FCC CFR47 PART 15 SUBPART E
INDUSTRY CANADA RSS-210 ISSUE 8

CLASS III PERMISSIVE CHANGE
CERTIFICATION TEST REPORT

FOR

802.11 a/b/g/n 2X2 ACCESS POINT MODULE

MODEL NUMBER: AP802

FCC ID: LDKTG2050
IC: 2461B-TG2050

REPORT NUMBER: 12U14476-5

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Prepared for
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: CISCO SYSTEMS, INC.
170 WEST TASMAN DRIVE
SAN JOSE, CA 95134

EUT DESCRIPTION: 802.11 a/b/g/n 2X2 ACCESS POINT MODULE

MODEL: AP802

SERIAL NUMBER: FGL151523FJ

DATE TESTED: JUNE 18 - JULY 24, 2012

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 9	Pass
INDUSTRY CANADA RSS-GEN Issue 3	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:

FRANK IBRAHIM
WiSE PROJECT LEADER
UL CCS

Tested By:

DAVID GARCIA
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, FCC KDB 789033, ANSI C63.10-2003, 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.

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 an 802.11a/b/g/n transceiver.

The radio module is manufactured by Hon Hai.

5.2. CLASS III PERMISSIVE CHANGE

The bands of 5250-5350 MHz and 5470-5725 were added.

5.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5260 - 5320	802.11a	14.499	28.177
5260 - 5320	802.11a Beam Forming	17.401	54.967
5260 - 5320	802.11n HT20	15.490	35.400
5270 - 5310	802.11n HT40	14.990	31.550
5500 - 5700	802.11a	15.328	34.104
5500 - 5700	802.11a Beam Forming	18.248	66.804
5500 - 5700	802.11n HT20	16.447	44.127
5510 - 5670	802.11n HT40	16.125	40.973

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an Omni-directional antenna, with a maximum peak gain of 4 dBi in the 2.4GHz band and 6 dBi in the 5.8GHz band.

TopGun2 Antennas			
Model	**Part Number**	**Antenna Type**	**Antenna Gain (dBi)**
CI2595-11-000-R Amphenol	Internal	Dual-resonant Omni Directional	2.4GHz (4dBi) 5GHz (6dBi)
MAF95295MO Laird	Internal	Dual-resonant Omni Directional	2.4GHz (4dBi) 5GHz (6dBi)
AIR-ANTM2050D-R	74-3786-01	Dual-resonant Dipole	2.4GHz (1.4dBi) 5GHz (4.5dBi)
AIR-ANT2524DB-R	07-1146-01	Dual-resonant Dipole	2.4GHz (1.5dBi) 5GHz (3.5dBi)
AIR-ANT5140V-R	07-1050-01	Omni Directional	5GHz (4dBi)
AIR-ANT2440NV-R	07-1098-01	Omni Directional	2.4GHz (4.0dBi)
AIR-ANT5140NV-R	07-1099-01	Omni Directional	5GHz (4.0dBi)

5.5. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was version 12.4.

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
802.11a Beam-Forming mode: 6 Mbps
802.11n HT20mode: MCS0
802.11n HT40mode: MCS8

Based on an input from the client, for SISO modes, left chain (Ant B) was selected as worst-case scenario as it has slightly higher power than the other chain.

Since there are two versions of the EUT (indoor and outdoor units); the middle channel 5560 MHz was selected as representative middle channel for both indoor and outdoor units as 5580 MHz can't be used for outdoor applications, except for the 20 dBc conducted spurious where 5580 MHz was used since this is closer to the BE at 5.6 GHz than 5560 MHz.

6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop PC	IBM	T20	08K6579	DoC
Mouse	HP	MOAFUO	FATSK0J9W0EG55	DoC
AC Adapter	IBM	02K6657	11S02K6657Z0ZA0755FK	N/A
AC Adapter	Delta Electronics	EADP-60MB B	DTH1537S47M	N/A

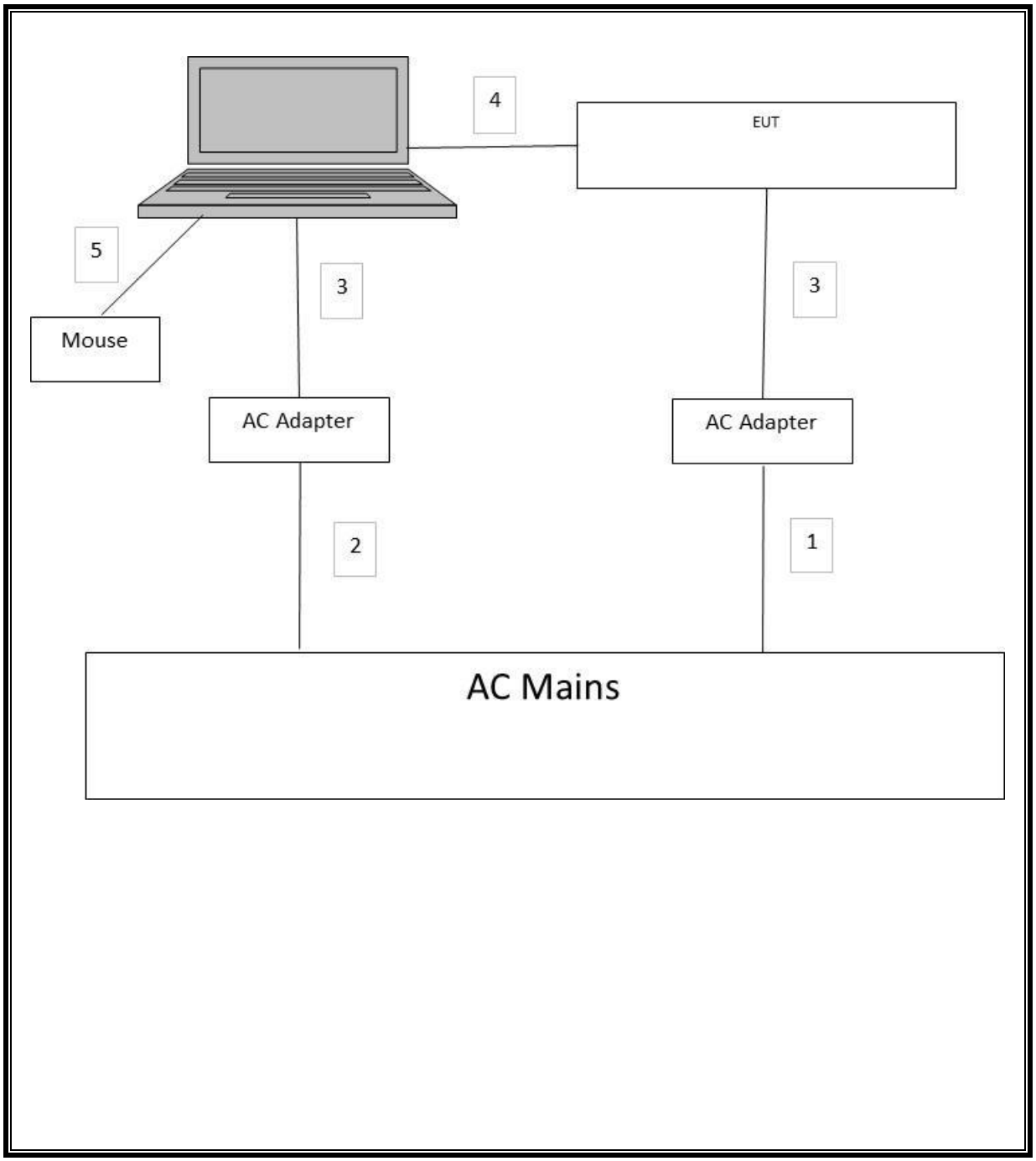
I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	1	AC	Unshielded	1.9m	
2	AC	1	AC	Unshielded	1.0m	
3	DC	1	DC	Unshielded	1.8m	
4	Serial	1	RJ45	Unshielded	1.8m	
5	USB	3	USB	Unshielded	1.88m	

TEST SETUP

The EUT is connected to a host laptop computer during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



7. 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	C01161	12/16/11	12/16/12
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	09/02/11	09/02/12
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/15/11	12/15/12
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/19/11	08/19/13
Power Meter	Agilent / HP	437B	T221	07/29/11	07/29/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	11/11/11	11/11/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	11/11/11	11/11/12
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	08/02/11	08/02/12
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	11/11/11	11/11/12
Power Sensor, 18 GHz	Agilent / HP	8481A	T225	08/04/11	08/04/12
LISN, 30 MHz	FCC	50/250-25-2	C00626	12/13/11	12/13/12
Antenna, Horn, 18 GHz	EMCO	3115	C00872	09/20/11	09/20/12
Antenna, Horn, 18 GHz	EMCO	3115	C00945	10/06/11	10/06/12
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	T243	02/07/12	02/07/13
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	07/28/11	07/28/12

8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

8.1. 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	1.436	1.448	0.992	99.2%	0.04	0.696
802.11n HT20	1.344	1.356	0.991	99.1%	0.04	0.744
802.11n HT40	0.356	0.368	0.967	96.7%	0.14	2.809

8.2. MEASUREMENT METHOD FOR POWER AND PPSD

Where the Duty Cycle is greater than or equal to 98%, KDB 789033 Method SA-1 is used.

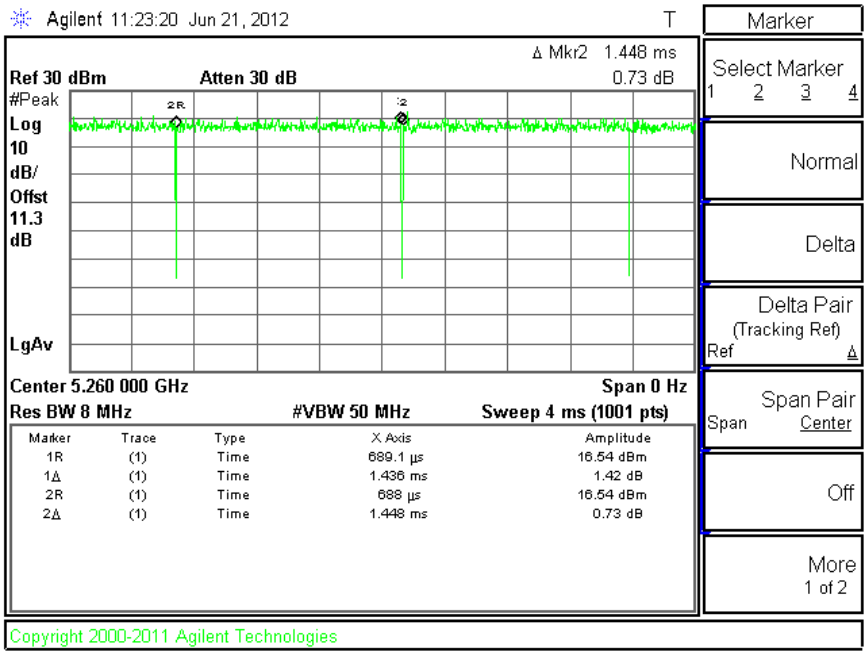
Where the Duty Cycle is less than 98% and consistent, KDB 789033 Method SA-2 is used.

8.3. MEASUREMENT METHOD FOR AVG SPURIOUS EMISSIONS ABOVE 1 GHz

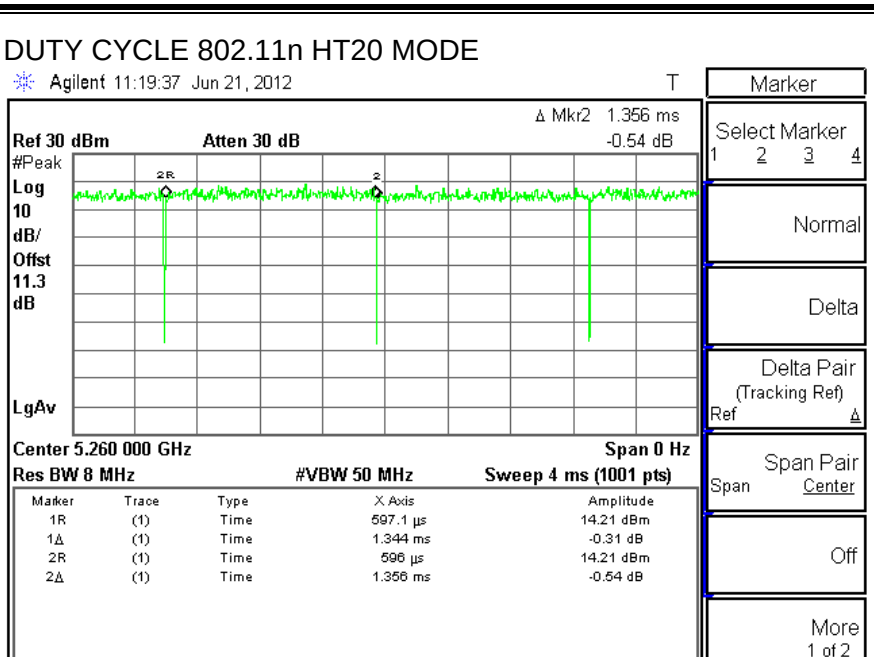
KDB 789033 Method VB with Power RMS Averaging is used for both cases of duty cycle greater than or equal to 98%, and duty cycle less than 98%.

8.4. DUTY CYCLE PLOTS

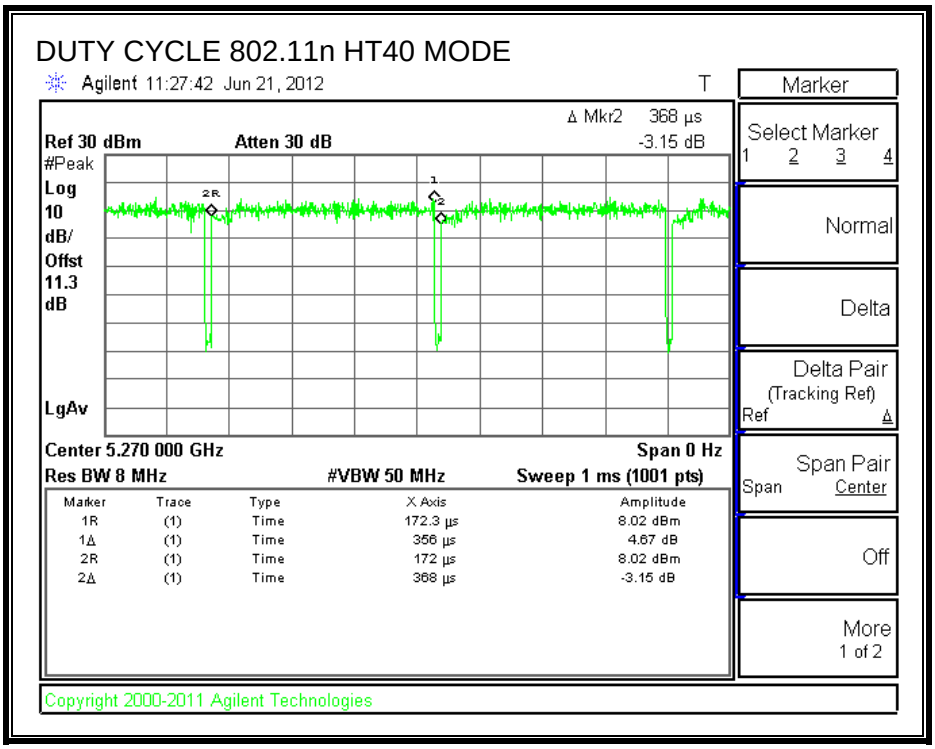
DUTY CYCLE 802.11a MODE



DUTY CYCLE 802.11n HT20 MODE



DUTY CYCLE 802.11n HT40 MODE



9. ANTENNA PORT TEST RESULTS

9.1. 802.11a MODE IN THE 5.3 GHz BAND

9.1.1. 26 dB BANDWIDTH

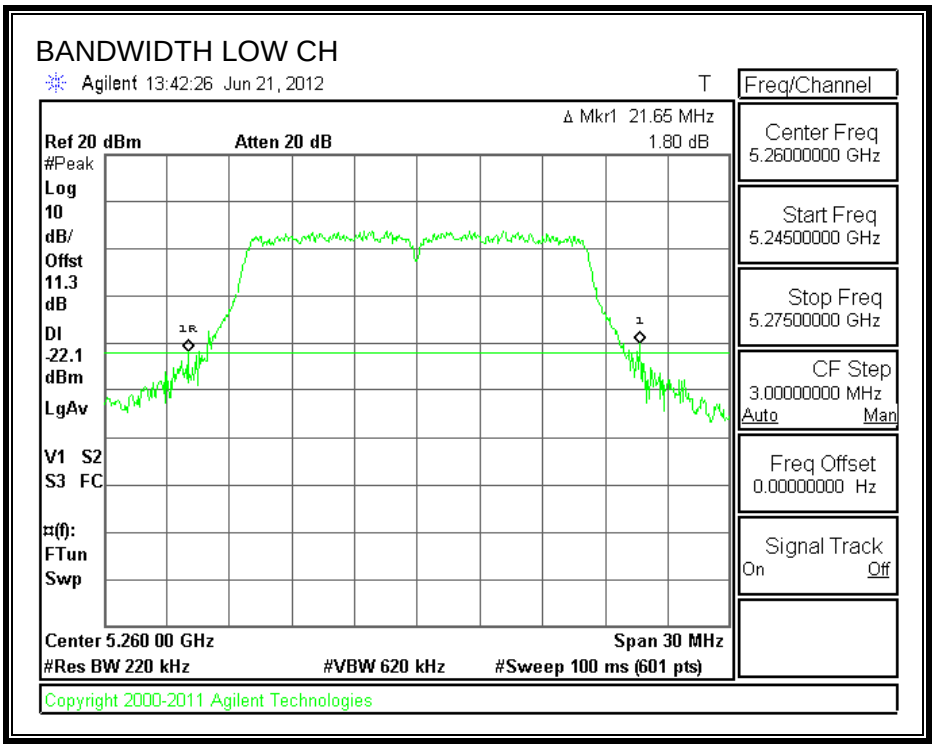
LIMITS

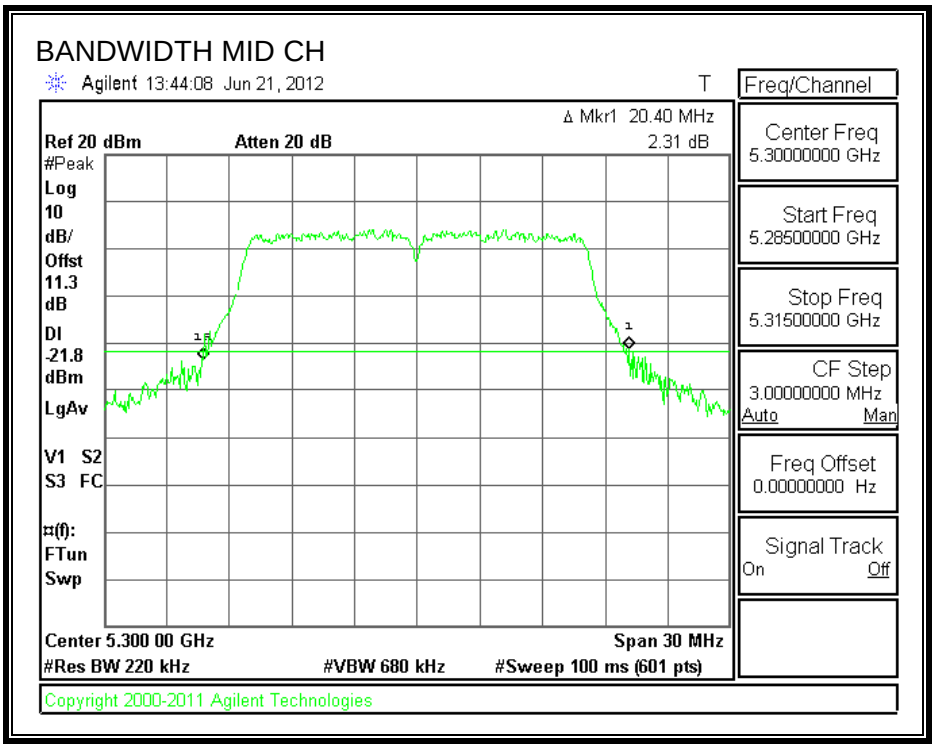
None; for reporting purposes only.

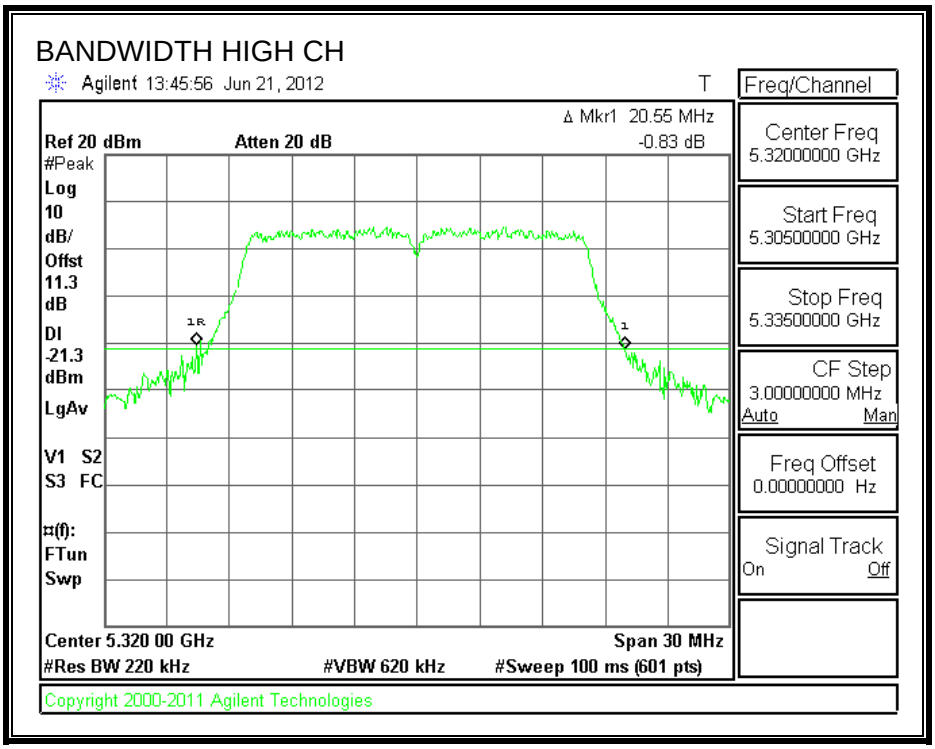
RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	21.65
Mid	5300	20.40
High	5320	20.55

26 dB BANDWIDTH







9.1.2. 99% BANDWIDTH

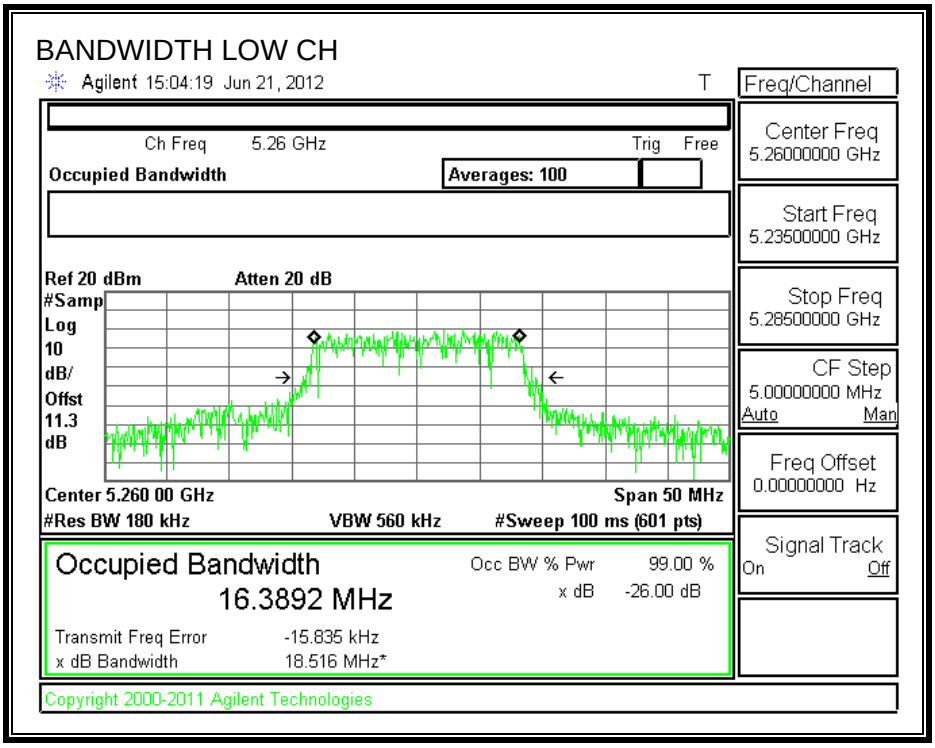
LIMITS

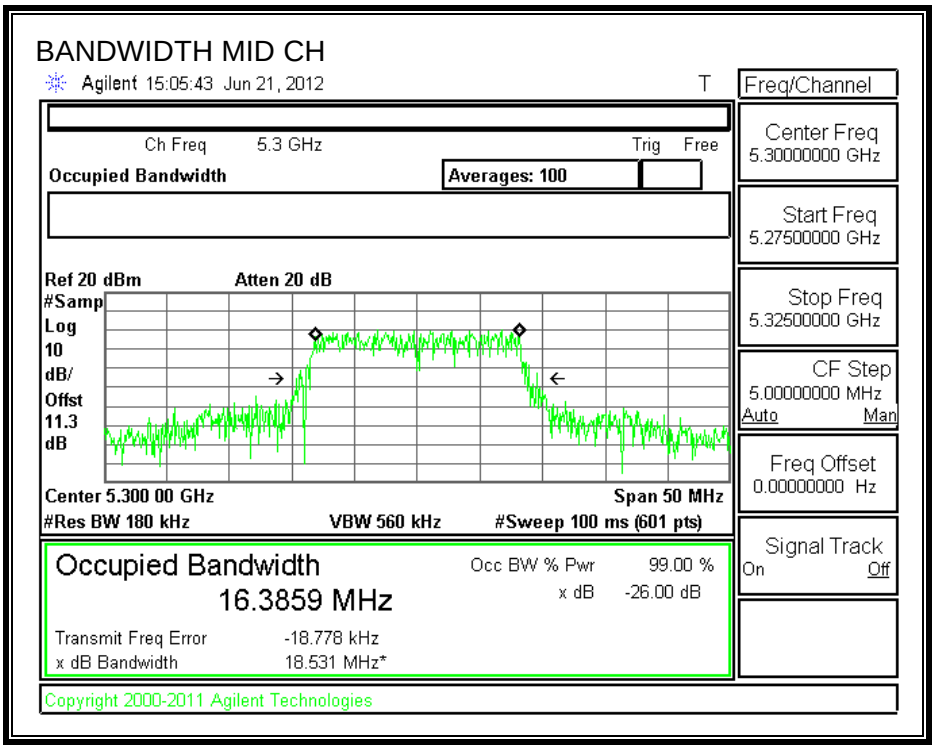
None; for reporting purposes only.

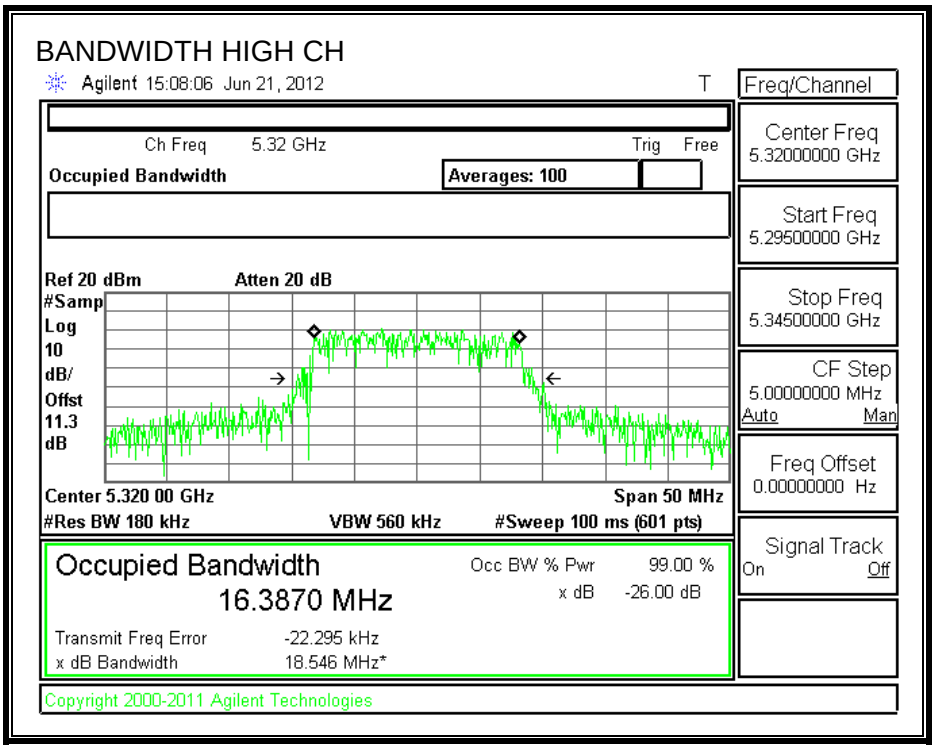
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	16.3892
Mid	5300	16.3859
High	5320	16.3870

99% BANDWIDTH







9.1.3. 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 11.3 dB (including 10 dB pad and 1.3 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
Low	5260	13.5
Mid	5300	13.9
High	5320	14.4

9.1.4. 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	21.65	24.35	6.00	24.00	11.00
Mid	5300	24	20.40	24.10	6.00	24.00	11.00
High	5320	24	20.55	24.13	6.00	24.00	11.00

Output Power Results

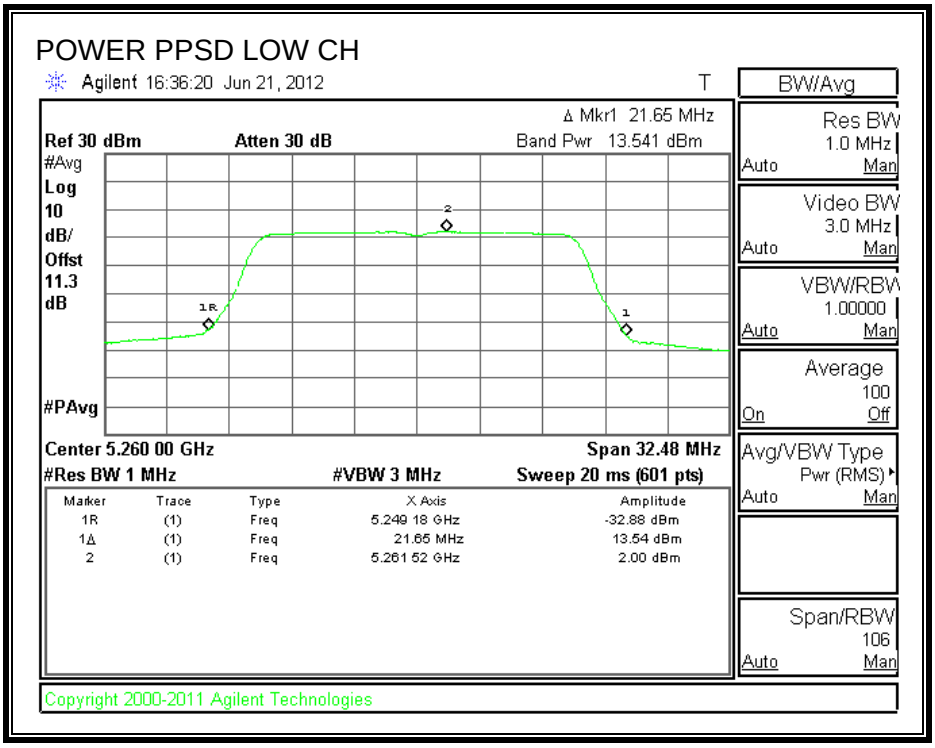
Channel	Frequency (MHz)	Meas Power (dBm)	Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	13.541	13.541	24.00	-10.459
Mid	5300	14.081	14.081	24.00	-9.919
High	5320	14.499	14.499	24.00	-9.501

PPSD Results

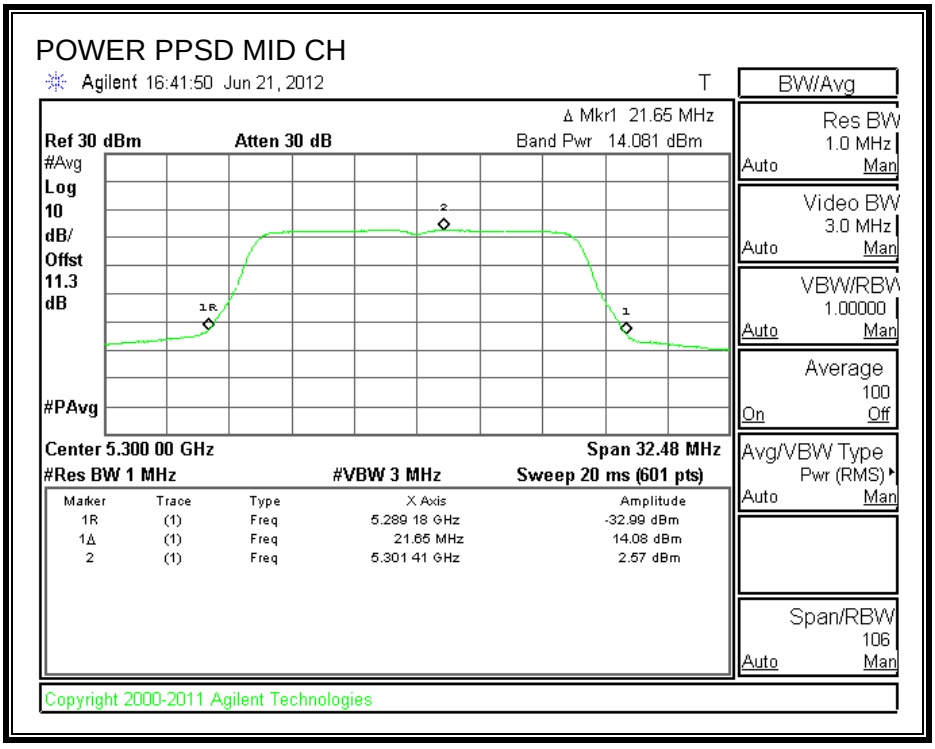
Channel	Frequency (MHz)	Meas PPSD (dBm)	Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	2.00	2.00	11.00	-9.00
Mid	5300	2.57	2.57	11.00	-8.43
High	5320	2.96	2.96	11.00	-8.04

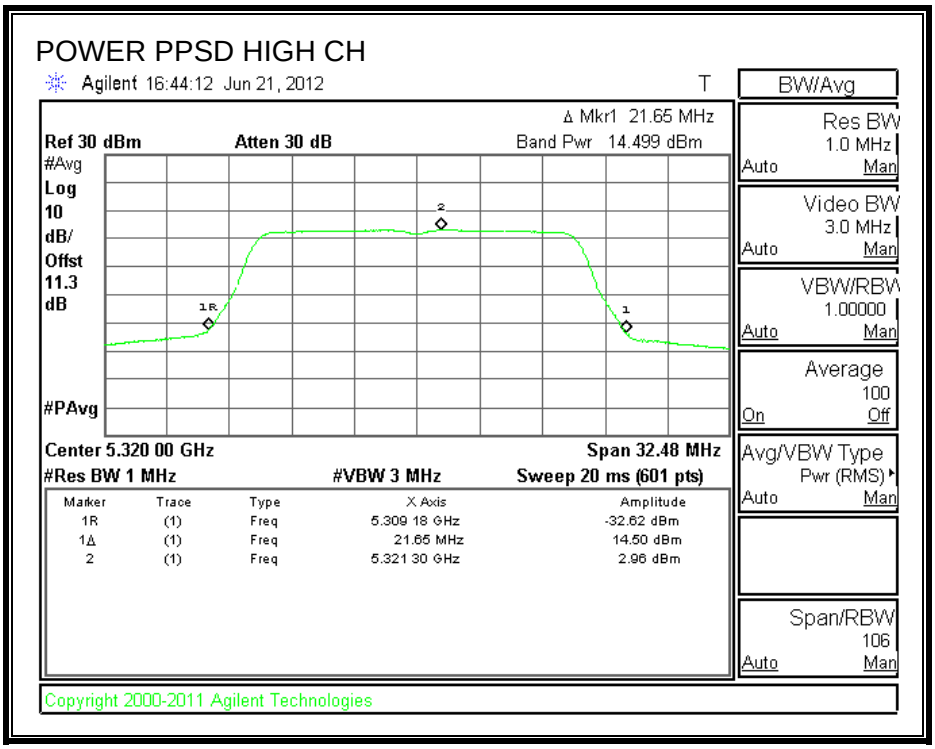
OUTPUT POWER AND PPSD

POWER PPSD LOW CH



POWER PPSD MID CH





9.1.5. PEAK EXCURSION

LIMITS

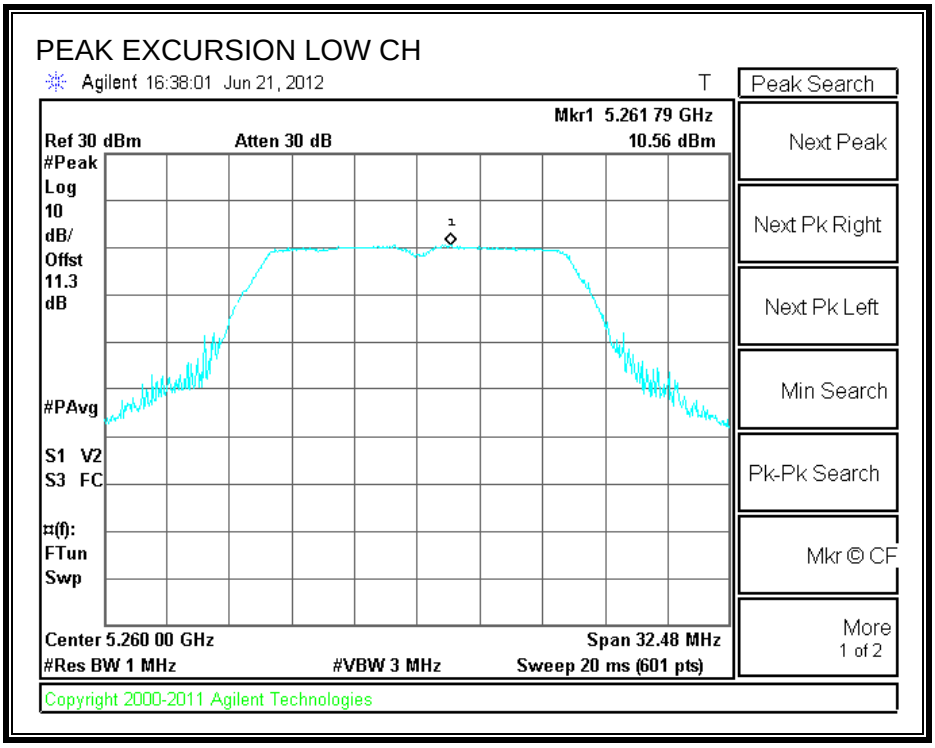
FCC §15.407 (a) (6)

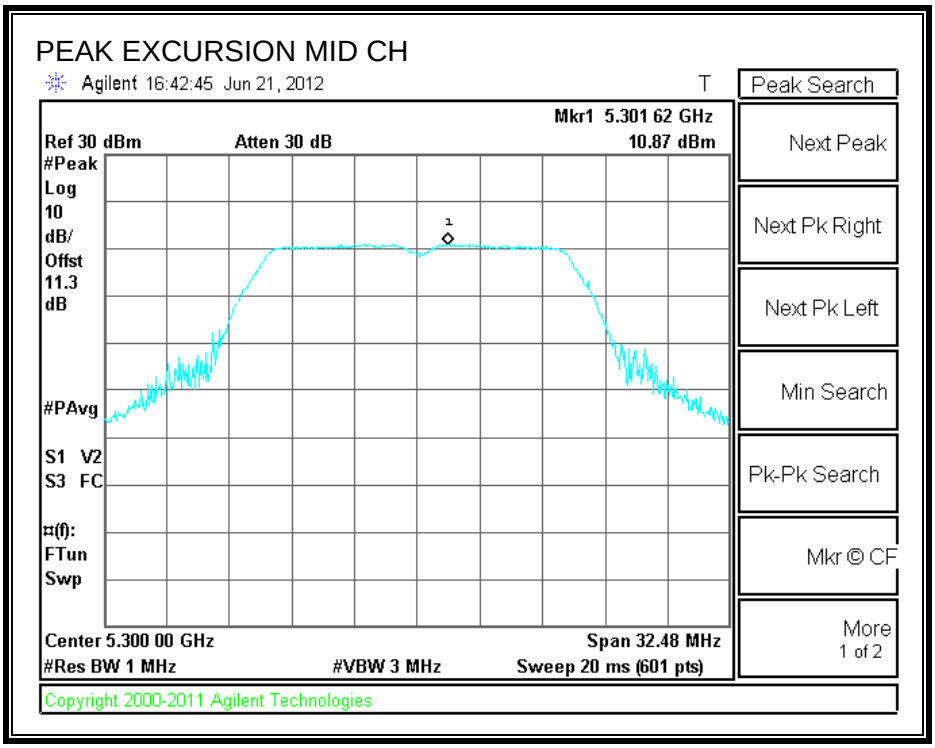
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

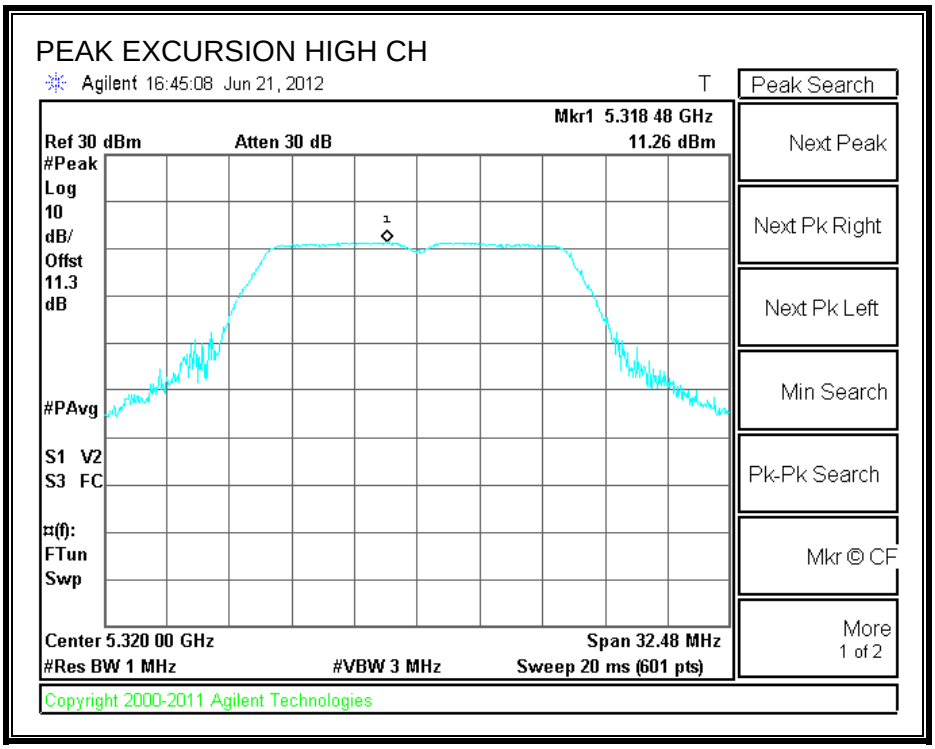
Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	10.56	2.00	0.04	8.52	13	-4.48
Mid	5300	10.87	2.57	0.04	8.26	13	-4.74
High	5320	11.26	2.96	0.04	8.26	13	-4.74

PEAK EXCURSION





PEAK EXCURSION HIGH CH



9.2. 802.11a BEAM FORMING MODE IN THE 5.3 GHz BAND

9.2.1. 26 dB BANDWIDTH

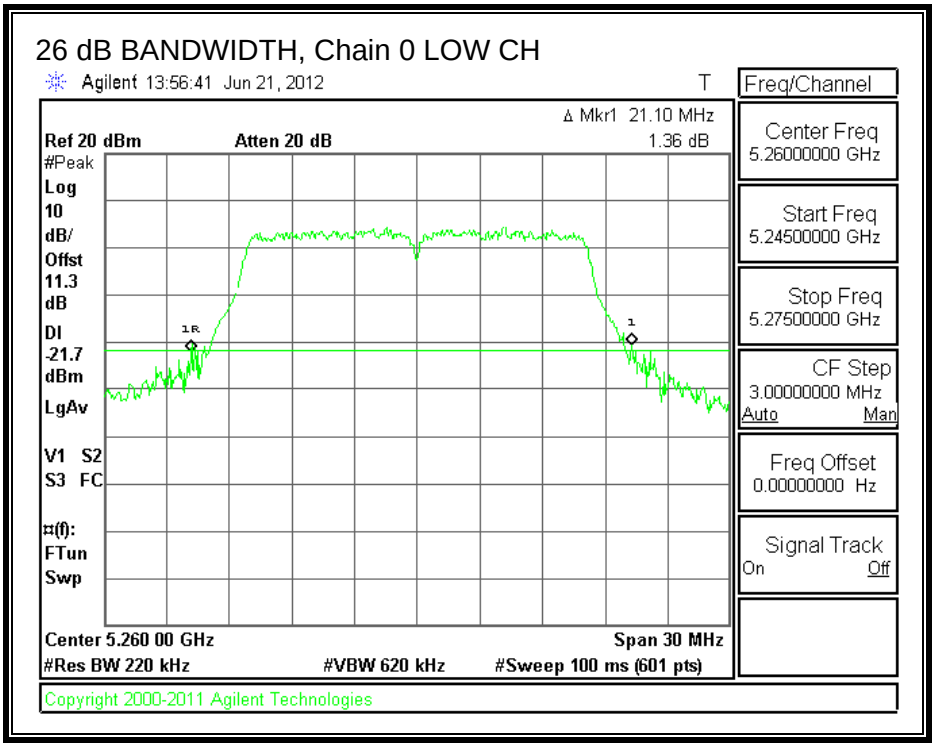
LIMITS

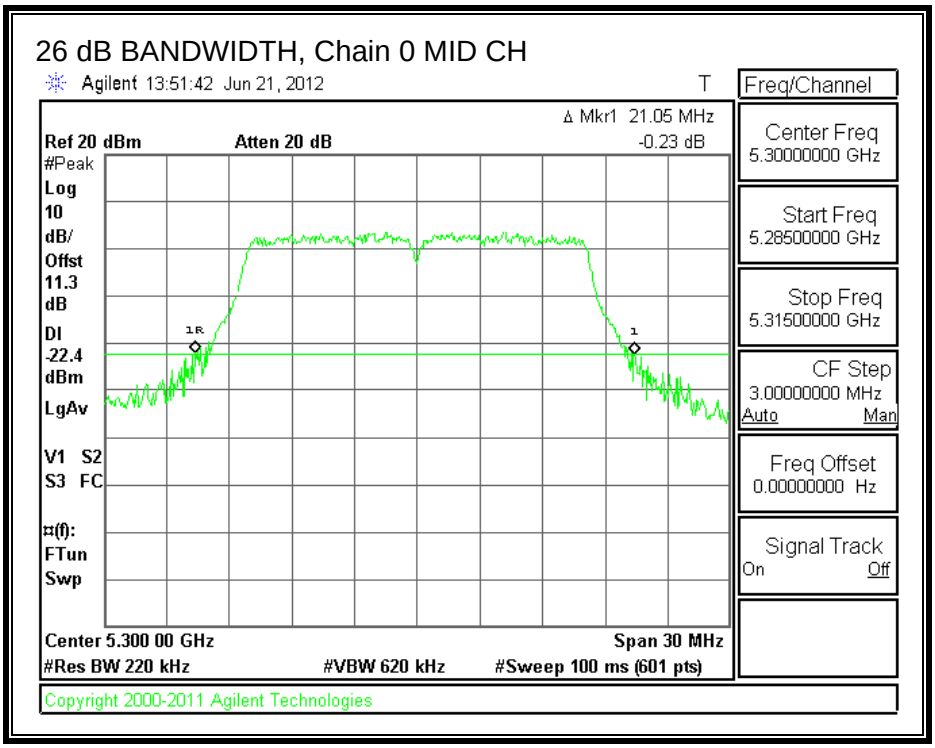
None; for reporting purposes only.

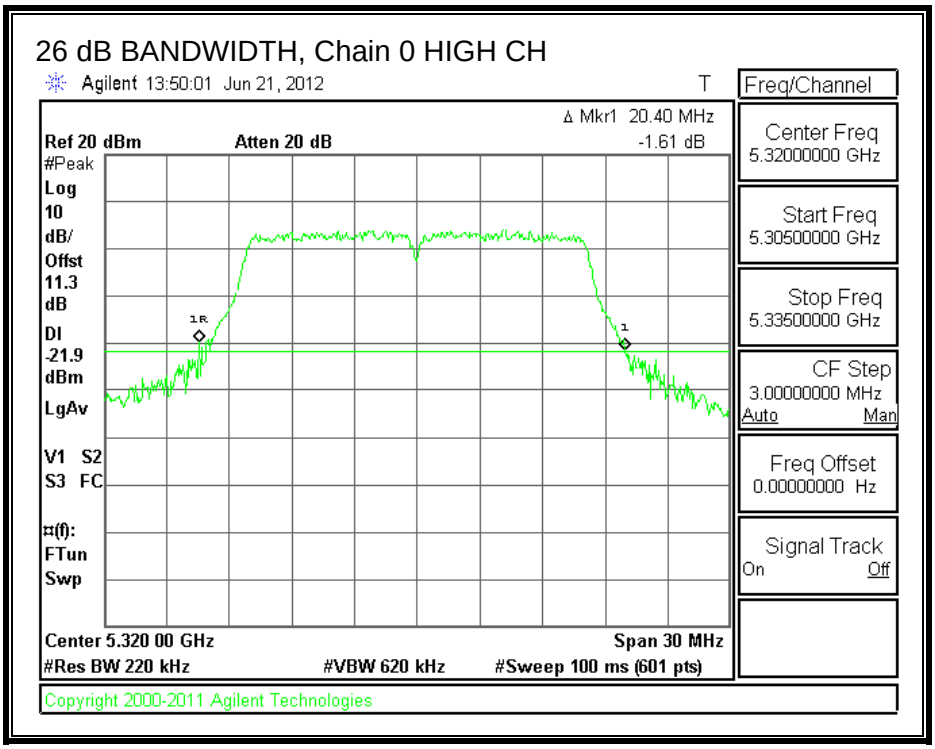
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5260	21.10	20.95
Mid	5300	21.05	20.55
High	5320	20.40	20.95

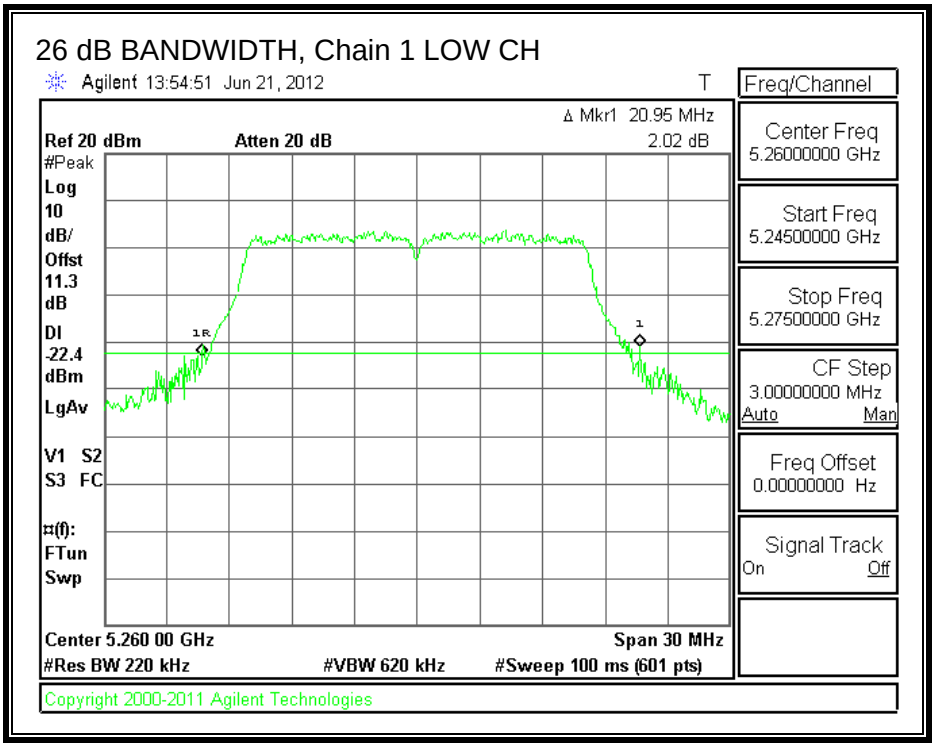
26 dB BANDWIDTH, Chain 0

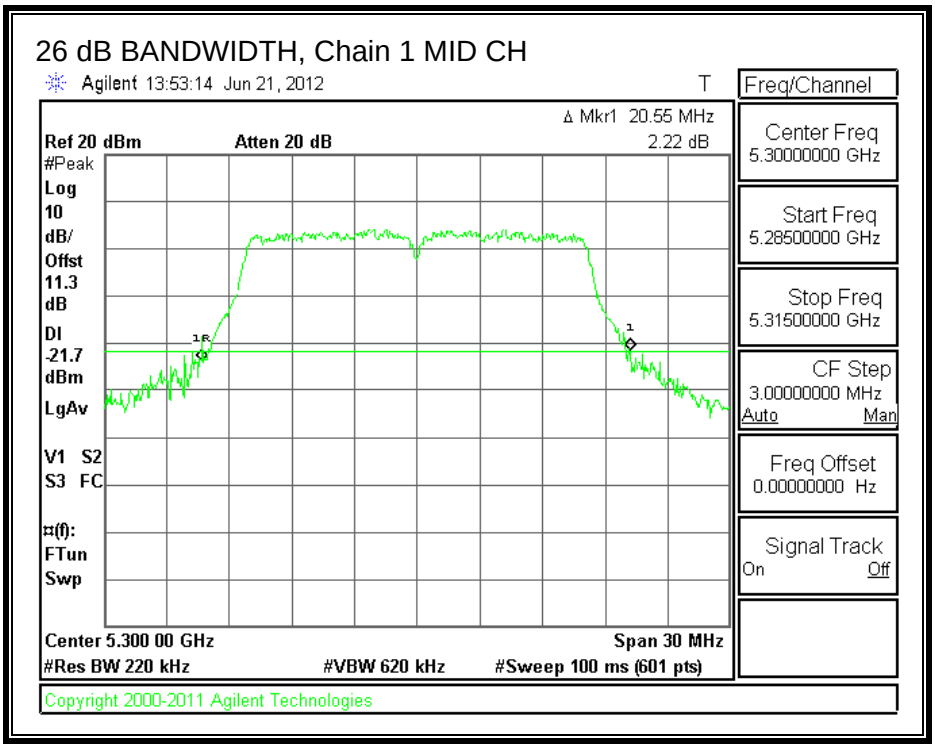


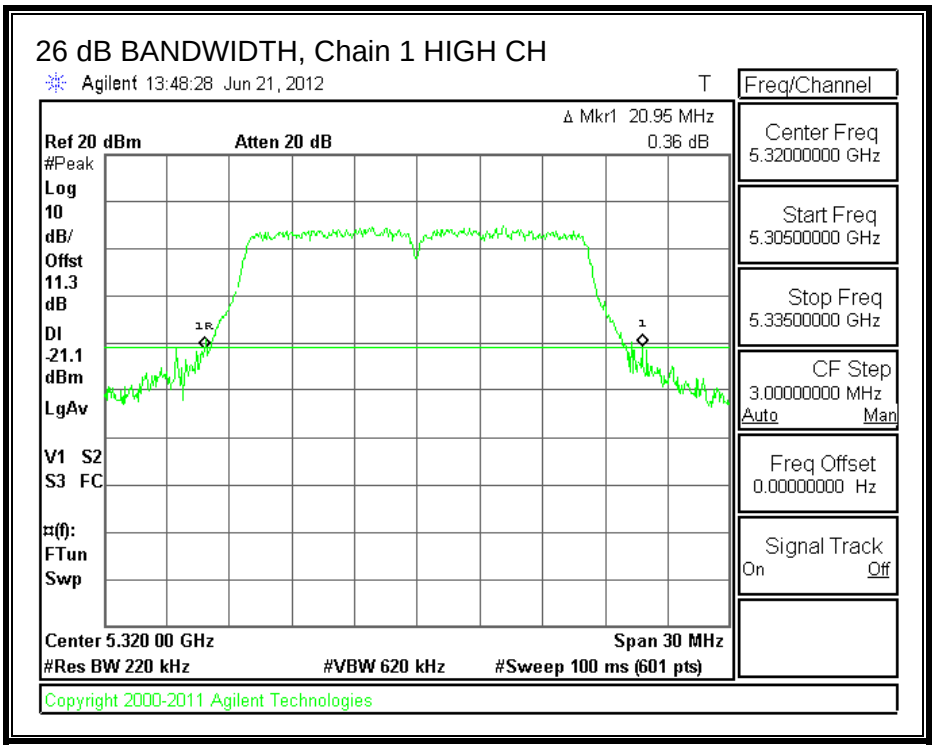




26 dB BANDWIDTH, Chain 1







9.2.2. 99% BANDWIDTH

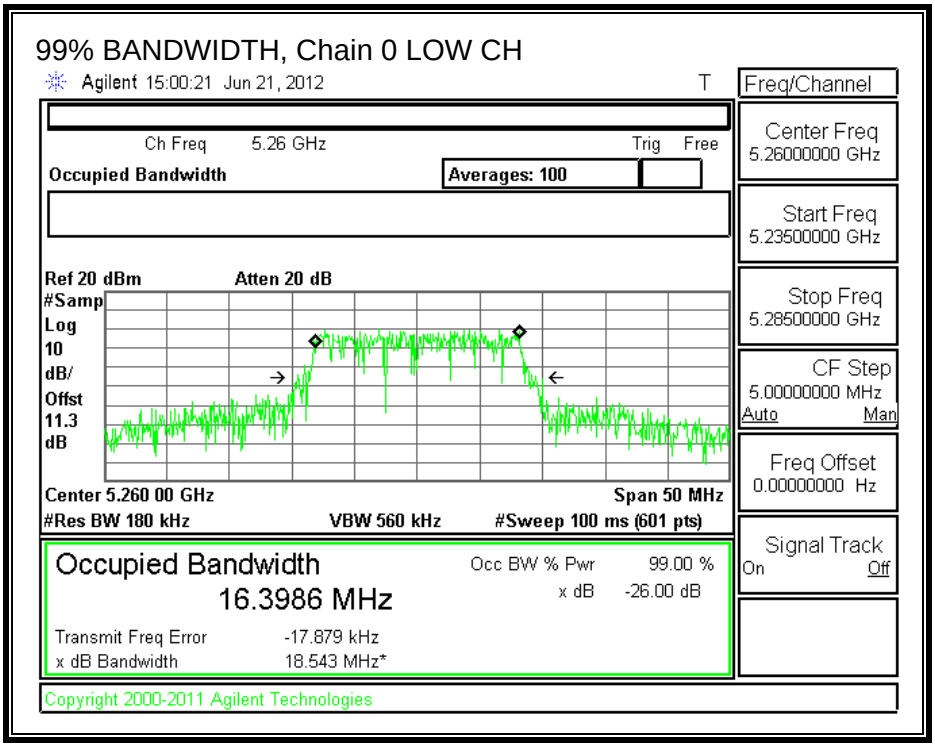
LIMITS

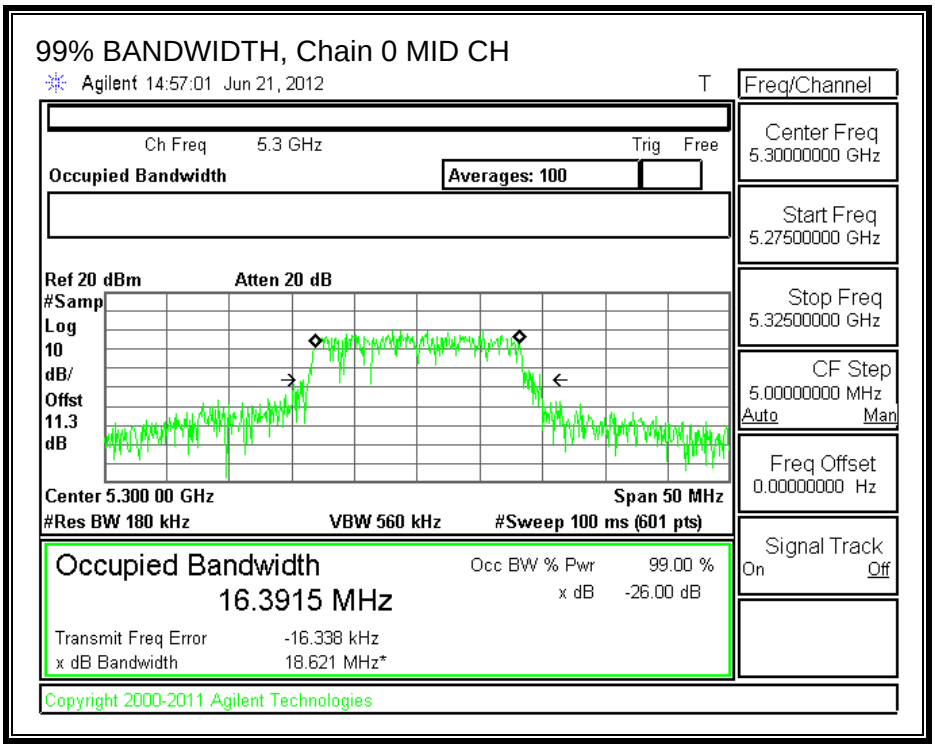
None; for reporting purposes only.

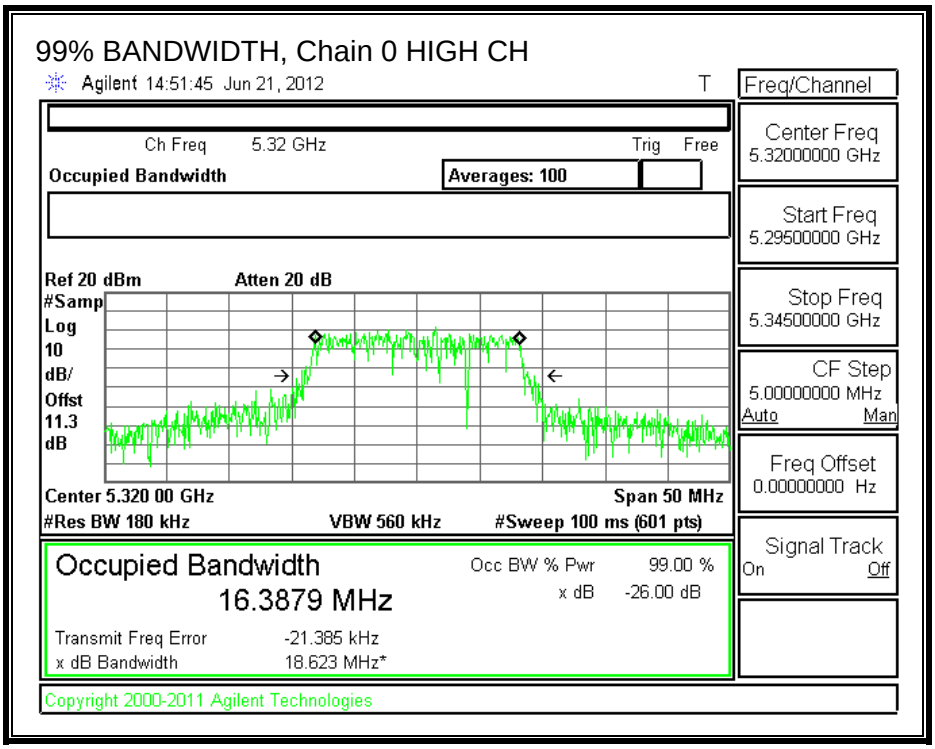
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5260	16.3986	16.3853
Mid	5300	16.3915	16.3984
High	5320	16.3879	16.3892

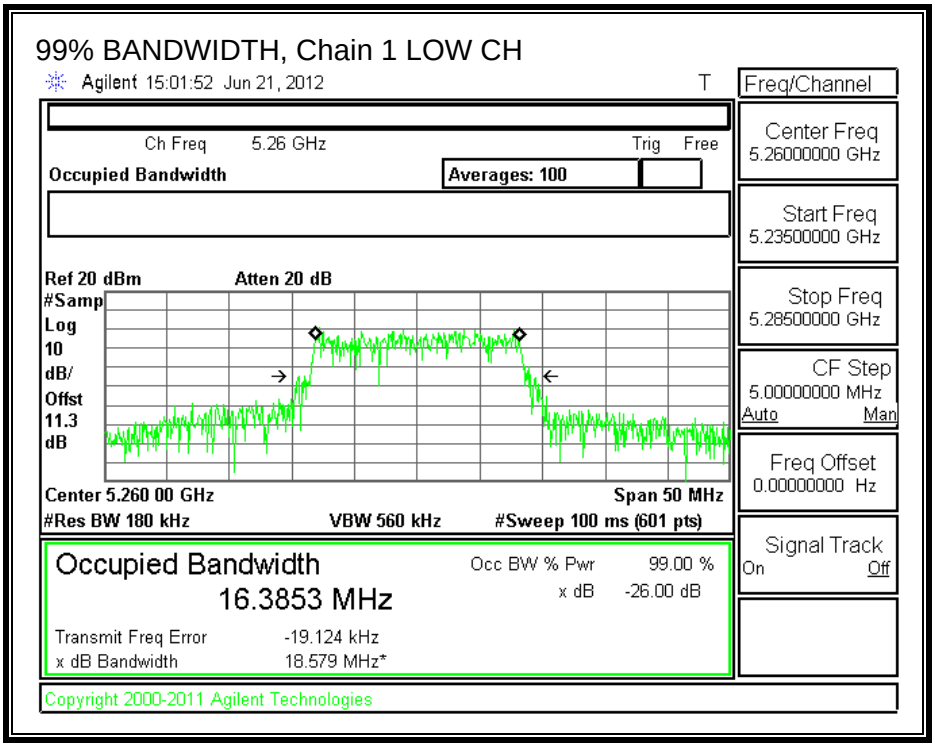
99% BANDWIDTH, Chain 0

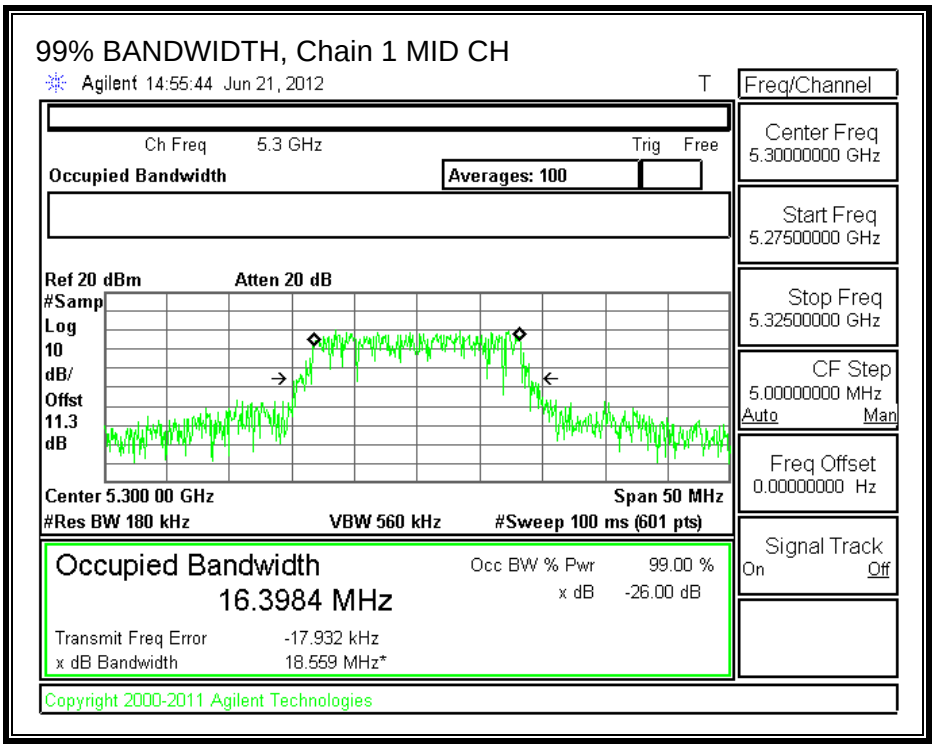


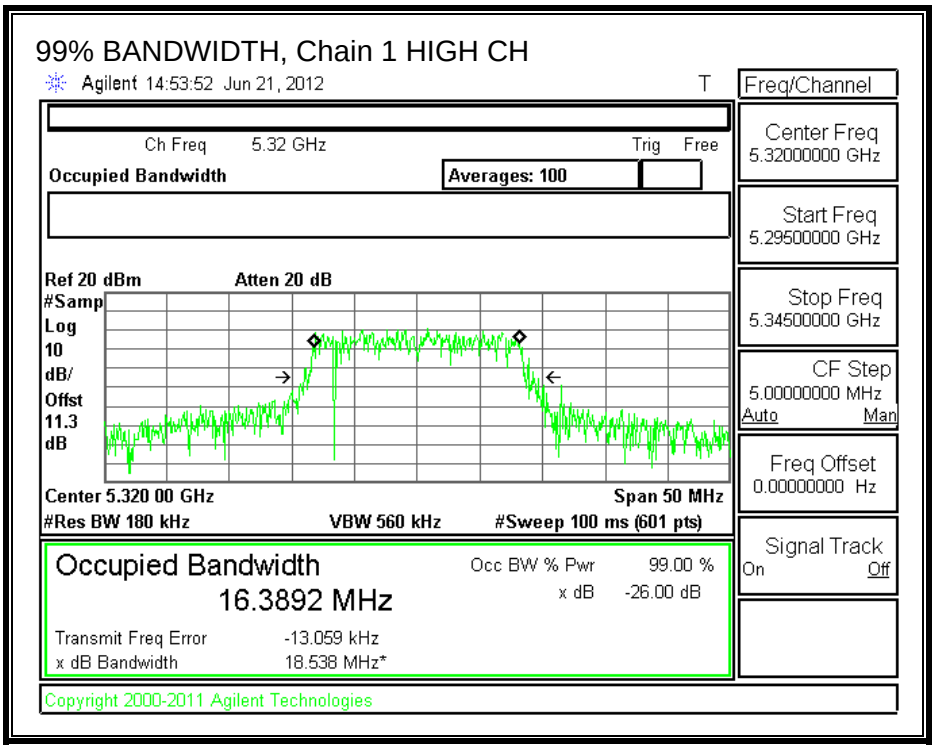




99% BANDWIDTH, Chain 1







9.2.3. 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 11.3 dB (including 10 dB pad and 1.3 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)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5260	14.20	13.30	16.78
Mid	5300	13.30	13.90	16.62
High	5320	14.00	14.40	17.21

9.2.4. 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

The TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Correlated Chains Directional Gain (dBi)
6.00	3.01	9.01

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	20.95	24.21	9.01	20.99	7.99
Mid	5300	24	20.55	24.13	9.01	20.99	7.99
High	5320	24	20.40	24.10	9.01	20.99	7.99

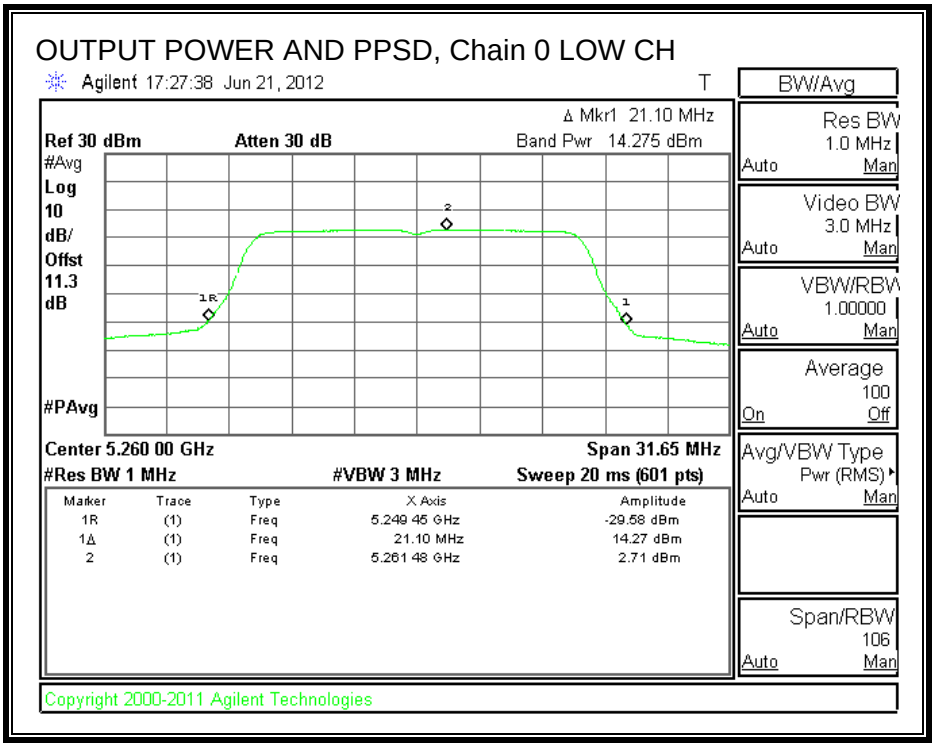
Output Power Results

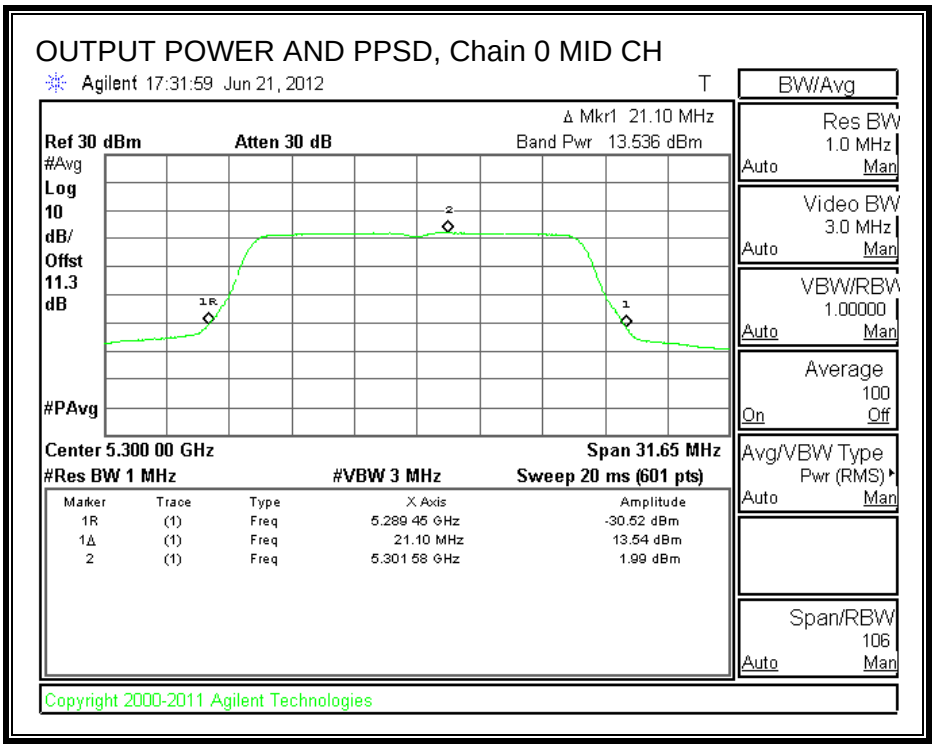
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.275	13.581	16.952	20.99	-4.038
Mid	5300	13.536	14.197	16.889	20.99	-4.101
High	5320	14.237	14.539	17.401	20.99	-3.589

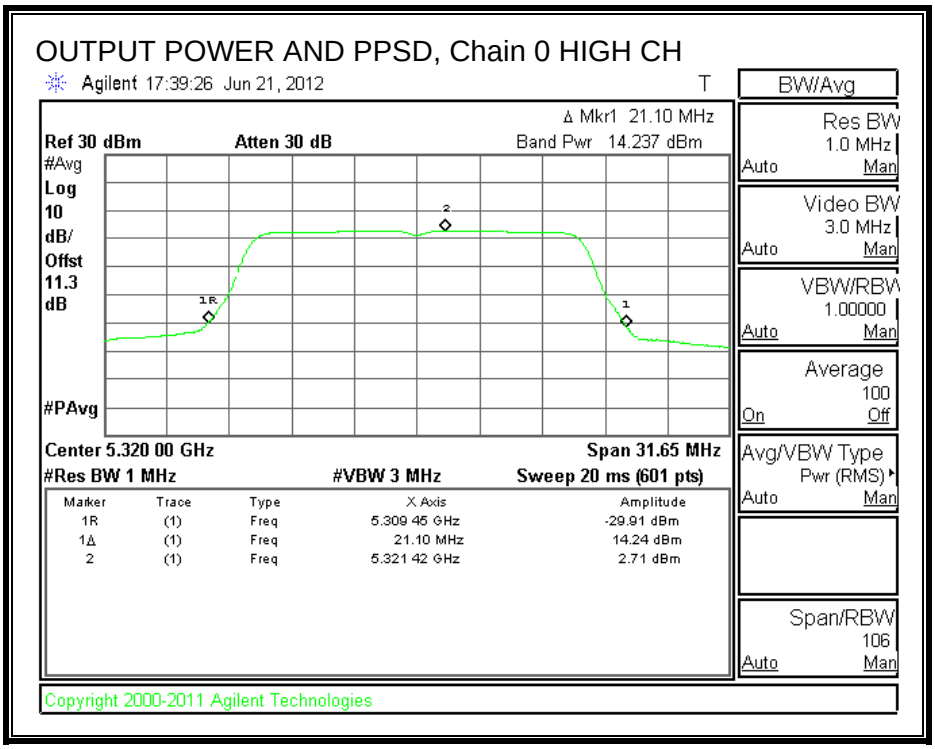
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	2.71	2.03	5.39	7.99	-2.60
Mid	5300	1.99	2.64	5.34	7.99	-2.65
High	5320	2.71	2.99	5.86	7.99	-2.13

