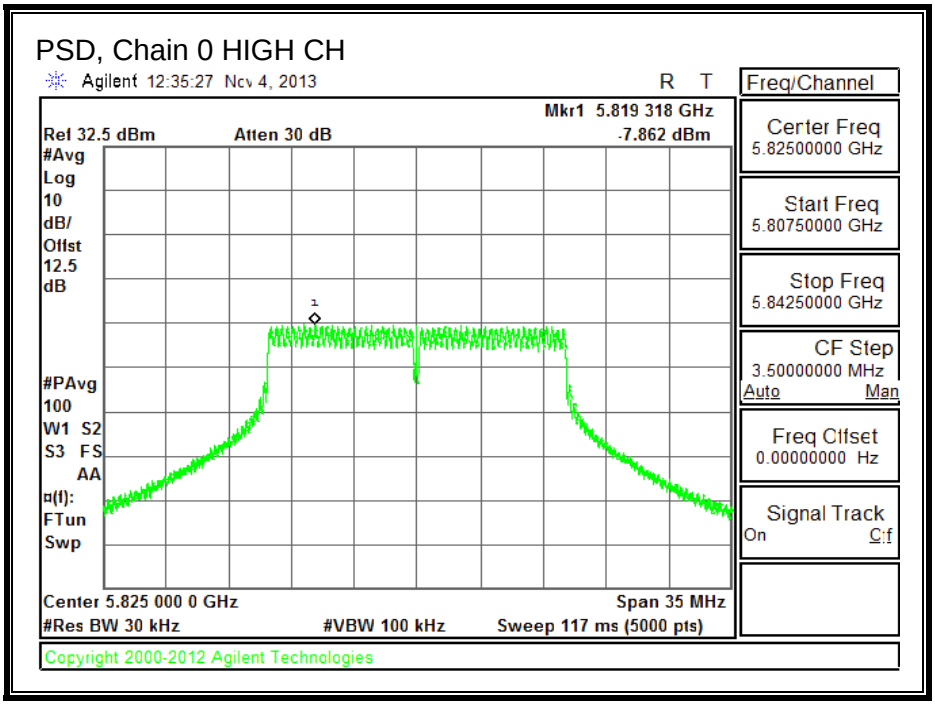
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Chain 1 Meas (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low	5745	-10.255	-9.268	-6.72	8.0	-14.7
Mid	5785	-11.493	-11.484	-8.48	8.0	-16.5
High	5825	-7.862	-8.230	-5.03	8.0	-13.0

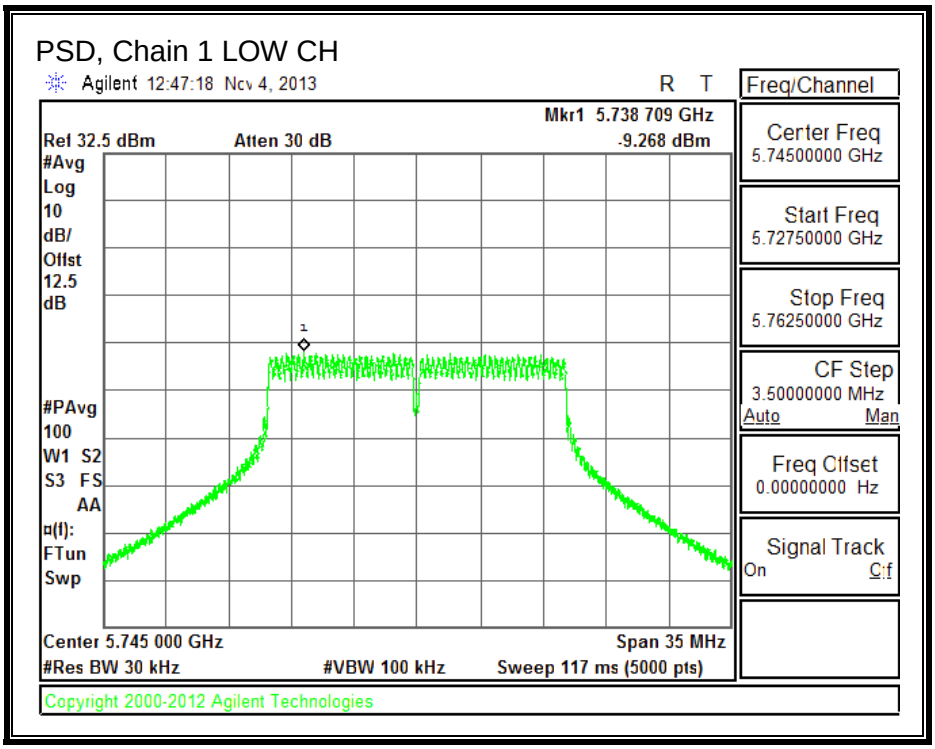
PSD, Chain 0



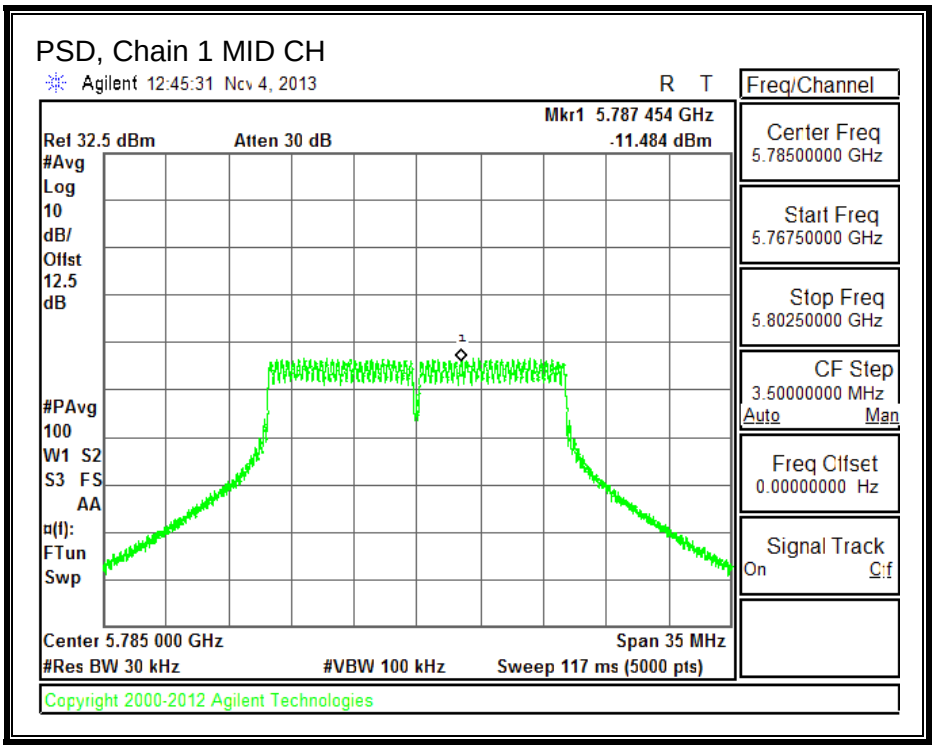




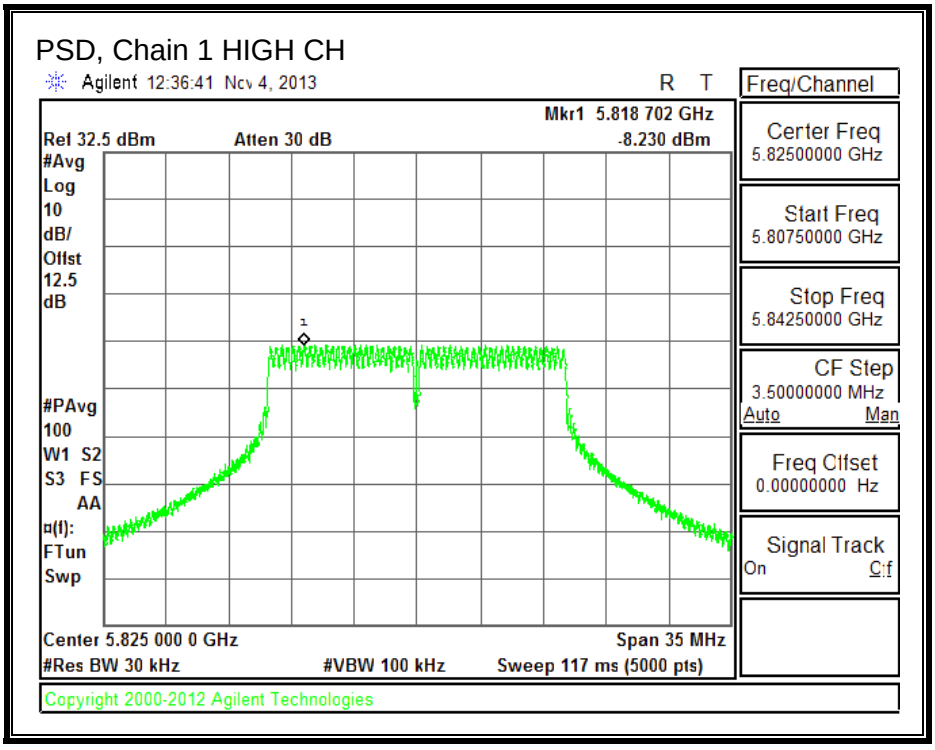
PSD, Chain 1



PSD, Chain 1 MID CH



PSD, Chain 1 HIGH CH



8.1.6. OUT-OF-BAND EMISSIONS

LIMITS

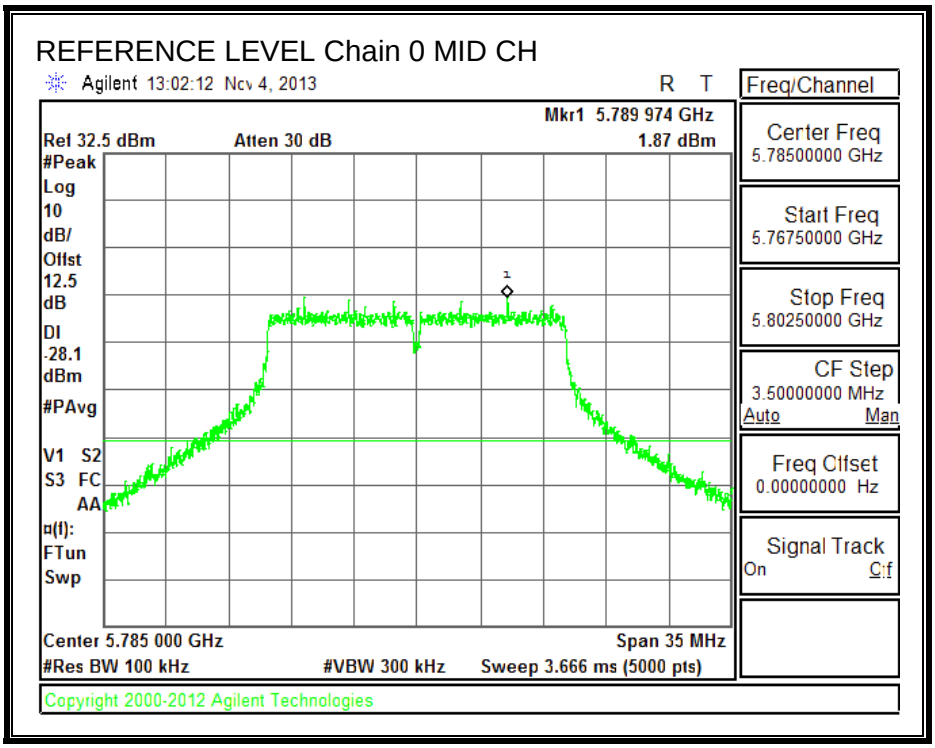
FCC §15.247 (d)

IC RSS-210 A8.5

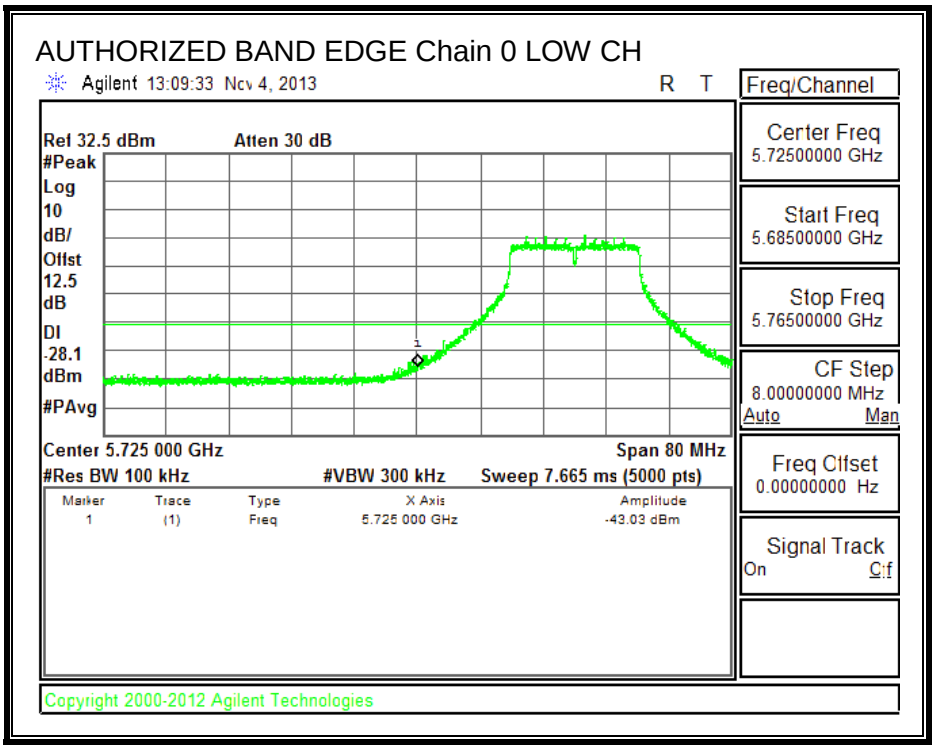
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

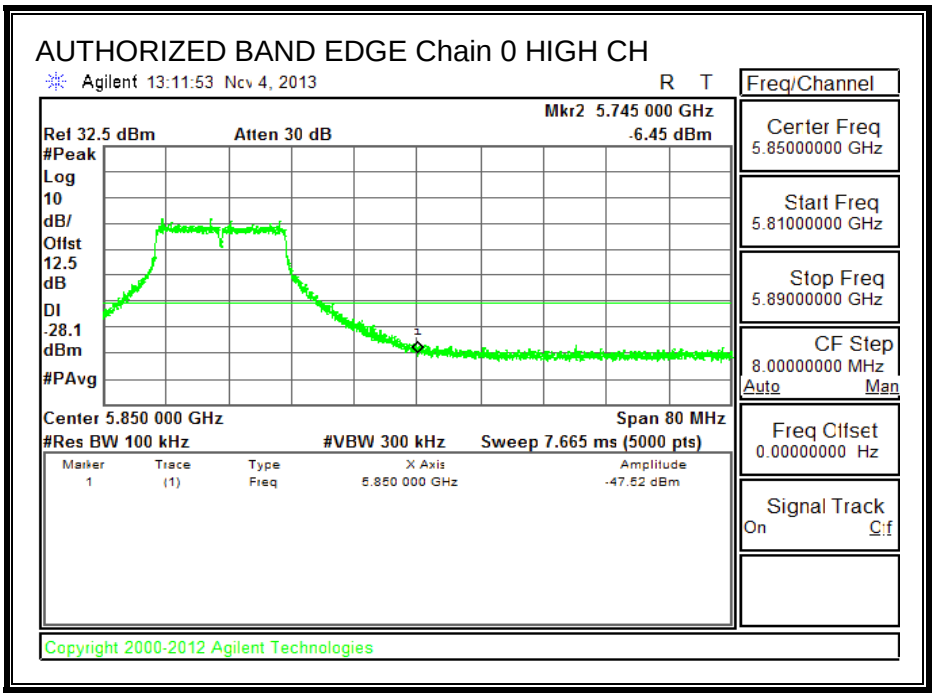
IN-BAND REFERENCE LEVEL, Chain 0



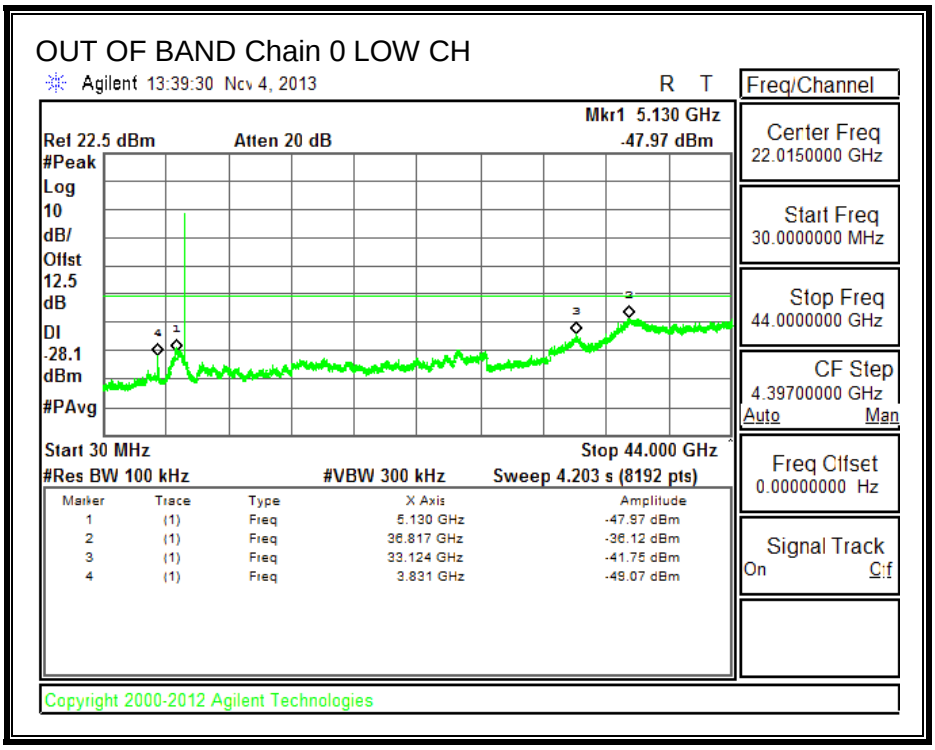
LOW CHANNEL BANDEDGE, Chain 0

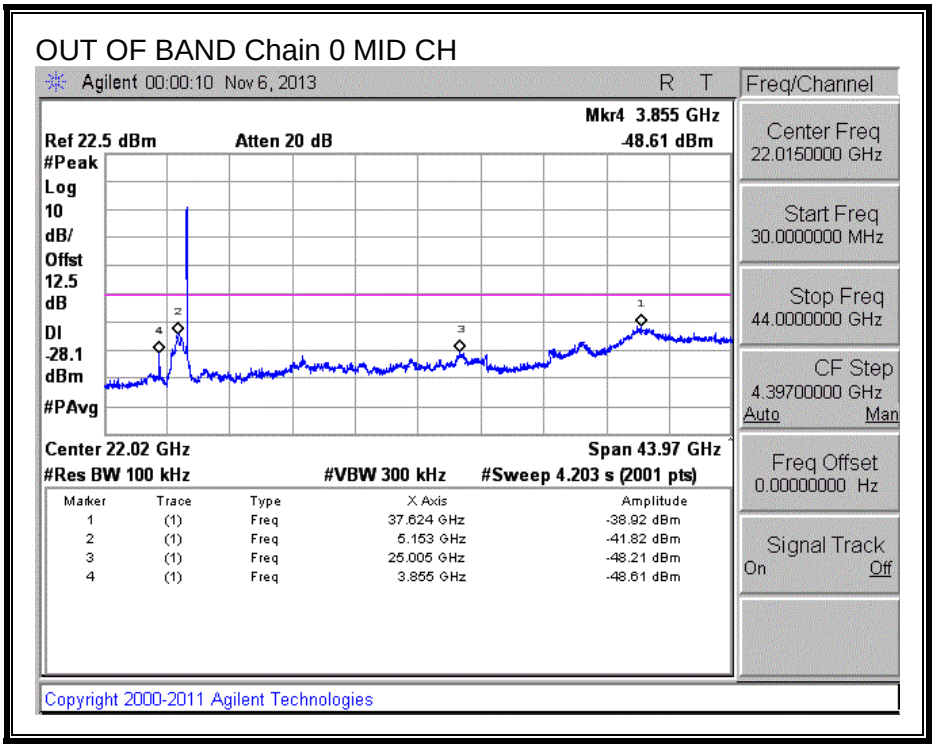


HIGH CHANNEL BANDEDGE, Chain 0

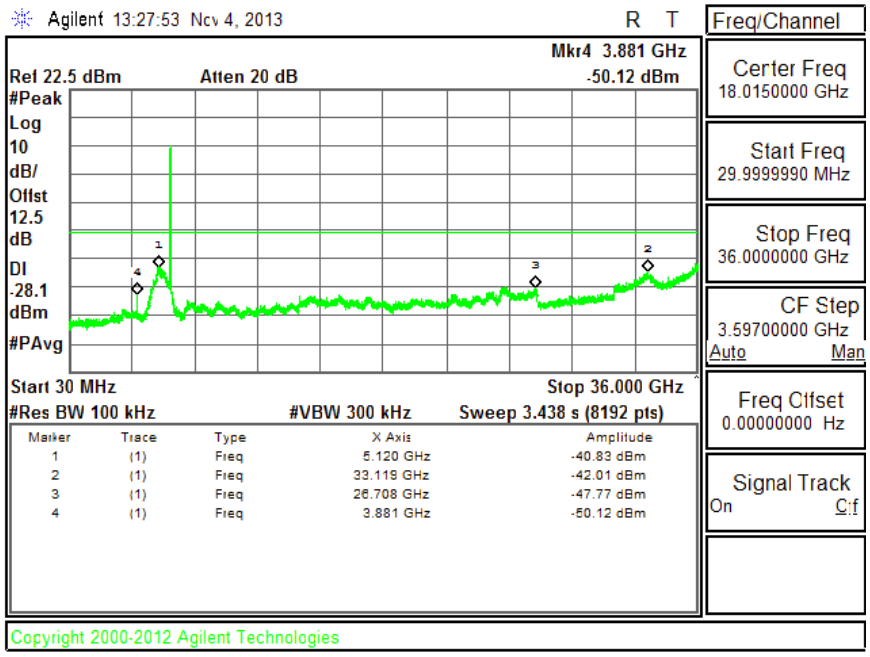


OUT-OF-BAND EMISSIONS, Chain 0

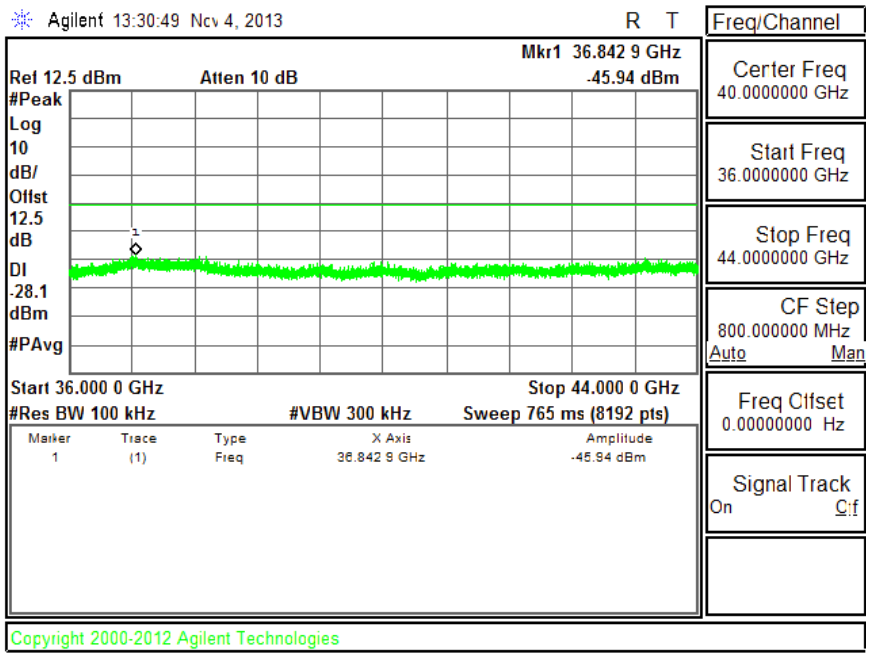




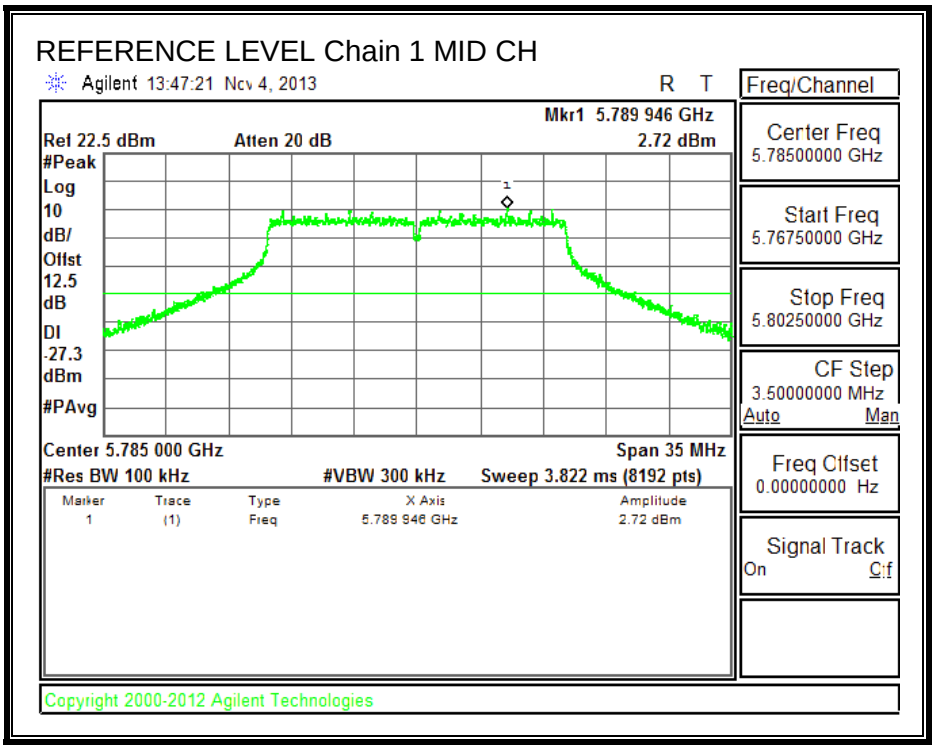
OUT OF BAND Chain 0 HIGH CH- 30MHz-36 GHz



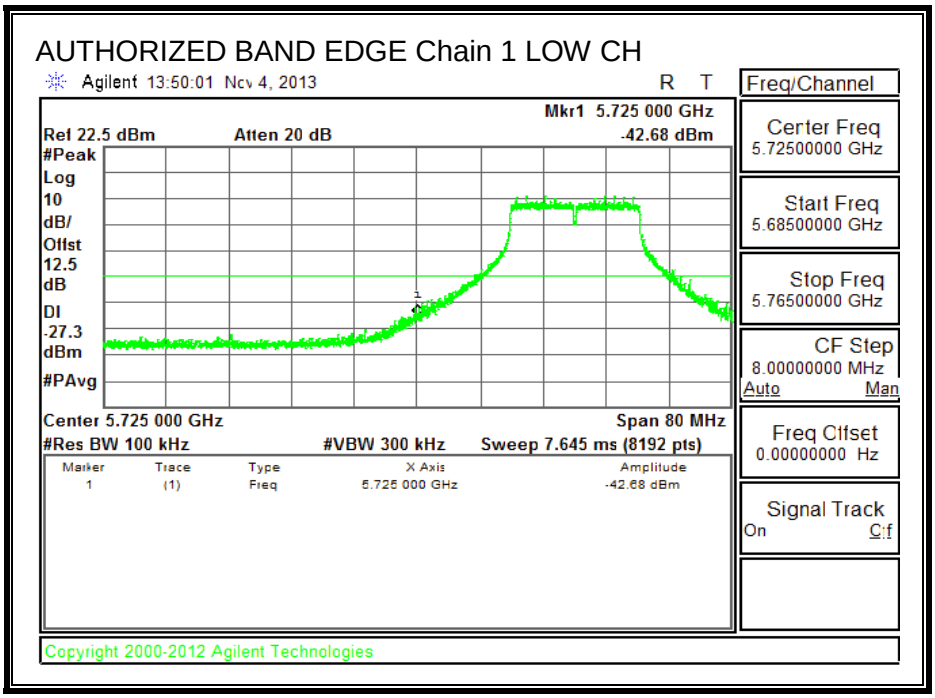
OUT OF BAND Chain 0 HIGH CH – 36GHz-44GHz



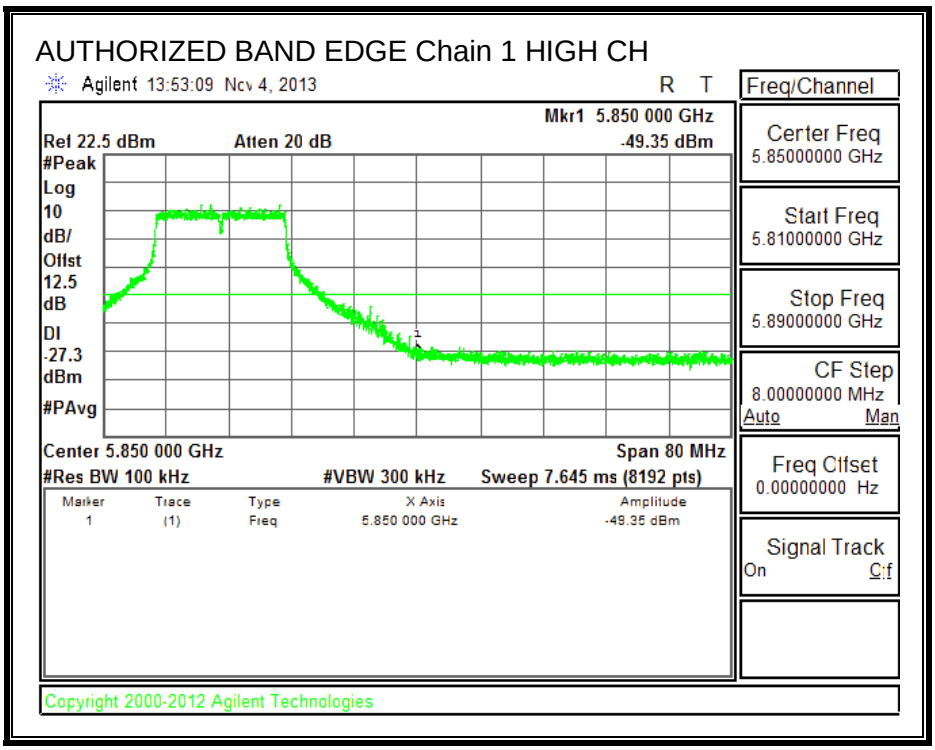
IN-BAND REFERENCE LEVEL, Chain 1



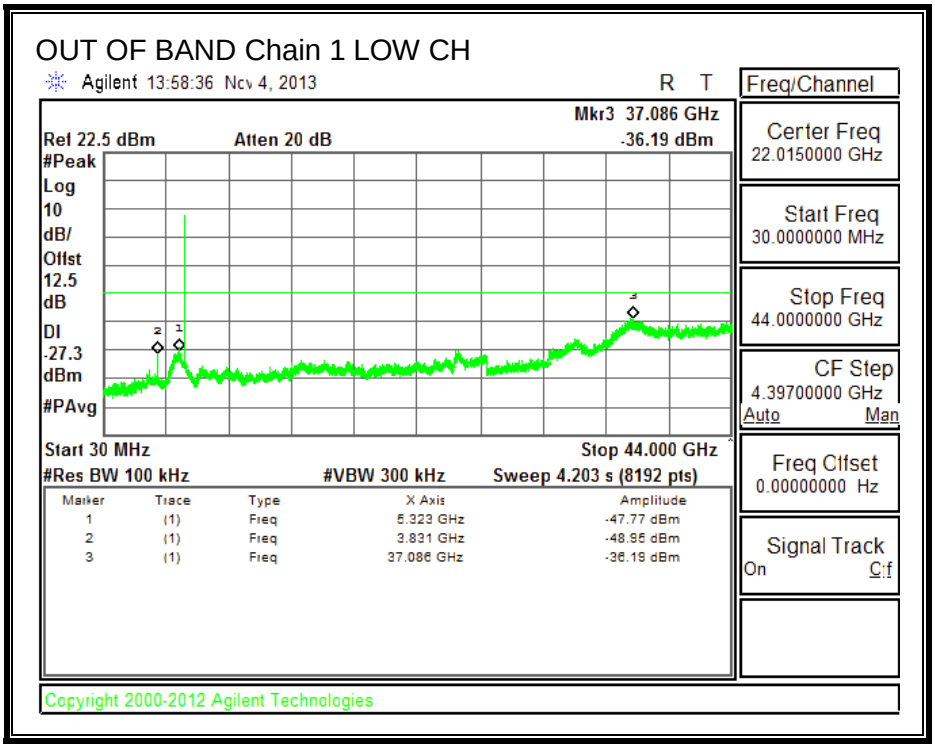
LOW CHANNEL BANDEDGE, Chain 1



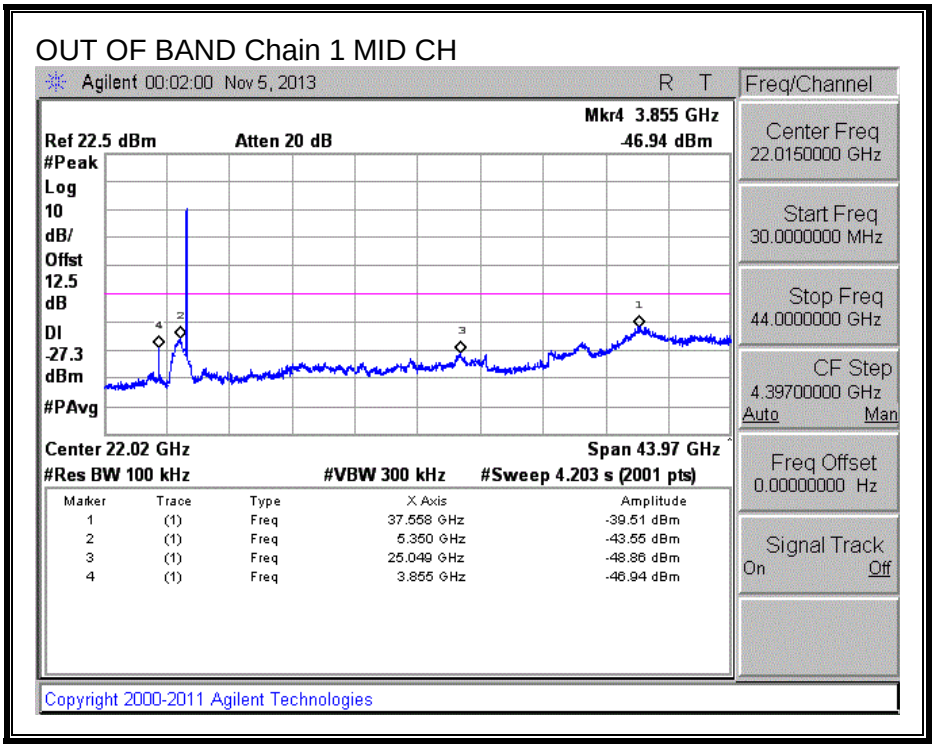
HIGH CHANNEL BANDEDGE, Chain 1

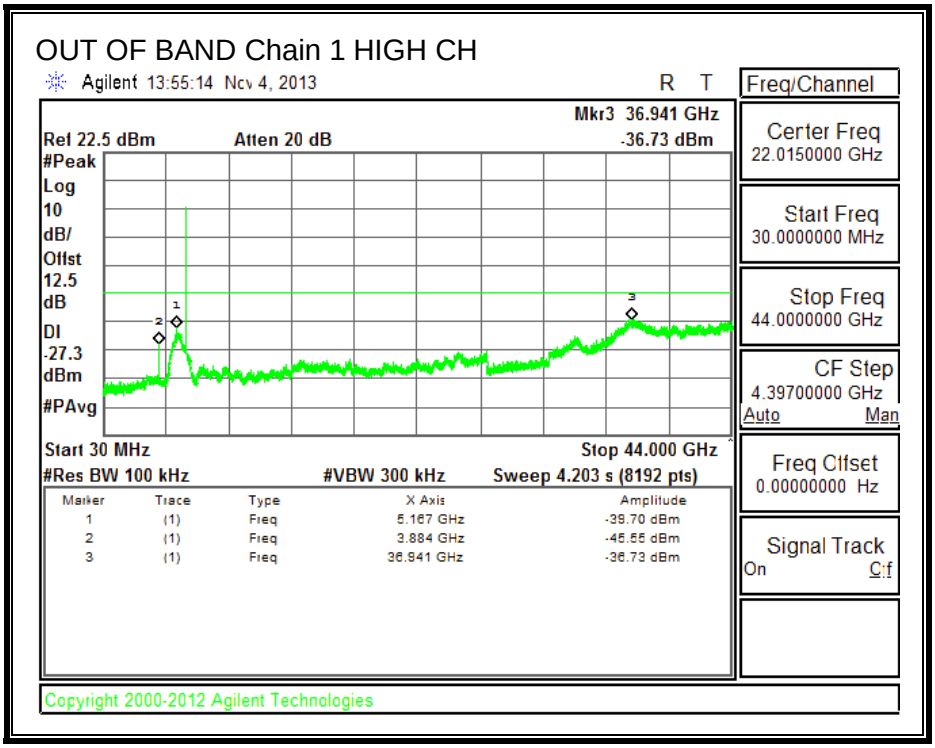


OUT OF BAND Chain 1 LOW CH



OUT OF BAND Chain 1 MID CH





8.2. 802.11n HT20 STBC 2TX MODE IN THE 5.8 GHz BAND

8.2.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

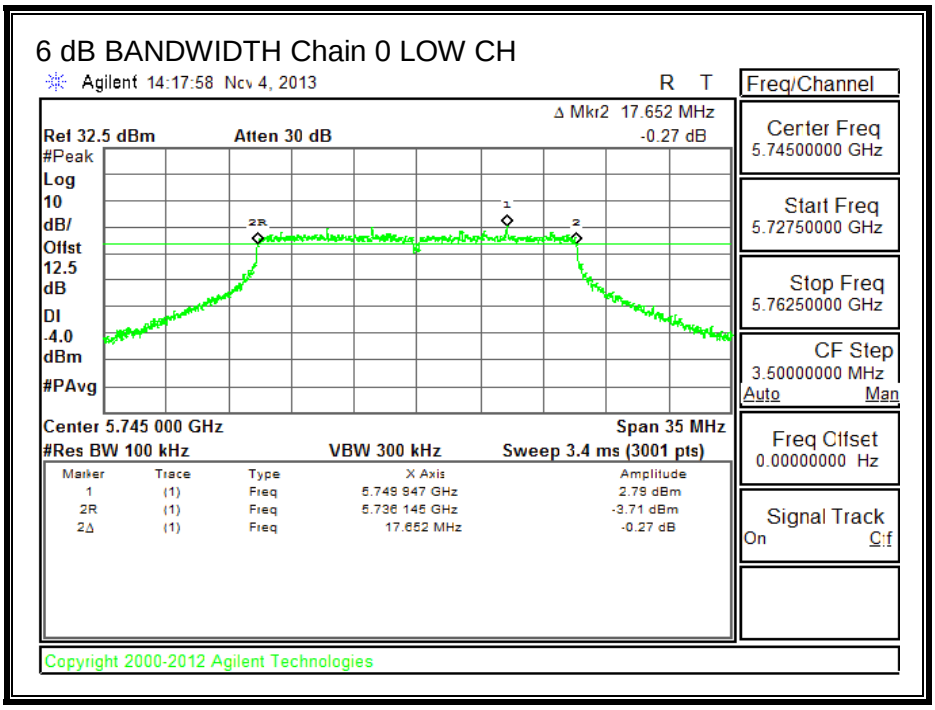
IC RSS-210 A8.2 (a)

