FCC 47 CFR PART 15 SUBPART E
INDUSTRY CANADA RSS-210 ISSUE 8

CERTIFICATION TEST REPORT

FOR

802.11a/b/g/n and Bluetooth Audio / Video Device

MODEL NUMBER: W2

FCC ID: A4R-W2
IC: 10395A-W2

REPORT NUMBER: 14U17400-2 Revision A

ISSUE DATE: June 10, 2014

Prepared for
GOOGLE
1600 AMPHITHEATRE PARKWAY
MOUNTAIN VIEW
CA, 94043, US

Prepared by
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	4/28/14	Initial Issue	F. de Anda
A	6/10/14	Update to 5.2 11a high channel data and directional gain for power	F. de Anda

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: GOOGLE
1600 AMPHITHEATRE PARKWAY
MOUNTAIN VIEW, 94043, CA US

EUT DESCRIPTION: 802.11a/b/g/n and Bluetooth Audio /Video Device

MODEL: W2

SERIAL NUMBER: Conducted: AD3Z1410029F
Radiated: AD3Z141002FC

DATE TESTED: April 2 to April 11, 2014

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

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Verification Services Inc. By:

FRANCISCO DE ANDA
PROJECT LEAD
UL Verification Services Inc.

Tested By:

TRI PHAM
EMC ENGINEER
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 06-96, FCC KDB 789033, ANSI C63.10-2009, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

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

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

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	±3.52 dB
Radiated Disturbance, 30 to 1000 MHz	±4.94 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an Access Point(AP) set top box device that supports WLAN, Bluetooth and 4k media.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Output Power (dBm)	Output Power (mW)
5180 - 5240	802.11a	8.26	12.03	13.55	6.70
5180 - 5240	802.11n HT20	8.10	11.32	13.01	6.46
5190 - 5230	802.11n HT40	12.67	12.70	15.70	18.49

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The EUT utilizes two PIFA antennas, with a maximum declared antenna gain as follows;

	Antenna peak gain (dBi)	
Band	Chain 0	Chain 1
5 GHz	4.4	3.6

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed in the HOST/SUPPORT equipment during testing was DUT LabTool Version 1.0.8.26.

The test utility software used during testing was WIFI Tool Version 1.0.8.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The EUT was investigated in its normal operation position (X), all final radiated testing was performed with the EUT in this orientation.

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

802.11a mode: 6 Mbps
802.11n HT20mode: MCS0
802.11n HT40mode: MCS0

Radiated emissions for EUT with antenna was performed and passed; therefore, antenna port spurious was not performed.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop PC	LENOVO	Thinkpad	R8-PCNFE	NA
AC-DC Adapter	LENOVO	42T4428	11S42T4428Z1ZF3G98A2Y7	DoC
Laptop MacBook Pro	APPLE	A1286	187512	DoC
AC-DC Adapter	APPLE	A1343	C0411820C6XDJ92AF	DoC

I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	1	3 prong	UN-Shielded	1.8	None
2	DC	1	Barrel	UN-Shielded	1.5	None
3	DC	1	Barrel	UN-Shielded	1.5	None
4	USB Spliter Cable	1	Mini-USB	Shielded	1	N/A
5	Ethernet	1	CAT5	UN-Shielded	1	N/A

TEST SETUP

The EUT is connected to host laptop computers via LAN port and USB port, and setup to transmit continuously.

SETUP DIAGRAM FOR CONDUCTED PORT TESTS

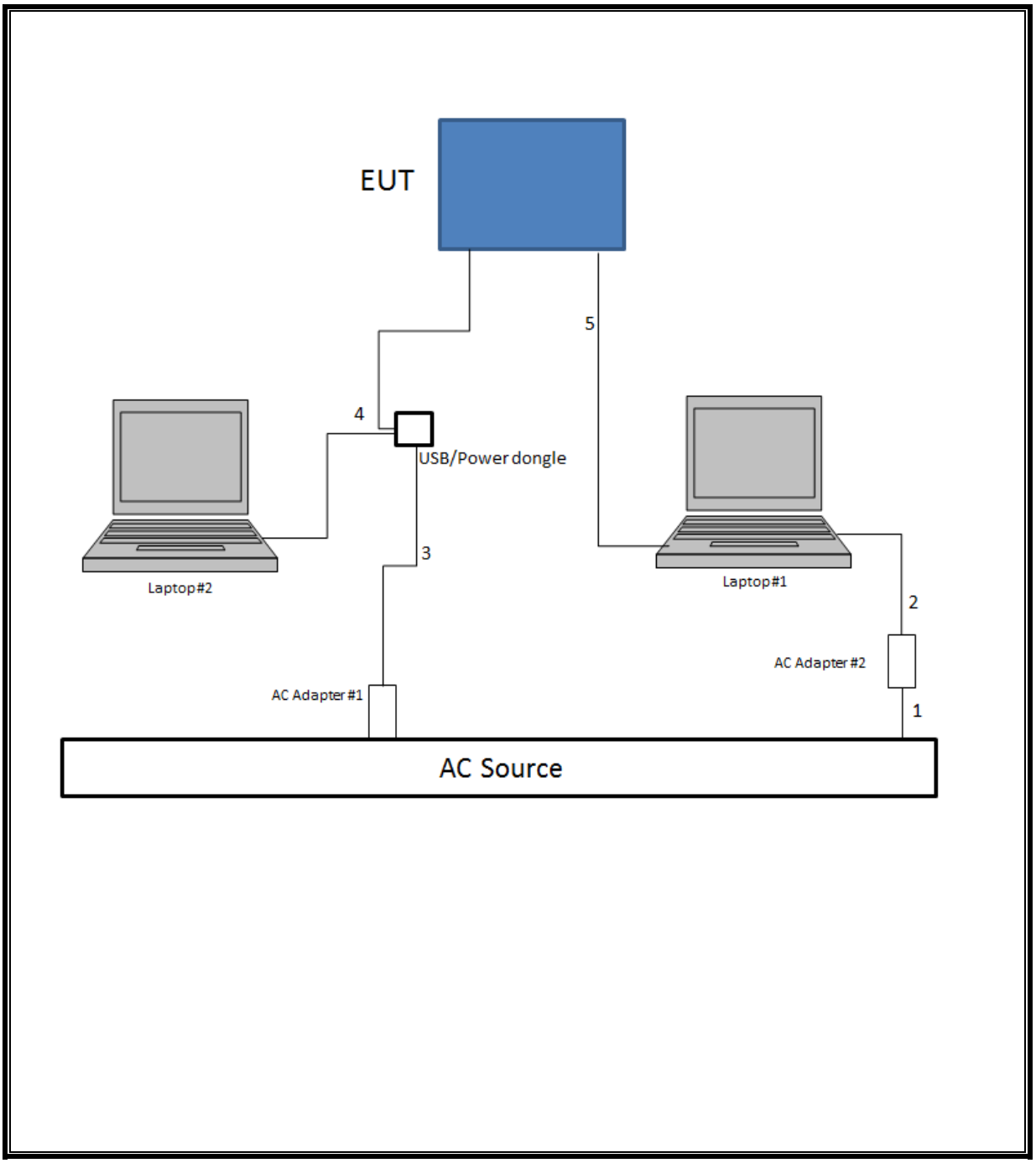
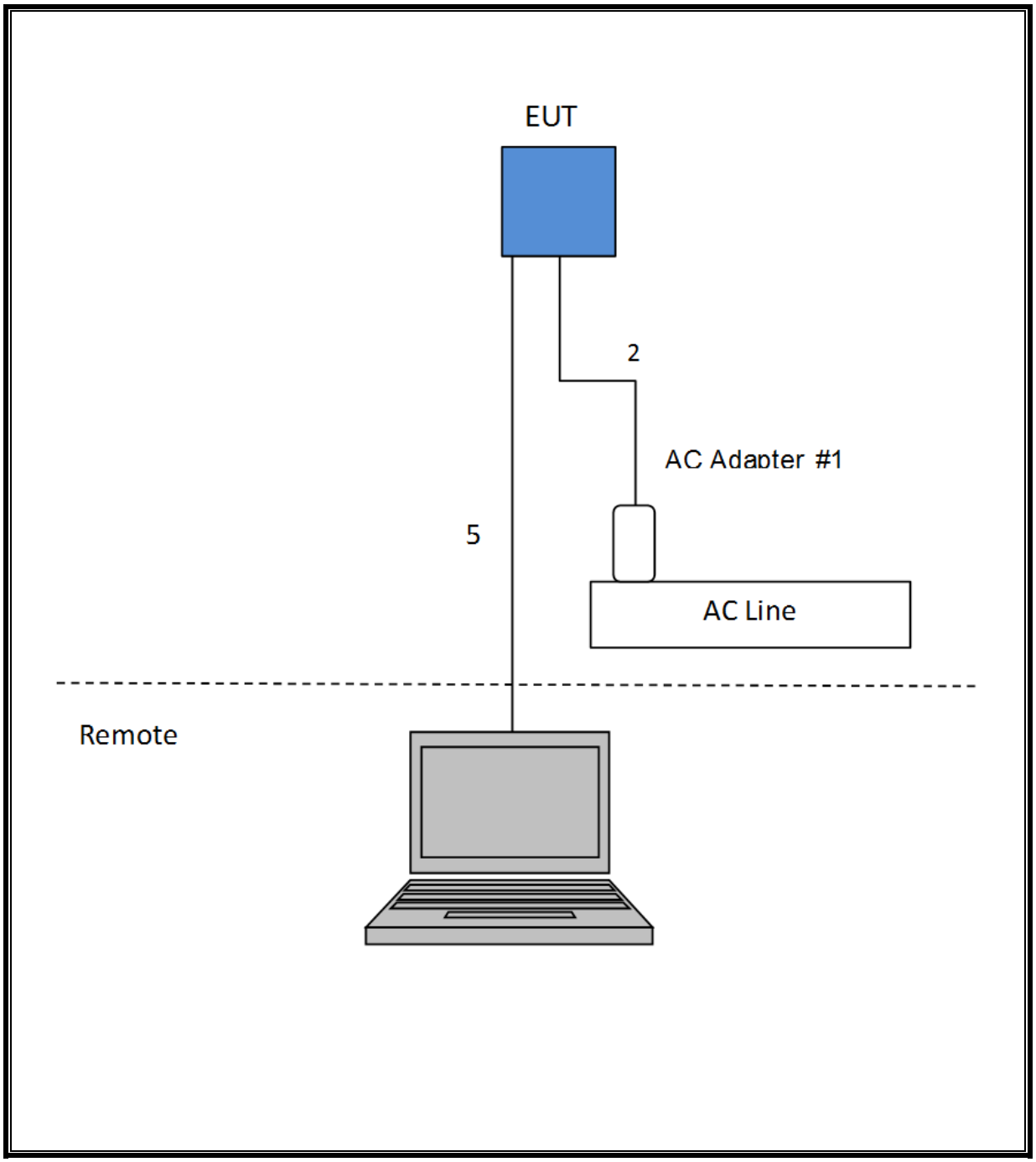


DIAGRAM FOR RADIATED EMISSION AND LINE CONDUCTED TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
PXA Signal Analyzer	Agilent	N9030A-544	RENTAL	05/10/14
Single Channel PK Power Meter	Agilent	N1911A	F00024	03/07/15
Wideband Power Sensor, 30MHz video bandwidth	Agilent	N1921A	F00358	03/10/15
Spectrum Analyzer	Agilent	N9030A	F00128	03/12/15
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	C01011	04/28/14
Antenna, Horn, 18GHz	ETS Lindgren	3117	--	06/24/14
Preamp, 1000MHz	Sonoma	310N	N02891	12/30/14
RF PreAmplifier, 1-18GHz	Miteq	AFS42-00101800-25-S-42	F00354	08/24/14
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/17/15
EMI Test Receiver, 30 MHz	R & S	ESHS20	N02396	08/15/14
High Pass Filter, fc: 3.0GHz, 50 Ohms	Micro-Tronics	HPM17543	F00181	08/24/14
Low Pass Filter, fc: 5GHz, 50 Ohms	Micro-Tronics	LPS17541	F00175	08/24/14
High Pass Filter, fc: 6GHz, 50 Ohms	Micro-Tronics	HPS17542	F00179	08/24/14

7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

7.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
802.11a CDD	1.000	1.000	1.000	100.00%	0.00	0.010
802.11n HT20 CDD	1.437	1.443	0.996	99.58%	0.00	0.010
802.11n HT40 CDD	1.5130	1.5230	0.993	99.34%	0.00	0.010

7.2. MEASUREMENT METHODS

26 dB Emission BW: KDB 789033 D01 v01r03, Section C.

99% Occupied BW: KDB 789033 D01 v01r03, Section D.

Power Spectral Density: KDB 789033 D01 v01r03, Section F.

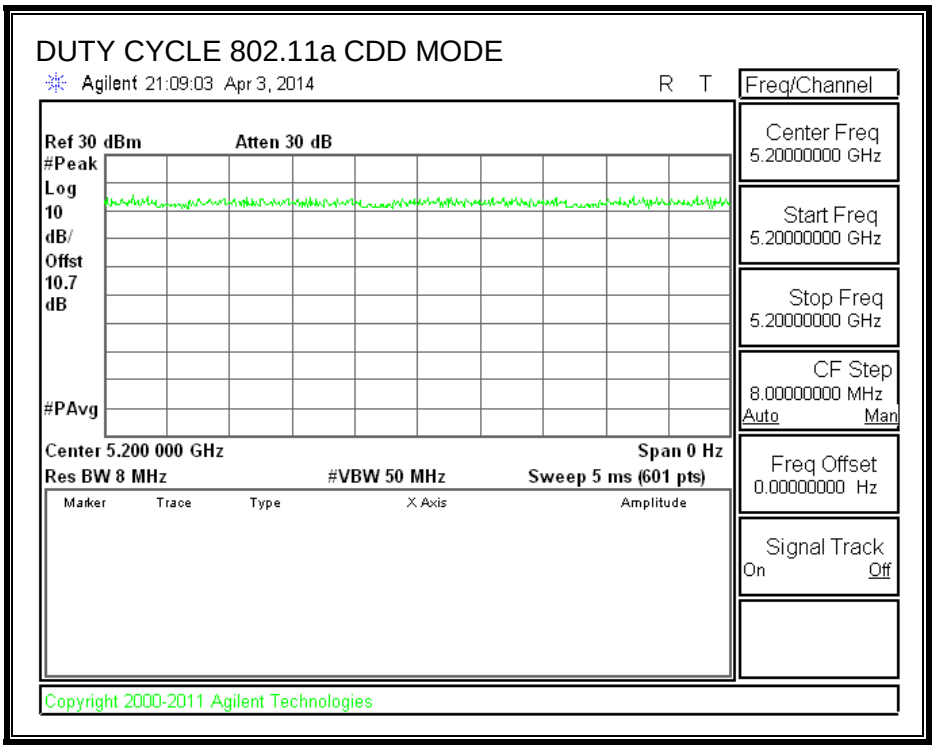
Peak Excursion: KDB 789033 D01 v01r03, Section G.

Unwanted emissions in restricted bands: KDB 789033 D01 v01r03, Sections H.3, H.4, H.5, and H.6.

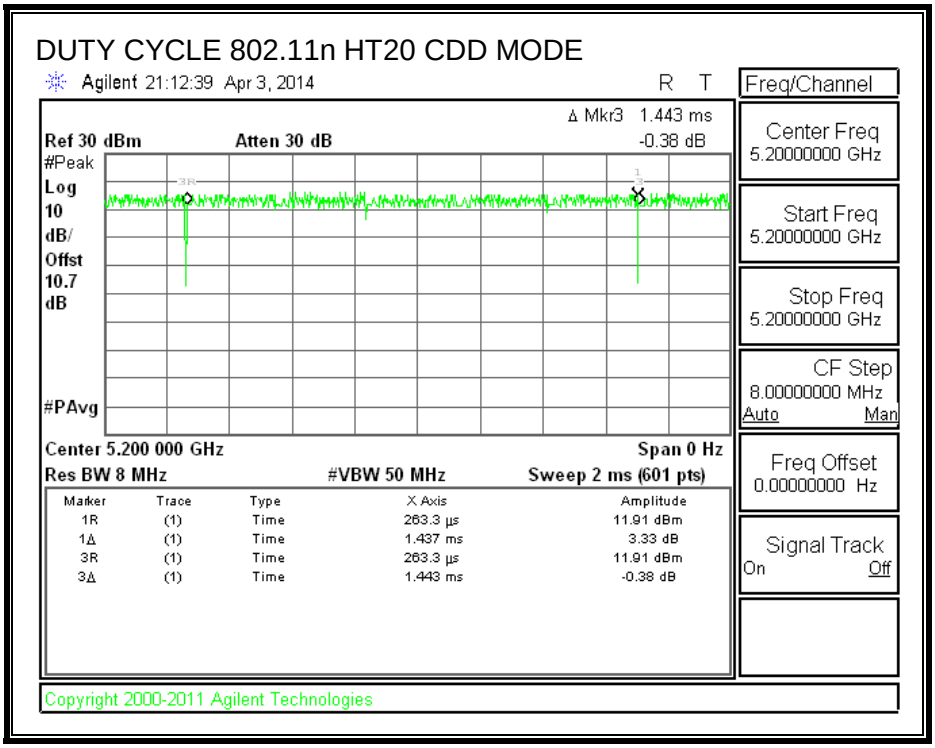
Unwanted emissions in non-restricted bands: KDB 789033 D01 v01r03, Sections H.3, H.4, and H.5.

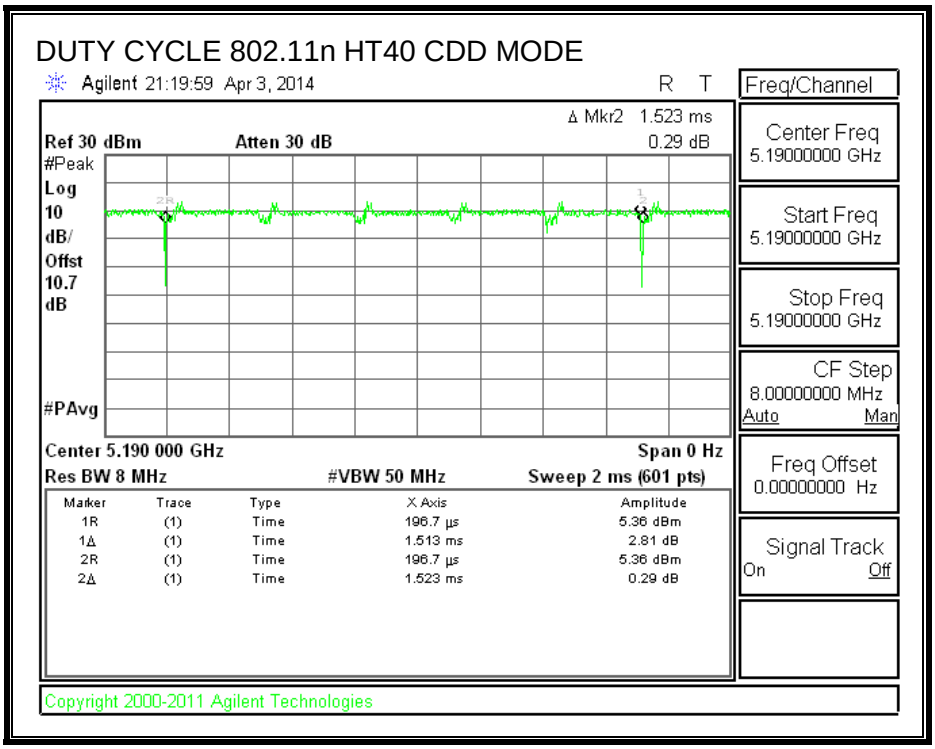
7.3. DUTY CYCLE PLOTS

DUTY CYCLE 802.11a CDD MODE



DUTY CYCLE 802.11n HT20 CDD MODE





8. ANTENNA PORT TEST RESULTS

8.1. 802.11a 2Tx CDD MODE IN THE 5.2 GHz BAND

8.1.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

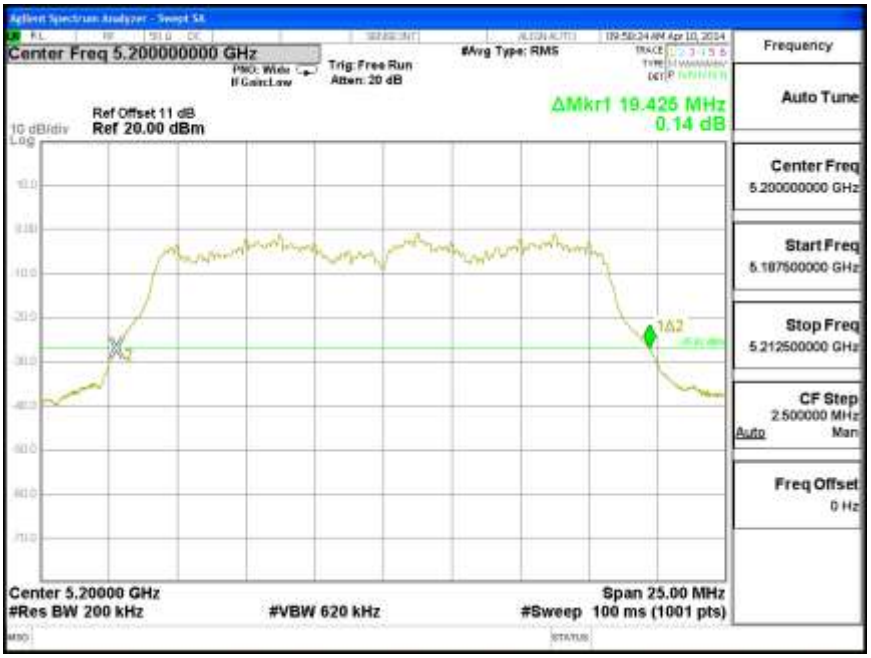
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5180	19.35	18.98
Mid	5200	19.43	19.05
High	5240	19.43	19.10

