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Report On

FCC Testing of the Sharp SHL25 Dual-band CDMA (BC0, BC6) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Dual-band UMTS (FDD I, FDD V) & Quad-band LTE (B1, B3, B17, B18) & AXGP (TDD 41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS
In accordance with FCC CFR 47 Part 15E

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FCC ID: APYHRO00206

Document 75925936 Report 14 Issue 1 May 2014

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COMMERCIAL-IN-CONFIDENCE

REPORT ON

FCC Testing of the Sharp SHL25 Dual-band CDMA (BC0, BC6) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Dual-band UMTS (FDD I, FDD V) & Quad-band LTE (B1, B3, B17, B18) & AXGP (TDD 41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS
In accordance with FCC CFR 47 Part 15E

Document 75925936 Report 14 Issue 1

May 2014

PREPARED FOR

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PREPARED BY

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Senior Administrator, Technical Solutions

APPROVED BY

Simon Bennett
Authorised Signatory

DATED 14 May 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);

T Guy S Milliken G Lawler

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Product Service

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Product Service

SECTION 1

REPORT SUMMARY

FCC Testing of the
Sharp SHL25 Dual-band CDMA (BC0, BC6) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Dual-band UMTS (FDD I, FDD V) & Quad-band LTE (B1, B3, B17, B18) & AXGP (TDD 41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS
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 Sharp SHL25 Dual-band CDMA (BC0, BC6) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Dual-band UMTS (FDD I, FDD V) & Quad-band LTE (B1, B3, B17, B18) & AXGP (TDD 41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS 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	Sharp Corporation
Model Number(s)	SHL25
Serial Number(s)	IMEI 004401115170496 IMEI 004401115170470
Number of Samples Tested	2
Test Specification/Issue/Date	FCC CFR 47 Part 15E (2013)
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	10070 10 March 2014
Start of Test	3 April 2014
Finish of Test	28 April 2014
Name of Engineer(s)	T Guy S Milliken G Lawler
Related Document(s)	FCC 06-96: 2006; FCC Public Notice DA 02-2138: 2002; UKAS M3003: Edition 2: 2007; ETSI TR 100 028: 2001 KDB 789033 D01 v01 r03

Product Service

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) - 5 GHz 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) - 5 GHz 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) - 5 GHz 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	
802.11(ac) - 5 GHz 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	

Product Service

Section	Spec Clause	Test Description	Result	Comments/Base Standard
802.11(ac) - 5 GHz 80 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	

1.3 PRODUCT TECHNICAL DESCRIPTION

Please refer to the SHL25 Model Description Form.

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp SHL25 Dual-band CDMA (BC0, BC6) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Dual-band UMTS (FDD I, FDD V) & Quad-band LTE (B1, B3, B17, B18) & AXGP (TDD 41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS. 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 4.0 V DC supply.

FCC Measurement Facility Registration Number
90987 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
Serial Number: IMEI 004401115170496			
0	As supplied by manufacturer.	N/A	N/A
1	Corrected ill fitting RF shield where the WLAN IC is located.	Manufacturer	15 April 2014

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
Sharp SHL25 Dual-band CDMA (BC0, BC6) & Quad-band GSM (GSM850/GSM900/DCS1800/PCS1900) & Dual-band UMTS (FDD I, FDD V) & Quad-band LTE (B1, B3, B17, B18) & AXGP (TDD 41) multi mode cellular phone with Bluetooth, ANT+, WLAN, SRD (NFC, FeliCa) and GPS
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

SHL25 S/N: IMEI 004401115170496 - Modification State 1

2.1.3 Date of Test

26 April 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

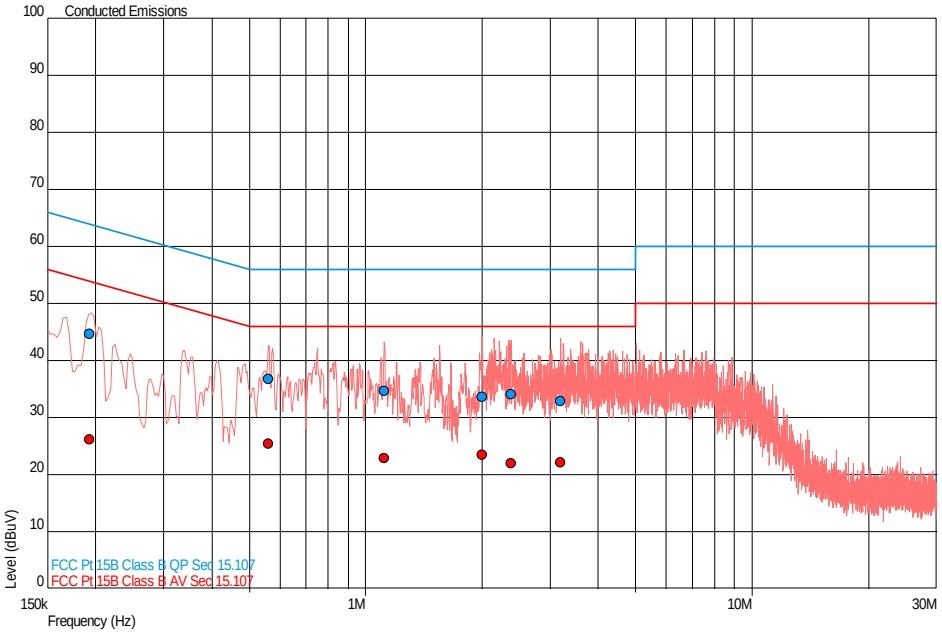
Ambient Temperature	20.6°C
Relative Humidity	46.0%

Product Service

2.1.7 Test Results

802.11(a)

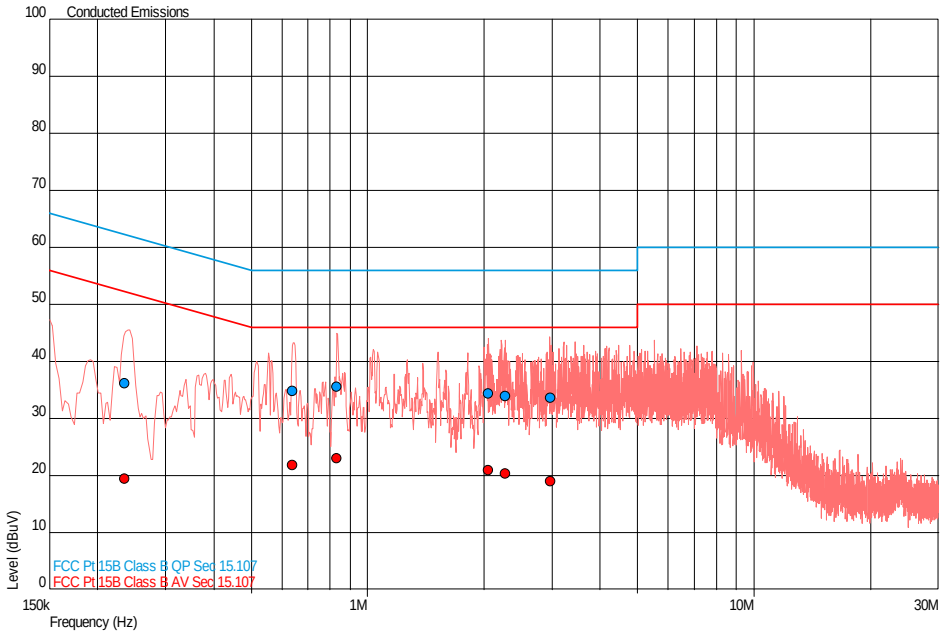
Live Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.192	44.7	63.9	-19.2	26.2	53.9	-27.7
0.560	36.8	56.0	-19.2	25.4	46.0	-20.6
1.117	34.8	56.0	-21.2	23.0	46.0	-23.0
2.004	33.6	56.0	-22.4	23.5	46.0	-22.5
2.372	34.0	56.0	-22.0	22.0	46.0	-24.0
3.189	32.8	56.0	-23.2	22.2	46.0	-23.8

Product Service

Neutral Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.235	36.2	62.3	-26.1	19.5	52.3	-32.7
0.638	34.8	56.0	-21.2	21.8	46.0	-24.2
0.833	35.6	56.0	-20.4	23.0	46.0	-23.0
2.054	34.4	56.0	-21.6	20.9	46.0	-25.1
2.275	33.9	56.0	-22.1	20.4	46.0	-25.6
2.966	33.6	56.0	-22.4	19.1	46.0	-26.9

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

SHL25 S/N: IMEI 004401115170470 - Modification State 0

2.2.3 Date of Test

3 April 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.

The EUT was transmitting at maximum power, for bottom, middle and top channels on the data rate pre-determined to give the highest level of average 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	25.4°C
Relative Humidity	36.4%

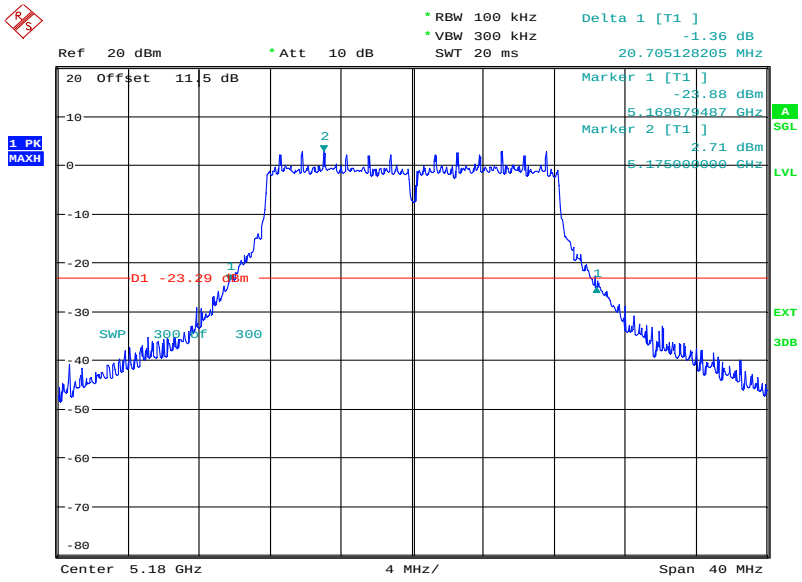
2.2.7 Test Results

802.11(a)

Frequency Band 1

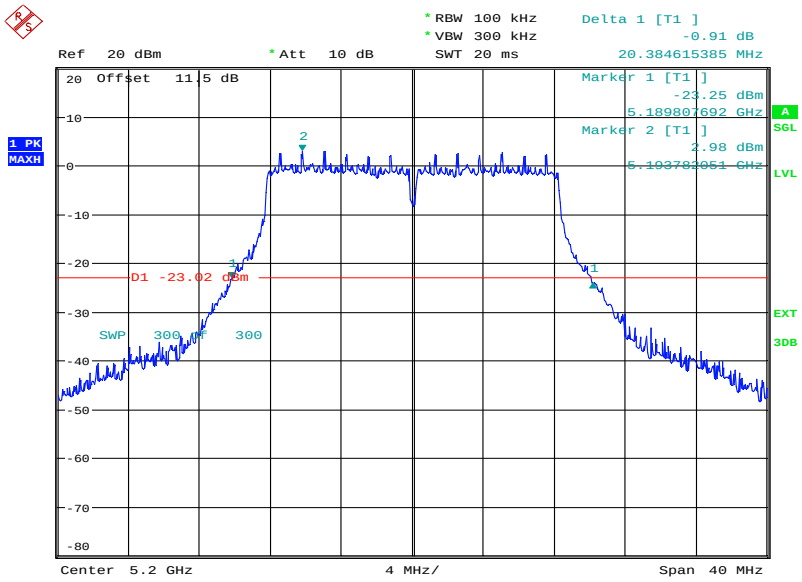
5180 MHz

26 dB Bandwidth (MHz)	20.705



5200 MHz

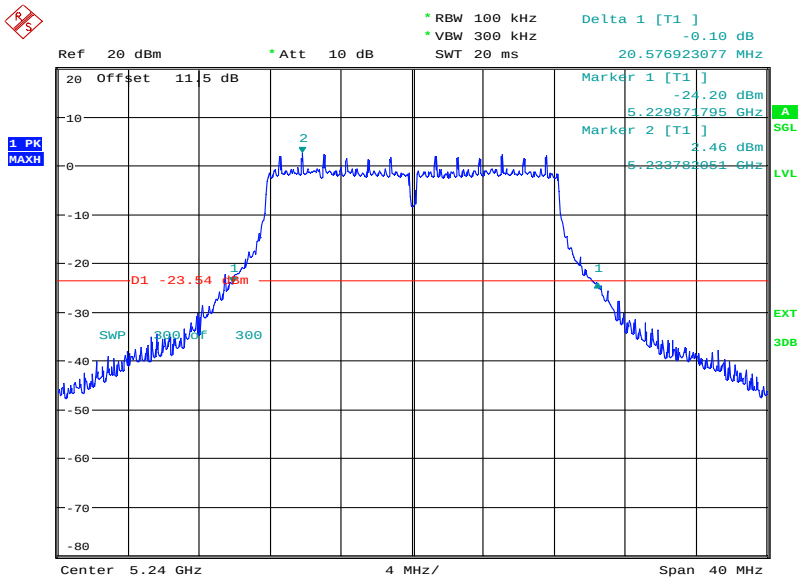
26 dB Bandwidth (MHz)	20.384



Date: 3.APR.2014 12:10:21

5240 MHz

26 dB Bandwidth (MHz)	20.577



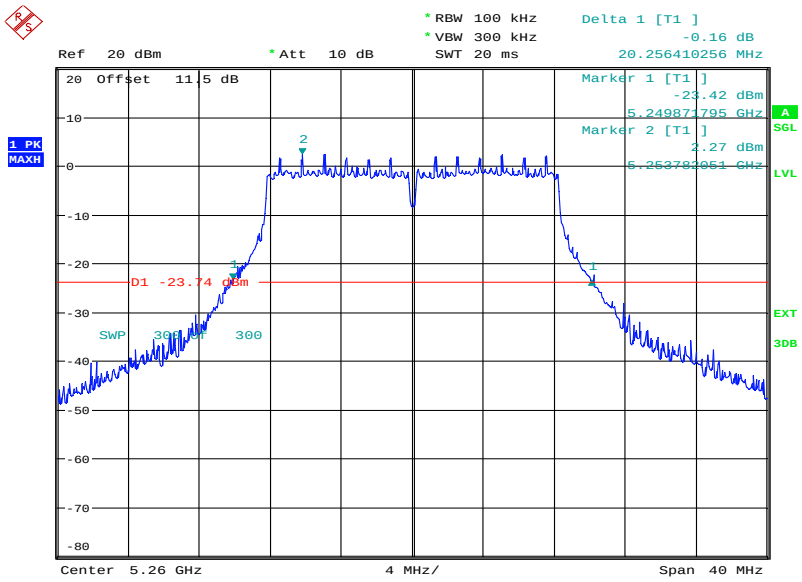
Date: 3.APR.2014 12:13:00

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 18 Mbps.

Frequency Band 2

5260 MHz

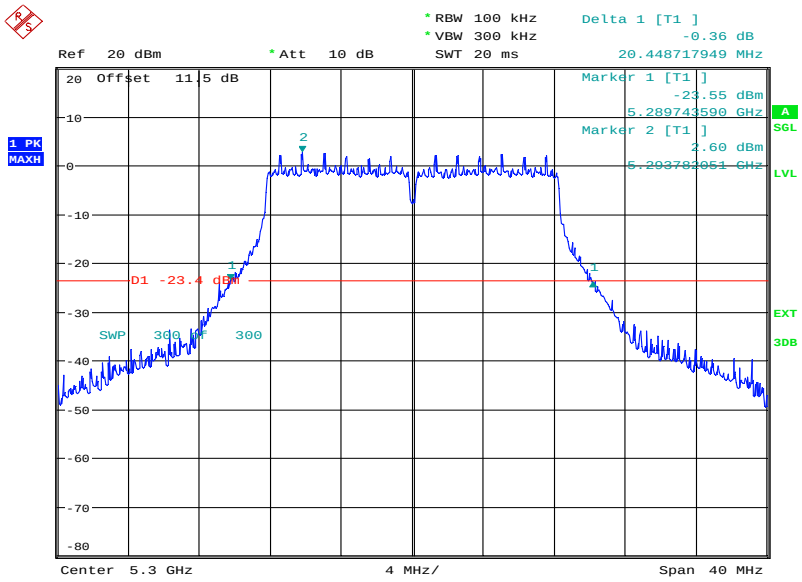
26 dB Bandwidth (MHz)	20.256



Date: 3.APR.2014 12:14:47

5300 MHz

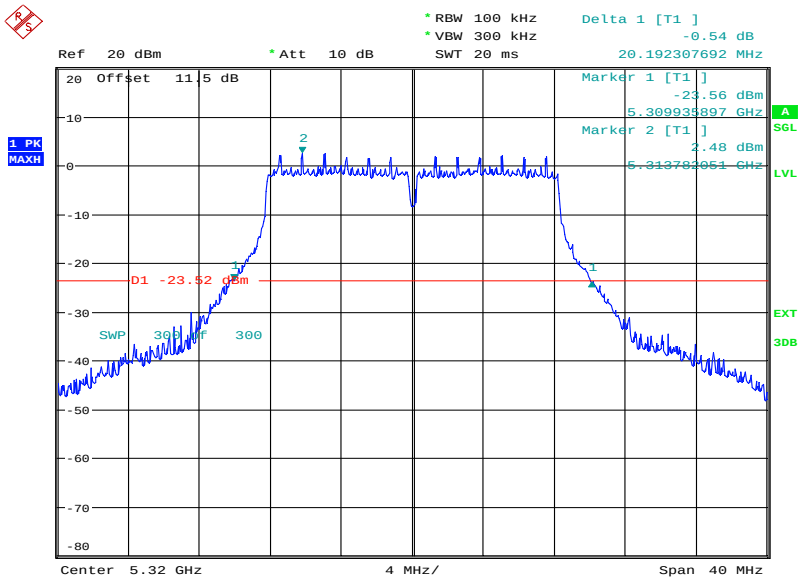
26 dB Bandwidth (MHz)	20.449



Date: 3.APR.2014 12:16:17

5320 MHz

26 dB Bandwidth (MHz)	20.192



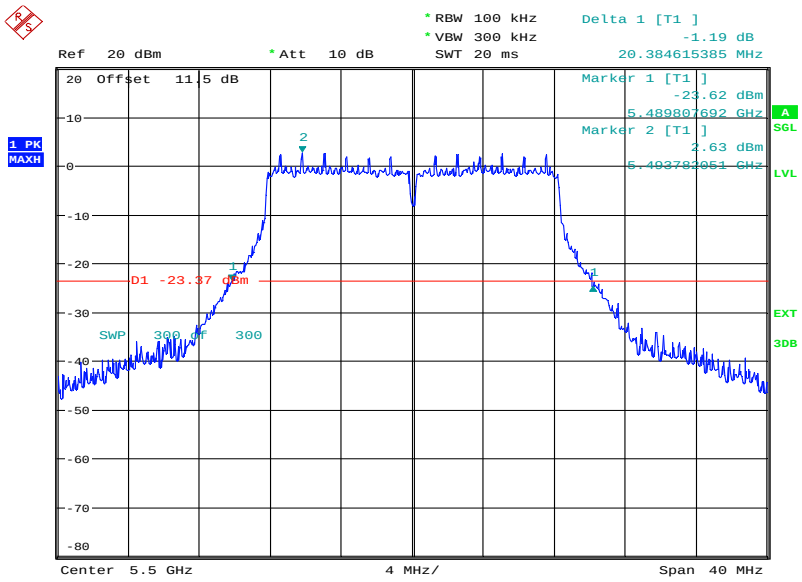
Date: 3.APR.2014 12:18:10

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 18 Mbps.

Frequency Band 3

5500 MHz

26 dB Bandwidth (MHz)	20.385

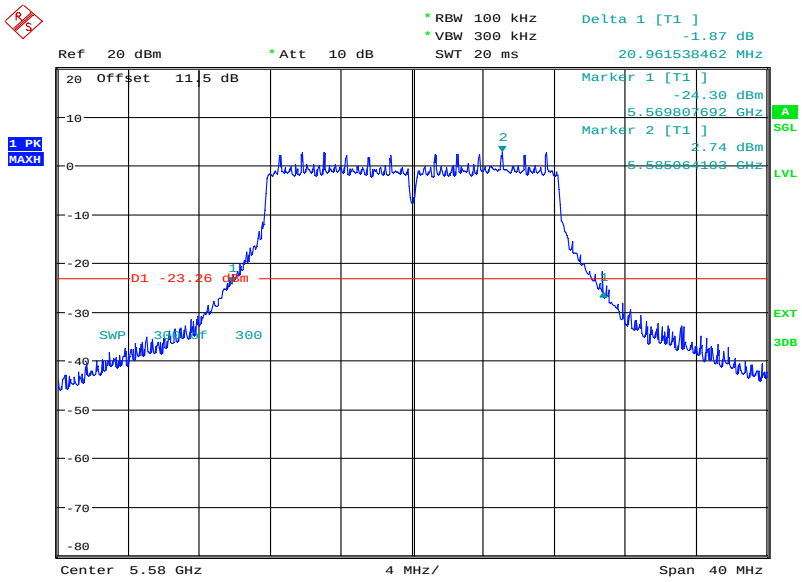


Date: 3.APR.2014 12:20:22

Product Service

5580 MHz

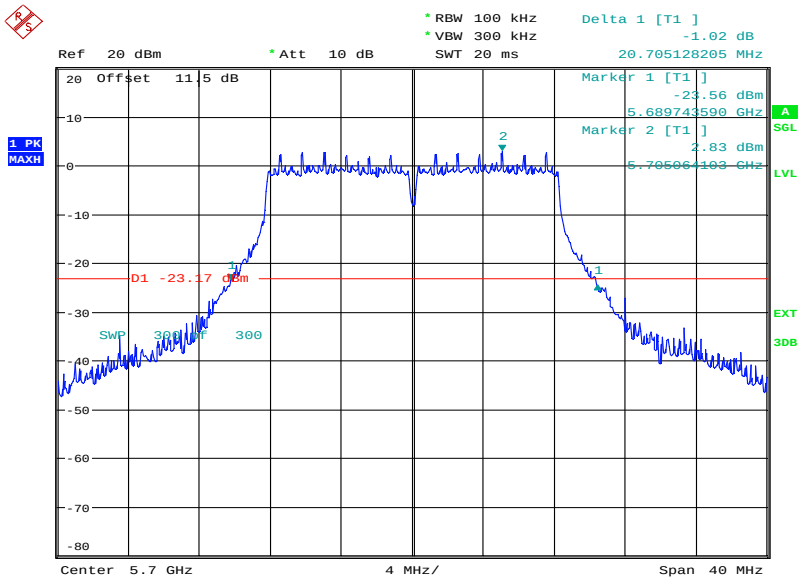
26 dB Bandwidth (MHz)	20.962



Date: 3.APR.2014 12:24:18

5700 MHz

26 dB Bandwidth (MHz)	20.705



Date: 3.APR.2014 12:28:18

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 18 Mbps.

Limit

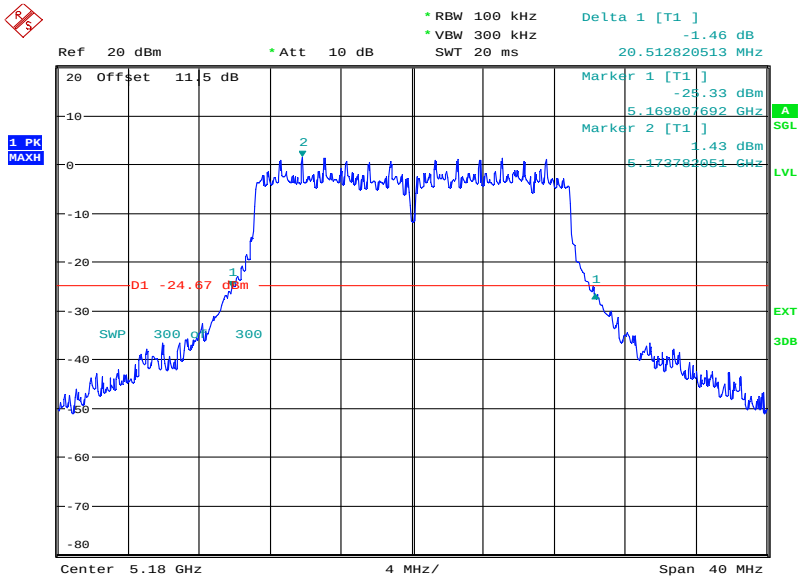
Not specified.

802.11(ac) - 5 GHz 20 MHz BW

Frequency Band 1

5180 MHz

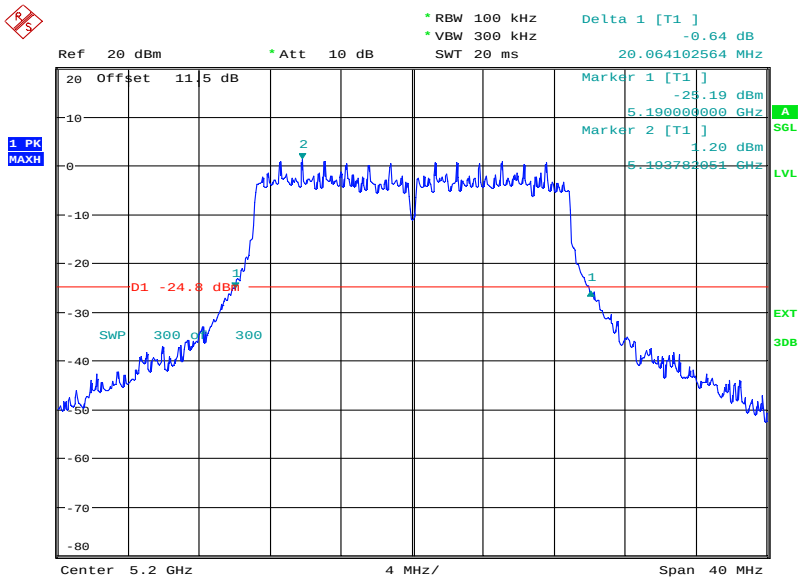
26 dB Bandwidth (MHz)	20.513



Date: 3.APR.2014 12:30:58

5200 MHz

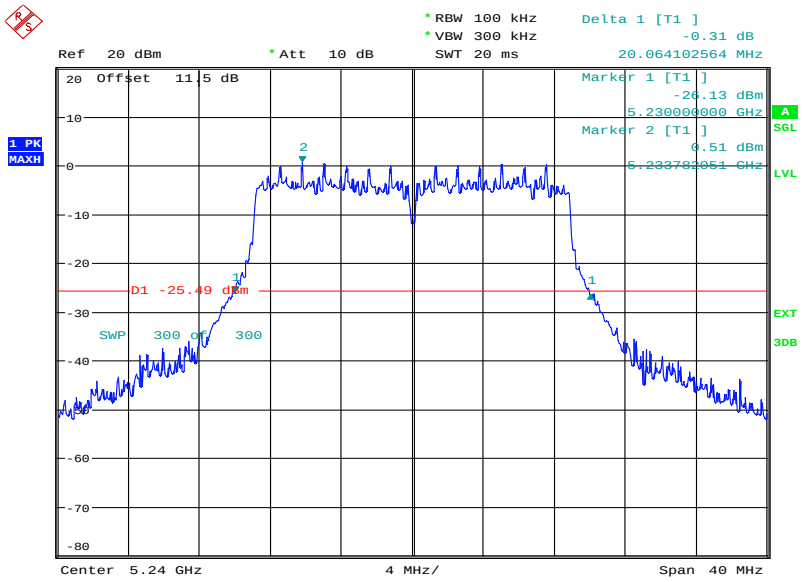
26 dB Bandwidth (MHz)	20.064



Date: 3.APR.2014 12:32:36

5240 MHz

26 dB Bandwidth (MHz)	20.064



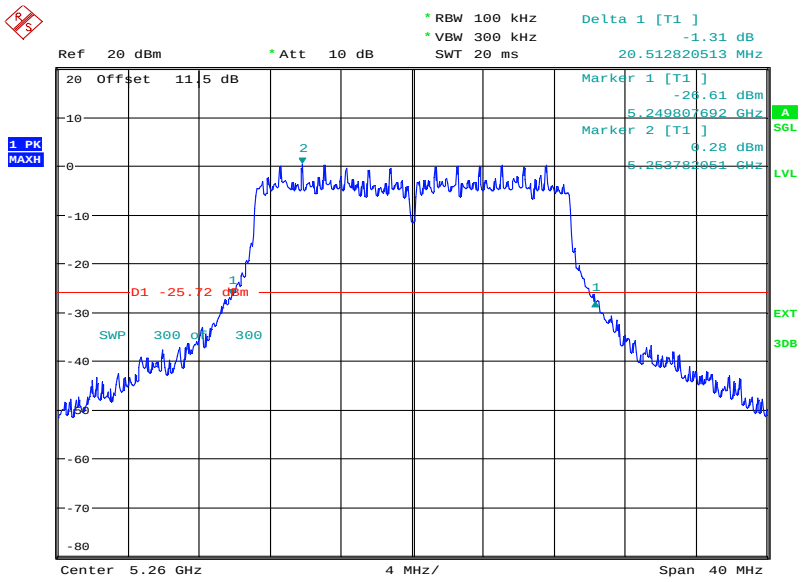
Date: 3.APR.2014 12:34:50

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 MCS3.

Frequency Band 2

5260 MHz

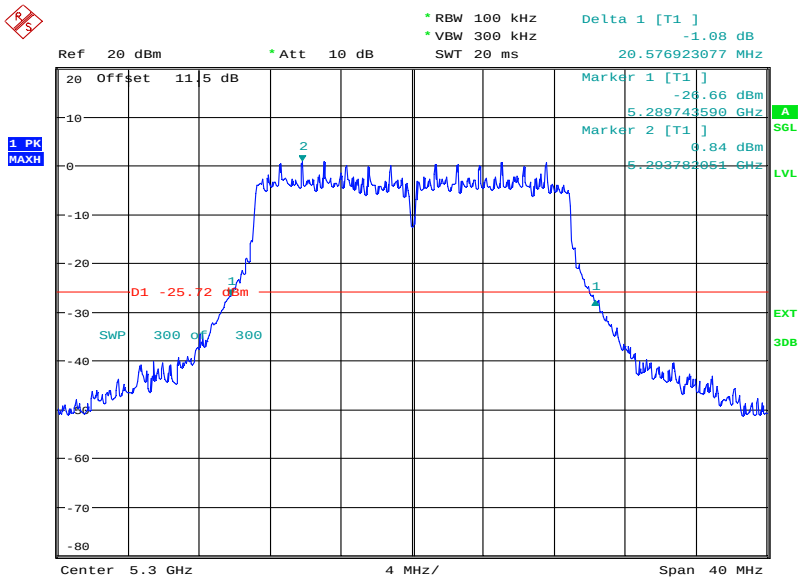
26 dB Bandwidth (MHz)	20.513



Date: 3.APR.2014 12:36:16

5300 MHz

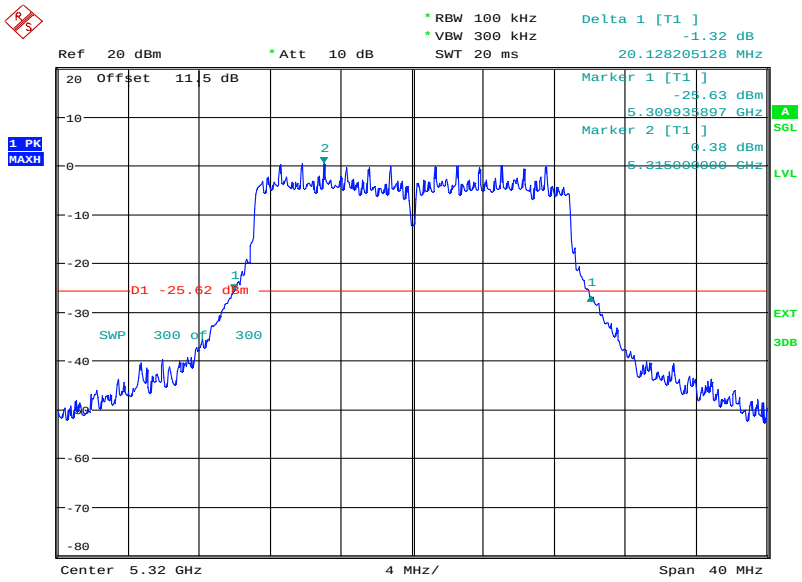
26 dB Bandwidth (MHz)	20.577



Date: 3.APR.2014 12:38:27

5320 MHz

26 dB Bandwidth (MHz)	20.128



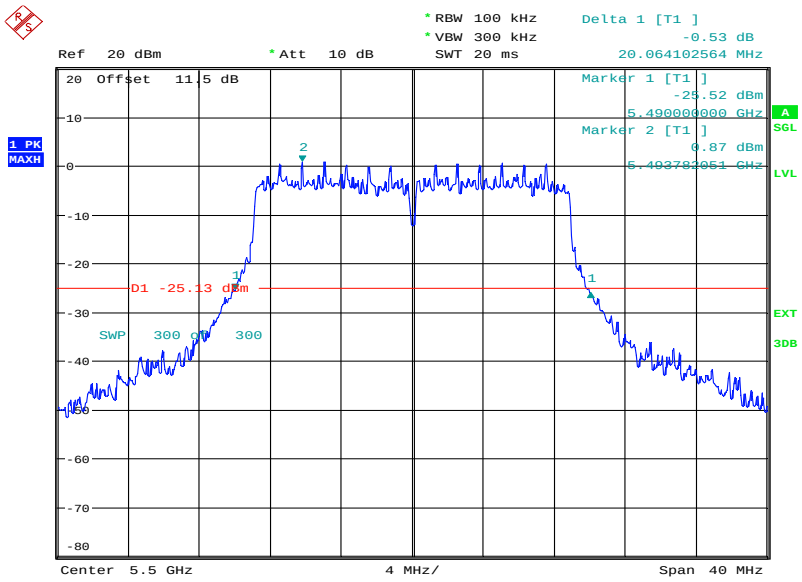
Date: 3.APR.2014 12:41:23

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 MCS3.

Frequency Band 3

5500 MHz

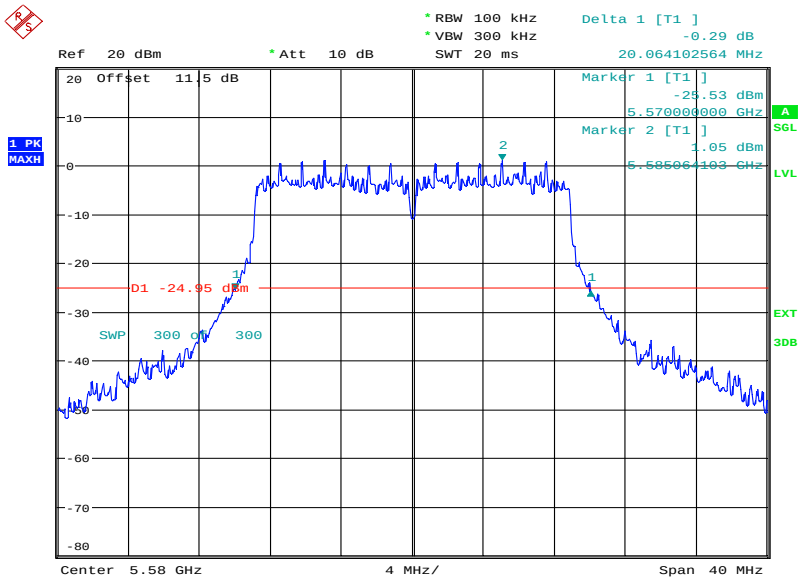
26 dB Bandwidth (MHz)	20.064



Date: 3.APR.2014 12:45:04

5580 MHz

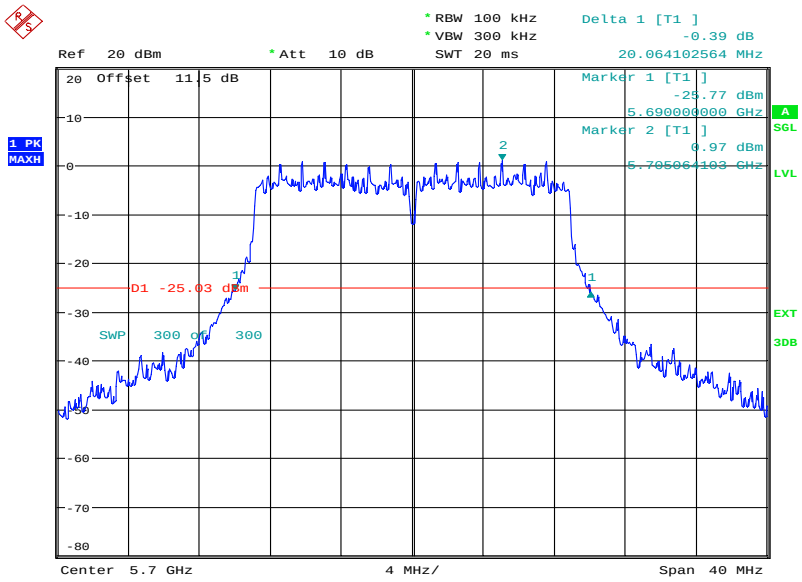
26 dB Bandwidth (MHz)	20.064



Date: 3.APR.2014 12:47:03

5700 MHz

26 dB Bandwidth (MHz)	20.064



Date: 3.APR.2014 12:52:45

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 MCS3.

Limit

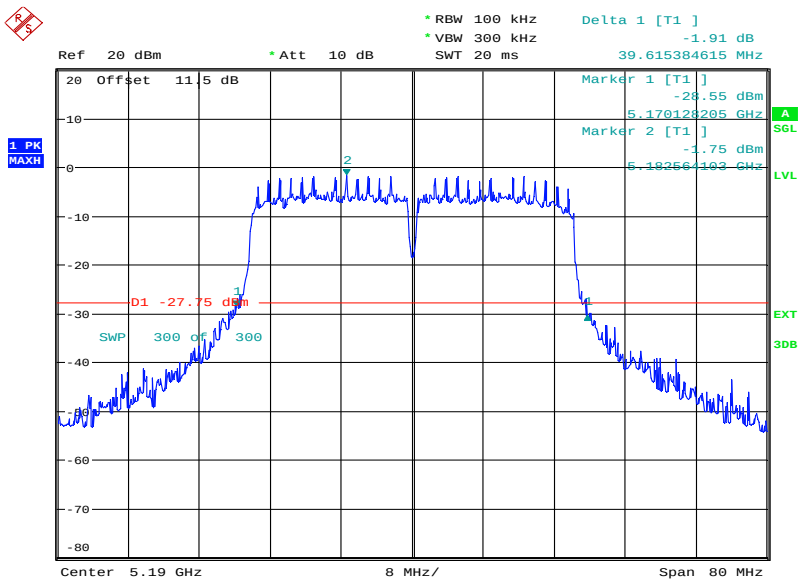
Not specified.

802.11(ac) - 5 GHz 40 MHz BW

Frequency Band 1

5190 MHz

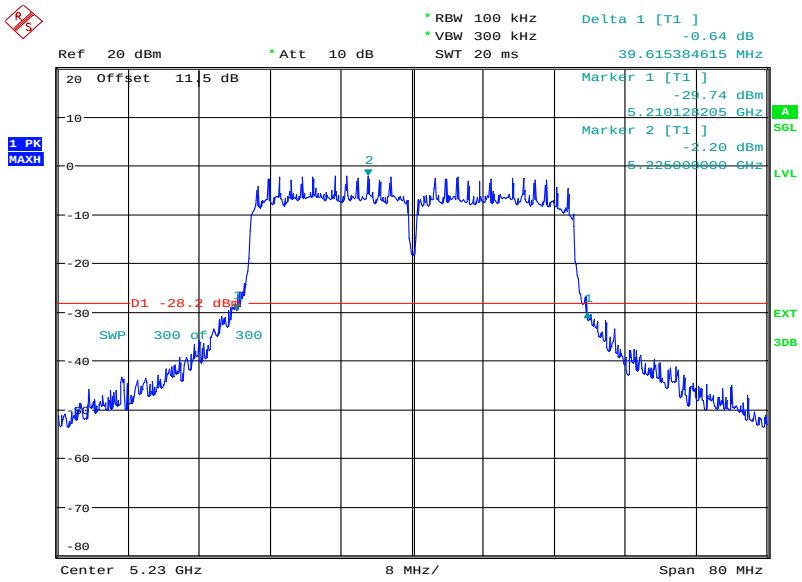
26 dB Bandwidth (MHz)	39.615



Date: 3.APR.2014 12:55:45

5230 MHz

26 dB Bandwidth (MHz)	39.615



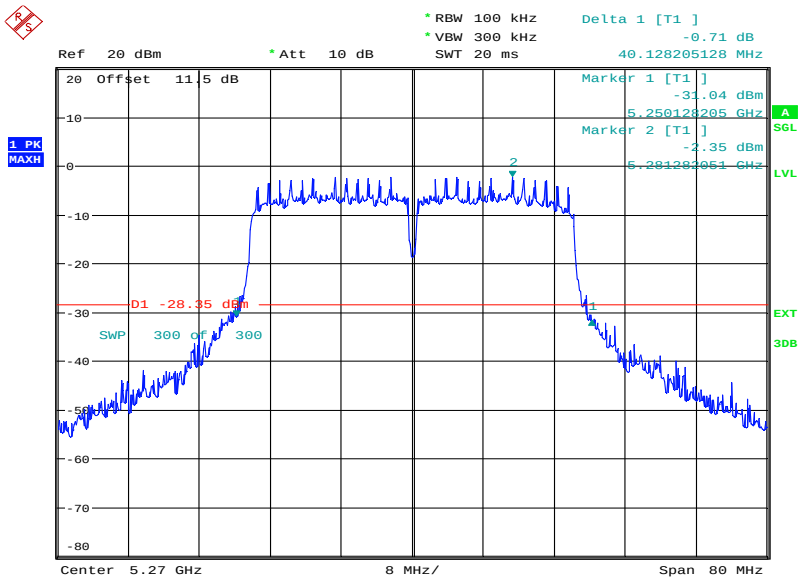
Date: 3.APR.2014 12:58:53

The test was performed on the worst case data rate for 802.11(ac) - 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.

