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Report On

FCC Testing of the
Sharp CDMA SHI13, Tri Band CDMA (BC0, BC3 and BC6) Cellular
Phone with Bluetooth, WLAN, FeliCa and GPS
In accordance with FCC CFR 47 Part 15C (WLAN)

COMMERCIAL-IN-CONFIDENCE

FCC ID: APYHRO00158

Document 75914914 Report 09 Issue 1

October 2011



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REPORT ON

FCC Testing of the
Sharp CDMA SH113, Tri Band CDMA (BC0, BC3 and BC6) Cellular
Phone with Bluetooth, WLAN, FeliCa and GPS
In accordance with FCC CFR 47 Part 15C (WLAN)

Document 75914914 Report 09 Issue 1

October 2011

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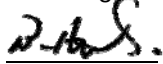
DATED

20 October 2011

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 15C. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);



B. A. S.



R Henley





G Lawler



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SECTION 1

REPORT SUMMARY

FCC Testing of the
Sharp CDMA SHI13, Tri Band CDMA (BC0, BC3 and BC6) Cellular Phone with Bluetooth,
WLAN, FeliCa and GPS
In accordance with FCC CFR 47 Part 15C (WLAN)



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1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC Testing of the Sharp CDMA SHI13, Tri Band CDMA (BC0, BC3 and 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
Model Number(s)	CDMA SHI13
Serial Number(s)	SSHFN000875 SSHFN000870 SSHFN000865
Number of Samples Tested	3
Test Specification/Issue/Date	FCC CFR 47 Part 15C (2010)
Incoming Release Date	Application Form 09 August 2011
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	8723 05 September 2011
Start of Test	12 September 2011
Finish of Test	16 October 2011
Name of Engineer(s)	B Airs R Henley G Lawler
Related Document(s)	ANSI C63.10: 2009



1.2 BRIEF SUMMARY OF RESULTS

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

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



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1.3 APPLICATION FORM

EQUIPMENT DESCRIPTION	
Model Name/Number	CDMA SHI13
Part Number	
FCC ID (if applicable)	APYHRO00158
Industry Canada ID (if applicable)	
Technical Description (Please provide a brief description of the intended use of the equipment)	Tri-Band CDMA(800MHz_BC0/3, 1900MHz_BC6) Cellular Phone with Bluetooth, W-LAN, FeliCa and GPS receiver enabled.

EXTREME TEMPERATURE RANGE over which the equipment is to be type tested	
☐	-20°C to +55°C
☒	Other (2)
☐	Not applicable (no extreme temperature testing required)
Extreme temperature range for the host(s): -20C to +60C	

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

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

TYPE OF ANTENNA	
☒	Integral
Temporary RF connector provided: ☒ Yes ☐ No	
☐	Antenna connector
☐	Number of antenna assembly(ies) submitted
Gain of the antenna intended for normal use:	
0	dBi for assembly identified as Bluetooth
0	dBi for assembly identified as WLAN
	dBi for assembly identified as
	dBi for assembly identified as
	dBi for assembly identified as

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



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



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



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

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

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

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

Signature: Yasuhiro Kawauchi Name: Yasuhiro Kawauchi

Position held: Manager Date: 09, Aug.2011



Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp CDMA SHI13, Tri Band CDMA (BC0, BC3 and BC6) Cellular Phone with Bluetooth, WLAN, FeliCa and GPS. A full technical description can be found in the manufacturer's documentation.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from a 4.0 V DC supply.

FCC 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

Modification 0 - No modifications were made to the test sample during testing.



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SECTION 2

TEST DETAILS

FCC Testing of the
Sharp CDMA SHI13, Tri Band CDMA (BC0, BC3 and BC6) Cellular Phone with Bluetooth,
WLAN, FeliCa and GPS
In accordance with FCC CFR 47 Part 15C (WLAN)



Product Service

2.1 MAXIMUM PEAK CONDUCTED OUTPUT POWER

2.1.1 Specification Reference

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

2.1.2 Equipment Under Test and Modification State

CDMA SHI13 S/N: SSHFN000875 - Modification State 0

2.1.3 Date of Test

30 September 2011

2.1.4 Test Equipment Used

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

2.1.5 Test Procedure

The EUT was transmitted at maximum power via a cable 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.

2.1.6 Environmental Conditions

Ambient Temperature 25.3 - 25.9°C
Relative Humidity 52.1 - 52.4%

2.1.7 Test Results

802.11(b)

4.0 V DC Supply

Modulation Data Rate (Mbps)	Maximum Peak Conducted Output Power					
	dBm			mW		
	2412 MHz	2437 MHz	2462 MHz	2412 MHz	2437 MHz	2462 MHz
1	18.96	18.86	18.56	78.70	76.91	71.78
2	19.46	18.60	19.40	88.31	72.44	87.10
5.5	19.39	18.27	19.78	86.90	67.14	95.06
11	19.56	18.61	19.60	90.36	72.61	91.20



Limit Clause

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

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

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

802.11(g)

4.0 V DC Supply

Modulation Data Rate (Mbps)	Maximum Peak Conducted Output Power					
	dBm			mW		
	2412 MHz	2437 MHz	2462 MHz	2412 MHz	2437 MHz	2462 MHz
6	21.36	20.45	21.49	136.77	110.92	140.93
9	21.46	20.53	21.50	139.96	112.97	141.25
12	21.31	20.40	21.48	135.21	135.21	138.04
18	21.03	20.39	21.24	126.77	109.40	133.05
24	21.21	20.36	21.44	132.13	108.64	139.32
36	21.35	20.39	21.54	136.46	109.40	142.56
48	21.23	20.08	21.19	132.74	101.86	131.52
54	21.30	20.41	21.38	134.90	109.90	137.40

Limit Clause

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

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

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

802.11(n)

4.0 V DC Supply

Modulation Data Rate (Mbps)	Maximum Peak Conducted Output Power					
	dBm			mW		
	2412 MHz	2437 MHz	2462 MHz	2412 MHz	2437 MHz	2462 MHz
6.5	21.15	20.36	21.29	130.317	108.643	134.586
13	21.24	20.45	21.44	133.045	110.917	139.316
19.5	20.99	20.28	21.13	125.603	106.660	129.718
26	20.84	20.42	21.15	121.339	110.154	130.317
39	21.11	20.16	21.29	129.122	103.753	134.586
52	21.07	20.18	21.44	127.938	104.232	139.316
58.5	21.18	19.68	21.89	131.220	92.897	154.525
65	21.34	20.34	21.38	136.144	108.143	137.404

Limit Clause

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

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

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



Product Service

2.2 EIRP PEAK POWER

2.2.1 Specification Reference

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

2.2.2 Equipment Under Test and Modification State

CDMA SHI13 S/N: SSHFN000870 - Modification State 0

2.2.3 Date of Test

12 September 2011

2.2.4 Test Equipment Used

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

2.2.5 Test Procedure

The EUT was transmitted at maximum power via a cable to the Spectrum Analyser. The Analyser settings were adjusted to display the resultant trace on screen and a resolution bandwidth and video bandwidth of 1 MHz were used to perform the measurement. The level on the spectrum analyser was maximised by rotating the EUT 360° and a height search of the measuring antenna. A substitution was then performed using a substitution antenna and signal generator.

This level was maximised by adjusting the height of the measuring antenna once more. The level from the signal generator was then adjusted to achieve the same raw result as with the EUT. This level was then corrected to account for cable loss and antenna factor. If applicable, a peak power analyser was also used to obtain a correction factor for wideband signals such as WLAN.

A calculation was then performed to obtain the final figure.

2.2.6 Environmental Conditions

Ambient Temperature	23.0°C
Relative Humidity	54.0%



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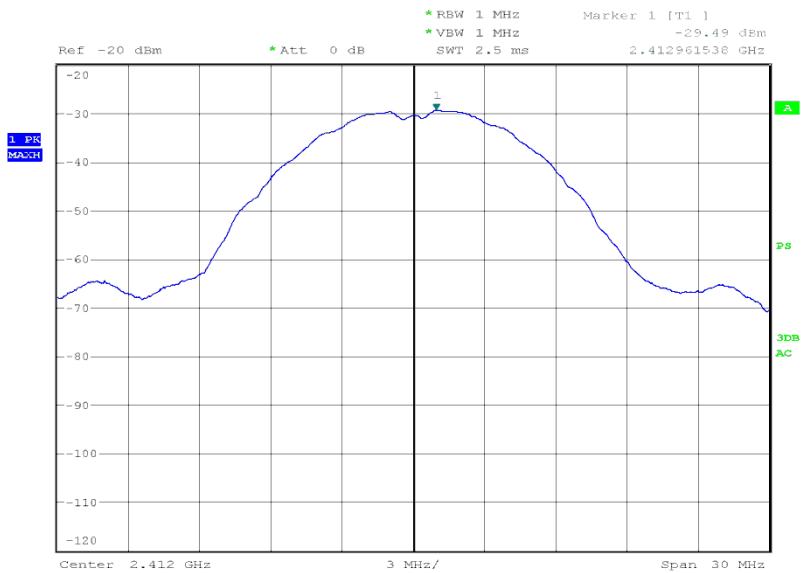
2.2.7 Test Results

802.11(b)

4.0 V DC Supply

2412 MHz

EIRP (dBm)	EIRP (mW)
+18.0	63.10



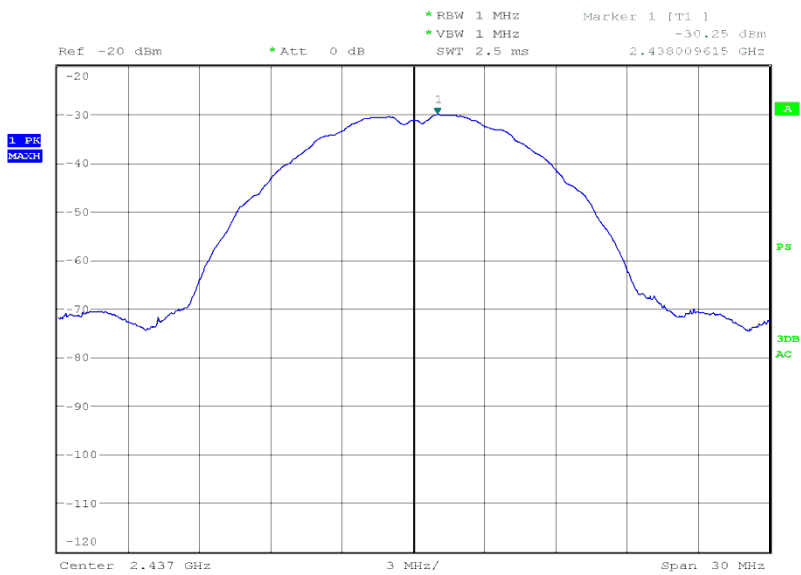
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2437 MHz

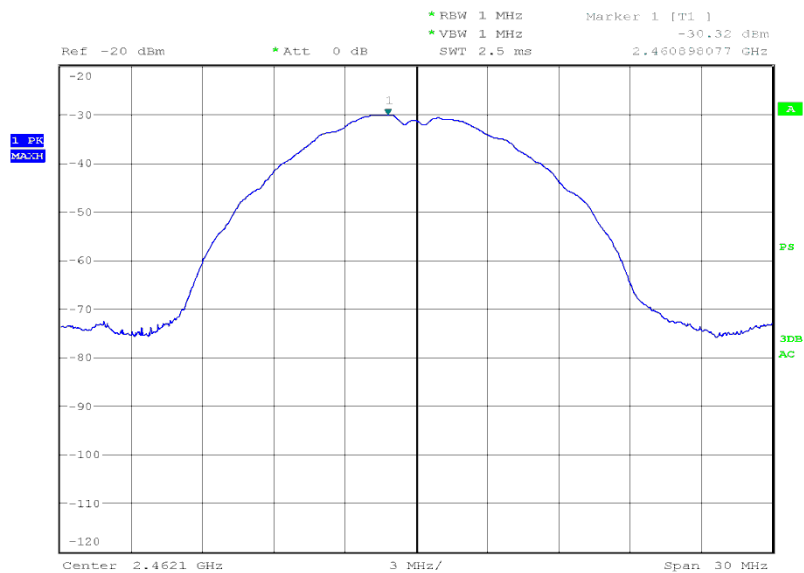
EIRP (dBm)	EIRP (mW)
+17.7	58.88



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2462 MHz

EIRP (dBm)	EIRP (mW)
+17.5	56.23



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Limit

EIRP (dBm)	EIRP (mW)
36.0	4000



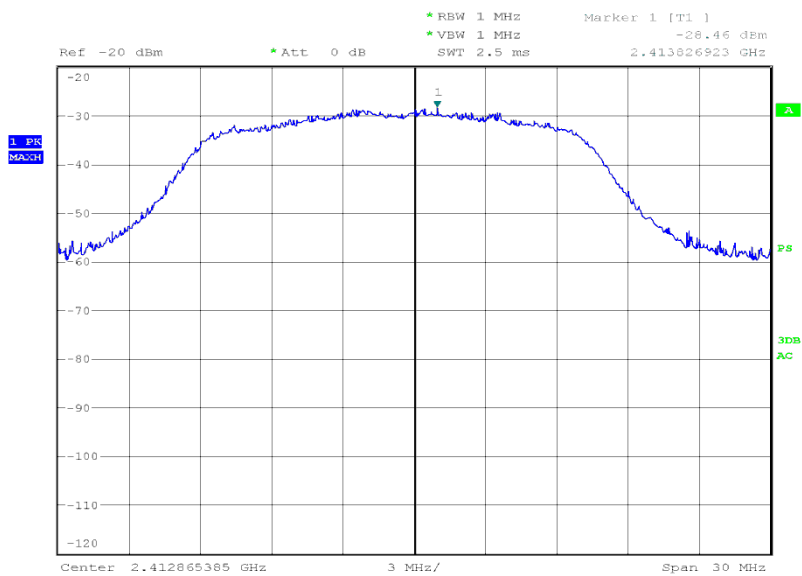
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802.11(g)

4.0 V DC Supply

2412 MHz

EIRP (dBm)	EIRP (mW)
+18.6	72.44



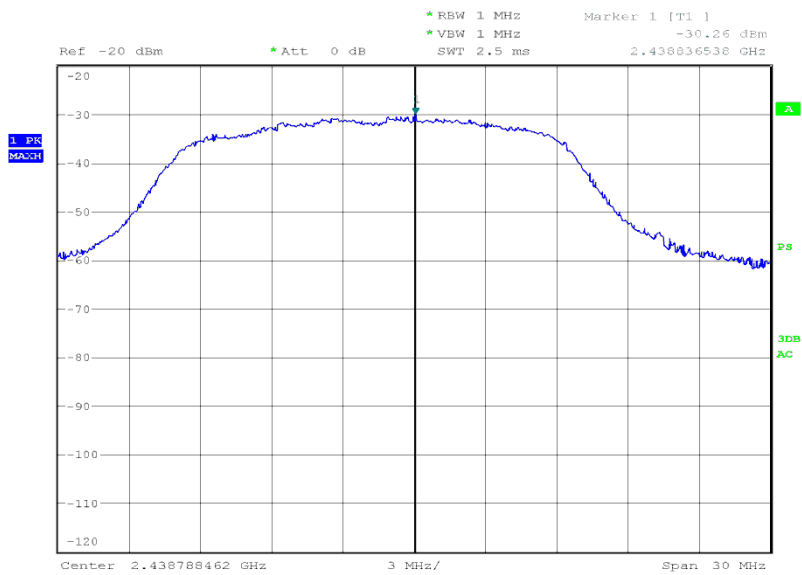
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Product Service

2437 MHz

EIRP (dBm)	EIRP (mW)
+17.3	53.70



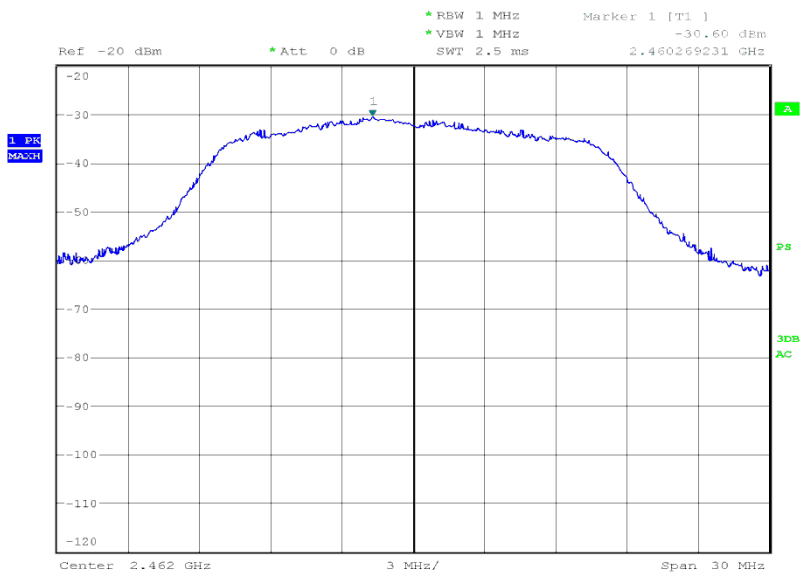
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Product Service

2462 MHz

EIRP (dBm)	EIRP (mW)
+16.8	47.86



Date: 12.SEP.2011 19:59:55

Limit

EIRP (dBm)	EIRP (mW)
36.0	4000



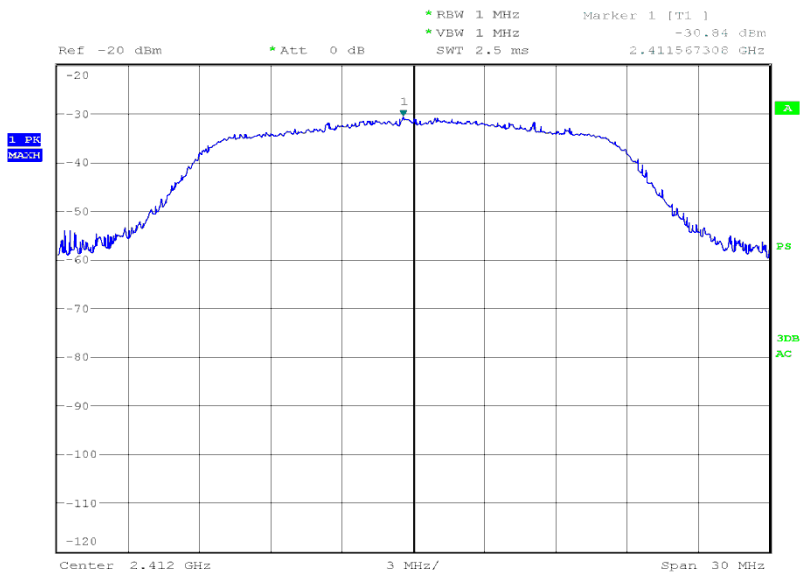
Product Service

802.11(n)

4.0 V DC Supply

2412 MHz

EIRP (dBm)	EIRP (mW)
+18.0	63.10



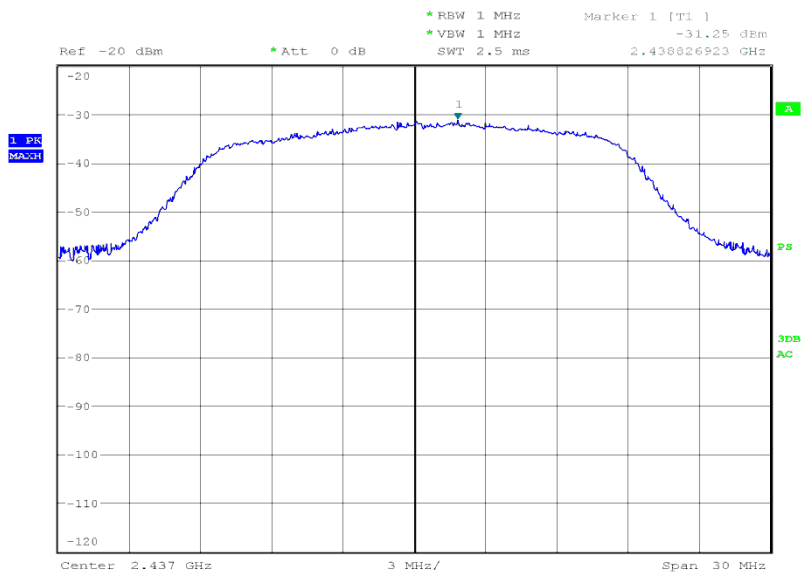
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Product Service

2437 MHz

EIRP (dBm)	EIRP (mW)
+18.1	64.57



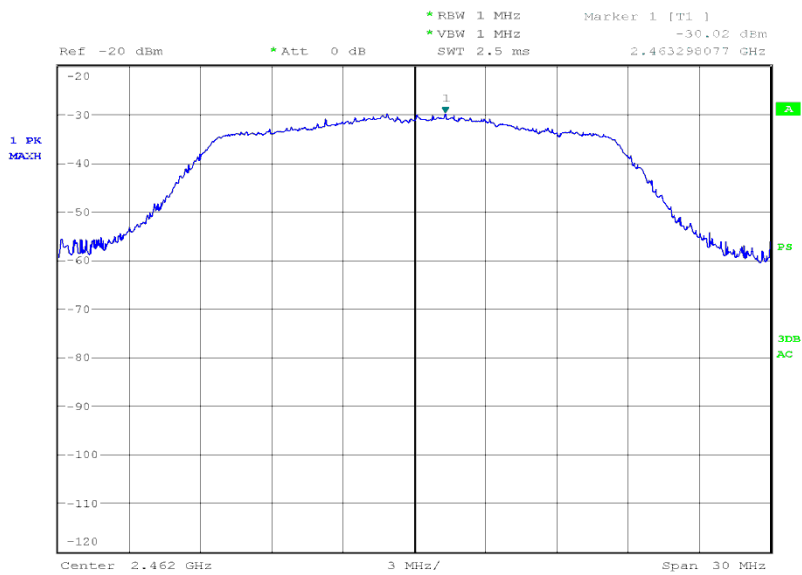
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Product Service

2462 MHz

EIRP (dBm)	EIRP (mW)
+19.1	81.28



Date: 12.SEP.2011 21:01:39

Limit

EIRP (dBm)	EIRP (mW)
36.0	4000



Product Service

2.3 POWER SPECTRAL DENSITY

2.3.1 Specification Reference

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

2.3.2 Equipment Under Test and Modification State

CDMA SHI13 S/N: SSHFN000875 - Modification State 0

2.3.3 Date of Test

30 September 2011

2.3.4 Test Equipment Used

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

2.3.5 Test Procedure

The EUT was connected to a spectrum analyser via 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.

2.3.6 Environmental Conditions

Ambient Temperature	25.3 - 25.9°C
Relative Humidity	52.1 - 52.4%

**2.3.7 Test Results**802.11(b)

4.0 V DC Supply

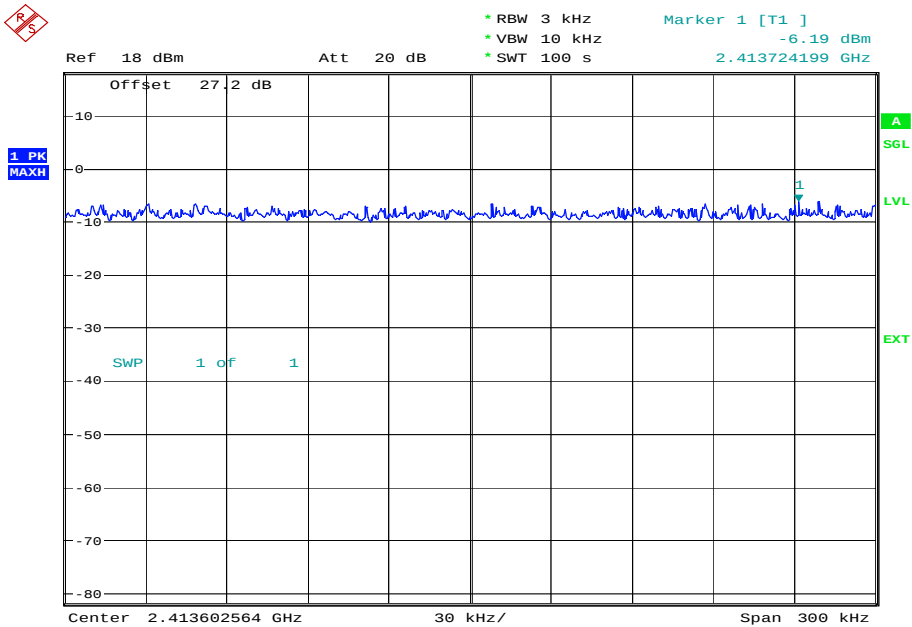
Frequency (MHz)	Data Rate (Mbps)	Power Spectral Density in 3 kHz Bands (dBm)
2412 MHz	1	-6.19
	2	-5.28
	5	-6.40
	11	-6.49
2437 MHz	1	-7.09
	2	-6.21
	5	-6.43
	11	-7.03
2462 MHz	1	-5.77
	2	-6.35
	5	-7.05
	11	-7.34



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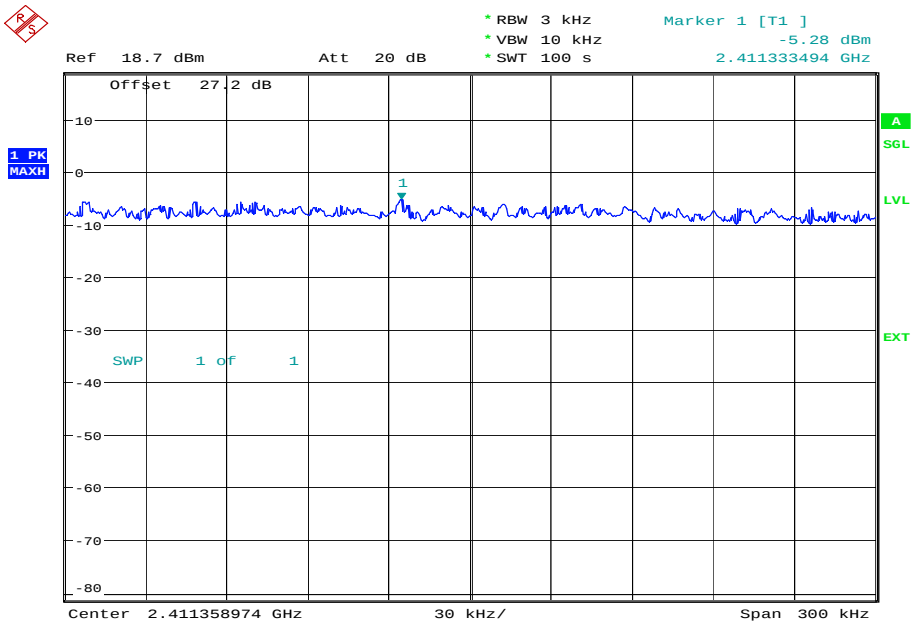
2412 MHz

1 Mbps



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2 Mbps

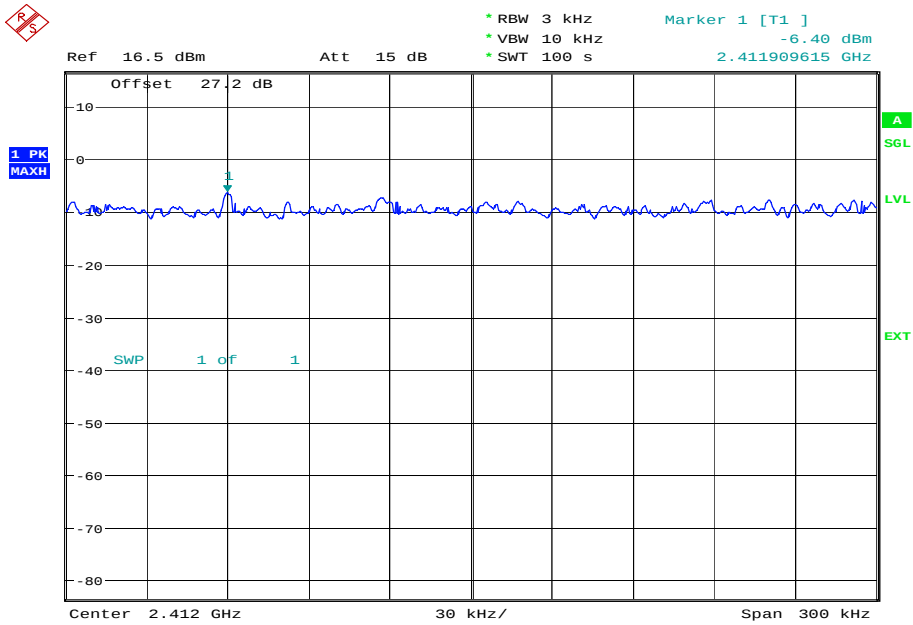


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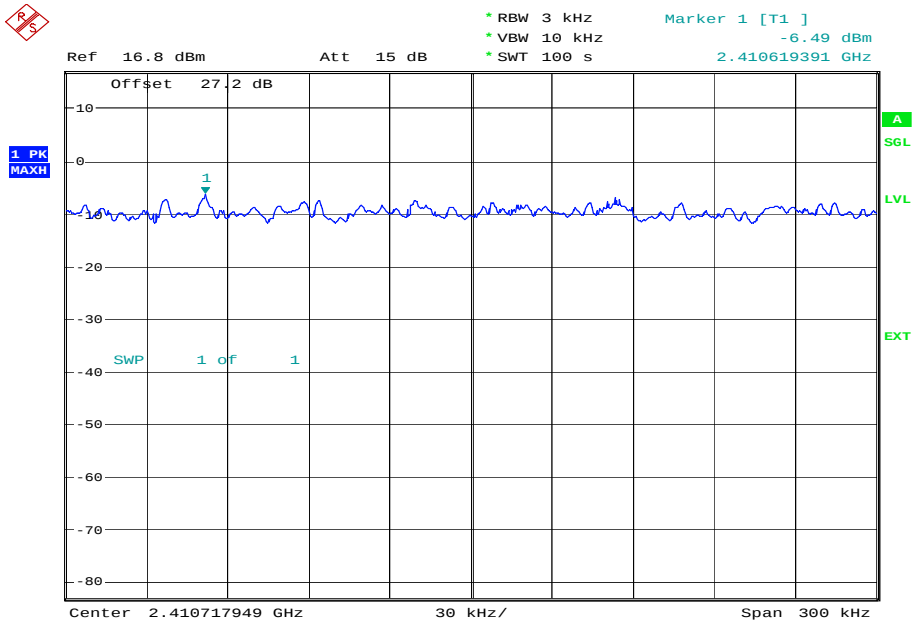
Product Service

5.5 Mbps



Date: 29.SEP.2011 15:03:52

11 Mbps



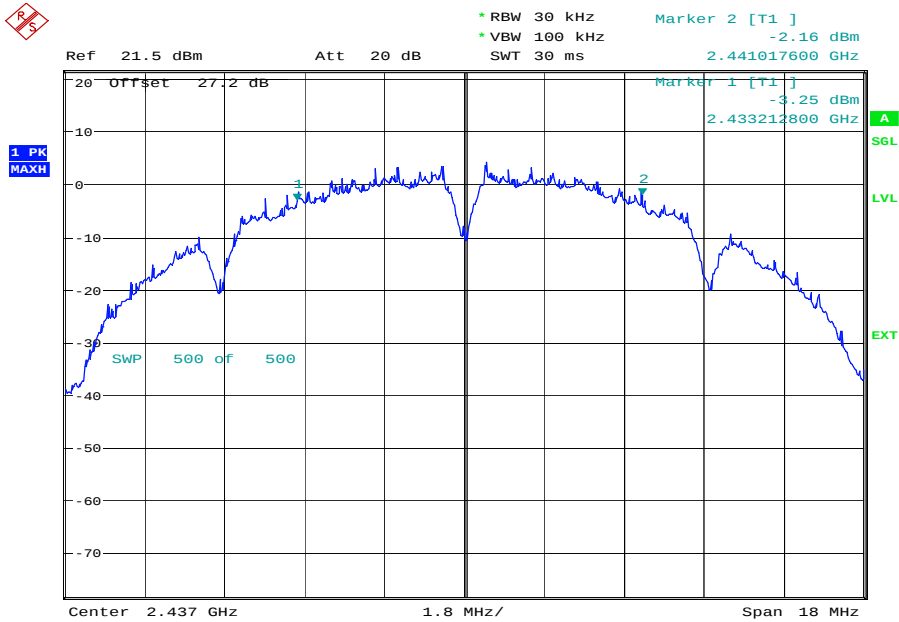
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Product Service

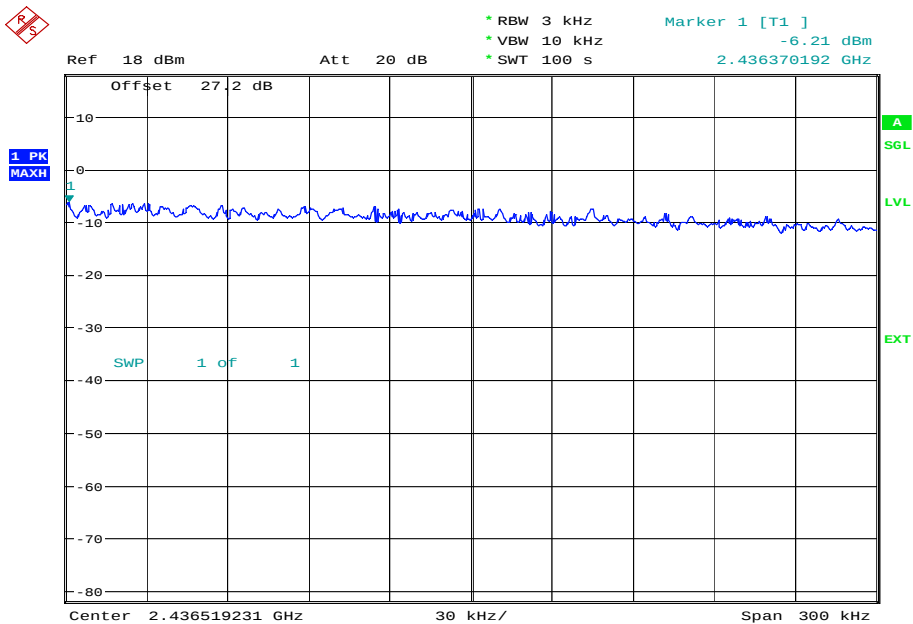
2437 MHz

1 Mbps



Date: 29.SEP.2011 12:18:30

2 Mbps

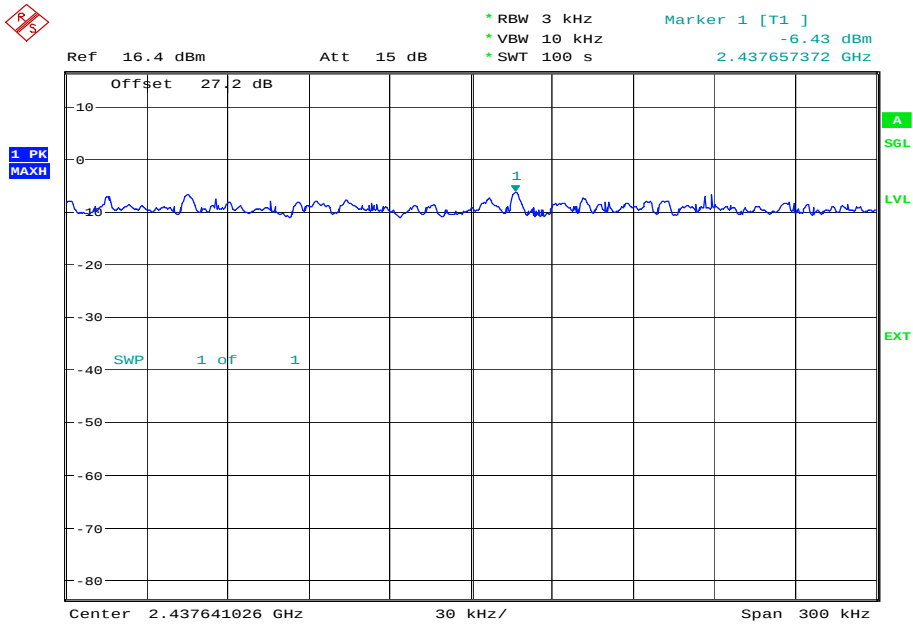


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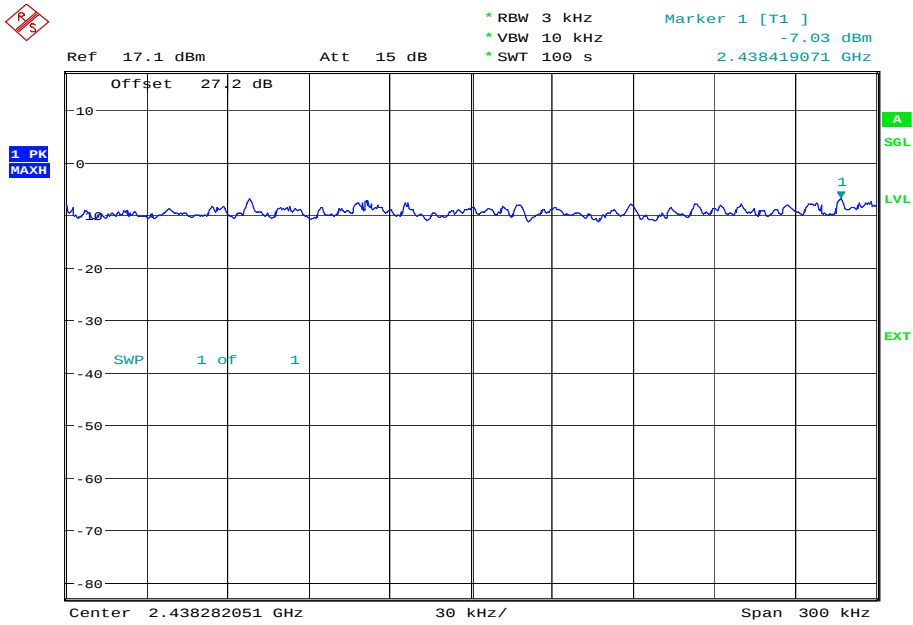
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5.5 Mbps



