FCC 47 CFR PART 15 SUBPART E

CERTIFICATION TEST REPORT

FOR

CELLULAR PHONE WITH BLUETOOTH AND WLAN RADIOS

MODEL NUMBER: A1586

FCC ID: BCG-E2816A

REPORT NUMBER: 14U17673-E9 Revision C

ISSUE DATE: : AUGUST 02, 2014

Prepared for
APPLE, INC.
1 INFINITE LOOP
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Prepared by
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	7/21/14	Initial Issue	F. de Anda
A	7/23/14	Product Description Update	H. Lau
B	7/29/14	Product description update, updated sections 5.2, 5.5, 5.6, 9.1.3, 9.2.3, 9.3.3, 9.4.3.9.5.3, 9.6.3, 9.7.3, 9.8.3, 9.9.3, 9.10.3, 9.11.2, 9.12.3, 9.13.2, 9.14.3, 9.15.4, 9.16.4, 9.17.4, 9.18.4, 9.19.3, 10.2.19, 12	D. Garcia
C	08/02/14	Address TCB Questions	T. Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	APPLE, INC. 1 INFINITE LOOP CUPERTINO, CA 95014, U.S.A.
EUT DESCRIPTION:	CELLULAR PHONE WITH BLUETOOTH AND WLAN RADIOS
MODEL:	A1586
SERIAL NUMBER:	C39MF01KFY6W - CONDUCTED, C39MD06FFY70 – RADIATED
DATE TESTED:	APRIL 28, 2014 – JUNE 27, 2014

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

MONA HUA
EMC TECHNICIAN
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 and ANSI C63.10-2009.

3. FACILITIES AND ACCREDITATION

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

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

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

Model A1586 is a mobile phone with multimedia functions (music, application support, and video), Cellular GSM/GPRS/EGPRS/CDMA2000/EVDO Rev.A/ EVDO Rev.B/WCDMA/HSPA+/DC-HSDPA/LTE FDD & Carrier Aggregation/TDD/TD-SCDMA radio, IEEE 802.11a/b/g/n/ac radio, Bluetooth radio and NFC. The rechargeable battery is not user accessible.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5180 - 5240	802.11a	17.98	62.81
5180 - 5240	802.11n HT20	17.97	62.66
5190 - 5230	802.11n HT40	15.95	39.36
5210	802.11ac VHT80	15.03	31.84
5260 - 5320	802.11a	16.89	48.87
5260 - 5320	802.11n HT20	16.85	48.42
5270 - 5310	802.11n HT40	16.87	48.64
5290	802.11ac VHT80	14.53	28.38
5500 - 5700	802.11a	14.48	28.05
5500 - 5700	802.11n HT20	14.49	28.12
5720	802.11n HT20	14.48	28.05
5510 - 5670	802.11n HT40	14.46	27.93
5710	802.11n HT40	13.75	23.71
5530	802.11ac VHT80	12.82	19.14
5690	802.11ac VHT80	12.43	17.50
5745 - 5825	802.11a	16.99	50.00
5745 - 5825	802.11n HT20	16.96	49.66
5755 - 5795	802.11n HT40	15.19	33.04
5775	802.11ac VHT80	14.28	26.79

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PiFA antenna, with a maximum gain as below table:

FREQUENCY (MHZ)	ANTENNA GAIN (dBi)
5150 -- 5250	-3.96
5250 -- 5350	-3.49
5500 -- 5700	-1.36

5725 -- 5850	-1.4

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 7.16.121

The test utility software used during testing was wl 7.16 RC121.0.

5.5. WORST-CASE CONFIGURATION AND MODE

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

The fundamental of the EUT was investigated in three orthogonal orientations X (Flatbed), Y (Landscape), Z (Portrait), it was determined that Y orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y (Landscape) orientation.

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

802.11a mode: 6 Mbps
802.11n HT20mode: MCS0
802.11n HT40mode: MCS0
802.11n AC80mode: MCS0

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

There are three vendors of the WiFi/Bluetooth radio modules: variant 1, variant 2 and variant 3 and they have the same mechanical outline, same on board antenna, matching circuit, antenna structure and same specification. Baseline testing was performed on all three variants to determine the worst case on all conducted power and radiated emissions.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC/DC adapter	Apple	A1401	60812	NA
Earphone	Apple	NA	NA	NA
Laptop	Apple	A1278	C02HJ0A7DTY4	NA

I/O CABLES (CONDUCTED TEST)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Antenna	1	SMA	Un-Shielded	0.1	to spectrum Analyzer
2	USB	1	USB	Shielded	1m	To EUT

I/O CABLES (RADIATED ABOVE 1 GHZ)

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

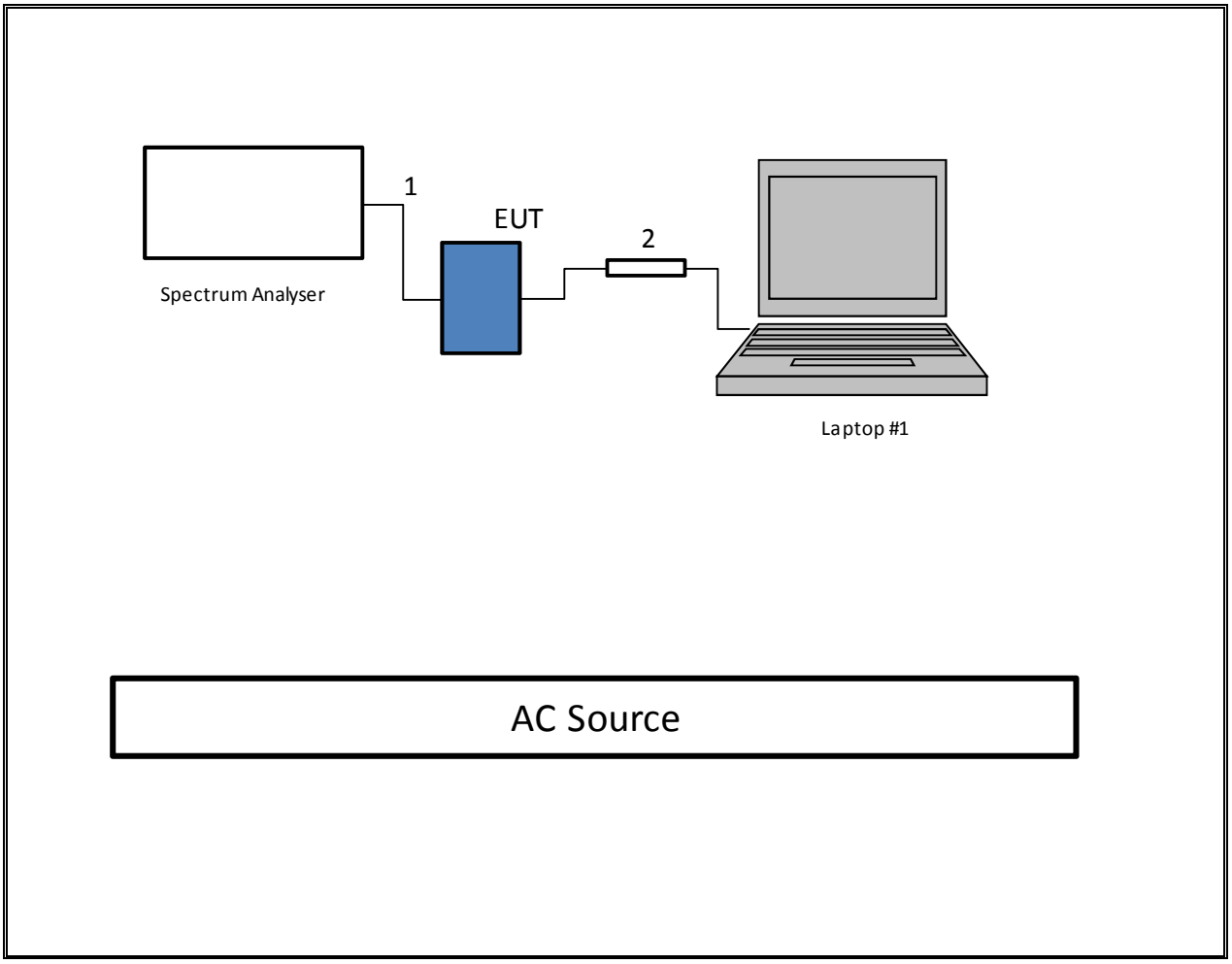
I/O CABLES (BELOW 1GHZ & AC LINE CONDUCTED TESTS)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	US115	Un-Shielded	80cm	NA
2	DC	1	USB	Un-Shielded	1m	NA
3	Audio	1	Jack	Un-Shielded	0.5m	NA

TEST SETUP- CONDUCTED PORT

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

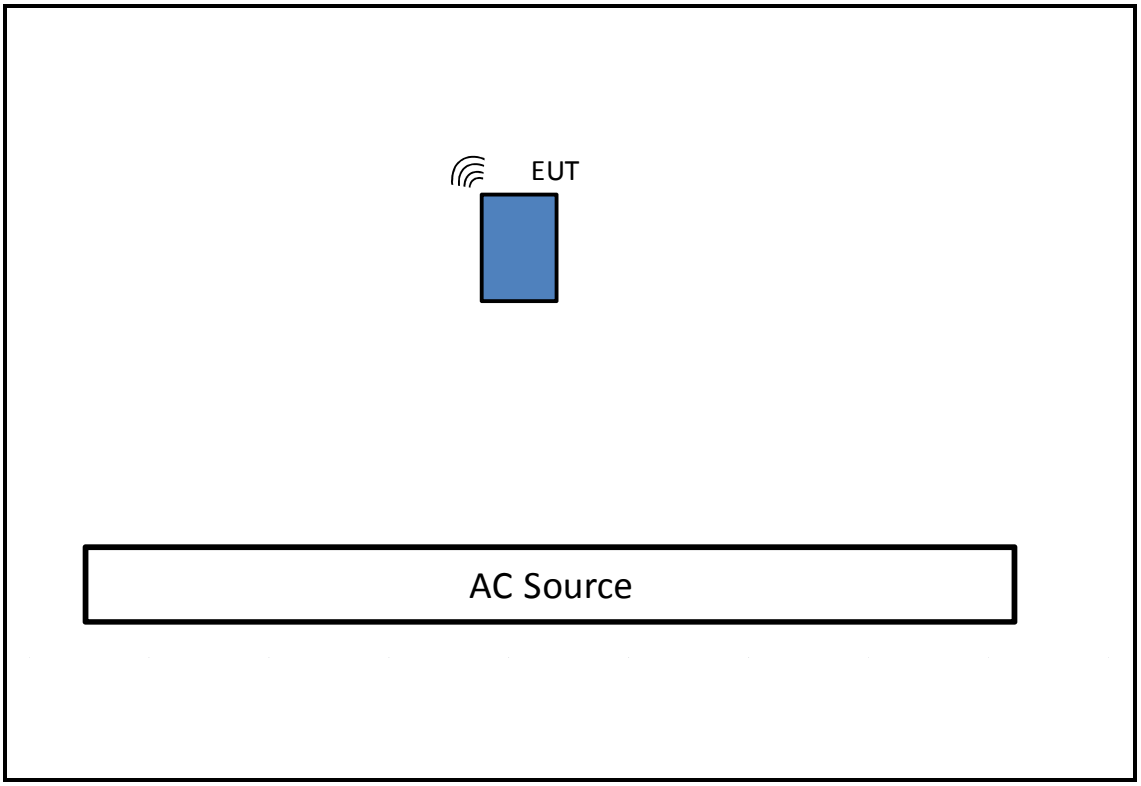
SETUP DIAGRAM



TEST SETUP- RADIATED-ABOVE 1 GHZ

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

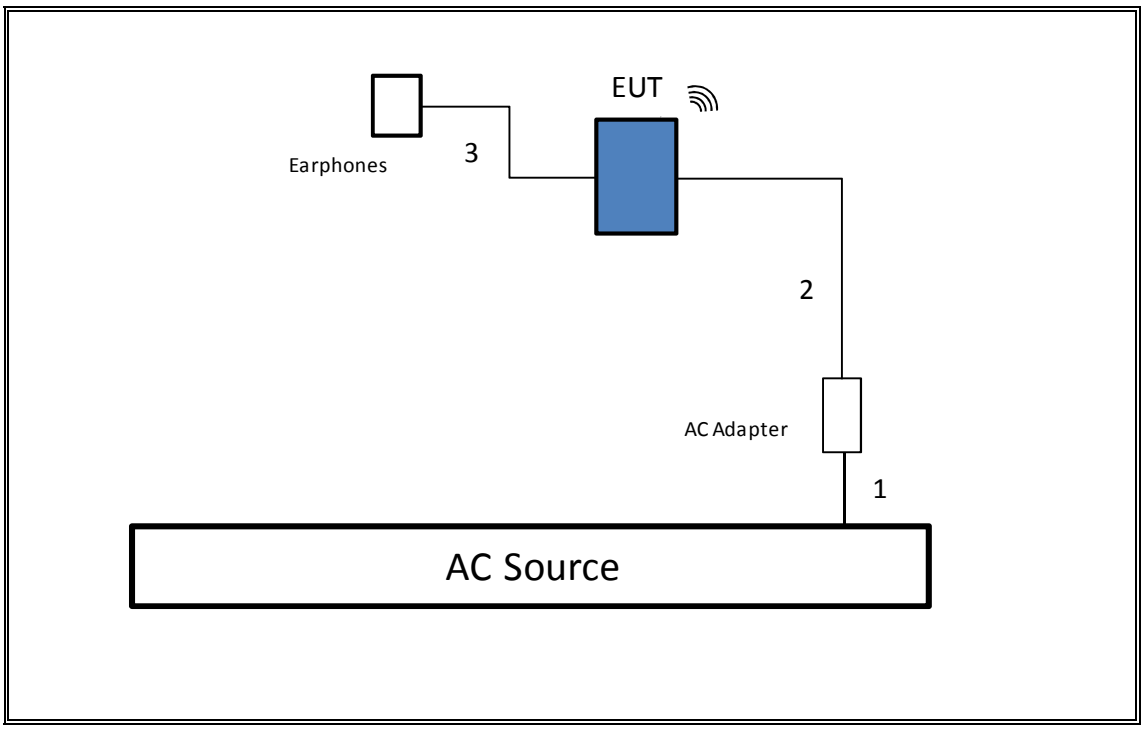
SETUP DIAGRAM



TEST SETUP- BELOW 1GHZ & AC LINE CONDUCTED TESTS

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

SETUP DIAGRAM



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Antenna, Horn, 18 GHz	ETS Lindgren	3117	F00131	02/18/15
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00589	11/26/14
Antenna, Horn, 40 GHz	ARA	MWH-2640/B	C00981	06/28/14
Peak / Average Power Sensor	Agilent / HP	N1911A	F00153	03/06/15
Peak Power Meter	Agilent / HP	E9323A	F00025	04/30/15
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	F00129	02/22/15
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	F00168	03/28/15
Preamplifier, 1300 MHz	Sonoma	310	F00008	05/27/15
Preamplifier, 26.5 GHz	Agilent / HP	8449B	F00165	03/25/15
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	08/20/14
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	F00092	09/05/14
LISN, 30 MHz	FCC	LISN-50/250-25-2	C00626	01/14/15

7. MEASUREMENT METHODS

26 dB Emission BW: KDB 789033 D02 v01, Section C.

99% Occupied BW: KDB 789033 D02 v01, Section D.

Power and PSD: KDB 789033 D02 v01, Method SA-1 and SA-1 Alternative.

Power Spectral Density: KDB 789033 D02 v01, Section F.

Unwanted emissions in restricted bands: KDB 789033 D02 v01, Sections G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v01, Sections G.3, G.4, and G.5.

8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

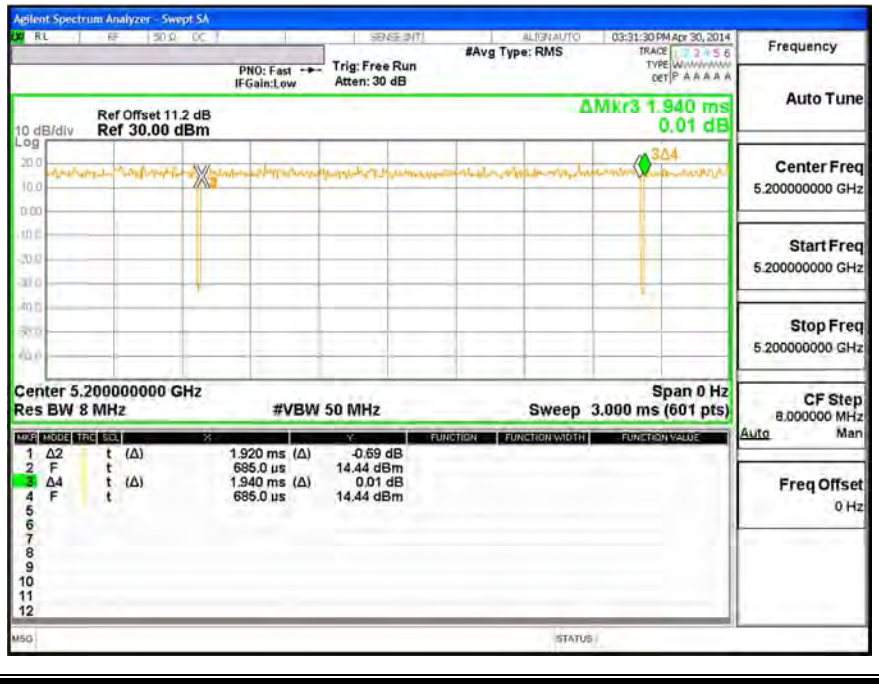
8.1. ON TIME AND DUTY CYCLE RESULTS

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 1TX	2.061	2.091	0.986	98.57%	0.00	0.010
802.11n HT20 1TX	1.920	1.940	0.990	98.97%	0.00	0.010
802.11n HT40 1TX	0.943	0.960	0.983	98.26%	0.00	0.010
802.11ac VHT80 1TX	0.515	0.533	0.966	96.57%	0.15	1.942

8.2. DUTY CYCLE PLOTS

DUTY CYCLE 802.11a 1TX MODE

DUTY CYCLE 802.11n HT20 1TX MODE



DUTY CYCLE 802.11n HT40 1TX MODE

DUTY CYCLE 802.11ac VHT80 1TX MODE

9. ANTENNA PORT TEST RESULTS

9.1. 802.11a MODE IN THE 5.2 GHz BAND

9.1.1. 26 dB BANDWIDTH

LIMITS

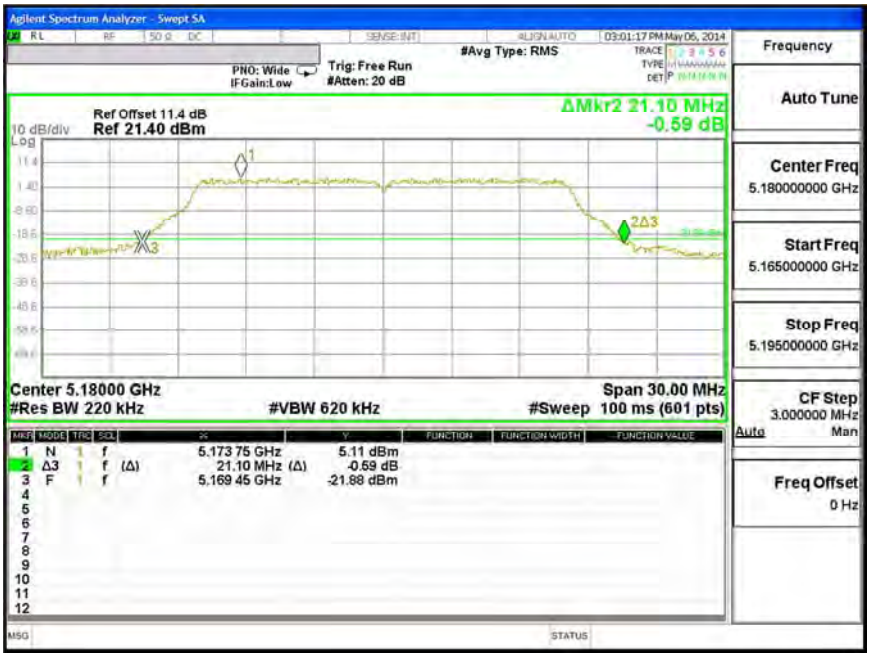
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	21.10
Mid	5200	21.10
High	5240	21.55

26 dB BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH MID CH

BANDWIDTH HIGH CH

9.1.2. 99% BANDWIDTH

LIMITS

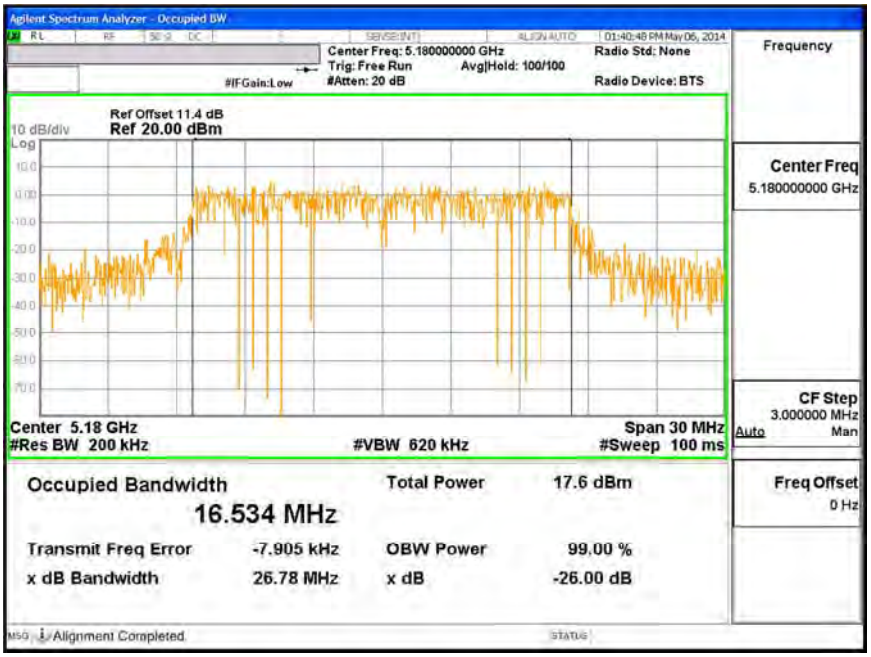
None; for reporting purposes only.

RESULTS

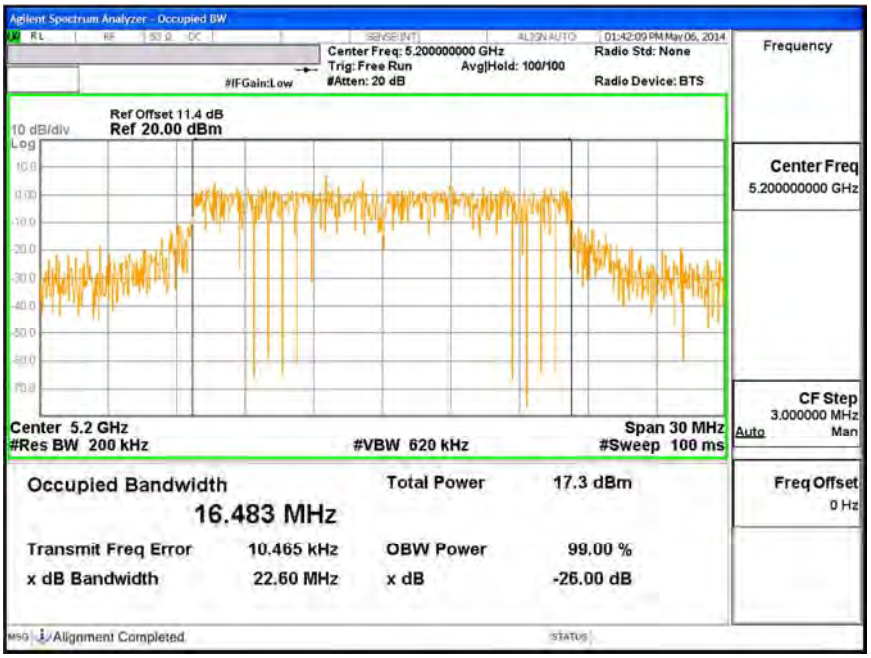
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	16.534
Mid	5200	16.483
High	5240	16.580

99% BANDWIDTH

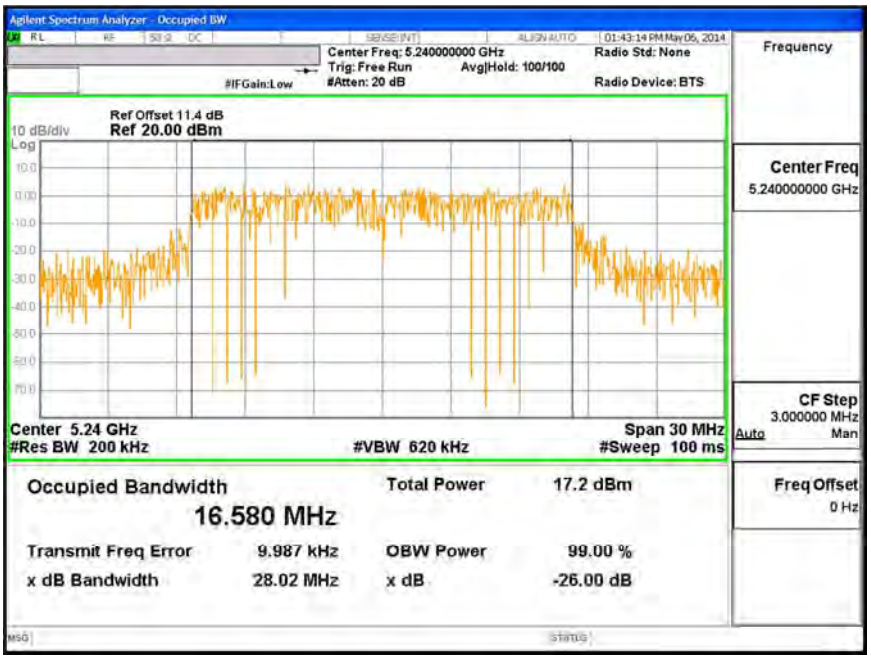
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



9.1.3. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. The maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 14.21 dB (including 10 dB pad and 4.21 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-3.96

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5180	17.45	24	-6.55
Mid	5200	17.98	24	-6.02
High	5240	17.82	24	-6.18

9.1.4. PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum 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, 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.

