Report On

FCC Testing of the
Yota Devices Ltd YotaPhone2/ YD201
In accordance with FCC CFR 47 Part 15E

COMMERCIAL-IN-CONFIDENCE

FCC ID: 2ADHW201

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December 2014

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DATED 11 December 2014

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 15E. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

G Lawler N Rousell S Bennett T Guy

Product Service

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SECTION 1

REPORT SUMMARY

FCC Testing of the
Yota Devices Ltd YotaPhone2/ YD201
In accordance with FCC CFR 47 Part 15E

1.1 INTRODUCTION

The information contained in this report is intended to show the verification of FCC Testing of the Yota Devices Ltd YotaPhone2/ YD201 to the requirements of FCC CFR 47 Part 15E.

Objective	To perform FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Yota Devices Ltd
Model Number(s)	YotaPhone2/ YD201
Serial Number(s)	IMEI 004402600038248 Not Serialised (75927375-TSR0007) Not Serialised (75927375-TSR0008)
Number of Samples Tested	3
Test Specification/Issue/Date	FCC CFR 47 Part 15E (2013)
Incoming Release Date	Application Form 05 December 2014
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	52831 15 September 2014
Start of Test	22 October 2014
Finish of Test	19 November 2014
Name of Engineer(s)	G Lawler N Rousell S Bennett T Guy
Related Document(s)	KDB 789033 D01 General UNII Test Procedures Old Rules v01r04 ANSI C63.10-2009 ETSI TR 100 028-1 V1.3.1 (2001-03) ETSI TR 100 028-2 V1.3.1 (2001-03)

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1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 15E is shown below.

Section	Spec Clause	Test Description	Result	Comments/Base Standard
802.11(a)				
2.1	15.207	AC Line Conducted Emissions	Pass	
2.2	15.407 (a)	26 dB Bandwidth	Pass	
2.3	15.407 (a)(1)(2)(3)	Power Limits	Pass	
2.4	15.407 (a)(5)	Peak Power Spectral Density	Pass	
2.5	15.407 (a)(6)	Ratio of the Peak Excursion of the Modulation Envelope	Pass	
2.6	15.407 (b)(1)(2)(3)(4)(6)(7)	Undesirable Emission Limits	Pass	
2.7	2.1055 and 15.407 (g)	Frequency Stability	Pass	
802.11(n) 20 MHz BW				
2.2	15.407 (a)	26 dB Bandwidth	Pass	
2.3	15.407 (a)(1)(2)(3)	Power Limits	Pass	
2.4	15.407 (a)(5)	Peak Power Spectral Density	Pass	
2.5	15.407 (a)(6)	Ratio of the Peak Excursion of the Modulation Envelope	Pass	
2.6	15.407 (b)(1)(2)(3)(4)(6)(7)	Undesirable Emission Limits	Pass	
2.7	2.1055 and 15.407 (g)	Frequency Stability	Pass	

Product Service

Section	Spec Clause	Test Description	Result	Comments/Base Standard
802.11(n) 40 MHz BW				
2.2	15.407 (a)	26 dB Bandwidth	Pass	
2.3	15.407 (a)(1)(2)(3)	Power Limits	Pass	
2.4	15.407 (a)(5)	Peak Power Spectral Density	Pass	
2.5	15.407 (a)(6)	Ratio of the Peak Excursion of the Modulation Envelope	Pass	
2.6	15.407 (b)(1)(2)(3)(4)(6)(7)	Undesirable Emission Limits	Pass	
2.7	2.1055 and 15.407 (g)	Frequency Stability	Pass	
802.11(ac) 20 MHz BW				
2.2	15.407 (a)	26 dB Bandwidth	Pass	
2.3	15.407 (a)(1)(2)(3)	Power Limits	Pass	
2.4	15.407 (a)(5)	Peak Power Spectral Density	Pass	
2.5	15.407 (a)(6)	Ratio of the Peak Excursion of the Modulation Envelope	Pass	
2.6	15.407 (b)(1)(2)(3)(4)(6)(7)	Undesirable Emission Limits	Pass	
2.7	2.1055 and 15.407 (g)	Frequency Stability	Pass	

Product Service

1.3 APPLICATION FORM

EQUIPMENT DESCRIPTION	
Model Name/Number	YotaPhone2/ YD201
Part Number	
FCC ID (if applicable)	
Industry Canada ID (if applicable)	
Technical Description (Please provide a brief description of the intended use of the equipment)	Smartphone

INFORMATION REQUIRED	
Modes:	
☒ 802.11(a)	
☒ 802.11(n)	
a) The occupied channel bandwidth(s):	
☒ Channel Bandwidth 1: 20MHz	☒ Channel Bandwidth 2: 40MHz
NOTE: Add more lines if the equipment has more channel Bandwidths.	
b) The DFS related operating mode(s) of the equipment:	
☐ Master	
☐ Slave with radar detection	
☒ Slave without radar detection	
NOTE: If the equipment has more than 1 operating mode, tick all that apply.	
c) The equipment can operate in ad-hoc mode:	
☐ no ad-hoc operation	
☐ ad-hoc operation in the frequency range 5150MHz to 5250MHz without DFS	
☒ ad-hoc operation with DFS	
NOTE: If more than 1 is applicable, tick all that apply	
d) Operating Frequency Range(s):	
☒	Range 1: 5150MHz to 5250MHz
☒	Range 2: 5250MHz to 5350MHz
☒	Range 3: 5470MHz to 5725MHz
☐	Range 4: 5725MHz to 5825MHz
NOTE: If the equipment has more than 1 Operating Frequency Range, tick all that apply.	
e) TPC feature available:	☒ Yes ☐ No

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INFORMATION REQUIRED			
f) If the equipment has a TPC range, the lowest and highest power level (or lowest and highest EIRP level in case of integrated antenna equipment), intended antenna assemblies and corresponding operating frequency range for the TPC range (or for each of the TPC ranges if more than one is implemented).			
TPC range: Applicable Frequency Range:			
☐	5250MHz to 5350MHz		
☐	5470 MHz to 5725 MHz		
☒	A TPC mechanism is not required for systems with an e.i.r.p of less than 500 mW		
DFS Threshold level:	dBm		
☐	at the antenna connector	☐	in front of the antenna
NOTE: For equipment with a maximum EIRP below 200 mW, the DFS threshold level shall be -62 dBm or less, for equipment with an EIRP of 200 mW or above, the DFS threshold level shall be -64 dBm or less. These levels assume a 0 dBi antenna gain. To define the applicable threshold level at the (temporary) antenna connector, the gain of the antenna (in dBi) shall be added to the threshold level. If more than one antenna is intended for this TPC range or power setting, the antenna gain of the antenna with the lowest gain shall be used.			
Power Setting 1: Applicable Frequency Range: 5150 MHz to 5250 MHz			
Conducted Average Power	15 dBm	Average EIRP	12.5 dBm
Power Setting 2: Applicable Frequency Range: 5250 MHz to 5350 MHz			
Conducted Average Power	14.5 dBm	Average EIRP	12 dBm
Power Setting 3: Applicable Frequency Range: 5470 MHz to 5725MHz			
Conducted Average Power	15 dBm	Average EIRP	12.5 dBm
Power Setting 4: Applicable Frequency Range: 5725 MHz to 5825MHz			
Conducted Average Power		Average EIRP	

Table 3: Intended Antenna Assemblies

Antenna Assembly name	Antenna Gain (dBi)
IFA LDS Antenna	-2.4 dBi

Product Service

INFORMATION REQUIRED	
h) The extreme operating temperature range that apply to the equipment:	
Please state conditions of normal operation as specified in the users manual: 20 C, 3.8V	
Supply Voltage:	
☐	AC mains. State AC voltage
☒	DC. State DC voltage
☐	State DC current
In case of DC, indicate the type of power source:	
☐	Internal Power Supply
☐	External Power Supply or AC/DC adapter
☐	Battery Nickel Cadmium
☐	Alkaline
☐	Nickel-Metal Hydride
☒	Lithium-Ion
☐	Lead acid (Vehicle regulated)
☐	Other (please specify):

ADDITIONAL INFORMATION PROVIDED BY THE SUBMITTER					
a) Modulation:					
Continuous duty		☒	Yes	☐	No
Can the transmitter operate un-modulated?		☐	Yes	☒	No
b) Duty Cycle					
Is transmitter intended for :					
Continuous duty		☒	Yes	☐	No
Intermittent duty only		☐	Yes	☐	No
If intermittent duty state DUTY CYCLE					
Transmitter ON	Seconds	Transmitter OFF		Seconds	
☐ Continuous operation possible for testing purposes					
Details:					

I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

Signature:	Held on File at TUV SUD	Name:	Jukka Ollila
Position held:	Test Lead	Date:	10.12.2014

Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Yota Devices Ltd YotaPhone2/ YD201. A full technical description can be found in the manufacturer's documentation.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from a 3.8 V DC supply.

FCC Measurement Facility Registration Number
90987 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No other deviations from the applicable test standard were made during testing.

Power Limits - The plots show results using a 100 kHz resolution bandwidth, this is a deviation to the measurement method in the KDB. There would be no effect on the result.

1.7 MODIFICATION RECORD

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Serial Number: IMEI 004402600038248			
0	As supplied by manufacturer.	N/A	N/A
Serial Number: Not Serialised (75927375-TSR0007)			
0	As supplied by manufacturer.	N/A	N/A
1	Revised Power table with new power settings provided by email from the customer.	Provided by email from Natividad Caro García.	04/08/2014
Serial Number: Not Serialised (75927375-TSR0008)			
0	As supplied by manufacturer.	N/A	N/A

The table above details modifications made to the EUT during the test programme. The modifications incorporated during each test are recorded on the appropriate test pages.

Product Service

SECTION 2

TEST DETAILS

FCC Testing of the
Yota Devices Ltd YotaPhone2/ YD201
In accordance with FCC CFR 47 Part 15E

2.1 AC LINE CONDUCTED EMISSIONS

2.1.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.207

2.1.2 Equipment Under Test and Modification State

YotaPhone2/ YD201 S/N: IMEI 004402600038248 - Modification State 0

2.1.3 Date of Test

19 November 2014

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Procedure

A test environment and testing arrangement meeting the specification of ANSI C63.4 was used during all testing. The Equipment Under Test (EUT) was set upon a non-conducting platform at an elevation of 80 cm above a horizontal reference ground plane. A vertical reference ground plane was situated 40 cm from the EUT and bonded to the horizontal reference ground plane.

The EUT was powered by a Line Impedance Stabilization Network (LISN), whereby emissions measurements of the current-carrying conductors were made through this LISN. The LISN was bonded to the horizontal reference ground plane with a separation distance greater than 80 cm from the EUT. A mains supply cable of 1 m length was used to supply mains power to the EUT from the LISN.

A preliminary emissions scan was conducted for each current-carrying conductor of the EUT, using a peak detector over a frequency range of 150 kHz to 30 MHz. At least six of the greatest peak emissions, frequency positions were selected from each preliminary emissions scan for further evaluation as final measuring points.

Final measurement points were measured using quasi-peak and average detectors. All final measurements were assessed against the emission limits in Clause 15.207 of FCC CFR 47 FCC Part 15.