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11 Mbps



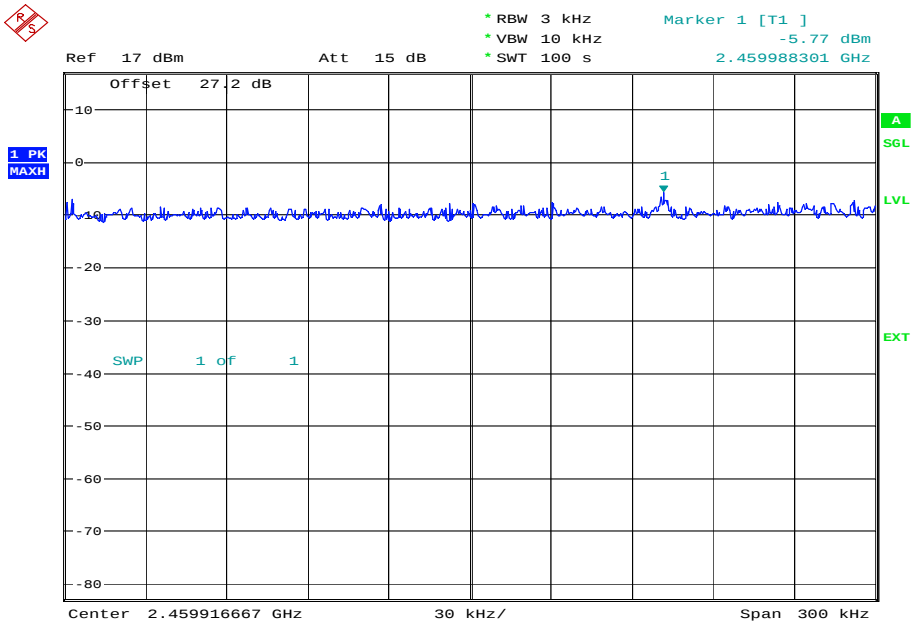
Date: 29.SEP.2011 15:49:40



Product Service

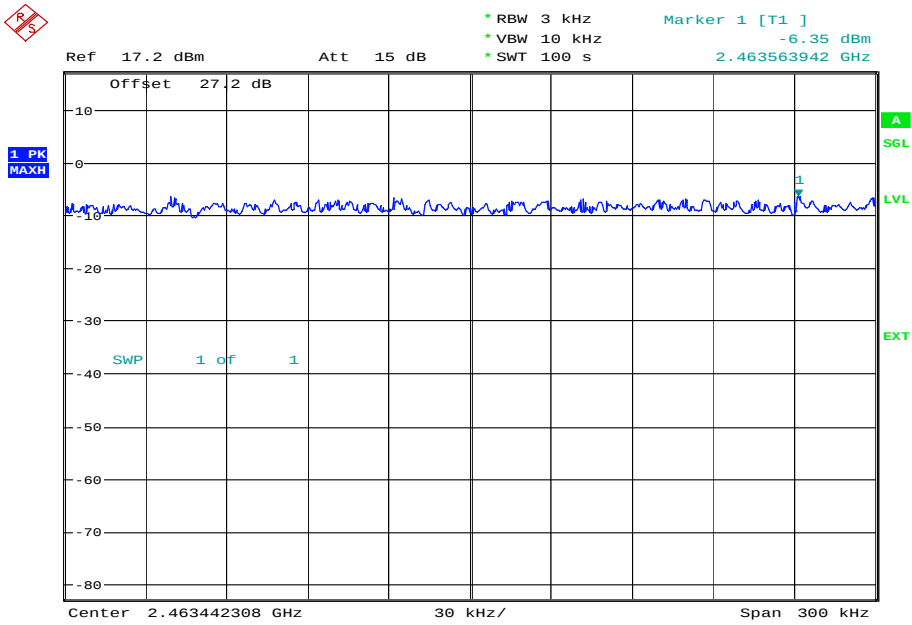
2462 MHz

1 Mbps



Date: 29.SEP.2011 14:55:42

2 Mbps

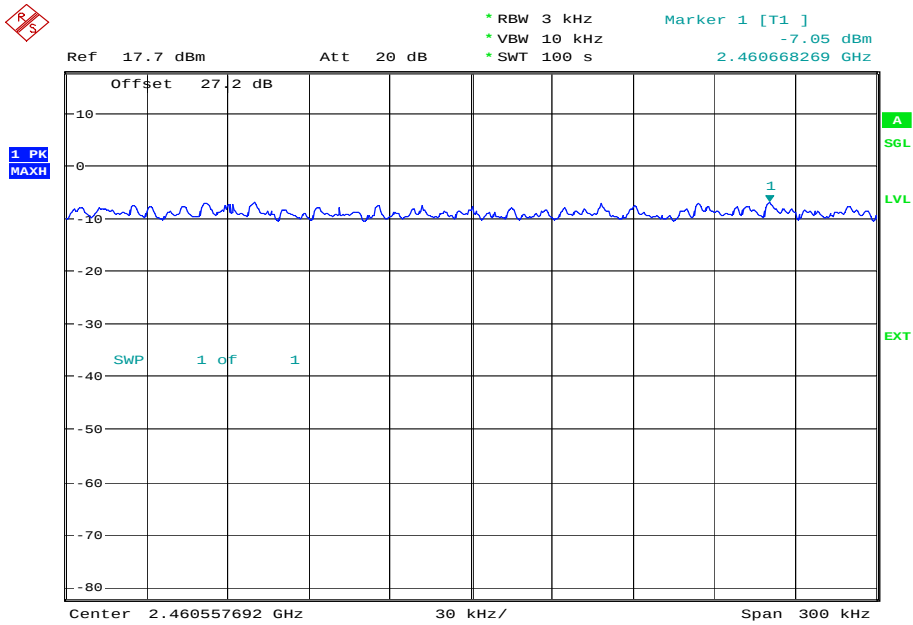


Date: 29.SEP.2011 11:51:51



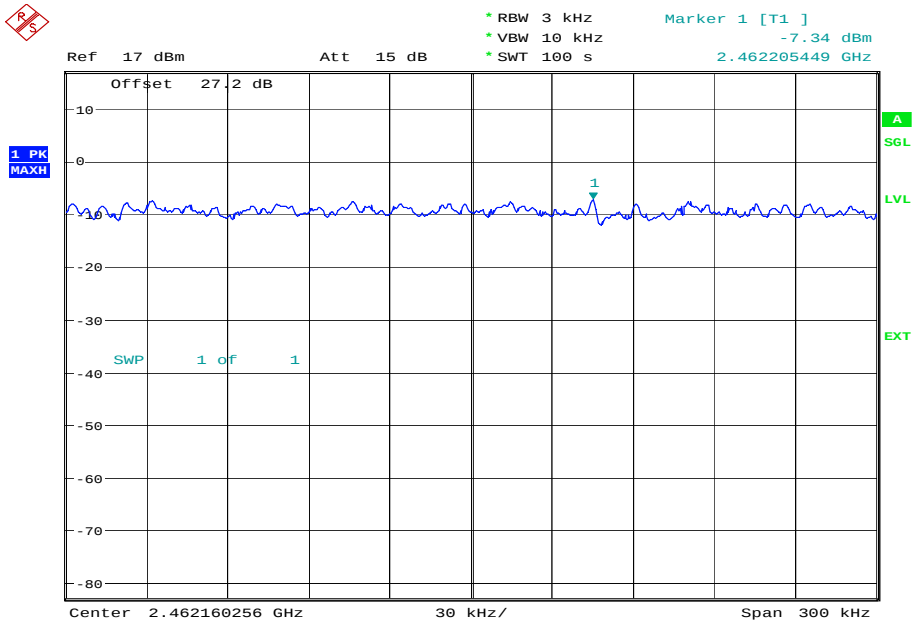
Product Service

5.5 Mbps



Date: 29.SEP.2011 15:18:32

11 Mbps



Date: 29.SEP.2011 16:00:14

Limit Clause

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

802.11(g)

4.0 V DC Supply

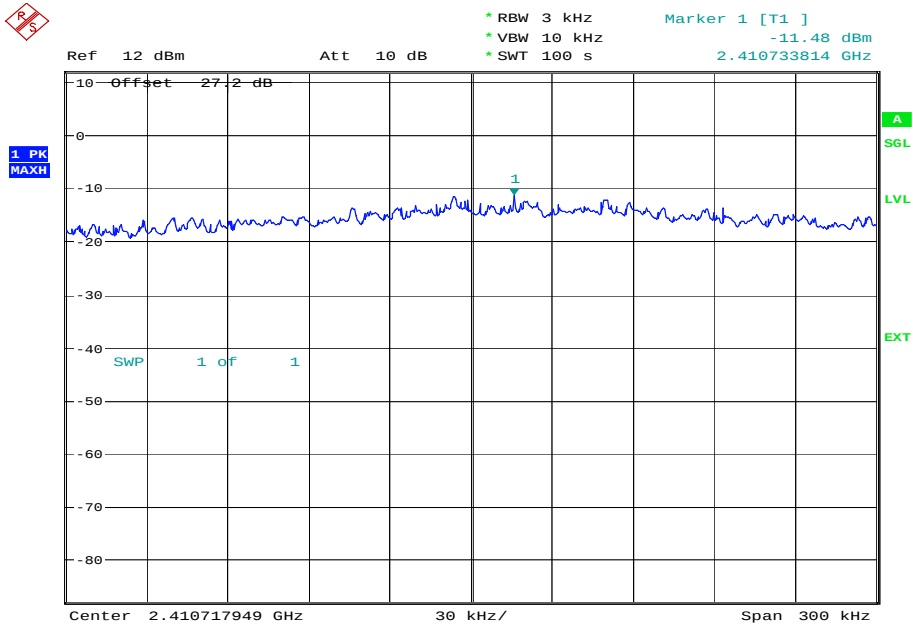
Frequency (MHz)	Data Rate (Mbps)	Power Spectral Density in 3 kHz Bands (dBm)
2412 MHz	6	-11.48
	9	-12.12
	12	-11.68
	18	-11.81
	24	-11.37
	36	-10.72
	48	-11.06
	54	-10.54
2437 MHz	6	-13.71
	9	-12.23
	12	-11.64
	18	-10.60
	24	-11.64
	36	-10.90
	48	-11.21
	54	-10.89
2462 MHz	6	-13.91
	9	-10.40
	12	-10.89
	18	-11.17
	24	-11.46
	36	-10.60
	48	-12.07
	54	-10.36



