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# Report On

Limited FCC and Industry Canada Testing of the  
1066 Labs Limited ASD041517

In accordance with FCC 47 CFR Part 15E, Industry Canada RSS-247  
and Industry Canada RSS-GEN

COMMERCIAL-IN-CONFIDENCE

FCC ID: XHUASD041517

IC: 8439A- ASD041517

Document 75930506 Report 04 Issue 2

September 2015



Product Service

TÜV SÜD Product Service, Octagon House, Concorde Way, Segensworth North,  
Fareham, Hampshire, United Kingdom, PO15 5RL  
Tel: +44 (0) 1489 558100. Website: [www.tuv-sud.co.uk](http://www.tuv-sud.co.uk)

COMMERCIAL-IN-CONFIDENCE

**REPORT ON**

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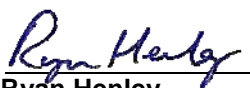
**PREPARED FOR**

1066 Labs Limited  
North Street  
Hailsham  
East Sussex  
BN27 1DW

**PREPARED BY**

  
Natalie Bennett  
Senior Administrator, Project Support

**APPROVED BY**

  
Ryan Henley  
Authorised Signatory

**DATED**


08 September 2015

**This report has been up-issued to Issue 2 to include references to FCC clause 15.209.**

**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 47 CFR Part 15E, Industry Canada RSS-247 and Industry Canada RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

  
G Lawler





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## **SECTION 1**

### **REPORT SUMMARY**

Limited FCC and Industry Canada Testing of the  
1066 Labs Limited ASD041517  
In accordance with FCC 47 CFR Part 15E, Industry Canada RSS-247  
and Industry Canada RSS-GEN



## 1.1 INTRODUCTION

The information contained in this report is intended to show the verification of Limited FCC and Industry Canada Testing of the 1066 Labs Limited ASD041517 to the requirements of FCC 47 CFR Part 15E, Industry Canada RSS-247 and Industry Canada RSS-GEN.

Objective	To perform Industry Canada Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	1066 Labs Limited
Model Number(s)	Beethoven
Serial Number(s)	EMC #1
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15E (2014) Industry Canada RSS-247(Issue 2, 2015) Industry Canada RSS-GEN (Issue 4, 2014)
Incoming Release Date	Application Form 26 May 2015
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	101298 13 July 2015
Start of Test	18 July 2015
Finish of Test	2 August 2015
Name of Engineer(s)	G Lawler
Related Document(s)	KDB 789033 D02 General UNII Test Procedures New Rules v01; ETSI TR 100 028 (2001) and ANCI C63.10 (2009)



**1.2 BRIEF SUMMARY OF RESULTS**

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15E, Industry Canada RSS-247 and Industry Canada RSS-GEN is shown below.

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	Part 15	RSS-247	RSS-GEN			
802.11a						
2.1	15.407 (a)(1)(2)(3)	6.2	-	Average EIRP	Pass	
2.2	15.407 (b), 15.205 and 15.209	6.2	-	Spurious Radiated Emissions	Pass	
2.3	15.205	-	8.10	Restricted Band Edges	Pass	
2.4	15.407 (b)(1)(2)(3)(4)	6.2	-	Authorised Band Edges	Pass	
802.11n - 20 MHz Bandwidth						
2.1	15.407 (a)(1)(2)(3)	6.2	-	Average EIRP	Pass	
2.2	15.407 (b), 15.205 and 15.209	6.2	-	Spurious Radiated Emissions	Pass	
2.3	15.205	-	8.10	Restricted Band Edges	Pass	
2.4	15.407 (b)(1)(2)(3)(4)	6.2	-	Authorised Band Edges	Pass	



Product Service

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	Part 15	RSS-247	RSS-GEN			
802.11n - 40 MHz Bandwidth						
2.1	15.407 (a)(1)(2)(3)	6.2	-	Average EIRP	Pass	
2.3	15.205	-	8.10	Restricted Band Edges	Pass	
2.4	15.407 (b)(1)(2)(3)( 4)	6.2	-	Authorised Band Edges	Pass	



Product Service

**1.3 APPLICATION FORM**

EQUIPMENT DESCRIPTION	
Model Name/Number	ASD041517
Part Number	
Hardware Version	DVT3
Software Version	Build 3.1.0
FCC ID	XHUASD041517
Technical Description (Please provide a brief description of the intended use of the equipment)	Set-Top-Box (STB) Videophone

TYPE OF EQUIPMENT
<input type="checkbox"/> Master
<input type="checkbox"/> Client with Radar Detection
<input type="checkbox"/> Client without Radar Detection
<input type="checkbox"/> Wi-Fi Direct Support

TRANSMITTER TECHNICAL CHARACTERISTICS
FREQUENCY CHARACTERISTICS
<input checked="" type="checkbox"/> 5.150 GHz to 5.250 GHz
<input type="checkbox"/> 5.250 GHz to 5.350 GHz
<input type="checkbox"/> 5.470 GHz to 5.725 GHz
<input type="checkbox"/> 5.725 GHz to 5.825 GHz
<input checked="" type="checkbox"/> Please confirm the EUT does not operate in the frequency band 5600 – 5650 MHz
<input type="checkbox"/> Off Channel CAC Implemented
Off Channel CAC within 5600 – 5650 MHz band                      hours, (1 – 24)
Off Channel CAC outside 5600 – 5650 MHz band                    minutes, (6 – 240)
Note: DFS is not required in the ranges 5.15 – 5.25 GHz and 5.725 – 5.825 GHz





TRANSMITTER RF POWER CHARACTERISTICS	
Maximum rated transmitter output power as stated by manufacturer	
Conducted Power	15 dBm
Maximum Antenna Gain	4.9 dBi
EIRP	19 dBm
Minimum rated transmitter output power as stated by manufacturer (if applicable)	
Conducted Power	dBm
Maximum Antenna Gain	dBi
EIRP	dBm
Is TPC supported?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, provide a description of operation.	

POWER SOURCE			
<input checked="" type="checkbox"/>	AC mains supply	State voltage	110
	AC supply frequency	60 (Hz)	VAC
<input type="checkbox"/>	DC supply		
Nominal voltage			

SYSTEM ARCHITECTURE			
<input type="checkbox"/>	Frame Based		
<input type="checkbox"/>	IP Based		
<input type="checkbox"/>	Other	If other please state	
<input checked="" type="checkbox"/>	802.11(a)	Receiver Bandwidth:	MHz
<input checked="" type="checkbox"/>	802.11(n) – 20 MHz	Receiver Bandwidth:	MHz
<input checked="" type="checkbox"/>	802.11(n) – 40 MHz	Receiver Bandwidth:	MHz
<input type="checkbox"/>	802.11(ac) – 20 MHz	Receiver Bandwidth:	MHz
<input type="checkbox"/>	802.11(ac) – 40 MHz	Receiver Bandwidth:	MHz
<input type="checkbox"/>	802.11(ac) – 80 MHz	Receiver Bandwidth:	MHz

DECLARATION	
No parameter or information relating to the detected radar waveforms is available or accessible to the end user.	
<input checked="" type="checkbox"/>	True
<input type="checkbox"/>	False

MISCELLANEOUS (Master Device Only)
Power-on cycle time*
* Time from switching on the UUT to the point at which Channel Availability Check (CAC) commences



Product Service

<b>UNIFORM SPREADING (Master Device Only)</b>
Describe how the meter provides, on aggregate, uniform channel loading of the spectrum across all channels.

<b>ANTENNA OPTIONS</b>	
<b>Antenna 1</b>	
Antenna Description:	Fractus SMT Chip (NOT USED)
Antenna Model:	FR05-S1-N-0-102
Antenna Maximum Gain:	1.7dBi
Antenna Frequency Range:	2.4-2.5 GHz
<b>Antenna 2</b>	
Antenna Description:	Fractus SMT Chip
Antenna Model:	FR05-S1-NO-1-004
Antenna Maximum Gain:	1.8dBi   4.9dBi
Antenna Frequency Range:	2.4-2.5 GHz   4.9-5.875 GHz
<b>Antenna 3</b>	
Antenna Description:	
Antenna Model:	
Antenna Maximum Gain:	
Antenna Frequency Range:	
<b>Antenna 4</b>	
Antenna Description:	
Antenna Model:	
Antenna Maximum Gain:	
Antenna Frequency Range:	
<b>Antenna 5</b>	
Antenna Description:	
Antenna Model:	
Antenna Maximum Gain:	
Antenna Frequency Range:	

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

Authorised Representative: Dave Williams  
 Position held: Certification Engineer Date: 26<sup>th</sup> May 2015



Product Service

**1.4 PRODUCT INFORMATION**

**1.4.1 Technical Description**

The Equipment Under Test (EUT) was a 1066 Labs Limited ASD041517. 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 an 18 V DC supply.

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

Industry Canada Company Address Code  
IC2932B-1 Octagon House, Fareham Test Laboratory

**1.6 DEVIATIONS FROM THE STANDARD**

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

**1.7 MODIFICATION RECORD**

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
<b>Serial Number: EMC #1</b>			
0	As supplied by manufacturer.	N/A	N/A
1	Board affected is 58-R41832-5551  Modification affects U2_SER and turns off the pre-emphasis.  R18_SER pull-up to VIN_3V3 is depopulated and is now DNP R20_SER is now populated with 10K and pulled down to GND  Ferrite added to camera cable nearest to camera.	Dave Williams	15/07/2015

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**

Limited FCC and Industry Canada Testing of the  
1066 Labs Limited ASD041517  
In accordance with FCC 47 CFR Part 15E, Industry Canada RSS-247  
and Industry Canada RSS-GEN



Product Service

**2.1 AVERAGE EIRP****2.1.1 Specification Reference**

FCC 47 CFR Part 15E, Clause 15.407 (a)(1)(2)(3)  
Industry Canada RSS-247, Clause 6.2

**2.1.2 Equipment Under Test and Modification State**

Beethoven S/N: EMC #1 - Modification State 1

**2.1.3 Date of Test**

2 August 2015

**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**

This test was performed in accordance with KDB 789033 D02 v01, Section II clause E.2f  
Method SA-3 and Industry Canada RSS-GEN, clause 6.12.

**2.1.6 Environmental Conditions**

Ambient Temperature	19.1°C
Relative Humidity	52.0%



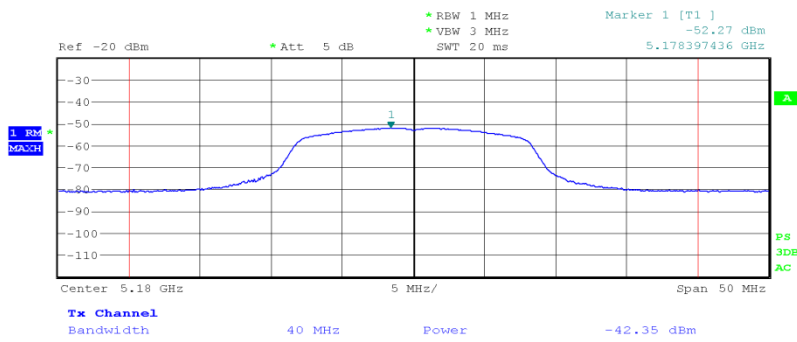
Product Service

**2.1.7 Test Results**

802.11a, OFDM, 6 Mbps, Frequency Band 1, Average EIRP Results

5180 MHz		5200 MHz		5240 MHz	
dBm	mW	dBm	mW	dBm	mW
10.11	10.26	10.64	11.59	9.87	9.71

802.11a, 5180 MHz, OFDM, 6 Mbps, Frequency Band 1, Average EIRP Plot

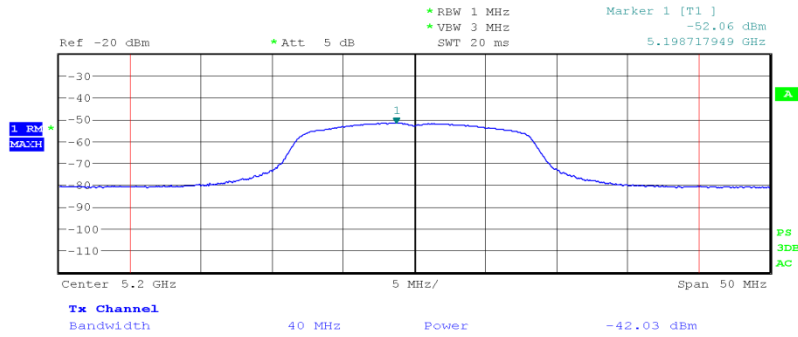


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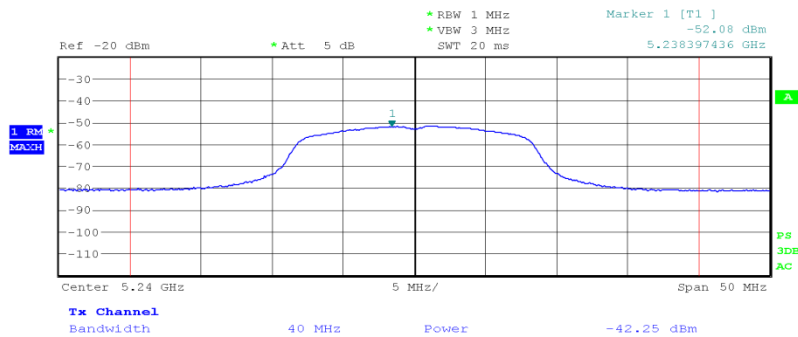
Product Service

802.11a, 5200 MHz, OFDM, 6 Mbps, Frequency Band 1, Average EIRP Plot



Date: 2.AUG.2015 11:39:16

802.11a, 5240 MHz, OFDM, 6 Mbps, Frequency Band 1, Average EIRP Plot



Date: 2.AUG.2015 11:42:24



Product Service

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

Frequency Band (MHz)	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.

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

Industry Canada RSS-247, Limit Clause 6.2

Frequency Band (MHz)	Limit
5150 to 5250	Lesser of 200 mW or 10 + 10 log B
5250 to 5350	Lesser of 1 W or 17 + 10 log B
5470 to 5600 and 5600 to 5725	Lesser of 1 W or 17 + 10 log B
5725 to 5850	≤1 W

Note: "B" = 99 % Emission Bandwidth (MHz).