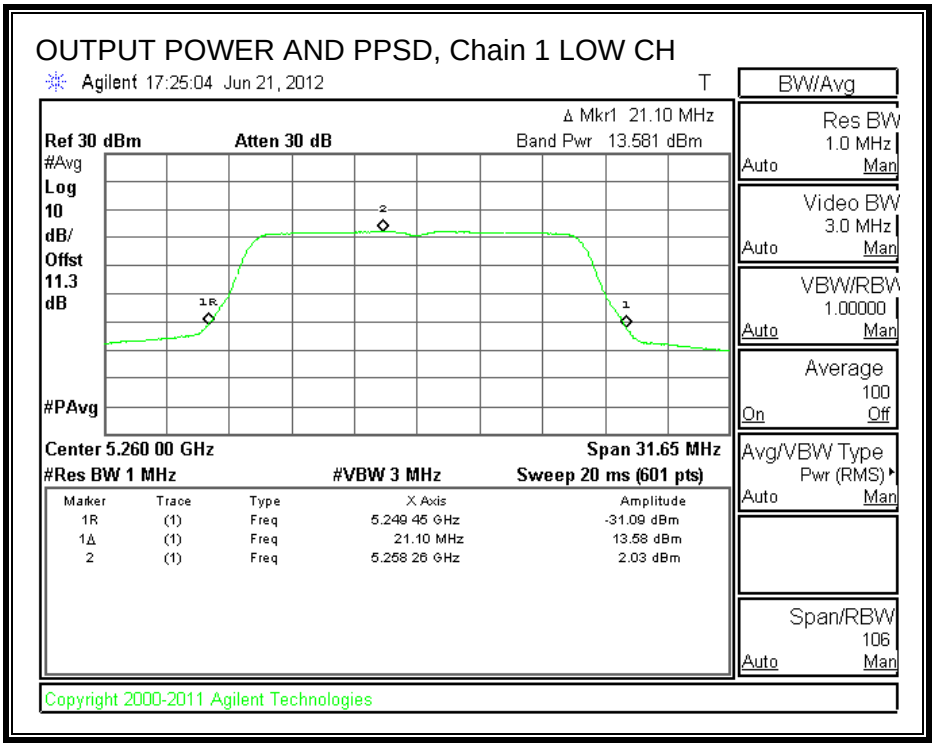
OUTPUT POWER AND PPSD, Chain 0

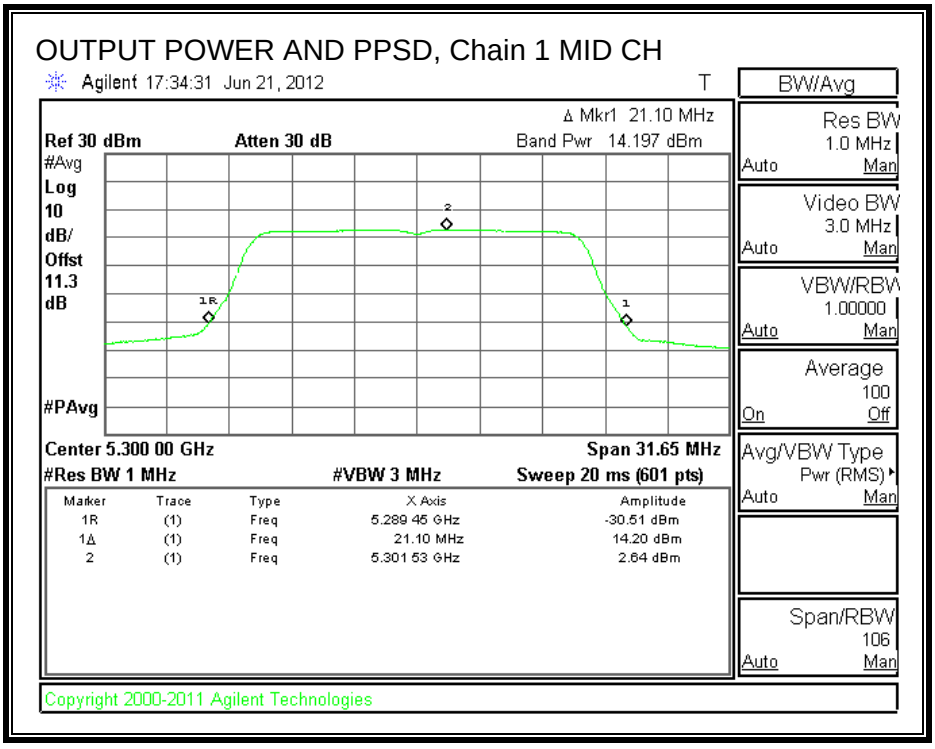


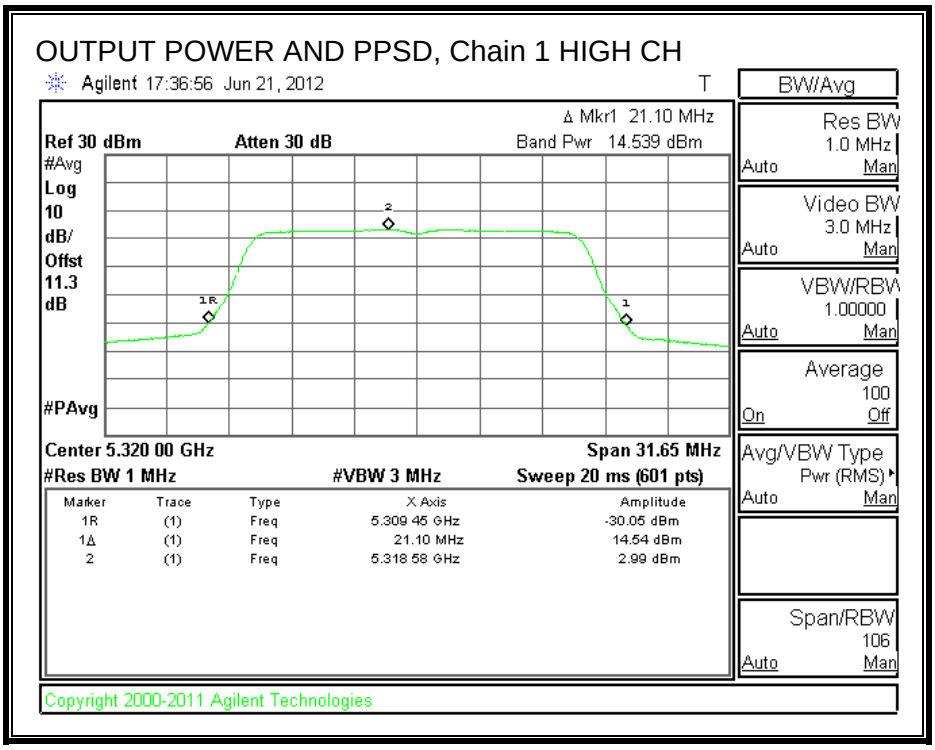




OUTPUT POWER AND PPSD, Chain 1







9.2.5. 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

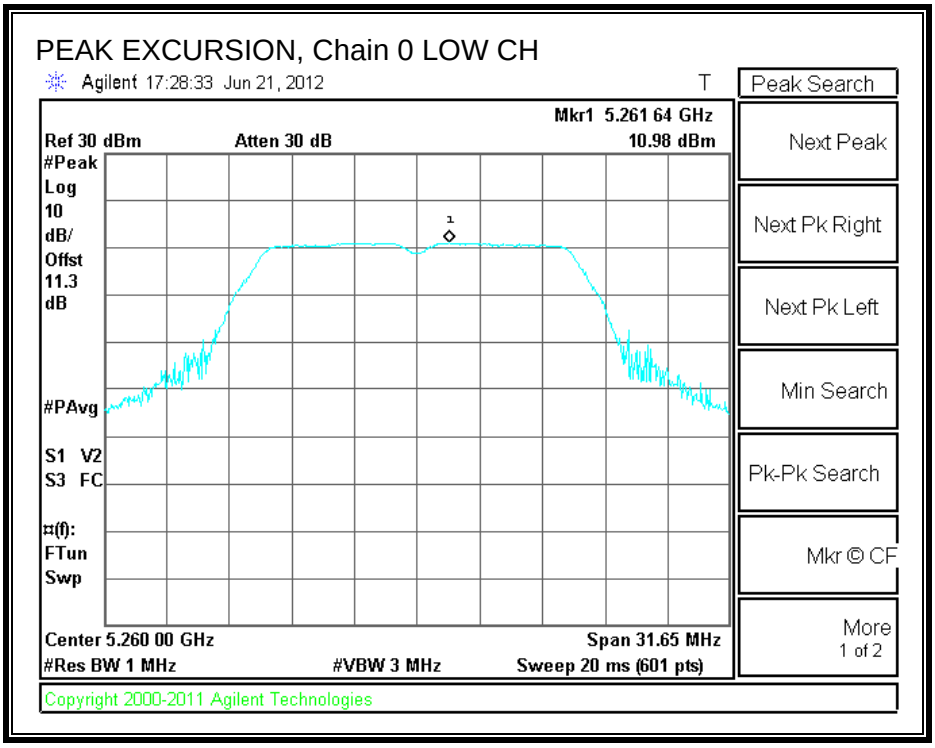
Chain 0

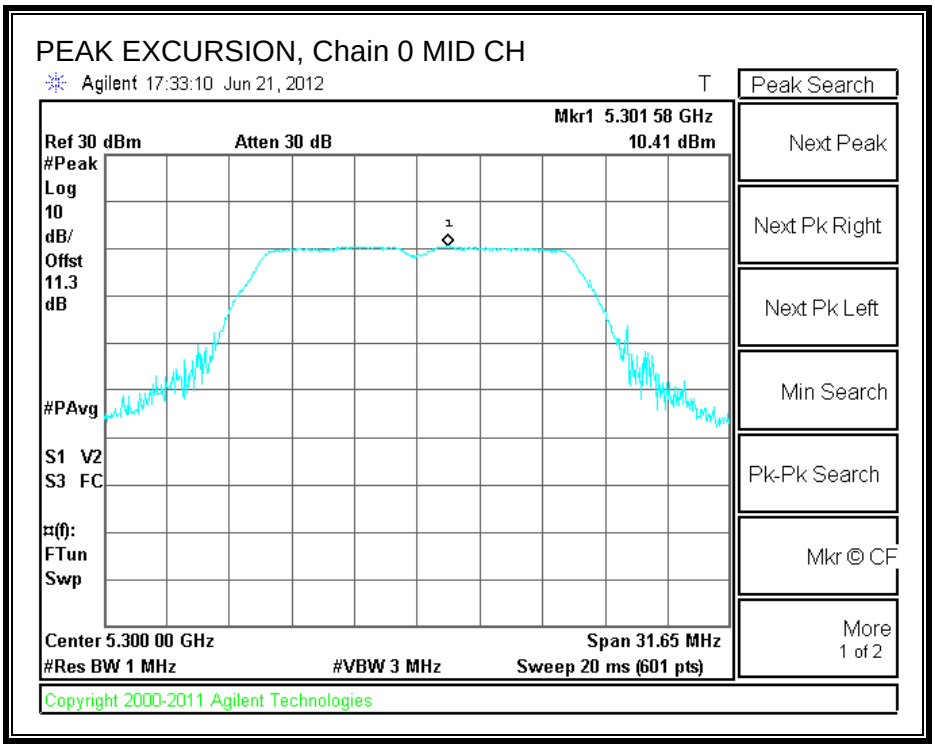
Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	10.98	2.71	0.04	8.23	13	-4.77
Mid	5300	10.41	1.99	0.04	8.38	13	-4.62
High	5320	10.92	2.71	0.04	8.17	13	-4.83

Chain 1

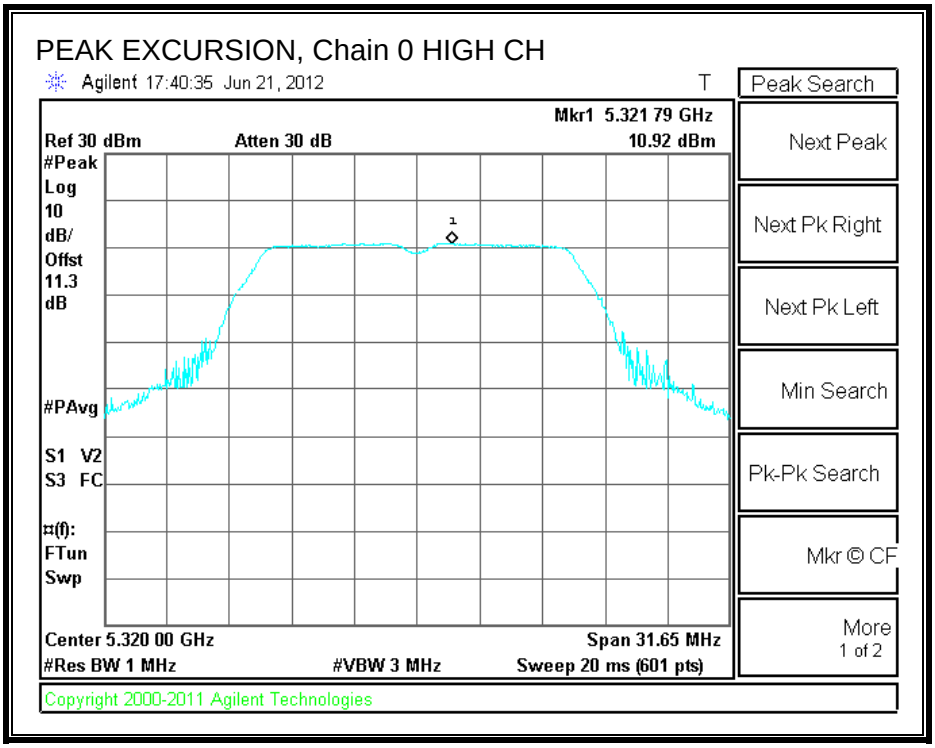
Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	10.40	2.03	0.04	8.33	13	-4.67
Mid	5300	11.05	2.64	0.04	8.37	13	-4.63
High	5320	11.44	2.99	0.04	8.41	13	-4.59

PEAK EXCURSION, Chain 0

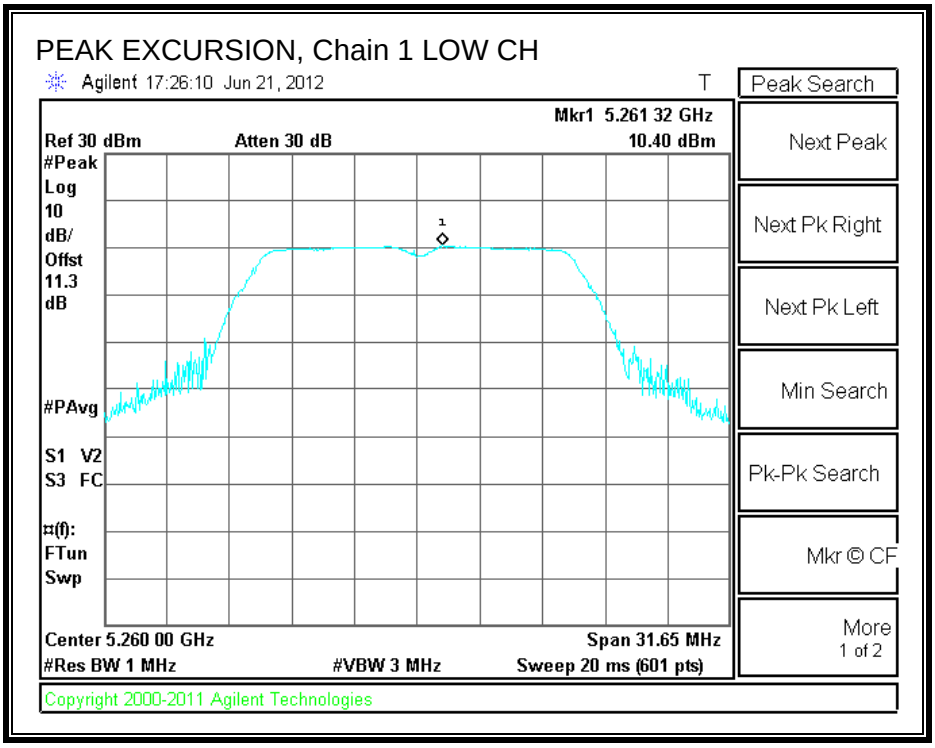


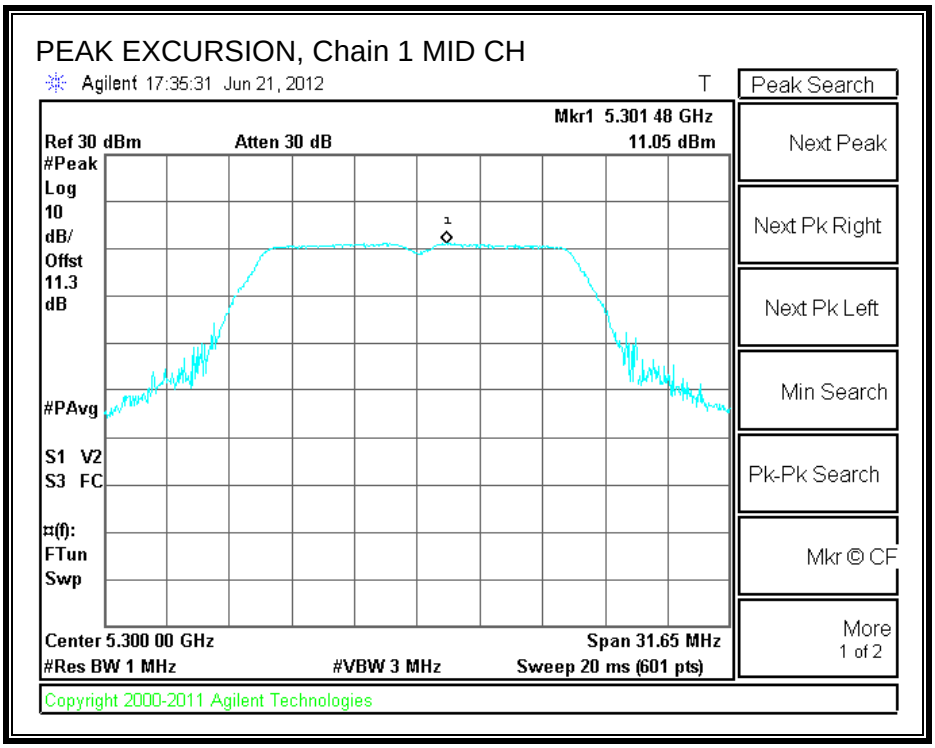


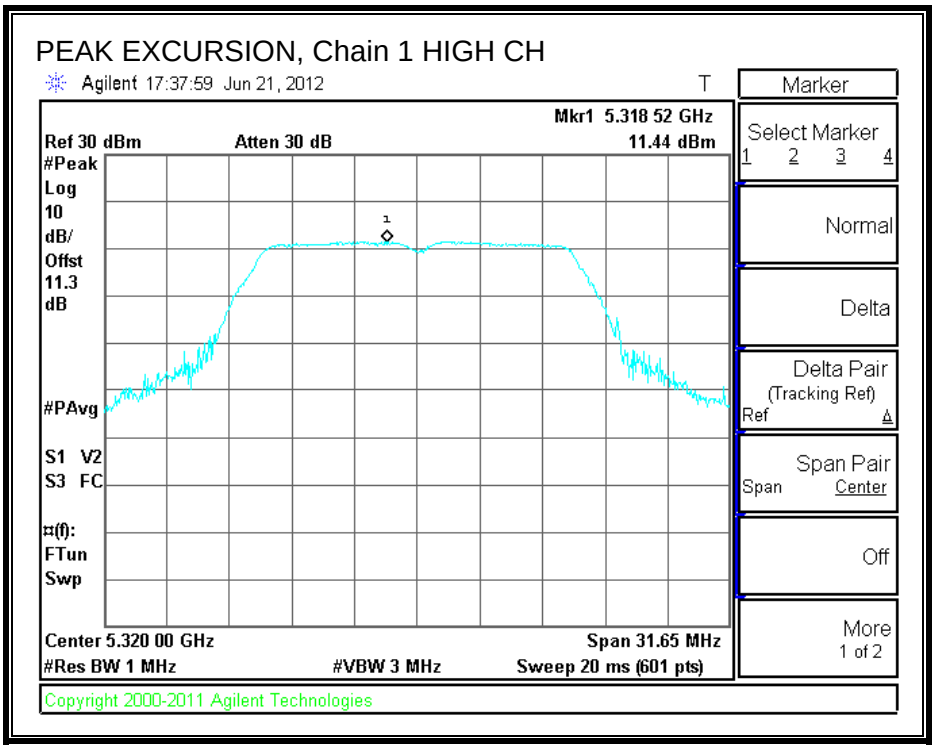
PEAK EXCURSION, Chain 0 HIGH CH



PEAK EXCURSION, Chain 1







9.3. 802.11n HT20 MODE IN THE 5.3 GHz BAND

9.3.1. 26 dB BANDWIDTH

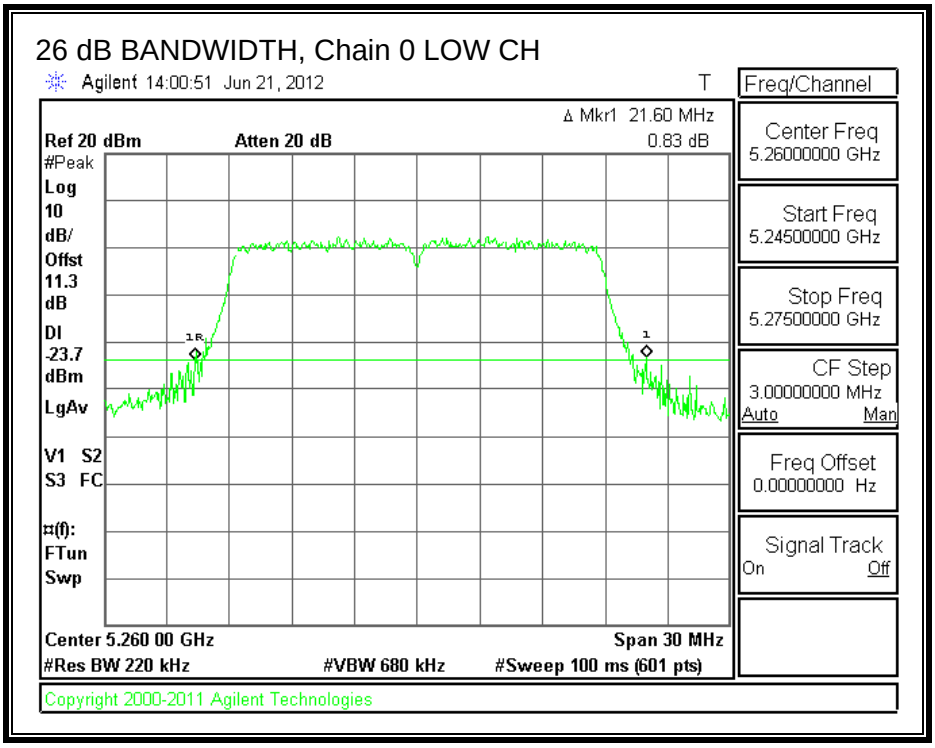
LIMITS

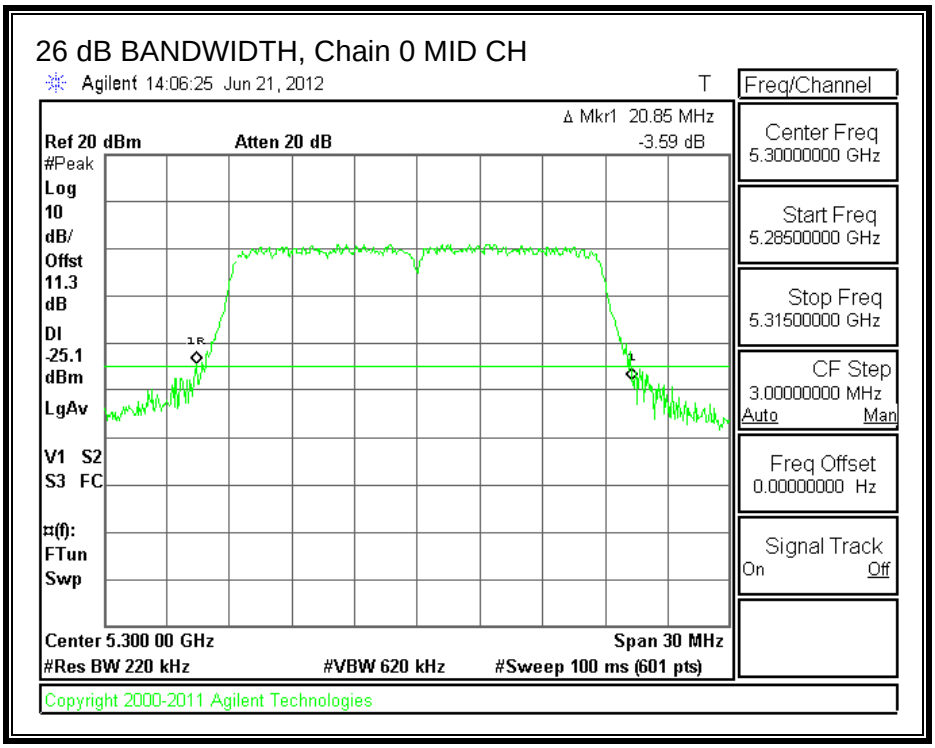
None; for reporting purposes only.

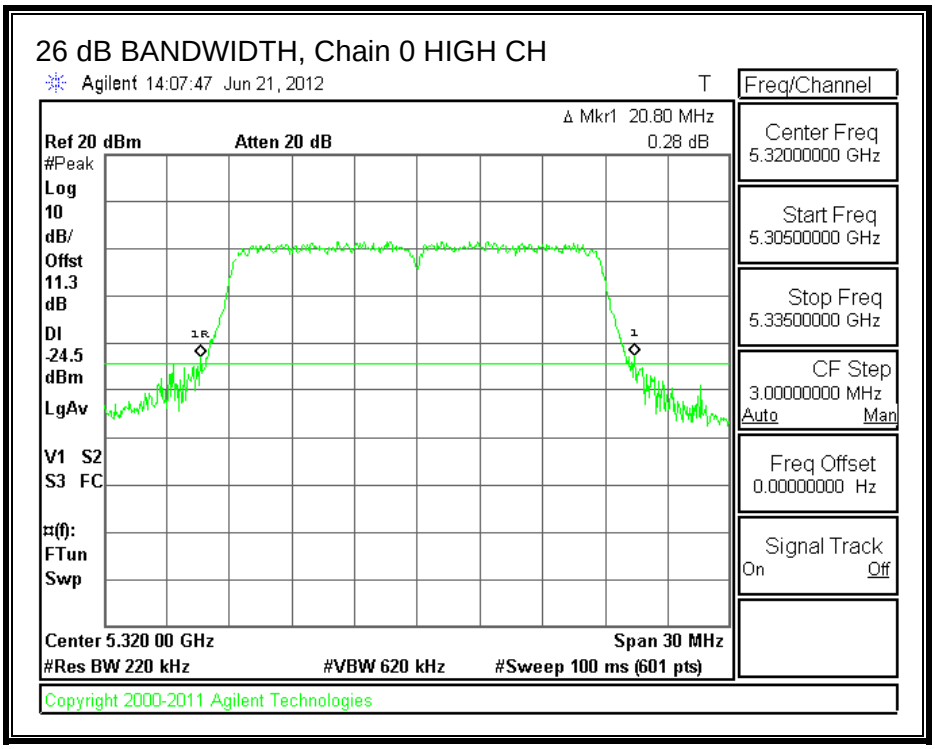
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5260	21.60	20.50
Mid	5300	20.85	20.70
High	5320	20.80	20.60

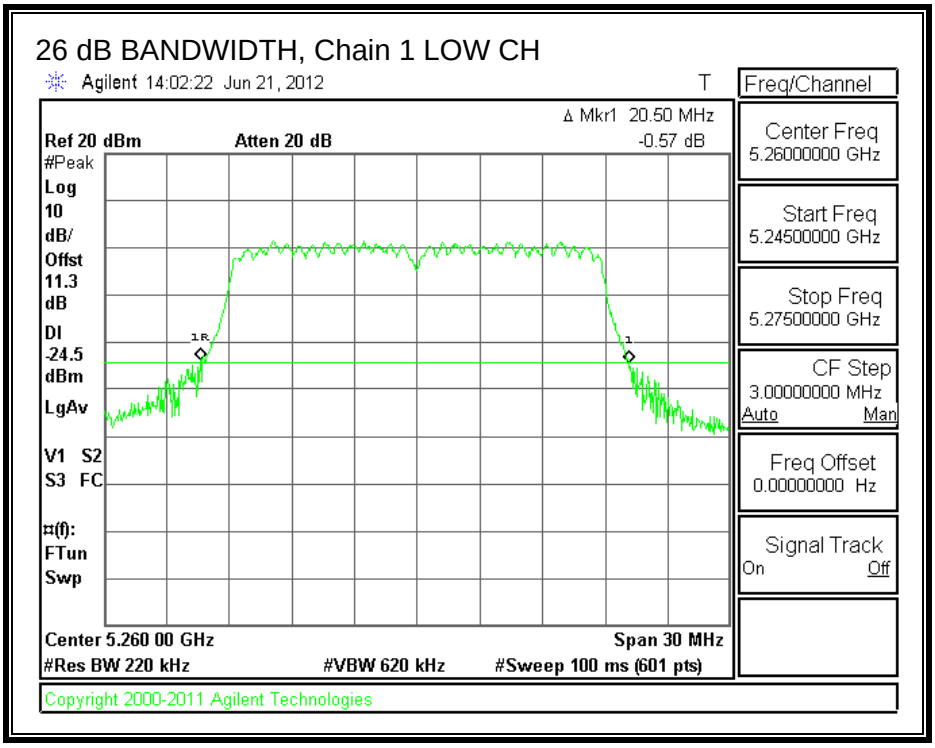
26 dB BANDWIDTH, Chain 0

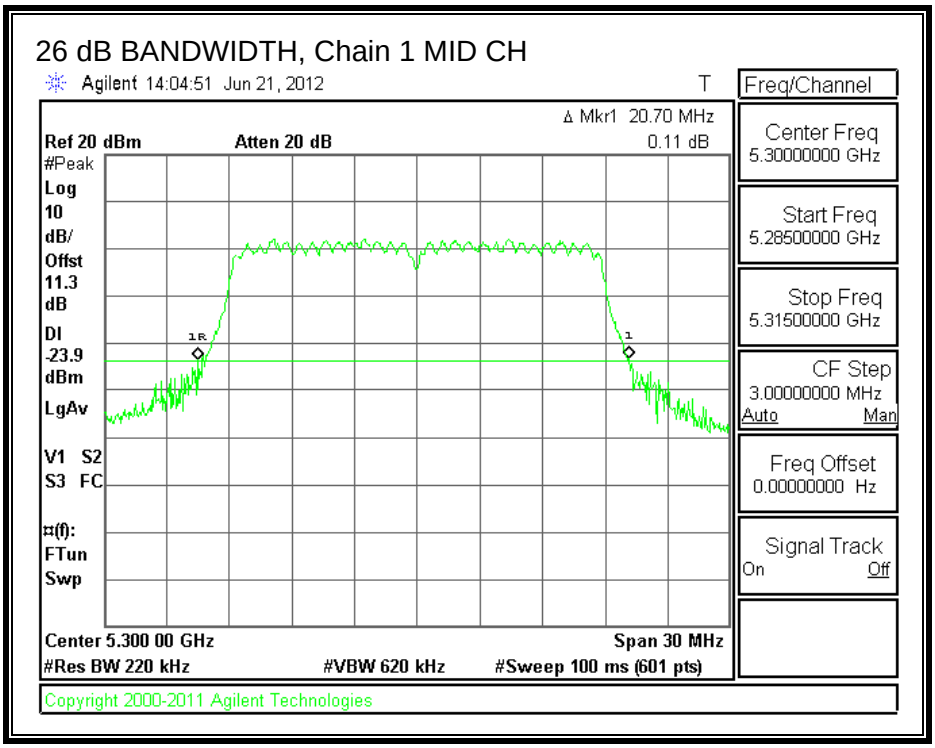


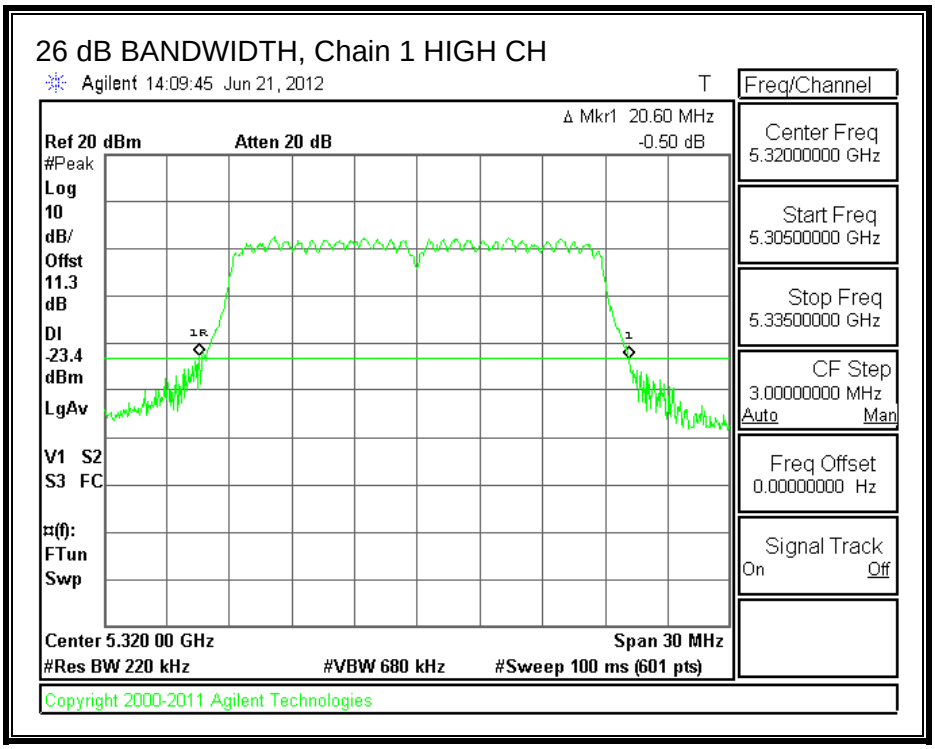




26 dB BANDWIDTH, Chain 1







9.3.2. 99% BANDWIDTH

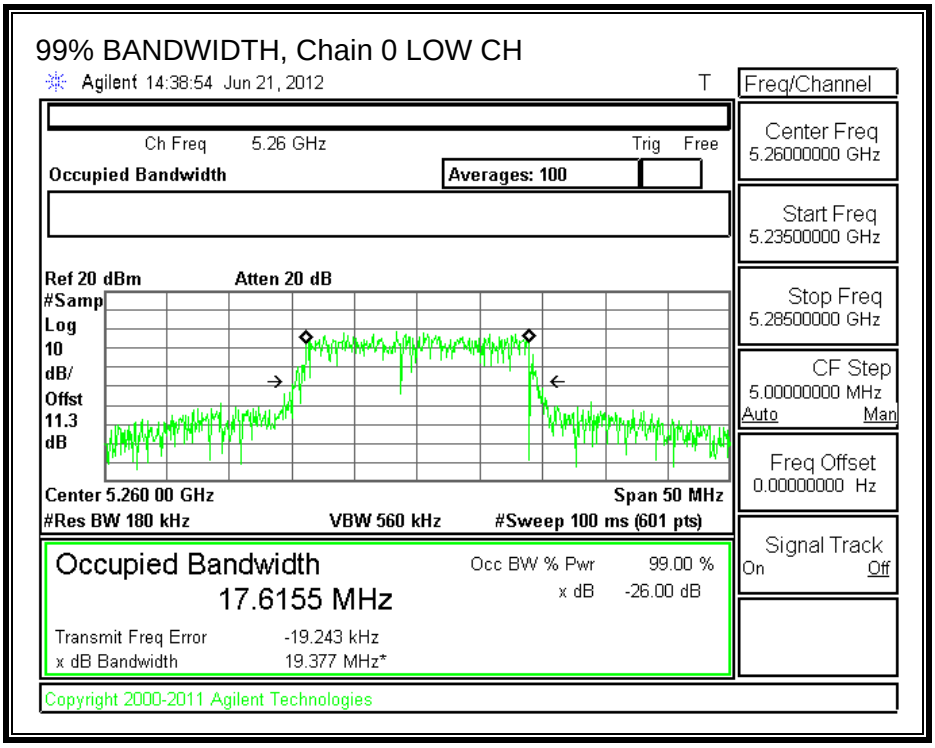
LIMITS

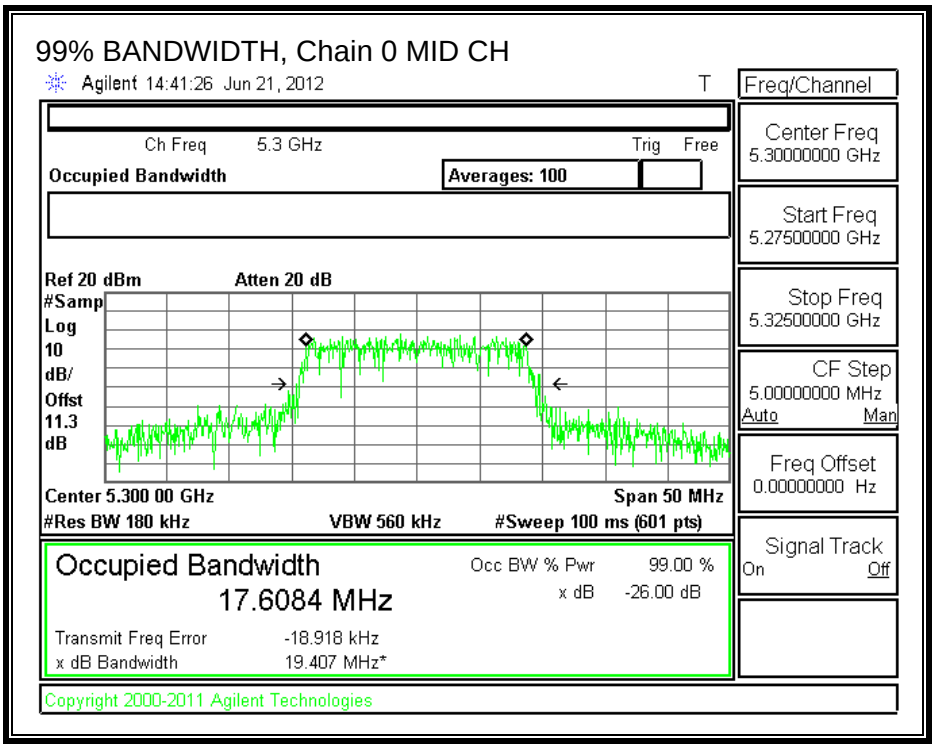
None; for reporting purposes only.

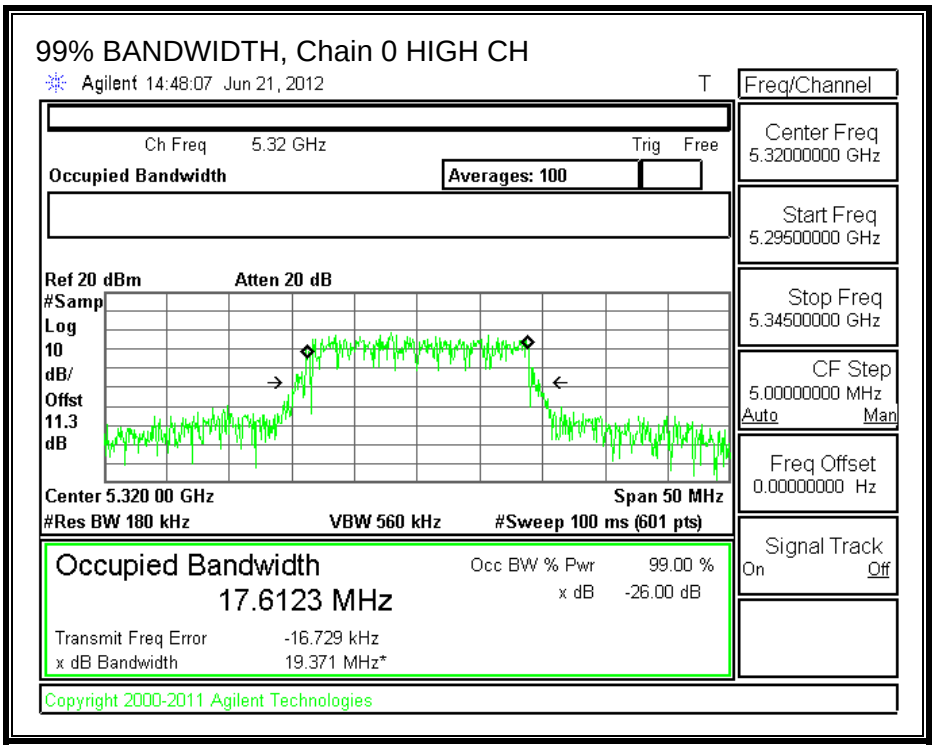
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5260	17.6155	17.6041
Mid	5300	17.6084	17.5954
High	5320	17.6123	17.5863

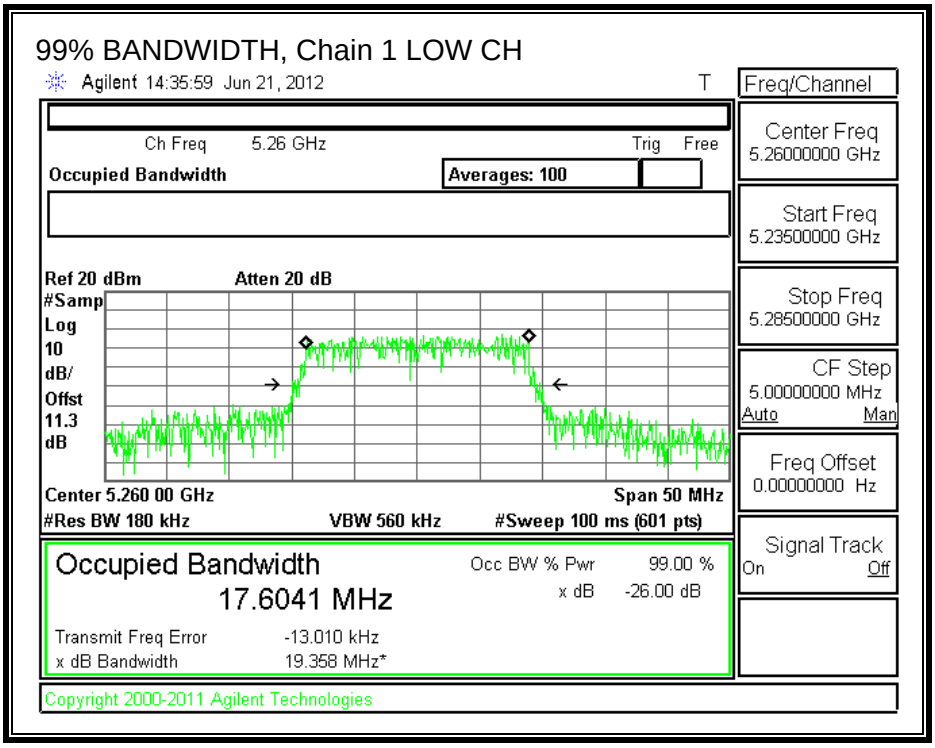
99% BANDWIDTH, Chain 0

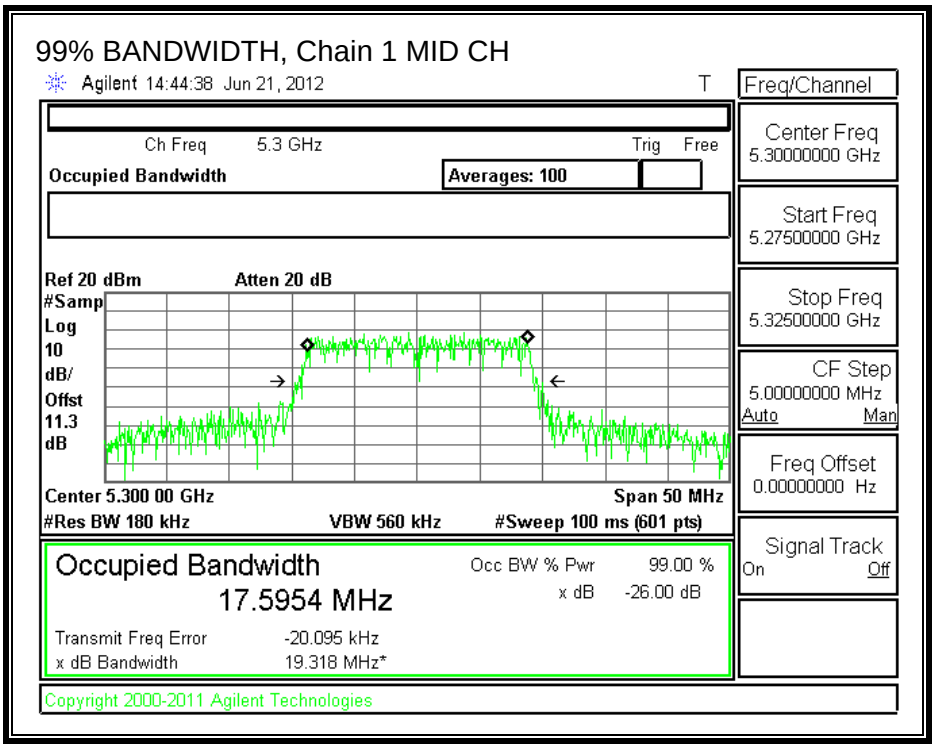


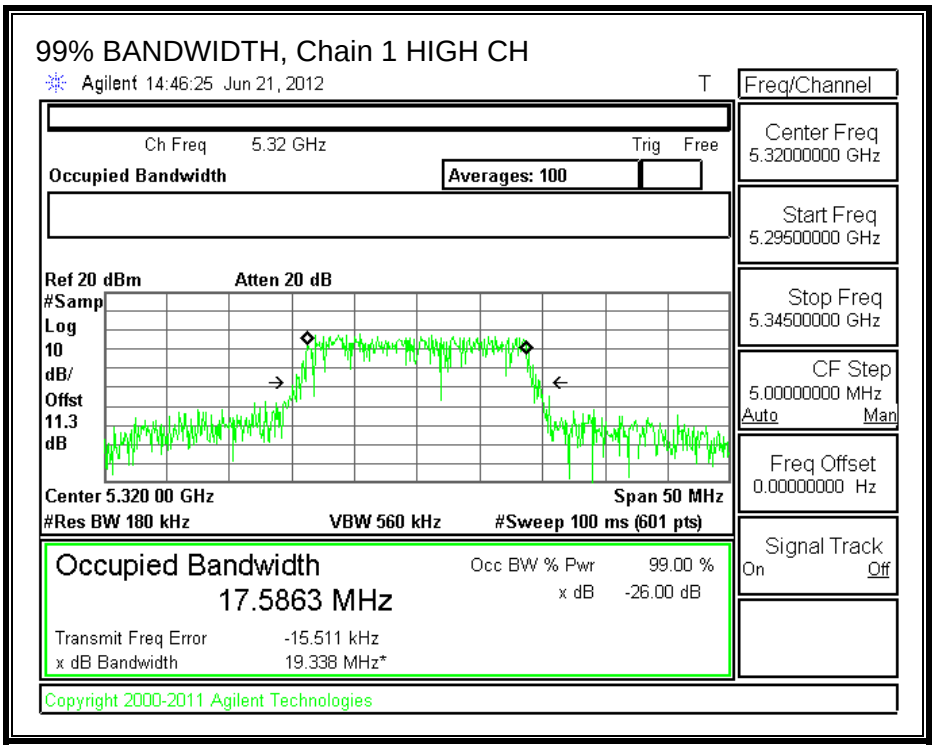




99% BANDWIDTH, Chain 1







9.3.3. 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 11.3 dB (including 10 dB pad and 1.3 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)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5260	12.40	11.30	14.90
Mid	5300	11.50	12.00	14.77
High	5320	11.90	12.40	15.17

9.3.4. 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

The TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Correlated Chains Directional Gain (dBi)
6.00	3.01	9.01

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	20.5	24.12	9.01	20.99	7.99
Mid	5300	24	20.7	24.16	9.01	20.99	7.99
High	5320	24	20.6	24.14	9.01	20.99	7.99

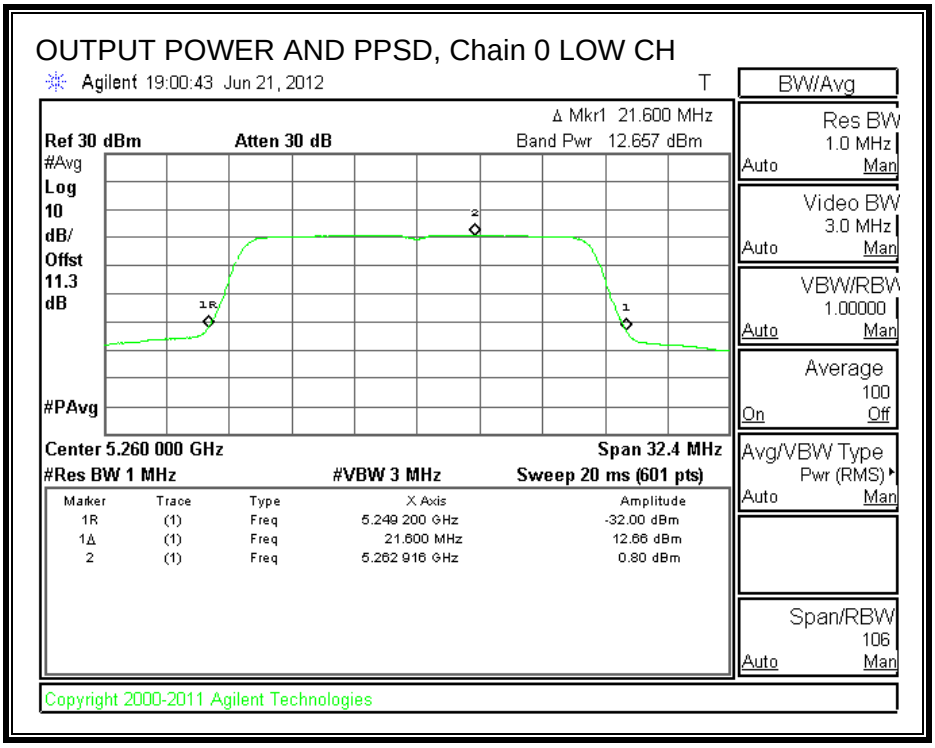
Output Power Results

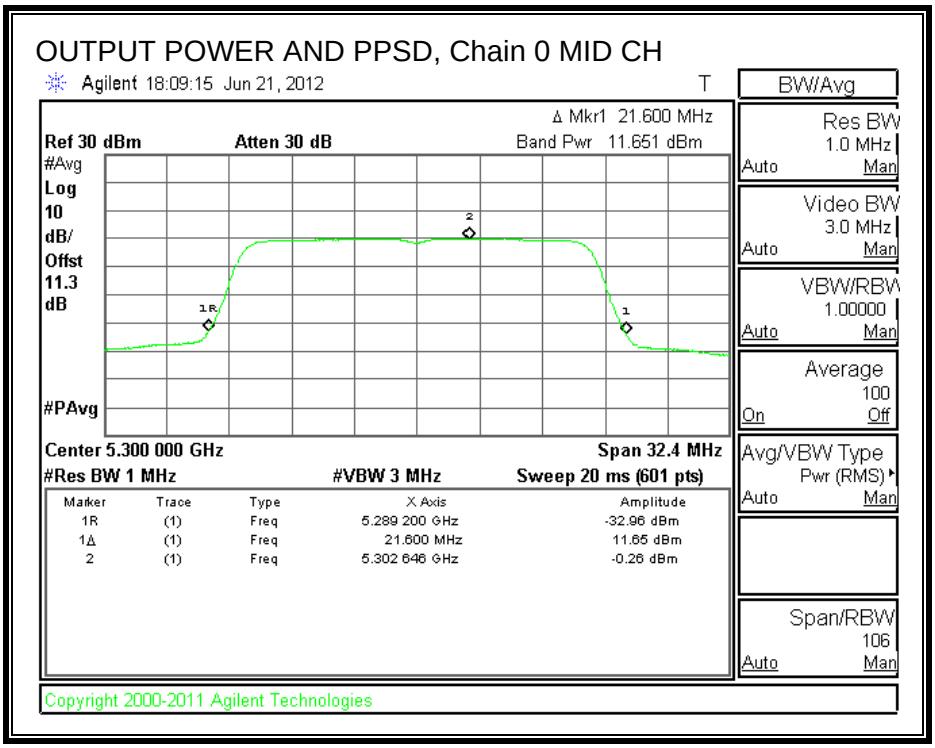
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	12.657	11.733	15.230	20.99	-5.760
Mid	5300	11.651	12.215	14.952	20.99	-6.038
High	5320	12.212	12.731	15.490	20.99	-5.500

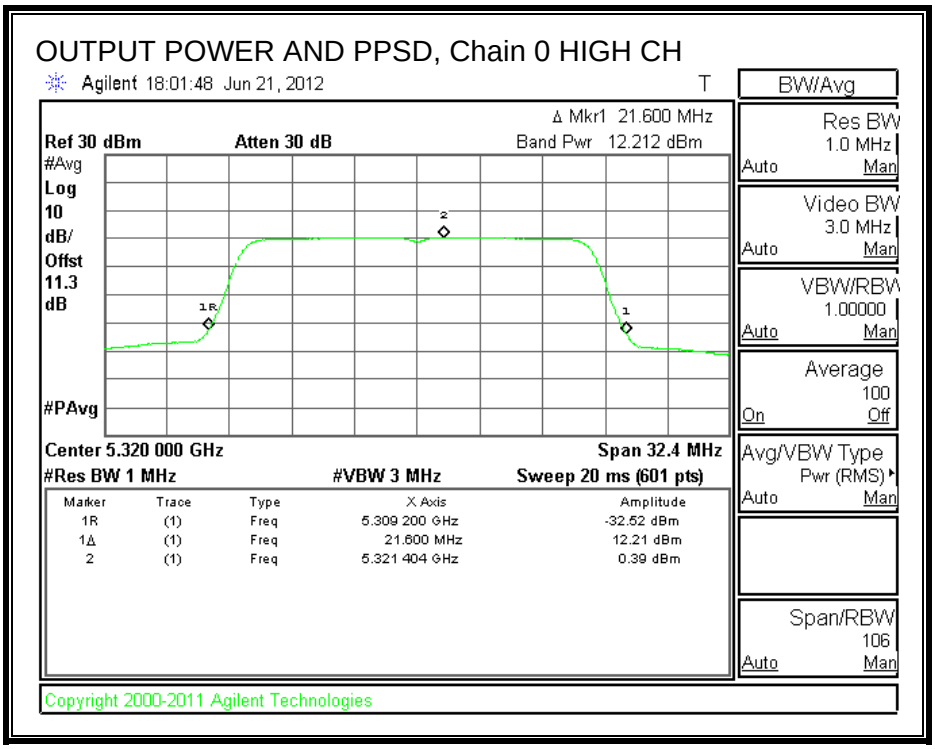
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	0.80	0.00	3.43	7.99	-4.56
Mid	5300	-0.26	0.41	3.10	7.99	-4.89
High	5320	0.39	0.93	3.68	7.99	-4.31

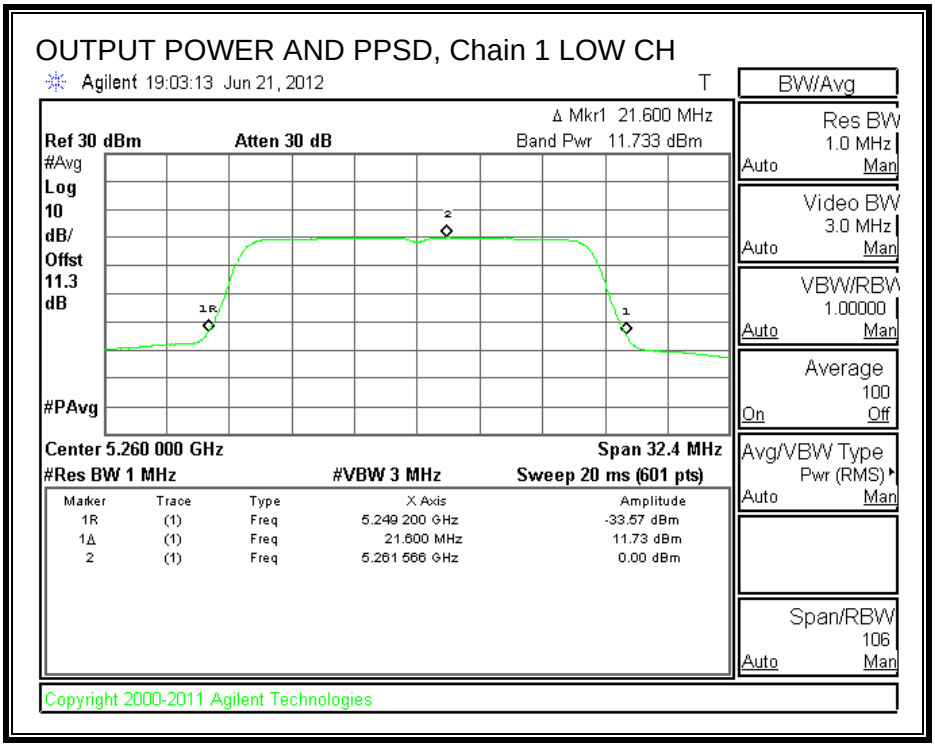
OUTPUT POWER AND PPSD, Chain 0

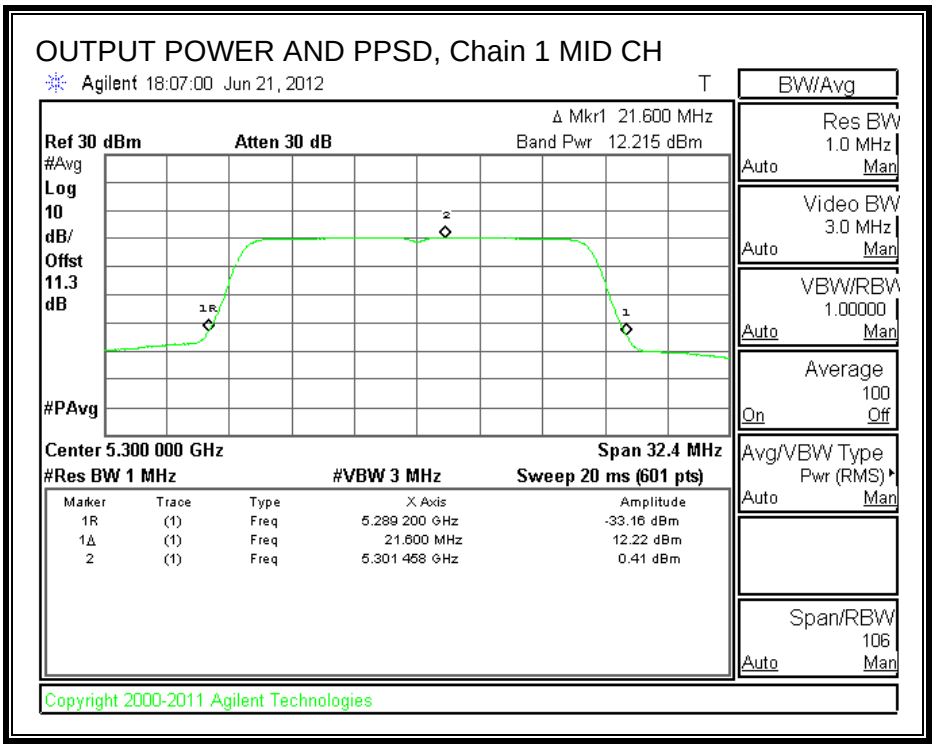


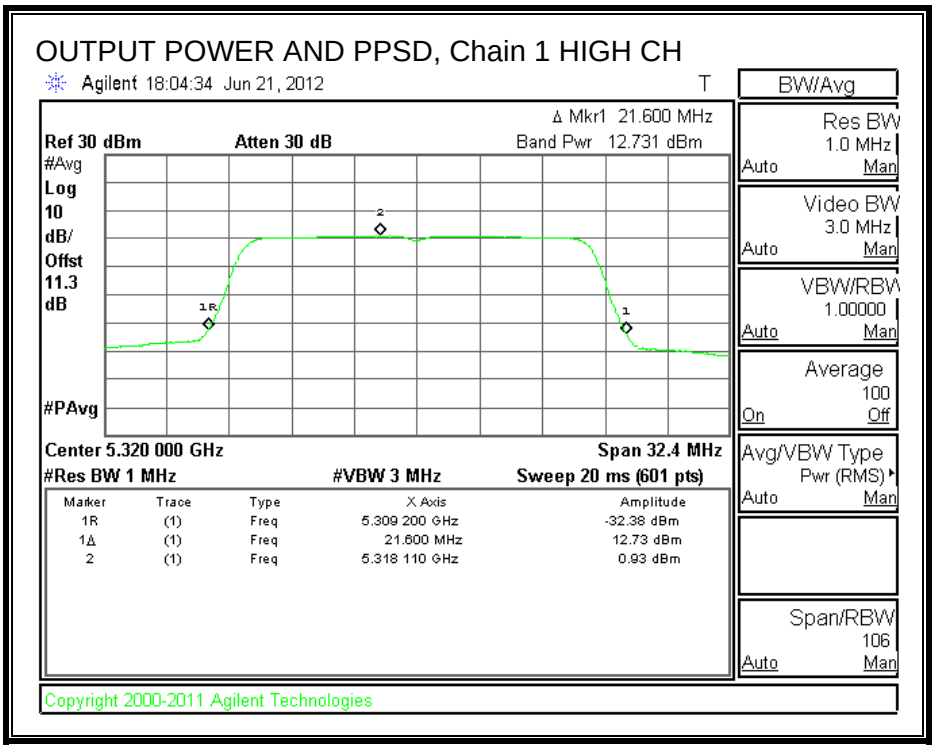




OUTPUT POWER AND PPSD, Chain 1







9.3.5. 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

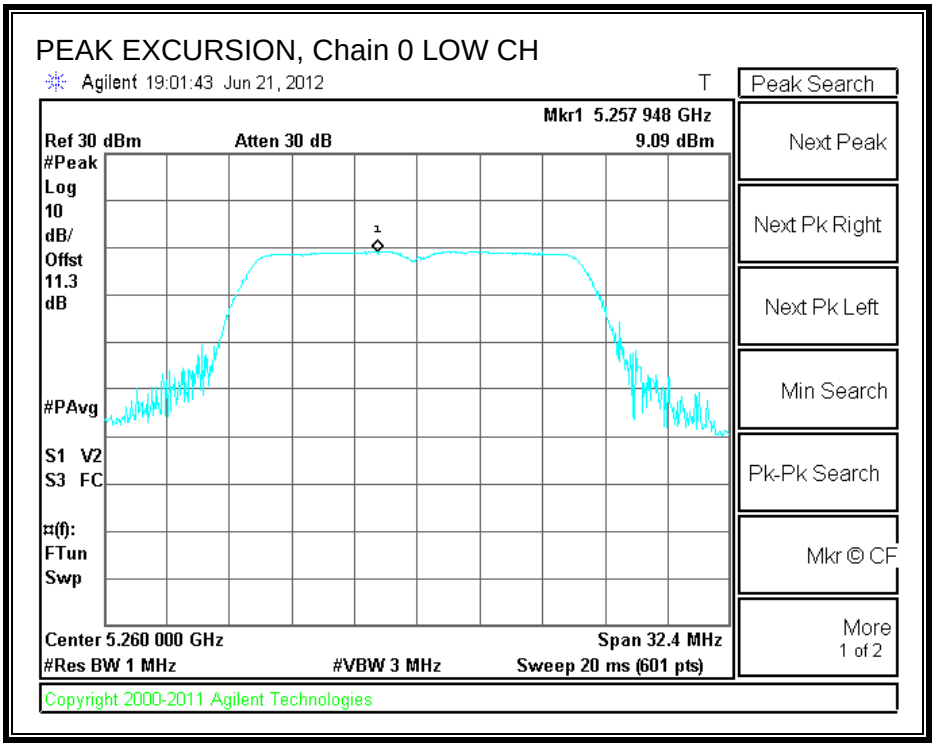
Chain 0

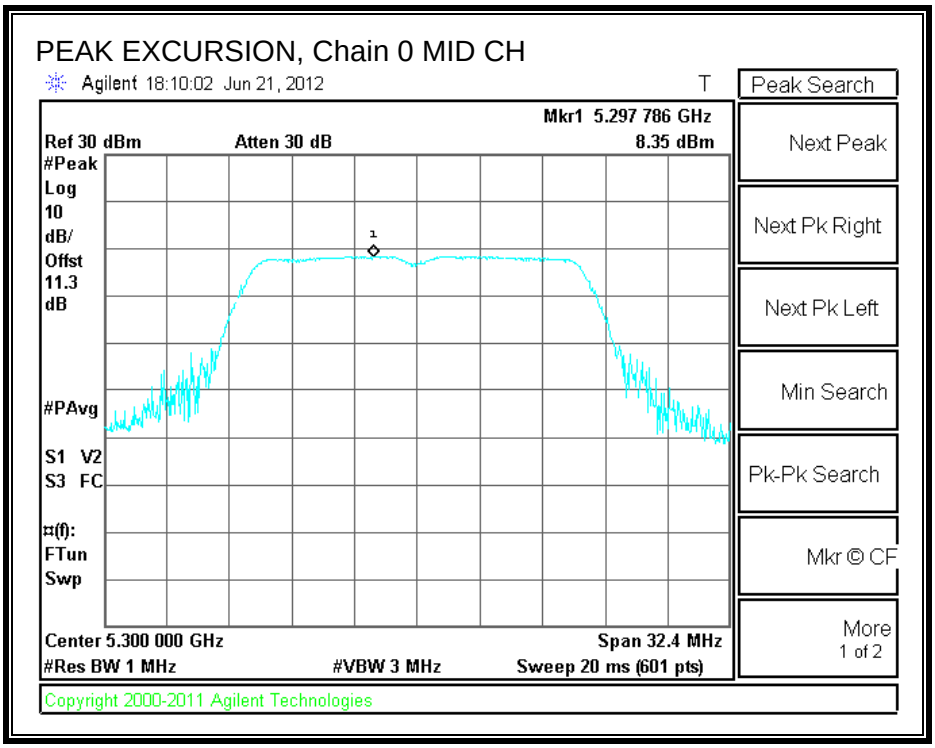
Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	9.09	0.80	0.04	8.25	13	-4.75
Mid	5300	8.35	-0.26	0.04	8.57	13	-4.43
High	5320	9.11	0.39	0.04	8.68	13	-4.32

Chain 1

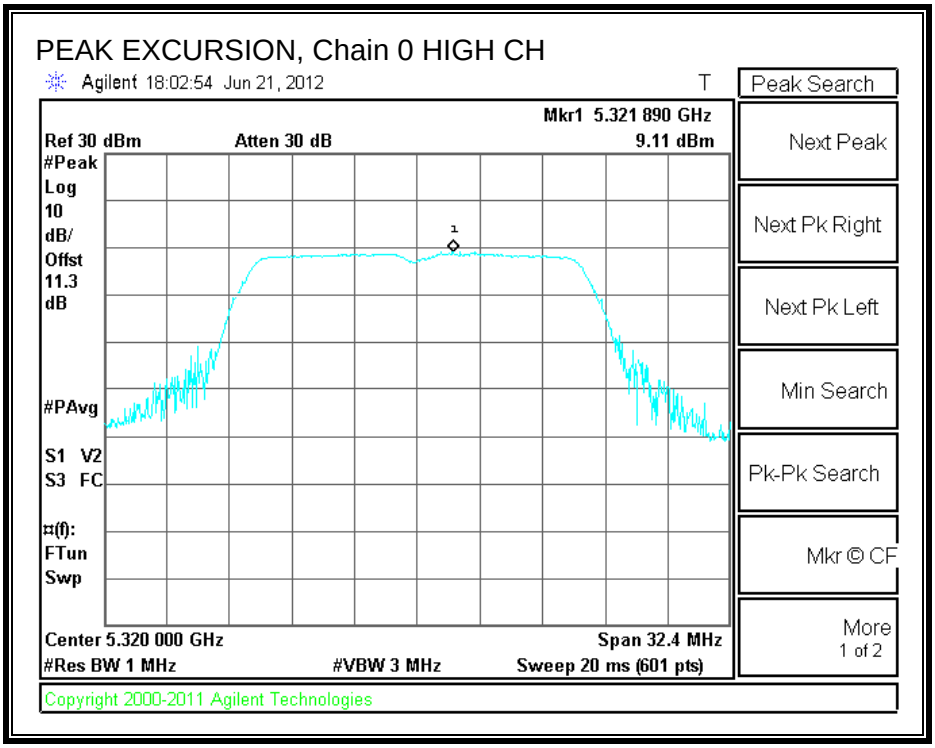
Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	9.64	0.00	0.04	9.60	13	-3.40
Mid	5300	9.82	0.41	0.04	9.37	13	-3.63
High	5320	10.57	0.93	0.04	9.60	13	-3.40

PEAK EXCURSION, Chain 0

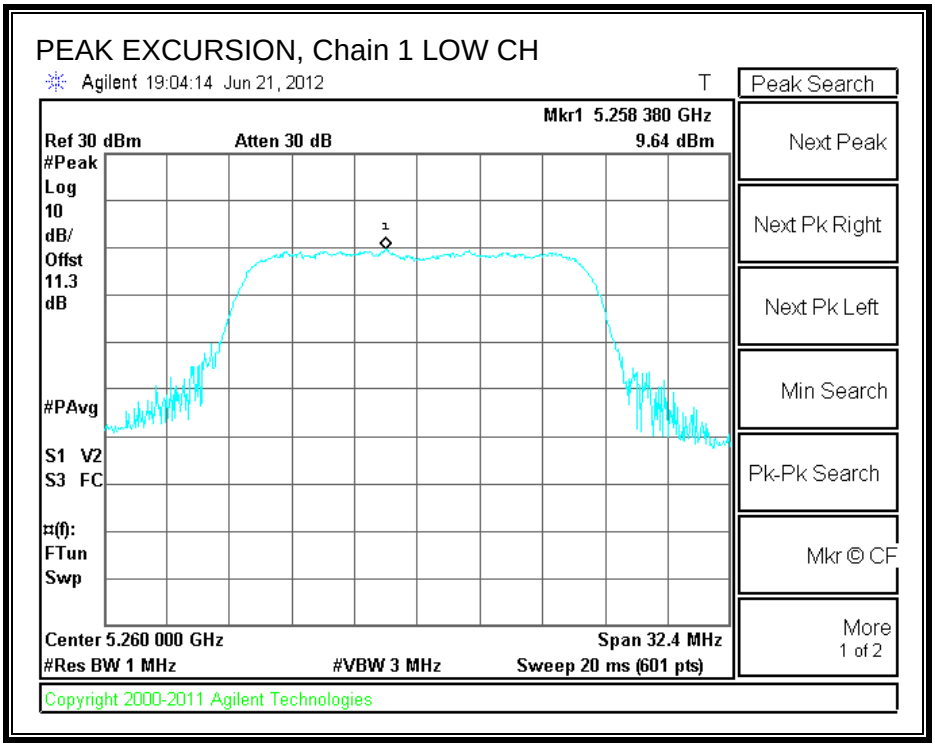


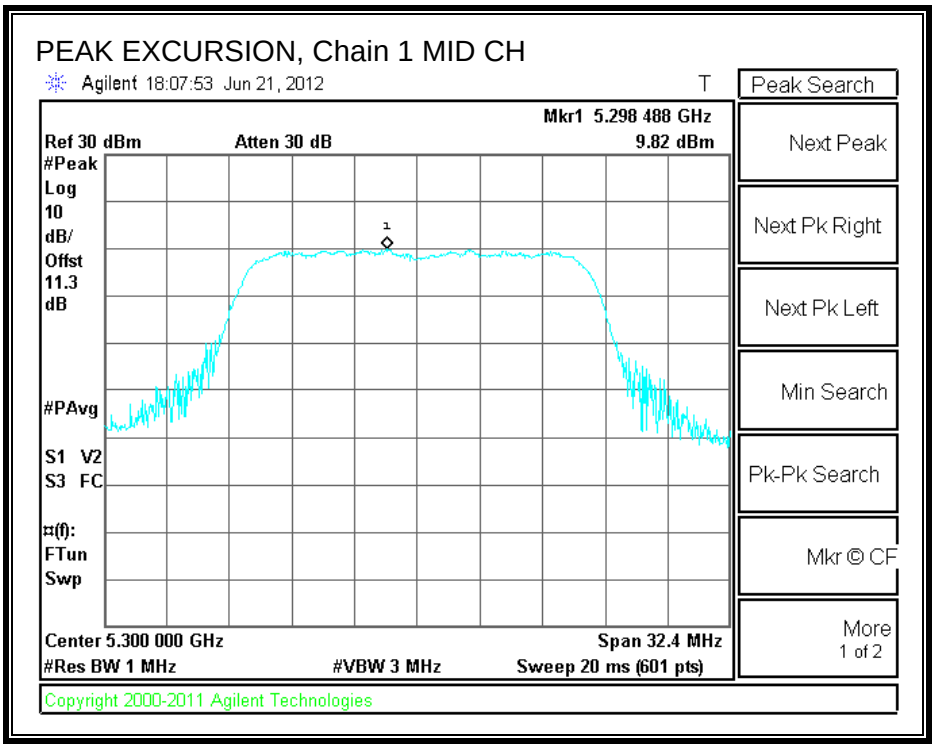


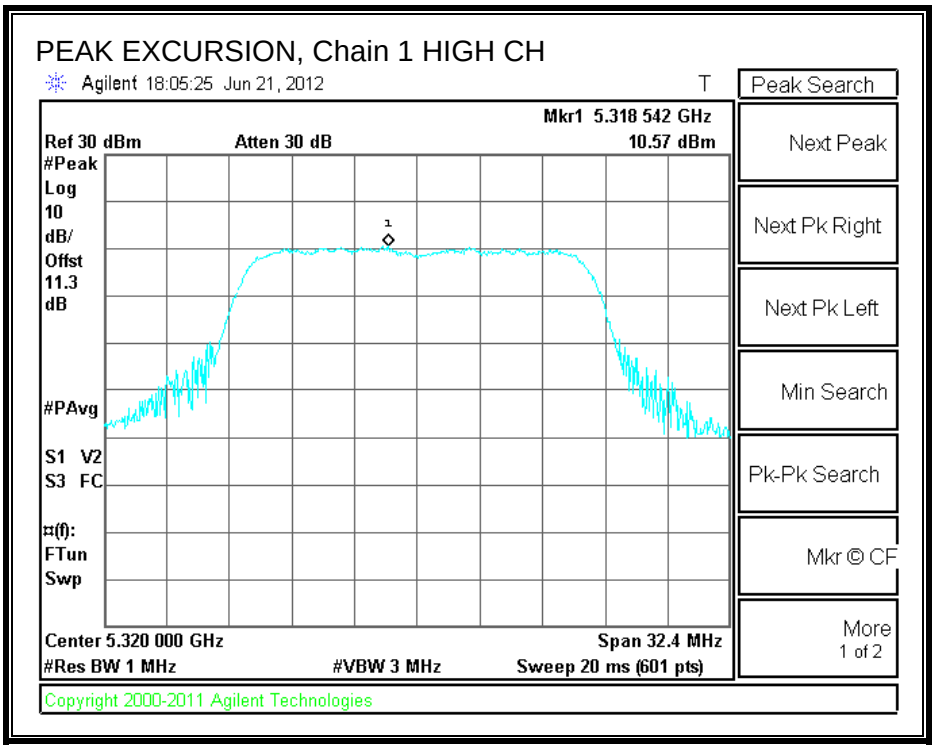
PEAK EXCURSION, Chain 0 HIGH CH



PEAK EXCURSION, Chain 1







9.4. 802.11n HT40 MODE IN THE 5.3 GHz BAND

9.4.1. 26 dB BANDWIDTH

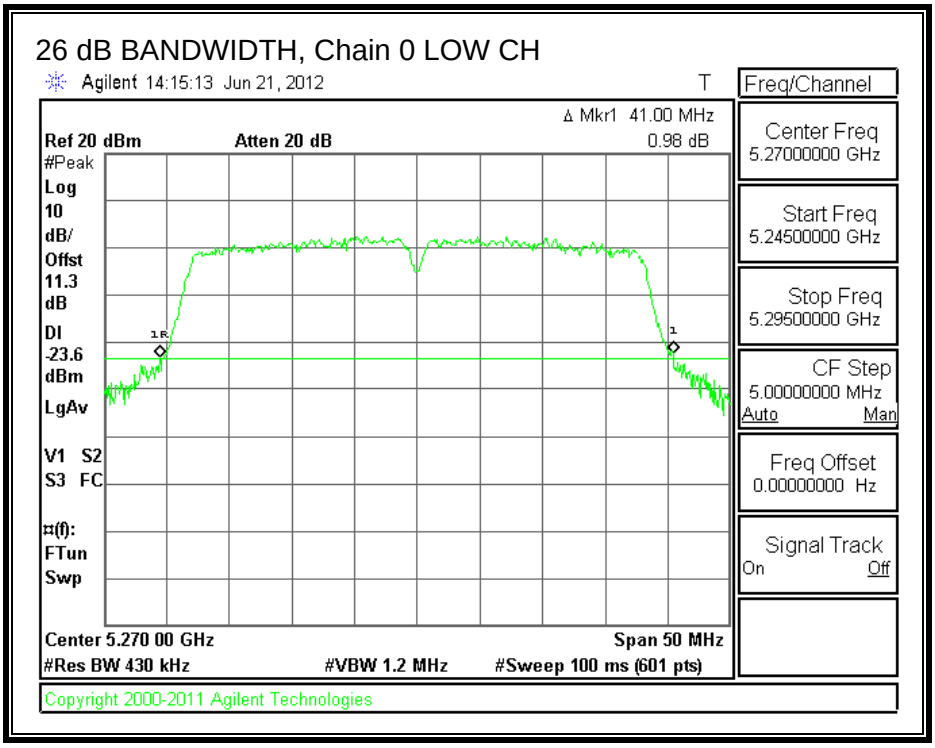
LIMITS

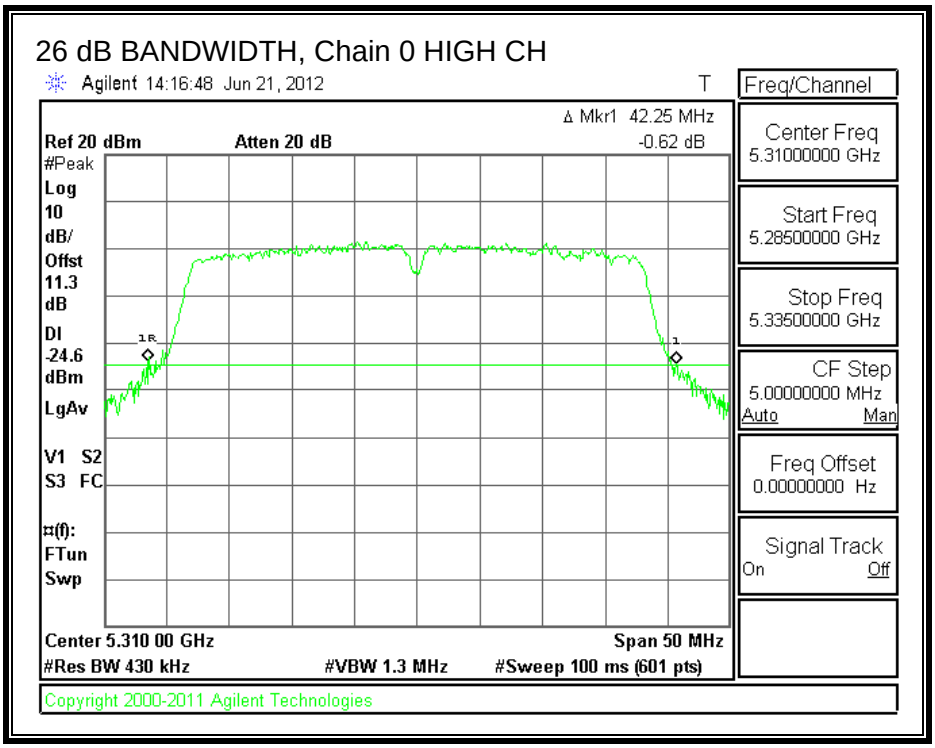
None; for reporting purposes only.

