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Report On

FCC Testing of the Sharp Quad-band LTE(B1 /B3/ B19/ B21), and Tri-band WCDMA(FDD I/ VI /XIX) Dual mode hand held Mini Phablet with Bluetooth, ANT+, W-LAN, NFC and GPS

In accordance with FCC CFR 47 Part 15C (WLAN and Bluetooth Low Energy)

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FCC ID: APYHRO00216

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January 2015



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REPORT ON

FCC Testing of the
Sharp Quad-band LTE(B1 /B3/ B19/ B21), and Tri-band
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In accordance with FCC CFR 47 Part 15C (WLAN and Bluetooth Low
Energy)

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DATED

13 January 2015

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 15C. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

J Tuckwell

G Lawler

M Russell



J Hurley

T Guy

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SECTION 1

REPORT SUMMARY

FCC Testing of the
Sharp Quad-band LTE(B1 /B3/ B19/ B21), and Tri-band WCDMA(FDD I/ VI /XIX) Dual mode
hand held Mini Phablet with Bluetooth, ANT+, W-LAN, NFC and GPS
In accordance with FCC CFR 47 Part 15C (WLAN and Bluetooth Low Energy)



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1.1 INTRODUCTION

The information contained in this report is intended to show the verification of FCC Testing of the Sharp Quad-band LTE(B1 /B3/ B19/ B21), and Tri-band WCDMA(FDD I/ VI /XIX) Dual mode hand held Mini Phablet with Bluetooth, ANT+, W-LAN, NFC and GPS to the requirements of FCC CFR 47 Part 15C.

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
Serial Number(s)	IMEI 004401115303352 IMEI 004401115303394 IMEI 004401115303360 IMEI 004401115303444
Number of Samples Tested	4
Test Specification/Issue/Date	FCC CFR 47 Part 15C (2013)
Incoming Release Date	Application Form 19 November 2014
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	10377 02 December 2014
Start of Test	22 November 2014
Finish of Test	19 December 2014
Name of Engineer(s)	J Tuckwell G Lawler M Russell J Hurley T Guy
Related Document(s)	ANSI C63.10: 2009 FCC KDB 558074 D01 DTS Meas Guidance v03r02



1.2 BRIEF SUMMARY OF RESULTS

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

Section	Spec Clause	Test Description	Result	Comments/Base Standard
802.11(b)				
2.1	15.207	AC Line Conducted Emissions	Pass	
2.2	15.247 (a)(2)	6 dB Bandwidth	Pass	
2.3	15.247 (b)(3)	Maximum Peak Conducted Output Power	Pass	
2.4	15.247 (b)(4)	EIRP Peak Power	Pass	
2.5	15.247 (d)	Spurious and Band Edge Emissions	Pass	
2.6	15.247 (e)	Power Spectral Density	Pass	
802.11(g)				
2.2	15.247 (a)(2)	6 dB Bandwidth	Pass	
2.3	15.247 (b)(3)	Maximum Peak Conducted Output Power	Pass	
2.4	15.247 (b)(4)	EIRP Peak Power	Pass	
2.5	15.247 (d)	Spurious and Band Edge Emissions	Pass	
2.6	15.247 (e)	Power Spectral Density	Pass	
802.11(n)				
2.2	15.247 (a)(2)	6 dB Bandwidth	Pass	
2.3	15.247 (b)(3)	Maximum Peak Conducted Output Power	Pass	
2.4	15.247 (b)(4)	EIRP Peak Power	Pass	
2.5	15.247 (d)	Spurious and Band Edge Emissions	Pass	
2.6	15.247 (e)	Power Spectral Density	Pass	



Product Service

Section	Spec Clause	Test Description	Result	Comments/Base Standard
Bluetooth Low Energy				
2.2	15.247 (a)(2)	6 dB Bandwidth	Pass	
2.3	15.247 (b)(3)	Maximum Peak Conducted Output Power	Pass	
2.4	15.247 (b)(4)	EIRP Peak Power	Pass	
2.5	15.247 (d)	Spurious and Band Edge Emissions	Pass	
2.6	15.247 (e)	Power Spectral Density	Pass	



1.3 APPLICATION FORM

EQUIPMENT DESCRIPTION	
Model Name/Number	See APYHRO00216 Model Description form
Part Number	CA283
FCC ID (if applicable)	APYHRO00216
Industry Canada ID (if applicable)	N/A
Technical Description (Please provide a brief description of the intended use of the equipment)	Quad-band LTE(B1/B3/B19/B21), Tri-band WCDMA(FDD-I/VI/XIX), Dual mode Mini Tablet with Bluetooth, ANT+, WLAN, NFC and GPS

Types of Modulations used by the Equipment	
☒	FHSS
☒	Other forms of modulation
In case of FHSS Modulation	
In case of non-Adaptive Frequency Hopping equipment:	
Number of Hopping Frequencies: N/A	
In case of Adaptive Frequency Hopping Equipment:	
Maximum number of Hopping Frequencies: Bluetooth(BR/EDR);79/ LE; 40	
Minimum number of Hopping Frequencies: 20	
Dwell Time: 3.75ms	
Minimum Channel Occupation Time: 1.25ms (5.5ms maximum)	
Adaptive / non-adaptive equipment:	
☐	non-adaptive Equipment
☒	adaptive Equipment without the possibility to switch to a non-adaptive mode
☐	adaptive Equipment which can also operate in a non-adaptive mode
In case of adaptive equipment:	
The Channel Occupancy Time implemented by the equipment: 13 ms	
☒	The equipment has implemented an LBT based DAA mechanism
In case of equipment using modulation different from FHSS:	
☐	The equipment is Frame Based equipment
☐	The equipment is Load Based equipment
☒	The equipment can switch dynamically between Frame Based and Load Based equipment
The CCA time implemented by the equipment: 34 μ s	
The value q as referred to in clause 4.3.2.5.2.2.2 is: 32	
☐	The equipment has implemented an non-LBT based DAA mechanism
☐	The equipment can operate in more than one adaptive mode



In case of non-adaptive Equipment:	
The maximum RF Output Power (e.i.r.p.): Bluetooth;7dBm/ WLAN;14.0 dBm	
The maximum (corresponding) Duty Cycle: %	
Equipment with dynamic behaviour, that behaviour is described here. (e.g. the different combinations of duty cycle and corresponding power levels to be declared):	
The worst case operational mode for each of the following tests:	
RF Output Power: Max.7dBm/ Nominal 4dBm(Bluetooth Power class-1), Max. 14dBm(IEEE802.11b)	
Power Spectral Density:	
Duty cycle, Tx-Sequence, Tx-gap:	
Dwell time, Minimum Frequency Occupation & Hopping Sequence (only for FHSS equipment): To be determined by test lab.	
Hopping Frequency Separation (only for FHSS equipment): To be determined by test lab.	
Medium Utilisation: To be determined by test lab.	
Adaptivity & Receiver Blocking: To be determined by test lab.	
Occupied Channel Bandwidth: To be determined by test lab.	
Transmitter unwanted emissions in the OOB domain: To be determined by test lab.	
Transmitter unwanted emissions in the spurious domain: To be determined by test lab.	
Receiver spurious emissions: To be determined by test lab.	
The different transmit operating modes (tick all that apply):	
☒	Operating mode 1: Single Antenna Equipment
☒	Equipment with only 1 antenna
☐	Equipment with 2 diversity antennas but only 1 antenna active at any moment in time
☐	Smart Antenna Systems with 2 or more antennas, but operating in a (legacy) mode where only 1 antenna is used. (e.g. IEEE 802.11™ [i.3] legacy mode in smart antenna systems)
☐	Operating mode 2: Smart Antenna Systems - Multiple Antennas without beam forming
☐	Single spatial stream / Standard throughput / (e.g. IEEE 802.11™ [i.3] legacy mode)
☐	High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 1
☐	High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 2
<i>NOTE: Add more lines if more channel bandwidths are supported.</i>	
☐	Operating mode 3: Smart Antenna Systems - Multiple Antennas with beam forming
☐	Single spatial stream / Standard throughput (e.g. IEEE 802.11™ [i.3] legacy mode)
☐	High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 1
☐	High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 2
<i>NOTE: Add more lines if more channel bandwidths are supported.</i>	
In case of Smart Antenna Systems:	
The number of Receive chains:	
The number of Transmit chains:	
☐	symmetrical power distribution
☐	asymmetrical power distribution
In case of beam forming, the maximum beam forming gain:	
<i>NOTE: Beam forming gain does not include the basic gain of a single antenna.</i>	



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Operating Frequency Range(s) of the equipment:	
Operating Frequency Range 1: 2402 MHz to 2480 MHz	Bluetooth (e.g Bluetooth for EU)
Operating Frequency Range 2: 2412 MHz to 2472 MHz	WLAN dor EU (e.g WLAN for EU)
Operating Frequency Range 3: MHz to MHz	(e.g Bluetooth for FCC and/or Industry Canada)
Operating Frequency Range 4: MHz to MHz	(e.g WLAN for FCC and/or Industry Canada)
NOTE: Add more lines if more Frequency Ranges are supported.	
Occupied Channel Bandwidth(s):	
Occupied Channel Bandwidth1: 1 MHz to 2 (LE) MHz	
Occupied Channel Bandwidth2: 20 (802.11 b/g) MHz to 40 (802.11n) MHz	
NOTE: Add more lines if more channel bandwidths are supported.	
Type of Equipment (stand-alone, combined, plug-in radio device, etc.):	
☒	Stand-alone
☐	Combined Equipment (Equipment where the radio part is fully integrated within another type of equipment)
☐	Plug-in radio device (Equipment intended for a variety of host systems)
☐	Other
The extreme operating conditions that apply to the equipment:	
Operating temperature range: -10 °C to 55 °C	
Operating voltage range: 3.7 V to 4.0 V	☐ AC ☒ DC
Details provided are for the:	
☒	stand-alone equipment
☐	combined (or host) equipment
☐	test jig



The intended combination(s) of the radio equipment power settings and one or more antenna assemblies and their corresponding e.i.r.p levels:			
Antenna Type:			
☒	Integral Antenna		
Antenna Gain: 0 dBi			
If applicable, additional beamforming gain (excluding basic antenna gain): dB			
☒	Temporary RF connector provided		
☐	No temporary RF connector provided		
☐	Dedicated Antennas (equipment with antenna connector)		
☐	Single power level with corresponding antenna(s)		
☐	Multiple power settings and corresponding antenna(s)		
Number of different Power Levels:			
Power Level 1: dBm			
Power Level 2: dBm			
Power Level 3: dBm			
Power Level 4: dBm			
NOTE 1: Add more lines in case the equipment has more power levels.			
NOTE 2: These power levels are conducted power levels (at antenna connector).			
For each of the Power Levels, provide the intended antenna assemblies, their corresponding gains (G) and the resulting e.i.r.p. levels also taking into account the beamforming gain (Y) if applicable			
Power Level 1: dBm			
Number of antenna assemblies provided for this power level:			
Assembly #	Gain (dBi)	e.i.r.p (dBm)	Part number or model number
1			
2			
3			
4			
NOTE: Add more rows in case more antenna assemblies are supported for this power level.			
Power Level 2: dBm			
Number of antenna assemblies provided for this power level:			
Assembly #	Gain (dBi)	e.i.r.p (dBm)	Part number or model number
1			
2			
3			
4			
NOTE: Add more rows in case more antenna assemblies are supported for this power level.			
Power Level 3: dBm			
Number of antenna assemblies provided for this power level:			
Assembly #	Gain (dBi)	e.i.r.p (dBm)	Part number or model number
1			
2			
3			
4			
NOTE: Add more rows in case more antenna assemblies are supported for this power level.			



The nominal voltages of the stand-alone radio equipment or the nominal voltages of the combined (host) equipment or test jig in case of plug-in devices:	
Details provided are for the: ☒ stand-alone equipment	
☐ combined (or host) equipment	
☐ test jig	
Supply Voltage ☐ AC mains State AC voltage	
☒ State DC voltage 4.0	
In case of DC, indicate the type of power source	
☐ Internal Power Supply	
☐ External Power Supply or AC/DC adapter	
☒ Battery	
☐ Other:	
Describe the test modes available which can facilitate testing:	
The equipment type (e.g. Bluetooth®, IEEE 802.11™ [i.3], proprietary, etc.):	
Bluetooth Ver.4 and , IEEE 802.11b/g/n	
Combination for testing (see clause 5.1.3.3 of EN 300 328 V1.8.1)	
From all combinations of conducted power settings and intended antenna assembly(ies) specified in clause 3.1 m), specify the combination resulting in the highest e.i.r.p. for the radio equipment.	
Unless otherwise specified in EN 300 328, this power setting is to be used for testing against the requirements of EN 300 328. In case there is more than one such conducted power setting resulting in the same (highest) e.i.r.p. level, the highest power setting is to be used for testing. See also EN 300 328, clause 5.1.3.3.	
Highest overall e.i.r.p. value: dBm	
Corresponding Antenna assembly gain: dBi	Antenna Assembly #:
Corresponding conducted power setting: dBm	Listed as Power Setting #:
(also the power level to be used for testing)	
Additional information provided by the applicant	
Modulation	
ITU Class(es) of emission:	
Can the transmitter operate unmodulated? ☐ Yes ☐ No	
Duty Cycle	
The transmitter is intended for:	
☐ Continuous duty	
☐ Intermittent duty	
☒ Continuous operation possible for testing purposes	
About the UUT	
☐ The equipment submitted are representative production models	
☐ If not, the equipment submitted are pre-production models ?	
☒ If pre-production equipment are submitted, the final production equipment will be identical in all respects with the equipment tested	
☐ If not, supply full details	
☐ The equipment submitted is CE marked	
☐ In addition to the CE mark, the Class-II identifier (Alert Sign) is affixed.	



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Additional items and/or supporting equipment provided	
☐	Spare batteries (e.g. for portable equipment)
☒	Battery charging device
☐	External Power Supply or AC/DC adapter
☐	Test Jig or interface box
☐	RF test fixture (for equipment with integrated antennas)
☐	Host System
	Manufacturer
	Model
	Model Name
☐	Combined equipment
	Manufacturer
	Model
	Model Name
☐	User Manual
☐	Technical documentation (Handbook and circuit diagrams)

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

Signature: *N. Arai* Name: Nobumasa Arai

Position held: Manager Date: 19th November 2014



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1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp Quad-band LTE(B1 /B3/ B19/ B21), and Tri-band WCDMA(FDD I/ VI /XIX) Dual mode hand held Mini Phablet with Bluetooth, ANT+, W-LAN, NFC 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 or test plan 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 004401115303352			
0	As supplied by manufacturer.	N/A	N/A
1	Adjusted display driver parameters in firmware	M Russell	11/12/2014
Serial Number: IMEI 004401115303394			
0	As supplied by manufacturer.	N/A	N/A
1	Adjusted display driver parameters in firmware	M Russell	11/12/2014
Serial Number: IMEI 004401115303360			
0	As supplied by manufacturer.	N/A	N/A
Serial Number: IMEI 004401115303444			
0	As supplied by manufacturer.	N/A	N/A

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



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SECTION 2

TEST DETAILS

FCC Testing of the
Sharp Quad-band LTE(B1 /B3/ B19/ B21), and Tri-band WCDMA(FDD I/ VI /XIX) Dual mode
hand held Mini Phablet with Bluetooth, ANT+, W-LAN, NFC and GPS
In accordance with FCC CFR 47 Part 15C (WLAN and Bluetooth Low Energy)



Product Service

2.1 AC LINE CONDUCTED EMISSIONS

2.1.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.207

2.1.2 Equipment Under Test and Modification State

S/N: IMEI 004401115303394 - Modification State 0

2.1.3 Date of Test

4 December 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	19.3°C
Relative Humidity	31.0%

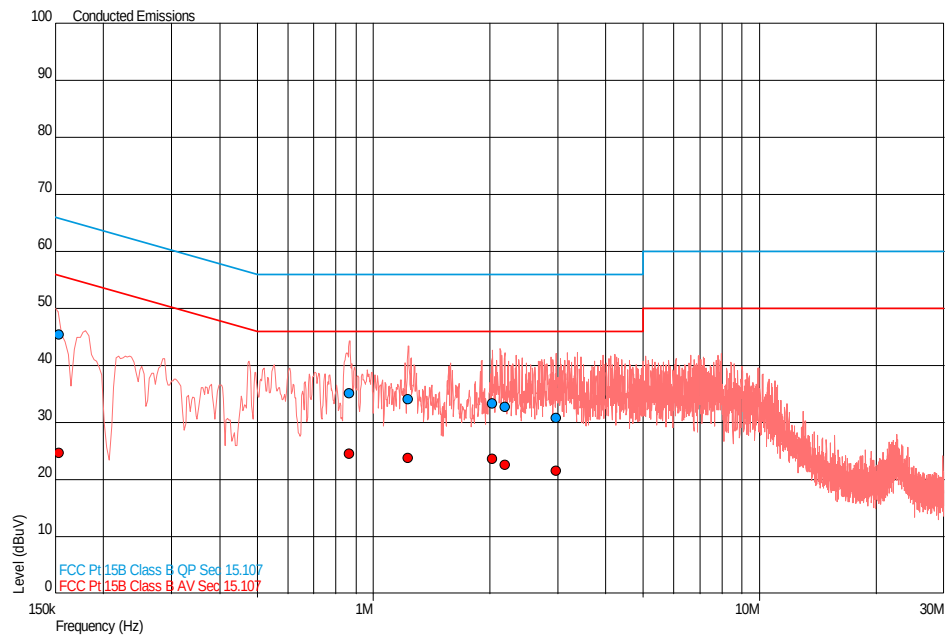


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2.1.7 Test Results

802.11(b)

Live Line

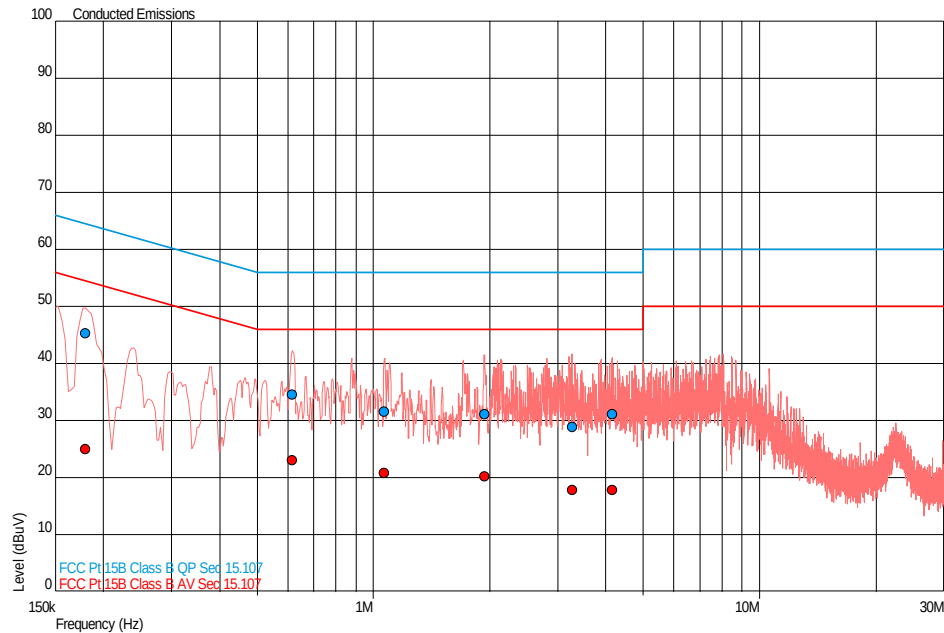


Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.154	45.4	65.8	-20.4	24.7	55.8	-31.1
0.866	35.1	56.0	-20.9	24.6	46.0	-21.4
1.231	34.1	56.0	-21.9	23.8	46.0	-22.2
2.037	33.4	56.0	-22.6	23.7	46.0	-22.3
2.189	32.7	56.0	-23.3	22.7	46.0	-23.3
2.973	30.8	56.0	-25.2	21.5	46.0	-24.5



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Neutral Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.180	45.3	64.5	-19.1	25.0	54.5	-29.5
0.617	34.6	56.0	-21.4	23.0	46.0	-23.0
1.067	31.5	56.0	-24.5	20.8	46.0	-25.2
1.938	31.1	56.0	-24.9	20.2	46.0	-25.8
3.267	28.9	56.0	-27.1	17.9	46.0	-28.1
4.147	31.1	56.0	-24.9	17.9	46.0	-28.1



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2.2 6 dB BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (a)(2)

2.2.2 Equipment Under Test and Modification State

S/N: IMEI 004401115303360 - Modification State 0

S/N: IMEI 004401115303352 - Modification State 0

S/N: IMEI 004401115303444 - Modification State 0

2.2.3 Date of Test

26 November 2014 & 27 November 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 15.247 (a) and FCC KDB 558074 D01 DTS Meas Guidance v03r02 Clause 8.1 Option 1.

The EUT was transmitting at maximum power, for bottom, middle and top channels on all supported data rates. The EUT was connected to a spectrum analyser via a cable and attenuator. The Analyser settings were adjusted to an RBW of 100 kHz, video bandwidth of 3 x RBW with peak detector and trace set to max hold. The peak point of the trace was measured and the markers positioned to give the -6 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 20.7 - 22.4°C

Relative Humidity 31.5 - 42.1%



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2.2.7 Test Results802.11(b)

4.0 V DC Supply

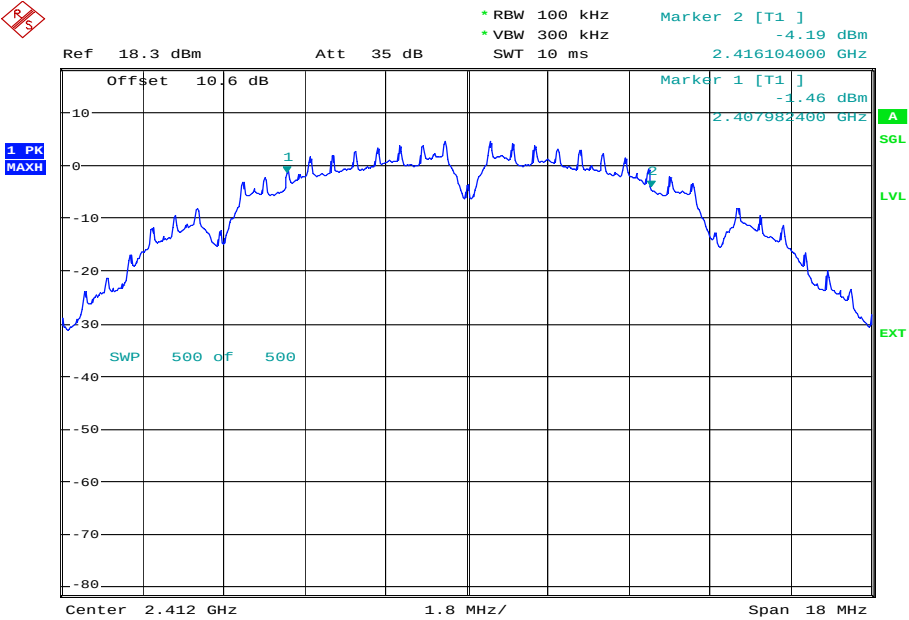
Frequency	Data Rate (Mbps)	6 dB Bandwidth (kHz)
2412 MHz	1	8121.60
	2	8035.20
	5.5	8323.20
	11	8553.60
2437 MHz	1	8611.20
	2	8121.60
	5.5	8323.20
	11	8150.40
2462 MHz	1	8611.20
	2	9150.40
	5.5	8467.20
	11	8524.80



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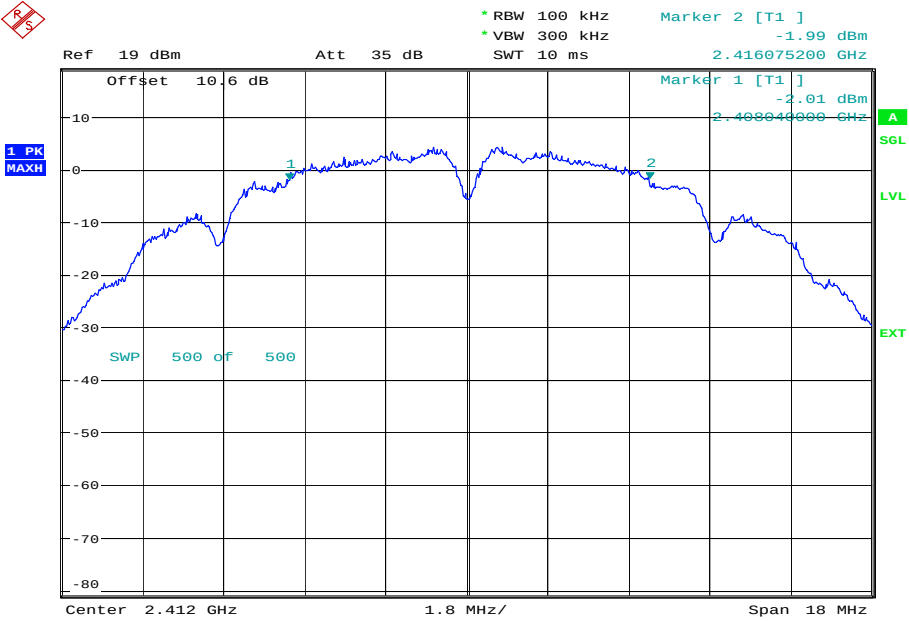
2412 MHz

1 Mbps



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2 Mbps

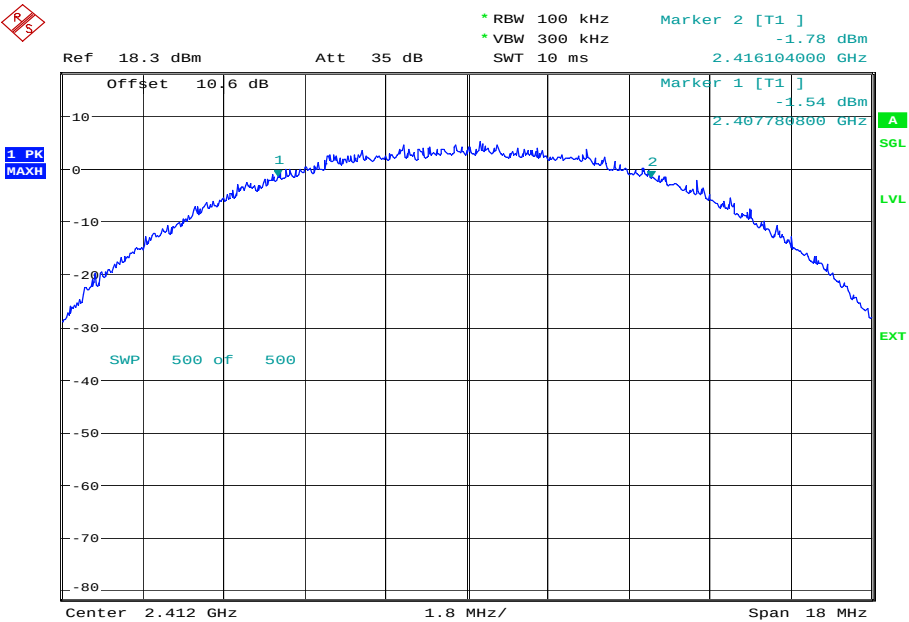


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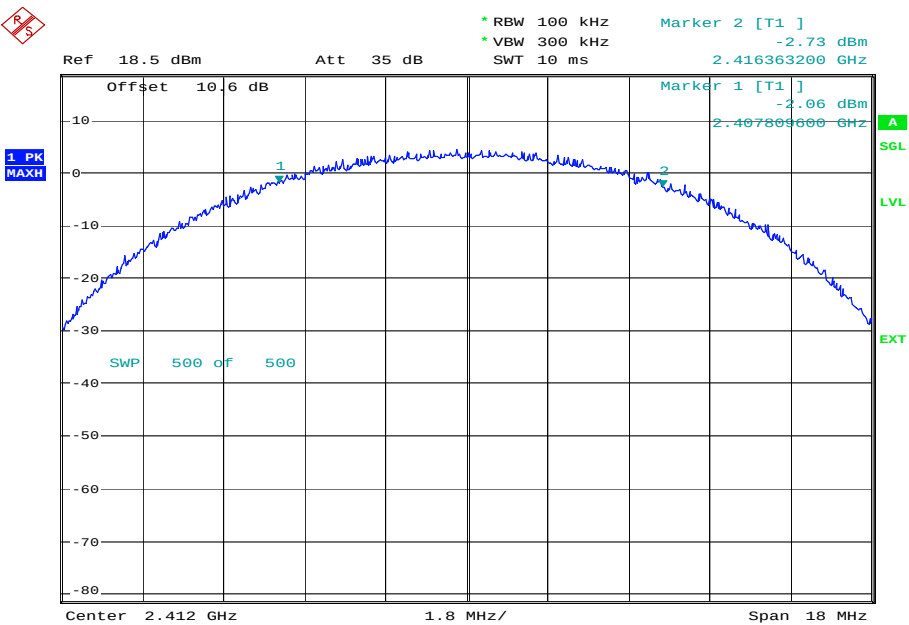
Product Service