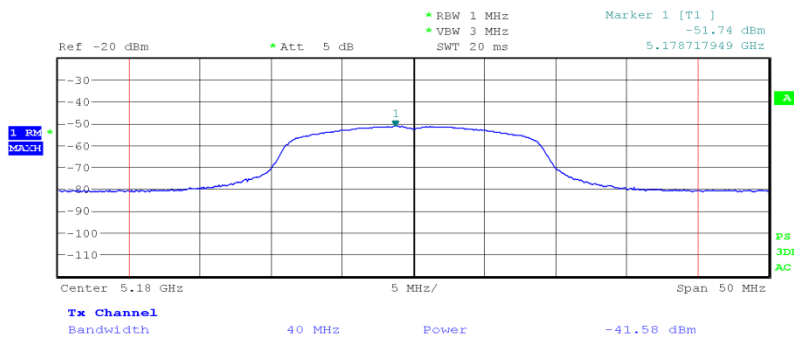


Product Service

802.11n - 20 MHz Bandwidth, OFDM, MCS0, Frequency Band 1, Average EIRP Results

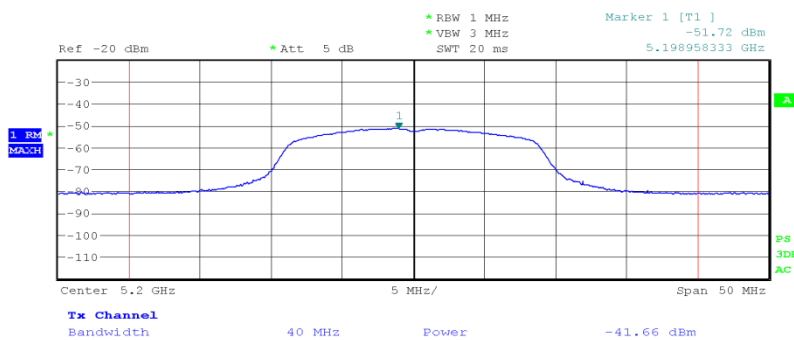
5180 MHz		5200 MHz		5240 MHz	
dBm	mW	dBm	mW	dBm	mW
10.90	12.30	11.01	12.62	10.22	10.52

802.11n - 20 MHz Bandwidth, 5180 MHz, OFDM, MCS0, Frequency Band 1, Average EIRP Plot



Date: 2.AUG.2015 11:45:57

802.11n - 20 MHz Bandwidth, 5200 MHz, OFDM, MCS0, Frequency Band 1, Average EIRP Plot

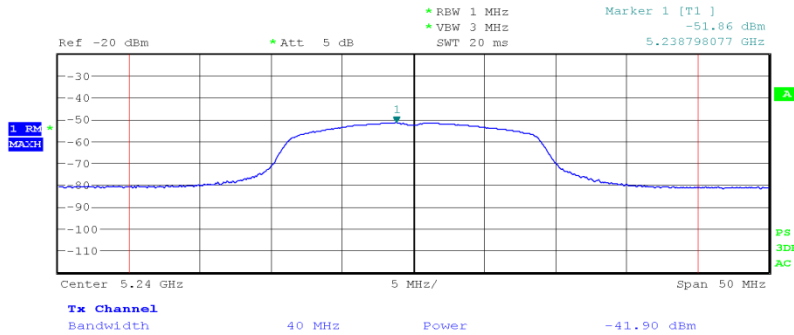


Date: 2.AUG.2015 11:50:11



Product Service

**802.11n - 20 MHz Bandwidth, 5240 MHz, OFDM, MCS0, Frequency Band 1, Average EIRP Plot**



Date: 2.AUG.2015 11:55:50

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

Frequency Band (MHz)	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.

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

**Industry Canada RSS-247, Limit Clause 6.2**

Frequency Band (MHz)	Limit
5150 to 5250	Lesser of 200 mW or 10 + 10 log B
5250 to 5350	Lesser of 1 W or 17 + 10 log B
5470 to 5600 and 5600 to 5725	Lesser of 1 W or 17 + 10 log B
5725 to 5850	≤1 W

Note: "B" = 99 % Emission Bandwidth (MHz).

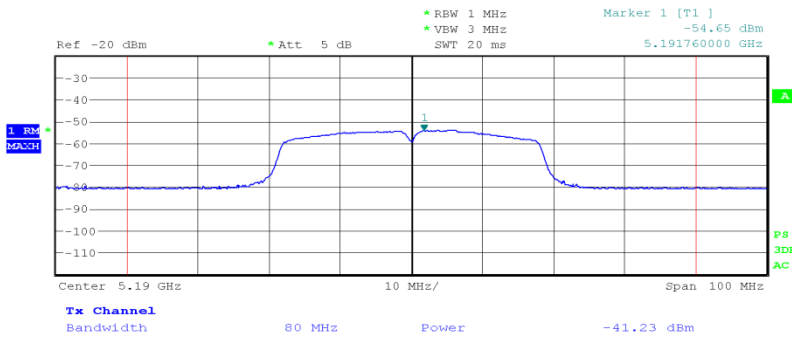


Product Service

**802.11n - 40 MHz Bandwidth, OFDM, MCS0, Frequency Band 1, Average EIRP Results**

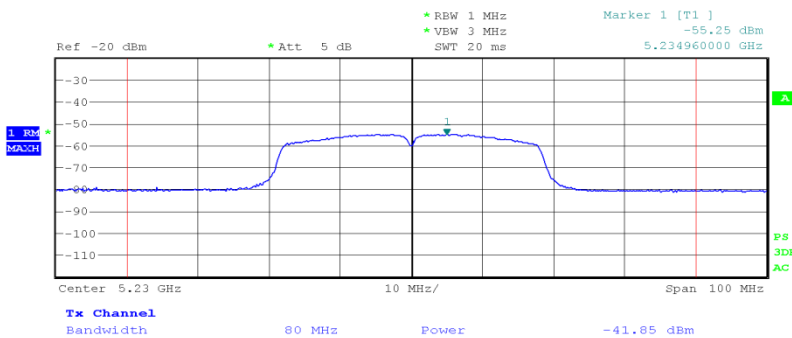
5190 MHz		5230 MHz	
dBm	mW	dBm	mW
10.75	11.89	10.09	10.21

**802.11n - 40 MHz Bandwidth, 5190 MHz, OFDM, MCS0, Frequency Band 1, Average EIRP Plot**



Date: 2.AUG.2015 12:01:28

**802.11n - 40 MHz Bandwidth, 5230 MHz, OFDM, MCS0, Frequency Band 1, Average EIRP Plot**



Date: 2.AUG.2015 12:04:27



Product Service

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

Frequency Band (MHz)	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.

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

Industry Canada RSS-247, Limit Clause 6.2

Frequency Band (MHz)	Limit
5150 to 5250	Lesser of 200 mW or 10 + 10 log B
5250 to 5350	Lesser of 1 W or 17 + 10 log B
5470 to 5600 and 5600 to 5725	Lesser of 1 W or 17 + 10 log B
5725 to 5850	≤1 W

Note: "B" = 99 % Emission Bandwidth (MHz).



Product Service

## **2.2 SPURIOUS RADIATED EMISSIONS**

### **2.2.1 Specification Reference**

FCC 47 CFR Part 15E, Clause 15.407 (b), 15.205 and 15.209  
Industry Canada RSS-247, Clause 6.2

### **2.2.2 Equipment Under Test and Modification State**

Beethoven S/N: EMC #1 - Modification State 1

### **2.2.3 Date of Test**

18 July 2015, 19 July 2015, 21 July 2015, 26 July 2015, 27 July 2015 & 29 July 2015

### **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**

For peak measurement this test was performed in accordance with KDB 789033 D02 v01, Section II clause G.2, G.3, G.4 and G.5 and Industry Canada RSS-GEN, clause 6.13, 8.9 and 8.10.

For average measurements this test was performed in accordance with KDB 789033 D02 v01, Section II clause G.6d Method VB and Industry Canada RSS-GEN, clause 6.13, 8.9 and 8.10.

### **2.2.6 Environmental Conditions**

Ambient Temperature	19.1 - 21.6°C
Relative Humidity	40.0 - 58.0%



Product Service

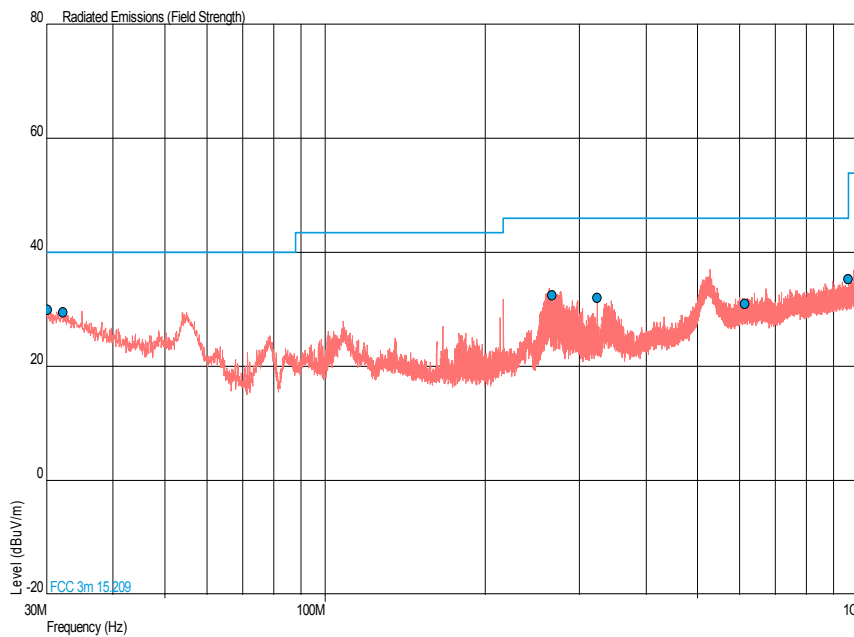
**2.2.7 Test Results**

110 V AC Supply

802.11a, 5180 MHz, 6 Mbps, 30 MHz to 1 GHz, Frequency Band 1, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dBµV/m)	QP Margin (dBµV/m)	QP Level (µV/m)	QP Margin (µV/m)	Angle (°)	Height (m)	Polarisation
30.196	30.0	-10.0	31.6	-68.4	155	1.00	Vertical
32.289	29.5	-10.5	29.9	-70.1	268	1.00	Vertical
266.545	32.5	-13.5	42.2	-157.8	5	1.00	Vertical
323.981	32.1	-13.9	40.3	-159.7	357	1.00	Vertical
614.000	31.0	-15.0	35.5	-164.5	135	1.00	Vertical
960.000	35.3	-10.7	58.2	-141.8	229	1.00	Vertical

802.11a, 5180 MHz, 6 Mbps, 30 MHz to 1 GHz, Frequency Band 1, Spurious Radiated Emissions Plot





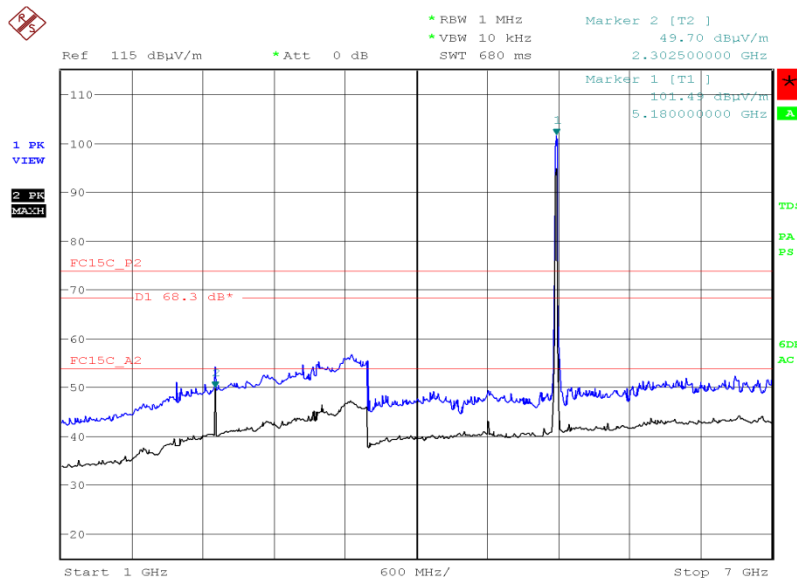
Product Service

802.11a, 5180 MHz, 6 Mbps, 1 GHz to 40 GHz, Frequency Band 1, Spurious Radiated Emissions Results

Frequency (MHz)	Final Peak (dBµV/m)	Final Average (dBµV/m)	Final Peak (µV/m)	Final Average (µV/m)	Angle (°)	Height (m)	Polarisation
*							

\*No emissions were detected within 10 dB of the limit.

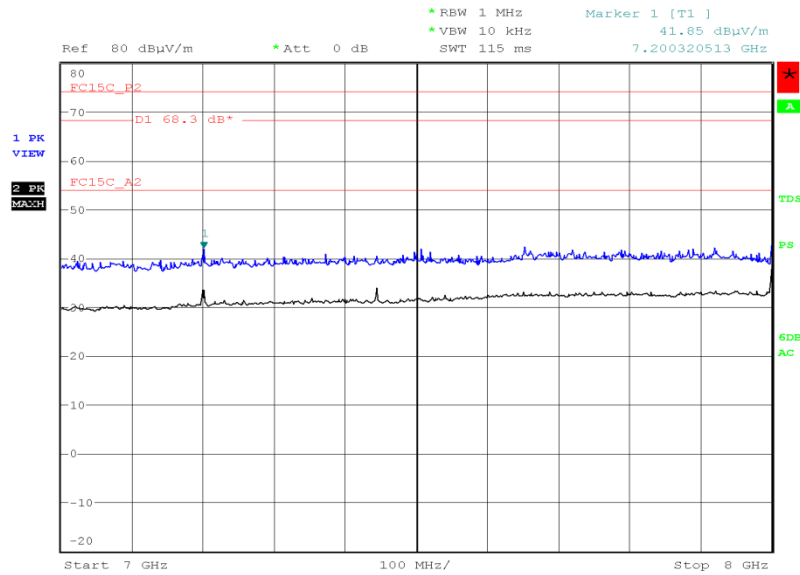
802.11a, 5180 MHz, 6 Mbps, 1 GHz to 7 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



Date: 18.JUL.2015 23:34:00

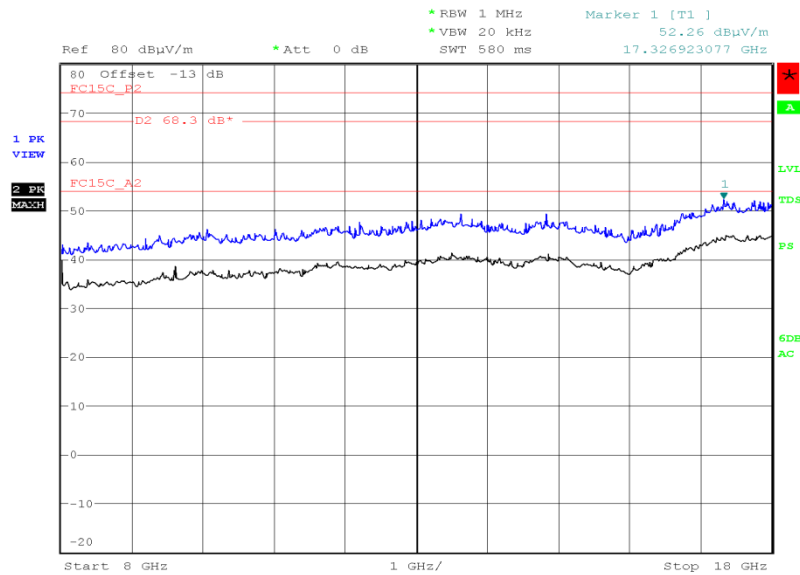


802.11a, 5180 MHz, 6 Mbps, 7 GHz to 8 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