Antenna Gain (dBi)
-3.96

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	21.10	16.53	-3.96
Mid	5200	21.10	16.48	-3.96
High	5240	21.55	16.58	-3.96

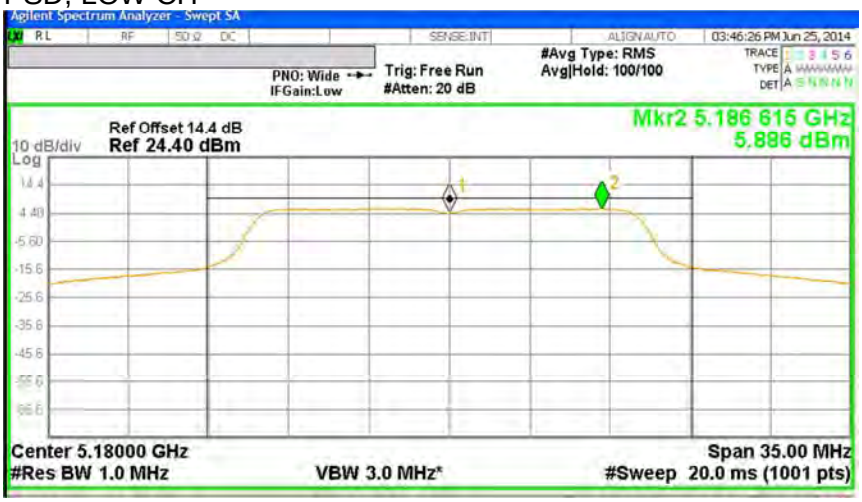
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PSD

PSD Results

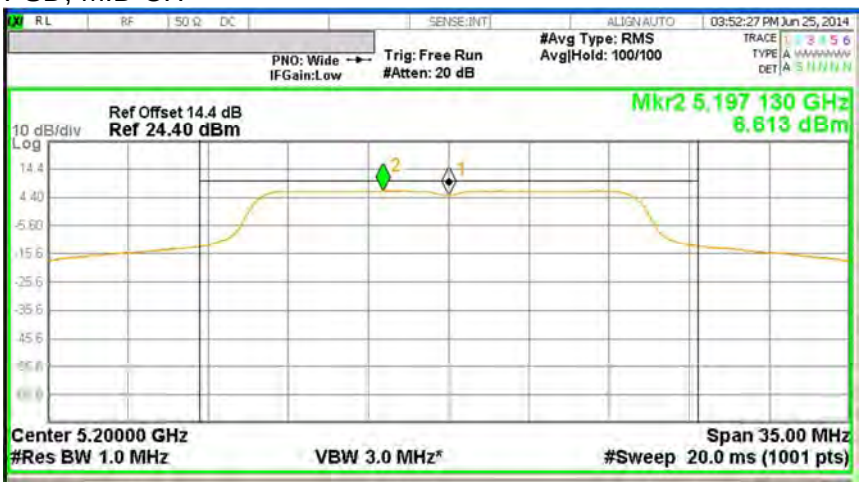
Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	5.89	5.89	11.00	-5.11
Mid	5200	6.61	6.61	11.00	-4.39
High	5240	6.76	6.76	11.00	-4.24

PSD

PSD, LOW CH



PSD, MID CH



PSD, HIGH CH

9.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

9.2.1. 26 dB BANDWIDTH

LIMITS

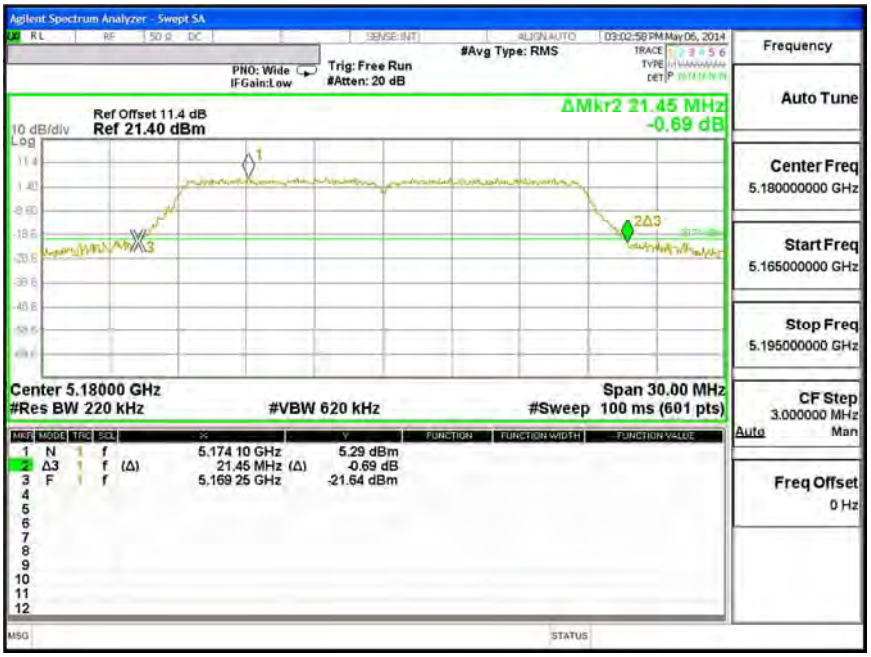
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	21.45
Mid	5200	21.00
High	5240	21.45

26 dB BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH MID CH

BANDWIDTH HIGH CH

9.2.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

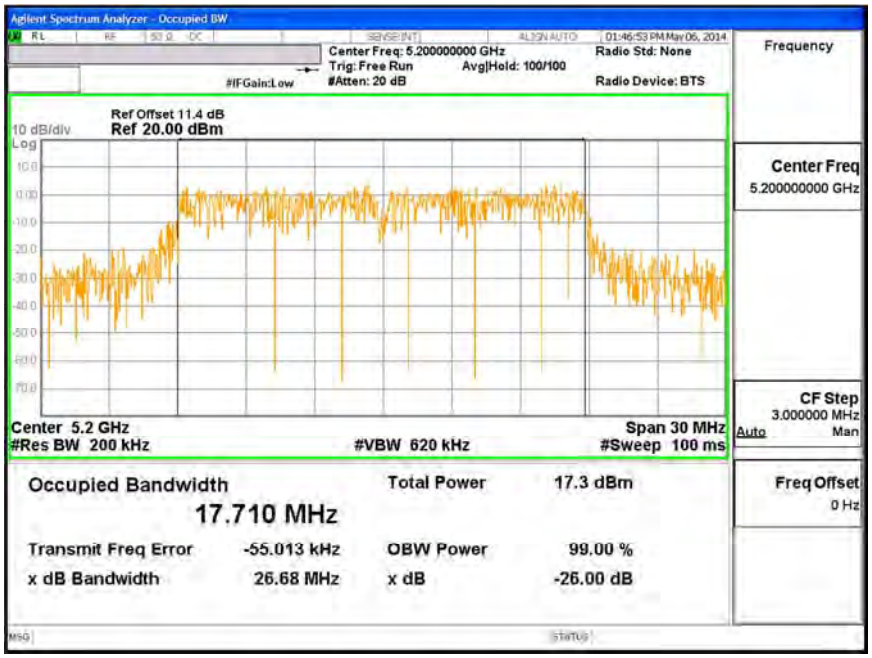
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	17.786
Mid	5200	17.710
High	5240	17.791

99% BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH MID CH



BANDWIDTH HIGH CH

9.2.3. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. The maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 14.21 dB (including 10 dB pad and 4.21 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-3.96

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5180	17.60	24	-6.40
Mid	5200	17.97	24	-6.03
High	5240	17.85	24	-6.15

9.2.4. PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum 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, 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.

Antenna Gain (dBi)
-3.96

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	21.35	17.77	-3.96
Mid	5200	21.20	17.81	-3.96
High	5240	21.55	17.85	-3.96

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

PSD Results

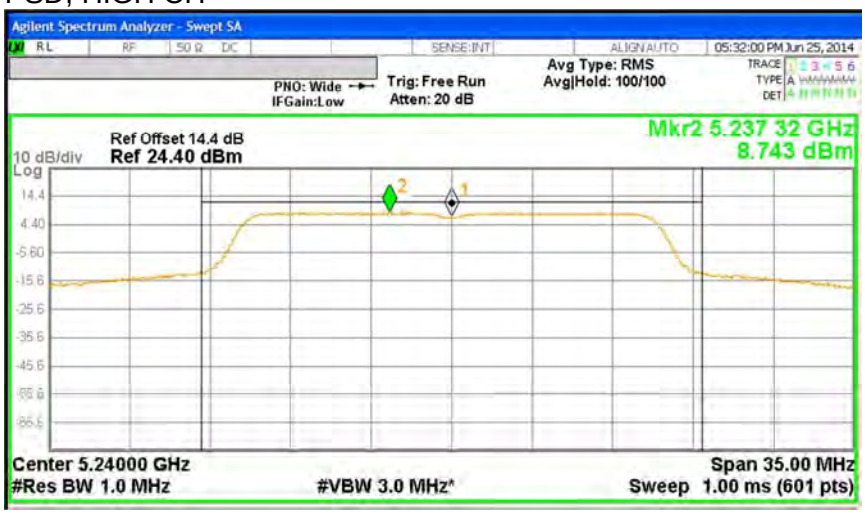
Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	7.93	7.93	11.00	-3.07
Mid	5200	8.74	8.74	11.00	-2.26
High	5240	8.74	8.74	11.00	-2.26

PSD

PSD, LOW CH

PSD, MID CH

PSD, HIGH CH



9.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

9.3.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

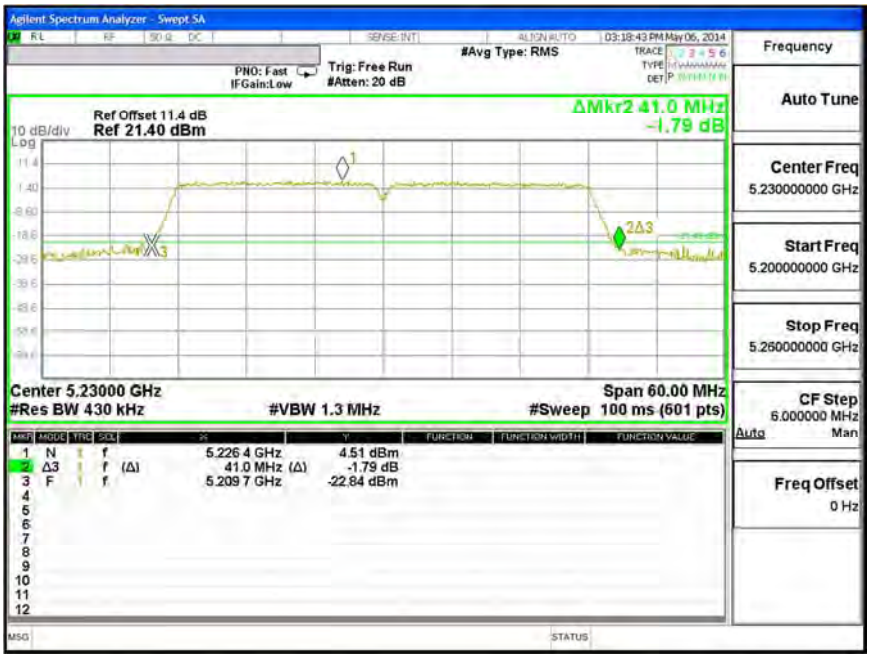
RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5190	40.4
High	5230	41.0

26 dB BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH HIGH CH



9.3.2. 99% BANDWIDTH

LIMITS

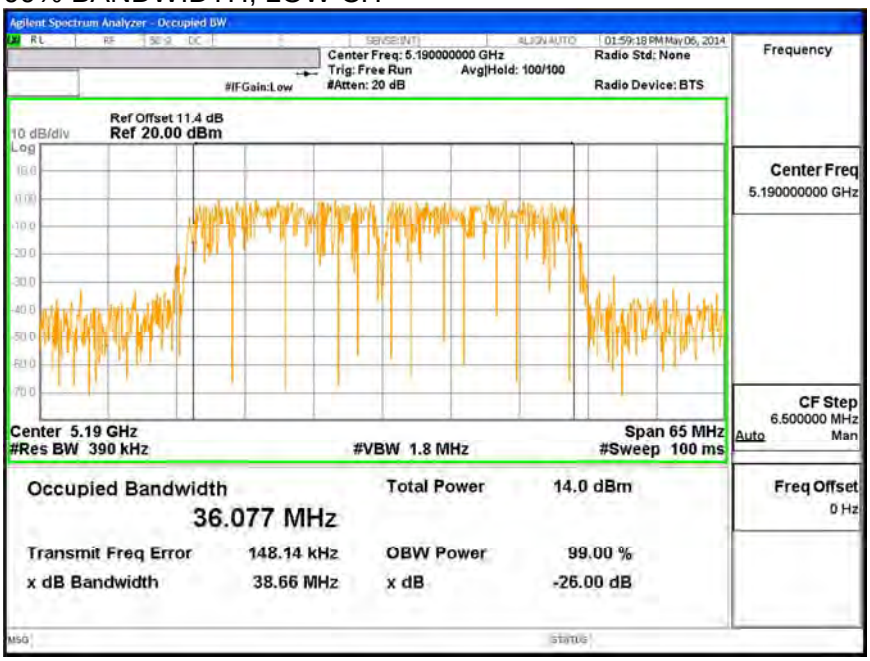
None; for reporting purposes only.

RESULTS

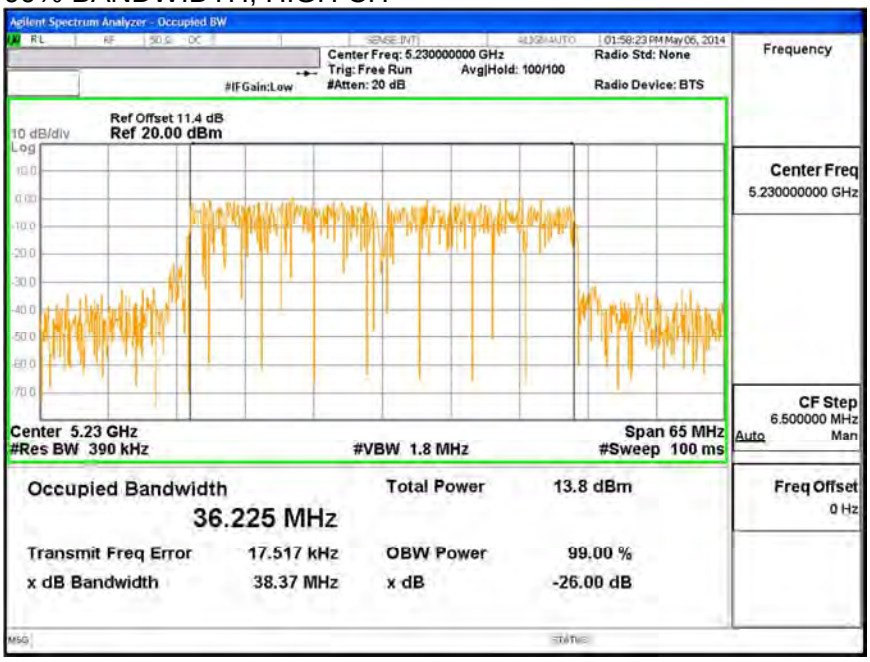
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	36.1
High	5230	36.2

99% BANDWIDTH

99% BANDWIDTH, LOW CH



99% BANDWIDTH, HIGH CH



9.3.3. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

For For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. The maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 14.21 dB (including 10 dB pad and 4.21 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-3.96

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5190	14.96	24	-9.04
High	5230	15.95	24	-8.05

9.3.4. PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum 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, 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.

Antenna Gain (dBi)
-3.96

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5190	40.1	36.1	-3.96
High	5230	41.0	36.2	-3.96

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

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5190	3.25	3.25	11.00	-7.76
High	5230	4.74	4.74	11.00	-6.26

PSD

PSD, LOW CH

PSD, HIGH CH

9.4. 802.11ac 80MHz 1TX SISO MODE IN THE 5.2 GHz BAND

9.4.1. 26 dB BANDWIDTH

LIMITS

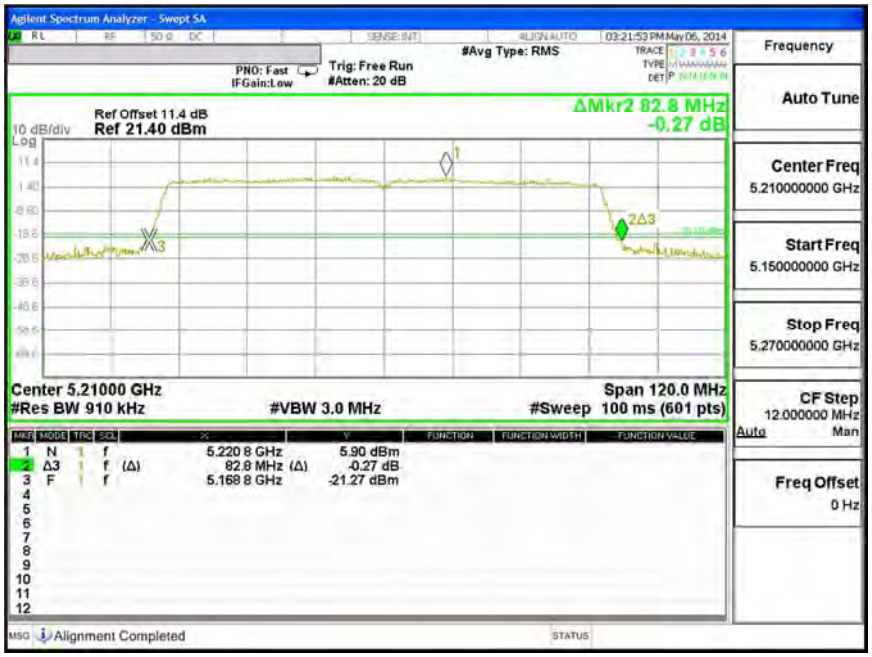
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
42	5210	82.80

26 dB BANDWIDTH

BANDWIDTH CH 42



9.4.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
42	5210	75.931

99% BANDWIDTH

99% BANDWIDTH, CH 42

9.4.3. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. The maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 14.36 dB (including 10 dB pad, 4.21 dB cable and 0.15dB duty cycle correction factor) was entered as an offset in the power meter to allow for direct reading of power.

A duty cycle correction factor of 0.15 is included in the offset

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-3.96

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
42	5210	15.03	24	-8.97

9.4.4. PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum 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, 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.

Antenna Gain (dBi)
-3.96

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
42	5210	82.8	76.0	-3.96
Duty Cycle CF (dB)		0.15	Included in Calculations of Corr'd Power & PSD	

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
42	5210	0.71	0.86	11.00	-10.14

PSD

PSD, CH 42

9.5. 802.11a MODE IN THE 5.3 GHz BAND

9.5.1. 26 dB BANDWIDTH

LIMITS

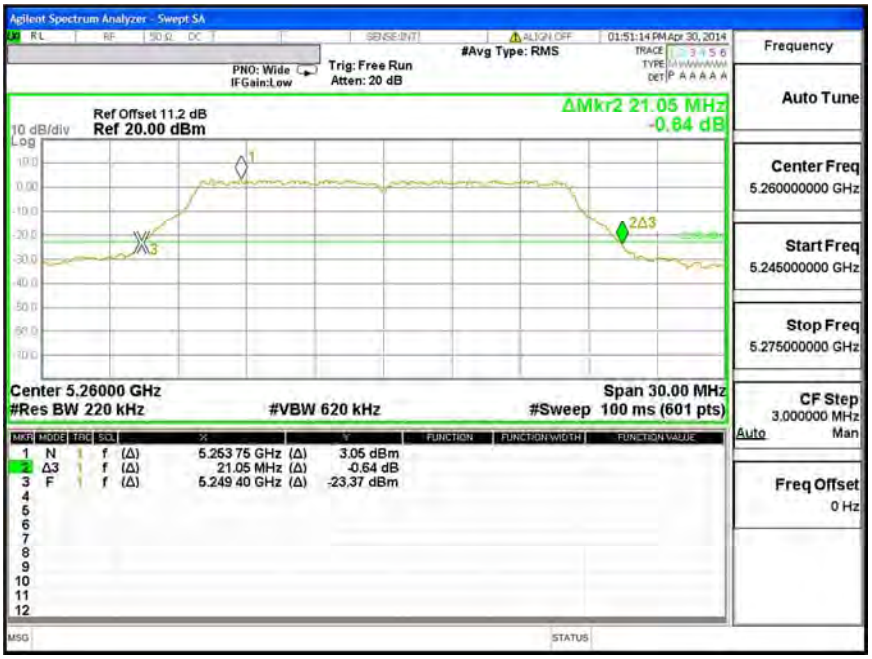
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	21.1
Mid	5300	20.9
High	5320	21.1

26 dB BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH MID CH

BANDWIDTH HIGH CH

9.5.2. 99% BANDWIDTH

LIMITS

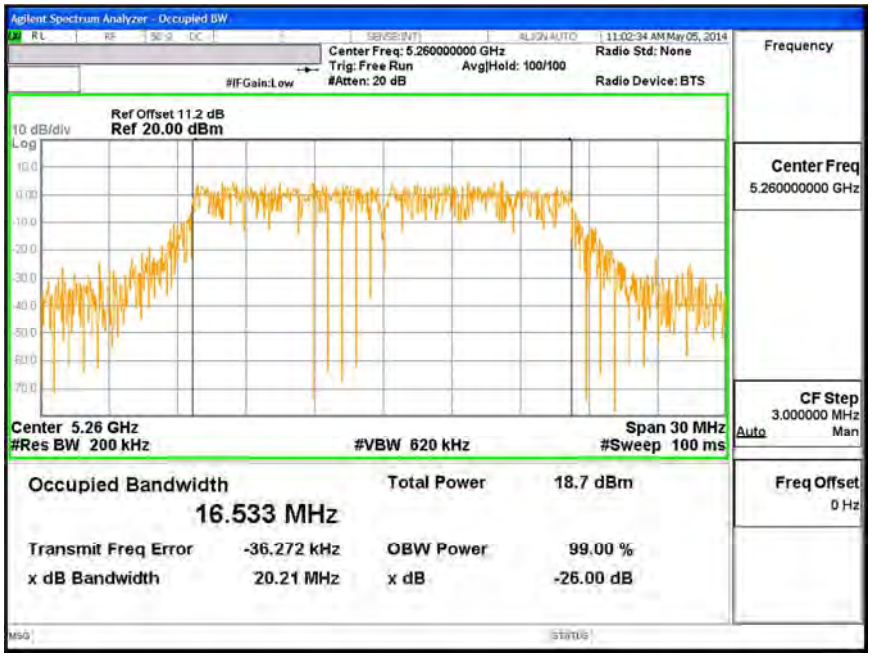
None; for reporting purposes only.