5.5 Mbps



Date: 24.NOV.2014 16:25:33

11 Mbps



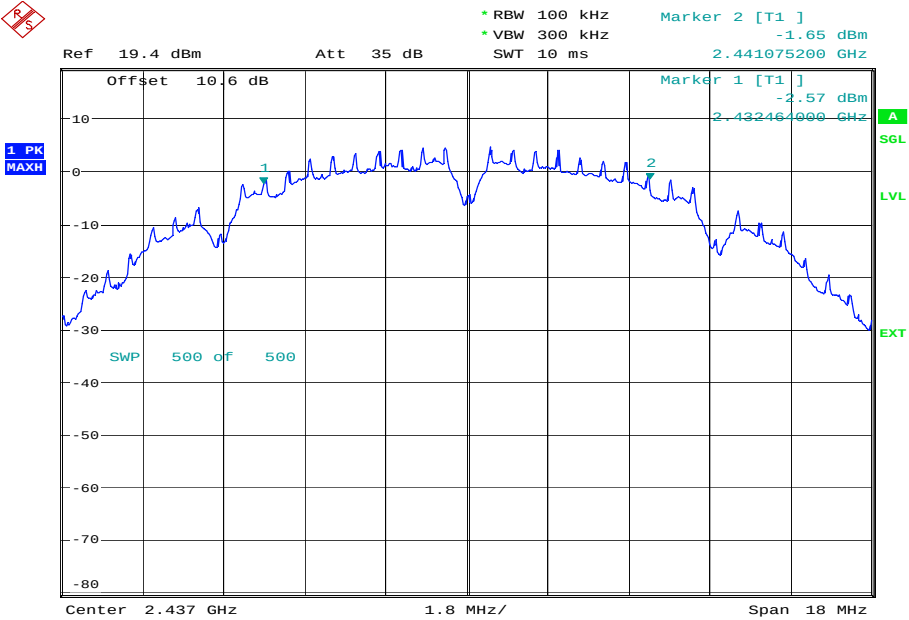
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Product Service

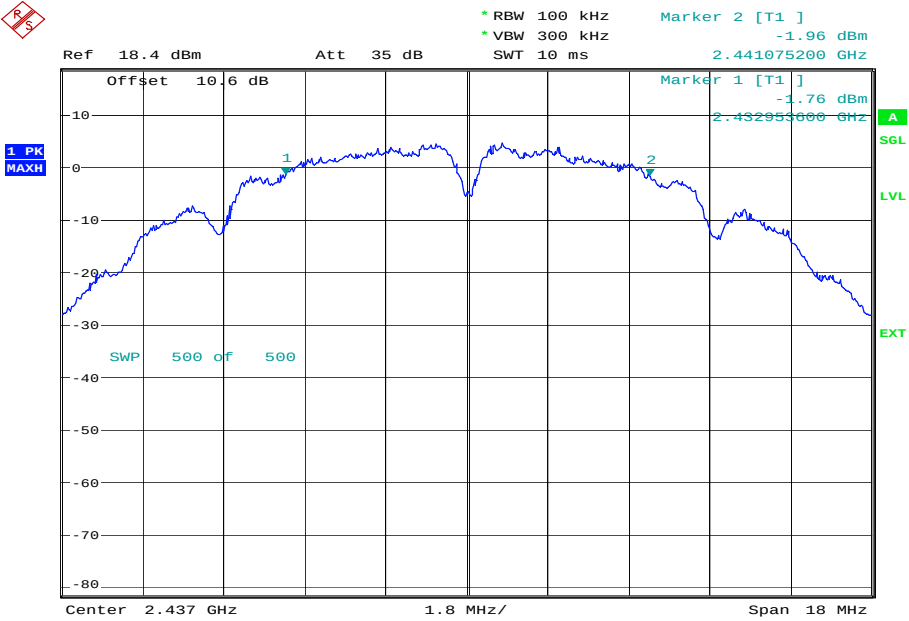
2437 MHz

1 Mbps



Date: 24.NOV.2014 15:56:28

2 Mbps

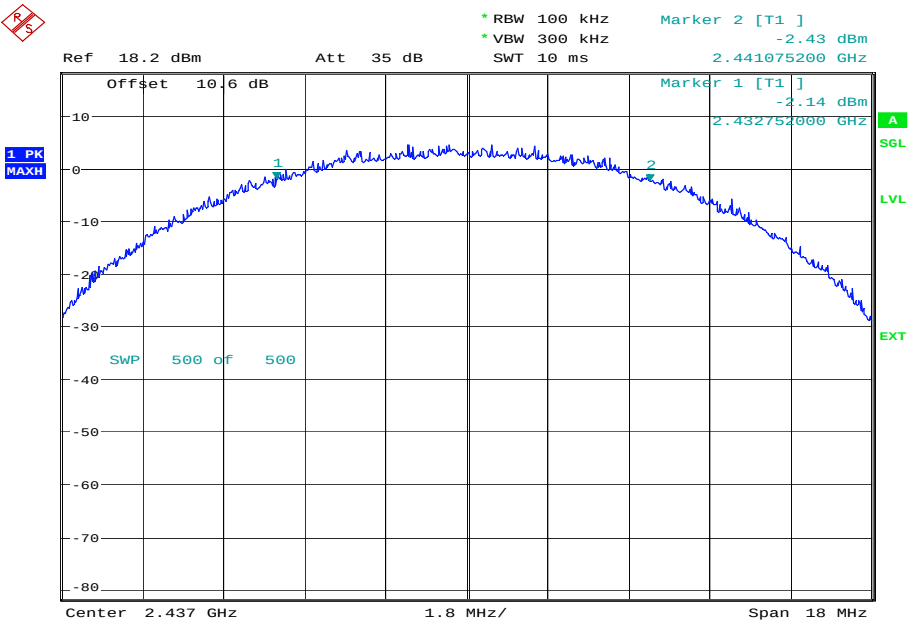


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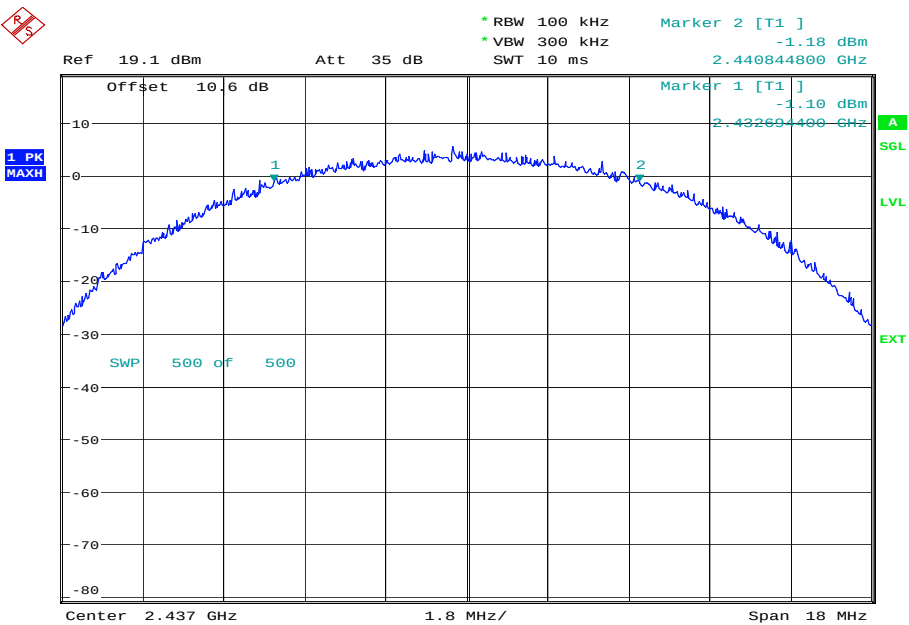
Product Service

5.5 Mbps



Date: 24.NOV.2014 16:31:32

11 Mbps



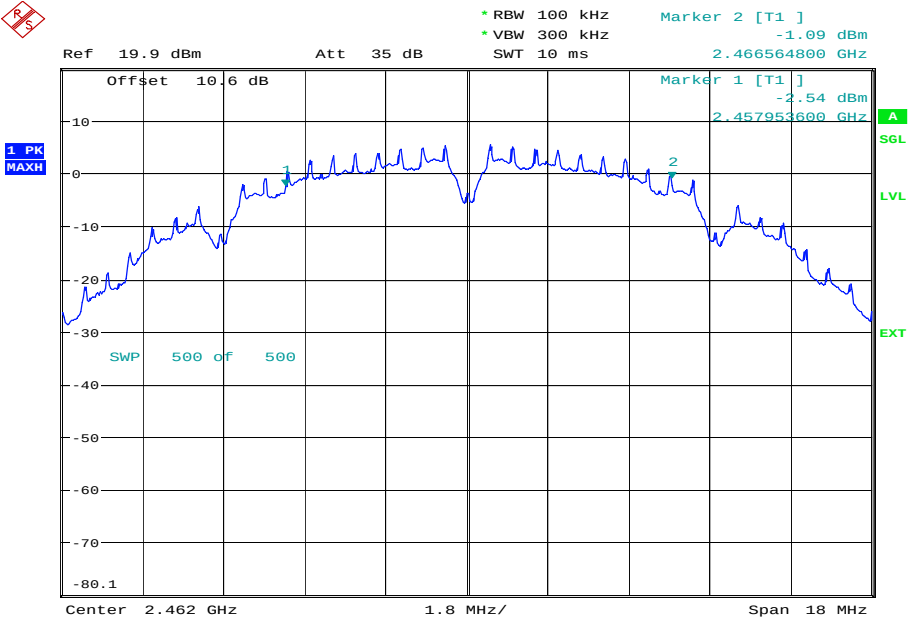
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Product Service

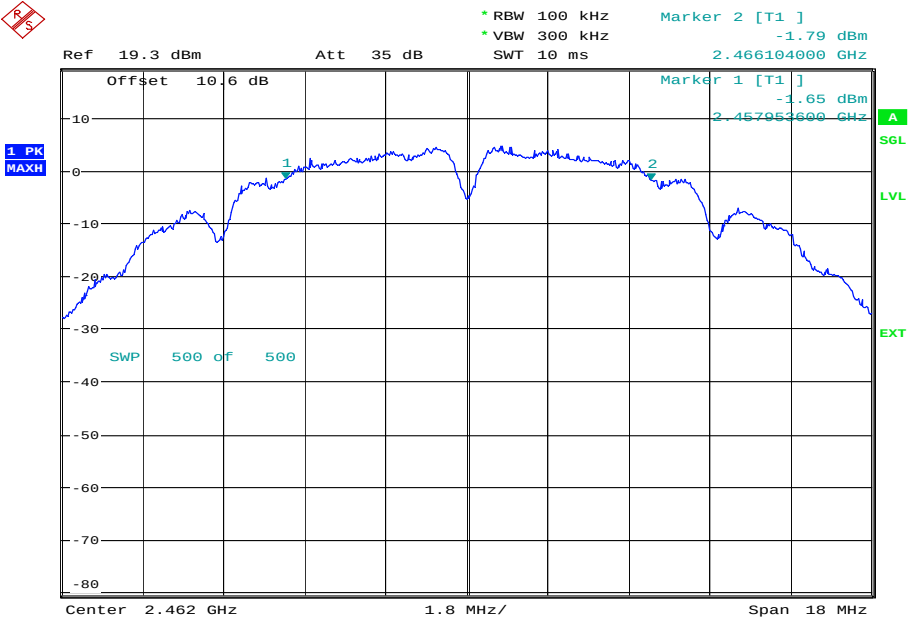
2462 MHz

1 Mbps



Date: 24.NOV.2014 16:01:35

2 Mbps

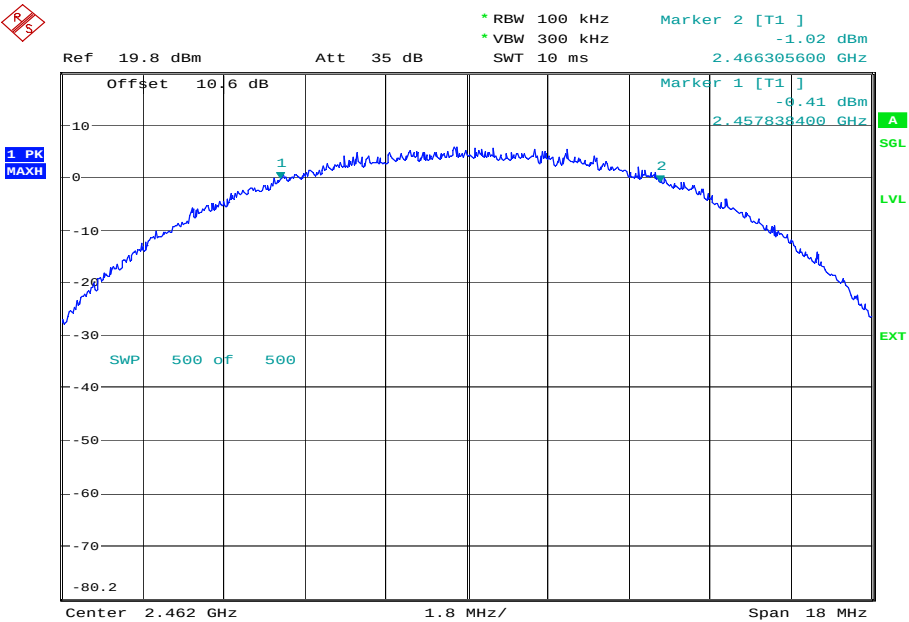


Date: 26.NOV.2014 15:38:09



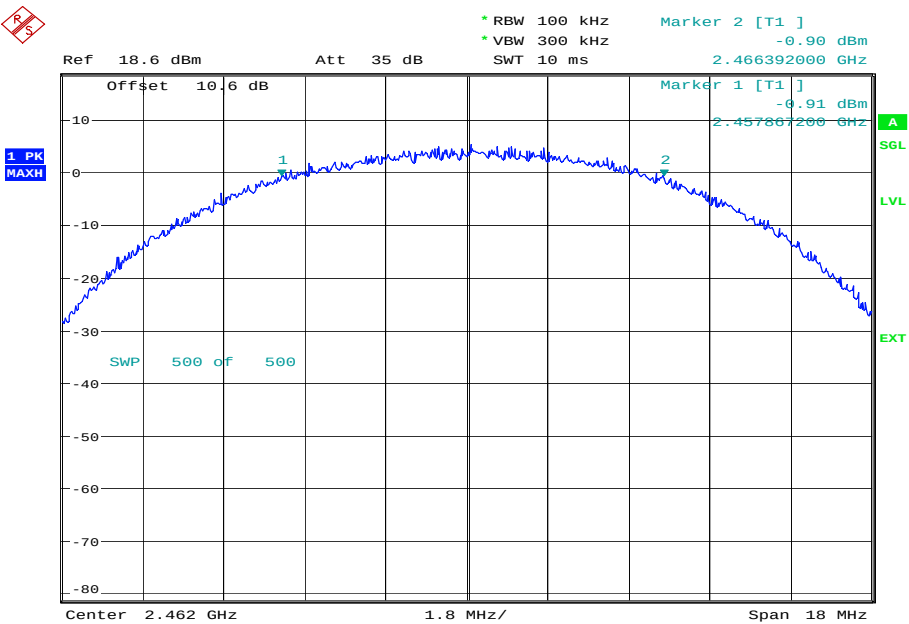
Product Service

5.5 Mbps



Date: 24.NOV.2014 16:36:45

11 Mbps



Date: 24.NOV.2014 17:10:26

Limit Clause

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

802.11(g)

4.0 V DC Supply

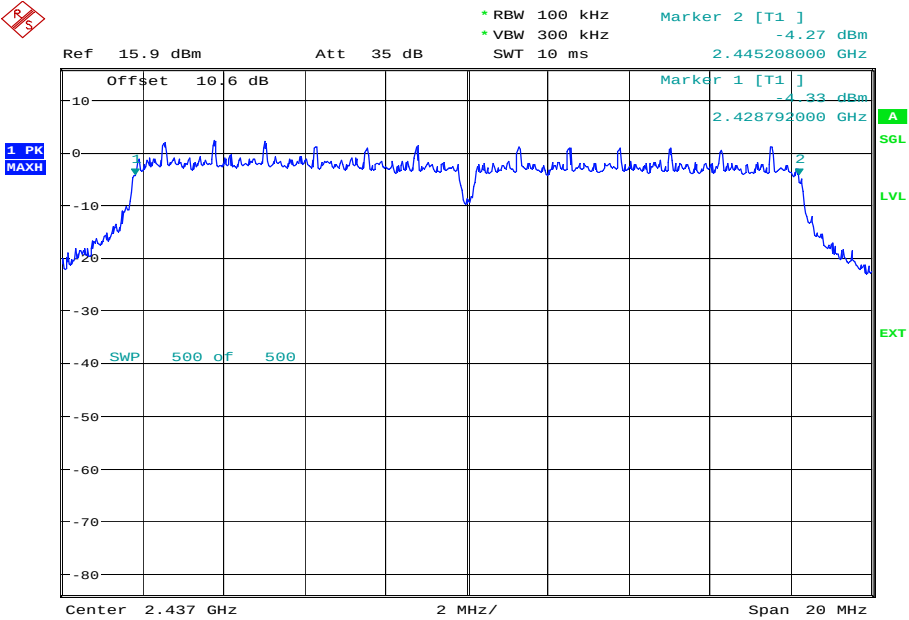
Frequency	Data Rate (Mbps)	6 dB Bandwidth (kHz)
2412 MHz	6	16416.00
	9	16448.00
	12	16512.00
	18	16512.00
	24	16608.00
	36	16544.00
	48	16576.00
	54	16576.00
2437 MHz	6	16480.00
	9	16416.00
	12	16512.00
	18	16512.00
	24	16544.00
	36	16544.00
	48	16576.00
	54	16544.00
2462 MHz	6	16416.00
	9	16416.00
	12	16512.00
	18	16544.00
	24	16544.00
	36	16544.00
	48	16544.00
	54	16576.00