Frequency Band 2

5270 MHz

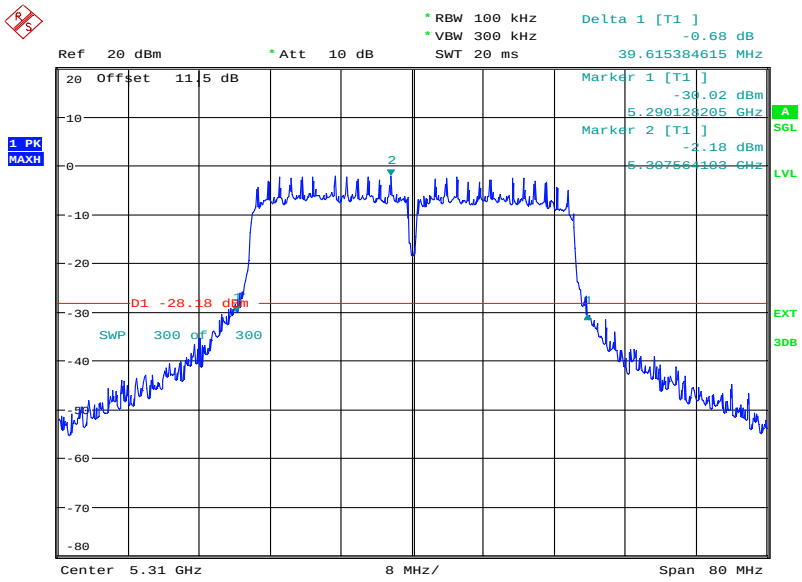
26 dB Bandwidth (MHz)	40.128



Date: 3.APR.2014 13:01:11

5310 MHz

26 dB Bandwidth (MHz)	39.615

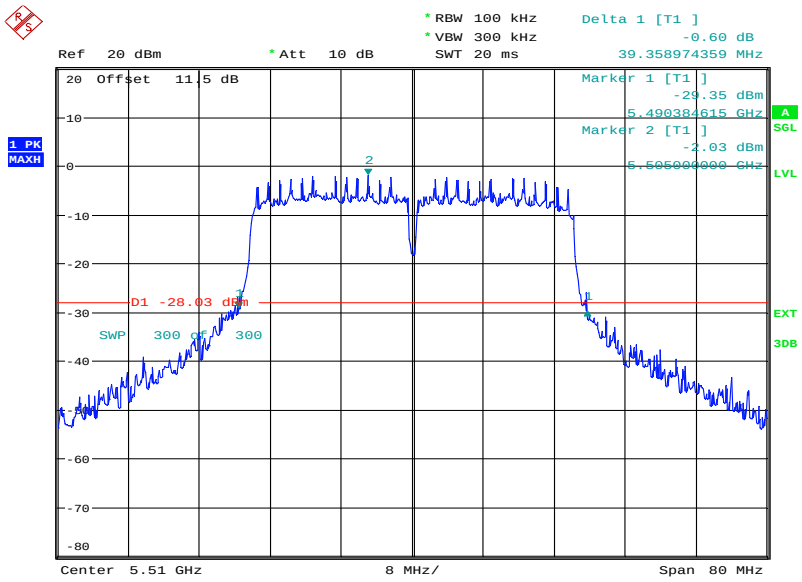


The test was performed on the worst case data rate for 802.11(ac) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Frequency Band 3

5510 MHz

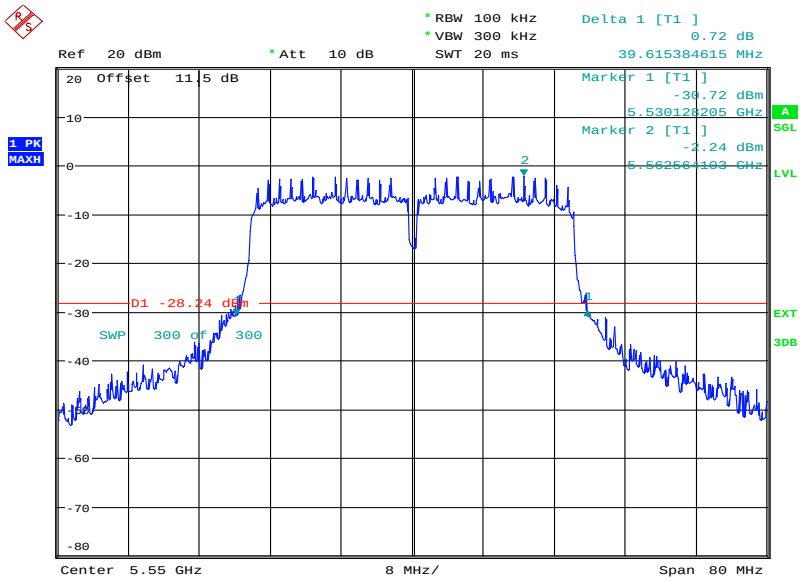
26 dB Bandwidth (MHz)	39.359



Product Service

5550 MHz

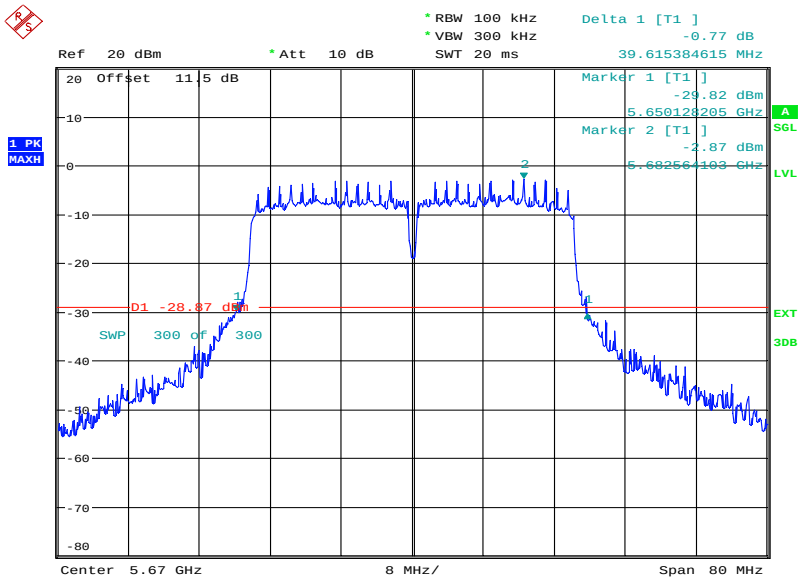
26 dB Bandwidth (MHz)	39.615



Date: 3.APR.2014 13:05:14

5670 MHz

26 dB Bandwidth (MHz)	39.615



The test was performed on the worst case data rate for 802.11(ac) - 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

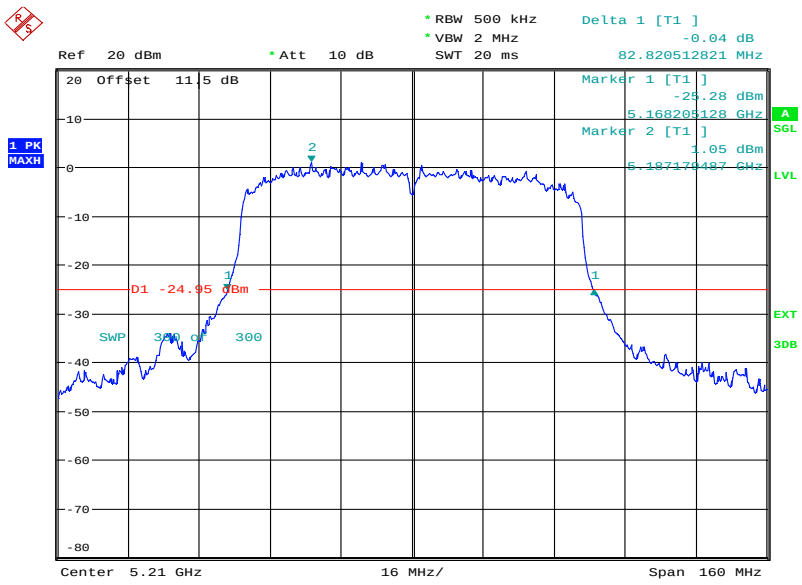
Not specified.

802.11(ac) - 5 GHz 80 MHz BW

Frequency Band 1

5210 MHz

26 dB Bandwidth (MHz)	82.821



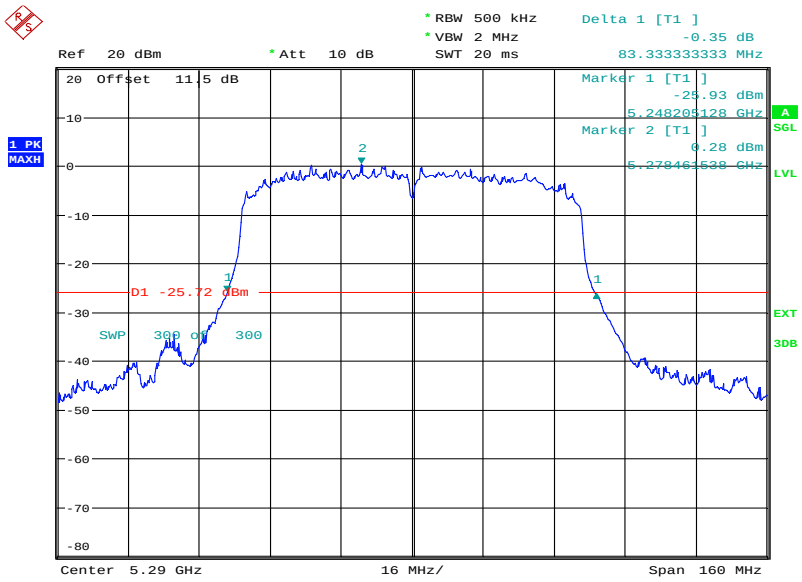
Date: 3.APR.2014 13:21:49

The test was performed on the worst case data rate for 802.11(ac) - 80 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 MCS1.

Frequency Band 2

5290 MHz

26 dB Bandwidth (MHz)	83.333



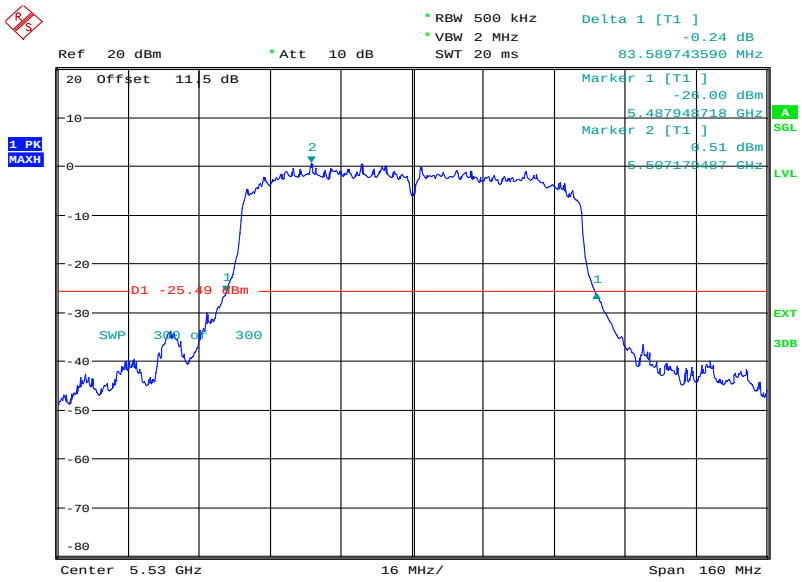
Date: 3.APR.2014 13:31:35

The test was performed on the worst case data rate for 802.11(ac) - 80 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 MCS1.

Frequency Band 3

5530 MHz

26 dB Bandwidth (MHz)	83.589



Date: 3.APR.2014 13:33:17

The test was performed on the worst case data rate for 802.11(ac) - 80 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 MCS1.

Limit

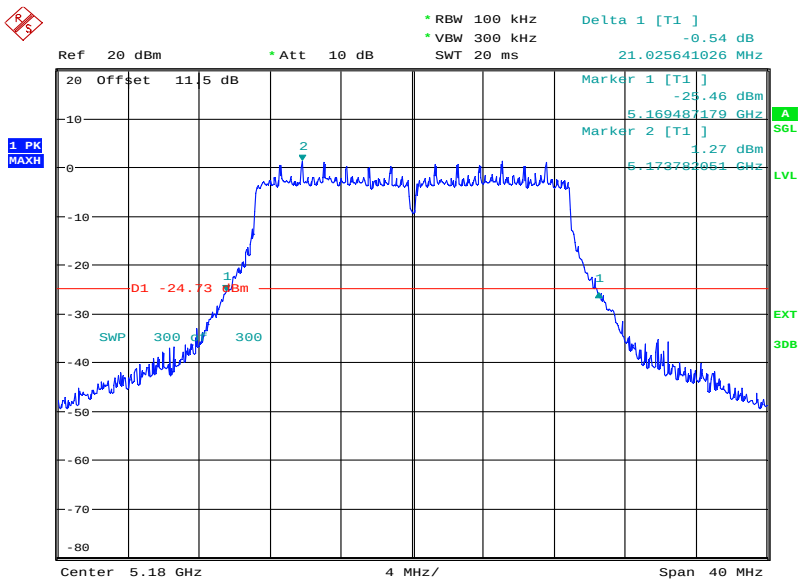
Not specified.

802.11(n) - 5 GHz 20 MHz BW

Frequency Band 1

5180 MHz

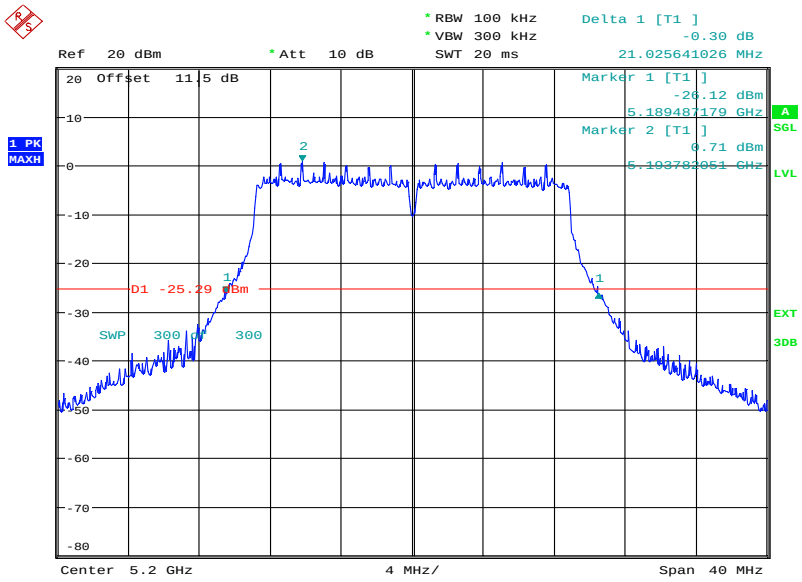
26 dB Bandwidth (MHz)	21.026



Date: 3.APR.2014 13:41:54

5200 MHz

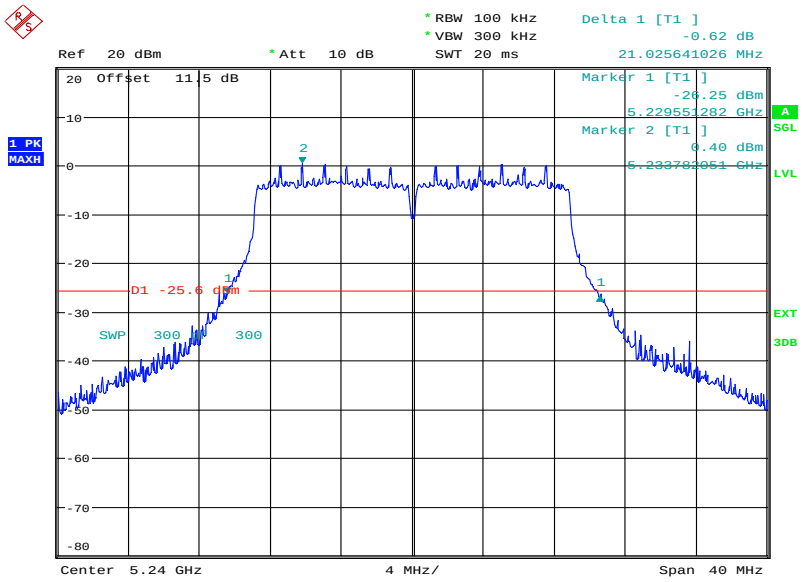
26 dB Bandwidth (MHz)	21.026



Date: 3.APR.2014 13:43:16

5240 MHz

26 dB Bandwidth (MHz)	21.0256



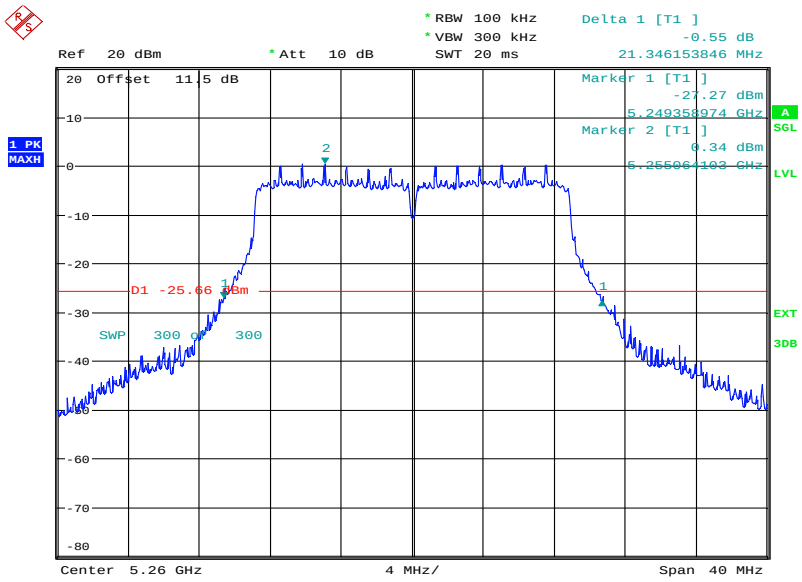
Date: 3.APR.2014 13:44:35

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 MCS2.

Frequency Band 2

5260 MHz

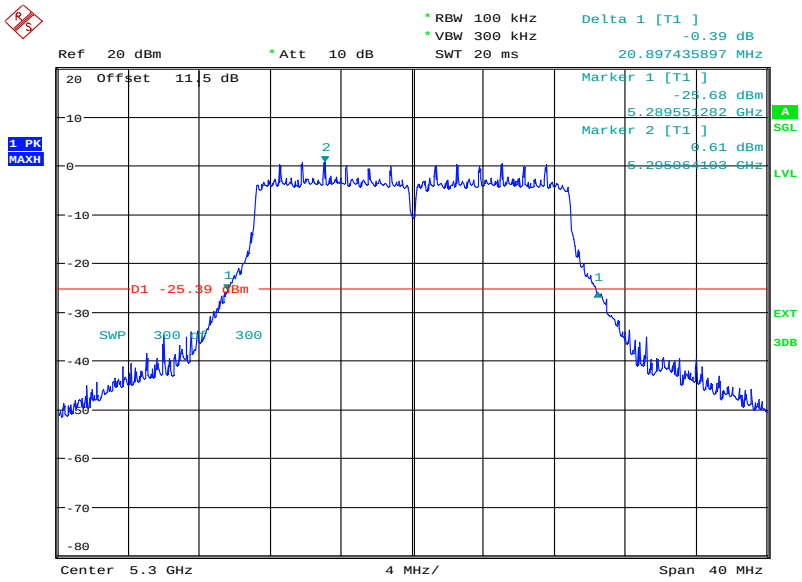
26 dB Bandwidth (MHz)	21.346



Date: 3.APR.2014 13:45:51

5300 MHz

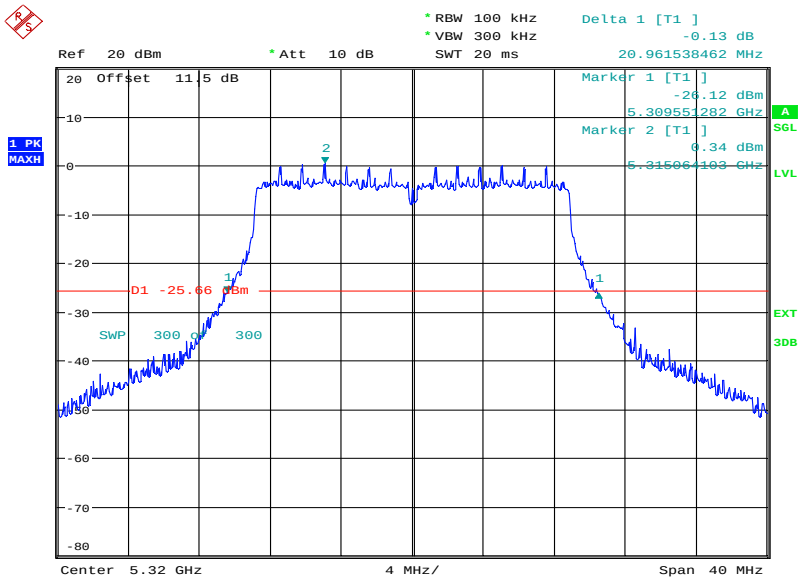
26 dB Bandwidth (MHz)	20.896



Date: 3.APR.2014 13:47:36

5320 MHz

26 dB Bandwidth (MHz)	20.962



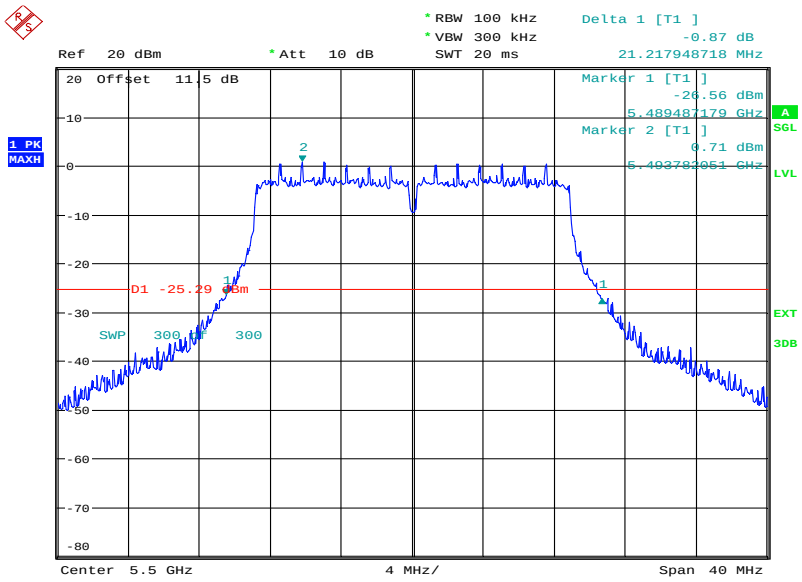
Date: 3.APR.2014 13:49:03

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 MCS2.

Frequency Band 3

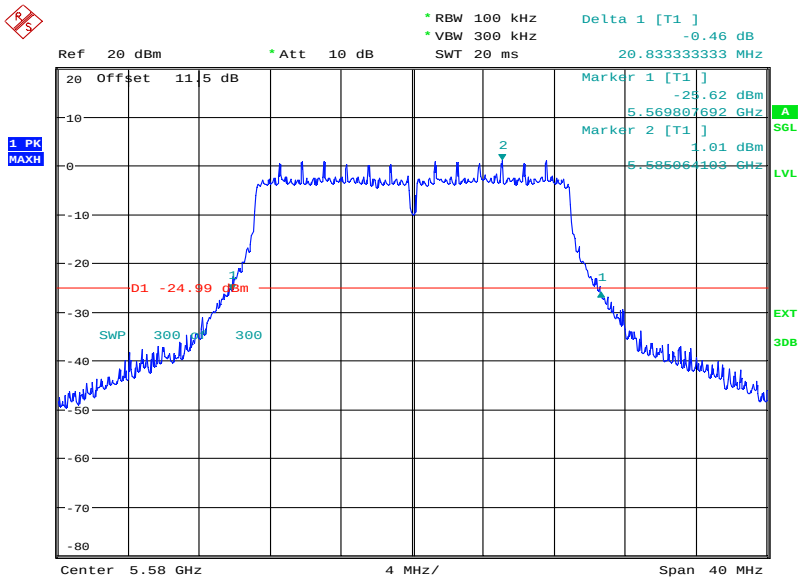
5500 MHz

26 dB Bandwidth (MHz)	21.218



5580 MHz

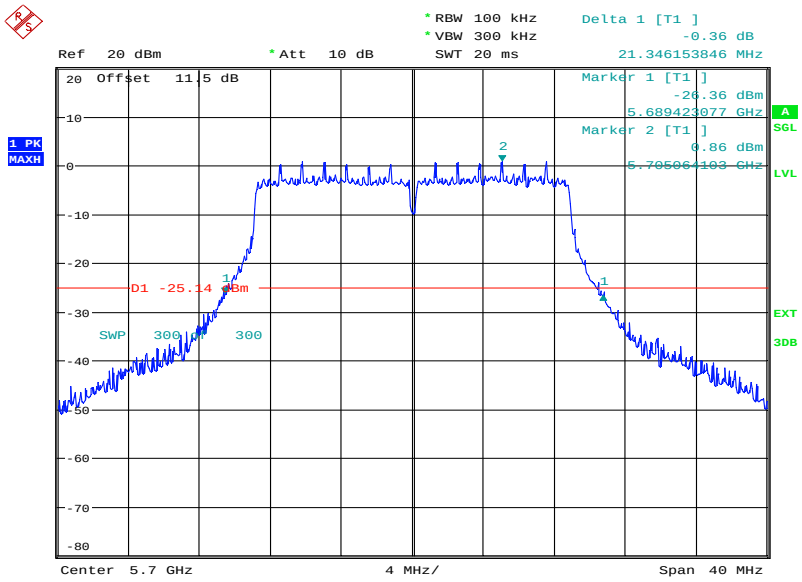
26 dB Bandwidth (MHz)	20.833



Date: 3.APR.2014 13:52:19

5700 MHz

26 dB Bandwidth (MHz)	21.346



Date: 3.APR.2014 13:53:25

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 MCS2.

Limit

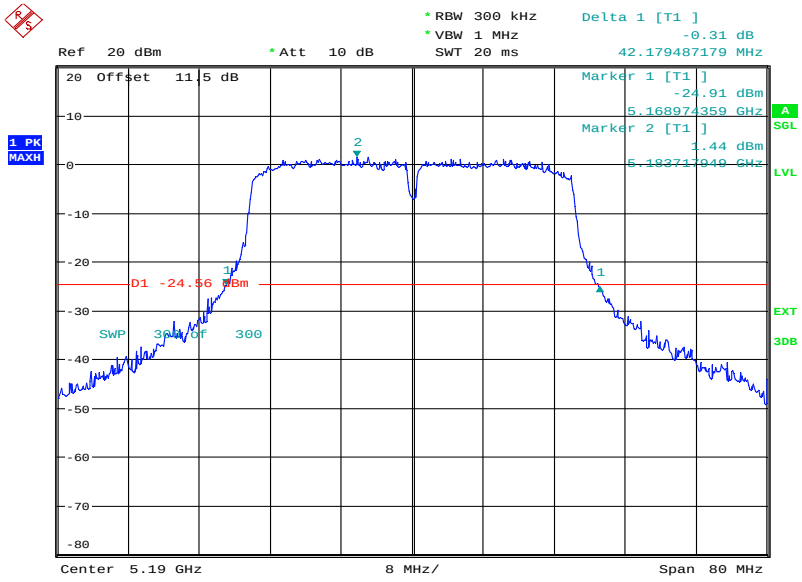
Not specified.

802.11(n) - 5 GHz 40 MHz BW

Frequency Band 1

5190 MHz

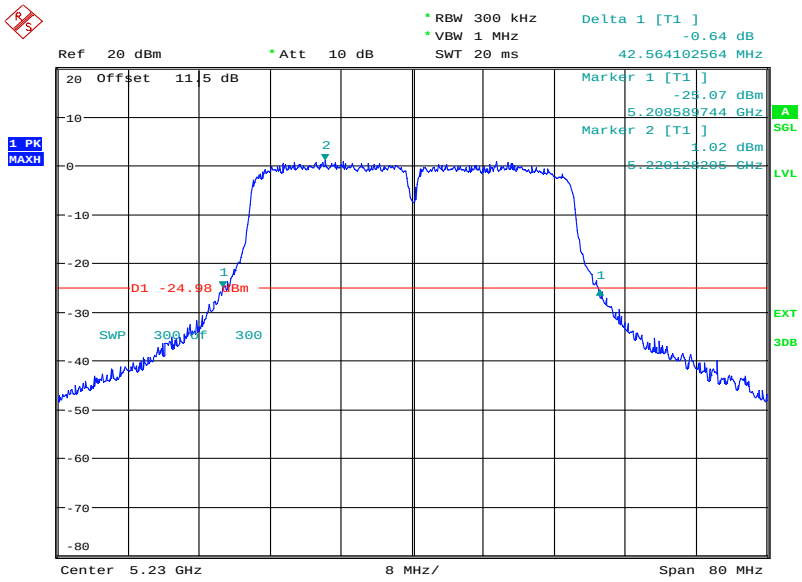
26 dB Bandwidth (MHz)	42.179



Date: 3.APR.2014 13:55:23

5230 MHz

26 dB Bandwidth (MHz)	42.564



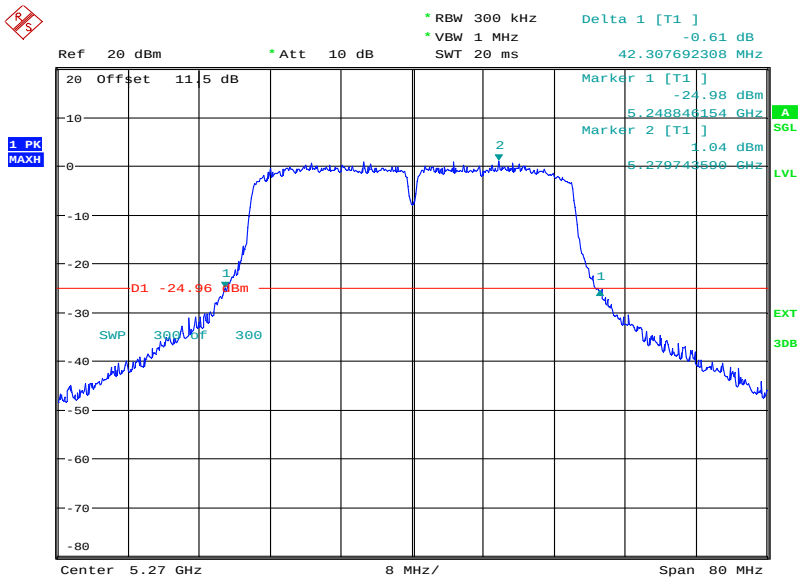
Date: 3.APR.2014 13:57:43

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 MCS1.

Frequency Band 2

5270 MHz

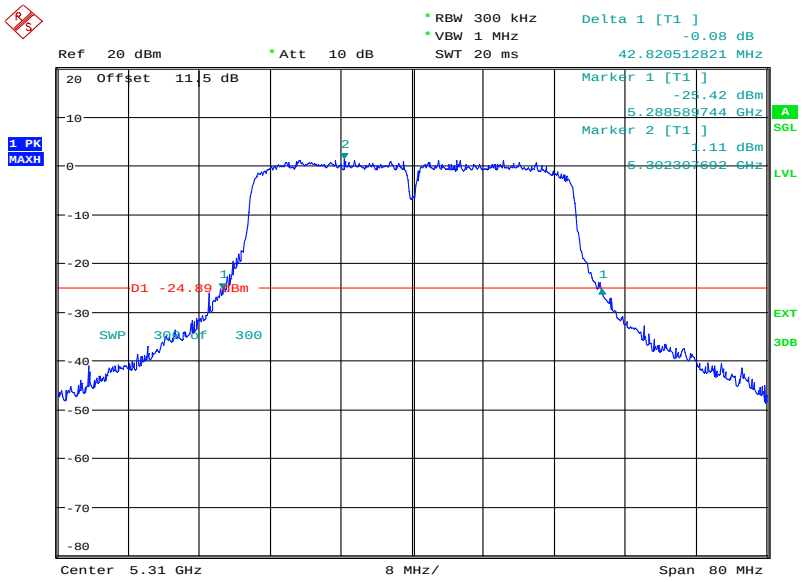
26 dB Bandwidth (MHz)	42.308



Date: 3.APR.2014 13:58:54

5310 MHz

26 dB Bandwidth (MHz)	42.821



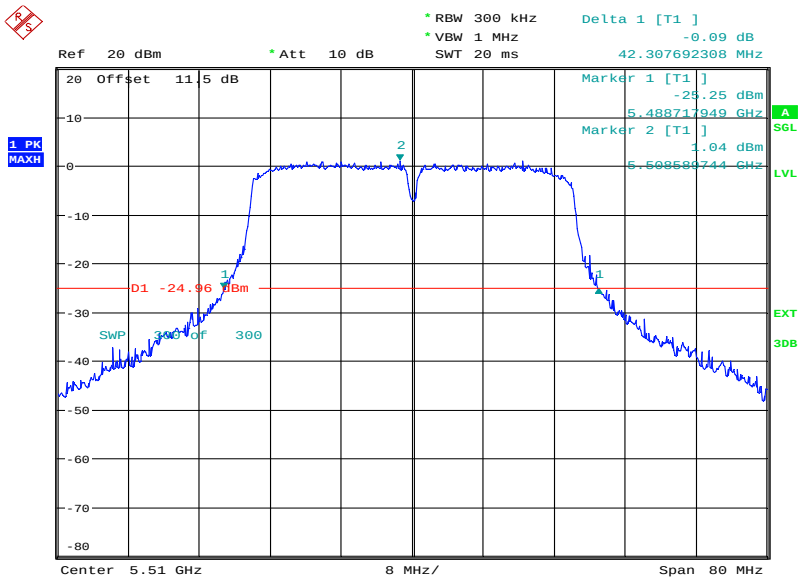
Date: 3.APR.2014 14:03:00

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 MCS1.

Frequency Band 3

5510 MHz

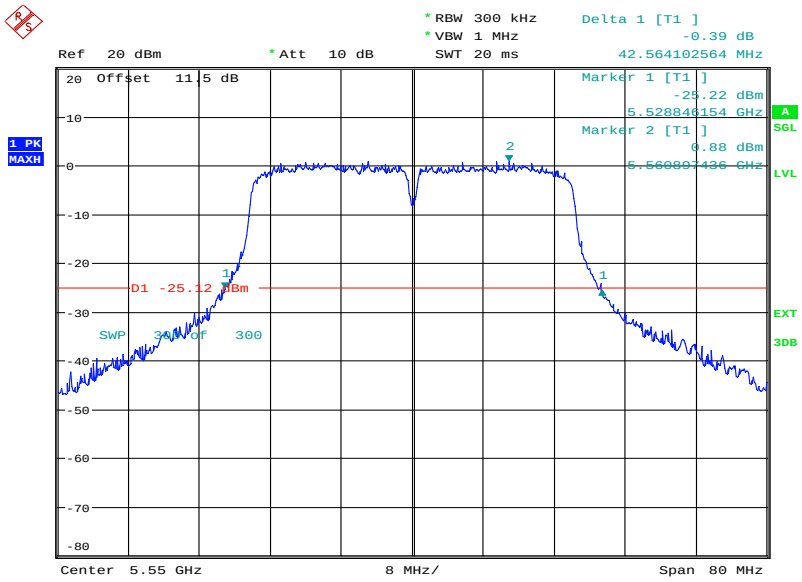
26 dB Bandwidth (MHz)	42.308



Date: 3.APR.2014 14:05:45

5550 MHz

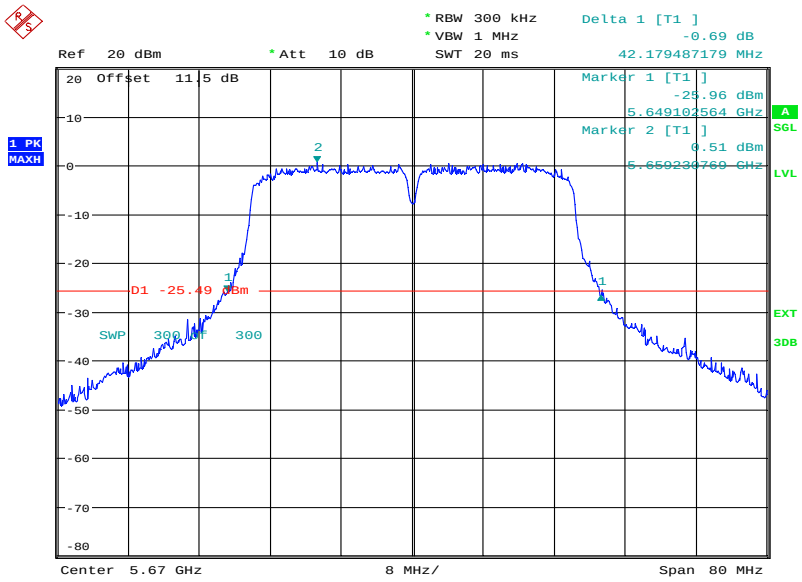
26 dB Bandwidth (MHz)	42.564



Date: 3.APR.2014 14:06:56

5670 MHz

26 dB Bandwidth (MHz)	42.180



Date: 3.APR.2014 14:08:10

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 MCS1.

Limit

Not specified.

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

SHL25 S/N: IMEI 004401115170496 - Modification State 1
SHL25 S/N: IMEI 004401115170470 - Modification State 0

2.3.3 Date of Test

3 April 2014, 18 April 2014, 21 April 2014 & 22 April 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 EUT was transmitted at maximum power via a cable and attenuator to a wideband RF power meter. The average power was then recorded in accordance with KDB 789033.

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.

A wideband power meter was then used to obtain a correction factor for the wideband signal and in terms of an rms-equivalent voltage.

