FCC CFR47 PART 15 SUBPART E

CERTIFICATION TEST REPORT

FOR

CELL PHONE WITH GSM/CDMA/WCDMA/LTE+BT LE+802.11ABGN (HT20)
WITH WIRELESS BACK COVER

MODEL NUMBER: LG-VS930

FCC ID: ZNFVS930

REPORT NUMBER: 12U14331-5

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Prepared for
LG ELECTRONICS INC.
60-39 GASAN-DONG, GEUMCHEON-GU
SEOUL, KOREA 153-801, SOUTH KOREA

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

NVLAP LAB CODE 200065-0

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TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS 5

2. TEST METHODOLOGY 6

3. FACILITIES AND ACCREDITATION 6

4. CALIBRATION AND UNCERTAINTY 6

4.1. MEASURING INSTRUMENT CALIBRATION 6

4.2. SAMPLE CALCULATION 6

4.3. MEASUREMENT UNCERTAINTY 6

5. EQUIPMENT UNDER TEST 7

5.1. DESCRIPTION OF EUT 7

5.2. MAXIMUM OUTPUT POWER 7

5.3. DESCRIPTION OF AVAILABLE ANTENNAS 7

5.4. SOFTWARE AND FIRMWARE 8

5.5. WORST-CASE CONFIGURATION AND MODE 8

5.6. DESCRIPTION OF TEST SETUP 9

6. TEST AND MEASUREMENT EQUIPMENT 11

7. ANTENNA PORT TEST RESULTS 12

7.1. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS 12
7.1.1. ON TIME AND DUTY CYCLE RESULTS 12
7.1.2. MEASUREMENT METHOD FOR POWER AND PPSD 12
7.1.3. MEASUREMENT METHOD FOR AVG SPURIOUS EMISSIONS ABOVE 1 GHz 12
7.1.4. DUTY CYCLE PLOTS 13

7.2. 802.11a MODE IN THE 5.2 GHz BAND 14
7.2.1. 26 dB BANDWIDTH 14
7.2.2. 99% BANDWIDTH 17
7.2.3. AVERAGE POWER 20
7.2.4. OUTPUT POWER AND PPSD 21

7.3. 802.11n HT20 MODE IN THE 5.2 GHz BAND 28
7.3.1. 26 dB BANDWIDTH 28
7.3.2. 99% BANDWIDTH 31
7.3.3. AVERAGE POWER 34
7.3.4. OUTPUT POWER AND PPSD 35

7.4. 802.11a MODE IN THE 5.3 GHz BAND 42
7.4.1. 26 dB BANDWIDTH 42
7.4.2. AVERAGE POWER 48
7.4.3. OUTPUT POWER AND PPSD 49
7.4.4. PEAK EXCURSION 53

7.5. 802.11n HT20 MODE IN THE 5.3 GHz BAND 56
7.5.1. 26 dB BANDWIDTH 56

7.5.2. AVERAGE POWER 62
7.5.3. OUTPUT POWER AND PPSD 63
7.5.4. PEAK EXCURSION 67

7.6. 802.11a MODE IN THE 5.6 GHz BAND 70
7.6.1. 26 dB BANDWIDTH 70
7.6.2. 99% BANDWIDTH 73
7.6.3. OUTPUT POWER AND PPSD 76
7.6.4. PEAK EXCURSION 80

7.7. 802.11n HT20 MODE IN THE 5.6 GHz BAND 83
7.7.1. 26 dB BANDWIDTH 83
7.7.2. 99% BANDWIDTH 86
7.7.3. OUTPUT POWER AND PPSD 89
7.7.4. PEAK EXCURSION 93

8. RADIATED TEST RESULTS 96

8.1. LIMITS AND PROCEDURE 96

8.2. TRANSMITTER ABOVE 1 GHz 97
8.2.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.2 GHz BAND 97
8.2.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.2 GHz BAND 106
8.2.3. 802.11a MODE IN THE 5.3 GHz BAND 115
8.2.4. 802.11n HT20 MODE IN THE 5.3 GHz BAND 124
8.2.5. 802.11a MODE IN THE 5.6 GHz BAND 133
8.2.6. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.6 GHz BAND 145

8.3. WORST-CASE BELOW 1 GHz 157

9. AC POWER LINE CONDUCTED EMISSIONS 166

10. DYNAMIC FREQUENCY SELECTION 179

10.1. OVERVIEW 179
10.1.1. LIMITS 179
10.1.2. TEST AND MEASUREMENT SYSTEM 182
10.1.3. SETUP OF EUT 185
10.1.4. DESCRIPTION OF EUT 186

10.2. RESULTS FOR 20 MHz BANDWIDTH 188
10.2.1. TEST CHANNEL 188
10.2.2. RADAR WAVEFORM AND TRAFFIC 188
10.2.3. OVERLAPPING CHANNEL TESTS 190
10.2.4. MOVE AND CLOSING TIME 190
10.2.5. NON-OCCUPANCY PERIOD 194

11. SETUP PHOTOS 195

1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	LG ELECTRONICS INC. 60-39 GASAN-DONG, GEUMCHEON-GU SEOUL, KOREA 153-801, SOUTH KOREA
EUT DESCRIPTION:	CELL PHONE WITH GSM/CDMA/WCDMA/LTE+BT LE+802.11ABGN (HT20) WITH WIRELESS BACK COVER
MODEL:	LG-VS930
SERIAL NUMBER:	990000760004152
DATE TESTED:	MARCH 25-APRIL 27, 2012

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Pass

Compliance Certification Services (UL CCS) 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 CCS 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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS 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 CCS By:

TIM LEE
STAFF ENGINEER
UL CCS

Tested By:

CHIN PANG
EMC ENGINEER
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 06-96 and FCC KDB 789033.

3. FACILITIES AND ACCREDITATION

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

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

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 Cell Phone with GSM/CDMA/WCDMA/LTE+BT LE+802.11abgn (HT20) w/ Wireless Back Cover

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)
5180 - 5240	802.11a	13.25	21.13
5180 - 5240	802.11n HT20	12.08	16.14
5260 - 5320	802.11a	12.49	17.74
5260 - 5320	802.11n HT20	11.65	14.62
5500 - 5700	802.11a	13.90	24.55
5500 - 5700	802.11n HT20	13.01	20.00

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes 2 IFA integrated antennas, with the following peak gains in dBi:

Frequency Band	Peak Gain (dBi)
5.2GHz	-2.59
5.3GHz	-2.28
5.5GHz	0.95

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was VS930_0311

The test utility software used during testing was FCC Test - LG.

The firmware used during testing was 3.0.8.00001_g114383

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1 GHz and power line conducted emissions were performed with the EUT set to the channel with highest output power.

For the fundamental investigation, since the EUT is a portable device that has three orientations; X, Y and Z orientations have been investigated, also with AC/DC adapter, and earphone, and the worst case was found to be at Y orientation with AC adapter and earphone for 5GHz band.

Worst-case data rates used based on an input from the client were as follows:

802.11a mode: 6 Mbps
802.11n mode: MCS0

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

STANDARD AND INDUCTIVE COVER

PERIPHERAL SUPPORT EQUIPMENT LIST			
Description	Manufacturer	Model	Serial Number
AC ADAPTER	LG ELECTRONICS	MCS-01WT	TA1Z0000522
HEADSET	LG ELECTRONICS	NA	N/A

INDUCTIVE CHARGER WITH INDUCTIVE COVER

PERIPHERAL SUPPORT EQUIPMENT LIST			
Description	Manufacturer	Model	Serial Number
AC ADAPTER	LG ELECTRONICS	WCAD01WT	TA120012180
HEADSET	LG ELECTRONICS	NA	N/A
INDUCTIVE CHARGER PAD	LG ELECTRONICS	WCP-700	A1108WP000002

I/O CABLES

STANDARD OND INDUCTIVE COVER

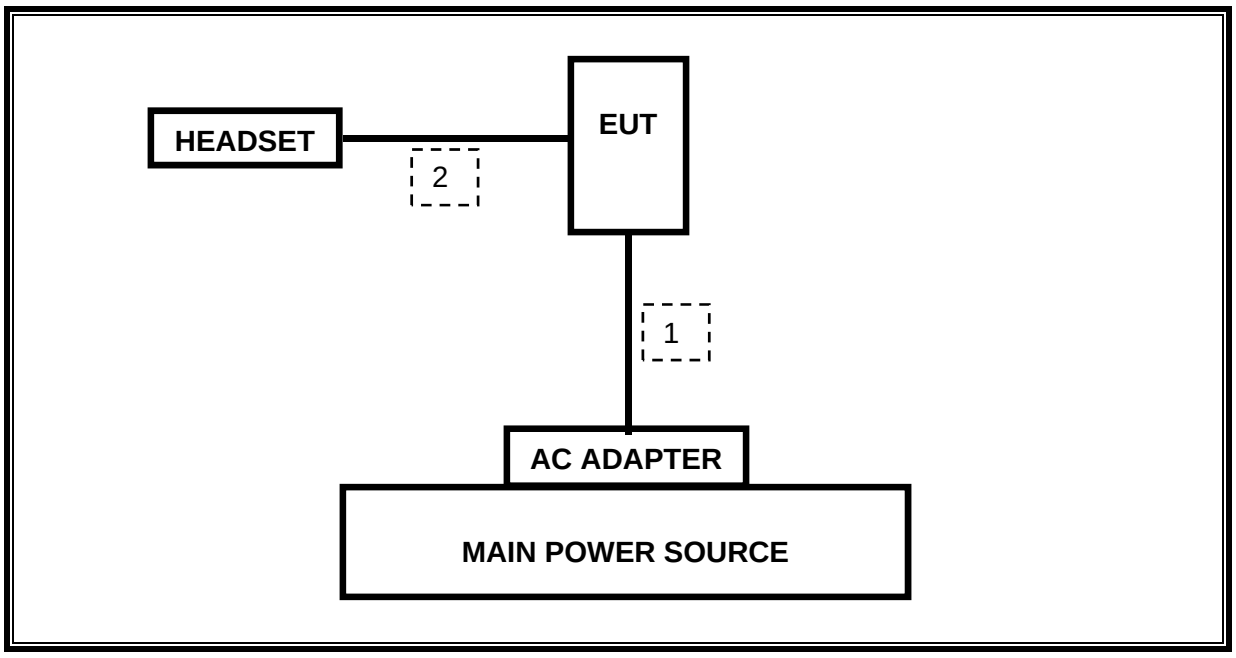
I/O CABLE LIST						
Cable No.	Port	# of Identica Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	MINI USB	UN-SHELDED	1.0m	N/A
2	AUDIO	1	MINI JACK	UN-SHELDED	1.0m	Volume control on cable

INDUCTIVE CHARGER WITH INDUCTIVE COVER

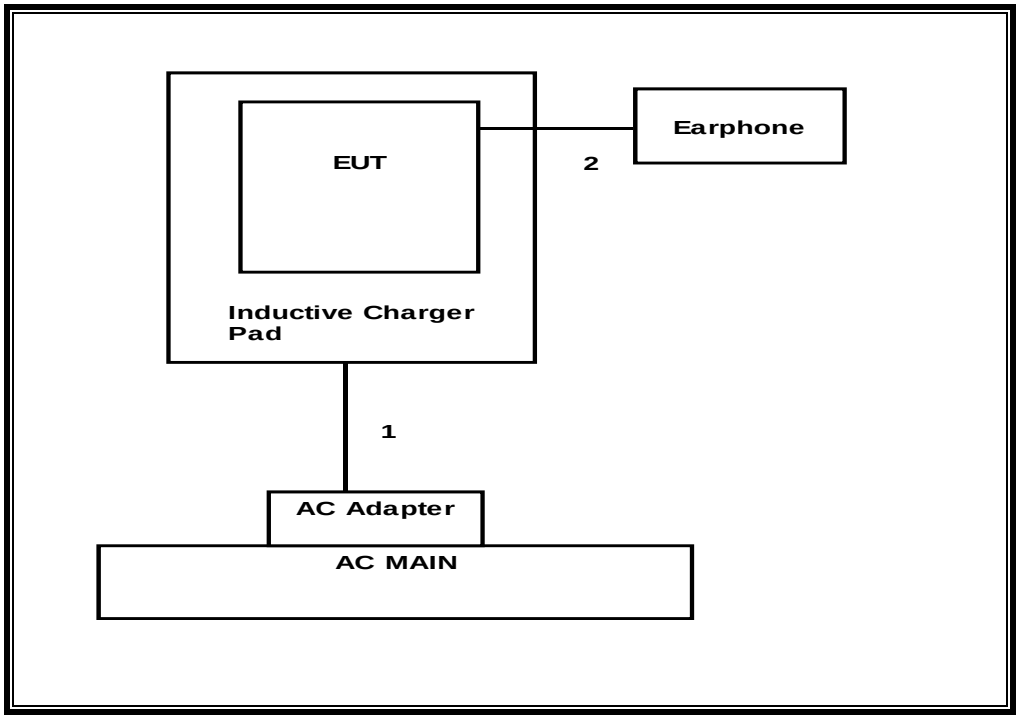
I/O CABLE LIST						
Cable No.	Port	# of Identica Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	MINI USB	UN-SHELDED	1.0m	External ferrite added
2	AUDIO	1	MINI JACK	UN-SHELDED	1.0m	Volume control on cable

SETUP DIAGRAM FOR TESTS

STANDARD AND INDUCTIVE COVER



INDUCTIVE CHARGER AND INDUCTIVE COVER



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**
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	07/14/12
Antenna, Horn, 18 GHz	EMCO	3115	C00945	06/29/12
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00580	11/11/12
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01016	07/12/12
Horn Antenna, 26.5 GHz	ARA	MWH-1826/B	C00589	07/28/12
Horn Antenna, 40 GHz	ARA	MWH-2640/B	C00981	06/14/12
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	03/14/13
Reject Filter, 2.0-2.9 GHz	Micro-Tronics	BRM50702	N02684	CNR
High Pass Filter, 7.6 GHz	Micro-Tronics	HPM13195	N02682	CNR
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01159	05/11/12
Peak Power Meter	Agilent	N1911A	1260847C	08/04/12
Peak Power Sensor	Agilent	E9323A	1244073F	08/04/12
Reject Filter, 5.725-5.825 GHz	Micro-Tronics	BRC13192	N02676	CNR
High pass Filter, 7.6 GHz	Micro-Tronics	HPM13195	N02682	CNR
EMI Test Receiver, 30MHz	R & S	ESHS 20	N02396	08/19/13
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	12/13/12

7. ANTENNA PORT TEST RESULTS

7.1. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

7.1.1. 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/B Minimum VBW (kHz)
802.11a 20 MHz	2.033	2.133	0.953	95.3%	0.21	0.492
802.11n HT20	1.890	1.990	0.950	95.0%	0.22	0.529

7.1.2. MEASUREMENT METHOD FOR POWER AND PPSD

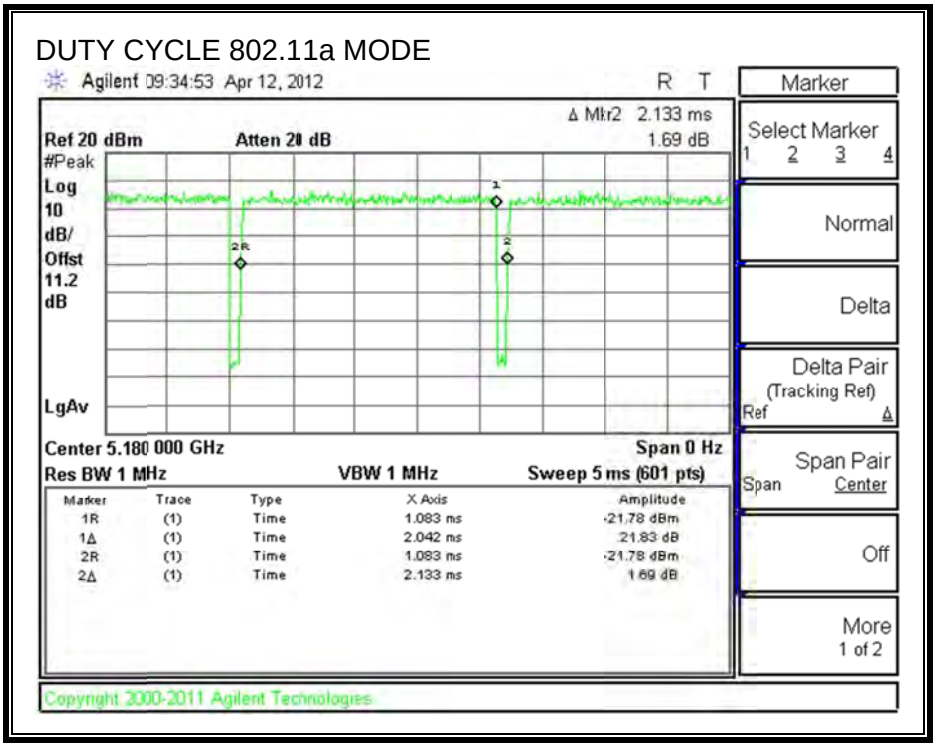
The Duty Cycle is less than 98% and not consistent therefore KDB 789033 Method SA-3 Alternative with Power RMS Averaging is used.

7.1.3. MEASUREMENT METHOD FOR AVG SPURIOUS EMISSIONS ABOVE 1 GHz

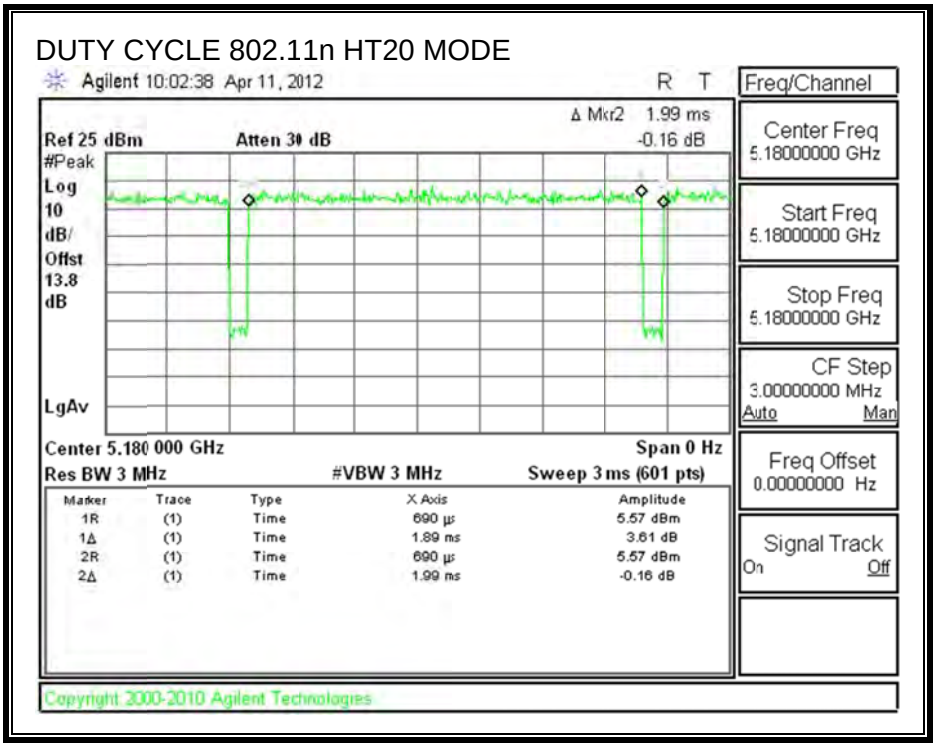
The Duty Cycle is less than 98% and consistent, KDB 789033 Method VB with Power RMS Averaging is used.

7.1.4. DUTY CYCLE PLOTS

DUTY CYCLE 802.11a MODE



DUTY CYCLE 802.11n HT20 MODE



7.2. 802.11a MODE IN THE 5.2 GHz BAND

7.2.1. 26 dB BANDWIDTH

LIMITS

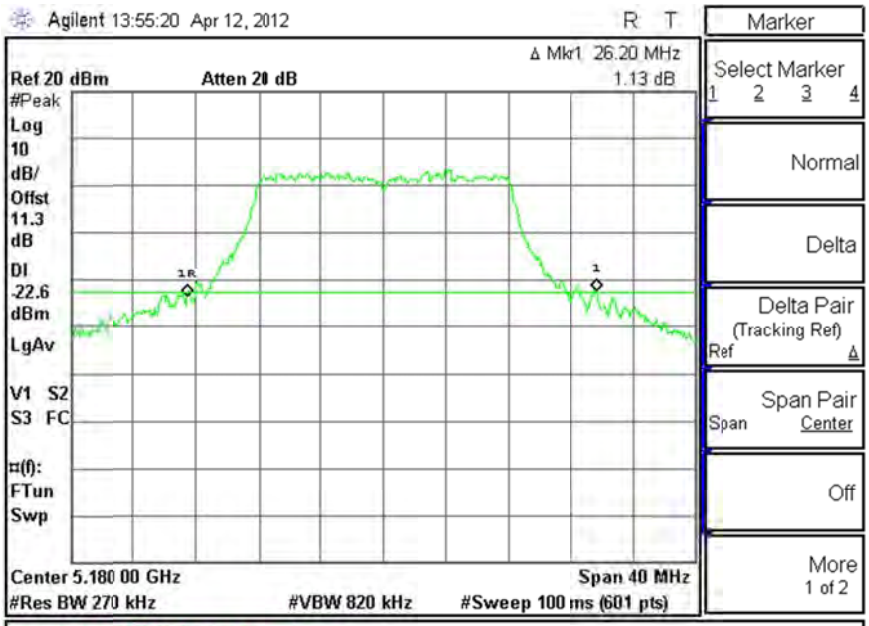
None; for reporting purposes only.