Product Service

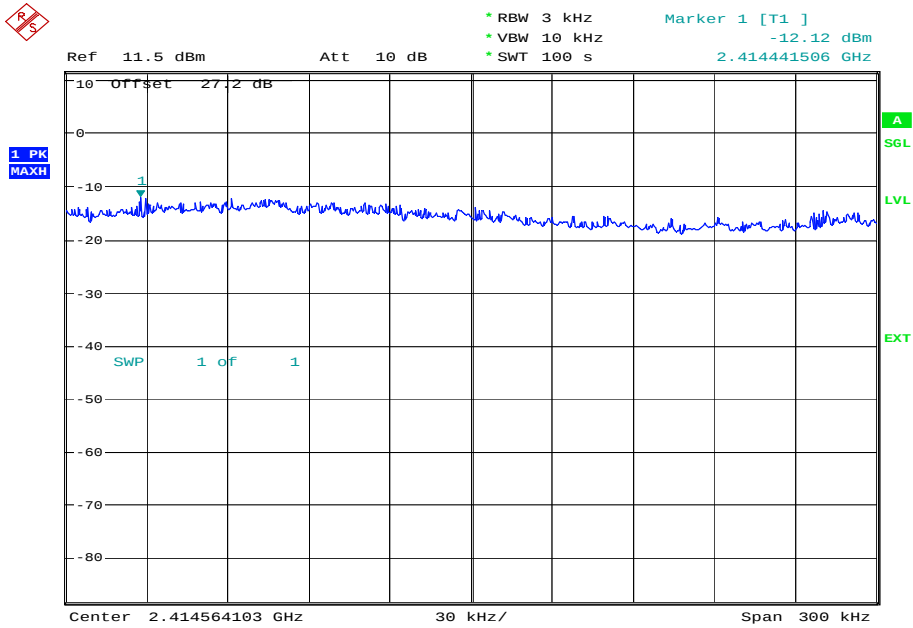
2412 MHz

6 Mbps



Date: 29.SEP.2011 16:21:02

9 Mbps

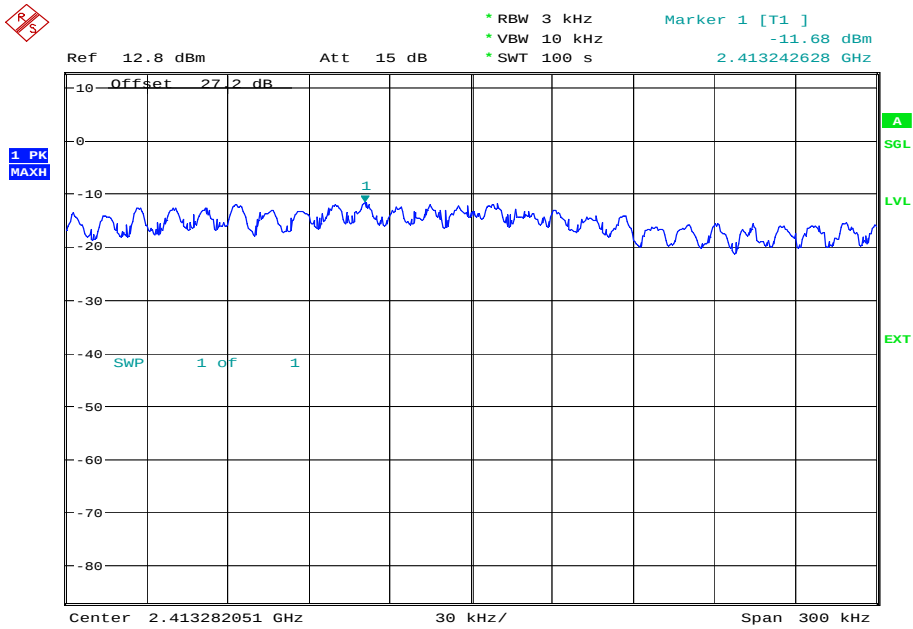


Date: 29.SEP.2011 16:52:29



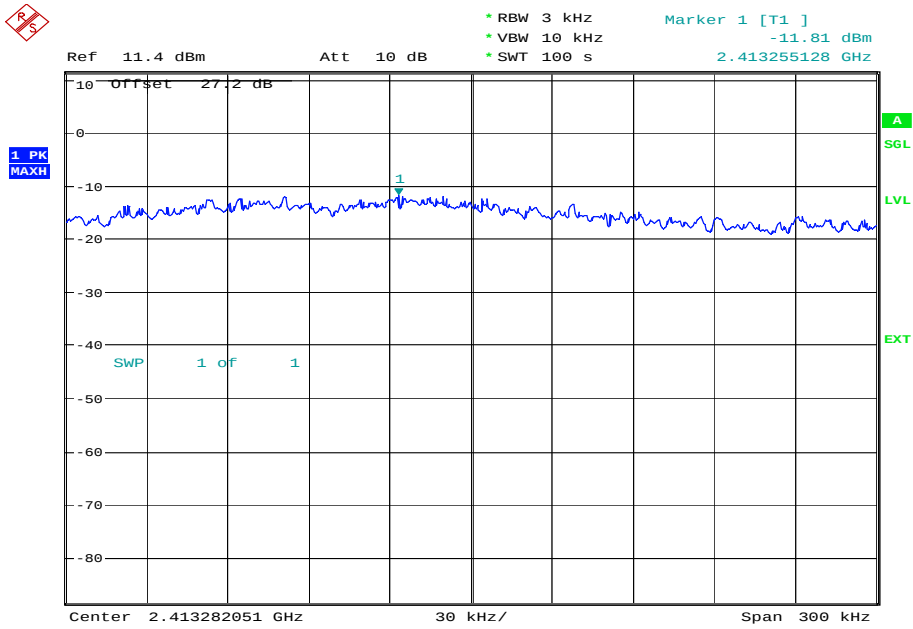
Product Service

12 Mbps



Date: 29.SEP.2011 17:09:57

18 Mbps

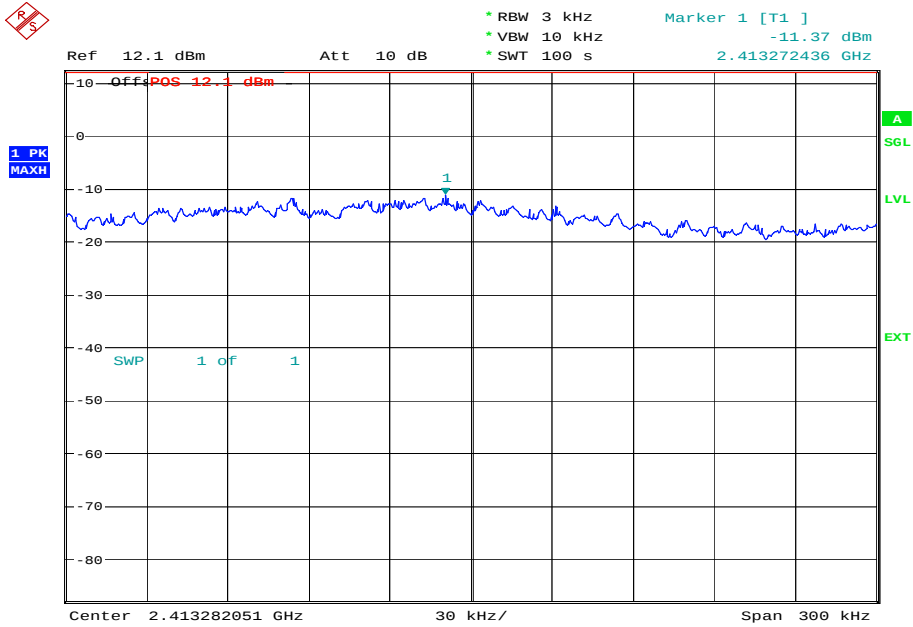


Date: 29.SEP.2011 17:33:49



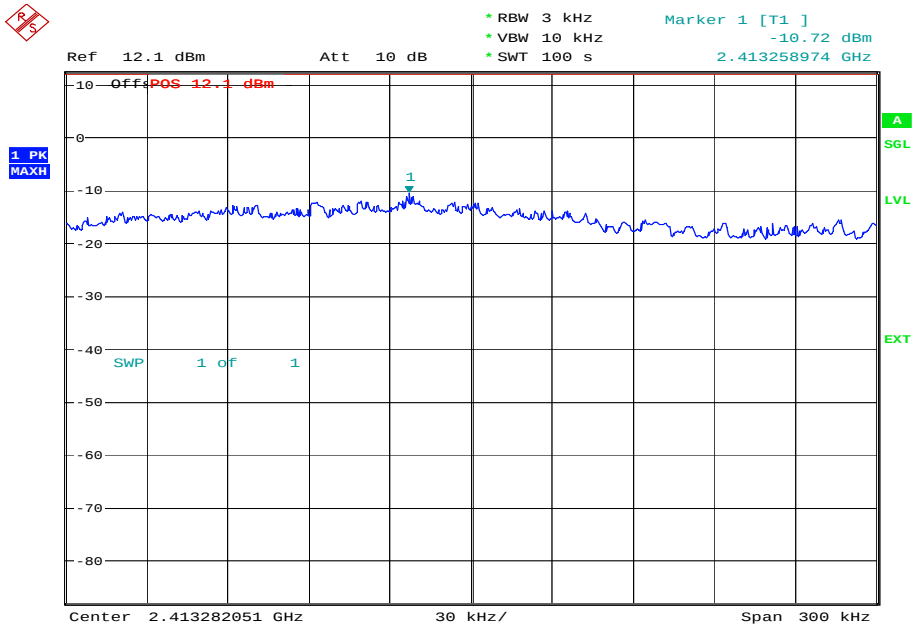
Product Service

24 Mbps



Date: 30.SEP.2011 10:06:03

36 Mbps

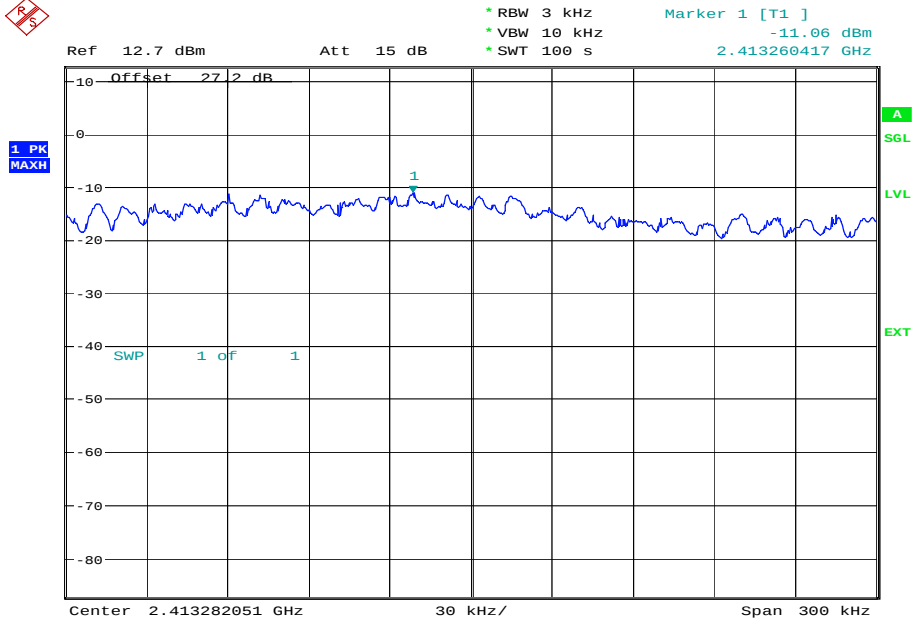


Date: 30.SEP.2011 10:26:36



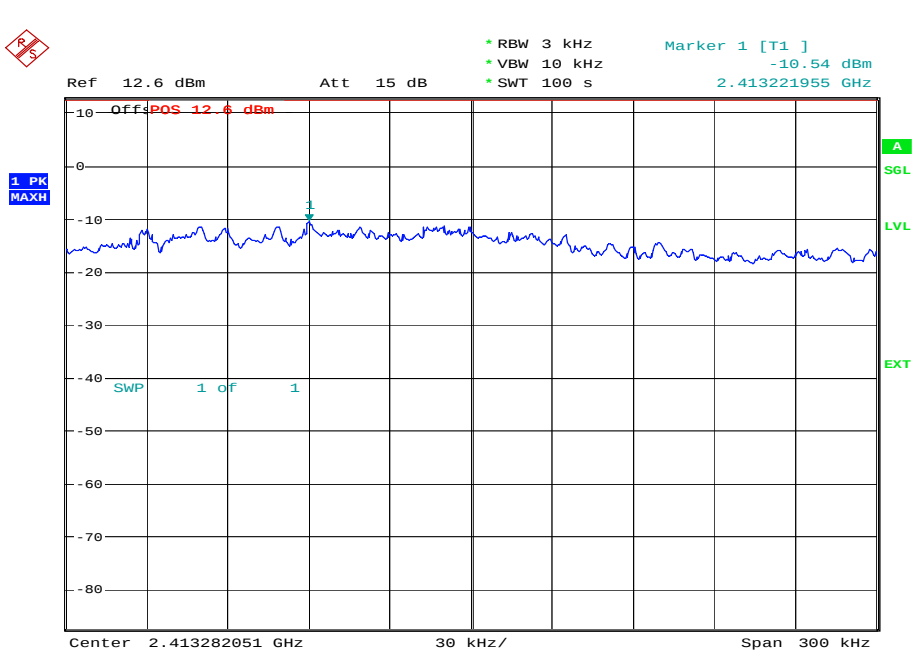
Product Service

48 Mbps



Date: 30.SEP.2011 10:45:46

54 Mbps



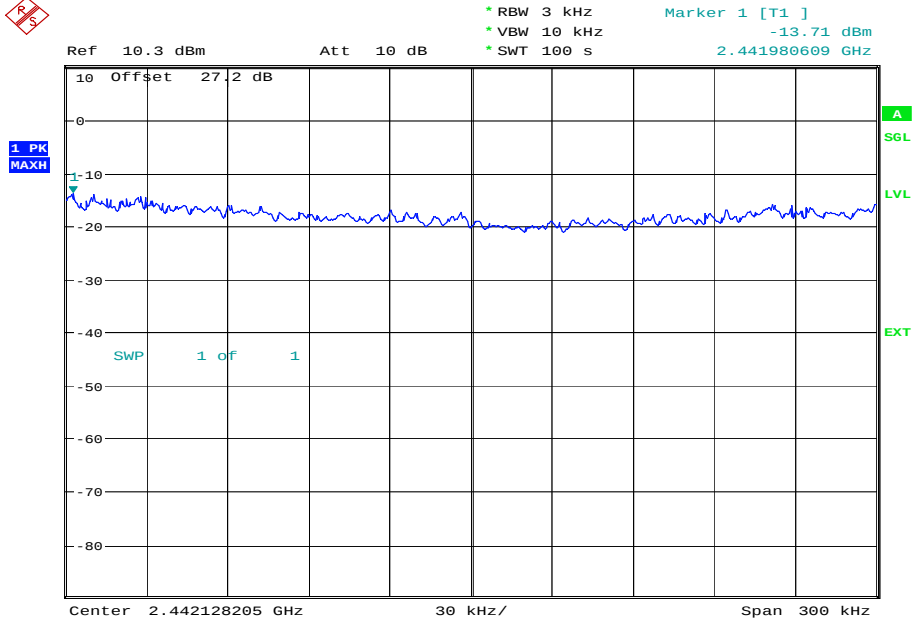
Date: 30.SEP.2011 11:14:28



Product Service

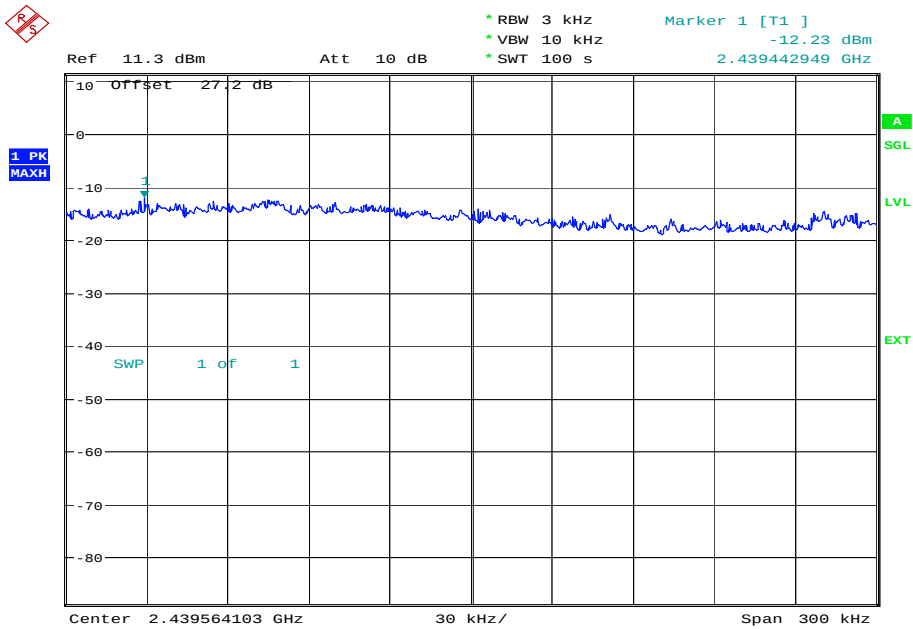
2437 MHz

6 Mbps



Date: 29.SEP.2011 16:37:19

9 Mbps

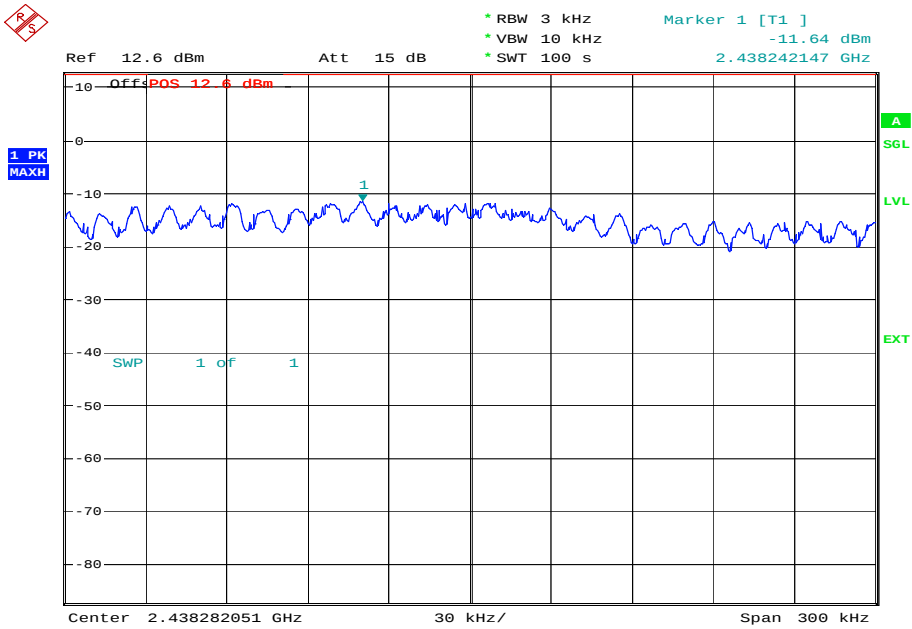


Date: 29.SEP.2011 16:57:42



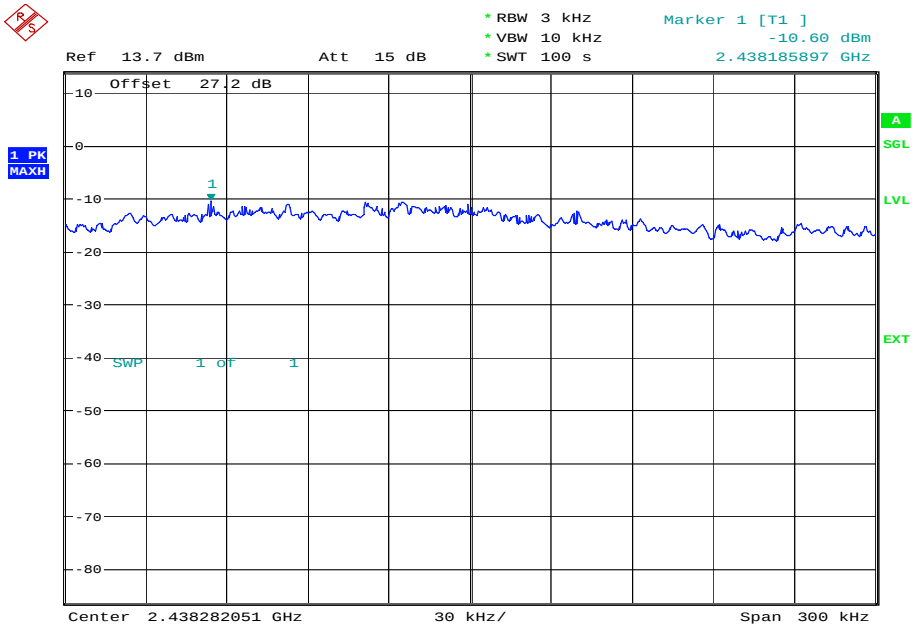
Product Service

12 Mbps



Date: 29.SEP.2011 17:14:55

18 Mbps

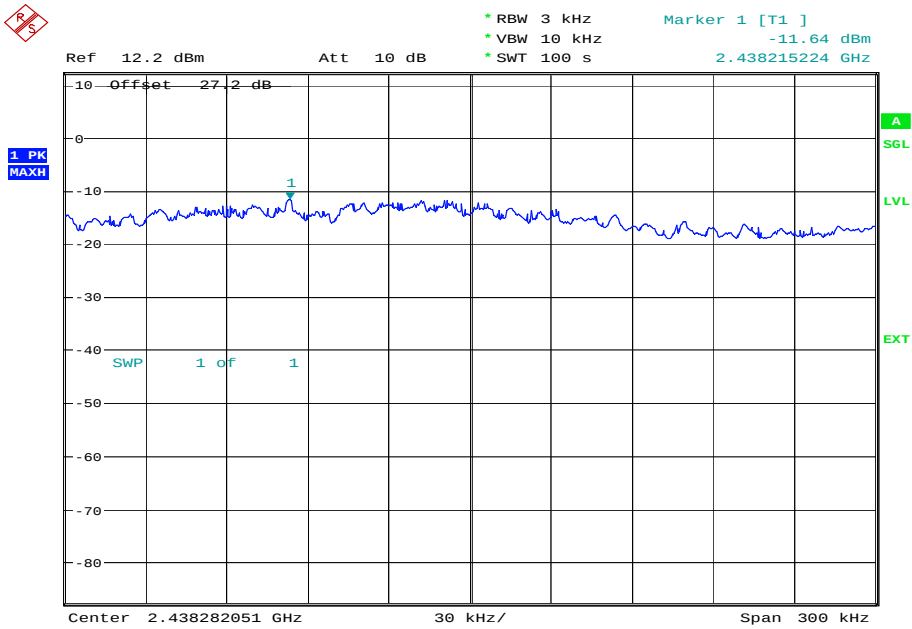


Date: 30.SEP.2011 09:47:34



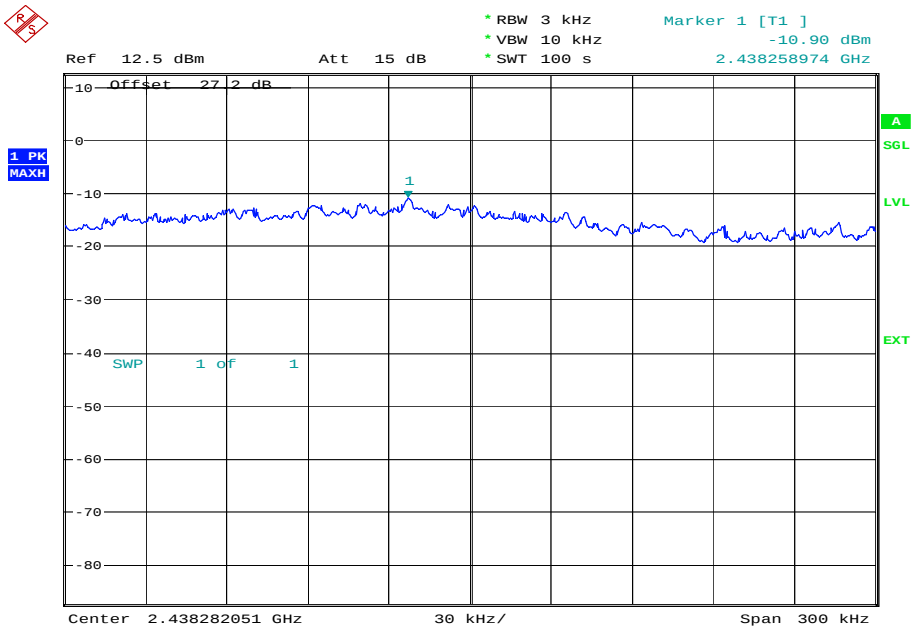
Product Service

24 Mbps



Date: 30.SEP.2011 10:12:57

36 Mbps

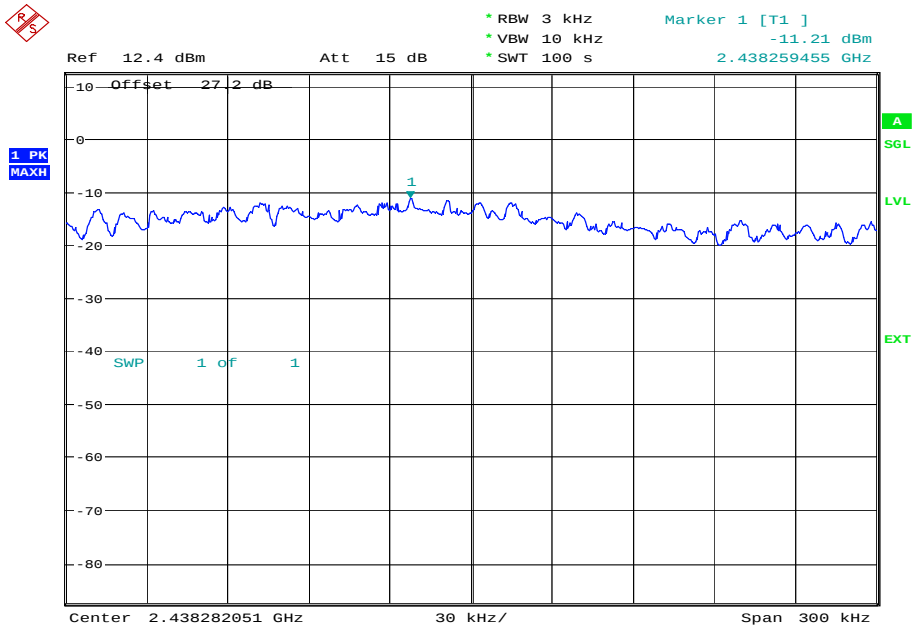


Date: 30.SEP.2011 10:31:34



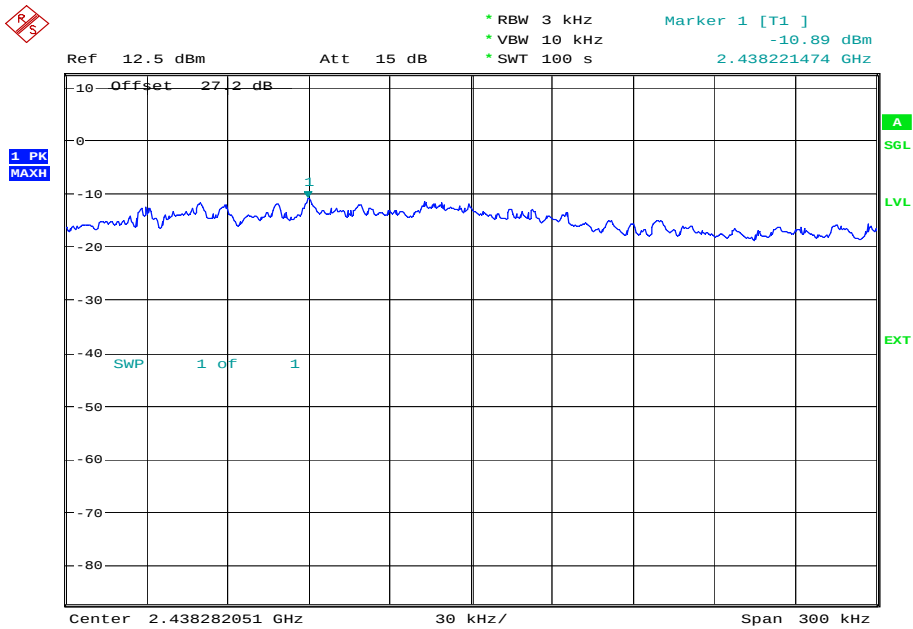
Product Service

48 Mbps



Date: 30.SEP.2011 10:50:57

54 Mbps



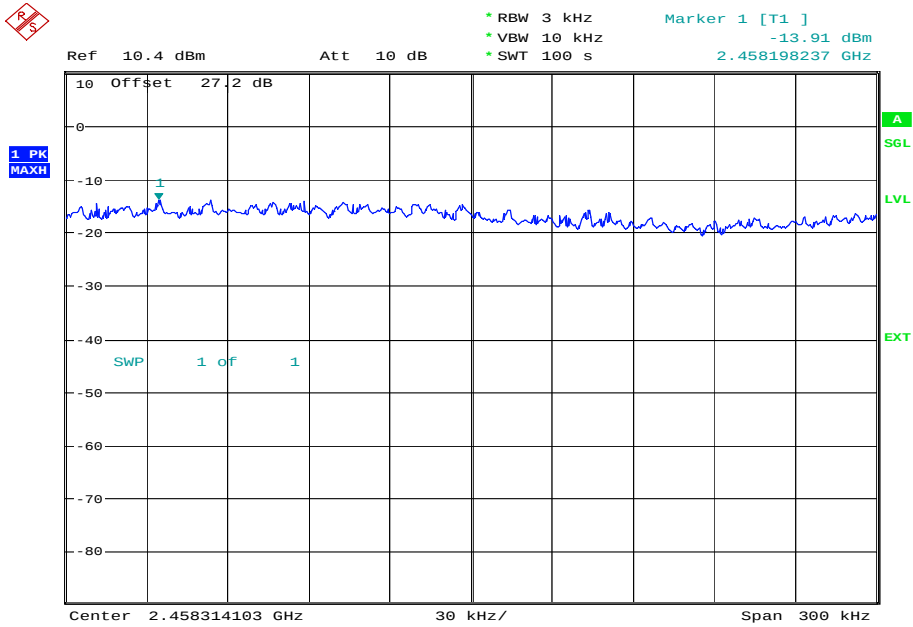
Date: 30.SEP.2011 11:26:30



Product Service

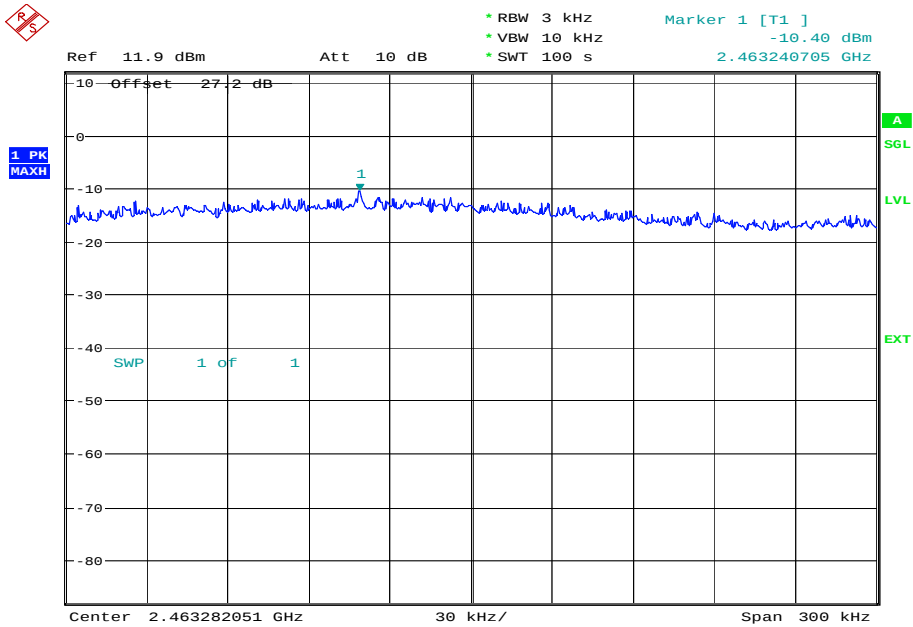
2462 MHz

6 Mbps



Date: 29.SEP.2011 16:43:23

9 Mbps

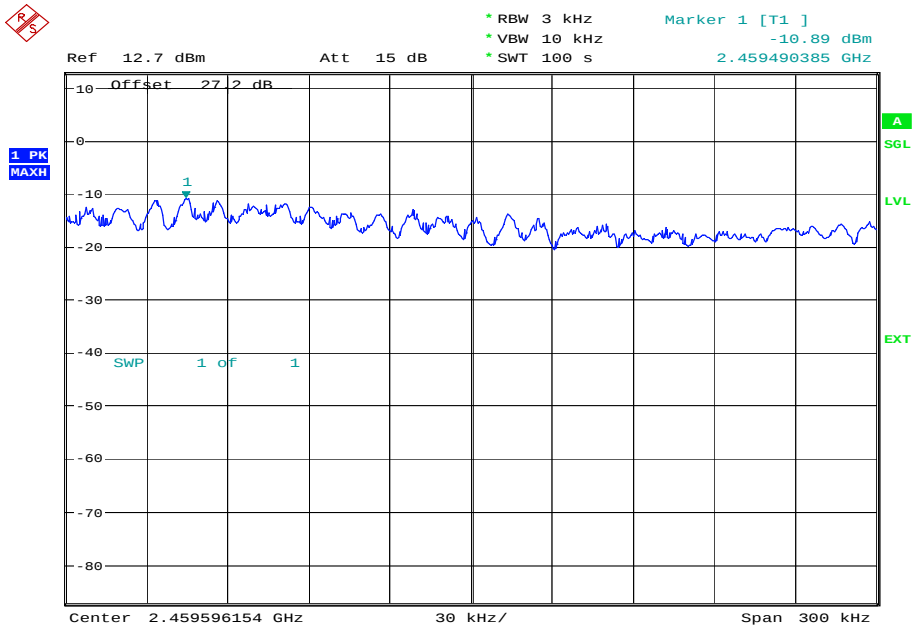


Date: 29.SEP.2011 17:02:42



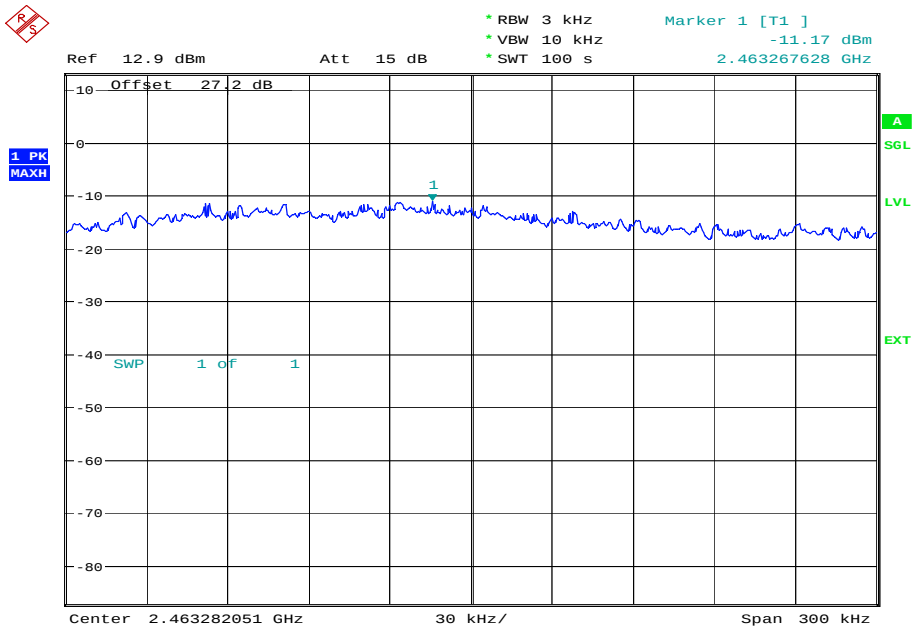
Product Service

12 Mbps



Date: 29.SEP.2011 17:22:07

18 Mbps

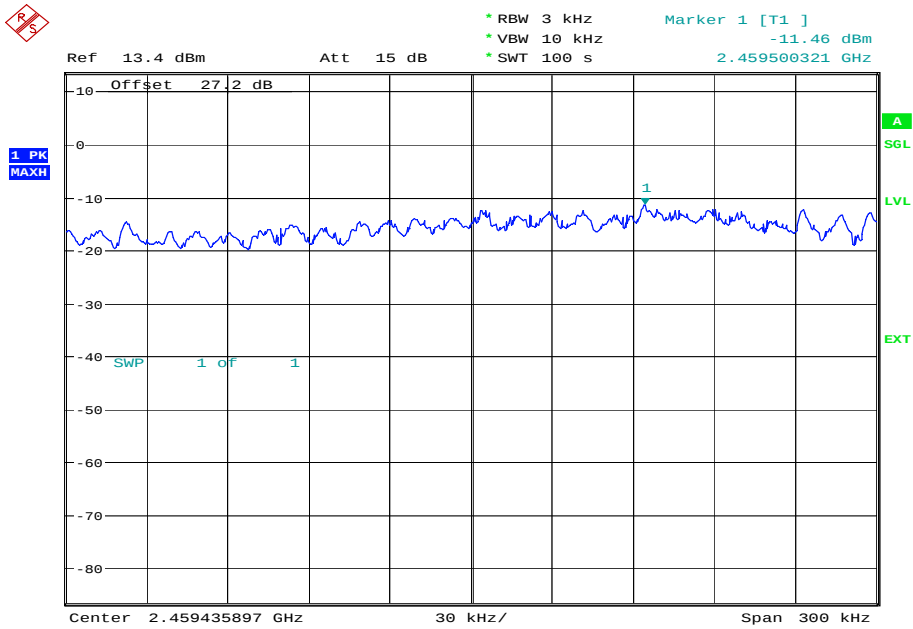


Date: 30.SEP.2011 09:57:05



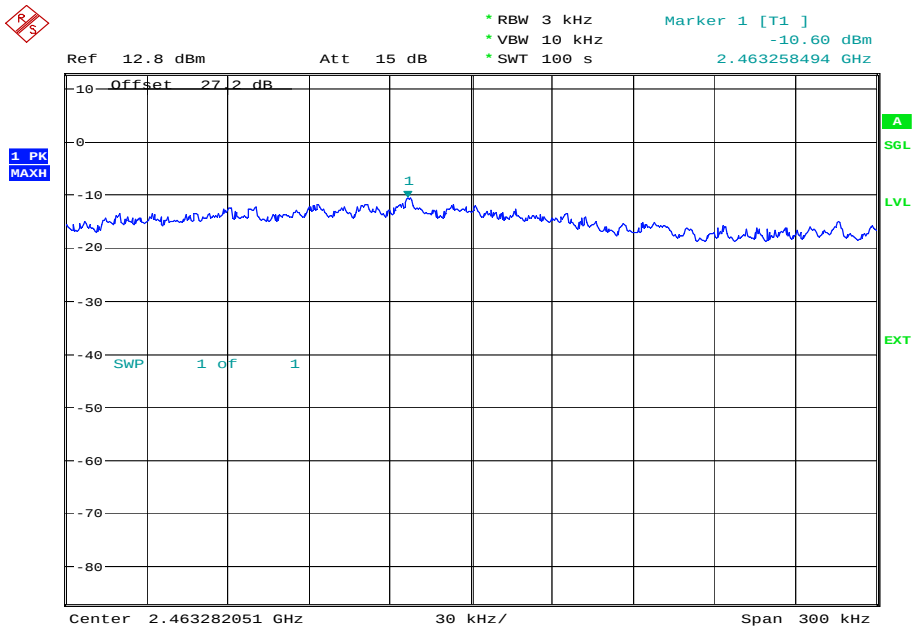
Product Service

24 Mbps



Date: 30.SEP.2011 10:18:12

36 Mbps

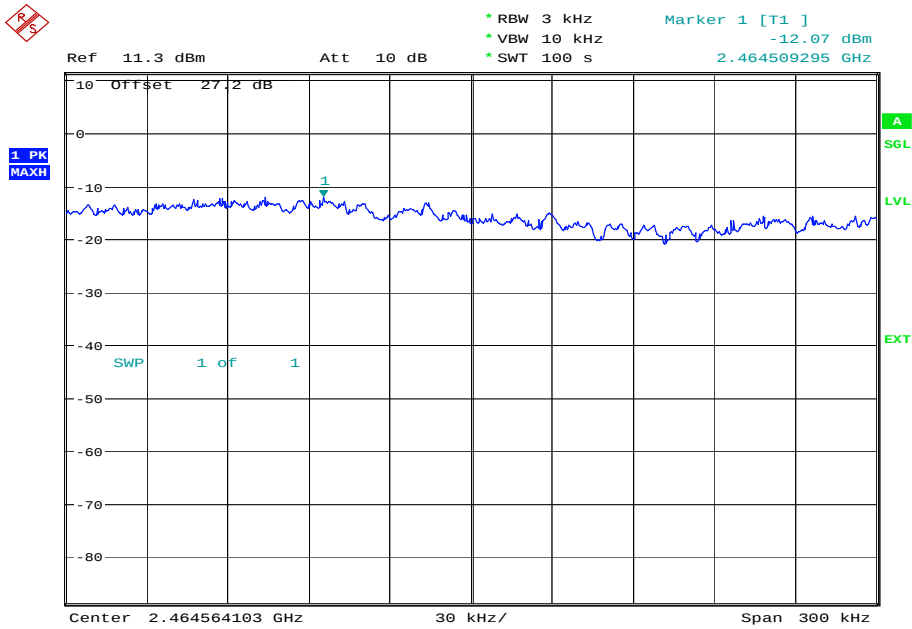


Date: 30.SEP.2011 10:36:28



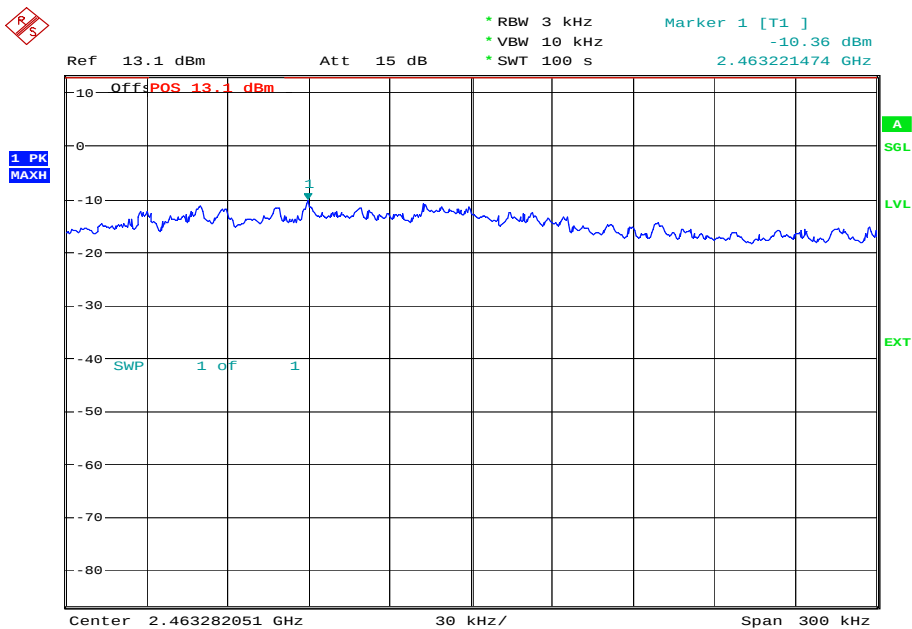
Product Service

48 Mbps



Date: 30.SEP.2011 10:59:42

54 Mbps



Date: 30.SEP.2011 11:33:07

Limit Clause

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

802.11(n)

4.0 V DC Supply

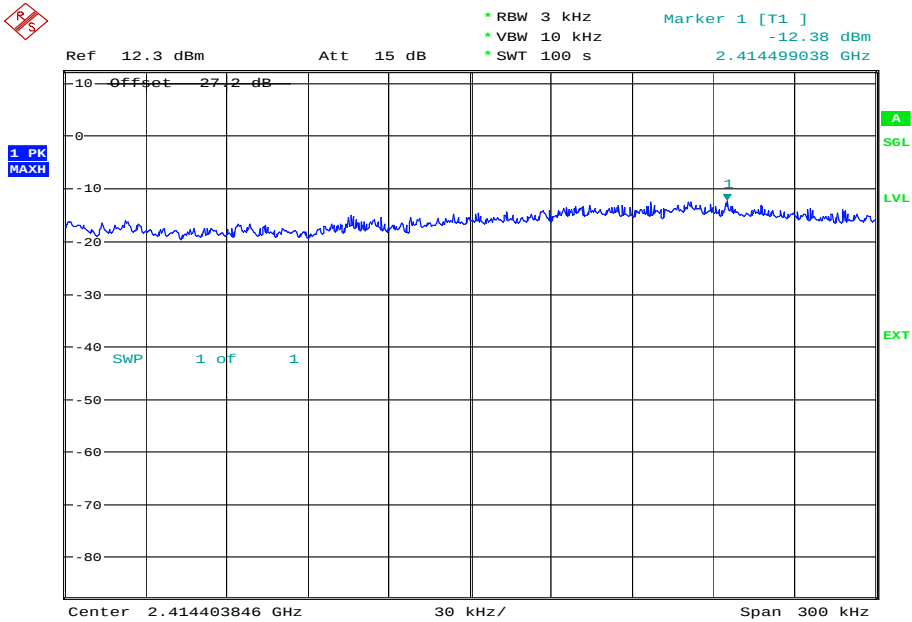
Frequency (MHz)	Data Rate (Mbps)	Power Spectral Density in 3 kHz Bands (dBm)
2412 MHz	6.5	-12.38
	13	-13.19
	19.5	-11.46
	26	-12.14
	39	-11.90
	52	-12.47
	58.5	-11.43
	65	-10.70
2437 MHz	6.5	-11.77
	13	-11.40
	19.5	-10.95
	26	-12.43
	39	-12.37
	52	-12.42
	58.5	-11.17
	65	-11.70
2462 MHz	6.5	-10.58
	13	-10.82
	19.5	-12.23
	26	-11.27
	39	-10.69
	52	-12.42
	58.5	-11.17
	65	-11.83