2.3.6 Environmental Conditions

Ambient Temperature	21.0 - 25.4°C
Relative Humidity	27.0 - 37.0%

Product Service

2.3.7 Test Results

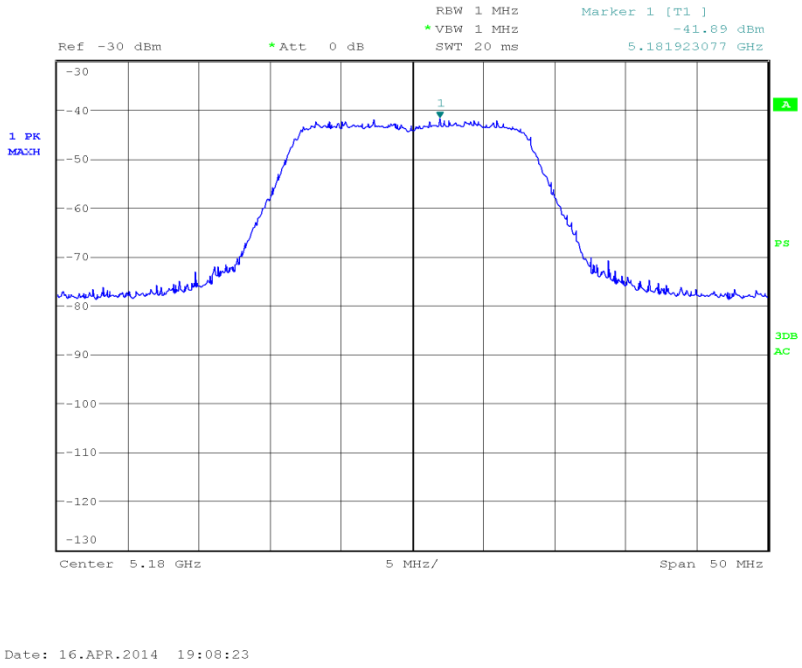
802.11(a)

Radiated

Frequency Band 1

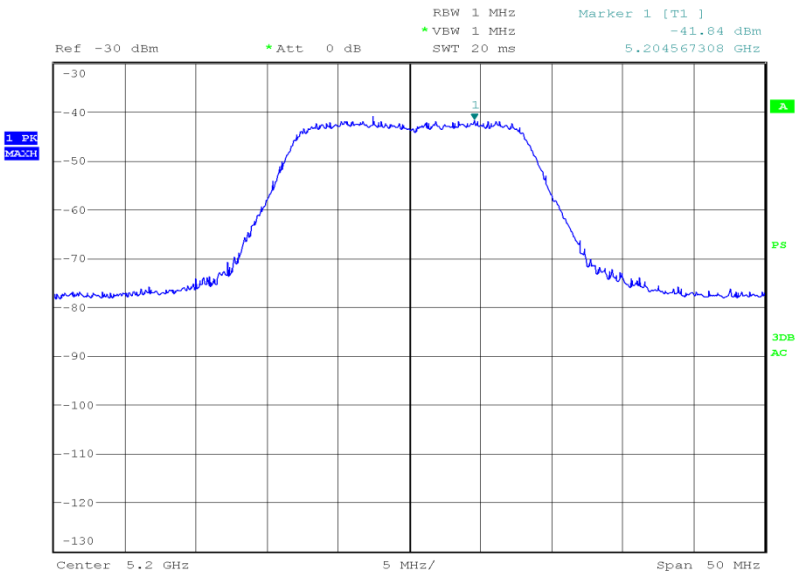
5180 MHz

EIRP (dBm)	EIRP (mW)
9.68	9.29



5200 MHz

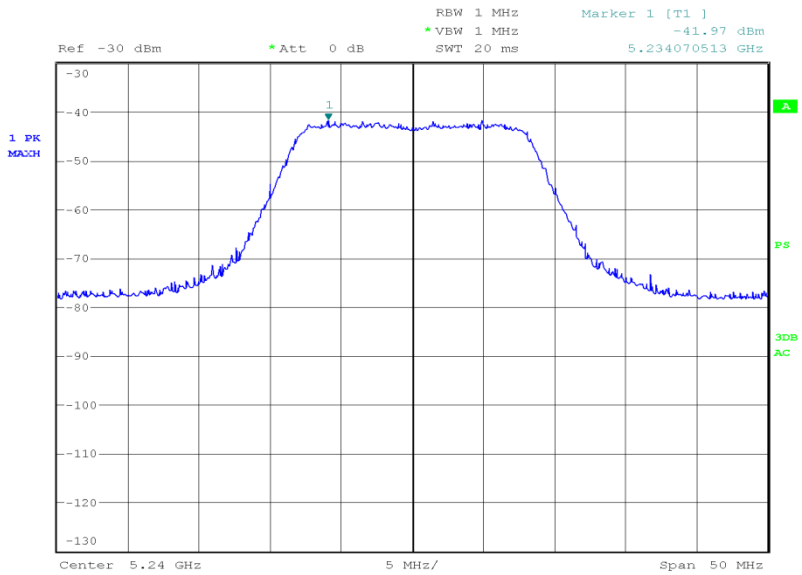
EIRP (dBm)	EIRP (mW)
9.83	9.61



Date: 16.APR.2014 20:36:10

5240 MHz

EIRP (dBm)	EIRP (mW)
9.78	9.51



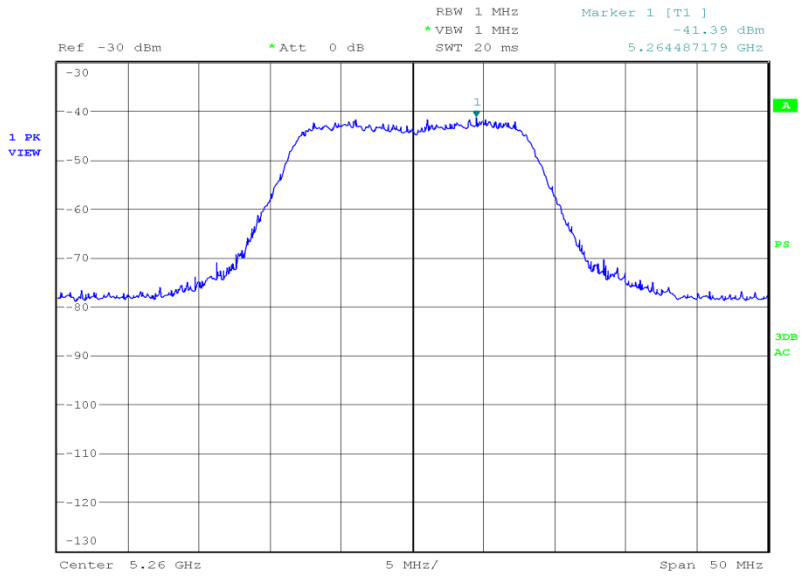
Date: 16.APR.2014 21:26:59

Radiated

Frequency Band 2

5260 MHz

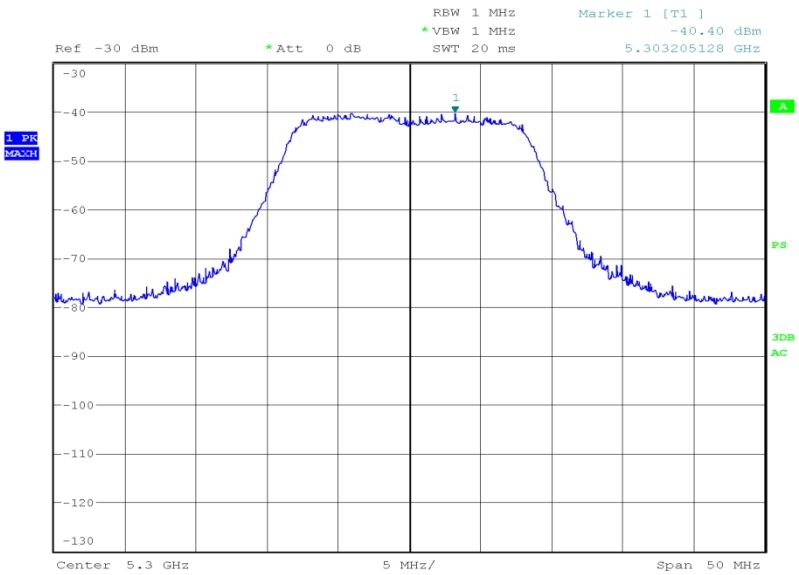
EIRP (dBm)	EIRP (mW)
10.64	11.59



Date: 16.APR.2014 21:14:01

5300 MHz

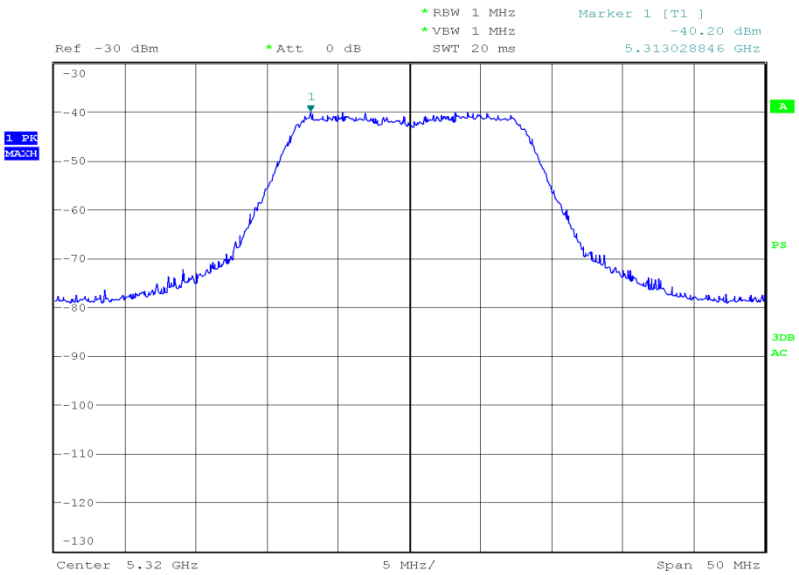
EIRP (dBm)	EIRP (mW)
11.21	13.20



Date: 16.APR.2014 21:21:31

5320 MHz

EIRP (dBm)	EIRP (mW)
11.87	15.38



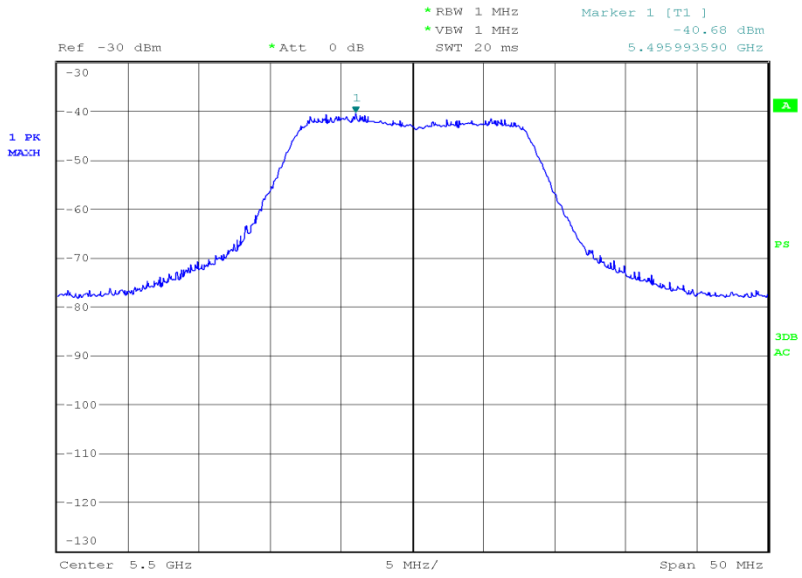
Date: 16.APR.2014 22:09:24

Radiated

Frequency Band 3

5500 MHz

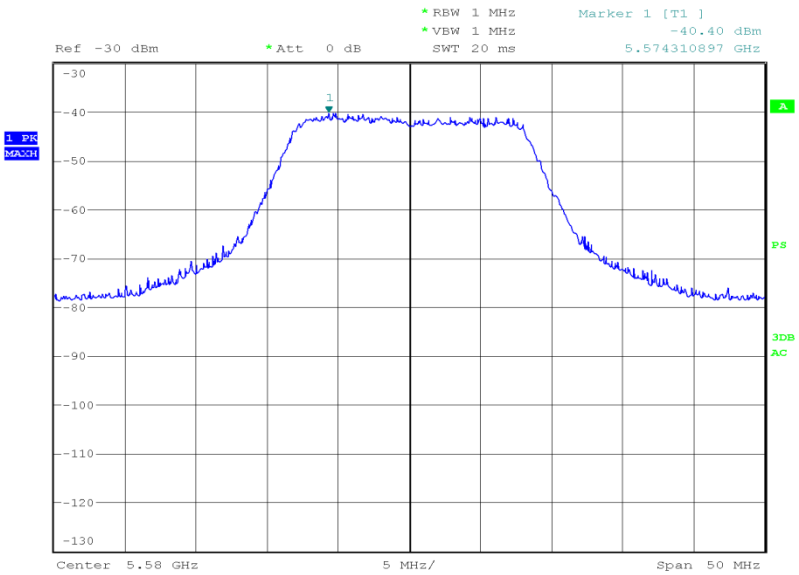
EIRP (dBm)	EIRP (mW)
12.36	17.21



Date: 18.APR.2014 07:59:41

5580 MHz

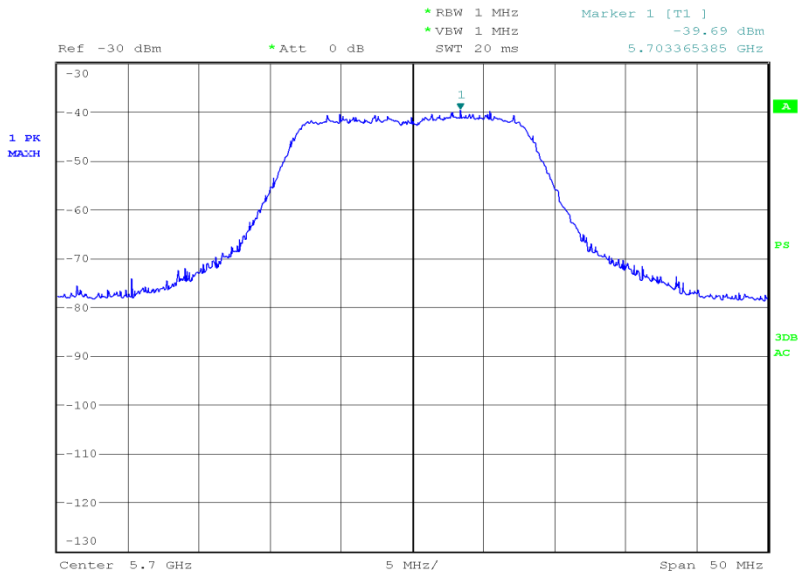
EIRP (dBm)	EIRP (mW)
12.13	16.33



Date: 18.APR.2014 09:26:51

5700 MHz

EIRP (dBm)	EIRP (mW)
12.95	19.71



Date: 18.APR.2014 09:31:02

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

Conducted

Frequency Band 1

5180 MHz

EIRP (dBm)	EIRP (mW)
13.98	25.00

5200 MHz

EIRP (dBm)	EIRP (mW)
13.86	24.32

5240 MHz

EIRP (dBm)	EIRP (mW)
13.75	23.71

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 18 Mbps.

Conducted

Frequency Band 2

5260 MHz

EIRP (dBm)	EIRP (mW)
13.85	24.27

5300 MHz

EIRP (dBm)	EIRP (mW)
13.98	25.00

5320 MHz

EIRP (dBm)	EIRP (mW)
13.97	24.95

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 18 Mbps.

Conducted

Frequency Band 3

5500 MHz

EIRP (dBm)	EIRP (mW)
13.96	24.89

5580 MHz

EIRP (dBm)	EIRP (mW)
13.98	25.00

5700 MHz

EIRP (dBm)	EIRP (mW)
13.94	24.77

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 18 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.

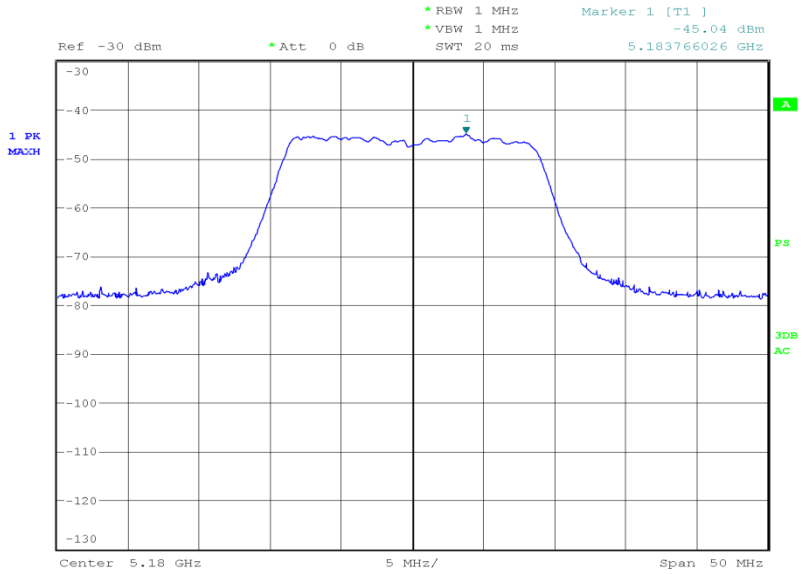
802.11(ac) - 5 GHz 20 MHz BW

Radiated

Frequency Band 1

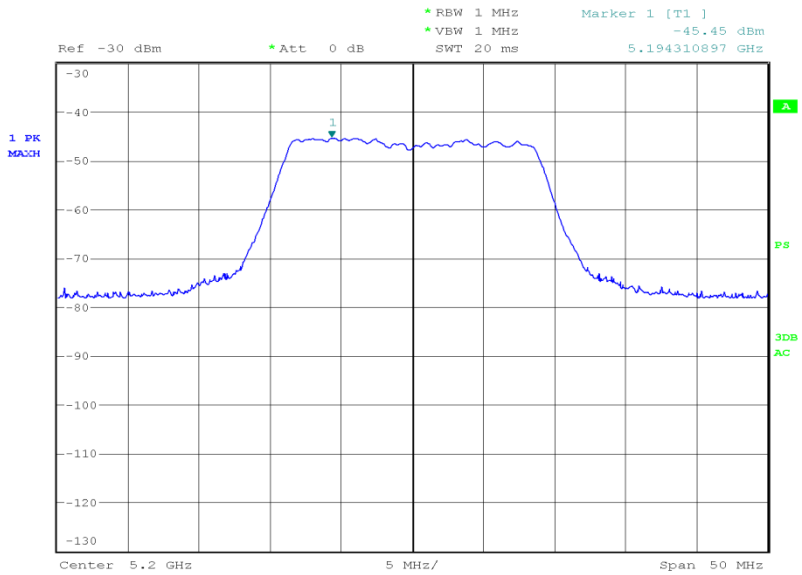
5180 MHz

EIRP (dBm)	EIRP (mW)
5.58	3.61



5200 MHz

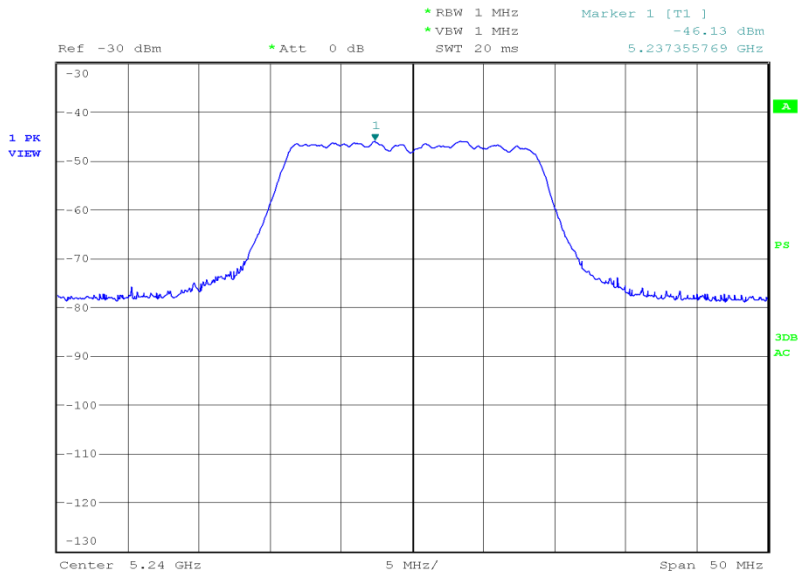
EIRP (dBm)	EIRP (mW)
5.27	3.36



Date: 21.APR.2014 16:49:25

5240 MHz

EIRP (dBm)	EIRP (mW)
4.67	2.93



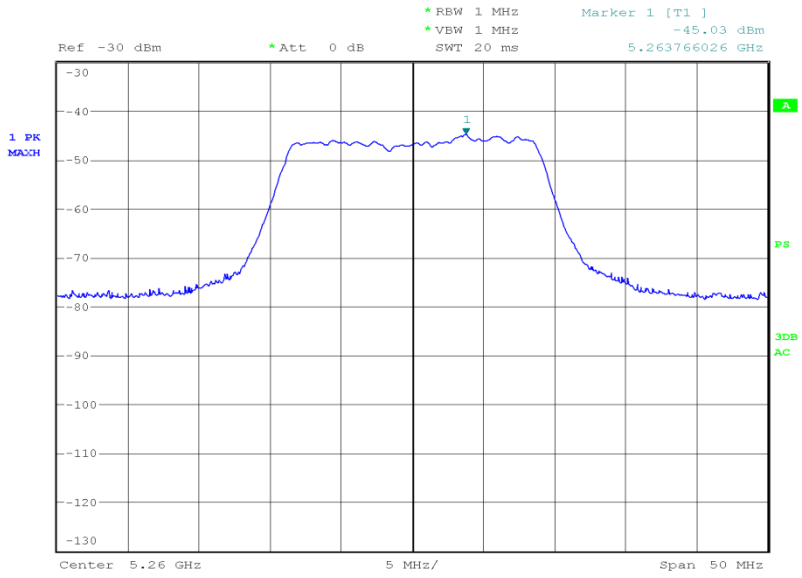
Date: 21.APR.2014 16:54:24

Radiated

Frequency Band 2

5260 MHz

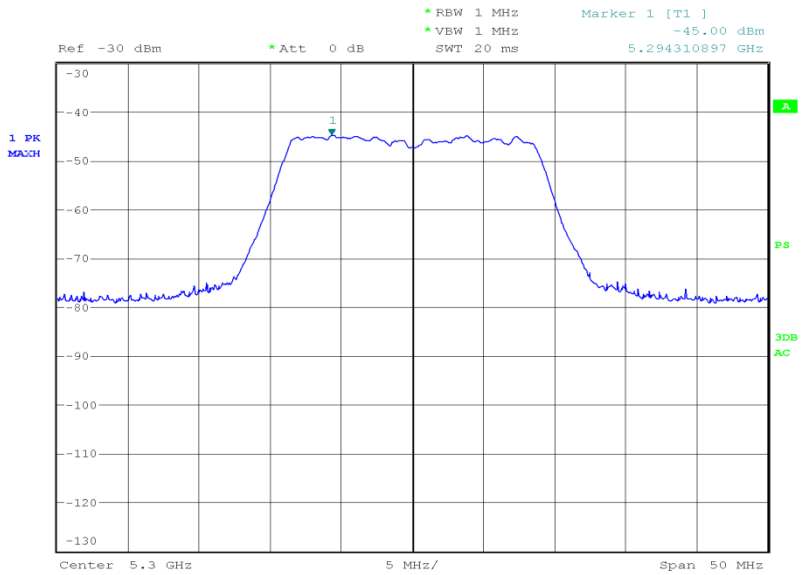
EIRP (dBm)	EIRP (mW)
6.05	4.03



Date: 21.APR.2014 17:00:50

5300 MHz

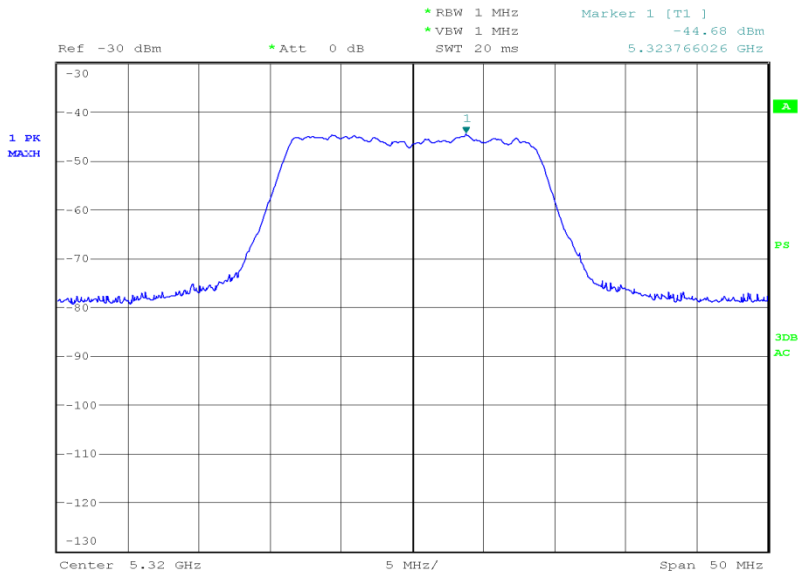
EIRP (dBm)	EIRP (mW)
5.66	3.68



Date: 21.APR.2014 17:07:31

5320 MHz

EIRP (dBm)	EIRP (mW)
6.44	4.41



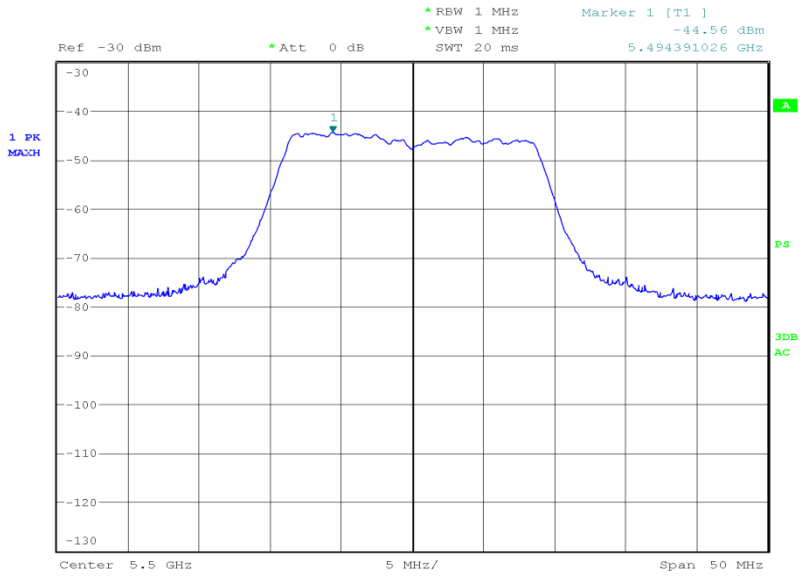
Date: 21.APR.2014 17:11:06

Radiated

Frequency Band 3

5500 MHz

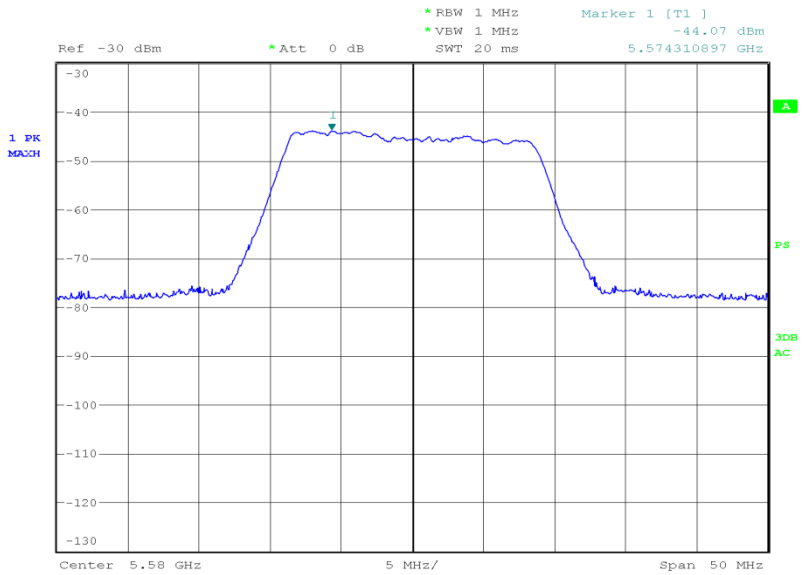
EIRP (dBm)	EIRP (mW)
7.53	5.66



Date: 21.APR.2014 17:14:58

5580 MHz

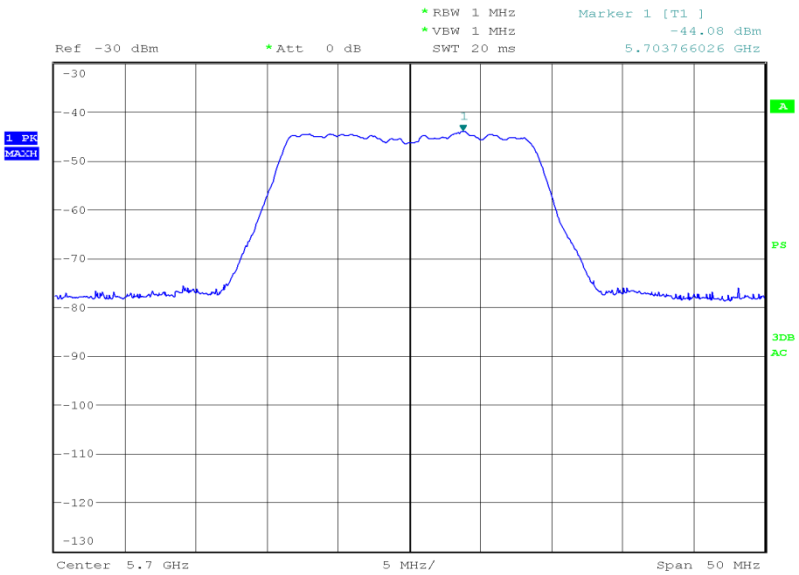
EIRP (dBm)	EIRP (mW)
7.51	5.64



Date: 21.APR.2014 17:18:15

5700 MHz

EIRP (dBm)	EIRP (mW)
7.61	5.76



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

Conducted

Frequency Band 1

5180 MHz

EIRP (dBm)	EIRP (mW)
11.76	15.00

5200 MHz

EIRP (dBm)	EIRP (mW)
11.88	15.42

5240 MHz

EIRP (dBm)	EIRP (mW)
11.16	13.06

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 MCS3.

Conducted

Frequency Band 2

5260 MHz

EIRP (dBm)	EIRP (mW)
11.37	13.71

5300 MHz

EIRP (dBm)	EIRP (mW)
11.43	13.90

5320 MHz

EIRP (dBm)	EIRP (mW)
11.25	13.34

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 MCS3.

Conducted

Frequency Band 3

5500 MHz

EIRP (dBm)	EIRP (mW)
11.58	14.39

5580 MHz

EIRP (dBm)	EIRP (mW)
11.94	15.63

5700 MHz

EIRP (dBm)	EIRP (mW)
11.97	15.74

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 MCS3.

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.

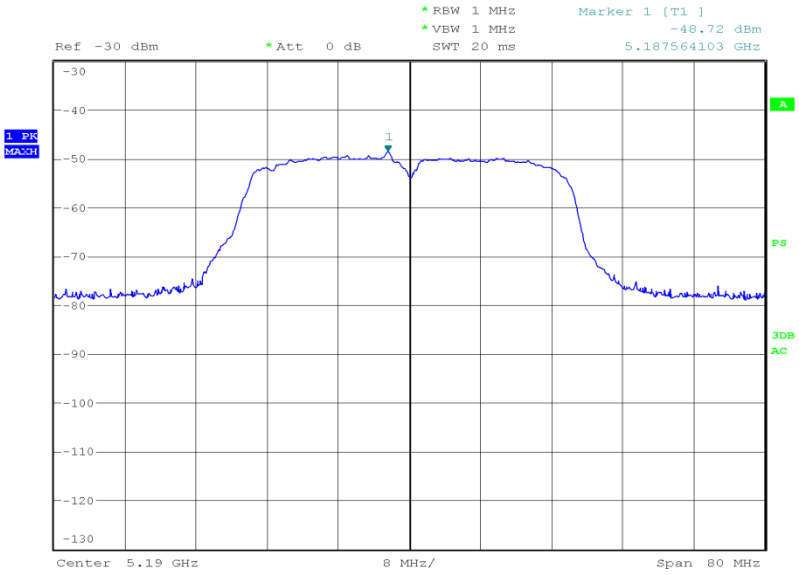
802.11(ac) - 5 GHz 40 MHz BW

Radiated

Frequency Band 1

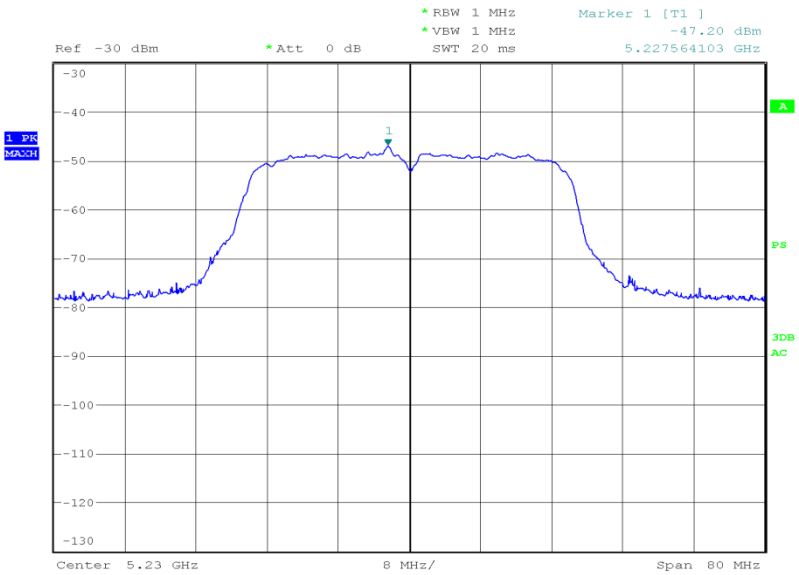
5190 MHz

EIRP (dBm)	EIRP (mW)
5.57	3.61



5230 MHz

EIRP (dBm)	EIRP (mW)
6.67	4.65



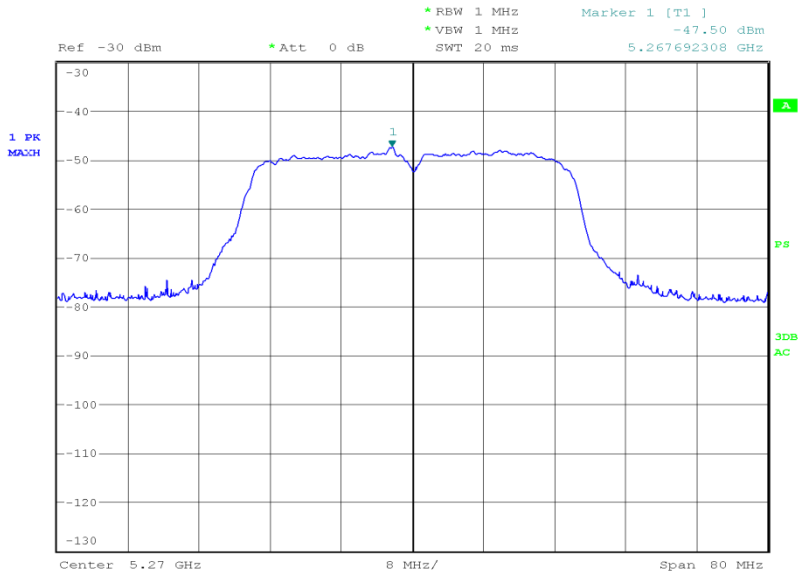
Date: 21.APR.2014 15:30:48

Radiated

Frequency Band 2

5270 MHz

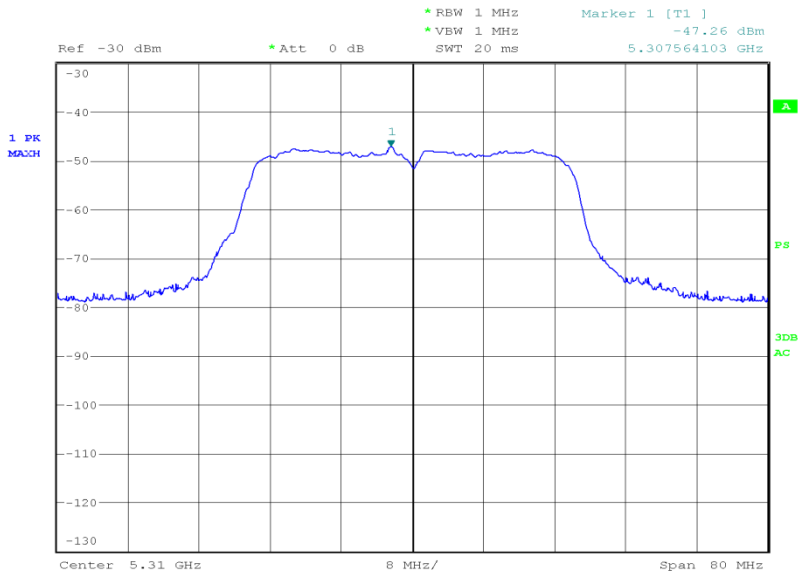
EIRP (dBm)	EIRP (mW)
7.19	5.24



Date: 21.APR.2014 15:34:02

5310 MHz

EIRP (dBm)	EIRP (mW)
7.73	5.93



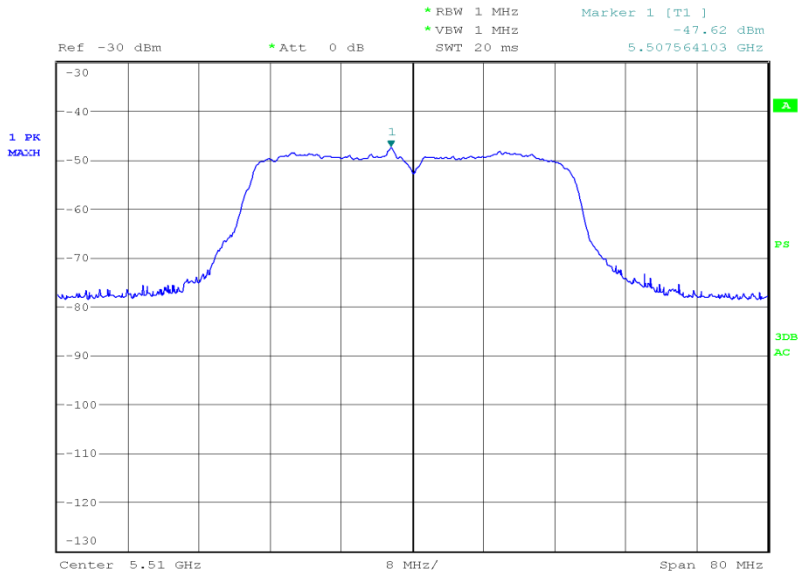
Date: 21.APR.2014 15:37:13

Radiated

Frequency Band 3

5510 MHz

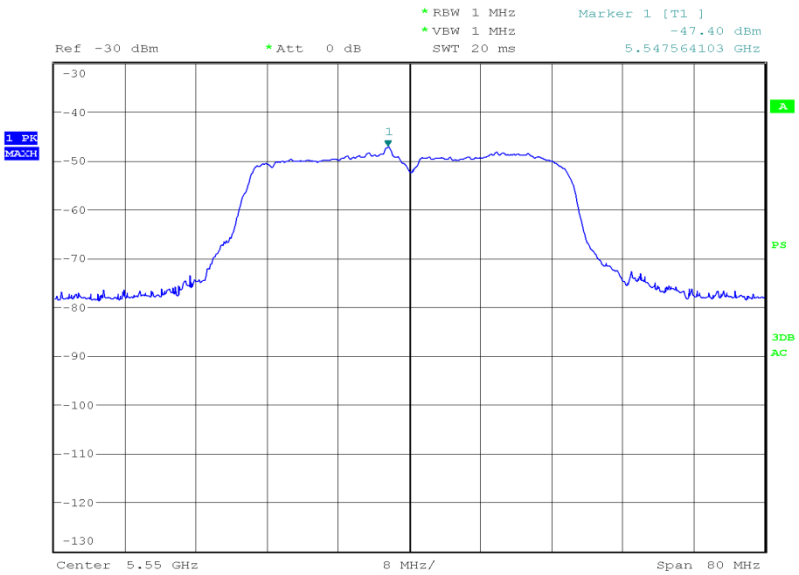
EIRP (dBm)	EIRP (mW)
8.16	6.55



Date: 21.APR.2014 15:41:30

5550 MHz

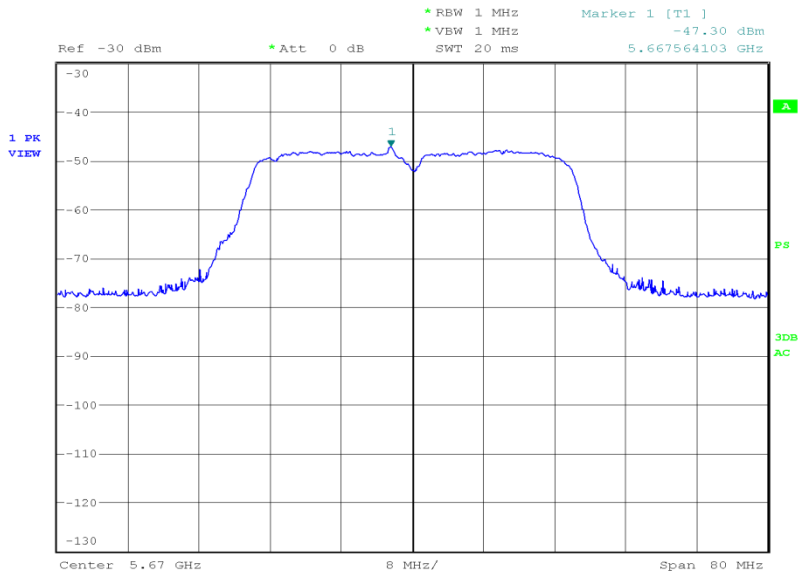
EIRP (dBm)	EIRP (mW)
7.75	5.96



Date: 21.APR.2014 15:46:43

5670 MHz

EIRP (dBm)	EIRP (mW)
8.08	6.43



Date: 22.APR.2014 23:23:51

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

Conducted

Frequency Band 1

5190 MHz

EIRP (dBm)	EIRP (mW)
11.54	14.26

5230 MHz

EIRP (dBm)	EIRP (mW)
11.34	13.61

The test was performed on the worst case data rate for 802.11(ac) - 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)
11.42	13.87

5310 MHz

EIRP (dBm)	EIRP (mW)
11.53	14.22

The test was performed on the worst case data rate for 802.11(ac) - 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 3

5510 MHz

EIRP (dBm)	EIRP (mW)
11.43	13.90

5550 MHz

EIRP (dBm)	EIRP (mW)
11.39	13.77

5670 MHz

EIRP (dBm)	EIRP (mW)
11.12	12.94

The test was performed on the worst case data rate for 802.11(ac) - 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.

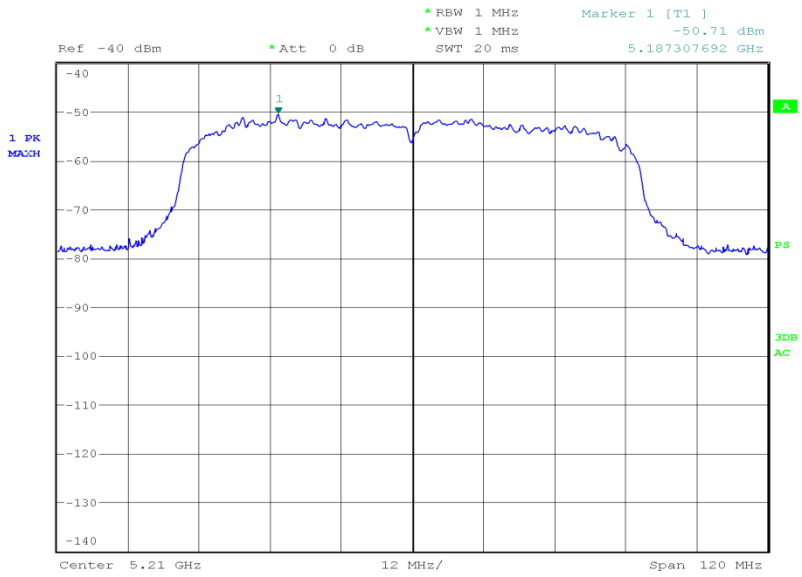
802.11(ac) - 5 GHz 80 MHz BW

Radiated

Frequency Band 1

5210 MHz

EIRP (dBm)	EIRP (mW)
6.10	4.07

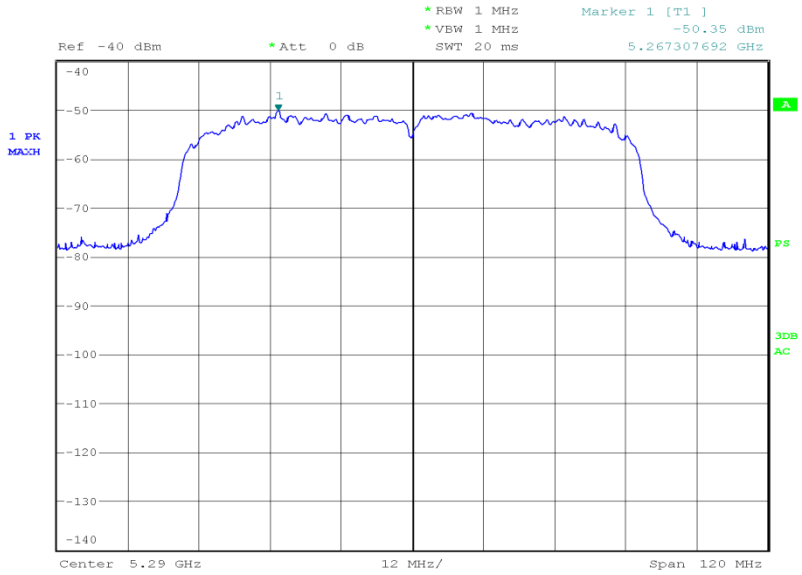


Radiated

Frequency Band 2

5290 MHz

EIRP (dBm)	EIRP (mW)
7.54	5.68



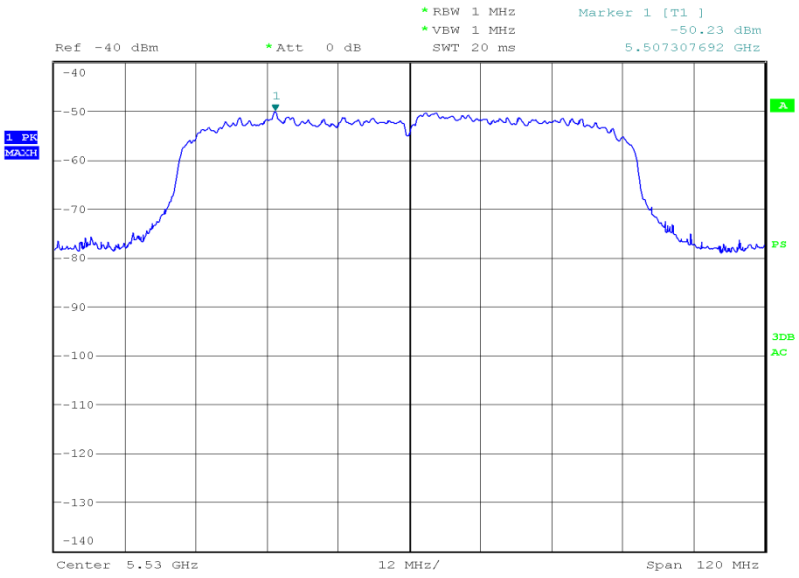
Date: 21.APR.2014 18:12:09

Radiated

Frequency Band 3

5530 MHz

EIRP (dBm)	EIRP (mW)
8.18	6.58



Date: 21.APR.2014 18:19:05

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

Conducted

Frequency Band 1

5210 MHz

EIRP (dBm)	EIRP (mW)
11.39	13.77

The test was performed on the worst case data rate for 802.11(ac) - 80 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 MCS1.

Conducted

Frequency Band 2

5290 MHz

EIRP (dBm)	EIRP (mW)
11.35	13.65

The test was performed on the worst case data rate for 802.11(ac) - 80 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 MCS1.

Conducted

Frequency Band 3

5530 MHz

EIRP (dBm)	EIRP (mW)
10.88	12.25

The test was performed on the worst case data rate for 802.11(ac) - 80 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 MCS1.

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.