RESULTS

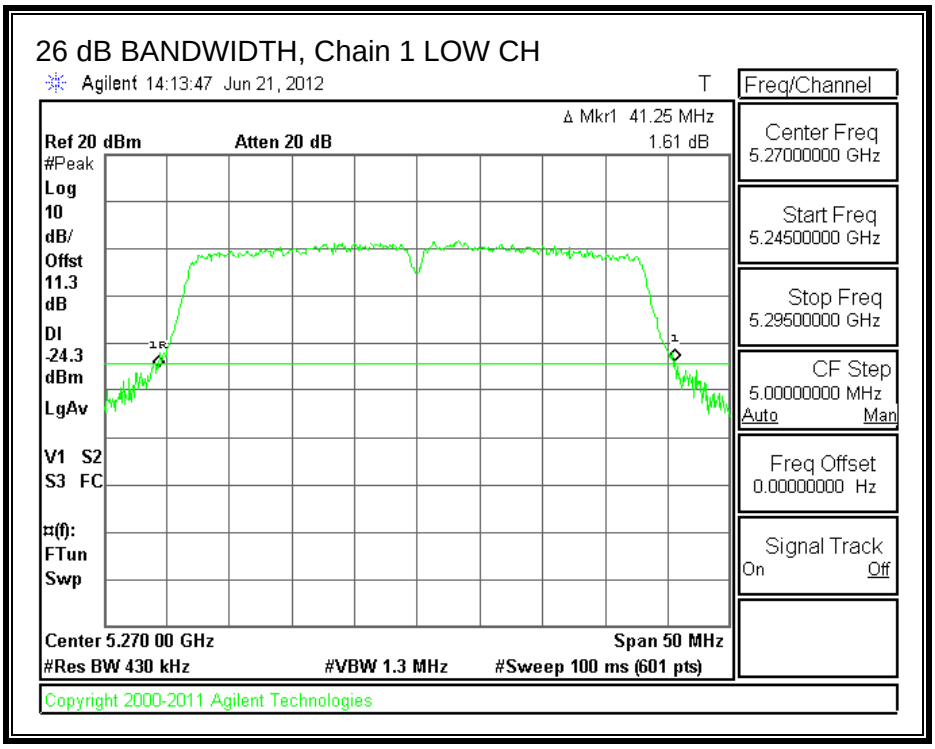
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5270	41.00	41.25
High	5310	42.25	42.67

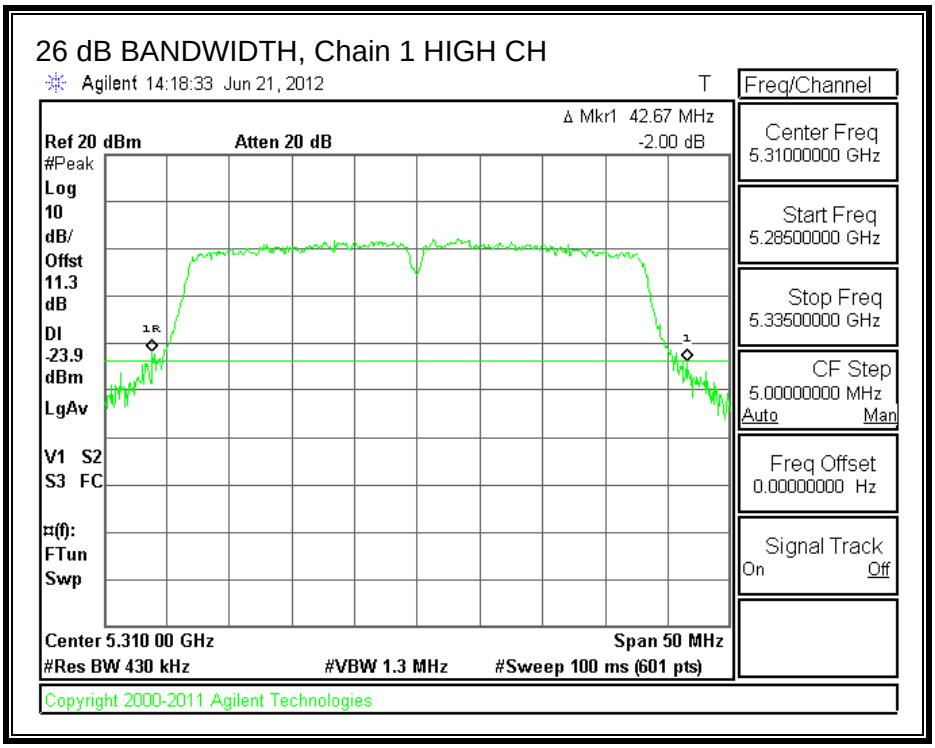
26 dB BANDWIDTH, Chain 0





26 dB BANDWIDTH, Chain 1





9.4.2. 99% BANDWIDTH

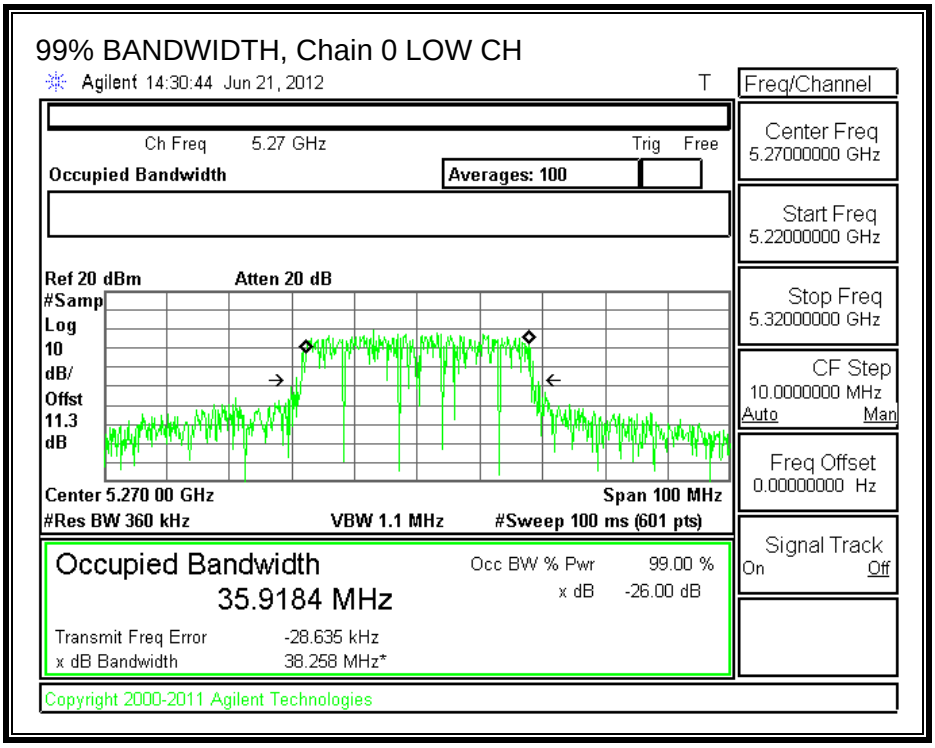
LIMITS

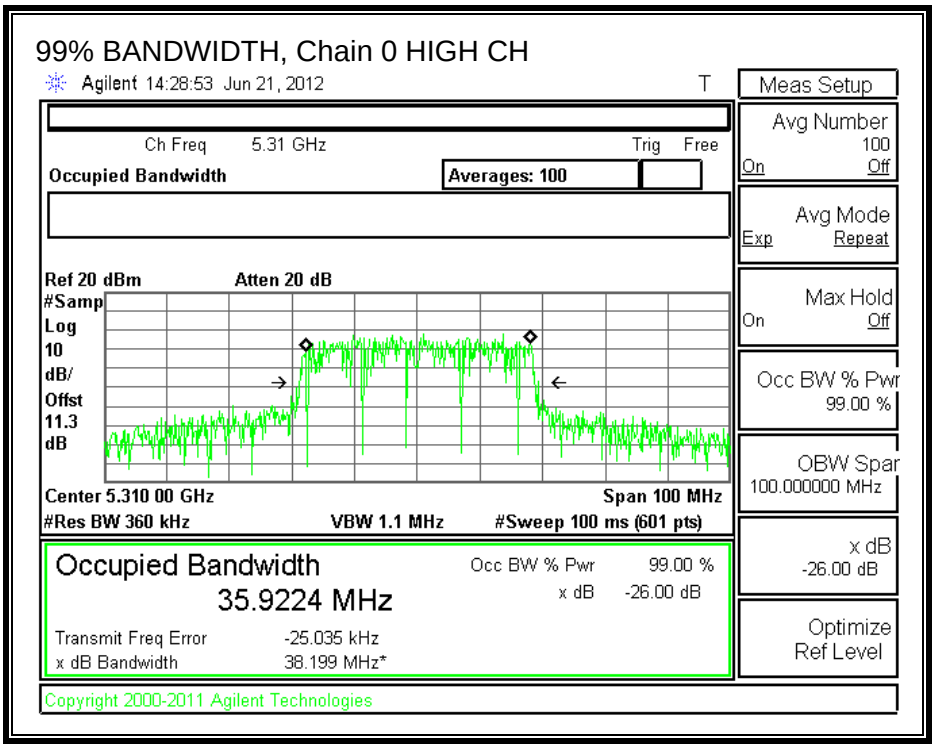
None; for reporting purposes only.

RESULTS

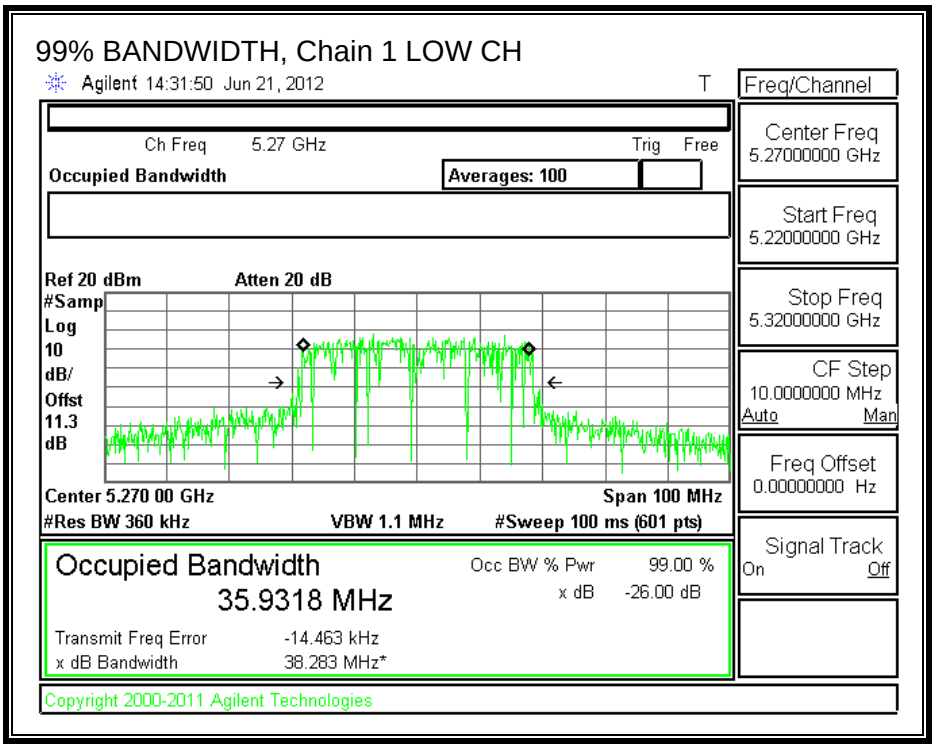
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5270	35.9184	35.9318
High	5310	35.9224	35.9385

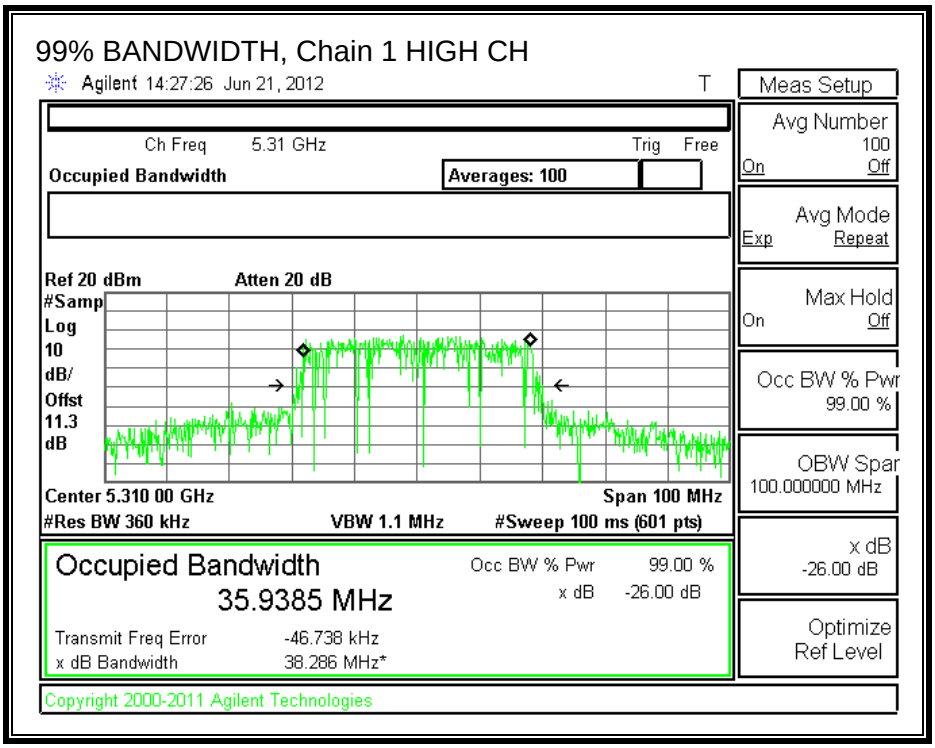
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





9.4.3. 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 11.3 dB (including 10 dB pad and 1.3 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)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5270	12.20	11.20	14.74
High	5310	11.20	11.60	14.41

9.4.4. 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

The TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Correlated Chains Directional Gain (dBi)
6.00	3.01	9.01

.

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	5270	24	41.00	27.13	9.01	20.99	7.99
High	5310	24	42.25	27.26	9.01	20.99	7.99

Duty Cycle CF (dB)	0.14	Included in Calculations of Corr'd Power & PPSD

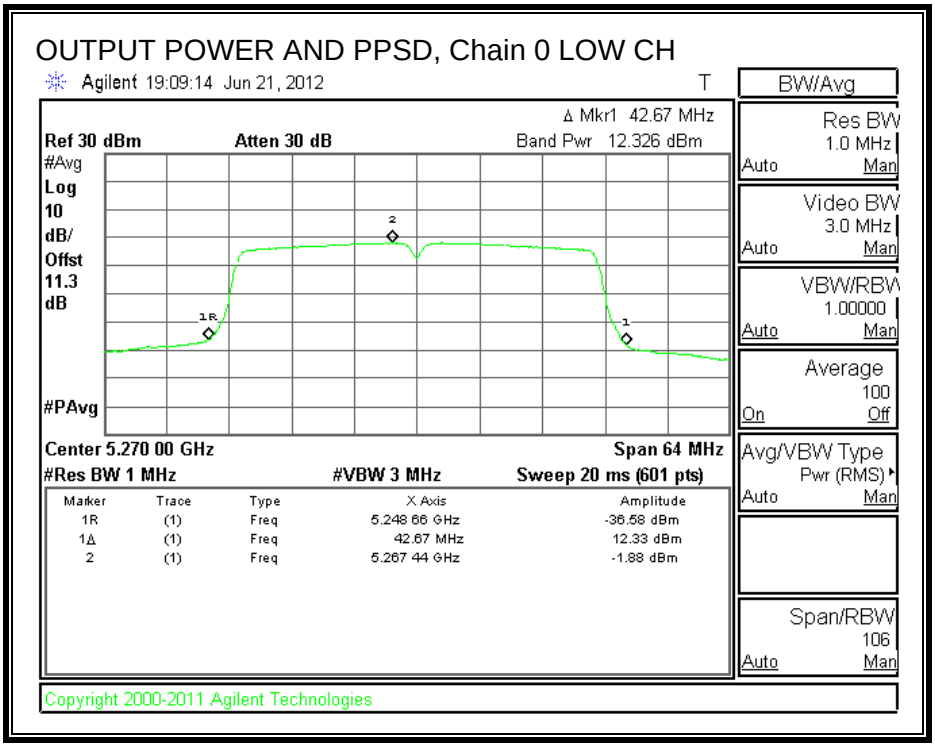
Output Power Results

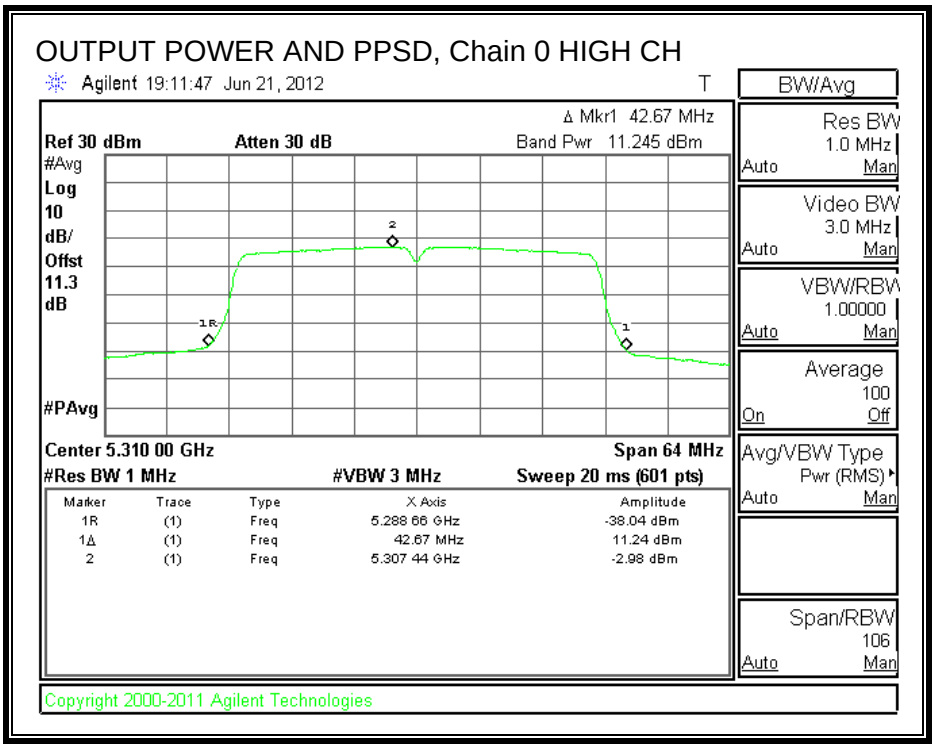
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	12.326	11.292	14.990	20.99	-6.000
High	5310	11.245	11.754	14.657	20.99	-6.333

PPSD Results

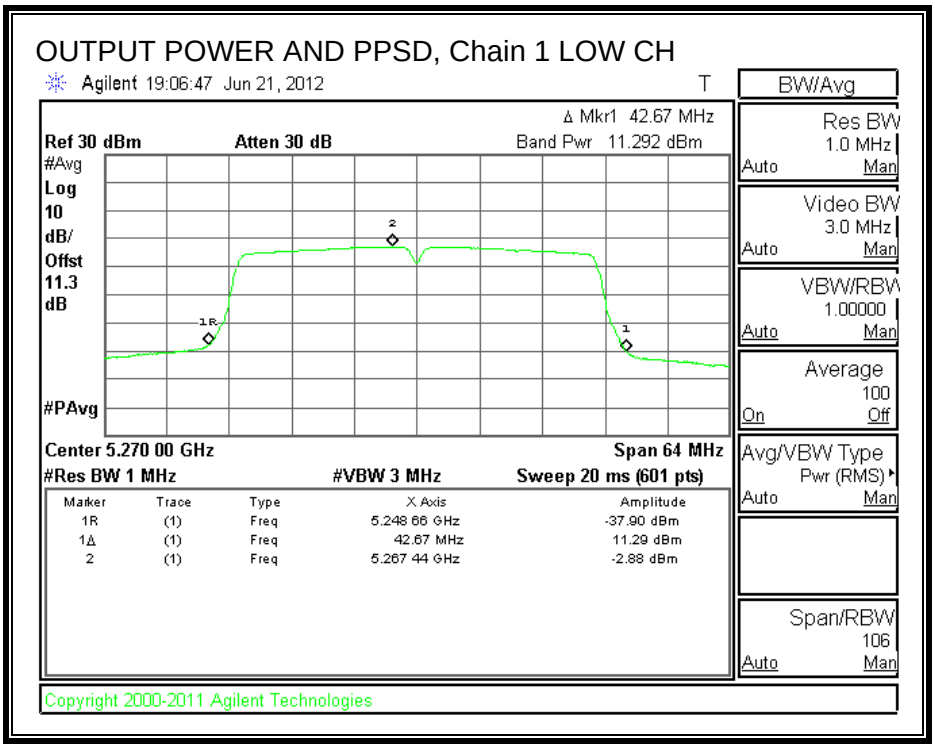
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	-1.88	-2.88	0.80	7.99	-7.19
High	5310	-2.98	-2.51	0.41	7.99	-7.58

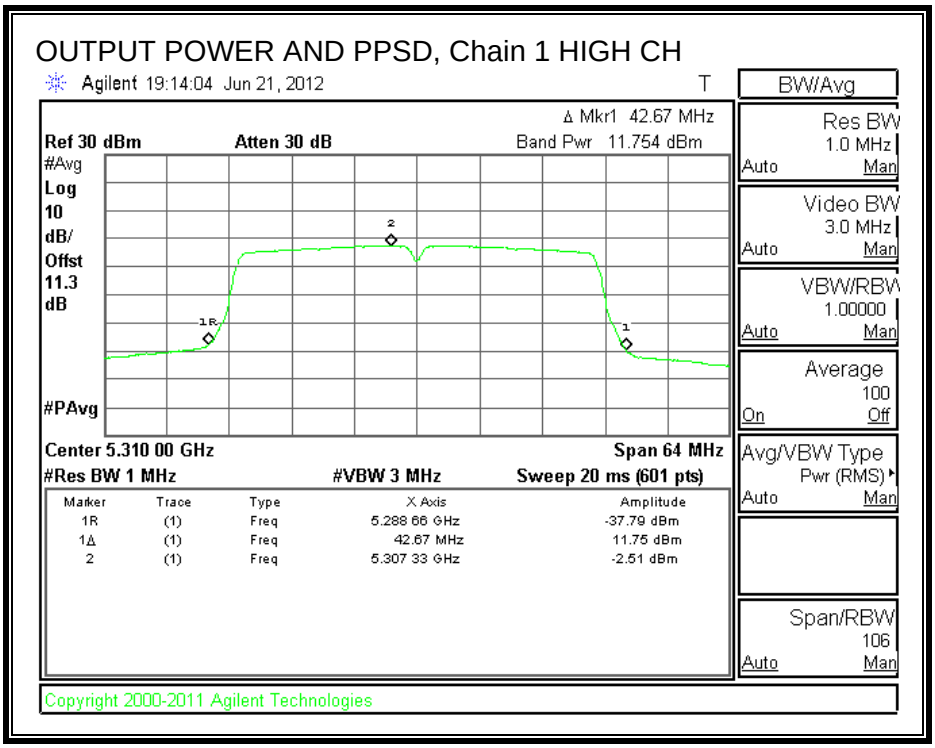
OUTPUT POWER AND PPSD, Chain 0





OUTPUT POWER AND PPSD, Chain 1





9.4.5. 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

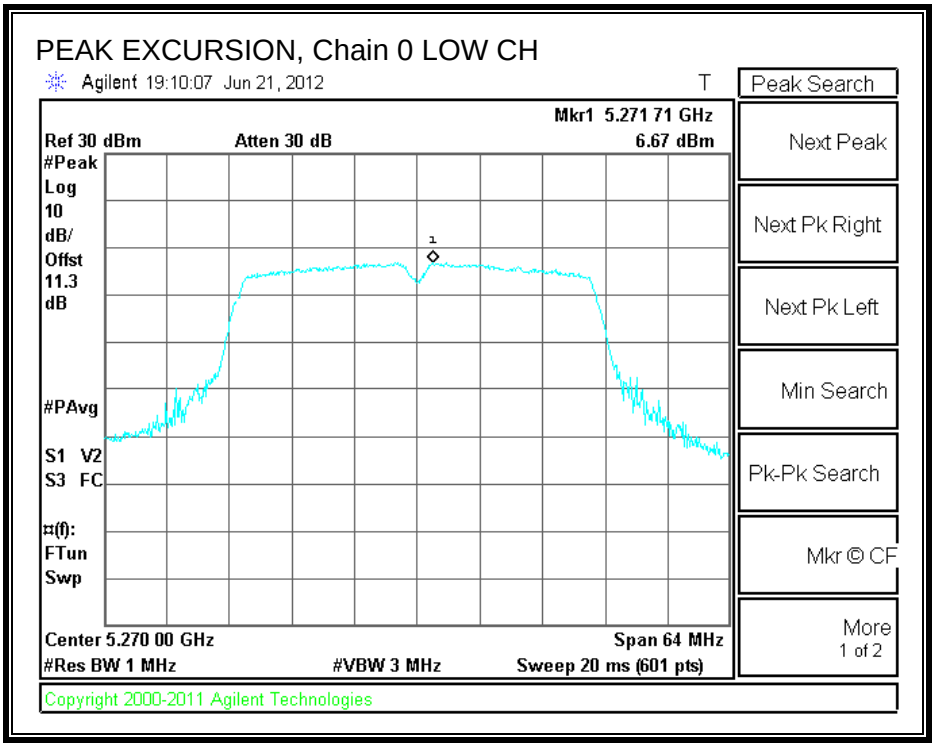
Chain 0

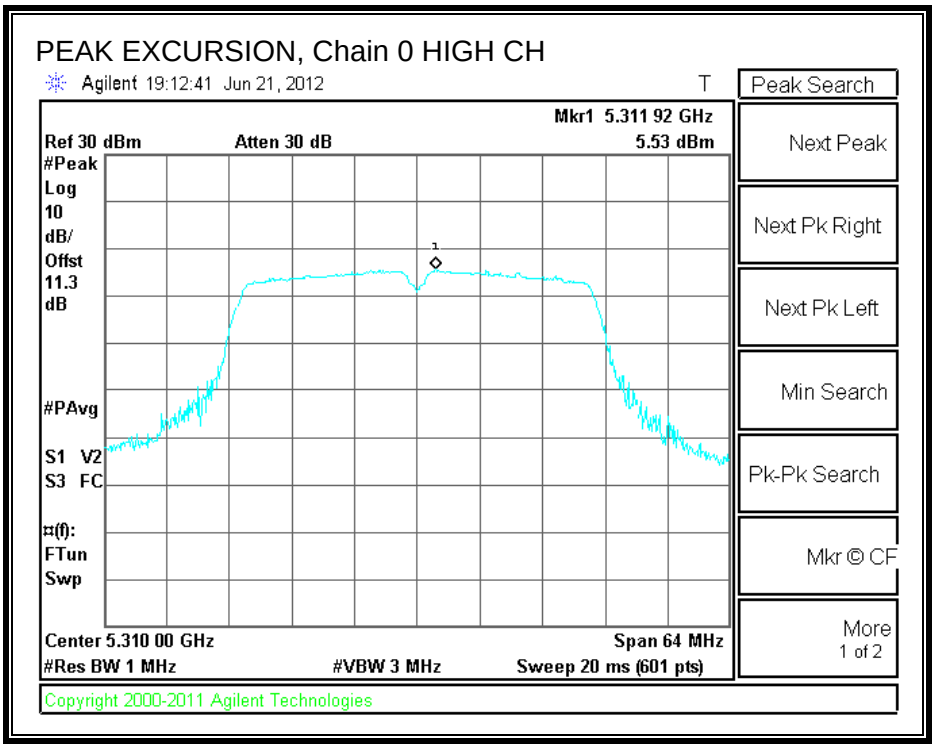
Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5270	6.67	-1.88	0.14	8.41	13	-4.59
High	5310	5.53	-2.98	0.14	8.37	13	-4.63

Chain 1

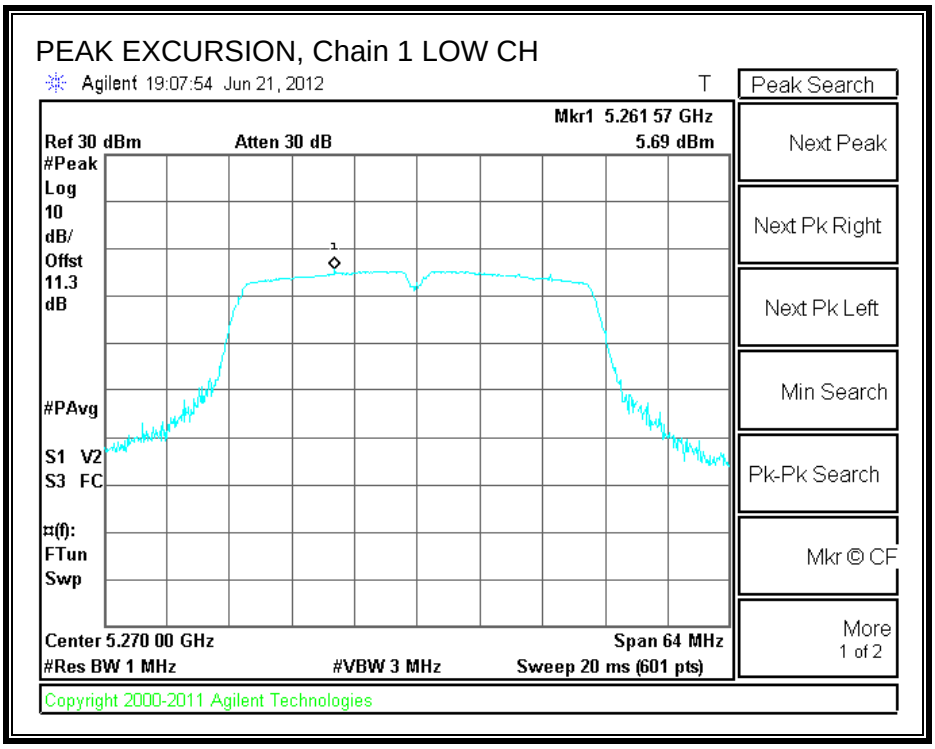
Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5270	5.69	-2.88	0.14	8.43	13	-4.57
High	5310	6.30	-2.51	0.14	8.67	13	-4.33

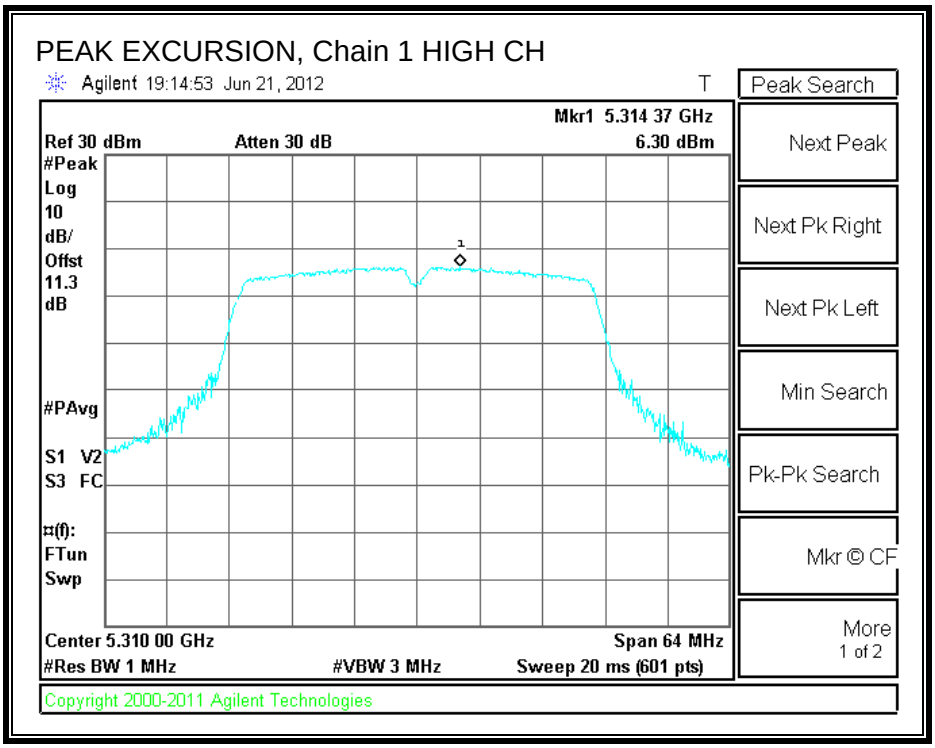
PEAK EXCURSION, Chain 0





PEAK EXCURSION, Chain 1





9.5. 802.11a MODE IN THE 5.6 GHz BAND

9.5.1. 26 dB BANDWIDTH

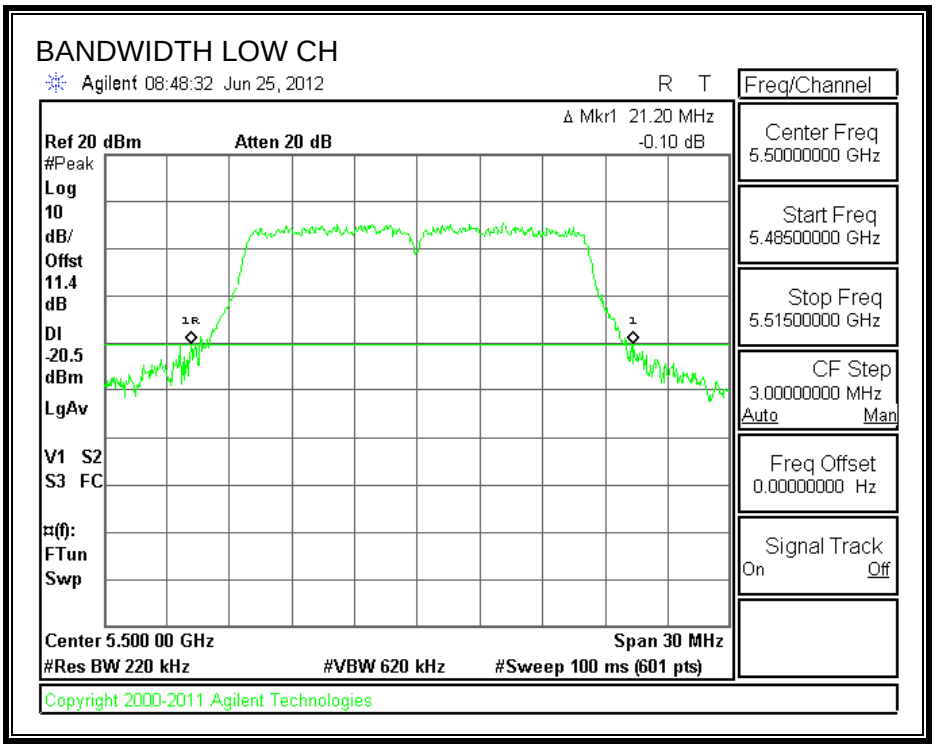
LIMITS

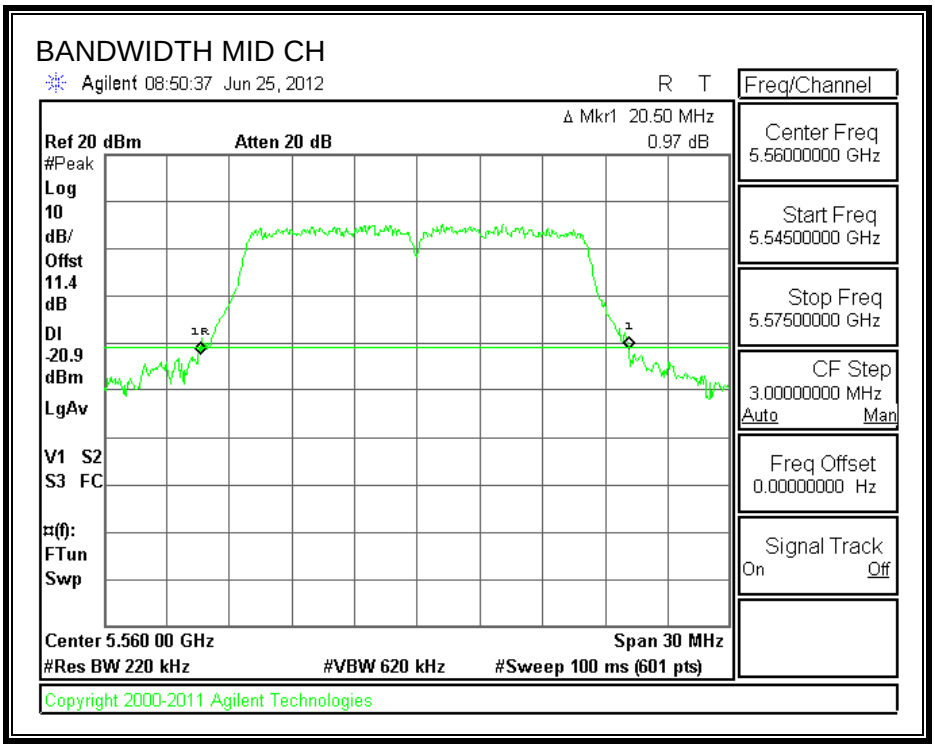
None; for reporting purposes only.

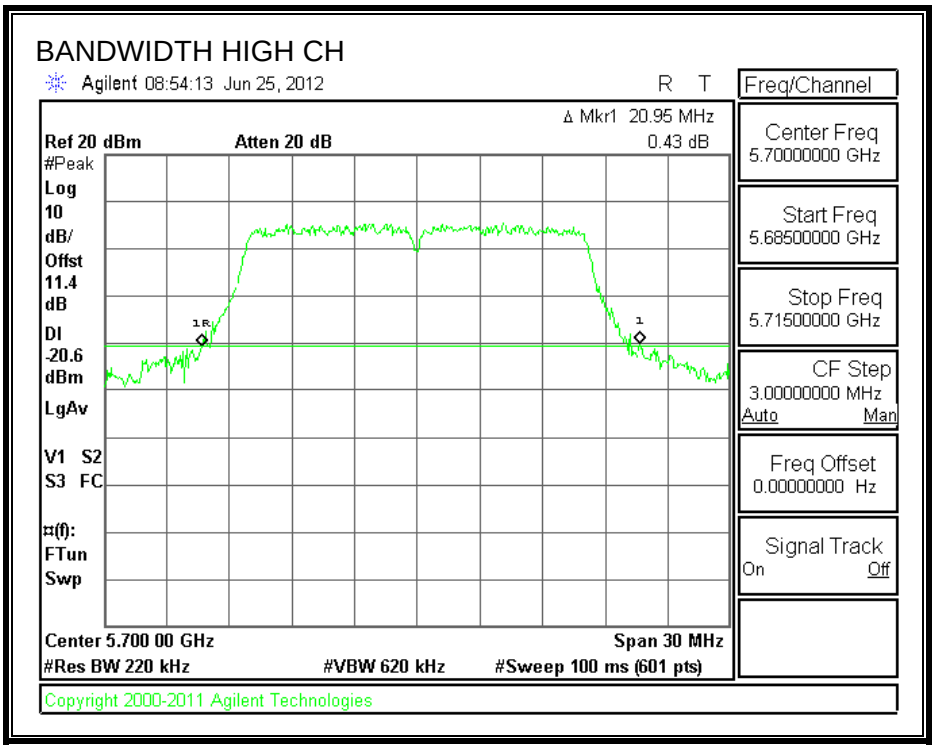
RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	21.20
Mid	5560	20.50
High	5700	20.95

26 dB BANDWIDTH







9.5.2. 99% BANDWIDTH

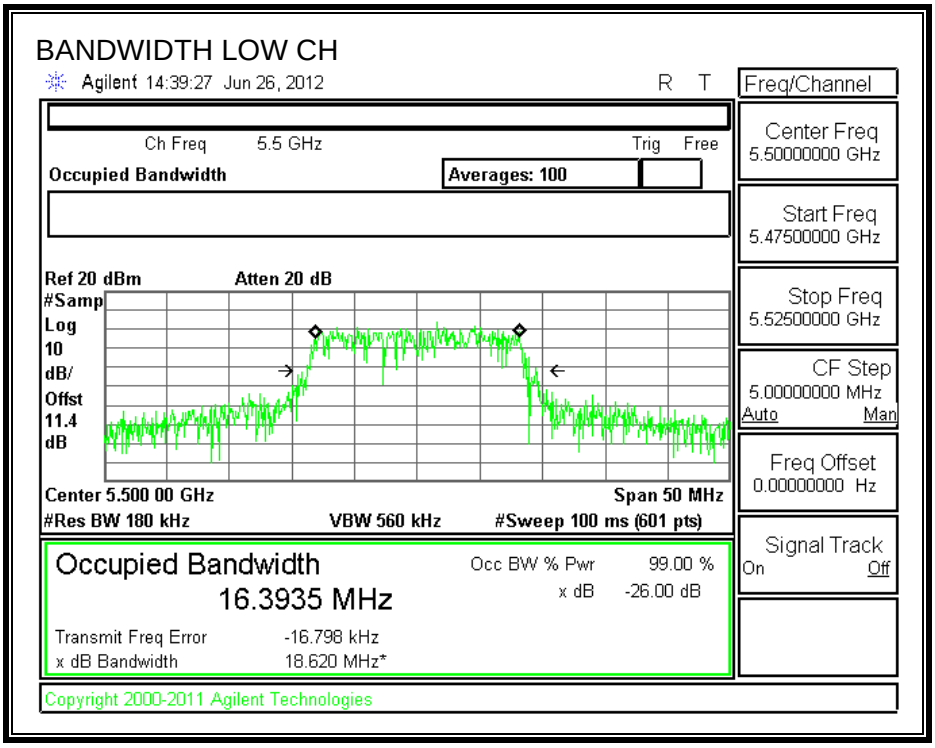
LIMITS

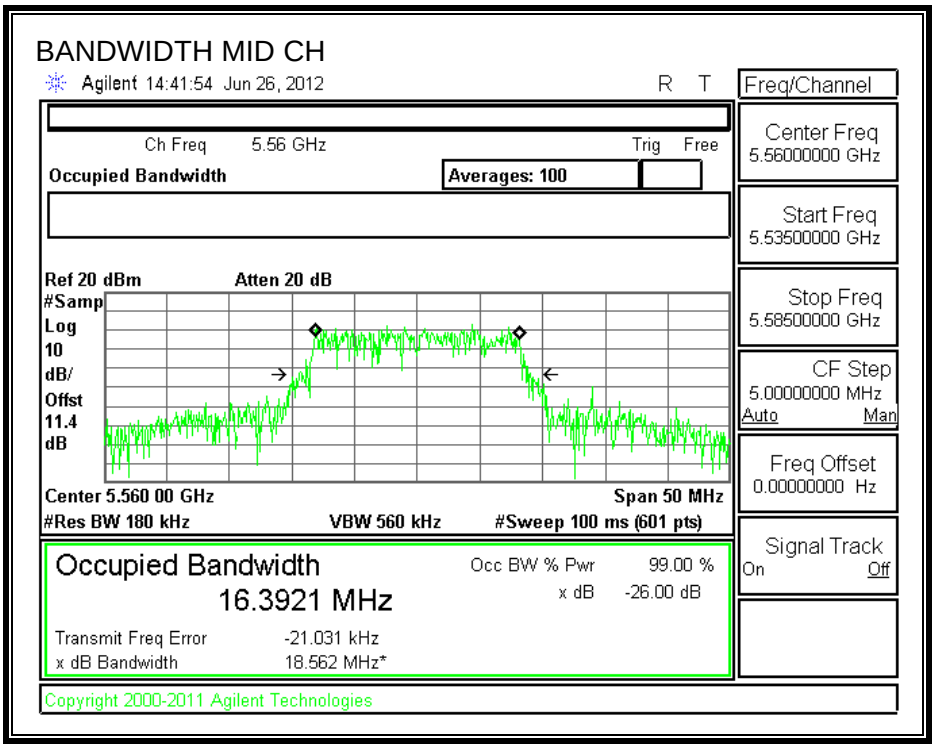
None; for reporting purposes only.

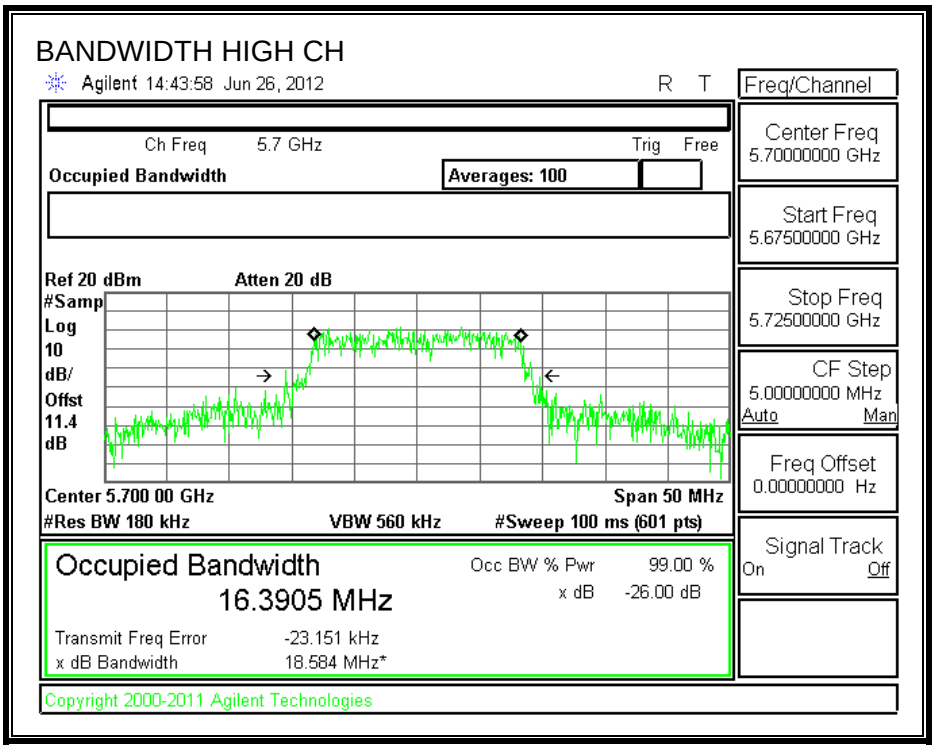
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	16.3935
Mid	5560	16.3921
High	5700	16.3905

99% BANDWIDTH







9.5.3. 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

Channel	Frequency (MHz)	Power (dBm)
Low	5500	15.0
Mid	5560	14.9
High	5700	15.0

9.5.4. 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	21.20	24.26	6.00	24.00	11.00
Mid	5560	24	20.50	24.12	6.00	24.00	11.00
High	5700	24	20.95	24.21	6.00	24.00	11.00

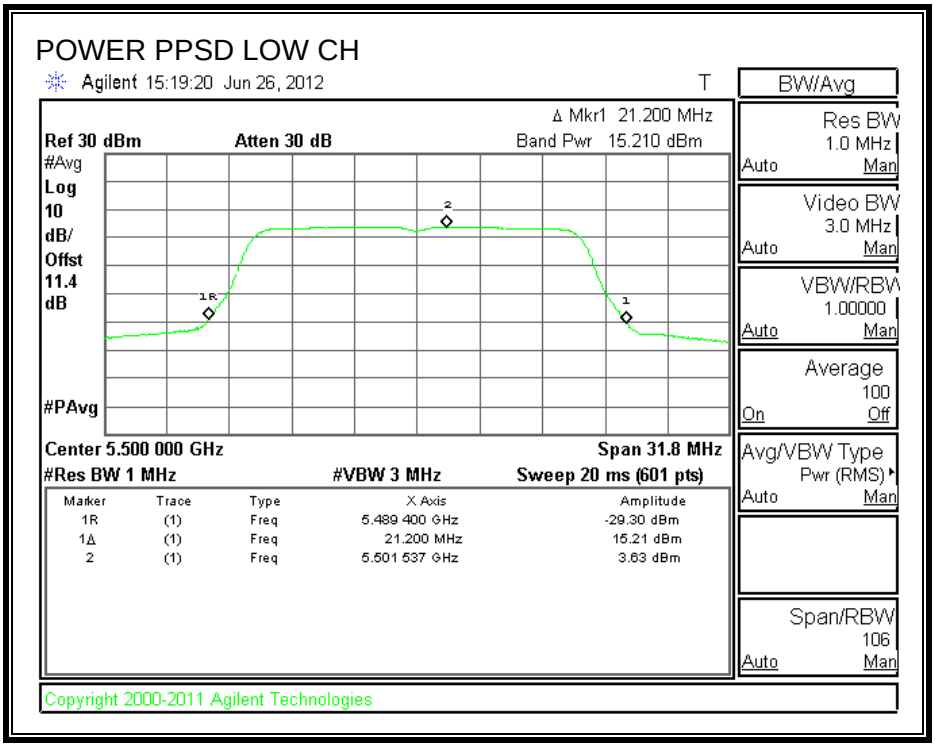
Output Power Results

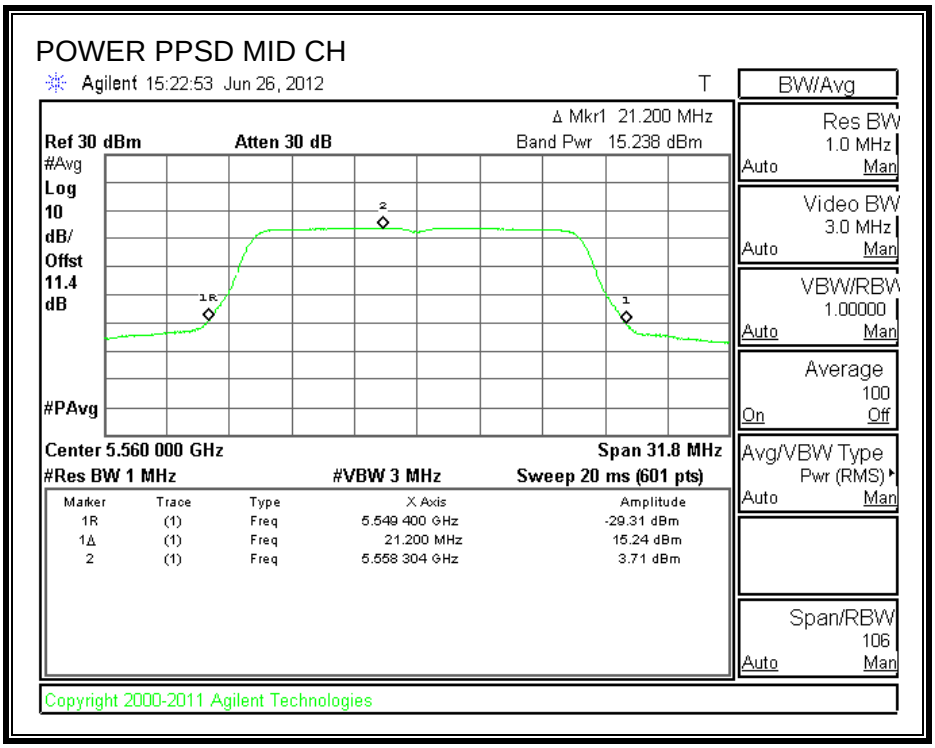
Channel	Frequency (MHz)	Meas Power (dBm)	Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	15.210	15.210	24.00	-8.790
Mid	5560	15.238	15.238	24.00	-8.762
High	5700	15.328	15.328	24.00	-8.672

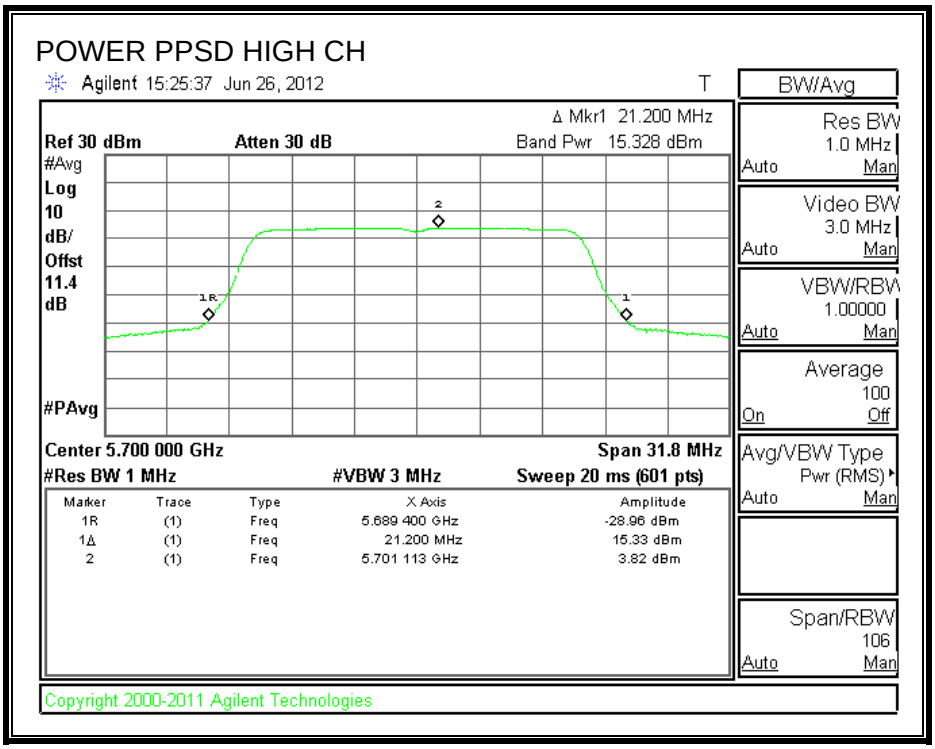
PPSD Results

Channel	Frequency (MHz)	Meas PPSD (dBm)	Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	3.63	3.63	11.00	-7.37
Mid	5560	3.71	3.71	11.00	-7.29
High	5700	3.82	3.82	11.00	-7.18

OUTPUT POWER AND PPSD







9.5.5. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

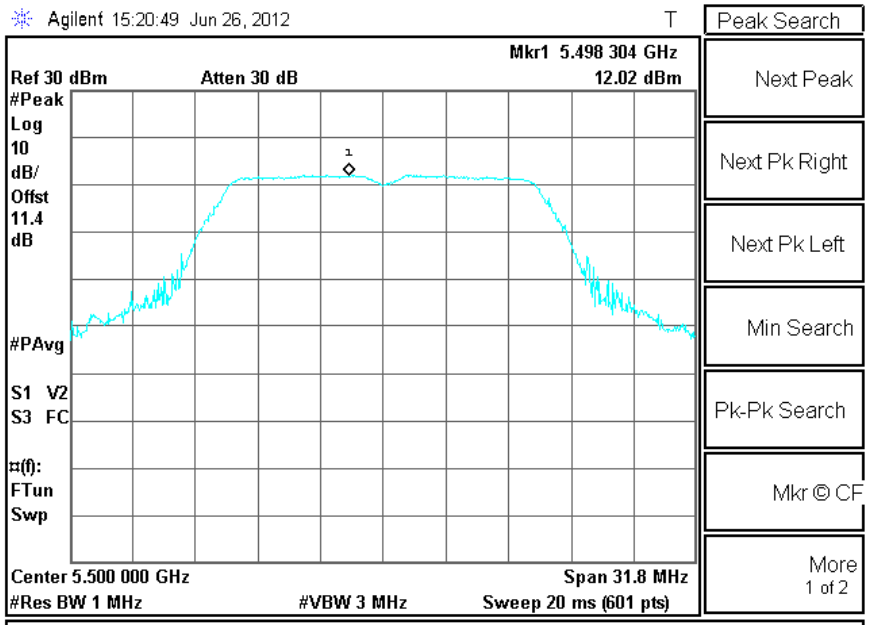
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

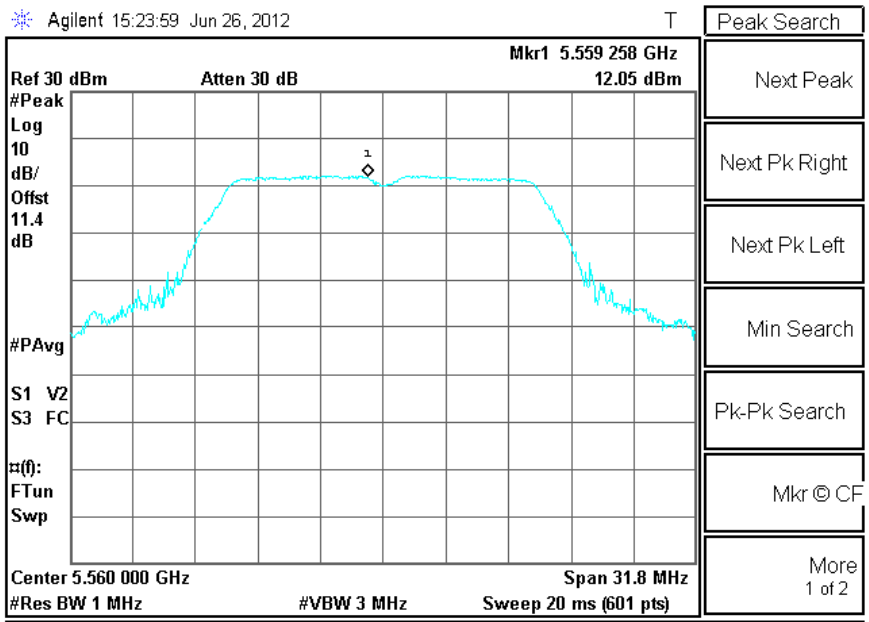
Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5500	12.02	3.63	0.04	8.35	13	-4.65
Mid	5560	12.05	3.71	0.04	8.30	13	-4.70
High	5700	12.16	3.82	0.04	8.30	13	-4.70

PEAK EXCURSION

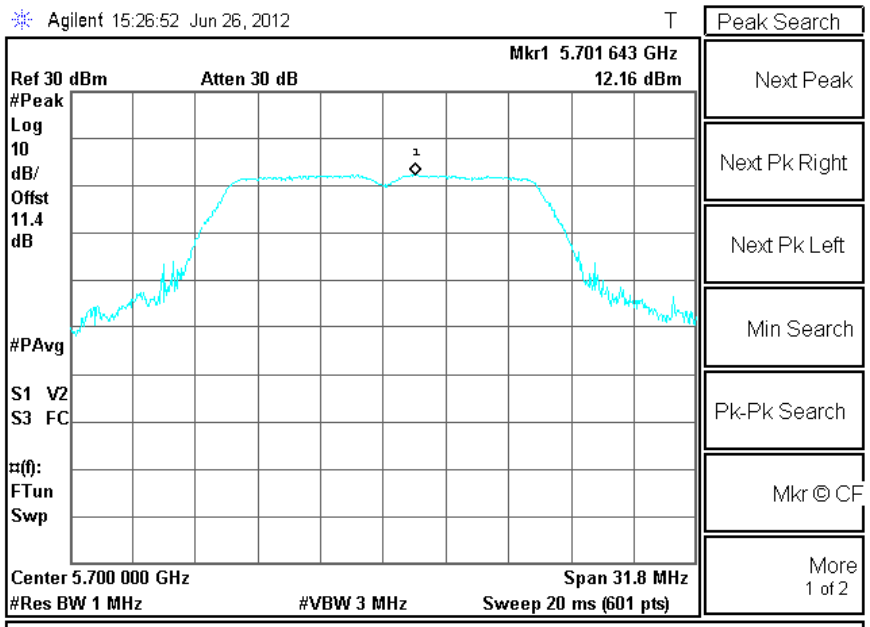
PEAK EXCURSION LOW CH



PEAK EXCURSION MID CH



PEAK EXCURSION HIGH CH



9.5.6. CONDUCTED WEATHER RADAR BAND EMISSIONS

LIMITS

Within 5600 – 5650 MHz band, -20 dBc relative to highest fundamental output power density per 100 kHz.

TEST PROCEDURE

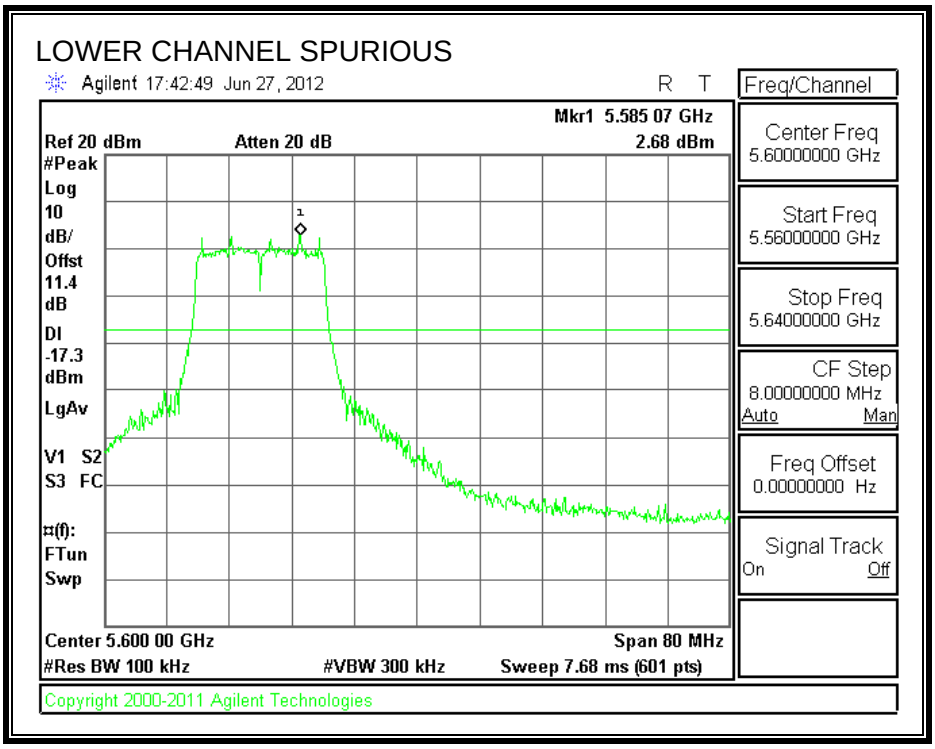
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The authorized channel nearest to and less than 5600 MHz is measured.

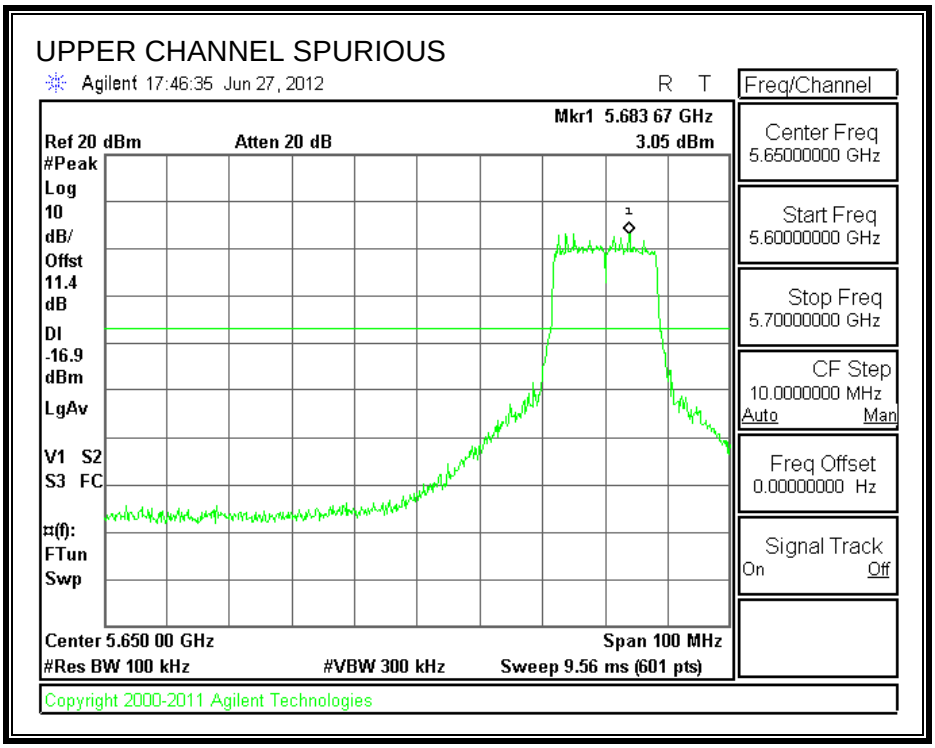
The authorized channel nearest to and greater than 5650 MHz is measured.

SPURIOUS EMISSIONS IN WEATHER RADAR BAND 5600 - 5650 MHz

LOWER CHANNEL SPURIOUS



UPPER CHANNEL SPURIOUS



9.6. 802.11a BEAM FORMING MODE IN THE 5.6 GHz BAND

9.6.1. 26 dB BANDWIDTH

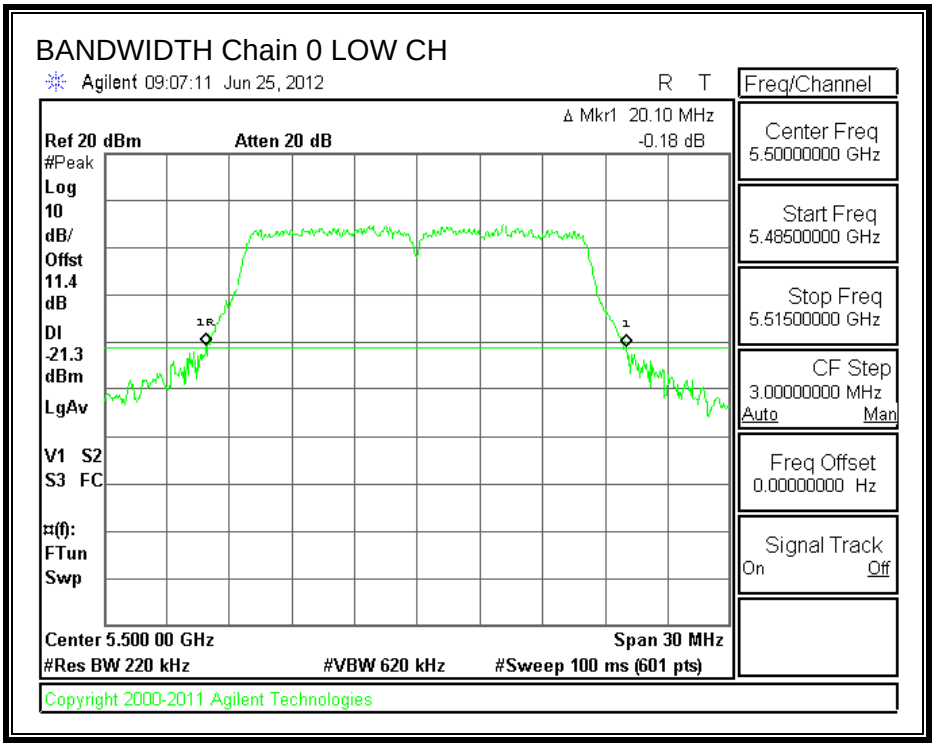
LIMITS

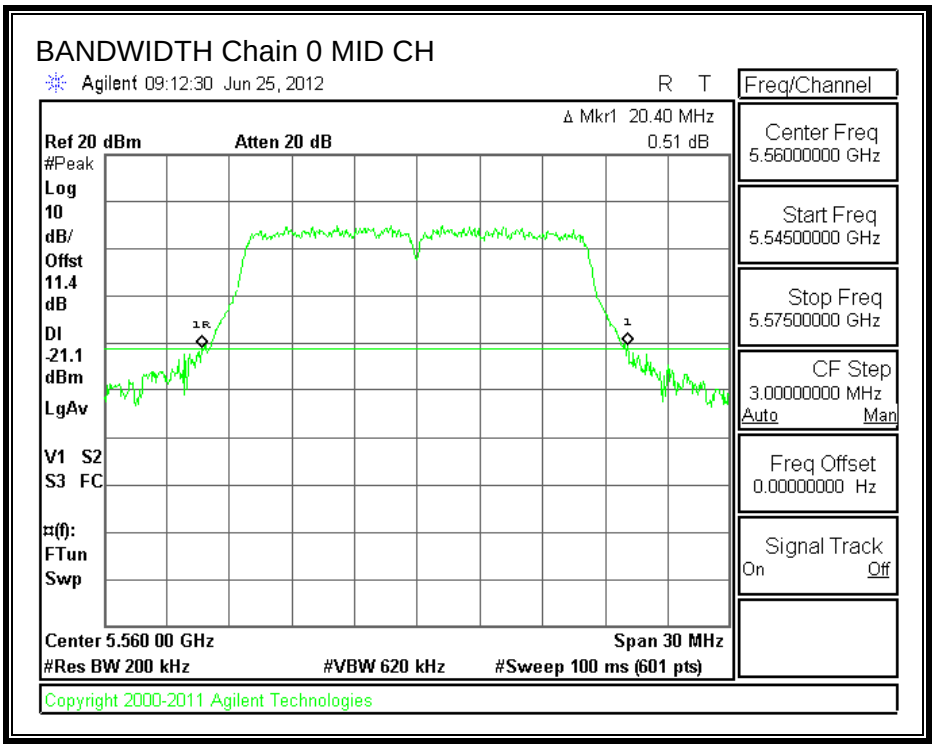
None; for reporting purposes only.

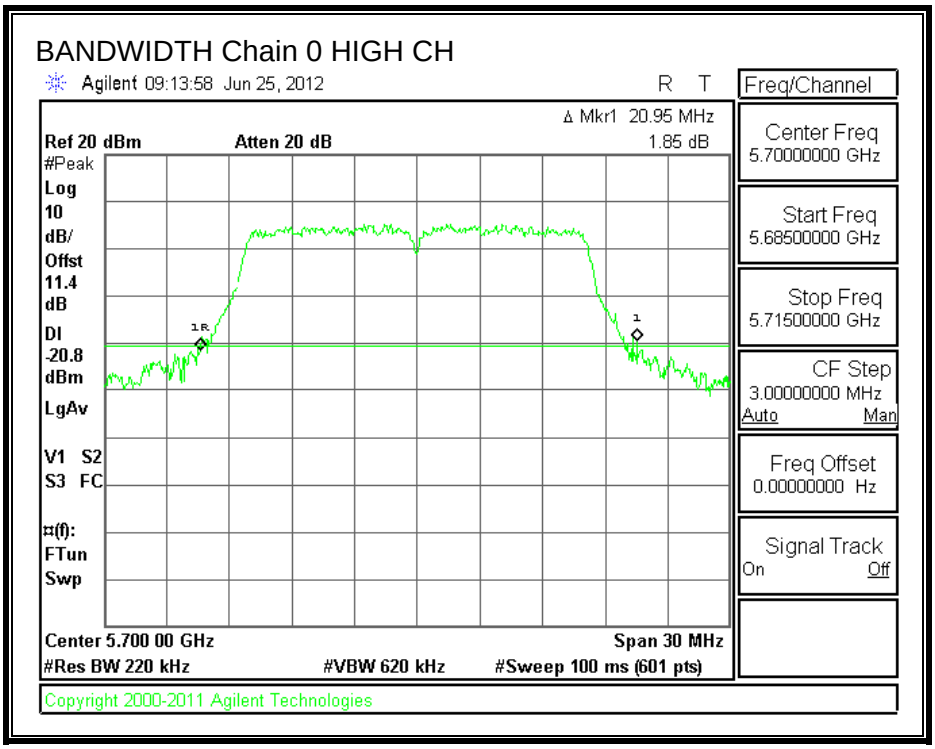
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5500	20.10	20.55
Mid	5560	20.40	21.10
High	5700	20.95	21.15

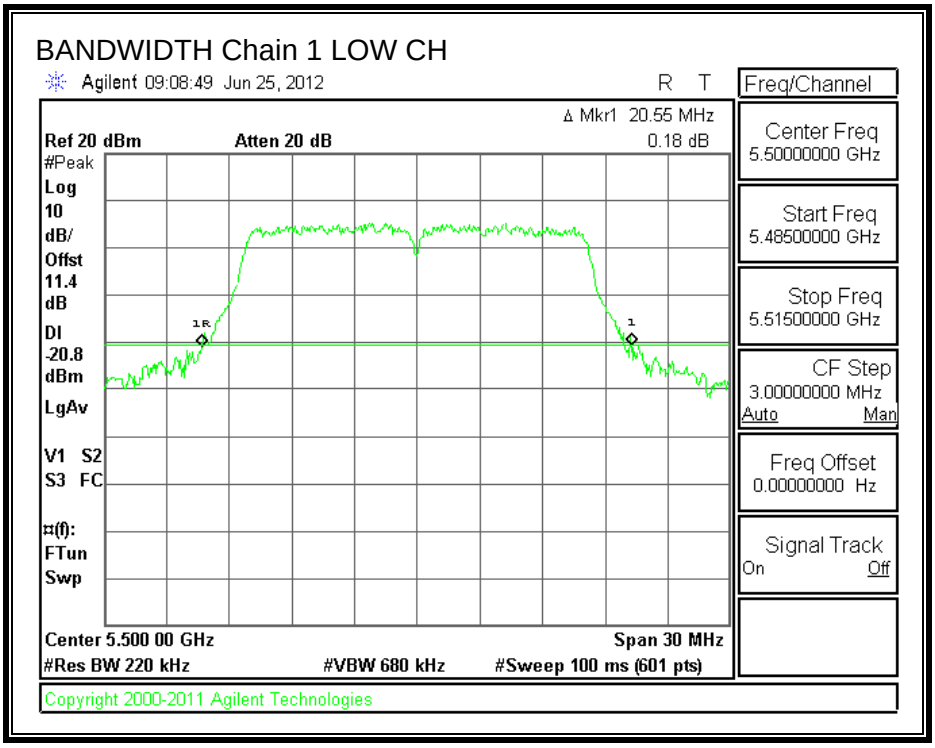
26 dB BANDWIDTH, Chain 0

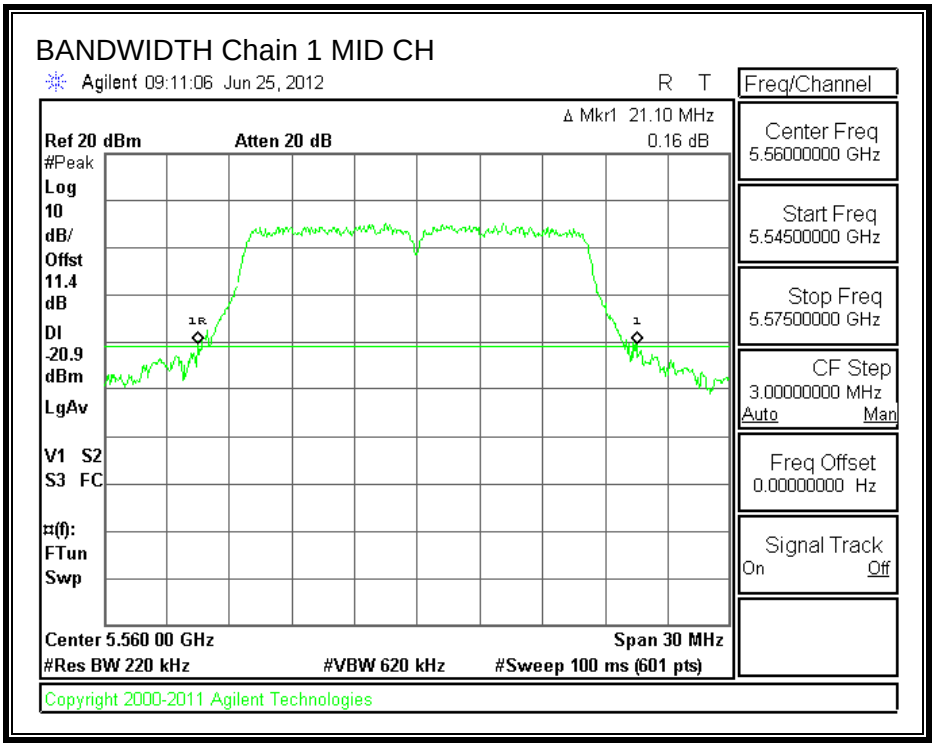


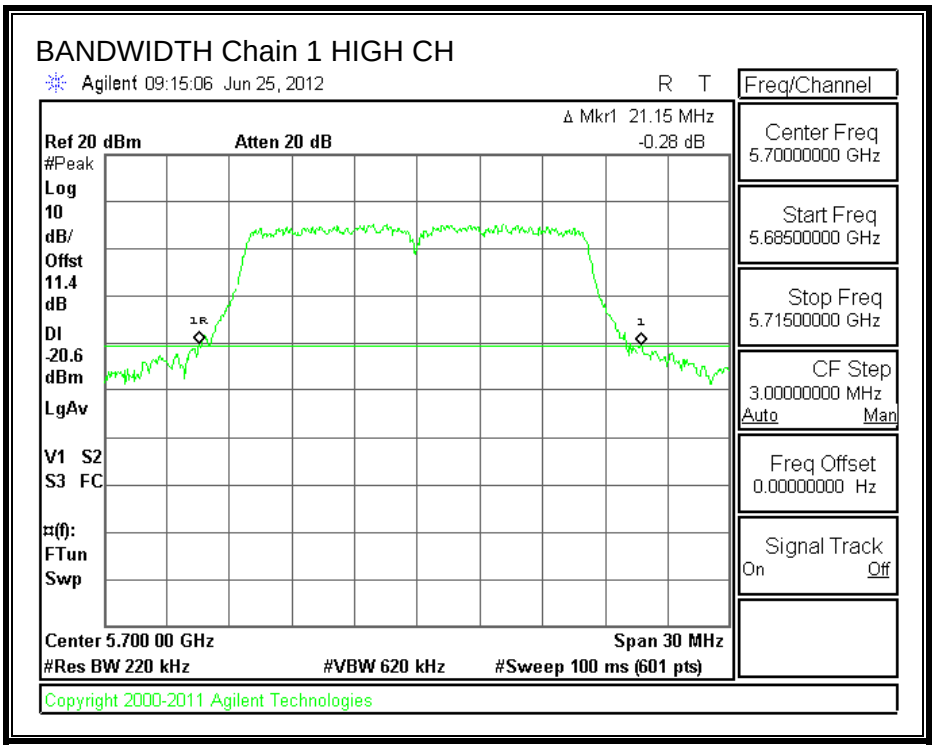




26 dB BANDWIDTH, Chain 1







9.6.2. 99% BANDWIDTH

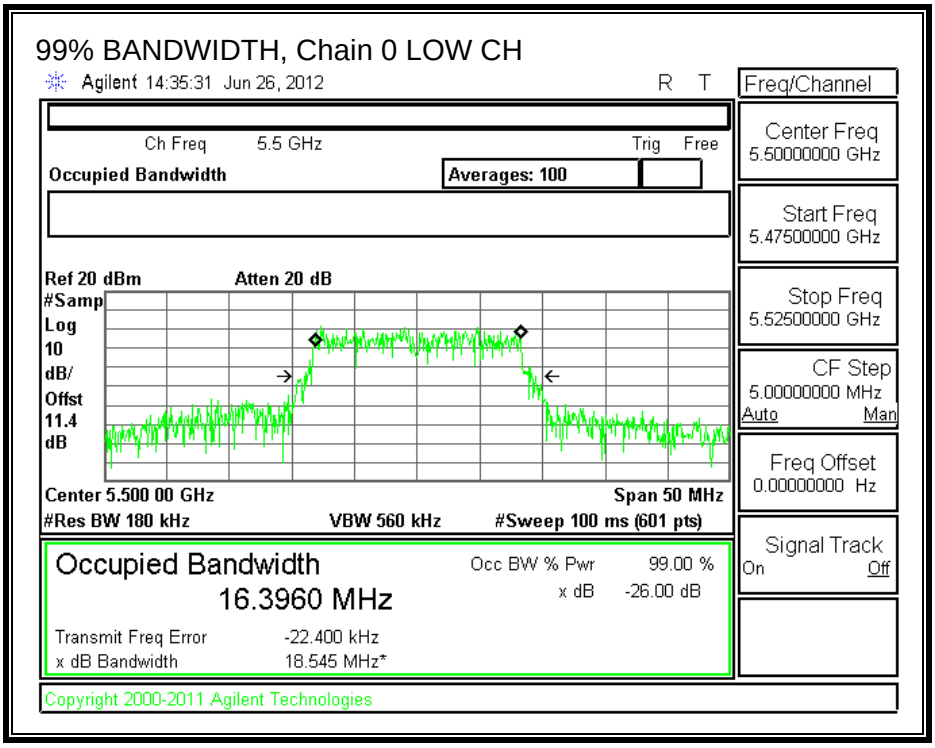
LIMITS

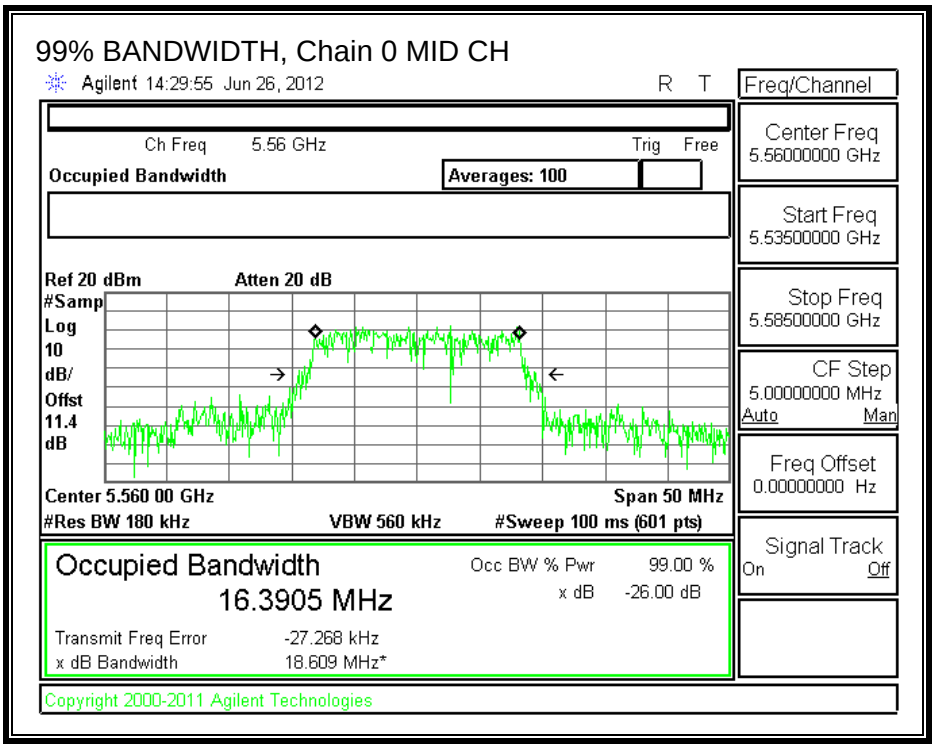
None; for reporting purposes only.