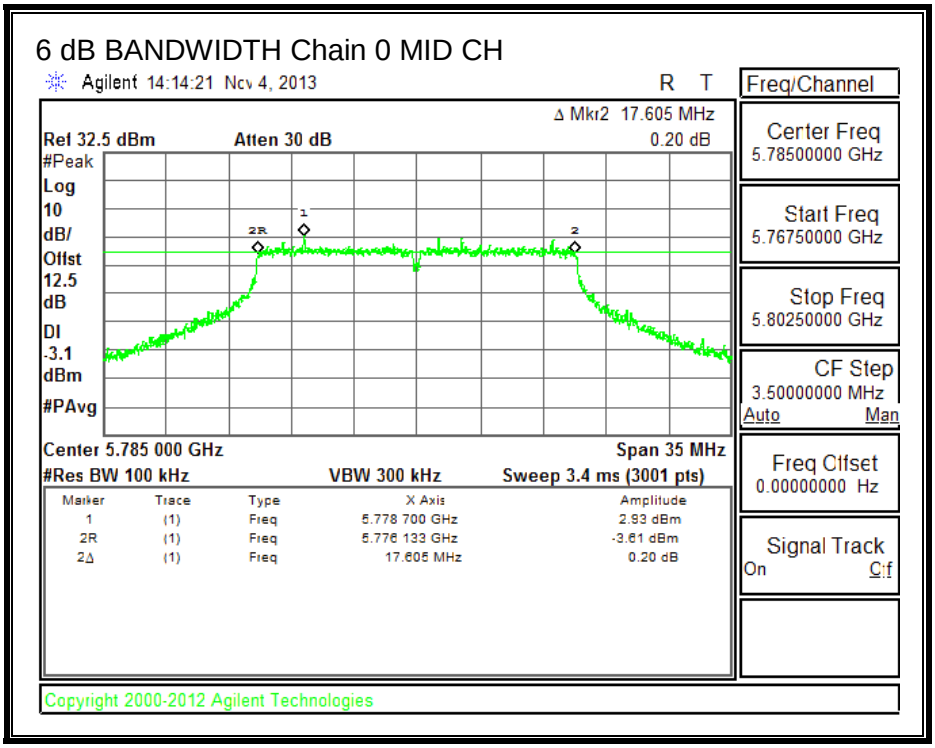
The minimum 6 dB bandwidth shall be at least 500 kHz.

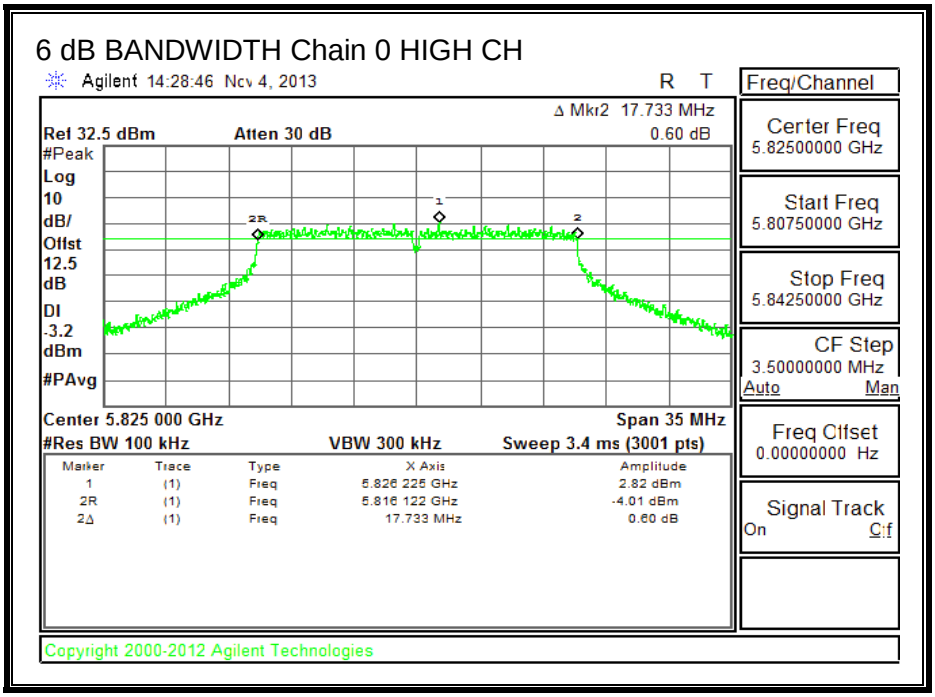
RESULTS

Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	5745	17.652	17.710	0.5
Mid	5785	17.605	17.640	0.5
High	5825	17.733	17.675	0.5

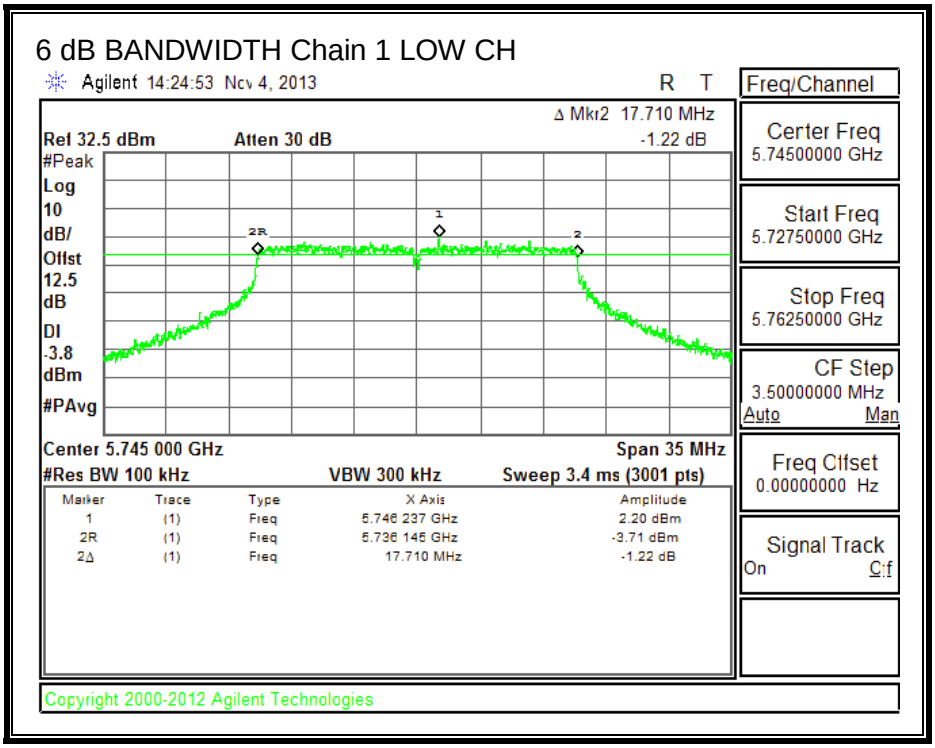
6 dB BANDWIDTH, Chain 0



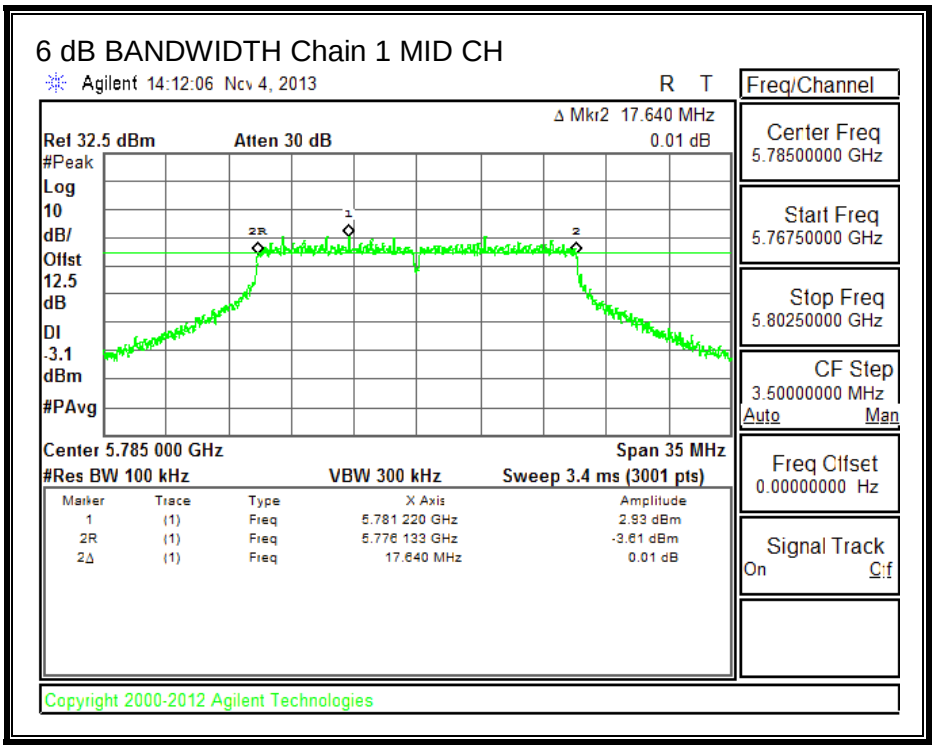




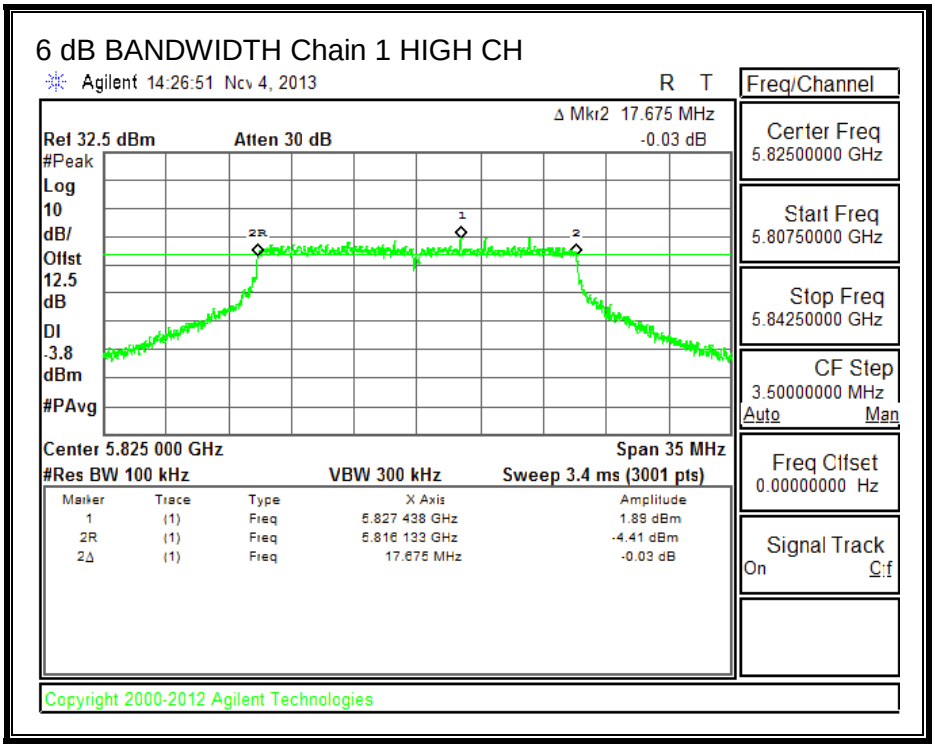
6 dB BANDWIDTH, Chain 1



6 dB BANDWIDTH Chain 1 MID CH



6 dB BANDWIDTH Chain 1 HIGH CH



8.2.2. 26 dB BANDWIDTH

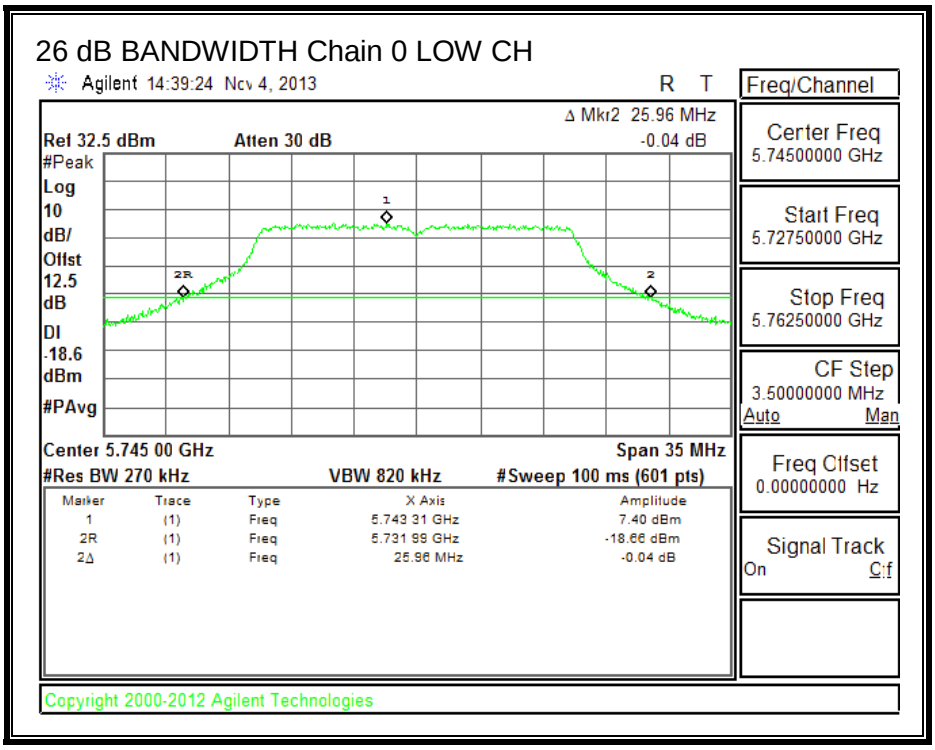
LIMITS

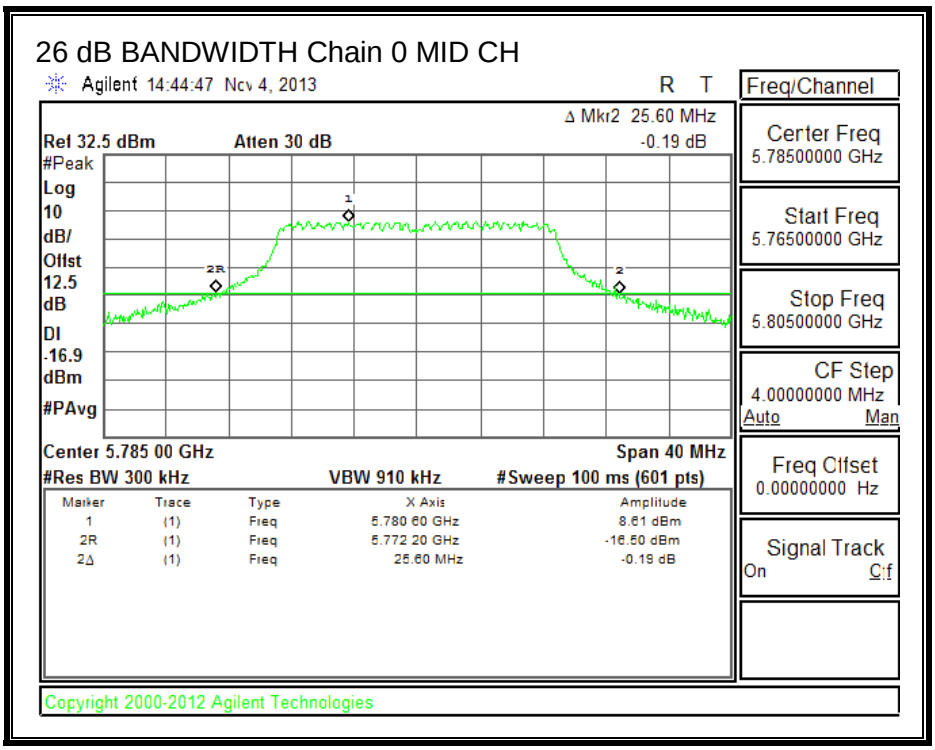
For reporting purposes.

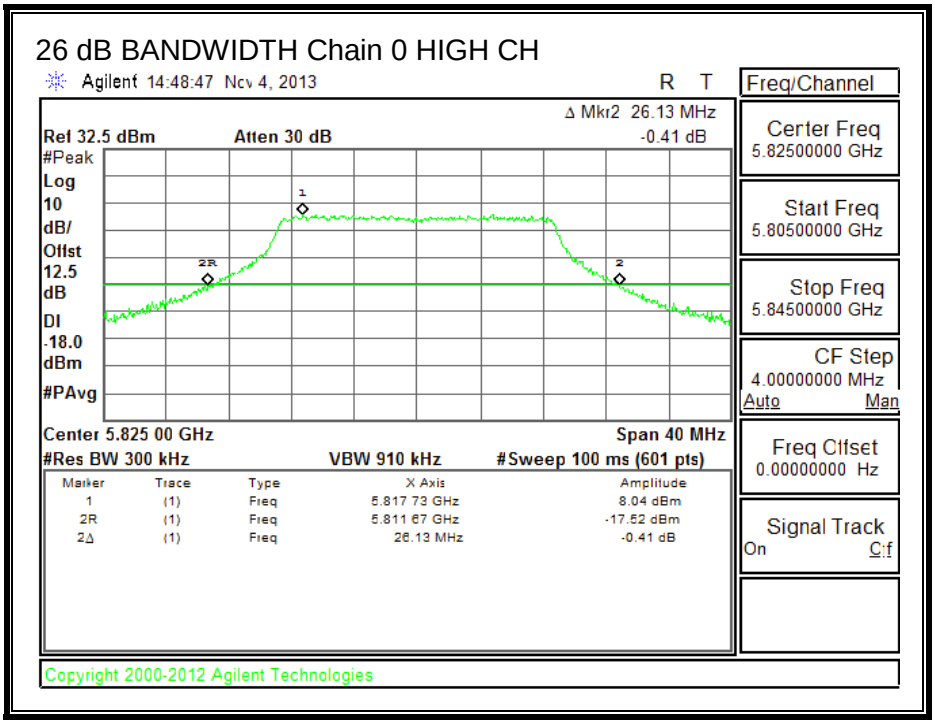
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5745	25.960	27.200
Mid	5785	25.600	26.330
High	5825	26.130	26.070

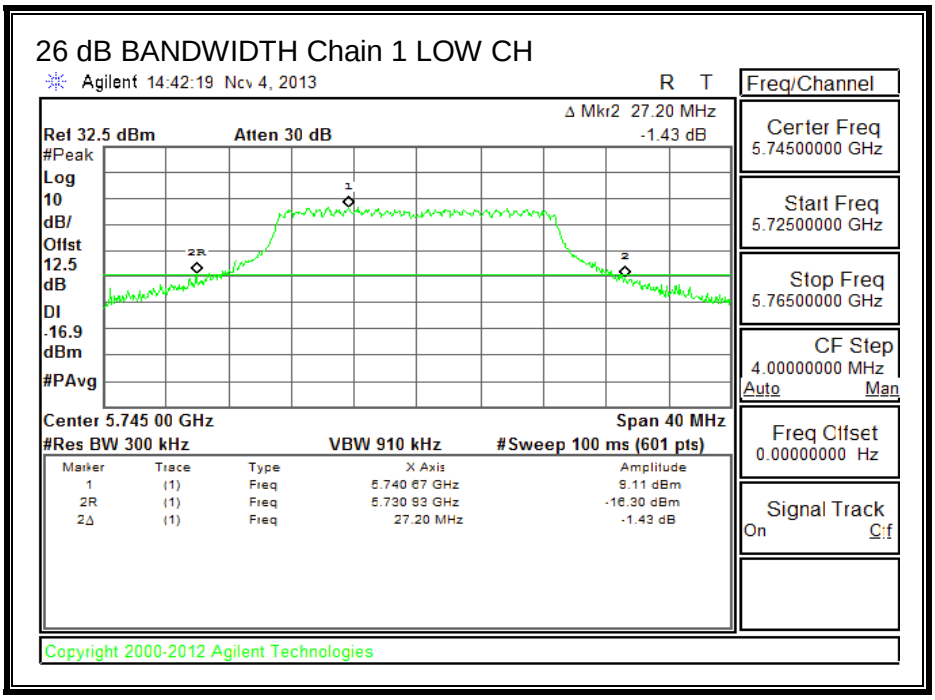
26 dB BANDWIDTH, Chain 0



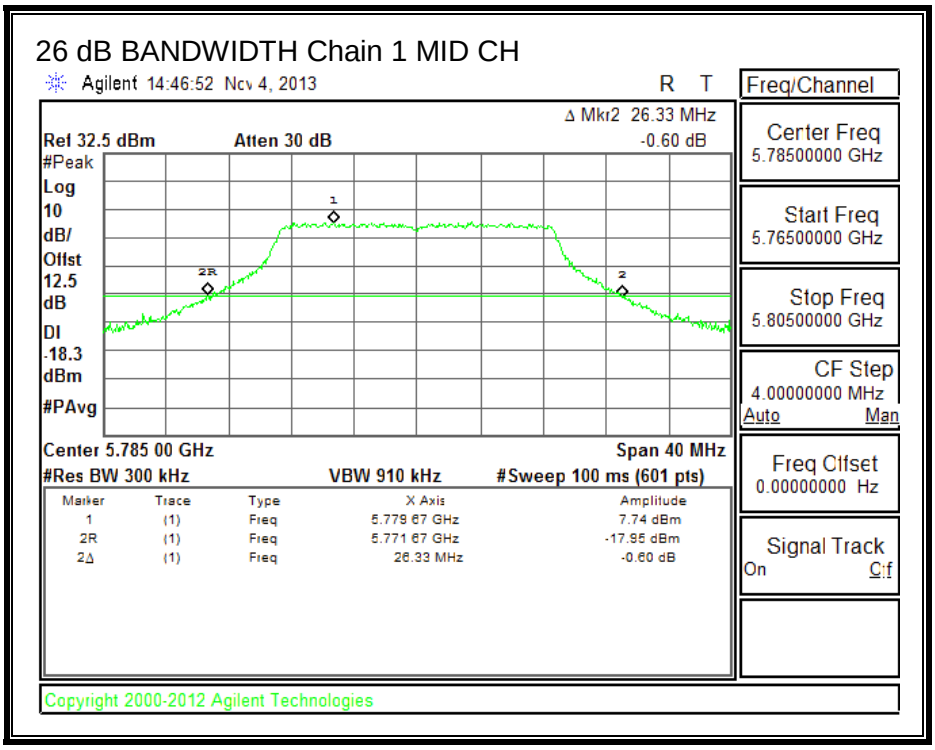




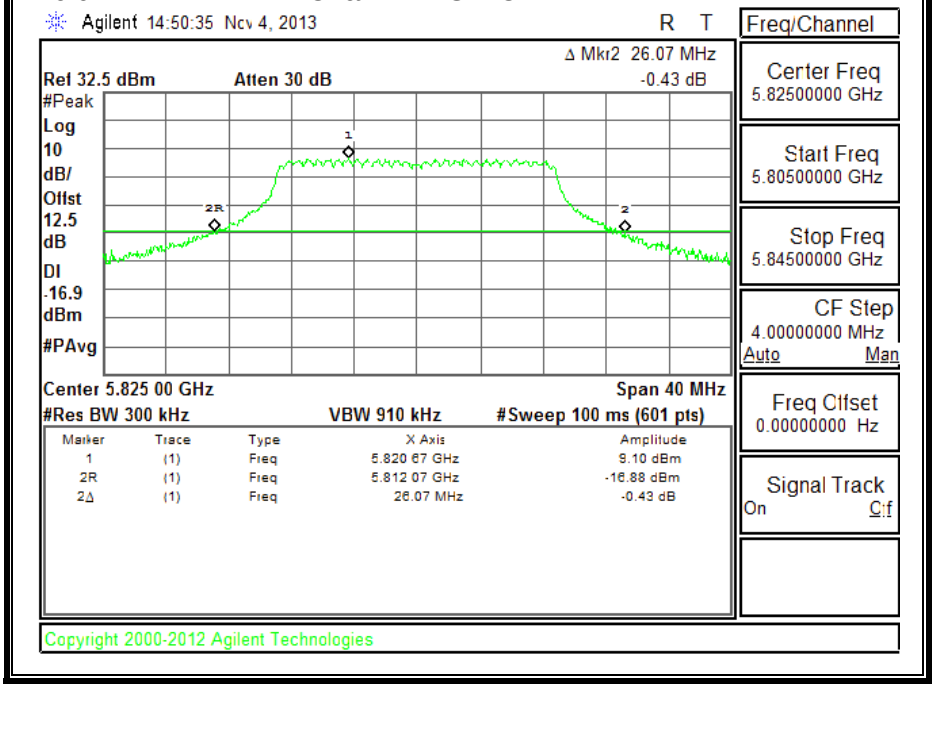
26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH Chain 1 MID CH



26 dB BANDWIDTH Chain 1 HIGH CH



8.2.3. 99% BANDWIDTH

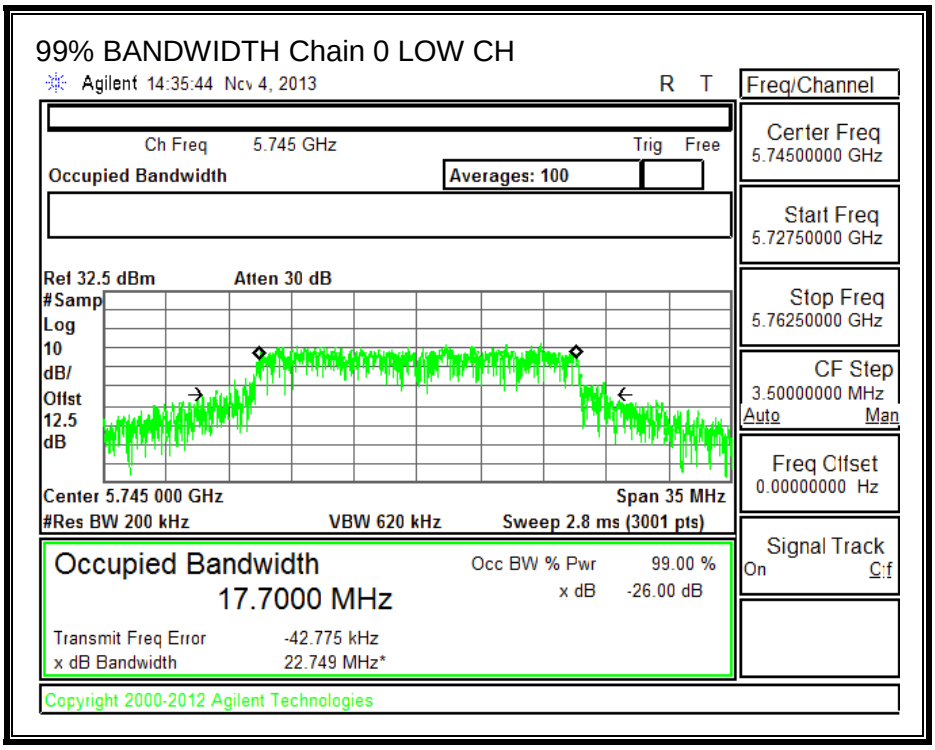
LIMITS

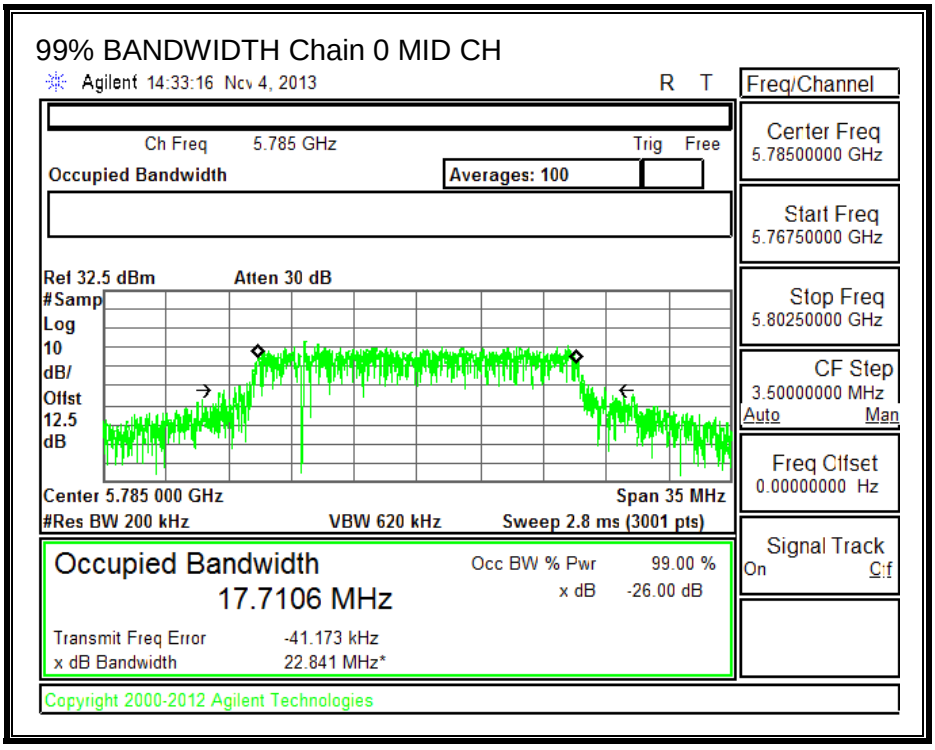
None; for reporting purposes only.