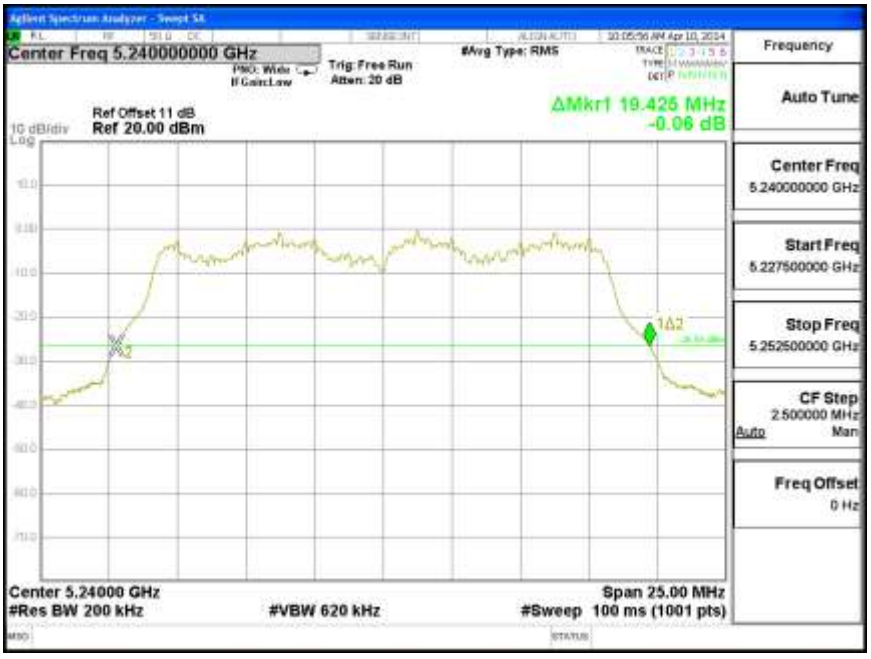
26 dB BANDWIDTH, Chain 0

BANDWIDTH Chain 0 LOW CH

BANDWIDTH Chain 0 MID CH

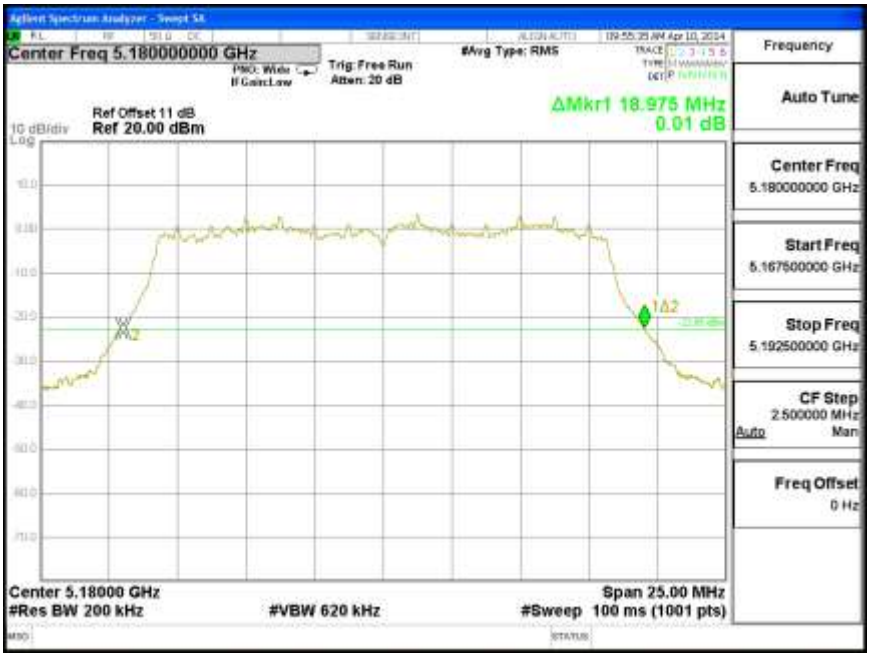


BANDWIDTH Chain 0 HIGH CH

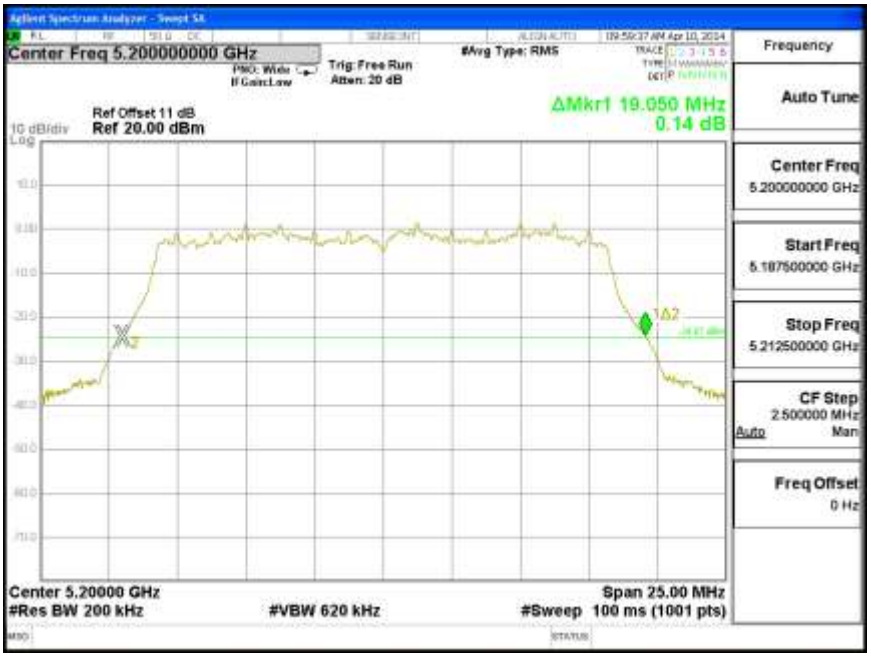


26 dB BANDWIDTH, Chain 1

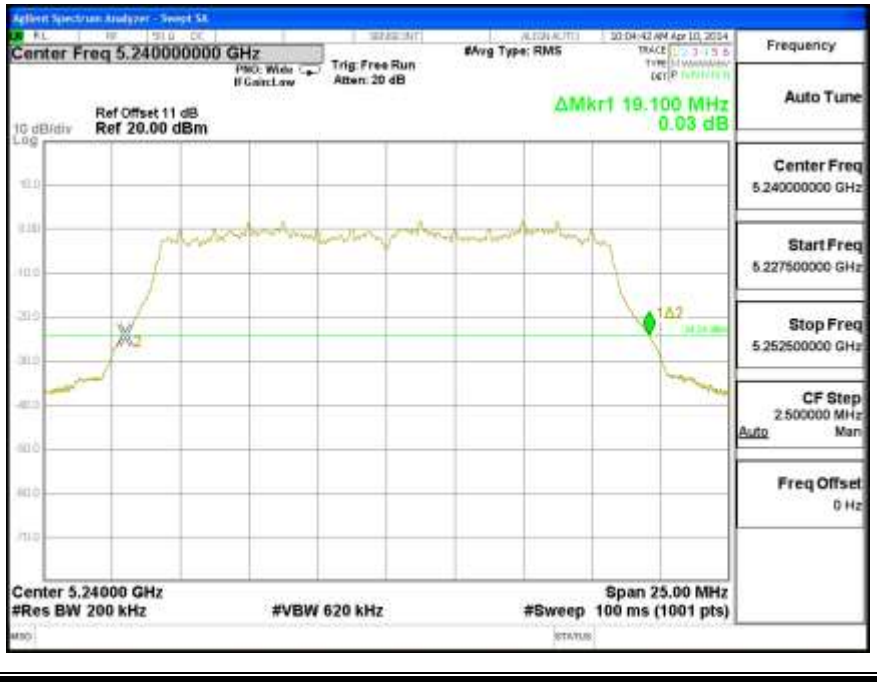
BANDWIDTH Chain 1 LOW CH



BANDWIDTH Chain 1 MID CH



BANDWIDTH Chain 1 HIGH CH



8.1.2. 99% BANDWIDTH

LIMITS

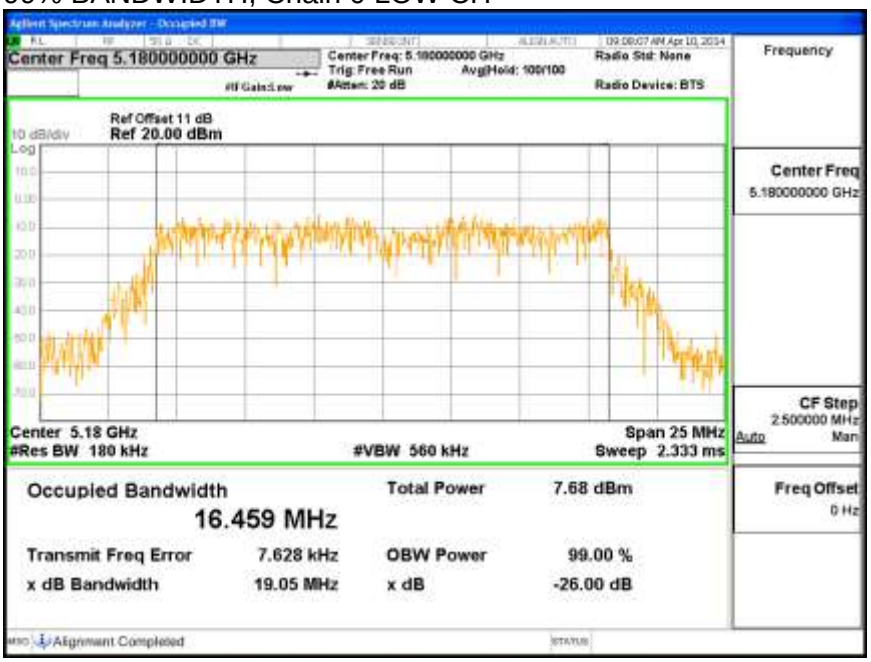
None; for reporting purposes only.

RESULTS

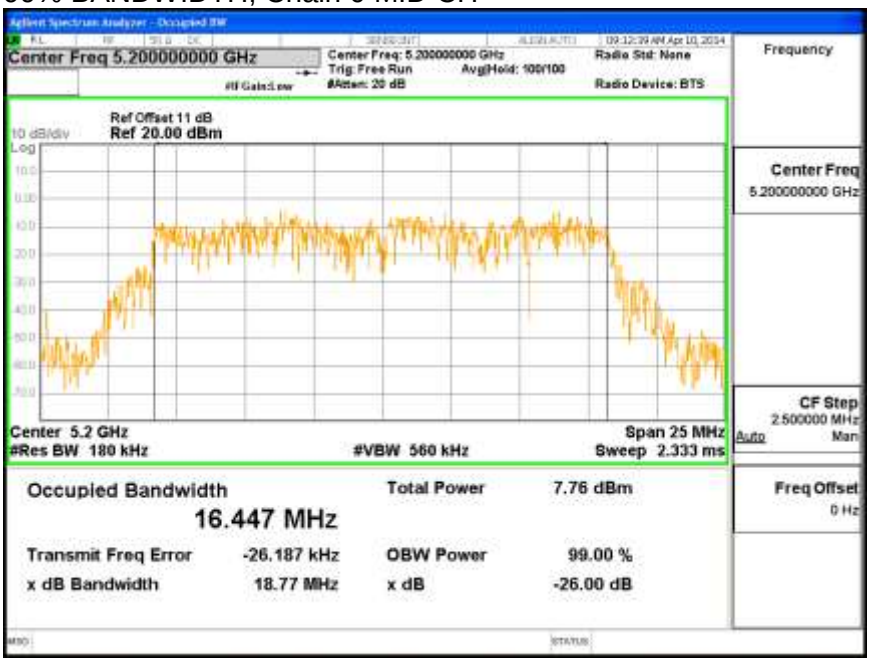
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5180	16.46	16.48
Mid	5200	16.45	16.34
High	5240	16.42	16.49

99% BANDWIDTH, Chain 0

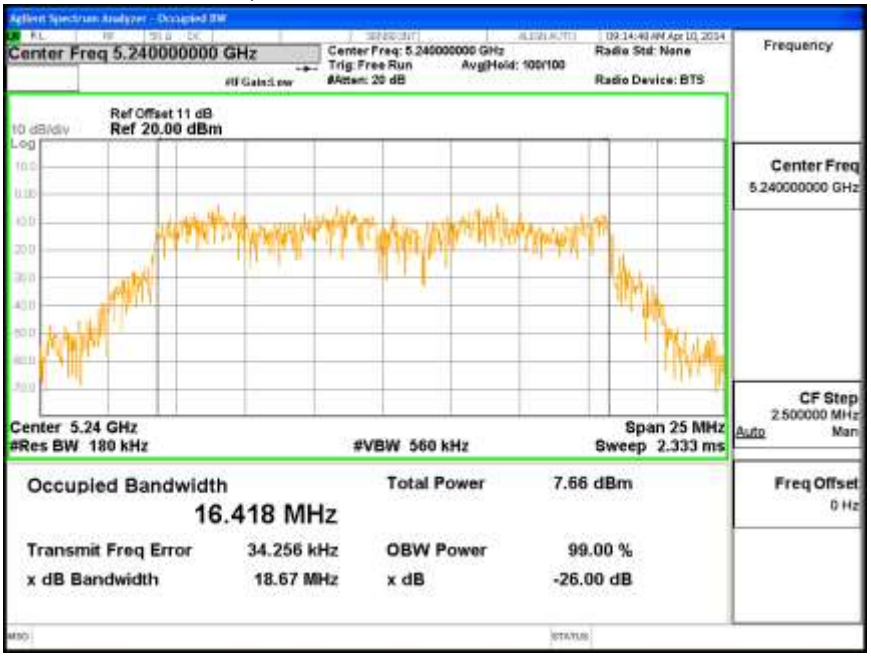
99% BANDWIDTH, Chain 0 LOW CH



99% BANDWIDTH, Chain 0 MID CH

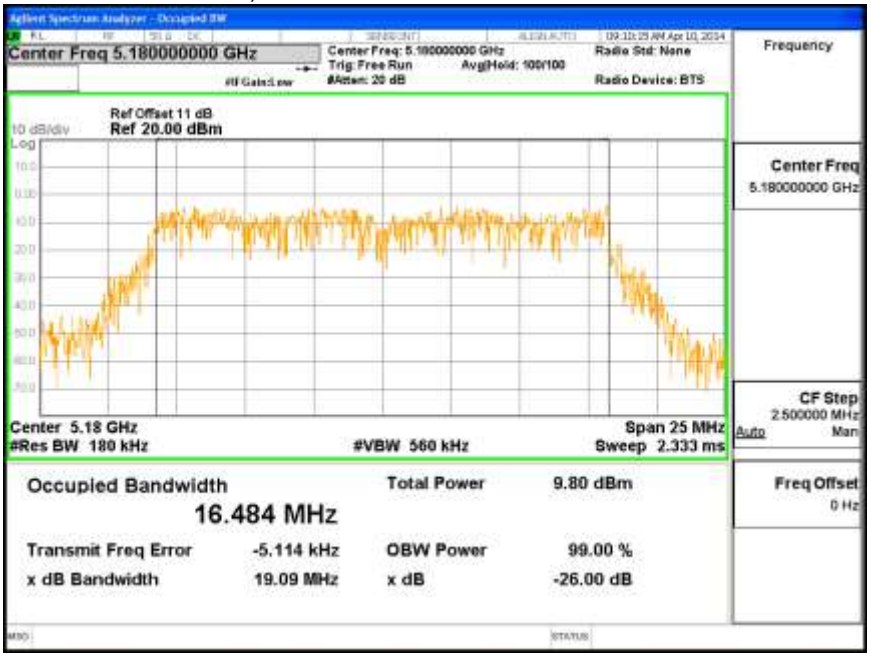


99% BANDWIDTH, Chain 0 HIGH CH

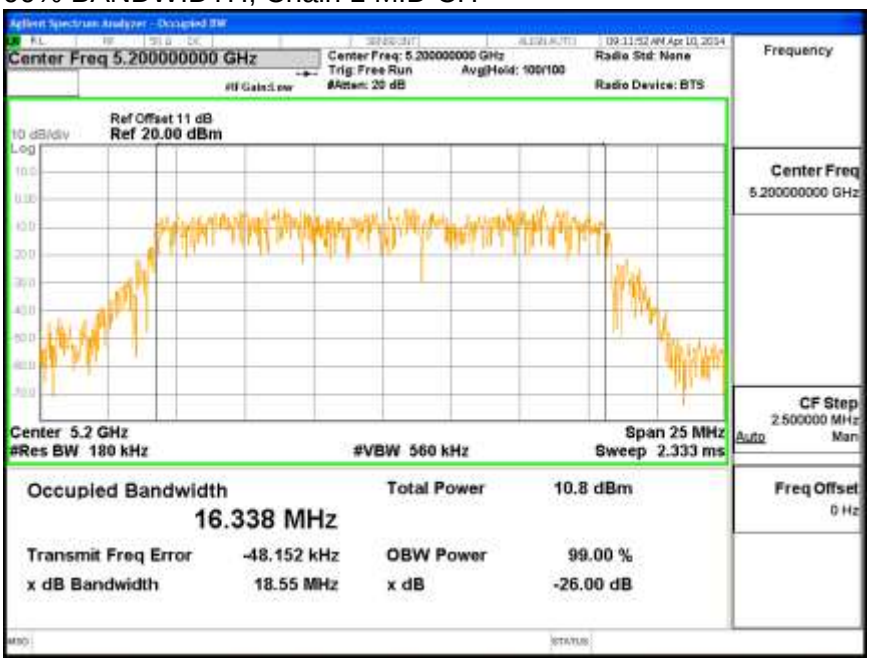


99% BANDWIDTH, Chain 1

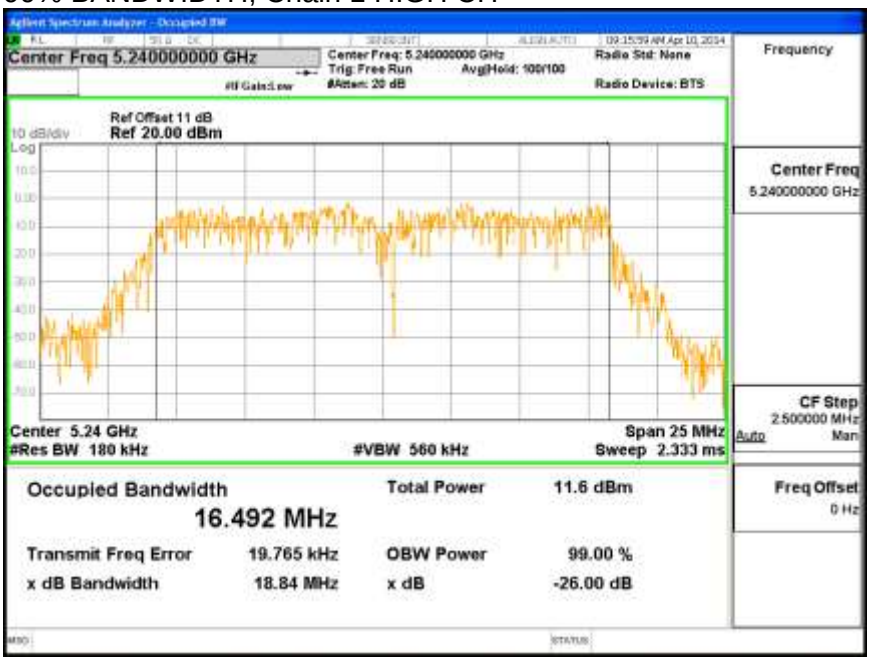
99% BANDWIDTH, Chain 1 LOW CH



99% BANDWIDTH, Chain 1 MID CH



99% BANDWIDTH, Chain 1 HIGH CH



8.1.3. 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 dB (including 10 dB pad and 1 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	5180	8.84	11.25	13.22
Mid	5200	8.12	11.02	12.82
High	5240	7.08	10.39	12.05

8.1.4. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

Output Power;
The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
4.40	3.60	4.02

PSD:
The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
4.40	3.60	7.02

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5180	18.98	16.4590	4.02	7.02
Mid	5200	19.05	16.3380	4.02	7.02
High	5240	19.10	16.4180	4.02	7.02

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5180	16.78	22.16	18.14	16.78	2.98	10.00	2.98
Mid	5200	16.80	22.13	18.11	16.80	2.98	10.00	2.98
High	5240	16.81	22.15	18.13	16.81	2.98	10.00	2.98

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

Output Power Results

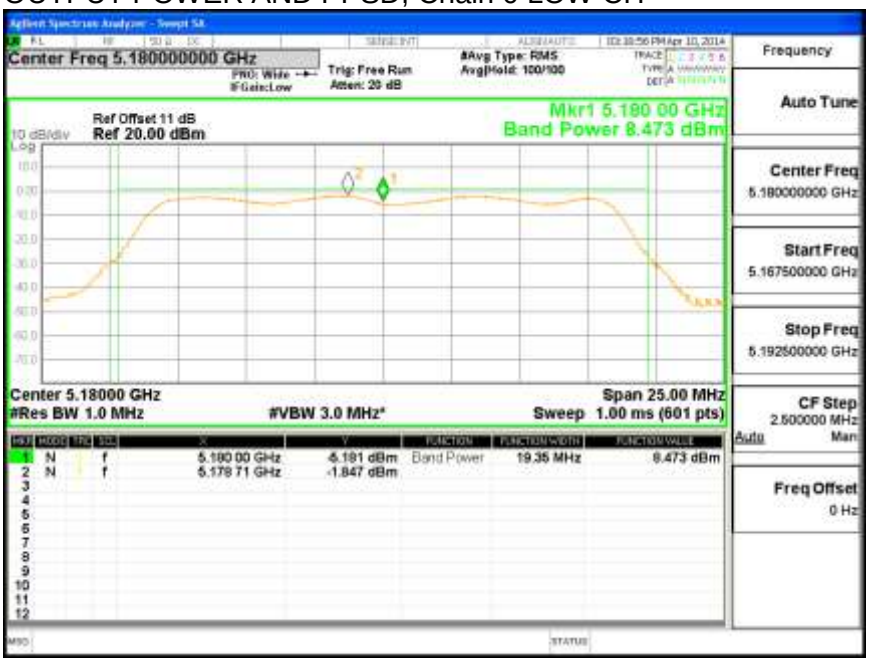
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	8.47	11.12	13.01	16.78	-3.77
Mid	5200	8.36	11.46	13.19	16.80	-3.61
High	5240	7.40	10.79	12.43	16.81	-4.38

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	5180	-1.85	0.70	2.62	2.98	-0.36
Mid	5200	-1.64	1.00	2.89	2.98	-0.09
High	5240	-2.19	0.53	2.39	2.98	-0.59