2.1.6 Environmental Conditions

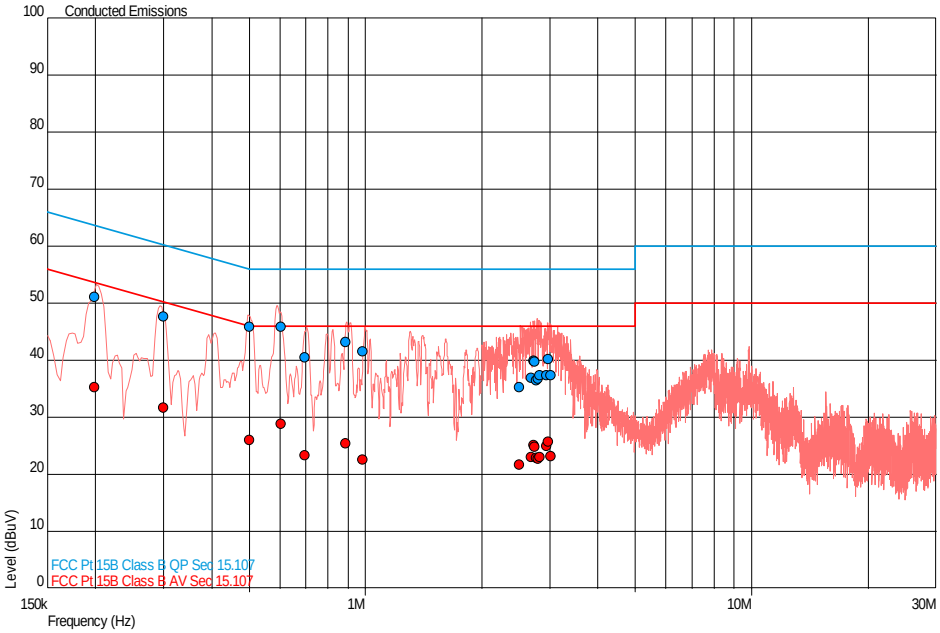
Ambient Temperature	20.3°C
Relative Humidity	40.0%

Product Service

2.1.7 Test Results

802.11(a)

Live Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.198	51.1	63.7	-12.6	35.3	53.7	-18.4
0.300	47.8	60.2	-12.4	31.7	50.2	-18.5
0.502	45.9	56.0	-10.1	26.0	46.0	-20.0
0.603	45.9	56.0	-10.1	28.9	46.0	-17.1
0.696	40.5	56.0	-15.5	23.3	46.0	-22.7
0.888	43.1	56.0	-12.9	25.5	46.0	-20.5
0.983	41.5	56.0	-14.5	22.6	46.0	-23.4
2.500	35.3	56.0	-20.7	21.7	46.0	-24.3
2.683	36.9	56.0	-19.1	23.0	46.0	-23.0
2.726	40.0	56.0	-16.0	25.2	46.0	-20.8
2.740	39.8	56.0	-16.2	24.8	46.0	-21.2
2.774	36.6	56.0	-19.4	22.9	46.0	-23.1
2.804	36.8	56.0	-19.2	22.7	46.0	-23.3
2.826	37.5	56.0	-18.5	23.1	46.0	-22.9
2.946	37.4	56.0	-18.6	25.0	46.0	-21.0
2.975	40.2	56.0	-15.8	25.8	46.0	-20.2
3.022	37.4	56.0	-18.6	23.3	46.0	-22.7

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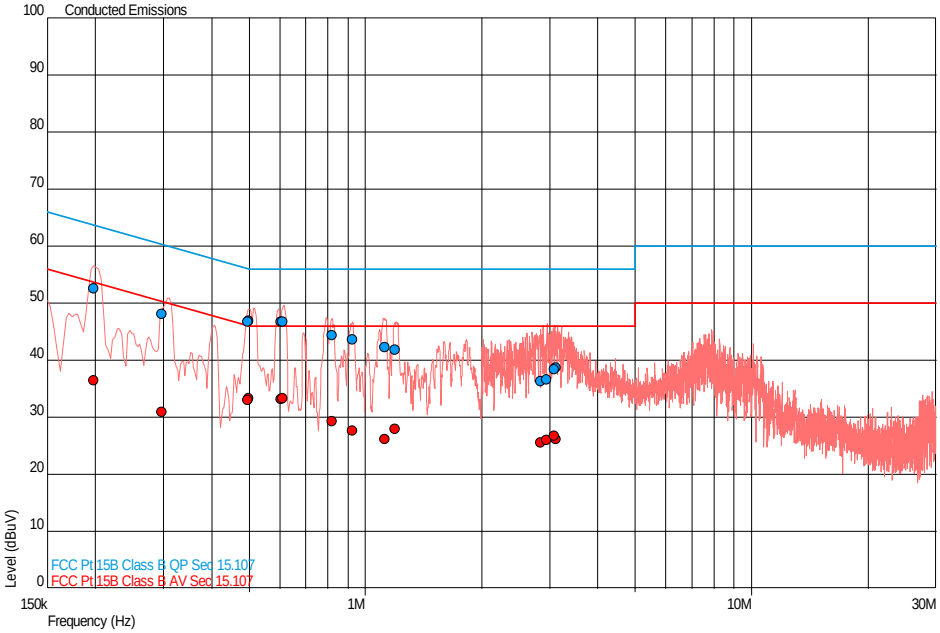
Neutral Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.198	52.7	63.7	-11.0	36.5	53.7	-17.2
0.297	48.1	60.3	-12.2	31.0	50.3	-19.3
0.496	46.8	56.1	-9.3	33.1	46.1	-13.0
0.499	47.0	56.0	-9.0	33.4	46.0	-12.6
0.604	46.7	56.0	-9.3	33.3	46.0	-12.7
0.611	46.7	56.0	-9.3	33.3	46.0	-12.7
0.821	44.3	56.0	-11.7	29.4	46.0	-16.6
0.926	43.7	56.0	-12.3	27.6	46.0	-18.4
1.122	42.3	56.0	-13.7	26.2	46.0	-19.8
1.193	41.9	56.0	-14.1	27.9	46.0	-18.1
2.846	36.4	56.0	-19.6	25.5	46.0	-20.5
2.946	36.6	56.0	-19.4	26.1	46.0	-19.9
3.074	38.4	56.0	-17.6	26.8	46.0	-19.2
3.105	38.7	56.0	-17.3	26.3	46.0	-19.7

2.2 26 dB BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.407 (a)

2.2.2 Equipment Under Test and Modification State

YotaPhone2/ YD201 S/N: Not Serialised (75927375-TSR0007) - Modification State 1

2.2.3 Date of Test

22 October 2014 & 28 October 2014

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.5 Test Procedure

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15.407 (a) and KDB 789033 D01 General UNII Test Procedures 1 Old Rules v01r04.

The EUT was transmitting at maximum power, for bottom, middle and top channels with a data rate that was determined to produce the greatest average RF output power. The EUT was connected to a spectrum analyser via a cable and attenuator. The Analyser settings were adjusted to an RBW of at least 1% of the emission bandwidth with a video bandwidth of 3 x RBW. The analyser was configured with peak detector and trace set to max hold. The peak point of the trace was measured and the markers positioned to give the -26 dBc points of the displayed spectrum.

The plots on the following pages show the resultant display from the Spectrum Analyser.

2.2.6 Environmental Conditions

Ambient Temperature	24.2 - 24.8°C
Relative Humidity	34.3 - 48.0%

Product Service

2.2.7 Test Results

802.11(a)

Frequency Band 1

5180 MHz

26 dB Bandwidth (MHz)	38.85

5220 MHz

26 dB Bandwidth (MHz)	41.20

Product Service

5240 MHz

26 dB Bandwidth (MHz)	38.55

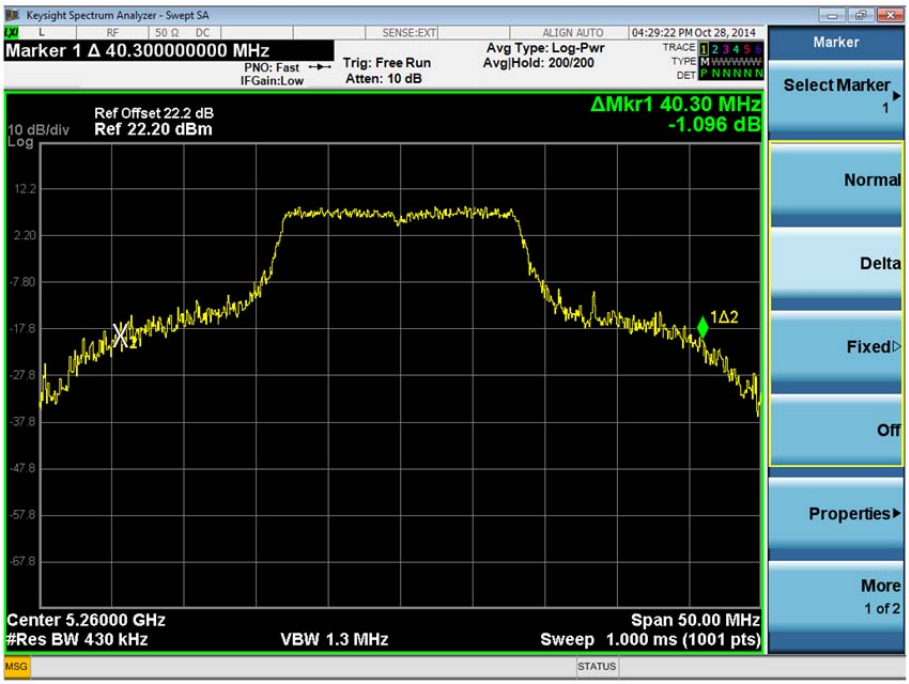
The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 6 Mbps.

Product Service

Frequency Band 2

5260 MHz

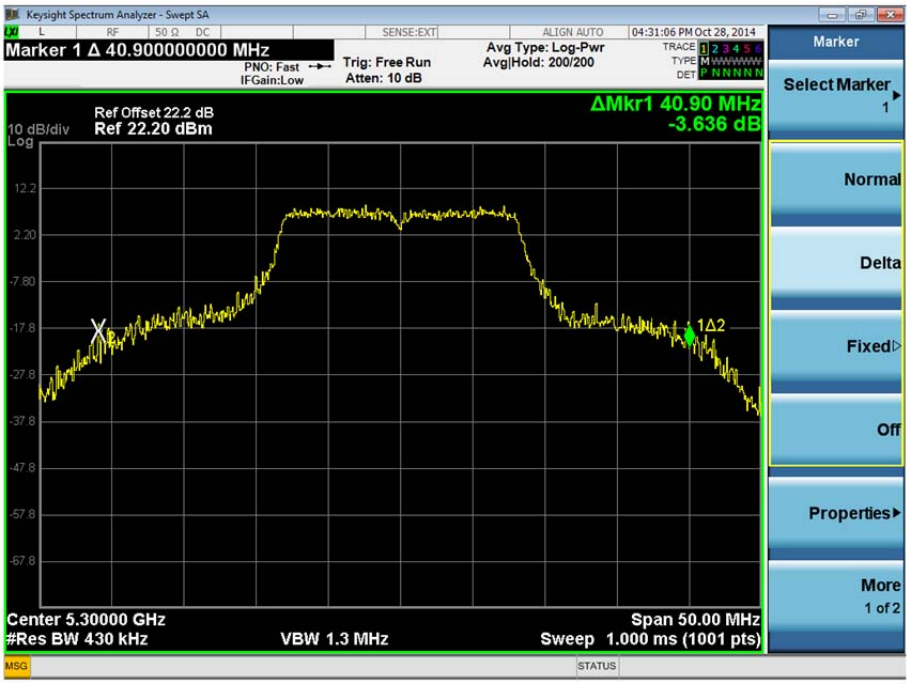
26 dB Bandwidth (MHz)	40.30



Product Service

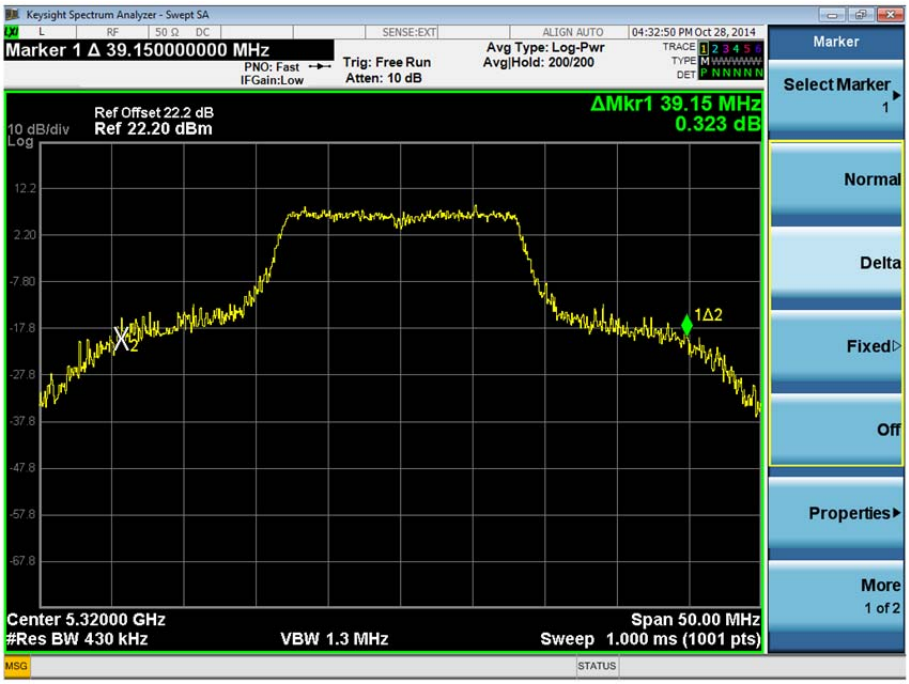
5300 MHz

26 dB Bandwidth (MHz)	40.90



5320 MHz

26 dB Bandwidth (MHz)	39.15



The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 6 Mbps.

