FCC 47 CFR PART 15 SUBPART E

CERTIFICATION TEST REPORT

FOR

CELLULAR PHONE WITH BLUETOOTH AND WLAN RADIOS

MODEL NUMBER: A1524

FCC ID: BCG-E2817A

REPORT NUMBER: 14U17676-E9, Revision C

ISSUE DATE: AUGUST 05, 2014

Prepared for
APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

Prepared by
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	7/28/2014	Initial Issue	D. Garcia
A	7/30/14	Product description updated, updated sections 1, 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, 9.11.3, 9.12.3, 9.13.3, 9.14.3, 9.15.3, 9.15.4, 9.16.4, 9.17.4, 9.18.4, 9.19.4, 10.2.17, 12	D. Garcia
B	08/02/14	Address TCB Questions	T. Lee
C	08/05/14	Update sections 5.2 and 5.5	D. Garcia

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

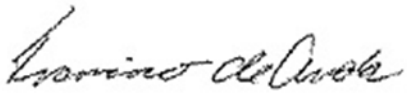
COMPANY NAME:	APPLE, INC. 1 INFINITE LOOP CUPERTINO, CA 95014, U.S.A.
EUT DESCRIPTION:	CELLULAR PHONE WITH BLUETOOTH AND WLAN RADIOS
MODEL:	A1524
SERIAL NUMBER:	C39MV097G1G3 (Conducted) C39MV004G2YF (Radiated)
DATE TESTED:	JUNE 3, 2014 TO JULY 24, 2014

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:

Chris Xiong
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, 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 E
☐ Chamber B	☒ Chamber F
☐ Chamber C	☐ Chamber G
☒ Chamber D	☒ 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 A1524 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 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	16.90	48.98
5180 - 5240	802.11n HT20	16.86	48.53
5190 - 5230	802.11n HT40	16.82	48.08
5210	802.11ac VHT80	12.78	18.97
5260 - 5320	802.11a	16.50	44.67
5260 - 5320	802.11n HT20	16.50	44.67
5270 - 5310	802.11n HT40	16.45	44.16
5290	802.11ac VHT80	12.86	19.32
5500 - 5700	802.11a	16.94	49.43
5500 - 5700	802.11n HT20	16.96	49.66
5720	802.11n HT20	15.98	39.63
5510 - 5670	802.11n HT40	16.98	49.89
5710	802.11n HT40	14.95	31.26
5530	802.11ac VHT80	12.98	19.86
5690	802.11ac VHT80	12.92	19.59
5745 - 5825	802.11a	16.83	48.19
5745 - 5825	802.11n HT20	16.93	49.32
5755 - 5795	802.11n HT40	16.93	49.32
5775	802.11ac VHT80	12.89	19.45

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	-2.56
5250 -- 5350	-1.46
5500 -- 5700	-0.44
5725 -- 5850	-0.87

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 X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X (Flatbed) orientation.

Worst-case data rates as provided by the client were:
Based on the baseline scan, the worst-case data rates were:

802.11a mode: 6 Mbps
802.11n HT20mode: MCS0
802.11n HT40mode: MCS0
802.11ac VHT80mode: 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.
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5.6. DESCRIPTION OF TEST SETUP

CONDUCTED TESTS SUPPORT EQUIPMENT

Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	T61	00044-315-135-244	MCLJ07H081
AC Adapter	Lenovo	N/A	92P1213	N/A
DC Power Supply	Sorensen	XT 15-4	1319A02780	N/A

RADIATED TESTS SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST			
Description	Manufacturer	Model	Serial Number
Earphone	Apple	N/A	N/A
AC Adpater	Apple	A1344	N/A

I/O CABLES (RF 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
3	DC	1	n/a	Un-Shielded	0.5	Power supply to EUT

I/O CABLES (RF Radiated Test)

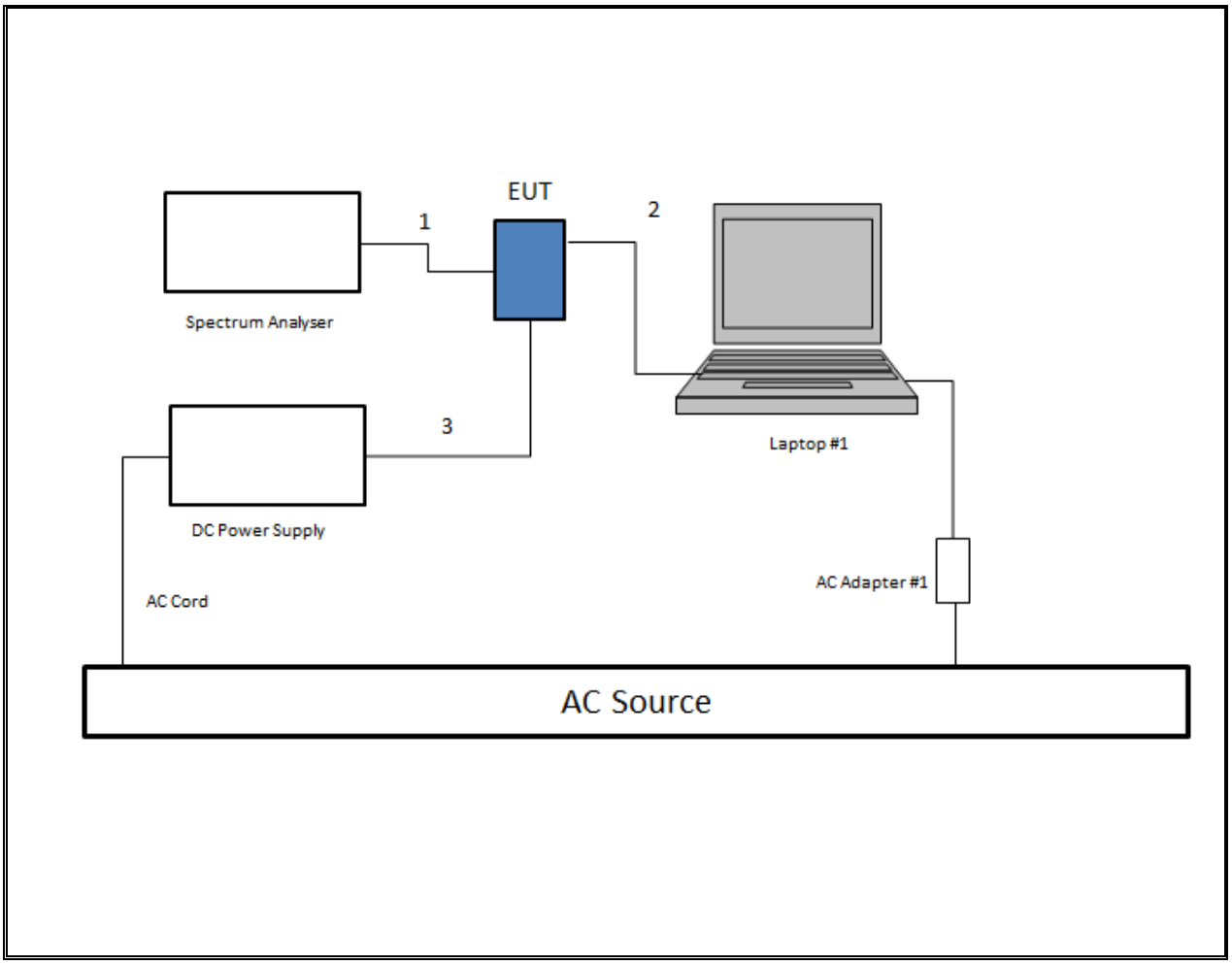
I/O CABLE LIST						
Cable No.	Port	# of Identica Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	2	US 115V	Un-shielded	2m	NA
2	DC	1	US 115V	Un-shielded	1m	NA
3	Jack	1	Earphone	Un-shielded	0.5m	NA
4	RF In/Out	1	Antenna	Un-shielded	none	NA

TEST SETUP

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.

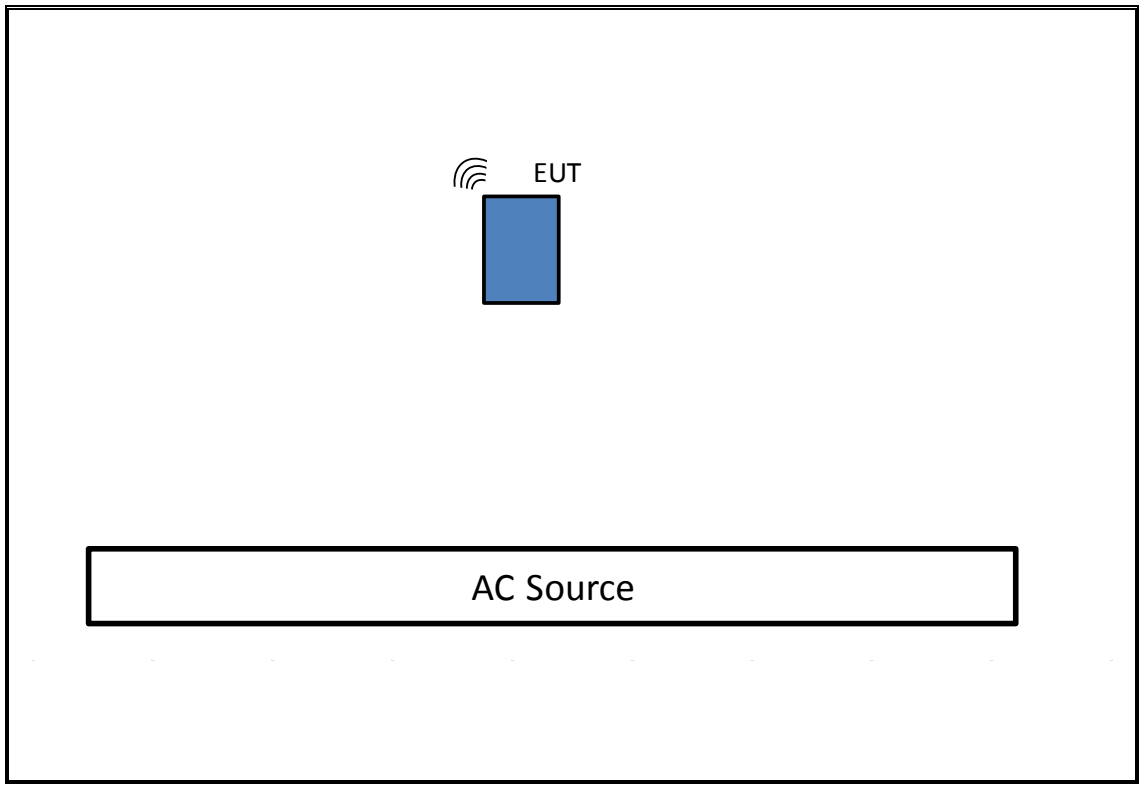
SETUP DIAGRAM



TEST SETUP- RADIATED-ABOVE 1 GHZ

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

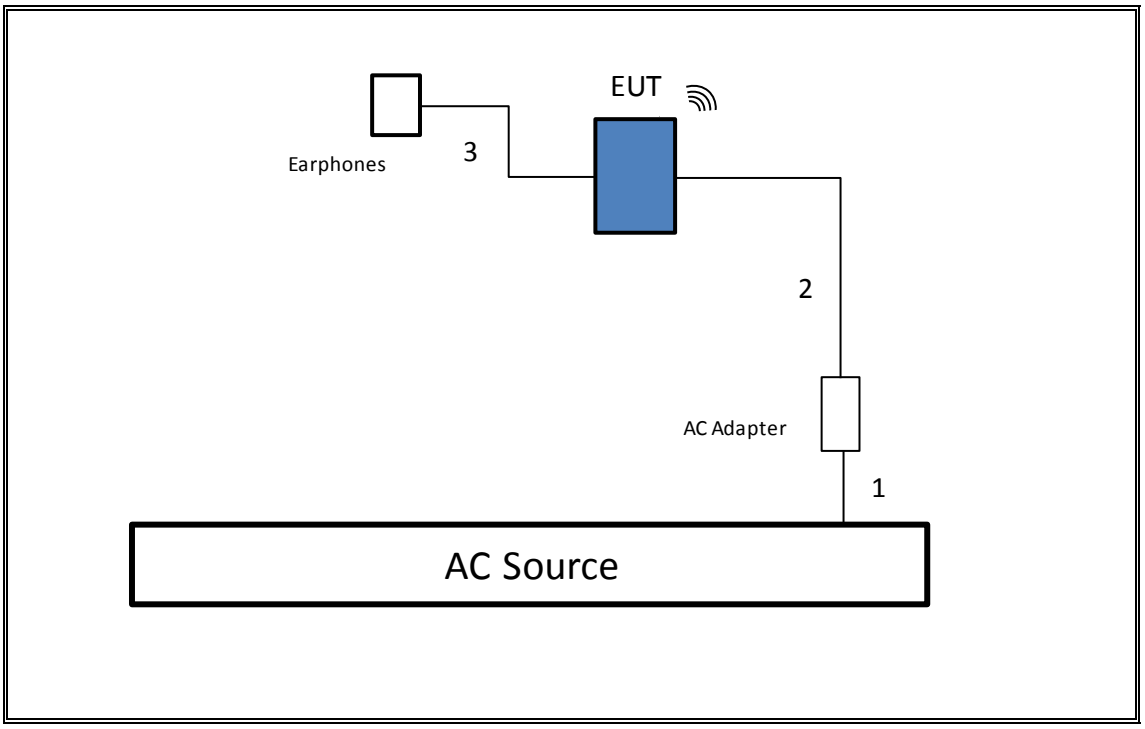
SETUP DIAGRAM



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	06/28/15
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	06/25/15
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	F00411	03/21/15
Spectrum Analyzer, 40 GHz	Agilent / HP	8564E	C00951	07/29/14
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	2.064	2.094	0.986	98.57%	0.00	0.010
802.11n HT20 1TX	1.915	1.945	0.985	98.46%	0.00	0.010
802.11n HT40 1TX	1.003	1.023	0.980	98.04%	0.00	0.010
802.11ac VHT80 1TX	0.460	0.479	0.960	96.03%	0.18	2.175

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	21.15
Mid	5200	21.40
High	5240	21.95

26 dB BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH MID CH

BANDWIDTH HIGH CH

9.1.2. 99% BANDWIDTH

LIMITS

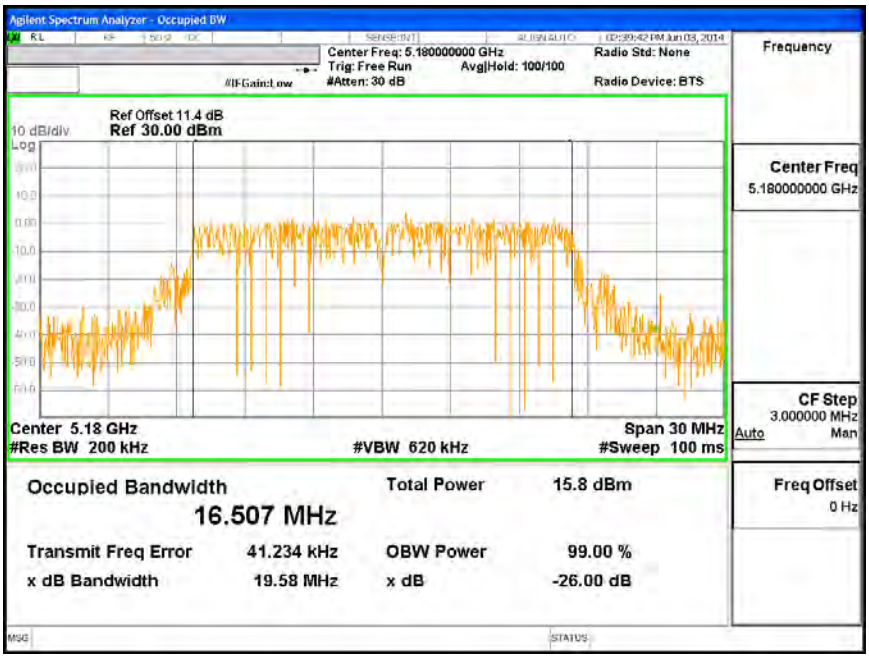
None; for reporting purposes only.

RESULTS

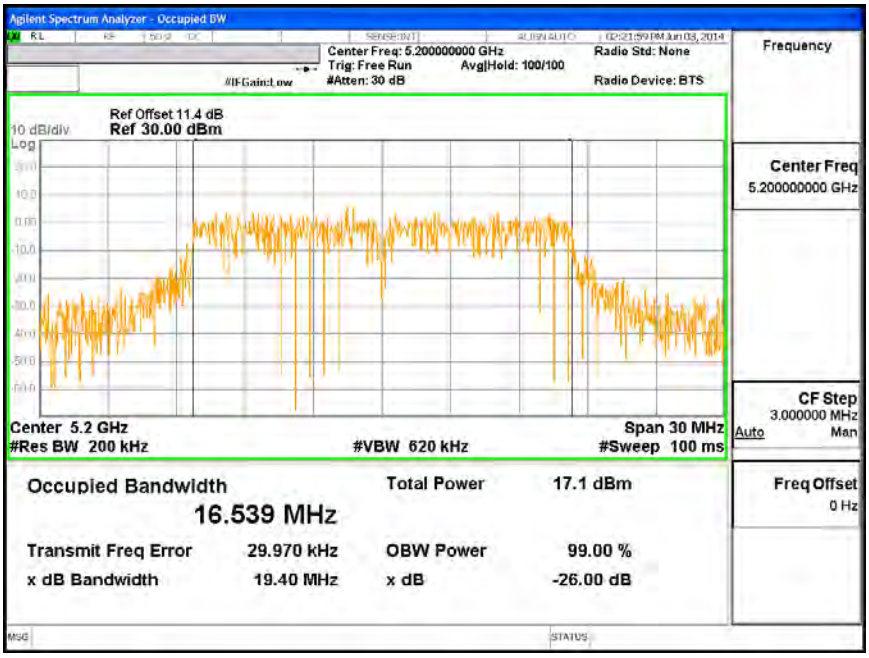
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	16.507
Mid	5200	16.539
High	5240	16.531

99% BANDWIDTH

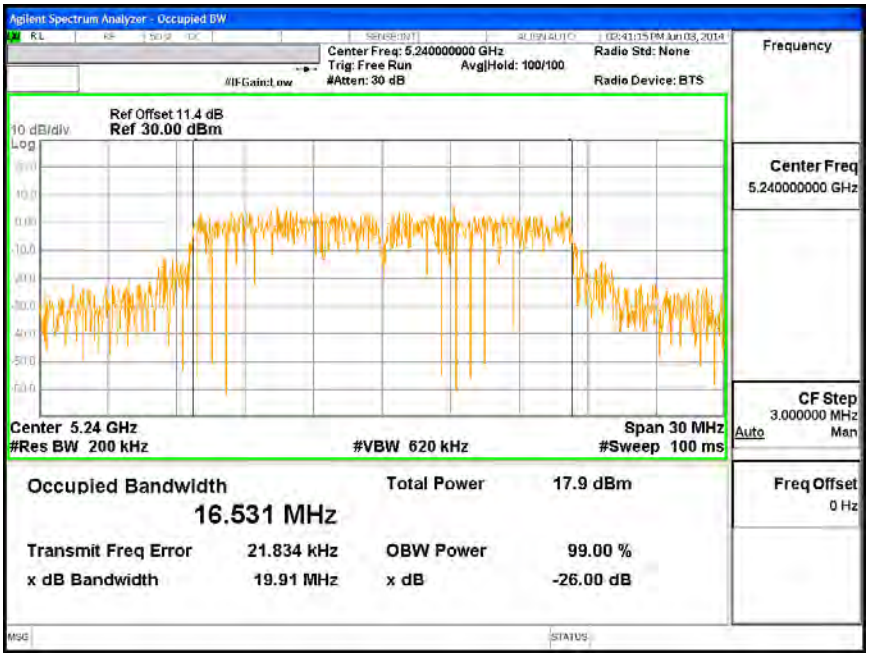
BANDWIDTH LOW CH



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 11.2 dB (including 10 dB pad and 1.2 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)
-2.56

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5180	15.98	24.00	-8.02
Mid	5200	16.89	24.00	-7.11
High	5240	16.90	24.00	-7.10

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)
-2.56

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	21.15	16.507	-2.56
Mid	5200	21.40	16.539	-2.56
High	5240	21.95	16.531	-2.56

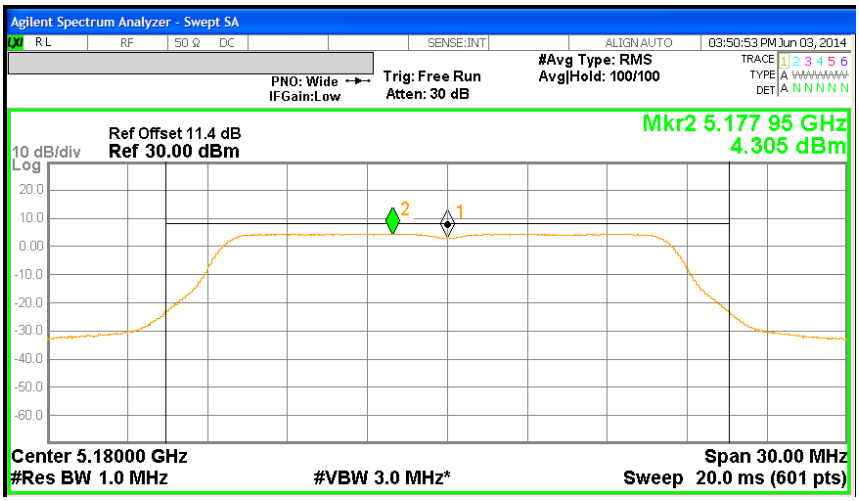
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PSD

PSD Results

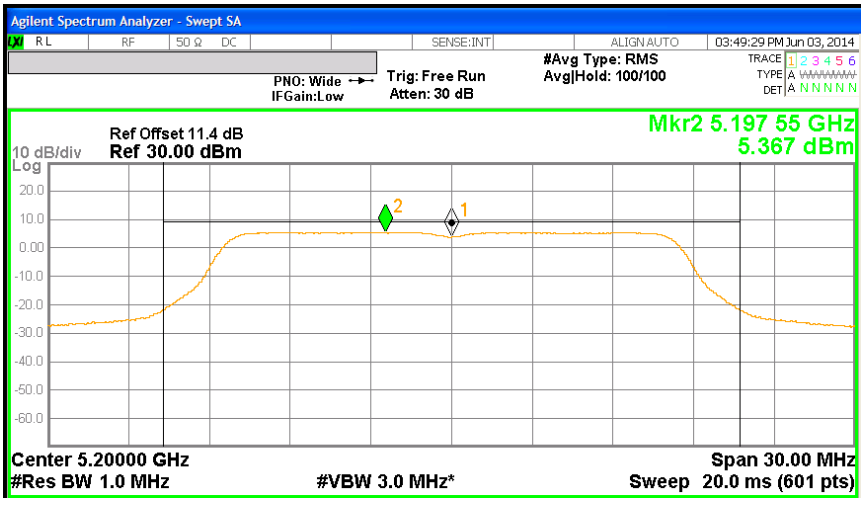
Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	4.305	4.31	11.00	-6.70
Mid	5200	5.367	5.37	11.00	-5.63
High	5240	6.439	6.44	11.00	-4.56