RESULTS

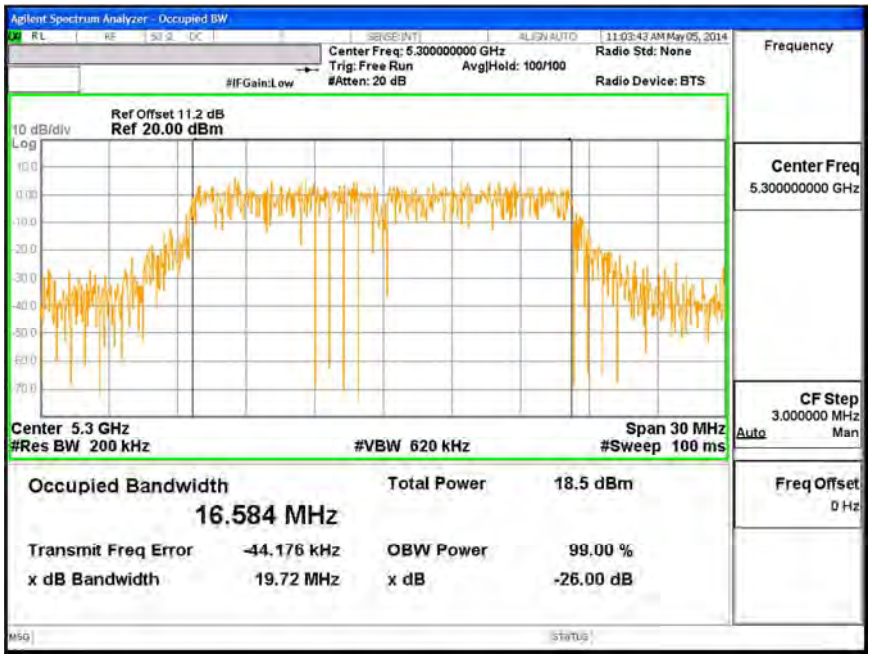
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	16.5
Mid	5300	16.6
High	5320	16.5

99% BANDWIDTH

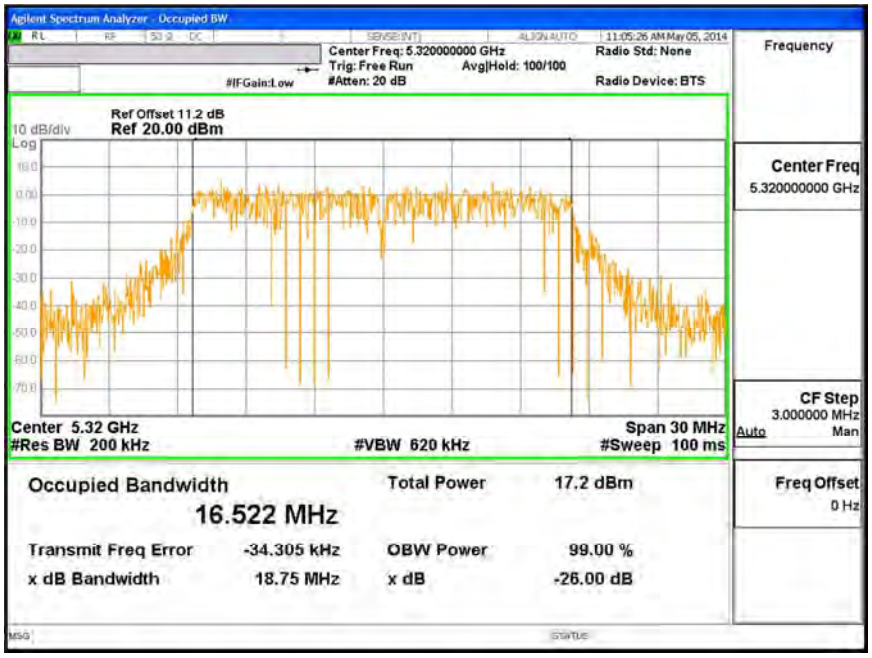
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



9.5.3. OUTPUT POWER

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band 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 MHz. If transmitting antennas of directional gain greater than 6 dBi are used, maximum conducted output power limit shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 14.37 dB (including 10 dB pad and 4.37 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-3.49

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5260	16.89	24	-7.11
Mid	5300	16.84	24	-7.16
High	5320	16.88	24	-7.12

9.5.4. PSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, 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.

Antenna Gain (dBi)
-3.49

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	21.1	16.5	-3.49
Mid	5300	21.9	16.6	-3.49
High	5320	21.1	16.5	-3.49

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

PSD Results

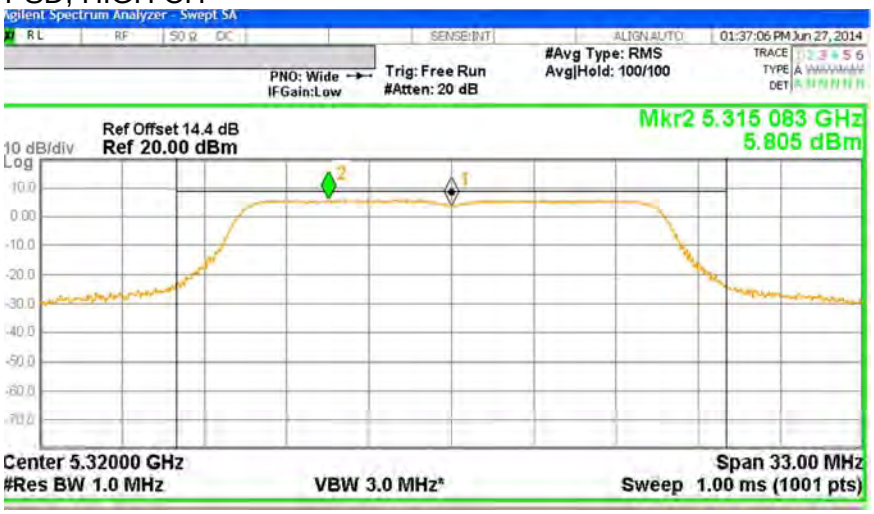
Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	6.02	6.02	11.00	-4.99
Mid	5300	6.31	6.31	11.00	-4.69
High	5320	5.81	5.81	11.00	-5.20

PSD

PSD, LOW CH

PSD, MID CH

PSD, HIGH CH



9.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

9.6.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	21.2
Mid	5300	21.0
High	5320	21.2

26 dB BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH MID CH

BANDWIDTH HIGH CH

9.6.2. 99% BANDWIDTH

LIMITS

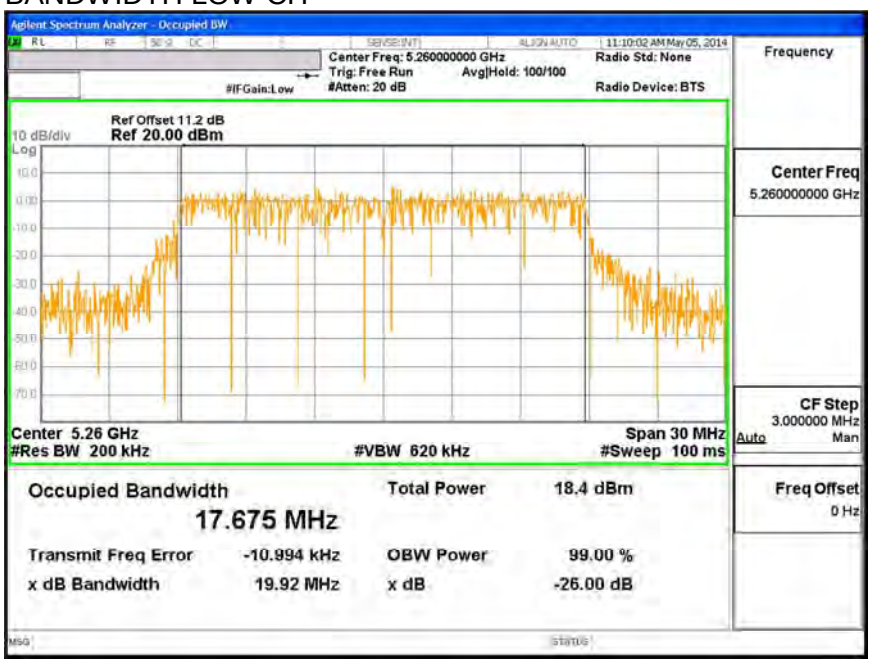
None; for reporting purposes only.

RESULTS

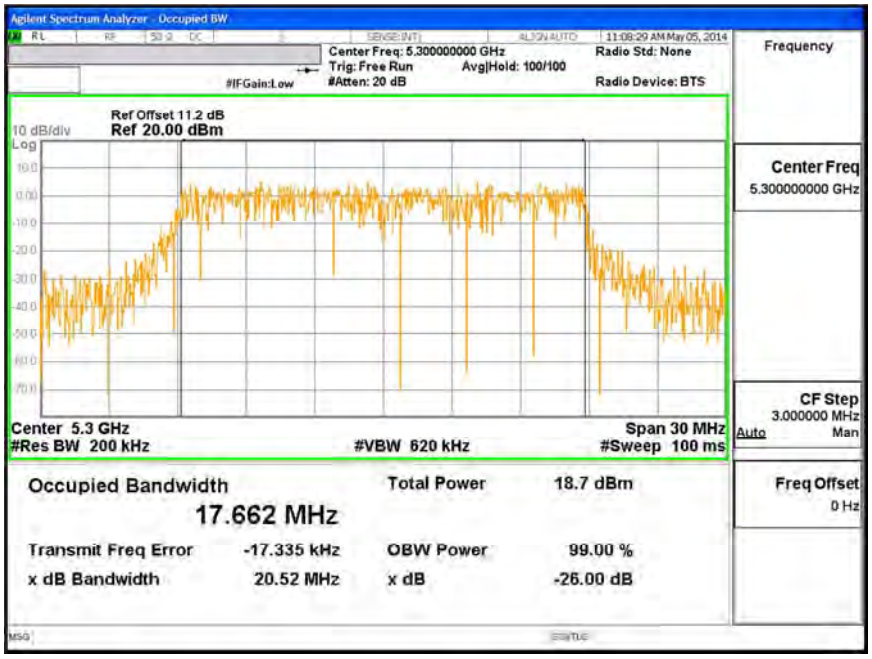
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	17.7
Mid	5300	17.7
High	5320	17.7

99% BANDWIDTH

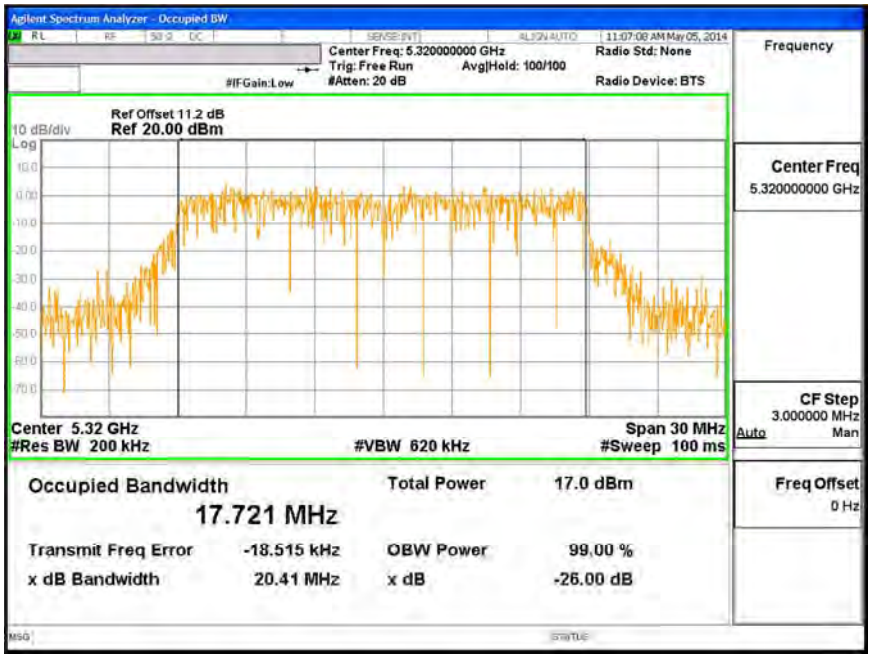
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



9.6.3. OUTPUT POWER

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band 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 MHz. If transmitting antennas of directional gain greater than 6 dBi are used, maximum conducted output power limit shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 14.37 dB (including 10 dB pad and 4.37 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-3.49

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5260	16.85	24	-7.15
Mid	5300	16.83	24	-7.17
High	5320	16.84	24	-7.16

9.6.4. PSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, 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.

Antenna Gain (dBi)
-3.49

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	21.2	17.7	-3.49
Mid	5300	21.0	17.7	-3.49
High	5320	21.2	17.7	-3.49

Limits

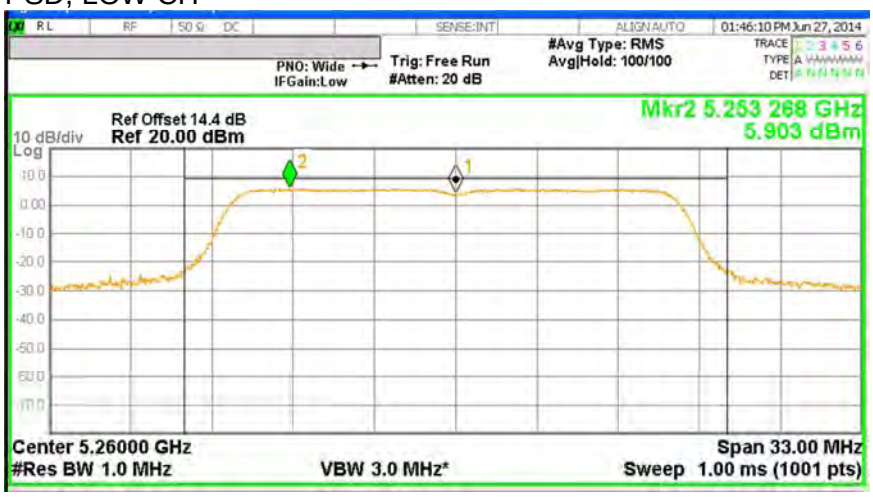
Duty Cycle CF (dB)	0.00	**Included in Calculations of Corr'd Power & PSD**

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	5.90	5.90	11.00	-5.10
Mid	5300	5.36	5.36	11.00	-5.64
High	5320	5.58	5.58	11.00	-5.42

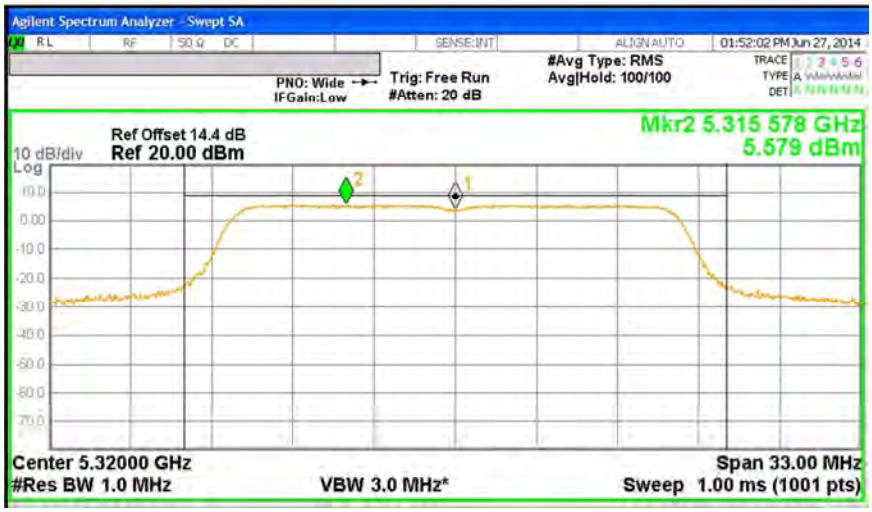
PSD

PSD, LOW CH



PSD, MID CH

PSD, HIGH CH



9.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

9.7.1. 26 dB BANDWIDTH

LIMITS

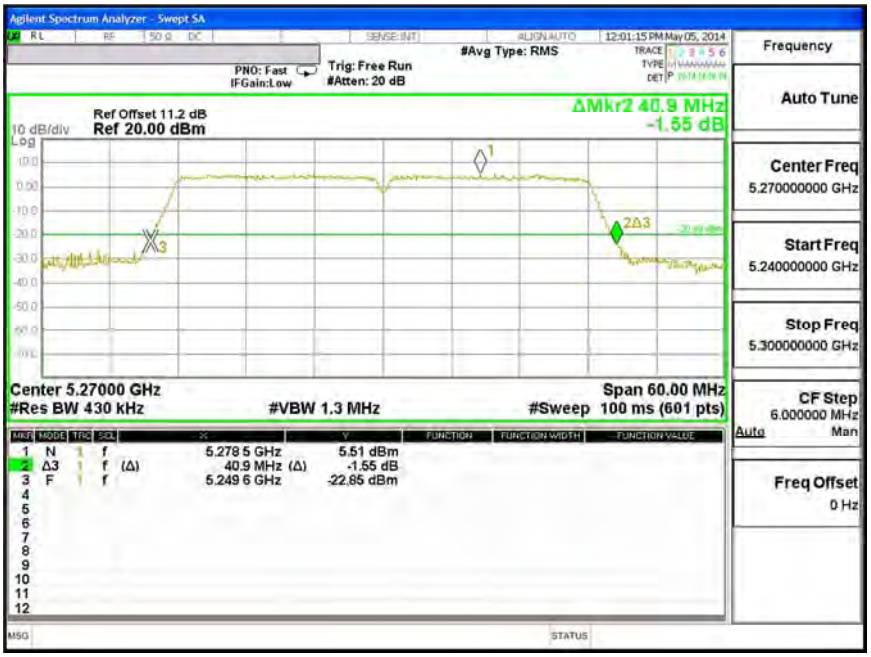
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5270	40.9
High	5310	40.5

26 dB BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH HIGH CH

9.7.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

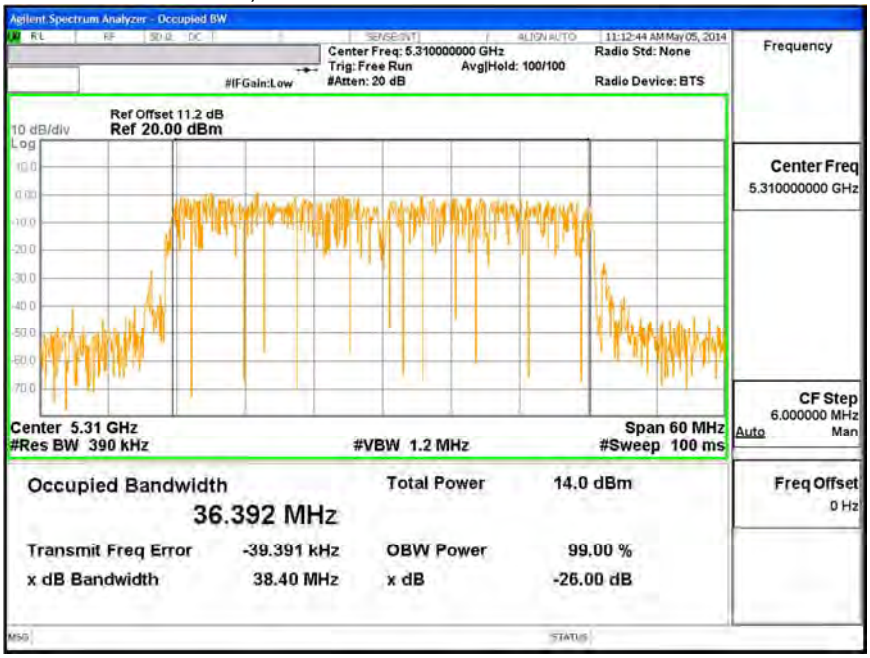
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5270	36.31
High	5310	36.39

99% BANDWIDTH

99% BANDWIDTH, LOW CH

99% BANDWIDTH, HIGH CH



9.7.3. OUTPUT POWER

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band 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 MHz. If transmitting antennas of directional gain greater than 6 dBi are used, maximum conducted output power limit shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 14.37 dB (including 10 dB pad and 4.37 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain

Antenna Gain (dBi)
-3.49

.

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5270	16.87	24	-7.13
High	5310	15.45	24	-8.55

9.7.4. PSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, 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

Antenna Gain (dBi)
-3.49

.

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5270	40.9	36.3	-3.49
High	5310	40.5	36.4	-3.49

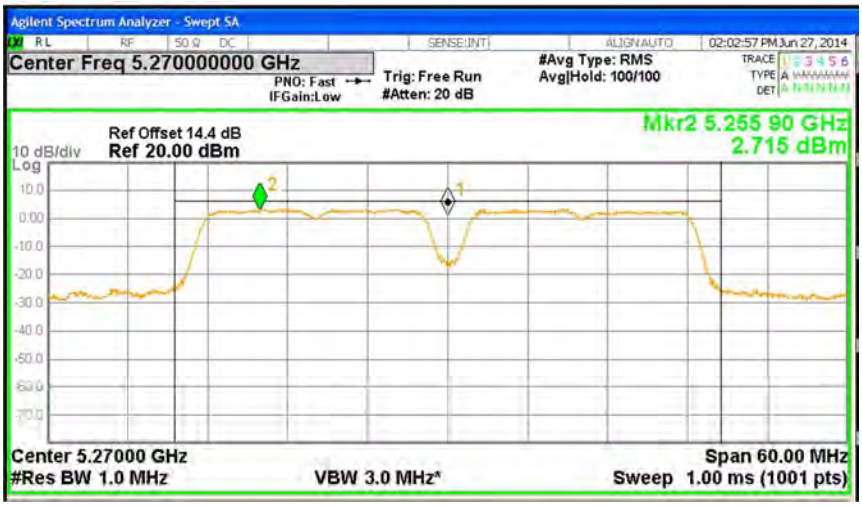
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PSD

PSD Results

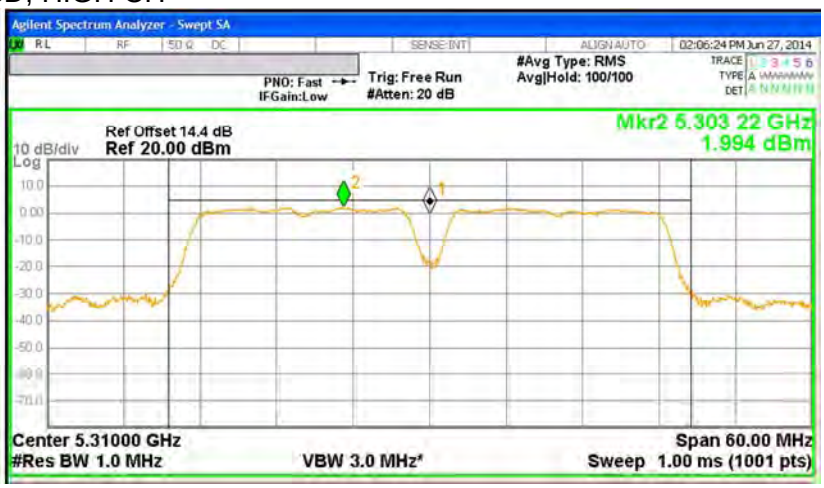
Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5270	2.72	2.72	11.00	-8.29
High	5310	1.99	1.99	11.00	-9.01

PSD

PSD, LOW CH



PSD, HIGH CH



9.8. 802.11ac 80MHz MODE IN THE 5.3 GHz BAND

9.8.1. 26 dB BANDWIDTH

LIMITS

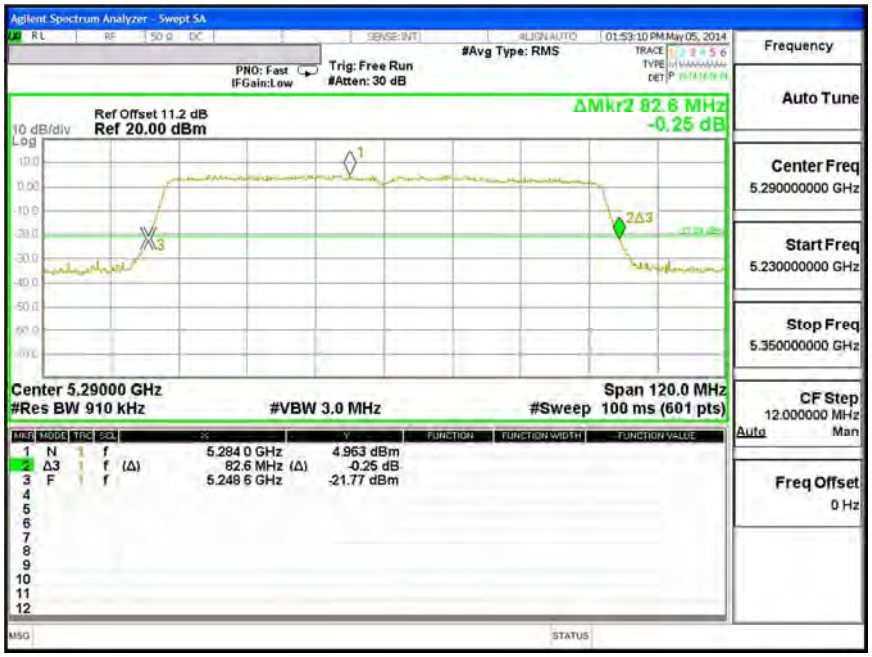
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
58	5290	82.60

26 dB BANDWIDTH

BANDWIDTH CH 58



9.8.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
58	5290	75.339

99% BANDWIDTH

99% BANDWIDTH, CH 58

9.8.3. OUTPUT POWER

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band 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 MHz. If transmitting antennas of directional gain greater than 6 dBi are used, maximum conducted output power limit shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 14.52 dB (including 10 dB pad, 4.37 dB cable and 0.15dB duty cycle correction factor) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain

Antenna Gain (dBi)
-3.49

.