Product Service

Frequency Band 3

5500 MHz

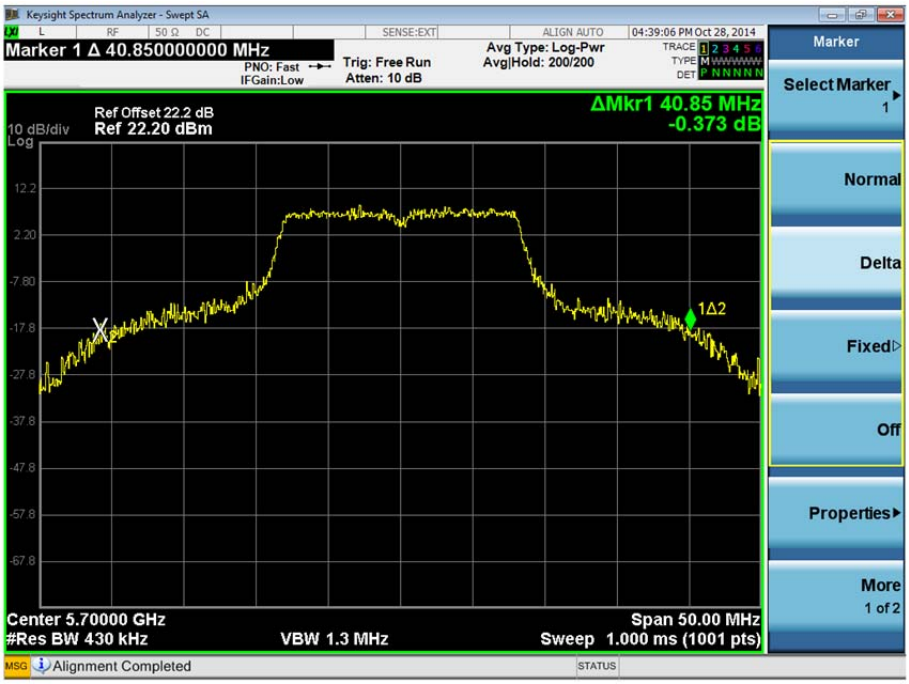
26 dB Bandwidth (MHz)	40.65

5580 MHz

26 dB Bandwidth (MHz)	42.40

5700 MHz

26 dB Bandwidth (MHz)	40.85



The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 6 Mbps.

Limit

Not specified.

802.11(ac) 20 MHz BW

Frequency Band 1

5180 MHz

26 dB Bandwidth (MHz)	31.75

Product Service

5220 MHz

26 dB Bandwidth (MHz)	33.30

Product Service

5240 MHz

26 dB Bandwidth (MHz)	33.55

The test was performed on the worst case data rate for 802.11(ac) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Product Service

Frequency Band 2

5260 MHz

26 dB Bandwidth (MHz)	33.50

Product Service

5300 MHz

26 dB Bandwidth (MHz)	33.15

5320 MHz

26 dB Bandwidth (MHz)	33.10

The test was performed on the worst case data rate for 802.11(ac) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Product Service

Frequency Band 3

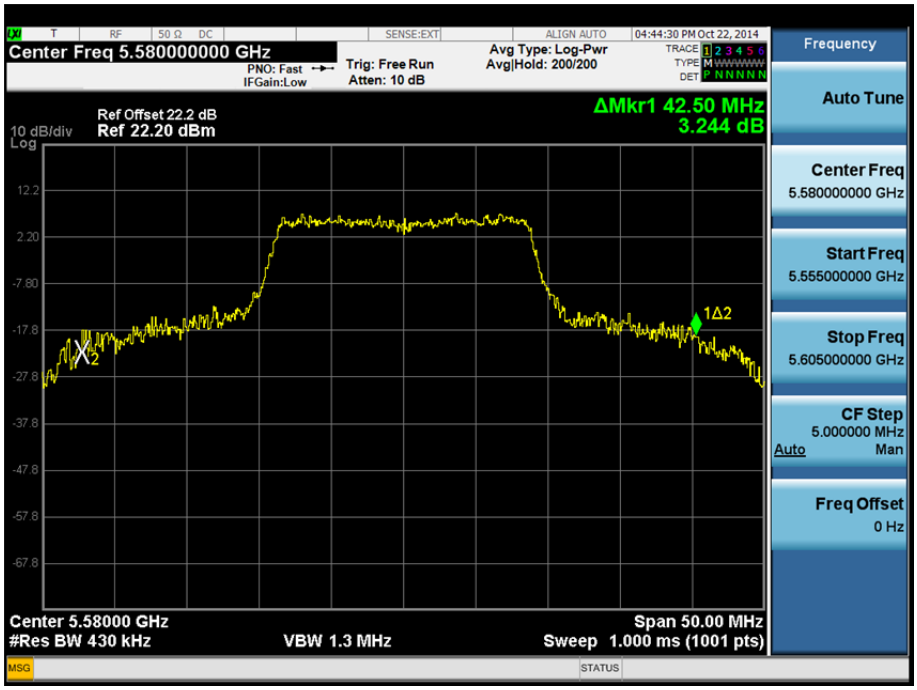
5500 MHz

26 dB Bandwidth (MHz)	33.85

Product Service

5580 MHz

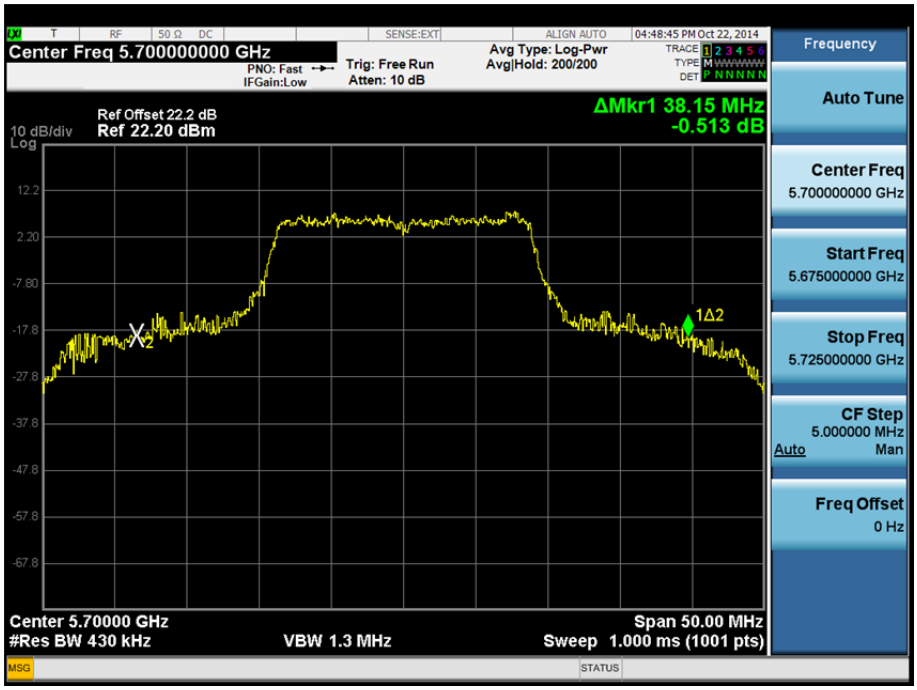
26 dB Bandwidth (MHz)	42.5



Product Service

5700 MHz

26 dB Bandwidth (MHz)	38.15



The test was performed on the worst case data rate for 802.11(ac) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Limit

Not specified.

802.11(n) 20 MHz BW

Frequency Band 1

5180 MHz

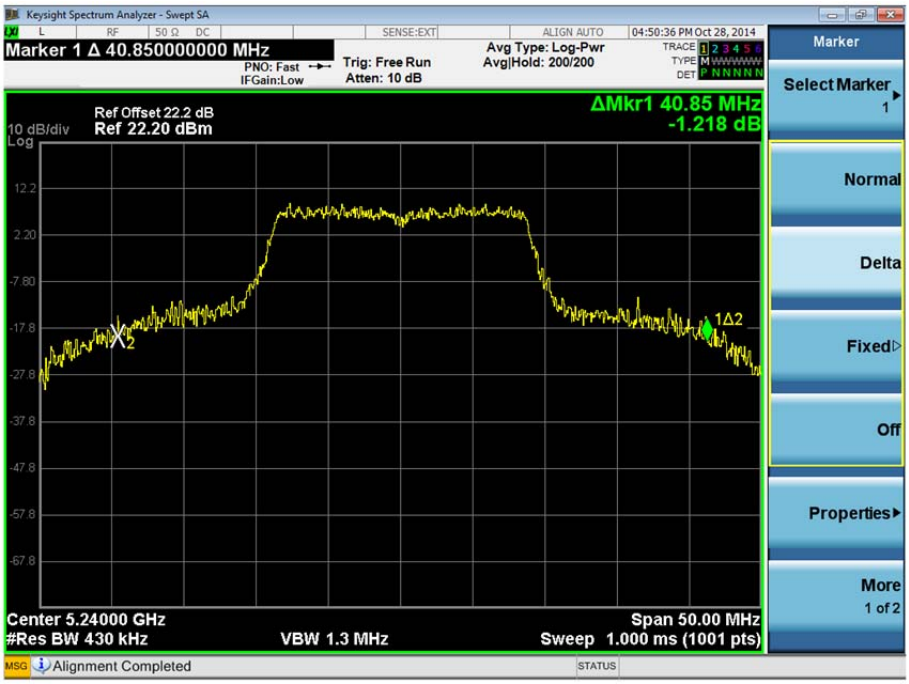
26 dB Bandwidth (MHz)	40.75

5220 MHz

26 dB Bandwidth (MHz)	40.85

5240 MHz

26 dB Bandwidth (MHz)	40.85



The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Product Service

Frequency Band 2

5260 MHz

26 dB Bandwidth (MHz)	41.05

5300 MHz

26 dB Bandwidth (MHz)	40.35

5320 MHz

26 dB Bandwidth (MHz)	40.70

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Frequency Band 3

5500 MHz

26 dB Bandwidth (MHz)	40.10

5580 MHz

26 dB Bandwidth (MHz)	42.05

5700 MHz

26 dB Bandwidth (MHz)	41.40

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Limit

Not specified.