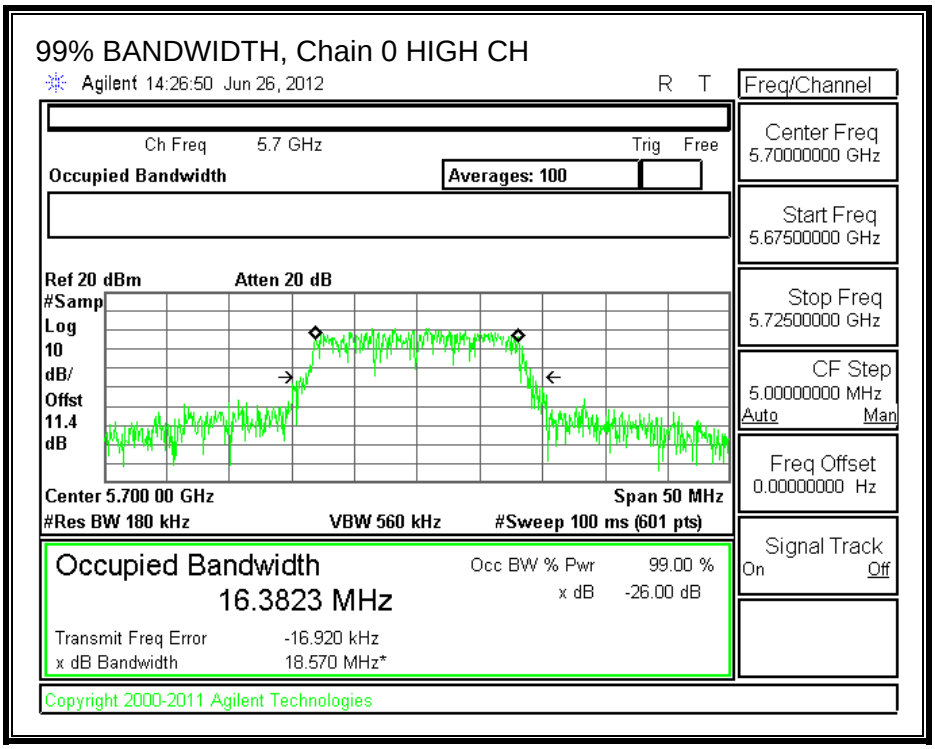
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5500	16.3960	16.3768
Mid	5560	16.3905	16.3916
High	5700	16.3823	16.3914

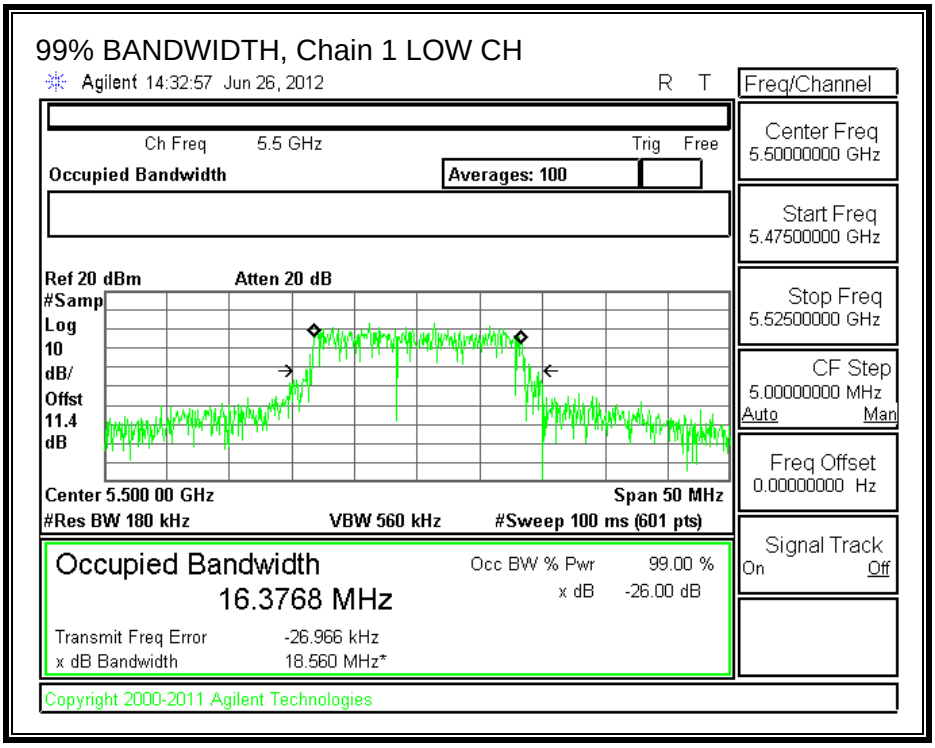
99% BANDWIDTH, Chain 0

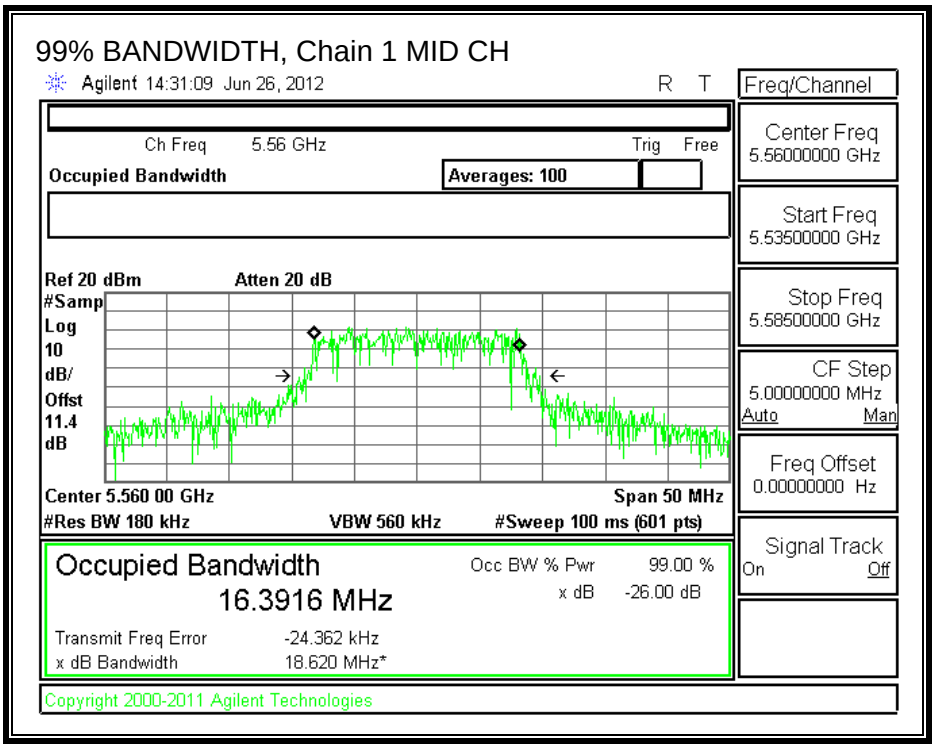


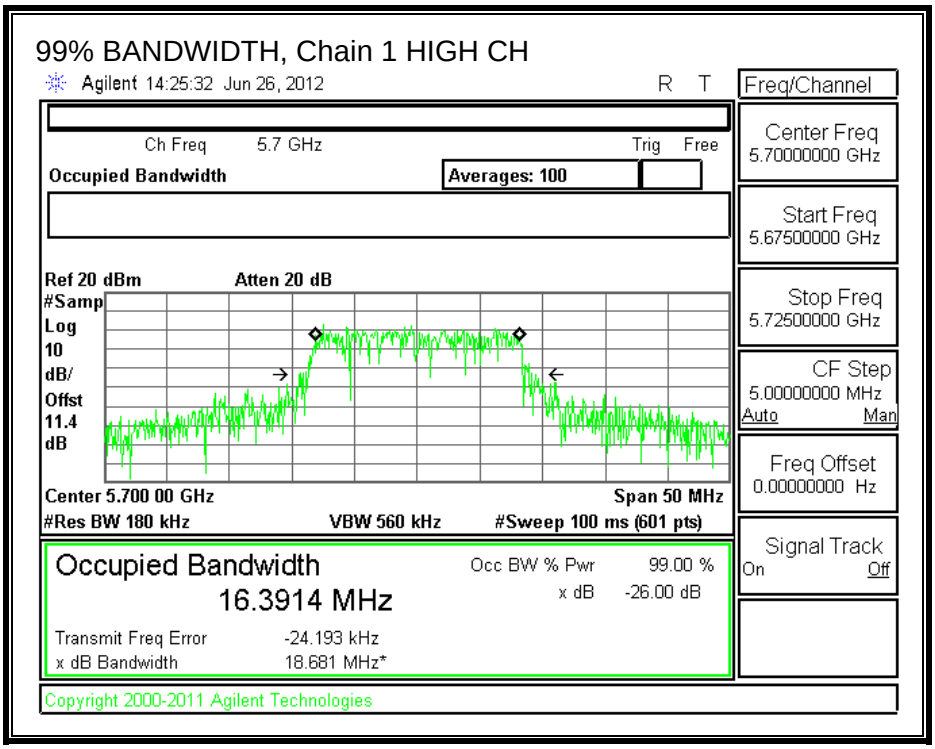




99% BANDWIDTH, Chain 1







9.6.3. 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)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5500	14.40	14.90	17.67
Mid	5560	14.90	14.90	17.91
High	5700	15.00	15.10	18.06

9.6.4. 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

The TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Correlated Chains Directional Gain (dBi)
6.00	3.01	9.01

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	20.10	24.03	9.01	20.99	7.99
Mid	5560	24	20.40	24.10	9.01	20.99	7.99
High	5700	24	20.95	24.21	9.01	20.99	7.99

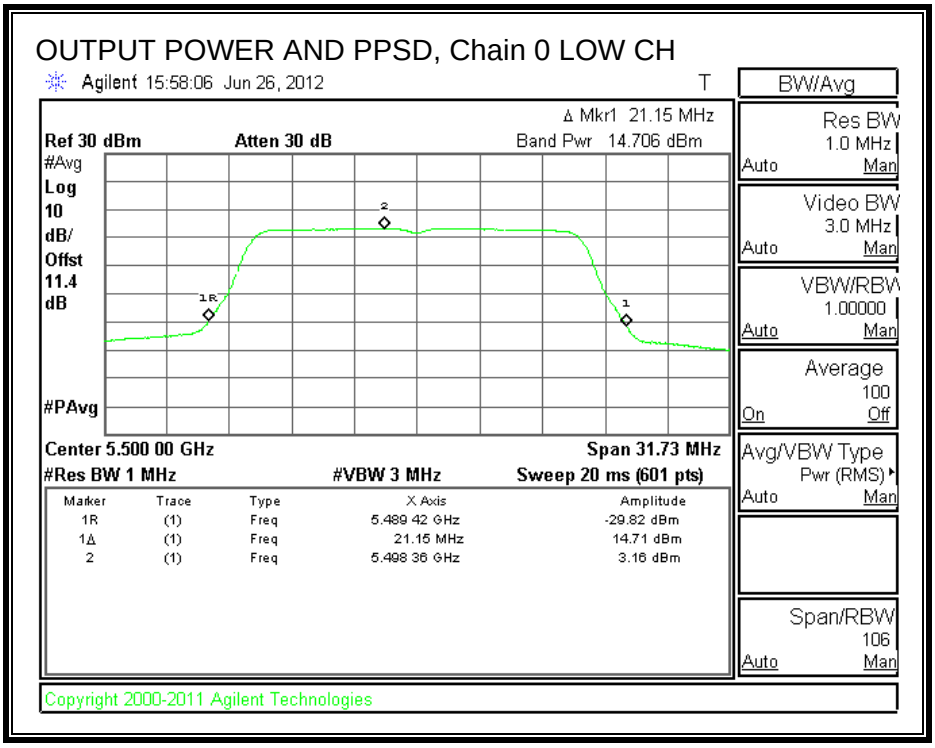
Output Power Results

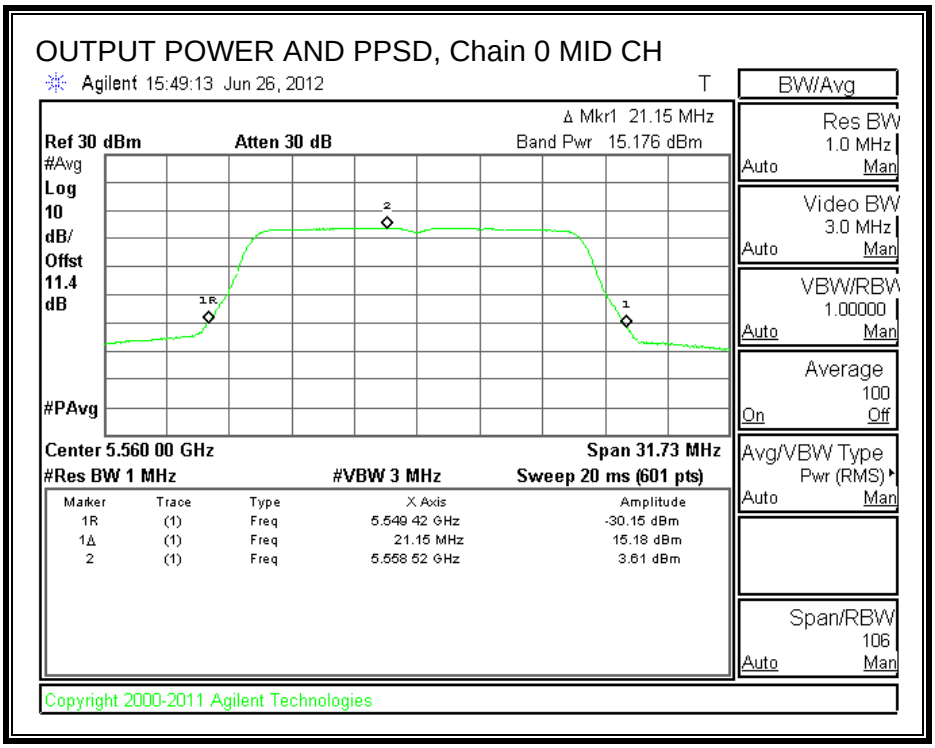
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	14.706	15.345	18.048	20.99	-2.942
Mid	5560	15.176	15.299	18.248	20.99	-2.742
High	5700	15.081	15.292	18.198	20.99	-2.792

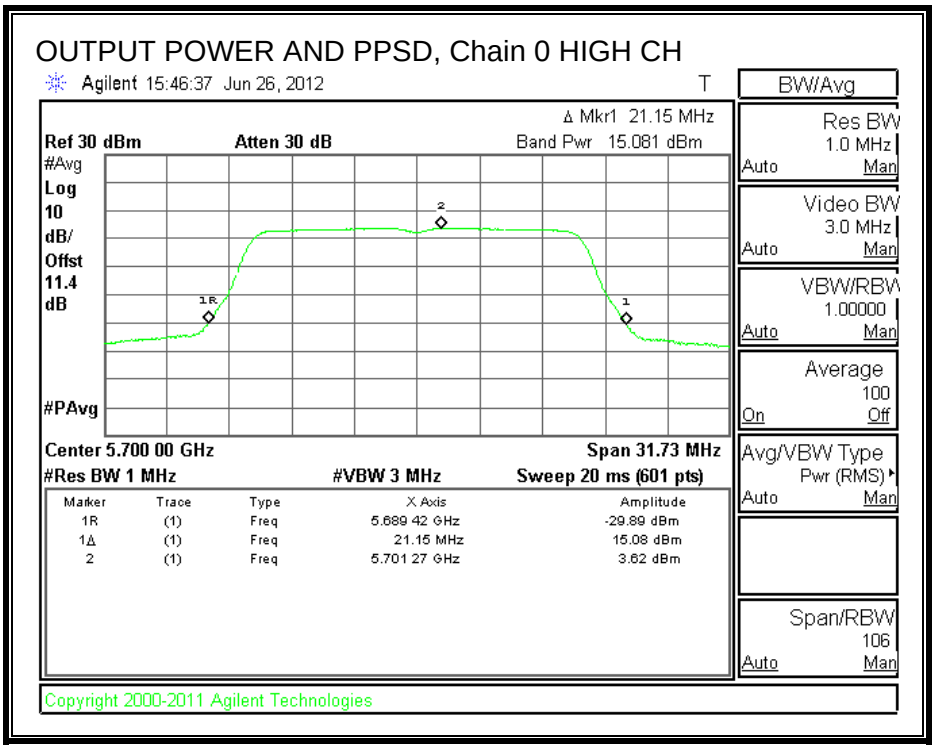
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	3.16	3.80	6.50	7.99	-1.49
Mid	5560	3.61	3.78	6.71	7.99	-1.28
High	5700	3.62	3.80	6.72	7.99	-1.27

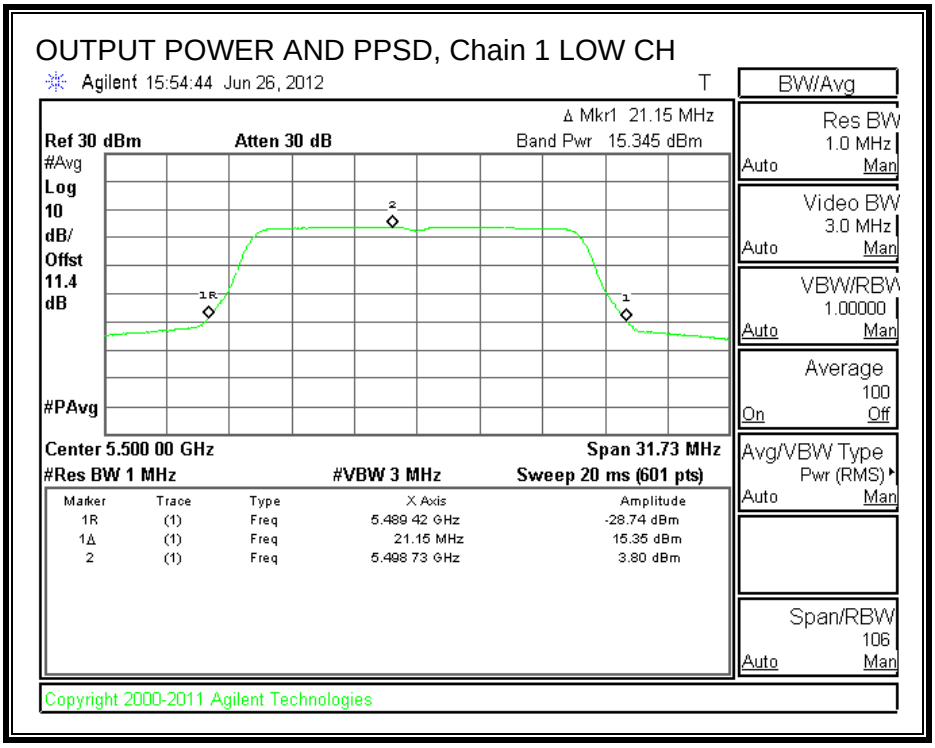
OUTPUT POWER AND PPSD, Chain 0

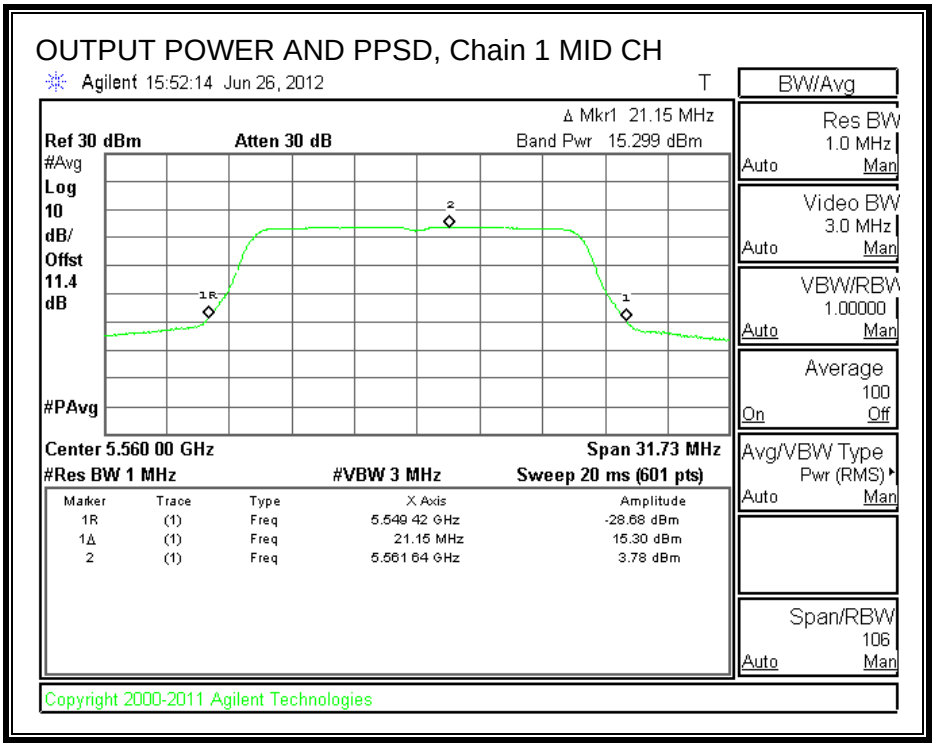


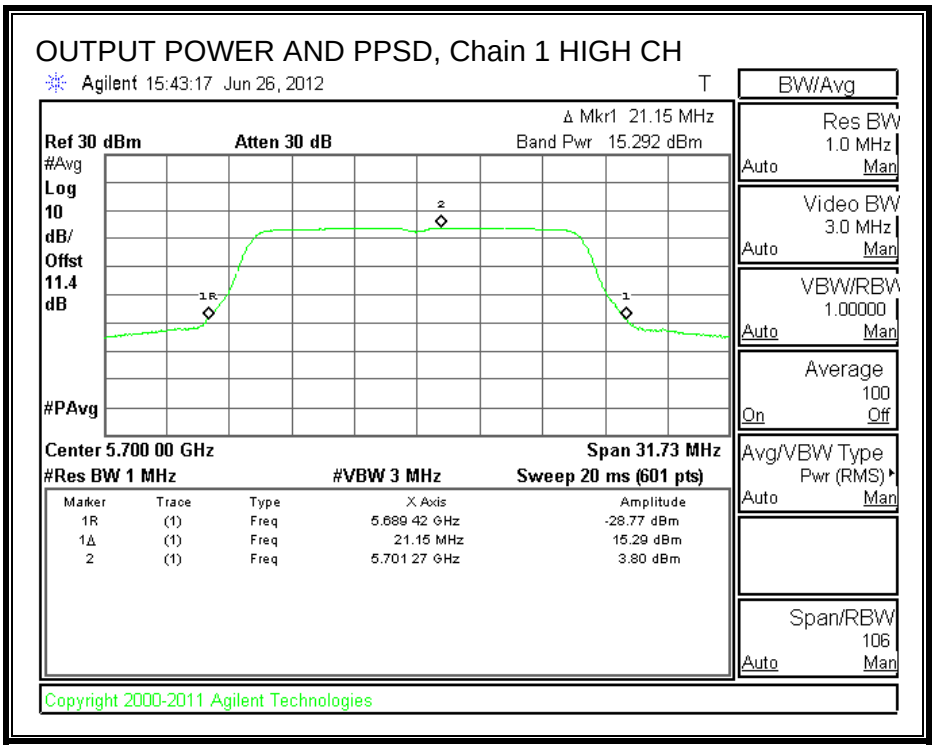




OUTPUT POWER AND PPSD, Chain 1







9.6.5. 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

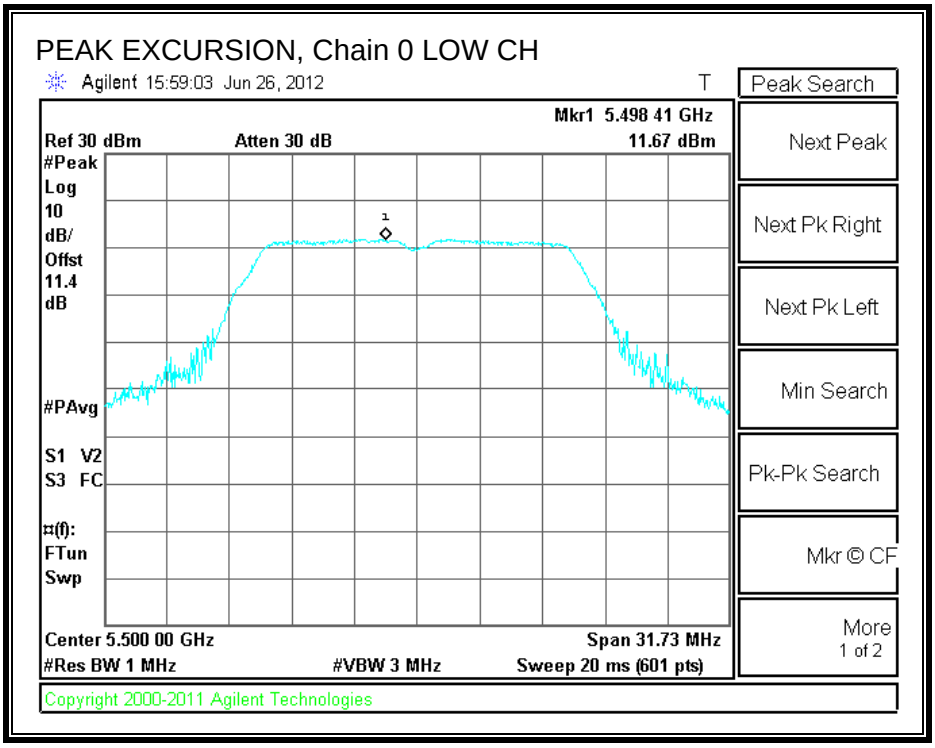
Chain 0

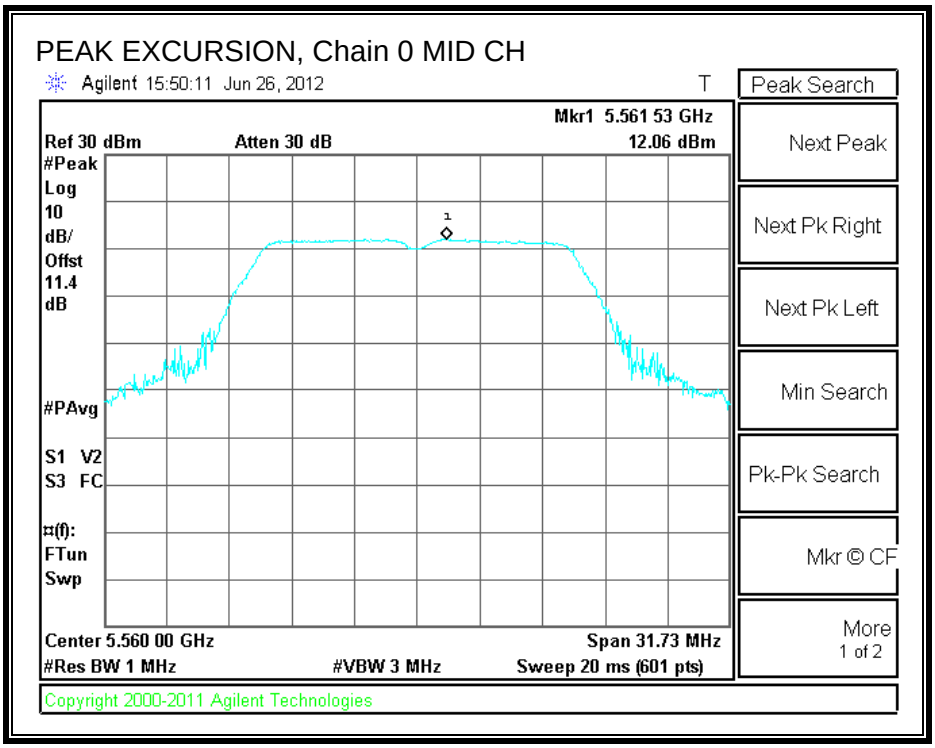
Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5500	11.67	3.16	0.04	8.47	13	-4.53
Mid	5560	12.06	3.61	0.04	8.41	13	-4.59
High	5700	12.10	3.62	0.04	8.44	13	-4.56

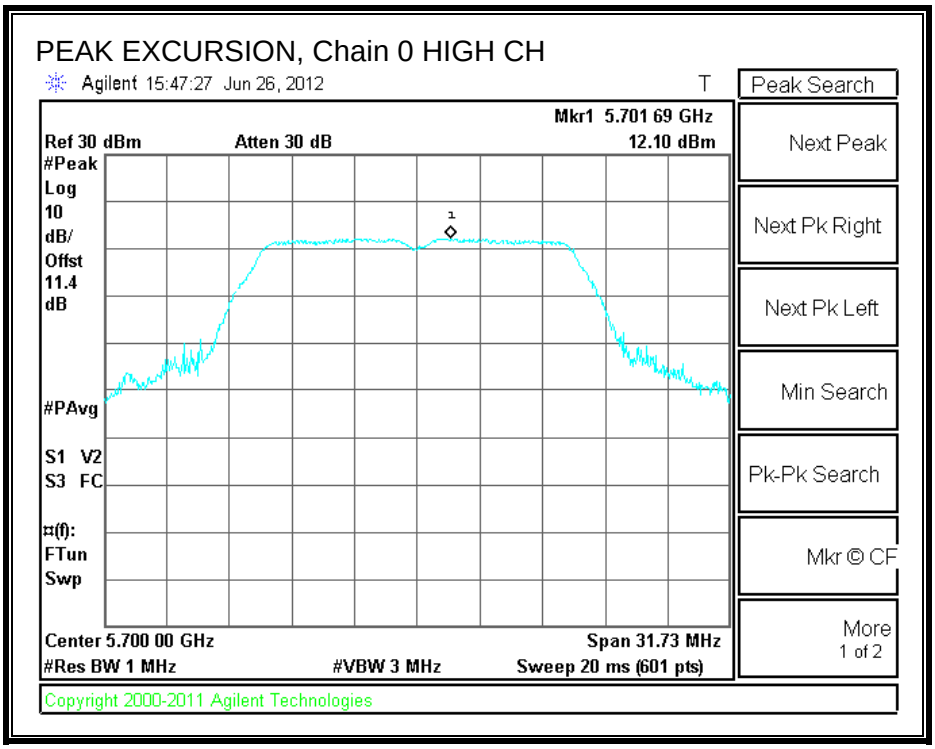
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5500	12.16	3.80	0.04	8.32	13	-4.68
Mid	5560	12.12	3.78	0.04	8.30	13	-4.70
High	5700	12.32	3.80	0.04	8.48	13	-4.52

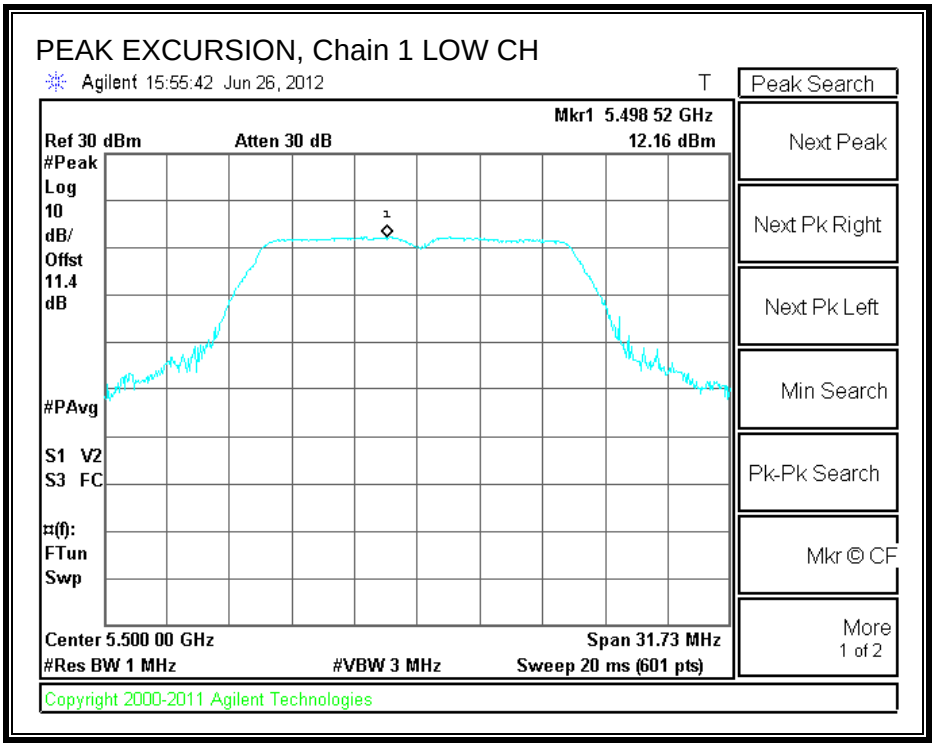
PEAK EXCURSION, Chain 0

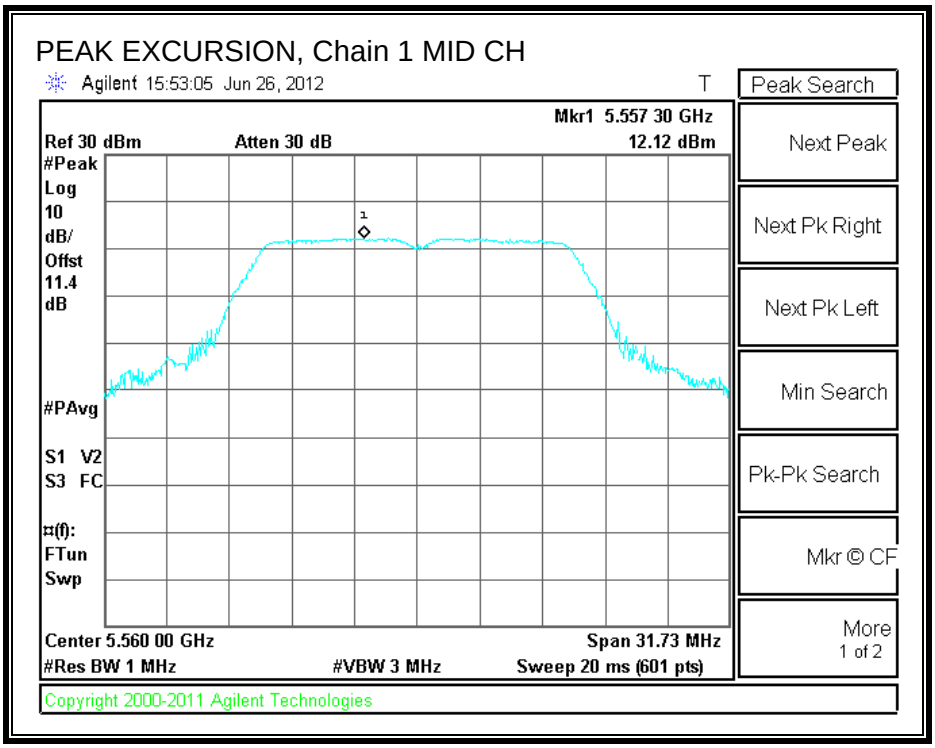


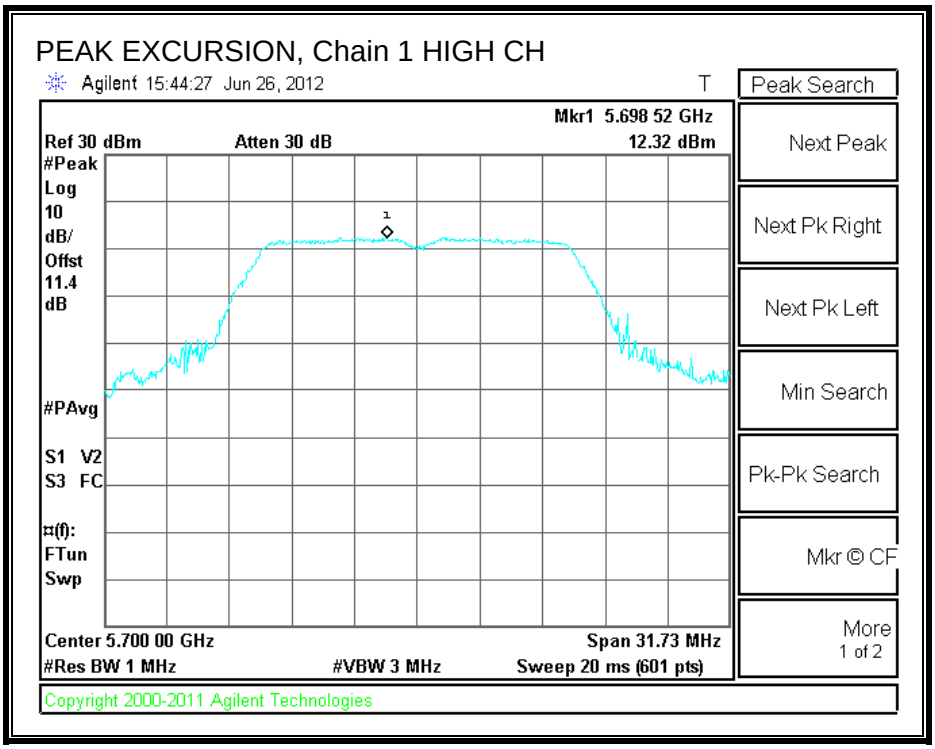




PEAK EXCURSION, Chain 1







9.6.6. CONDUCTED WEATHER RADAR BAND EMISSIONS

LIMITS

Within 5600 – 5650 MHz band, -20 dBc relative to highest fundamental output power density per 100 kHz.

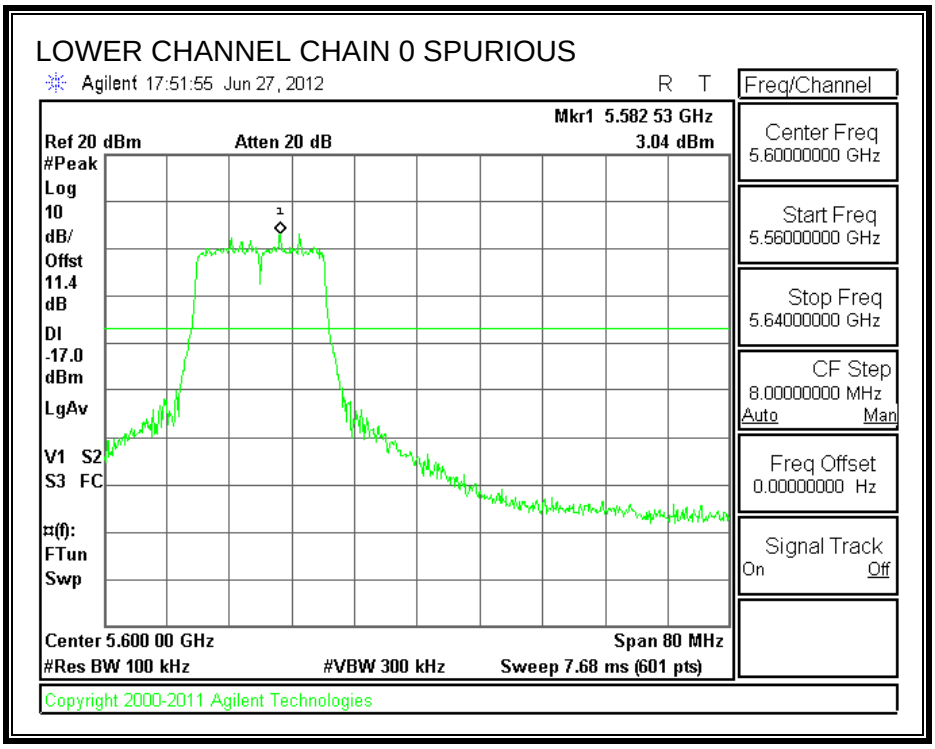
TEST PROCEDURE

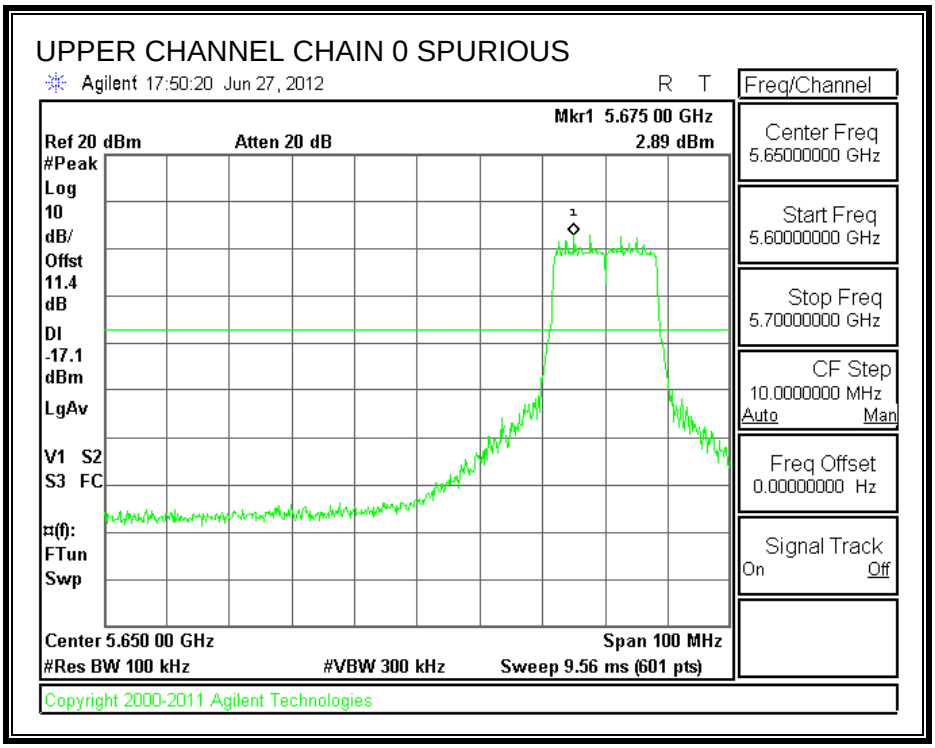
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The authorized channel nearest to and less than 5600 MHz is measured.

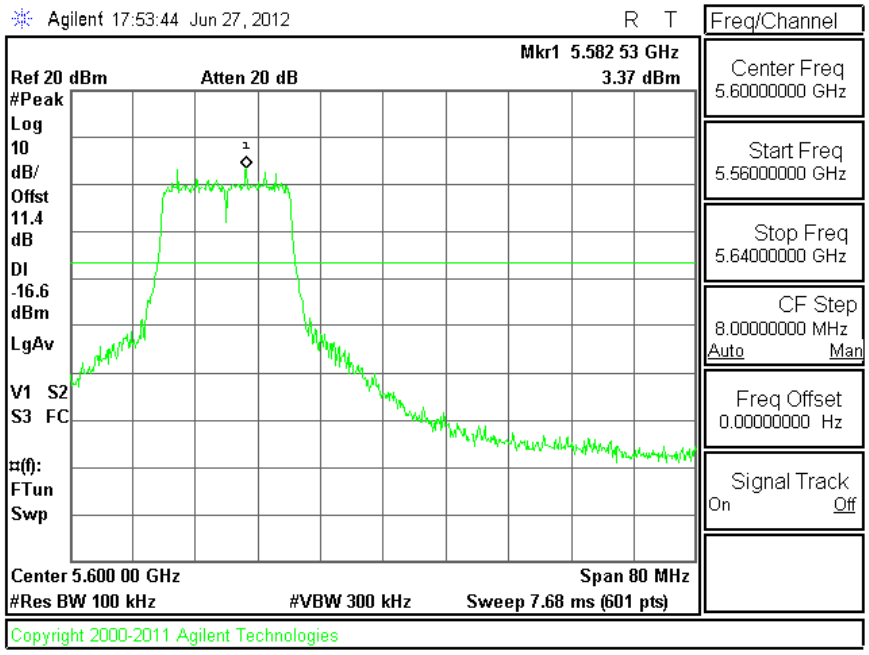
The authorized channel nearest to and greater than 5650 MHz is measured.

SPURIOUS EMISSIONS IN WEATHER RADAR BAND 5600 - 5650 MHz

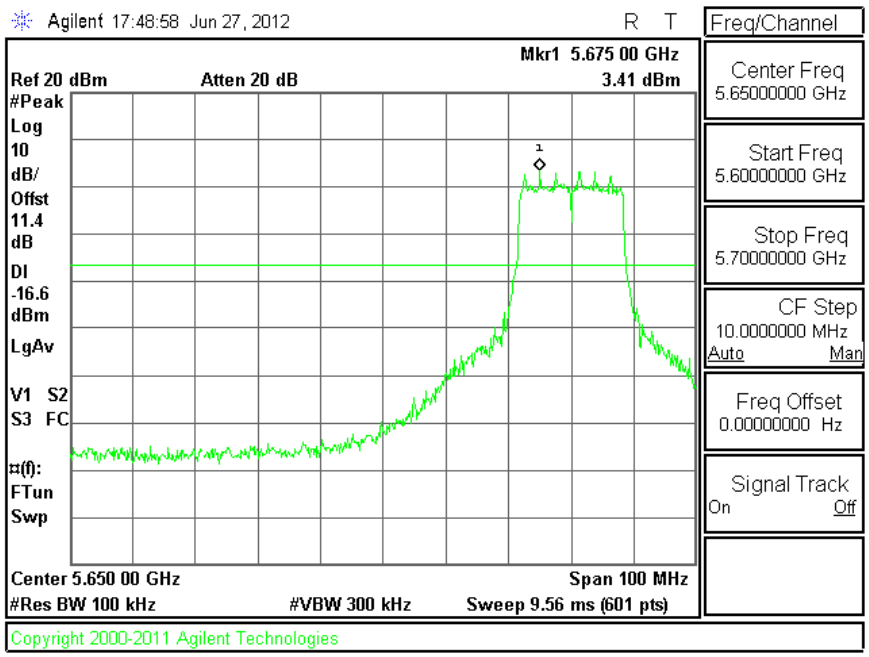




LOWER CHANNEL CHAIN 1 SPURIOUS



UPPER CHANNEL CHAIN 1 SPURIOUS



9.7. 802.11n HT20 MODE IN THE 5.6 GHz BAND

9.7.1. 26 dB BANDWIDTH

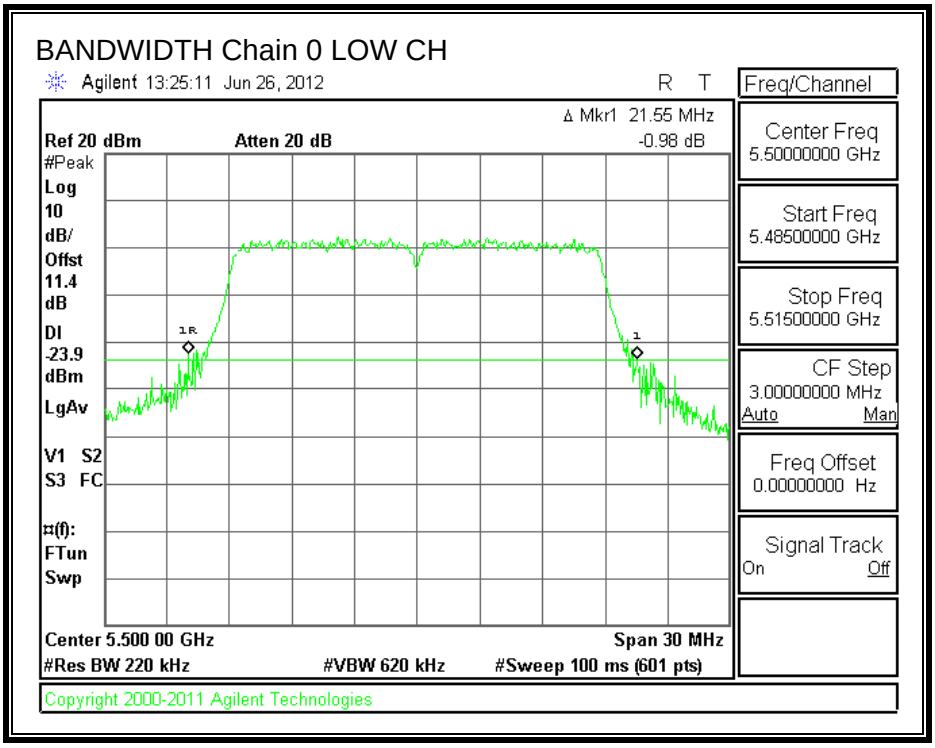
LIMITS

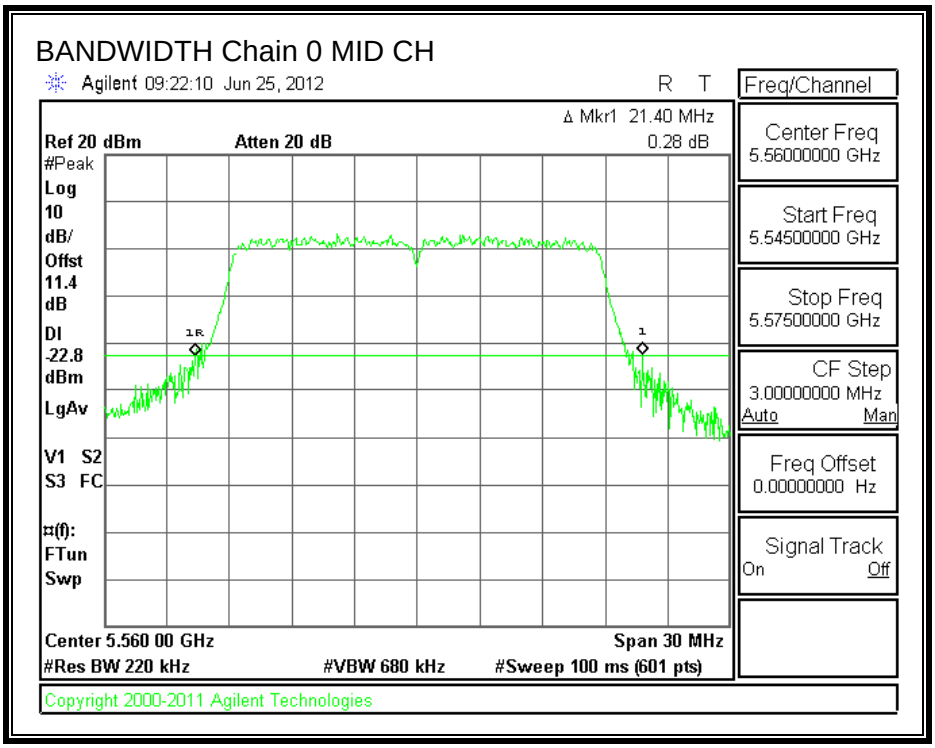
None; for reporting purposes only.

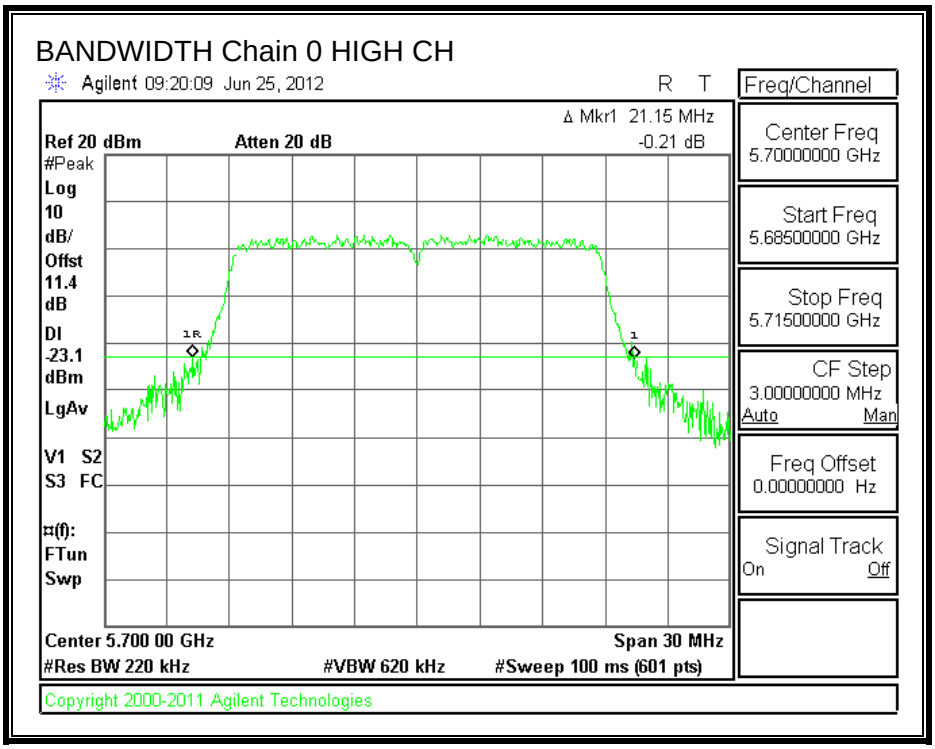
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5500	21.55	20.40
Mid	5560	21.40	20.90
High	5700	21.15	21.15

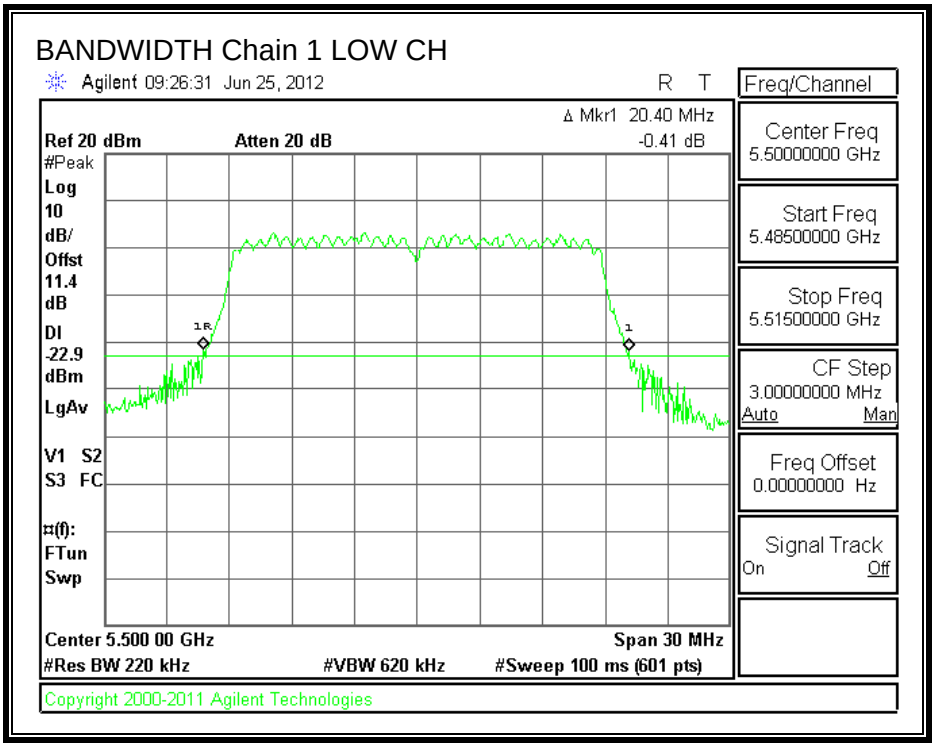
26 dB BANDWIDTH, Chain 0

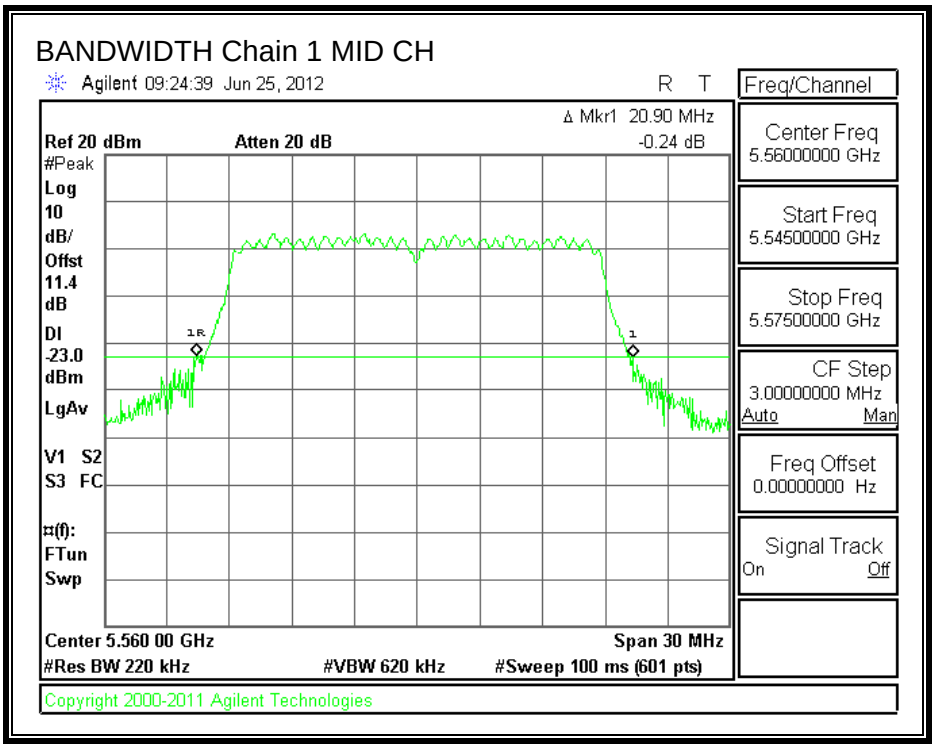


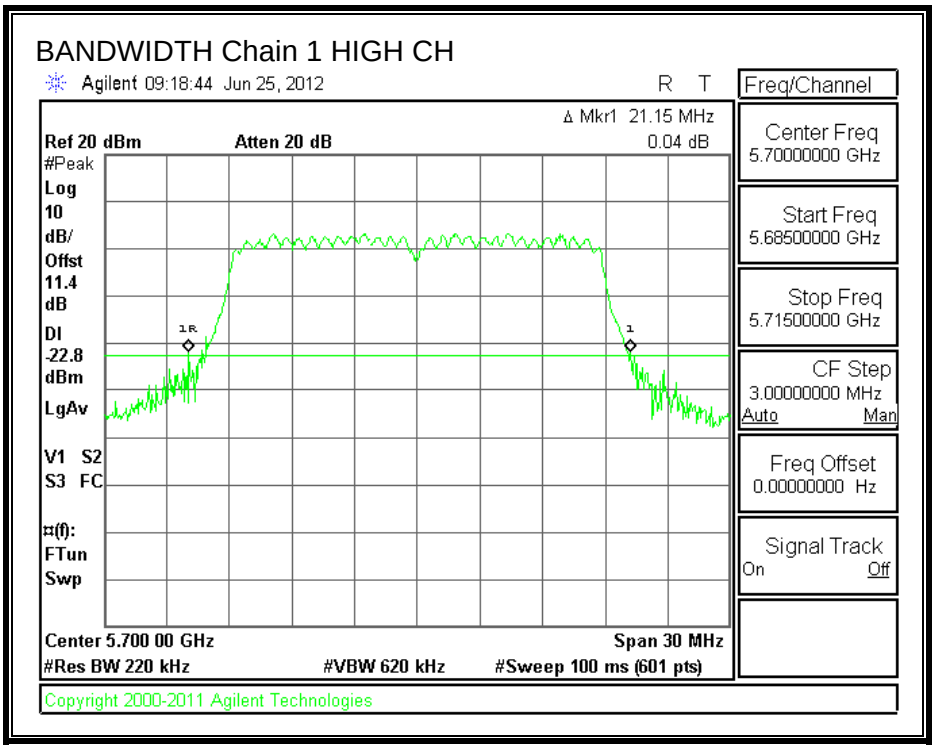




26 dB BANDWIDTH, Chain 1







9.7.2. 99% BANDWIDTH

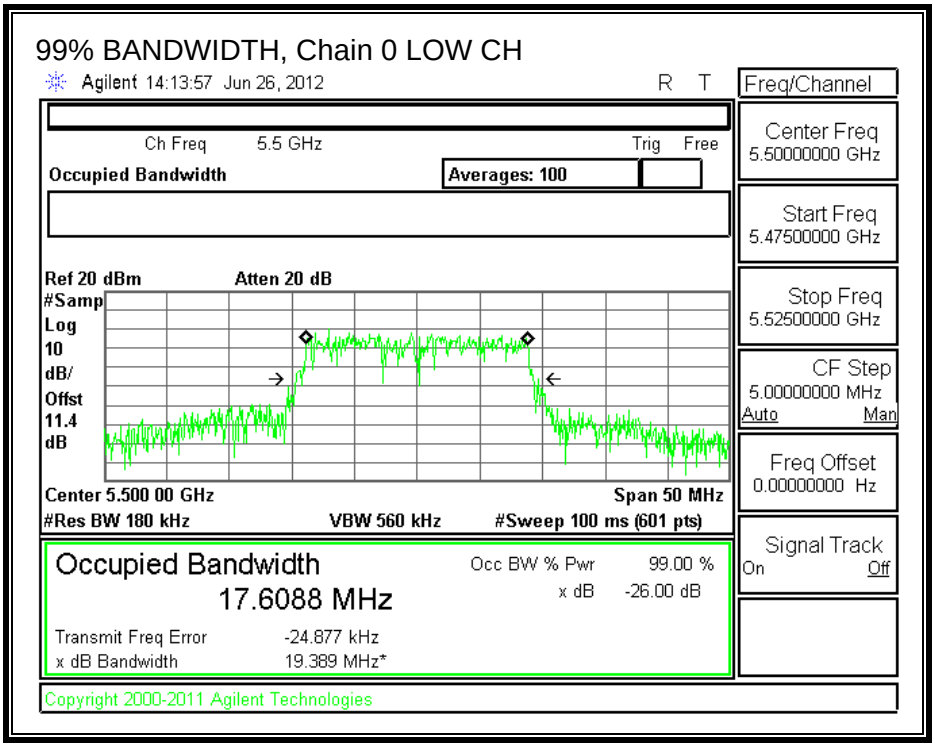
LIMITS

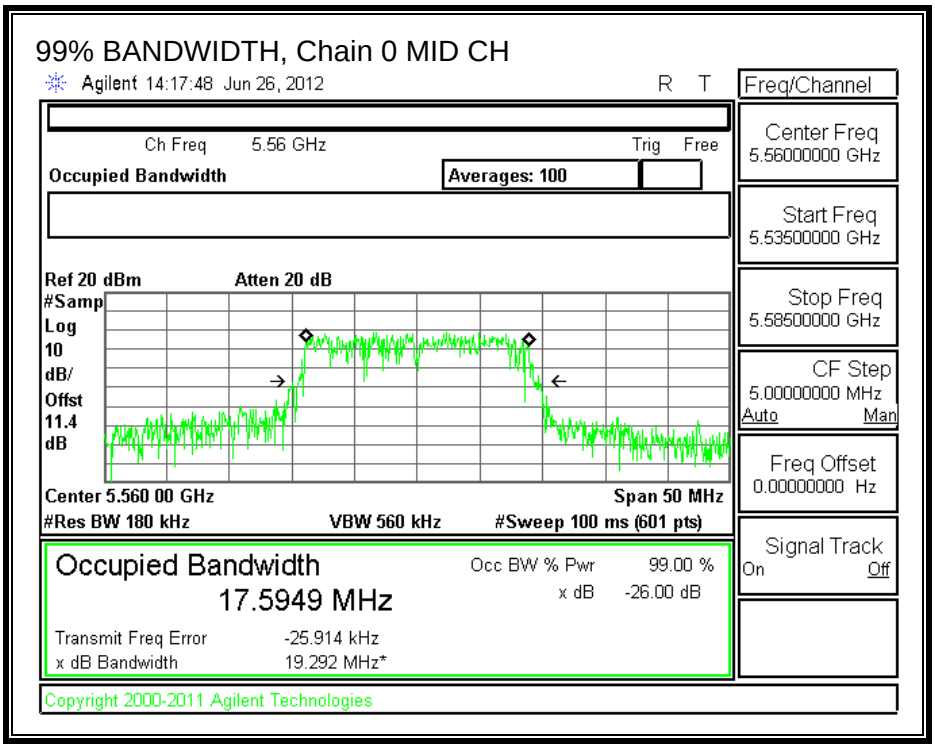
None; for reporting purposes only.