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
58	5290	14.53	24	-9.47

9.8.4. PSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, 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.

Antenna Gain (dBi)
-3.49

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
58	5290	82.6	75.7	-3.49

Duty Cycle CF (dB)	0.15	Included in Calculations of Corr'd Power & PSD

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
58	5290	-2.62	-2.47	11.00	-13.47

PSD

PSD, CH 58

9.9. 802.11a MODE IN THE 5.6 GHz BAND

9.9.1. 26 dB BANDWIDTH

LIMITS

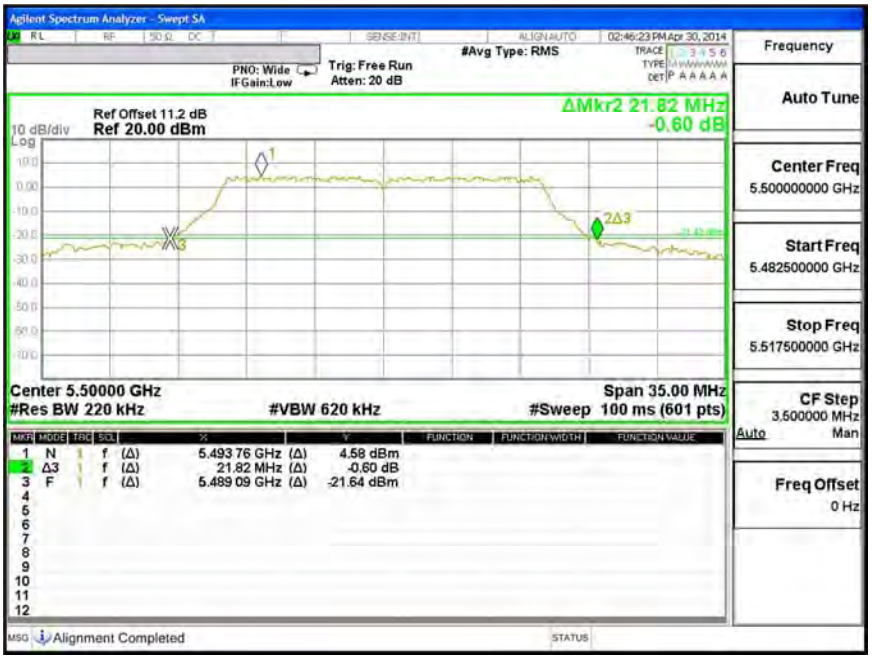
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	21.8
Mid	5580	21.9
High	5700	21.9

26 dB BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH MID CH

BANDWIDTH HIGH CH

9.9.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

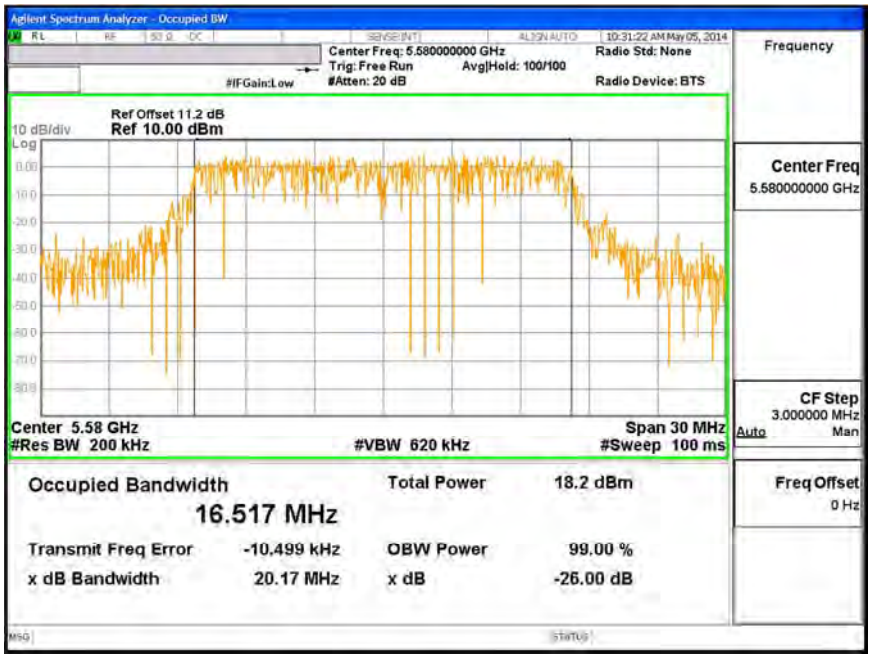
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	16.6
Mid	5580	16.5
High	5700	16.5

99% BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH MID CH



BANDWIDTH HIGH CH

9.9.3. OUTPUT POWER

LIMITS

FCC §15.407 (a) (2)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band 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 MHz. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 14.31 dB (including 10 dB pad and 4.31 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-1.36

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5500	14.48	24	-9.52
Mid	5580	14.45	24	-9.55
High	5700	14.45	24	-9.55

9.9.4. PSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.5–5.7 GHz, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, 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.

Antenna Gain (dBi)
-1.36

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	21.8	16.6	-1.36
Mid	5580	21.9	16.5	-1.36
High	5700	21.9	16.5	-1.36

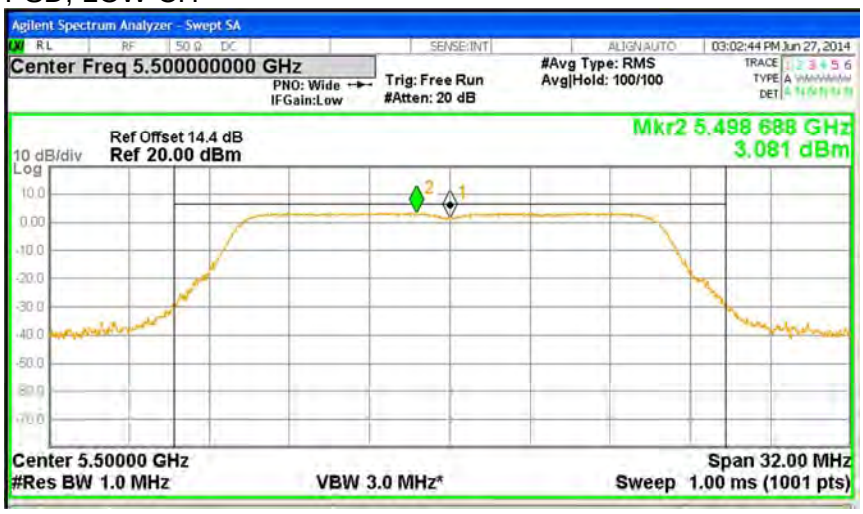
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PSD

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	3.08	3.08	11.00	-7.92
Mid	5580	3.14	3.14	11.00	-7.86
High	5700	3.44	3.44	11.00	-7.56

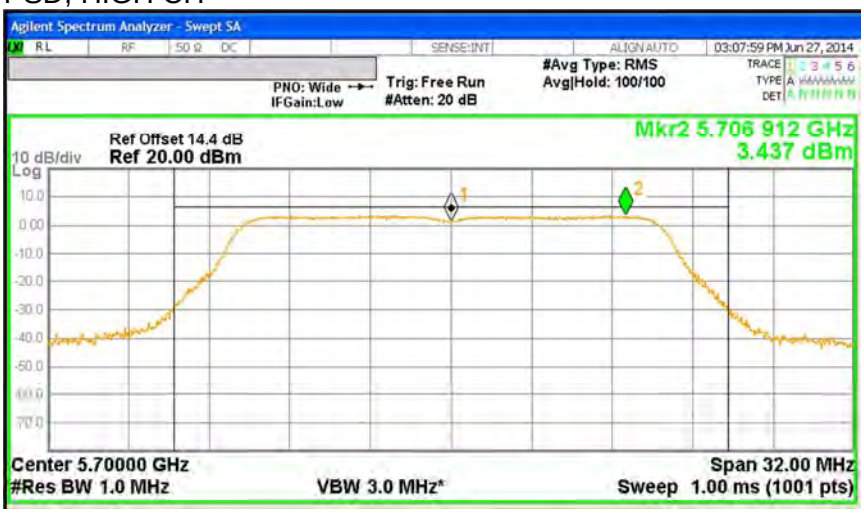
PSD

PSD, LOW CH



PSD, MID CH

PSD, HIGH CH



9.10. 802.11n HT20 MODE IN THE 5.6 GHz BAND

9.10.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	21.2
Mid	5580	21.5
High	5700	21.3

26 dB BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH MID CH

BANDWIDTH HIGH CH

9.10.2. 99% BANDWIDTH

LIMITS

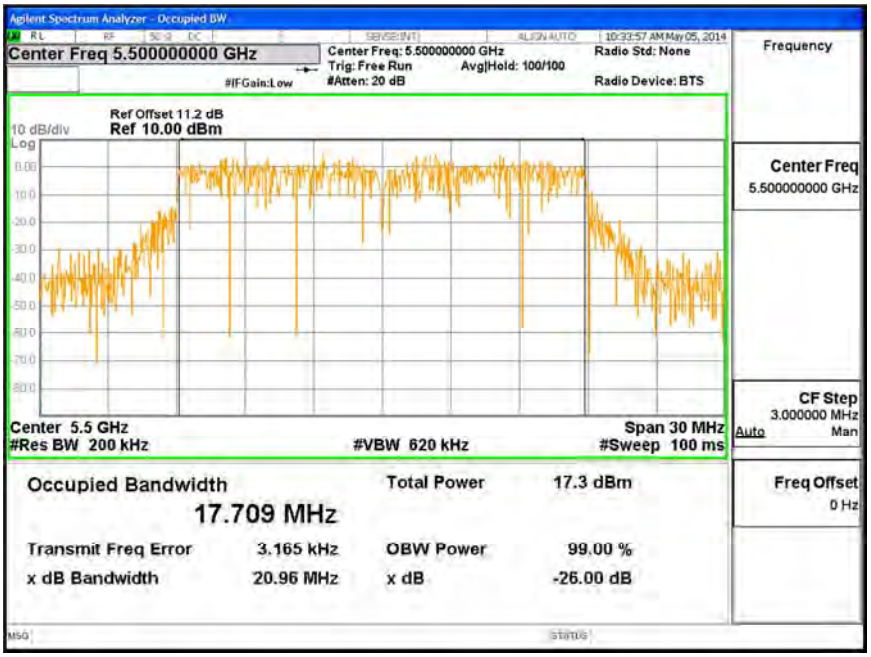
None; for reporting purposes only.

RESULTS

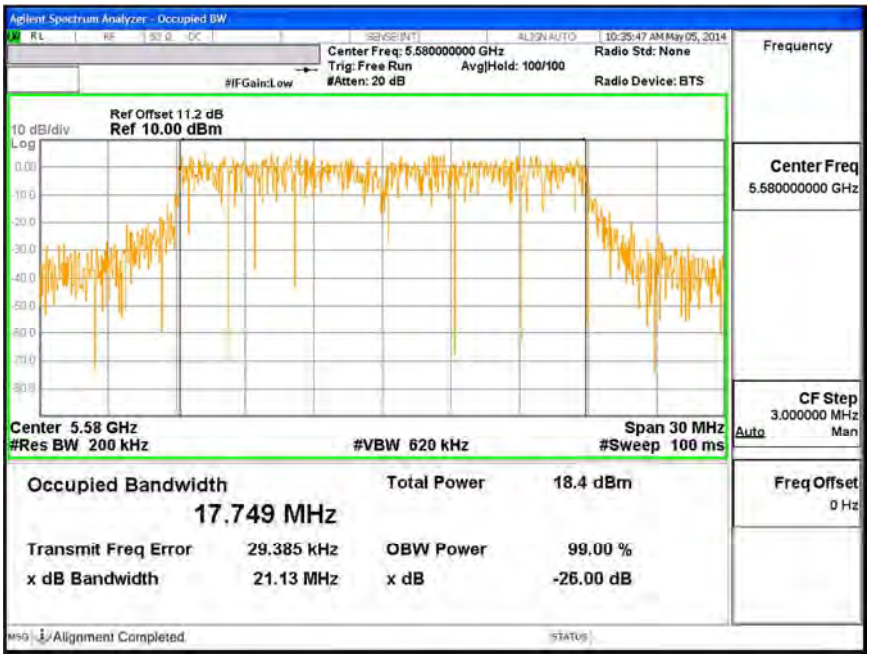
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	17.7
Mid	5580	17.7
High	5700	17.7

99% BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH

9.10.3. OUTPUT POWER

LIMITS

FCC §15.407 (a) (2)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band 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 MHz. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 14.31 dB (including 10 dB pad and 4.31 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-1.36

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5500	14.49	24	-9.51
Mid	5580	14.49	24	-9.51
High	5700	14.48	24	-9.52

9.10.4. PSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.5–5.7 GHz, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, 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.

Antenna Gain (dBi)
-1.36

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	21.2	17.7	-1.36
Mid	5580	21.5	17.7	-1.36
High	5700	21.3	17.7	-1.36

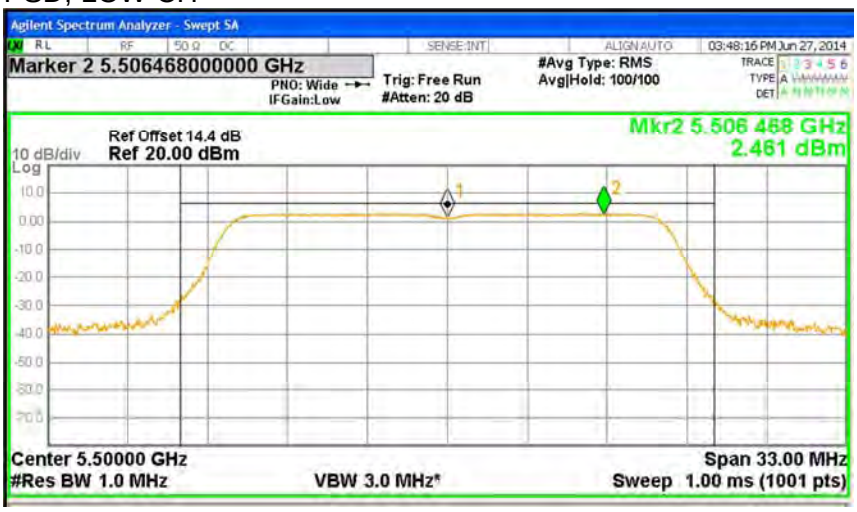
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PSD

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	2.46	2.46	11.00	-8.54
Mid	5580	3.02	3.02	11.00	-7.98
High	5700	2.62	2.62	11.00	-8.38

PSD

PSD, LOW CH



PSD, MID CH

PSD, HIGH CH

9.11. 802.11n HT20 MODE, CHANNEL 144, 5.6 GHz BAND

9.11.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
High	5720	25.4

26 dB BANDWIDTH

BANDWIDTH HIGH CH

9.11.2. 99% BANDWIDTH

LIMITS

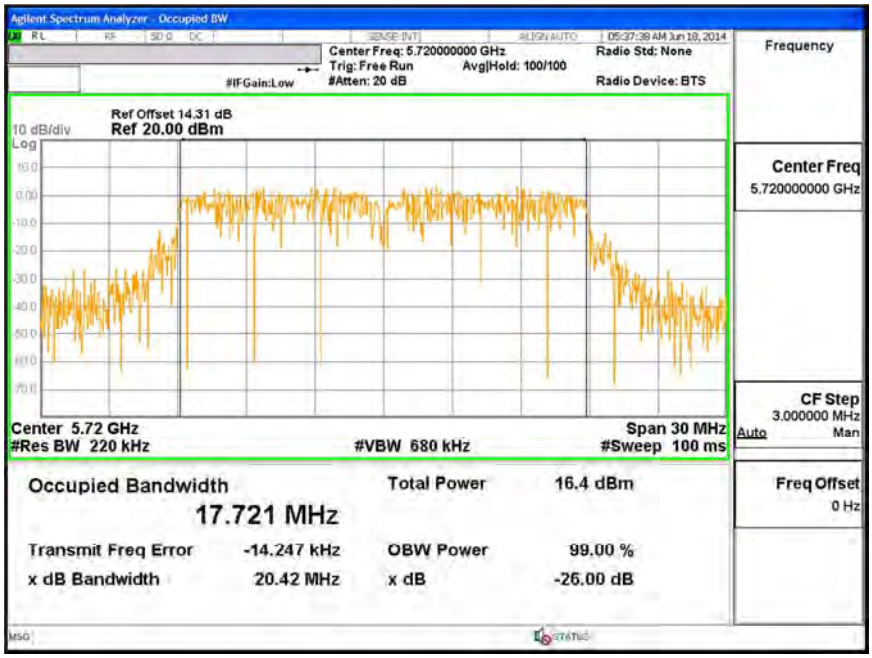
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
High	5720	17.7

99% BANDWIDTH

BANDWIDTH HIGH CH



9.11.1. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 14.31 dB (including 10 dB pad and 4.31 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
High	5720	14.48

9.11.2. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band 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 MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-1.36

Limits (FCC), portion in UNII 2C ext band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
144	5720	25.41	17.72	-1.36

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	14.62	14.62	23.48	-8.86

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
144	5720	3.724	3.72	11.00	-7.28

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

Limits (FCC), portion in UNII-3 ext band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
144	5720	25.41	17.72	-1.36

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	8.90	8.90	23.48	-14.58

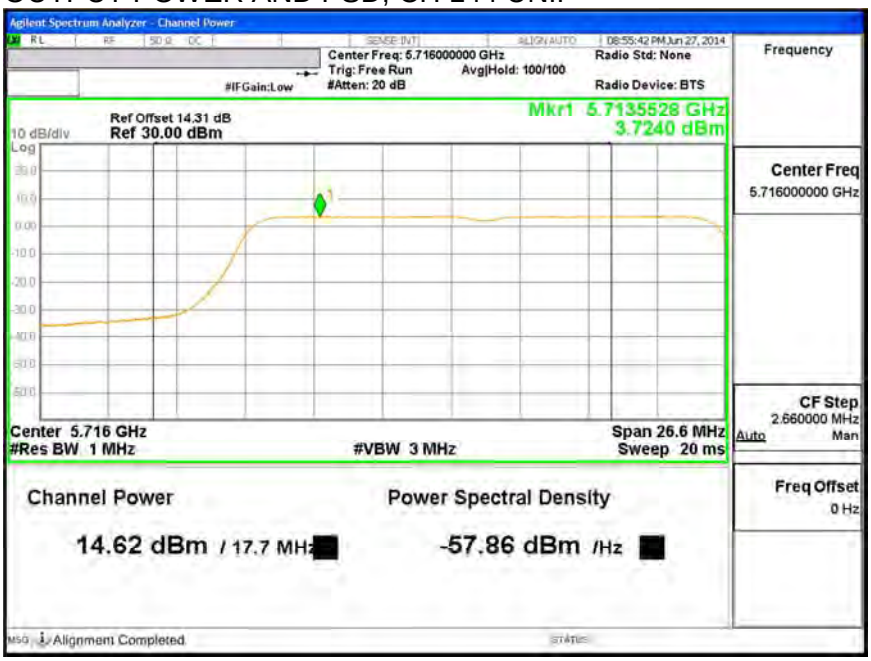
PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
144	5720	0.659	0.66	30.00	-29.34

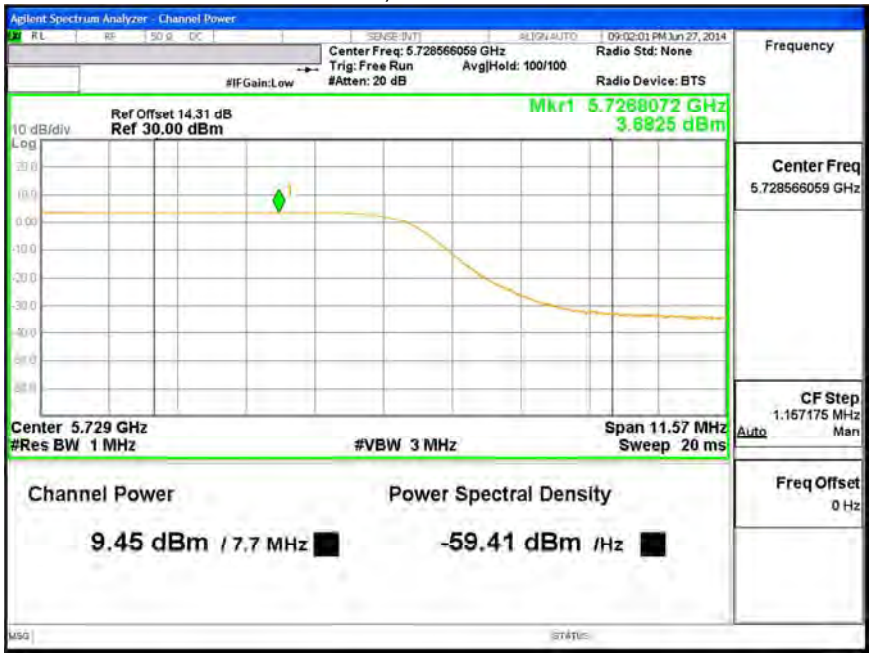
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PSD

OUTPUT POWER AND PSD

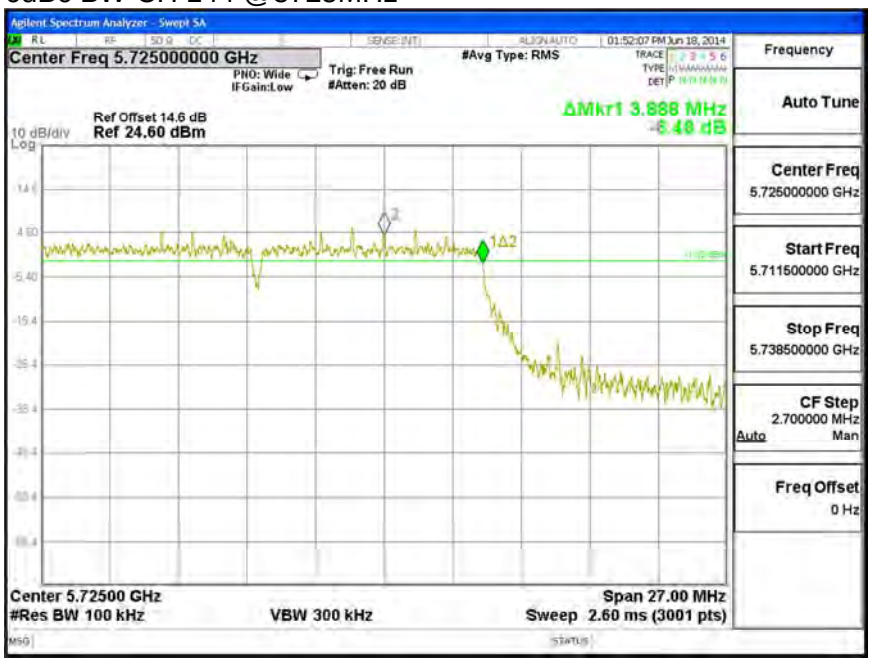
OUTPUT POWER AND PSD, CH 144 UNII



OUTPUT POWER AND PSD, CH 144



6dBc BW CH 144 @5725MHz



OUTPUT POWER AND PSD, CH144 WITH 500KHz

9.12. 802.11n HT40 MODE IN THE 5.6 GHz BAND

9.12.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5510	40.2
Mid	5550	40.5
High	5670	40.1

26 dB BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH MID CH

BANDWIDTH HIGH CH

9.12.2. 99% BANDWIDTH

LIMITS

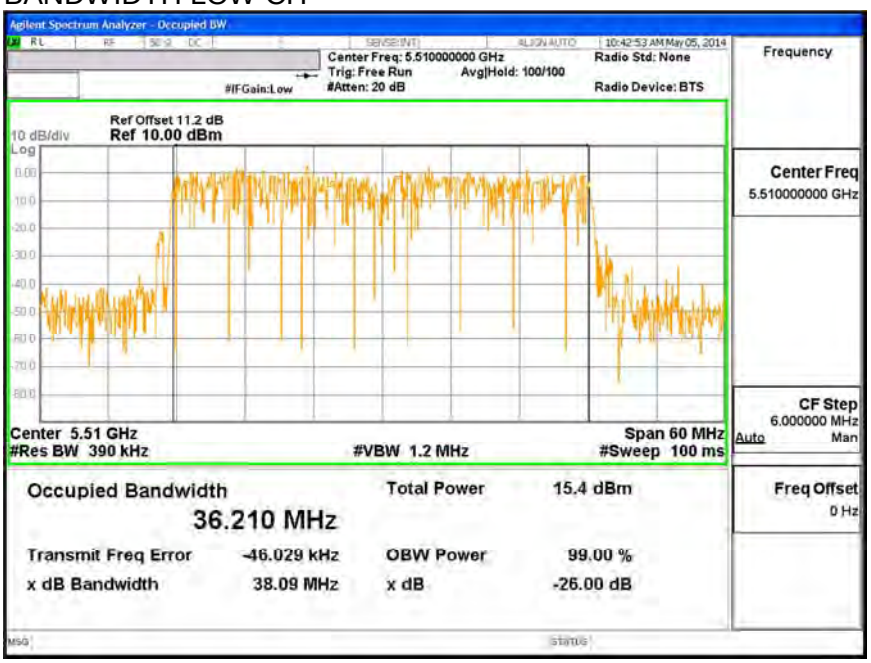
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5510	36.2
Mid	5550	36.3
High	5670	36.2

99% BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH MID CH

BANDWIDTH HIGH CH

9.12.3. OUTPUT POWER

LIMITS

FCC §15.407 (a) (2)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band 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 MHz. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 14.31 dB (including 10 dB pad and 4.31 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-1.36

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5510	13.69	24	-10.31
Mid	5550	14.46	24	-9.54
High	5670	14.45	24	-9.55

9.12.4. PSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.5–5.7 GHz, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, 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.