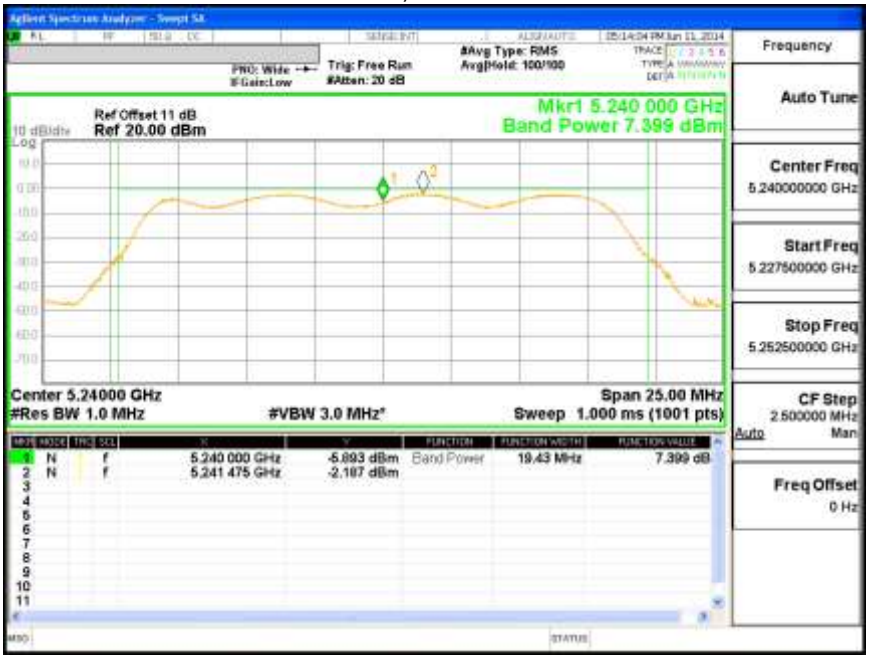
OUTPUT POWER AND PPSD, Chain 0

OUTPUT POWER AND PPSD, Chain 0 LOW CH



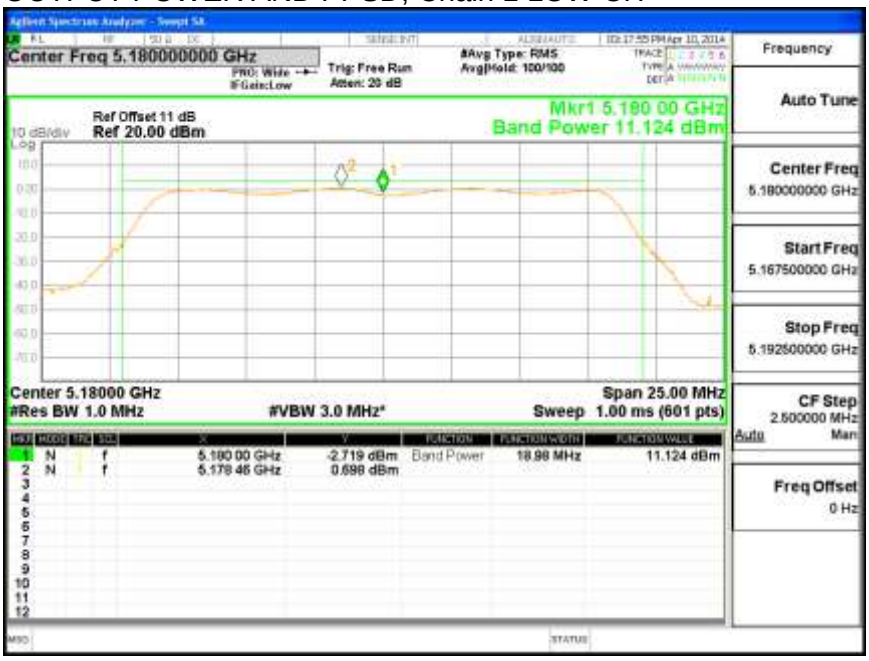
OUTPUT POWER AND PPSD, Chain 0 MID CH

OUTPUT POWER AND PPSD, Chain 0 HIGH CH

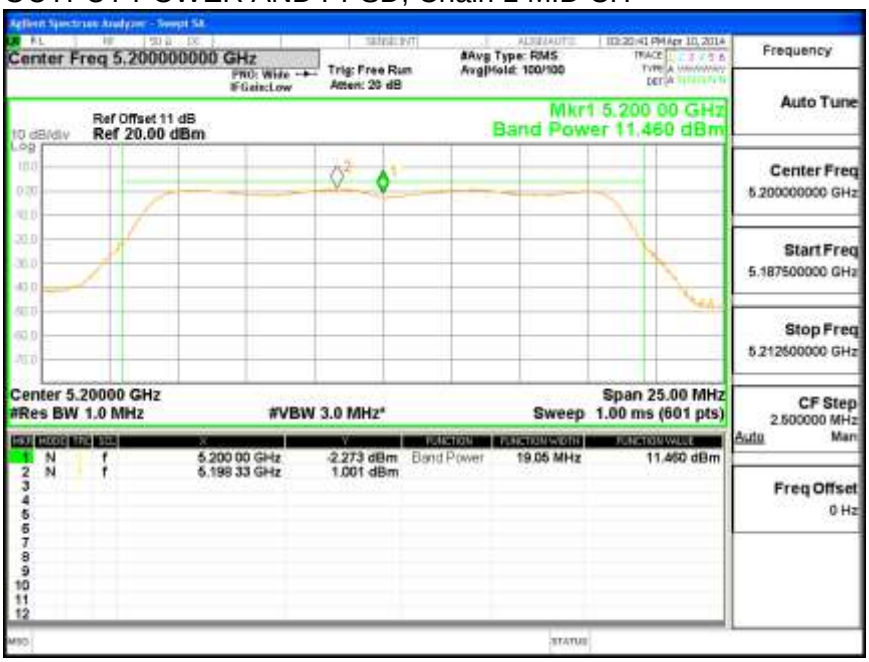


OUTPUT POWER AND PPSD, Chain 1

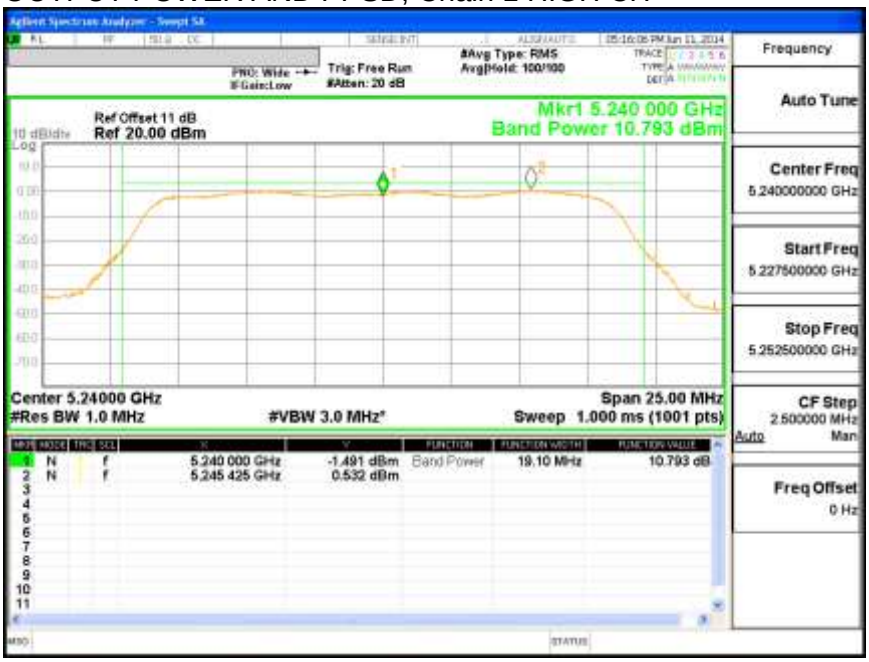
OUTPUT POWER AND PPSD, Chain 1 LOW CH



OUTPUT POWER AND PPSD, Chain 1 MID CH



OUTPUT POWER AND PPSD, Chain 1 HIGH CH



8.1.5. 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

Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	5.54	-1.64	0.00	7.18	13	-5.82

Chain 1

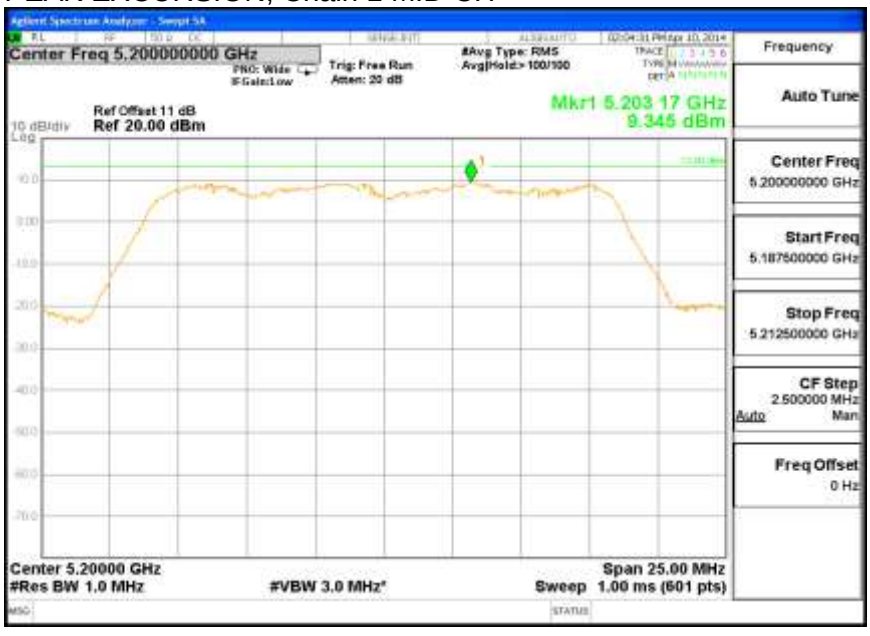
Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	9.35	1.00	0.00	8.34	13	-4.66

PEAK EXCURSION, Chain 0

PEAK EXCURSION, Chain 0 MID CH

PEAK EXCURSION, Chain 1

PEAK EXCURSION, Chain 1 MID CH



8.2. 802.11n HT20 2Tx CDD MODE IN THE 5.2 GHz BAND

8.2.1. 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	5180	20.50	20.63
Mid	5200	20.50	20.70
High	5240	20.53	20.70

26 dB BANDWIDTH, Chain 0

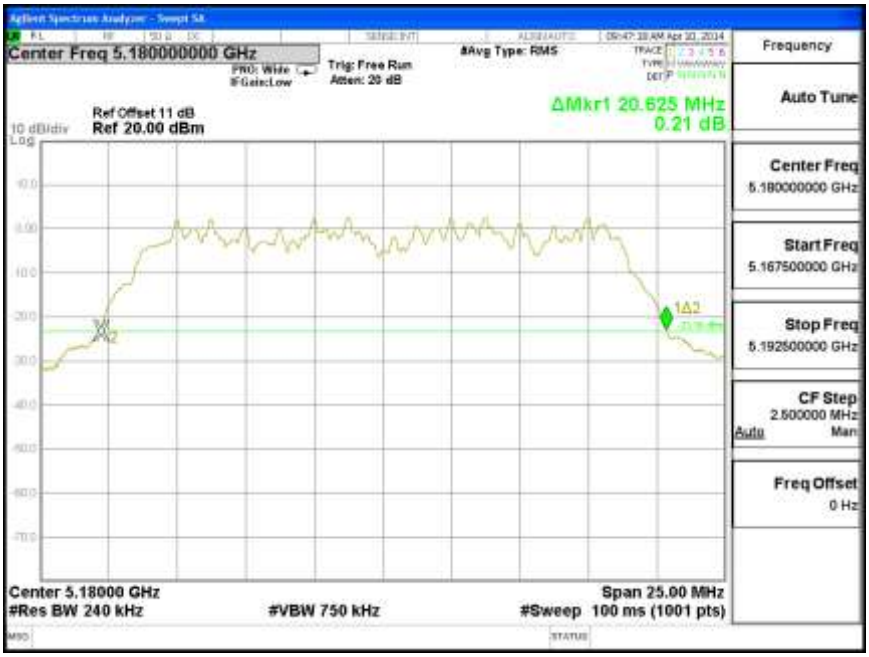
BANDWIDTH Chain 0 LOW CH

BANDWIDTH Chain 0 MID CH

BANDWIDTH Chain 0 HIGH CH

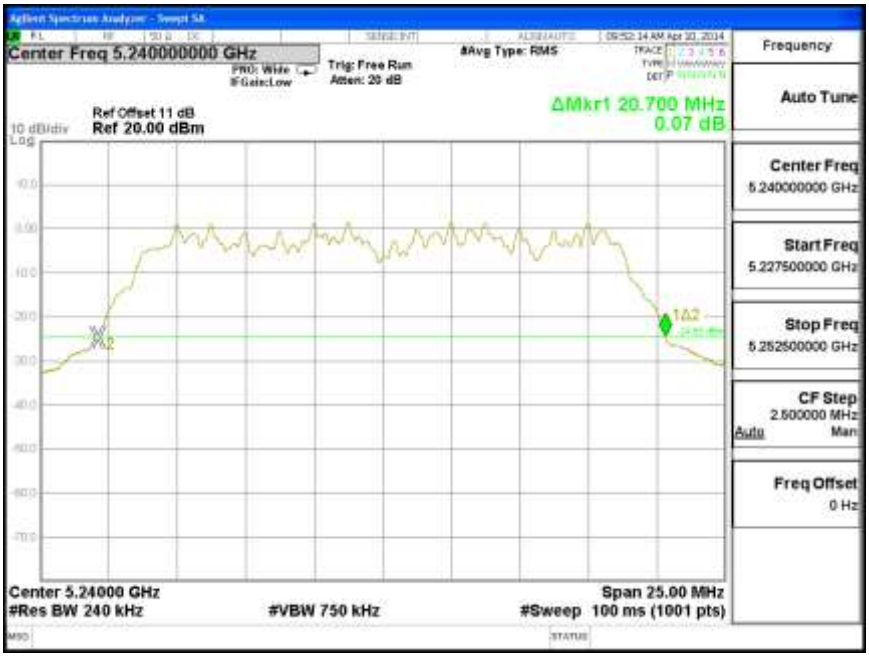
26 dB BANDWIDTH, Chain 1

BANDWIDTH Chain 1 LOW CH



BANDWIDTH Chain 1 MID CH

BANDWIDTH Chain 1 HIGH CH



8.2.2. 99% BANDWIDTH

LIMITS

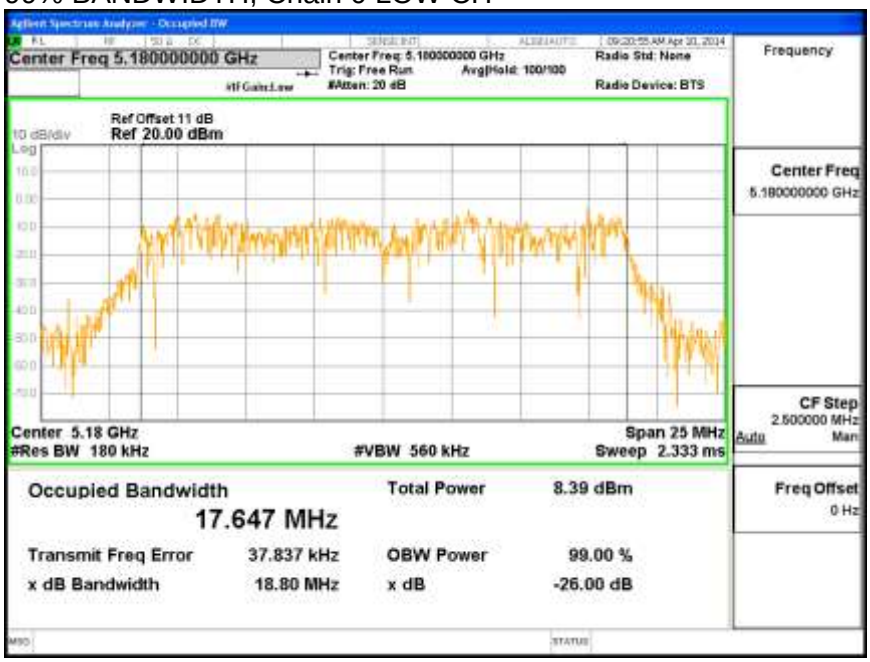
None; for reporting purposes only.

RESULTS

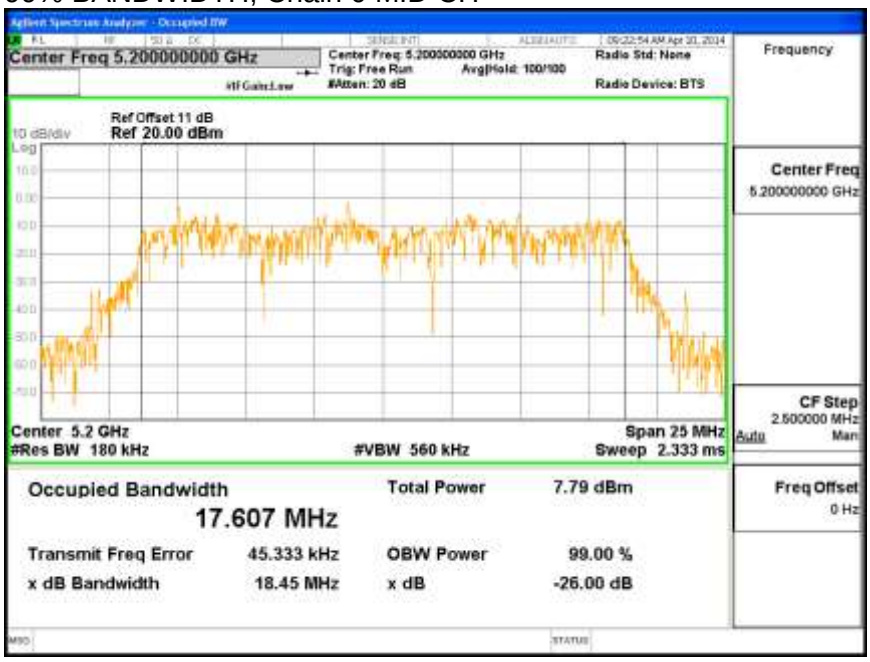
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5180	17.65	17.63
Mid	5200	17.61	17.63
High	5240	17.50	17.55

99% BANDWIDTH, Chain 0

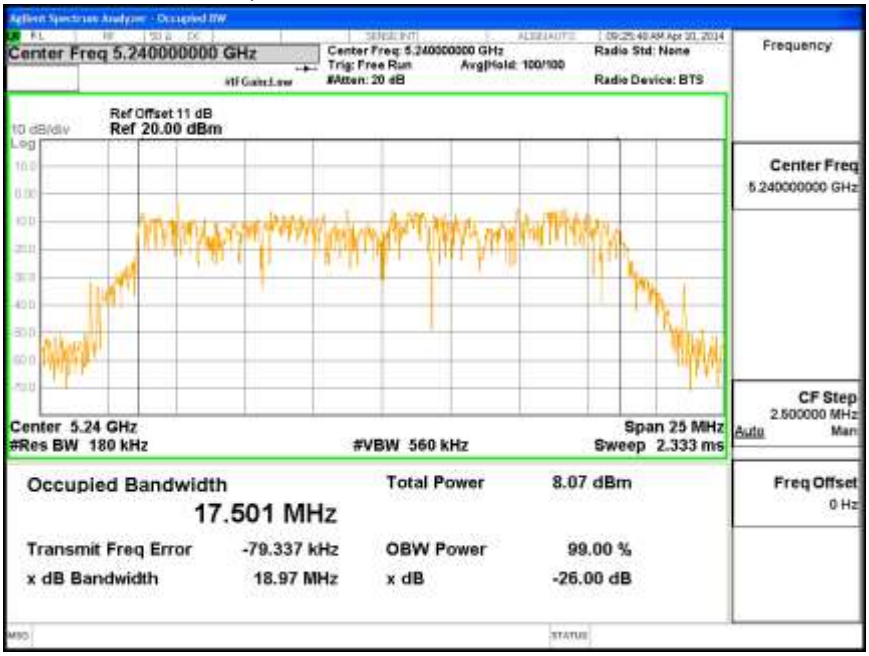
99% BANDWIDTH, Chain 0 LOW CH



99% BANDWIDTH, Chain 0 MID CH

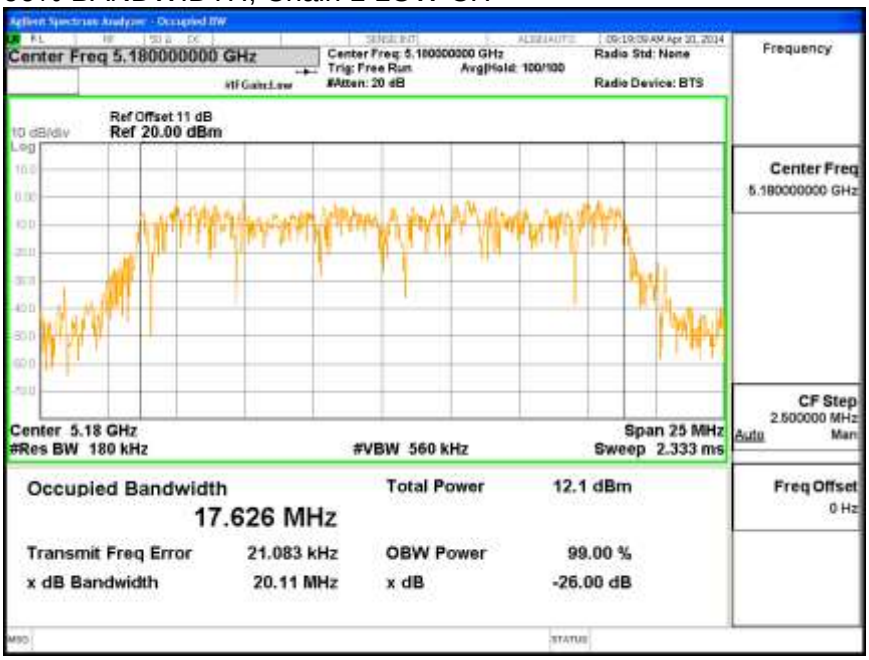


99% BANDWIDTH, Chain 0 HIGH CH

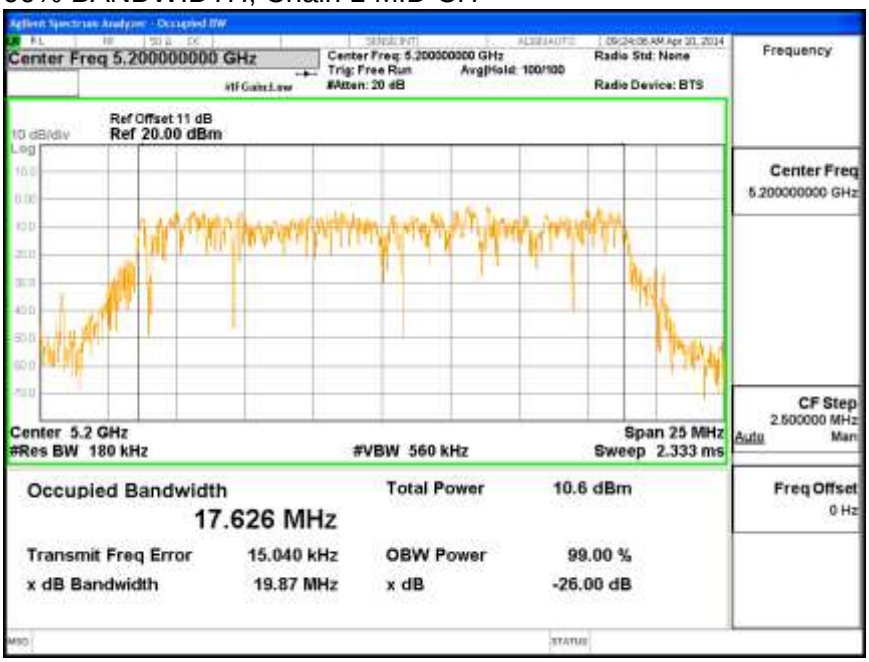


99% BANDWIDTH, Chain 1

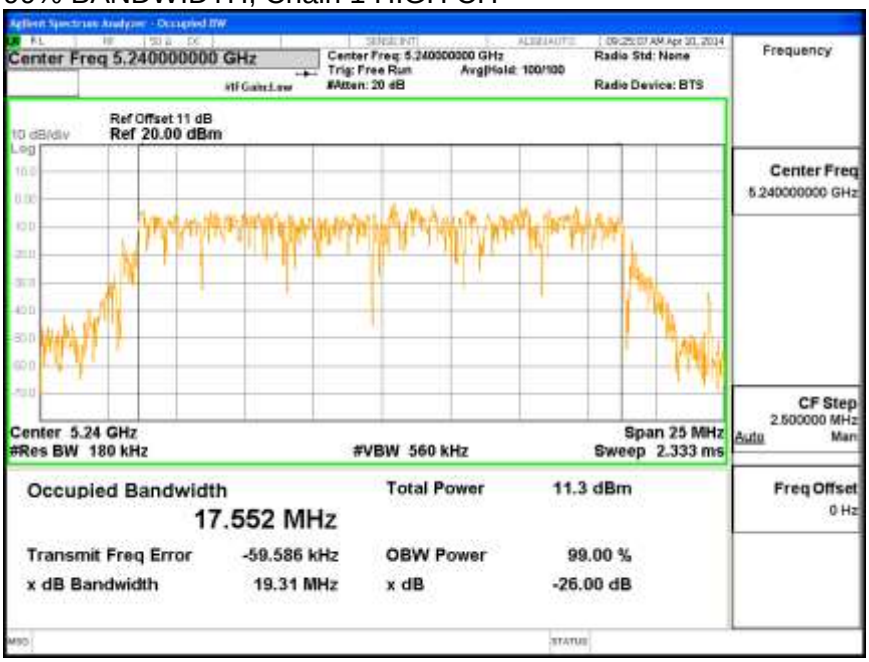
99% BANDWIDTH, Chain 1 LOW CH



99% BANDWIDTH, Chain 1 MID CH



99% BANDWIDTH, Chain 1 HIGH CH



8.2.3. 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 dB (including 10 dB pad and 1 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	5180	8.22	10.87	12.75
Mid	5200	8.26	11.33	13.07
High	5240	6.83	10.41	11.99