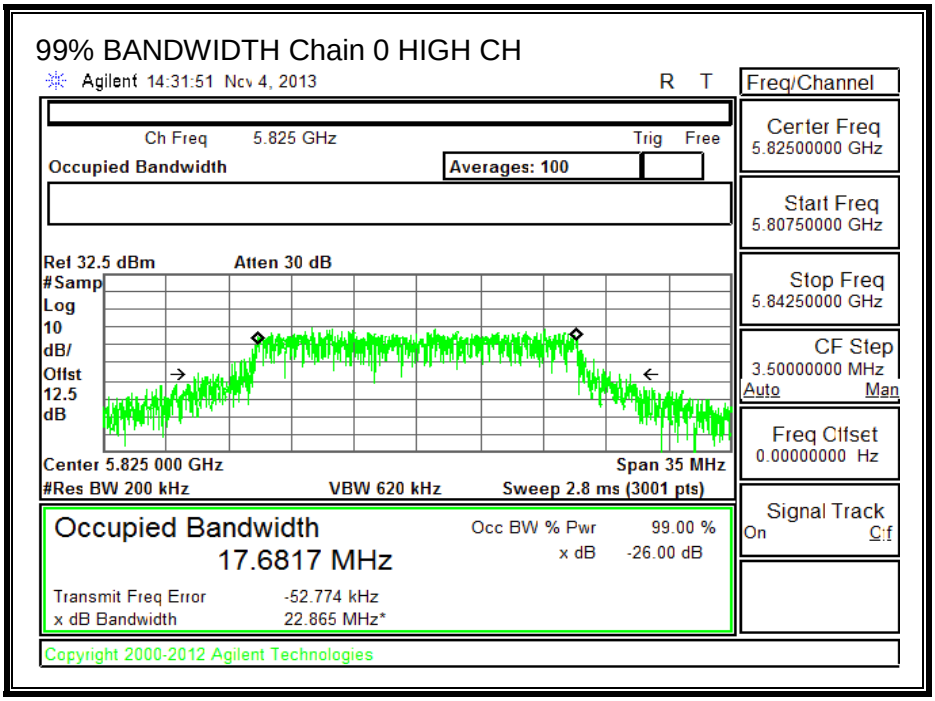
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5745	17.7000	17.6938
Mid	5785	17.7106	17.7070
High	5825	17.6817	17.6881

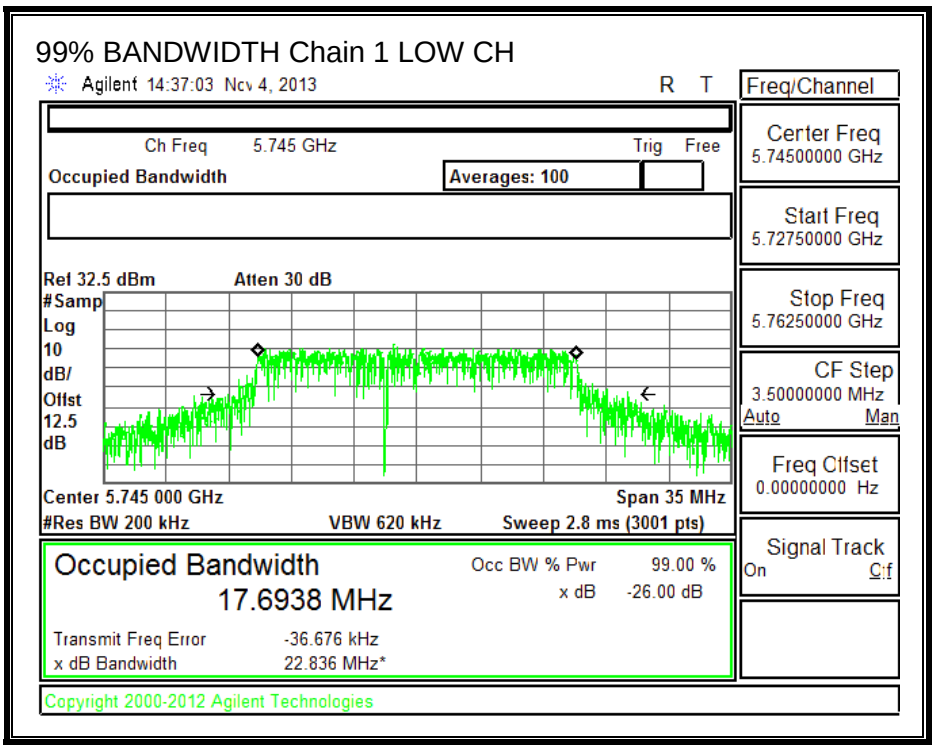
99% BANDWIDTH, Chain 0

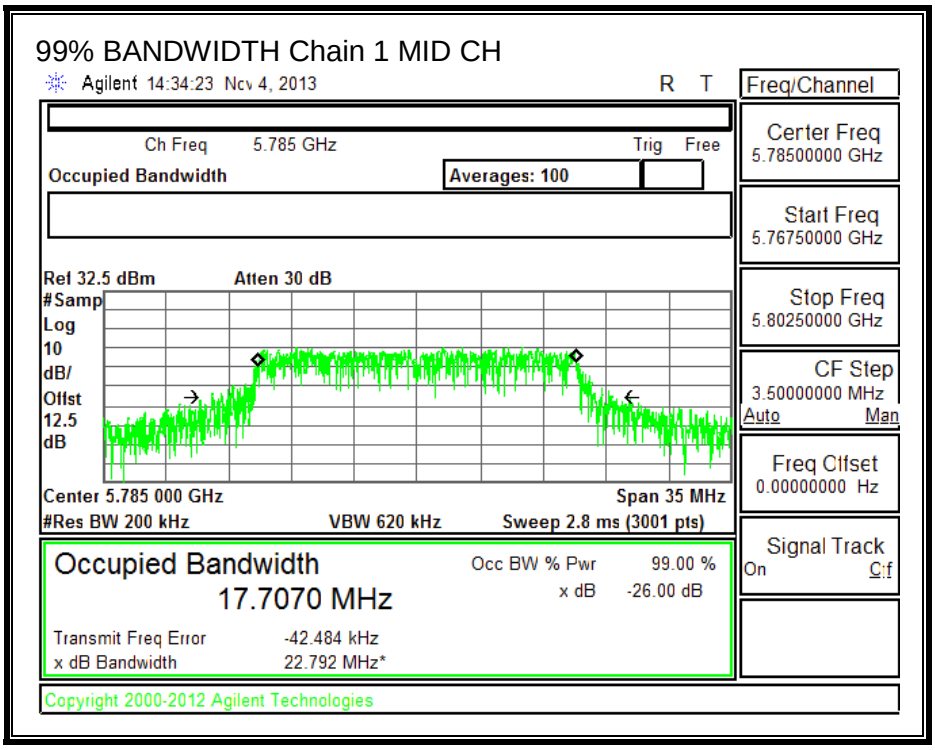


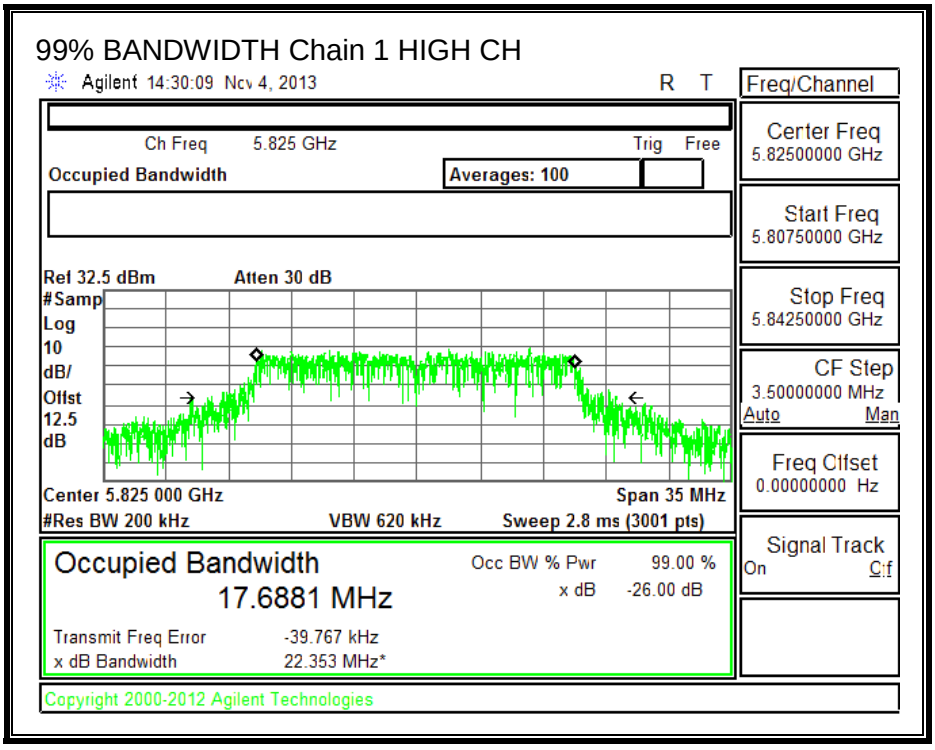




99% BANDWIDTH, Chain 1







8.2.4. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

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

DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is the same for each chain. The directional gain is equal to the antenna gain.

RESULTS

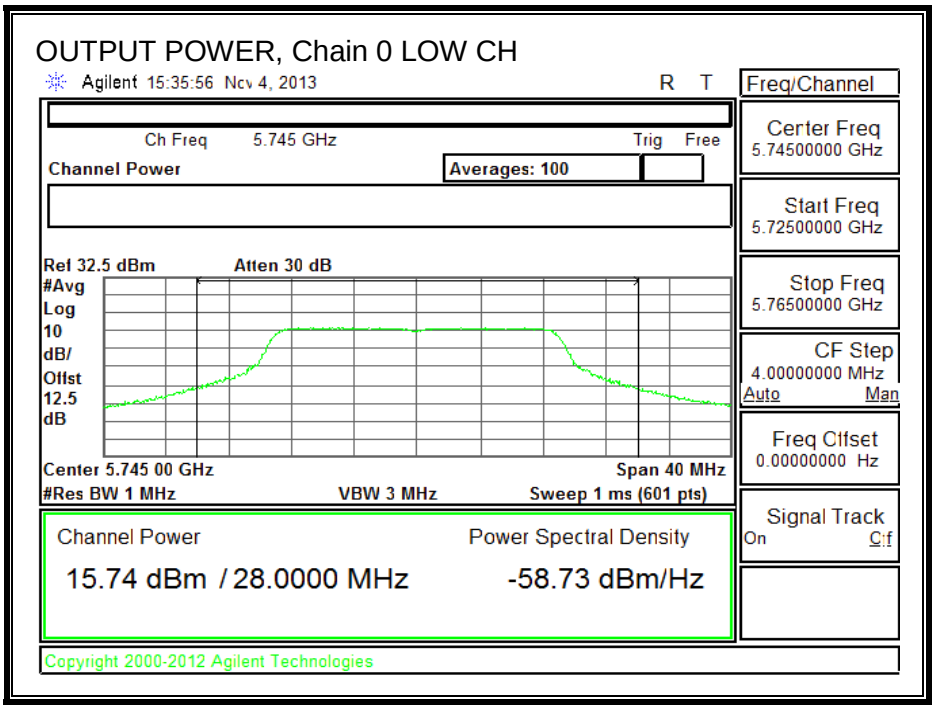
Limits

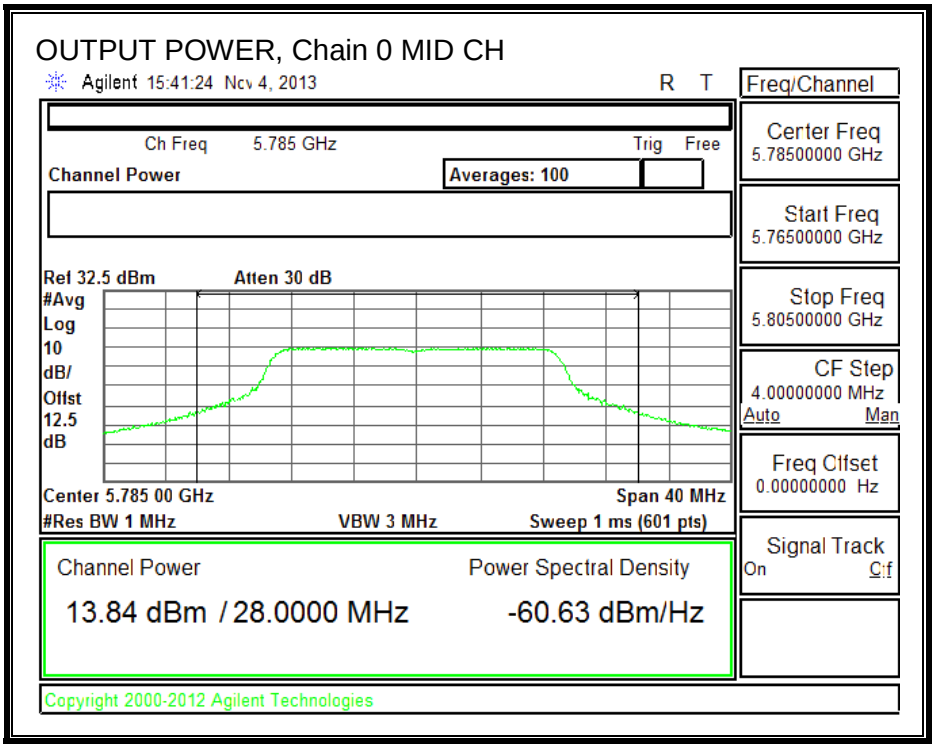
Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	5745	13.00	23.00	30	36	23.00
Mid	5785	13.00	23.00	30	36	23.00
High	5825	13.00	23.00	30	36	23.00

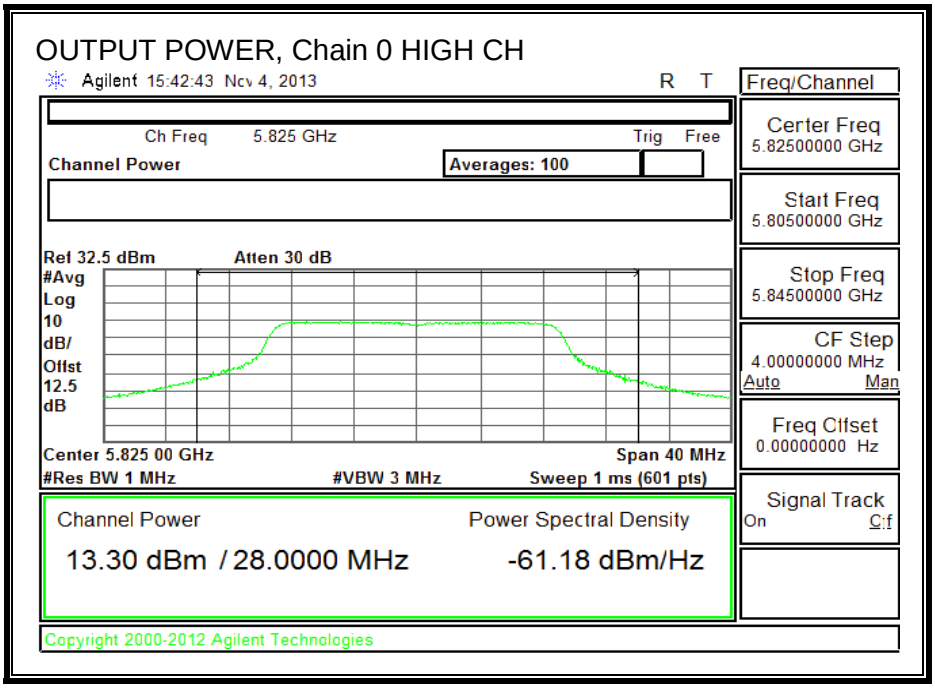
Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	5745	15.74	15.90	18.83	23.00	-4.17
Mid	5785	13.84	14.28	17.08	23.00	-5.92
High	5825	13.30	14.17	16.77	23.00	-6.23

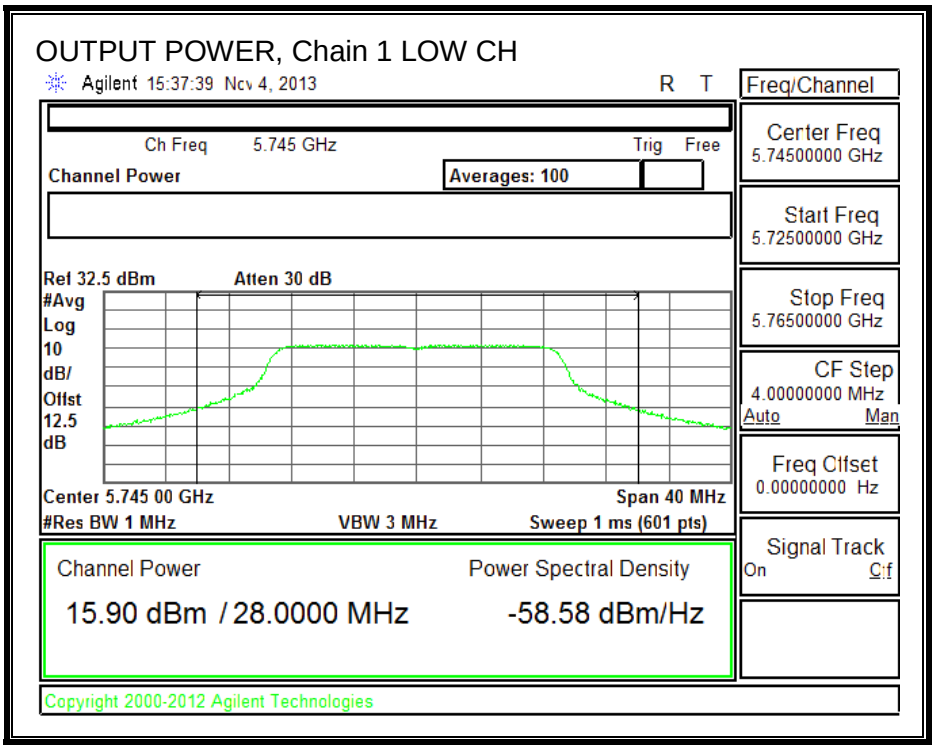
OUTPUT POWER, Chain 0



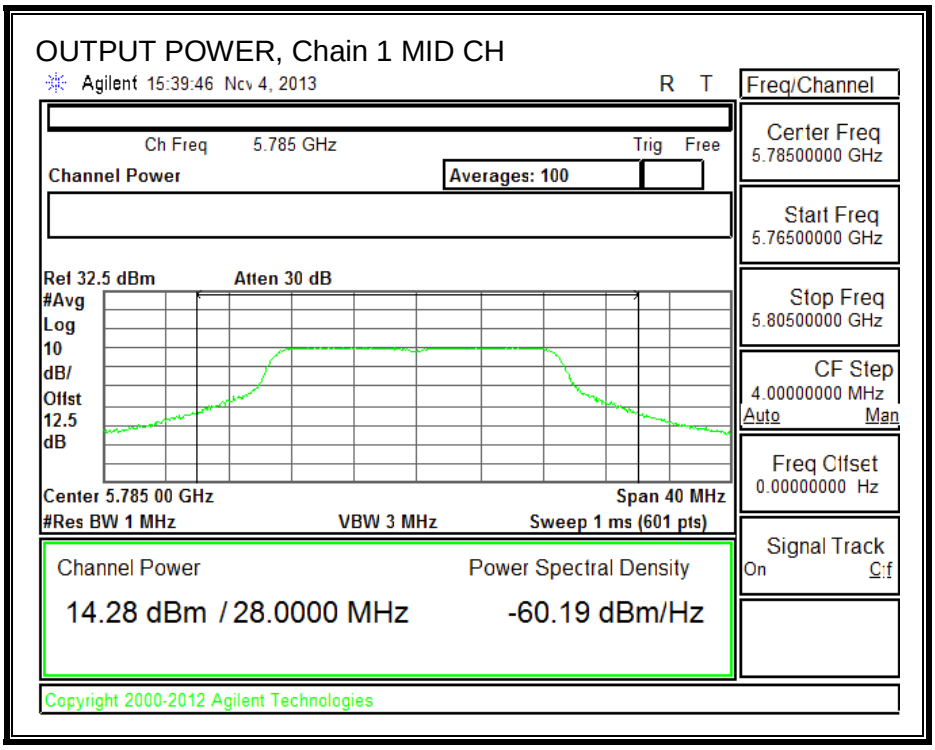




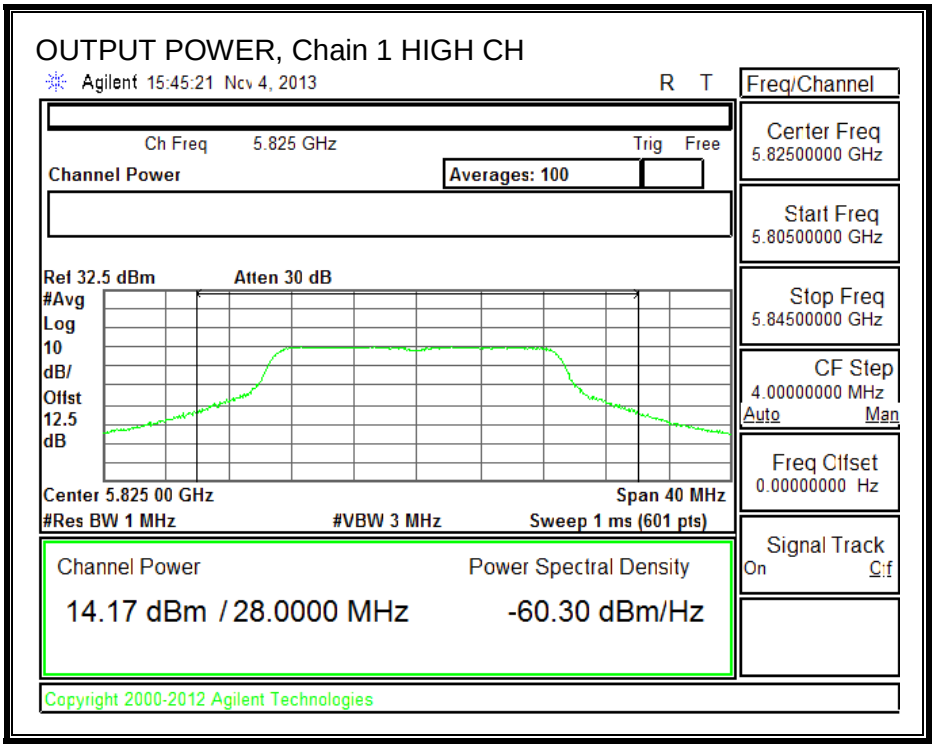
OUTPUT POWER, Chain 1



OUTPUT POWER, Chain 1 MID CH



OUTPUT POWER, Chain 1 HIGH CH



8.2.5. PSD

LIMITS

FCC §15.247

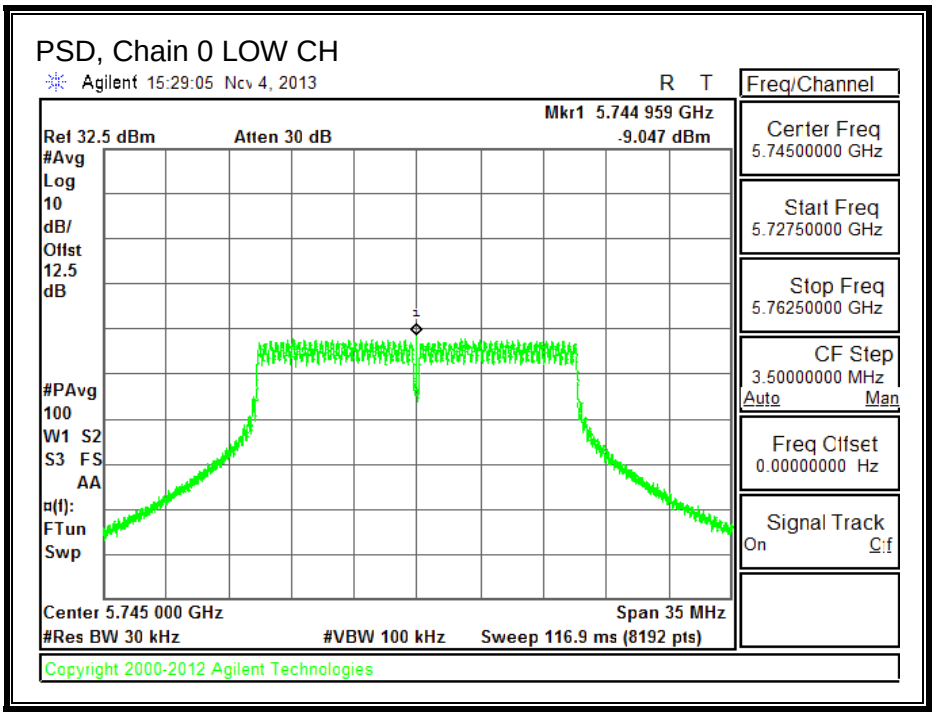
IC RSS-210 A8.2

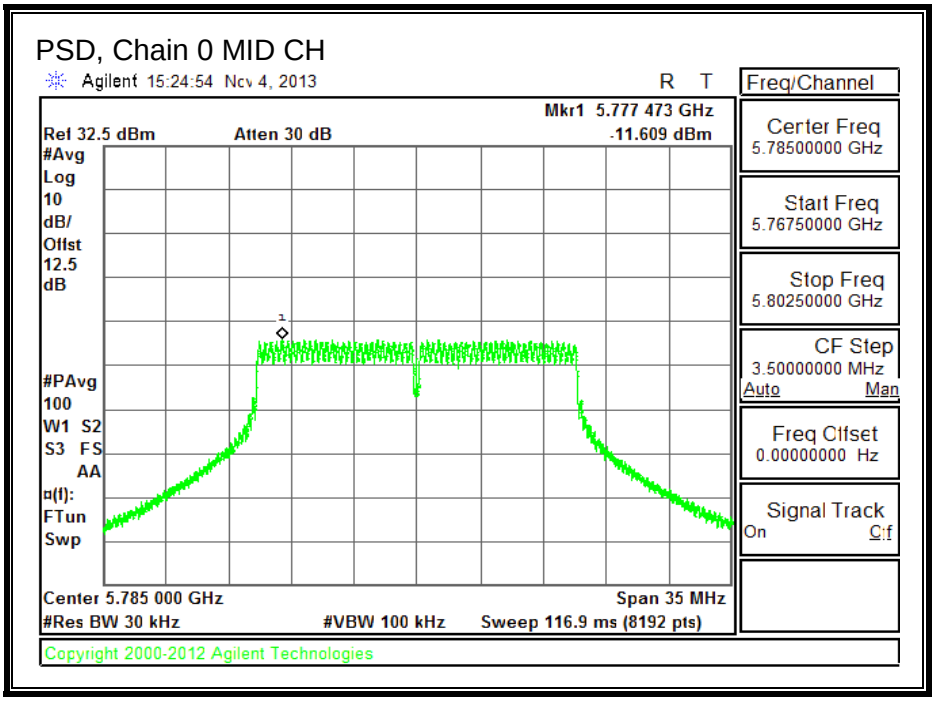
RESULTS

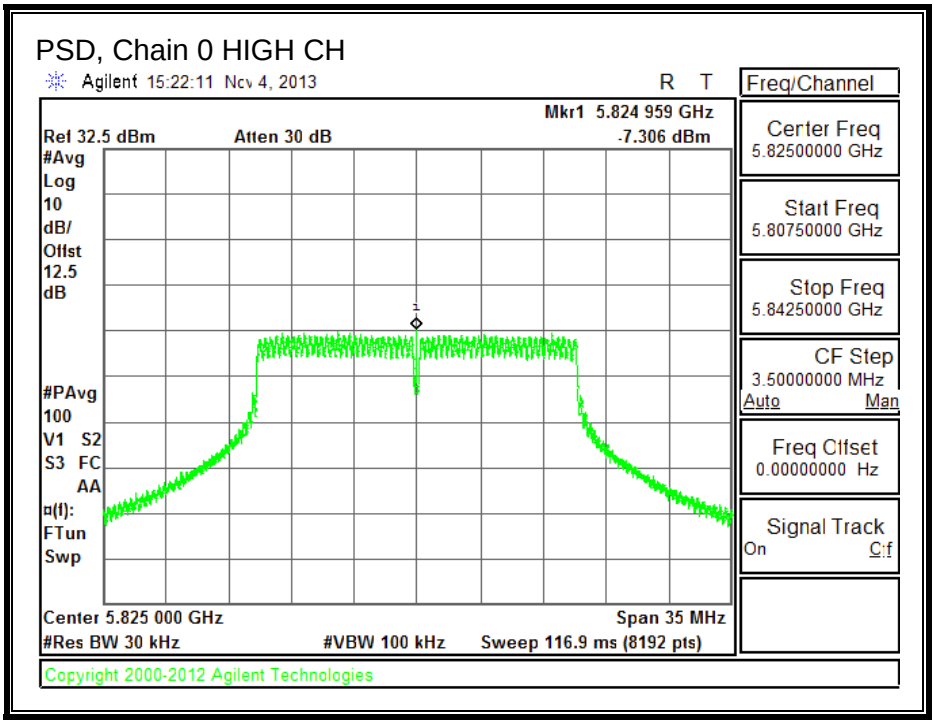
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Chain 1 Meas (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low	5745	-9.047	-9.046	-6.04	8.0	-14.0
Mid	5785	-11.609	-10.834	-8.19	8.0	-16.2
High	5825	-7.306	-5.683	-3.41	8.0	-11.4

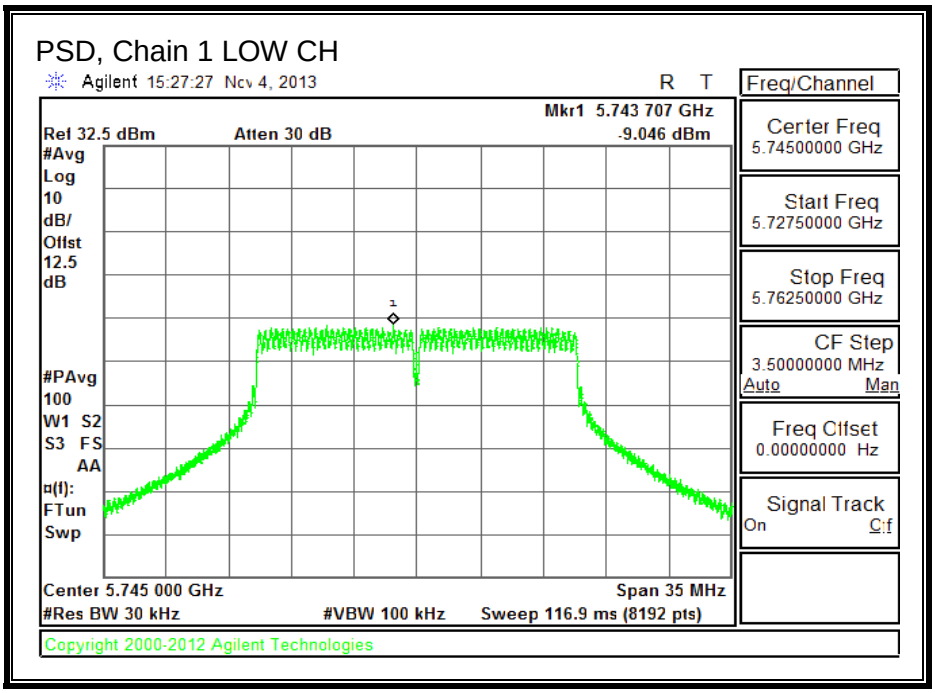
PSD, Chain 0



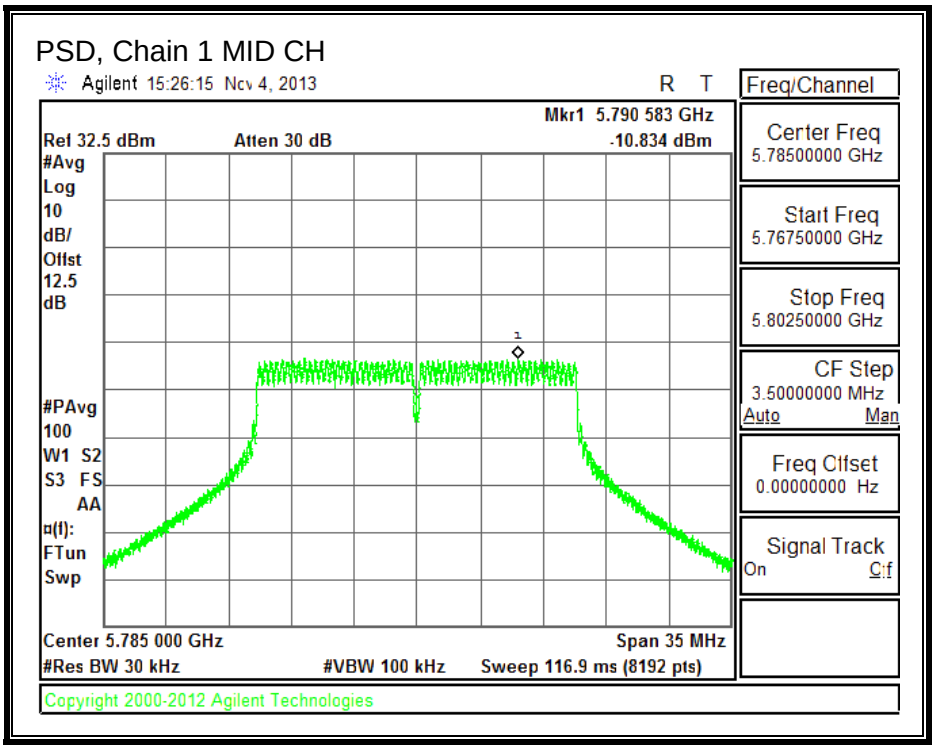




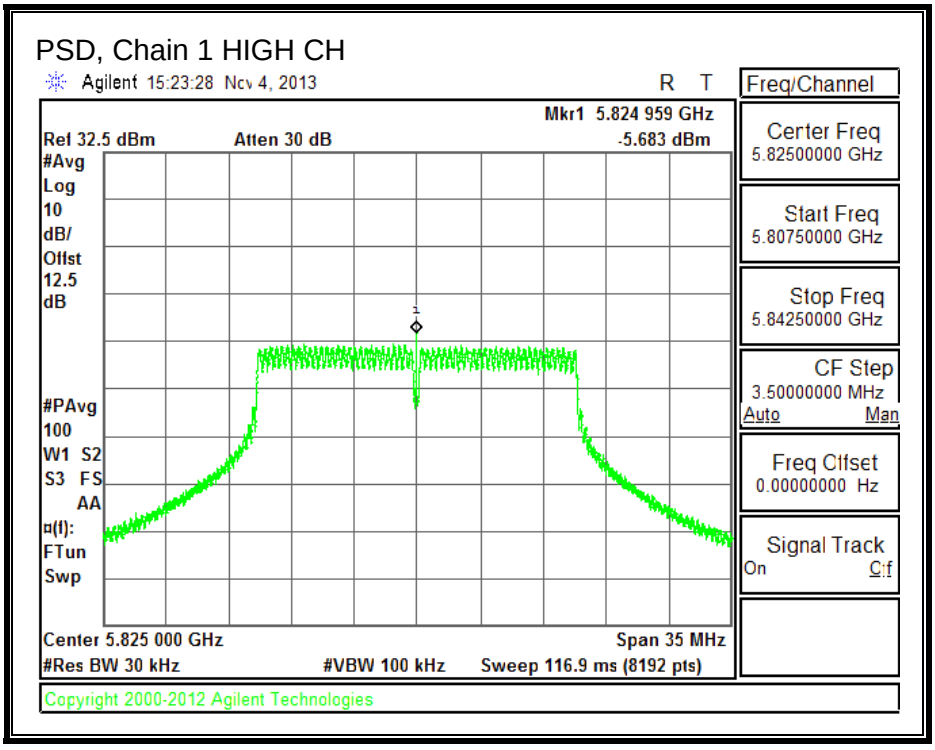
PSD, Chain 1



PSD, Chain 1 MID CH



PSD, Chain 1 HIGH CH



8.2.6. OUT-OF-BAND EMISSIONS

LIMITS

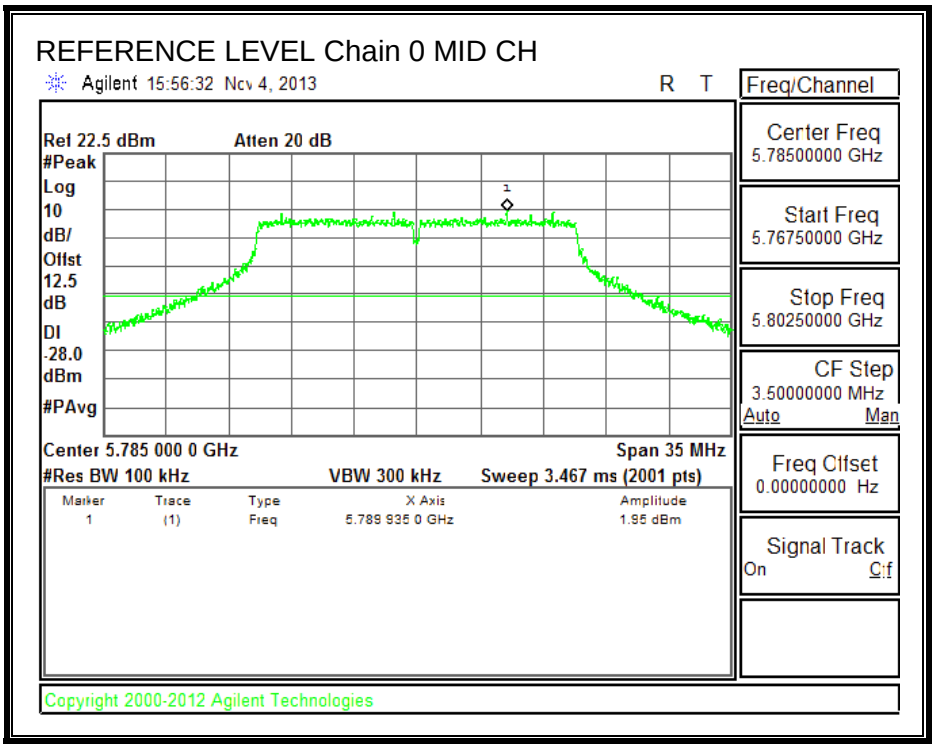
FCC §15.247 (d)