Product Service

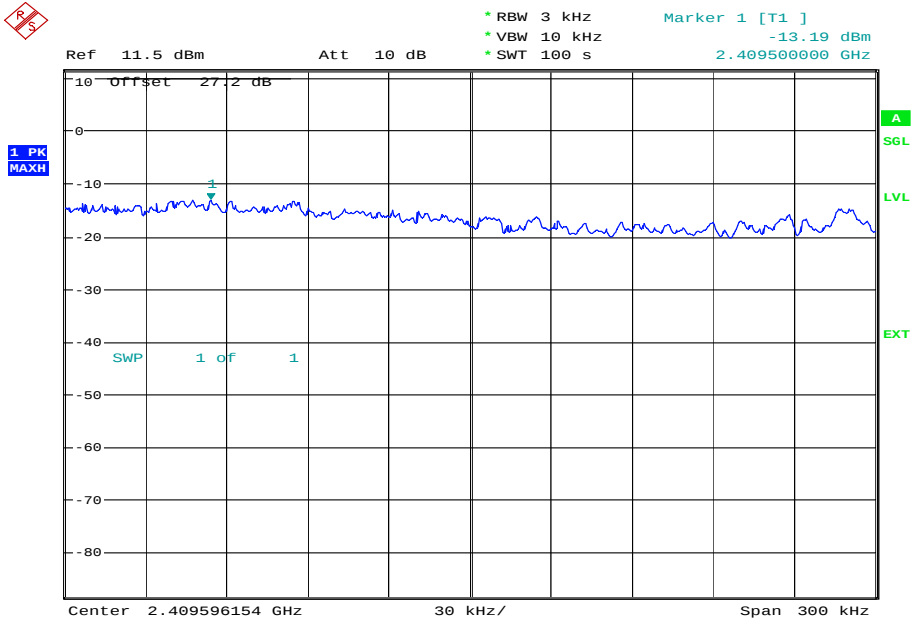
2412 MHz

6.5 Mbps



Date: 30.SEP.2011 11:45:28

13 Mbps

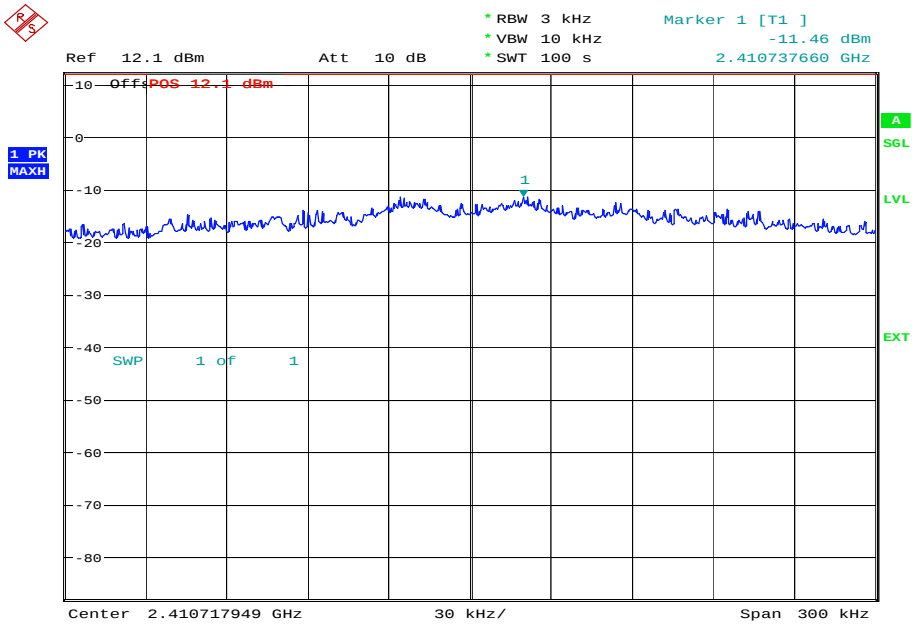


Date: 30.SEP.2011 12:04:51



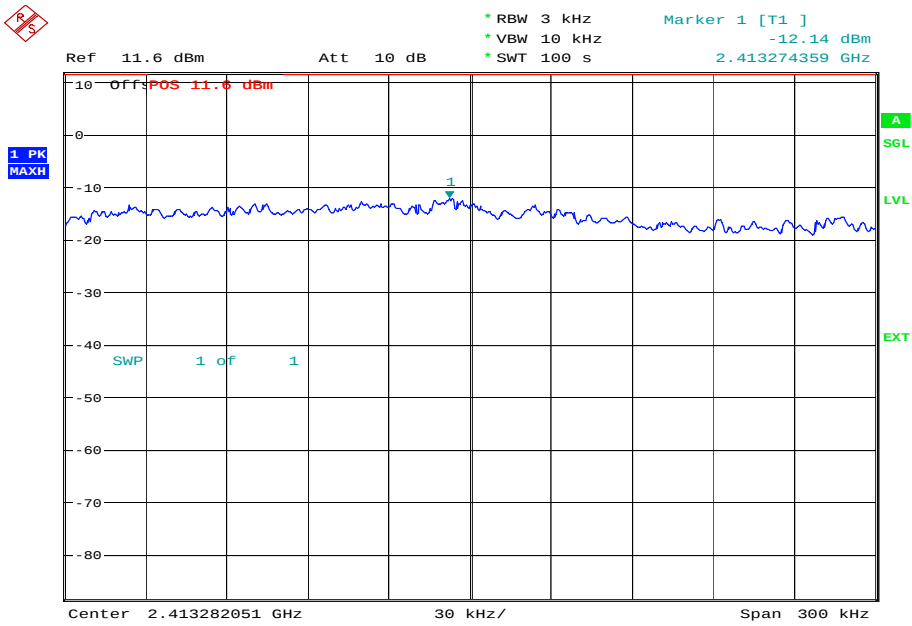
Product Service

19.5 Mbps



Date: 30.SEP.2011 12:21:49

26 Mbps

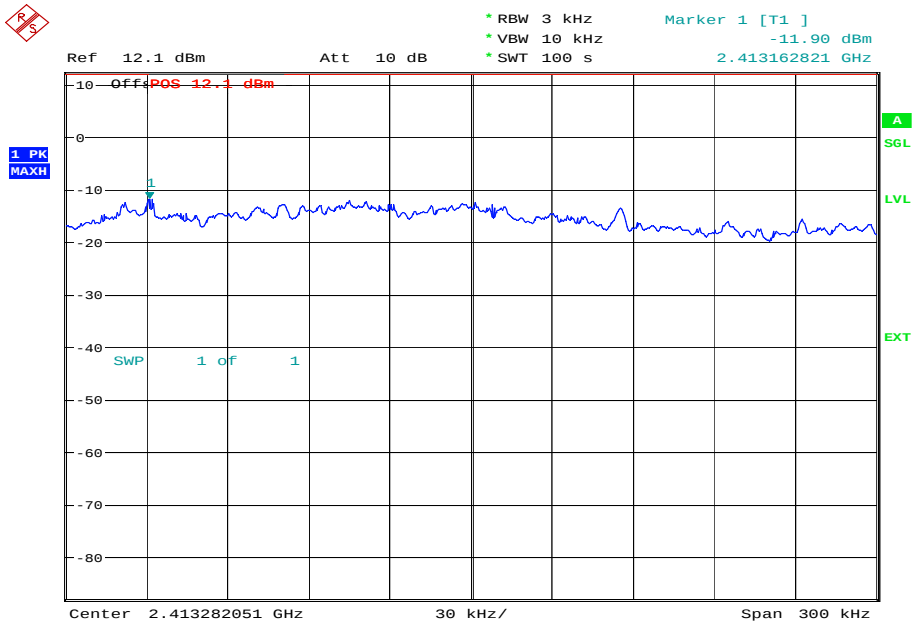


Date: 30.SEP.2011 14:39:08



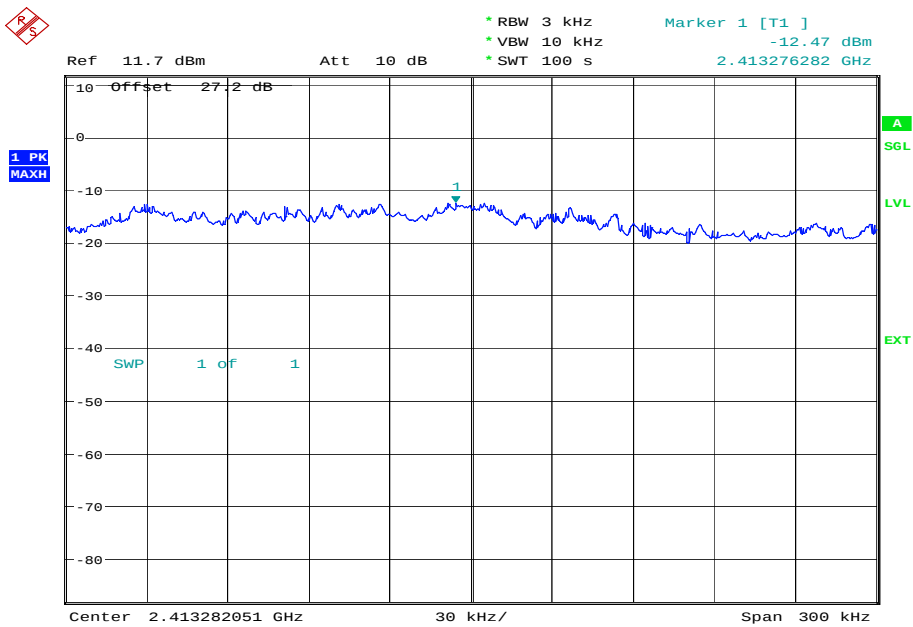
Product Service

39 Mbps



Date: 30.SEP.2011 15:01:27

52 Mbps

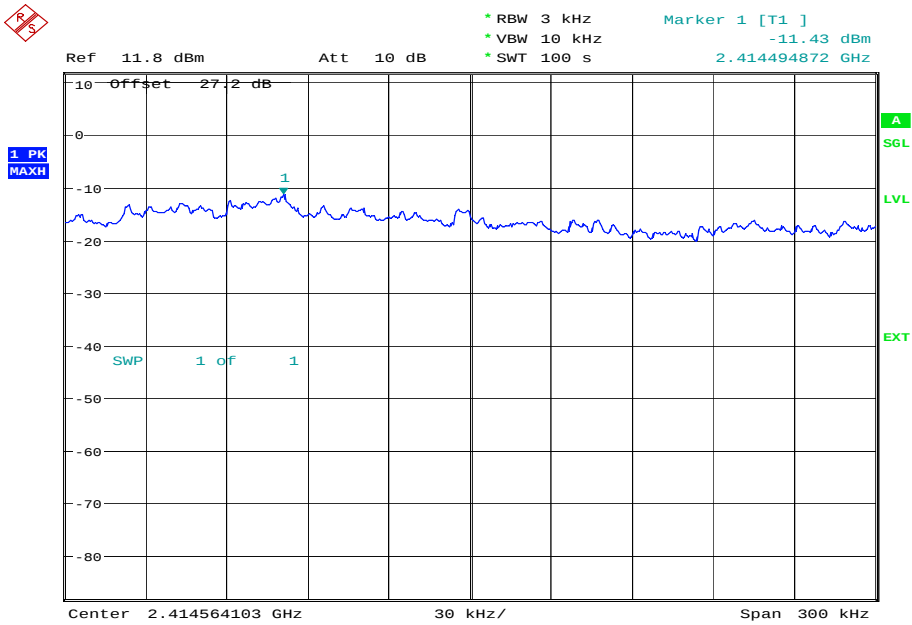


Date: 30.SEP.2011 15:28:15



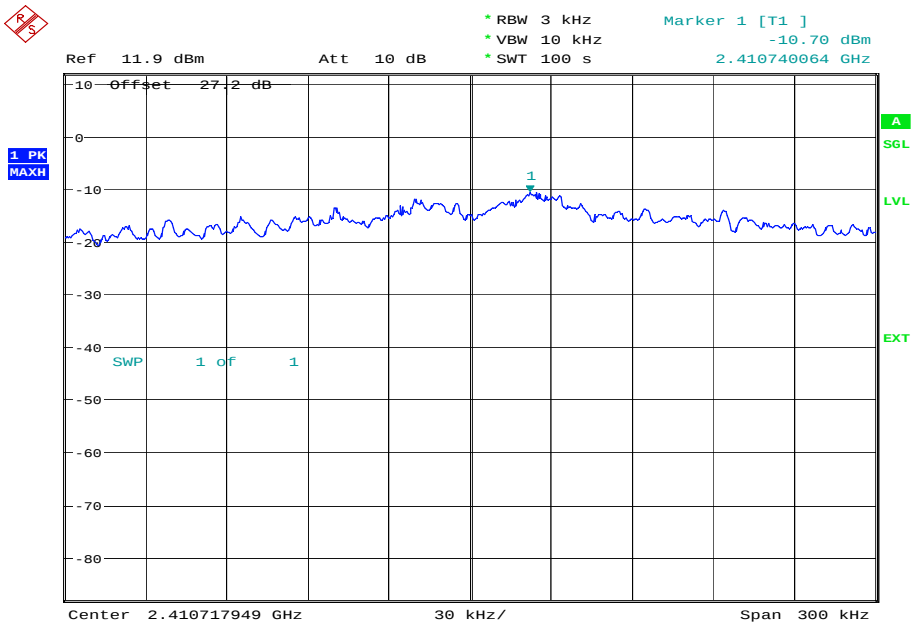
Product Service

58.5 Mbps



Date: 30.SEP.2011 15:47:50

65 Mbps

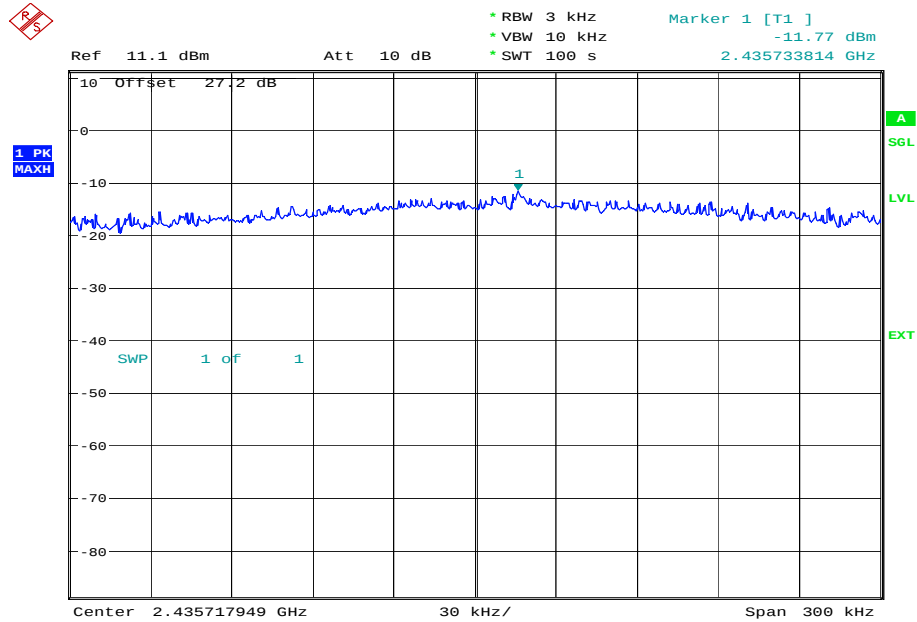


Date: 30.SEP.2011 16:06:59



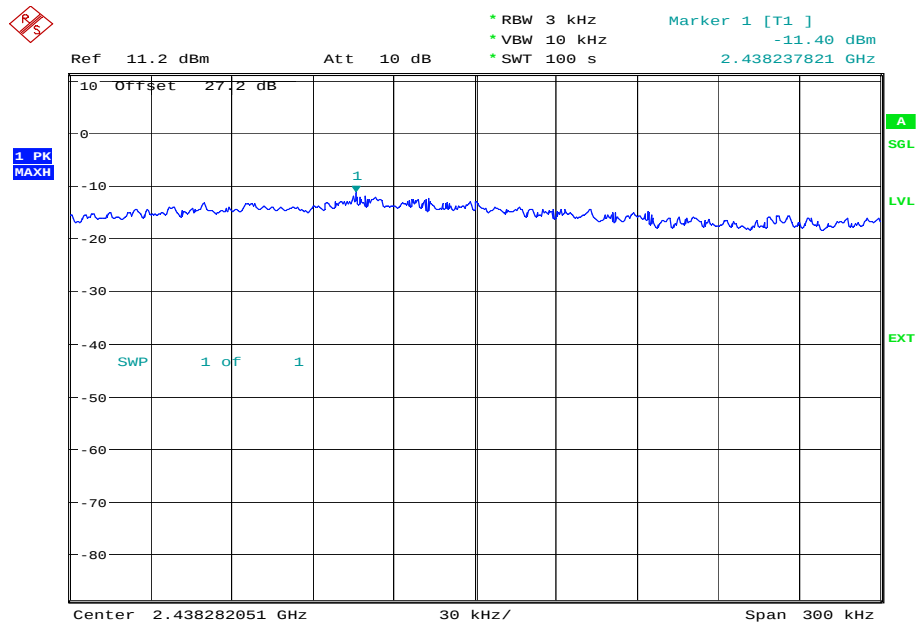
2437 MHz

6.5 Mbps



Date: 30.SEP.2011 11:51:17

13 Mbps

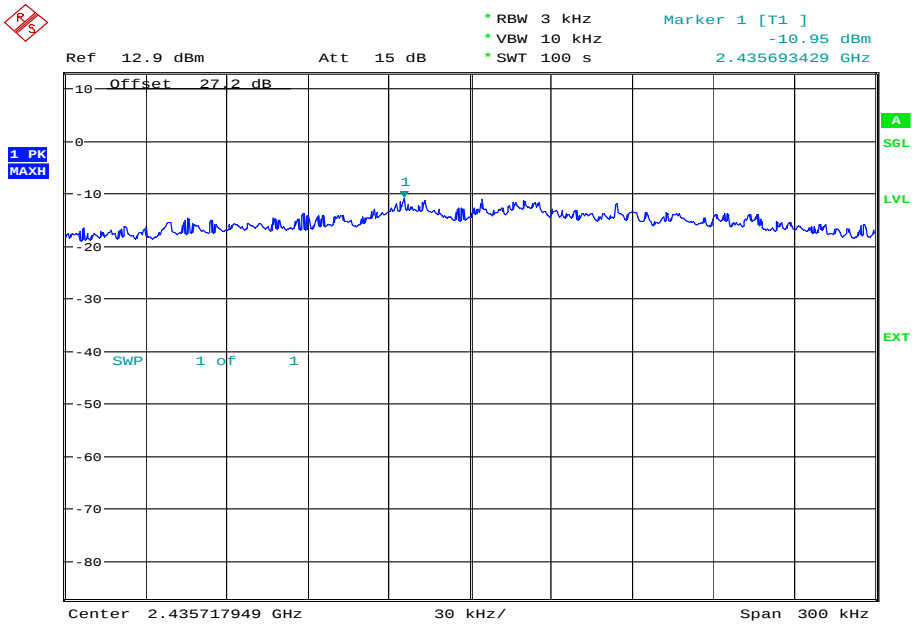


Date: 30.SEP.2011 12:09:36



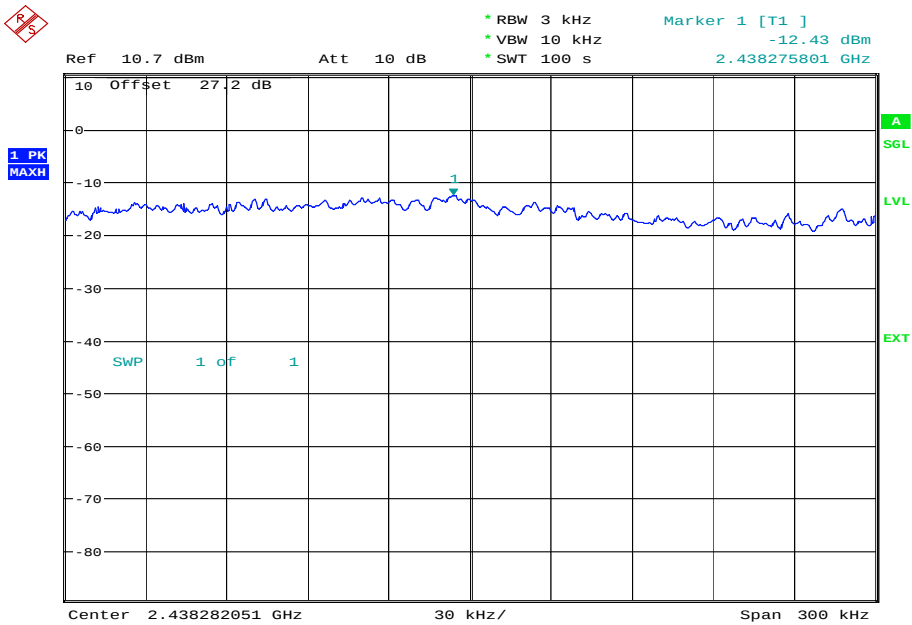
Product Service

19.5 Mbps



Date: 30.SEP.2011 12:30:51

26 Mbps

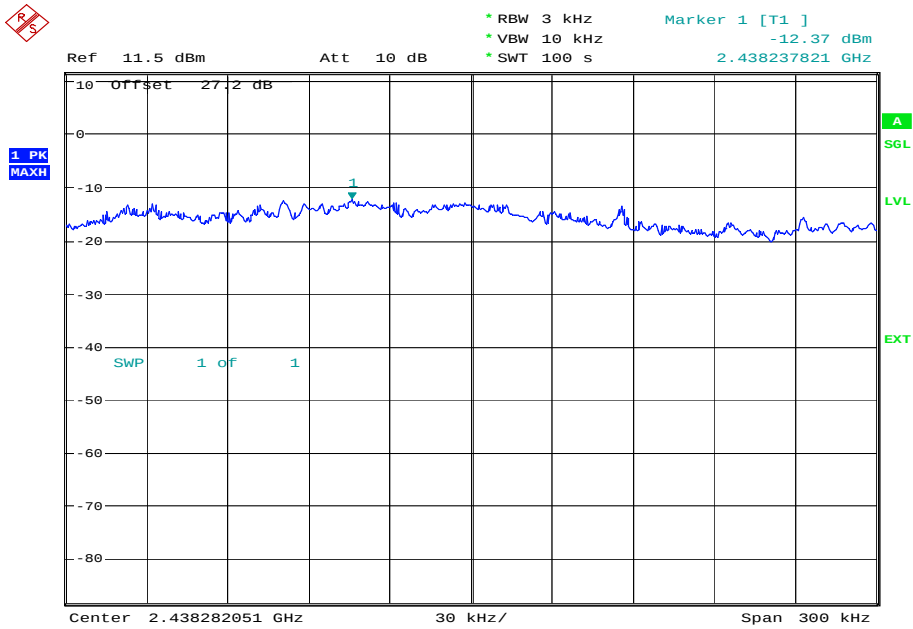


Date: 30.SEP.2011 14:46:28



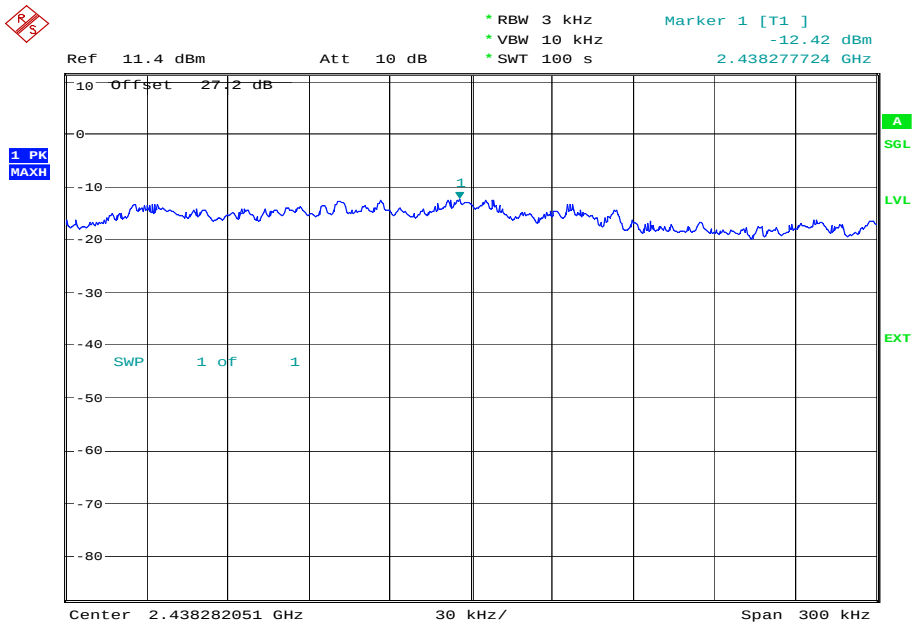
Product Service

39 Mbps



Date: 30.SEP.2011 15:09:42

52 Mbps

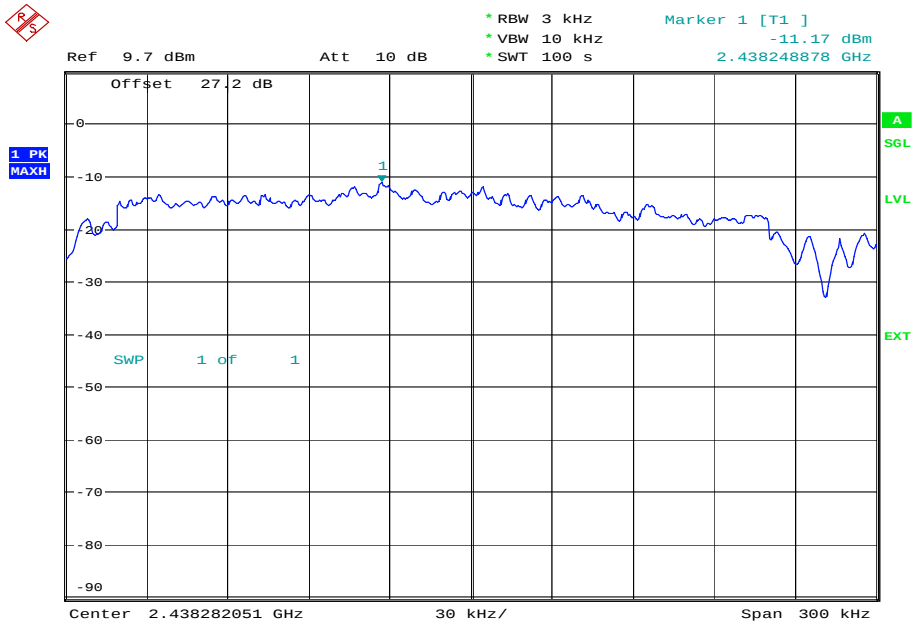


Date: 30.SEP.2011 15:33:50



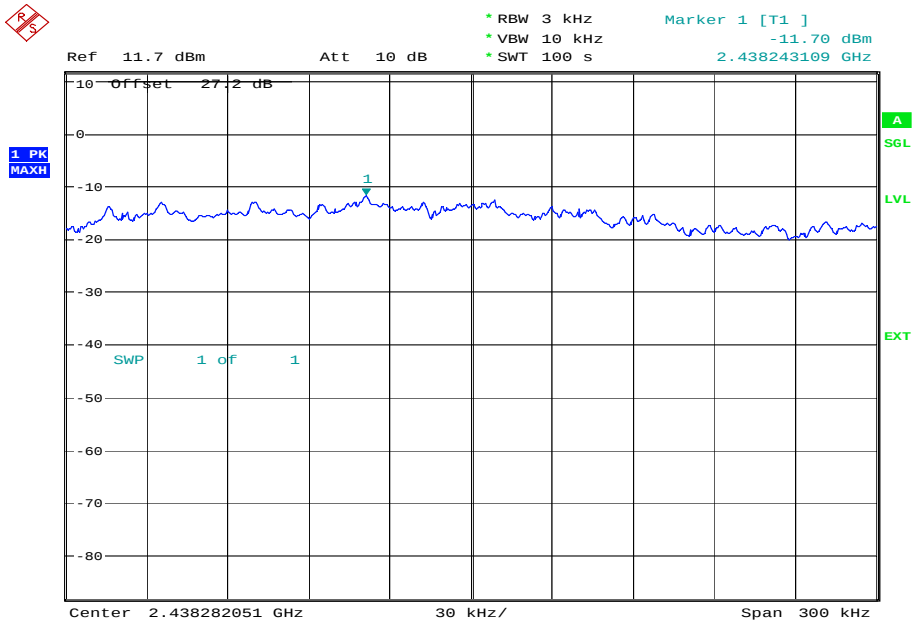
Product Service

58.5 Mbps



Date: 30.SEP.2011 15:52:49

65 Mbps



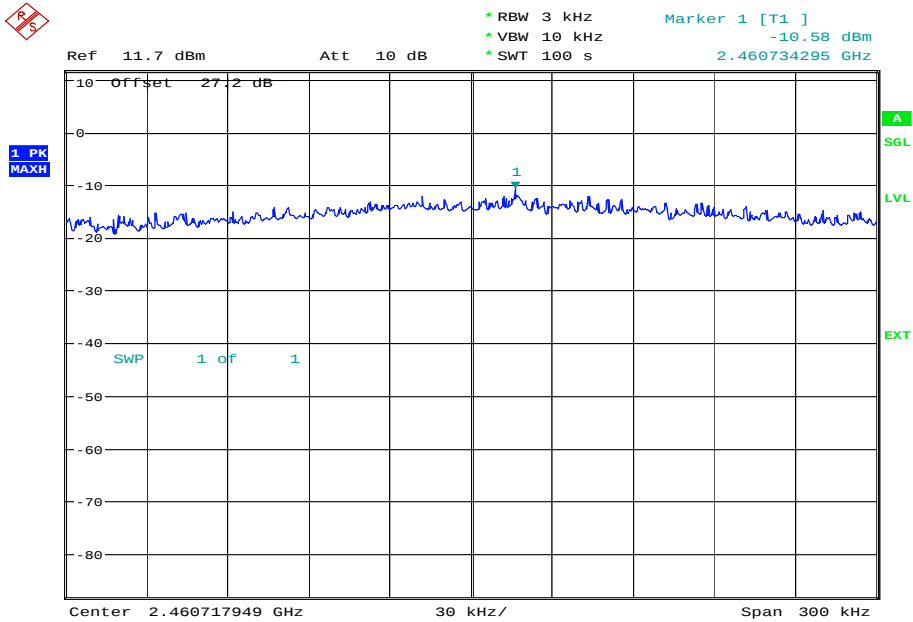
Date: 30.SEP.2011 16:11:42



Product Service

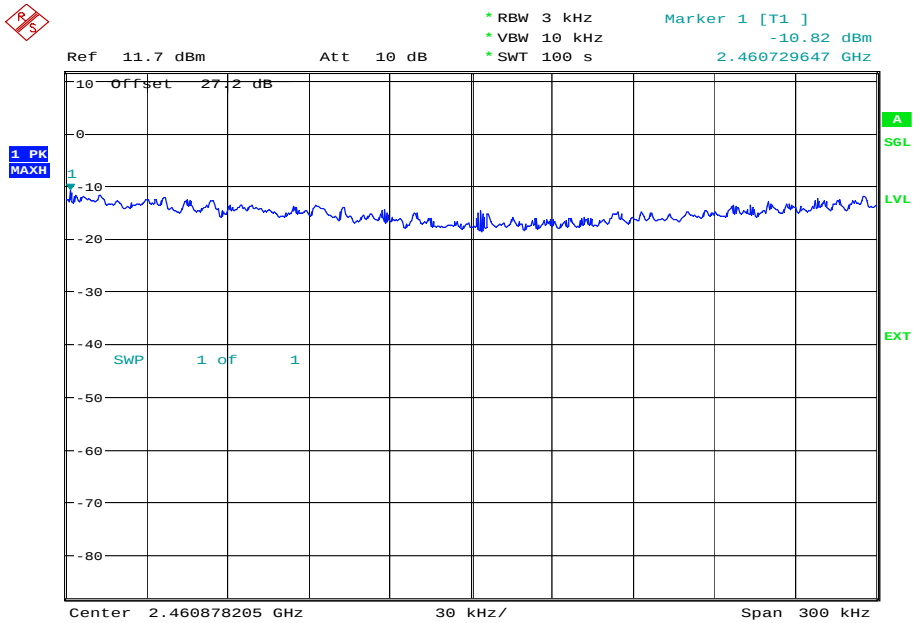
2462 MHz

6.5 Mbps



Date: 30.SEP.2011 11:58:06

13 Mbps

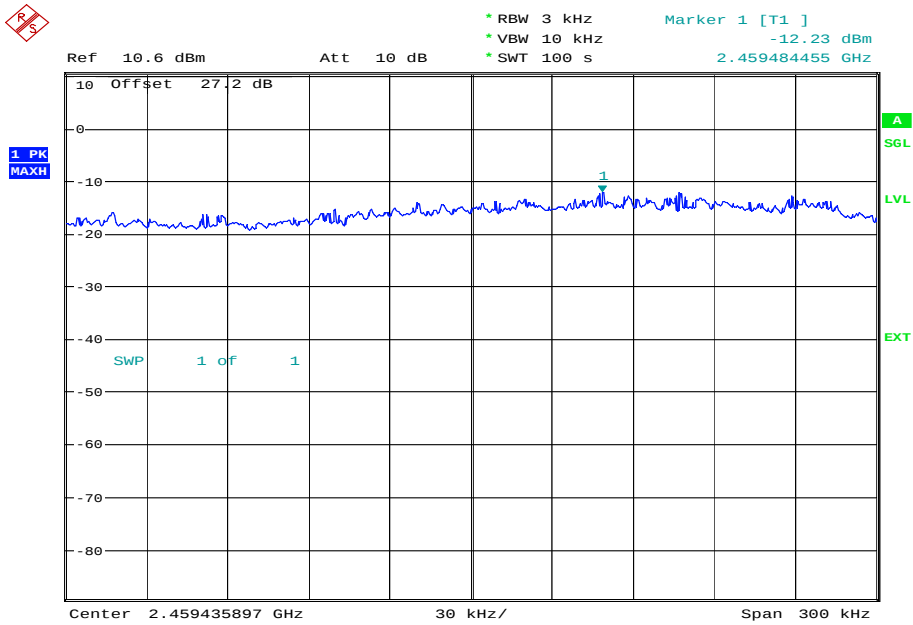


Date: 30.SEP.2011 12:15:04



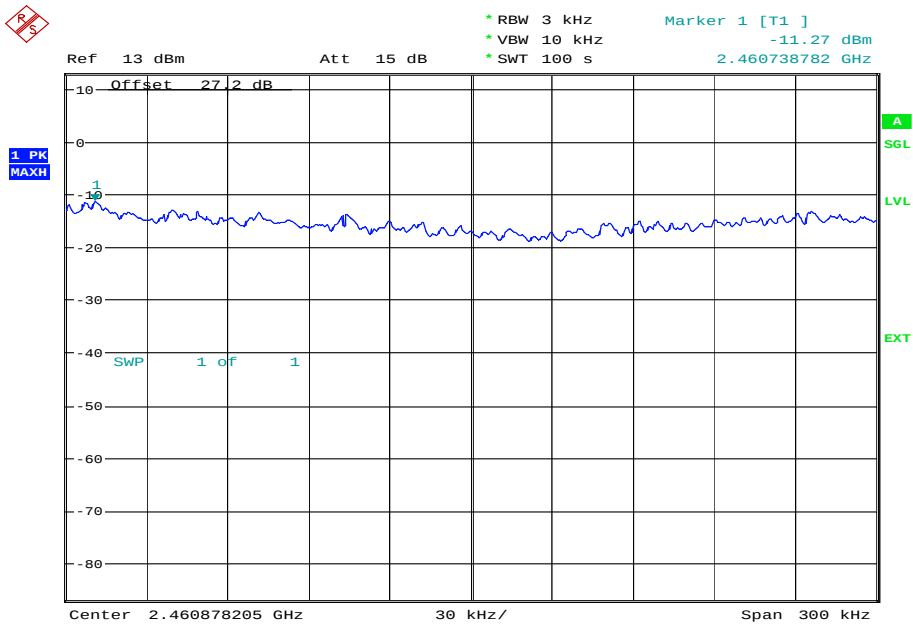
Product Service

19.5 Mbps



Date: 30.SEP.2011 14:04:47

26 Mbps

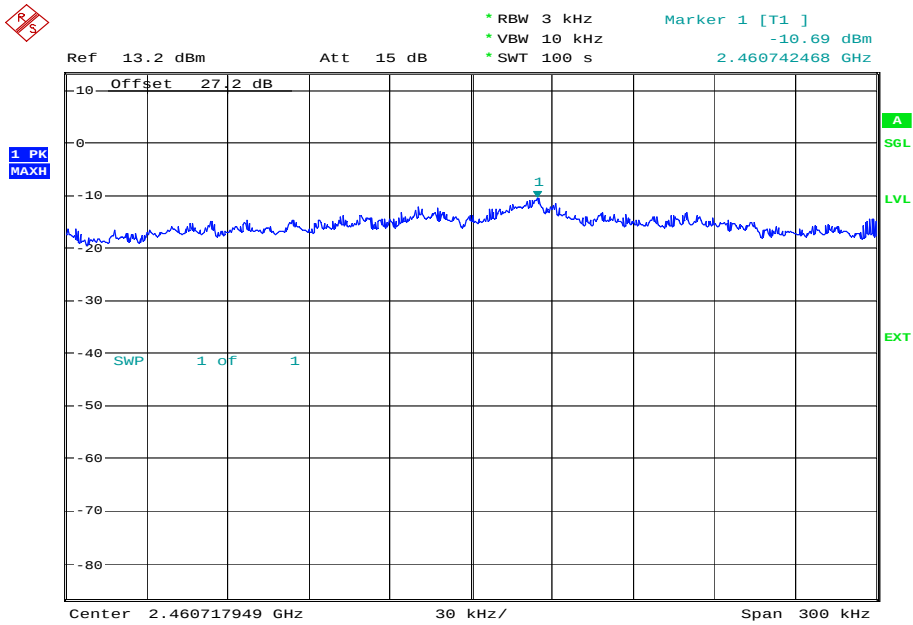


Date: 30.SEP.2011 14:52:25



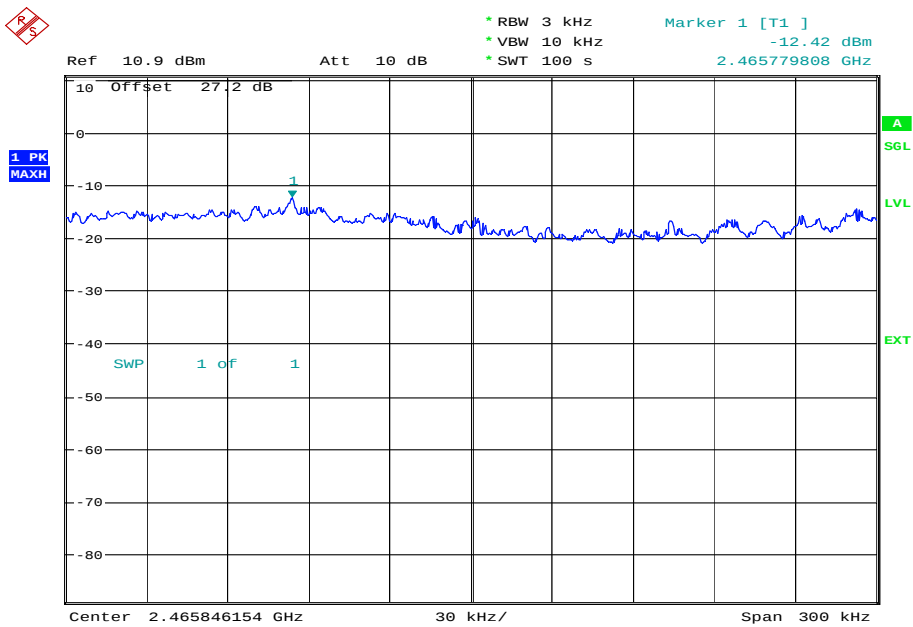
Product Service

39 Mbps



Date: 30.SEP.2011 15:17:31

52 Mbps

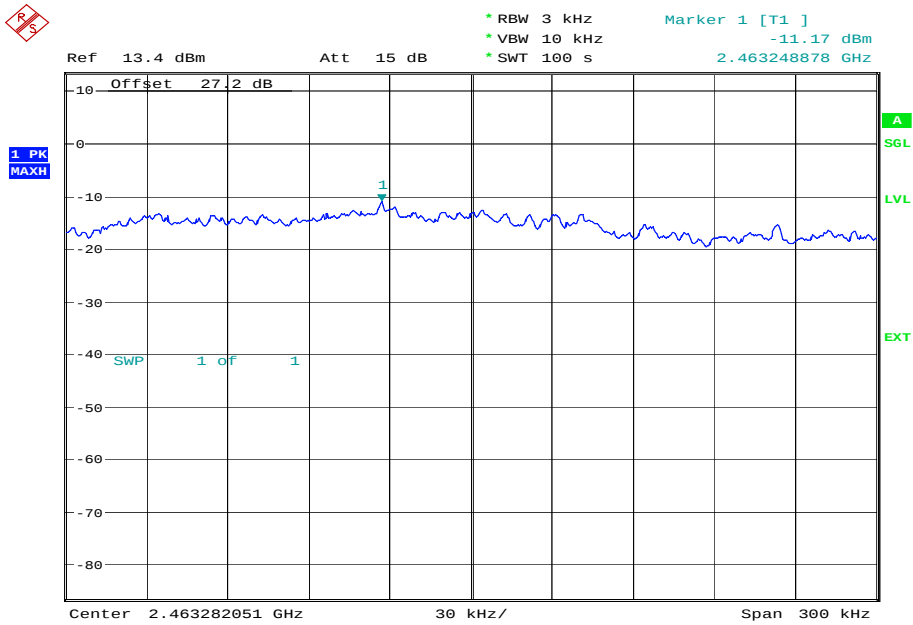


Date: 30.SEP.2011 15:40:38

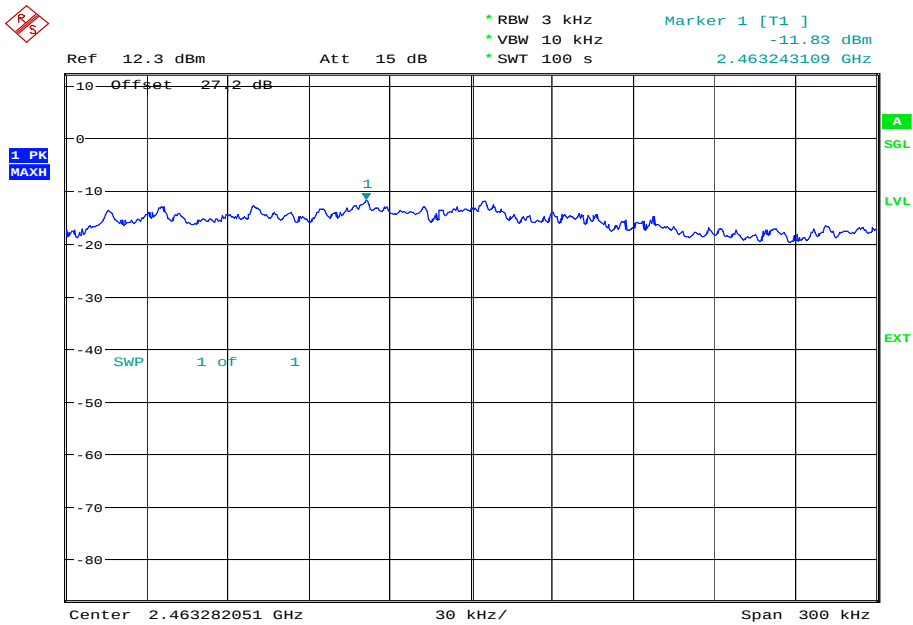


Product Service

58.5 Mbps



65 Mbps



Limit Clause

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



2.4 SPURIOUS AND BAND EDGE EMISSIONS

2.4.1 Specification Reference

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

2.4.2 Equipment Under Test and Modification State

CDMA SHI13 S/N: SSHFN000865 - Modification State 0

2.4.3 Date of Test

5 October 2011, 6 October 2011, 9 October 2011, 11 October 2011 & 16 October 2011

2.4.4 Test Equipment Used

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

2.4.5 Test Procedure

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

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

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

2.4.6 Environmental Conditions

Ambient Temperature	17.4 - 25.4°C
Relative Humidity	38.0 - 68.0%



Product Service

2.4.7 Test Results

802.11(b)