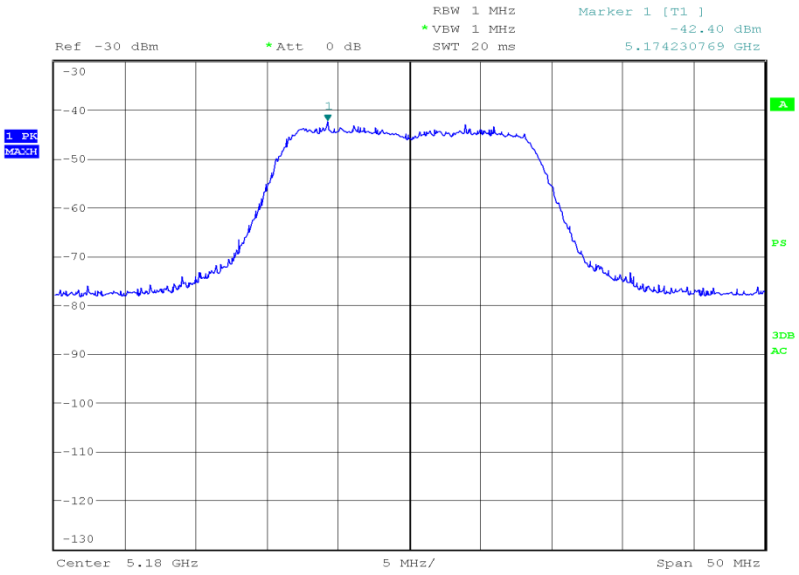
802.11(n) - 5 GHz 20 MHz BW

Radiated

Frequency Band 1

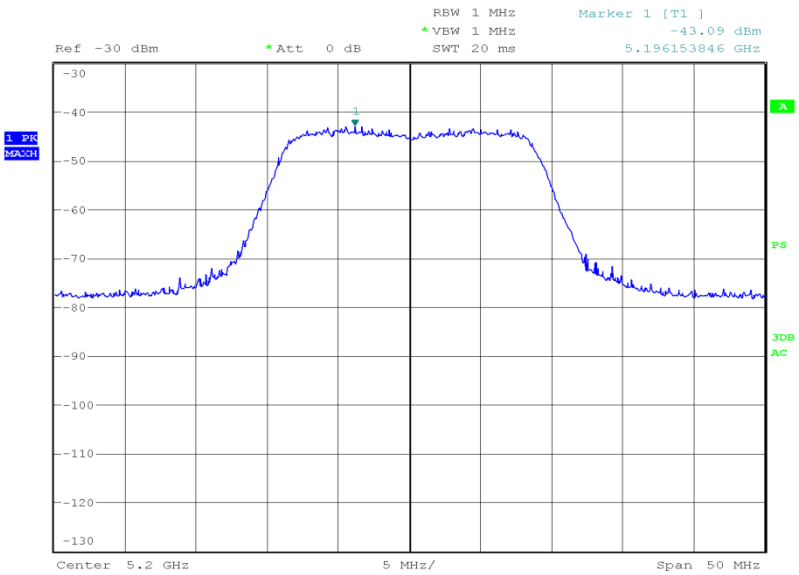
5180 MHz

EIRP (dBm)	EIRP (mW)
8.62	7.28



5200 MHz

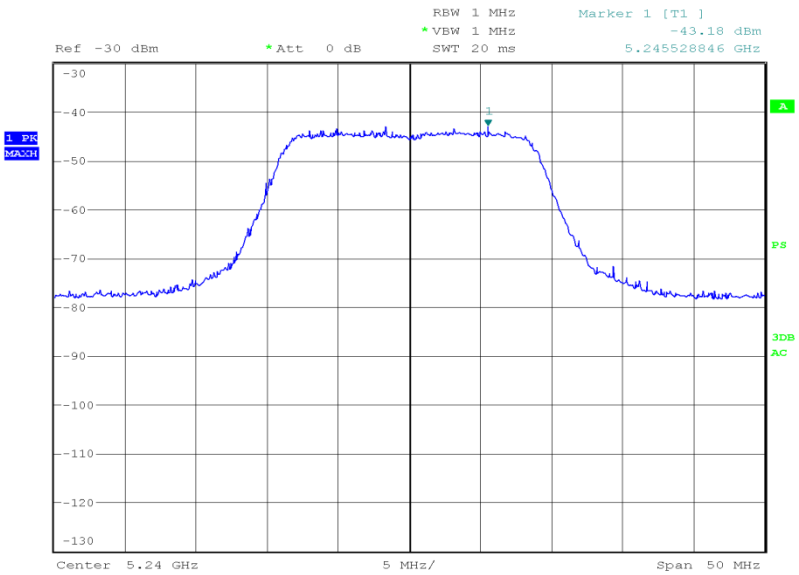
EIRP (dBm)	EIRP (mW)
8.03	6.35



Date: 18.APR.2014 11:00:33

5240 MHz

EIRP (dBm)	EIRP (mW)
8.02	6.34



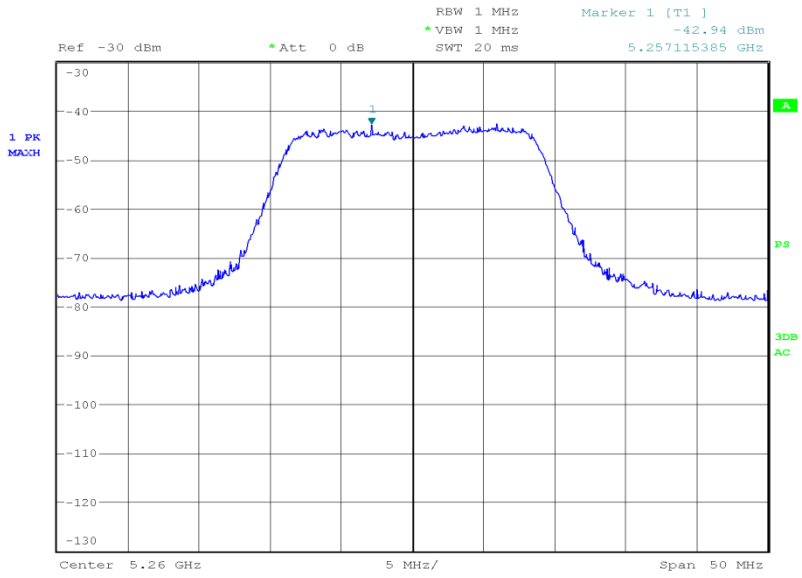
Date: 18.APR.2014 11:42:39

Radiated

Frequency Band 2

5260 MHz

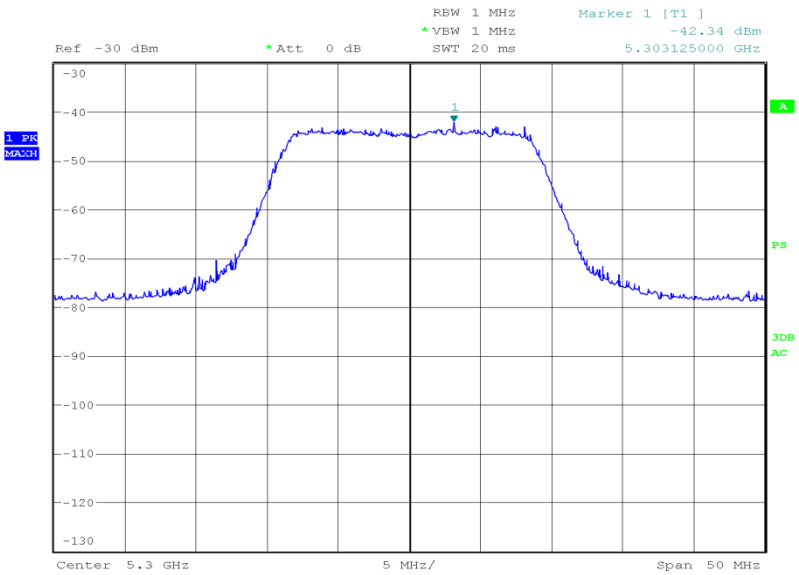
EIRP (dBm)	EIRP (mW)
8.54	7.14



Date: 18.APR.2014 11:47:44

5300 MHz

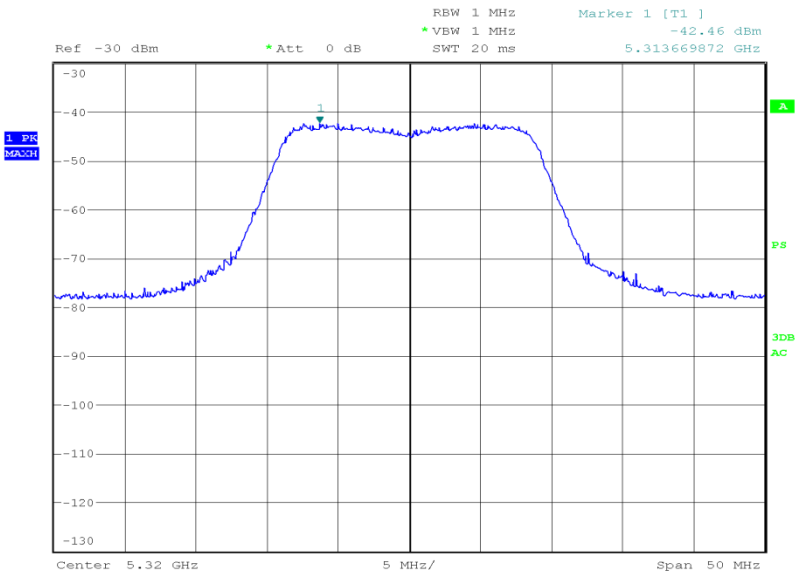
EIRP (dBm)	EIRP (mW)
8.72	7.44



Date: 18.APR.2014 13:48:33

5320 MHz

EIRP (dBm)	EIRP (mW)
9.06	8.05



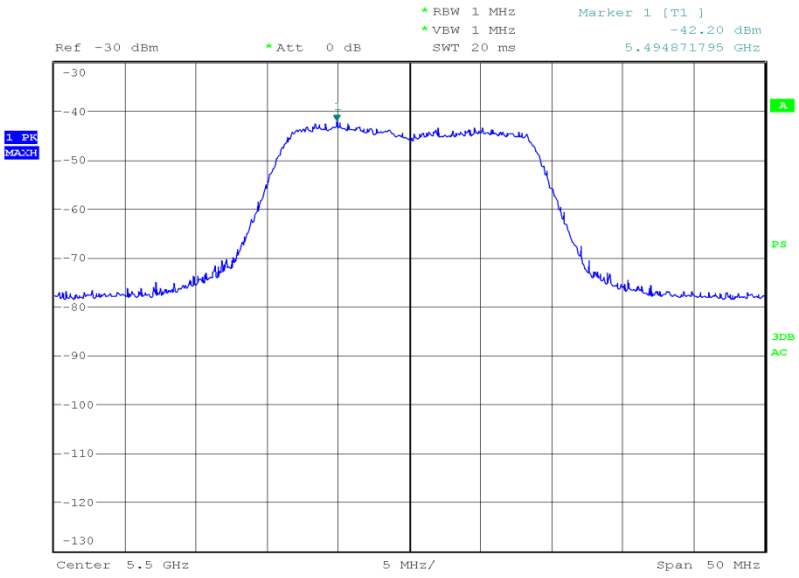
Date: 18.APR.2014 12:37:21

Radiated

Frequency Band 3

5500 MHz

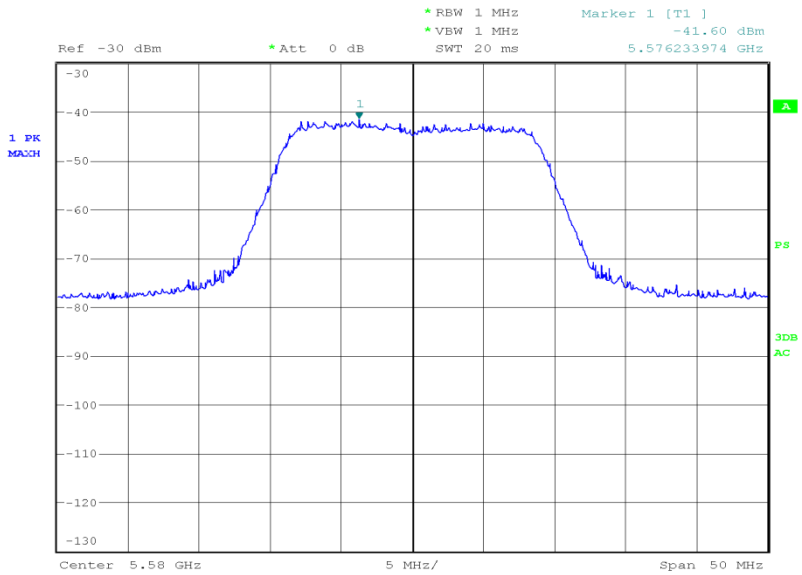
EIRP (dBm)	EIRP (mW)
10.29	10.68



Date: 18.APR.2014 13:11:37

5580 MHz

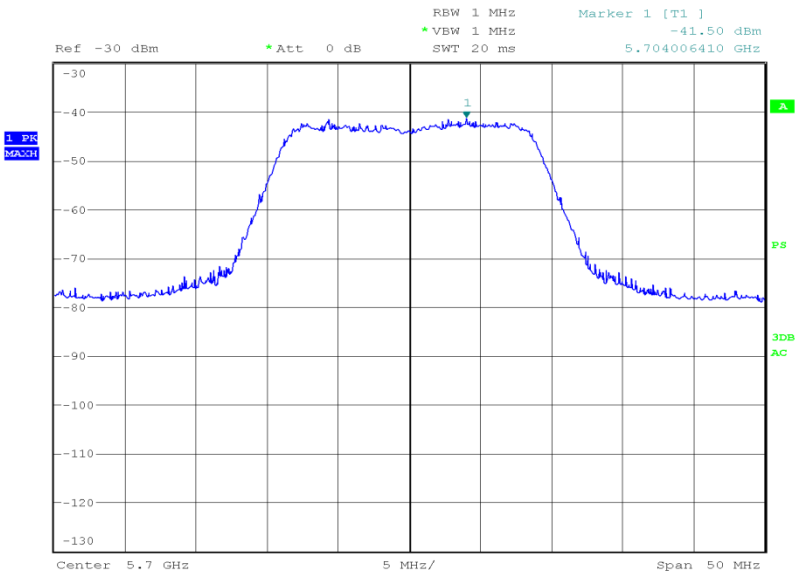
EIRP (dBm)	EIRP (mW)
10.38	10.92



Date: 18.APR.2014 13:15:47

5700 MHz

EIRP (dBm)	EIRP (mW)
10.59	11.45



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

Conducted

Frequency Band 1

5180 MHz

EIRP (dBm)	EIRP (mW)
12.16	16.44

5200 MHz

EIRP (dBm)	EIRP (mW)
12.03	15.96

5240 MHz

EIRP (dBm)	EIRP (mW)
11.49	14.09

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 MCS2.

Conducted

Frequency Band 2

5260 MHz

EIRP (dBm)	EIRP (mW)
11.24	13.30

5300 MHz

EIRP (dBm)	EIRP (mW)
11.36	13.68

5320 MHz

EIRP (dBm)	EIRP (mW)
11.44	13.93

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 MCS2.

Conducted

Frequency Band 3

5500 MHz

EIRP (dBm)	EIRP (mW)
11.76	15.00

5580 MHz

EIRP (dBm)	EIRP (mW)
12.11	16.26

5700 MHz

EIRP (dBm)	EIRP (mW)
12.21	16.63

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 MCS2.

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.

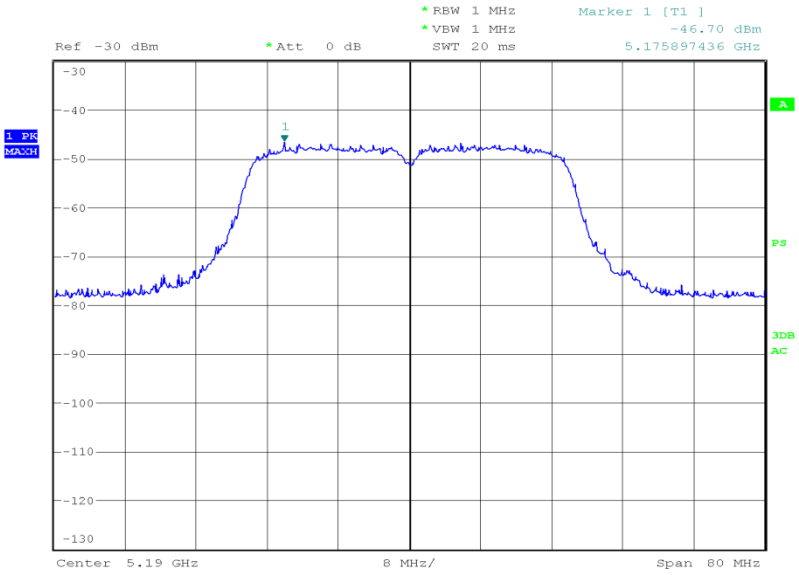
802.11(n) - 5 GHz 40 MHz BW

Radiated

Frequency Band 1

5190 MHz

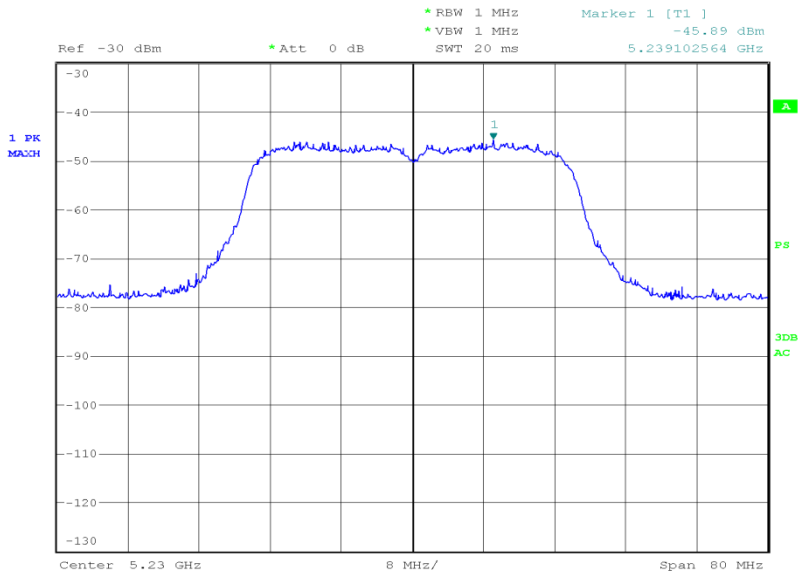
EIRP (dBm)	EIRP (mW)
7.39	5.48



Date: 18.APR.2014 14:03:31

5230 MHz

EIRP (dBm)	EIRP (mW)
7.56	5.70



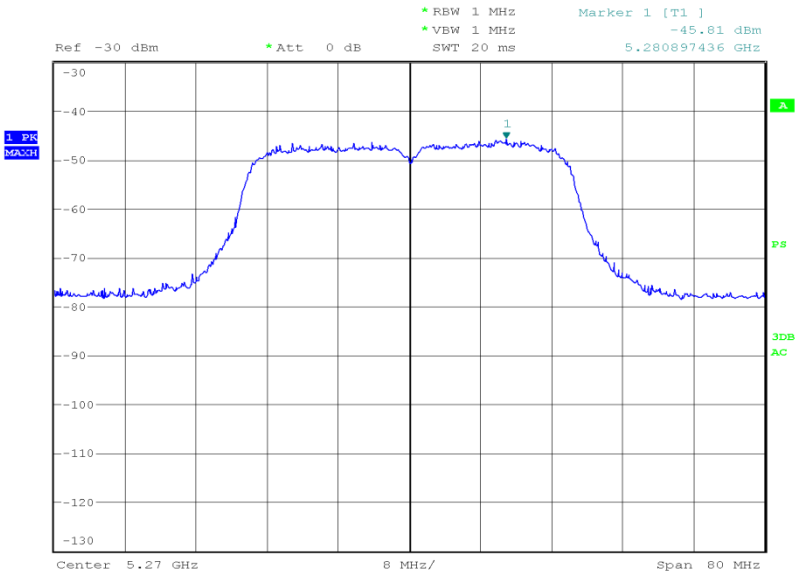
Date: 18.APR.2014 14:21:06

Radiated

Frequency Band 2

5270 MHz

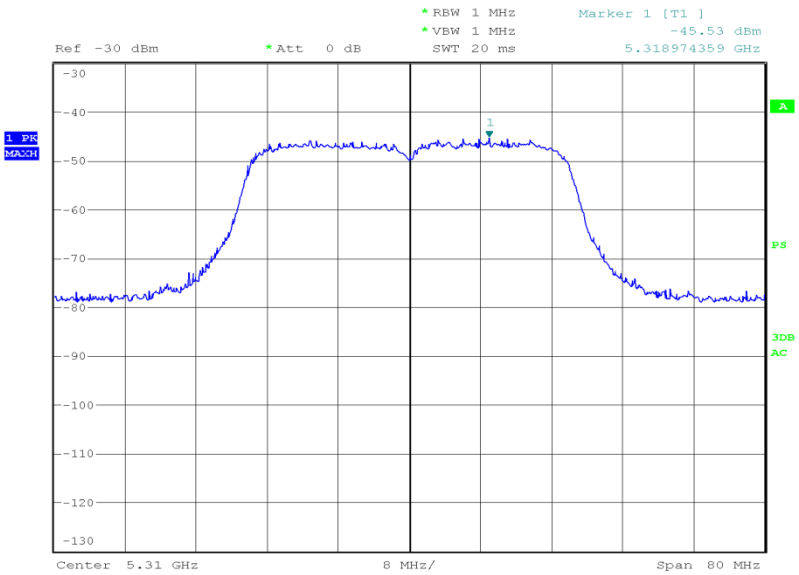
EIRP (dBm)	EIRP (mW)
8.46	7.01



Date: 18.APR.2014 14:29:02

5310 MHz

EIRP (dBm)	EIRP (mW)
9.04	8.02



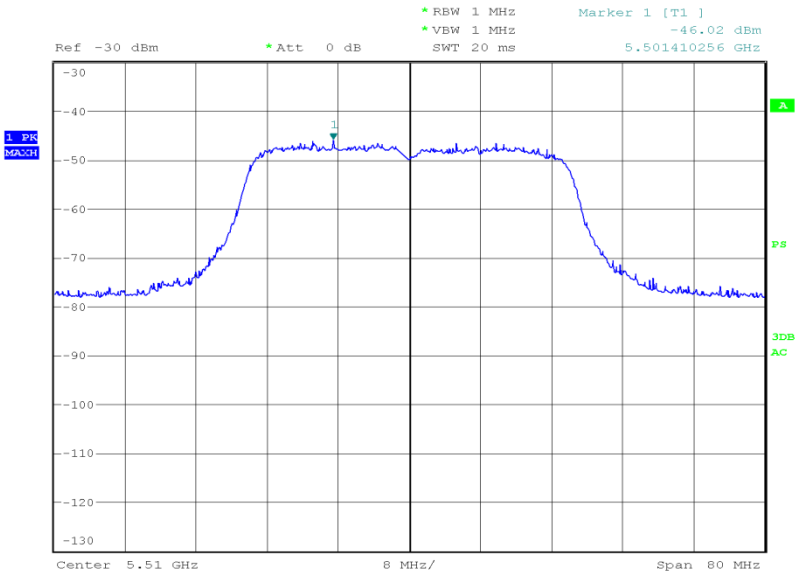
Date: 18.APR.2014 14:35:17

Radiated

Frequency Band 3

5510 MHz

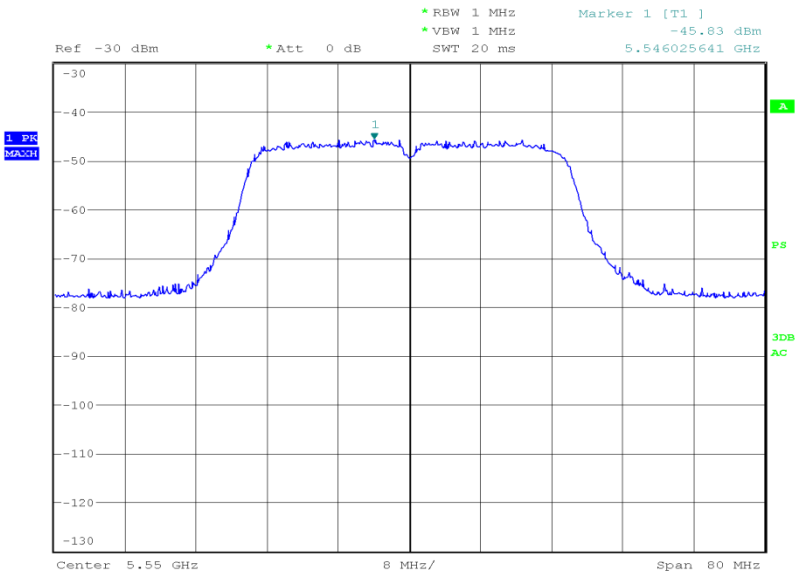
EIRP (dBm)	EIRP (mW)
9.34	8.59



Date: 18.APR.2014 17:20:45

5550 MHz

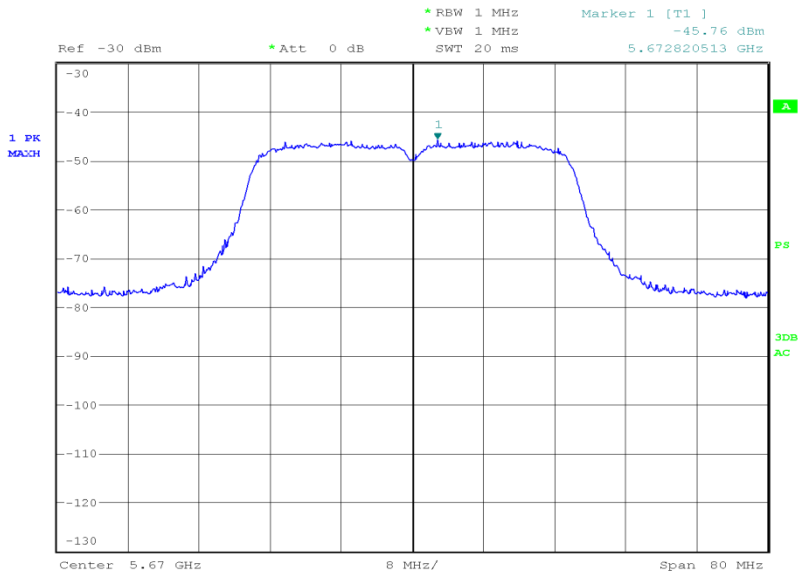
EIRP (dBm)	EIRP (mW)
9.10	8.13



Date: 18.APR.2014 17:31:36

5670 MHz

EIRP (dBm)	EIRP (mW)
9.20	8.32



Date: 18.APR.2014 17:39:18

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

Conducted

Frequency Band 1

5190 MHz

EIRP (dBm)	EIRP (mW)
11.81	15.17

5230 MHz

EIRP (dBm)	EIRP (mW)
11.49	14.09

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 MCS1.

Conducted

Frequency Band 2

5270 MHz

EIRP (dBm)	EIRP (mW)
11.61	14.49

5310 MHz

EIRP (dBm)	EIRP (mW)
11.37	13.71

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 MCS1.

Conducted

Frequency Band 3

5510 MHz

EIRP (dBm)	EIRP (mW)
11.25	13.34

5550 MHz

EIRP (dBm)	EIRP (mW)
11.58	14.39

5670 MHz

EIRP (dBm)	EIRP (mW)
11.01	12.62

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 MCS1.

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

SHL25 S/N: IMEI 004401115170470 - Modification State 0

2.4.3 Date of Test

3 April 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.

The EUT was transmitted at maximum power for bottom, middle and top channels on the data rate pre-determined to give the highest level of average output power. The EUT was connected to a spectrum analyser via an attenuator and cable. The Analyser settings were adjusted to display the resultant trace on screen. The analyser settings were configured with an RBW of 1 MHz and video bandwidth of 3 x RBW. The trace was set to average using an RMS detector and the maximum value was recorded.

2.4.6 Environmental Conditions

Ambient Temperature	25.4°C
Relative Humidity	36.4%

Product Service

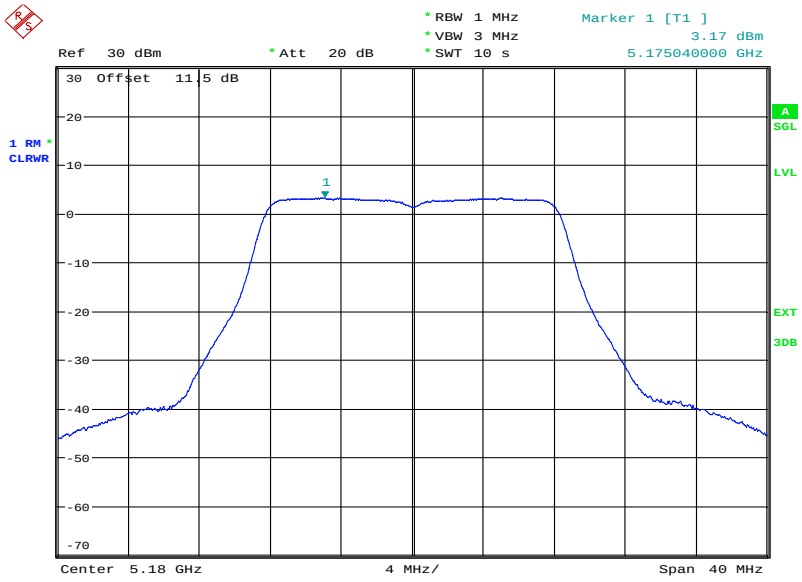
2.4.7 Test Results

802.11(a)

Frequency Band 1

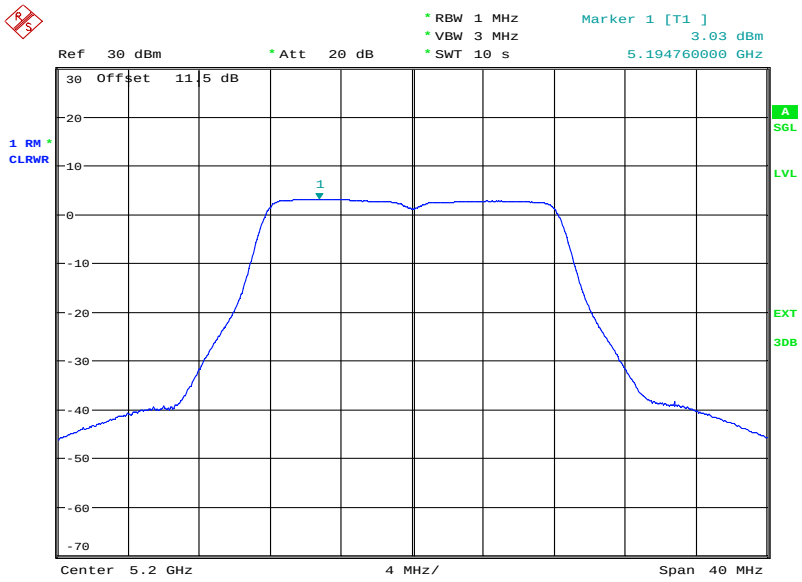
5180 MHz

Peak Power Spectral Density (dBm)	3.17



5200 MHz

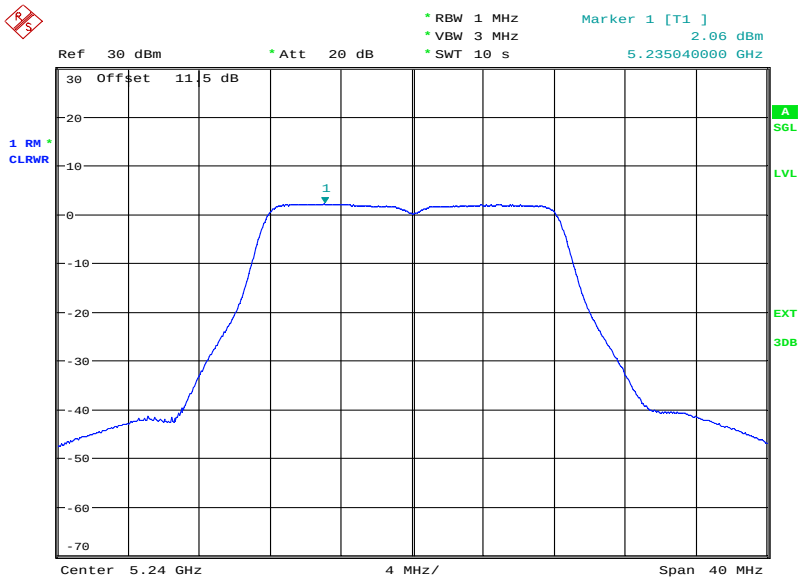
Peak Power Spectral Density (dBm)	3.03



Date: 3.APR.2014 16:29:22

5240 MHz

Peak Power Spectral Density (dBm)	2.06



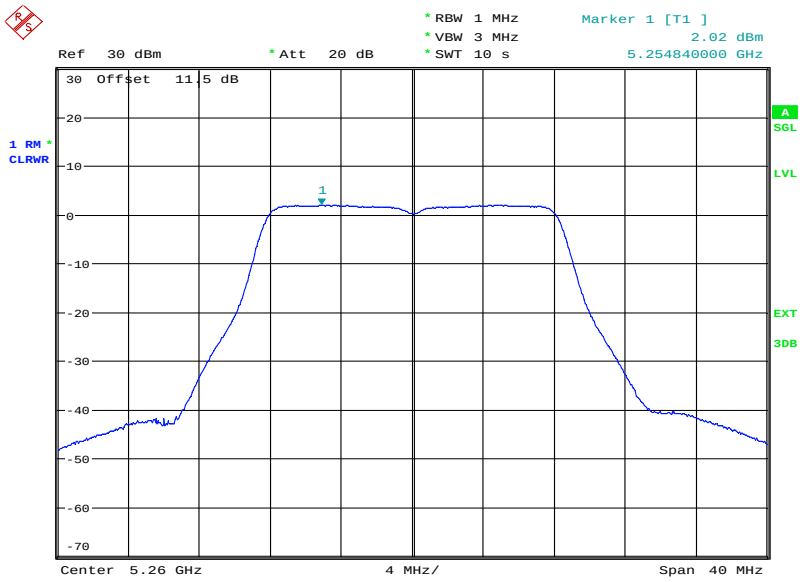
Date: 3.APR.2014 16:30:09

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 18 Mbps.

Frequency Band 2

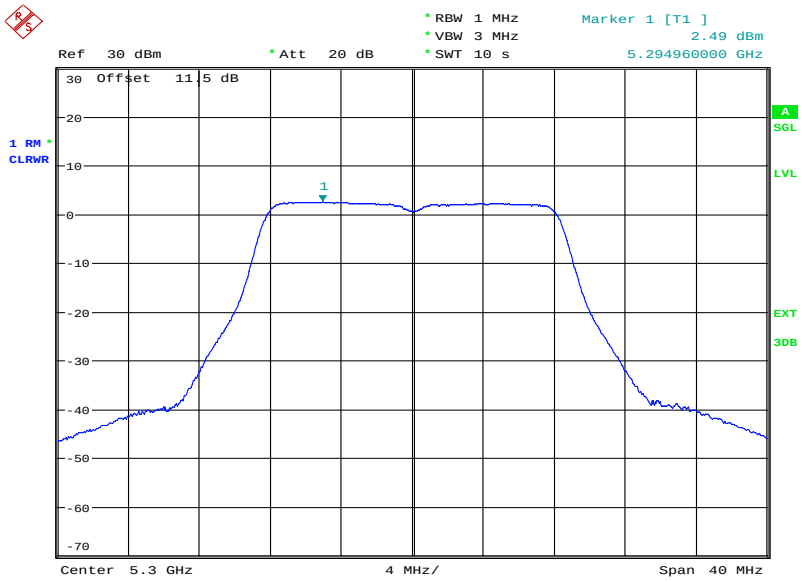
5260 MHz

Peak Power Spectral Density (dBm)	2.02



5300 MHz

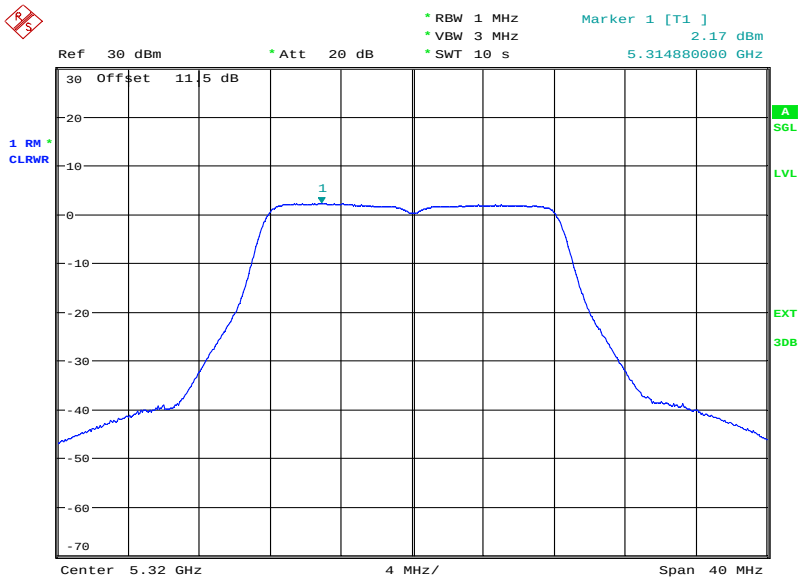
Peak Power Spectral Density (dBm)	2.49



Date: 3.APR.2014 16:31:58

5320 MHz

Peak Power Spectral Density (dBm)	2.17

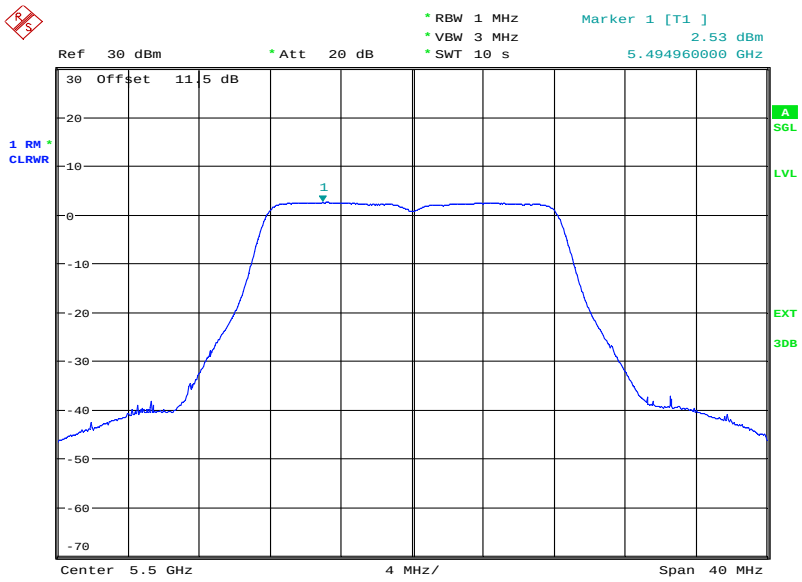


The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 18 Mbps.

Frequency Band 3

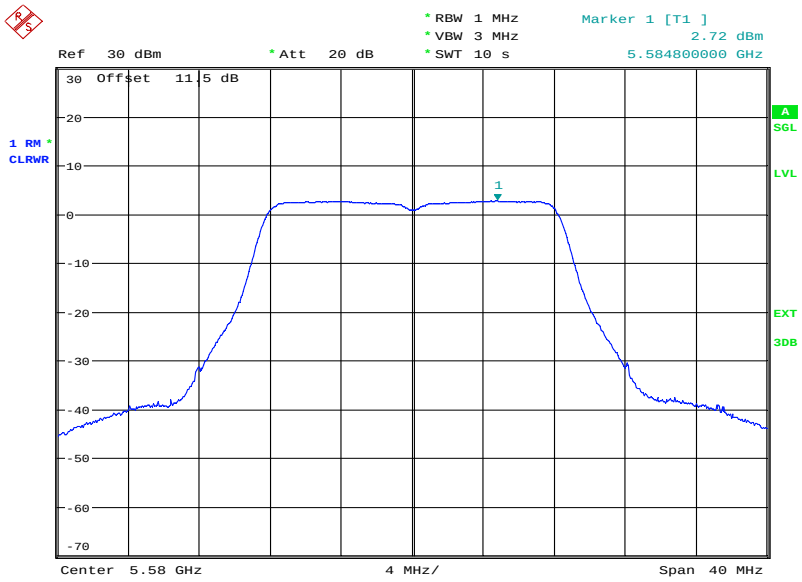
5500 MHz

Peak Power Spectral Density (dBm)	2.53



5580 MHz

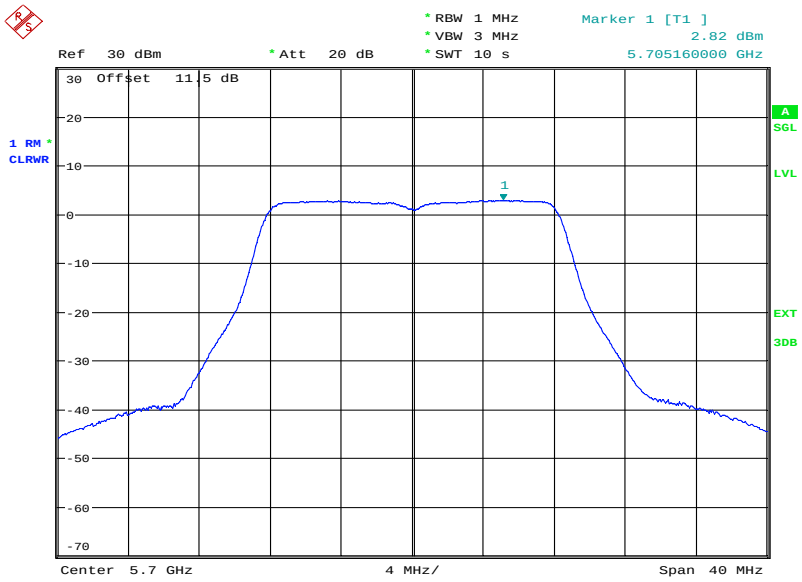
Peak Power Spectral Density (dBm)	2.72



Date: 3.APR.2014 16:34:35

5700 MHz

Peak Power Spectral Density (dBm)	2.82



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 18 Mbps.