Antenna Gain (dBi)
-1.36

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5510	40.2	36.2	-1.36
Mid	5550	40.5	36.3	-1.36
High	5670	40.1	36.2	-1.36

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

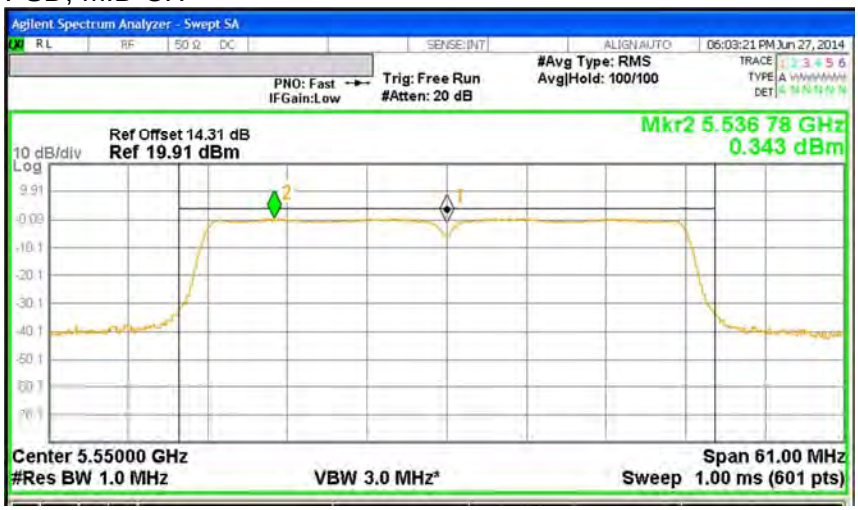
PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5510	-0.59	-0.59	11.00	-11.59
Mid	5550	0.34	0.34	11.00	-10.66
High	5670	0.01	0.01	11.00	-11.00

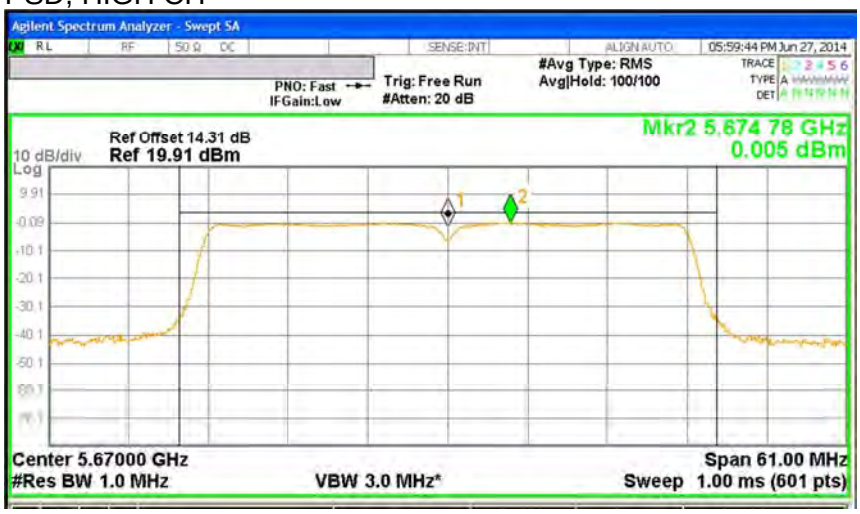
PSD

PSD, LOW CH

PSD, MID CH



PSD, HIGH CH



9.13. 802.11n HT40 MODE, CHANNEL 142, 5.6 GHz BAND

9.13.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
High	5710	40.040

26 dB BANDWIDTH

BANDWIDTH HIGH CH

9.13.2. 99% BANDWIDTH

LIMITS

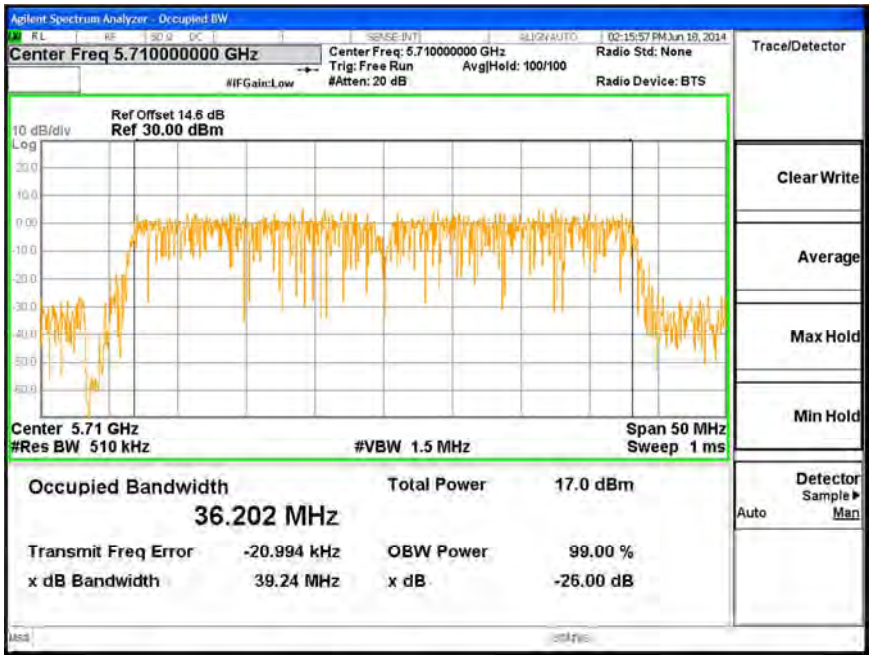
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
High	5710	36.202

99% BANDWIDTH

BANDWIDTH HIGH CH



9.13.1. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 14.31 dB (including 10 dB pad and 4.31 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
High	5710	13.75

9.13.2. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band 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 MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-1.36

Limits (FCC), portion in UNII 2 ext band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
142	5710	35.02	33.10	-1.36

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
142	5710	13.91	13.91	24.00	-10.09

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
142	5710	-0.295	-0.30	11.00	-11.30

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

Limits (FCC), portion in UNII-3 ext band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
138	5710	5.02	3.10	-1.36

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC PSD Limit (dBm)	PSD Limit (dBm)
138	5710	30.00	15.91	21.91	15.91	30.00	11.00	30.00

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5710	2.82	2.82	15.91	-13.09

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
138	5710	-3.76	-3.76	30.00	-33.76

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

OUTPUT POWER AND PSD

OUTPUT POWER AND PSD, CH 142 UNII

OUTPUT POWER AND PSD, CH 142

, 6dBc BW CH 142 @ 5725MHz

OUTPUT POWER AND PSD, CH 142

9.14. 802.11ac 80MHz MODE IN THE 5.6 GHz BAND

9.14.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
106	5530	82.600

26 dB BANDWIDTH

BANDWIDTH CH 106

9.14.2. 99% BANDWIDTH

LIMITS

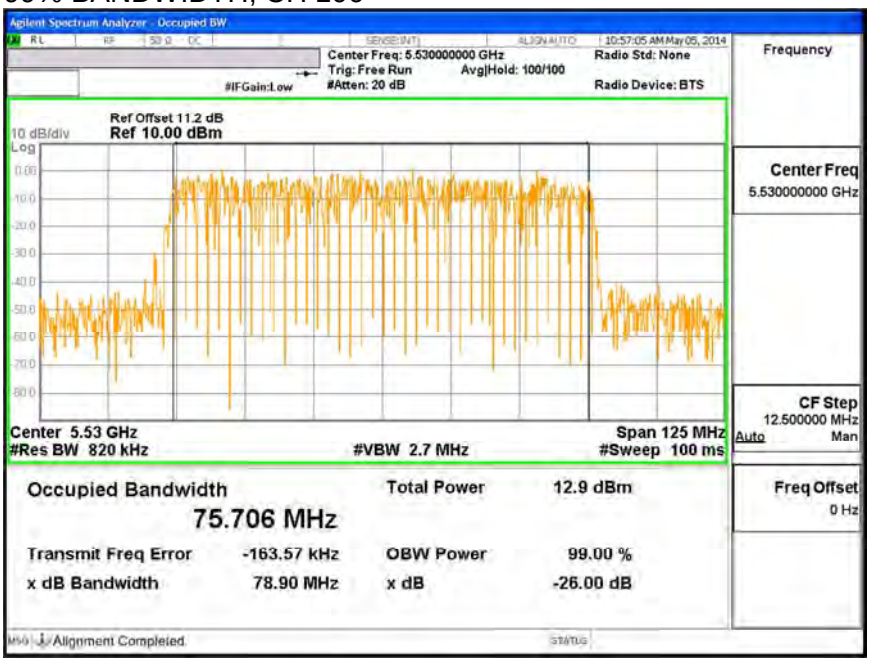
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
106	5530	75.706

99% BANDWIDTH

99% BANDWIDTH, CH 106



9.14.3. OUTPUT POWER

LIMITS

FCC §15.407 (a) (2)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band 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 MHz. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 14.46 dB (including 10 dB pad, 4.31 dB cable and 0.15dB duty cycle correction factor) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-1.36

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
106	5530	12.82	24	-11.18

9.14.4. PSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.5–5.7 GHz, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, 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.

Antenna Gain (dBi)
-1.36

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
106	5530	82.6	75.7	-1.36

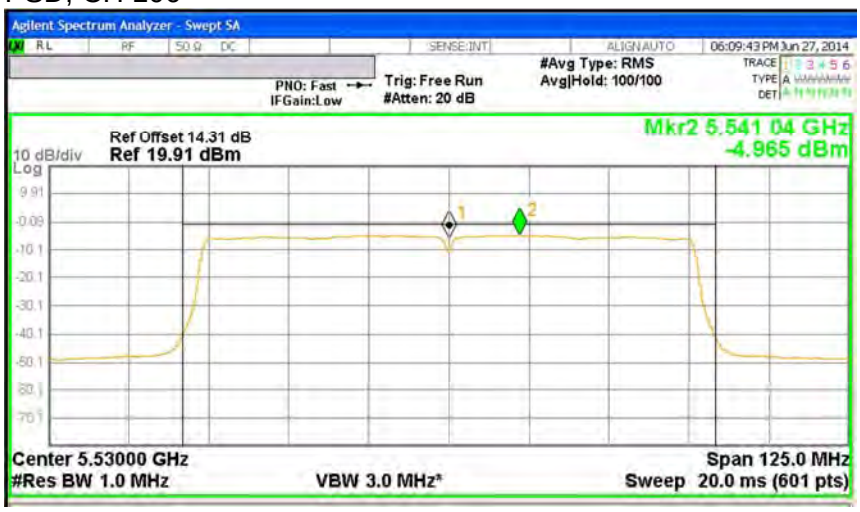
Duty Cycle CF (dB)	0.15	Included in Calculations of Corr'd Power & PSD

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
106	5530	-4.97	-4.82	11.00	-15.82

PSD

PSD, CH 106



9.15. 802.11ac 80MHz MODE, CHANNEL 138, 5.6 GHz BAND

9.15.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Frequency (MHz)	26 dB Bandwidth (MHz)
5690	82.80

26 dB BANDWIDTH

BANDWIDTH CH 138

9.15.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Frequency (MHz)	99% Bandwidth (MHz)
5690	75.6800

99% BANDWIDTH

BANDWIDTH CH 138

9.15.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
Mid	5690	12.43

9.15.4. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band 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 MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-1.36

RESULTS

Limits (FCC), portion in UNII 2 ext band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
138	5690	75.41	72.84	-1.36

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5690	12.53	12.68	24.00	-11.32

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
138	5690	-5.155	-5.00	11.00	-16.00

Duty Cycle CF (dB)	0.15	Included in Calculations of Corr'd Power & PPSD

Limits (FCC), portion in UNII-3 ext band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
138	5690	5.41	2.84	-1.36

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm)	IC PSD Limit (dBm)	PSD Limit (dBm)
138	5690	30.00	15.53	21.53	15.53	30.00	11.00	30.00

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5690	-2.06	-1.91	15.53	-17.44

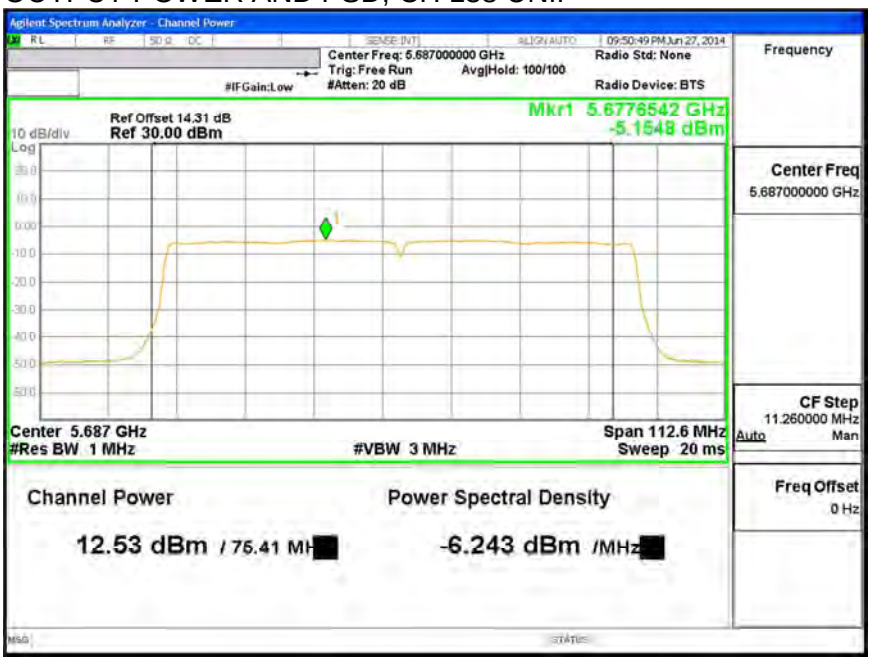
PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
138	5690	-8.990	-8.84	30.00	-38.84

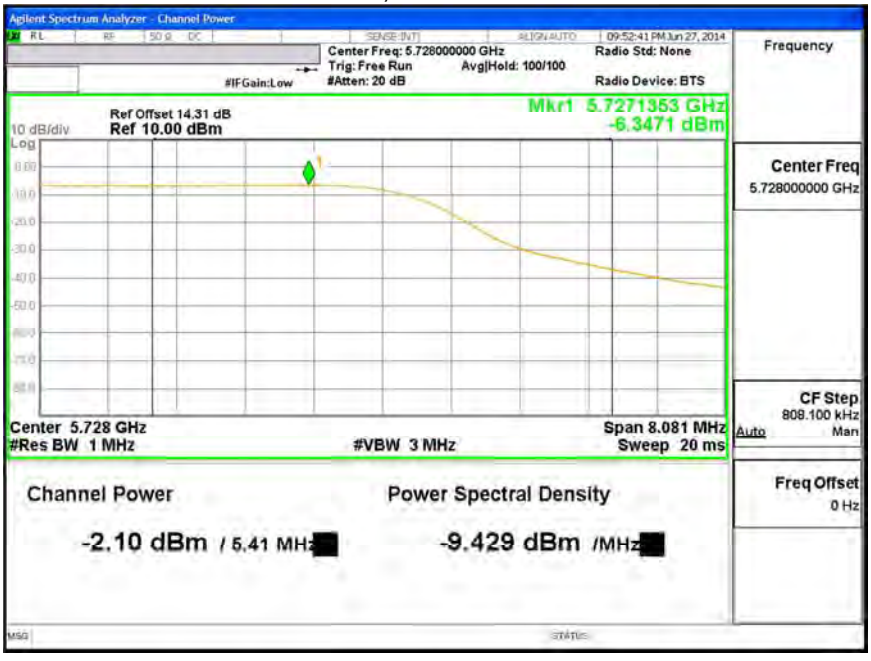
Duty Cycle CF (dB)	0.15	Included in Calculations of Corr'd Power & PSD

OUTPUT POWER AND PSD

OUTPUT POWER AND PSD, CH 138 UNII



OUTPUT POWER AND PSD, CH 138



6dBc BANDWIDTH, CH 138 @5725MHz

OUTPUT POWER AND PSD, CH 138

9.16. 802.11a MODE IN THE 5.8 GHz BAND

9.16.1. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

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

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	16.375	0.5
Mid	5785	16.375	0.5
High	5825	16.375	0.5

6 dB BANDWIDTH

6 dB BANDWIDTH LOW CH

6 dB BANDWIDTH MID CH

6 dB BANDWIDTH HIGH CH

9.16.2. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	21.3
Mid	5785	21.5
High	5825	21.3

26 dB BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH MID CH

BANDWIDTH HIGH CH

9.16.3. 99% BANDWIDTH

LIMITS

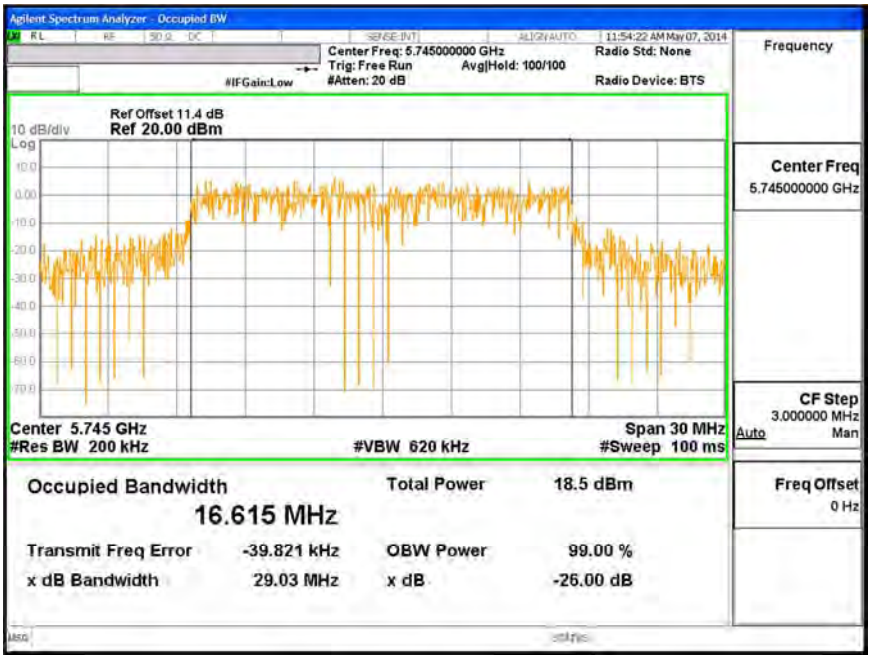
None; for reporting purposes only.

RESULTS

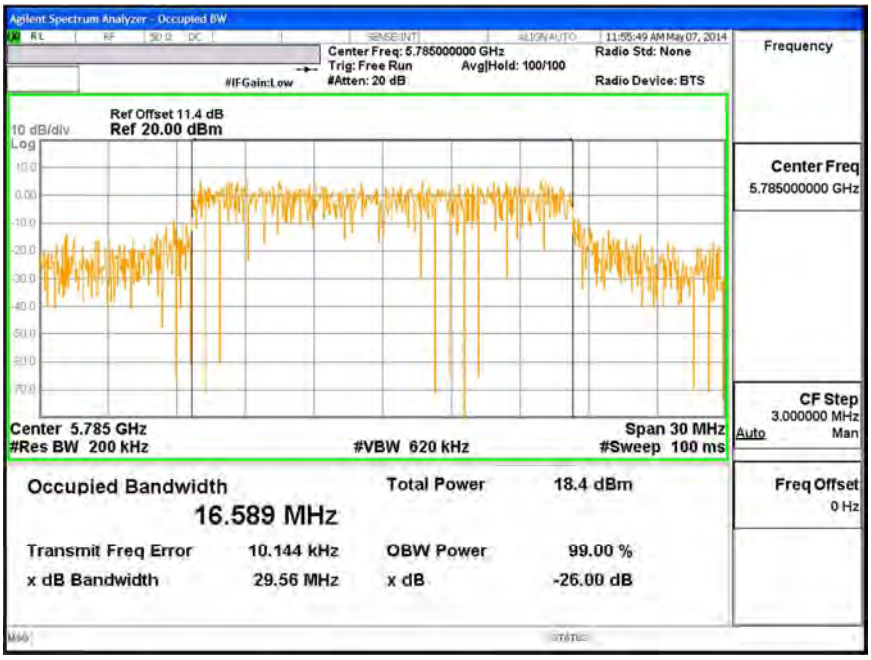
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	16.6150
Mid	5785	16.5890
High	5825	16.7240

99% BANDWIDTH

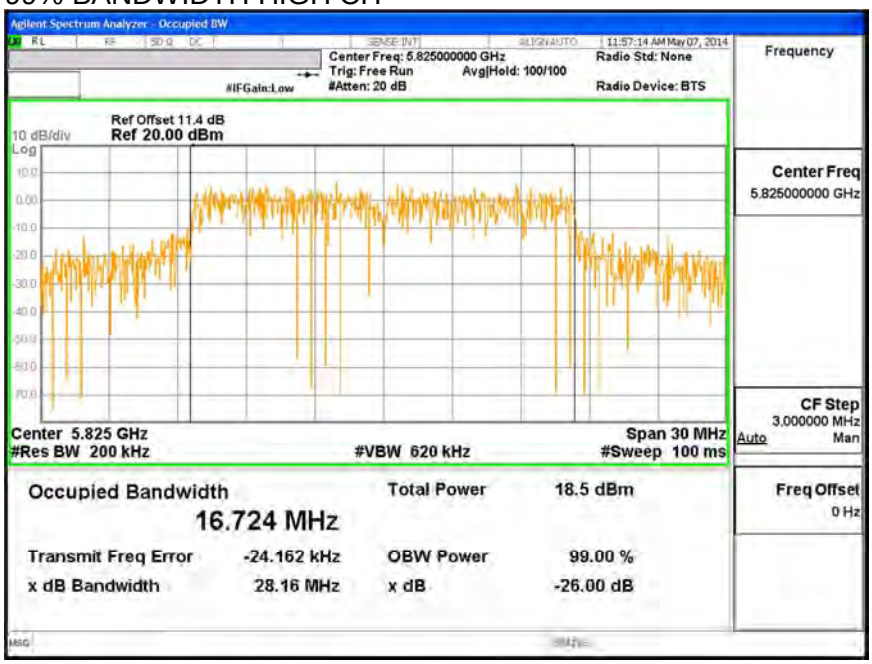
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



99% BANDWIDTH HIGH CH



9.16.4. OUTPUT POWER

LIMITS

FCC §15.407 (a) (3)

For the band 5.725-5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 30 dBm. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-1.40

RESULTS

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	14.85	14.85	30.00	-15.15
Mid	5785	16.95	16.95	30.00	-13.05
High	5825	16.99	16.99	30.00	-13.01

9.16.5. PSD

LIMITS

FCC §15.407 (a) (3)

For the band 5.725-5.825 GHz, the peak power spectral density shall not exceed 30 dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RESULTS

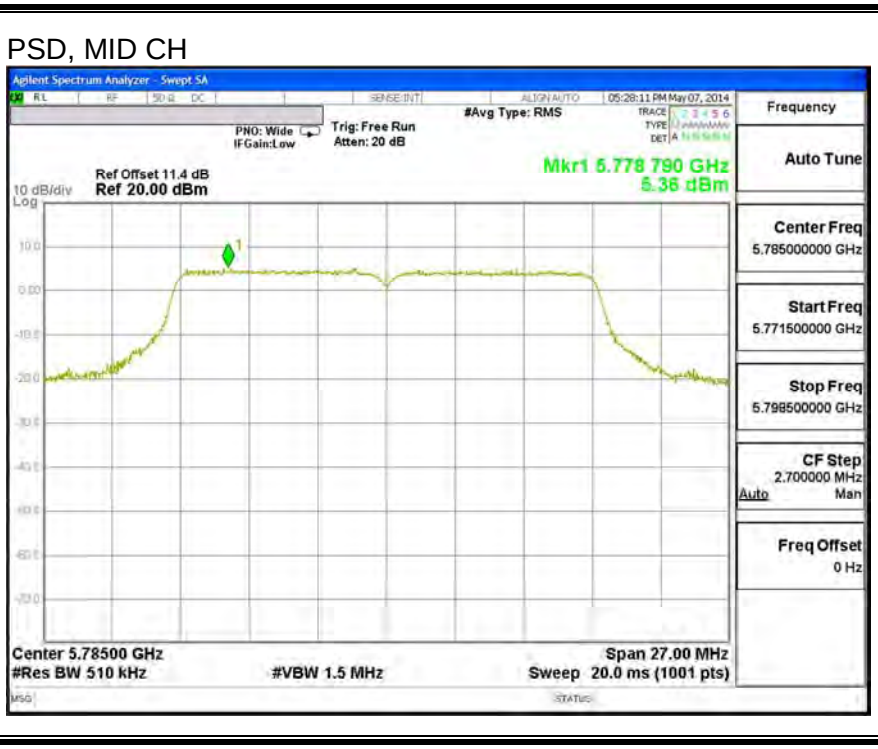
PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Limit (dBm)	Margin (dB)
Low	5745	5.41	30.0	-24.6
Mid	5785	5.36	30.0	-24.6
High	5825	5.53	30.0	-24.5

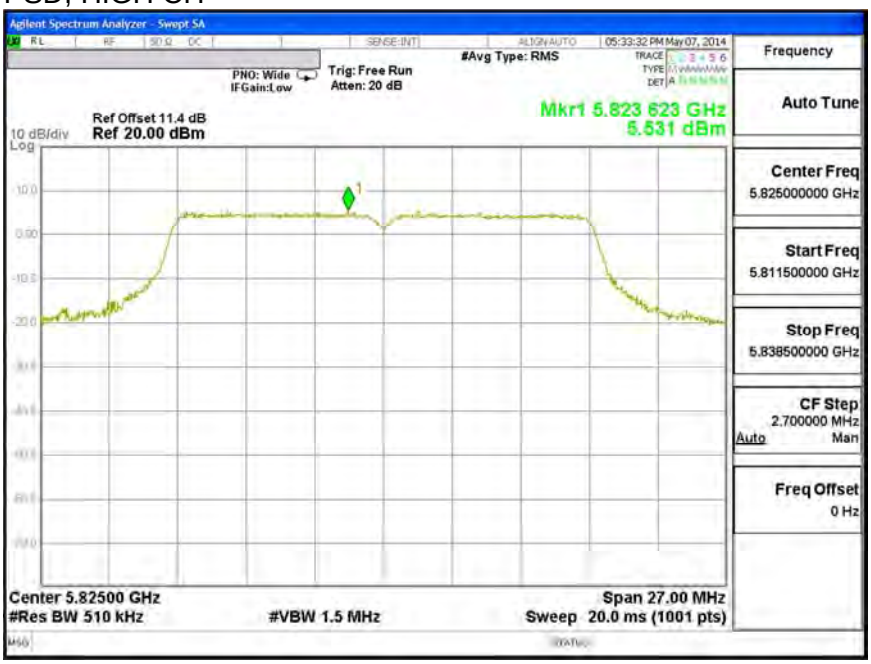
PSD

PSD, LOW CH

PSD, MID CH



PSD, HIGH CH



9.17. 802.11n HT20 MODE IN THE 5.8 GHz BAND

9.17.1. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

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

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	17.631	0.5
Mid	5785	17.631	0.5
High	5825	17.631	0.5

6 dB BANDWIDTH

6 dB BANDWIDTH LOW CH

6 dB BANDWIDTH MID CH

6 dB BANDWIDTH HIGH CH

9.17.2. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	21.4
Mid	5785	21.3
High	5825	21.4

26 dB BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH MID CH

BANDWIDTH HIGH CH

9.17.3. 99% BANDWIDTH

LIMITS

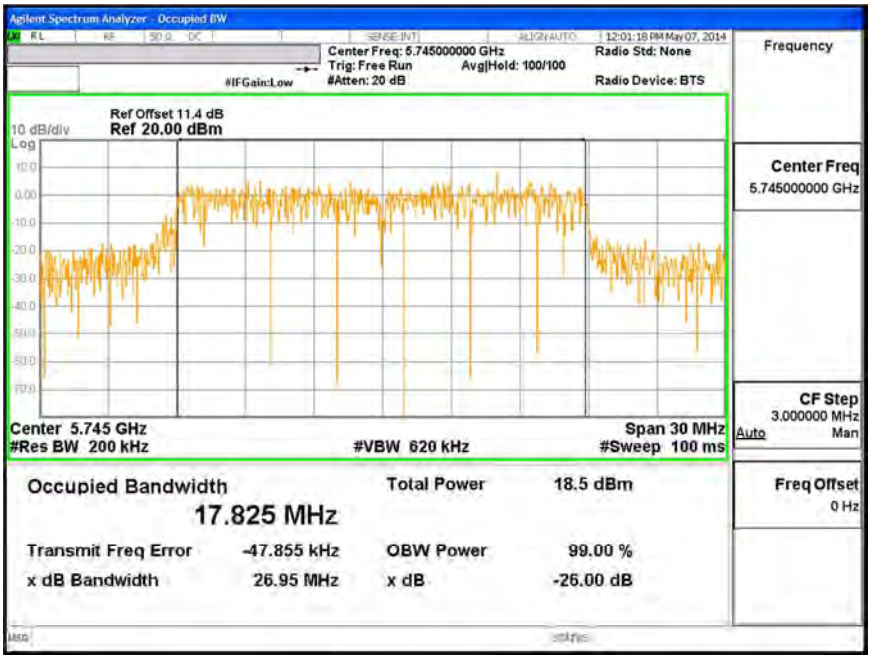
None; for reporting purposes only.