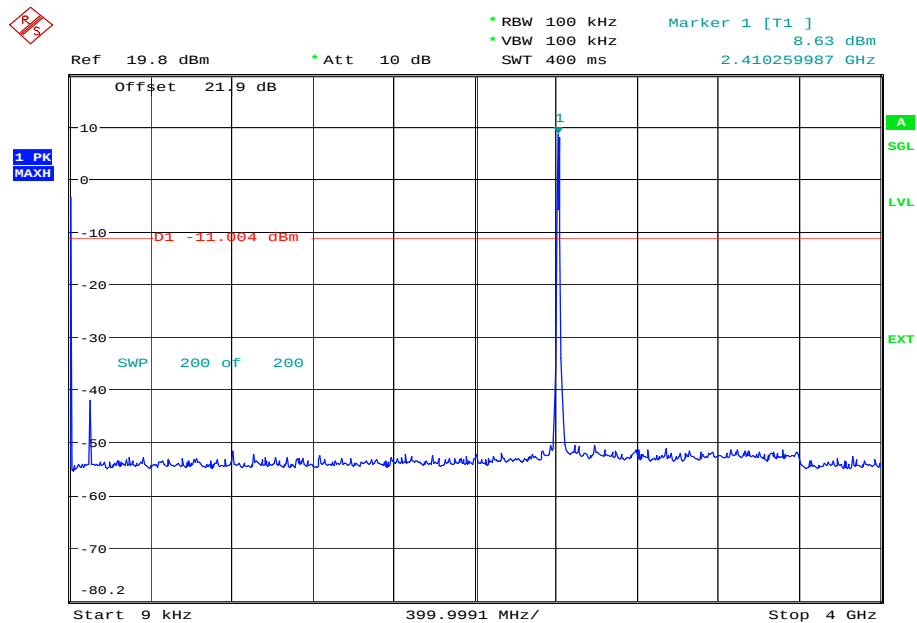
4.0 V DC Supply

Spurious Conducted Emissions

2 Mbps

2412 MHz

9 kHz to 4 GHz

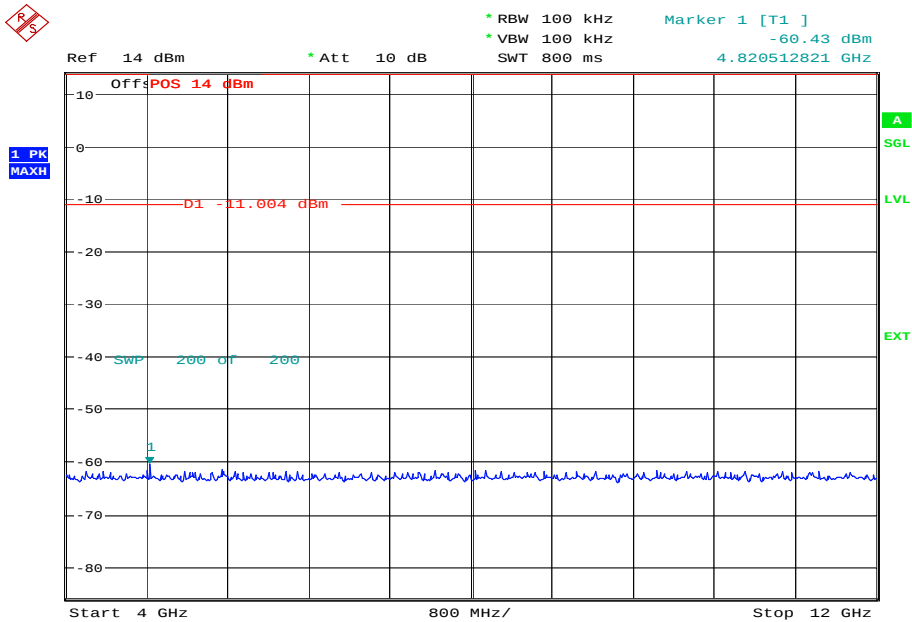


Date: 11.OCT.2011 13:25:35



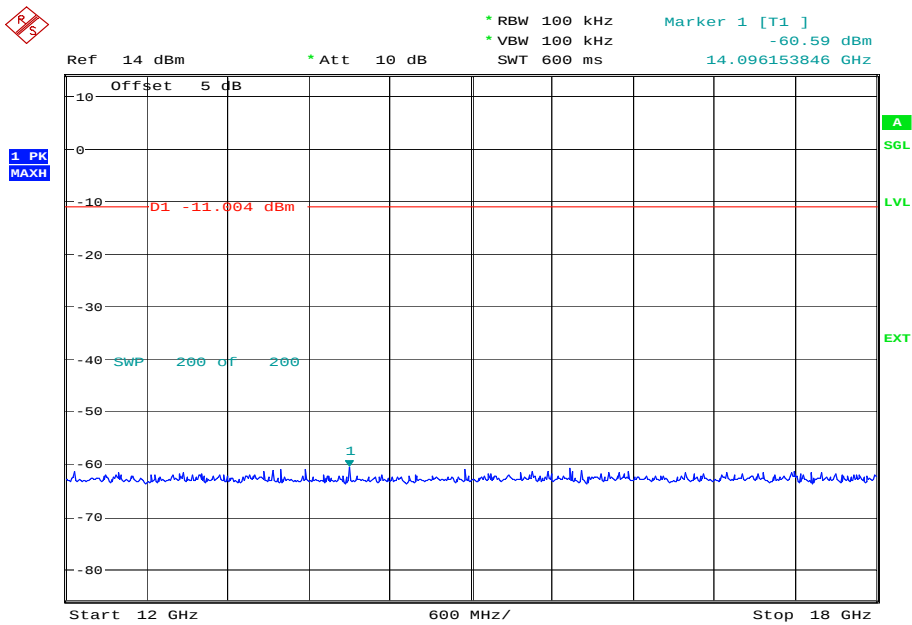
Product Service

4 GHz to 12 GHz



Date: 11.OCT.2011 14:00:20

12 GHz to 18 GHz

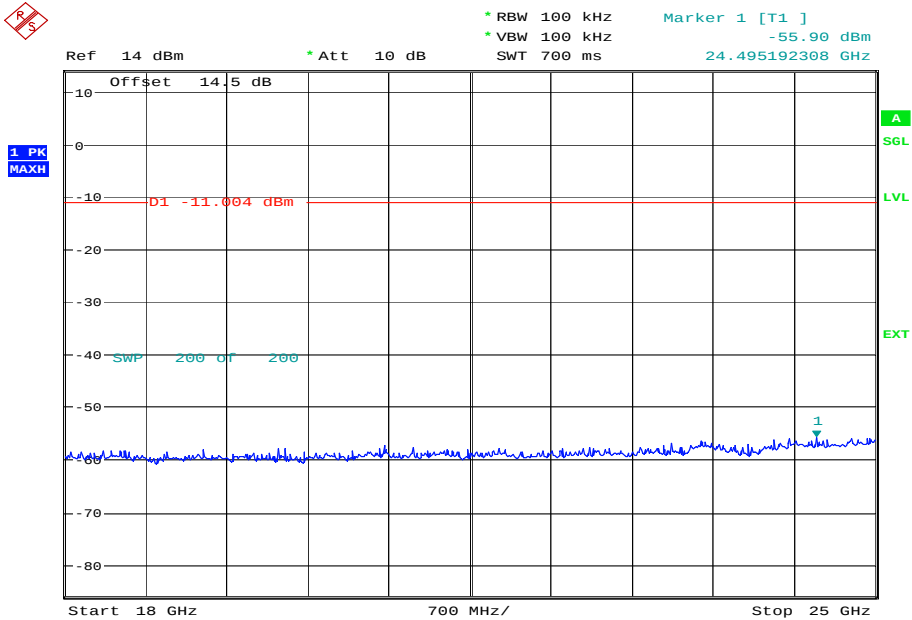


Date: 11.OCT.2011 14:02:50



Product Service

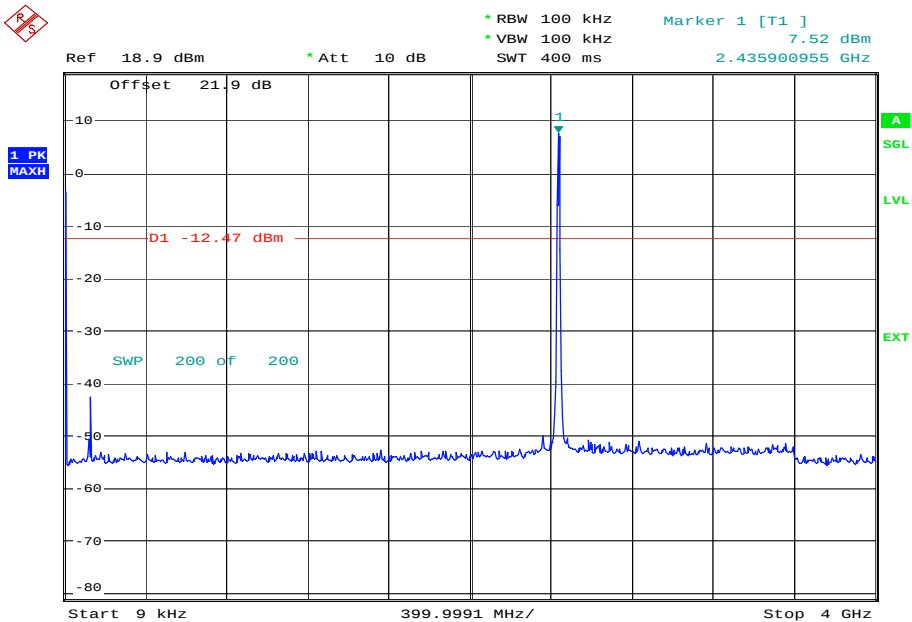
18 GHz to 25 GHz



Date: 11.OCT.2011 14:28:15

2437 MHz

9 kHz to 4 GHz

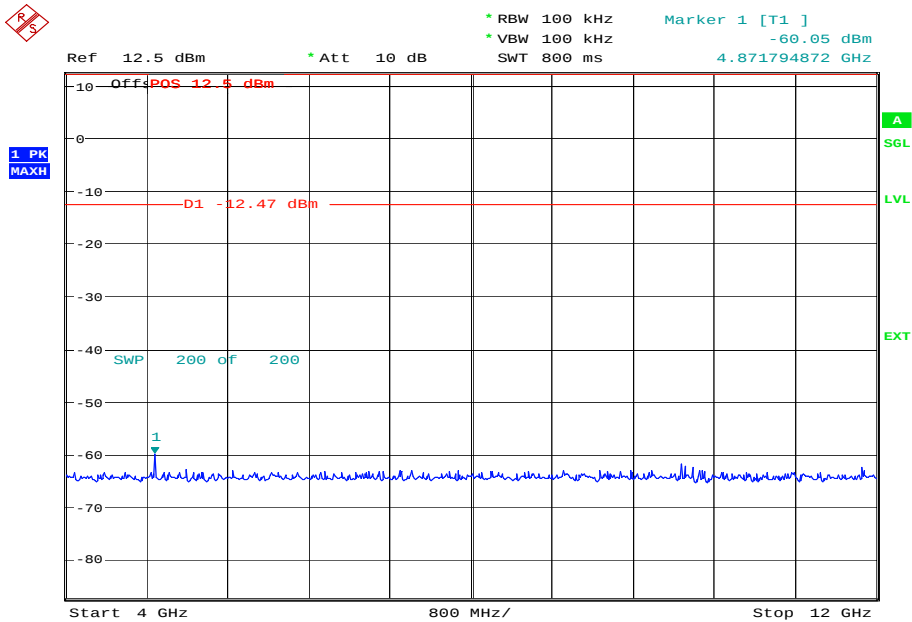


Date: 11.OCT.2011 13:30:23



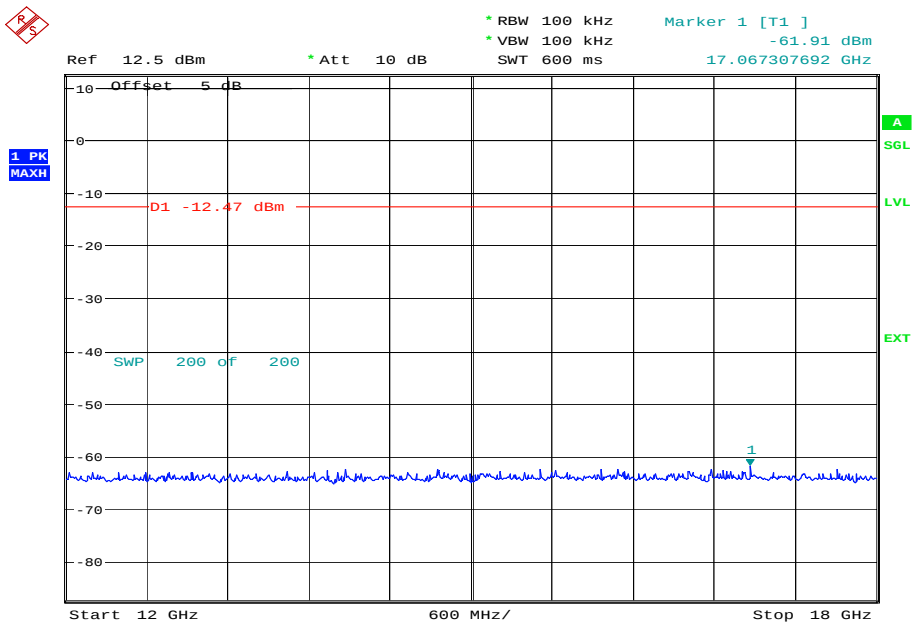
Product Service

4 GHz to 12 GHz



Date: 11.OCT.2011 14:07:48

12 GHz to 18 GHz

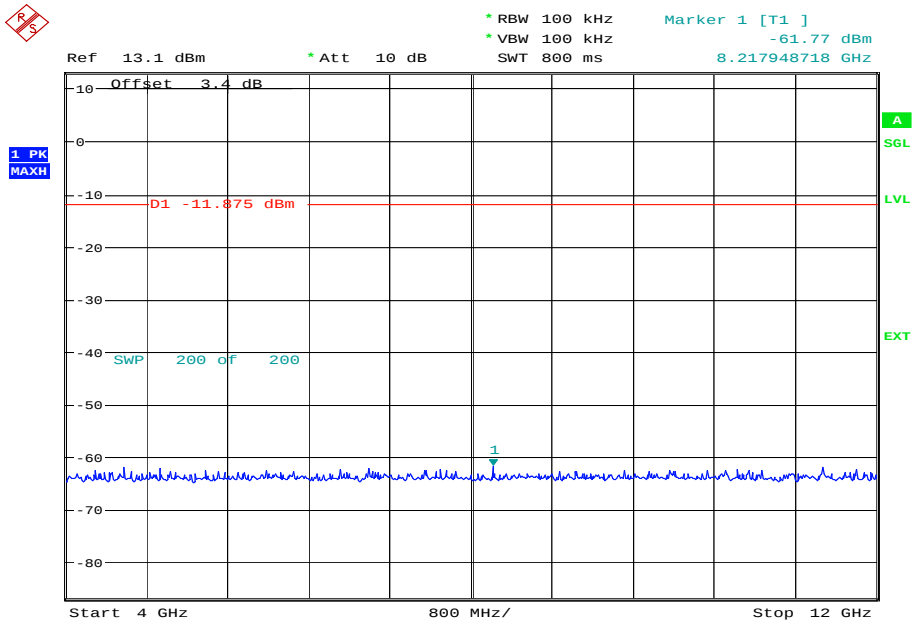


Date: 11.OCT.2011 14:10:49



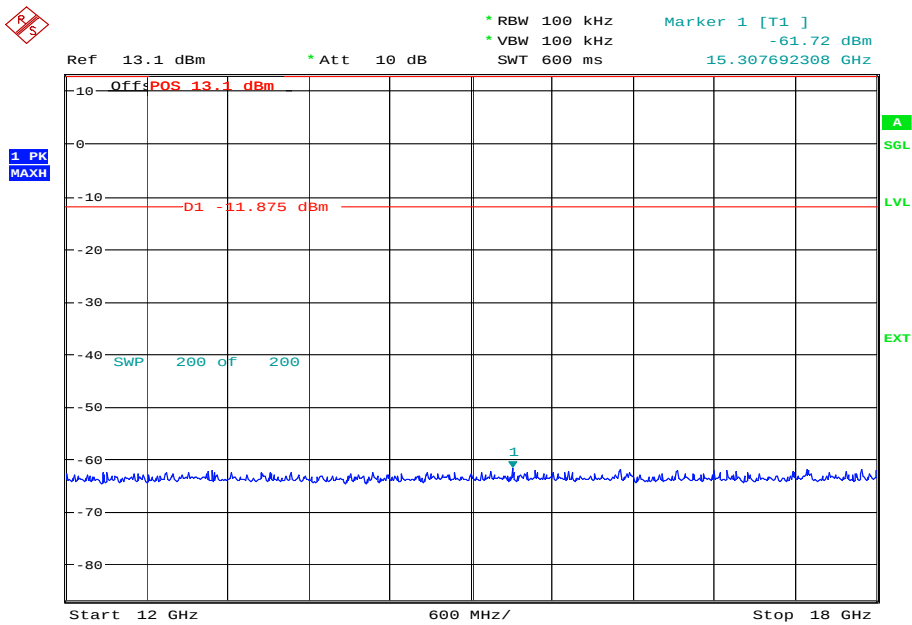
Product Service

4 GHz to 12 GHz



Date: 11.OCT.2011 14:14:57

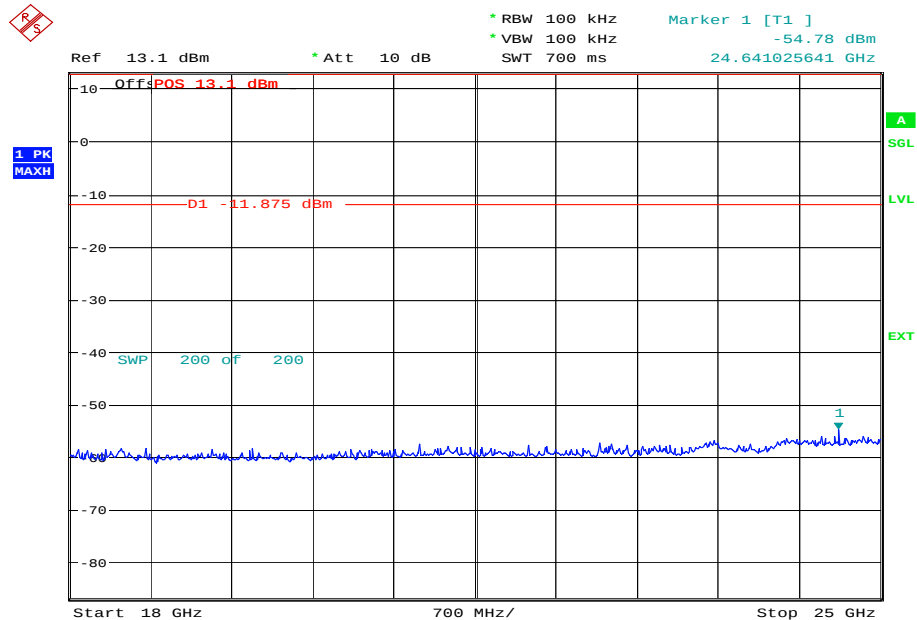
12 GHz to 18 GHz



Date: 11.OCT.2011 14:17:27



Product Service

18 GHz to 25 GHz

Date: 11.OCT.2011 14:43:10

Limit Clause

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

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

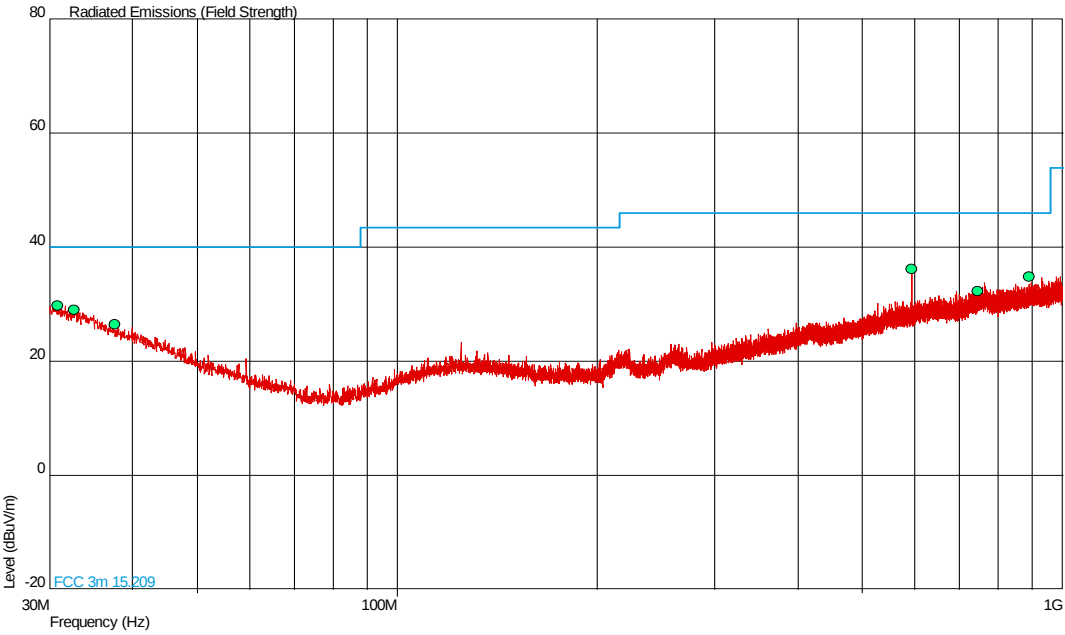


Product Service

Spurious Radiated Emissions

2412 MHz

30 MHz to 1 GHz

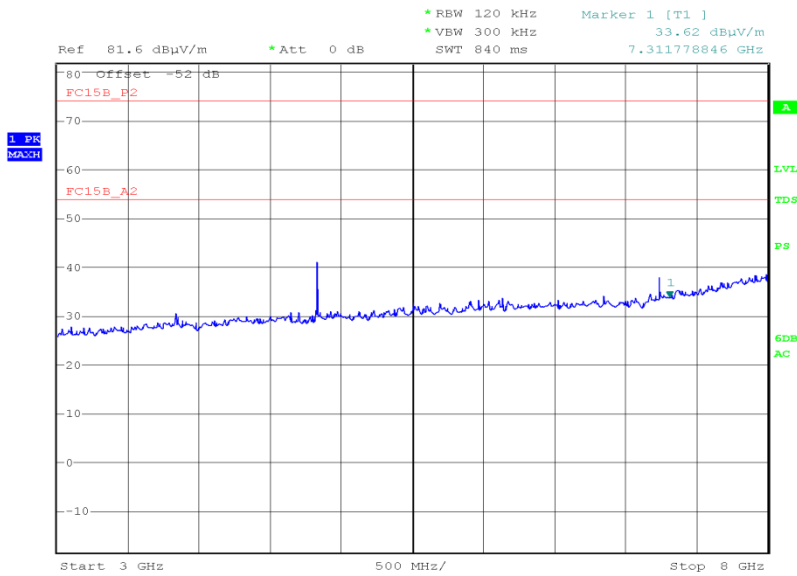


Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle (Deg)	Height (m)	Polarity
30.865	29.7	40.0	-10.3	1	1.00	Horizontal
32.694	29.0	40.0	-11.0	1	1.00	Vertical
37.625	26.5	40.0	-13.5	1	1.00	Horizontal
593.106	36.2	46.0	-9.8	1	1.00	Vertical
744.406	32.3	46.0	-13.7	1	1.00	Vertical
889.633	34.8	46.0	-11.2	1	1.00	Vertical



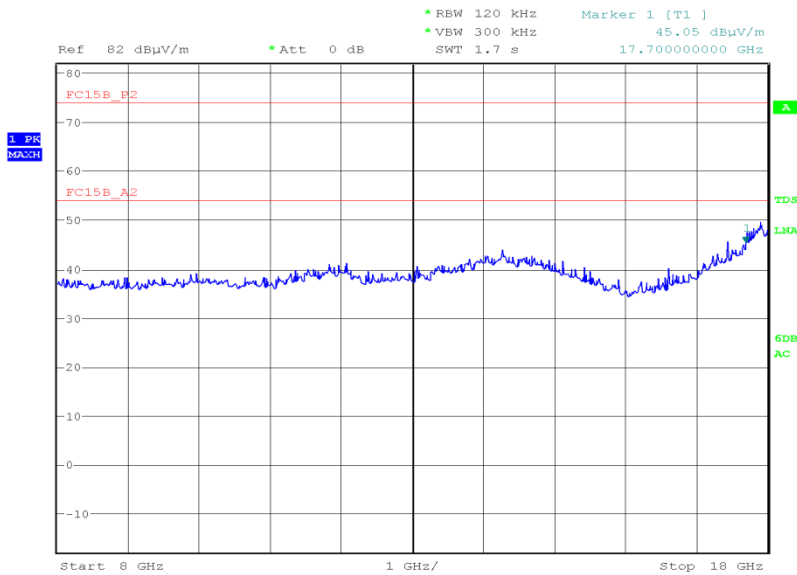
Product Service

3 GHz to 8 GHz



Date: 5.OCT.2011 22:36:50

8 GHz to 18 GHz

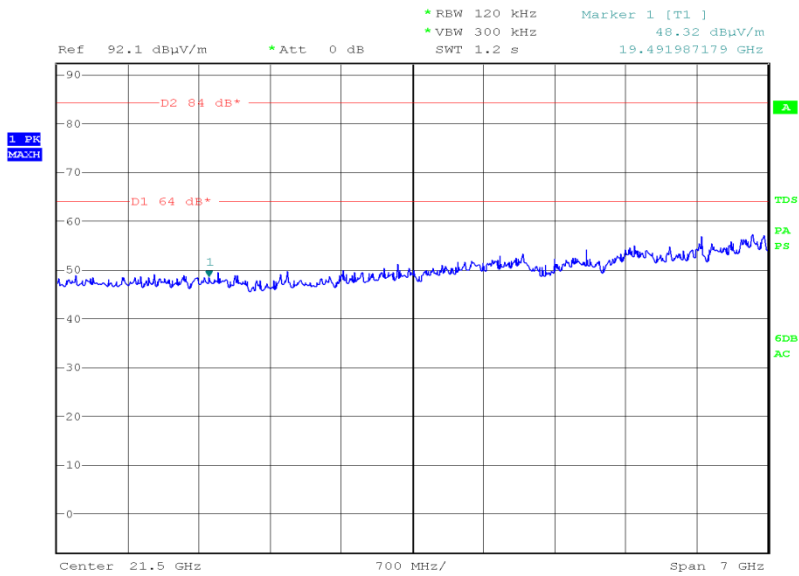


Date: 16.OCT.2011 14:37:42



Product Service

18 GHz to 25 GHz



Date: 16.OCT.2011 16:10:23

Limit

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

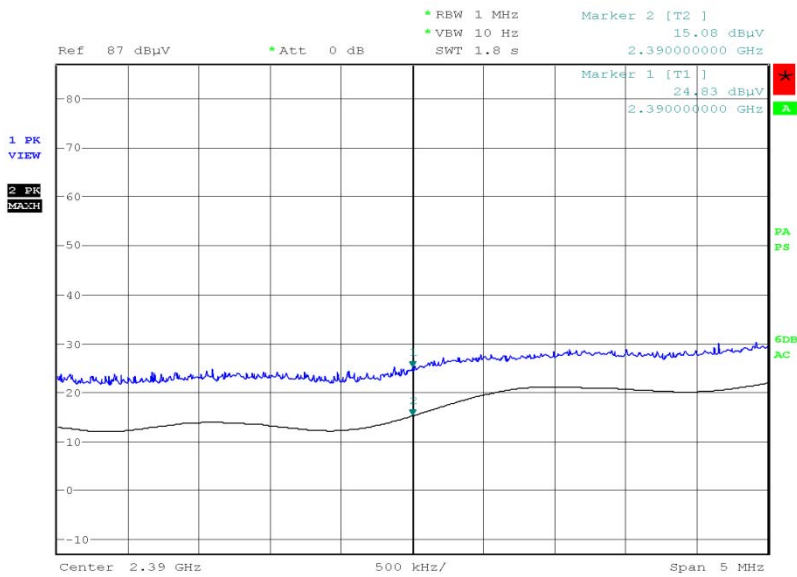


Product Service

Band Edge Emissions

2412 MHz

Polarisation	Final Peak (dBμV/m)	Final Average (dBμV/m)
Horizontal	56.8	47.1



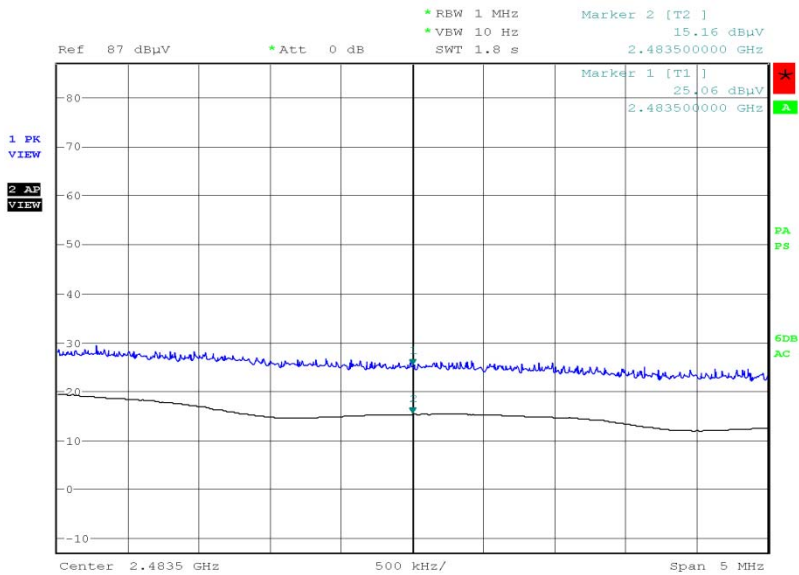
Date: 16.OCT.2011 07:46:34



Product Service

2462 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	57.2	47.3



Date: 16.OCT.2011 08:31:05

Limit

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



Product Service

802.11(g)