IC RSS-210 A8.5

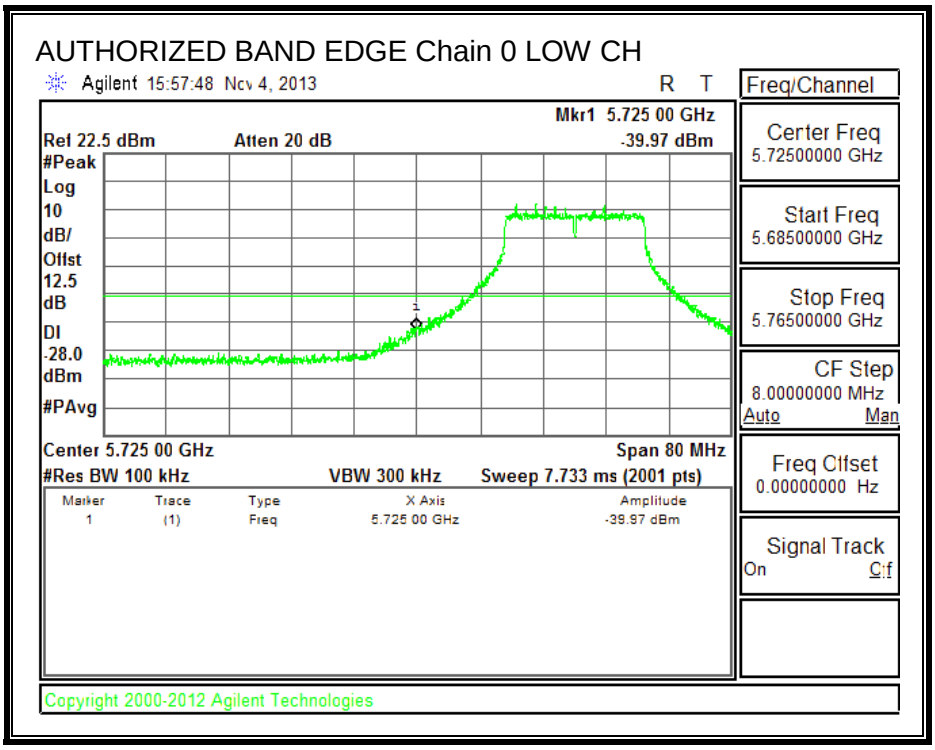
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

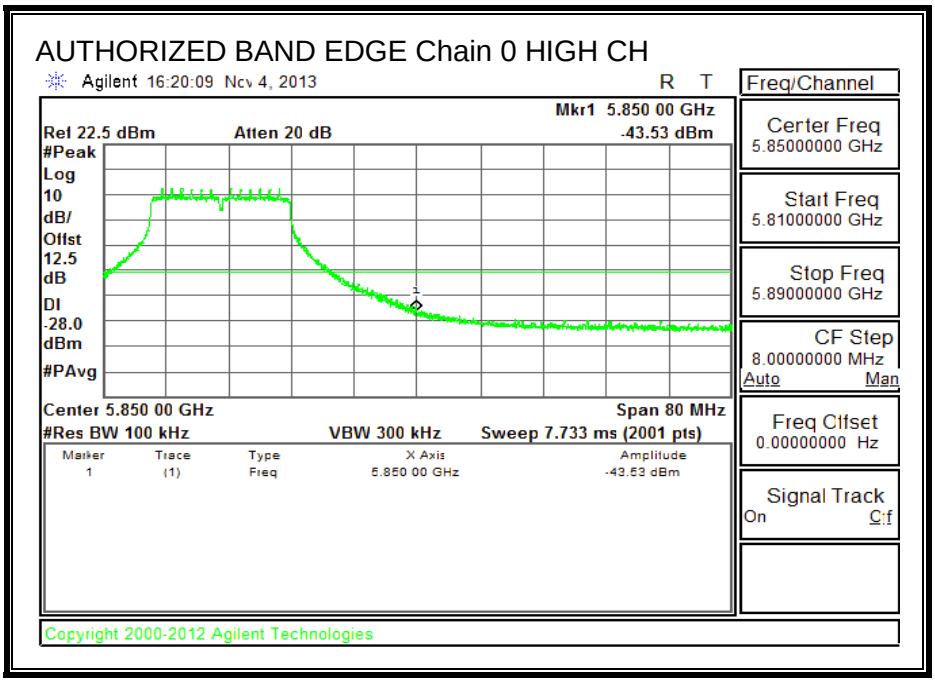
IN-BAND REFERENCE LEVEL, Chain 0



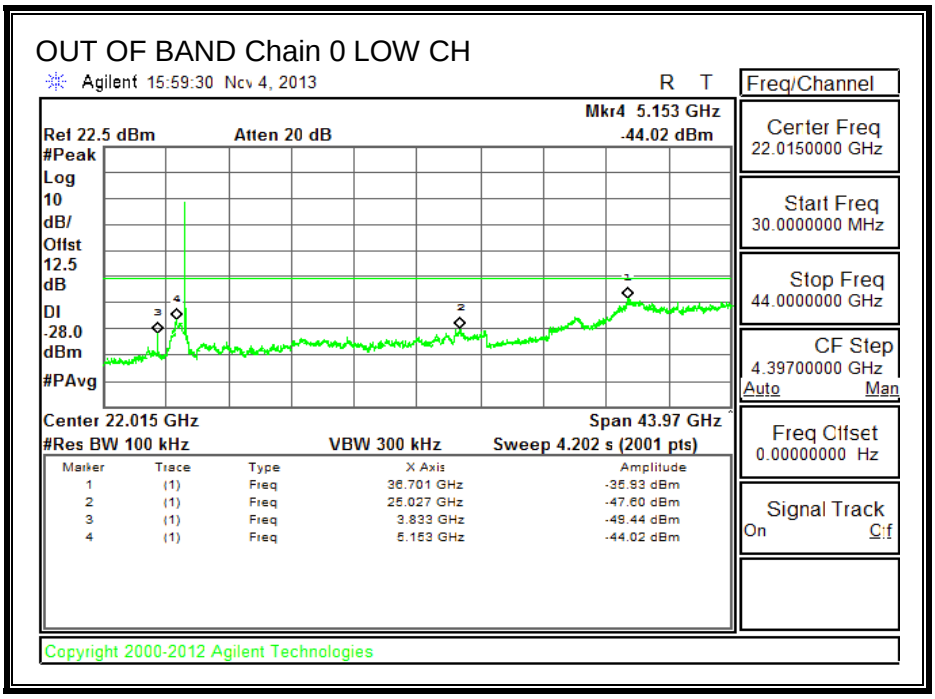
LOW CHANNEL BANDEDGE, Chain 0

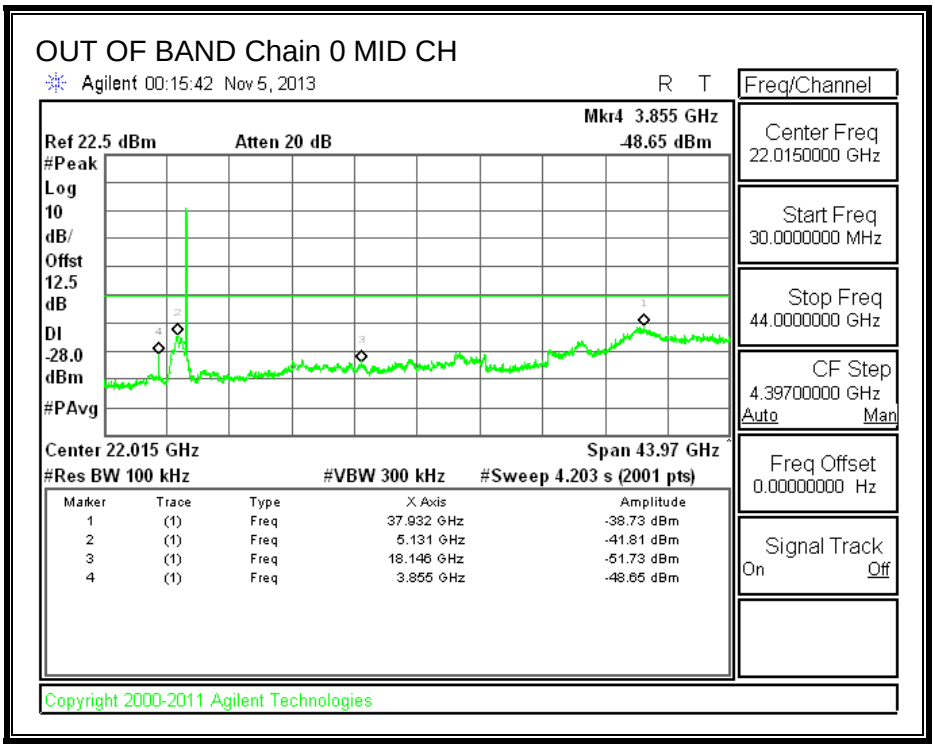


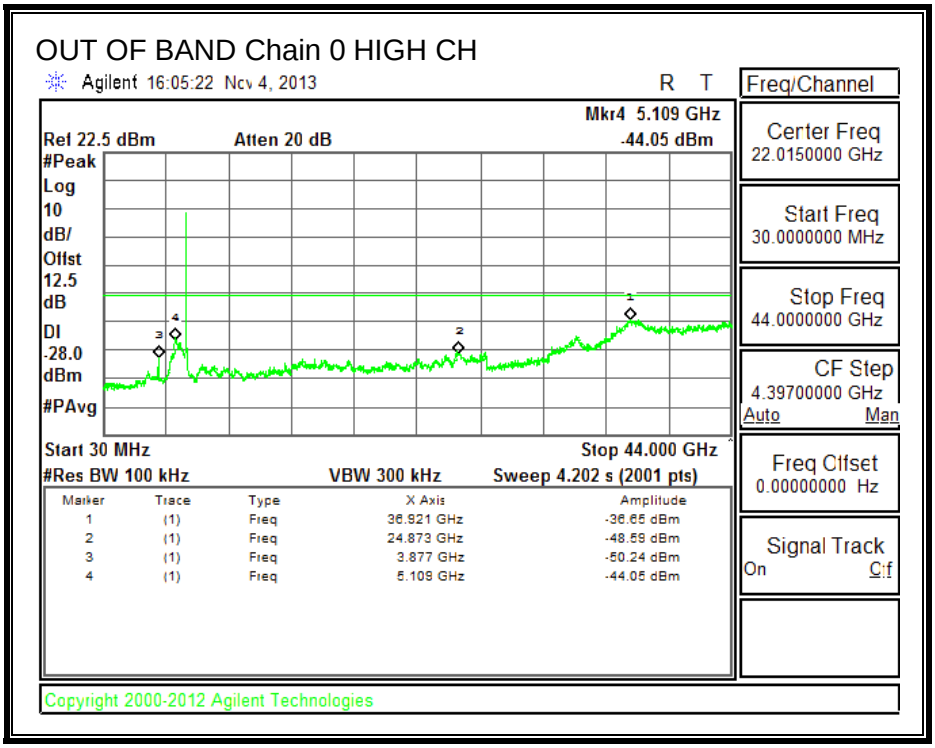
HIGH CHANNEL BANDEDGE, Chain 0



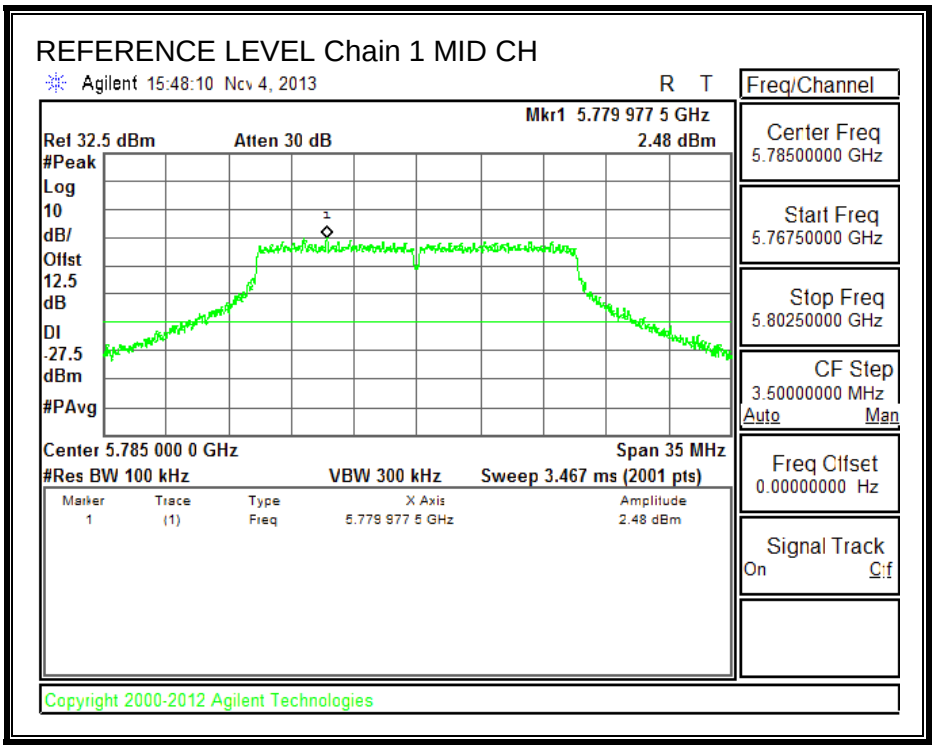
OUT-OF-BAND EMISSIONS, Chain 0



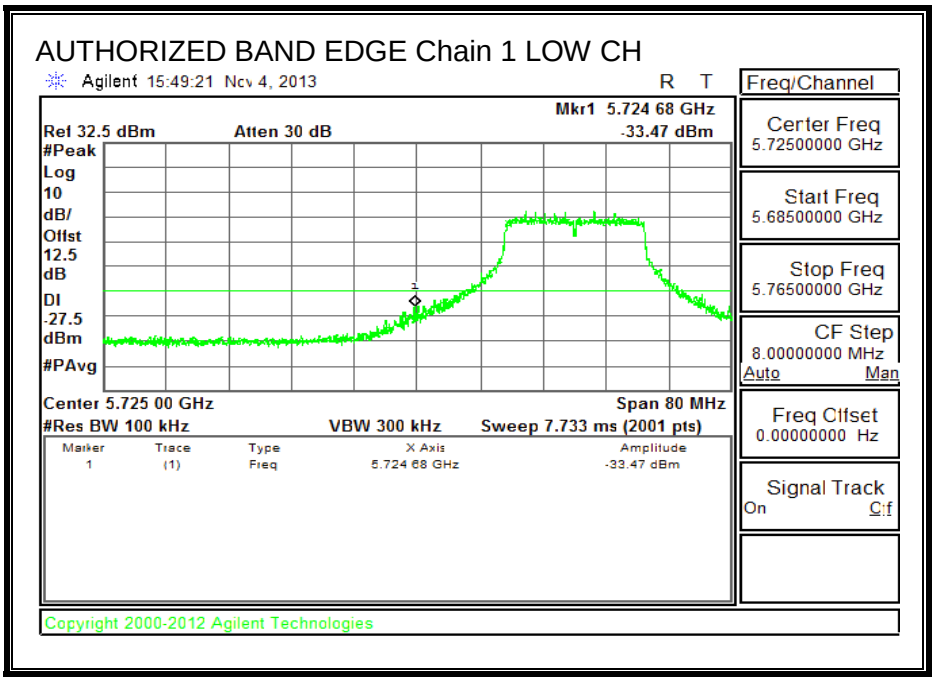




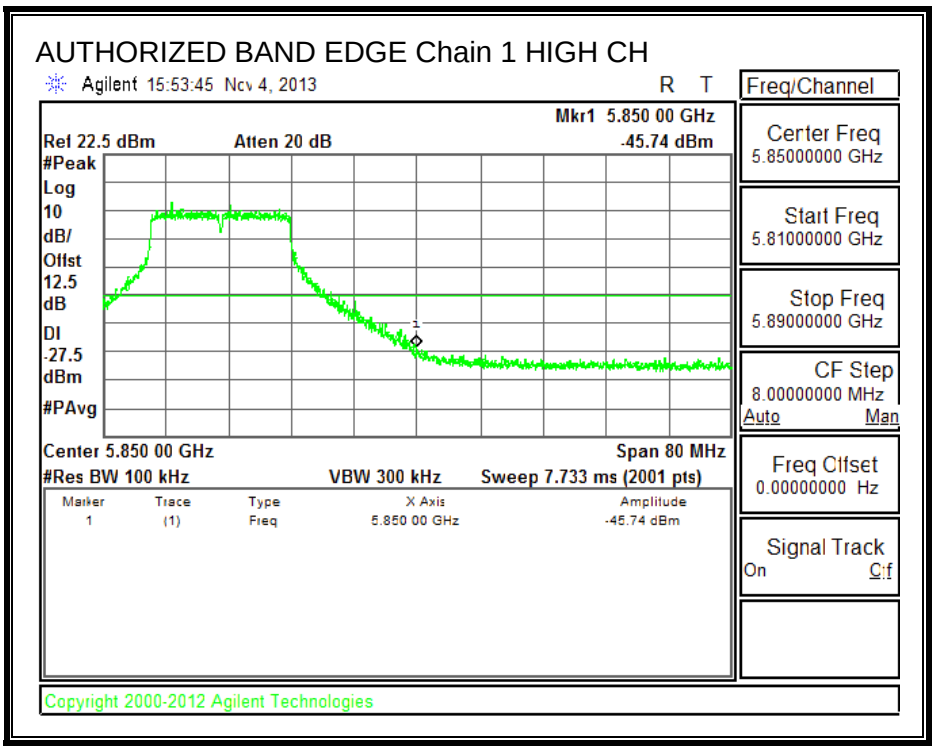
IN-BAND REFERENCE LEVEL, Chain 1



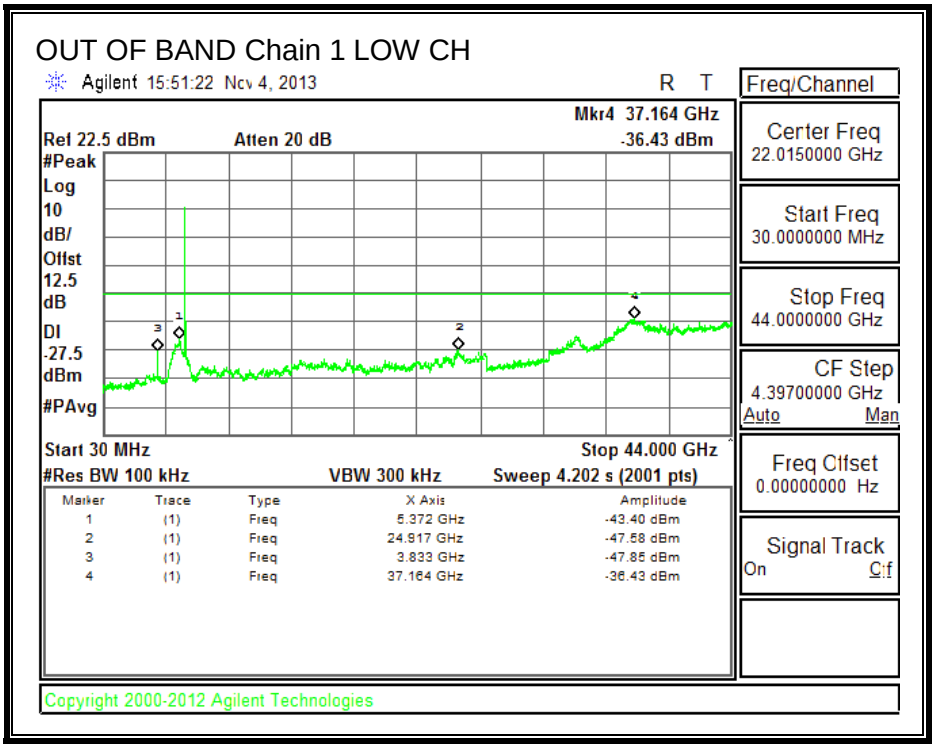
LOW CHANNEL BANDEDGE, Chain 1



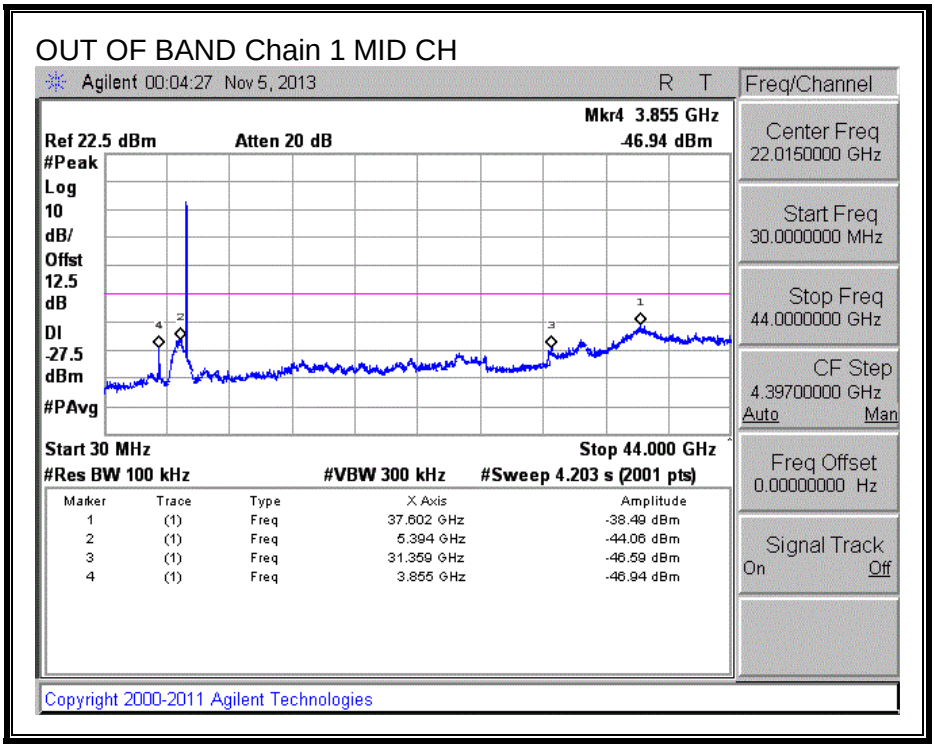
HIGH CHANNEL BANDEDGE, Chain 1

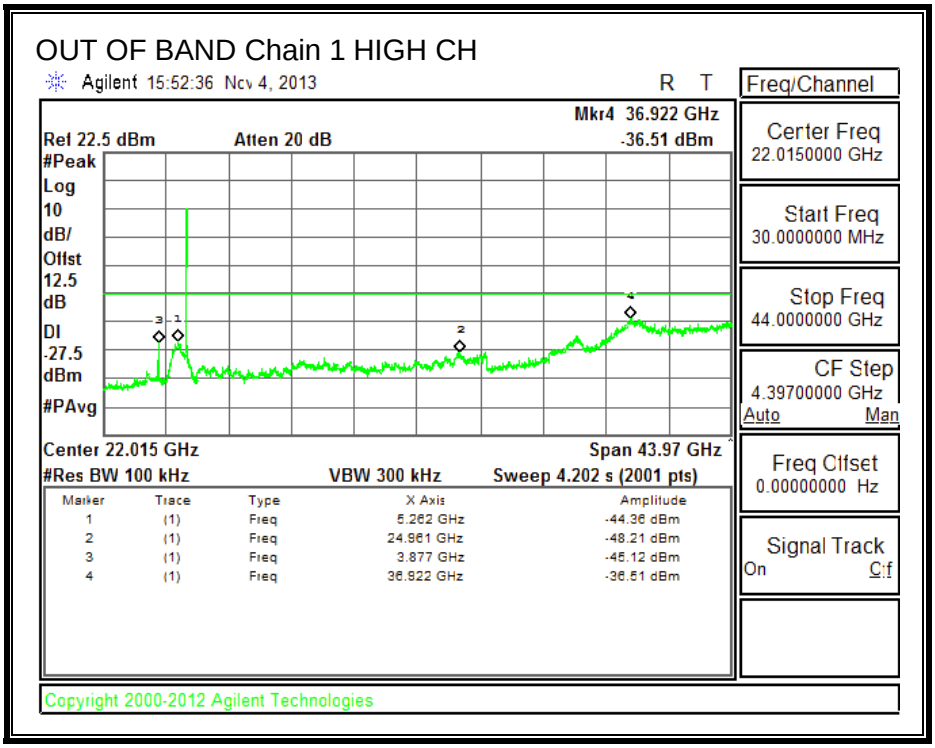


OUT OF BAND Chain 1 LOW CH



OUT OF BAND Chain 1 MID CH





8.3. 802.11n HT40 STBC 2TX MODE IN THE 5.8 GHz BAND

8.3.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

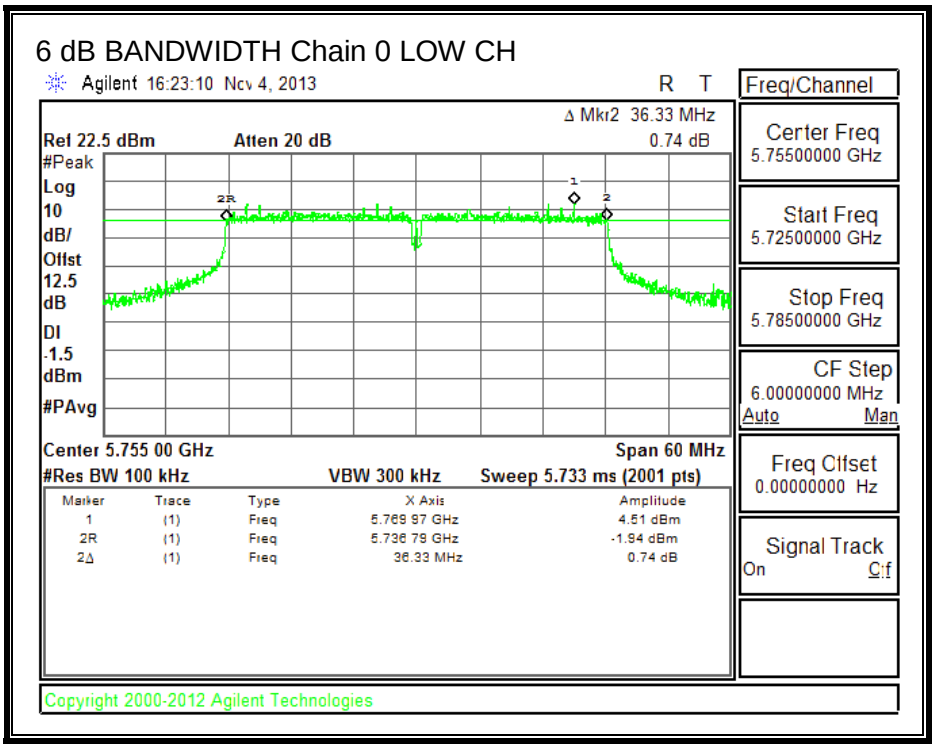
IC RSS-210 A8.2 (a)

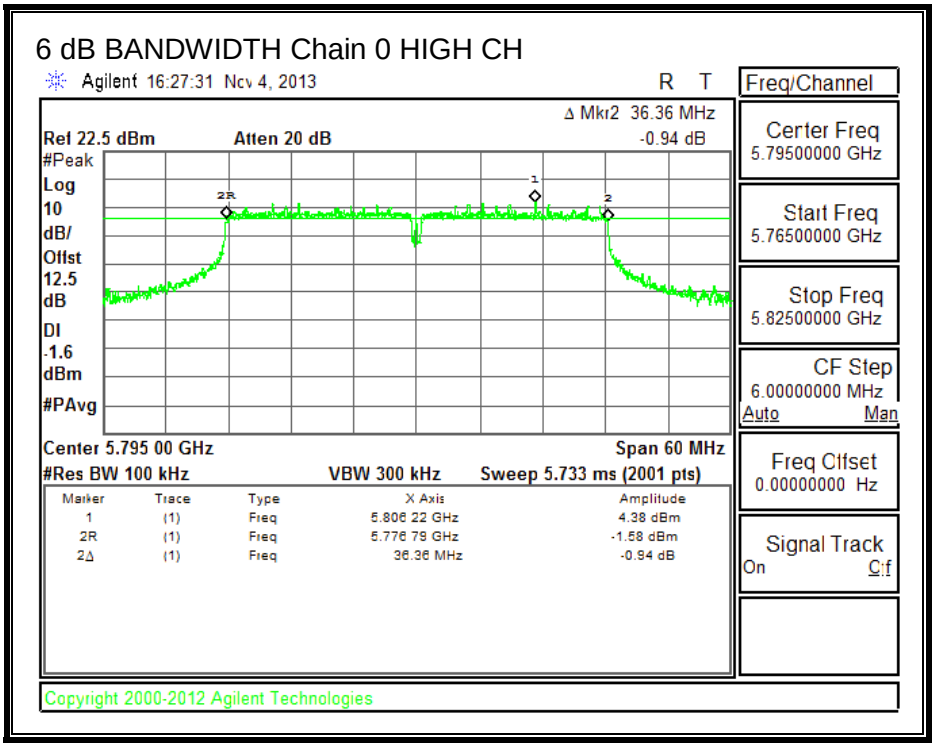
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

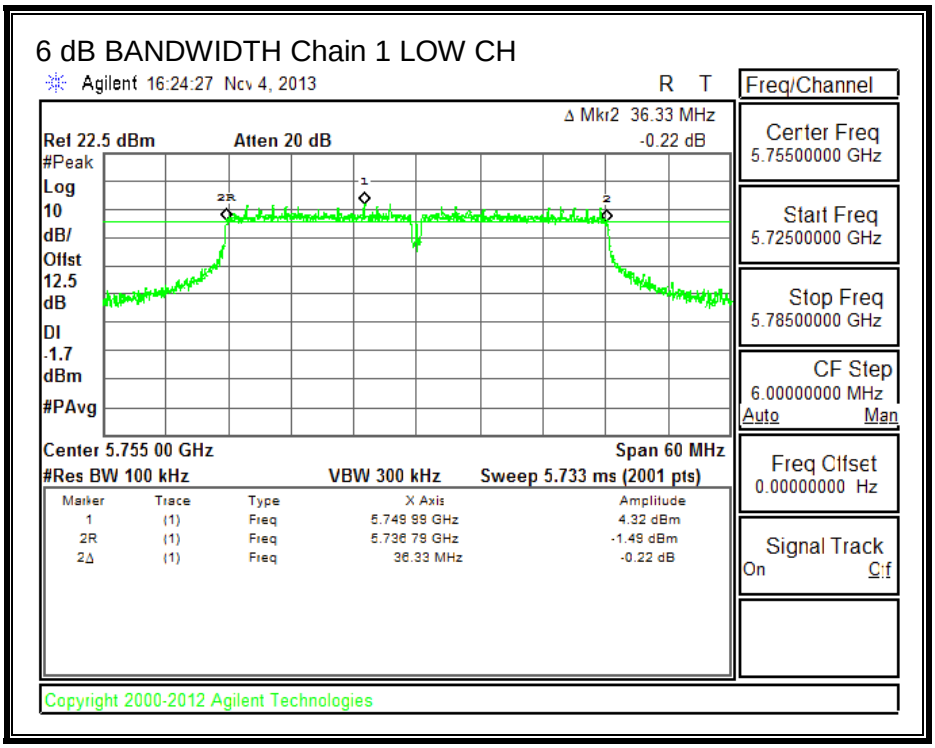
Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	5755	36.33	36.33	0.5
High	5795	36.36	36.37	0.5

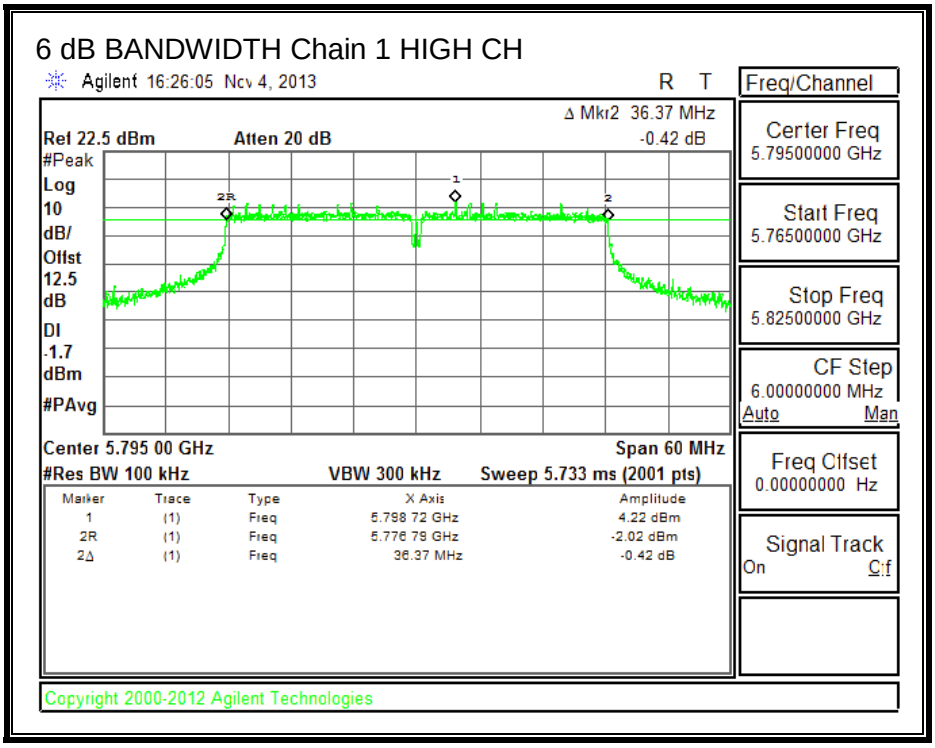
6 dB BANDWIDTH, Chain 0





6 dB BANDWIDTH, Chain 1





8.3.2. 26 dB BANDWIDTH

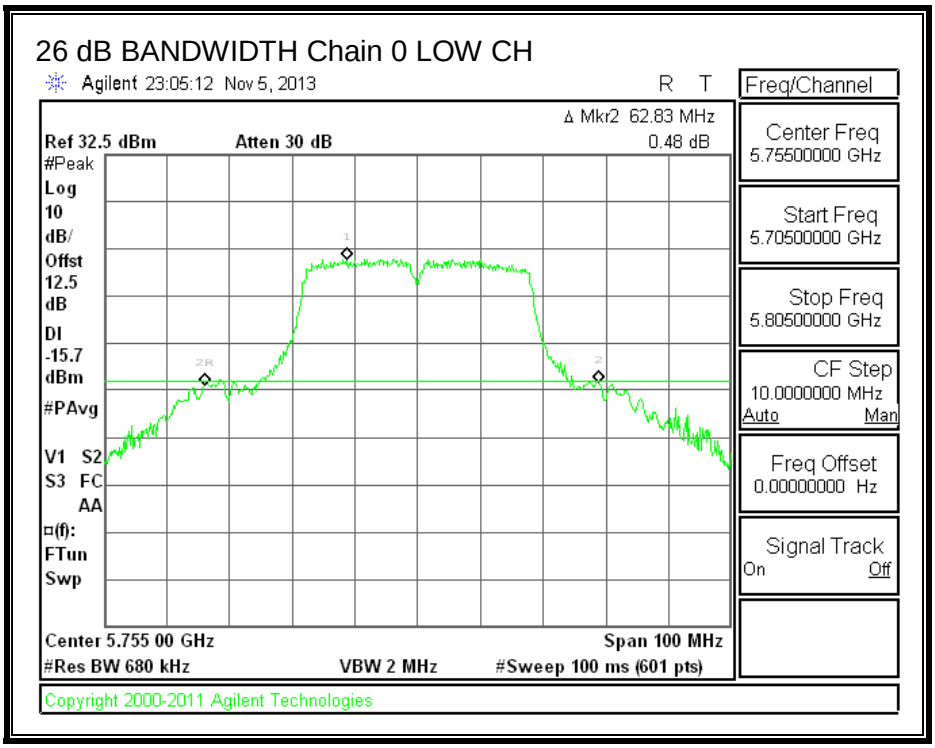
LIMITS

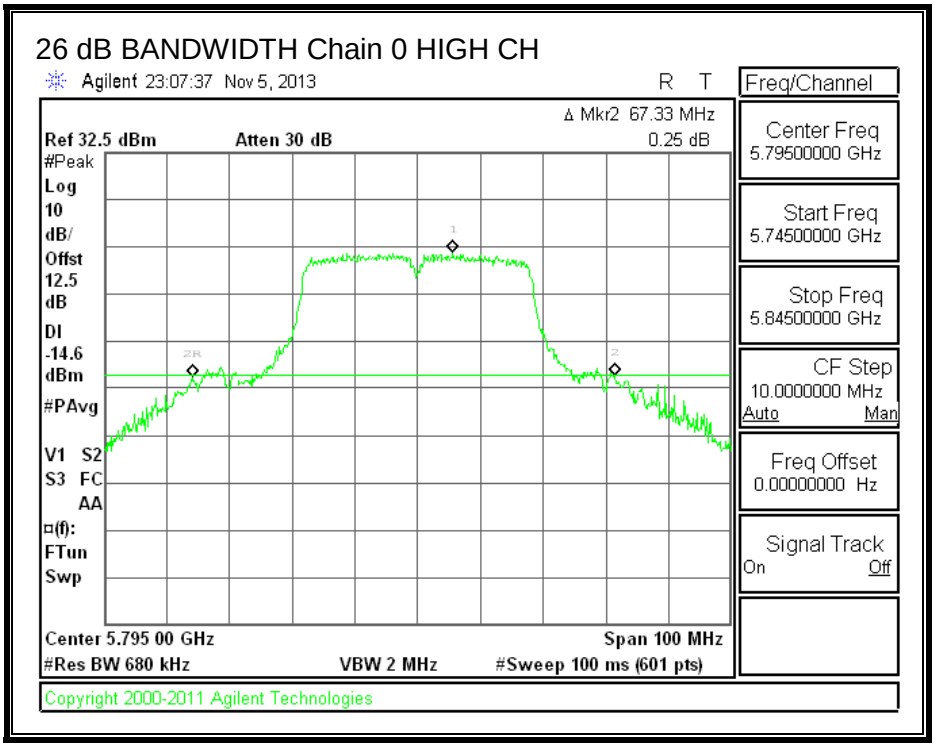
For reporting purposes.