RESULTS

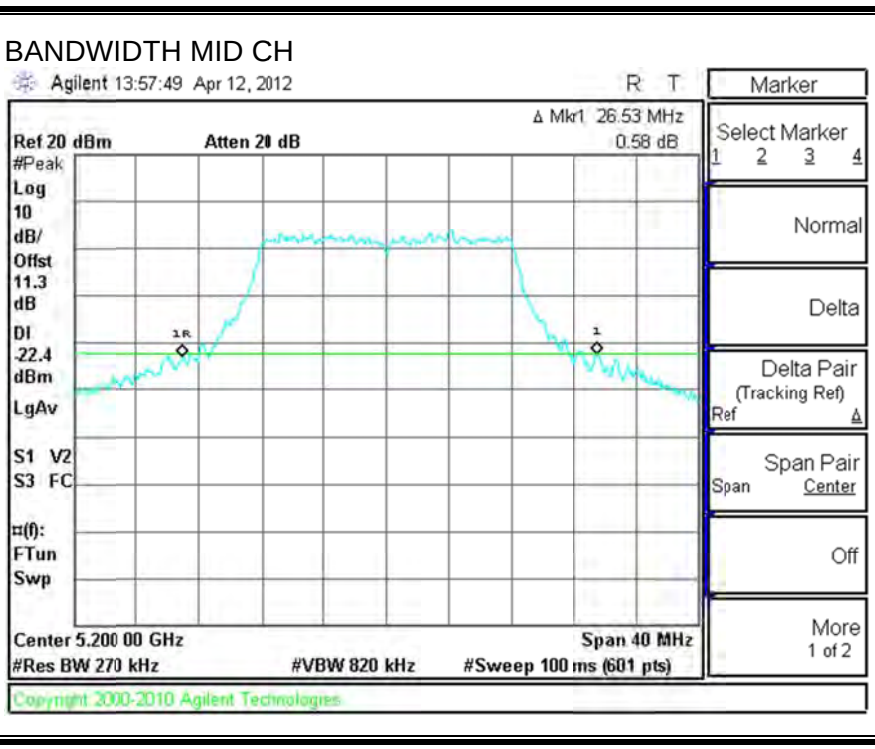
Channel	Frequency (MHz)	26 dB BW (MHz)
Low	5180	26.20
Mid	5200	26.53
High	5240	25.60

26 dB BANDWIDTH

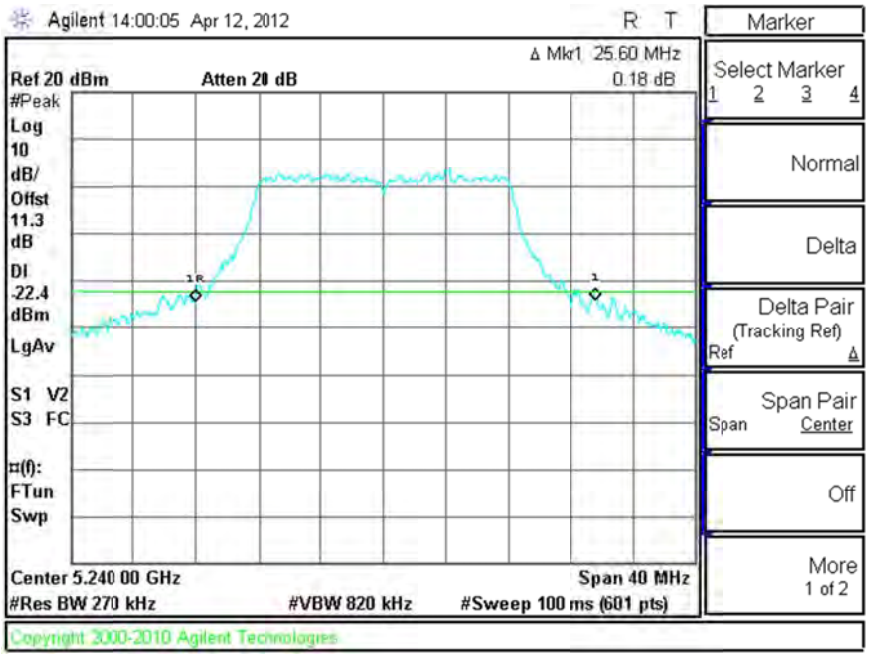
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



7.2.2. 99% BANDWIDTH

LIMITS

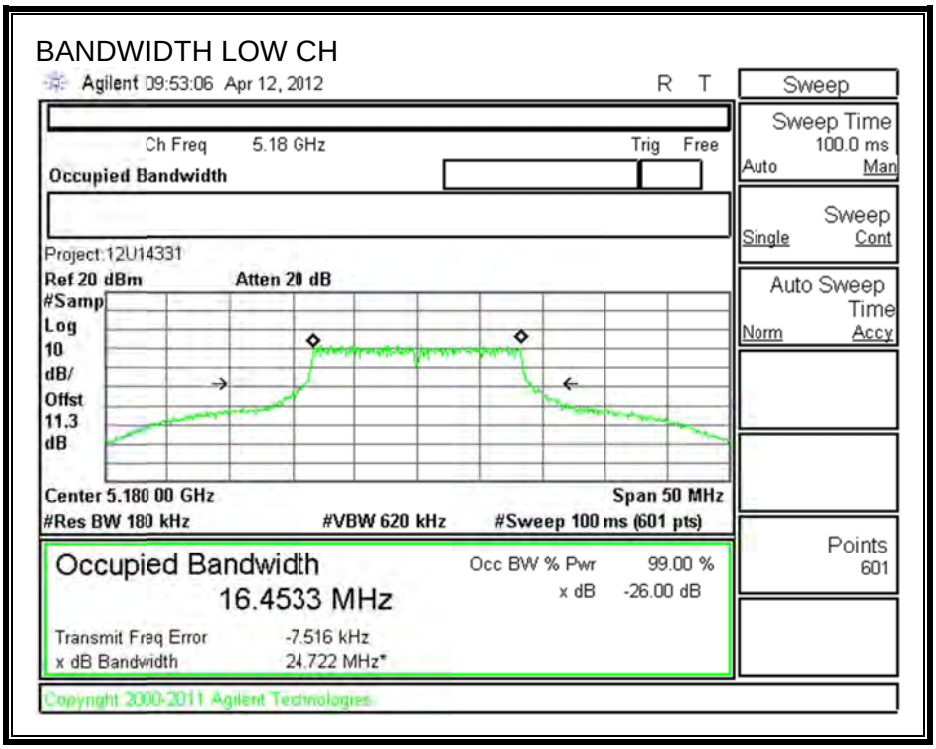
None; for reporting purposes only.

RESULTS

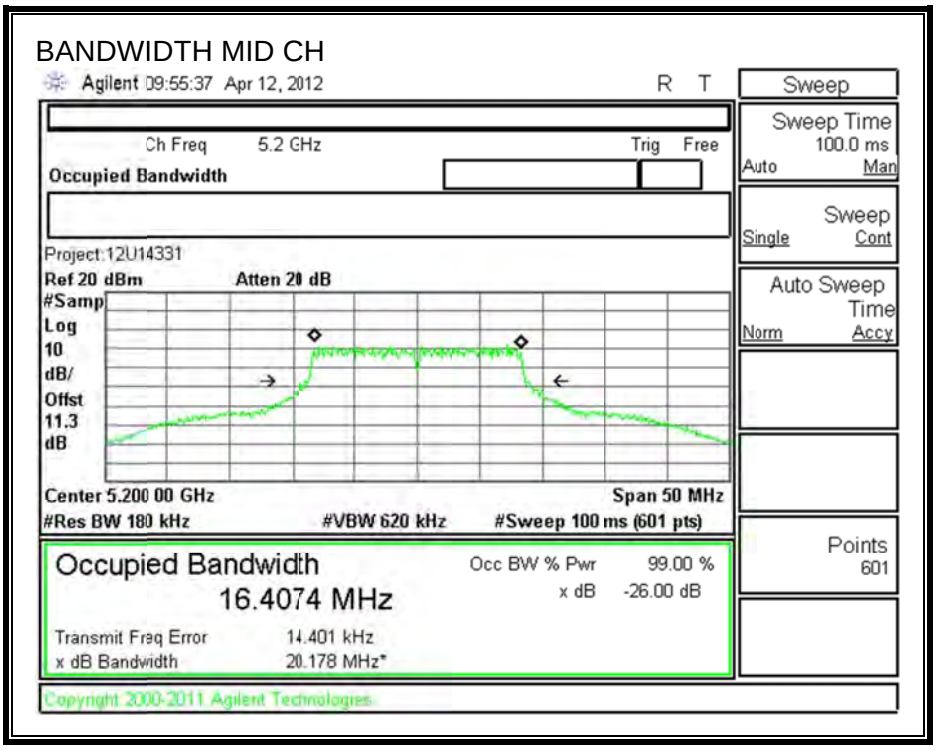
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)
Low	5180	16.4533
Mid	5200	16.4074
High	5240	16.4217

99% BANDWIDTH

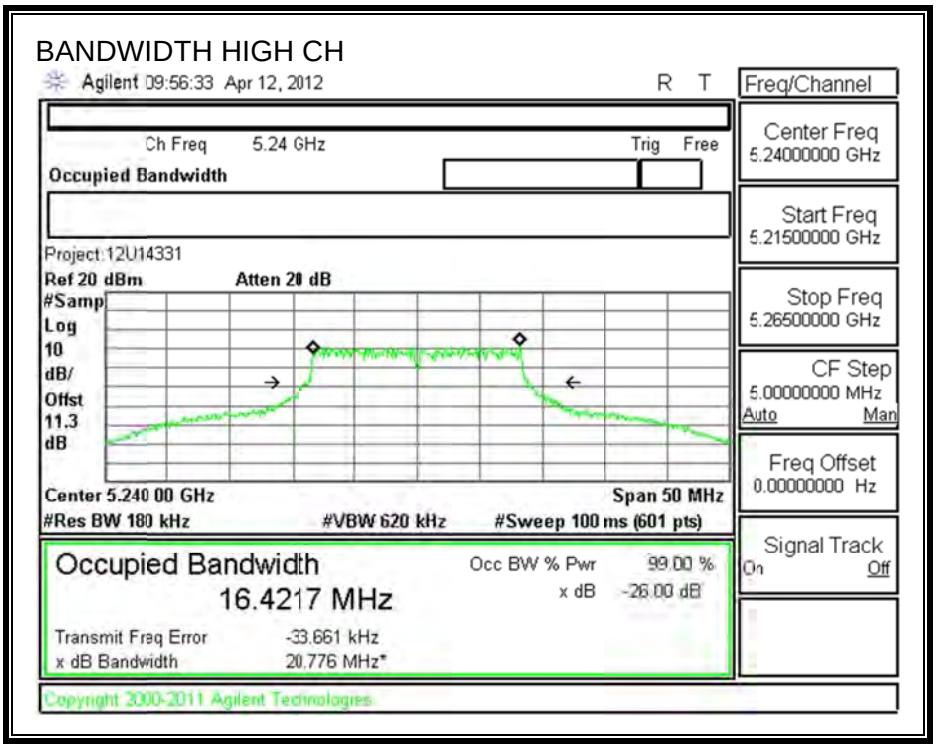
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



7.2.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.4 dB (including 10 dB pad and 1.4 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Average Power Results

Channel	Frequency (MHz)	Total Power (dBm)
Low	5180	11.85
Mid	5200	11.75
High	5240	11.60

7.2.4. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density 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)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5180	17	26.20	18.18	-2.59	17.00	4.00
Mid	5200	17	26.53	18.24	-2.59	17.00	4.00
High	5240	17	25.60	18.08	-2.59	17.00	4.00

Duty Cycle CF (dB)	0.21	Included in Calculations of Corr'd Power & PPSD

Output Power Results

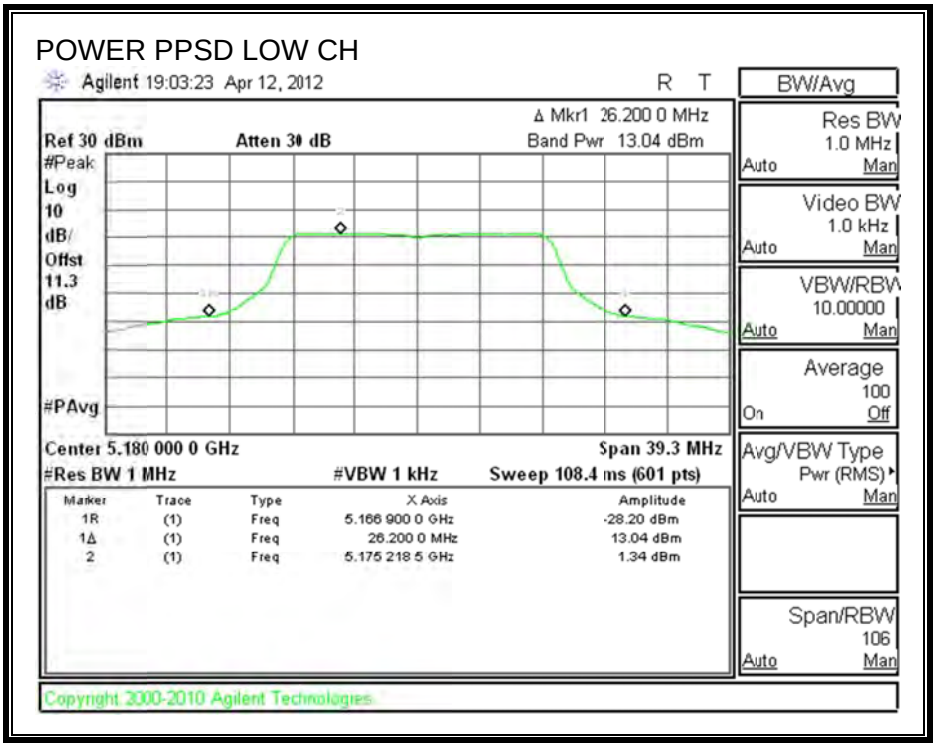
Channel	Frequency (MHz)	Meas Power (dBm)	Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	13.04	13.25	17.00	-3.75
Mid	5200	12.91	13.12	17.00	-3.88
High	5240	12.35	12.56	17.00	-4.44

PPSD Results

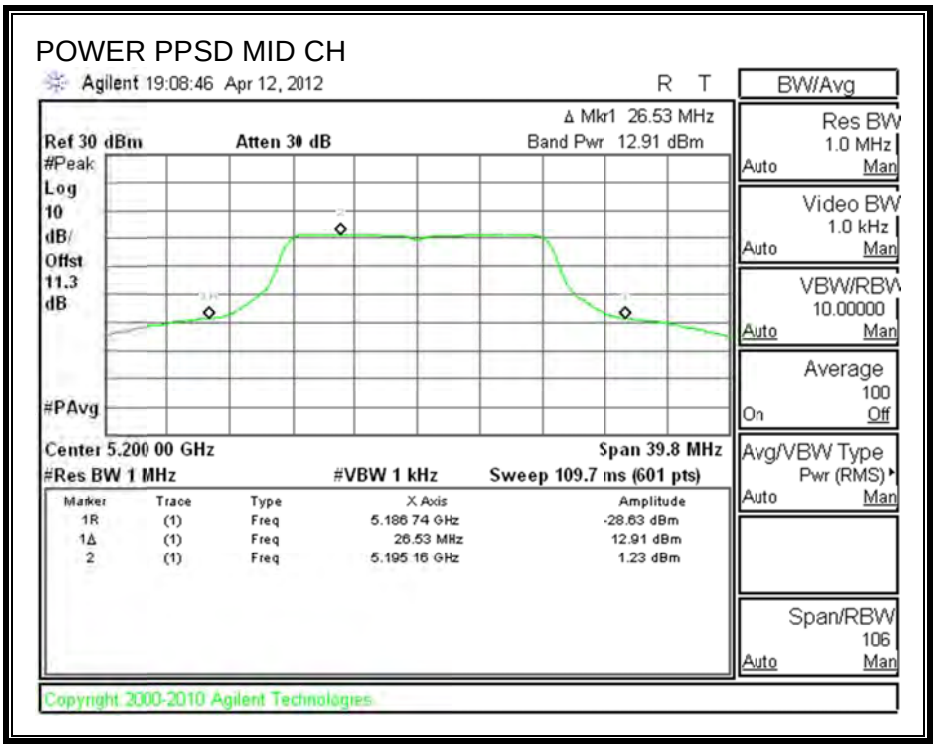
Channel	Frequency (MHz)	Meas PPSD (dBm)	Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	1.34	1.55	4.00	-2.45
Mid	5200	1.23	1.44	4.00	-2.56
High	5240	0.72	0.93	4.00	-3.07

OUTPUT POWER AND PPSD

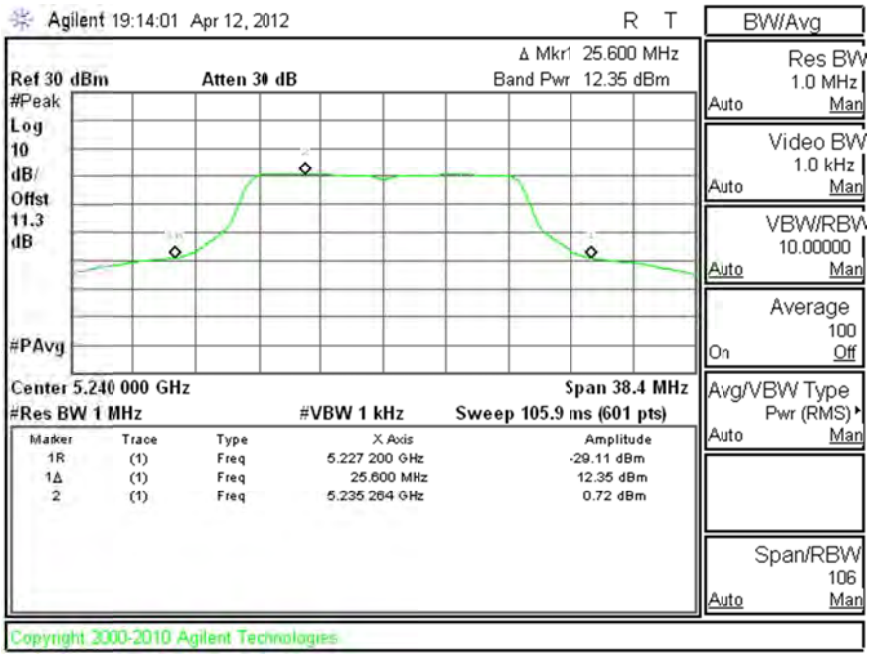
POWER PPSD LOW CH



POWER PPSD MID CH



POWER PPSD HIGH CH



PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

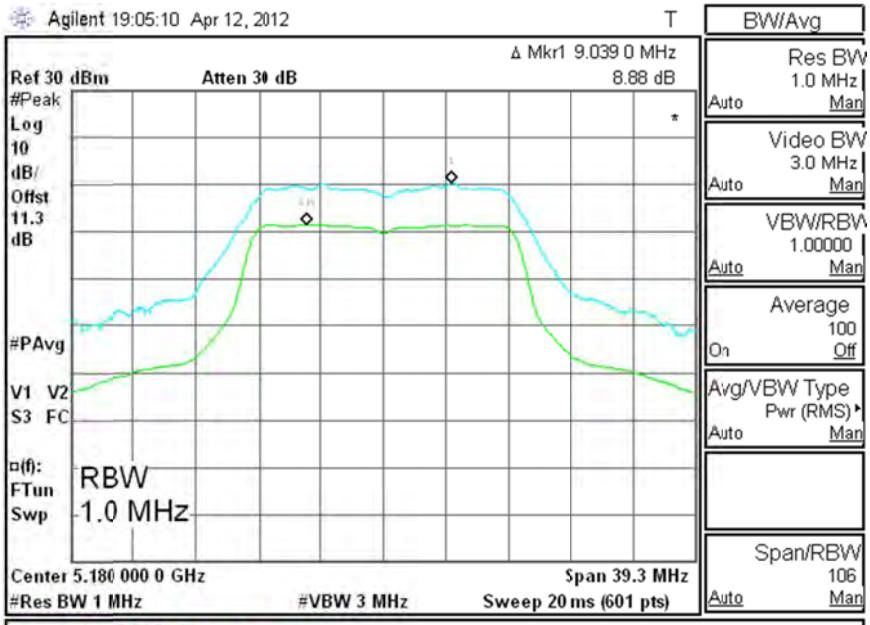
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

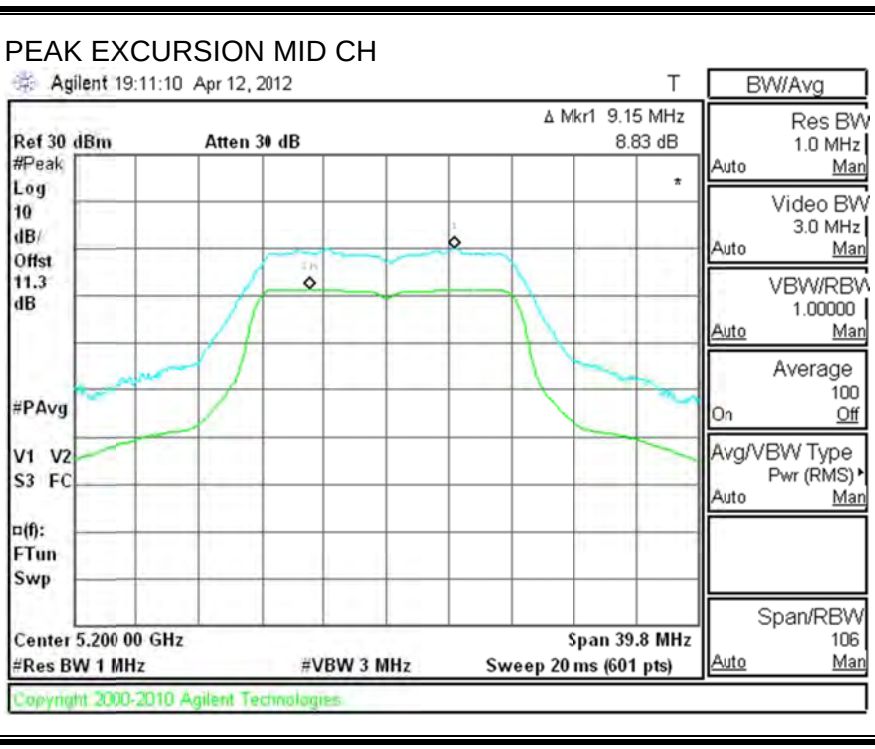
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	8.88	13	-4.1
Mid	5200	8.83	13	-4.2
High	5240	8.75	13	-4.3