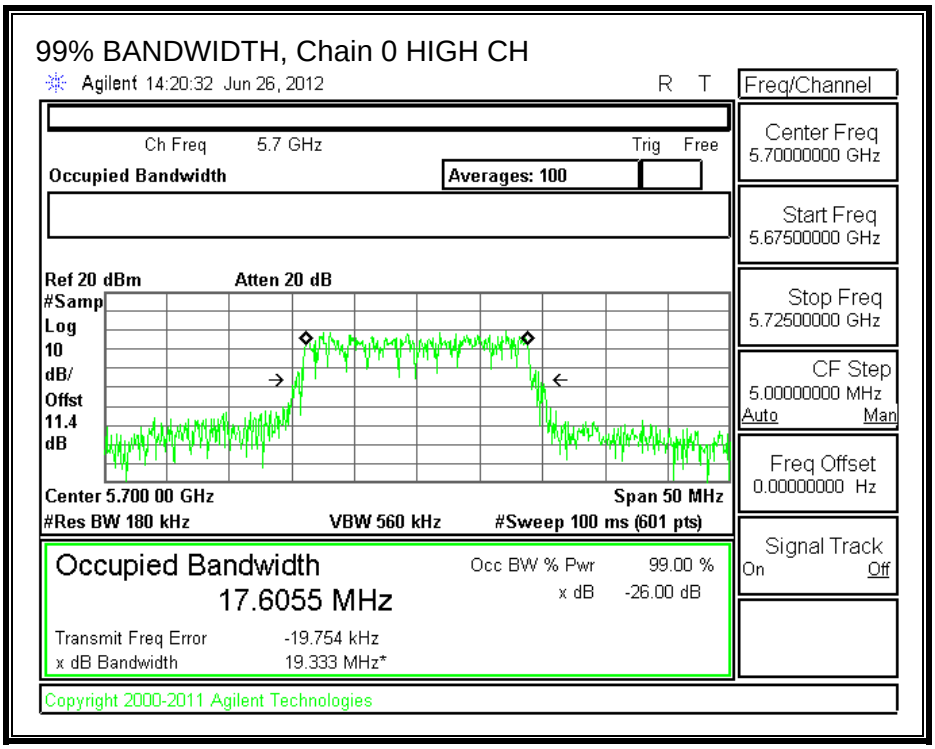
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5500	17.6088	17.6088
Mid	5560	17.5949	17.5943
High	5700	17.6055	17.5706

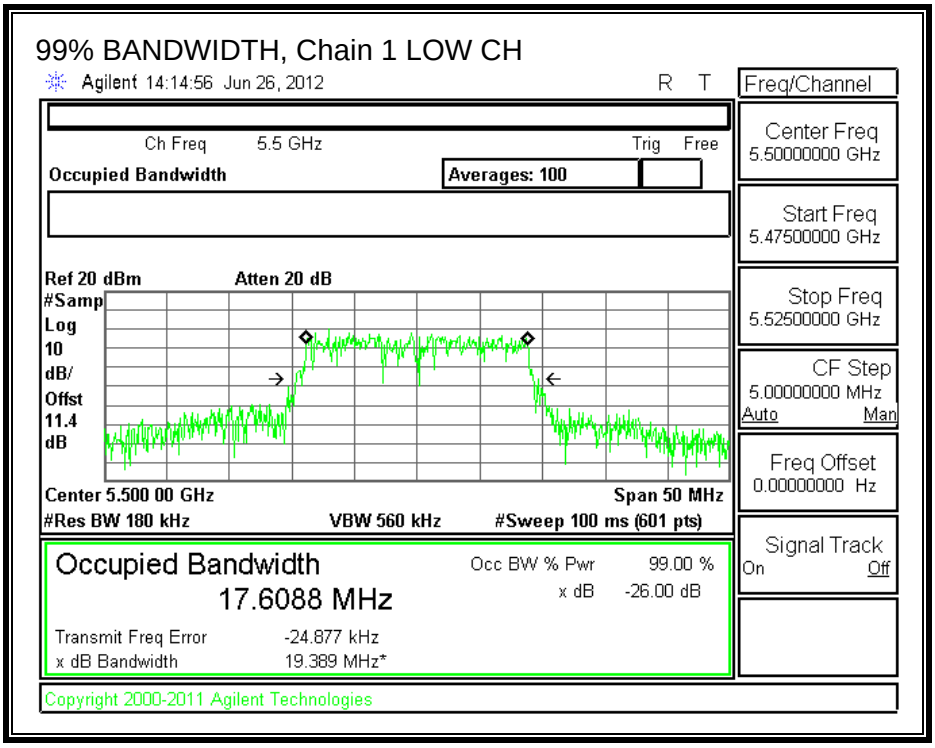
99% BANDWIDTH, Chain 0

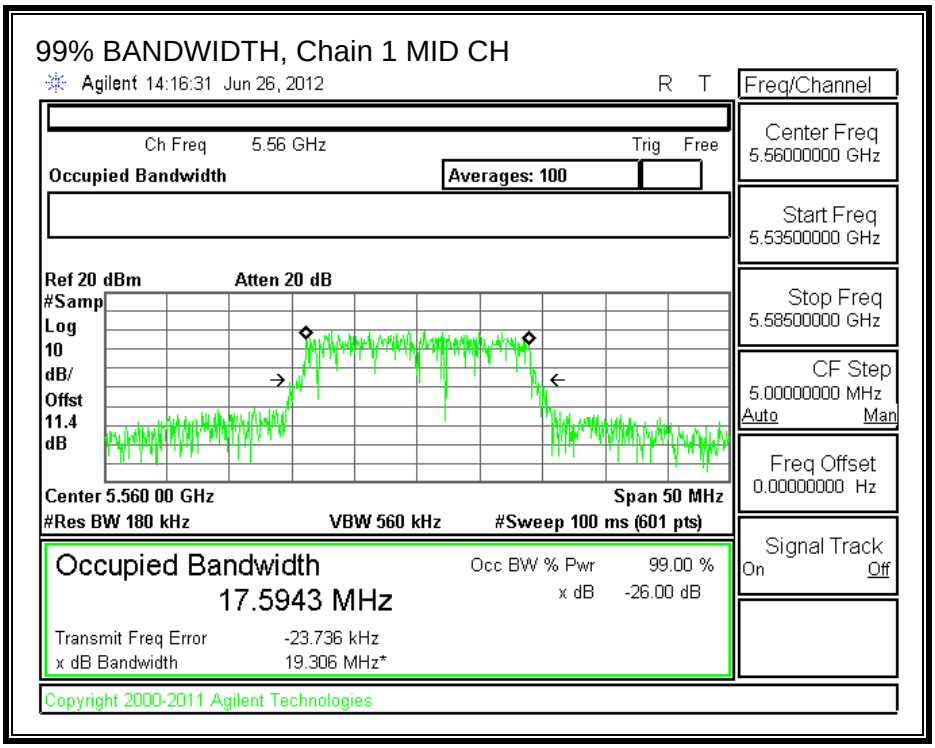


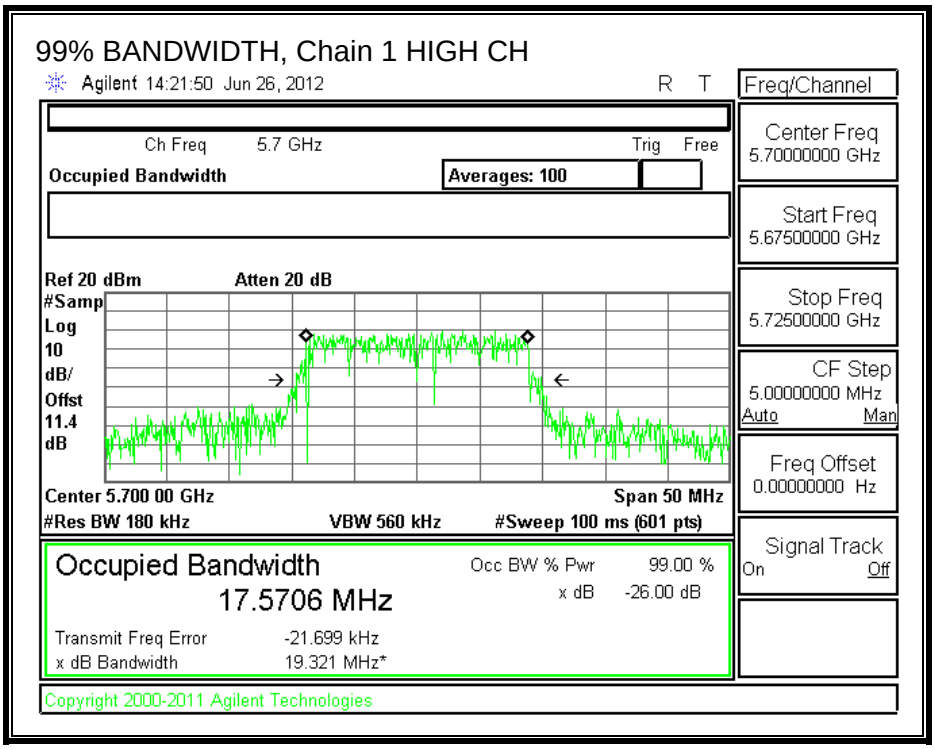




99% BANDWIDTH, Chain 1







9.7.3. 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)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5500	12.30	12.90	15.62
Mid	5560	12.90	12.90	15.91
High	5700	13.10	13.20	16.16

9.7.4. 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

The TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Correlated Chains Directional Gain (dBi)
6.00	3.01	9.01

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	20.40	24.10	9.01	20.99	7.99
Mid	5560	24	20.90	24.20	9.01	20.99	7.99
High	5700	24	21.15	24.25	9.01	20.99	7.99

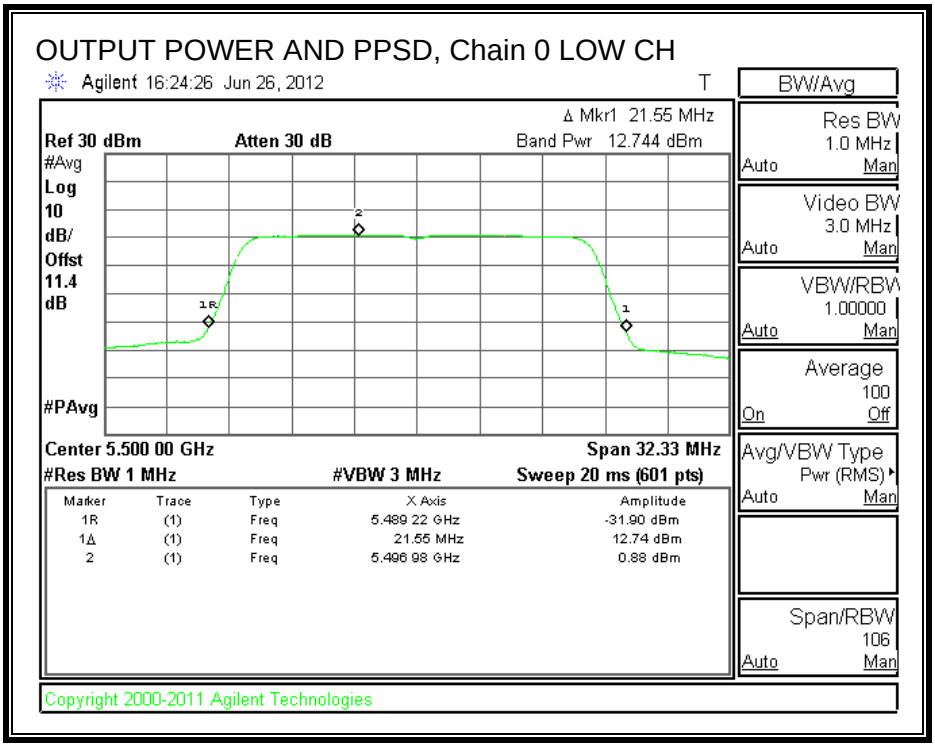
Output Power Results

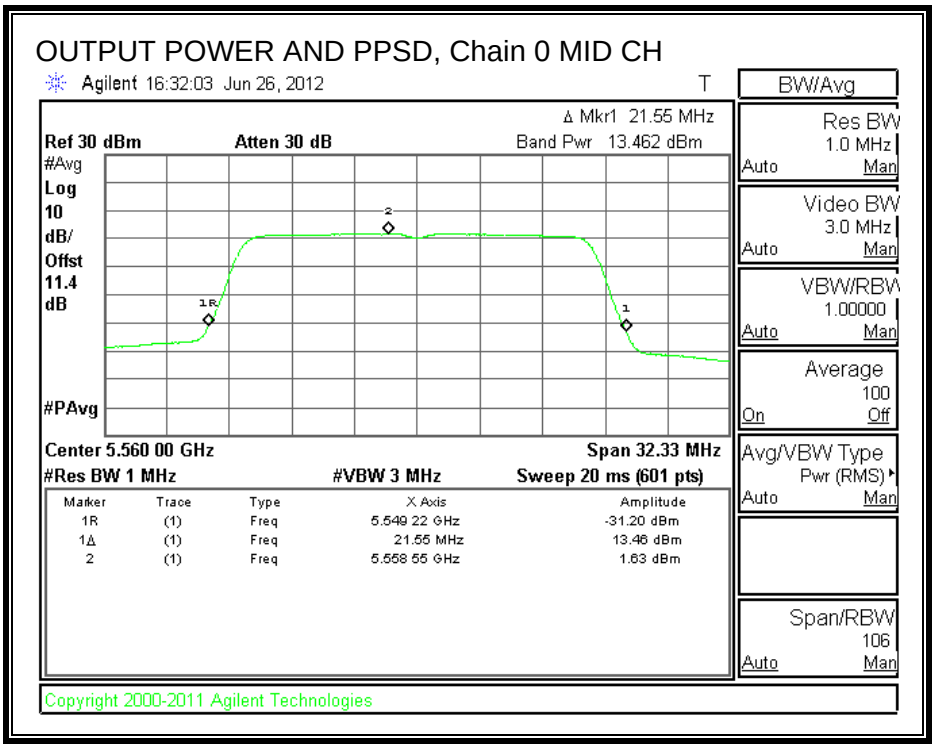
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	12.744	13.436	16.114	20.99	-4.876
Mid	5560	13.462	13.412	16.447	20.99	-4.543
High	5700	13.248	13.456	16.364	20.99	-4.626

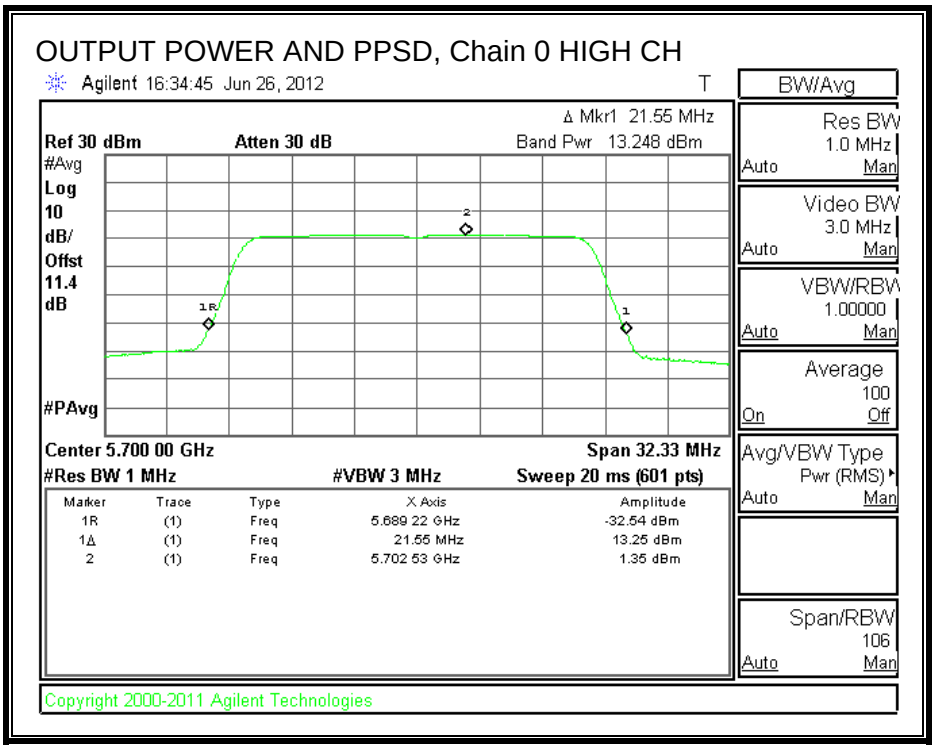
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	0.88	1.64	4.29	7.99	-3.70
Mid	5560	1.63	1.66	4.66	7.99	-3.33
High	5700	1.35	1.69	4.53	7.99	-3.46

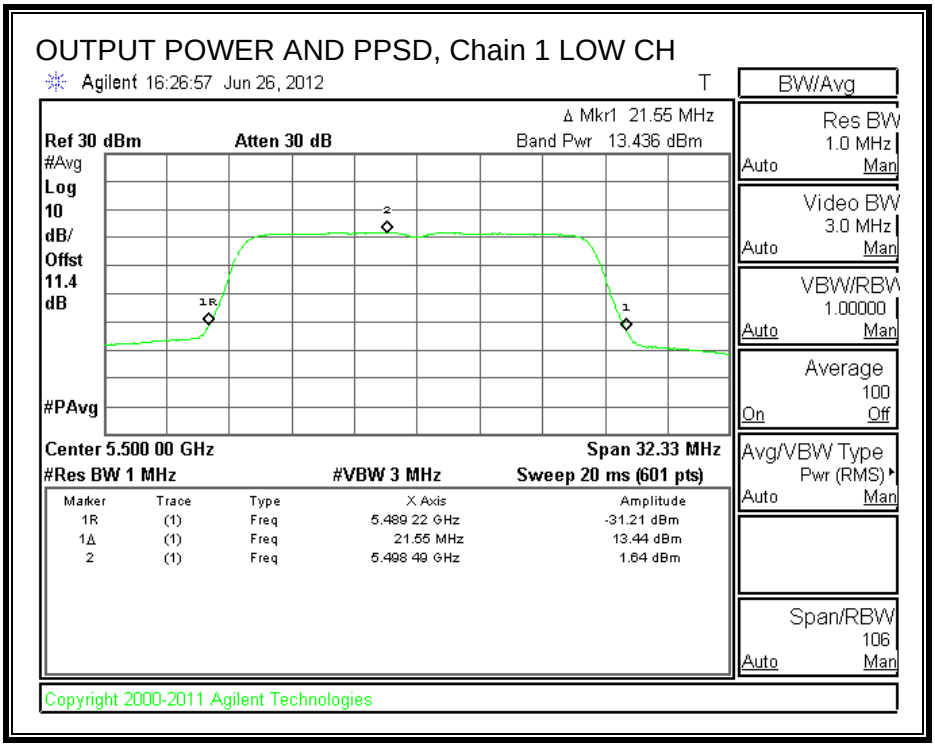
OUTPUT POWER AND PPSD, Chain 0

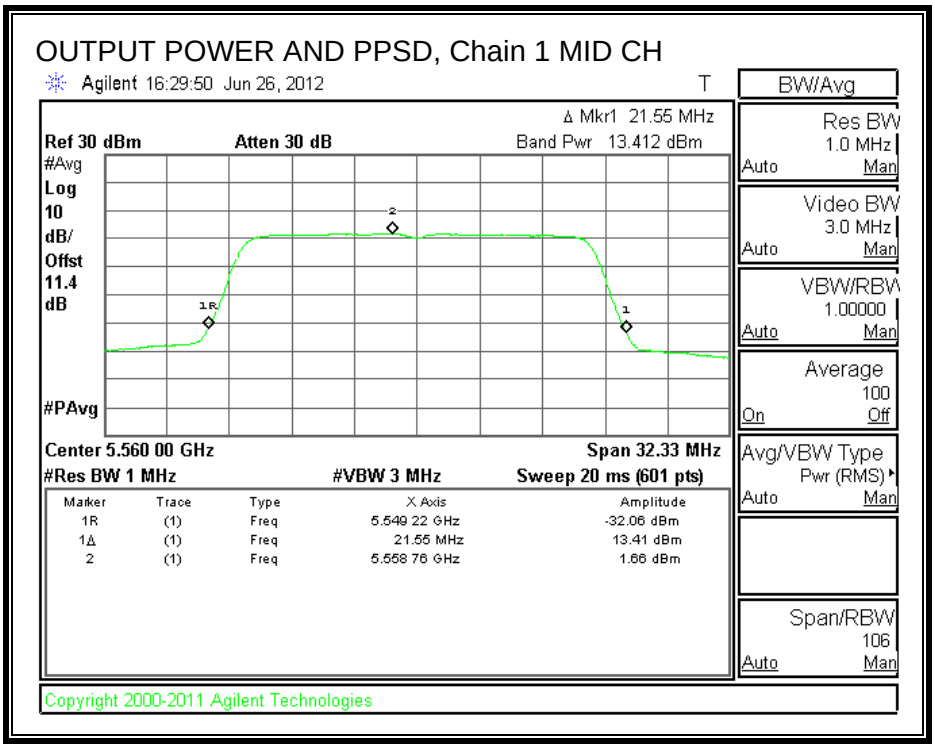


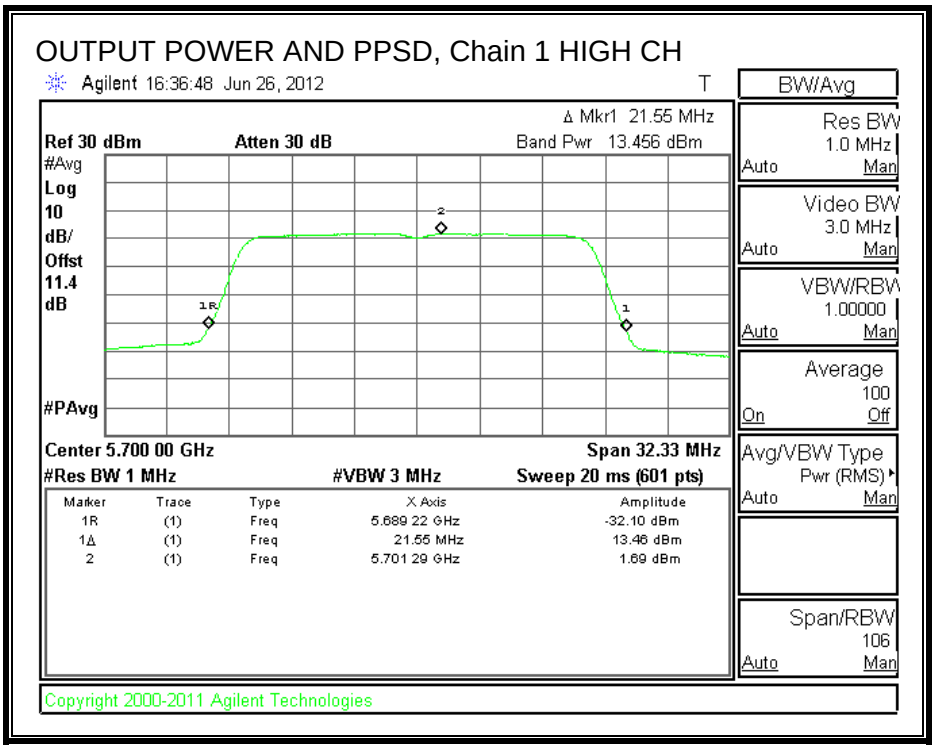




OUTPUT POWER AND PPSD, Chain 1







9.7.5. 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

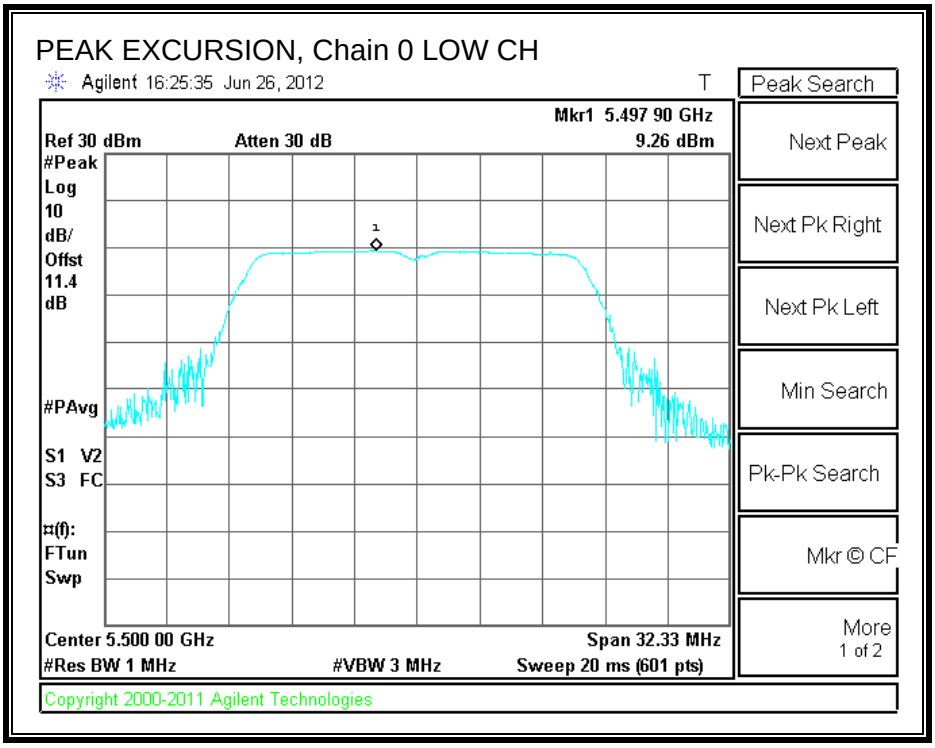
Chain 0

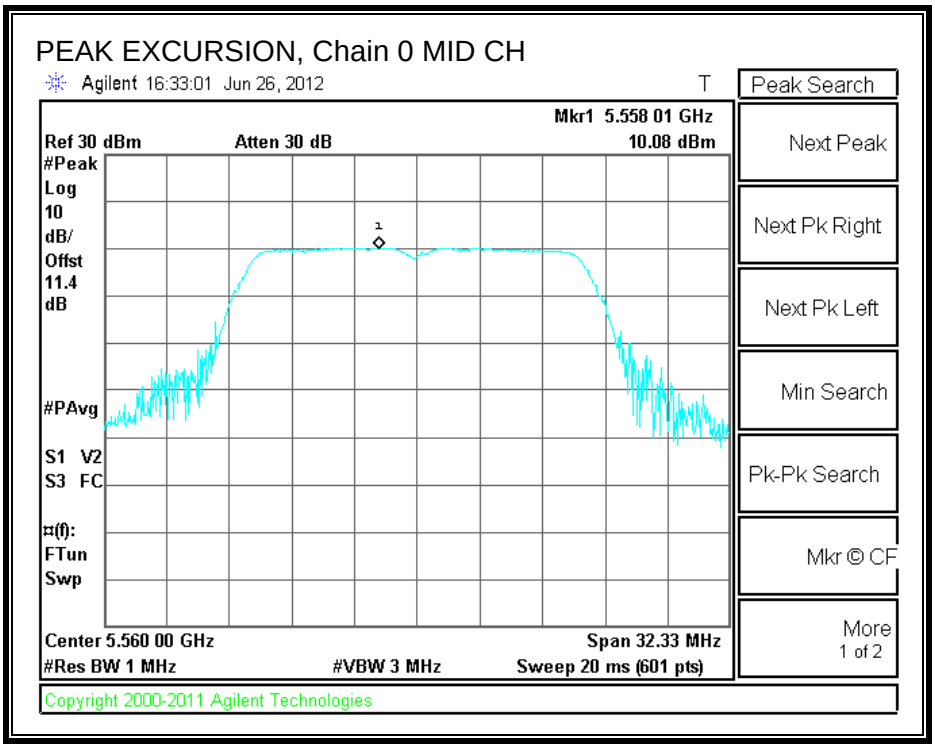
Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5500	9.26	0.88	0.04	8.34	13	-4.66
Mid	5580	10.08	1.63	0.04	8.41	13	-4.59
High	5700	10.00	1.35	0.04	8.61	13	-4.39

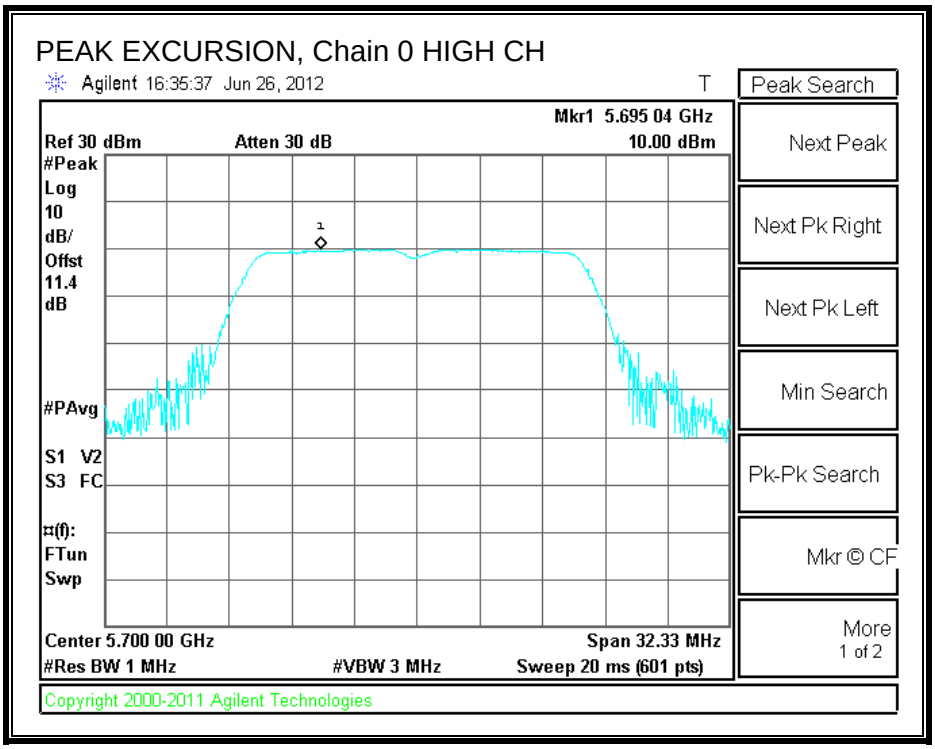
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5500	11.66	1.64	0.04	9.98	13	-3.02
Mid	5580	11.34	1.66	0.04	9.64	13	-3.36
High	5700	11.25	1.69	0.04	9.52	13	-3.48

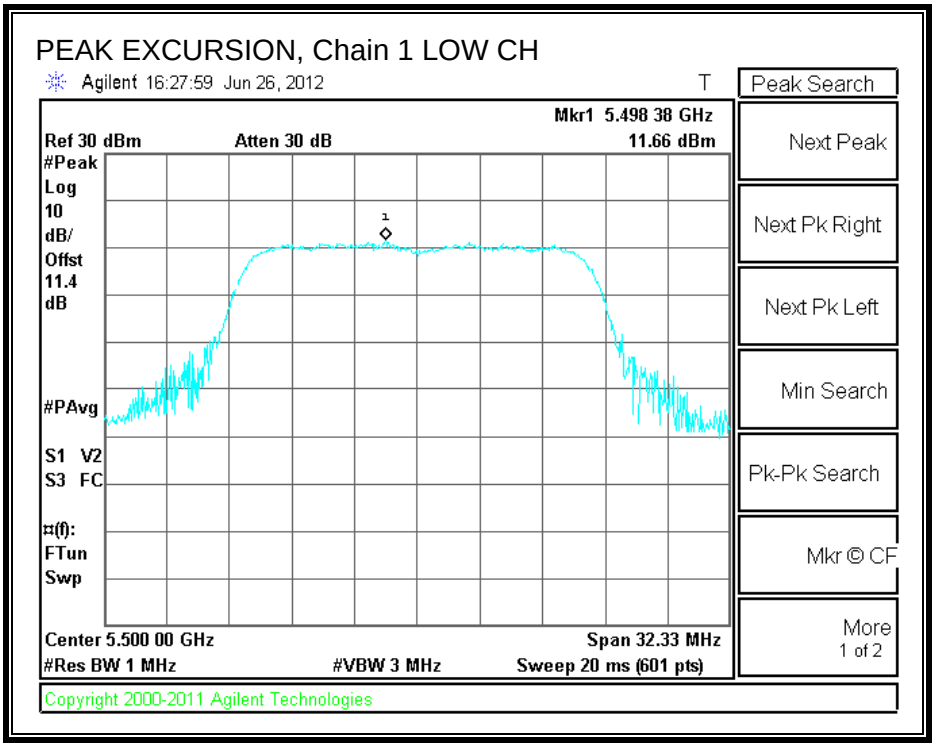
PEAK EXCURSION, Chain 0

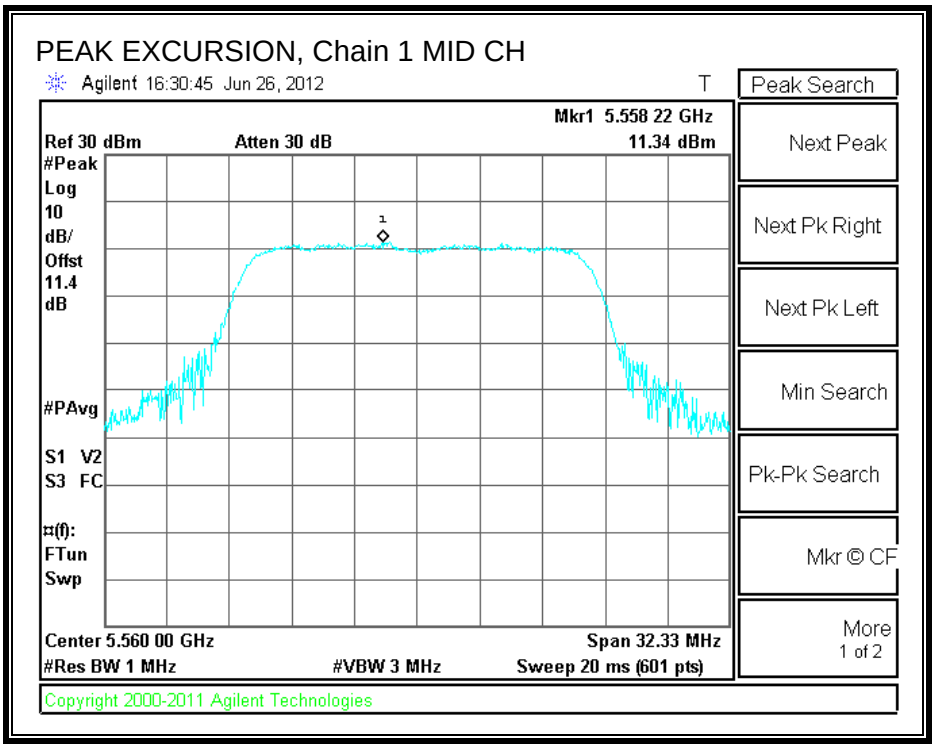


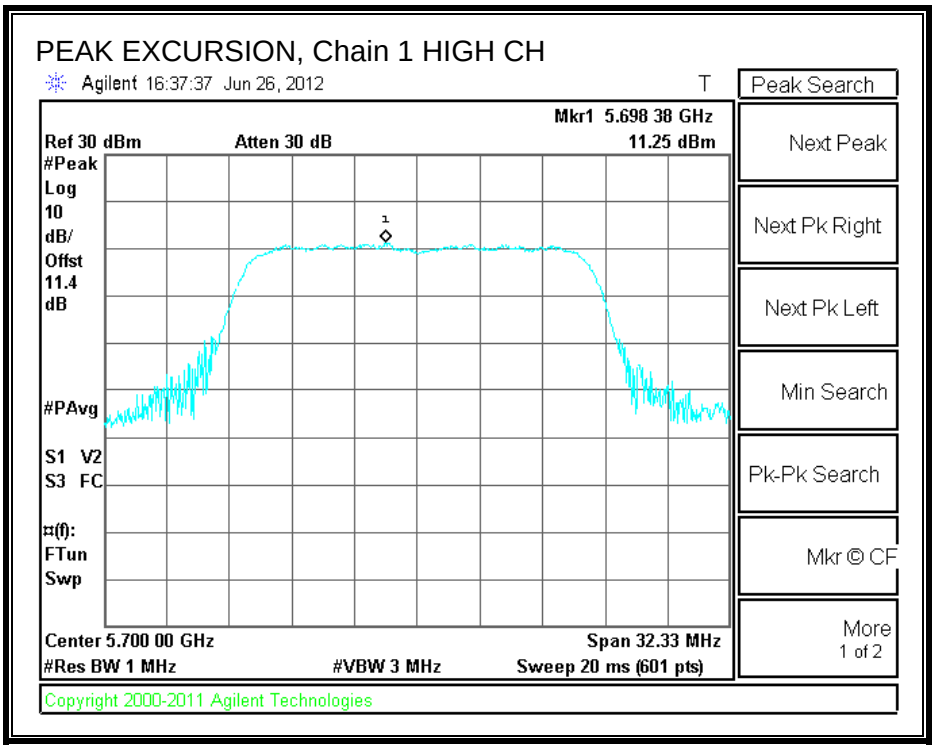




PEAK EXCURSION, Chain 1







9.7.6. CONDUCTED WEATHER RADAR BAND EMISSIONS

LIMITS

Within 5600 – 5650 MHz band, -20 dBc relative to highest fundamental output power density per 100 kHz.

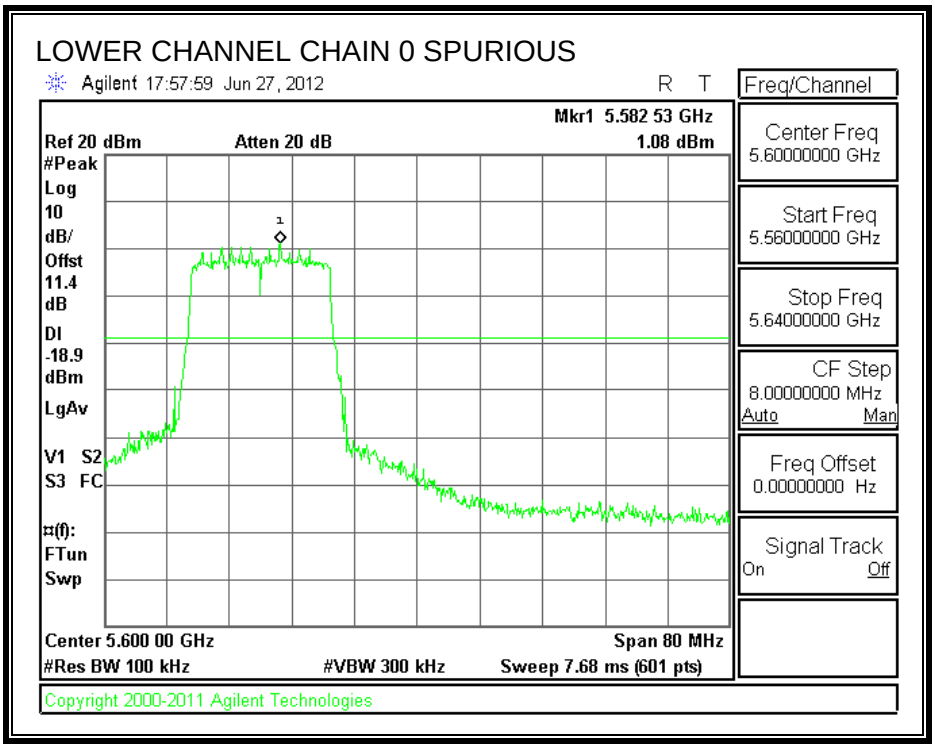
TEST PROCEDURE

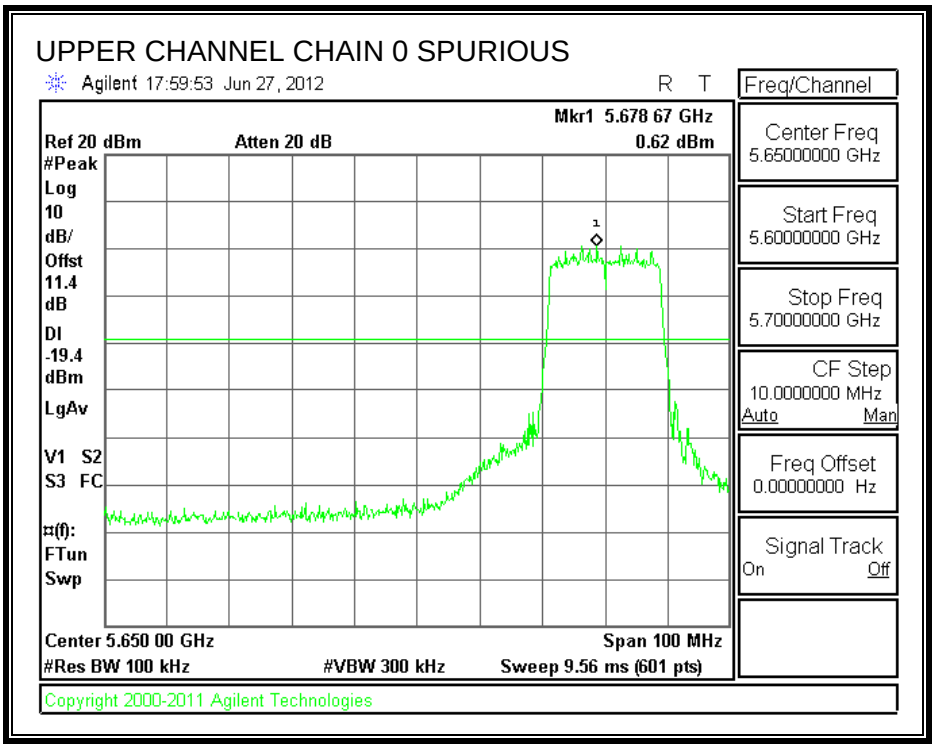
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The authorized channel nearest to and less than 5600 MHz is measured.

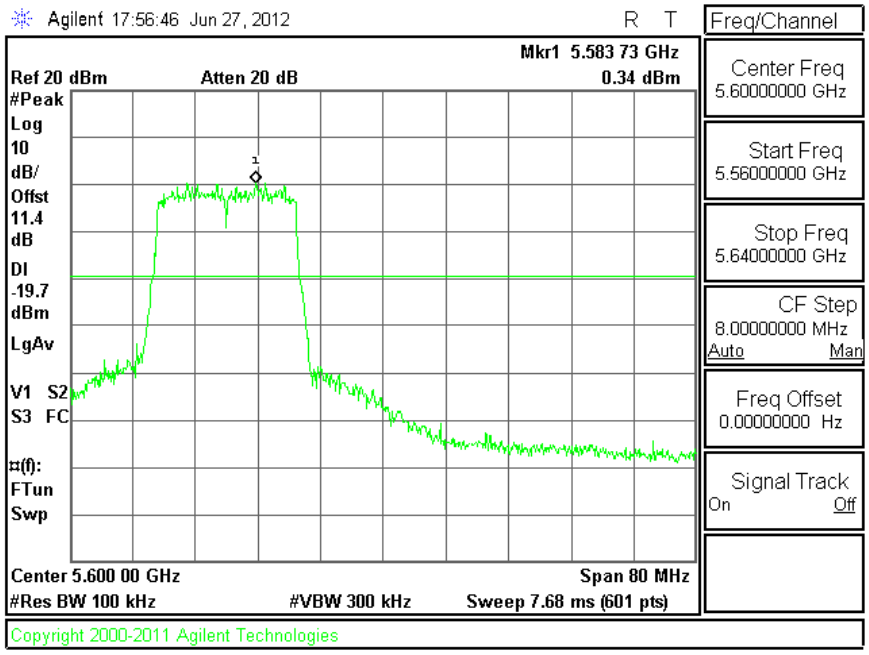
The authorized channel nearest to and greater than 5650 MHz is measured.

SPURIOUS EMISSIONS IN WEATHER RADAR BAND 5600 - 5650 MHz

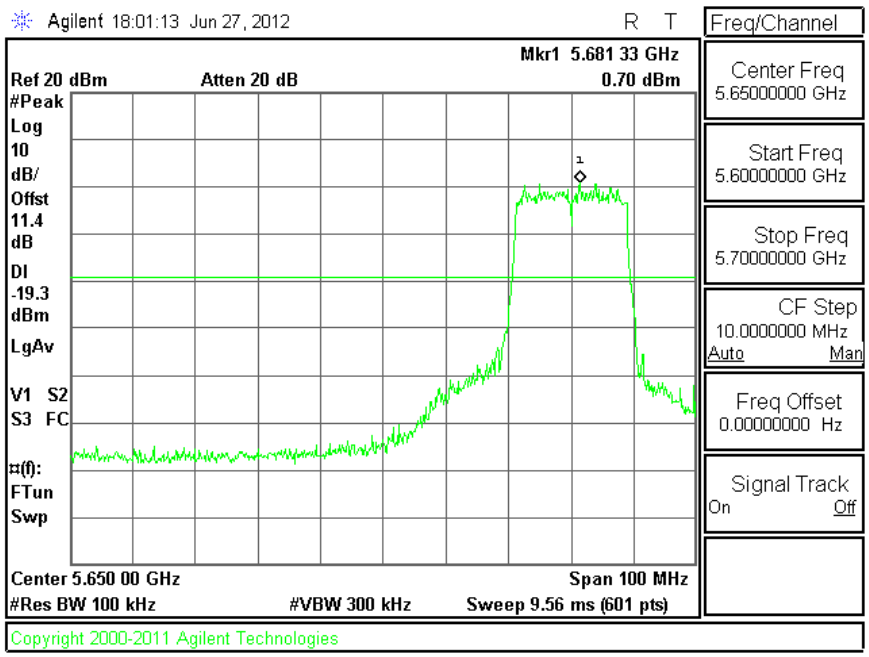




LOWER CHANNEL CHAIN 1 SPURIOUS



UPPER CHANNEL CHAIN 1 SPURIOUS



9.8. 802.11n HT40 MODE IN THE 5.6 GHz BAND

9.8.1. 26 dB BANDWIDTH

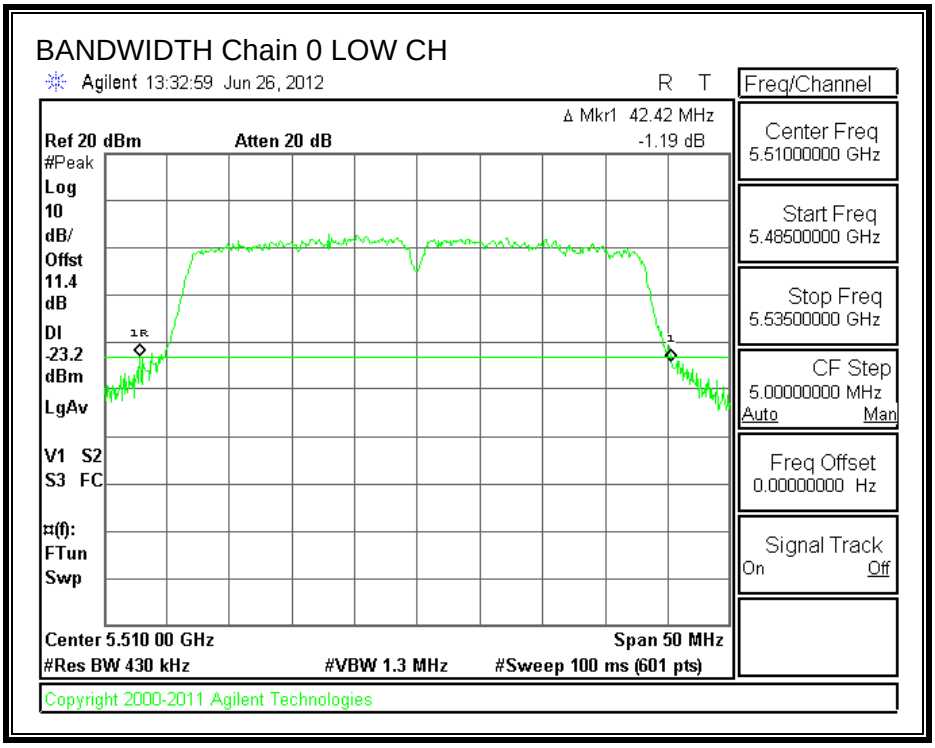
LIMITS

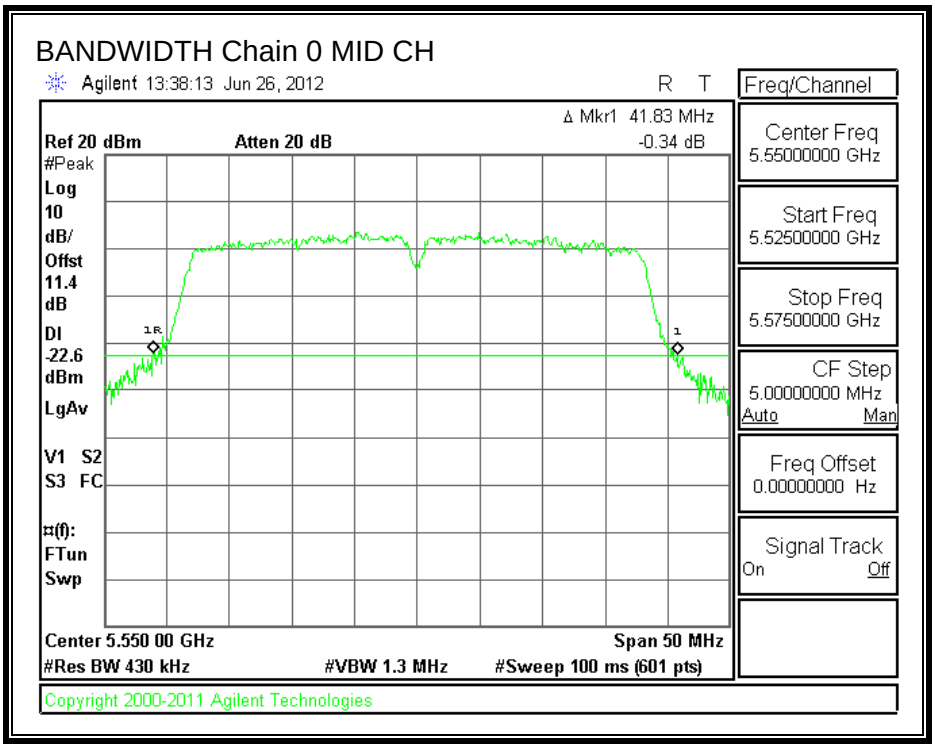
None; for reporting purposes only.

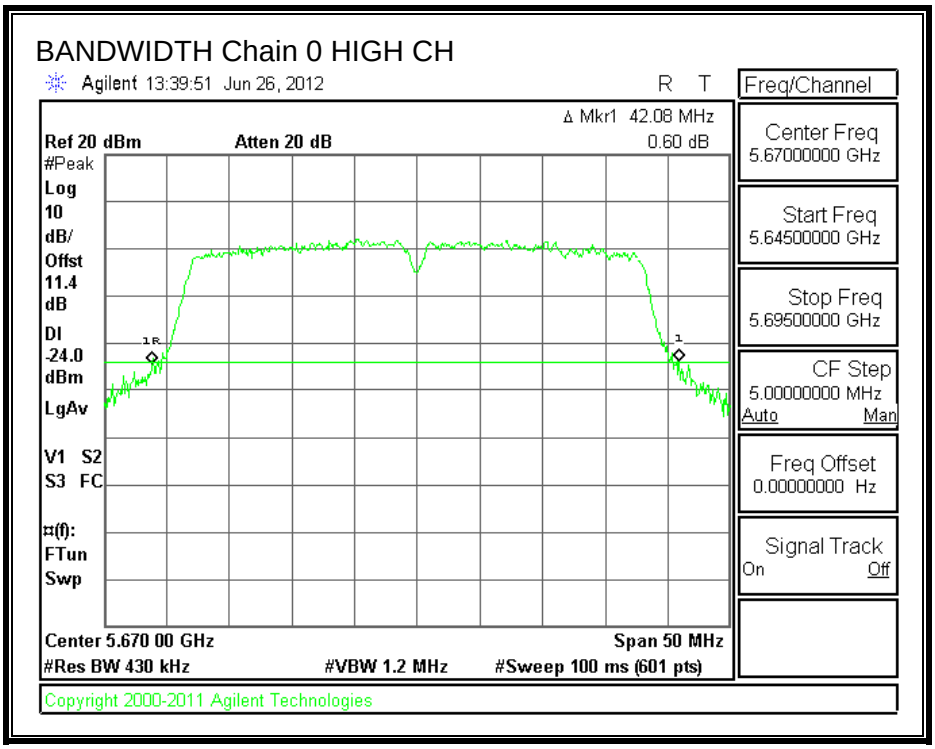
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5510	42.42	41.08
Mid	5550	41.83	42.42
High	5670	42.08	41.58

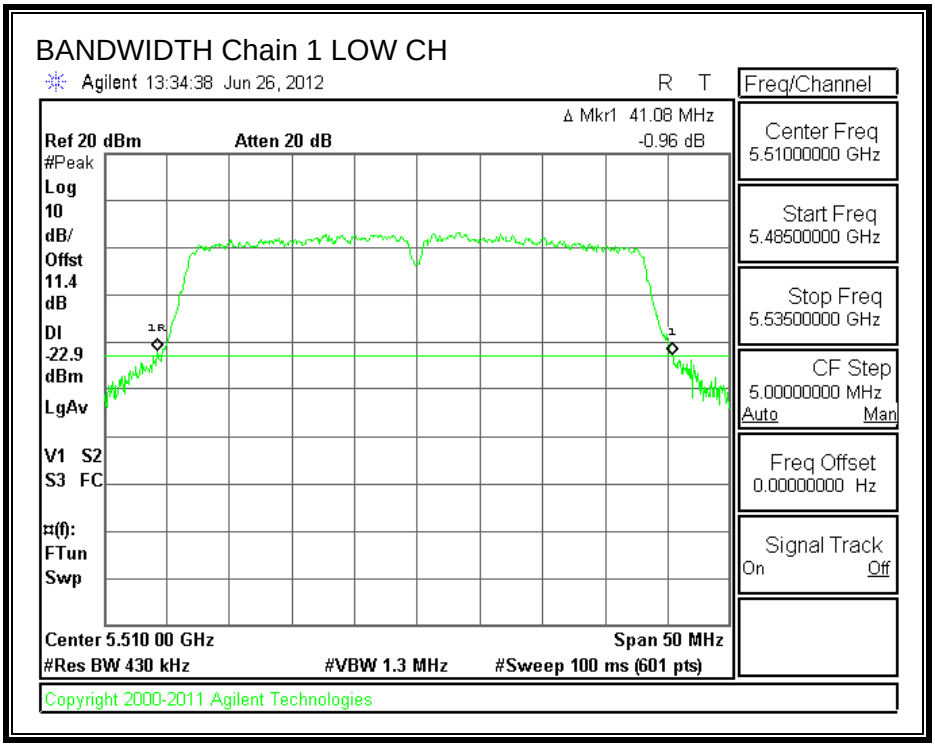
26 dB BANDWIDTH, Chain 0

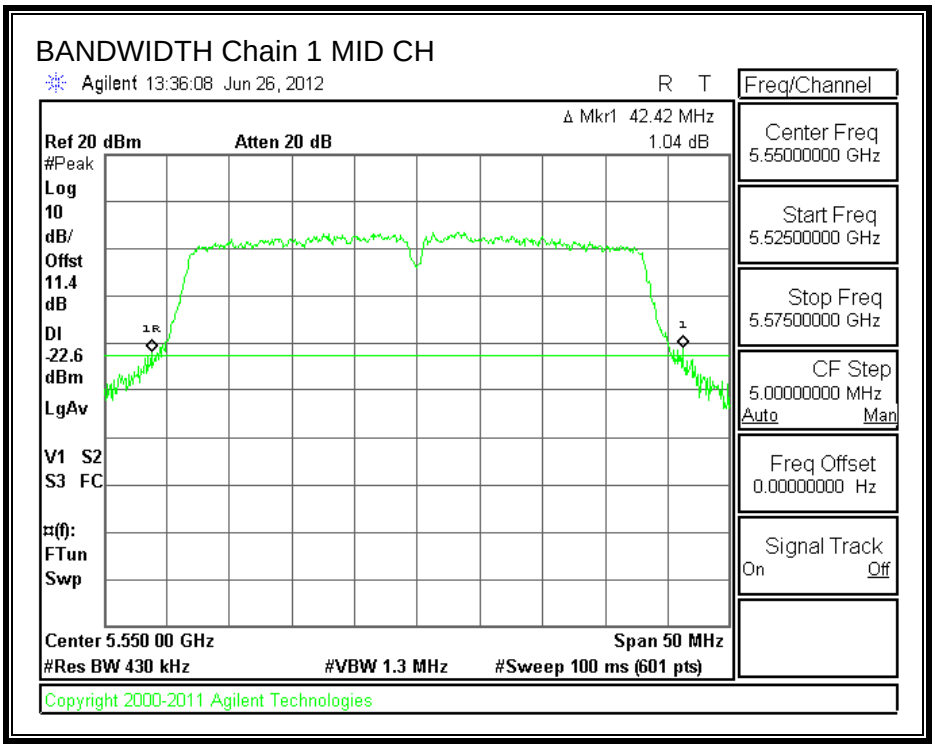


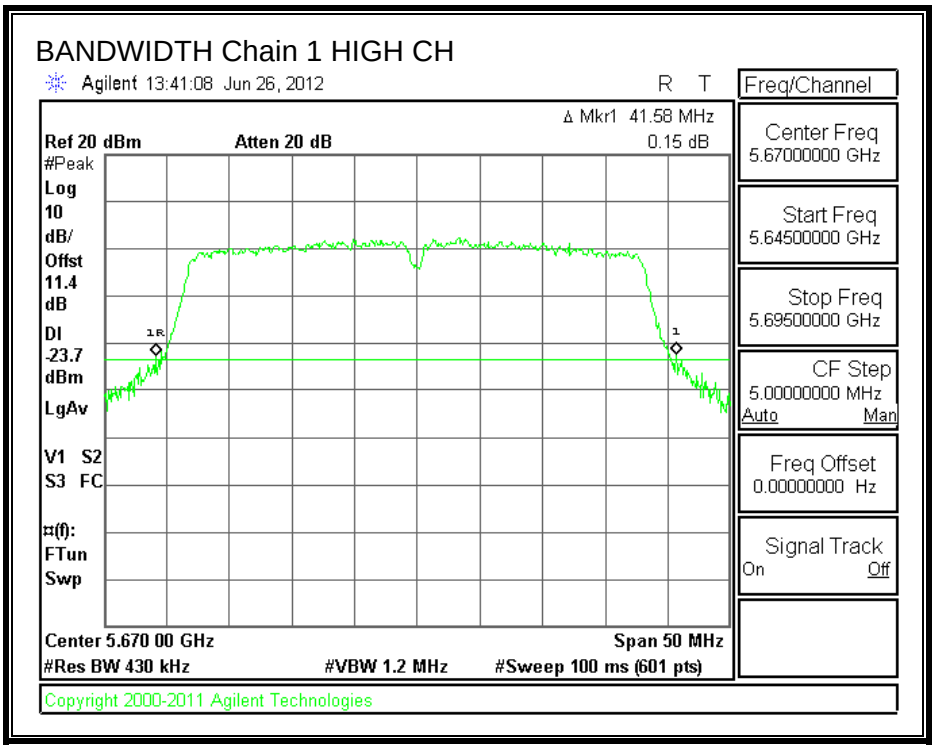




26 dB BANDWIDTH, Chain 1







9.8.2. 99% BANDWIDTH

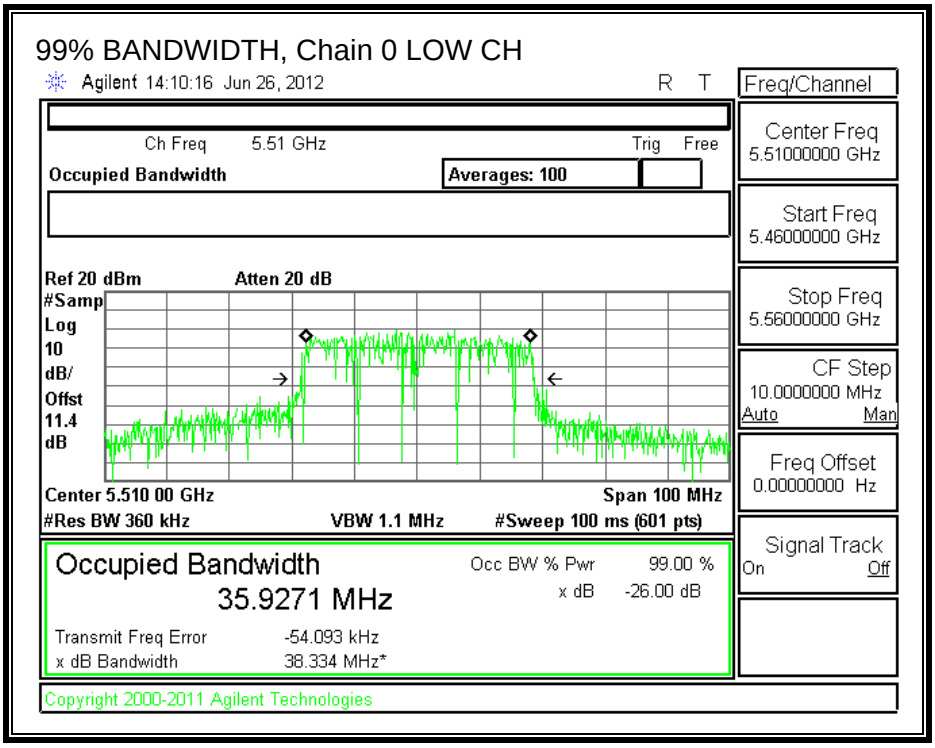
LIMITS

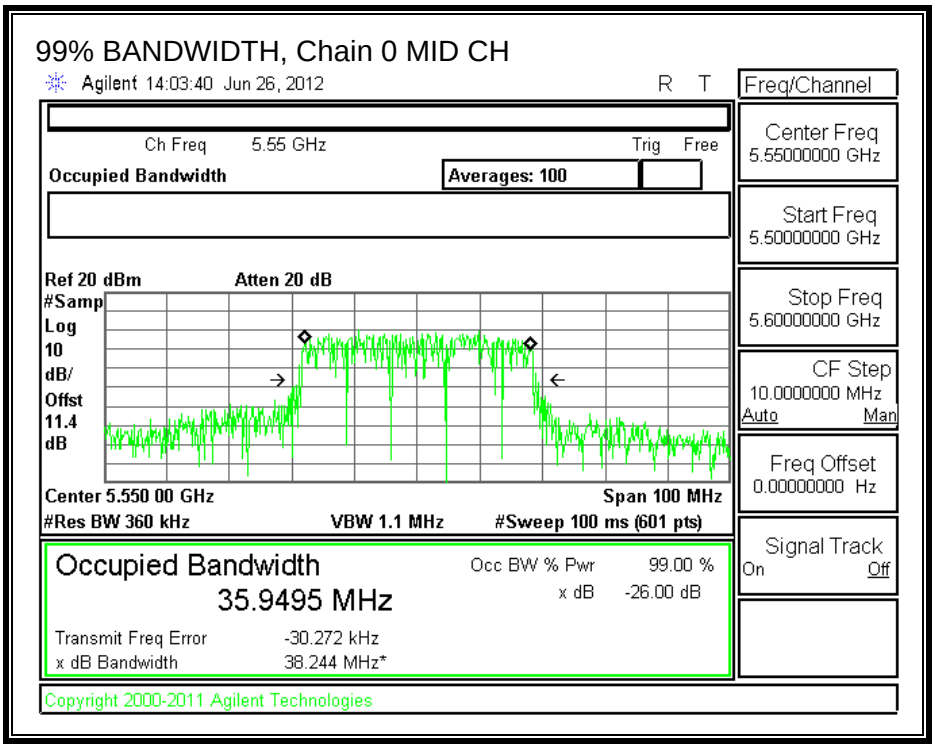
None; for reporting purposes only.

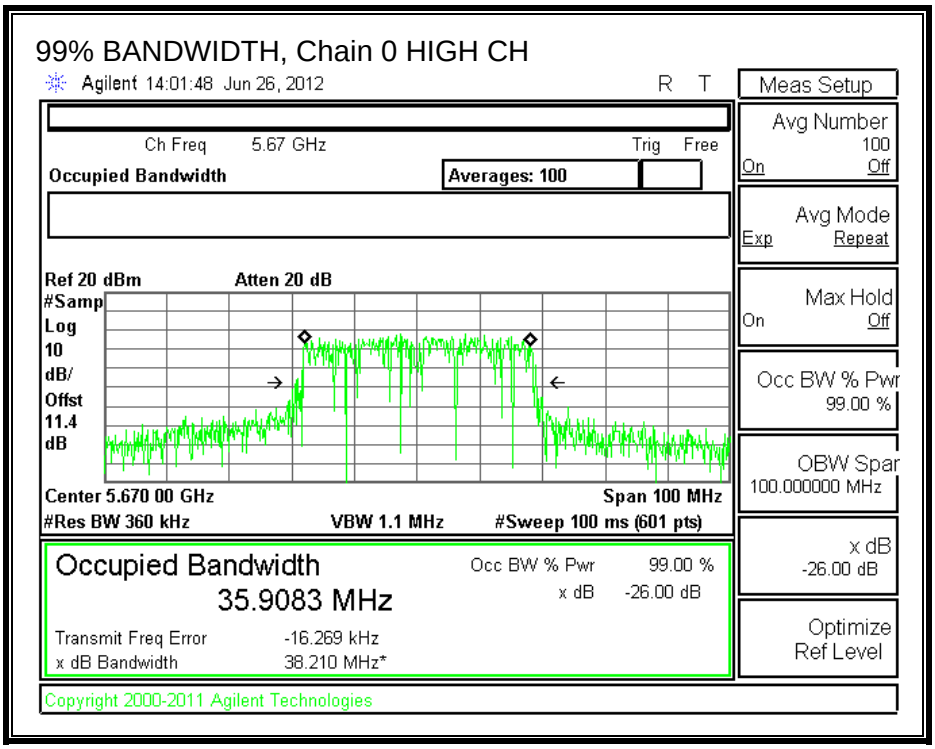
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5510	35.9271	35.9210
Mid	5550	35.9495	35.9436
High	5670	35.9083	35.9007

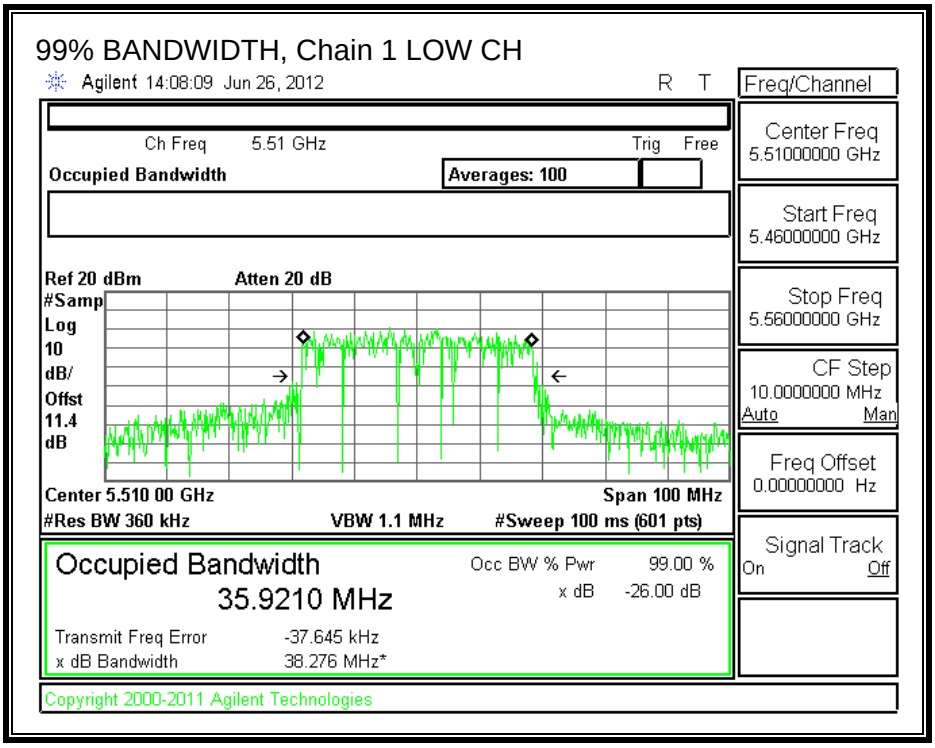
99% BANDWIDTH, Chain 0

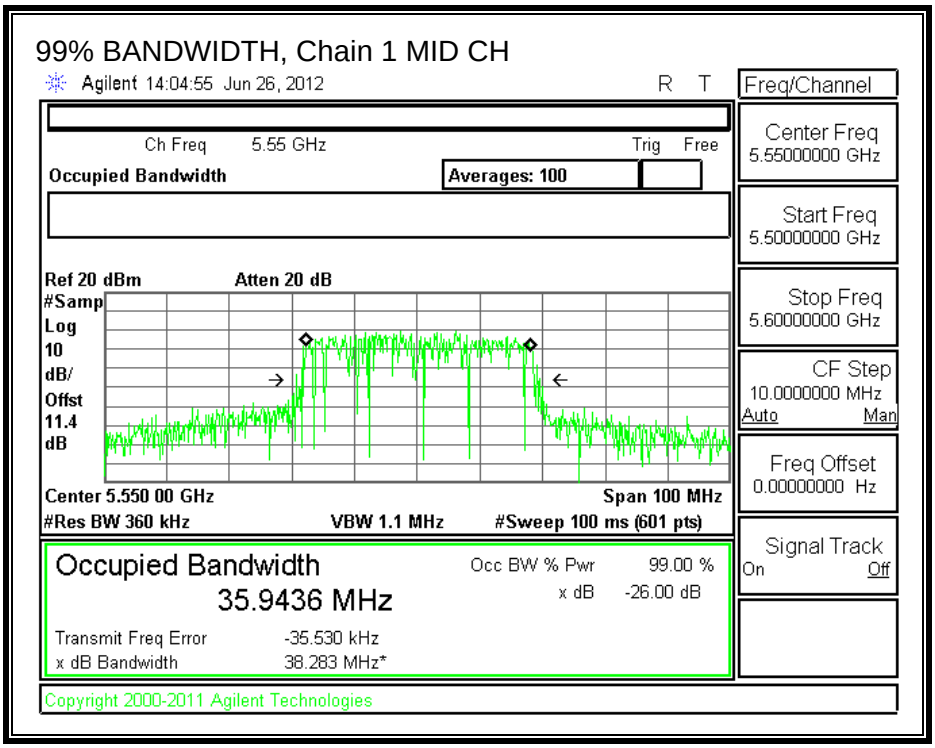


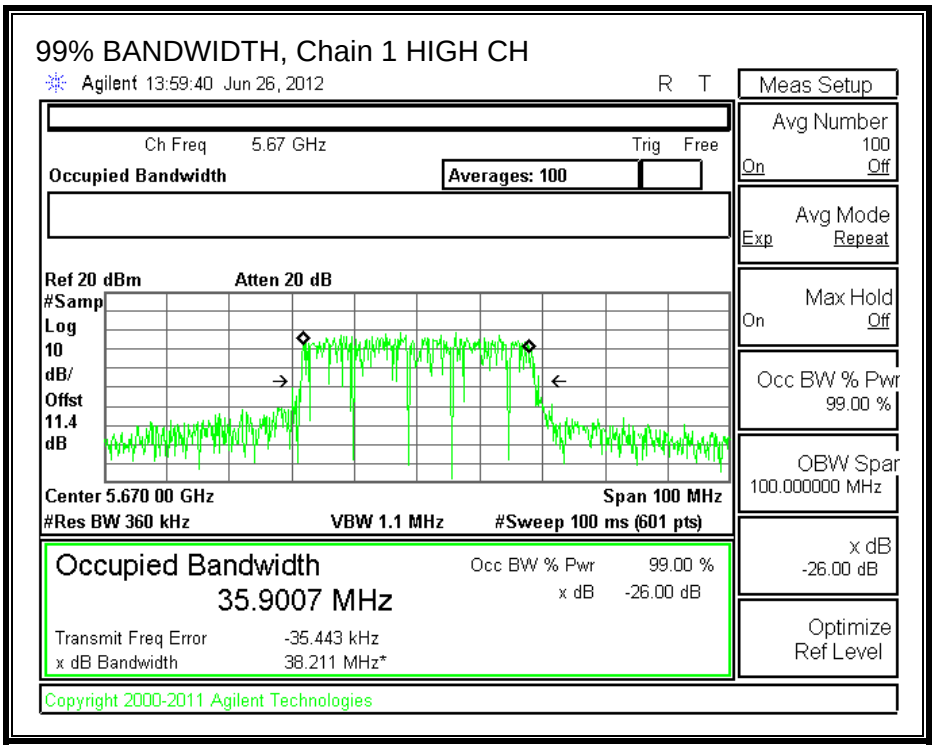




99% BANDWIDTH, Chain 1







9.8.3. 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)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5510	12.00	12.60	15.32
Mid	5550	12.60	12.90	15.76
High	5670	11.60	11.50	14.56

9.8.4. 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

The TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Correlated Chains Directional Gain (dBi)
6.00	3.01	9.01

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	5510	24	41.08	27.14	9.01	20.99	7.99
Mid	5550	24	41.83	27.21	9.01	20.99	7.99
High	5670	24	41.58	27.19	9.01	20.99	7.99

Duty Cycle CF (dB)	0.14	Included in Calculations of Corr'd Power & PPSD

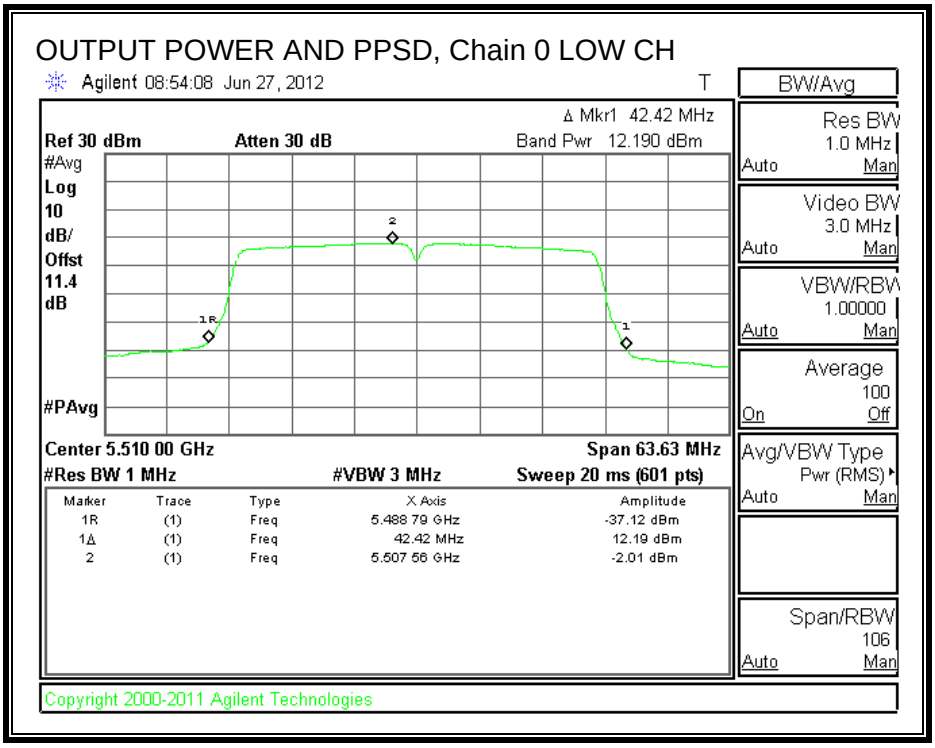
Output Power Results

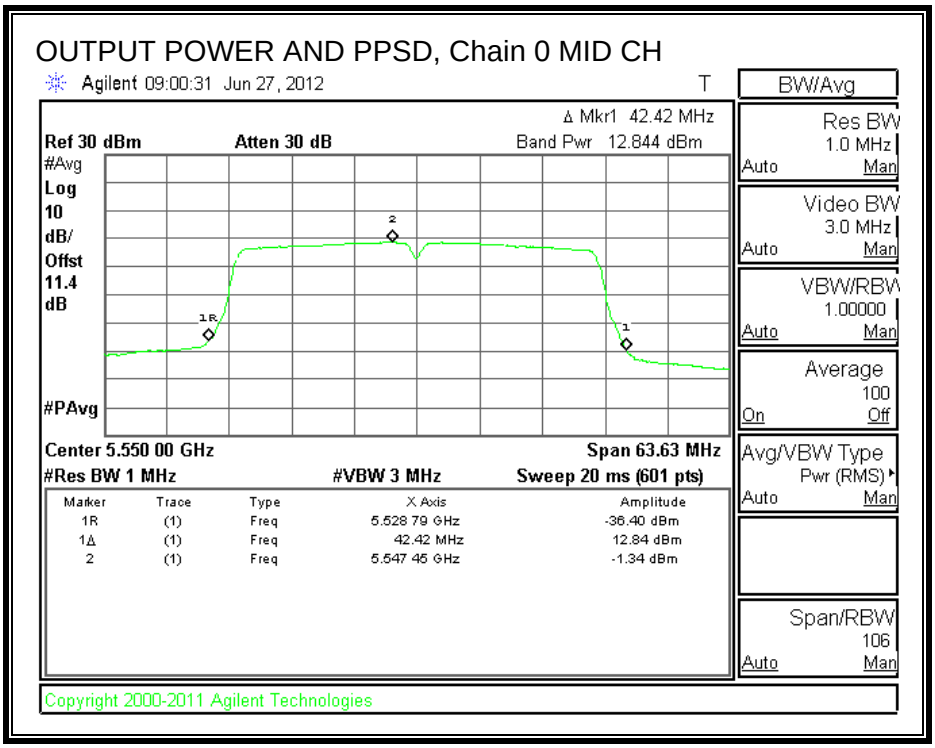
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	12.190	12.909	15.719	20.99	-5.271
Mid	5550	12.844	13.093	16.125	20.99	-4.865
High	5670	11.873	11.831	15.006	20.99	-5.984

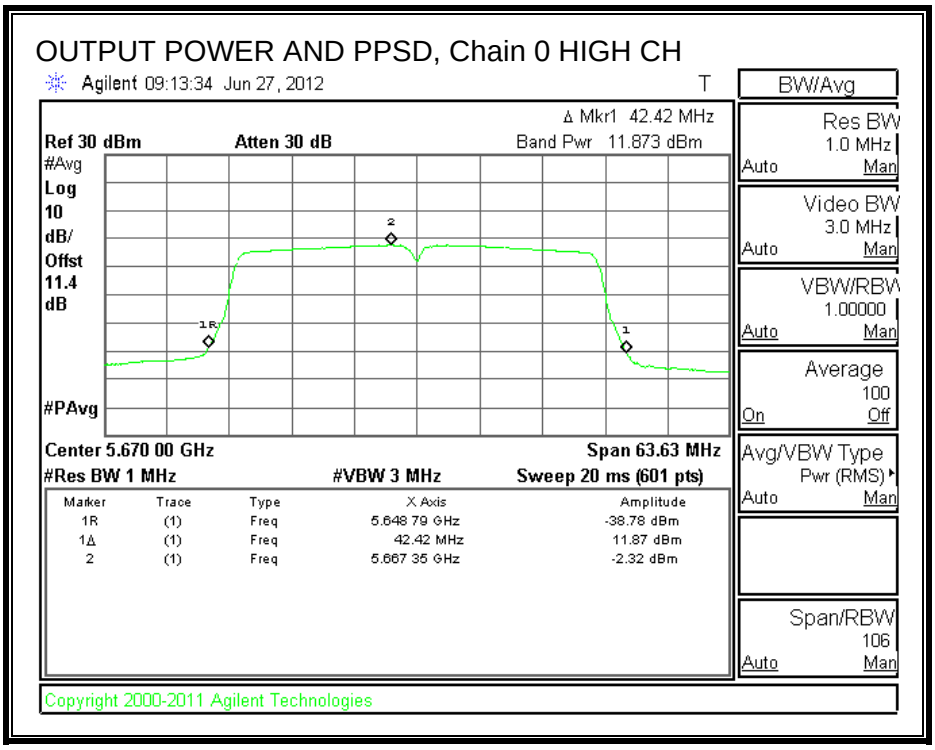
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5510	-2.01	-1.36	1.48	7.99	-6.51
Mid	5550	-1.34	-1.16	1.91	7.99	-6.08
High	5670	-2.32	-2.41	0.79	7.99	-7.20

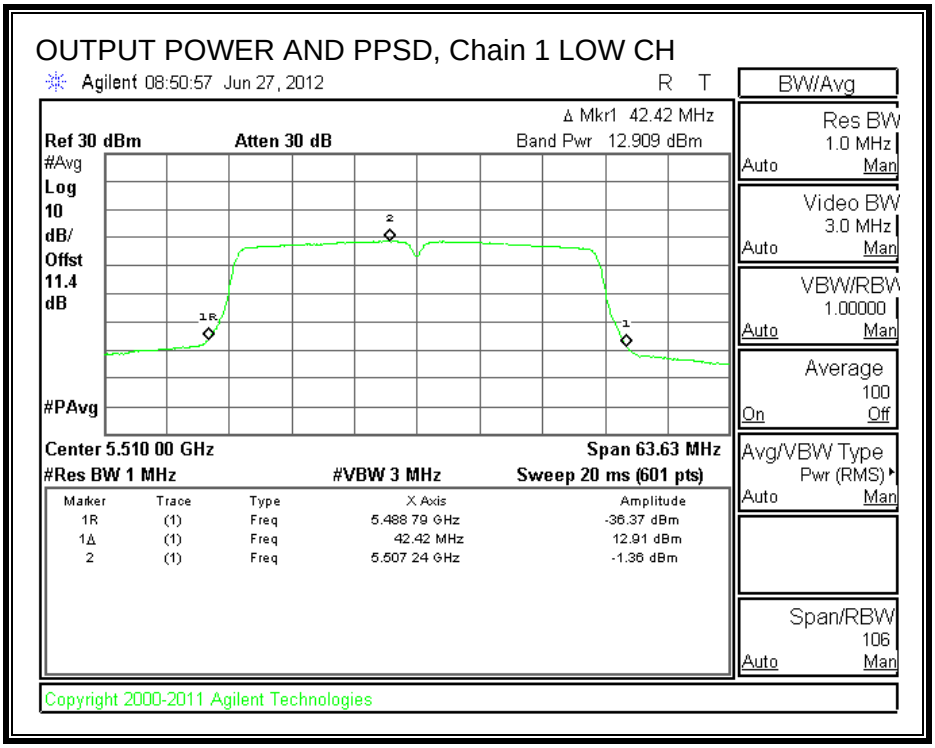
OUTPUT POWER AND PPSD, Chain 0

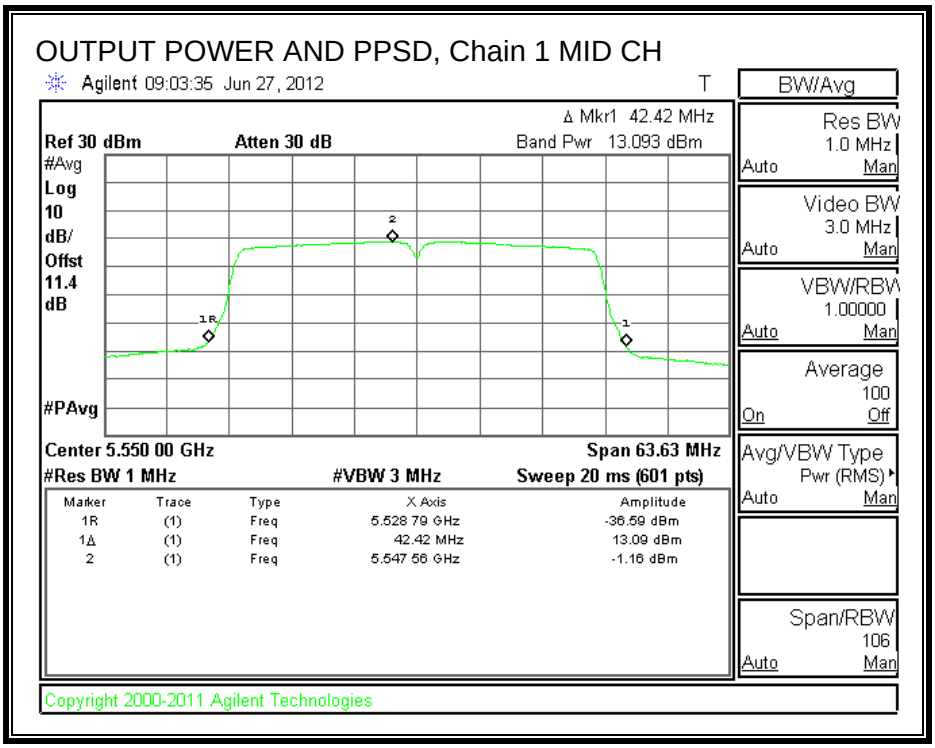


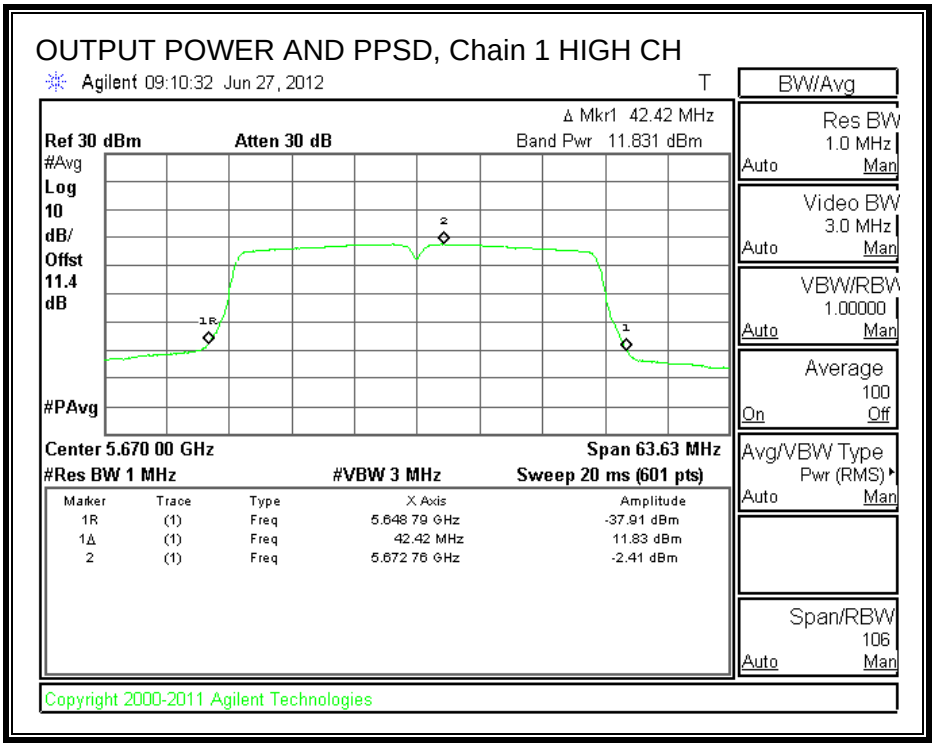




OUTPUT POWER AND PPSD, Chain 1







9.8.5. 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

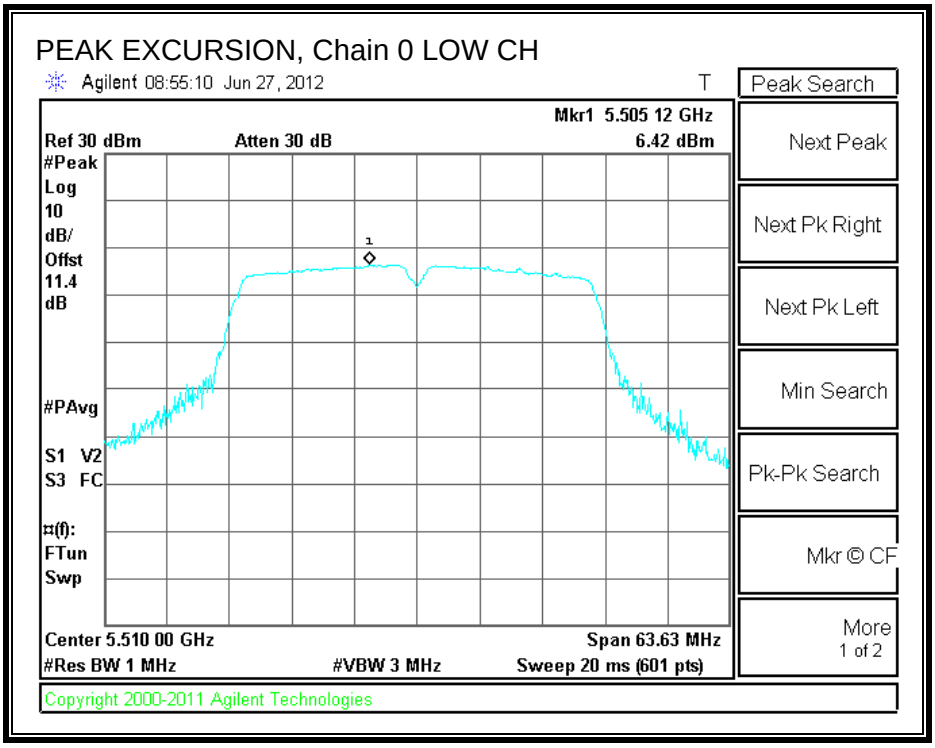
Chain 0

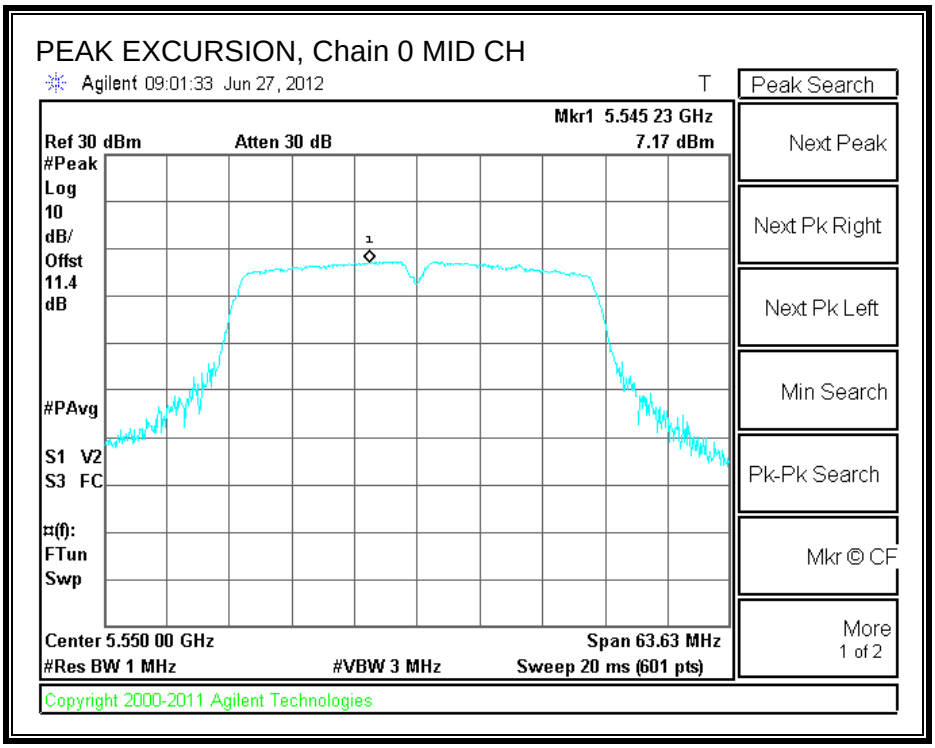
Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5510	6.42	-2.01	0.14	8.29	13	-4.71
Mid	5550	7.17	-1.34	0.14	8.37	13	-4.63
High	5670	6.35	-2.32	0.14	8.53	13	-4.47