PSD

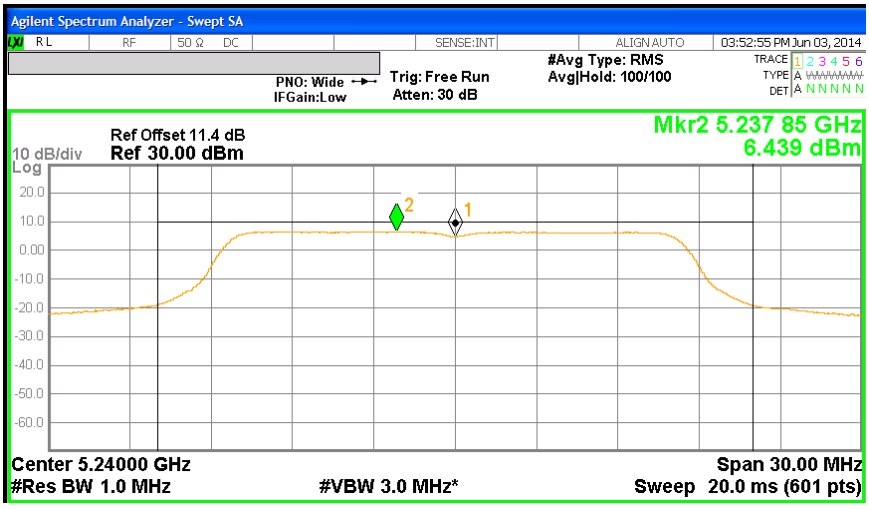
PSD LOW CH



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

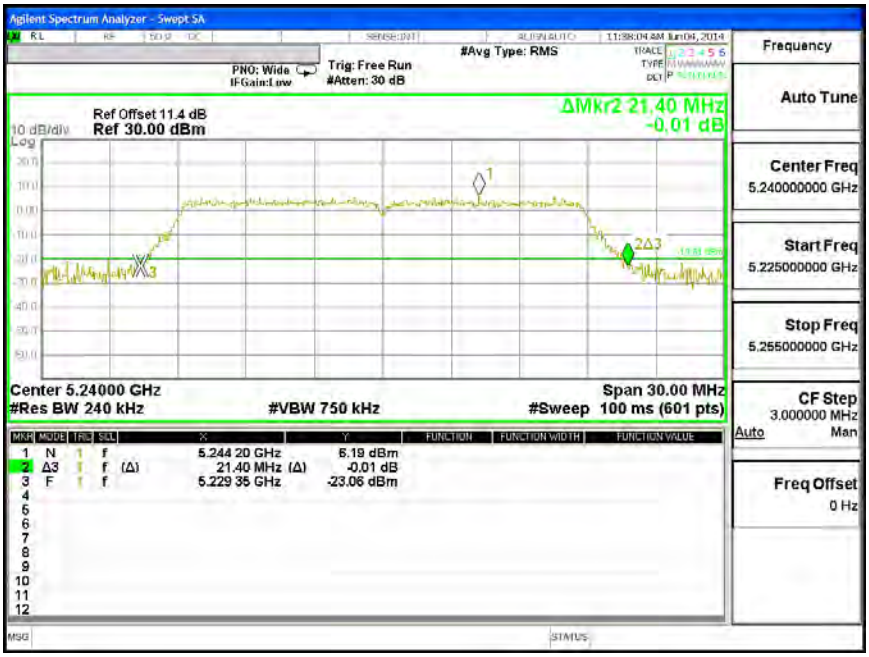
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	21.50
Mid	5200	22.60
High	5240	21.40

26 dB BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH MID CH

BANDWIDTH HIGH CH



9.2.2. 99% BANDWIDTH

LIMITS

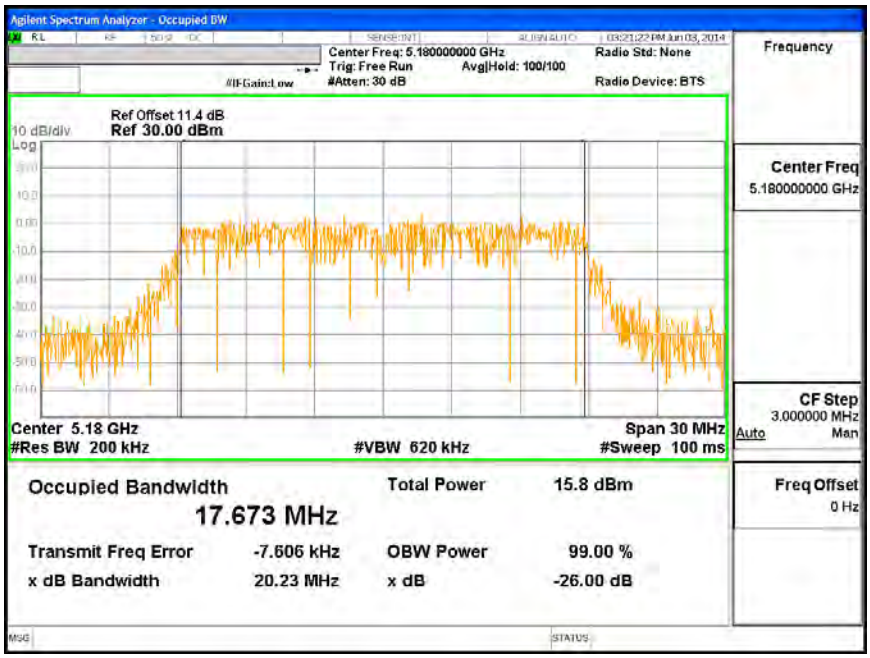
None; for reporting purposes only.

RESULTS

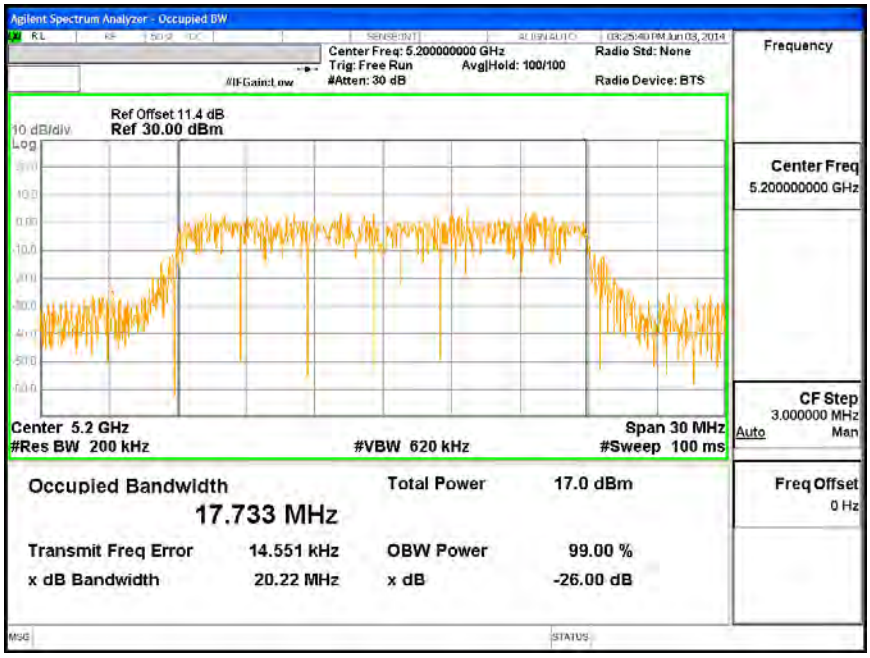
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	17.673
Mid	5200	17.733
High	5240	17.714

99% BANDWIDTH

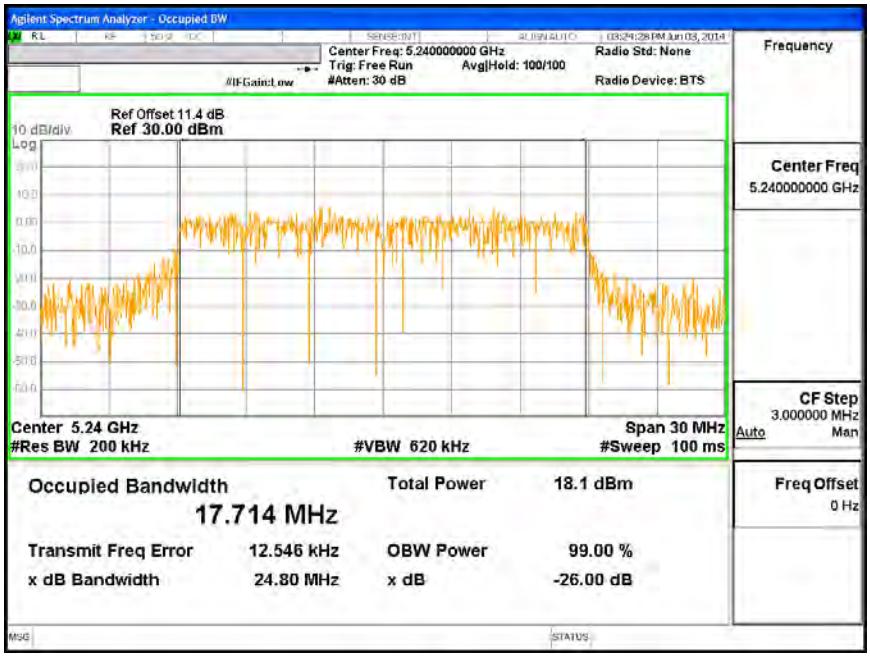
BANDWIDTH LOW CH



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 11.2 dB (including 10 dB pad and 1.2 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)
-2.56

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5180	15.98	24	-8.02
Mid	5200	16.86	24	-7.14
High	5240	16.80	24	-7.20

9.2.4. PSD

LIMITS

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)
-2.56

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	21.50	17.673	-2.56
Mid	5200	22.60	17.733	-2.56
High	5240	21.40	17.714	-2.56

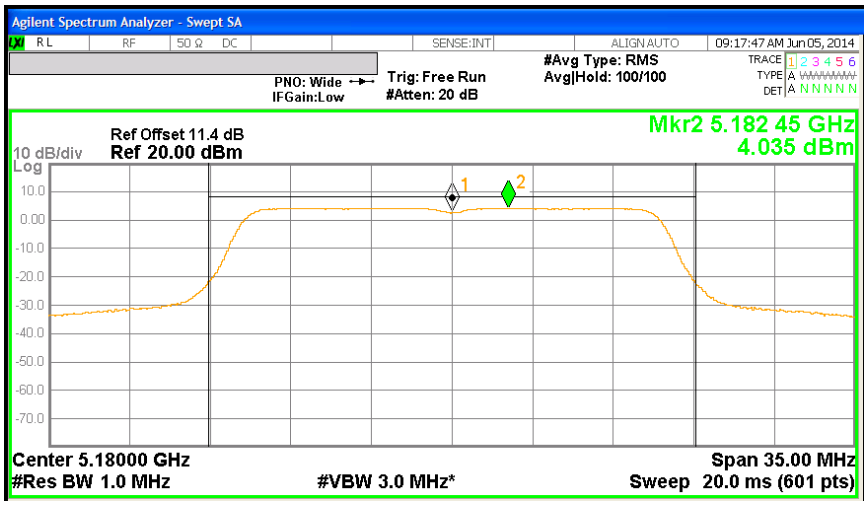
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PSD

PSD Results

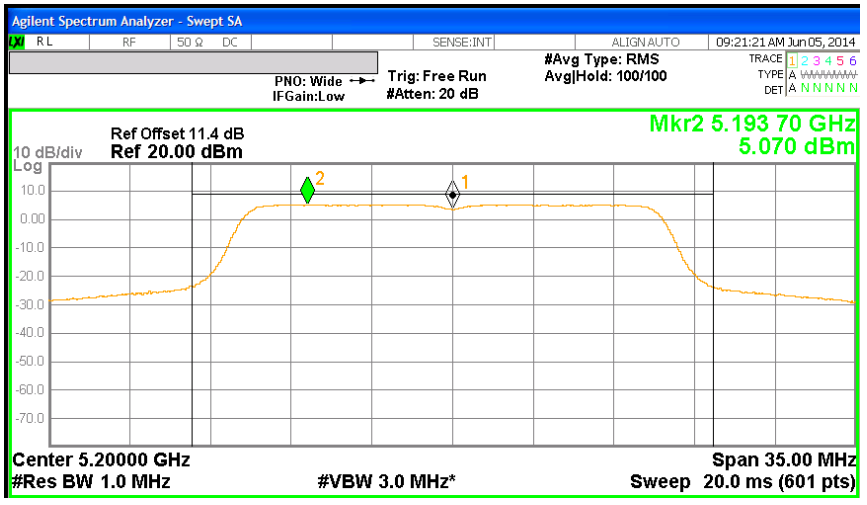
Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	4.035	4.04	11.00	-6.97
Mid	5200	5.070	5.07	11.00	-5.93
High	5240	6.026	6.03	11.00	-4.97

PSD

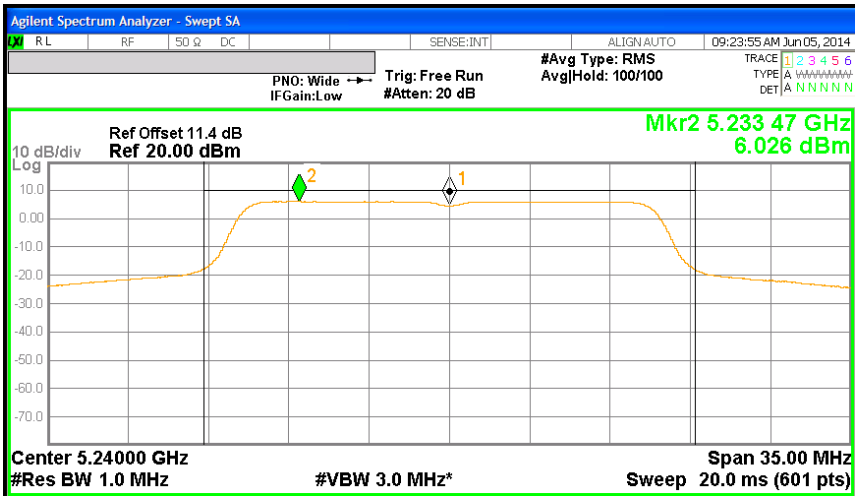
PSD LOW CH



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	40.95
High	5230	41.06

26 dB BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH HIGH CH

9.3.2. 99% BANDWIDTH

LIMITS

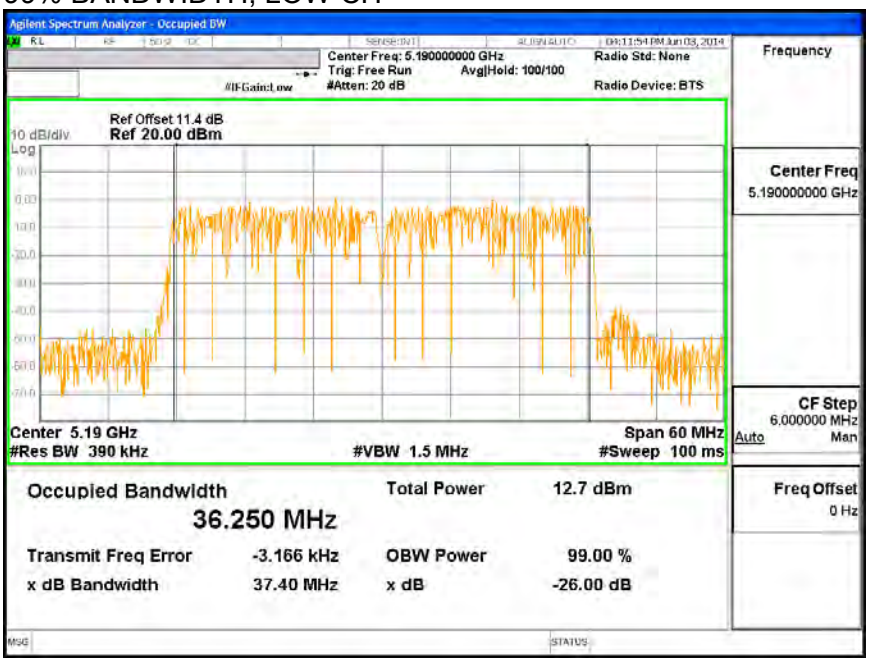
None; for reporting purposes only.

RESULTS

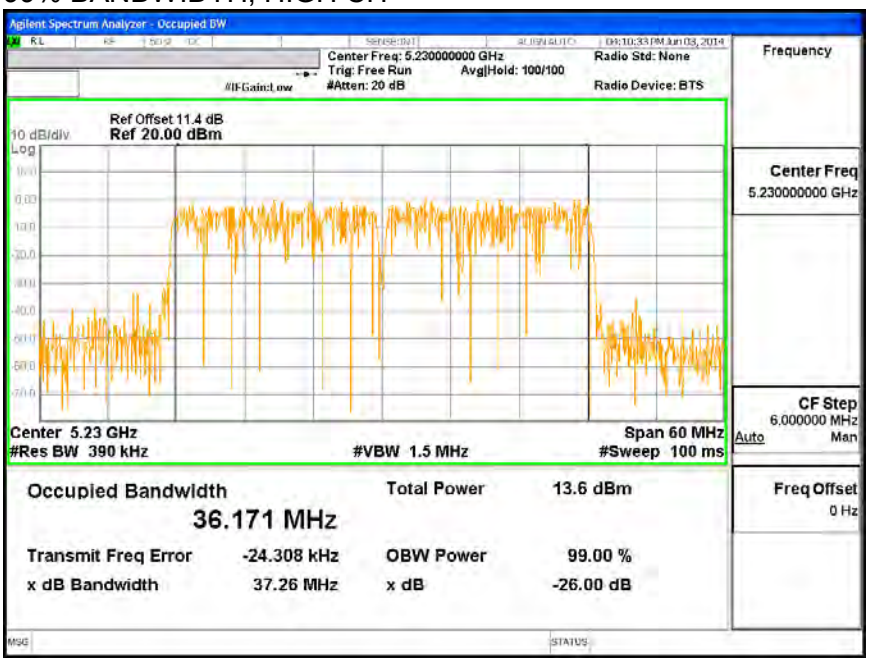
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	36.250
High	5230	36.171

99% BANDWIDTH

99% BANDWIDTH, LOW CH



99% BANDWIDTH, HIGH CH



9.3.3. 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 11.2 dB (including 10 dB pad and 1.2 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)
-2.56

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5190	12.57	24	-11.43
High	5230	16.82	24	-7.18

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)
-2.56

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5190	40.95	36.250	-2.56
High	5230	41.06	36.171	-2.56

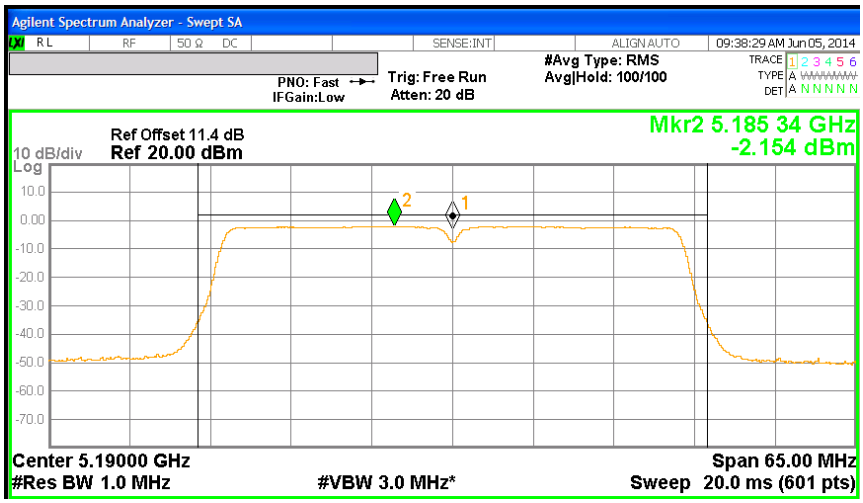
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

PPSD Results

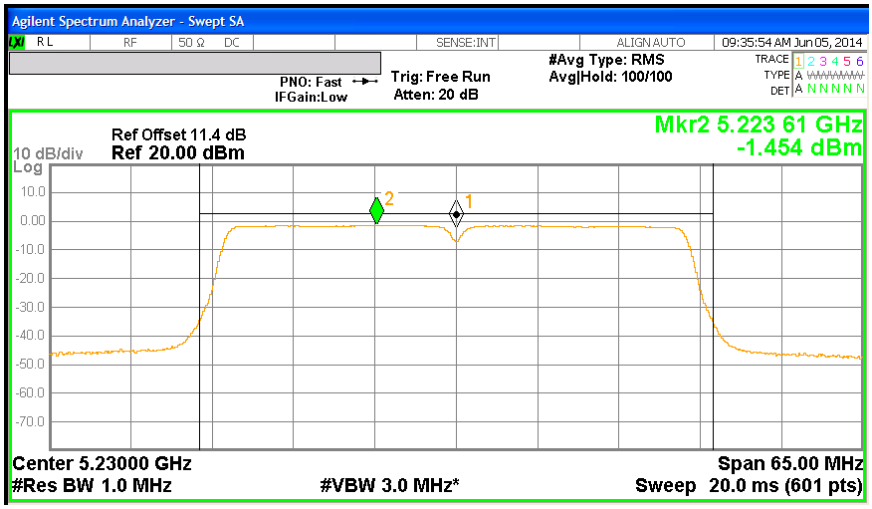
Channel	Frequency (MHz)	Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5190	-2.154	-2.15	11.00	-13.15
High	5230	-1.454	-1.45	11.00	-12.45

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	82.50

26 dB BANDWIDTH

BANDWIDTH CH 42

9.4.2. 99% BANDWIDTH

LIMITS

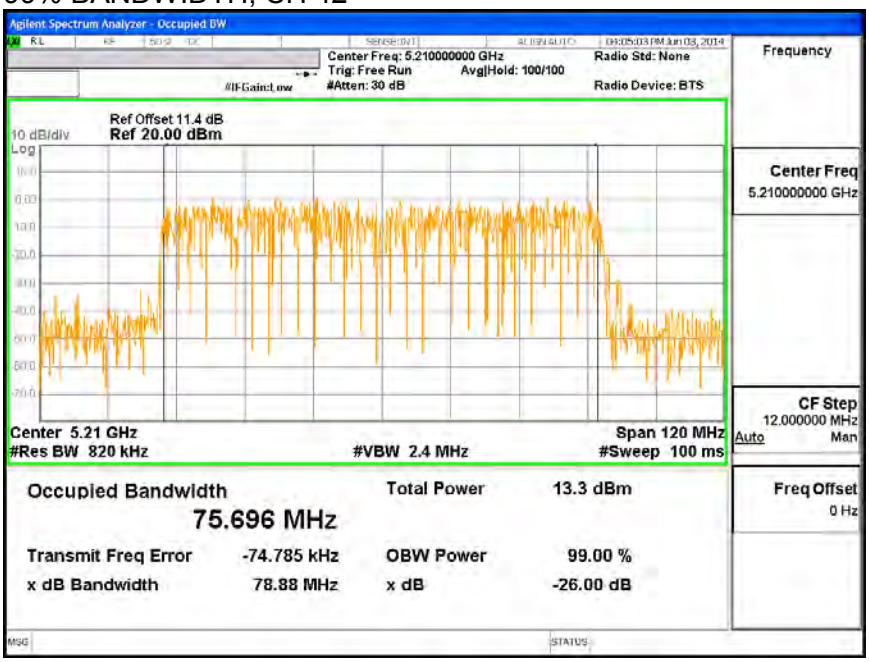
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
42	5210	75.696