PEAK EXCURSION

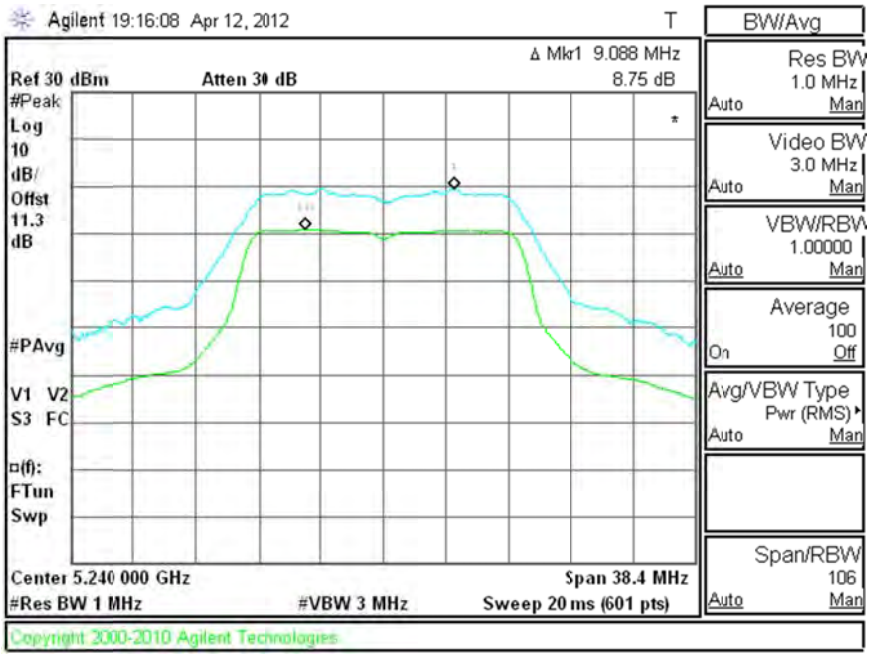
PEAK EXCURSION LOW CH



PEAK EXCURSION MID CH



PEAK EXCURSION HIGH CH



7.3. 802.11n HT20 MODE IN THE 5.2 GHz BAND

7.3.1. 26 dB BANDWIDTH

LIMITS

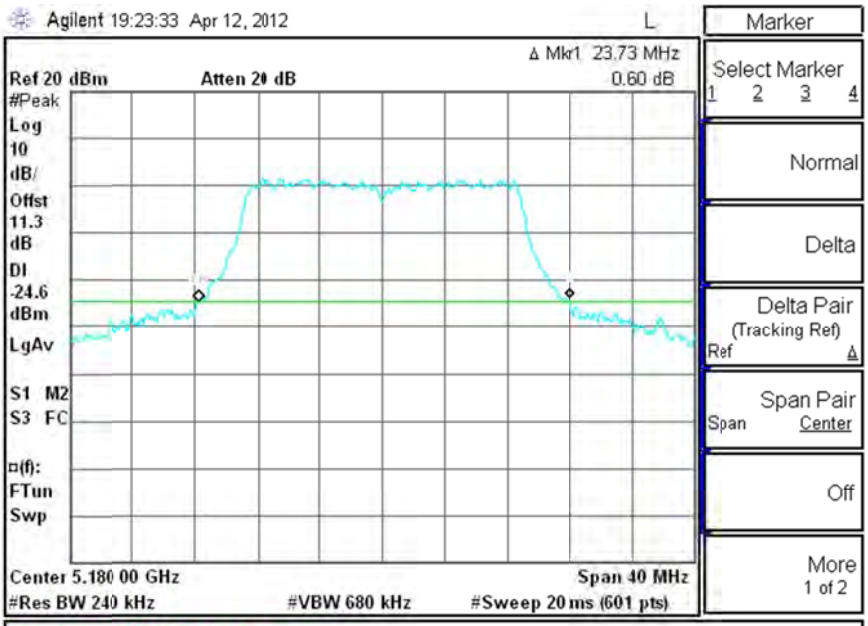
None; for reporting purposes only.

RESULTS

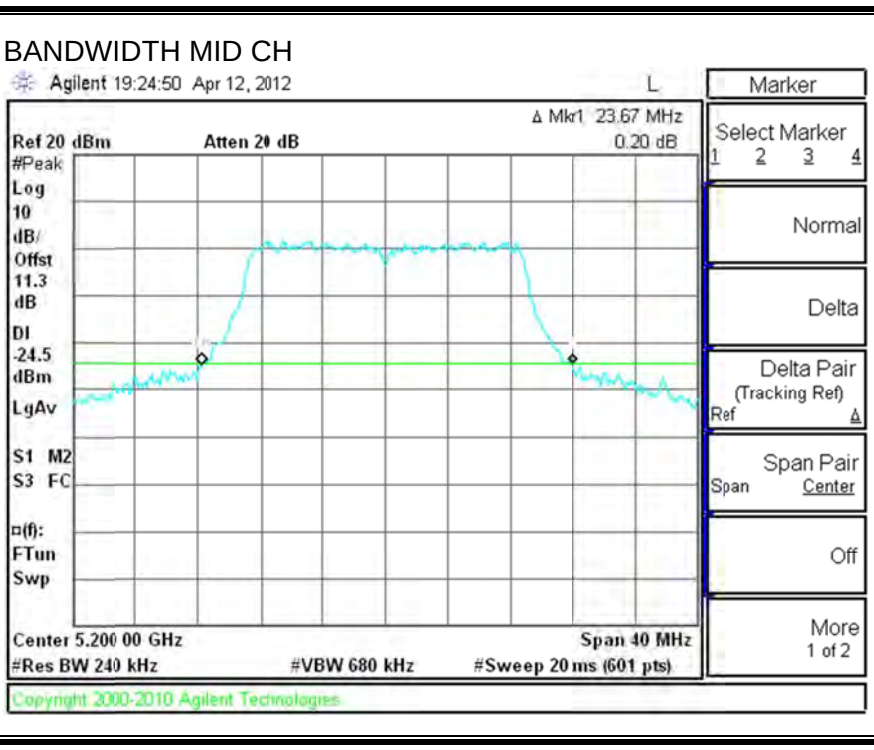
Channel	Frequency (MHz)	26 dB BW (MHz)
Low	5180	23.73
Mid	5200	23.67
High	5240	23.67

26 dB BANDWIDTH

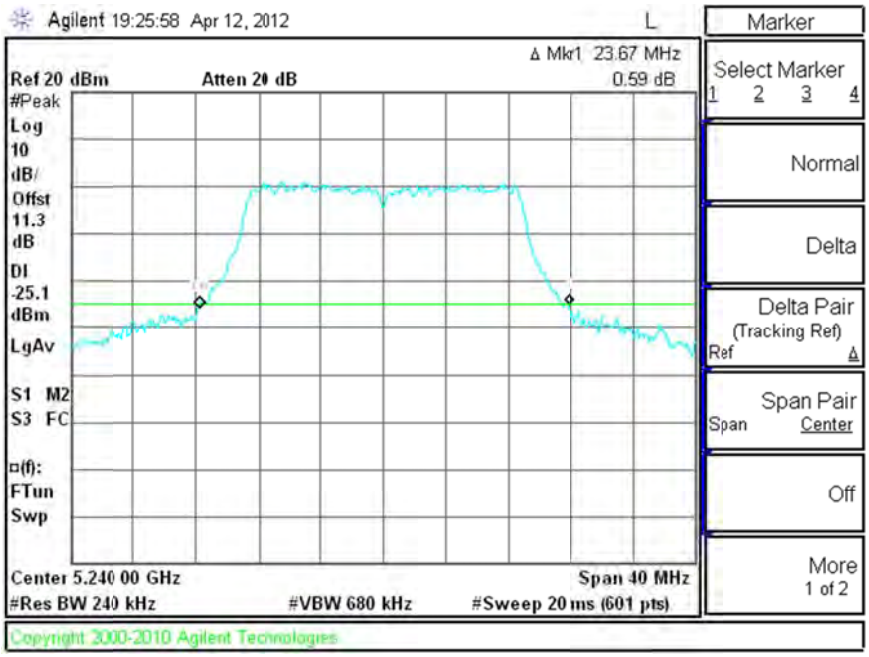
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



7.3.2. 99% BANDWIDTH

LIMITS

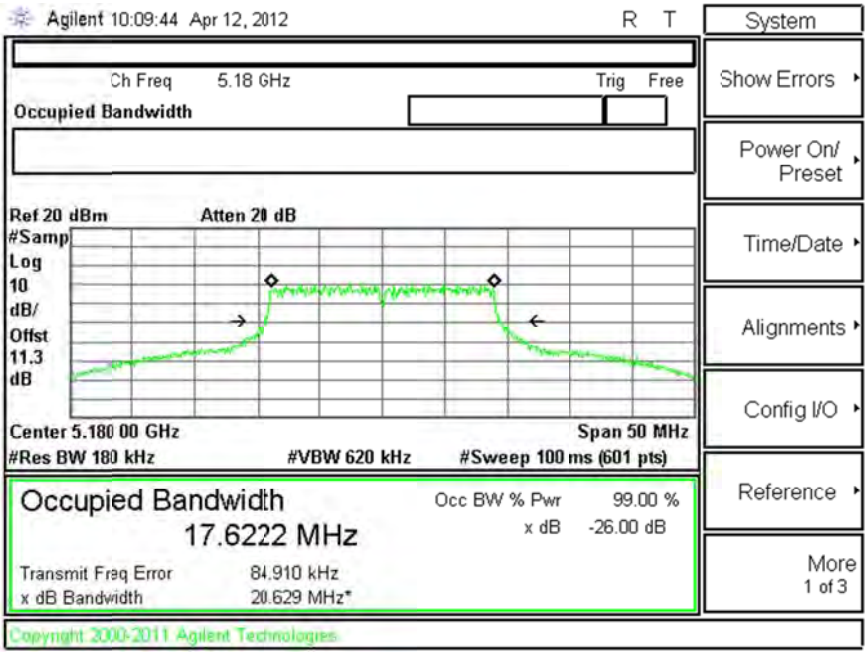
None; for reporting purposes only.

RESULTS

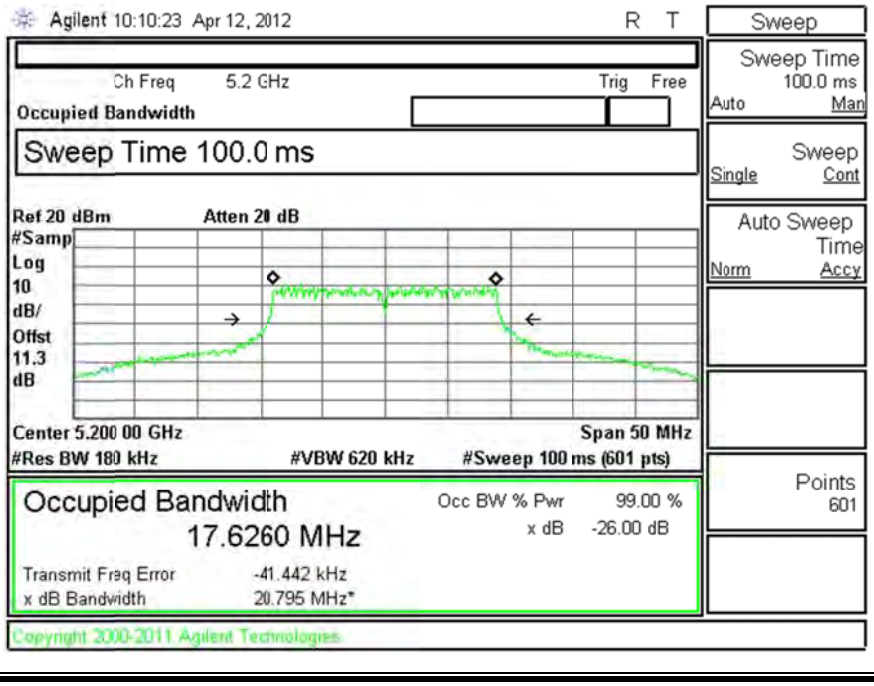
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)
Low	5180	17.6222
Mid	5200	17.6260
High	5240	17.6110

99% BANDWIDTH

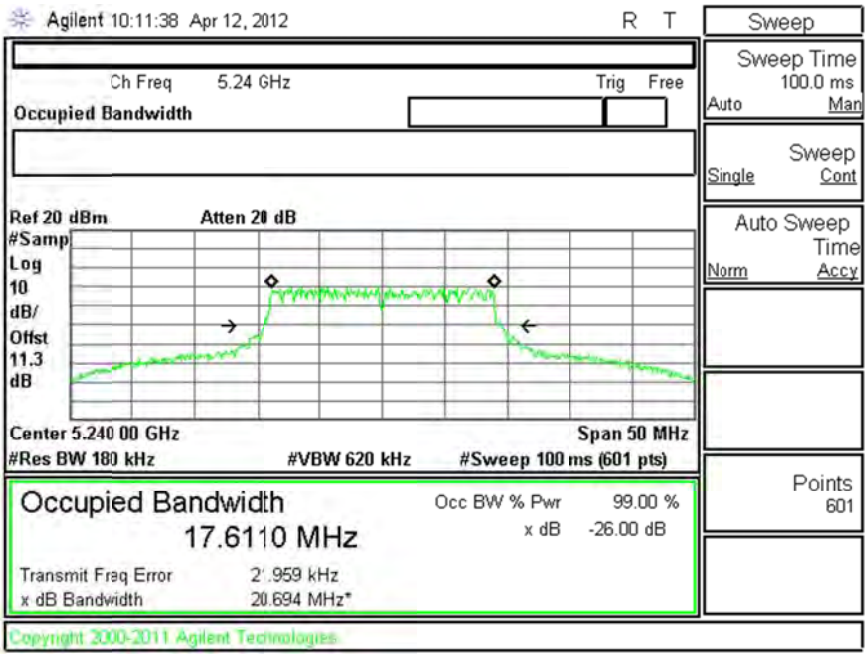
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



7.3.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.4 dB (including 10 dB pad and 1.4 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Average Power Results

Channel	Frequency (MHz)	Total Power (dBm)
Low	5180	10.70
Mid	5200	10.52
High	5240	10.56

7.3.4. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density 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)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5180	17	23.73	17.75	-2.59	17.00	4.00
Mid	5200	17	23.67	17.74	-2.59	17.00	4.00
High	5240	17	23.67	17.74	-2.59	17.00	4.00

Duty Cycle CF (dB)	0.22	Included in Calculations of Corr'd Power & PPSD

Output Power Results

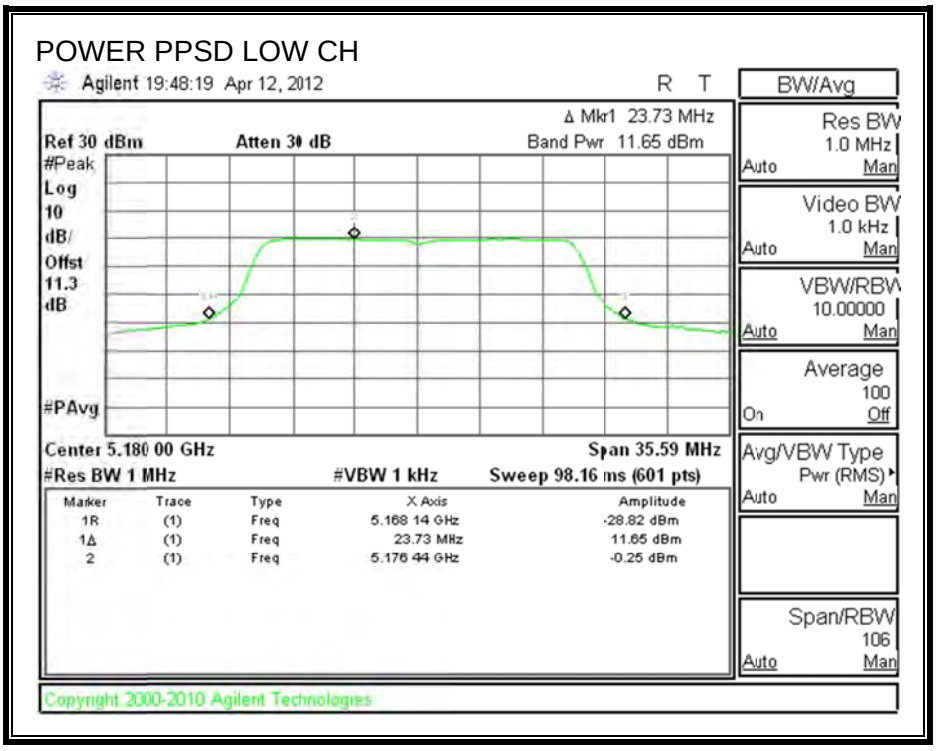
Channel	Frequency (MHz)	Meas Power (dBm)	Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	11.65	11.87	17.00	-5.13
Mid	5200	11.86	12.08	17.00	-4.92
High	5240	11.24	11.46	17.00	-5.54

PPSD Results

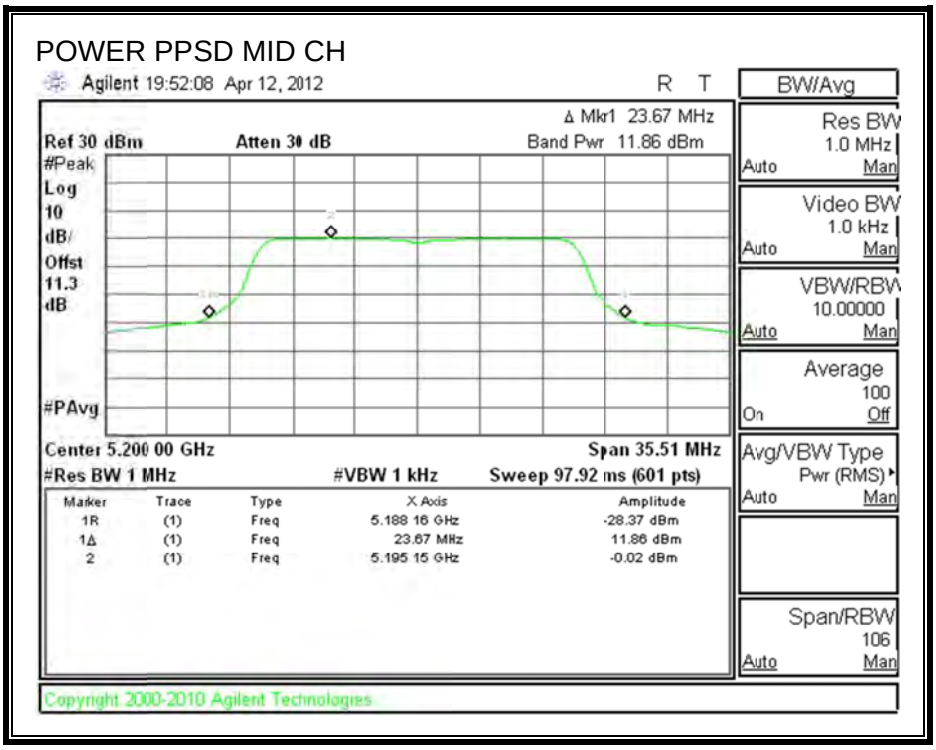
Channel	Frequency (MHz)	Meas PPSD (dBm)	Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	-0.25	-0.03	4.00	-4.03
Mid	5200	-0.02	0.20	4.00	-3.80
High	5240	-0.51	-0.29	4.00	-4.29