Date: 26.JUL.2015 08:38:03

802.11a, 5180 MHz, 6 Mbps, 8 GHz to 18 GHz, Frequency Band 1, Spurious Radiated Emissions Plot

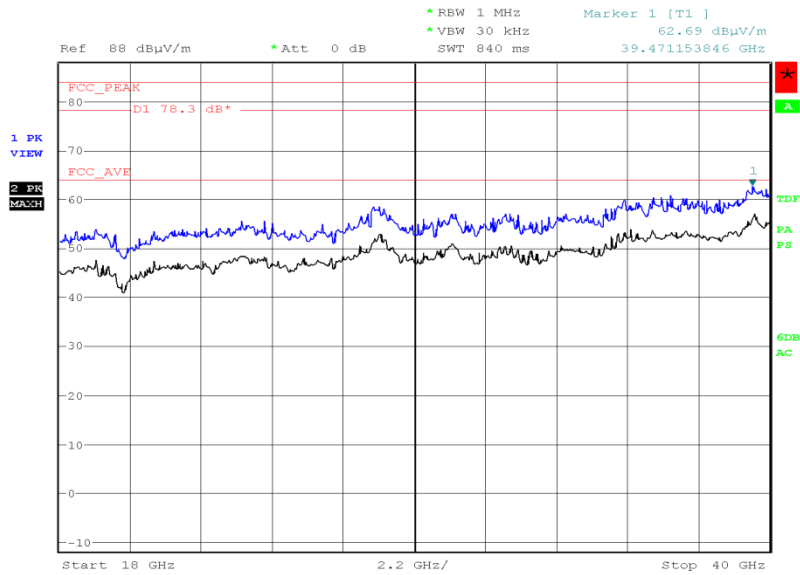


Date: 27.JUL.2015 19:33:21





802.11a, 5180 MHz, 6 Mbps, 18 GHz to 40 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



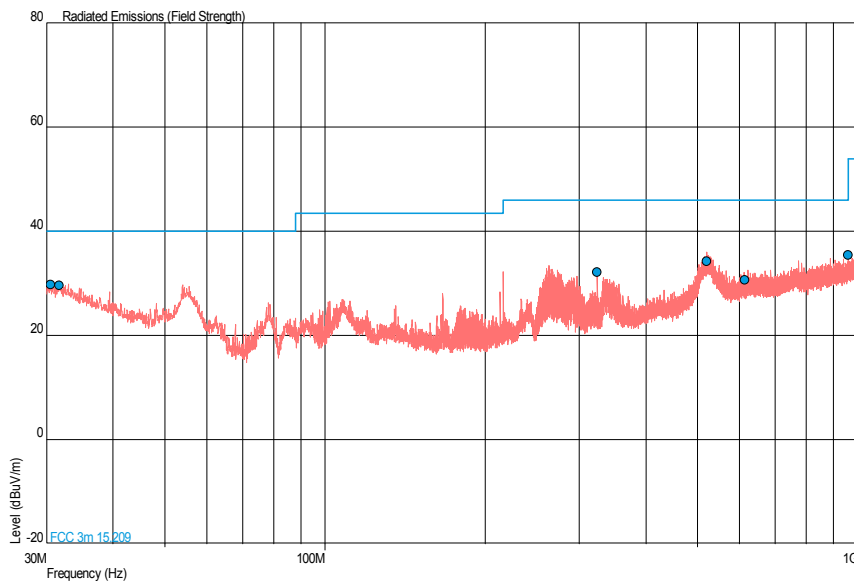
Date: 28.JUL.2015 18:21:44



802.11a, 5200 MHz, 6 Mbps, 30 MHz to 1 GHz, Frequency Band 1, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dBµV/m)	QP Margin (dBµV/m)	QP Level (µV/m)	QP Margin (µV/m)	Angle (°)	Height (m)	Polarisation
30.561	29.8	-10.2	30.9	-69.1	323	1.00	Vertical
31.703	29.6	-10.4	30.2	-69.8	127	1.00	Vertical
324.005	32.2	-13.8	40.7	-159.3	359	1.00	Vertical
520.197	34.3	-11.7	51.9	-148.1	41	1.00	Vertical
614.000	30.7	-15.3	34.3	-165.7	91	1.00	Vertical
960.000	35.4	-10.6	58.9	-141.1	239	1.00	Vertical

802.11a, 5200 MHz, 6 Mbps, 30 MHz to 1 GHz, Frequency Band 1, Spurious Radiated Emissions Plot





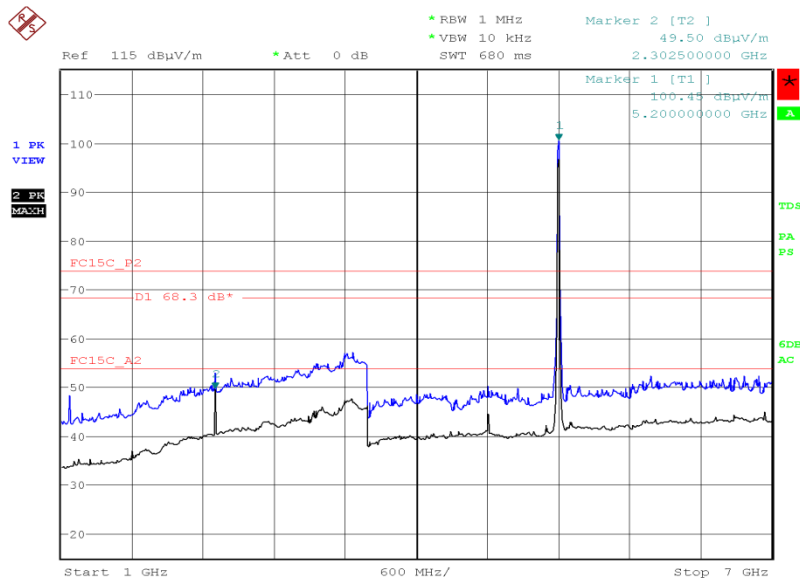
Product Service

**802.11a, 5200 MHz, 6 Mbps, 1 GHz to 40 GHz, Frequency Band 1, Spurious Radiated Emissions Results**

Frequency (MHz)	Final Peak (dBμV/m)	Final Average (dBμV/m)	Final Peak (μV/m)	Final Average (μV/m)	Angle (°)	Height (m)	Polarisation
*							

\*No emissions were detected within 10 dB of the limit.

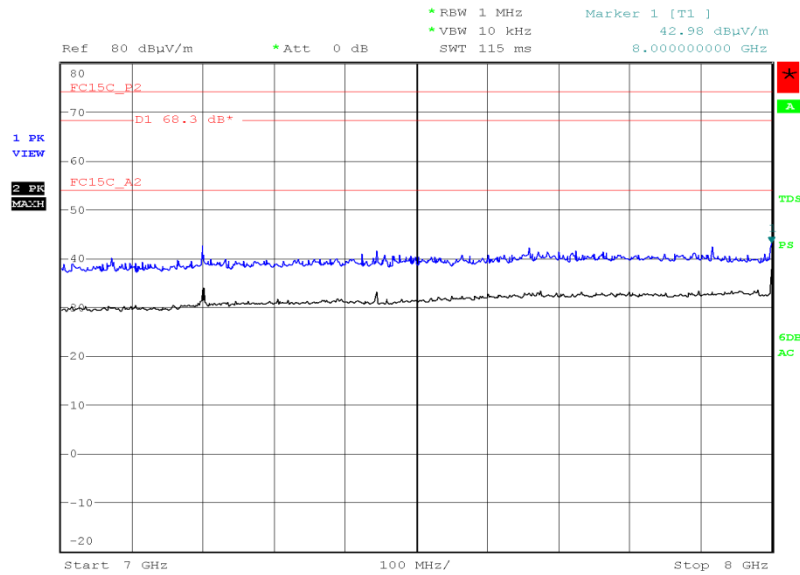
**802.11a, 5200 MHz, 6 Mbps, 1 GHz to 7 GHz, Frequency Band 1, Spurious Radiated Emissions Plot**



Date: 18.JUL.2015 23:51:37

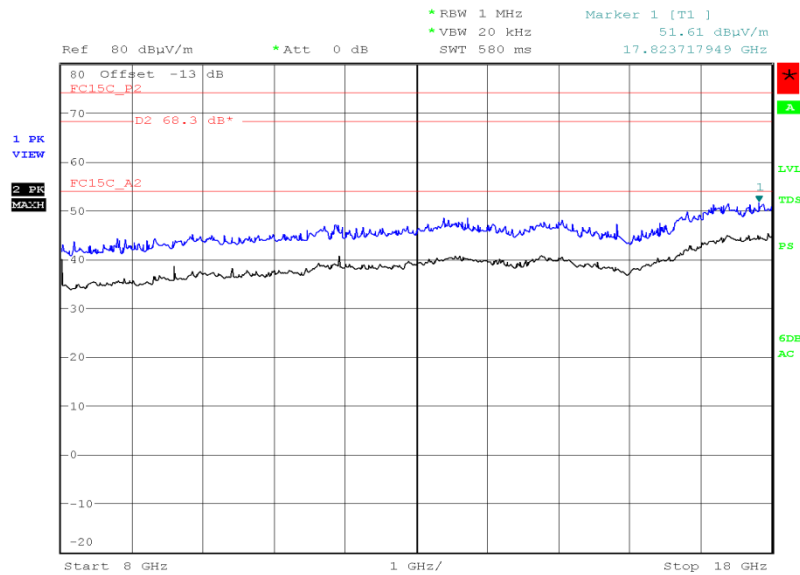


802.11a, 5200 MHz, 6 Mbps, 7 GHz to 8 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



Date: 26.JUL.2015 08:42:20

802.11a, 5200 MHz, 6 Mbps, 8 GHz to 18 GHz, Frequency Band 1, Spurious Radiated Emissions Plot

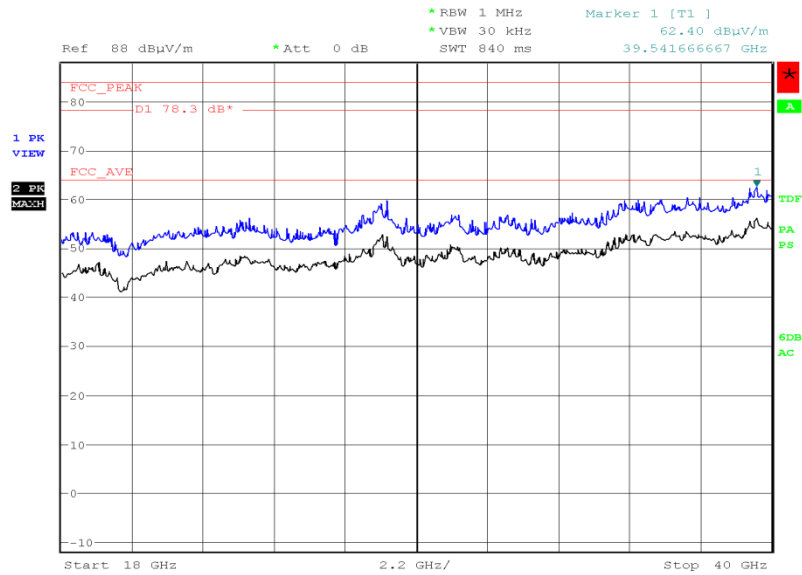


Date: 27.JUL.2015 19:50:43



Product Service

802.11a, 5200 MHz, 6 Mbps, 18 GHz to 40 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



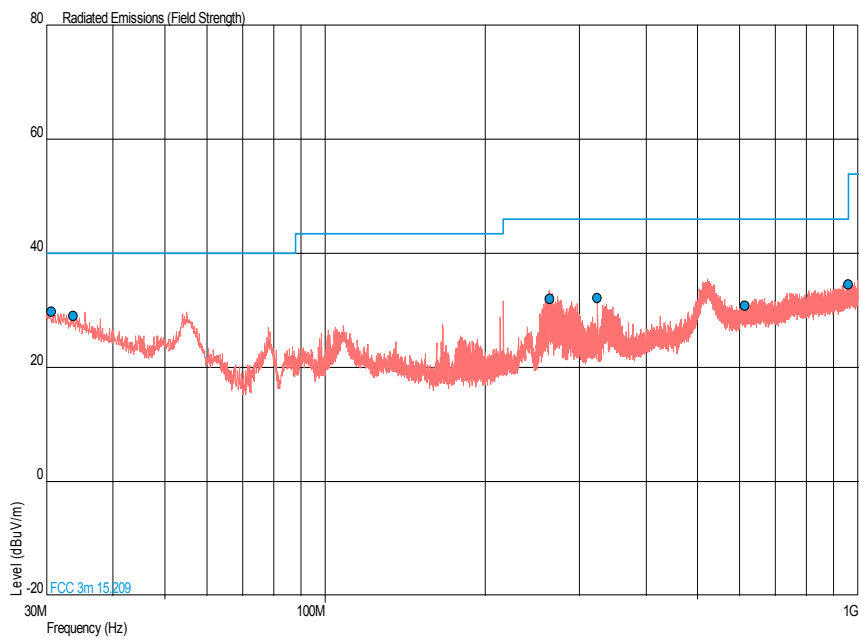
Date: 28.JUL.2015 18:35:21



802.11a, 5240 MHz, 6 Mbps, 30 MHz to 1 GHz, Frequency Band 1, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dBµV/m)	QP Margin (dBµV/m)	QP Level (µV/m)	QP Margin (µV/m)	Angle (°)	Height (m)	Polarisation
30.627	29.7	-10.3	30.5	-69.5	353	1.00	Vertical
33.655	29.0	-11.0	28.2	-71.8	64	1.00	Vertical
264.122	32.0	-14.0	39.8	-160.2	31	1.00	Vertical
323.993	32.2	-13.8	40.7	-159.3	360	1.00	Vertical
614.000	30.8	-15.2	34.7	-165.3	330	1.00	Vertical
960.000	34.6	-11.4	53.7	-146.3	148	1.00	Vertical

802.11a, 5240 MHz, 6 Mbps, 30 MHz to 1 GHz, Frequency Band 1, Spurious Radiated Emissions Plot





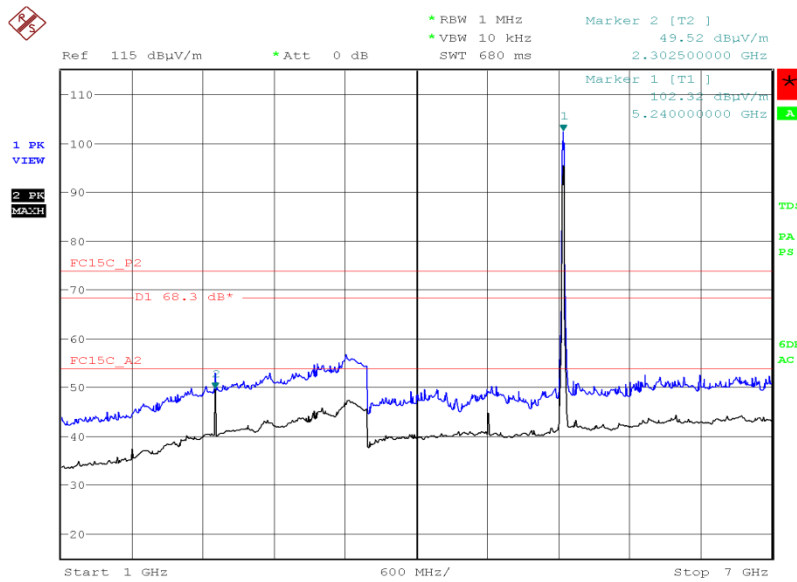
Product Service

802.11a, 5240 MHz, 6 Mbps, 1 GHz to 40 GHz, Frequency Band 1, Spurious Radiated Emissions Results

Frequency (MHz)	Final Peak (dBµV/m)	Final Average (dBµV/m)	Final Peak (µV/m)	Final Average (µV/m)	Angle (°)	Height (m)	Polarisation
*							

\*No emissions were detected within 10 dB of the limit.