RESULTS

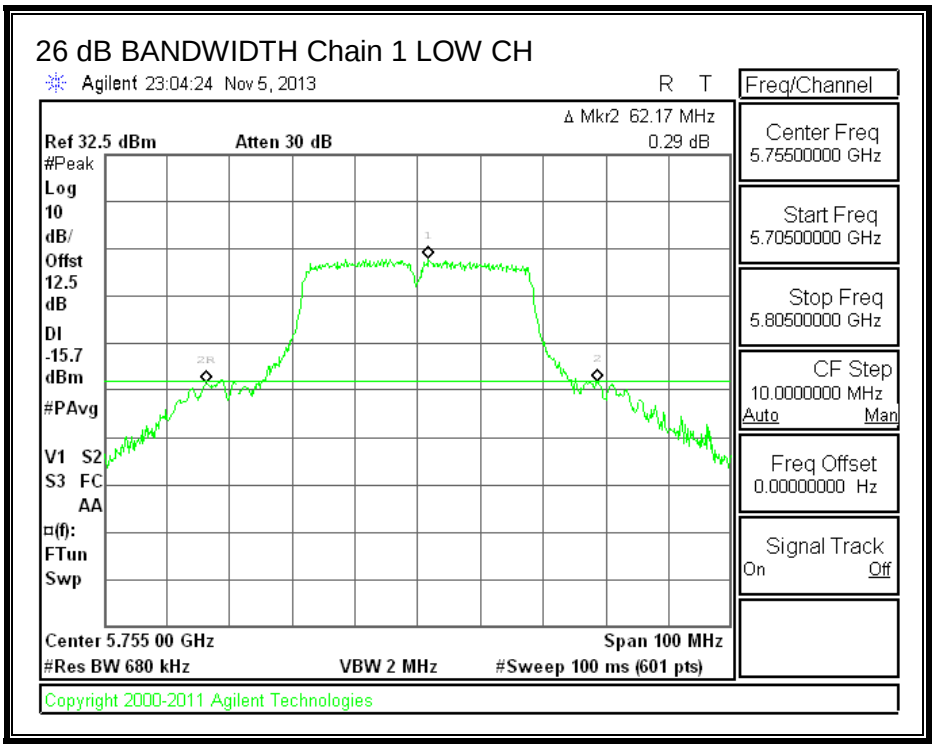
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	5755	62.83	62.17	0.5
High	5795	67.33	65.50	0.5

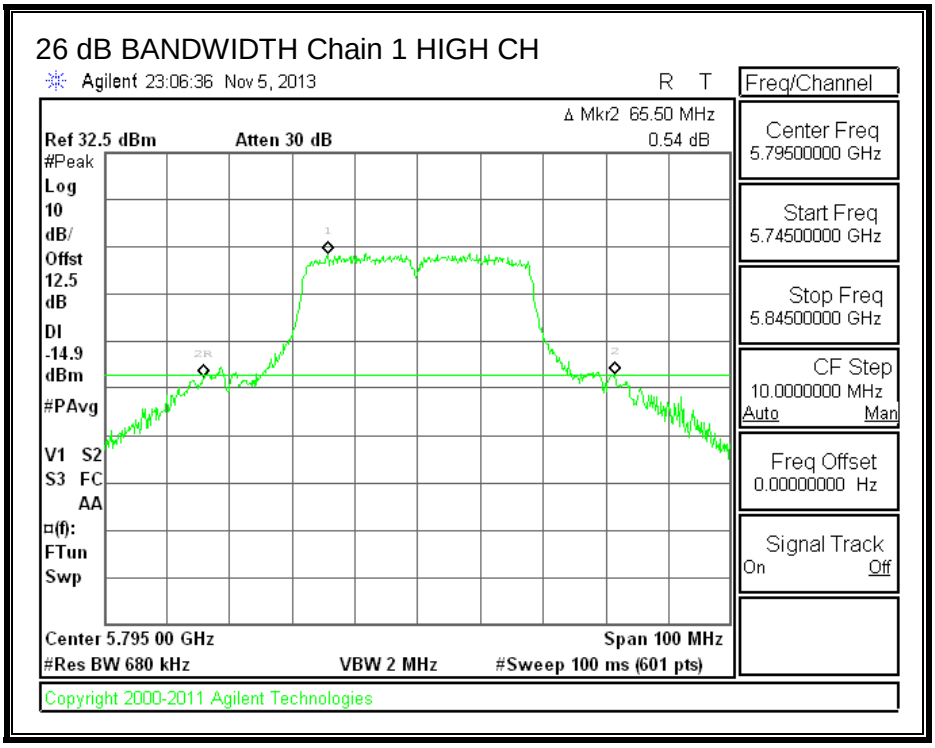
26 dB BANDWIDTH, Chain 0





26 dB BANDWIDTH, Chain 1





8.3.3. 99% BANDWIDTH

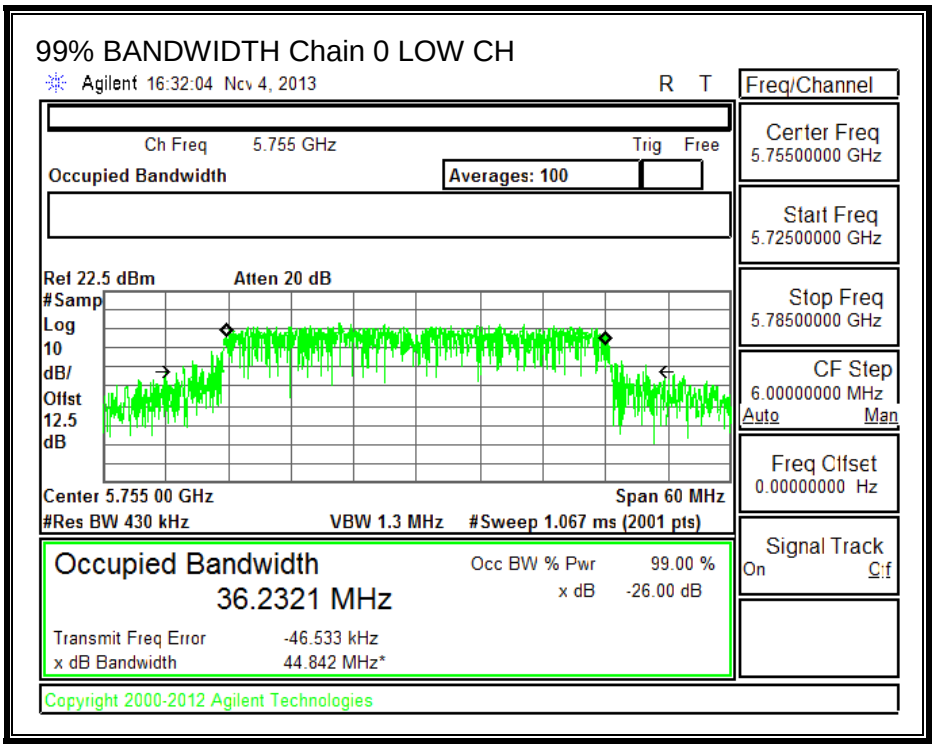
LIMITS

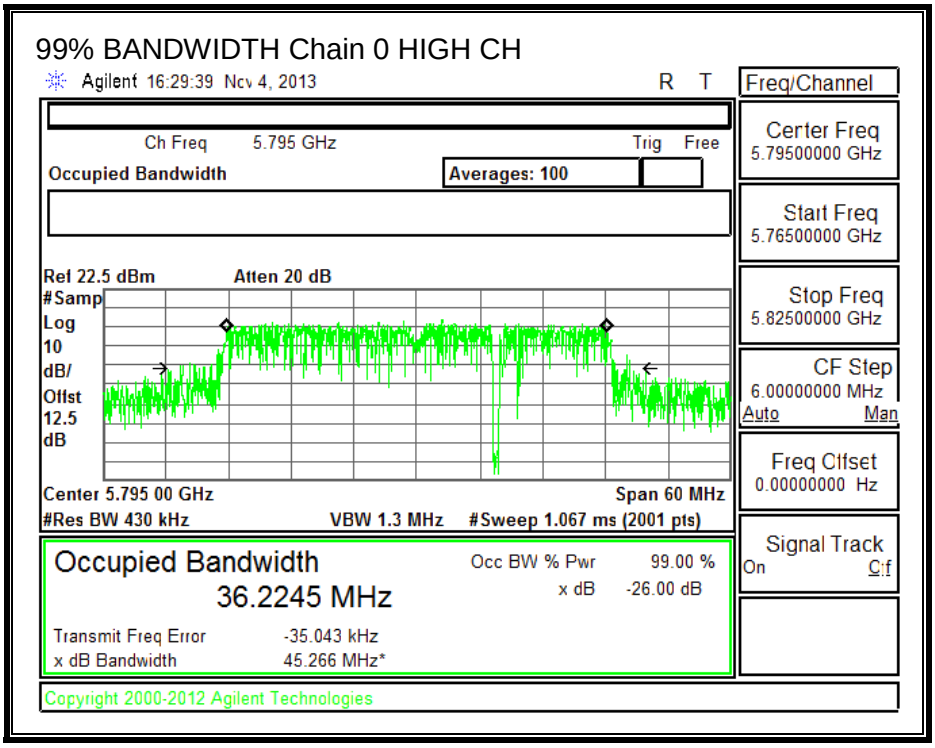
None; for reporting purposes only.

RESULTS

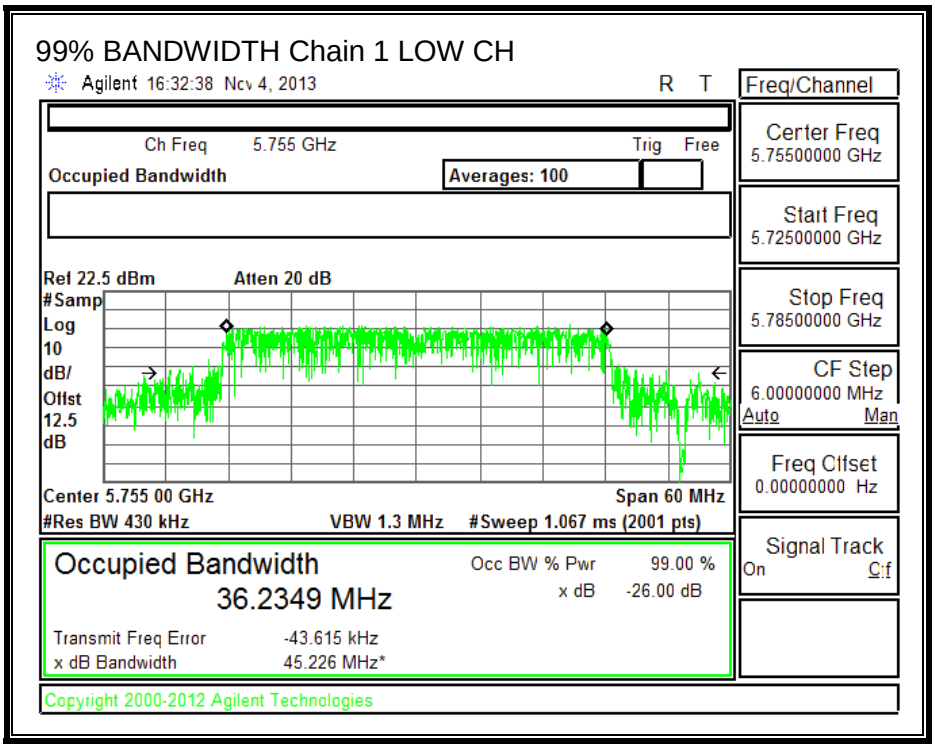
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5755	36.2321	36.2349
High	5795	36.2245	36.2308

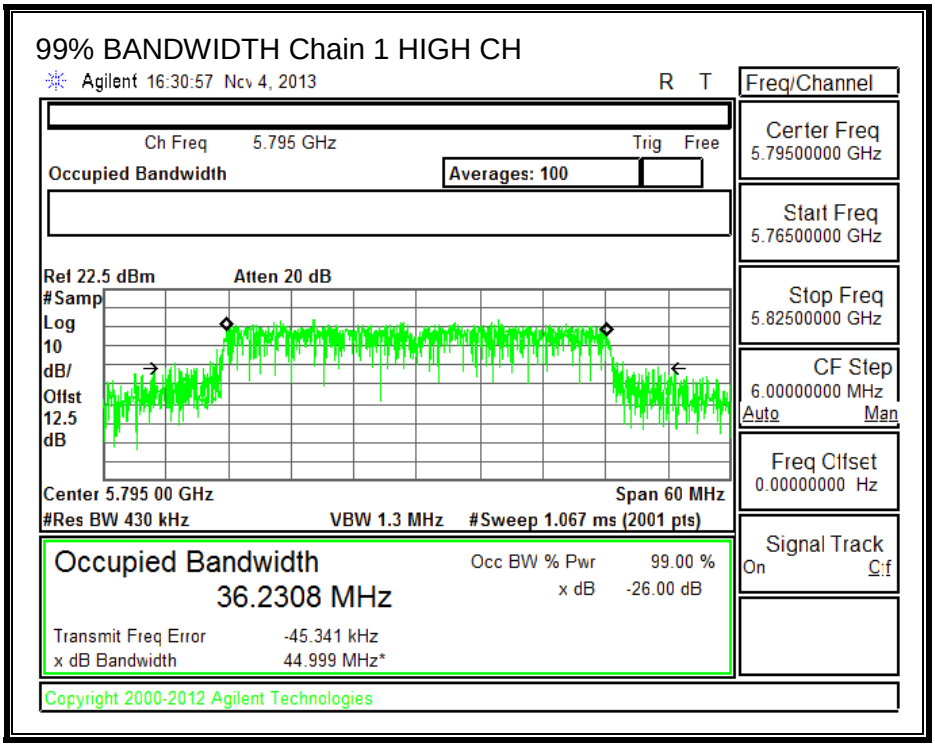
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





8.3.4. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

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

DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is the same for each chain. The directional gain is equal to the antenna gain.

RESULTS

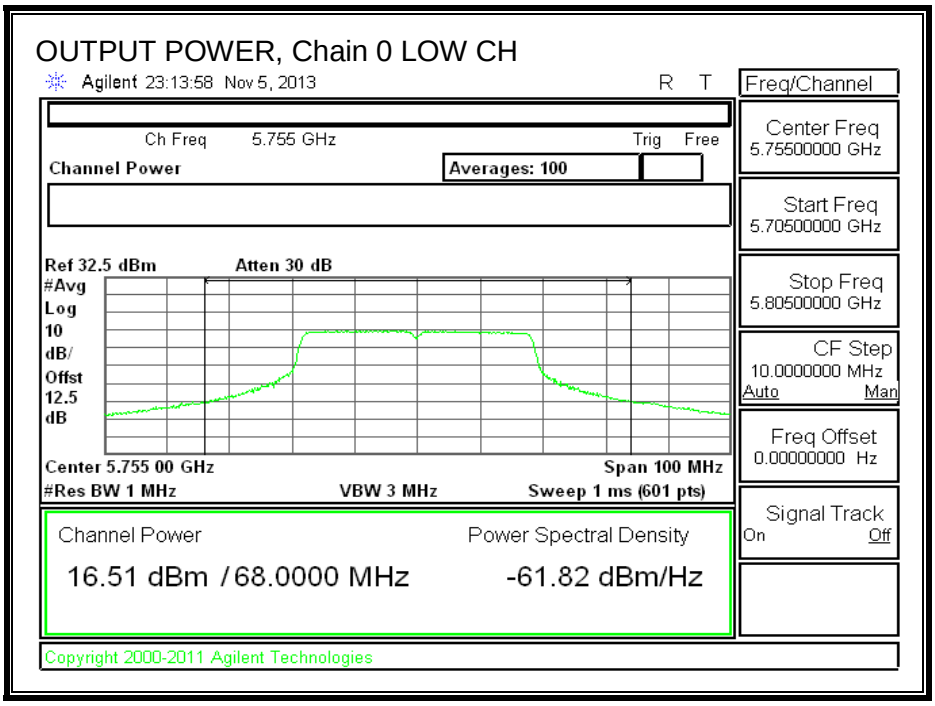
Limits

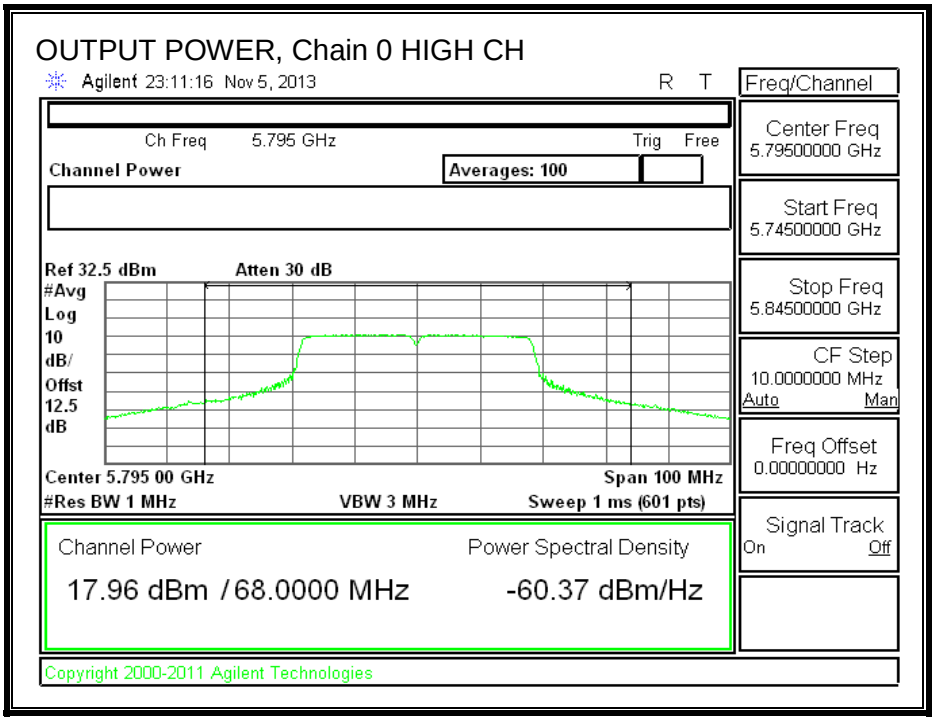
Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	5755	13.00	23.00	30	36	23.00
High	5795	13.00	23.00	30	36	23.00

Results

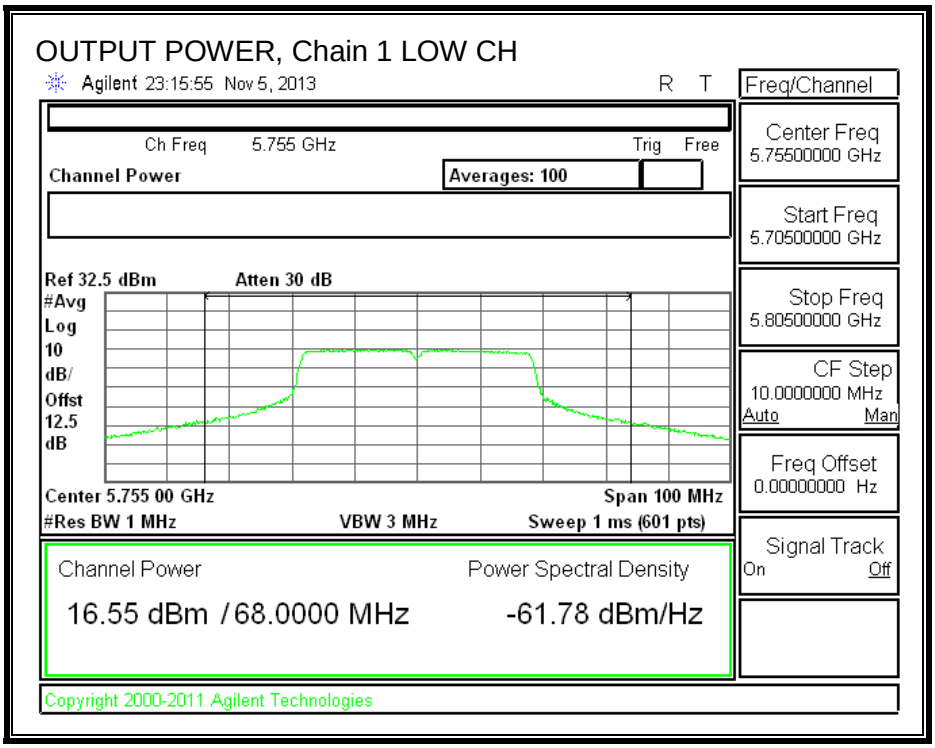
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	5755	16.51	16.55	19.54	23.00	-3.46
High	5795	17.96	17.28	20.64	23.00	-2.36

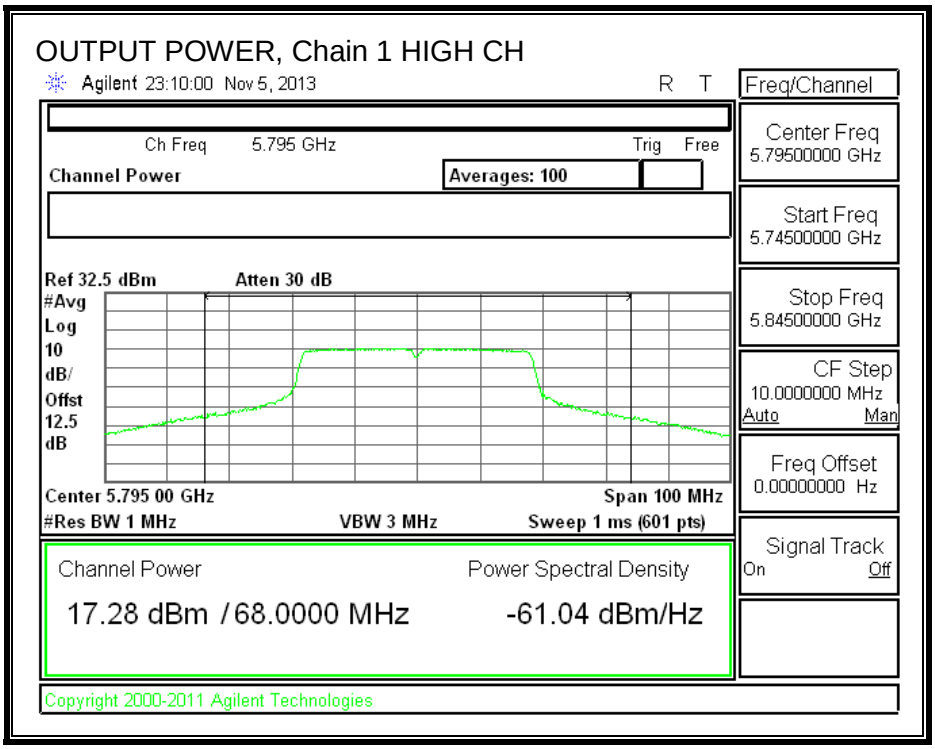
OUTPUT POWER, Chain 0





OUTPUT POWER, Chain 1





8.3.5. PSD

LIMITS

FCC §15.247

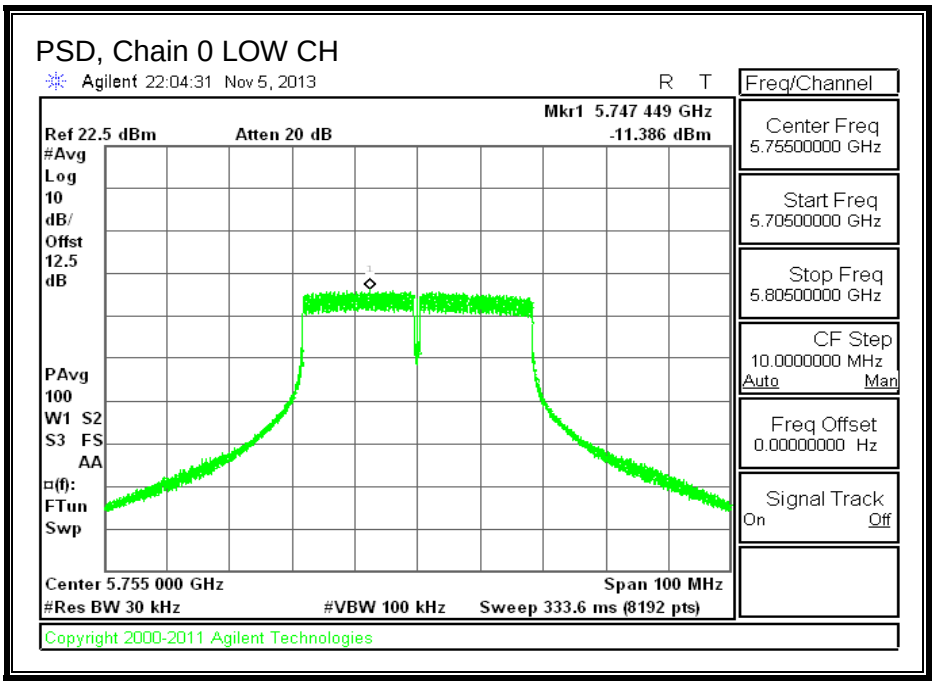
IC RSS-210 A8.2

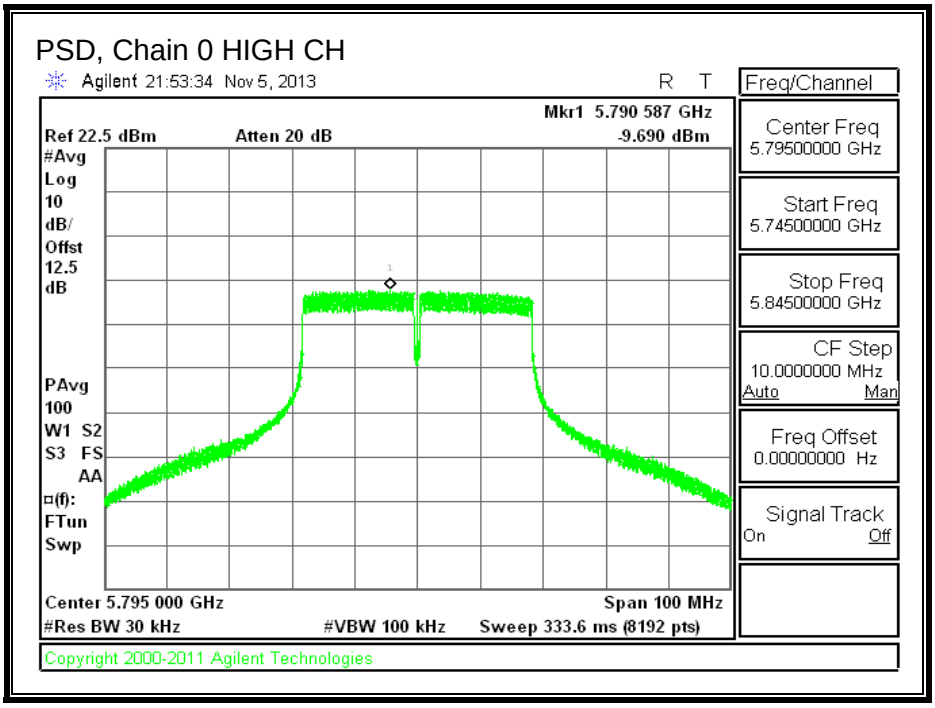
RESULTS

PSD Results

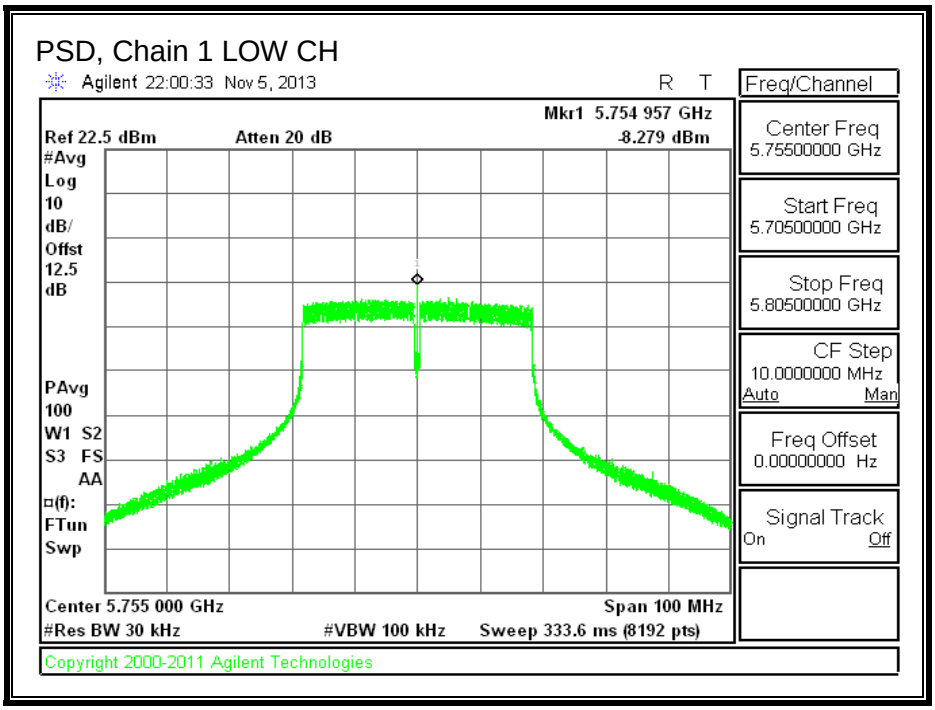
Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Chain 1 Meas (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low	5755	-11.386	-8.279	-6.55	8.0	-14.6
High	5795	-9.690	-10.596	-7.11	8.0	-15.1