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 11.38 dB (including 10 dB pad, 1.2 dB cable and 0.18dB 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)
-2.56

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
42	5210	12.78	24	-11.22

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)
-2.56

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
42	5210	82.50	75.696	-2.56

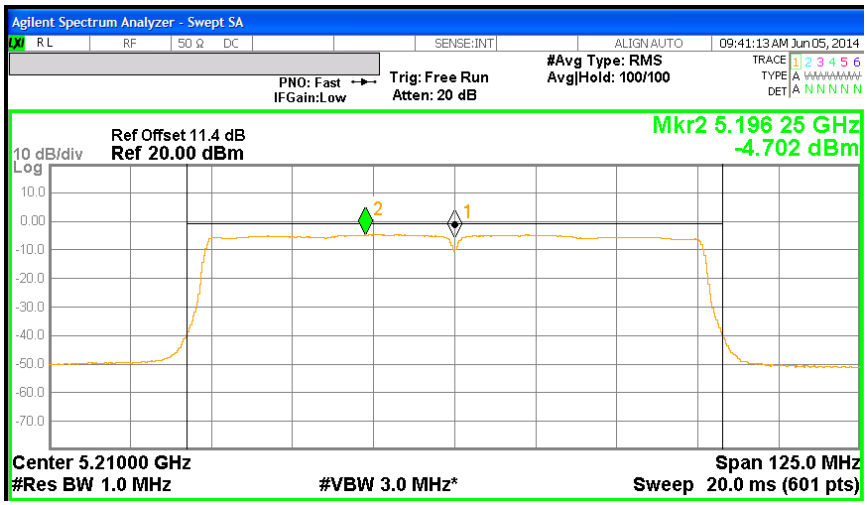
Duty Cycle CF (dB)	0.18	Included in Calculations of Corr'd Power & PSD

PPSD Results

Channel	Frequency (MHz)	Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
42	5210	-4.702	-4.52	11.00	-15.52

PSD

PSD CH 42



9.5. 802.11a MODE IN THE 5.3 GHz BAND

9.5.1. 26 dB BANDWIDTH

LIMITS

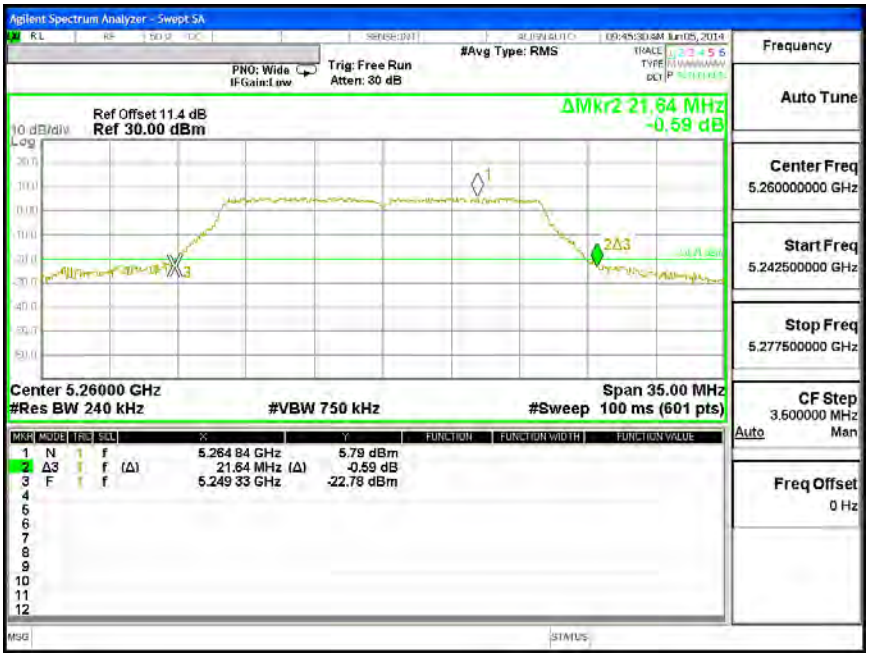
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	21.64
Mid	5300	21.29
High	5320	21.41

26 dB BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH MID CH

BANDWIDTH HIGH CH

9.5.2. 99% BANDWIDTH

LIMITS

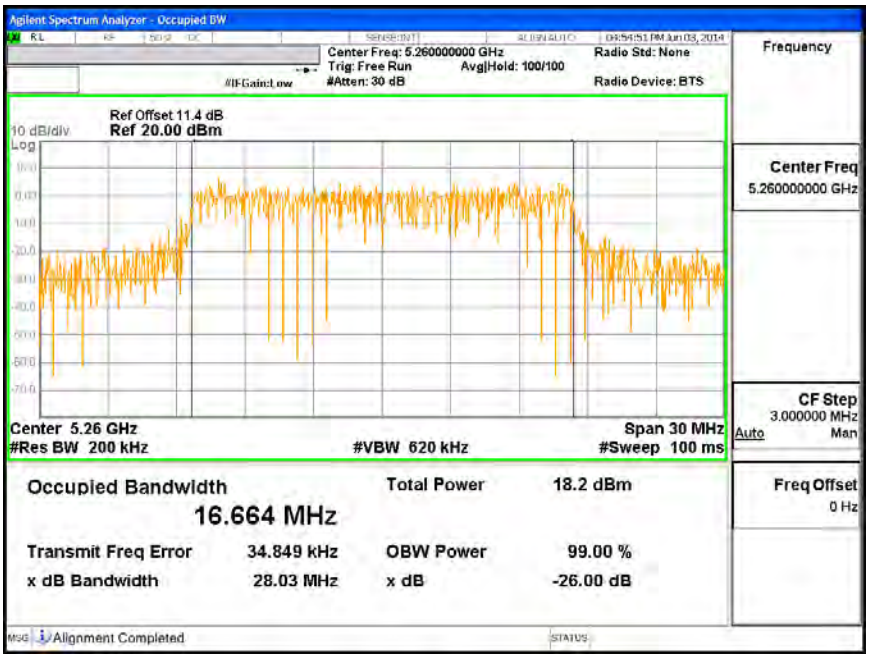
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	16.664
Mid	5300	16.523
High	5320	16.520

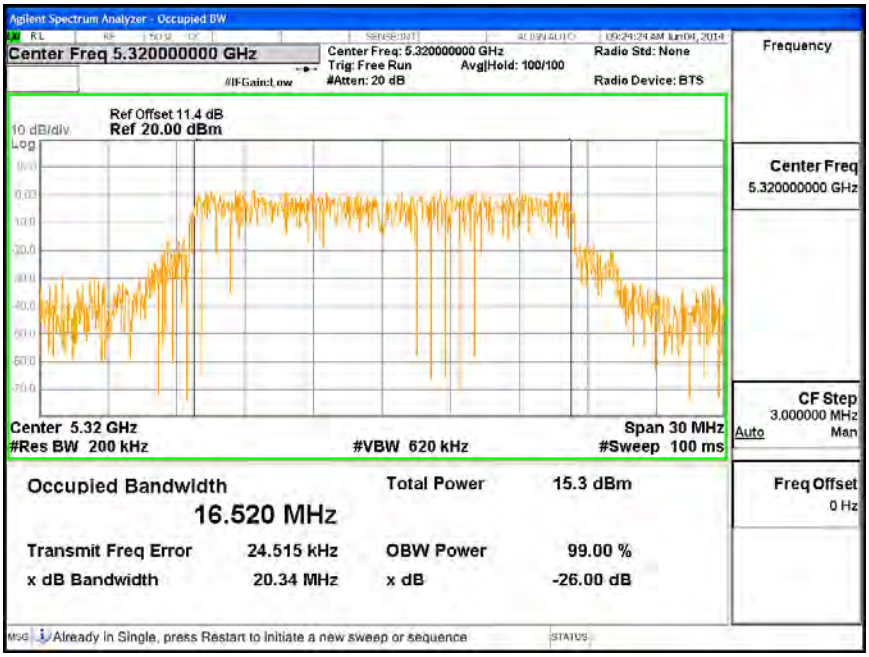
99% BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH MID CH

BANDWIDTH HIGH CH



9.5.3. 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 11.2 dB (including 10 dB pad and 1.2 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)
-1.46

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5260	16.50	24	-7.50
Mid	5300	16.43	24	-7.57
High	5320	16.45	24	-7.55

9.5.4. PSD

LIMITS

FCC §15.407 (a) (2)

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)
-1.46

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	21.64	16.664	-1.46
Mid	5300	21.29	16.523	-1.46
High	5320	21.41	16.520	-1.46

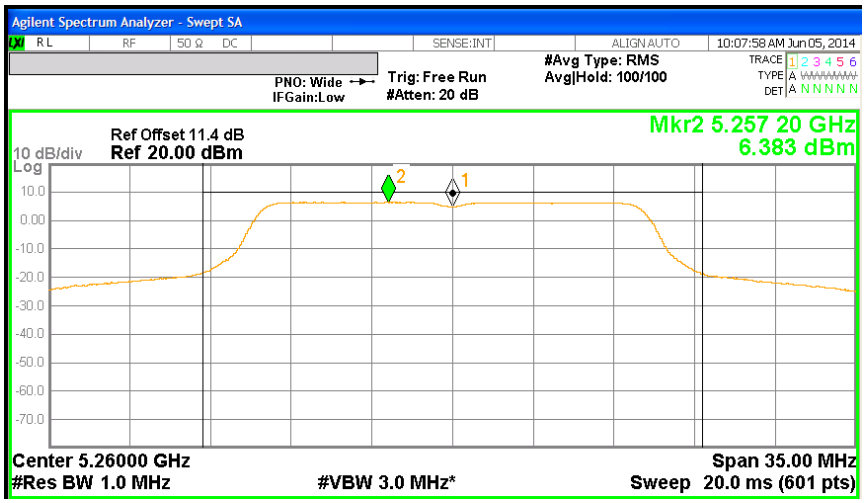
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PSD

PPSD Results

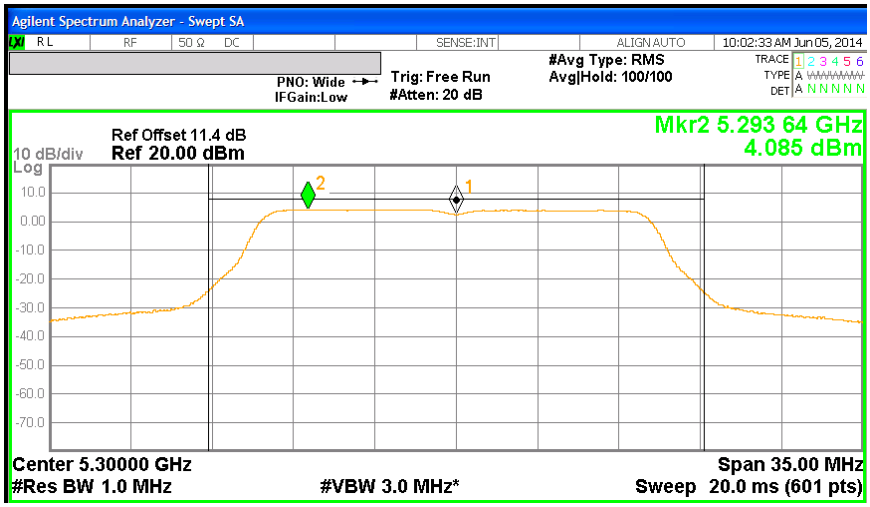
Channel	Frequency (MHz)	Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	6.383	6.38	11.00	-4.62
Mid	5300	4.085	4.09	11.00	-6.92
High	5320	3.414	3.41	11.00	-7.59

PSD

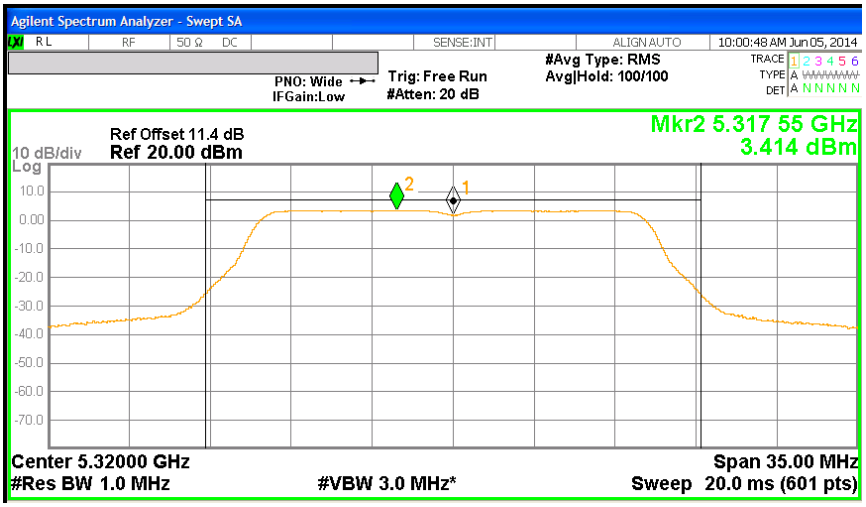
PSD LOW CH



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

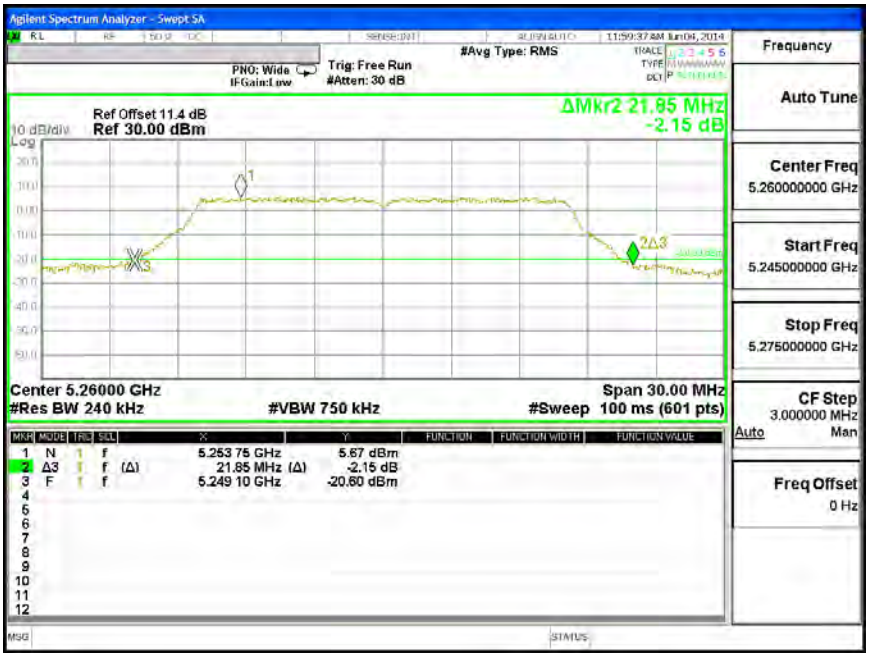
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	21.85
Mid	5300	21.45
High	5320	21.65

26 dB BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH MID CH

BANDWIDTH HIGH CH

9.6.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

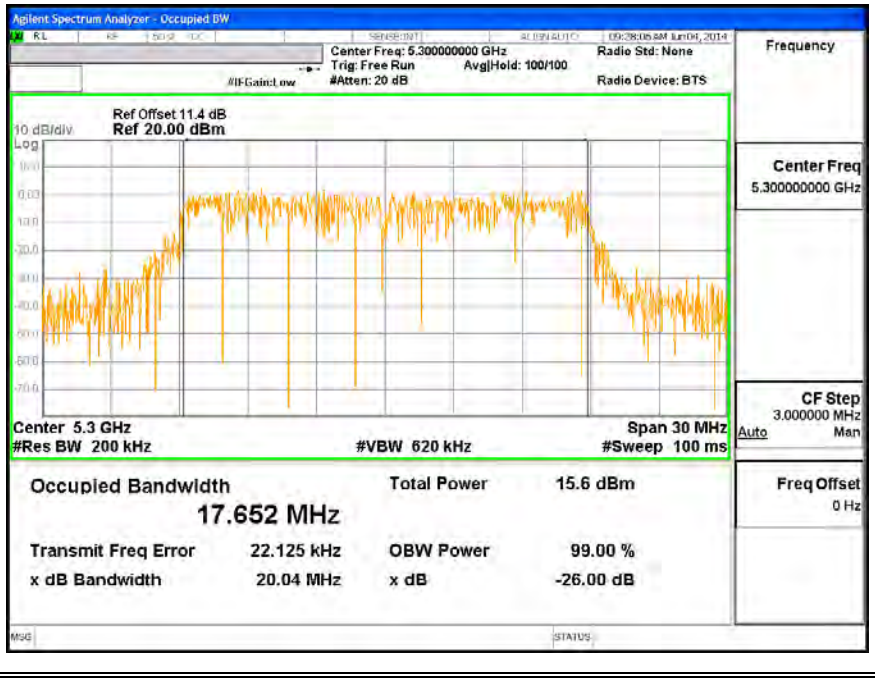
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	17.820
Mid	5300	17.652
High	5320	17.758

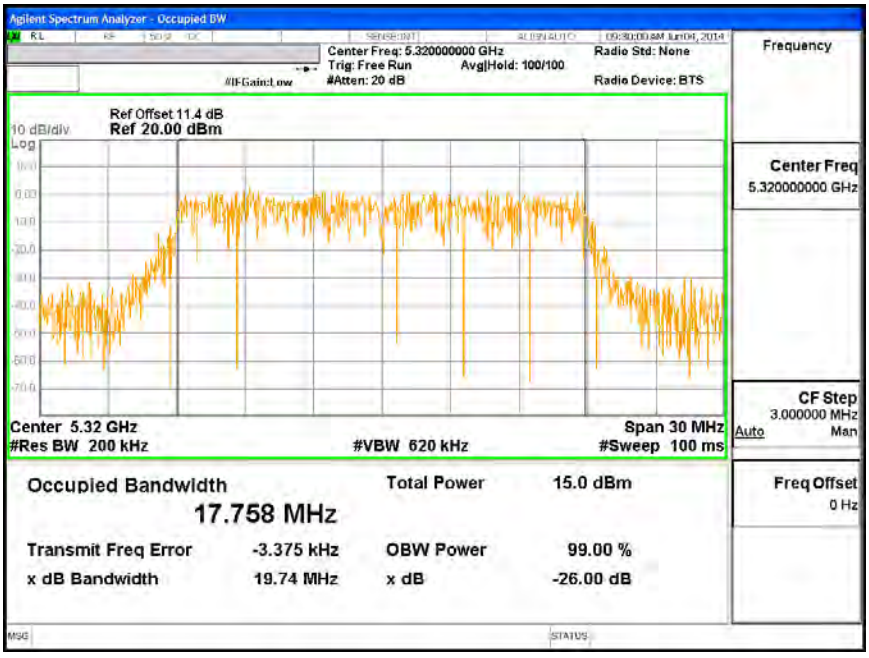
99% BANDWIDTH

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. 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.

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 11.2 dB (including 10 dB pad and 1.2 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)
-1.46

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5260	16.49	24	-7.51
Mid	5300	16.40	24	-7.60
High	5320	16.50	24	-7.50

9.6.4. PSD

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. 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)
-1.46

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	21.85	17.820	-1.46
Mid	5300	21.45	17.652	-1.46
High	5320	21.65	17.758	-1.46

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

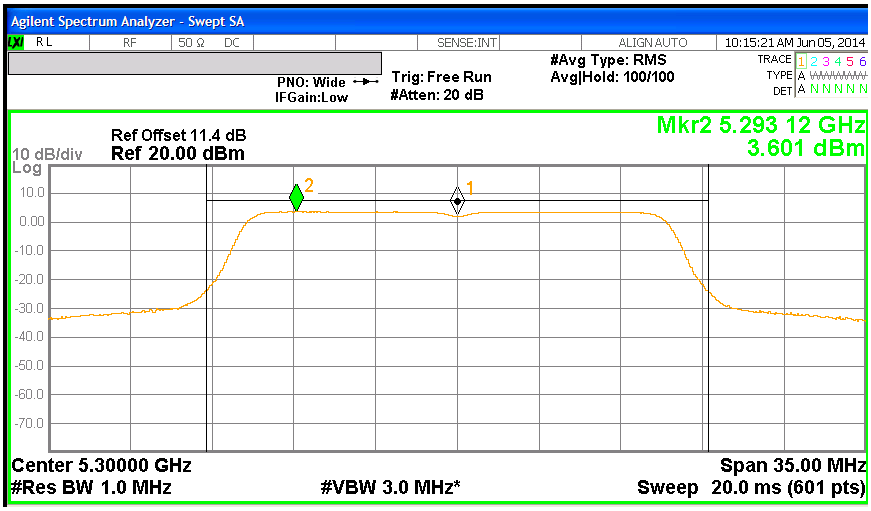
PPSD Results

Channel	Frequency (MHz)	Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	3.864	3.86	11.00	-7.14
Mid	5300	3.601	3.60	11.00	-7.40
High	5320	2.957	2.96	11.00	-8.04

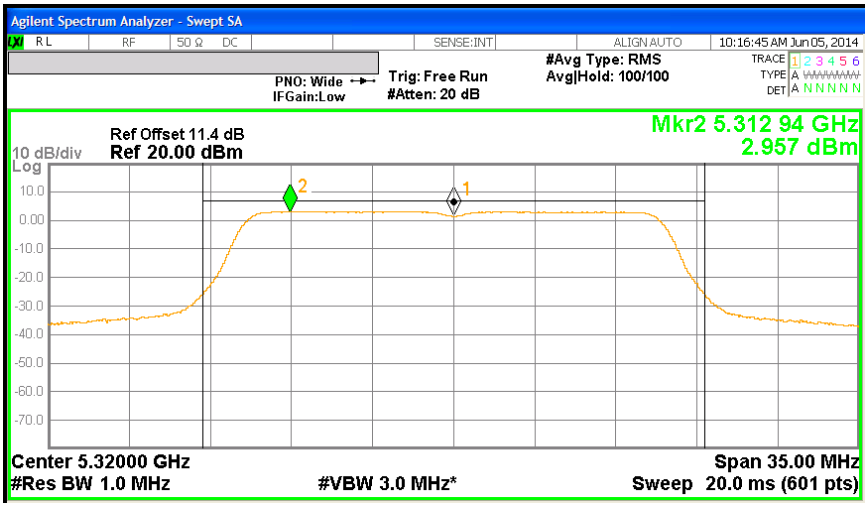
PSD

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	40.95
High	5310	40.63

26 dB BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH HIGH CH

9.7.2. 99% BANDWIDTH

LIMITS

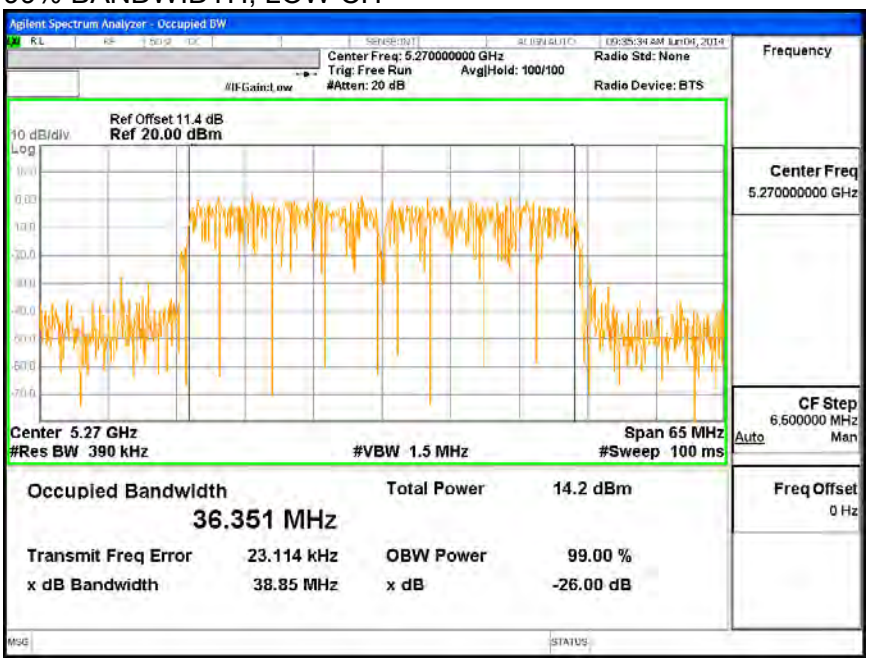
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5270	36.351
High	5310	36.168

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. 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.