8.2.4. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

Output Power;
The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
4.40	3.60	4.02

PSD:
The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
4.40	3.60	7.02

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5180	20.5	17.6260	4.02	7.02
Mid	5200	20.5	17.6070	4.02	7.02
High	5240	20.5	17.5010	4.02	7.02

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5180	17.00	22.46	18.44	17.00	2.98	10.00	2.98
Mid	5200	17.00	22.46	18.44	17.00	2.98	10.00	2.98
High	5240	17.00	22.43	18.41	17.00	2.98	10.00	2.98

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

Output Power Results

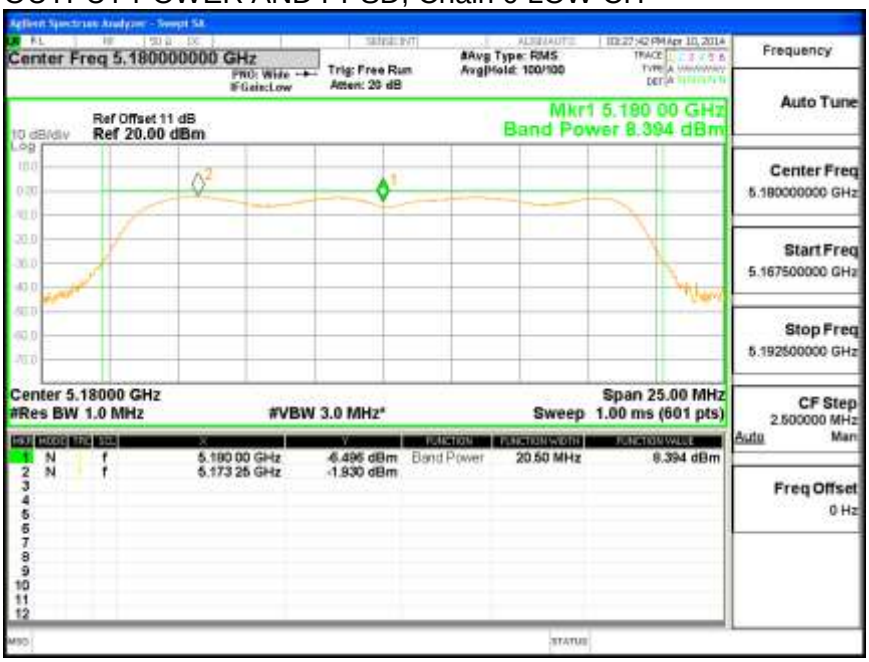
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	8.39	10.99	12.89	17.00	-4.11
Mid	5200	8.10	11.32	13.01	17.00	-3.99
High	5240	7.10	10.56	12.18	17.00	-4.82

PPSD Results

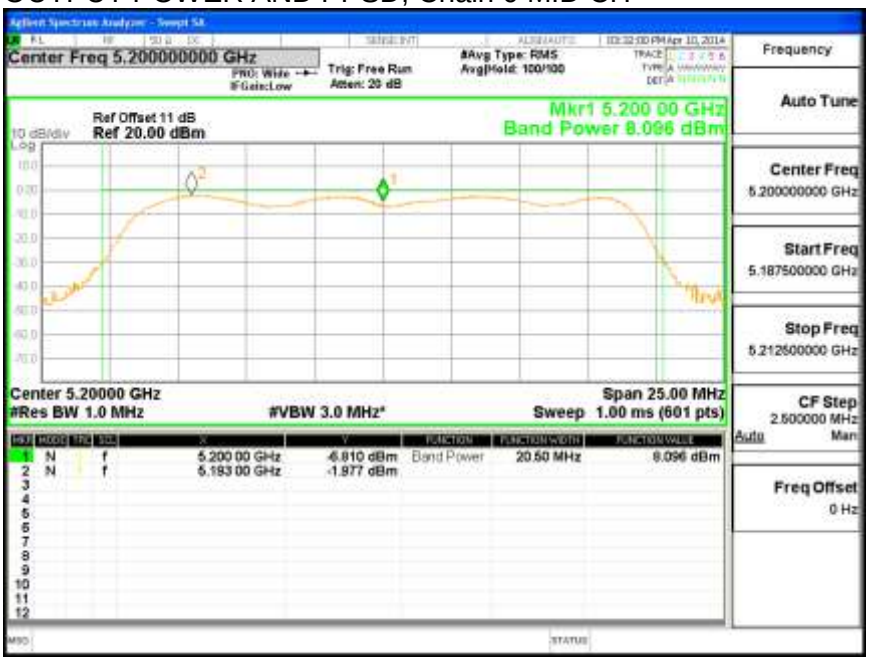
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	-1.93	0.30	2.34	2.98	-0.64
Mid	5200	-1.98	0.73	2.59	2.98	-0.39
High	5240	-2.29	-0.17	1.91	2.98	-1.07

OUTPUT POWER AND PPSD, Chain 0

OUTPUT POWER AND PPSD, Chain 0 LOW CH



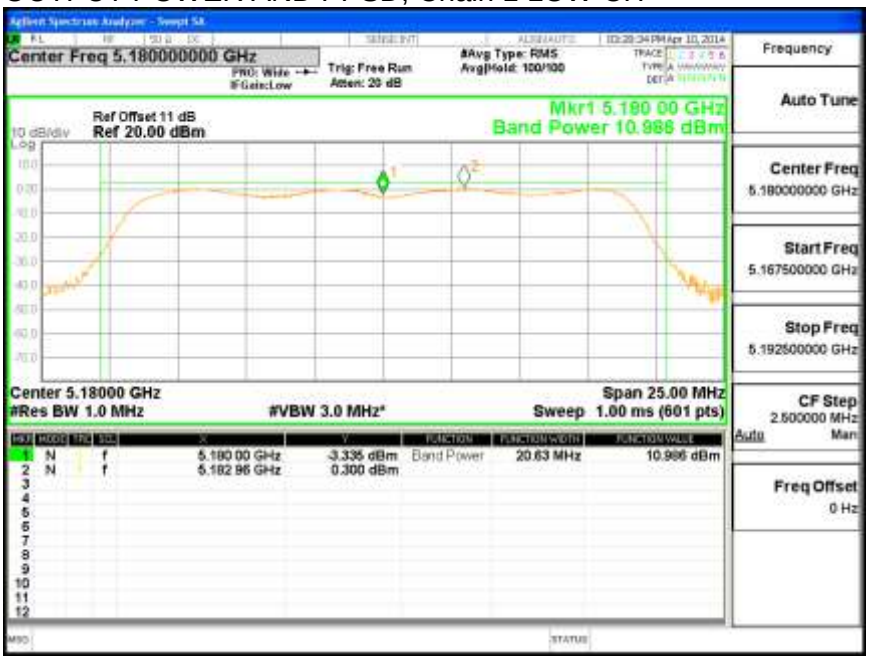
OUTPUT POWER AND PPSD, Chain 0 MID CH



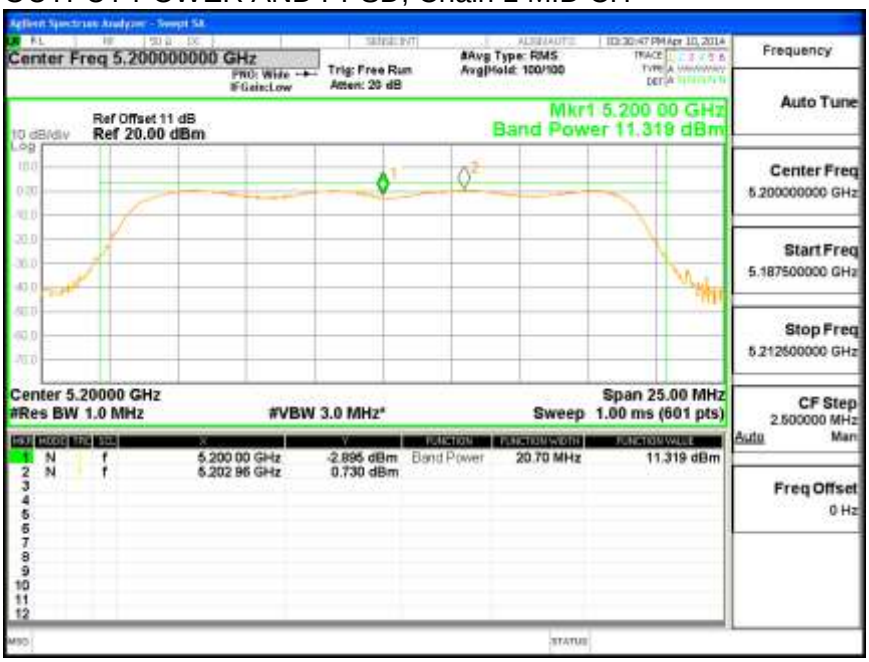
OUTPUT POWER AND PPSD, Chain 0 HIGH CH

OUTPUT POWER AND PPSD, Chain 1

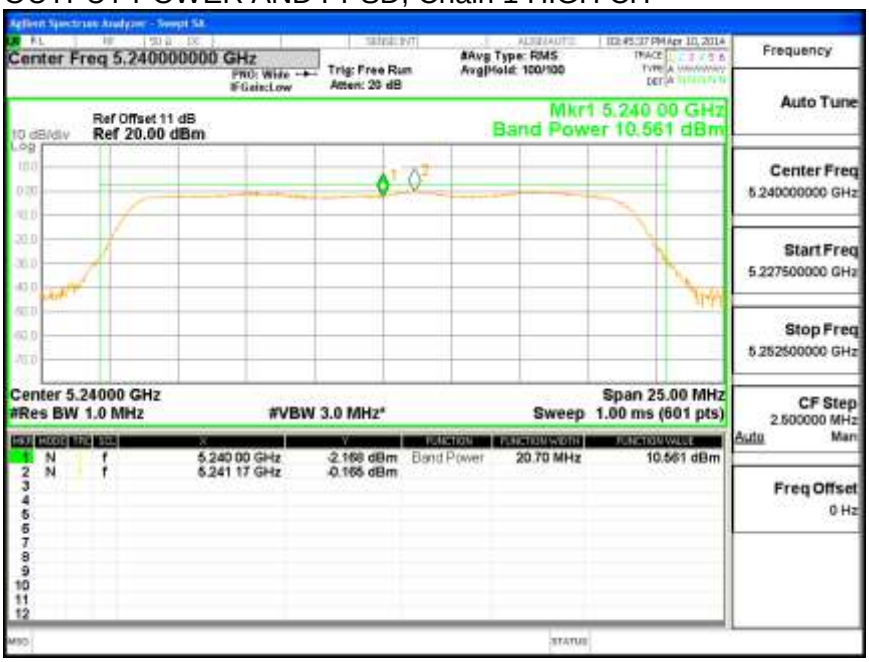
OUTPUT POWER AND PPSD, Chain 1 LOW CH



OUTPUT POWER AND PPSD, Chain 1 MID CH



OUTPUT POWER AND PPSD, Chain 1 HIGH CH



8.2.5. 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)
Mid	5200	4.57	-1.98	0.00	6.55	13	-6.45

Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	8.01	0.73	0.00	7.28	13	-5.72

PEAK EXCURSION, Chain 0

PEAK EXCURSION, Chain 0 MID CH

PEAK EXCURSION, Chain 1

PEAK EXCURSION, Chain 1 MID CH

8.3. 802.11n HT40 2Tx CDD MODE IN THE 5.2 GHz BAND

8.3.1. 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	5190	40.43	41.20
High	5230	40.81	41.09

26 dB BANDWIDTH, Chain 0

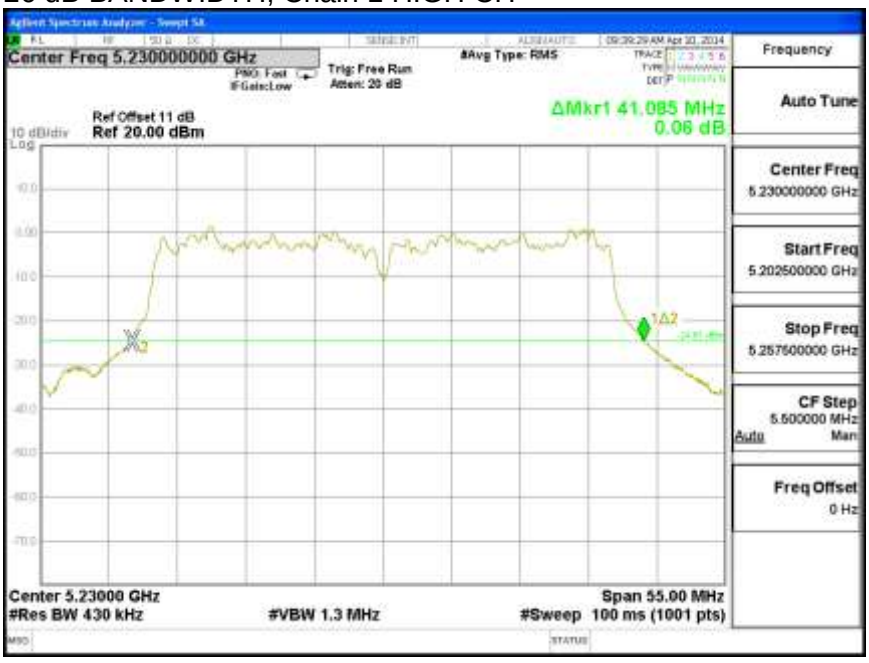
26 dB BANDWIDTH, Chain 0 LOW CH

26 dB BANDWIDTH, Chain 0 HIGH CH

26 dB BANDWIDTH, Chain 1

26 dB BANDWIDTH, Chain 1 LOW CH

26 dB BANDWIDTH, Chain 1 HIGH CH



8.3.2. 99% BANDWIDTH

LIMITS

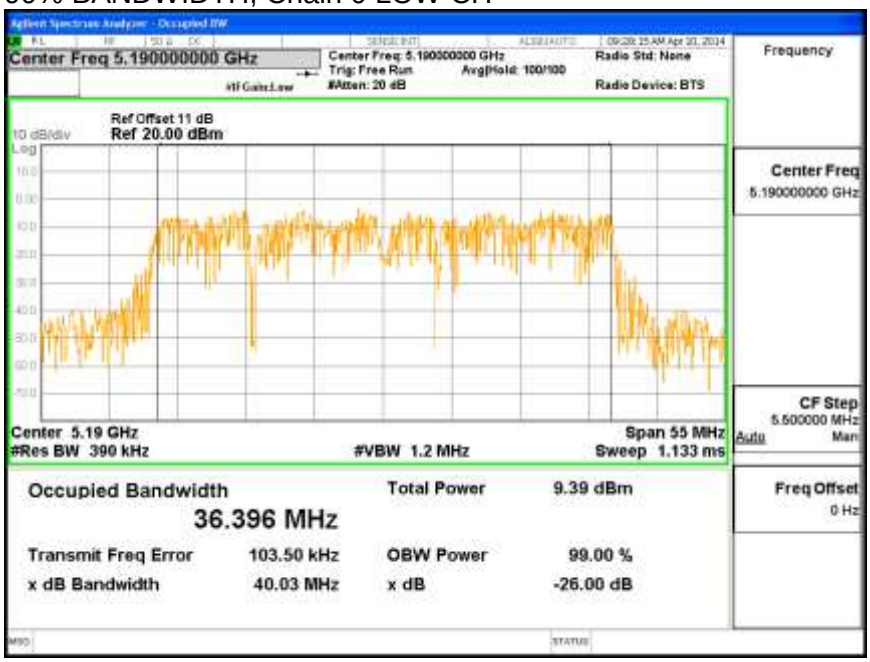
None; for reporting purposes only.

RESULTS

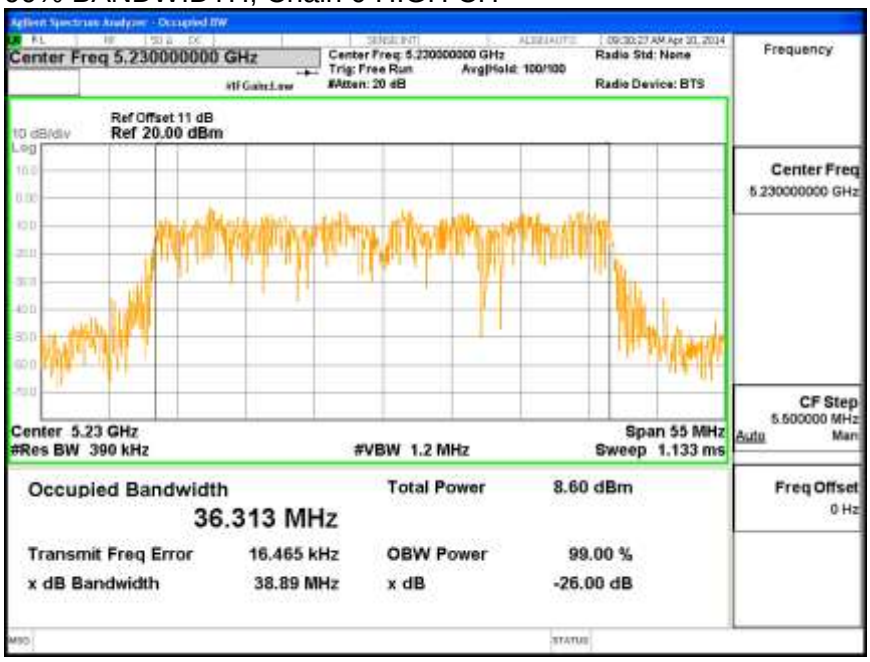
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5190	36.40	36.46
High	5230	36.31	36.32

99% BANDWIDTH, Chain 0

99% BANDWIDTH, Chain 0 LOW CH

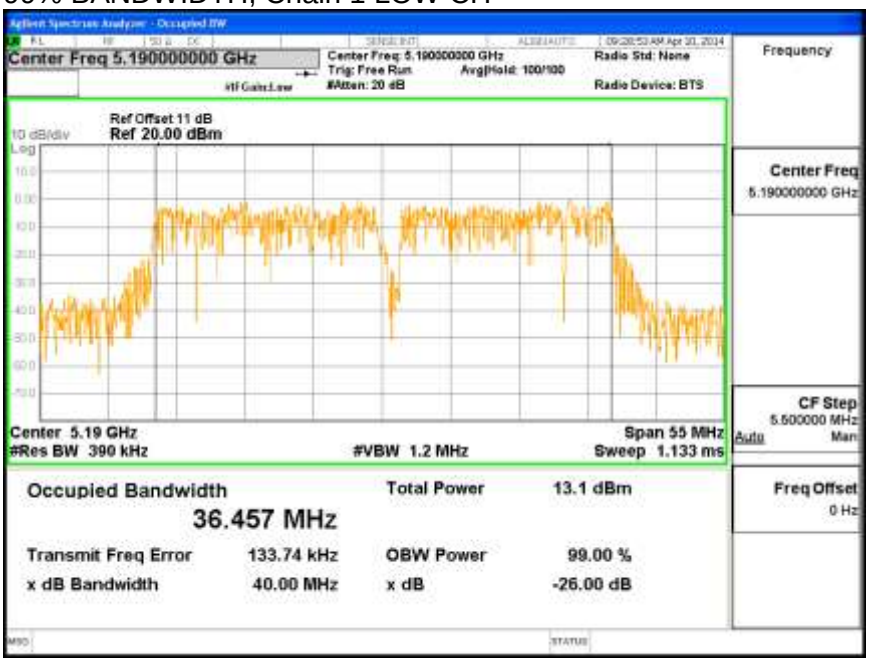


99% BANDWIDTH, Chain 0 HIGH CH

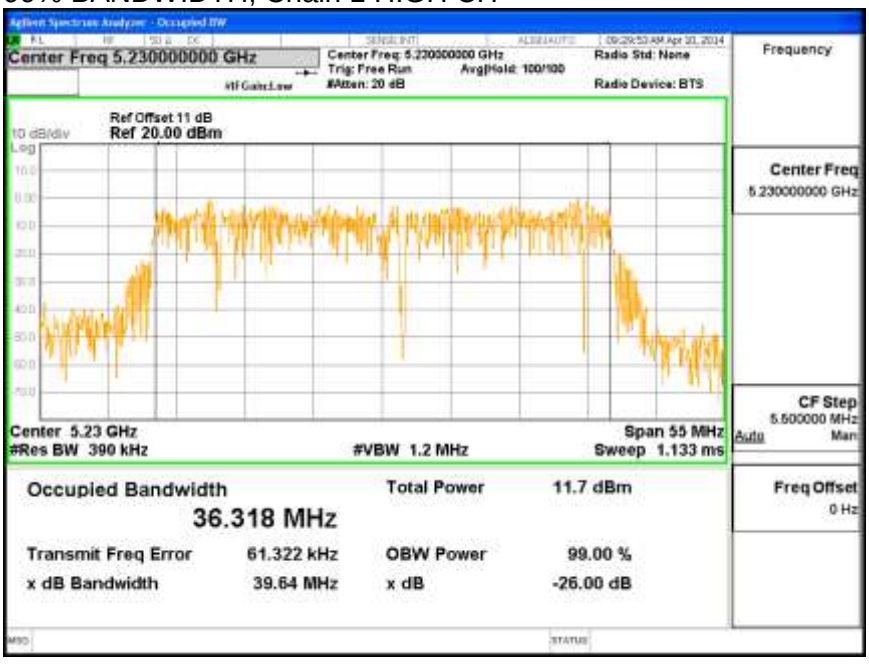


99% BANDWIDTH, Chain 1

99% BANDWIDTH, Chain 1 LOW CH



99% BANDWIDTH, Chain 1 HIGH CH



8.3.3. 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 dB (including 10 dB pad and 1 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	5190	7.89	11.32	12.95
High	5230	9.54	12.85	14.51