Limit

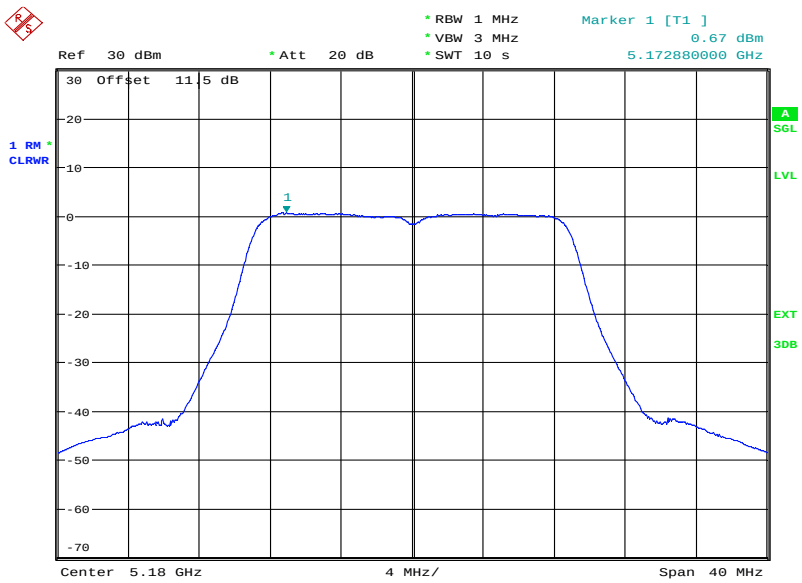
Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz

802.11(ac) - 5 GHz 20 MHz BW

Frequency Band 1

5180 MHz

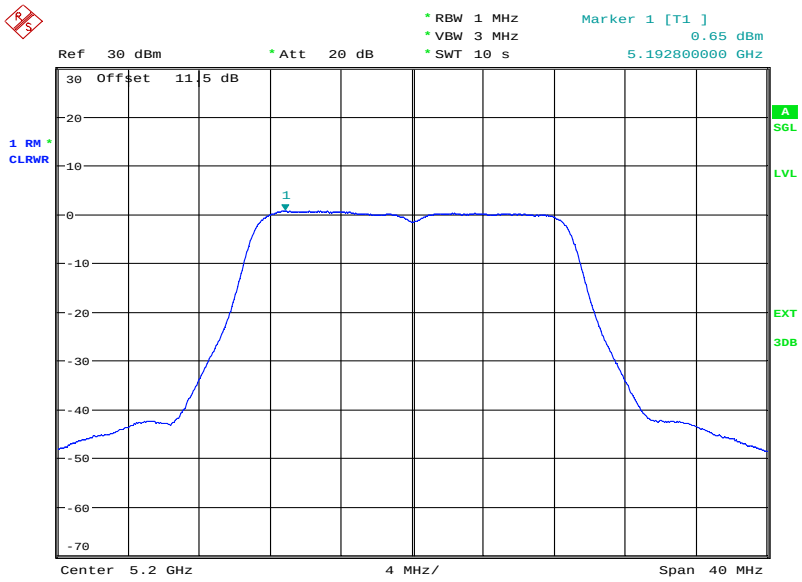
Peak Power Spectral Density (dBm)	0.67



Date: 3.APR.2014 16:37:42

5200 MHz

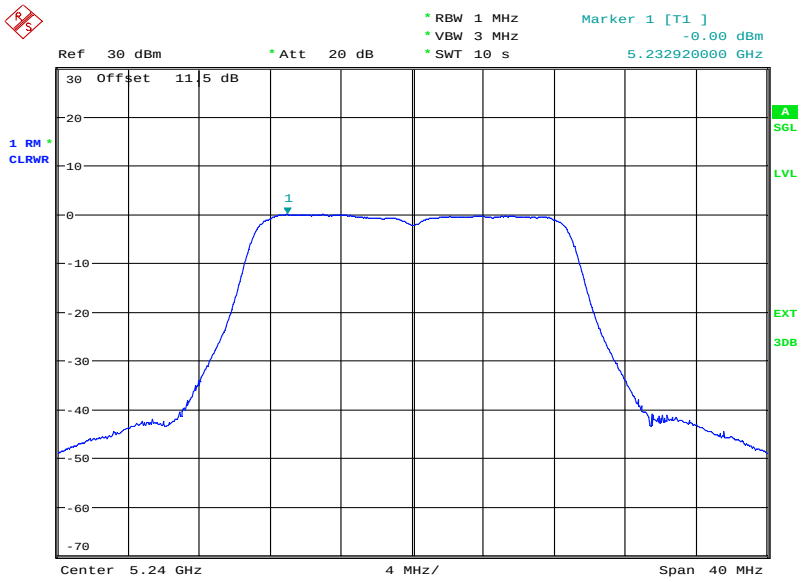
Peak Power Spectral Density (dBm)	0.65



Date: 3.APR.2014 16:42:05

5240 MHz

Peak Power Spectral Density (dBm)	0.00

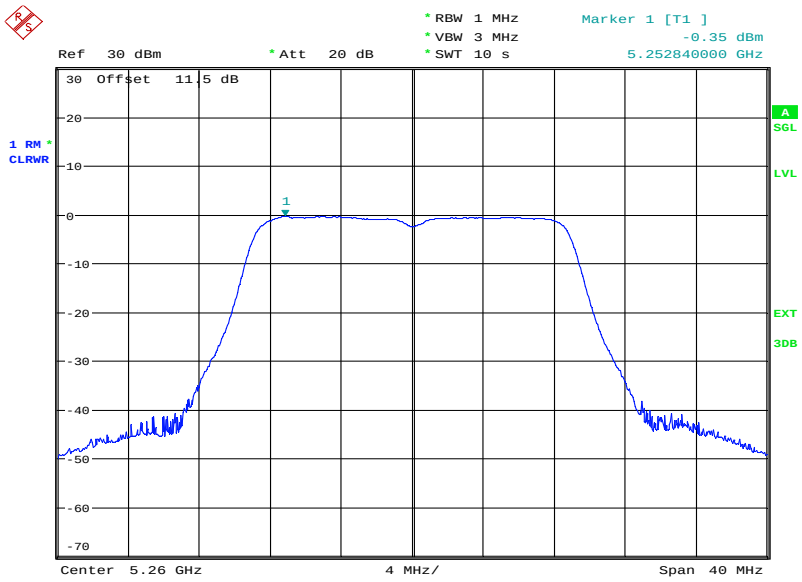


The test was performed on the worst case data rate for 802.11(ac) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS3.

Frequency Band 2

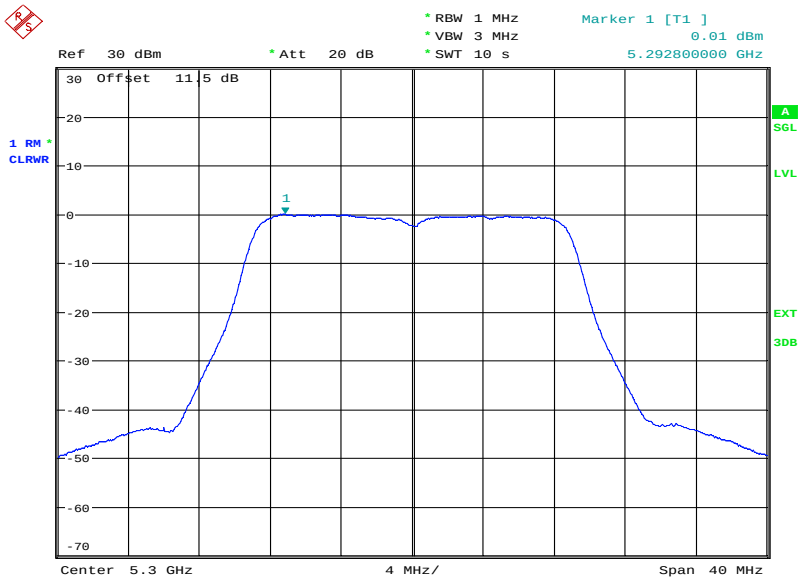
5260 MHz

Peak Power Spectral Density (dBm)	-0.35



5300 MHz

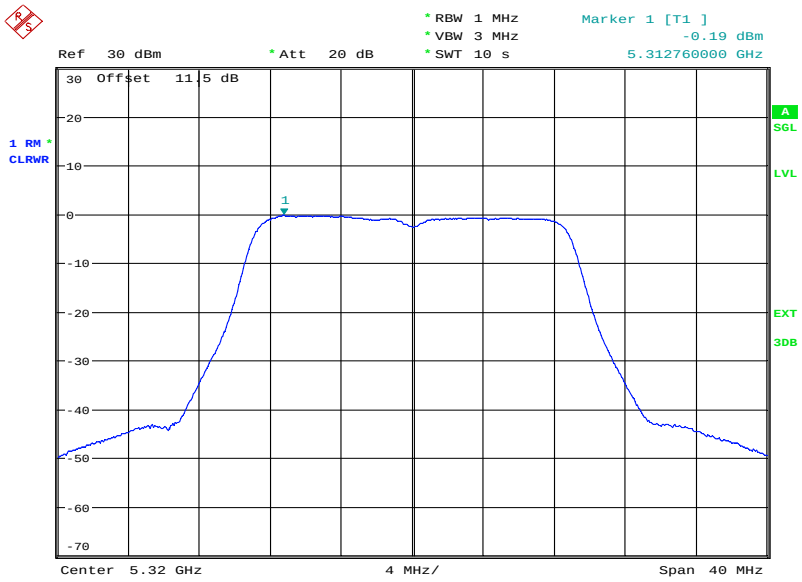
Peak Power Spectral Density (dBm)	0.01



Date: 3.APR.2014 16:45:21

5320 MHz

Peak Power Spectral Density (dBm)	-0.19



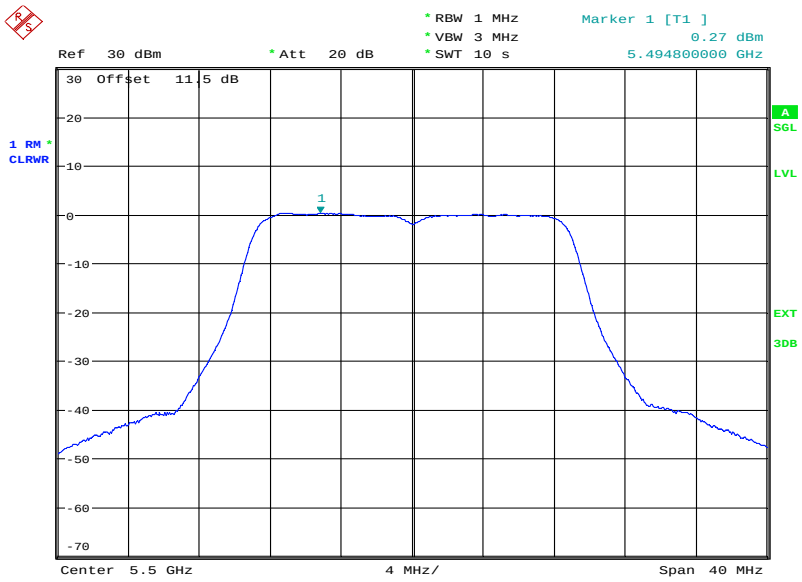
Date: 3.APR.2014 16:45:59

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 MCS3.

Frequency Band 3

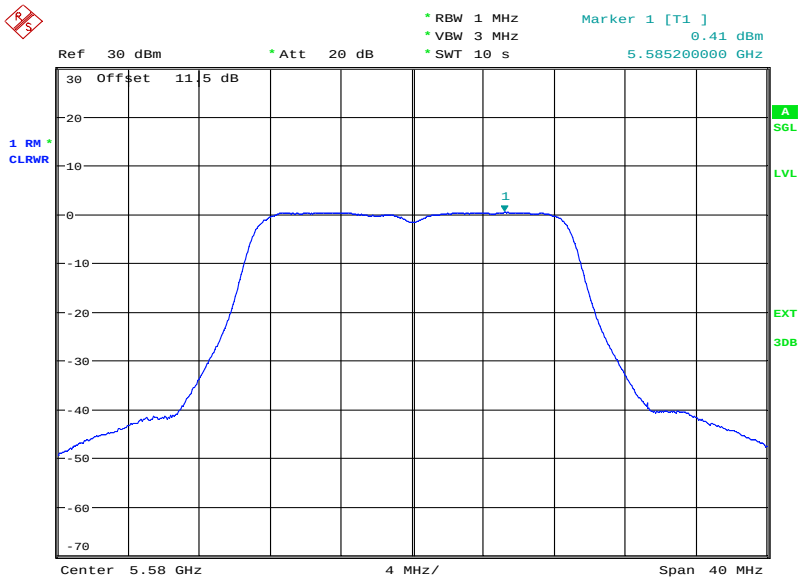
5500 MHz

Peak Power Spectral Density (dBm)	0.27



5580 MHz

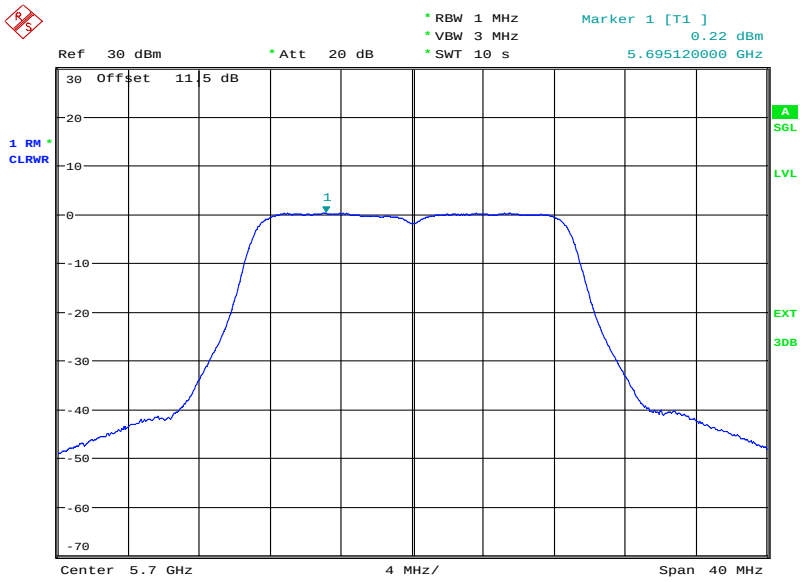
Peak Power Spectral Density (dBm)	0.41



Date: 3.APR.2014 16:48:21

5700 MHz

Peak Power Spectral Density (dBm)	0.22



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 MCS3.

Limit

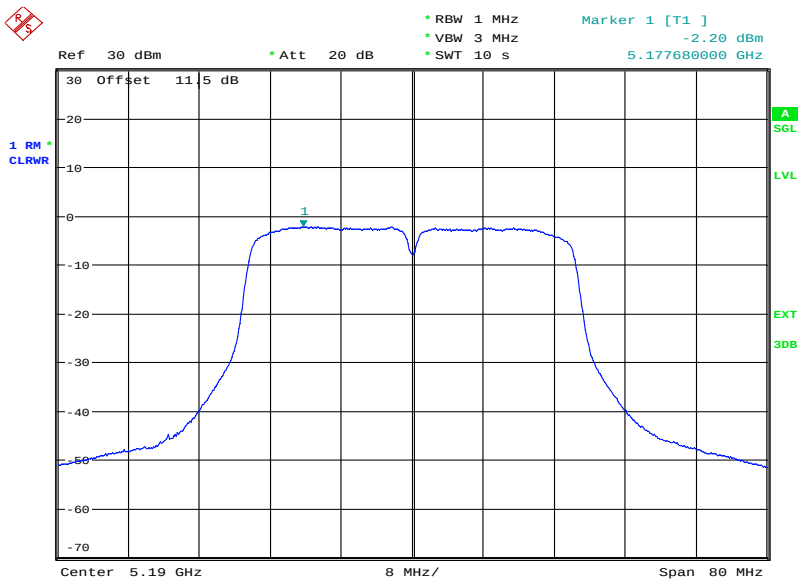
Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz

802.11(ac) - 5 GHz 40 MHz BW

Frequency Band 1

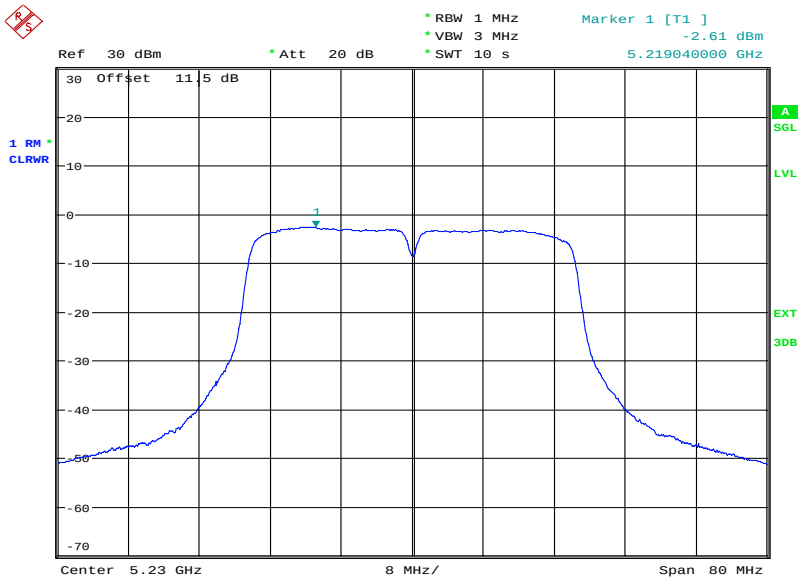
5190 MHz

Peak Power Spectral Density (dBm)	-2.20



5230 MHz

Peak Power Spectral Density (dBm)	-2.61



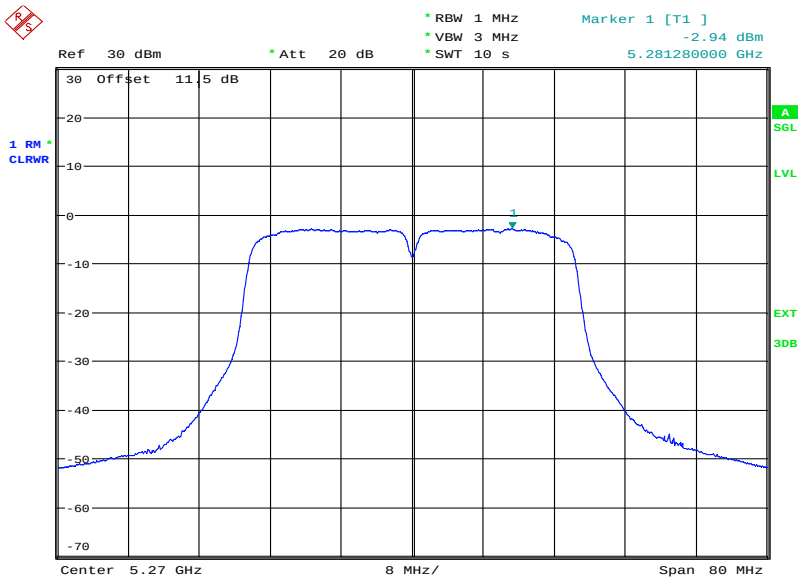
Date: 3.APR.2014 16:54:00

The test was performed on the worst case data rate for 802.11(ac) - 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.

Frequency Band 2

5270 MHz

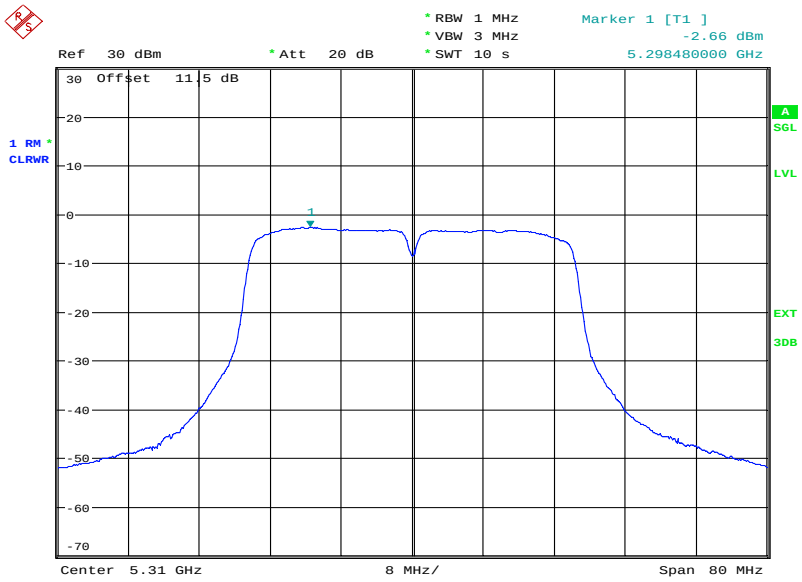
Peak Power Spectral Density (dBm)	-2.94



Date: 3.APR.2014 16:54:38

5310 MHz

Peak Power Spectral Density (dBm)	-2.66

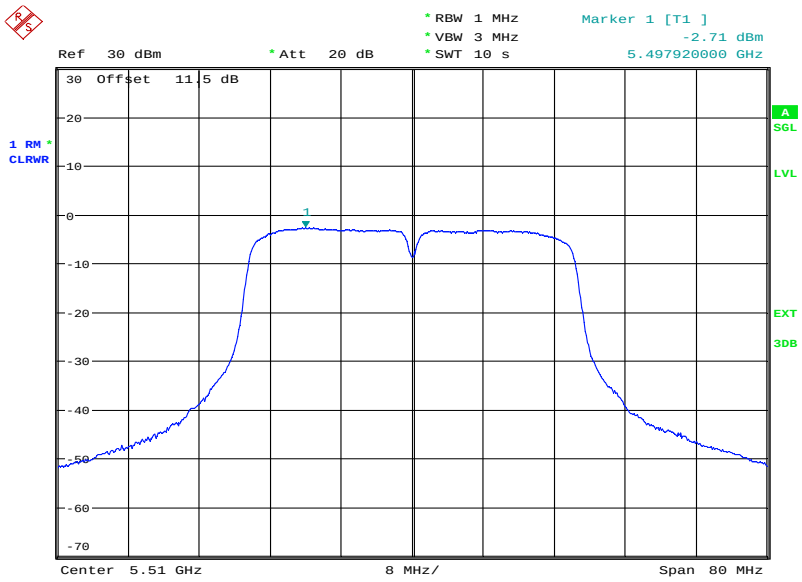


The test was performed on the worst case data rate for 802.11(ac) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Frequency Band 3

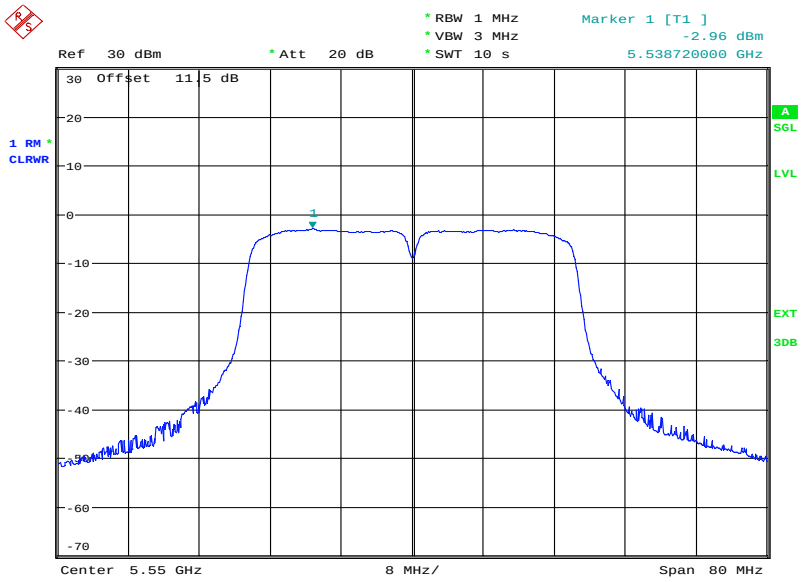
5510 MHz

Peak Power Spectral Density (dBm)	-2.71



5550 MHz

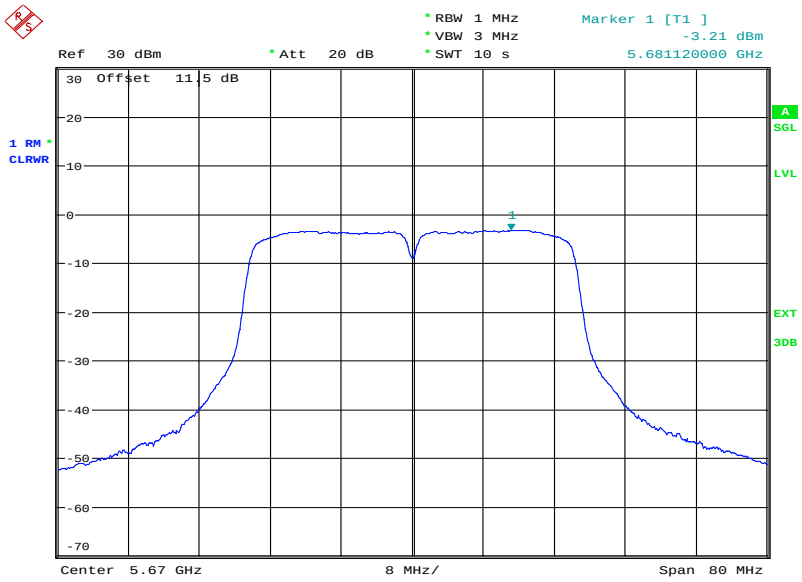
Peak Power Spectral Density (dBm)	-2.96



Date: 3.APR.2014 16:57:16

5670 MHz

Peak Power Spectral Density (dBm)	-3.21



The test was performed on the worst case data rate for 802.11(ac) - 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

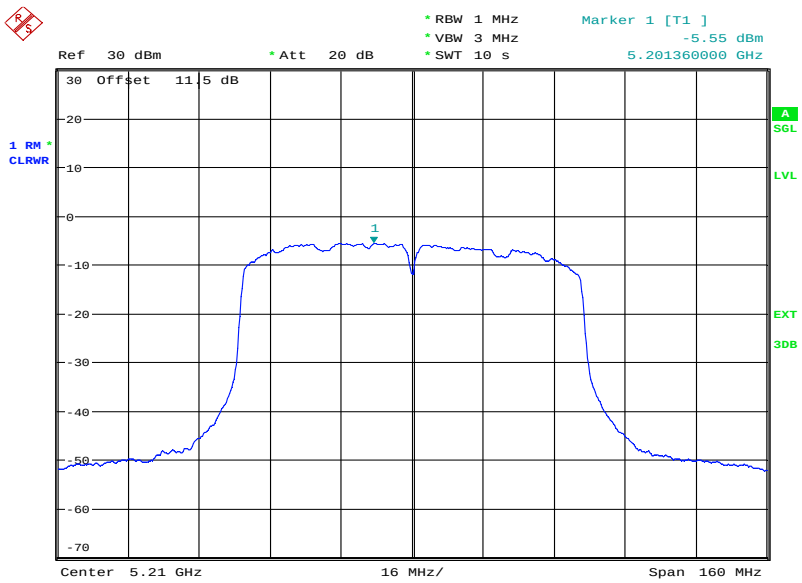
Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz

802.11(ac) - 5 GHz 80 MHz BW

Frequency Band 1

5210 MHz

Peak Power Spectral Density (dBm)	-5.55



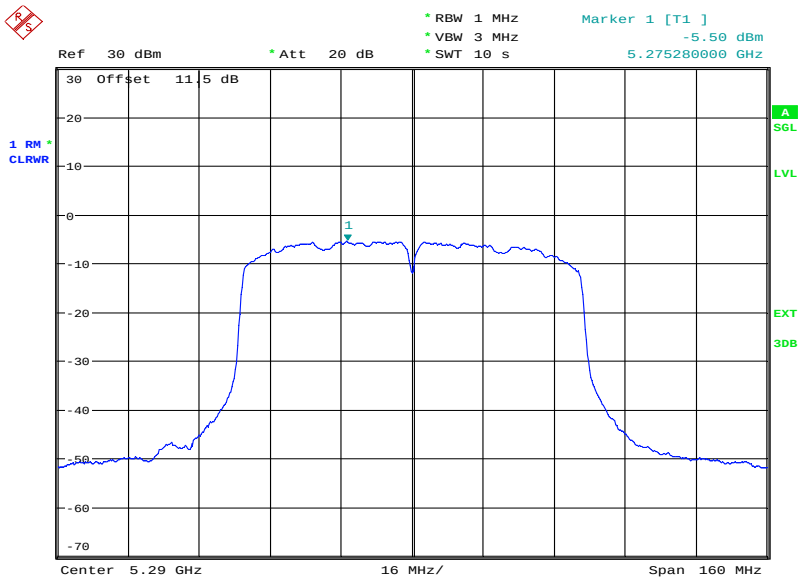
Date: 3.APR.2014 17:39:55

The test was performed on the worst case data rate for 802.11(ac) - 80 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 MCS1.

Frequency Band 2

5290 MHz

Peak Power Spectral Density (dBm)	-5.50

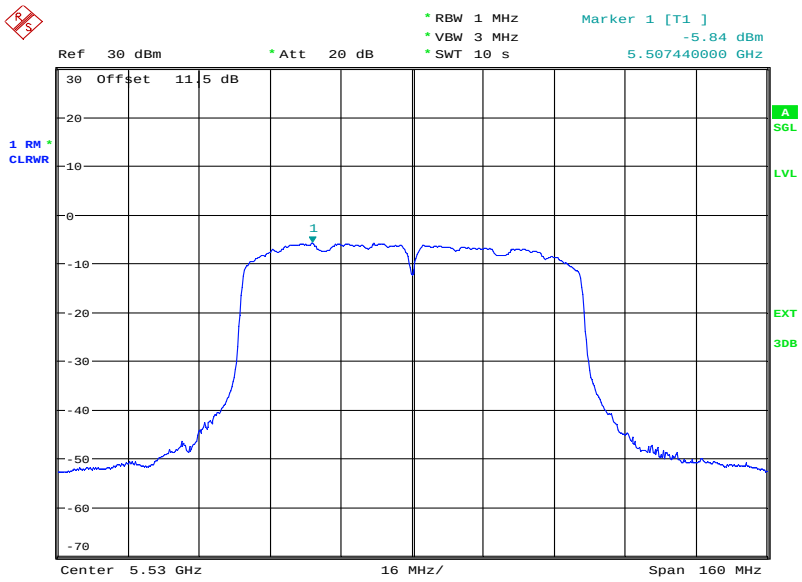


The test was performed on the worst case data rate for 802.11(ac) - 80 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS1.

Frequency Band 3

5530 MHz

Peak Power Spectral Density (dBm)	-5.84



The test was performed on the worst case data rate for 802.11(ac) - 80 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 MCS1.

Limit

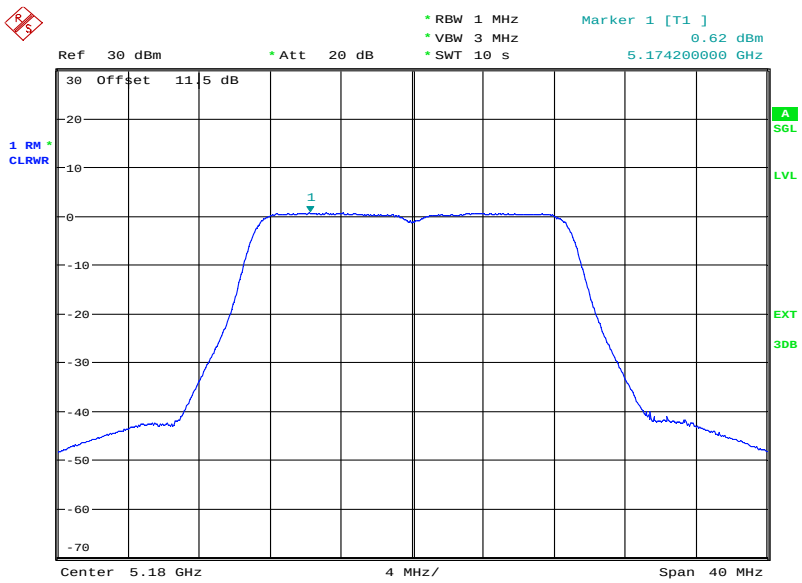
Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz

802.11(n) - 5 GHz 20 MHz BW

Frequency Band 1

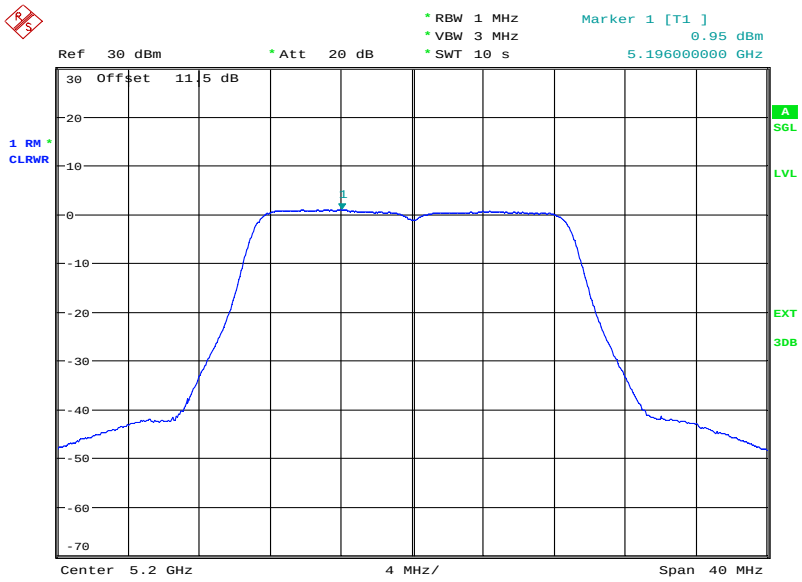
5180 MHz

Peak Power Spectral Density (dBm)	0.62



5200 MHz

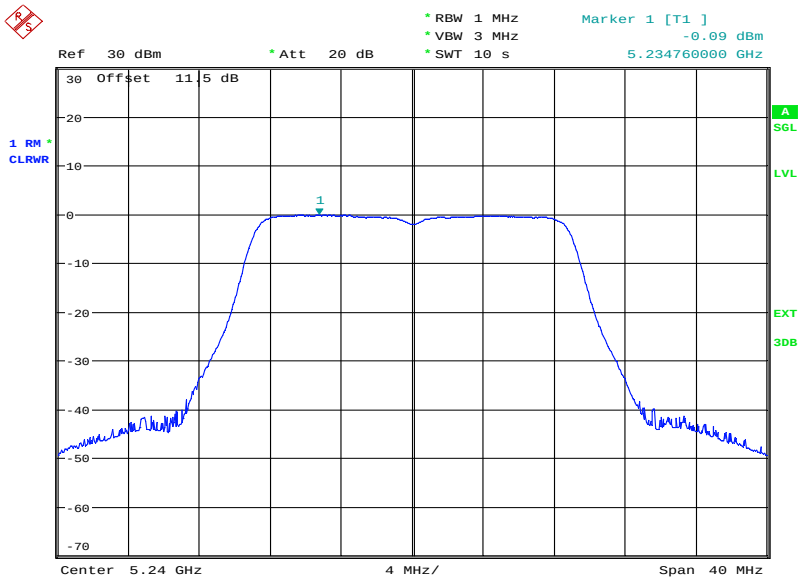
Peak Power Spectral Density (dBm)	0.95



Date: 3.APR.2014 17:46:26

5240 MHz

Peak Power Spectral Density (dBm)	-0.09

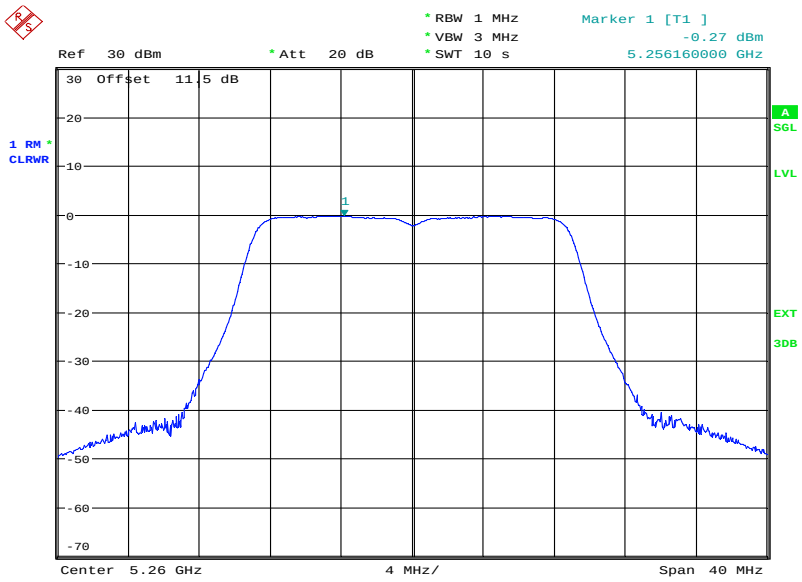


The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS2.

Frequency Band 2

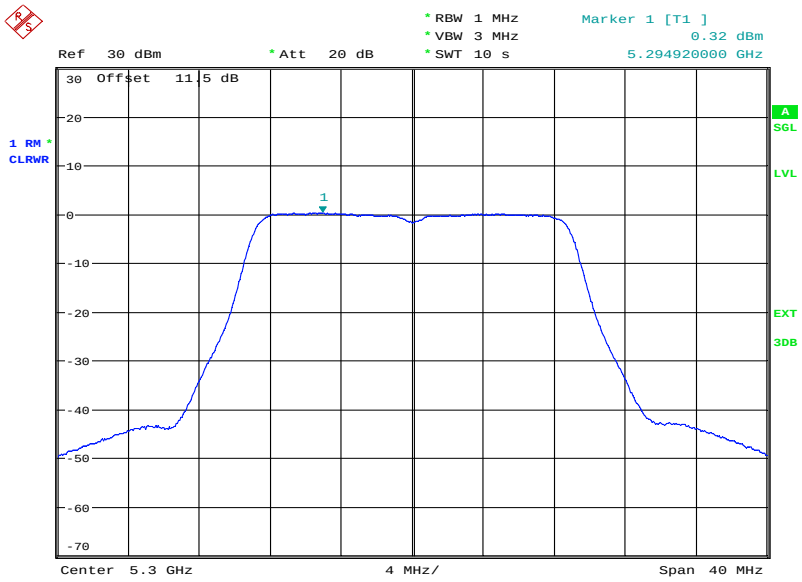
5260 MHz

Peak Power Spectral Density (dBm)	-0.27



5300 MHz

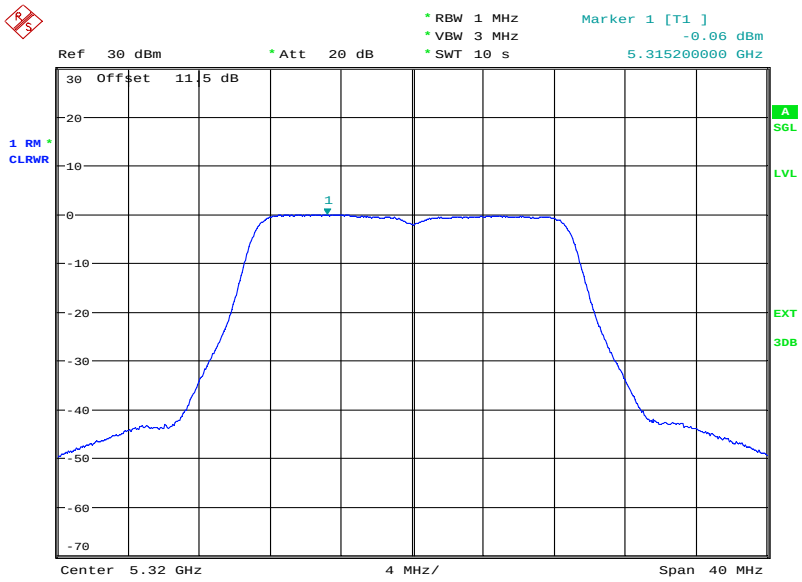
Peak Power Spectral Density (dBm)	0.32



Date: 3.APR.2014 17:48:51

5320 MHz

Peak Power Spectral Density (dBm)	-0.06

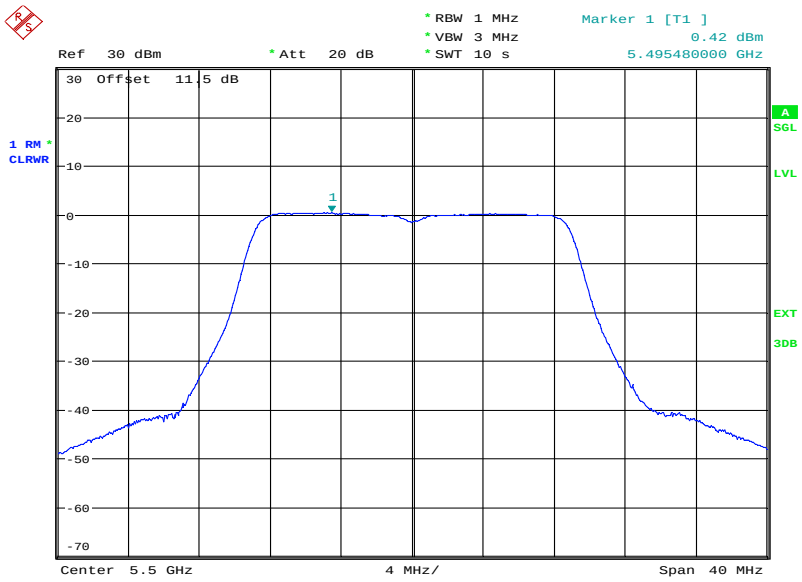


The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS2.

Frequency Band 3

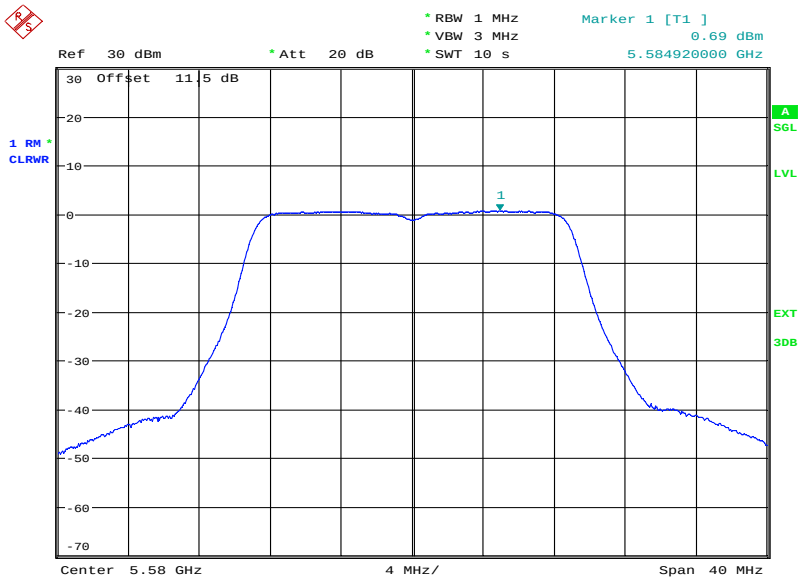
5500 MHz

Peak Power Spectral Density (dBm)	0.42



5580 MHz

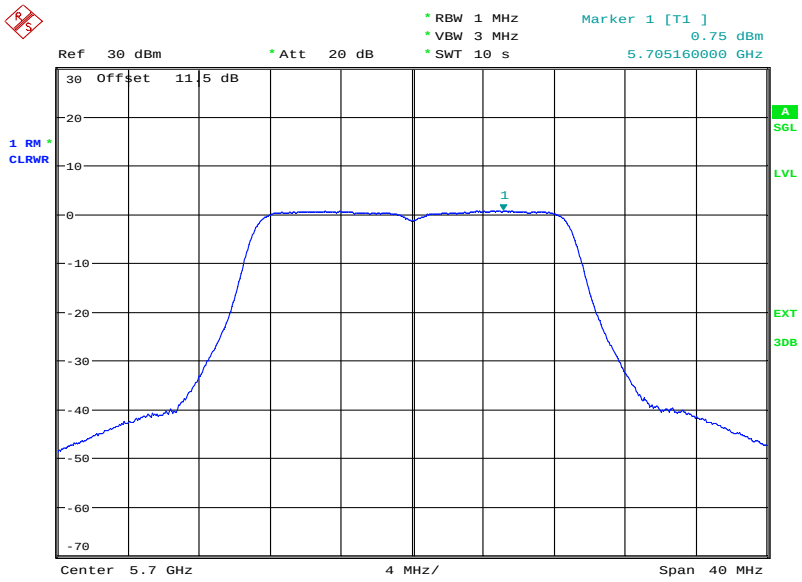
Peak Power Spectral Density (dBm)	0.69



Date: 3.APR.2014 17:51:30

5700 MHz

Peak Power Spectral Density (dBm)	0.75



Date: 3.APR.2014 17:52:10

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 MCS2.