Product Service

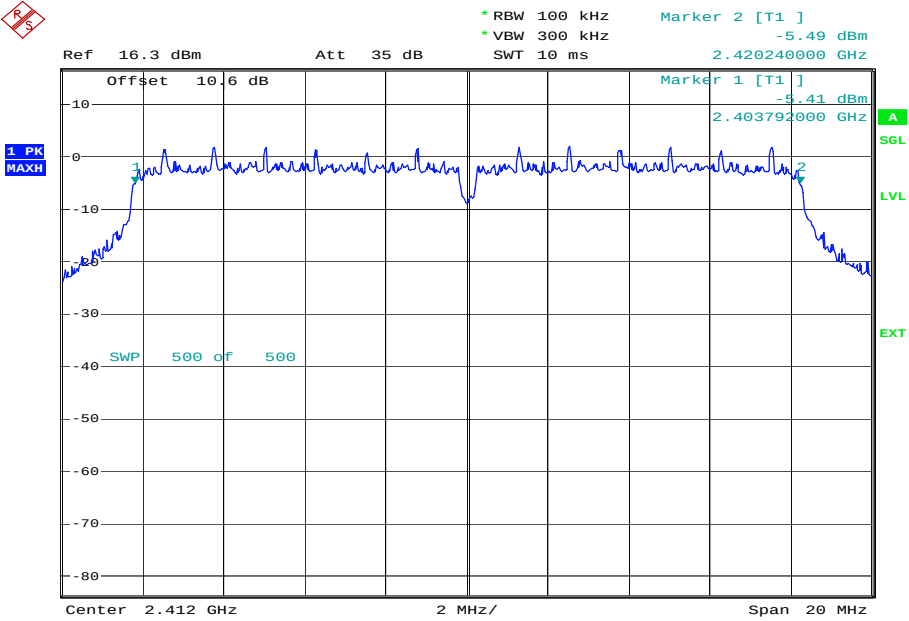
2412 MHz

6 Mbps



Date: 24.NOV.2014 17:27:52

9 Mbps

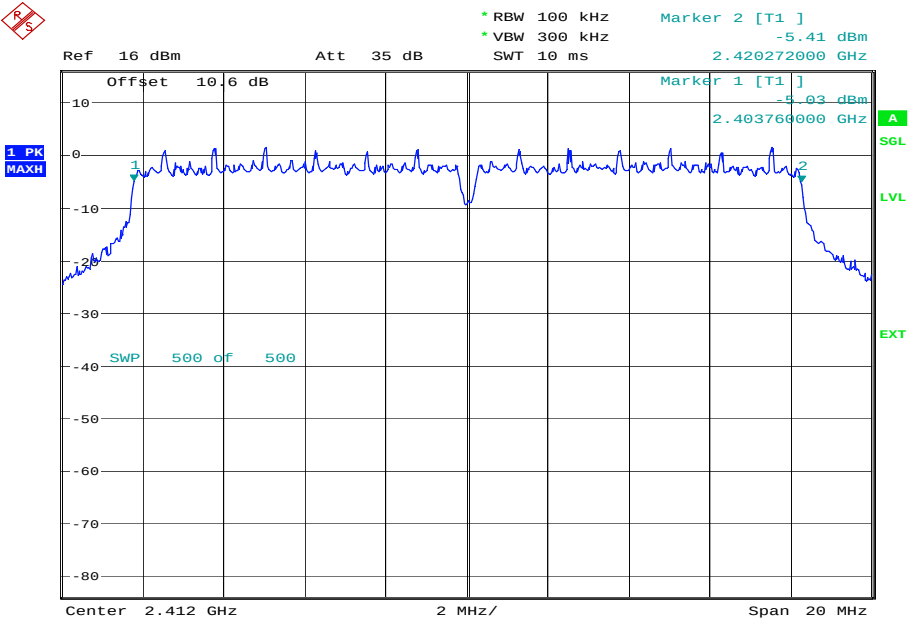


Date: 25.NOV.2014 10:52:16



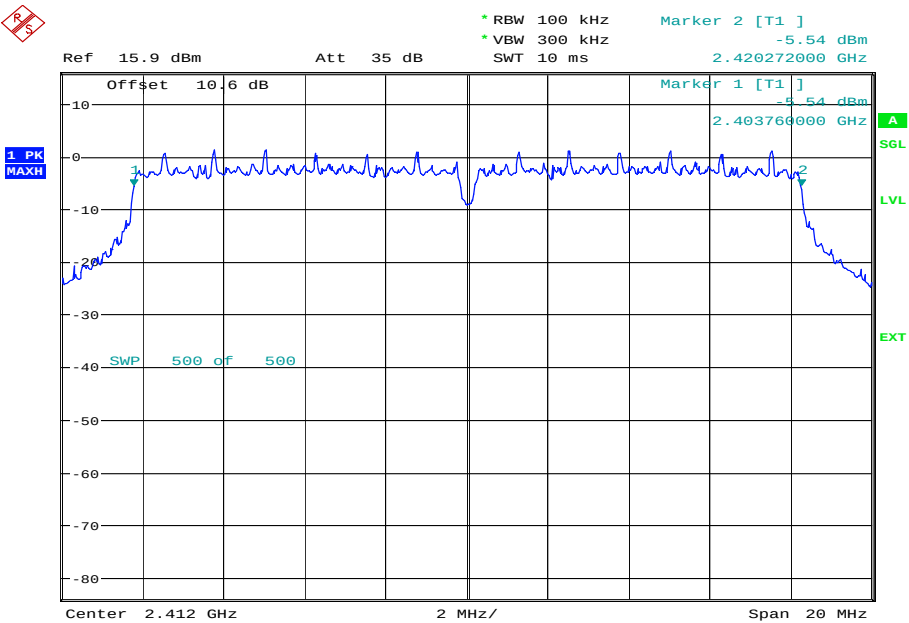
Product Service

12 Mbps



Date: 25.NOV.2014 11:20:29

18 Mbps

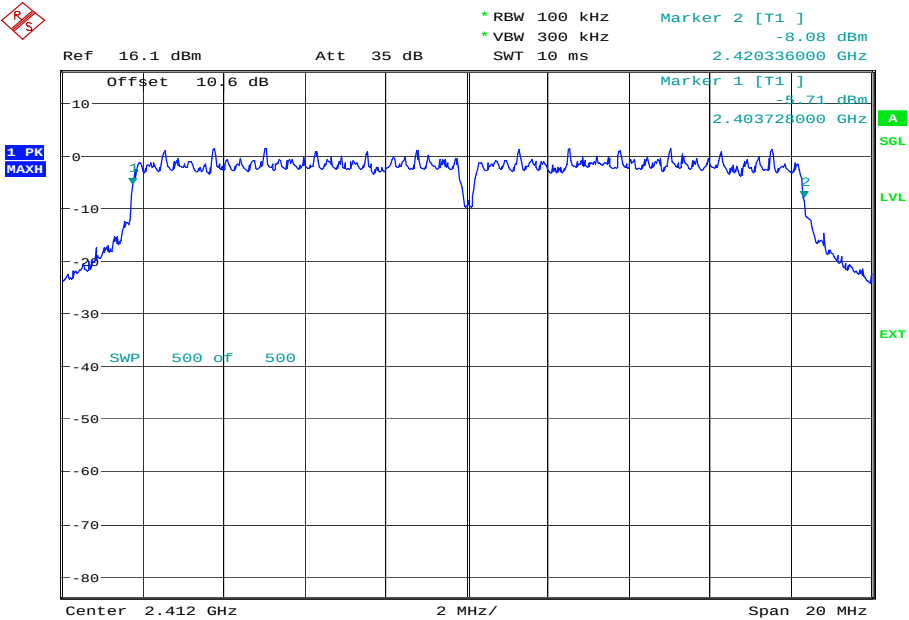


Date: 25.NOV.2014 11:55:28



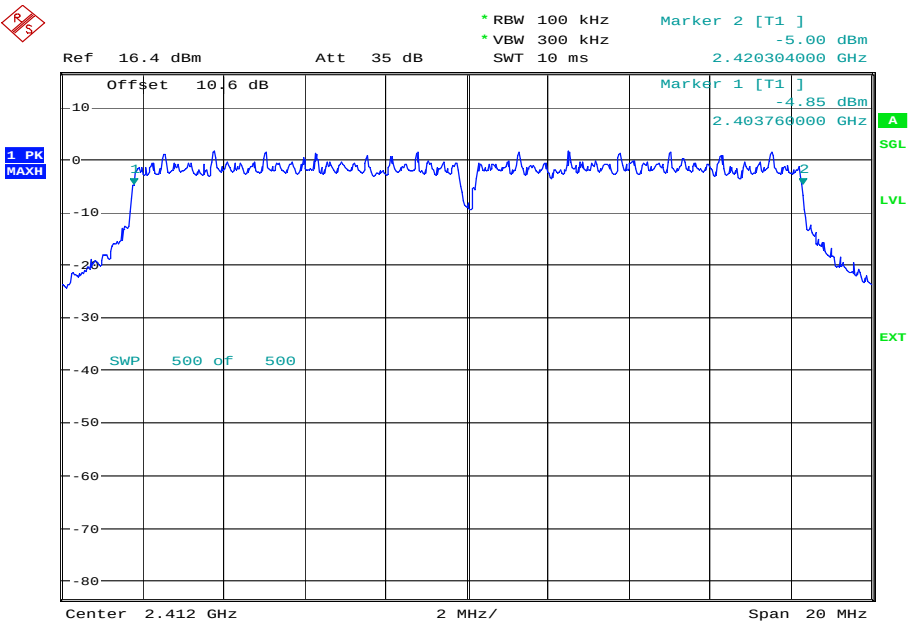
Product Service

24 Mbps



Date: 25.NOV.2014 12:20:56

36 Mbps

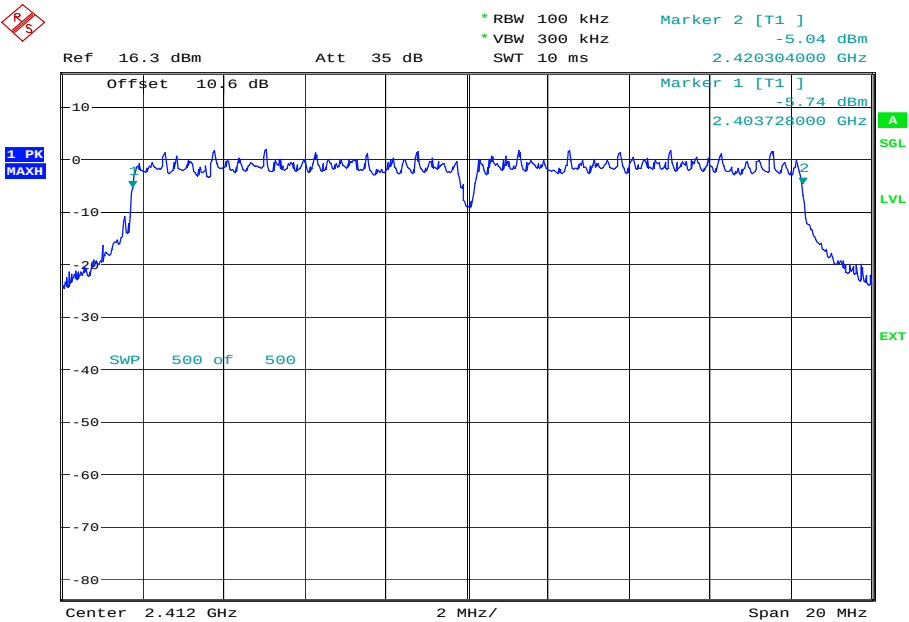


Date: 25.NOV.2014 12:41:49



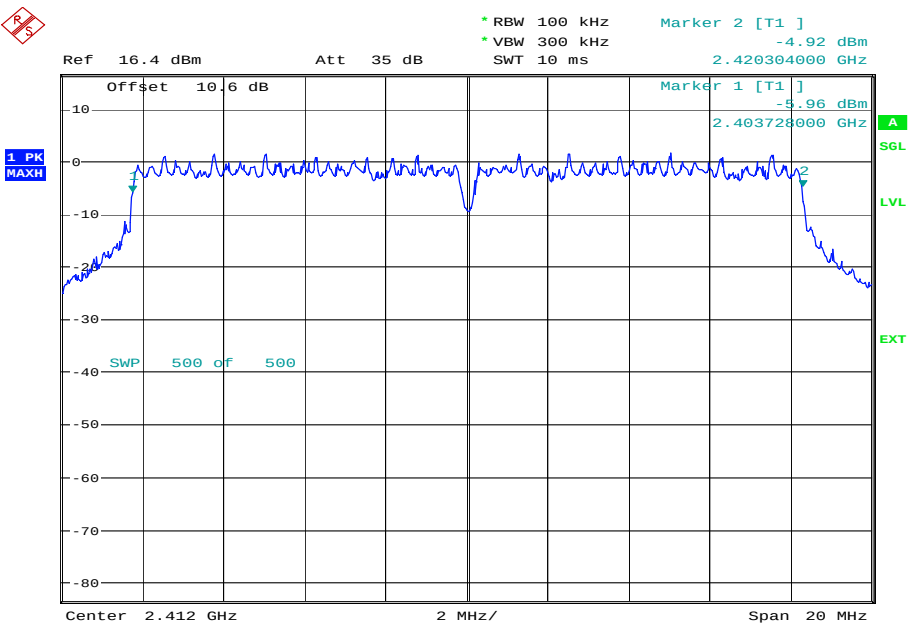
Product Service

48 Mbps



Date: 25.NOV.2014 13:26:26

54 Mbps



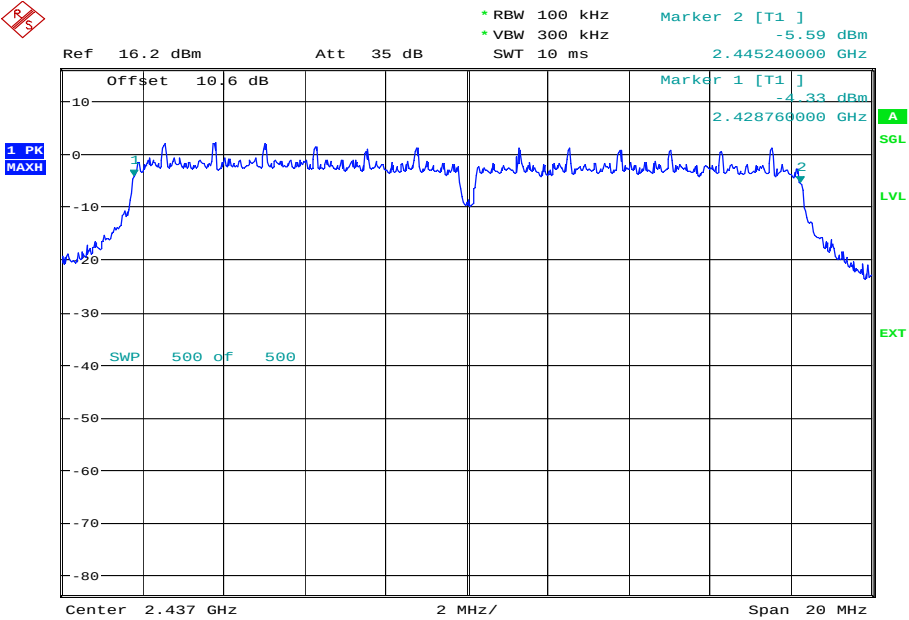
Date: 25.NOV.2014 13:49:57



Product Service

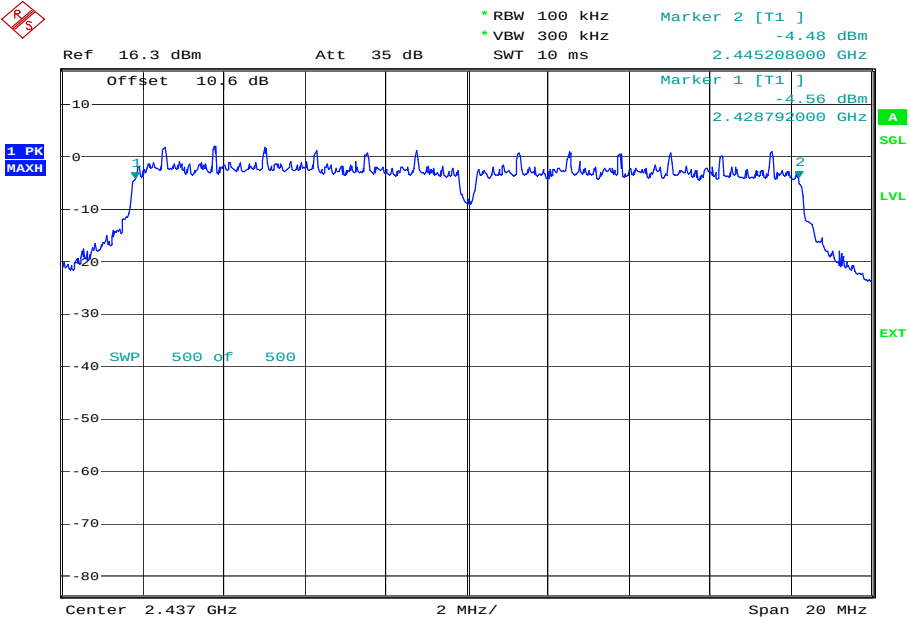
2437 MHz

6 Mbps



Date: 24.NOV.2014 17:29:20

9 Mbps

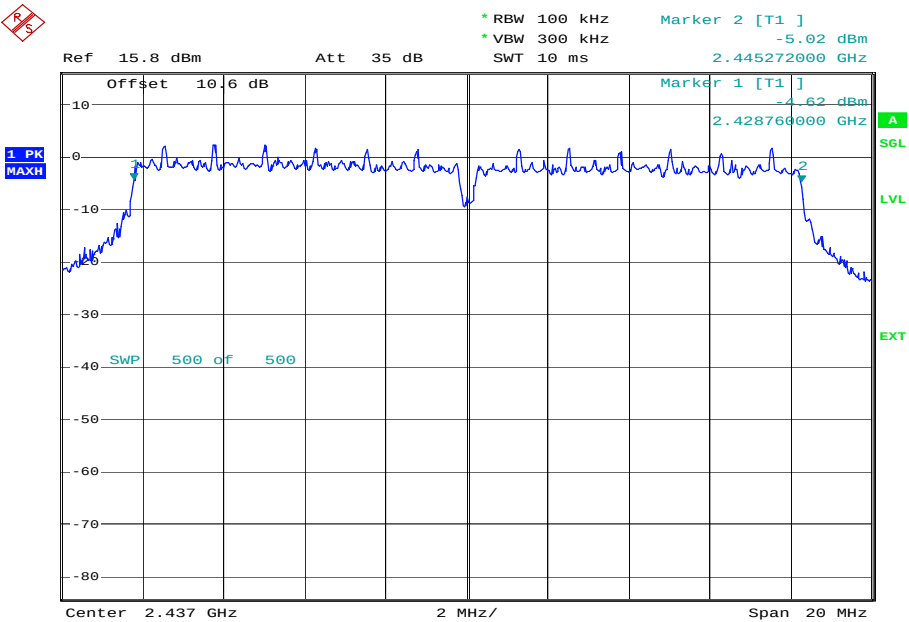


Date: 25.NOV.2014 10:58:56



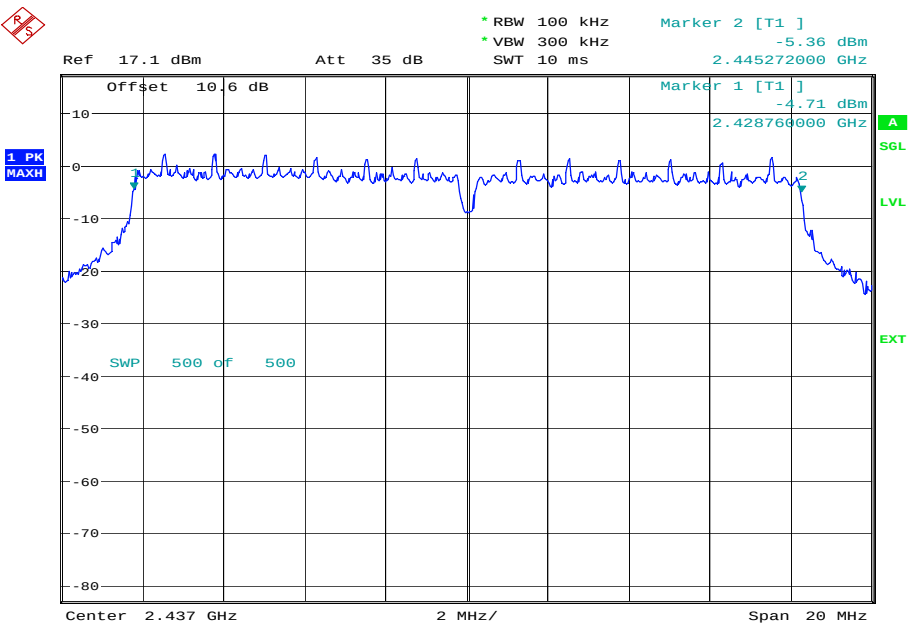
Product Service

12 Mbps



Date: 25.NOV.2014 11:24:21

18 Mbps

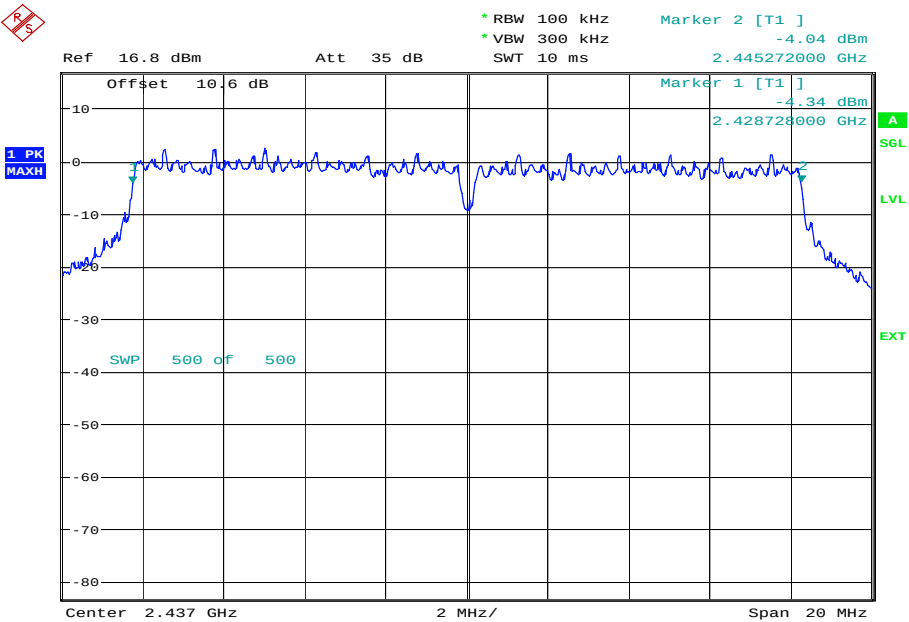


Date: 25.NOV.2014 12:08:09



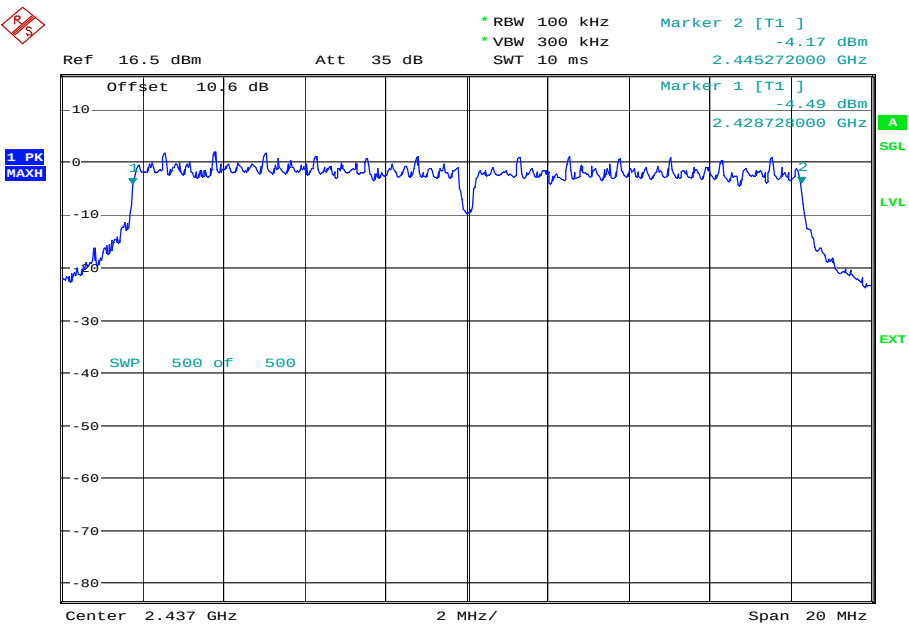
Product Service

24 Mbps



Date: 25.NOV.2014 12:25:56

36 Mbps

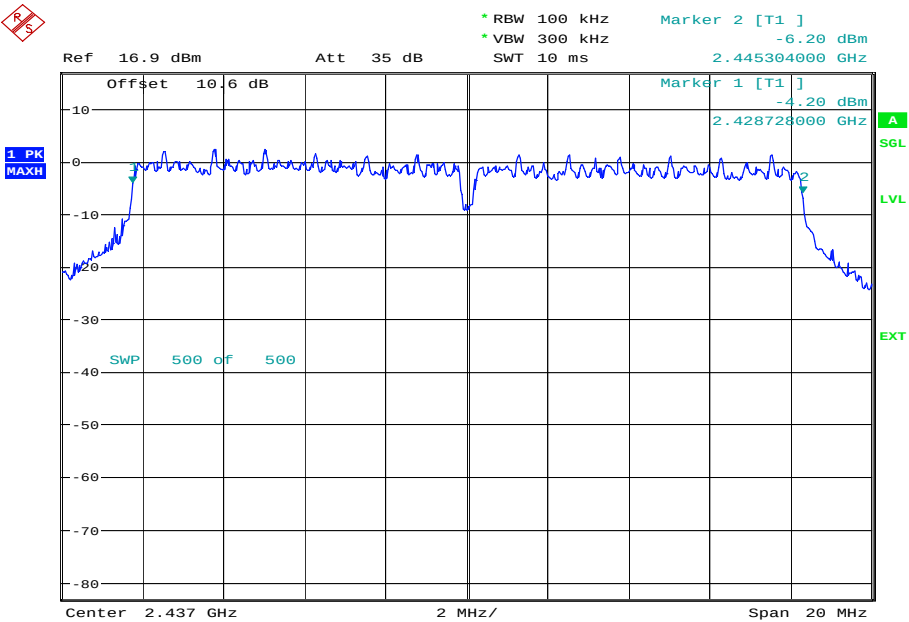


Date: 25.NOV.2014 13:03:02



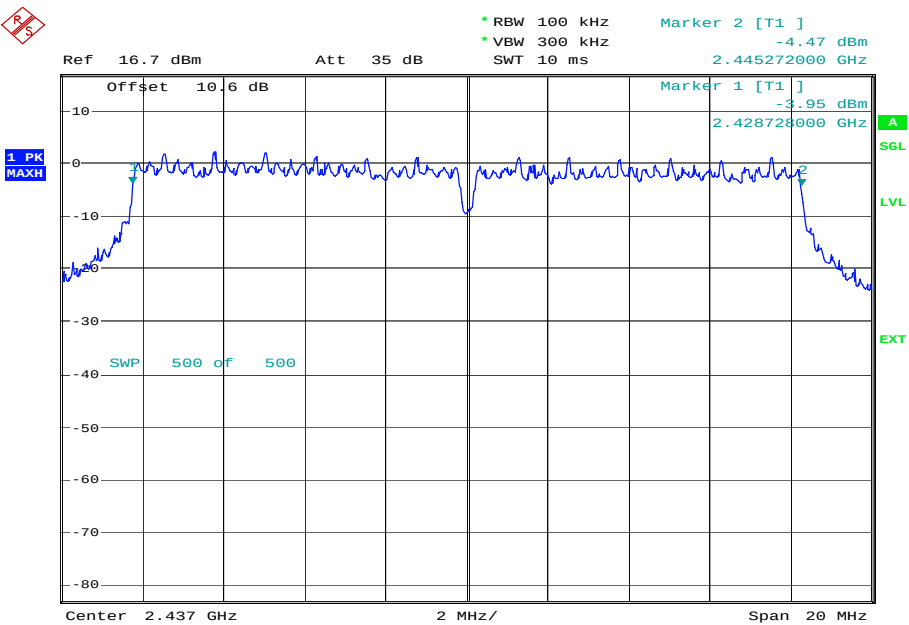
Product Service

48 Mbps



Date: 25.NOV.2014 13:33:43

54 Mbps



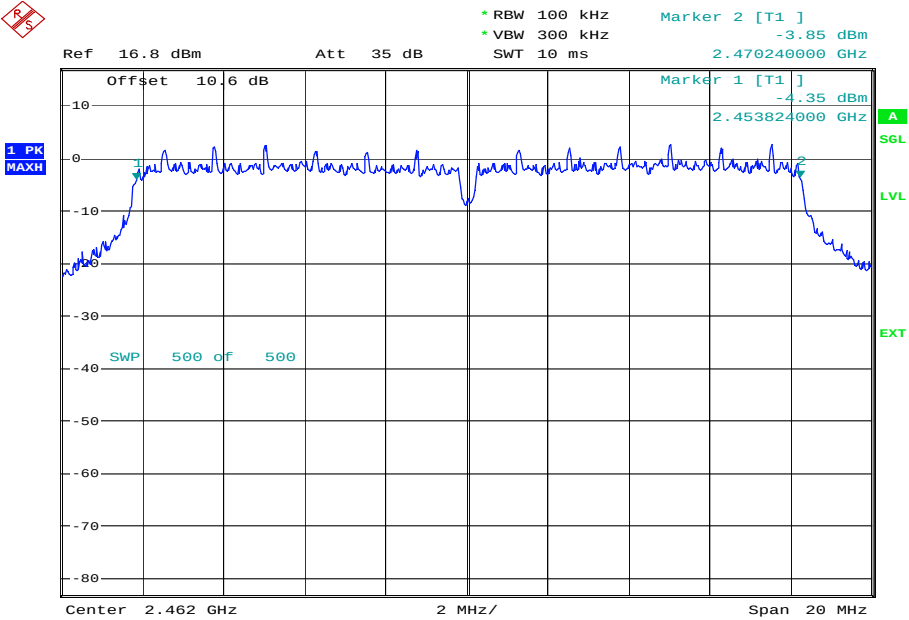
Date: 25.NOV.2014 14:05:23



Product Service

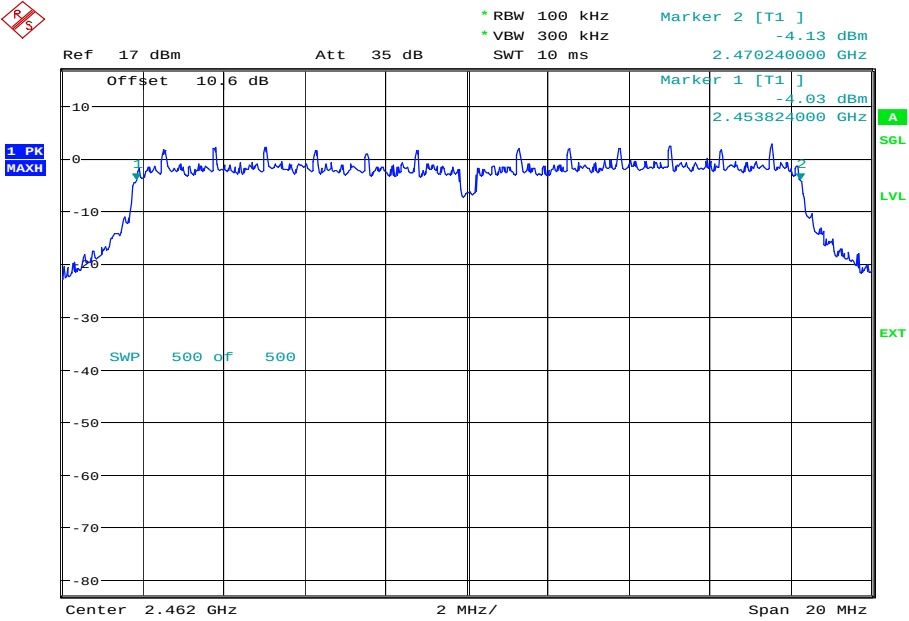
2462 MHz

6 Mbps



Date: 25.NOV.2014 10:45:21

9 Mbps

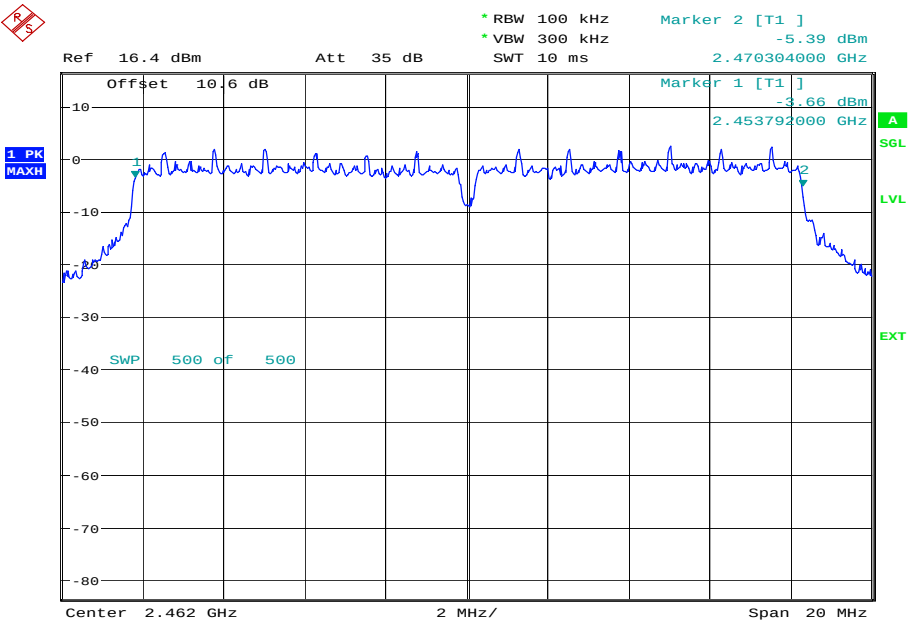


Date: 25.NOV.2014 11:12:38



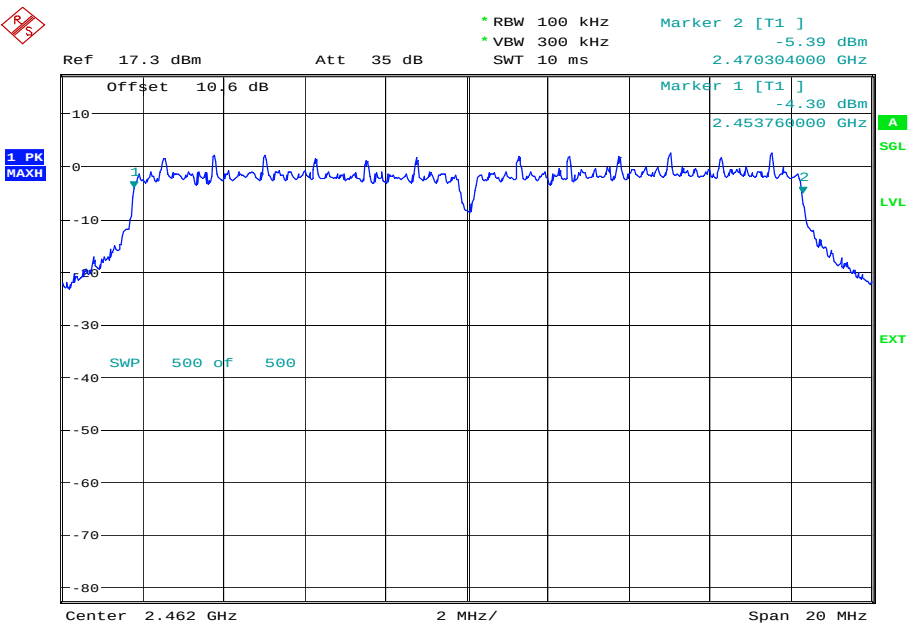
Product Service

12 Mbps



Date: 25.NOV.2014 11:32:35

18 Mbps

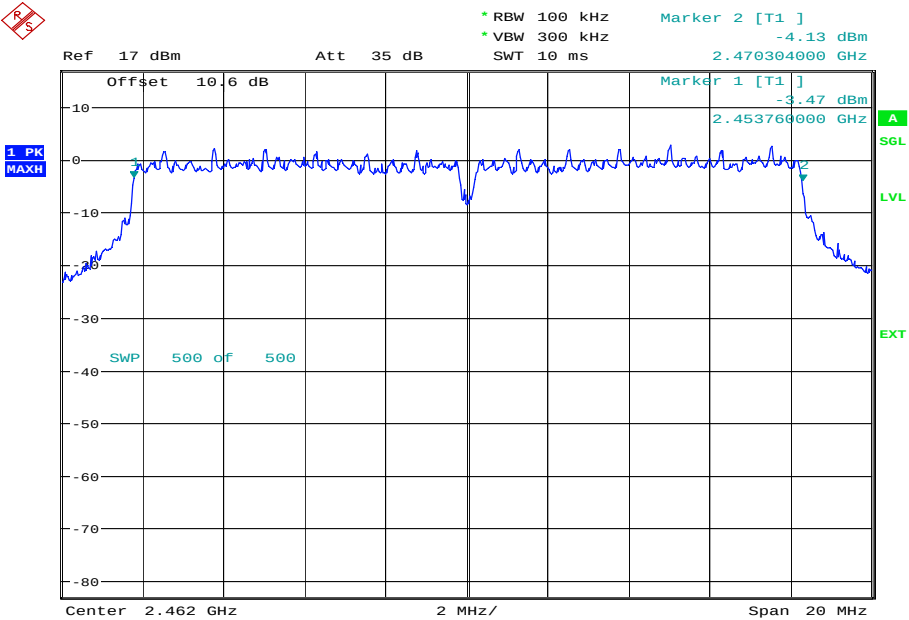


Date: 25.NOV.2014 12:14:04



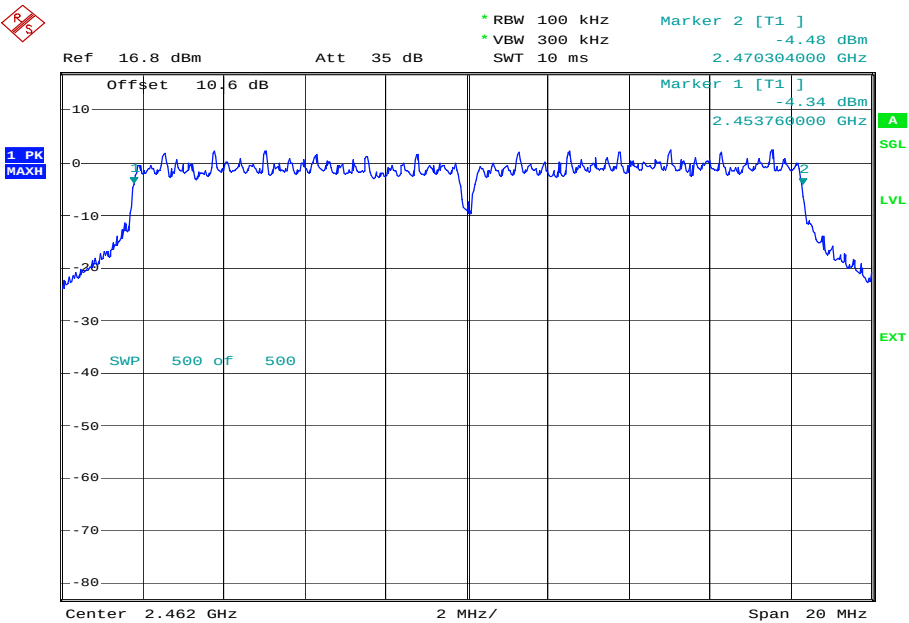
Product Service

24 Mbps



Date: 25.NOV.2014 12:33:57

36 Mbps

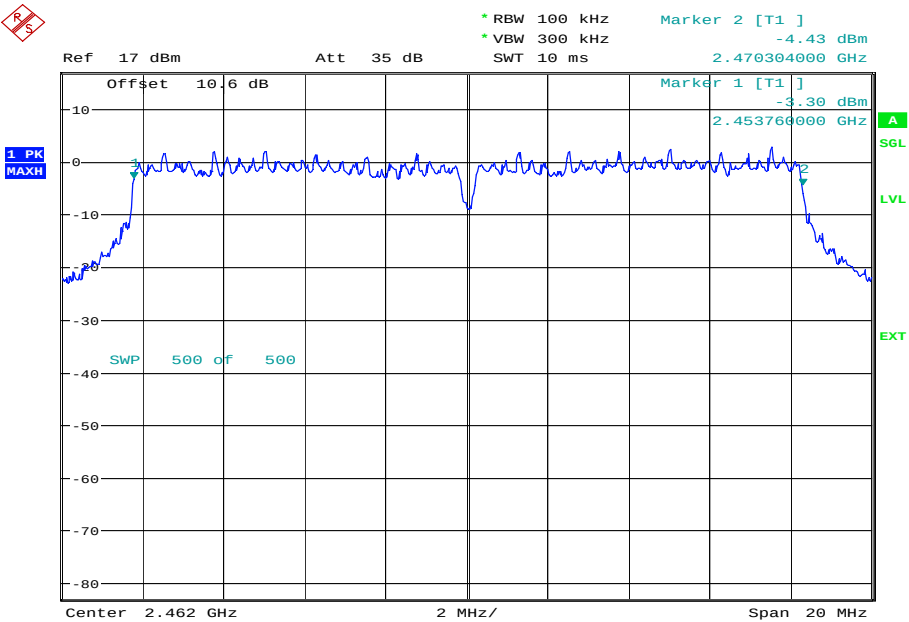


Date: 25.NOV.2014 13:11:06



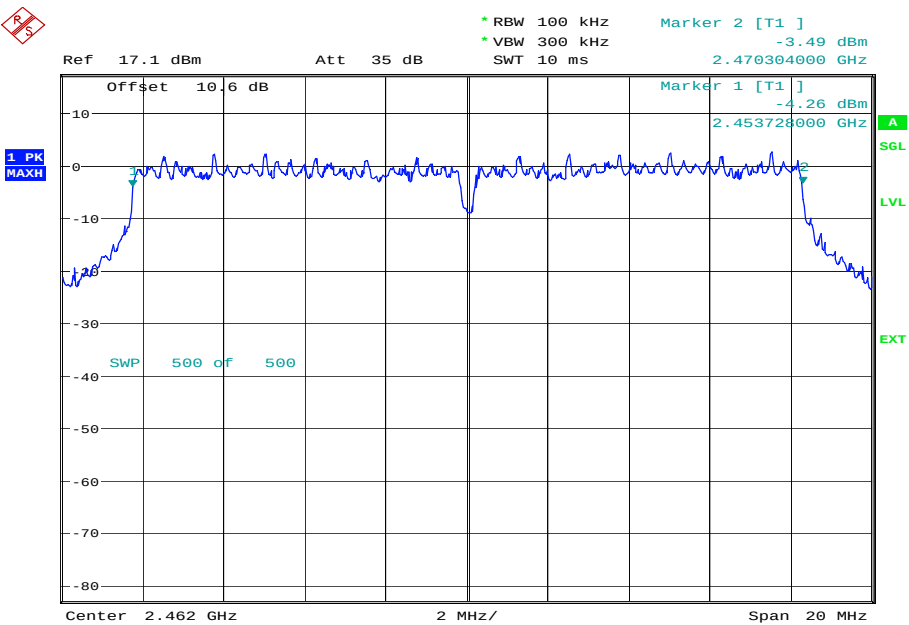
Product Service

48 Mbps



Date: 25.NOV.2014 13:39:50

54 Mbps



Date: 25.NOV.2014 14:21:41

Limit Clause

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

802.11(n)

4.0 V DC Supply

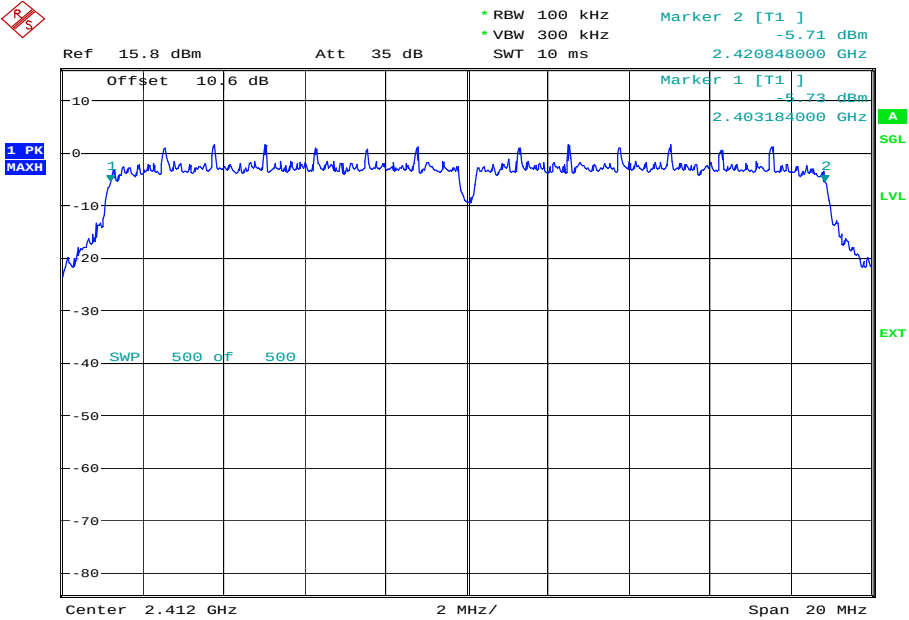
Frequency	Data Rate (Mbps)	6 dB Bandwidth (kHz)
2412 MHz	6.5	17664.00
	13	17728.00
	19.5	17728.00
	26	17824.00
	39	17792.00
	52	17792.00
	58.5	17824.00
	65	17824.00
2437 MHz	6.5	17632.00
	13	17728.00
	19.5	17696.00
	26	17760.00
	39	17760.00
	52	17760.00
	58.5	17792.00
	65	17760.00
2462 MHz	6.5	17664.00
	13	17760.00
	19.5	17728.00
	26	17792.00
	39	17760.00
	52	17792.00
	58.5	17824.00
	65	17792.00