RESULTS

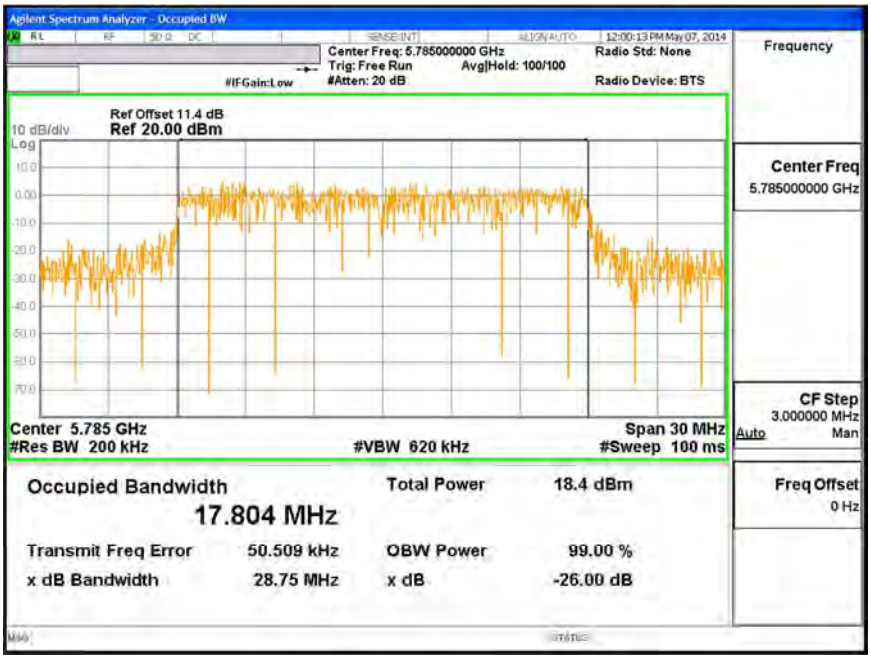
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	17.8250
Mid	5785	17.8040
High	5825	17.7540

99% BANDWIDTH

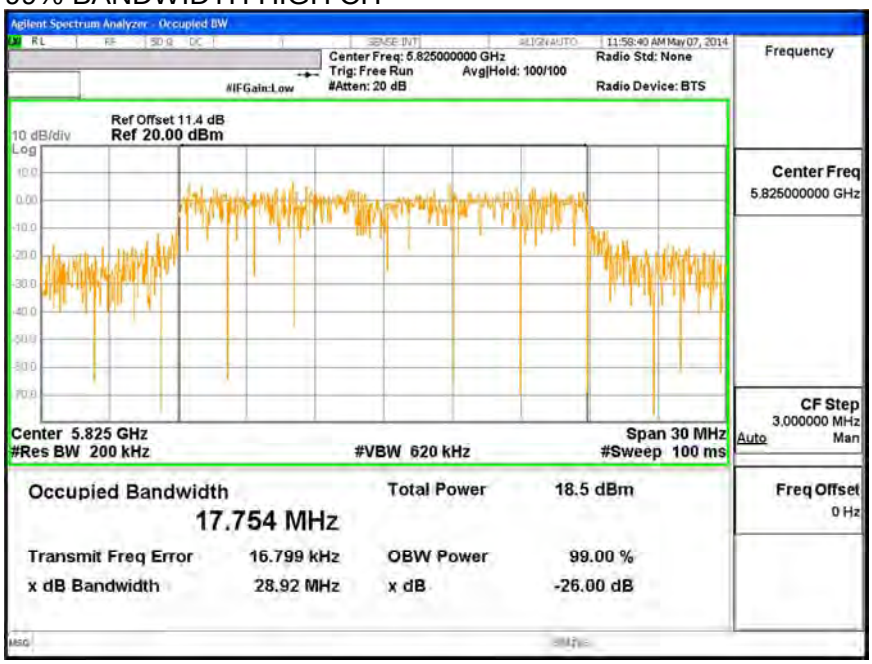
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



99% BANDWIDTH HIGH CH



9.17.4. OUTPUT POWER

LIMITS

FCC §15.407 (a) (3)

For the band 5.725-5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 30 dBm. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-1.40

RESULTS

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	14.97	14.97	30.00	-15.03
Mid	5785	16.95	16.95	30.00	-13.05
High	5825	16.96	16.96	30.00	-13.04

9.17.5. PSD

LIMITS

FCC §15.407 (a) (3)

For the band 5.725-5.825 GHz, the peak power spectral density shall not exceed 30 dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RESULTS

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Limit (dBm)	Margin (dB)
Low	5745	5.65	30.0	-24.4
Mid	5785	5.30	30.0	-24.7
High	5825	5.73	30.0	-24.3

PSD

PSD, LOW CH

PSD, MID CH

PSD, HIGH CH

9.18. 802.11n HT40 MODE IN THE 5.8 GHz BAND

9.18.1. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

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

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	36.465	0.5
High	5795	36.465	0.5

6 dB BANDWIDTH

6 dB BANDWIDTH LOW CH

6 dB BANDWIDTH HIGH CH

9.18.2. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5755	41.7
High	5795	41.2

26 dB BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH HIGH CH

9.18.3. 99% BANDWIDTH

LIMITS

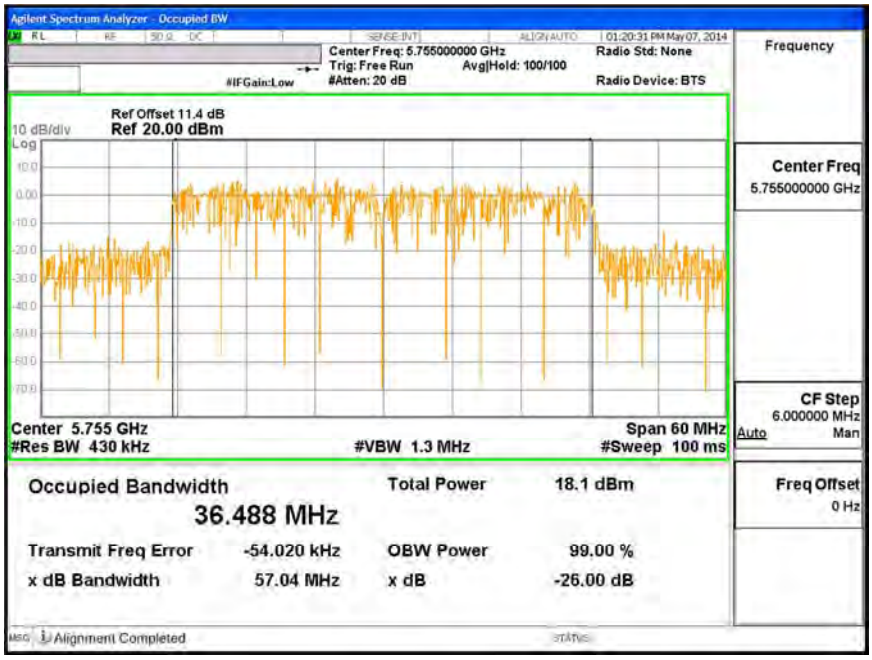
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5755	36.4880
High	5795	36.3890

99% BANDWIDTH

99% BANDWIDTH LOW CH



99% BANDWIDTH HIGH CH

9.18.4. OUTPUT POWER

LIMITS

FCC §15.407 (a) (3)

For the band 5.725–5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 30 dBm. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-1.40

RESULTS

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	13.12	13.12	30.00	-16.88
High	5795	15.19	15.19	30.00	-14.81

9.18.5. PSD

LIMITS

FCC §15.407 (a) (3)

For the band 5.725-5.825 GHz, the peak power spectral density shall not exceed 30 dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

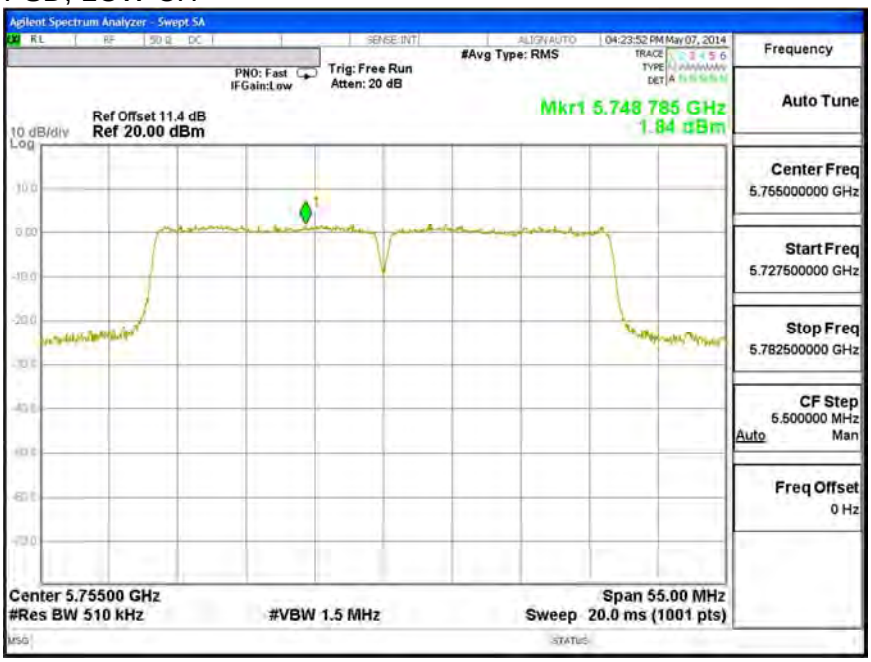
RESULTS

PSD Results

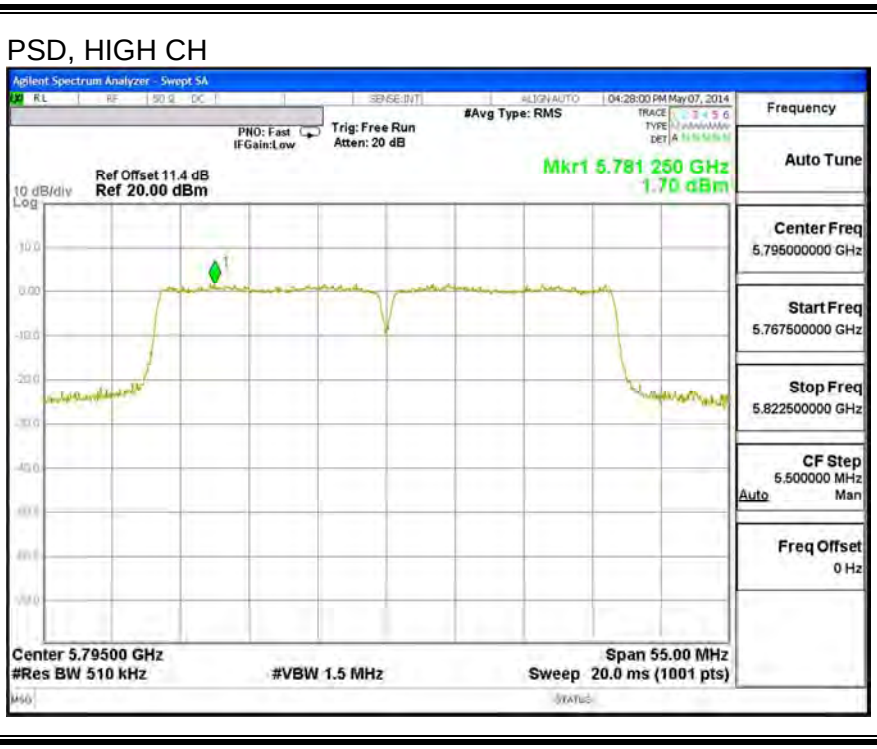
Channel	Frequency (MHz)	Meas PSD (dBm)	Limit (dBm)	Margin (dB)
Low	5755	1.84	30.0	-28.2
High	5795	1.70	30.0	-28.3

PSD

PSD, LOW CH



PSD, HIGH CH



9.19. 802.11ac 80 MODE IN THE 5.8 GHz BAND

9.19.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5775	82.5

26 dB BANDWIDTH

BANDWIDTH LOW CH

9.19.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
155	5775	75.520

99% BANDWIDTH

99% BANDWIDTH CH 155

9.19.3. OUTPUT POWER

LIMITS

FCC §15.407 (a) (3)

For the band 5.725-5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 30 dBm. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Antenna Gain (dBi)
-1.40

RESULTS

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5775	14.13	14.28	30.00	-15.72

9.19.4. PSD

LIMITS

FCC §15.407 (a) (3)

For the band 5.725-5.825 GHz, the peak power spectral density shall not exceed 30 dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RESULTS

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Limit (dBm)	Margin (dB)
155	5775	-1.68	30.0	-31.7

PSD

PSD, CH 155

10. RADIATED TEST RESULTS

10.1. 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.

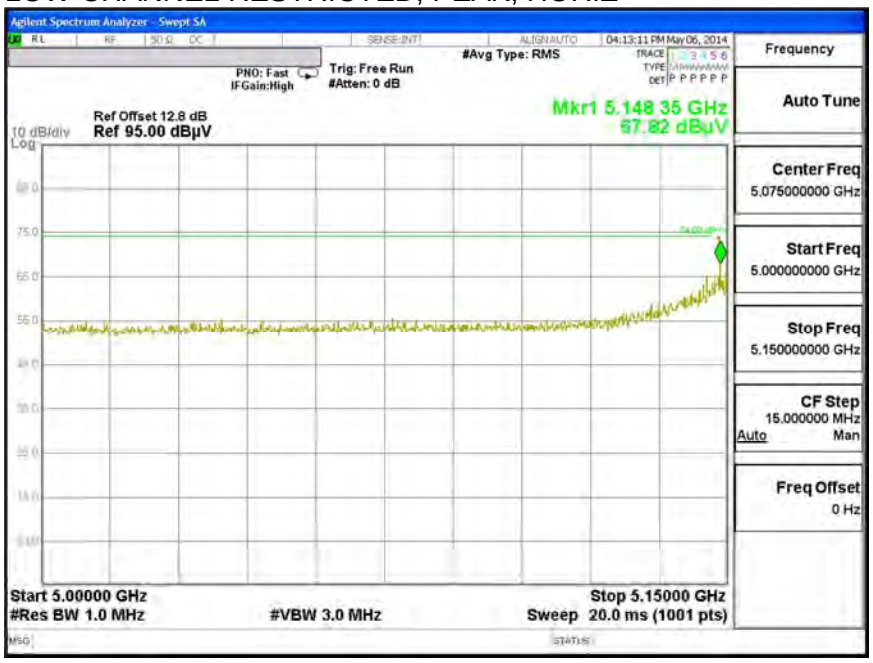
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.2 GHz BAND

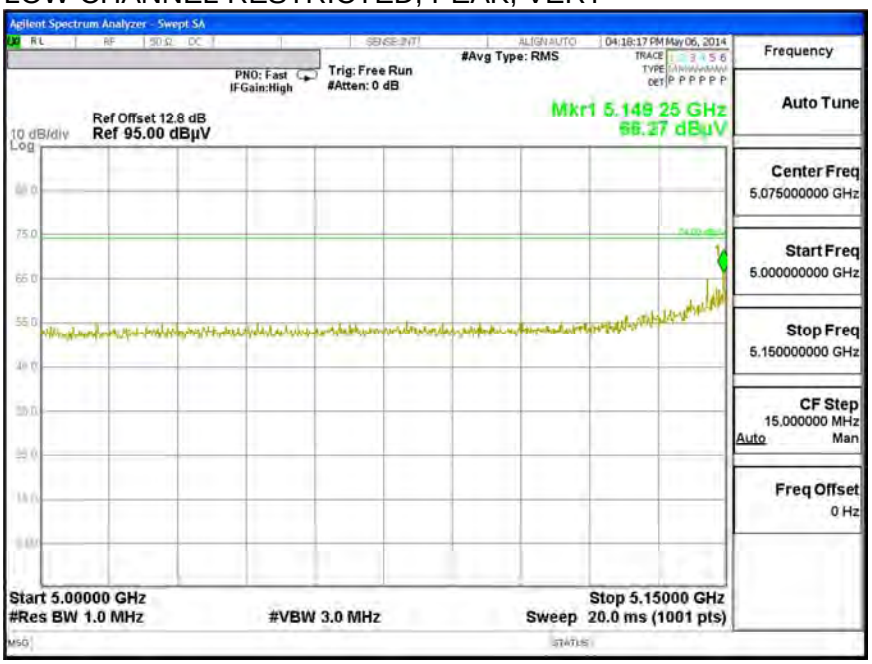
RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, PEAK, HORIZ



LOW CHANNEL RESTRICTED, AVERAGE, HORIZ

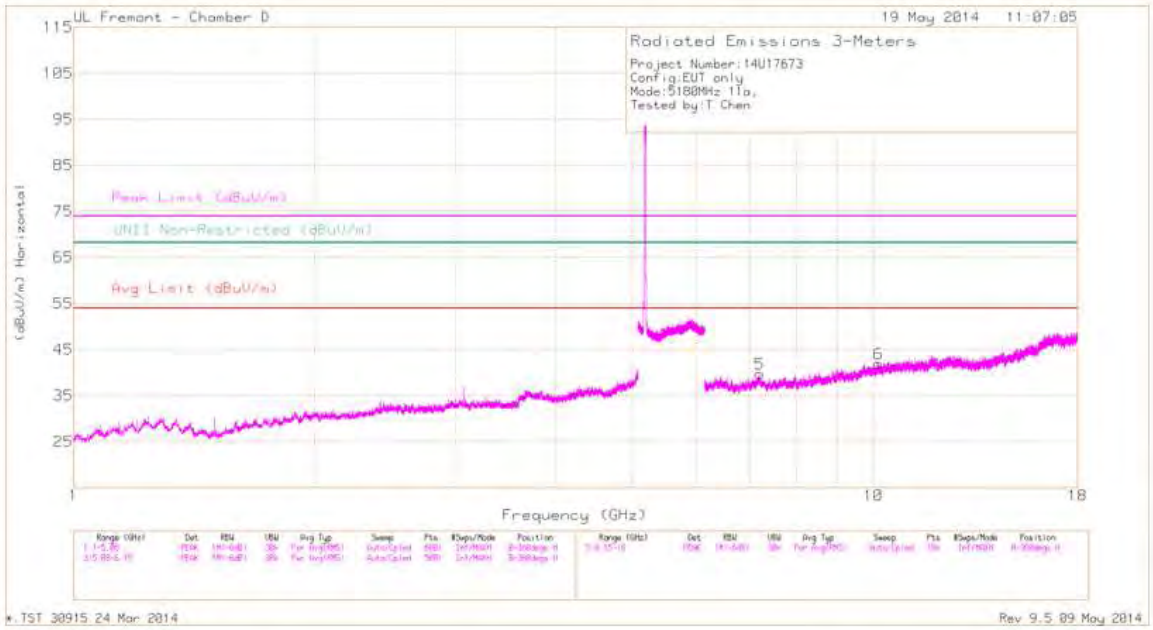
LOW CHANNEL RESTRICTED, PEAK, VERT



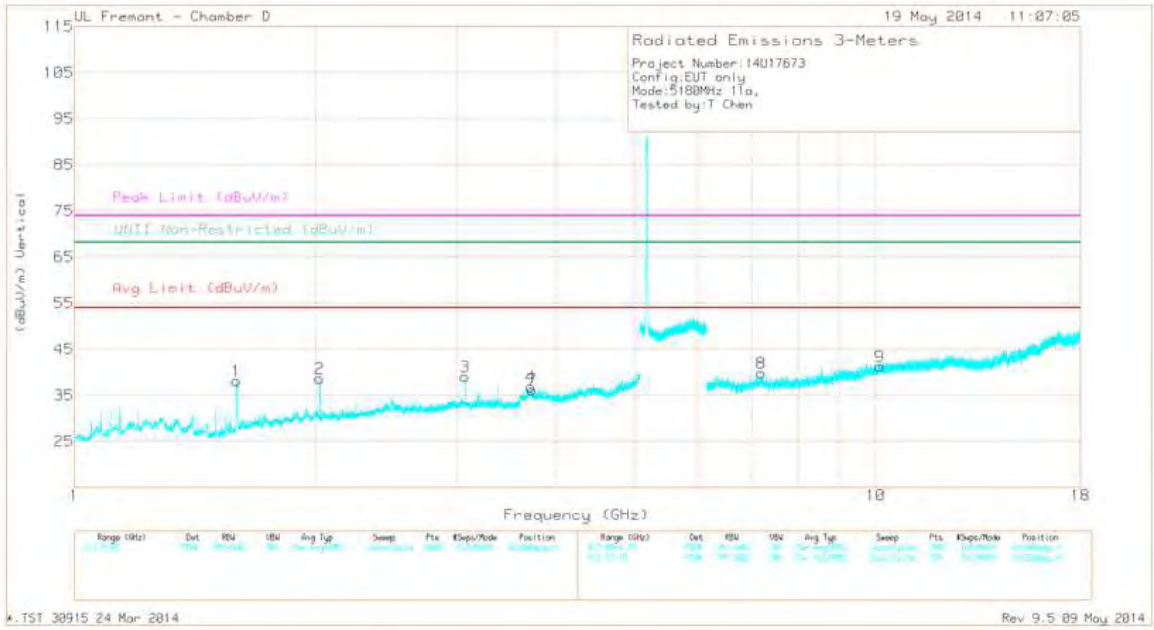
LOW CHANNEL RESTRICTED, AVERAGE, VERT

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT, CH 36



LOW CHANNEL VERTICAL PLOT, CH 36



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Flt r/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
1	* 1.596	47.39	PK1	27.9	-31.1	44.19	-	-	74	-29.81	-	-	195	141	V
	* 1.598	33.46	AD1	27.9	-31.1	30.26	54	-23.74	-	-	-	-	195	141	V
2	2.035	43.57	PK1	30.7	-30.7	43.57	-	-	-	-	68.2	-24.63	226	161	V
3	3.072	41.73	PK1	32.5	-29	45.23	-	-	-	-	68.2	-22.97	286	223	V
4	* 3.71	38.79	PK1	32.6	-28.4	42.99	-	-	74	-31.01	-	-	186	379	V
	* 3.711	27.34	AD1	32.6	-28.5	31.44	54	-22.56	-	-	-	-	186	379	V
5	7.205	35.59	PK1	35.1	-23.9	46.79	-	-	-	-	68.2	-21.41	286	223	H
6	10.152	33.96	PK1	36.9	-21.1	49.76	-	-	-	-	68.2	-18.44	286	223	H
7	* 3.714	39.59	PK1	32.6	-28.5	43.69	-	-	74	-30.31	-	-	186	379	V
	* 3.718	27.27	AD1	32.6	-28.6	31.27	54	-22.73	-	-	-	-	186	379	V
8	7.194	36.38	PK1	35.1	-23.8	47.68	-	-	-	-	68.2	-20.52	286	223	V
9	10.112	34.45	PK1	36.8	-21.6	49.65	-	-	-	-	68.2	-18.55	286	223	V