Limit

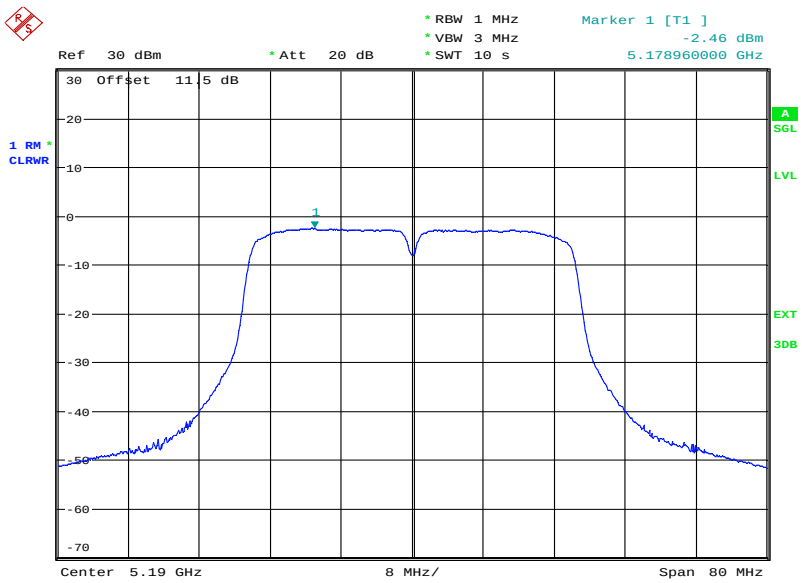
Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz

802.11(n) - 5 GHz 40 MHz BW

Frequency Band 1

5190 MHz

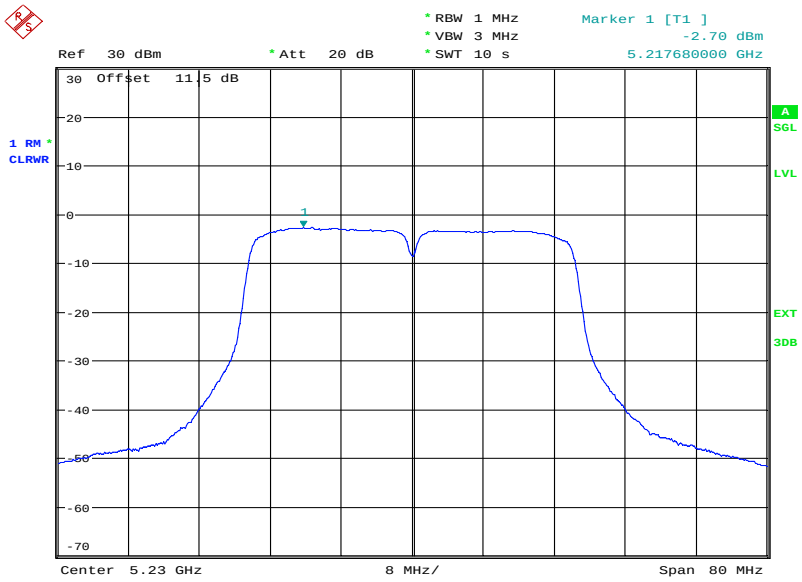
Peak Power Spectral Density (dBm)	-2.46



Date: 3.APR.2014 18:00:28

5230 MHz

Peak Power Spectral Density (dBm)	-2.70



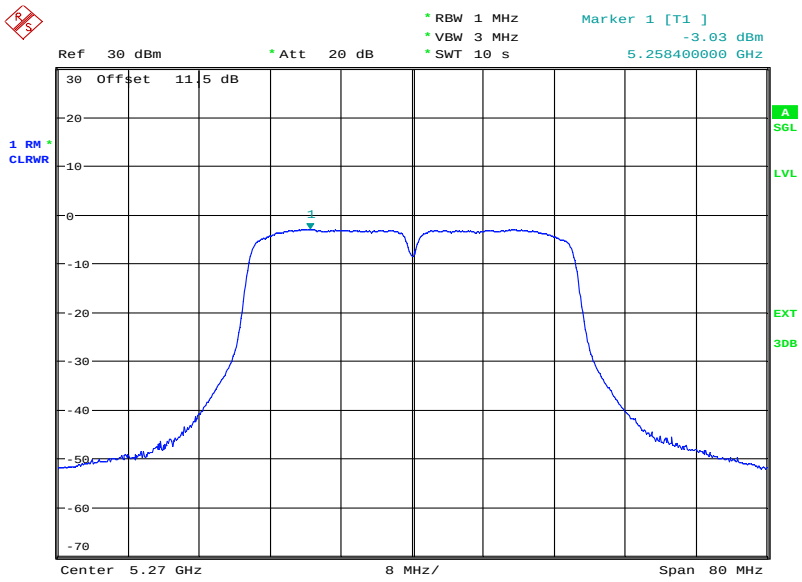
Date: 3.APR.2014 18:02:15

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 MCS1.

Frequency Band 2

5270 MHz

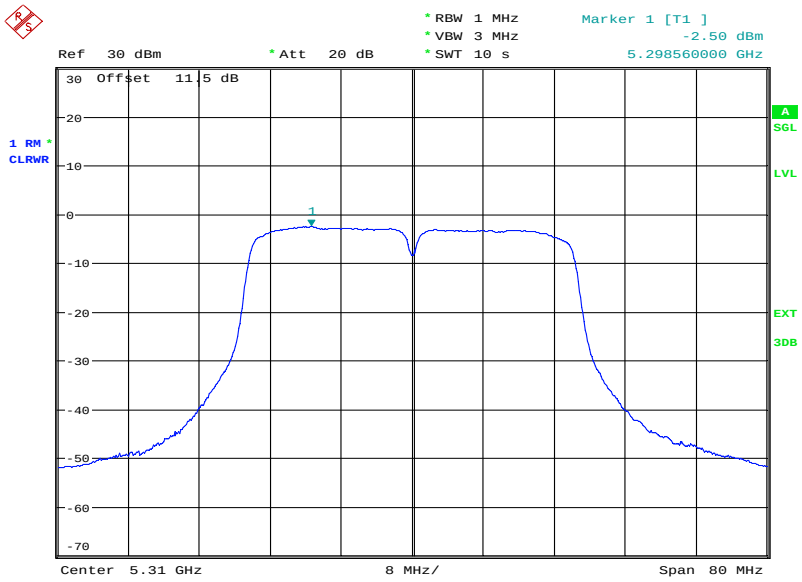
Peak Power Spectral Density (dBm)	-3.03



Date: 3.APR.2014 18:03:04

5310 MHz

Peak Power Spectral Density (dBm)	-2.50

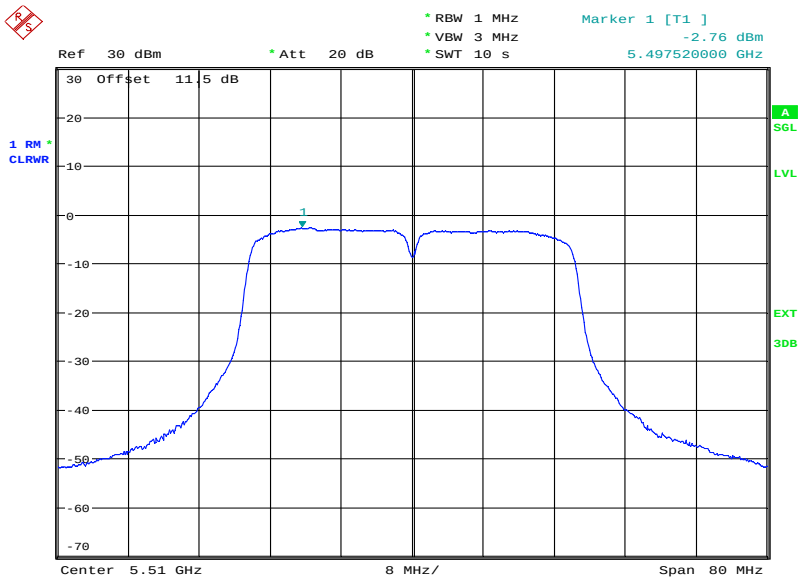


The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS1.

Frequency Band 3

5510 MHz

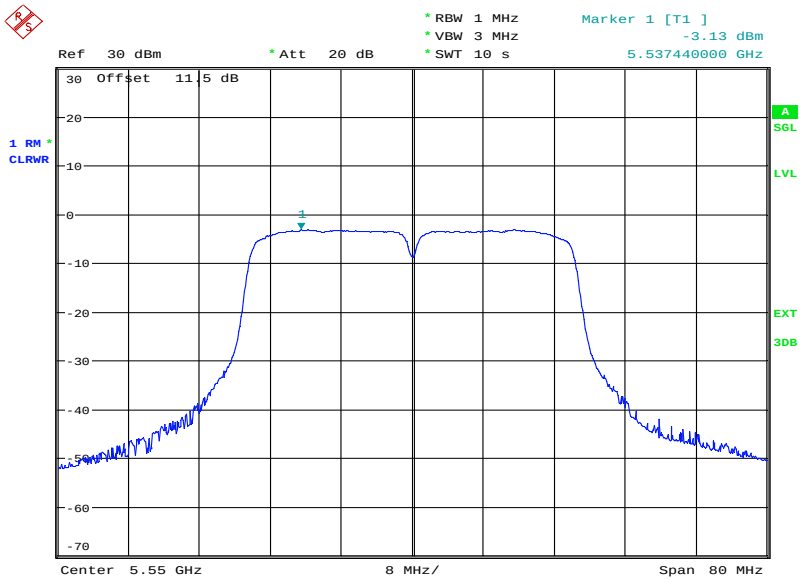
Peak Power Spectral Density (dBm)	-2.76



Date: 3.APR.2014 18:04:43

5550 MHz

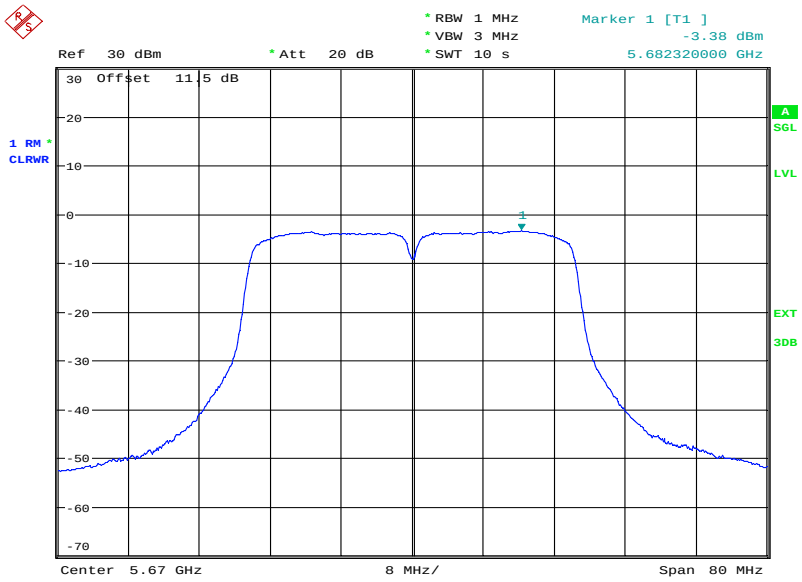
Peak Power Spectral Density (dBm)	-3.13



Date: 3.APR.2014 18:05:27

5670 MHz

Peak Power Spectral Density (dBm)	-3.38



Date: 3.APR.2014 18:06:27

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 MCS1.

Limit

Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz

2.5 RATIO OF THE PEAK EXCURSION OF THE MODULATION ENVELOPE

2.5.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.407 (a)(6)

2.5.2 Equipment Under Test and Modification State

SHL25 S/N: IMEI 004401115170470 - Modification State 0

2.5.3 Date of Test

3 April 2014

2.5.4 Test Equipment Used

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

2.5.5 Test Procedure

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15.407 (a) and KDB 789033.

The EUT was transmitted at maximum power for bottom, middle and top channels on the data rate pre-determined to give the highest level of average output power. The EUT was connected to a spectrum analyser via an attenuator and cable. The Analyser settings were adjusted to display the resultant trace on screen. The analyser settings were configured with an RBW of 1 MHz and video bandwidth of 3 x RBW. The trace was set to max hold using a peak detector and the maximum value was recorded. The ratio of this result to the peak power spectral density was calculated and reported.

2.5.6 Environmental Conditions

Ambient Temperature	25.4°C
Relative Humidity	36.4%

Product Service

2.5.7 Test Results

802.11(a)

Frequency Band 1

5180 MHz

Ratio (dB)	10.22

5200 MHz

Ratio (dB)	10.20

5240 MHz

Ratio (dB)	10.44

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 18 Mbps.

Frequency Band 2

5260 MHz

Ratio (dB)	10.42

5300 MHz

Ratio (dB)	10.34

5320 MHz

Ratio (dB)	10.51

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 18 Mbps.

Frequency Band 3

5500 MHz

Ratio (dB)	10.68

5580 MHz

Ratio (dB)	10.05

5700 MHz

Ratio (dB)	9.99

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 18 Mbps.

Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

802.11(ac) - 5 GHz 20 MHz BW

Frequency Band 1

5180 MHz

Ratio (dB)	8.89

5200 MHz

Ratio (dB)	8.77

5240 MHz

Ratio (dB)	9.82

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 MCS3.

Frequency Band 2

5260 MHz

Ratio (dB)	8.91

5300 MHz

Ratio (dB)	8.77

5320 MHz

Ratio (dB)	9.60

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 MCS3.

Frequency Band 3

5500 MHz

Ratio (dB)	8.81

5580 MHz

Ratio (dB)	8.84

5700 MHz

Ratio (dB)	9.09

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 MCS3.

Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

802.11(ac) - 5 GHz 40 MHz BW

Frequency Band 1

5190 MHz

Ratio (dB)	9.44

5230 MHz

Ratio (dB)	9.17

The test was performed on the worst case data rate for 802.11(ac) - 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.

Frequency Band 2

5270 MHz

Ratio (dB)	9.32

5310 MHz

Ratio (dB)	9.20

The test was performed on the worst case data rate for 802.11(ac) - 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.

Frequency Band 3

5510 MHz

Ratio (dB)	9.21

5550 MHz

Ratio (dB)	9.26

5670 MHz

Ratio (dB)	9.09

The test was performed on the worst case data rate for 802.11(ac) - 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

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

802.11(ac) - 5 GHz 80 MHz BW

Frequency Band 1

5210 MHz

Ratio (dB)	9.12

The test was performed on the worst case data rate for 802.11(ac) - 80 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 MCS1.

Frequency Band 2

5290 MHz

Ratio (dB)	9.20

The test was performed on the worst case data rate for 802.11(ac) - 80 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 MCS1.

Frequency Band 3

5530 MHz

Ratio (dB)	9.33

The test was performed on the worst case data rate for 802.11(ac) - 80 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 MCS1.

Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

802.11(n) - 5 GHz 20 MHz BW

Frequency Band 1

5180 MHz

Ratio (dB)	10.19

5200 MHz

Ratio (dB)	10.40

5240 MHz

Ratio (dB)	10.44

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 MCS2.

Frequency Band 2

5260 MHz

Ratio (dB)	10.69

5300 MHz

Ratio (dB)	10.34

5320 MHz

Ratio (dB)	10.66

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 MCS2.

Frequency Band 3

5500 MHz

Ratio (dB)	10.57

5580 MHz

Ratio (dB)	10.35

5700 MHz

Ratio (dB)	10.42

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 MCS2.

Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

802.11(n) - 5 GHz 40 MHz BW

Frequency Band 1

5190 MHz

Ratio (dB)	10.44

5230 MHz

Ratio (dB)	10.30

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 MCS1.

Frequency Band 2

5270 MHz

Ratio (dB)	10.59

5310 MHz

Ratio (dB)	10.63

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 MCS1.

Frequency Band 3

5510 MHz

Ratio (dB)	10.41

5550 MHz

Ratio (dB)	10.72

5670 MHz

Ratio (dB)	10.22

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 MCS1.

Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

2.6 UNDESIRABLE EMISSION LIMITS

2.6.1 Specification Reference

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

2.6.2 Equipment Under Test and Modification State

SHL25 S/N: IMEI 004401115170496 - Modification State 1

2.6.3 Date of Test

4 April 2014, 6 April 2014, 18 April 2014, 21 April 2014, 22 April 2014, 23 April 2014, 24 April 2014, 25 April 2014, 27 April 2014 & 28 April 2014

2.6.4 Test Equipment Used

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

2.6.5 Test Procedure

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15.407 (b) and KDB 789033.

For conducted emissions, the EUT was set to operate at maximum power on the data rate pre-determined to give the highest level of average output power. The analyser settings were configured with a peak detector and max hold trace using an RBW of 1 MHz; the measurement path loss in each relevant frequency band was measured and entered as a reference level offset. The test was performed on the bottom, middle and top channels of each sub-band. The test was performed over the frequency range 9 kHz to 40 GHz.

For radiated emissions, the test method described above was also used. However, the measurement was performed from 30 MHz to 40 GHz and the path loss is incorporated as a transducer factor and entered into the spectrum analyser. In each frequency span the level was maximised by rotating the EUT 360° and a height search of the measuring antenna.

Band edge measurements were performed in accordance with ANSI C63.10, Clause 6.9.3. The results were analysed to ensure compliance with restricted bands. The EUT was set to the lowest and highest operating frequencies.

2.6.6 Environmental Conditions

Ambient Temperature	19.7 - 22.9°C
Relative Humidity	27.0 - 44.0%

Product Service

2.6.7 Test Results

802.11(a)

4.0 V DC Supply

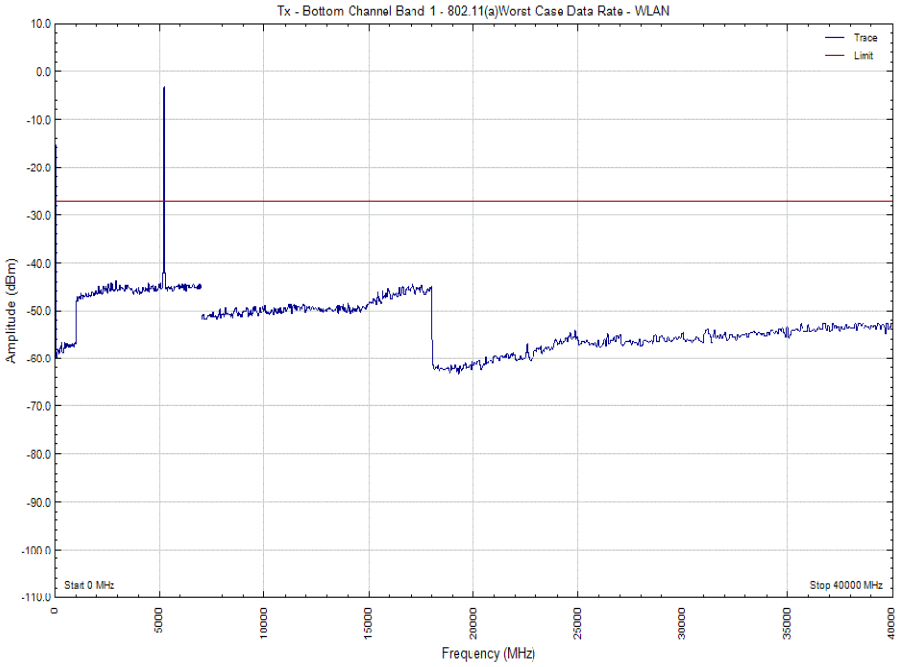
Spurious Conducted Emissions

18 Mbps

Frequency Band 1

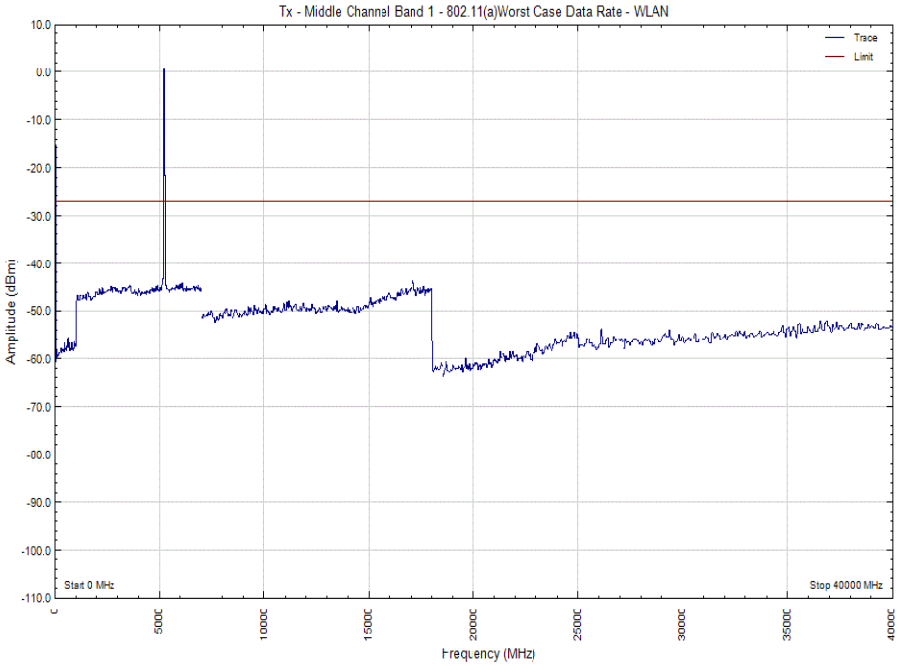
5180 MHz

9 kHz to 40 GHz



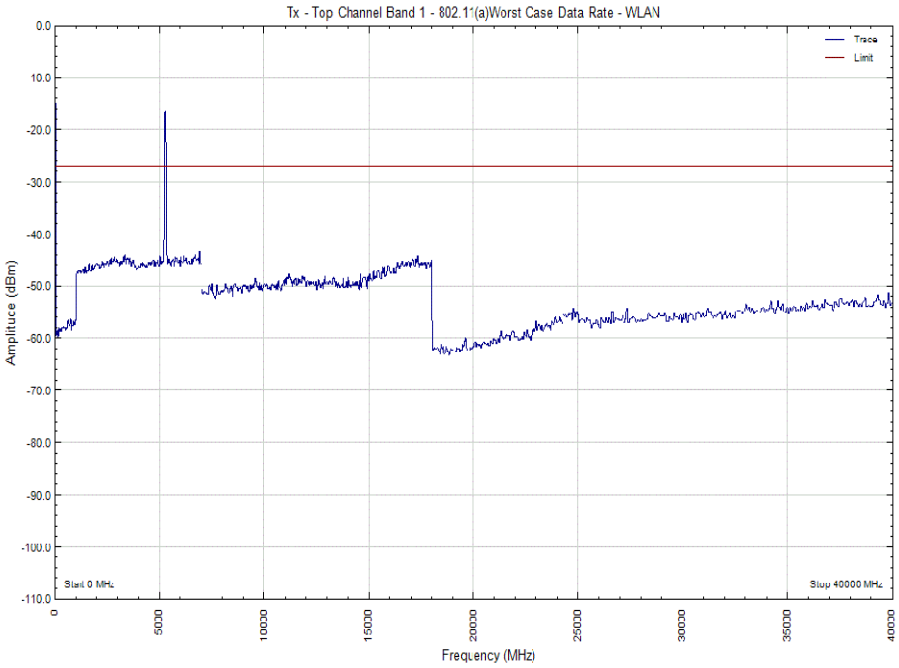
5200 MHz

9 kHz to 40 GHz



5200 MHz

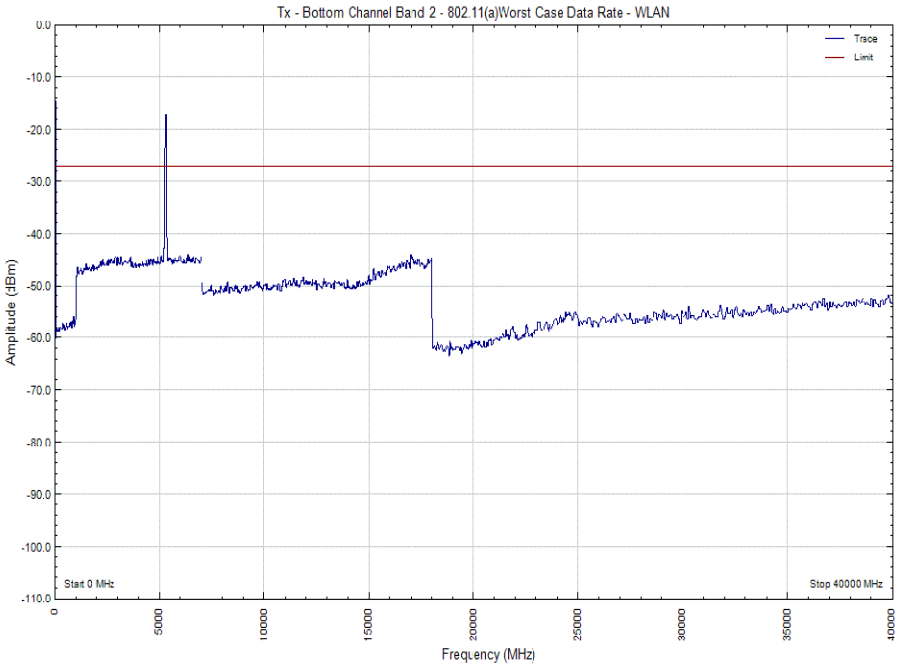
9 kHz to 40 GHz



Frequency Band 2

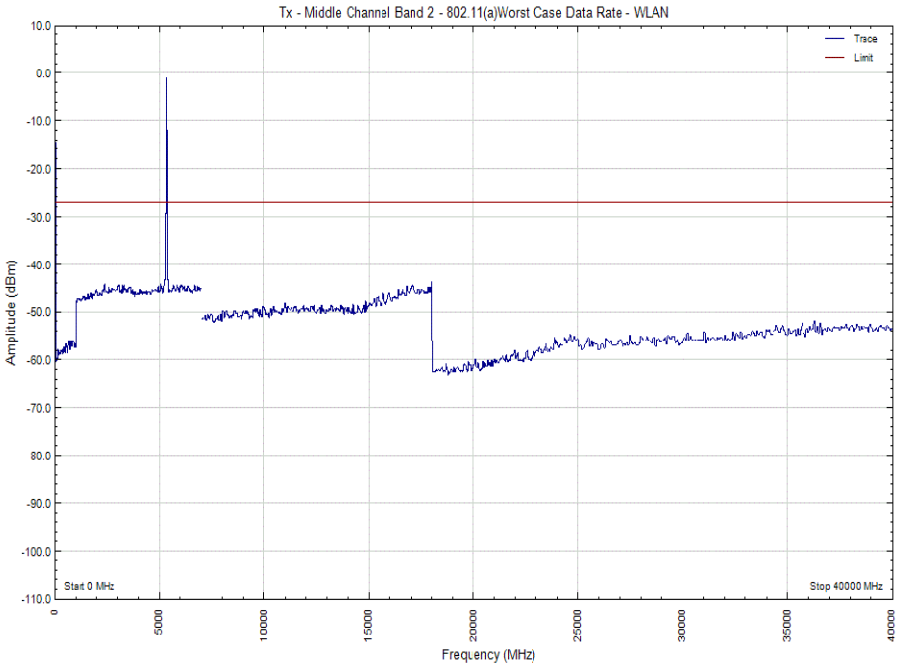
5260 MHz

9 kHz to 40 GHz



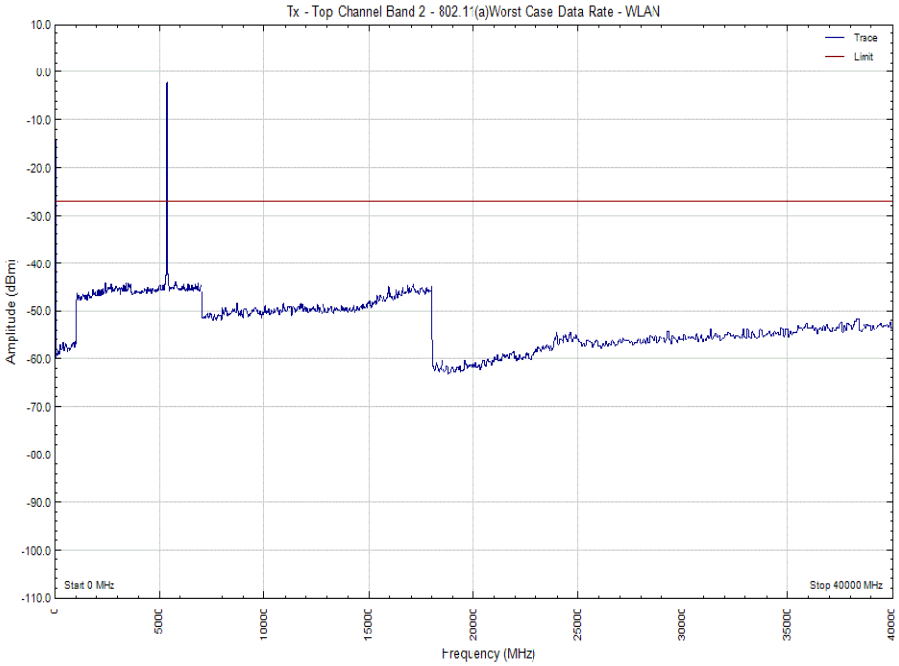
5300 MHz

9 kHz to 40 GHz



5320 MHz

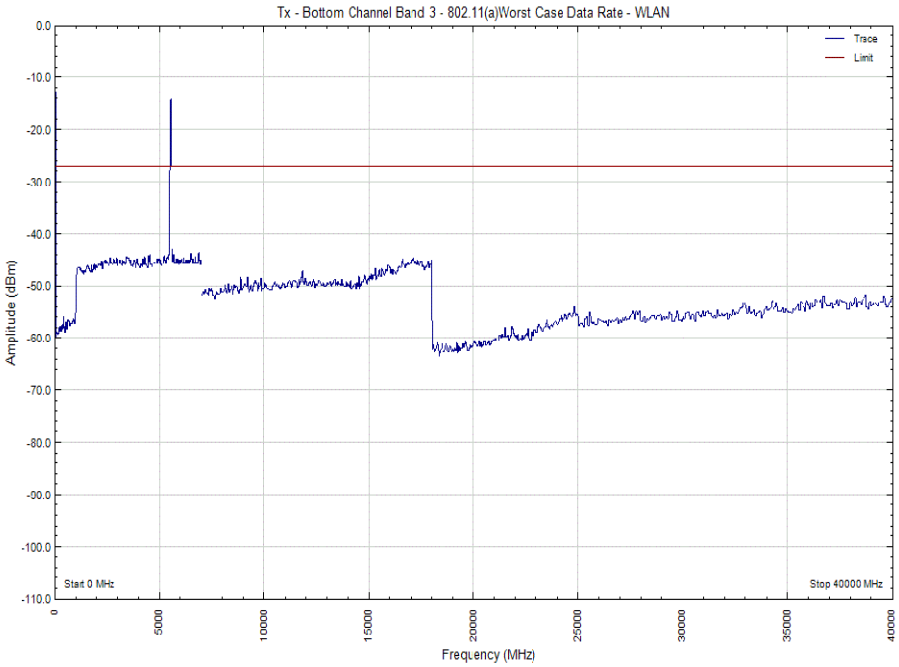
9 kHz to 40 GHz



Frequency Band 3

5500 MHz

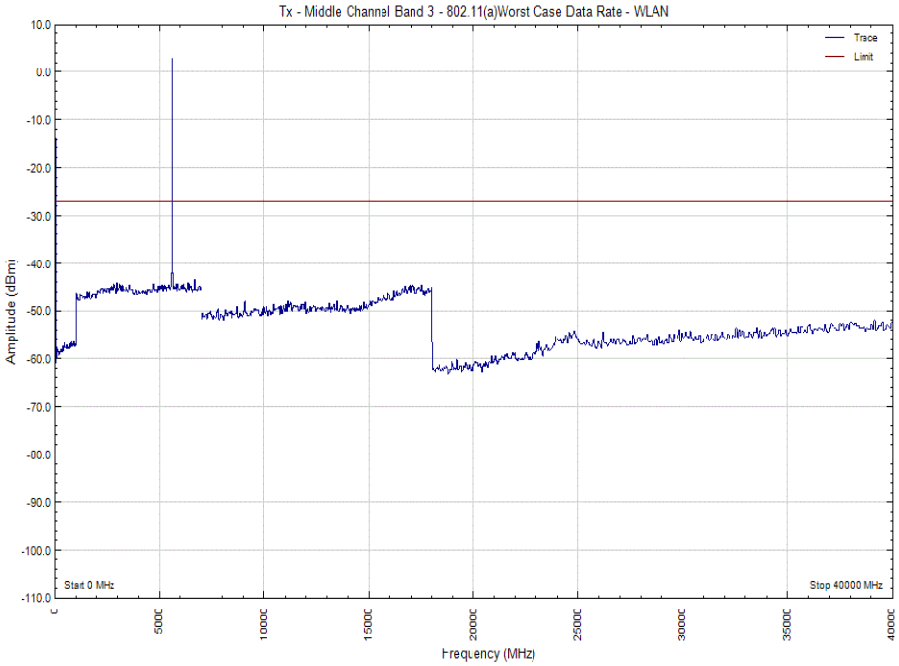
9 kHz to 40 GHz



Product Service

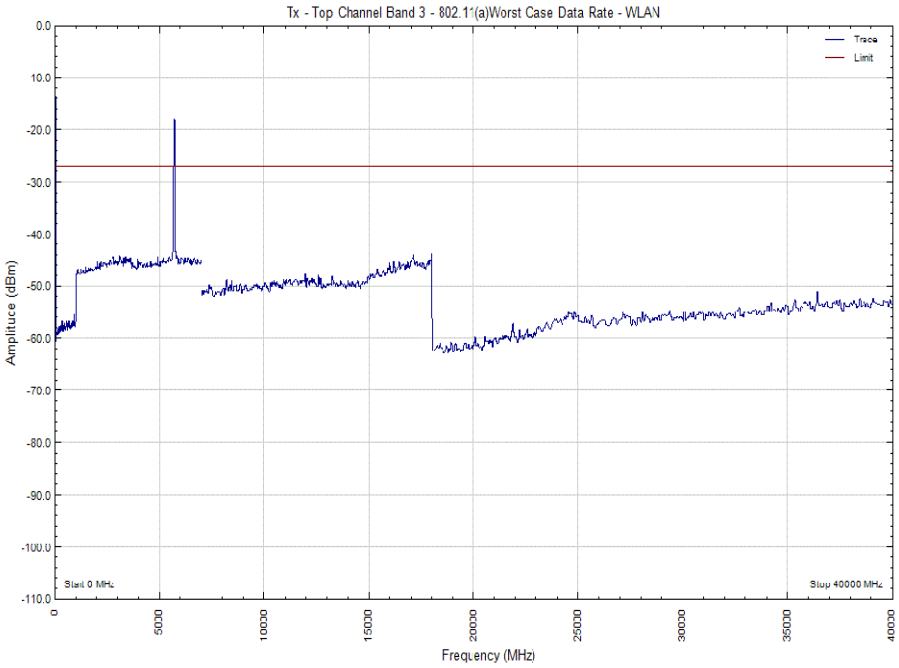
5580 MHz

9 kHz to 40 GHz



5700 MHz

9 kHz to 40 GHz



Limit Clause

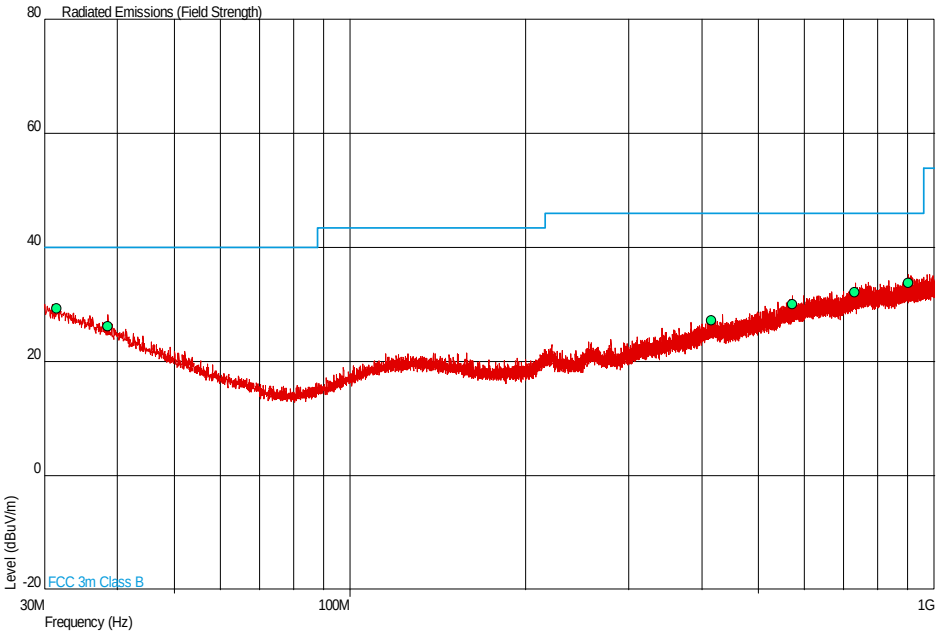
Band of Operation (MHz)	Limit
5150 to 5250	-27 dBm/MHz
5250 to 5350	-27 dBm/MHz
5470 to 5725	-27 dBm/MHz
5725 to 5825	(5715 to 5725 MHz) -17 dBm/MHz (5825 to 5835 MHz) -17 dBm/MHz (<5715 and > 5835 MHz) -27 dBm/MHz

Spurious Radiated Emissions

Frequency Band 1

5180 MHz

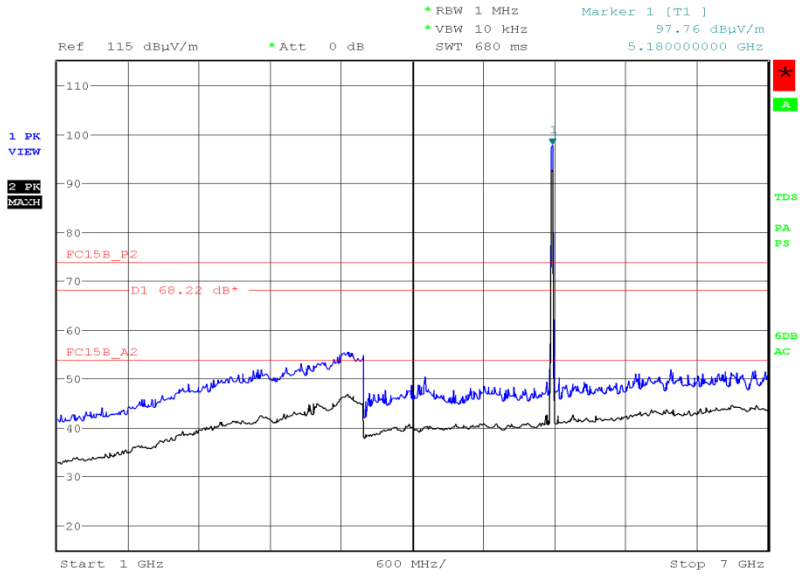
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (uV/m)	QP Limit (dBµV/m)	QP Limit (uV/m)	QP Margin (dB)	QP Margin (uV)	Angle (Deg)	Height (m)	Polarity
31.501	29.4	29.5	40.0	100	-10.6	-70.5	360	1.00	Vertical
38.585	26.2	20.4	40.0	100	-13.8	-79.6	342	1.00	Horizontal
416.130	27.2	22.9	46.0	200	-18.8	-177.1	210	1.00	Horizontal
571.531	30.1	32.0	46.0	200	-15.9	-168.0	0	1.03	Horizontal
729.569	32.2	40.7	46.0	200	-13.8	-159.3	161	1.00	Vertical
902.666	33.7	48.4	46.0	200	-12.3	-151.6	124	1.04	Horizontal