8.3.4. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

Output Power;
The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
4.40	3.60	4.02

PSD:
The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
4.40	3.60	7.02

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5190	40.4	36.4	4.02	7.02
High	5230	40.8	36.3	4.02	7.02

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5190	17.00	23.00	18.98	17.00	2.98	10.00	2.98
High	5230	17.00	23.00	18.98	17.00	2.98	10.00	2.98

Duty Cycle CF (dB)	0.00	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	5190	6.88	9.57	11.44	17.00	-5.56
High	5230	12.67	12.70	15.70	17.00	-1.30

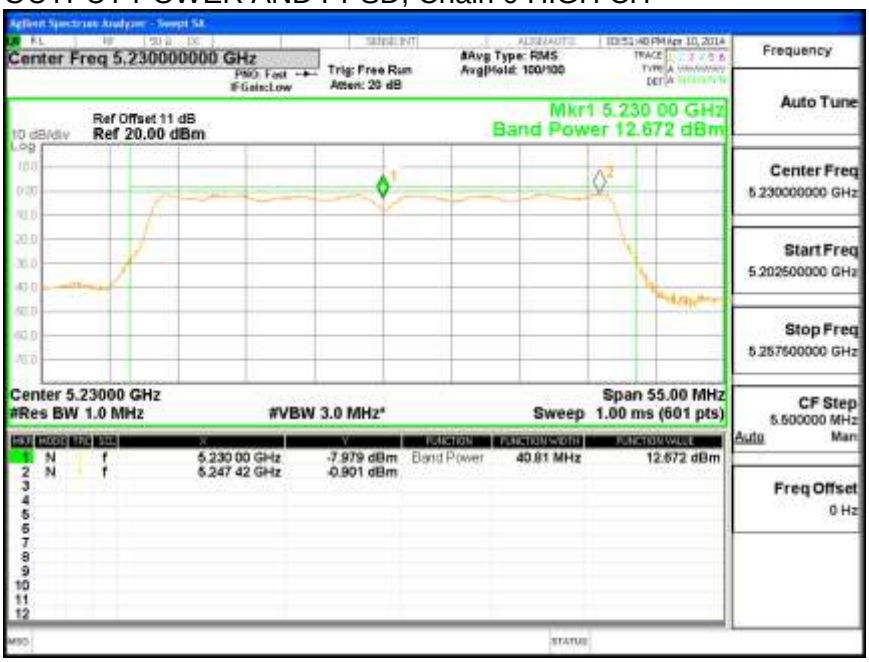
PPSD Results

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	5190	-6.32	-4.03	-2.02	2.98	-5.00
High	5230	-0.90	-1.10	2.01	2.98	-0.97

OUTPUT POWER AND PPSD, Chain 0

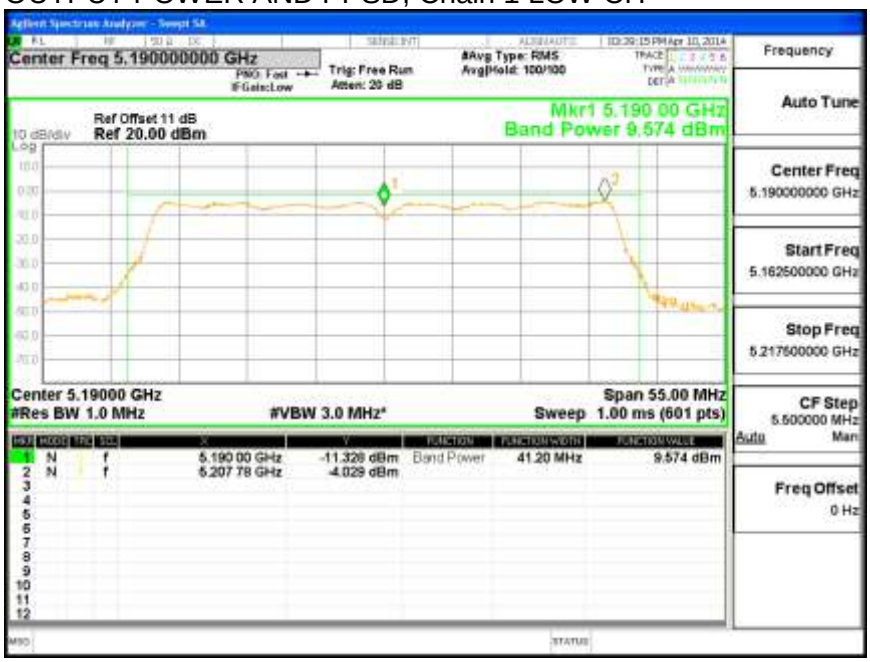
OUTPUT POWER AND PPSD, Chain 0 LOW CH

OUTPUT POWER AND PPSD, Chain 0 HIGH CH

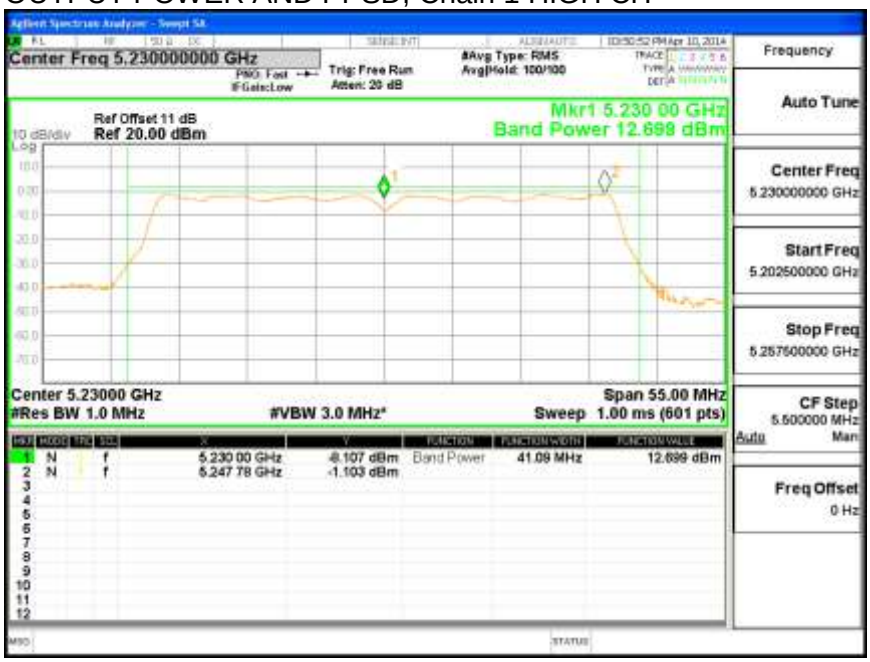


OUTPUT POWER AND PPSD, Chain 1

OUTPUT POWER AND PPSD, Chain 1 LOW CH



OUTPUT POWER AND PPSD, Chain 1 HIGH CH



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 1 MHz for peak measurements and as applicable for average measurements.

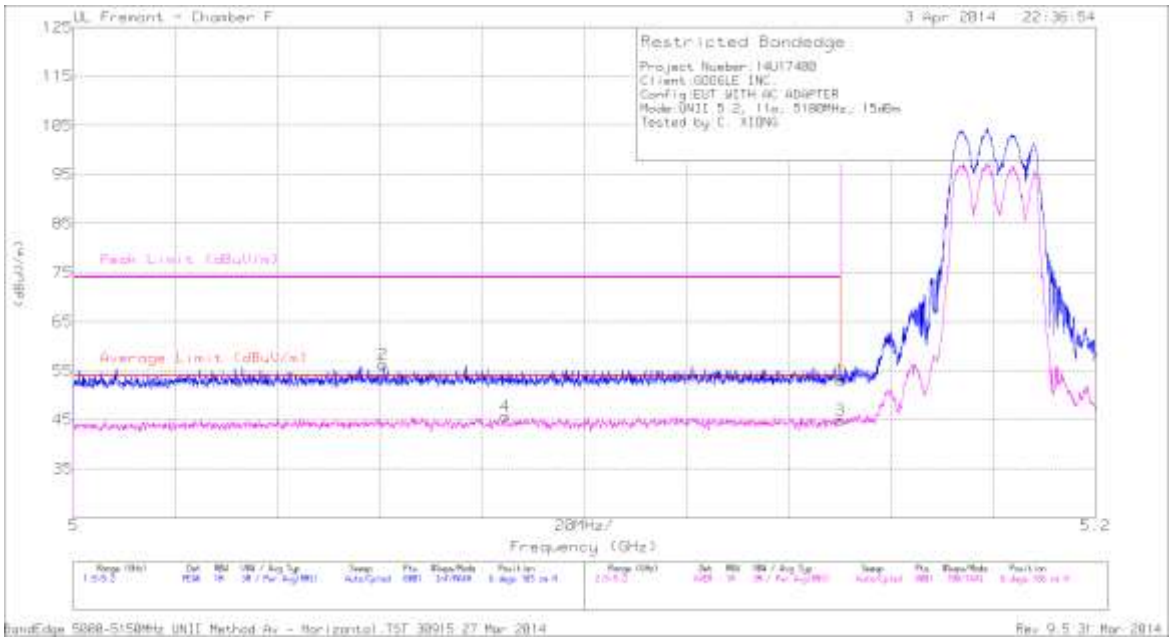
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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

9.2. TX ABOVE 1 GHz 802.11a 2Tx CDD MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL HORIZONTAL PLOT

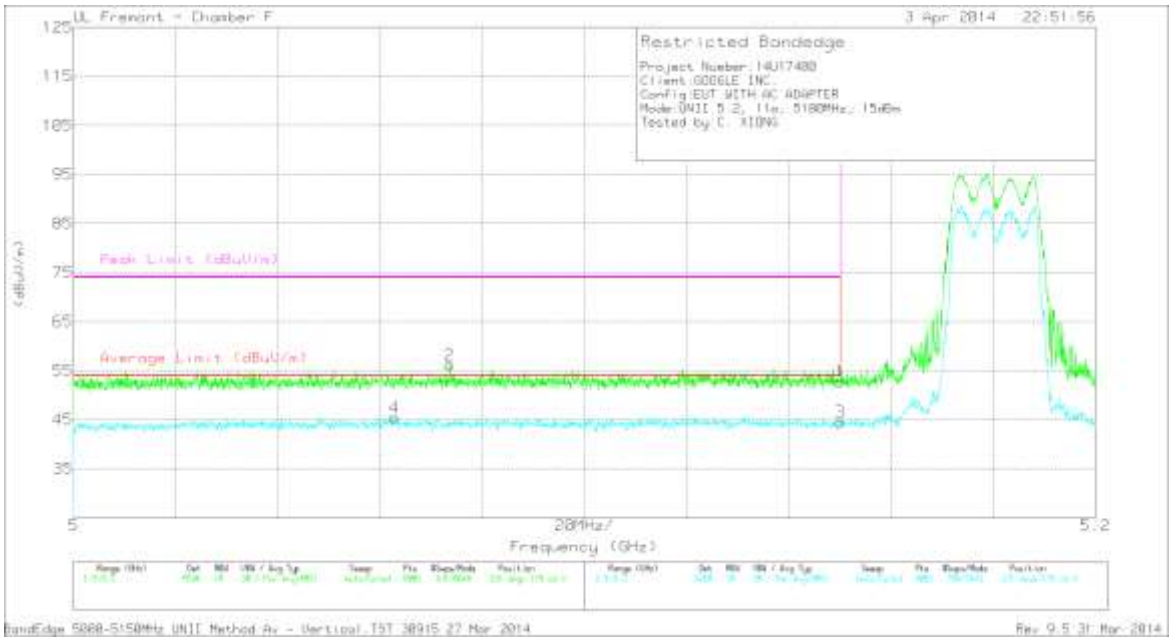


DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	38.1	PK	34.4	-19.3	53.2	-	-	74	-20.8	6	165	H
2	* 5.061	41.9	PK	34.3	-20	56.2	-	-	74	-17.8	6	165	H
3	* 5.15	29.81	RMS	34.4	-19.3	44.91	54	-9.09	-	-	6	165	H
4	* 5.085	31.11	RMS	34.3	-19.7	45.71	54	-8.29	-	-	6	165	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK - Peak detector
RMS - RMS detection

LOW CHANNEL VERTICAL PLOT



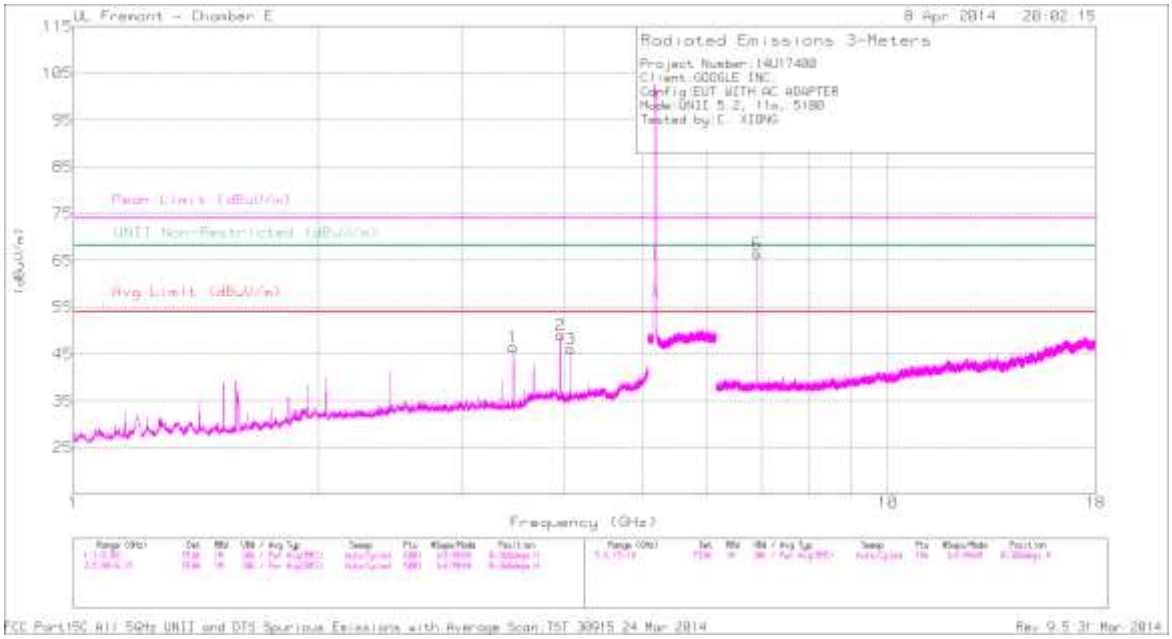
DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	37.7	PK	34.4	-19.3	52.8	-	-	74	-21.2	331	179	V
2	* 5.074	41.59	PK	34.3	-19.8	56.09	-	-	74	-17.91	331	179	V
3	* 5.15	29.52	RMS	34.4	-19.3	44.62	54	-9.38	-	-	331	179	V
4	* 5.063	31.02	RMS	34.3	-19.9	45.42	54	-8.58	-	-	331	179	V

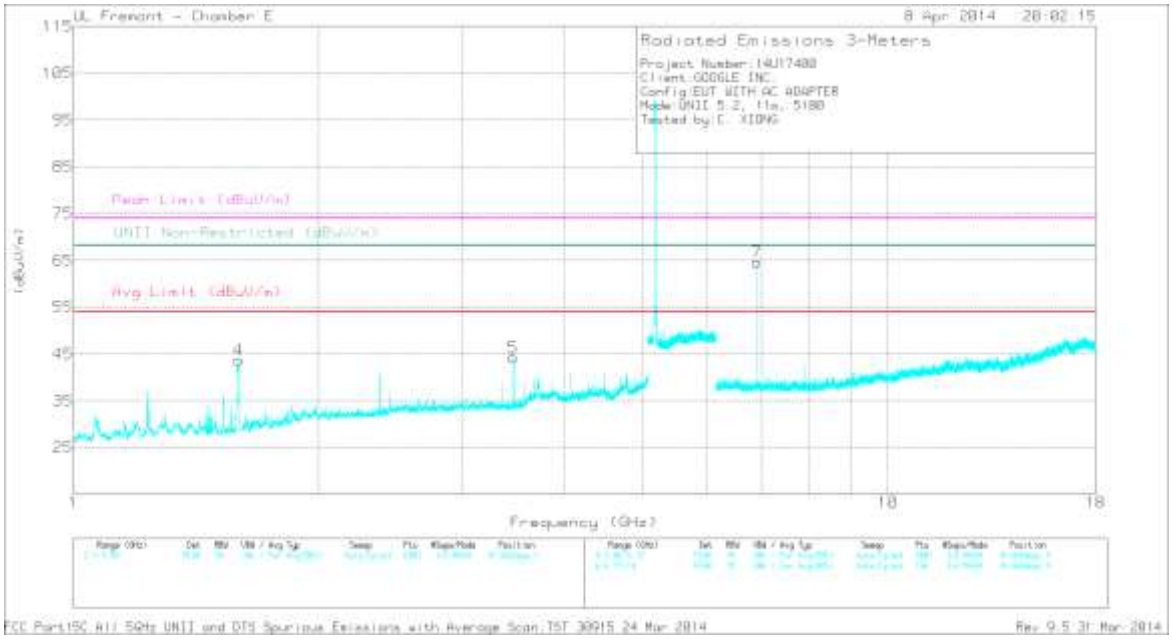
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



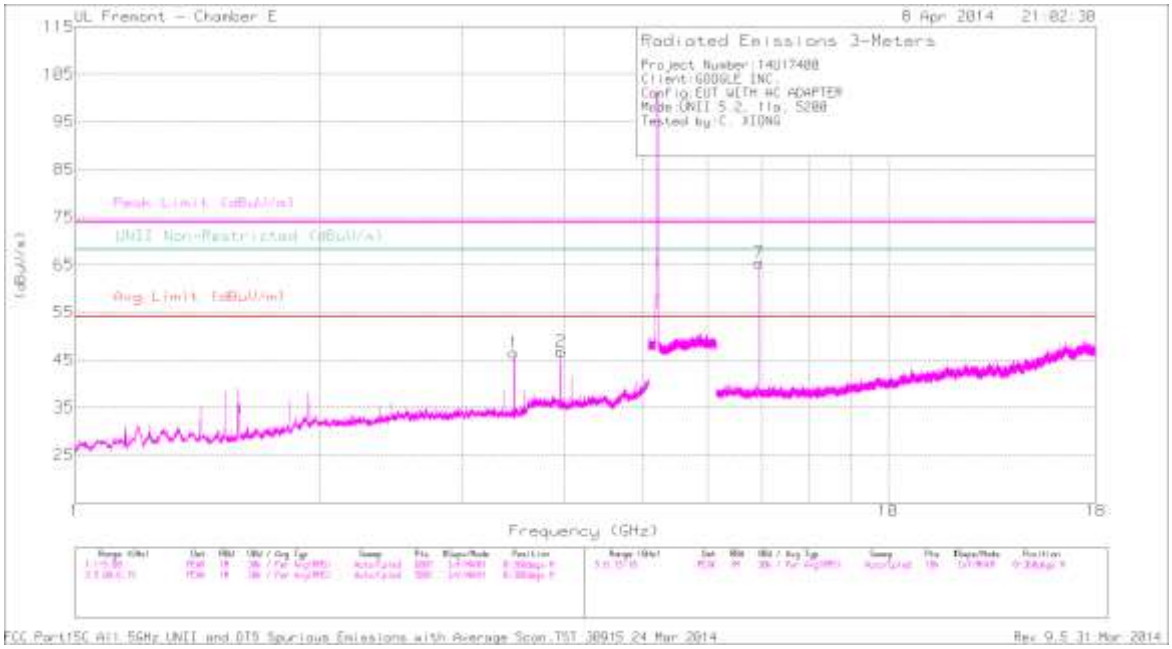
DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 3.965	41.33	PK1	33.5	-31.5	43.33	-	-	74	-30.67	-	-	125	272	H
* 3.962	30.63	AD1	33.5	-31.5	32.63	54	-21.37	-	-	-	-	125	272	H
* 4.08	45.43	PK1	33.5	-31.2	47.73	-	-	74	-26.27	-	-	13	351	H
* 4.08	35.52	AD1	33.5	-31.2	37.82	54	-16.18	-	-	-	-	13	351	H
* 1.591	61.63	PK1	28.4	-33.9	56.13	-	-	74	-17.87	-	-	154	139	V
* 1.594	46.25	AD1	28.4	-33.8	40.85	54	-13.15	-	-	-	-	154	139	V
3.467	50.52	PK1	32.8	-32.3	51.02	-	-	-	-	68.2	-17.18	26	238	H
3.468	49.32	PK1	32.8	-32.3	49.82	-	-	-	-	68.2	-18.38	9	246	V
6.907	58.57	PK1	35.9	-28.8	65.67	-	-	-	-	68.2	-2.53	293	282	H
6.907	58.2	PK1	35.9	-28.8	65.3	-	-	-	-	68.2	-2.9	157	225	V