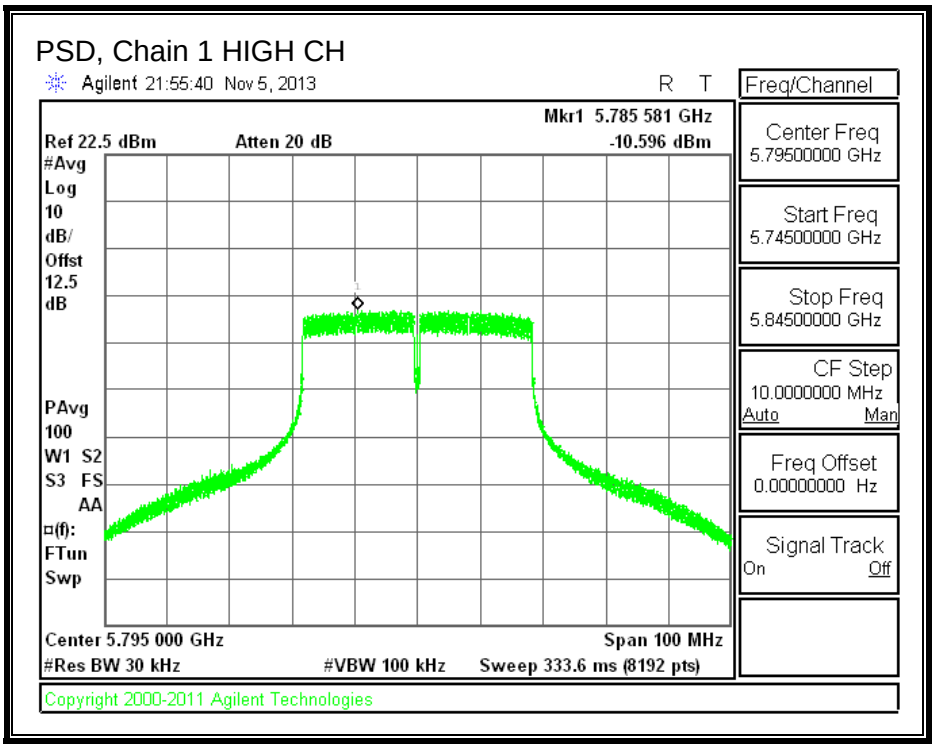
PSD, Chain 0





PSD, Chain 1





8.3.6. OUT-OF-BAND EMISSIONS

LIMITS

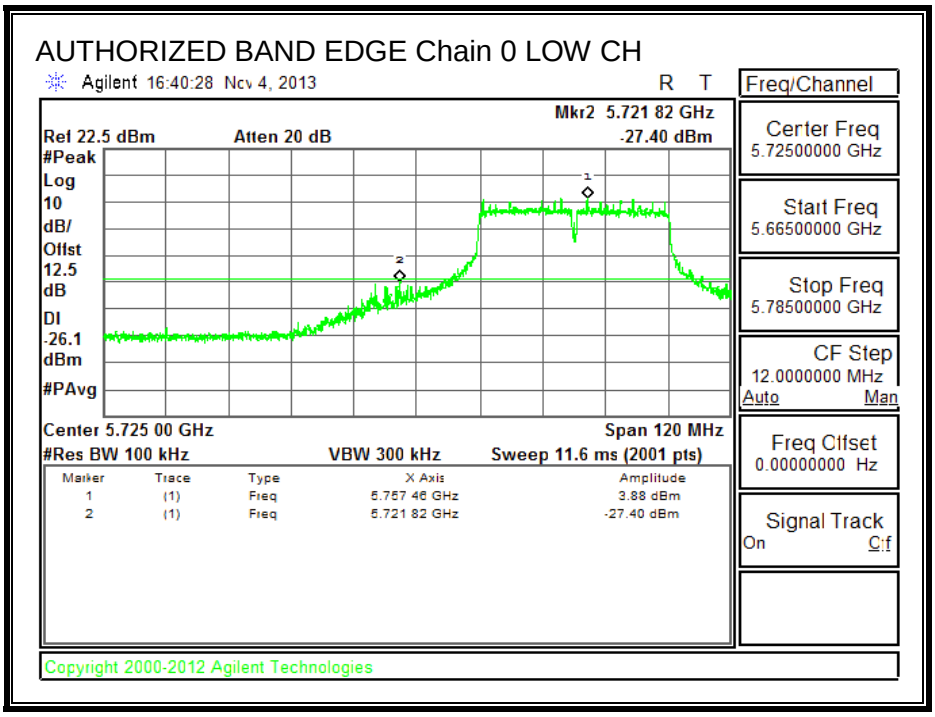
FCC §15.247 (d)

IC RSS-210 A8.5

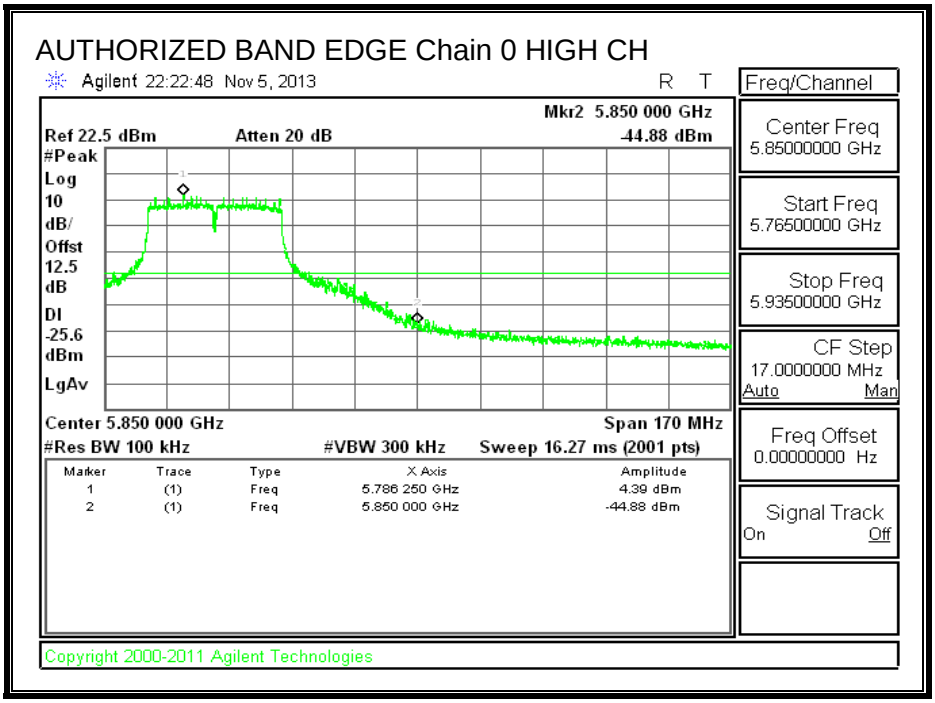
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

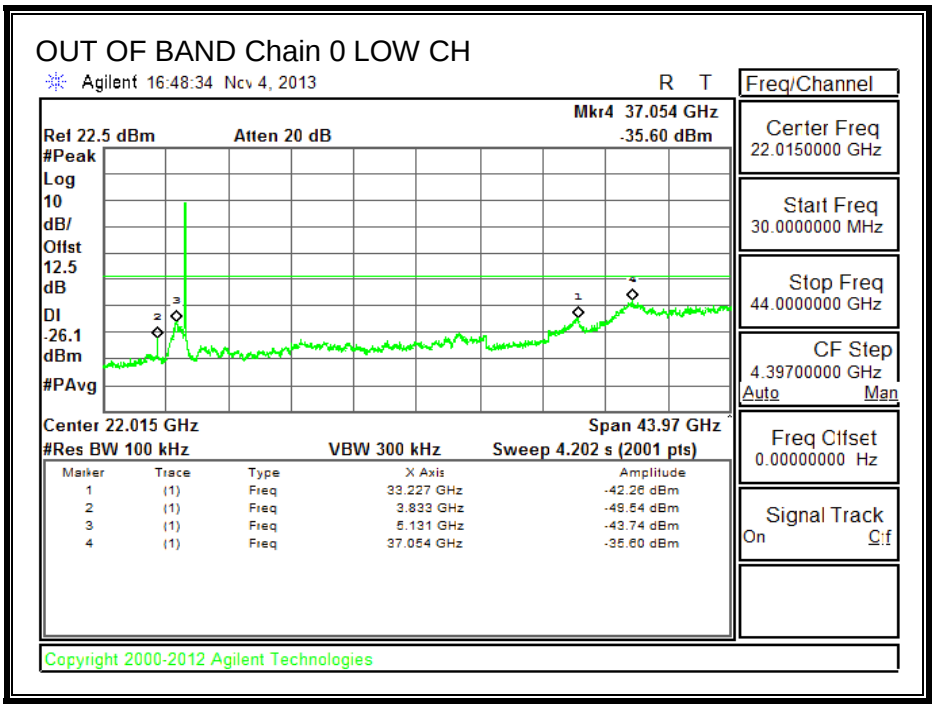
LOW CHANNEL BANDEDGE, Chain 0

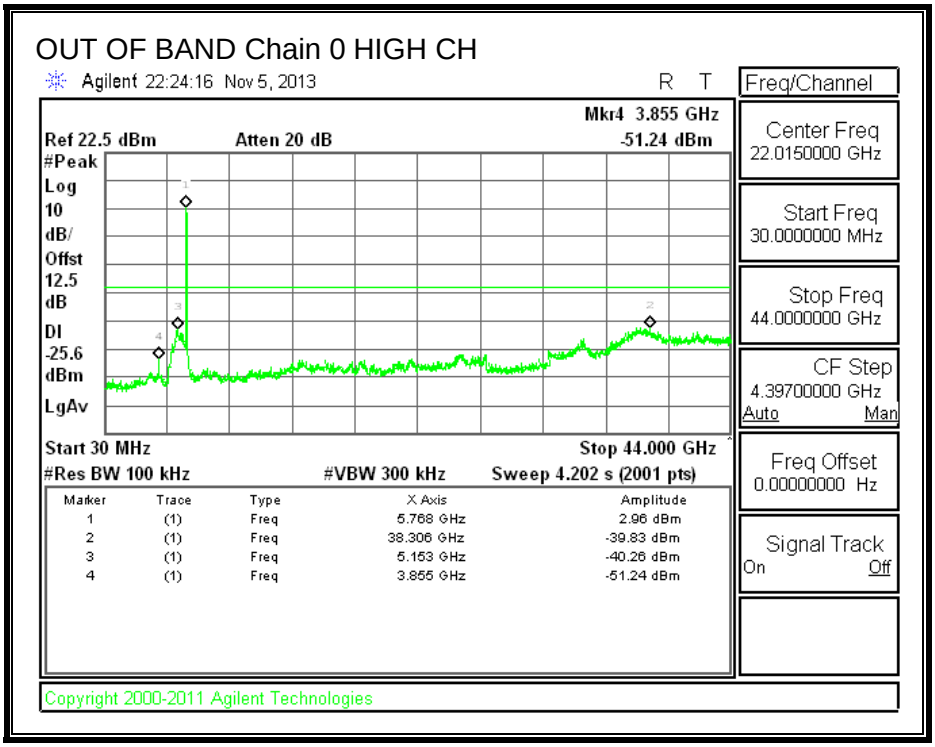


HIGH CHANNEL BANDEDGE, Chain 0

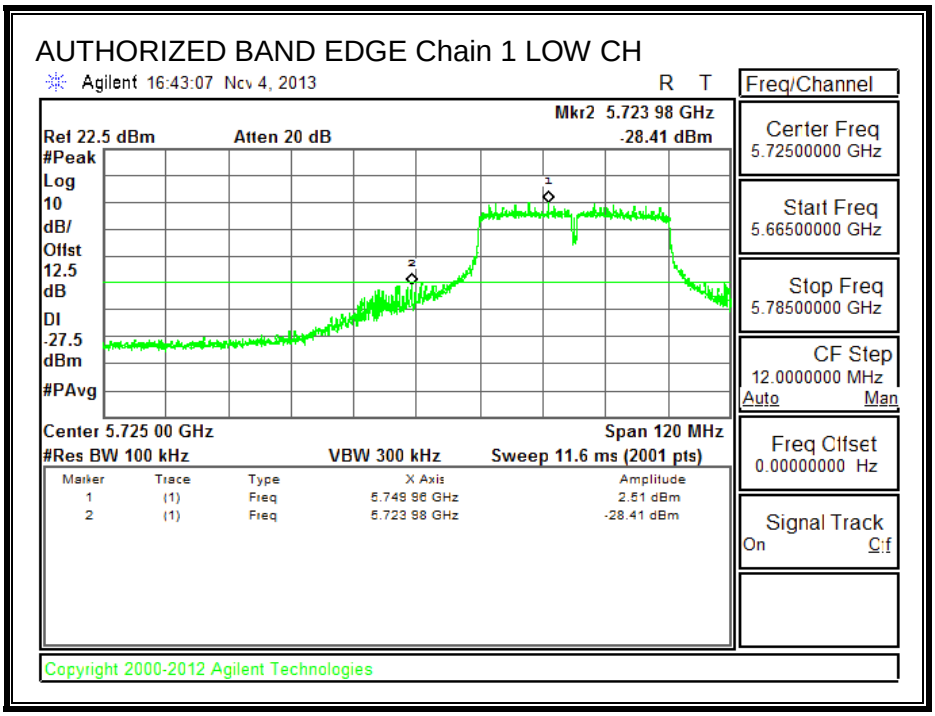


OUT-OF-BAND EMISSIONS, Chain 0

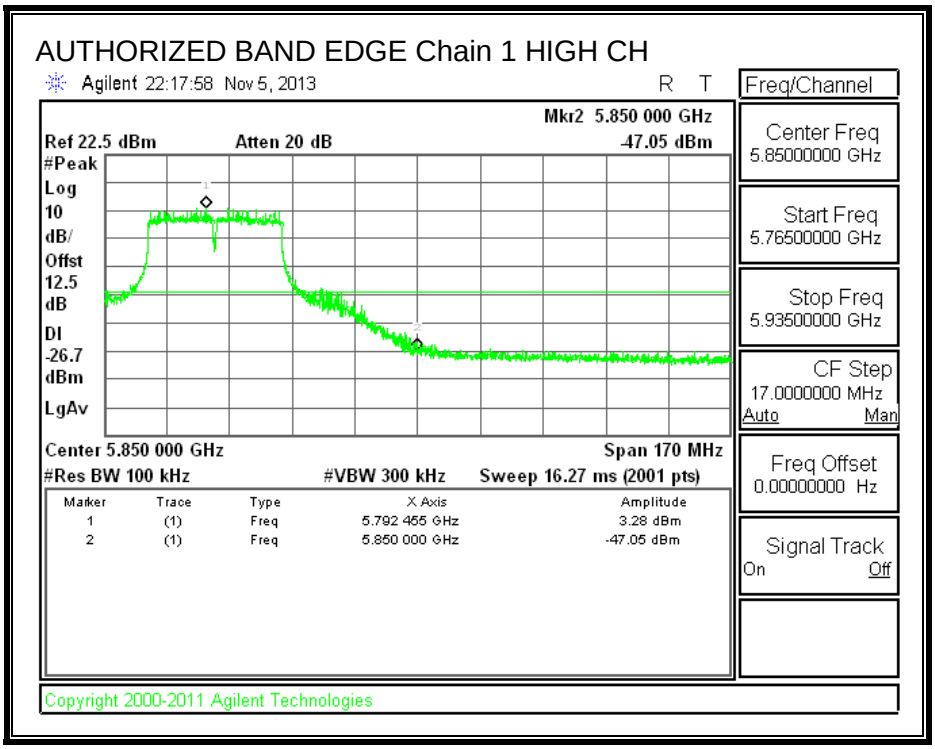




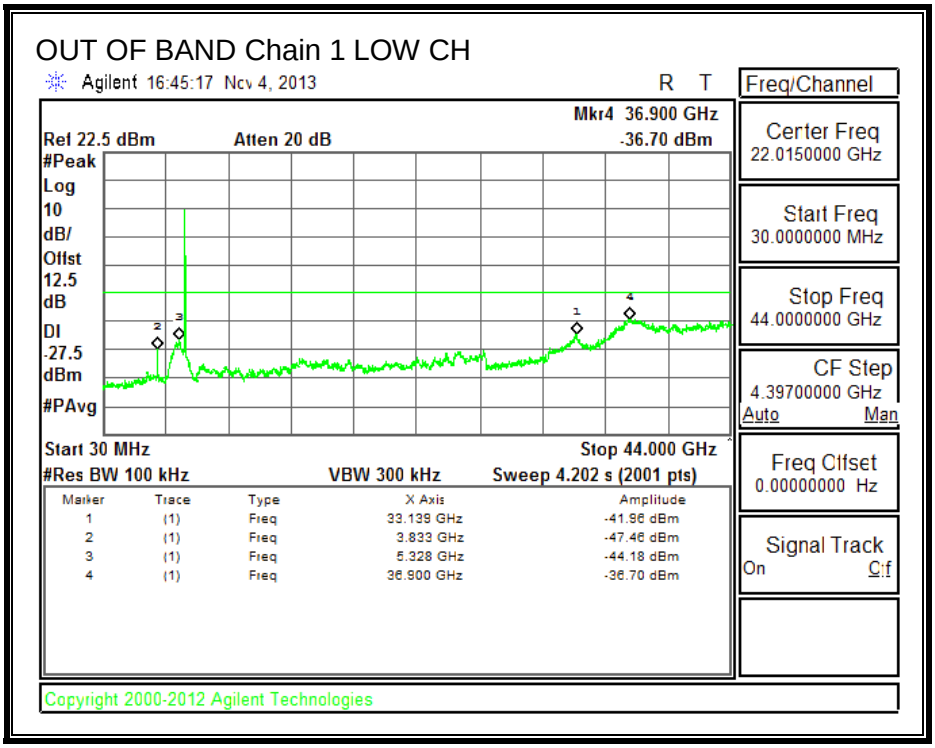
LOW CHANNEL BANDEDGE, Chain 1



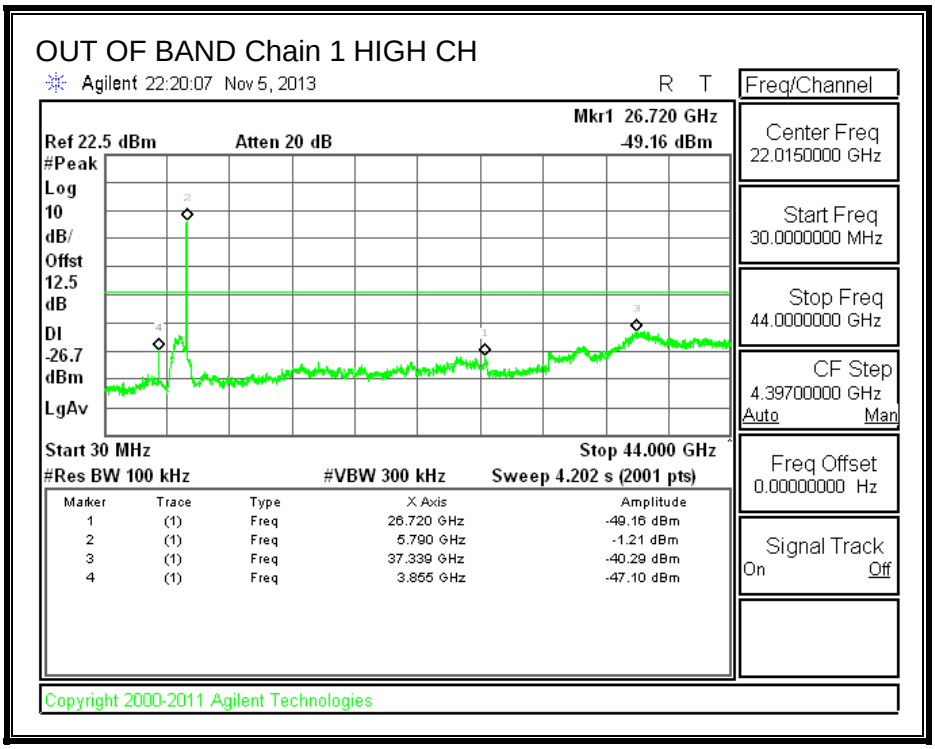
HIGH CHANNEL BANDEDGE, Chain 1



OUT OF BAND Chain 1 LOW CH



OUT OF BAND Chain 1 HIGH CH



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

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.

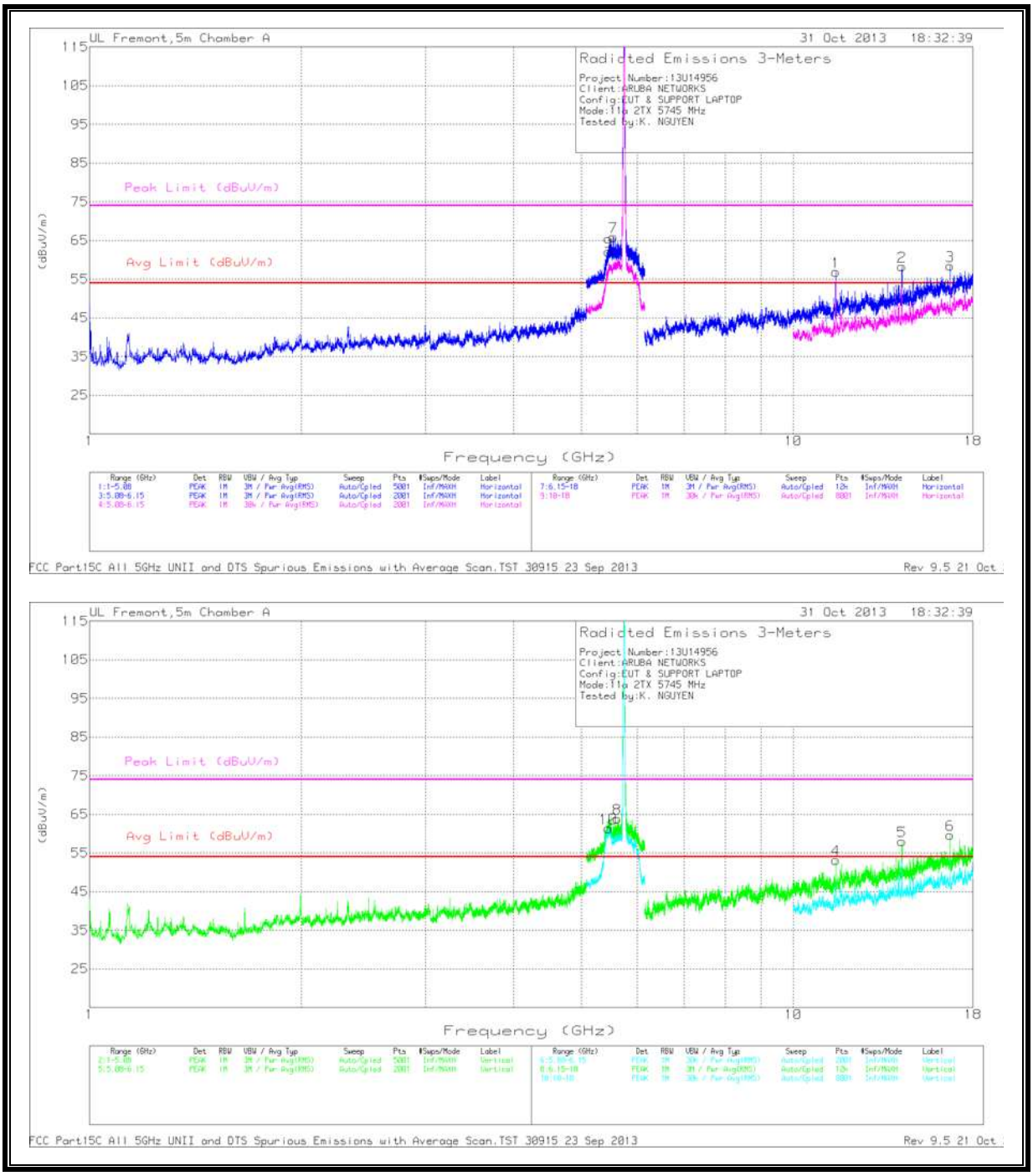
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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. TX ABOVE 1 GHz 802.11a CDD 2TX MODE IN THE 5.8 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

Low Channel



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Avg Margin (dB)	Peak Limit (dBuV/m)	Peak Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
10*	5.458	45.48	PK	34.4	-18.5	61.38	-	-	74	-12.62	0-360	100	V
9*	5.46	46.21	PK	34.4	-18.5	62.11	-	-	74	-11.89	0-360	100	H
7**	5.548	49.86	PK	34.4	-18.4	65.86	-	-	-	-	0-360	100	H
8**	5.621	48.1	PK	34.4	-18.6	63.9	-	-	-	-	0-360	100	V
1*	11.489	40.48	PK	38.3	-21.9	56.88	-	-	74	-17.12	0-360	100	H
4*	11.489	36.82	PK	38.3	-21.9	53.22	-	-	74	-20.78	0-360	100	V
5**	14.268	41.07	PK	39.5	-22.5	58.07	-	-	-	-	0-360	200	V
2**	14.271	41.18	PK	39.5	-22.4	58.28	-	-	-	-	0-360	200	H
3**	16.701	37.75	PK	40.7	-20	58.45	-	-	-	-	0-360	100	H
6**	16.701	38.99	PK	40.7	-20	59.69	-	-	-	-	0-360	200	V

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Avg Margin (dB)	Peak Limit (dBuV/m)	Peak Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
*5.46	37.16	MAv1	34.4	-18.3	53.26	53.97	-0.71	-	-	21	106	H
*5.458	35	MAv1	34.4	-18.4	51	53.97	-2.97	-	-	355	105	V
* 11.489	29.67	MAv1	38.3	-21.9	46.07	53.97	-7.9	-	-	272	111	H
* 11.489	26.74	MAv1	38.3	-21.9	43.14	53.97	-10.83	-	-	294	130	V

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

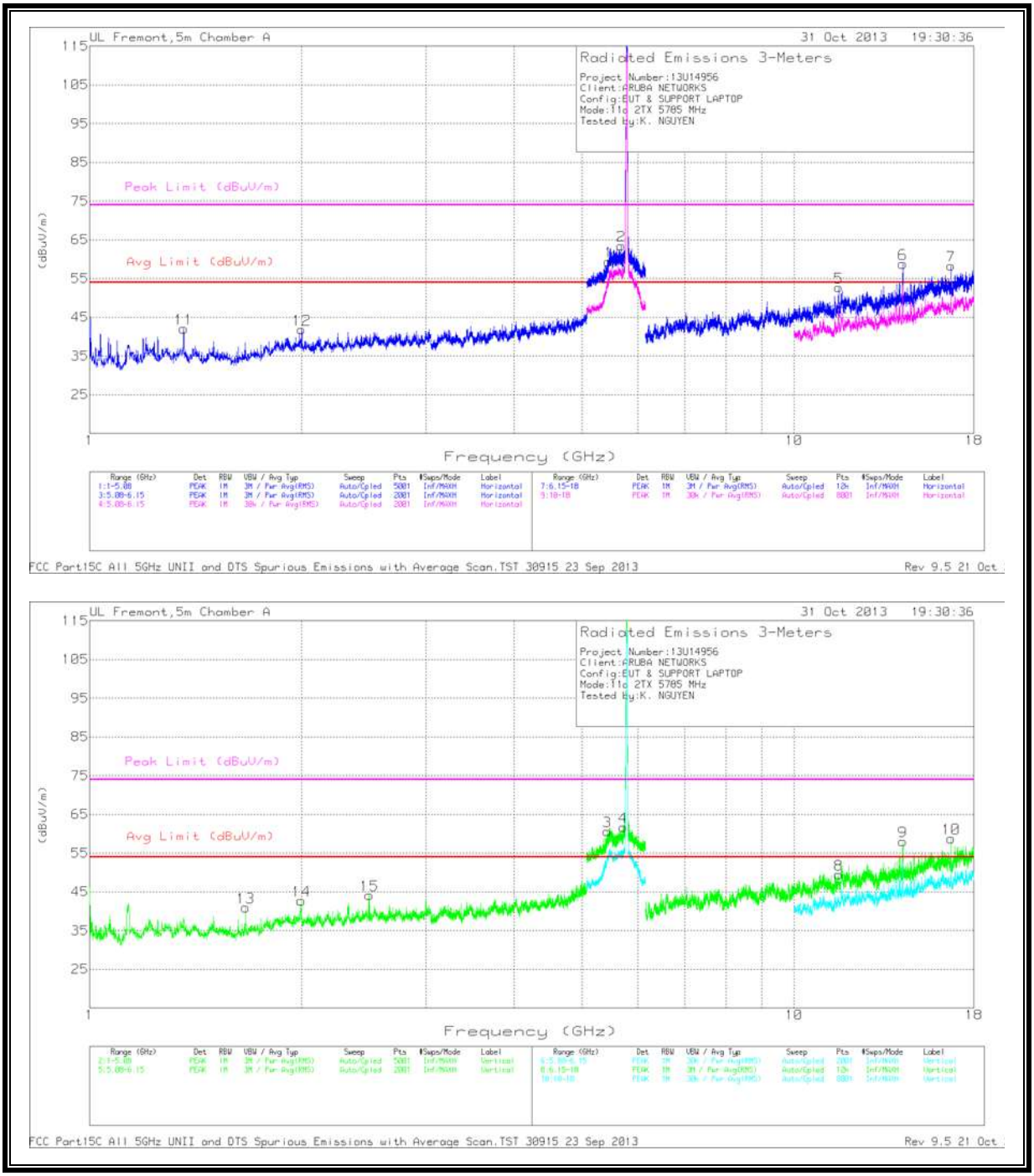
** - Indicates a frequency outside of the CFR15.205/IC7.2.2 Restricted Bands. Compliance is shown in the Out of Bands Emission section.

*** - Indicates a frequency with a peak measurement that satisfies both peak and average limits.

PK - Peak detector

MAv1 - KDB558074 Option 1 Maximum RMS Average

Mid Channel



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
11***	1.36	47.15	PK	30	-35.1	42.05	53.97	-11.92	74	-31.95	0-360	200	H
13***	1.665	46.67	PK	29	-34.7	40.97	53.97	-13	74	-33.03	0-360	100	V
14**	1.998	44.93	PK	31.9	-34.1	42.73	-	-	-	-	0-360	200	V
12**	2	44.06	PK	31.9	-34.1	41.86	-	-	-	-	0-360	200	H
15***	2.494	43.77	PK	32.6	-32.2	44.17	53.97	-9.8	74	-29.83	0-360	100	V
3*	5.432	44.57	PK	34.4	-18.3	60.67	-	-	74	-13.33	0-360	100	V
1*	5.456	43.53	PK	34.4	-18.5	59.43	-	-	74	-14.57	0-360	100	H
2**	5.684	47.81	PK	34.6	-18.9	63.51	-	-	-	-	0-360	100	H
4**	5.717	45.64	PK	34.6	-18.5	61.74	-	-	-	-	0-360	100	V
8*	11.57	32.78	PK	38.4	-21.7	49.48	-	-	74	-24.52	0-360	100	V
5*	11.575	36.12	PK	38.4	-21.8	52.72	-	-	74	-21.28	0-360	100	H
6**	14.268	41.8	PK	39.5	-22.5	58.8	-	-	-	-	0-360	100	H
9**	14.269	40.98	PK	39.5	-22.4	58.08	-	-	-	-	0-360	100	V
7**	16.703	37.74	PK	40.7	-20.1	58.34	-	-	-	-	0-360	100	H
10**	16.703	38.2	PK	40.7	-20.1	58.8	-	-	-	-	0-360	200	V

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
*5.456	37.53	MAv1	34.4	-18.3	53.63	53.97	-0.34	-	-	31	106	H
*5.432	30.63	MAv1	34.4	-18.3	46.73	53.97	-7.24	-	-	114	365	V
* 11.57	25.81	MAv1	38.4	-21.7	42.51	53.97	-11.46	-	-	299	101	H
* 11.56	23.91	MAv1	38.4	-21.8	40.51	53.97	-13.46	-	-	357	217	V

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

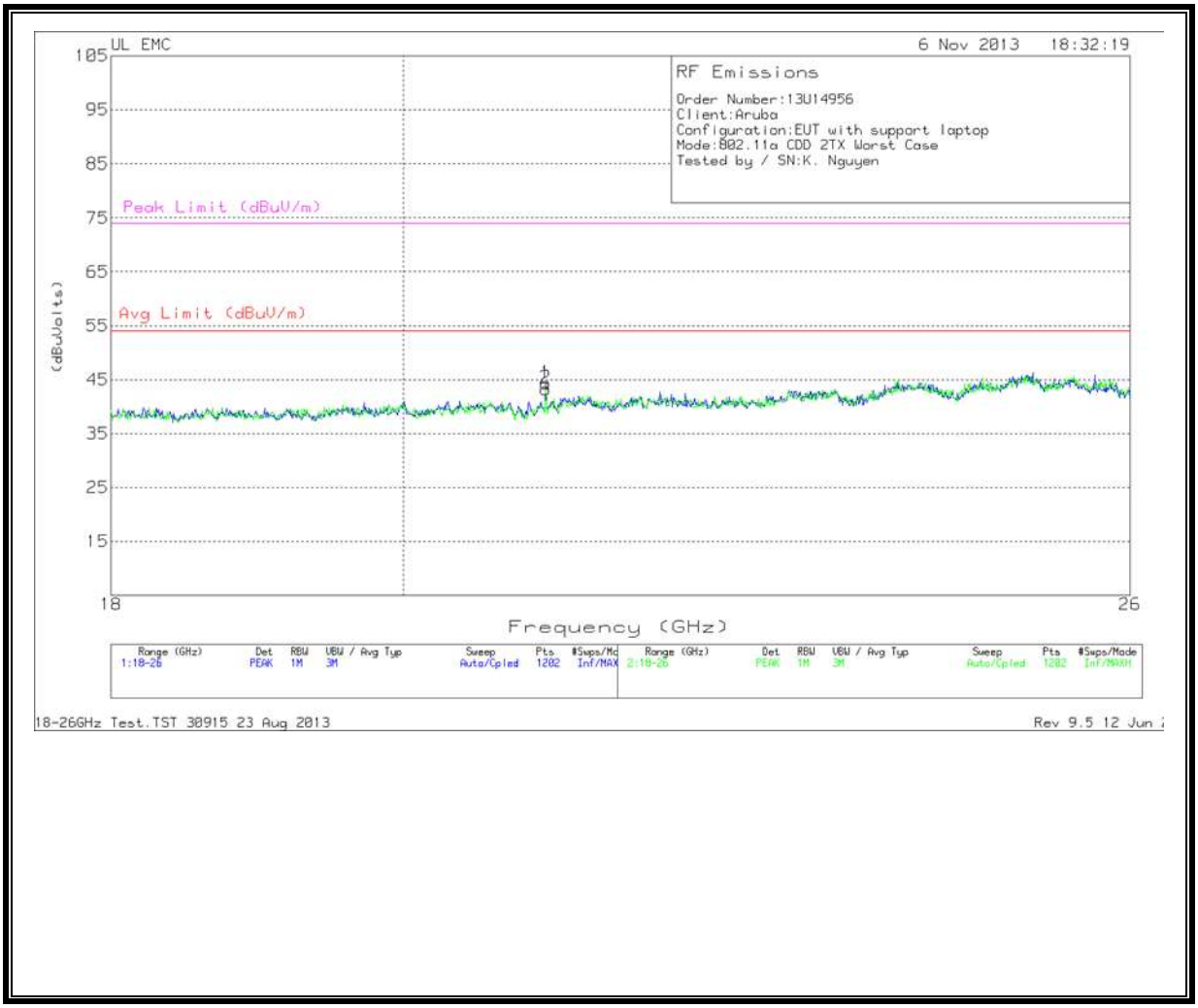
** - Indicates a frequency outside of the CFR15.205/IC7.2.2 Restricted Bands. Compliance is shown in the Out of Bands Emission section.