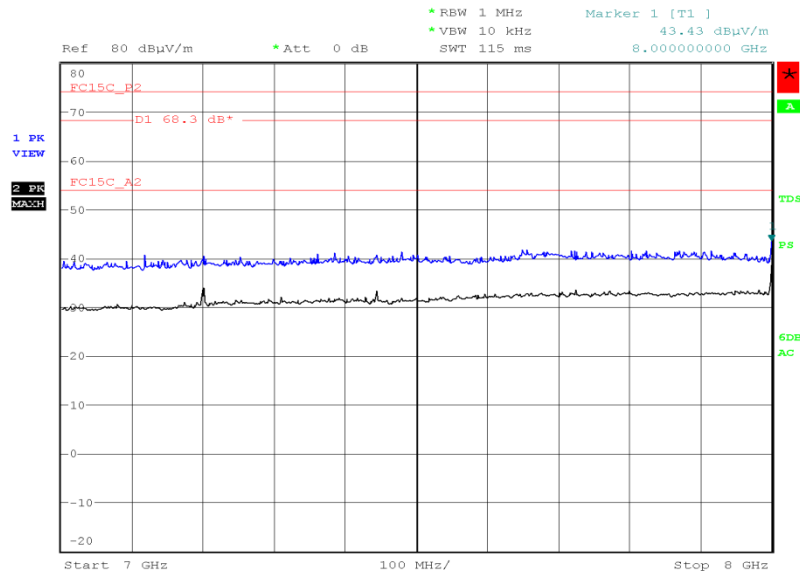
802.11a, 5240 MHz, 6 Mbps, 1 GHz to 7 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



Date: 19.JUL.2015 08:31:24

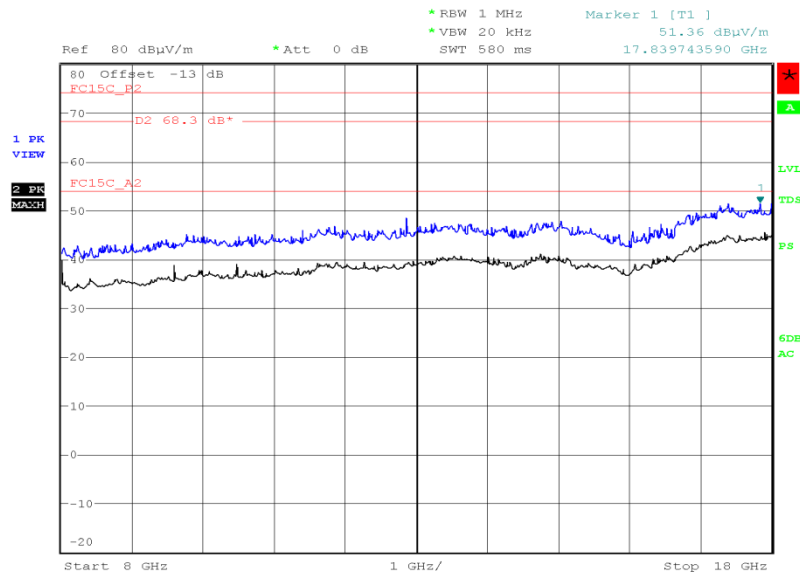


802.11a, 5240 MHz, 6 Mbps, 7 GHz to 8 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



Date: 26.JUL.2015 08:52:21

802.11a, 5240 MHz, 6 Mbps, 8 GHz to 18 GHz, Frequency Band 1, Spurious Radiated Emissions Plot

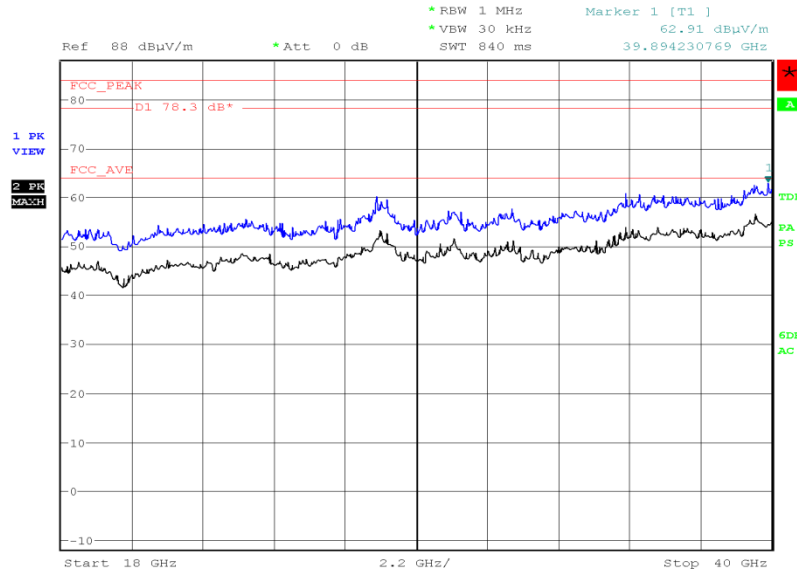


Date: 27.JUL.2015 20:04:28





**802.11a, 5240 MHz, 6 Mbps, 18 GHz to 40 GHz, Frequency Band 1, Spurious Radiated Emissions Plot**



Date: 28.JUL.2015 18:47:42

**FCC 47 CFR Part 15, Limit Clause 15.407 (b)(1)(2)(3)(4)(6)(7)**

Outside the 5.15 GHz to 5.35 GHz band	-27 dBm/MHz
Outside the 5.25 GHz to 5.35 GHz band	-27 dBm/MHz
Outside the 5.47 GHz to 5.725 GHz band	-27 dBm/MHz
5.715 GHz to 5.725 GHz and 5.850 GHz to 5.860 GHz band	-17 dBm/MHz
Outside the 5.715 GHz to 5.860 GHz band	-27 dBm/MHz

**FCC 47 CFR Part 15, Limit Clause 15.205**

	Peak (dBμV/m)	Average (dBμV/m)
Restricted Bands of Operation	74	54

**FCC 47 CFR Part 15, Limit Clause 15.209**

Frequency (MHz)	Field Strength			Measurement Distance (m)
	(μV/m)	Average (dBμV/m)	Peak (dBμV/m)	
30-88	100	40.0	60.0	3
88-216	150	43.5	63.5	3
216-960	200	46.0	66.0	3
Above 960	500	54.0	74.0	3



Product Service

Industry Canada RSS-247, Limit Clause 6.2

Outside the 5.15 GHz to 5.35 GHz band	-27 dBm/MHz
Outside the 5.25 GHz to 5.35 GHz band	-27 dBm/MHz
Outside the 5.47 GHz to 5.725 GHz band	-27 dBm/MHz
5.715 GHz to 5.725 GHz and 5.850 GHz to 5.860 GHz band	-17 dBm/MHz
Outside the 5.715 GHz to 5.860 GHz band	-27 dBm/MHz

Industry Canada RSS-GEN, Limit Clause 8.9

Frequency (MHz)	Field Strength			Measurement Distance (m)
	( $\mu$ V/m)	Average (dB $\mu$ V/m)	Peak (dB $\mu$ V/m)	
30-88	100	40.0	60.0	3
88-216	150	43.5	63.5	3
216-960	200	46.0	66.0	3
Above 960	500	54.0	74.0	3

Industry Canada RSS-GEN, Limit Clause 8.10

	Peak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)
Restricted Bands of Operation	74	54



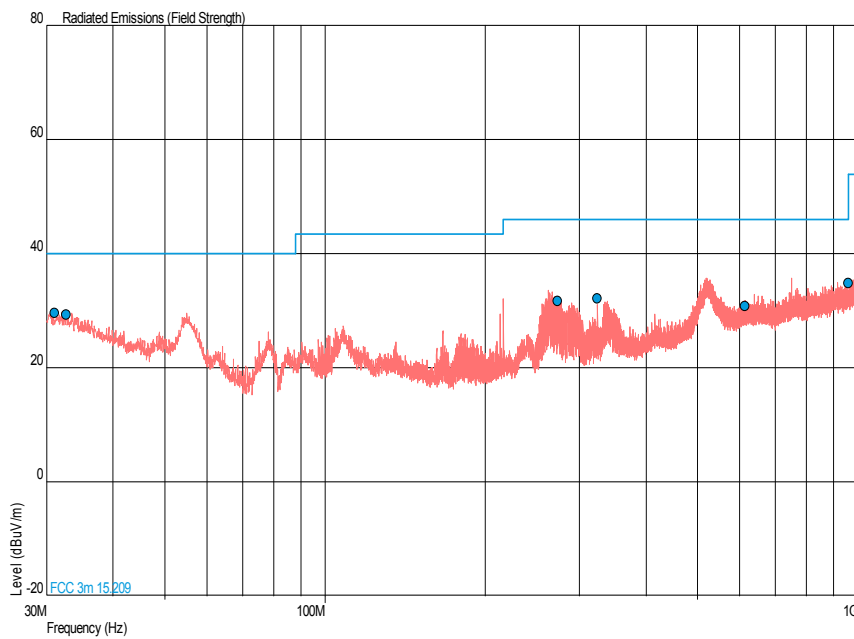
Product Service

110 V AC Supply

802.11n - 20 MHz Bandwidth, 5180 MHz, MCS0, 30 MHz to 1 GHz, Frequency Band 1, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dBµV/m)	QP Margin (dBµV/m)	QP Level (µV/m)	QP Margin (µV/m)	Angle (°)	Height (m)	Polarisation
31.105	29.7	-10.3	30.5	-69.5	189	1.00	Vertical
32.730	29.4	-10.6	29.5	-70.5	226	1.00	Vertical
273.307	31.7	-14.3	38.5	-161.5	3	1.00	Vertical
324.009	32.2	-13.8	40.7	-159.3	336	1.00	Vertical
614.000	30.8	-15.2	34.7	-165.3	342	1.00	Vertical
960.000	34.9	-11.1	55.6	-144.4	1	1.00	Vertical

802.11n - 20 MHz Bandwidth, 5180 MHz, MCS0, 30 MHz to 1 GHz, Frequency Band 1, Spurious Radiated Emissions Plot





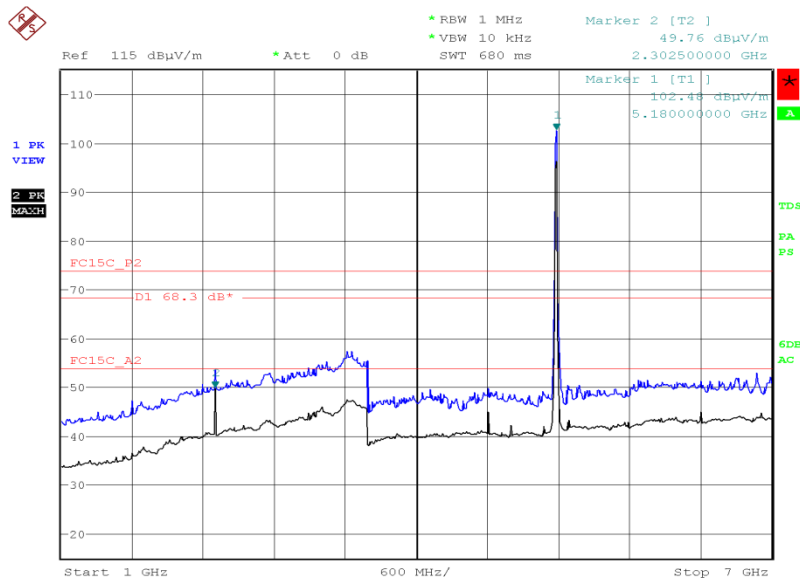
Product Service

802.11n - 20 MHz Bandwidth, 5180 MHz, MCS0, 1 GHz to 40 GHz, Frequency Band 1, Spurious Radiated Emissions Results

Frequency (MHz)	Final Peak (dBµV/m)	Final Average (dBµV/m)	Final Peak (µV/m)	Final Average (µV/m)	Angle (°)	Height (m)	Polarisation
*							

\*No other emissions were detected within 10 dB of the limit.