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 11.2 dB (including 10 dB pad and 1.2 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)
-1.46

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5270	16.45	24	-7.55
High	5310	13.95	24	-10.05

9.7.4. PSD

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. 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)
-1.46

.

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5270	40.95	36.351	-1.46
High	5310	40.63	36.106	-1.46

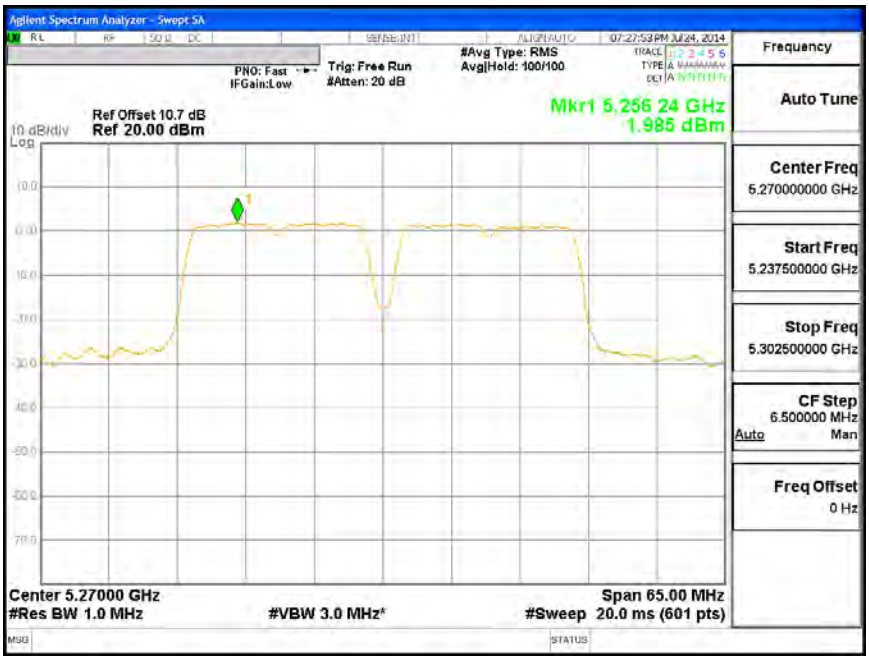
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PSD

PPSD Results

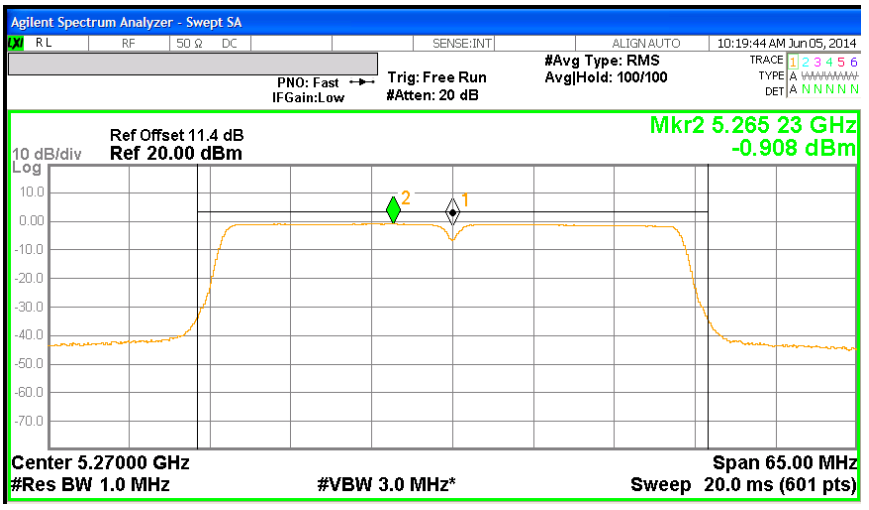
Channel	Frequency (MHz)	Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5270	1.985	1.99	11.00	-9.02
High	5310	-0.908	-0.91	11.00	-11.91

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	83.33

26 dB BANDWIDTH

BANDWIDTH CH 58

9.8.2. 99% BANDWIDTH

LIMITS

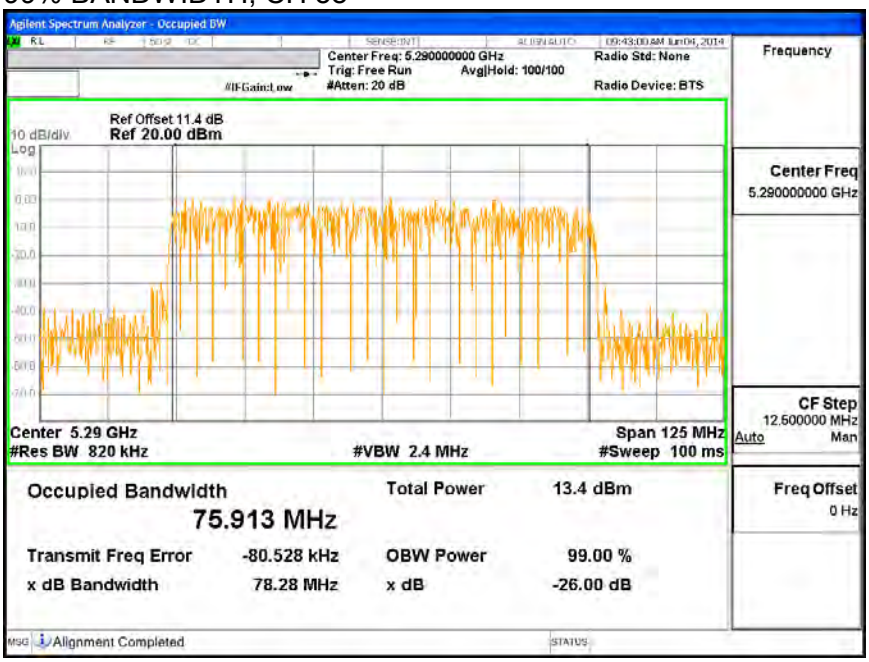
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
58	5290	75.913

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. 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.

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 11.38 dB (including 10 dB pad, 1.2 dB cable, and 0.18dB duty cycle correction factor) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

Antenna Gain (dBi)
-1.46

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
58	5290	12.86	24	-11.14

9.8.4. PSD

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. 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

Antenna Gain (dBi)
-1.46

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

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
58	5290	83.33	75.913	-1.46

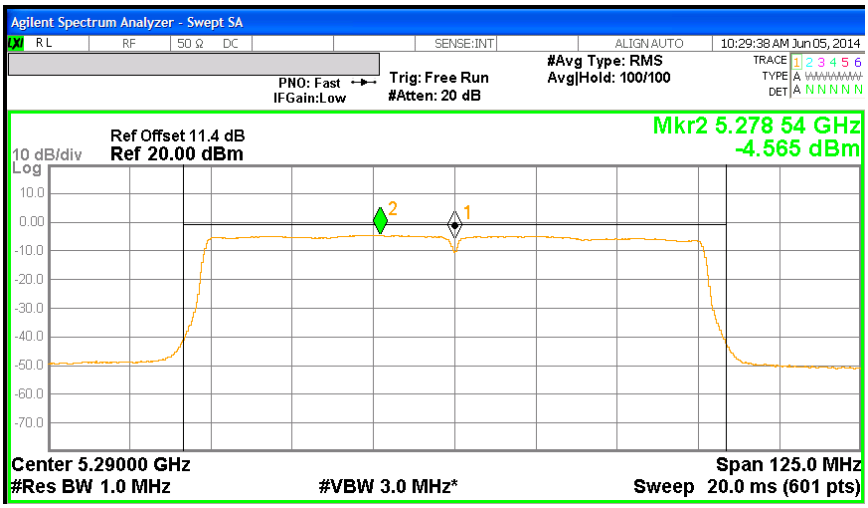
Duty Cycle CF (dB)	0.18	Included in Calculations of Corr'd Power & PSD

PPSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	Margin (dB)
58	5290	-4.565	-4.39	11.00	-15.39

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.

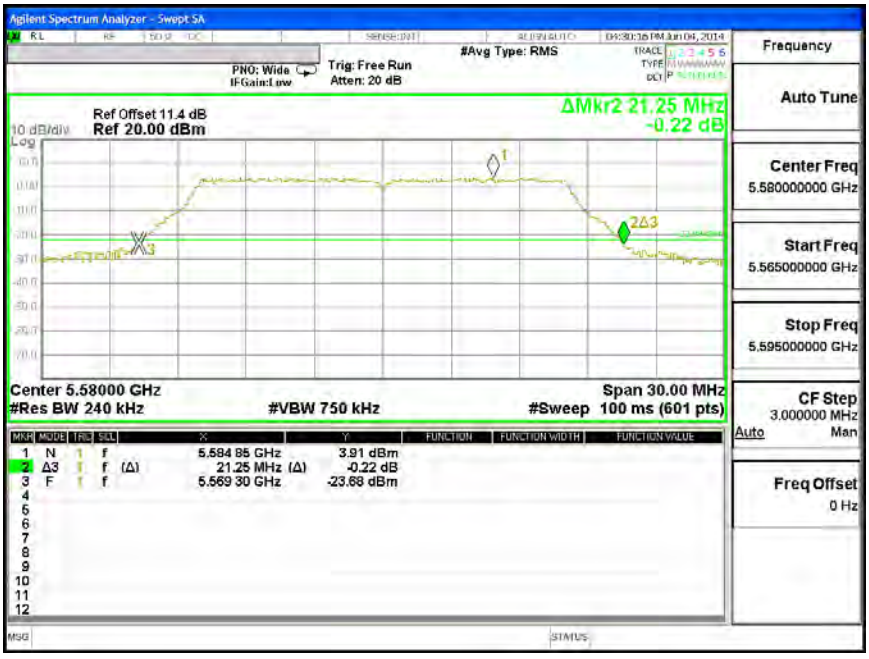
RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	21.15
Mid	5580	21.25
High	5700	21.25

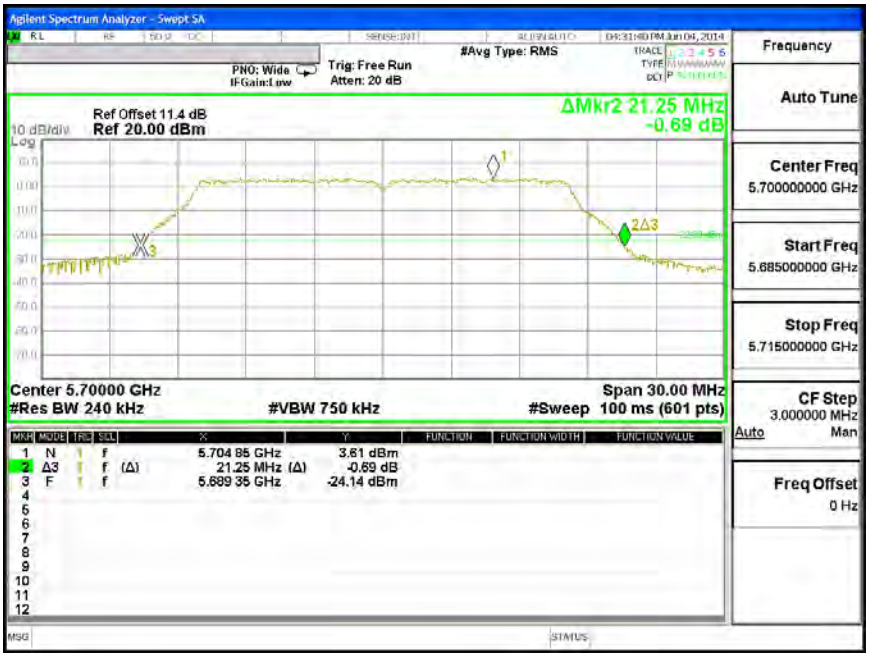
26 dB BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH MID CH



BANDWIDTH HIGH CH



9.9.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

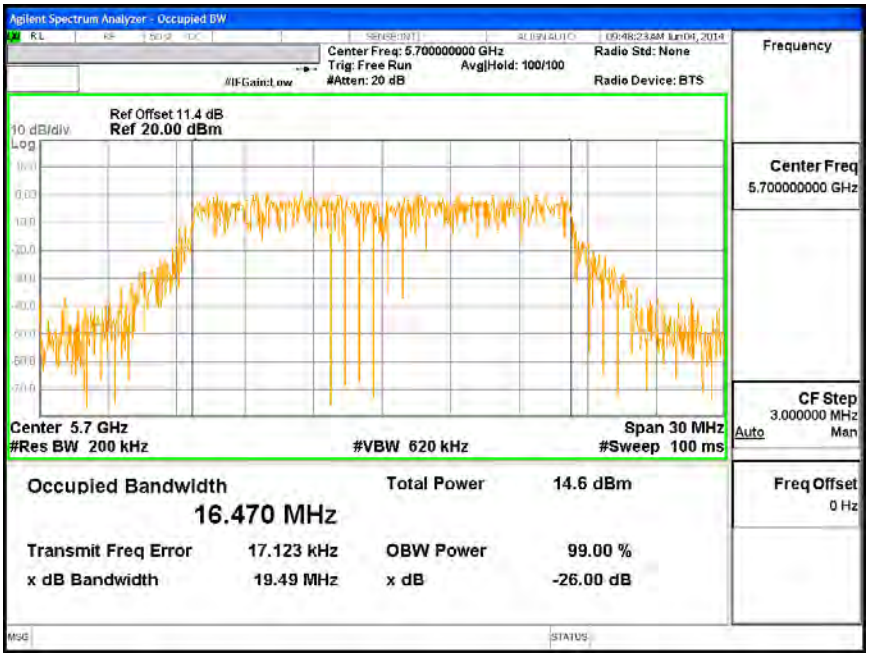
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	16.485
Mid	5580	16.613
High	5700	16.470

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. 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.

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 11.2 dB (including 10 dB pad and 1.2 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)
-0.44

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5500	14.90	24	-9.10
Mid	5580	16.94	24	-7.06
High	5700	15.88	24	-8.12

9.9.4. 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)
-0.44

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	21.15	16.485	-0.44
Mid	5580	21.25	16.613	-0.44
High	5700	21.25	16.470	-0.44

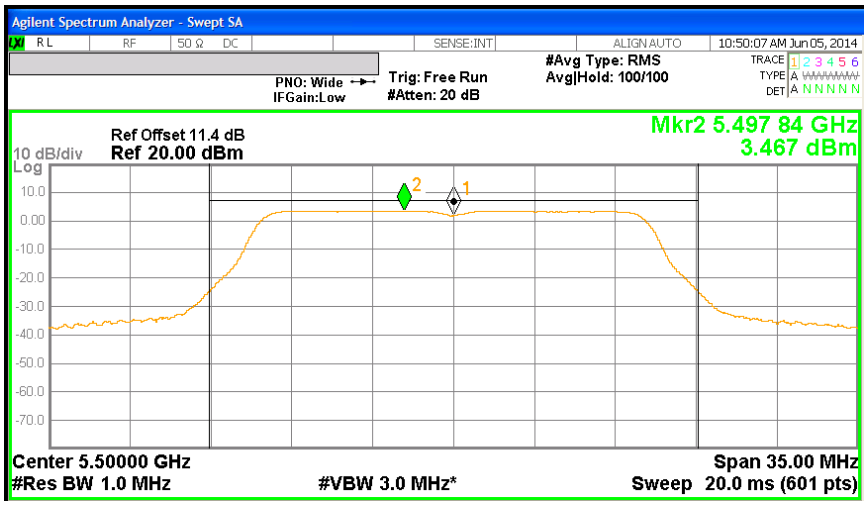
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PSD

PPSD Results

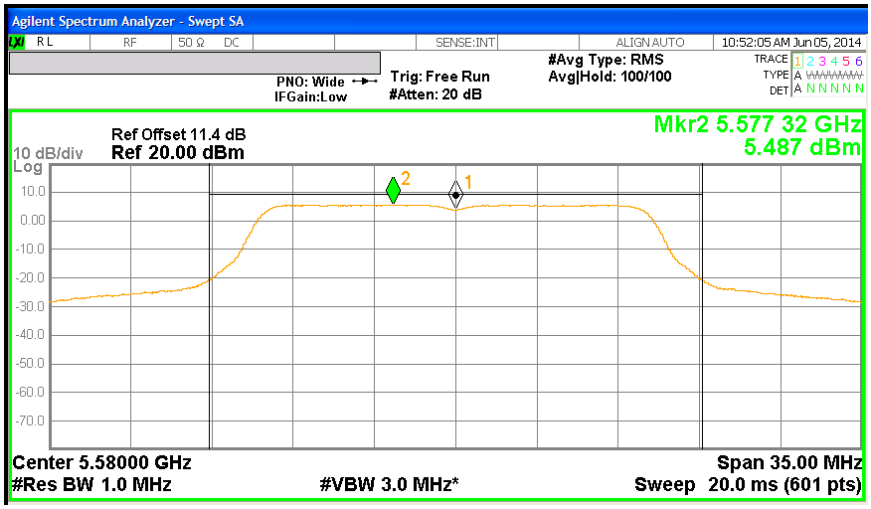
Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	3.467	3.47	11.00	-7.53
Mid	5580	5.487	5.49	11.00	-5.51
High	5700	2.345	2.35	11.00	-8.66

PSD

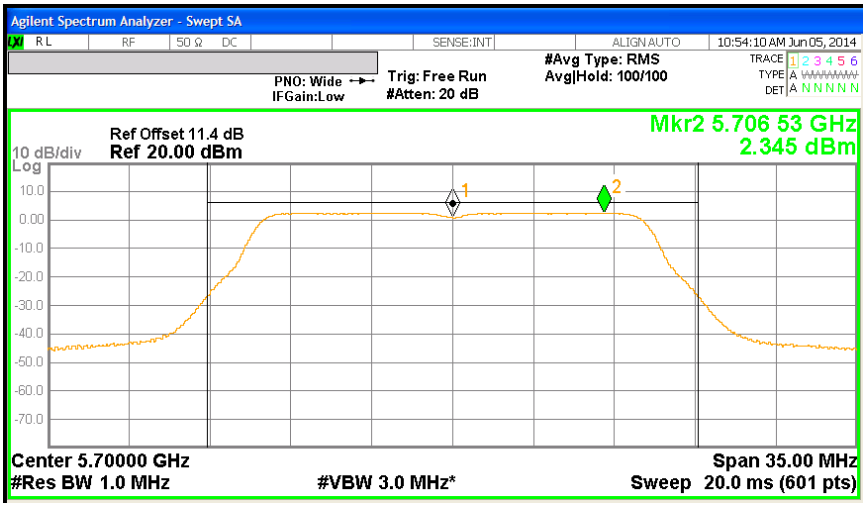
PSD LOW CH



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	21.55
Mid	5580	21.55
High	5700	21.50
144	5720	21.60

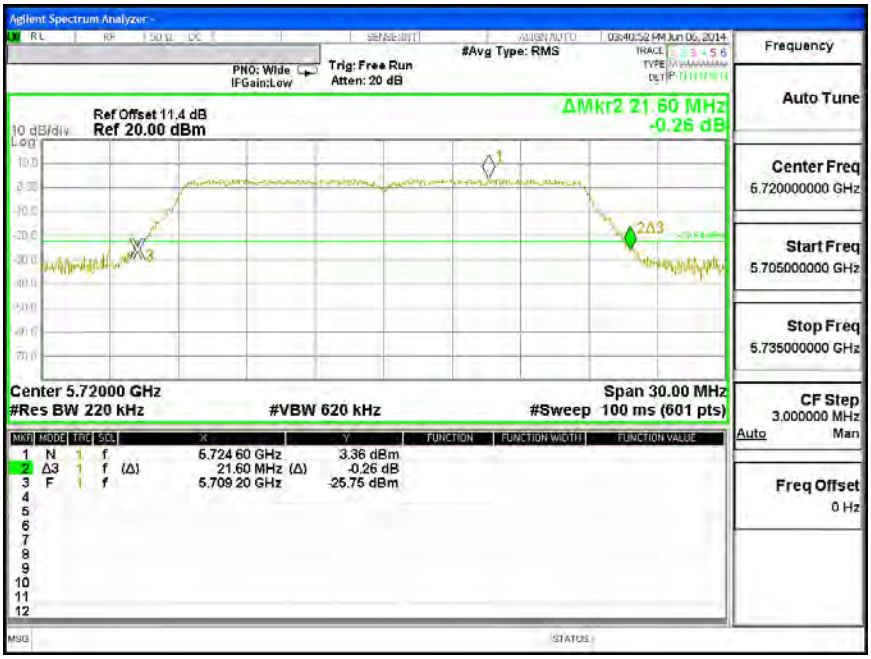
26 dB BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH MID CH

BANDWIDTH HIGH CH

BANDWIDTH 144 CH



9.10.2. 99% BANDWIDTH

LIMITS

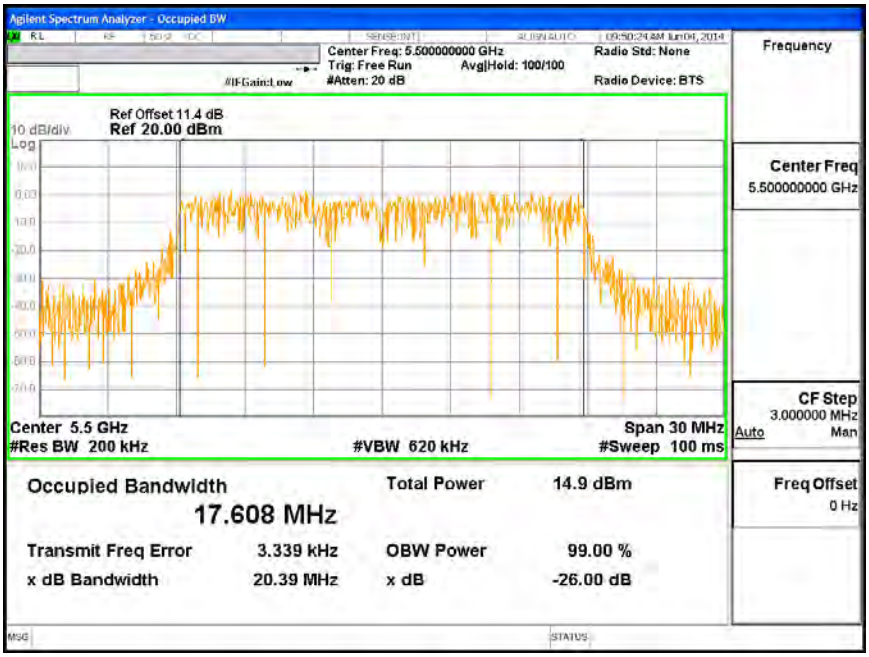
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	17.608
Mid	5580	17.712
High	5700	17.684
144	5720	17.719

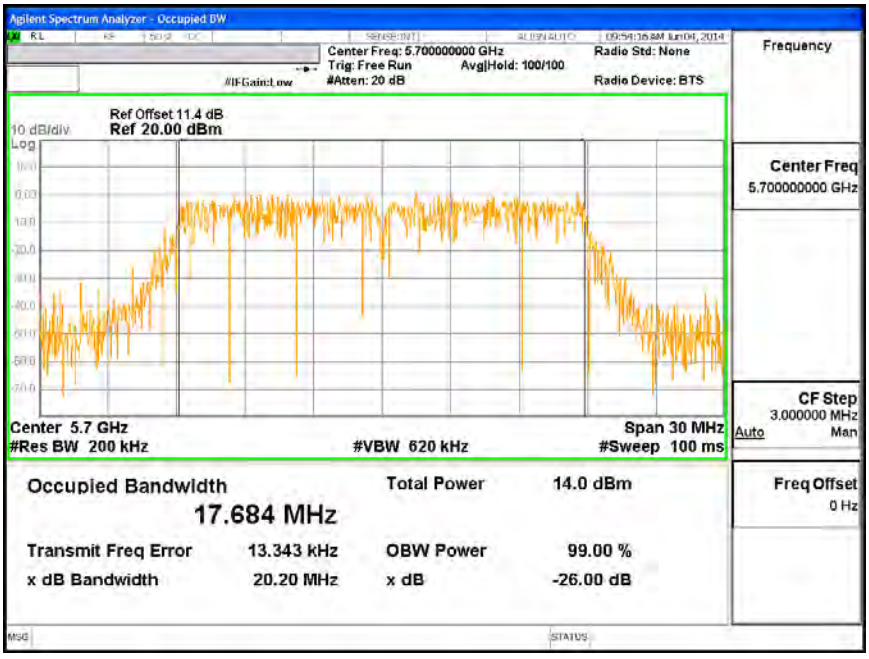
99% BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH MID CH

BANDWIDTH HIGH CH



BANDWIDTH CH144

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. 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.