802.11(n) 40 MHz BW

Frequency Band 1

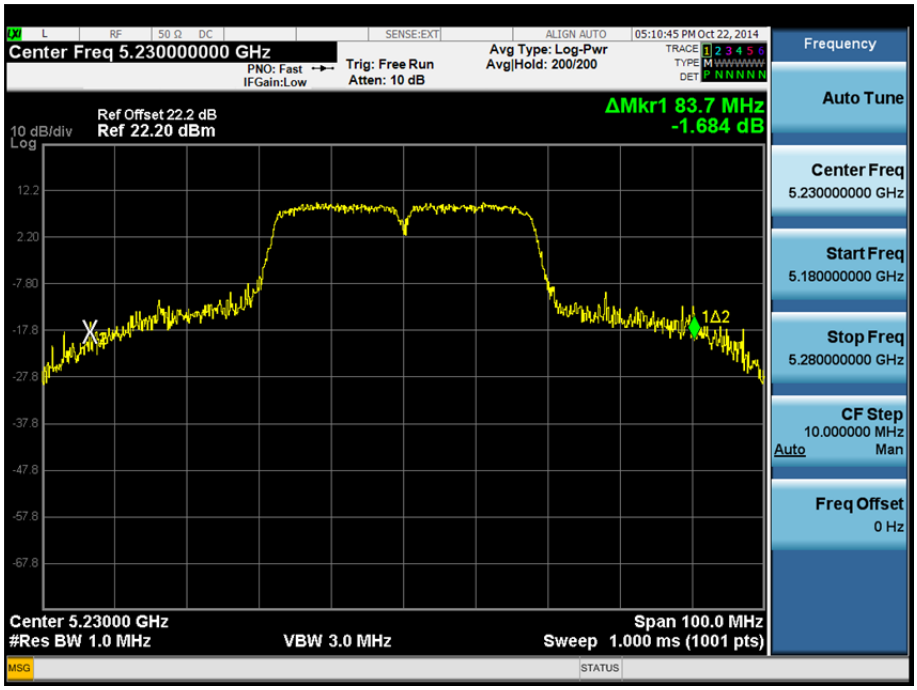
5190 MHz

26 dB Bandwidth (MHz)	87.20

Product Service

5230 MHz

26 dB Bandwidth (MHz)	83.70



The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Product Service

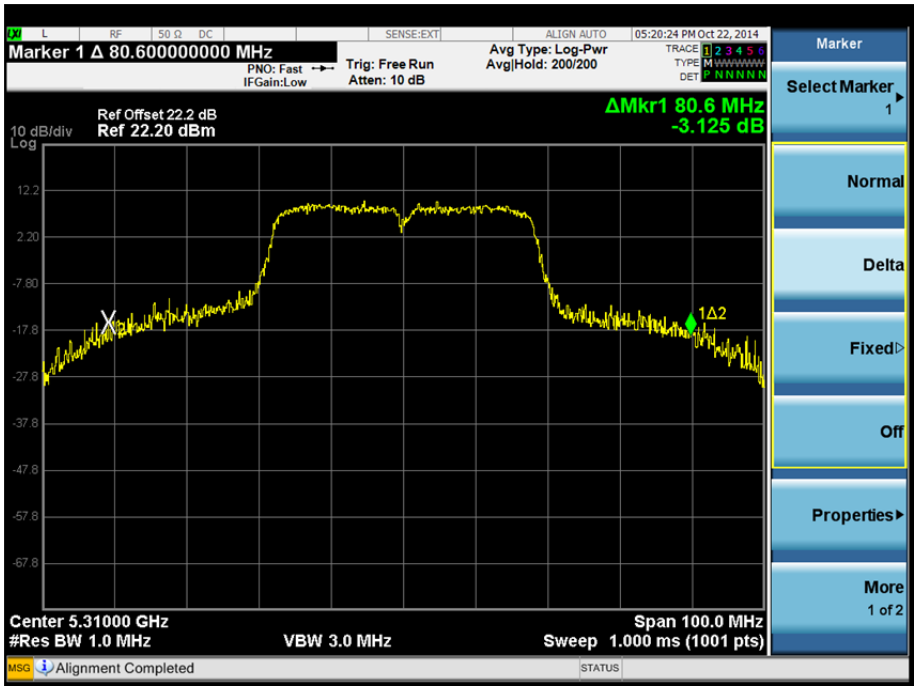
Frequency Band 2

5270 MHz

26 dB Bandwidth (MHz)	83.60

5310 MHz

26 dB Bandwidth (MHz)	80.60



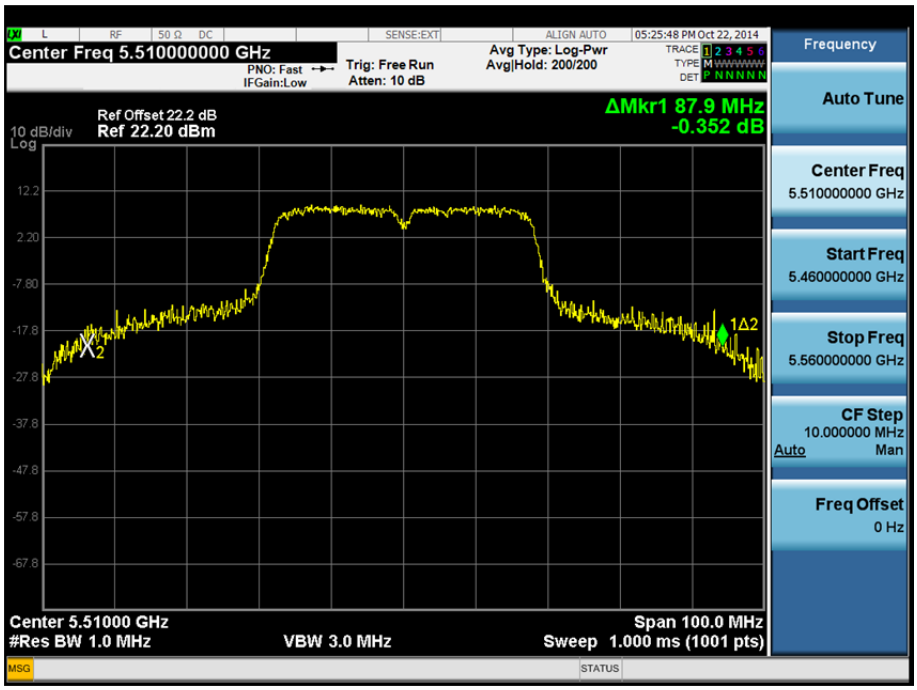
The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Product Service

Frequency Band 3

5510 MHz

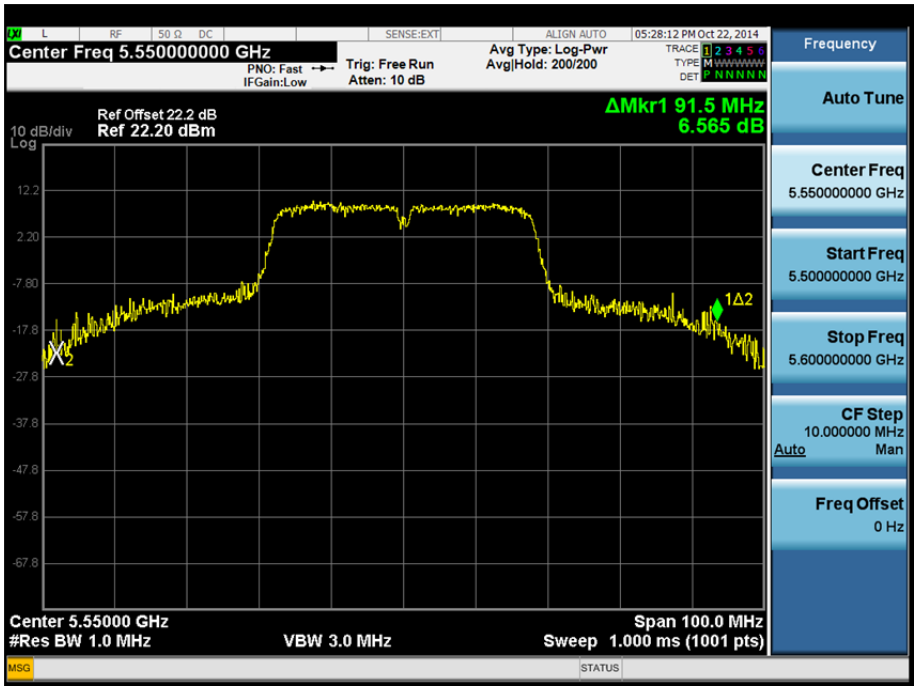
26 dB Bandwidth (MHz)	87.90



Product Service

5550 MHz

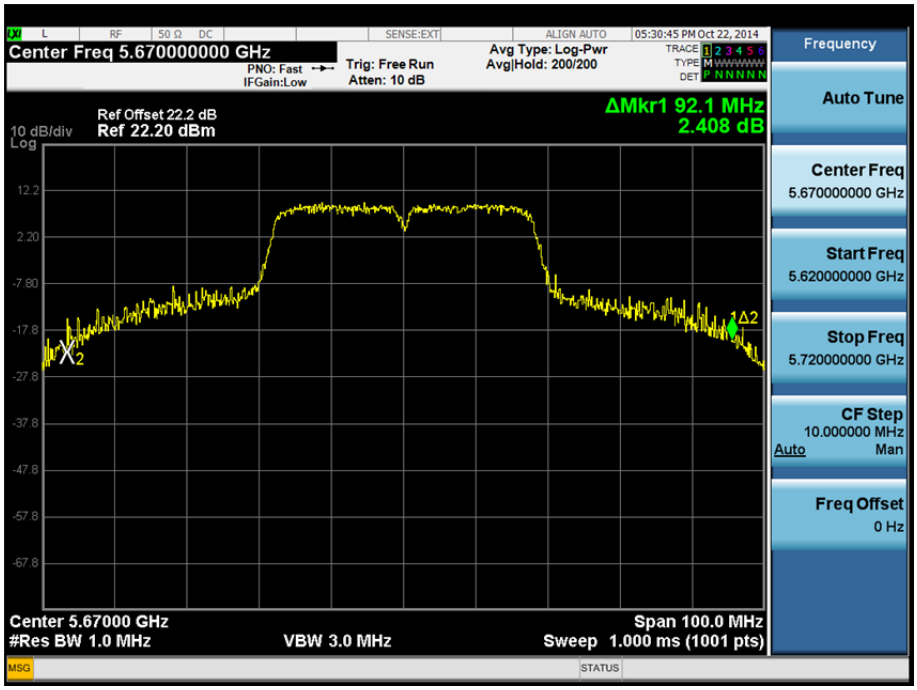
26 dB Bandwidth (MHz)	91.50



Product Service

5670 MHz

26 dB Bandwidth (MHz)	92.10



The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Limit

Not specified.

Product Service

2.3 POWER LIMITS

2.3.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.407 (a)(1)(2)(3)

2.3.2 Equipment Under Test and Modification State

YotaPhone2/ YD201 S/N: Not Serialised (75927375-TSR0007) - Modification State 0
YotaPhone2/ YD201 S/N: Not Serialised (75927375-TSR0008) - Modification State 0

2.3.3 Date of Test

23 October 2014, 29 October 2014, 14 November 2014 & 18 November 2014

2.3.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.5 Test Procedure

For Conducted Power, the path loss between the EUT and Power Sensor was measured using a Network Analyser. The path loss at the measurement frequency was entered as an offset. The EUT was set to transmit at maximum power at 100% duty cycle on the worst case data rate. All measurements were performed FCC 789033 D01 General UNII Test Procedures 1 Old Rules v01r04. Conducted measurements were performed according to, clause E.3.a whereas radiated measurements were additionally performed using the methods described in ANSI C63.10.

For radiated power, the EUT was transmitted at maximum power. The signal was observed on the Spectrum Analyser with a 1 MHz RBW using a Double Ridge Guide antenna at 3 metres from the EUT. The signal was maximised by rotating the EUT 360° and a height search of the measuring antenna. A substitution was then performed using a substitution antenna and signal generator.

This level was maximised by adjusting the height of the measuring antenna once more. The level from the signal generator was then adjusted to achieve the same raw result as with the EUT. This level was then corrected to account for cable loss and antenna factor. A calculation was then performed to obtain the final figure.

2.3.6 Environmental Conditions

Ambient Temperature	20.6 - 24.3°C
Relative Humidity	36.2 - 59.2%

2.3.7 Test Results

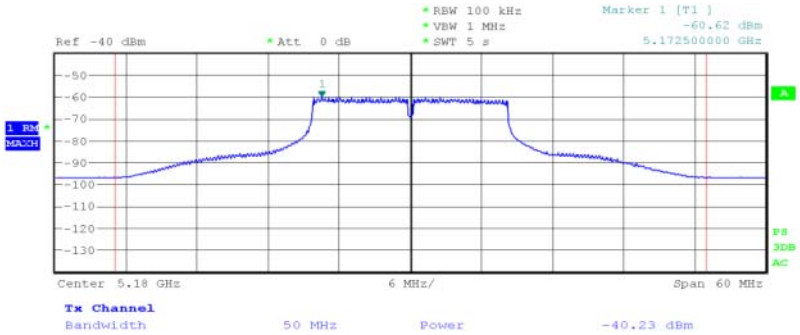
802.11(a)