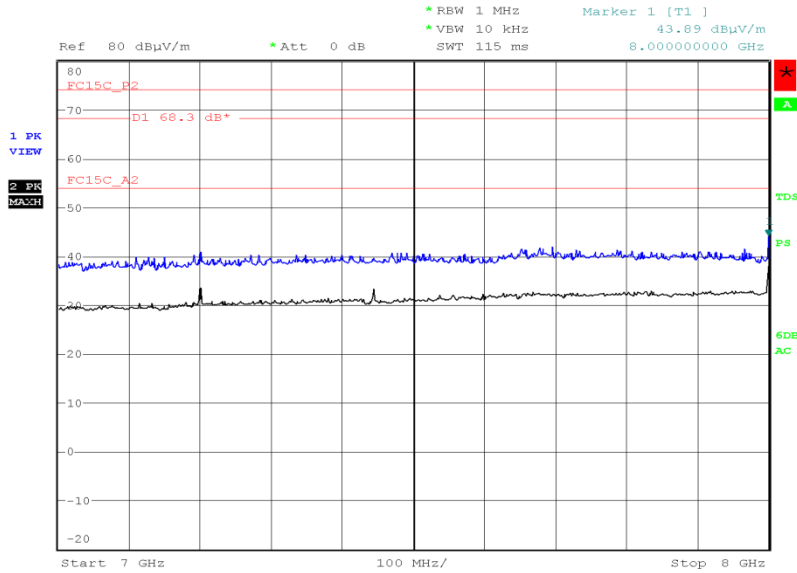
802.11n - 20 MHz Bandwidth, 5180 MHz, MCS0, 1 GHz to 7 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



Date: 19.JUL.2015 09:53:32

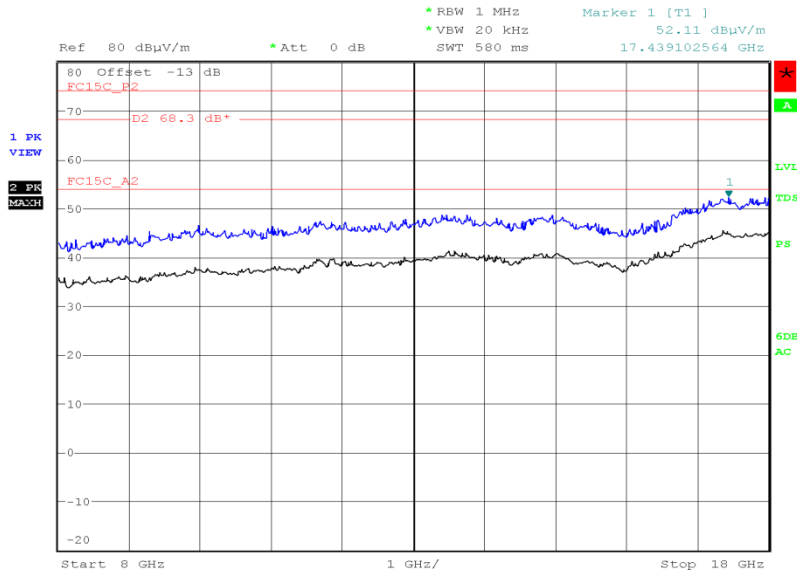


802.11n - 20 MHz Bandwidth, 5180 MHz, MCS0, 7 GHz to 8 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



Date: 26.JUL.2015 08:59:33

802.11n - 20 MHz Bandwidth, 5180 MHz, MCS0, 8 GHz to 18 GHz, Frequency Band 1, Spurious Radiated Emissions Plot

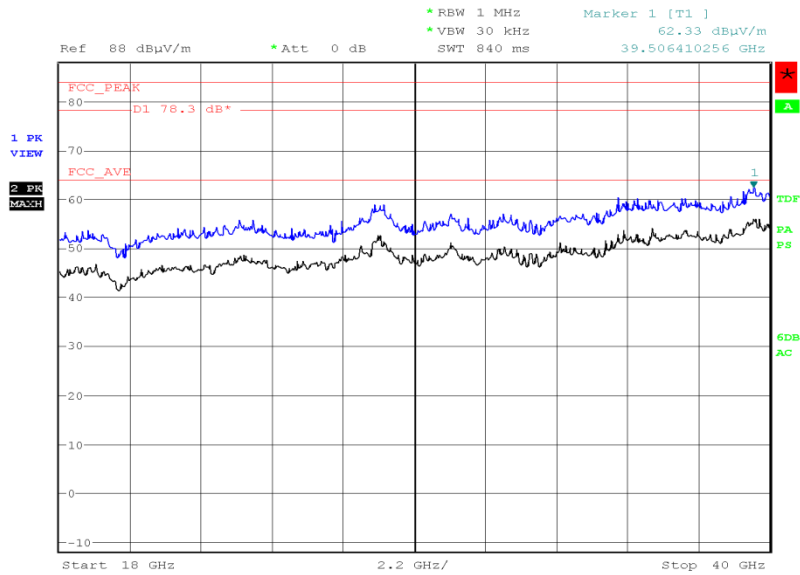


Date: 27.JUL.2015 20:22:25



Product Service

802.11n - 20 MHz Bandwidth, 5180 MHz, MCS0, 18 GHz to 40 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



Date: 28.JUL.2015 18:57:51

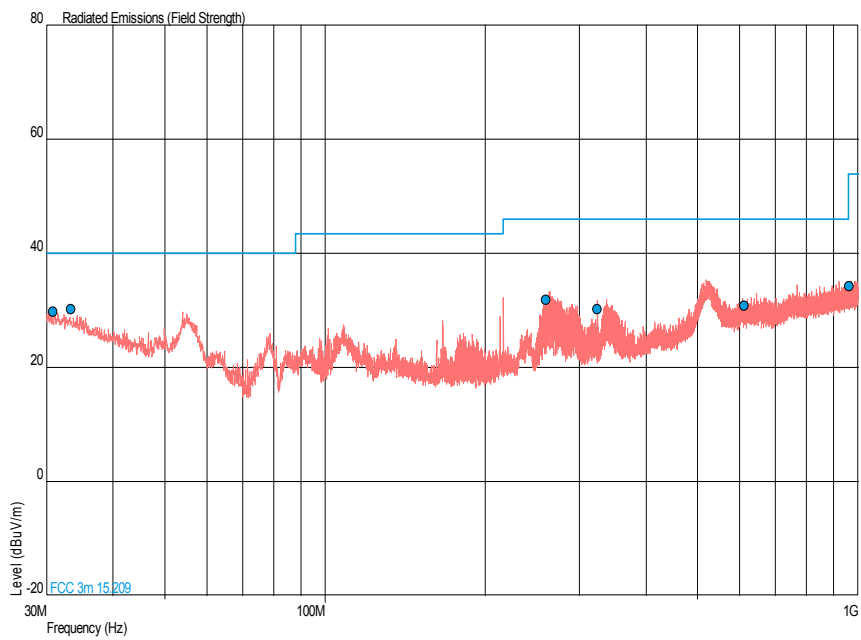


Product Service

802.11n - 20 MHz Bandwidth, 5200 MHz, MCS0, 30 MHz to 1 GHz, Frequency Band 1, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dBµV/m)	QP Margin (dBµV/m)	QP Level (µV/m)	QP Margin (µV/m)	Angle (°)	Height (m)	Polarisation
30.825	29.7	-10.3	30.5	-69.5	0	1.00	Vertical
33.298	30.2	-9.8	29.5	-70.5	0	1.00	Vertical
259.793	31.9	-14.1	38.5	-161.5	0	1.00	Vertical
323.959	30.3	-15.7	40.7	-159.3	0	1.00	Vertical
612.064	30.8	-15.2	34.7	-165.3	0	1.00	Vertical
962.469	34.2	-19.8	55.6	-445.4	0	1.00	Vertical

802.11n - 20 MHz Bandwidth, 5200 MHz, MCS0, 30 MHz to 1 GHz, Frequency Band 1, Spurious Radiated Emissions Plot





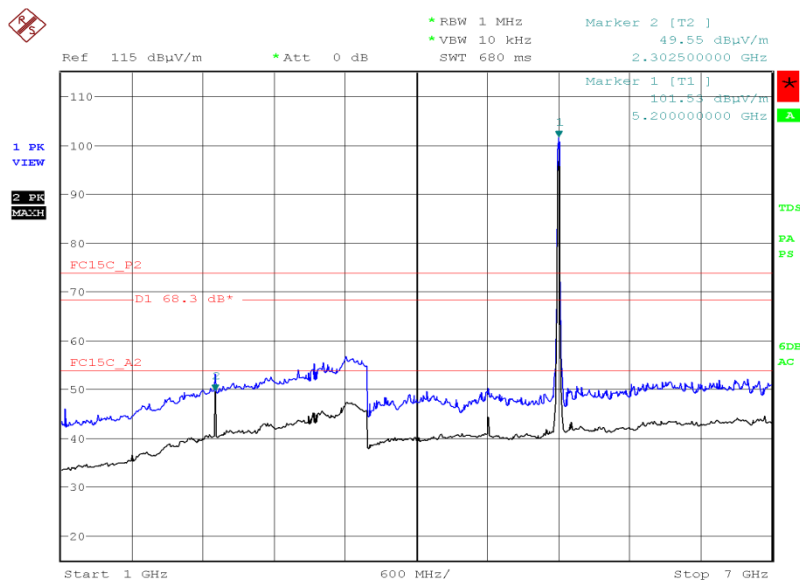
Product Service

802.11n - 20 MHz Bandwidth, 5200 MHz, MCS0, 1 GHz to 40 GHz, Frequency Band 1, Spurious Radiated Emissions Results

Frequency (MHz)	Final Peak (dBµV/m)	Final Average (dBµV/m)	Final Peak (µV/m)	Final Average (µV/m)	Angle (°)	Height (m)	Polarisation
*							

\*No emissions were detected within 10 dB of the limit.

802.11n - 20 MHz Bandwidth, 5200 MHz, MCS0, 1 GHz to 7 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



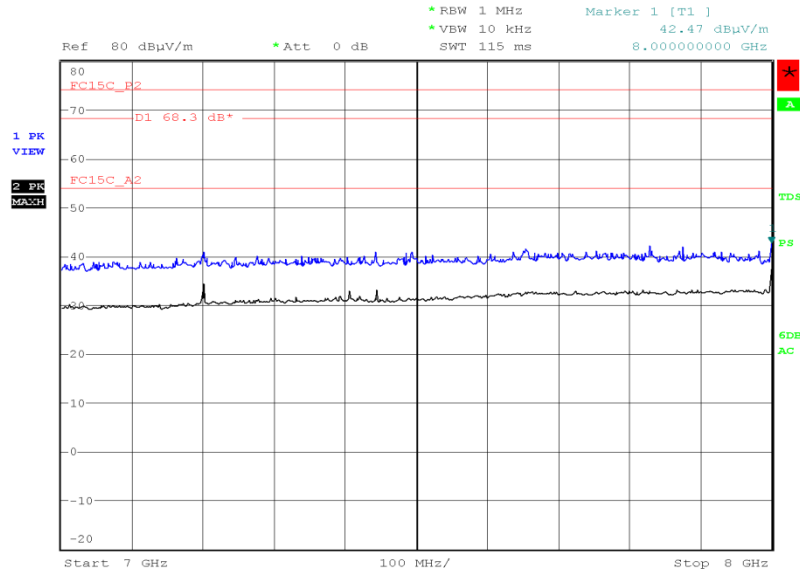
Date: 19.JUL.2015 10:12:54





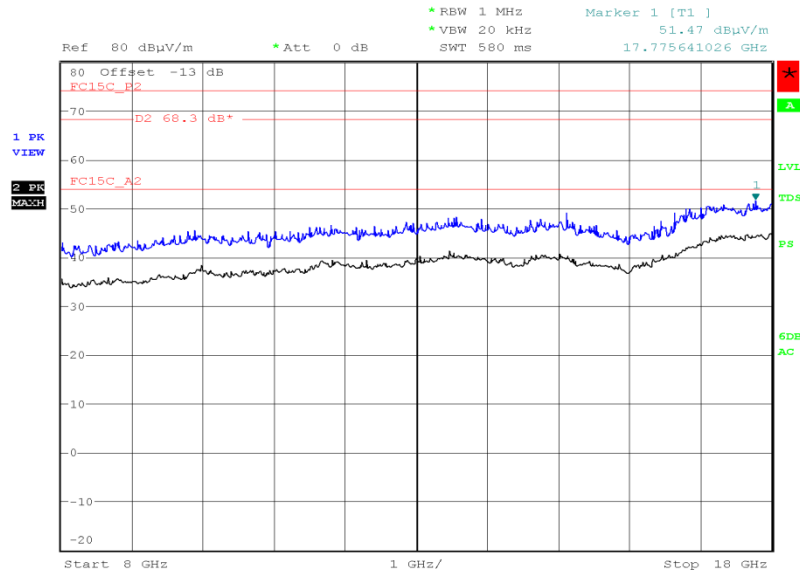
Product Service

802.11n - 20 MHz Bandwidth, 5200 MHz, MCS0, 7 GHz to 8 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



Date: 26.JUL.2015 09:05:13

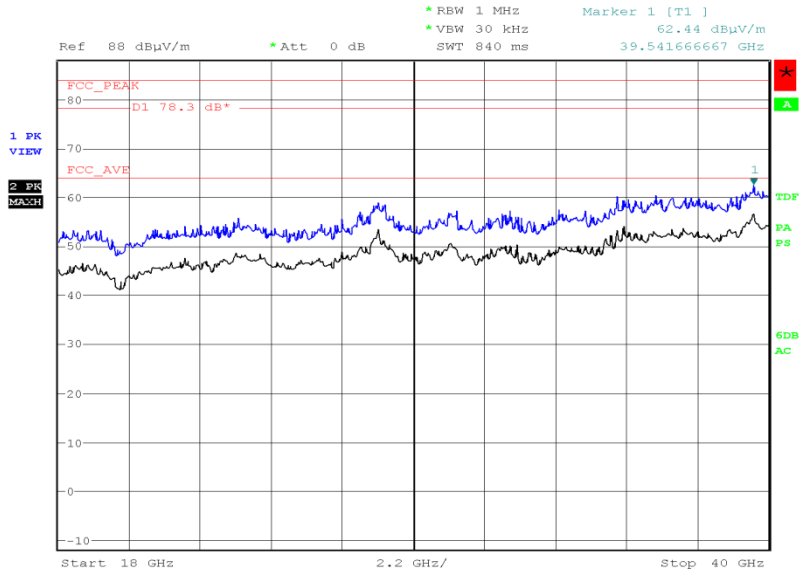
802.11n - 20 MHz Bandwidth, 5200 MHz, MCS0, 8 GHz to 18 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



Date: 27.JUL.2015 20:33:04



802.11n - 20 MHz Bandwidth, 5200 MHz, MCS0, 18 GHz to 40 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



Date: 28.JUL.2015 19:03:12

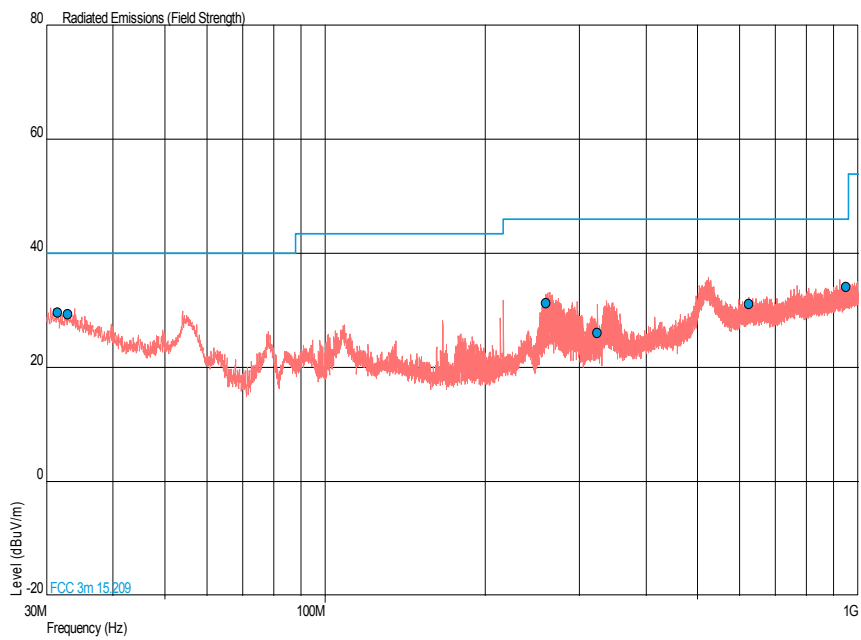


Product Service

802.11n - 20 MHz Bandwidth, 5240 MHz, MCS0, 30 MHz to 1 GHz, Frequency Band 1, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dBµV/m)	QP Margin (dBµV/m)	QP Level (µV/m)	QP Margin (µV/m)	Angle (°)	Height (m)	Polarisation
31.455	29.6	-10.4	30.2	-69.8	0	1.00	Vertical
32.862	29.3	-10.7	29.2	-70.8	180	1.00	Vertical
259.211	31.3	-14.7	36.7	-163.3	0	1.00	Vertical
323.910	26.0	-20.0	20.0	-180.0	0	1.00	Vertical
623.204	31.1	-14.9	35.9	-164.1	90	1.00	Vertical
950.627	34.0	-12.0	50.1	-149.9	90	1.00	Vertical