*** - Indicates a frequency with a peak measurement that satisfies both peak and average limits.

PK - Peak detector

MAv1 - KDB558074 Option 1 Maximum RMS Average

Mid Channel 18-26 GHz

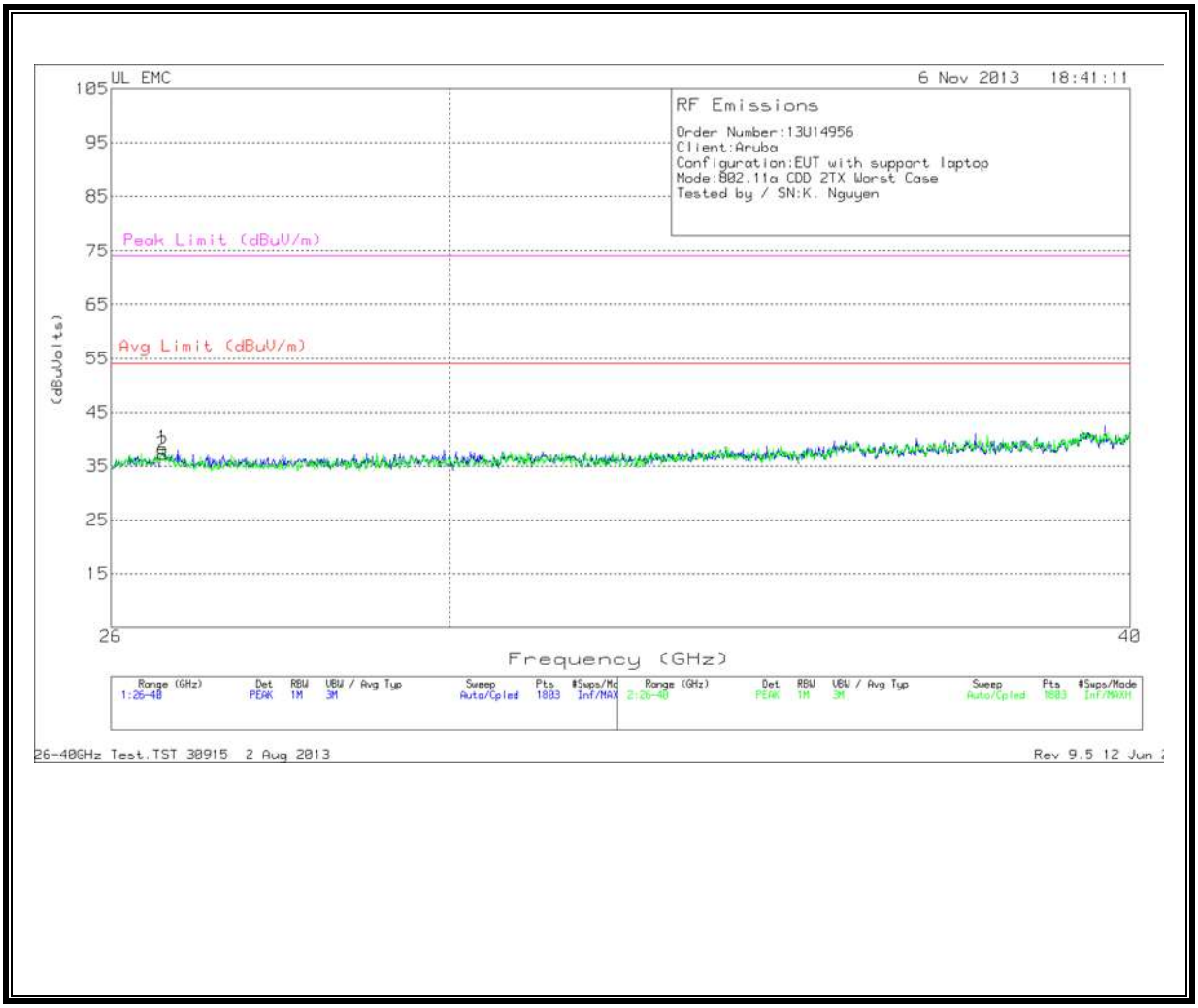


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T89 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	21.057	46.23	PK	32.6	-25	-9.5	44.33	54	-9.67	74	-29.67
2	21.057	45.23	PK	32.6	-25	-9.5	43.33	54	-10.67	74	-30.67

PK - Peak detector

Mid Channel 26-40 GHz

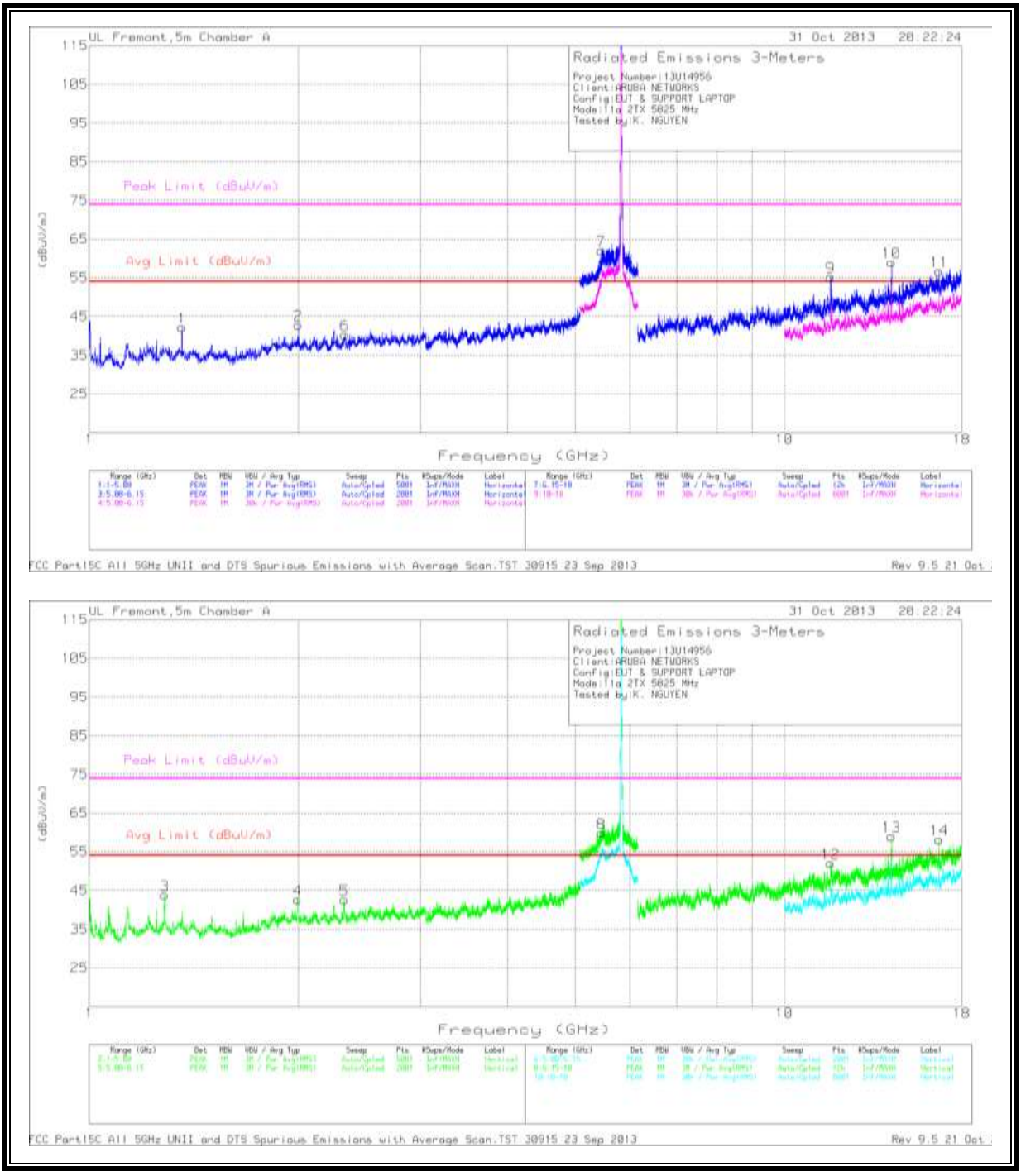


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T90 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
2	26.575	44.57	PK	35.4	-33.3	-9.5	37.17	54	-16.83	74	-36.83
1	26.575	45.73	PK	35.4	-33.3	-9.5	38.33	54	-15.67	74	-35.67

PK - Peak detector

High Channel



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3***	1.285	48.94	PK	30.2	-35.3	43.84	53.97	-10.13	74	-30.16	0-360	100	V
1***	1.36	47.36	PK	30	-35.1	42.26	53.97	-11.71	74	-31.74	0-360	200	H
4**	1.996	44.87	PK	31.9	-34.1	42.67	53.97	-11.3	74	-31.33	0-360	100	V
2**	1.999	45.08	PK	31.9	-34.1	42.88	53.97	-11.09	74	-31.12	0-360	200	H
5***	2.329	43.53	PK	31.7	-32.6	42.63	53.97	-11.34	74	-31.37	0-360	100	V
6***	2.333	41.33	PK	31.8	-32.8	40.33	53.97	-13.64	74	-33.67	0-360	200	H
7*	5.453	46.17	PK	34.4	-18.5	62.07	-	-	74	-11.93	0-360	100	H
8*	5.457	43.96	PK	34.4	-18.5	59.86	-	-	74	-14.14	0-360	100	V
9*	11.658	38.71	PK	38.5	-22	55.21	-	-	74	-18.79	0-360	100	H
12*	11.658	35.55	PK	38.5	-22	52.05	-	-	74	-21.95	0-360	100	V
10**	14.268	42.07	PK	39.5	-22.5	59.07	-	-	-	-	0-360	100	H
13**	14.268	41.99	PK	39.5	-22.5	58.99	-	-	-	-	0-360	200	V
14**	16.705	37.62	PK	40.7	-20.1	58.22	-	-	-	-	0-360	100	V
11**	16.706	36.21	PK	40.7	-20.2	56.71	-	-	-	-	0-360	100	H

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 5.453	37.92	MAv1	34.4	-18.5	53.82	53.97	-0.15	-	-	0	107	H
* 5.457	36.89	MAv1	34.4	-18.5	52.79	53.97	-1.18	-	-	360	110	V
* 11.658	26.57	MAv1	38.5	-22	43.07	53.97	-10.9	-	-	5	203	V
* 11.658	28.15	MAv1	38.5	-22	44.65	53.97	-9.32	-	-	247	101	H

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

** - Indicates a frequency outside of the CFR15.205/IC7.2.2 Restricted Bands. Compliance is shown in the Out of Bands Emission section.

*** - Indicates a frequency with a peak measurement that satisfies both peak and average limits.

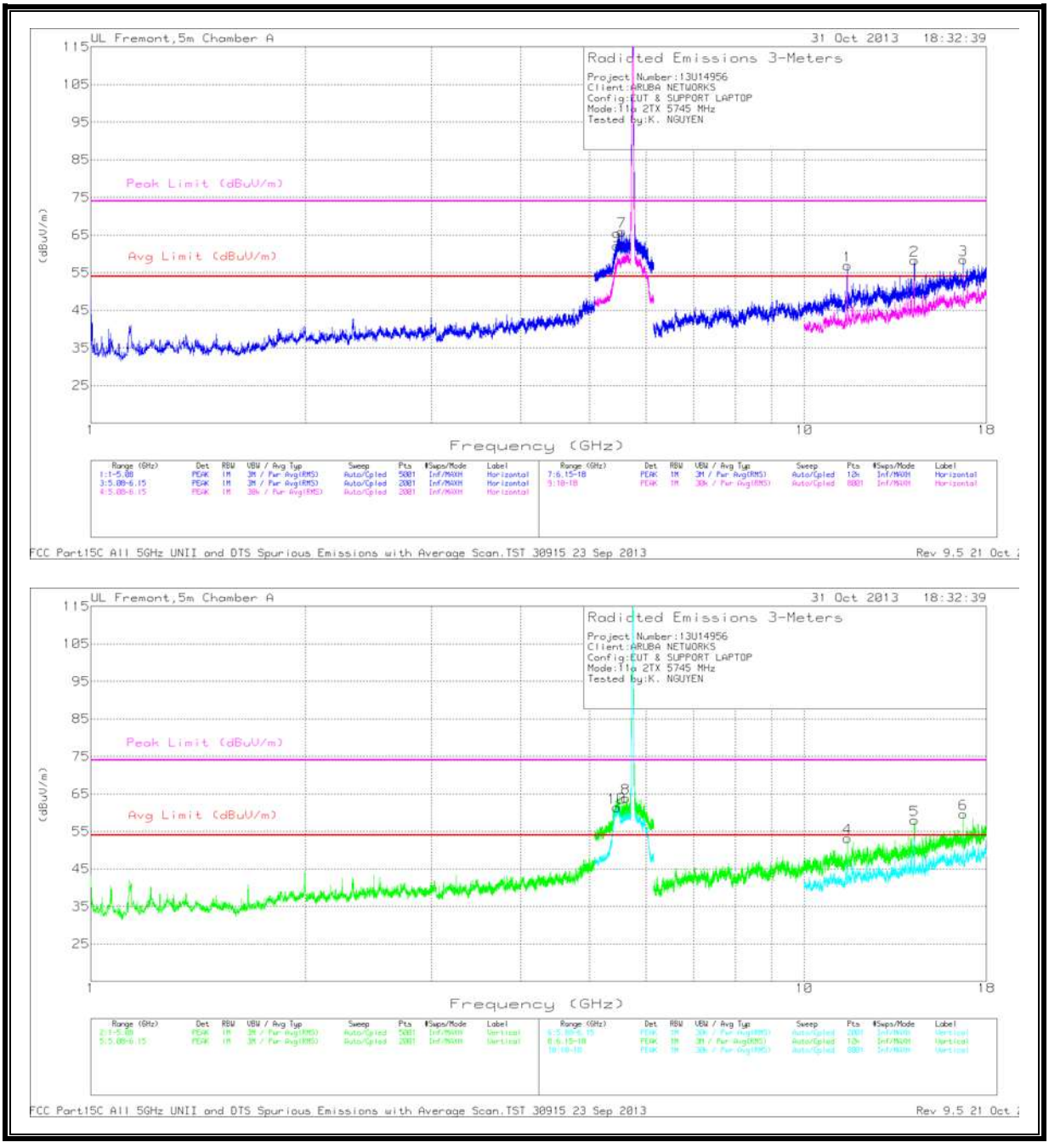
PK - Peak detector

MAv1 - KDB558074 Option 1 Maximum RMS Average

9.3. TX ABOVE 1 GHz 802.11n HT20 STBC 2TX MODE IN THE 5.8 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

Low Channel



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3***	1.137	47.77	PK	28.5	-34.5	41.77	53.97	-12.2	74	-32.23	0-360	200	V
1***	1.36	46.86	PK	30	-35.1	41.76	53.97	-12.21	74	-32.24	0-360	101	H
4***	1.663	45.98	PK	29	-34.7	40.28	53.97	-13.69	74	-33.72	0-360	100	V
5**	1.996	45.87	PK	31.9	-34.1	43.67	-	-	-	-	0-360	200	V
2**	2	43.38	PK	31.9	-34.1	41.18	-	-	-	-	0-360	200	H
6***	2.494	43.41	PK	32.6	-32.2	43.81	53.97	-10.16	74	-30.19	0-360	200	V
8***	3.83	39.22	PK	33.6	-29.7	43.12	53.97	-10.85	74	-30.88	0-360	101	H
7***	3.83	40.56	PK	33.6	-29.7	44.46	53.97	-9.51	74	-29.54	0-360	200	V
9*	5.458	46.3	PK	34.4	-18.5	62.2	-	-	74	-11.8	0-360	100	H
10*	5.459	43.64	PK	34.4	-18.5	59.54	-	-	74	-14.46	0-360	100	V
11*	11.489	36.59	PK	38.3	-21.9	52.99	-	-	74	-21.01	0-360	100	H
14*	11.49	32.91	PK	38.3	-21.9	49.31	-	-	74	-24.69	0-360	100	V
20*	11.49	30.02	Avg	38.3	-21.9	46.42	53.97	-7.55	-	-	0-360	100	V
12*	11.658	35.84	PK	38.5	-22	52.34	-	-	74	-21.66	0-360	100	H
19*	11.658	29.89	Avg	38.5	-22	46.39	53.97	-7.58	-	-	0-360	200	H
15*	11.71	36.6	PK	38.5	-21.9	53.2	-	-	74	-20.8	0-360	200	V
21*	11.71	29.35	Avg	38.5	-21.9	45.95	53.97	-8.02	-	-	0-360	100	V
17**	14.269	41.28	PK	39.5	-22.4	58.38	-	-	-	-	0-360	200	V
13**	14.27	41.54	PK	39.5	-22.4	58.64	-	-	-	-	0-360	200	H
16**	16.699	37.24	PK	40.7	-19.9	58.04	-	-	-	-	0-360	200	V
18**	16.7	36.4	PK	40.7	-19.9	57.2	-	-	-	-	0-360	100	H

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 5.458	37.14	MAv1	34.4	-18.3	53.24	53.97	-0.73	-	-	18	105	H
* 5.459	36.29	MAv1	34.4	-18.6	52.09	53.97	-1.88	-	-	12	105	V
* 11.49	31.03	MAv1	38.3	-21.9	47.43	53.97	-6.54	-	-	270	110	H
* 11.488	27.43	MAv1	38.3	-21.9	43.83	53.97	-10.14	-	-	11	109	V

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

** - Indicates a frequency outside of the CFR15.205/IC7.2.2 Restricted Bands. Compliance is shown in the Out of Bands Emission section.

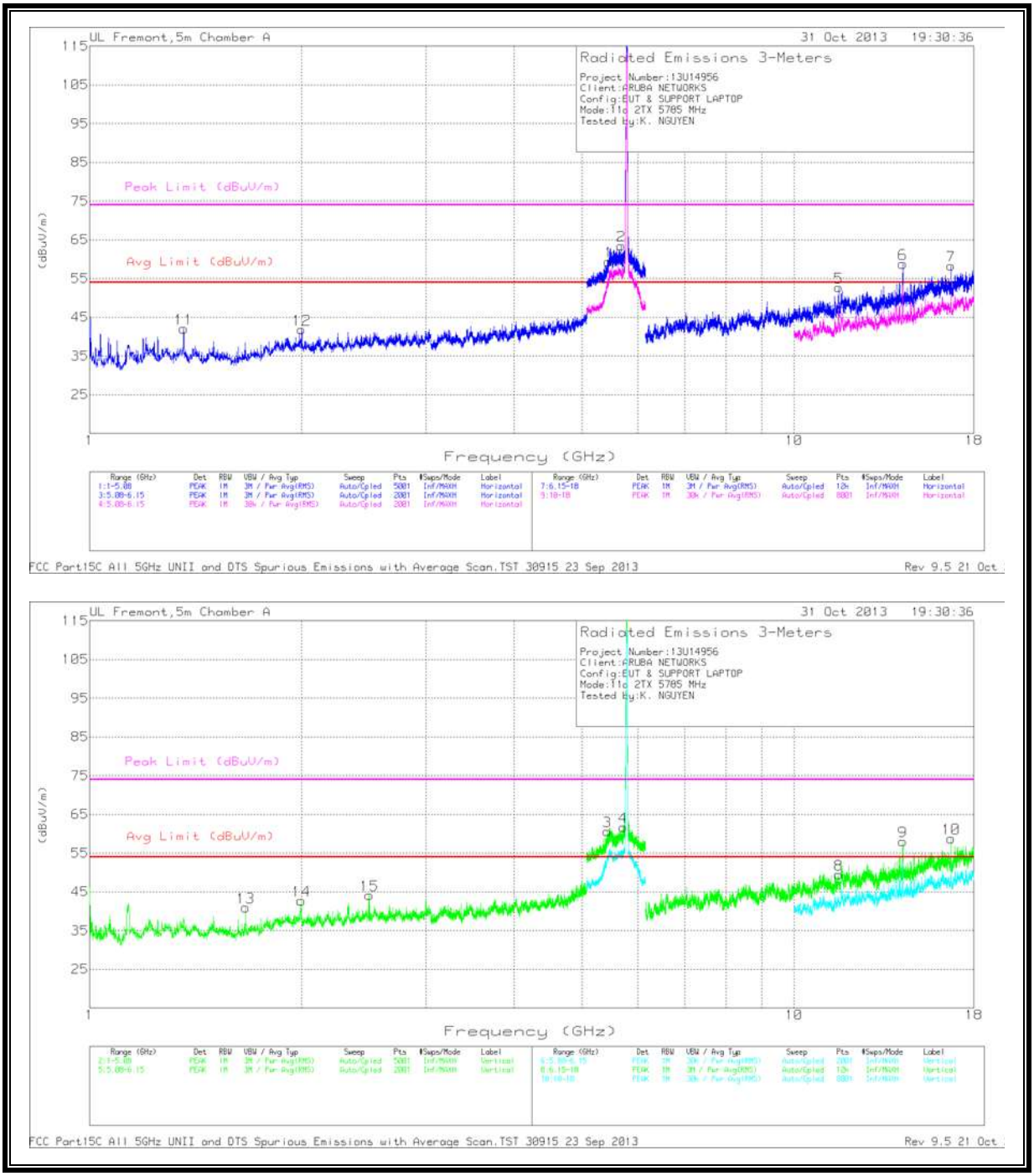
*** - Indicates a frequency with a peak measurement that satisfies both peak and average limits.

PK - Peak detector

MAv1 - KDB558074 Option 1 Maximum RMS Average

Avg - Average measurements taken at a reduced VBW. (RBW:VBW, 1MHz:30kHz)

Mid Channel



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1***	1.36	46.83	PK	30	-35.1	41.73	53.97	-12.24	74	-32.27	0-360	100	H
3***	1.36	45.45	PK	30	-35.1	40.35	53.97	-13.62	74	-33.65	0-360	100	V
4**	1.991	44.92	PK	31.9	-34.1	42.72	-	-	-	-	0-360	100	V
2**	2	44.11	PK	31.9	-34.1	41.91	-	-	-	-	0-360	200	H
6*	5.458	46	PK	34.4	-18.5	61.9	-	-	74	-12.1	0-360	100	V
5*	5.46	46.52	PK	34.4	-18.5	62.42	-	-	74	-11.58	0-360	100	H
11*	11.566	33.15	PK	38.4	-21.8	49.75	-	-	74	-24.25	0-360	100	V
20*	11.566	27.43	Avg	38.4	-21.8	44.03	53.97	-9.94	-	-	0-360	100	V
7*	11.568	35.48	PK	38.4	-21.8	52.08	-	-	74	-21.92	0-360	100	H
12*	11.659	36.32	PK	38.5	-22	52.82	-	-	74	-21.18	0-360	200	V
21*	11.659	29.63	Avg	38.5	-22	46.13	53.97	-7.84	-	-	0-360	200	V
8*	11.664	35.04	PK	38.5	-22.1	51.44	-	-	74	-22.56	0-360	100	H
19*	11.664	29.77	Avg	38.5	-22	46.27	53.97	-7.7	-	-	0-360	200	H
16*	13.399	35.98	PK	39.1	-22.6	52.48	53.97	-1.49	74	-21.52	0-360	100	V
18*	13.399	30.09	Avg	39.1	-22.6	46.59	53.97	-7.38	-	-	0-360	200	V
15*	13.4	35.47	PK	39.1	-22.6	51.97	-	-	74	-22.03	0-360	200	H
17*	13.4	29.86	Avg	39.1	-22.6	46.36	53.97	-7.61	-	-	0-360	100	H
9**	14.268	42.12	PK	39.5	-22.5	59.12	-	-	-	-	0-360	200	H
13**	14.268	41.28	PK	39.5	-22.5	58.28	-	-	-	-	0-360	200	V
10**	16.704	36.99	PK	40.7	-20.1	57.59	-	-	-	-	0-360	100	H
14**	16.704	37.48	PK	40.7	-20.1	58.08	-	-	-	-	0-360	200	V

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
*5.464	37.15	MAv1	34.4	-18.5	53.05	53.97	-0.92	-	-	8	100	V
*5.469	37.74	MAv1	34.4	-18.2	53.94	53.97	-0.03	-	-	29	108	H
* 11.568	23.22	MAv1	38.4	-21.8	39.82	53.97	-14.15	-	-	304	358	H

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

** - Indicates a frequency outside of the CFR15.205/IC7.2.2 Restricted Bands. Compliance is shown in the Out of Bands Emission section.

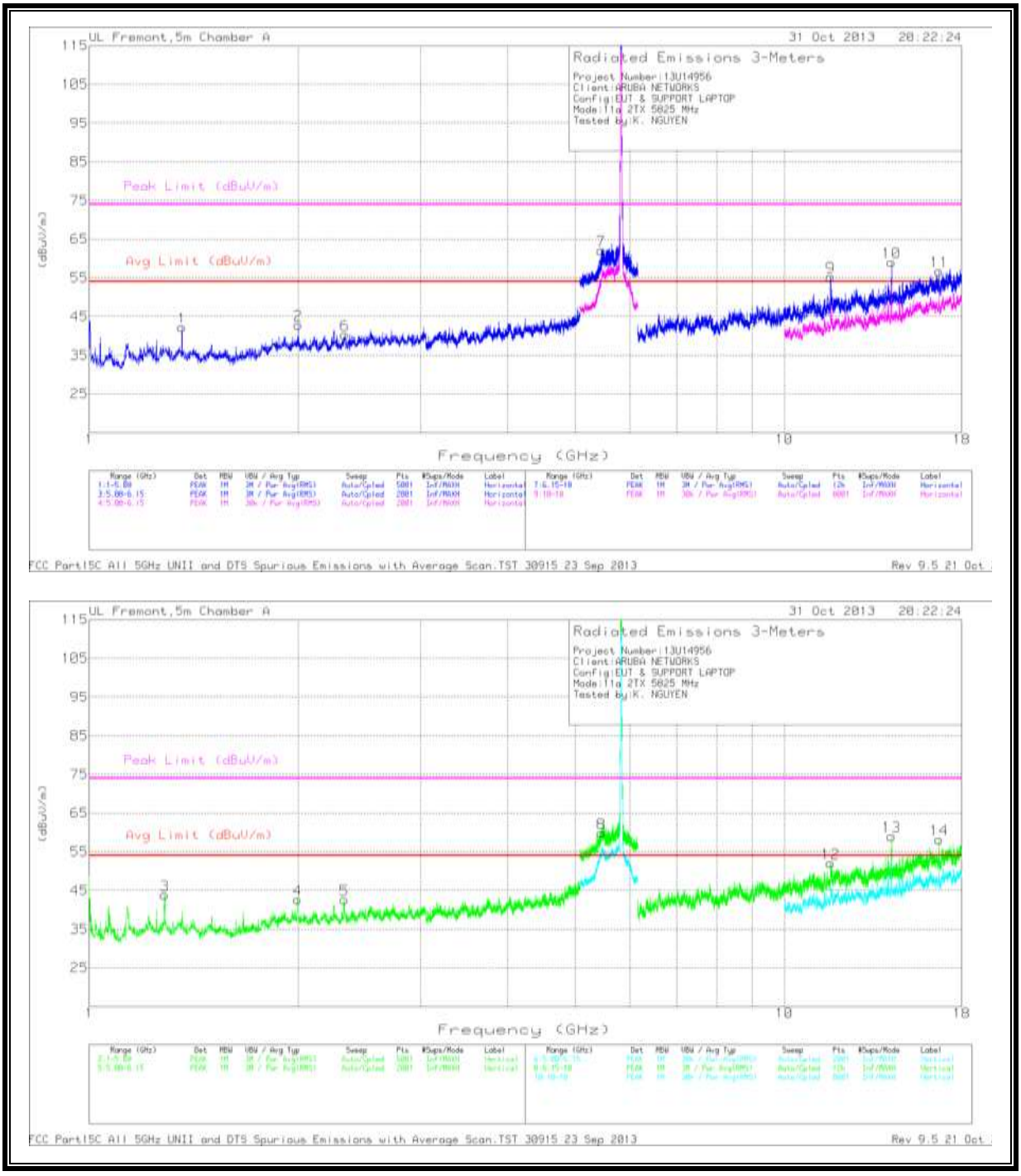
*** - Indicates a frequency with a peak measurement that satisfies both peak and average limits.

PK - Peak detector

MAv1 - KDB558074 Option 1 Maximum RMS Average

Avg - Average measurements taken at a reduced VBW. (RBW:VBW, 1MHz:30kHz)

High Channel



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1***	1.36	47.44	PK	30	-35.1	42.34	53.97	-11.63	74	-31.66	0-360	100	H
4**	1.991	46.55	PK	31.9	-34.1	44.35	-	-	-	-	0-360	200	V
5***	2.325	43.82	PK	31.7	-32.7	42.82	53.97	-11.15	74	-31.18	0-360	100	V
2***	2.332	41.9	PK	31.8	-32.8	40.9	53.97	-13.07	74	-33.1	0-360	200	H
3***	3.883	42.11	PK	33.7	-30.4	45.41	53.97	-8.56	74	-28.59	0-360	200	H
6***	3.883	41.16	PK	33.7	-30.4	44.46	53.97	-9.51	74	-29.54	0-360	200	V
7*	5.457	44.09	PK	34.4	-18.5	59.99	-	-	74	-14.01	0-360	100	H
8*	5.459	46.36	PK	34.4	-18.5	62.26	-	-	74	-11.74	0-360	100	V
12*	11.655	35.38	PK	38.5	-21.9	51.98	-	-	74	-22.02	0-360	100	V
15*	11.655	29.45	Avg	38.5	-22	45.95	-	-	-	-	0-360	200	V
9*	11.658	36.6	PK	38.5	-22	53.1	-	-	74	-20.9	0-360	100	H
10**	14.268	41.71	PK	39.5	-22.5	58.71	-	-	-	-	0-360	200	H
13**	14.269	42.22	PK	39.5	-22.4	59.32	-	-	-	-	0-360	200	V
11**	16.703	37.66	PK	40.7	-20.1	58.26	-	-	-	-	0-360	100	H
14**	16.703	37.23	PK	40.7	-20.1	57.83	-	-	-	-	0-360	200	V

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
*5.457	37.83	MAv1	34.4	-18.3	53.93	53.97	-0.04	-	-	32	106	H
*5.459	35.73	MAv1	34.4	-18.5	51.63	53.97	-2.34	-	-	35	100	V
*11.658	23.48	MAv1	38.4	-21.8	40.08	53.97	-13.89	-	-	249	382	H

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

** - Indicates a frequency outside of the CFR15.205/IC7.2.2 Restricted Bands. Compliance is shown in the Out of Bands Emission section.

*** - Indicates a frequency with a peak measurement that satisfies both peak and average limits.

PK - Peak detector

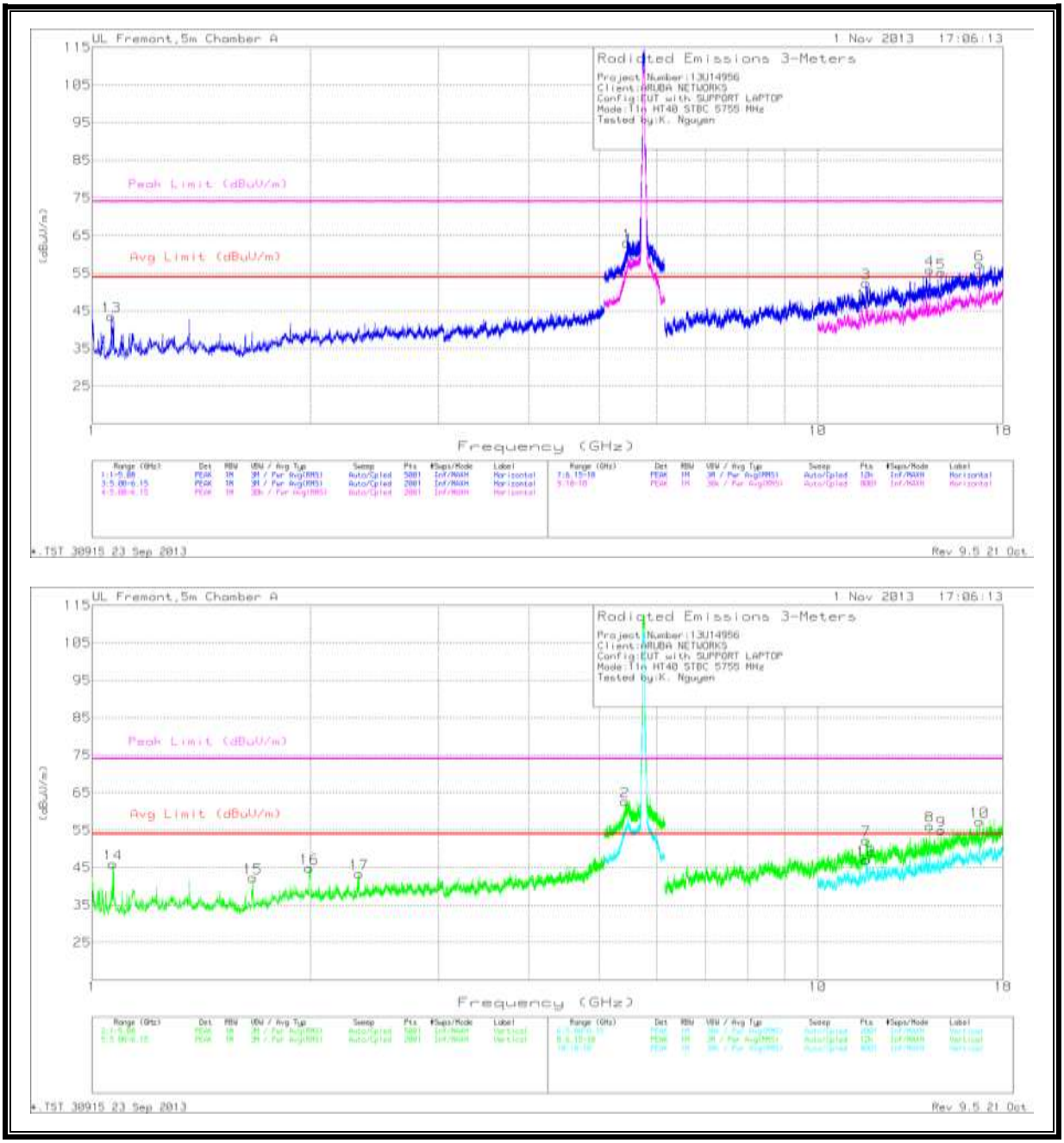
MAv1 - KDB558074 Option 1 Maximum RMS Average

Avg - Average measurements taken at a reduced VBW. (RBW:VBW, 1MHz:30kHz)

9.4. TX ABOVE 1 GHz 802.11n HT40 STBC 2TX MODE IN THE 5.8 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

Low Channel



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
13***	1.062	50.74	PK	28	-35.2	43.54	53.97	-10.43	74	-30.46	0-360	200	H
14***	1.069	53.17	PK	28	-35.2	45.97	53.97	-8	74	-28.03	0-360	100	V
15***	1.665	47.96	PK	29	-34.7	42.26	53.97	-11.71	74	-31.74	0-360	100	V
16**	1.991	47.03	PK	31.9	-34.1	44.83	-	-	-	-	0-360	200	V
17***	2.332	44.4	PK	31.8	-32.8	43.4	53.97	-10.57	74	-30.6	0-360	100	V
2*	5.425	46.54	PK	34.4	-18.3	62.64	-	-	74	-11.36	0-360	100	V
1*	5.456	47.17	PK	34.4	-18.5	63.07	-	-	74	-10.93	0-360	100	H
7*	11.655	35.67	PK	38.5	-21.9	52.27	-	-	74	-21.73	0-360	200	V
12*	11.657	30.52	Avg	38.5	-22	47.02	53.97	-6.95	-	-	0-360	100	V
3*	11.656	35.78	PK	38.5	-21.9	52.38	-	-	74	-21.62	0-360	200	H
11*	11.657	30.41	Avg	38.5	-22	46.91	53.97	-7.06	-	-	0-360	200	H
4**	14.265	38.85	PK	39.5	-22.5	55.85	-	-	-	-	0-360	200	H
8**	14.265	39.14	PK	39.5	-22.5	56.14	-	-	-	-	0-360	200	V
9**	14.788	37.27	PK	39.9	-22.3	54.87	-	-	-	-	0-360	200	V
5**	14.794	37.58	PK	39.9	-22.4	55.08	-	-	-	-	0-360	200	H
10**	16.702	36.59	PK	40.7	-20	57.29	-	-	-	-	0-360	200	V
6**	16.705	36.8	PK	40.7	-20.2	57.3	-	-	-	-	0-360	100	H

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
*5.456	37.8	MAv1	34.4	-18.5	53.7	53.97	-0.27	-	-	49	101	H
*5.425	36.41	MAv1	34.4	-18.5	52.31	53.97	-1.66	-	-	21	103	V

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

** - Indicates a frequency outside of the CFR15.205/IC7.2.2 Restricted Bands. Compliance is shown in the Out of Bands Emission section.