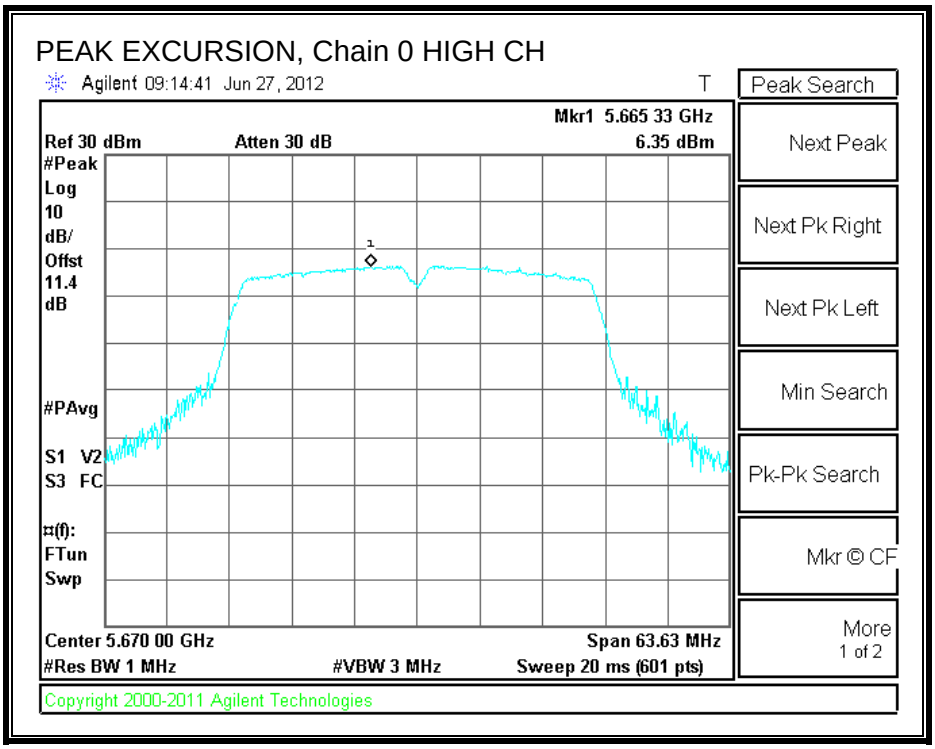
Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5510	7.00	-1.36	0.14	8.22	13	-4.78
Mid	5550	7.36	-1.16	0.14	8.38	13	-4.62
High	5670	6.03	-2.41	0.14	8.30	13	-4.70

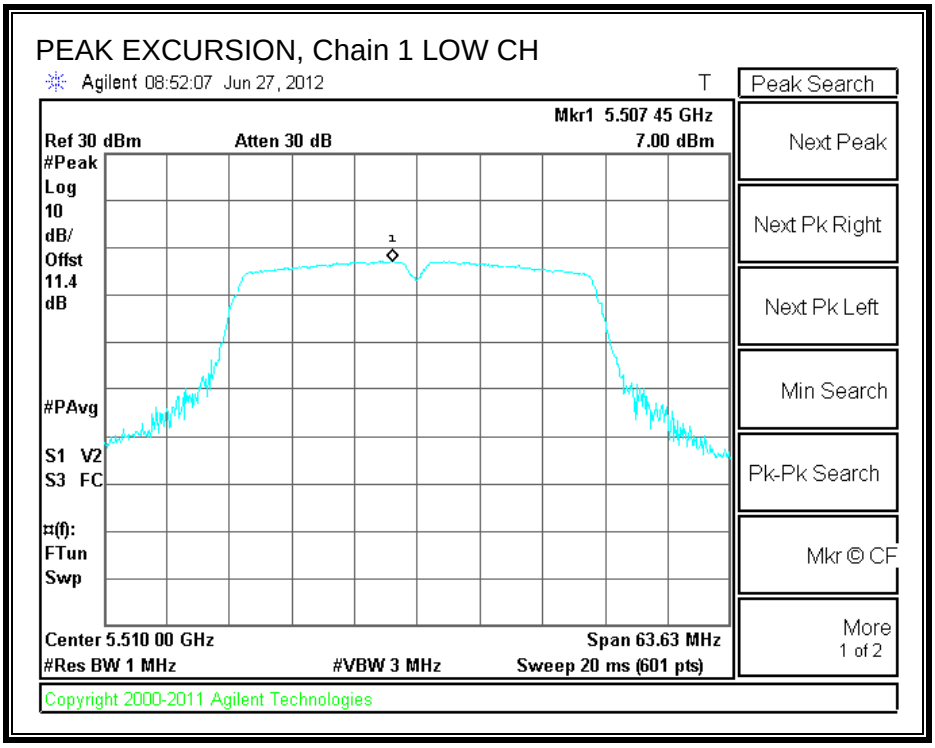
PEAK EXCURSION, Chain 0

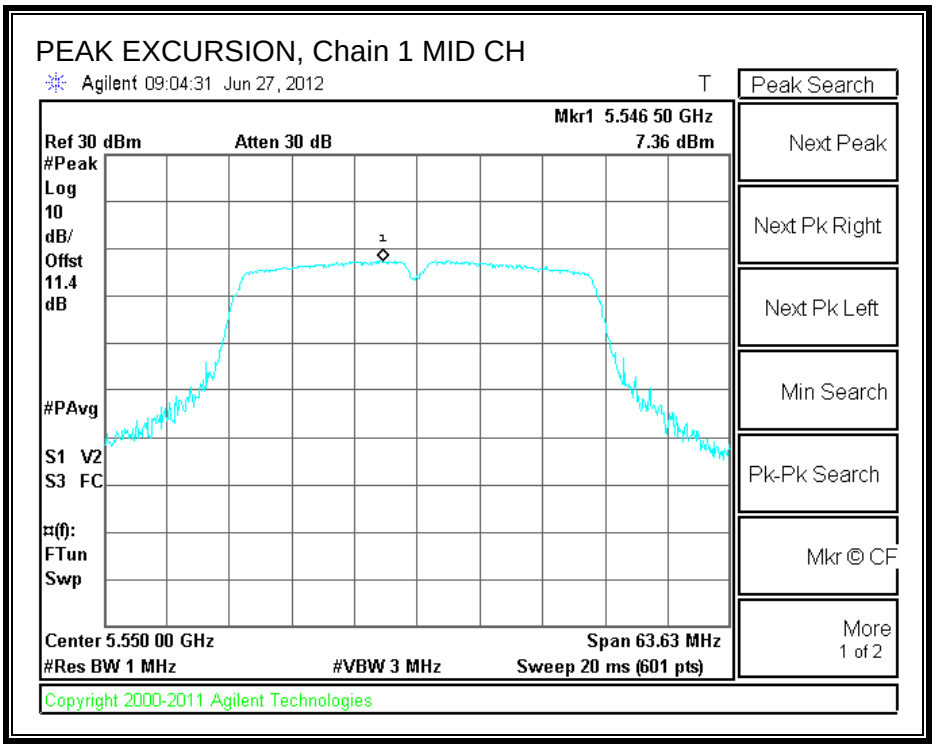


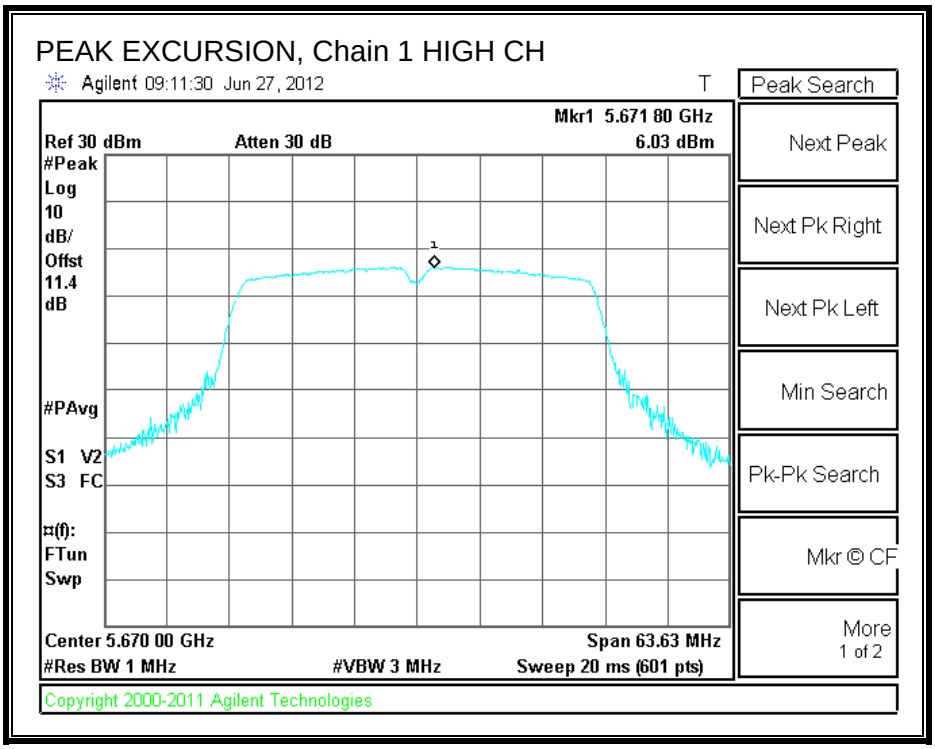




PEAK EXCURSION, Chain 1







9.8.6. CONDUCTED WEATHER RADAR BAND EMISSIONS

LIMITS

Within 5600 – 5650 MHz band, -20 dBc relative to highest fundamental output power density per 100 kHz.

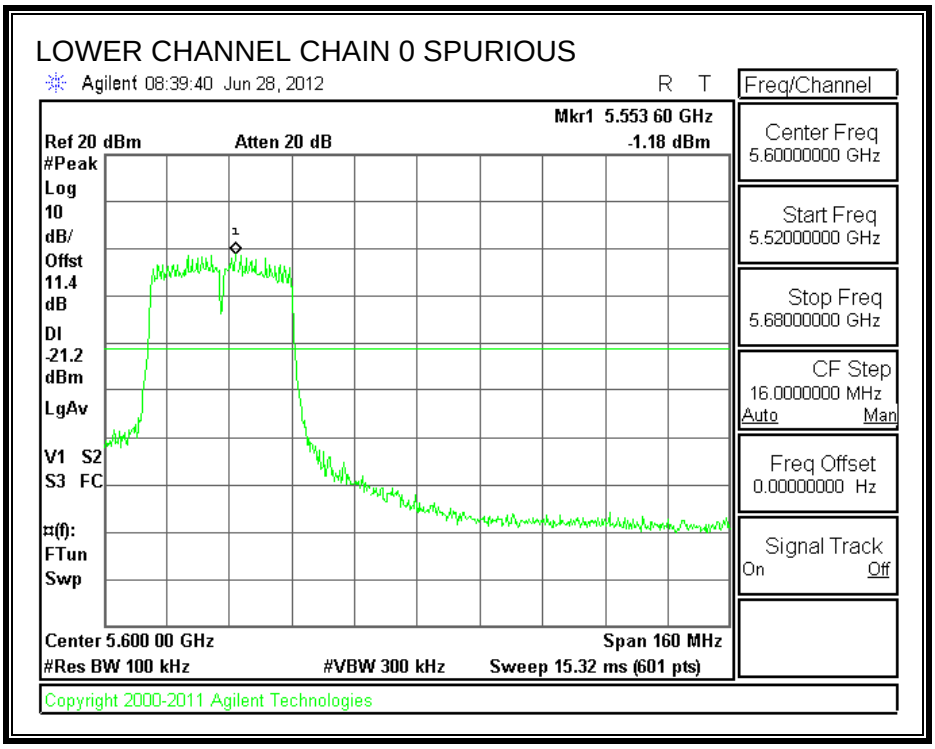
TEST PROCEDURE

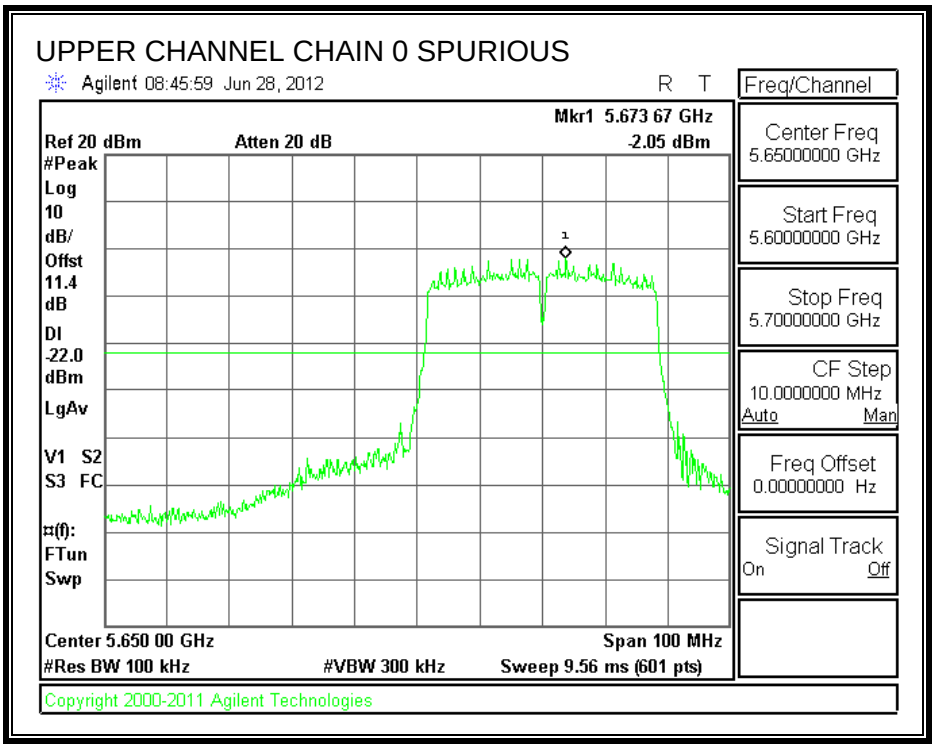
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The authorized channel nearest to and less than 5600 MHz is measured.

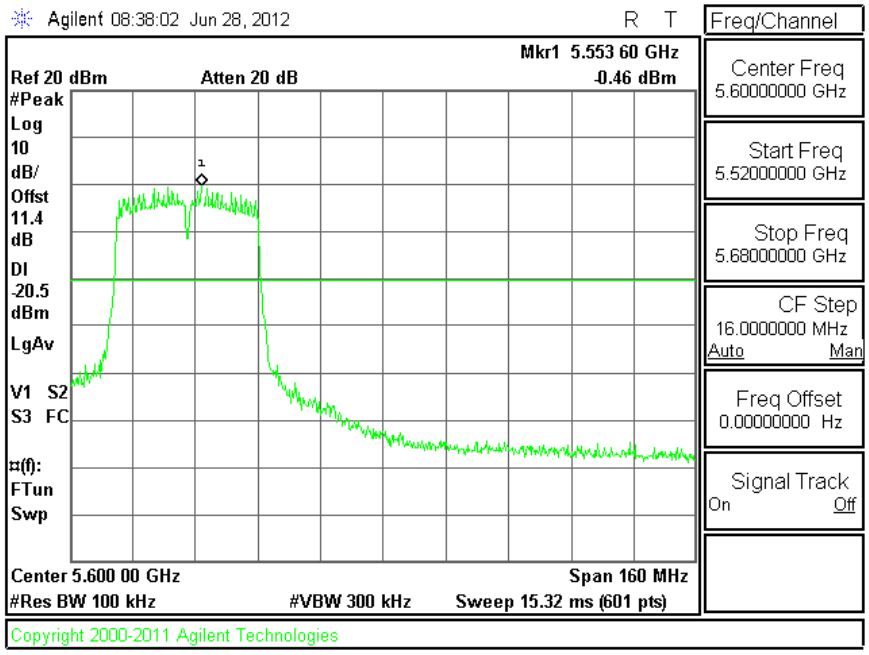
The authorized channel nearest to and greater than 5650 MHz is measured.

SPURIOUS EMISSIONS IN WEATHER RADAR BAND 5600 - 5650 MHz

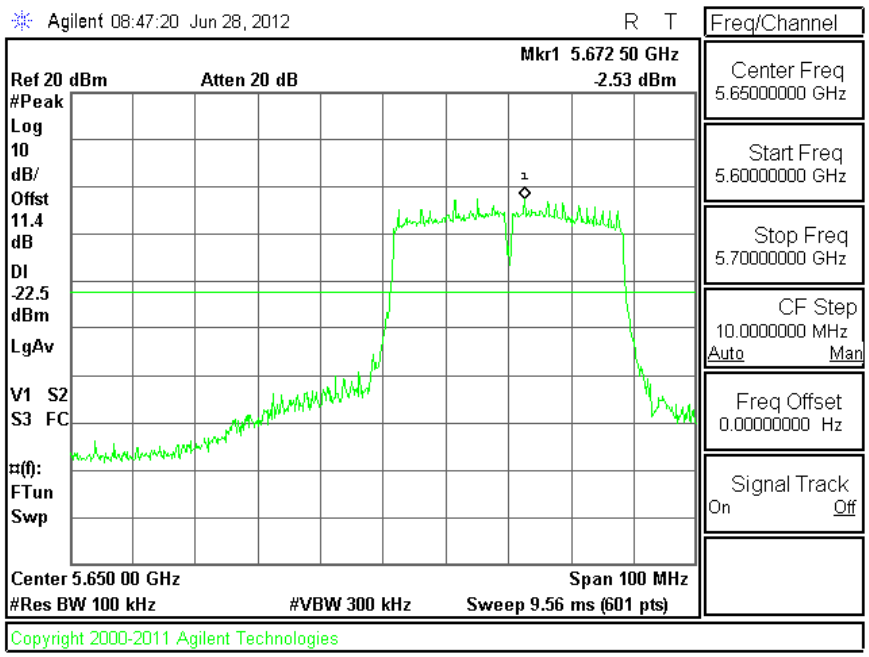




LOWER CHANNEL CHAIN 1 SPURIOUS



UPPER CHANNEL CHAIN 1 SPURIOUS



10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

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.

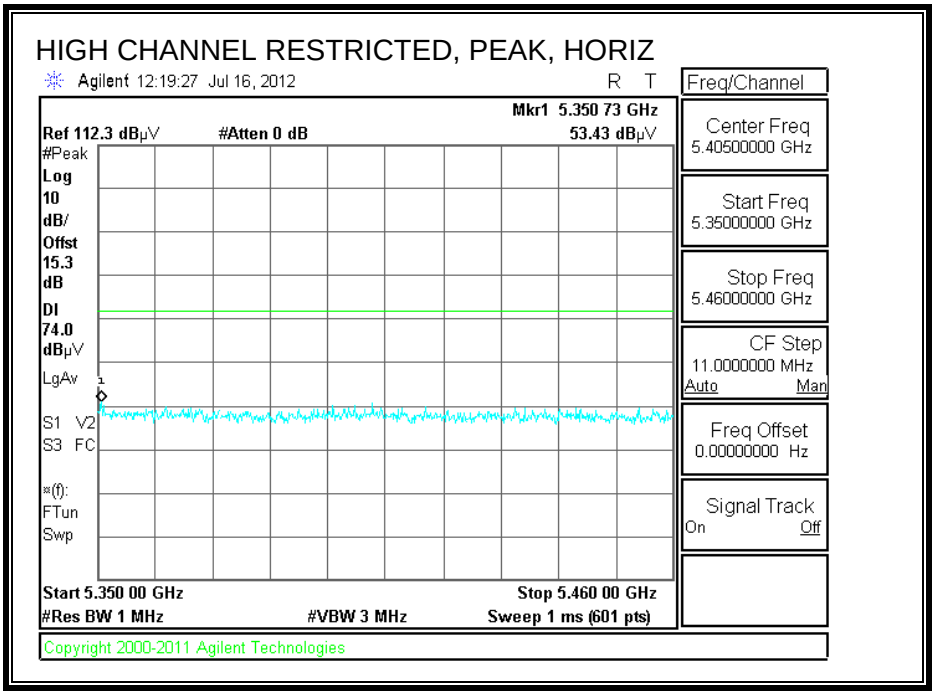
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

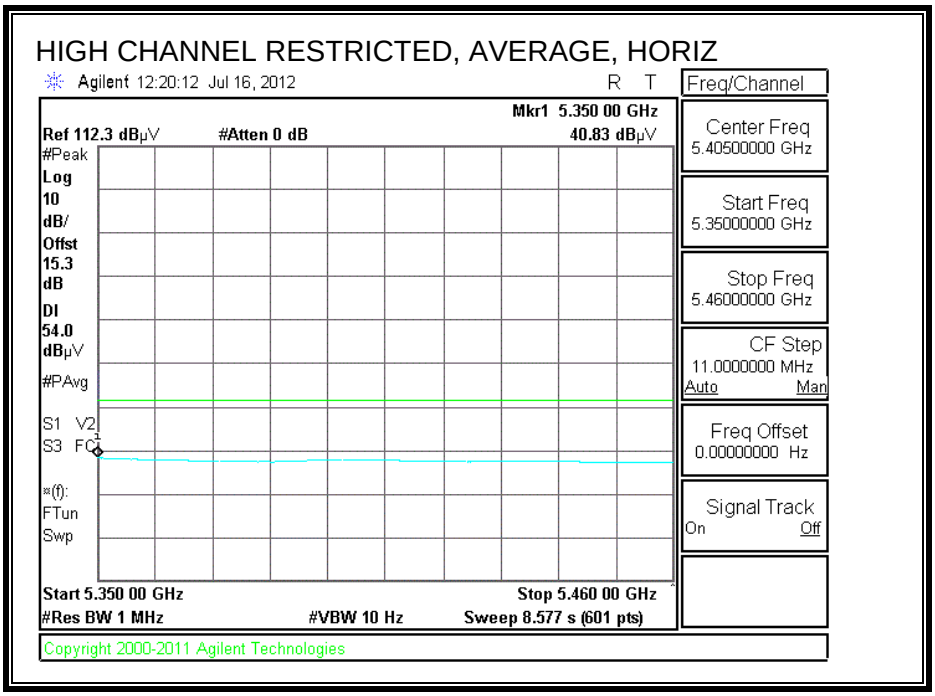
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

10.2. TRANSMITTER ABOVE 1 GHz

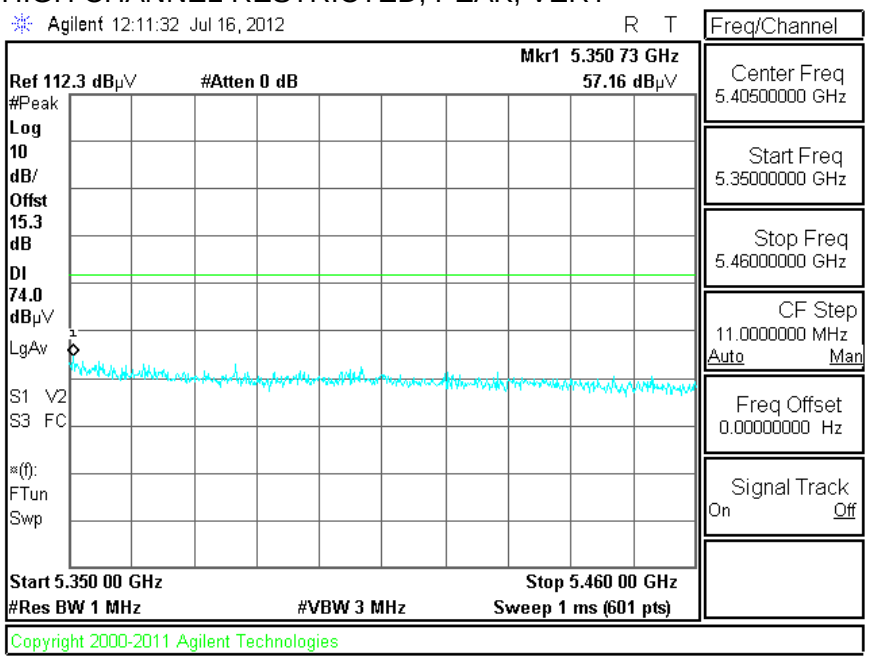
10.2.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)

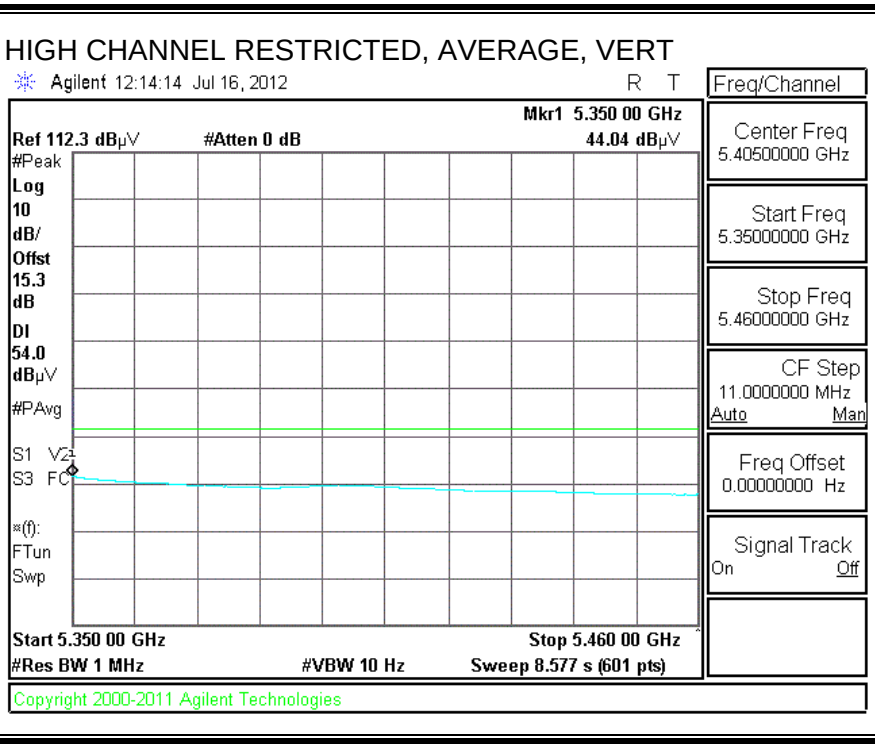




HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber-A

Company: Cisco
Project #: 12U14476
Date: 7/18/2012
Test Engineer: David Garcia
Configuration: EUT, Laptop
Mode: 11a SISO, 6mb/s

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T144 Miteq 3008A00931	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

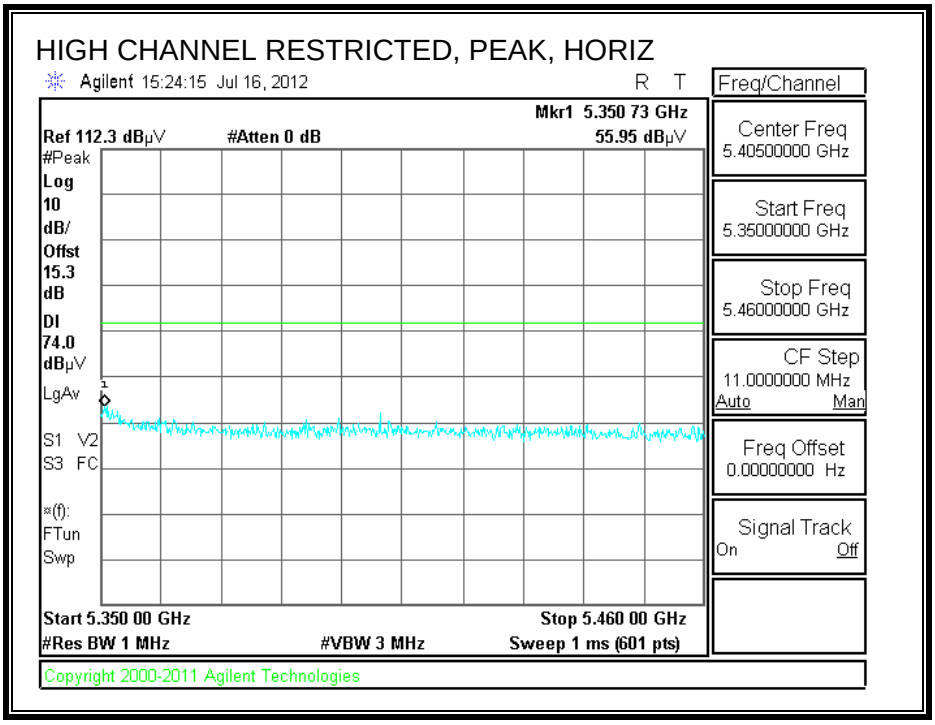
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel: 5260 MHz															
15.780	3.0	35.5	25.4	38.2	12.3	-33.9	0.0	0.0	52.1	41.9	74	54	-21.9	-12.1	V
15.780	3.0	35.2	24.9	38.2	12.3	-33.9	0.0	0.0	51.8	41.4	74	54	-22.2	-12.6	H
Middle Channel: 5300 MHz															
10.600	3.0	35.4	25.7	38.3	9.7	-35.7	0.0	0.0	47.6	37.9	74	54	-26.4	-16.1	V
15.900	3.0	35.0	24.7	37.8	12.4	-33.9	0.0	0.0	51.3	40.9	74	54	-22.7	-13.1	V
10.600	3.0	34.6	24.8	38.3	9.7	-35.7	0.0	0.0	46.8	37.0	74	54	-27.2	-17.0	H
15.900	3.0	34.7	24.6	37.8	12.4	-33.9	0.0	0.0	50.9	40.9	74	54	-23.1	-13.1	H
High Channel: 5320 MHz															
10.640	3.0	36.6	27.1	25.1	9.8	-35.7	0.0	0.0	35.7	26.2	74	54	-38.3	-27.8	V
15.960	3.0	35.4	25.1	37.6	12.4	-33.9	0.0	0.0	51.5	41.2	74	54	-22.5	-12.8	V
10.640	3.0	34.9	24.7	38.3	9.8	-35.7	0.0	0.0	47.2	37.0	74	54	-26.8	-17.0	H
15.960	3.0	35.1	24.9	37.6	12.4	-33.9	0.0	0.0	51.2	41.0	74	54	-22.8	-13.0	H

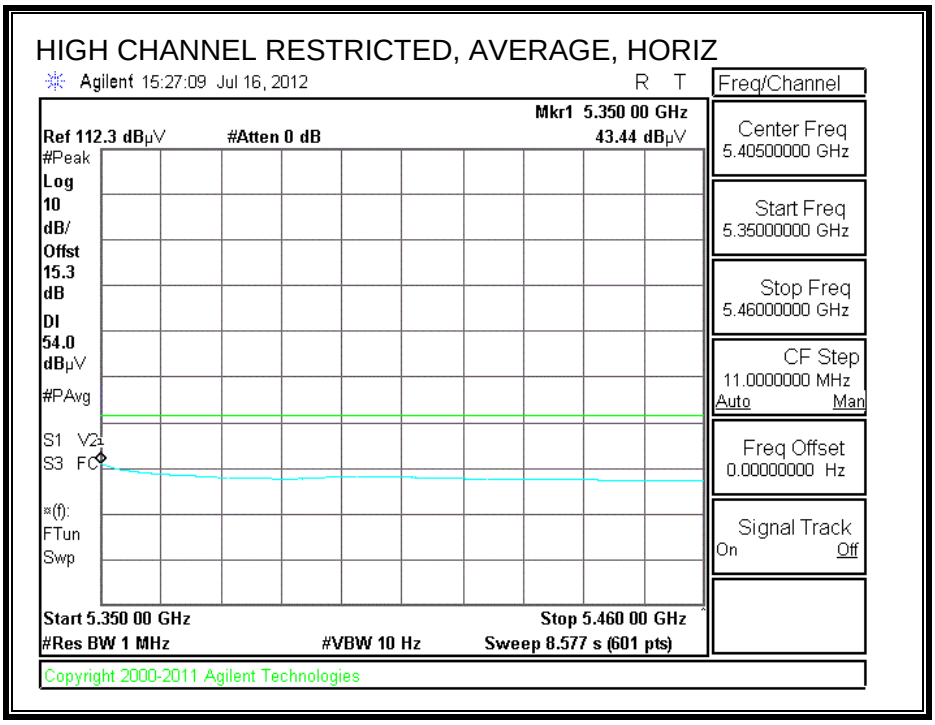
Rev. 11.10.11

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

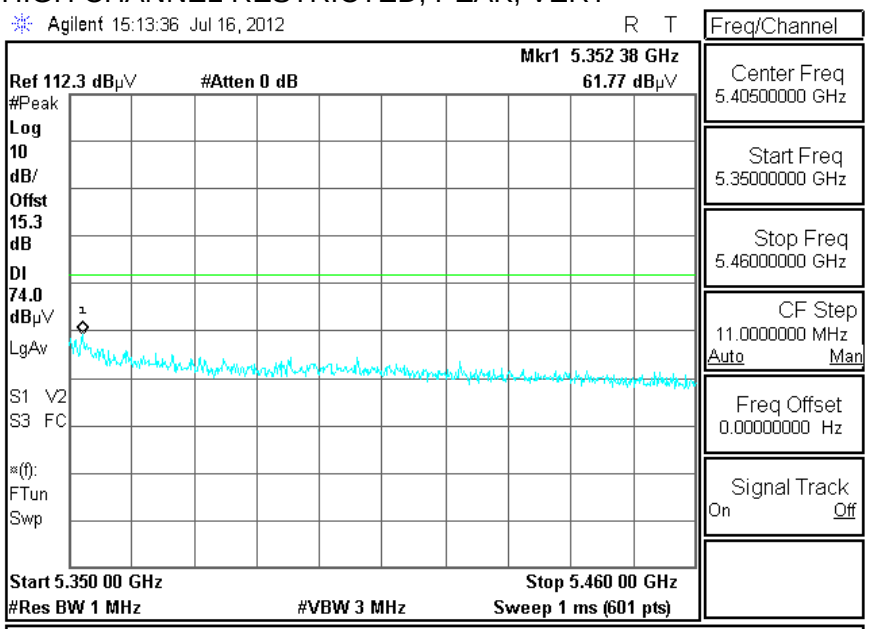
10.2.2. TX ABOVE 1 GHz 802.11a BEAM FORMING MODE, 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)

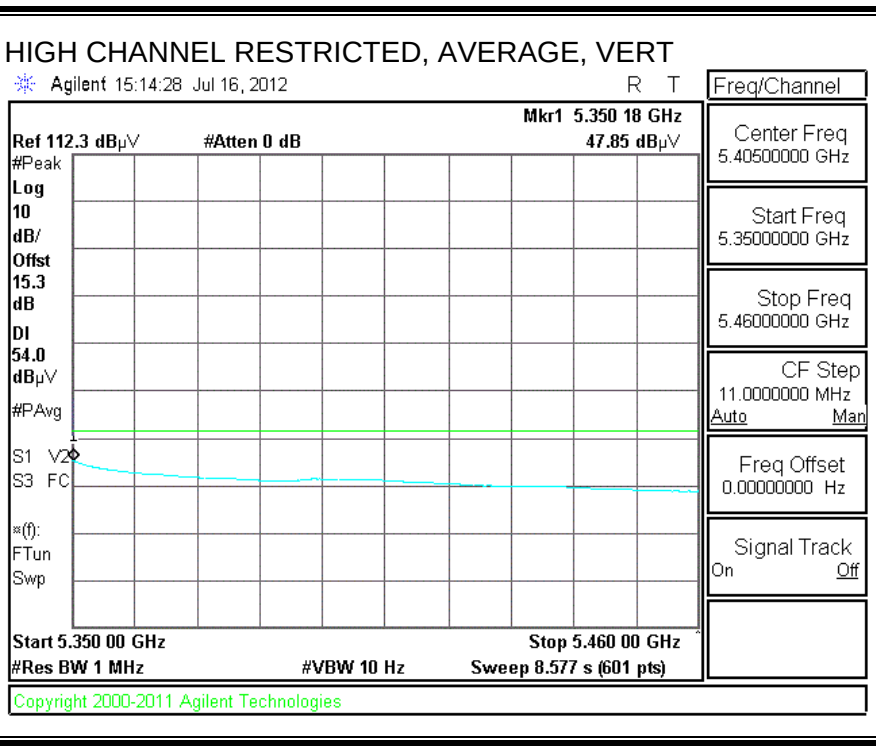




HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber-A

Company: Cisco
Project #: 12U14476
Date: 7/17/2012
Test Engineer: David Garcia
Configuration: EUT, Laptop
Mode: 11a Beam Forming, 6mb/s

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T144 Miteq 3008A00931	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

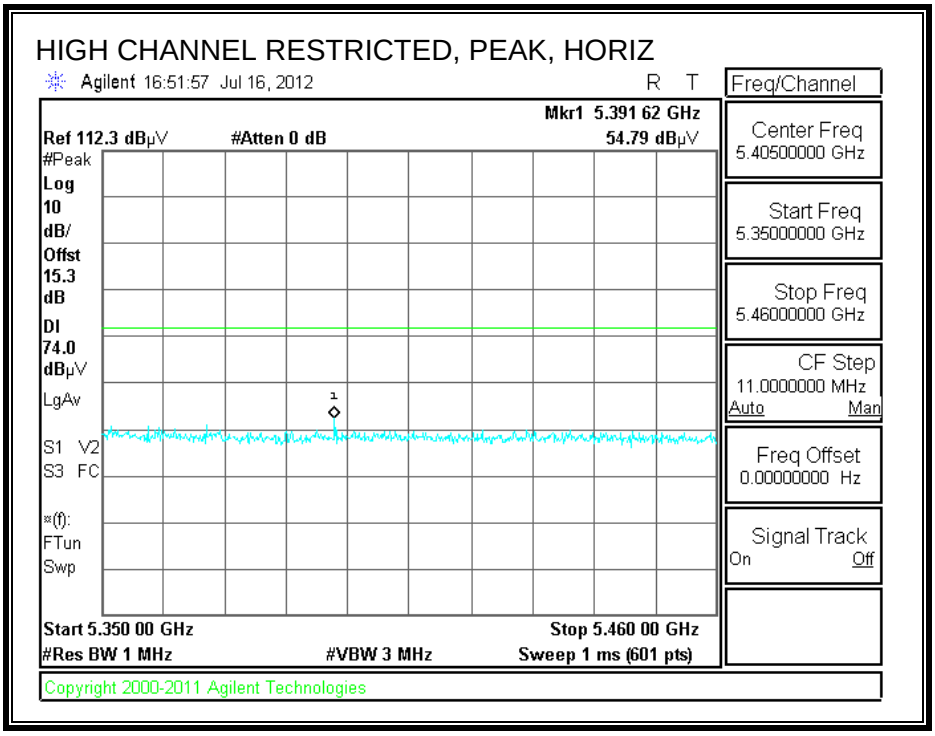
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel: 5260 MHz															
15.780	3.0	35.4	25.7	38.2	12.3	-33.9	0.0	0.0	52.0	42.3	74	54	-22.0	-11.7	V
15.780	3.0	35.1	25.0	38.2	12.3	-33.9	0.0	0.0	51.7	41.6	74	54	-22.3	-12.4	H
Middle Channel: 5300 MHz															
10.600	3.0	35.3	24.9	38.3	9.7	-35.7	0.0	0.0	47.5	37.1	74	54	-26.5	-16.9	V
15.900	3.0	35.9	25.1	37.8	12.4	-33.9	0.0	0.0	52.1	41.4	74	54	-21.9	-12.6	V
10.600	3.0	34.7	25.0	38.3	9.7	-35.7	0.0	0.0	46.9	37.3	74	54	-27.1	-16.7	H
15.900	3.0	34.9	24.6	37.8	12.4	-33.9	0.0	0.0	51.1	40.9	74	54	-22.9	-13.1	H
High Channel: 5320 MHz															
10.640	3.0	36.1	25.6	25.1	9.8	-35.7	0.0	0.0	35.2	24.7	74	54	-38.8	-29.3	V
15.960	3.0	35.3	25.3	37.6	12.4	-33.9	0.0	0.0	51.4	41.4	74	54	-22.6	-12.6	V
10.640	3.0	35.0	24.5	38.3	9.8	-35.7	0.0	0.0	47.3	36.8	74	54	-26.7	-17.2	H
15.960	3.0	35.6	25.2	37.6	12.4	-33.9	0.0	0.0	51.7	41.4	74	54	-22.3	-12.6	H

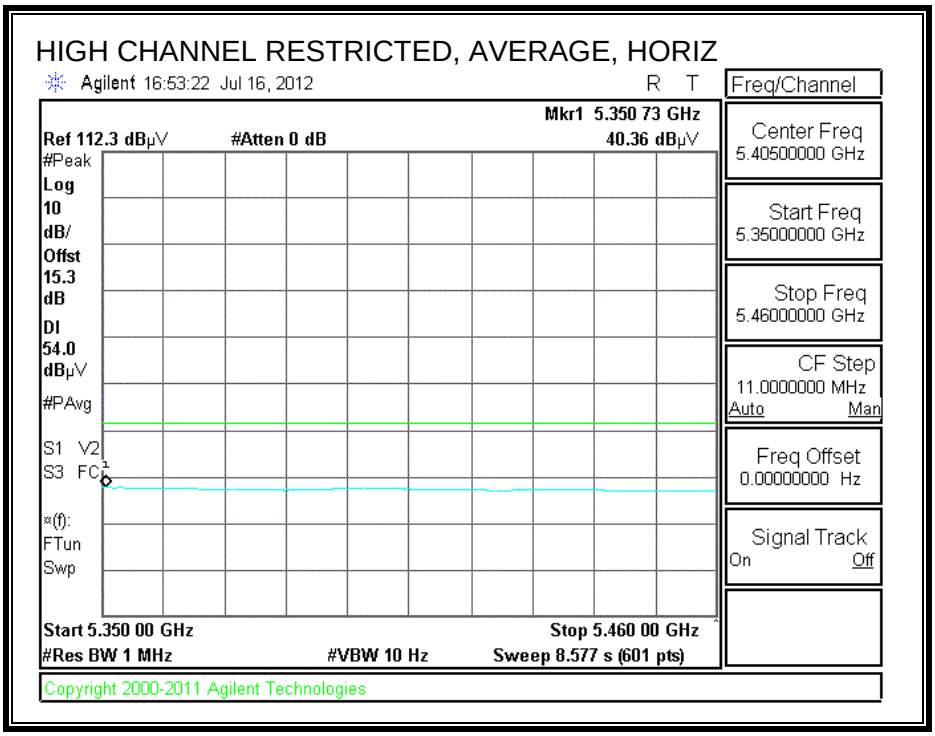
Rev. 11.10.11

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

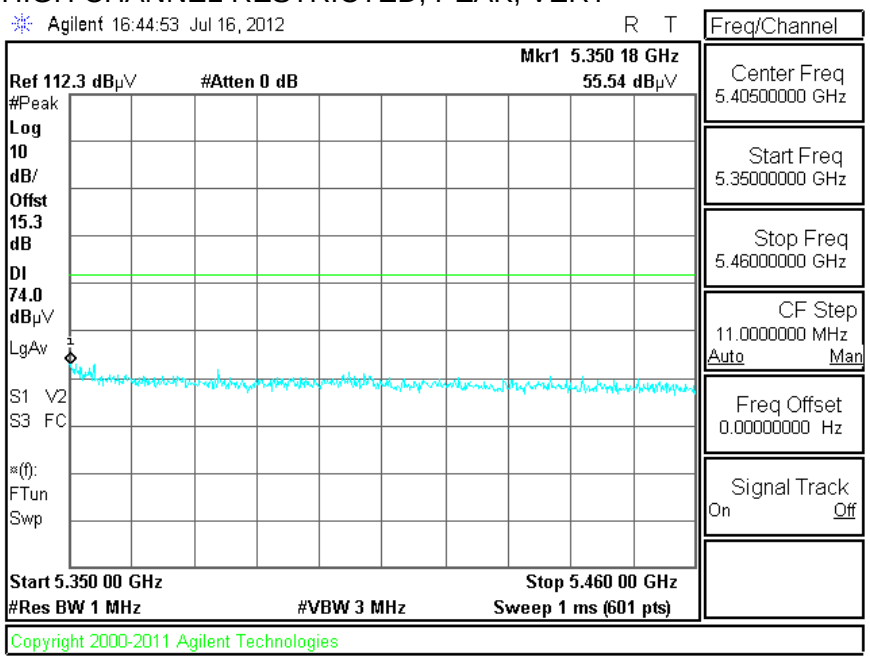
10.2.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)

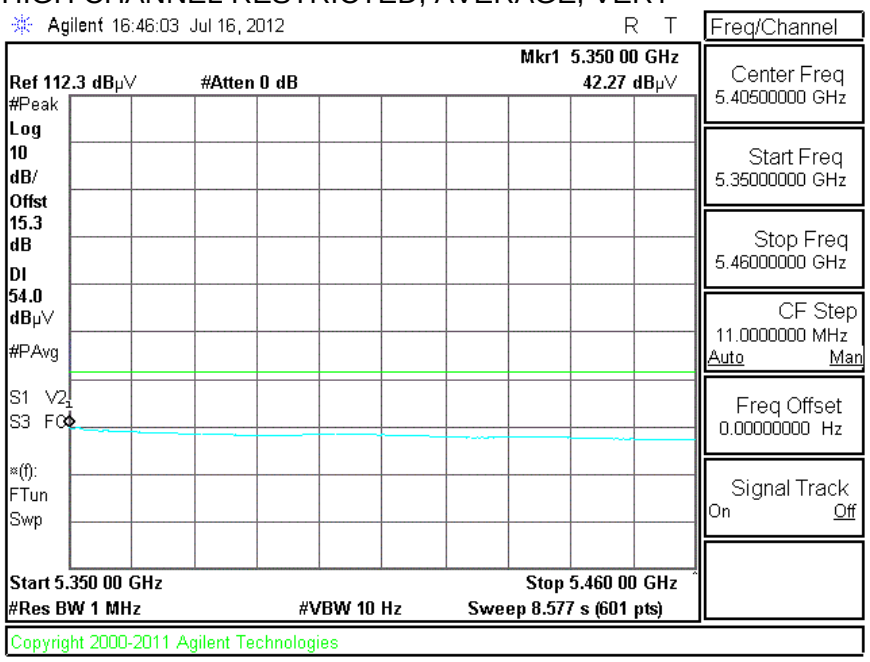




HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber-A

Company: Cisco
Project #: 12U14476
Date: 7/17/2012
Test Engineer: David Garcia
Configuration: EUT, Laptop
Mode: 11n HT20, MCS0

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T144 Miteq 3008A00931	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

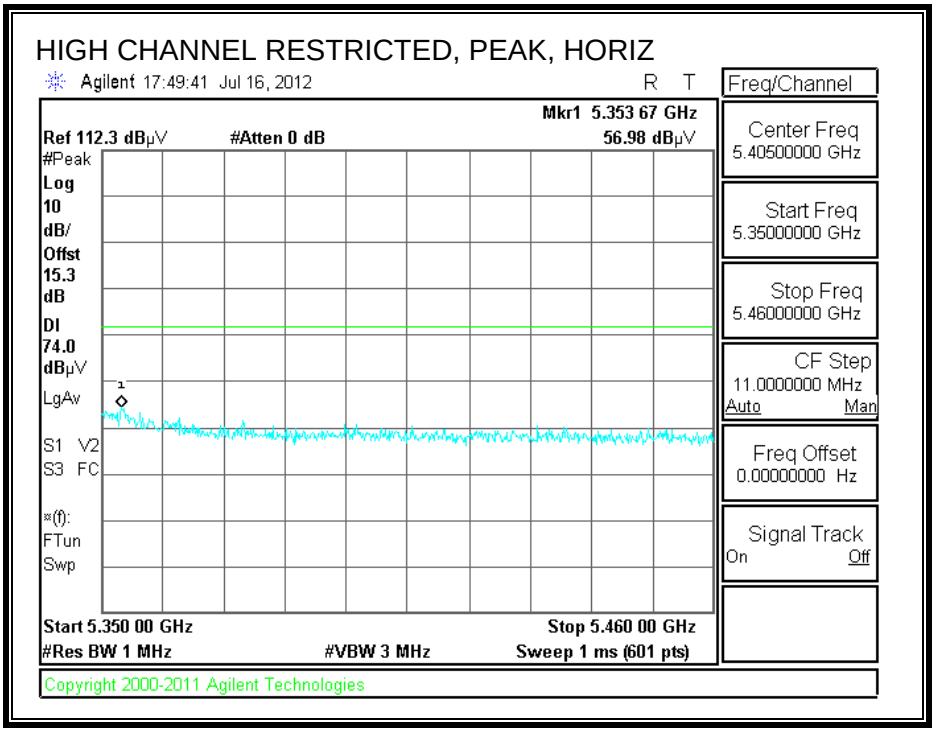
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel: 5260 MHz															
15.780	3.0	35.3	25.8	38.2	12.3	-33.9	0.0	0.0	51.9	42.3	74	54	-22.1	-11.7	V
15.780	3.0	35.2	25.3	38.2	12.3	-33.9	0.0	0.0	51.7	41.9	74	54	-22.3	-12.1	H
Middle Channel: 5300 MHz															
10.600	3.0	35.6	25.1	38.3	9.7	-35.7	0.0	0.0	47.9	37.4	74	54	-26.1	-16.6	V
15.900	3.0	35.9	25.2	37.8	12.4	-33.9	0.0	0.0	52.1	41.5	74	54	-21.9	-12.5	V
10.600	3.0	34.6	24.9	38.3	9.7	-35.7	0.0	0.0	46.9	37.1	74	54	-27.1	-16.9	H
15.900	3.0	34.8	24.5	37.8	12.4	-33.9	0.0	0.0	51.0	40.8	74	54	-23.0	-13.2	H
High Channel: 5320 MHz															
10.640	3.0	36.0	25.4	25.1	9.8	-35.7	0.0	0.0	35.1	24.5	74	54	-38.9	-29.5	V
15.960	3.0	35.5	25.2	37.6	12.4	-33.9	0.0	0.0	51.6	41.3	74	54	-22.4	-12.7	V
10.640	3.0	34.9	24.8	38.3	9.8	-35.7	0.0	0.0	47.2	37.1	74	54	-26.8	-16.9	H
15.960	3.0	35.7	25.1	37.6	12.4	-33.9	0.0	0.0	51.8	41.2	74	54	-22.2	-12.8	H

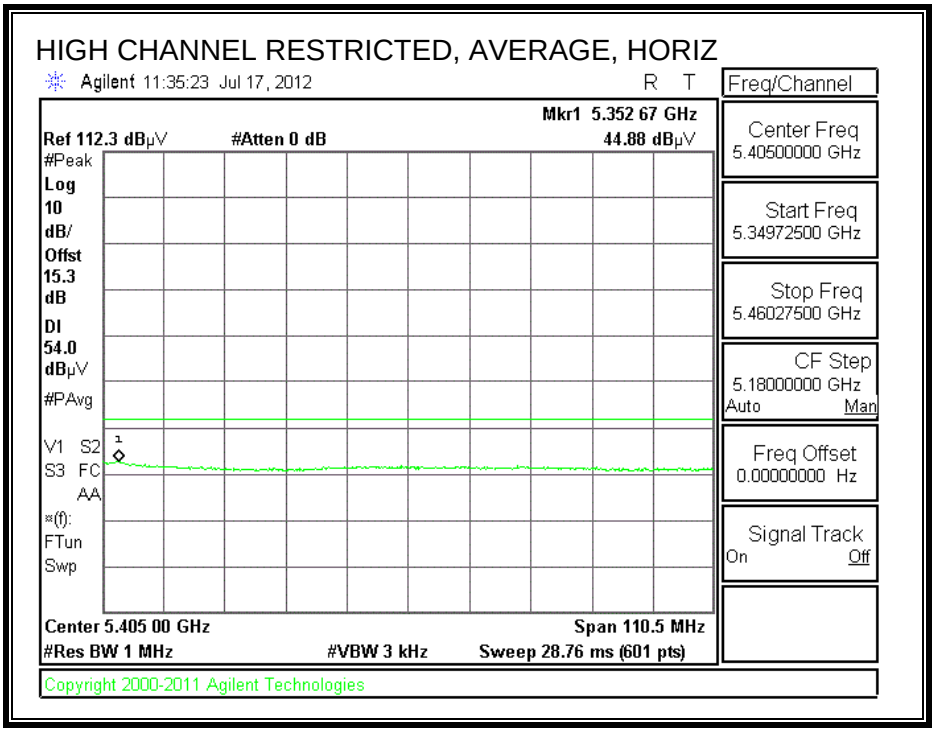
Rev. 11.10.11

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

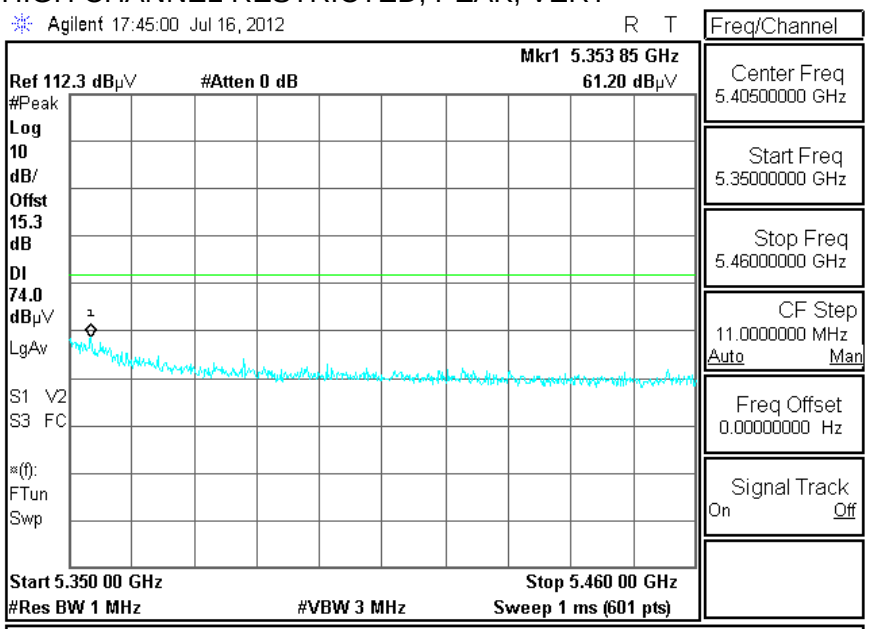
10.2.4. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)

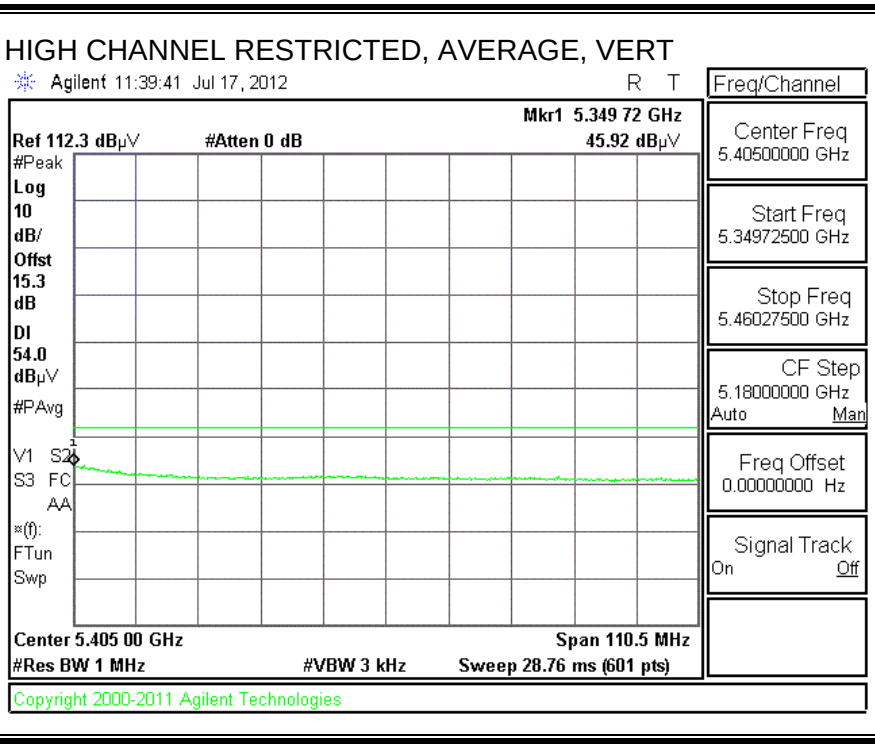




HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber-A

Company: Cisco
Project #: 12U14476
Date: 7/17/2012
Test Engineer: David Garcia
Configuration: EUT, Laptop
Mode: 11n, HT40 MIMO, MCS8

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T144 Miteq 3008A00931	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

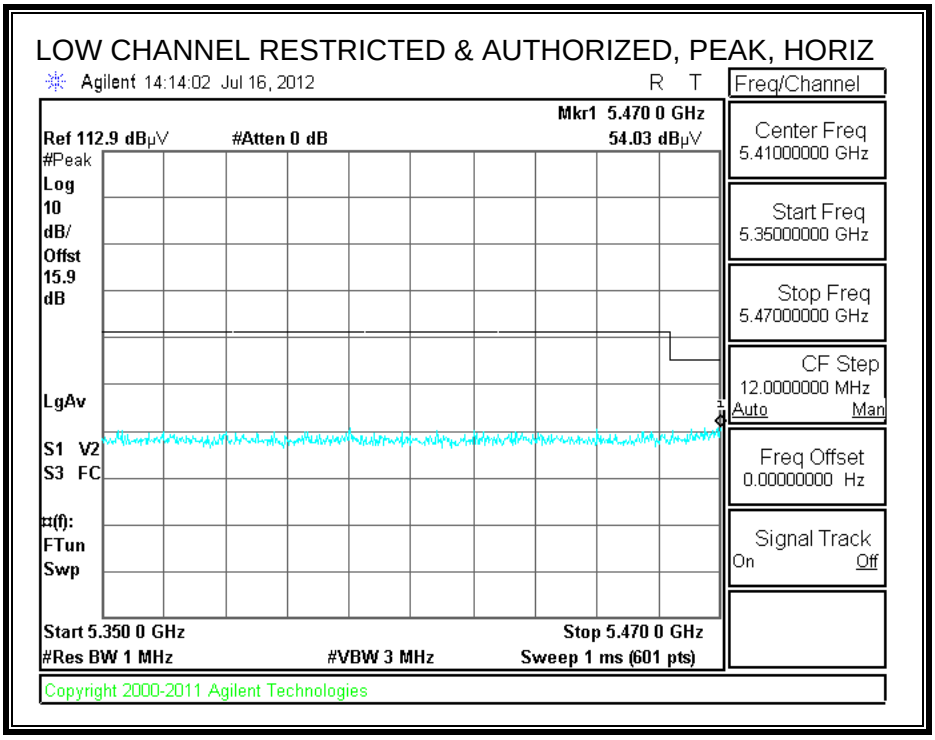
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel: 5270 MHz															
15.810	3.0	35.7	25.3	38.1	12.3	-33.9	0.0	0.0	52.2	41.8	74	54	-21.8	-12.2	V
15.810	3.0	35.2	25.1	38.1	12.3	-33.9	0.0	0.0	51.7	41.6	74	54	-22.3	-12.4	H
High Channel: 5310 MHz															
15.690	3.0	35.6	25.1	25.1	12.3	-34.0	0.0	0.0	38.9	28.5	74	54	-35.1	-25.5	V
15.690	3.0	35.1	25.0	38.5	12.3	-34.0	0.0	0.0	51.9	41.8	74	54	-22.1	-12.2	H

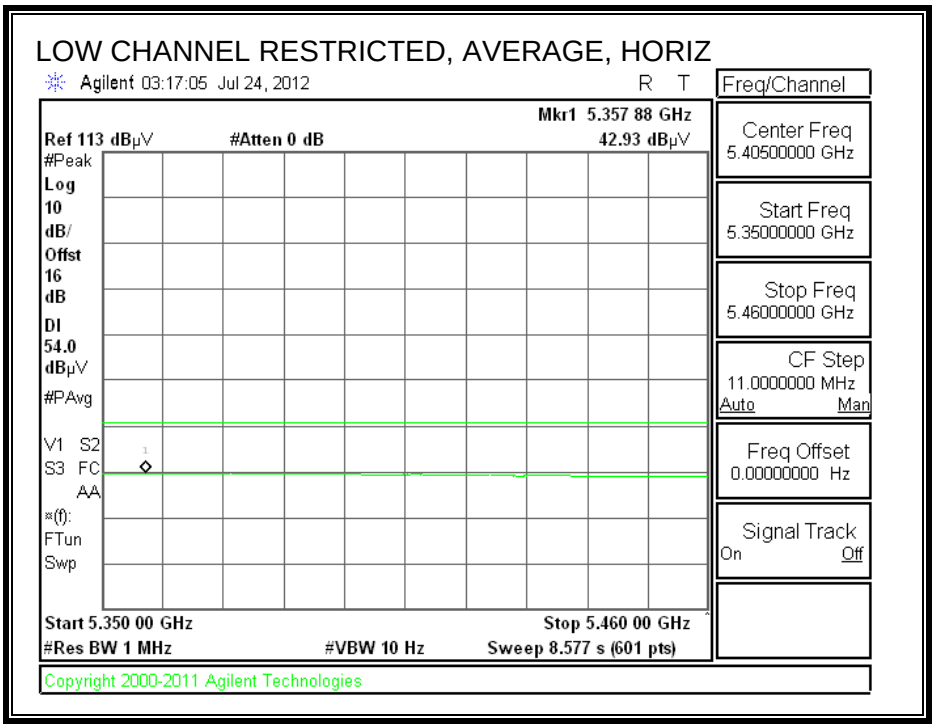
Rev. 11.10.11

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

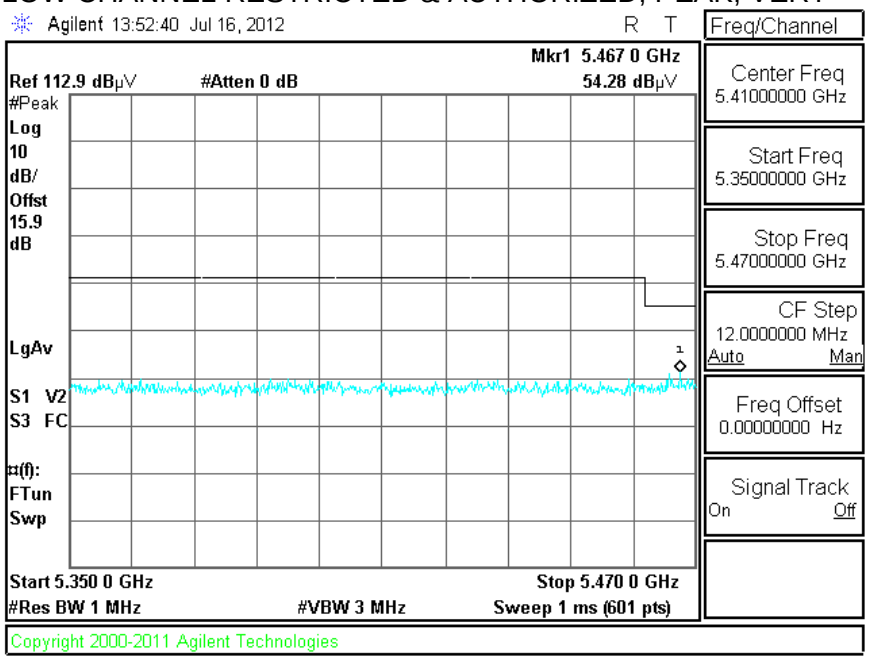
10.2.5. TX ABOVE 1 GHz 802.11a MODE IN THE 5.6 GHz BAND

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

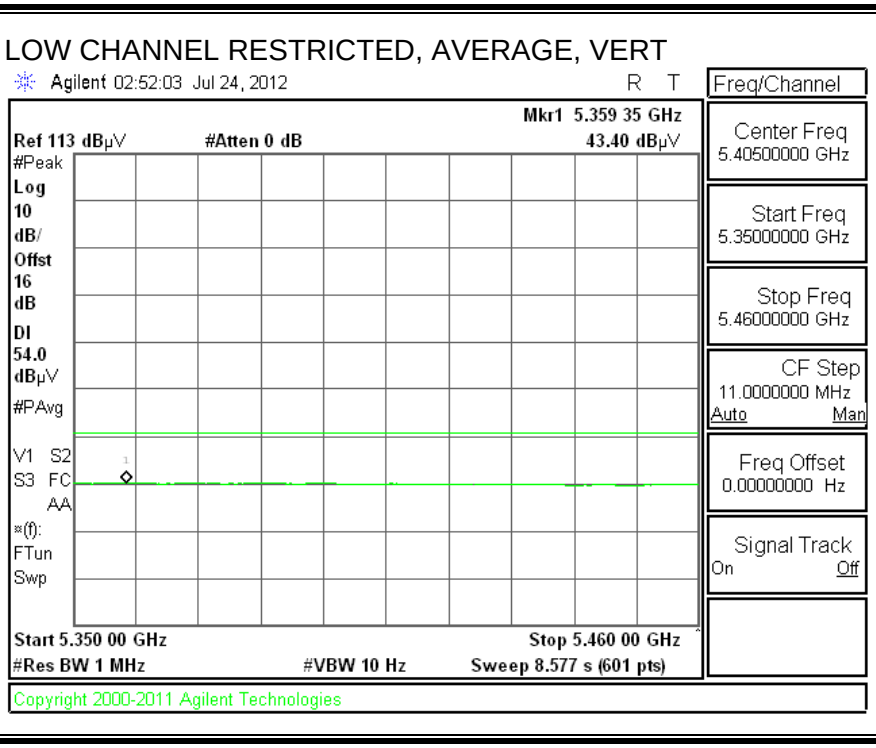




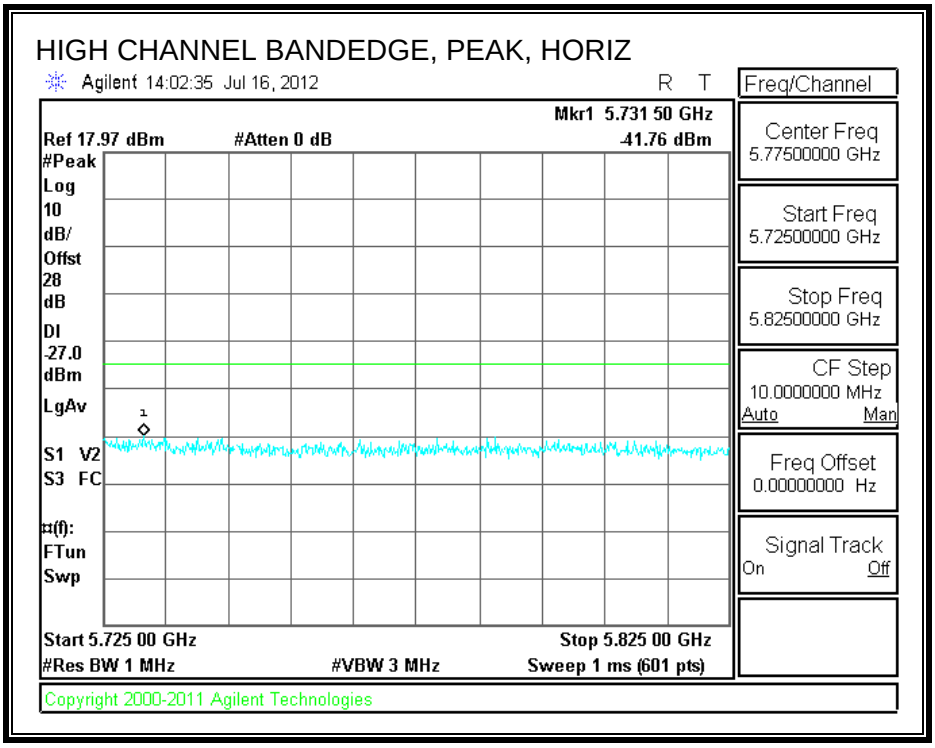
LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT

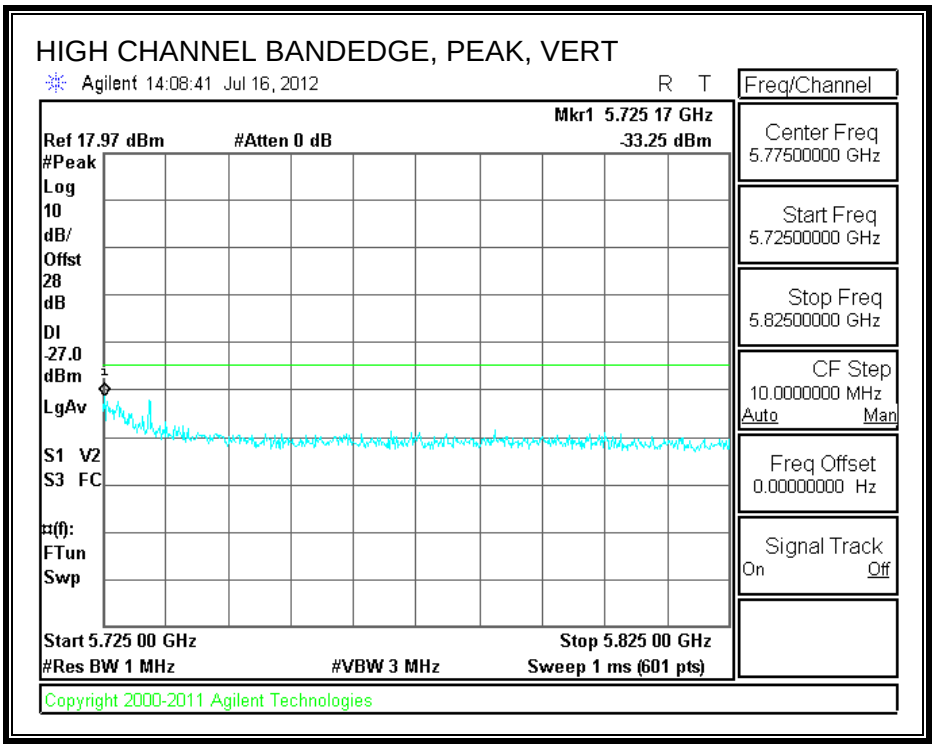


LOW CHANNEL RESTRICTED, AVERAGE, VERT



AUTHORIZED BANDEDGE (HIGH CHANNEL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber-A

Company: Cisco
Project #: 12U14476
Date: 7/18/2012
Test Engineer: David Garcia
Configuration: EUT, Laptop
Mode: 11a SISO, 6mb/s

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T144 Miteq 3008A00931	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

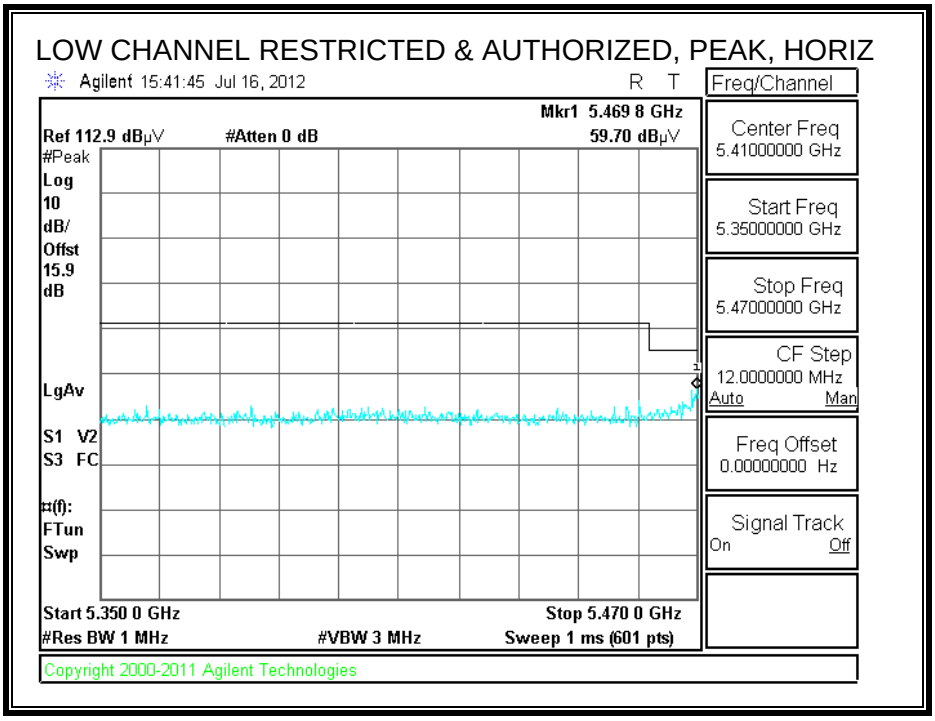
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel: 5500 MHz															
11.000	3.0	39.5	29.3	38.4	10.2	-35.6	0.0	0.0	52.4	42.1	74	54	-21.6	-11.9	V
11.000	3.0	38.8	28.7	38.4	10.2	-35.6	0.0	0.0	51.6	41.5	74	54	-22.4	-12.5	H
Middle Channel: 5560 MHz															
11.120	3.0	41.4	30.6	38.5	10.3	-35.6	0.0	0.0	54.5	43.7	74	54	-19.5	-10.3	V
11.120	3.0	38.7	27.2	38.5	10.3	-35.6	0.0	0.0	51.8	40.3	74	54	-22.2	-13.7	H
High Channel: 5700 MHz															
11.400	3.0	37.9	27.7	25.1	10.6	-35.6	0.0	0.0	38.0	27.8	74	54	-36.0	-26.2	V
11.400	3.0	35.6	25.6	38.7	10.6	-35.6	0.0	0.0	49.4	39.4	74	54	-24.6	-14.6	H

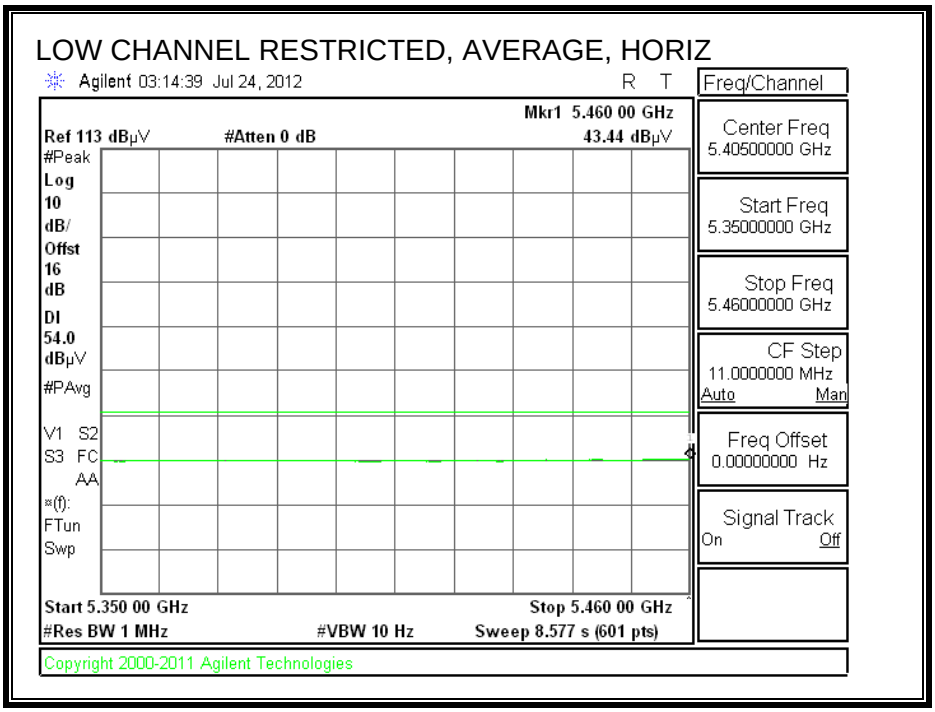
Rev. 11.10.11

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

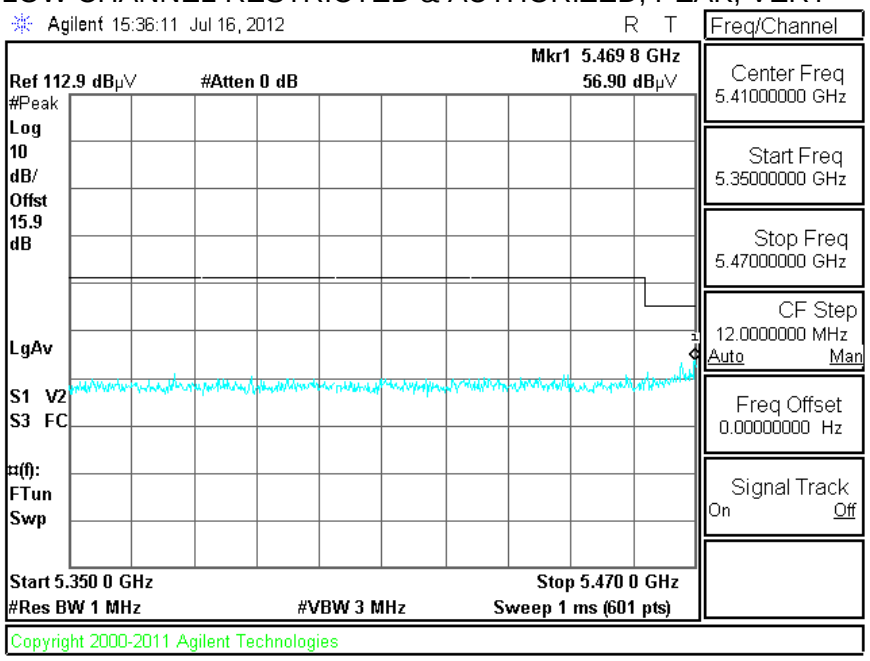
10.2.6. TX ABOVE 1 GHz 802.11a BEAM FORMING MODE, 5.6 GHz BAND