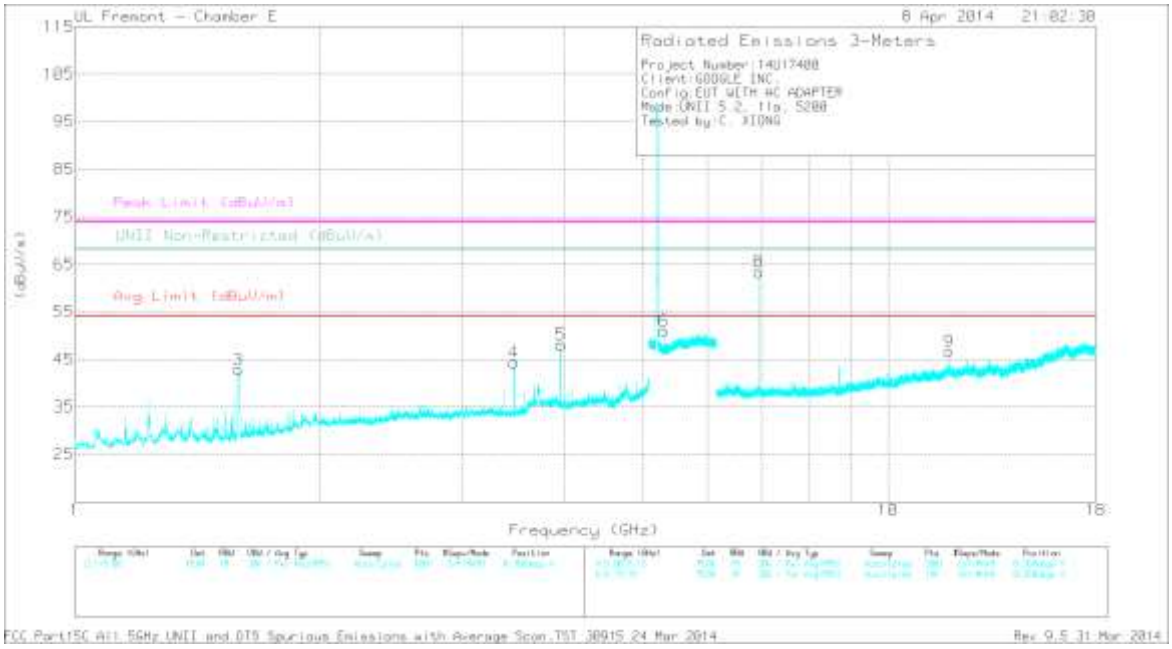
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK1 - KDB789033 Method: Peak
AD1 - KDB789033 Method: AD Primary Power Average

HARMONICS AND SPURIOUS EMISSIONS

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



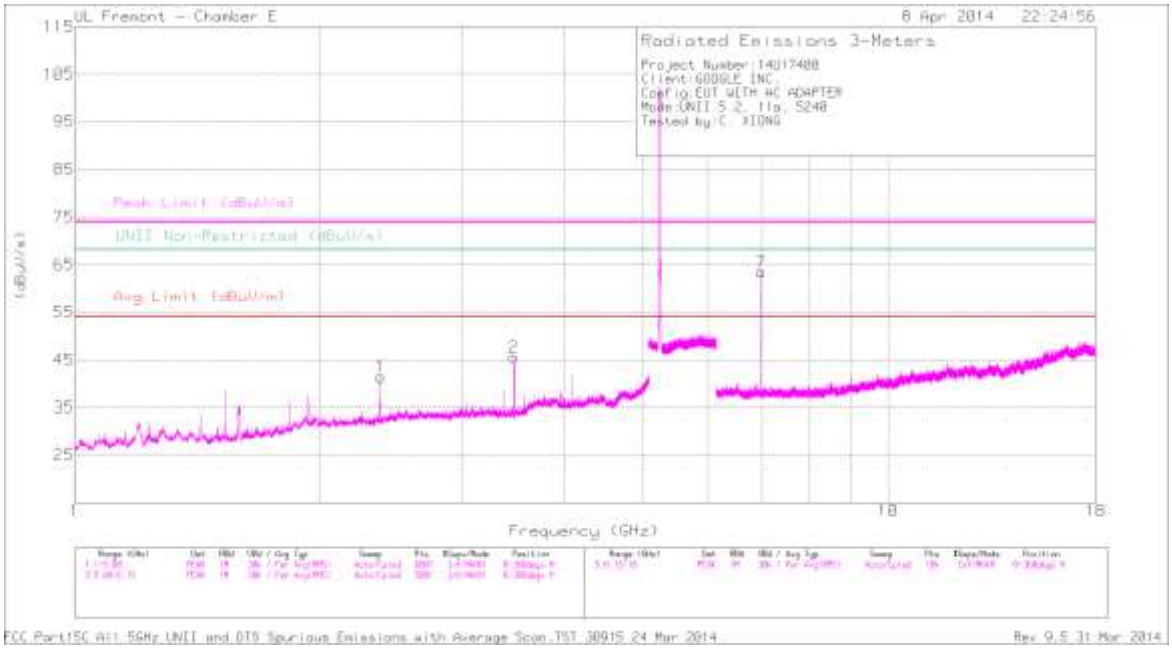
DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 3.964	35.61	PK1	33.5	-31.5	0	37.61	-	-	74	-36.39	-	-	249	267	H
* 3.956	30.5	AD1	33.5	-31.5	0	32.5	54	-21.5	-	-	-	-	249	267	H
* 1.594	59	PK1	28.4	-33.8	0	53.6	-	-	74	-20.4	-	-	149	147	V
* 1.591	46.08	AD1	28.4	-33.9	0	40.58	54	-13.42	-	-	-	-	149	147	V
* 3.956	41.52	PK1	33.5	-31.5	0	43.52	-	-	74	-30.48	-	-	356	295	V
* 3.963	30.56	AD1	33.5	-31.5	0	32.56	54	-21.44	-	-	-	-	356	295	V
* 11.883	36.24	PK1	38.5	-23.9	0	50.84	-	-	74	-23.16	-	-	143	102	V
* 11.883	25.17	AD1	38.5	-23.9	0	39.77	54	-14.23	-	-	-	-	143	102	V
3.468	50.11	PK1	32.8	-32.3	0	50.61	-	-	-	-	68.2	-17.59	23	267	H
3.468	49.88	PK1	32.8	-32.3	0	50.38	-	-	-	-	68.2	-17.82	58	324	V
5.304	44.4	PK1	34.3	-21.4	0	57.3	-	-	-	-	68.2	-10.9	25	218	V
6.933	59.13	PK1	35.9	-28.4	0	66.63	-	-	-	-	68.2	-1.57	339	240	H
6.933	57.01	PK1	35.9	-28.4	0	64.51	-	-	-	-	68.2	-3.69	160	190	V

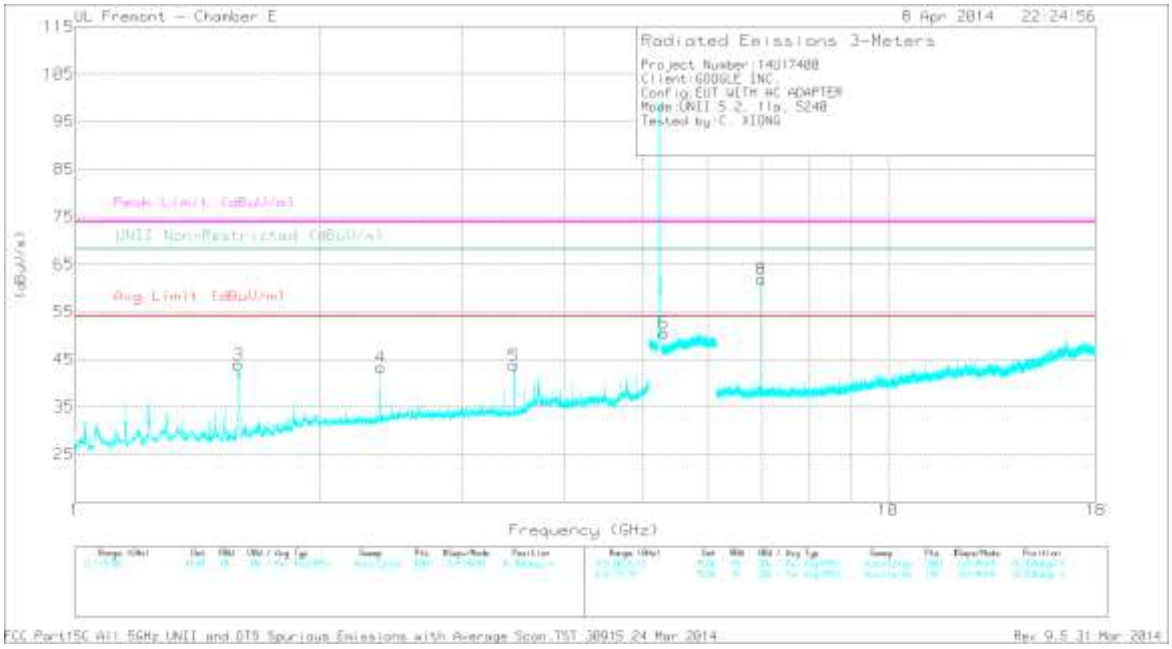
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK1 - KDB789033 Method: Peak
AD1 - KDB789033 Method: AD Primary Power Average

HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL VERTICAL PLOT



DATA

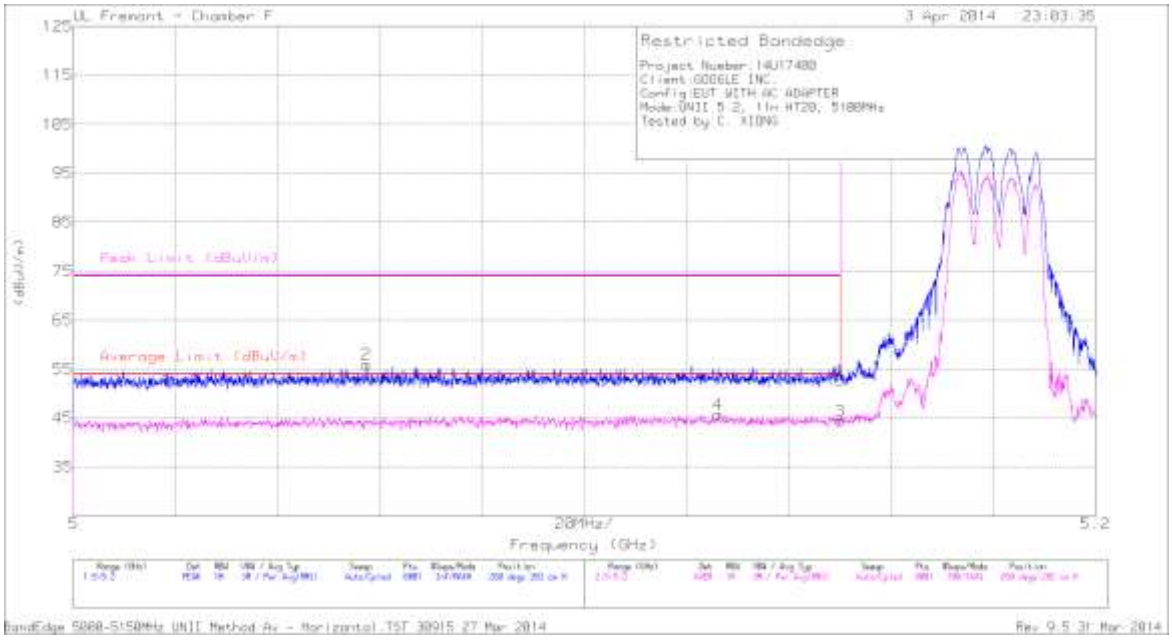
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.375	42.3	PK1	31.9	-33.2	0	41	-	-	74	-33	-	-	15	335	H
* 2.382	31.35	AD1	31.9	-33.2	0	30.05	54	-23.95	-	-	-	-	15	335	H
* 1.588	60.43	PK1	28.4	-34	0	54.83	-	-	74	-19.17	-	-	148	135	V
* 1.589	45.96	AD1	28.4	-34	0	40.36	54	-13.64	-	-	-	-	148	135	V
* 2.376	47.5	PK1	31.9	-33.2	0	46.2	-	-	74	-27.8	-	-	168	284	V
* 2.377	31.34	AD1	31.9	-33.2	0	30.04	54	-23.96	-	-	-	-	168	284	V
3.468	49.86	PK1	32.8	-32.3	0	50.36	-	-	-	-	68.2	-17.84	305	326	H
3.468	49.18	PK1	32.8	-32.3	0	49.68	-	-	-	-	68.2	-18.52	0	288	V
5.304	45.08	PK1	34.3	-21.4	0	57.98	-	-	-	-	68.2	-10.22	31	236	V
6.987	57.37	PK1	35.9	-28.3	0	64.97	-	-	-	-	68.2	-3.23	346	275	H
6.987	56.58	PK1	35.9	-28.3	0	64.18	-	-	-	-	68.2	-4.02	166	203	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK1 - KDB789033 Method: Peak
AD1 - KDB789033 Method: AD Primary Power Average

9.3. TX ABOVE 1 GHz 802.11n HT20 2Tx CDD MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL HORIZONTAL PLOT

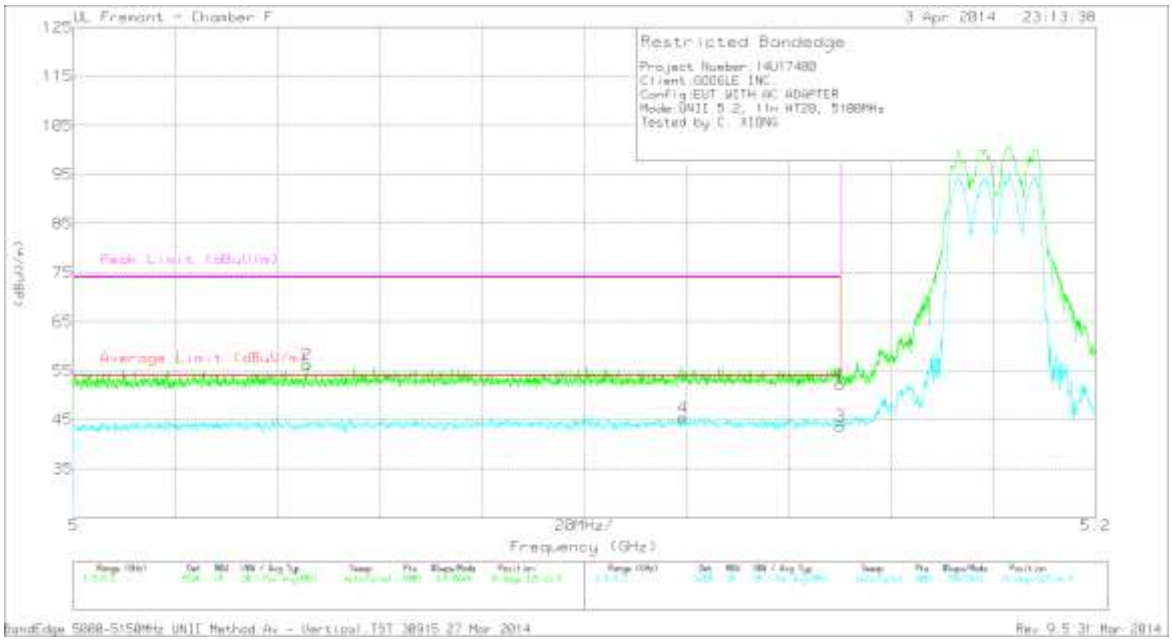


DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	37.7	PK	34.4	-19.3	52.8	-	-	74	-21.2	260	282	H
2	* 5.057	41.66	PK	34.3	-20	55.96	-	-	74	-18.04	260	282	H
3	* 5.15	29.31	RMS	34.4	-19.3	44.41	54	-9.59	-	-	260	282	H
4	* 5.126	30.65	RMS	34.4	-19.3	45.75	54	-8.25	-	-	260	282	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK - Peak detector
RMS - RMS detection

LOW CHANNEL VERTICAL PLOT



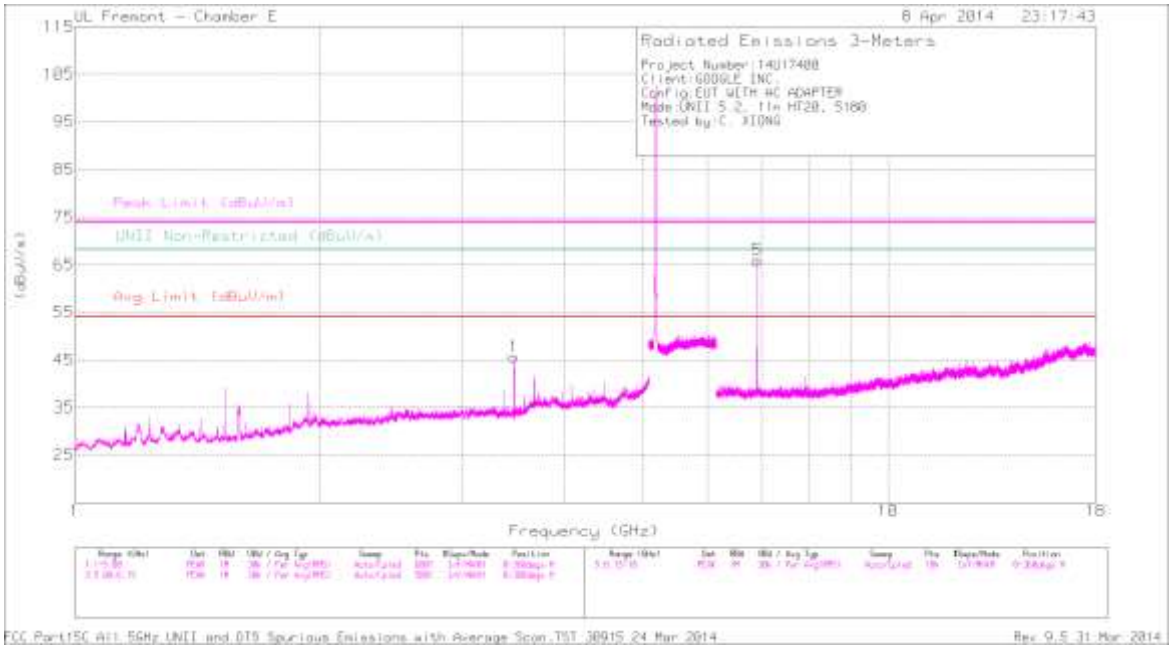
DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	37.08	PK	34.4	-19.3	52.18	-	-	74	-21.82	16	325	V
2	* 5.046	42.12	PK	34.3	-20.2	56.22	-	-	74	-17.78	16	325	V
3	* 5.15	28.63	RMS	34.4	-19.3	43.73	54	-10.27	-	-	16	325	V
4	* 5.119	30.4	RMS	34.4	-19.4	45.4	54	-8.6	-	-	16	325	V

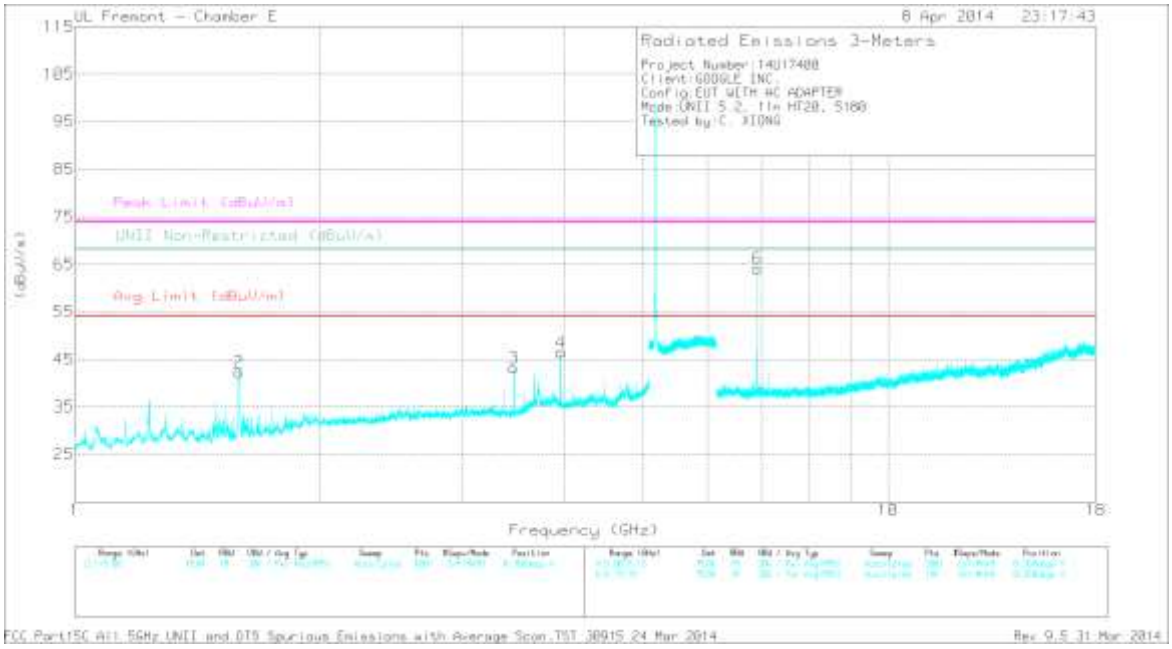
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