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

MID CHANNEL HORIZONTAL PLOT, CH 40

MID CHANNEL VERTICAL PLOT, CH 40

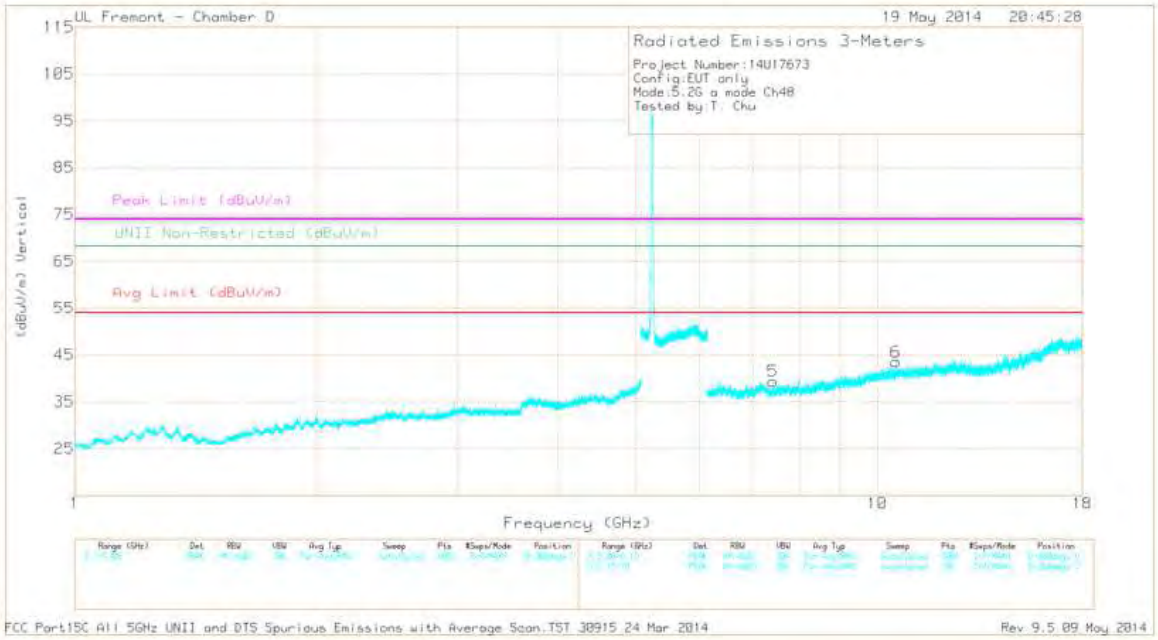
DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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
1	* 4.287	38.26	PK1	33	-27.7	43.56	-	-	74	-30.44	-	-	256	100	V
	* 4.289	27.18	AD1	33	-27.7	32.48	54	-21.52	-	-	-	-	256	100	V
2	* 12.073	34.18	PK1	38.3	-22.1	50.38	-	-	74	-23.62	-	-	256	100	V
	* 12.076	23.13	AD1	38.3	-22.1	39.33	54	-14.67	-	-	-	-	256	100	V
3	* 4.285	37.88	PK1	33	-27.7	43.18	-	-	74	-30.82	-	-	256	100	H
	* 4.293	27.2	AD1	33	-27.7	32.5	54	-21.5	-	-	-	-	256	100	H
4	* 4.285	37.88	PK1	33	-27.7	43.18	-	-	74	-30.82	-	-	256	100	H
	* 4.293	27.2	AD1	33	-27.7	32.5	54	-21.5	-	-	-	-	256	100	H
5	* 7.514	36.17	PK1	35.2	-25	46.37	-	-	74	-27.63	-	-	256	100	H
	* 7.518	25.38	AD1	35.2	-25.1	35.48	54	-18.52	-	-	-	-	256	100	H
6	10.01	33.97	PK1	36.8	-21.6	49.17	-	-	-	-	68.2	-19.03	12	202	H

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

HIGH CHANNEL HORIZONTAL PLOT, CH 48

HIGH CHANNEL VERTICAL PLOT, CH 48



DATA

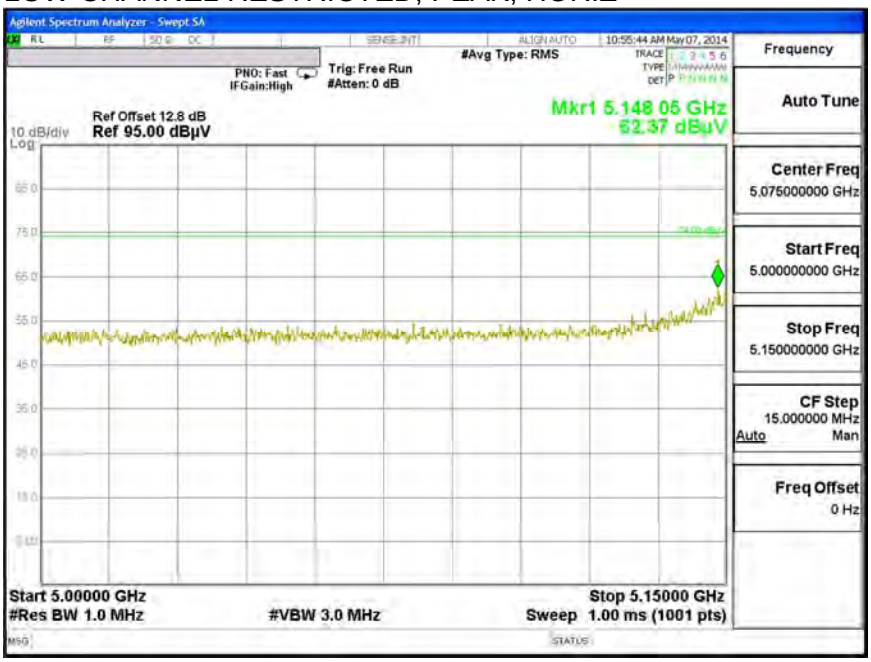
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.177	41.58	PK1	28.6	-32	0	38.18	-	-	74	-35.82	-	-	266	201	H
	* 1.178	29.19	AD1	28.6	-32	.1	25.89	54	-28.11	-	-	-	-	266	201	H
2	* 1.232	40.6	PK1	29.3	-31.8	0	38.1	-	-	74	-35.9	-	-	69	201	H
	* 1.231	29.07	AD1	29.3	-31.8	.1	26.67	54	-27.33	-	-	-	-	69	201	H
3	2.46	40.25	PK1	31.9	-29.8	0	42.35	-	-	-	-	68.2	-25.85	112	191	H
4	* 4.634	38.51	PK1	33.5	-26.7	0	45.31	-	-	74	-28.69	-	-	25	106	H
	* 4.634	26.45	AD1	33.5	-26.7	.1	33.35	54	-20.65	-	-	-	-	25	106	H
5	* 7.411	36.77	PK1	35.2	-25	0	46.97	-	-	74	-27.03	-	-	25	106	V
	* 7.412	25.53	AD1	35.2	-25	.1	35.83	54	-18.17	-	-	-	-	25	106	V
6	10.545	34.62	PK1	37.2	-21.6	0	50.22	-	-	-	-	68.2	-17.98	25	106	V

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

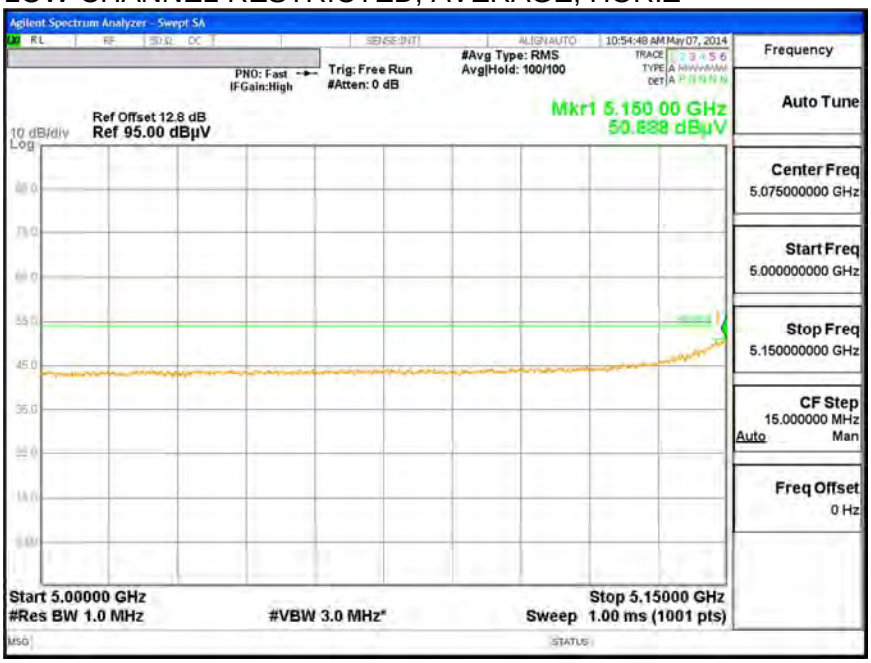
10.2.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

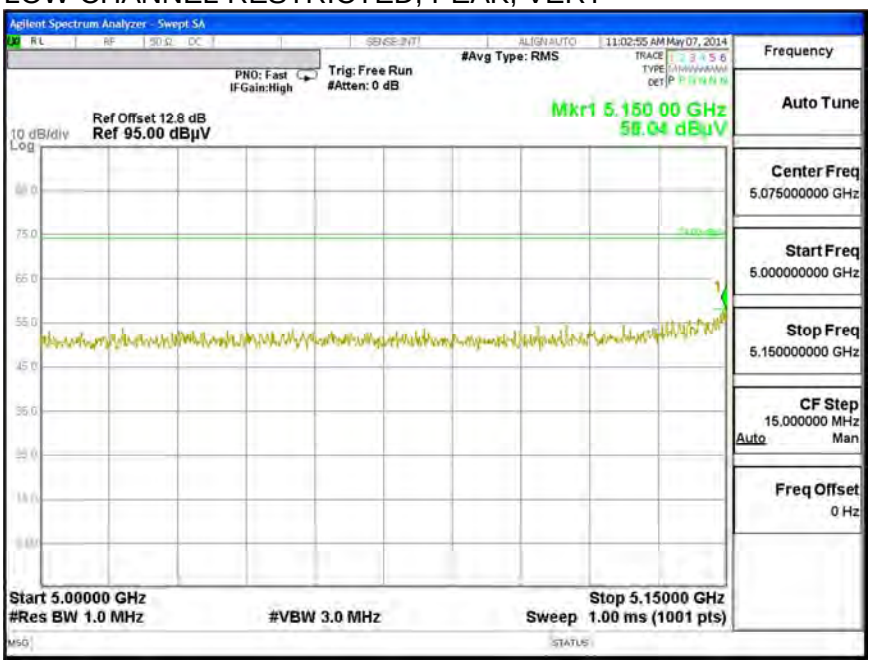
LOW CHANNEL RESTRICTED, PEAK, HORIZ



LOW CHANNEL RESTRICTED, AVERAGE, HORIZ



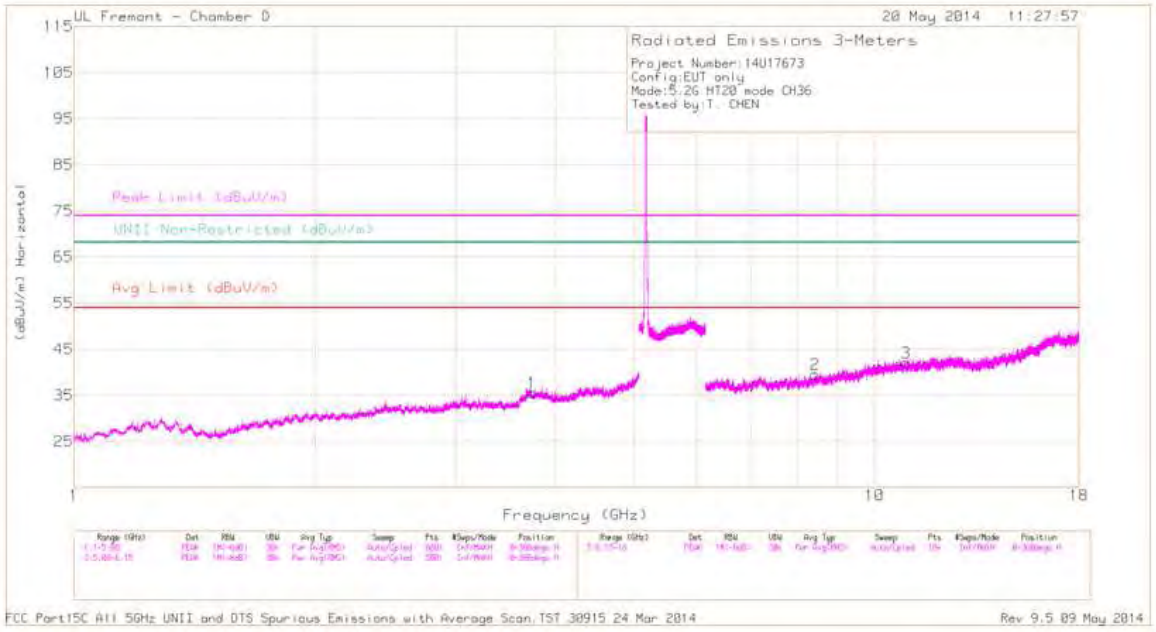
LOW CHANNEL RESTRICTED, PEAK, VERT



LOW CHANNEL RESTRICTED, AVERAGE, VERT

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT, CH 36



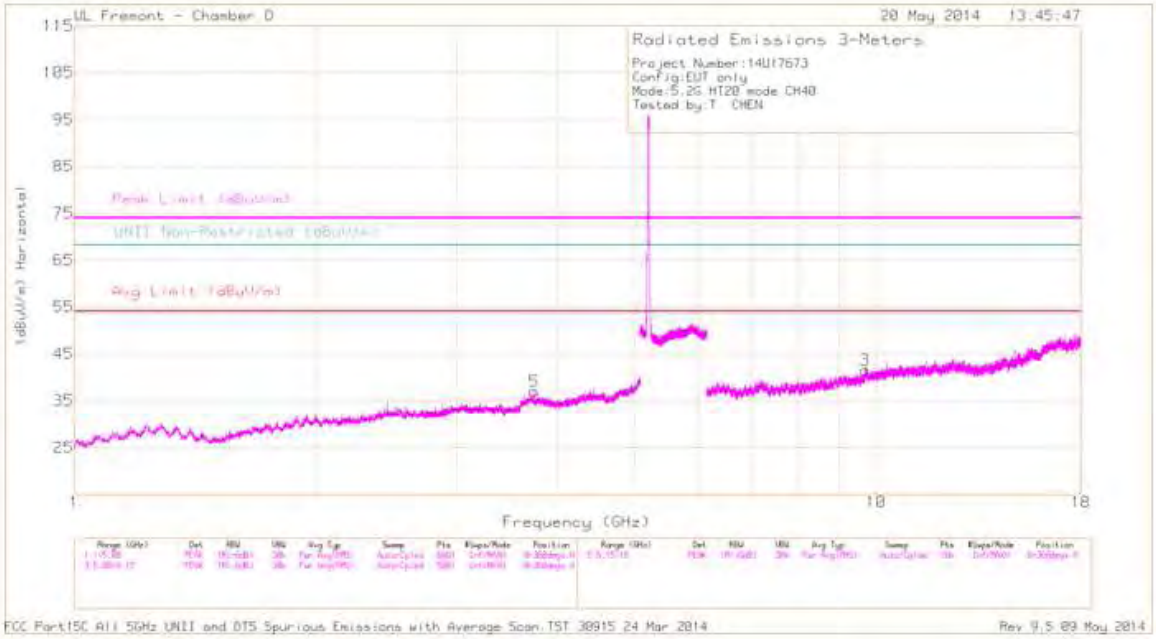
LOW CHANNEL VERTICAL PLOT, CH 36

DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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
1	* 3.735	38.13	PK1	32.7	-28.8	42.03	-	-	74	-31.97	-	-	92	202	H
	* 3.729	27.12	AD1	32.7	-28.7	31.12	54	-22.88	-	-	-	-	92	202	H
2	* 8.436	35.87	PK1	35.4	-24	47.27	-	-	74	-26.73	-	-	307	100	H
	* 8.437	24.63	AD1	35.4	-24	36.03	54	-17.97	-	-	-	-	307	100	H
3	* 10.999	34.7	PK1	37.5	-21.7	50.5	-	-	74	-23.5	-	-	307	100	H
	* 10.998	22.66	AD1	37.5	-21.7	38.46	54	-15.54	-	-	-	-	307	100	H
4	* 3.828	38.69	PK1	32.8	-28.7	42.79	-	-	74	-31.21	-	-	82	202	V
	* 3.826	27.62	AD1	32.8	-28.7	31.72	54	-22.28	-	-	-	-	82	202	V
5	8.56	24.12	AD1	35.4	-23.1	36.42	-	-	-	-	-	-	28	202	V
	8.561	35.32	PK1	35.4	-23.1	47.62	-	-	-	-	68.2	-20.58	28	202	V
6	* 11.018	34.29	PK1	37.5	-21.7	50.09	-	-	74	-23.91	-	-	28	202	V
	* 11.011	22.97	AD1	37.5	-21.7	38.77	54	-15.23	-	-	-	-	28	202	V

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

MID CHANNEL HORIZONTAL PLOT, CH 40



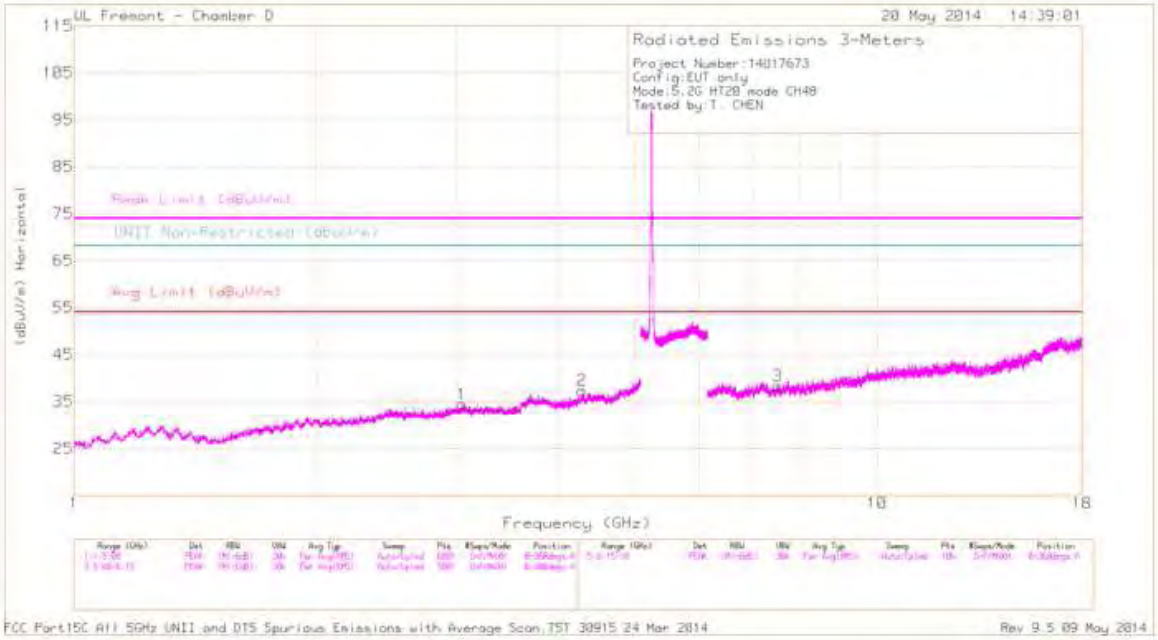
MID CHANNEL VERTICAL PLOT, CH 40

DATA

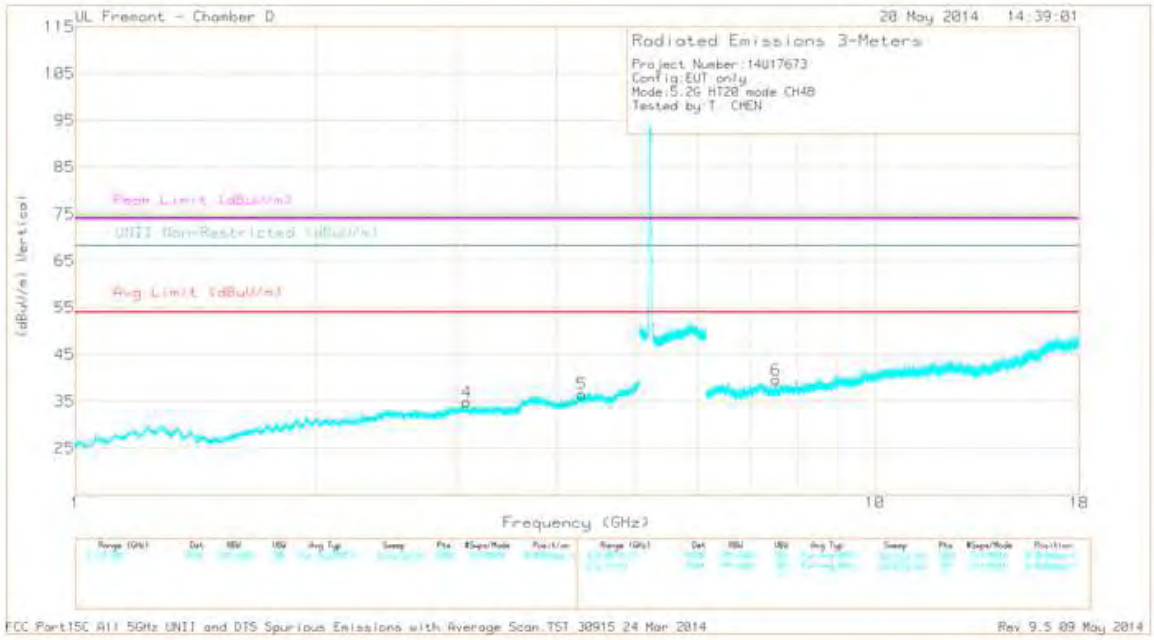
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.866	39.26	PK1	30	-30.7	38.56	-	-	-	-	68.2	-29.64	129	202	V
	1.866	28.02	AD1	30	-30.7	27.32	-	-	-	-	-	-	129	202	V
2	* 3.746	38.31	PK1	32.7	-28.8	42.21	-	-	74	-31.79	-	-	360	101	H
	* 3.739	26.95	AD1	32.7	-28.8	30.85	54	-23.15	-	-	-	-	360	101	H
3	9.678	34.16	PK1	36.3	-21.7	48.76	-	-	-	-	68.2	-19.44	60	200	H
	9.678	23.28	AD1	36.3	-21.7	37.88	-	-	-	-	-	-	60	200	H
4	2.459	39.9	PK1	31.9	-29.8	42	-	-	-	-	68.2	-26.2	60	200	V
	2.459	27.57	AD1	31.9	-29.8	29.67	-	-	-	-	-	-	60	200	V
5	* 3.712	38.95	PK1	32.6	-28.5	43.05	-	-	74	-30.95	-	-	123	182	V
	* 3.706	27.09	AD1	32.6	-28.4	31.29	54	-22.71	-	-	-	-	123	182	V
6	9.737	23	AD1	36.4	-21.4	38	-	-	-	-	-	-	301	200	V
	9.739	34.81	PK1	36.4	-21.4	49.81	-	-	-	-	68.2	-18.39	301	200	V

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

HIGH CHANNEL HORIZONTAL PLOT, CH 48



HIGH CHANNEL VERTICAL PLOT, CH 48



DATA

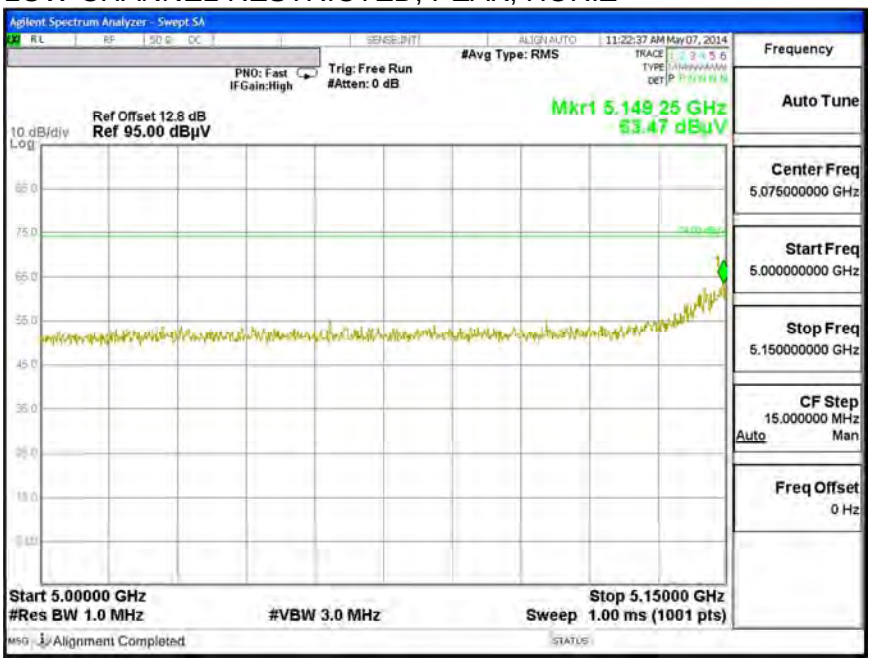
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.043	26.97	AD1	32.5	-28.7	30.77	-	-	-	-	-	-	318	100	H
	3.044	38.79	PK1	32.5	-28.7	42.59	-	-	-	-	68.2	-25.61	318	100	H
2	* 4.294	37.77	PK1	33	-27.7	43.07	-	-	74	-30.93	-	-	227	202	H
	* 4.293	26.69	AD1	33	-27.7	31.99	54	-22.01	-	-	-	-	227	202	H
3	* 7.514	36.05	PK1	35.2	-25	46.25	-	-	74	-27.75	-	-	341	100	H
	* 7.519	24.91	AD1	35.2	-25.1	35.01	54	-18.99	-	-	-	-	341	100	H
4	3.089	38.97	PK1	32.5	-29.3	42.17	-	-	-	-	68.2	-26.03	9	182	V
	3.091	27.17	AD1	32.5	-29.4	30.27	-	-	-	-	-	-	9	182	V
5	* 4.3	37.63	PK1	33	-27.8	42.83	-	-	74	-31.17	-	-	227	166	V
	* 4.299	27.02	AD1	33	-27.8	32.22	54	-21.78	-	-	-	-	227	166	V
6	* 7.524	36.16	PK1	35.2	-25.1	46.26	-	-	74	-27.74	-	-	181	202	V
	* 7.523	24.96	AD1	35.2	-25.1	35.06	54	-18.94	-	-	-	-	181	202	V