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 11.2 dB (including 10 dB pad and 1.2 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)
-0.44

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5500	14.98	24	-9.02
Mid	5580	16.96	24	-7.04
High	5700	15.99	24	-8.01

9.10.4. 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.

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

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

Antenna Gain (dBi)
-0.44

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	21.55	17.608	-0.44
Mid	5580	21.55	17.712	-0.44
High	5700	21.50	17.684	-0.44

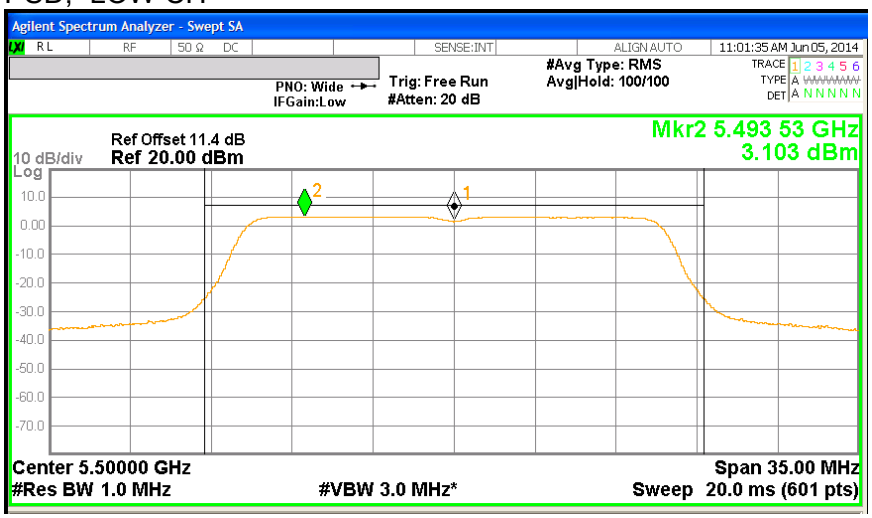
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PSD

PSD Results

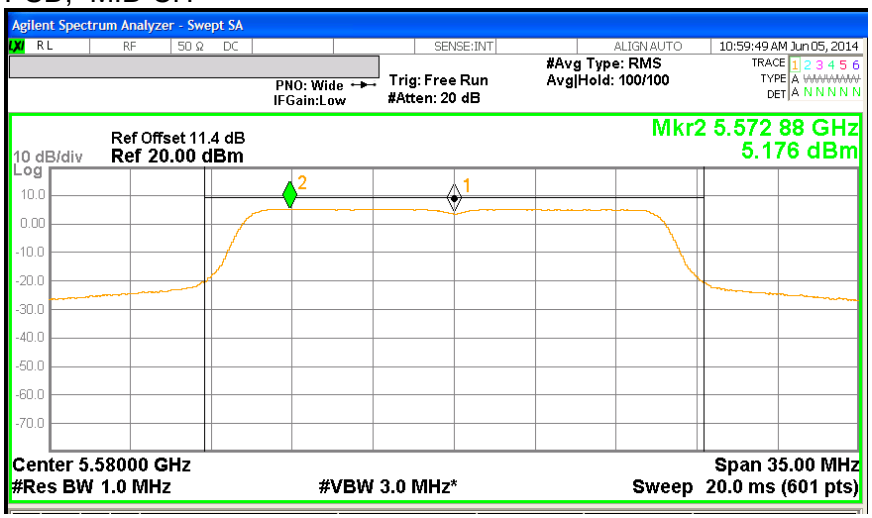
Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	3.103	3.10	11.00	-7.90
Mid	5580	5.176	5.18	11.00	-5.82
High	5700	2.202	2.20	11.00	-8.80

PSD,

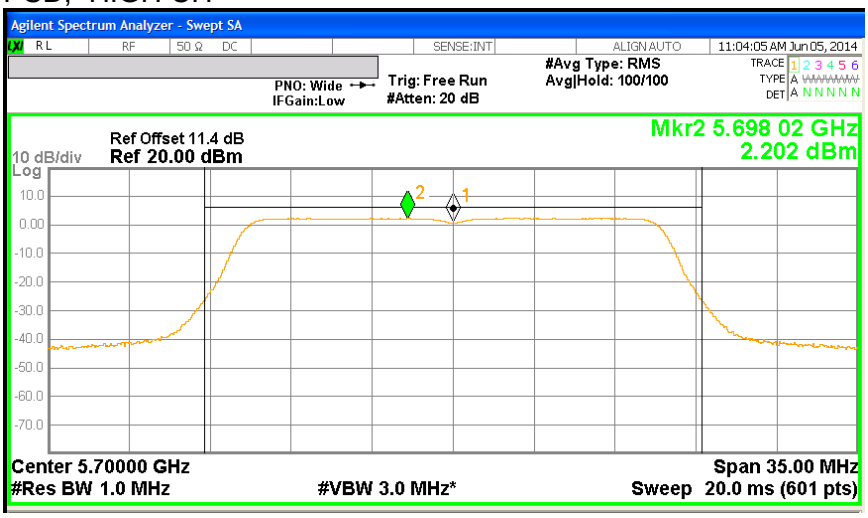
PSD, LOW CH



PSD, MID CH



PSD, HIGH CH



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

9.11.1. 26 dB BANDWIDTH

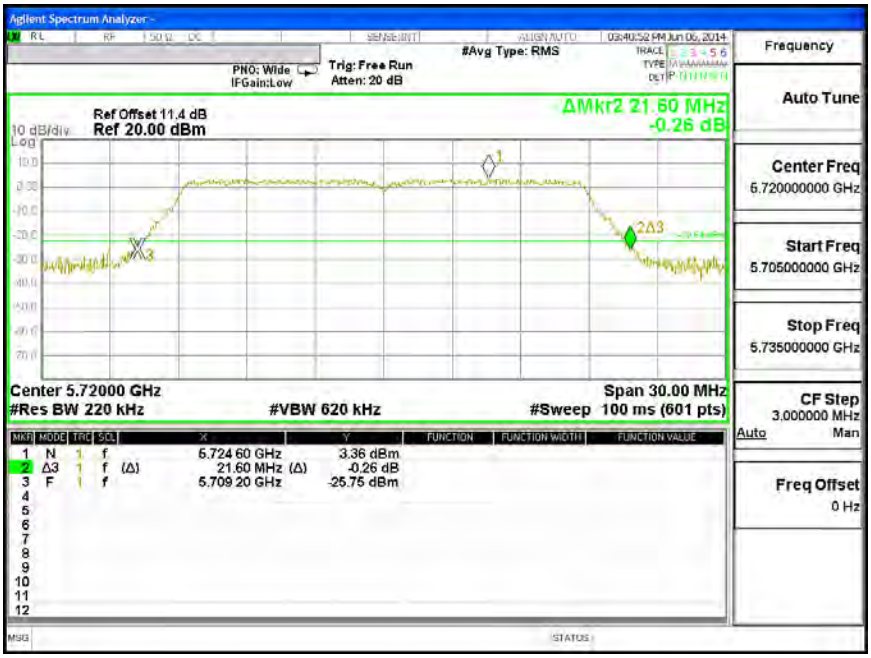
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
144	5720	21.60

BANDWIDTH 144 CH



9.11.2. 99% BANDWIDTH

LIMITS

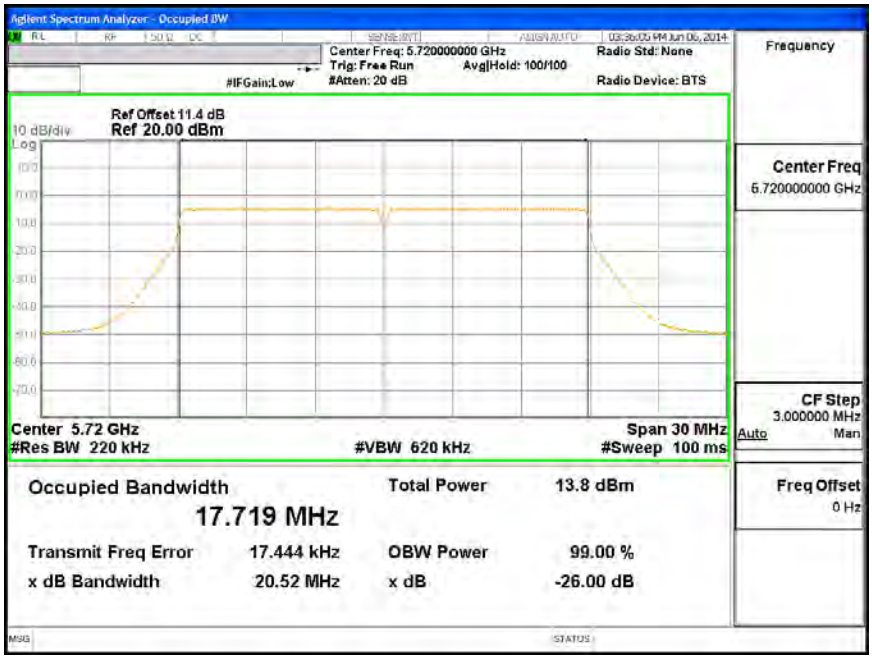
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
144	5720	17.719

99% BANDWIDTH

BANDWIDTH CH144



9.11.3. 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 11.2 dB (including 10 dB pad and 1.2 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
144	5720	15.98

9.11.4. 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.

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

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

Antenna Gain (dBi)
-0.44

RESULTS

STRADDLE CHANNEL 144 RESULTS

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	21.60	-0.44	-0.44	24.00	11.00

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

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.89	12.89	24.00	-11.11

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
144	5720	1.89	1.89	11.00	-9.11

OUTPUT POWER AND PSD, CH 144 UNII-2C

UNII-3 BAND

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	0.44	30.00	30.00

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

Output Power Results

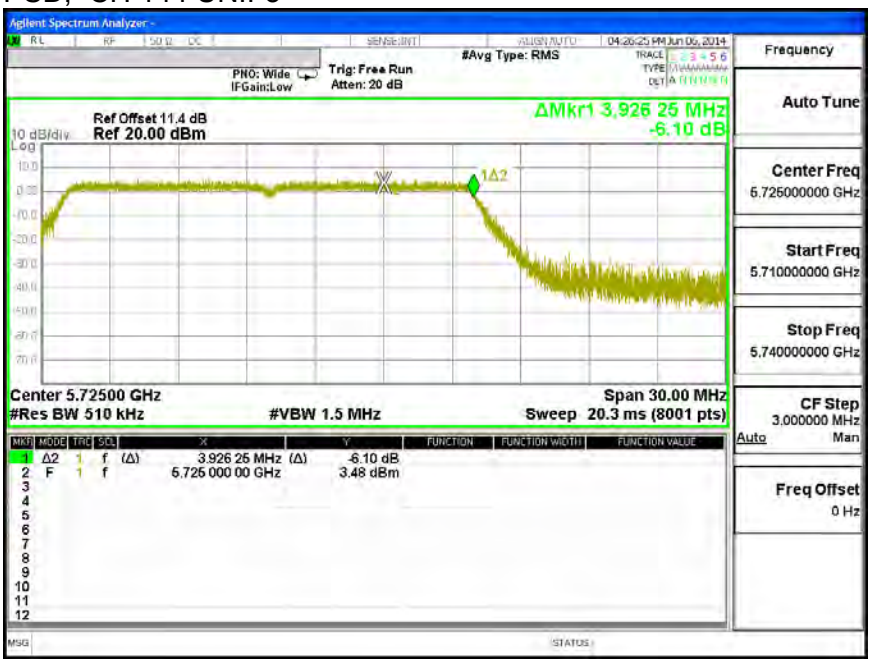
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	7.43	7.43	30.00	-22.57

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
144	5720	1.65	1.65	30.00	-28.35

OUTPUT POWER, CH 144 UNII-3

PSD, CH 144 UNII-3



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

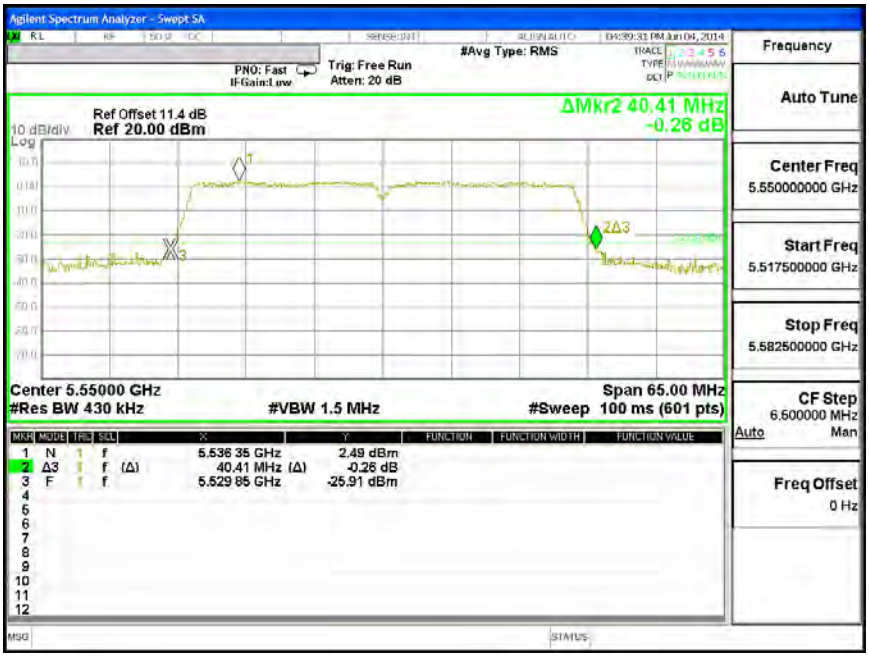
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5510	40.30
Mid	5550	40.41
High	5670	40.62

26 dB BANDWIDTH

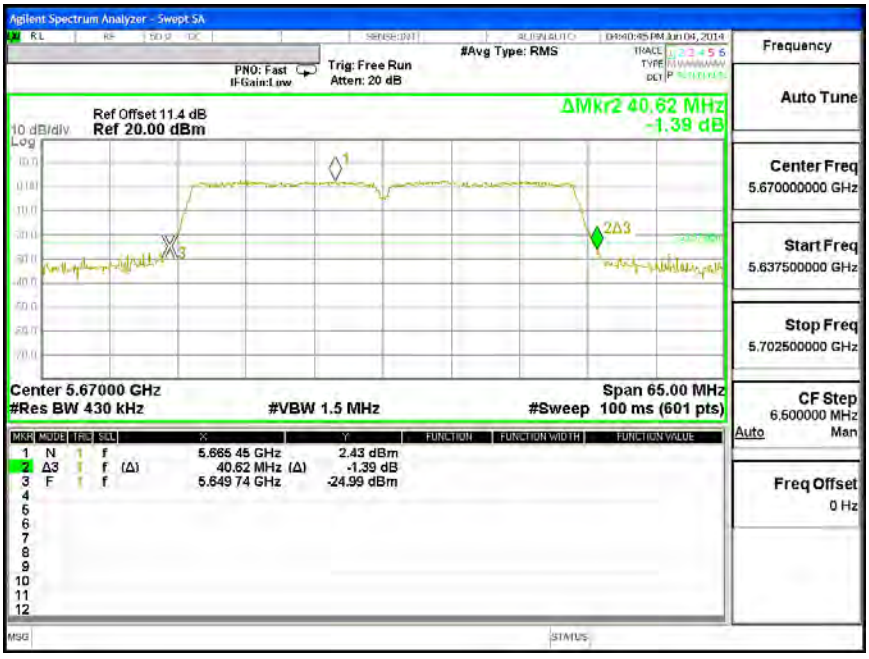
BANDWIDTH LOW CH

26 dB BANDWIDTH

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	36.184
Mid	5550	36.307
High	5670	36.161

99% BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH MID CH

BANDWIDTH HIGH CH

9.12.1. 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. 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.

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 11.2 dB (including 10 dB pad and 1.2 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)
-0.44

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
Low	5510	14.91	24	-9.09
Mid	5550	16.92	24	-7.08
High	5670	16.98	24	-7.02

9.12.2. 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)
-0.44

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5510	40.30	36.184	-0.44
Mid	5550	40.41	36.307	-0.44
High	5670	40.62	36.161	-0.44

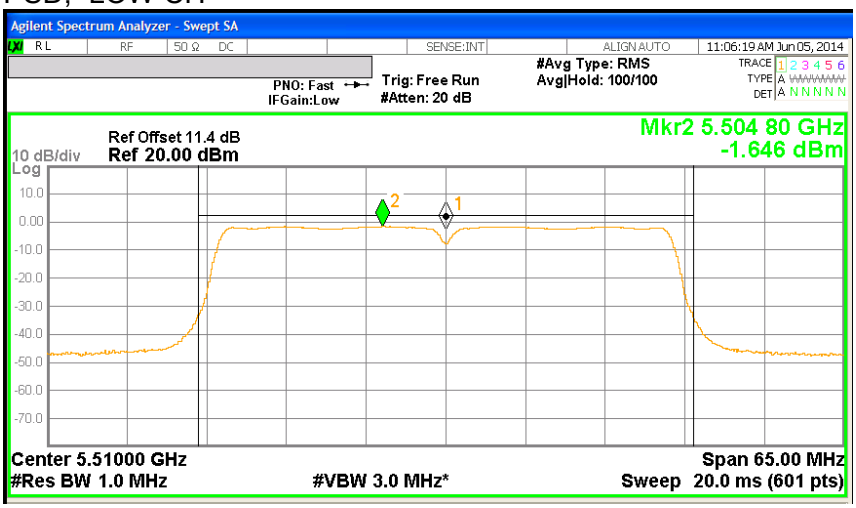
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PSD

PPSD Results

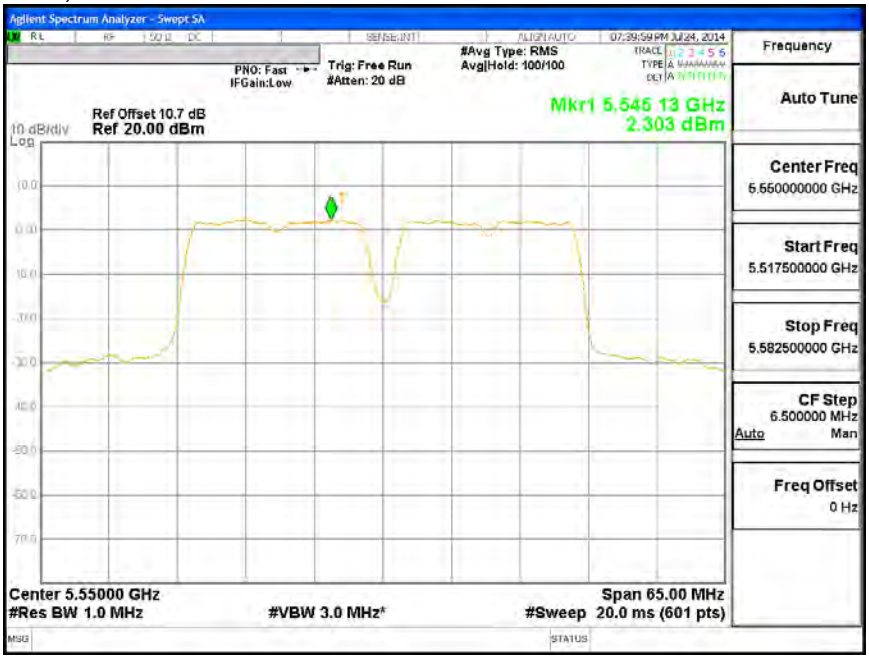
Channel	Frequency (MHz)	Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5510	-1.646	-1.65	11.00	-12.65
Mid	5550	2.303	2.30	11.00	-8.70
High	5670	2.308	2.31	11.00	-8.69