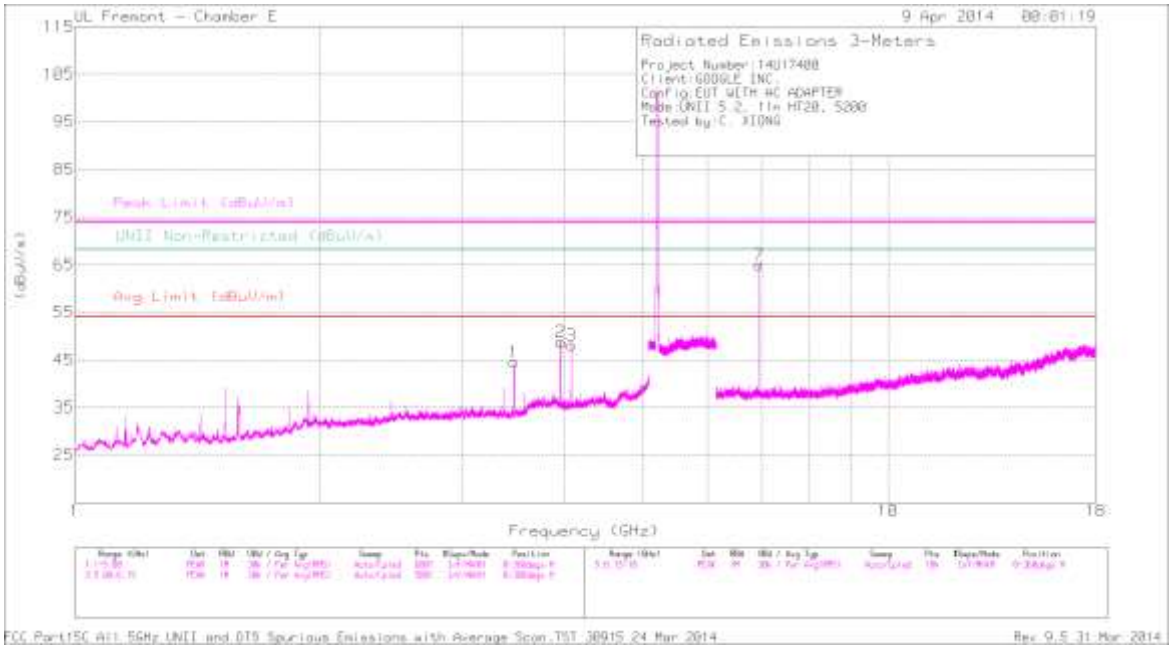
DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.588	61.06	PK1	28.4	-34	0	55.46	-	-	74	-18.54	-	-	144	164	V
* 1.593	46.62	AD1	28.4	-33.8	0	41.22	54	-12.78	-	-	-	-	144	164	V
* 3.954	41.52	PK1	33.5	-31.4	0	43.62	-	-	74	-30.38	-	-	108	156	V
* 3.954	31.49	AD1	33.5	-31.4	0	33.59	54	-20.41	-	-	-	-	108	156	V
3.467	48.03	PK1	32.8	-32.3	0	48.53	-	-	-	-	68.2	-19.67	310	307	V
3.468	50.06	PK1	32.8	-32.3	0	50.56	-	-	-	-	68.2	-17.64	24	271	H
6.907	59.6	PK1	35.9	-28.8	0	66.7	-	-	-	-	68.2	-1.5	296	180	H
6.907	58.34	PK1	35.9	-28.8	0	65.44	-	-	-	-	68.2	-2.76	157	224	V

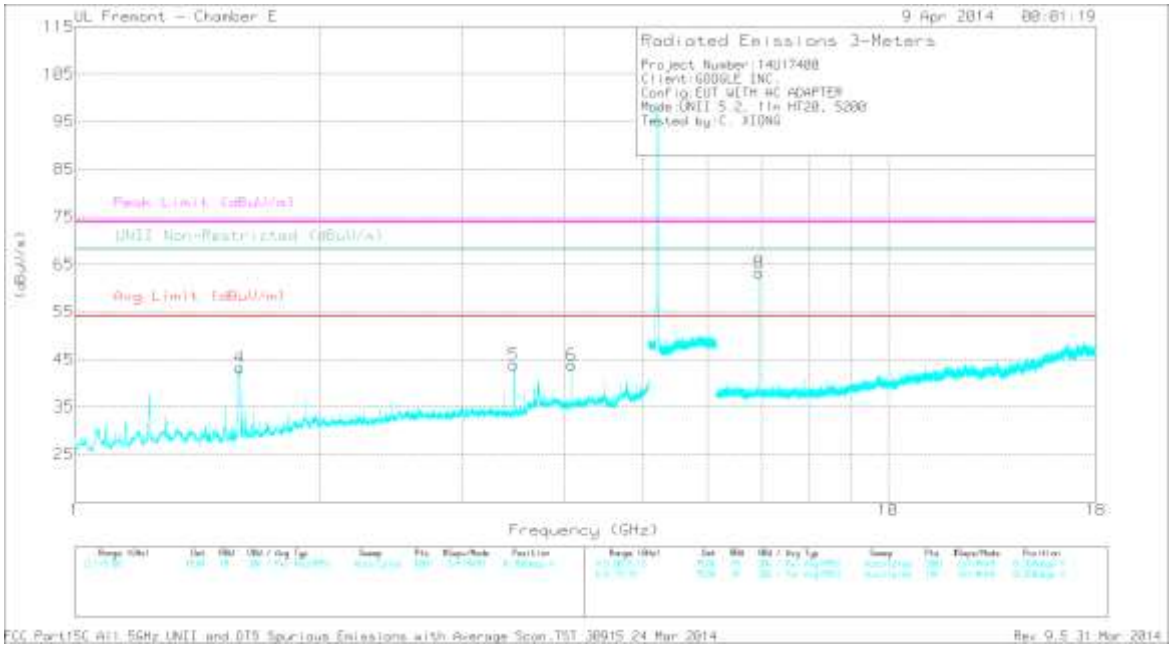
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK1 - KDB789033 Method: Peak
AD1 - KDB789033 Method: AD Primary Power Average

HARMONICS AND SPURIOUS EMISSIONS

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



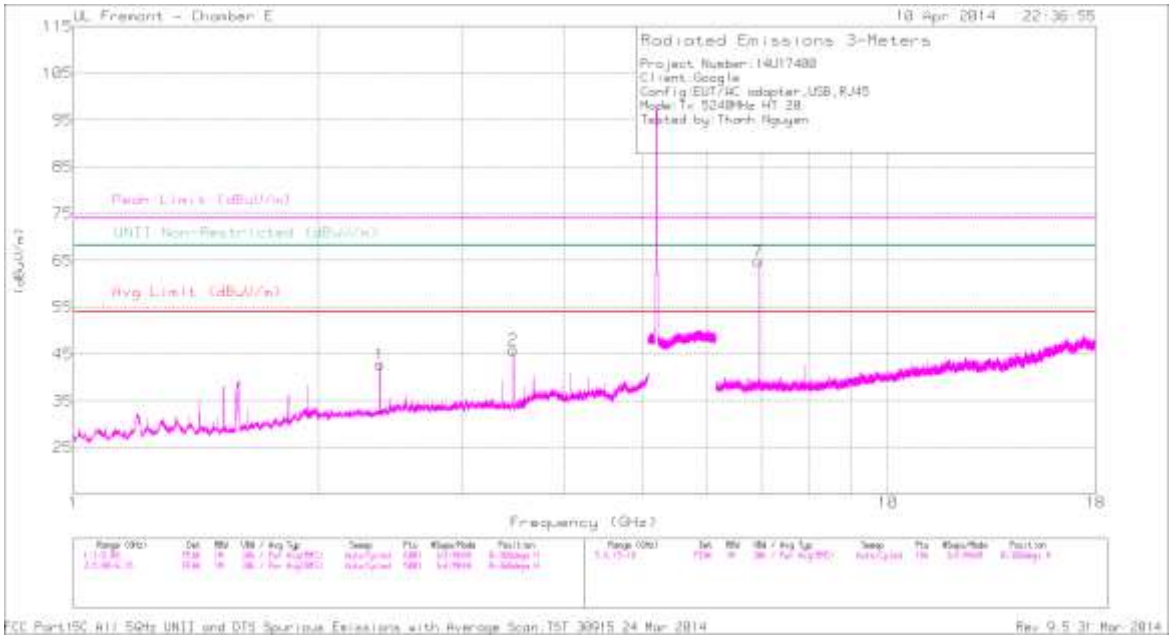
DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 3.96	45.41	PK1	33.5	-31.5	0	47.41	-	-	74	-26.59	-	-	62	146	H
* 3.954	31.35	AD1	33.5	-31.4	0	33.45	54	-20.55	-	-	-	-	62	146	H
* 4.079	44.16	PK1	33.5	-31.2	0	46.46	-	-	74	-27.54	-	-	13	247	H
* 4.08	34.83	AD1	33.5	-31.2	0	37.13	54	-16.87	-	-	-	-	13	247	H
* 1.594	61.84	PK1	28.4	-33.8	0	56.44	-	-	74	-17.56	-	-	185	105	V
* 1.589	45.91	AD1	28.4	-34	0	40.31	54	-13.69	-	-	-	-	185	105	V
* 4.082	43.39	PK1	33.5	-31.2	0	45.69	-	-	74	-28.31	-	-	191	281	V
* 4.08	32.75	AD1	33.5	-31.2	0	35.05	54	-18.95	-	-	-	-	191	281	V
3.467	48.48	PK1	32.8	-32.3	0	48.98	-	-	-	-	68.2	-19.22	31	386	V
3.468	49.4	PK1	32.8	-32.3	0	49.9	-	-	-	-	68.2	-18.3	292	248	H
6.933	58.68	PK1	35.9	-28.4	0	66.18	-	-	-	-	68.2	-2.02	336	241	H
6.933	57.39	PK1	35.9	-28.4	0	64.89	-	-	-	-	68.2	-3.31	157	225	V

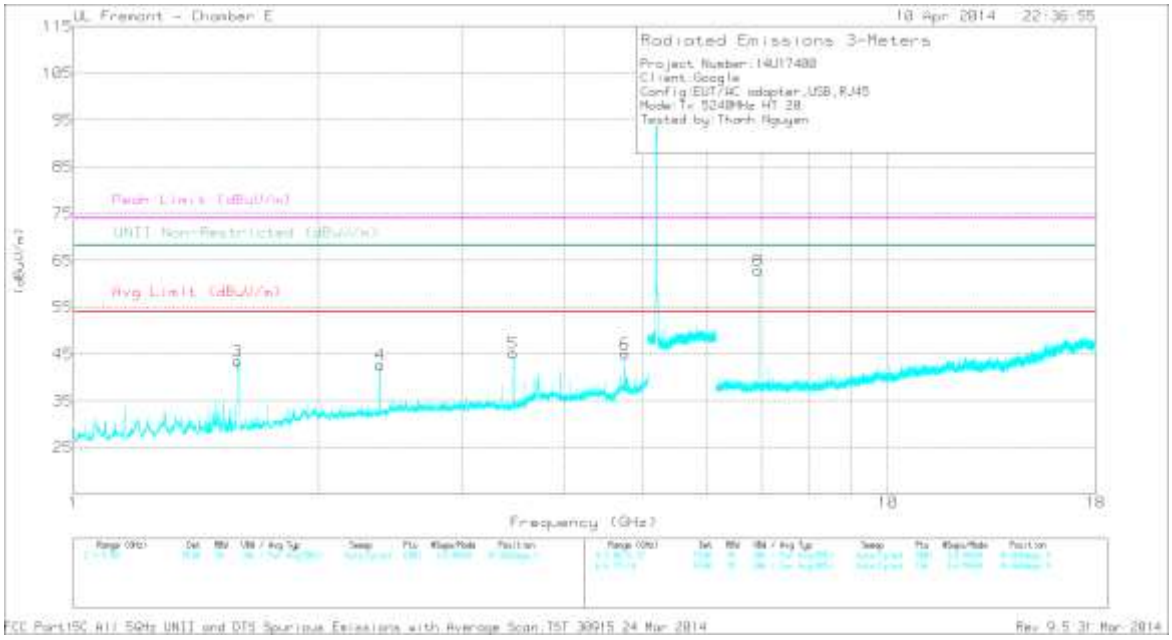
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK1 - KDB789033 Method: Peak
AD1 - KDB789033 Method: AD Primary Power Average

HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL VERTICAL PLOT



DATA

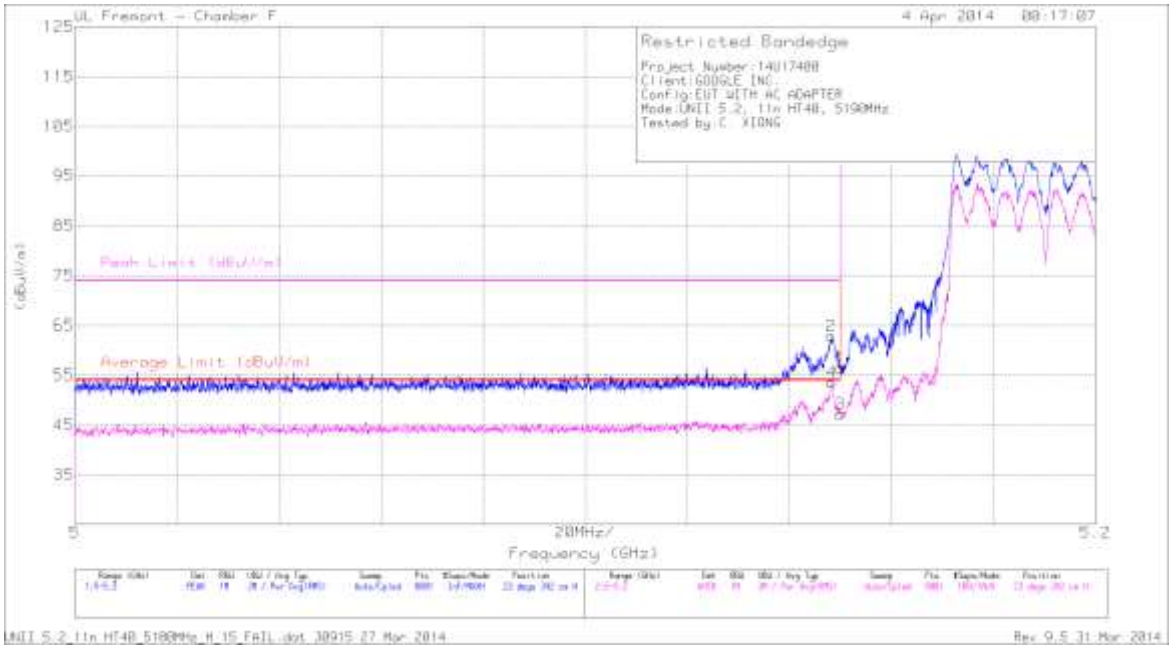
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.376	43.83	PK1	31.9	-33.2	0	42.53	-	-	74	-31.47	-	-	195	366	H
* 2.376	31.73	AD1	31.9	-33.2	0	30.43	54	-23.57	-	-	-	-	195	366	H
* 1.591	64.2	PK1	28.4	-33.9	0	58.7	-	-	74	-15.3	-	-	183	131	V
* 1.591	46.61	AD1	28.4	-33.9	0	41.11	54	-12.89	-	-	-	-	183	131	V
* 2.376	47.67	PK1	31.9	-33.2	0	46.37	-	-	74	-27.63	-	-	336	151	V
* 2.376	31.49	AD1	31.9	-33.2	0	30.19	54	-23.81	-	-	-	-	336	151	V
* 4.753	42.14	PK1	34.1	-30.6	0	45.64	-	-	74	-28.36	-	-	82	303	V
* 4.753	31.08	AD1	34.1	-30.6	0	34.58	54	-19.42	-	-	-	-	82	303	V
3.467	50.89	PK1	32.8	-32.3	0	51.39	-	-	-	-	68.2	-16.81	25	318	H
3.468	48.02	PK1	32.8	-32.3	0	48.52	-	-	-	-	68.2	-19.68	19	392	V
6.933	59.18	PK1	35.9	-28.4	0	66.68	-	-	-	-	68.2	-1.52	76	176	H
6.934	37.95	PK1	35.9	-28.4	0	45.45	-	-	-	-	68.2	-22.75	298	317	V
6.935	38.86	PK1	35.9	-28.4	0	46.36	-	-	-	-	68.2	-21.84	298	317	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK1 - KDB789033 Method: Peak
AD1 - KDB789033 Method: AD Primary Power Average

9.4. TX ABOVE 1 GHz 802.11n HT40 2Tx CDD MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL HORIZONTAL PLOT

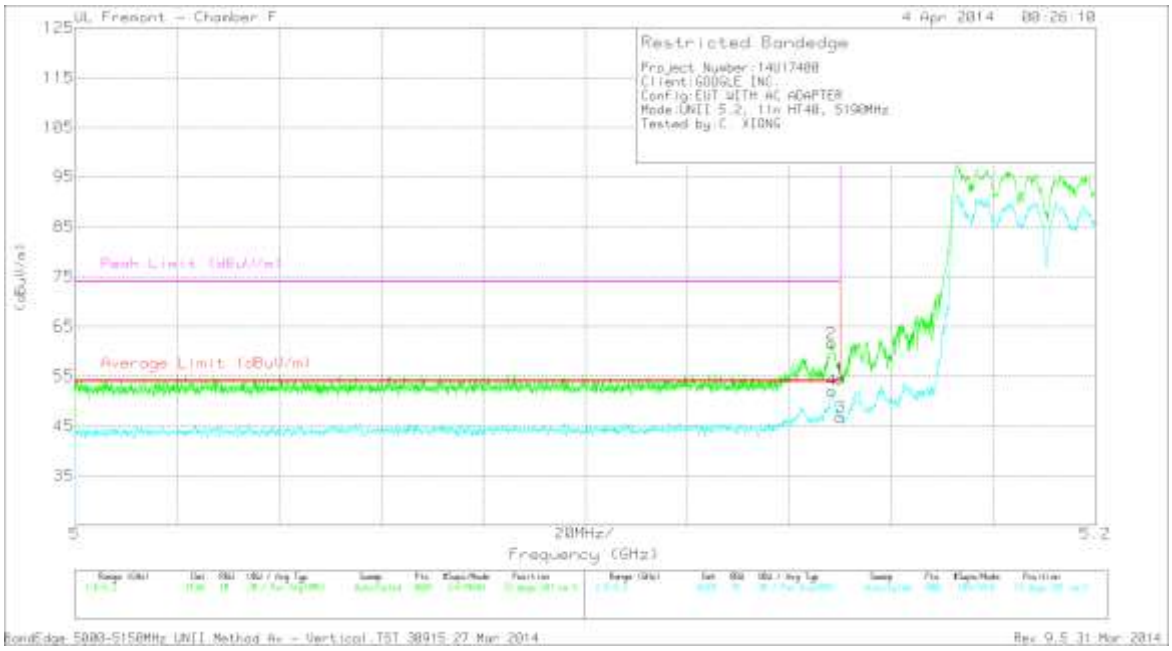


DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	41.36	PK	34.4	-19.3	56.46	-	-	74	-17.54	23	342	H
2	* 5.148	47.78	PK	34.4	-19.3	62.88	-	-	74	-11.12	23	342	H
3	* 5.15	32.18	RMS	34.4	-19.3	47.28	54	-6.72	-	-	23	342	H
4	* 5.148	38.48	RMS	34.4	-19.3	53.58	54	-.42	-	-	23	342	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK - Peak detector
RMS - RMS detection

LOW CHANNEL VERTICAL PLOT



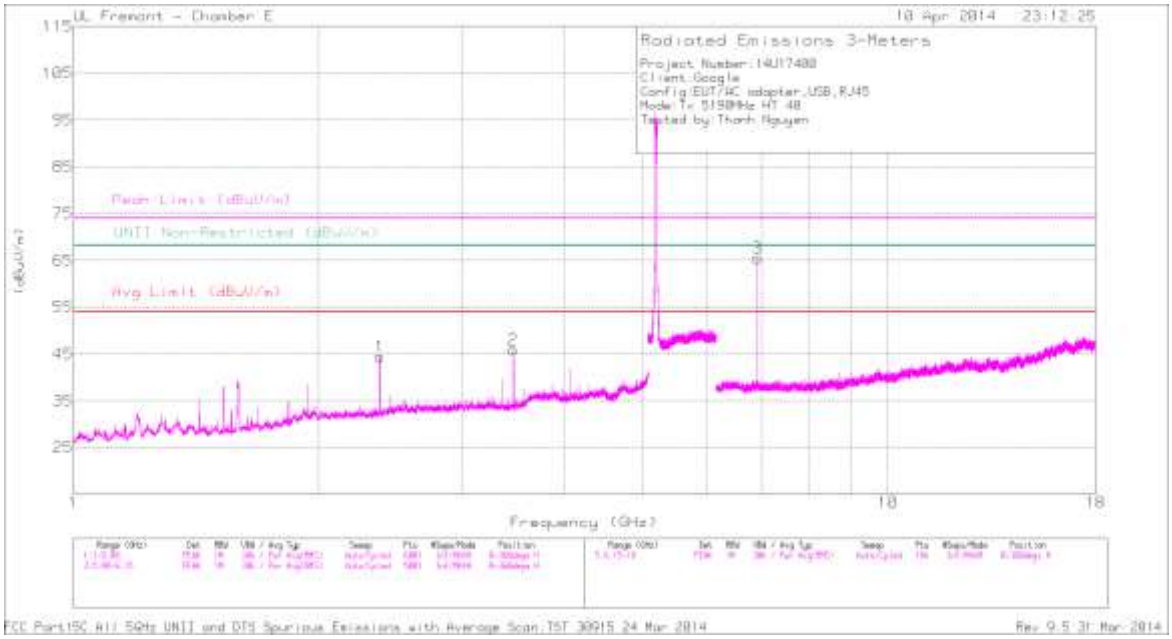
DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	39.38	PK	34.4	-19.3	54.48	-	-	74	-19.52	73	341	V
2	* 5.148	46.46	PK	34.4	-19.3	61.56	-	-	74	-12.44	73	341	V
3	* 5.15	31.64	RMS	34.4	-19.3	46.74	54	-7.26	-	-	73	341	V
4	* 5.148	37	RMS	34.4	-19.3	52.1	54	-1.9	-	-	73	341	V

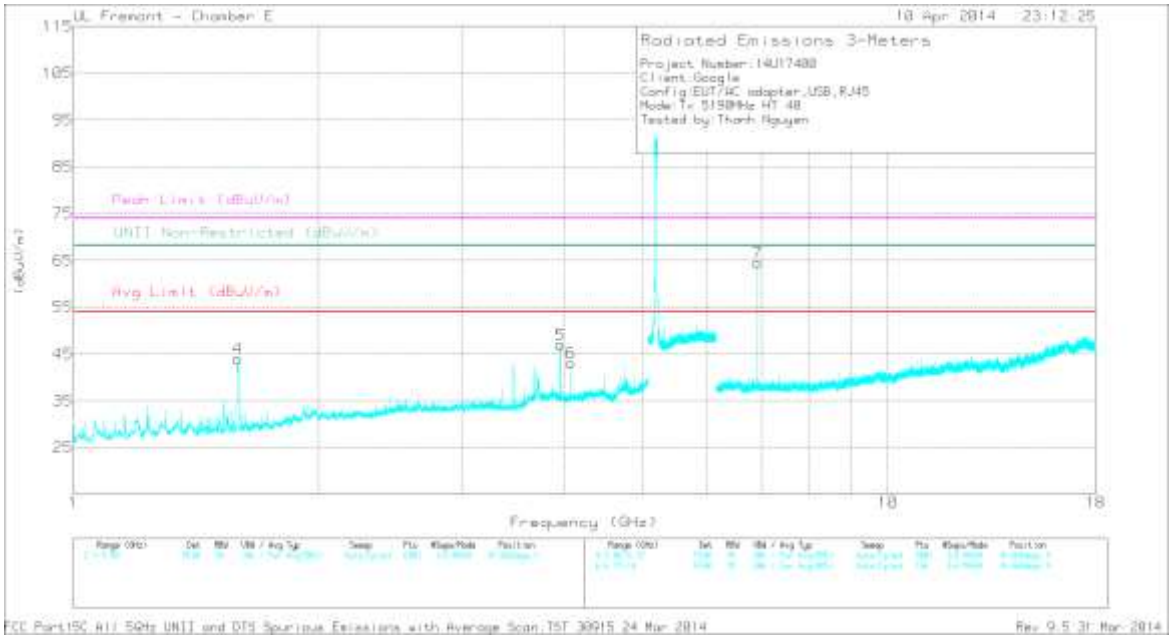
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.376	46.31	PK1	31.9	-33.2	0	45.01	-	-	74	-28.99	-	-	159	262	H
* 2.376	31.49	AD1	31.9	-33.2	0	30.19	54	-23.81	-	-	-	-	159	262	H
* 1.59	63.09	PK1	28.4	-33.9	0	57.59	-	-	74	-16.41	-	-	143	164	V
* 1.591	48.03	AD1	28.4	-33.9	0	42.53	54	-11.47	-	-	-	-	143	164	V
* 1.592	60.14	PK1	28.4	-33.9	0	54.64	-	-	74	-19.36	-	-	126	119	V
* 1.591	44.37	AD1	28.4	-33.9	0	38.87	54	-15.13	-	-	-	-	126	119	V
* 4.08	41.71	PK1	33.5	-31.2	0	44.01	-	-	74	-29.99	-	-	177	167	V
* 4.08	31.9	AD1	33.5	-31.2	0	34.2	54	-19.8	-	-	-	-	177	167	V
3.468	50.58	PK1	32.8	-32.3	0	51.08	-	-	-	-	68.2	-17.12	300	376	H
6.92	59.36	PK1	35.9	-28.4	0	66.86	-	-	-	-	68.2	-1.34	297	285	H
6.92	59.39	PK1	35.9	-28.4	0	66.89	-	-	-	-	68.2	-1.31	161	213	V