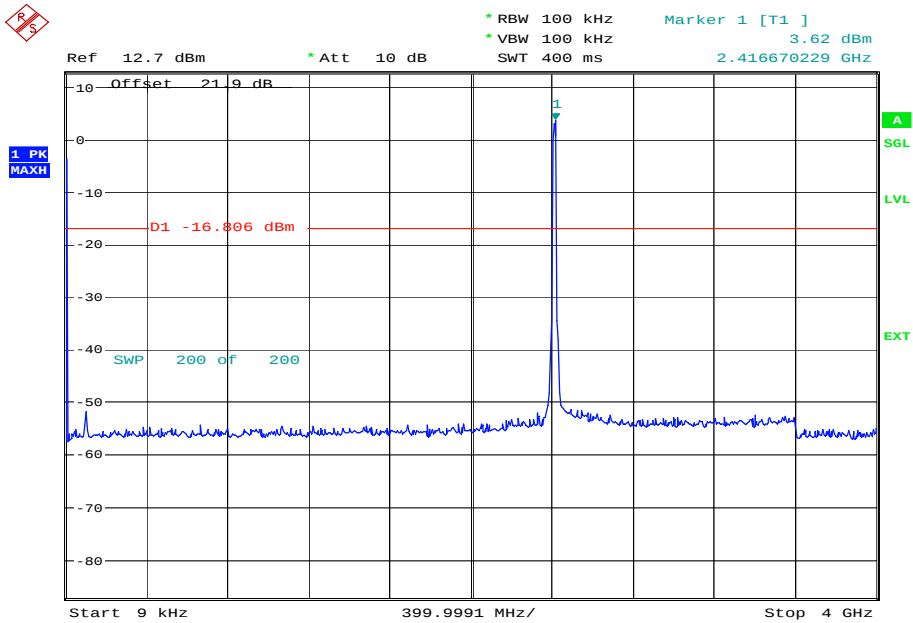
4.0 V DC Supply

Spurious Conducted Emissions

18 Mbps

2412 MHz

9 kHz to 4 GHz

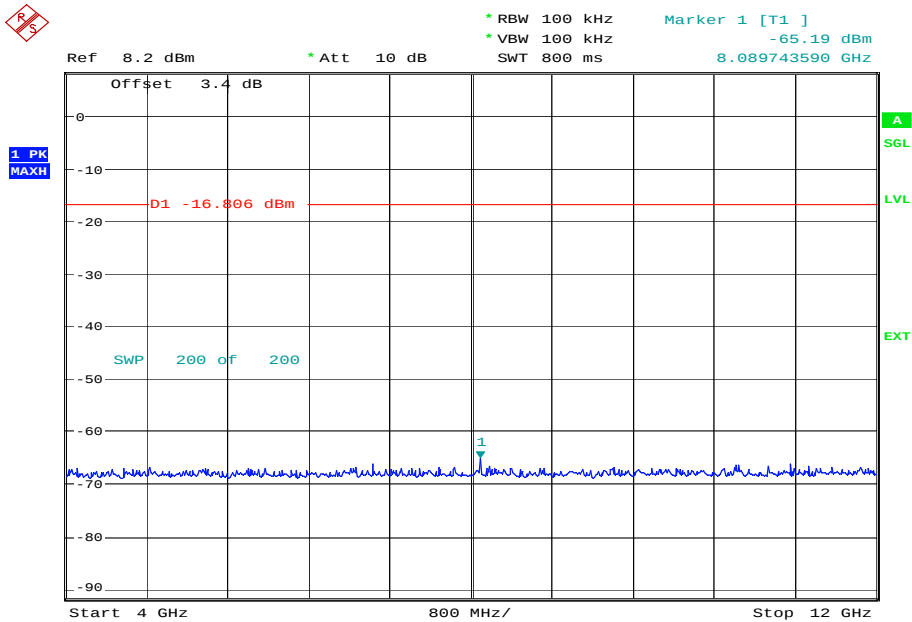


Date: 11.OCT.2011 14:49:49



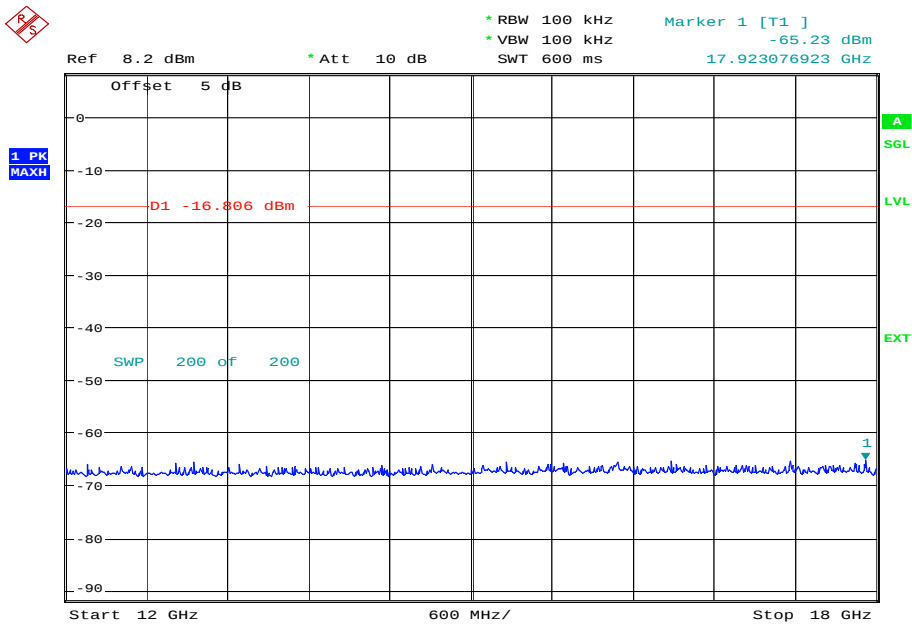
Product Service

4 GHz to 12 GHz



Date: 11.OCT.2011 15:11:41

12 GHz to 18 GHz

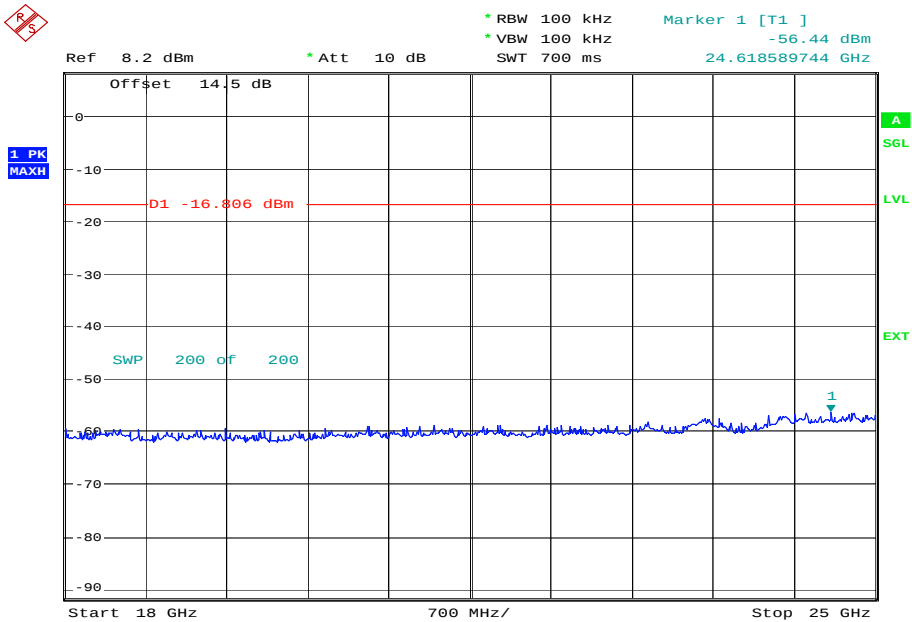


Date: 11.OCT.2011 15:15:59



Product Service

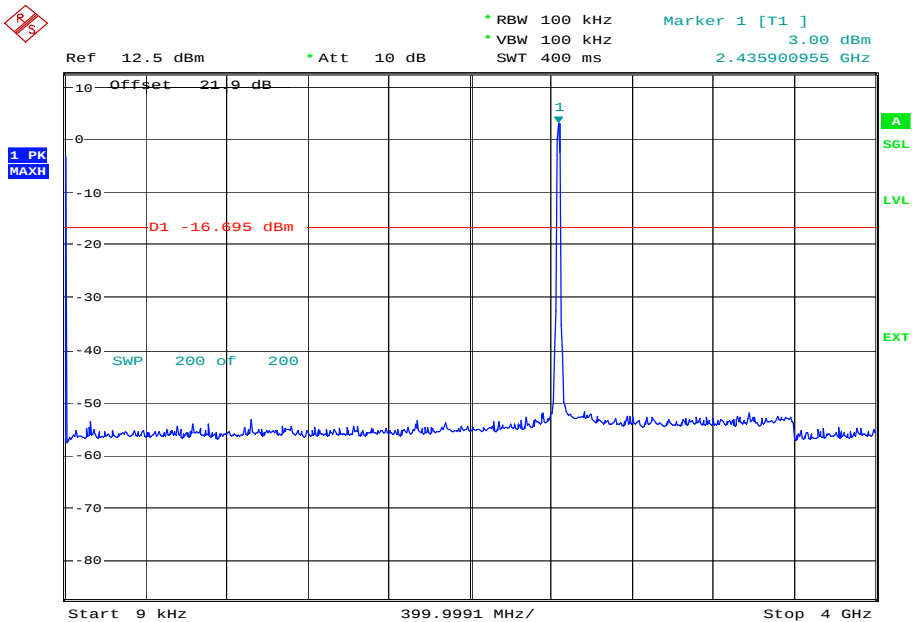
18 GHz to 25 GHz



Date: 11.OCT.2011 15:46:32

2437 MHz

9 kHz to 4 GHz

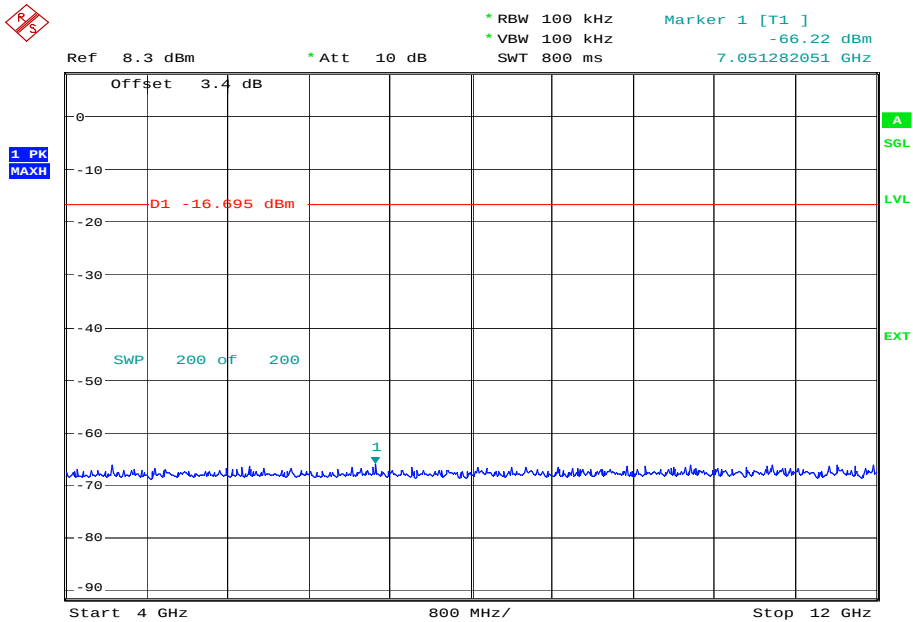


Date: 11.OCT.2011 14:53:56



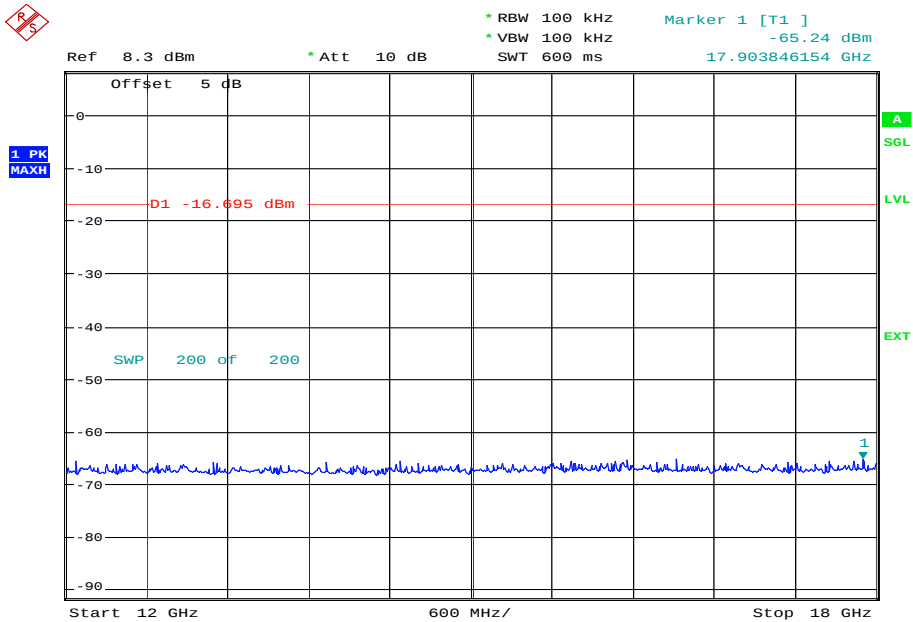
Product Service

4 GHz to 12 GHz



Date: 11.OCT.2011 15:21:56

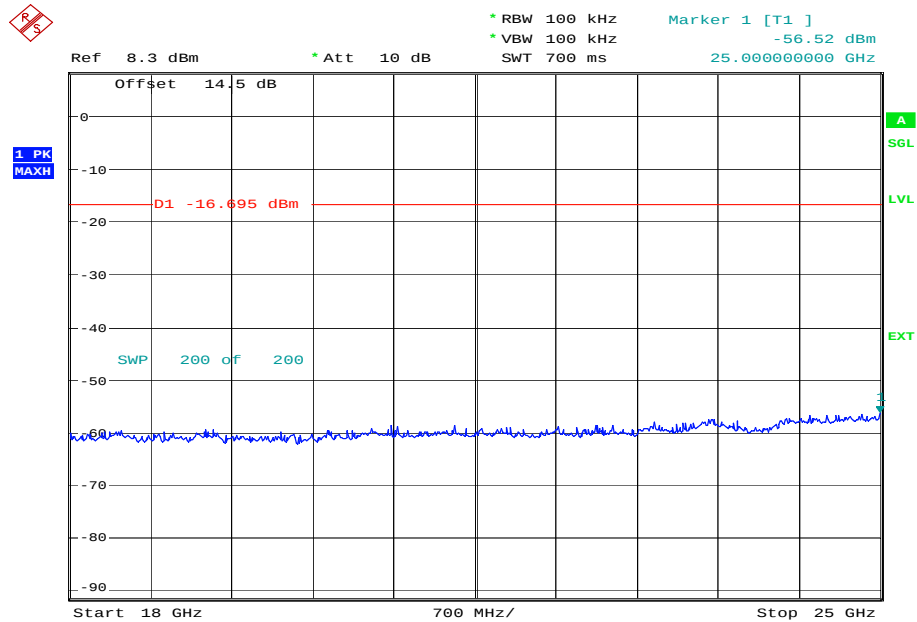
12 GHz to 18 GHz



Date: 11.OCT.2011 15:24:25



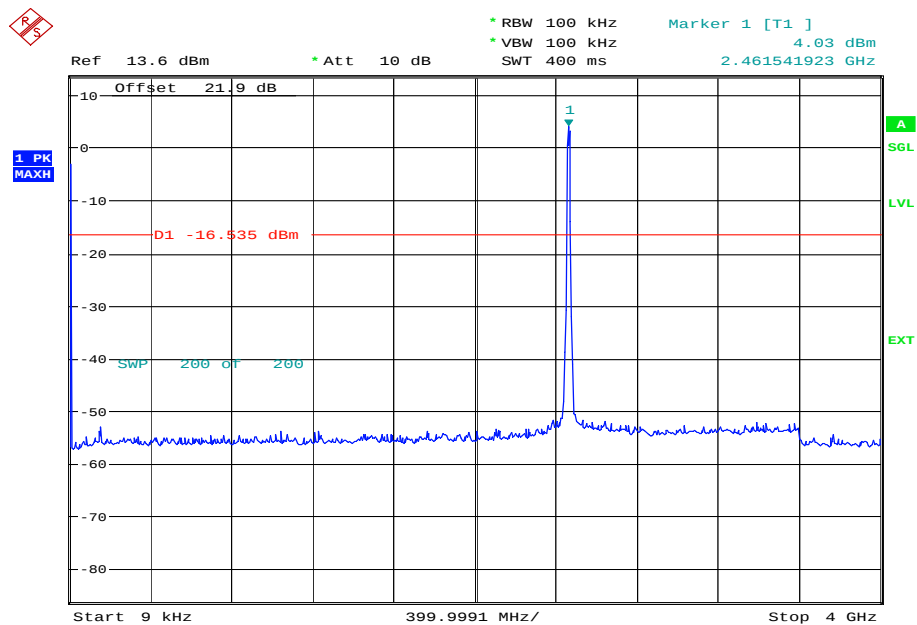
18 GHz to 25 GHz



Date: 11.OCT.2011 15:51:26

2462 MHz

9 kHz to 4 GHz

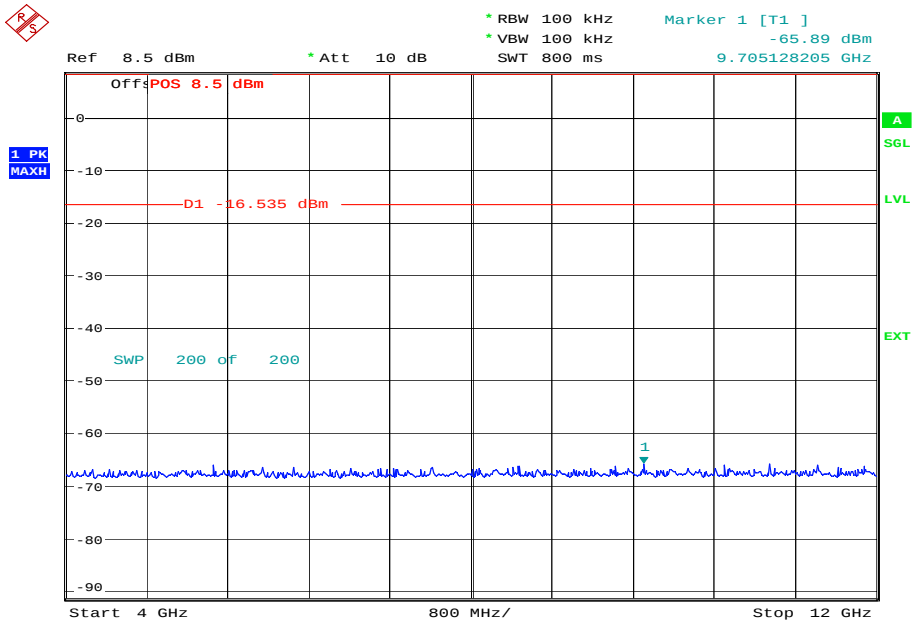


Date: 11.OCT.2011 14:57:05



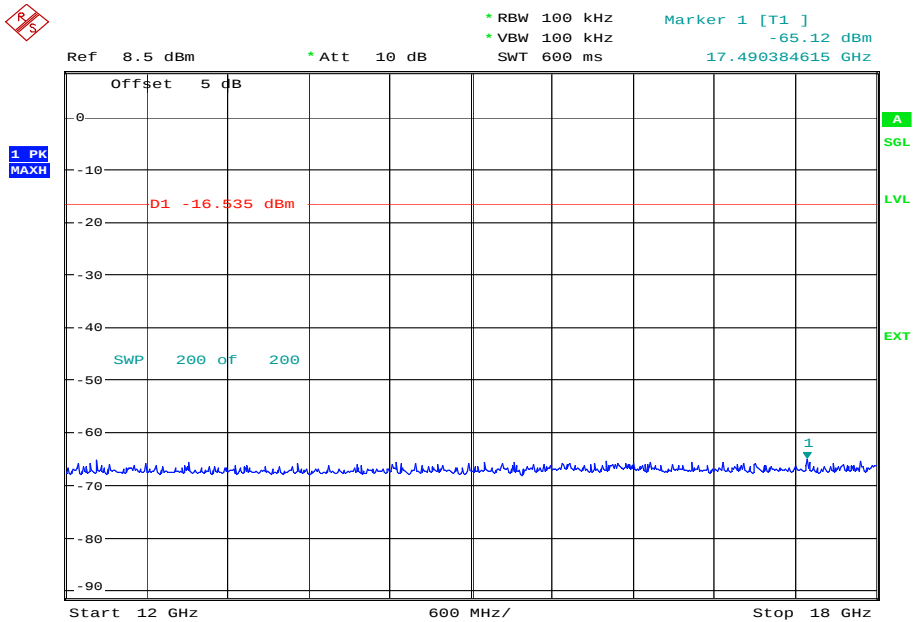
Product Service

4 GHz to 12 GHz



Date: 11.OCT.2011 15:29:08

12 GHz to 18 GHz

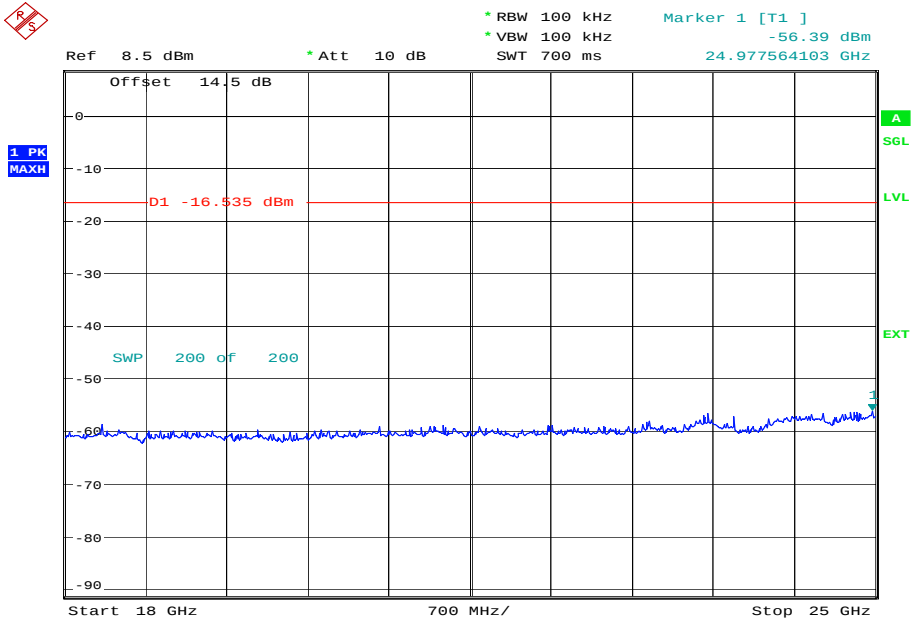


Date: 11.OCT.2011 15:31:56



Product Service

18 GHz to 25 GHz



Date: 11.OCT.2011 16:01:20

Limit Clause

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

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

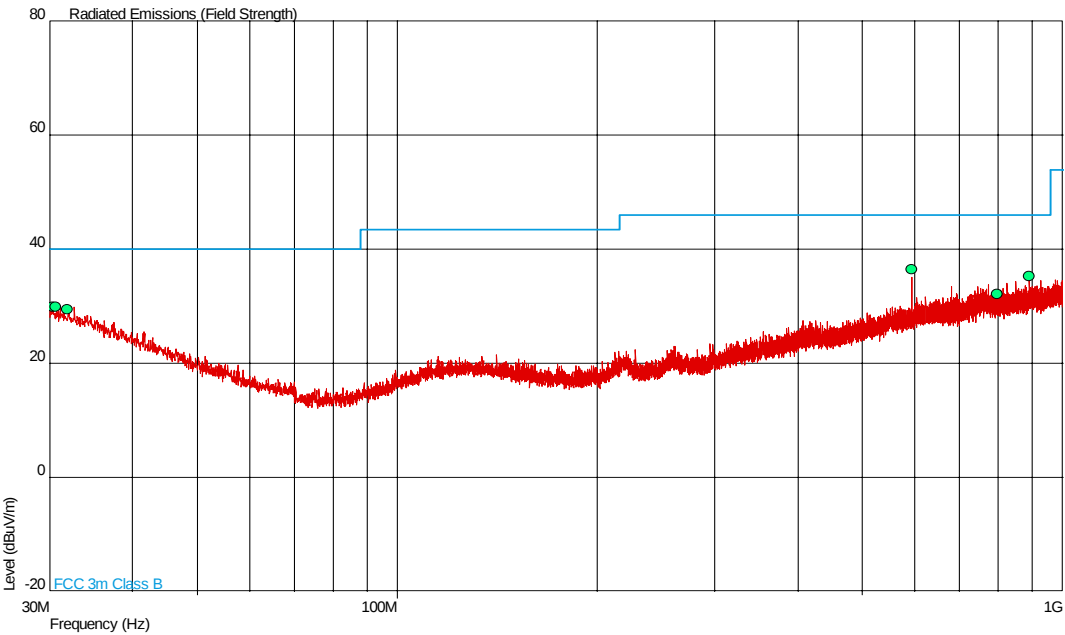


Product Service

Spurious Radiated Emissions

2412 MHz

30 MHz to 1 GHz

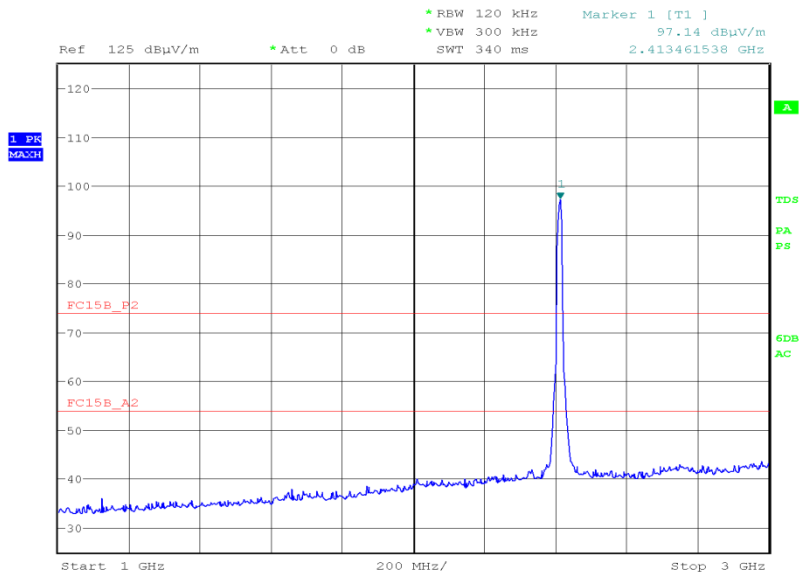


Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle (Deg)	Height (m)	Polarity
30.310	30.0	40.0	-10.0	1	1.00	Vertical
30.642	29.9	40.0	-10.1	1	1.00	Vertical
31.940	29.4	40.0	-10.6	1	1.00	Vertical
593.113	36.5	46.0	-9.5	1	1.00	Vertical
797.419	32.2	46.0	-13.8	1	1.00	Vertical
889.691	35.4	46.0	-10.6	1	1.00	Vertical



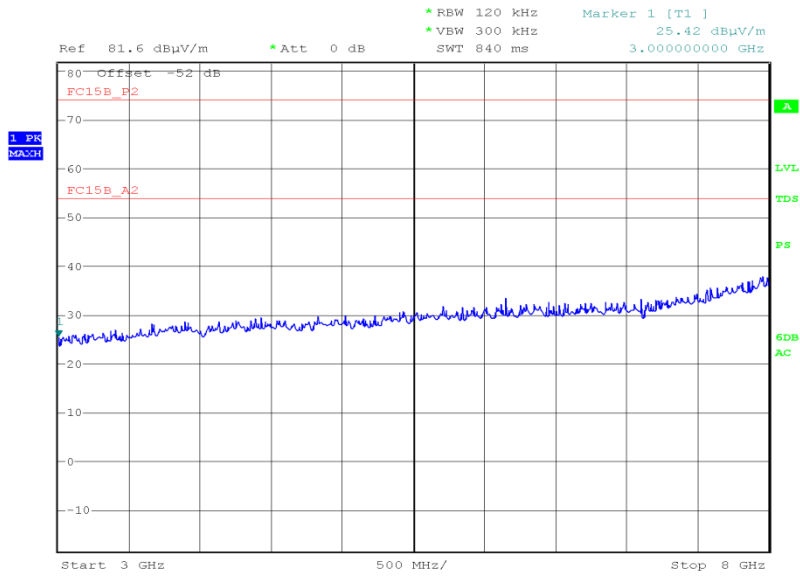
Product Service

1 GHz to 3 GHz



Date: 16.OCT.2011 09:33:52

3 GHz to 8 GHz

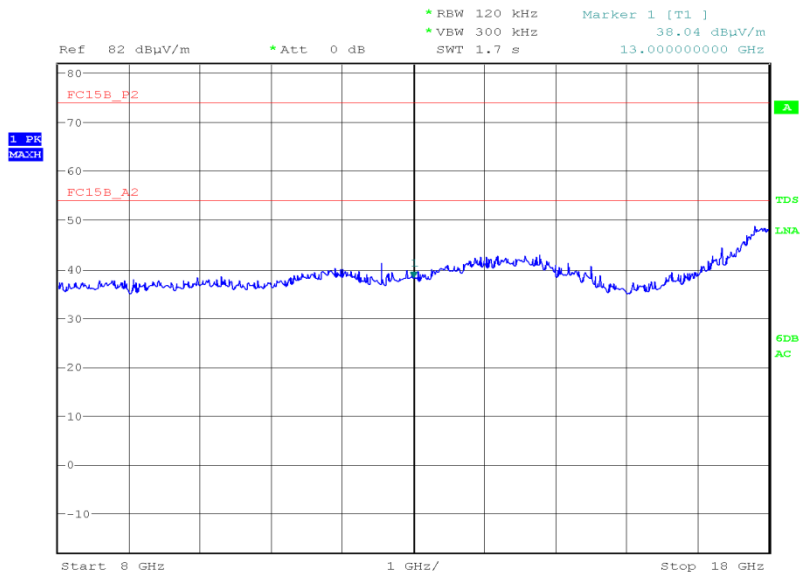


Date: 5.OCT.2011 22:54:40



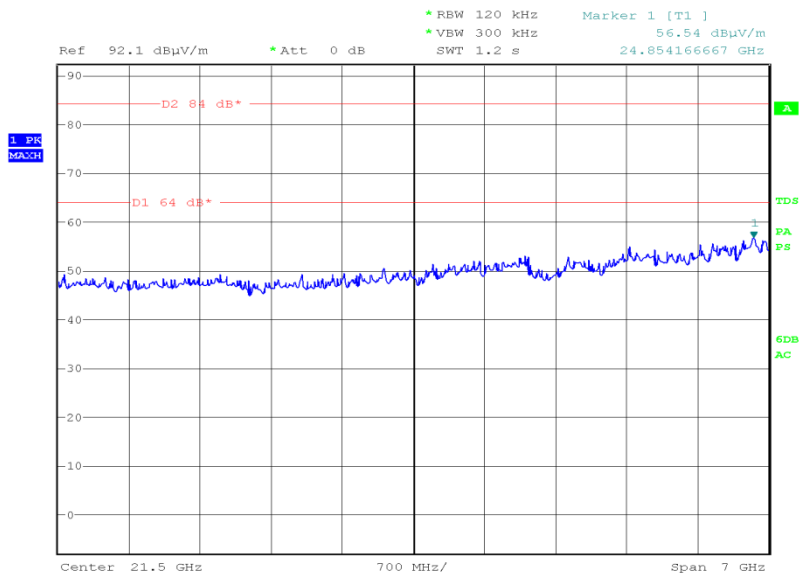
Product Service

8 GHz to 18 GHz



Date: 16.OCT.2011 13:21:15

18 GHz to 25 GHz



Date: 16.OCT.2011 16:21:49

Limit

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

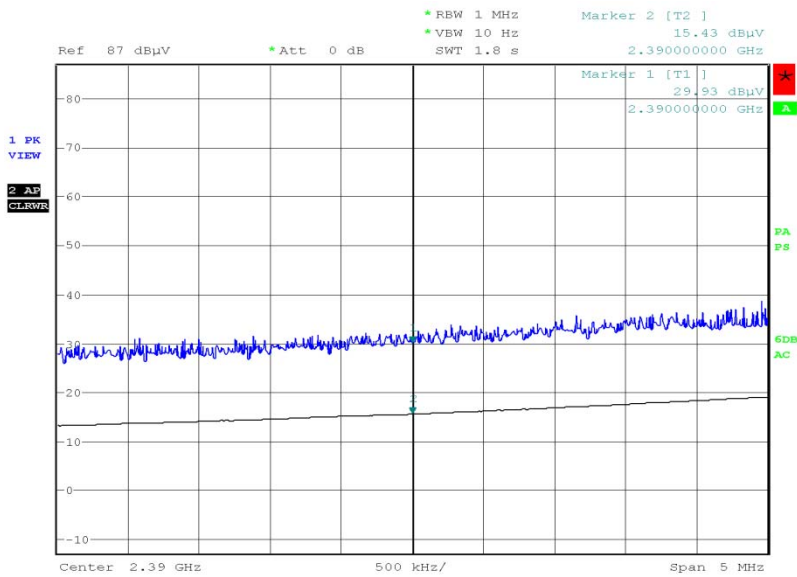


Product Service

Band Edge Emissions

2412 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	61.9	47.4



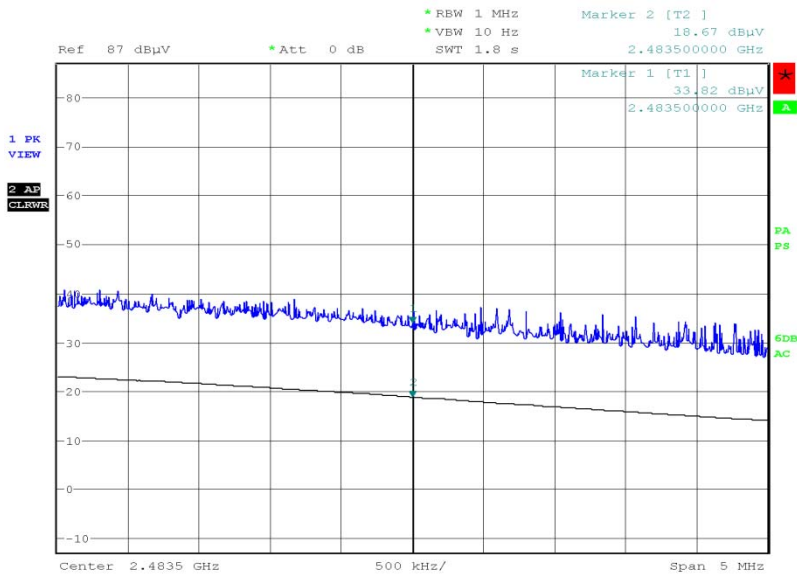
Date: 16.OCT.2011 09:28:44



Product Service

2462 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	66.0	50.9



Date: 16.OCT.2011 08:48:12

Limit

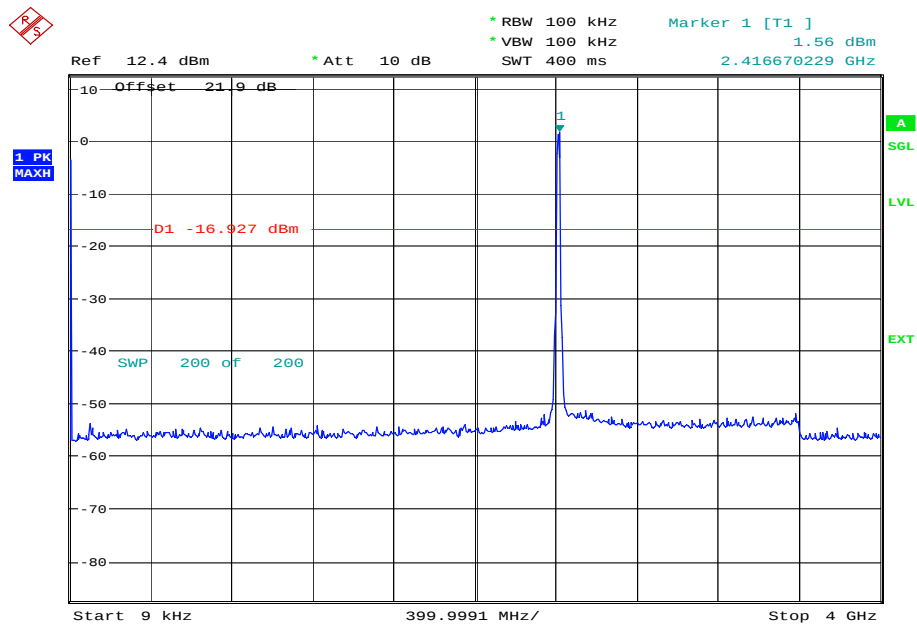
Peak (dBµV/m)	Average (dBµV/m)
74.0	54.0



Product Service

802.11(n)

4.0 V DC Supply

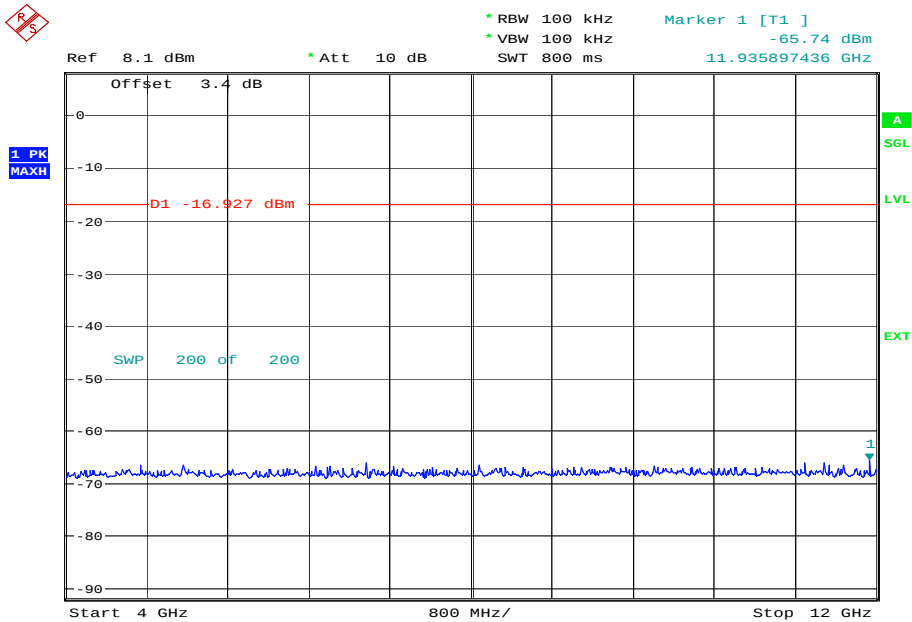
Spurious Conducted Emissions6.5 Mbps2412 MHz9 kHz to 4 GHz