OUTPUT POWER AND PPSD

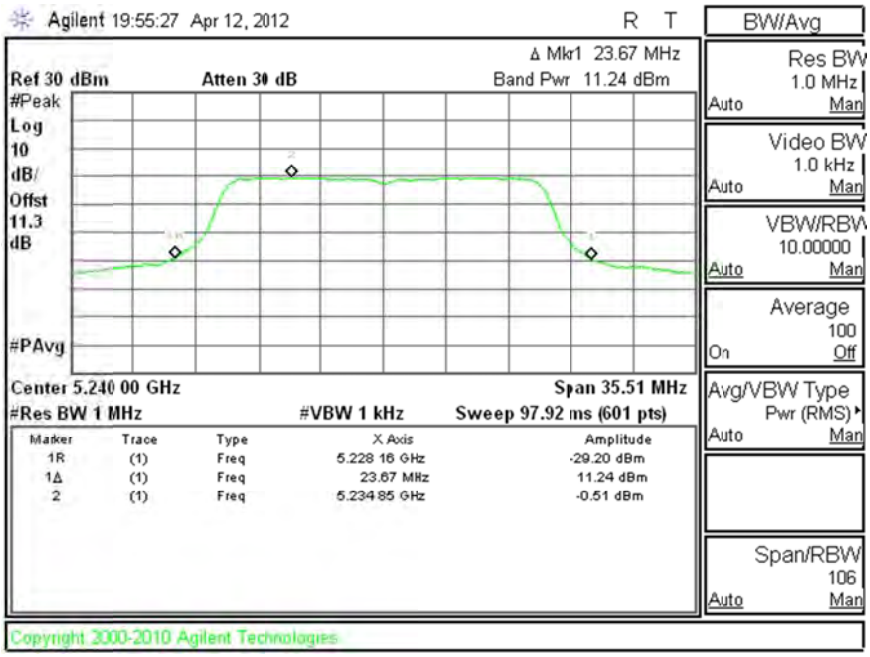
POWER PPSD LOW CH



POWER PPSD MID CH



POWER PPSD HIGH CH



PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

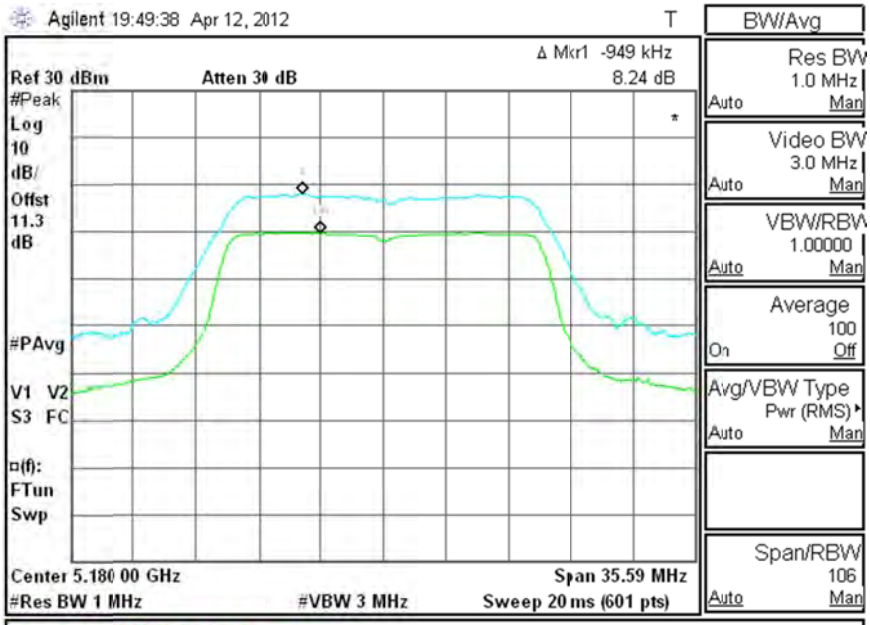
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

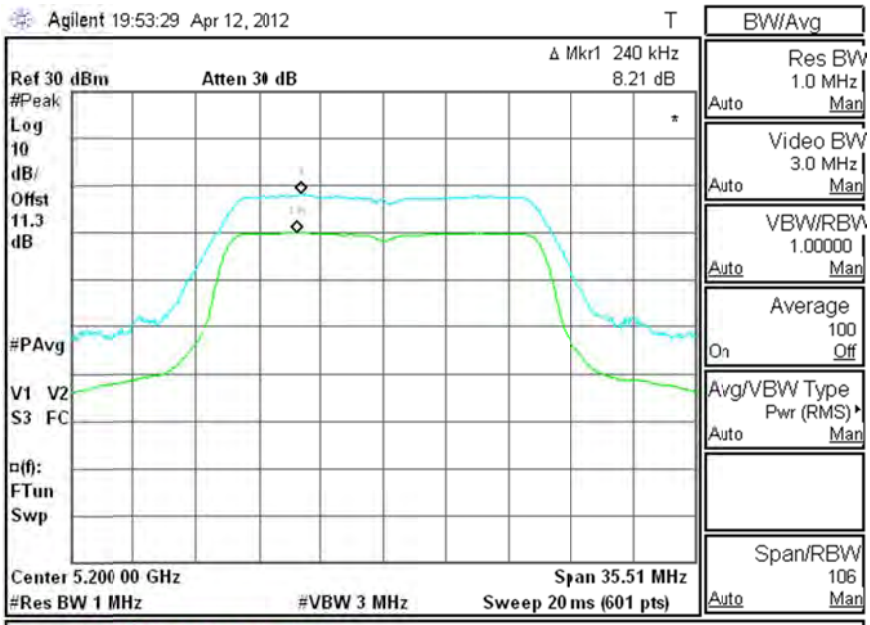
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	8.24	13	-4.8
Mid	5200	8.21	13	-4.8
High	5240	8.26	13	-4.7

PEAK EXCURSION

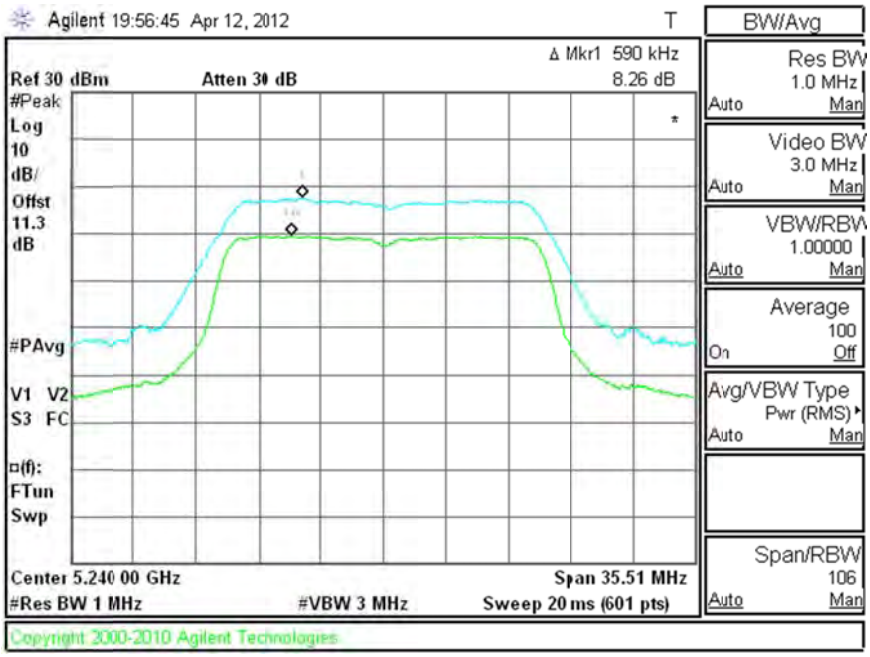
PEAK EXCURSION LOW CH



PEAK EXCURSION MID CH



PEAK EXCURSION HIGH CH



7.4. 802.11a MODE IN THE 5.3 GHz BAND

7.4.1. 26 dB BANDWIDTH

LIMITS

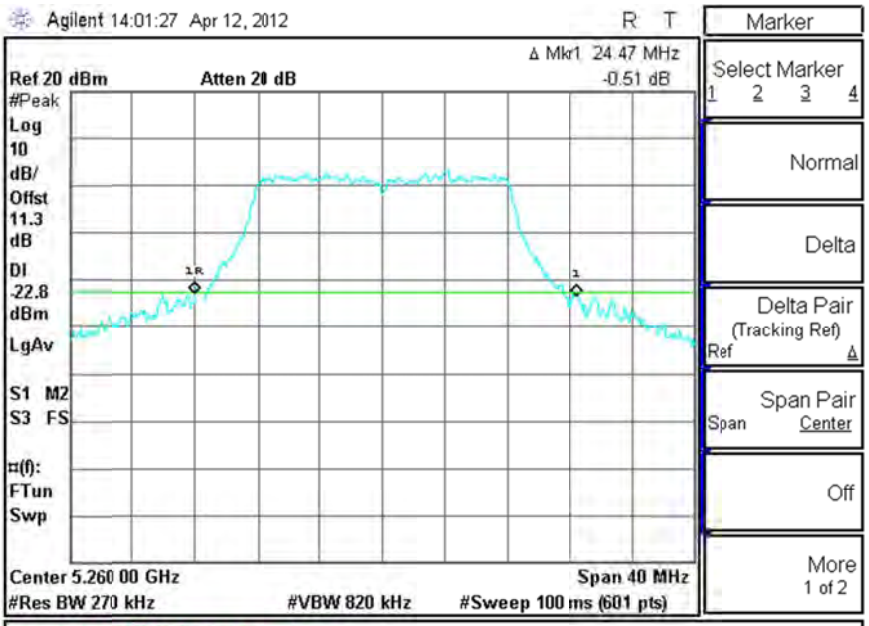
None; for reporting purposes only.

RESULTS

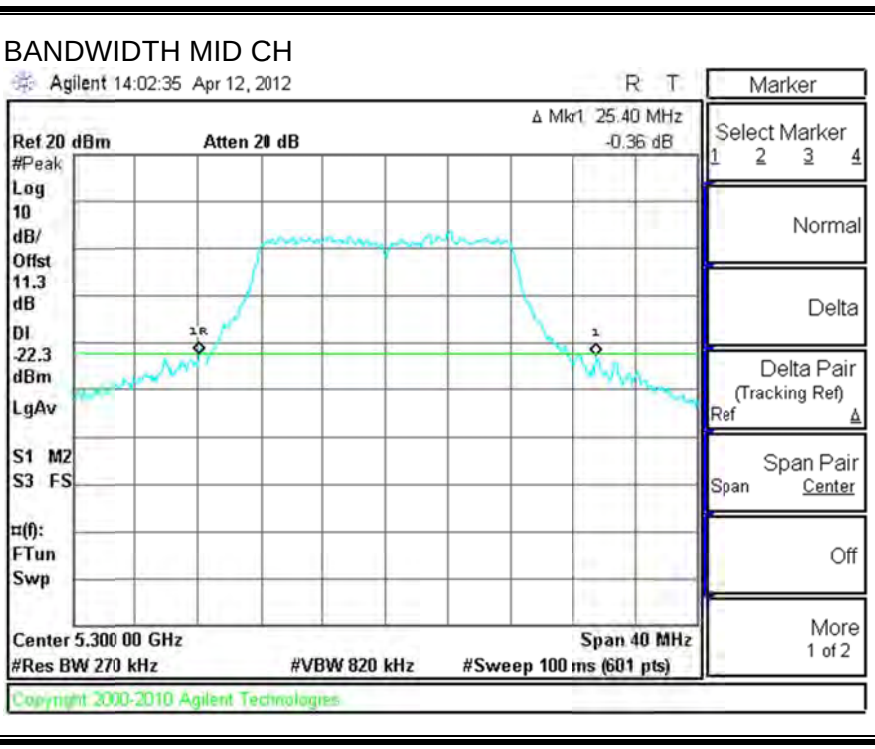
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)
Low	5260	24.47
Mid	5300	25.40
High	5320	25.53

26 dB BANDWIDTH

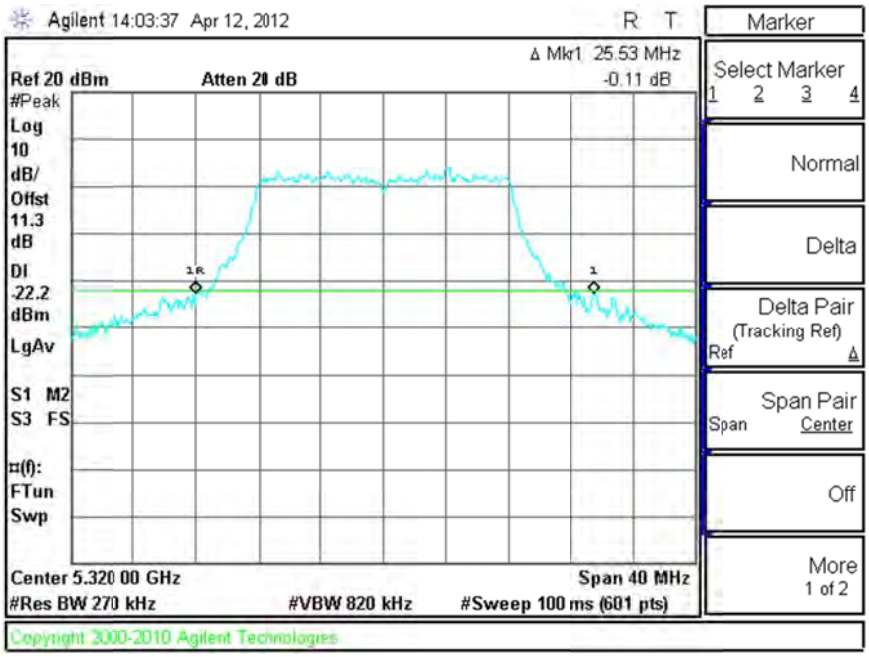
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



99% BANDWIDTH

LIMITS

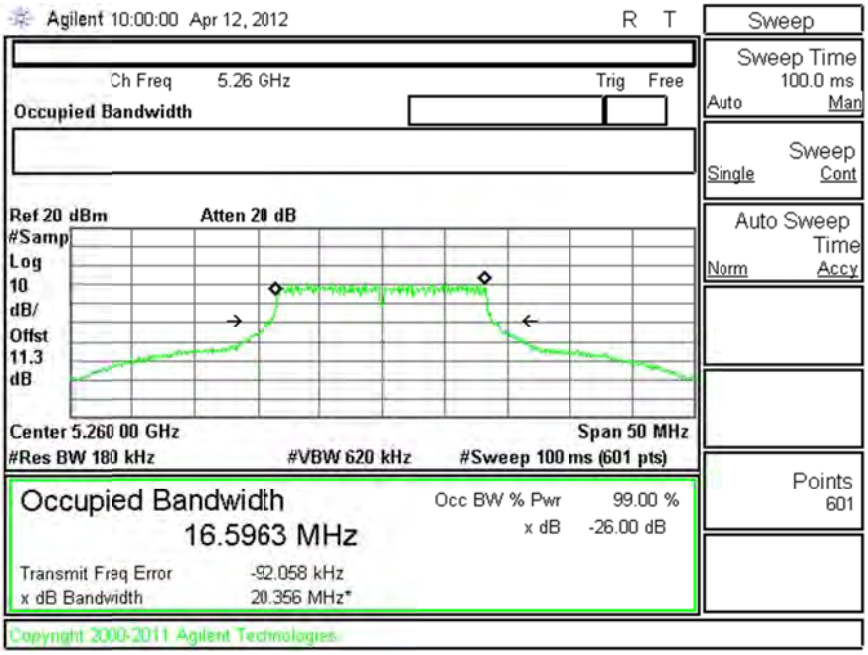
None; for reporting purposes only.

RESULTS

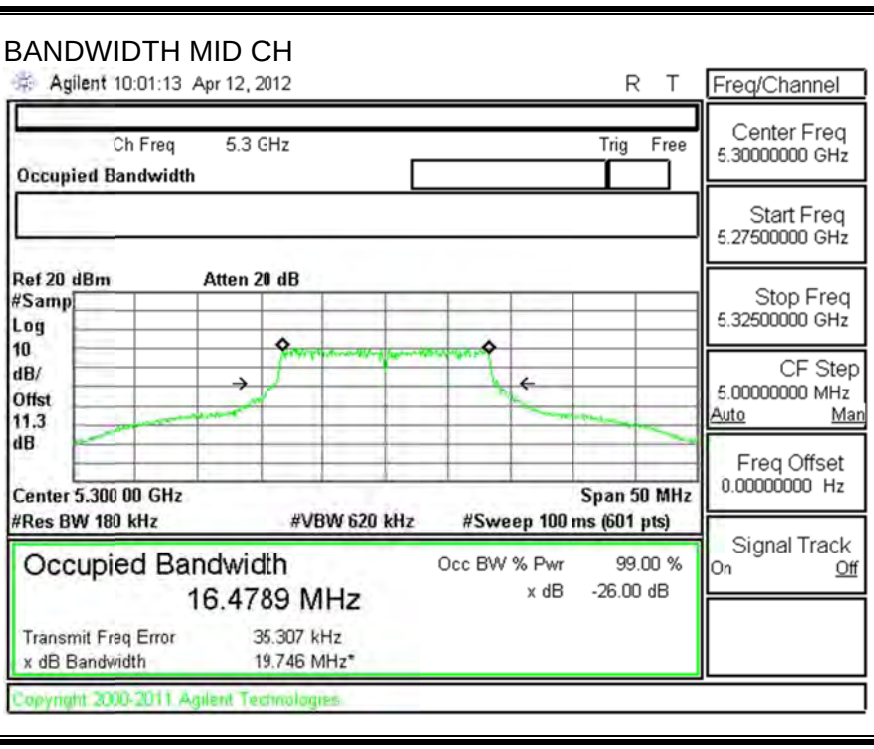
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)
Low	5260	16.5963
Mid	5300	16.4789
High	5320	16.6036

99% BANDWIDTH

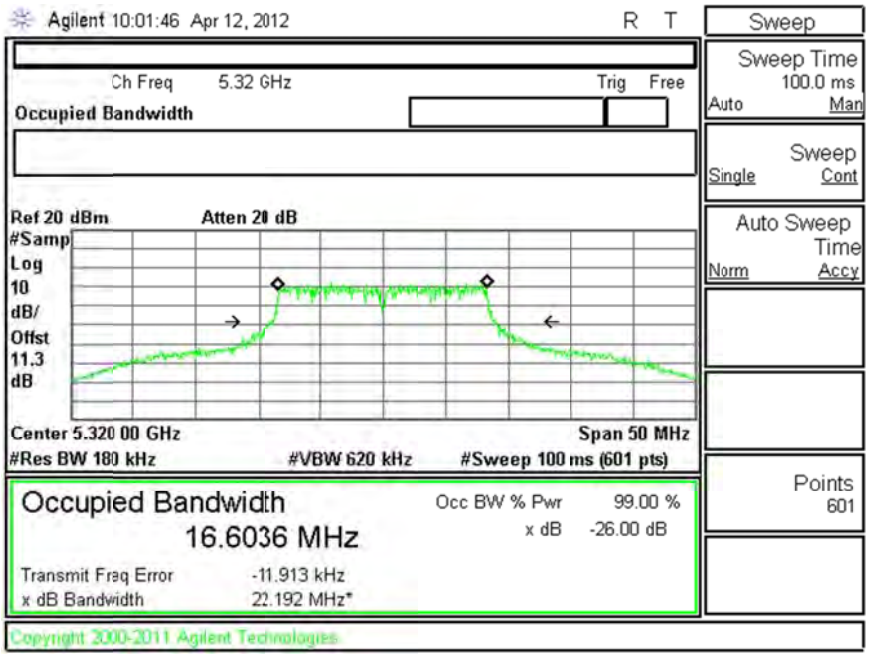
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



7.4.2. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.4 dB (including 10 dB pad and 1.4 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Average Power Results

Channel	Frequency (MHz)	Total Power (dBm)
Low	5260	11.42
Mid	5300	11.50
High	5320	11.60

7.4.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density 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)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5260	24	24.47	24.89	-2.28	24.00	11.00
Mid	5300	24	25.40	25.05	-2.28	24.00	11.00
High	5320	24	25.53	25.07	-2.28	24.00	11.00

Duty Cycle CF (dB)	0.21	Included in Calculations of Corr'd Power & PPSD

Output Power Results

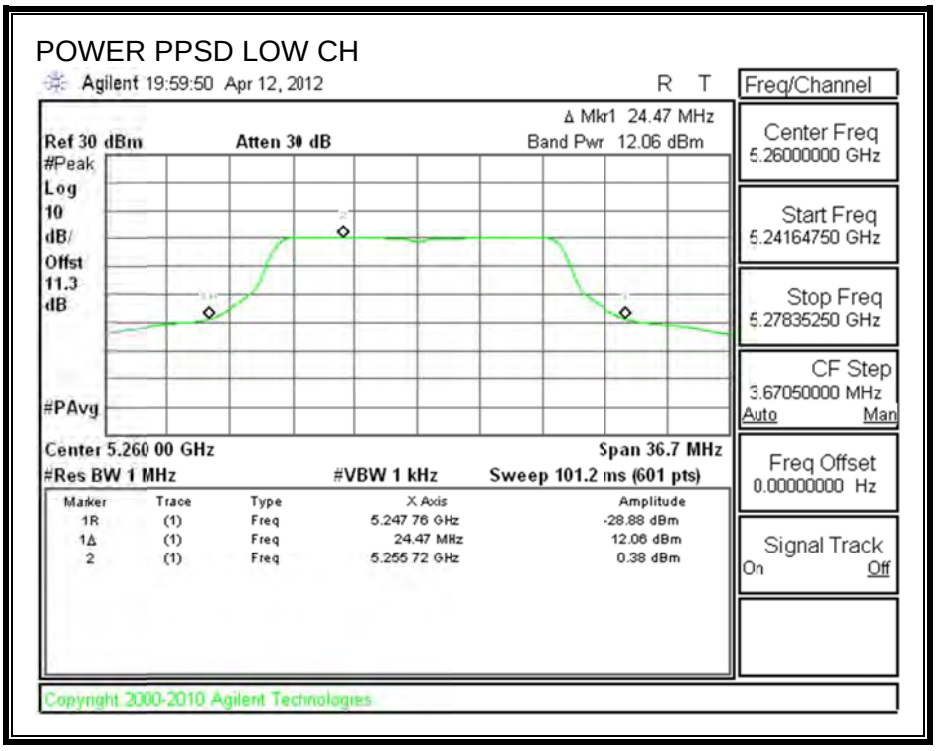
Channel	Frequency (MHz)	Meas Power (dBm)	Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	12.06	12.27	24.00	-11.73
Mid	5300	12.03	12.24	24.00	-11.76
High	5320	12.28	12.49	24.00	-11.51