PSD

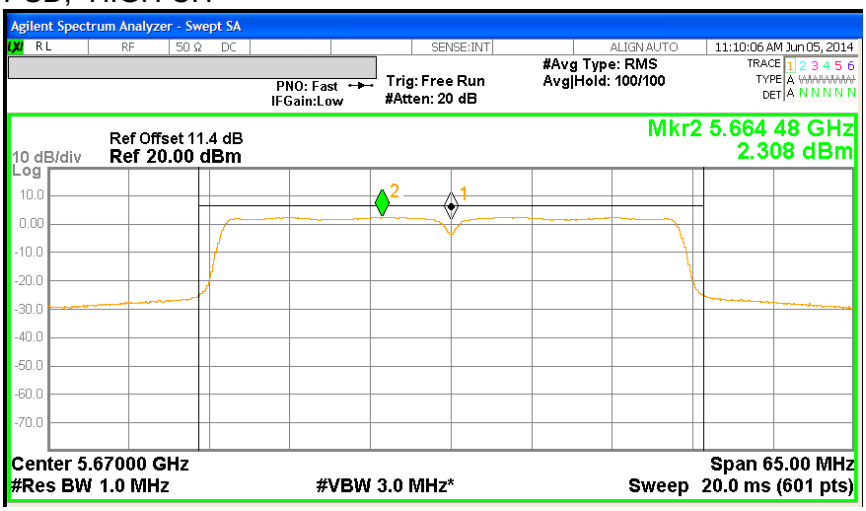
PSD, LOW CH



PSD, MID CH



PSD, HIGH CH



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

9.13.1. 26 dB BANDWIDTH

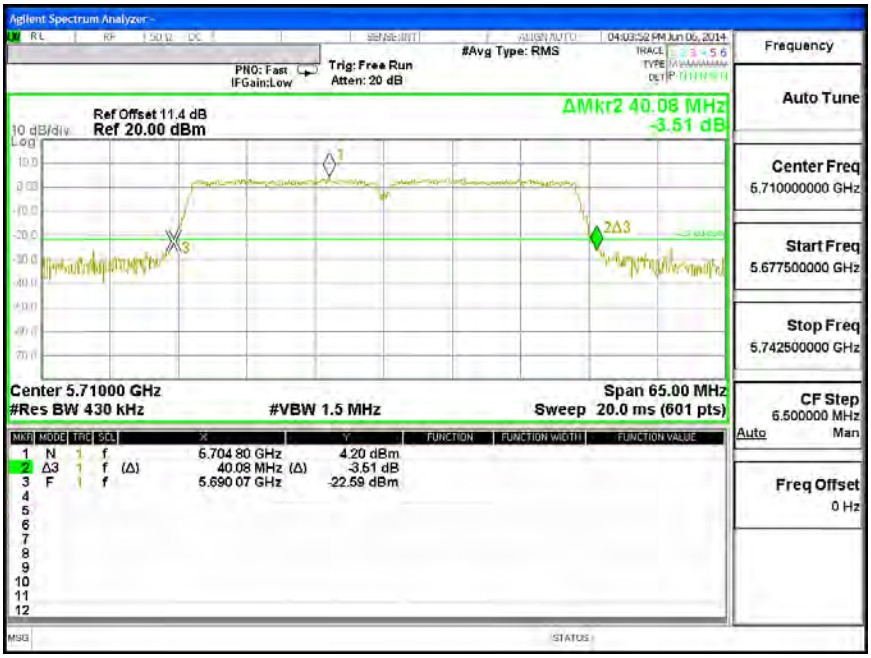
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
142	5710	40.08

BANDWIDTH CH142



9.13.2. 99% BANDWIDTH

LIMITS

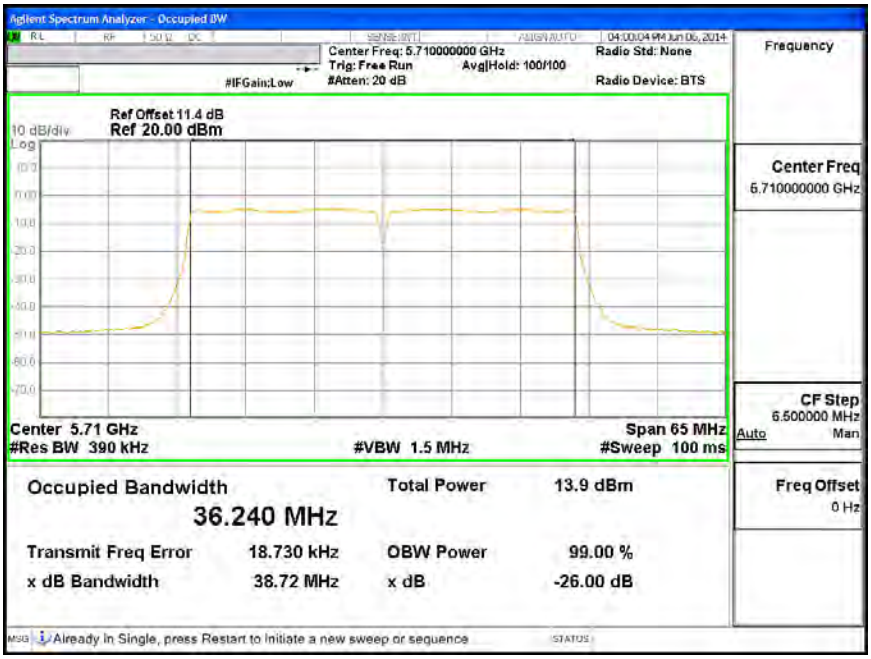
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
142	5710	36.240

99% BANDWIDTH

BANDWIDTH CH142



9.13.3. 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 11.2 dB (including 10 dB pad and 1.2 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
142	5710	14.95

9.13.4. 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)
-0.44

RESULTS

STRADDLE CH 142 RESULTS

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
142	5710	40.08	-0.44	-0.44	24.00	11.00

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

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
142	5710	13.76	13.76	24.00	-10.24

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
142	5710	-0.58	-0.58	11.00	-11.58

OUTPUT POWER AND PSD, CH 142 UNII

UNII-3 BAND

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm)
142	5710	-0.44	30.00	30.00

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

Output Power Results

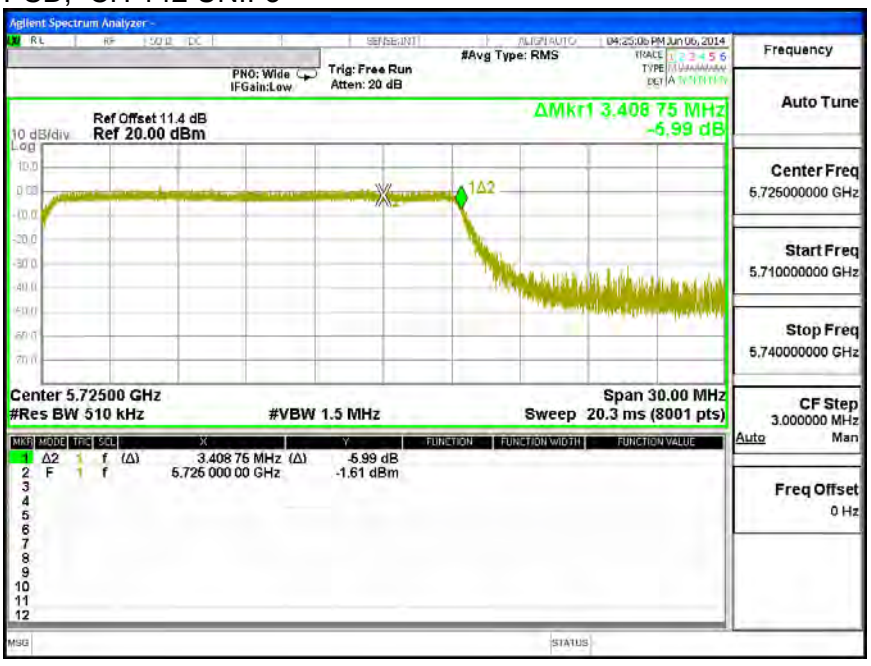
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
142	5710	3.52	3.52	30.00	-26.48

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
142	5710	-1.22	-1.22	30.00	-31.22

OUTPUT POWER, CH 142 UNII-3

PSD, CH 142 UNII-3



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

9.14.1. 26 dB BANDWIDTH

LIMITS

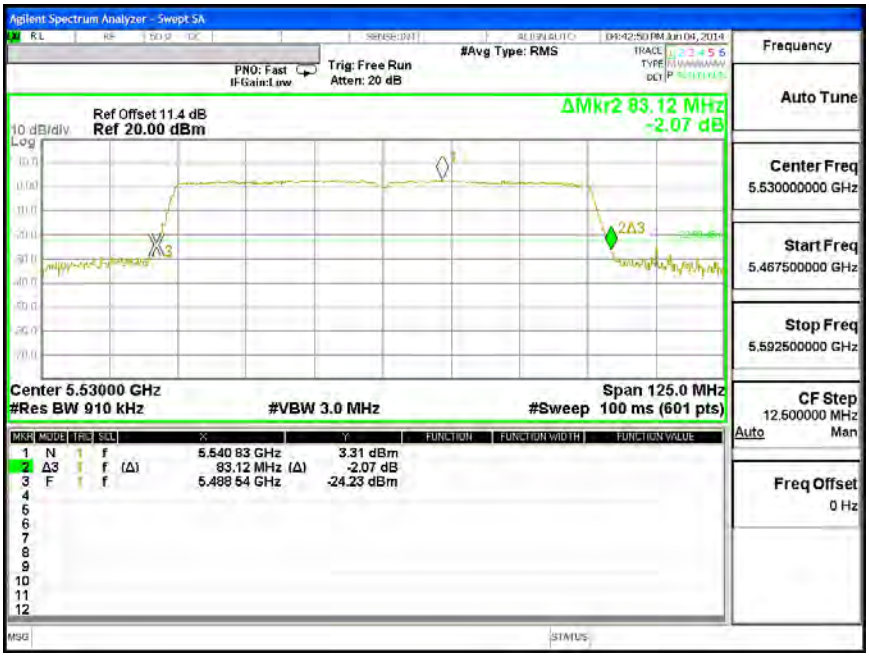
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
106	5530	83.12

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	75.332

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. 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.

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 11.38 dB (including 10 dB pad and 1.2dB cable and 0.18dB 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)
-0.44

RESULTS

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dBm)
106	5530	12.98	24	-11.02

9.14.4. 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)
-0.44

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
106	5530	83.12	75.332	-0.44

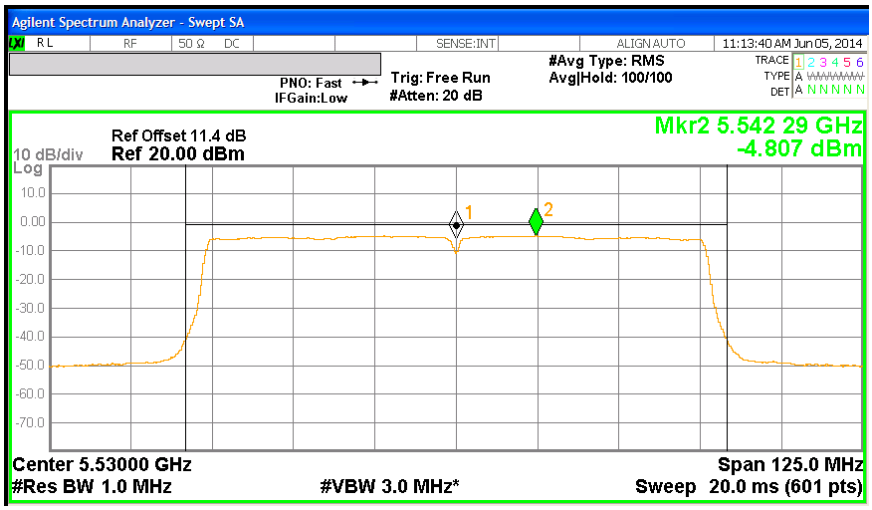
Duty Cycle CF (dB)	0.18	Included in Calculations of Corr'd Power & PSD

PPSD Results

Channel	Frequency (MHz)	Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
106	5530	-4.807	-4.63	11.00	-15.63

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	83.13

26 dB BANDWIDTH

BANDWIDTH CH 138

9.15.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Frequency (MHz)	99% Bandwidth (MHz)
5690	75.662

99% BANDWIDTH

BANDWIDTH CH 138

9.15.3. 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 11.2 dB (including 10 dB pad and 1.2 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	Power (dBm)
Mid	5690	12.92

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)
-0.44

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	76.57	72.831	-0.44

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	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5690	12.86	13.04	24.00	-10.96

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
138	5690	-4.49	-4.31	11.00	-15.31

Duty Cycle CF (dB)	0.18	Included in Calculations of Corr'd Power & PPSD

Limits (FCC), portion in DTS 2 ext band

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
138	5690	76.57	72.831	-0.44

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	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5690	-1.34	0.18	24.00	-23.82

PSD Results

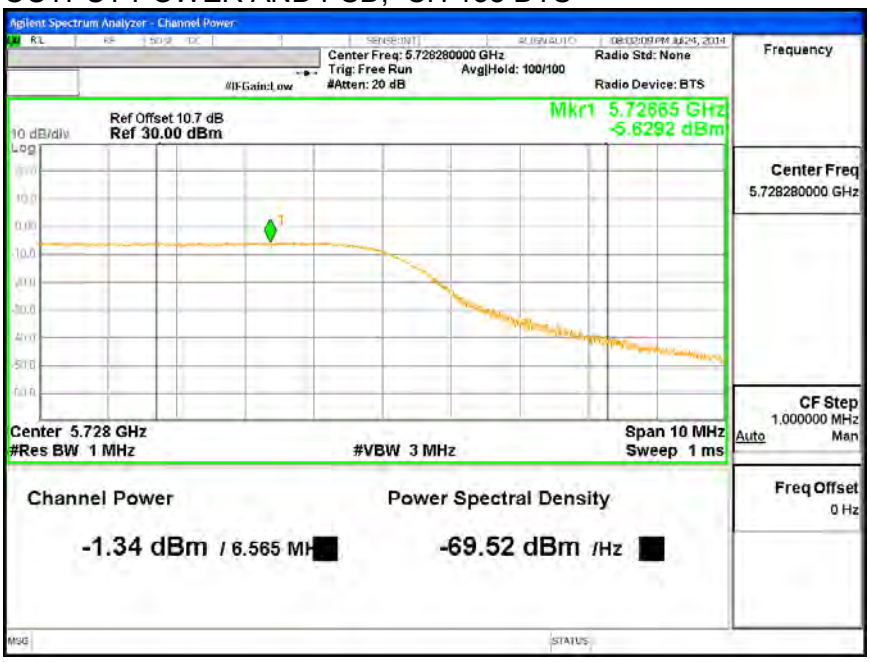
Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
138	5690	-5.629	-5.45	11.00	-16.45

Duty Cycle CF (dB)	0.18	Included in Calculations of Corr'd Power & PPSD

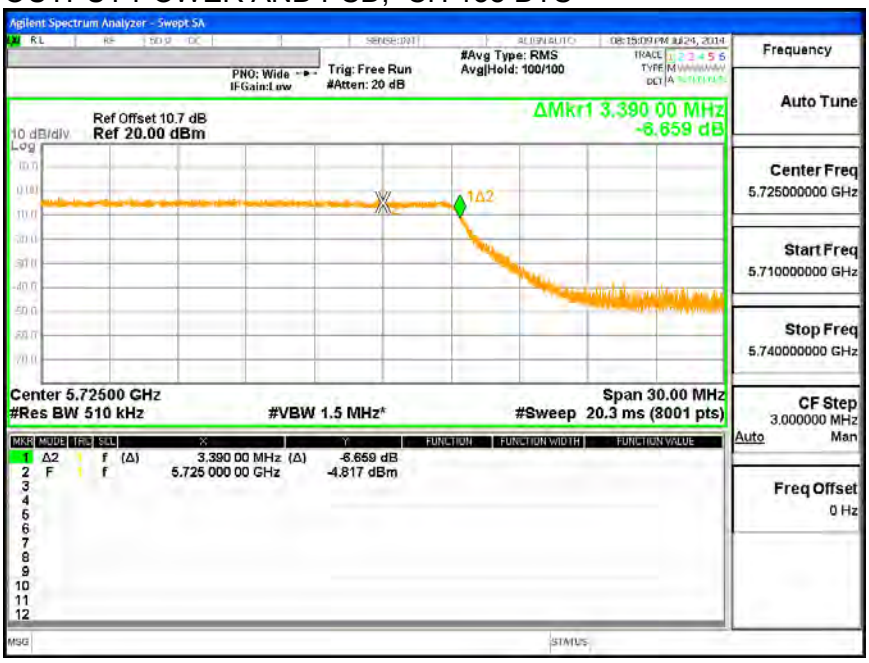
OUTPUT POWER AND PSD,

OUTPUT POWER AND PSD, CH 138 UNII

OUTPUT POWER AND PSD, CH 138 DTS



OUTPUT POWER AND PSD, CH 138 DTS



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.

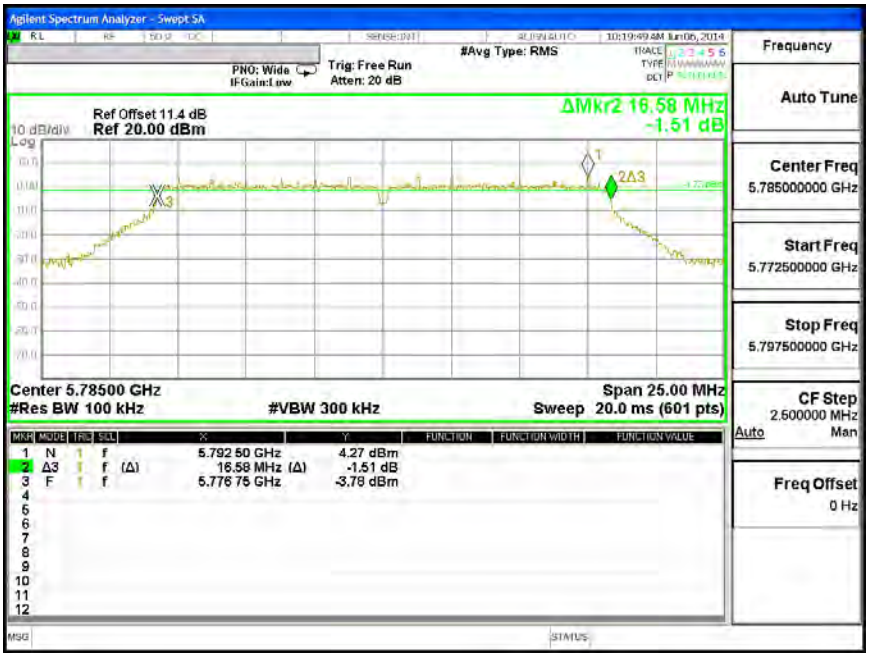
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	16.50	0.5
Mid	5785	16.58	0.5
High	5825	16.50	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

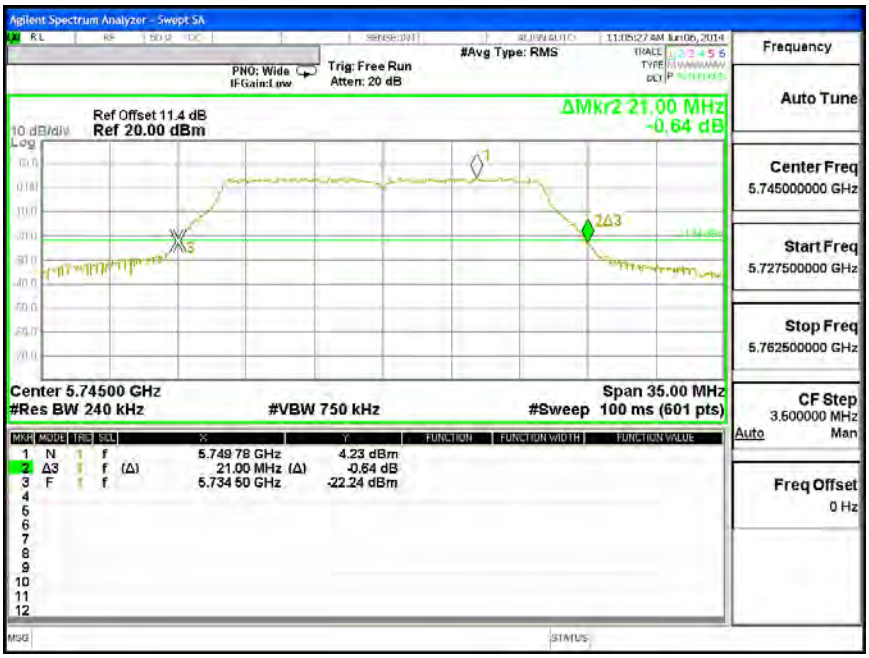
None; for reporting purposes only.