Date: 11.OCT.2011 16:07:42



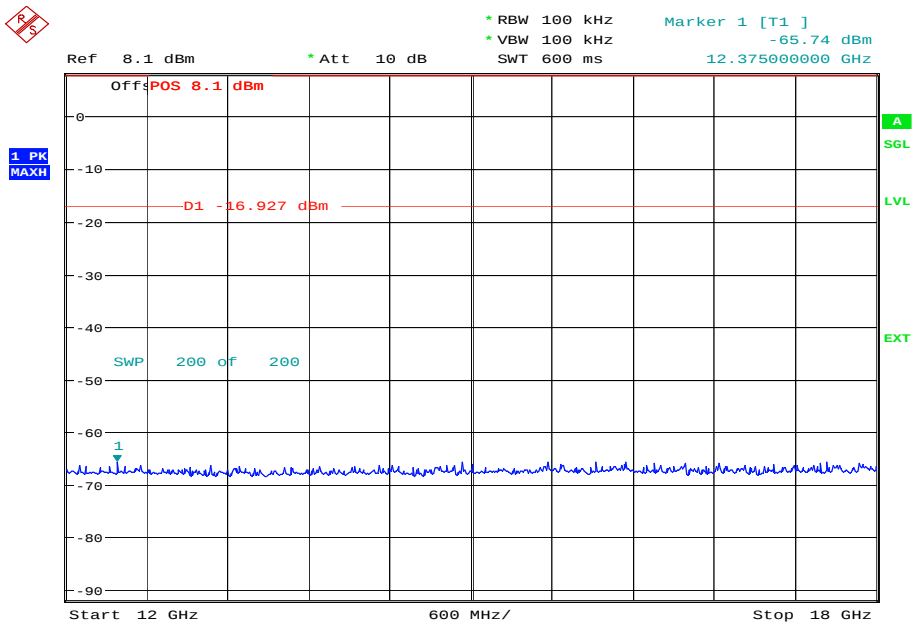
Product Service

4 GHz to 12 GHz



Date: 11.OCT.2011 16:24:51

12 GHz to 18 GHz

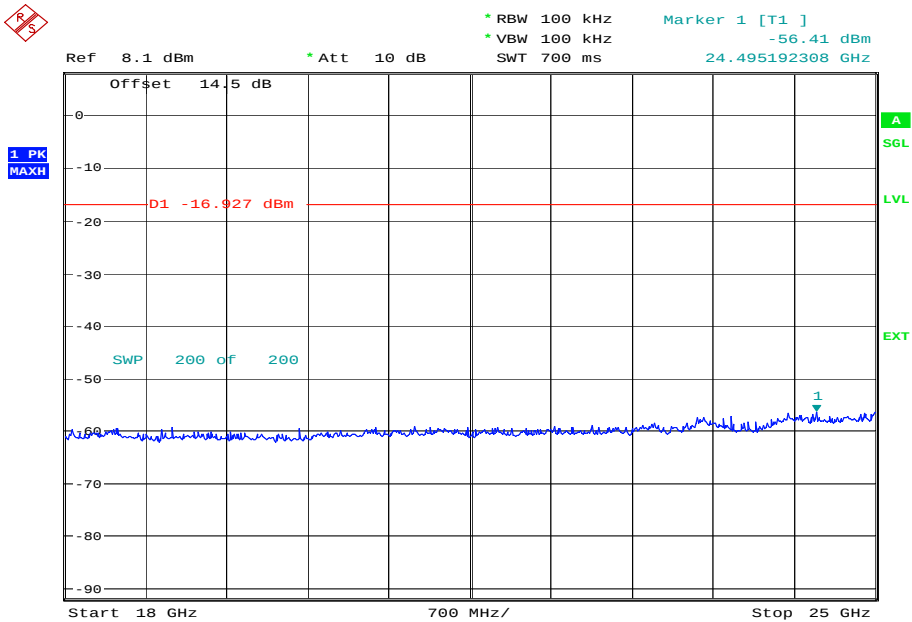


Date: 11.OCT.2011 16:27:21



Product Service

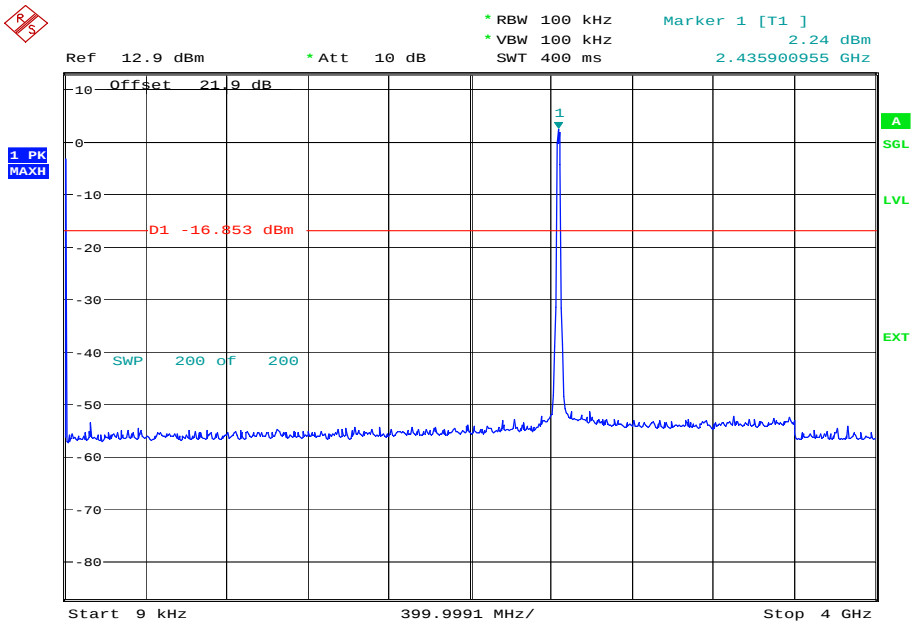
18 GHz to 25 GHz



Date: 11.OCT.2011 17:04:02

2437 MHz

9 kHz to 4 GHz

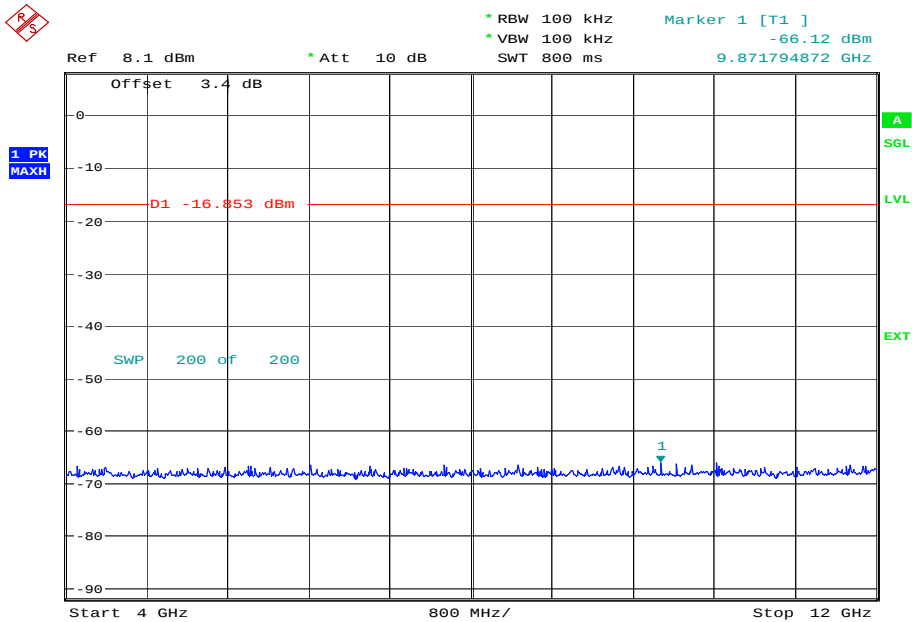


Date: 11.OCT.2011 16:12:09



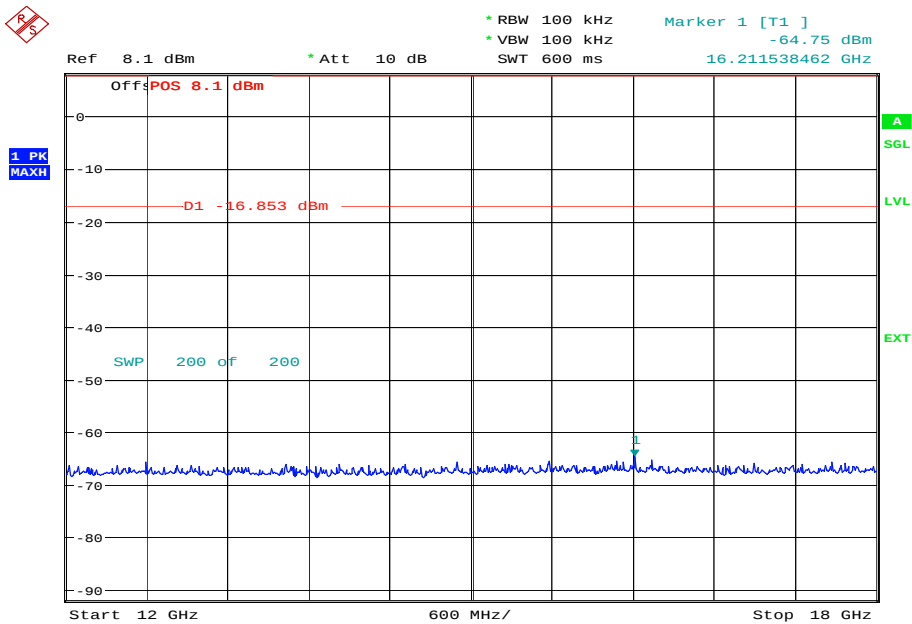
Product Service

4 GHz to 12 GHz



Date: 11.OCT.2011 16:31:33

12 GHz to 18 GHz

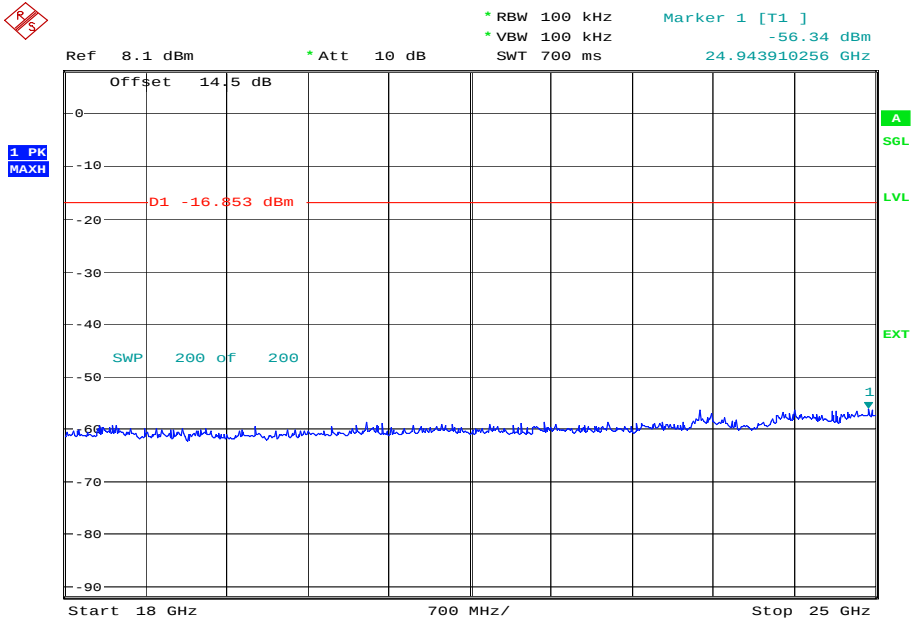


Date: 11.OCT.2011 16:34:02



Product Service

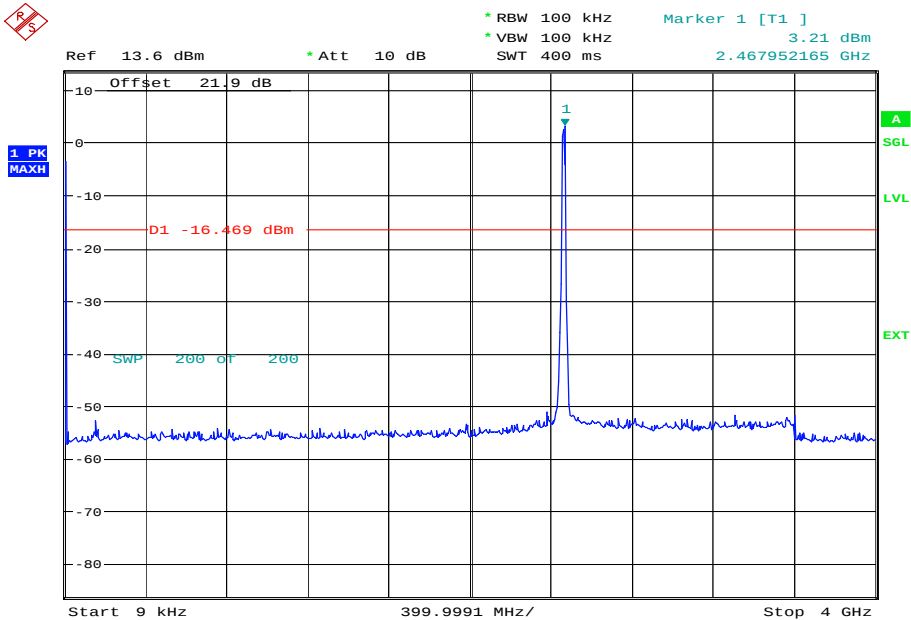
18 GHz to 25 GHz



Date: 11.OCT.2011 17:10:47

2462 MHz

9 kHz to 4 GHz

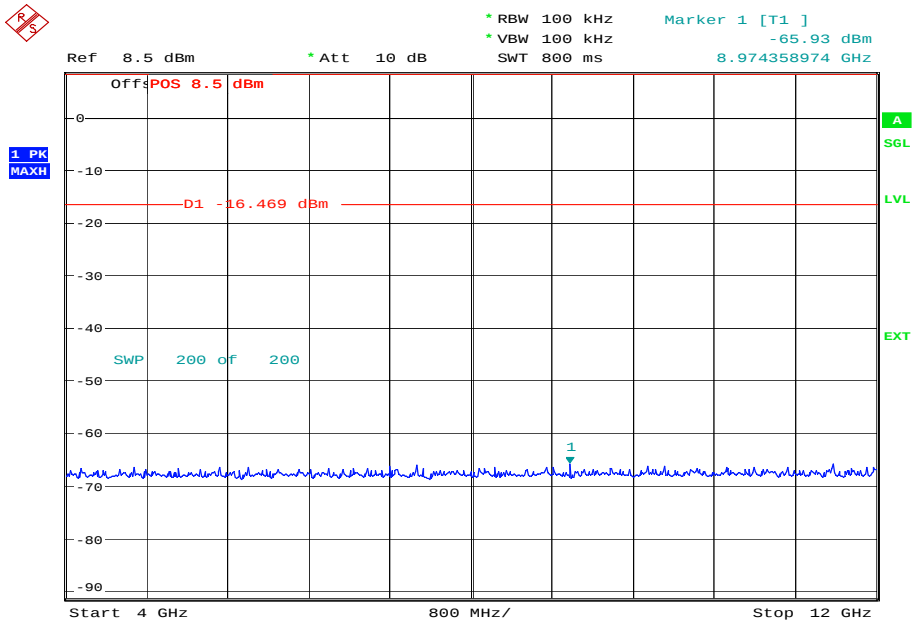


Date: 11.OCT.2011 16:18:13



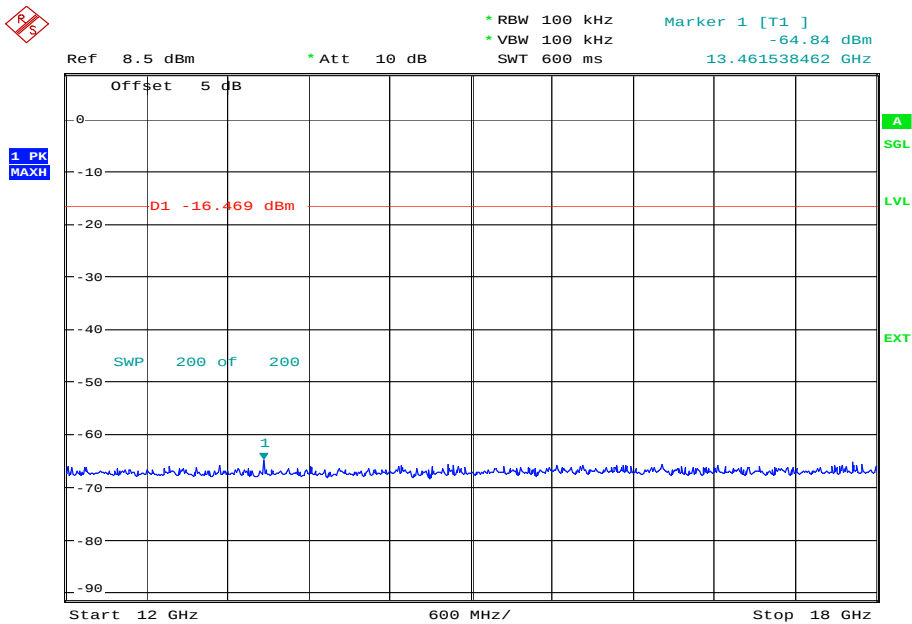
Product Service

4 GHz to 12 GHz



Date: 11.OCT.2011 16:37:58

12 GHz to 18 GHz

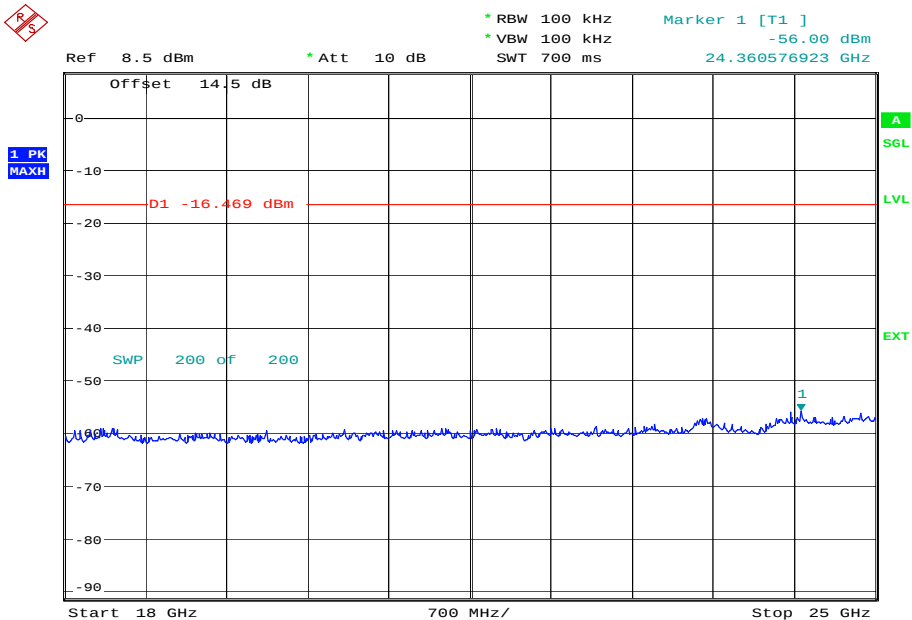


Date: 11.OCT.2011 16:40:30



Product Service

18 GHz to 25 GHz



Date: 11.OCT.2011 17:15:57

Limit Clause

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

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

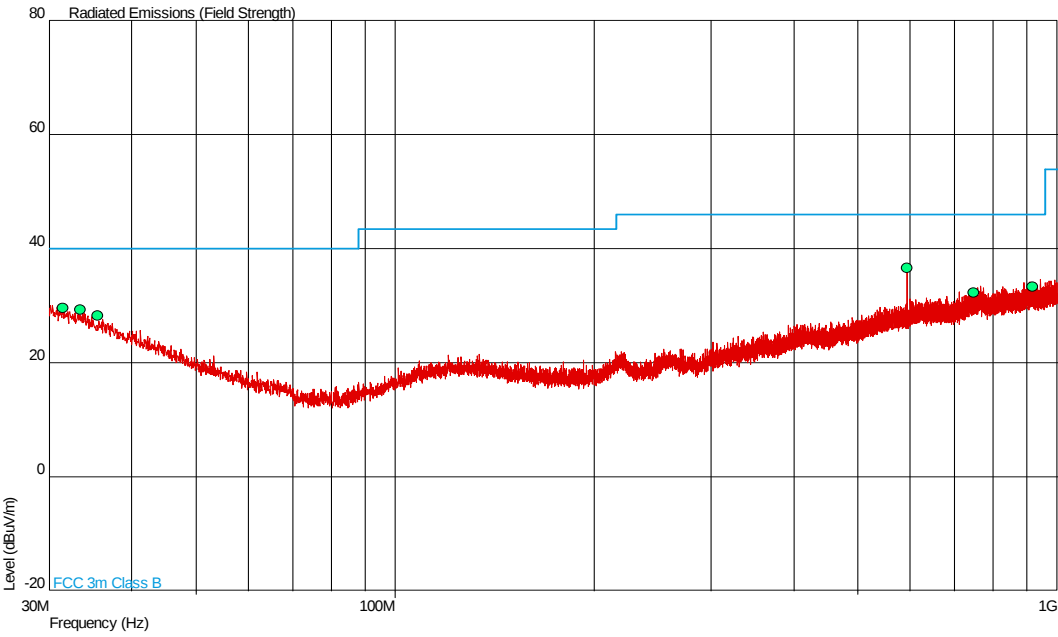


Product Service

Spurious Radiated Emissions

2412 MHz

30 MHz to 1 GHz

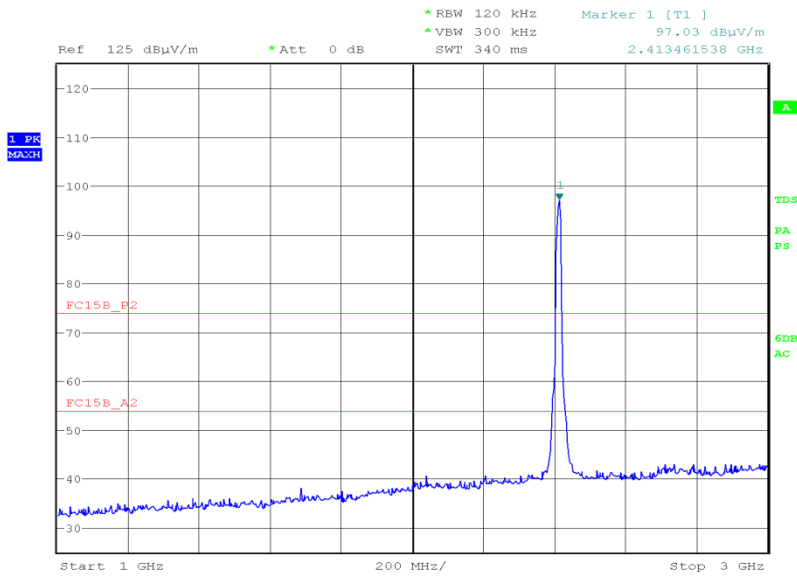


Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle (Deg)	Height (m)	Polarity
31.474	29.6	40.0	-10.4	1	1.00	Horizontal
33.438	29.4	40.0	-10.6	1	1.00	Horizontal
35.494	28.2	40.0	-11.8	1	1.00	Horizontal
593.114	36.6	46.0	-9.4	1	1.00	Vertical
748.776	32.3	46.0	-13.7	1	1.00	Vertical
918.705	33.3	46.0	-12.7	1	1.00	Vertical



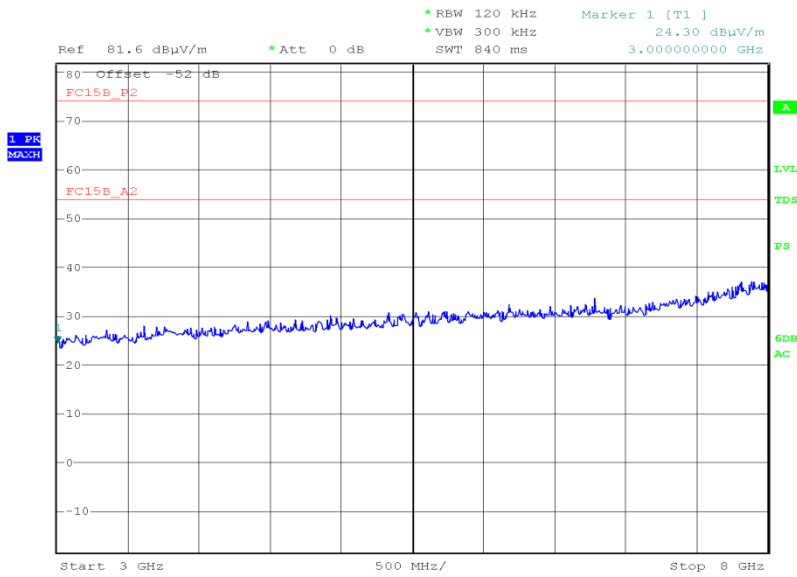
Product Service

1 GHz to 3 GHz



Date: 16.OCT.2011 09:59:27

3 GHz to 8 GHz

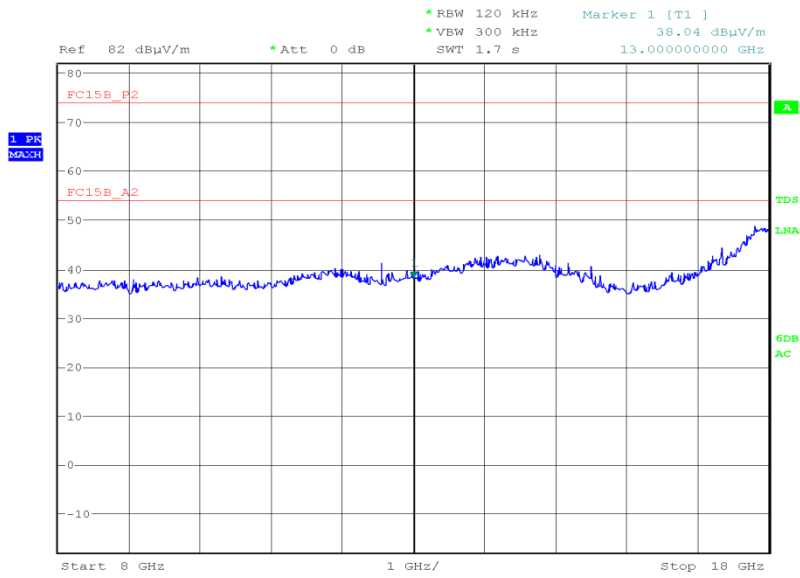


Date: 5.OCT.2011 23:22:46



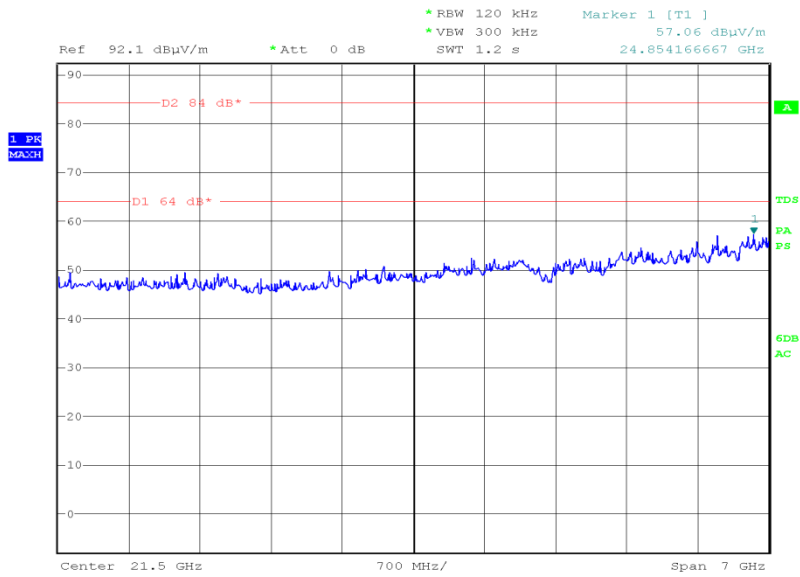
Product Service

8 GHz to 18 GHz



Date: 16.OCT.2011 13:21:15

18 GHz to 25 GHz



Date: 16.OCT.2011 16:39:25

Limit

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

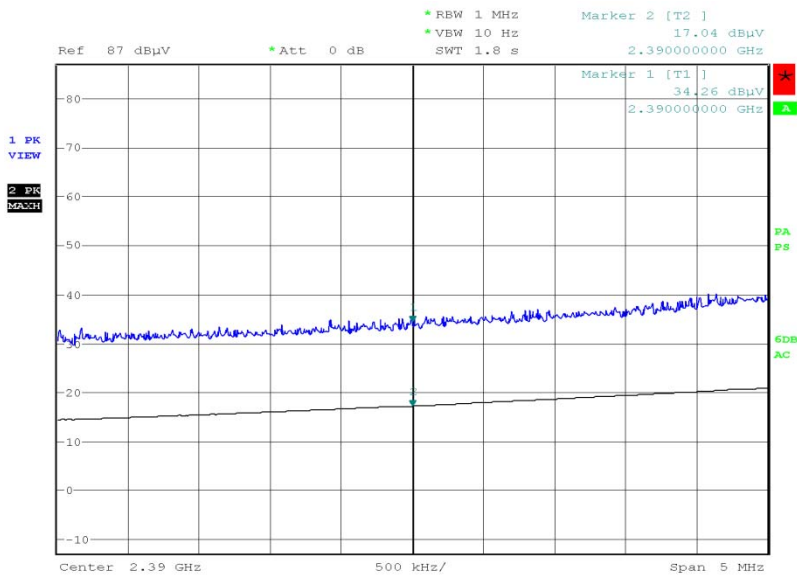


Product Service

Band Edge Emissions

2412 MHz

Polarisation	Final Peak (dBμV/m)	Final Average (dBμV/m)
Horizontal	66.3	48.7



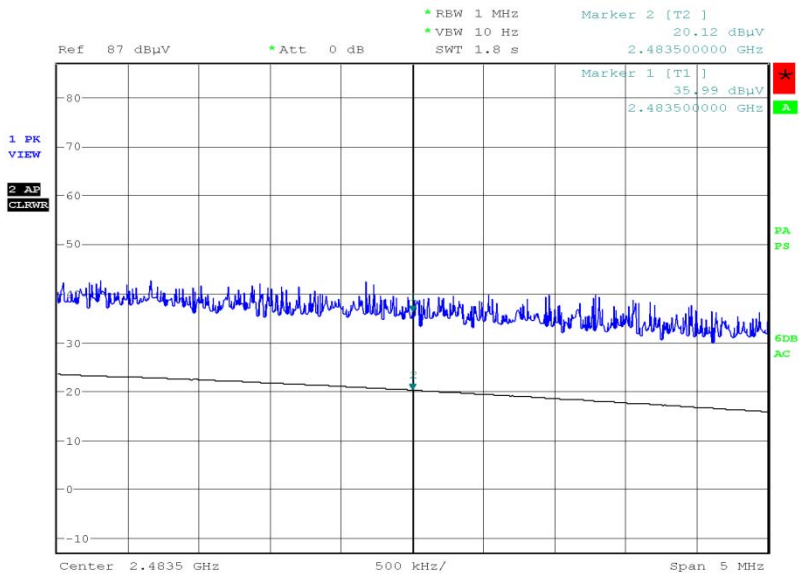
Date: 16.OCT.2011 10:12:11



Product Service

2462 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	68.2	52.3



Date: 16.OCT.2011 11:04:24

Limit

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



Product Service

2.5 6DB BANDWIDTH**2.5.1 Specification Reference**

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

2.5.2 Equipment Under Test and Modification State

CDMA SHI13 S/N: SSHFN000875 - Modification State 0

2.5.3 Date of Test

30 September 2011

2.5.4 Test Equipment Used

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

2.5.5 Test Procedure

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

2.5.6 Environmental Conditions

Ambient Temperature	25.3 - 25.9°C
Relative Humidity	52.1 - 52.4%



Product Service

2.5.7 Test Results802.11(b)

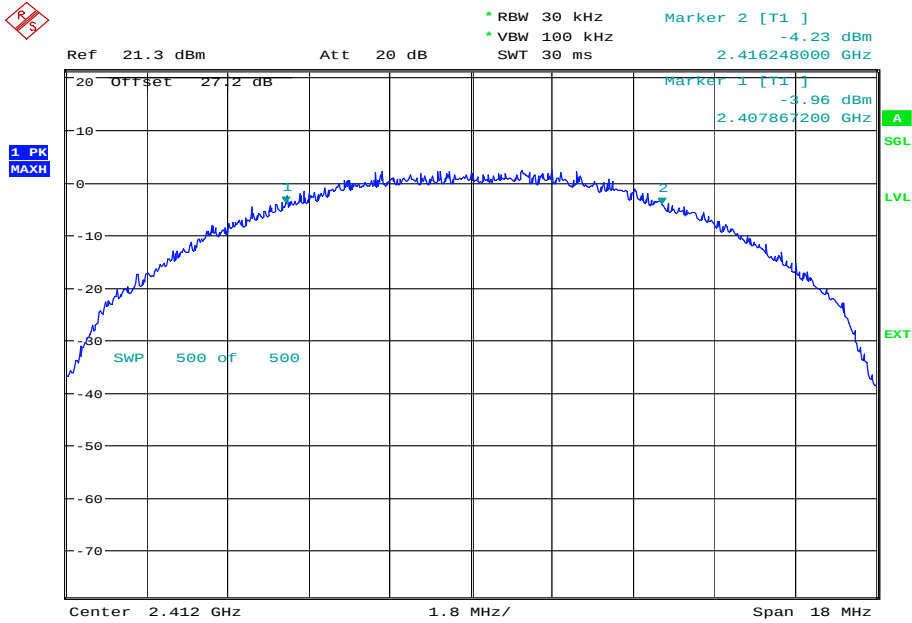
4.0 V DC Supply

Frequency (MHz)	Data Rate (Mbps)	6dB Bandwidth (kHz)
2412 MHz	1	7833.6
	2	7920.0
	5	8380.8
	11	8092.8
2437 MHz	1	7804.8
	2	8265.6
	5	8092.8
	11	8064.0
2462 MHz	1	7113.6
	2	7603.2
	5	8496.0
	11	7718.4



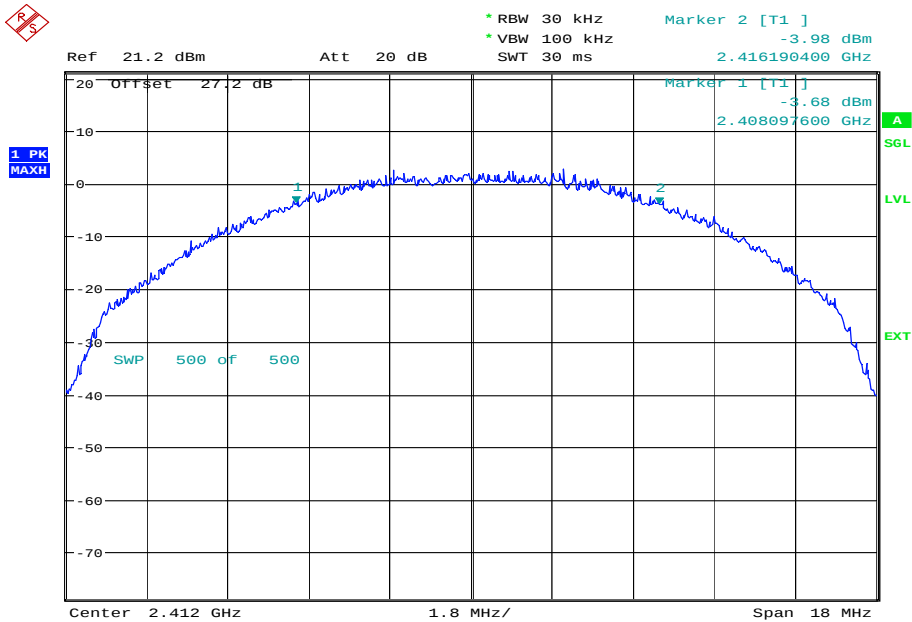
Product Service

5.5 Mbps



Date: 29.SEP.2011 15:00:11

11 Mbps



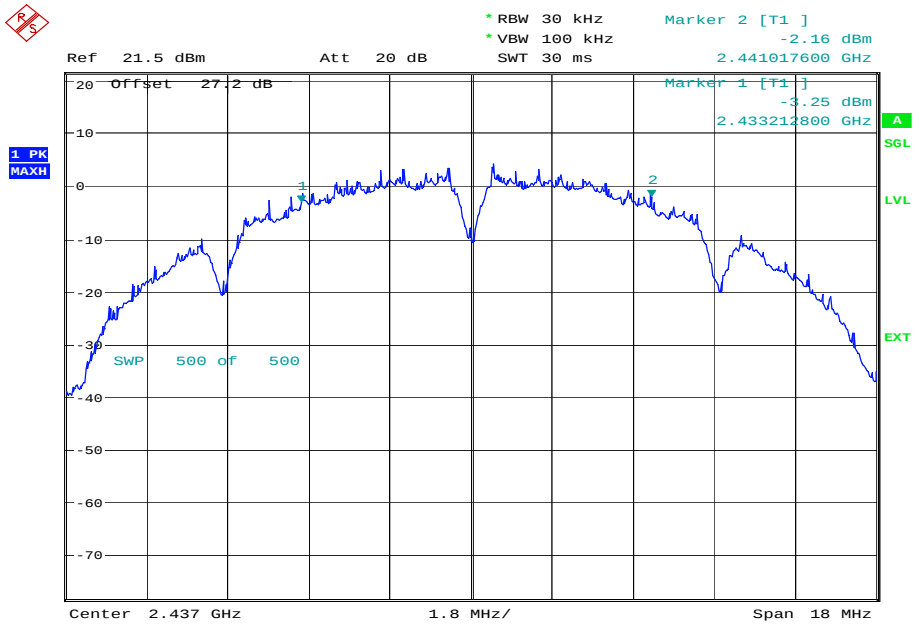
Date: 29.SEP.2011 15:22:33



Product Service

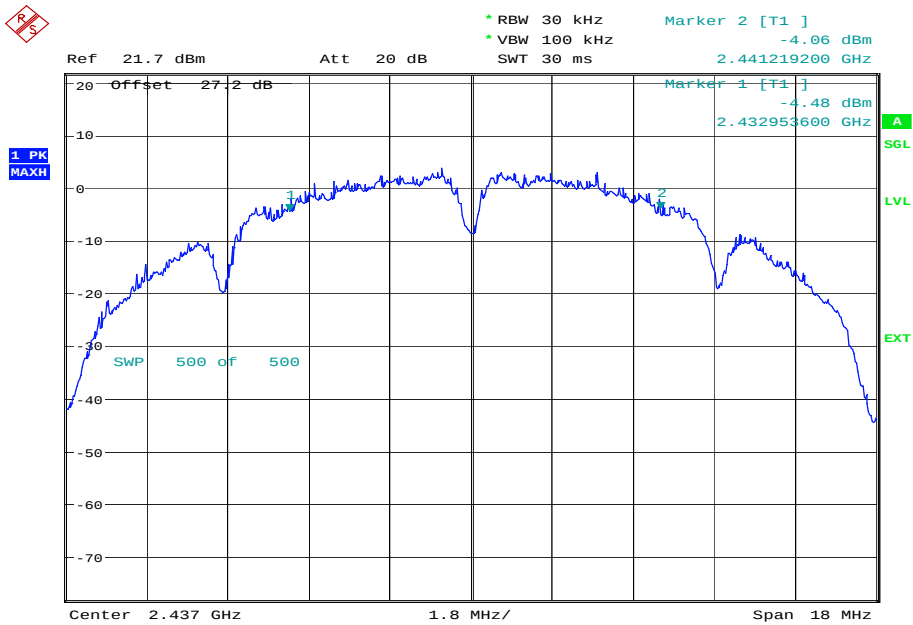
2437 MHz

1 Mbps



Date: 29.SEP.2011 12:18:30

2 Mbps

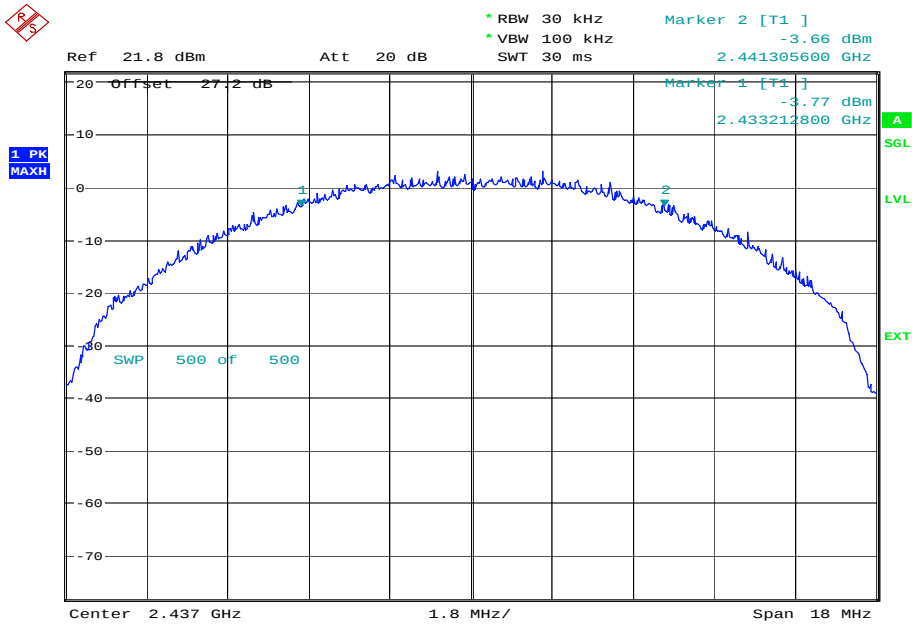


Date: 29.SEP.2011 11:38:29



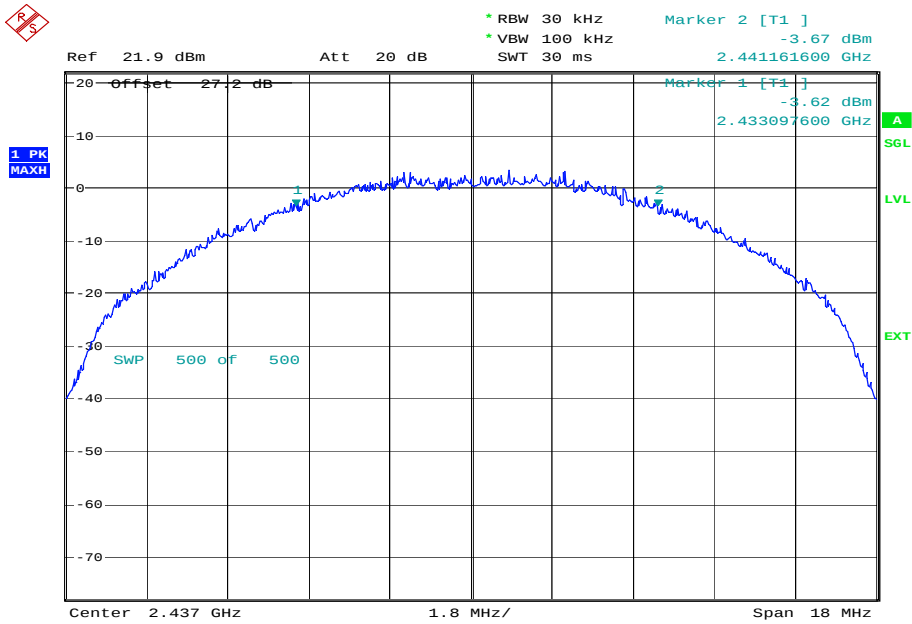
Product Service

5.5 Mbps



Date: 29.SEP.2011 15:09:03

11 Mbps



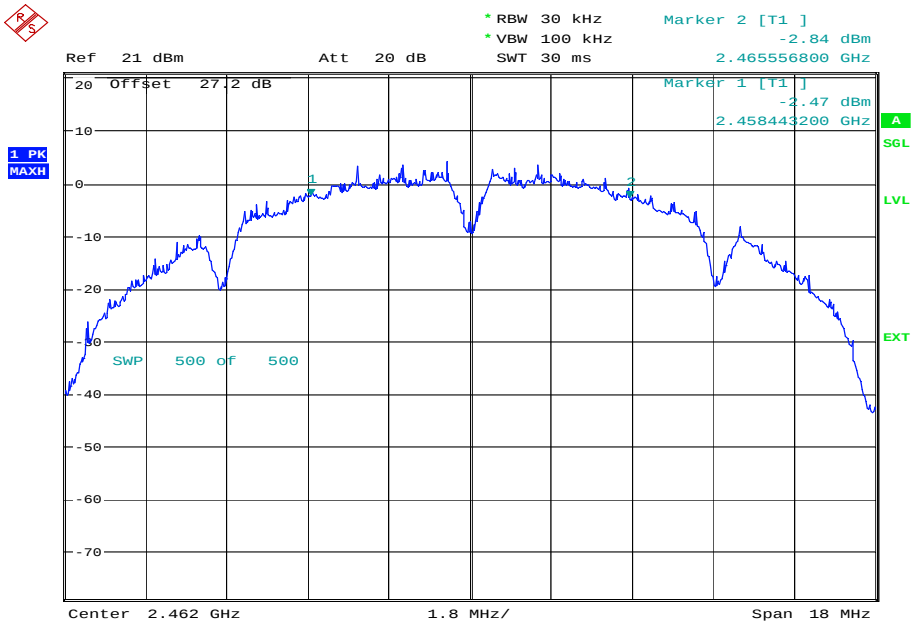
Date: 29.SEP.2011 15:47:18



Product Service

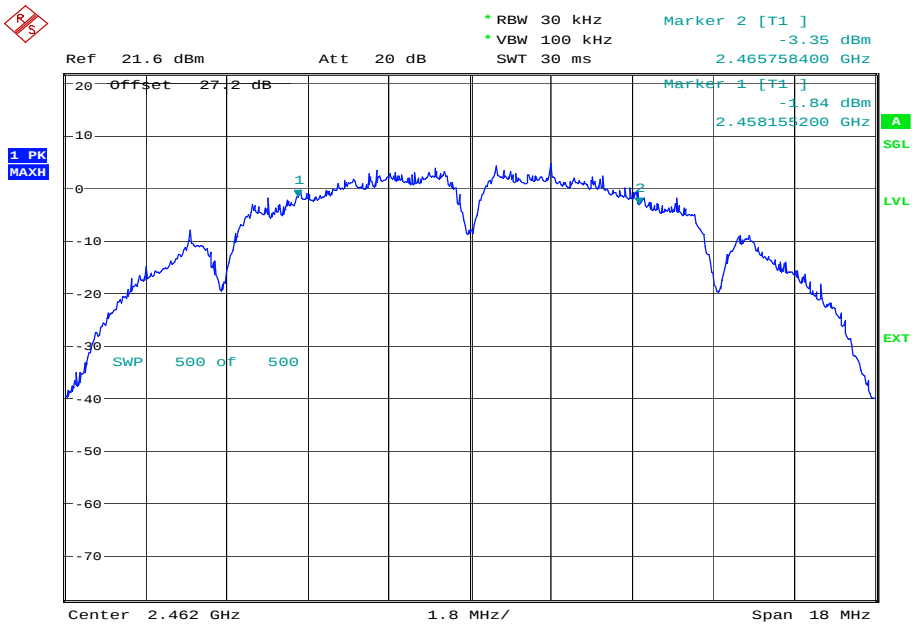
2462 MHz

1 Mbps



Date: 29.SEP.2011 14:53:17

2 Mbps

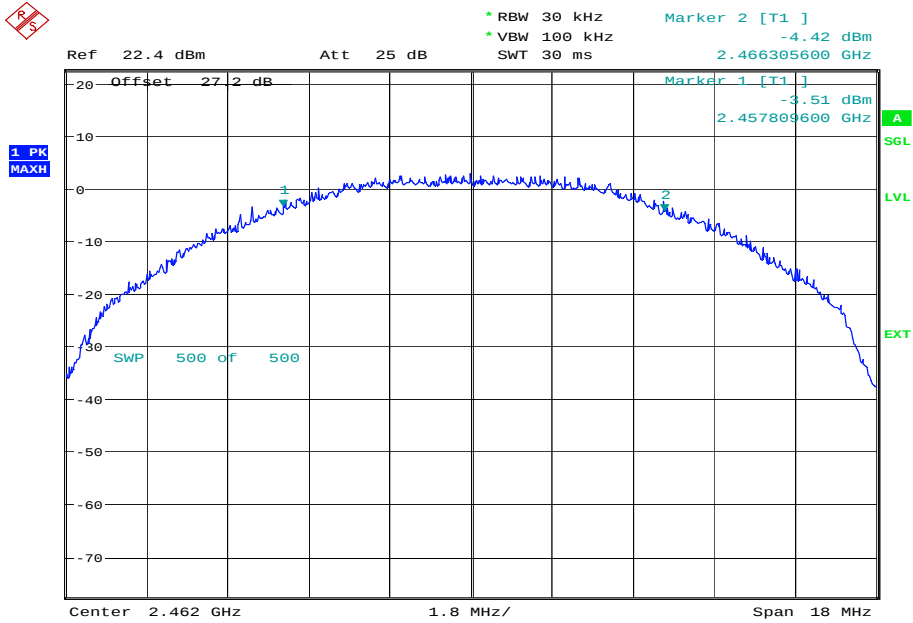


Date: 29.SEP.2011 11:49:25



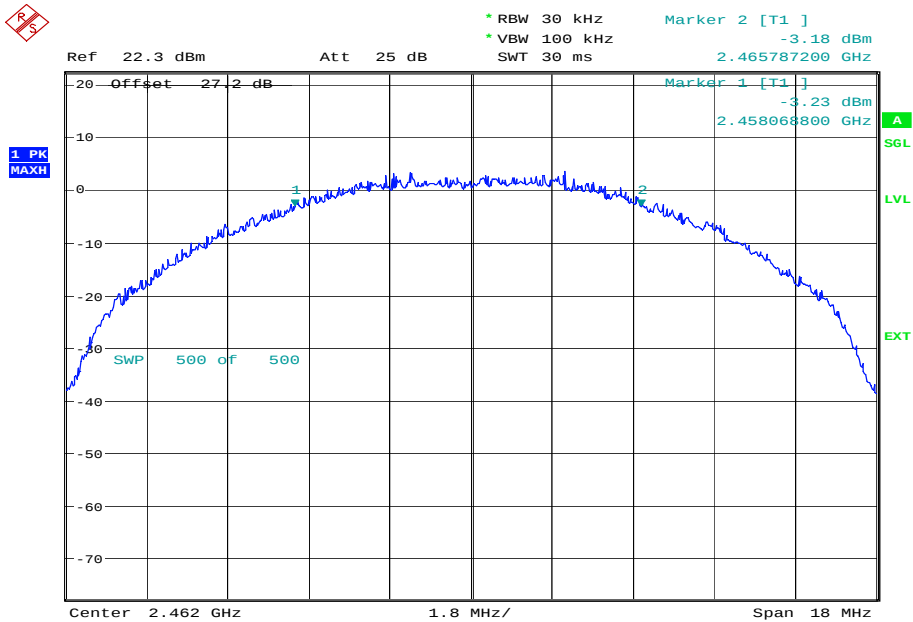
Product Service

5.5 Mbps



Date: 29.SEP.2011 15:16:09

11 Mbps



Date: 29.SEP.2011 15:57:55

Limit Clause

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

802.11(g)