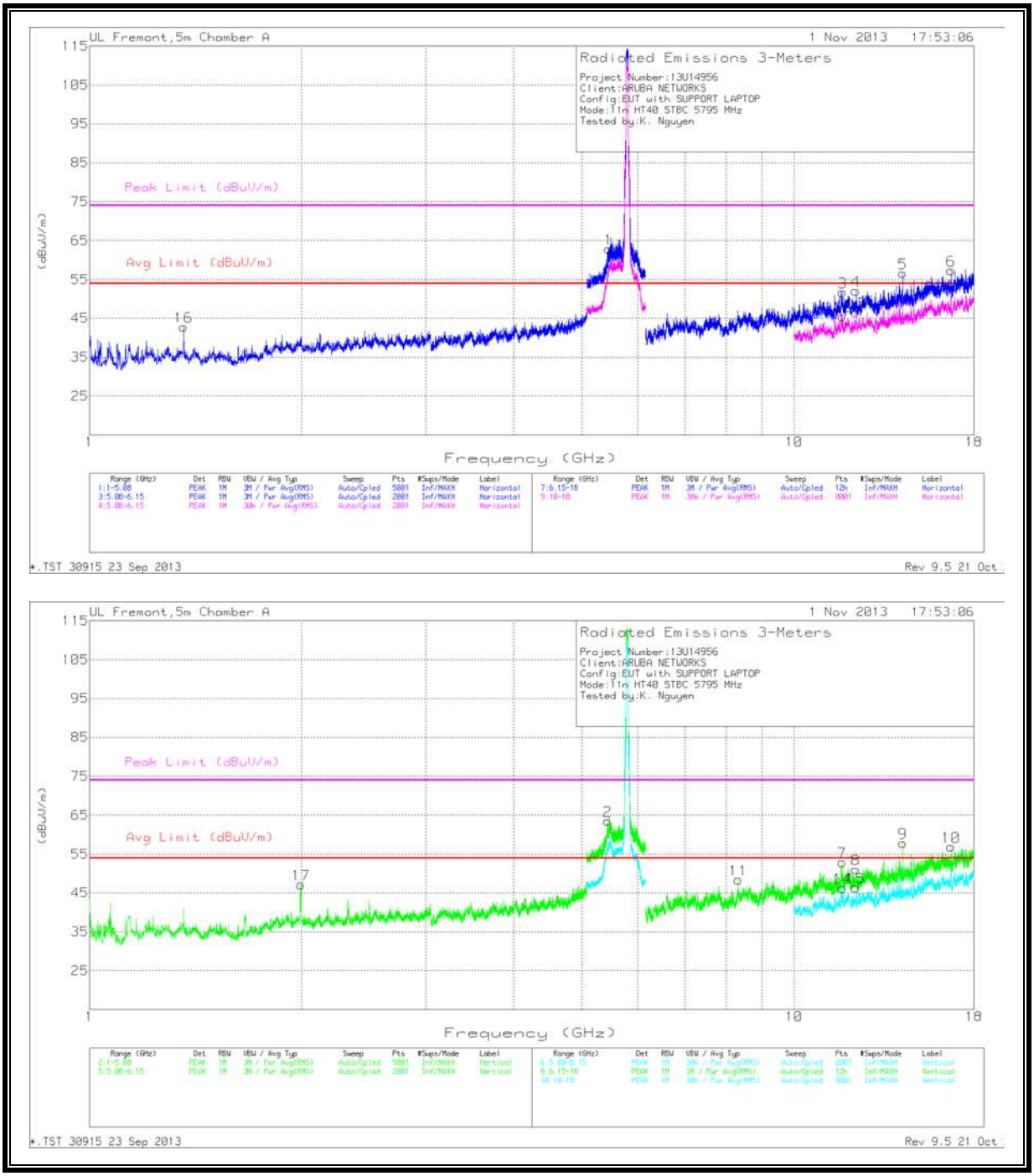
*** - Indicates a frequency with a peak measurement that satisfies both peak and average limits.

PK - Peak detector

MAv1 - KDB558074 Option 1 Maximum RMS Average

Avg - Average measurements taken at a reduced VBW. (RBW:VBW, 1MHz:30kHz)

High Channel



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
16***	1.36	47.95	PK	30	-35.1	42.85	53.97	-11.12	74	-31.15	0-360	200	H
17**	1.996	49.41	PK	31.9	-34.1	47.21	-	-	-	-	0-360	100	V
2*	5.436	47.57	PK	34.4	-18.4	63.57	-	-	74	-10.43	0-360	100	V
1*	5.46	47.01	PK	34.4	-18.5	62.91	-	-	74	-11.09	0-360	100	H
11*	8.334	38.03	PK	35.6	-25.2	48.43	-	-	74	-25.57	0-360	100	V
7*	11.71	36.32	PK	38.5	-21.9	52.92	-	-	74	-21.08	0-360	100	V
14*	11.71	29.7	Avg	38.5	-21.9	46.3	53.97	-7.67	-	-	0-360	200	V
3*	11.716	35.13	PK	38.5	-21.9	51.73	-	-	74	-22.27	0-360	200	H
12*	11.716	28.98	Avg	38.5	-21.9	45.58	53.97	-8.39	-	-	0-360	200	H
4*	12.238	35.31	PK	39	-22.2	52.11	-	-	74	-21.89	0-360	100	H
13*	12.238	29.83	Avg	39	-22.2	46.63	53.97	-7.34	-	-	0-360	100	H
8*	12.238	34.33	PK	39	-22.2	51.13	-	-	74	-22.87	0-360	100	V
15*	12.238	29.61	Avg	39	-22.2	46.41	53.97	-7.56	-	-	0-360	200	V
5**	14.267	39.63	PK	39.5	-22.5	56.63	-	-	-	-	0-360	200	H
9**	14.268	40.85	PK	39.5	-22.5	57.85	-	-	-	-	0-360	100	V
10**	16.702	36.21	PK	40.7	-20	56.91	-	-	-	-	0-360	200	V
6**	16.705	36.84	PK	40.7	-20.2	57.34	-	-	-	-	0-360	100	H

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 5.456	37.95	MAv1	34.4	-18.5	53.85	53.97	-0.12	-	-	36	113	H
* 5.458	38.02	MAv1	34.4	-18.5	53.92	53.97	-0.05	-	-	44	113	V
* 8.342	25.4	MAv1	35.6	-25.3	35.7	53.97	-18.27	-	-	34	205	V

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

** - Indicates a frequency outside of the CFR15.205/IC7.2.2 Restricted Bands. Compliance is shown in the Out of Bands Emission section.

*** - Indicates a frequency with a peak measurement that satisfies both peak and average limits.

PK - Peak detector

MAv1 - KDB558074 Option 1 Maximum RMS Average

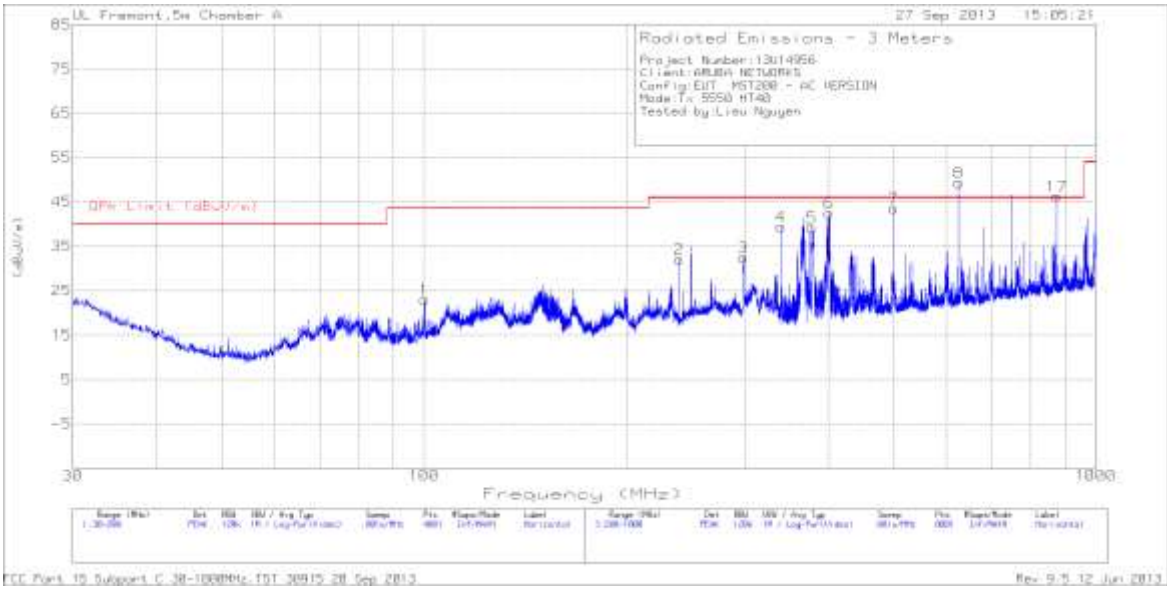
Avg - Average measurements taken at a reduced VBW. (RBW:VBW, 1MHz:30kHz)

9.5. WORST-CASE BELOW 1 GHz

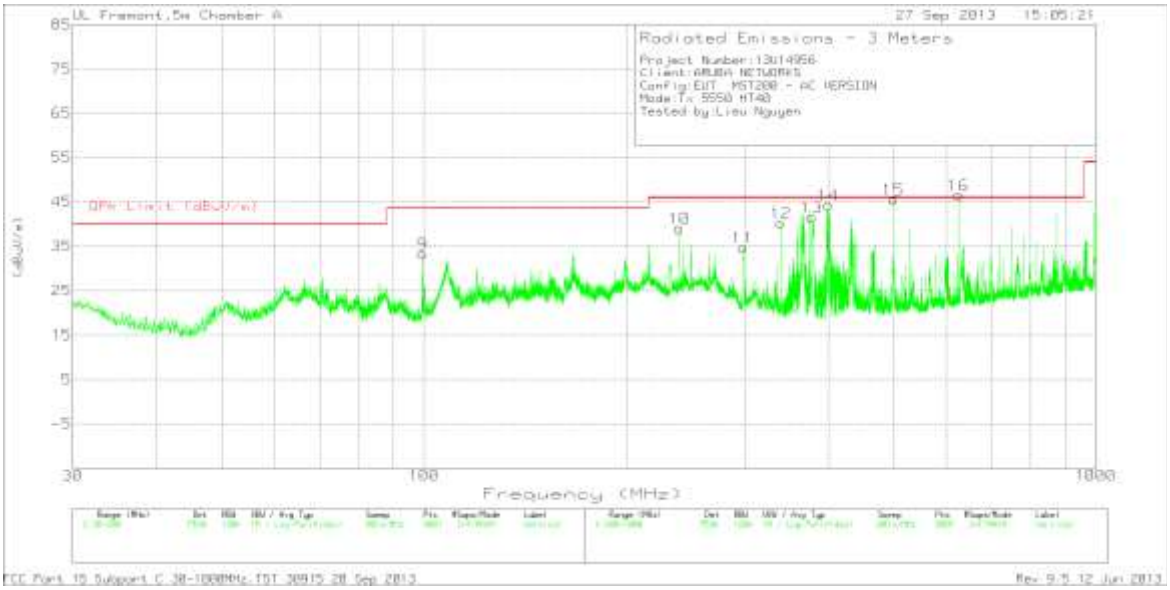
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)

AC UNIT

HORIZONTAL PLOT



VERTICAL PLOT



HORIZONTAL AND VERTICAL DATA

Trace Markers

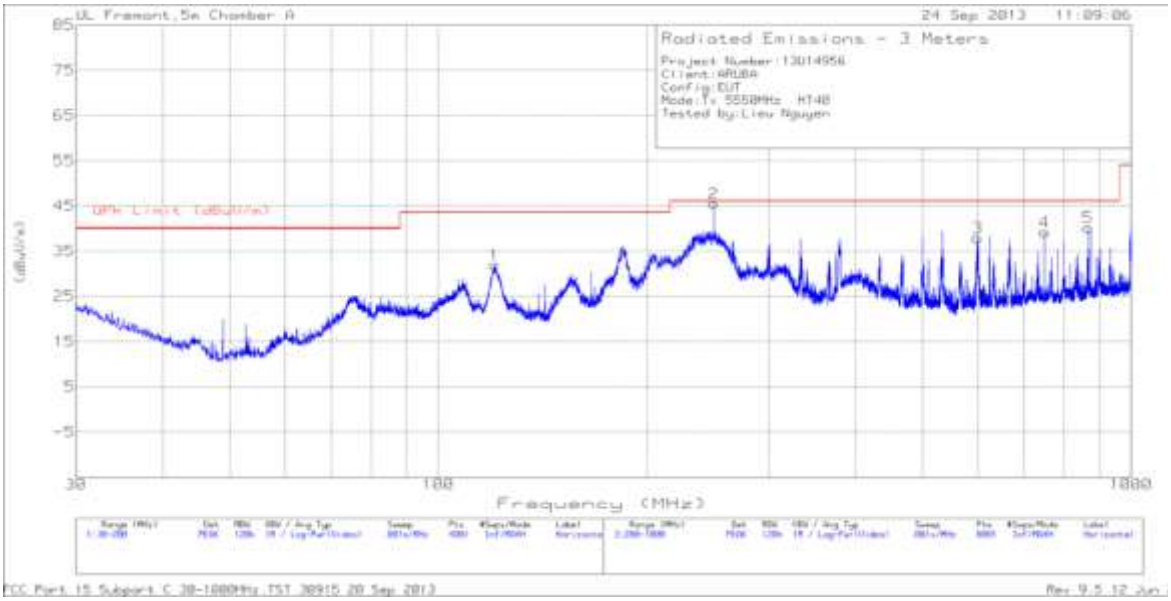
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	100.2525	39.57	PK	10.4	-26.9	23.07	43.52	-20.45	0-360	100	H
9	99.6575	50.02	PK	10.2	-26.9	33.32	43.52	-10.2	0-360	100	V
2	240	46.65	PK	11.4	-25.9	32.15	46.02	-13.87	0-360	200	H
3	298.7	44.91	PK	13.2	-25.6	32.51	46.02	-13.51	0-360	100	H
4	340	50.89	PK	13.9	-25.3	39.49	46.02	-6.53	0-360	100	H
5	377.9	49.47	PK	14.9	-25.1	39.27	46.02	-6.75	0-360	200	H
6	399.9973	45.37	QP	15.5	-25.1	35.77	46.02	-10.25	0-360	300	H
7	499.9992	46.6	QP	17.7	-24.3	40	46.02	-6.02	0-360	200	H
8	624.9976	41.79	QP	19.1	-23.3	37.59	46.02	-8.43	0-360	100	H
17	874.9967	35.04	QP	21.6	-22.5	34.14	46.02	-11.88	0-360	100	H
10	240	53.58	PK	11.4	-25.9	39.08	46.02	-6.94	0-360	100	V
11	298.7	47.16	PK	13.2	-25.6	34.76	46.02	-11.26	0-360	100	V
12	339.9926	38.59	QP	13.9	-25.3	27.19	46.02	-18.83	0-360	100	V
13	367.8827	34.9	QP	15	-25.2	24.7	46.02	-21.32	0-360	100	V
14	400	46.07	QP	15.5	-25.1	36.47	46.02	-9.55	0-360	100	V
15	500	42.5	QP	17.7	-24.3	35.9	46.02	-10.12	0-360	100	V
16	625	42.17	QP	19.1	-23.3	37.97	46.02	-8.05	0-360	100	V

PK - Peak detector

QP - Quasi-Peak detection

POE UNIT

HORIZONTAL PLOT



VERTICAL PLOT

HORIZONTAL AND VERTICAL DATA

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	120.61	44.87	PK	13.8	-26.7	31.97	43.52	-11.55	0-360	300	H
6	122.5225	39.88	QP	13.7	-26.7	26.88	43.52	-16.64	0-360	100	V
7	184.02	41.99	QP	11.3	-26.3	26.99	43.52	-16.53	0-360	100	V
2	250	42.75	QP	11.4	-25.8	28.35	46.02	-17.67	0-360	100	H
3	599.8	43	PK	18.4	-23.5	37.9	46.02	-8.12	0-360	100	H
4	750	41.54	PK	20.3	-22.6	39.24	46.02	-6.78	0-360	100	H
5	866.7	35.99	QP	21.6	-22.5	35.09	46.02	-10.93	0-360	200	H
8	250	44.43	QP	11.5	-25.9	30.03	46.02	-15.99	0-360	100	V
9	466.7	38.07	QP	17	-24.6	30.47	46.02	-15.55	0-360	100	V
10	500	38.74	QP	17.7	-24.4	32.04	46.02	-13.98	0-360	100	V
11	533.3	32.38	QP	18.3	-24.1	26.58	46.02	-19.44	0-360	100	V
12	625	34.92	QP	19.1	-23.3	30.72	46.02	-15.3	0-360	100	V

PK - Peak detector

QP - Quasi-Peak detection

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

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

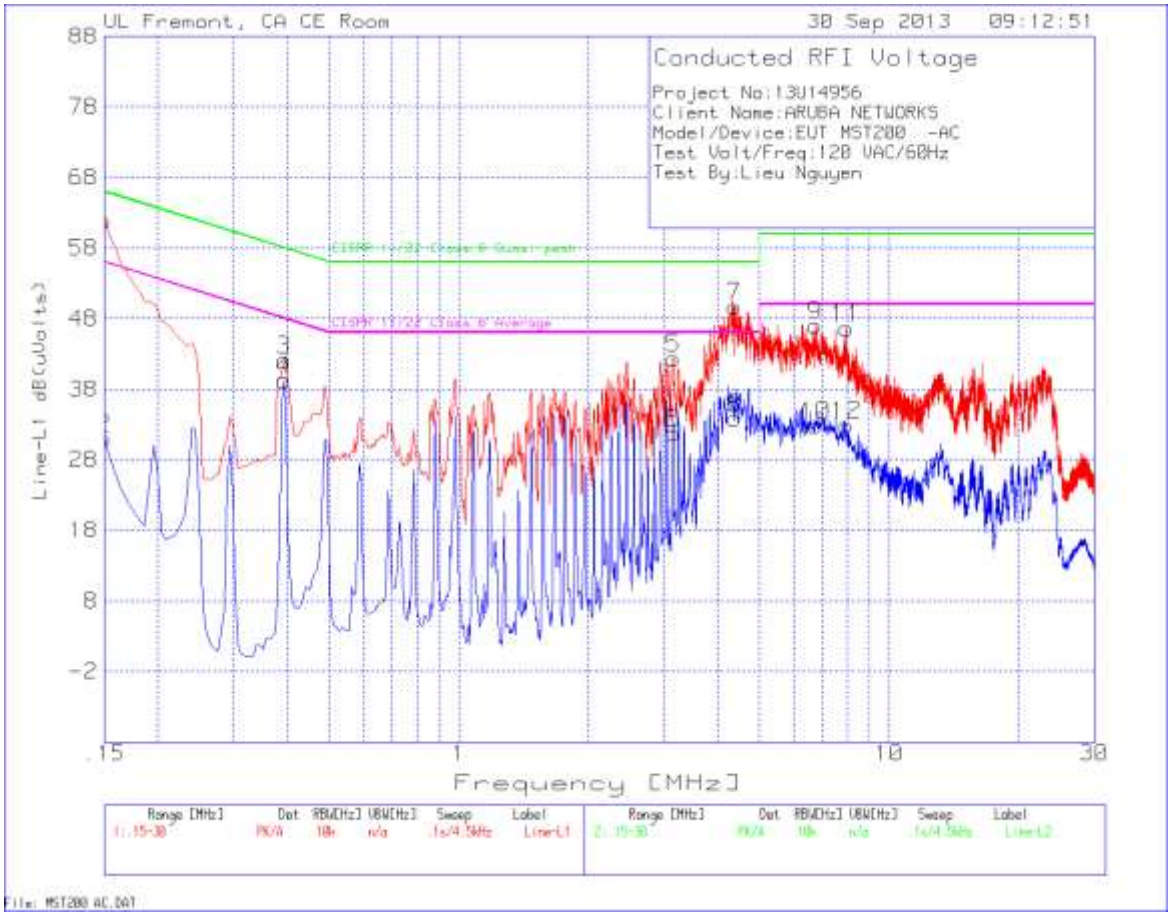
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

10.1. AC UNIT

LINE 1 RESULTS

Line 1



Line-L1 .15 - 30MHz

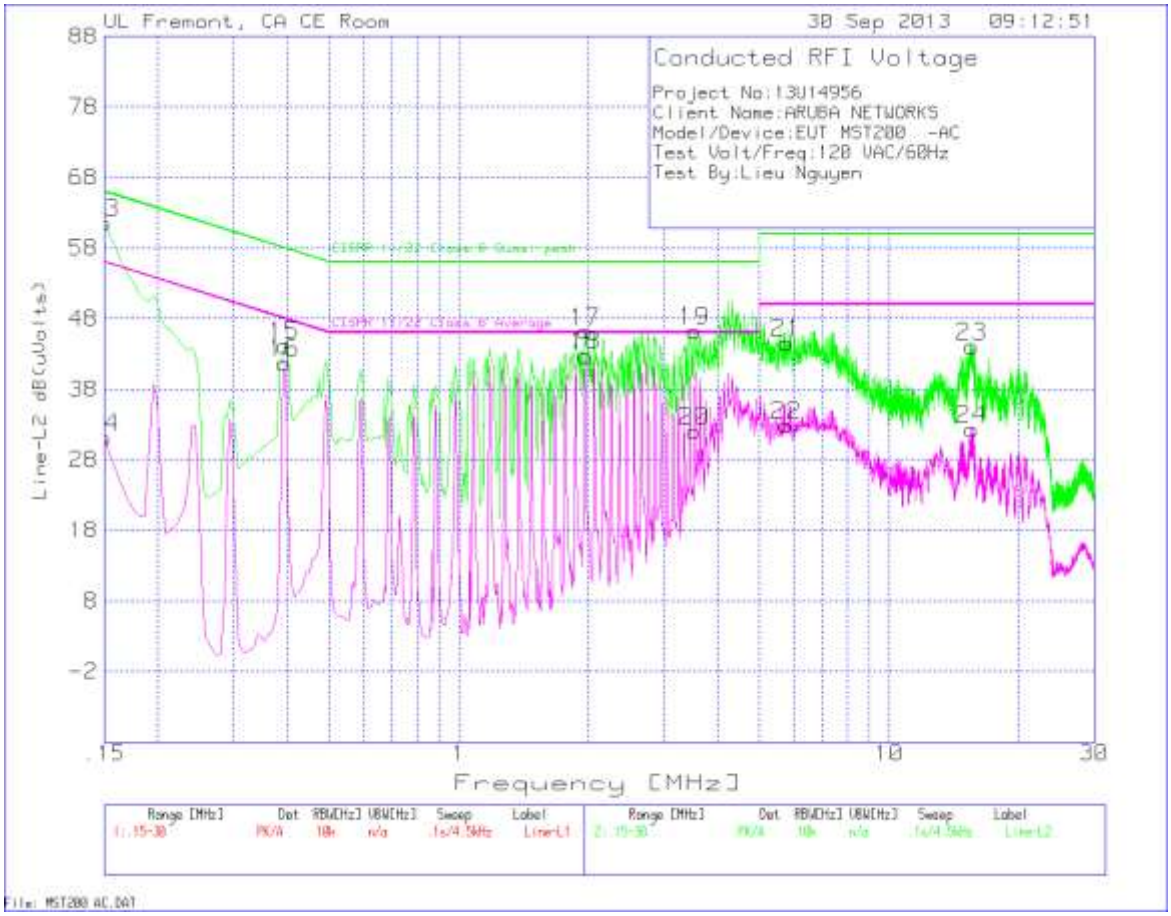
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dB(uVolts)	CISPR 11/22 Class B Quasi-peak	Margin to Limit (dB)	CISPR 11/22 Class B Average	Margin to Limit (dB)
1	0.15	61.81	PK	0.1	0	61.91	66	-4.09	-	-
2	0.15	30.9	Av	0.1	0	31	-	-	56	-25
3	0.393	41.99	PK	0.1	0	42.09	58	-15.91	-	-
4	0.393	39.11	Av	0.1	0	39.21	-	-	48	-8.79
5	3.1515	42.11	PK	0.1	0.1	42.31	56	-13.69	-	-
6	3.1515	31.58	Av	0.1	0.1	31.78	-	-	46	-14.22
7	4.371	49.56	PK	0.1	0.1	49.76	56	-6.24	-	-
8	4.371	33.64	Av	0.1	0.1	33.84	-	-	46	-12.16
9	6.7605	46.75	PK	0.1	0.1	46.95	60	-13.05	-	-
10	6.7605	32.62	Av	0.1	0.1	32.82	-	-	50	-17.18
11	7.971	46.42	PK	0.1	0.1	46.62	60	-13.38	-	-
12	7.971	32.69	Av	0.1	0.1	32.89	-	-	50	-17.11

PK - Peak detector

Av - average detection

LINE 2 RESULTS



Line-L2 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dB(uVolts)	CISPR 11/22 Class B Quasi-peak	Margin to Limit (dB)	CISPR 11/22 Class B Average	Margin to Limit (dB)
13	0.15	61.47	PK	0.1	0	61.57	66	-4.43	-	-
14	0.15	31.07	Av	0.1	0	31.17	-	-	56	-24.83
15	0.393	44.1	PK	0.1	0	44.2	58	-13.8	-	-
16	0.393	41.58	Av	0.1	0	41.68	-	-	48	-6.32
17	1.968	45.96	PK	0.1	0.1	46.16	56	-9.84	-	-
18	1.968	42.51	Av	0.1	0.1	42.71	-	-	46	-3.29
19	3.534	45.99	PK	0.1	0.1	46.19	56	-9.81	-	-
20	3.534	31.83	Av	0.1	0.1	32.03	-	-	46	-13.97
21	5.7795	44.38	PK	0.1	0.1	44.58	60	-15.42	-	-
22	5.7795	32.68	Av	0.1	0.1	32.88	-	-	50	-17.12
23	15.5895	43.68	PK	0.2	0.2	44.08	60	-15.92	-	-
24	15.5895	31.88	Av	0.2	0.2	32.28	-	-	50	-17.72

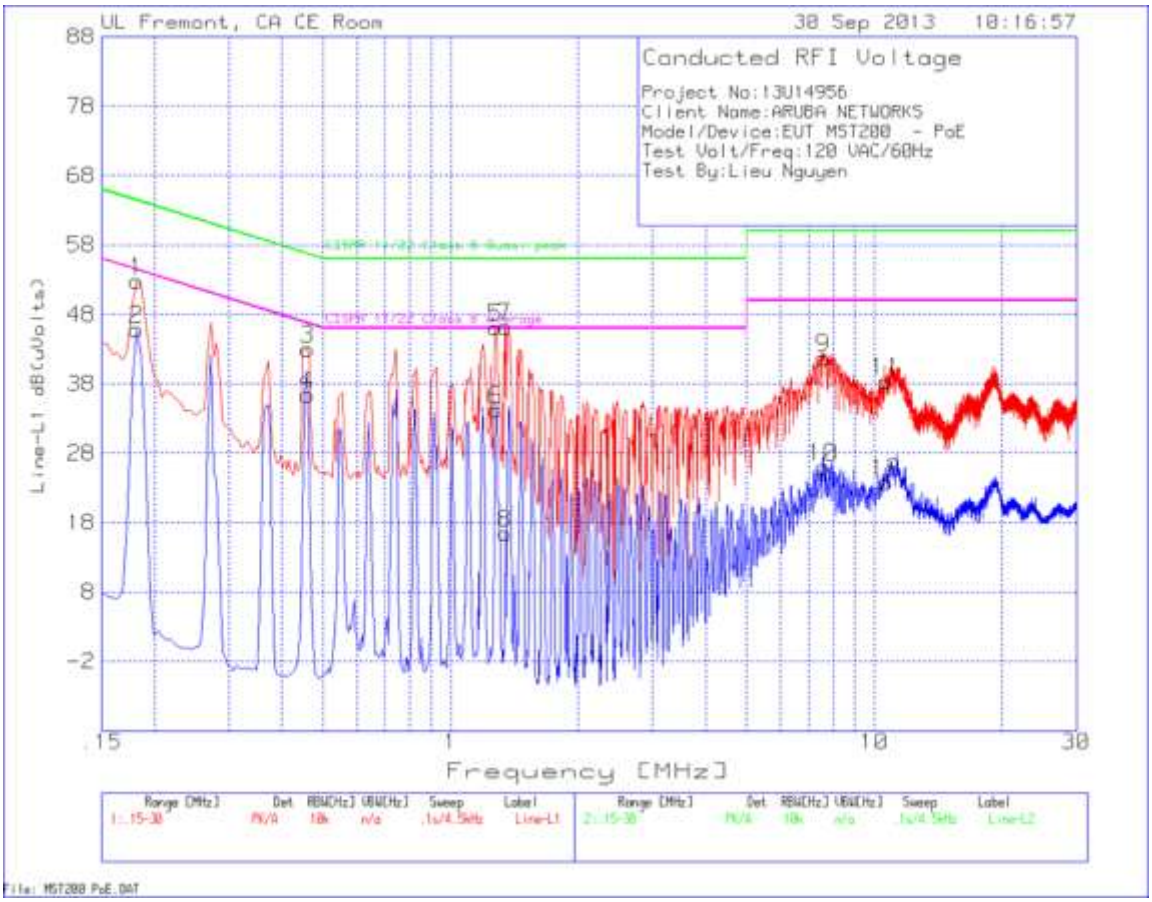
PK - Peak detector

Av - average detection

10.2. POE UNIT

LINE 1 RESULTS

Line 1



Line-L1 .15 - 30MHz

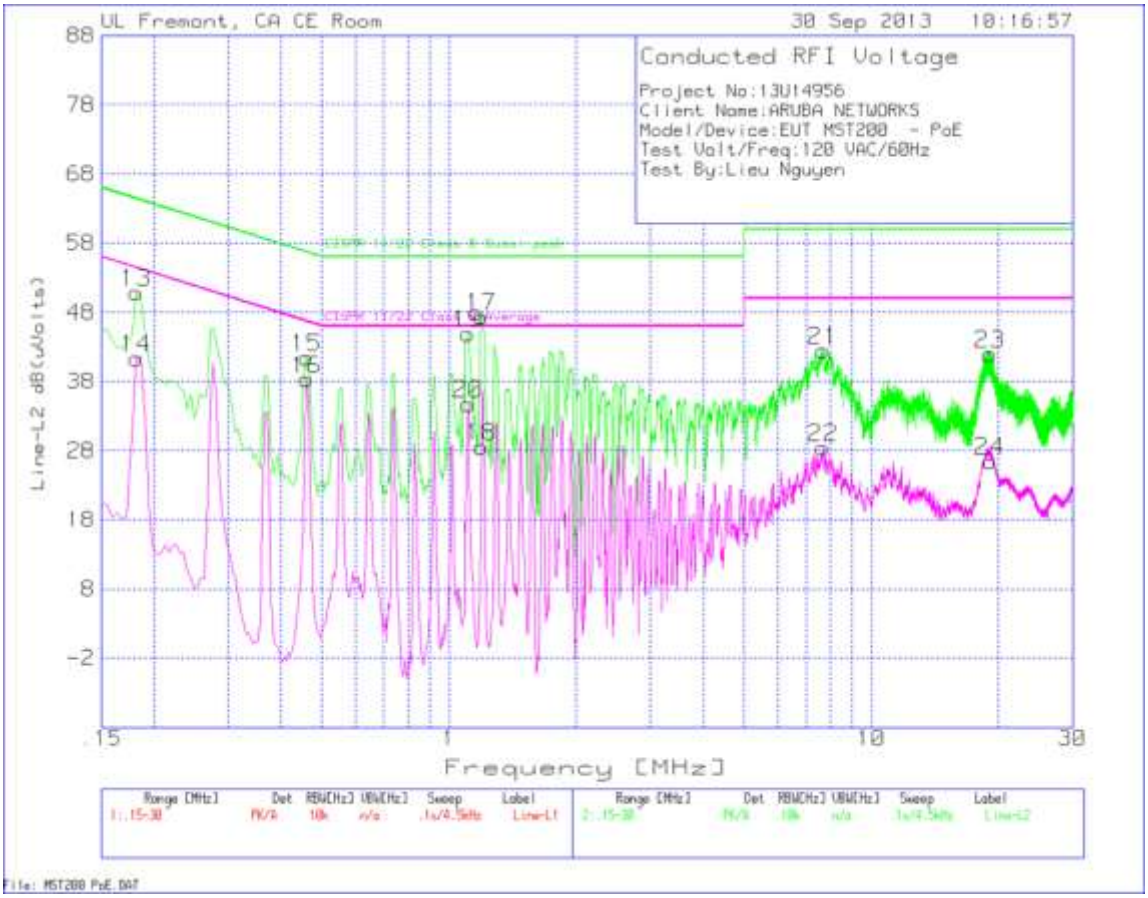
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dB(uVolts)	CISPR 11/22 Class B Quasi-peak	Margin to Limit (dB)	CISPR 11/22 Class B Average	Margin to Limit (dB)
1	0.1815	52.71	PK	0.1	0	52.81	64.4	-11.59	-	-
2	0.1815	45.7	Av	0.1	0	45.8	-	-	54.4	-8.6
3	0.4605	42.94	PK	0.1	0	43.04	56.7	-13.66	-	-
4	0.4605	36.35	Av	0.1	0	36.45	-	-	46.7	-10.25
5	1.275	45.95	PK	0.1	0.1	46.15	56	-9.85	-	-
6	1.275	34.04	Av	0.1	0.1	34.24	-	-	46	-11.76
7	1.34475	46.03	PK	0.1	0.1	46.23	56	-9.77	-	-
8	1.34475	16.24	Av	0.1	0.1	16.44	-	-	46	-29.56
9	7.593	41.47	PK	0.1	0.1	41.67	60	-18.33	-	-
10	7.593	25.73	Av	0.1	0.1	25.93	-	-	50	-24.07
11	10.653	38.11	PK	0.1	0.2	38.41	60	-21.59	-	-
12	10.653	23.54	Av	0.1	0.2	23.84	-	-	50	-26.16

PK - Peak detector

Av - average detection

LINE 2 RESULTS



Line-L2 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dB(uVolts)	CISPR 11/22 Class B Quasi-peak	Margin to Limit (dB)	CISPR 11/22 Class B Average	Margin to Limit (dB)
13	0.1815	50.76	PK	0.1	0	50.86	64.4	-13.54	-	-
14	0.1815	41.25	Av	0.1	0	41.35	-	-	54.4	-13.05
15	0.4605	41.41	PK	0.1	0	41.51	56.7	-15.19	-	-
16	0.4605	38.2	Av	0.1	0	38.3	-	-	46.7	-8.4
19	1.1085	44.86	PK	0.1	0	44.96	56	-11.04	-	-
20	1.1085	34.7	Av	0.1	0	34.8	-	-	46	-11.2
17	1.194	47.23	PK	0.1	0.1	47.43	56	-8.57	-	-
18	1.194	28.35	Av	0.1	0.1	28.55	-	-	46	-17.45
21	7.701	42.24	PK	0.1	0.1	42.44	60	-17.56	-	-
22	7.701	28.21	Av	0.1	0.1	28.41	-	-	50	-21.59
23	19.0995	41.52	PK	0.3	0.2	42.02	60	-17.98	-	-
24	19.0995	26.01	Av	0.3	0.2	26.51	-	-	50	-23.49

PK - Peak detector

Av - average detection

11. SETUP PHOTOS

11.1. ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

Note: Antenna port testing was leveraged from the AC/DC powered MSR4K43N3 model. Please refer to UL Verifications Services, Inc. Report 13U14957-1 FCC IC UNII WLAN.