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

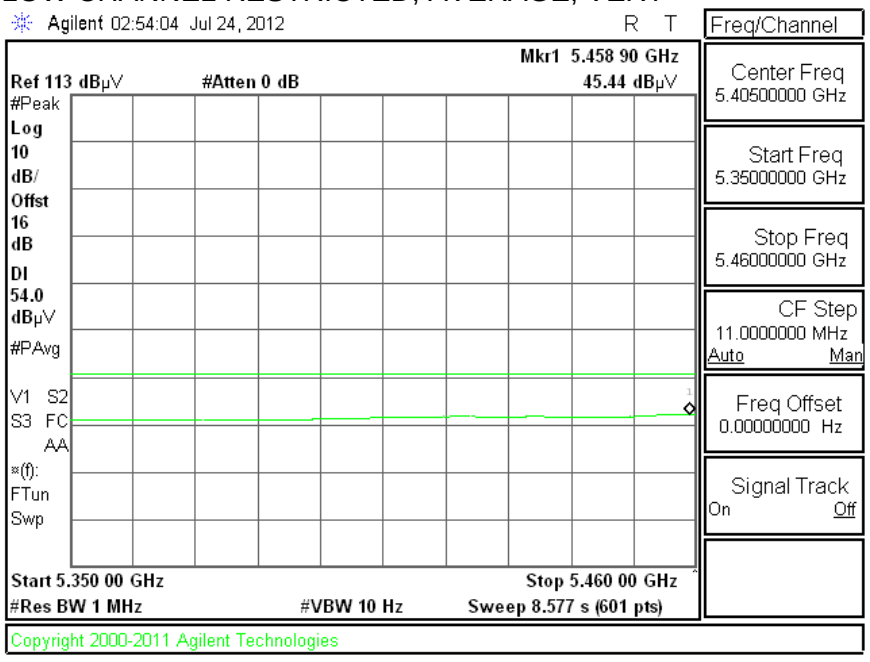




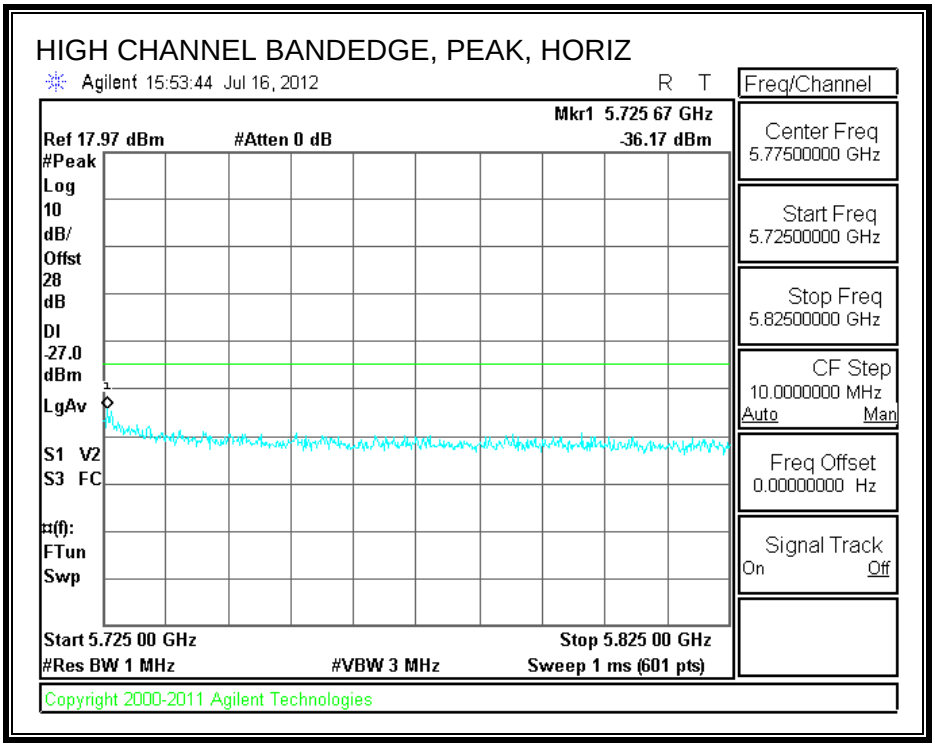
LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT

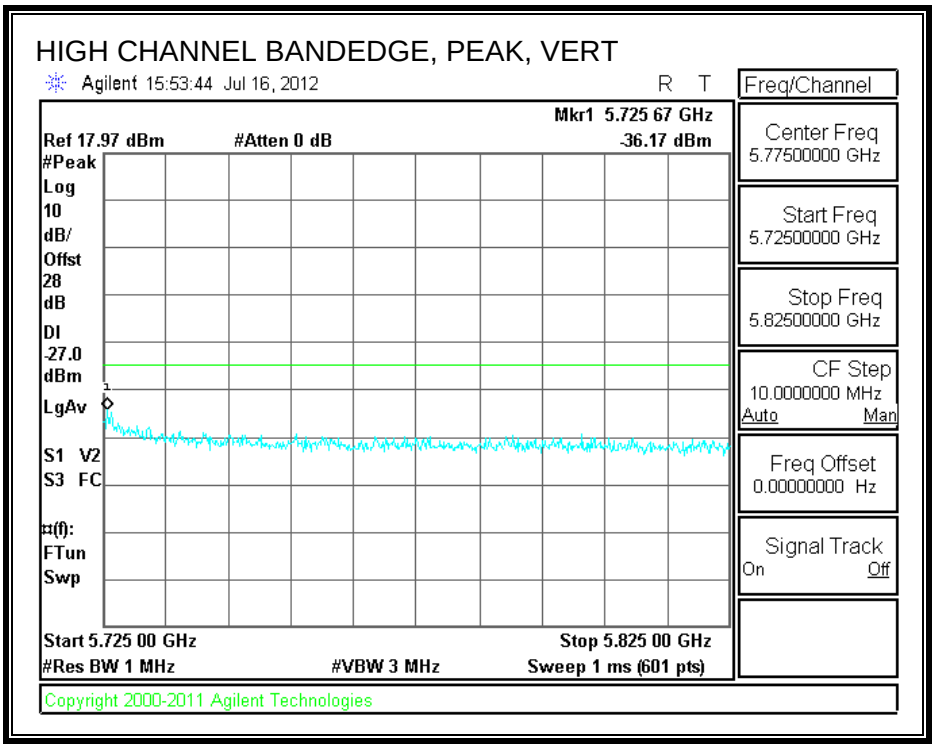


LOW CHANNEL RESTRICTED, AVERAGE, VERT



AUTHORIZED BANDEDGE (HIGH CHANNEL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber-A

Company: Cisco
Project #: 12U14476
Date: 7/18/2012
Test Engineer: David Garcia
Configuration: EUT, Laptop
Mode: 11a Beam Forming, 6mb/s

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T144 Miteq 3008A00931	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

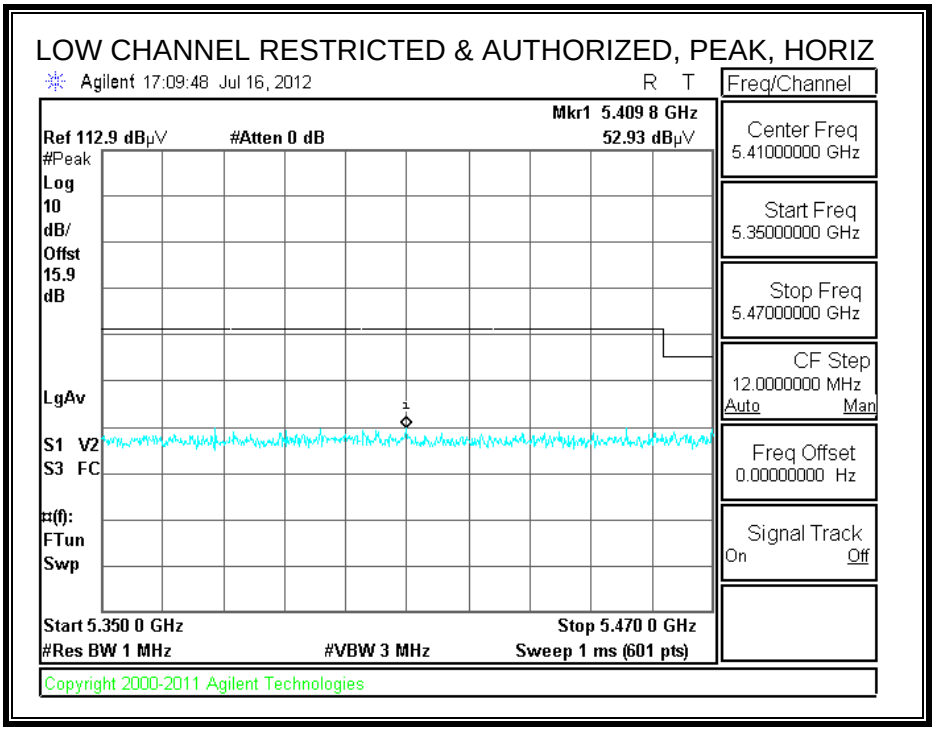
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel: 5500 MHz															
11.000	3.0	39.2	29.6	38.4	10.2	-35.6	0.0	0.0	52.1	42.4	74	54	-21.9	-11.6	V
11.000	3.0	37.0	27.7	38.4	10.2	-35.6	0.0	0.0	49.9	40.6	74	54	-24.1	-13.4	H
Middle Channel: 5560 MHz															
11.120	3.0	41.4	30.9	38.5	10.3	-35.6	0.0	0.0	54.5	44.1	74	54	-19.5	-9.9	V
11.120	3.0	36.8	26.9	38.5	10.3	-35.6	0.0	0.0	50.0	40.0	74	54	-24.0	-14.0	H
High Channel: 5700 MHz															
11.400	3.0	42.4	31.2	25.1	10.6	-35.6	0.0	0.0	42.5	31.3	74	54	-31.5	-22.7	V
11.400	3.0	39.7	29.4	38.7	10.6	-35.6	0.0	0.0	53.5	43.2	74	54	-20.5	-10.8	H

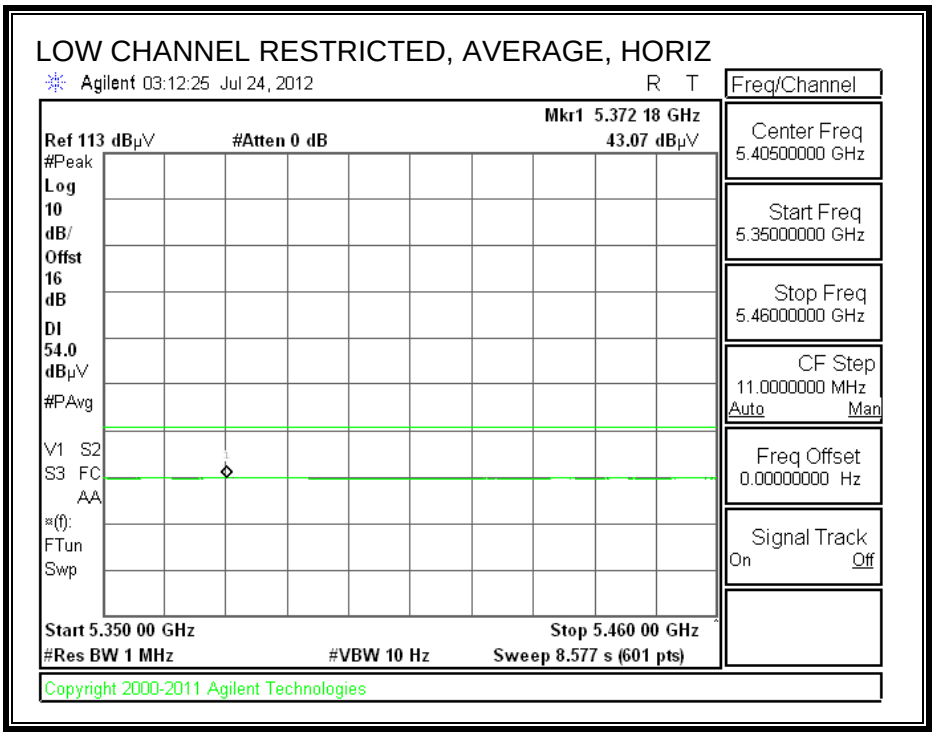
Rev. 11.10.11

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

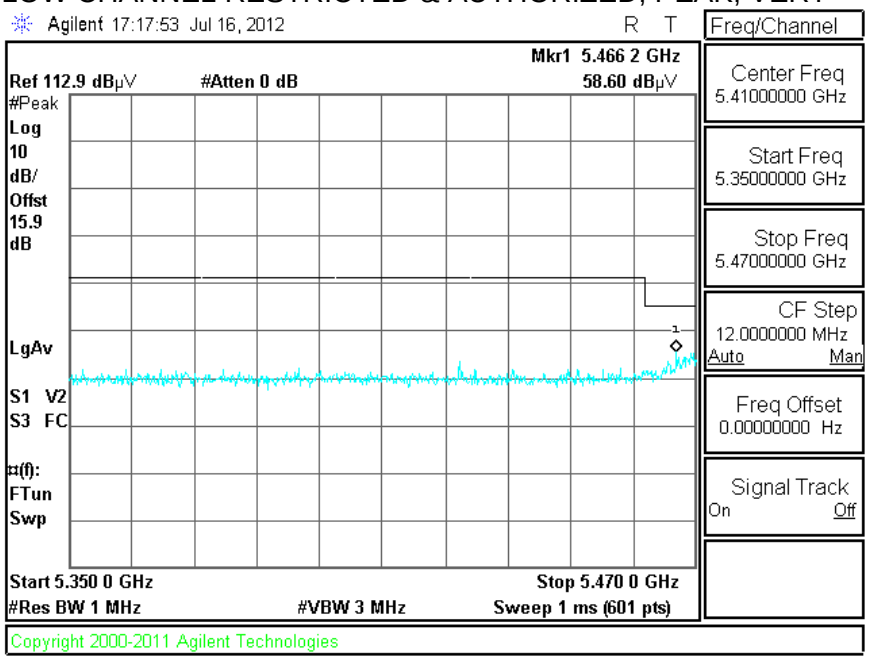
10.2.7. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.6 GHz BAND

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

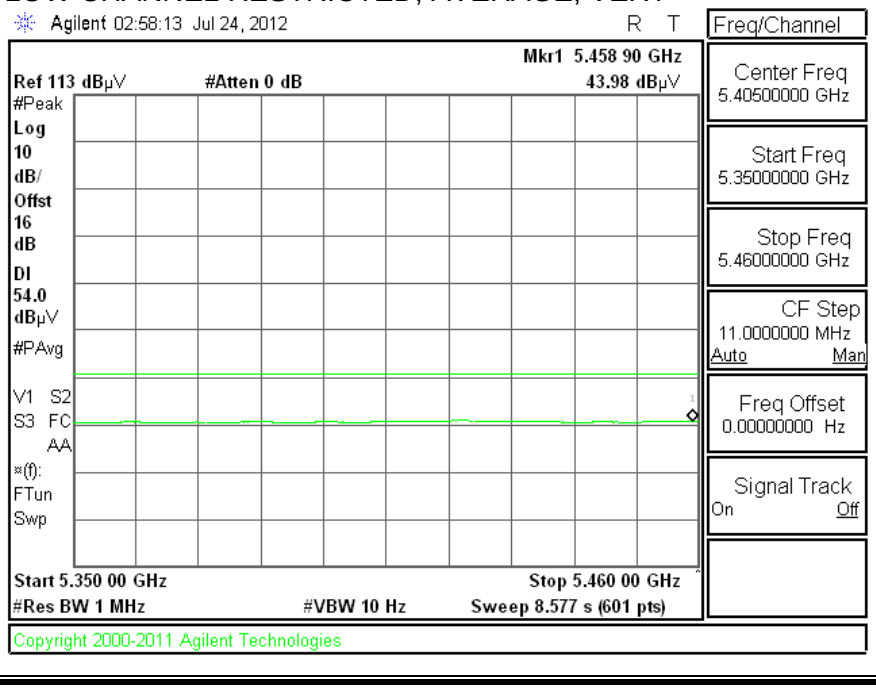




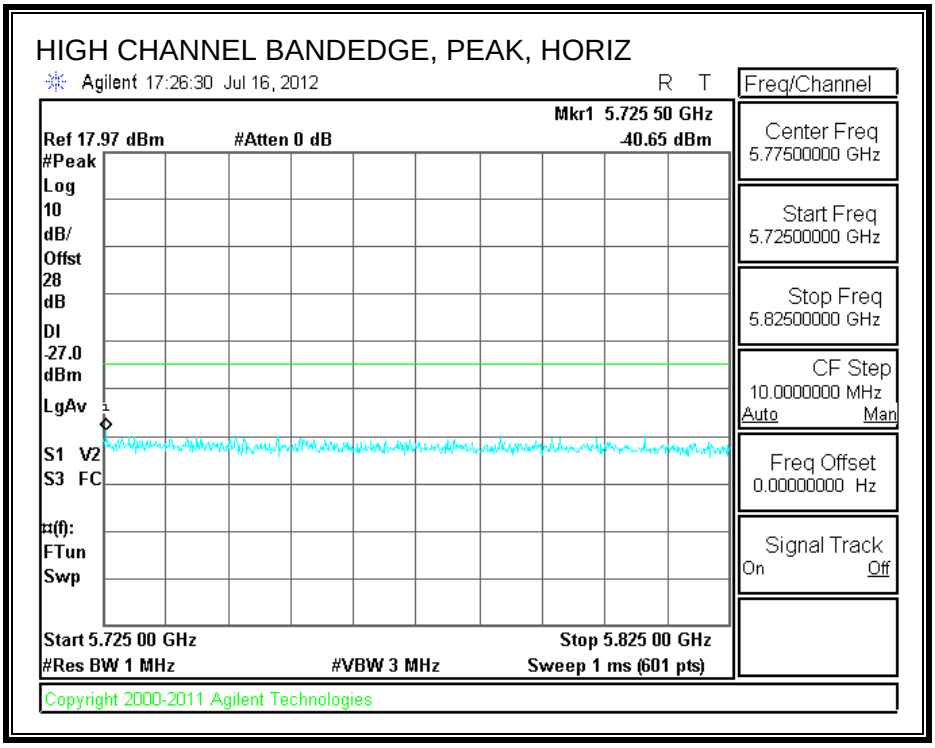
LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT

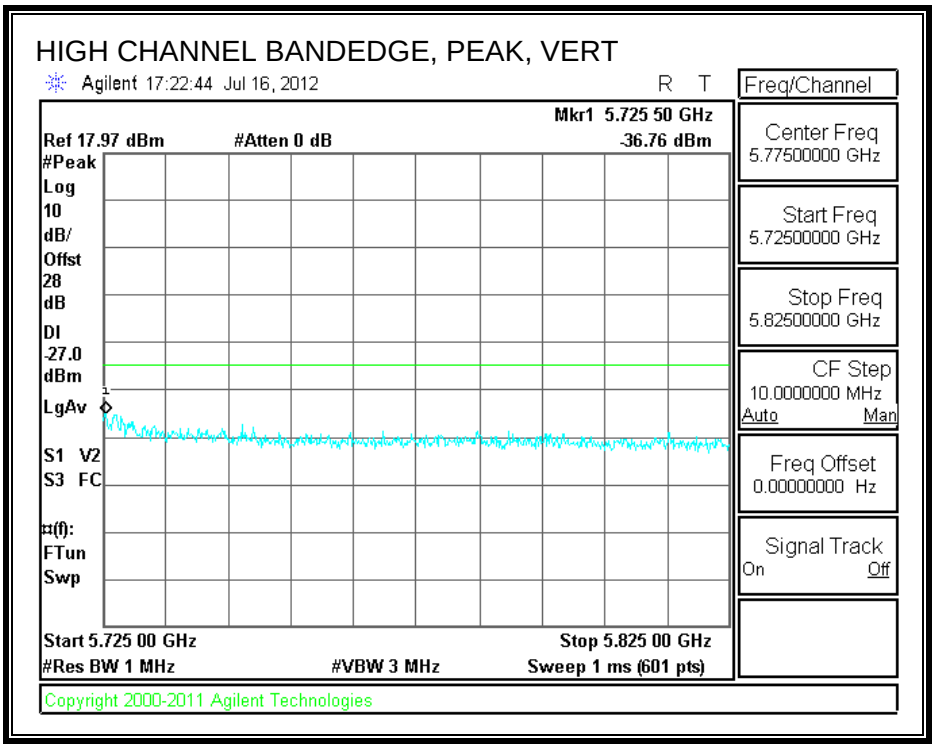


LOW CHANNEL RESTRICTED, AVERAGE, VERT



AUTHORIZED BANDEDGE (HIGH CHANNEL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber-A

Company: Cisco
Project #: 12U14476
Date: 7/18/2012
Test Engineer: David Garcia
Configuration: EUT, Laptop
Mode: 11n HT20 MIMO, MCS0

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T144 Miteq 3008A00931	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

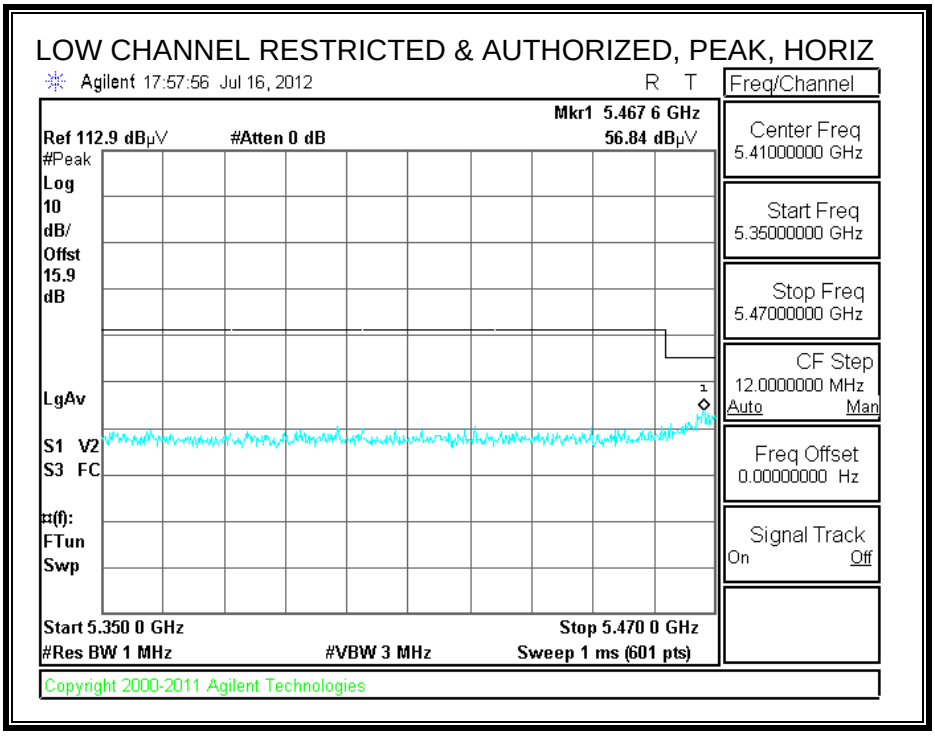
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel: 5500 MHz															
11.000	3.0	39.8	28.5	38.4	10.2	-35.6	0.0	0.0	52.7	41.3	74	54	-21.3	-12.7	V
11.000	3.0	36.4	26.9	38.4	10.2	-35.6	0.0	0.0	49.2	39.8	74	54	-24.8	-14.2	H
Middle Channel: 5560 MHz															
11.120	3.0	38.2	28.2	38.5	10.3	-35.6	0.0	0.0	51.3	41.3	74	54	-22.7	-12.7	V
11.120	3.0	35.5	25.8	38.5	10.3	-35.6	0.0	0.0	48.7	39.0	74	54	-25.3	-15.0	H
High Channel: 5700 MHz															
11.400	3.0	39.7	29.4	25.1	10.6	-35.6	0.0	0.0	39.8	29.5	74	54	-34.2	-24.5	V
11.400	3.0	37.2	27.1	38.7	10.6	-35.6	0.0	0.0	51.0	40.9	74	54	-23.0	-13.1	H

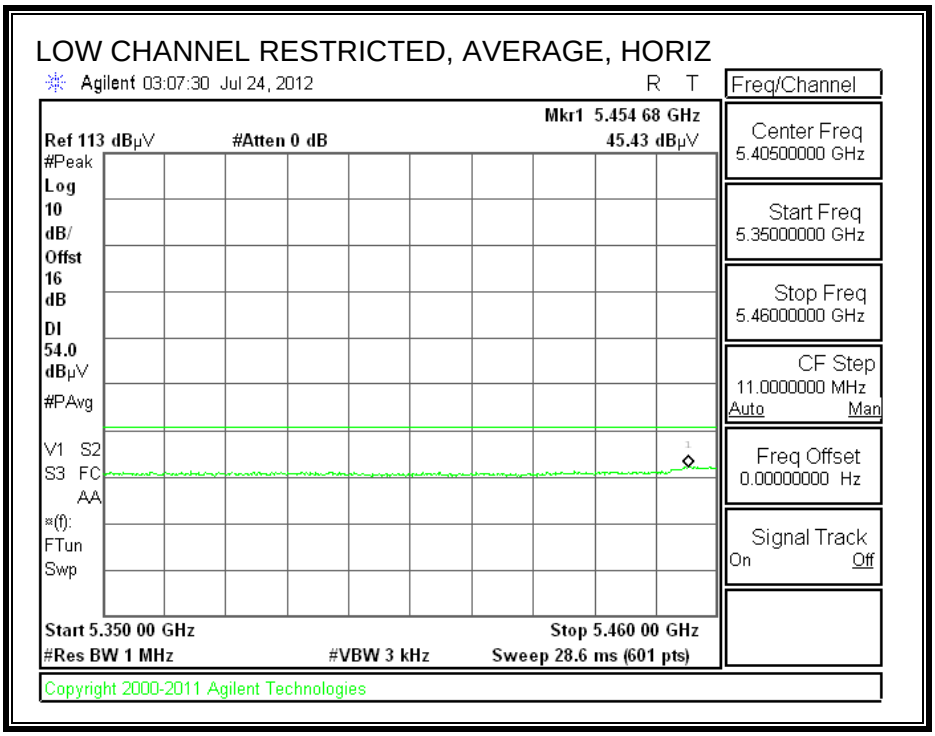
Rev. 11.10.11

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

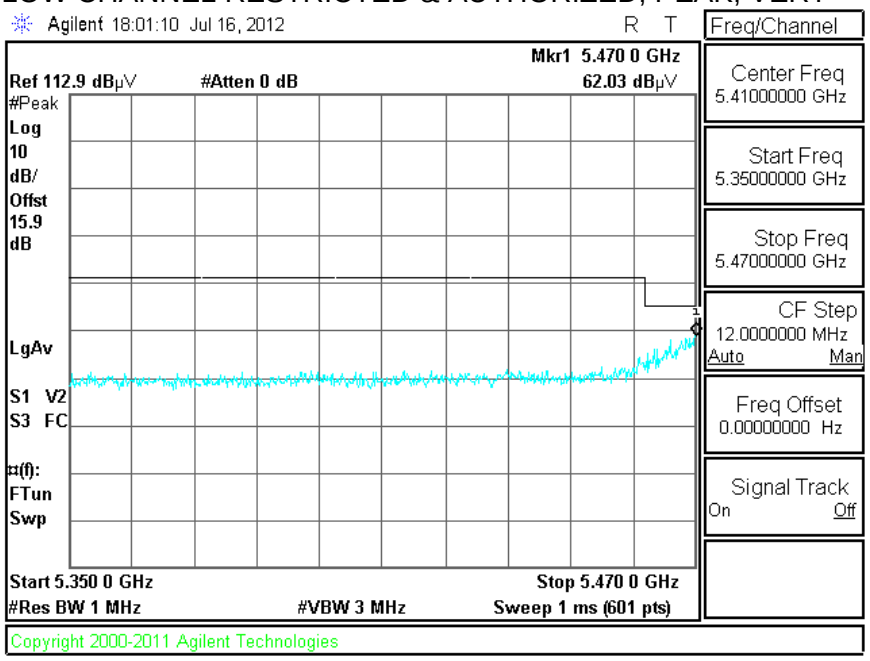
10.2.8. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.6 GHz BAND

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

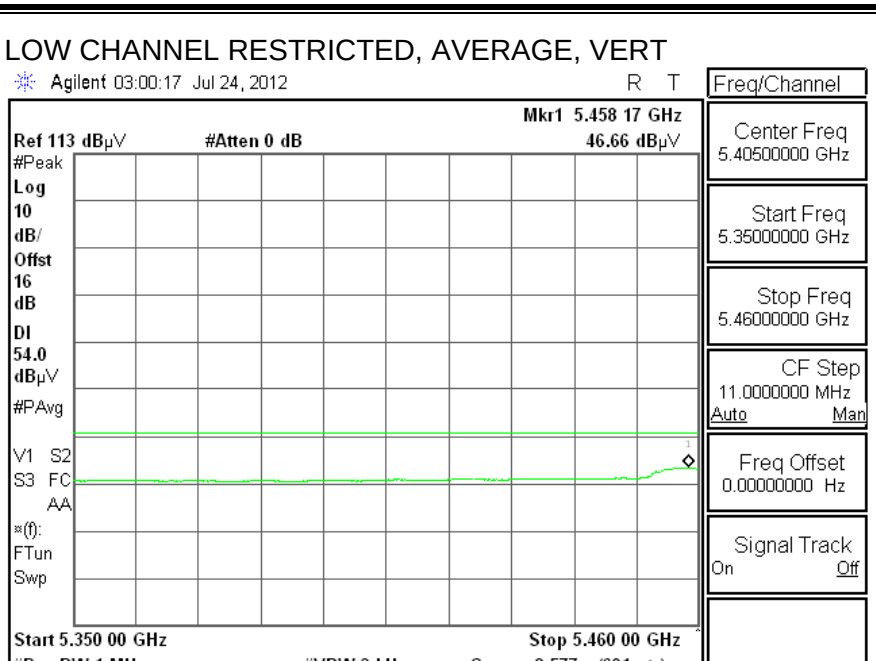




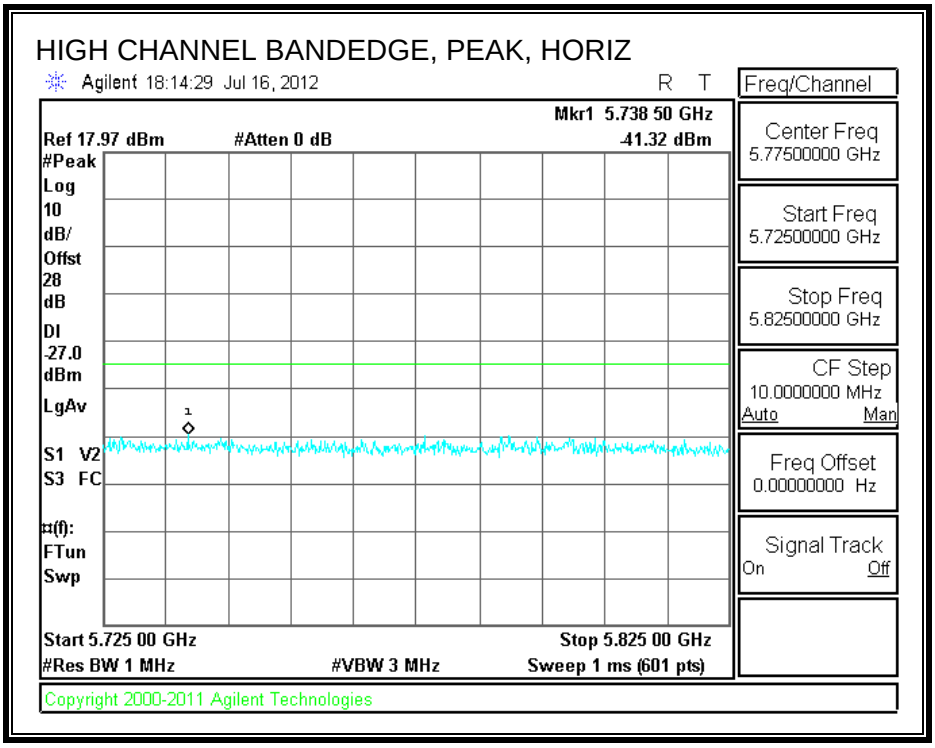
LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT

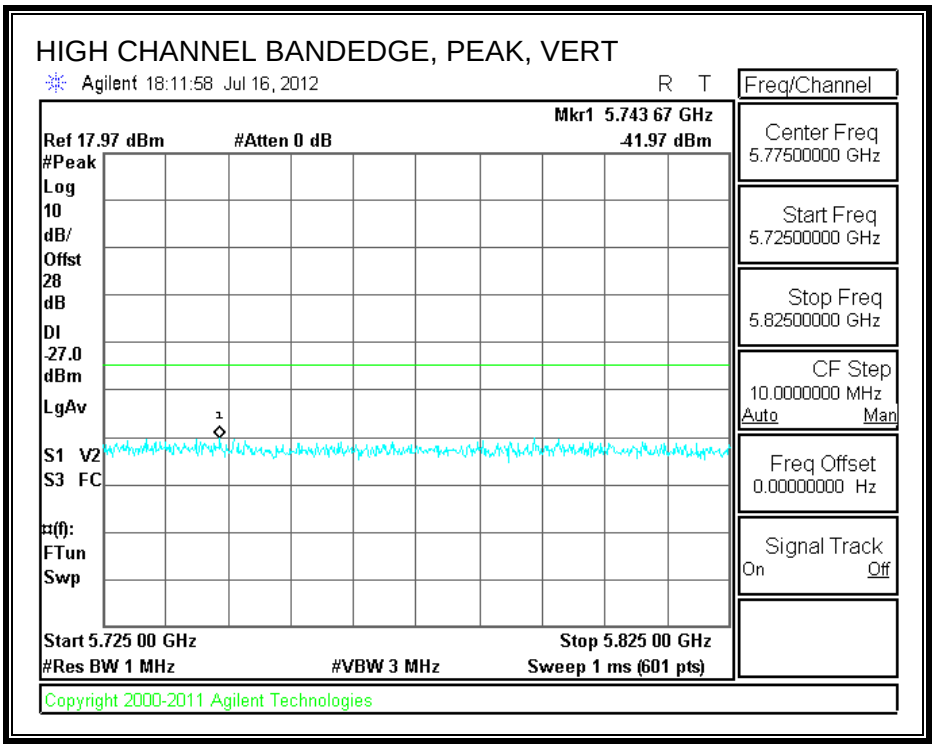


LOW CHANNEL RESTRICTED, AVERAGE, VERT



AUTHORIZED BANDEDGE (HIGH CHANNEL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber-A

Company: Cisco
Project #: 12U14476
Date: 7/18/2012
Test Engineer: David Garcia
Configuration: EUT, Laptop
Mode: 11n HT40 MIMO, MCS8

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T144 Miteq 3008A00931	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

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3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel: 5510 MHz															
11.020	3.0	37.1	25.5	38.4	10.2	-35.6	0.0	0.0	50.0	38.5	74	54	-24.0	-15.5	V
11.020	3.0	35.3	25.0	38.4	10.2	-35.6	0.0	0.0	48.3	37.9	74	54	-25.7	-16.1	H
Middle Channel: 5550 MHz															
11.100	3.0	37.1	26.6	38.5	10.3	-35.6	0.0	0.0	50.2	39.7	74	54	-23.8	-14.3	V
11.100	3.0	35.2	25.8	38.5	10.3	-35.6	0.0	0.0	48.3	38.9	74	54	-25.7	-15.1	H
High Channel: 5670 MHz															
11.340	3.0	35.3	25.3	25.1	10.6	-35.6	0.0	0.0	35.3	25.4	74	54	-38.7	-28.6	V
11.340	3.0	34.7	25.1	38.7	10.6	-35.6	0.0	0.0	48.3	38.8	74	54	-25.7	-15.2	H

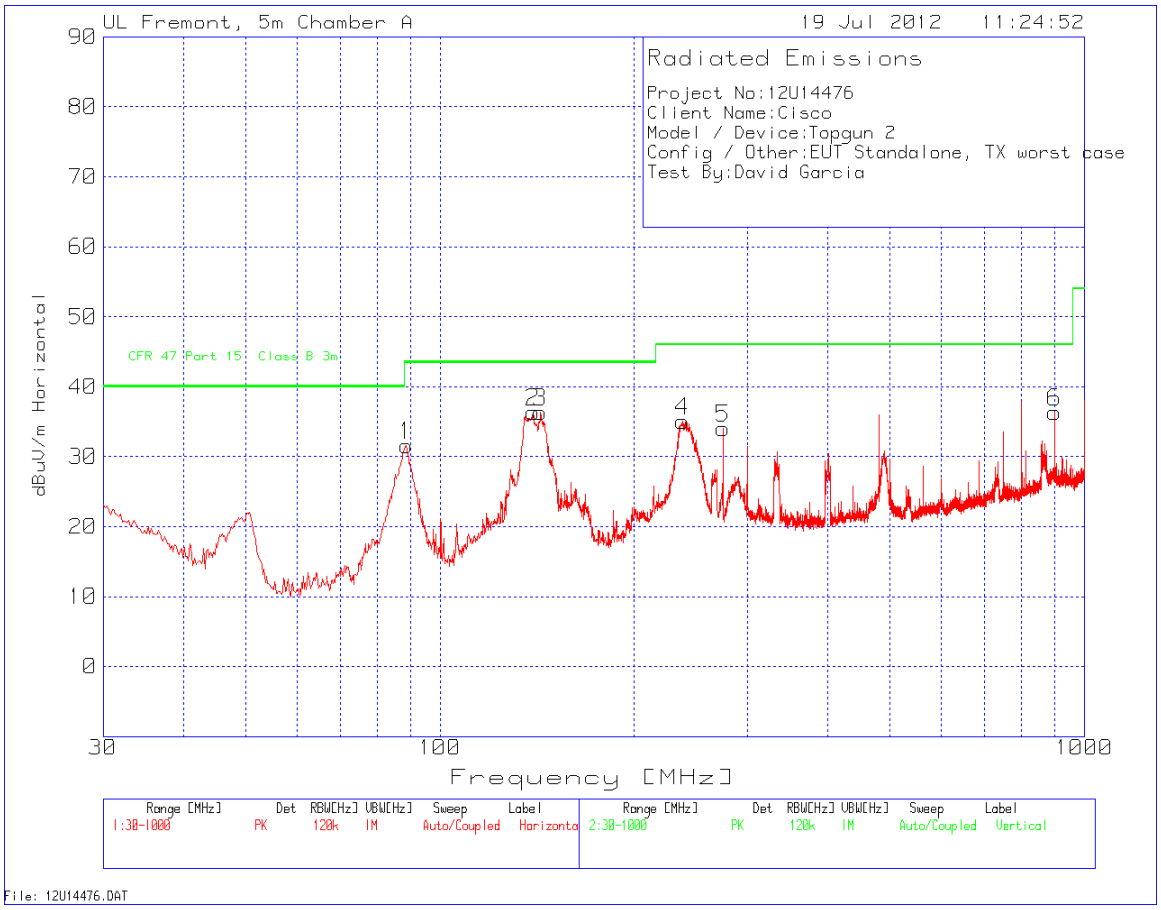
Rev. 11.10.11

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

10.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



VERTICAL PLOT

HORIZONTAL AND VERTICAL DATA

Project No:	12U14476
Client Name:	Cisco
Model / Device:	Topgun 2
Config / Other:	EUT Standalone, TX worst case
Test By:	David Garcia

Test Frequency	Meter Reading	Detector	25MHz-1GHz ChmbrA Amplified.TX (dB)	T243 Sunol Bilog.TXT (dB)	dBuV/m	CFR 47 Part 15 Class B 3m	Margin	Polarity
88.735	51.14	PK	-27.0	7.5	31.64	43.5	-11.86	Horz
139.5224	50.31	PK	-26.7	12.8	36.41	43.5	-7.09	Horz
143.2054	50.34	PK	-26.6	12.6	36.34	43.5	-7.16	Horz
237.8018	49.76	PK	-26.0	11.3	35.06	46.0	-10.94	Horz
275.02	46.60	PK	-25.9	13.3	34.00	46.0	-12.00	Horz
900.1699	37.60	PK	-23.4	22.2	36.40	46.0	-9.60	Horz
50.3537	53.96	PK	-27.2	7.9	34.66	40.0	-5.34	Vert
88.1535	52.38	PK	-27.0	7.4	32.78	43.5	-10.72	Vert
136.0332	50.25	PK	-26.7	13	36.55	43.5	-6.95	Vert
480.1079	45.07	PK	-25.0	17.3	37.37	46.0	-8.63	Vert
799.952	41.72	PK	-23.3	21	39.42	46.0	-6.58	Vert
1000	40.86	PK	-23.1	23	40.76	54.0	-13.24	Vert

PK - Peak detector
QP - Quasi-Peak detector
Av - Average detector
RMS - RMS detection

11. 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

ANSI C63.4

RESULTS

6 WORST EMISSIONS

Project No:	12U14776
Client Name:	Cisco
Model/Device:	Topgun 2
Test Volt/Freq:	120AC/60Hz
Test By:	David Garcia

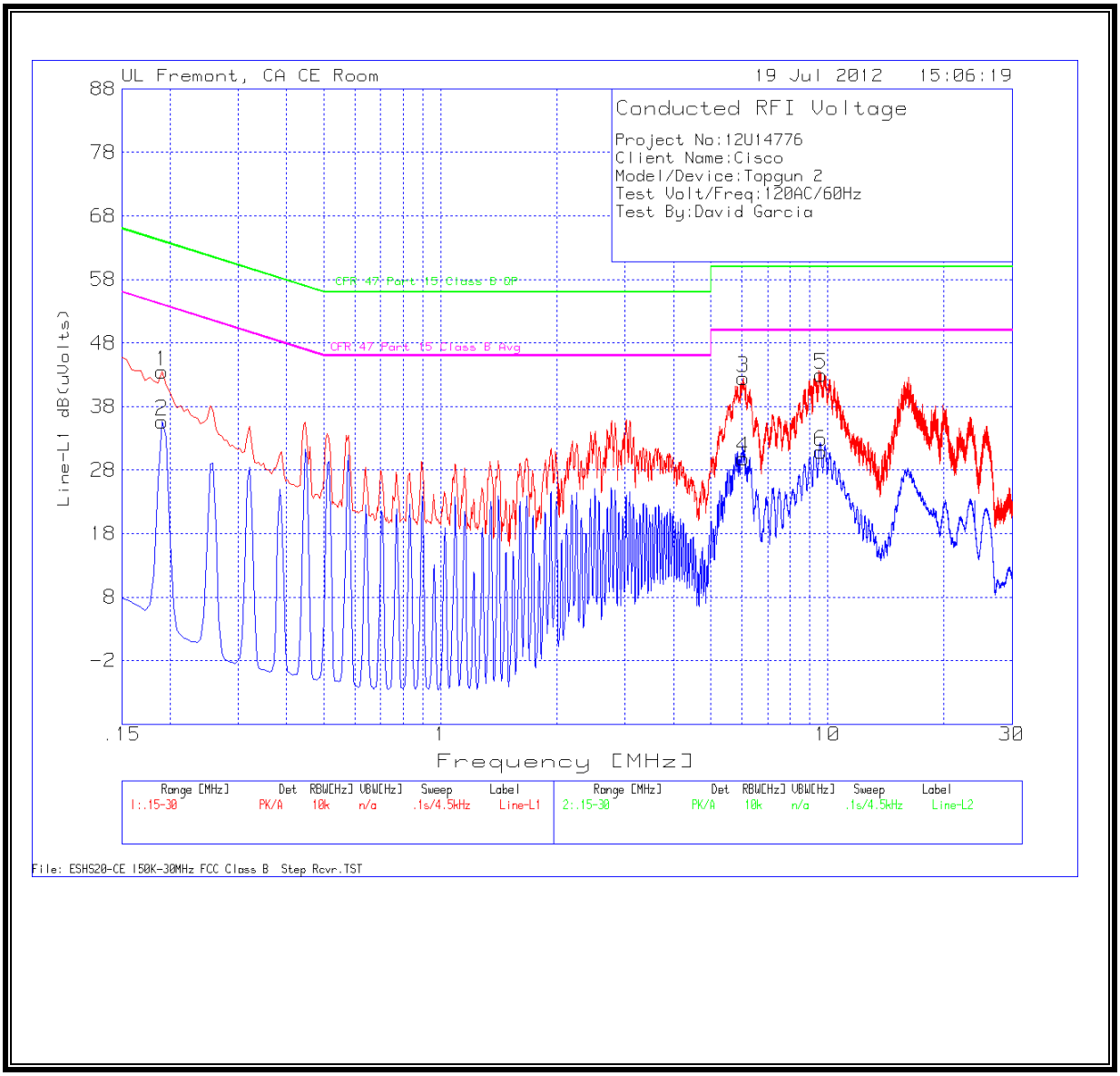
Line-L1 .15 - 30MHz

Test Frequency	Meter Reading	Detector	T24 IL L1.TXT (dB)	LC Cables 1&3.TXT (dB)	dB(uVolts)	CFR 47 Part 15 Class B QP	Margin	CFR 47 Part 15 Class B Avg	Margin
0.1905	43.36	PK	0.1	0.0	43.46	64	-20.54	-	-
0.1905	35.53	Av	0.1	0.0	35.63	-	-	54	-18.37
6.0585	42.31	PK	0.1	0.1	42.51	60	-17.49	-	-
6.0585	29.68	Av	0.1	0.1	29.88	-	-	50	-20.12
9.6405	42.67	PK	0.1	0.2	42.97	60	-17.03	-	-
9.6405	30.60	Av	0.1	0.2	30.9	-	-	50	-19.10

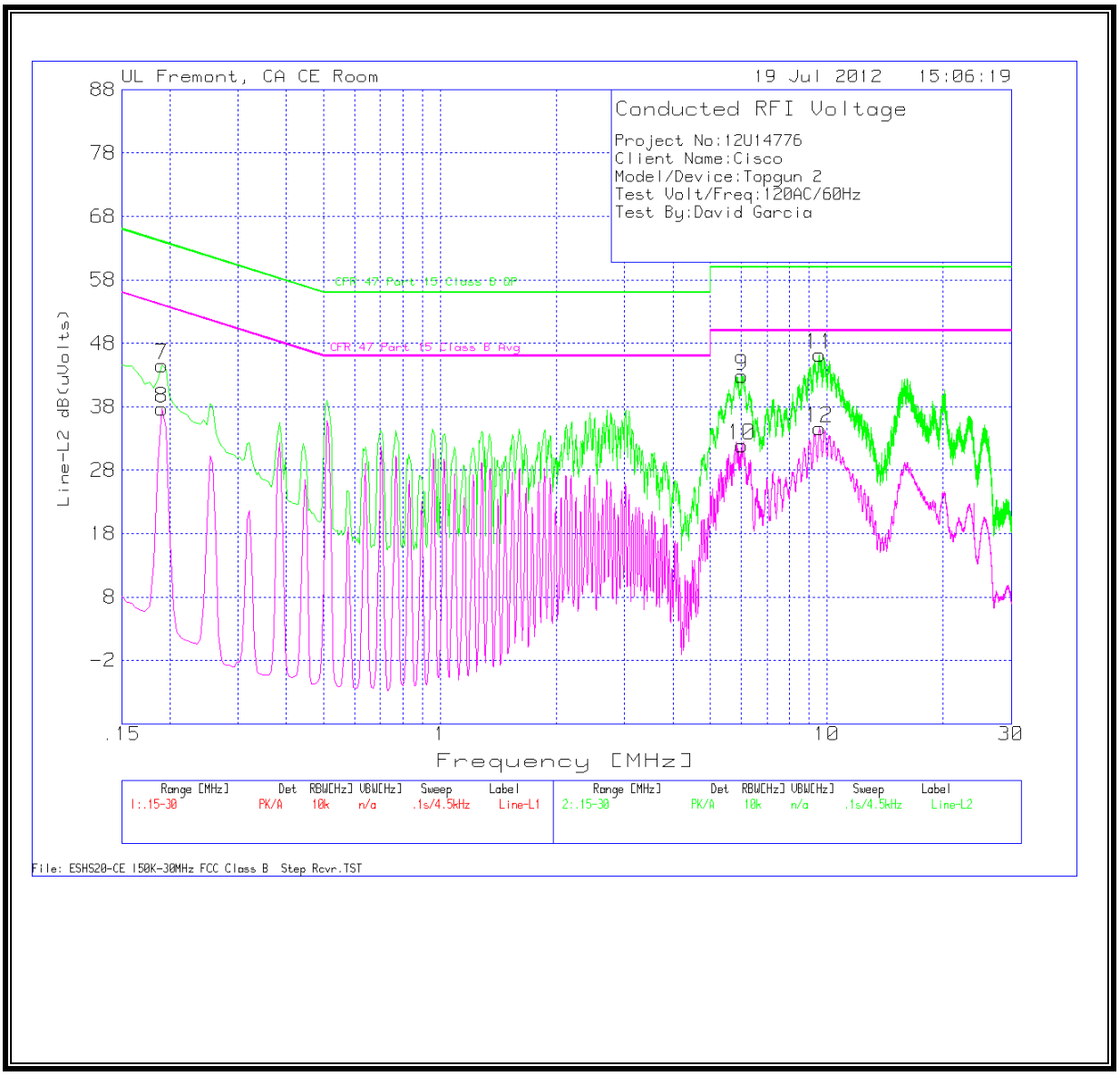
Line-L2 .15 - 30MHz

Test Frequency	Meter Reading	Detector	T24 IL L2.TXT (dB)	LC Cables 2&3.TXT (dB)	dB(uVolts)	CFR 47 Part 15 Class B QP	Margin	CFR 47 Part 15 Class B Avg	Margin
0.1905	44.44	PK	0.1	0.0	44.54	64	-19.46	-	-
0.1905	37.61	Av	0.1	0.0	37.71	-	-	54	-16.29
6.0315	42.64	PK	0.1	0.1	42.84	60	-17.16	-	-
6.0315	31.72	Av	0.1	0.1	31.92	-	-	50	-18.08
9.582	45.98	PK	0.1	0.2	46.28	60	-13.72	-	-
9.582	34.31	Av	0.1	0.2	34.61	-	-	50	-15.39

LINE 1 RESULTS



LINE 2 RESULTS



12. DYNAMIC FREQUENCY SELECTION

12.1. OVERVIEW

12.1.1. LIMITS

INDUSTRY CANADA

IC RSS-210 is closely harmonized with FCC Part 15 DFS rules. The deviations are as follows:

RSS-210 Issue 7 A9.4 (b) (ii) **Channel Availability Check Time:** …

Additional requirements for the band 5600-5650 MHz: Until further notice, devices subject to this Section shall not be capable of transmitting in the band 5600-5650 MHz, so that Environment Canada weather radars operating in this band are protected.

RSS-210 Issue 7 A9.4 (b) (iv) **Channel closing time:** the maximum channel closing time is 260 ms.

FCC

§15.407 (h) and FCC 06-96 APPENDIX “COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVCIES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION”.

Table 1: Applicability of DFS requirements prior to use of a channel

Requirement	Operational Mode		
	Master	Client (without radar detection)	Client (with radar detection)
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
Uniform Spreading	Yes	Not required	Not required

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client **(without DFS)**	Client **(with DFS)**
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes

Table 3: Interference Threshold values, Master or Client incorporating In-Service Monitoring

Maximum Transmit Power	Value (see note)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.		

Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds
Channel Closing Transmission Time	200 milliseconds + approx. 60 milliseconds over remaining 10 second period
The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows: For the Short pulse radar Test Signals this instant is the end of the *Burst*. For the Frequency Hopping radar Test Signal, this instant is the end of the last radar burst generated. For the Long Pulse radar Test Signal this instant is the end of the 12-second period defining the radar transmission. The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate channel changes (an aggregate of approximately 60 milliseconds) during the remainder of the 10-second period. The aggregate duration of control signals will not count quiet periods in between transmissions.	

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (Microseconds)	PRI (Microseconds)	Pulses	Minimum Percentage of Successful Detection	Minimum Trials
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Table 6 – Long Pulse Radar Test Signal

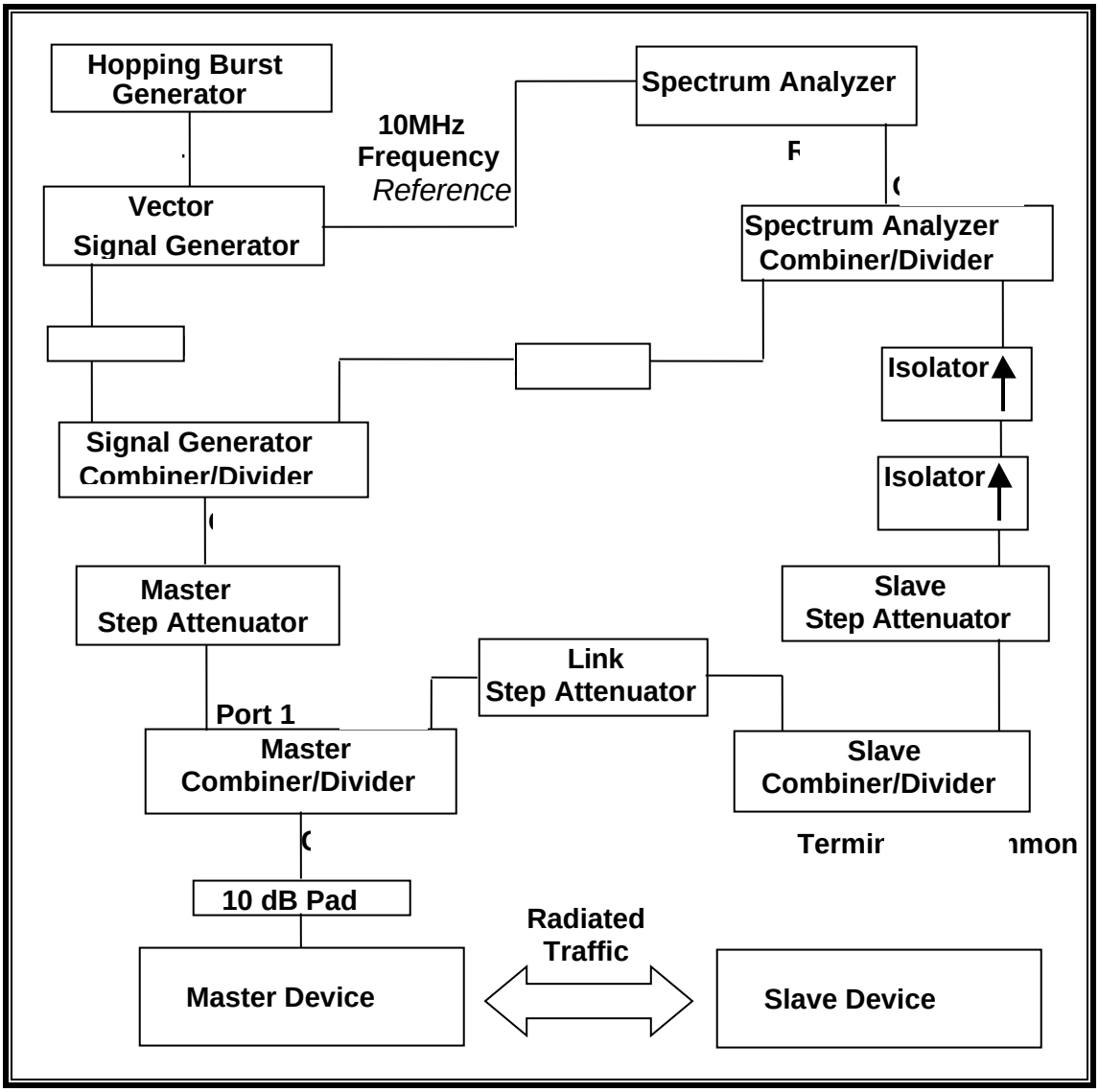
Radar Waveform	Bursts	Pulses per Burst	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Minimum Percentage of Successful Detection	Minimum Trials
5	8-20	1-3	50-100	5-20	1000-2000	80%	30

Table 7 – Frequency Hopping Radar Test Signal

Radar Waveform	Pulse Width (µsec)	PRI (µsec)	Burst Length (ms)	Pulses per Hop	Hopping Rate (kHz)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	300	9	.333	70%	30

12.1.2. TEST AND MEASUREMENT SYSTEM

CONDUCTED METHOD SYSTEM BLOCK DIAGRAM



SYSTEM OVERVIEW

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of FCC 06-96 APPENDIX. The frequency of the signal generator is incremented in 1 MHz steps from F_L to F_H for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

Should multiple RF ports be utilized for the Master and/or Slave devices (for example, for diversity or MIMO implementations), additional combiner/dividers are inserted between the Master Combiner/Divider and the pad connected to the Master Device (and/or between the Slave Combiner/Divider and the pad connected to the Slave Device). Additional pads are utilized such that there is one pad at each RF port on each EUT.

SYSTEM CALIBRATION

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected in place of the master device. The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyzer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. The Reference Level Offset of the spectrum analyzer is adjusted so that the displayed amplitude of the signal is –64 dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

A link is established between the Master and Slave and the Link Step Attenuator between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. The video test file is streamed to generate WLAN traffic. The WLAN traffic level, as displayed on the spectrum analyzer, is confirmed to be at lower amplitude than the radar detection threshold and is confirmed to be the Radar Detection Device rather than the associated device. If a different setting of the Master Step Attenuator is required to meet the above conditions, a new System Calibration is performed for the new Master Step Attenuator setting.

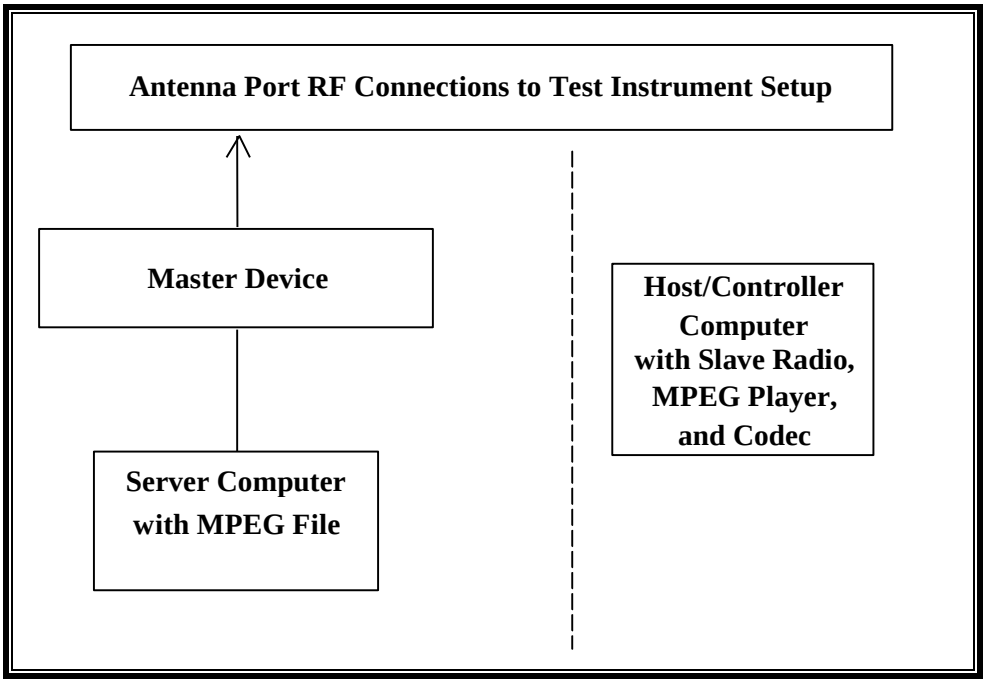
TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Due**
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/15/12
Vector Signal Generator, 20GHz	Agilent / HP	E8267C	C01066	11/17/12
Arbitrary Waveform Generator	Agilent / HP	33220A	C01146	09/16/12

12.1.3. SETUP OF EUT

CONDUCTED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

The following support equipment was utilized for the DFS tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter (EUT)	Delta Electronics	EADP-60MB B	DTH1537S47M	Doc
Notebook PC (Server)	HP	Pavilion DV6500	CNF7383J6K	Doc
AC Adapter (Server PC)	HP	PA-1650-02H	592C40E3VV3OPB	Doc
Notebook PC (Host/Controller PC)	Lenovo	Type 2007-OTO	L3-5X8F4	Doc
AC Adapter (Host PC)	Lenovo	92P1109	11S92P1109Z1ZB TZ73CDAW	Doc
Wireless-N Dual Band USB Adapter (Slave Device)	Netgear	WNDA3100	2D4125BD125E8	PY310100130

12.1.4. DESCRIPTION OF EUT

The EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges, excluding channels which would overlap the 5600-5650 MHz band.

The EUT is a Master Device.

The highest power level within these bands is 24.85 dBm EIRP in the 5250-5350 MHz band and 24.28 dBm EIRP in the 5470-5725 MHz band.

The highest gain antenna assembly utilized with the EUT has a gain of 6 dBi in the 5250-5350 MHz band and 6 dBi in the 5470-5725 MHz band. The lowest gain antenna assembly utilized with the EUT has a gain of 3.5 dBi in the 5250-5350 MHz band and 3.5 dBi in the 5470-5725 MHz band.

Three identical antennas are utilized to meet the diversity and MIMO operational requirements.

The rated output power of the Master unit is < 23dBm (EIRP). Therefore the required interference threshold level is –62 dBm. After correction for minimum antenna gain of 0 dBi and procedural adjustments the required conducted threshold at the antenna port is –62 + 1 = -61 dBm.

The calibrated conducted DFS Detection Threshold level is set to –62 dBm. The tested level is lower than the required level hence it provides margin to the limit.

The EUT uses two transmitter/receiver chains and one receive only chain, each connected to a 50-ohm coaxial antenna port. All antenna ports are connected to the test system via a power divider to perform conducted tests.

The Slave device associated with the EUT during these tests does not have radar detection capability.

WLAN traffic is generated by streaming the video file TestFile.mp2 “6 ½ Magic Hours” from the Master to the Slave in full motion video mode using VLC gcc version 3.4.5 media player.

TPC is not required since the maximum EIRP is less than 500 mW (27 dBm), however TPC is implemented.

The EUT utilizes the 802.11a/n architecture. Two nominal channel bandwidths are implemented: 20 MHz and 40 MHz.

The software installed in the access point is version 12.4.

UNIFORM CHANNEL SPREADING

See Manufacturer’s Attestation.

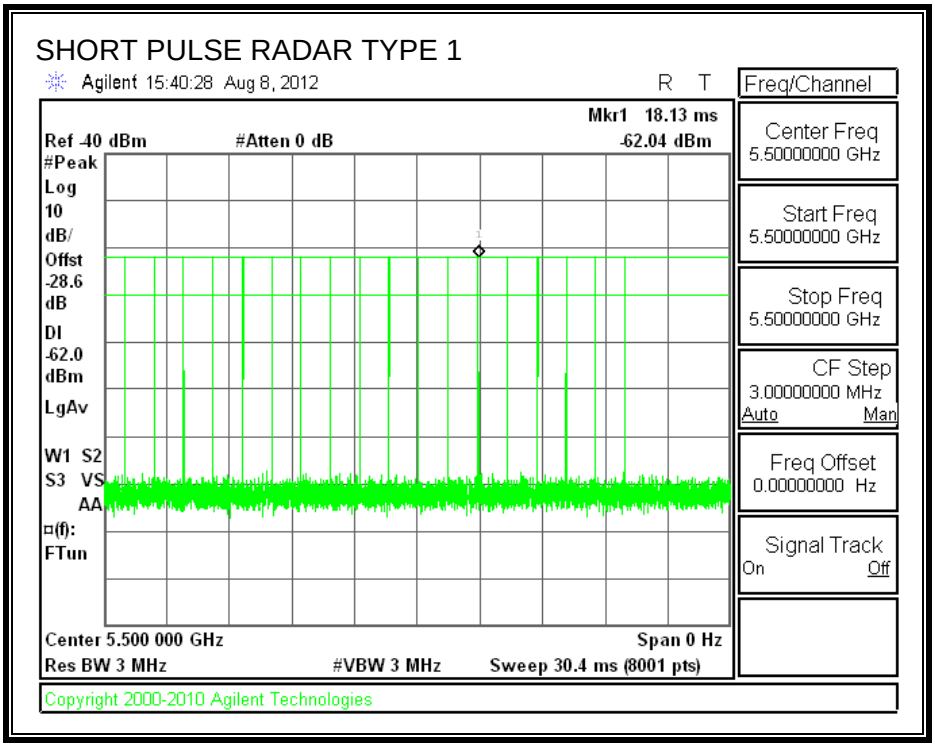
12.2. RESULTS FOR 20 MHz BANDWIDTH

12.2.1. TEST CHANNEL

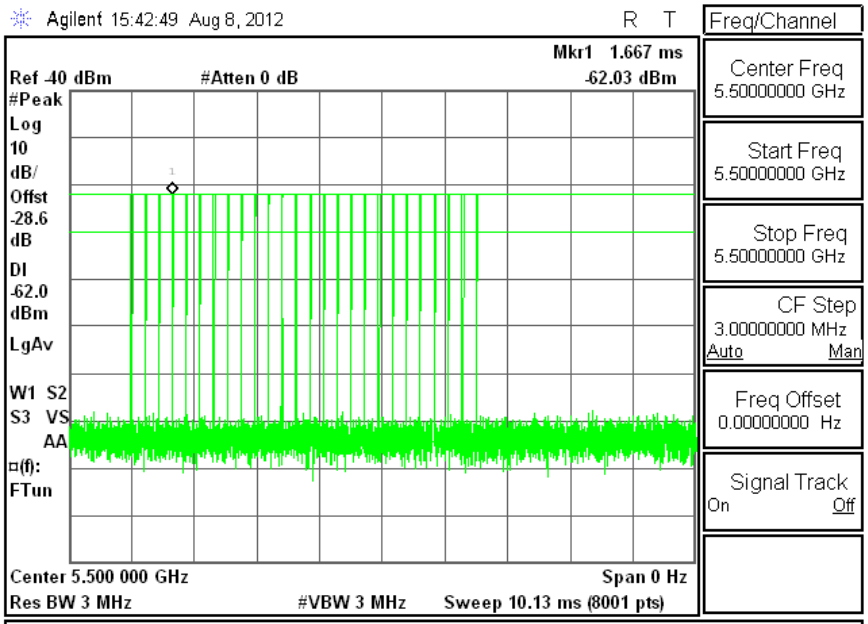
All tests were performed at a channel center frequency of 5500 MHz.

12.2.2. RADAR WAVEFORMS AND TRAFFIC

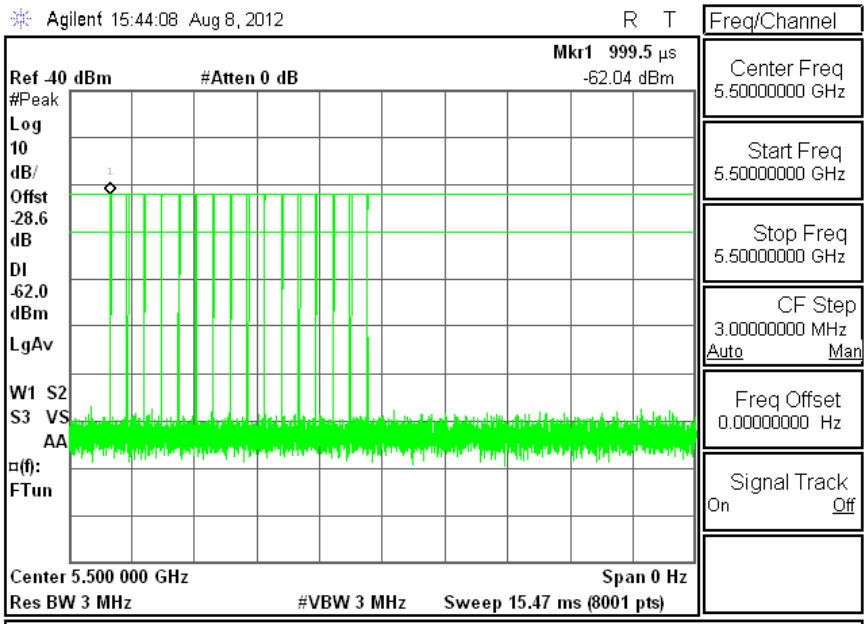
RADAR WAVEFORMS



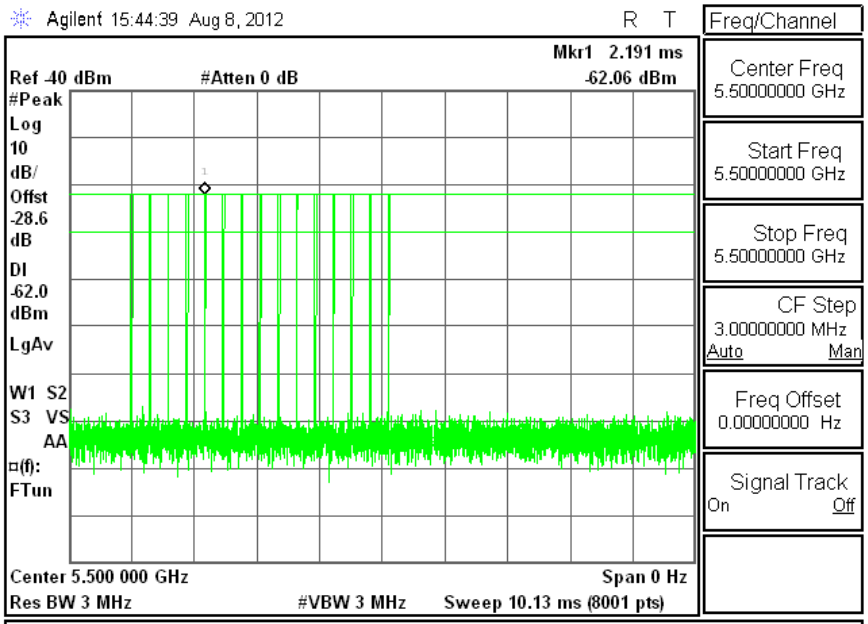
SAMPLE OF RADAR TYPE 2



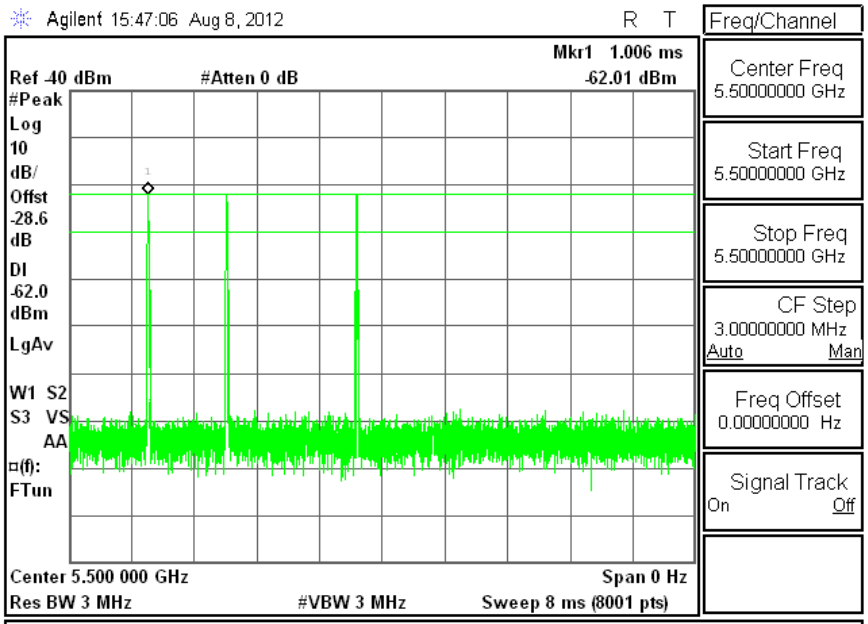
SAMPLE OF RADAR TYPE 3



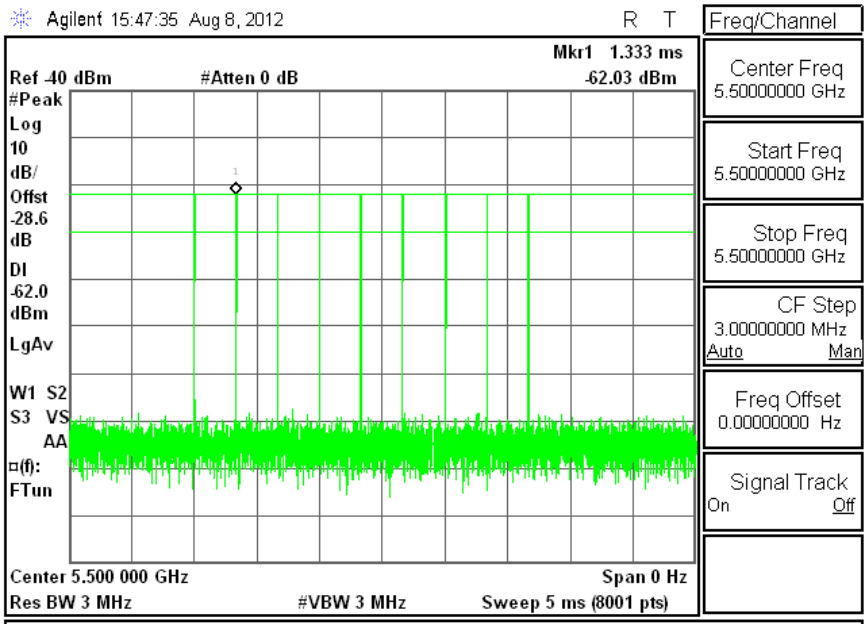
SAMPLE OF RADAR TYPE 4



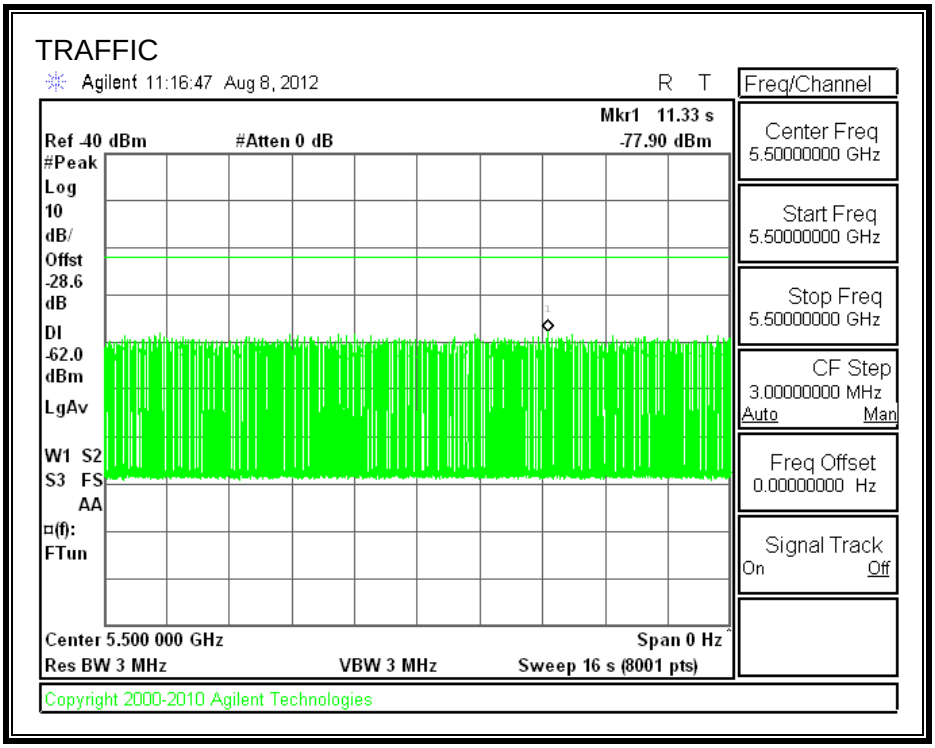
SAMPLE OF SINGLE BURST OF RADAR TYPE 5



SINGLE BURST OF RADAR TYPE 6



TRAFFIC



12.2.3. CHANNEL AVAILABILITY CHECK TIME

PROCEDURE TO DETERMINE INITIAL POWER-UP CYCLE TIME

The EUT was rebooted at zero-seconds elapsed time. The time from the reboot to the beginning of traffic on the selected channel was measured as the time required for the EUT to complete the total power-up cycle. The time to complete the initial power-up period is 60 seconds less than this total power-up time.

PROCEDURE FOR TIMING OF RADAR BURST

The EUT was rebooted at zero-seconds elapsed time. A radar signal was triggered within 0 to 6 seconds after the initial power-up period, and transmissions on the channel were monitored on the spectrum analyzer.

The Non-Occupancy list was cleared. The EUT was rebooted at zero-seconds elapsed time. A radar signal was triggered within 54 to 60 seconds after the initial power-up period, and transmissions on the channel were monitored on the spectrum analyzer.