Radiated

Frequency Band 1

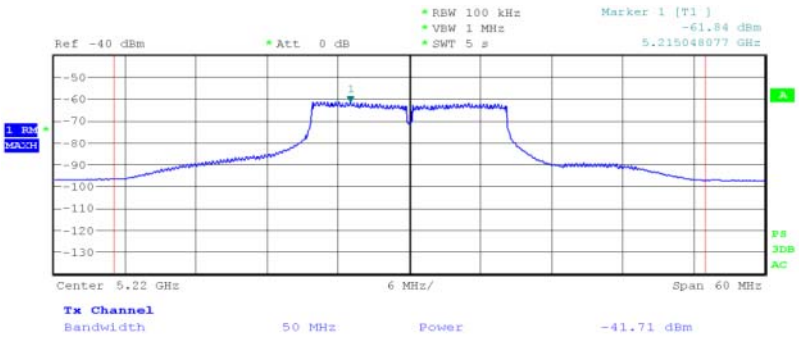
5180 MHz

EIRP (dBm)	EIRP (mW)
12.07	16.11



5220 MHz

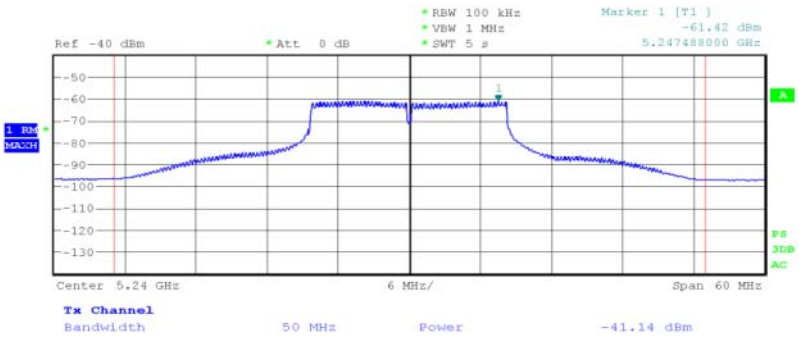
EIRP (dBm)	EIRP (mW)
10.57	11.41



Date: 4.NOV.2014 18:19:32

5240 MHz

EIRP (dBm)	EIRP (mW)
11.23	13.27



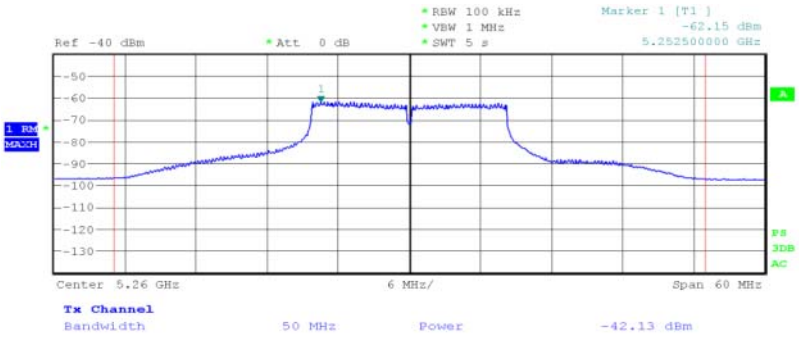
Date: 4.NOV.2014 18:43:59

Radiated

Frequency Band 2

5260 MHz

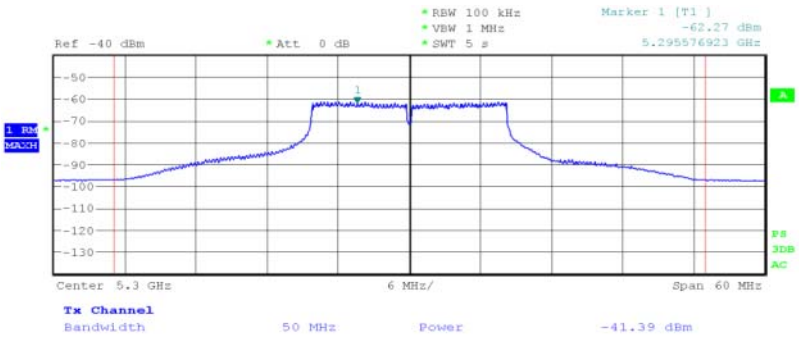
EIRP (dBm)	EIRP (mW)
11.0	12.69



Date: 4.NOV.2014 18:53:16

5300 MHz

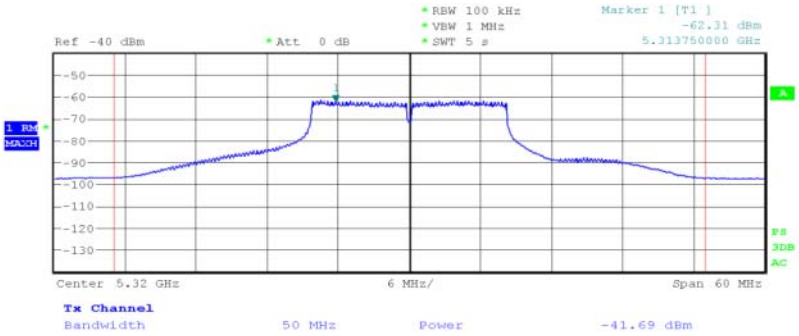
EIRP (dBm)	EIRP (mW)
11.21	13.20



Date: 4.NOV.2014 19:04:22

5320 MHz

EIRP (dBm)	EIRP (mW)
11.11	12.91



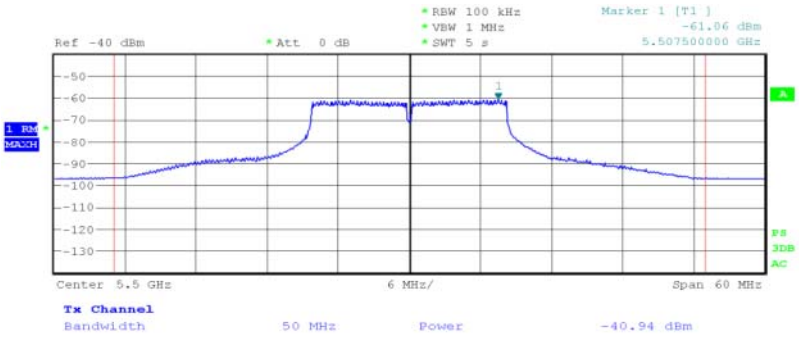
Date: 4.NOV.2014 19:16:32

Radiated

Frequency Band 3

5500 MHz

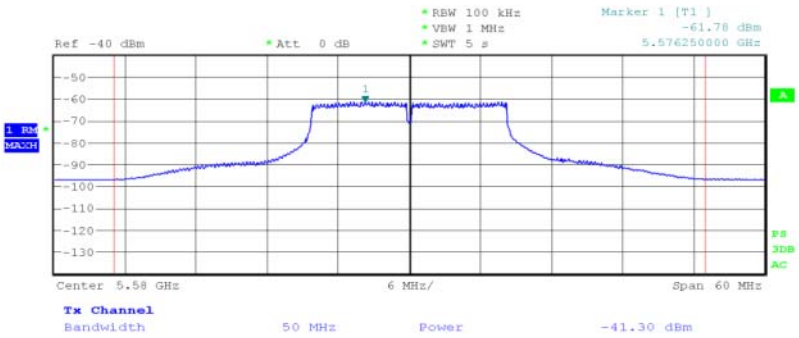
EIRP (dBm)	EIRP (mW)
13.02	20.06



Date: 4.NOV.2014 19:24:51

5580 MHz

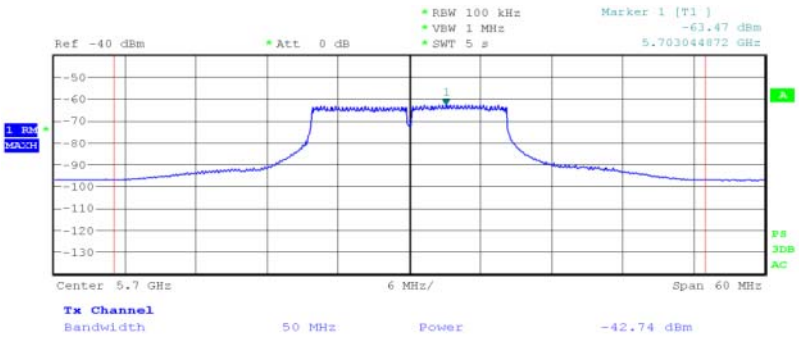
EIRP (dBm)	EIRP (mW)
10.93	12.39



Date: 4.NOV.2014 19:56:16

5700 MHz

EIRP (dBm)	EIRP (mW)
9.87	9.71



Date: 4.NOV.2014 19:51:42

Remark

The plots show results using a 100 kHz resolution bandwidth, this is a deviation to the measurement method in the KDB. There would be no effect on the result.

It is acceptable to have an antenna with up to 6 dBi gain, without reducing the conducted output power.

Limit for Radiated

Frequency Band (MHz)	FCC Limit
5150 to 5250	Lesser of 200 mW or 10 dBm + 10 log B
5250 to 5350	Lesser of 1 W or 17 dBm + 10 log B
5470 to 5725	Lesser of 1 W or 17 dBm + 10 log B
5725 to 5825	Lesser of 4 W or 23 dBm + 10 log B

Note: “B” = 26 dB Bandwidth.

Conducted

Frequency Band 1

5180 MHz

EIRP (dBm)	EIRP (mW)
13.54	22.5

5220 MHz

EIRP (dBm)	EIRP (mW)
13.68	23.3

5240 MHz

EIRP (dBm)	EIRP (mW)
13.68	23.3

The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 6 Mbps.

Conducted

Frequency Band 2

5260 MHz

EIRP (dBm)	EIRP (mW)
13.87	24.3

5300 MHz

EIRP (dBm)	EIRP (mW)
13.54	22.5

5320 MHz

EIRP (dBm)	EIRP (mW)
13.47	22.2

The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 9 Mbps.

Conducted

Frequency Band 3

5500 MHz

EIRP (dBm)	EIRP (mW)
13.66	23.7

5580 MHz

EIRP (dBm)	EIRP (mW)
14.04	25.2

5700 MHz

EIRP (dBm)	EIRP (mW)
13.88	24.3

The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 6 Mbps.

Limit for Conducted

Frequency Band (MHz)	FCC Limit
5150 to 5250	Lesser of 50 mW or 4 dBm + 10 log B
5250 to 5350	Lesser of 250 mW or 11 dBm + 10 log B
5470 to 5725	Lesser of 250 mW or 11 dBm + 10 log B
5725 to 5825	Lesser of 1 W or 17 dBm + 10 log B

Note: “B” = 26 dB Bandwidth.