Product Service

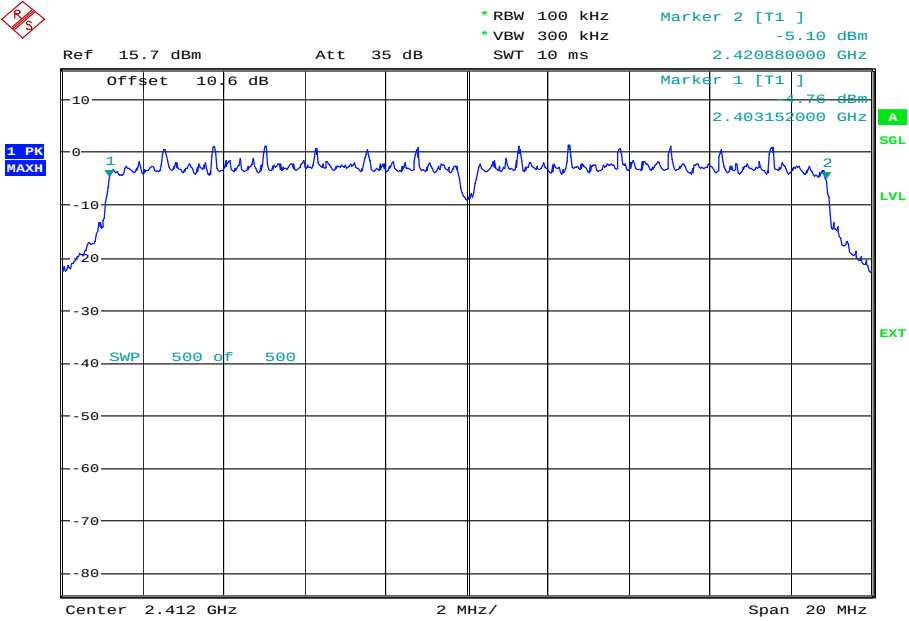
2412 MHz

6.5 Mbps



Date: 25.NOV.2014 14:37:03

13 Mbps

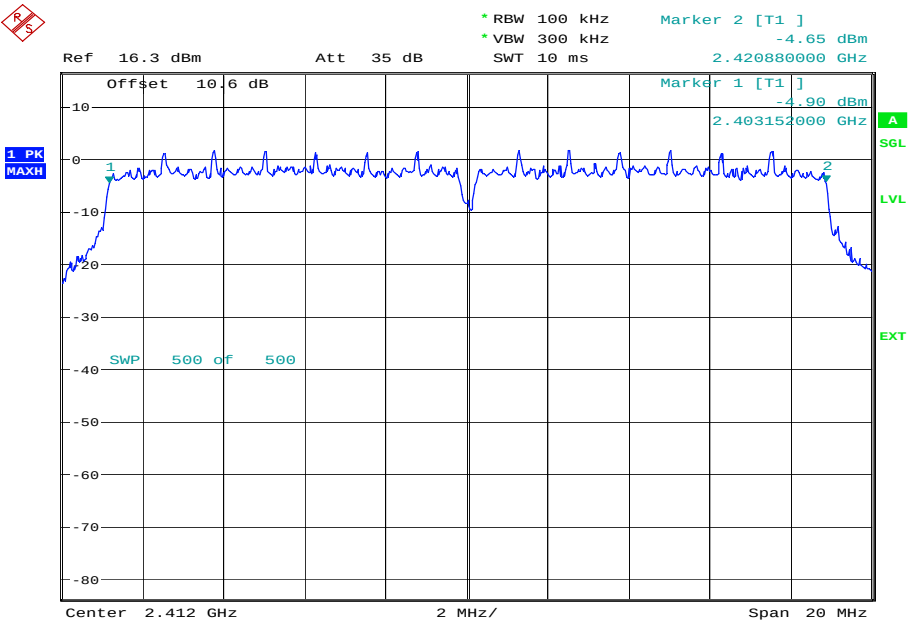


Date: 25.NOV.2014 14:53:00



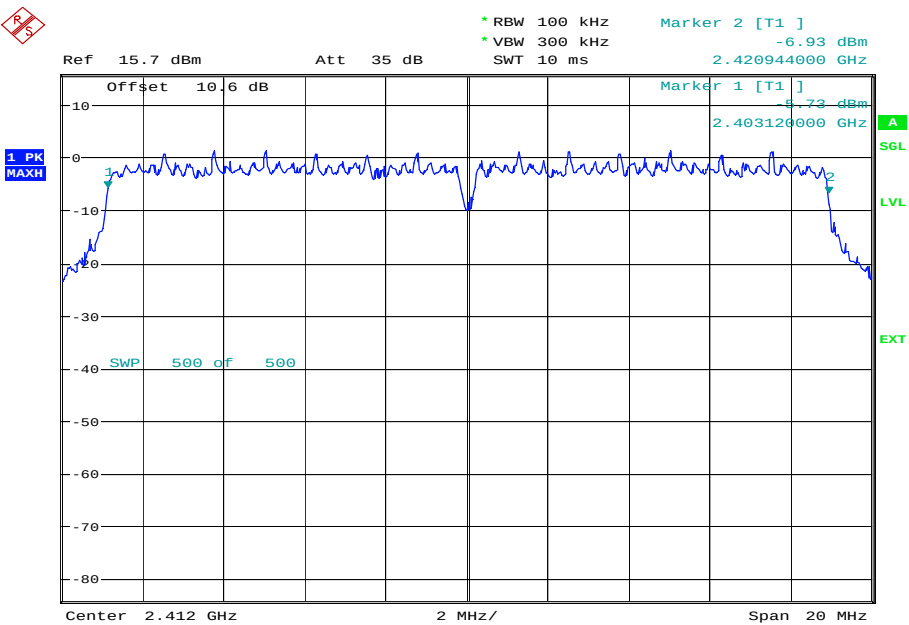
Product Service

19.5 Mbps



Date: 25.NOV.2014 15:48:19

26 Mbps

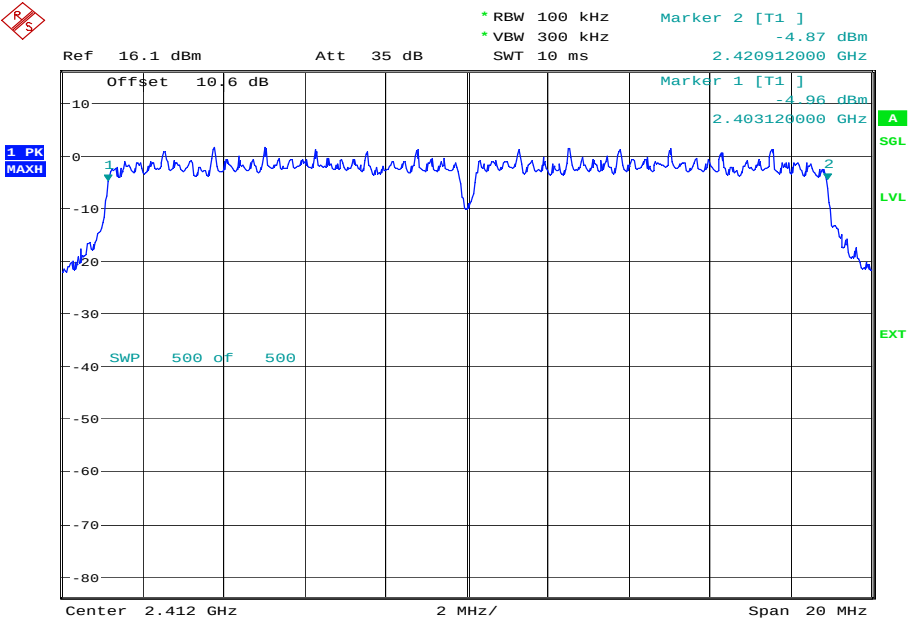


Date: 25.NOV.2014 16:16:21



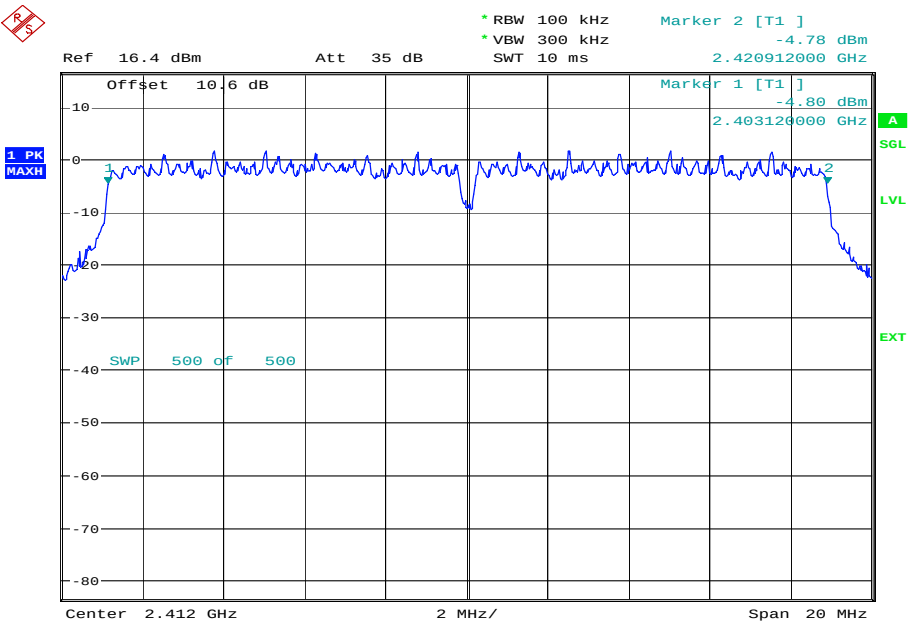
Product Service

39 Mbps



Date: 25.NOV.2014 17:15:39

52 Mbps

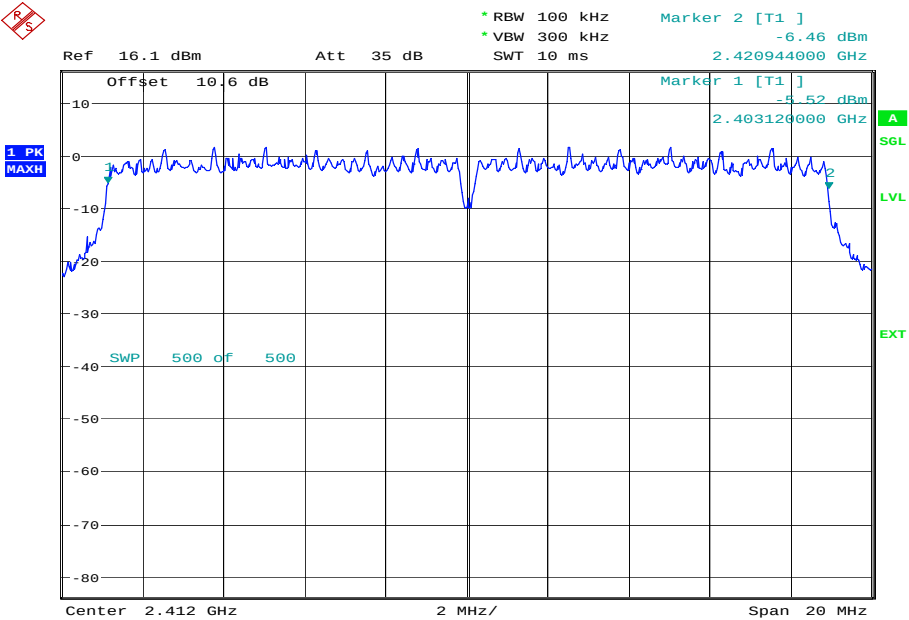


Date: 25.NOV.2014 17:44:43



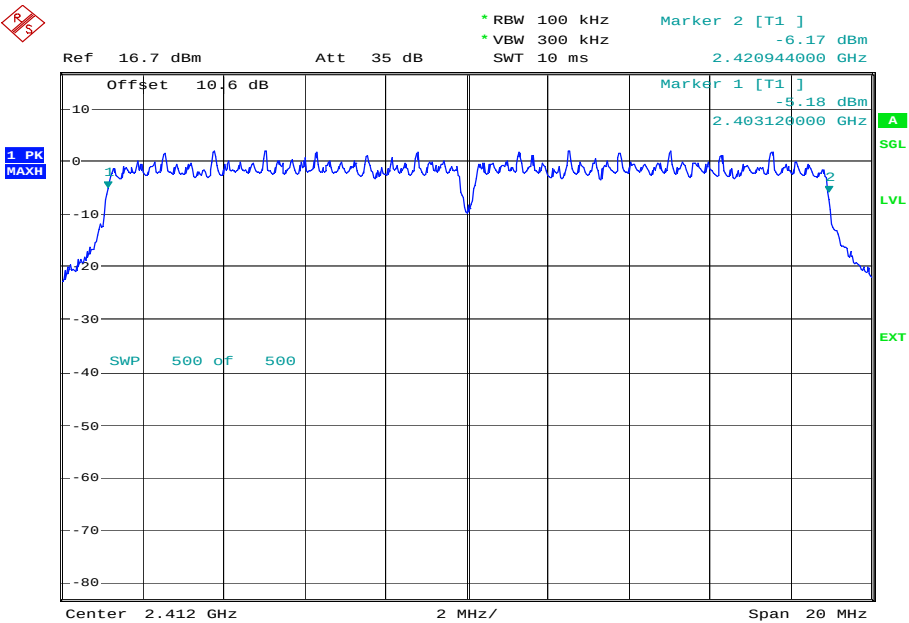
Product Service

58.5 Mbps



Date: 26.NOV.2014 14:59:11

65 Mbps



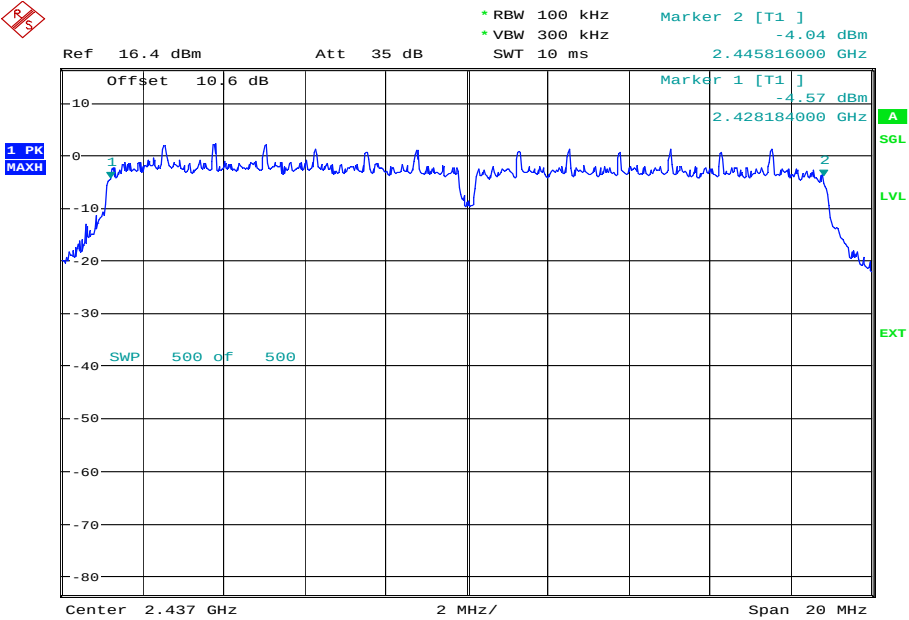
Date: 26.NOV.2014 15:18:28



Product Service

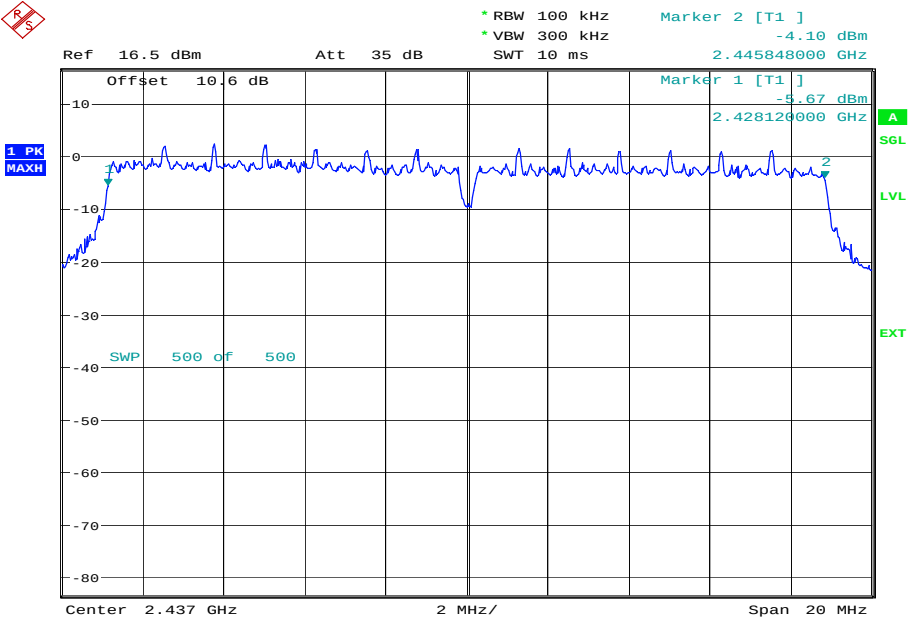
2437 MHz

6.5 Mbps



Date: 25.NOV.2014 14:42:42

13 Mbps

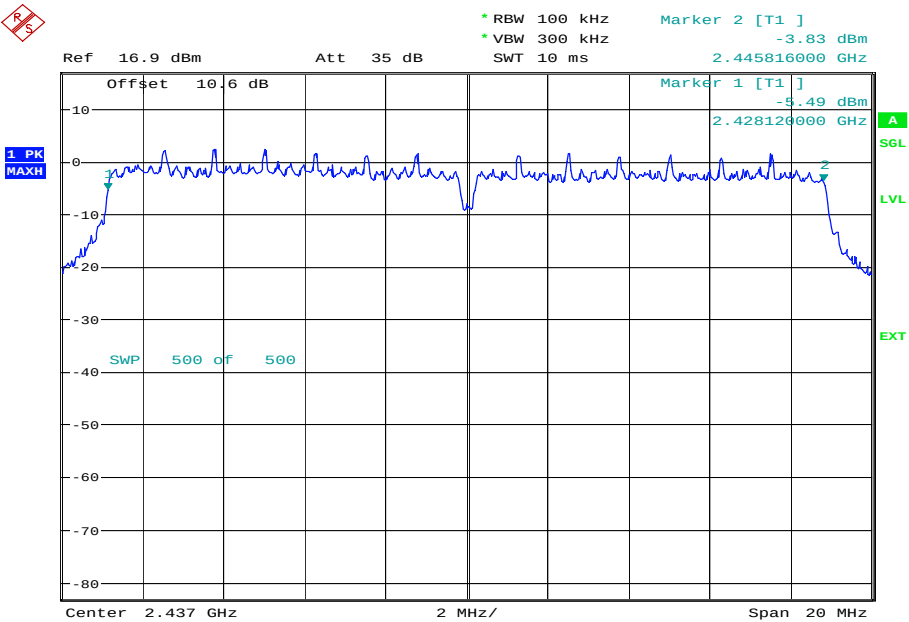


Date: 25.NOV.2014 15:11:18



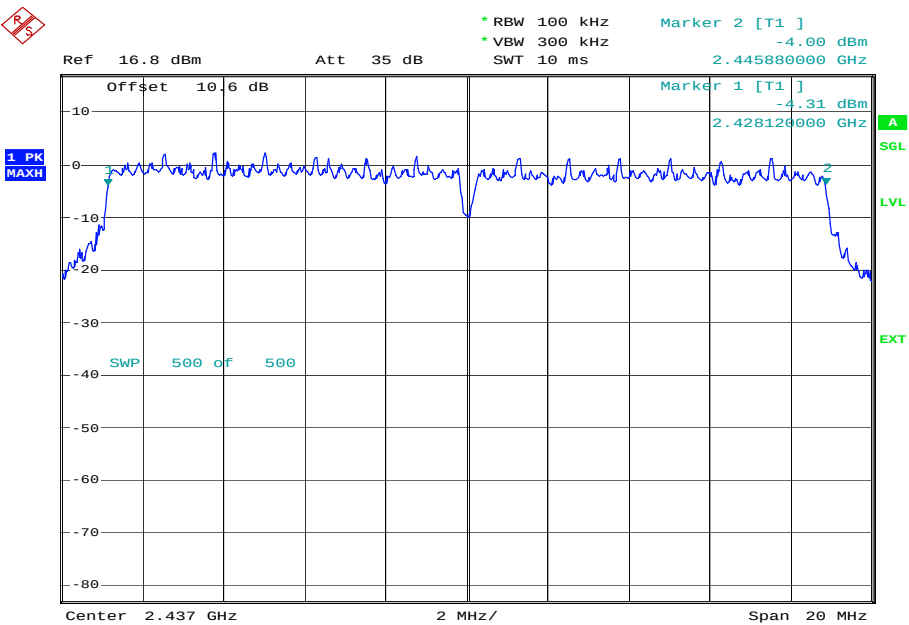
Product Service

19.5 Mbps



Date: 25.NOV.2014 16:07:03

26 Mbps

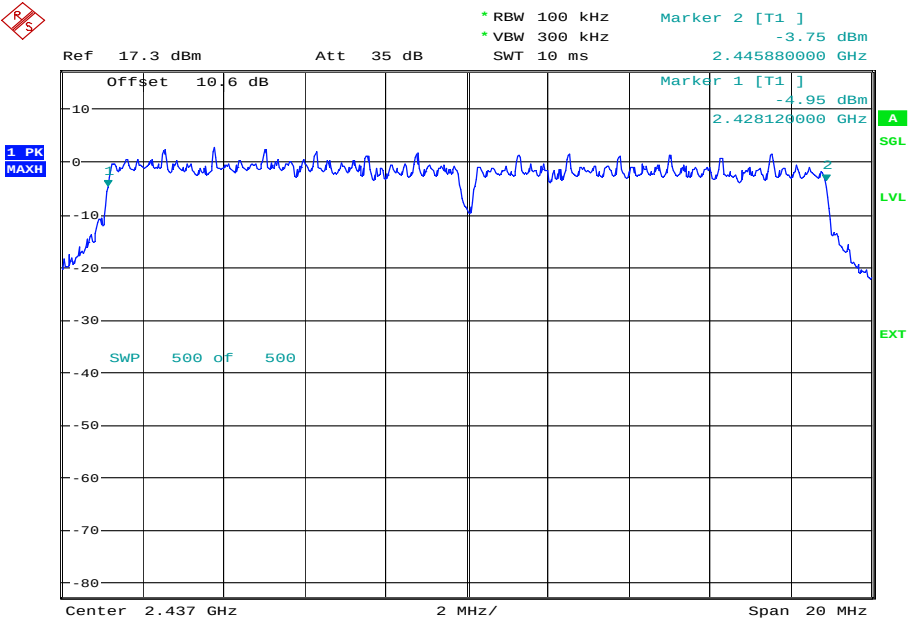


Date: 25.NOV.2014 16:54:03



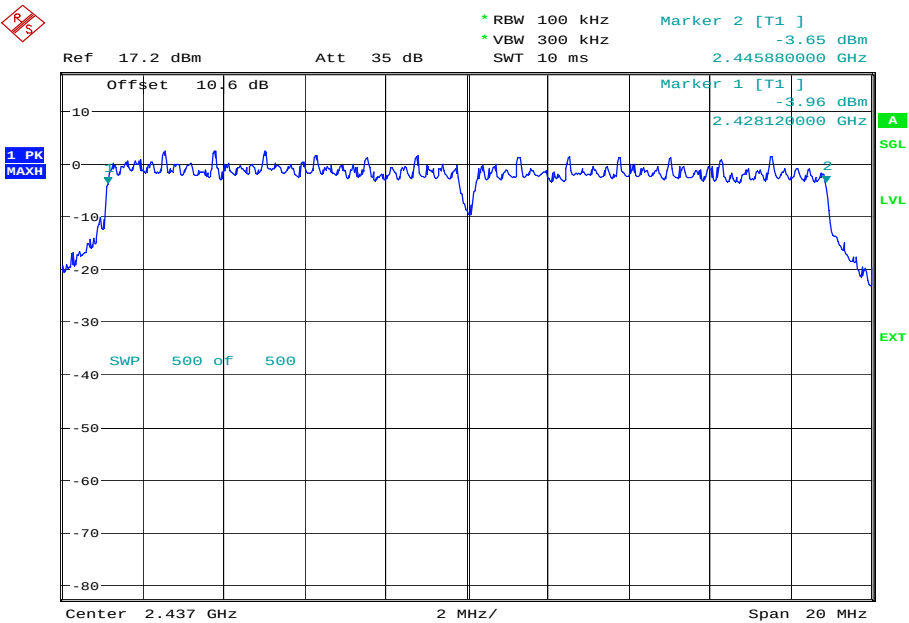
Product Service

39 Mbps



Date: 25.NOV.2014 17:28:49

52 Mbps

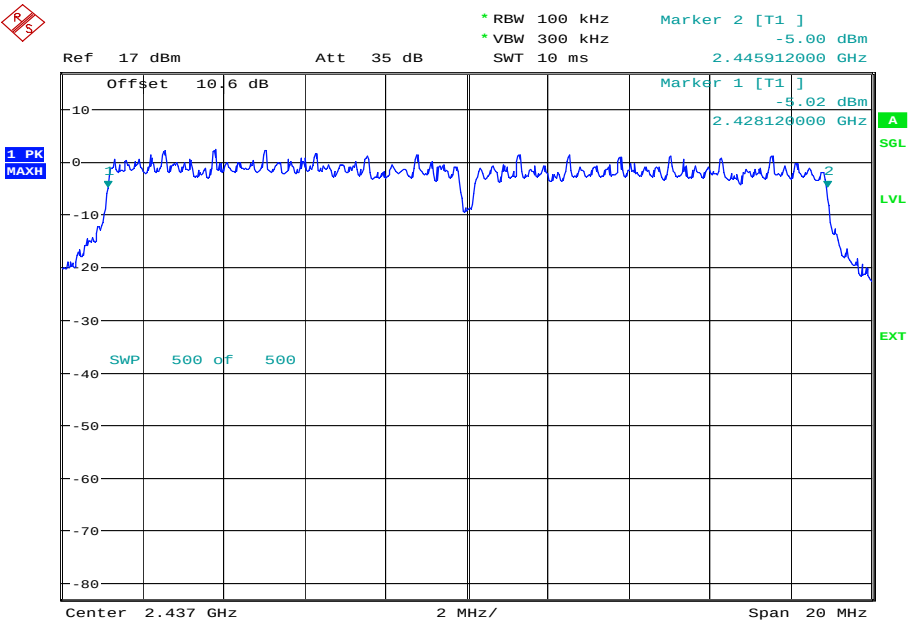


Date: 25.NOV.2014 17:48:57



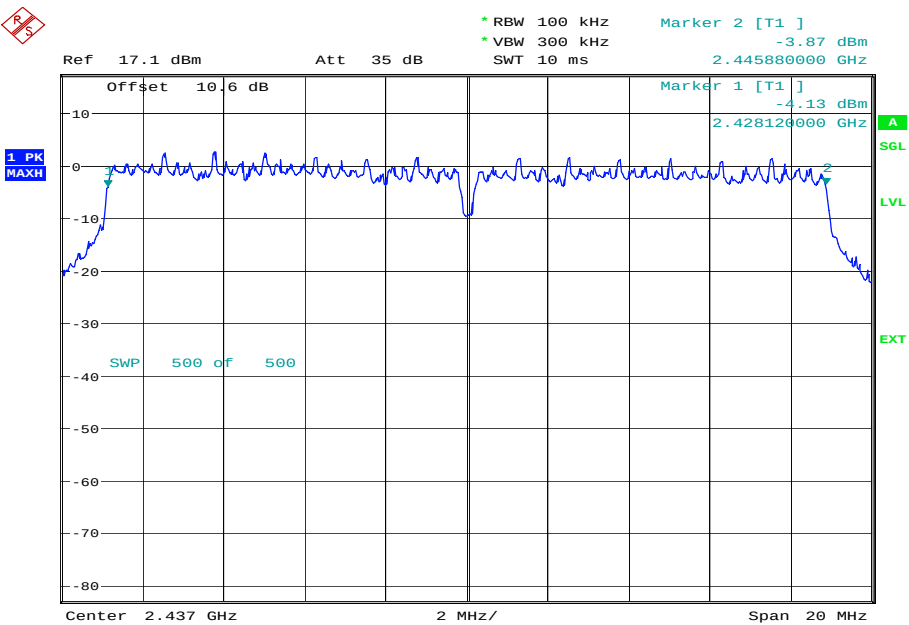
Product Service

58.5 Mbps



Date: 26.NOV.2014 15:04:56

65 Mbps



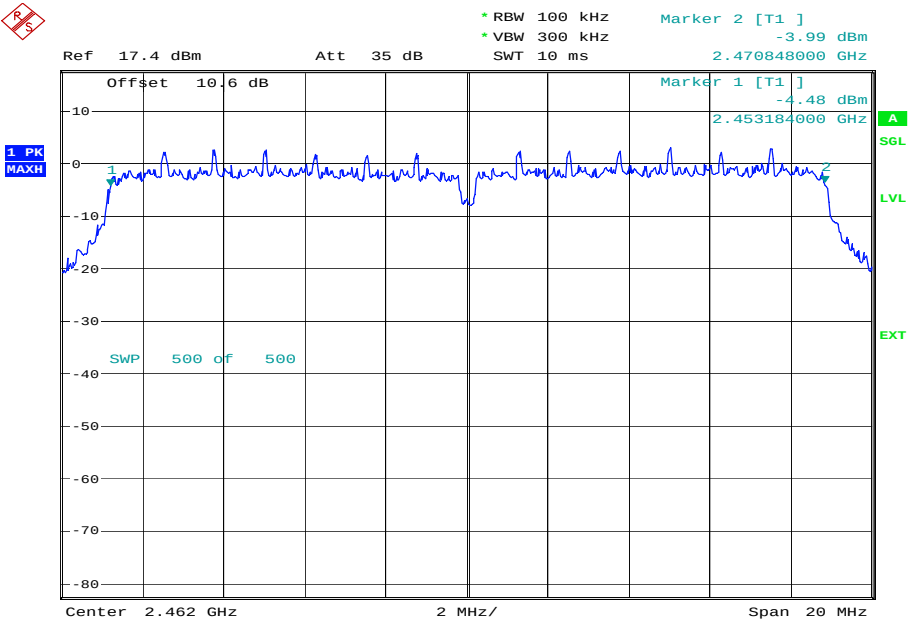
Date: 26.NOV.2014 15:22:14



Product Service

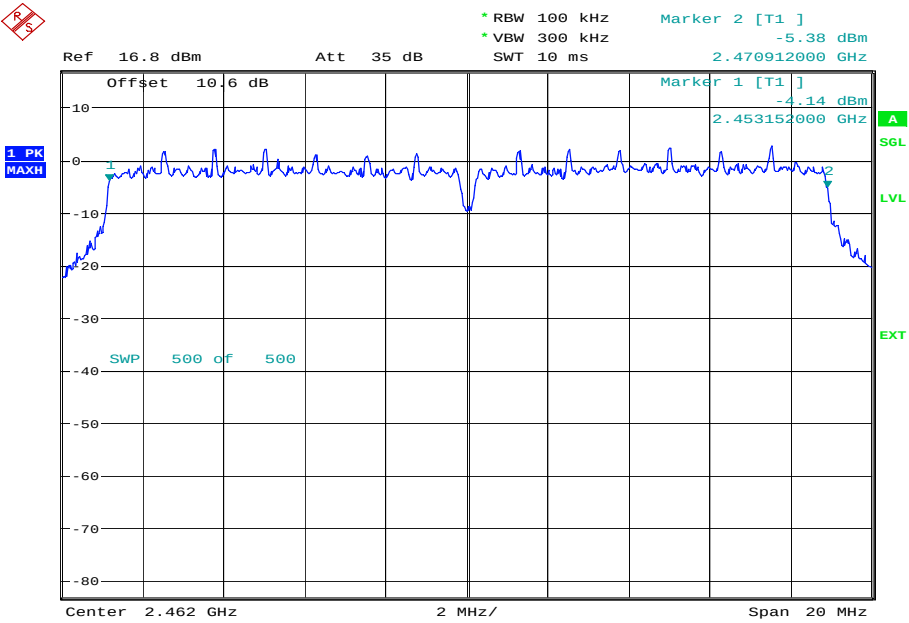
2462 MHz

6.5 Mbps



Date: 25.NOV.2014 14:46:54

13 Mbps

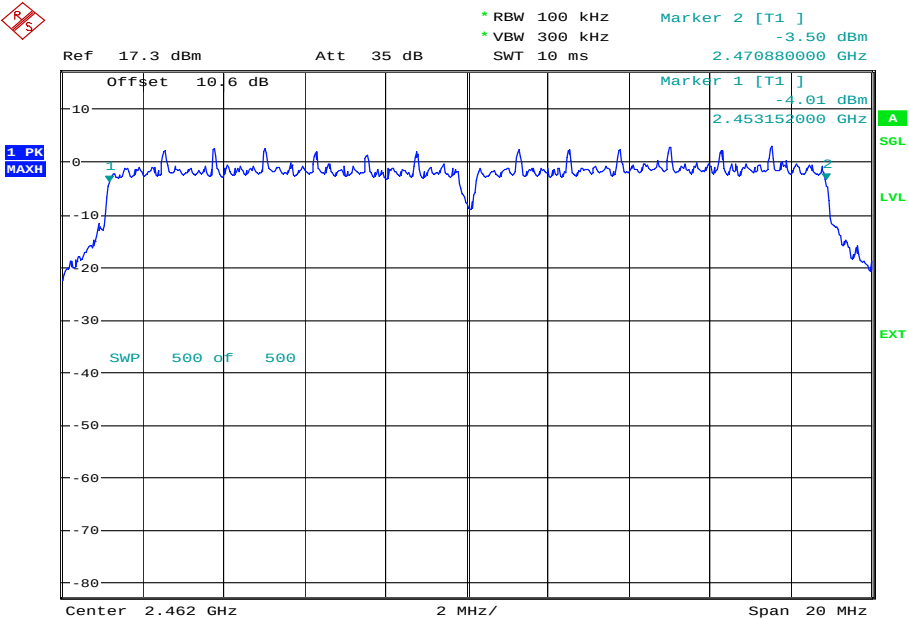


Date: 25.NOV.2014 15:41:01



