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Report On

FCC Testing of the
Sharp CDMA SHX12 Dual Band CDMA (BC0 and BC6) and Tri Band
GSM (900, 1800 and 1900 MHz) Dual Mode Cellular Phone with
Bluetooth, FeliCa, WLAN and GPS
In accordance with FCC CFR 47 Part 15C (WLAN)

COMMERCIAL-IN-CONFIDENCE

FCC ID: APYHRO00162

Document 75915934 Report 10 Issue 1

December 2011



Product Service

TÜV SÜD Product Service Ltd, Octagon House, Concorde Way, Segensworth North,
Fareham, Hampshire, United Kingdom, PO15 5RL
Tel: +44 (0) 1489 558100. Website: www.tuvps.co.uk

COMMERCIAL-IN-CONFIDENCE

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Sharp CDMA SHX12 Dual Band CDMA (BC0 and BC6) and Tri Band
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Document 75915934 Report 10 Issue 1

December 2011

PREPARED FOR

Sharp Communication Compliance Ltd
Azure House
Bagshot Road
Bracknell
Berkshire
RG12 7QY

PREPARED BY

Natalie Bennett
Senior Administrator

APPROVED BY

Mark Jenkins
Authorised Signatory

DATED

15 December 2011

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):

S Bennett

G Lawler





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SECTION 1

REPORT SUMMARY

FCC Testing of the
Sharp CDMA SHX12 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and
1900 MHz) Dual Mode Cellular Phone with Bluetooth, FeliCa, WLAN and GPS
In accordance with FCC CFR 47 Part 15C (WLAN)



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1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC Testing of the Sharp CDMA SHX12 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) Dual Mode Cellular Phone with Bluetooth, FeliCa, WLAN 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
Model Number(s)	CDMA SHX12
Serial Number(s)	IMEI 004401113640995 IMEI 004401113638320 IMEI 004401113638338
Number of Samples Tested	3
Test Specification/Issue/Date	FCC CFR 47 Part 15C (2010)
Incoming Release Date	Application Form 09 November 2011
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	8873 11 November 2011
Start of Test	21 November 2011
Finish of Test	6 December 2011
Name of Engineer(s)	S Bennett G Lawler
Related Document(s)	ANSI C63.10: 2009



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1.2 BRIEF SUMMARY OF RESULTS

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

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



Product Service

1.3 APPLICATION FORM

EQUIPMENT DESCRIPTION	
Model Name/Number	CDMA SHX12
Part Number	
FCC ID (if applicable)	APYHRO00162
Industry Canada ID (if applicable)	
Technical Description (Please provide a brief description of the intended use of the equipment)	Dual-Band CDMA(800MHz_BC0, 1900MHz_BC6) and Tri-Band GSM (GSM900MHz, DCS1800MHz, PCS1900MHz) Dual Mode Cellular Phone with Bluetooth, W-LAN, FeliCa and GPS receiver enabled.

EXTREME TEMPERATURE RANGE over which the equipment is to be type tested	
<input type="checkbox"/> -20°C to +55°C	
<input checked="" type="checkbox"/> Other (2)	
<input type="checkbox"/> Not applicable (no extreme temperature testing required)	
Extreme temperature range for the host(s):	-20C to +60C

(2) The equipment shall be tested over the following temperature ranges :

- a) 0°C to +35°C for equipment for indoor use only, or intended for used in areas where the temperature is controlled within this range.
- b) Over the extremes of the temperature range(s) of the declared host equipment(s) in case of plug-in radio devices.

TYPE OF ANTENNA	
<input checked="" type="checkbox"/> Integral	
Temporary RF connector provided:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Antenna connector	
<input type="checkbox"/> Number of antenna assembly(ies) submitted	
Gain of the antenna intended for normal use:	
0 dBi for assembly identified as Bluetooth	
0 dBi for assembly identified as WLAN	
dBi for assembly identified as	
dBi for assembly identified as	
dBi for assembly identified as	

TRANSMITTER TECHNICAL CHARACTERISTICS		
TRANSMITTER OPERATING FREQUENCY RANGE(S)		
	FCC and/or Industry Canada	EU
Bluetooth	2402 to 2480 MHz	2402 to 2480 MHz
WLAN	2412 to 2462 MHz	2412 to 2472 MHz
FCC and/or Industry Canada (only)		
Highest Internally Generated Frequency 1401.6 MHz		



SPREAD SPECTRUM PARAMETERS			
<input checked="" type="checkbox"/> Bluetooth			
FHSS:	Channel <input checked="" type="checkbox"/> 79 Other	EDR	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Medium Access Protocol (Customer Declaration)			
"We have implemented Bluetooth protocol which satisfies the medium access protocol requirement of EN 300 328".			
<input checked="" type="checkbox"/> WLAN			
IEEE 802.11(b) – DSSS <input checked="" type="checkbox"/>			
IEEE 802.11(g) – OFDM <input checked="" type="checkbox"/>			
IEEE 802.11(n) – OFDM <input checked="" type="checkbox"/>			
Supported Spatial Streams		2.4 GHz	5GHz
Transmitter (Tx)		Yes	No
Receiver (Rx)		Yes	No
GI (Guard Interval)	<input checked="" type="checkbox"/> 800 ns	<input type="checkbox"/> 400 ns	
Band Width	<input checked="" type="checkbox"/> 20 MHz	<input type="checkbox"/> 40 MHz	
<input type="checkbox"/> Other Technology			
Direct Sequence	<input type="checkbox"/>	Frequency Hopping	<input type="checkbox"/>
		Combined	<input type="checkbox"/>
		Other	
DSSS	Chip Sequence Length		bit
	Spectrum Width		MHz
FHSS	Total Number of Hops		
	Dwell Time		ms
	Bandwidth Per Hop		MHz
	Maximum Separation of Hops		MHz for ETSI EN 300 328
Other			
Medium Access Protocol (Customer Declaration)			
"We have implemented IEEE 802.11 (b/g/n) protocol which satisfies the medium access protocol requirement of EN 300 328".			



TRANSMITTER POWER CHARACTERISTICS			
Bluetooth			
Maximum Rated Transmitter Output			
Effective radiated power (for equipment with antenna connector)	0.0025	W	
Effective radiated power (for equipment with integral antenna)	0.0025	W	
Minimum Rated Transmitter Output			
Effective radiated power (for equipment with antenna connector)	0.00025	W	
Effective radiated power (for equipment with integral antenna)	0.00025	W	
Is transmitter intended for :			
Continuous duty	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/> No
Intermittent duty	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/> No
If intermittent state DUTY CYCLE			
Transmitter ON	seconds	Transmitter OFF	minutes
Is continuous operation possible for testing purposes?			
	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/> No
Is transmitter output power variable:			
	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/> No
State during the test:			
Transmitter duty cycle	Tx on	Seconds	Tx Off
Duty cycle (Tx on /(Tx on +Tx off))		%	Seconds
<input type="checkbox"/> Continuously variable		<input type="checkbox"/> Stepped	
dB per step			
WLAN			
Maximum Rated Transmitter Output			
Effective radiated power (for equipment with antenna connector)	0.065(b/0.025(g.n	W)
Effective radiated power (for equipment with integral antenna)	0.065(b/0.025(g/n	W)
Minimum Rated Transmitter Output			
Effective radiated power (for equipment with antenna connector)		W	
Effective radiated power (for equipment with integral antenna)		W	
Is transmitter intended for :			
Continuous duty	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/> No
Intermittent duty	<input type="checkbox"/>	Yes	<input type="checkbox"/> No
If intermittent state DUTY CYCLE			
Transmitter ON	seconds	Transmitter OFF	minutes
Is continuous operation possible for testing purposes?			
	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/> No
Is transmitter output power variable:			
	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/> No
State during the test:			
Transmitter duty cycle	Tx on	Seconds	Tx Off
Duty cycle (Tx on /(Tx on +Tx off))		%	Seconds
<input type="checkbox"/> Continuously variable		<input type="checkbox"/> Stepped	
dB per step			



Product Service

TRANSMITTER POWER SOURCE (3)				
<input checked="" type="checkbox"/> Common power source for transmitter and receiver				
<input type="checkbox"/> AC mains				
AC supply frequency	(Hz)	VAC	Max Current	Hz
<input type="checkbox"/> Single phase		<input type="checkbox"/> Three phase		
And / Or				
<input type="checkbox"/> External DC supply				
Nominal voltage		Max Current A		
Extreme upper voltage		Extreme lower voltage		
Battery				
<input type="checkbox"/> Nickel Cadmium				
<input type="checkbox"/> Lead acid (Vehicle regulated)				
<input type="checkbox"/> Alkaline				
<input checked="" type="checkbox"/> Lithium				
<input type="checkbox"/> Other Details :				
4.0 Volts nominal.				
End point voltage as quoted by equipment manufacturer		3.7 V		

(3) If a transmitter and receiver use the same power source, this should be declared. In such cases only the box for the transmitter power source should be filled in.

AUTOMATIC EQUIPMENT SWITCH OFF	
If the equipment is designed to automatically switch off at a predetermined voltage level which is higher or lower in value than the battery minimum and minimum calculated values this shall be clearly stated.	
<input checked="" type="checkbox"/> Applies	3.4 V cut-off voltage
<input type="checkbox"/> Does not apply	



Product Service

RECEIVER POWER SOURCE (4)				
<input type="checkbox"/> AC mains	State voltage			
AC supply frequency	(Hz)	VAC	Max Current	Hz
<input type="checkbox"/> Single phase		<input type="checkbox"/> Three phase		
And / Or				
<input type="checkbox"/> External DC supply				
Nominal voltage		Max Current		A
Extreme upper voltage		Extreme lower voltage		
Battery				
<input type="checkbox"/> Nickel Cadmium				
<input type="checkbox"/> Lead acid (Vehicle regulated)				
<input type="checkbox"/> Alkaline				
<input type="checkbox"/> Lithium				
<input type="checkbox"/> Other Details :				
	Volts nominal.			
End point voltage as quoted by equipment manufacturer				V

(4) If a transmitter and receiver use the same power source, this should be declared. In such cases only the box for the transmitter power source should be filled in.

AUTOMATIC EQUIPMENT SWITCH OFF	
If the equipment is designed to automatically switch off at a predetermined voltage level which is higher or lower in value than the battery minimum and minimum calculated values this shall be clearly stated.	
<input type="checkbox"/> Applies	V cut-off voltage
<input type="checkbox"/> Does not apply	

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

Signature: T. Taki

Name: Tetsuya Taki

Position held: Manager

Date: 09, Nov.,2011



Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp CDMA SHX12 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) Dual Mode Cellular Phone with Bluetooth, FeliCa, WLAN 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 Accreditation
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 0 - No modifications were made to the test sample during testing.



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SECTION 2

TEST DETAILS

FCC Testing of the
Sharp CDMA SHX12 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and
1900 MHz) Dual Mode Cellular Phone with Bluetooth, FeliCa, WLAN and GPS
In accordance with FCC CFR 47 Part 15C (WLAN)



Product Service

2.1 MAXIMUM PEAK CONDUCTED OUTPUT POWER

2.1.1 Specification Reference

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

2.1.2 Equipment Under Test and Modification State

CDMA SHX12 S/N: IMEI 004401113640995 - Modification State 0

2.1.3 Date of Test

21 November 2011 & 22 November 2011

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

The EUT was transmitted at maximum power via a cable and attenuator to a Peak Power Meter. An offset was entered to account for the measurement path loss. The peak power was measured and recorded.

2.1.6 Environmental Conditions

Ambient Temperature	24.8°C
Relative Humidity	22.5 - 30.5%



Product Service

2.1.7 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	16.34	17.06	17.49	43.05	50.82	56.1
2	17.22	17.77	17.90	52.72	59.84	61.66
5.5	16.96	17.71	17.80	49.66	59.02	60.26
11	17.18	17.88	17.87	52.24	61.38	61.24

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	23.03	22.91	23.53	200.91	195.43	225.42
9	22.62	22.96	23.16	182.81	197.70	207.01
12	22.12	22.52	22.80	162.93	162.93	178.65
18	22.52	22.61	23.12	178.65	182.39	205.12
24	22.10	22.66	22.85	162.18	181.97	162.18
36	22.51	22.72	23.17	178.24	187.07	207.49
48	22.14	22.59	22.85	163.68	181.55	192.75
54	22.22	22.52	22.84	166.72	178.65	192.31

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	22.13	22.28	22.84	163.31	169.04	192.31
13	22.39	22.53	22.95	173.38	179.06	197.24
19.5	21.65	22.01	22.72	146.22	158.85	187.07
26	21.80	21.89	22.33	151.36	154.53	171
39	21.57	21.69	22.37	143.55	147.57	172.58
52	21.79	21.83	22.43	151.01	152.41	174.98
58.5	21.75	21.97	22.31	149.62	157.40	170.22
65	21.55	21.89	22.39	142.89	154.53	173.38

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

2.2 EIRP PEAK POWER

2.2.1 Specification Reference

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

2.2.2 Equipment Under Test and Modification State

CDMA SHX12 S/N: IMEI 004401113638320 - Modification State 0

2.2.3 Date of Test

27 November 2011

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 EUT was transmitted at maximum power via a cable to the Spectrum Analyser. 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 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. If applicable, a peak power analyser was also used to obtain a correction factor for wideband signals such as WLAN.

A calculation was then performed to obtain the final figure.

2.2.6 Environmental Conditions

Ambient Temperature	20.9°C
Relative Humidity	36.0%



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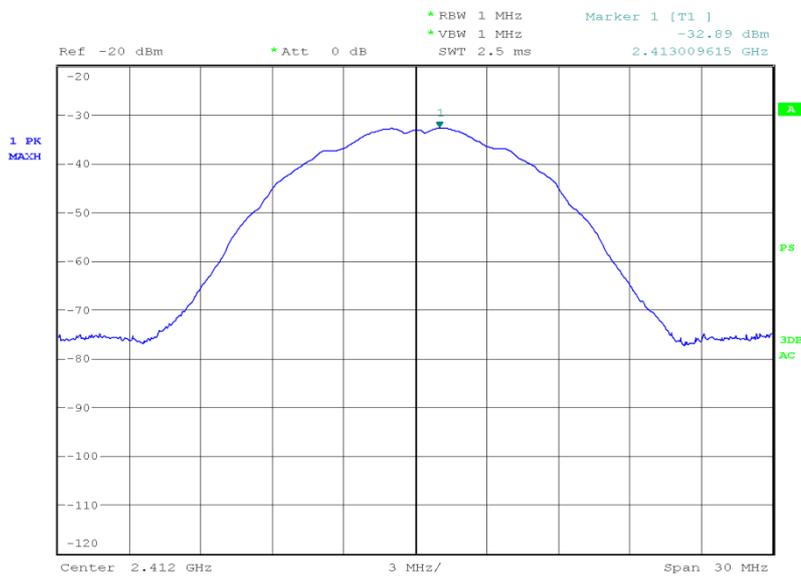
2.2.7 Test Results

802.11(b)

4.0 V DC Supply

2412 MHz

EIRP (dBm)	EIRP (mW)
15.40	34.67



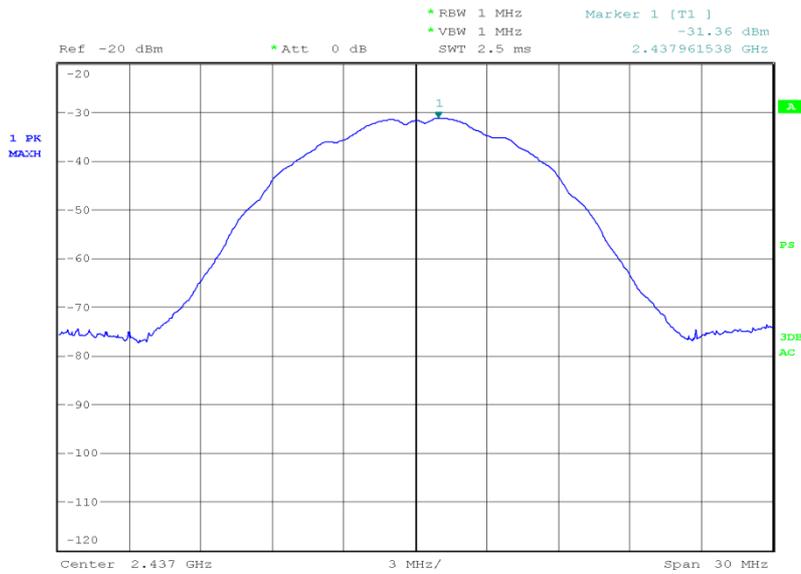
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2437 MHz

EIRP (dBm)	EIRP (mW)
16.93	49.32



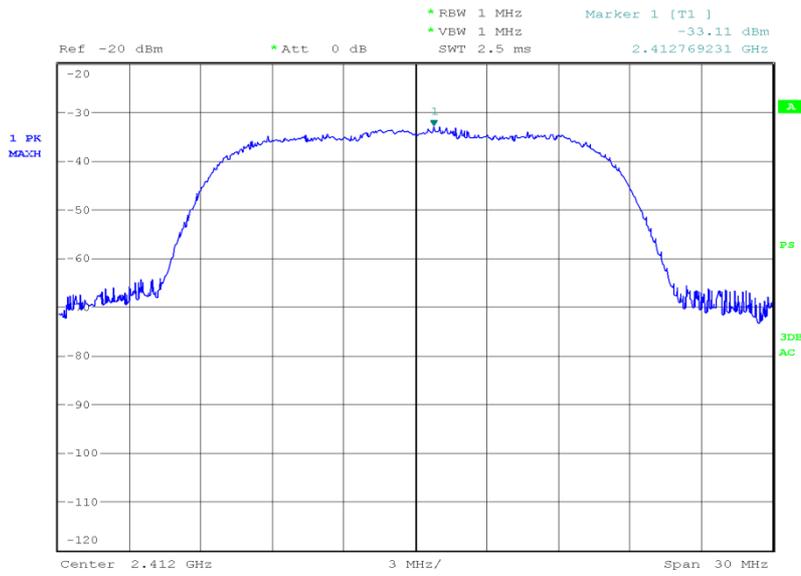
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Product Service

2462 MHz

EIRP (dBm)	EIRP (mW)
18.53	71.29



Date: 26.NOV.2011 15:51:56

Limit

EIRP (dBm)	EIRP (mW)
36.0	4000



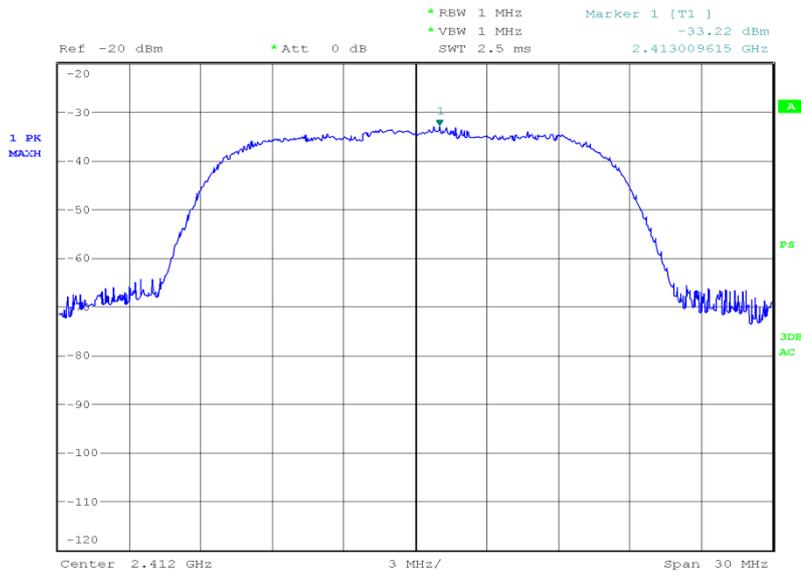
Product Service

802.11(g)

4.0 V DC Supply

2412 MHz

EIRP (dBm)	EIRP (mW)
18.76	75.16

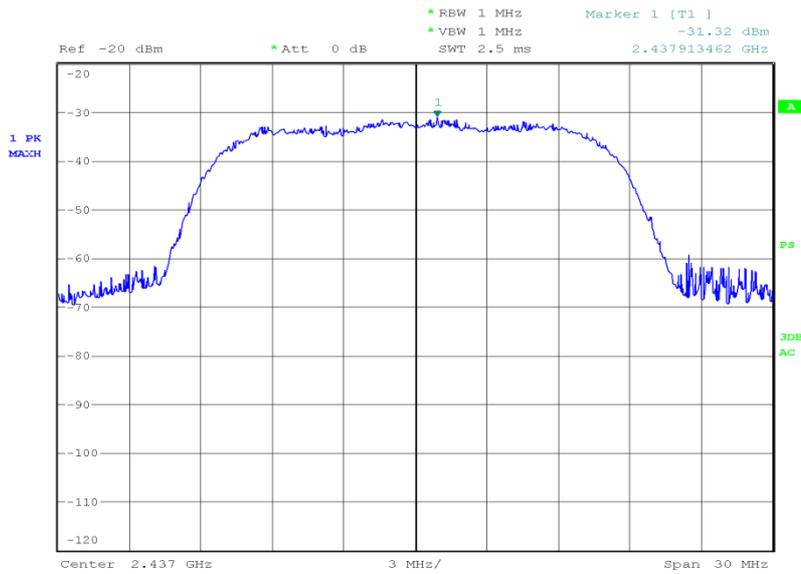


Date: 26.NOV.2011 15:51:45



2437 MHz

EIRP (dBm)	EIRP (mW)
20.51	112.46

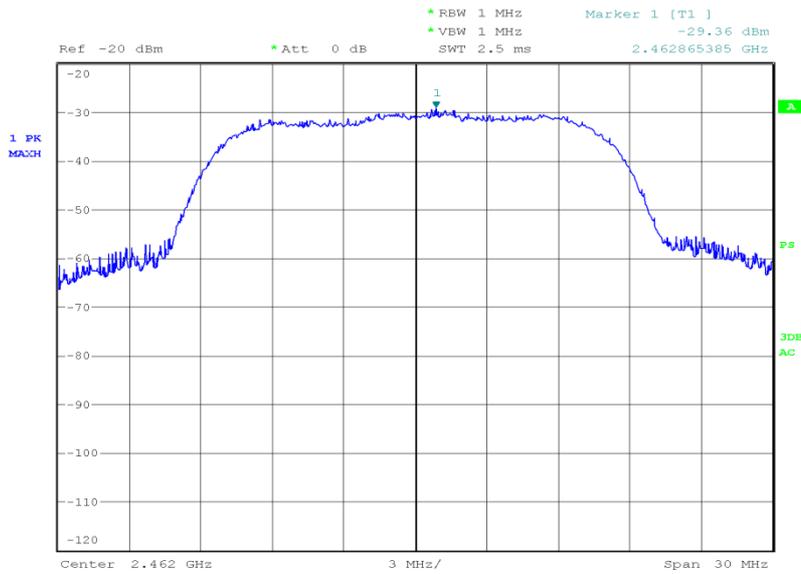


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2462 MHz

EIRP (dBm)	EIRP (mW)
22.30	169.82



Date: 26.NOV.2011 16:05:15

Limit

EIRP (dBm)	EIRP (mW)
36.0	4000



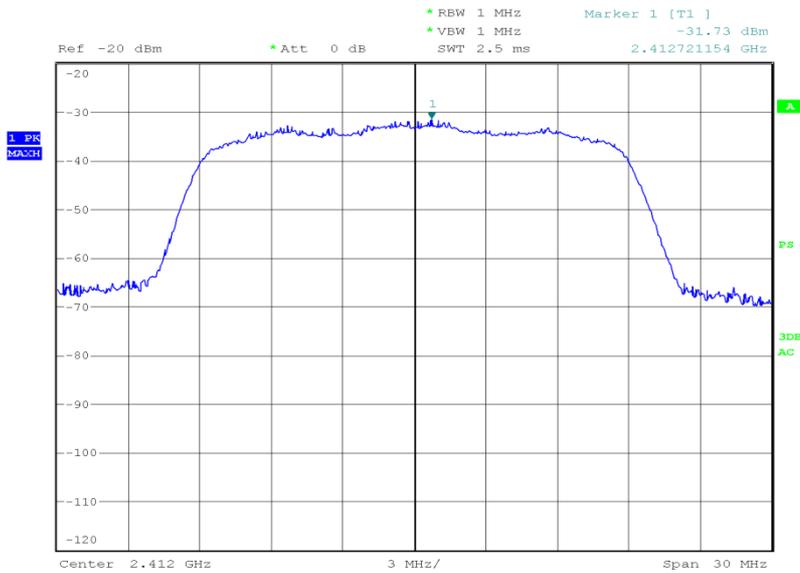
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802.11(n)

4.0 V DC Supply

2412 MHz

EIRP (dBm)	EIRP (mW)
21.1	128.82



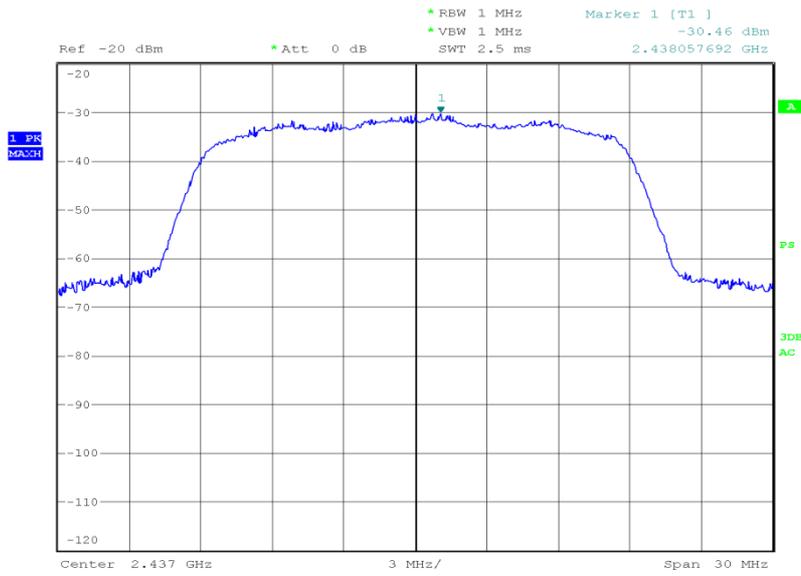
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Product Service

2437 MHz

EIRP (dBm)	EIRP (mW)
+22.31	170.22



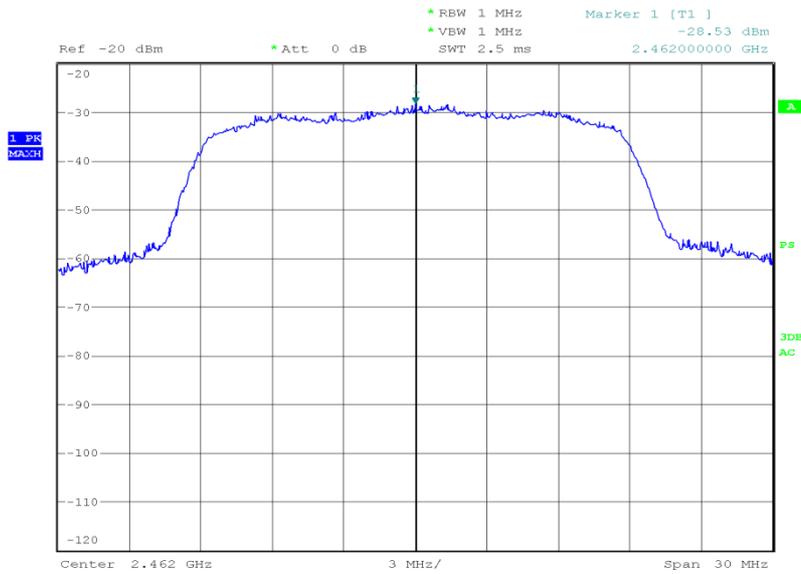
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Product Service

2462 MHz

EIRP (dBm)	EIRP (mW)
+23.94	247.74



Date: 26.NOV.2011 16:50:24

Limit

EIRP (dBm)	EIRP (mW)
36.0	4000



2.3 POWER SPECTRAL DENSITY

2.3.1 Specification Reference

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

2.3.2 Equipment Under Test and Modification State

CDMA SHX12 S/N: IMEI 004401113640995 - Modification State 0

2.3.3 Date of Test

21 November 2011 & 22 November 2011

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 EUT was connected to a spectrum analyser via an attenuator. The path loss was measured between the EUT and the spectrum analyser and entered as a reference level offset. The trace was set to max hold and using a peak detector the maximum response was established. With the spectrum analyser RBW at 3 kHz and VBW at 10 kHz, the power spectral density in a 3 kHz bandwidth was measured.

2.3.6 Environmental Conditions

Ambient Temperature	24.8°C
Relative Humidity	30.5%



Product Service

2.3.7 Test Results

802.11(b)

4.0 V DC Supply

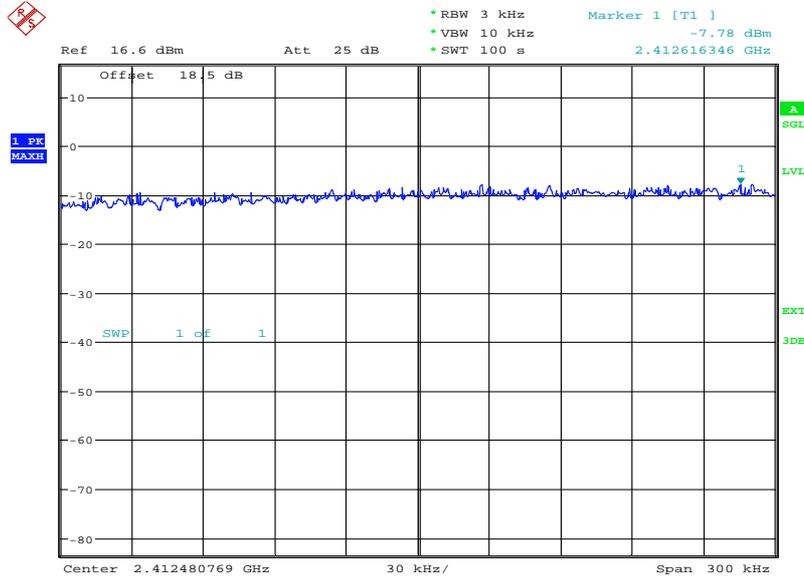
Frequency (MHz)	Data Rate (Mbps)	Power Spectral Density in 3 kHz Bands (dBm)
2412 MHz	1	-7.78
	2	-6.29
	5	-7.53
	11	-7.70
2437 MHz	1	-7.37
	2	-5.91
	5	-7.18
	11	-7.79
2462 MHz	1	-5.83
	2	-5.91
	5	-6.72
	11	-6.86



Product Service

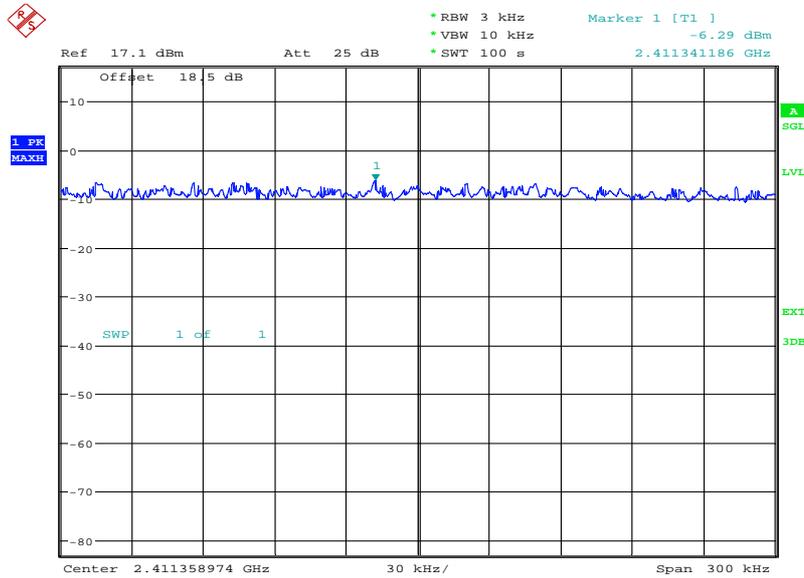
2412 MHz

1 Mbps



Date: 21.NOV.2011 11:52:24

2 Mbps

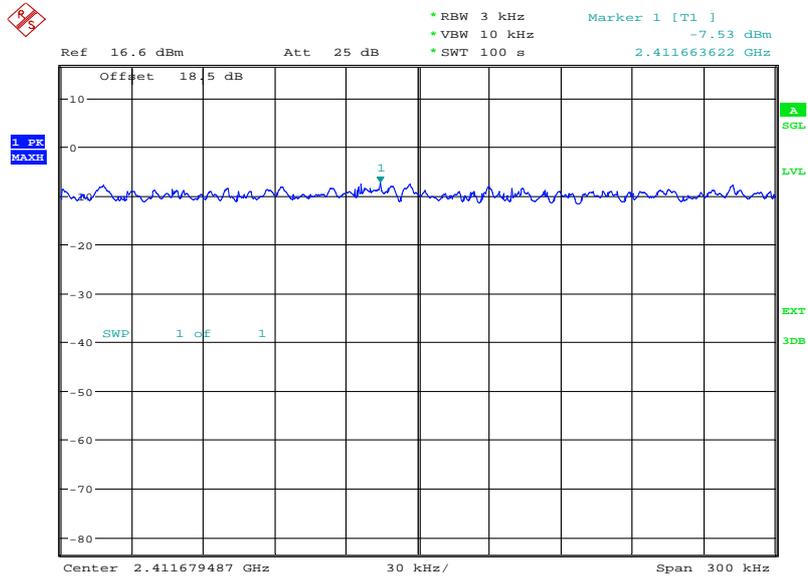


Date: 21.NOV.2011 11:37:35



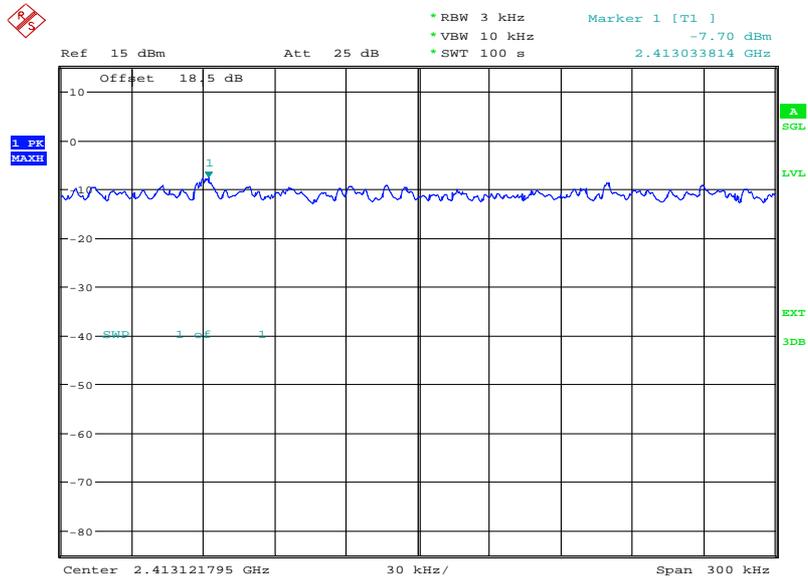
Product Service

5.5 Mbps



Date: 21.NOV.2011 12:09:41

11 Mbps



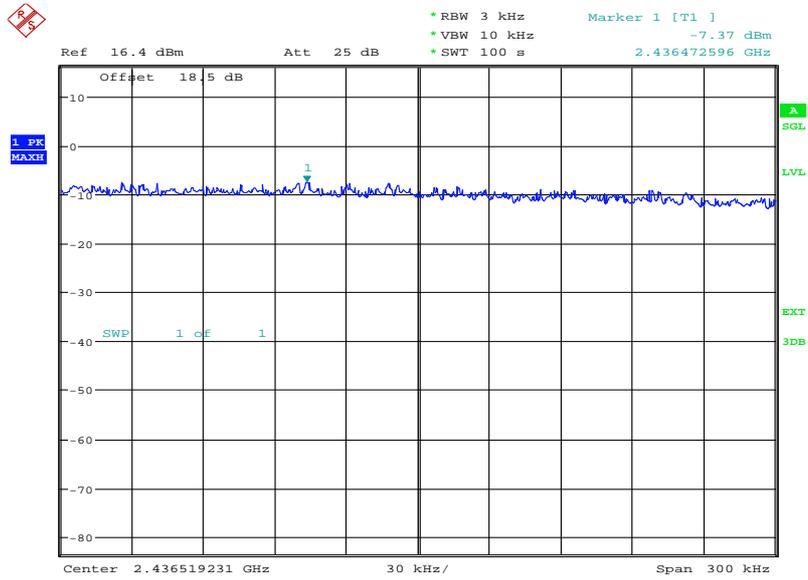
Date: 21.NOV.2011 12:29:39



Product Service

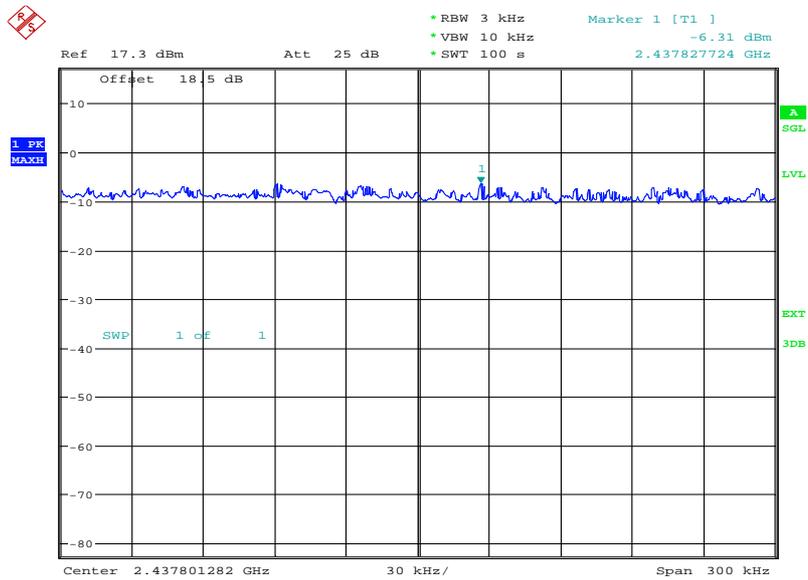
2437 MHz

1 Mbps



Date: 21.NOV.2011 11:56:13

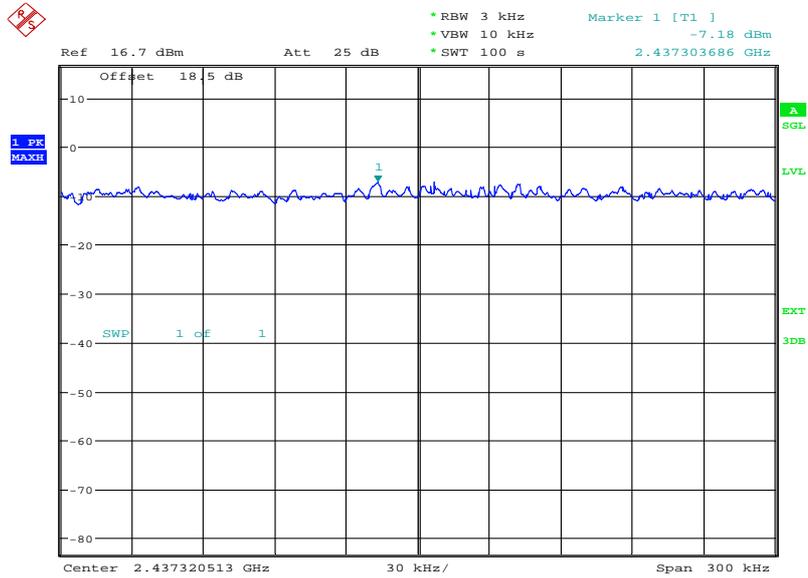
2 Mbps



Date: 21.NOV.2011 11:41:58

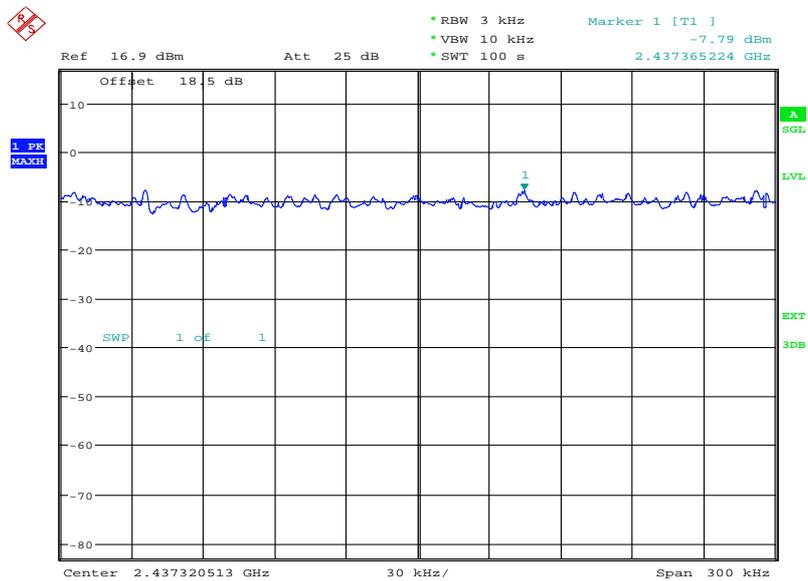


5.5 Mbps



Date: 21.NOV.2011 12:15:54

11 Mbps



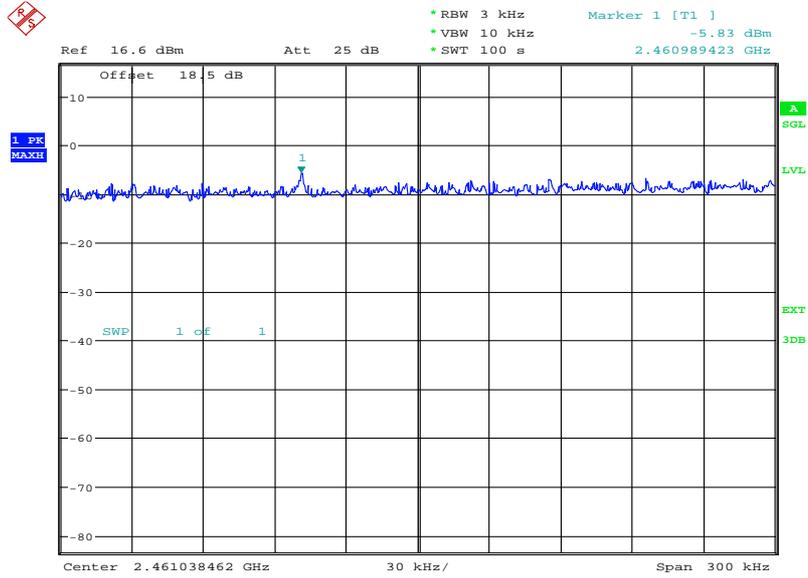
Date: 21.NOV.2011 12:33:58



Product Service

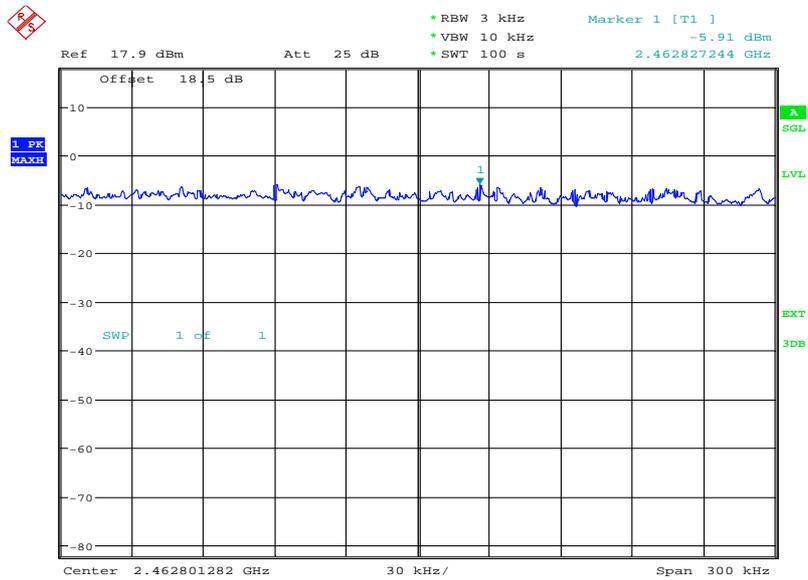
2462 MHz

1 Mbps



Date: 21.NOV.2011 12:02:49

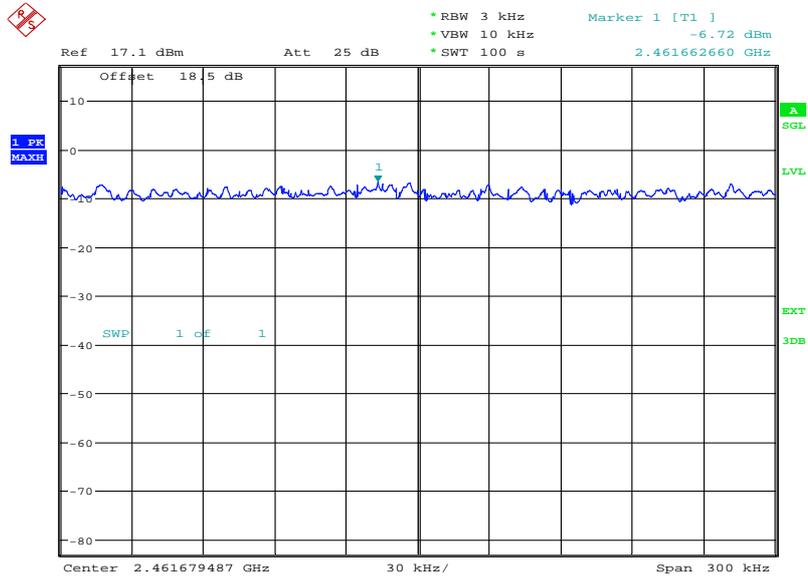
2 Mbps



Date: 21.NOV.2011 11:45:55

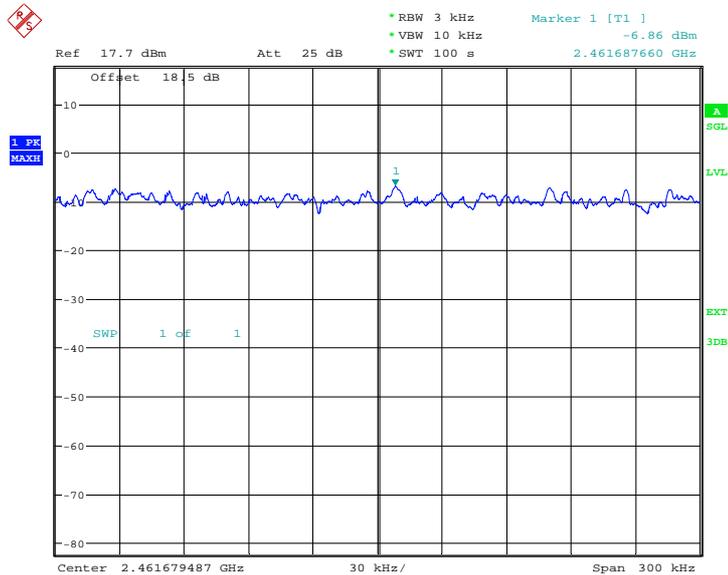


5.5 Mbps



Date: 21.NOV.2011 12:20:29

11 Mbps



Date: 21.NOV.2011 12:38:52

Limit Clause

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



Product Service

802.11(g)

4.0 V DC Supply

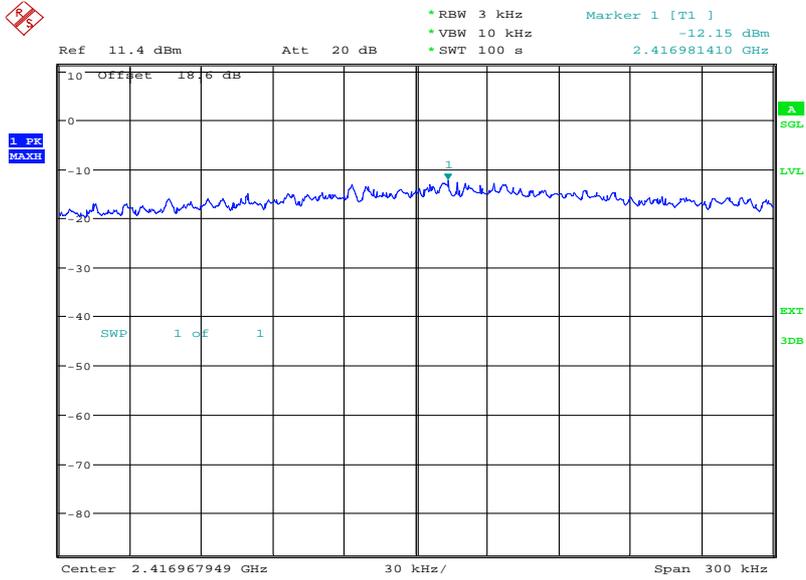
Frequency (MHz)	Data Rate (Mbps)	Power Spectral Density in 3 kHz Bands (dBm)
2412 MHz	6	-12.15
	9	-11.26
	12	-11.34
	18	-10.88
	24	-10.57
	36	-10.40
	48	-11.64
	54	-11.56
2437 MHz	6	-10.58
	9	-10.24
	12	-10.54
	18	-10.59
	24	-10.74
	36	-10.92
	48	-10.69
	54	-11.28
2462 MHz	6	-10.77
	9	-9.77
	12	-9.93
	18	-10.19
	24	-10.31
	36	-9.69
	48	-9.83
	54	-11.00



Product Service

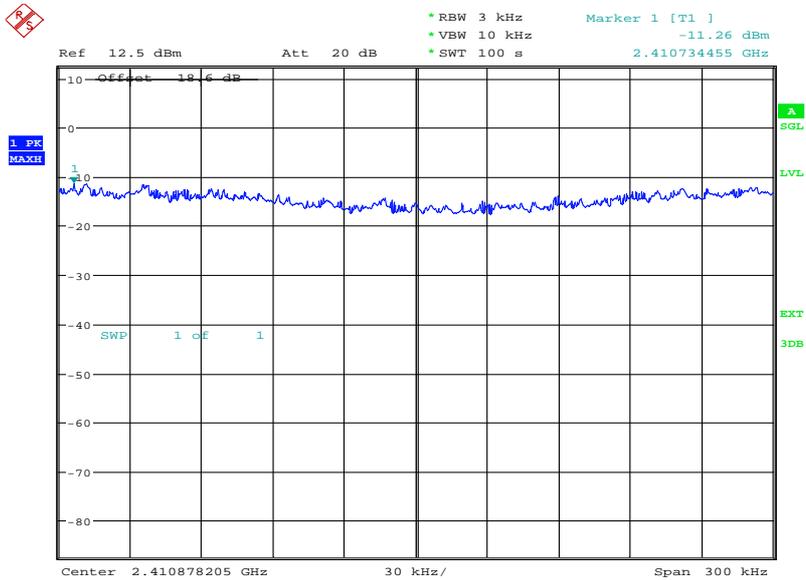
2412 MHz

6 Mbps



Date: 21.NOV.2011 12:46:54

9 Mbps

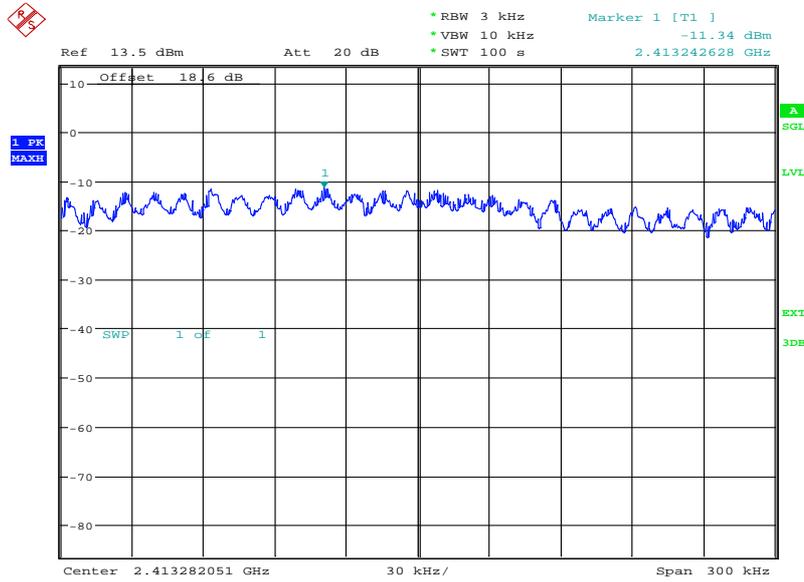


Date: 21.NOV.2011 12:59:59



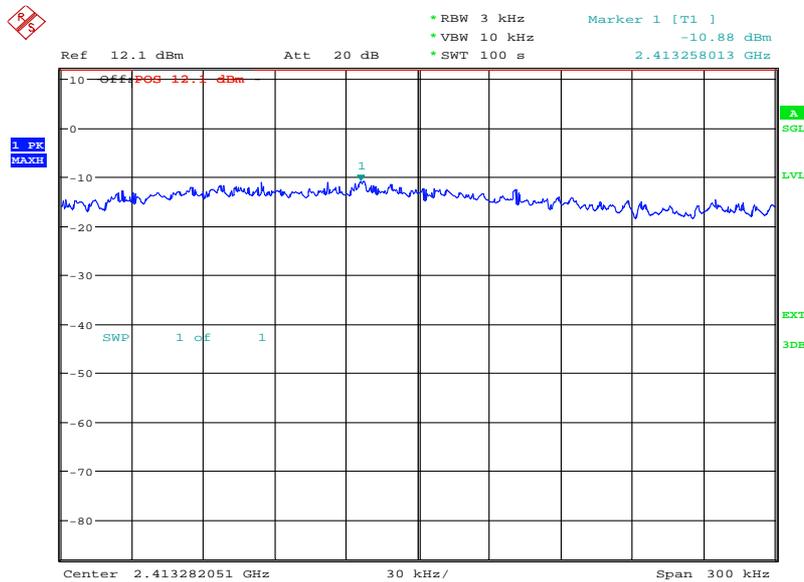
Product Service

12 Mbps



Date: 21.NOV.2011 13:19:12

18 Mbps

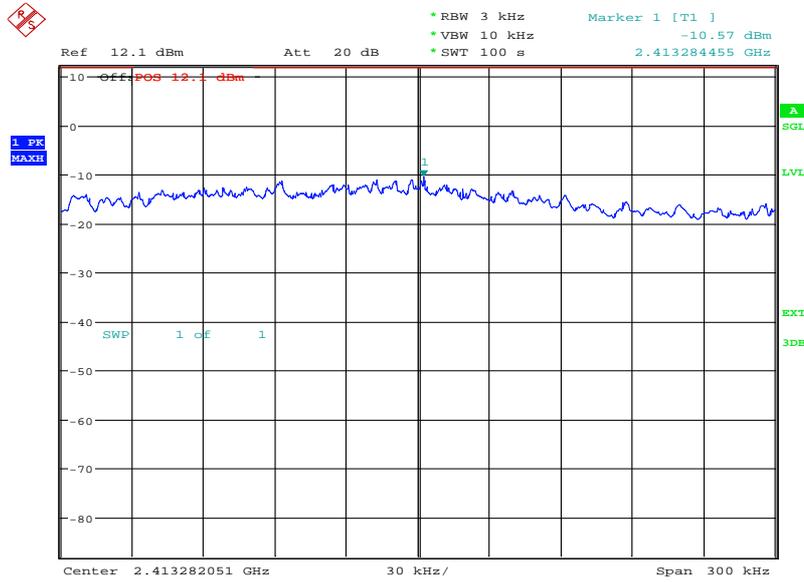


Date: 21.NOV.2011 13:33:09



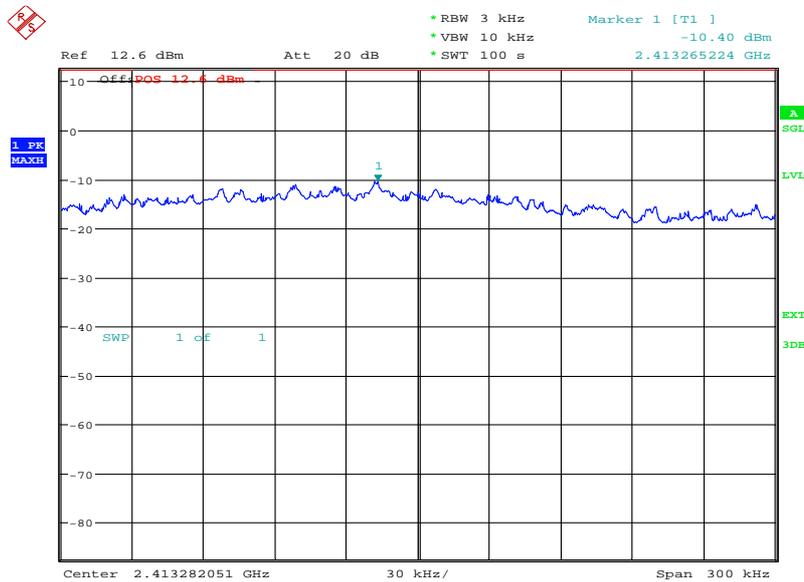
Product Service

24 Mbps



Date: 21.NOV.2011 14:28:49

36 Mbps

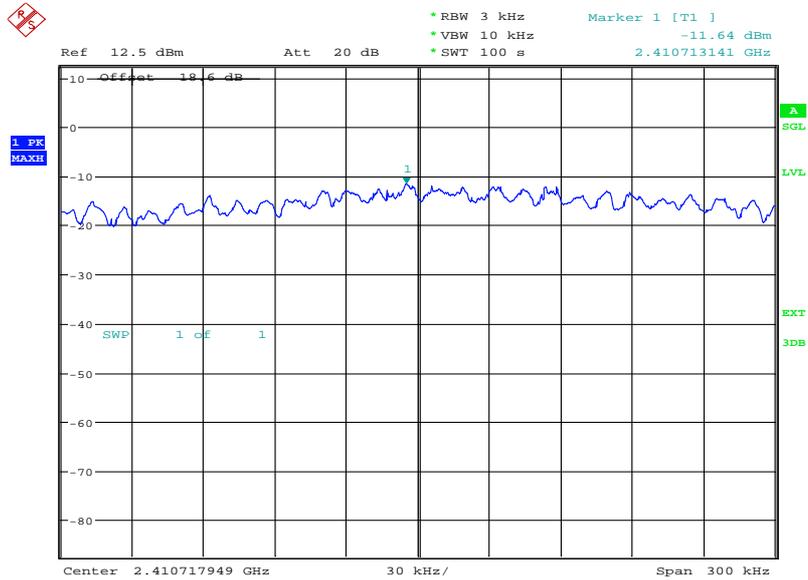


Date: 21.NOV.2011 14:44:01



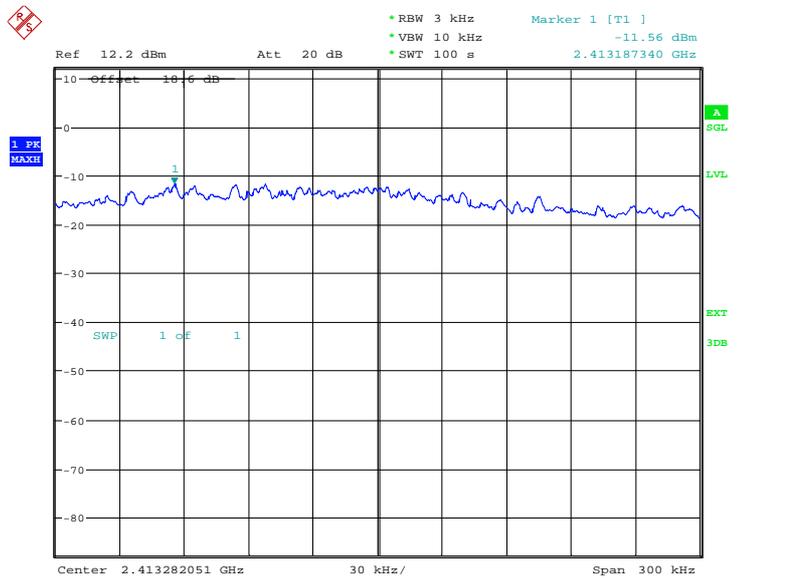
Product Service

48 Mbps



Date: 21.NOV.2011 14:58:48

54 Mbps



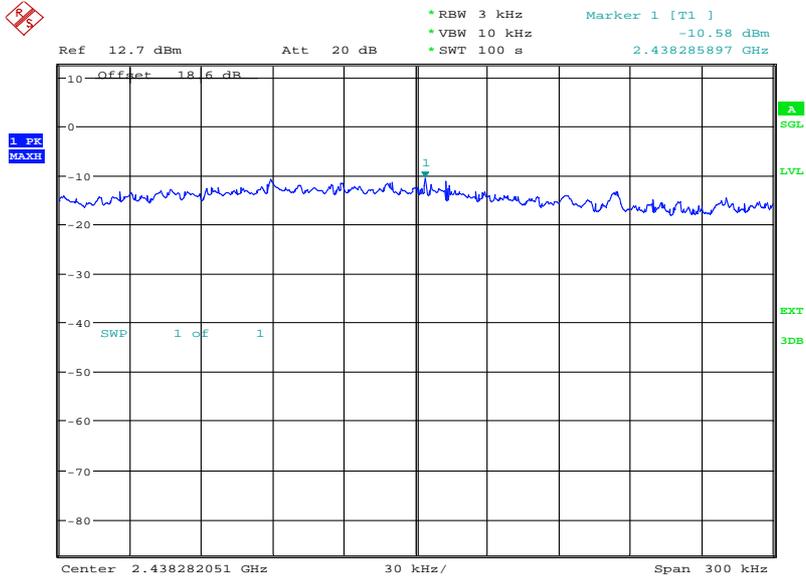
Date: 21.NOV.2011 15:13:04



Product Service

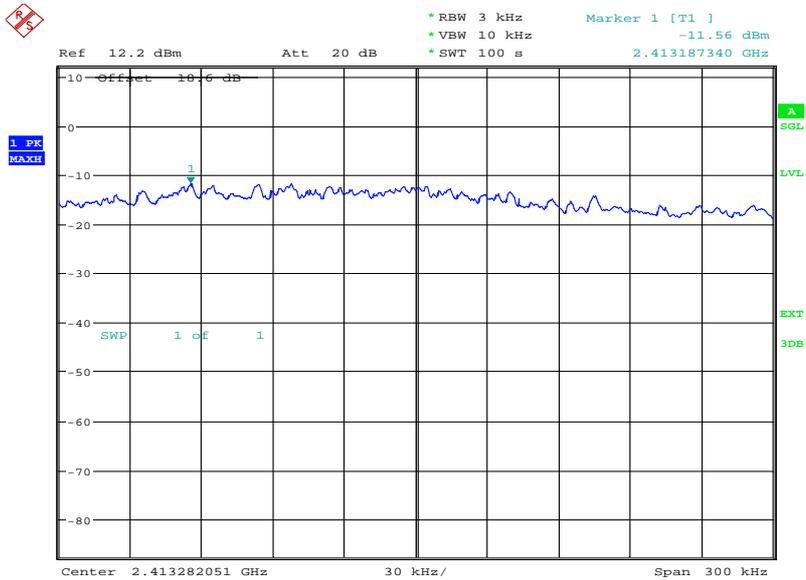
2437 MHz

6 Mbps



Date: 21.NOV.2011 12:50:54

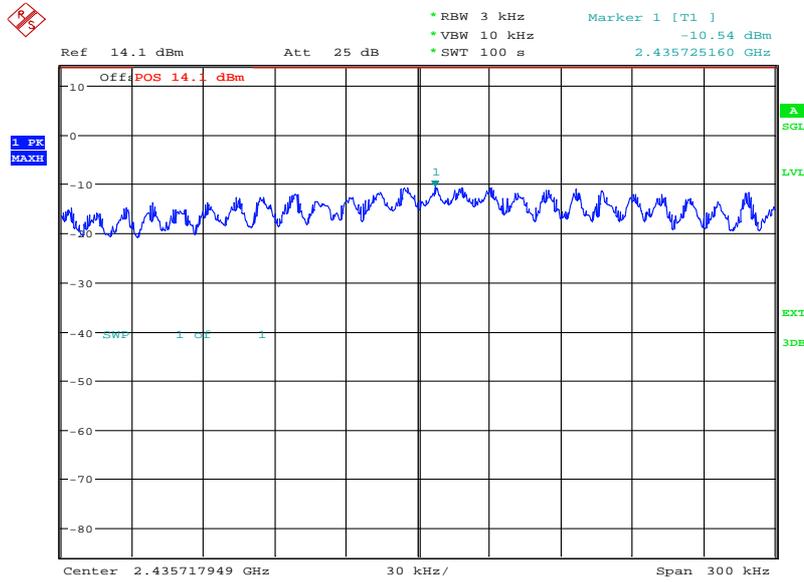
9 Mbps



Date: 21.NOV.2011 15:13:04

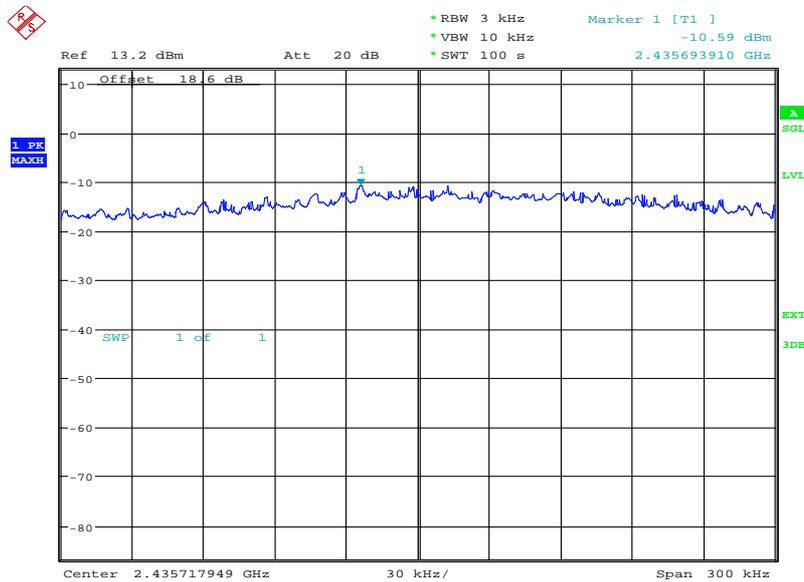


12 Mbps



Date: 21.NOV.2011 13:23:22

18 Mbps

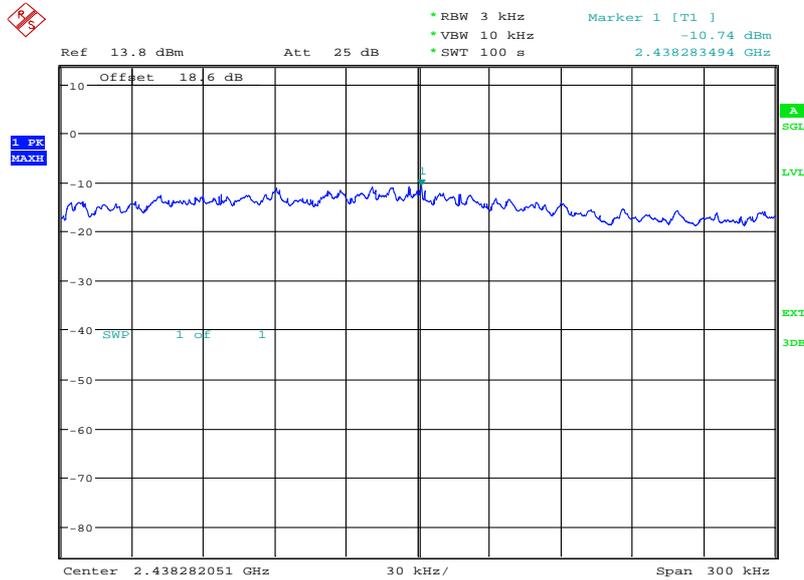


Date: 21.NOV.2011 13:37:08



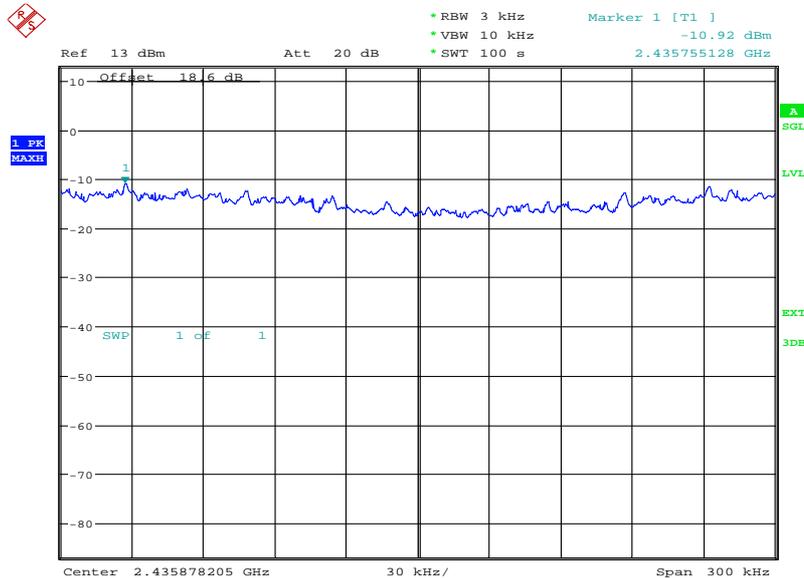
Product Service

24 Mbps



Date: 21.NOV.2011 14:32:42

36 Mbps

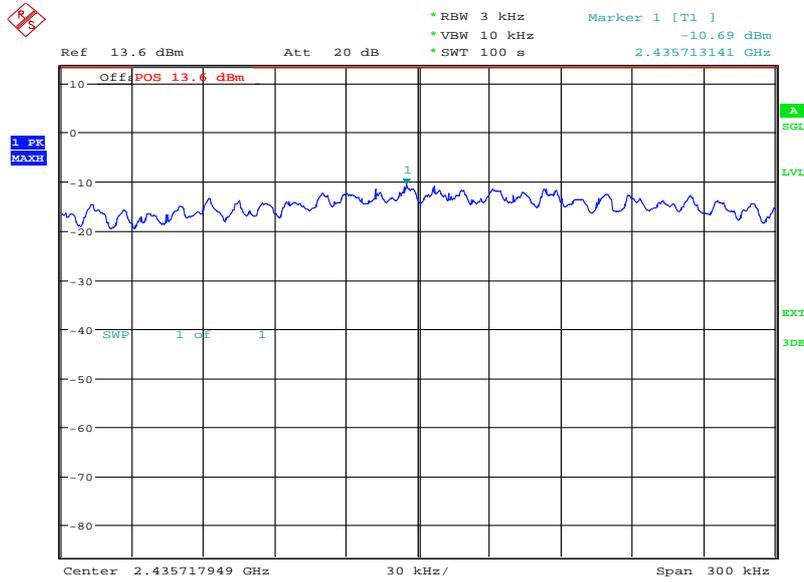


Date: 21.NOV.2011 14:47:57



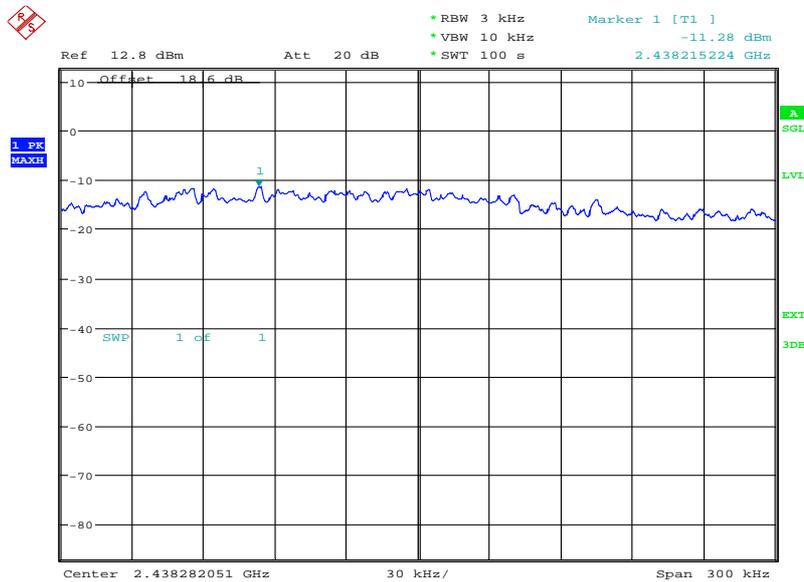
Product Service

48 Mbps



Date: 21.NOV.2011 15:02:35

54 Mbps



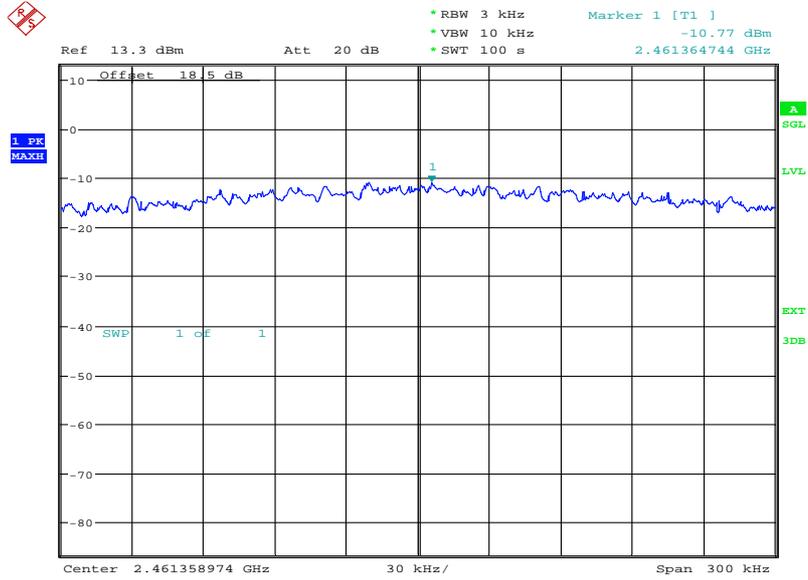
Date: 21.NOV.2011 15:17:14



Product Service

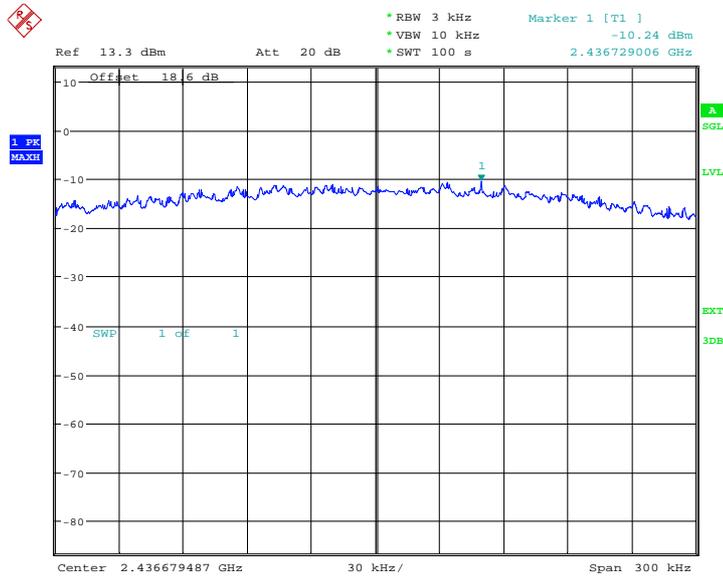
2462 MHz

6 Mbps



Date: 21.NOV.2011 12:54:44

9 Mbps

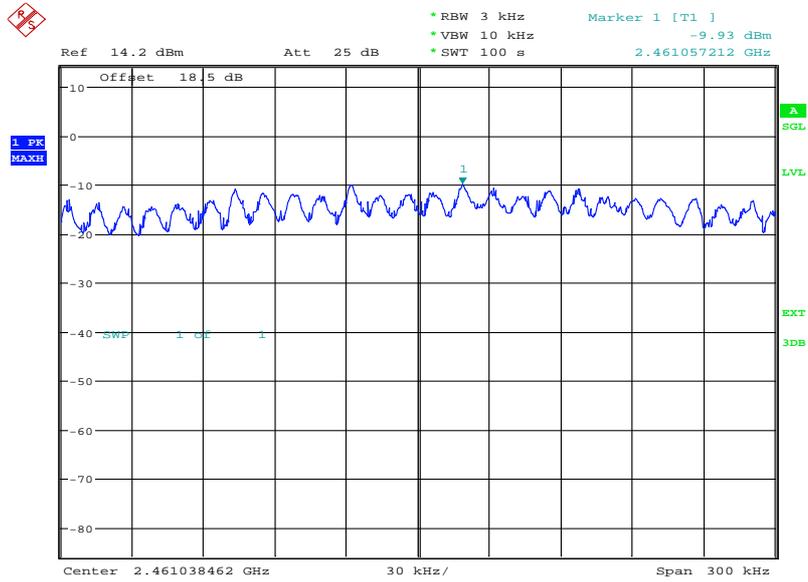


Date: 21.NOV.2011 13:04:25



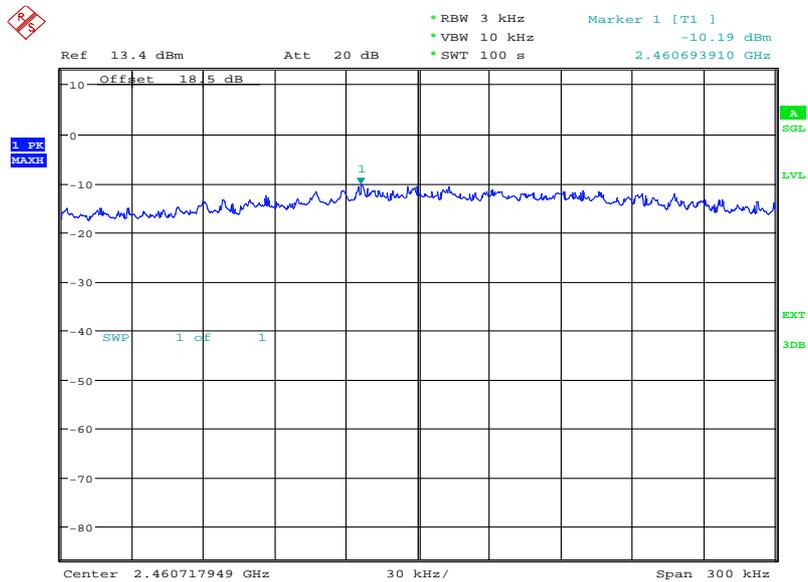
Product Service

12 Mbps



Date: 21.NOV.2011 13:27:32

18 Mbps

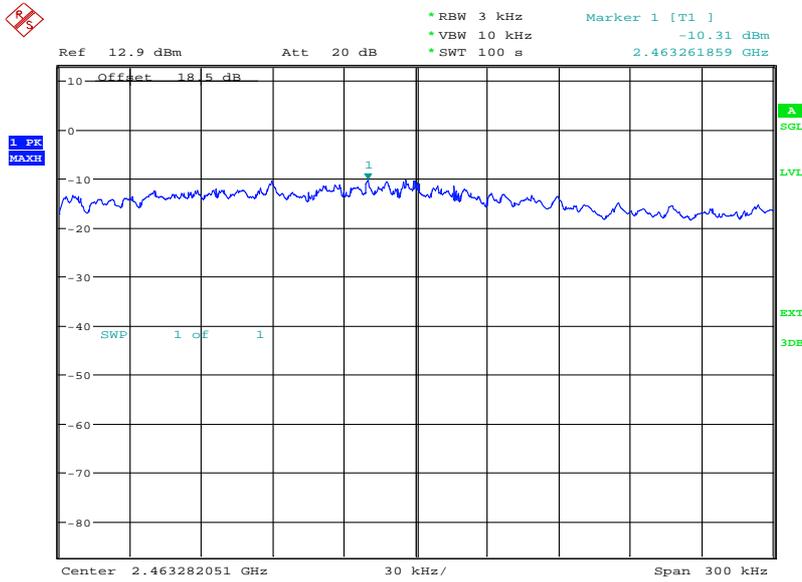


Date: 21.NOV.2011 13:43:09



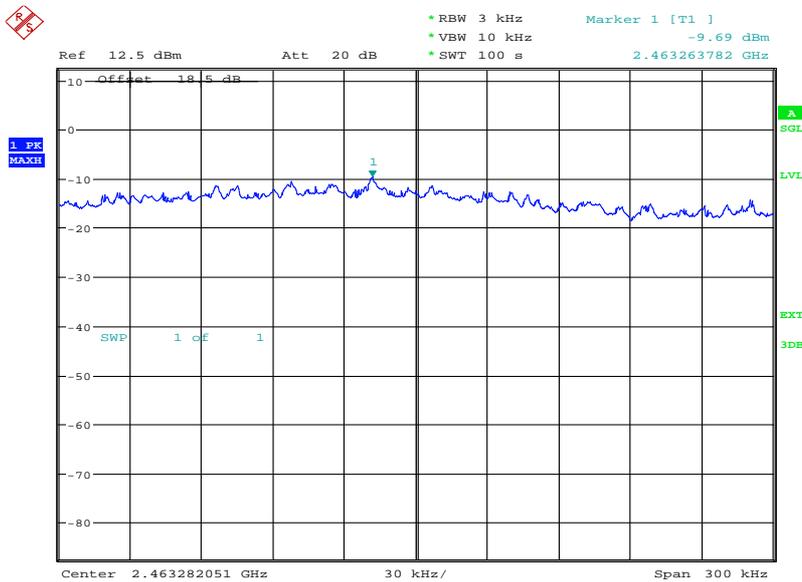
Product Service

24 Mbps



Date: 21.NOV.2011 14:38:12

36 Mbps

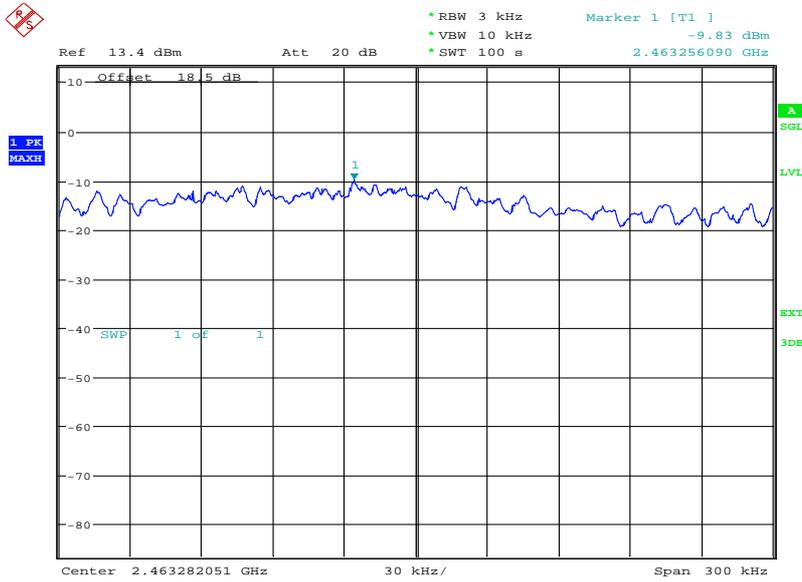


Date: 21.NOV.2011 14:51:55



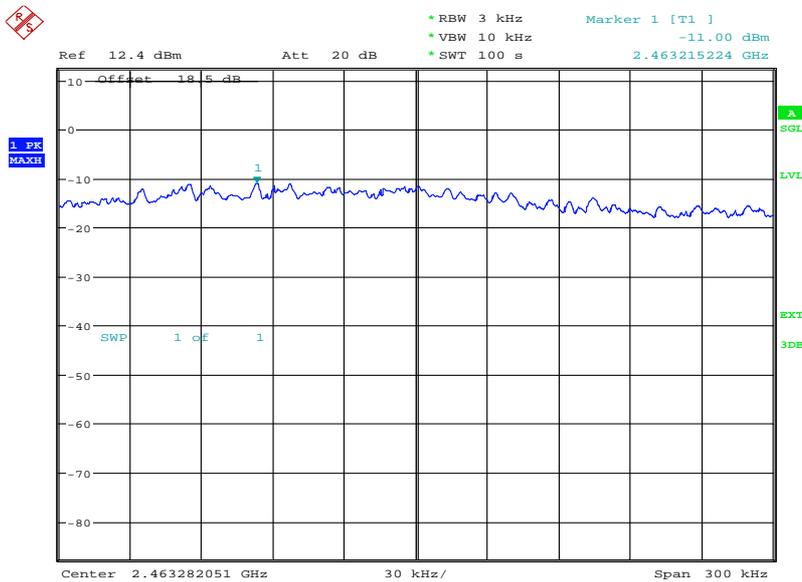
Product Service

48 Mbps



Date: 21.NOV.2011 15:06:30

54 Mbps



Date: 21.NOV.2011 15:21:30



Product Service

Limit Clause

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

802.11(n)

4.0 V DC Supply

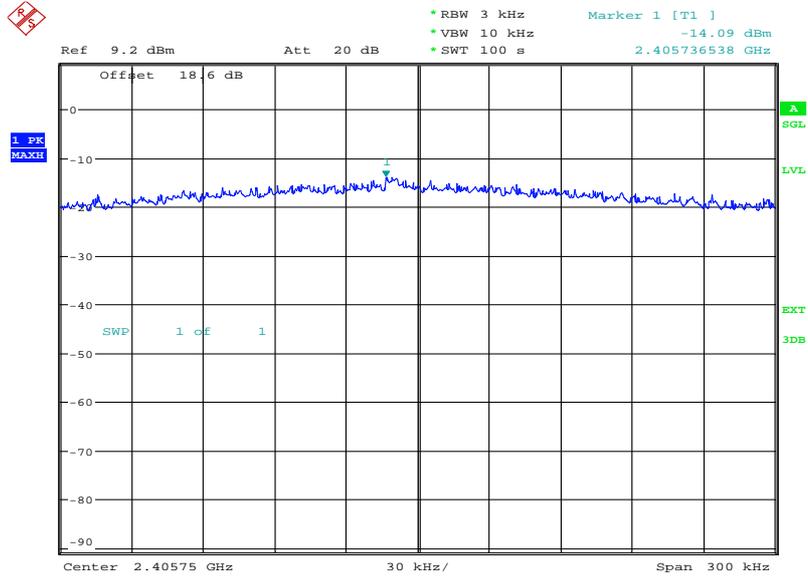
Frequency (MHz)	Data Rate (Mbps)	Power Spectral Density in 3 kHz Bands (dBm)
2412 MHz	6.5	-14.09
	13	-13.95
	19.5	-13.10
	26	-11.70
	39	-12.45
	52	-11.64
	58.5	-11.29
	65	-12.47
2437 MHz	6.5	-11.57
	13	-11.09
	19.5	-11.88
	26	-11.40
	39	-12.48
	52	-11.85
	58.5	-11.45
	65	-12.14
2462 MHz	6.5	-10.98
	13	-10.98
	19.5	-11.40
	26	-12.44
	39	-11.97
	52	-11.81
	58.5	-10.85
	65	-12.06



Product Service

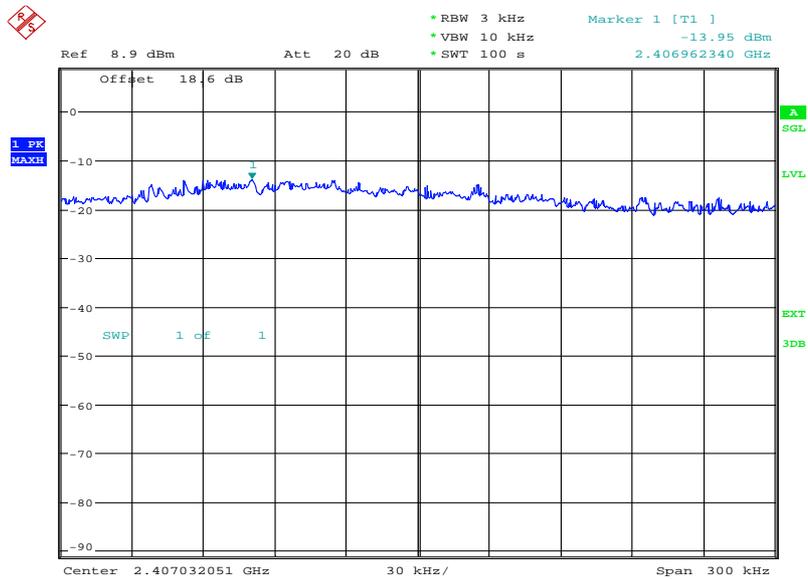
2412 MHz

6.5 Mbps



Date: 21.NOV.2011 15:30:02

13 Mbps

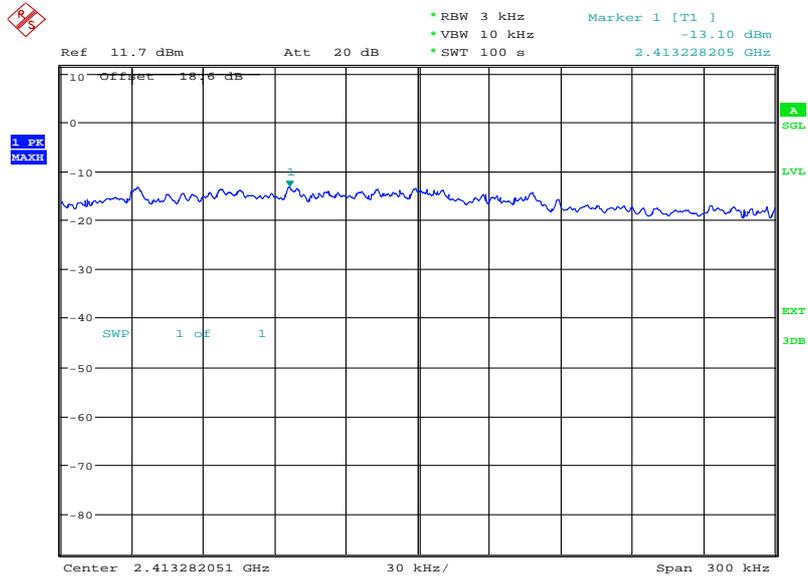


Date: 21.NOV.2011 15:53:02



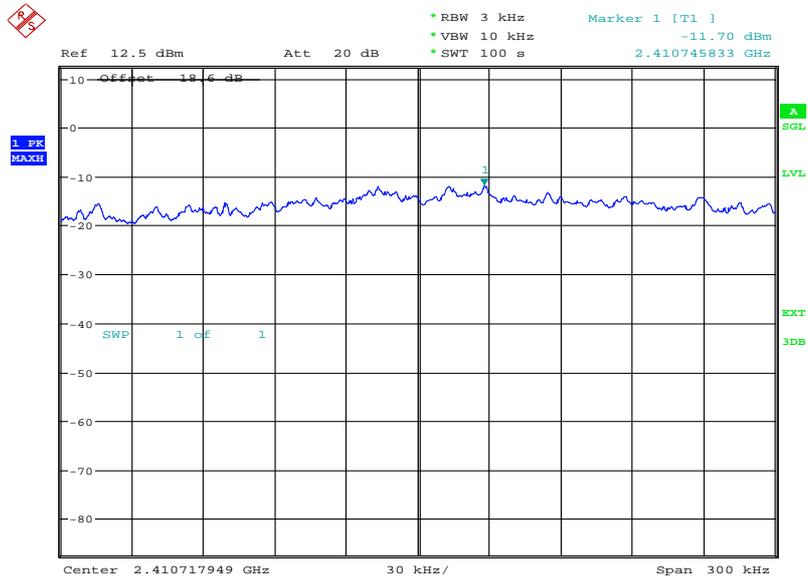
Product Service

19.5 Mbps



Date: 22.NOV.2011 07:49:15

26 Mbps

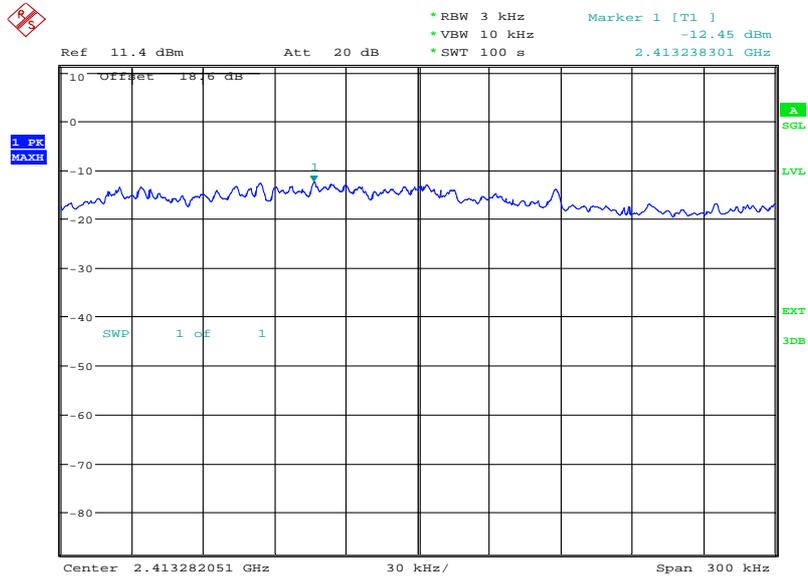


Date: 22.NOV.2011 08:04:39



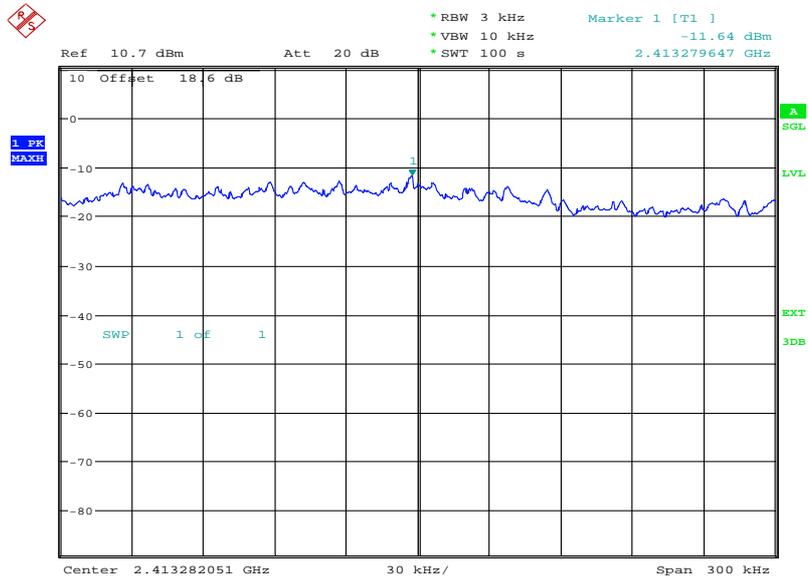
Product Service

39 Mbps



Date: 22.NOV.2011 08:17:45

52 Mbps

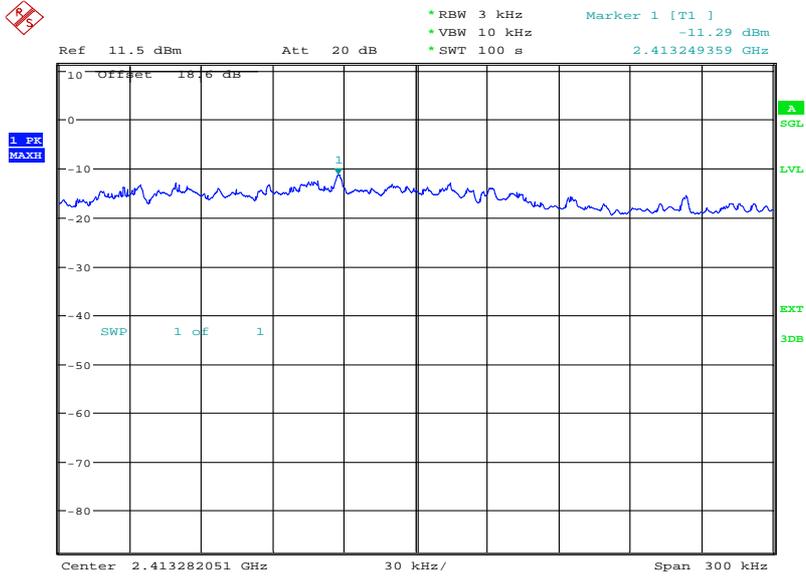


Date: 22.NOV.2011 08:30:28



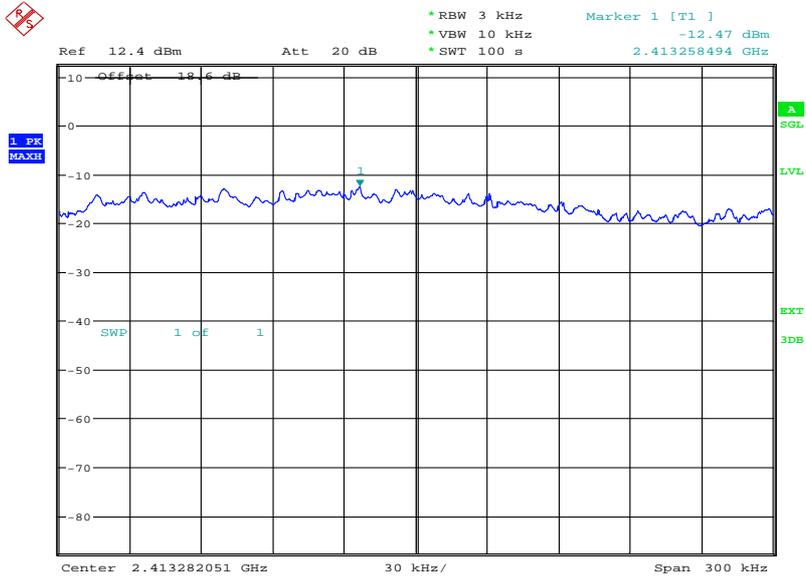
Product Service

58.5 Mbps



Date: 22.NOV.2011 08:49:47

65 Mbps



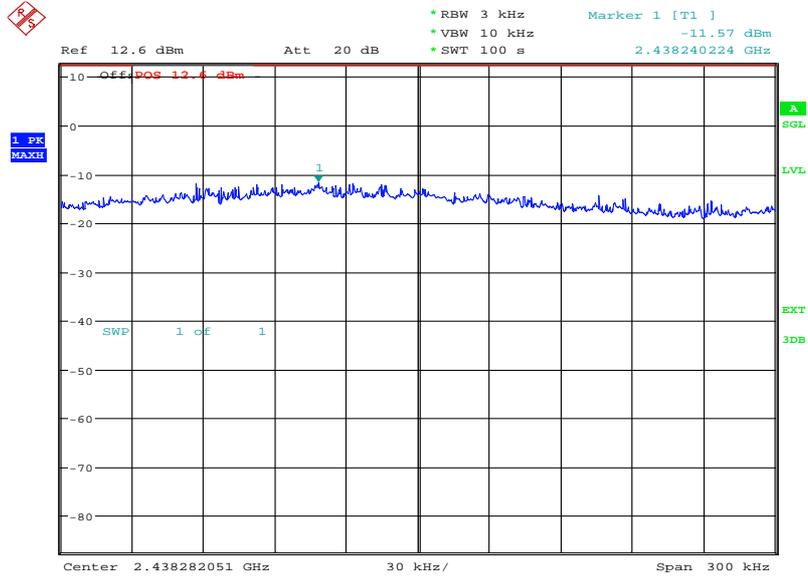
Date: 22.NOV.2011 09:07:40



Product Service

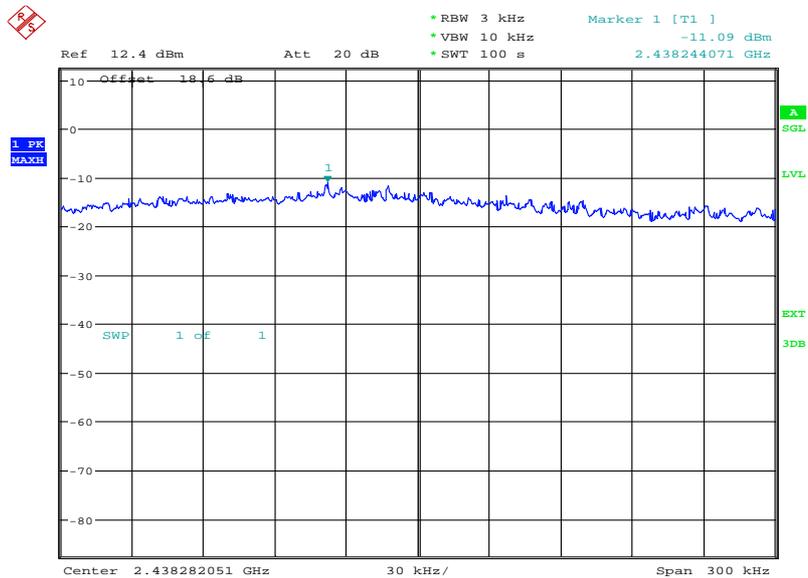
2437 MHz

6.5 Mbps



Date: 21.NOV.2011 15:34:15

13 Mbps

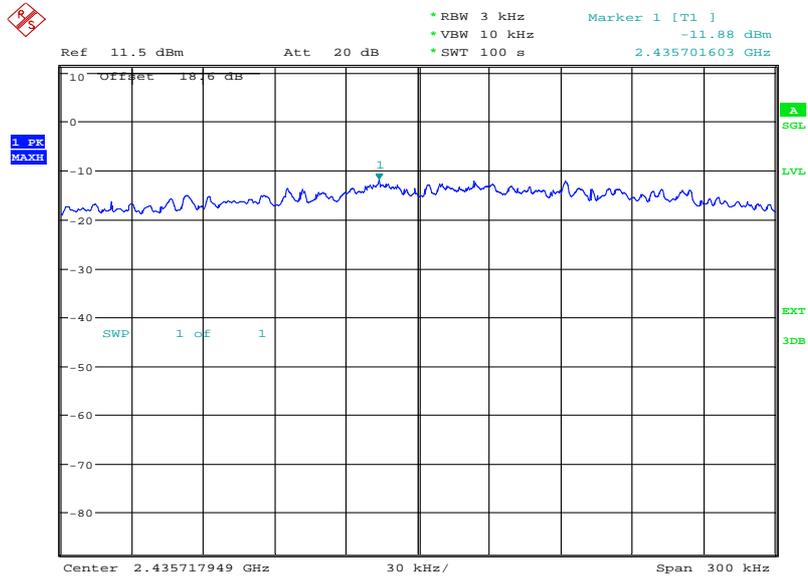


Date: 21.NOV.2011 16:00:50



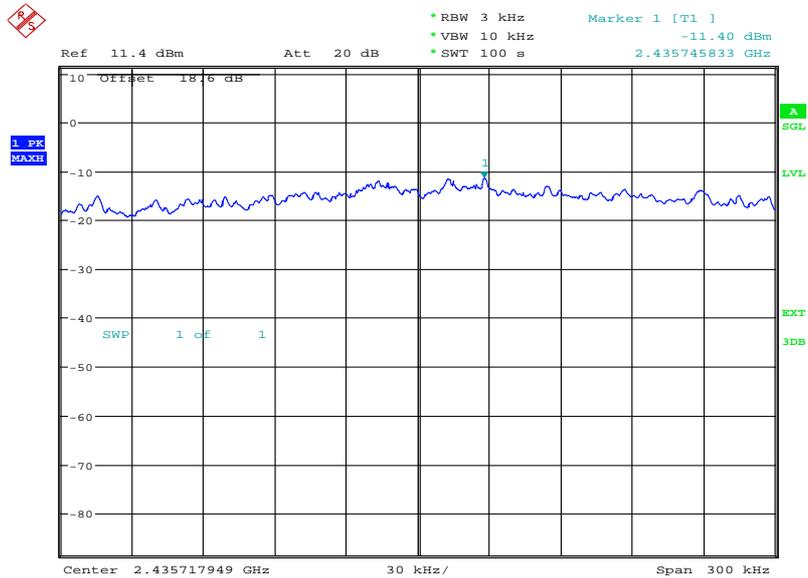
Product Service

19.5 Mbps



Date: 22.NOV.2011 07:53:17

26 Mbps

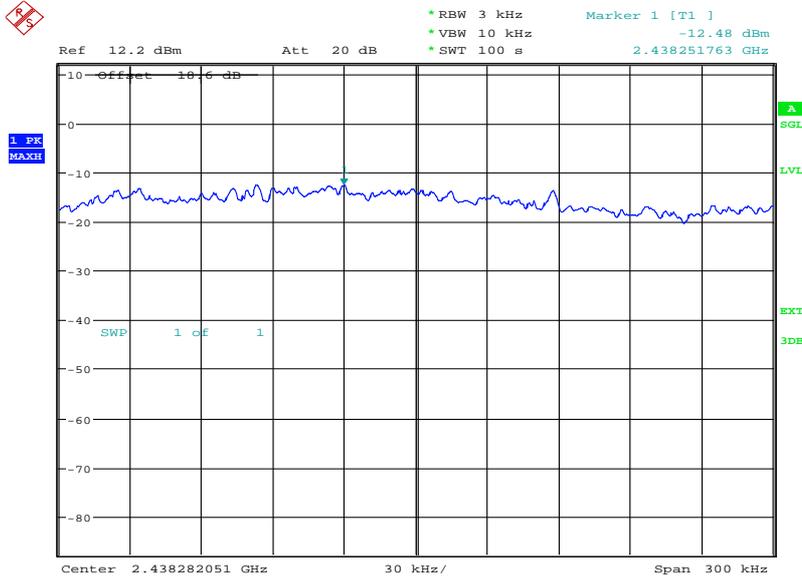


Date: 22.NOV.2011 08:08:32



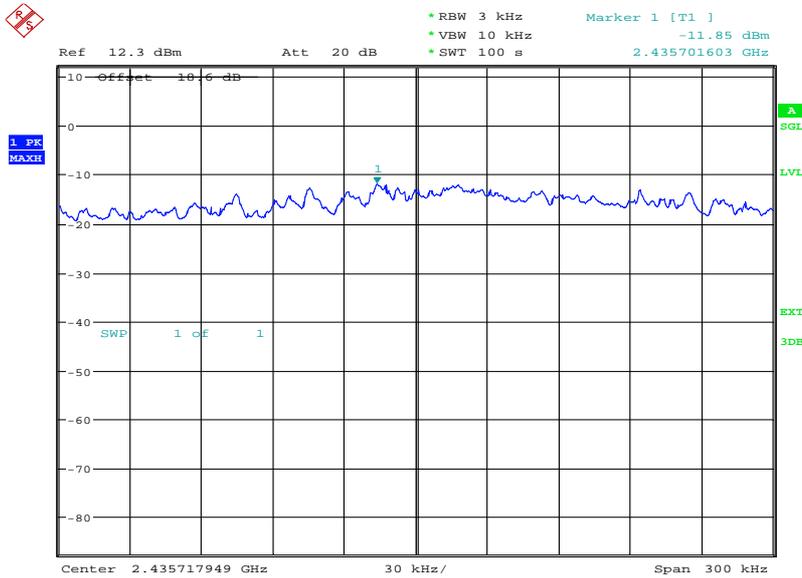
Product Service

39 Mbps



Date: 22.NOV.2011 08:21:30

52 Mbps

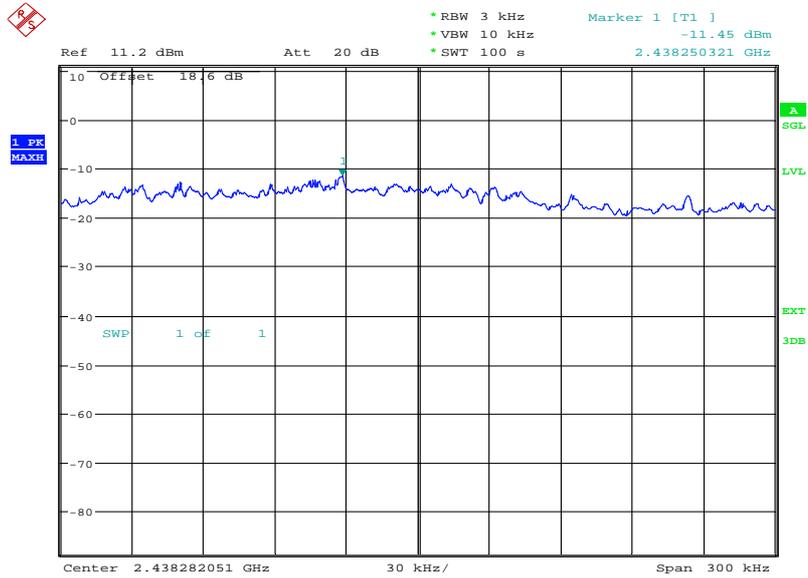


Date: 22.NOV.2011 08:41:25



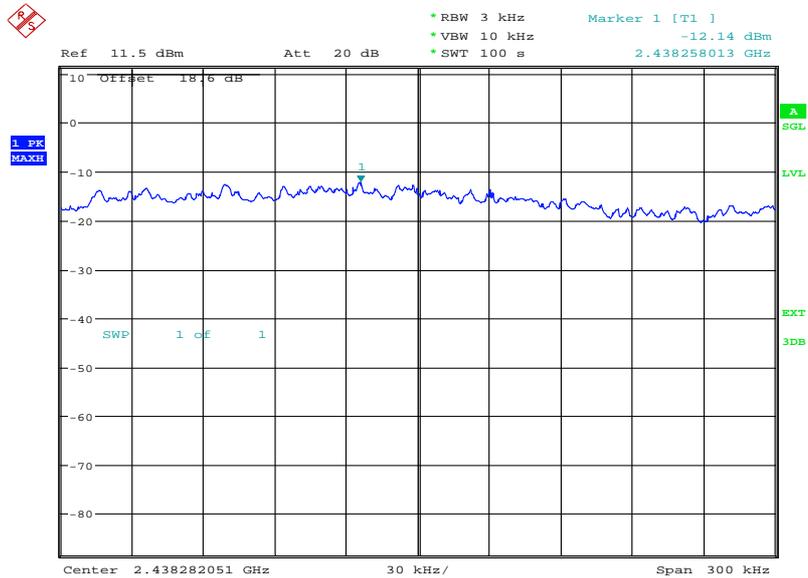
Product Service

58.5 Mbps



Date: 22.NOV.2011 08:55:41

65 Mbps



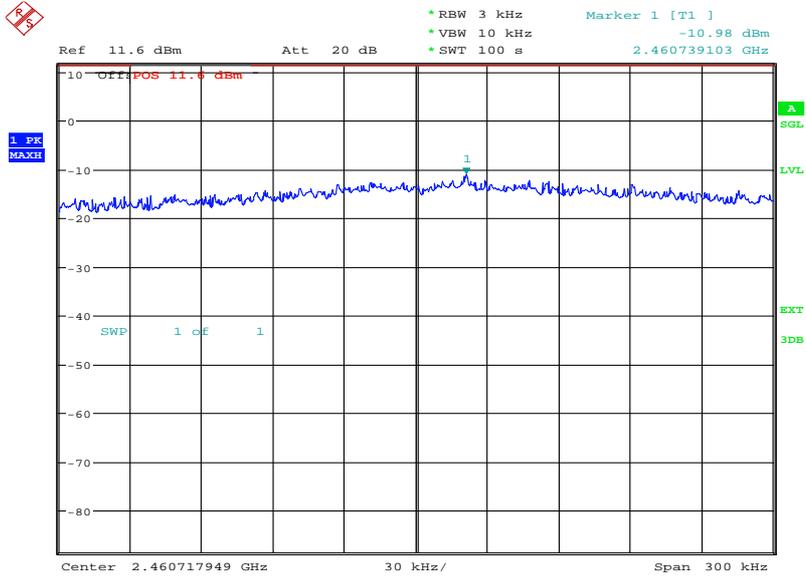
Date: 22.NOV.2011 09:11:31



Product Service

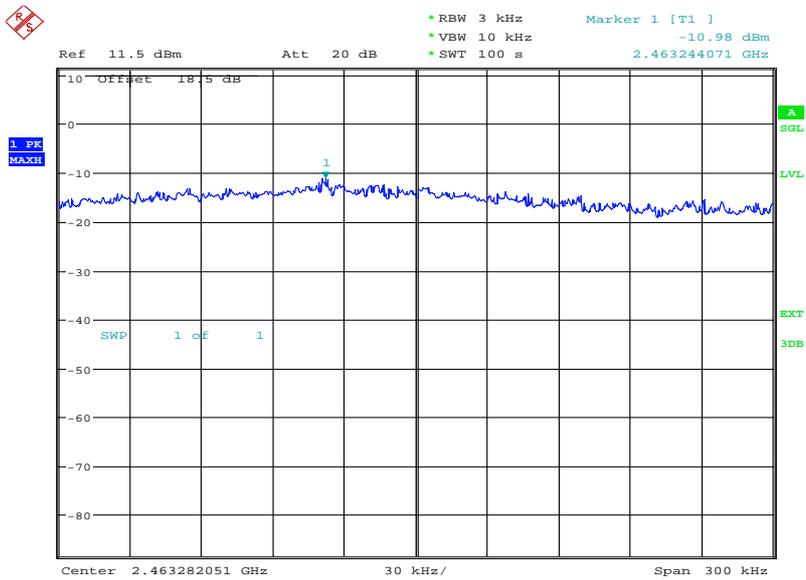
2462 MHz

6.5 Mbps



Date: 21.NOV.2011 15:47:57

13 Mbps

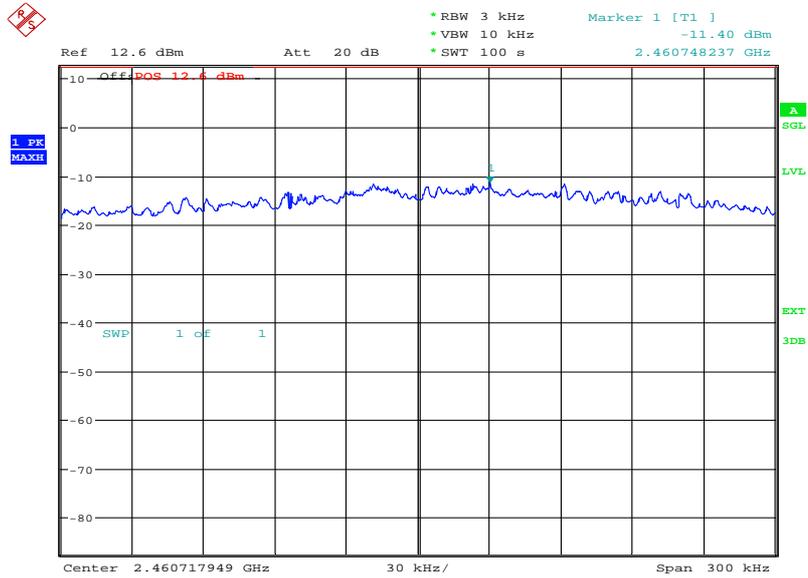


Date: 21.NOV.2011 16:24:15



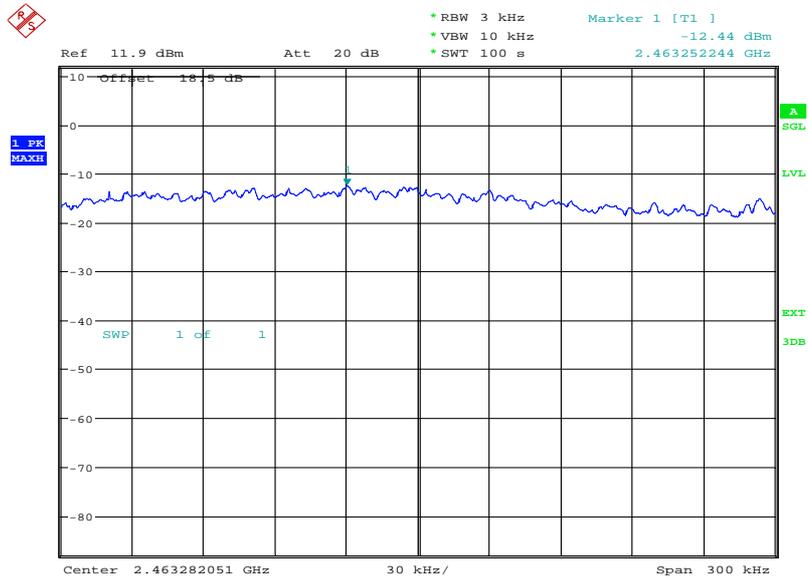
Product Service

19.5 Mbps



Date: 22.NOV.2011 07:57:16

26 Mbps

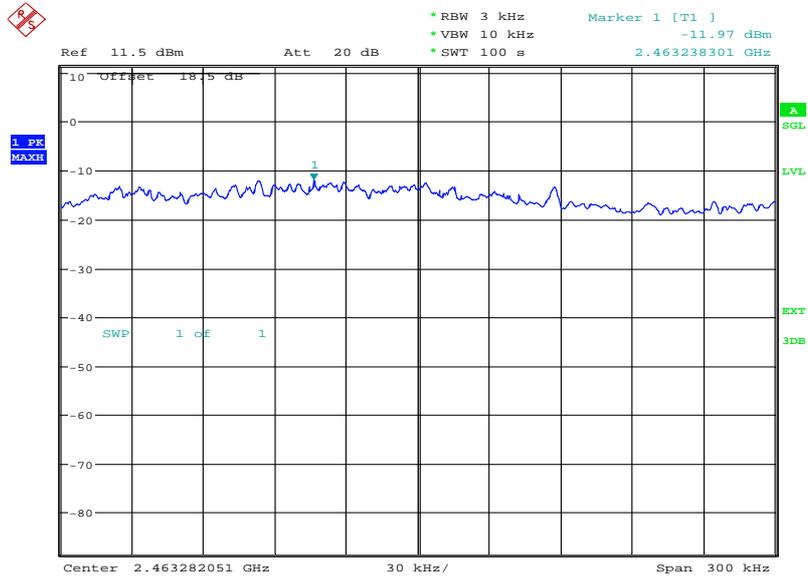


Date: 22.NOV.2011 08:12:30



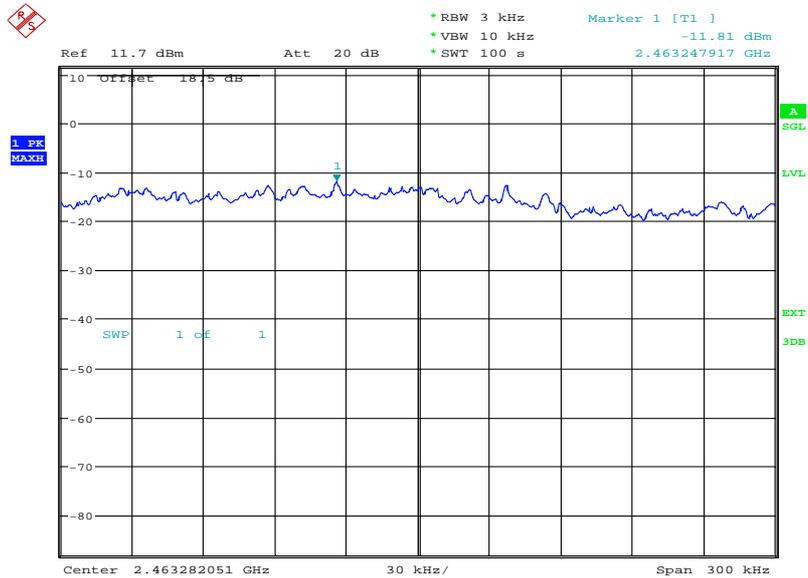
Product Service

39 Mbps



Date: 22.NOV.2011 08:25:08

52 Mbps

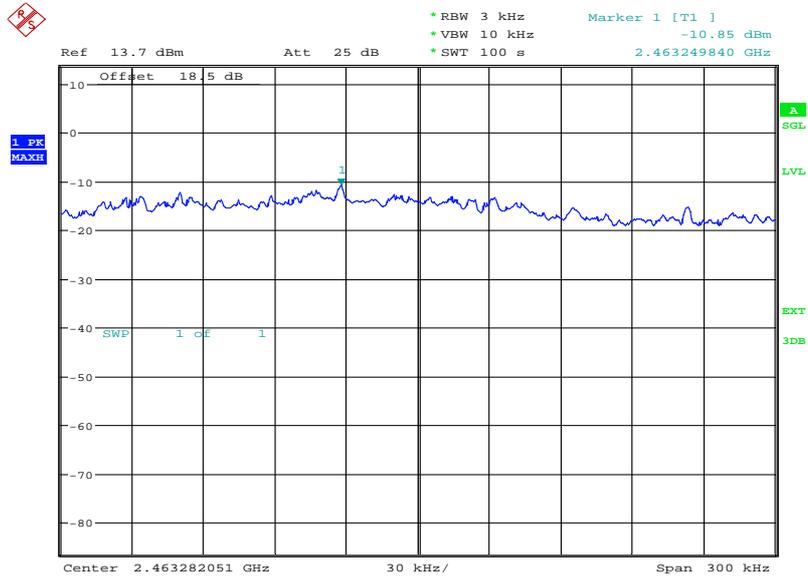


Date: 22.NOV.2011 08:45:11



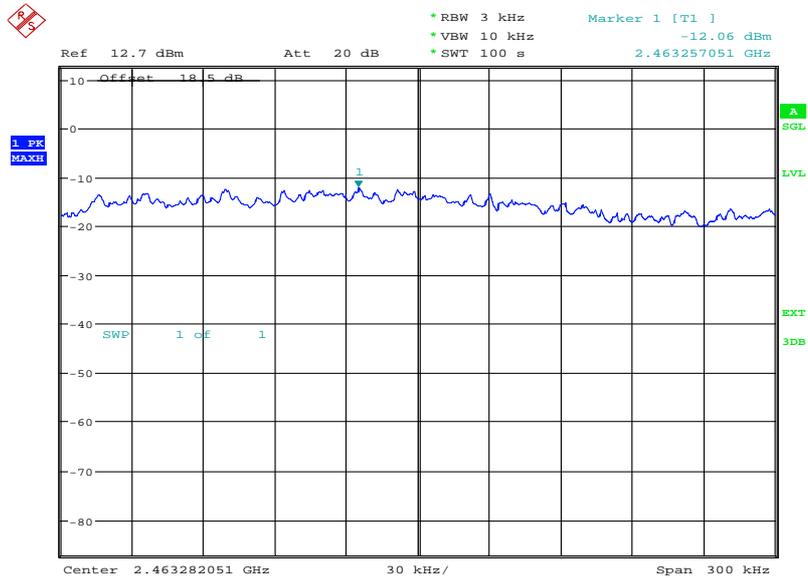
Product Service

58.5 Mbps



Date: 22.NOV.2011 08:59:28

65 Mbps



Date: 22.NOV.2011 09:15:09

Limit Clause

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



2.4 SPURIOUS AND BAND EDGE EMISSIONS

2.4.1 Specification Reference

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

2.4.2 Equipment Under Test and Modification State

CDMA SHX12 S/N: IMEI 004401113638338 - Modification State 0

2.4.3 Date of Test

25 November 2011, 28 November 2011, 29 November 2011, 5 December 2011 & 6 December 2011

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

For conducted emissions, the EUT was set to operate at maximum power on the worst case data rate. The test was performed on the bottom, middle and top channels. The test was performed from 9 kHz to 25 GHz. Firstly, the power of each fundamental frequency was measured in 100 kHz bandwidth and this was used to show a -20 dBc limit line on the trace. The measurement path loss in each relevant frequency band was measured and entered as a reference level offset.

For radiated emissions, the test method described above was also used. However, the measurement was performed from 30 MHz to 25 GHz and the path loss is incorporated as a transducer factor and entered into the spectrum analyser.

The 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.

2.4.6 Environmental Conditions

Ambient Temperature	19.7 - 26.1°C
Relative Humidity	28.5 - 42.0%



Product Service

2.4.7 Test Results

802.11(b)

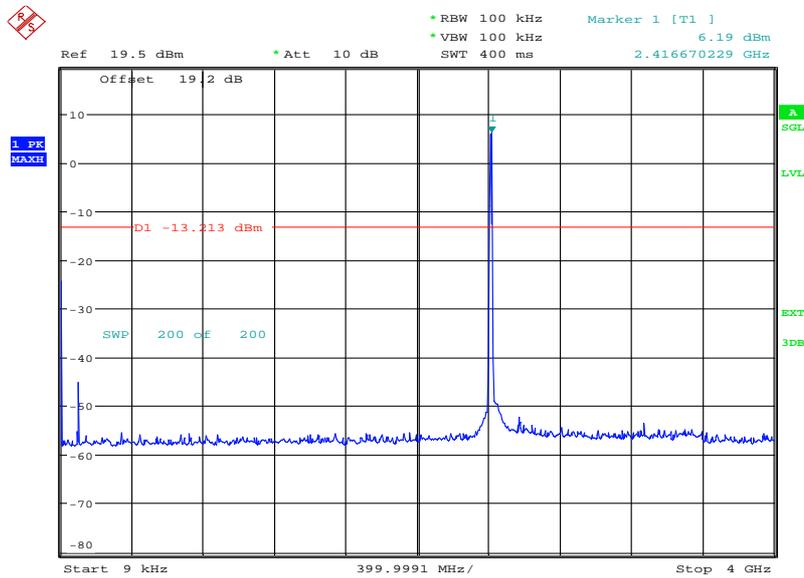
4.0 V DC Supply

Spurious Conducted Emissions

2 Mbps

2412 MHz

9 kHz to 4 GHz

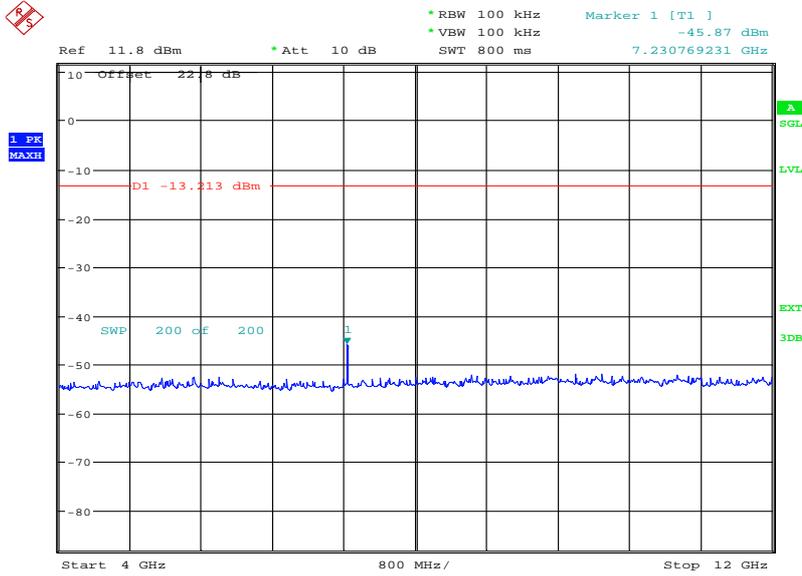


Date: 24.NOV.2011 09:57:44



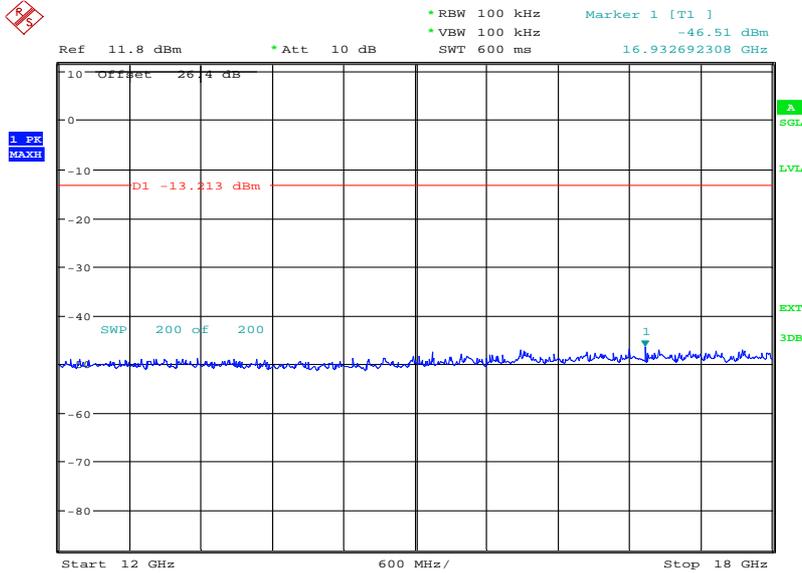
Product Service

4 GHz to 12 GHz



Date: 24.NOV.2011 10:02:20

12 GHz to 18 GHz

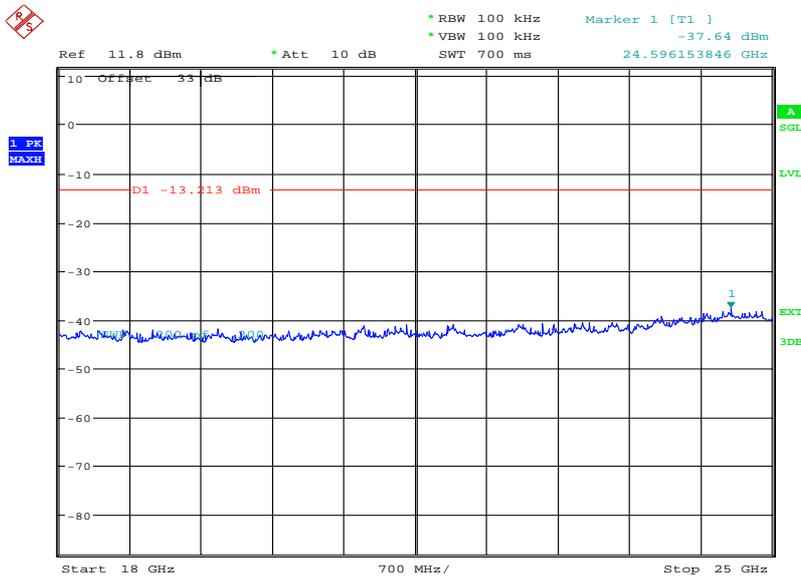


Date: 24.NOV.2011 10:04:59



Product Service

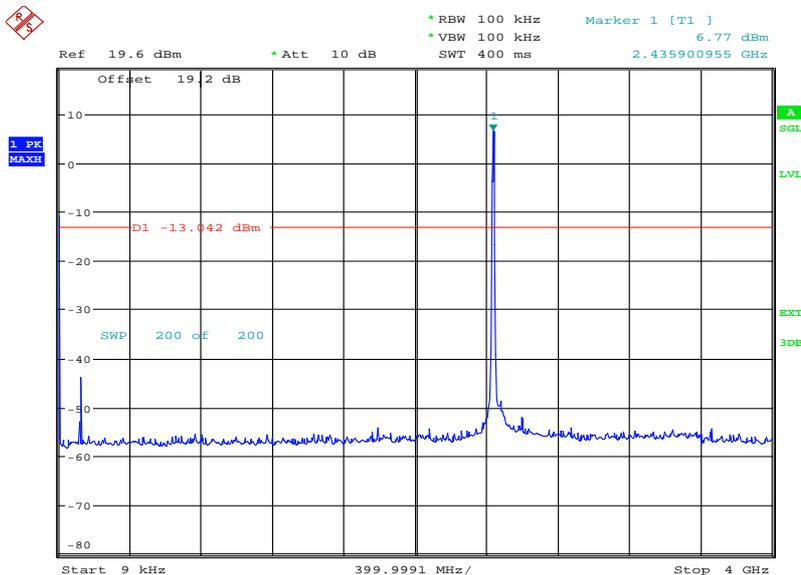
18 GHz to 25 GHz



Date: 24.NOV.2011 10:10:12

2437 MHz

9 kHz to 4 GHz

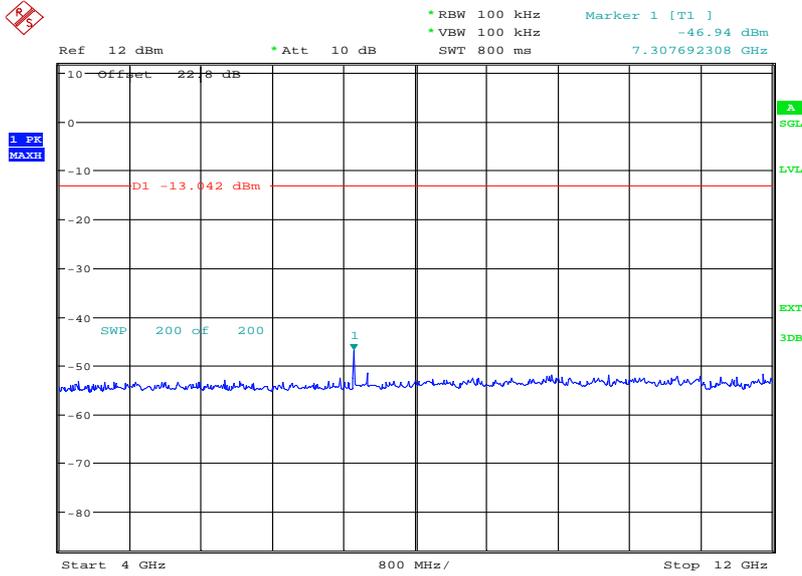


Date: 24.NOV.2011 10:14:34



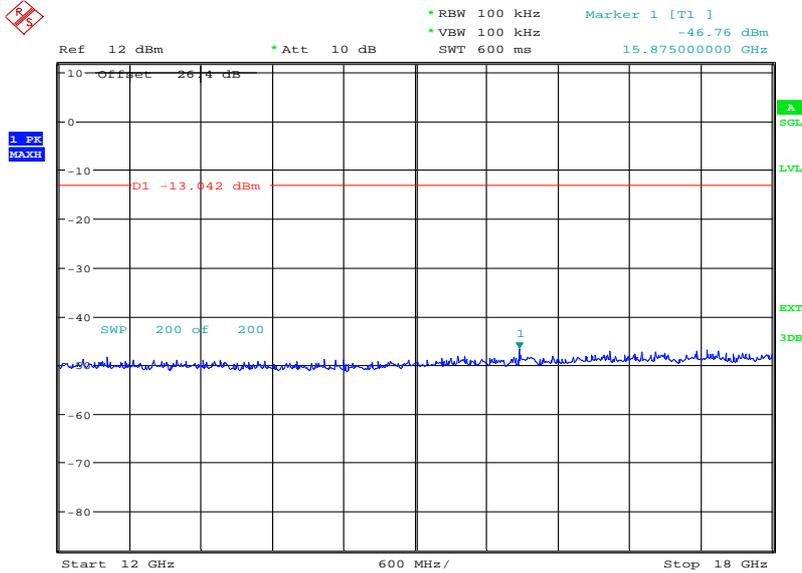
Product Service

4 GHz to 12 GHz



Date: 24.NOV.2011 10:23:12

12 GHz to 18 GHz

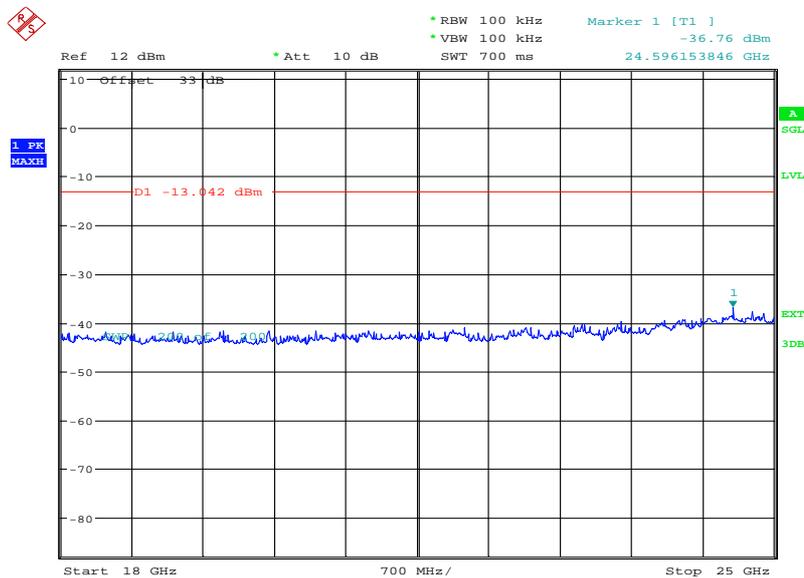


Date: 24.NOV.2011 10:25:53



Product Service

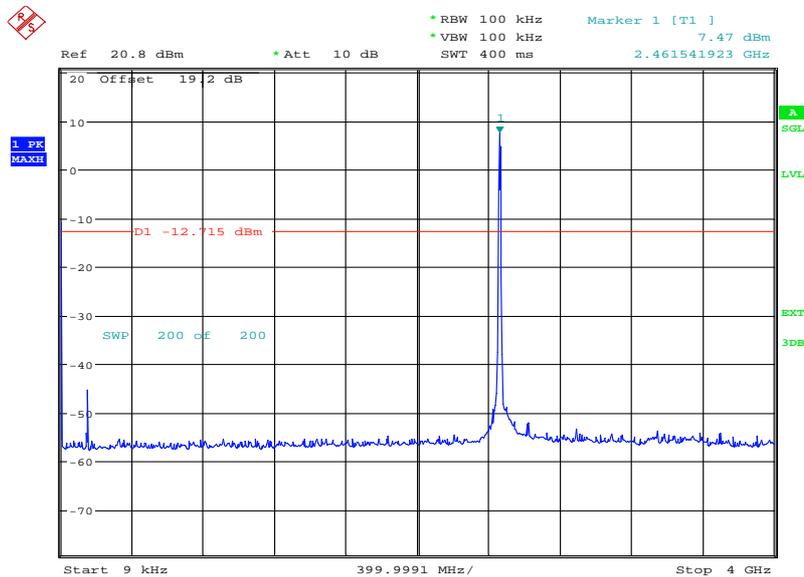
18 GHz to 25 GHz



Date: 24.NOV.2011 10:44:07

2462 MHz

9 kHz to 4 GHz

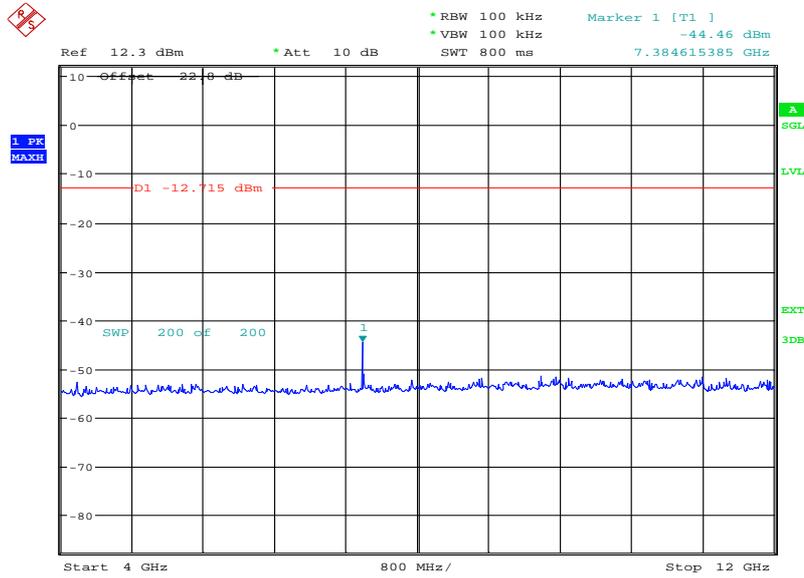


Date: 24.NOV.2011 10:18:30



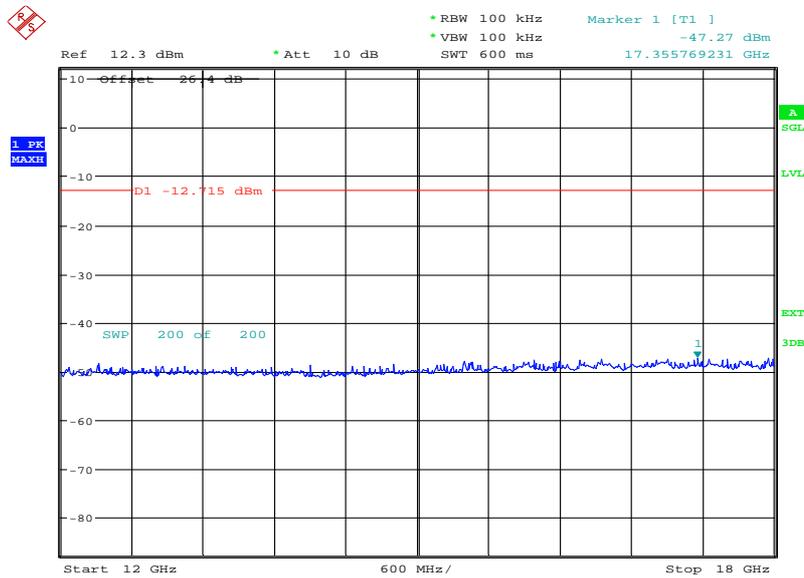
Product Service

4 GHz to 12 GHz



Date: 24.NOV.2011 10:29:41

12 GHz to 18 GHz

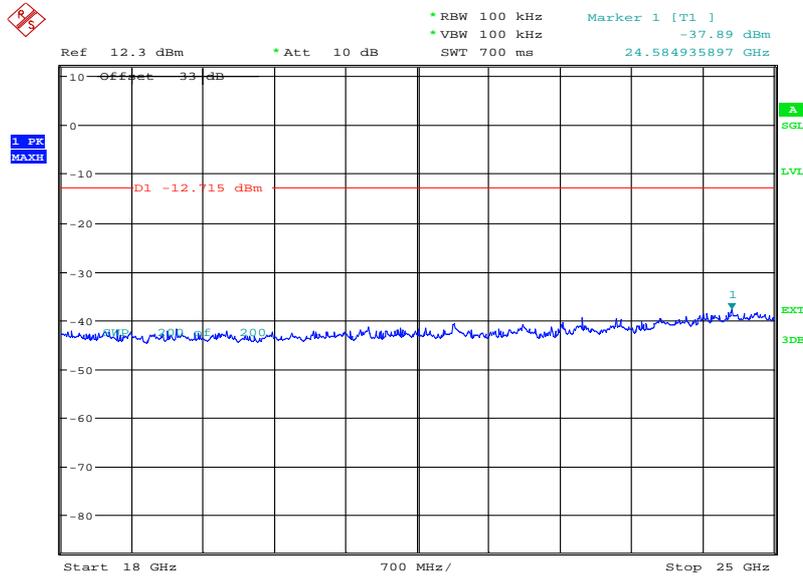


Date: 24.NOV.2011 10:32:55



Product Service

18 GHz to 25 GHz



Date: 24.NOV.2011 10:47:44

Limit Clause

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval the attenuation required shall be 30 dB instead of 20 dB.

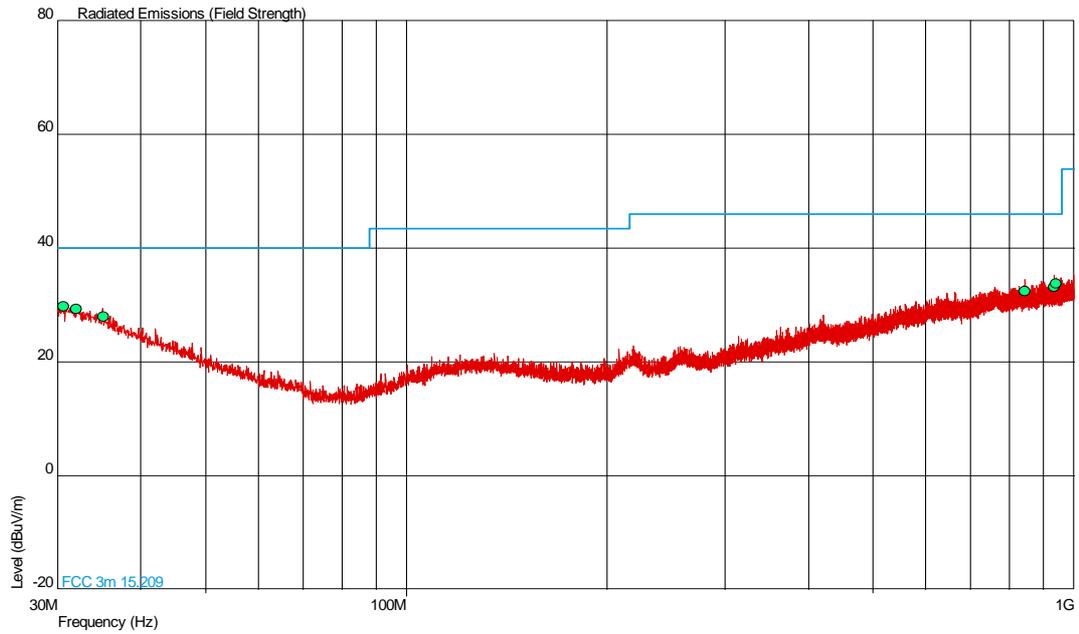


Product Service

Spurious Radiated Emissions

2412 MHz

30 MHz to 1 GHz



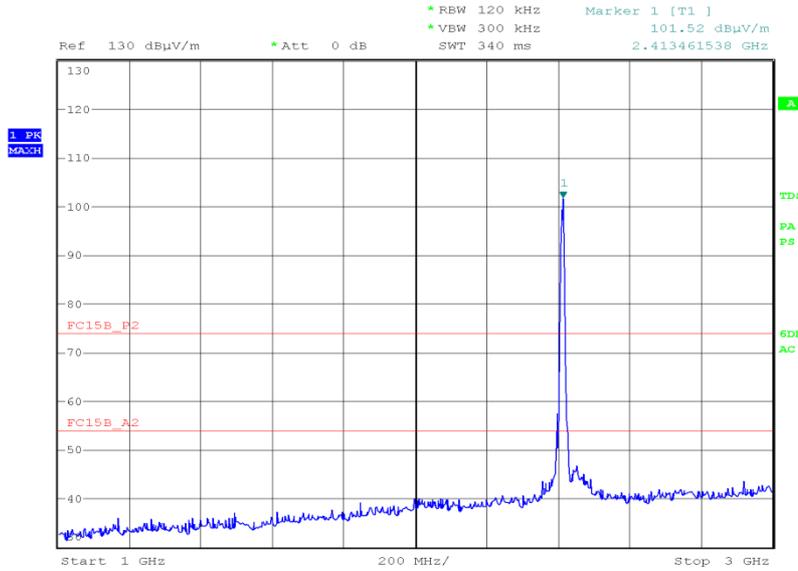
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.631	29.8	30.9	40.0	100	-10.2	69.1	90	1.00	Horizontal
31.989	29.3	29.2	40.0	100	-10.7	70.8	270	1.00	Horizontal
35.141	28.0	25.1	40.0	100	-12.0	74.9	270	1.00	Horizontal
845.140	32.5	42.2	46.0	200	-13.5	157.8	90	1.00	Vertical
932.828	33.2	45.7	46.0	200	-12.8	154.3	180	1.00	Horizontal
940.782	33.8	49.0	46.0	200	-12.2	151.0	90	1.00	Vertical



1GHz to 25GHz

Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
4.8240	Vertical	100	204	51.13	45.32

1 GHz to 3 GHz

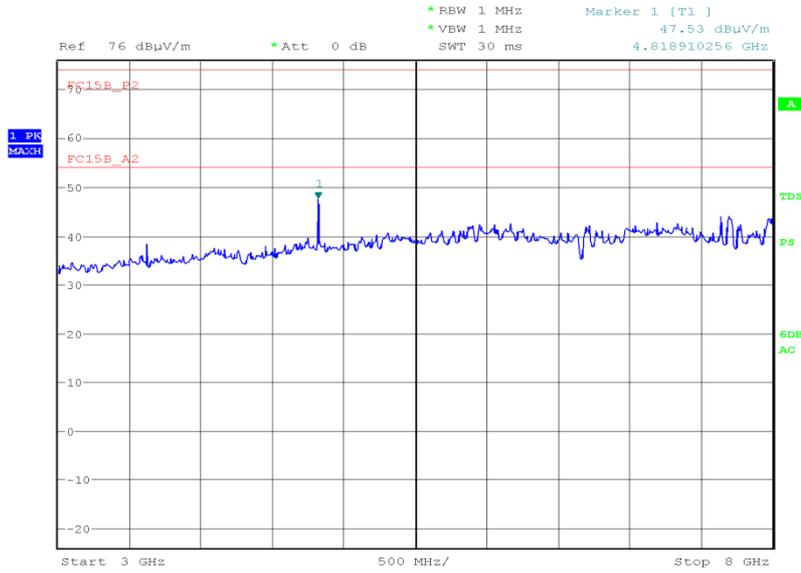


Date: 28.NOV.2011 18:26:43



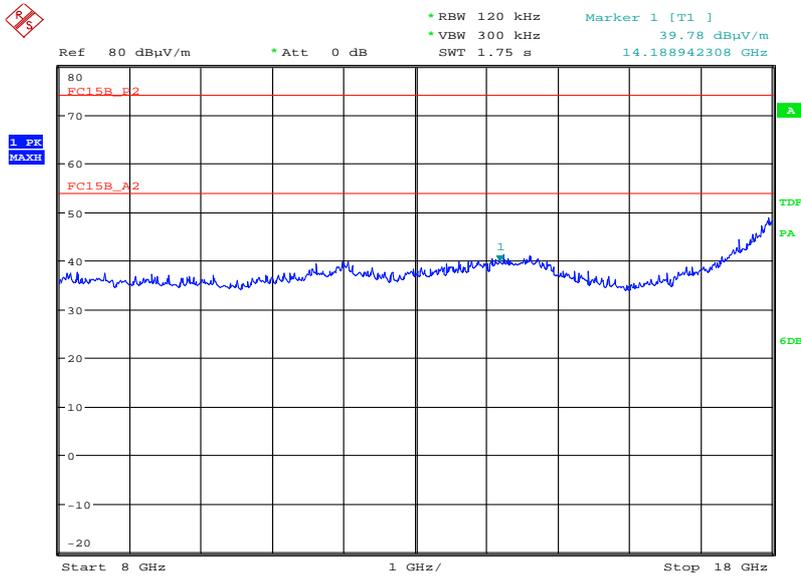
Product Service

3 GHz to 8 GHz



Date: 28.NOV.2011 22:25:59

8 GHz to 18 GHz

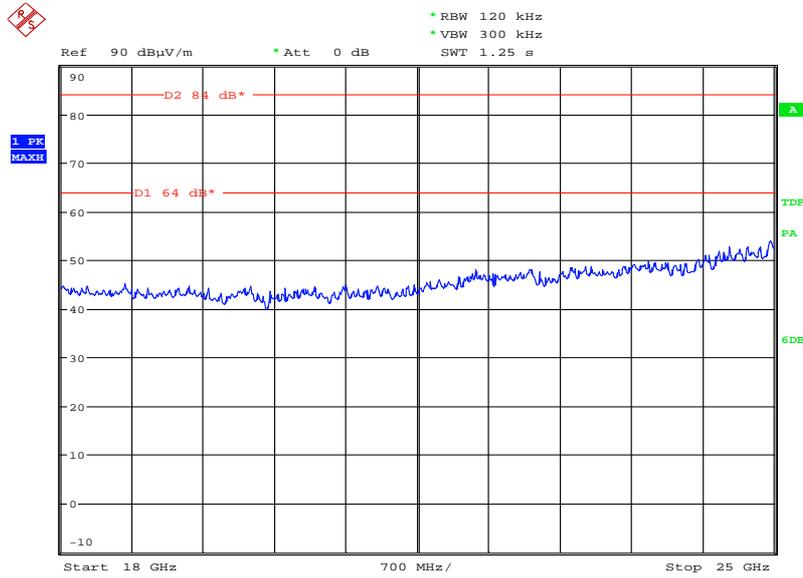


Date: 5.DEC.2011 21:17:01



Product Service

18 GHz to 25 GHz



Date: 6.DEC.2011 19:47:34

Limit

Peak (dB μ V/m)	Average (dB μ V/m)
74.0	54.0

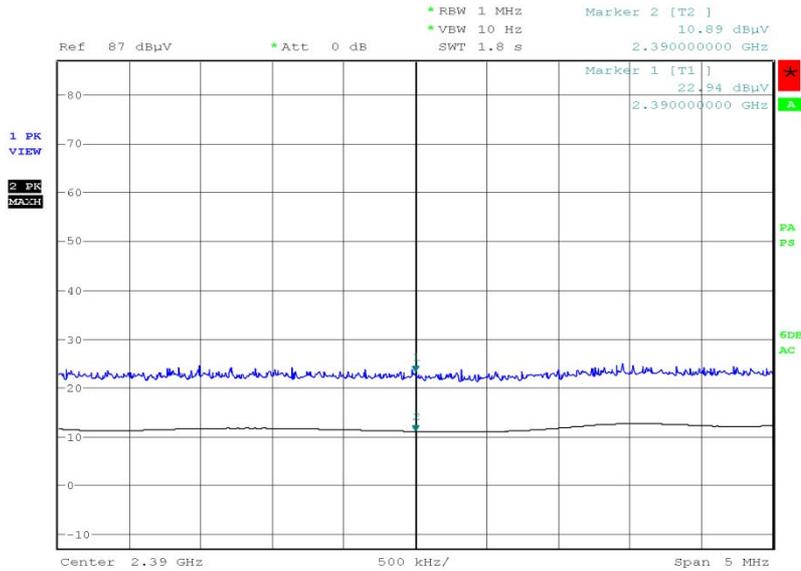


Product Service

Band Edge Emissions

2412 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	55.50	43.45



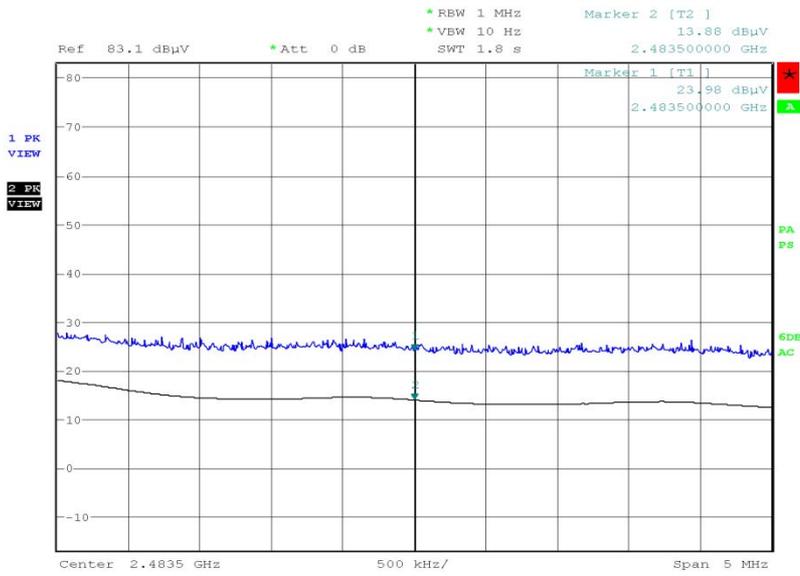
Date: 28.NOV.2011 18:21:03



Product Service

2462 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	56.68	46.58



Date: 28.NOV.2011 18:53:28

Limit

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



Product Service

802.11(g)

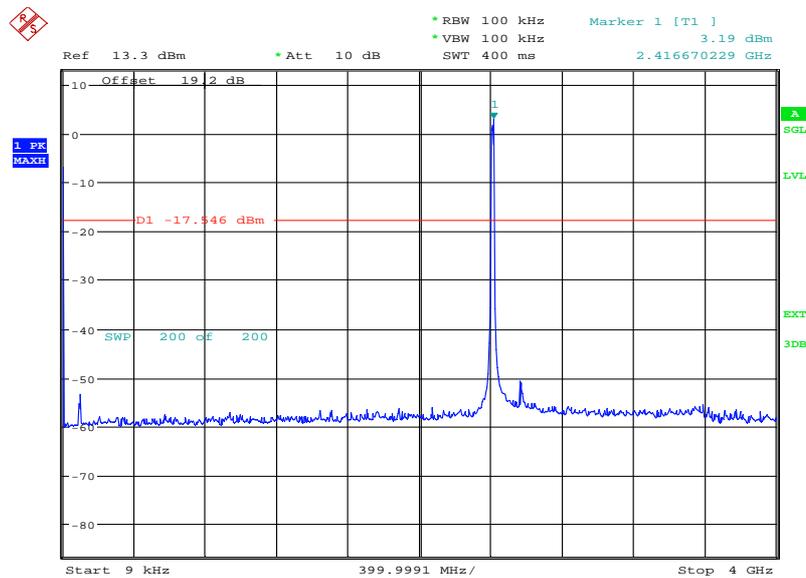
4.0 V DC Supply

Spurious Conducted Emissions

18 Mbps

2412 MHz

9 kHz to 4 GHz

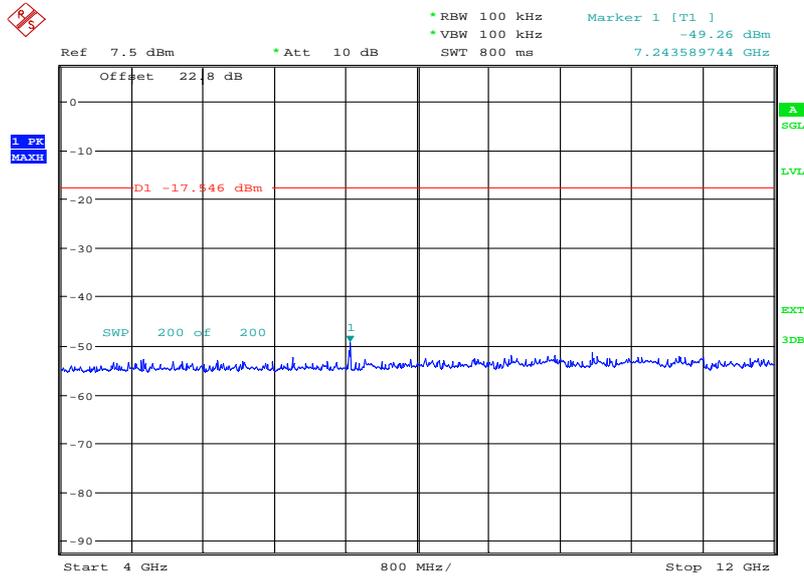


Date: 24.NOV.2011 10:58:30



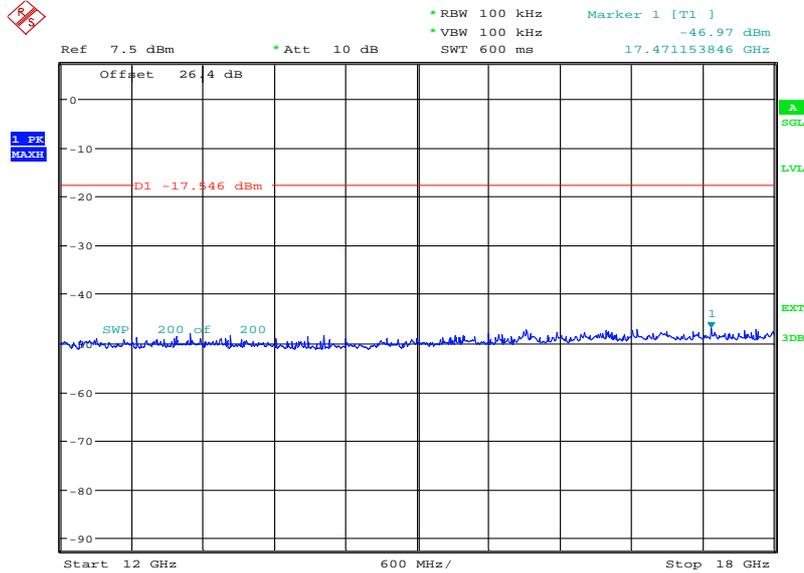
Product Service

4 GHz to 12 GHz



Date: 24.NOV.2011 11:17:09

12 GHz to 18 GHz

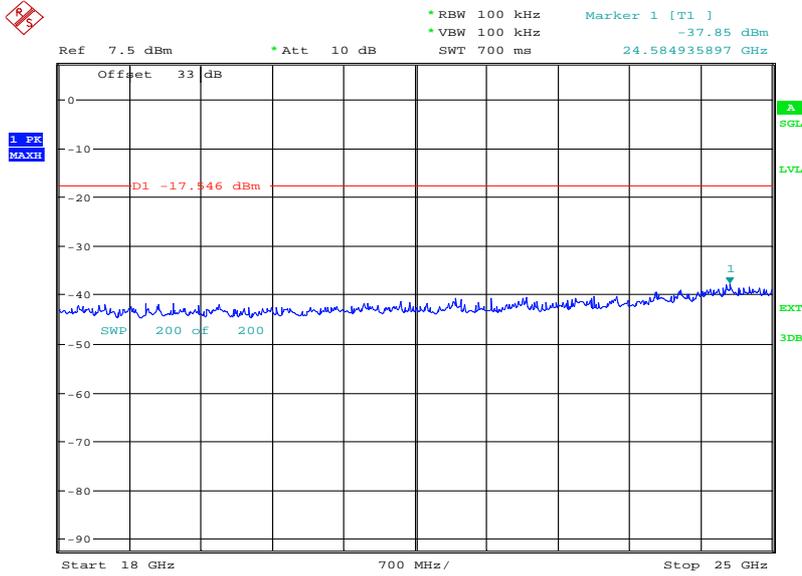


Date: 24.NOV.2011 11:20:11



Product Service

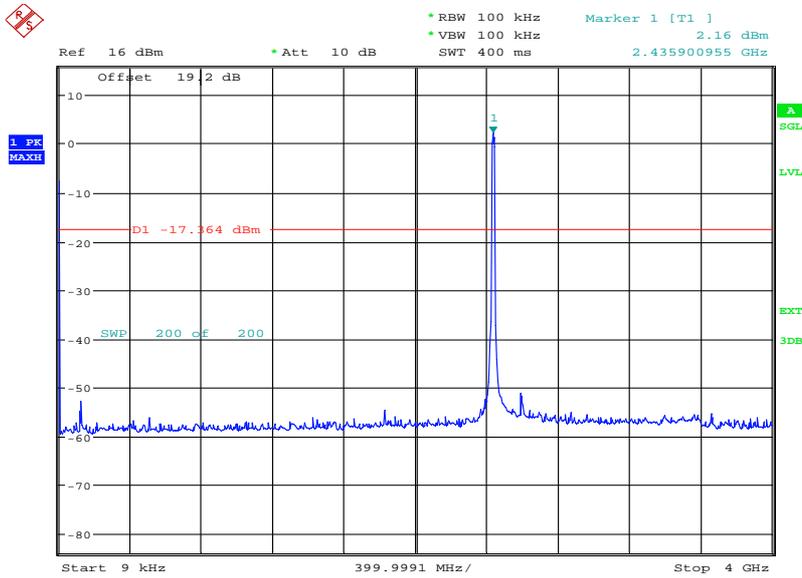
18 GHz to 25 GHz



Date: 24.NOV.2011 11:50:11

2437 MHz

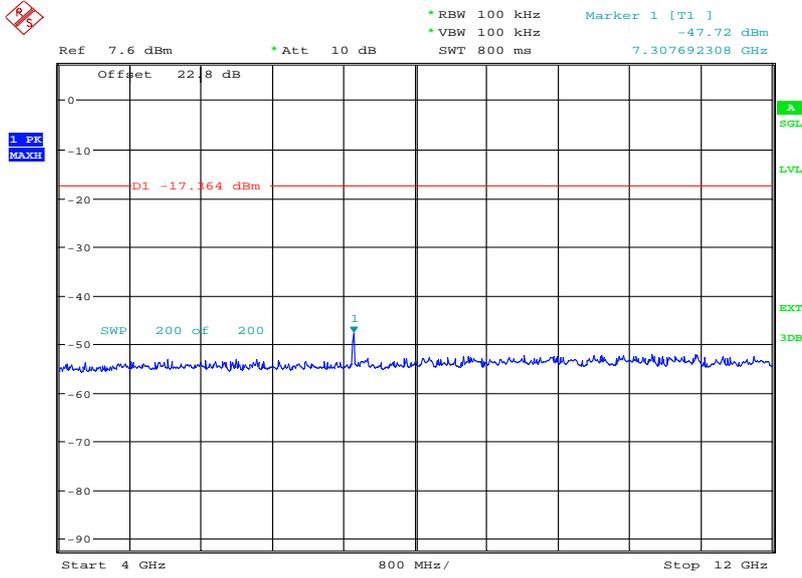
9 kHz to 4 GHz



Date: 24.NOV.2011 11:01:15

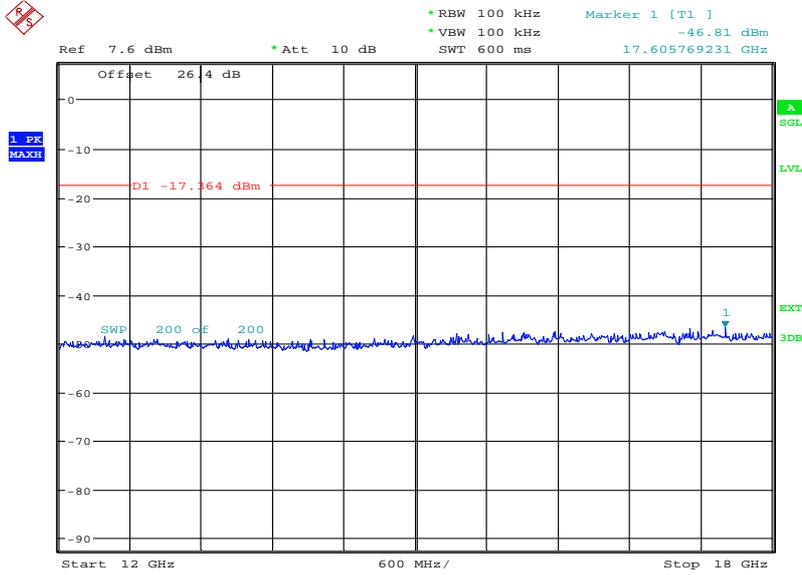


4 GHz to 12 GHz



Date: 24.NOV.2011 11:27:29

12 GHz to 18 GHz

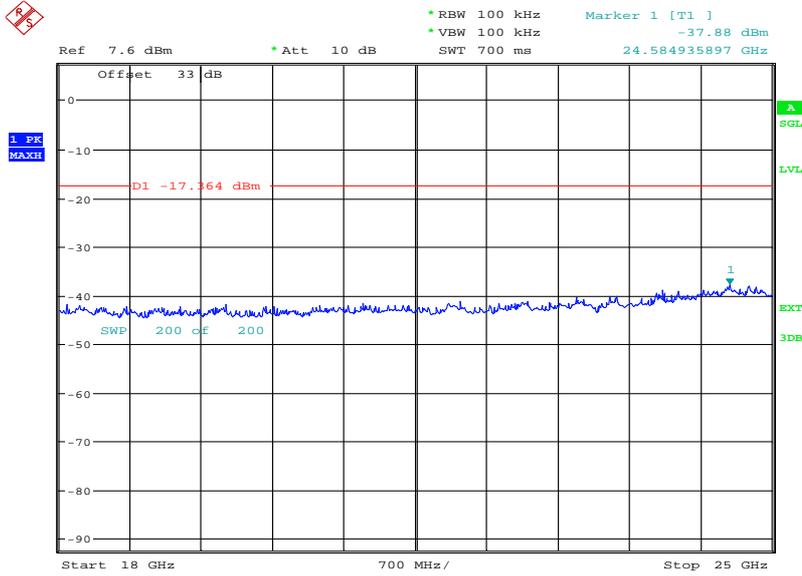


Date: 24.NOV.2011 11:29:57



Product Service

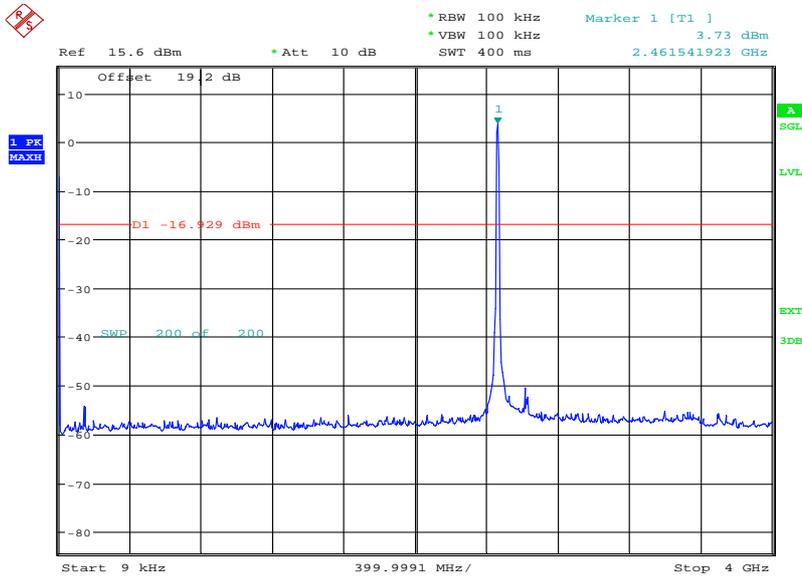
18 GHz to 25 GHz



Date: 24.NOV.2011 11:53:41

2462 MHz

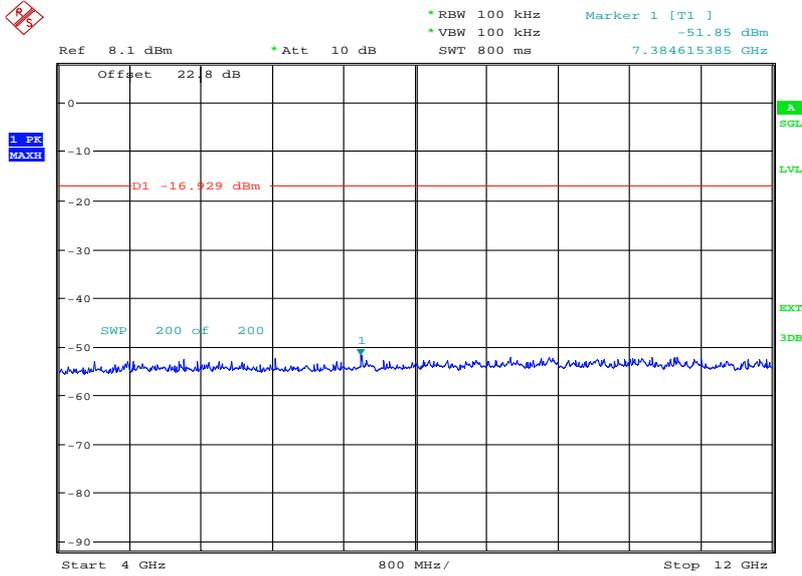
9 kHz to 4 GHz



Date: 24.NOV.2011 11:07:22

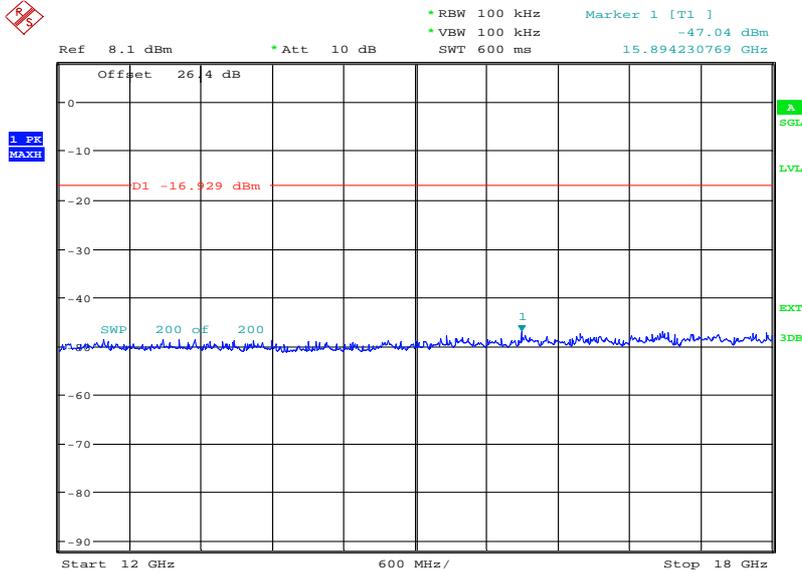


4 GHz to 12 GHz



Date: 24.NOV.2011 11:39:01

12 GHz to 18 GHz

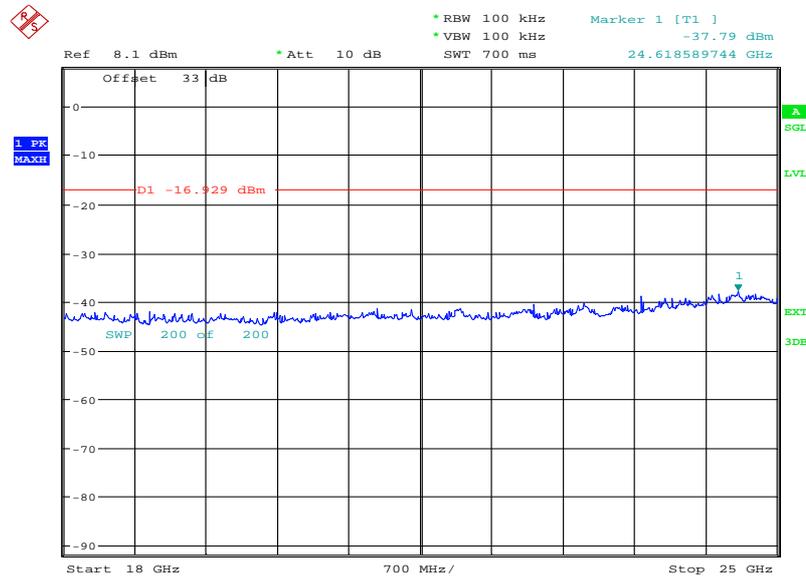


Date: 24.NOV.2011 11:41:26



Product Service

18 GHz to 25 GHz



Date: 24.NOV.2011 12:04:42

Limit Clause

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval the attenuation required shall be 30 dB instead of 20 dB.

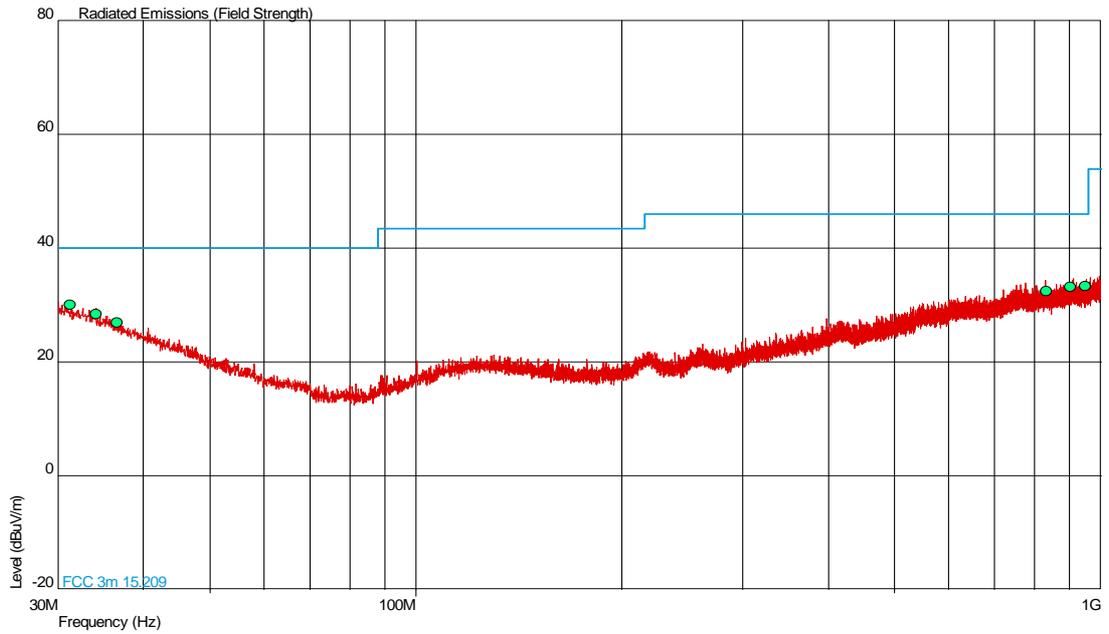


Product Service

Spurious Radiated Emissions

2412 MHz

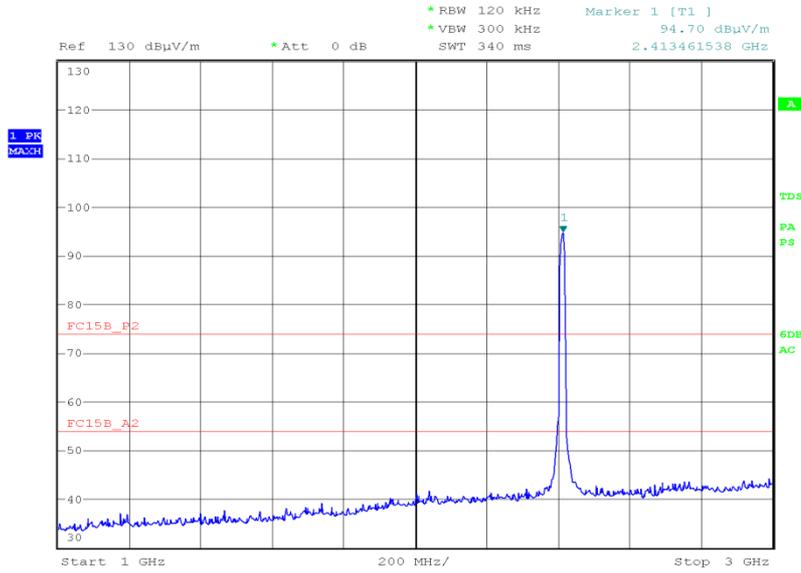
30 MHz to 1 GHz



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
31.261	30.1	32.0	40.0	100	-9.9	68.0	90	1.00	Horizontal
34.171	28.4	26.3	40.0	100	-11.6	73.7	0	1.00	Vertical
36.693	27.0	22.4	40.0	100	-13.0	77.6	90	1.00	Horizontal
832.530	32.5	42.2	46.0	200	-13.5	157.8	0	1.00	Vertical
902.030	33.3	46.2	46.0	200	-12.7	153.8	90	1.00	Vertical
950.094	33.3	46.2	46.0	200	-12.7	153.8	270	1.00	Horizontal



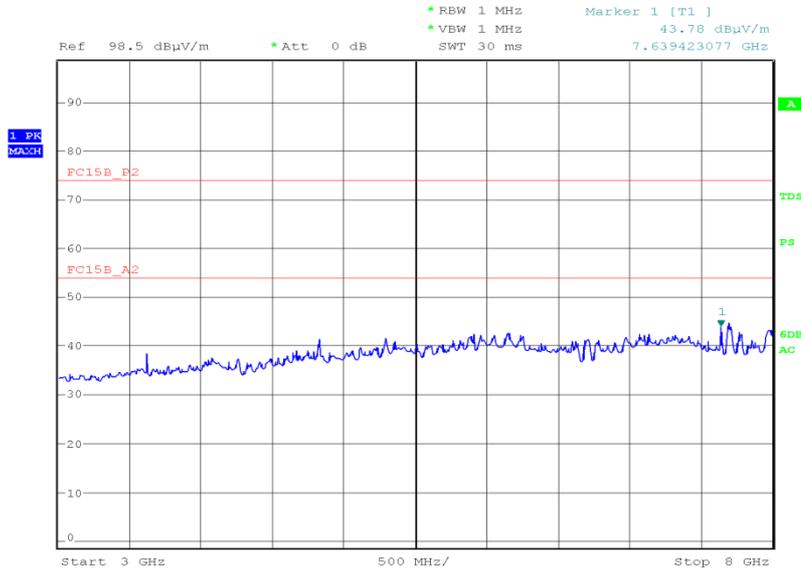
1 GHz to 3 GHz



Date: 28.NOV.2011 19:15:27

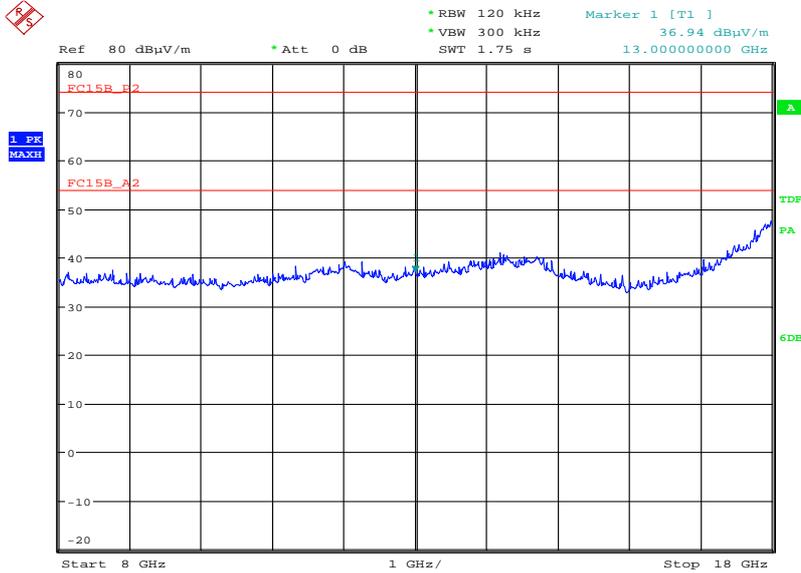


3 GHz to 8 GHz



Date: 28.NOV.2011 23:05:03

8 GHz to 18 GHz

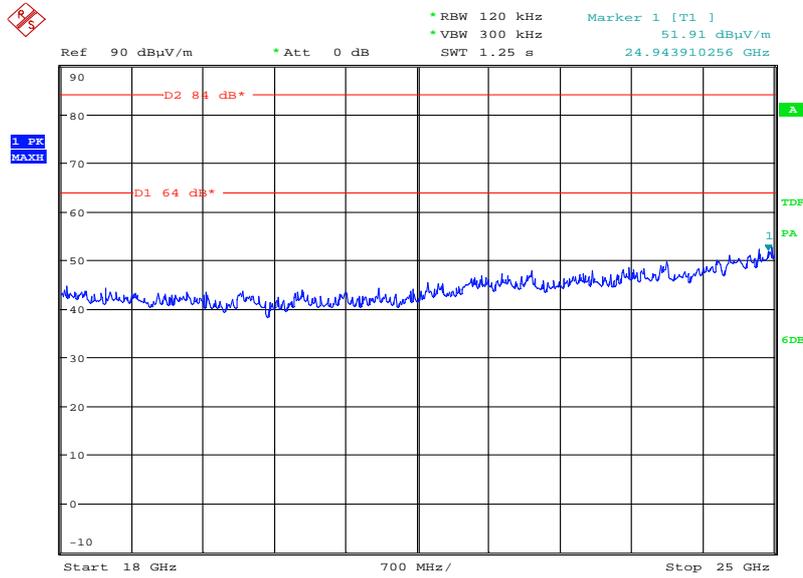


Date: 5.DEC.2011 22:21:57



Product Service

18 GHz to 25 GHz



Date: 6.DEC.2011 20:15:48

Limit

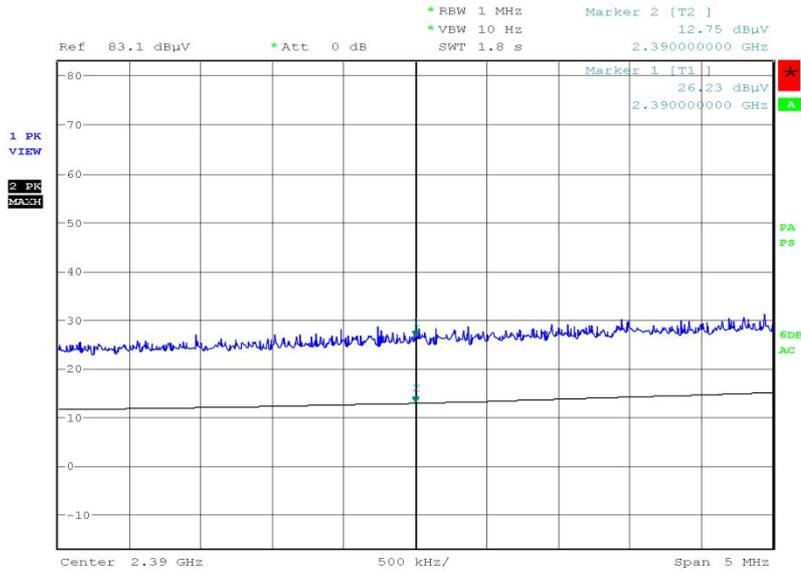
Peak (dB μ V/m)	Average (dB μ V/m)
74.0	54.0



Band Edge Emissions

2412 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	58.79	45.33



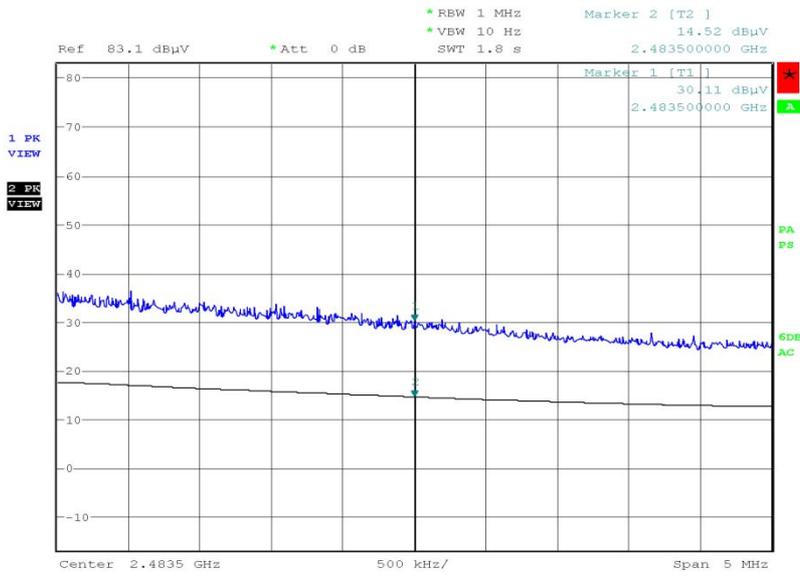
Date: 28.NOV.2011 19:21:12



Product Service

2462 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	62.81	47.22



Date: 28.NOV.2011 20:09:39

Limit

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



Product Service

802.11(n)

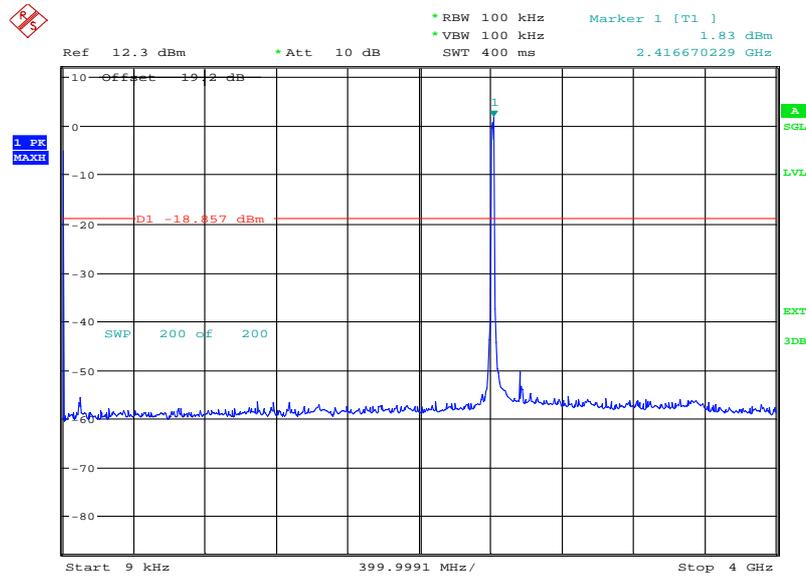
4.0 V DC Supply

Spurious Conducted Emissions

26 Mbps

2412 MHz

9 kHz to 4 GHz

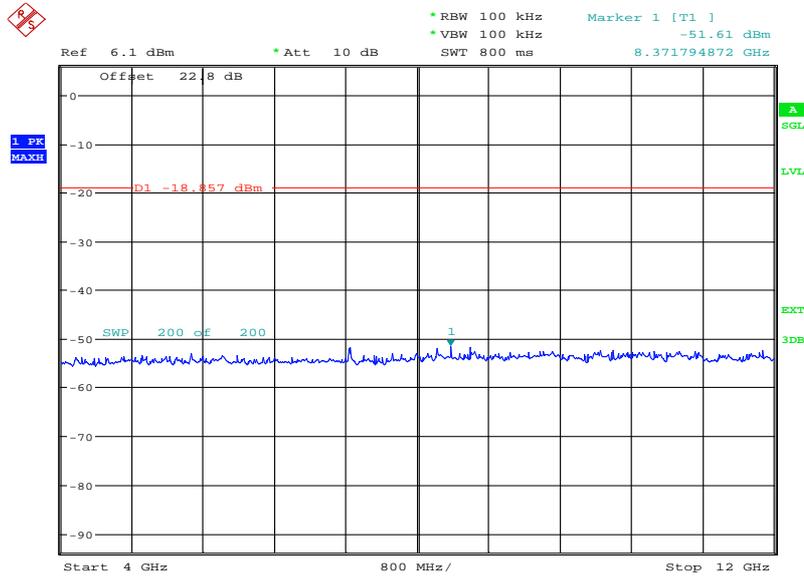


Date: 24.NOV.2011 12:14:42



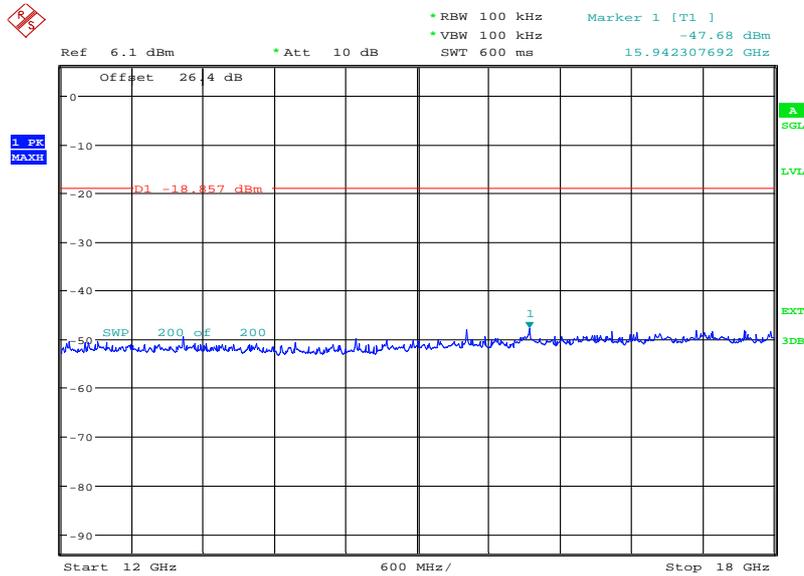
Product Service

4 GHz to 12 GHz



Date: 24.NOV.2011 12:38:34

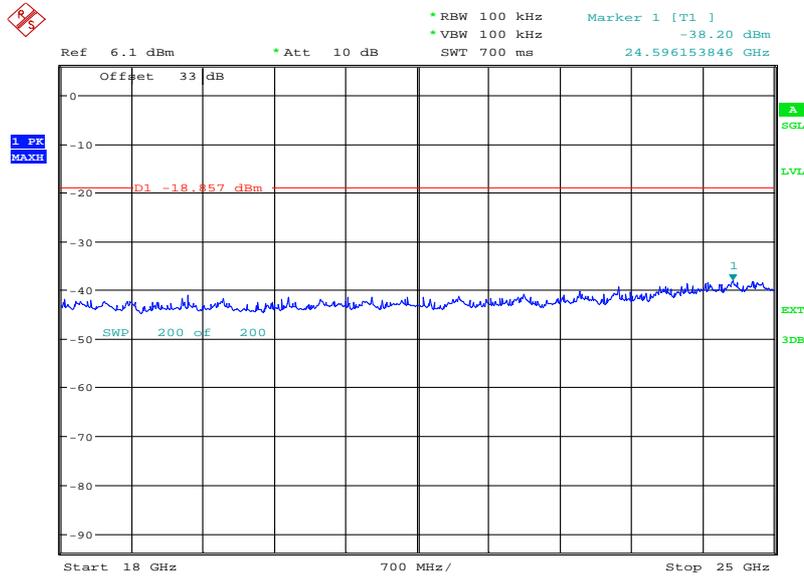
12 GHz to 18 GHz



Date: 24.NOV.2011 12:46:20



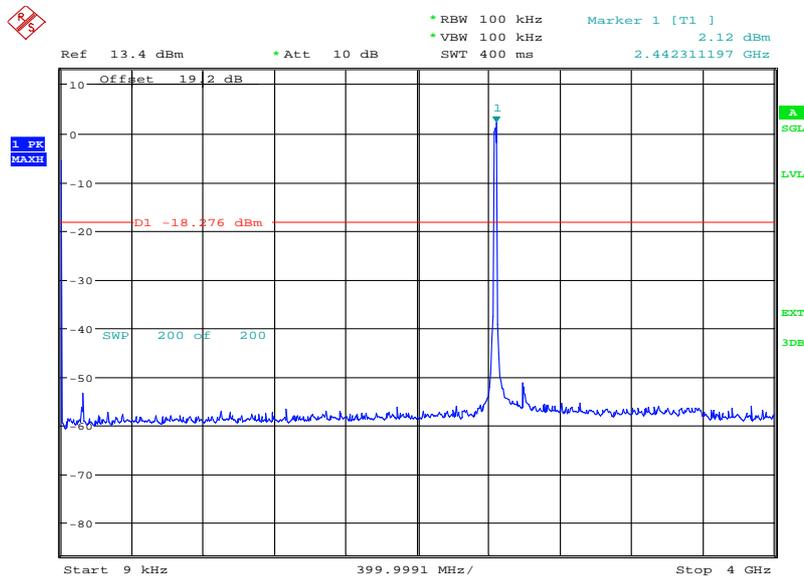
18 GHz to 25 GHz



Date: 24.NOV.2011 13:55:20

2437 MHz

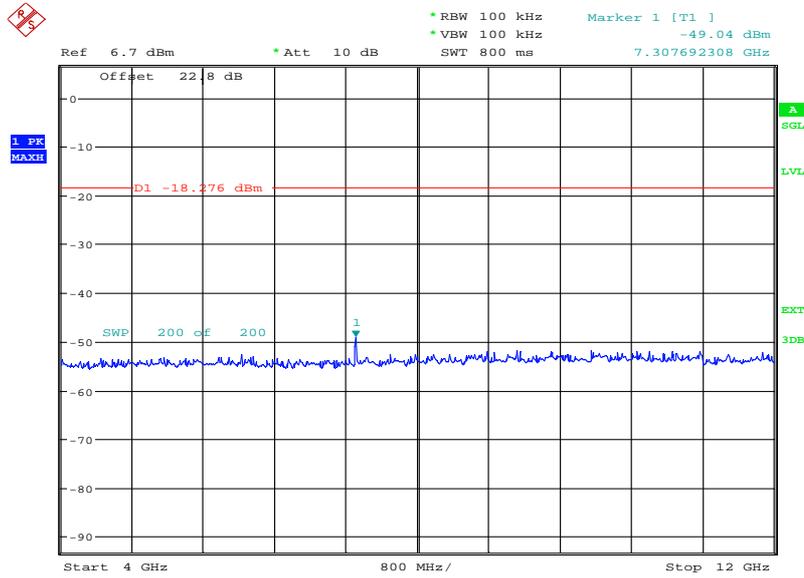
9 kHz to 4 GHz



Date: 24.NOV.2011 12:19:32

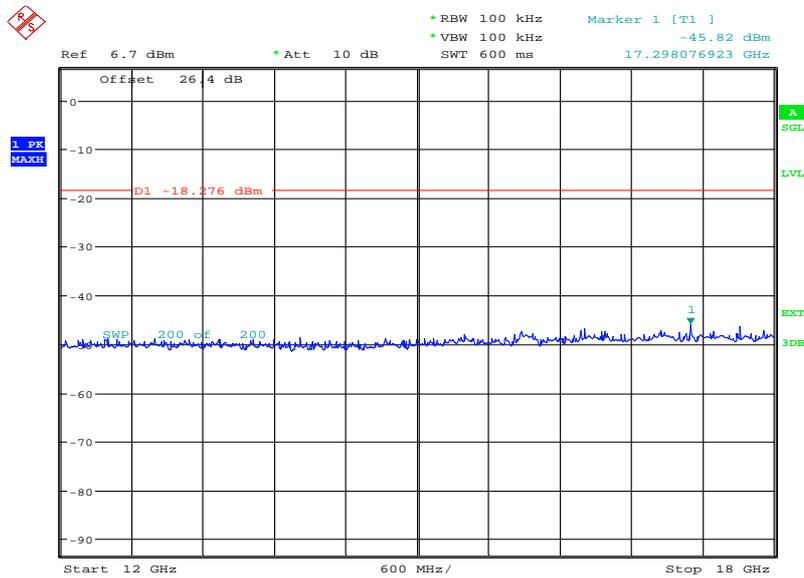


4 GHz to 12 GHz



Date: 24.NOV.2011 12:57:12

12 GHz to 18 GHz

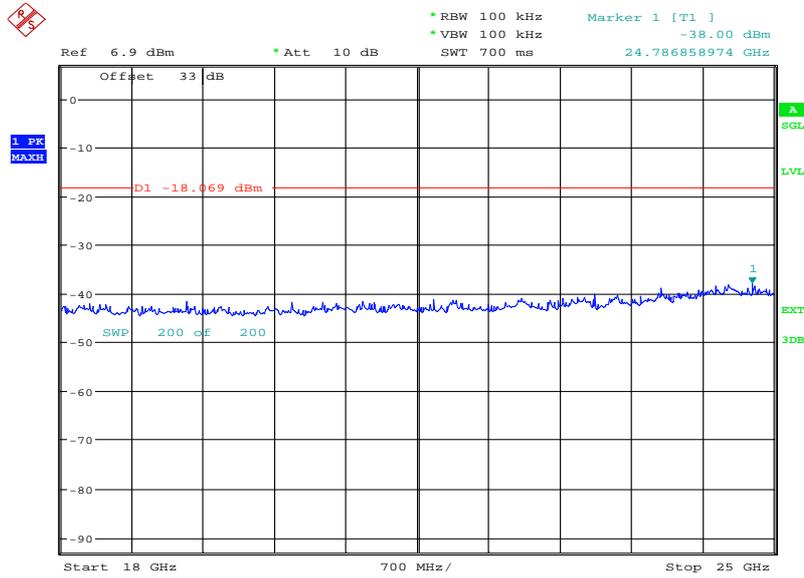


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Product Service

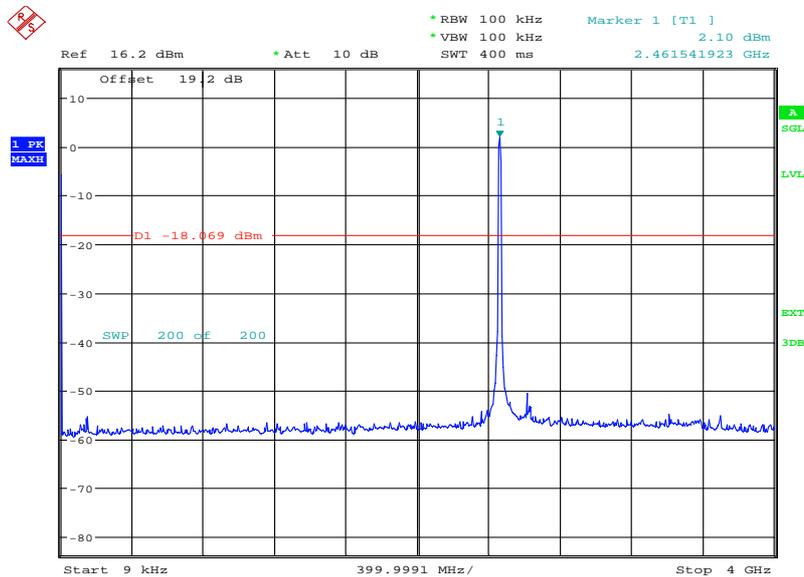
18 GHz to 25 GHz



Date: 24.NOV.2011 14:11:54

2462 MHz

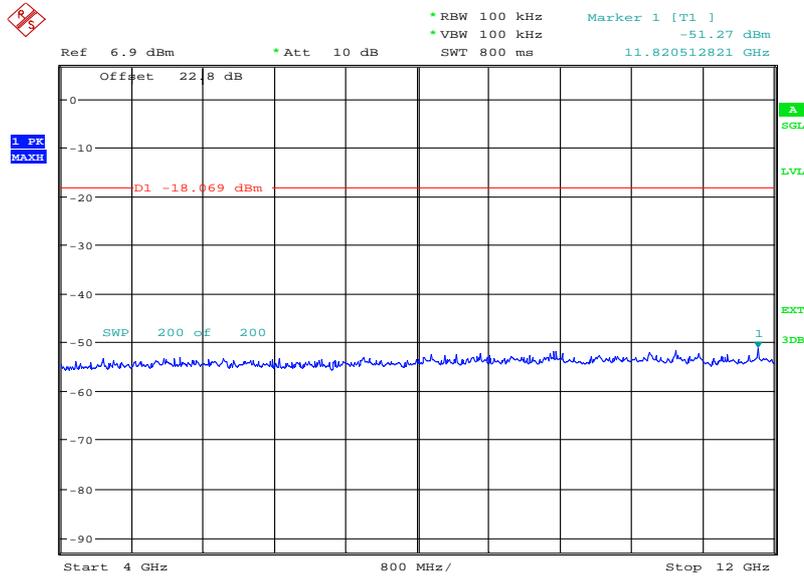
9 kHz to 4 GHz



Date: 24.NOV.2011 12:23:30

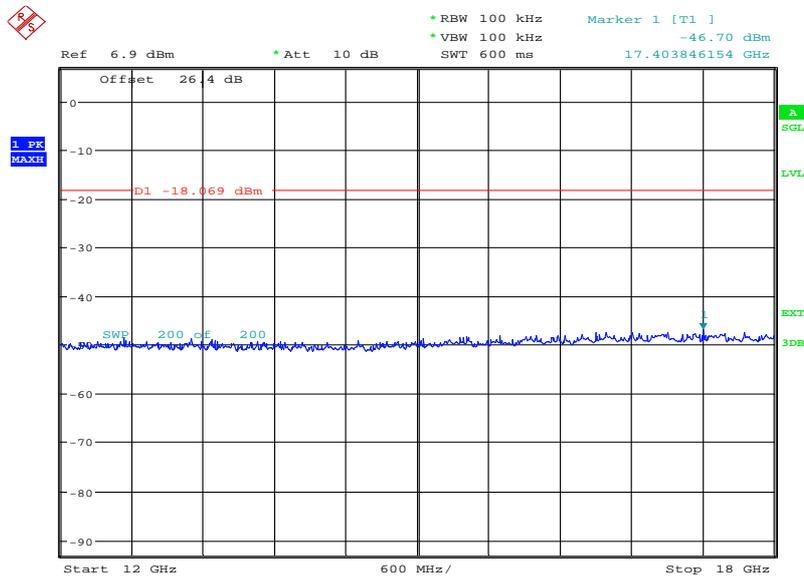


4 GHz to 12 GHz



Date: 24.NOV.2011 13:42:56

12 GHz to 18 GHz

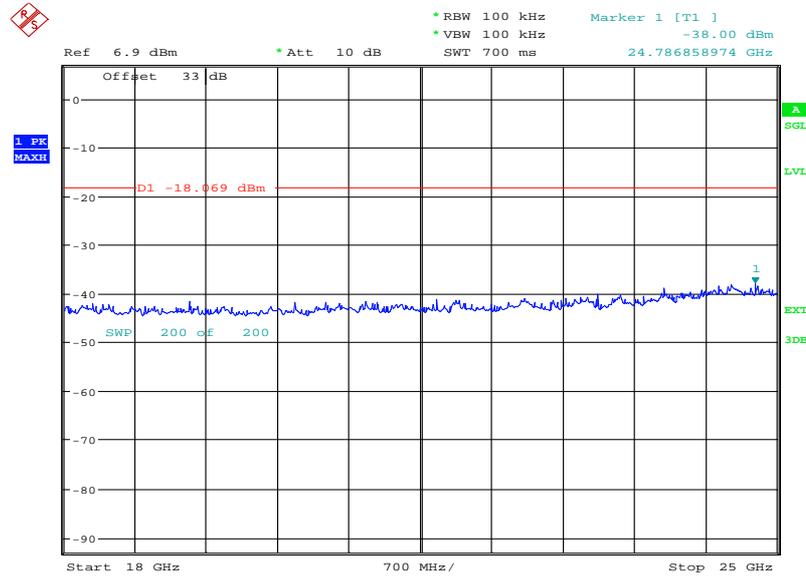


Date: 24.NOV.2011 13:46:47



Product Service

18 GHz to 25 GHz



Date: 24.NOV.2011 14:11:54

Limit Clause

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval the attenuation required shall be 30 dB instead of 20 dB.

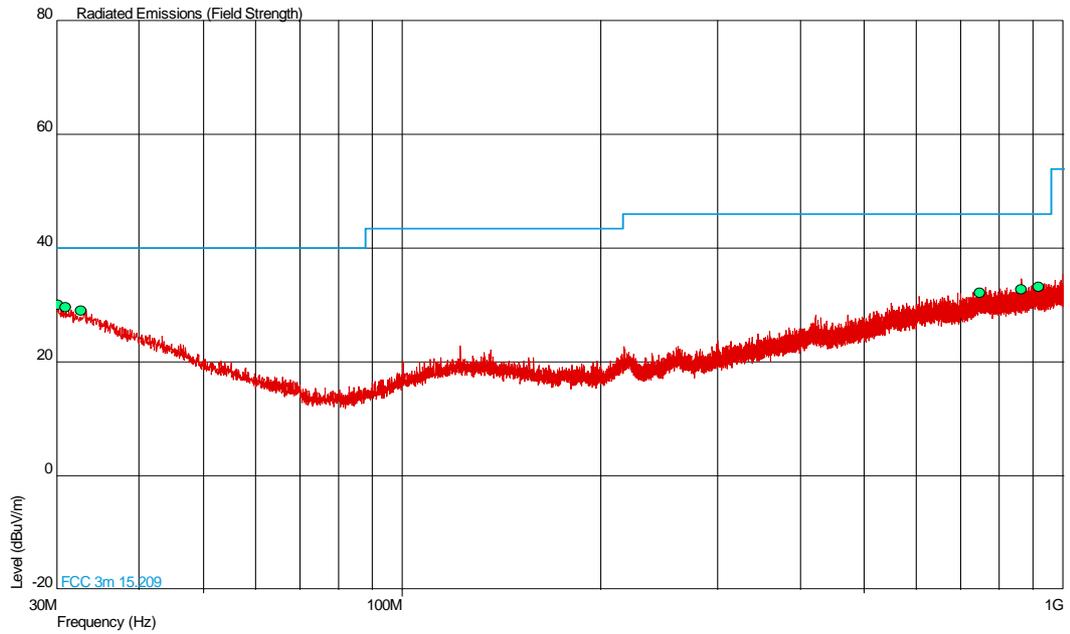


Product Service

Spurious Radiated Emissions

2412 MHz

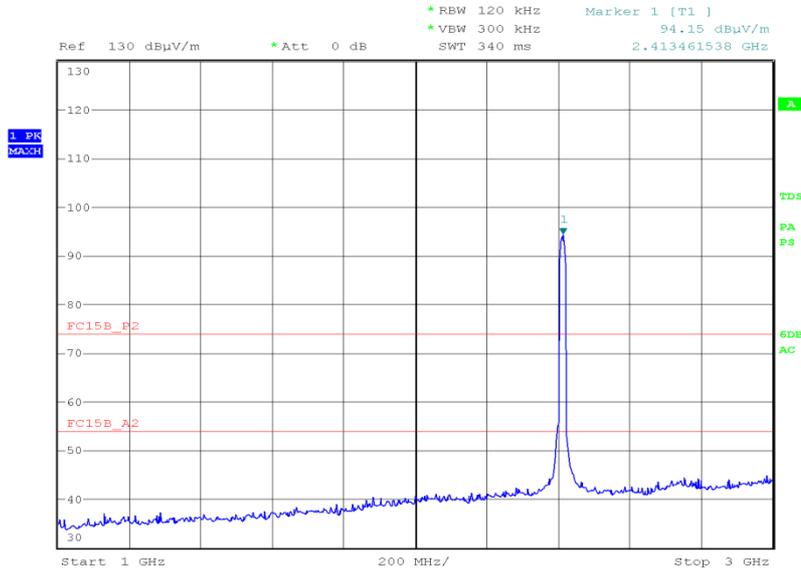
30 MHz to 1 GHz



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
30.194	30.1	32.0	40.0	100	-9.9	68.0	0	1.00	Horizontal
30.922	29.7	30.5	40.0	100	-10.3	69.5	180	1.00	Vertical
32.716	29.0	28.2	40.0	100	-11.0	71.8	180	1.00	Horizontal
748.770	32.2	40.7	46.0	200	-13.8	159.3	0	1.00	Horizontal
864.879	32.7	43.2	46.0	200	-13.3	156.8	0	1.00	Vertical
917.516	33.2	45.7	46.0	200	-12.8	154.3	0	1.00	Vertical

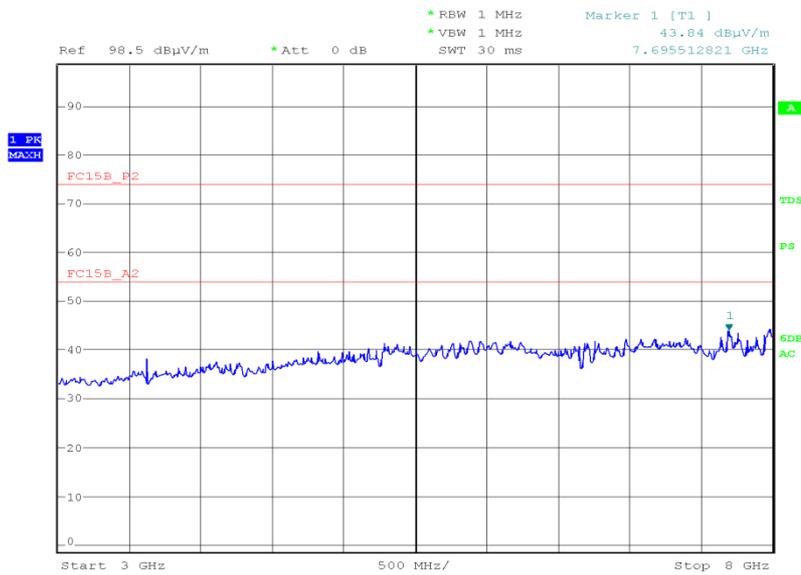


1 GHz to 3 GHz



Date: 28.NOV.2011 20:29:19

3 GHz to 8 GHz

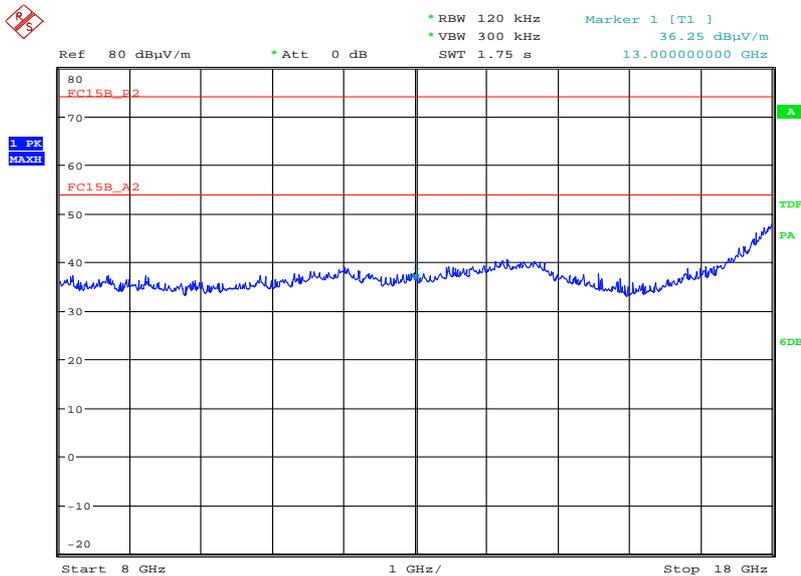


Date: 28.NOV.2011 23:14:39



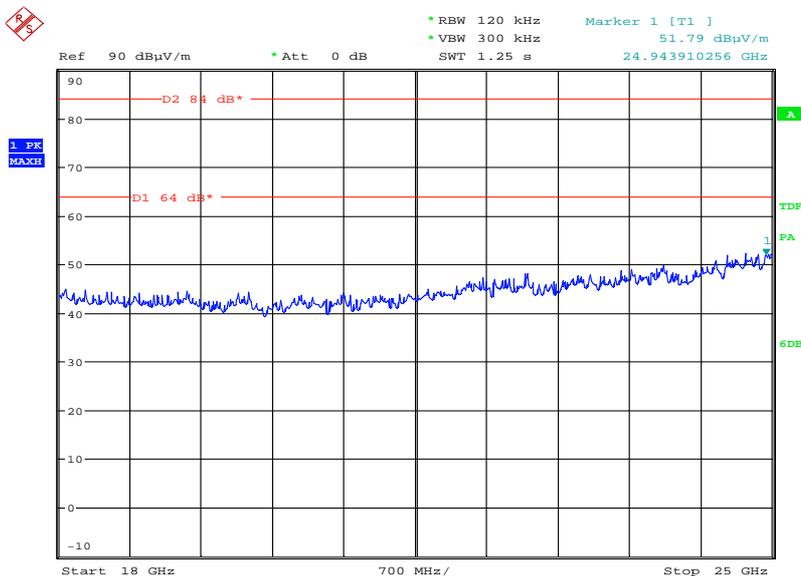
Product Service

8 GHz to 18 GHz



Date: 5.DEC.2011 23:07:57

18 GHz to 25 GHz



Date: 6.DEC.2011 20:37:21

Limit

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

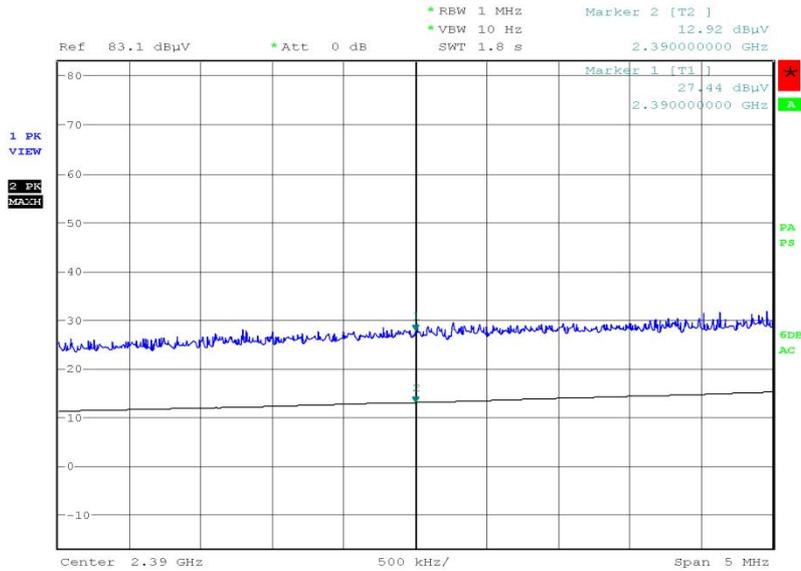


Product Service

Band Edge Emissions

2412 MHz

Polarisation	Final Peak (dB μ V/m)	Final Average (dB μ V/m)
Horizontal	60.00	45.58

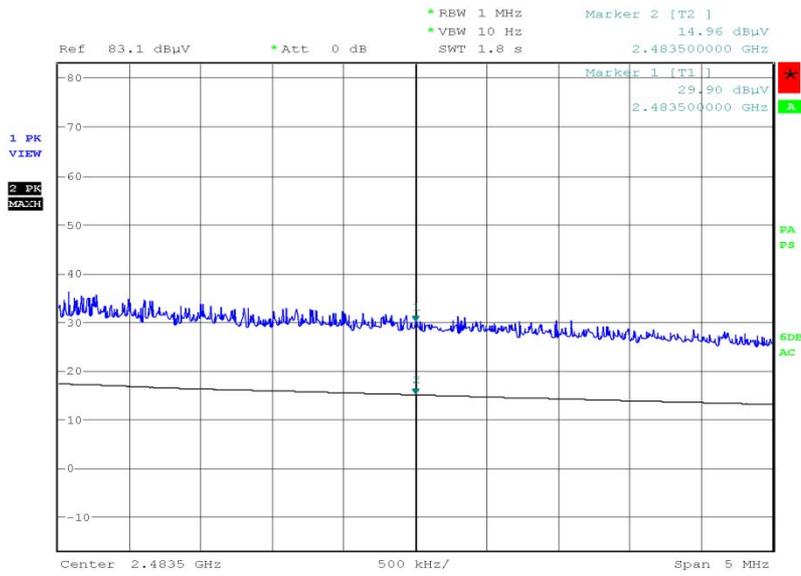


Date: 28.NOV.2011 20:40:12



2462 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	62.60	47.66



Date: 28.NOV.2011 21:18:41

Limit

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



Product Service

2.5 6DB BANDWIDTH

2.5.1 Specification Reference

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

2.5.2 Equipment Under Test and Modification State

CDMA SHX12 S/N: IMEI 004401113640995 - Modification State 0

2.5.3 Date of Test

21 November 2011 & 22 November 2011

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 EUT was transmitted at maximum power via a cable to the Spectrum Analyser. The Analyser settings were adjusted to display the resultant trace on screen. The peak point of the trace was measured and the markers positioned to give the -6dBc points of the displayed spectrum.

2.5.6 Environmental Conditions

Ambient Temperature	24.8°C
Relative Humidity	30.5%



Product Service

2.5.7 Test Results

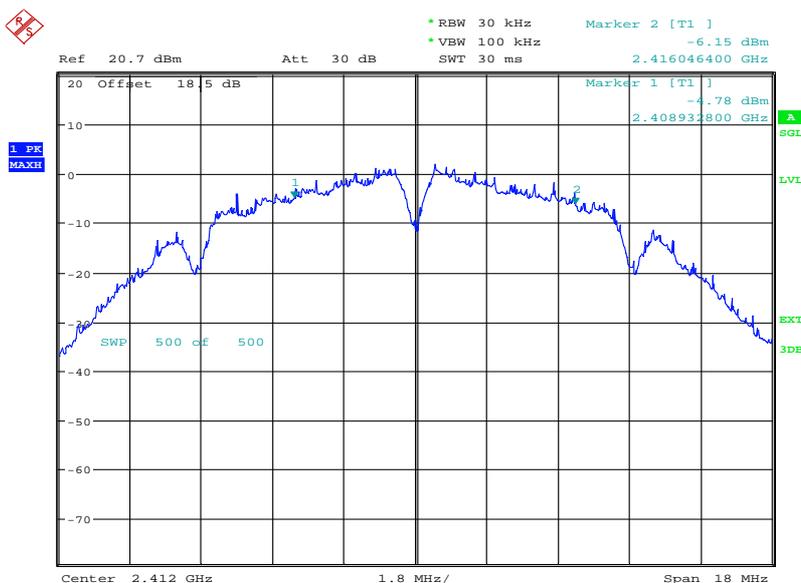
802.11(b)

4.0 V DC Supply

Frequency (MHz)	Data Rate (Mbps)	6dB Bandwidth (kHz)
2412 MHz	1	7113.6
	2	6508.8
	5	7084.8
	11	7574.4
2437 MHz	1	6595.2
	2	7545.6
	5	7372.8
	11	6508.8
2462 MHz	1	7084.8
	2	7603.2
	5	8438.4
	11	7315.2

2412 MHz

1 Mbps

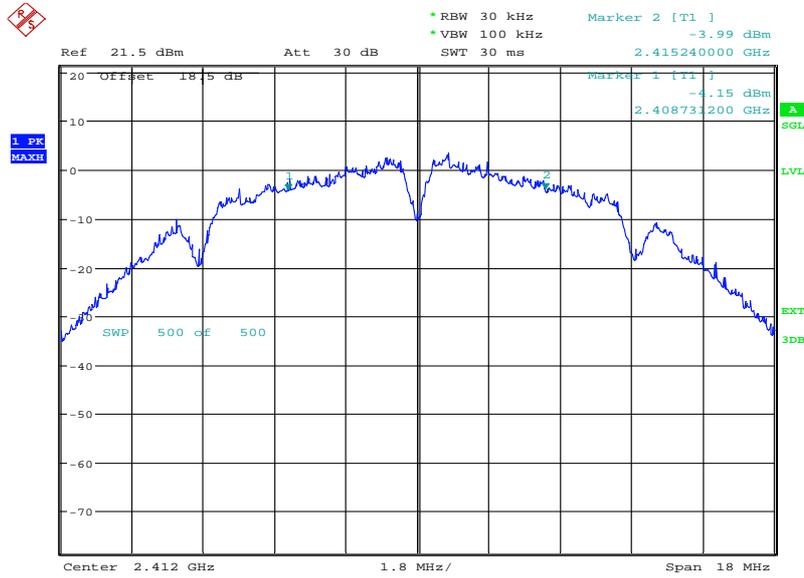


Date: 21.NOV.2011 11:50:20



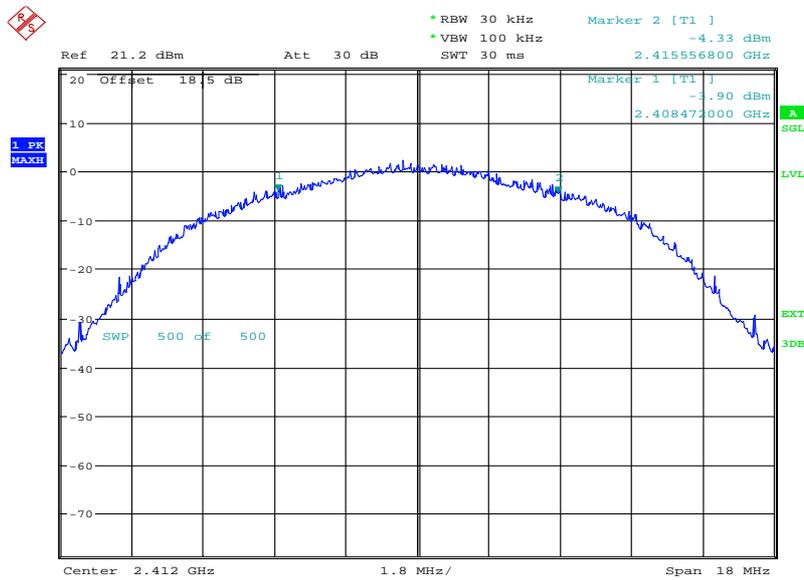
Product Service

2 Mbps



Date: 21.NOV.2011 11:35:25

5.5 Mbps

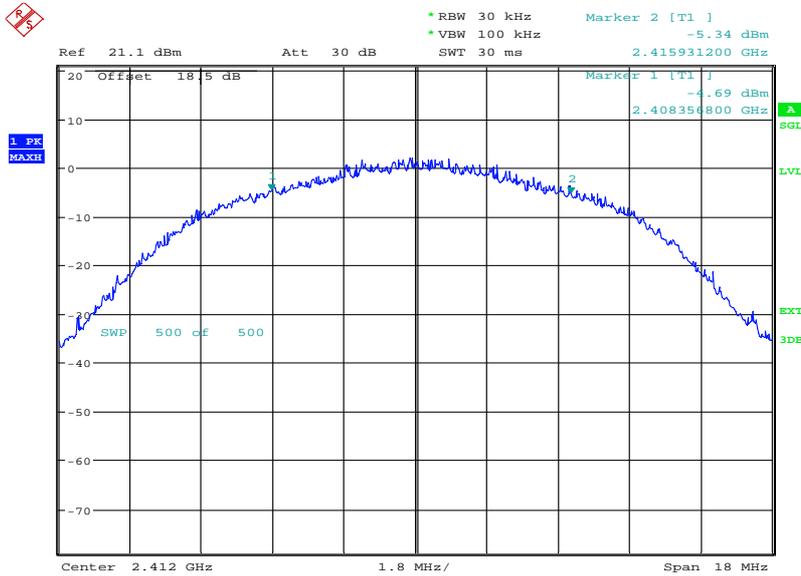


Date: 21.NOV.2011 12:07:36



Product Service

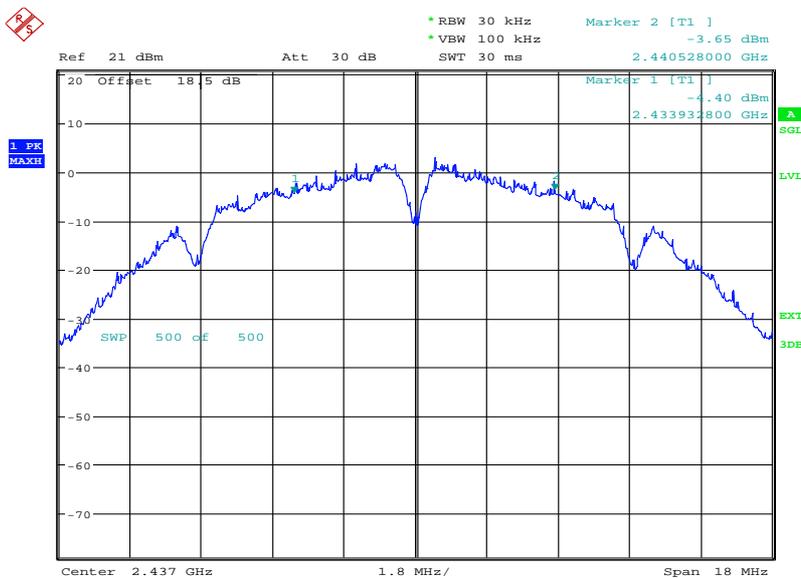
11 Mbps



Date: 21.NOV.2011 12:27:34

2437 MHz

1 Mbps

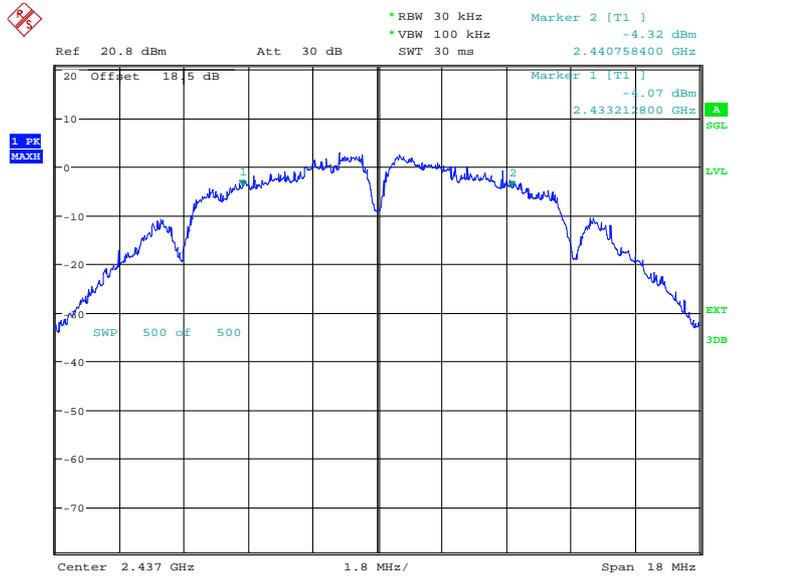


Date: 21.NOV.2011 11:54:10



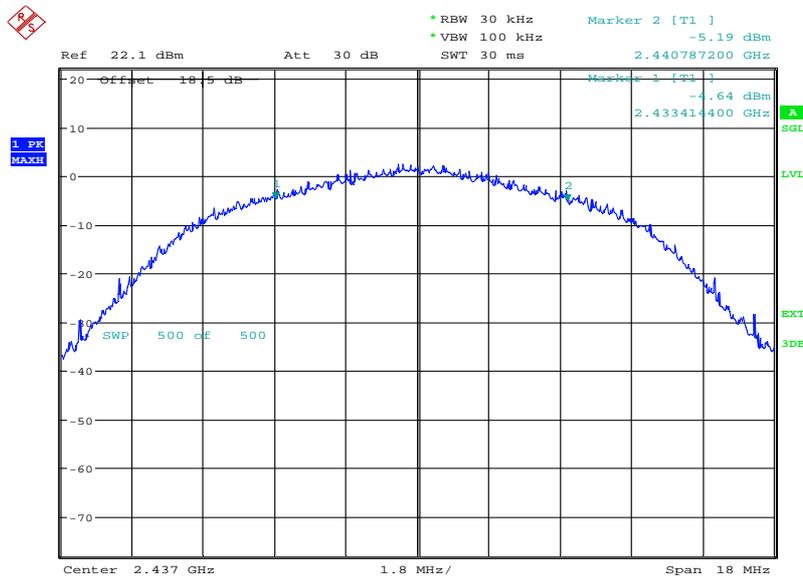
Product Service

2 Mbps



Date: 21.NOV.2011 11:39:55

5.5 Mbps

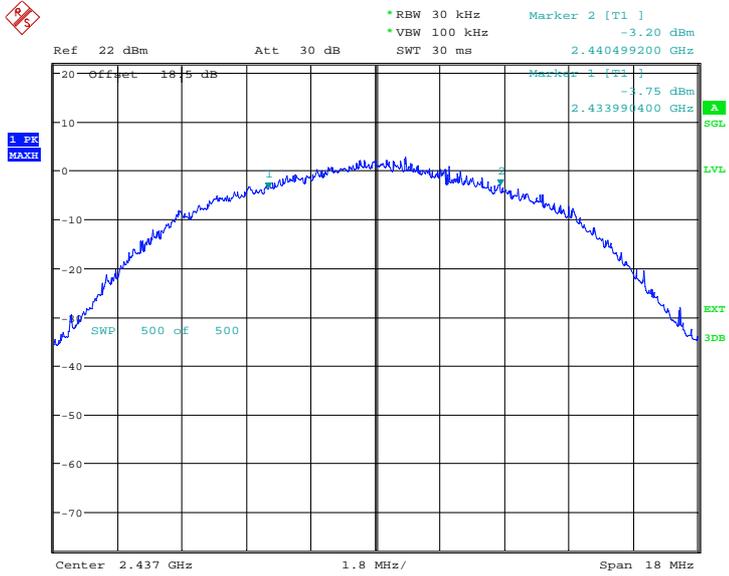


Date: 21.NOV.2011 12:13:51



Product Service

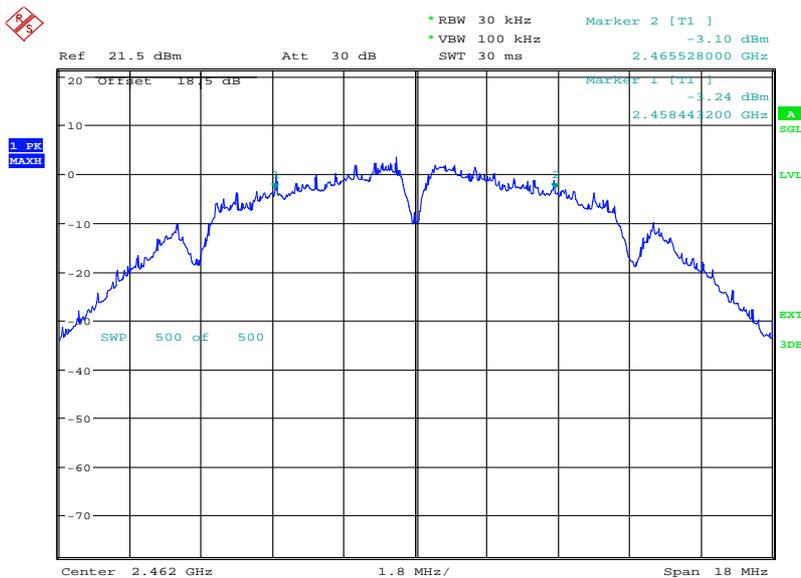
11 Mbps



Date: 21.NOV.2011 12:31:55

2462 MHz

1 Mbps

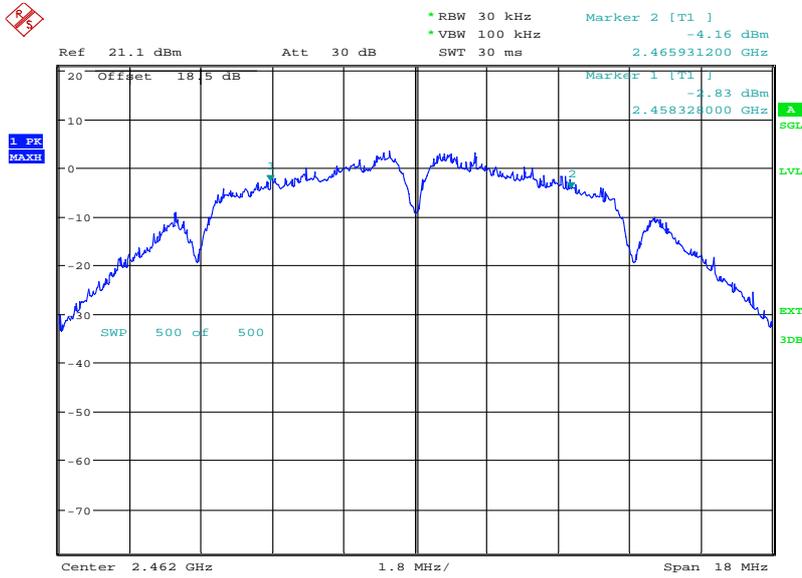


Date: 21.NOV.2011 12:00:48



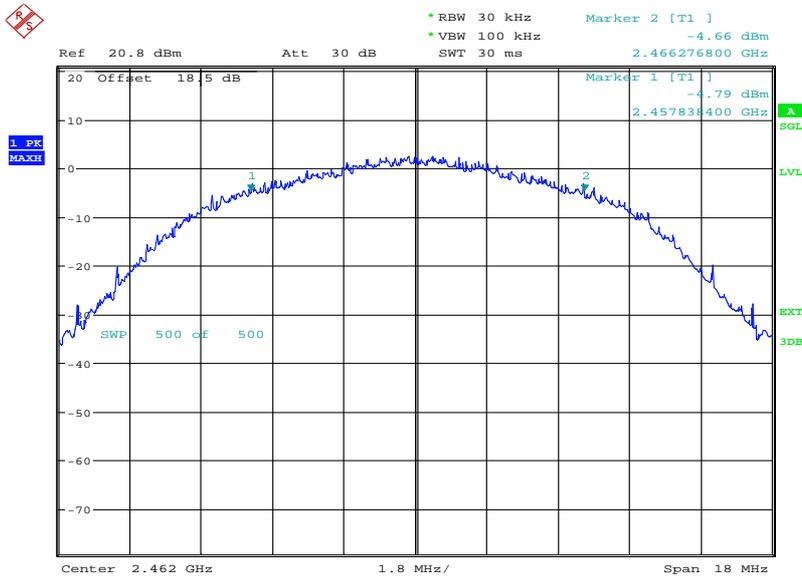
Product Service

2 Mbps



Date: 21.NOV.2011 11:43:53

5.5 Mbps

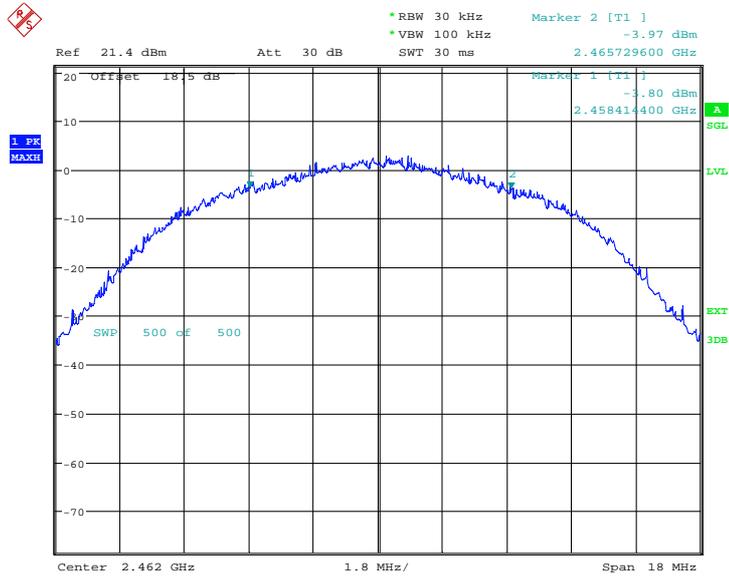


Date: 21.NOV.2011 12:18:26



Product Service

11 Mbps



Date: 21.NOV.2011 12:36:49

Limit Clause

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



Product Service

802.11(g)

4.0 V DC Supply

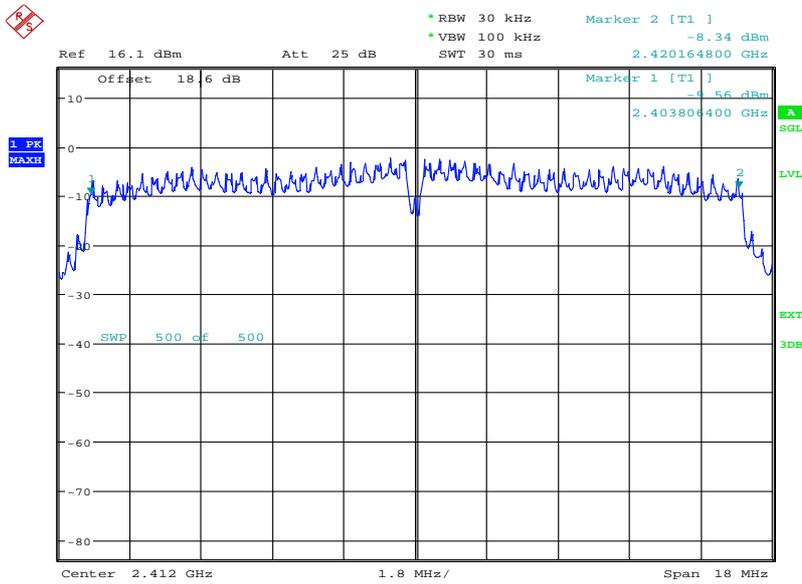
Frequency (MHz)	Data Rate (Mbps)	6dB Bandwidth (kHz)
2412 MHz	6	16358.4
	9	16358.4
	12	16444.8
	18	16473.6
	24	16384
	36	16448
	48	16448
	54	16480
2437 MHz	6	16358.4
	9	16358.4
	12	16444.8
	18	16387.2
	24	16416
	36	16416
	48	16416
	54	16448
2462 MHz	6	16358.4
	9	16358.4
	12	16416
	18	16473.6
	24	16480
	36	16352
	48	16448
	54	16416



Product Service

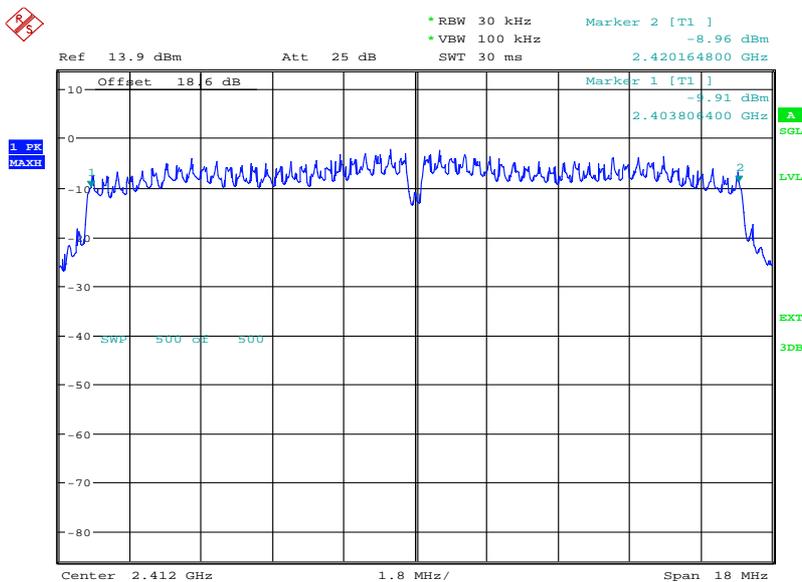
2412 MHz

6 Mbps



Date: 21.NOV.2011 12:44:49

9 Mbps

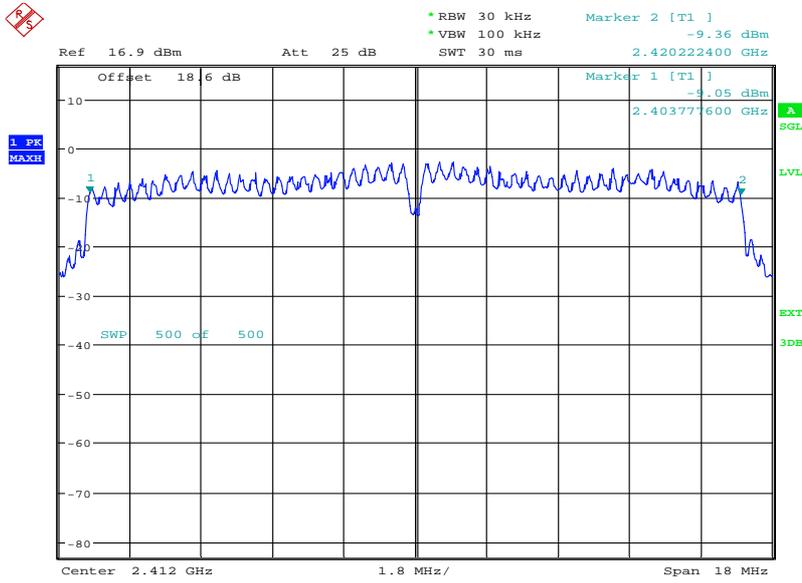


Date: 21.NOV.2011 12:57:54



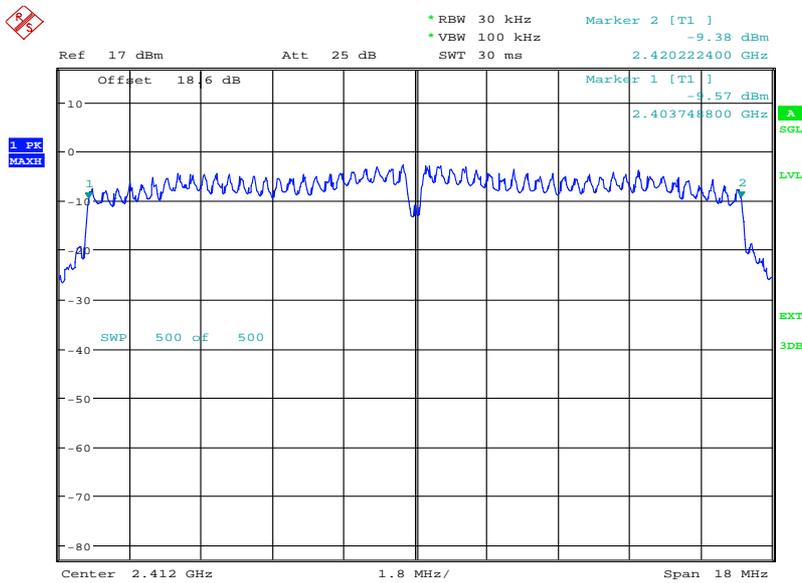
Product Service

12 Mbps



Date: 21.NOV.2011 13:17:06

18 Mbps

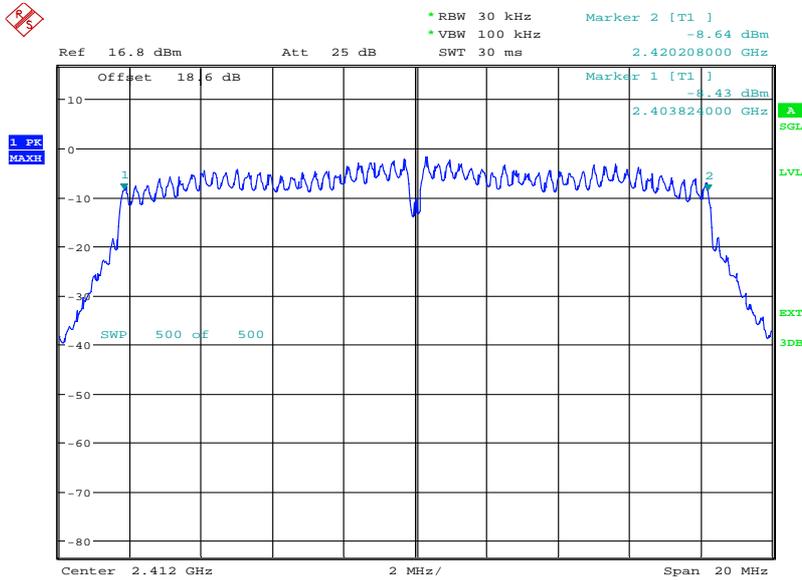


Date: 21.NOV.2011 13:31:04



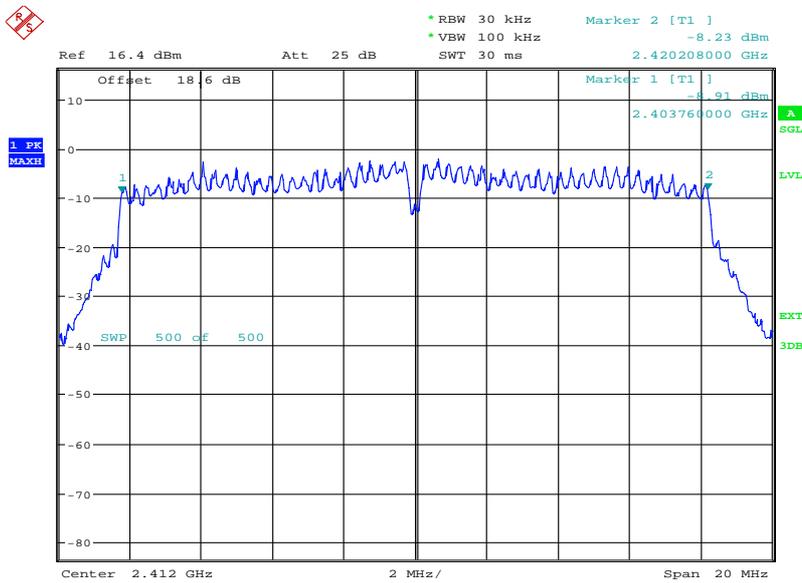
Product Service

24 Mbps



Date: 21.NOV.2011 14:26:45

36 Mbps

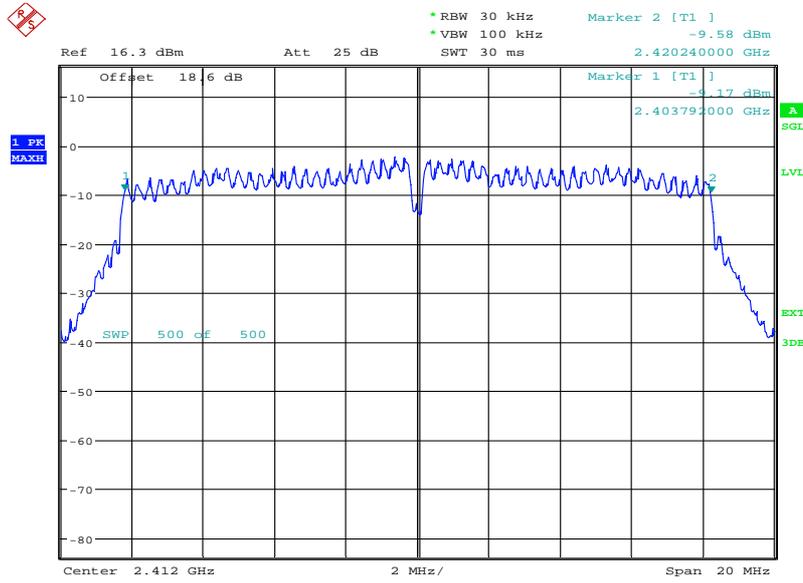


Date: 21.NOV.2011 14:41:56



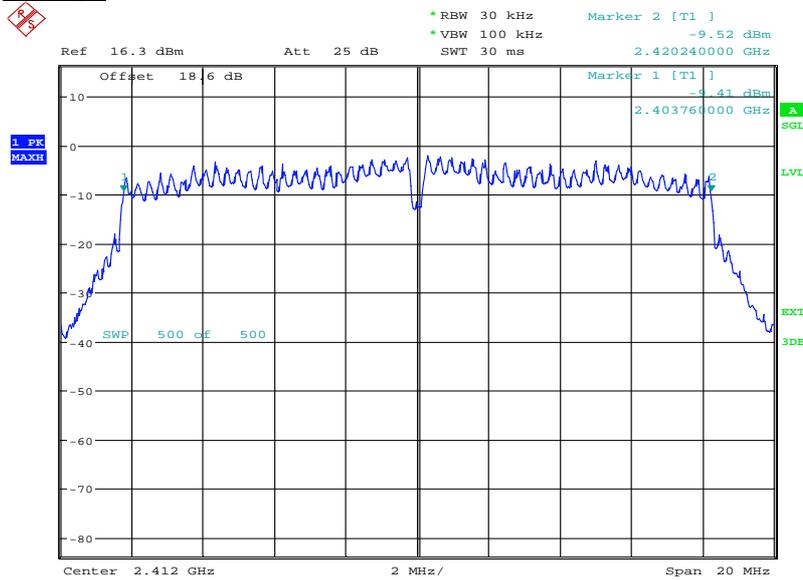
Product Service

48 Mbps



Date: 21.NOV.2011 14:56:43

54 Mbps



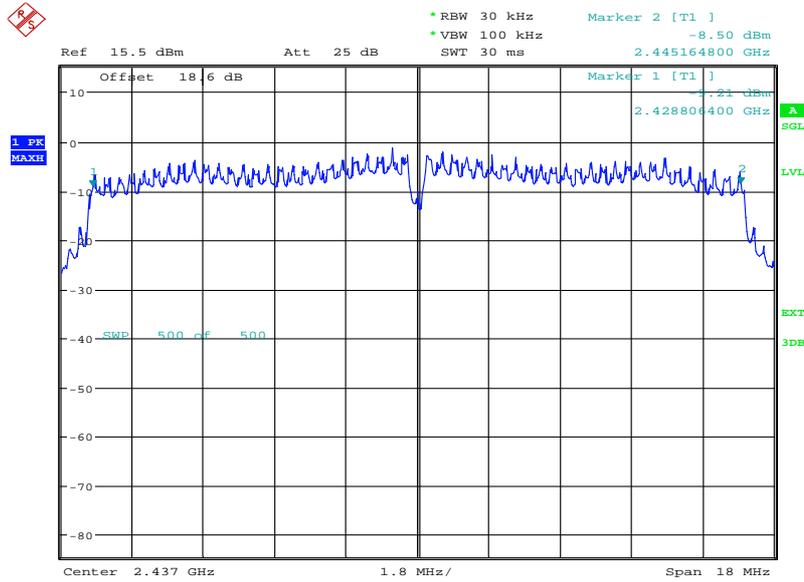
Date: 21.NOV.2011 15:10:59



Product Service

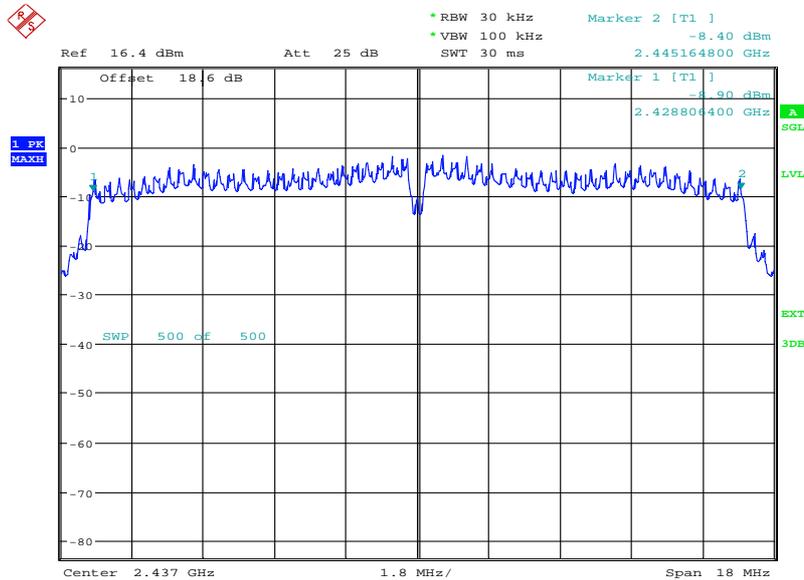
2437 MHz

6 Mbps



Date: 21.NOV.2011 12:48:50

9 Mbps

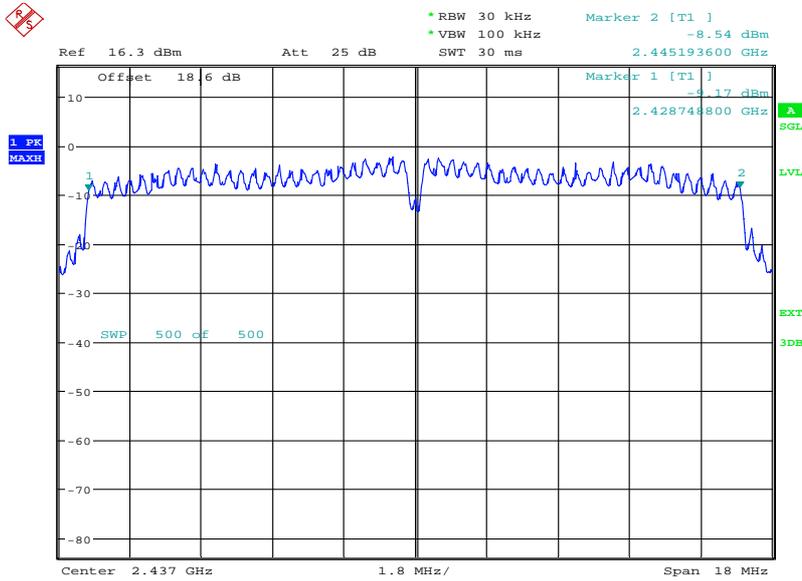


Date: 21.NOV.2011 13:02:21



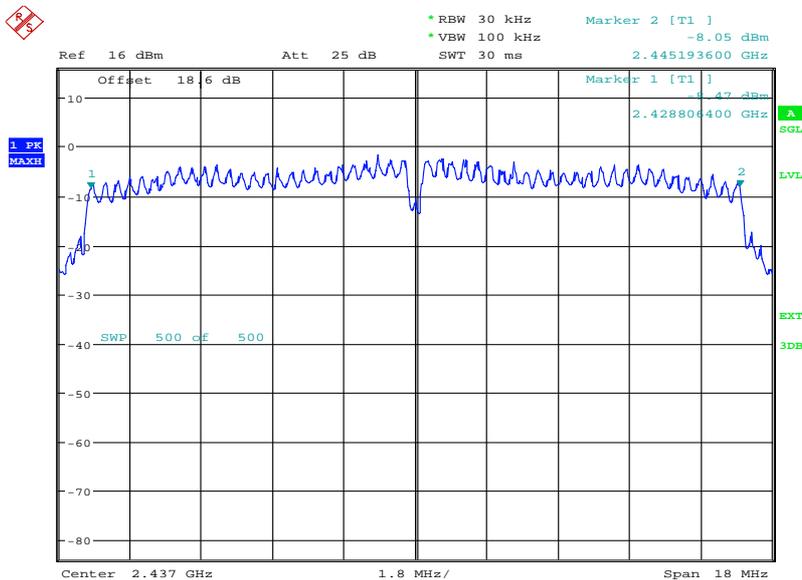
Product Service

12 Mbps



Date: 21.NOV.2011 13:21:18

18 Mbps

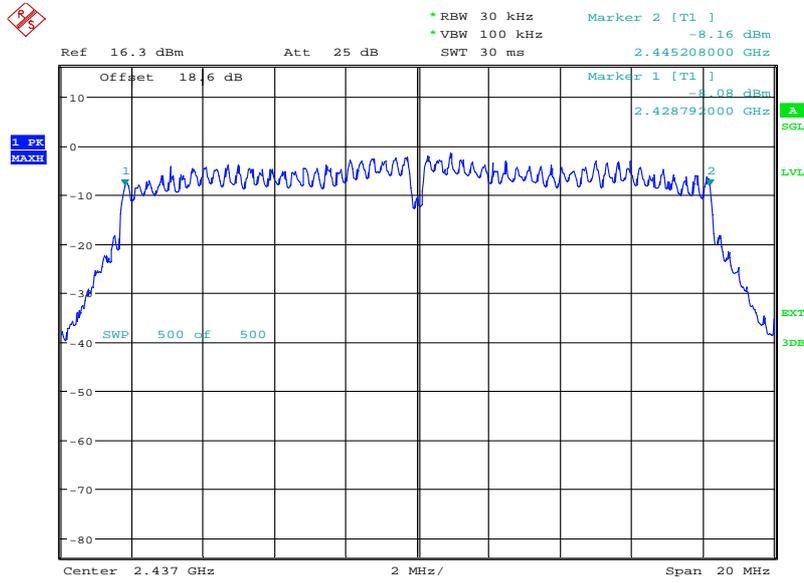


Date: 21.NOV.2011 13:35:04



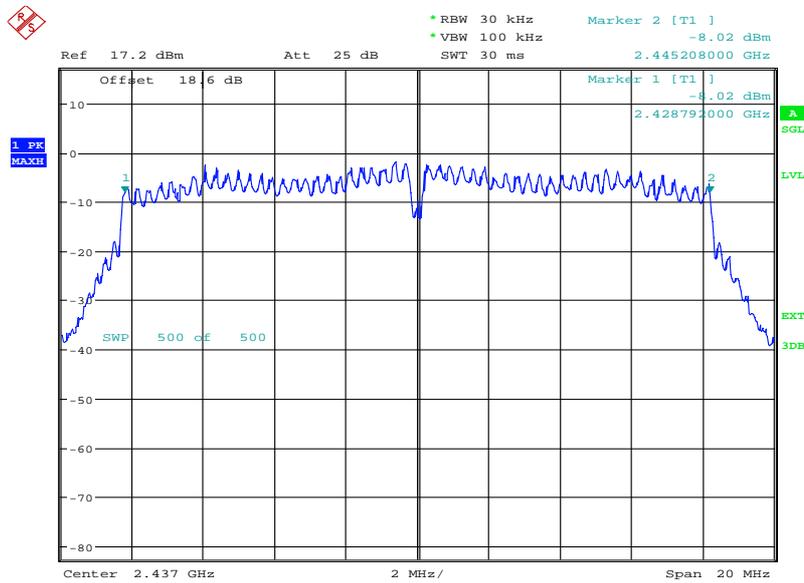
Product Service

24 Mbps



Date: 21.NOV.2011 14:30:38

36 Mbps

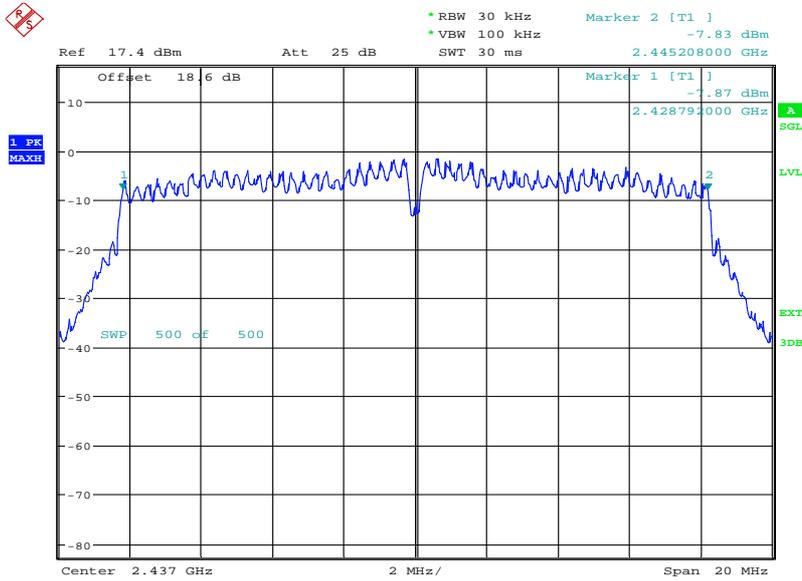


Date: 21.NOV.2011 14:45:54



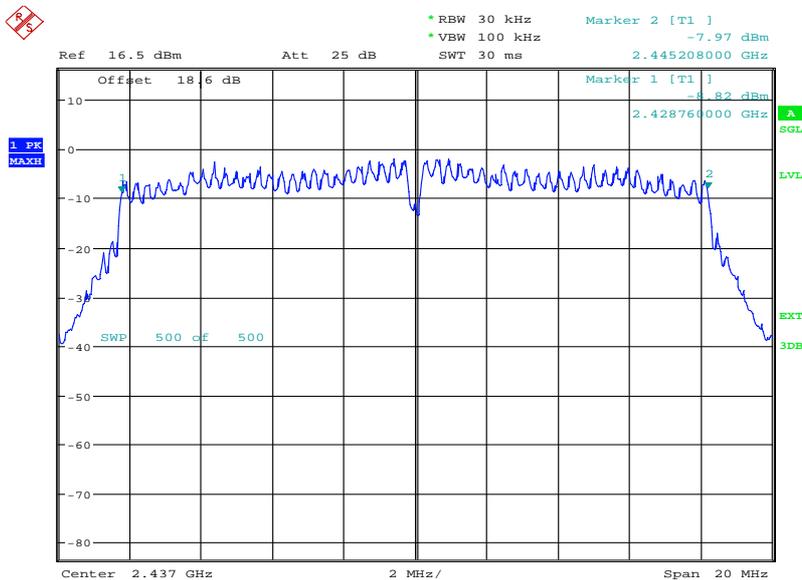
Product Service

48 Mbps



Date: 21.NOV.2011 15:00:32

54 Mbps



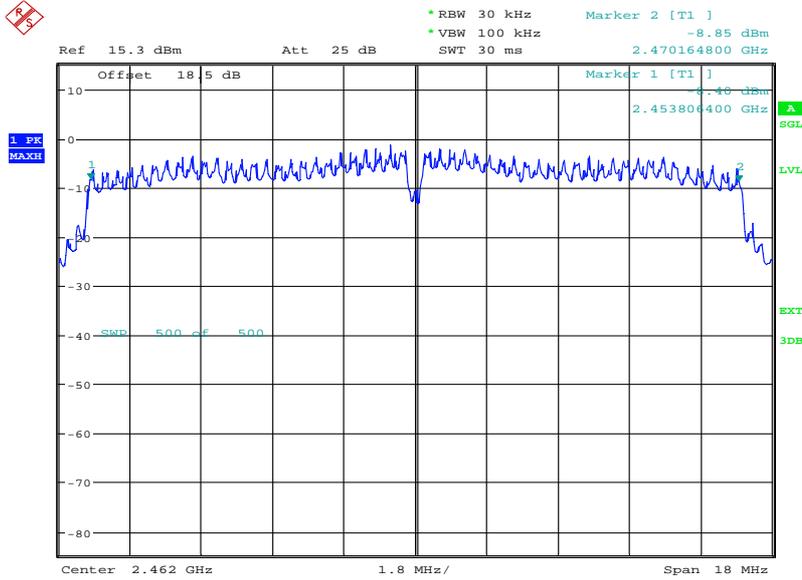
Date: 21.NOV.2011 15:15:11



Product Service

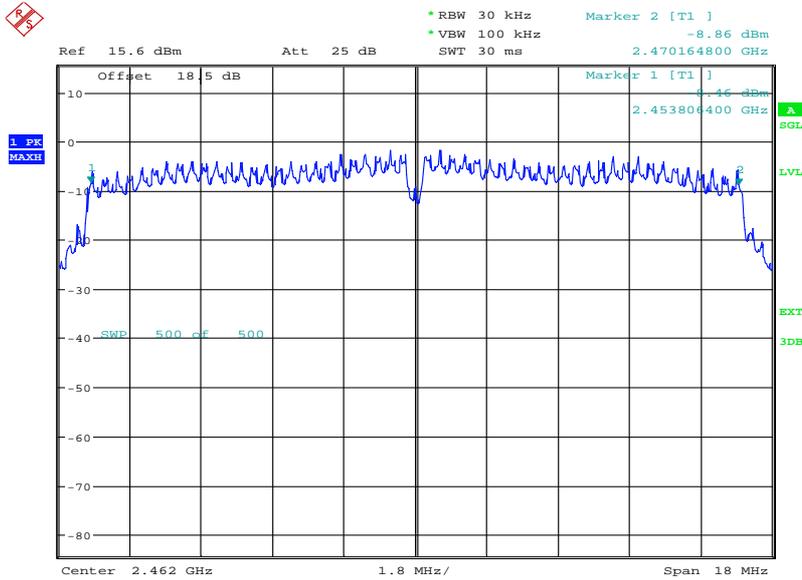
2462 MHz

6 Mbps



Date: 21.NOV.2011 12:52:41

9 Mbps

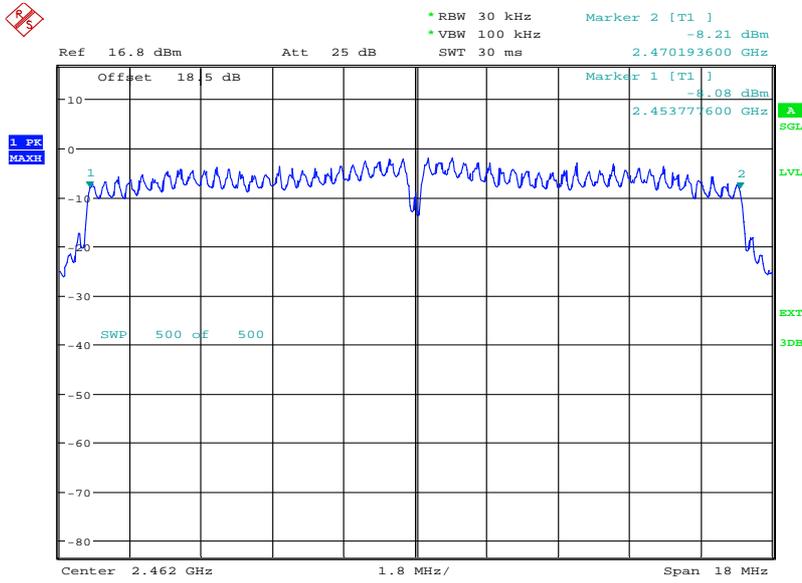


Date: 21.NOV.2011 13:06:34



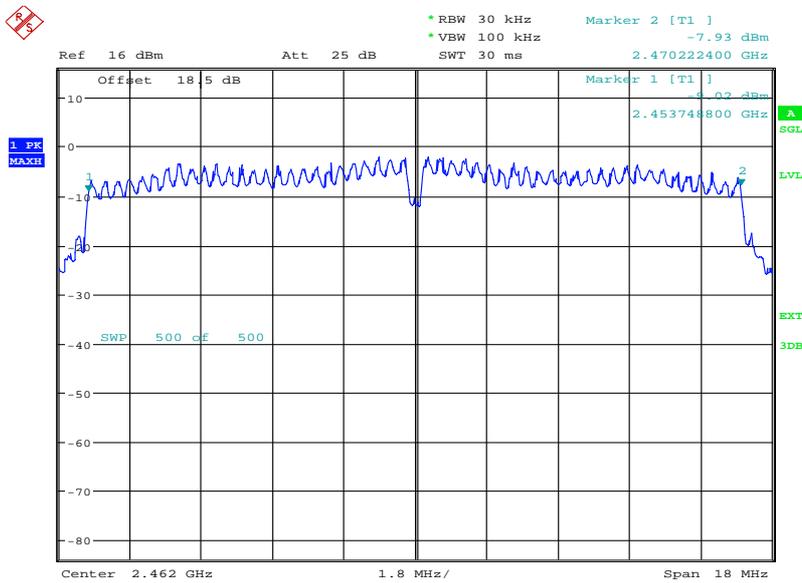
Product Service

12 Mbps



Date: 21.NOV.2011 13:25:30

18 Mbps

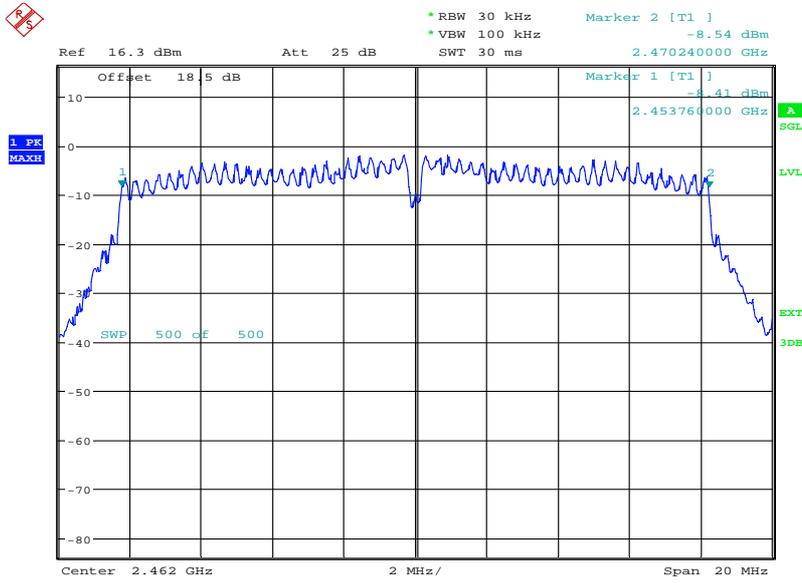


Date: 21.NOV.2011 13:41:07



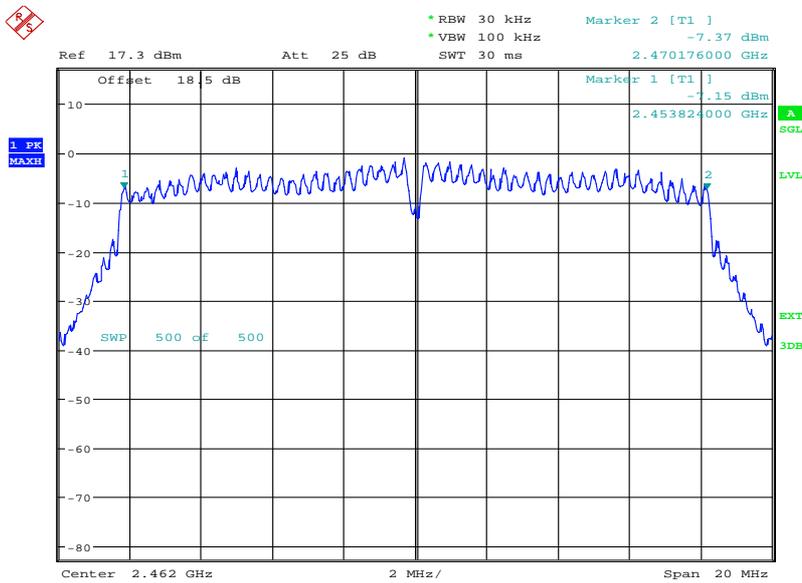
Product Service

24 Mbps



Date: 21.NOV.2011 14:36:08

36 Mbps

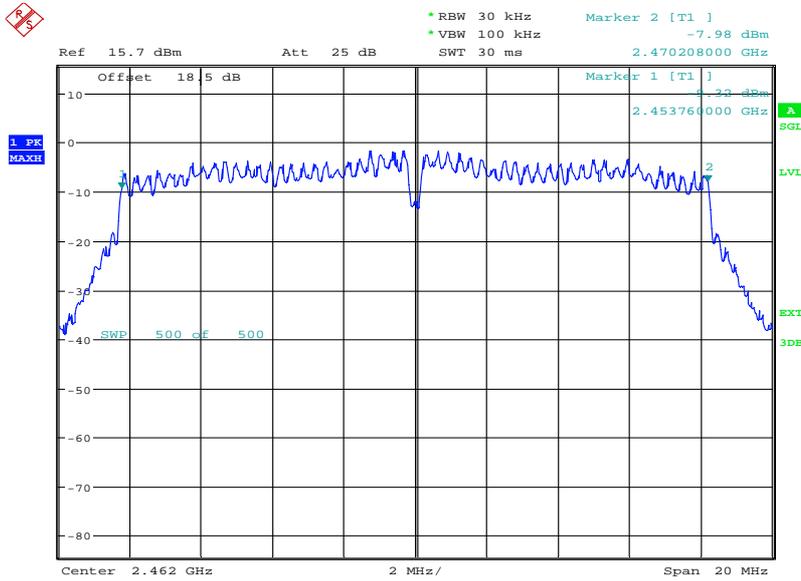


Date: 21.NOV.2011 14:49:52



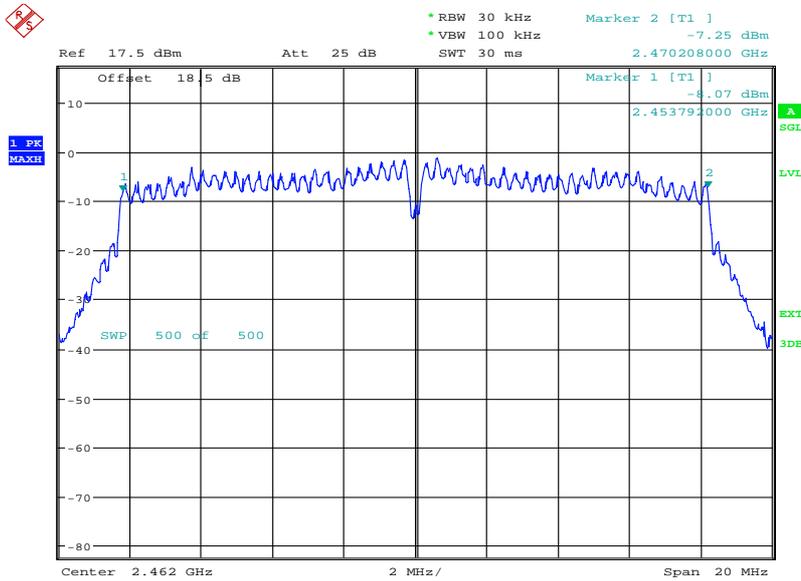
Product Service

48 Mbps



Date: 21.NOV.2011 15:04:27

54 Mbps



Date: 21.NOV.2011 15:19:27

Limit Clause

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



Product Service

802.11(n)

4.0 V DC Supply

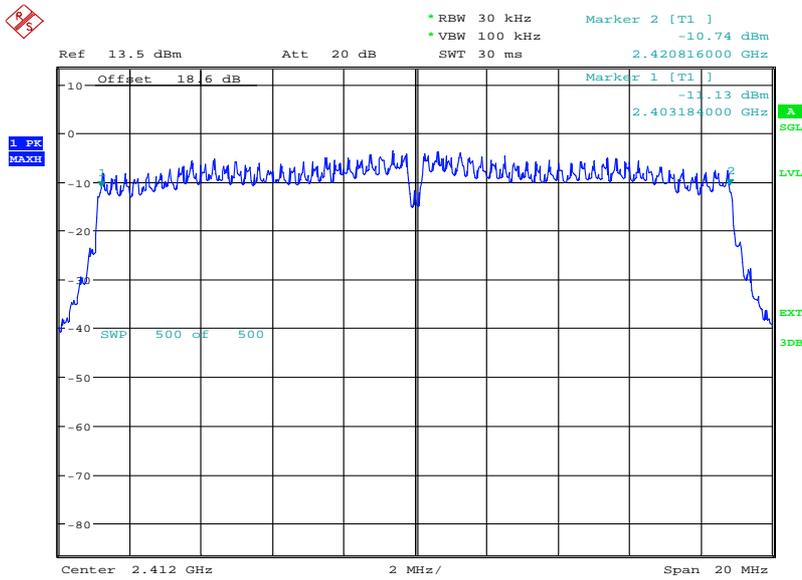
Frequency (MHz)	Data Rate (Mbps)	6dB Bandwidth (kHz)
2412 MHz	6.5	17632
	13	17600
	19.5	17344
	26	17664
	39	15744
	52	17632
	58.5	17664
	65	17696
2437 MHz	6.5	17600
	13	17600
	19.5	17696
	26	17664
	39	17632
	52	17664
	58.5	17408
	65	17664
2462 MHz	6.5	17632
	13	17696
	19.5	17696
	26	17632
	39	17696
	52	17632
	58.5	17696
	65	17664