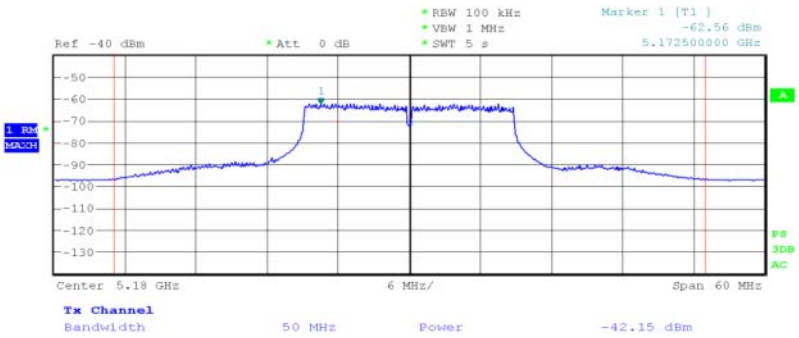
802.11(ac) 20 MHz BW

Radiated

Frequency Band 1

5180 MHz

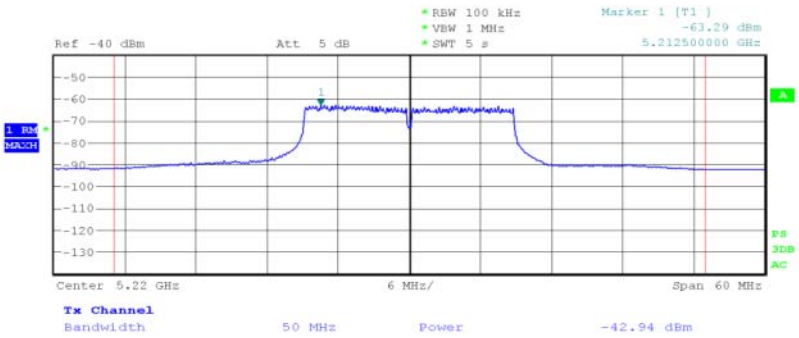
EIRP (dBm)	EIRP (mW)
9.87	9.71



Date: 4.NOV.2014 22:15:13

5220 MHz

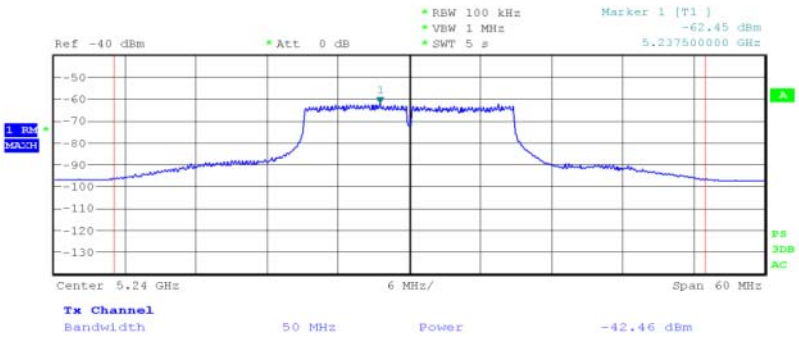
EIRP (dBm)	EIRP (mW)
9.39	8.70



Date: 4.NOV.2014 22:19:34

5240 MHz

EIRP (dBm)	EIRP (mW)
9.95	9.89



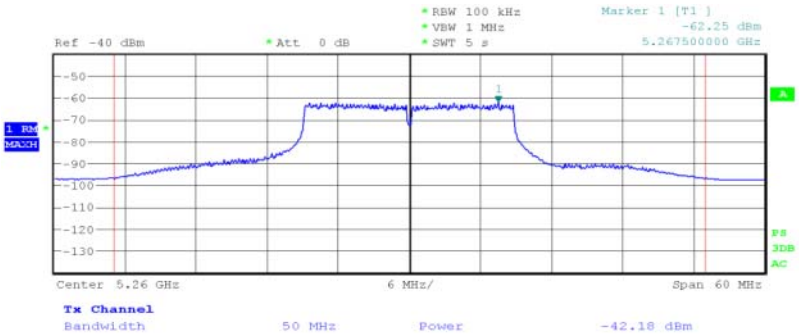
Date: 4.NOV.2014 23:04:29

Radiated

Frequency Band 2

5260 MHz

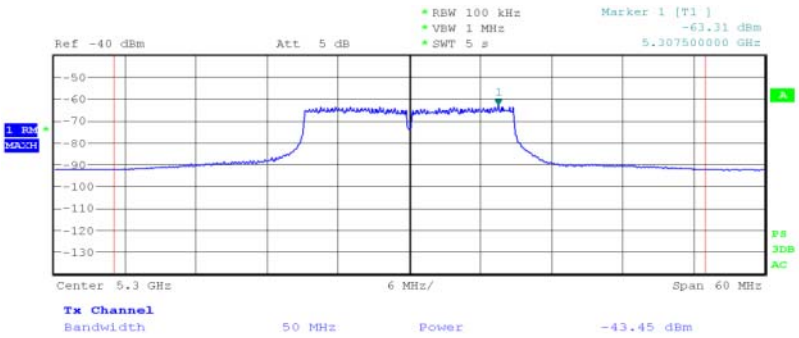
EIRP (dBm)	EIRP (mW)
10.80	12.02



Date: 4.NOV.2014 22:31:20

5300 MHz

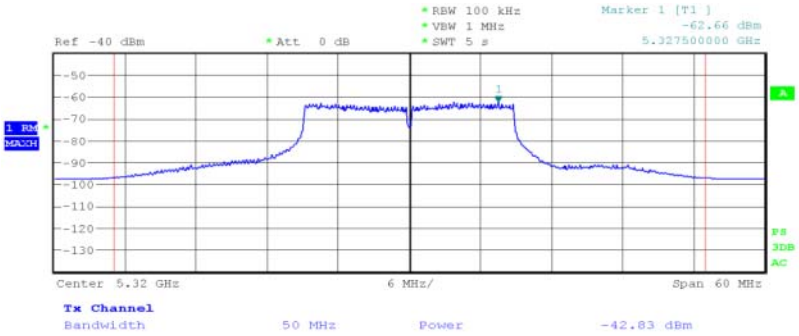
EIRP (dBm)	EIRP (mW)
8.83	7.63



Date: 4.NOV.2014 22:36:28

5320 MHz

EIRP (dBm)	EIRP (mW)
10.02	10.05



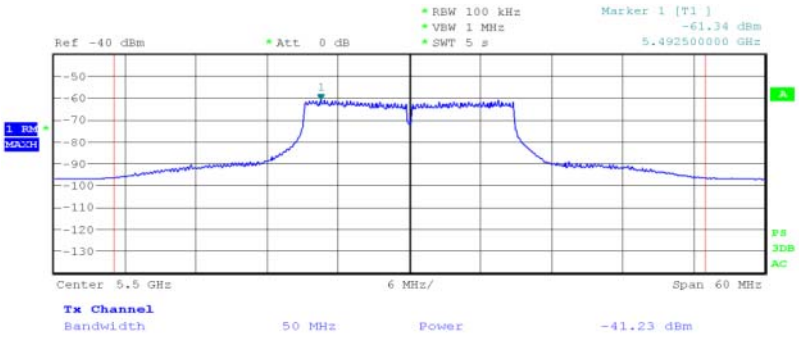
Date: 4.NOV.2014 23:08:04

Radiated

Frequency Band 3

5500 MHz

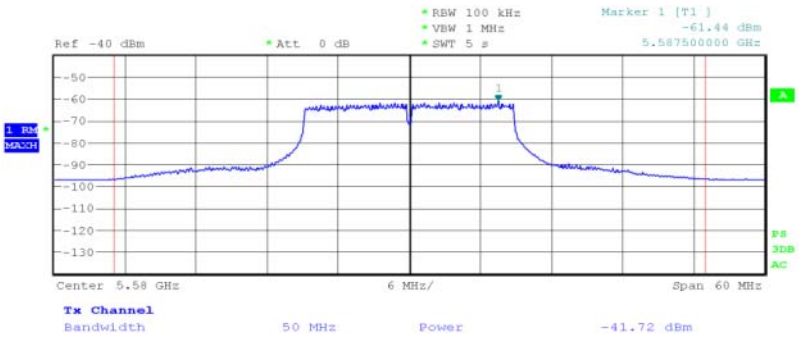
EIRP (dBm)	EIRP (mW)
12.52	17.87



Date: 4.NOV.2014 22:48:53

5580 MHz

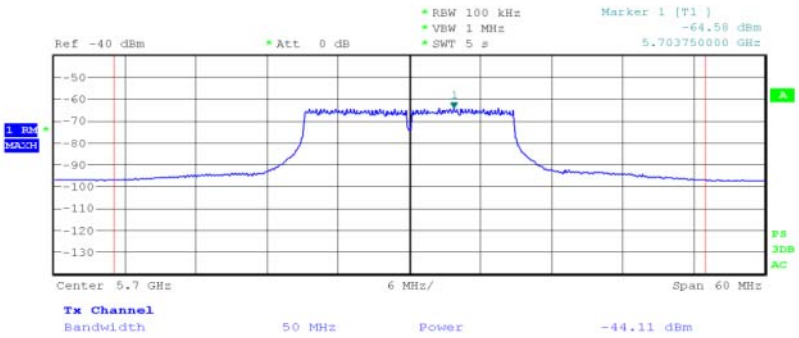
EIRP (dBm)	EIRP (mW)
10.54	11.32



Date: 4.NOV.2014 23:10:15

5700 MHz

EIRP (dBm)	EIRP (mW)
8.43	6.97



Date: 4.NOV.2014 23:01:00

Remark

The plots show results using a 100 kHz resolution bandwidth, this is a deviation to the measurement method in the KDB. There would be no effect on the result.

It is acceptable to have an antenna with up to 6 dBi gain, without reducing the conducted output power.

Limit for Radiated

Frequency Band (MHz)	FCC Limit
5150 to 5250	Lesser of 200 mW or 10 dBm + 10 log B
5250 to 5350	Lesser of 1 W or 17 dBm + 10 log B
5470 to 5725	Lesser of 1 W or 17 dBm + 10 log B
5725 to 5825	Lesser of 4 W or 23 dBm + 10 log B

Note: “B” = 26 dB Bandwidth.

Product Service

Conducted

Frequency Band 1

5180 MHz

EIRP (dBm)	EIRP (mW)
14.26	26.67

5220 MHz

EIRP (dBm)	EIRP (mW)
14.43	27.73

5240 MHz

EIRP (dBm)	EIRP (mW)
14.51	28.25

The test was performed on the worst case data rate for 802.11(ac) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Conducted

Frequency Band 2

5260 MHz

EIRP (dBm)	EIRP (mW)
14.60	28.84

5300 MHz

EIRP (dBm)	EIRP (mW)
14.33	27.10

5320 MHz

EIRP (dBm)	EIRP (mW)
14.23	26.49

The test was performed on the worst case data rate for 802.11(ac) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Conducted

Frequency Band 3

5500 MHz

EIRP (dBm)	EIRP (mW)
14.63	29.04

5580 MHz

EIRP (dBm)	EIRP (mW)
14.58	28.71

5700 MHz

EIRP (dBm)	EIRP (mW)
14.23	26.49

The test was performed on the worst case data rate for 802.11(ac) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Limit for Conducted

Frequency Band (MHz)	FCC Limit
5150 to 5250	Lesser of 50 mW or 4 dBm + 10 log B
5250 to 5350	Lesser of 250 mW or 11 dBm + 10 log B
5470 to 5725	Lesser of 250 mW or 11 dBm + 10 log B
5725 to 5825	Lesser of 1 W or 17 dBm + 10 log B

Note: “B” = 26 dB Bandwidth.