PPSD Results

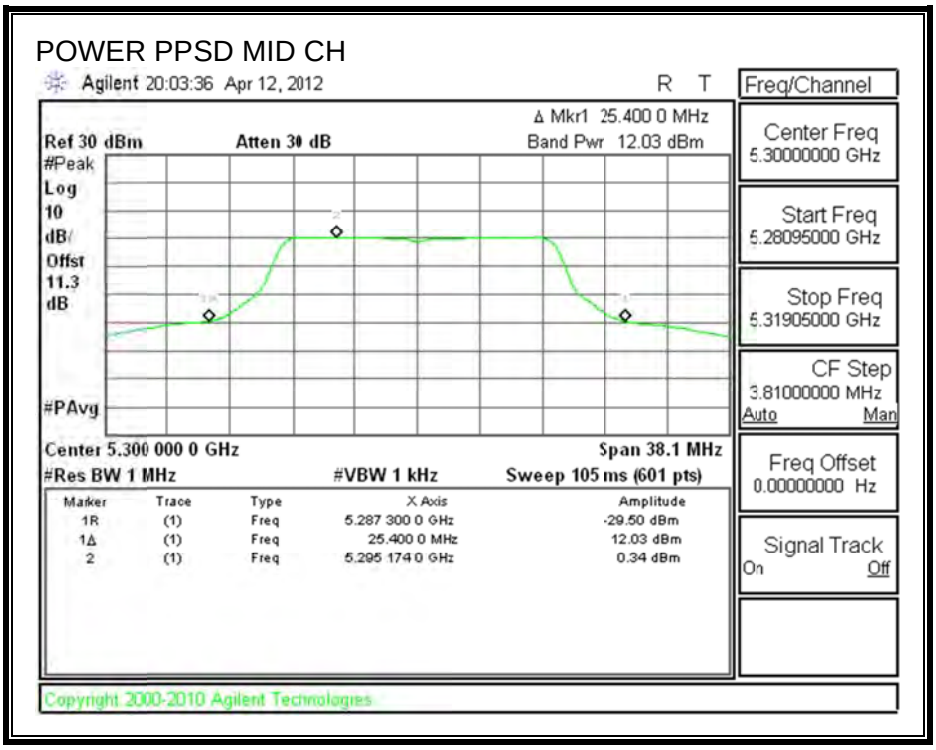
Channel	Frequency (MHz)	Meas PPSD (dBm)	Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	0.38	0.59	11.00	-10.41
Mid	5300	0.34	0.55	11.00	-10.45
High	5320	0.58	0.79	11.00	-10.21

OUTPUT POWER AND PPSD

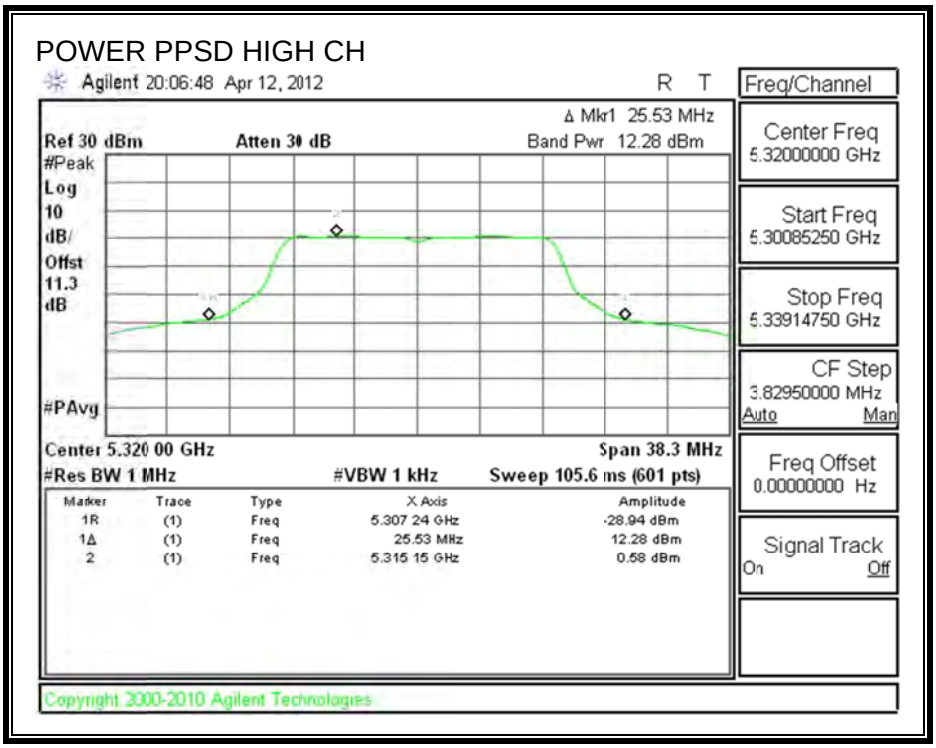
POWER PPSD LOW CH



POWER PPSD MID CH



POWER PPSD HIGH CH



7.4.4. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

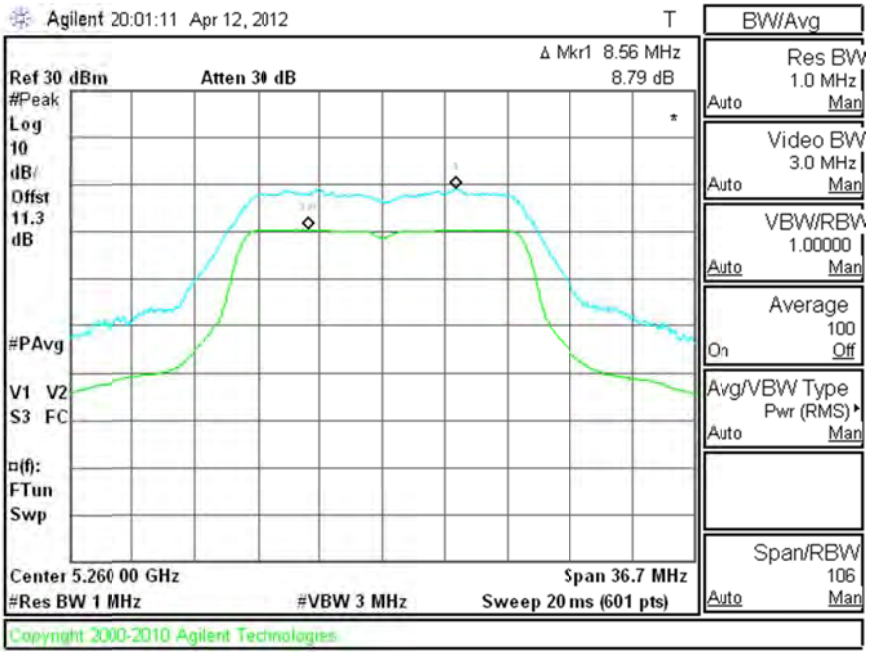
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

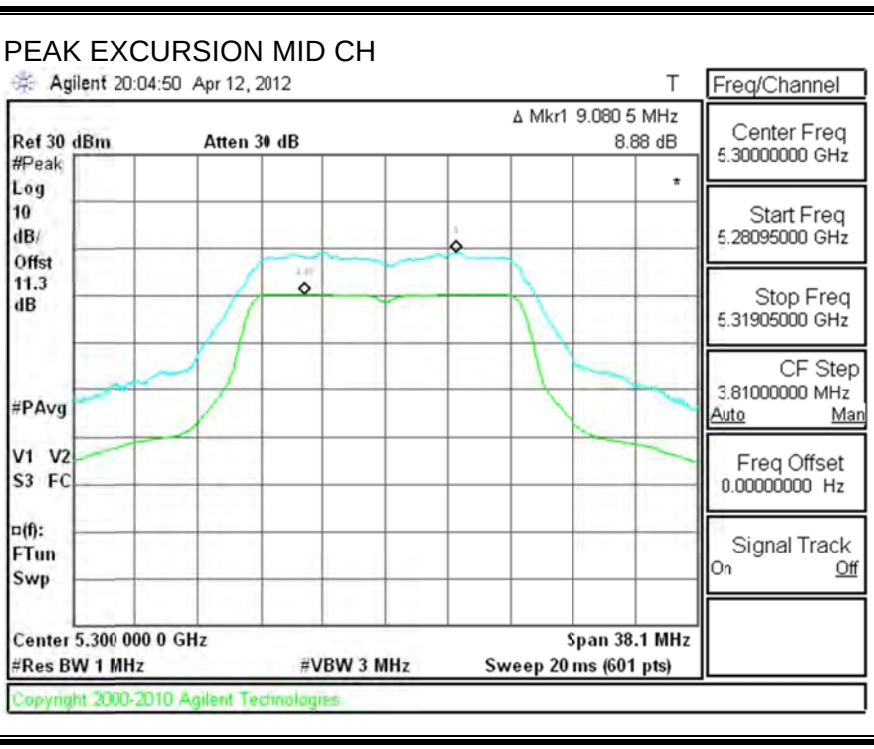
Channel	Frequency (MHz)	Pk Exc (dB)	Limit (dB)
Low	5260	8.79	13
Mid	5300	8.88	13
High	5320	8.87	13

PEAK EXCURSION

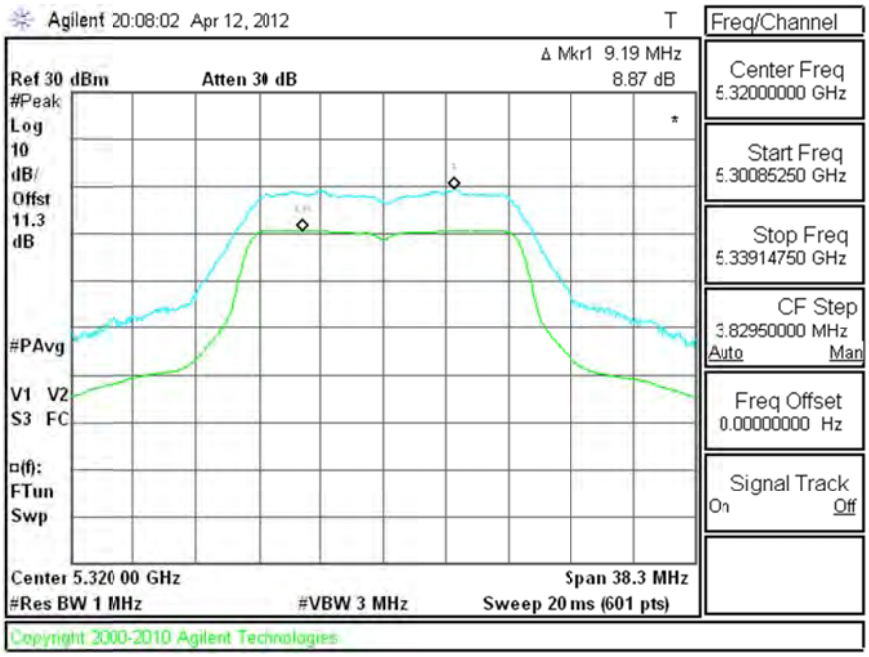
PEAK EXCURSION LOW CH



PEAK EXCURSION MID CH



PEAK EXCURSION HIGH CH



7.5. 802.11n HT20 MODE IN THE 5.3 GHz BAND

7.5.1. 26 dB BANDWIDTH

LIMITS

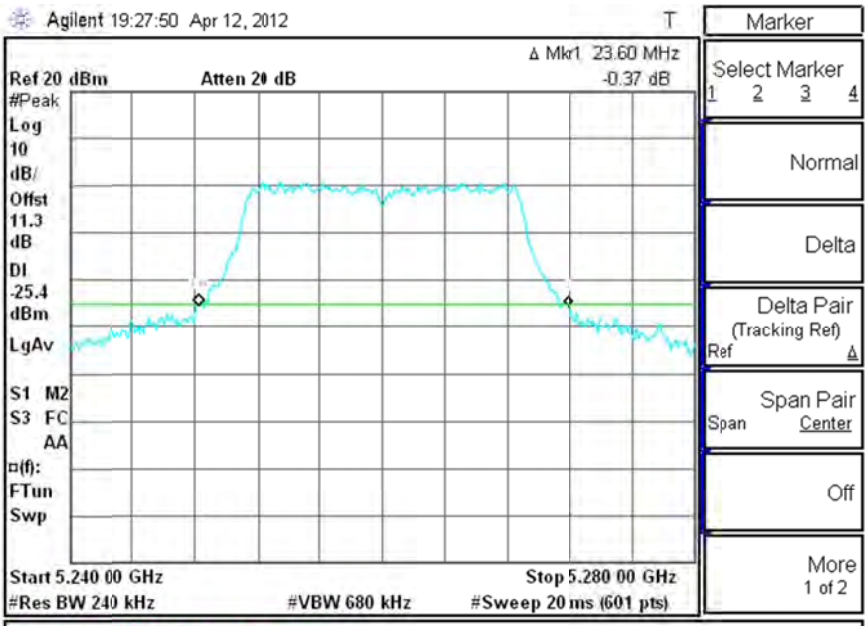
None; for reporting purposes only.

RESULTS

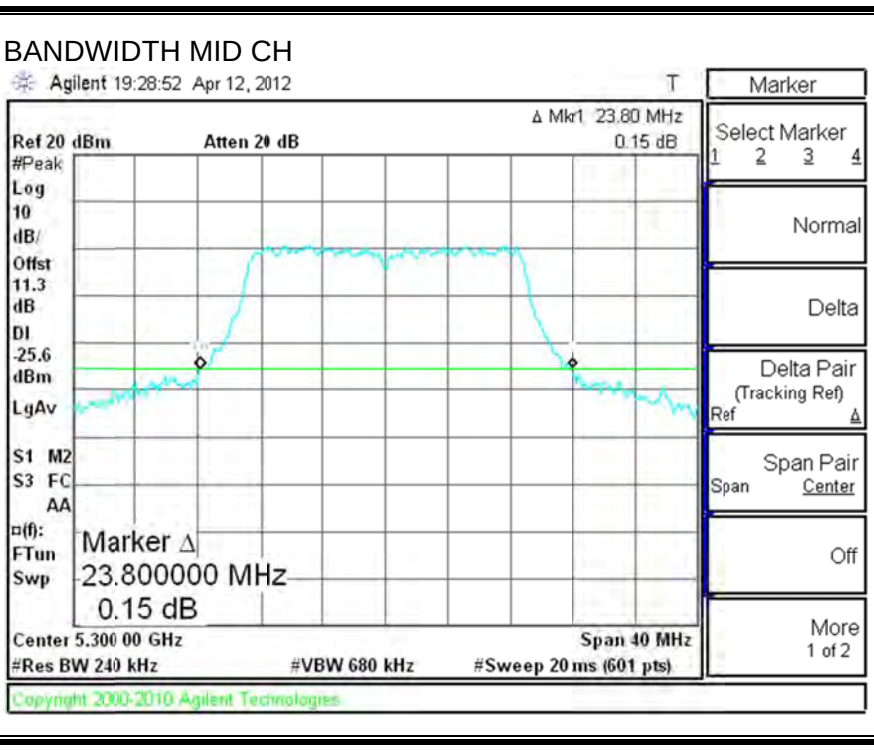
Channel	Frequency (MHz)	26 dB BW (MHz)
Low	5260	23.60
Mid	5300	23.80
High	5320	23.87

26 dB BANDWIDTH

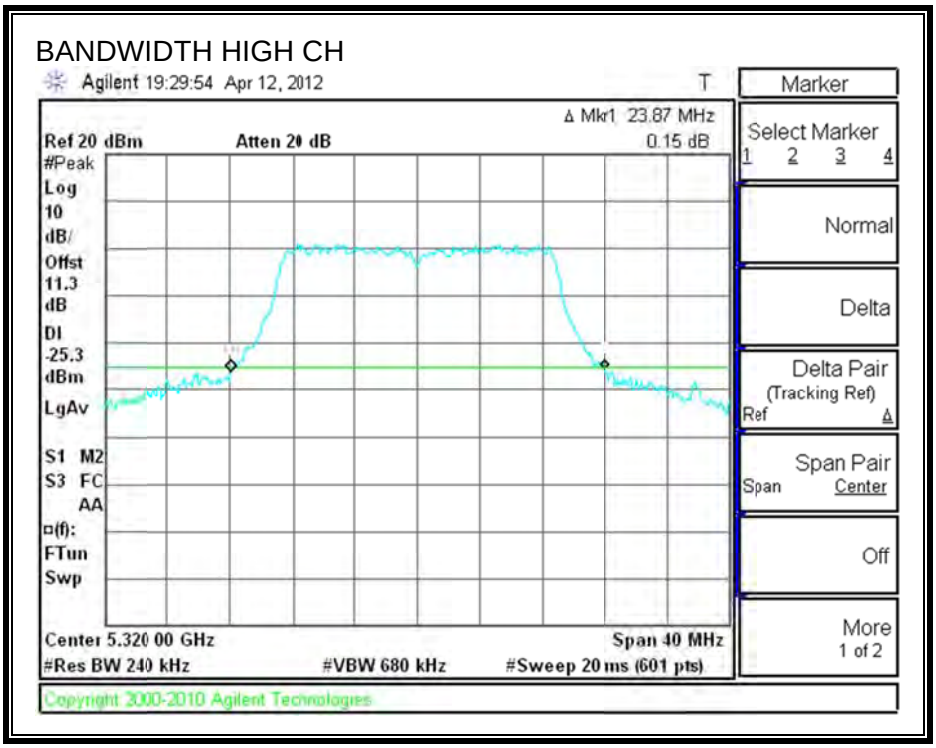
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



99% BANDWIDTH

LIMITS

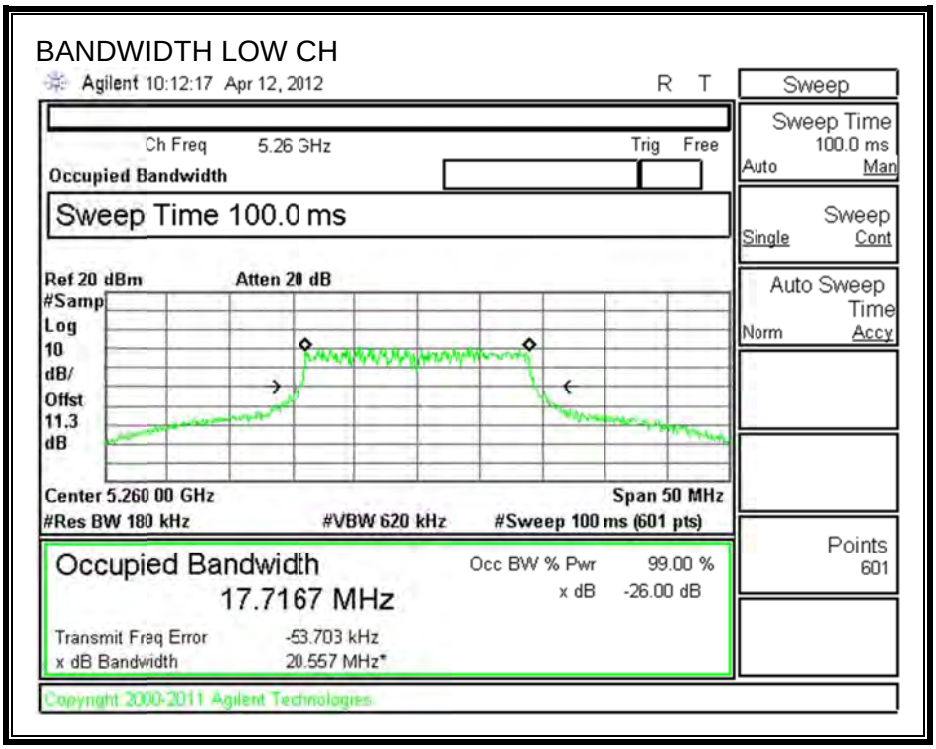
None; for reporting purposes only.