802.11n - 20 MHz Bandwidth, 5240 MHz, MCS0, 30 MHz to 1 GHz, Frequency Band 1, Spurious Radiated Emissions Plot





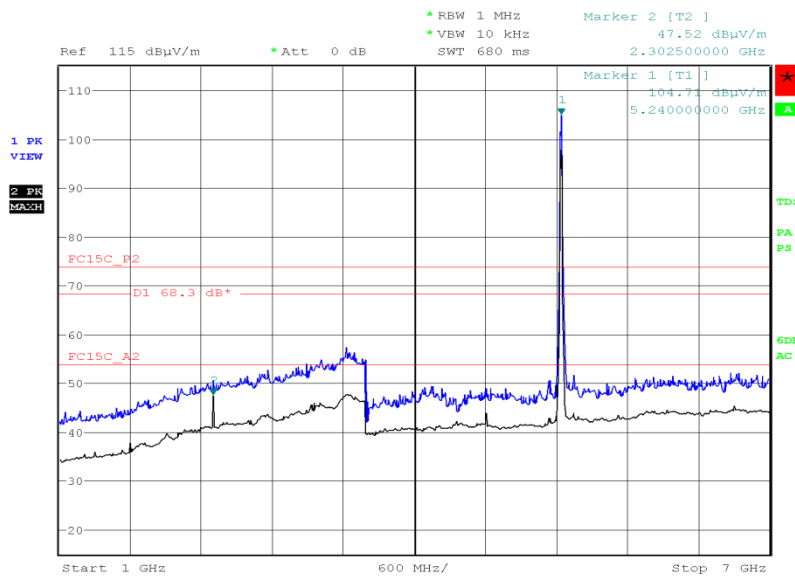
Product Service

802.11n - 20 MHz Bandwidth, 5240 MHz, MCS0, 1 GHz to 40 GHz, Frequency Band 1, Spurious Radiated Emissions Results

Frequency (MHz)	Final Peak (dBµV/m)	Final Average (dBµV/m)	Final Peak (µV/m)	Final Average (µV/m)	Angle (°)	Height (m)	Polarisation
*							

\*No emissions were detected within 10 dB of the limit.

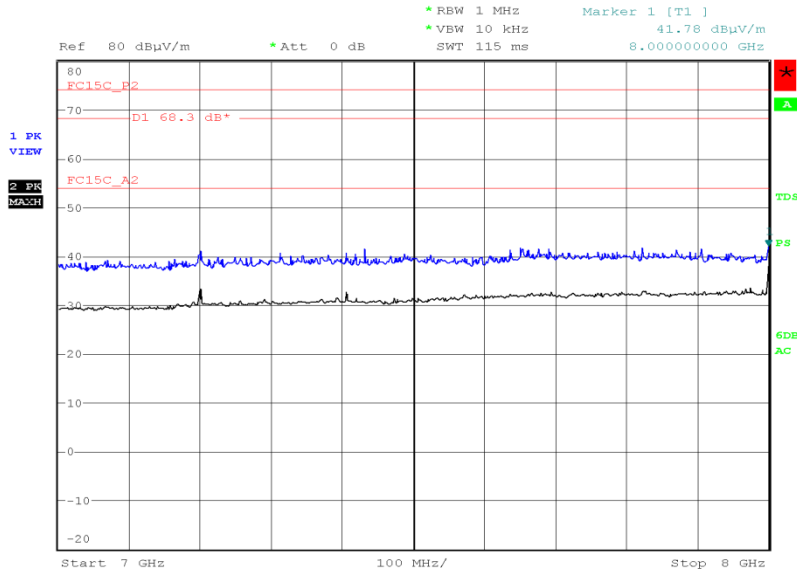
802.11n - 20 MHz Bandwidth, 5240 MHz, MCS0, 1 GHz to 7 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



Date: 20.JUL.2015 18:16:12

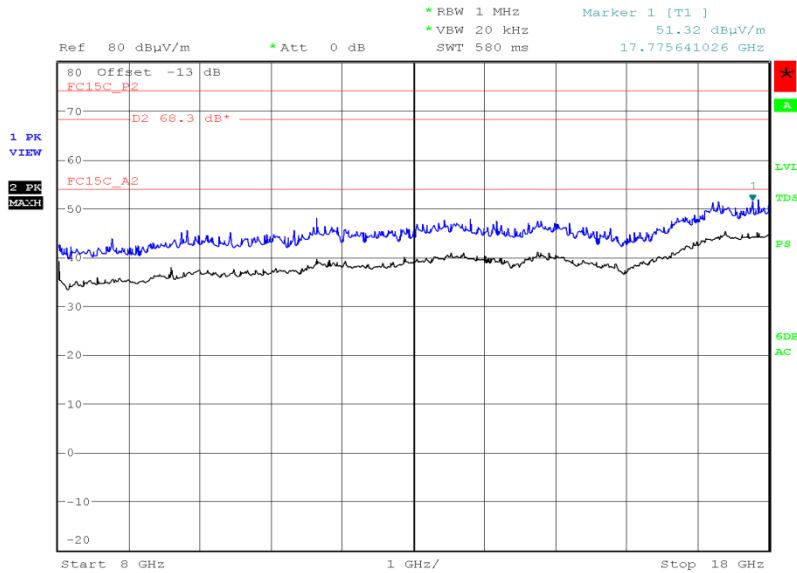


802.11n - 20 MHz Bandwidth, 5240 MHz, MCS0, 7 GHz to 8 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



Date: 26.JUL.2015 09:08:37

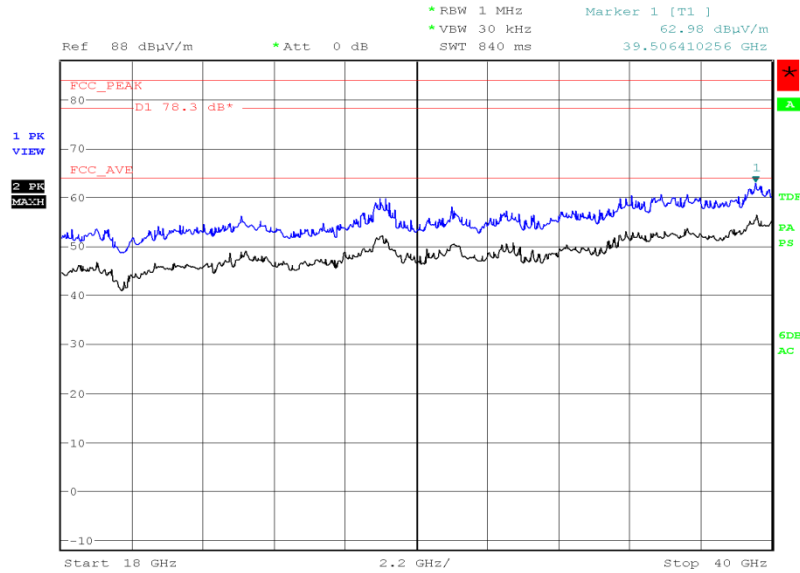
802.11n - 20 MHz Bandwidth, 5240 MHz, MCS0, 8 GHz to 18 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



Date: 27.JUL.2015 20:38:37



802.11n - 20 MHz Bandwidth, 5240 MHz, MCS0, 18 GHz to 40 GHz, Frequency Band 1, Spurious Radiated Emissions Plot



Date: 28.JUL.2015 19:06:03

FCC 47 CFR Part 15, Limit Clause 15.407 (b)(1)(2)(3)(4)(6)(7)

Outside the 5.15 GHz to 5.35 GHz band	-27 dBm/MHz
Outside the 5.25 GHz to 5.35 GHz band	-27 dBm/MHz
Outside the 5.47 GHz to 5.725 GHz band	-27 dBm/MHz
5.715 GHz to 5.725 GHz and 5.850 GHz to 5.860 GHz band	-17 dBm/MHz
Outside the 5.715 GHz to 5.860 GHz band	-27 dBm/MHz

FCC 47 CFR Part 15, Limit Clause 15.205

	Peak (dBμV/m)	Average (dBμV/m)
Restricted Bands of Operation	74	54

FCC 47 CFR Part 15, Limit Clause 15.209

Frequency (MHz)	Field Strength			Measurement Distance (m)
	(μV/m)	Average (dBμV/m)	Peak (dBμV/m)	
30-88	100	40.0	60.0	3
88-216	150	43.5	63.5	3
216-960	200	46.0	66.0	3
Above 960	500	54.0	74.0	3



Product Service

Industry Canada RSS-247, Limit Clause 6.2

Outside the 5.15 GHz to 5.35 GHz band	-27 dBm/MHz
Outside the 5.25 GHz to 5.35 GHz band	-27 dBm/MHz
Outside the 5.47 GHz to 5.725 GHz band	-27 dBm/MHz
5.715 GHz to 5.725 GHz and 5.850 GHz to 5.860 GHz band	-17 dBm/MHz
Outside the 5.715 GHz to 5.860 GHz band	-27 dBm/MHz

Industry Canada RSS-GEN, Limit Clause 8.9

Frequency (MHz)	Field Strength			Measurement Distance (m)
	( $\mu$ V/m)	Average (dB $\mu$ V/m)	Peak (dB $\mu$ V/m)	
30-88	100	40.0	60.0	3
88-216	150	43.5	63.5	3
216-960	200	46.0	66.0	3
Above 960	500	54.0	74.0	3

Industry Canada RSS-GEN, Limit Clause 8.10

	Peak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)
Restricted Bands of Operation	74	54



Product Service

## **2.3 RESTRICTED BAND EDGES**

### **2.3.1 Specification Reference**

FCC 47 CFR Part 15E, Clause 15.205  
Industry Canada RSS-GEN, Clause 8.10

### **2.3.2 Equipment Under Test and Modification State**

Beethoven S/N: EMC #1 - Modification State 1

### **2.3.3 Date of Test**

19 July 2015 & 21 July 2015

### **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 peak measurements this test was performed in accordance with KDB 789033 D02 v01, Section II clause G.1, G.3, G.4 and G.5 and Industry Canada RSS-GEN, clause 8.10.

For average measurements this test was performed in accordance with KDB 789033 D02 v01, Section II clause G.6d Method VB and Industry Canada RSS-GEN, clause 8.10.

### **2.3.6 Environmental Conditions**

Ambient Temperature	21.1 - 21.6°C
Relative Humidity	45.0 - 58.0%





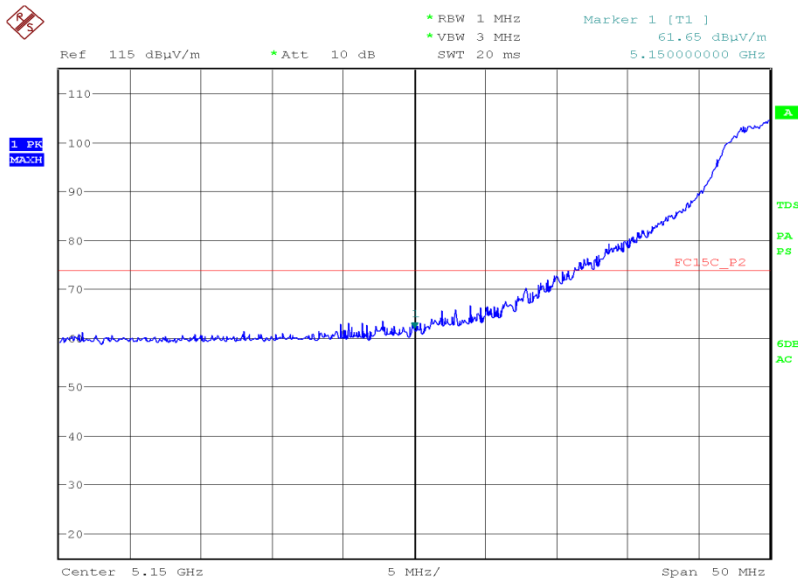
Product Service

2.3.7 Test Results

802.11a, 6 Mbps, Restricted Band Edges Results

5180 MHz	
Measured Frequency 5150 MHz	
dB $\mu$ V/m	
Final Peak	Final Average
61.65	49.12

802.11a, 5180 MHz, Measured Frequency 5150 MHz, 6 Mbps, Final Peak, Restricted Band Edges Plot

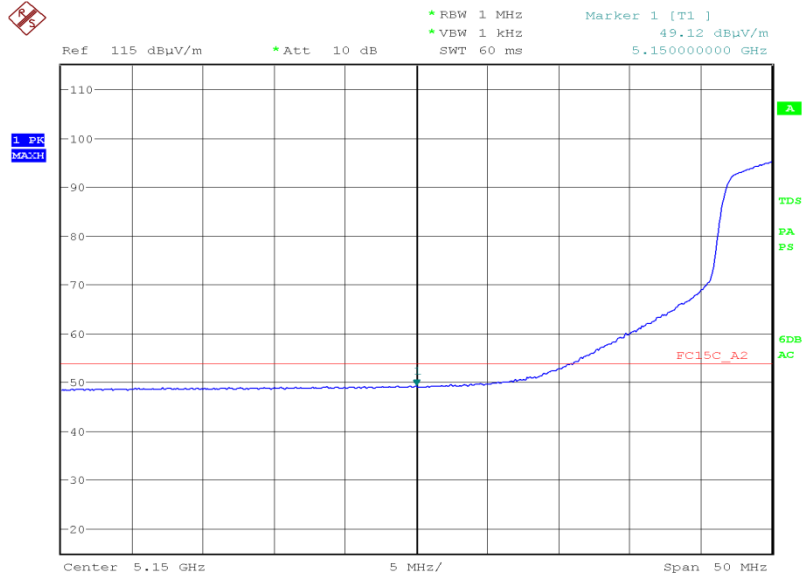


Date: 19.JUL.2015 08:46:49



Product Service

802.11a, 5180 MHz, Measured Frequency 5150 MHz, 6 Mbps, Final Average, Restricted Band Edges Plot