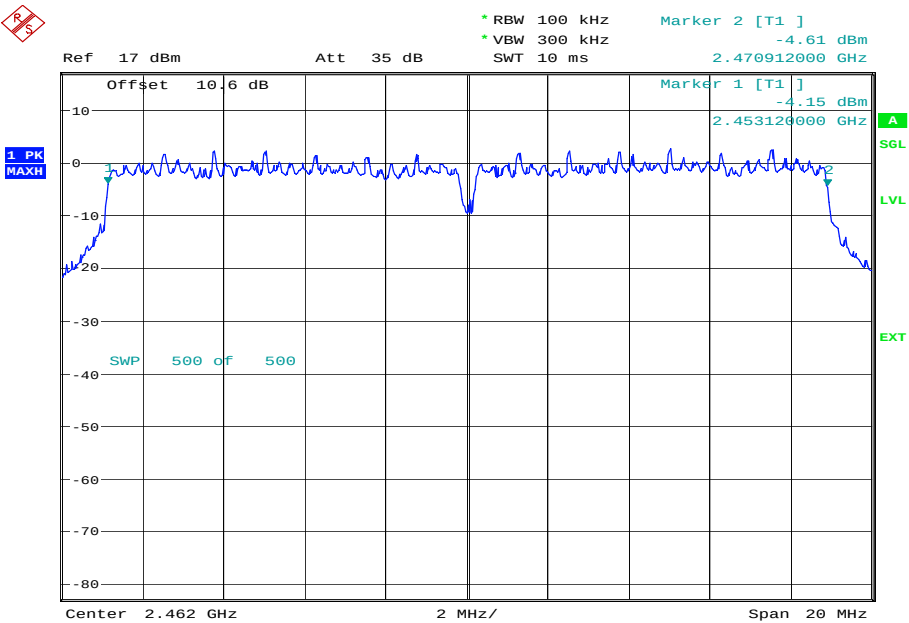
Product Service

19.5 Mbps



Date: 25.NOV.2014 16:12:00

26 Mbps

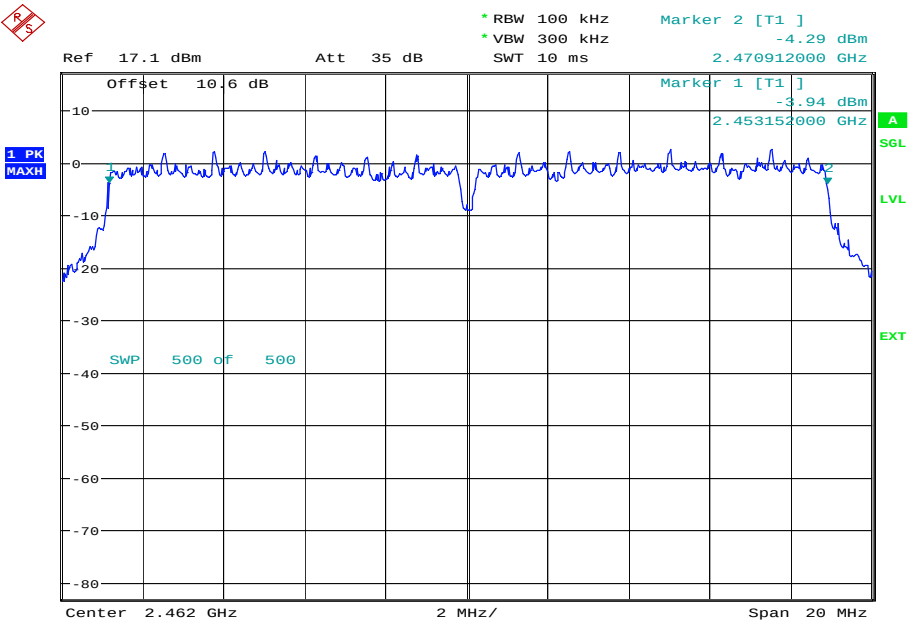


Date: 25.NOV.2014 16:59:00



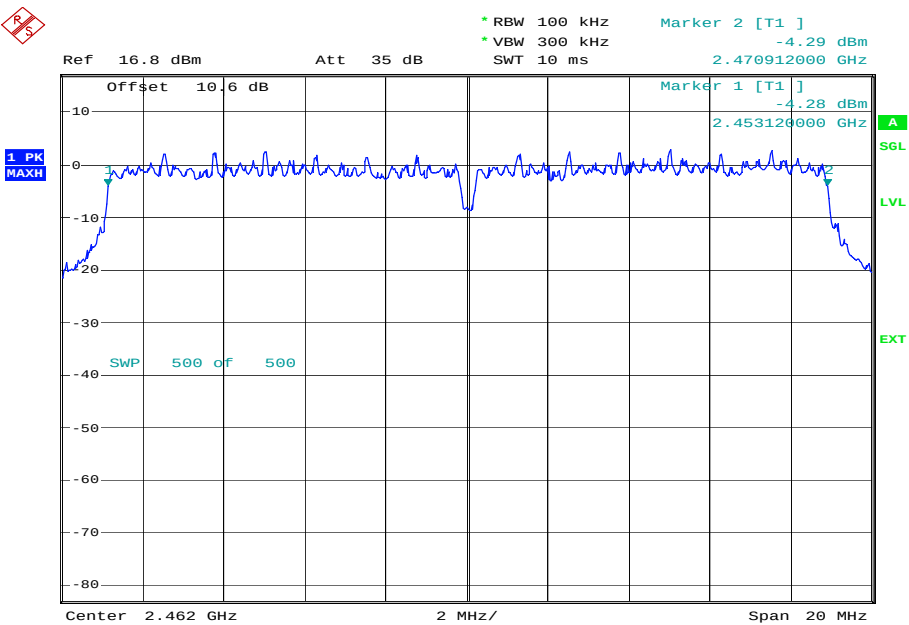
Product Service

39 Mbps



Date: 25.NOV.2014 17:39:15

52 Mbps

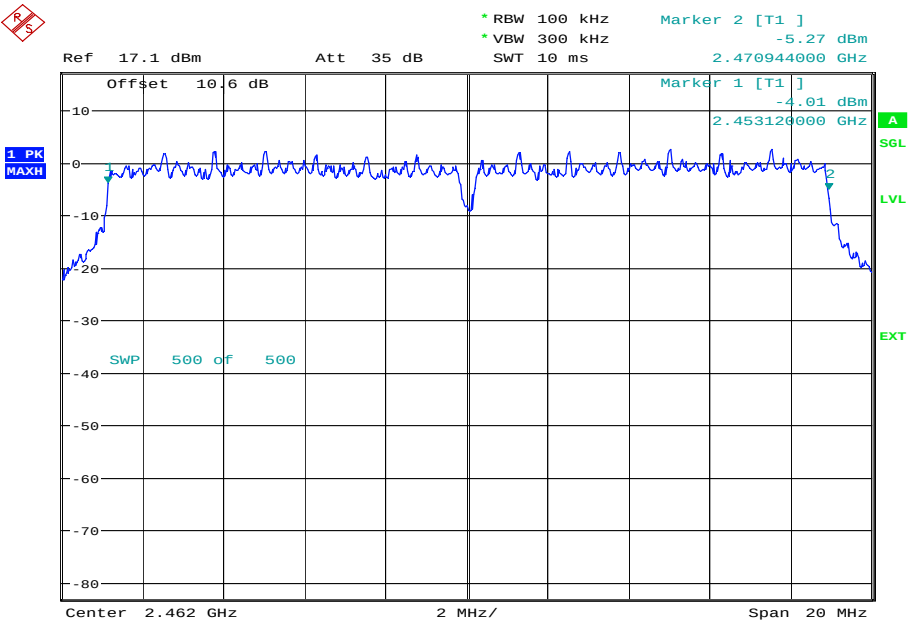


Date: 26.NOV.2014 14:51:57



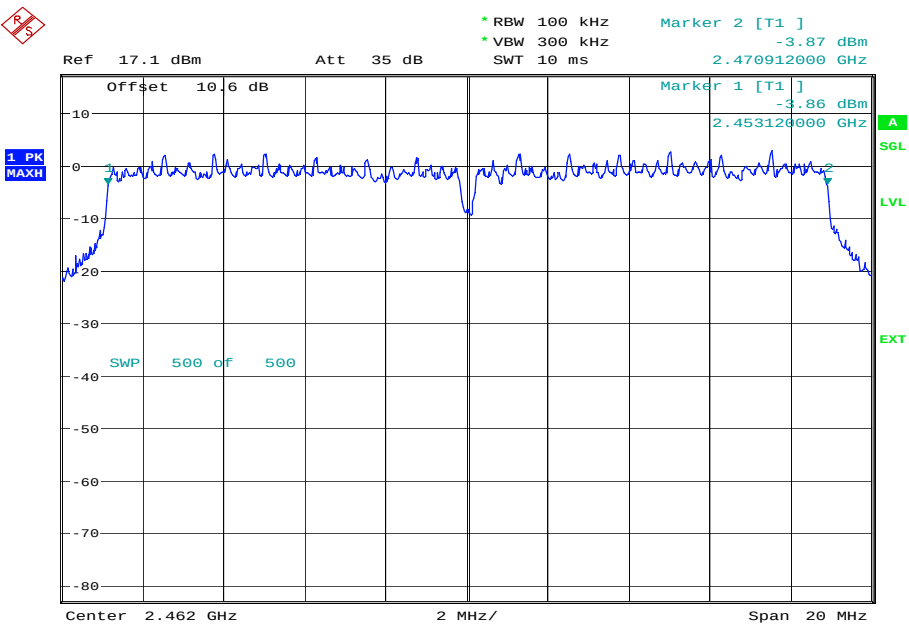
Product Service

58.5 Mbps



Date: 26.NOV.2014 15:12:29

65 Mbps



Date: 26.NOV.2014 15:30:56

Limit Clause

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



Product Service

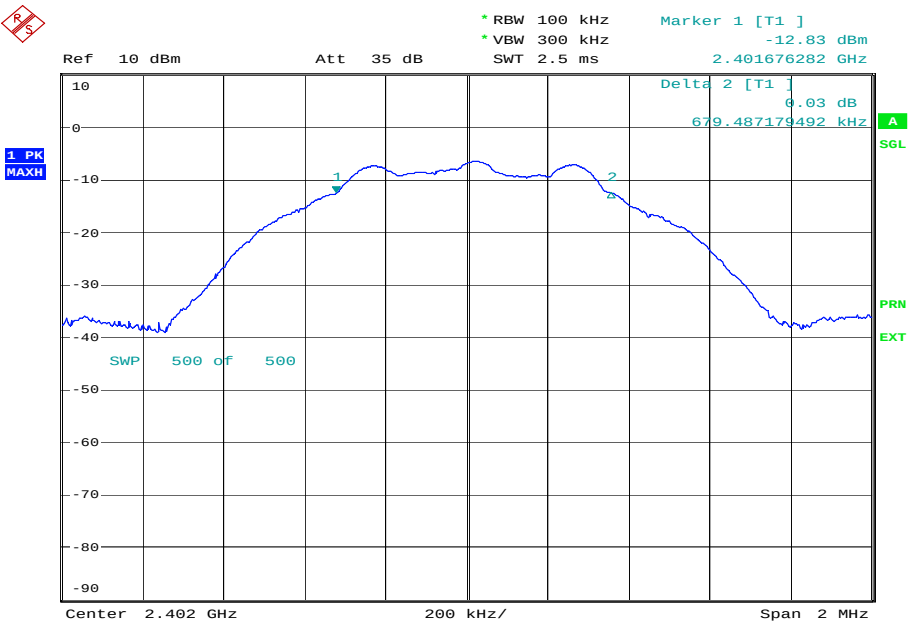
Bluetooth Low Energy

4.0 V DC Supply

Frequency	Packet Type	6 dB Bandwidth (kHz)
2402 MHz	DH1	679.49
2441 MHz	DH1	676.28
2480 MHz	DH1	676.28

2402 MHz

DH1



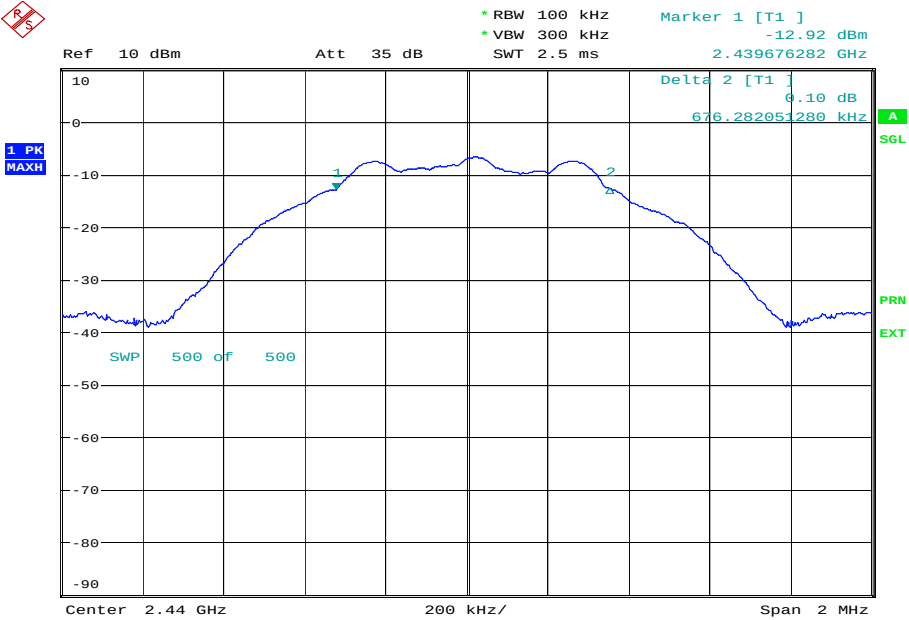
Date: 27.NOV.2014 15:16:01



Product Service

2441 MHz

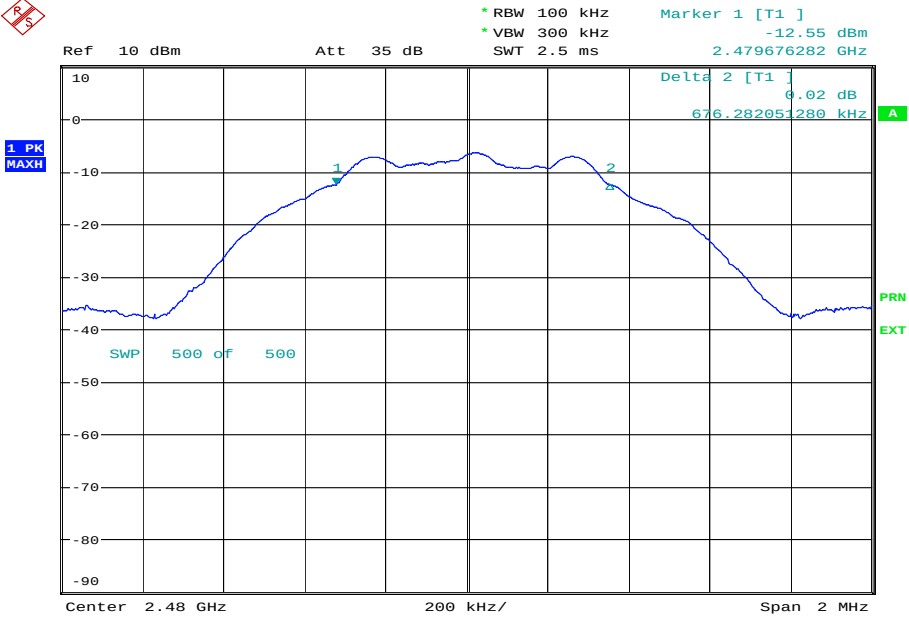
DH1



Date: 27.NOV.2014 15:14:02

2480 MHz

DH1



Date: 27.NOV.2014 15:12:00

Limit Clause

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



Product Service

2.3 MAXIMUM PEAK CONDUCTED OUTPUT POWER

2.3.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (b)(3)

2.3.2 Equipment Under Test and Modification State

S/N: IMEI 004401115303360 - Modification State 0

S/N: IMEI 004401115303444 - Modification State 0

2.3.3 Date of Test

26 November 2014 & 27 November 2014

2.3.4 Test Equipment Used

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

2.3.5 Test Procedure

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15.247 (b) and FCC KDB 558074 D01 DTS Meas Guidance v03r02 Clause 9.1.2.