RESULTS

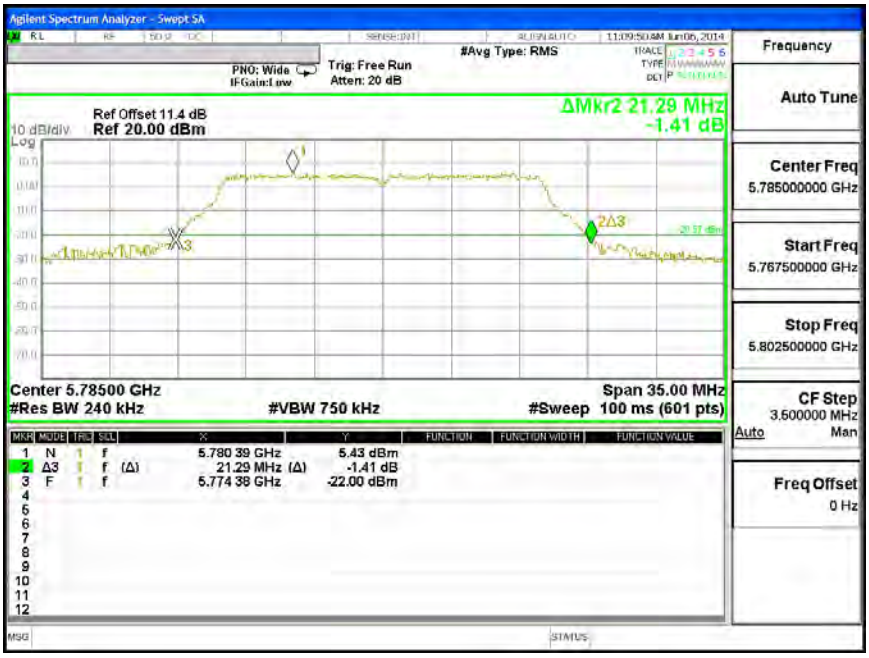
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	21.00
Mid	5785	21.29
High	5825	21.23

26 dB BANDWIDTH

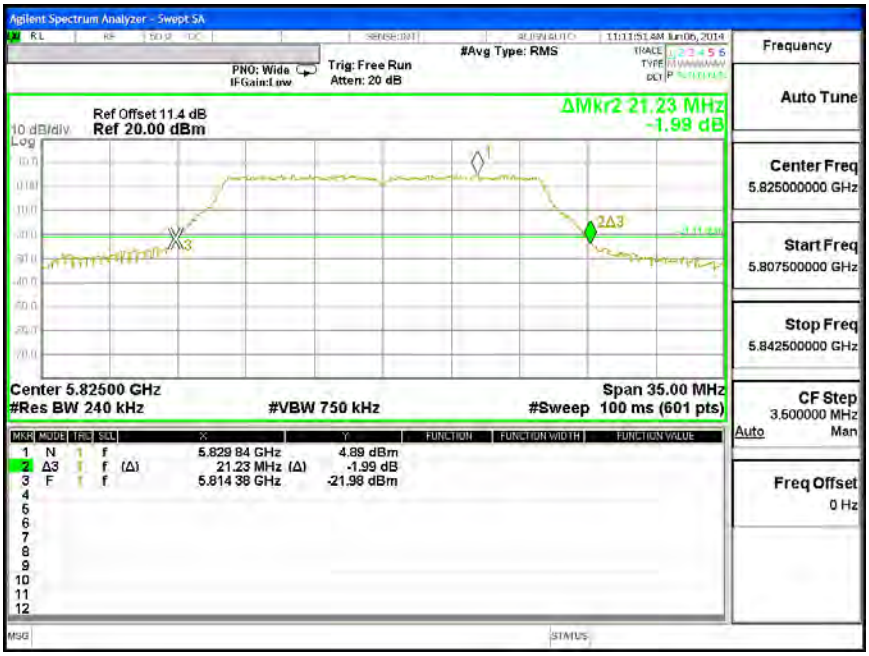
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



9.16.3. 99% BANDWIDTH

LIMITS

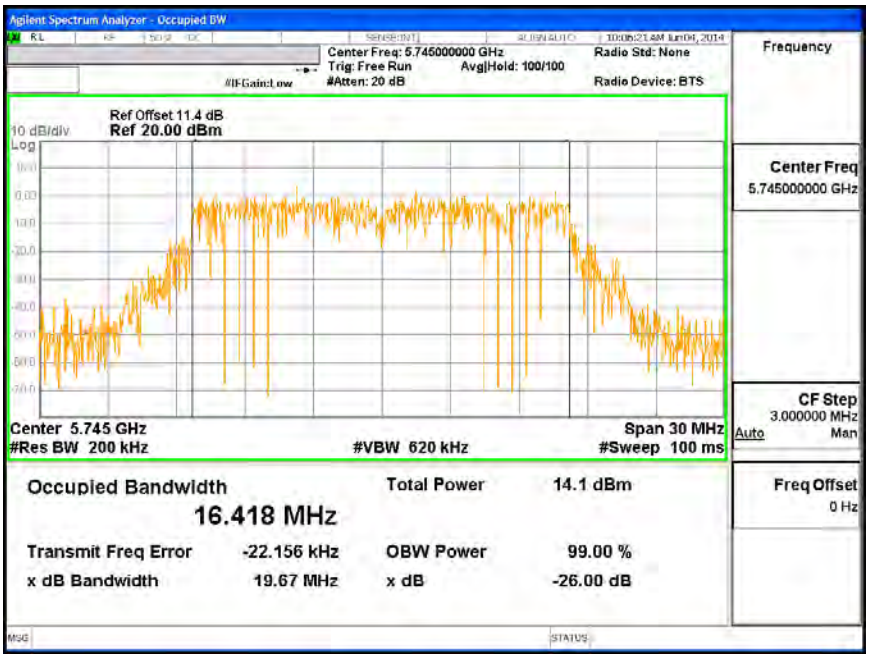
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	16.418
Mid	5785	16.528
High	5825	16.517

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. In addition, 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, 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.

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 11.2 dB (including 10 dB pad and 1.2 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)
-0.87

RESULTS

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	15.930	15.93	30.00	-14.07
Mid	5785	16.830	16.83	30.00	-13.17
High	5825	16.820	16.82	30.00	-13.18

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, 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.

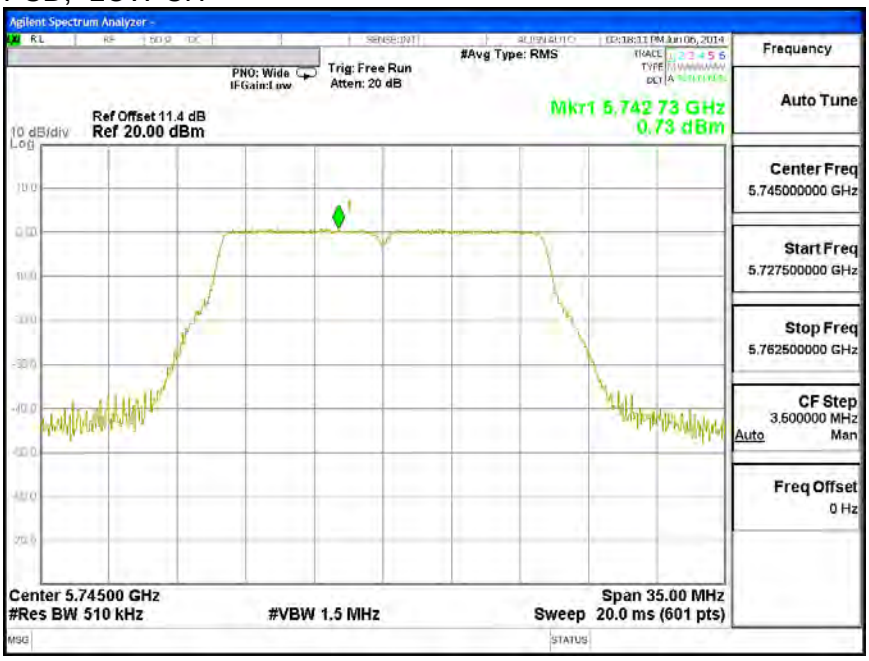
RESULTS

PSD Results

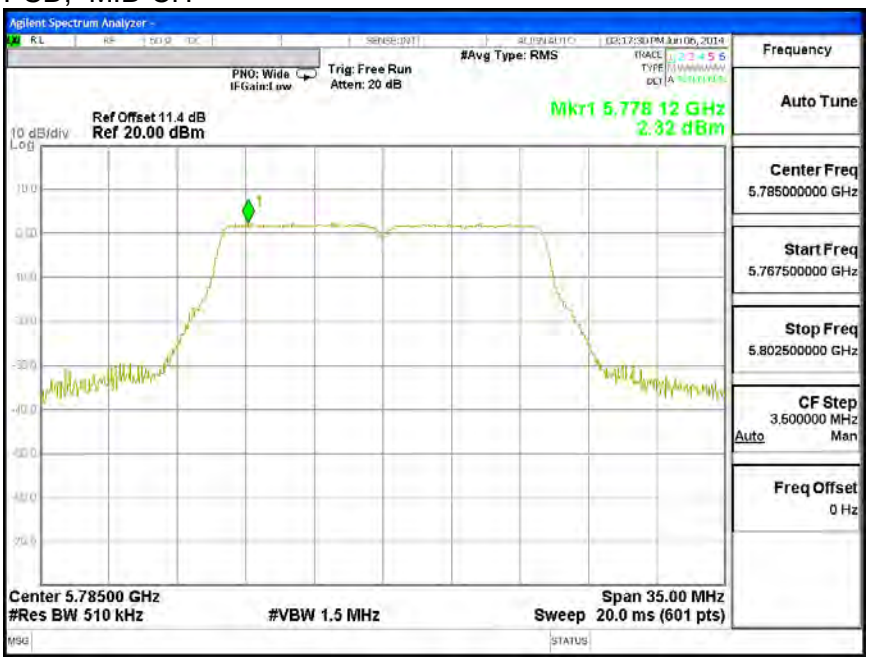
Channel	Frequency (MHz)	Meas (dBm)	Limit (dBm)	Margin (dB)
Low	5745	0.73	30.0	-29.3
Mid	5785	2.32	30.0	-27.7
High	5825	1.62	30.0	-28.4

PSD,

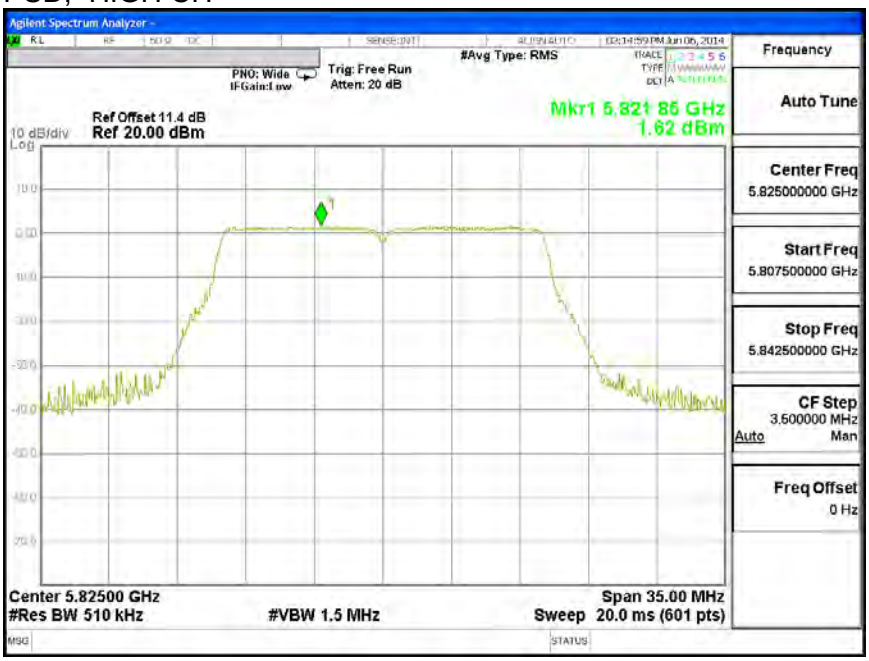
PSD, LOW CH



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.

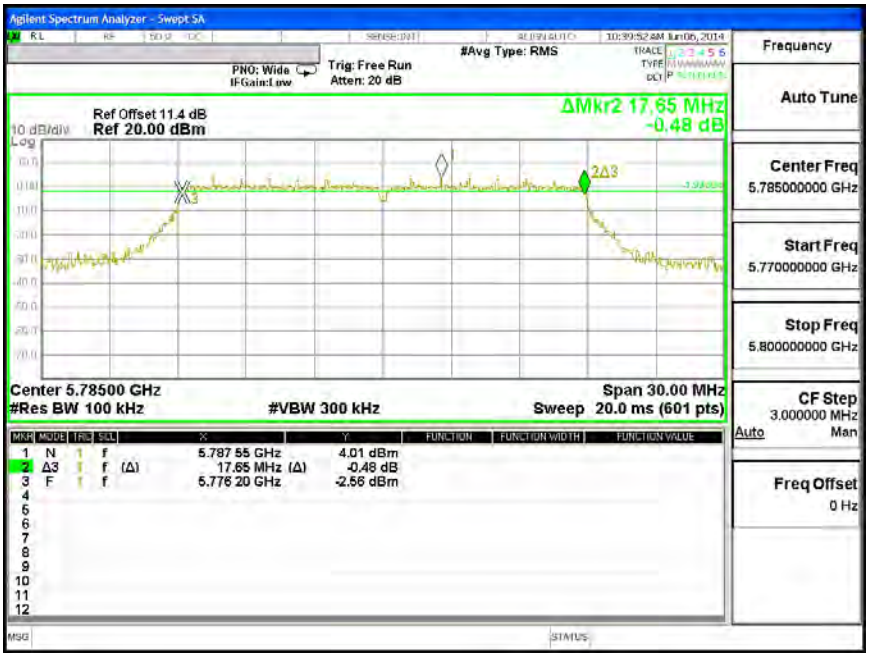
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	17.70	0.5
Mid	5785	17.65	0.5
High	5825	17.70	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	21.87
Mid	5785	21.53
High	5825	21.76

26 dB BANDWIDTH

BANDWIDTH LOW CH

BANDWIDTH MID CH

BANDWIDTH HIGH CH

9.17.3. 99% BANDWIDTH

LIMITS

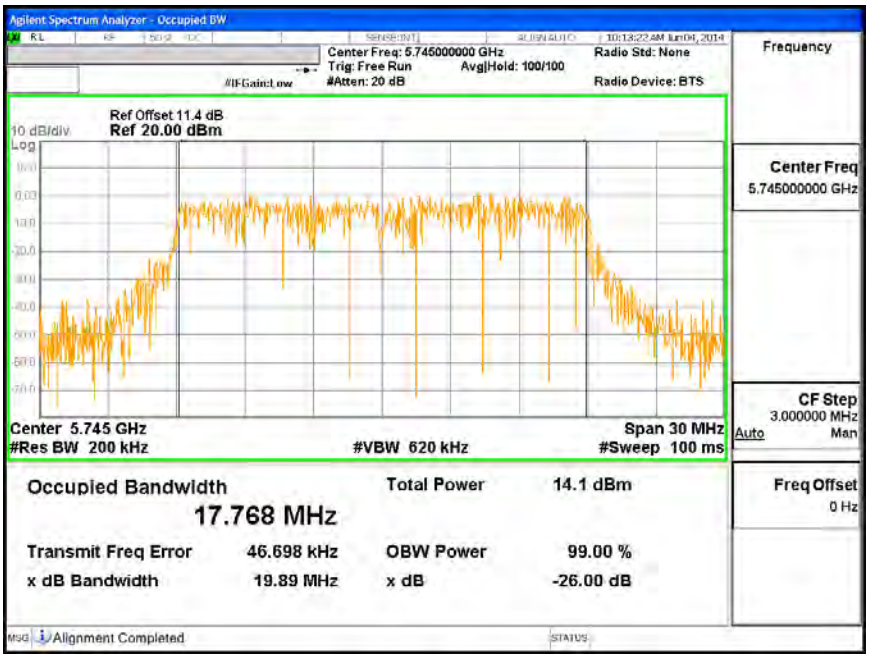
None; for reporting purposes only.

RESULTS

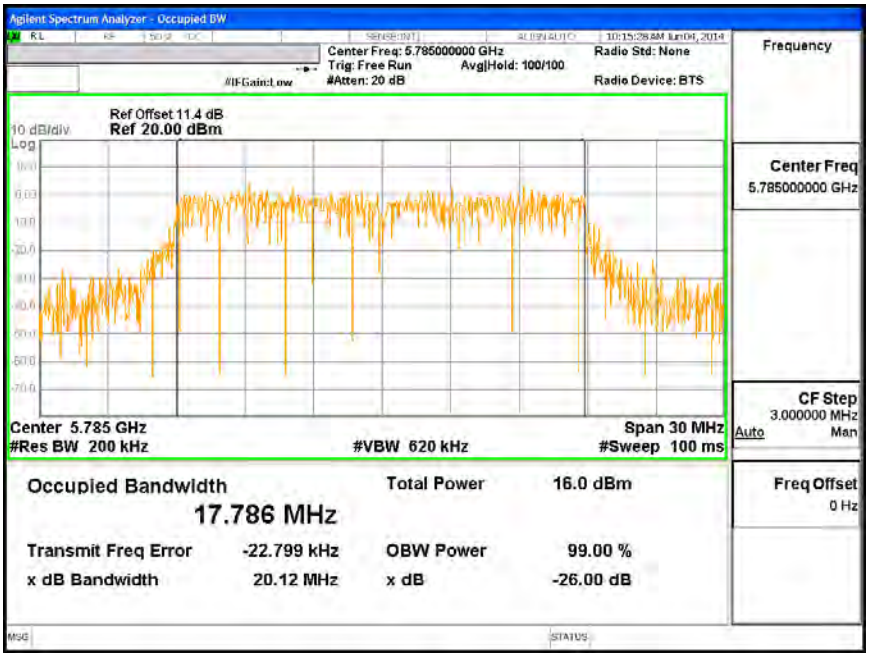
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	17.768
Mid	5785	17.786
High	5825	17.796

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 a1 W or 30 dBm. In addition, 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, 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.

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 11.2 dB (including 10 dB pad and 1.2 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)
-0.87

RESULTS

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	15.920	15.92	30.00	-14.08
Mid	5785	16.890	16.89	30.00	-13.11
High	5825	16.930	16.93	30.00	-13.07

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, 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.

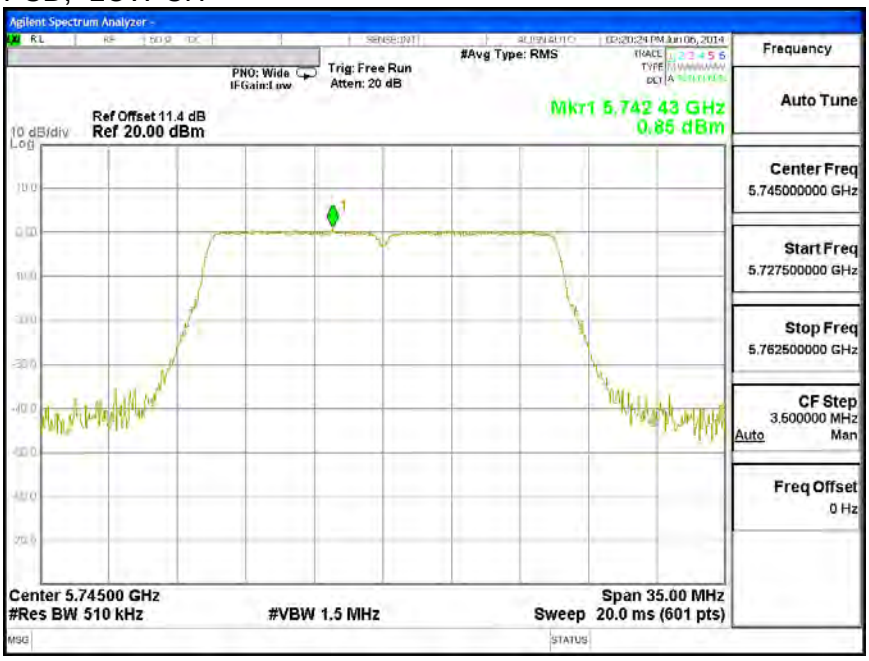
RESULTS

PSD Results

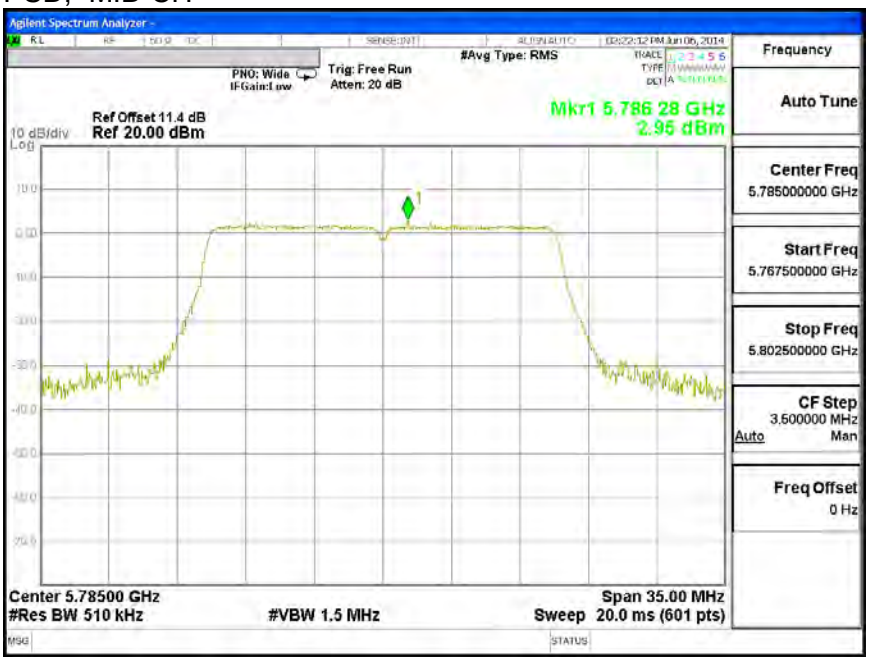
Channel	Frequency (MHz)	Meas (dBm)	Limit (dBm)	Margin (dB)
Low	5745	0.85	30.0	-29.2
Mid	5785	2.95	30.0	-27.1
High	5825	2.18	30.0	-27.8

PSD

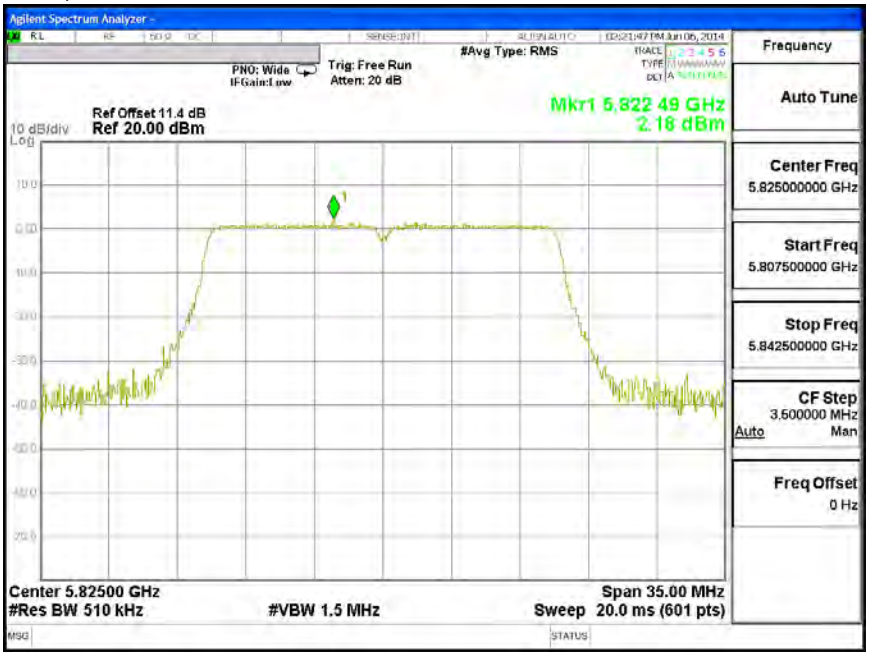
PSD, LOW CH



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 §15.247 (a) (2)

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

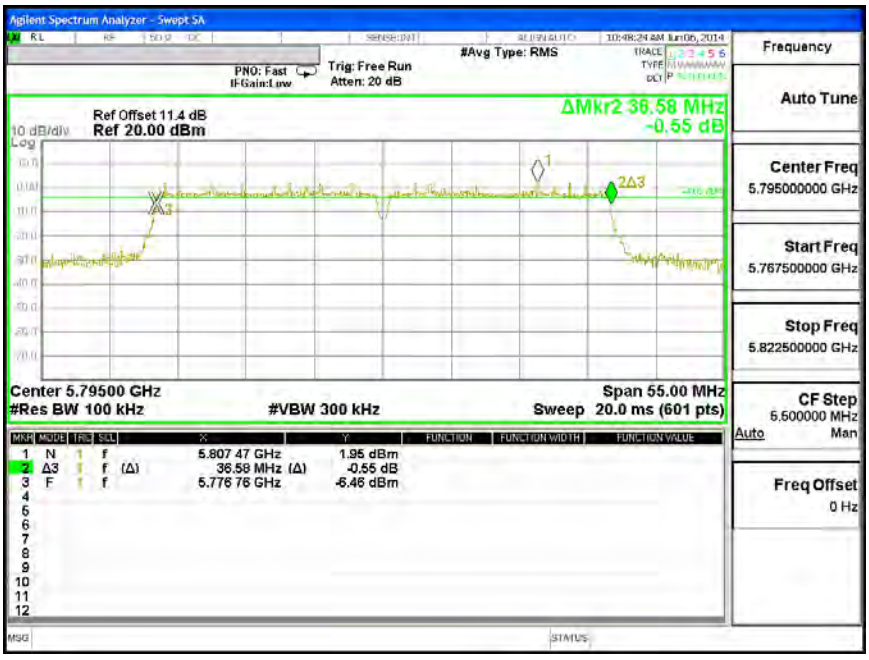
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	36.57	0.5
High	5795	36.58	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	40.41
High	5795	40.30

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	36.134
High	5795	36.302

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. In addition, 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, 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.