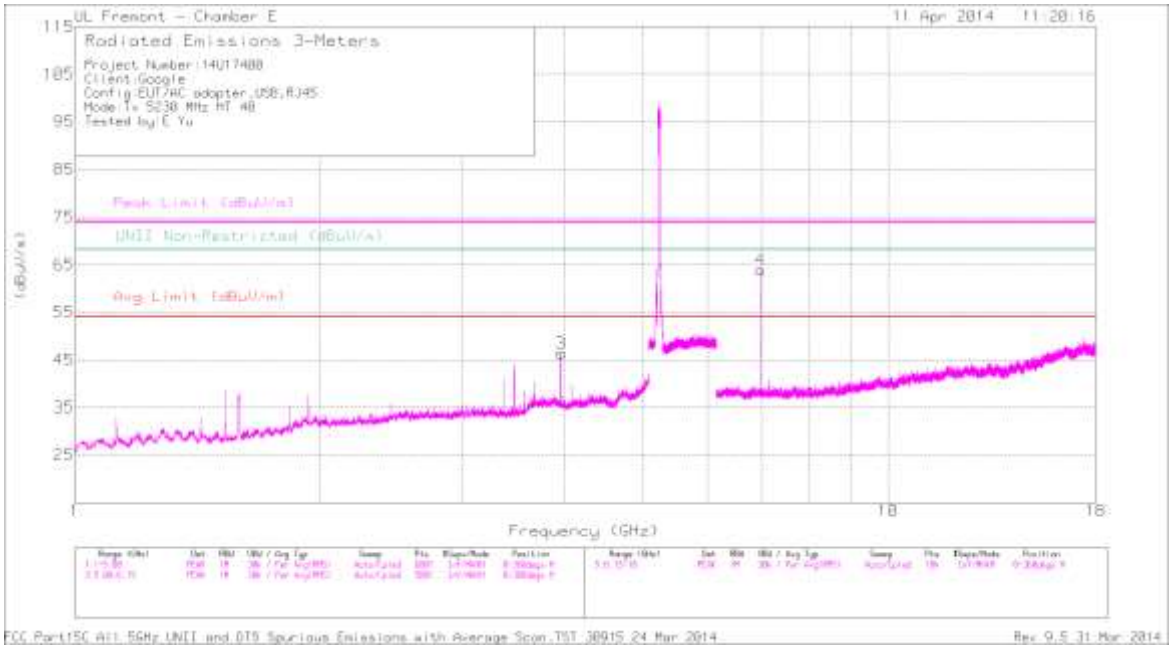
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK1 - KDB789033 Method: Peak

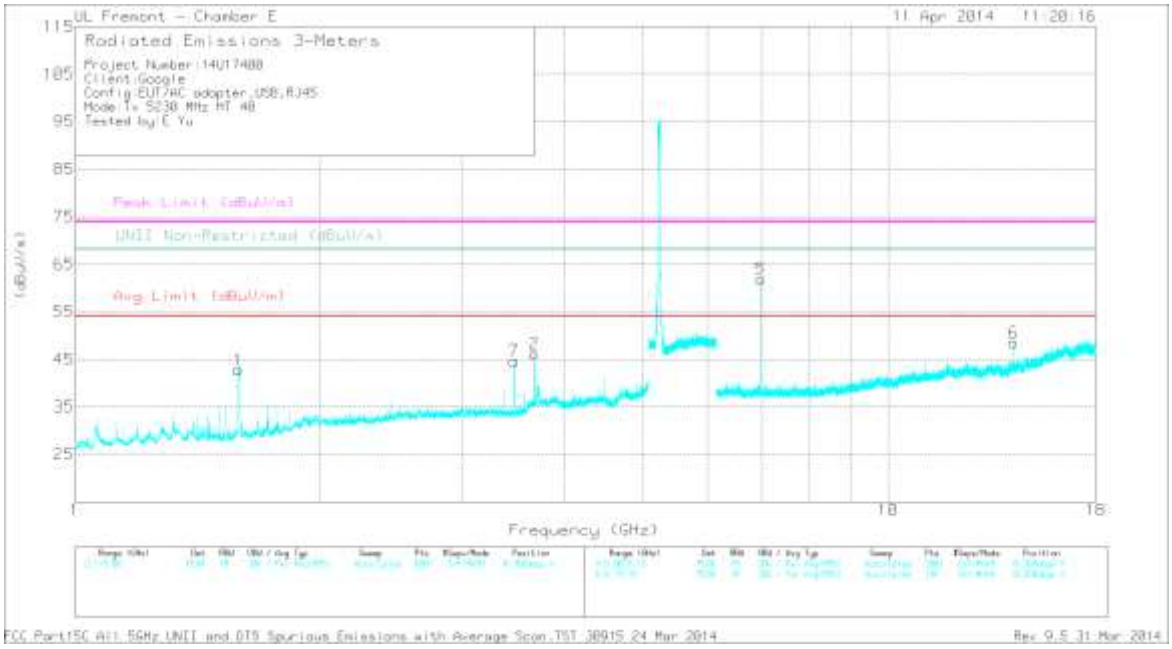
AD1 - KDB789033 Method: AD Primary Power Average

HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL VERTICAL PLOT



DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 3.961	41.09	PK1	33.5	-31.5	43.09	-	-	74	-30.91	-	-	196	333	H
* 3.959	30.93	AD1	33.5	-31.5	32.93	54	-21.07	-	-	-	-	196	333	H
* 1.59	64.89	PK1	28.4	-33.9	59.39	-	-	74	-14.61	-	-	144	147	V
* 1.59	47.65	AD1	28.4	-34	42.05	54	-11.95	-	-	-	-	144	147	V
* 3.672	48.63	PK1	33.3	-31	50.93	-	-	74	-23.07	-	-	350	335	V
* 3.672	35.99	AD1	33.3	-31	38.29	54	-15.71	-	-	-	-	350	335	V
3.468	48.77	PK1	32.8	-32.3	49.27	-	-	-	-	68.2	-18.93	323	262	V
6.973	56.27	PK1	35.9	-28.3	63.87	-	-	-	-	68.2	-4.33	80	200	H
6.973	58.42	PK1	35.9	-28.3	66.02	-	-	-	-	68.2	-2.18	76	175	H
6.973	55.73	PK1	35.9	-28.3	63.33	-	-	-	-	68.2	-4.87	127	247	V
14.257	37.16	PK1	39	-25.2	50.96	-	-	-	-	68.2	-17.24	257	212	V

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

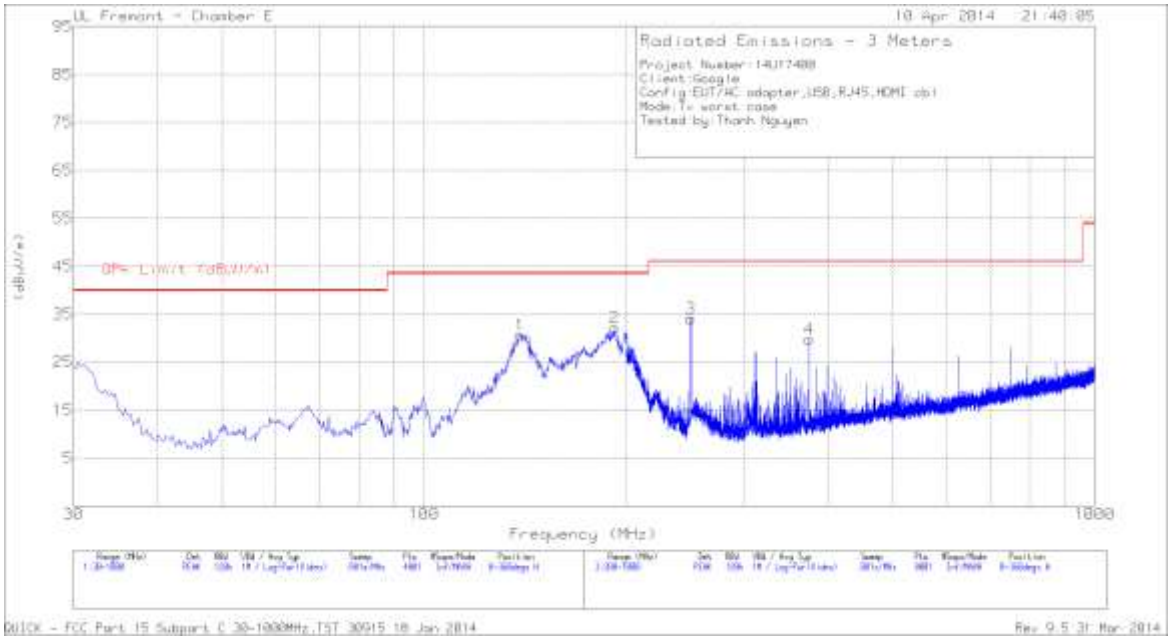
PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

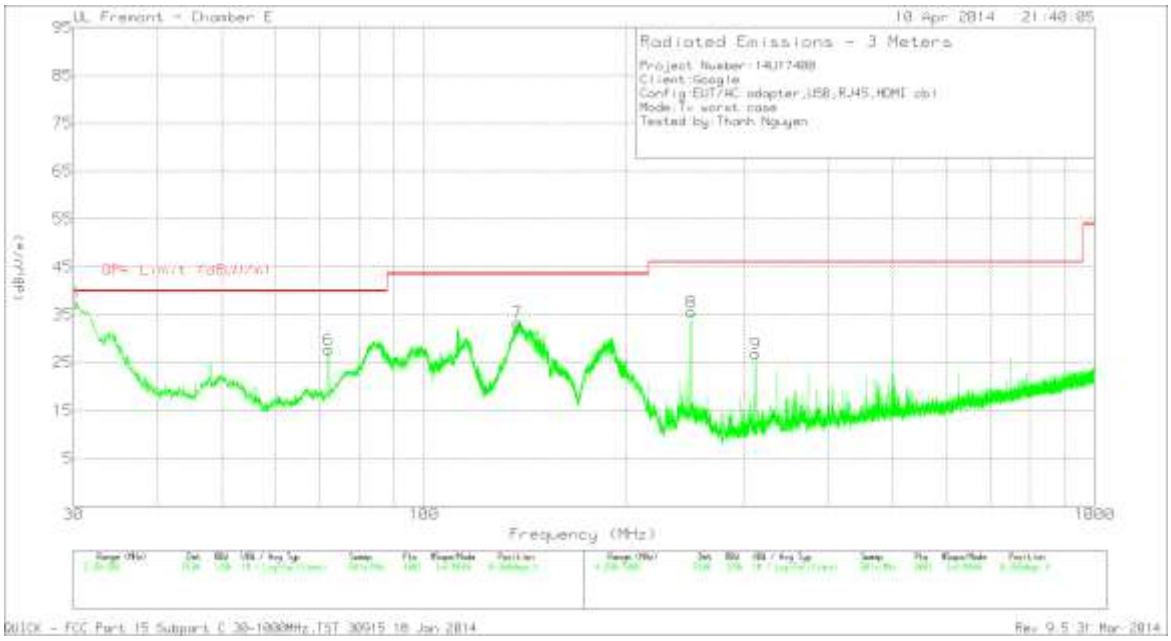
9.5. WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL & VERTICAL)

HORIZONTAL PLOT



VERTICAL PLOT



HORIZONTAL AND VERTICAL DATA

Frequency (MHz)	Meter Reading (dBuV)	Det	AF T243 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
30.4424	44.93	QP	21.1	-31.8	34.23	40	-5.77	342	107	V
139.6425	46.31	QP	13	-31.1	28.21	43.52	-15.31	149	203	H
30.0425	47.79	PK	21.4	-31.8	37.39	40	-2.61	0-360	100	V
71.99	51.15	PK	8.1	-31.5	27.75	40	-12.25	0-360	100	V
138.8825	48.64	PK	13.1	-31.1	30.64	43.52	-12.88	0-360	100	H
192.475	51.7	PK	11.3	-30.8	32.2	43.52	-11.32	0-360	100	H
311.9	43.46	PK	13.7	-30.3	26.86	46.02	-19.16	0-360	100	V
375.0775	44.74	PK	15	-30	29.74	46.02	-16.28	0-360	100	H

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

QP - Quasi-Peak detector

PK - Peak detector

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

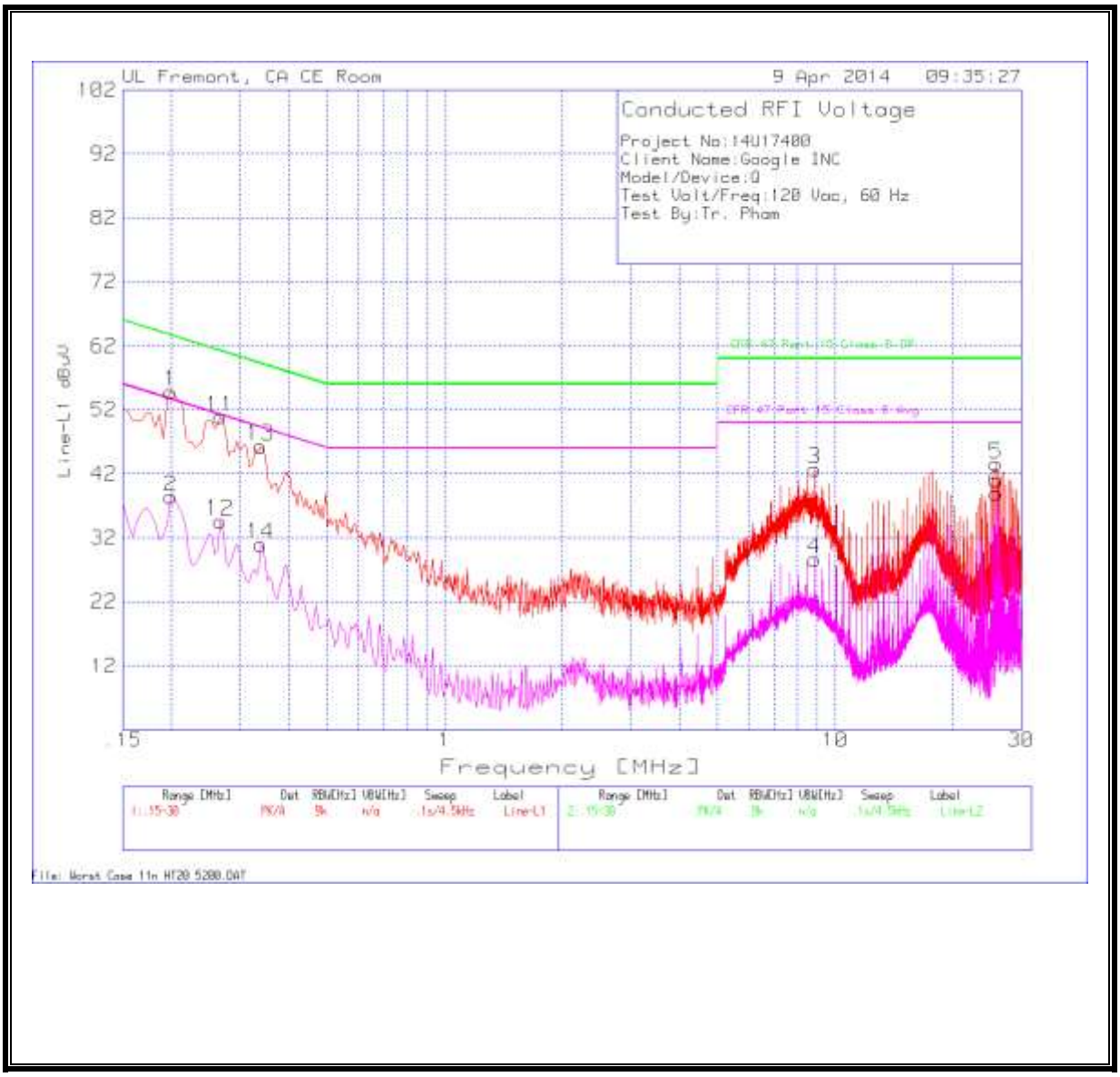
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

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

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

RESULTS

LINE 1 RESULTS



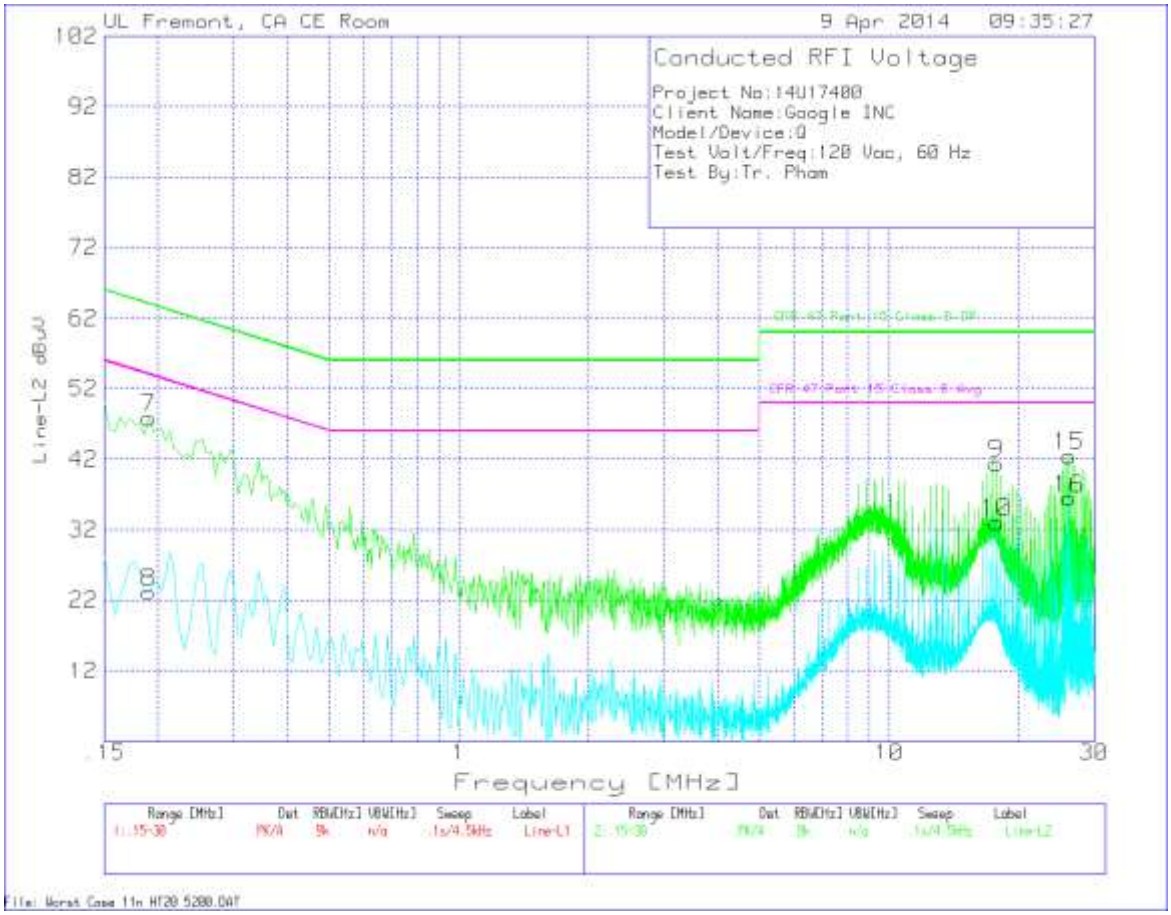
RESULTS

Line-L1 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin to Limit (dB)	CFR 47 Part 15 Class B Avg	Margin to Limit (dB)
1	.1995	53.87	PK	.9	0	54.77	63.6	-8.83	--	--
2	.1995	37.48	Av	.9	0	38.38	--	--	53.6	-15.22
11	.267	50.28	PK	.6	0	50.88	61.2	-10.32	--	--
12	.267	33.92	Av	.6	0	34.52	--	--	51.2	-16.68
13	.339	45.76	PK	.5	0	46.26	59.2	-12.94	--	--
14	.339	30.51	Av	.5	0	31.01	--	--	49.2	-18.19
3	8.8665	42.39	PK	.2	.1	42.69	60	-17.31	--	--
4	8.8665	28.39	Av	.2	.1	28.69	--	--	50	-21.31
5	25.809	42.93	PK	.3	.3	43.53	60	-16.47	--	--
6	25.809	38.41	Av	.3	.3	39.01	--	--	50	-10.99

LINE 2 RESULTS



RESULTS

Line-L2 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin to Limit (dB)	CFR 47 Part 15 Class B Avg	Margin to Limit (dB)
7	.1905	46.77	PK	1.1	0	47.87	64	-16.13	--	--
8	.1905	22.06	Av	1.1	0	23.16	--	--	54	-30.84
9	17.7405	40.91	PK	.3	.2	41.41	60	-18.59	--	--
10	17.7405	32.49	Av	.3	.2	32.99	--	--	50	-17.01
15	26.2095	41.88	PK	.3	.3	42.48	60	-17.52	--	--
16	26.2095	35.84	Av	.3	.3	36.44	--	--	50	-13.56