The EUT was connected to a broadband peak RF power meter via a cable and attenuator. The EUT was transmitting at maximum power, for bottom, middle and top channels on all supported data rates. The path loss between the EUT and sensor was measured and entered as a reference level offset. The peak power was recorded for measurements on the bottom, middle and top channels on all supported data rates.

2.3.6 Environmental Conditions

Ambient Temperature	20.7 - 22.4°C
Relative Humidity	31.5 - 42.1%



2.3.7 Test Results

802.11(b)

4.0 V DC Supply

Modulation Data Rate (Mbps)	Maximum Peak Conducted Output Power					
	dBm			mW		
	2412 MHz	2437 MHz	2462 MHz	2412 MHz	2437 MHz	2462 MHz
1	16.26	16.56	17.02	42.27	45.29	50.35
2	16.32	16.75	16.83	42.85	47.32	48.19
5.5	16.15	16.70	16.93	41.21	46.77	49.32
11	16.38	16.34	17.32	43.45	43.05	53.95

Limit Clause

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

802.11(g)

4.0 V DC Supply

Modulation Data Rate (Mbps)	Maximum Peak Conducted Output Power					
	dBm			mW		
	2412 MHz	2437 MHz	2462 MHz	2412 MHz	2437 MHz	2462 MHz
6	22.51	22.29	22.78	178.24	169.43	189.67
9	22.54	22.04	22.60	179.47	159.96	181.97
12	22.48	22.34	22.77	177.01	177.01	171.40
18	22.21	22.37	22.80	166.34	172.58	190.55
24	22.34	22.30	22.70	171.40	169.82	186.21
36	22.37	22.95	22.92	172.58	197.24	195.88
48	22.42	22.33	22.75	174.58	171.00	188.36
54	22.23	22.54	22.81	167.11	179.47	190.99

Limit Clause

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.



Product Service

802.11(n)

4.0 V DC Supply

Modulation Data Rate (Mbps)	Maximum Peak Conducted Output Power					
	dBm			mW		
	2412 MHz	2437 MHz	2462 MHz	2412 MHz	2437 MHz	2462 MHz
6.5	22.40	22.38	22.67	173.78	172.98	184.93
13	22.43	22.70	22.43	174.98	186.21	174.98
19.5	22.35	22.53	22.88	171.79	179.06	194.09
26	22.18	22.26	22.50	165.20	168.27	177.83
39	22.32	22.69	22.87	170.61	185.78	193.64
52	22.31	22.70	22.60	170.22	186.21	184.50
58.5	22.26	22.77	22.97	168.57	189.23	198.34
65	22.51	22.81	22.74	178.24	190.99	187.93

Limit Clause

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.



Product Service

Bluetooth Low Energy

4.0 V DC Supply

Packet Type	Maximum Peak Conducted Output Power					
	dBm			mW		
	2402 MHz	2441 MHz	2480 MHz	2402 MHz	2441 MHz	2480 MHz
DH1	4.37	4.30	4.51	2.74	2.69	2.83

Limit Clause

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.



Product Service

2.4 EIRP PEAK POWER

2.4.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (b)(4)

2.4.2 Equipment Under Test and Modification State

S/N: IMEI 004401115303394 - Modification State 0

S/N: IMEI 004401115303352 - Modification State 0

2.4.3 Date of Test

22 November 2014, 23 November 2014 & 27 November 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 15.247 (b) and ANSI C63.10.

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 during testing. The EUT elevation was 80 cm above the horizontal reference ground plane. The Analyser settings were adjusted to display the resultant trace on screen and a resolution bandwidth and video bandwidth of 1 MHz were used to perform the measurement. The level on the spectrum analyser was maximised by rotating the EUT through 360° and a height search of the measuring antenna. A substitution was then performed using a suitable calibrated 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 integrated power. This level was then corrected to account for cable loss and antenna factor.

A calculation accounting for antenna gain and cable loss was then performed to obtain the final figure.

2.4.6 Environmental Conditions

Ambient Temperature	19.7 - 20.5°C
Relative Humidity	43.0 - 56.2%



Product Service

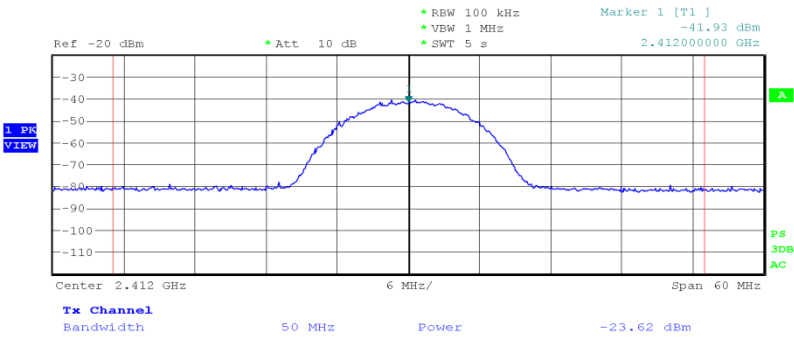
2.4.7 Test Results

802.11(b)

4.0 V DC Supply

2412 MHz

EIRP (dBm)	EIRP (mW)
21.0	125.89



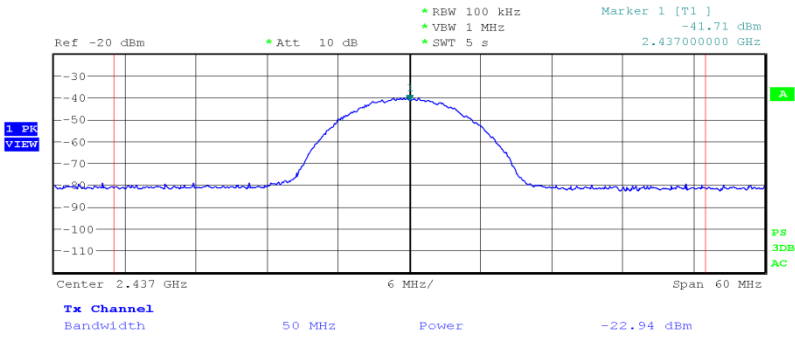
Date: 21.NOV.2014 22:44:42



Product Service

2437 MHz

EIRP (dBm)	EIRP (mW)
20.21	104.95



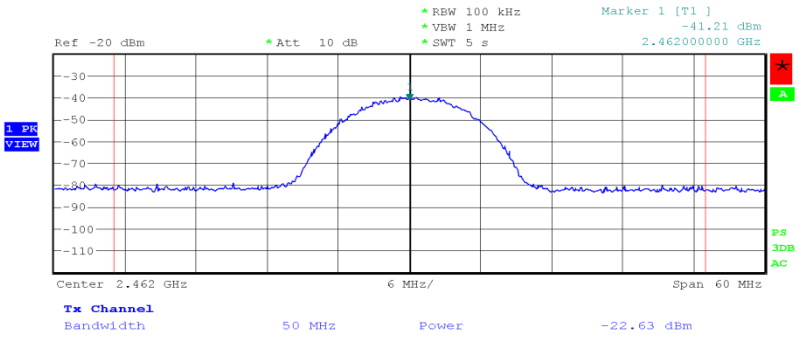
Date: 21.NOV.2014 22:38:01



Product Service

2462 MHz

EIRP (dBm)	EIRP (mW)
21.48	140.6



Date: 21.NOV.2014 23:14:21

Limit

EIRP (dBm)	EIRP (mW)
36.0	4000



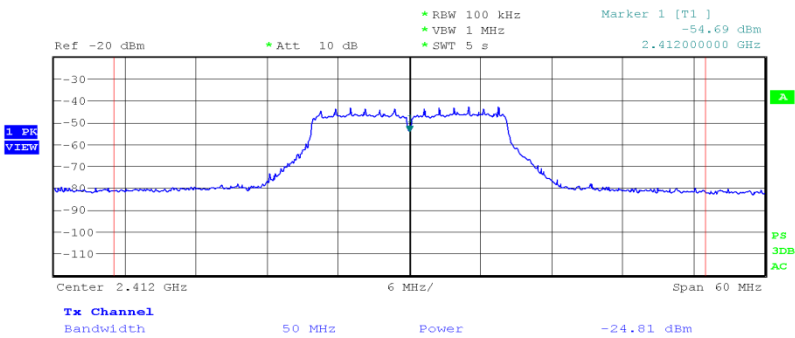
Product Service

802.11(g)

4.0 V DC Supply

2412 MHz

EIRP (dBm)	EIRP (mW)
20.02	100.6



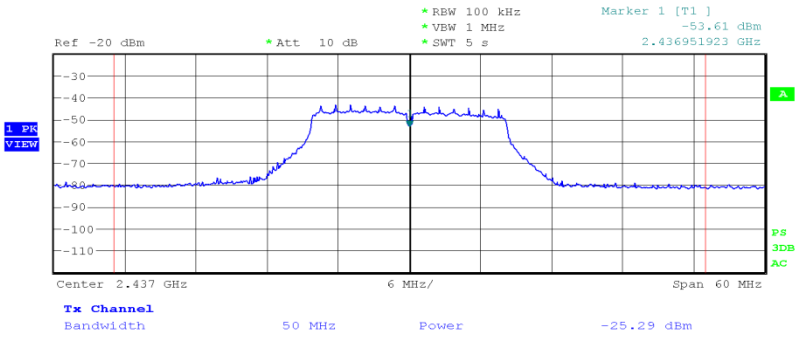
Date: 21.NOV.2014 22:50:52



Product Service

2437 MHz

EIRP (dBm)	EIRP (mW)
18.11	64.71



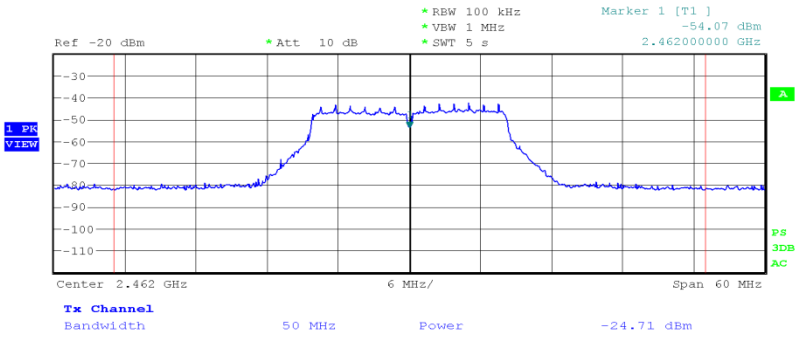
Date: 21.NOV.2014 22:20:50



Product Service

2462 MHz

EIRP (dBm)	EIRP (mW)
19.42	87.50



Date: 21.NOV.2014 23:08:07

Limit

EIRP (dBm)	EIRP (mW)
36.0	4000



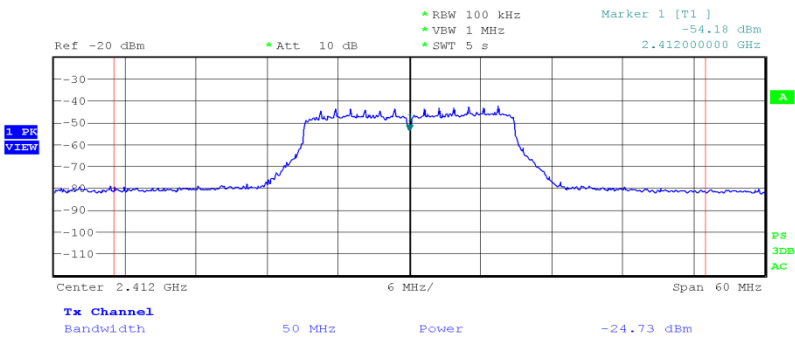
Product Service

802.11(n)

4.0 V DC Supply

2412 MHz

EIRP (dBm)	EIRP (mW)
19.92	98.17



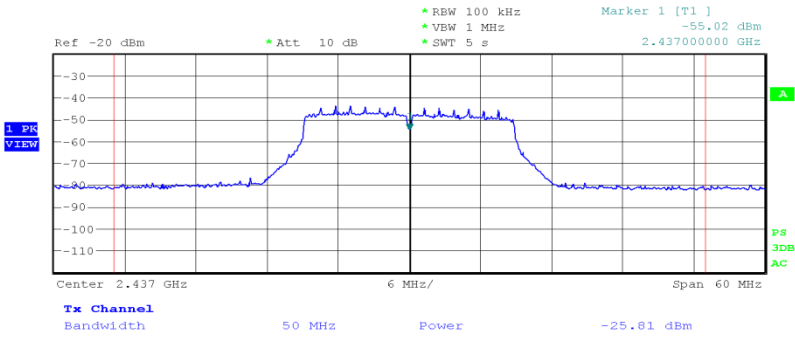
Date: 21.NOV.2014 22:56:39



Product Service

2437 MHz

EIRP (dBm)	EIRP (mW)
17.78	59.98



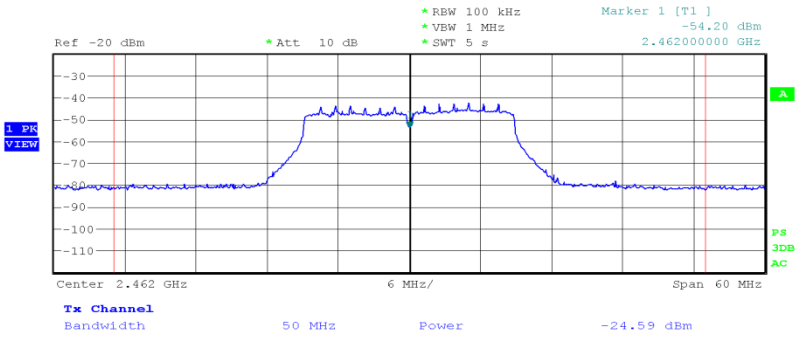
Date: 21.NOV.2014 22:02:44



Product Service

2462 MHz

EIRP (dBm)	EIRP (mW)
19.68	92.90



Date: 21.NOV.2014 23:02:18

Limit

EIRP (dBm)	EIRP (mW)
36.0	4000



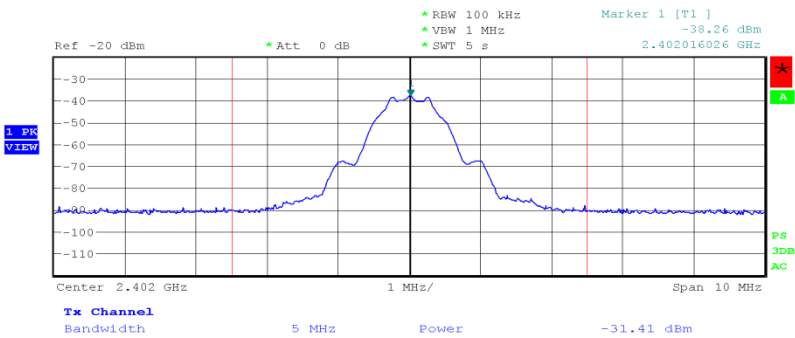
Product Service

Bluetooth Low Energy

4.0 V DC Supply

2402 MHz

EIRP (dBm)	EIRP (mW)
10.28	10.67



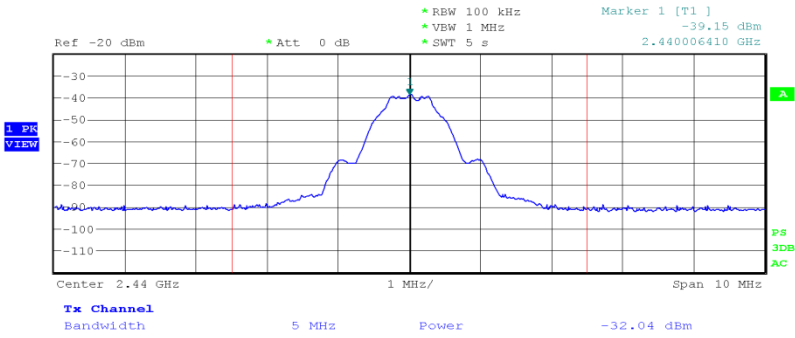
Date: 27.NOV.2014 01:25:33



Product Service

2441 MHz

EIRP (dBm)	EIRP (mW)
10.11	10.26



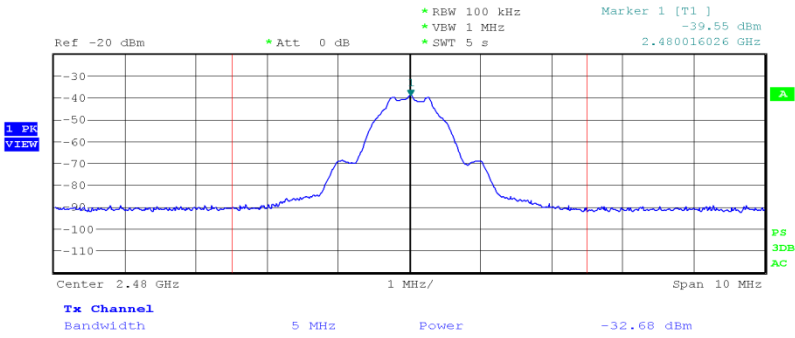
Date: 27.NOV.2014 00:49:01



Product Service

2480 MHz

EIRP (dBm)	EIRP (mW)
9.75	9.44



Date: 27.NOV.2014 01:36:25

Limit

EIRP (dBm)	EIRP (mW)
36.0	4000



2.5 SPURIOUS AND BAND EDGE EMISSIONS

2.5.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (d)

2.5.2 Equipment Under Test and Modification State

S/N: IMEI 004401115303394 - Modification State 0 and 1

S/N: IMEI 004401115303352 - Modification State 0 and 1

2.5.3 Date of Test

22 November 2014, 23 November 2014, 27 November 2014, 29 November 2014, 12 December 2014 & 19 December 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 15.247 (d) and ANSI C63.10

The EUT was set to operate at maximum power on the bottom, middle and top channels for the data rate which resulted in the highest conducted average output power. The field strength of each fundamental frequency was measured in 100 kHz RBW, the resultant limit line on the trace was set at -20 dBc of this value. Measurements were performed from 30 MHz to 25 GHz and the path loss was incorporated as a transducer factor and entered into the spectrum analyser.

Band edge measurements were performed with the EUT operating on the lowest and highest channels for the data rate which gave the highest conducted power and the highest 6dB bandwidth. Peak measurements have been made at the relevant authorised band edge in a 100kHz RBW and 300kHz VBW. Peak and average measurements have been made at the relevant restricted band edges with 1MHz RBW / 3MHz VBW and 1MHz RBW / 10Hz VBW respectively.

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. The EUT was set upon a non-conducting platform during testing. When frequencies less than 18 GHz were measured; the EUT elevation was 80 cm above the horizontal reference ground plane. When frequencies greater than 18 GHz were measured; the EUT elevation was 1 m above the horizontal reference ground plane to ensure adequate vertical beam width coverage of the measuring antenna with respect to the EUT.

The horizontal reference ground plane encompasses a turntable which is used to adjust the azimuth of the EUT. An antenna positioner is used to elevate the measuring antenna above the horizontal reference ground plane whereby the antenna elevation is adjustable between 1 m and 4 m.



Product Service

Exploratory radiated emissions measurements were made by azimuth emissions searches over a range of 0° and 360°. These exploratory radiated emissions measurements were made using a peak detector over a frequency range of 30 MHz to 25 GHz, with the measuring antenna in both vertical and horizontal polarizations.

At least six of the greatest peak emissions, frequency positions were selected from the exploratory radiated emissions measurements for further evaluation as final measuring points.

To ascertain the azimuth and measuring antenna polarization that yields the highest peak emission level, each final measurement frequency was investigated by continuous azimuth emissions searching with the measuring antenna in both vertical and horizontal polarizations. For each final measurement frequency, the respective peak emission azimuth and measuring antenna polarization was used during a measuring antenna elevation search from 1 m to 4 m. Each final measurement frequency was then measured with the EUT azimuth, measuring antenna height and polarization that yielded the greatest peak emission level.

Final measurement points over the frequency range of 30 MHz to 1 GHz were measured using a quasi-peak detector. Final measurement points over the frequency range of 1 GHz and 25 GHz were measured using peak and average methods. Peak measurements were made using a peak detector with 1 MHz RBW and 3MHz VBW. Average measurements were made using a peak detector with a RBW of 1MHz and VBW of 10Hz.

All final measurements were assessed against the Class B emission limits in Clause 15.209 of FCC CFR 47 FCC Part 15.

2.5.6 Environmental Conditions

Ambient Temperature	19.5 - 20.5°C
Relative Humidity	38.0 - 57.6%



Product Service

2.5.7 Test Results

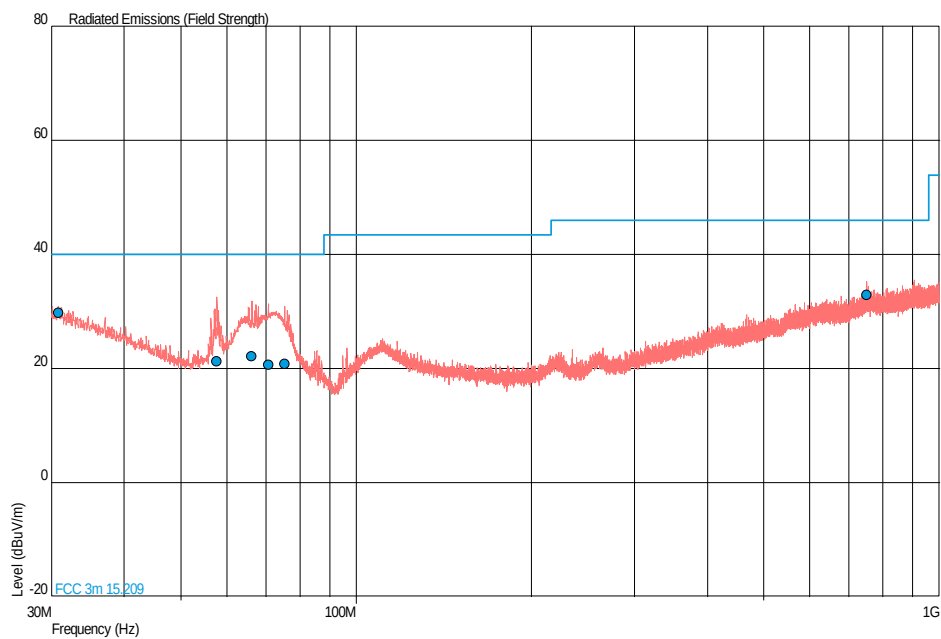
802.11(b)

4.0 V DC Supply

Spurious Radiated Emissions

2412 MHz

30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.822	29.8	30.9	40.0	100	-10.2	-69.1	346	1.00	Vertical
57.681	21.3	11.6	40.0	100	-18.7	-88.4	0	1.00	Vertical
66.267	22.1	12.7	40.0	100	-17.9	-87.3	132	1.00	Vertical
70.687	20.6	10.7	40.0	100	-19.4	-89.3	149	1.00	Vertical
75.434	20.8	11.0	40.0	100	-19.2	-89.0	169	1.00	Vertical
749.996	32.8	43.7	46.0	200	-13.2	-156.3	301	1.00	Horizontal

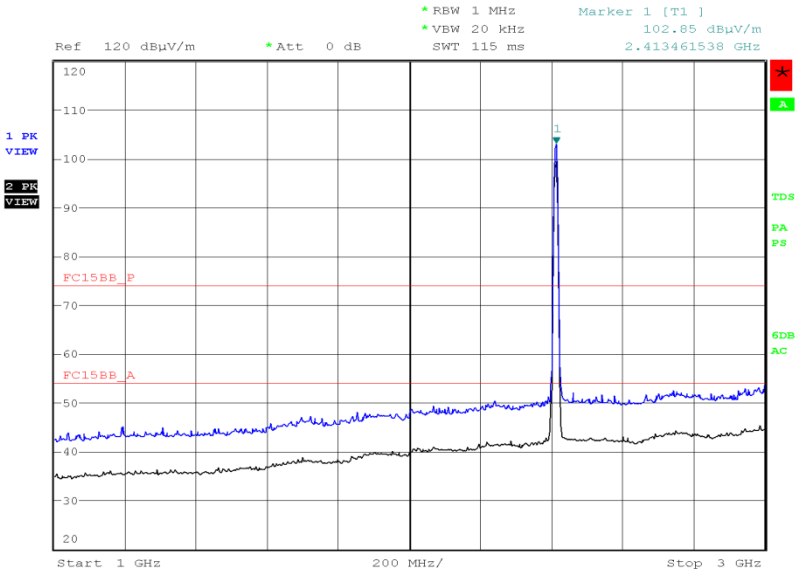


Product Service

1 GHz to 25 GHz

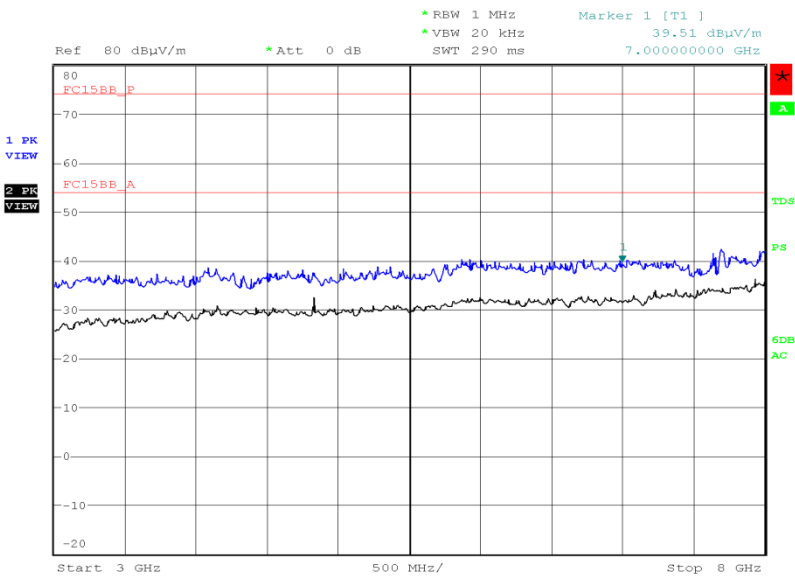
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
19.296	Horizontal	110	320	55.53	49.09