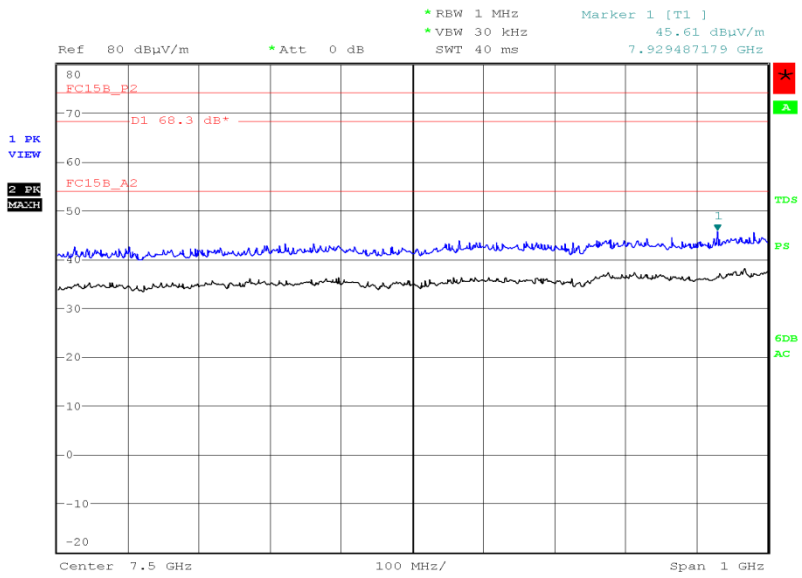
Product Service

1 GHz to 7 GHz



Date: 18.APR.2014 08:33:53

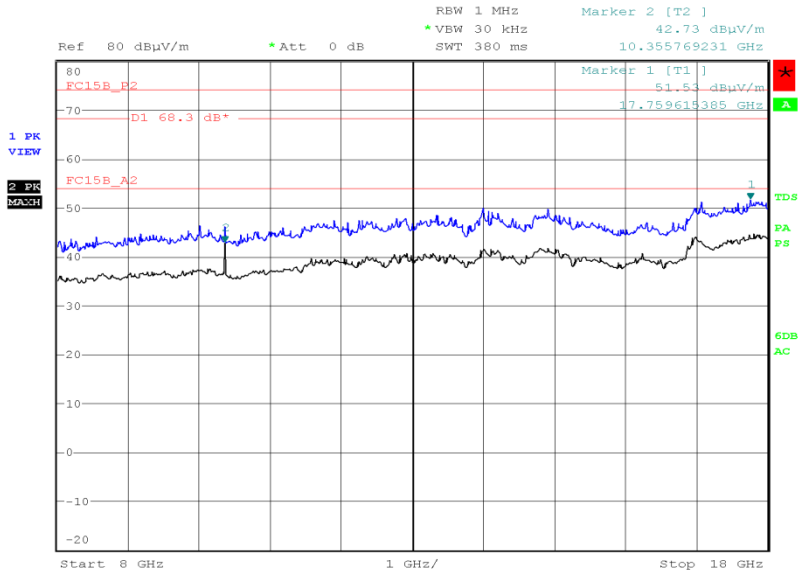
7 GHz to 8 GHz



Date: 22.APR.2014 17:45:02

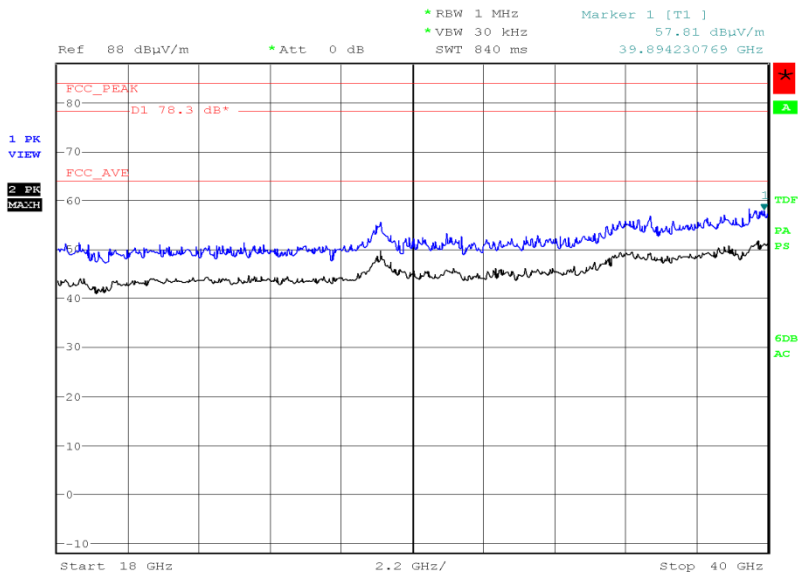
Product Service

8 GHz to 18 GHz



Date: 22.APR.2014 20:12:55

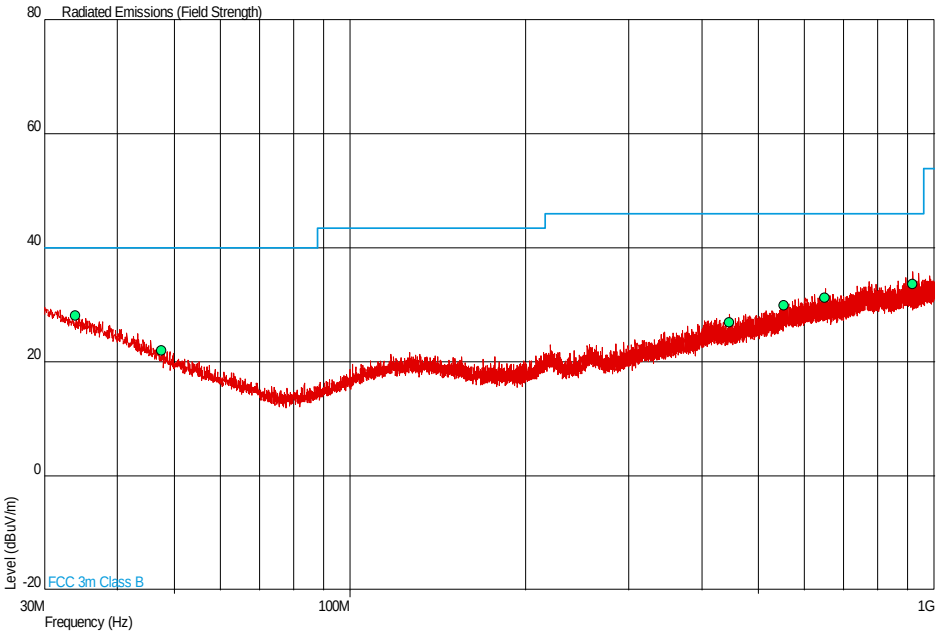
18 GHz to 40 GHz



Date: 27.APR.2014 07:18:10

5200 MHz

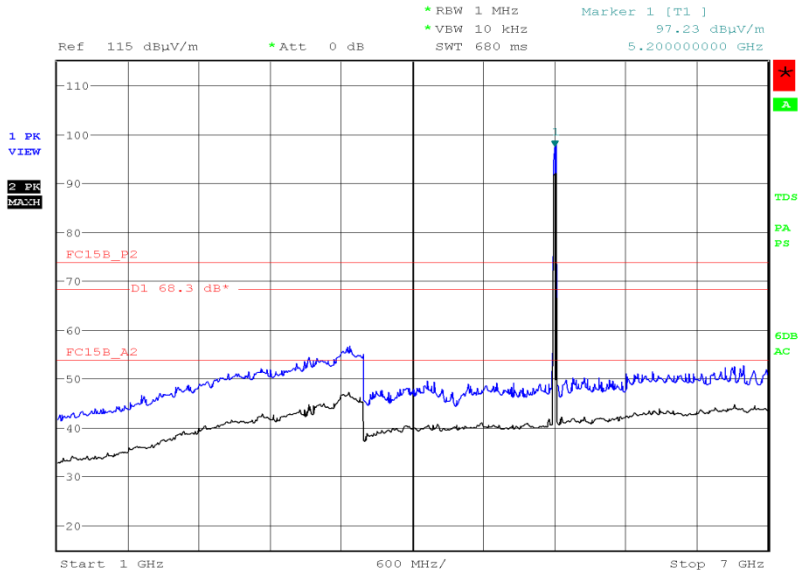
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (uV/m)	QP Limit (dBµV/m)	QP Limit (uV/m)	QP Margin (dB)	QP Margin (uV)	Angle (Deg)	Height (m)	Polarity
33.876	28.1	25.4	40.0	100	-11.9	-74.6	92	1.00	Horizontal
47.598	22.1	12.7	40.0	100	-17.9	-87.3	181	1.00	Vertical
445.577	26.9	22.1	46.0	200	-19.1	-177.9	334	1.00	Horizontal
552.729	29.9	31.3	46.0	200	-16.1	-168.7	199	1.35	Horizontal
650.418	31.3	36.7	46.0	200	-14.7	-163.3	183	1.42	Vertical
919.199	33.6	47.9	46.0	200	-12.4	-152.1	1	1.00	Horizontal

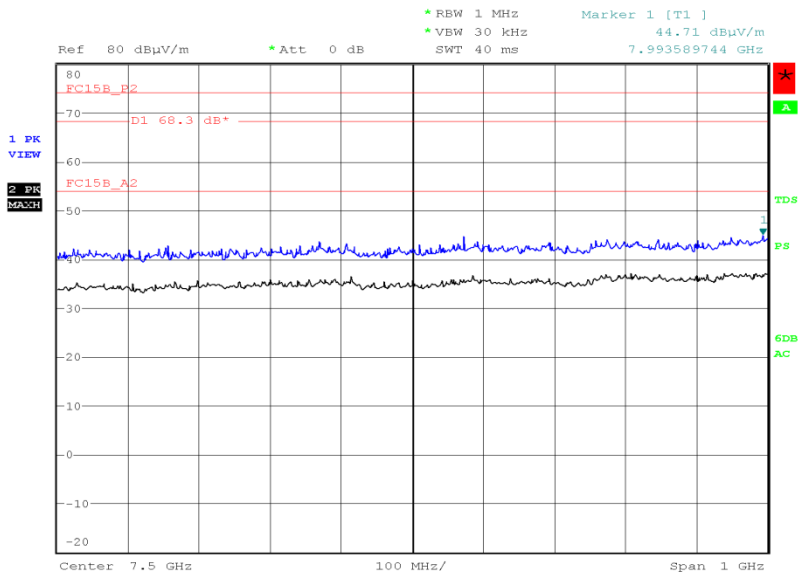
Product Service

1 GHz to 7 GHz



Date: 21.APR.2014 21:19:20

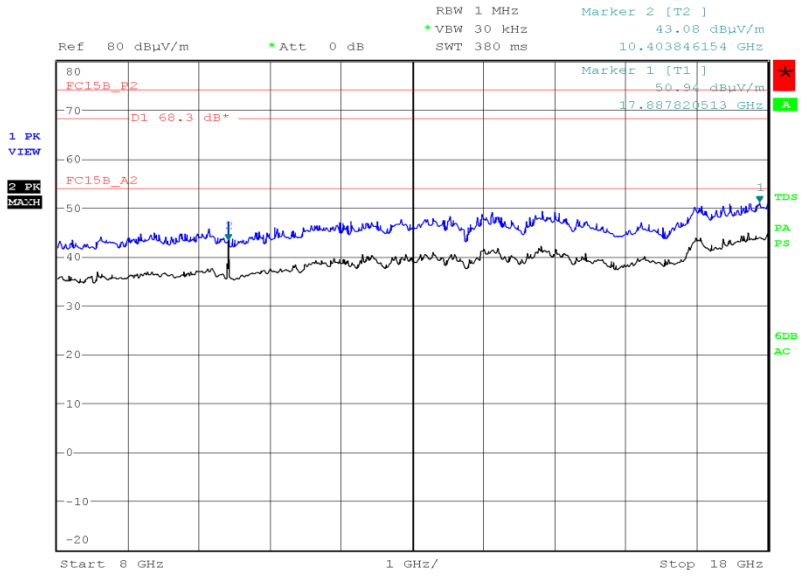
7 GHz to 8 GHz



Date: 22.APR.2014 18:14:19

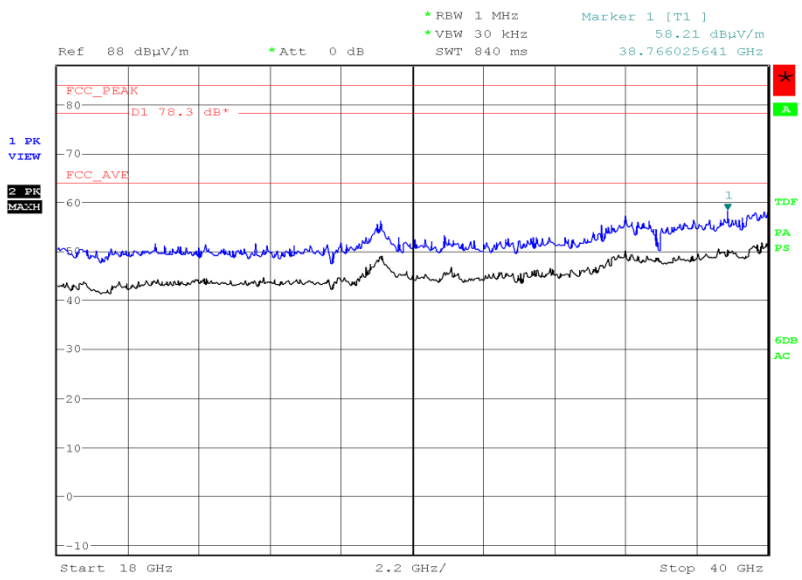
Product Service

8 GHz to 18 GHz



Date: 22.APR.2014 20:26:10

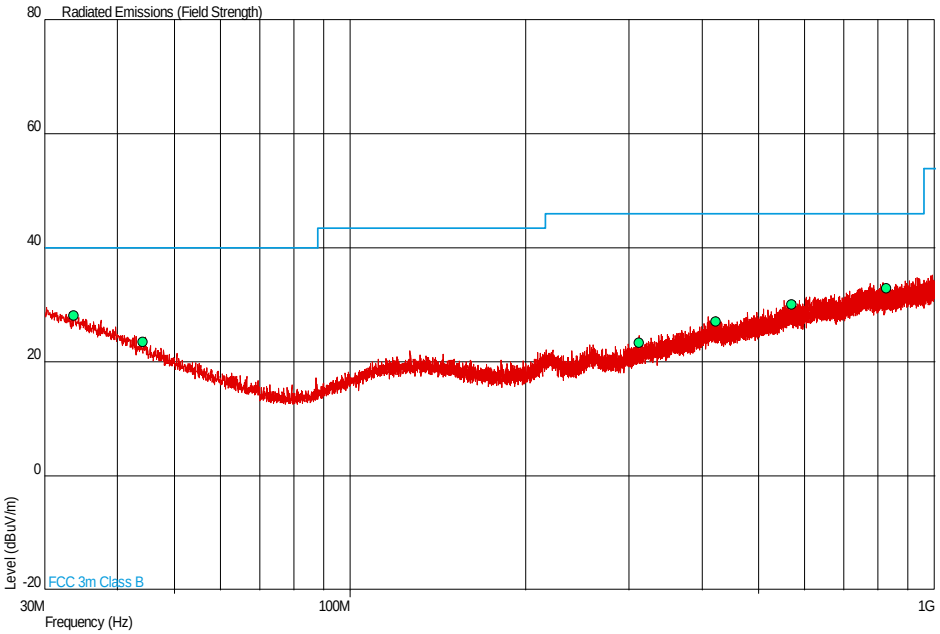
18 GHz to 40 GHz



Date: 27.APR.2014 07:18:45

5240 MHz

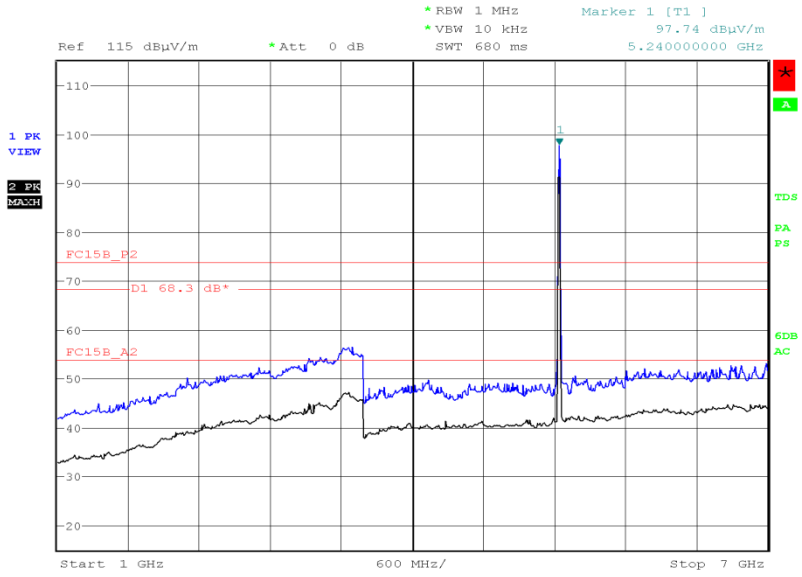
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (uV/m)	QP Limit (dBµV/m)	QP Limit (uV/m)	QP Margin (dB)	QP Margin (uV)	Angle (Deg)	Height (m)	Polarity
33.685	28.2	25.7	40.0	100	-11.8	-74.3	65	2.45	Vertical
44.263	23.5	15.0	40.0	100	-16.5	-85.0	175	1.00	Vertical
311.850	23.4	14.8	46.0	200	-22.6	-185.2	351	1.00	Horizontal
422.913	27.1	22.6	46.0	200	-18.9	-177.4	134	1.00	Horizontal
570.601	30.0	31.6	46.0	200	-16.0	-168.4	37	1.00	Horizontal
825.806	32.9	44.2	46.0	200	-13.1	-155.8	157	1.00	Horizontal

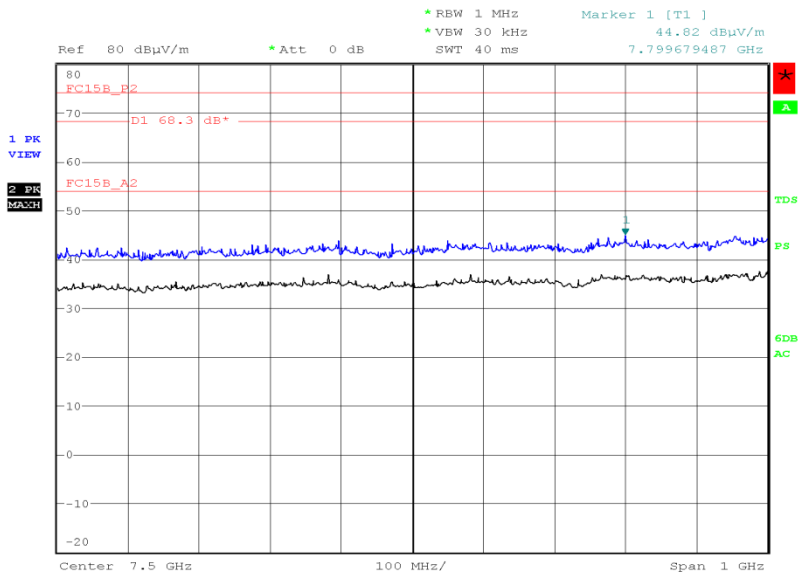
Product Service

1 GHz to 7 GHz



Date: 16.APR.2014 20:52:31

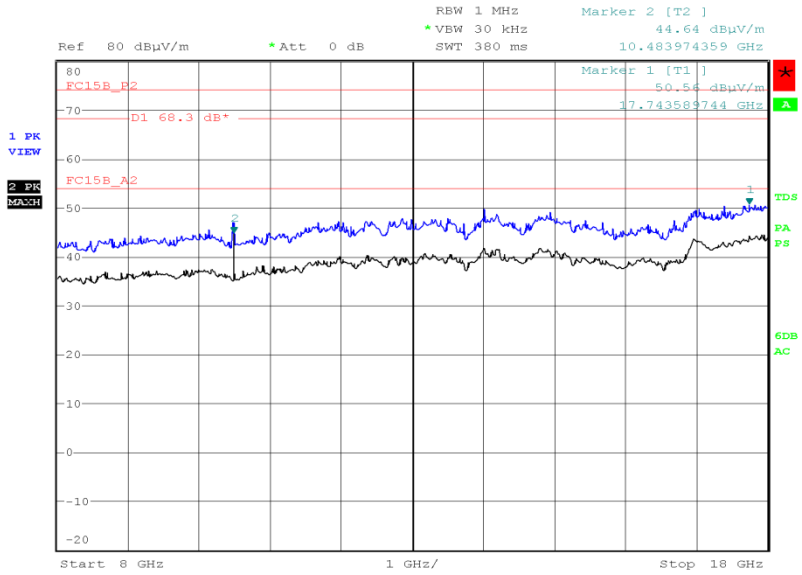
7 GHz to 8 GHz



Date: 22.APR.2014 18:17:47

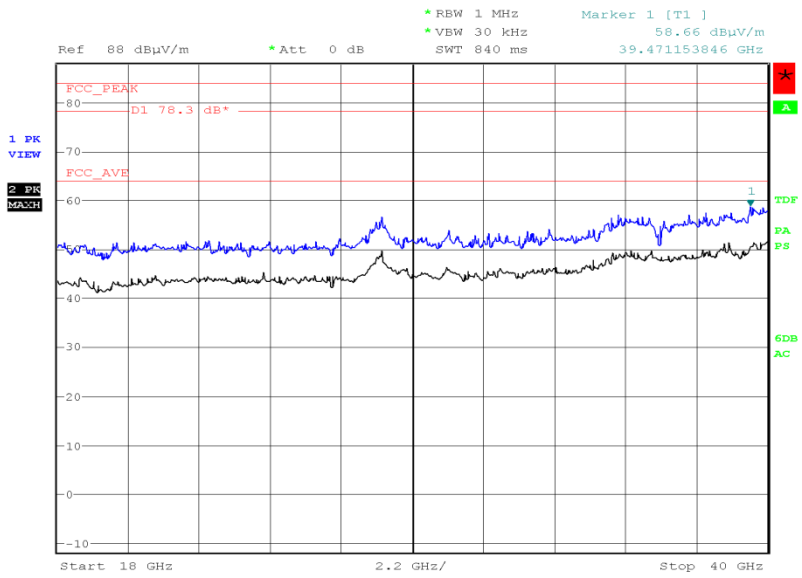
Product Service

8 GHz to 18 GHz



Date: 22.APR.2014 20:42:38

18 GHz to 40 GHz

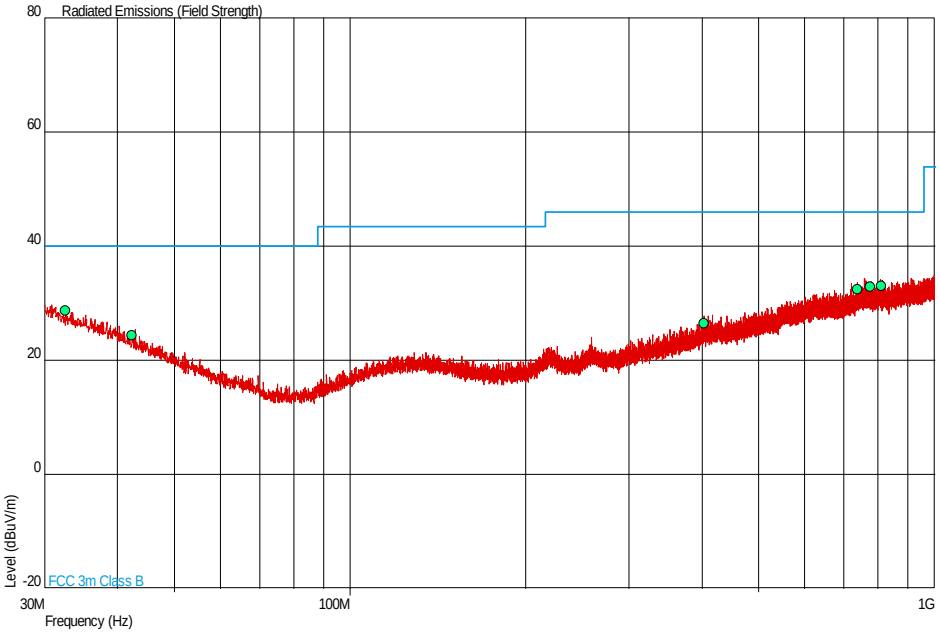


Date: 27.APR.2014 07:16:59

Frequency Band 2

5260 MHz

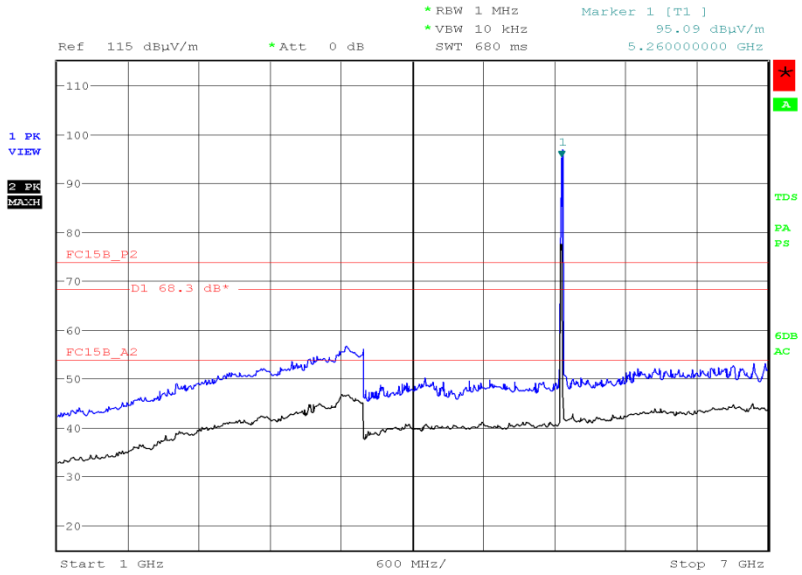
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (uV/m)	QP Limit (dBµV/m)	QP Limit (uV/m)	QP Margin (dB)	QP Margin (uV)	Angle (Deg)	Height (m)	Polarity
32.588	28.7	27.2	40.0	100	-11.3	-72.8	106	1.97	Horizontal
42.322	24.4	16.6	40.0	100	-15.6	-83.4	302	1.00	Horizontal
403.317	26.5	21.1	46.0	200	-19.5	-178.9	304	1.00	Vertical
737.494	32.4	41.7	46.0	200	-13.6	-158.3	276	1.00	Horizontal
777.117	32.9	44.2	46.0	200	-13.1	-155.8	261	2.28	Horizontal
810.174	33.1	45.2	46.0	200	-12.9	-154.8	0	1.00	Horizontal

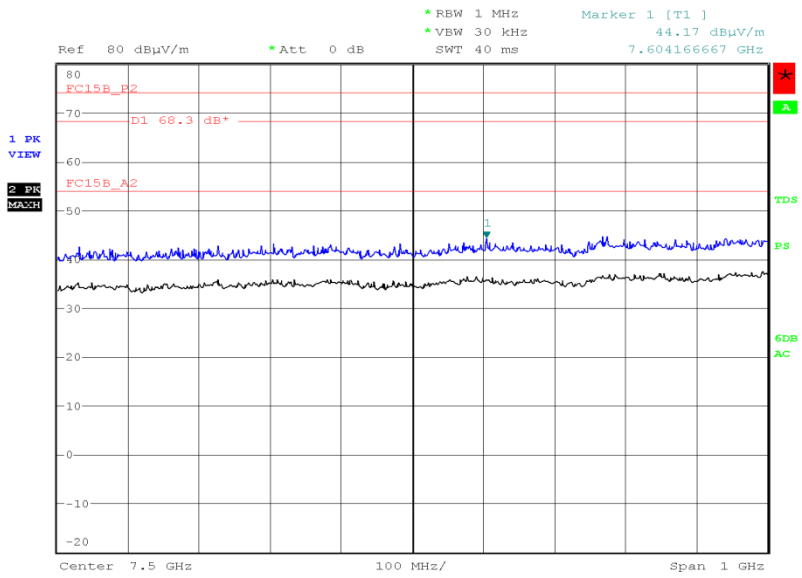
Product Service

1 GHz to 7 GHz



Date: 16.APR.2014 21:08:18

7 GHz to 8 GHz



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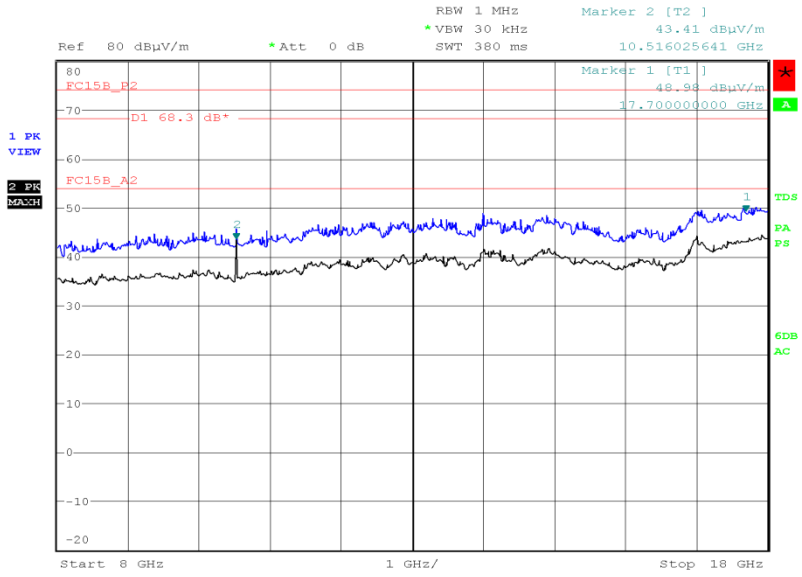
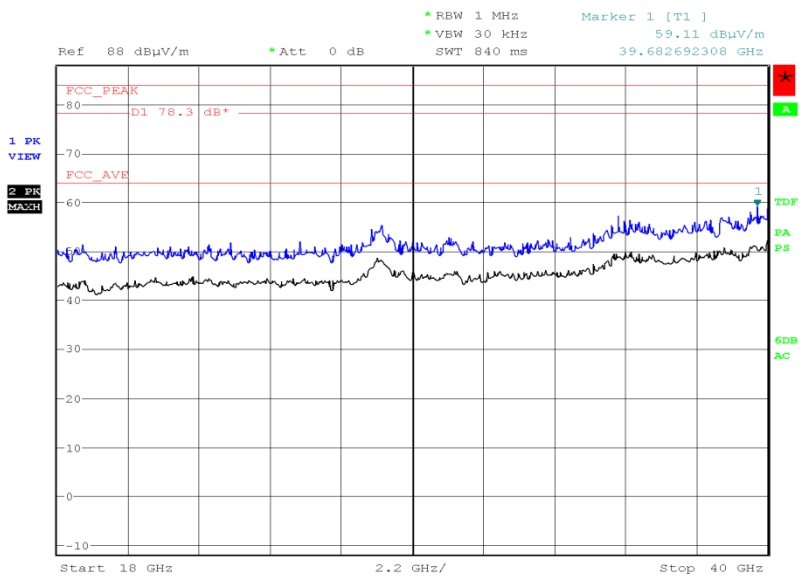
Product Service

8 GHz to 18 GHz



Date: 22.APR.2014 20:53:24

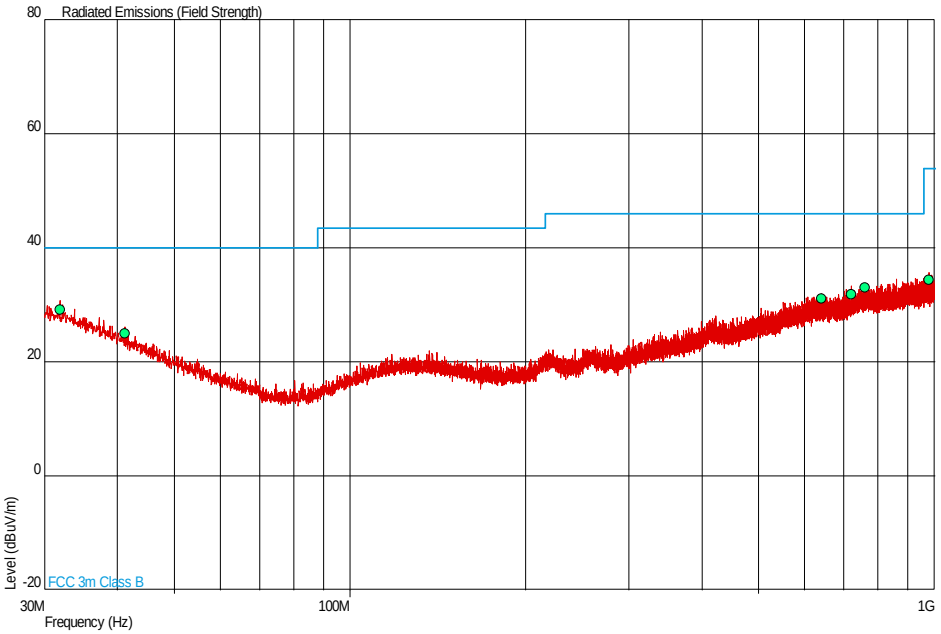
18 GHz to 40 GHz



Date: 27.APR.2014 07:32:29

5300 MHz

30 MHz to 1 GHz

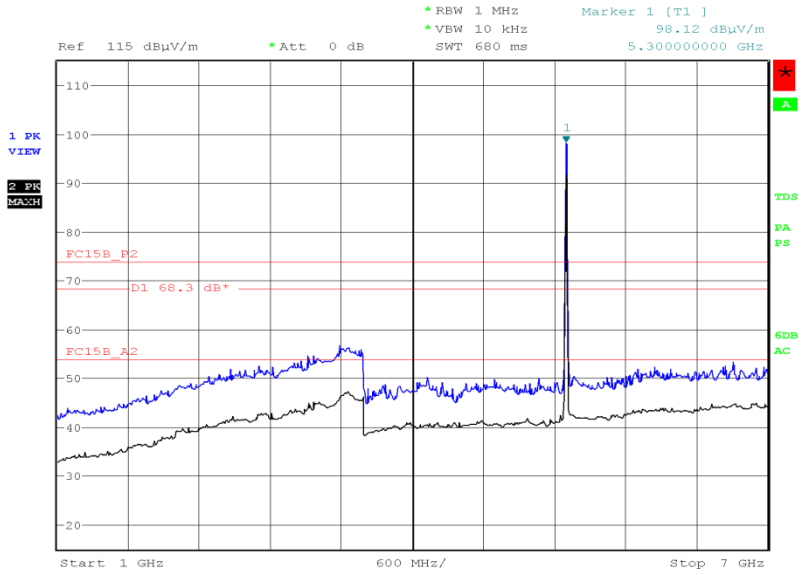


Frequency (MHz)	QP Level (dBµV/m)	QP Level (uV/m)	QP Limit (dBµV/m)	QP Limit (uV/m)	QP Margin (dB)	QP Margin (uV)	Angle (Deg)	Height (m)	Polarity
31.893	29.1	28.5	40.0	100	-10.9	-71.5	306	1.00	Vertical
41.209	24.9	17.6	40.0	100	-15.1	-82.4	176	1.00	Vertical
640.064	31.1	35.9	46.0	200	-14.9	-164.1	297	1.00	Horizontal
719.793	31.9	39.4	46.0	200	-14.1	-160.6	206	1.00	Vertical
760.157	33.0	44.7	46.0	200	-13.0	-155.3	170	1.00	Horizontal
978.189	34.4	52.5	54.0	200	-19.6	-147.5	13	1.00	Horizontal

1 GHz to 40 GHz

Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.352	Horizontal	153	195	55.11	42.75
10.600	Vertical	100	205	50.59	46.12

1 GHz to 7 GHz



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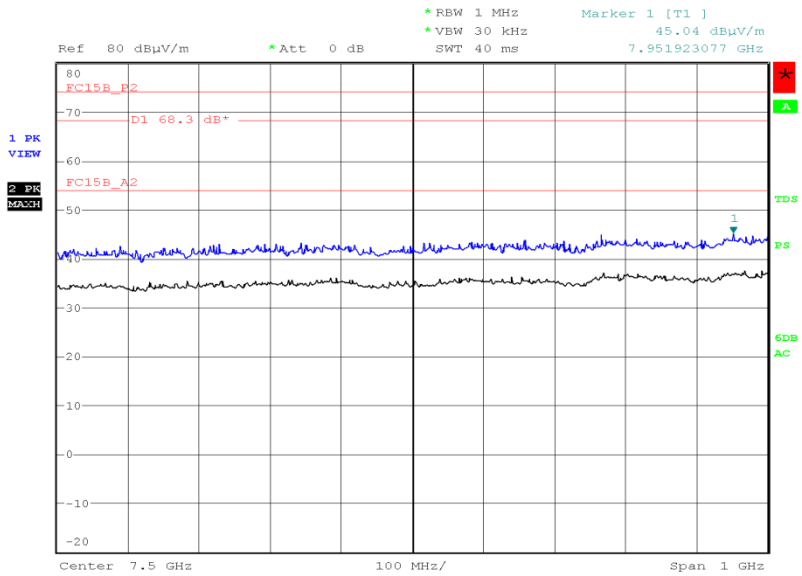
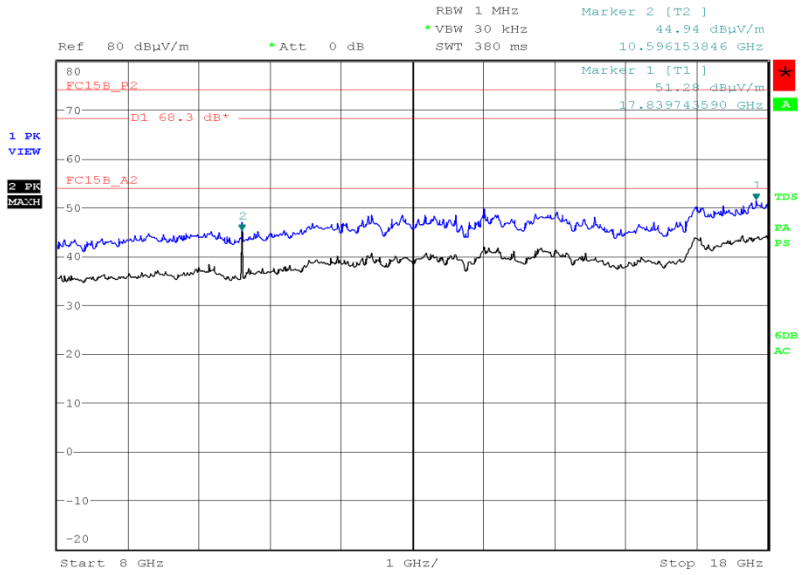
7 GHz to 8 GHz



Date: 22.APR.2014 18:23:54

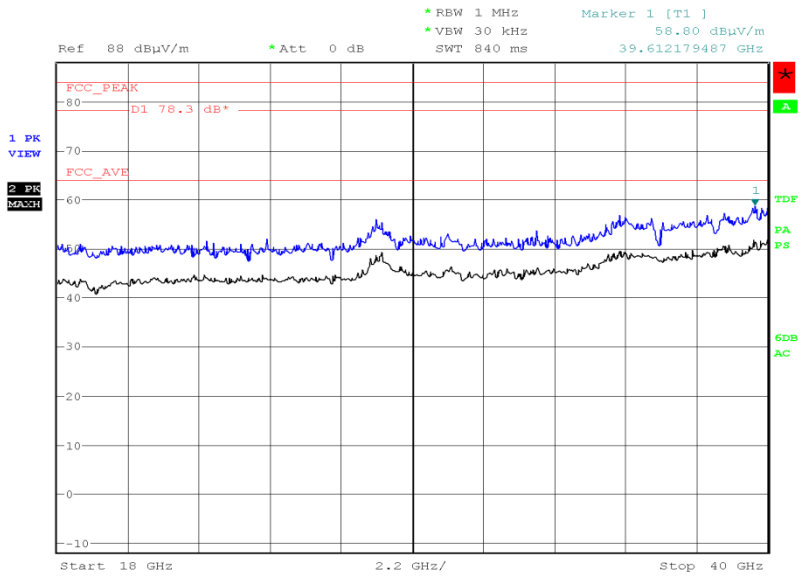
Product Service

8 GHz to 18 GHz



Date: 22.APR.2014 21:00:02

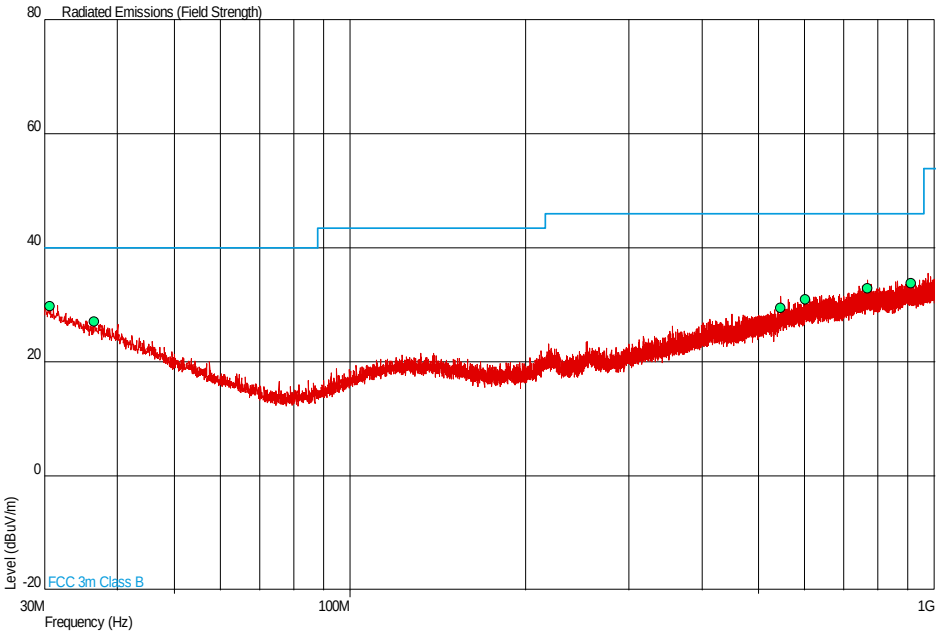
18 GHz to 40 GHz



Date: 27.APR.2014 07:53:39

5320 MHz

30 MHz to 1 GHz

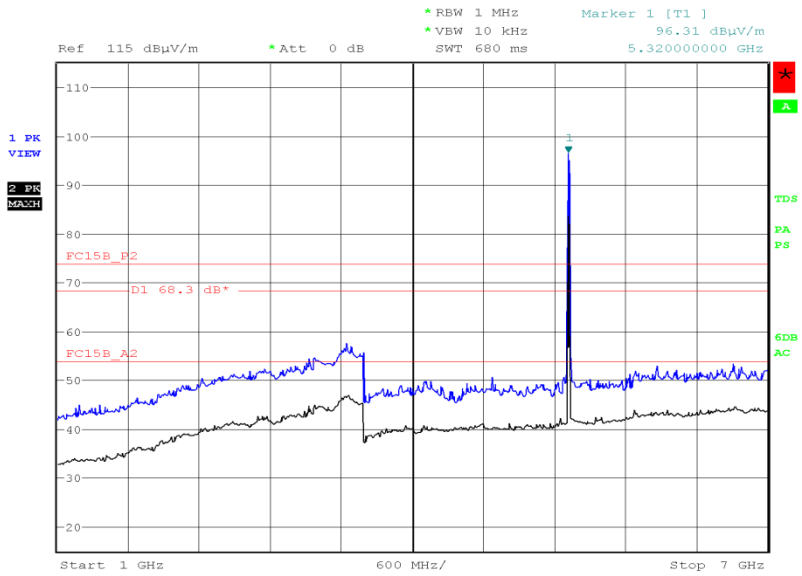


Frequency (MHz)	QP Level (dBµV/m)	QP Level (uV/m)	QP Limit (dBµV/m)	QP Limit (uV/m)	QP Margin (dB)	QP Margin (uV)	Angle (Deg)	Height (m)	Polarity
30.621	29.7	30.5	40.0	100	-10.3	-69.5	294	1.00	Vertical
36.549	27.1	22.6	40.0	100	-12.9	-77.4	74	1.00	Horizontal
545.519	29.5	29.9	46.0	200	-16.5	-170.1	360	1.81	Horizontal
601.602	30.9	35.1	46.0	200	-15.1	-164.9	162	1.00	Vertical
768.621	33.0	44.7	46.0	200	-13.0	-155.3	205	1.00	Horizontal
912.060	33.8	52.5	46.0	200	-12.2	-147.5	238	1.56	Horizontal

1 GHz to 40 GHz

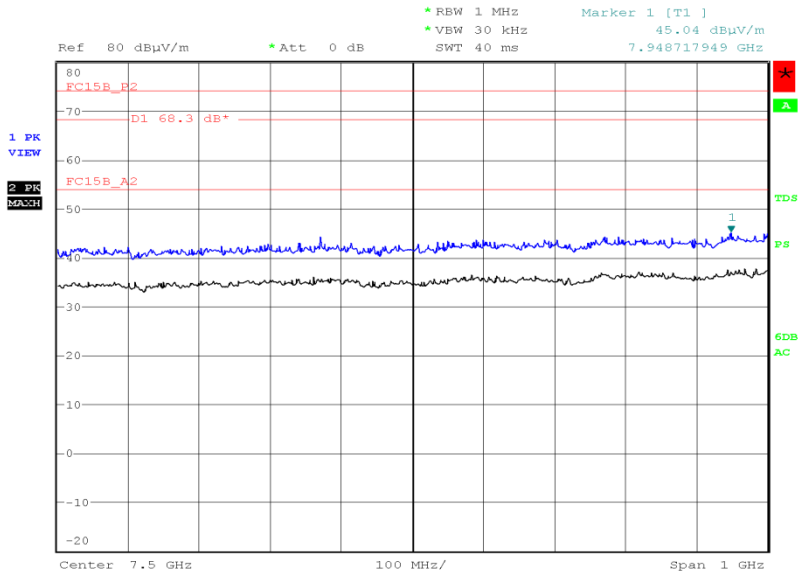
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
10.640	Vertical	100	199	51.35	47.03