QUANTITATIVE RESULTS

No Radar Triggered

Timing of Reboot (sec)	Timing of Start of Traffic (sec)	Total Power-up Cycle Time (sec)	Initial Power-up Cycle Time (sec)
0	110.3	110.3	50.3

Radar Near Beginning of CAC

Timing of Reboot (sec)	Timing of Radar Burst (sec)	Radar Relative to Reboot (sec)	Radar Relative to Start of CAC (sec)
0	51.3	51.3	1.0

Radar Near End of CAC

Timing of Reboot (sec)	Timing of Radar Burst (sec)	Radar Relative to Reboot (sec)	Radar Relative to Start of CAC (sec)
0	109.2	109.2	58.9

QUALITATIVE RESULTS

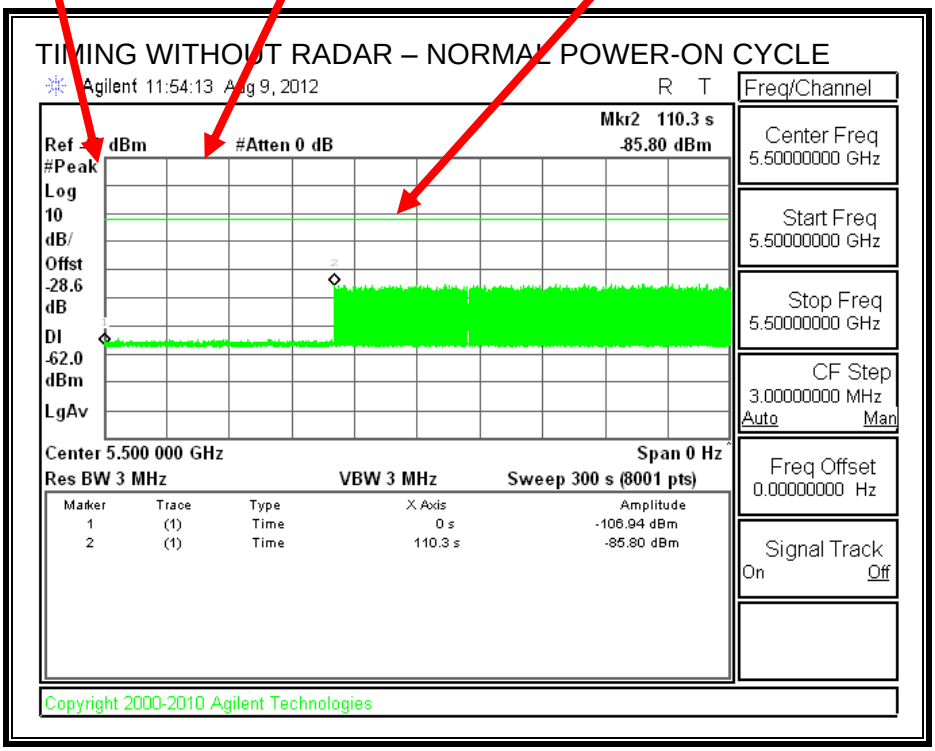
Timing of Radar Burst	Display on Control Computer	Spectrum Analyzer Display
No Radar Triggered	EUT marks Channel as active	Transmissions begin on channel after completion of the initial power-up cycle and the CAC
Within 0 to 6 second window	EUT indicates radar detected	No transmissions on channel
Within 54 to 60 second window	EUT indicates radar detected	No transmissions on channel

TIMING WITHOUT RADAR DURING CAC

AP is rebooted
Start of Initial Power-up cycle

End of Initial Power-up cycle
Start of CAC

End of CAC
Traffic is Initiated



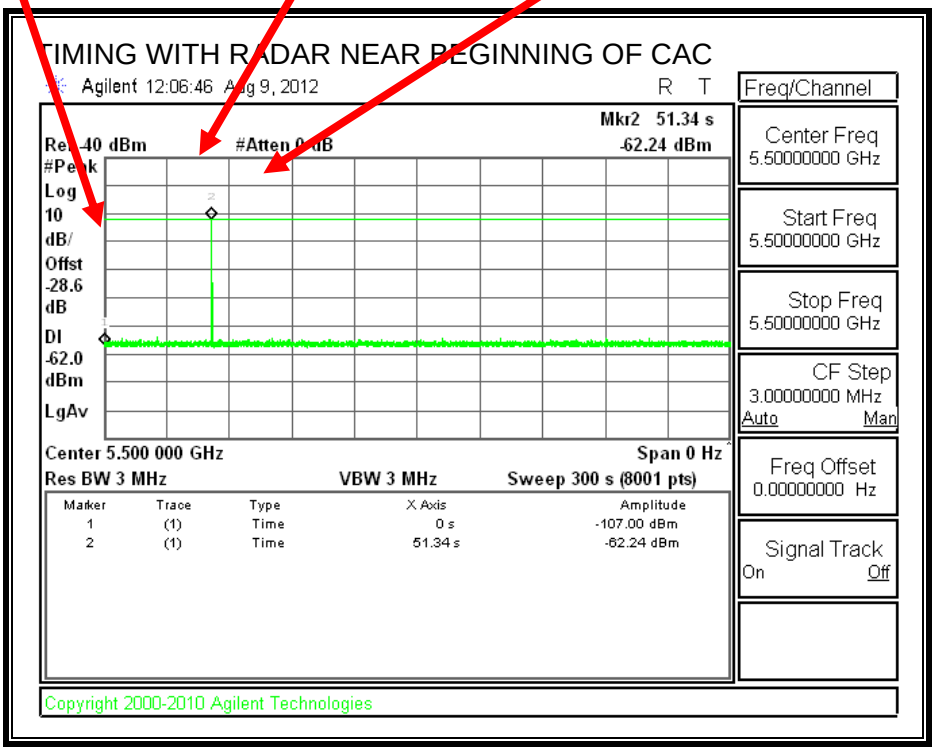
Transmissions begin on channel after completion of the initial power-up cycle and the CAC.

TIMING WITH RADAR NEAR BEGINNING OF CAC

AP is rebooted
Start of Initial Power-up cycle

End of Initial Power-up cycle
Start of CAC

Radar Signal Applied



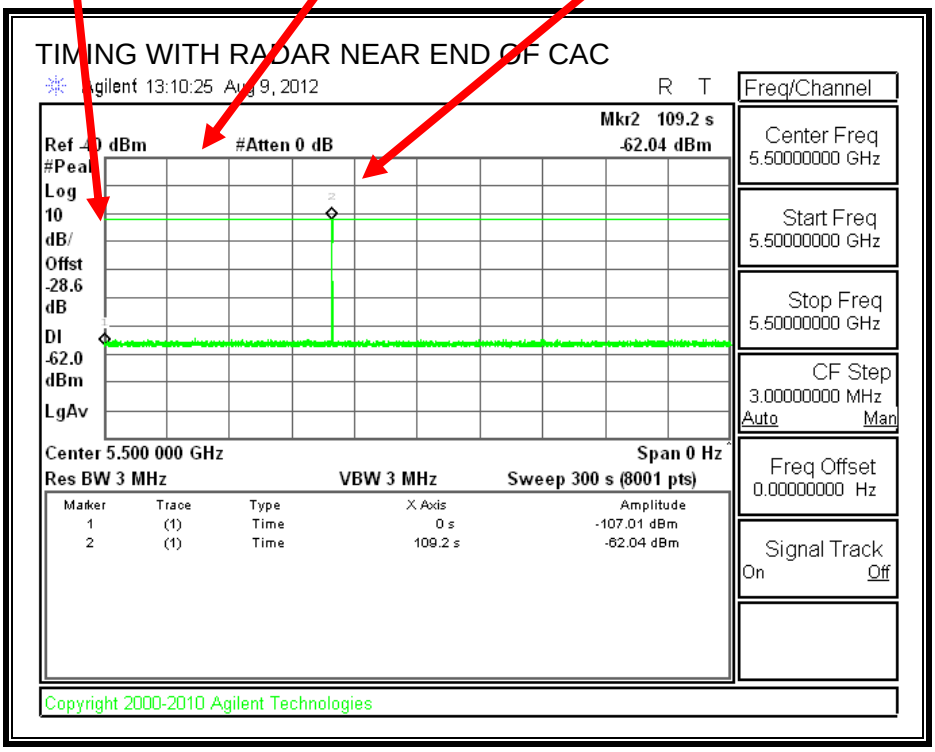
No EUT transmissions were observed after the radar signal.

TIMING WITH RADAR NEAR END OF CAC

AP is rebooted
Start of Initial Power-up cycle

End of Initial Power-up cycle
Start of CAC

Radar Signal Applied



No EUT transmissions were observed after the radar signal.

12.2.4. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

12.2.5. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =
(Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

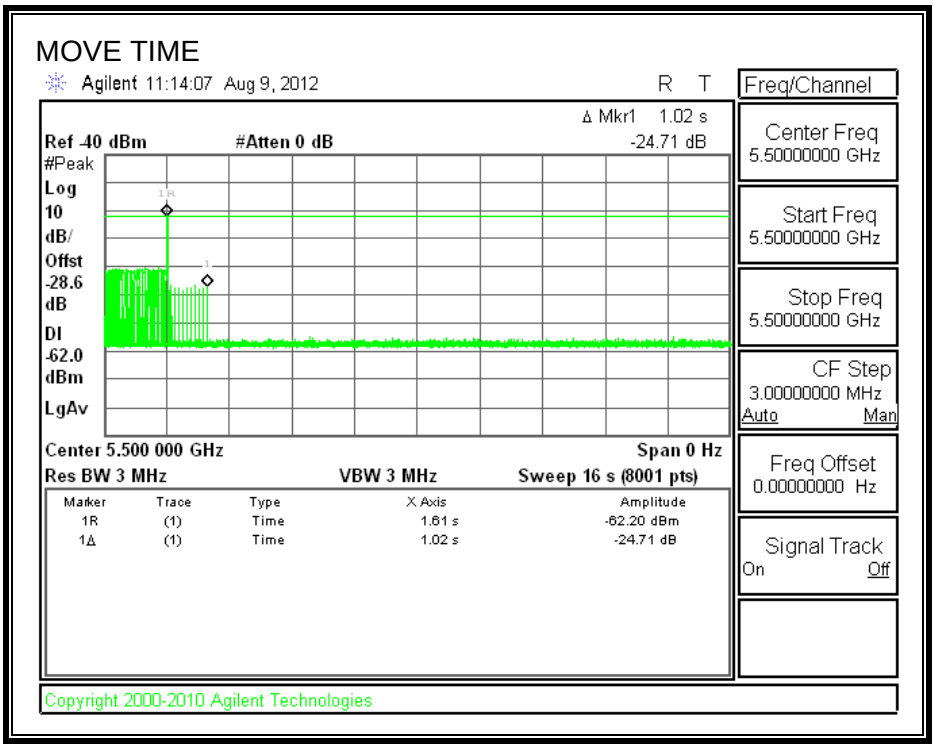
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

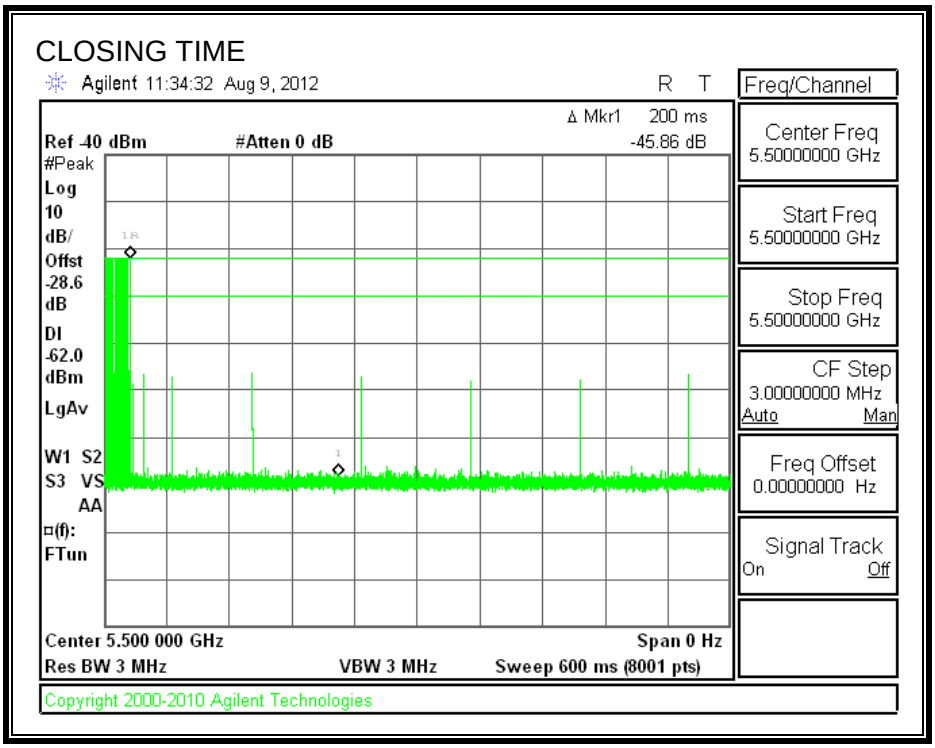
Agency	Channel Move Time (sec)	Limit (sec)
FCC / IC	1.02	10

Agency	Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
FCC	16.0	60
IC	30.0	260

MOVE TIME



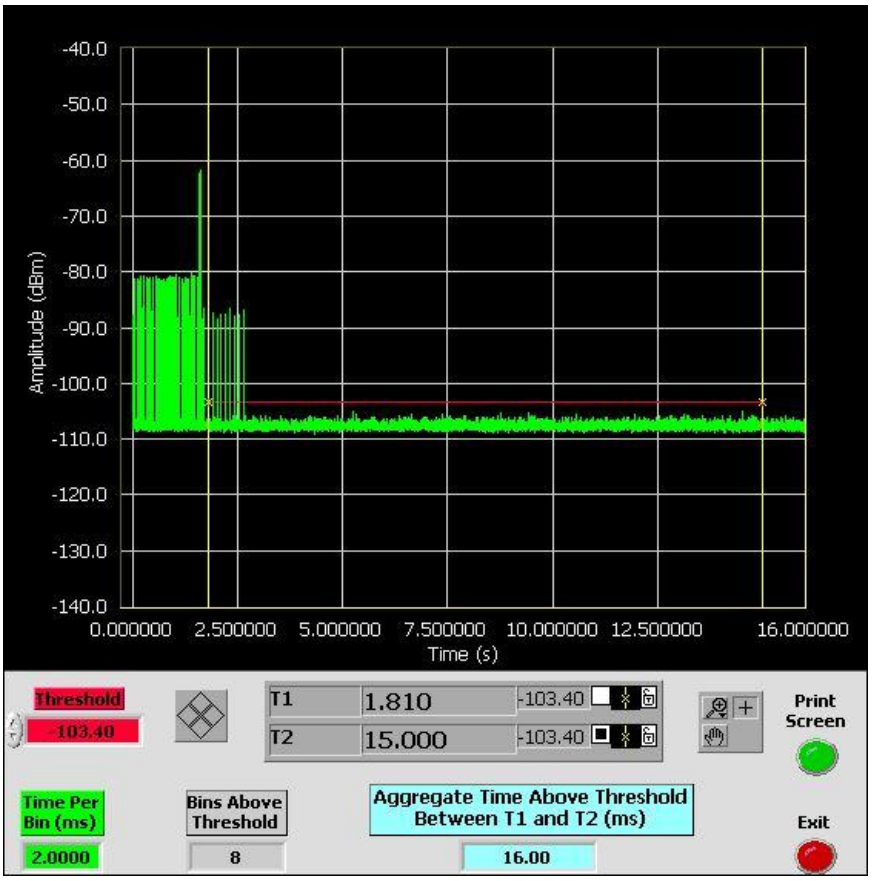
CHANNEL CLOSING TIME



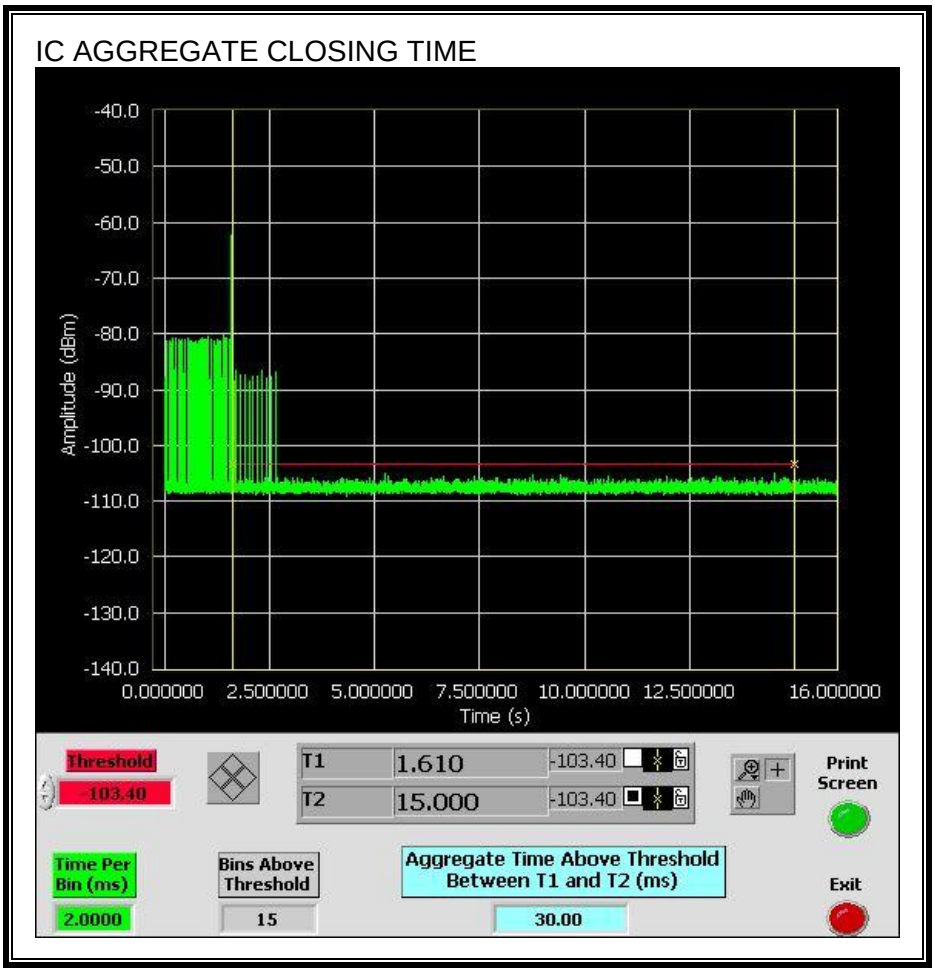
AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

Only intermittent transmissions are observed during the FCC aggregate monitoring period.

FCC AGGREGATE CLOSING TIME

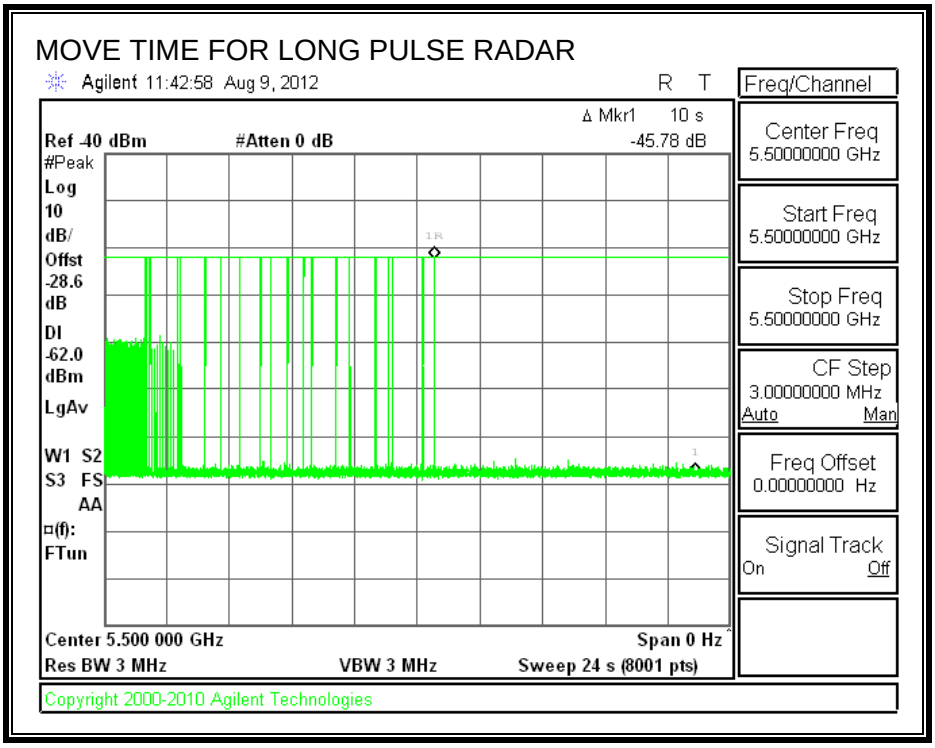


Only intermittent transmissions are observed during the IC aggregate monitoring period.



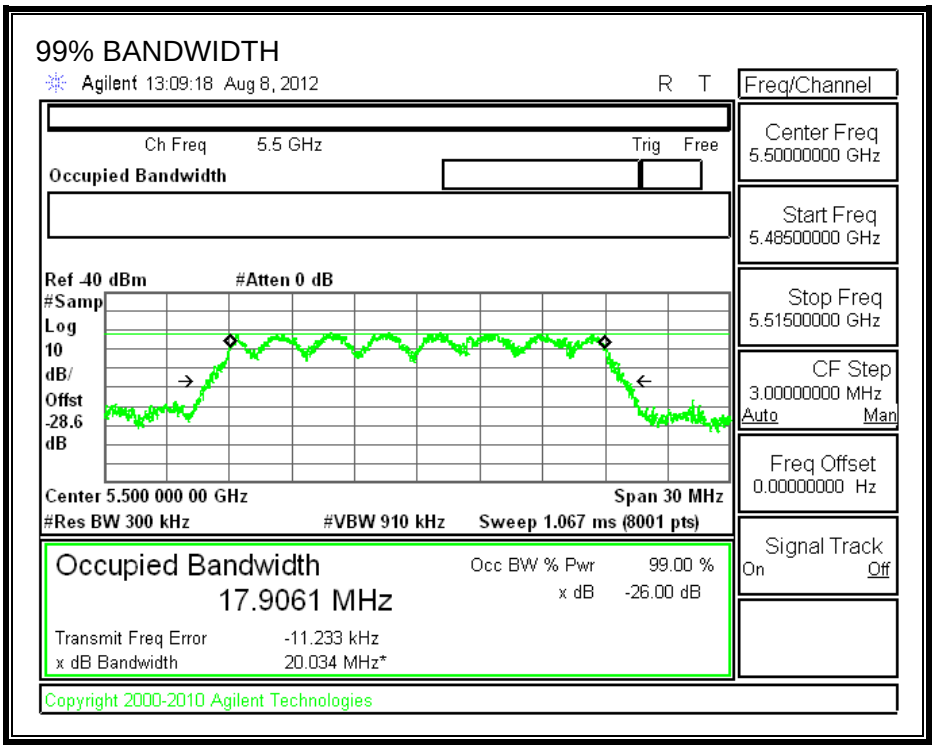
LONG PULSE CHANNEL MOVE TIME

The traffic ceases prior to 10 seconds after the end of the radar waveform.



12.2.6. DETECTION BANDWIDTH

REFERENCE PLOT OF 99% POWER BANDWIDTH



RESULTS

FL (MHz)	FH (MHz)	Detection Bandwidth (MHz)	99% Power Bandwidth (MHz)	Ratio of Detection BW to 99% Power BW (%)	Minimum Limit (%)
5492	5508	16	17.906	89.4	80

DETECTION BANDWIDTH PROBABILITY

DETECTION BANDWIDTH PROBABILITY RESULTS

Detection Bandwidth Test Results				
FCC Type 1 Waveform: 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst				
Frequency (MHz)	Number of Trials	Number Detected	Detection (%)	Mark
5492	10	10	100	FL
5493	10	10	100	
5494	10	10	100	
5495	10	10	100	
5496	10	10	100	
5497	10	10	100	
5498	10	10	100	
5499	10	10	100	
5500	10	10	100	
5501	10	10	100	
5502	10	10	100	
5503	10	10	100	
5504	10	10	100	
5505	10	10	100	
5506	10	10	100	
5507	10	10	100	
5508	10	10	100	FH

12.2.7. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary				
Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail
FCC Short Pulse Type 1	30	100.00	60	Pass
FCC Short Pulse Type 2	30	90.00	60	Pass
FCC Short Pulse Type 3	30	73.33	60	Pass
FCC Short Pulse Type 4	30	83.33	60	Pass
Aggregate		86.67	80	Pass
FCC Long Pulse Type 5	30	100.00	80	Pass
FCC Hopping Type 6	34	91.18	70	Pass

TYPE 1 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 1 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst	
Trial	Successful Detection (Yes/No)
1	Yes
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes
9	Yes
10	Yes
11	Yes
12	Yes
13	Yes
14	Yes
15	Yes
16	Yes
17	Yes
18	Yes
19	Yes
20	Yes
21	Yes
22	Yes
23	Yes
24	Yes
25	Yes
26	Yes
27	Yes
28	Yes
29	Yes
30	Yes

TYPE 2 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 2				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
2001	2.9	223.00	26	Yes
2002	1.8	191.00	27	Yes
2003	1.5	223.00	29	Yes
2004	2.7	200.00	23	No
2005	1.5	215.00	28	Yes
2006	3.1	159.00	29	Yes
2007	2.9	156.00	29	Yes
2008	1.7	172.00	23	Yes
2009	1.6	188.00	29	Yes
2010	3.9	173.00	24	Yes
2011	1.1	163.00	23	Yes
2012	1.2	197.00	27	Yes
2013	3.5	227.00	25	Yes
2014	2.2	188.00	28	Yes
2015	1.2	151.00	28	No
2016	4.2	221.00	23	Yes
2017	3.6	166.00	24	Yes
2018	1.3	198.00	23	Yes
2019	5	206.00	25	No
2020	4.4	224.00	28	Yes
2021	2.8	176.00	25	Yes
2022	2.4	174.00	28	Yes
2023	2.3	161.00	28	Yes
2024	4.7	230.00	25	Yes
2025	3.7	196.00	24	Yes
2026	3.3	166.00	26	Yes
2027	1.8	161.00	29	Yes
2028	1.4	215.00	23	Yes
2029	4.8	167.00	26	Yes
2030	2.9	206.00	23	Yes

TYPE 3 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 3				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
3001	8.3	425.00	16	Yes
3002	10	414.00	17	Yes
3003	6.5	483.00	16	No
3004	9.5	253.00	18	Yes
3005	8.1	473.00	18	Yes
3006	9.1	326.00	18	Yes
3007	6	449.00	18	No
3008	8.9	381.00	16	Yes
3009	8.4	495.00	18	Yes
3010	9.4	429.00	17	Yes
3011	7.1	273.00	18	Yes
3012	6.7	267.00	16	No
3013	9.4	393.00	18	Yes
3014	10	278.00	16	Yes
3015	8.2	408.00	18	No
3016	6	374.00	16	Yes
3017	5.7	262.00	18	Yes
3018	6.9	287.00	17	No
3019	8.9	396.00	17	Yes
3020	8.3	305.00	18	Yes
3021	8.2	465.00	18	Yes
3022	9.7	321.00	18	Yes
3023	7.7	465.00	16	Yes
3024	9.1	379.00	18	Yes
3025	8.7	448.00	17	Yes
3026	6.7	357.00	18	Yes
3027	9.7	495.00	17	No
3028	5.3	469.00	16	No
3029	8.5	330	18	No
3030	9	339	16	Yes

TYPE 4 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 4				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
4001	10.8	298.00	15	Yes
4002	10.3	480.00	13	Yes
4003	15.8	473.00	13	Yes
4004	10.8	421.00	16	Yes
4005	18.9	437.00	14	Yes
4006	12.5	271.00	16	Yes
4007	15.2	297.00	16	Yes
4008	13.4	351.00	14	Yes
4009	10.8	361.00	16	Yes
4010	13.2	400.00	12	Yes
4011	16.6	322.00	14	Yes
4012	19.1	470.00	13	Yes
4013	19.8	433.00	12	No
4014	19.7	257.00	13	Yes
4015	11.7	326.00	15	Yes
4016	19.5	334.00	13	No
4017	16.7	282.00	13	Yes
4018	18.3	464.00	13	Yes
4019	15.9	353.00	15	Yes
4020	14.5	264.00	15	Yes
4021	18.2	396.00	12	Yes
4022	16.2	257.00	14	Yes
4023	12.4	348.00	16	Yes
4024	10.5	461.00	15	Yes
4025	10.4	270.00	16	Yes
4026	18.1	421.00	16	Yes
4027	17.2	386.00	12	No
4028	11.3	327.00	12	No
4029	18.4	256.00	12	No
4030	10	353.00	14	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5	
Trial	Successful Detection (Yes/No)
1	Yes
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes
9	Yes
10	Yes
11	Yes
12	Yes
13	Yes
14	Yes
15	Yes
16	Yes
17	Yes
18	Yes
19	Yes
20	Yes
21	Yes
22	Yes
23	Yes
24	Yes
25	Yes
26	Yes
27	Yes
28	Yes
29	Yes
30	Yes

Note: The Type 5 randomized parameters are shown in a separate document.

TYPE 6 DETECTION PROBABILITY

Data Sheet for FCC Hopping Radar Type 6				
1 us Pulse Width, 333 us PRI, 9 Pulses per Burst, 1 Burst per Hop				
NTIA August 2005 Hopping Sequence				
Trial	Starting Index Within Sequence	Signal Generator Frequency (MHz)	Hops within Detection BW	Successful Detection (Yes/No)
1	171	5492	3	Yes
2	646	5493	4	Yes
3	1121	5494	2	Yes
4	1596	5495	1	No
5	2546	5496	5	Yes
6	3021	5497	2	Yes
7	3496	5498	2	No
8	3971	5499	4	Yes
9	4446	5500	1	Yes
10	4921	5501	5	Yes
11	5396	5502	5	Yes
12	5871	5503	5	Yes
13	6346	5504	3	Yes
14	6821	5505	4	Yes
15	7296	5506	4	Yes
16	7771	5507	5	Yes
17	8246	5508	6	Yes
18	8721	5492	4	No
19	9196	5493	4	Yes
20	9671	5494	5	Yes
21	10146	5495	2	Yes
22	10621	5496	3	Yes
23	11096	5497	3	Yes
24	11571	5498	4	Yes
25	12046	5499	2	Yes
26	12521	5500	5	Yes
27	12996	5501	3	Yes
28	13471	5502	4	Yes
29	13946	5503	1	Yes
30	14421	5504	2	Yes
31	14896	5505	3	Yes
32	15371	5506	4	Yes
33	15846	5507	3	Yes
34	16321	5508	3	Yes

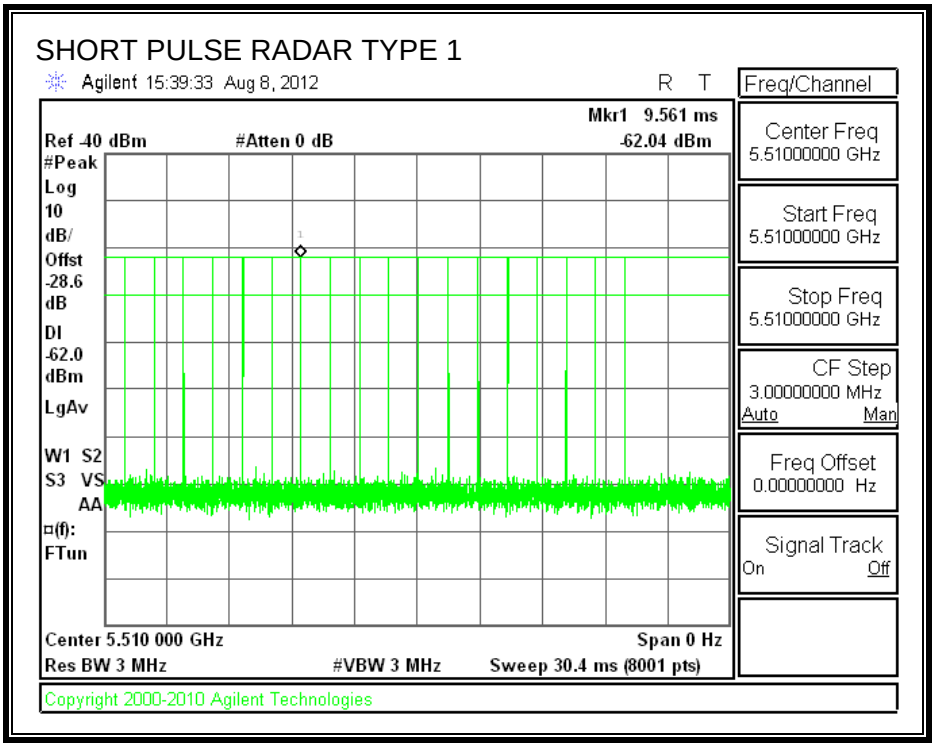
12.3. RESULTS FOR 40 MHz BANDWIDTH

12.3.1. TEST CHANNEL

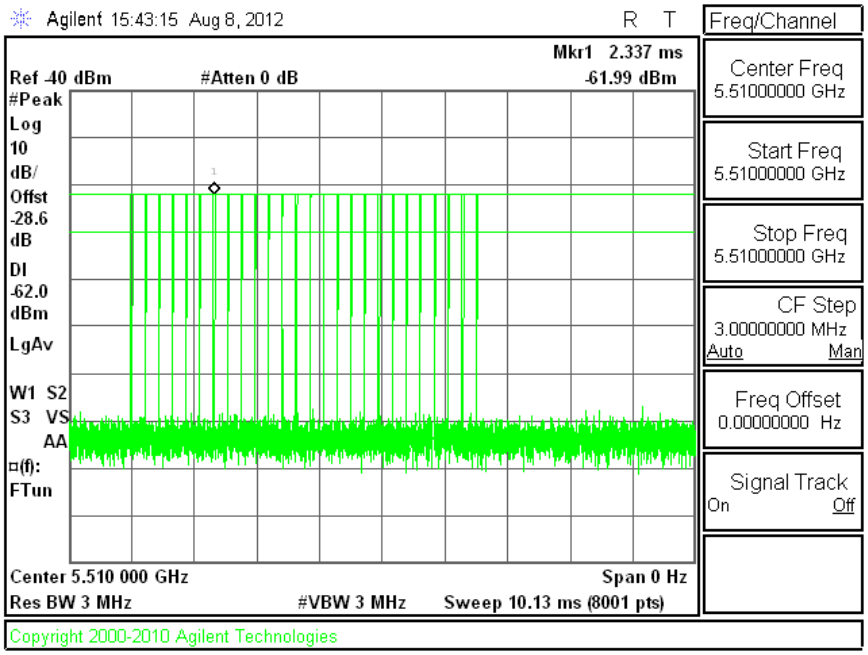
All tests were performed at a channel center frequency of 5510 MHz.

12.3.2. RADAR WAVEFORMS AND TRAFFIC

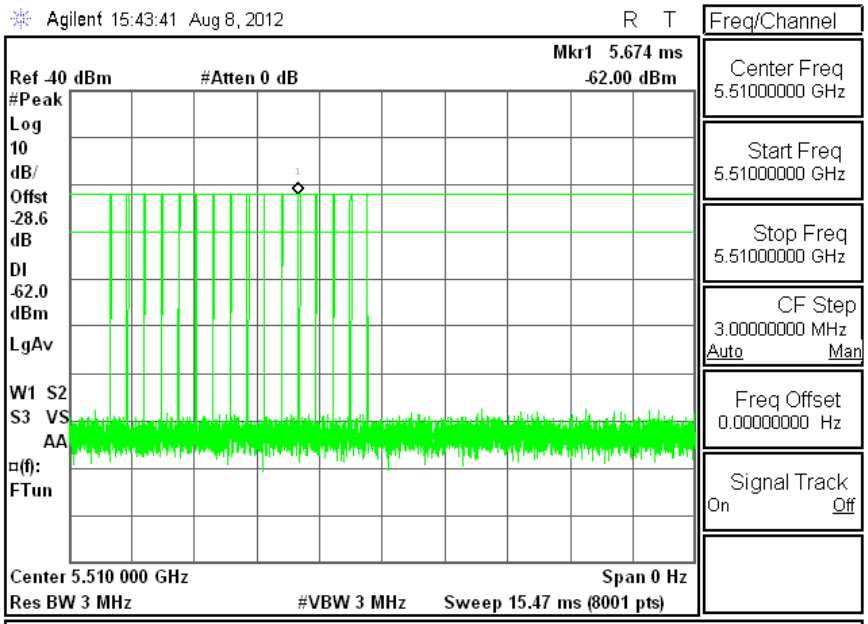
RADAR WAVEFORMS



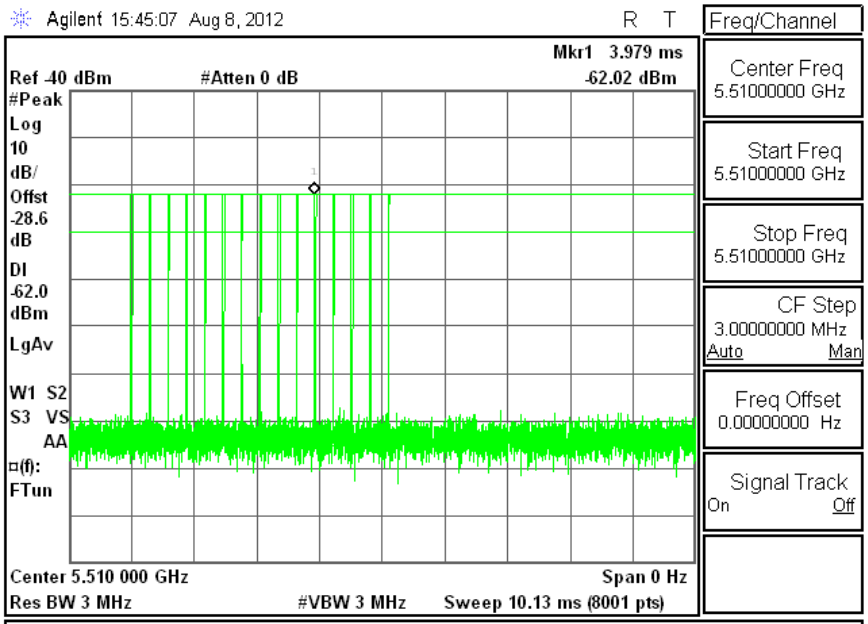
SAMPLE OF RADAR TYPE 2



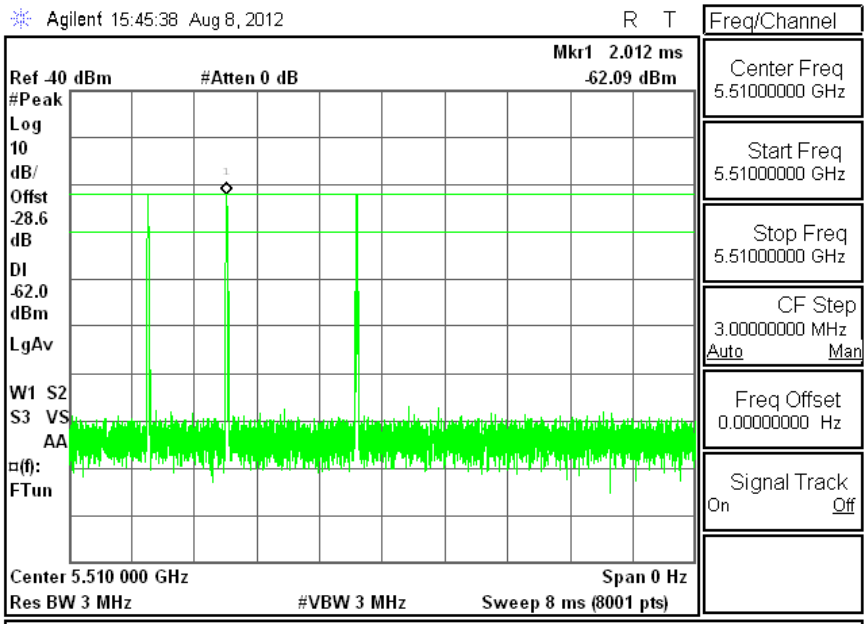
SAMPLE OF RADAR TYPE 3



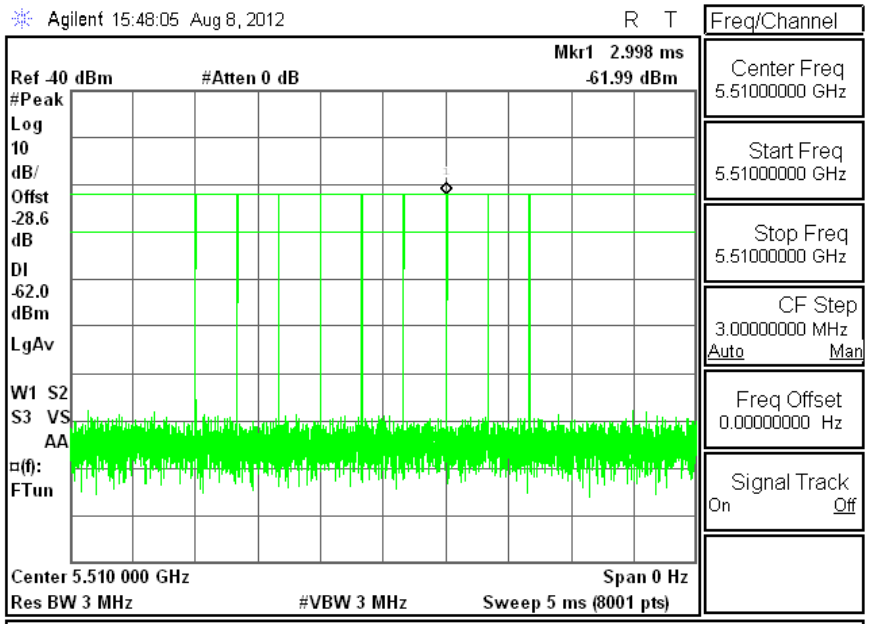
SAMPLE OF RADAR TYPE 4



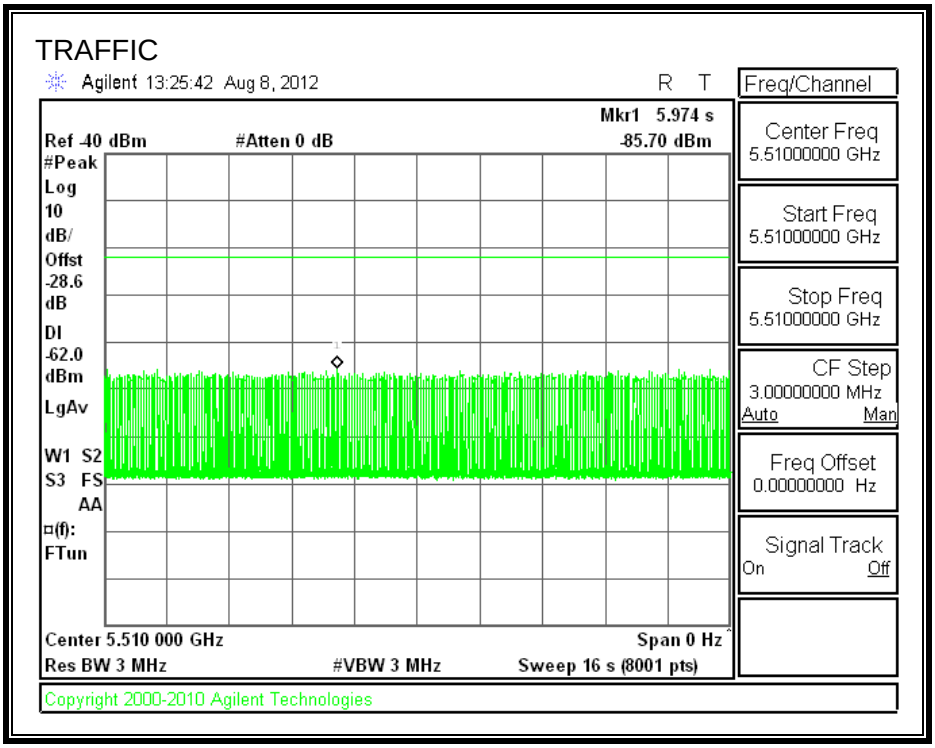
SAMPLE OF SINGLE BURST OF RADAR TYPE 5



SINGLE BURST OF RADAR TYPE 6



TRAFFIC



12.3.3. CHANNEL AVAILABILITY CHECK TIME

PROCEDURE TO DETERMINE INITIAL POWER-UP CYCLE TIME

The EUT was rebooted at zero-seconds elapsed time. The time from the reboot to the beginning of traffic on the selected channel was measured as the time required for the EUT to complete the total power-up cycle. The time to complete the initial power-up period is 60 seconds less than this total power-up time.

PROCEDURE FOR TIMING OF RADAR BURST

The EUT was rebooted at zero-seconds elapsed time. A radar signal was triggered within 0 to 6 seconds after the initial power-up period, and transmissions on the channel were monitored on the spectrum analyzer.

The Non-Occupancy list was cleared. The EUT was rebooted at zero-seconds elapsed time. A radar signal was triggered within 54 to 60 seconds after the initial power-up period, and transmissions on the channel were monitored on the spectrum analyzer.

QUANTITATIVE RESULTS

No Radar Triggered

Timing of Reboot (sec)	Timing of Start of Traffic (sec)	Total Power-up Cycle Time (sec)	Initial Power-up Cycle Time (sec)
0	110.4	110.4	50.4

Radar Near Beginning of CAC

Timing of Reboot (sec)	Timing of Radar Burst (sec)	Radar Relative to Reboot (sec)	Radar Relative to Start of CAC (sec)
0	51.4	51.4	1.0

Radar Near End of CAC

Timing of Reboot (sec)	Timing of Radar Burst (sec)	Radar Relative to Reboot (sec)	Radar Relative to Start of CAC (sec)
0	109.0	109.0	58.6

QUALITATIVE RESULTS

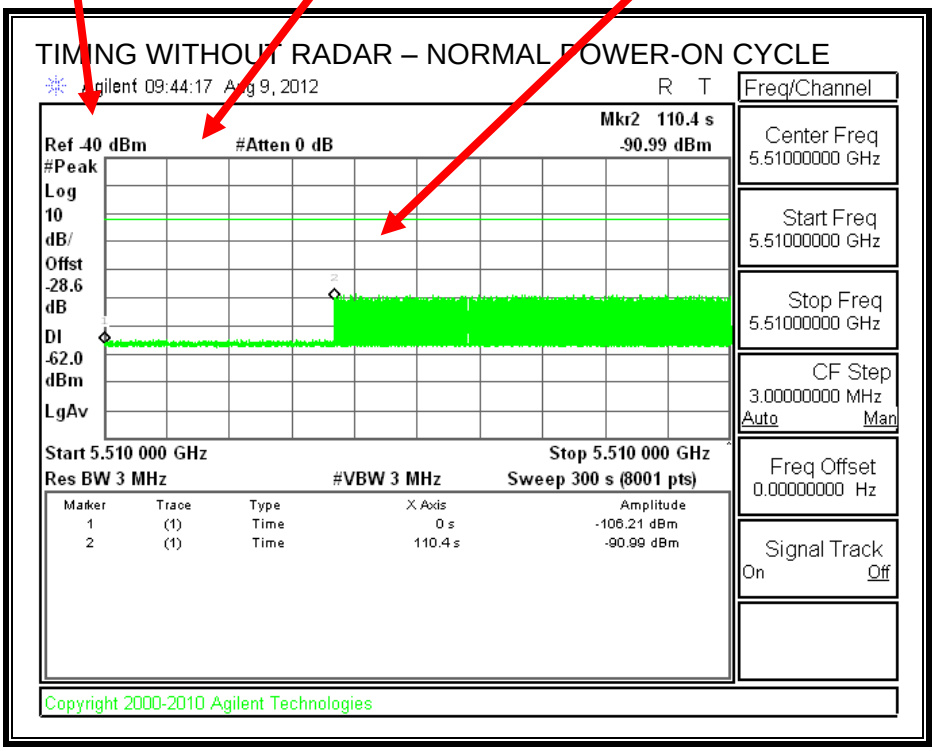
Timing of Radar Burst	Display on Control Computer	Spectrum Analyzer Display
No Radar Triggered	EUT marks Channel as active	Transmissions begin on channel after completion of the initial power-up cycle and the CAC
Within 0 to 6 second window	EUT indicates radar detected	No transmissions on channel
Within 54 to 60 second window	EUT indicates radar detected	No transmissions on channel

TIMING WITHOUT RADAR DURING CAC

AP is rebooted
Start of Initial Power-up cycle

End of Initial Power-up cycle
Start of CAC

End of CAC
Traffic is Initiated



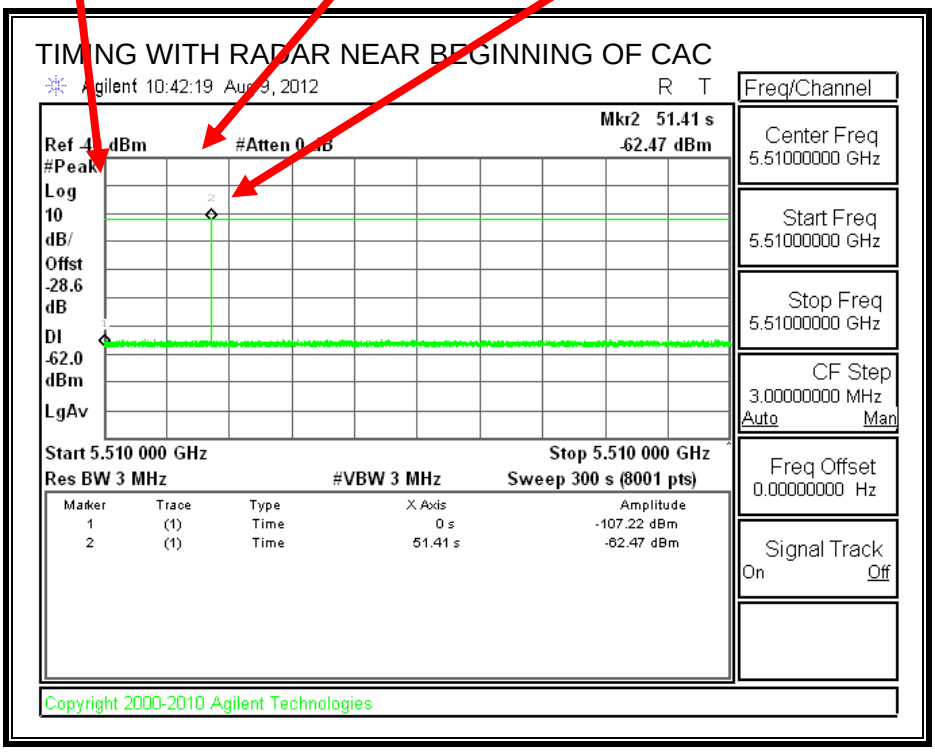
Transmissions begin on channel after completion of the initial power-up cycle and the CAC.

TIMING WITH RADAR NEAR BEGINNING OF CAC

AP is rebooted
Start of Initial Power-up cycle

End of Initial Power-up cycle
Start of CAC

Radar Signal Applied



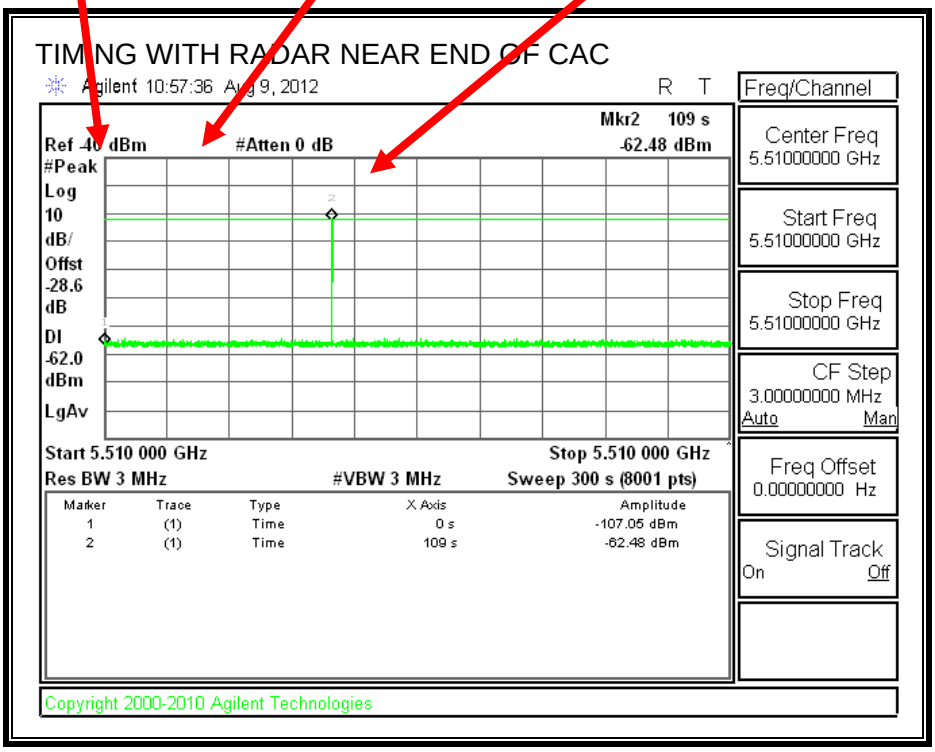
No EUT transmissions were observed after the radar signal.

TIMING WITH RADAR NEAR END OF CAC

AP is rebooted
Start of Initial Power-up cycle

End of Initial Power-up cycle
Start of CAC

Radar Signal Applied



No EUT transmissions were observed after the radar signal.

12.3.4. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

12.3.5. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =
(Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

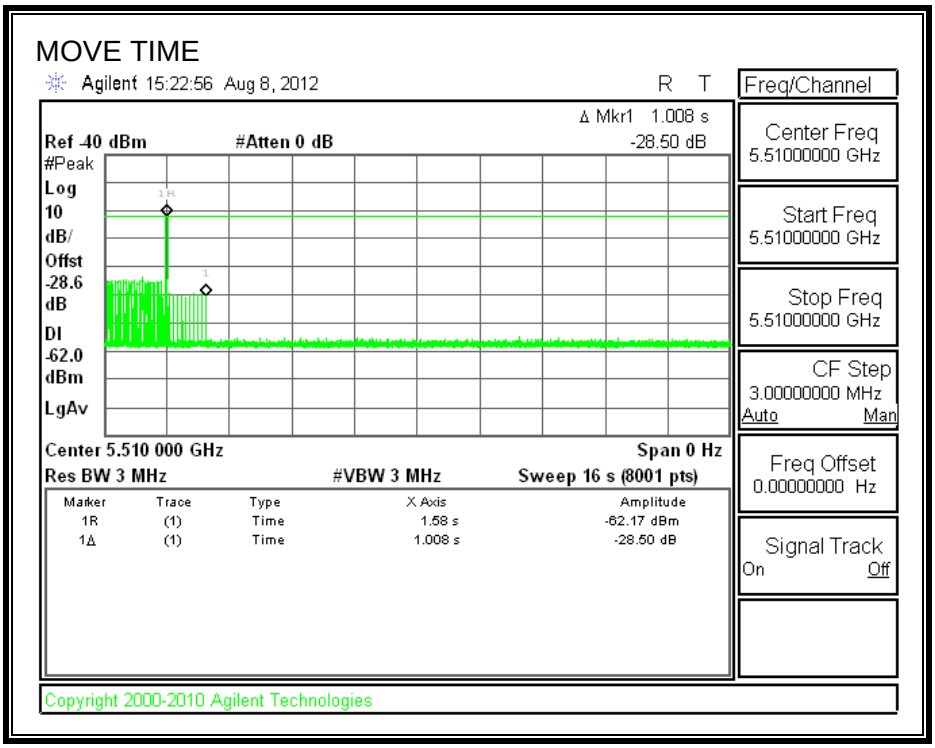
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

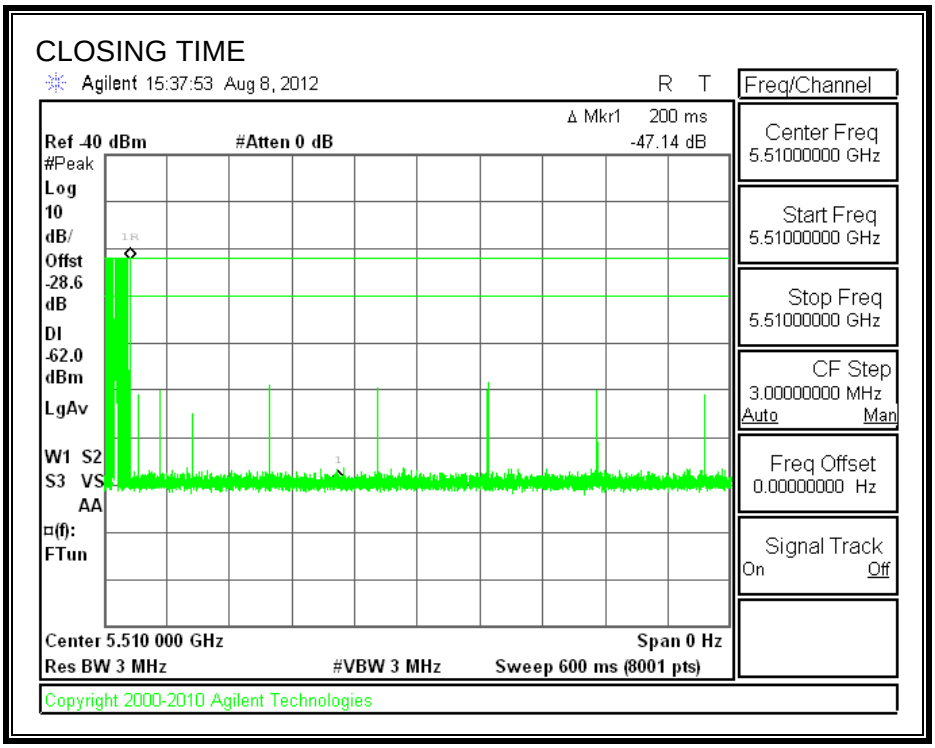
Agency	Channel Move Time (sec)	Limit (sec)
FCC / IC	1.008	10

Agency	Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
FCC	16.00	60
IC	42.0	260

MOVE TIME

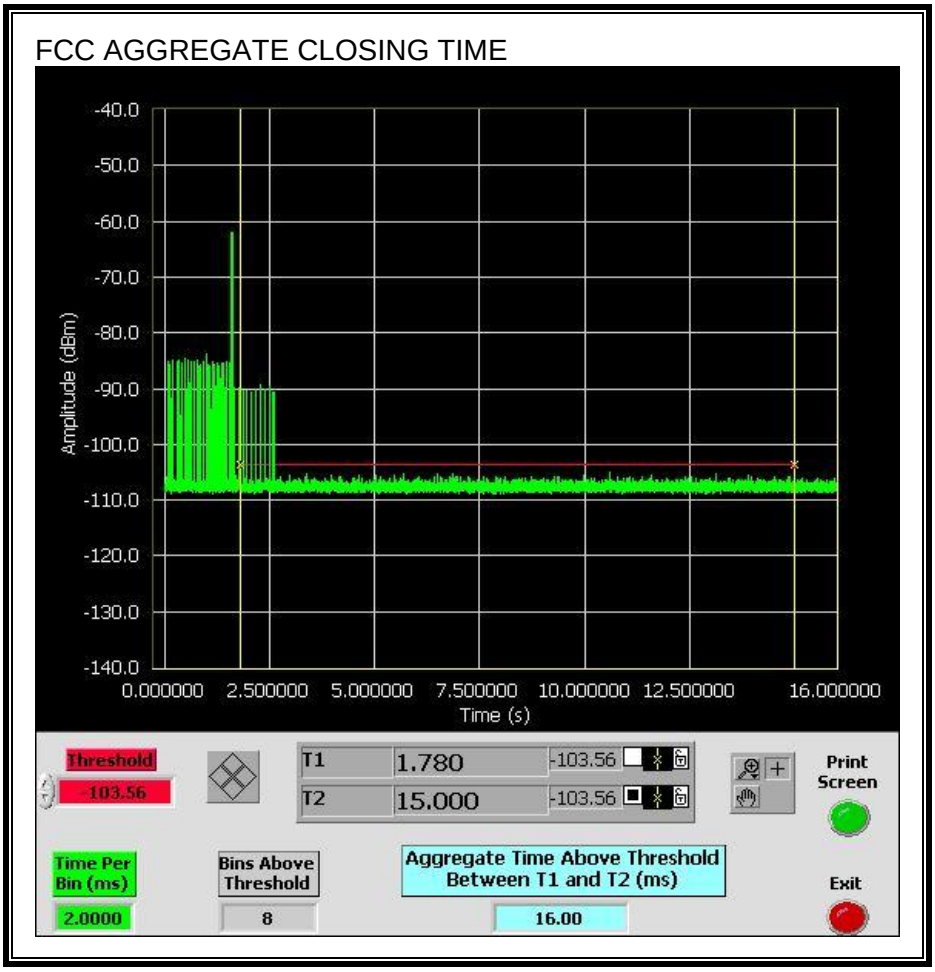


CHANNEL CLOSING TIME

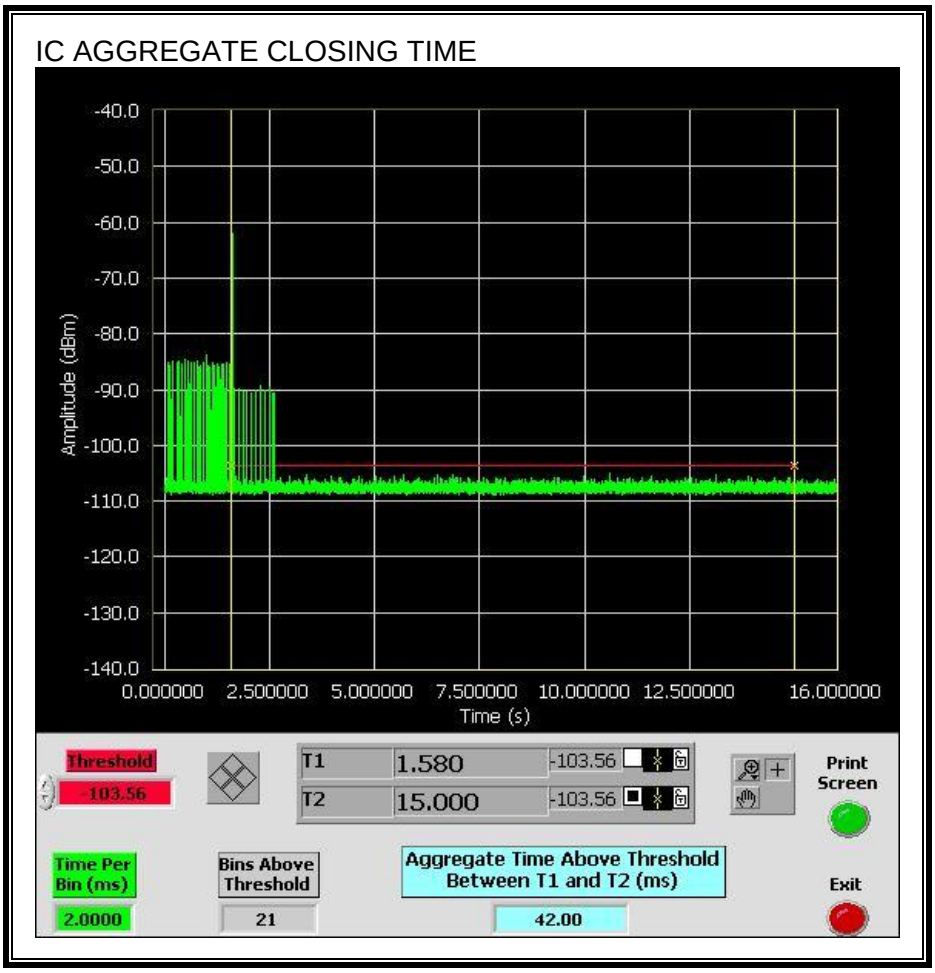


AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

Only intermittent transmissions are observed during the FCC aggregate monitoring period.

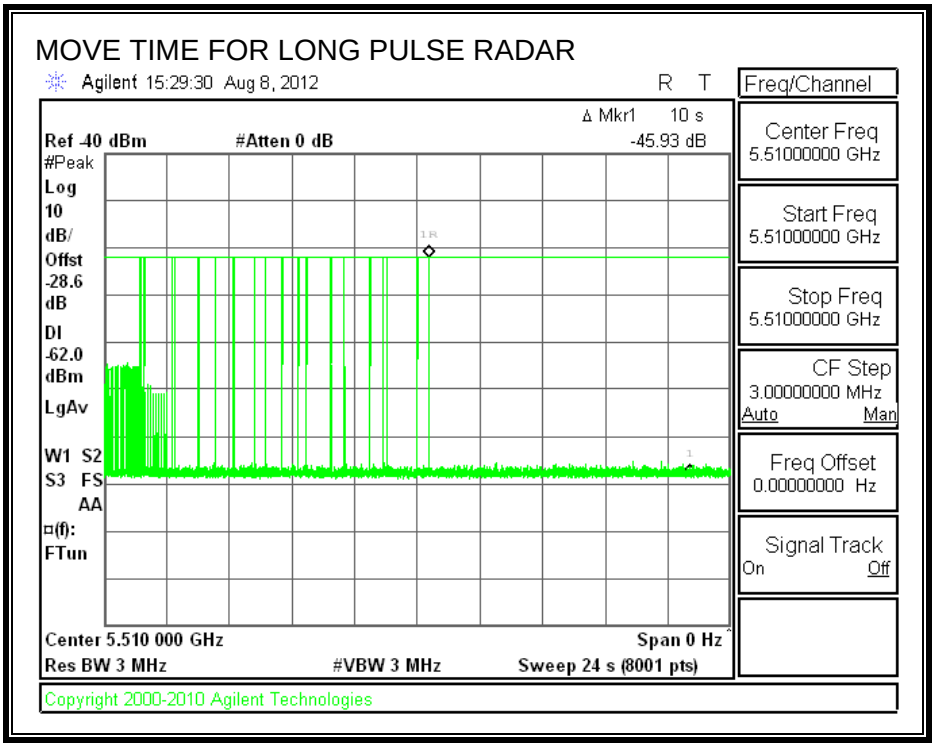


Only intermittent transmissions are observed during the IC aggregate monitoring period.



LONG PULSE CHANNEL MOVE TIME

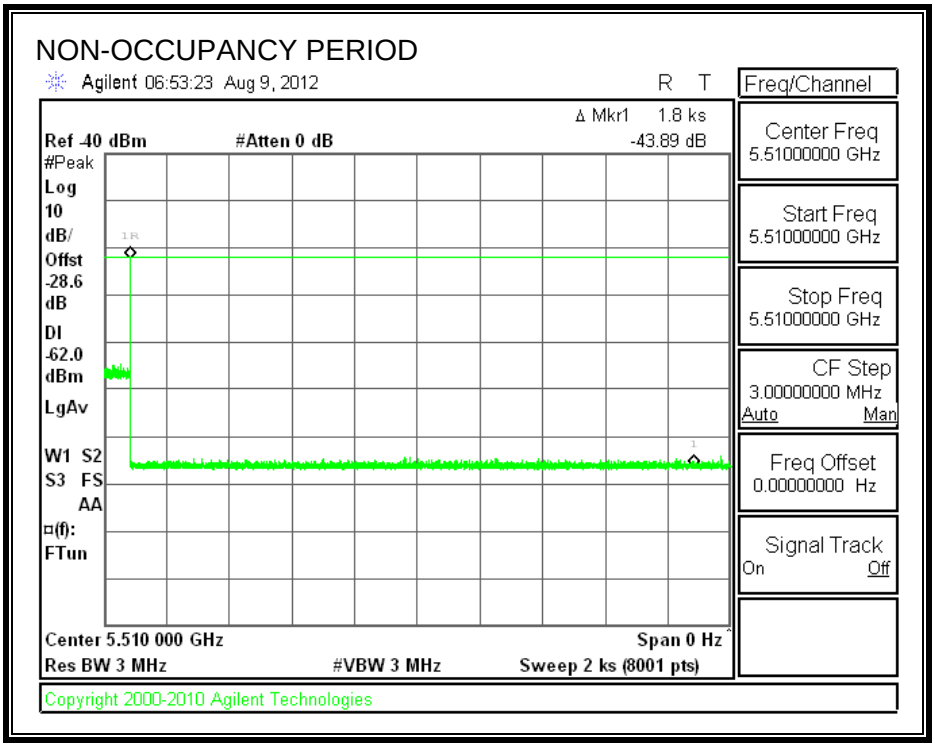
The traffic ceases prior to 10 seconds after the end of the radar waveform.



12.3.6. NON-OCCUPANCY PERIOD

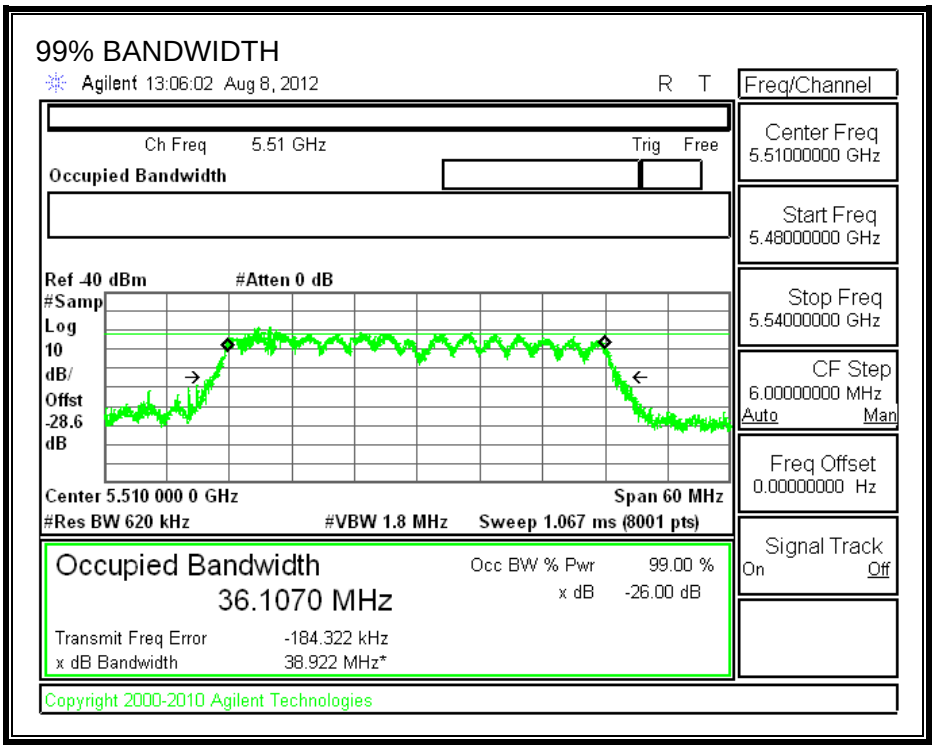
RESULTS

No EUT transmissions were observed on the test channel during the 30-minute observation time.



12.3.7. DETECTION BANDWIDTH

REFERENCE PLOT OF 99% POWER BANDWIDTH



RESULTS

FL (MHz)	FH (MHz)	Detection Bandwidth (MHz)	99% Power Bandwidth (MHz)	Ratio of Detection BW to 99% Power BW (%)	Minimum Limit (%)
5493	**5527**	**34**	**36.107**	**94.2**	**80**

DETECTION BANDWIDTH PROBABILITY

DETECTION BANDWIDTH PROBABILITY RESULTS

Detection Bandwidth Test Results				
FCC Type 1 Waveform: 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst				
Frequency (MHz)	Number of Trials	Number Detected	Detection (%)	Mark
5493	10	10	100	FL
5494	10	10	100	
5495	10	10	100	
5496	10	10	100	
5497	10	10	100	
5498	10	10	100	
5499	10	10	100	
5500	10	10	100	
5501	10	10	100	
5502	10	10	100	
5503	10	10	100	
5504	10	10	100	
5505	10	10	100	
5506	10	10	100	
5507	10	10	100	
5508	10	10	100	
5509	10	10	100	
5510	10	10	100	
5511	10	10	100	
5512	10	10	100	
5513	10	10	100	
5514	10	10	100	
5515	10	10	100	
5516	10	10	100	
5517	10	10	100	
5518	10	10	100	
5519	10	10	100	
5520	10	10	100	
5521	10	10	100	
5522	10	10	100	
5523	10	10	100	
5524	10	10	100	
5525	10	10	100	
5526	10	10	100	
5527	10	10	100	FH

12.3.8. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary				
Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail
FCC Short Pulse Type 1	30	100.00	60	Pass
FCC Short Pulse Type 2	30	86.67	60	Pass
FCC Short Pulse Type 3	30	96.67	60	Pass
FCC Short Pulse Type 4	30	100.00	60	Pass
Aggregate		95.83	80	Pass
FCC Long Pulse Type 5	30	100.00	80	Pass
FCC Hopping Type 6	35	100.00	70	Pass

TYPE 1 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 1 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst	
Trial	**Successful Detection (Yes/No)**
1	Yes
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes
9	Yes
10	Yes
11	Yes
12	Yes
13	Yes
14	Yes
15	Yes
16	Yes
17	Yes
18	Yes
19	Yes
20	Yes
21	Yes
22	Yes
23	Yes
24	Yes
25	Yes
26	Yes
27	Yes
28	Yes
29	Yes
30	Yes

TYPE 2 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 2				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
2001	2.9	223.00	26	Yes
2002	1.8	191.00	27	Yes
2003	1.5	223.00	29	Yes
2004	2.7	200.00	23	No
2005	1.5	215.00	28	Yes
2006	3.1	159.00	29	Yes
2007	2.9	156.00	29	Yes
2008	1.7	172.00	23	Yes
2009	1.6	188.00	29	Yes
2010	3.9	173.00	24	Yes
2011	1.1	163.00	23	No
2012	1.2	197.00	27	Yes
2013	3.5	227.00	25	Yes
2014	2.2	188.00	28	Yes
2015	1.2	151.00	28	Yes
2016	4.2	221.00	23	Yes
2017	3.6	166.00	24	No
2018	1.3	198.00	23	Yes
2019	5	206.00	25	Yes
2020	4.4	224.00	28	Yes
2021	2.8	176.00	25	Yes
2022	2.4	174.00	28	Yes
2023	2.3	161.00	28	Yes
2024	4.7	230.00	25	Yes
2025	3.7	196.00	24	Yes
2026	3.3	166.00	26	Yes
2027	1.8	161.00	29	Yes
2028	1.4	215.00	23	Yes
2029	4.8	167.00	26	No
2030	2.9	206.00	23	Yes

TYPE 3 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 3				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
3001	8.3	425.00	16	Yes
3002	10	414.00	17	Yes
3003	6.5	483.00	16	Yes
3004	9.5	253.00	18	No
3005	8.1	473.00	18	Yes
3006	9.1	326.00	18	Yes
3007	6	449.00	18	Yes
3008	8.9	381.00	16	Yes
3009	8.4	495.00	18	Yes
3010	9.4	429.00	17	Yes
3011	7.1	273.00	18	Yes
3012	6.7	267.00	16	Yes
3013	9.4	393.00	18	Yes
3014	10	278.00	16	Yes
3015	8.2	408.00	18	Yes
3016	6	374.00	16	Yes
3017	5.7	262.00	18	Yes
3018	6.9	287.00	17	Yes
3019	8.9	396.00	17	Yes
3020	8.3	305.00	18	Yes
3021	8.2	465.00	18	Yes
3022	9.7	321.00	18	Yes
3023	7.7	465.00	16	Yes
3024	9.1	379.00	18	Yes
3025	8.7	448.00	17	Yes
3026	6.7	357.00	18	Yes
3027	9.7	495.00	17	Yes
3028	5.3	469.00	16	Yes
3029	8.5	330	18	Yes
3030	9	339	16	Yes

TYPE 4 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 4				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
4001	10.8	298.00	15	Yes
4002	10.3	480.00	13	Yes
4003	15.8	473.00	13	Yes
4004	10.8	421.00	16	Yes
4005	18.9	437.00	14	Yes
4006	12.5	271.00	16	Yes
4007	15.2	297.00	16	Yes
4008	13.4	351.00	14	Yes
4009	10.8	361.00	16	Yes
4010	13.2	400.00	12	Yes
4011	16.6	322.00	14	Yes
4012	19.1	470.00	13	Yes
4013	19.8	433.00	12	Yes
4014	19.7	257.00	13	Yes
4015	11.7	326.00	15	Yes
4016	19.5	334.00	13	Yes
4017	16.7	282.00	13	Yes
4018	18.3	464.00	13	Yes
4019	15.9	353.00	15	Yes
4020	14.5	264.00	15	Yes
4021	18.2	396.00	12	Yes
4022	16.2	257.00	14	Yes
4023	12.4	348.00	16	Yes
4024	10.5	461.00	15	Yes
4025	10.4	270.00	16	Yes
4026	18.1	421.00	16	Yes
4027	17.2	386.00	12	Yes
4028	11.3	327.00	12	Yes
4029	18.4	256.00	12	Yes
4030	10	353.00	14	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5	
Trial	Successful Detection (Yes/No)
1	Yes
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes
9	Yes
10	Yes
11	Yes
12	Yes
13	Yes
14	Yes
15	Yes
16	Yes
17	Yes
18	Yes
19	Yes
20	Yes
21	Yes
22	Yes
23	Yes
24	Yes
25	Yes
26	Yes
27	Yes
28	Yes
29	Yes
30	Yes

Note: The Type 5 randomized parameters are shown in a separate document.

TYPE 6 DETECTION PROBABILITY

Data Sheet for FCC Hopping Radar Type 6				
1 us Pulse Width, 333 us PRI, 9 Pulses per Burst, 1 Burst per Hop				
NTIA August 2005 Hopping Sequence				
Trial	Starting Index Within Sequence	Signal Generator Frequency (MHz)	Hops within Detection BW	Successful Detection (Yes/No)
1	333	5493	5	Yes
2	808	5494	3	Yes
3	1283	5495	9	Yes
4	1758	5496	7	Yes
5	2233	5497	8	Yes
6	2708	5498	5	Yes
7	3183	5499	6	Yes
8	3658	5500	8	Yes
9	4133	5501	7	Yes
10	4608	5502	4	Yes
11	5083	5503	4	Yes
12	5558	5504	4	Yes
13	6033	5505	5	Yes
14	6508	5506	6	Yes
15	6983	5507	5	Yes
16	7458	5508	5	Yes
17	7933	5509	4	Yes
18	8408	5510	9	Yes
19	8883	5511	8	Yes
20	9358	5512	7	Yes
21	9833	5513	6	Yes
22	10308	5514	6	Yes
23	10783	5515	7	Yes
24	11258	5516	9	Yes
25	11733	5517	6	Yes
26	12208	5518	8	Yes
27	12683	5519	11	Yes
28	13158	5520	7	Yes
29	13633	5521	8	Yes
30	14108	5522	10	Yes
31	14583	5523	6	Yes
32	15058	5524	8	Yes
33	15533	5525	7	Yes
34	16008	5526	8	Yes
35	16483	5527	9	Yes