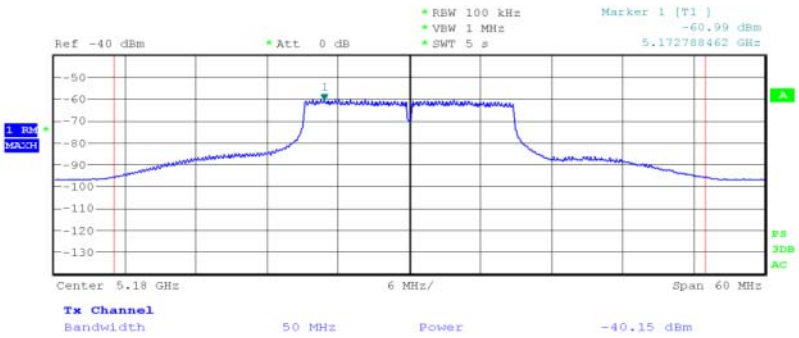
802.11(n) 20 MHz BW

Radiated

Frequency Band 1

5180 MHz

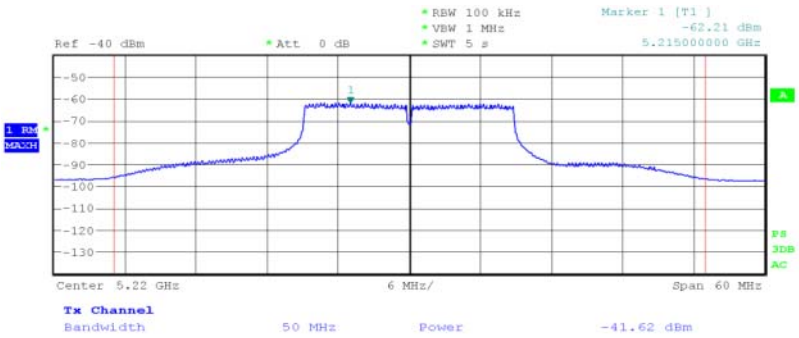
EIRP (dBm)	EIRP (mW)
11.95	15.67



Date: 4.NOV.2014 20:48:38

5220 MHz

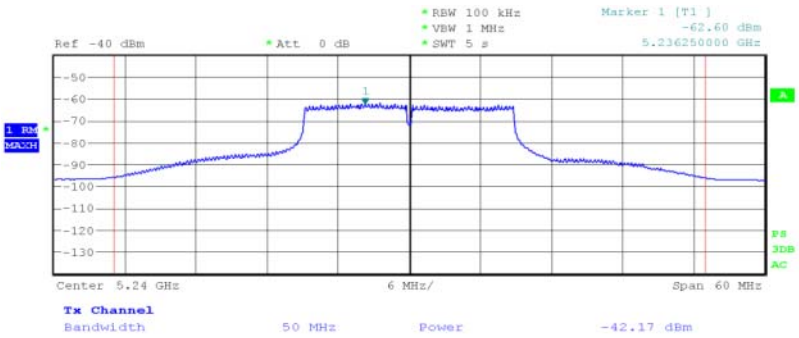
EIRP (dBm)	EIRP (mW)
10.67	11.68



Date: 4.NOV.2014 20:46:50

5240 MHz

EIRP (dBm)	EIRP (mW)
10.24	10.57



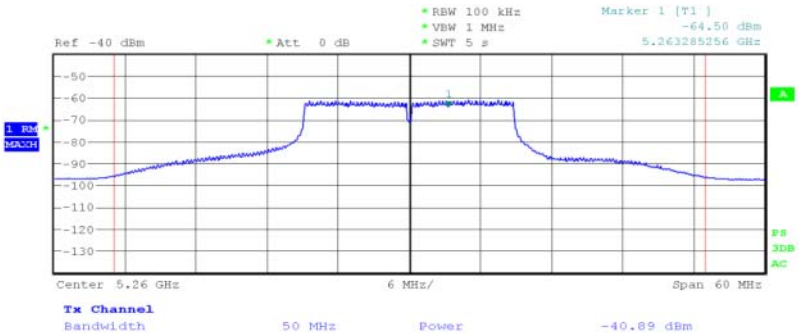
Date: 4.NOV.2014 21:05:13

Radiated

Frequency Band 2

5260 MHz

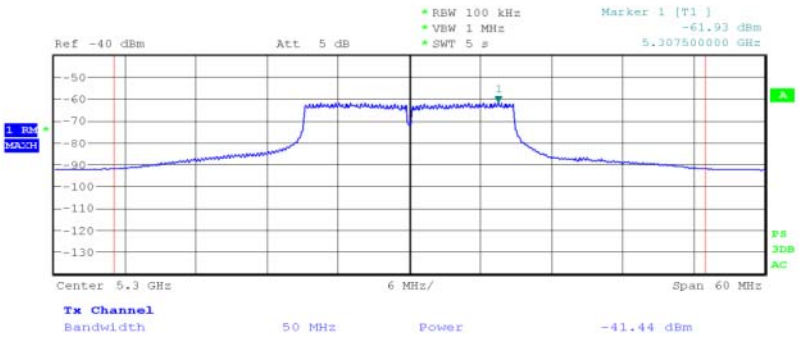
EIRP (dBm)	EIRP (mW)
11.09	12.85



Date: 4.NOV.2014 21:26:09

5300 MHz

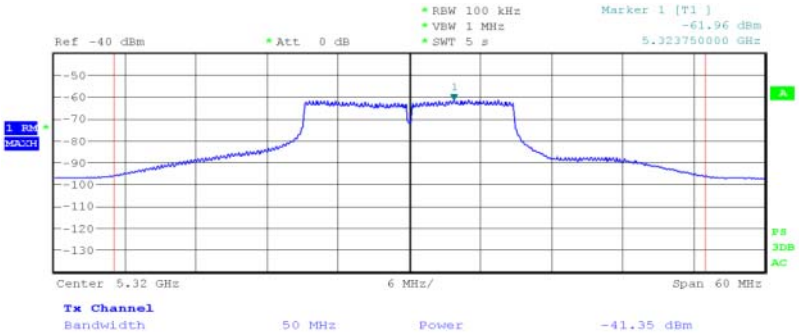
EIRP (dBm)	EIRP (mW)
11.12	12.93



Date: 4.NOV.2014 21:32:21

5320 MHz

EIRP (dBm)	EIRP (mW)
11.39	13.77



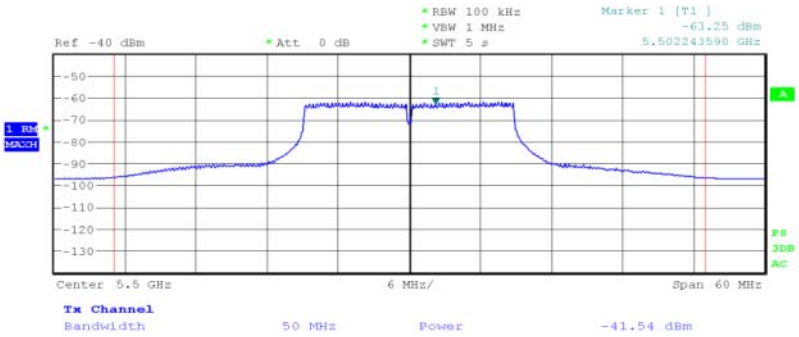
Date: 4.NOV.2014 21:44:00

Radiated

Frequency Band 3

5500 MHz

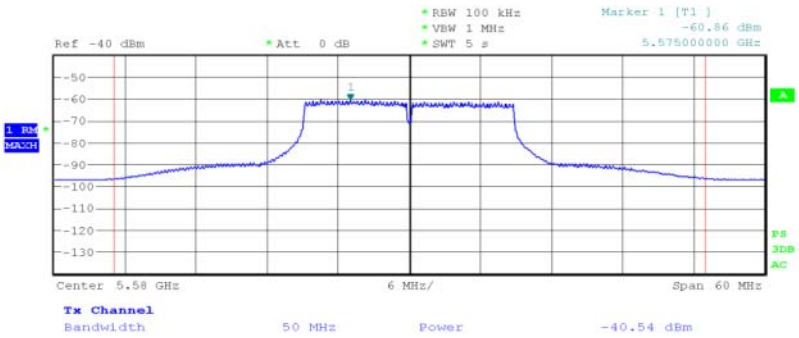
EIRP (dBm)	EIRP (mW)
12.44	17.55



Date: 4.NOV.2014 21:54:51

5580 MHz

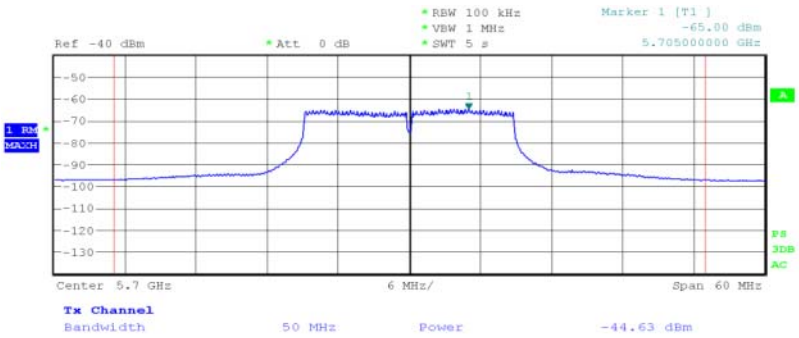
EIRP (dBm)	EIRP (mW)
11.75	14.96



Date: 4.NOV.2014 22:02:13

5700 MHz

EIRP (dBm)	EIRP (mW)
7.94	6.22



Date: 4.NOV.2014 22:08:47

Remark

The plots show results using a 100 kHz resolution bandwidth, this is a deviation to the measurement method in the KDB. There would be no effect on the result.

It is acceptable to have an antenna with up to 6 dBi gain, without reducing the conducted output power.

Limit for Radiated

Frequency Band (MHz)	FCC Limit
5150 to 5250	Lesser of 200 mW or 10 dBm + 10 log B
5250 to 5350	Lesser of 1 W or 17 dBm + 10 log B
5470 to 5725	Lesser of 1 W or 17 dBm + 10 log B
5725 to 5825	Lesser of 4 W or 23 dBm + 10 log B

Note: “B” = 26 dB Bandwidth.

Conducted

Frequency Band 1

5180 MHz

EIRP (dBm)	EIRP (mW)
13.55	22.5

5220 MHz

EIRP (dBm)	EIRP (mW)
13.67	23.3

5240 MHz

EIRP (dBm)	EIRP (mW)
13.75	23.6

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Conducted

Frequency Band 2

5260 MHz

EIRP (dBm)	EIRP (mW)
13.79	23.8

5300 MHz

EIRP (dBm)	EIRP (mW)
13.62	23.0

5320 MHz

EIRP (dBm)	EIRP (mW)
13.53	22.4

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Conducted

Frequency Band 3

5500 MHz

EIRP (dBm)	EIRP (mW)
13.60	22.9

5580 MHz

EIRP (dBm)	EIRP (mW)
13.30	21.3

5700 MHz

EIRP (dBm)	EIRP (mW)
13.09	20.3

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Limit for Conducted

Frequency Band (MHz)	FCC Limit
5150 to 5250	Lesser of 50 mW or 4 dBm + 10 log B
5250 to 5350	Lesser of 250 mW or 11 dBm + 10 log B
5470 to 5725	Lesser of 250 mW or 11 dBm + 10 log B
5725 to 5825	Lesser of 1 W or 17 dBm + 10 log B

Note: “B” = 26 dB Bandwidth.