1 GHz to 3 GHz



Date: 22.NOV.2014 01:12:21

3 GHz to 8 GHz

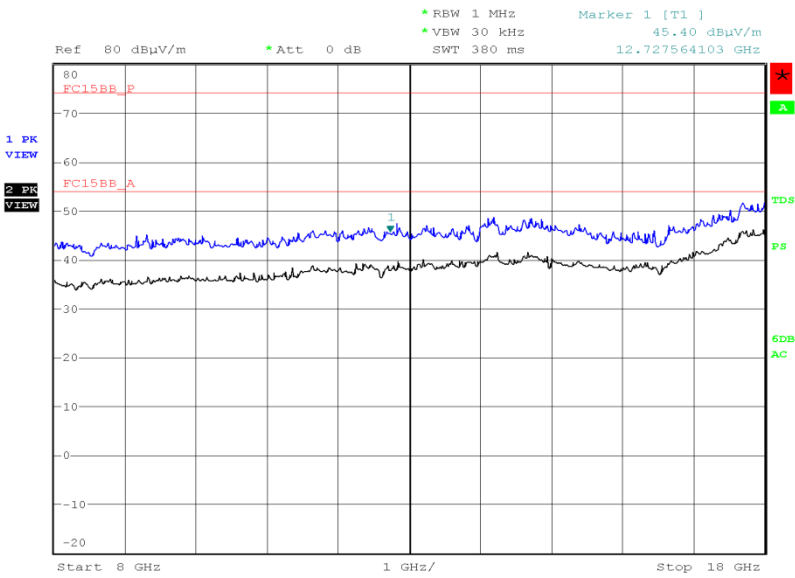


Date: 22.NOV.2014 02:31:30



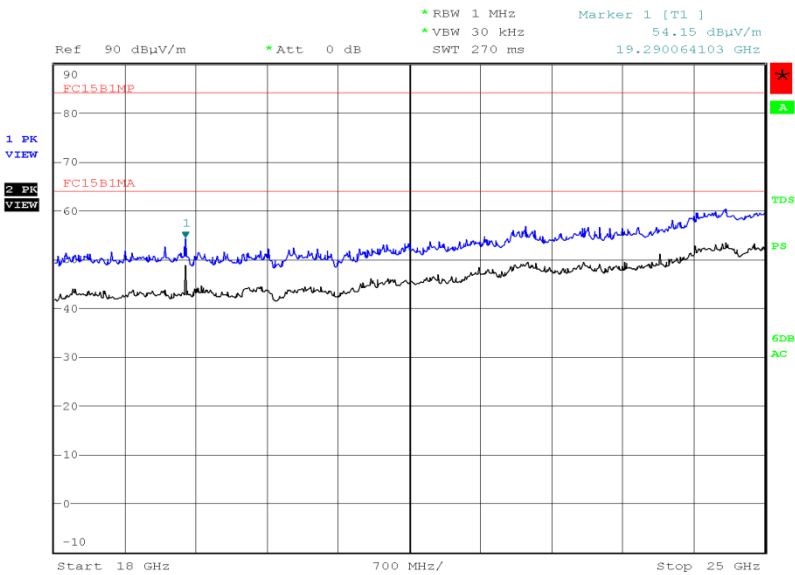
Product Service

8 GHz to 18 GHz

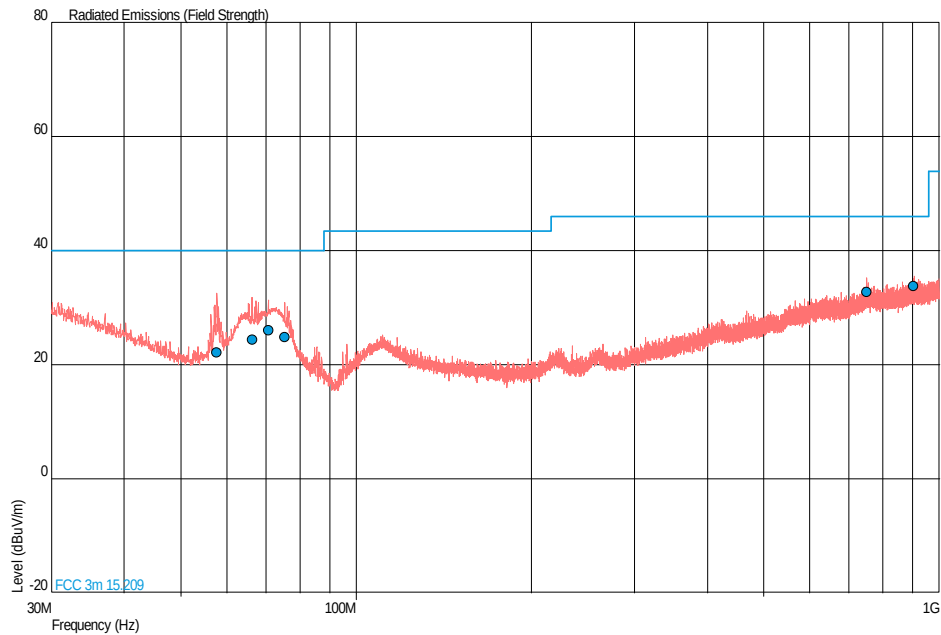


Date: 22.NOV.2014 04:45:30

18 GHz to 25 GHz



Date: 22.NOV.2014 21:15:59

2437 MHz30 MHz to 1 GHz

Frequency (MHz)	QP Level (dBμV/m)	QP Level (μV/m)	QP Limit (dBμV/m)	QP Limit (μV/m)	QP Margin (dBμV/m)	QP Margin (μV/m)	Angle (Deg)	Height (m)	Polarity
57.693	22.2	12.9	40.0	100	-17.8	-87.1	71	1.00	Vertical
66.279	24.4	16.6	40.0	100	-15.6	-83.4	261	1.16	Vertical
70.694	26.0	20.0	40.0	100	-14.0	-80.0	185	1.25	Vertical
75.437	24.9	17.6	40.0	100	-15.1	-82.4	204	1.00	Vertical
750.080	32.8	43.7	46.0	200	-13.2	-156.3	315	3.53	Horizontal
902.946	33.8	49.0	46.0	200	-12.2	-151.0	60	1.00	Horizontal

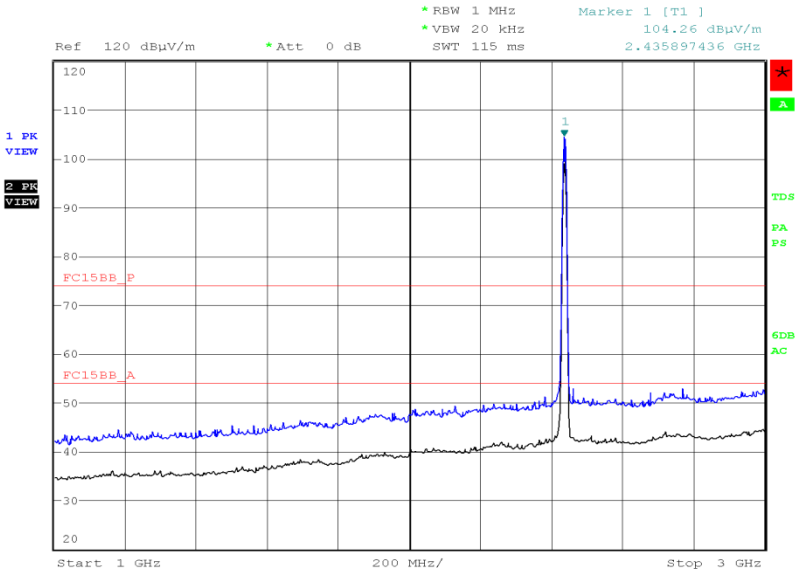


Product Service

1 GHz to 25 GHz

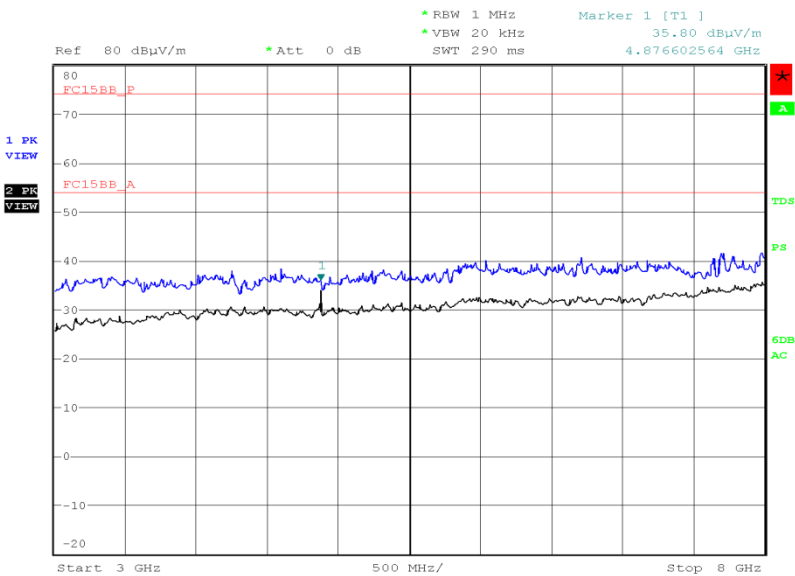
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
19.496	Horizontal	110	320	54.82	47.28

1 GHz to 3 GHz



Date: 22.NOV.2014 01:16:00

3 GHz to 8 GHz

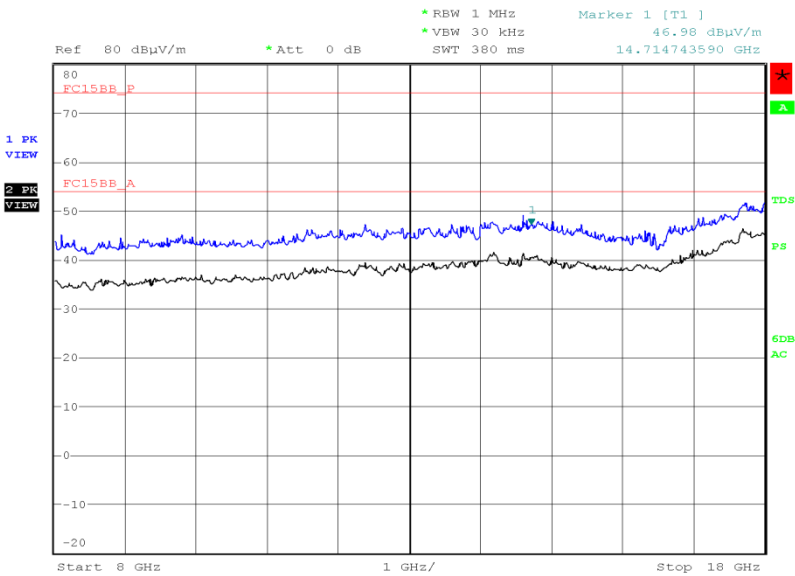


Date: 22.NOV.2014 02:37:22



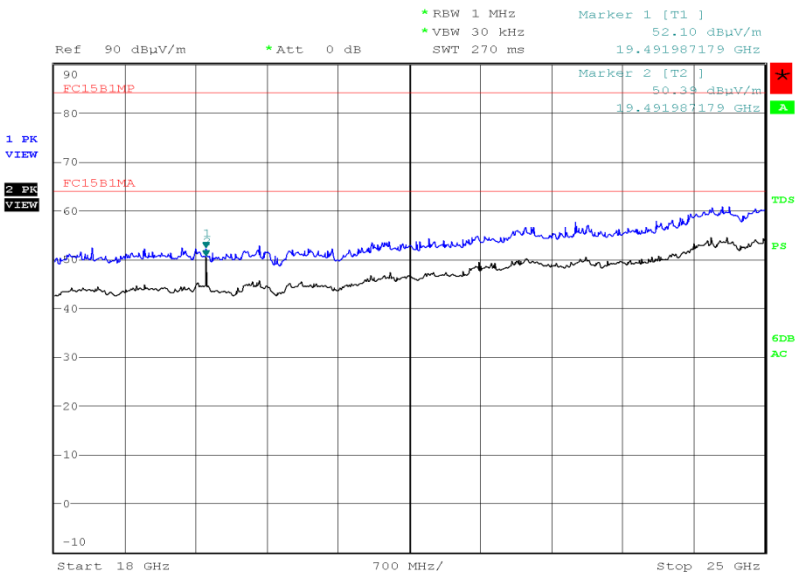
Product Service

8 GHz to 18 GHz

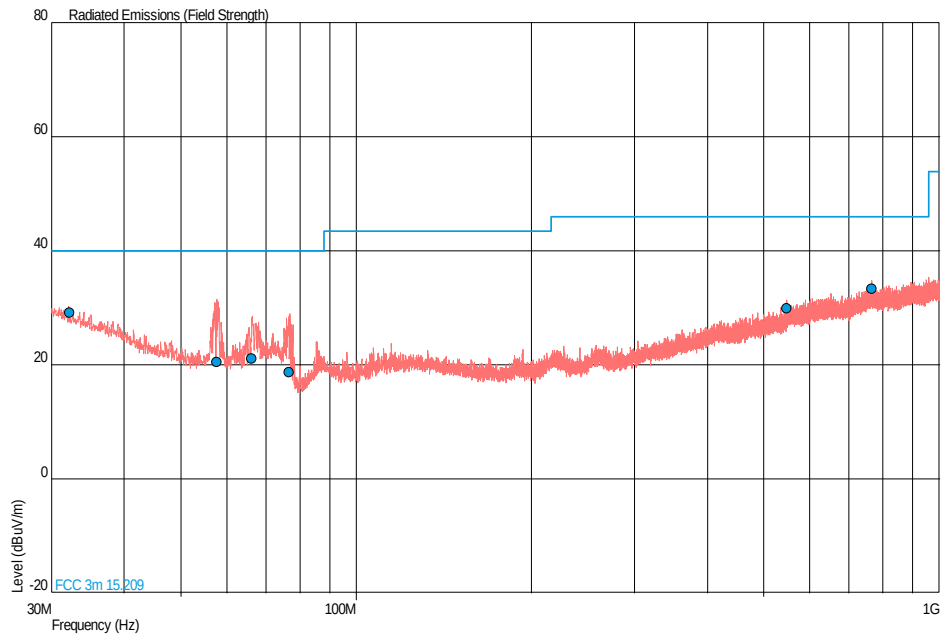


Date: 22.NOV.2014 04:39:40

18 GHz to 25 GHz



Date: 22.NOV.2014 21:22:28

2462 MHz30 MHz to 1 GHz

Frequency (MHz)	QP Level (dBμV/m)	QP Level (μV/m)	QP Limit (dBμV/m)	QP Limit (μV/m)	QP Margin (dBμV/m)	QP Margin (μV/m)	Angle (Deg)	Height (m)	Polarity
32.193	29.1	28.5	40.0	100	-10.9	-71.5	360	1.00	Vertical
57.597	20.5	10.6	40.0	100	-19.5	-89.4	0	1.00	Vertical
66.217	21.2	11.5	40.0	100	-18.8	-88.5	254	1.18	Vertical
76.749	18.8	8.7	40.0	100	-21.2	-91.3	248	1.00	Vertical
547.914	29.9	31.3	46.0	200	-16.1	-168.7	305	1.00	Horizontal
765.854	33.4	46.8	46.0	200	-12.6	-153.2	99	1.00	Horizontal

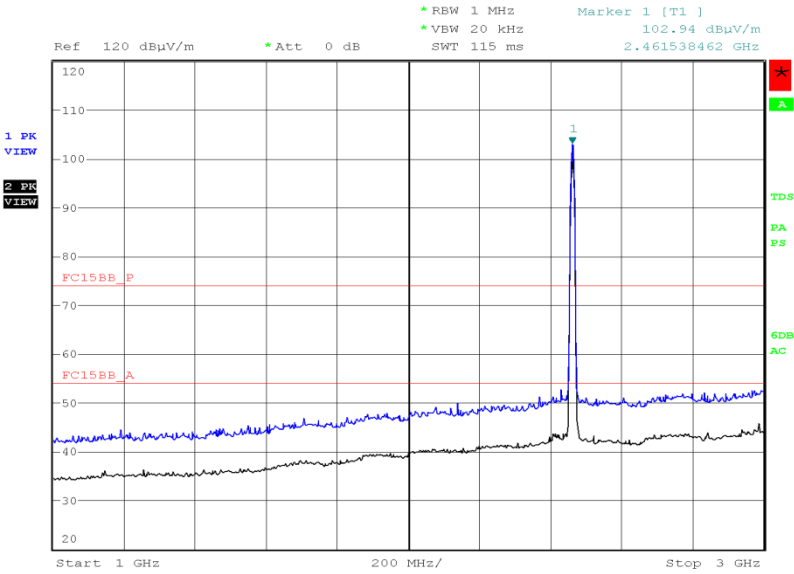


Product Service

1GHz to 25 GHz

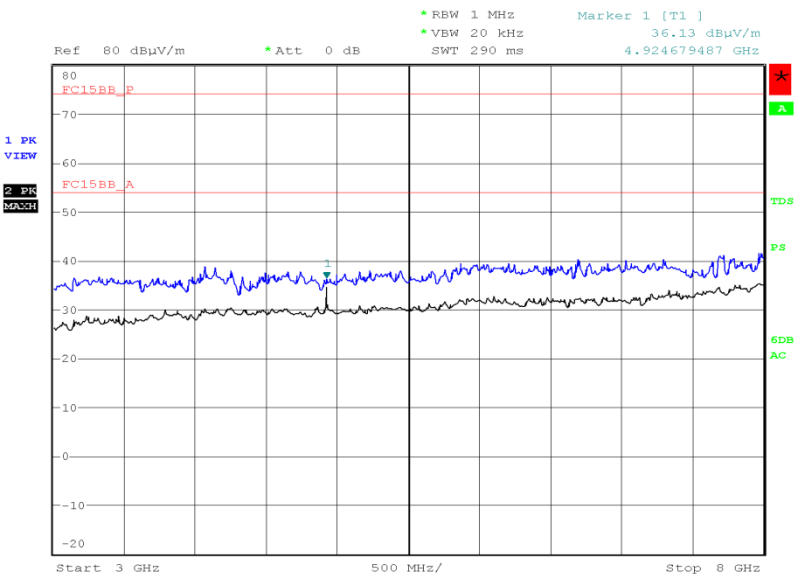
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
19.696	Horizontal	115	323	51.84	43.68

1 GHz to 3 GHz



Date: 22.NOV.2014 01:19:03

3 GHz to 8 GHz

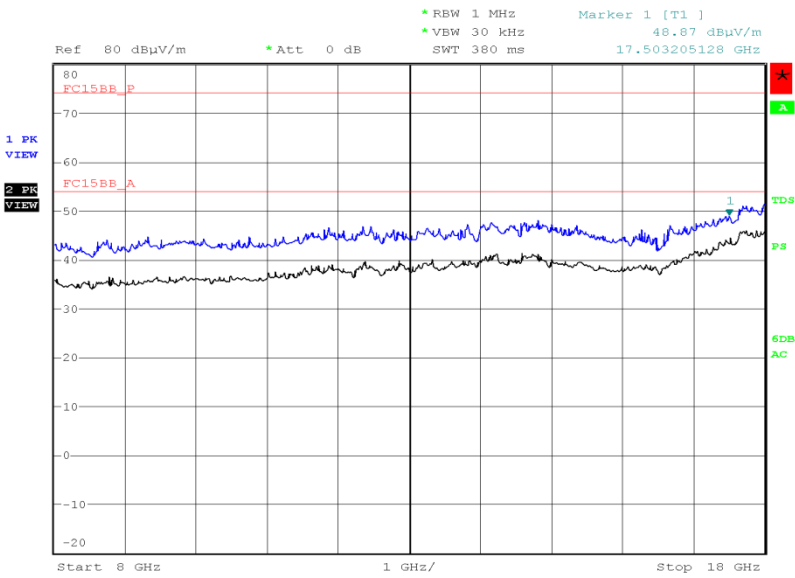


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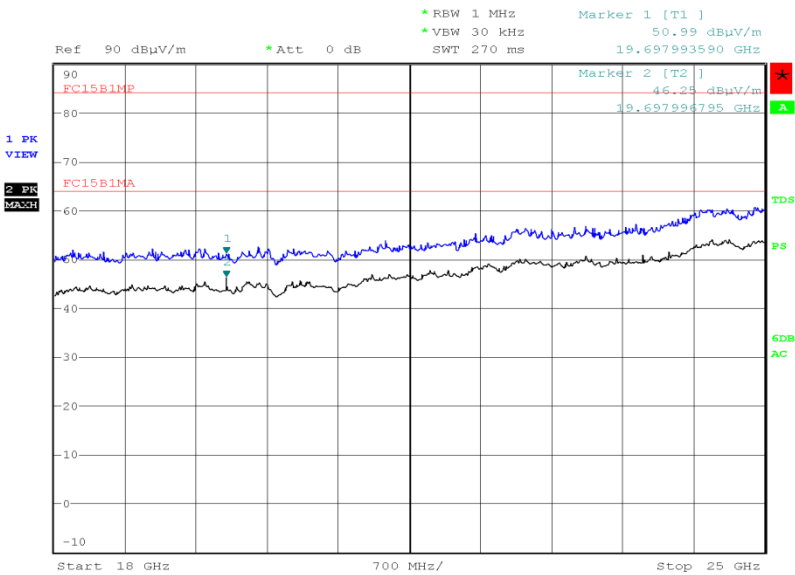
Product Service

8 GHz to 18 GHz



Date: 22.NOV.2014 04:29:42

18 GHz to 25 GHz



Date: 22.NOV.2014 21:33:16

Limit

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

Radiated Emissions which fall only in the restricted bands as defined in 15.205 must also comply with the limits in the table above. The table above does not apply for Radiated Emissions which fall outside the restricted bands as defined in 15.205. These emissions outside the restricted bands shall be at least 20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuator required shall be 30 dB below the fundamental instead on 20 dB.



Product Service

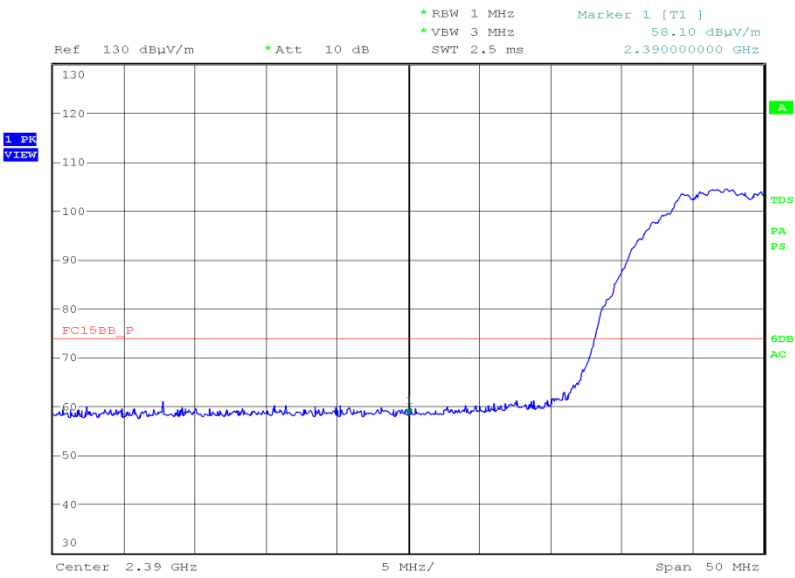
Band Edge Emissions

Modulation/Data Rate: DSSS/5.5 Mbps

Restricted Bands of Operation		
Frequency (MHz)	Final Peak (dBμV/m)	Final Average (dBμV/m)
2390.00	58.10	47.89
2483.50	58.91	47.82