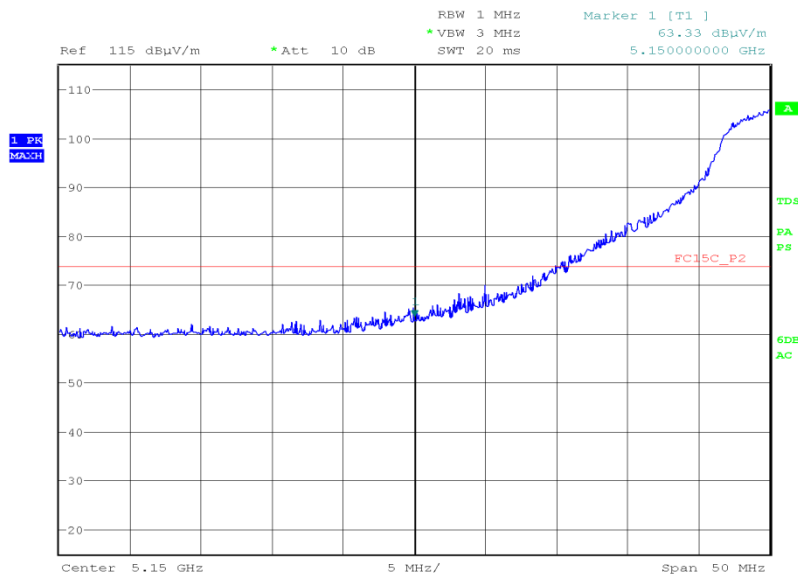
Date: 19.JUL.2015 08:48:02



802.11a, 9 Mbps, Restricted Band Edges Results

5180 MHz	
Measured Frequency 5150 MHz	
dB $\mu$ V/m	
Final Peak	Final Average
63.33	49.63

802.11a, 5180 MHz, Measured Frequency 5150 MHz, 9 Mbps, Final Peak, Restricted Band Edges Plot

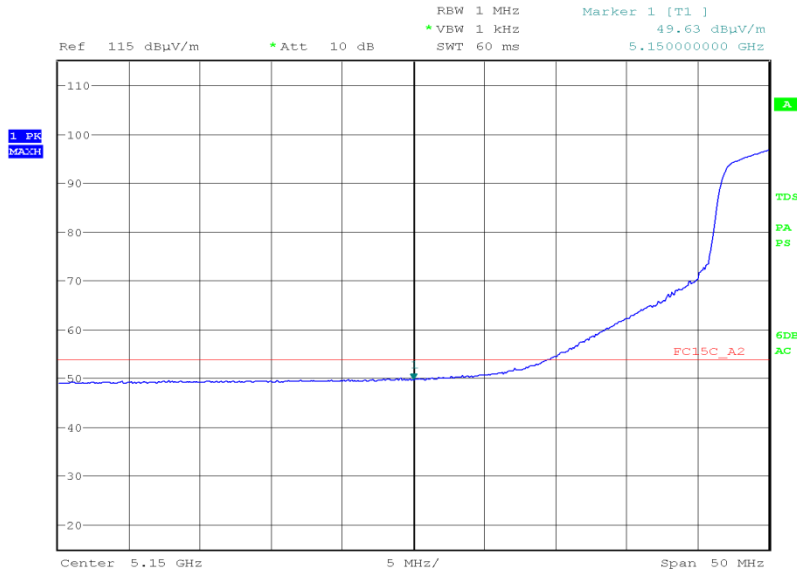


Date: 21.JUL.2015 18:47:31



Product Service

**802.11a, 5180 MHz, Measured Frequency 5150 MHz, 9 Mbps, Final Average, Restricted Band Edges Plot**



Date: 21.JUL.2015 18:48:19

**Remark**

The test was performed on 6 Mbps because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on 9 Mbps because this was deemed the worst case data rate for 6 dB Bandwidth.

**FCC 47 CFR Part 15, Limit Clause 15.205**

	Peak (dBµV/m)	Average (dBµV/m)
Restricted Bands of Operation	74	54

**Industry Canada RSS-GEN, Limit Clause 8.10**

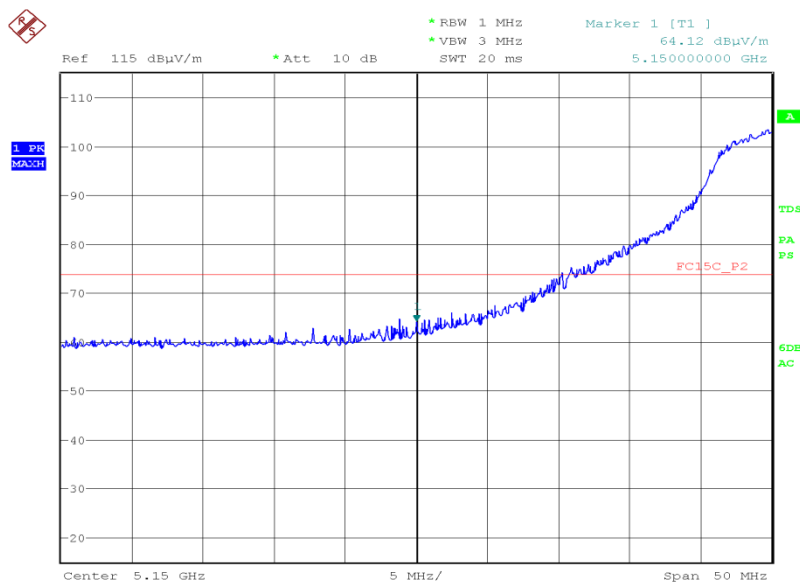
	Peak (dBµV/m)	Average (dBµV/m)
Restricted Bands of Operation	74	54



802.11n - 20 MHz Bandwidth, MCS0, Restricted Band Edges Results

5180 MHz	
Measured Frequency 5150 MHz	
dB $\mu$ V/m	
Final Peak	Final Average
64.12	49.14

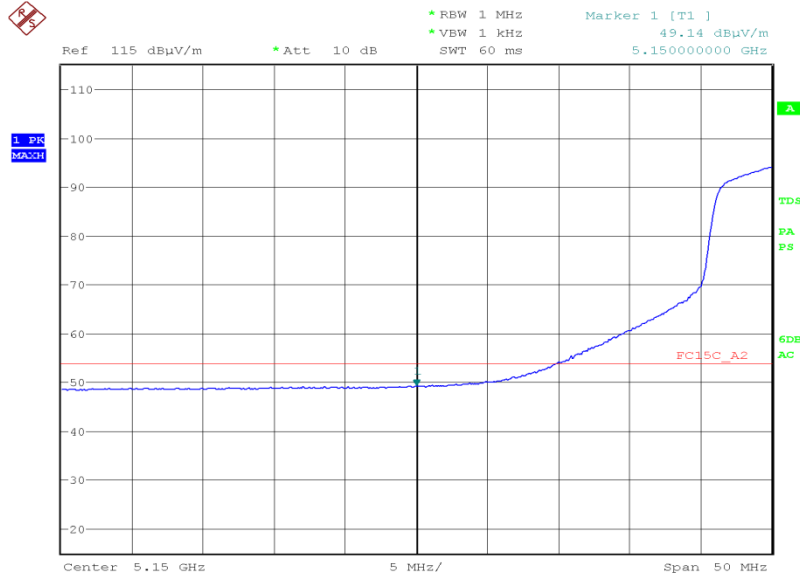
802.11n - 20 MHz Bandwidth, 5180 MHz, Measured Frequency 5150 MHz, MCS0, Final Peak, Restricted Band Edges Plot



Date: 19.JUL.2015 09:29:13



**802.11n - 20 MHz Bandwidth, 5180 MHz, Measured Frequency 5150 MHz, MCS0, Final Average, Restricted Band Edges Plot**



Date: 19.JUL.2015 09:01:21

**Remark**

The test was performed on MCS0 because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on MCS0 because this was deemed the worst case data rate for 6 dB Bandwidth.

**FCC 47 CFR Part 15, Limit Clause 15.205**

	Peak (dBμV/m)	Average (dBμV/m)
Restricted Bands of Operation	74	54

**Industry Canada RSS-GEN, Limit Clause 8.10**

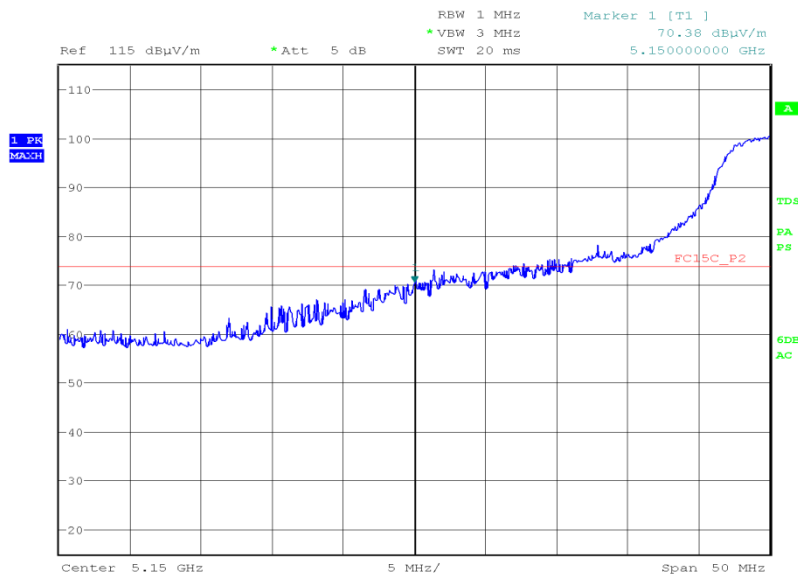
	Peak (dBμV/m)	Average (dBμV/m)
Restricted Bands of Operation	74	54



802.11n - 40 MHz Bandwidth, MCS0, Restricted Band Edges Results

5190 MHz	
Measured Frequency 5150 MHz	
dB $\mu$ V/m	
Final Peak	Final Average
70.38	51.65

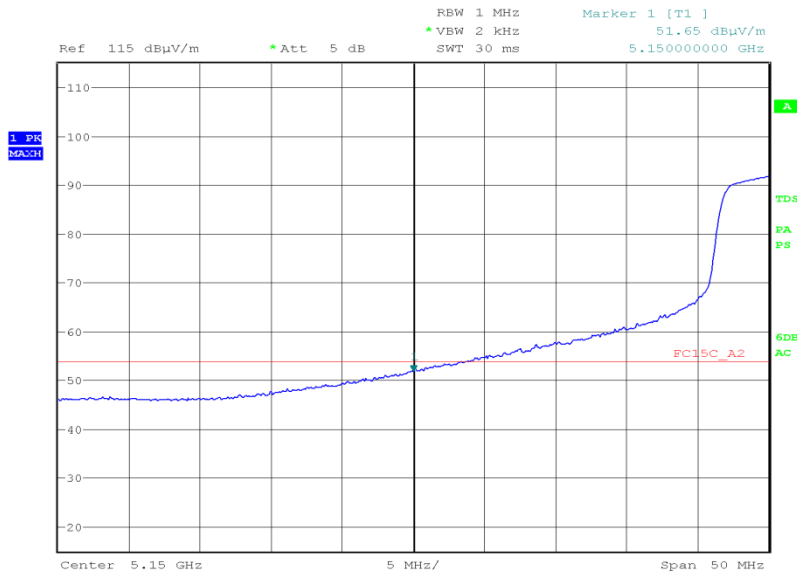
802.11n - 40 MHz Bandwidth, 5190 MHz, Measured Frequency 5150 MHz, MCS0, Final Peak, Restricted Band Edges Plot



Date: 21.JUL.2015 19:09:14



802.11n - 40 MHz Bandwidth, 5190 MHz, Measured Frequency 5150 MHz, MCS0, Final Average, Restricted Band Edges Plot



Date: 21.JUL.2015 19:08:22

Remark

The test was performed on MCS0 because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on MCS0 because this was deemed the worst case data rate for 6 dB Bandwidth.

FCC 47 CFR Part 15, Limit Clause 15.205

	Peak (dBµV/m)	Average (dBµV/m)
Restricted Bands of Operation	74	54

Industry Canada RSS-GEN, Limit Clause 8.10

	Peak (dBµV/m)	Average (dBµV/m)
Restricted Bands of Operation	74	54





Product Service

## 2.4 AUTHORISED BAND EDGES

### 2.4.1 Specification Reference

FCC 47 CFR Part 15E, Clause 15.407 (b)(1)(2)(3)(4)  
Industry Canada RSS-247, Clause 6.2

### 2.4.2 Equipment Under Test and Modification State

Beethoven S/N: EMC #1 - Modification State 1

### 2.4.3 Date of Test

19 July 2015 & 21 July 2015

### 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 performed in accordance with ANSI C63.10, clause 6.9.2.

#### Remarks

The following formula was used as per KDB 412172 D01 v01 to convert from field strength (dB $\mu$ V/m) to E.I.R.P (dBm).

$$\text{E.I.R.P} = (E \times d)^2 / 30$$

For a measurement distance of 3m, the used conversion factor from dB $\mu$ V/m to dBm is -95.2 dB.