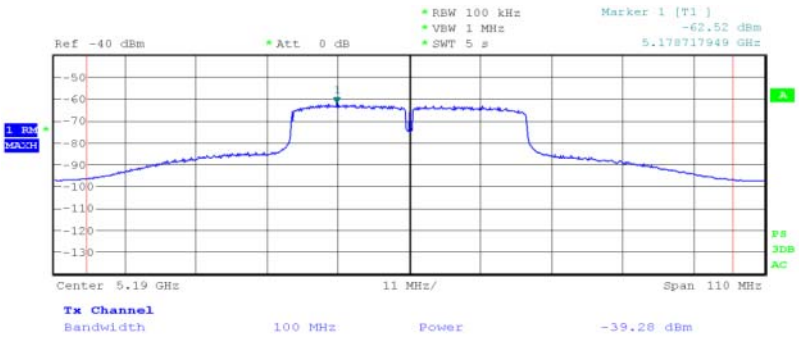
802.11(n) 40 MHz BW

Radiated

Frequency Band 1

5190 MHz

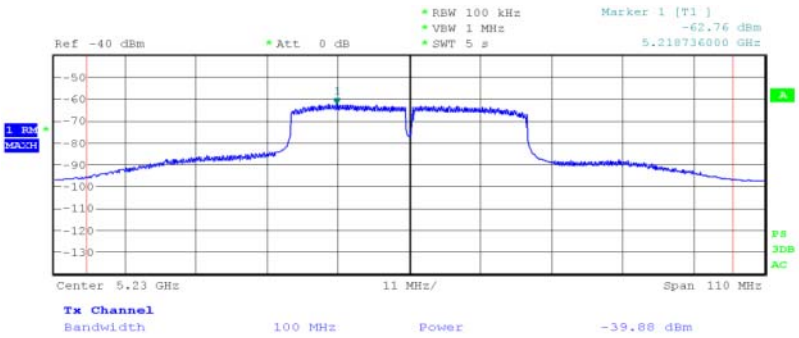
EIRP (dBm)	EIRP (mW)
12.92	19.59



Date: 18.NOV.2014 18:49:05

5230 MHz

EIRP (dBm)	EIRP (mW)
11.80	15.14



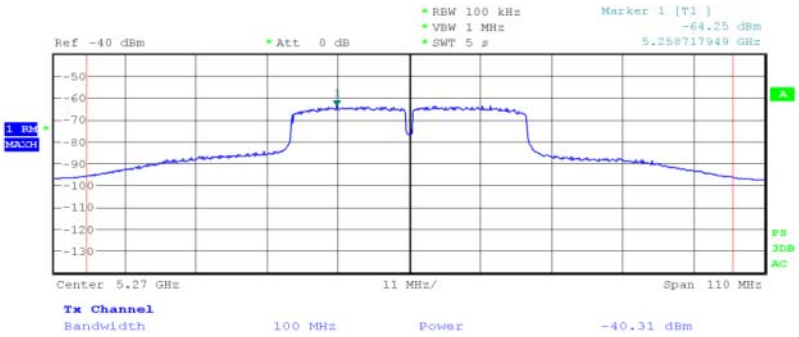
Date: 18.NOV.2014 18:58:50

Radiated

Frequency Band 2

5270 MHz

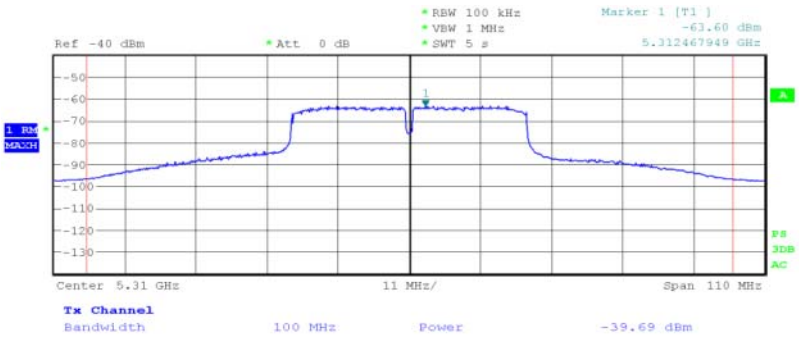
EIRP (dBm)	EIRP (mW)
10.93	12.39



Date: 18.NOV.2014 19:36:51

5310 MHz

EIRP (dBm)	EIRP (mW)
11.43	13.90



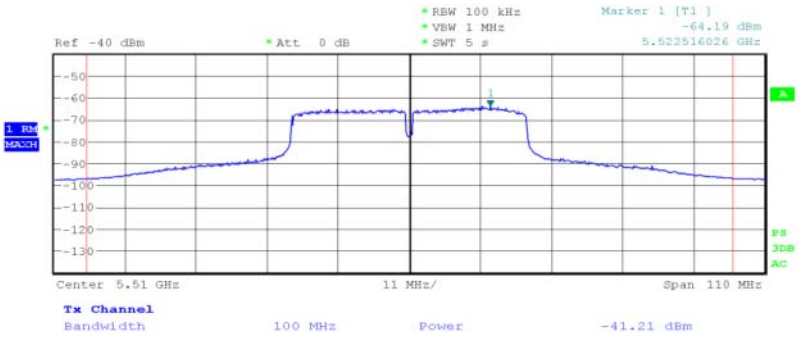
Date: 18.NOV.2014 19:12:50

Radiated

Frequency Band 3

5510 MHz

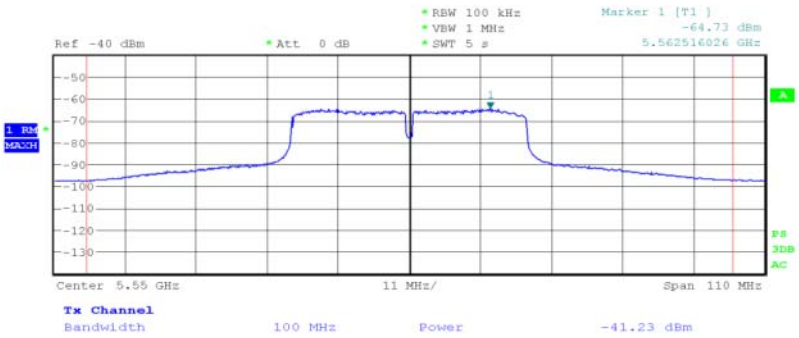
EIRP (dBm)	EIRP (mW)
10.68	11.70



Date: 18.NOV.2014 19:40:02

5550 MHz

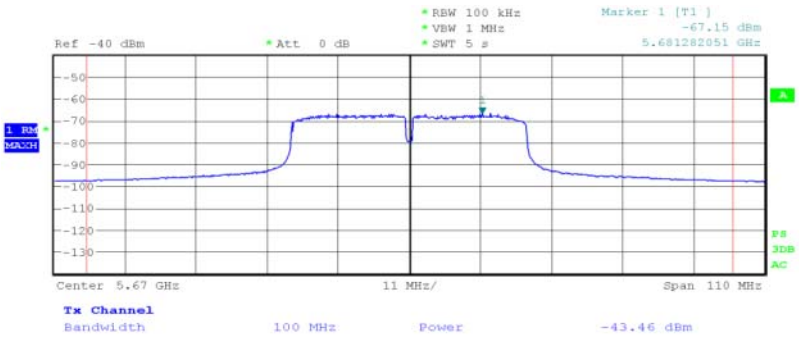
EIRP (dBm)	EIRP (mW)
10.54	11.32



Date: 18.NOV.2014 20:35:02

5670 MHz

EIRP (dBm)	EIRP (mW)
6.58	4.55



Date: 18.NOV.2014 19:32:58

Remark

The plots show results using a 100 kHz resolution bandwidth, this is a deviation to the measurement method in the KDB. There would be no effect on the result.

It is acceptable to have an antenna with up to 6 dBi gain, without reducing the conducted output power.

Limit for Radiated

Frequency Band (MHz)	FCC Limit
5150 to 5250	Lesser of 200 mW or 10 dBm + 10 log B
5250 to 5350	Lesser of 1 W or 17 dBm + 10 log B
5470 to 5725	Lesser of 1 W or 17 dBm + 10 log B
5725 to 5825	Lesser of 4 W or 23 dBm + 10 log B

Note: “B” = 26 dB Bandwidth.

Conducted

Frequency Band 1

5190 MHz

EIRP (dBm)	EIRP (mW)
14.86	30.62

N/A

EIRP (dBm)	EIRP (mW)
-	-

5230 MHz

EIRP (dBm)	EIRP (mW)
14.90	30.90

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Conducted

Frequency Band 2

5270 MHz

EIRP (dBm)	EIRP (mW)
14.91	30.97

N/A

EIRP (dBm)	EIRP (mW)
-	-

5310 MHz

EIRP (dBm)	EIRP (mW)
14.87	30.69

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Product Service

Conducted

Frequency Band 3

5510 MHz

EIRP (dBm)	EIRP (mW)
14.69	29.44

5550 MHz

EIRP (dBm)	EIRP (mW)
14.48	28.05

5670 MHz

EIRP (dBm)	EIRP (mW)
14.28	26.79

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Limit for Conducted

Frequency Band (MHz)	FCC Limit
5150 to 5250	Lesser of 50 mW or 4 dBm + 10 log B
5250 to 5350	Lesser of 250 mW or 11 dBm + 10 log B
5470 to 5725	Lesser of 250 mW or 11 dBm + 10 log B
5725 to 5825	Lesser of 1 W or 17 dBm + 10 log B

Note: “B” = 26 dB Bandwidth.

2.4 PEAK POWER SPECTRAL DENSITY

2.4.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.407 (a)(5)

2.4.2 Equipment Under Test and Modification State

YotaPhone2/ YD201 S/N: Not Serialised (75927375-TSR0007) - Modification State 1
YotaPhone2/ YD201 S/N: Not Serialised (75927375-TSR0008) - Modification State 0

2.4.3 Date of Test

23 October 2014, 27 October 2014 & 28 October 2014

2.4.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.5 Test Procedure

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15.407 (a) and KDB 789033 D01 General UNII Test Procedures 1 Old Rules v01r04.

The EUT was transmitted at maximum power for bottom, middle and top channels with a data rate that was determined to produce the greatest average RF output power. In addition, all modulation types were tested for Peak Excursion on each test in each applicable frequency band. The EUT was connected to the Spectrum Analyser via attenuators and cables. For Trace 1, the analyser settings were configured with an RBW of 1 MHz and video bandwidth of 3MHz. The trace was set to a 10 second sweep time using an RMS detector. The maximum value was recorded for Power Spectral Density. For Trace 2, the RBW was set to 1MHz and the VBW to 3MHz. A Peak detector and Max Hold were used with a 10 second sweep time. The peak value was found and referenced to the Peak in Trace 1 to give the Peak Excursion.

2.4.6 Environmental Conditions

Ambient Temperature	23.0 - 25.9°C
Relative Humidity	42.2 - 54.9%

Product Service

2.4.7 Test Results

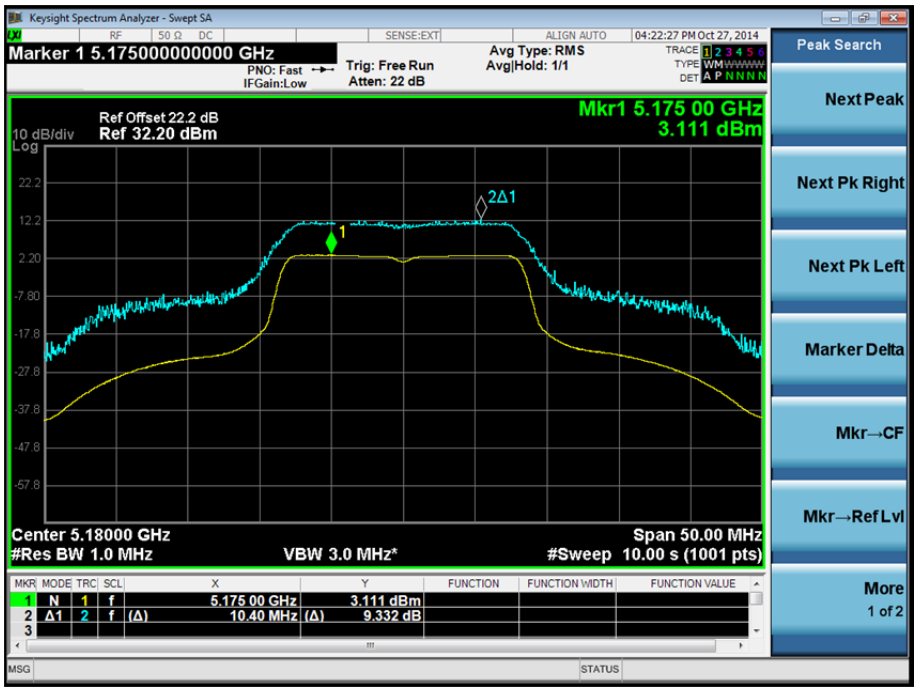
802.11(a)

Frequency Band 1

5180 MHz

Modulation: BPSK

Peak Power Spectral Density (dBm)	3.111



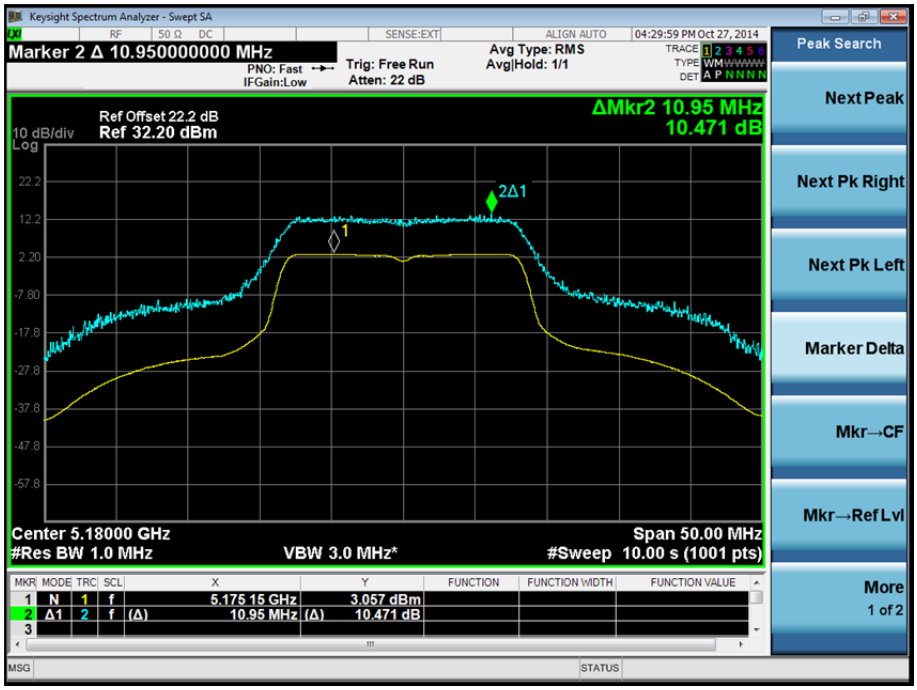
Product Service

Modulation: QPSK

Peak Power Spectral Density (dBm)	3.182

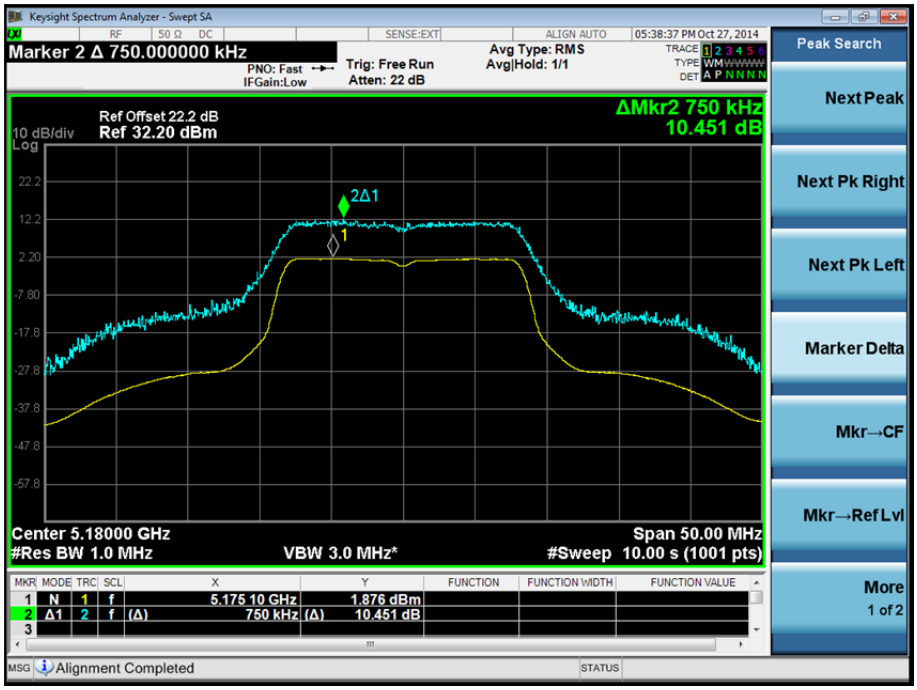
Modulation: 16-QAM

Peak Power Spectral Density (dBm)	3.057



Modulation: 64-QAM

Peak Power Spectral Density (dBm)	1.876



Product Service

5220 MHz

Modulation: BPSK

Peak Power Spectral Density (dBm)	3.286