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

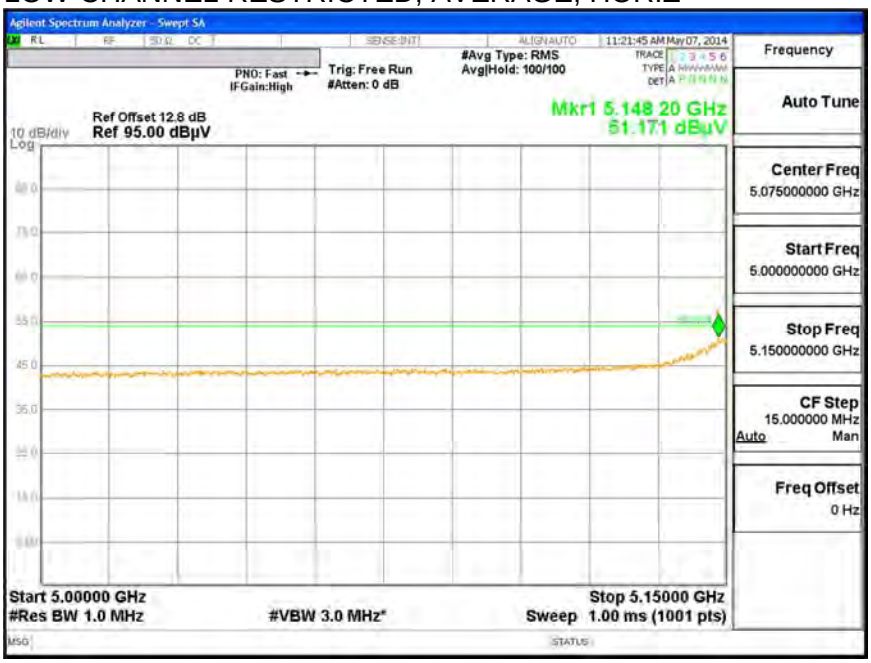
10.2.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

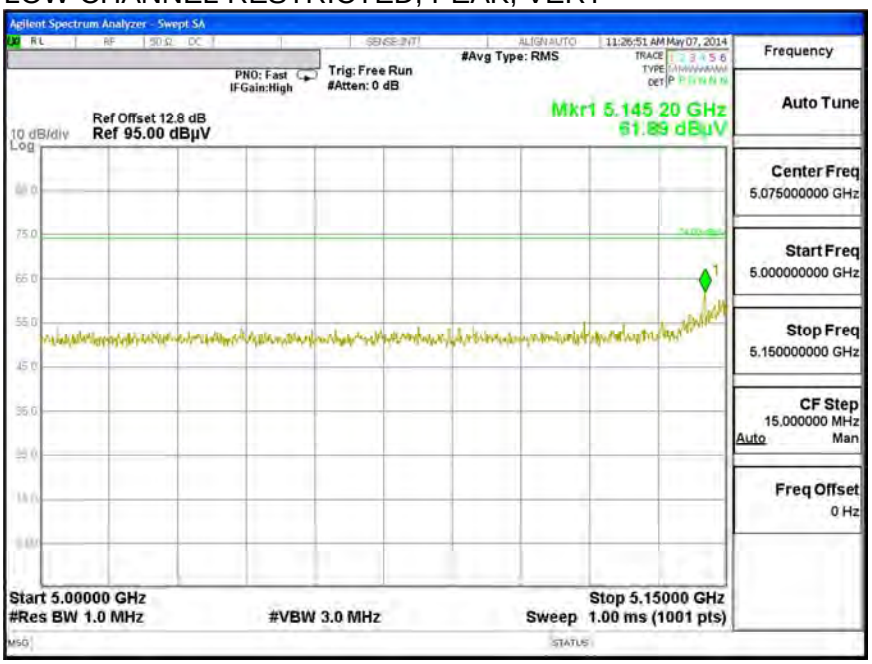
LOW CHANNEL RESTRICTED, PEAK, HORIZ



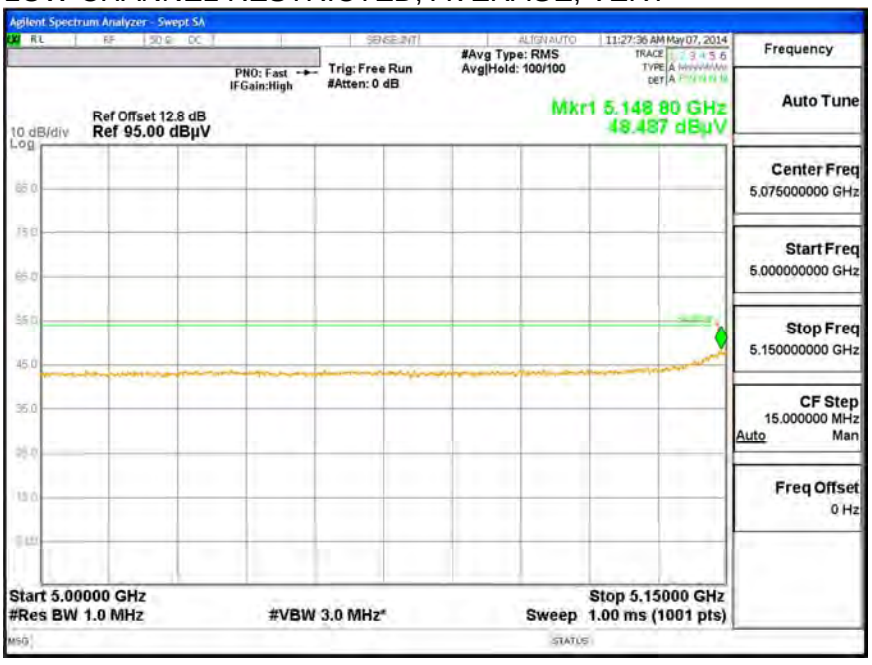
LOW CHANNEL RESTRICTED, AVERAGE, HORIZ



LOW CHANNEL RESTRICTED, PEAK, VERT



LOW CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT, CH 38

LOW CHANNEL VERTICAL PLOT, CH 38

DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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
* 4.555	38.15	PK1	33.5	-27.8	43.85	-	-	74	-30.15	-	-	0	202	H
* 4.556	27.27	AD1	33.5	-27.9	32.87	54	-21.13	-	-	-	-	0	202	H
* 4.854	38.61	PK1	33.5	-27.5	44.61	-	-	74	-29.39	-	-	125	202	H
* 4.857	27.16	AD1	33.5	-27.6	33.06	54	-20.94	-	-	-	-	125	202	H
* 4.322	37.31	PK1	33.1	-27.8	42.61	-	-	74	-31.39	-	-	72	100	V
* 4.324	26.26	AD1	33.1	-27.7	31.66	54	-22.34	-	-	-	-	72	100	V
1.881	39.57	PK1	30.1	-30.6	39.07	-	-	-	-	68.2	-29.13	331	133	V
1.885	28.22	AD1	30.1	-30.5	27.82	-	-	-	-	-	-	331	133	V
9.742	23.08	AD1	36.4	-21.5	37.98	-	-	-	-	-	-	126	100	V
9.744	34.15	PK1	36.4	-21.6	48.95	-	-	-	-	68.2	-19.25	126	100	V
9.827	35.08	PK1	36.5	-22.2	49.38	-	-	-	-	68.2	-18.82	189	202	H
9.829	23.22	AD1	36.5	-22.2	37.52	-	-	-	-	-	-	189	202	H

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

PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

HIGH CHANNEL HORIZONTAL PLOT, CH 46

HIGH CHANNEL VERTICAL PLOT, CH 46

DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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
* 2.696	38.17	PK1	31.7	-29.4	40.47	-	-	74	-33.53	-	-	237	100	H
* 2.706	27.18	AD1	31.6	-29.5	29.28	54	-24.72	-	-	-	-	237	100	H
* 4.397	37.82	PK1	33.3	-27.9	43.22	-	-	74	-30.78	-	-	205	100	H
* 4.397	26.89	AD1	33.3	-27.9	32.29	54	-21.71	-	-	-	-	205	100	H
* 3.686	38.04	PK1	32.6	-28.6	42.04	-	-	74	-31.96	-	-	205	100	V
* 3.694	27.61	AD1	32.6	-28.6	31.61	54	-22.39	-	-	-	-	205	100	V
* 4.568	38.36	PK1	33.5	-27.8	44.06	-	-	74	-29.94	-	-	311	100	V
* 4.57	27.31	AD1	33.5	-27.8	33.01	54	-20.99	-	-	-	-	311	100	V
8.551	35.42	PK1	35.4	-23	47.82	-	-	-	-	68.2	-20.38	151	100	H
8.555	24.1	AD1	35.4	-23	36.5	-	-	-	-	-	-	151	100	H
9.685	23.3	AD1	36.3	-21.6	38	-	-	-	-	-	-	151	167	V
9.693	34.32	PK1	36.4	-21.7	49.02	-	-	-	-	68.2	-19.18	151	167	V

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

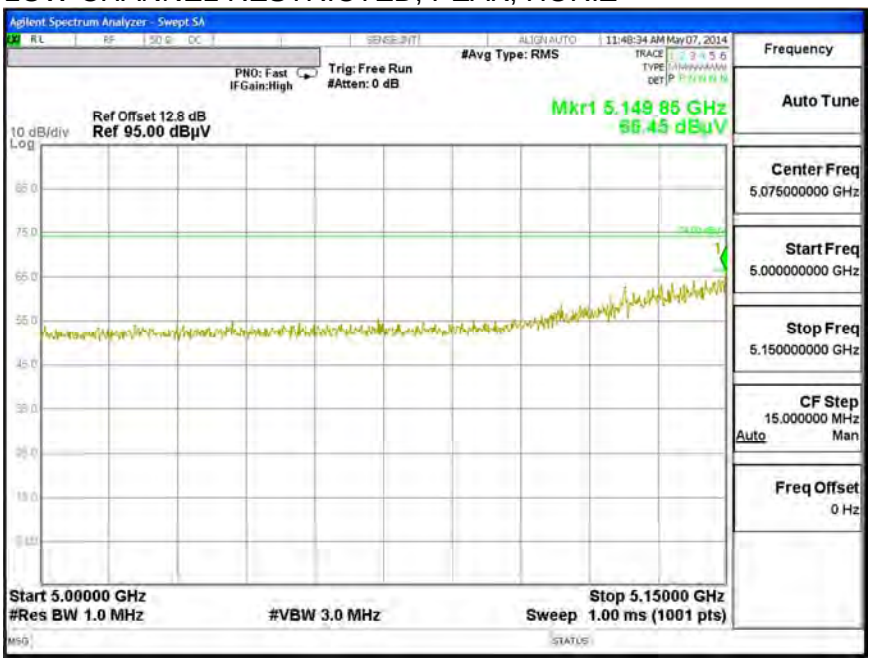
PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

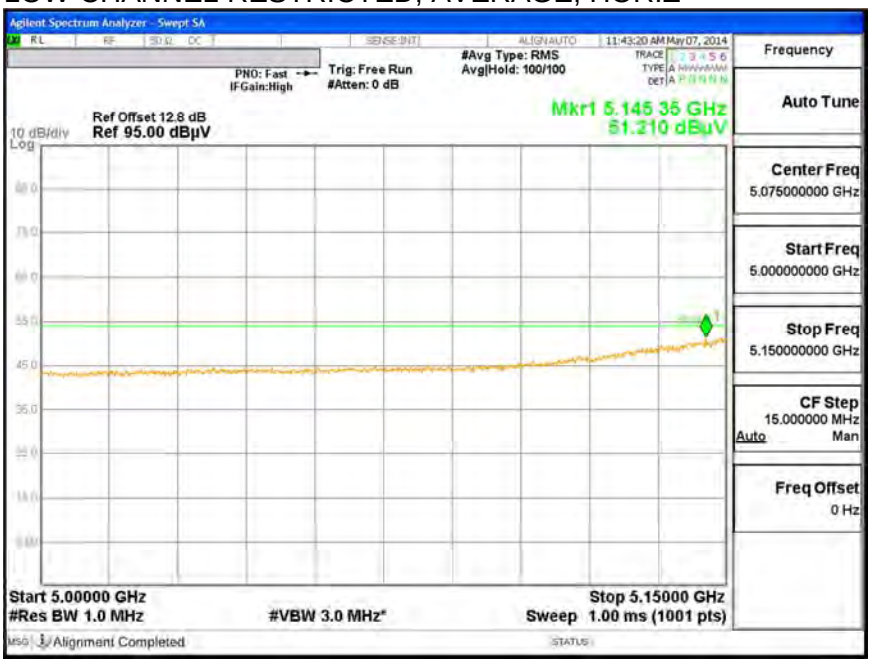
10.2.4. TX ABOVE 1G 802.11ac 80MHz MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, CH 42)

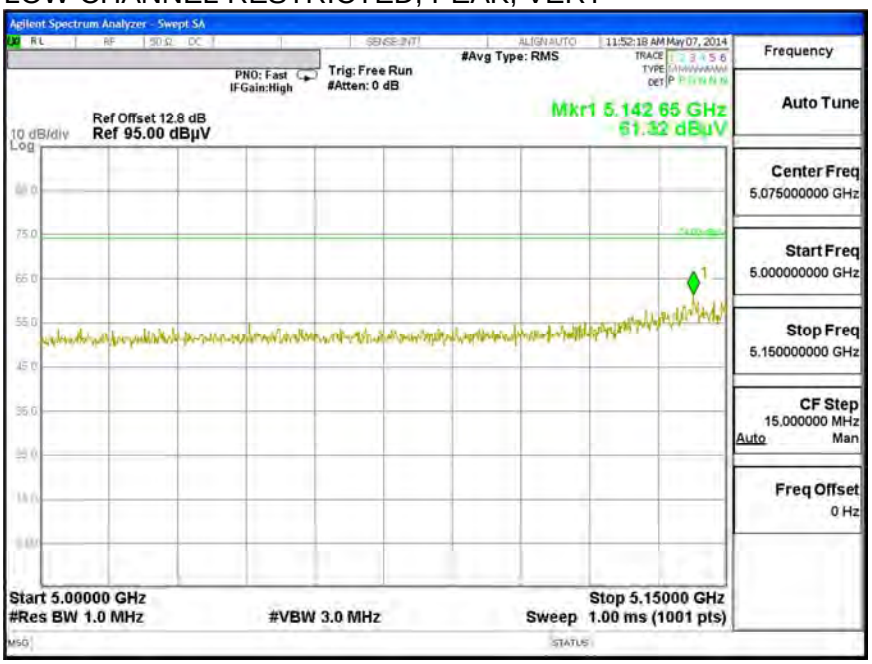
LOW CHANNEL RESTRICTED, PEAK, HORIZ



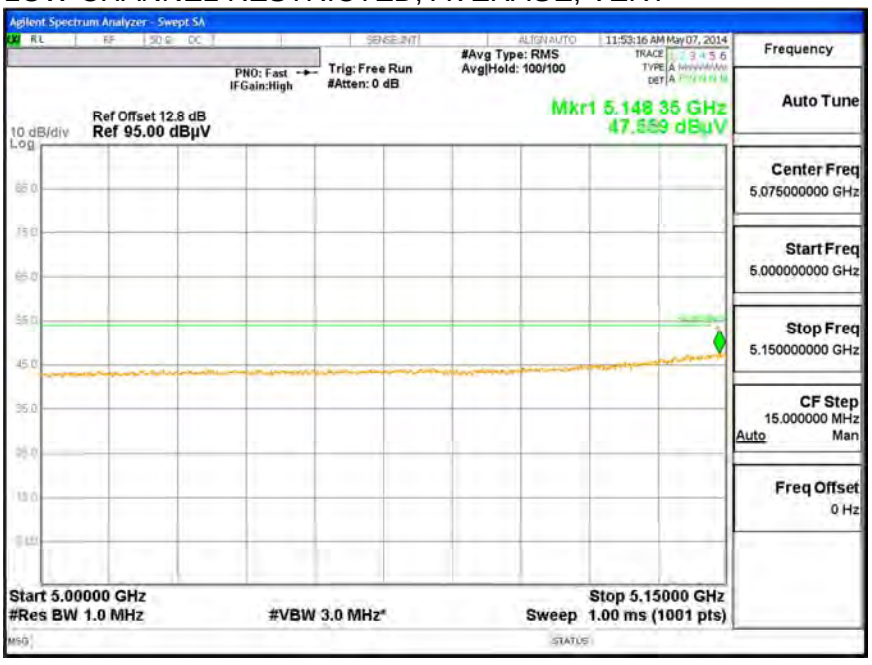
LOW CHANNEL RESTRICTED, AVERAGE, HORIZ



LOW CHANNEL RESTRICTED, PEAK, VERT



LOW CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT, CH 42

LOW CHANNEL VERTICAL PLOT, CH 42

DATA

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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
* 3.846	40.46	PK1	32.8	-28.7	44.56	-	-	74	-29.44	-	-	106	202	H
* 3.834	28.51	AD1	32.8	-28.6	32.71	54	-21.29	-	-	-	-	106	202	H
* 3.743	38.76	PK1	32.7	-28.8	42.66	-	-	74	-31.34	-	-	52	202	V
* 3.737	27.07	AD1	32.7	-28.8	30.97	54	-23.03	-	-	-	-	52	202	V
2.984	27.06	AD1	32.4	-29.1	30.36	-	-	-	-	-	-	176	100	H
2.988	38.41	PK1	32.5	-29.1	41.81	-	-	-	-	68.2	-26.39	176	100	H
3.036	38.67	PK1	32.5	-28.7	42.47	-	-	-	-	68.2	-25.73	52	202	V
3.042	26.82	AD1	32.5	-28.7	30.62	-	-	-	-	-	-	52	202	V
9.68	22.92	AD1	36.3	-21.6	37.62	-	-	-	-	-	-	323	202	H
9.682	34.88	PK1	36.3	-21.6	49.58	-	-	-	-	68.2	-18.62	323	202	H
9.722	23.06	AD1	36.4	-21.4	38.06	-	-	-	-	-	-	301	100	V
9.723	34.26	PK1	36.4	-21.4	49.26	-	-	-	-	68.2	-18.94	301	100	V

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

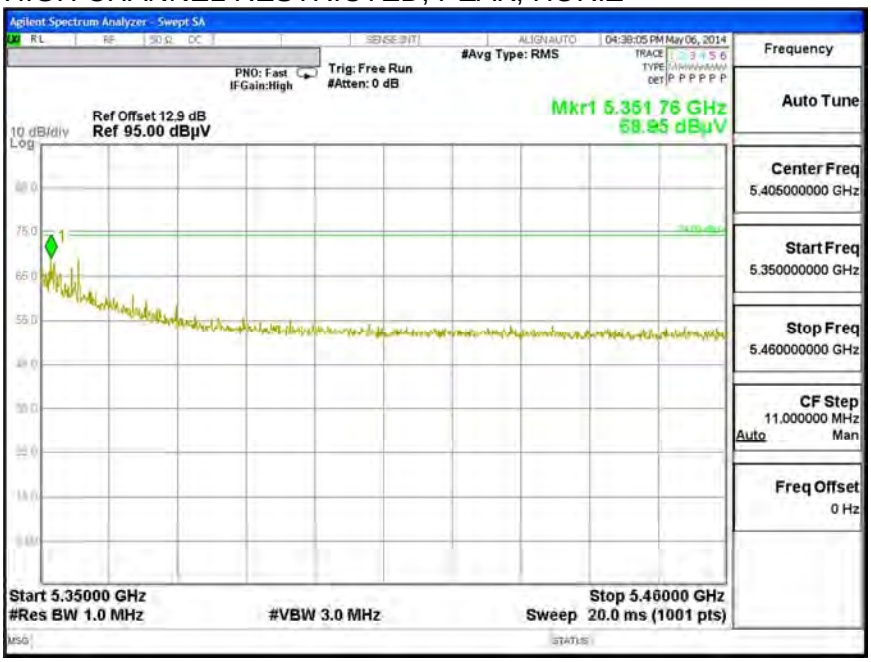
PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

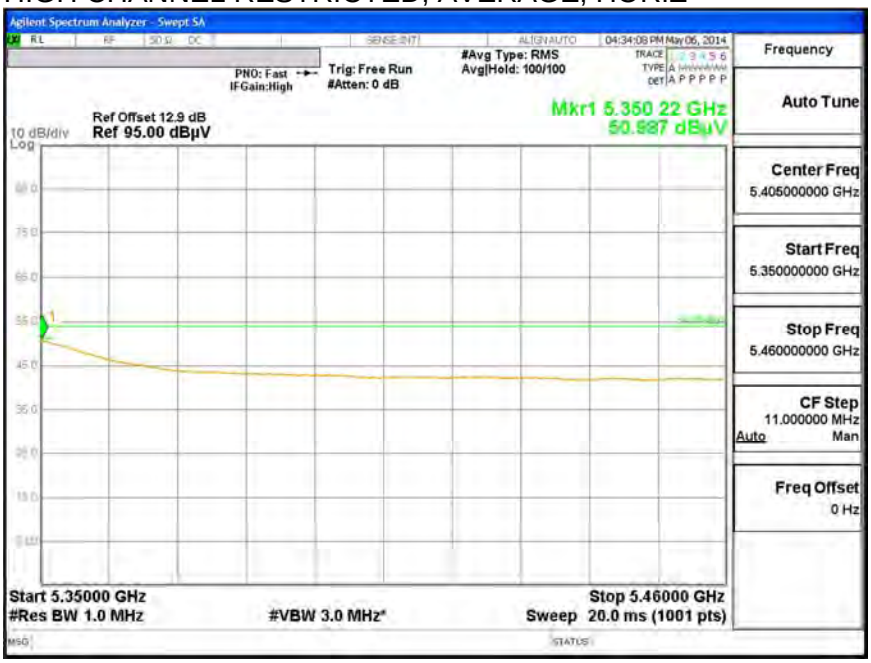
10.2.5. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)

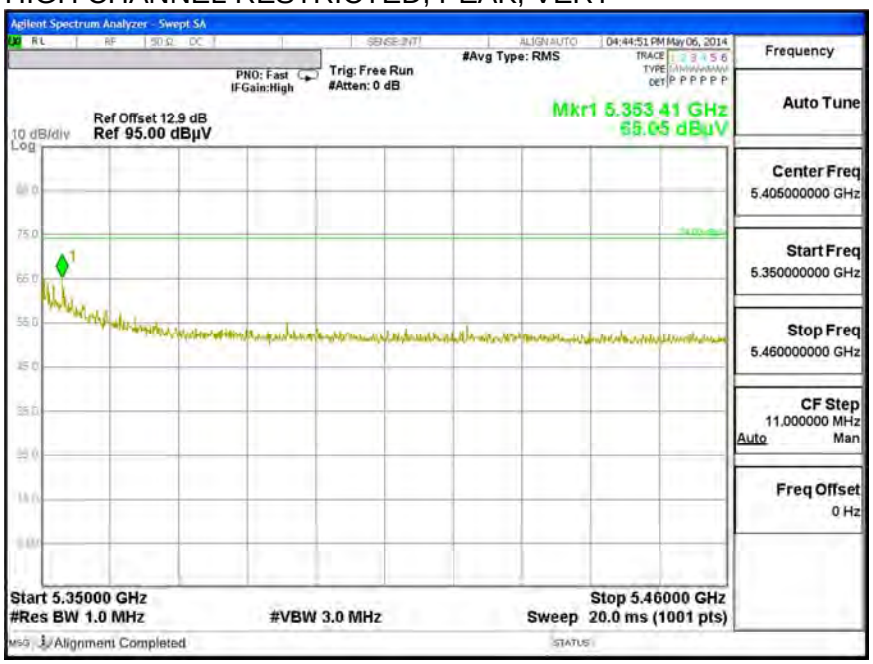
HIGH CHANNEL RESTRICTED, PEAK, HORIZ



HIGH CHANNEL RESTRICTED, AVERAGE, HORIZ



HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT