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Report On

FCC Testing of the Sharp CDMA SHI12
Tri-band CDMA (BC0/BC3, BC6) Cellular Phone with Bluetooth, WLAN
& FeliCa and GPS
In accordance with FCC CFR 47 Part 15C (WLAN)

COMMERCIAL-IN-CONFIDENCE

FCC ID: APYHRO00150

Document 75913731 Report 05 Issue 2

June 2011



Product Service

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Fareham, Hampshire, United Kingdom, PO15 5RL
Tel: +44 (0) 1489 558100. Website: www.tuvps.co.uk

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REPORT ON

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Document 75913731 Report 05 Issue 2

June 2011

PREPARED FOR

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Bracknell
Berkshire
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PREPARED BY


N Bennett
Senior Administrator

APPROVED BY


M Jenkins
Authorised Signatory

DATED

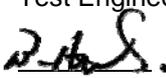
17 June 2011

This report has been up-issued to Issue 2 to correct typographical errors.

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);


B. J. Airs


M Russell


G Lawler




P Harrison



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SECTION 1

REPORT SUMMARY

FCC Testing of the Sharp CDMA SHI12
Tri-band CDMA (BC0/BC3, BC6) Cellular Phone with Bluetooth, WLAN & FeliCa and GPS
In accordance with FCC CFR 47 Part 15C (WLAN)



1.1 INTRODUCTION

The information contained in this report is intended to show verification of Sharp CDMA SHI12 Tri-band CDMA (BC0/BC3, BC6) Cellular Phone with Bluetooth, WLAN & FeliCa 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
Manufacturing Description	Tri-band CDMA (BC0/BC3, BC6) Cellular Phone with Bluetooth, WLAN & FeliCa and GPS
Model Number(s)	CDMA SHI12
Serial Number(s)	SSHFJ000863 SSHFJ000865 SSHFJ000853
Software Version	A4110
Hardware Version	PP1
Number of Samples Tested	Three
Test Specification/Issue/Date	FCC CFR 47 Part 15C: 2010
Incoming Release Date	Application Form 14 June 2011
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	8525 10 May 2011
Start of Test	23 May 2011
Finish of Test	15 June 2011
Name of Engineer(s)	B Airs M Russell G Lawler P Harrison
Related Document(s)	ANSI C63.4: 2003



Product Service

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 15C is shown below.

Configuration 1: 802.11(b)						
Section	Spec Clause	Test Description	Mode	Mod State	Result	Base Standard
2.1	15.247 (2)	6dB Bandwidth	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.2	15.247(a)(2)	Radiated Emissions (Enclosure Port)	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.3	15.247 (b)(3)	Maximum Peak Conducted Output Power	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.4	15.247 (b)(4)	EIRP Peak Power	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.5	15.247(d)	Spurious Emissions	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.6	15.247 (e)	Peak Spectral Power	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.7	15.247 (e)	Band Edge Measurements	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	-	N/A	
			2462 MHz Tx	0	Pass	



Configuration 1: 802.11(g)						
Section	Spec Clause	Test Description	Mode	Mod State	Result	Base Standard
2.1	15.247 (2)	6dB Bandwidth	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.2	15.247(a)(2)	Radiated Emissions (Enclosure Port)	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.3	15.247 (b)(3)	Maximum Peak Conducted Output Power	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.4	15.247 (b)(4)	EIRP Peak Power	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.5	15.247(d)	Spurious Emissions	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.6	15.247 (e)	Peak Spectral Power	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.7	15.247 (e)	Band Edge Measurements	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	-	N/A	
			2462 MHz Tx	0	Pass	



Configuration 1: 802.11(n)						
Section	Spec Clause	Test Description	Mode	Mod State	Result	Base Standard
2.1	15.247 (2)	6dB Bandwidth	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.2	15.247(a)(2)	Radiated Emissions (Enclosure Port)	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.3	15.247 (b)(3)	Maximum Peak Conducted Output Power	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.4	15.247 (b)(4)	EIRP Peak Power	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.5	15.247(d)	Spurious Emissions	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.6	15.247 (e)	Peak Spectral Power	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	0	Pass	
			2462 MHz Tx	0	Pass	
2.7	15.247 (e)	Band Edge Measurements	2412 MHz Tx	0	Pass	ANSI C63.4
			2437 MHz Tx	-	N/A	
			2462 MHz Tx	0	Pass	

N/A – Not Applicable



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1.3 APPLICATION FORM

APPLICANT'S DETAILS			
COMPANY NAME :	Sharp Telecommunications of Europe Ltd		
ADDRESS :	Azure House, Bagshot Road Bracknell, Berkshire RG12 7QY		
NAME FOR CONTACT PURPOSES :	Ken Newman		
TELEPHONE NO: 01344 301 883	FAX NO:	01344 300 293	
	E-MAIL:	ken.newman@sharp.eu	

EQUIPMENT INFORMATION			
<u>Equipment designator:</u>			
Model name/number	CDMA SH12	Identification number	APYHRO00150
<u>Supply Voltage:</u>			
<input type="checkbox"/>	AC mains	State AC voltage V	and AC frequency Hz
<input type="checkbox"/>	DC (external)	State DC voltage V	and DC current A
<input checked="" type="checkbox"/>	DC (internal)	State DC voltage 3.7 V	and Battery type Li-ion
<u>Frequency characteristics:</u>			
Frequency range	2412 MHz to 2462 MHz	Channel spacing	(if channelized)
Designated test frequencies:	Bottom: 2412 MHz	Middle: 2437 MHz	Top: 2462 MHz
<u>Power characteristics:</u>			
Maximum transmitter power	17.3 dBm	Minimum transmitter power W
<input checked="" type="checkbox"/>	Continuous transmission	(if variable)	
<input type="checkbox"/>	Intermittent transmission	State duty cycle	
	If intermittent, can transmitter be set to continuous transmit test mode? Y/N		
<u>Antenna characteristics:</u>			
<input type="checkbox"/>	Antenna connector	State impedance	ohm
<input checked="" type="checkbox"/>	Temporary antenna connector	State impedance 50 ohm	
<input type="checkbox"/>	Integral antenna	State gain 2.14 dBi	
<u>Modulation characteristics:</u>			
<input type="checkbox"/>	Amplitude	<input type="checkbox"/>	Other
<input type="checkbox"/>	Frequency	Details:	
<input checked="" type="checkbox"/>	Phase		
Can the transmitter operate un-modulated?	N		
ITU Class of emission:			
<u>Extreme conditions:</u>			
Maximum temperature	+60 °C	Minimum temperature	-20 °C
Maximum supply voltage	4.0 V	Minimum supply voltage	3.7 V

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

Signature : *M. Kishino*
 Name : Masahiko Kishino
 Position held : Manager
 Date : 14 June 2011



Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp CDMA SHI12 Tri-band CDMA (BC0/BC3, BC6) Cellular Phone with Bluetooth, WLAN & FeliCa and GPS. A full technical description can be found in the manufacturer's documentation.

1.4.2 Test Configuration

Configuration 1: 802.11(b)

The EUT was configured in accordance with FCC CFR 47 Part 15C.

Configuration 2: 802.11(g)

The EUT was configured in accordance with FCC CFR 47 Part 15C.

Configuration 3: 802.11(n)

The EUT was configured in accordance with FCC CFR 47 Part 15C.

1.4.3 Modes of Operation

Modes of operation of each EUT during testing were as follows:

Mode 1 – 2412 MHz Tx

Mode 2 – 2437 MHz Tx

Mode 3 – 2462 MHz Tx

Information on the specific test modes utilised are detailed in the test procedure for each individual test.



Product Service

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 or test laboratories as appropriate.

The EUT was powered from a 3.7 V DC Supply.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.7 MODIFICATION RECORD

No modifications were made to the EUT during testing.



Product Service

SECTION 2

TEST DETAILS

FCC Testing of the Sharp CDMA SHI12
Tri-band CDMA (BC0/BC3, BC6) Cellular Phone with Bluetooth, WLAN & FeliCa and GPS
In accordance with FCC CFR 47 Part 15C (WLAN)



Product Service

2.1 6dB BANDWIDTH

2.1.1 Specification Reference

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

2.1.2 Equipment Under Test

CDMA SHI12, S/N: SSHFJ000853

2.1.3 Date of Test and Modification State

06 June 2011 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15.

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.

The test was performed with the EUT in the following configurations and modes of operation:

- Configuration 1
 - Mode 1
 - Mode 2
 - Mode 3
- Configuration 2
 - Mode 1
 - Mode 2
 - Mode 3
- Configuration 3
 - Mode 1
 - Mode 2
 - Mode 3

2.1.6 Environmental Conditions

	06 June 2011
Ambient Temperature	22.6°C
Relative Humidity	41.9%



Product Service

2.1.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C for 6dB Bandwidth.

The test results are shown below.

4.0 V DC Supply

Configuration 1 – Modes 1, 2 and 3

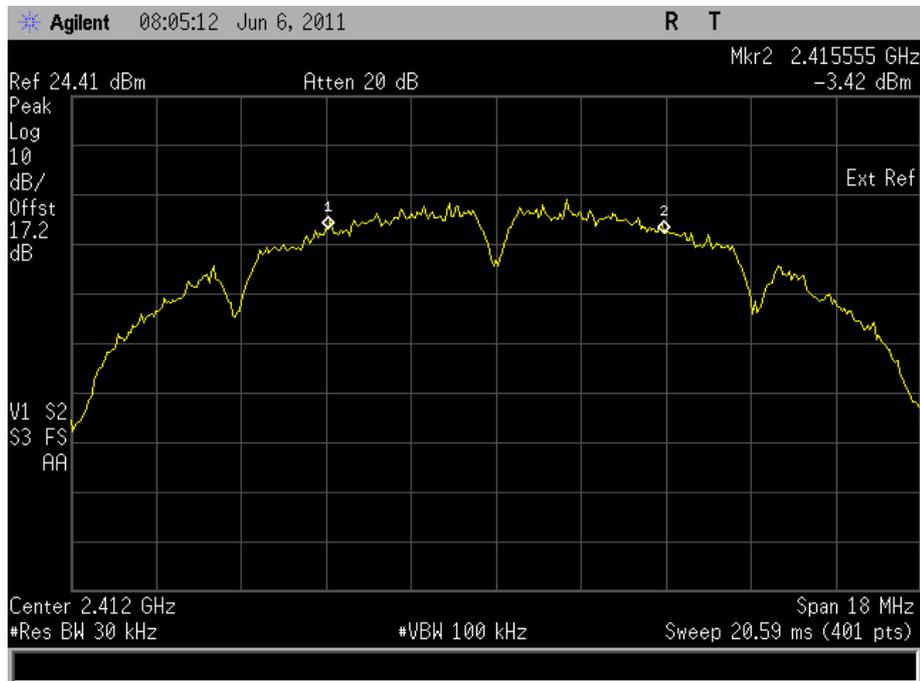
Frequency (MHz)	Data Rate (Mbps)	6dB Bandwidth (kHz)
2412	1	7110
	2	7650
	5	8460
	11	7920
2437	1	7830
	2	7965
	5	7740
	11	8010
2462	1	6615
	2	8775
	5	8145
	11	7560



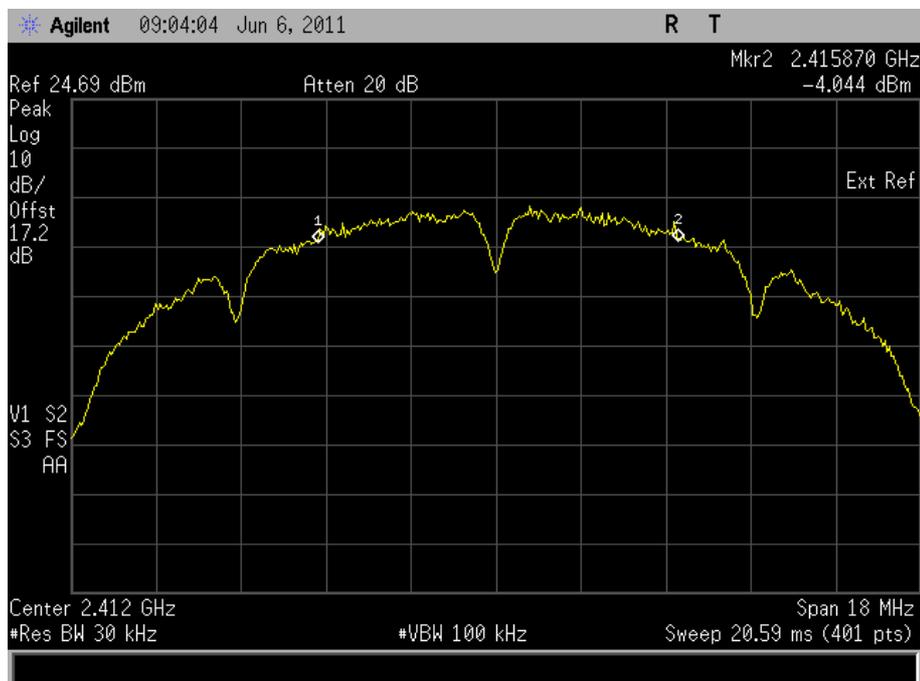
Product Service

2412 MHz

1 Mbps



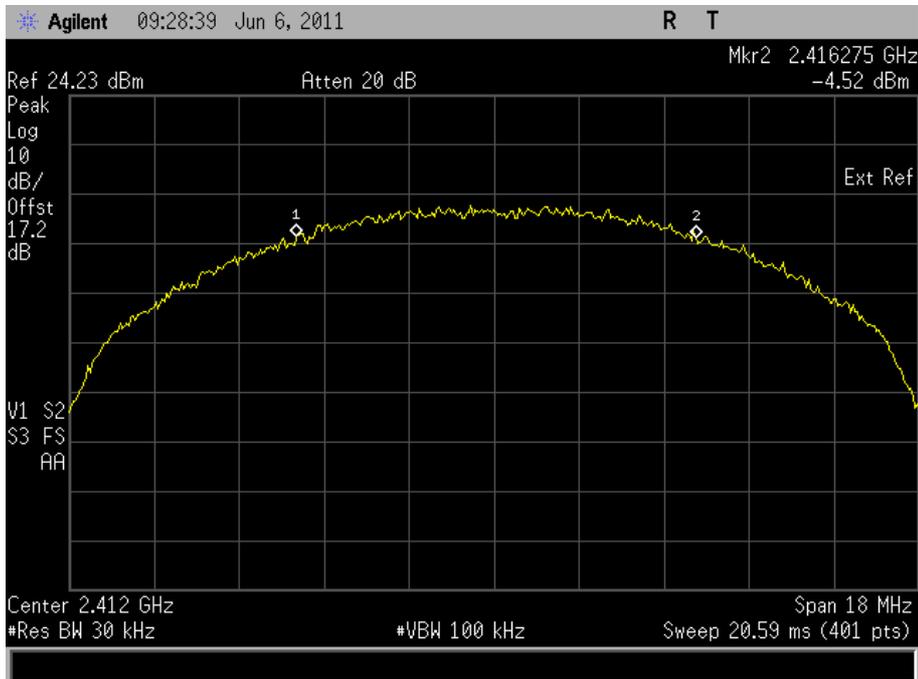
2 Mbps



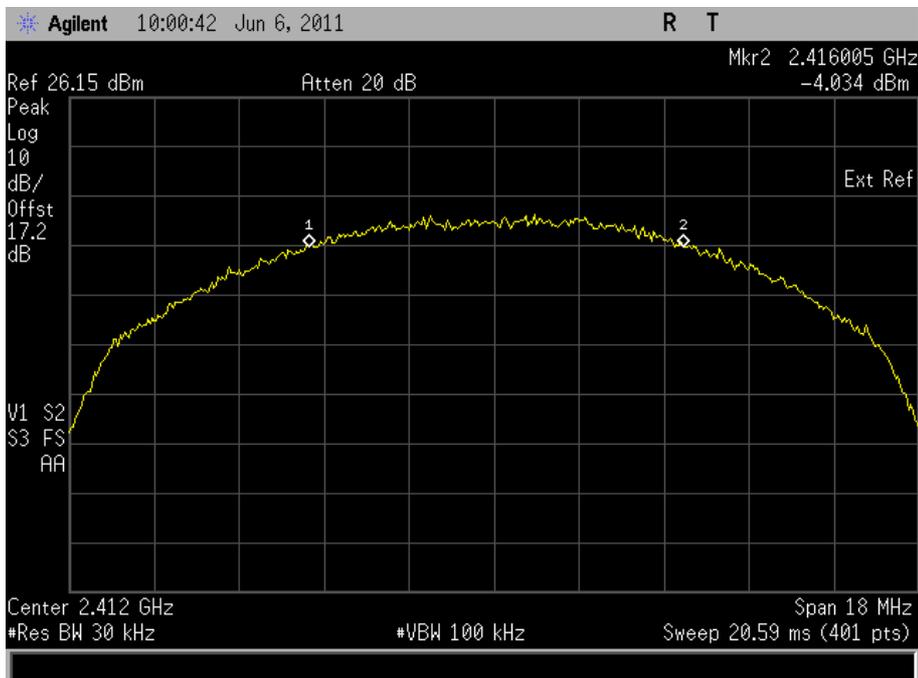


Product Service

5.5 Mbps



11 Mbps

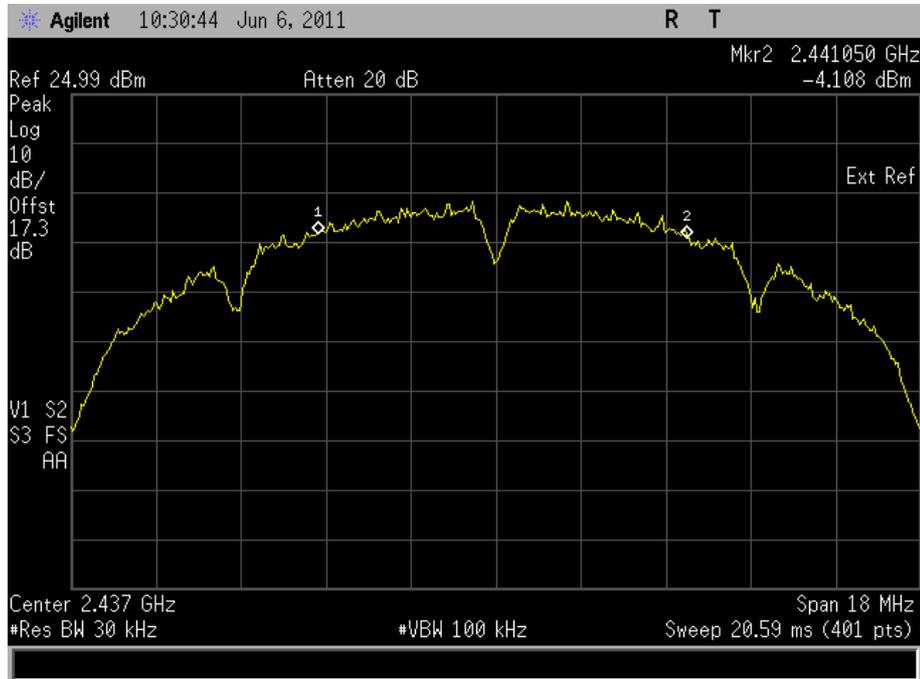




Product Service

2437 MHz

1 Mbps



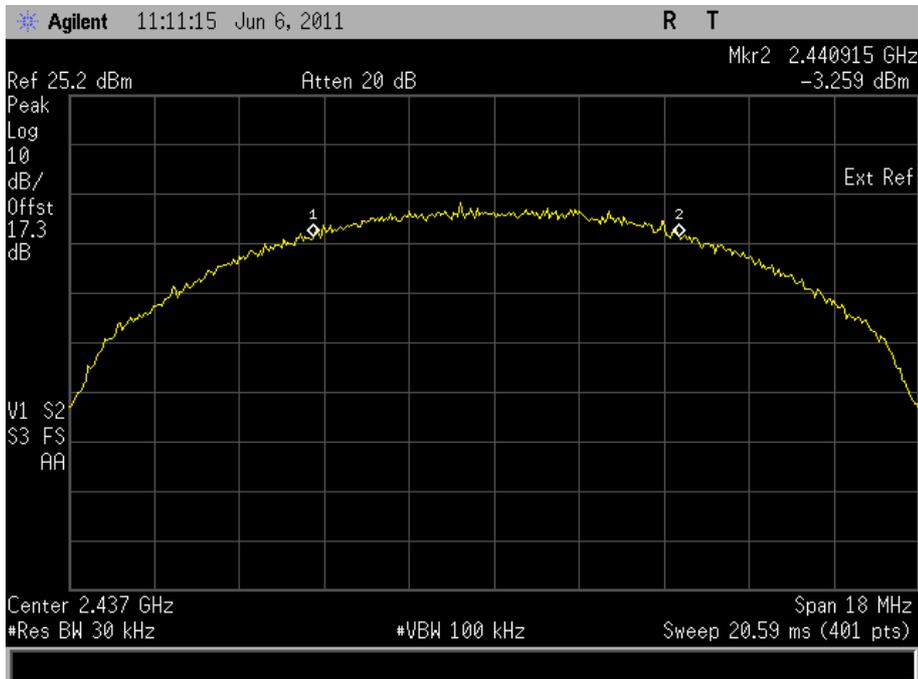
2 Mbps



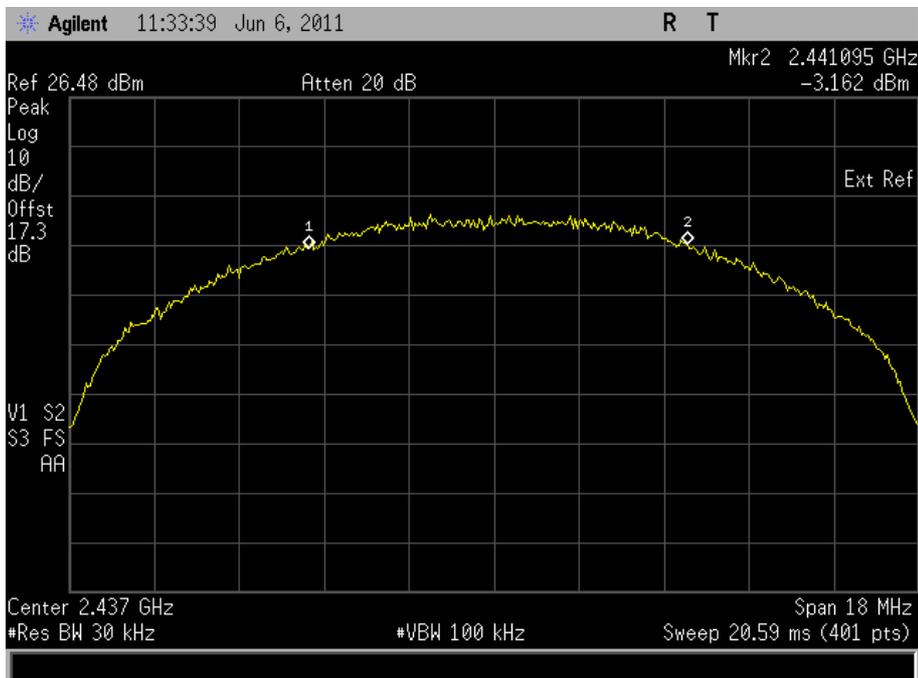


Product Service

5.5 Mbps



11 Mbps

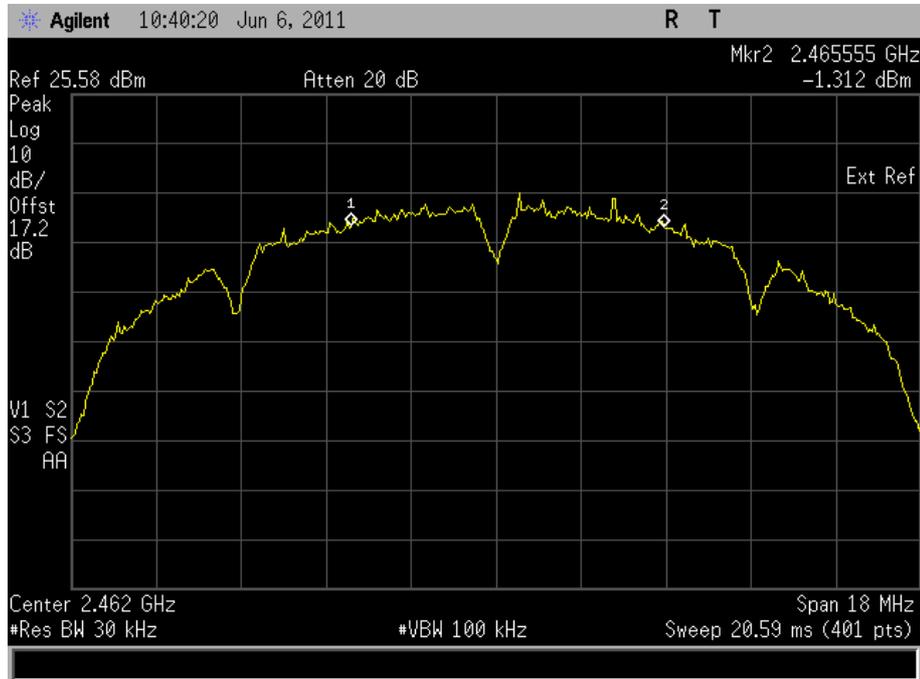




Product Service

2462 MHz

1 Mbps



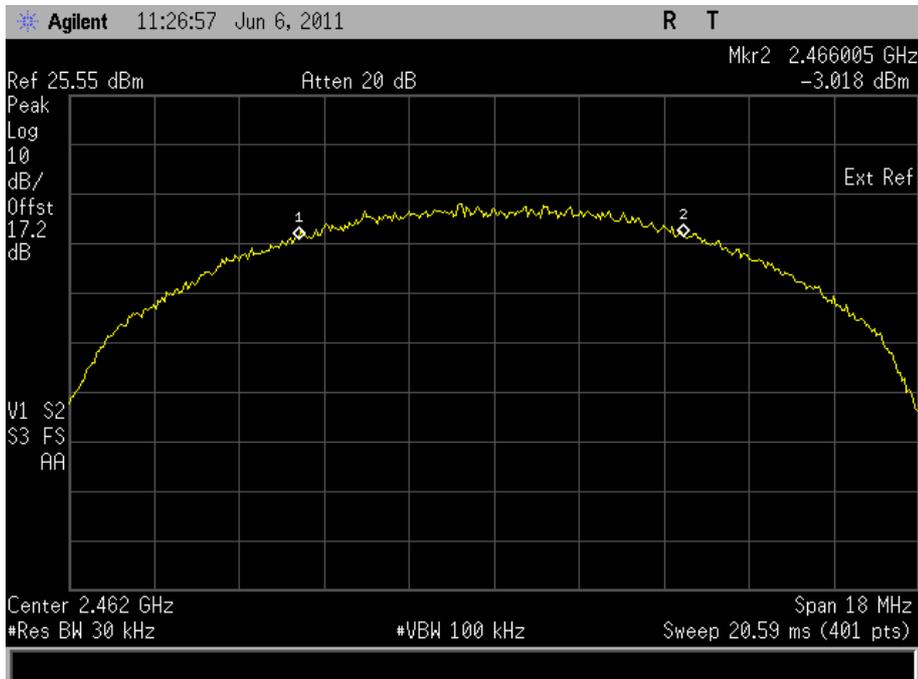
2 Mbps



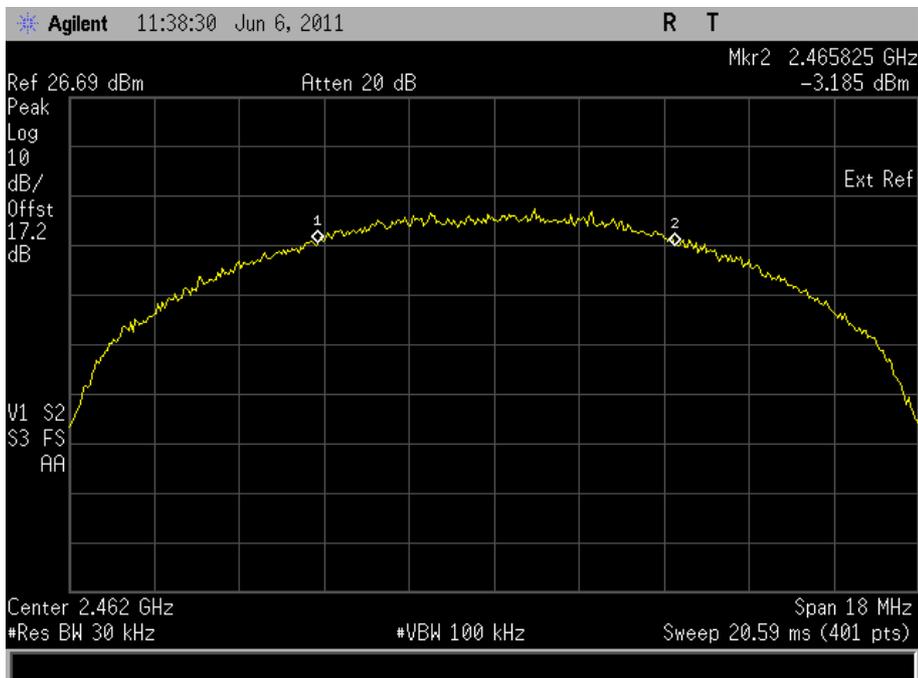


Product Service

5.5 Mbps



11 Mbps





Product Service

Configuration 2 – Modes 1, 2 and 3

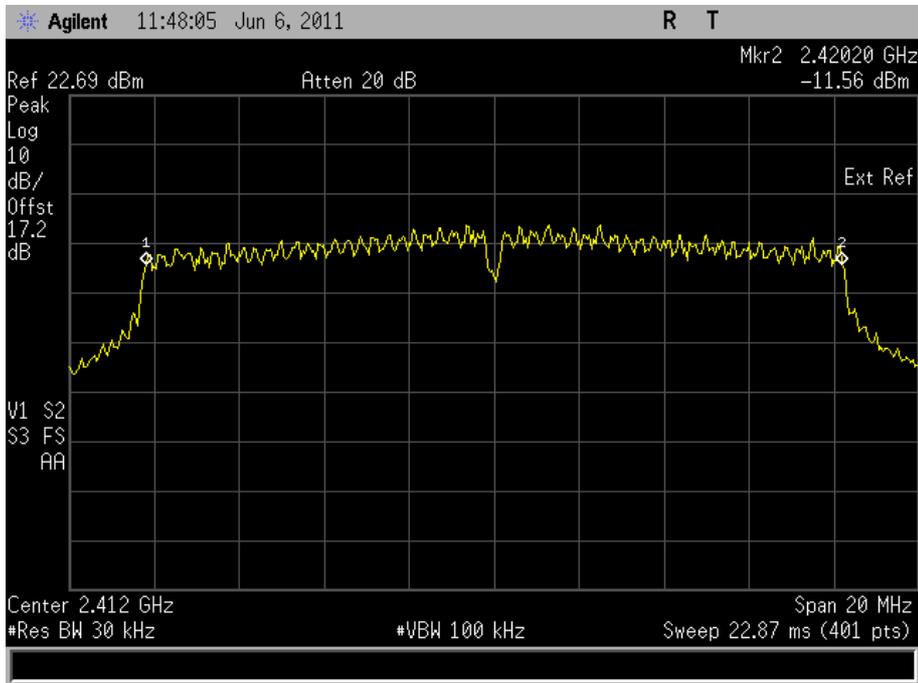
Frequency (MHz)	Data Rate (Mbps)	6dB Bandwidth (kHz)
2412	6	16400
	9	16400
	12	16100
	18	16000
	24	16350
	36	16300
	48	16300
	54	16350
2437	6	16400
	9	16400
	12	16050
	18	16350
	24	16300
	36	16100
	48	16400
	54	16400
2462	6	16400
	9	16400
	12	16350
	18	16400
	24	15850
	36	16450
	48	16450
	54	16400



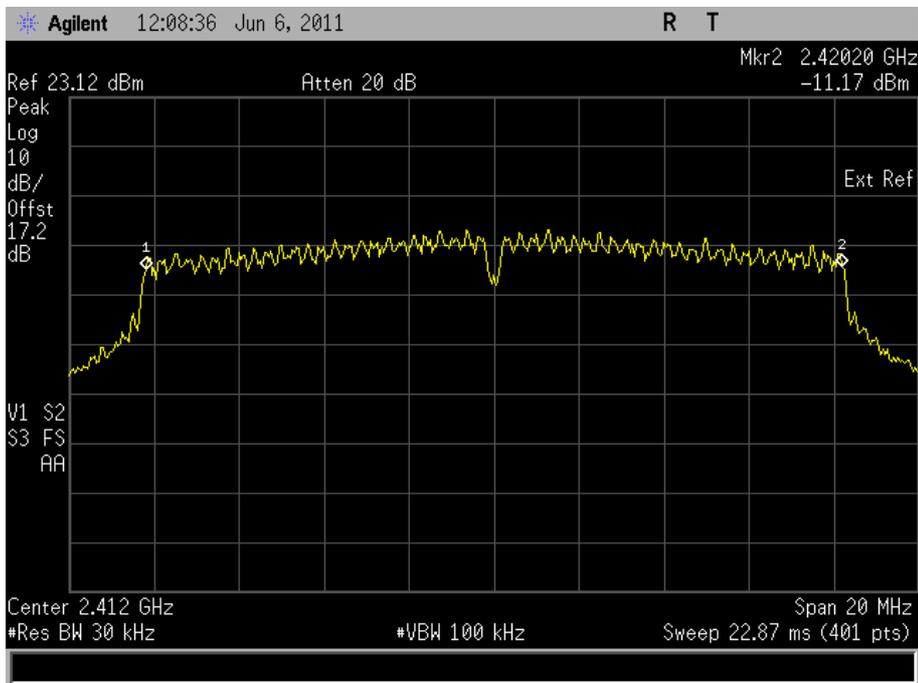
Product Service

2412 MHz

6 Mbps



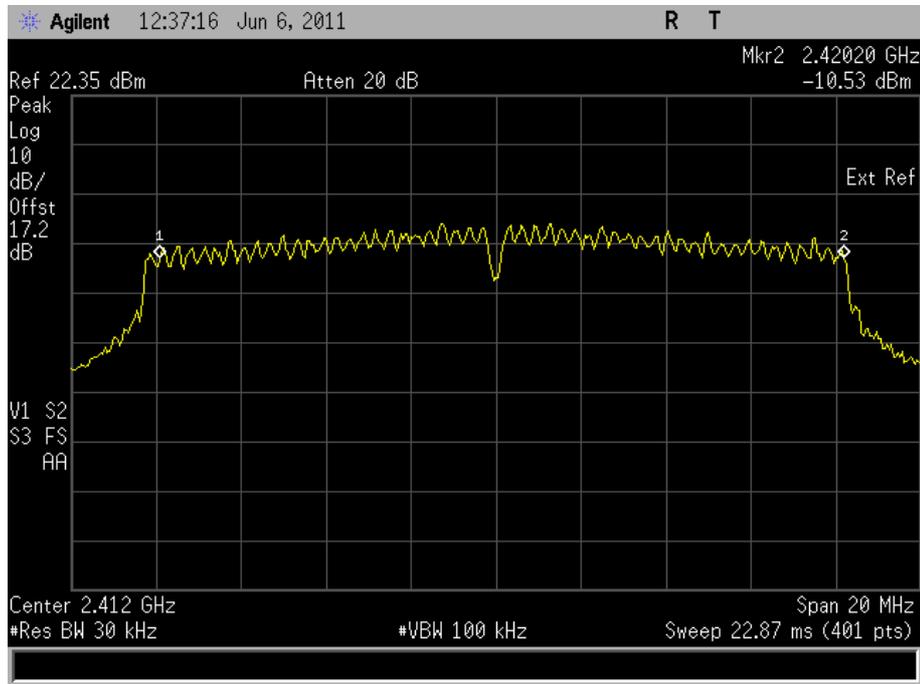
9 Mbps



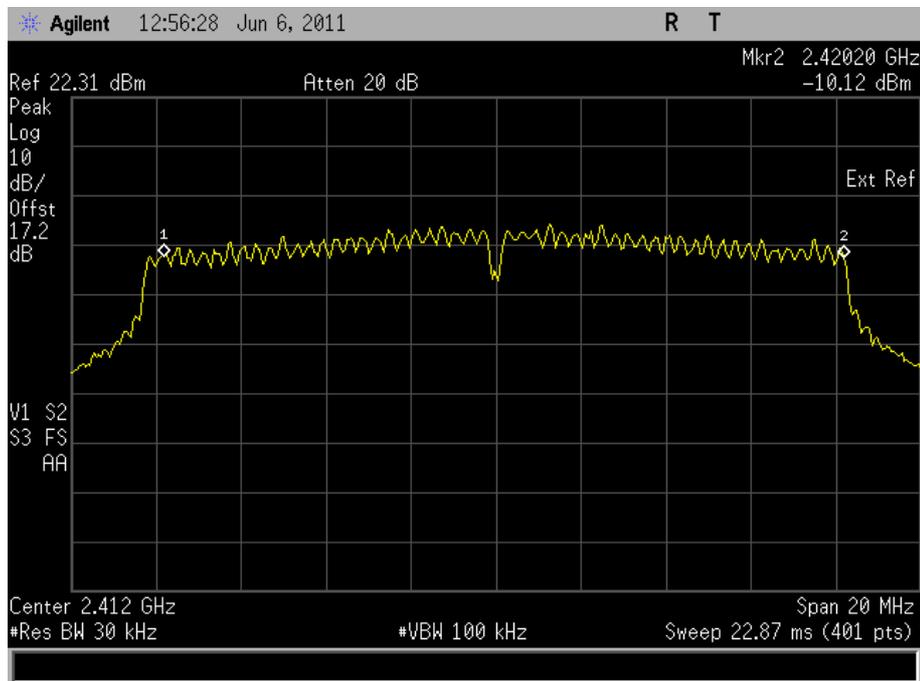


Product Service

12 Mbps



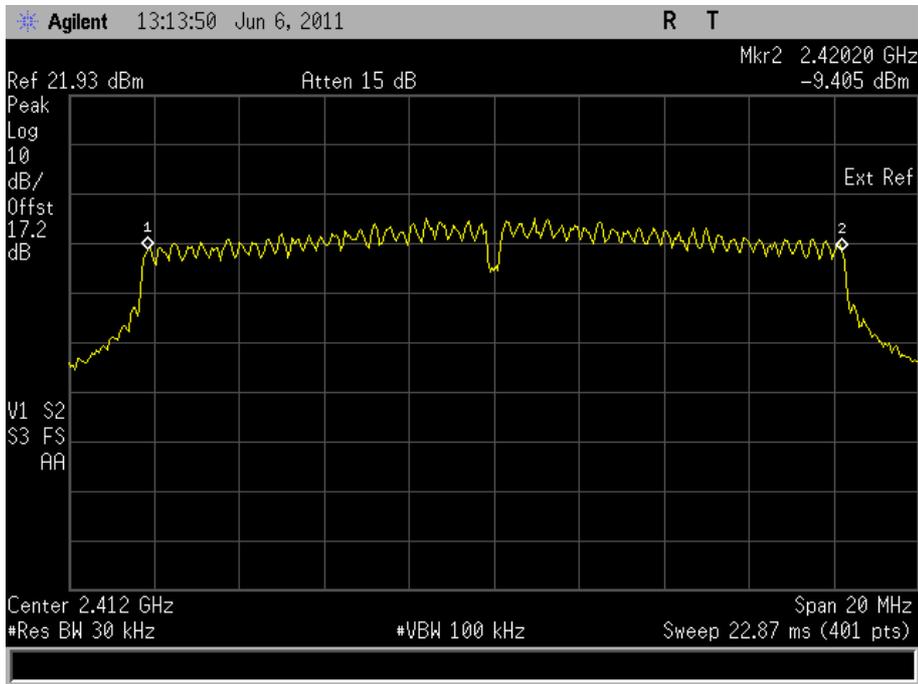
18 Mbps



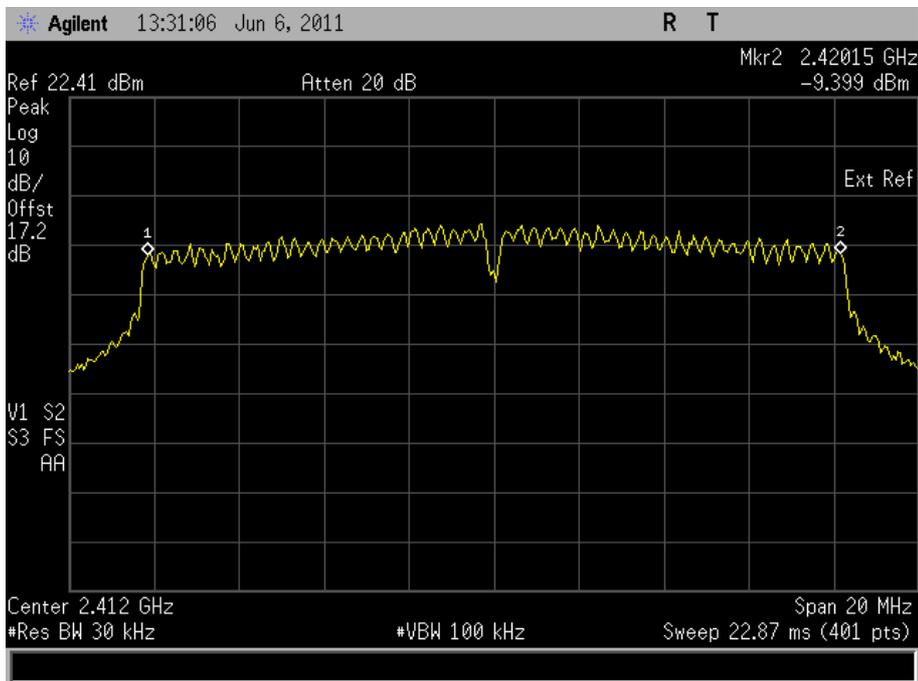


Product Service

24 Mbps



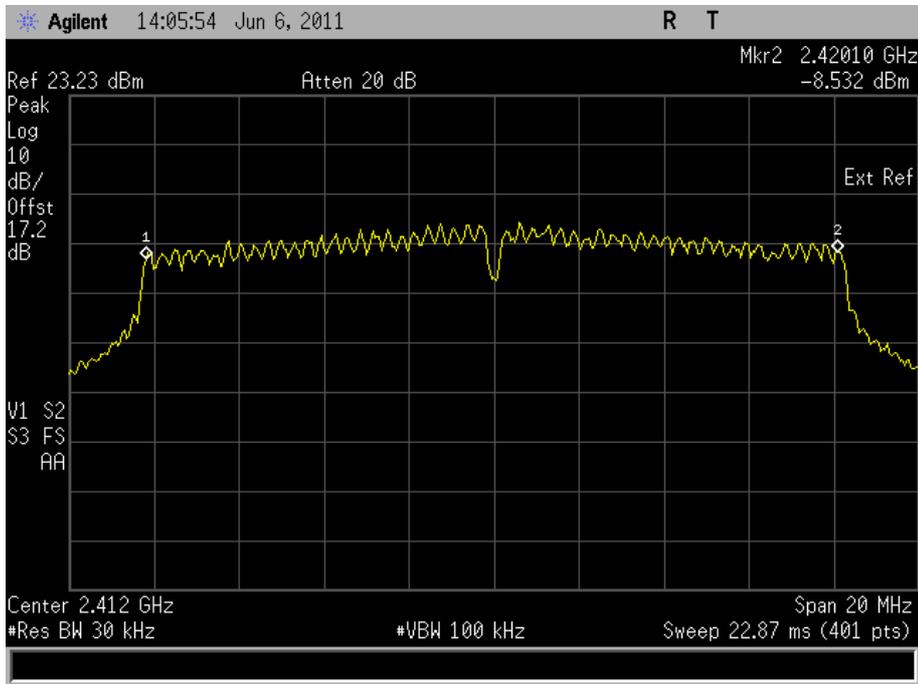
36 Mbps



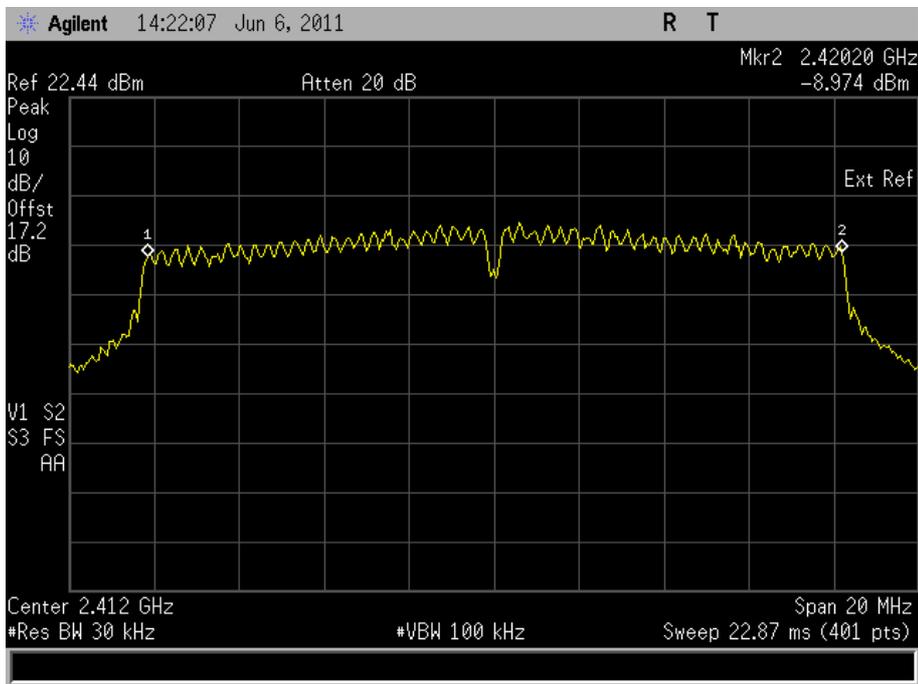


Product Service

48 Mbps



54 Mbps

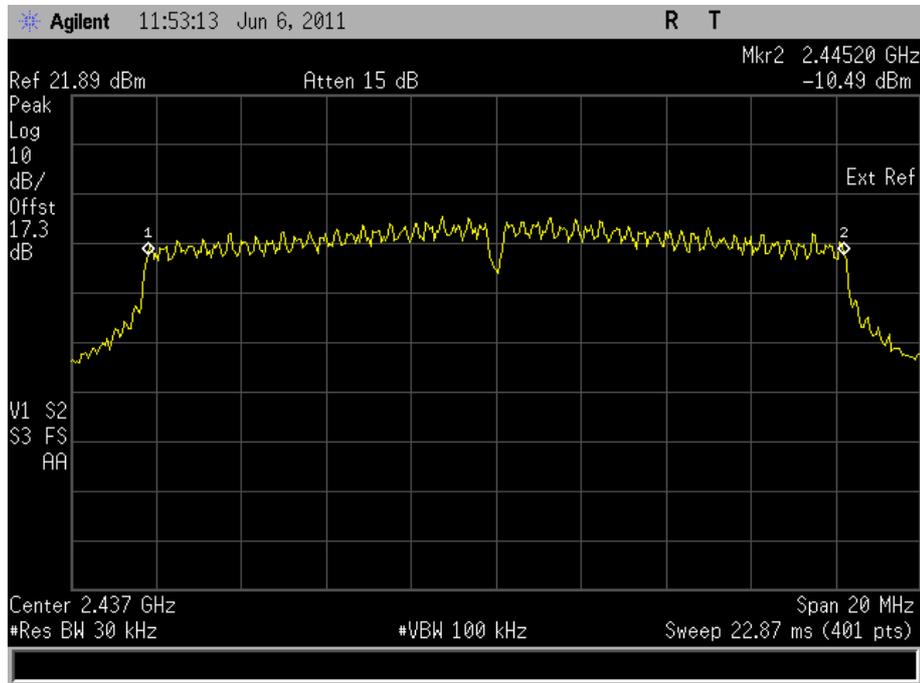




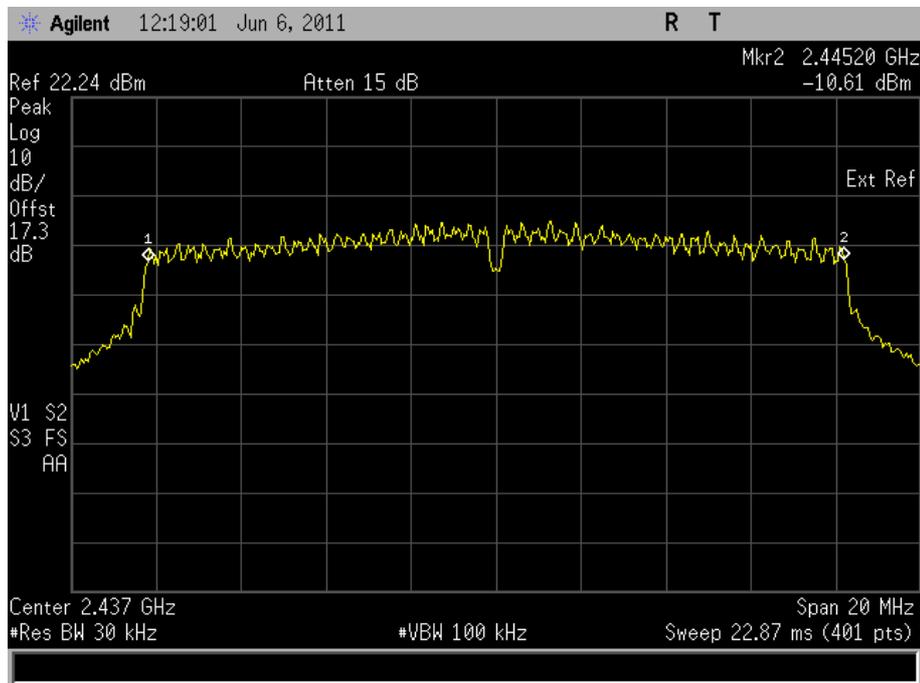
Product Service

2437 MHz

6 Mbps

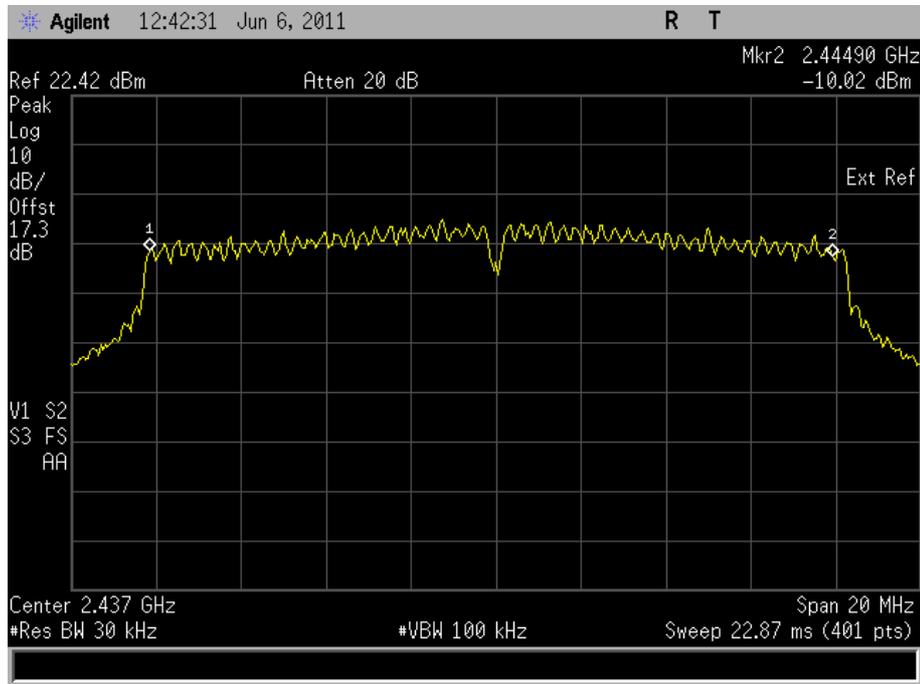


9 Mbps

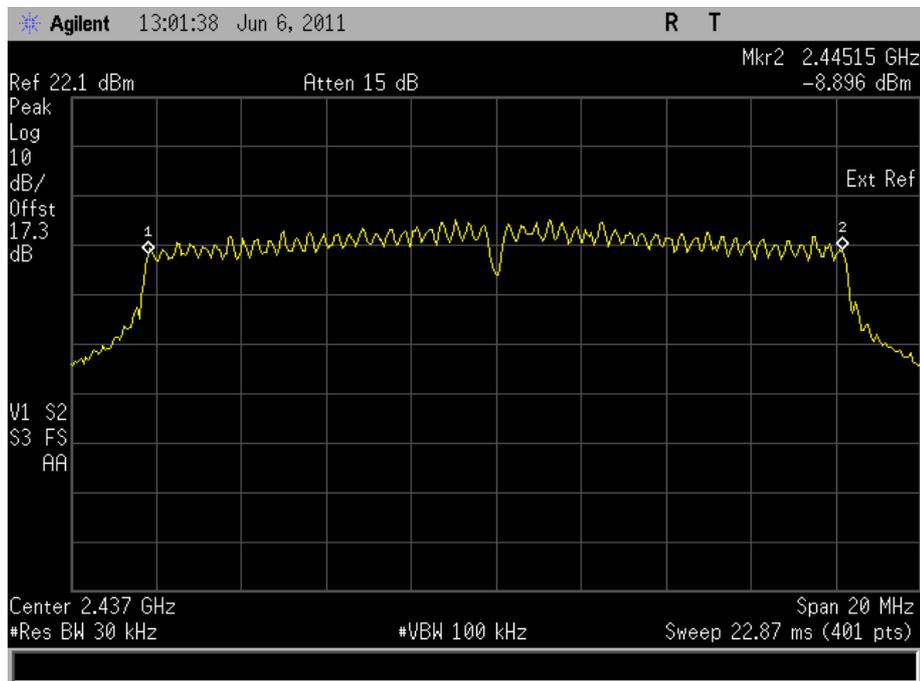




12 Mbps

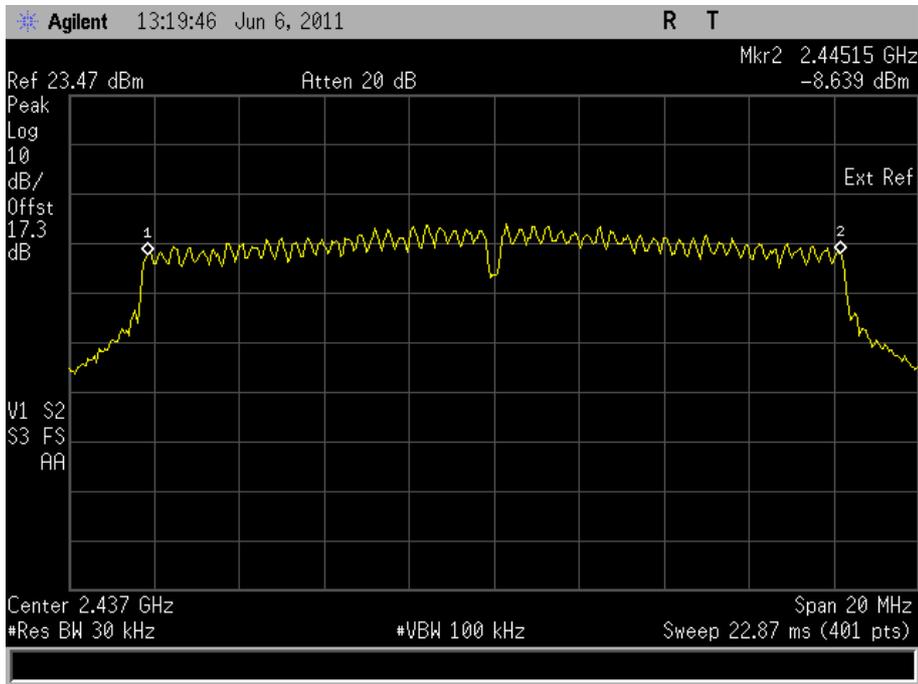


18 Mbps

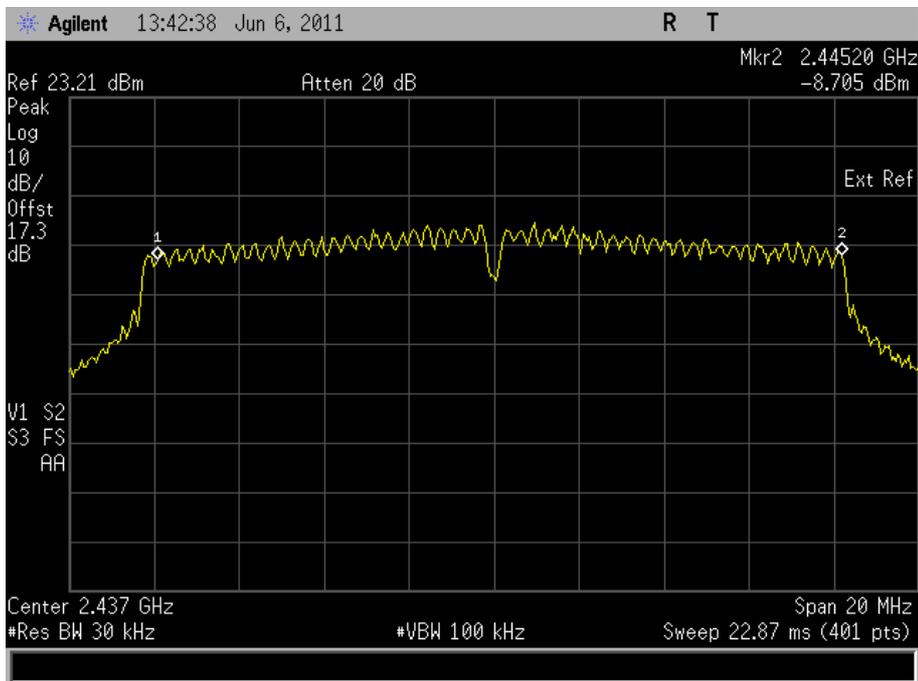




24 Mbps



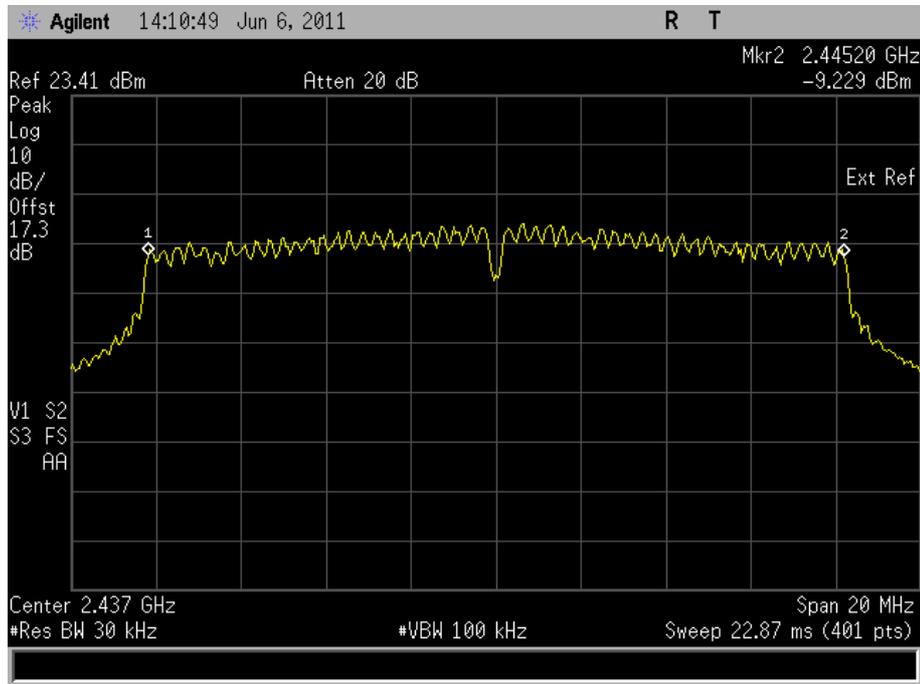
36 Mbps



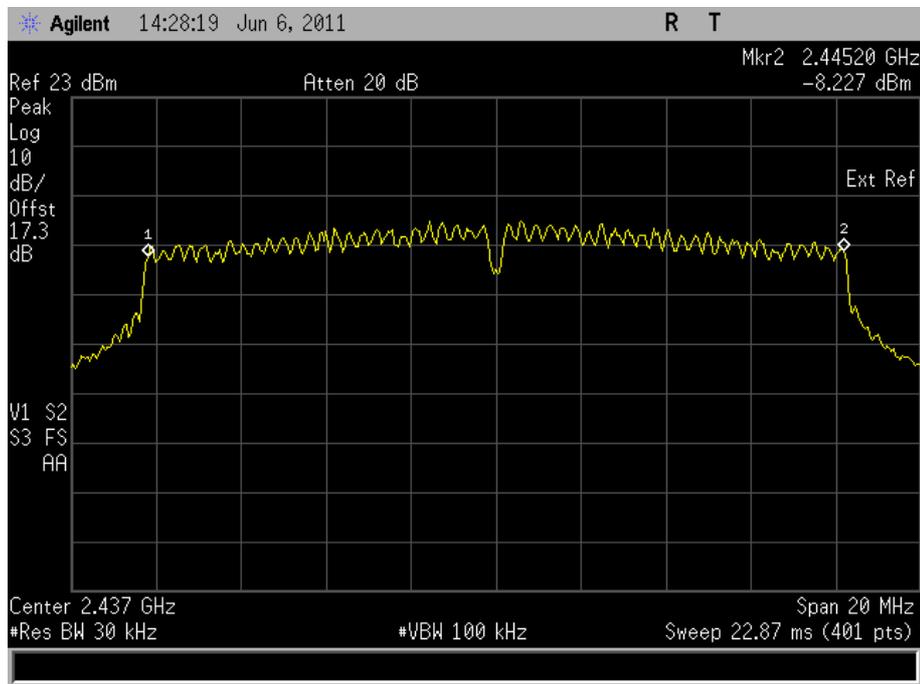


Product Service

48 Mbps



54 Mbps

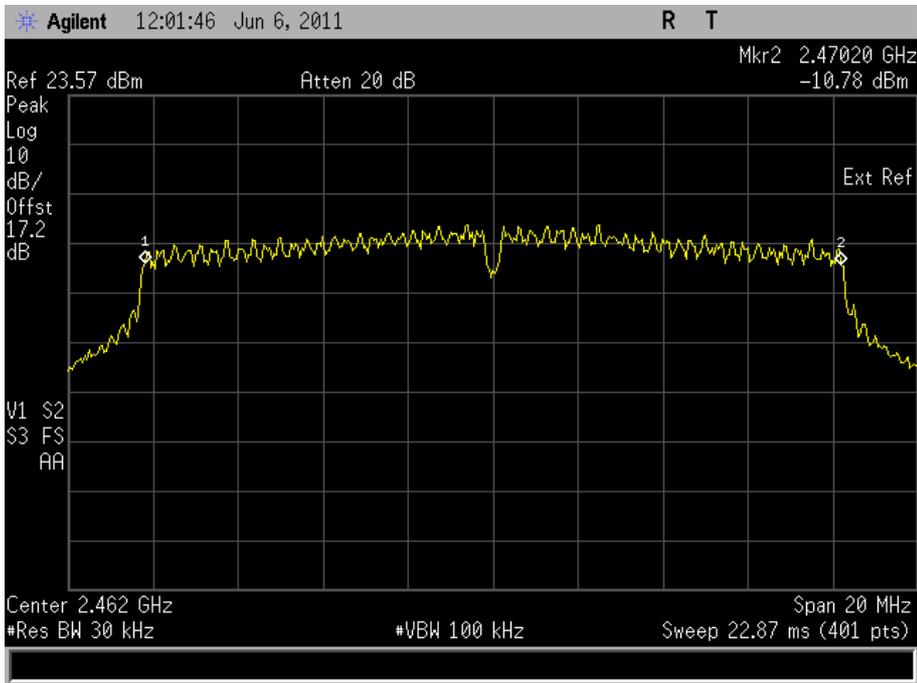




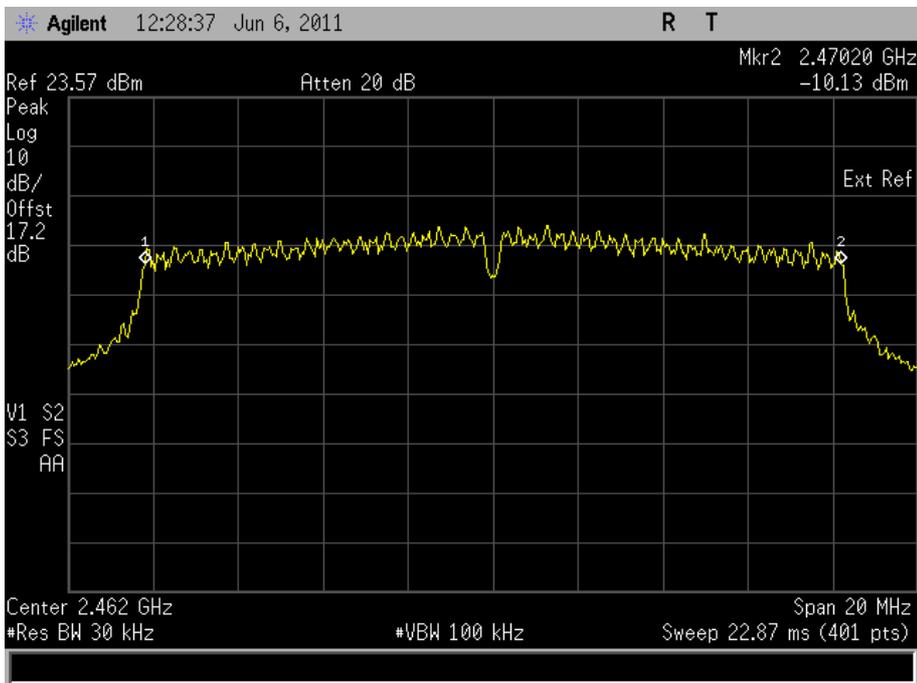
Product Service

2462 MHz

6 Mbps

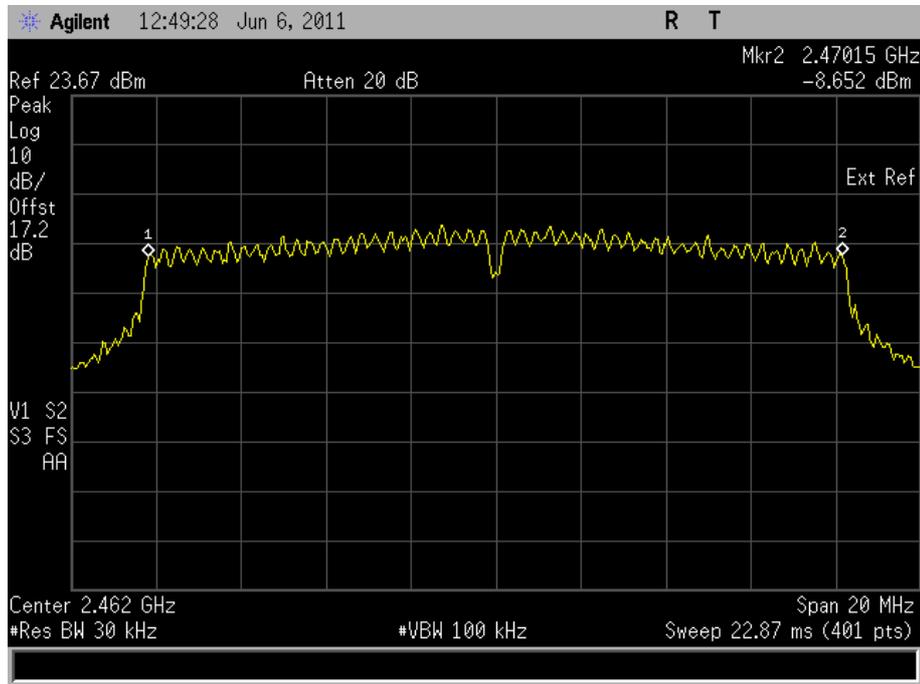


9 Mbps

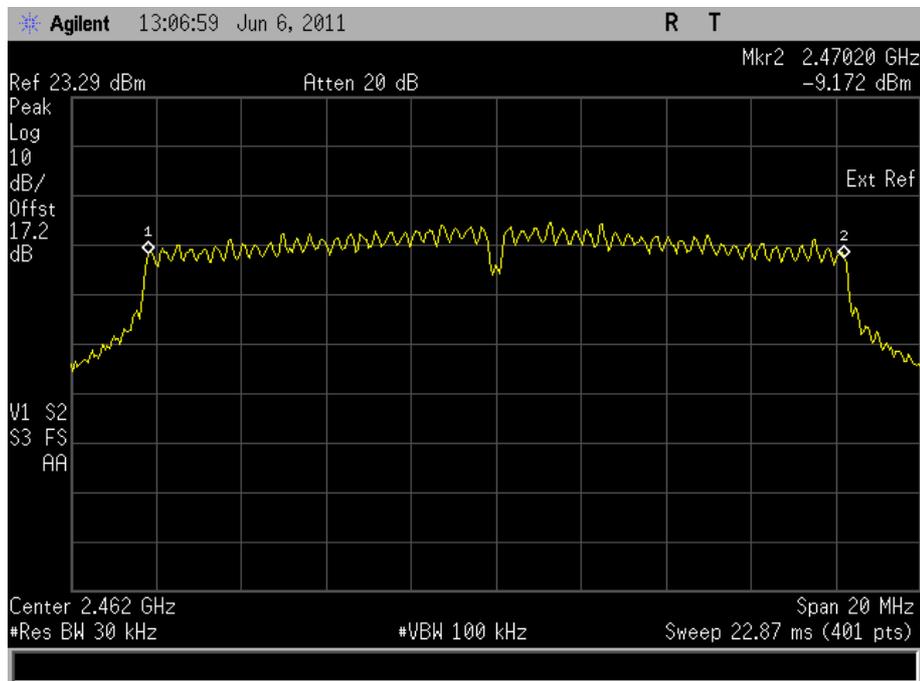




12 Mbps

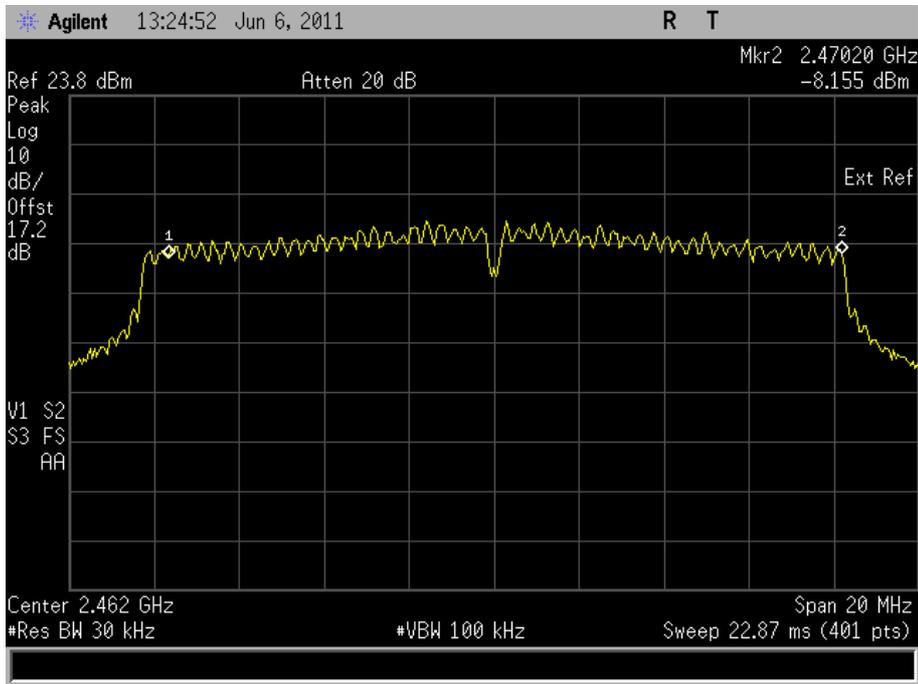


18 Mbps

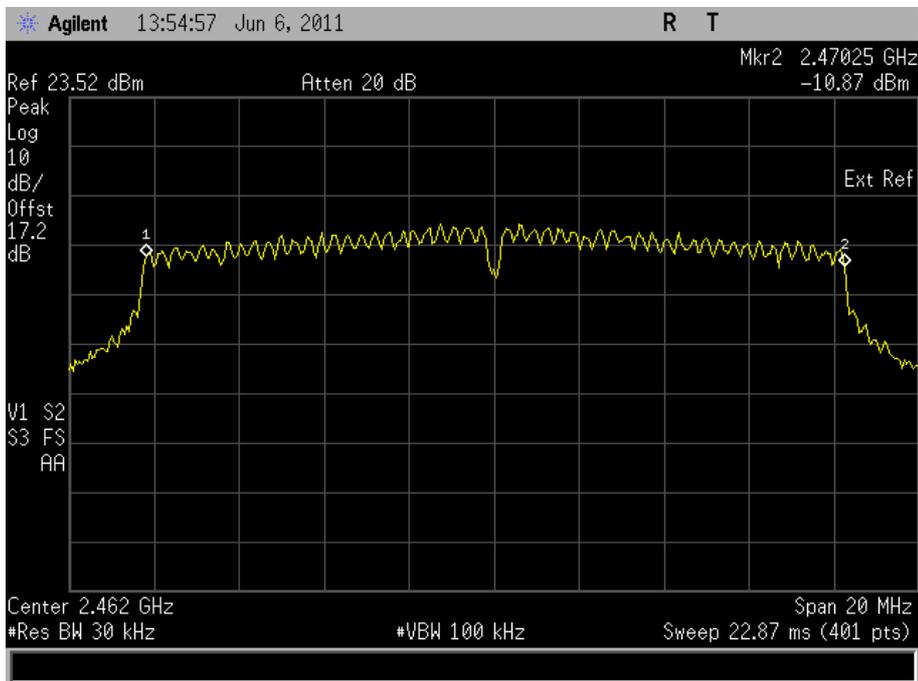




24 Mbps



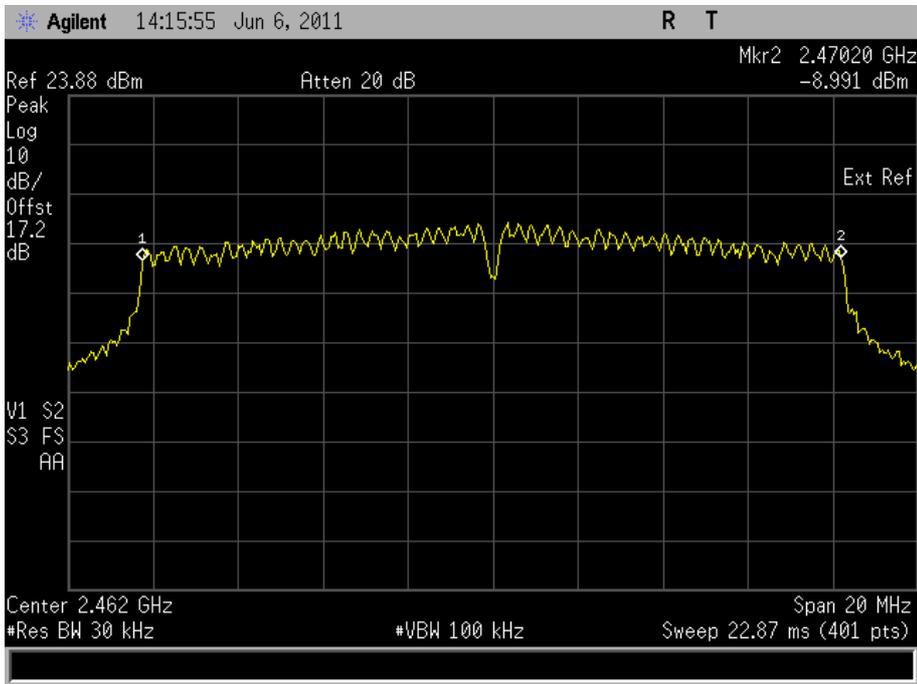
36 Mbps



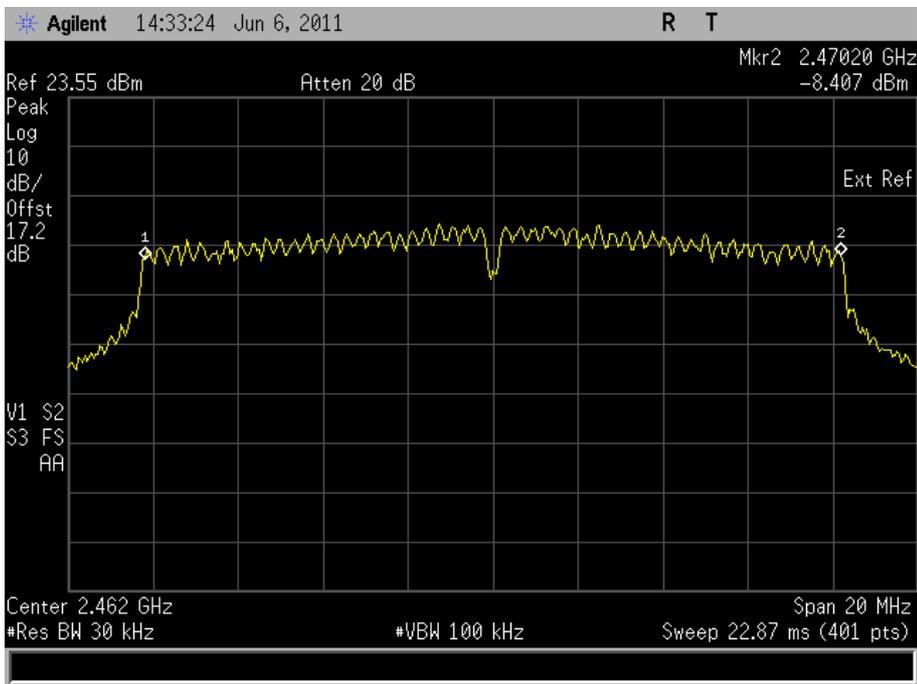


Product Service

48 Mbps



54 Mbps





Product Service

Configuration 3 – Modes 1, 2 and 3

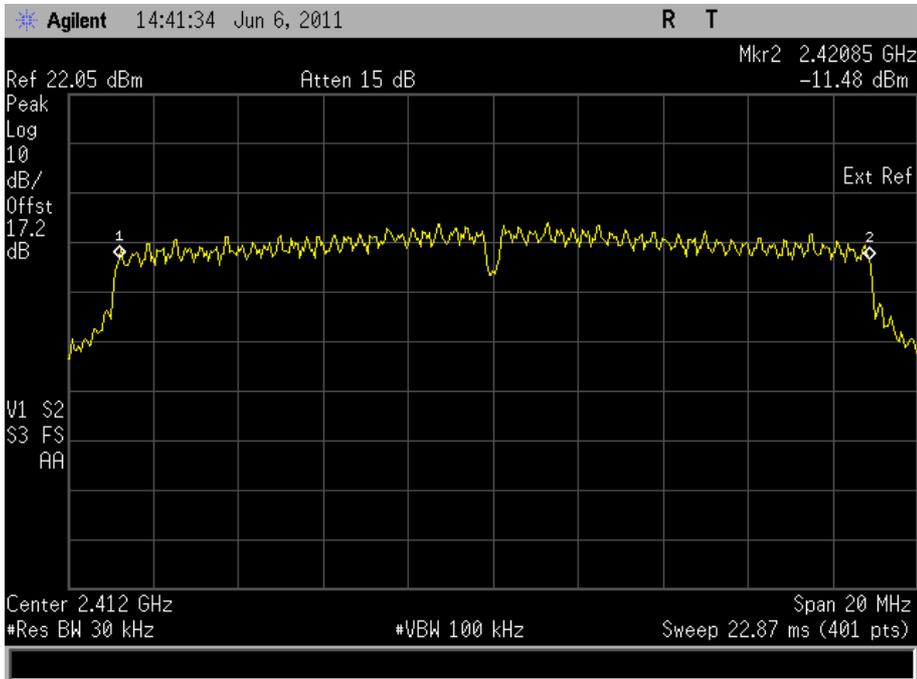
Frequency (MHz)	Data Rate (Mbps)	6dB Bandwidth (kHz)
2412	6.5	17650
	13	17050
	19.5	17650
	26	17700
	39	17350
	52	17650
	58.5	17600
	65	17650
2437	6.5	17600
	13	17650
	19.5	17050
	26	17650
	39	17700
	52	17700
	58.5	17700
	65	17350
2462	6.5	1760
	13	17000
	19.5	17050
	26	17350
	39	17700
	52	17700
	58.5	17750
	65	17700



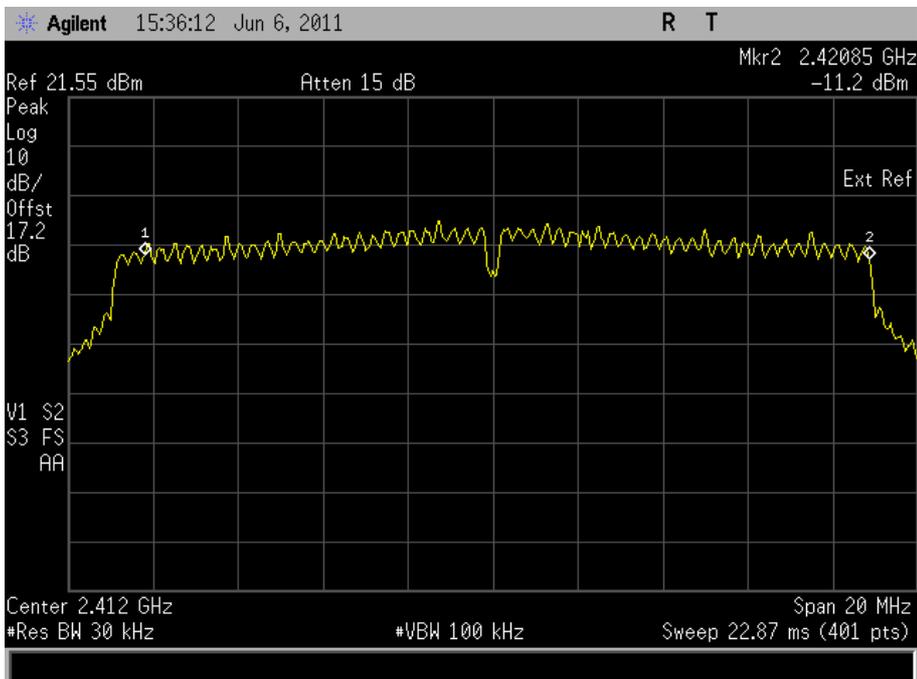
Product Service

2412 MHz

6.5 Mbps



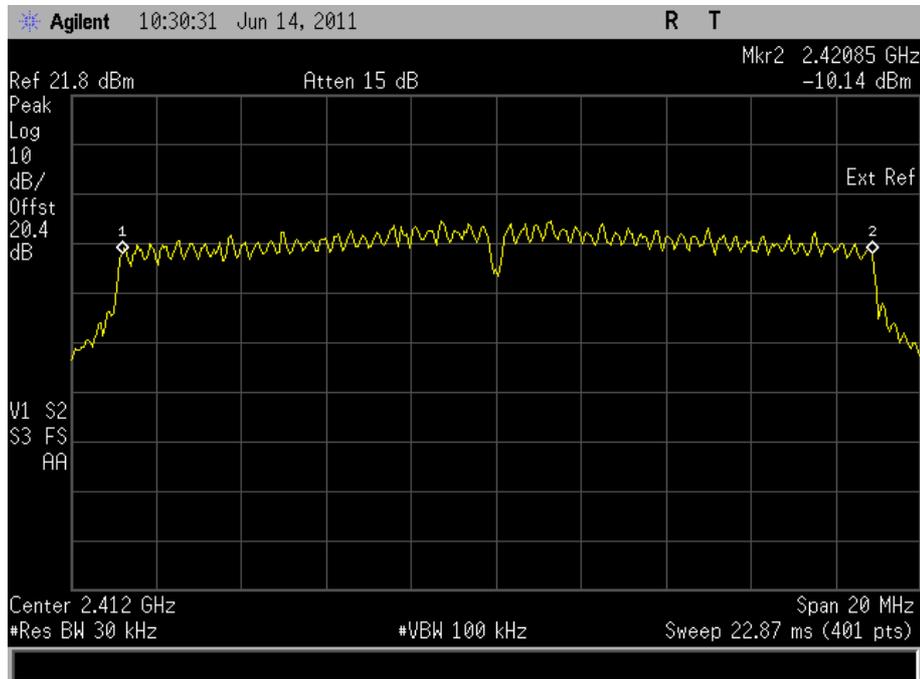
13 Mbps



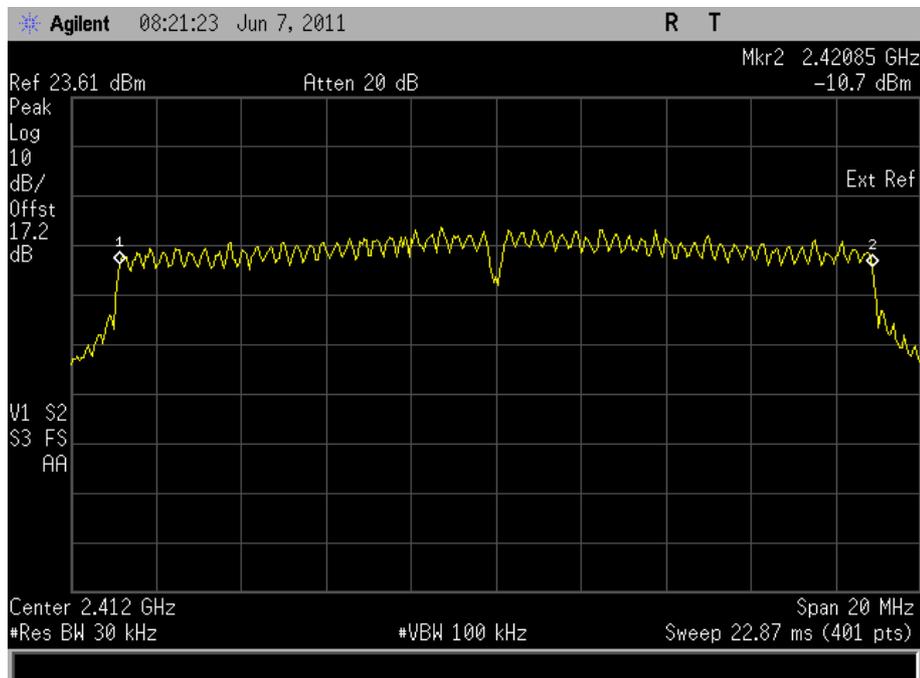


Product Service

19.5 Mbps



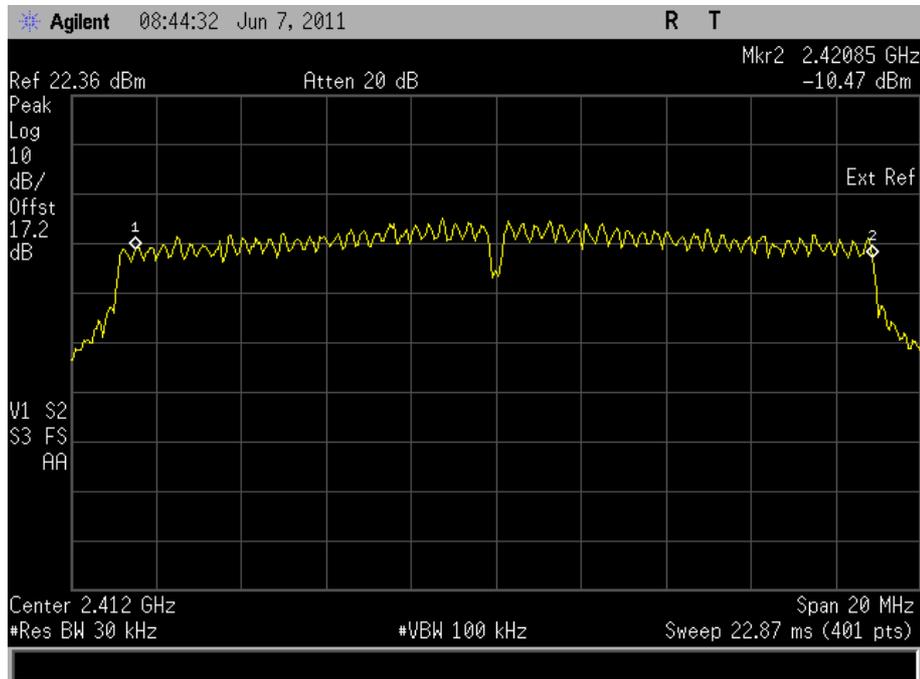
26 Mbps



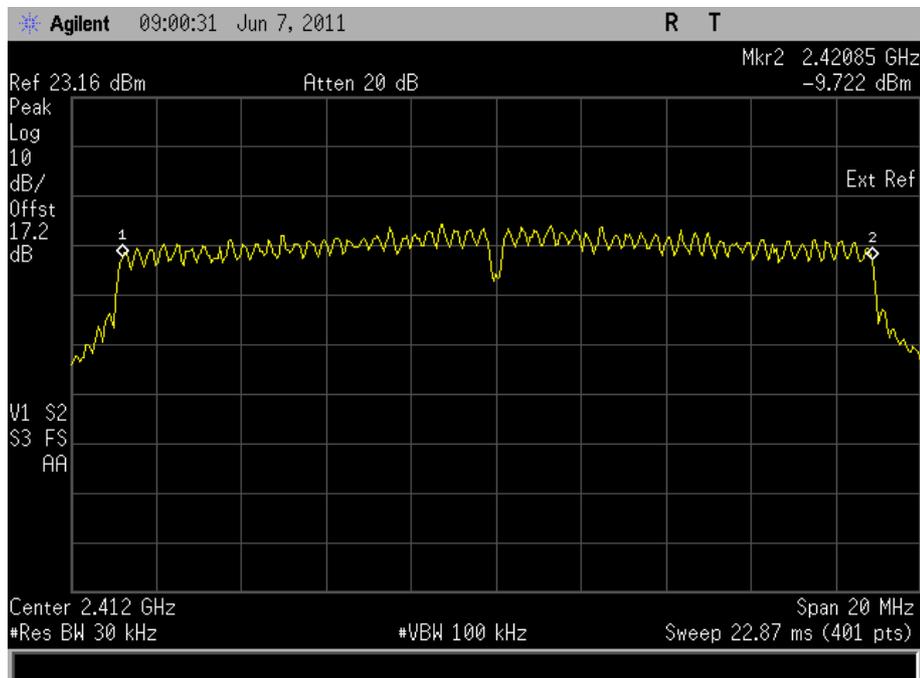


Product Service

39 Mbps



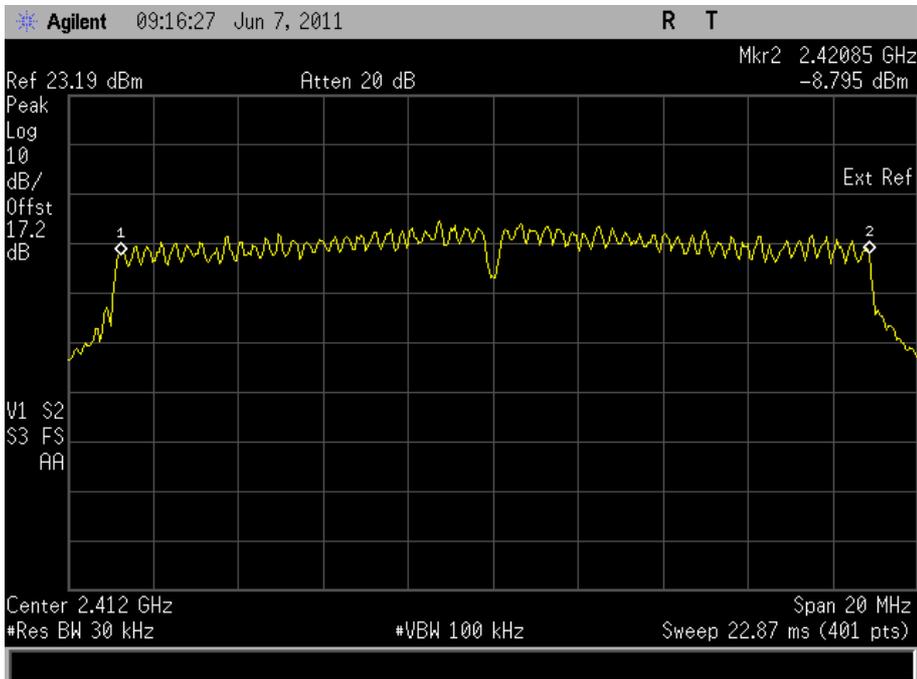
52 Mbps



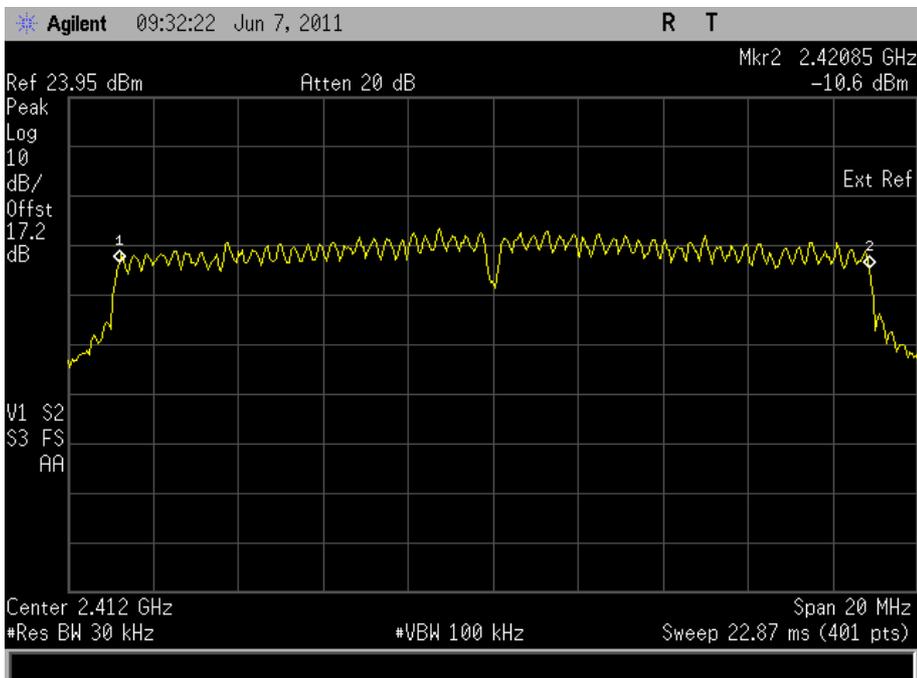


Product Service

58.5 Mbps



65 Mbps

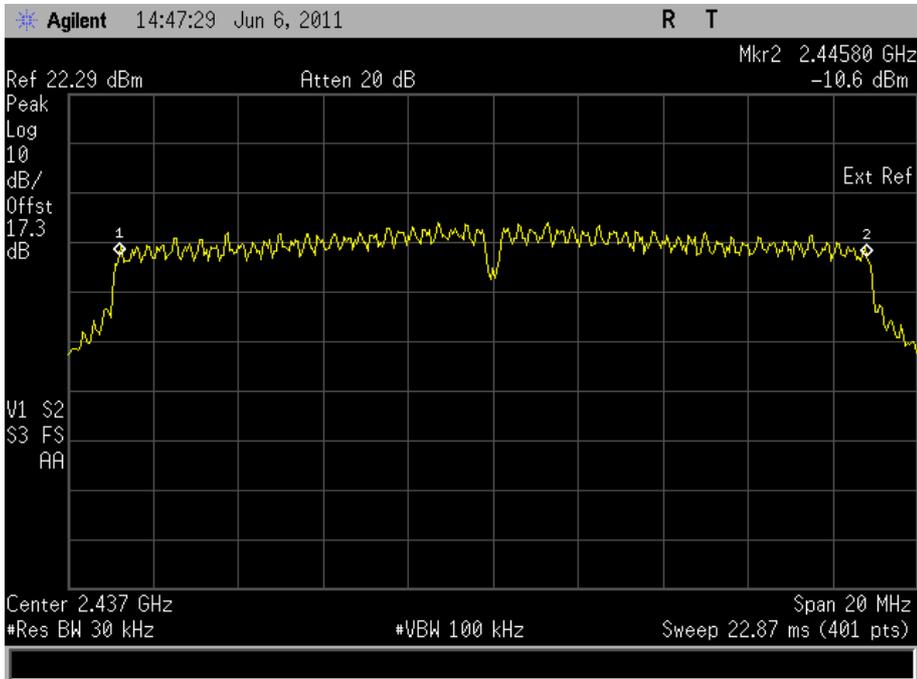




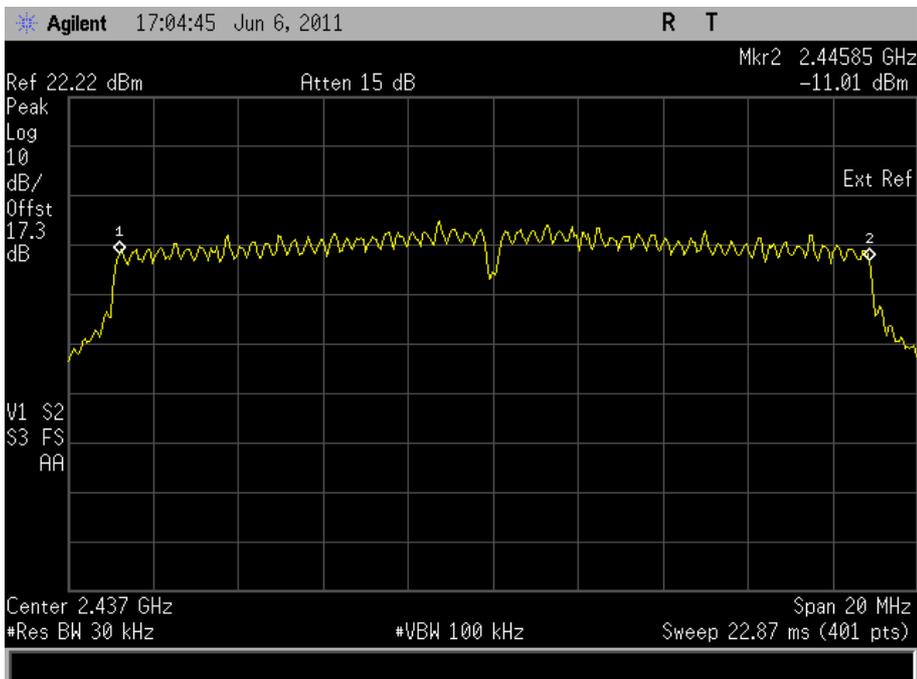
Product Service

2437 MHz

6.5 Mbps



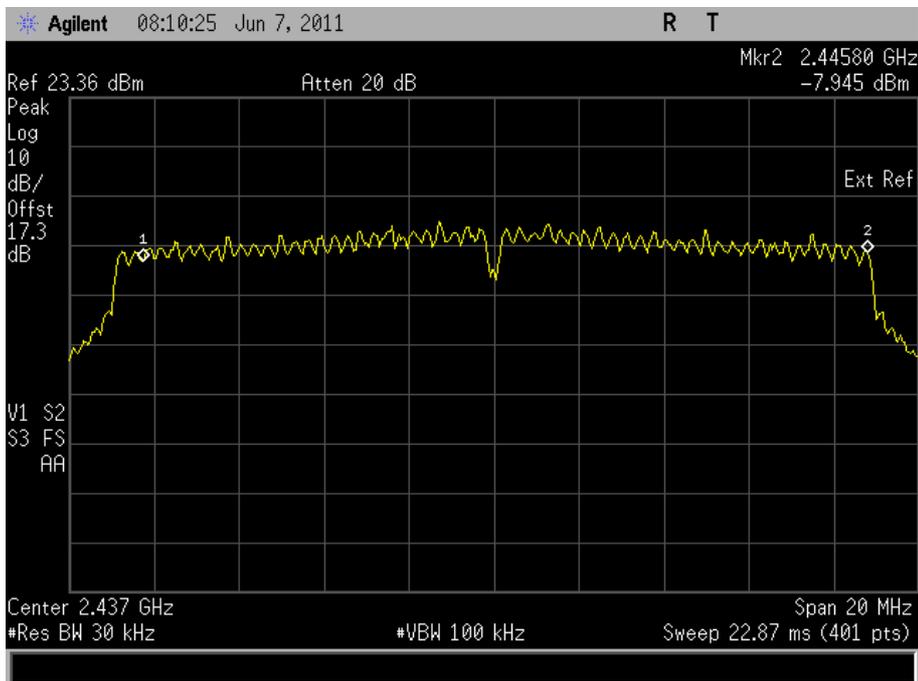
13 Mbps



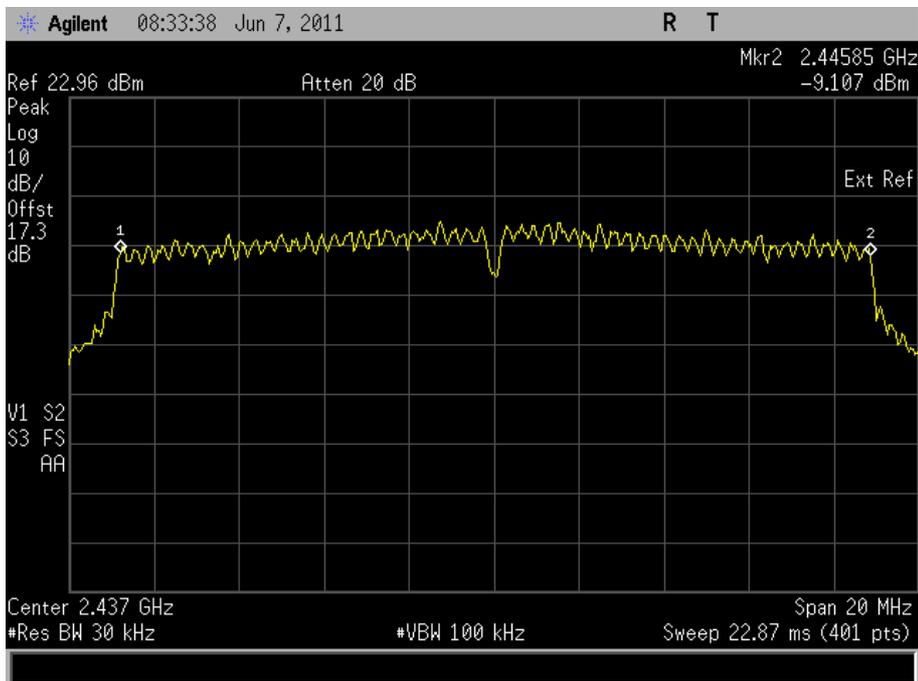


Product Service

19.5 Mbps



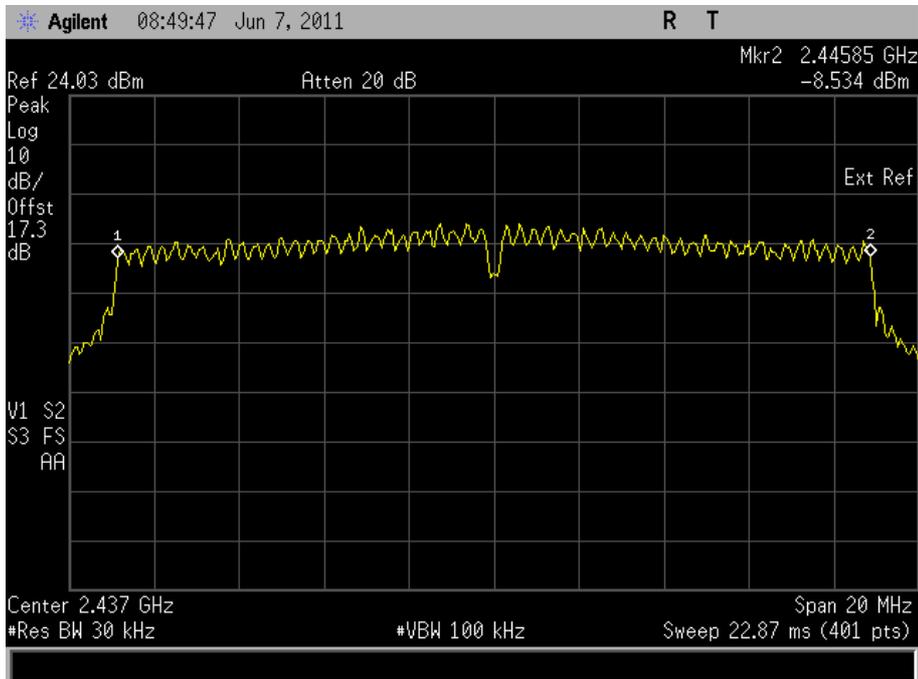
26 Mbps



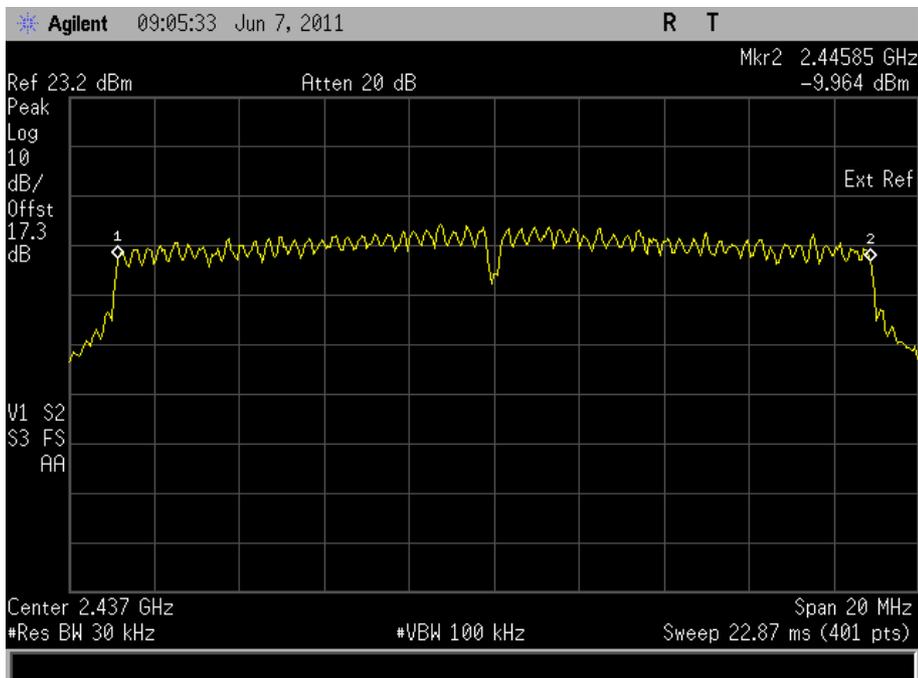


Product Service

39 Mbps



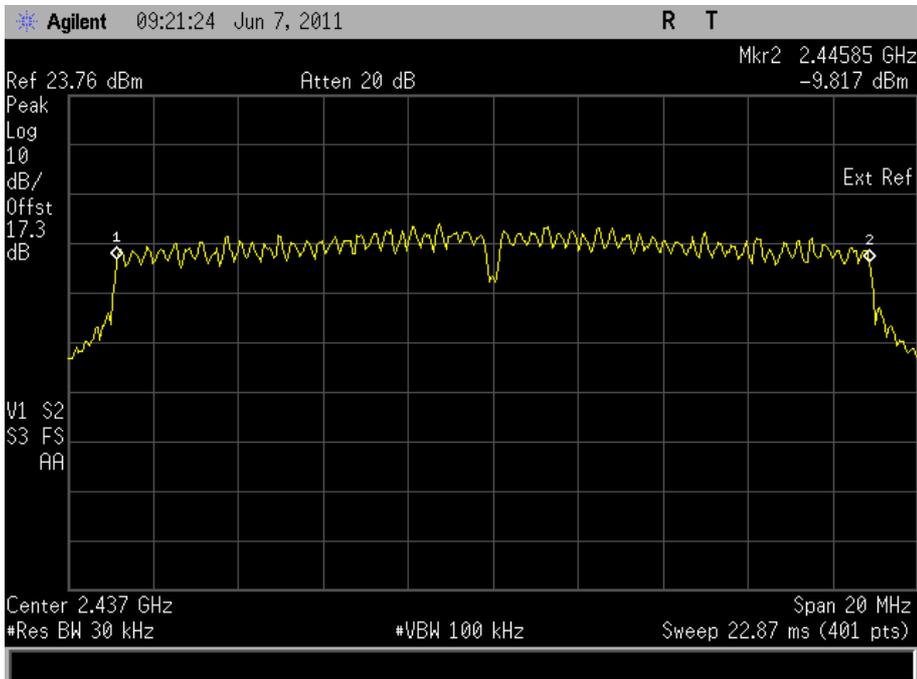
52 Mbps



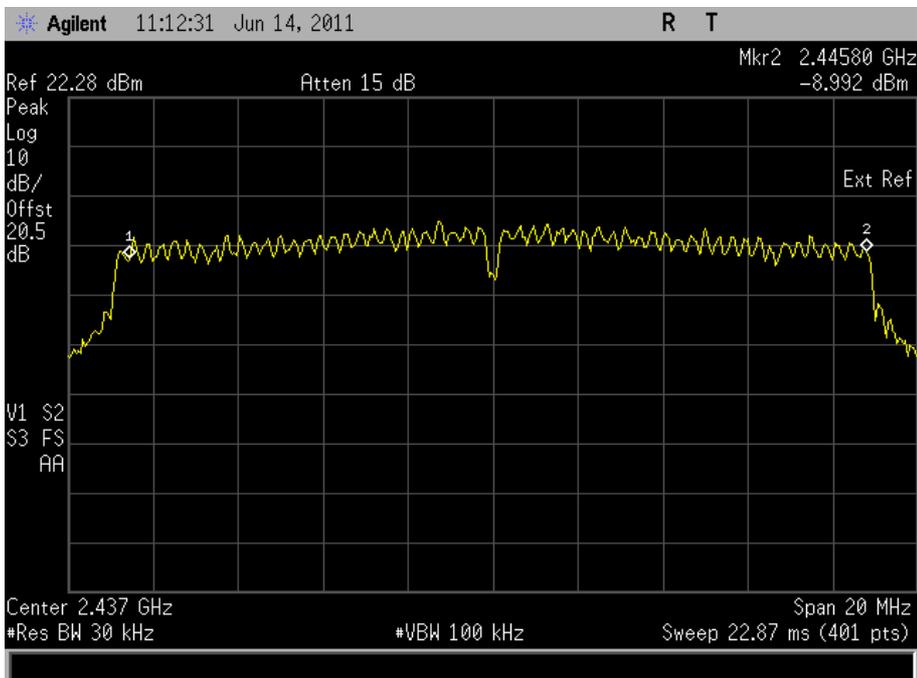


Product Service

58.5 Mbps



65 Mbps

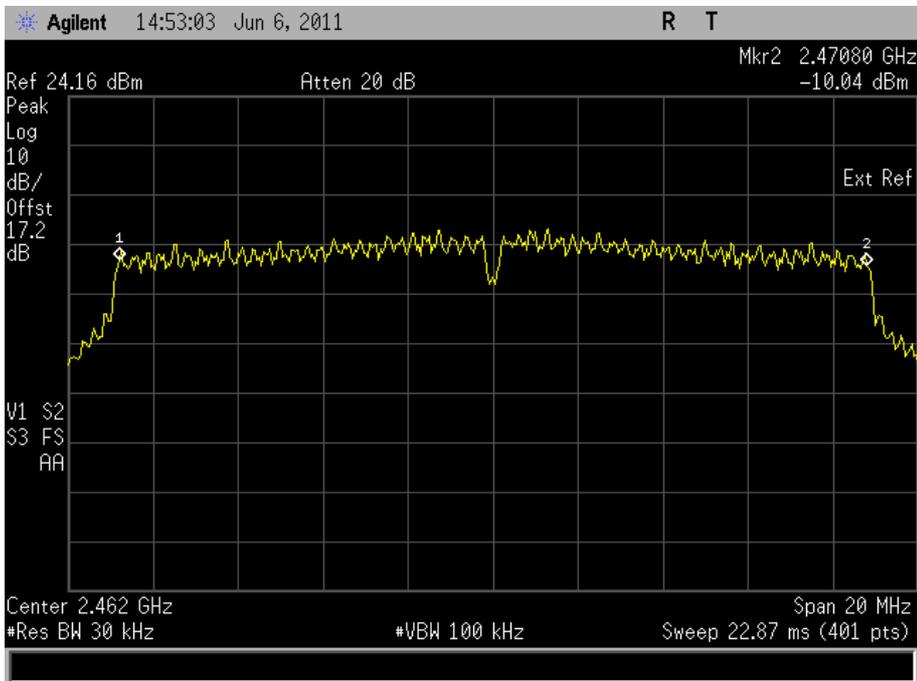




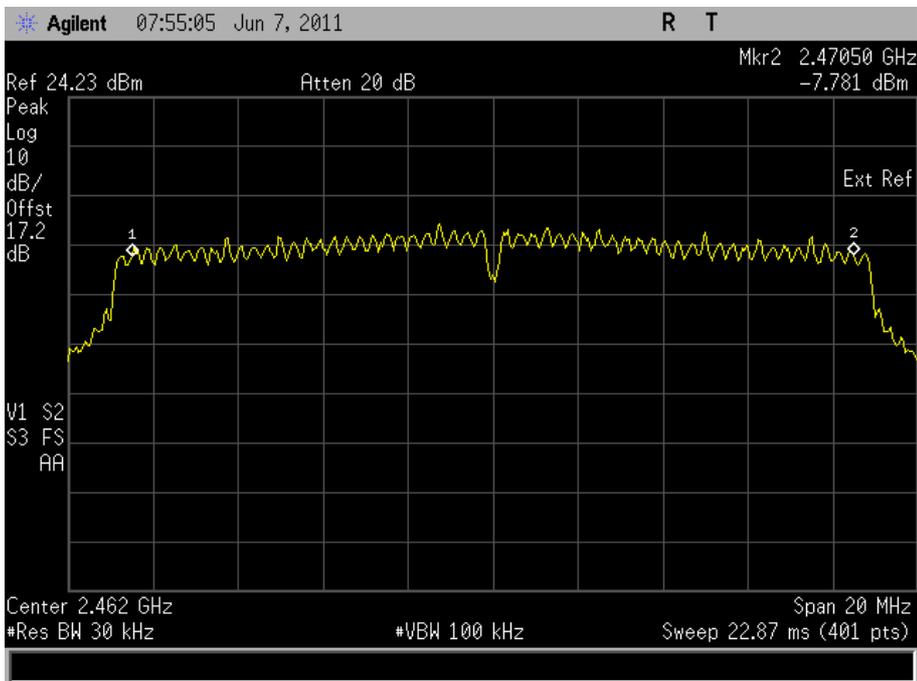
Product Service

2462 MHz

6.5 Mbps



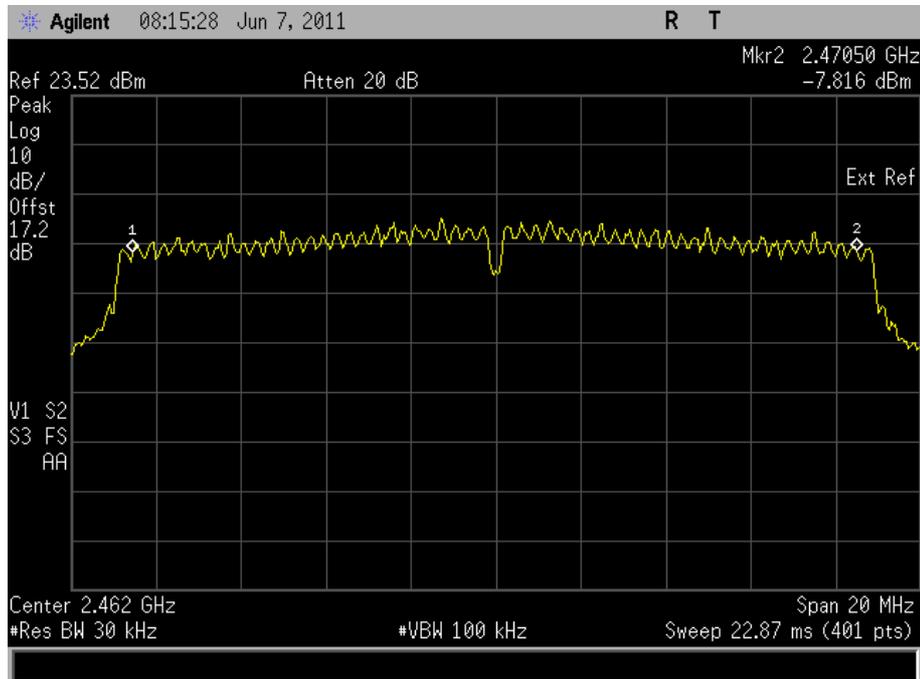
13 Mbps



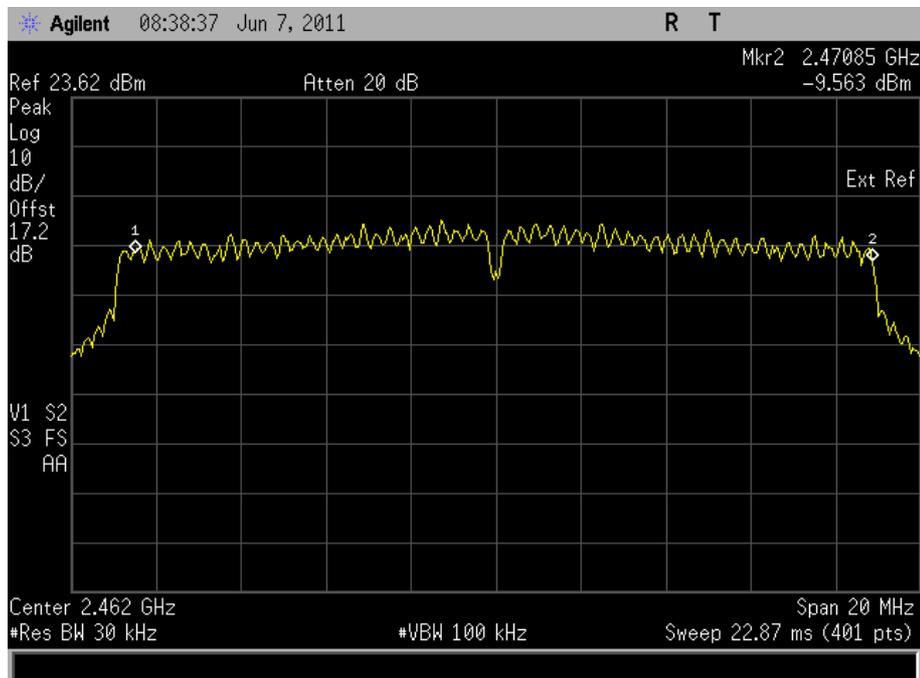


Product Service

19.5 Mbps



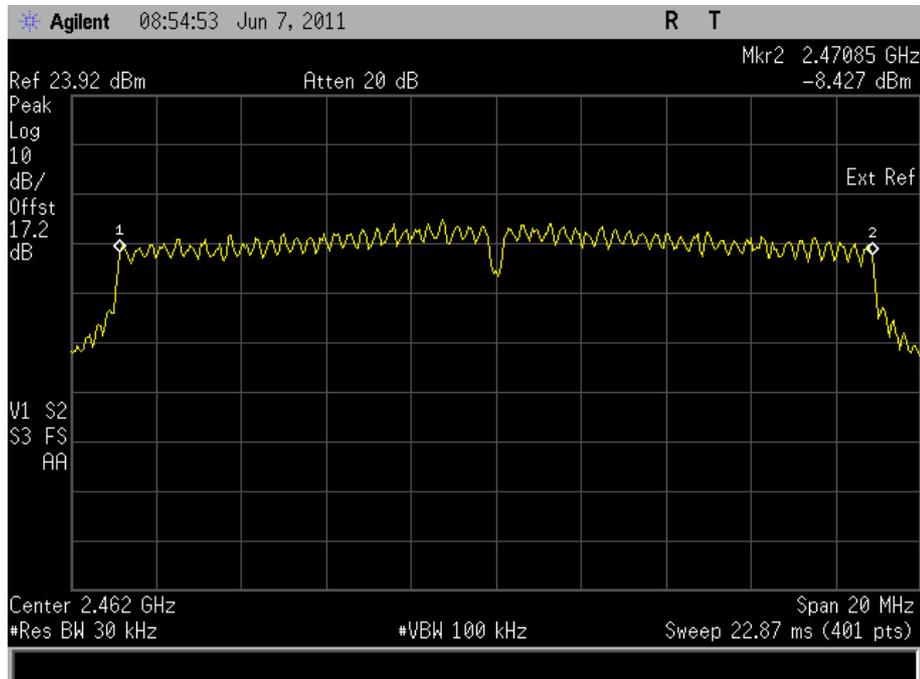
26 Mbps



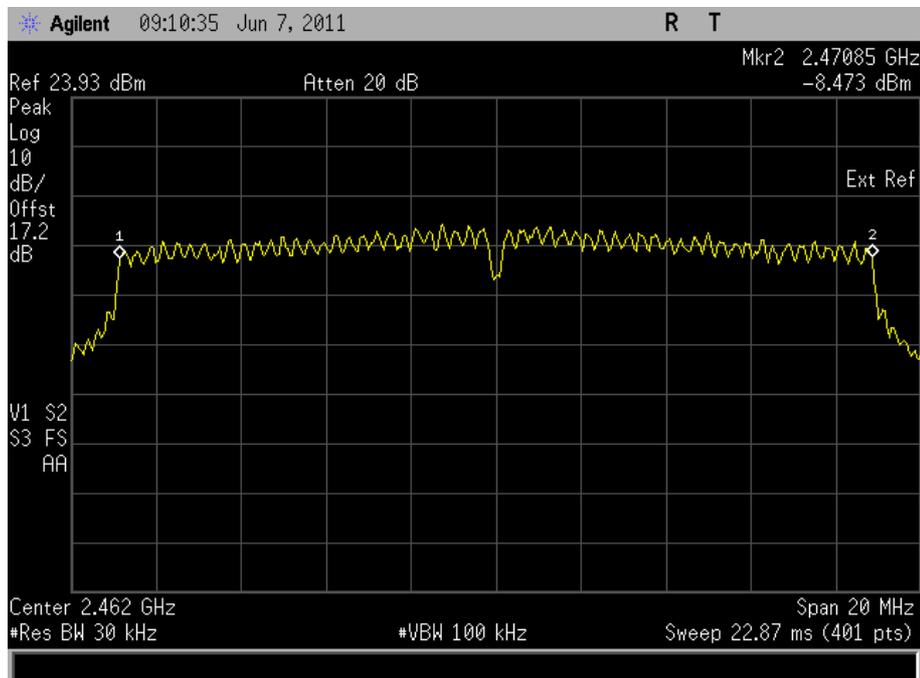


Product Service

39 Mbps



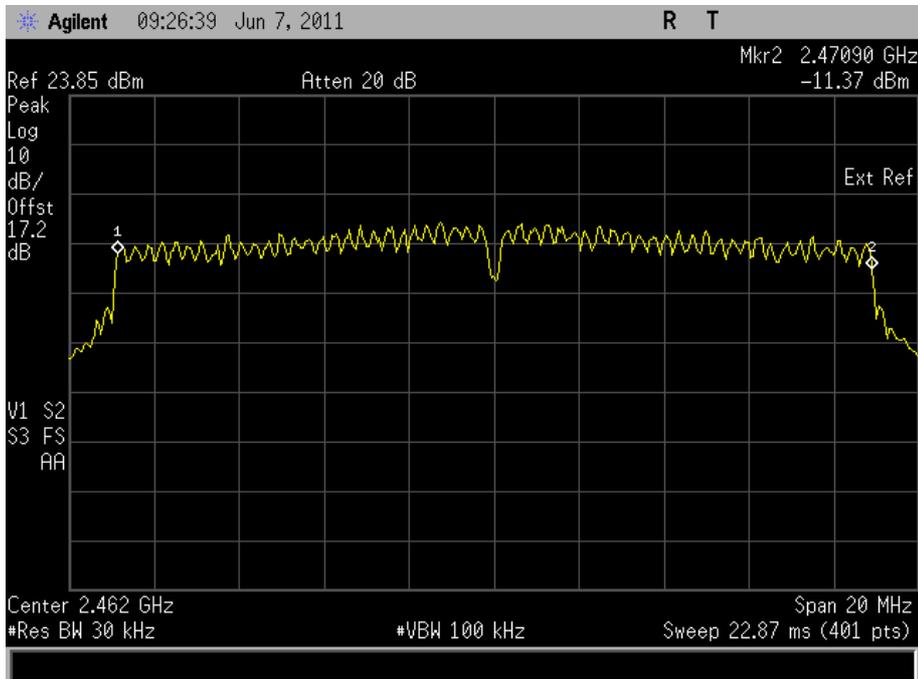
52 Mbps



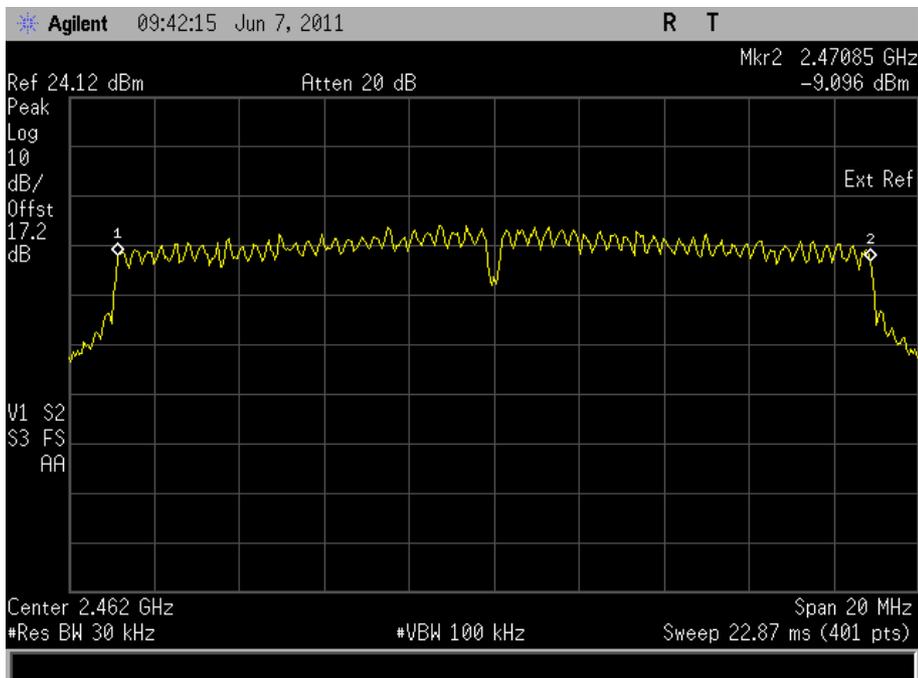


Product Service

58.5 Mbps



65 Mbps



Limit Clause

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



Product Service

2.2 RADIATED EMISSIONS (ENCLOSURE PORT)

2.2.1 Specification Reference

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

2.2.2 Equipment Under Test

CDMA SHI12, S/N: SSHFJ000863

2.2.3 Date of Test and Modification State

06 June 2011 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI C63.4.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Using the information from the preliminary profiling of the EUT, the list of emissions was then confirmed or updated under Alternative Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

Emissions within the restricted bands defined in 15.205 were measured in accordance with 15.209. Emissions measured below 1GHz employed a quasi peak detector, in accordance with 15.35(a). Emissions measured above 1GHz employed an average detector as defined in 15.35(b). The peak level of the emission was also measured to ensure that a difference of 20dB from the average level was not exceeded, as defined in 15.35(b). Emissions identified within the range 30MHz – 1GHz were then formally measured using a CISPR Quasi-Peak detector. Other emissions from 30MHz to 25GHz excluding the restricted bands were measured using a peak detector.

The test was performed with the EUT in the following configurations and modes of operation:

- Configuration 1 - Mode 1
- Mode 2
- Mode 3
- Configuration 2 - Mode 1
- Mode 2
- Mode 3
- Configuration 3 - Mode 1
- Mode 2
- Mode 3



Product Service

2.2.6 Environmental Conditions

06 June 2011

Ambient Temperature 20.0°C

Relative Humidity 44.0%

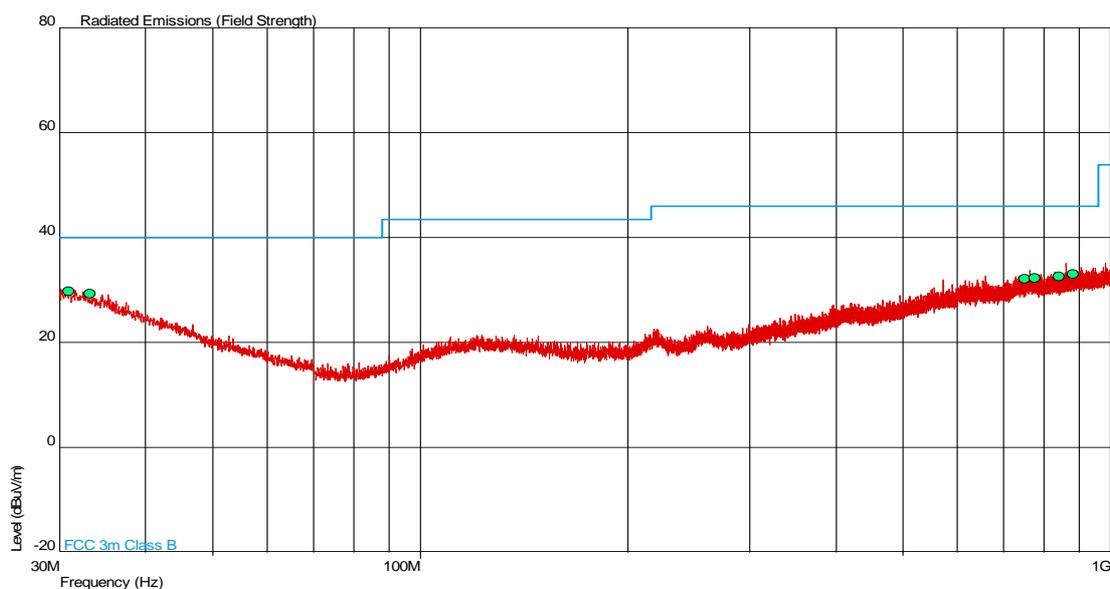
2.2.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C for Radiated Emissions (Enclosure Port).

The test results are shown below.

Configuration 1 - Mode 1

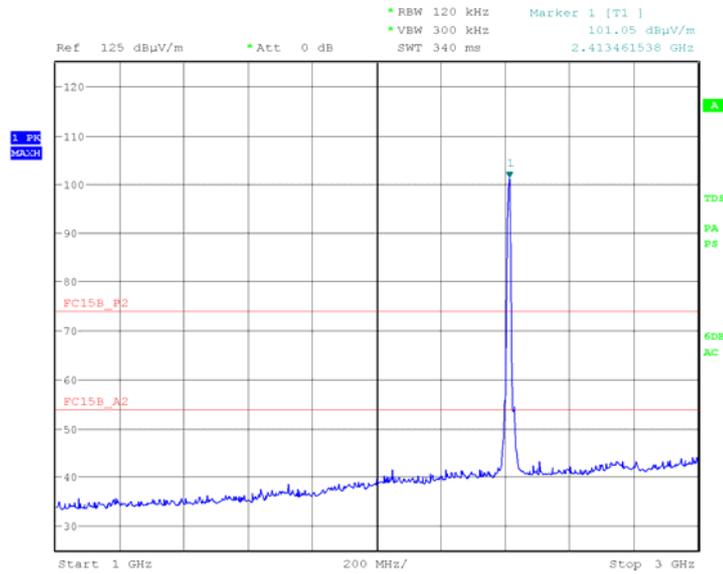
30 MHz to 1 GHz



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
30.922	29.7	30.5	40.0	100	-10.3	69.5	90	1.00	Horizontal
33.201	29.3	29.2	40.0	100	-10.7	70.8	270	1.00	Horizontal
750.565	32.2	40.7	46.0	200	-13.8	159.3	90	1.00	Vertical
776.852	32.4	41.7	46.0	200	-13.6	158.3	180	1.00	Vertical
841.939	32.6	42.7	46.0	200	-13.4	157.3	180	1.00	Vertical
881.660	33.0	44.7	46.0	200	-13.0	155.3	0	1.00	Horizontal

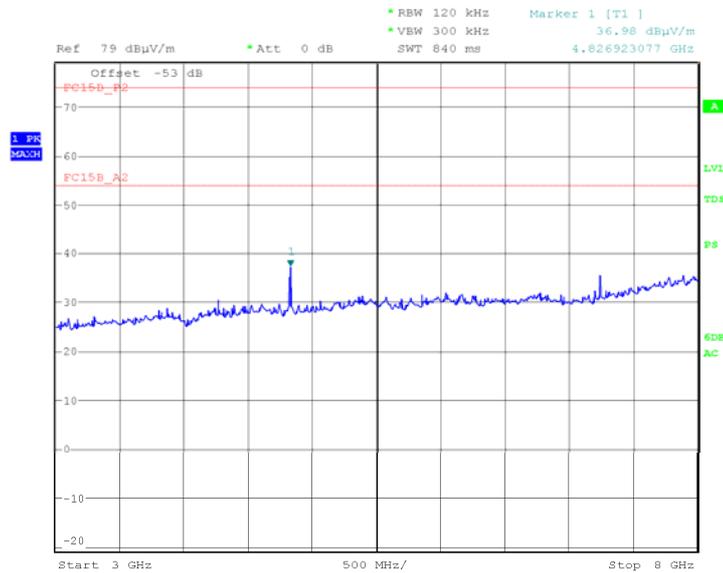


1GHz to 3GHz



Date: 6.JUN.2011 18:43:43

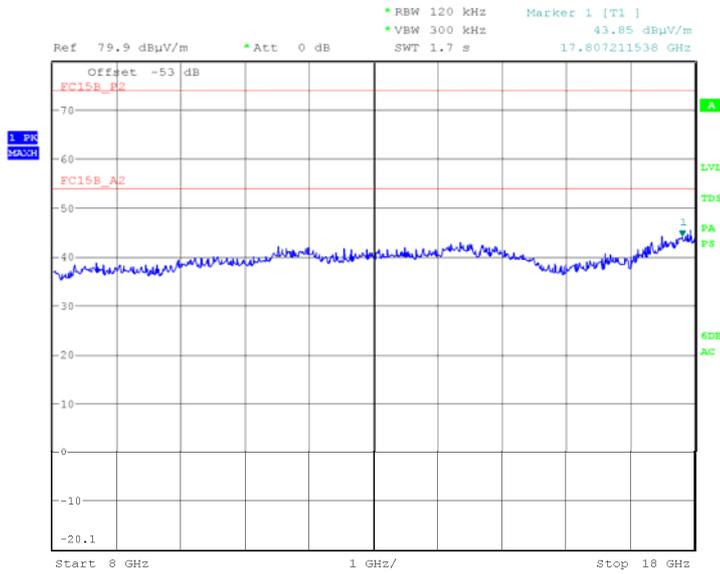
3GHz to 8GHz



Date: 7.JUN.2011 17:13:07

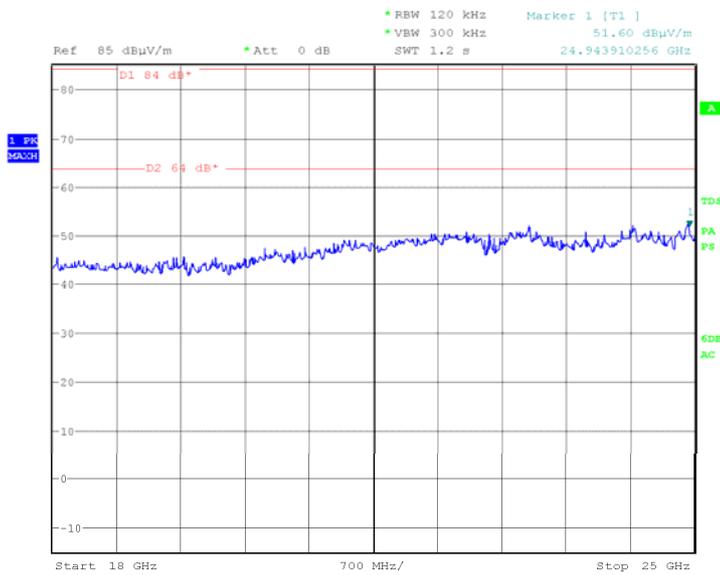


8GHz to 18GHz



Date: 7.JUN.2011 19:01:52

18GHz to 25GHz



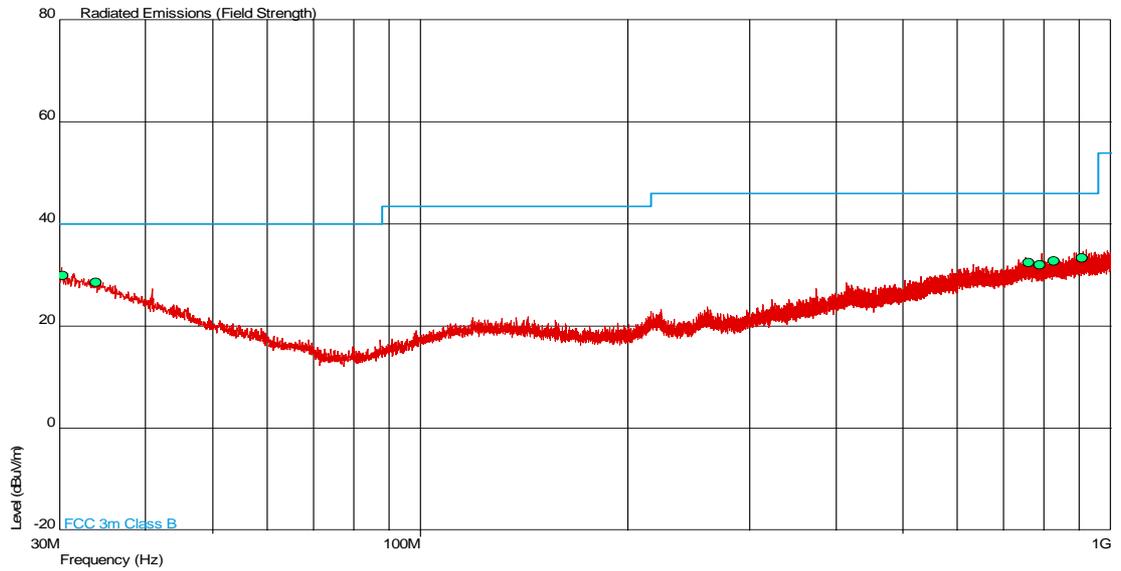
Date: 7.JUN.2011 23:33:53



Product Service

Configuration 1 - Mode 2

30 MHz to 1 GHz

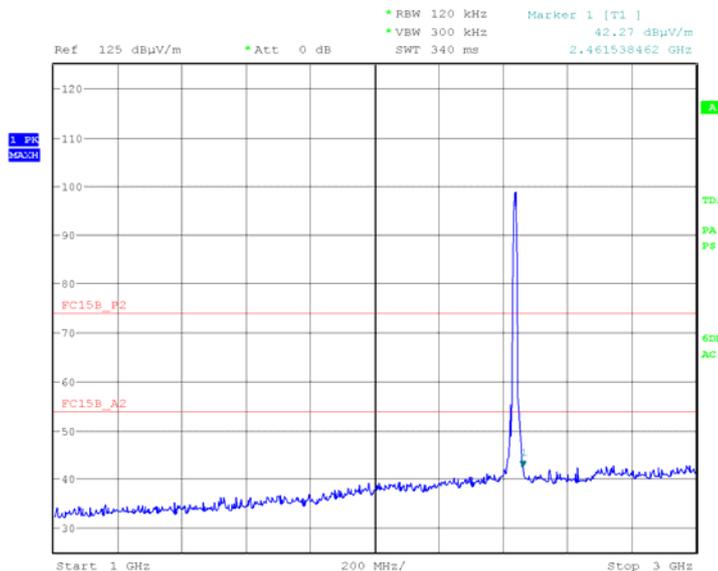


Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (deg)	Height (m)	Polarity
30.388	30.0	31.6	40.0	100	-10.0	68.4	90	1.00	Horizontal
33.880	28.6	26.9	40.0	100	-11.4	73.1	180	1.00	Vertical
759.295	32.4	41.7	46.0	200	-13.6	158.3	0	1.00	Vertical
790.335	32.0	39.8	46.0	200	-14.0	160.2	0	1.00	Vertical
827.631	32.8	43.7	46.0	200	-13.2	156.3	90	1.00	Horizontal
908.044	33.4	46.8	46.0	200	-12.6	153.2	90	1.00	Vertical



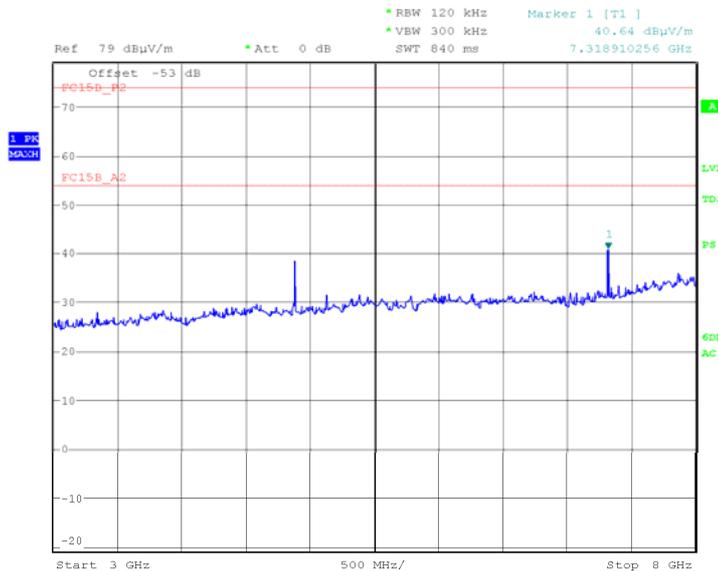
Product Service

1GHz to 3GHz



Date: 6.JUN.2011 18:09:46

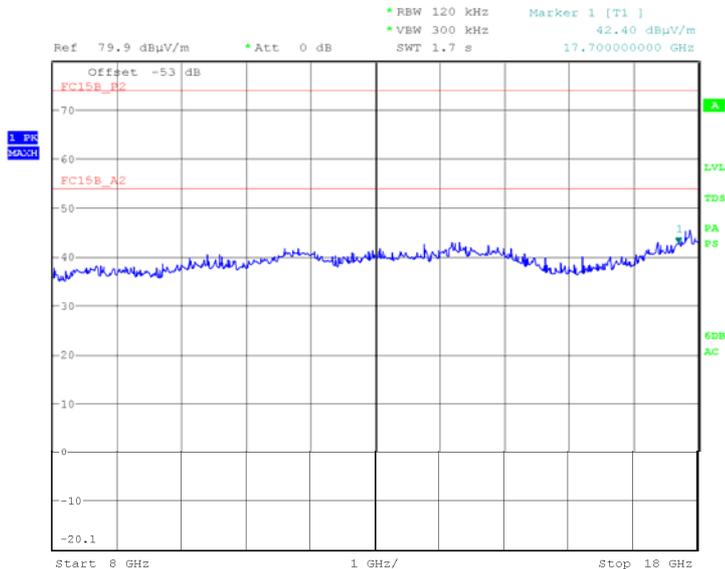
3GHz to 8GHz



Date: 7.JUN.2011 17:29:13

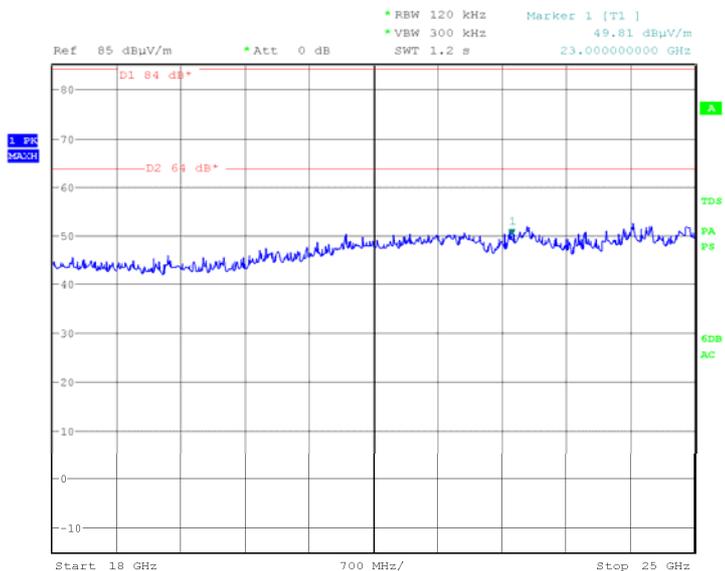


8GHz to 18GHz



Date: 7.JUN.2011 19:17:13

18GHz to 25GHz



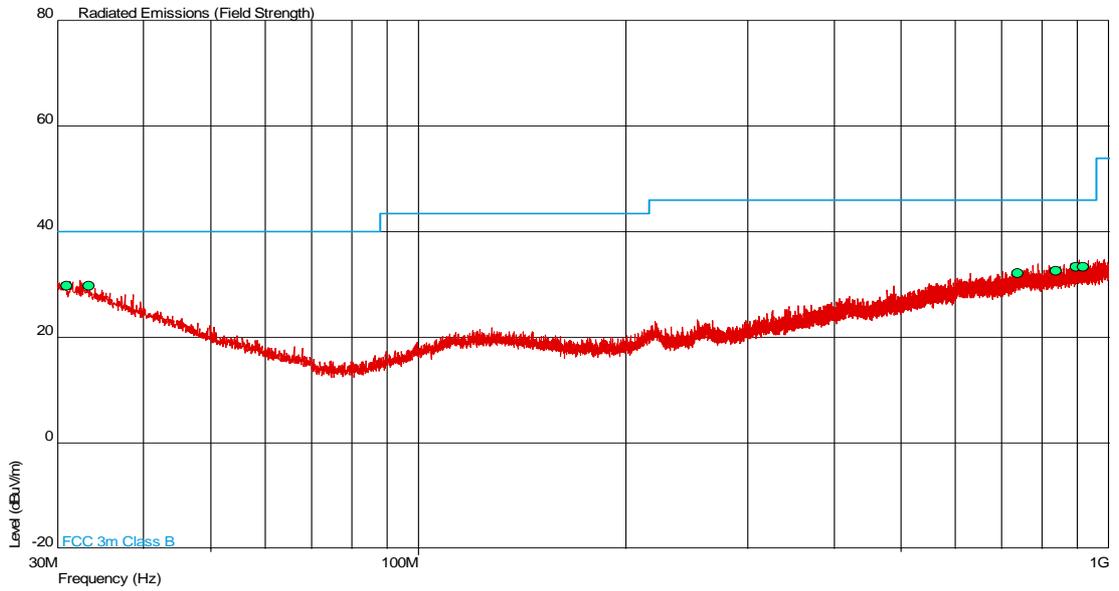
Date: 7.JUN.2011 22:02:27



Product Service

Configuration 1 - Mode 3

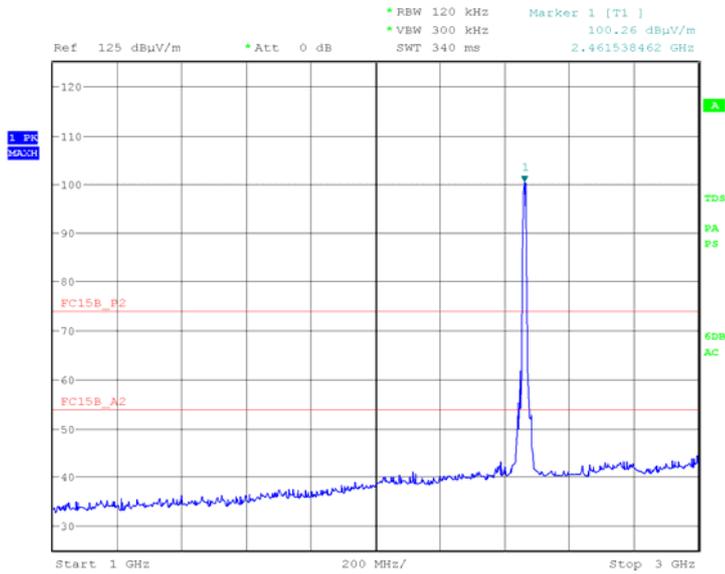
30 MHz to 1 GHz



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
30.922	29.7	30.5	40.0	100	-10.3	69.5	90	1.00	Vertical
33.298	29.8	30.9	40.0	100	-10.2	69.1	180	1.00	Vertical
738.149	32.1	40.3	46.0	200	-13.9	159.7	180	1.00	Horizontal
837.525	32.6	42.7	46.0	200	-13.4	157.3	0	1.00	Vertical
896.792	33.3	46.2	46.0	200	-12.7	153.8	0	1.00	Vertical
918.278	33.4	46.8	46.0	200	-12.6	153.2	0	1.00	Horizontal

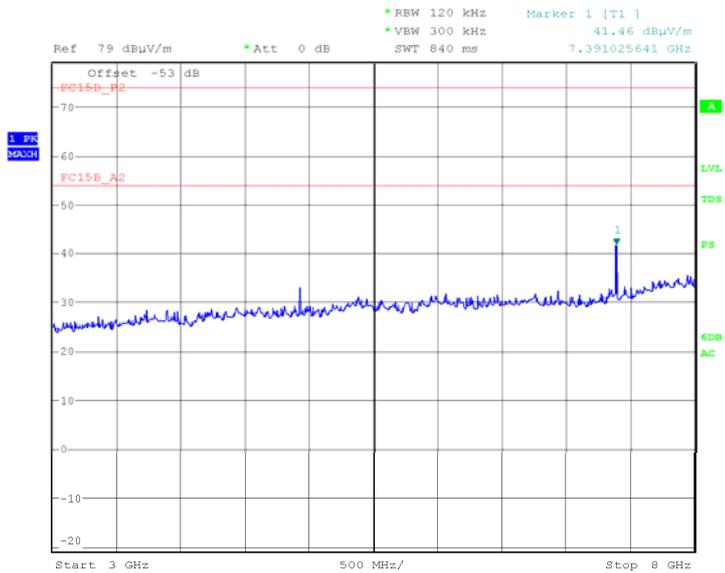


1GHz to 3GHz



Date: 6.JUN.2011 18:00:07

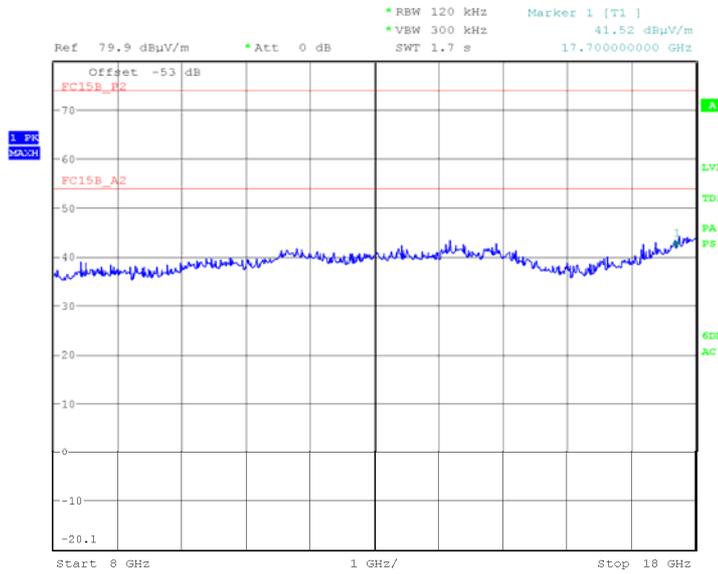
3GHz to 8GHz



Date: 7.JUN.2011 17:37:40

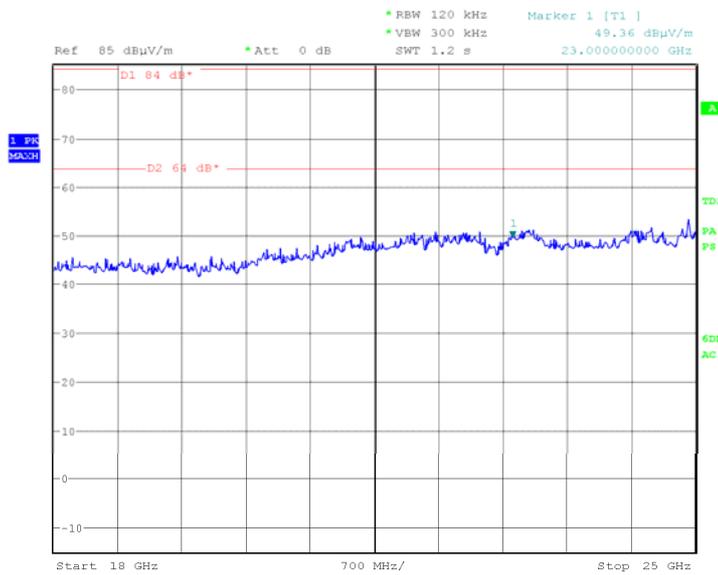


8GHz to 18GHz



Date: 7.JUN.2011 19:34:02

18GHz to 25GHz

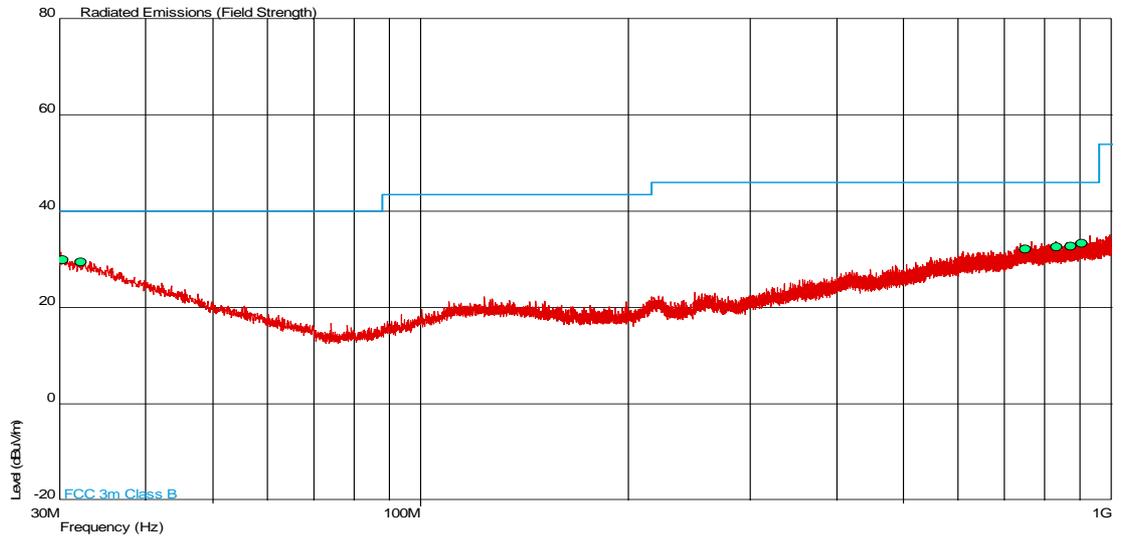


Date: 7.JUN.2011 22:11:45



Configuration 2 - Mode 1

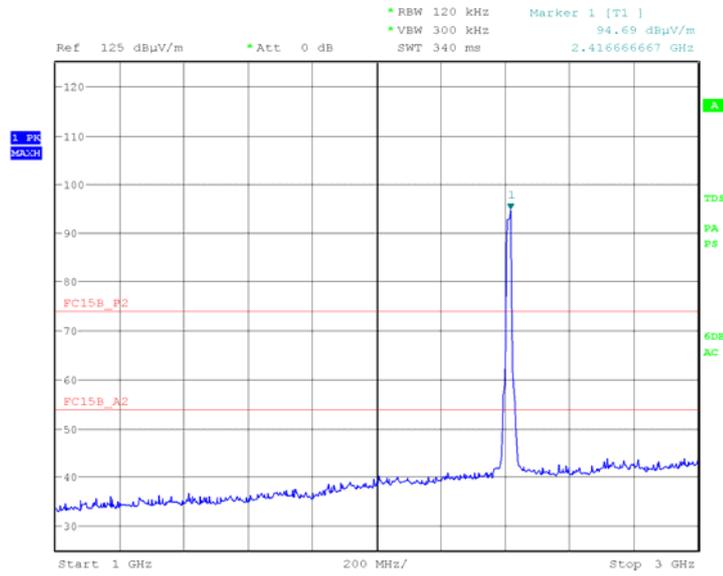
30 MHz to 1 GHz



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
30.388	29.9	31.3	40.0	100	-10.1	68.7	270	1.00	Vertical
32.231	29.4	29.5	40.0	100	-10.6	70.5	270	1.00	Vertical
750.710	32.2	40.7	46.0	200	-13.8	159.3	90	1.00	Vertical
832.239	32.7	43.2	46.0	200	-13.3	156.8	270	1.00	Horizontal
871.572	32.8	43.7	46.0	200	-13.2	156.3	180	1.00	Vertical
905.668	33.3	46.2	46.0	200	-12.7	153.8	270	1.00	Vertical

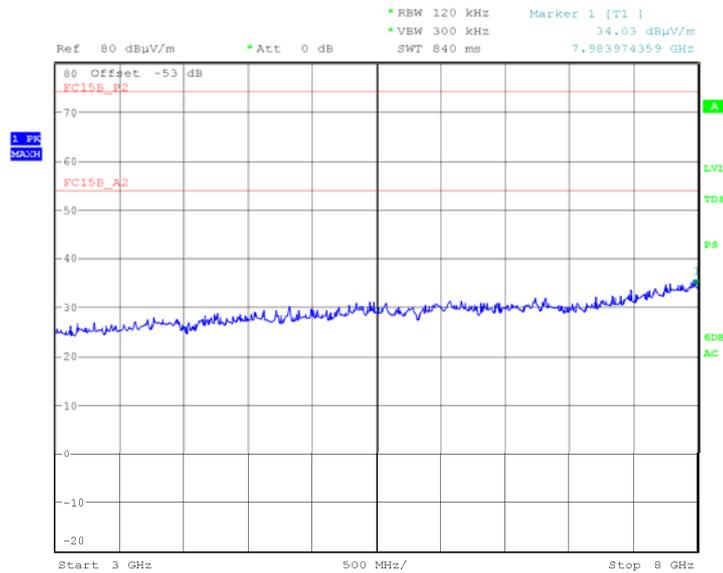


1GHz to 3GHz



Date: 6.JUN.2011 19:20:01

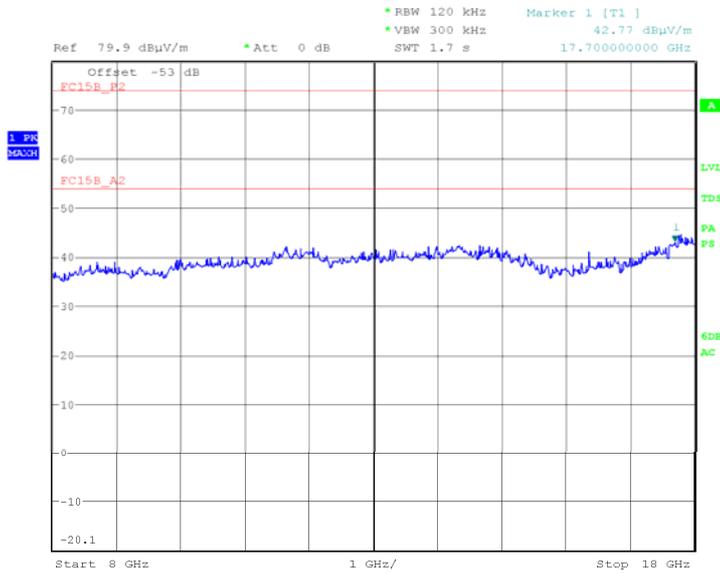
3GHz to 8GHz



Date: 7.JUN.2011 17:49:54

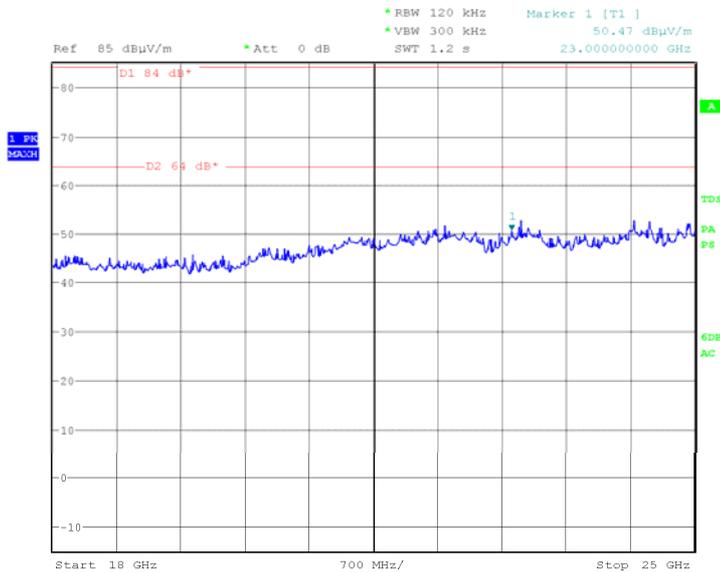


8GHz to 18GHz



Date: 7.JUN.2011 19:52:34

18GHz to 25GHz

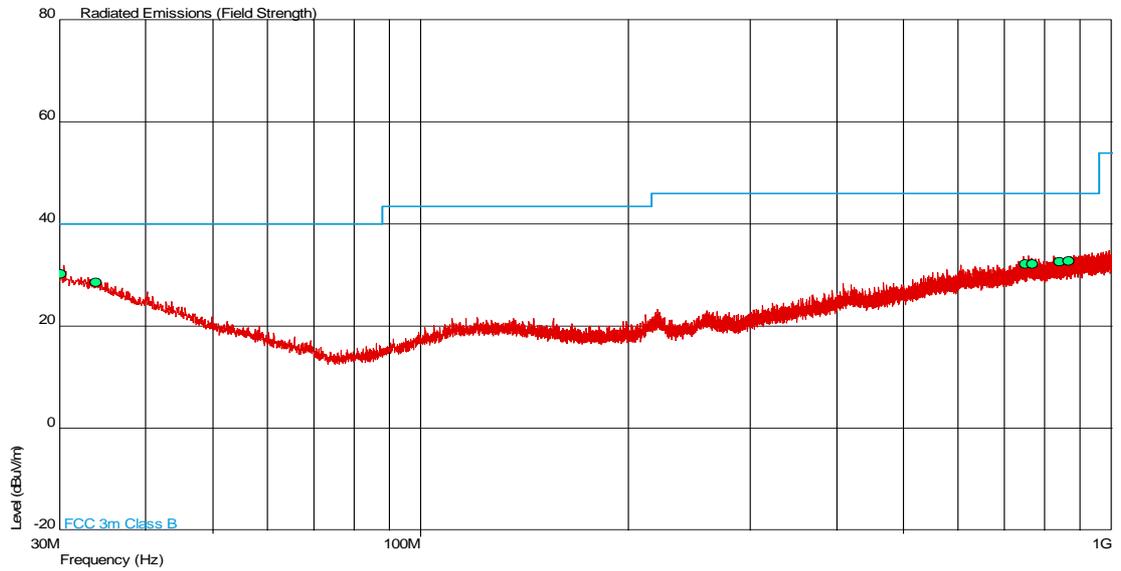


Date: 7.JUN.2011 22:25:49



Configuration 2 - Mode 2

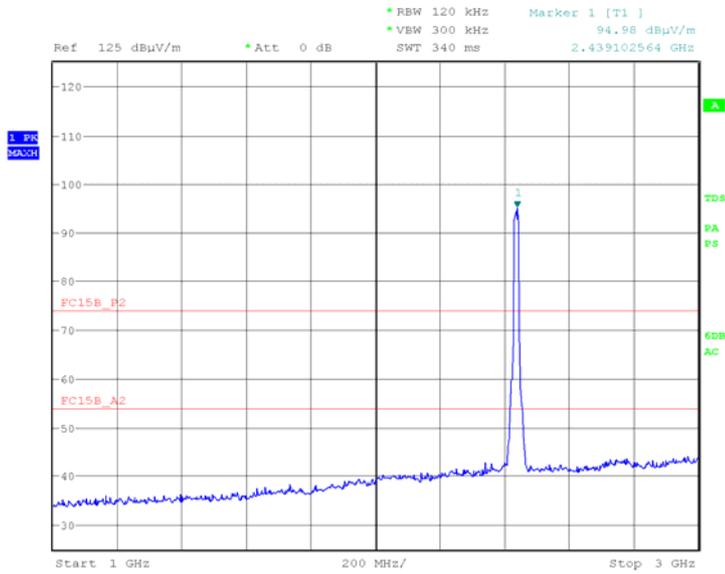
30 MHz to 1 GHz



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
30.146	30.2	32.4	40.0	100	-9.8	67.6	90	1.00	Horizontal
33.880	28.6	26.9	40.0	100	-11.4	73.1	0	1.00	Vertical
750.565	32.2	40.7	46.0	200	-13.8	159.3	90	1.00	Vertical
768.025	32.1	40.3	46.0	200	-13.9	159.7	90	1.00	Vertical
841.842	32.6	42.7	46.0	200	-13.4	157.3	90	1.00	Horizontal
866.771	32.8	43.7	46.0	200	-13.2	156.3	90	1.00	Vertical

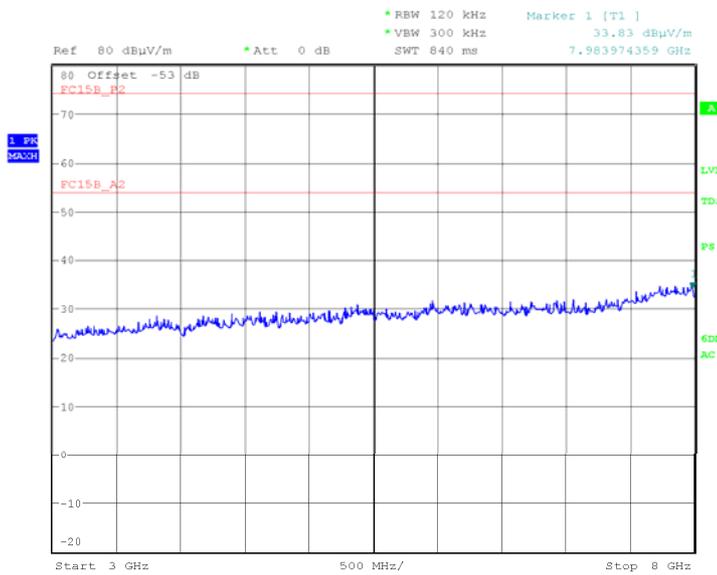


1GHz to 3GHz



Date: 6.JUN.2011 19:59:15

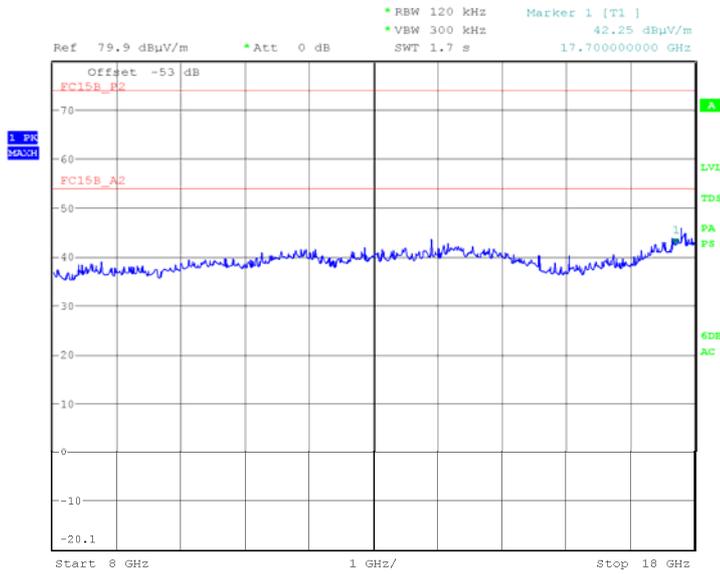
3GHz to 8GHz



Date: 7.JUN.2011 17:56:39

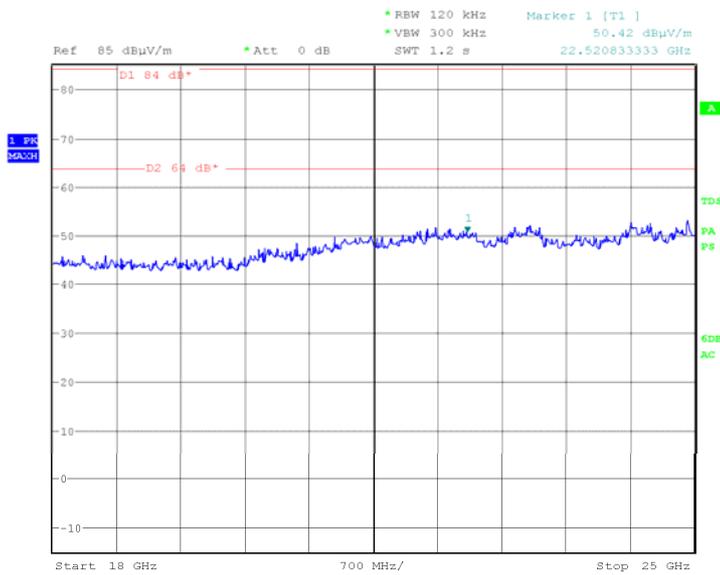


8GHz to 18GHz



Date: 7.JUN.2011 20:07:41

18GHz to 25GHz

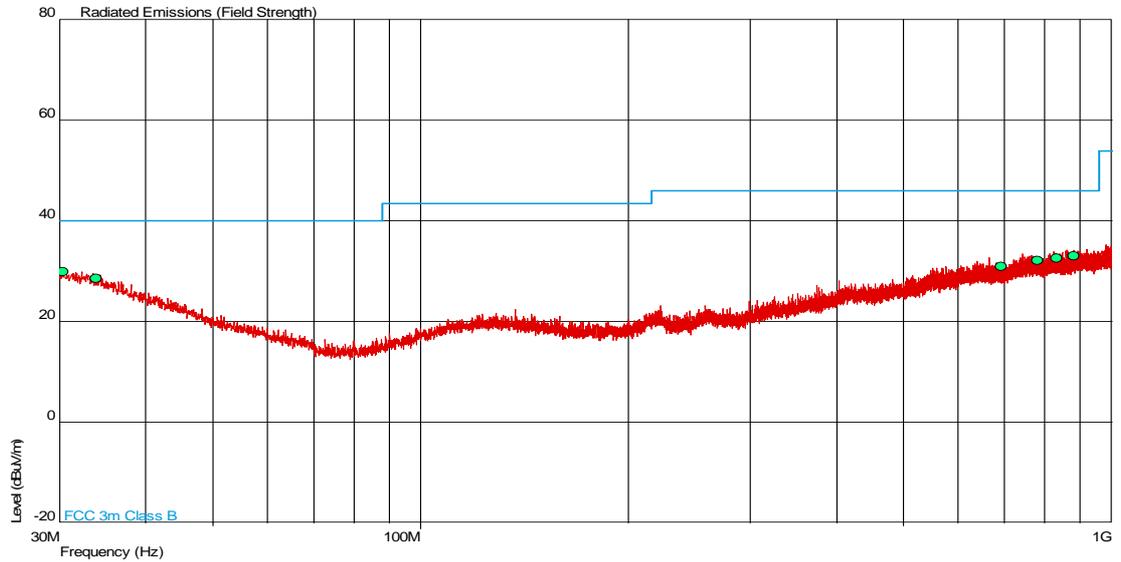


Date: 7.JUN.2011 22:39:14



Configuration 2 - Mode 3

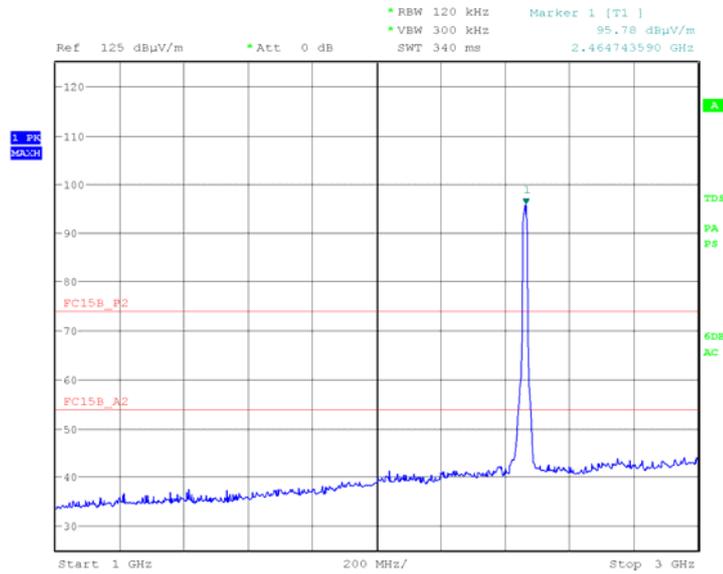
30 MHz to 1 GHz



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
30.388	30.0	31.6	40.0	100	-10.0	68.4	270	1.00	Vertical
33.880	28.6	26.9	40.0	100	-11.4	73.1	0	1.00	Horizontal
692.656	31.0	35.5	46.0	200	-15.0	164.5	90	1.00	Horizontal
781.896	32.2	40.7	46.0	200	-13.8	159.3	90	1.00	Horizontal
832.821	32.6	42.7	46.0	200	-13.4	157.3	270	1.00	Vertical
881.515	33.0	44.7	46.0	200	-13.0	155.3	270	1.00	Vertical

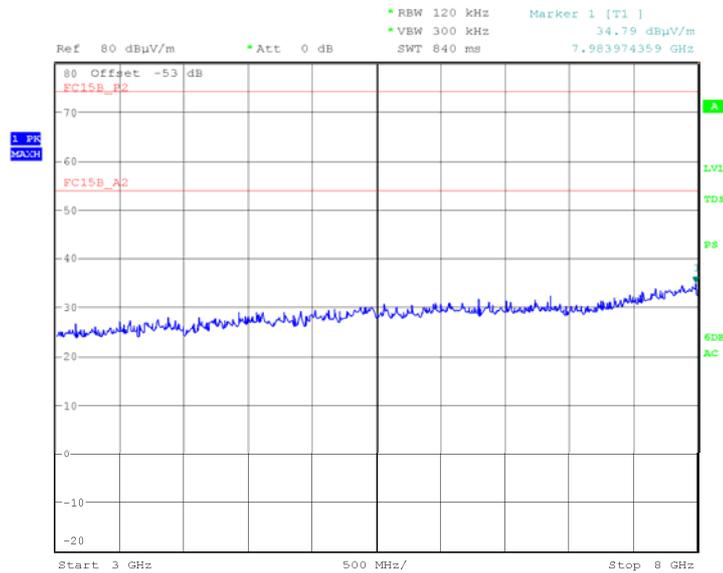


1GHz to 3GHz



Date: 6.JUN.2011 20:05:23

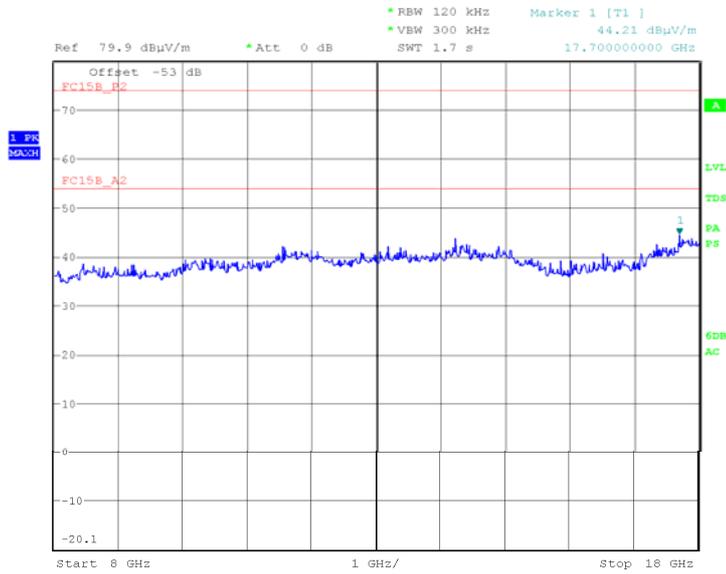
3GHz to 8GHz



Date: 7.JUN.2011 18:03:01

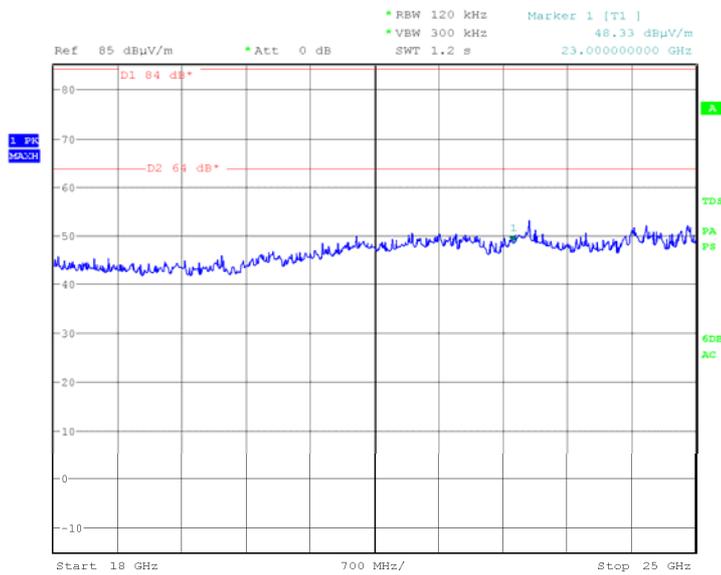


8GHz to 18GHz



Date: 7.JUN.2011 20:21:14

18GHz to 25GHz

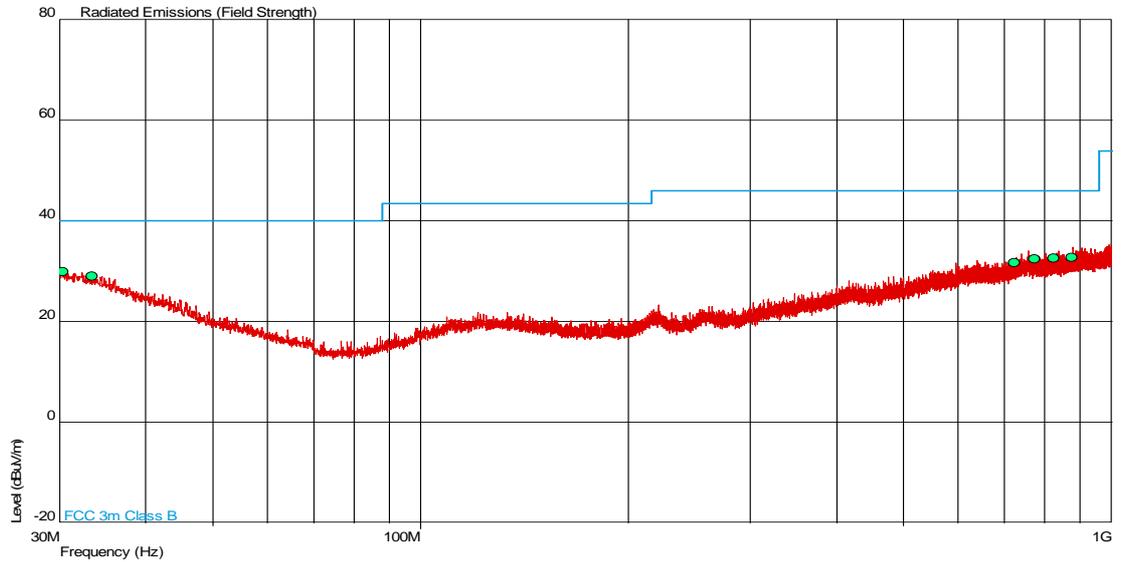


Date: 7.JUN.2011 23:02:29



Configuration 3 - Mode 1

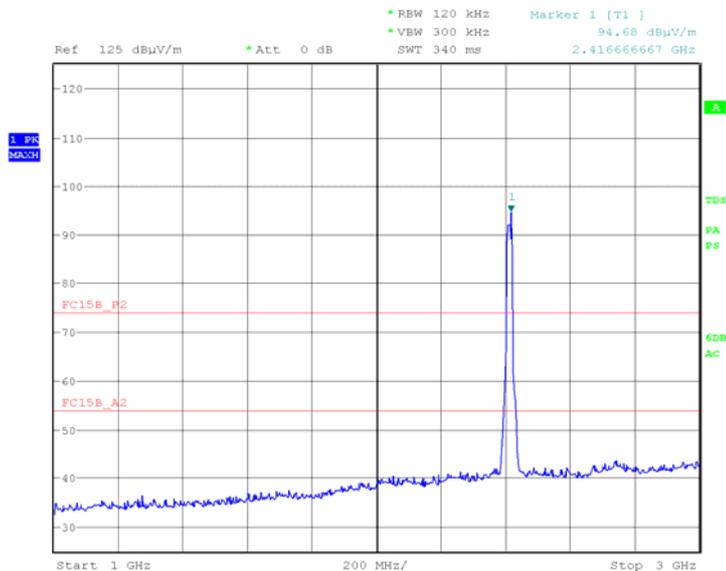
30 MHz to 1 GHz



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
30.388	30.0	31.6	40.0	100	-10.0	68.4	270	1.00	Horizontal
33.492	29.0	28.2	40.0	100	-11.0	71.8	90	1.00	Vertical
724.375	31.7	38.5	46.0	200	-14.3	161.5	180	1.00	Vertical
773.651	32.4	41.7	46.0	200	-13.6	158.3	0	1.00	Vertical
823.315	32.6	42.7	46.0	200	-13.4	157.3	270	1.00	Vertical
876.568	32.7	43.2	46.0	200	-13.3	156.8	0	1.00	Horizontal

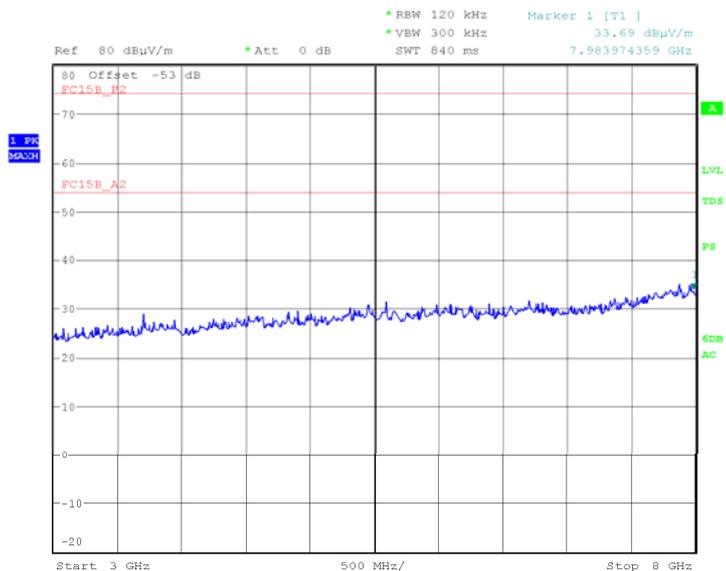


1GHz to 3GHz



Date: 6.JUN.2011 20:56:07

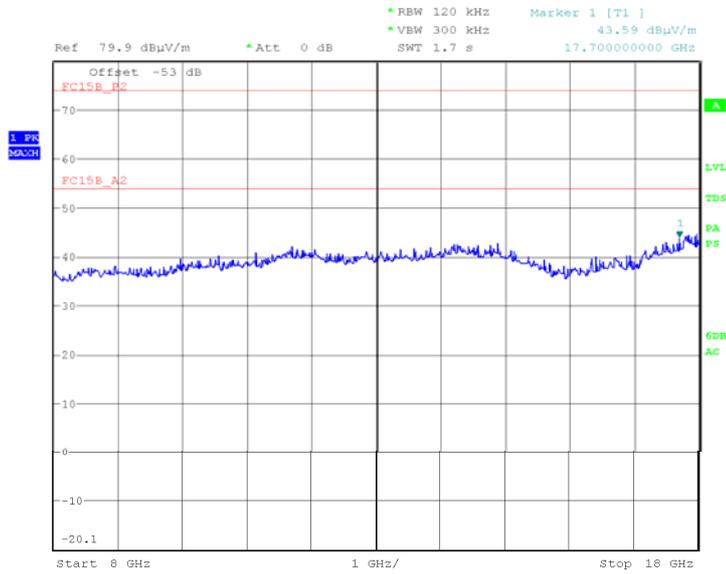
3GHz to 8GHz



Date: 7.JUN.2011 18:09:56

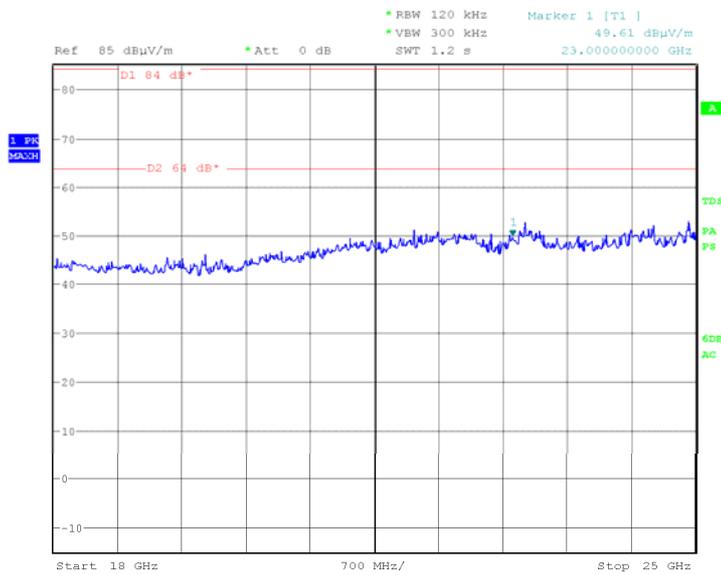


8GHz to 18GHz



Date: 7.JUN.2011 20:35:30

18GHz to 25GHz

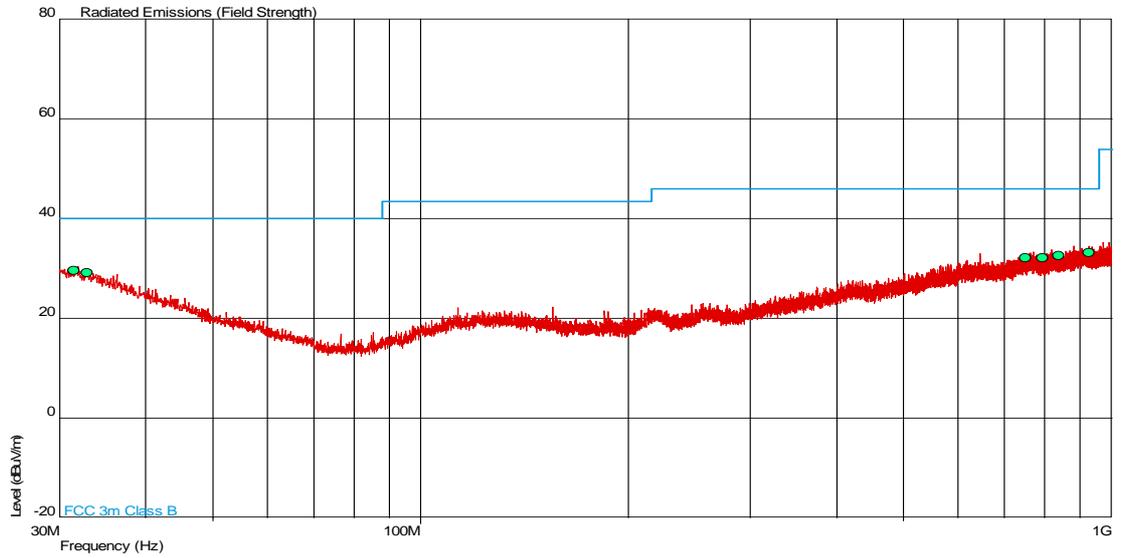


Date: 7.JUN.2011 23:13:09



Configuration 3 - Mode 2

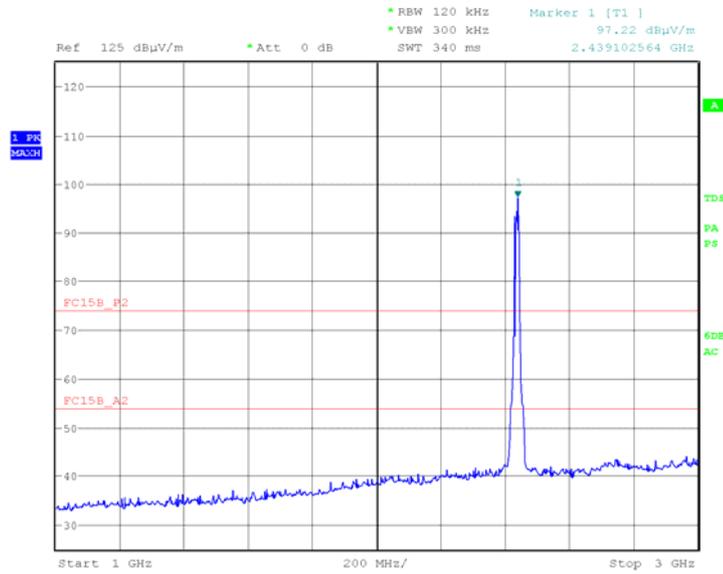
30 MHz to 1 GHz



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
31.455	29.6	30.2	40.0	100	-10.4	69.8	0	1.00	Horizontal
32.910	29.1	28.5	40.0	100	-10.9	71.5	0	1.00	Horizontal
750.565	32.2	40.7	46.0	200	-13.8	159.3	270	1.00	Horizontal
794.991	32.2	40.7	46.0	200	-13.8	159.3	0	1.00	Vertical
837.089	32.6	42.7	46.0	200	-13.4	157.3	0	1.00	Horizontal
926.280	33.3	46.2	46.0	200	-12.7	153.8	90	1.00	Vertical

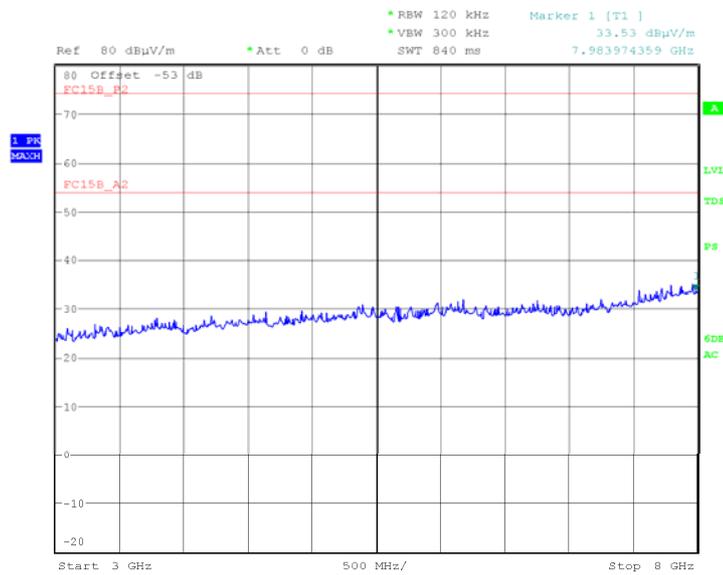


1GHz to 3GHz



Date: 6.JUN.2011 21:03:28

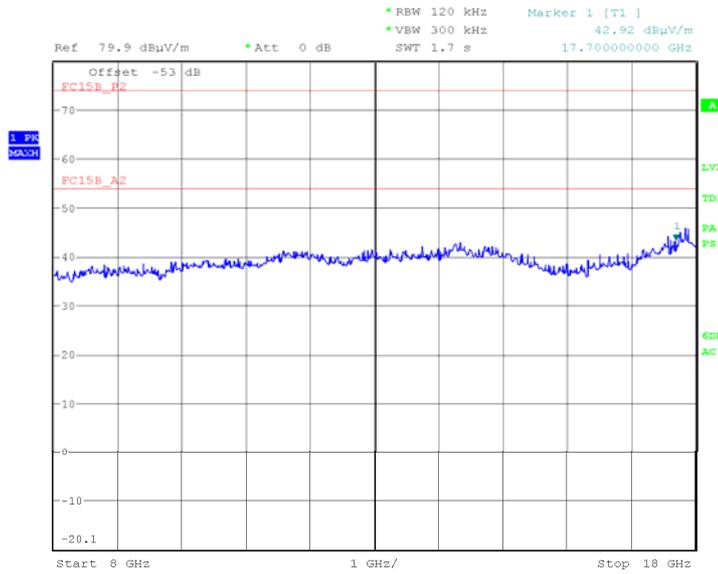
3GHz to 8GHz



Date: 7.JUN.2011 18:15:20

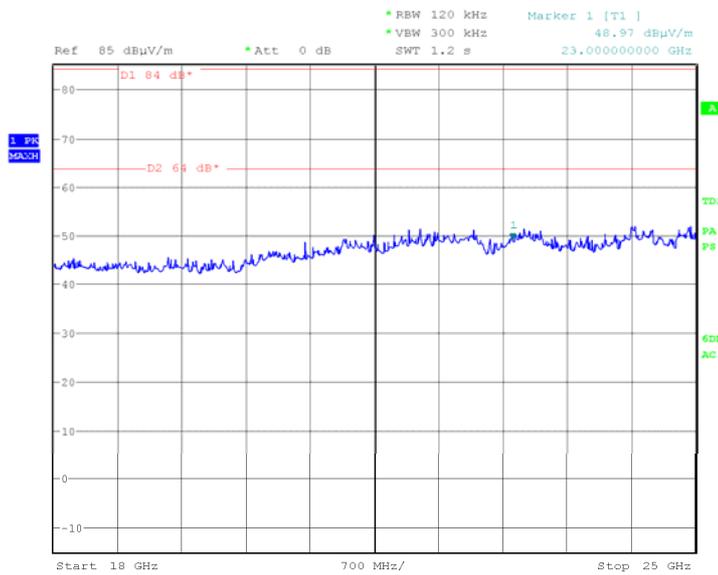


8GHz to 18GHz



Date: 7.JUN.2011 20:54:25

18GHz to 25GHz



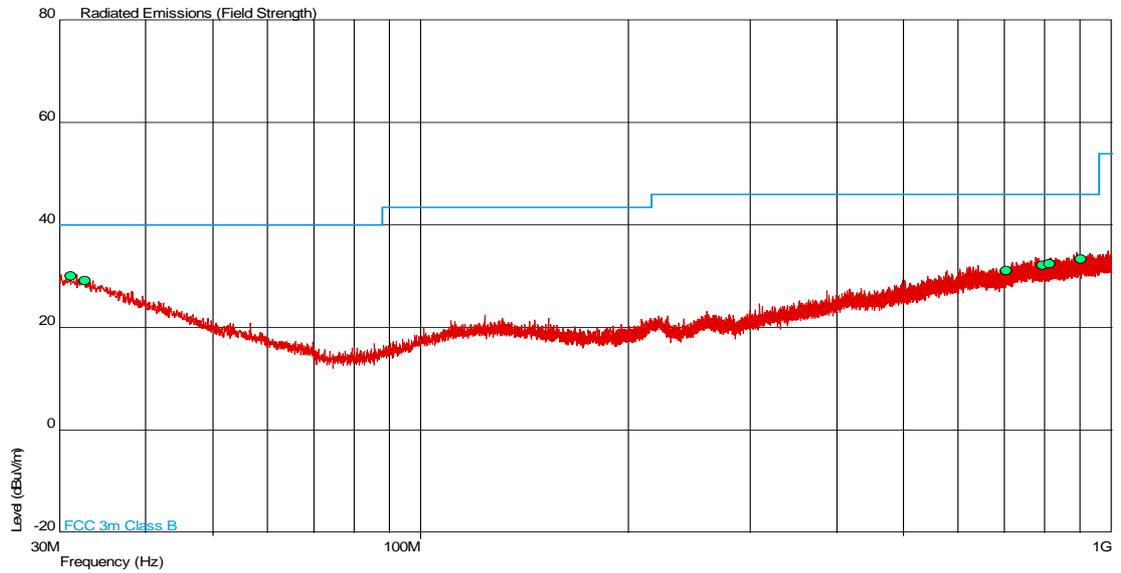
Date: 7.JUN.2011 23:23:24



Product Service

Configuration 3 - Mode 3

30 MHz to 1 GHz

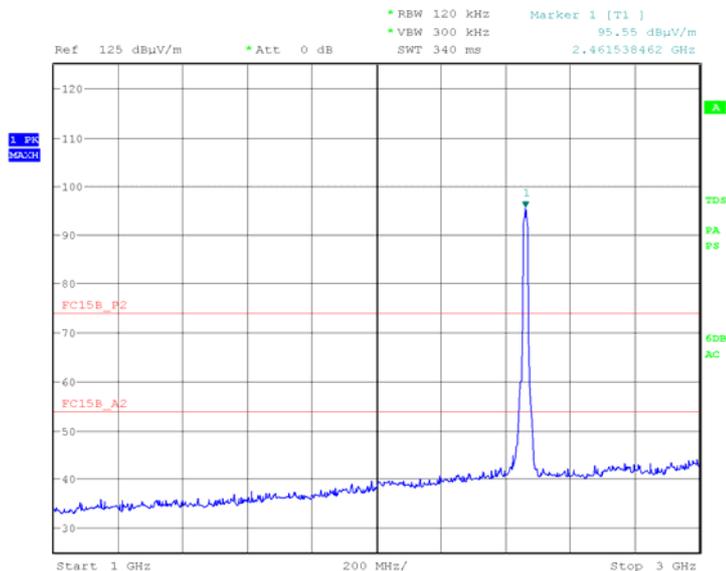


Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (deg)	Height (m)	Polarity
31.164	30.0	31.6	40.0	100	-10.0	68.4	0	1.00	Horizontal
32.716	29.2	28.8	40.0	100	-10.8	71.2	270	1.00	Vertical
704.878	31.1	35.9	46.0	200	-14.9	164.1	270	1.00	Horizontal
795.136	32.2	40.7	46.0	200	-13.8	159.3	270	1.00	Vertical
813.421	32.5	42.2	46.0	200	-13.5	157.8	0	1.00	Vertical
901.885	33.4	46.8	46.0	200	-12.6	153.2	270	1.00	Horizontal



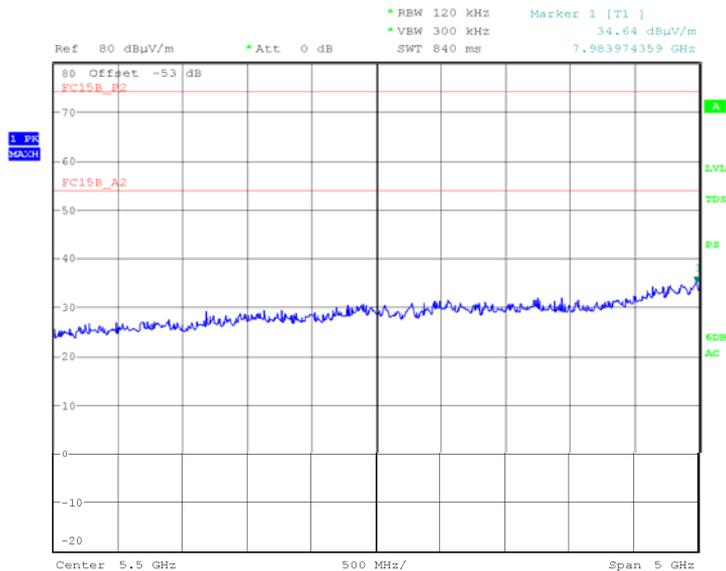
Product Service

1GHz to 3GHz



Date: 6.JUN.2011 22:00:51

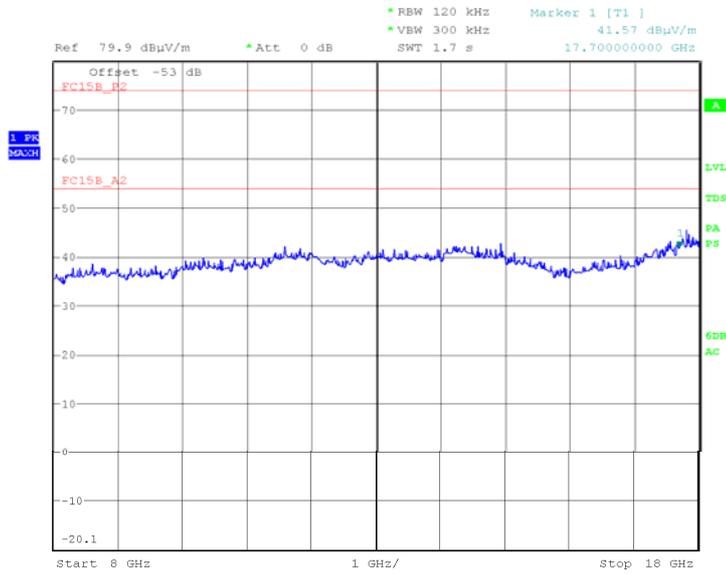
3GHz to 8GHz



Date: 7.JUN.2011 18:22:27

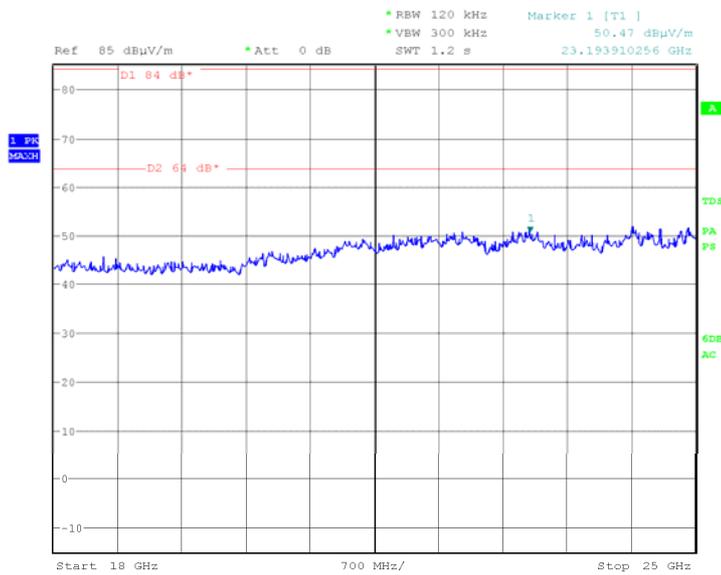


8GHz to 18GHz



Date: 7.JUN.2011 21:06:11

18GHz to 25GHz



Date: 7.JUN.2011 23:32:14



Product Service

2.3 MAXIMUM PEAK CONDUCTED OUTPUT POWER

2.3.1 Specification Reference

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

2.3.2 Equipment Under Test

CDMA SHI12, S/N: SSHFJ000853

2.3.3 Date of Test and Modification State

07 June 2011 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15.

The EUT was transmitted at maximum power via a cable to the Peak Power Analyser. The Analyser settings were adjusted to display the resultant trace on screen and a reference level offset was entered to account for the measurement path loss. The measurement bandwidth was set according to the signal being measured and the peak and average levels were recorded.

The test was performed with the EUT in the following configurations and modes of operation:

- Configuration 1 - Mode 1
- Mode 2
- Mode 3
- Configuration 2 - Mode 1
- Mode 2
- Mode 3
- Configuration 3 - Mode 1
- Mode 2
- Mode 3

2.3.6 Environmental Conditions

	07 June 2011
Ambient Temperature	20.0°C
Relative Humidity	45.9%



Product Service

2.3.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C for Maximum Peak Conducted Output Power.

The test results are shown below.

4.0 V DC Supply

Configuration 1 - Modes 1, 2 & 3

Modulation Data Rate (Mbps)	Maximum Peak Conducted Output Power					
	mW			dBm		
	2412 MHz	2437 MHz	2462 MHz	2412 MHz	2437 MHz	2462 MHz
1	83.15	66.78	89.21	19.19	18.24	19.50
2	89.90	85.77	100.32	19.53	19.33	20.01
5.5	89.40	88.97	102.33	19.51	19.49	20.10
11	89.36	89.82	110.04	19.51	19.53	20.41

Configuration 2 - Modes 1, 2 & 3

Modulation Data Rate (Mbps)	Maximum Peak Conducted Output Power					
	mW			dBm		
	2412 MHz	2437 MHz	2462 MHz	2412 MHz	2437 MHz	2462 MHz
6	130.77	144.47	161.67	21.16	21.59	22.08
9	130.09	141.41	161.51	21.14	21.50	22.08
12	123.13	130.59	147.97	20.90	21.15	21.70
18	113.72	126.48	144.71	20.55	21.02	21.60
24	119.82	138.03	162.40	20.78	21.39	22.10
36	128.84	140.36	154.06	21.10	21.47	21.87
48	118.23	125.55	143.90	20.72	21.09	21.58
54	120.24	134.99	154.83	20.80	21.30	21.89

Configuration 3 - Modes 1, 2 & 3

Modulation Data Rate (Mbps)	Maximum Peak Conducted Output Power					
	mW			dBm		
	2412 MHz	2437 MHz	2462 MHz	2412 MHz	2437 MHz	2462 MHz
6.5	123.54	136.59	152.68	20.91	21.35	21.83
13	125.36	133.73	102.84	20.98	21.26	20.12
19.5	120.02	134.97	142.56	20.79	21.30	21.54
26	71.23	125.98	144.40	18.52	21.00	21.60
39	116.40	126.85	146.28	20.65	21.03	21.65
52	120.47	127.29	115.10	20.80	21.04	20.61
58.5	125.94	148.20	110.43	21.10	21.70	20.43
65	116.11	125.64	143.09	20.64	20.99	21.55

Limit Clause

<1 watt.



Product Service

2.4 EIRP PEAK POWER

2.4.1 Specification Reference

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

2.4.2 Equipment Under Test

CDMA SHI12, S/N: SSHFJ000863 and SSHFJ000865

2.4.3 Date of Test and Modification State

23 May 2011 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI C63.4.

The EUT was placed on a remotely controlled turntable within a semi-anechoic chamber. Measurements of the carrier frequency from the EUT were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

The measurement was performed with a peak detector and the trace set to max hold using a Resolution and Video bandwidth of 1 MHz.

A substitution was then performed by replacing the EUT with a substitution antenna and signal generator. The signal generator level was increased to achieve the same raw result as the EUT. Cable loss and antenna gain was included to obtain the result.

A wideband power metre was then used to apply a correction factor to achieve the final result.

The test was performed with the EUT in the following configurations and modes of operation:

- Configuration 1 - Mode 1
- Mode 2
- Mode 3
- Configuration 2 - Mode 1
- Mode 2
- Mode 3
- Configuration 3 - Mode 1
- Mode 2
- Mode 3

2.4.6 Environmental Conditions

23 May 2011

Ambient Temperature 19.5°C

Relative Humidity 45.0%



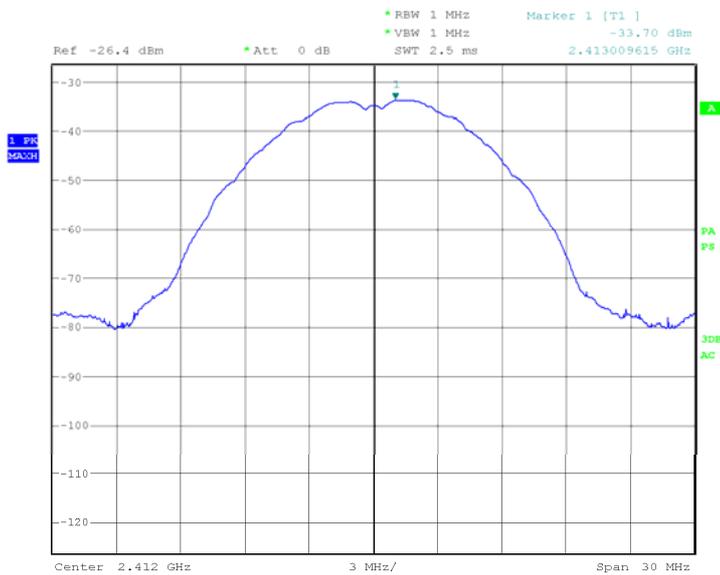
2.4.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C for EIRP Peak Power.

The test results are shown below.

Configuration 1 - Mode 1

Freq GHz	Result EIRP dBm	Limit EIRP dBm	Result EIRP mW	Limit EIRP mW
2.412	15.16	36.0	32.81	4000

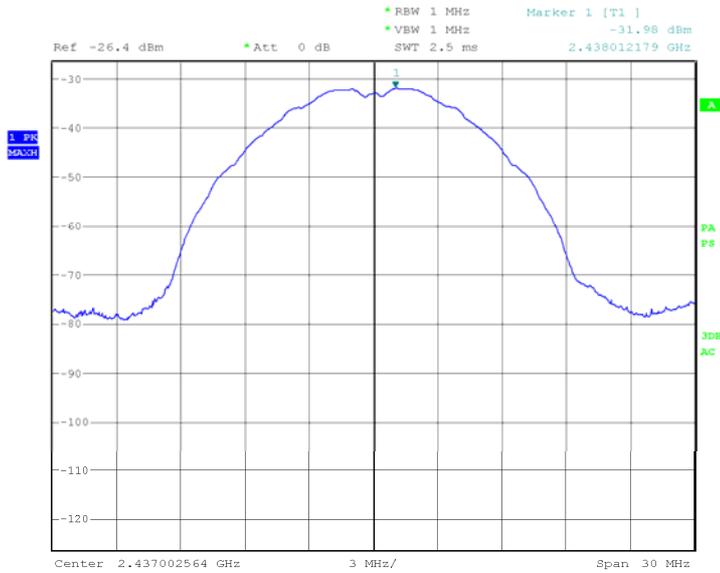


Date: 6.JUN.2011 18:32:25



Configuration 1 - Mode 2

Freq GHz	Result EIRP dBm	Limit EIRP dBm	Result EIRP mW	Limit EIRP mW
2.437	14.10	36.0	25.70	4000

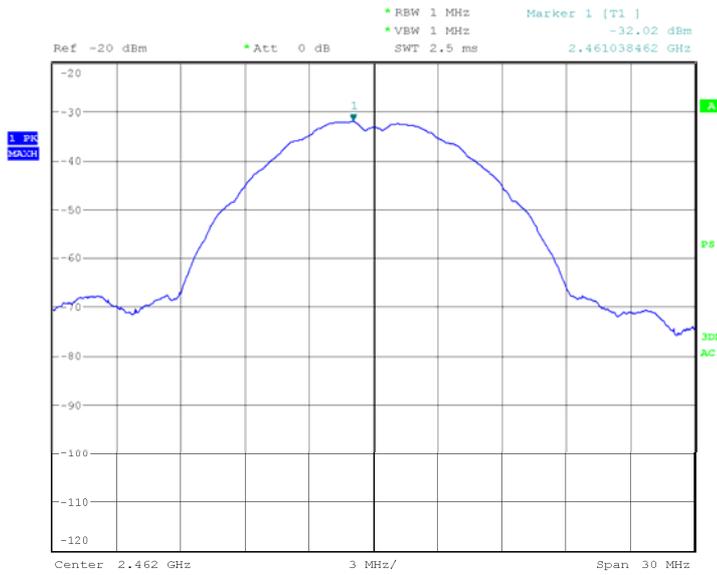


Date: 6.JUN.2011 18:26:18



Configuration 1 - Mode 3

Freq GHz	Result EIRP dBm	Limit EIRP dBm	Result EIRP mW	Limit EIRP mW
2.462	14.84	36.0	30.48	4000

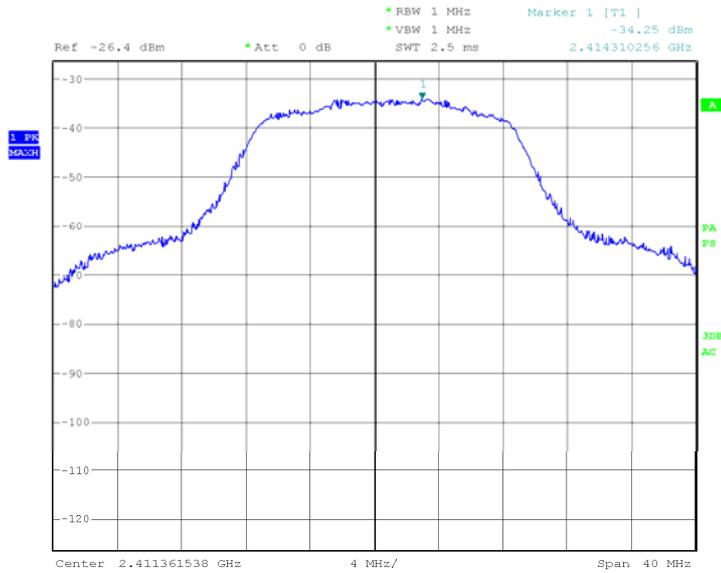


Date: 6.JUN.2011 17:46:12



Configuration 2 - Mode 1

Freq GHz	Result EIRP dBm	Limit EIRP dBm	Result EIRP mW	Limit EIRP mW
2.412	17.25	36.0	53.09	4000

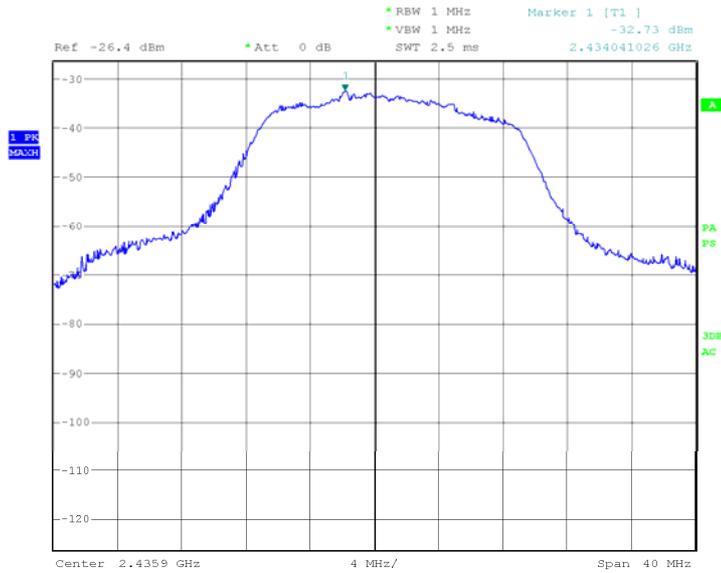


Date: 6.JUN.2011 19:29:08



Configuration 2 - Mode 2

Freq GHz	Result EIRP dBm	Limit EIRP dBm	Result EIRP mW	Limit EIRP mW
2.437	16.60	36.0	45.71	4000

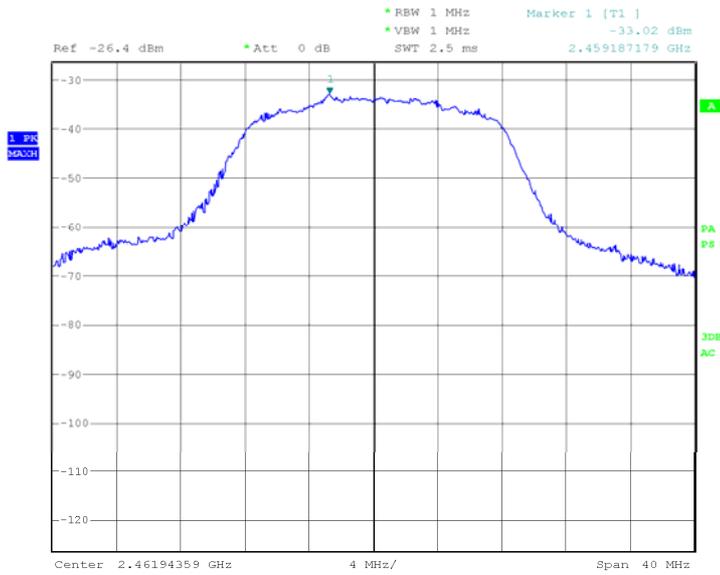


Date: 6.JUN.2011 19:51:33



Configuration 2 - Mode 3

Freq GHz	Result EIRP dBm	Limit EIRP dBm	Result EIRP mW	Limit EIRP mW
2.462	18.68	36.0	73.79	4000

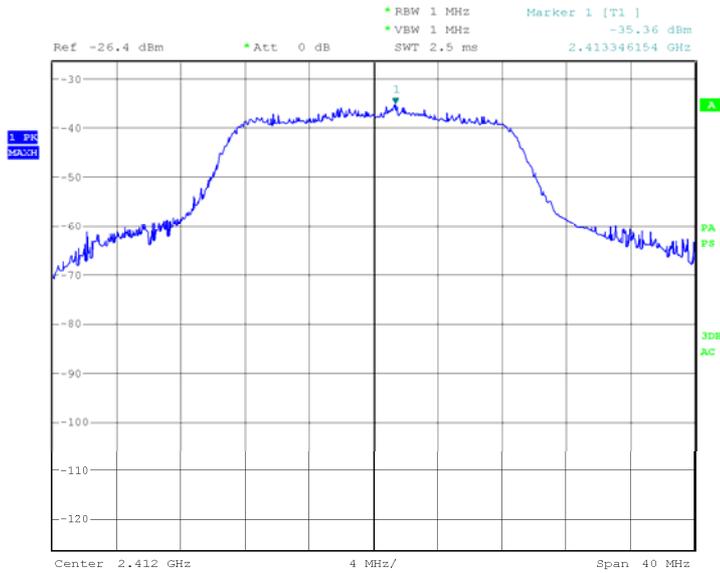


Date: 6.JUN.2011 20:13:16



Configuration 3 - Mode 1

Freq GHz	Result EIRP dBm	Limit EIRP dBm	Result EIRP mW	Limit EIRP mW
2.412	18.47	36.0	70.31	4000

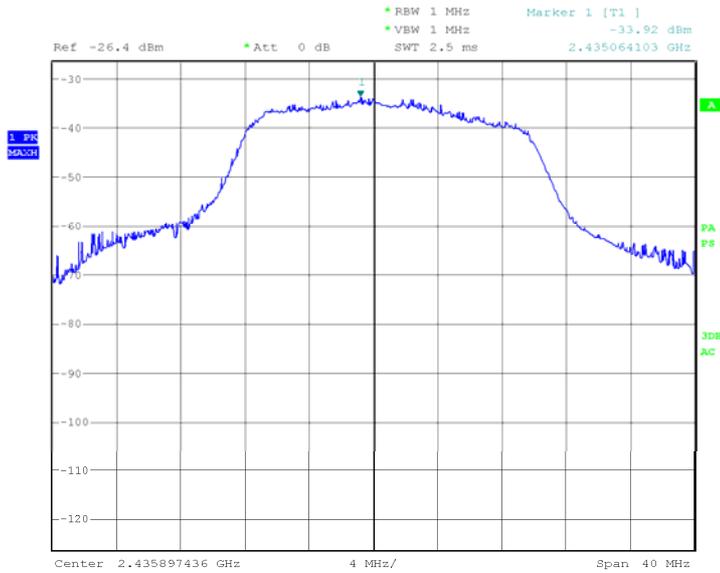


Date: 6.JUN.2011 20:48:24



Configuration 3 - Mode 2

Freq GHz	Result EIRP dBm	Limit EIRP dBm	Result EIRP mW	Limit EIRP mW
2.437	17.35	36.0	54.33	4000

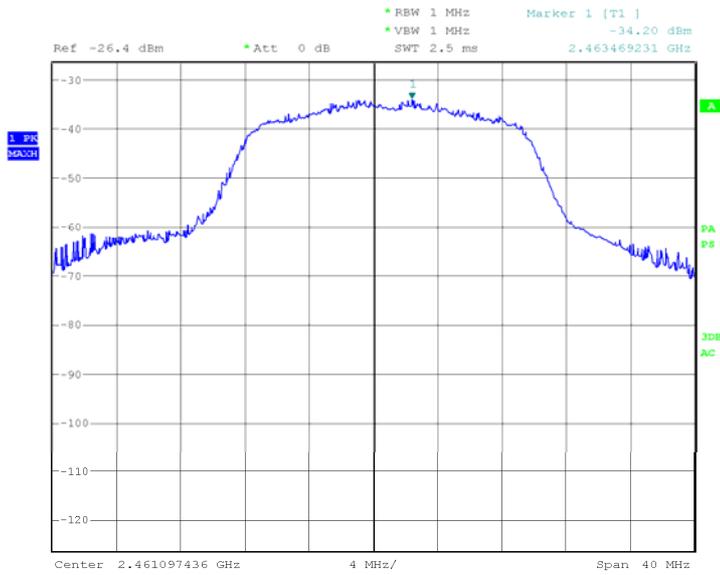


Date: 6.JUN.2011 21:16:58



Configuration 3 - Mode 3

Freq GHz	Result EIRP dBm	Limit EIRP dBm	Result EIRP mW	Limit EIRP mW
2.462	15.73	36.0	37.41	4000



Date: 6.JUN.2011 21:42:31



Product Service

2.5 SPURIOUS EMISSIONS

2.5.1 Specification Reference

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

2.5.2 Equipment Under Test

CDMA SHI12, S/N: SSHJ000856

2.5.3 Date of Test and Modification State

15 June 2011 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with FCC CFR 47 Part 15.

In accordance with Part 15.247(d), the Spurious Conducted Emissions from the antenna terminal were measured. The transmitter output power was attenuated using a combination of filters and attenuators and the frequency spectrum investigated from 9 kHz to 25 GHz. The EUT was set to transmit on full power. The resolution and video bandwidths were set to 100 kHz in accordance with Part 15.247. The spectrum analyser detector was set to Max Hold.

With the EUT transmitting at maximum power, the Spectrum Analyser was set to Max Hold and the fundamental peak measured in a RBW and VBW of 100 kHz. This level was used to determine the limit line as displayed on the plots of -20dBc.

The maximum path loss across each measurement band was used as the reference level offset to ensure worst case results.

The test was performed with the EUT in the following configurations and modes of operation:

- Configuration 1 - Mode 1
- Mode 2
- Mode 3
- Configuration 2 - Mode 1
- Mode 2
- Mode 3
- Configuration 3 - Mode 1
- Mode 2
- Mode 3

2.5.6 Environmental Conditions

	15 June 2011
Ambient Temperature	25.5°C
Relative Humidity	50.2%



2.5.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C for Spurious Emissions.

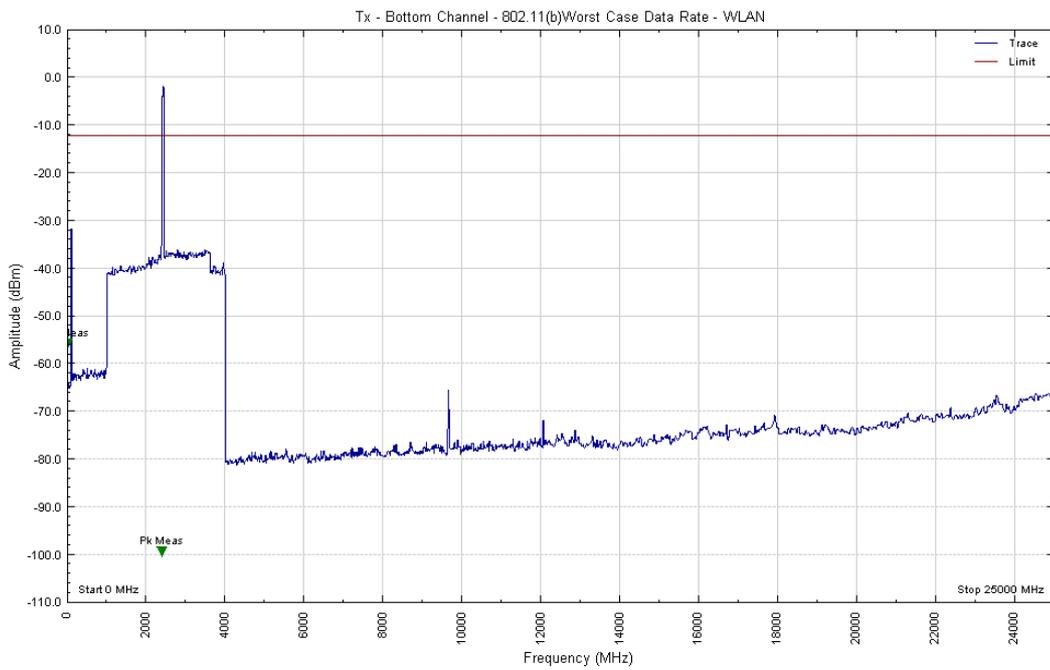
The test results are shown below.

4.0 V DC Supply

Configuration 1 – Mode 1

2 Mbps

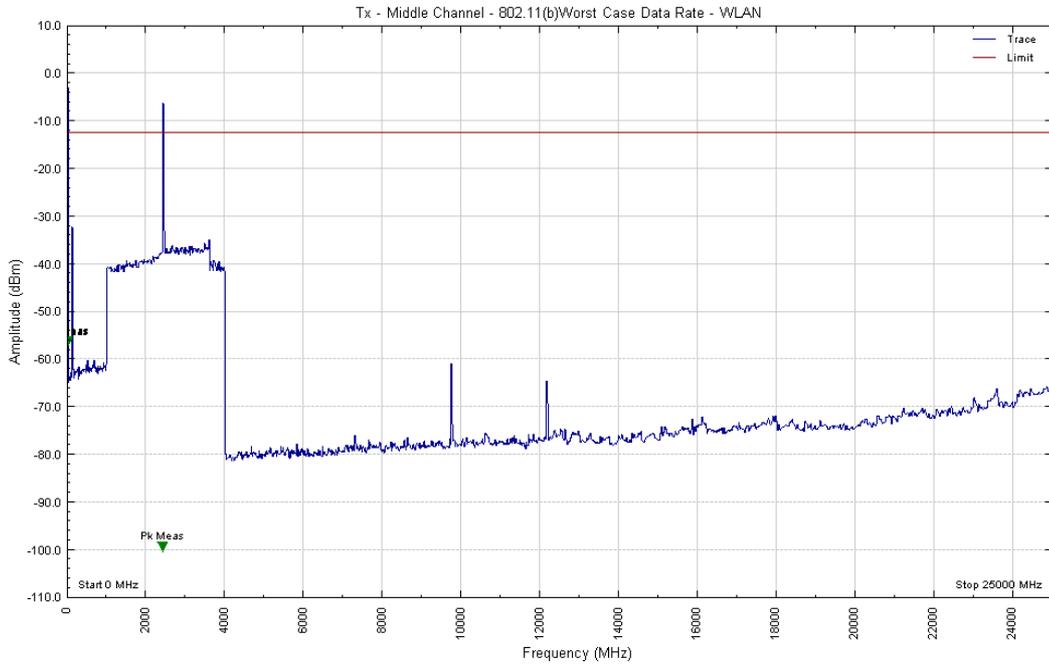
9 kHz to 25 GHz





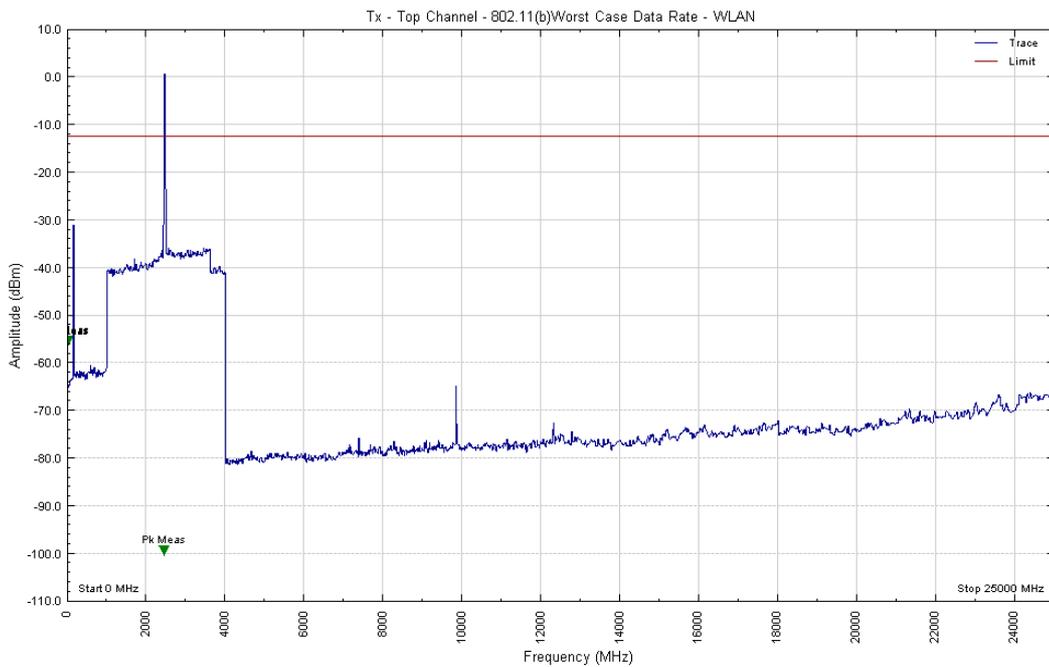
Configuration 1 – Mode 2

9 kHz to 25 GHz



Configuration 1 – Mode 3

9 kHz to 25 GHz

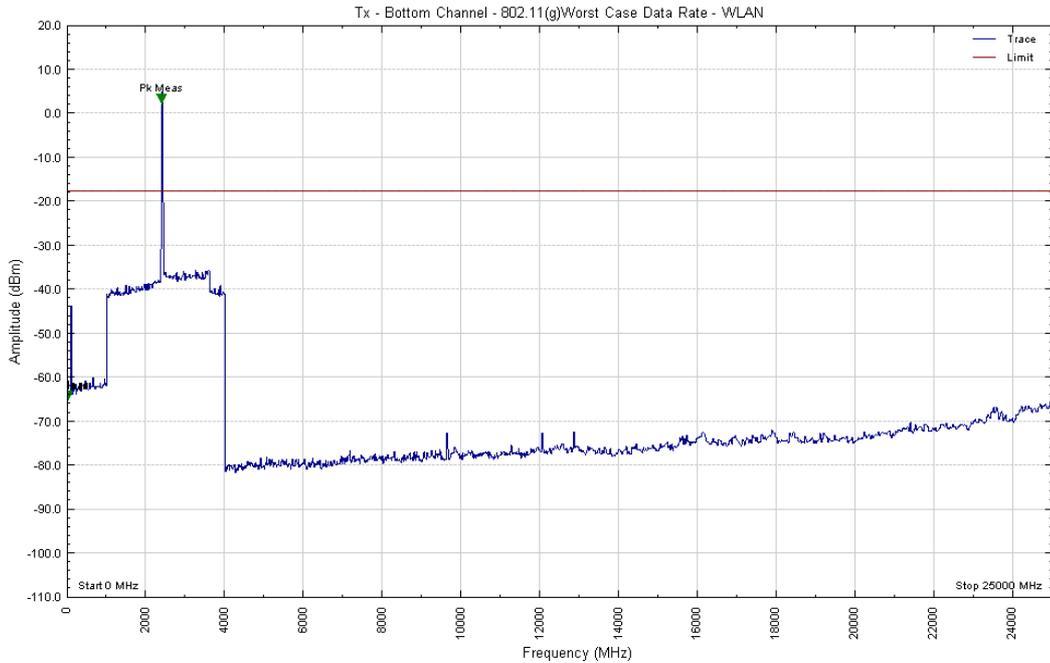




Configuration 2 – Mode 1

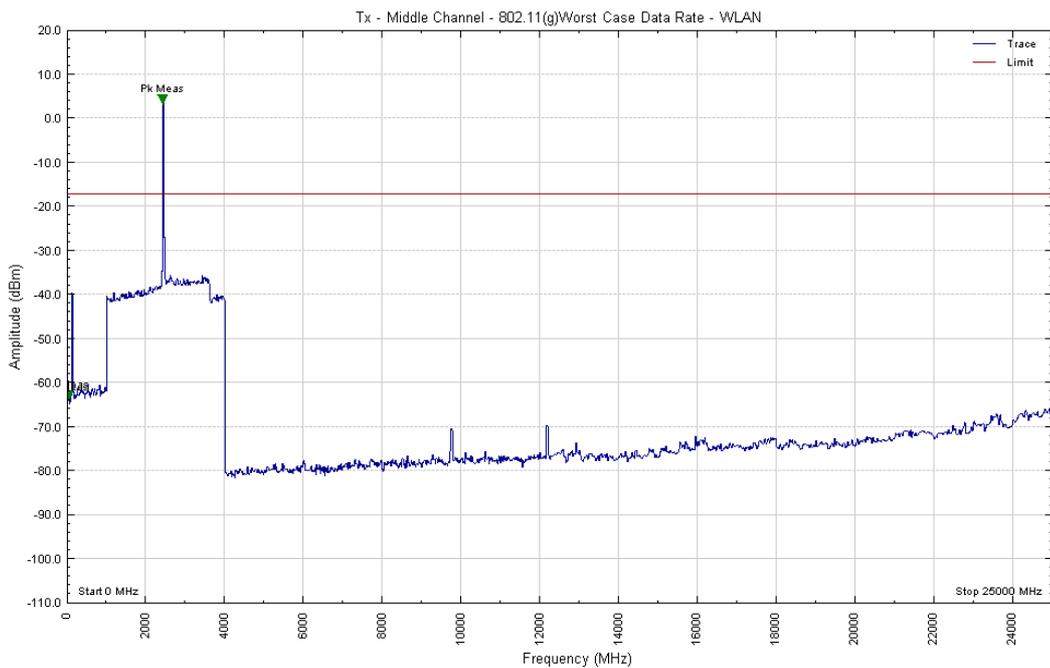
24 Mbps

9 kHz to 25 GHz



Configuration 2 – Mode 2

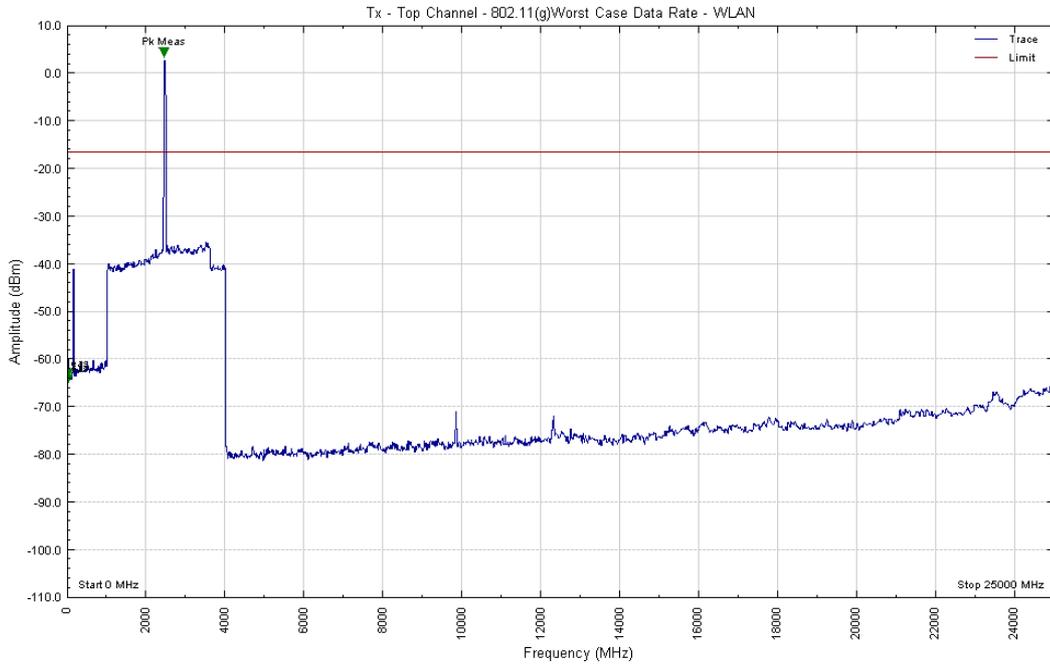
9 kHz to 25 GHz





Configuration 2 – Mode 3

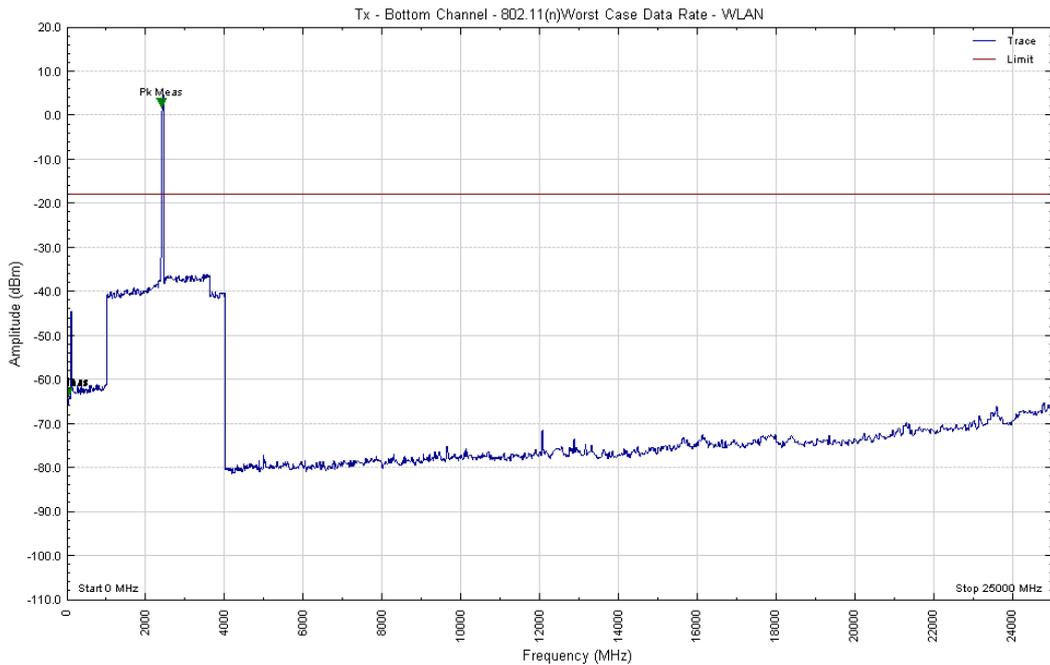
9 kHz to 25 GHz



Configuration 3 – Mode 1

13 Mbps

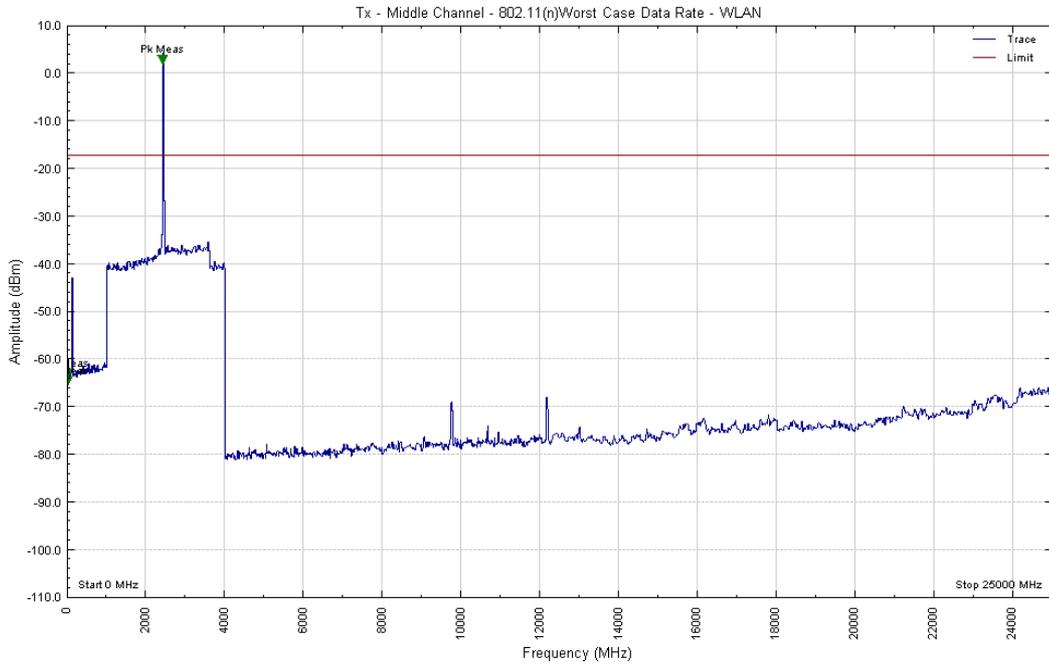
9 kHz to 25 GHz





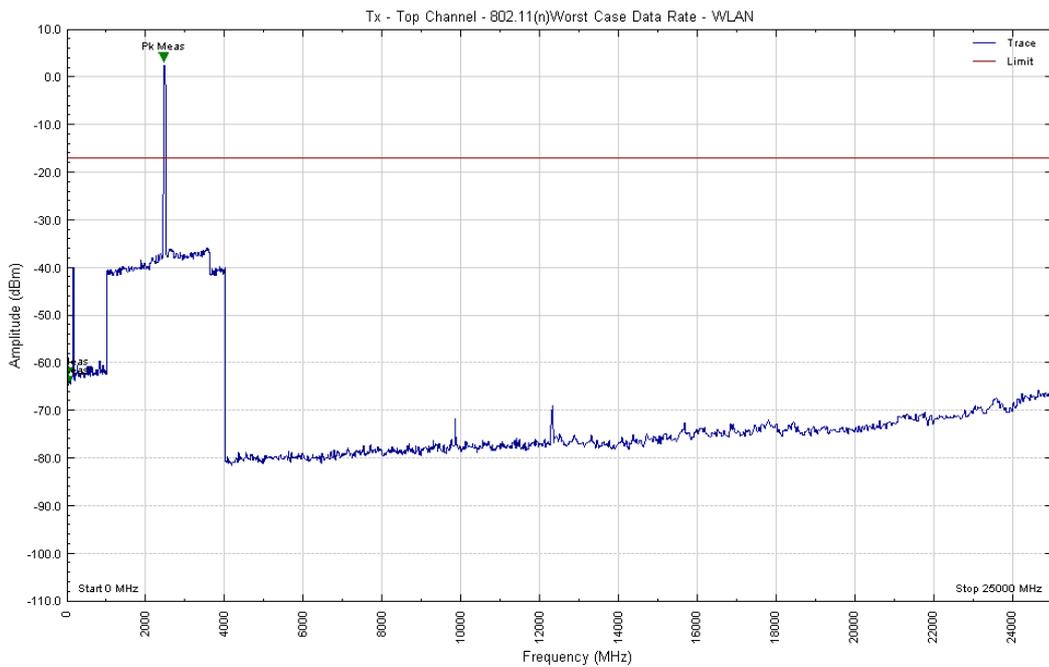
Configuration 3 – Mode 2

9 kHz to 25 GHz



Configuration 3 – Mode 3

9 kHz to 25 GHz





Product Service

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

2.6 POWER SPECTRAL DENSITY

2.6.1 Specification Reference

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

2.6.2 Equipment Under Test

CDMA SHI12, S/N: SSHFJ000853

2.6.3 Date of Test and Modification State

06 June 2011 - Modification State 0

2.6.4 Test Equipment Used

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

2.6.5 Test Method and Operating Modes

The test was applied in accordance with FCC CFR 47 Part 15.

The EUT was connected to a spectrum analyser via a 10 dB 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.

The test was performed with the EUT in the following configurations and modes of operation:

- Configuration 1 - Mode 1
- Mode 2
- Mode 3
- Configuration 2 - Mode 1
- Mode 2
- Mode 3
- Configuration 3 - Mode 1
- Mode 2
- Mode 3

2.6.6 Environmental Conditions

	06 June 2011
Ambient Temperature	22.6°C
Relative Humidity	41.9%



Product Service

2.6.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C for Power Spectral Density.

The test results are shown below.

4.0 V DC Supply

Configuration 1 – Modes 1, 2 and 3

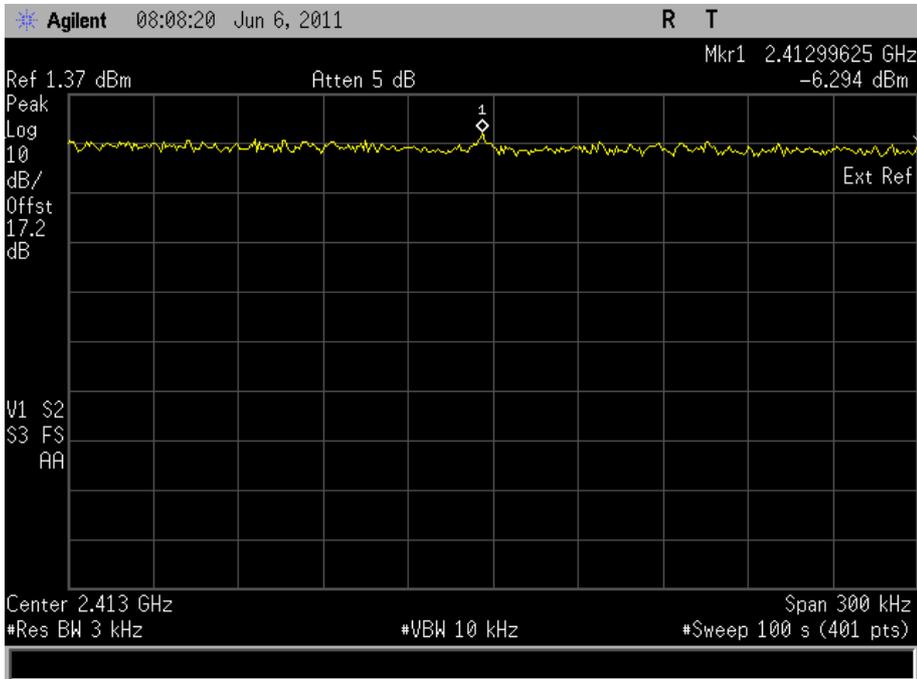
Frequency (MHz)	Data Rate (Mbps)	Power Spectral Density in 3 kHz Bands
2412	1	-6.29
	2	-6.64
	5	-8.35
	11	-7.65
2437	1	-5.62
	2	-5.67
	5	-7.45
	11	-6.73
2462	1	-5.08
	2	-5.17
	5	-7.07
	11	-7.18



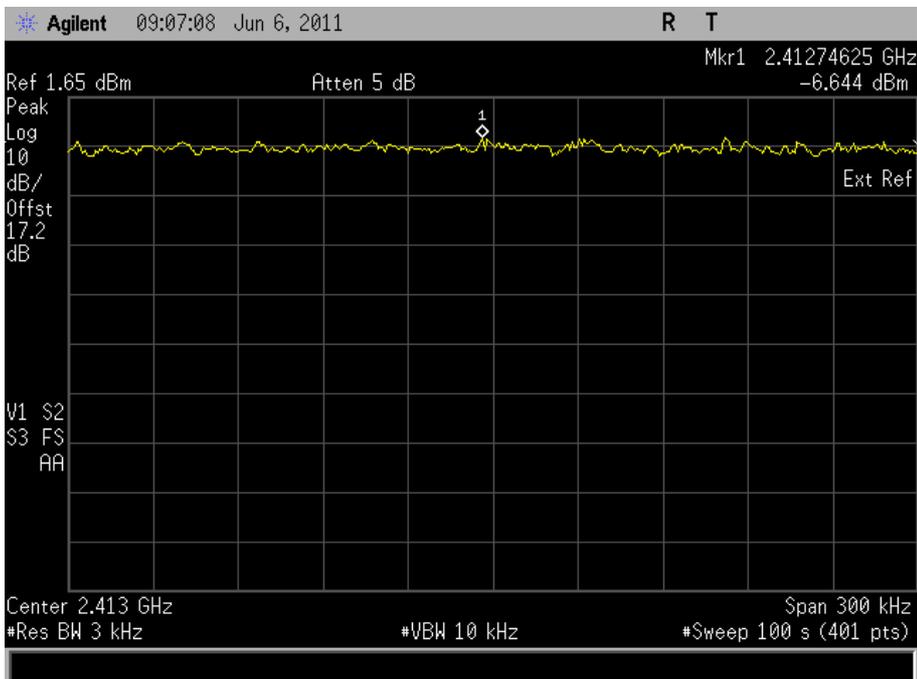
Product Service

2412 MHz

1 Mbps



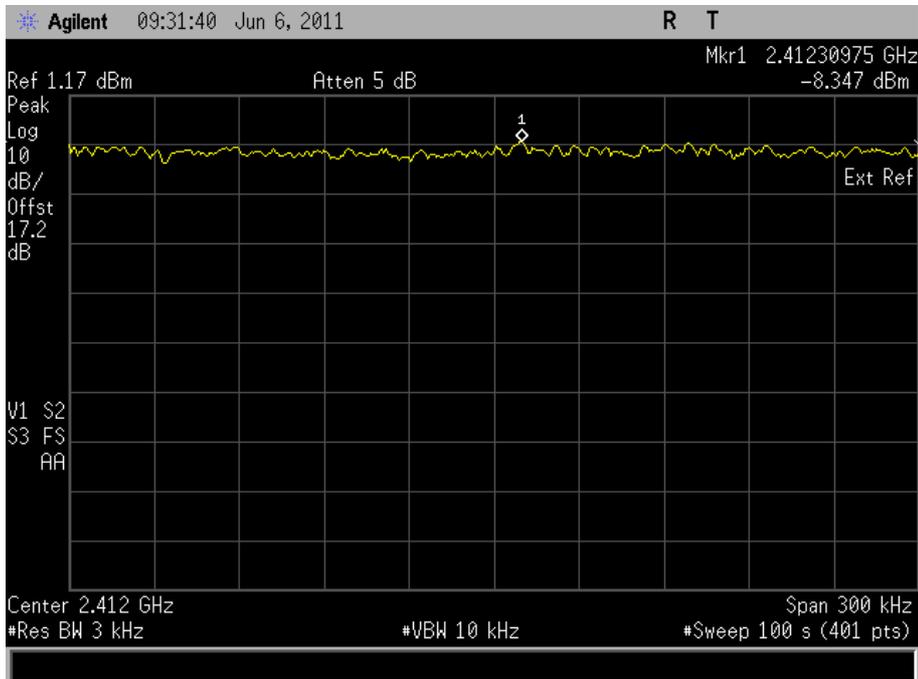
2 Mbps



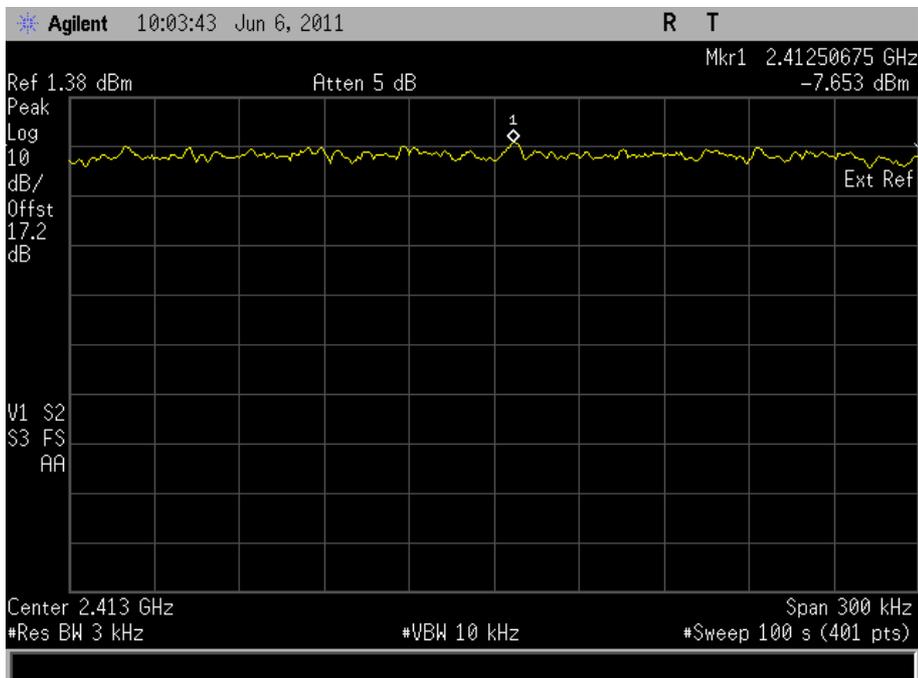


Product Service

5.5 Mbps



11 Mbps

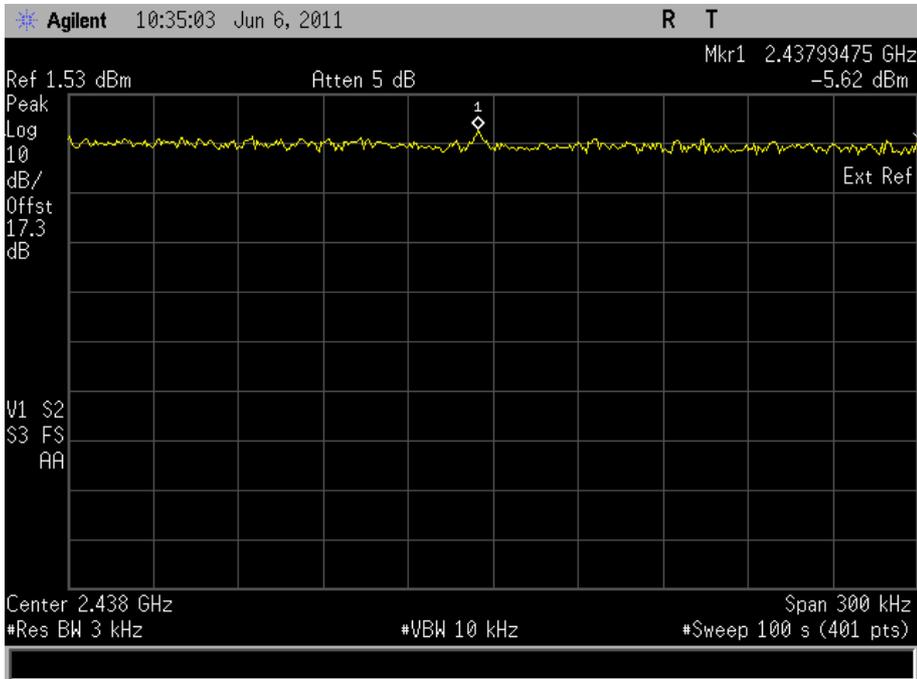




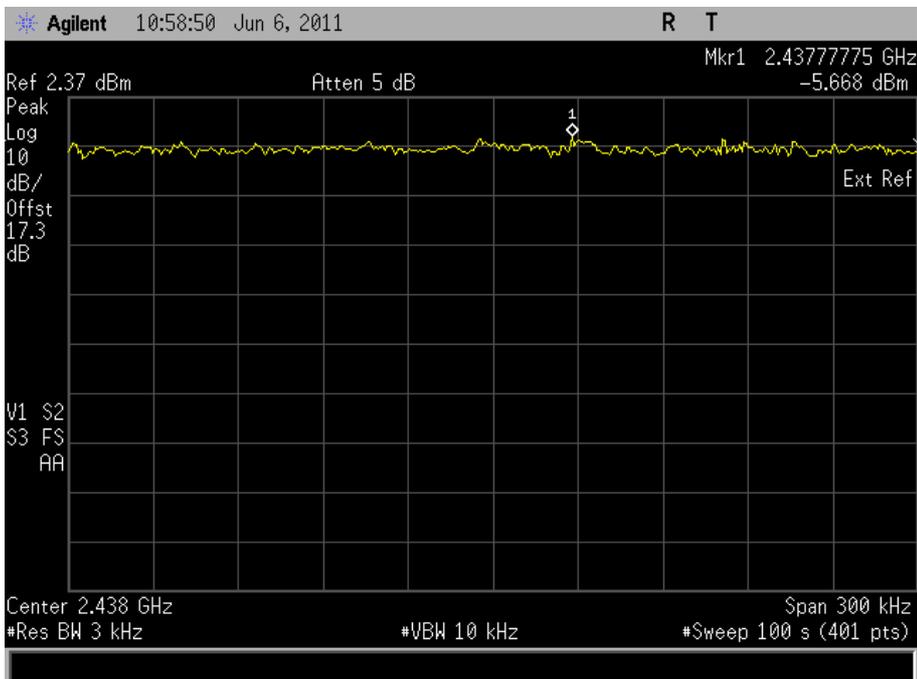
Product Service

2437 MHz

1 Mbps



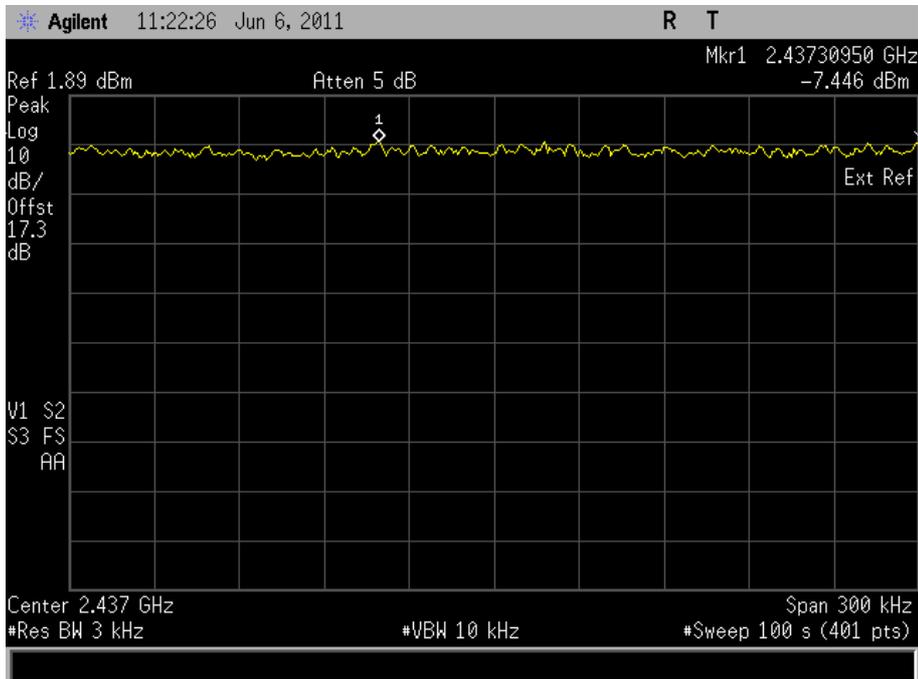
2 Mbps



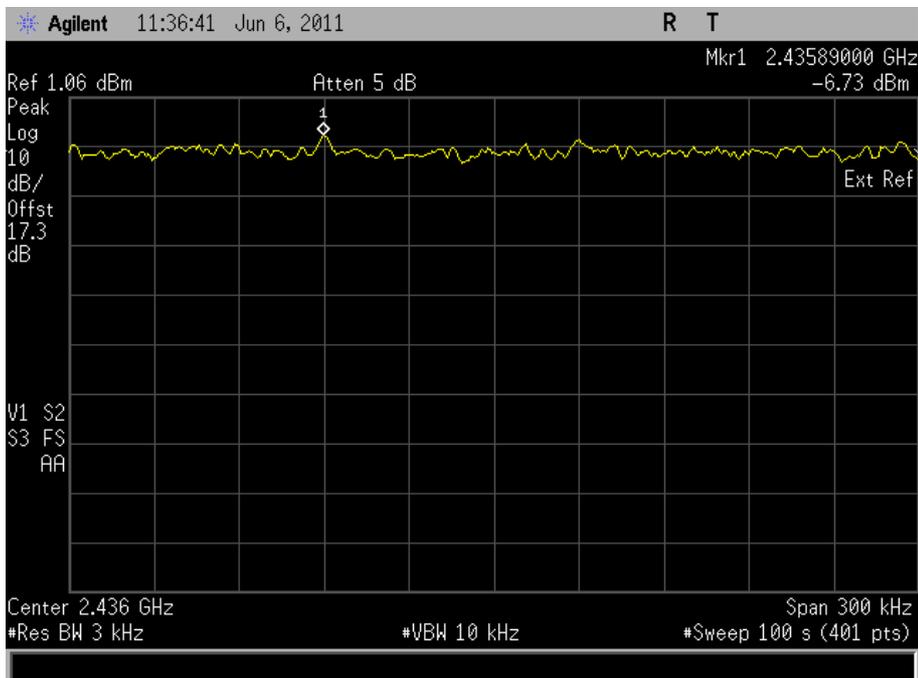


Product Service

5.5 Mbps



11 Mbps

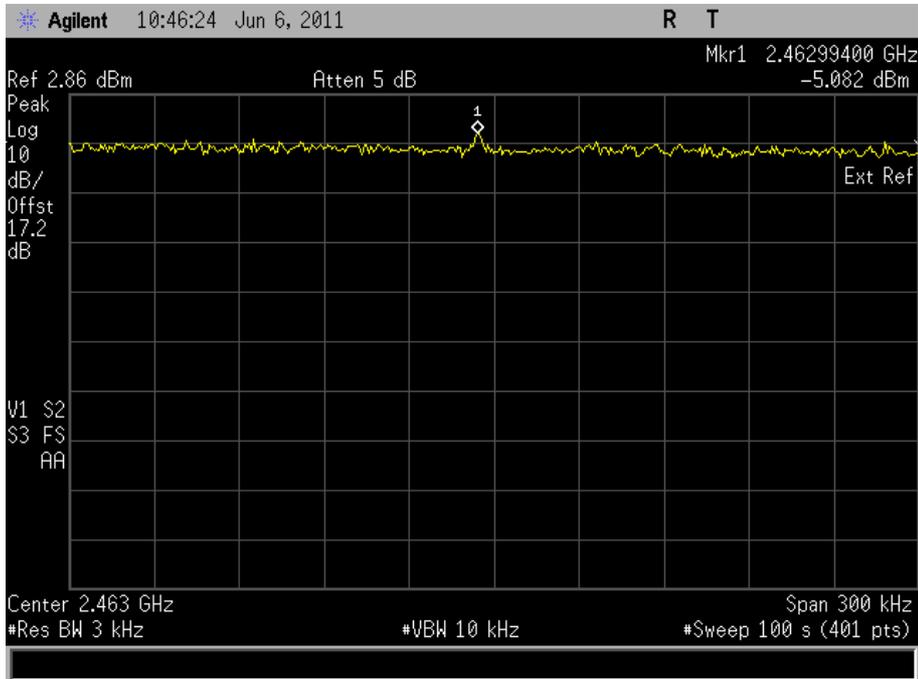




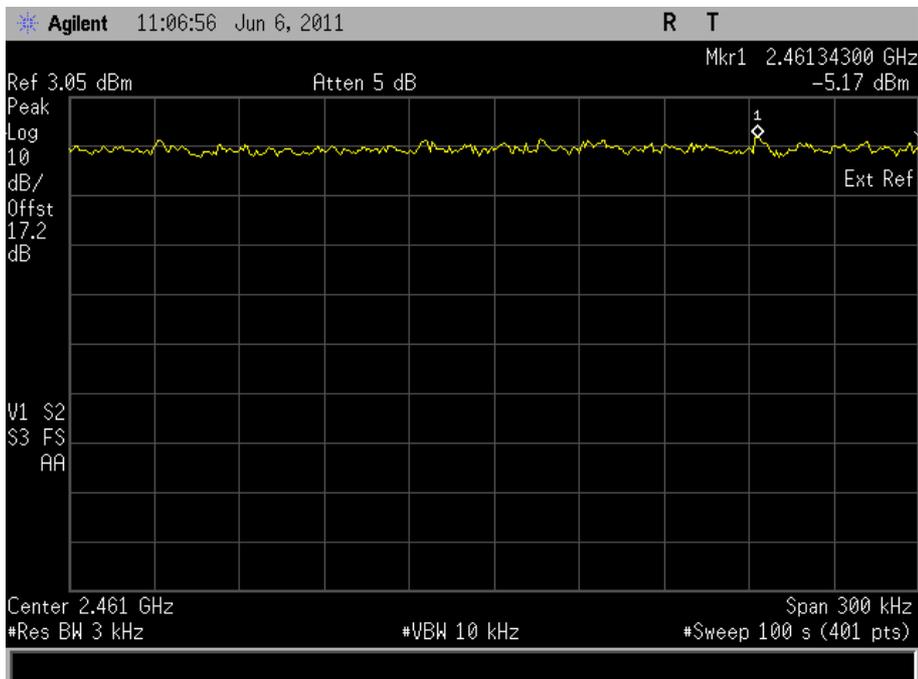
Product Service

2462 MHz

1 Mbps



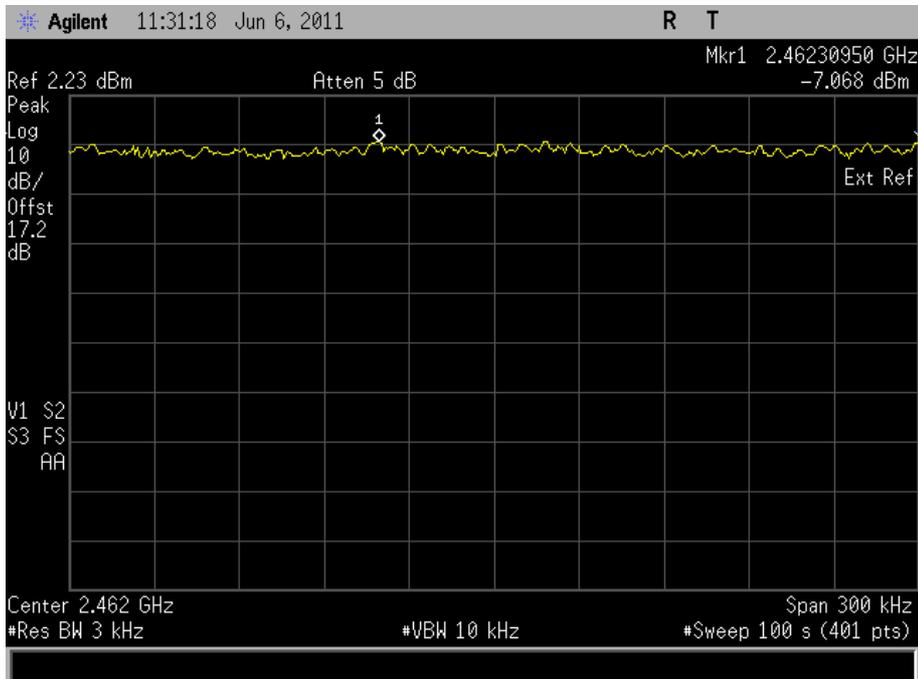
2 Mbps



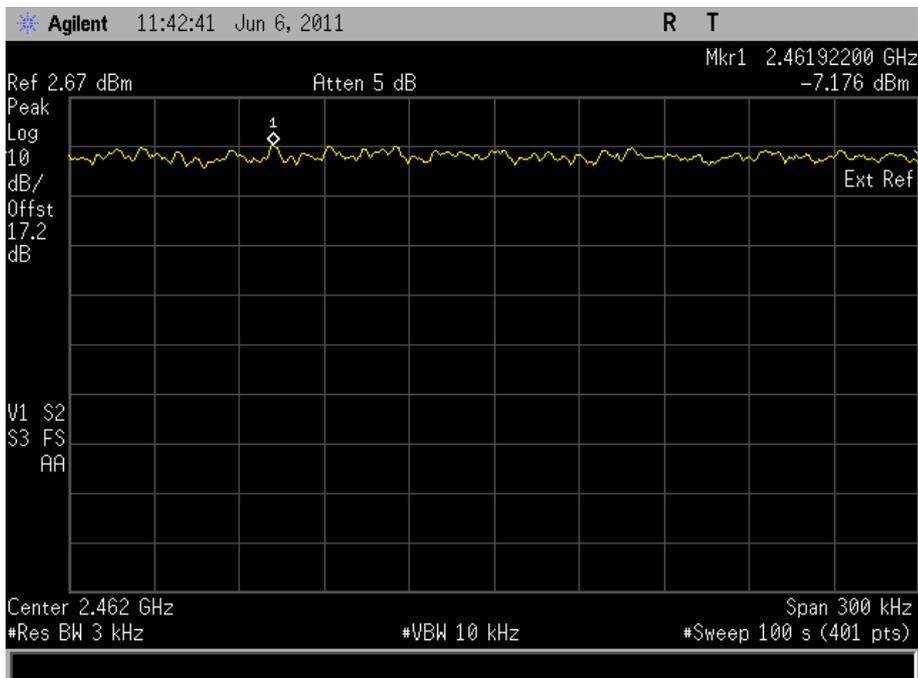


Product Service

5.5 Mbps



11 Mbps





Product Service

Configuration 2 – Modes 1, 2 and 3

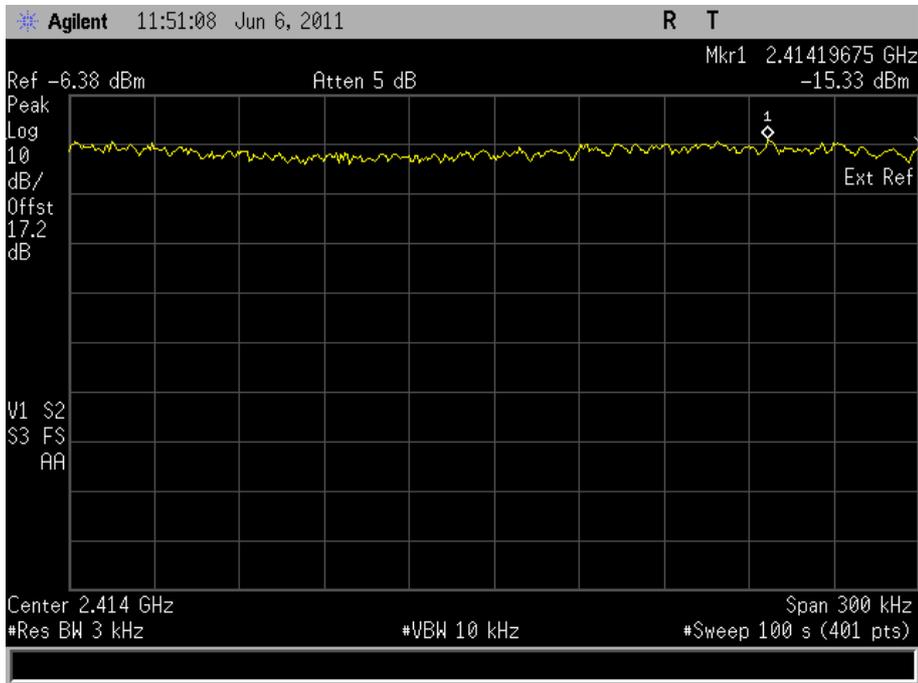
Frequency (MHz)	Data Rate (Mbps)	Power Spectral Density in 3 kHz Bands
2412	6	-15.33
	9	-12.52
	12	-12.00
	18	-11.42
	24	-12.76
	36	-12.58
	48	-11.89
	54	-13.11
2437	6	-11.98
	9	-12.90
	12	-12.02
	18	-11.75
	24	-11.42
	36	-13.12
	48	-11.71
	54	-11.07
2462	6	-11.66
	9	-11.56
	12	-11.04
	18	-11.01
	24	-10.95
	36	-12.03
	48	-11.09
	54	-11.84



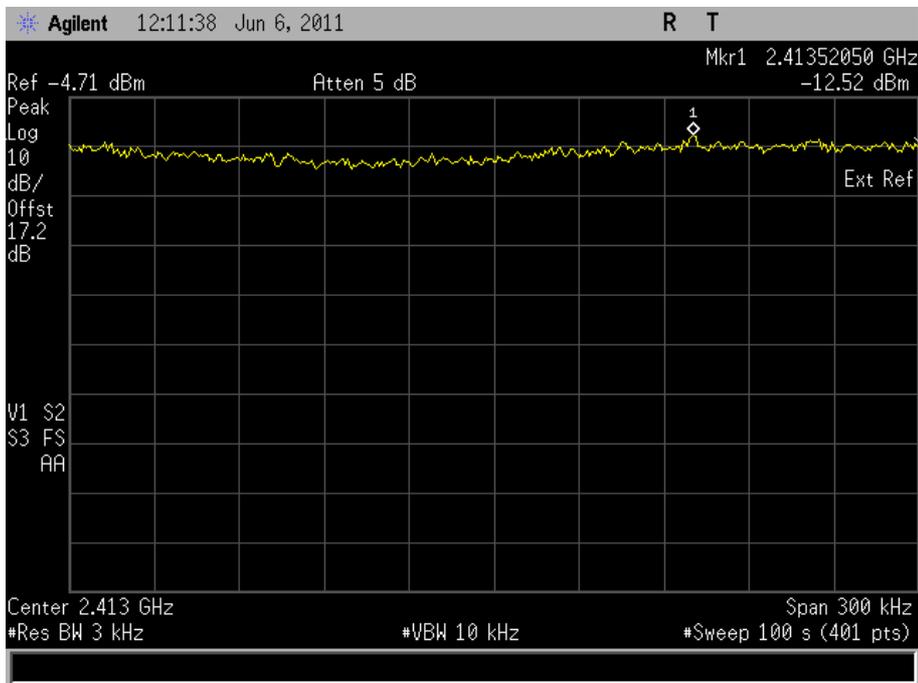
Product Service

2412 MHz

6 Mbps



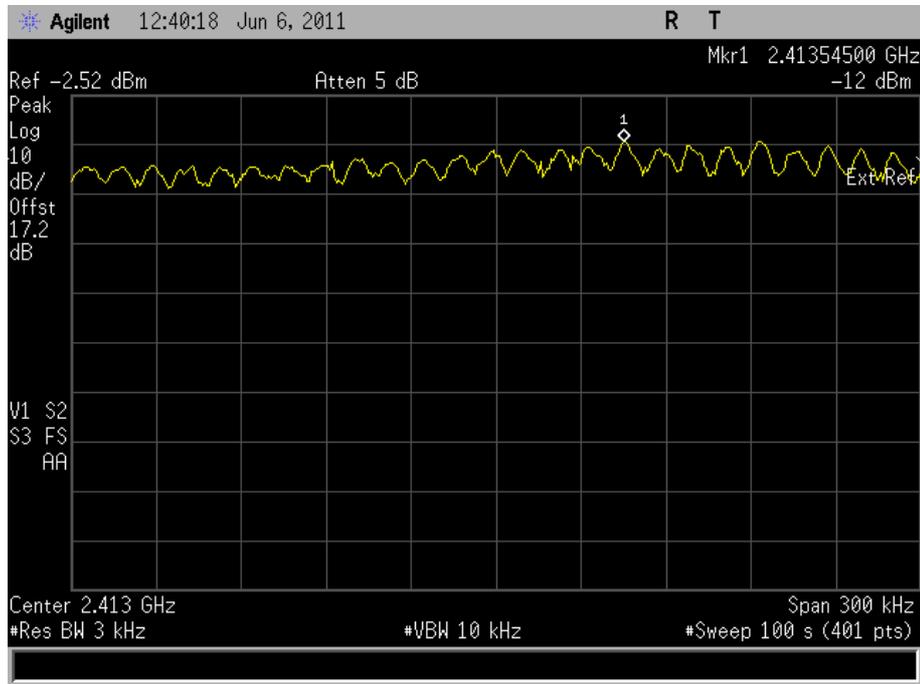
9 Mbps



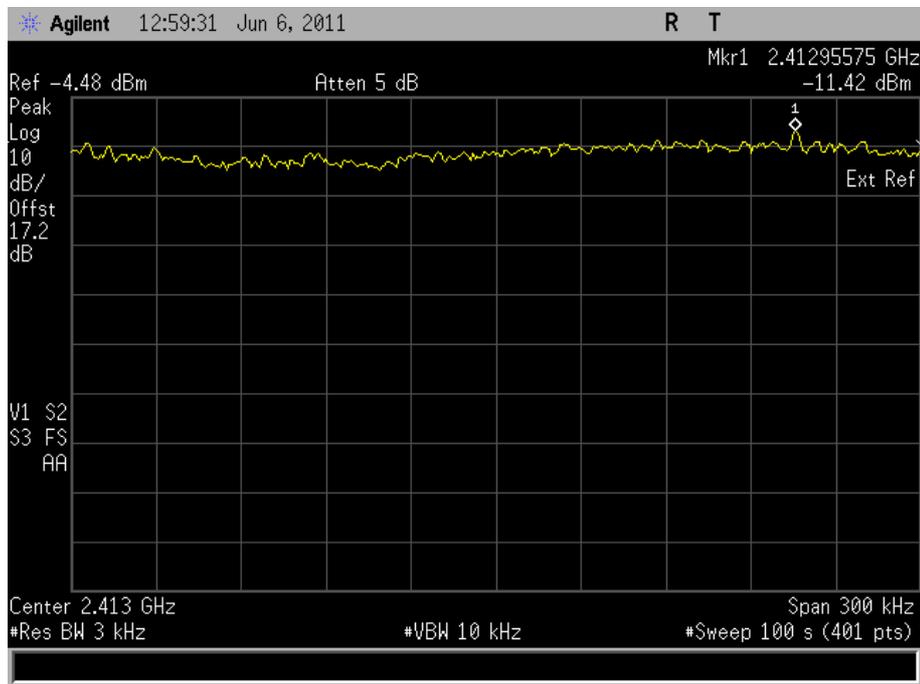


Product Service

12 Mbps



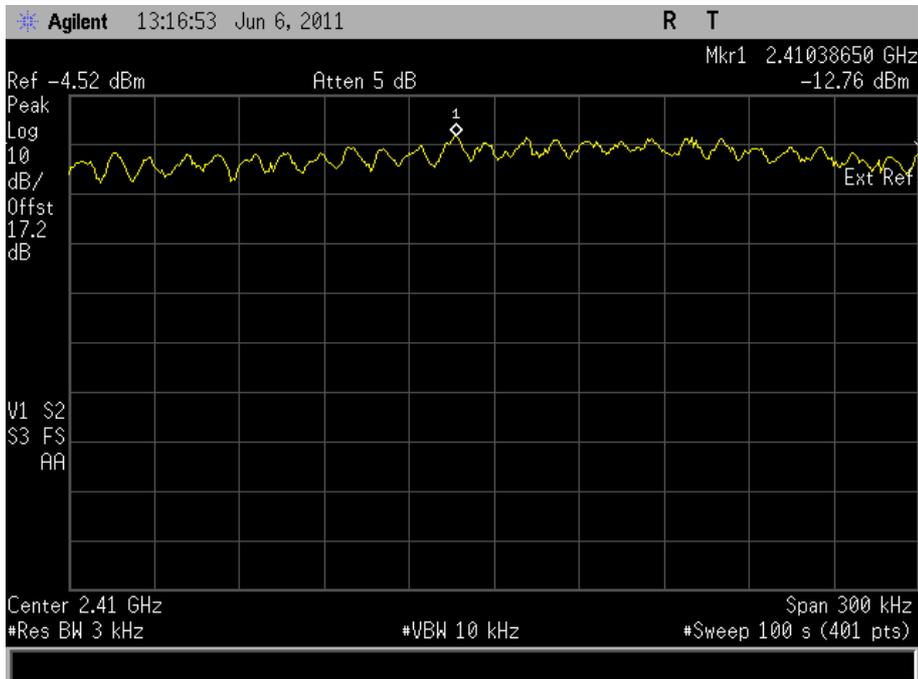
18 Mbps



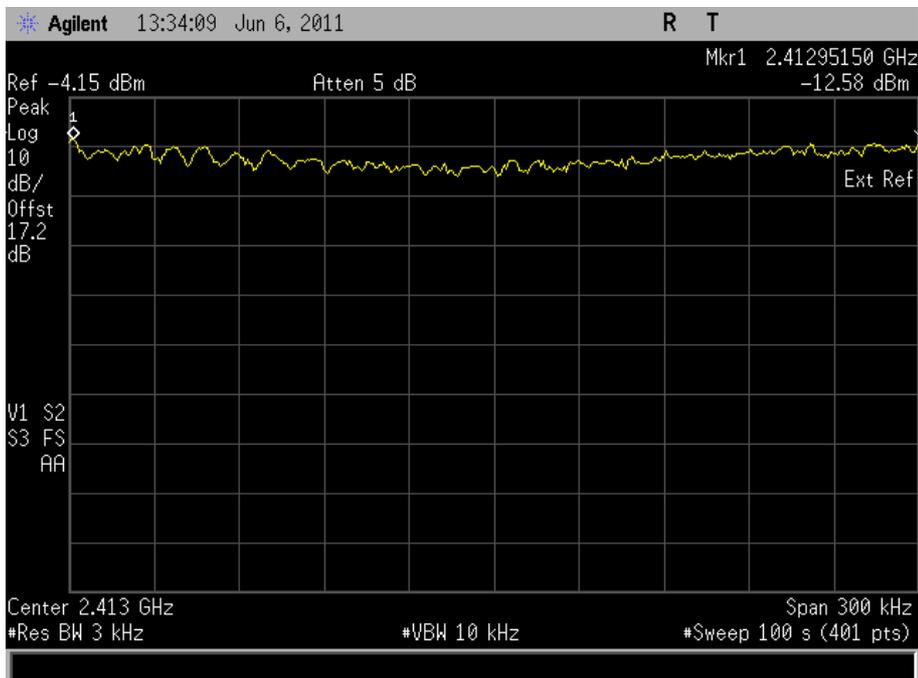


Product Service

24 Mbps



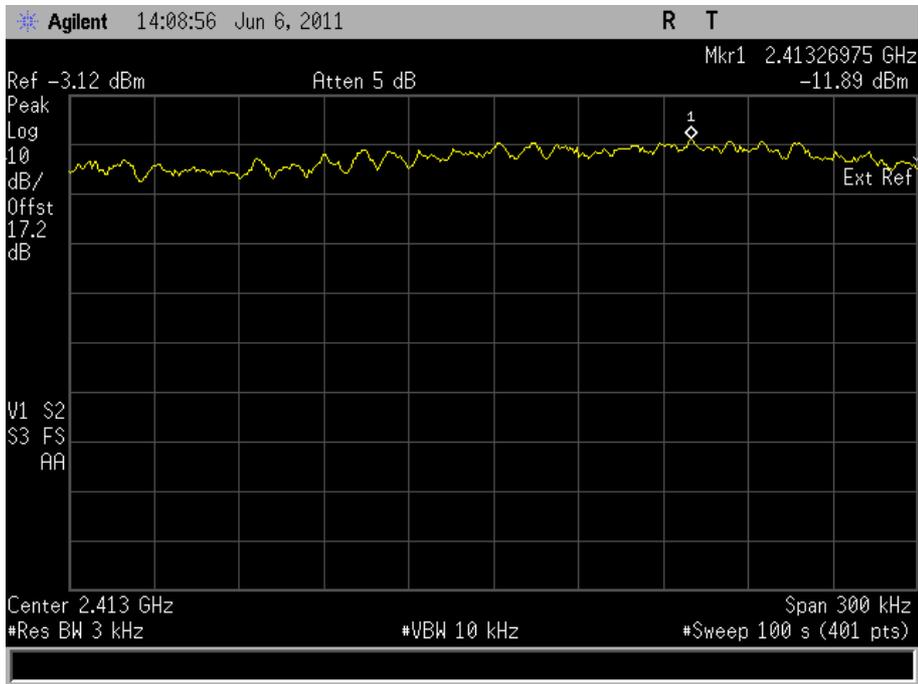
36 Mbps



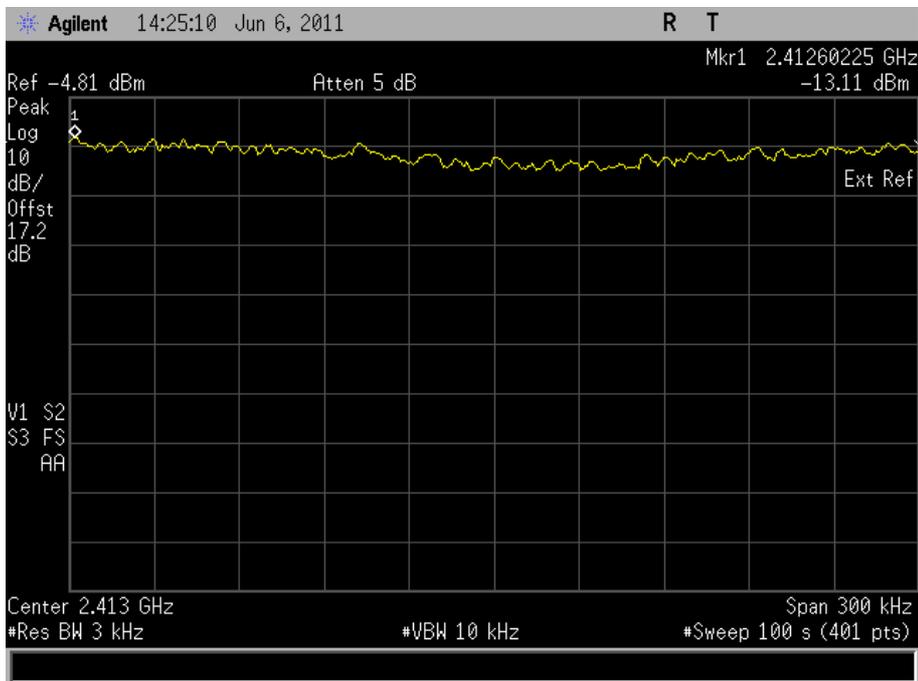


Product Service

48 Mbps



54 Mbps

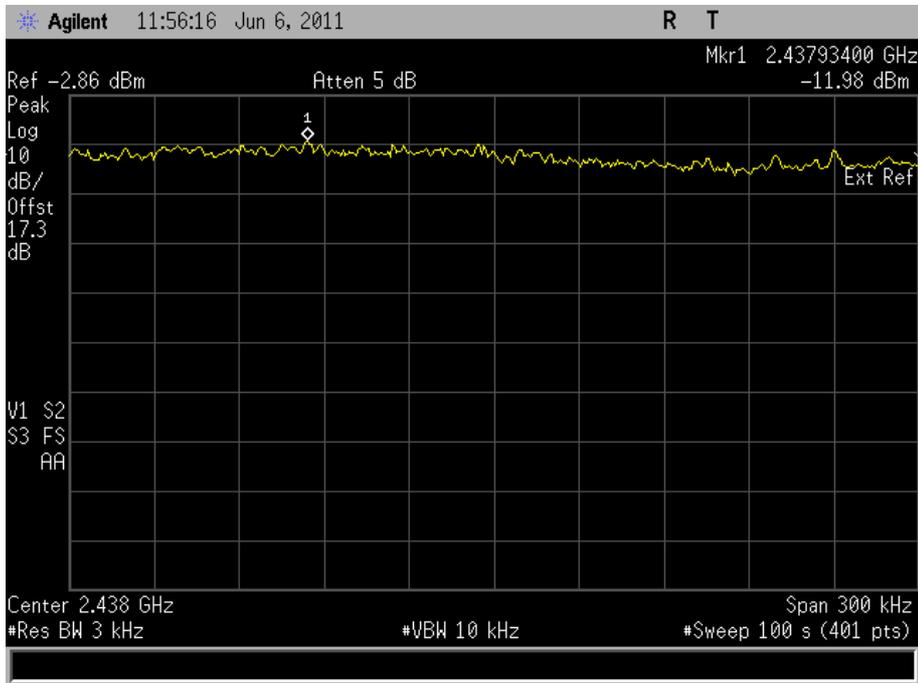




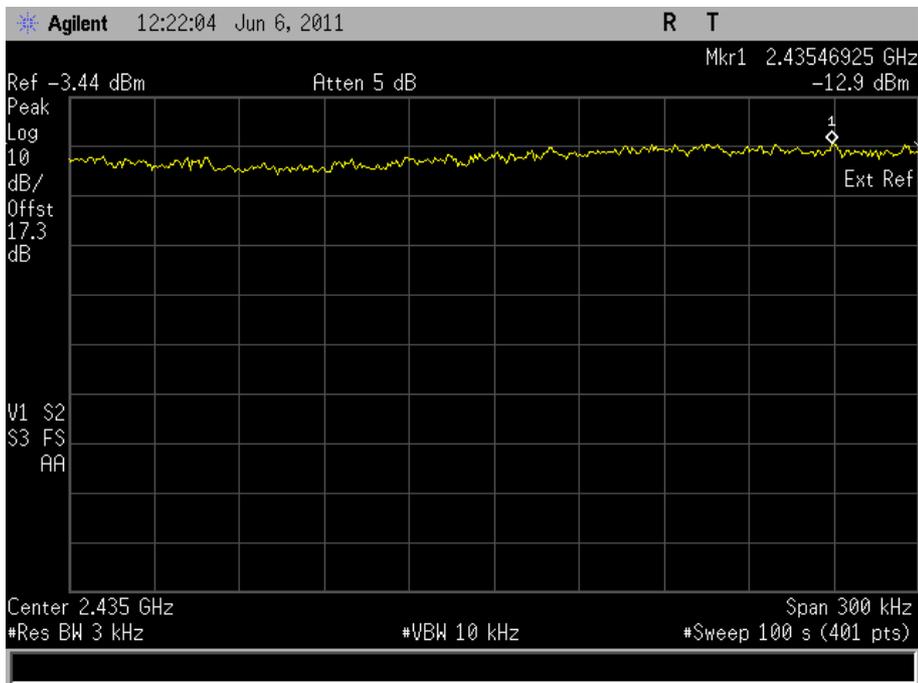
Product Service

2437 MHz

6 Mbps



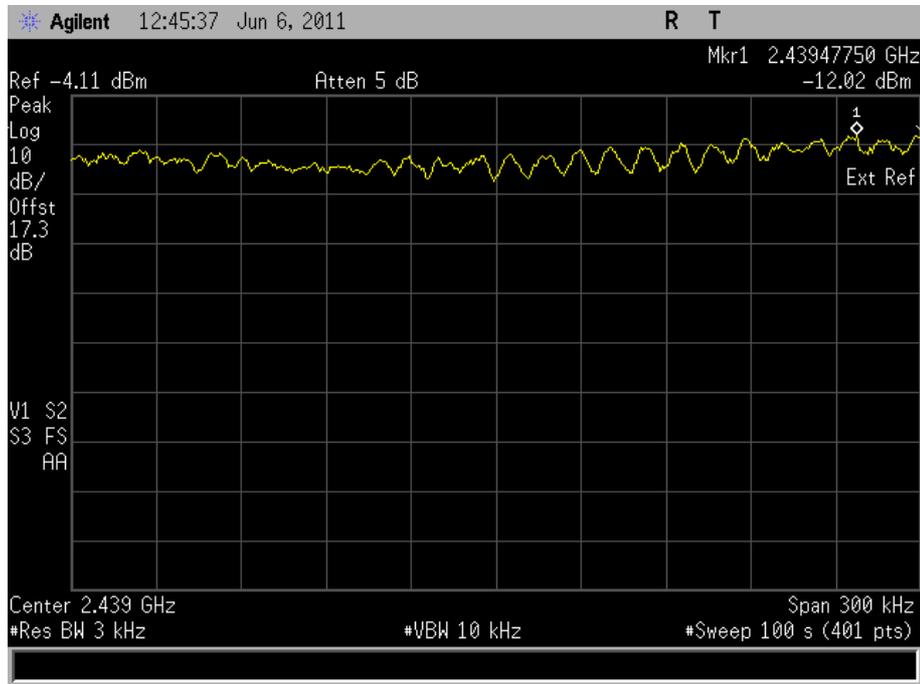
9 Mbps



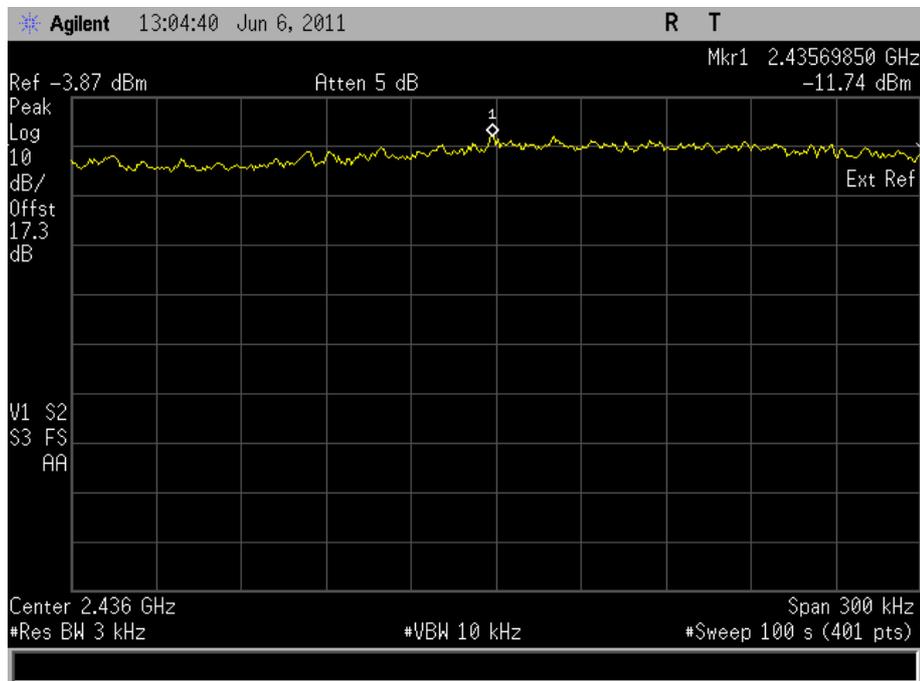


Product Service

12 Mbps



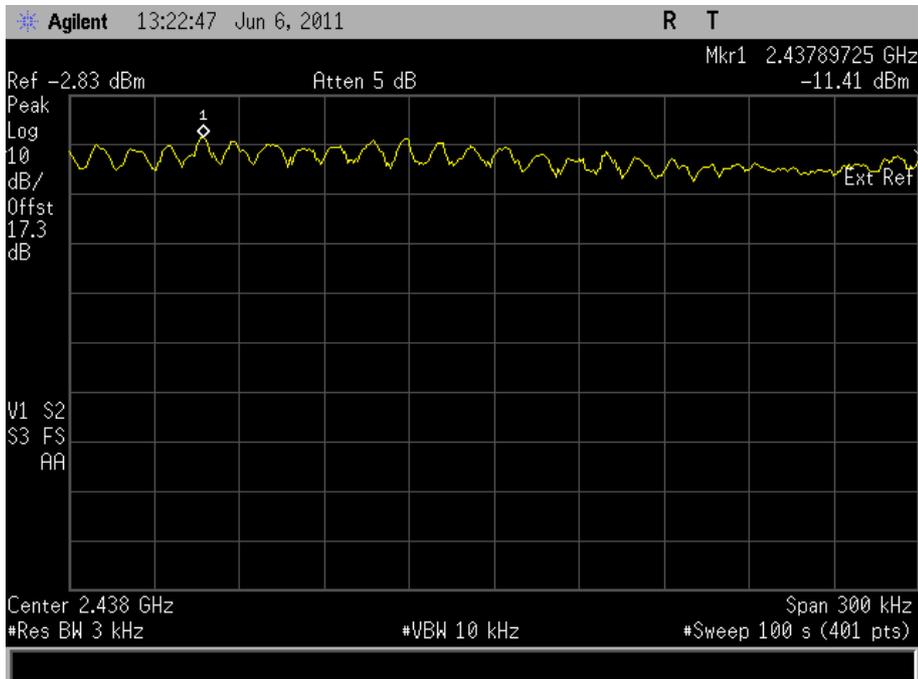
18 Mbps



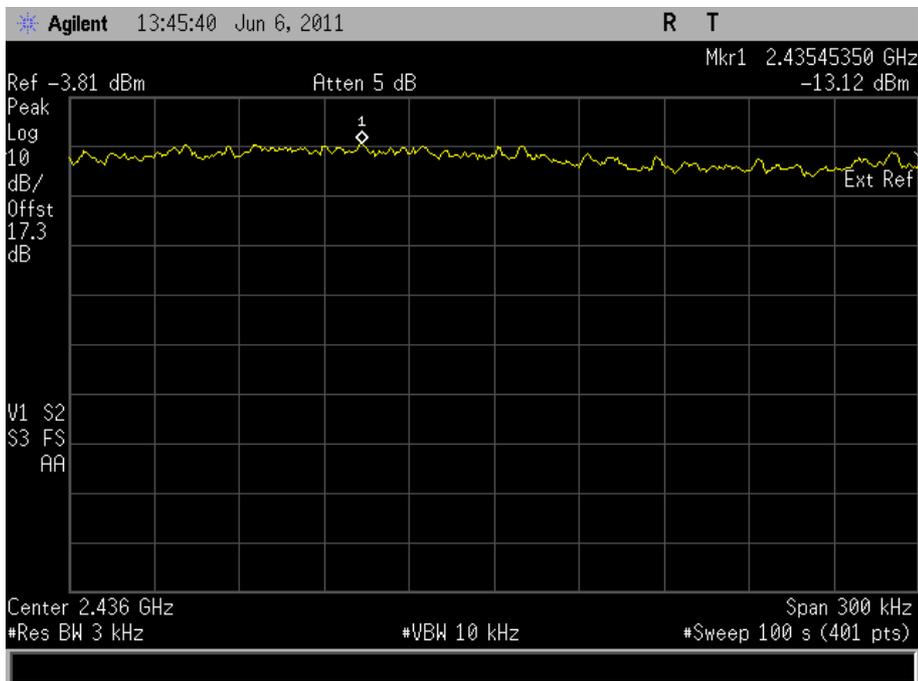


Product Service

24 Mbps



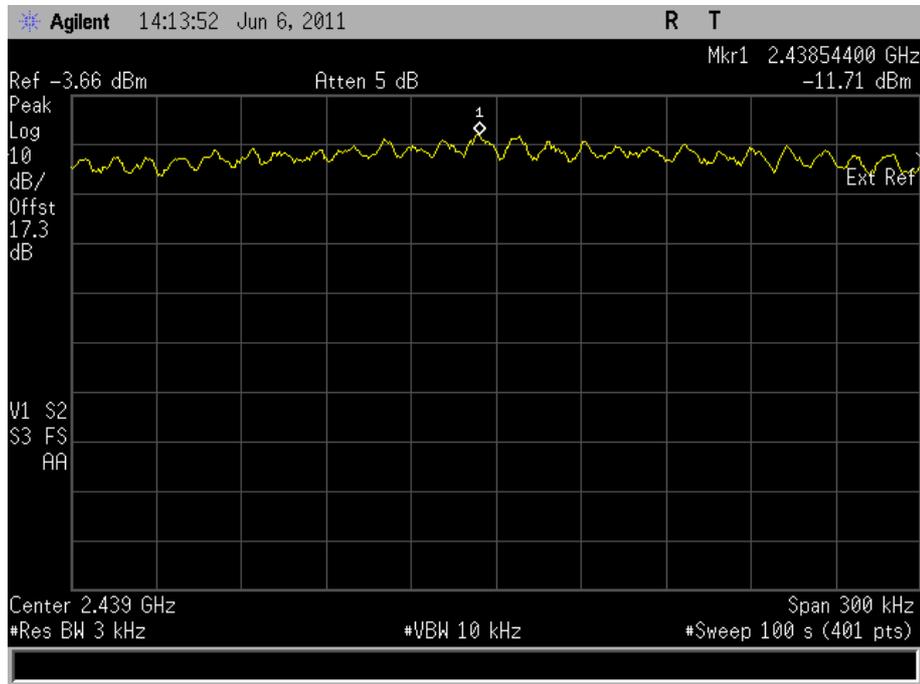
36 Mbps



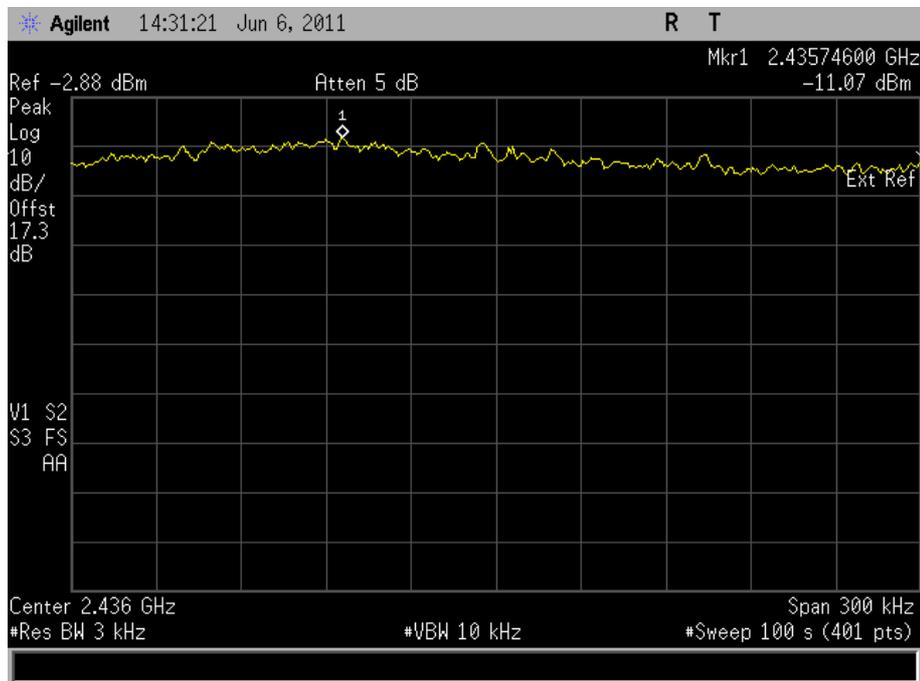


Product Service

48 Mbps



54 Mbps

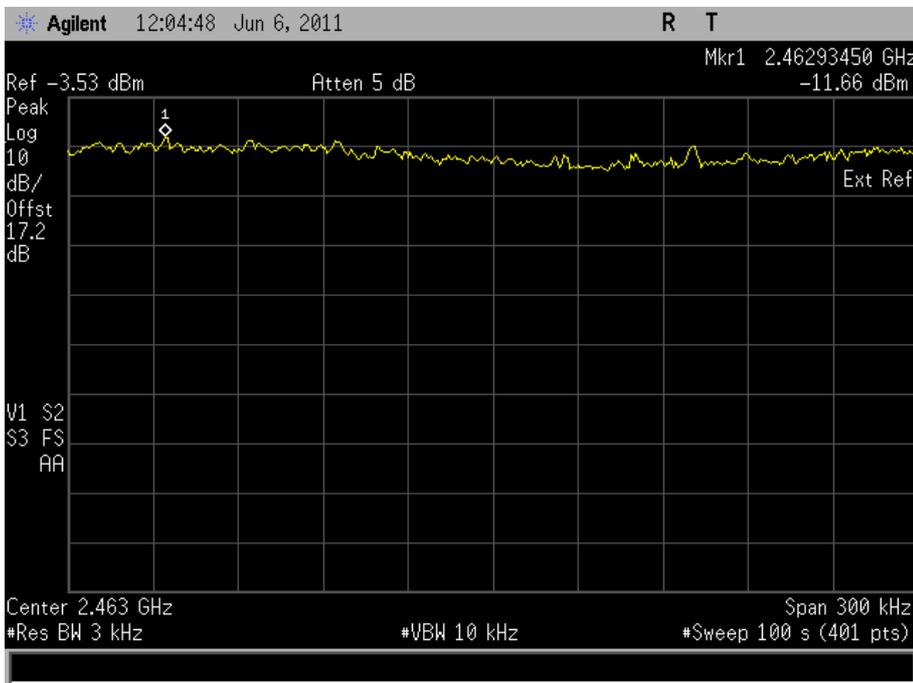




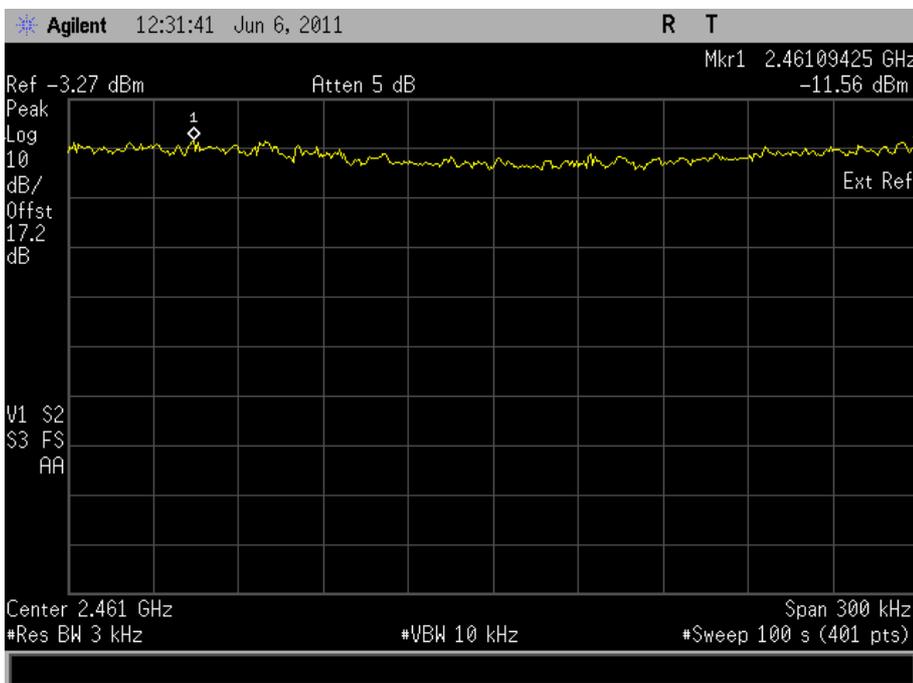
Product Service

2462 MHz

6 Mbps



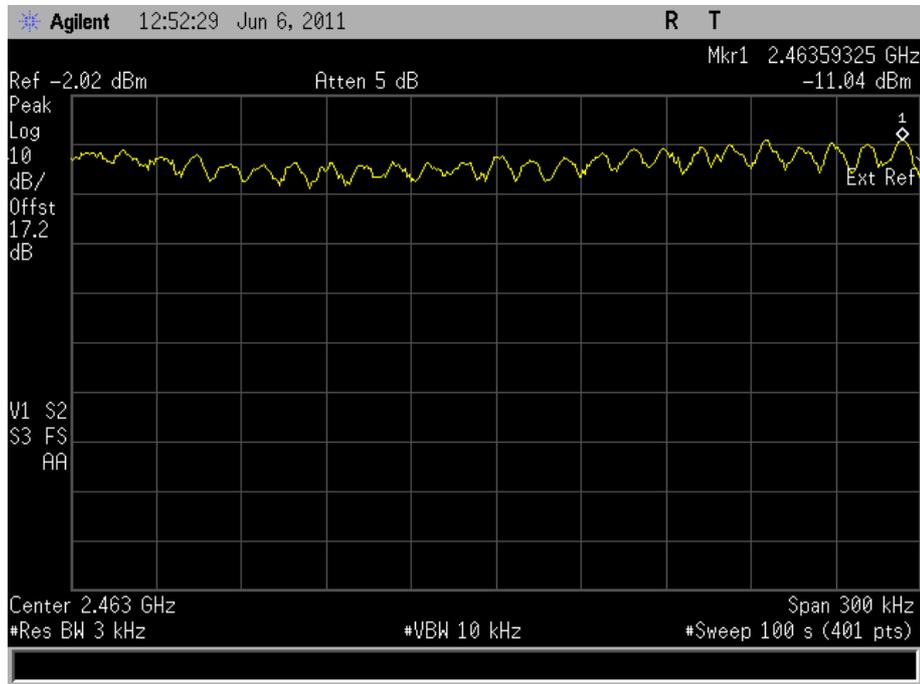
9 Mbps



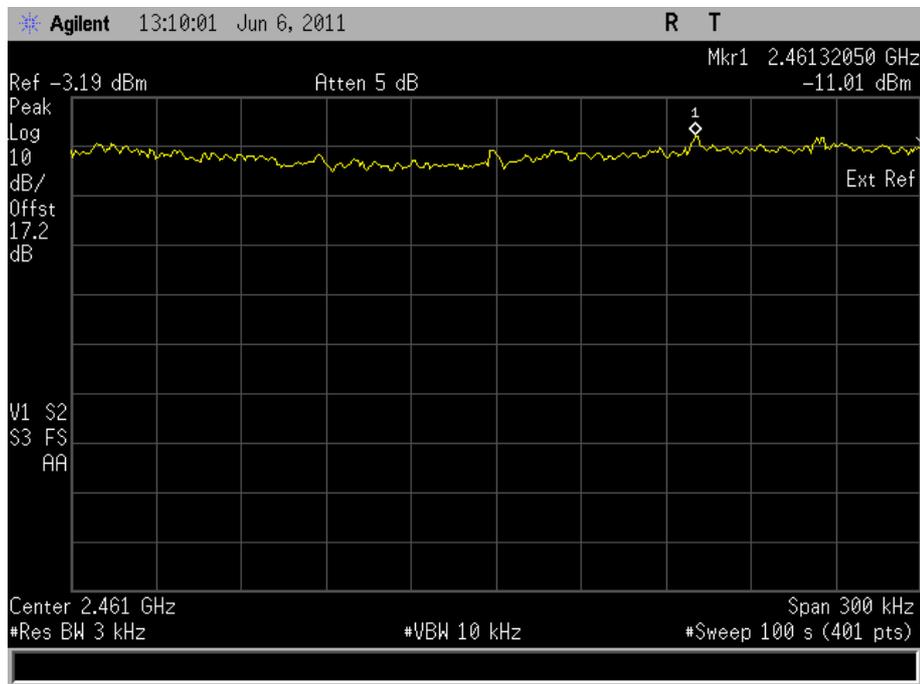


Product Service

12 Mbps



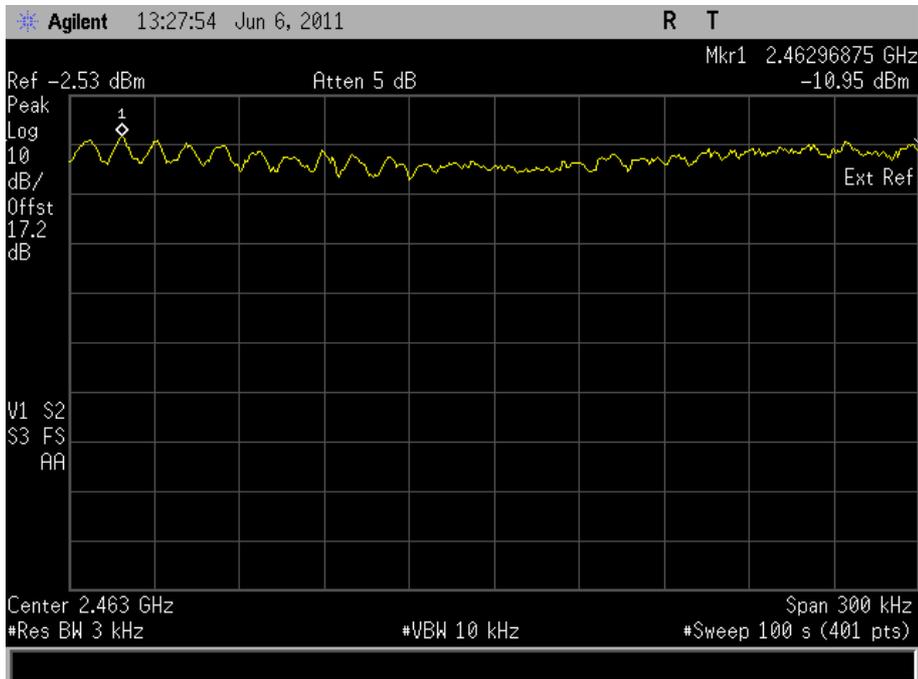
18 Mbps



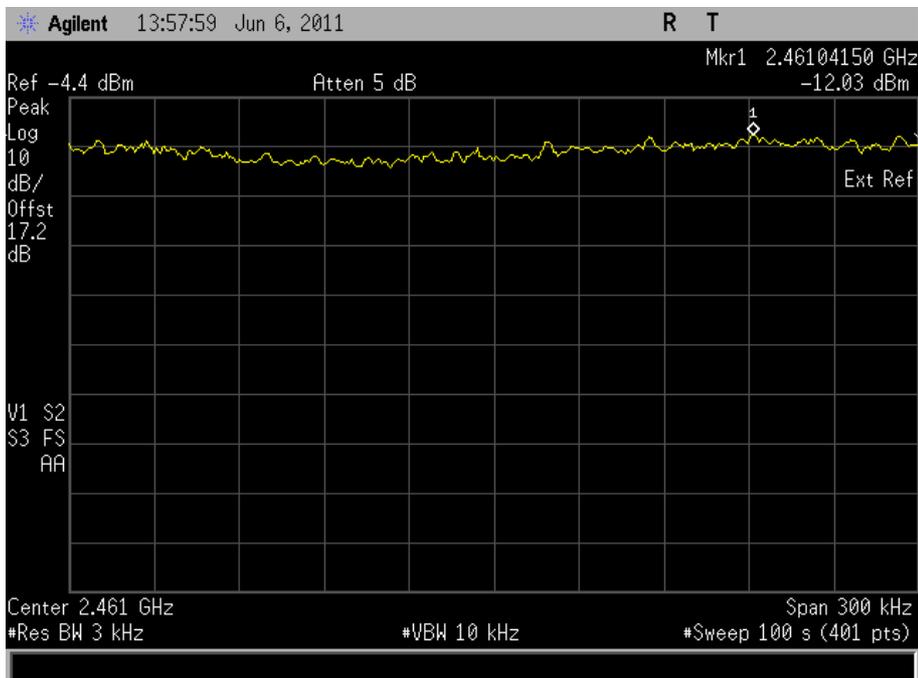


Product Service

24 Mbps



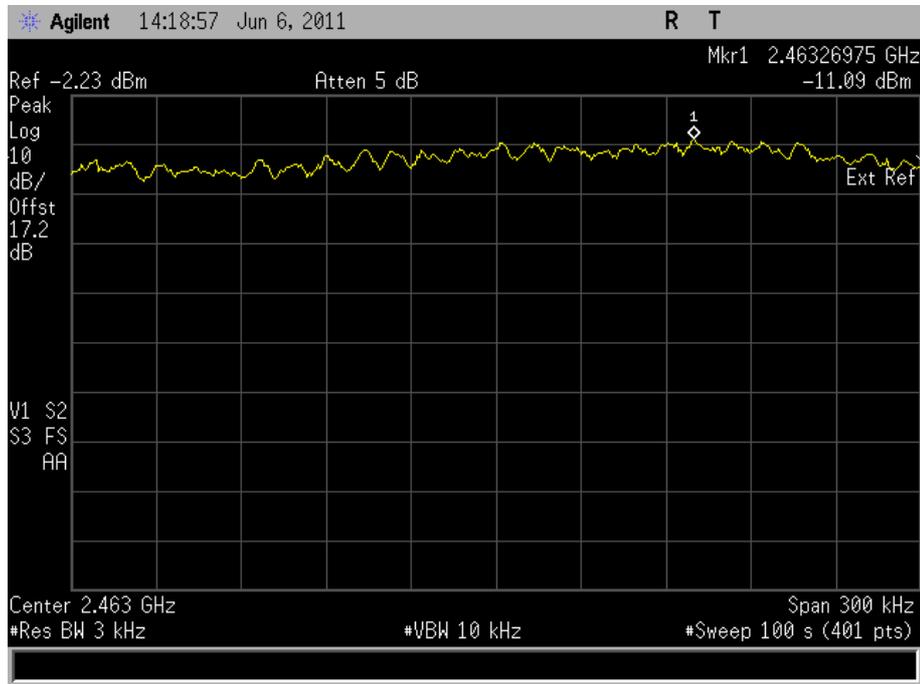
36 Mbps



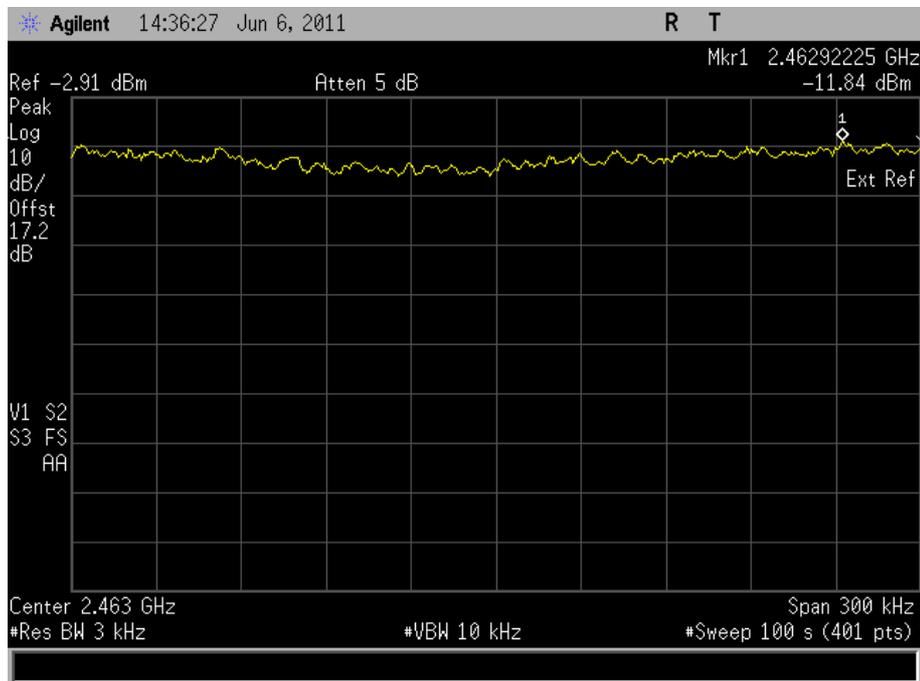


Product Service

48 Mbps



54 Mbps





Configuration 3 – Modes 1, 2 and 3

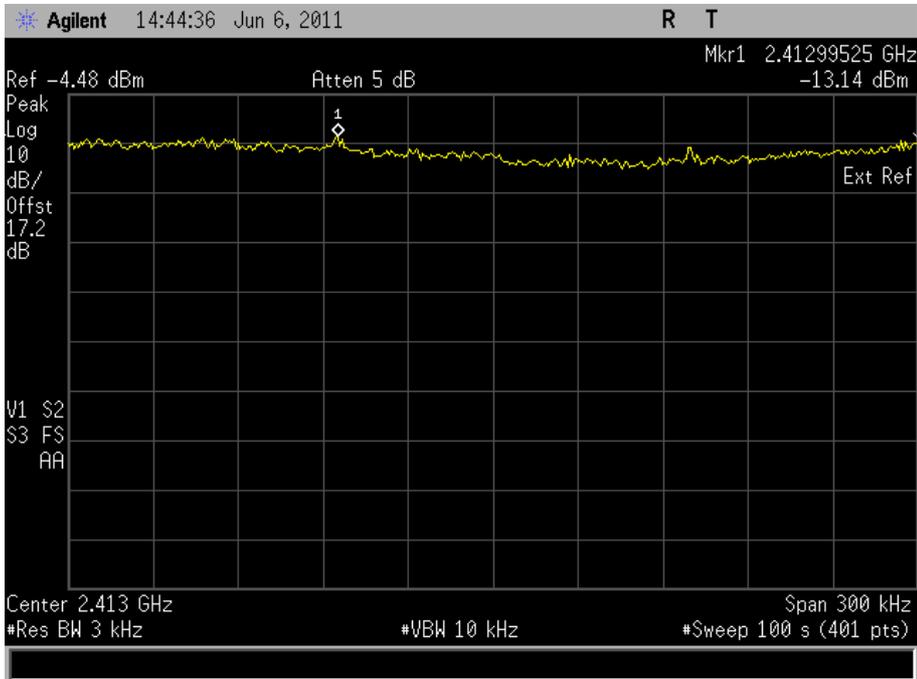
Frequency (MHz)	Data Rate (Mbps)	Power Spectral Density in 3 kHz Bands
2412	6.5	-13.14
	13	-13.65
	19.5	-15.27
	26	-12.59
	39	-10.70
	52	-12.62
	58.5	-12.60
	65	-12.62
2437	6.5	-12.61
	13	-12.68
	19.5	-10.67
	26	-11.94
	39	-12.10
	52	-12.10
	58.5	-13.99
	65	-10.78
2462	6.5	-11.89
	13	-10.69
	19.5	-10.27
	26	-11.61
	39	-11.45
	52	-11.64
	58.5	-11.67
	65	-10.34



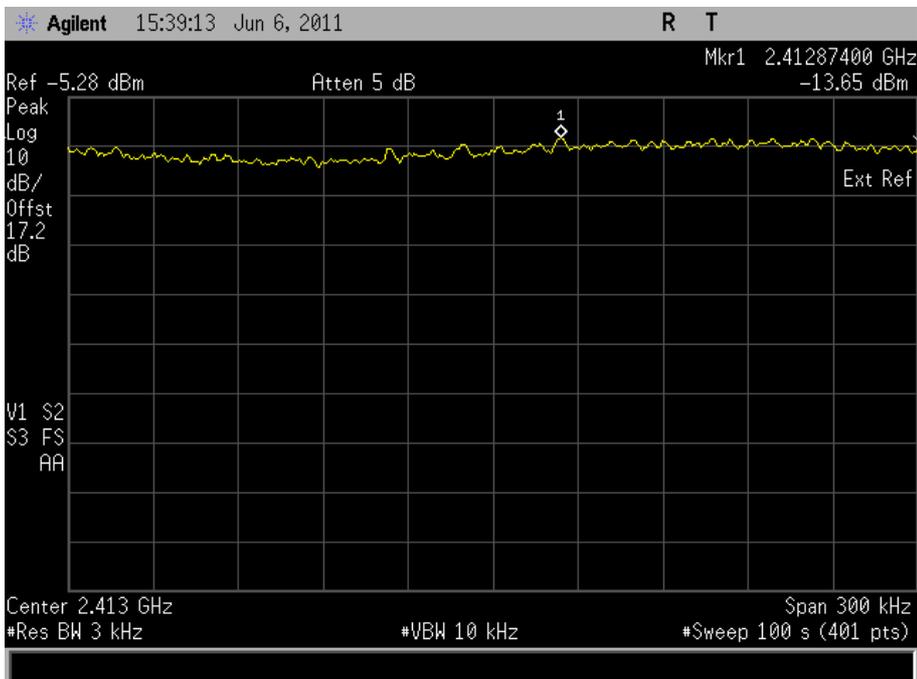
Product Service

2412 MHz

6.5 Mbps



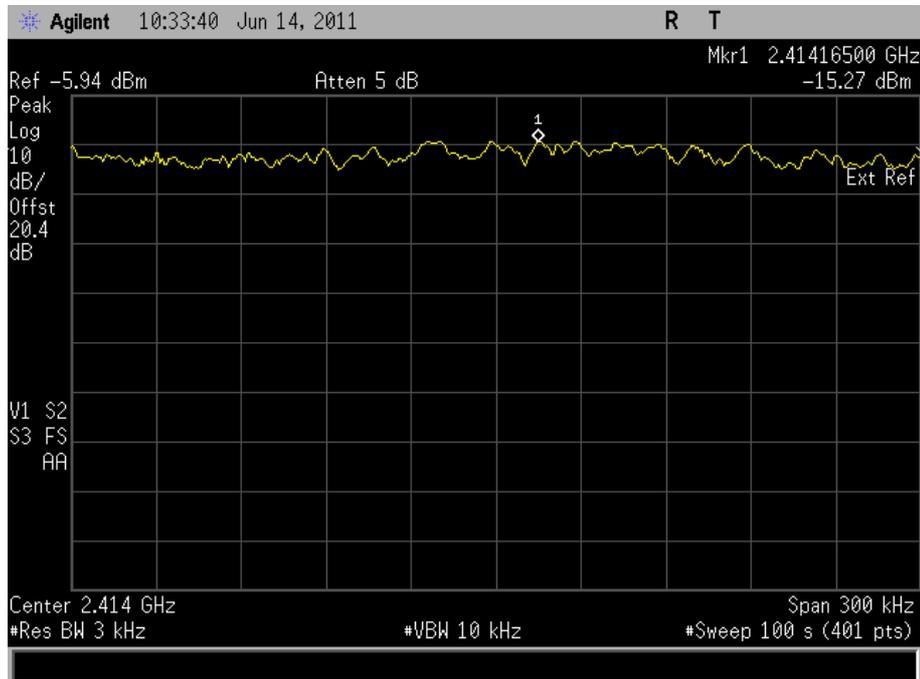
13 Mbps



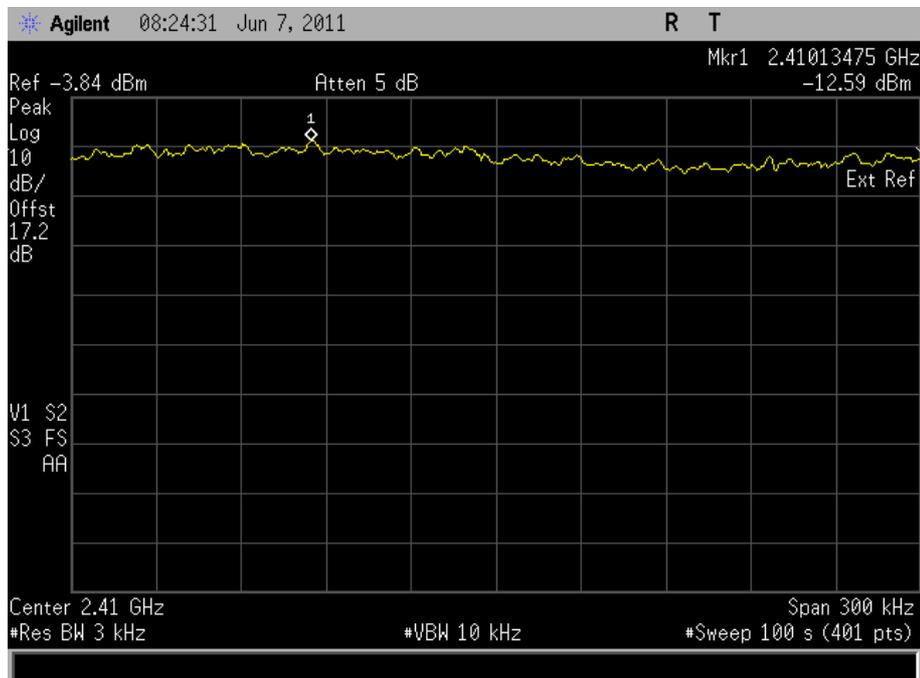


Product Service

19.5 Mbps



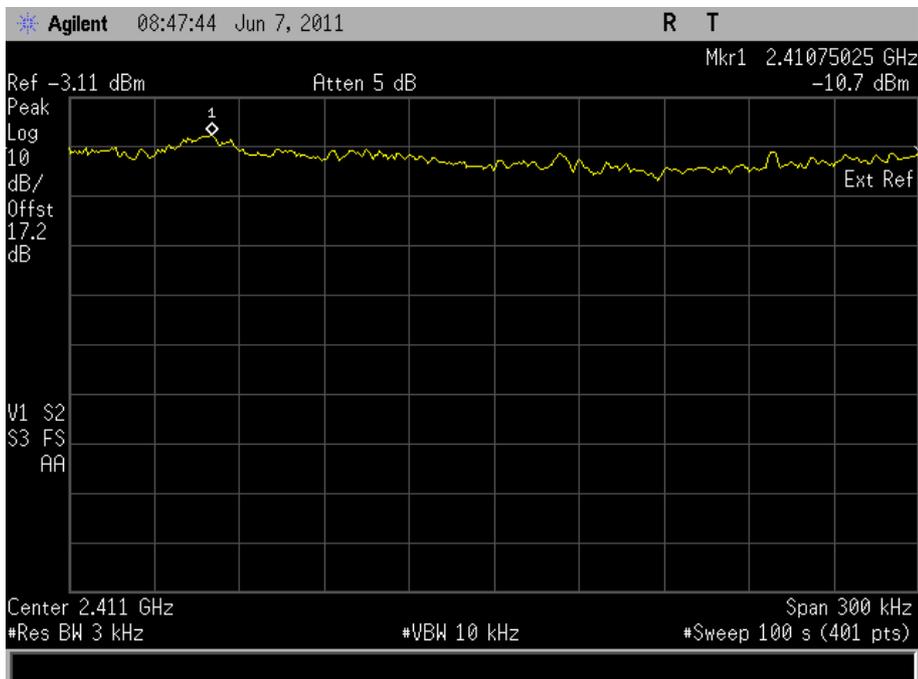
26 Mbps



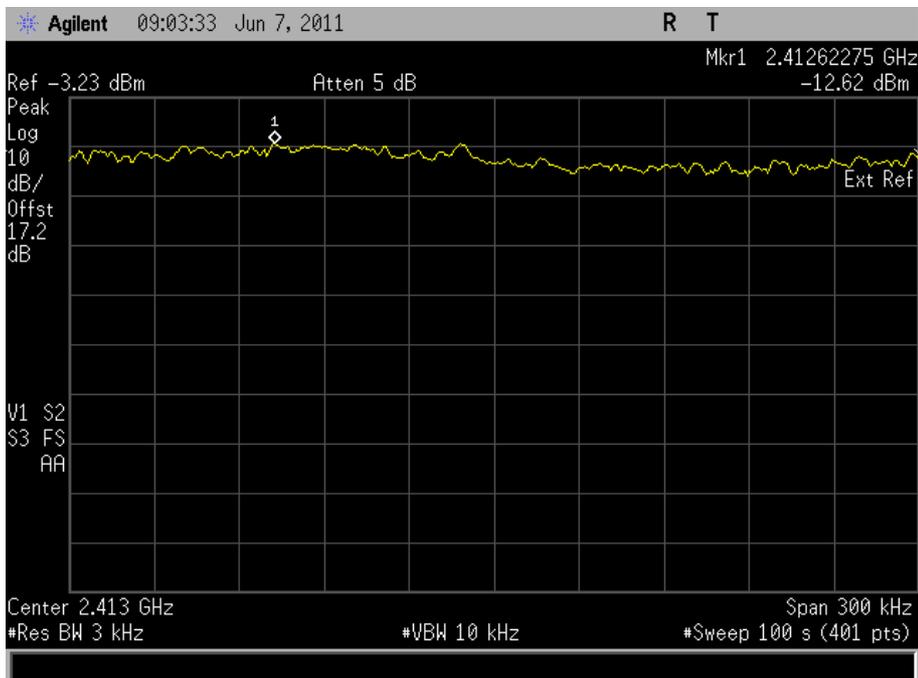


Product Service

39 Mbps



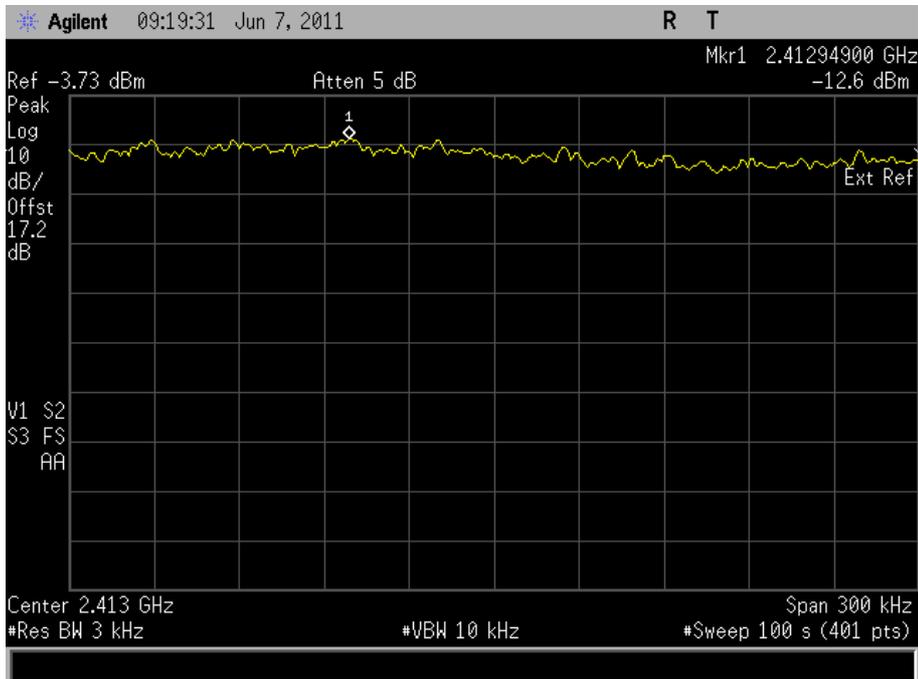
52 Mbps



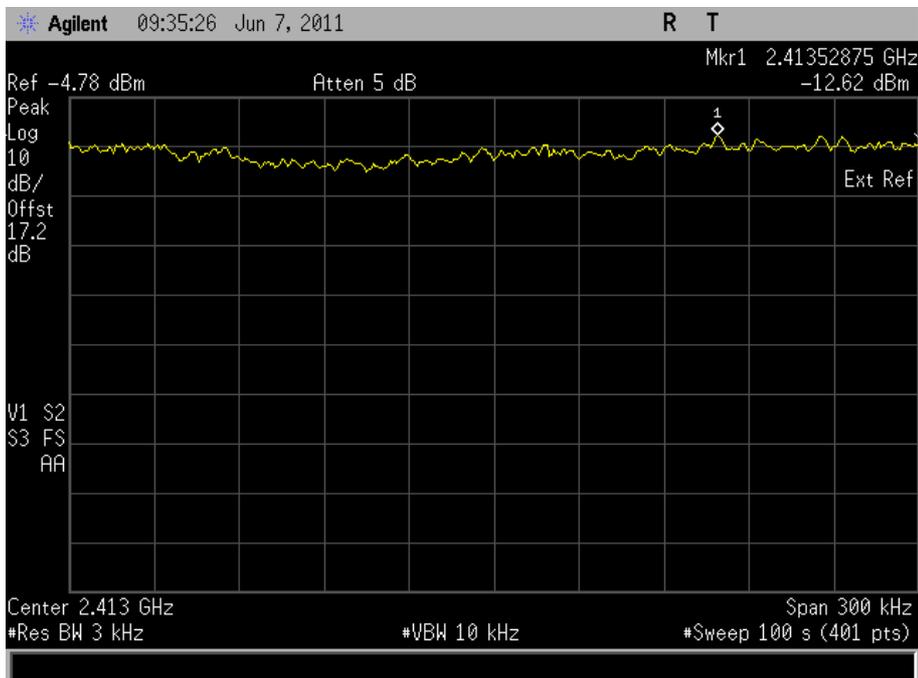


Product Service

58.5 Mbps



65 Mbps

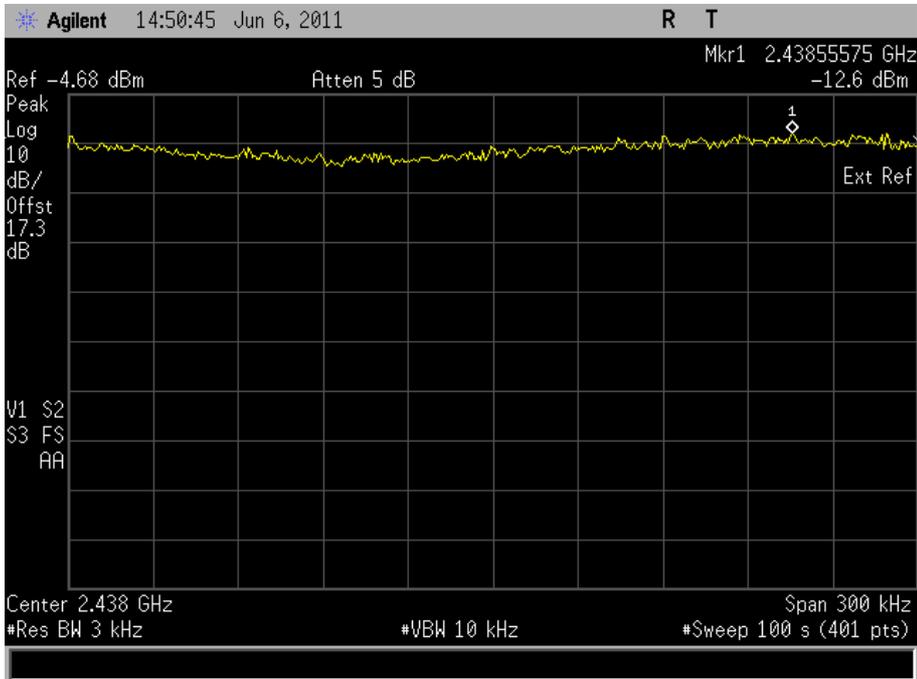




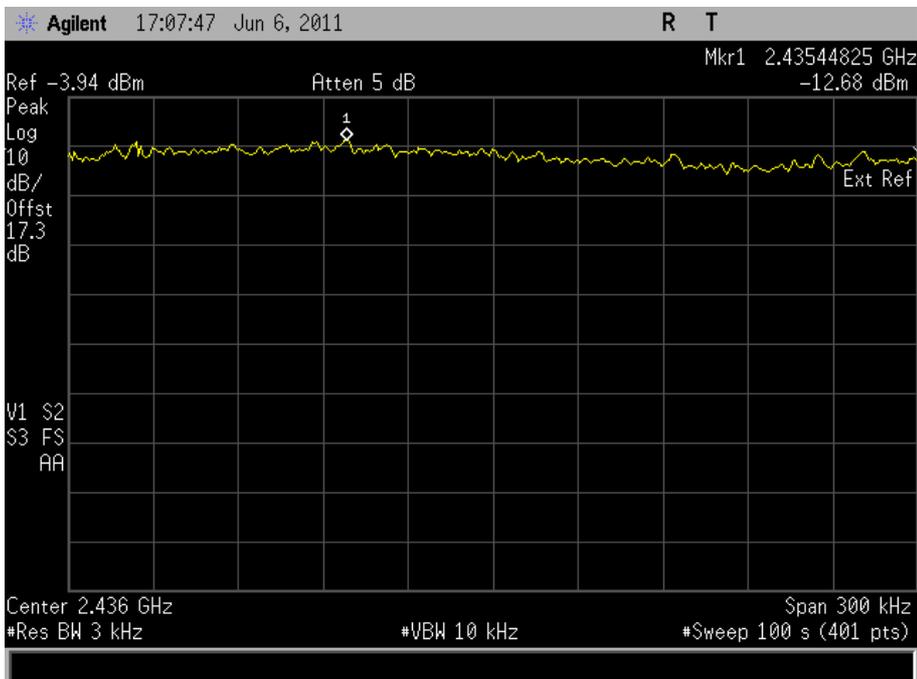
Product Service

2437 MHz

6.5 Mbps



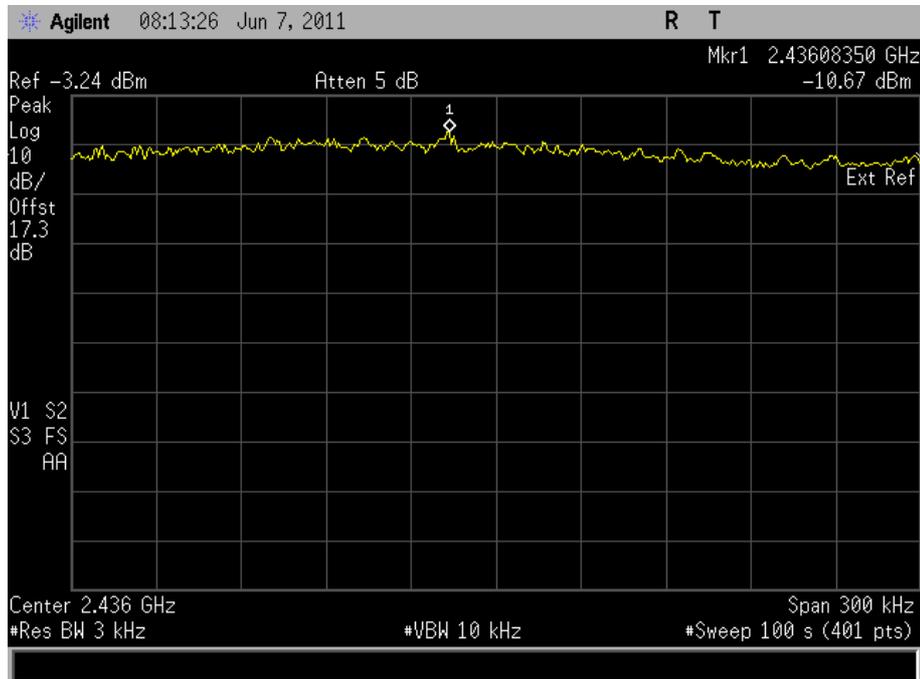
13 Mbps



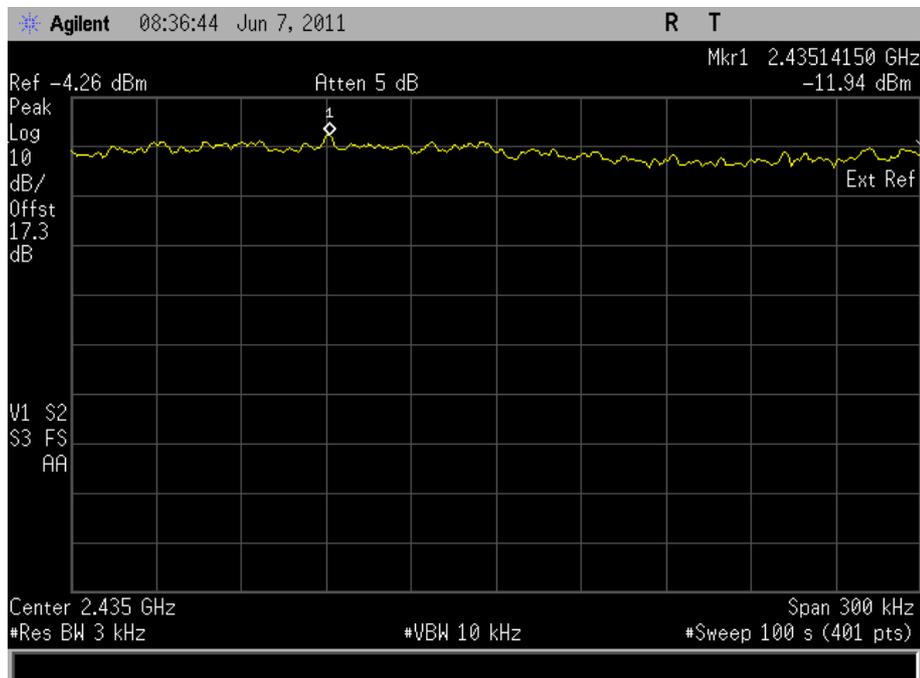


Product Service

19.5 Mbps



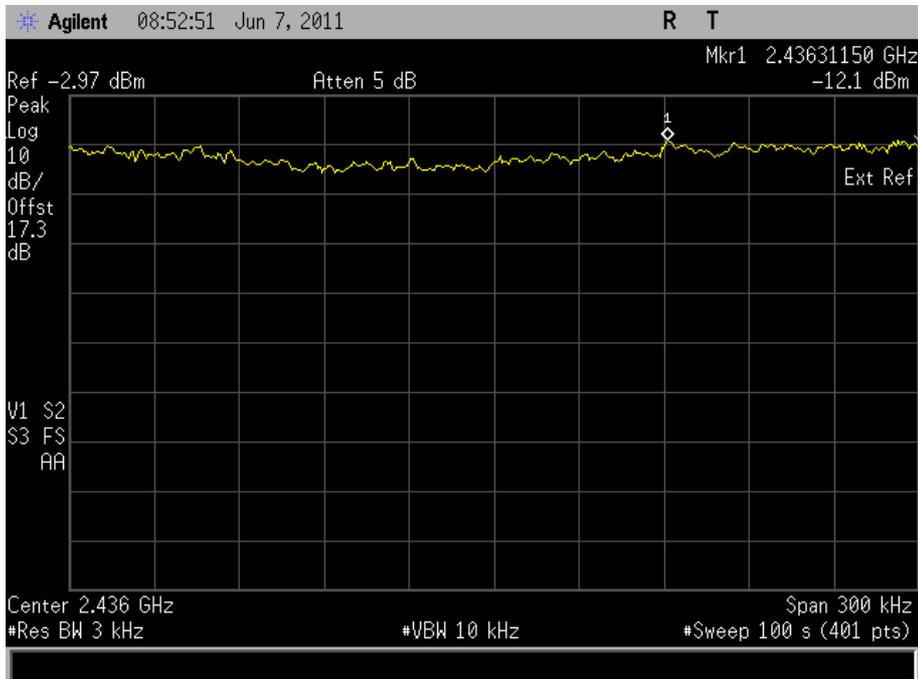
26 Mbps



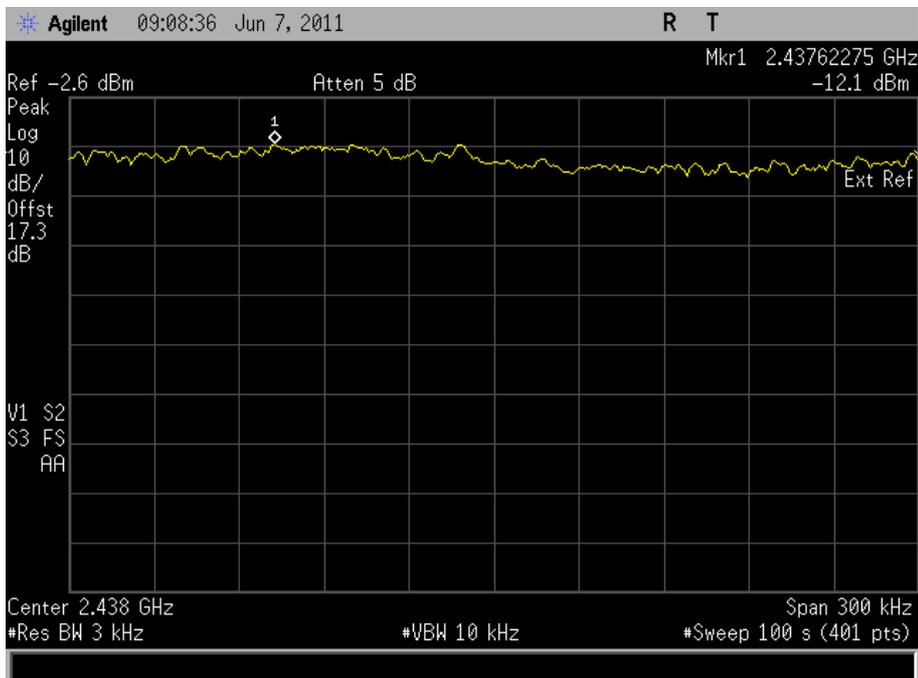


Product Service

39 Mbps



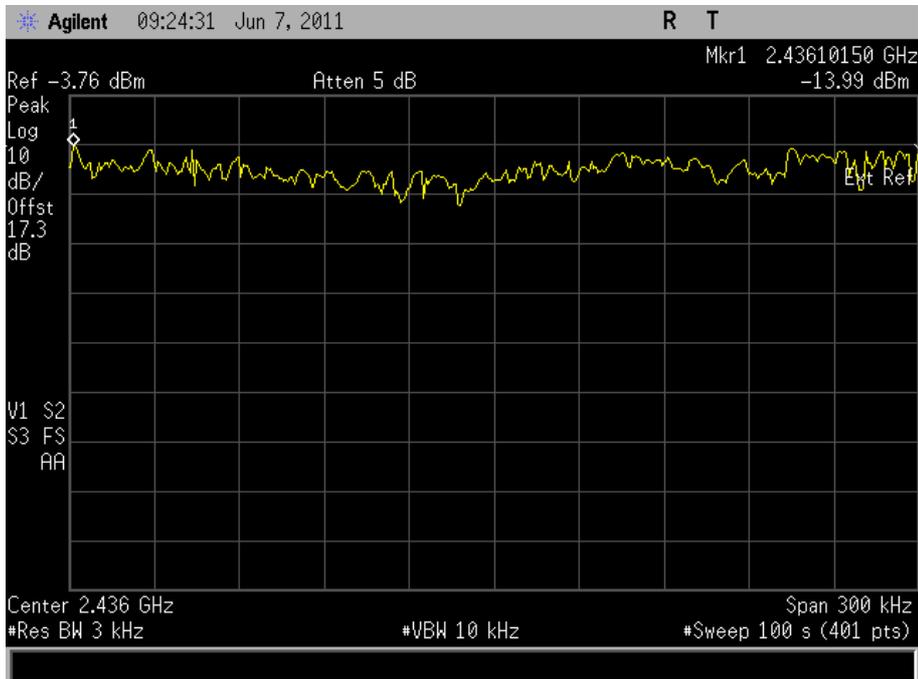
52 Mbps



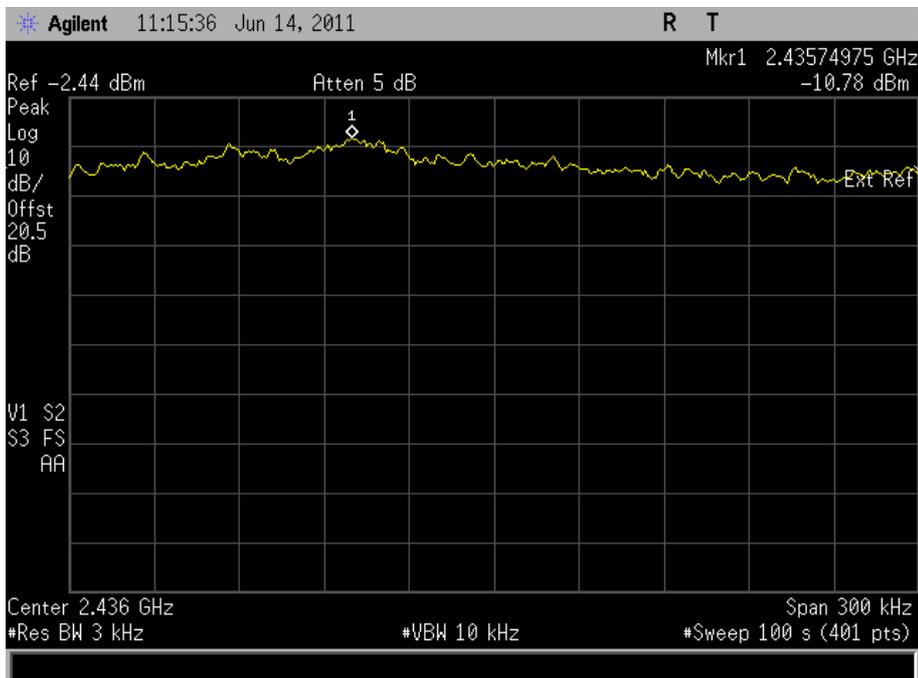


Product Service

58.5 Mbps



65 Mbps

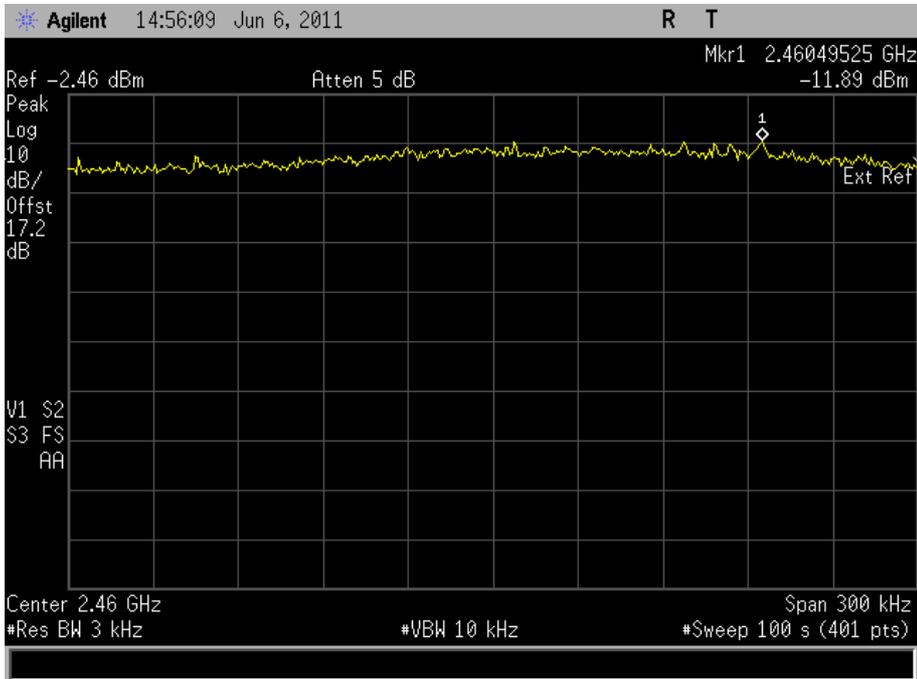




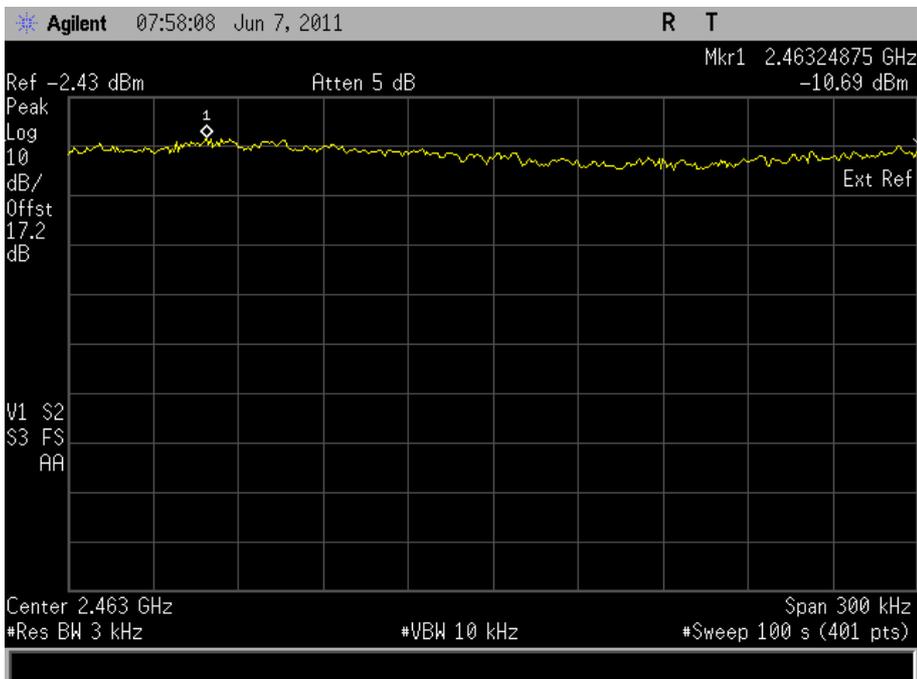
Product Service

2462 MHz

6.5 Mbps



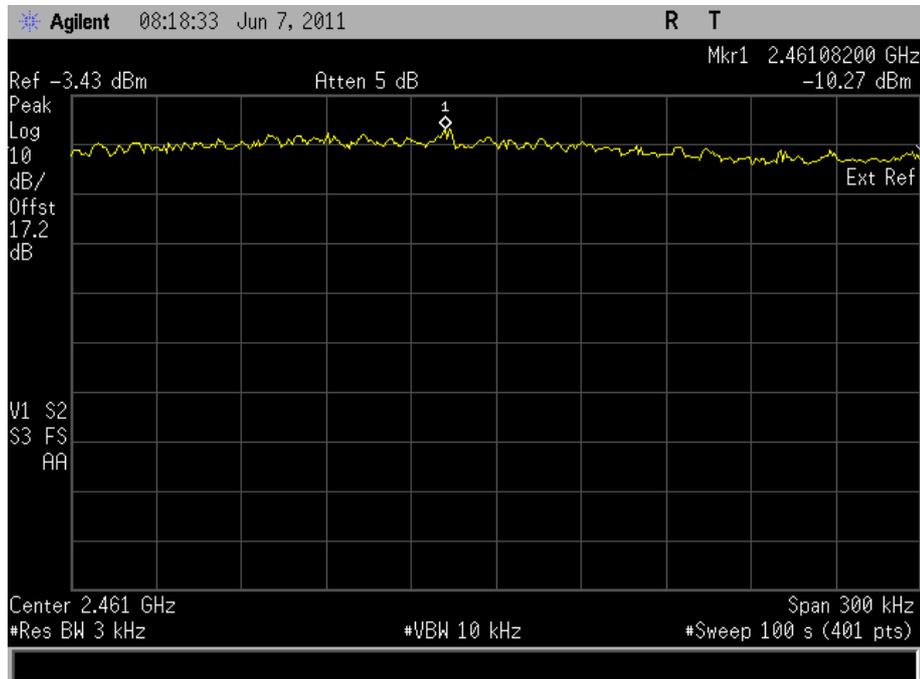
13 Mbps



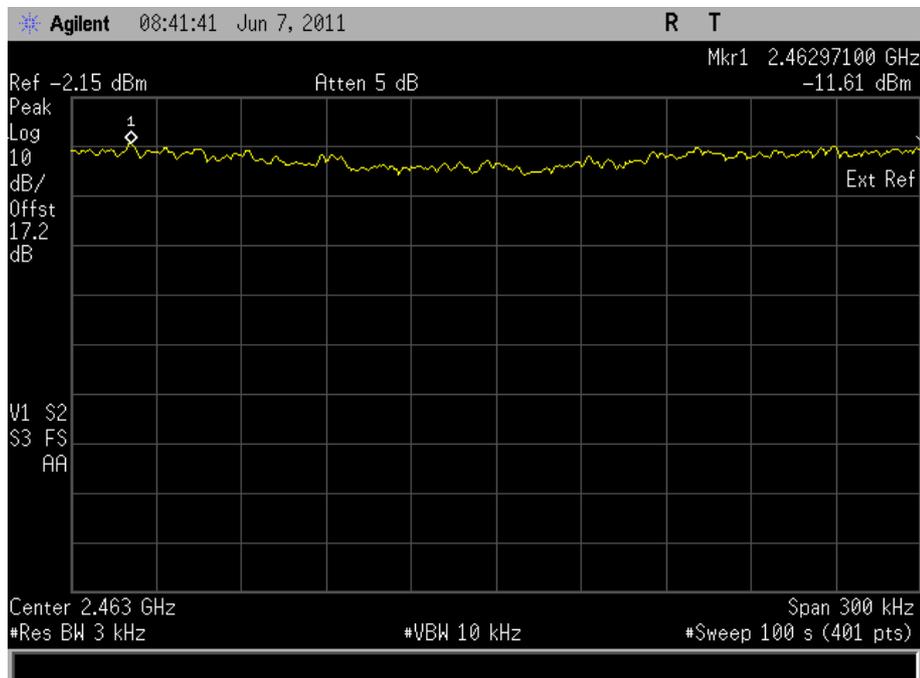


Product Service

19.5 Mbps



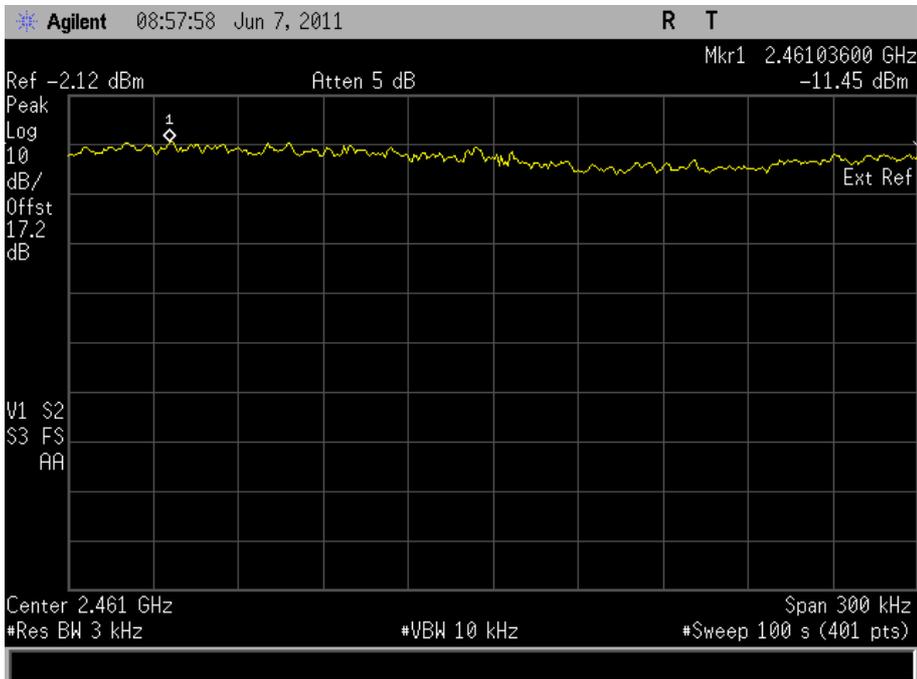
26 Mbps



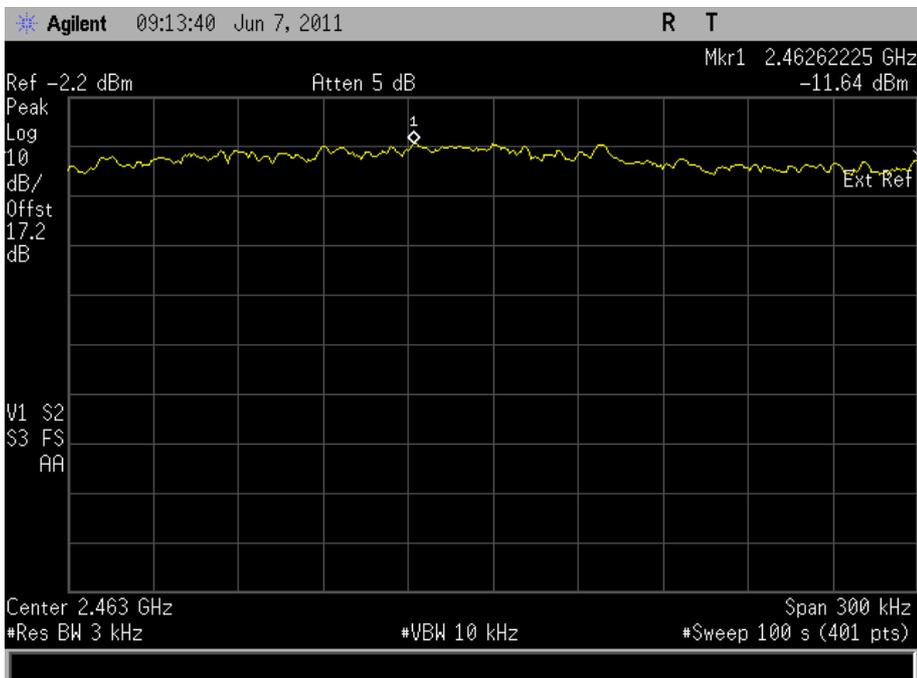


Product Service

39 Mbps



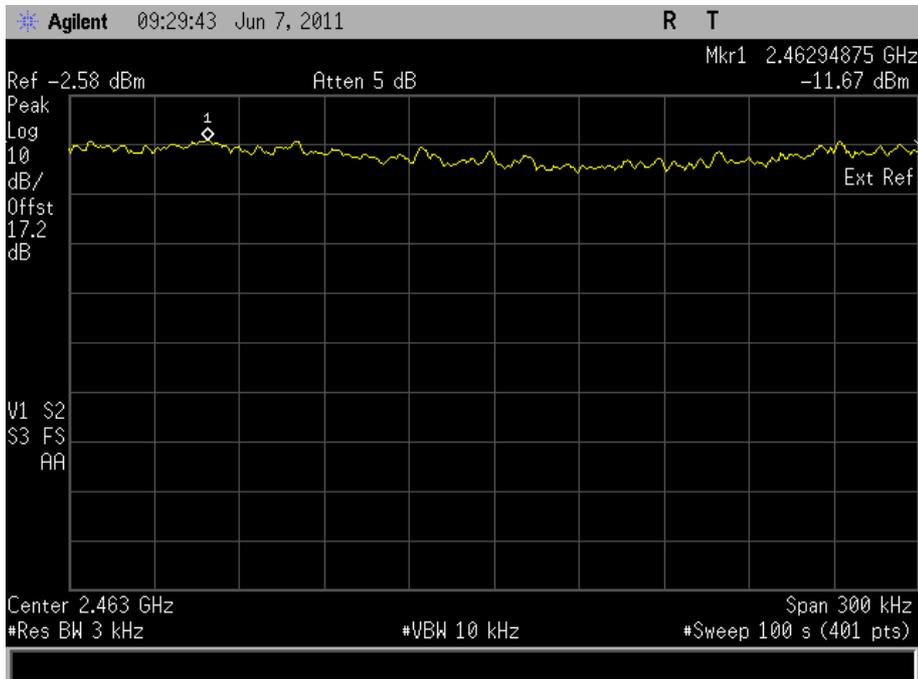
52 Mbps



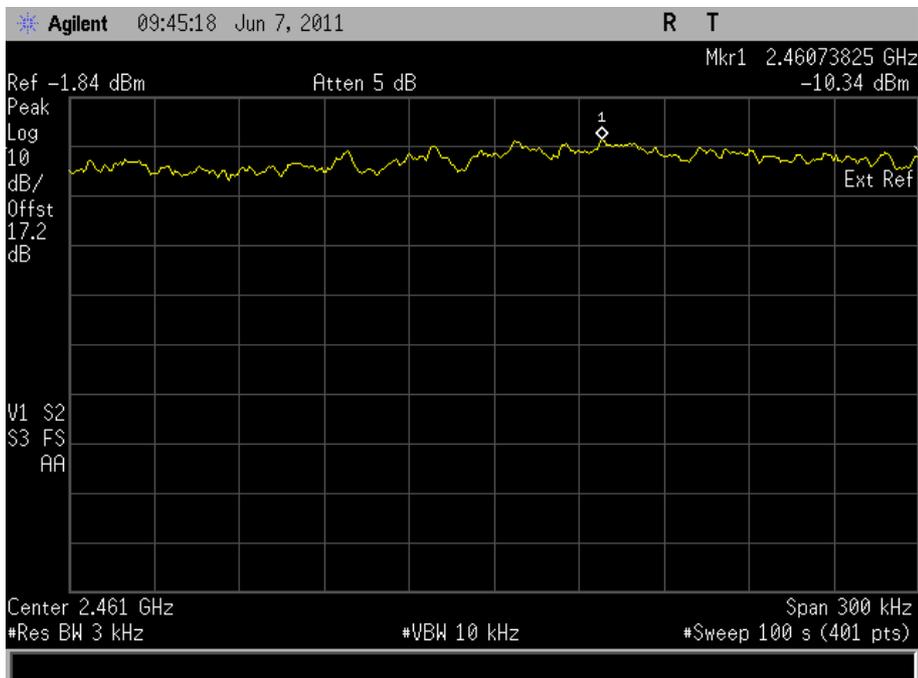


Product Service

58.5 Mbps



65 Mbps



Limit Clause

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



Product Service

2.7 BAND EDGE EMISSIONS

2.7.1 Specification Reference

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

2.7.2 Equipment Under Test

CDMA SH112, S/N: SSHFJ000863

2.7.3 Date of Test and Modification State

06 June 2011 - Modification State 0

2.7.4 Test Equipment Used

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

2.7.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI C63.4.

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.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1
 - Mode 3
 Configuration 2 - Mode 1
 - Mode 3
 Configuration 2 - Mode 1
 - Mode 3

2.7.6 Environmental Conditions

	06 June 2011
Ambient Temperature	20.0°C
Relative Humidity	44.0%



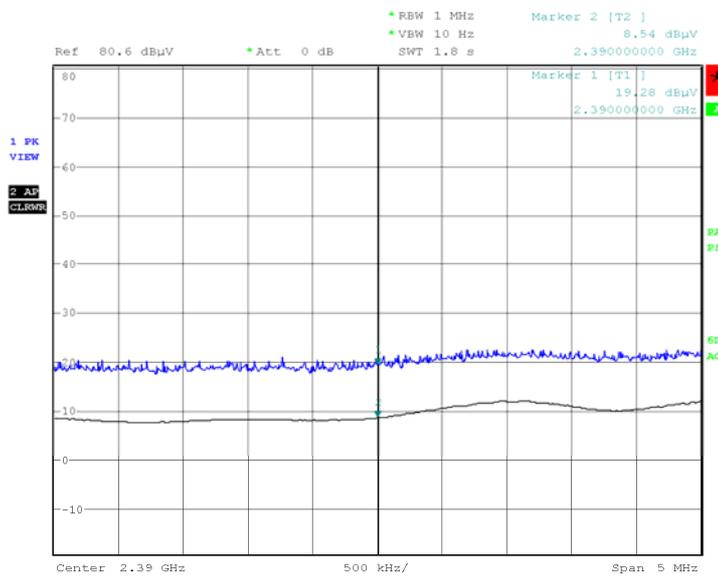
2.7.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C for Band Edge Emissions.

The test results are shown below.

Configuration 1 - Mode 1

Freq in GHz	Polarisation	Final Peak dBµV/m	Peak Limit dBµV/m	Final Average dBµV/m	Average Limit dBµV/m
2.412	Vertical	49.5	74.0	45.1	54.0

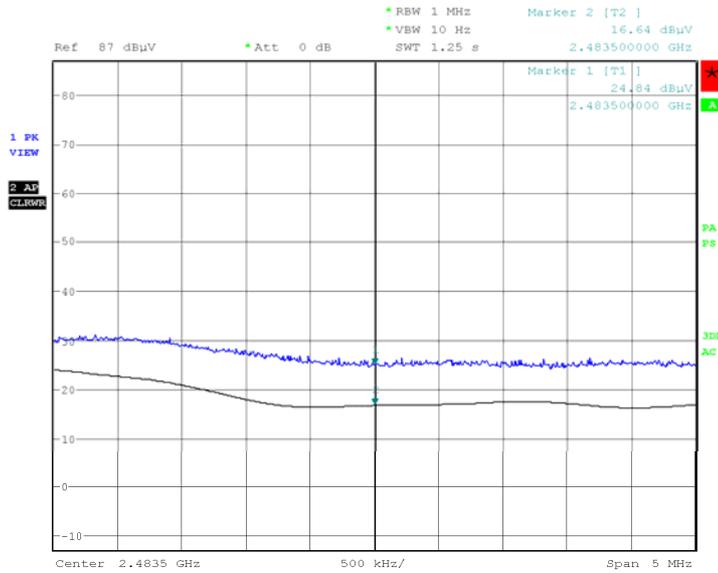


Date: 6.JUN.2011 18:38:44



Configuration 1 - Mode 3

Freq in GHz	Polarisation	Final Peak dBµV/m	Peak Limit dBµV/m	Final Average dBµV/m	Average Limit dBµV/m
2.462	Vertical	55.9	74.0	51.5	54.0



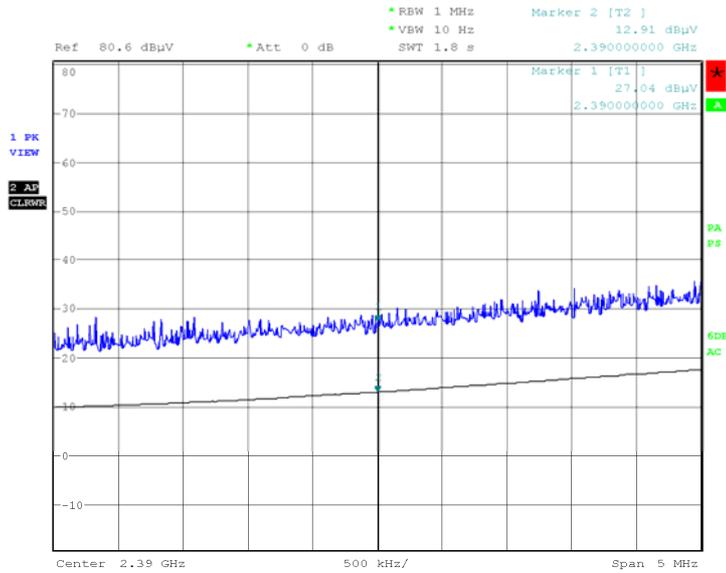
Date: 6.JUN.2011 17:53:06



Product Service

Configuration 2 - Mode 1

Freq in GHz	Polarisation	Final Peak dBµV/m	Peak Limit dBµV/m	Final Average dBµV/m	Average Limit dBµV/m
2.412	Horizontal	59.8	74.0	46.8	54.0

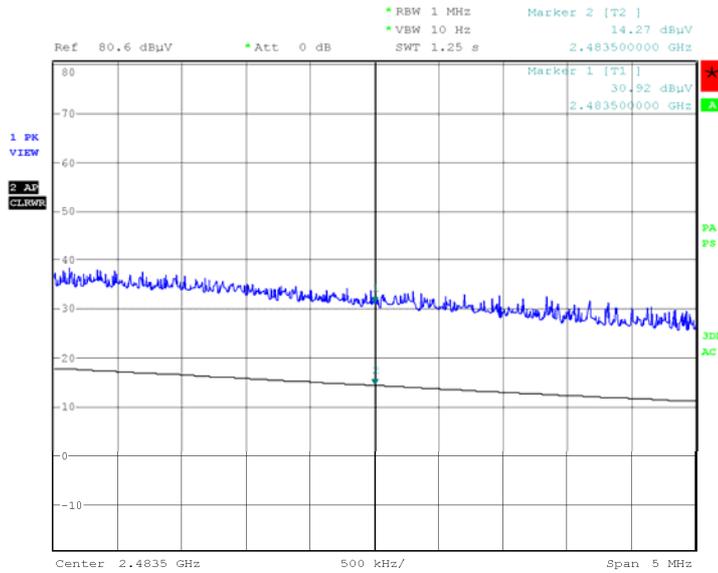


Date: 6.JUN.2011 19:34:22



Configuration 2 - Mode 3

Freq in GHz	Polarisation	Final Peak dBµV/m	Peak Limit dBµV/m	Final Average dBµV/m	Average Limit dBµV/m
2.462	Horizontal	61.6	74.0	49.2	54.0



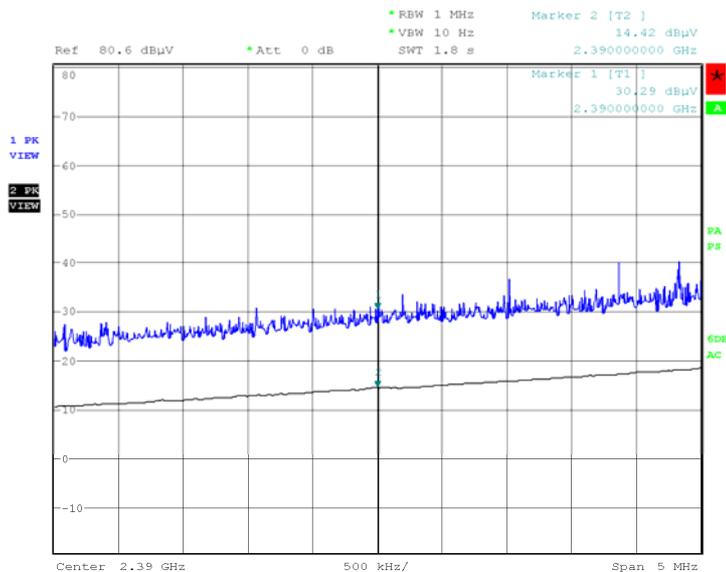
Date: 6.JUN.2011 20:18:45



Product Service

Configuration 3 - Mode 1

Freq in GHz	Polarisation	Final Peak dBµV/m	Peak Limit dBµV/m	Final Average dBµV/m	Average Limit dBµV/m
2.412	Horizontal	62.4	74.0	50.7	54.0

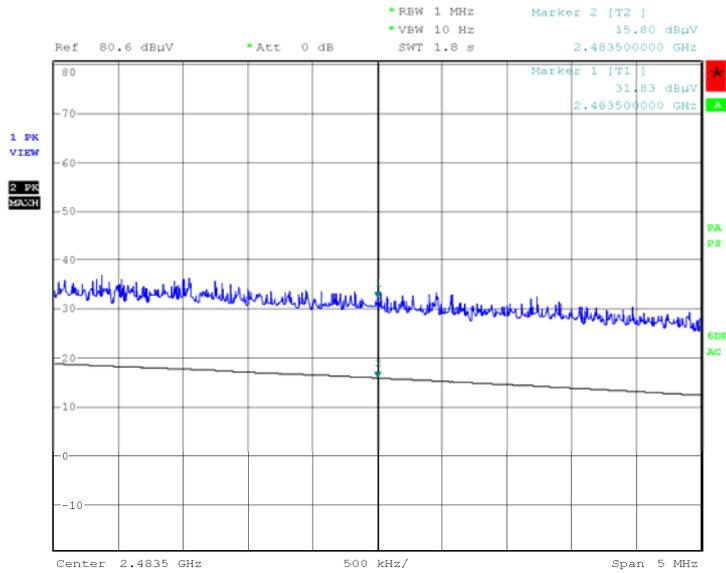


Date: 6.JUN.2011 20:53:19



Configuration 3 - Mode 3

Freq in GHz	Polarisation	Final Peak dBµV/m	Peak Limit dBµV/m	Final Average dBµV/m	Average Limit dBµV/m
2.462	Horizontal	62.5	74.0	51.3	54.0



Date: 6.JUN.2011 21:56:45



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 - 6dB Bandwidth					
Multimeter	White Gold	WG022	190	12	26-Oct-2011
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	23-Jun-2011
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	17-Jun-2011
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	11-Sep-2011
Programmable Power Supply	Iso-tech	IPS 2010	2437	-	O/P Mon
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
Combiner/Splitter	Weinschel	1506A	3880	12	22-Feb-2012
Section 2.2, 2.4 and 2.7 - Radiated Emissions (Enclosure Port), EIRP Peak Power and Band Edge Emissions					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	12-Nov-2011
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	12-Nov-2011
Amplifier (Low Noise, 18GHz-40GHz)	Narda	NARDA DB02-0447	237	12	25-Jun-2011
Antenna (Bilog)	Schaffner	CBL6143	287	24	19-Jan-2012
Antenna (Active Loop, 9kHz-30MHz)	Rohde & Schwarz	HFH2-Z2	333	24	20-Sep-2012
Antenna (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	2-Aug-2012
Pre-Amplifier	Phase One	PS04-0086	1533	12	15-Sep-2011
Pre-Amplifier	Phase One	PSO4-0087	1534	12	22-Sep-2011
Screened Room (5)	Rainford	Rainford	1545	24	3-Feb-2014
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
4GHz HPF	Sematron	F-100-4000-5-R	2245	-	TU
High Pass Filter (7GHz)	Lorch	9HP7-7000-SR	2246	12	TU
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	12-Aug-2011
Amplifier (1 - 8GHz)	Phase One	PS06-0060	3175	12	2-Jul-2011
Amplifier (8 - 18GHz)	Phase One	PS06-0061	3176	12	2-Jul-2011
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	9-Sep-2011
3 GHz High Pass Filter	K&L Microwave	11SH10-3000/X18000-O/O	3552	12	14-Apr-2012
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	10-Aug-2011
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.3 – Maximum Peak Conducted Output Power					
Peak Power Analyser	Hewlett Packard	8990A	107	12	11-Feb-2012
Multimeter	White Gold	WG022	190	12	26-Oct-2011
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	23-Jun-2011
Signal Generator	Marconi	2031	762	12	28-Oct-2011
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	17-Jun-2011
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	11-Sep-2011
Power Supply Unit	Farnell	TSV-70	2043	-	O/P Mon
Hygromer	Rotronic	A1	2138	12	14-Jun-2011
Programmable Power Supply	Iso-tech	IPS 2010	2437	-	O/P Mon
Power Sensor	Hewlett Packard	84812A	2743	-	TU
Attenuator (20dB, 20W)	Weinschel	1	3032	12	9-Jul-2011
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3160	12	10-Jun-2011
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
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	10-Aug-2011
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	8-Feb-2012
Combiner/Splitter	Weinschel	1506A	3877	12	22-Feb-2012
Combiner/Splitter	Weinschel	1506A	3880	12	22-Feb-2012
Section 2.5 - Spurious Emissions					
Multimeter	White Gold	WG022	190	12	26-Oct-2011
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	17-Jun-2011
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	11-Sep-2011
Power Supply Unit	Farnell	TSV-70	2043	-	O/P Mon
Multimeter	Iso-tech	IDM101	2419	12	3-Sep-2011
Programmable Power Supply	Iso-tech	IPS 2010	2437	-	O/P Mon
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	12-Nov-2011
High Pass Filter (4GHz)	RLC Electronics	F-100-4000-5-R	2773	12	6-Sep-2011
Filter	Daden Anthony Ass	MH-1500-7SS	2778	12	22-Dec-2011
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3160	12	10-Jun-2011
Attenuator (20dB, 50W)	Aeroflex / Weinschel	47-20-34	3165	12	10-Jun-2012
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	8-Feb-2012
Combiner/Splitter	Weinschel	1506A	3877	12	22-Feb-2012



Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.6 - Power Spectral Density					
Multimeter	White Gold	WG022	190	12	26-Oct-2011
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	23-Jun-2011
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	17-Jun-2011
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	11-Sep-2011
Programmable Power Supply	Iso-tech	IPS 2010	2437	-	O/P Mon
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
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	10-Aug-2011
Combiner/Splitter	Weinschel	1506A	3880	12	22-Feb-2012

TU – Traceability Unscheduled

O/P Mon – Output monitored using calibrated equipment.



3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	Frequency / Parameter	MU
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.1dB*
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Conducted Emissions, LISN	150kHz to 30MHz Amplitude	3.2dB*
Conducted Emissions, ISN	150kHz to 30MHz Amplitude	2.1dB
Substitution Antenna, Radiated Field	30MHz to 18GHz Amplitude	2.6dB
Discontinuous Interference	150kHz to 30MHz Amplitude	3.0dB*
Interference Power	30MHz to 300MHz Amplitude	3.0dB*
Radiated E-Field Susceptibility	10MHz to 6GHz Test Amplitude	2.0dB†
Conducted Susceptibility RF	50kHz to 1000MHz Amplitude	3.1dB•
	EM Clamp Method of Test	1.2dB•
	CDN Method of Test	1.1dB•
	BCI Clamp Method of Test	1.2dB•
Conducted Susceptibility LF	DC to 150kHz	1.0%†
Power Frequency Magnetic Field	50Hz/60Hz Amplitude	0.45%
Magnetic Emissions	9kHz to 30MHz Amplitude	3.4dB*
Magnetic Field/Flux iaw EN 50366	10Hz to 400kHz	2.64%
Harmonics and Flicker	The test was applied using proprietary equipment that meets the requirements of EN 61000-3-2 and EN 61000-3-3	—
Mains Voltage Variations and Interrupts	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-11	—
Fast Transient Burst	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-4	—
Electrostatic Discharge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-2	—
Surge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-5	—
Vehicle Transients	The test was applied using proprietary equipment that meets the requirements of ISO 7637-1 and 2	—
Compass Safe Distance	Azimuth Accuracy	0.10°
Channel Occupancy/Separation	19.1kHz	N/A
Maximum Output Power	Not Applicable	±0.5dB
Number of Channels	Not Applicable	N/A
20dB Bandwidth	19.1kHz	±0.5dB

Worst case error for both Time and Frequency measurement 12 parts in 10⁶.

- * In accordance with CISPR 16-4-2
- † In accordance with UKAS Lab 34
- In accordance with EN61000-4-6



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.

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