Product Service

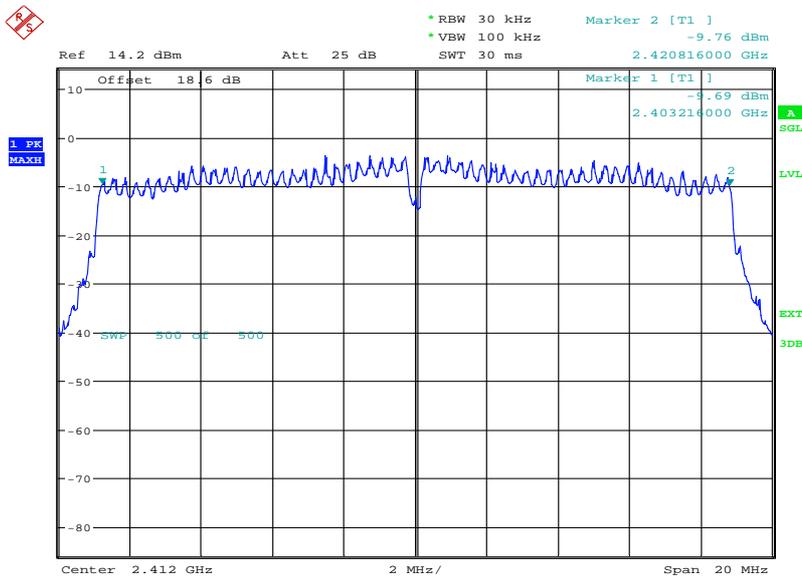
2412 MHz

6.5 Mbps



Date: 21.NOV.2011 15:27:57

13 Mbps

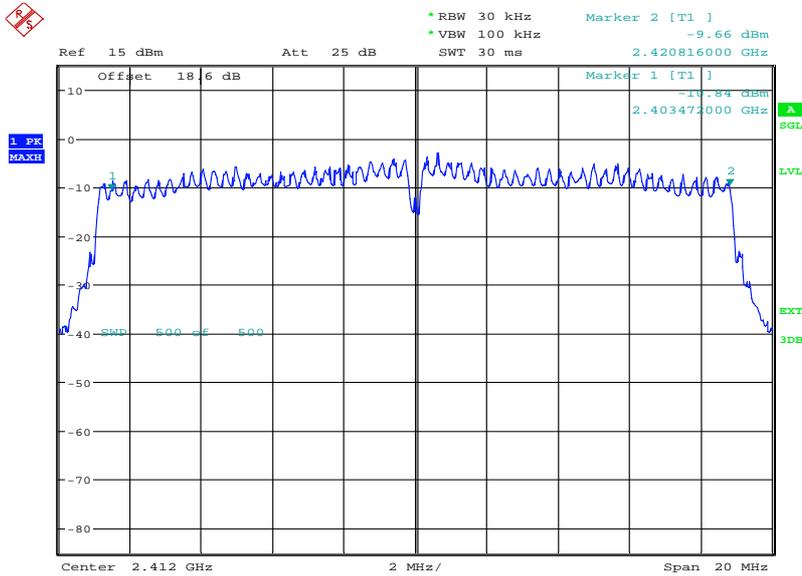


Date: 21.NOV.2011 15:50:57



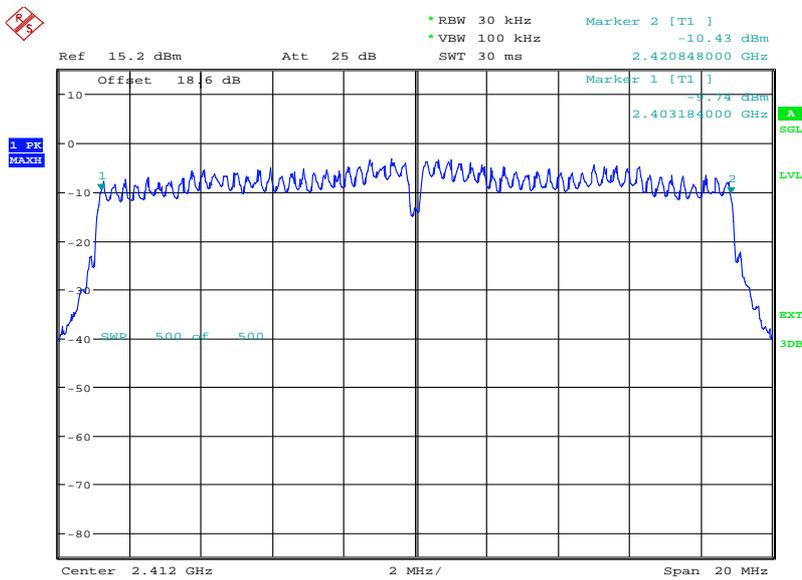
Product Service

19.5 Mbps



Date: 22.NOV.2011 07:47:10

26 Mbps

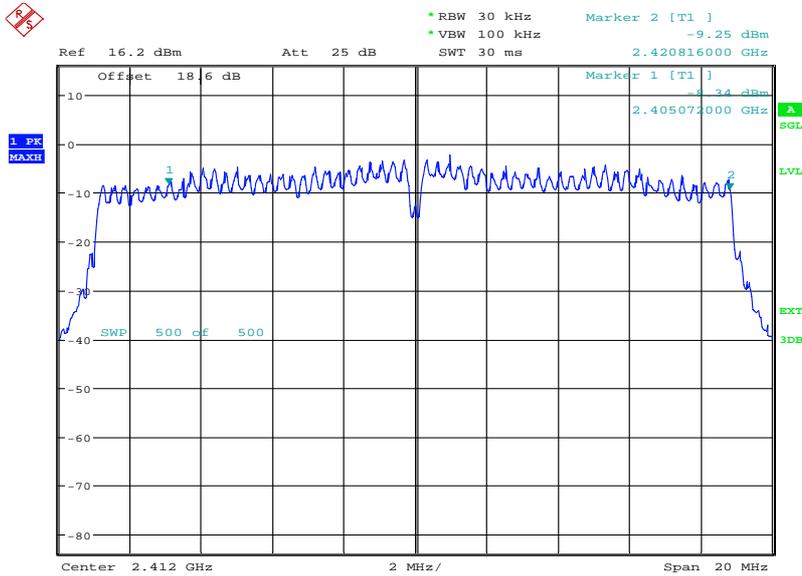


Date: 22.NOV.2011 08:02:35



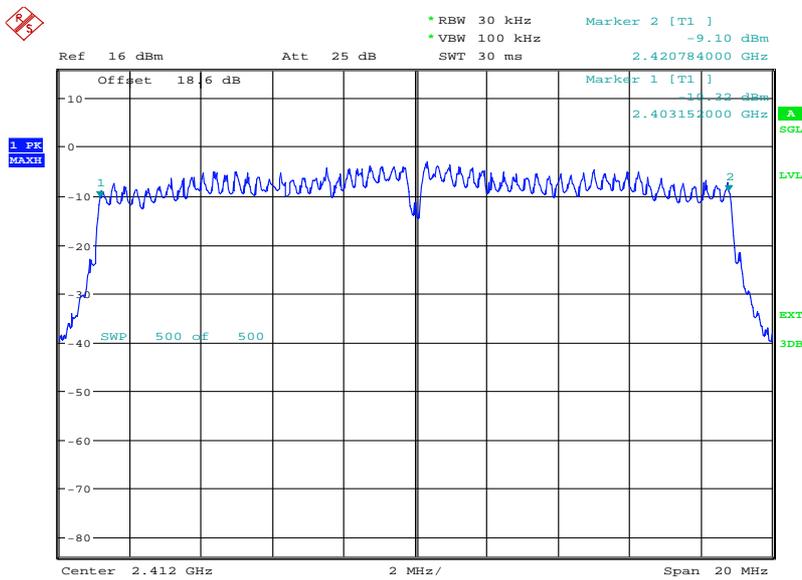
Product Service

39 Mbps



Date: 22.NOV.2011 08:15:40

52 Mbps

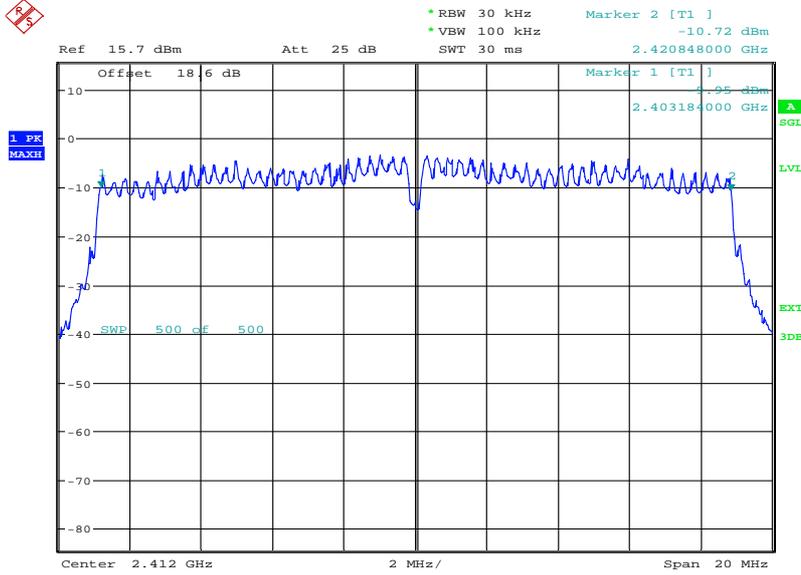


Date: 22.NOV.2011 08:28:31



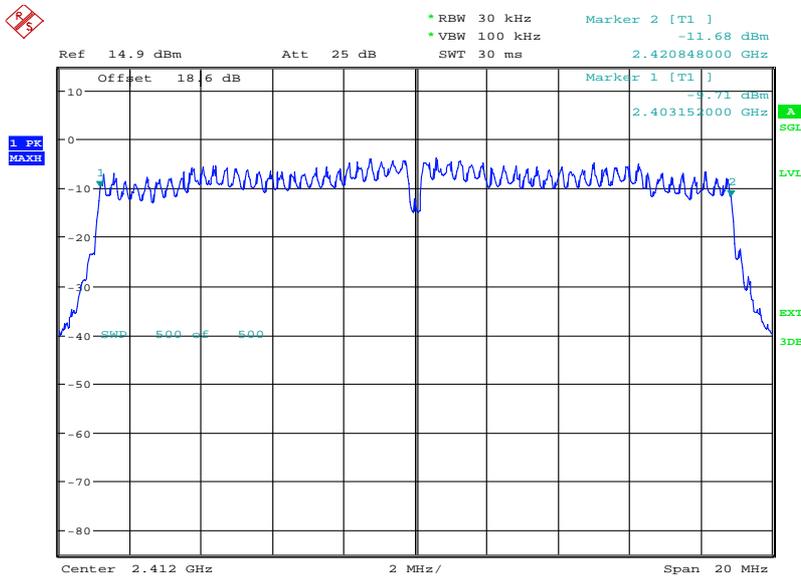
Product Service

58.5 Mbps



Date: 22.NOV.2011 08:47:49

65 Mbps



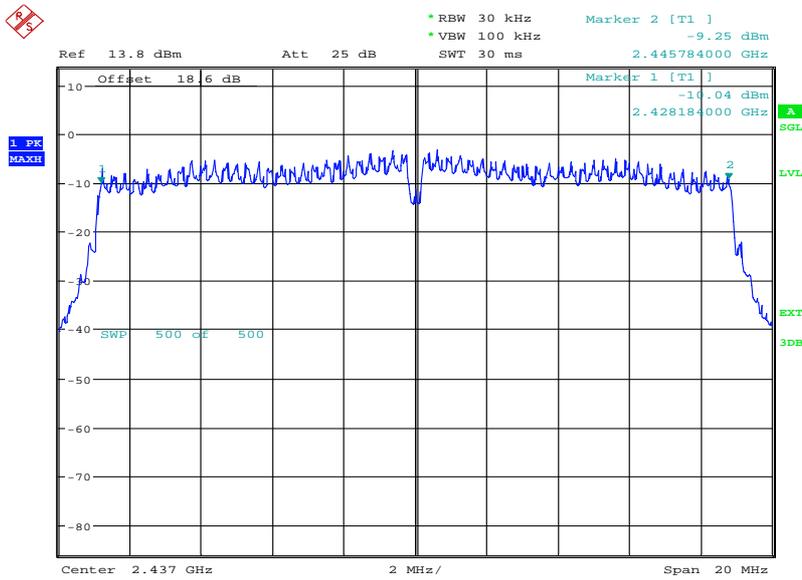
Date: 22.NOV.2011 09:05:42



Product Service

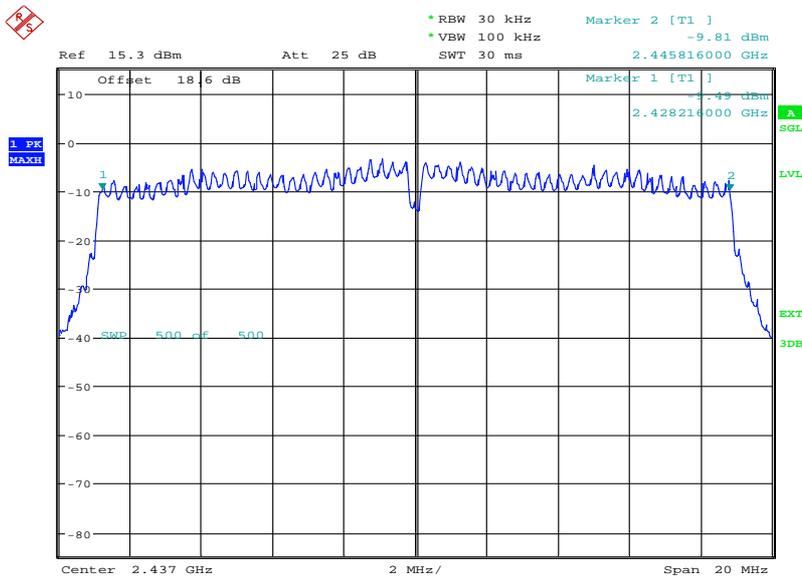
2437 MHz

6.5 Mbps



Date: 21.NOV.2011 15:32:11

13 Mbps

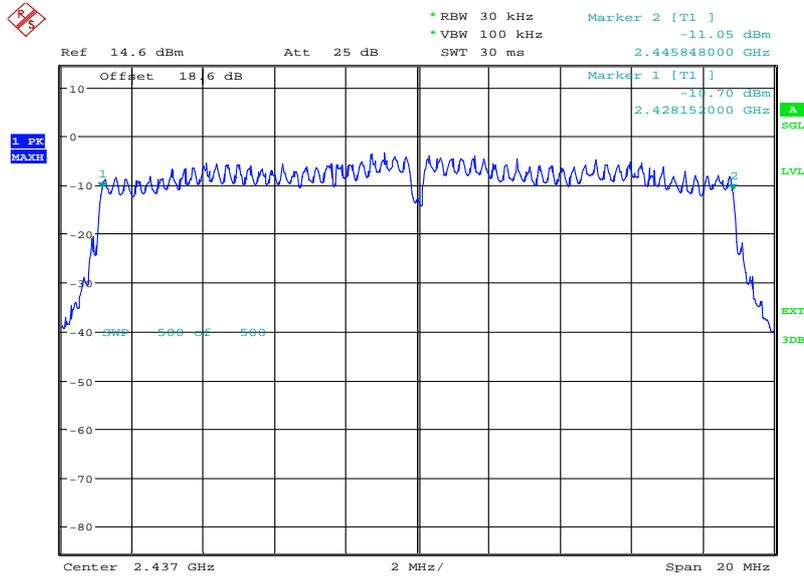


Date: 21.NOV.2011 15:58:47



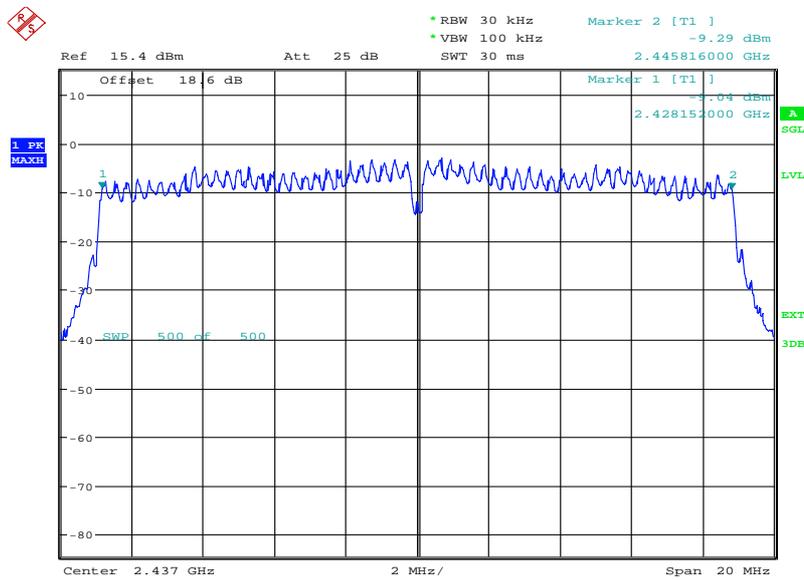
Product Service

19.5 Mbps



Date: 22.NOV.2011 07:51:13

26 Mbps

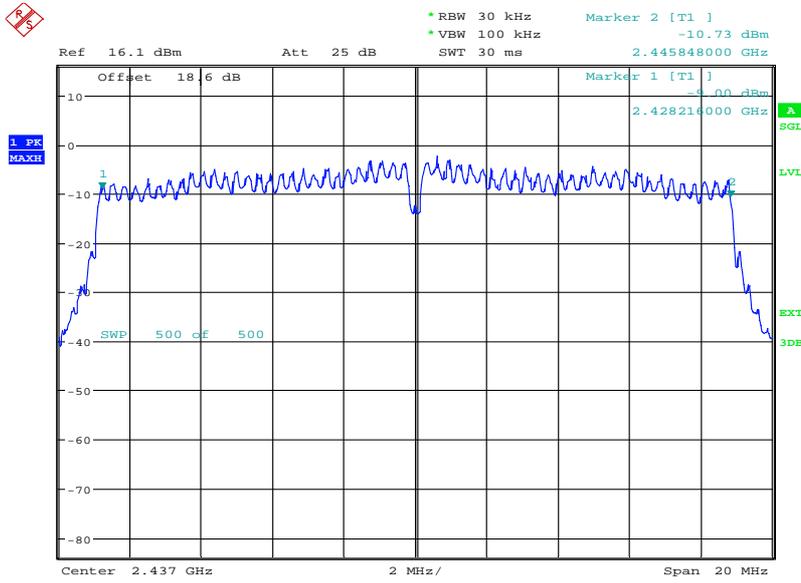


Date: 22.NOV.2011 08:06:28



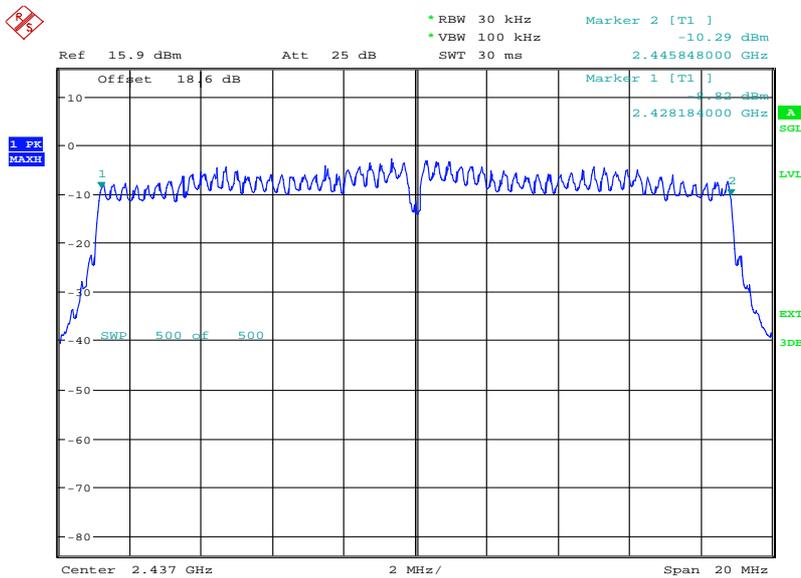
Product Service

39 Mbps



Date: 22.NOV.2011 08:19:26

52 Mbps

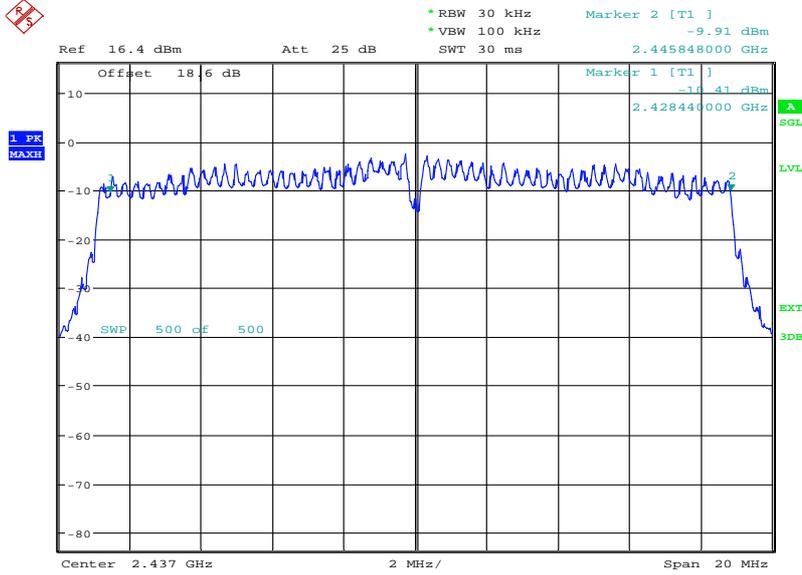


Date: 22.NOV.2011 08:39:28



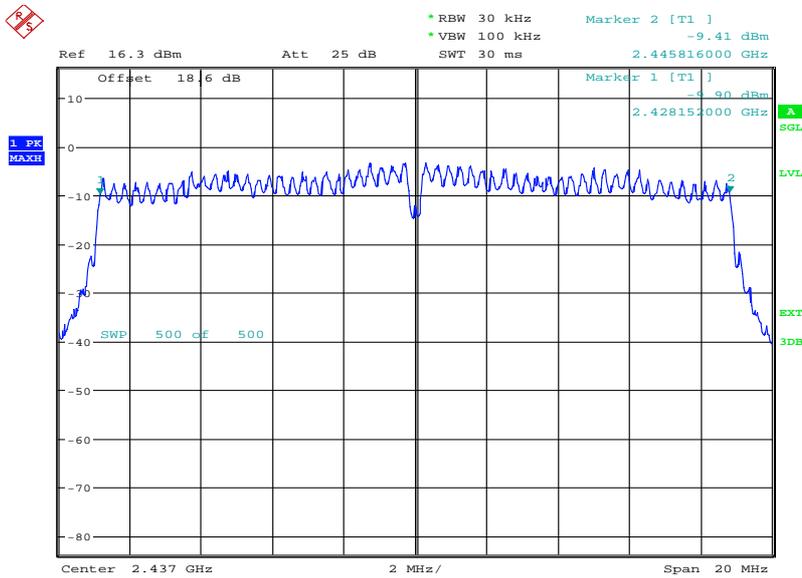
Product Service

58.5 Mbps



Date: 22.NOV.2011 08:53:44

65 Mbps



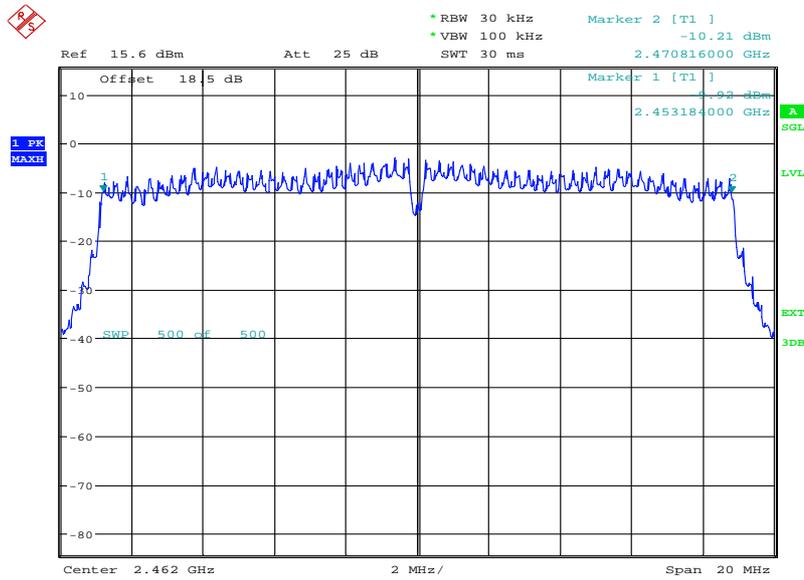
Date: 22.NOV.2011 09:09:34



Product Service

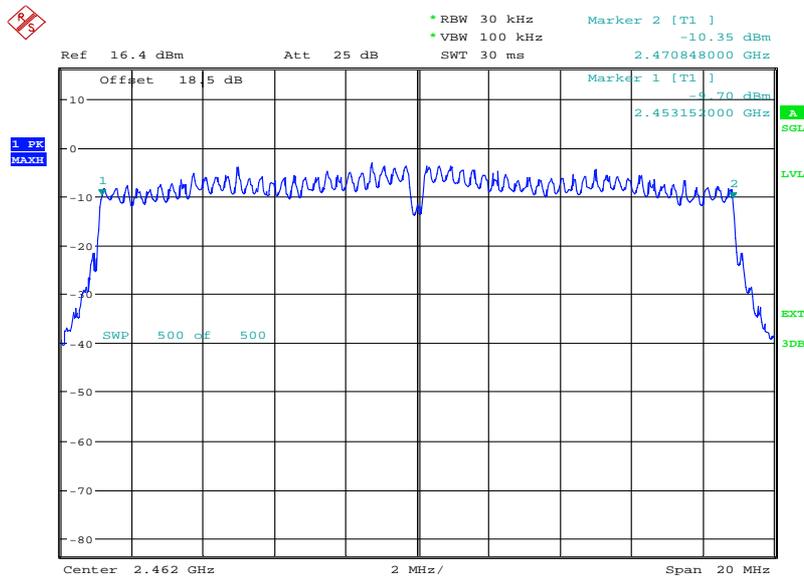
2462 MHz

6.5 Mbps



Date: 21.NOV.2011 15:45:55

13 Mbps

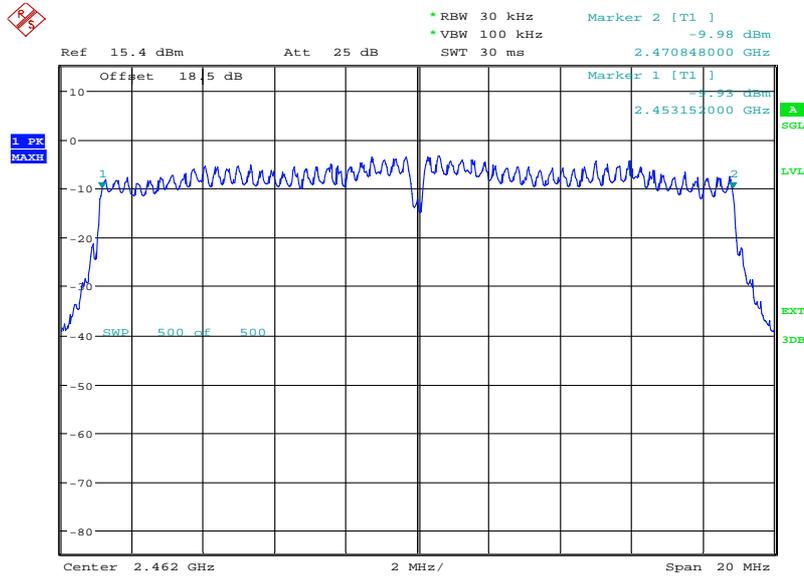


Date: 21.NOV.2011 16:20:40



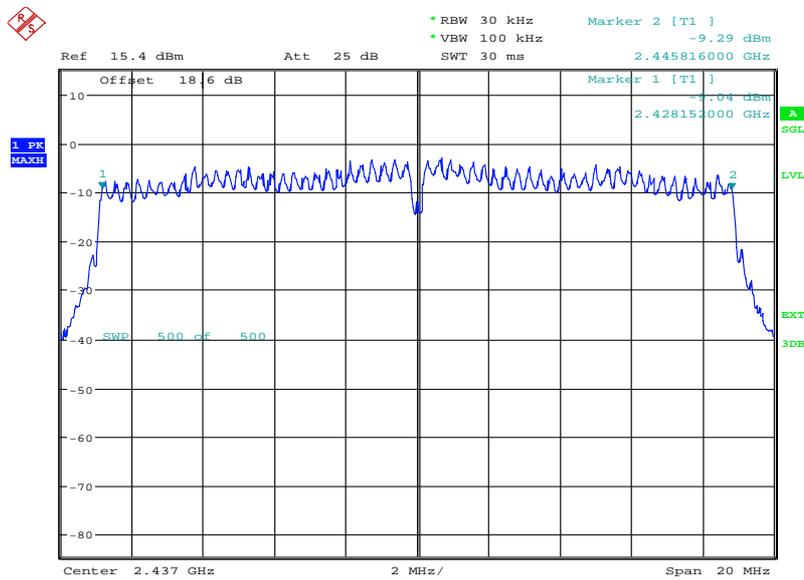
Product Service

19.5 Mbps



Date: 22.NOV.2011 07:55:15

26 Mbps

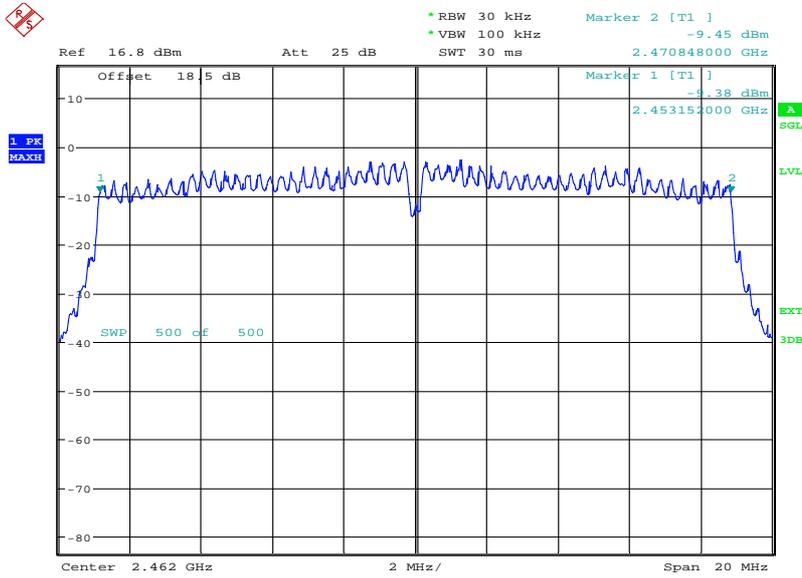


Date: 22.NOV.2011 08:06:28



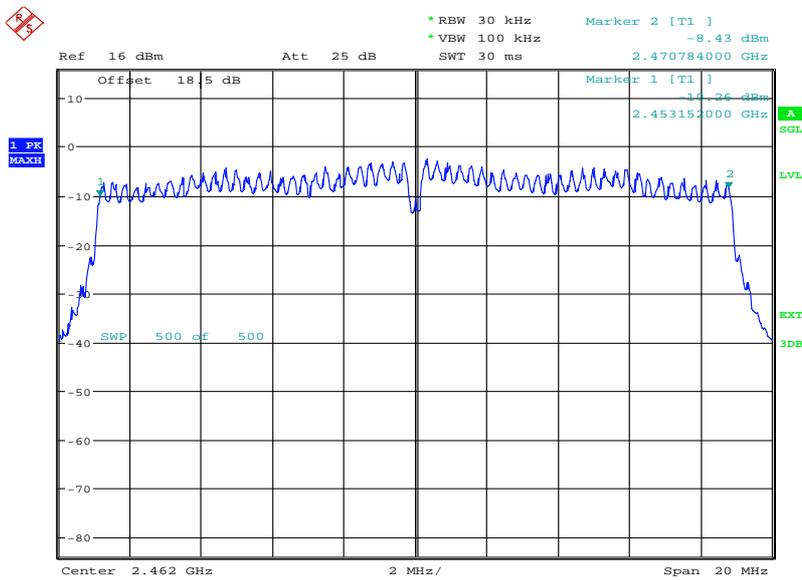
Product Service

39 Mbps



Date: 22.NOV.2011 08:23:12

52 Mbps

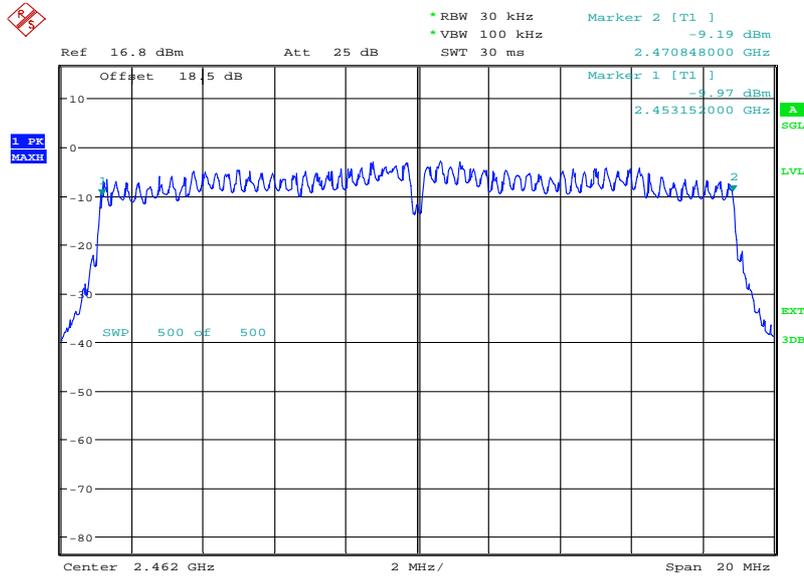


Date: 22.NOV.2011 08:43:15



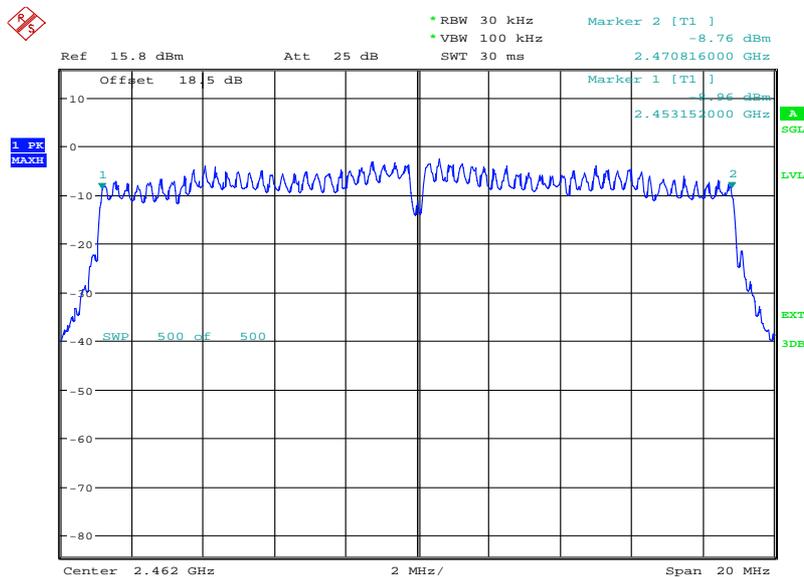
Product Service

58.5 Mbps



Date: 22.NOV.2011 08:57:32

65 Mbps



Date: 22.NOV.2011 09:13:12

Limit Clause

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



Product Service

SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

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

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 – Maximum Peak Conducted Output Power					
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	23-Jun-2012
Attenuator (10dB)	Weinschel	47-10-34	481	12	24-Mar-2012
Attenuator (20dB/ 2W)	Pasternack	PE7004-20	489	12	21-Sep-2012
Power Divider	Weinschel	1506A	604	12	17-Mar-2012
Broadband Resistive Power Divider	Weinschel	1506A	605	12	6-Sep-2012
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	28-Jun-2012
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	13-Mar-2012
Power Supply Unit	Farnell	TSV-70	2043	-	O/P Mon
Multimeter	Iso-tech	IDM101	2421	12	26-Oct-2012
Multimeter	Iso-tech	IDM101	2424	12	5-Sep-2012
Power Supply Unit	Weir	460	2754	-	TU
GSM Test Set	Rohde & Schwarz	CMU 200	2809	12	26-May-2012
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Feb-2012
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	8-Feb-2012
DC - 12.4 GHz 10 dB Attenuator 1 W	Suhner	6810.17.A	3964	12	24-Jun-2012
P-Series Power Meter	Agilent	N1911A	3981	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3983	12	12-Sep-2012
Section 2.2 – EIRP Peak Power					
Peak Power Analyser	Hewlett Packard	8990A	107	12	11-Feb-2012
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Screened Room (5)	Rainford	Rainford	1545	36	3-Feb-2014
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
EMI Test Receiver	Rohde & Schwarz	ESIB26	2028	12	4-Oct-2012
Power Sensor	Hewlett Packard	84812A	2743	-	TU
Antenna (DRG Horn)	ETS-LINDGREN	3115	3125	12	27-Apr-2012
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	22-Aug-2012
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2011
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Feb-2012
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	26-Aug-2012
Tilt Antenna Mast	mature GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	mature GmbH	NCD	3917	-	TU
P-Series Power Meter	Agilent	N1911A	3980	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3982	12	12-Sep-2012



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.3 - Power Spectral Density					
Power Divider	Weinschel	1506A	604	12	17-Mar-2012
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	13-Mar-2012
Multimeter	Iso-tech	IDM101	2424	12	5-Sep-2012
Power Supply Unit	Weir	460	2754	-	TU
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Feb-2012
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	8-Feb-2012
DC - 12.4 GHz 10 dB Attenuator 1 W	Suhner	6810.17.A	3964	12	24-Jun-2012
P-Series Power Meter	Agilent	N1911A	3981	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3983	12	12-Sep-2012
Section 2.4 – Spurious and Band Edge Emissions					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Communications Tester	Rohde & Schwarz	CMU 200	442	12	13-Oct-2012
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	23-Jun-2012
Attenuator (10dB)	Weinschel	47-10-34	481	12	24-Mar-2012
Attenuator (20dB/ 2W)	Pasternack	PE7004-20	489	12	21-Sep-2012
Power Divider	Weinschel	1506A	604	12	17-Mar-2012
Broadband Resistive Power Divider	Weinschel	1506A	605	12	6-Sep-2012
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	28-Jun-2012
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	13-Mar-2012
Antenna (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	2-Aug-2012
Pre-Amplifier	Phase One	PS04-0086	1533	12	20-Sep-2012
Screened Room (5)	Rainford	Rainford	1545	36	3-Feb-2014
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
EMI Test Receiver	Rohde & Schwarz	ESIB26	2028	12	4-Oct-2012
Power Supply Unit	Farnell	TSV-70	2043	-	O/P Mon
4GHz HPF	Sematron	F-100-4000-5-R	2245	-	TU
Multimeter	Iso-tech	IDM101	2421	12	26-Oct-2012
Multimeter	Iso-tech	IDM101	2424	12	5-Sep-2012
Power Supply Unit	Weir	460	2754	-	TU
Filter	Daden Anthony Ass	MH-1500-7SS	2778	12	22-Dec-2011
GSM Test Set	Rohde & Schwarz	CMU 200	2809	12	26-May-2012
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
Antenna (DRG Horn)	ETS-LINDGREN	3115	3125	12	27-Apr-2012
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	10-Jun-2012
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	22-Aug-2012
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
Power Divider	Weinschel	1506A	3345	12	4-May-2012
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2011
Power Meter	Rohde & Schwarz	NRP	3491	12	19-Apr-2012
Wideband Power Sensor, 50MHz - 18GHz	Rohde & Schwarz	NRP-Z81	3492	12	19-Apr-2012
Vector Signal Generator	Rohde & Schwarz	SMU 200A	3493	12	20-Sep-2012
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
Power magnetic field Coil (Horizontal 2.1m*2.2m)	TUV	N/A	3522	-	TU
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Feb-2012
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	8-Feb-2012
3 GHz High Pass Filter	K&L Microwave	11SH10-3000/X18000-O/O	3552	12	14-Apr-2012



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Section 2.4 – Spurious and Band Edge Emissions					
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3696	12	28-Jan-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	11-Jan-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	11-Jan-2012
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3703	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	26-Aug-2012
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU
DC - 12.4 GHz 10 dB Attenuator 1 W	Suhner	6810.17.A	3964	12	24-Jun-2012
Low Noise Amplifier	Wright Technologies	APS04-0085	3969	12	8-Jul-2012
P-Series Power Meter	Agilent	N1911A	3981	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3983	12	12-Sep-2012
Section 2.5 - 6dB Bandwidth					
Power Divider	Weinschel	1506A	604	12	17-Mar-2012
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	13-Mar-2012
Multimeter	Iso-tech	IDM101	2424	12	5-Sep-2012
Power Supply Unit	Weir	460	2754	-	TU
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Feb-2012
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	8-Feb-2012
DC - 12.4 GHz 10 dB Attenuator 1 W	Suhner	6810.17.A	3964	12	24-Jun-2012
P-Series Power Meter	Agilent	N1911A	3981	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3983	12	12-Sep-2012

TU – Traceability Unscheduled

O/P MON – Output Monitored with Calibrated Equipment



3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	MU
Maximum Peak Conducted Output Power	± 0.70 dB
EIRP Peak Power	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB
Power Spectral Density	± 3.0 dB
Spurious and Band Edge Emissions	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB
6dB Bandwidth	± 212.114 kHz



Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

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