1 GHz to 7 GHz



Date: 16.APR.2014 22:01:31

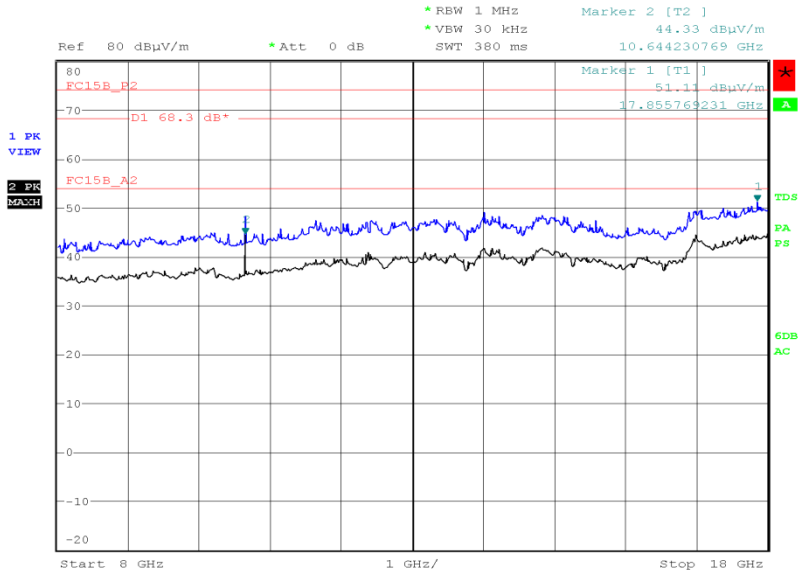
7 GHz to 8 GHz



Date: 22.APR.2014 18:28:14

Product Service

8 GHz to 18 GHz



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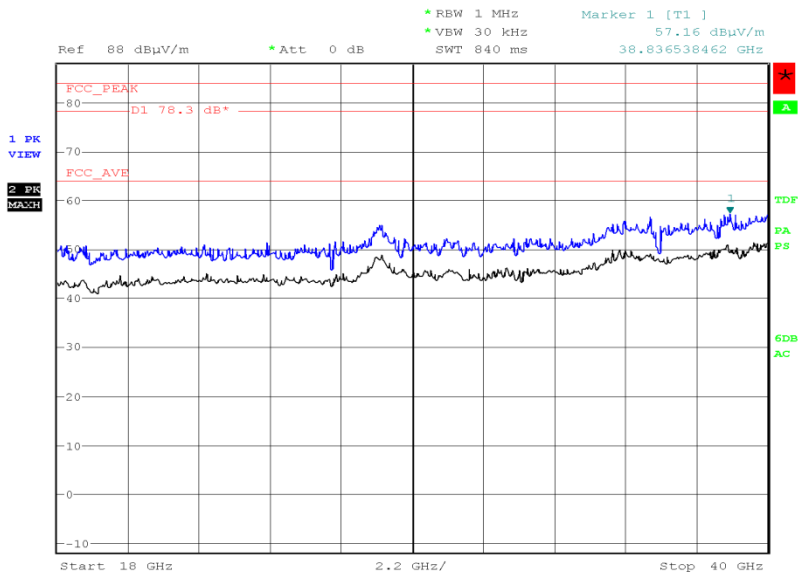
18 GHz to 40 GHz

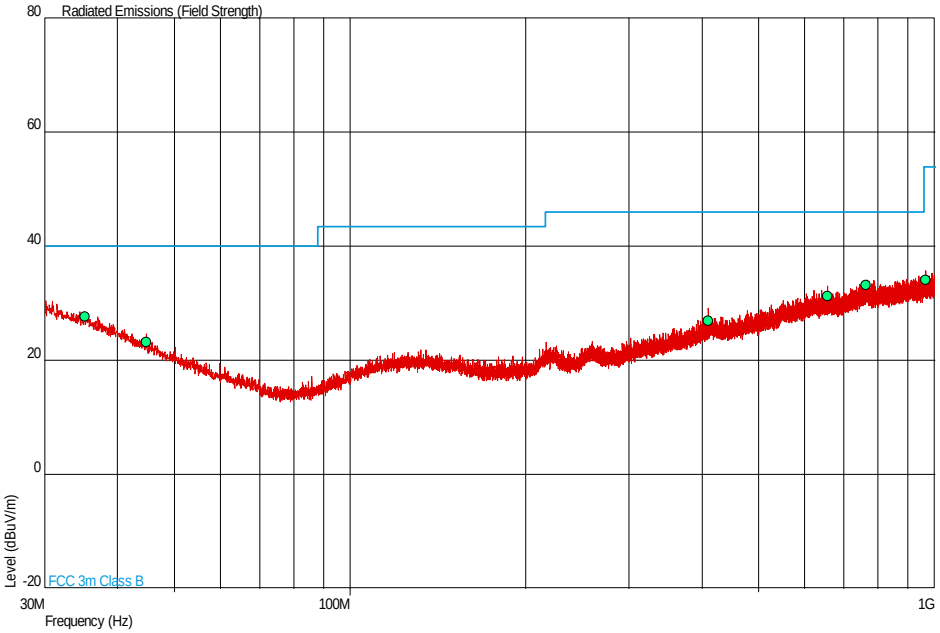


Date: 27.APR.2014 08:06:43

Frequency Band 3

5500 MHz

30 MHz to 1 GHz



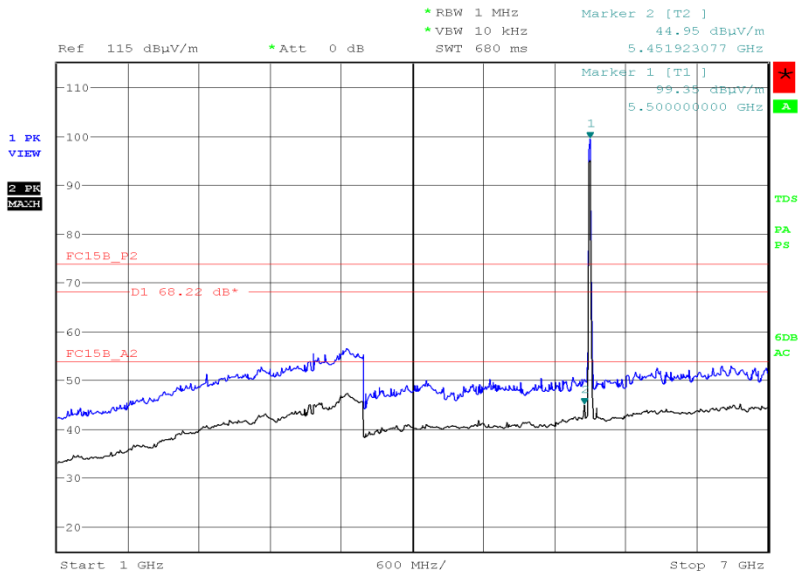
Frequency (MHz)	QP Level (dBµV/m)	QP Level (uV/m)	QP Limit (dBµV/m)	QP Limit (uV/m)	QP Margin (dB)	QP Margin (uV)	Angle (Deg)	Height (m)	Polarity
35.197	27.7	24.3	40.0	100	-12.3	-75.7	313	1.00	Horizontal
44.849	23.2	14.5	40.0	100	-16.8	-85.5	152	2.43	Vertical
410.597	27.0	22.4	46.0	200	-19.0	-177.6	67	1.00	Vertical
655.614	31.2	36.3	46.0	200	-14.8	-163.7	270	1.00	Horizontal
762.593	33.2	45.7	46.0	200	-12.8	-154.3	214	1.00	Horizontal
964.471	34.1	50.7	54.0	200	-19.9	-149.3	173	1.00	Horizontal

Product Service

1 GHz to 40 GHz

Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.447	Horizontal	177	199	54.71	43.21

1 GHz to 7 GHz



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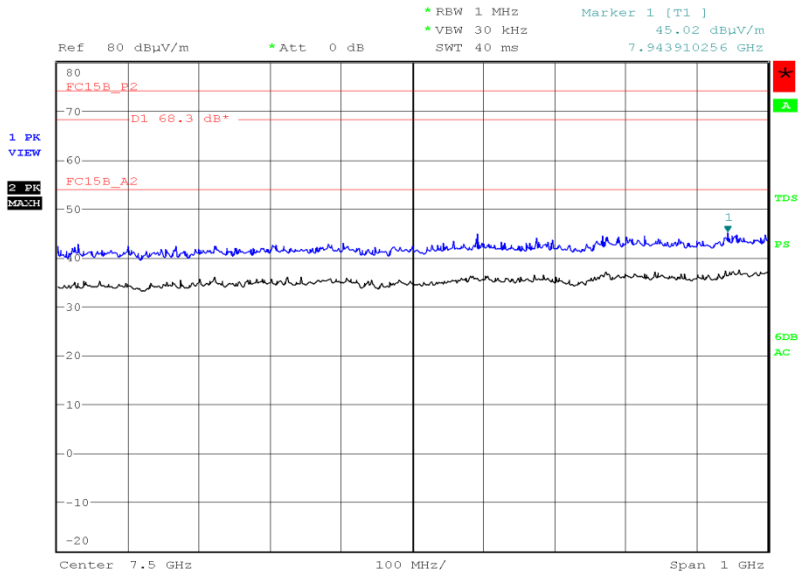
7 GHz to 8 GHz



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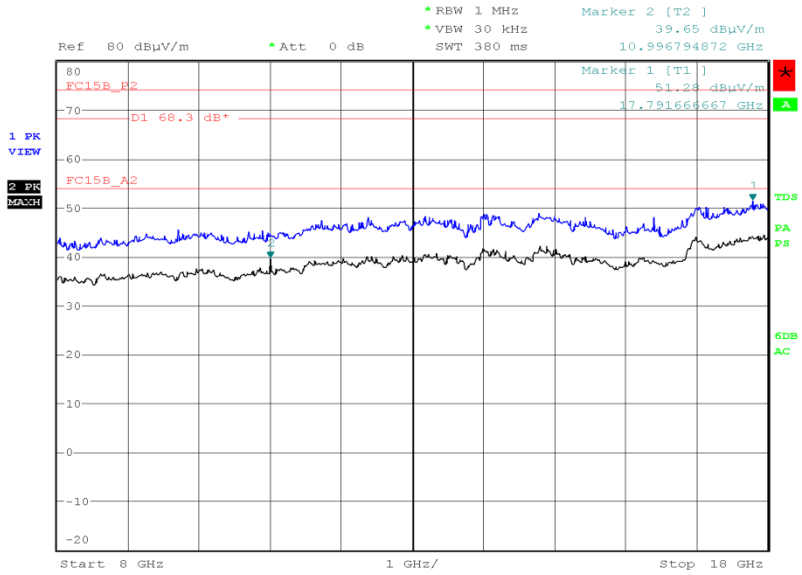
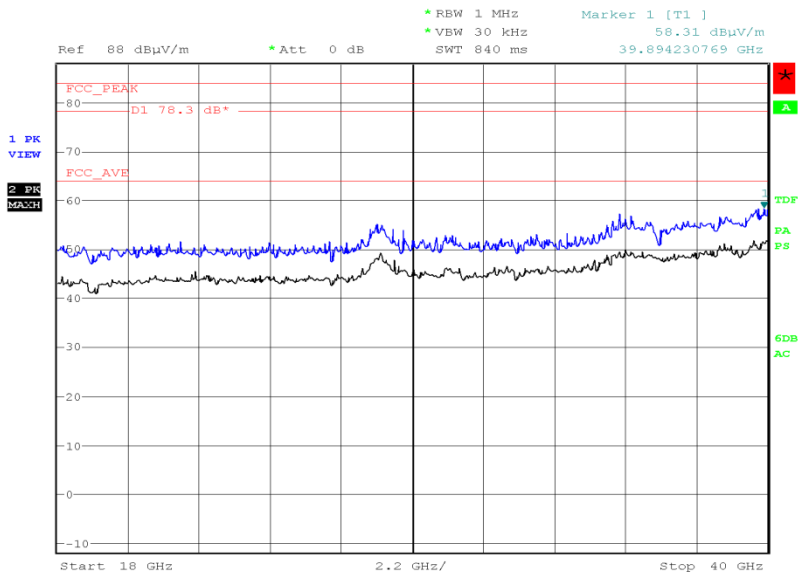
Product Service

8 GHz to 18 GHz



Date: 22.APR.2014 21:52:06

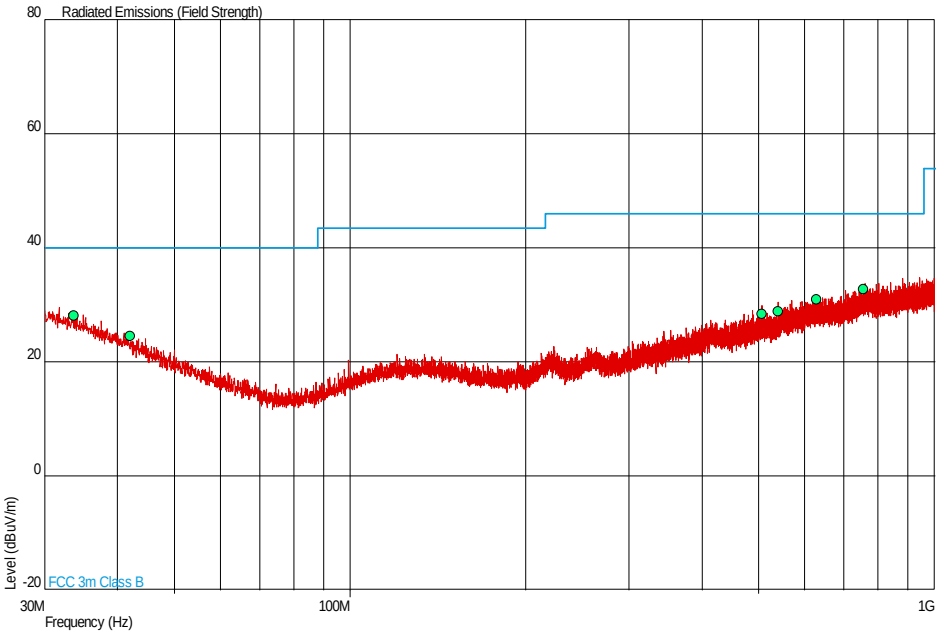
18 GHz to 40 GHz



Date: 27.APR.2014 08:42:36

5580 MHz

30 MHz to 1 GHz

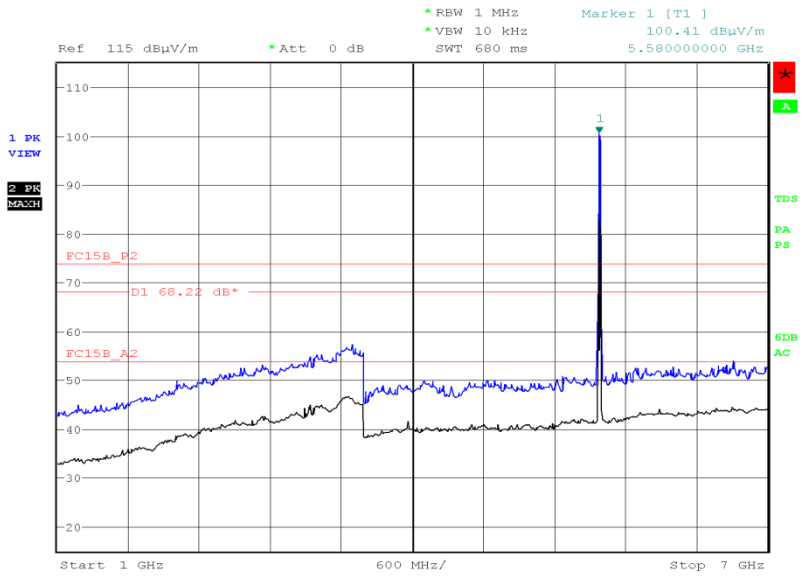


Frequency (MHz)	QP Level (dBµV/m)	QP Level (uV/m)	QP Limit (dBµV/m)	QP Limit (uV/m)	QP Margin (dB)	QP Margin (uV)	Angle (Deg)	Height (m)	Polarity
33.738	28.2	25.7	40.0	100	-11.8	-74.3	187	1.00	Vertical
42.053	24.5	16.8	40.0	100	-15.5	-83.2	236	1.20	Vertical
506.424	28.4	26.3	46.0	200	-17.6	-173.7	347	1.00	Vertical
539.639	28.9	27.9	46.0	200	-17.1	-172.1	336	1.00	Vertical
627.797	31.0	35.5	46.0	200	-15.0	-164.5	79	2.39	Horizontal
754.263	32.8	43.7	46.0	200	-13.2	-156.3	360	1.80	Horizontal

1 GHz to 40 GHz

Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
11.160	Vertical	130	168	50.26	44.54

1 GHz to 7 GHz



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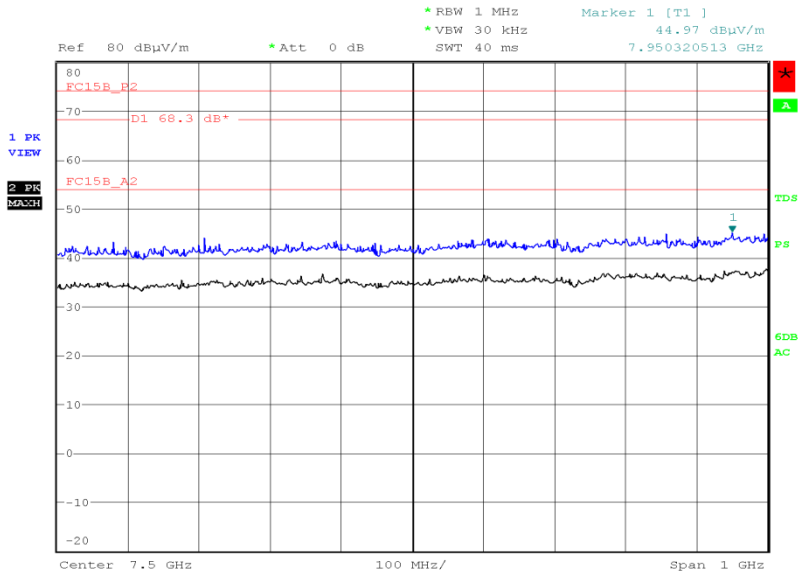
7 GHz to 8 GHz



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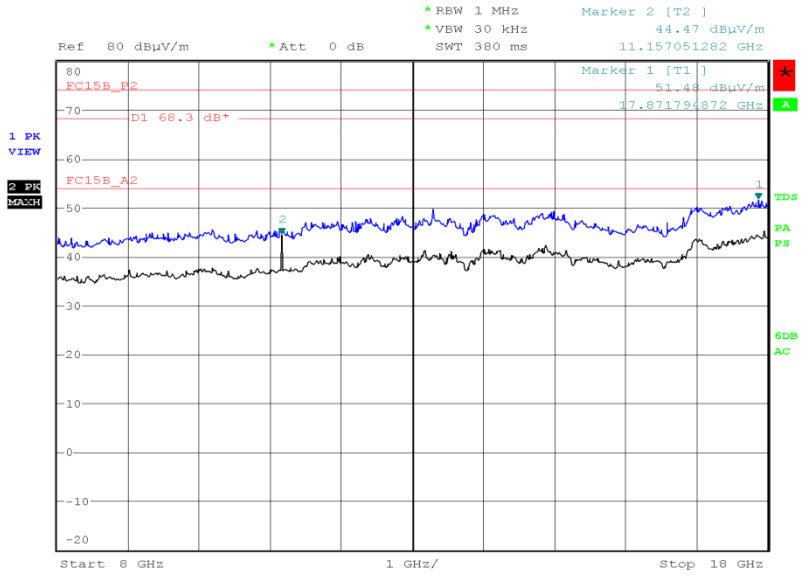
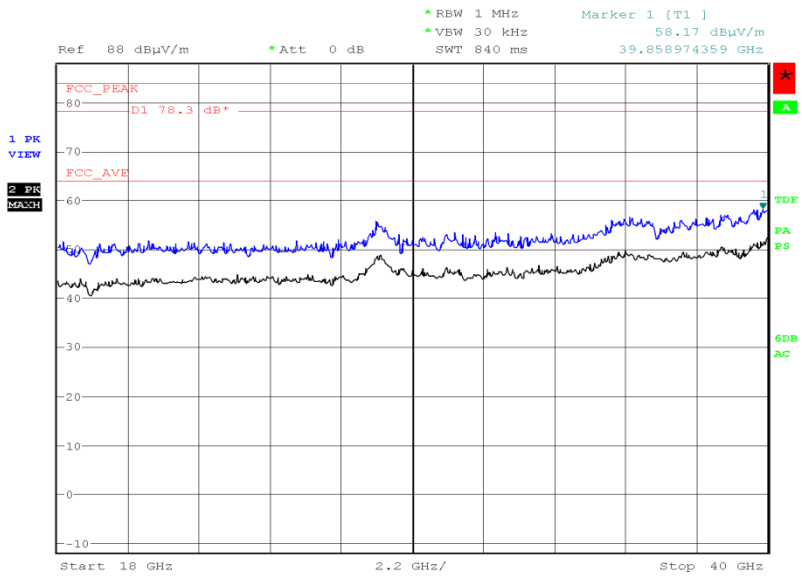
Product Service

8 GHz to 18 GHz



Date: 22.APR.2014 22:05:23

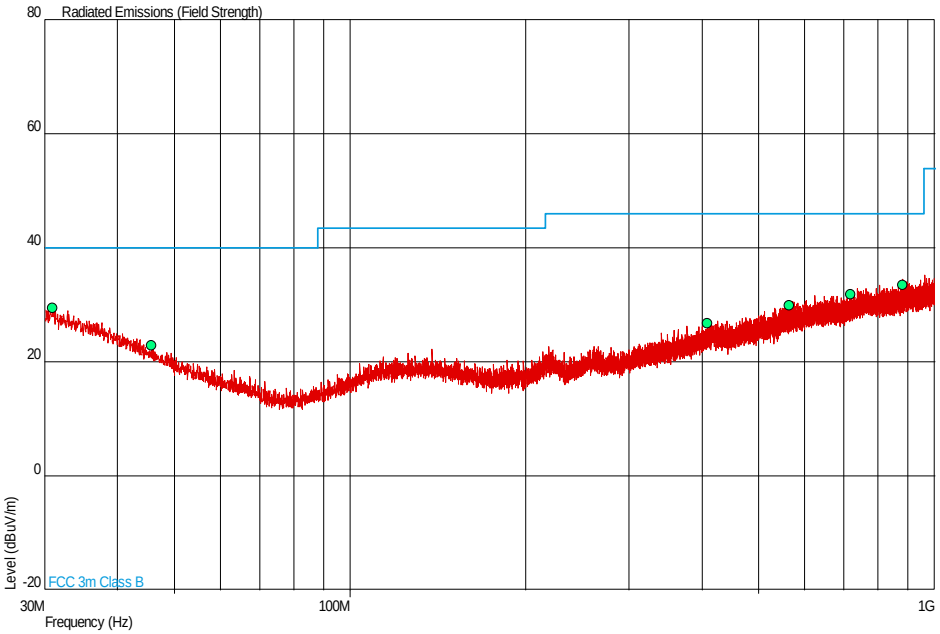
18 GHz to 40 GHz



Date: 27.APR.2014 08:58:24

5700 MHz

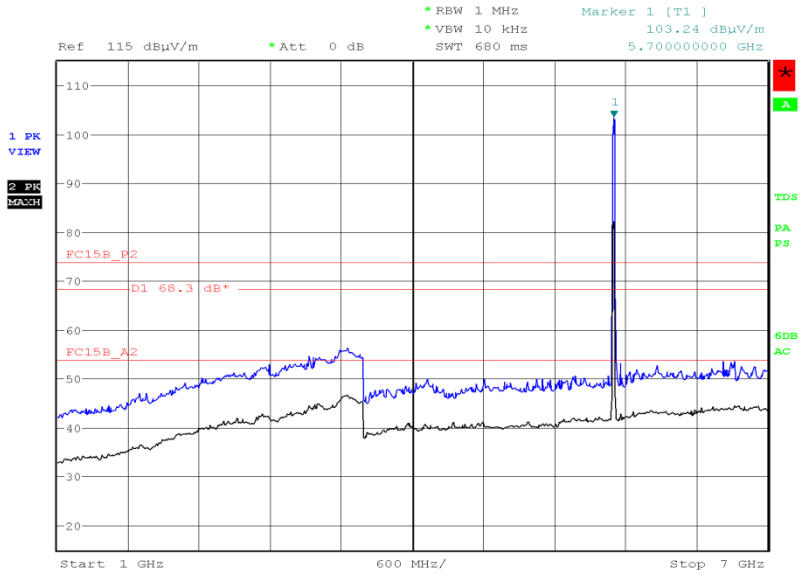
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (uV/m)	QP Limit (dBµV/m)	QP Limit (uV/m)	QP Margin (dB)	QP Margin (uV)	Angle (Deg)	Height (m)	Polarity
31.018	29.5	29.9	40.0	100	-10.5	-70.1	360	1.00	Horizontal
45.684	22.9	14.0	40.0	100	-17.1	-86.0	211	1.00	Horizontal
408.058	26.7	21.6	46.0	200	-19.3	-178.4	277	1.00	Horizontal
563.462	30.0	31.6	46.0	200	-16.0	-168.4	84	1.00	Horizontal
717.704	31.8	38.9	46.0	200	-14.2	-161.1	117	1.00	Vertical
881.597	33.6	47.9	46.0	200	-12.4	-152.1	13	1.54	Vertical

Product Service

1 GHz to 7 GHz



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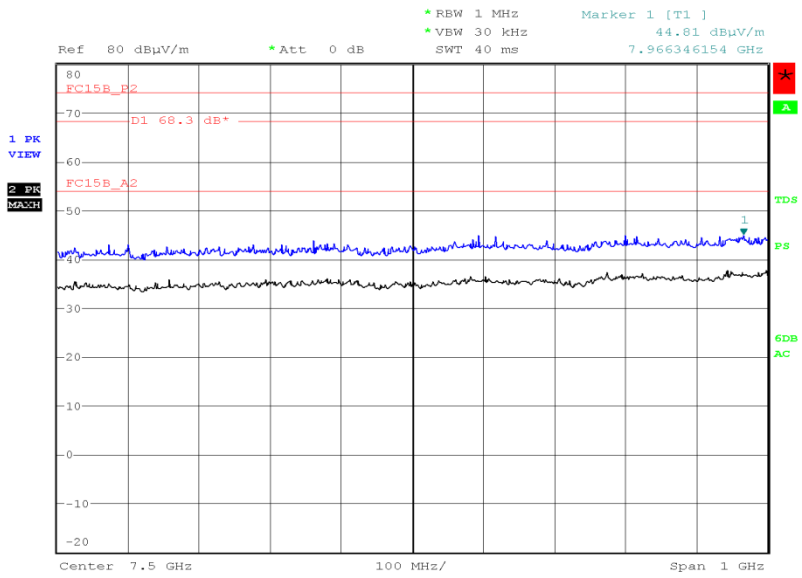
7 GHz to 8 GHz



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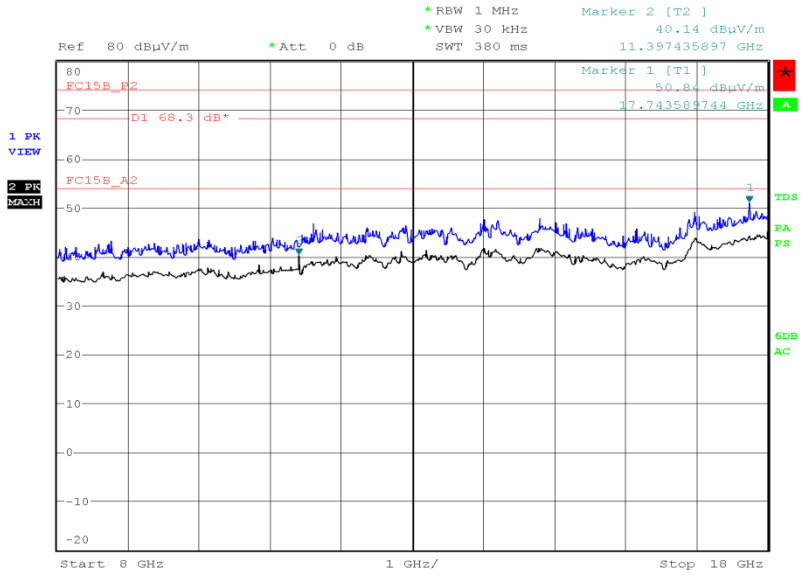
Product Service

8 GHz to 18 GHz



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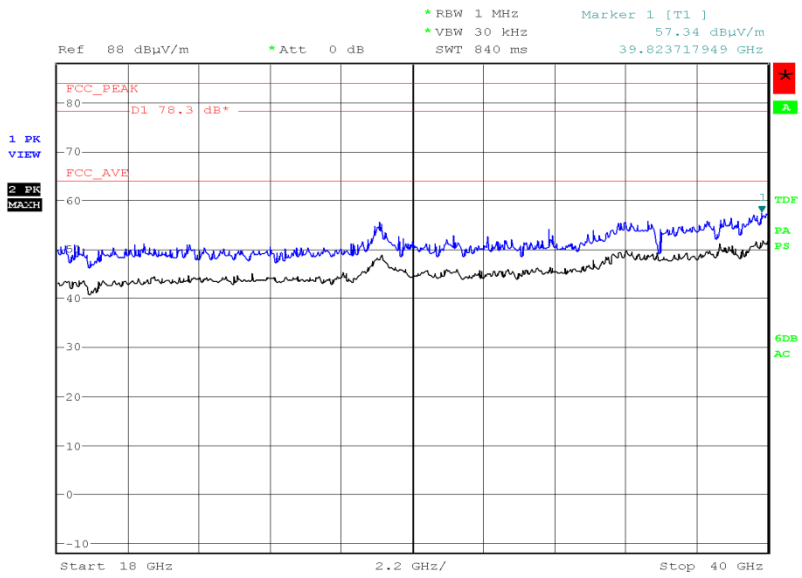
18 GHz to 40 GHz



Date: 27.APR.2014 09:13:50

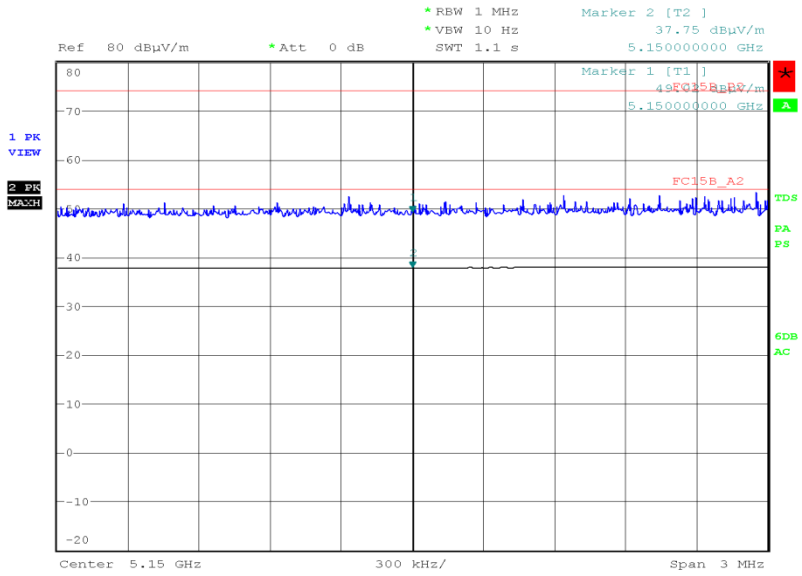
Limit

Peak (dBµV/m)	Average (dBµV/m)
74.0	54.0

Band Edge Emissions

5180 MHz

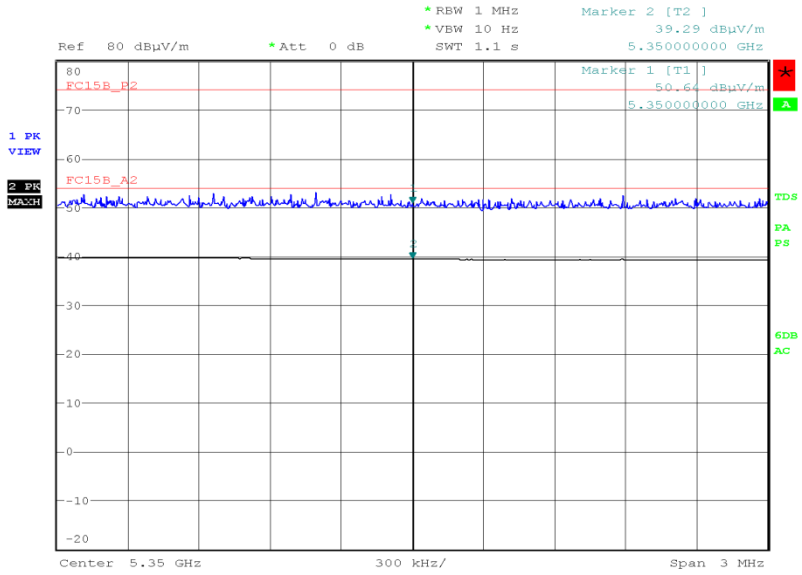
Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	49.02	37.75



Date: 16.APR.2014 19:13:37

5320 MHz

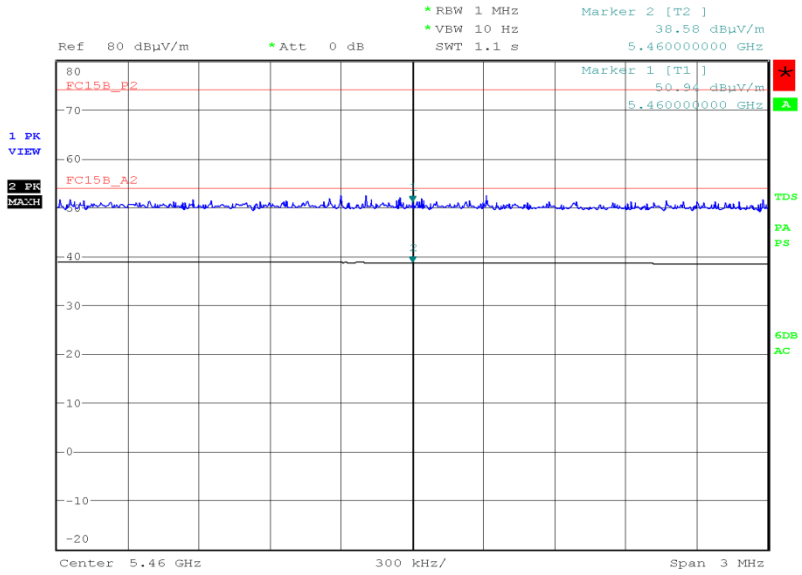
Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	50.64	39.29



Date: 16.APR.2014 22:07:37

5500 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	50.94	38.58



Date: 18.APR.2014 09:52:07

Limit

Peak (dBµV/m)	Average (dBµV/m)
74.0	54.0

802.11(ac) - 5 GHz 20 MHz BW

4.0 V DC Supply

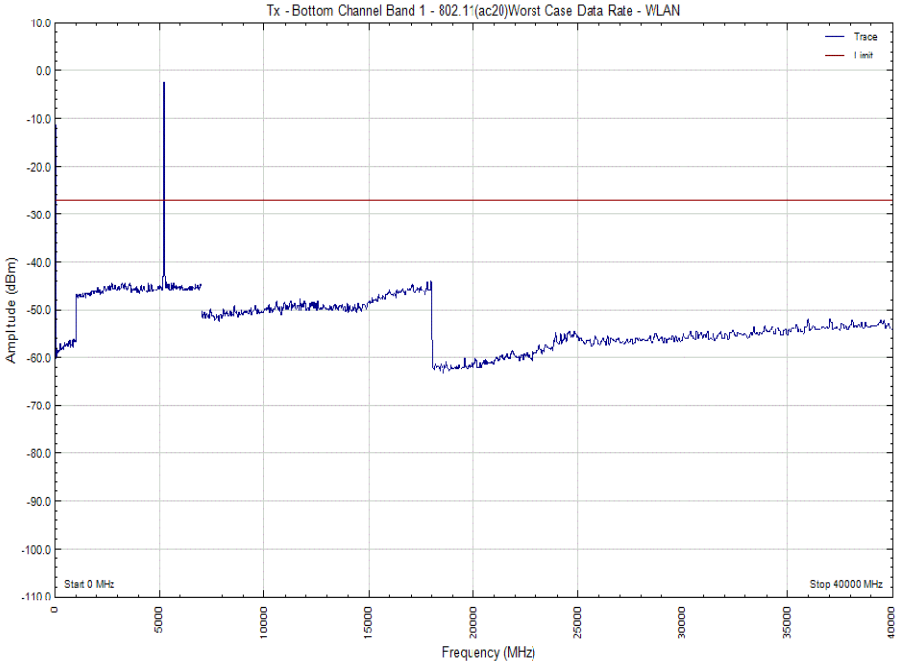
Spurious Conducted Emissions

MCS3

Frequency Band 1

5180 MHz

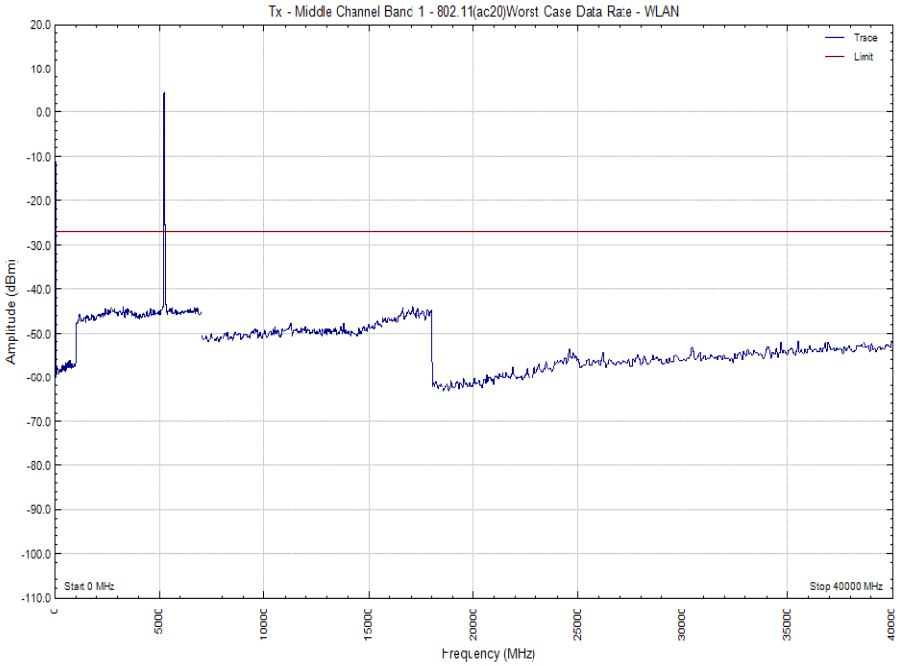
9 kHz to 40 GHz



Product Service

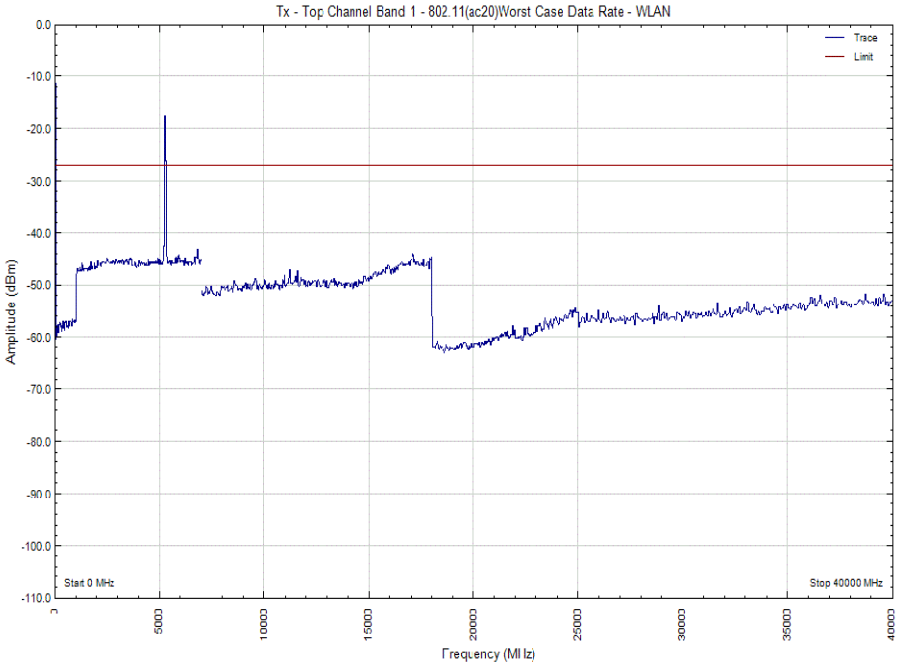
5200 MHz

9 kHz to 40 GHz



5240 MHz

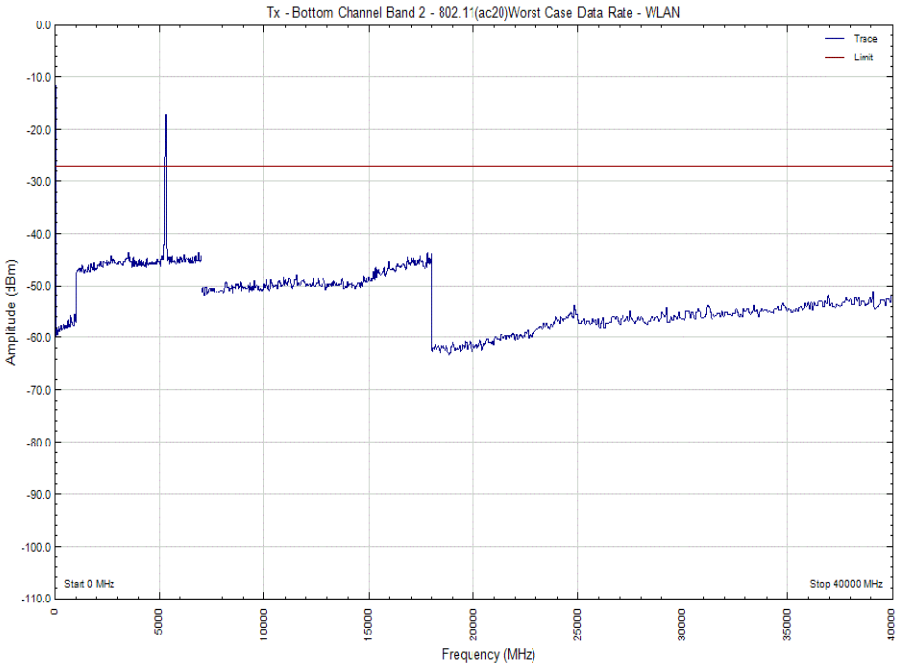
9 kHz to 40 GHz



Frequency Band 2

5260 MHz

9 kHz to 40 GHz



5300 MHz

9 kHz to 40 GHz