RESULTS

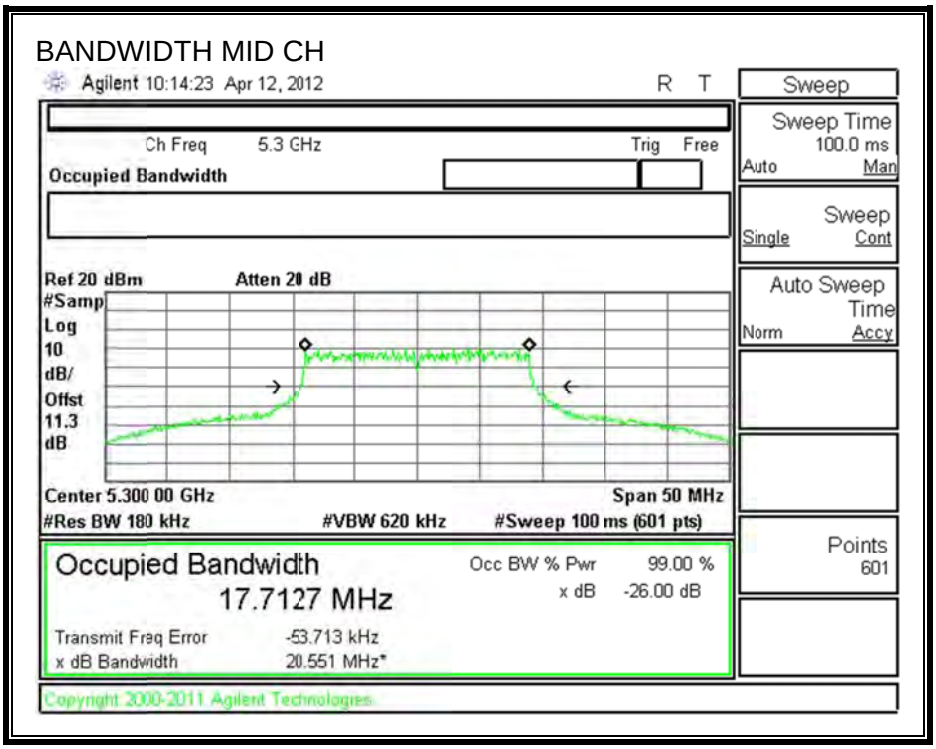
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)
Low	5260	17.7167
Mid	5300	17.7127
High	5320	17.6807

99% BANDWIDTH

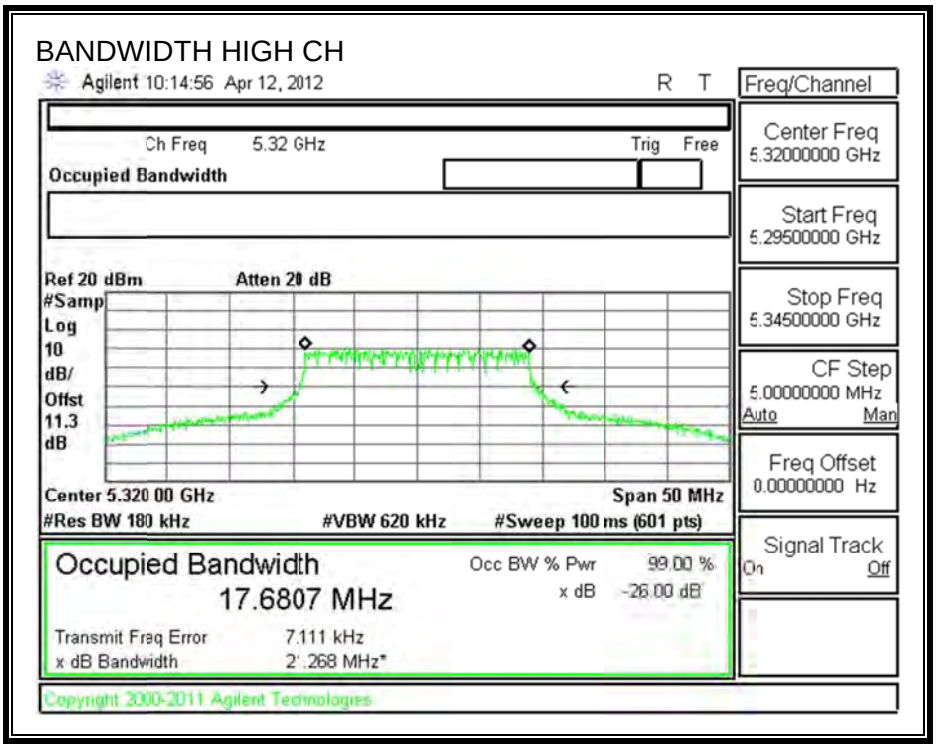
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



7.5.2. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.4 dB (including 10 dB pad and 1.4 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Average Power Results

Channel	Frequency (MHz)	Total Power (dBm)
Low	5260	10.70
Mid	5300	10.75
High	5320	10.71

7.5.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density 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)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5260	24	23.60	24.73	-2.28	24.00	11.00
Mid	5300	24	23.80	24.77	-2.28	24.00	11.00
High	5320	24	23.87	24.78	-2.28	24.00	11.00

Duty Cycle CF (dB)	0.22	Included in Calculations of Corr'd Power & PPSD

Output Power Results

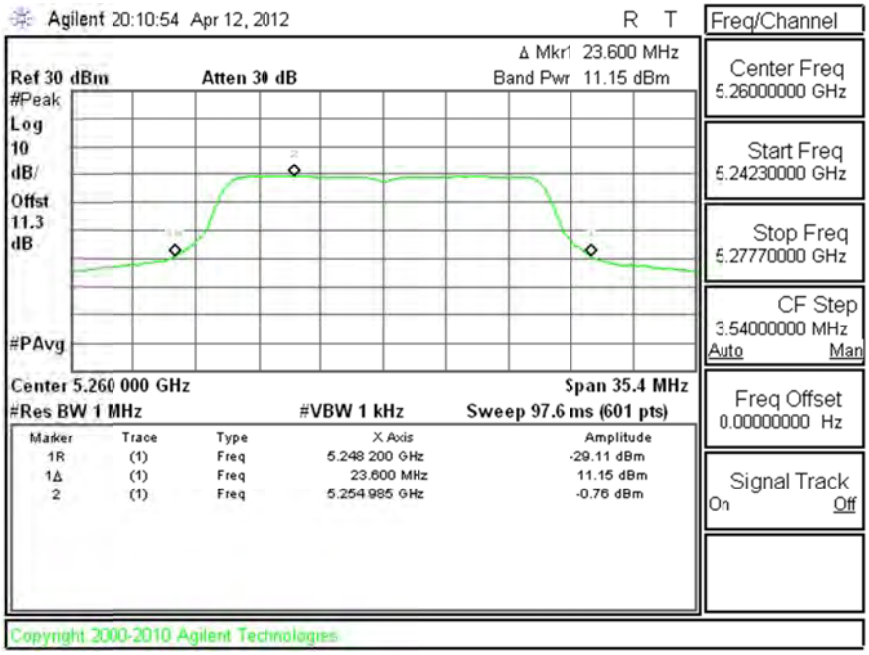
Channel	Frequency (MHz)	Meas Power (dBm)	Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	11.15	11.37	24.00	-12.63
Mid	5300	11.17	11.39	24.00	-12.61
High	5320	11.43	11.65	24.00	-12.35

PPSD Results

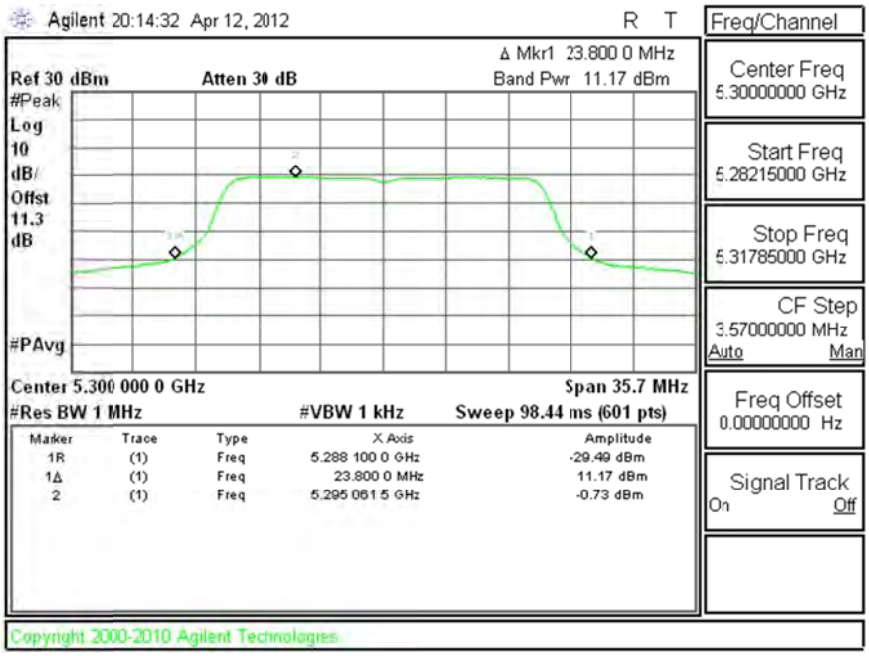
Channel	Frequency (MHz)	Meas PPSD (dBm)	Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	-0.76	-0.54	11.00	-11.54
Mid	5300	-0.73	-0.51	11.00	-11.51
High	5320	-0.48	-0.26	11.00	-11.26

OUTPUT POWER AND PPSD

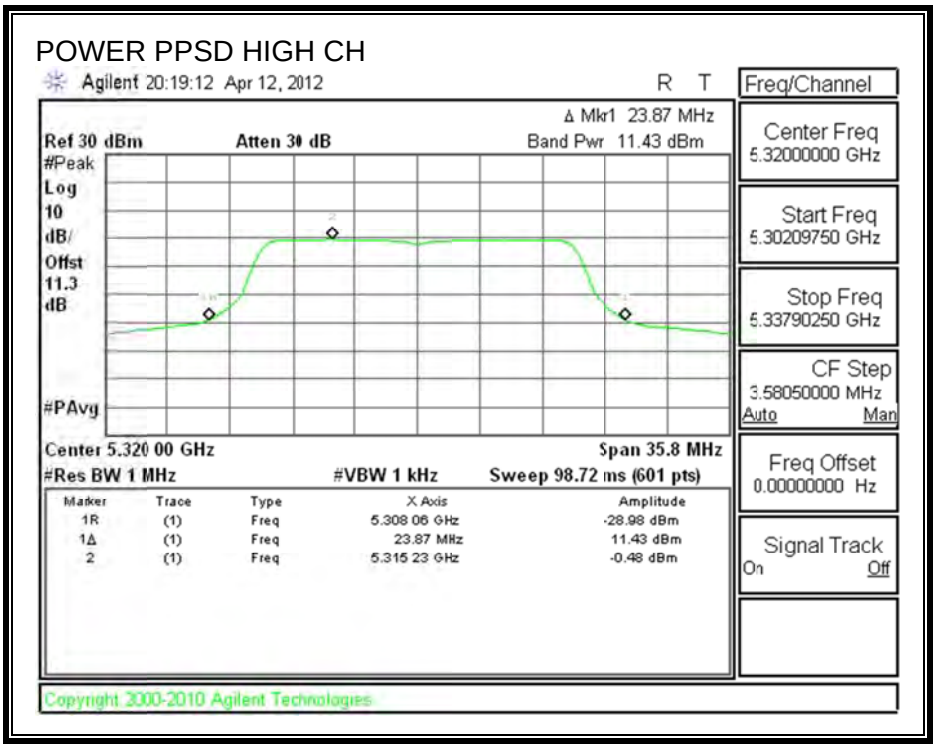
POWER PPSD LOW CH



POWER PPSD MID CH



POWER PPSD HIGH CH



7.5.4. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

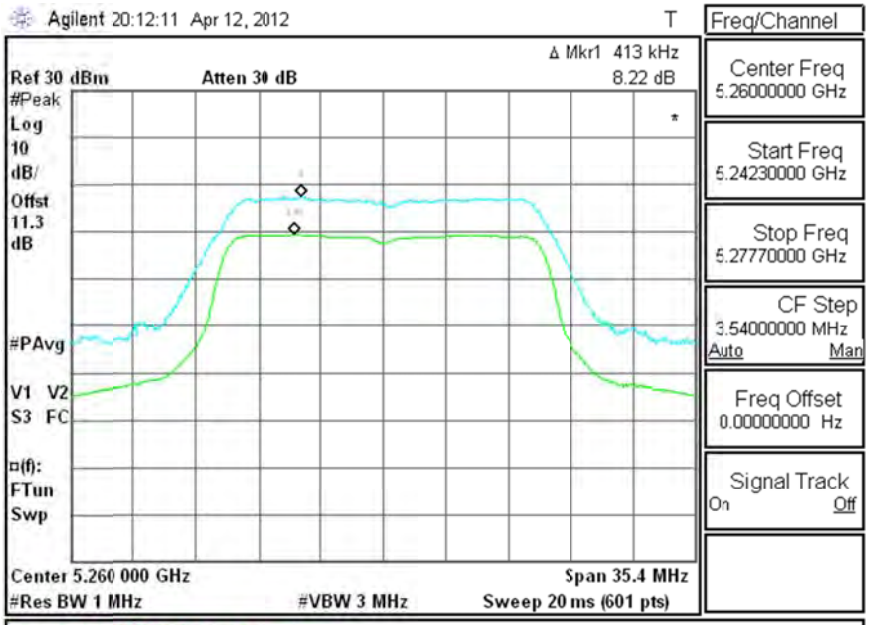
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

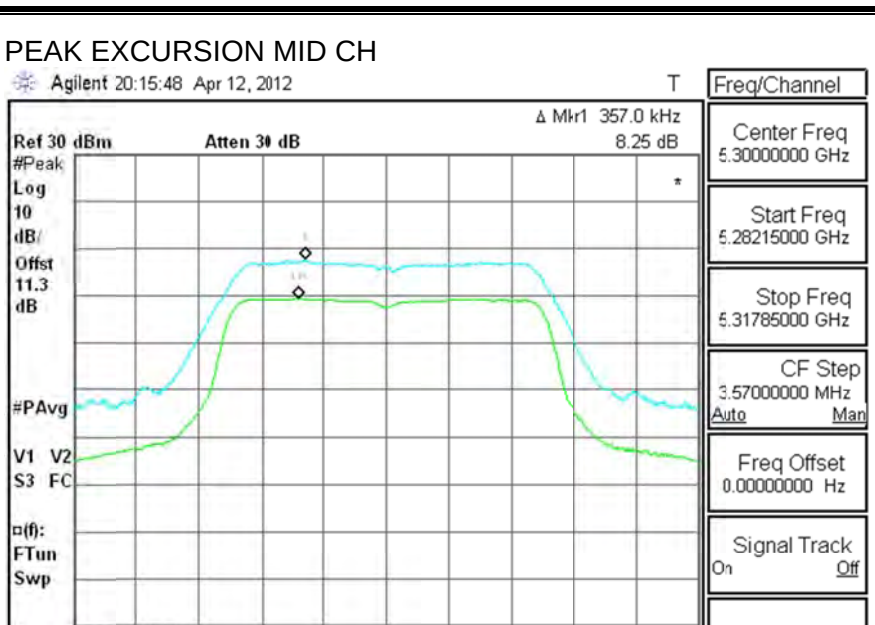
Channel	Frequency (MHz)	Pk Exc (dB)	Limit (dB)	Margin (dB)
Low	5260	8.22	13	-3.9
Mid	5300	8.25	13	-4.1
High	5320	8.23	13	-4.1

PEAK EXCURSION

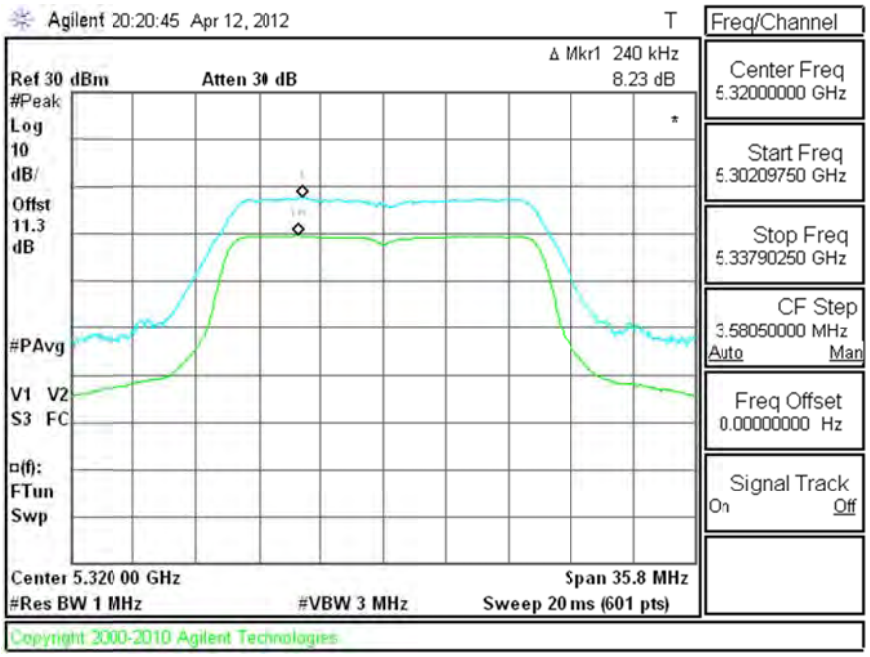
PEAK EXCURSION LOW CH



PEAK EXCURSION MID CH



PEAK EXCURSION HIGH CH



7.6. 802.11a MODE IN THE 5.6 GHz BAND

7.6.1. 26 dB BANDWIDTH

LIMITS

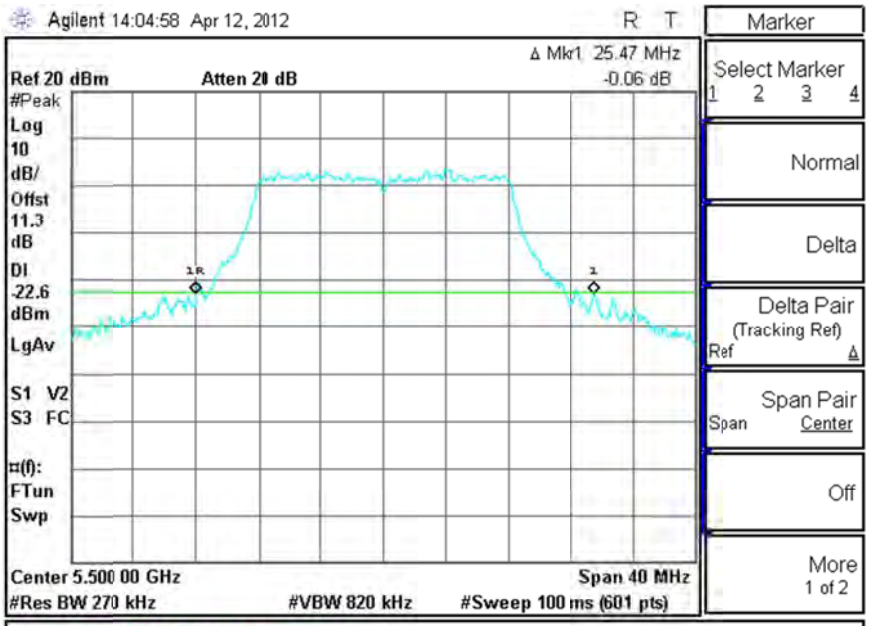
None; for reporting purposes only.

RESULTS

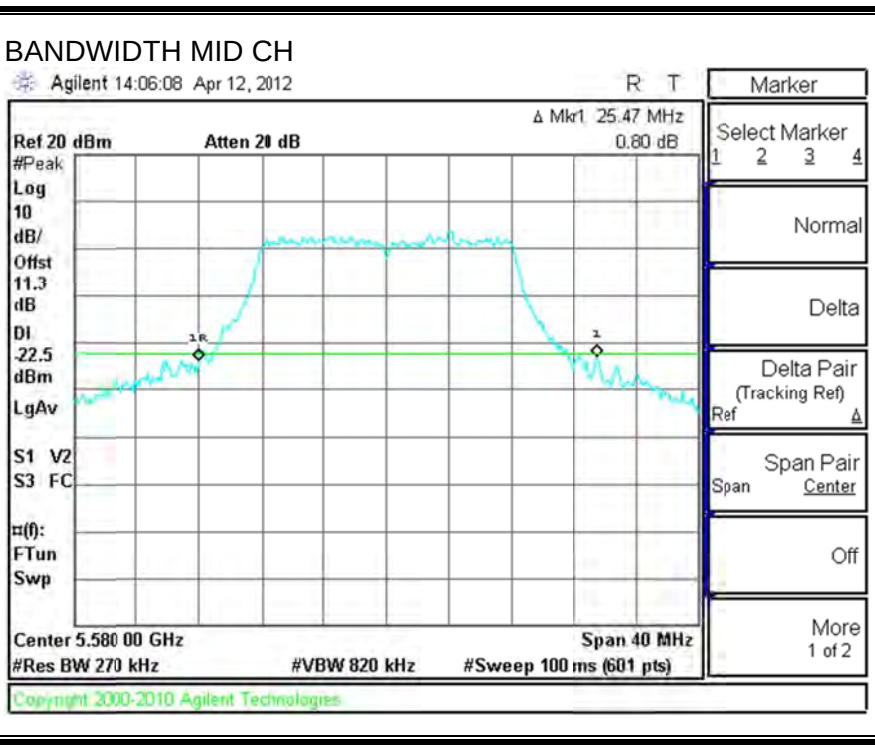
Channel	Frequency (MHz)	26 dB BW (MHz)
Low	5500	25.47
Mid	5580	25.47
High	5700	25.60

26 dB BANDWIDTH

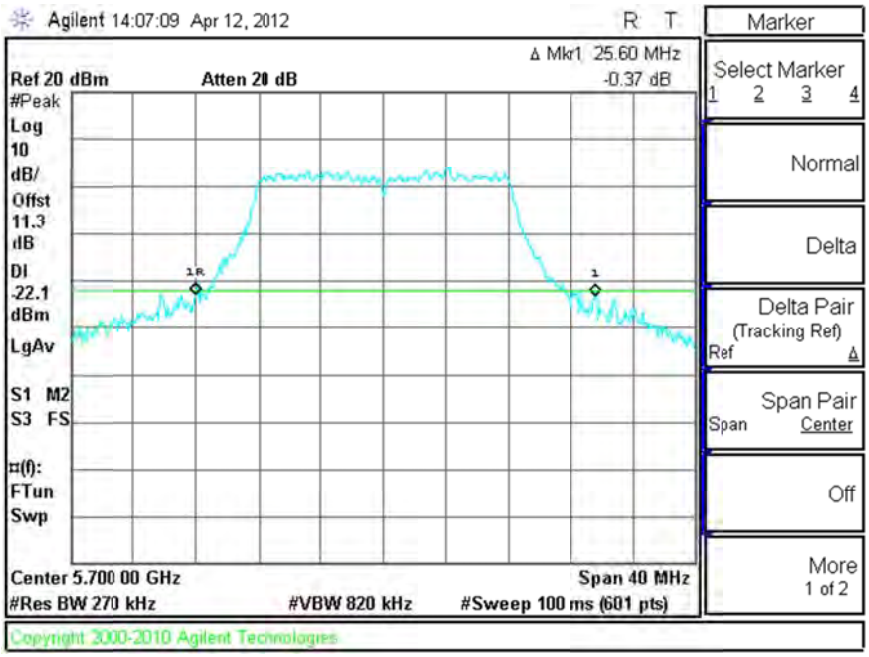
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



7.6.2. 99% BANDWIDTH

LIMITS

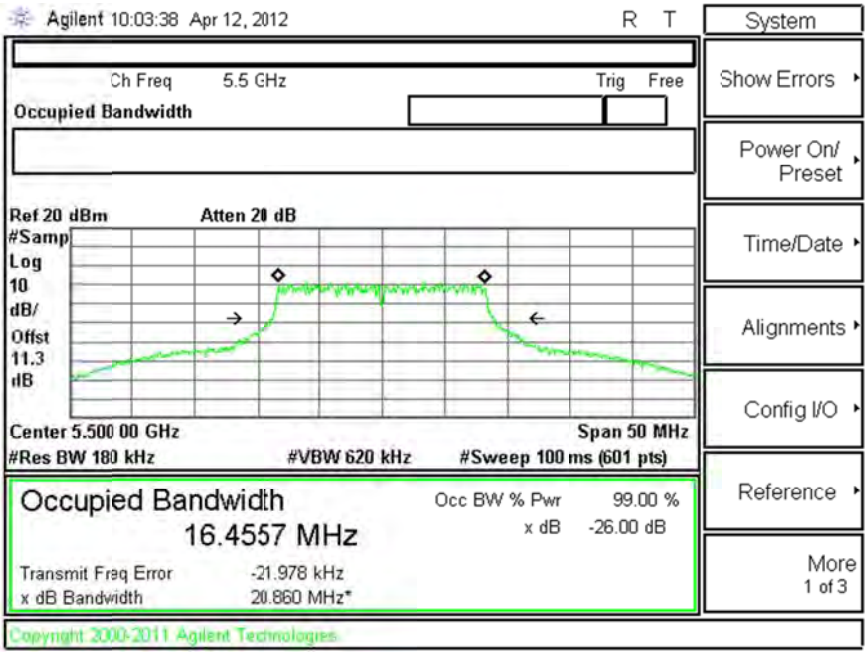
None; for reporting purposes only.