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 11.2 dB (including 10 dB pad and 1.2 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)
-0.87

RESULTS

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	14.370	14.37	30.00	-15.63
High	5795	16.930	16.93	30.00	-13.07

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, 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.

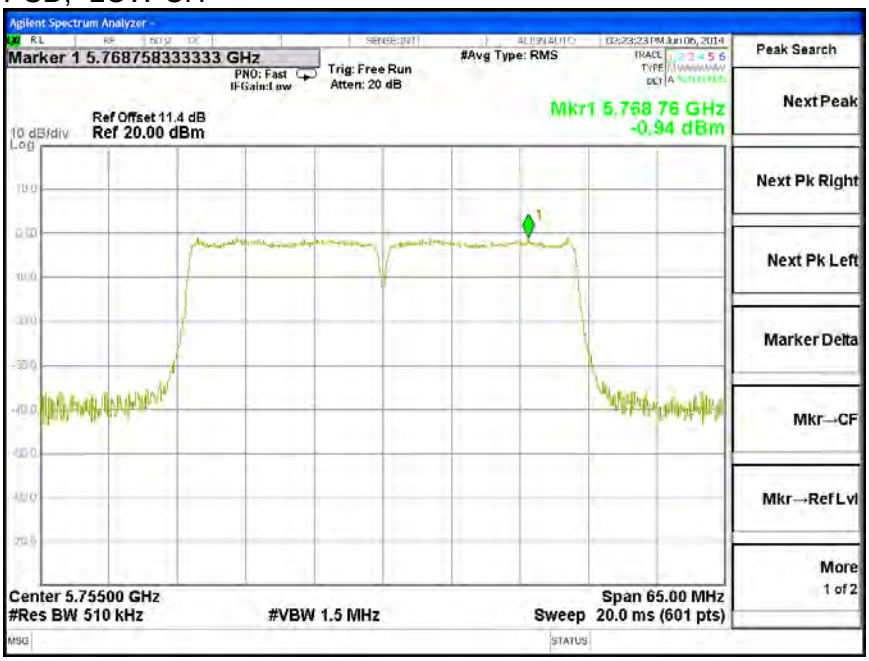
RESULTS

PSD Results

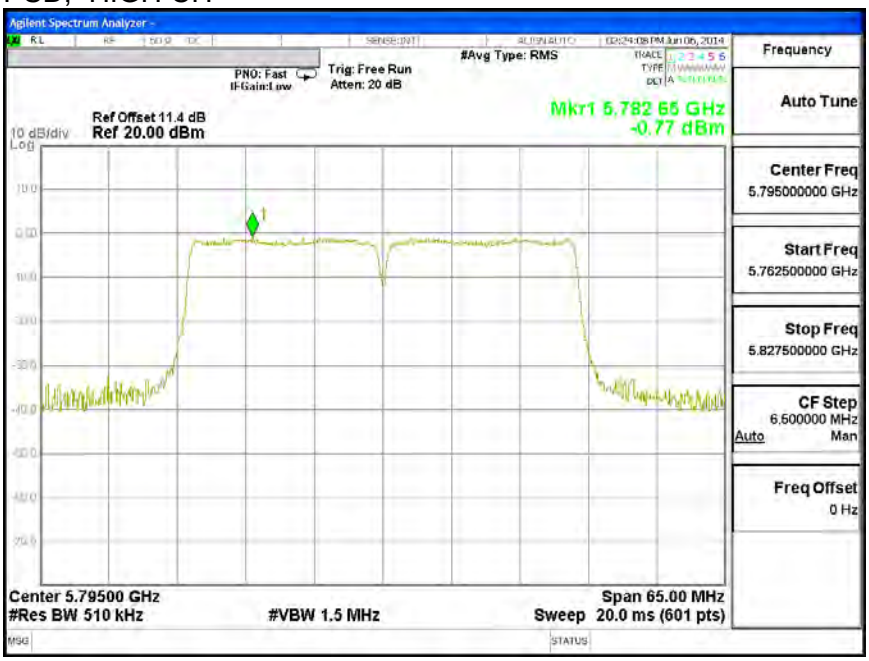
Channel	Frequency (MHz)	Meas (dBm)	Limit (dBm)	Margin (dB)
Low	5755	-0.94	8.0	-8.9
High	5795	-0.77	8.0	-8.8

PSD,

PSD, LOW CH



PSD, HIGH CH



9.19. 802.11ac 80 MODE IN THE 5.8 GHz BAND

9.19.1. 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)
155	5775	77.00	0.5

6 dB BANDWIDTH

6 dB BANDWIDTH CH 155

9.19.2. 26 dB BANDWIDTH

LIMITS

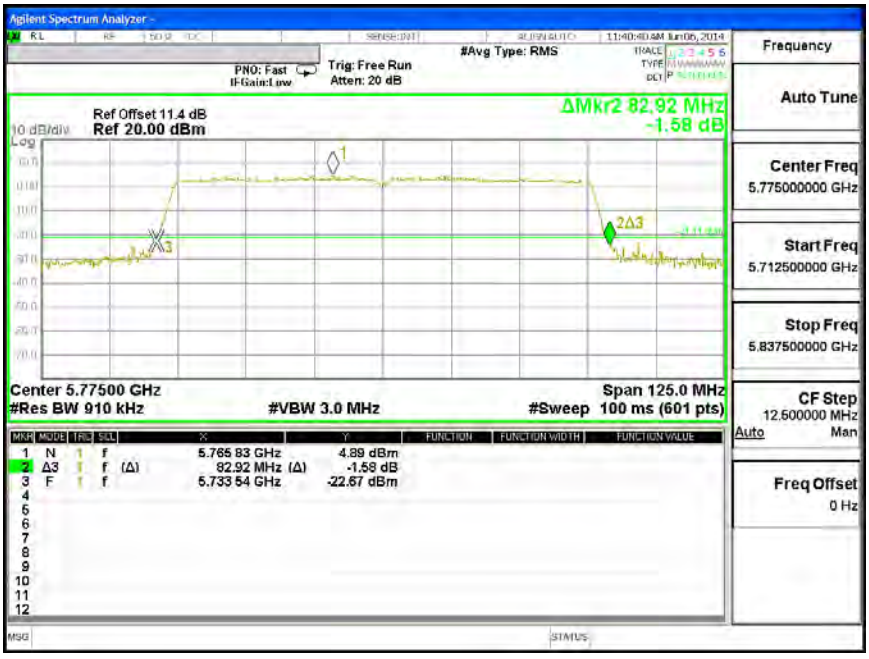
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5775	82.92

26 dB BANDWIDTH

BANDWIDTH LOW CH



9.19.3. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
155	5775	75.782

99% BANDWIDTH

99% BANDWIDTH CH 155

9.19.4. 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. In addition, 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, 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.

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 11.38 dB (including 10 dB pad 1.2dB cable and 0.18dB 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)
-0.87

RESULTS

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5775	12.890	13.07	30.00	-16.93

9.19.5. 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, 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.

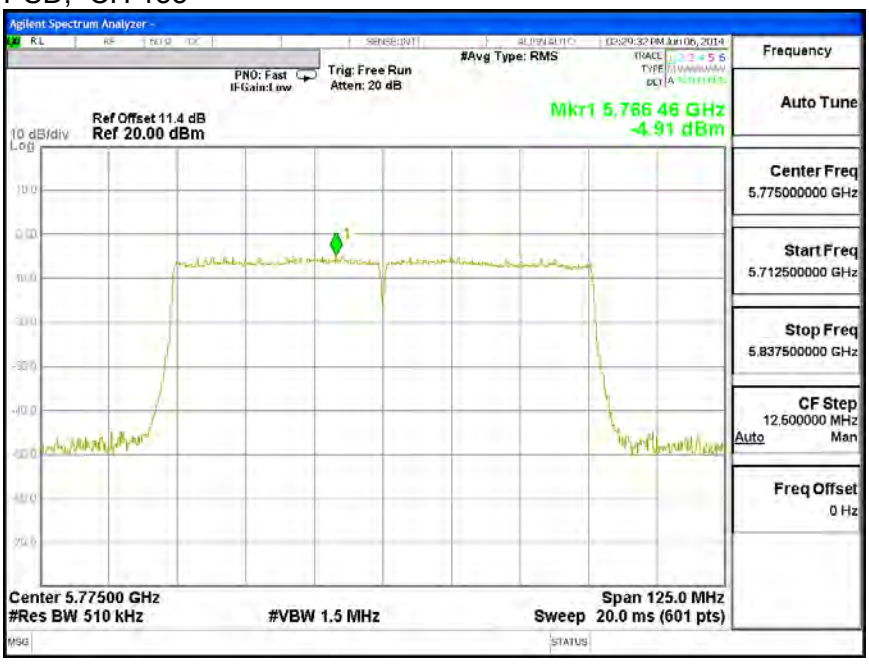
RESULTS

PSD Results

Channel	Frequency (MHz)	Meas (dBm)	Limit (dBm)	Margin (dB)
155	5775	-4.91	30.0	-34.9

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 3 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.

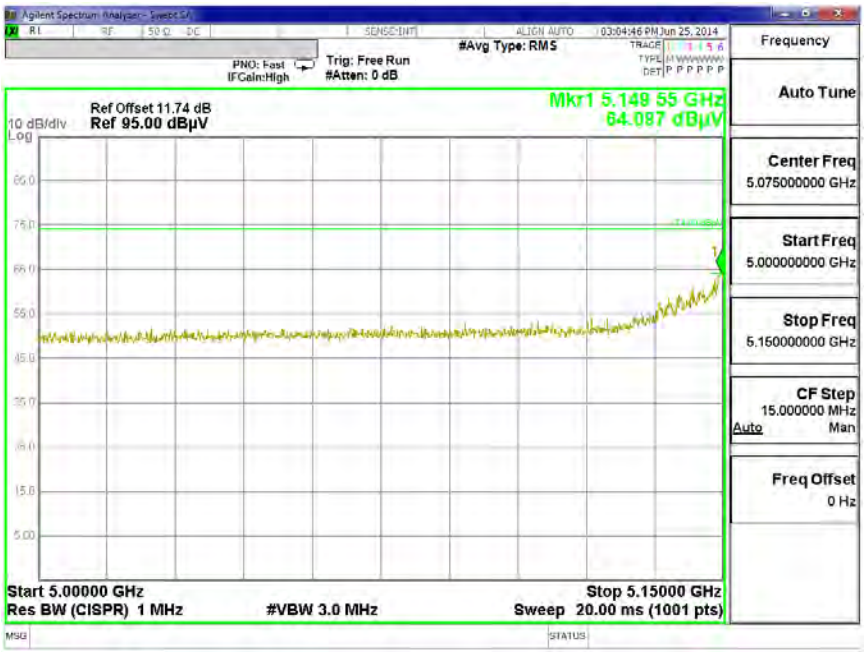
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

10.2. TRANSMITTER ABOVE 1 GHz

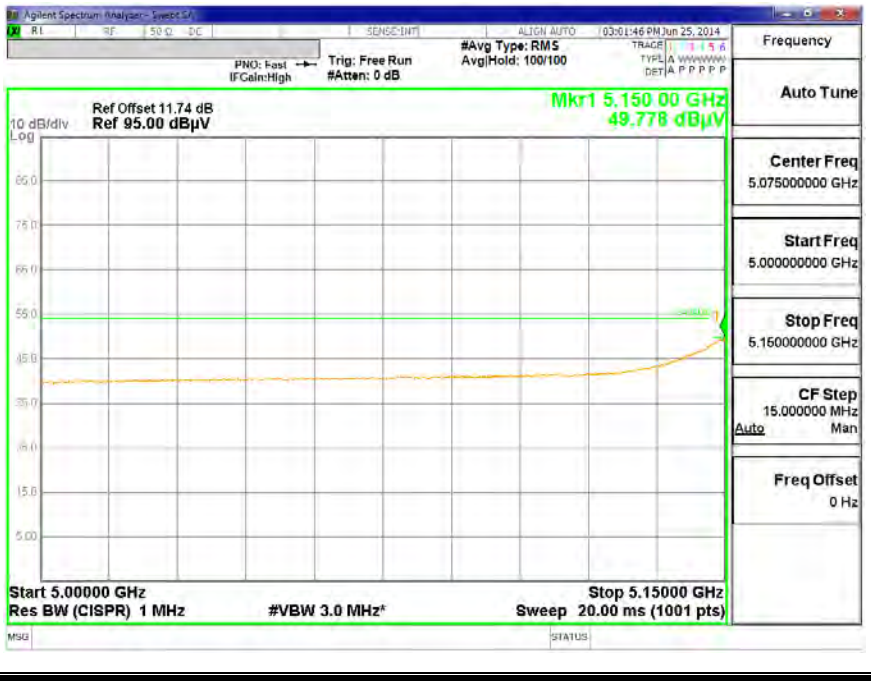
10.2.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

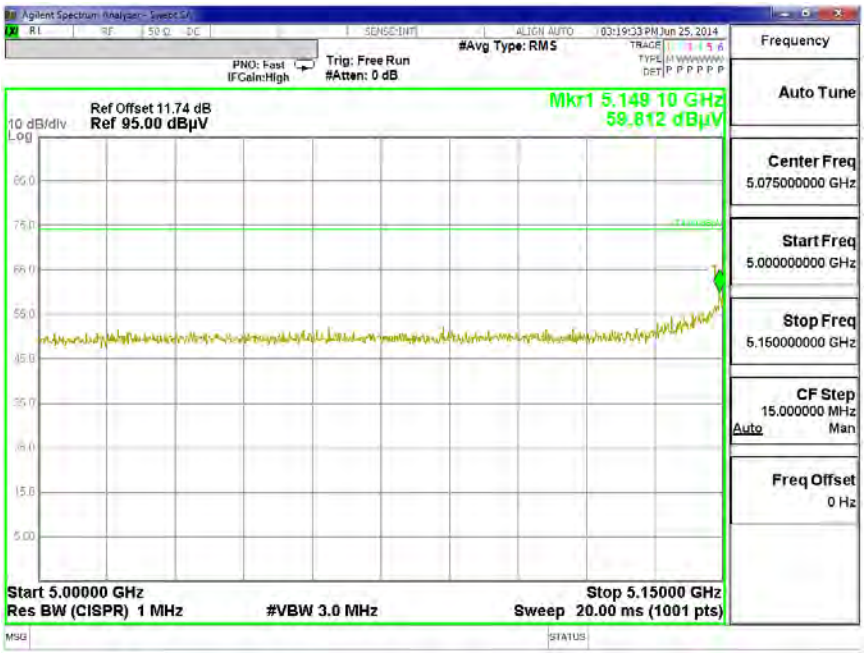
LOW CHANNEL RESTRICTED, PEAK, HORIZ



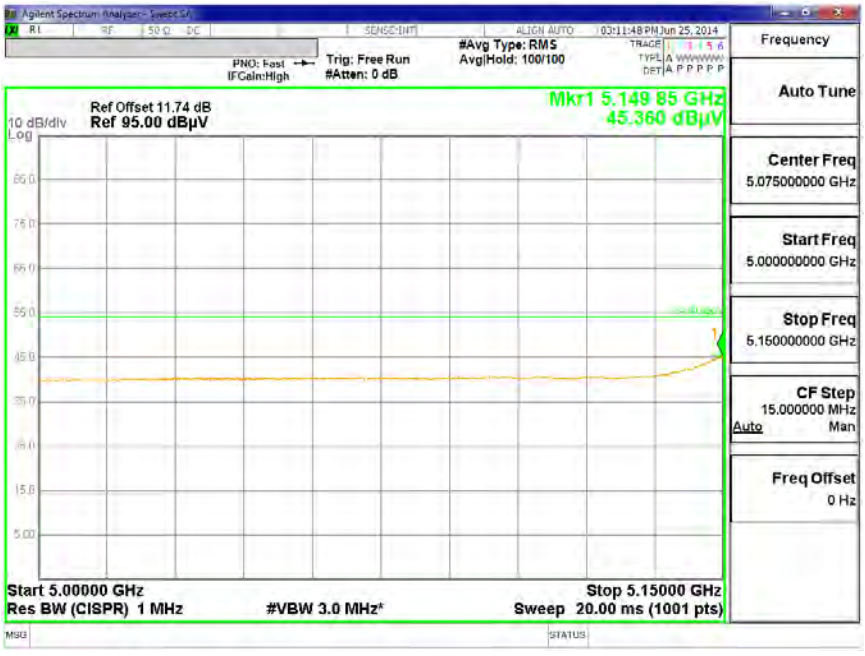
LOW CHANNEL RESTRICTED, AVERAGE, HORIZ



LOW CHANNEL RESTRICTED, PEAK, VERT

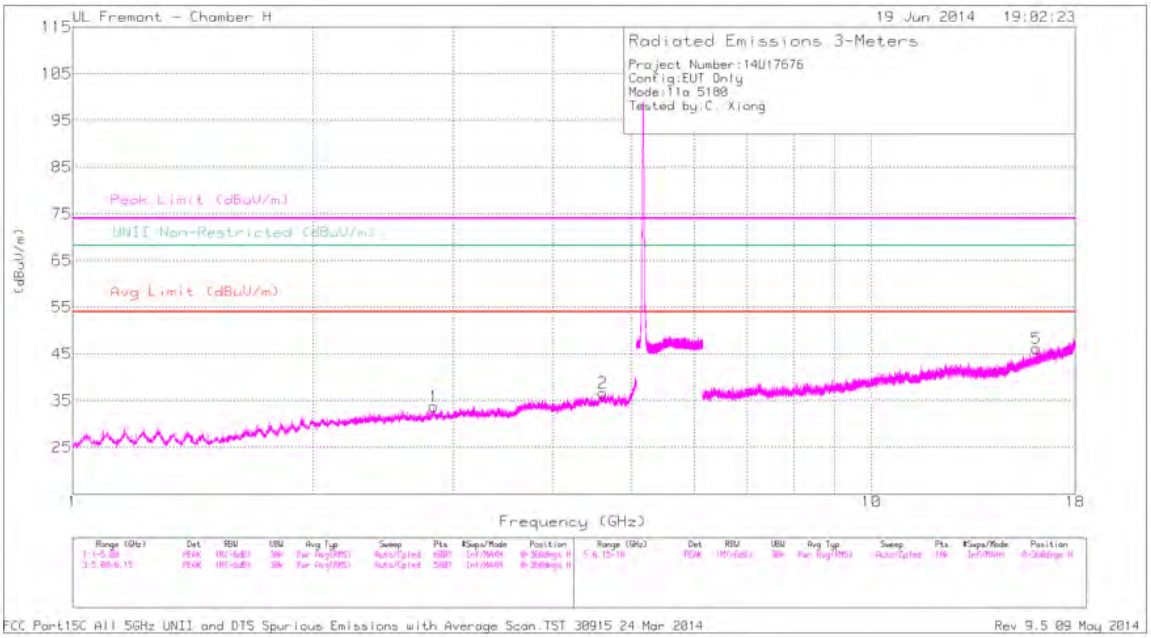


LOW CHANNEL RESTRICTED, AVERAGE, VERT

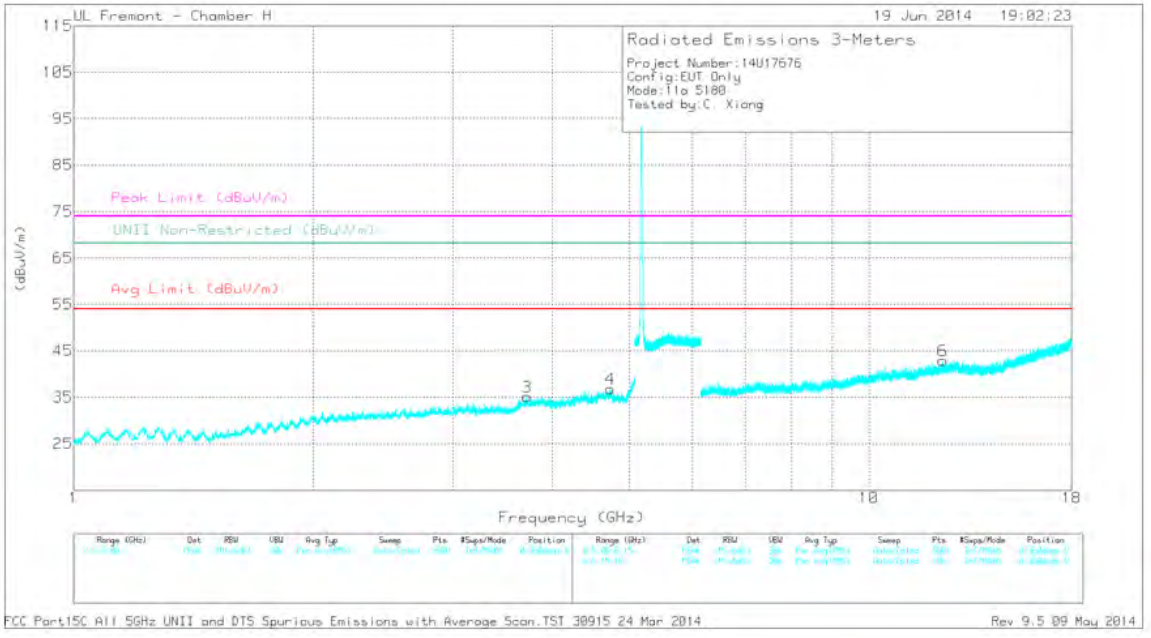


HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT, CH 36



LOW CHANNEL VERTICAL PLOT, CH 36



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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	* 2.828	41.84	PK1	32.5	-33	0	41.34	-	-	74	-32.66	-	-	250	203	H
	* 2.834	30.52	AD1	32.5	-33	.1	30.12	54	-23.88	-	-	-	-	250	203	H
2	* 4.615	41.69	PK1	34.1	-31.8	0	43.99	-	-	74	-30.01	-	-	189	218	H
	* 4.61	30.74	AD1	34.1	-31.7	.1	33.24	54	-20.76	-	-	-	-	189	218	H
3	* 3.72	41.84	PK1	33.2	-32.7	0	42.34	-	-	74	-31.66	-	-	68	145	V
	* 3.724	31.1	AD1	33.2	-32.8	.1	31.6	54	-22.4	-	-	-	-	68	145	V
4	* 4.735	41.03	PK1	34.3	-31.5	0	43.83	-	-	74	-30.17	-	-	332	249	V
	* 4.734	30.18	AD1	34.3	-31.5	.1	33.08	54	-20.92	-	-	-	-	332	249	V
5	* 16.083	35.73	PK1	41.2	-24.1	0	52.83	-	-	74	-21.17	-	-	313	154	H
	* 16.078	24.94	AD1	41.2	-24.1	.1	42.14	54	-11.86	-	-	-	-	313	154	H
6	* 12.399	36.56	PK1	39.1	-25.1	0	50.56	-	-	74	-23.44	-	-	34	185	V
	* 12.394	25.82	AD1	39.1	-25.2	.1	39.82	54	-14.18	-	-	-	-	34	185	V

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