2390.00 MHz

Final Peak

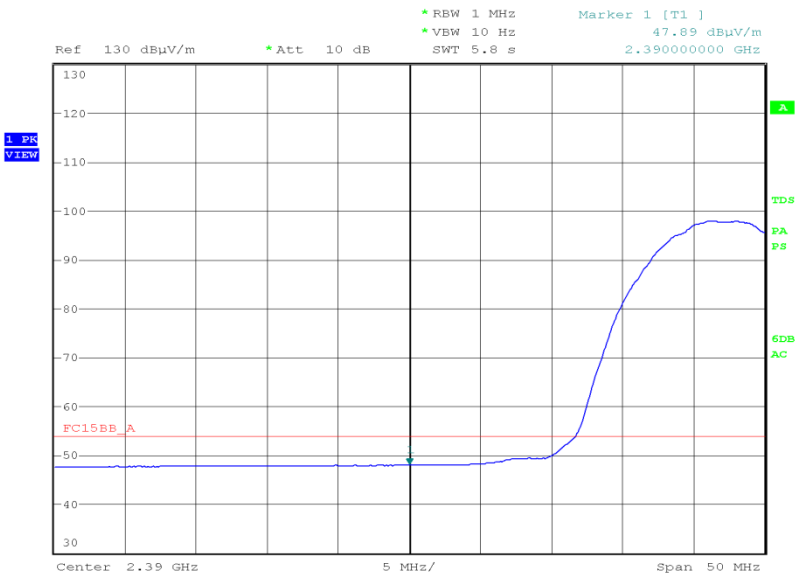


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Product Service

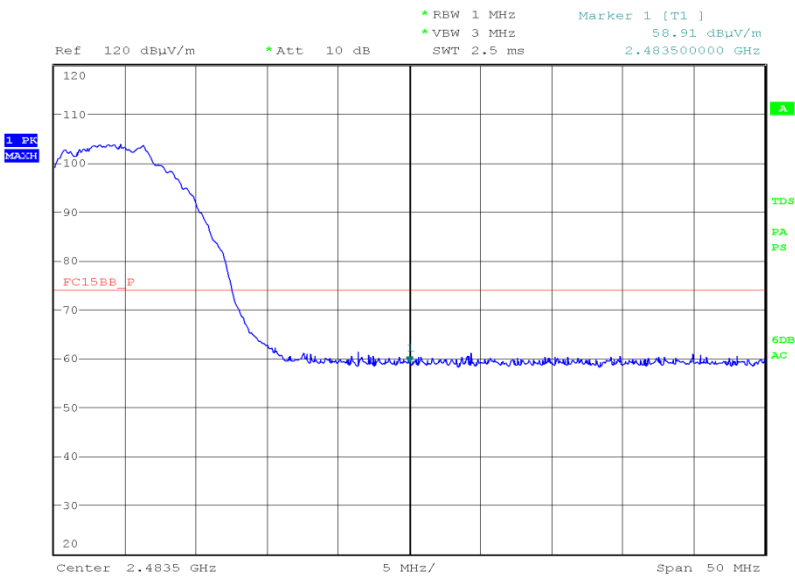
Final Average



Date: 29.NOV.2014 02:56:47

2483.50 MHz

Final Peak

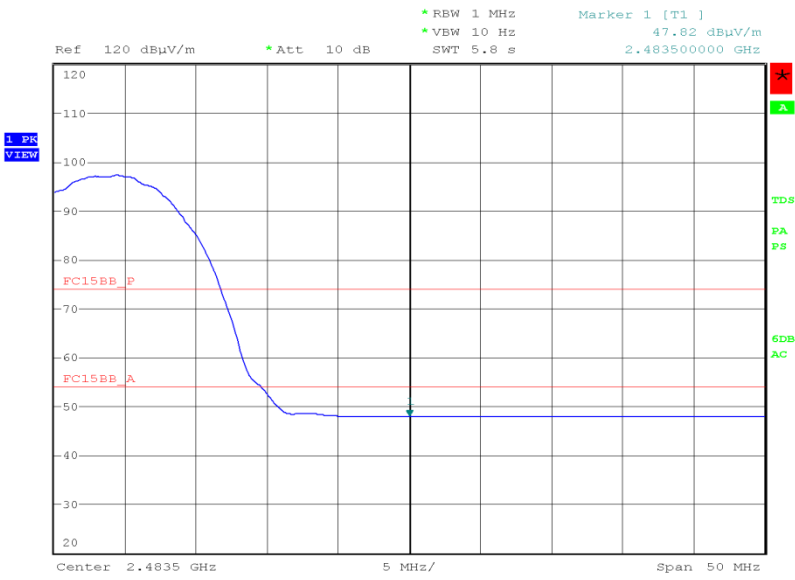


Date: 29.NOV.2014 04:04:20



Product Service

Final Average



Date: 29.NOV.2014 04:05:04

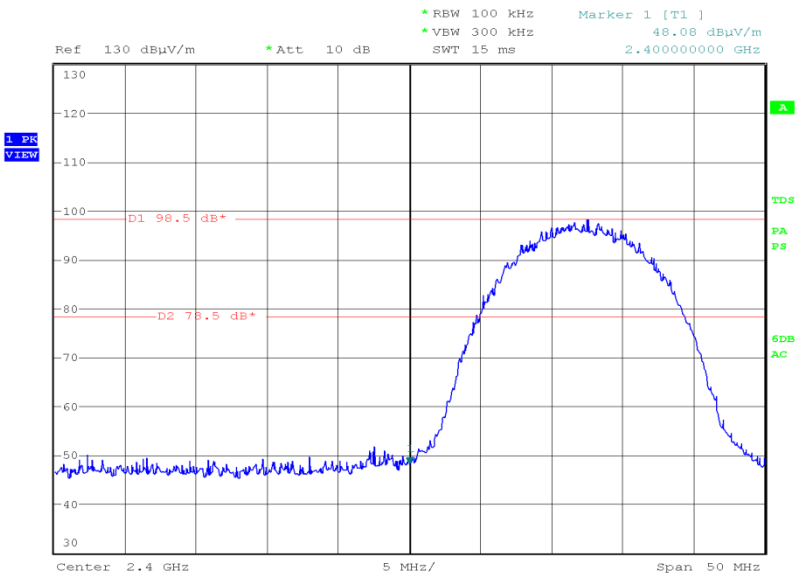


Product Service

Band Edge	
Frequency (MHz)	Final Peak (dBμV/m)
2400.00	48.08
2483.50	46.55

2400.00 MHz

Final Peak



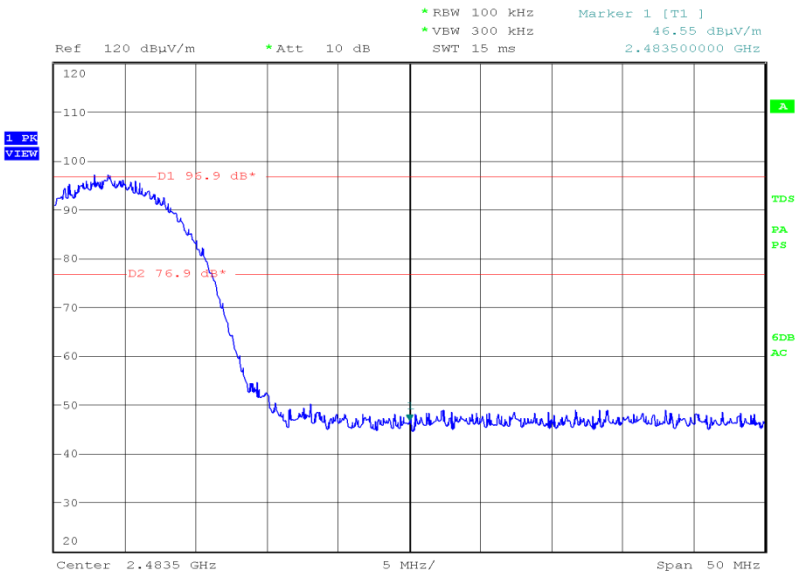
Date: 29.NOV.2014 03:00:04



Product Service

2483.50 MHz

Final Peak



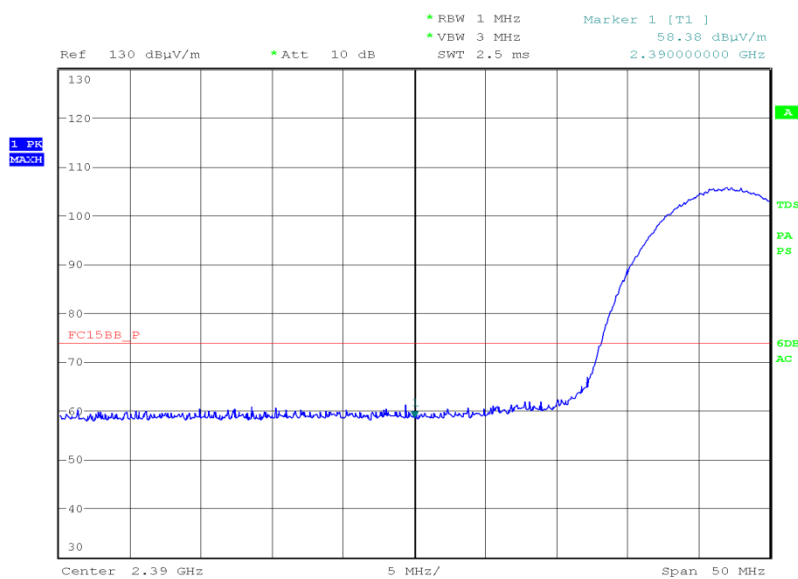
Date: 29.NOV.2014 04:07:12



Product Service

Modulation/Data Rate: DSSS/11 Mbps

Restricted Bands of Operation		
Frequency (MHz)	Final Peak (dBμV/m)	Final Average (dBμV/m)
2390.00	58.38	47.84
2483.50	58.40	47.87

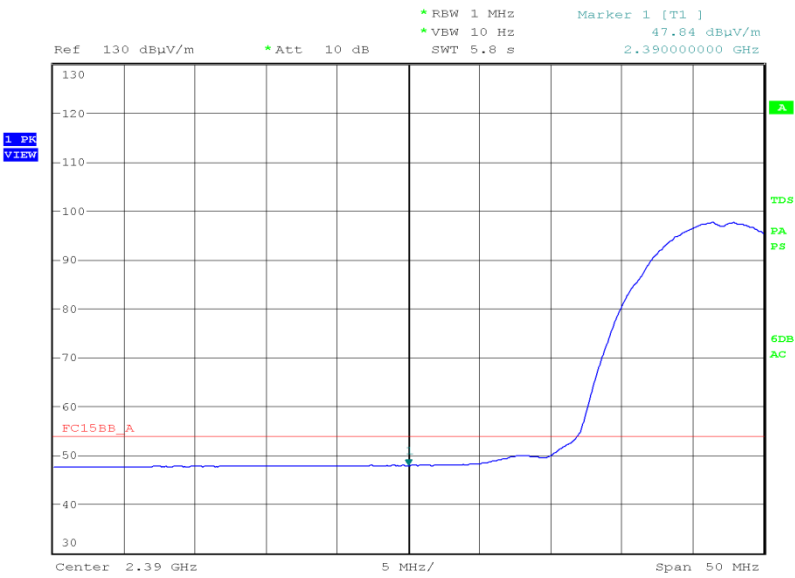
2390.00 MHzFinal Peak

Date: 29.NOV.2014 03:06:36



Product Service

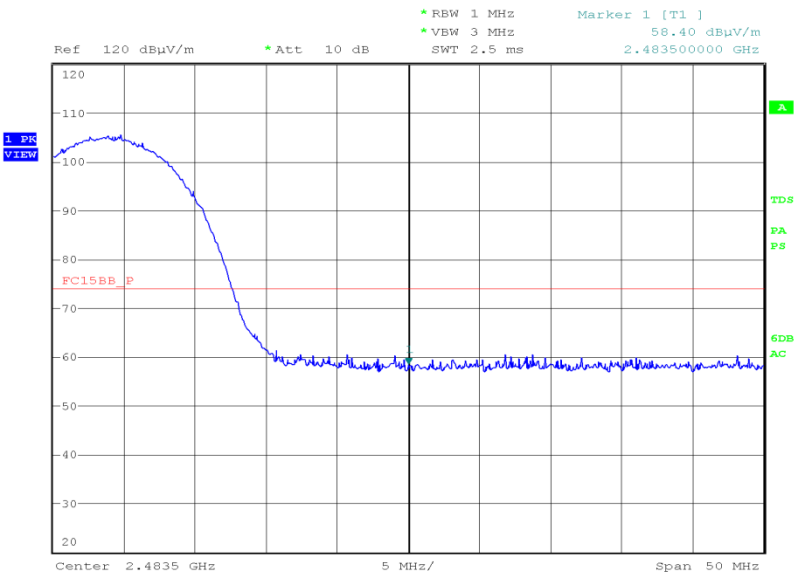
Final Average



Date: 29.NOV.2014 03:07:36

2483.50 MHz

Final Peak

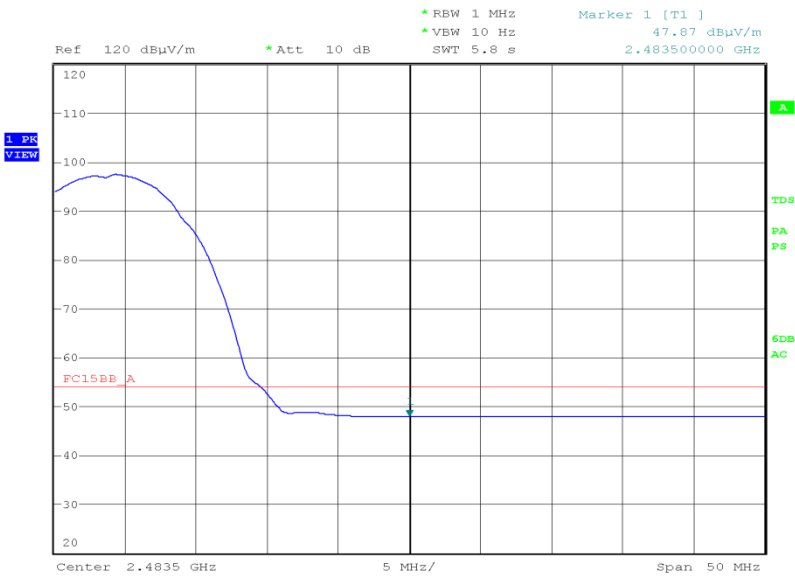


Date: 29.NOV.2014 04:11:15



Product Service

Final Average



Date: 29.NOV.2014 04:13:16

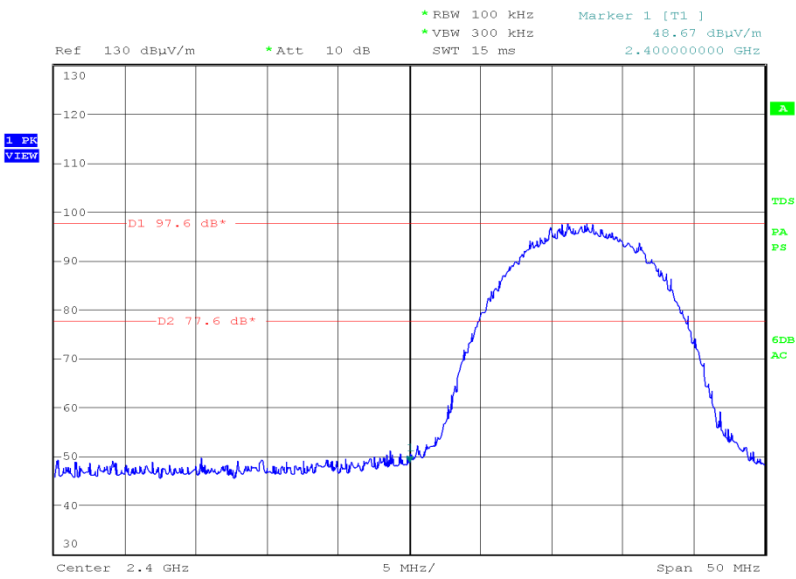


Product Service

Band Edge	
Frequency (MHz)	Final Peak (dBμV/m)
2400.00	48.67
2483.50	48.60

2400.00 MHz

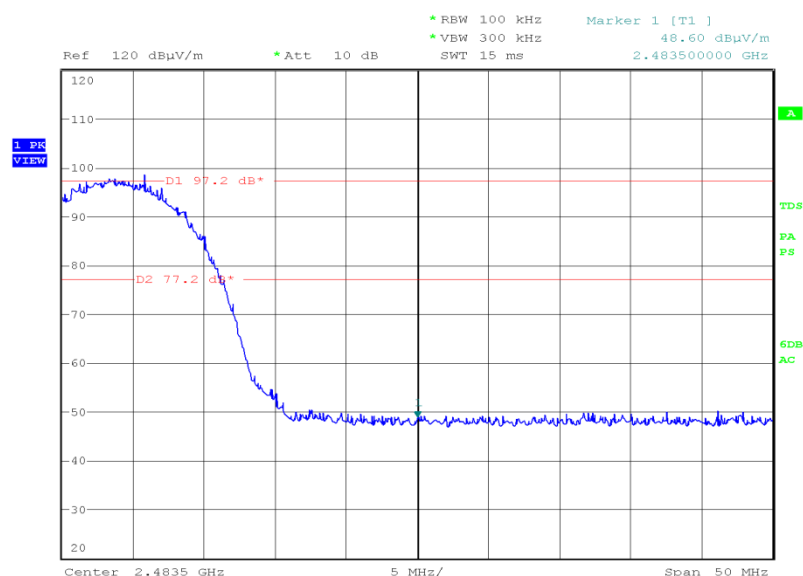
Final Peak



Date: 29.NOV.2014 03:03:48



Product Service

2483.50 MHzFinal Peak

Date: 29.NOV.2014 04:08:48

Remark

The test was performed on 11 Mbps because this was deemed the worst case data rate for 6 dB Bandwidth.

The test was performed on 5.5 Mbps because this was deemed the worst case data rate for Conducted Output Power.

Limit

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

Radiated Emissions which fall only in the restricted bands as defined in 15.205 must also comply with the limits in the table above. The table above does not apply for Radiated Emissions which fall outside the restricted bands as defined in 15.205. These emissions outside the restricted bands shall be at least 20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuator required shall be 30 dB below the fundamental instead on 20 dB.



Product Service

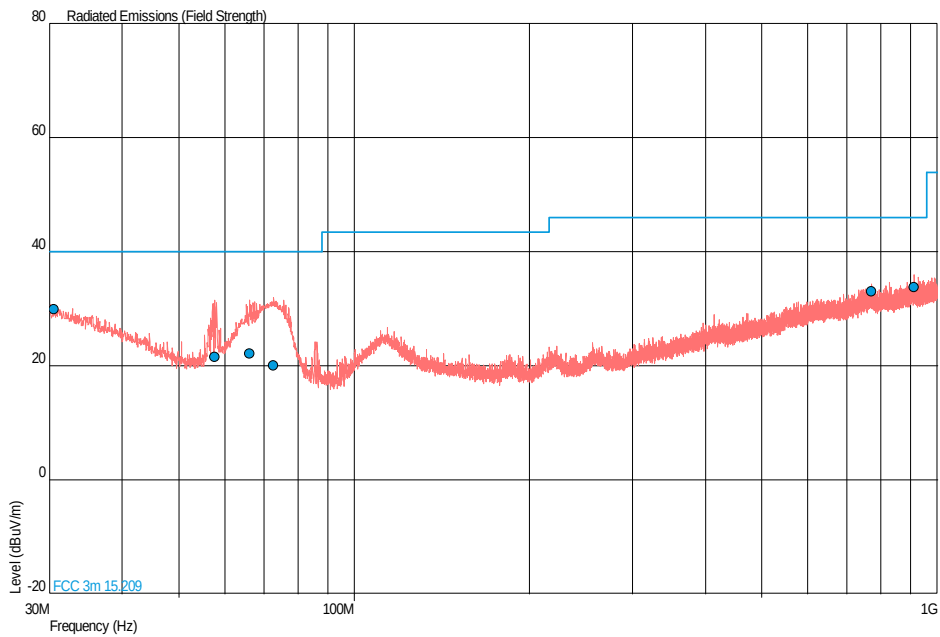
802.11(g)

4.0 V DC Supply

Spurious Radiated Emissions

2412 MHz

30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.582	30.0	31.6	40.0	100	-10.0	-68.4	148	1.29	Horizontal
57.698	21.6	12.0	40.0	100	-18.4	-88.0	360	1.00	Vertical
66.235	22.1	12.7	40.0	100	-17.9	-87.3	135	1.30	Vertical
72.635	20.1	10.1	40.0	100	-19.9	-89.9	224	1.00	Vertical
769.721	33.1	45.2	46.0	200	-12.9	-154.8	183	1.20	Horizontal
912.205	33.9	49.5	46.0	200	-12.1	-150.5	277	3.14	Horizontal

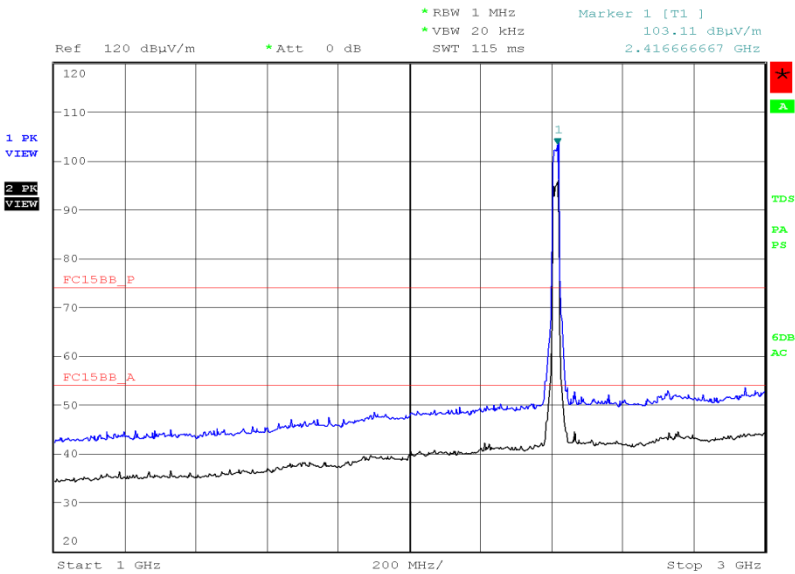


Product Service

1 GHz to 25 GHz

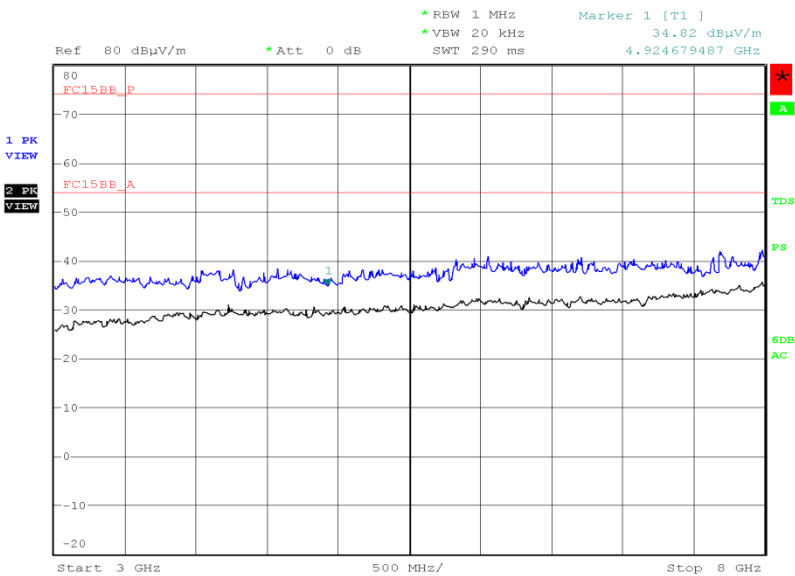
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
19.296	Horizontal	110	320	53.78	46.98

1 GHz to 3 GHz



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3 GHz to 8 GHz

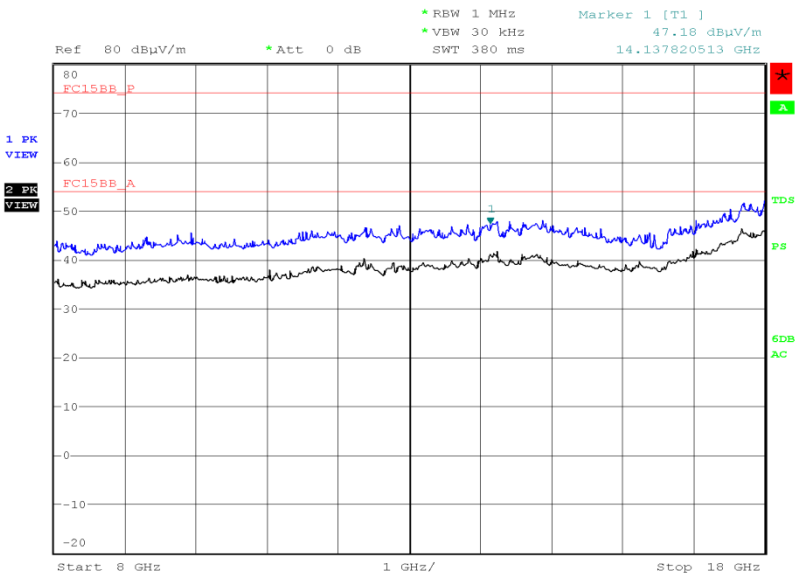


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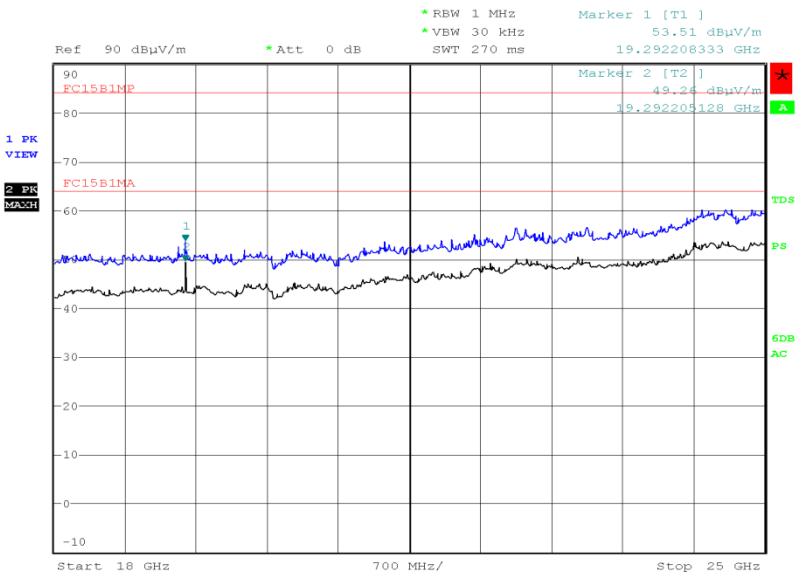
Product Service

8 GHz to 18 GHz



Date: 22.NOV.2014 04:24:36

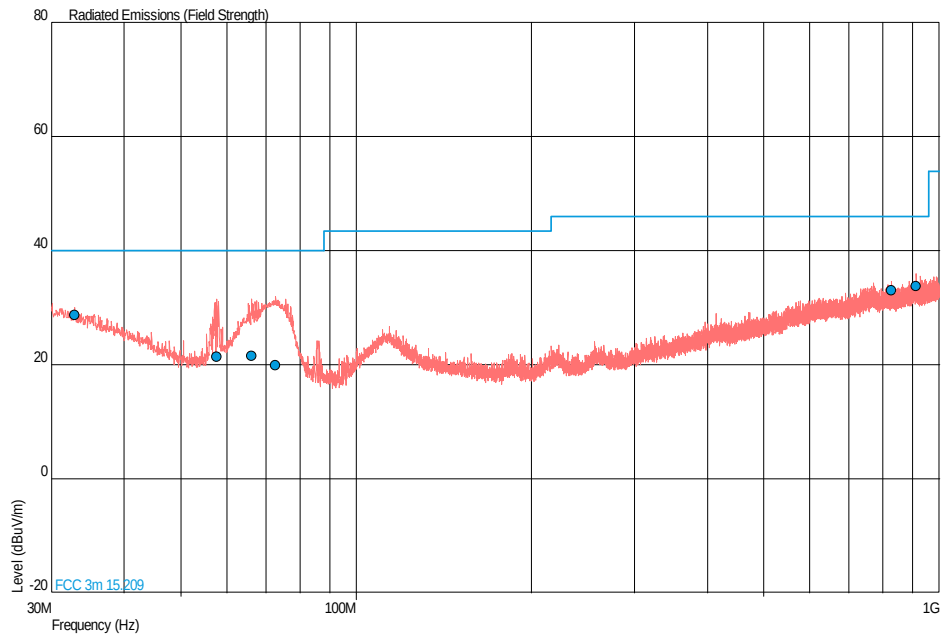
18 GHz to 25 GHz



Date: 22.NOV.2014 21:38:43



Product Service

2437 MHz30 MHz to 1 GHz

Frequency (MHz)	QP Level (dBμV/m)	QP Level (μV/m)	QP Limit (dBμV/m)	QP Limit (μV/m)	QP Margin (dBμV/m)	QP Margin (μV/m)	Angle (Deg)	Height (m)	Polarity
32.859	28.7	27.2	40.0	100	-11.3	-72.8	253	2.25	Vertical
57.672	21.4	11.7	40.0	100	-18.6	-88.3	333	1.00	Vertical
66.218	21.6	12.0	40.0	100	-18.4	-88.0	352	1.00	Vertical
72.625	19.9	9.9	40.0	100	-20.1	-90.1	275	1.00	Vertical
827.781	33.0	44.7	46.0	200	-13.0	-155.3	64	1.02	Horizontal
912.147	33.9	49.5	46.0	200	-12.1	-150.5	287	1.00	Horizontal

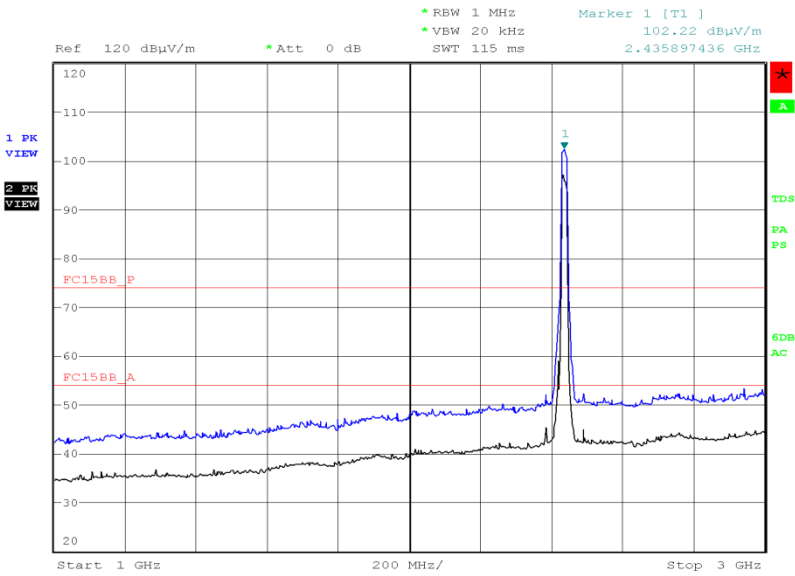


Product Service

1 GHz to 25 GHz

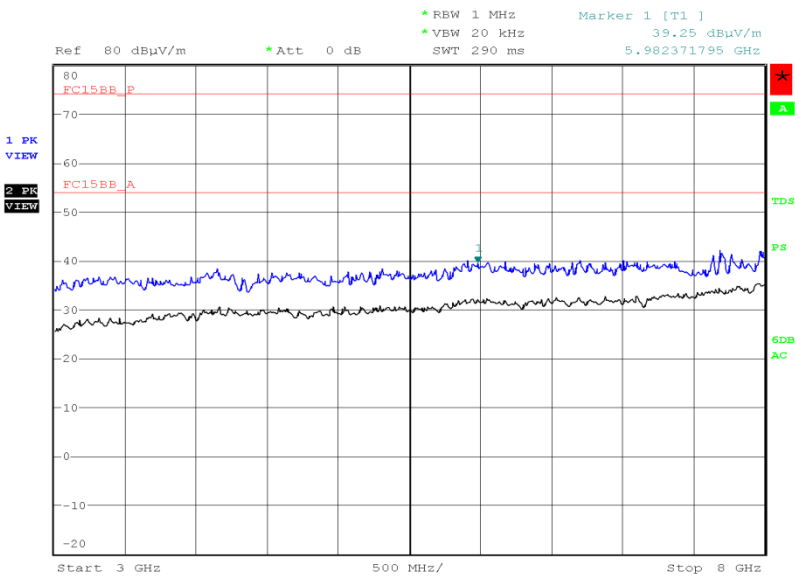
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
19.496	Horizontal	112	323	54.27	47.54

1 GHz to 3 GHz



Date: 22.NOV.2014 01:32:16

3 GHz to 8 GHz



Date: 22.NOV.2014 03:00:43