RESULTS

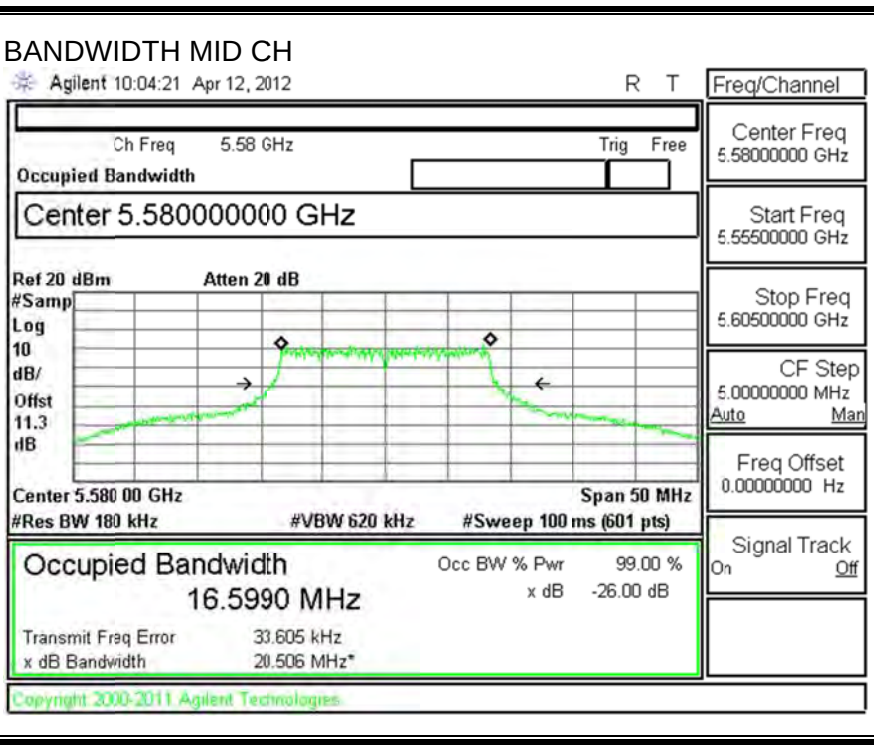
Channel	Frequency (MHz)	99% BW (MHz)
Low	5500	16.4557
Mid	5580	16.5990
High	5700	16.4559

99% BANDWIDTH

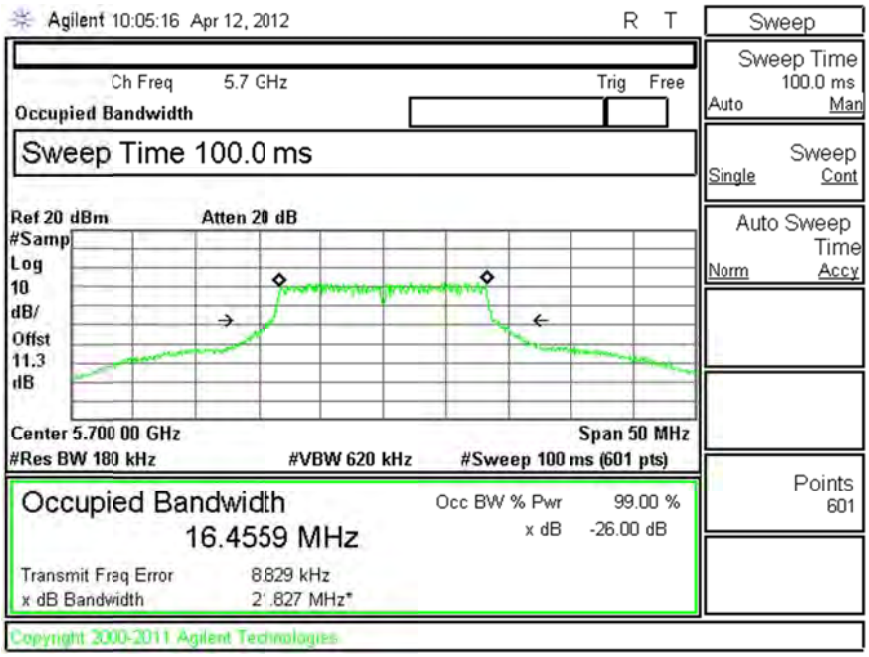
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



7.6.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (3)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density 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)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5500	24	25.47	25.06	0.95	24.00	11.00
Mid	5580	24	25.47	25.06	0.95	24.00	11.00
High	5700	24	25.60	25.08	0.95	24.00	11.00

Duty Cycle CF (dB)	0.21	Included in Calculations of Corr'd Power & PPSD

Output Power Results

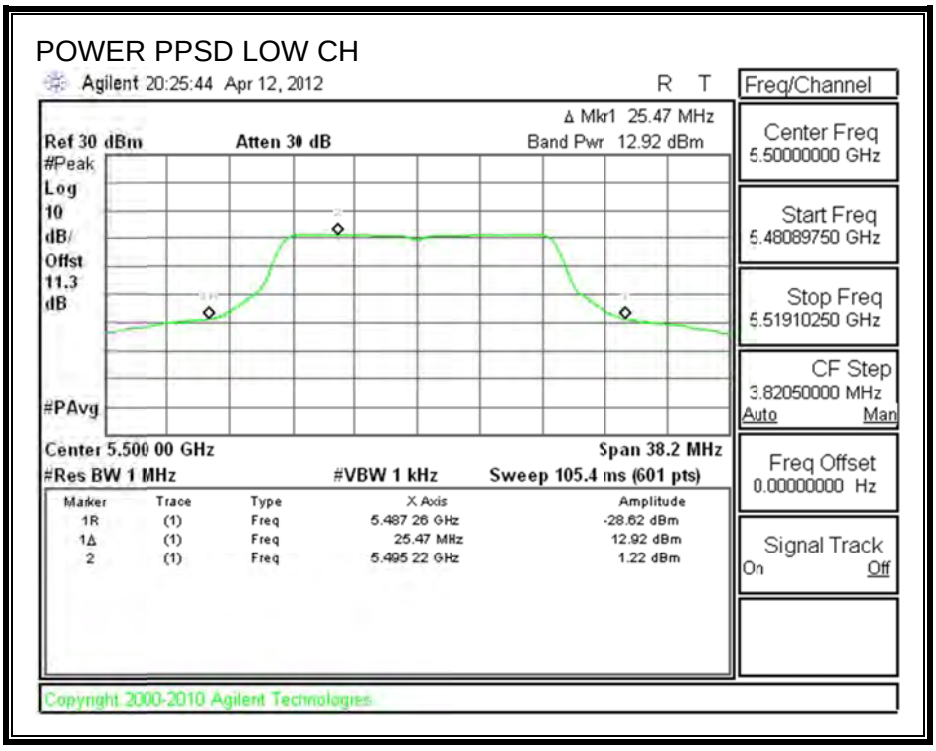
Channel	Frequency (MHz)	Meas Power (dBm)	Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	12.92	13.13	24.00	-10.87
Mid	5580	12.68	12.89	24.00	-11.11
High	5700	13.69	13.90	24.00	-10.10

PPSD Results

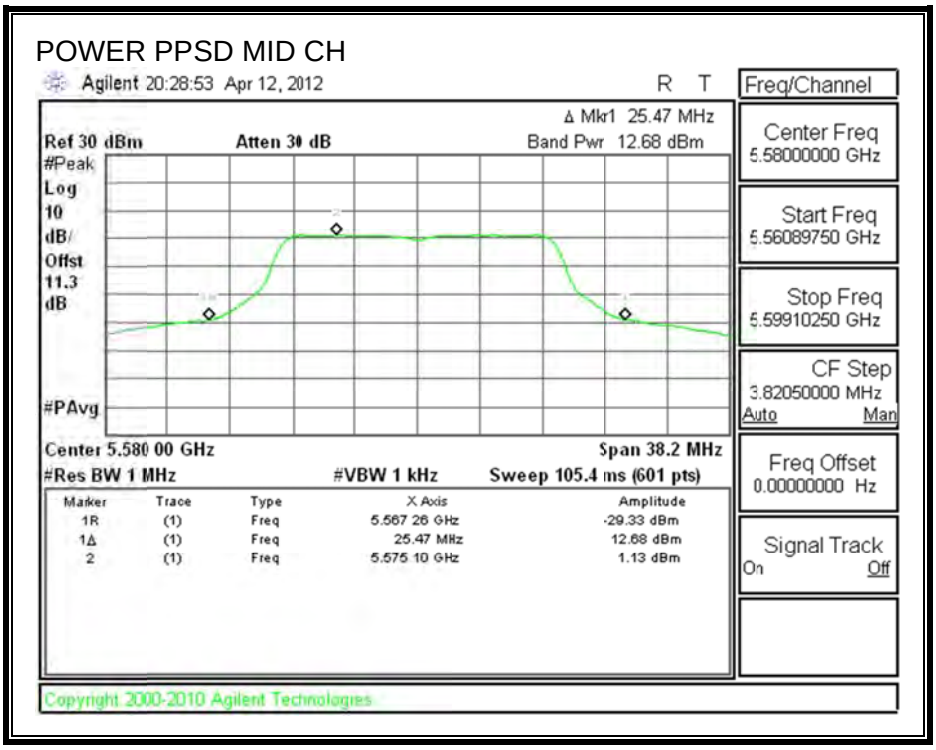
Channel	Frequency (MHz)	Meas PPSD (dBm)	Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	1.22	1.43	11.00	-9.57
Mid	5580	1.13	1.34	11.00	-9.66
High	5700	2.01	2.22	11.00	-8.78

OUTPUT POWER AND PPSD

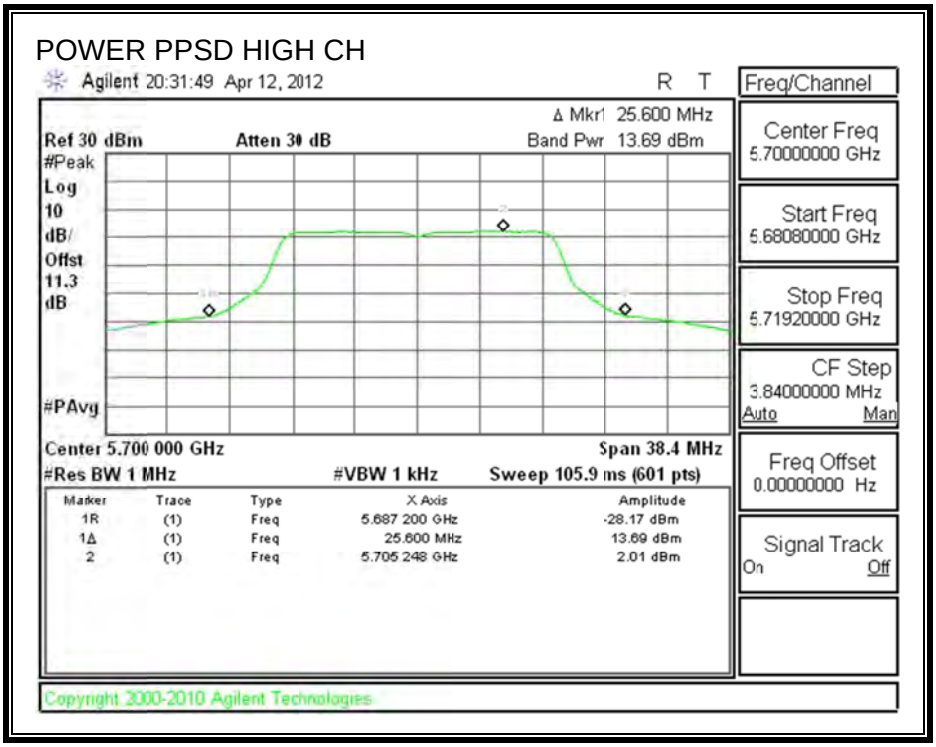
POWER PPSD LOW CH



POWER PPSD MID CH



POWER PPSD HIGH CH



7.6.4. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

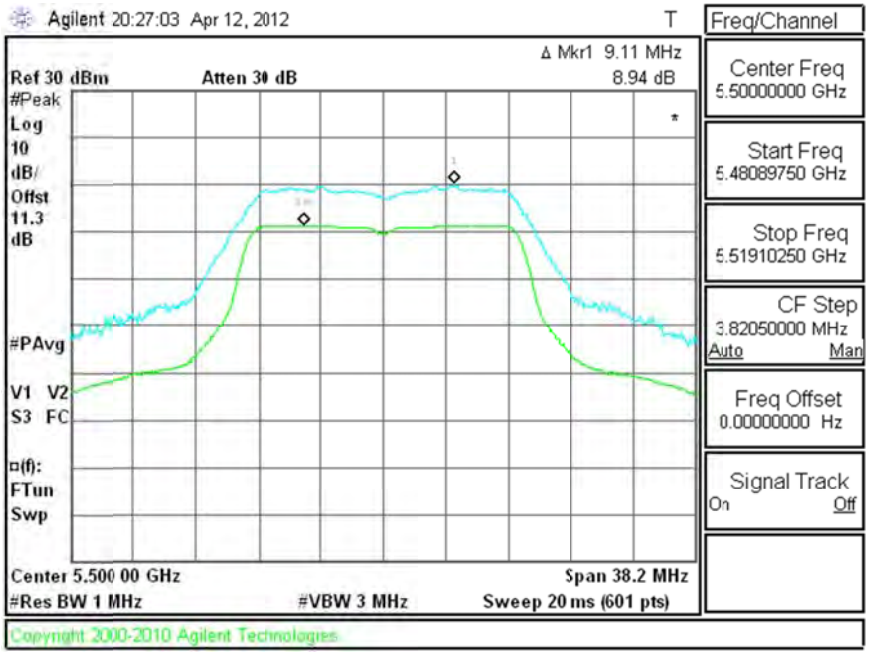
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

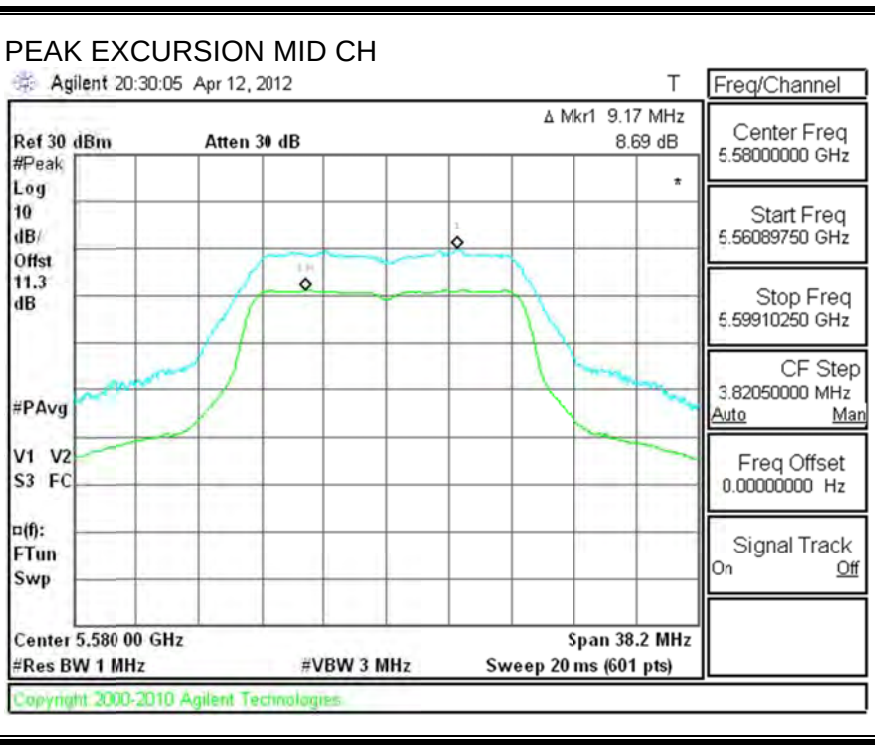
Channel	Frequency (MHz)	Pk Exc (dB)	Limit (dB)	Margin (dB)
Low	5500	8.94	13	-3.2
Mid	5580	8.69	13	-3.0
High	5700	8.73	13	-2.5

PEAK EXCURSION

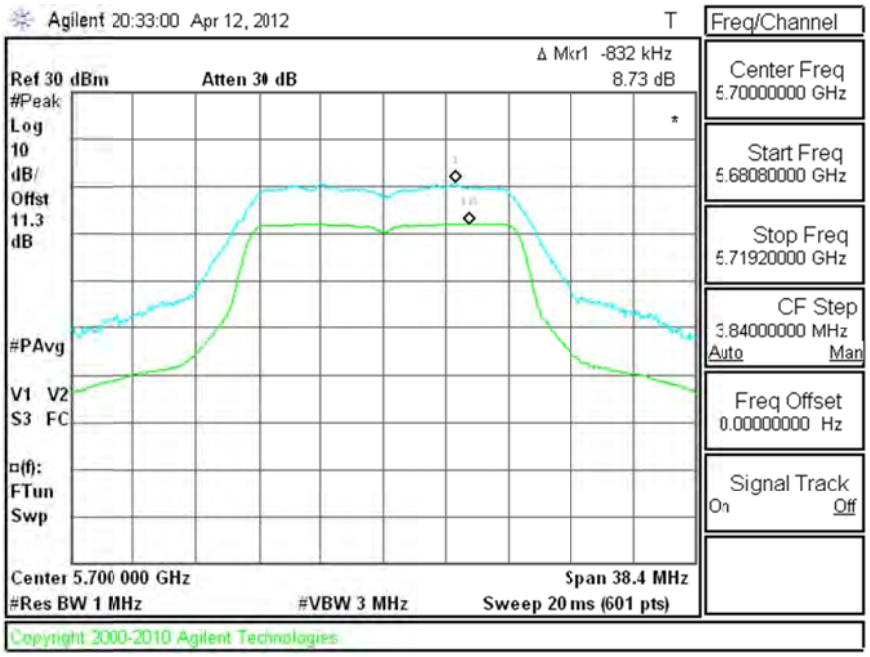
PEAK EXCURSION LOW CH



PEAK EXCURSION MID CH



PEAK EXCURSION HIGH CH



7.7. 802.11n HT20 MODE IN THE 5.6 GHz BAND

7.7.1. 26 dB BANDWIDTH

LIMITS

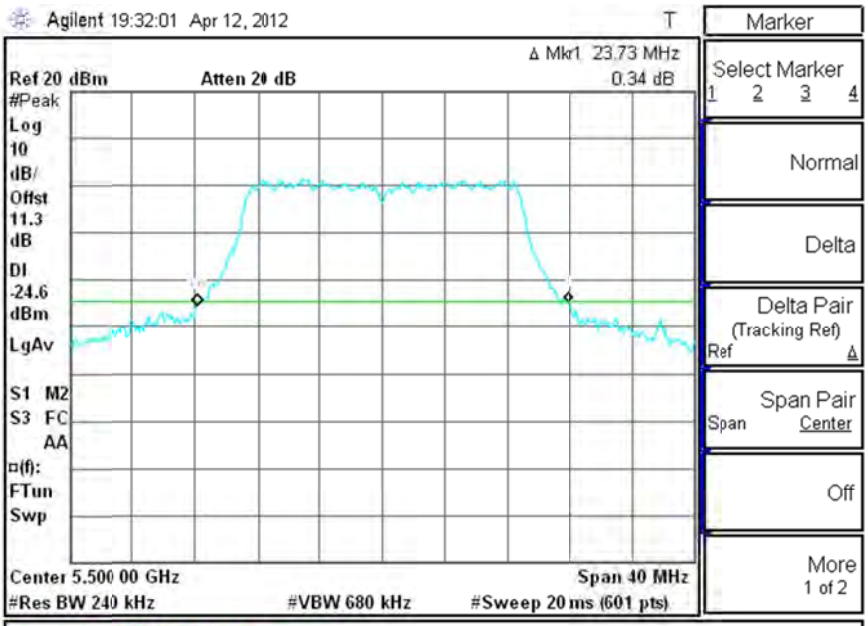
None; for reporting purposes only.