### 2.4.6 Environmental Conditions

Ambient Temperature	21.1 - 21.6°C
Relative Humidity	45.0 - 58.0%



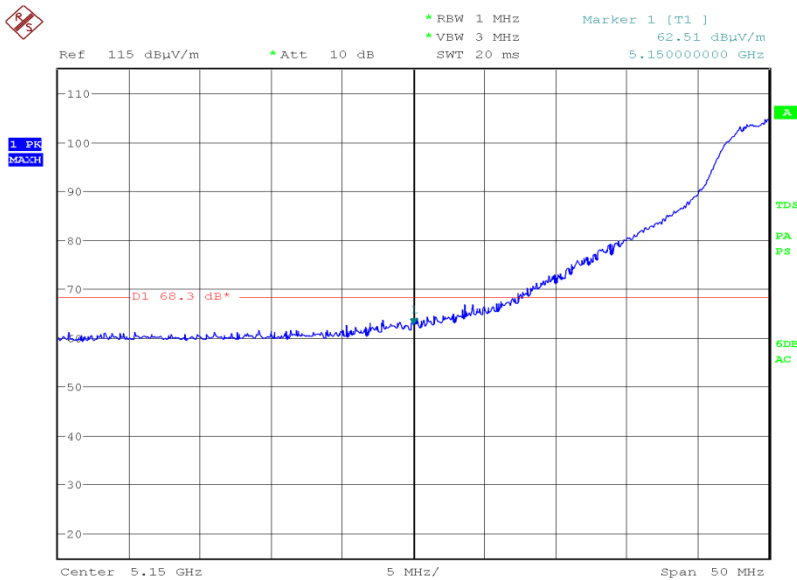
Product Service

2.4.7 Test Results

802.11a, 6 Mbps, Authorised Band Edges Results

5180 MHz
Measured Frequency 5150 MHz
dBm
Final Peak
-32.69

802.11a, 5180 MHz, Measured Frequency 5150 MHz, 6 Mbps, Final Peak, Authorised Band Edges Plot



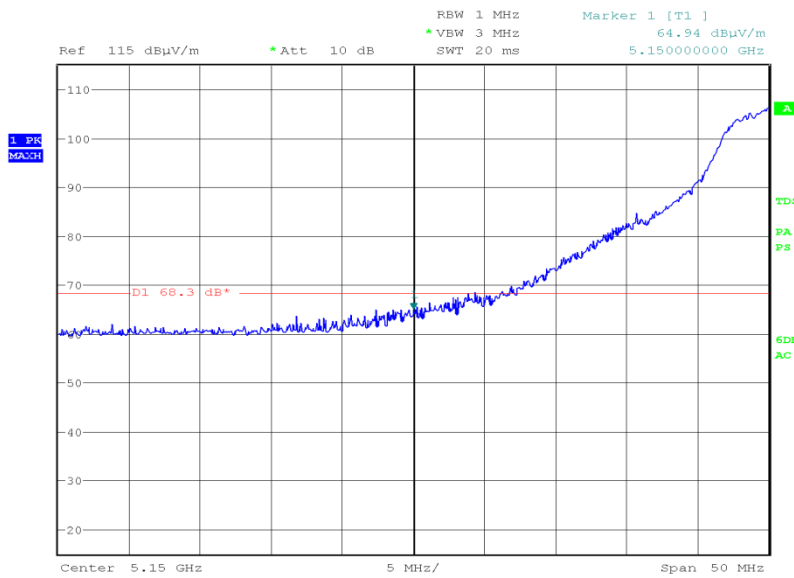


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**802.11a, 9 Mbps, Authorised Band Edges Results**

5180 MHz
Measured Frequency 5150 MHz
dBm
Final Peak
-30.26

**802.11a, 5180 MHz, Measured Frequency 5150 MHz, 9 Mbps, Final Peak, Authorised Band Edges Plot**



Date: 21.JUL.2015 18:46:27

**Remark**

The test was performed on 6 Mbps because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on 9 Mbps because this was deemed the worst case data rate for 6 dB Bandwidth.

**FCC 47 CFR Part 15, Limit Clause 15.407 (b)(1)(2)(3)(4)**

5.15 GHz to 5.25 GHz	-27 dBm/MHz
5.25 GHz to 5.35 GHz	-27 dBm/MHz
5.47 GHz to 5.725 GHz	-27 dBm/MHz
5.725 GHz to 5.850 GHz	-17 dBm/MHz



Product Service

Industry Canada RSS-247, Limit Clause 6.2

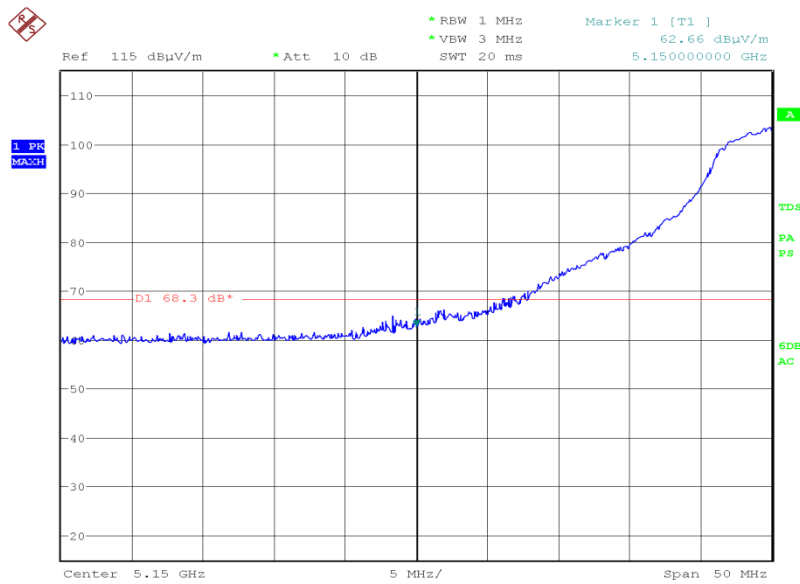
5.15 GHz to 5.25 GHz	-27 dBm/MHz
5.25 GHz to 5.35 GHz	-27 dBm/MHz
5.47 GHz to 5.725 GHz	-27 dBm/MHz
5.725 GHz to 5.850 GHz	-17 dBm/MHz



**802.11n - 20 MHz Bandwidth, MCS0, Authorised Band Edges Results**

5180 MHz
Measured Frequency 5150 MHz
dBm
Final Peak
-32.54

**802.11n - 20 MHz Bandwidth, 5180 MHz, Measured Frequency 5150 MHz, MCS0, Final Peak, Authorised Band Edges Plot**



Date: 19.JUL.2015 09:34:21

**Remark**

The test was performed on MCS0 because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on MCS0 because this was deemed the worst case data rate for 6 dB Bandwidth.

**FCC 47 CFR Part 15, Limit Clause 15.407 (b)(1)(2)(3)(4)**

5.15 GHz to 5.25 GHz	-27 dBm/MHz
5.25 GHz to 5.35 GHz	-27 dBm/MHz
5.47 GHz to 5.725 GHz	-27 dBm/MHz
5.725 GHz to 5.850 GHz	-17 dBm/MHz



Product Service

Industry Canada RSS-247, Limit Clause 6.2

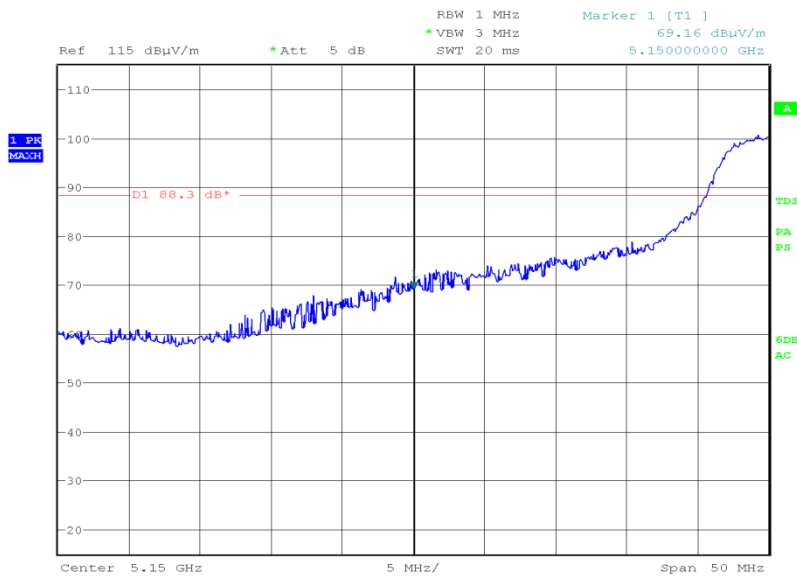
5.15 GHz to 5.25 GHz	-27 dBm/MHz
5.25 GHz to 5.35 GHz	-27 dBm/MHz
5.47 GHz to 5.725 GHz	-27 dBm/MHz
5.725 GHz to 5.850 GHz	-17 dBm/MHz



802.11n - 40 MHz Bandwidth, MCS0, Authorised Band Edges Results

5190 MHz	
Measured Frequency 5150 MHz	
dBm	
Final Peak	Final Average
-26.04	-43.35

802.11n - 40 MHz Bandwidth, 5190 MHz, Measured Frequency 5150 MHz, MCS0, Final Peak, Authorised Band Edges Plot

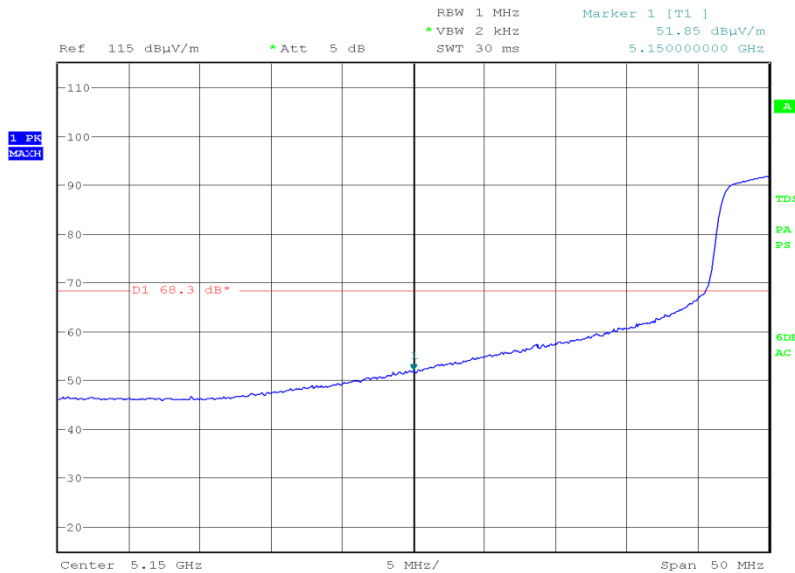


Date: 21.JUL.2015 19:10:50



Product Service

802.11n - 40 MHz Bandwidth, 5190 MHz, Measured Frequency 5150 MHz, MCS0, Final Average, Authorised Band Edges Plot



Date: 21.JUL.2015 19:09:52

Remark

The test was performed on MCS0 because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on MCS0 because this was deemed the worst case data rate for 6 dB Bandwidth.

The plots above show the peak and average measurement. This was done due to the peak measurement exceeding the average limit but compliant with the peak limit of -7 dBm. Therefore, an average measurement was performed separately to show compliance.

FCC 47 CFR Part 15, Limit Clause 15.407 (b)(1)(2)(3)(4)

5.15 GHz to 5.25 GHz	-27 dBm/MHz
5.25 GHz to 5.35 GHz	-27 dBm/MHz
5.47 GHz to 5.725 GHz	-27 dBm/MHz
5.725 GHz to 5.850 GHz	-17 dBm/MHz





Product Service

Industry Canada RSS-247, Limit Clause 6.2

5.15 GHz to 5.25 GHz	-27 dBm/MHz
5.25 GHz to 5.35 GHz	-27 dBm/MHz
5.47 GHz to 5.725 GHz	-27 dBm/MHz
5.725 GHz to 5.850 GHz	-17 dBm/MHz



Product Service

### **SECTION 3**

#### **TEST EQUIPMENT USED**



### 3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
<b>Section 2.1 - Average EIRP</b>					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	29-Apr-2016
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	22	28-Nov-2015
Attenuator (20dB/ 2W)	Pasternack	PE7004-20	489	12	30-Oct-2015
Screened Room (5)	Rainford	Rainford	1545	0	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Multimeter	Iso-tech	IDM101	2417	12	26-Sep-2015
Hygrometer	Rotronic	A1	2677	12	11-Jun-2016
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	18-Sep-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000- NPS	3791	-	TU
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
P-Series Power Meter	Agilent Technologies	N1911A	3980	12	22-Sep-2015
50 MHz-18 GHz Wideband Power Sensor	Agilent Technologies	N1921A	3982	12	22-Sep-2015
2 metre SMA Cable	IW Microwave	3PS-1806LC-788- 3PS	4525	12	29-Jan-2016
2m K-Type Cable (Rx)	Scott Cables	KPS-1501-2000- KPS	4527	-	TU



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
<b>Section 2.2 - Spurious Radiated Emissions</b>					
Antenna (Double Ridge Guide)	Link Microtek Ltd	AM180HA-K-TU2	230	24	26-Nov-2015
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	29-Apr-2016
Antenna (Bilog)	Schaffner	CBL6143	287	24	3-Feb-2016
Pre-Amplifier	Phase One	PSO4-0087	1534	12	23-Dec-2015
Screened Room (5)	Rainford	Rainford	1545	0	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Multimeter	Iso-tech	IDM101	2424	12	26-Sep-2015
Hygromer	Rotronic	A1	2677	12	11-Jun-2016
Filter (Hi Pass)	Lorch	9HP7-7000-SR	2833	12	5-Feb-2016
Comb Generator	Schaffner	RSG1000	3034	-	TU
Amplifier (8 - 18GHz)	Phase One	PS06-0061	3176	12	11-Aug-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	matur GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	matur GmbH	NCD	3917	-	TU
1 Metre K Type Cable	Rhophase	KPS-1501A-1000-KPS	4105	12	7-Nov-2015
1 Metre K Type Cable	Rhophase	KPS-1501A-1000-KPS	4106	12	7-Nov-2015
1GHz to 8GHz Low Noise Amplifier	Wright Technologies	APS04-0085	4365	12	1-Oct-2015
Hygropalm Temperature and Humidity Meter	Rotronic	HP21	4410	12	15-Apr-2016
Suspended Substrate Highpass Filter	Advance Power Components	11SH10-3000/X18000-O/O	4411	12	24-Mar-2016
2m K-Type Cable (Rx)	Scott Cables	KPS-1501-2000-KPS	4527	-	TU
0.5m SMA Cable (Rx)	Scott Cables	SLSLL18-SMSM-00.50M	4528	6	29-Jul-2015
<b>Section 2.3 - Restricted Band Edges</b>					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	29-Apr-2016
Screened Room (5)	Rainford	Rainford	1545	0	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Multimeter	Iso-tech	IDM101	2424	12	26-Sep-2015
Hygromer	Rotronic	A1	2677	12	11-Jun-2016
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	matur GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	matur GmbH	NCD	3917	-	TU
Hygropalm Temperature and Humidity Meter	Rotronic	HP21	4410	12	15-Apr-2016
2m K-Type Cable (Rx)	Scott Cables	KPS-1501-2000-KPS	4527	-	TU



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Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
<b>Section 2.4 - Authorised Band Edges</b>					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	29-Apr-2016
Screened Room (5)	Rainford	Rainford	1545	0	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Multimeter	Iso-tech	IDM101	2424	12	26-Sep-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
Hygropalm Temperature and Humidity Meter	Rotronic	HP21	4410	12	15-Apr-2016
2m K-Type Cable (Rx)	Scott Cables	KPS-1501-2000-KPS	4527	-	TU

TU – Traceability Unscheduled



Product Service

### 3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	MU
Restricted Band Edges	± 6.3 dB
Spurious Radiated Emissions	30 MHz to 1 GHz: ± 5.1 dB 1 GHz to 40 GHz: ± 6.3 dB
Average EIRP	± 6.3 dB
Authorised Band Edges	± 6.3 dB



Product Service

## **SECTION 4**

### **ACCREDITATION, DISCLAIMERS AND COPYRIGHT**



Product Service

#### 4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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