RESULTS

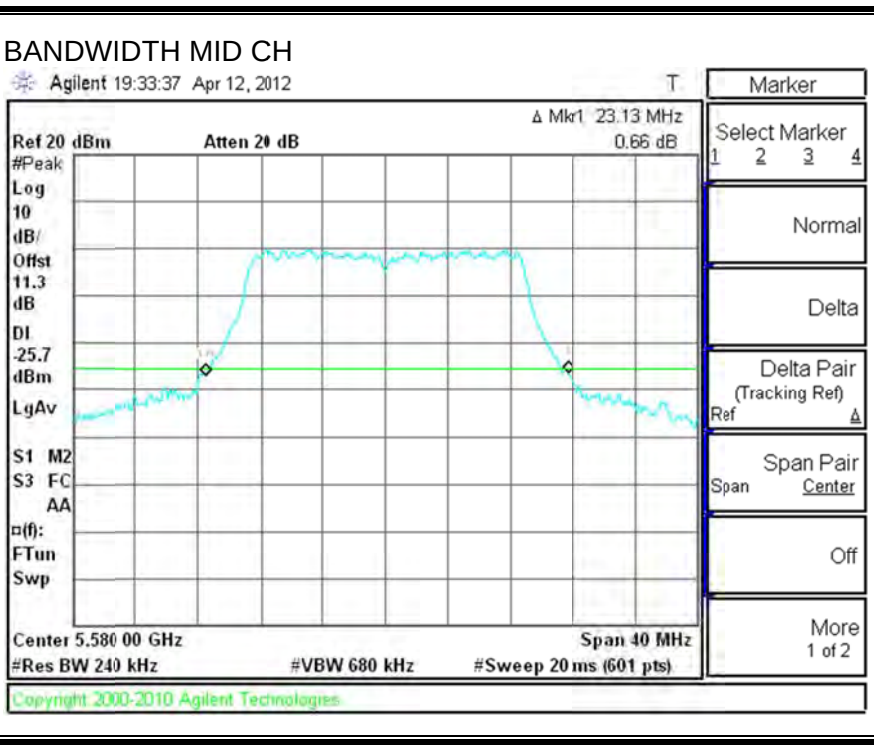
Channel	Frequency (MHz)	26 dB BW (MHz)
Low	5500	23.73
Mid	5580	23.13
High	5700	23.67

26 dB BANDWIDTH

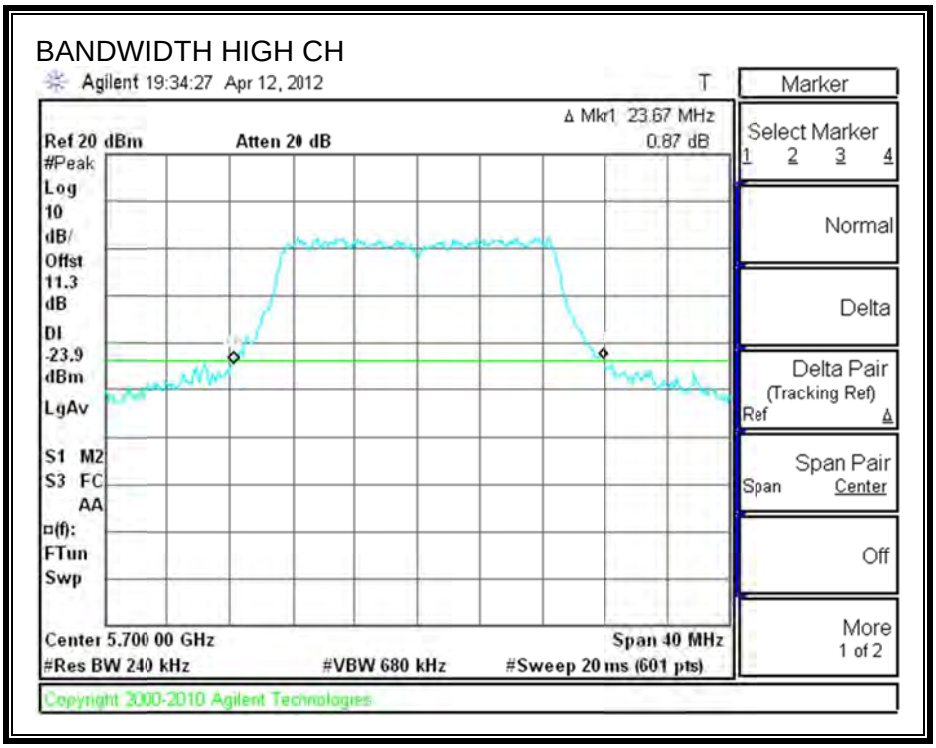
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



7.7.2. 99% BANDWIDTH

LIMITS

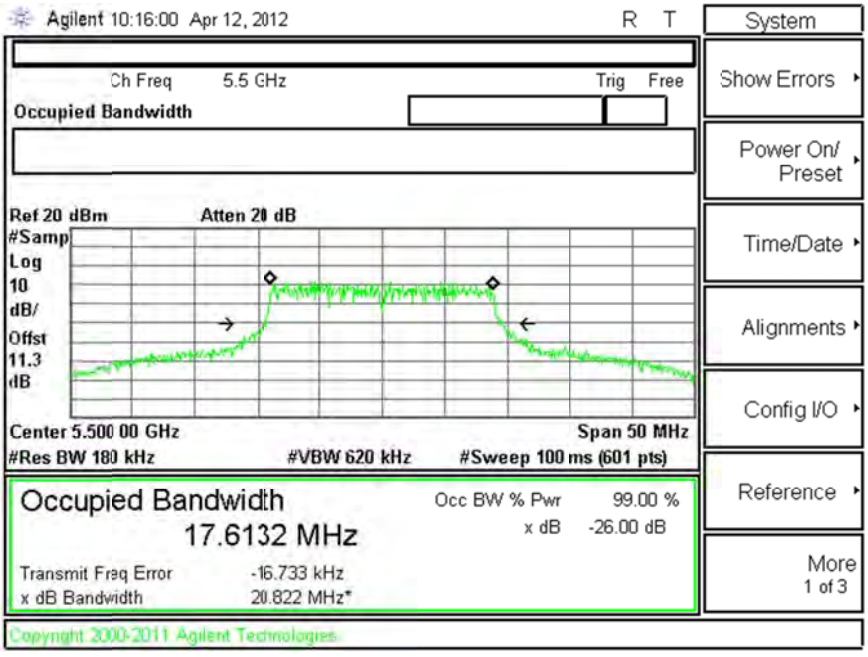
None; for reporting purposes only.

RESULTS

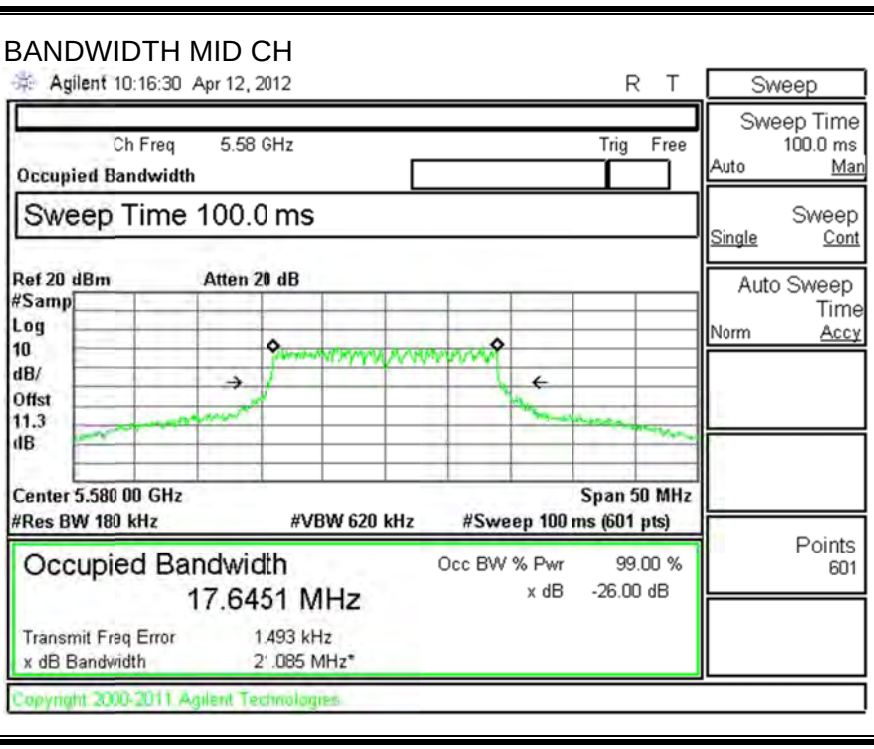
Channel	Frequency (MHz)	99% BW (MHz)
Low	5500	17.6132
Mid	5580	17.6451
High	5700	17.5891

99% BANDWIDTH

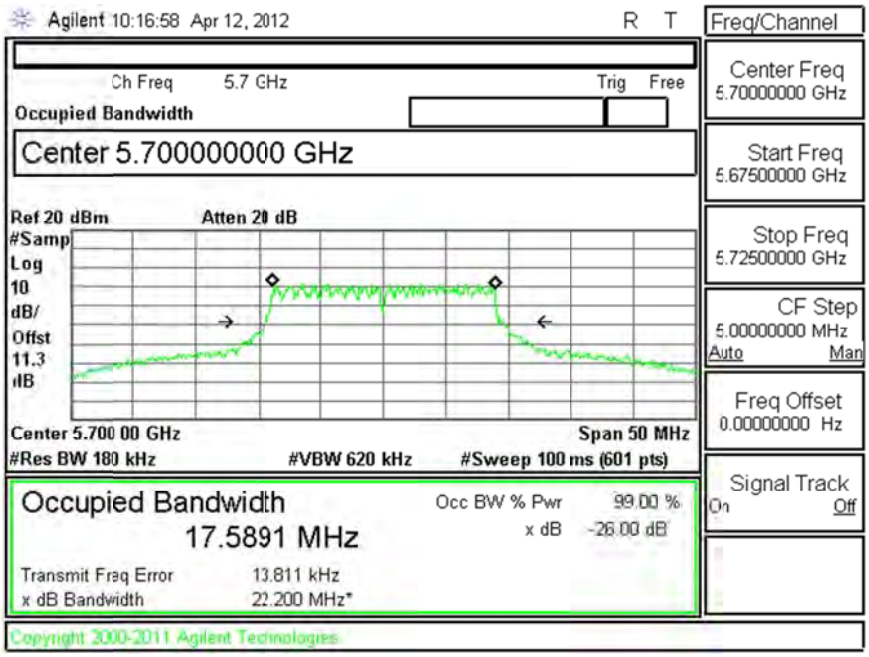
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



7.7.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (3)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density 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)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5500	24	23.73	24.75	0.95	24.00	11.00
Mid	5580	24	23.13	24.64	0.95	24.00	11.00
High	5700	24	23.67	24.74	0.95	24.00	11.00

Duty Cycle CF (dB)	0.22	Included in Calculations of Corr'd Power & PPSD

Output Power Results

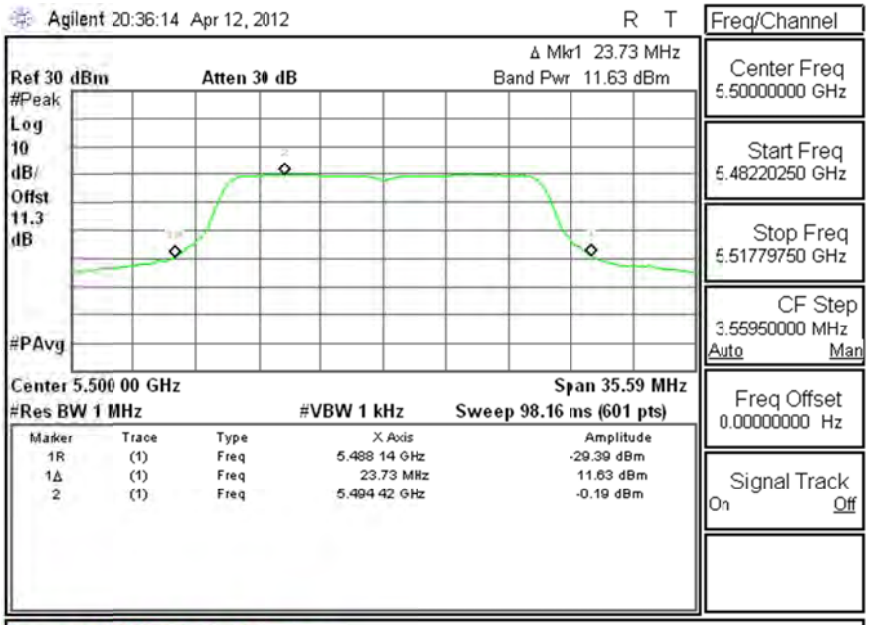
Channel	Frequency (MHz)	Meas Power (dBm)	Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	11.63	11.85	24.00	-12.15
Mid	5580	11.14	11.36	24.00	-12.64
High	5700	12.79	13.01	24.00	-10.99

PPSD Results

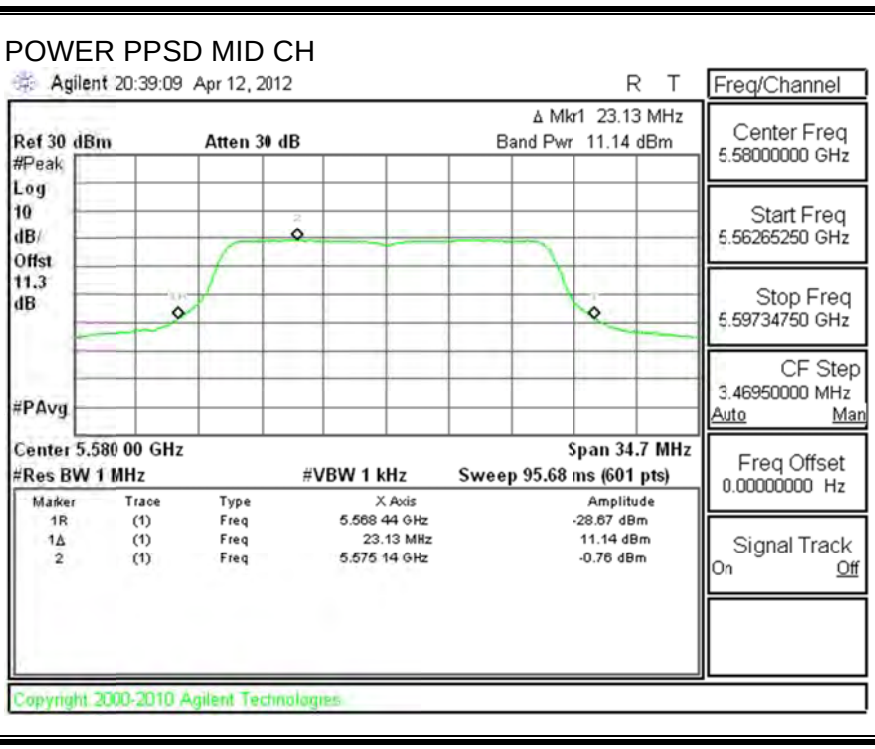
Channel	Frequency (MHz)	Meas PPSD (dBm)	Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	-0.19	0.03	11.00	-10.97
Mid	5580	-0.76	-0.54	11.00	-11.54
High	5700	0.90	1.12	11.00	-9.88

OUTPUT POWER AND PPSD

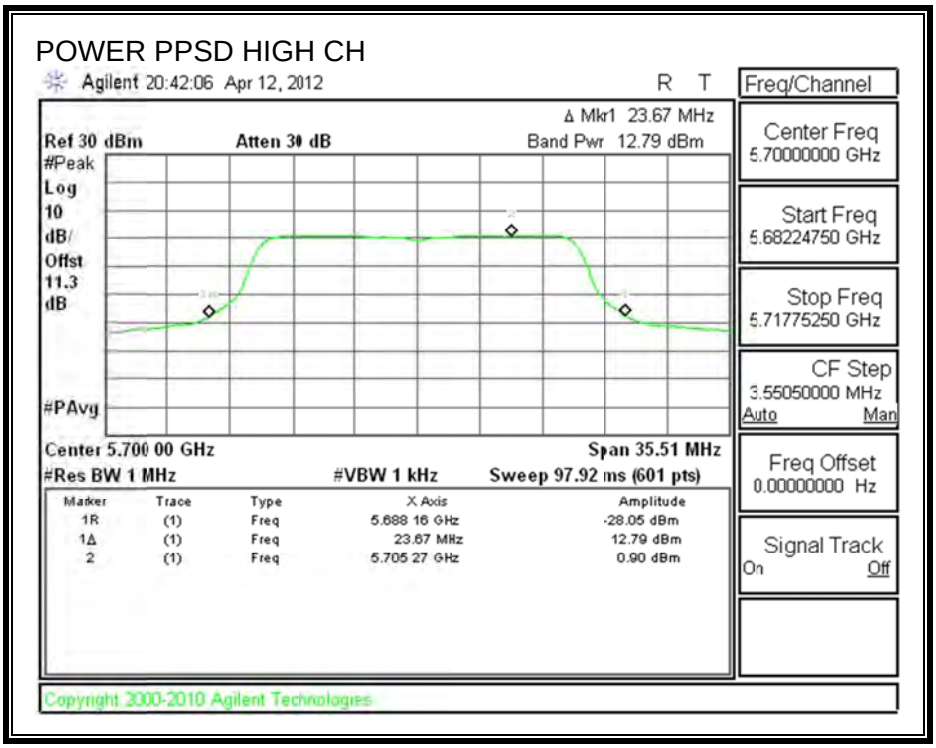
POWER PPSD LOW CH



POWER PPSD MID CH



POWER PPSD HIGH CH



7.7.4. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

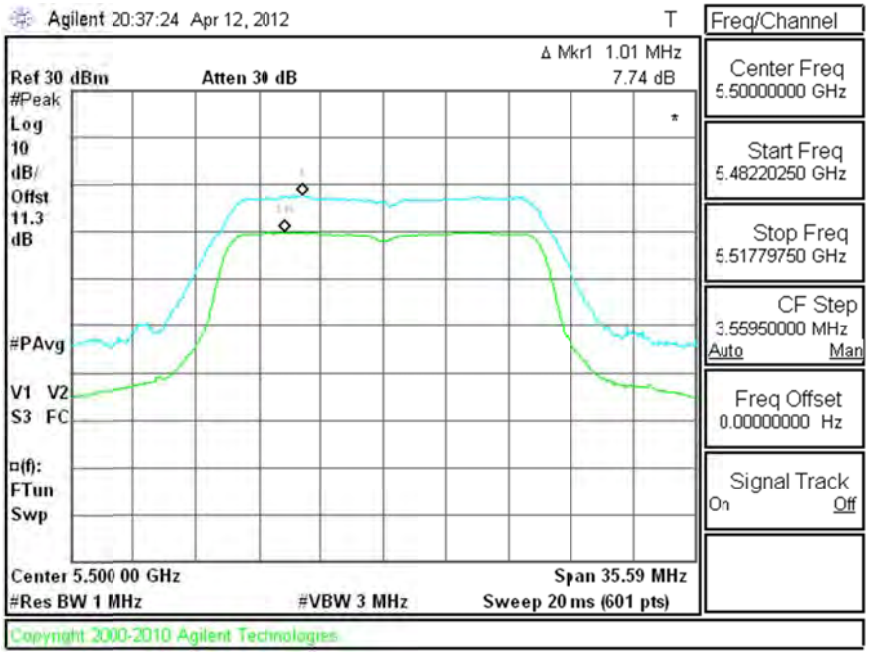
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

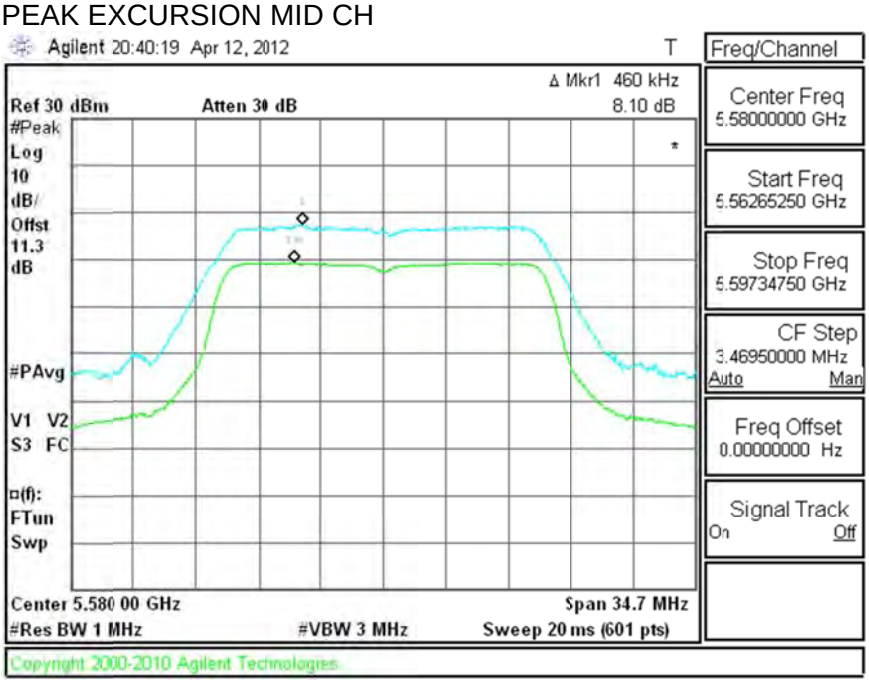
Channel	Frequency (MHz)	Pk Exc (dB)	Limit (dB)	Margin (dB)
Low	5500	7.74	13	-4.2
Mid	5580	8.10	13	-4.2
High	5700	8.13	13	-4.4

PEAK EXCURSION

PEAK EXCURSION LOW CH



PEAK EXCURSION MID CH



PEAK EXCURSION HIGH CH