4.0 V DC Supply

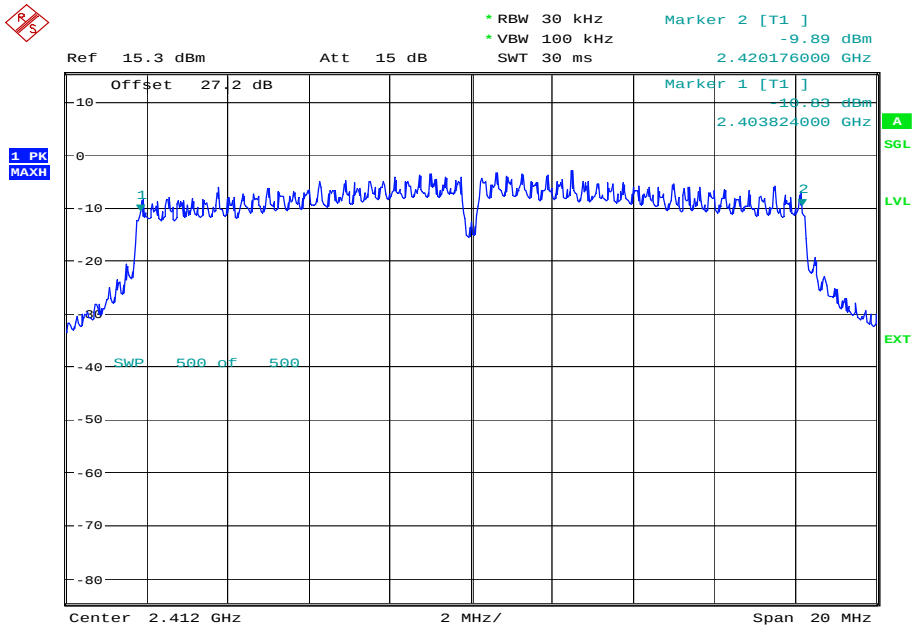
Frequency (MHz)	Data Rate (Mbps)	6dB Bandwidth (kHz)
2412 MHz	6	16352
	9	16000
	12	15776
	18	16352
	24	16352
	36	15488
	48	16000
	54	16448
2437 MHz	6	16352
	9	16352
	12	160064
	18	16384
	24	16416
	36	16384
	48	16096
	54	16352
2462 MHz	6	16352
	9	16352
	12	16352
	18	16384
	24	16384
	36	16416
	48	16064
	54	16416



Product Service

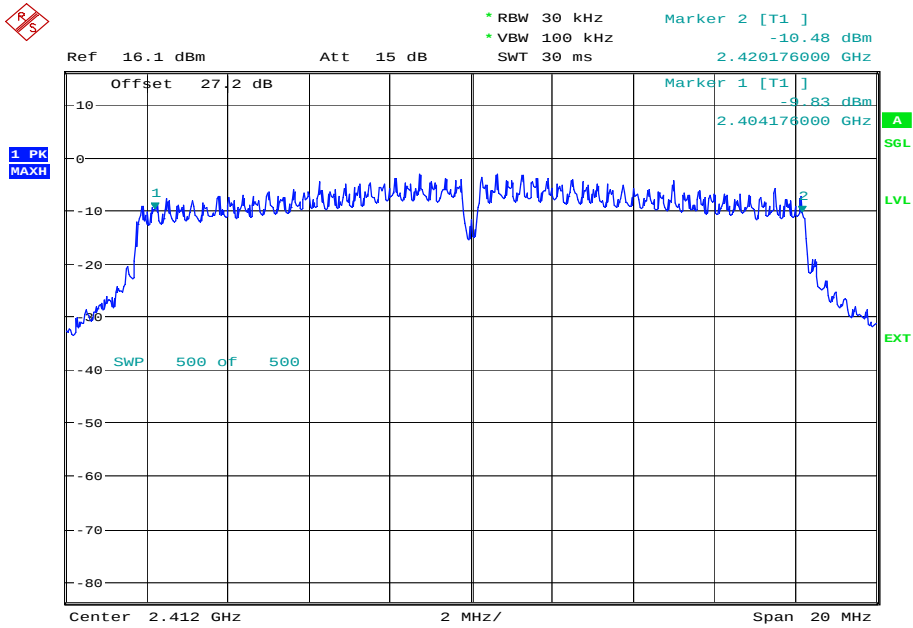
2412 MHz

6 Mbps



Date: 29.SEP.2011 16:18:39

9 Mbps

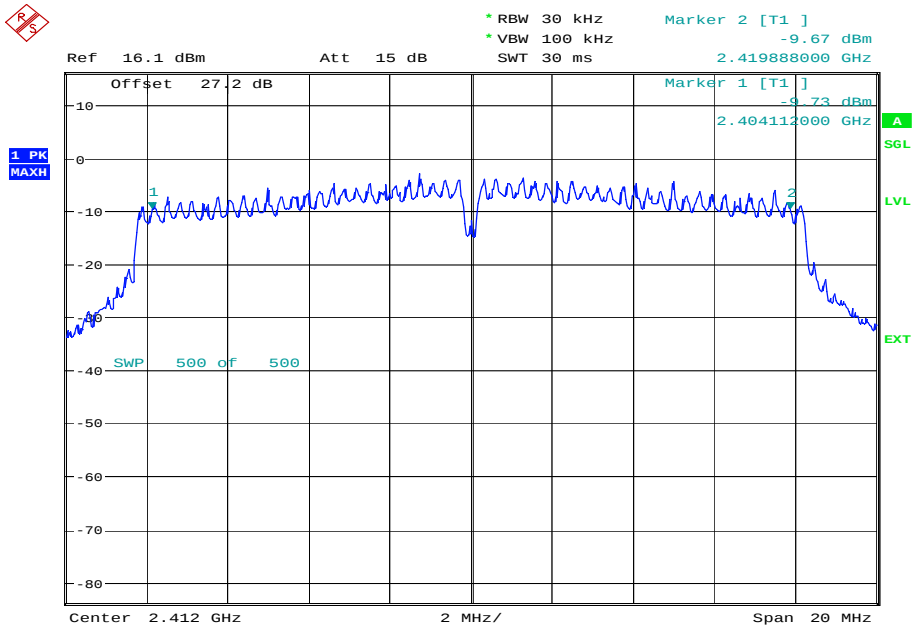


Date: 29.SEP.2011 16:50:07



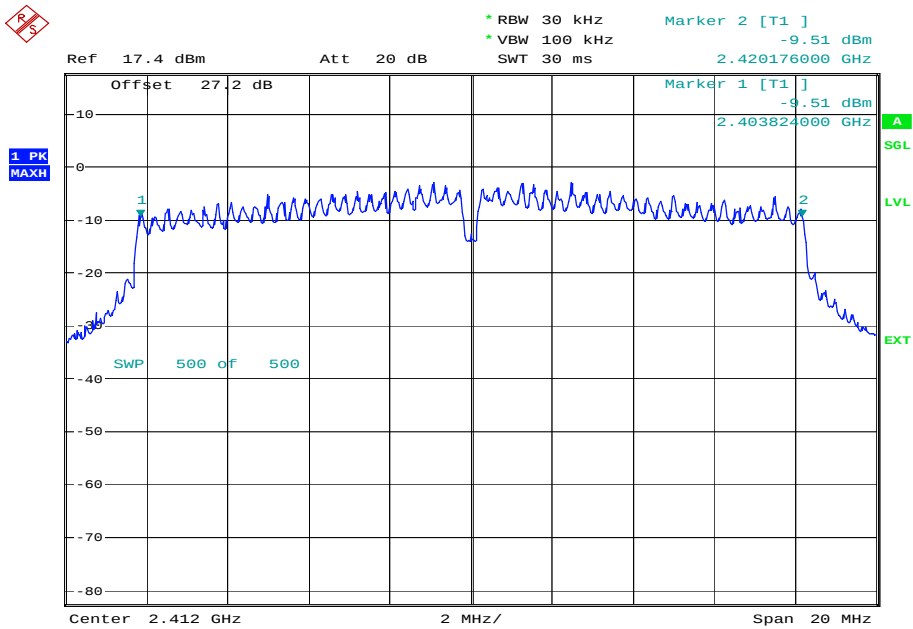
Product Service

12 Mbps



Date: 29.SEP.2011 17:07:34

18 Mbps

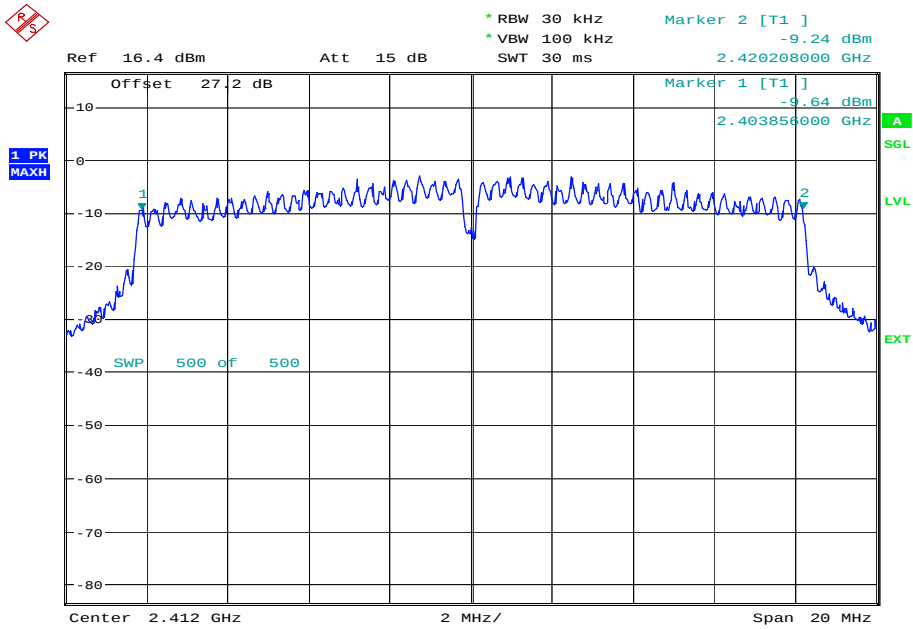


Date: 29.SEP.2011 17:25:58



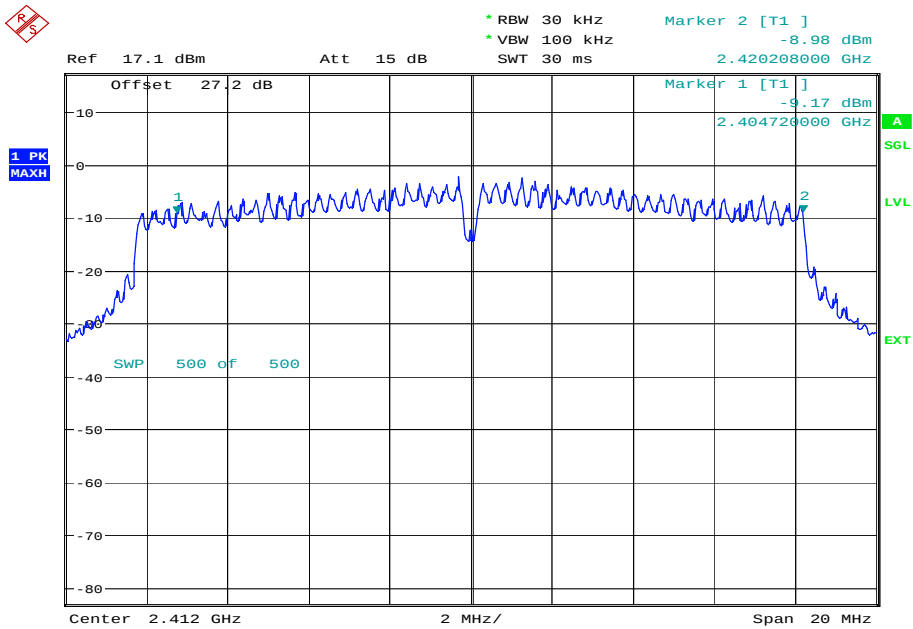
Product Service

24 Mbps



Date: 30.SEP.2011 10:03:43

36 Mbps

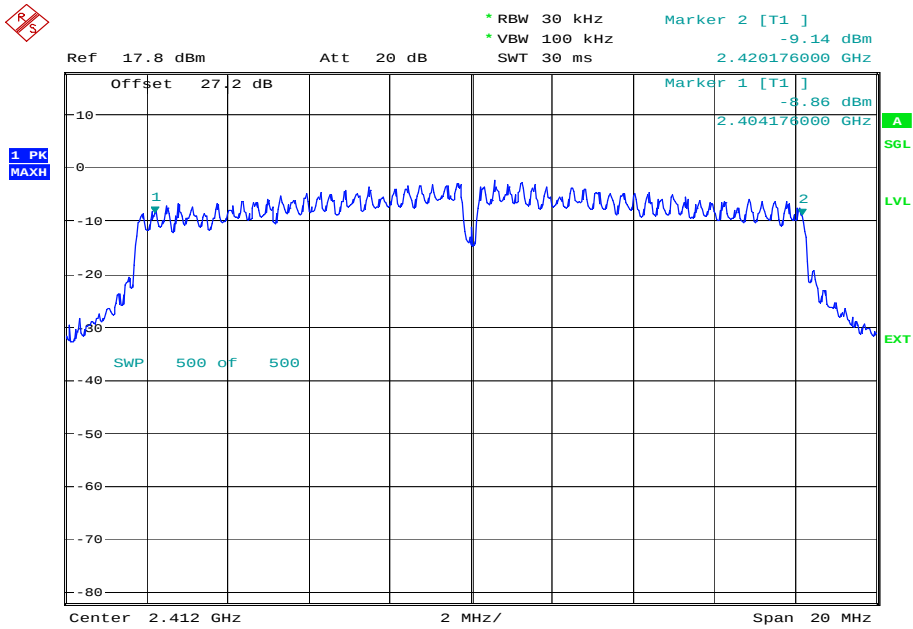


Date: 30.SEP.2011 10:24:10



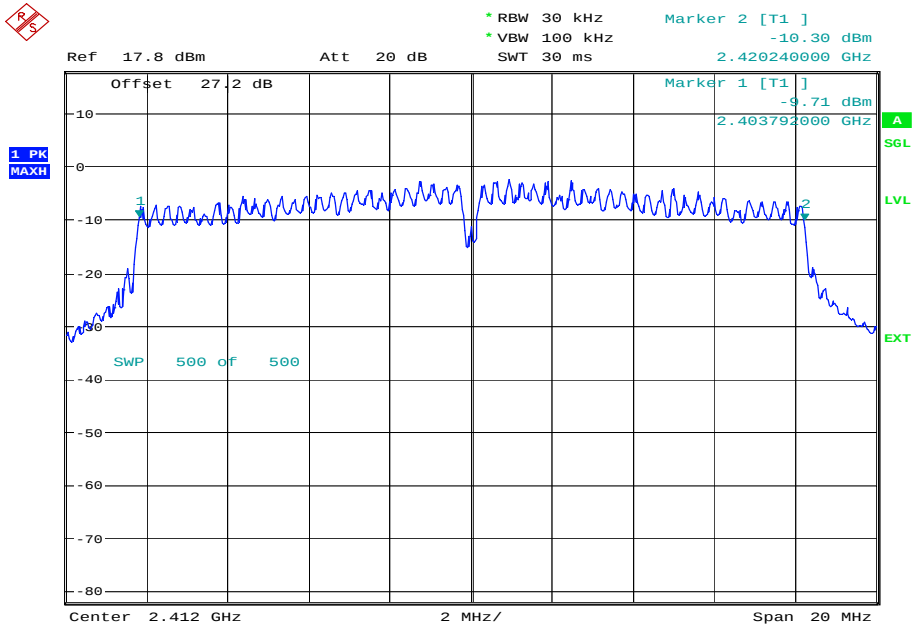
Product Service

48 Mbps



Date: 30.SEP.2011 10:43:26

54 Mbps



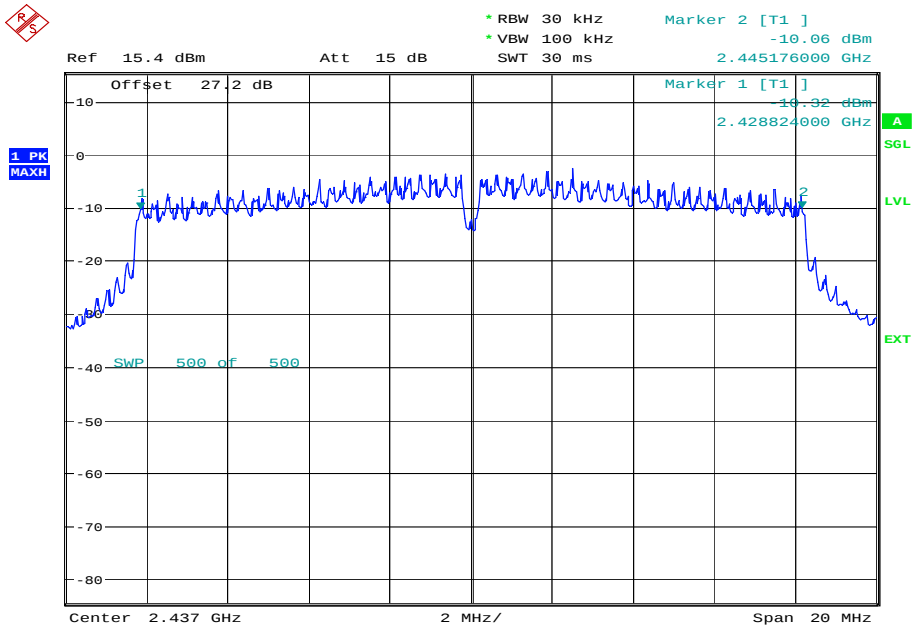
Date: 30.SEP.2011 11:12:05



Product Service

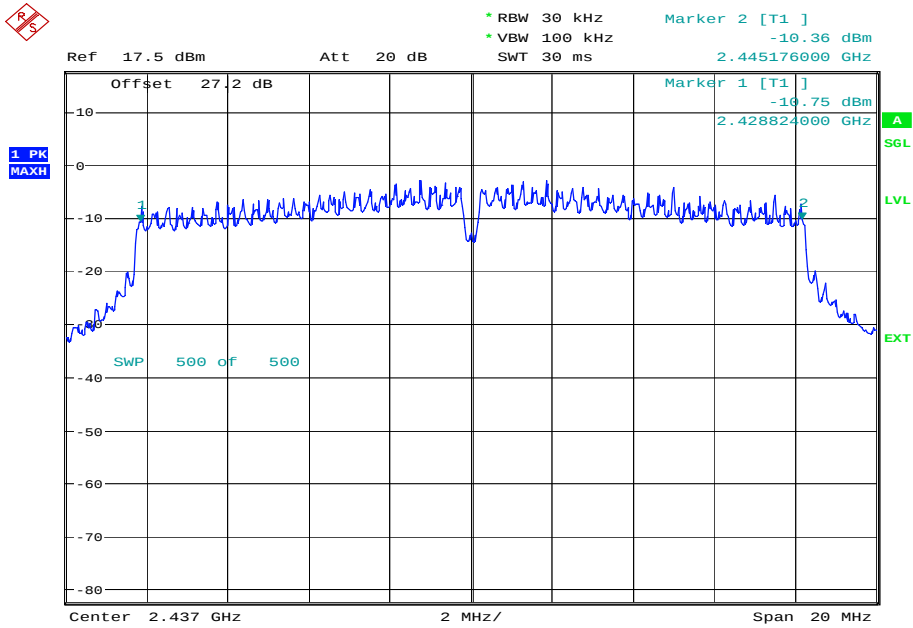
2437 MHz

6 Mbps



Date: 29.SEP.2011 16:34:39

9 Mbps

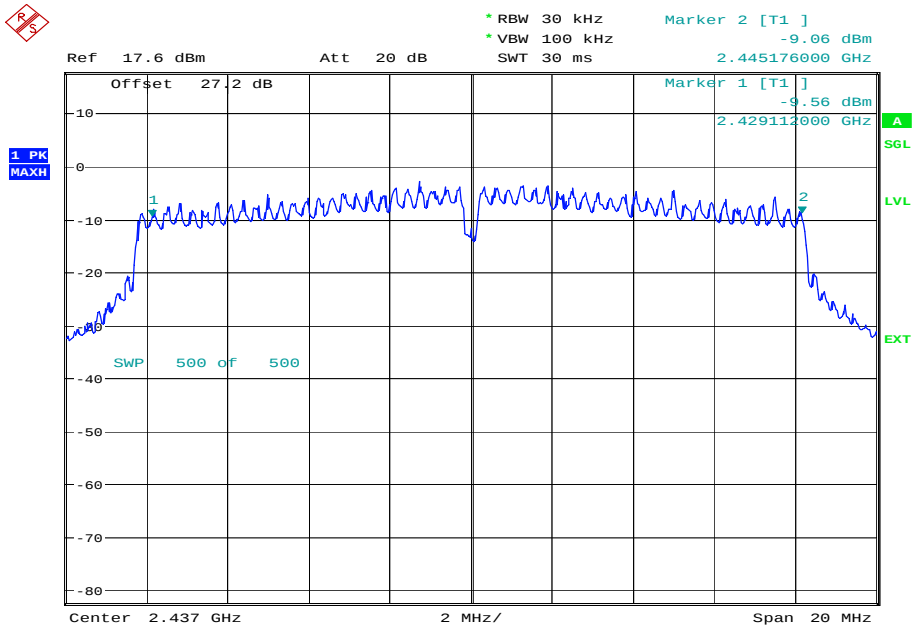


Date: 29.SEP.2011 16:55:22



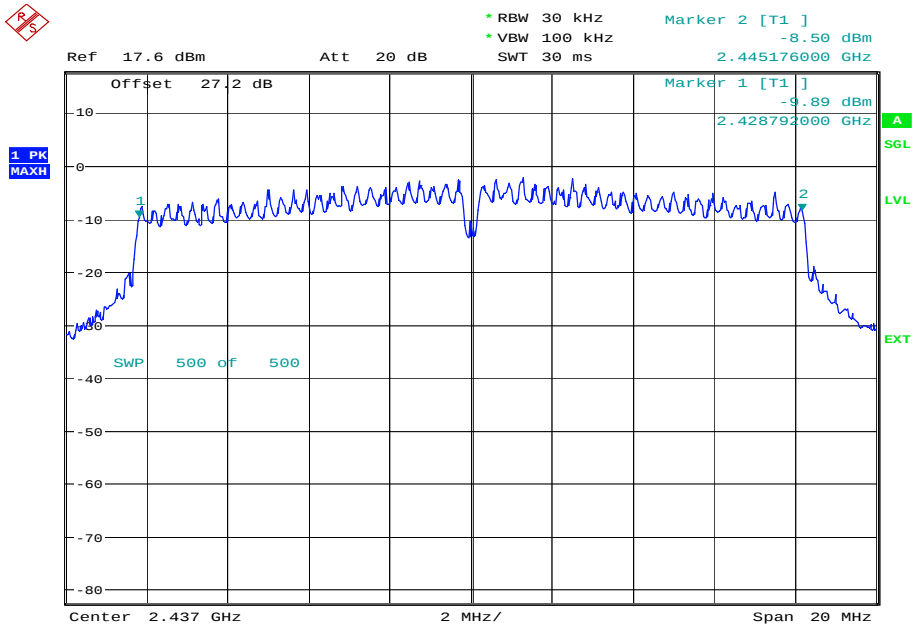
Product Service

12 Mbps



Date: 29.SEP.2011 17:12:36

18 Mbps

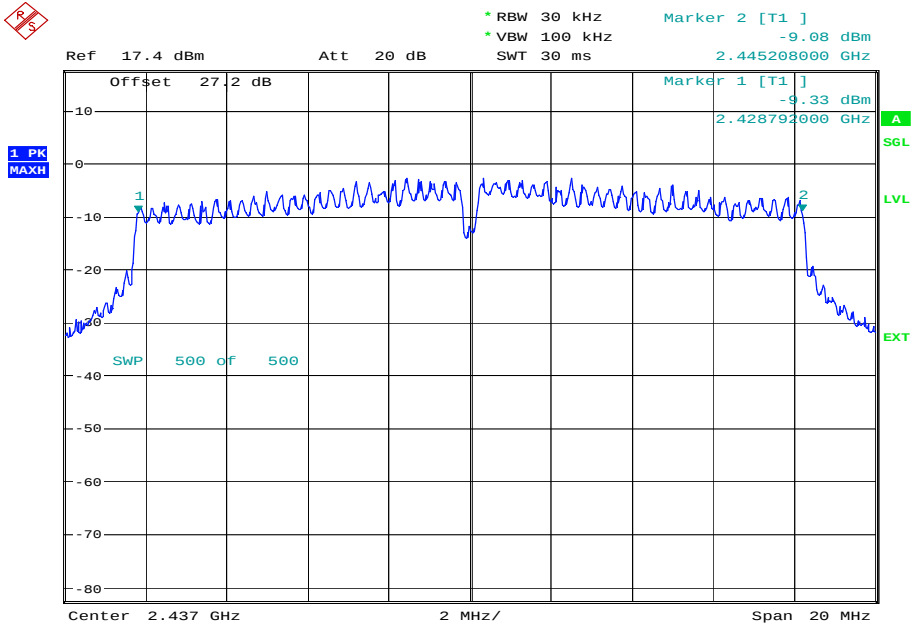


Date: 30.SEP.2011 09:40:28



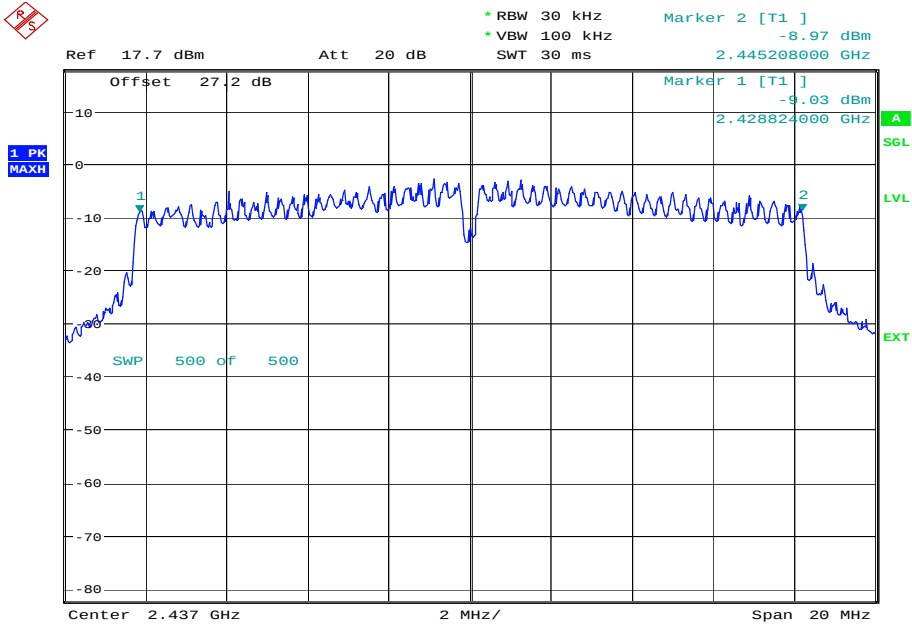
Product Service

24 Mbps



Date: 30.SEP.2011 10:10:32

36 Mbps

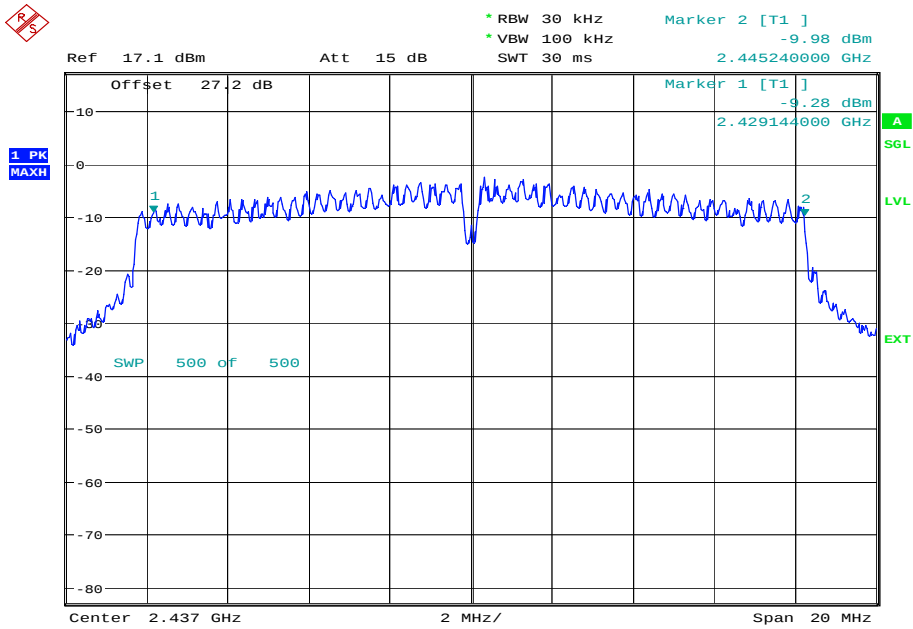


Date: 30.SEP.2011 10:29:14



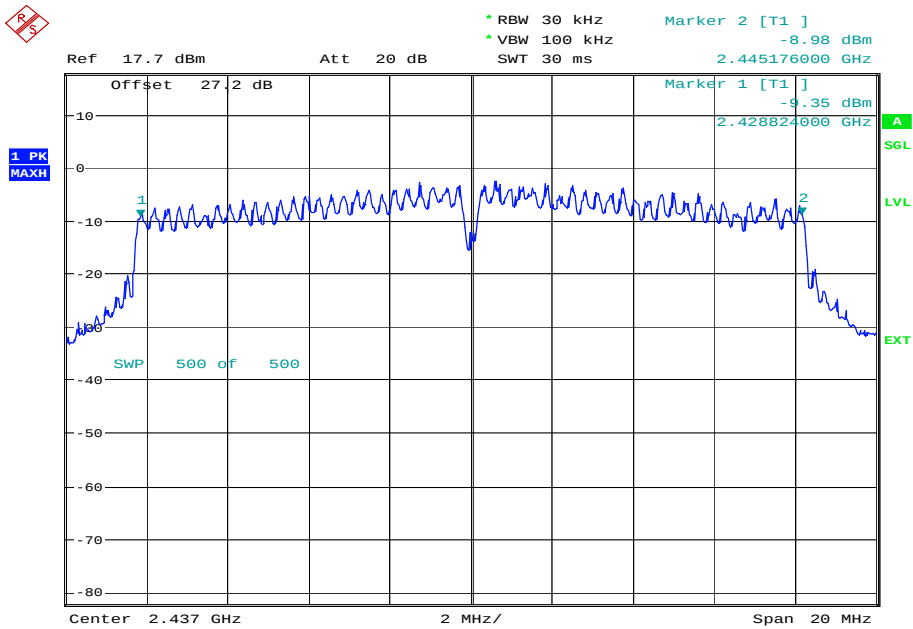
Product Service

48 Mbps



Date: 30.SEP.2011 10:48:38

54 Mbps



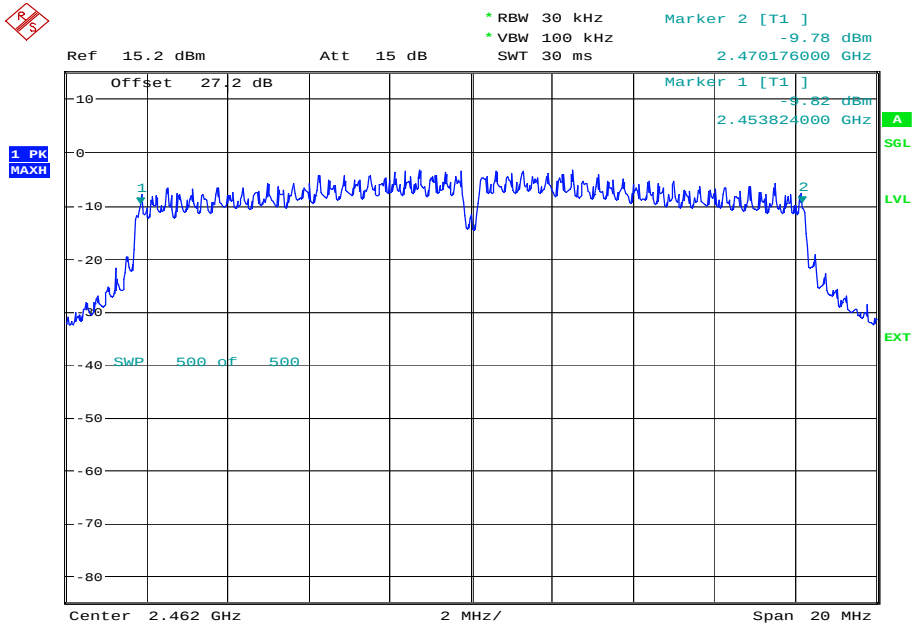
Date: 30.SEP.2011 11:23:02



Product Service

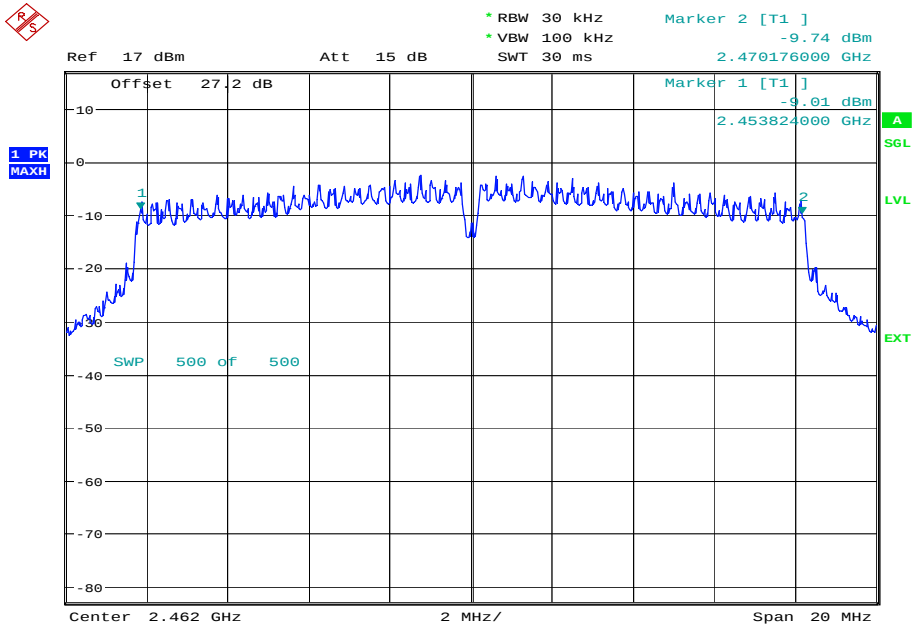
2462 MHz

6 Mbps



Date: 29.SEP.2011 16:41:05

9 Mbps

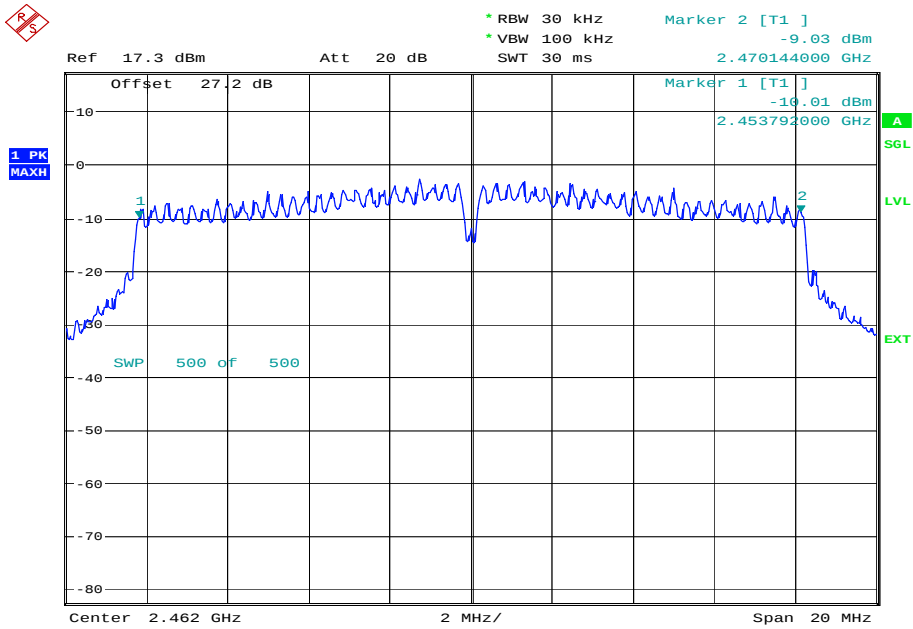


Date: 29.SEP.2011 17:00:25



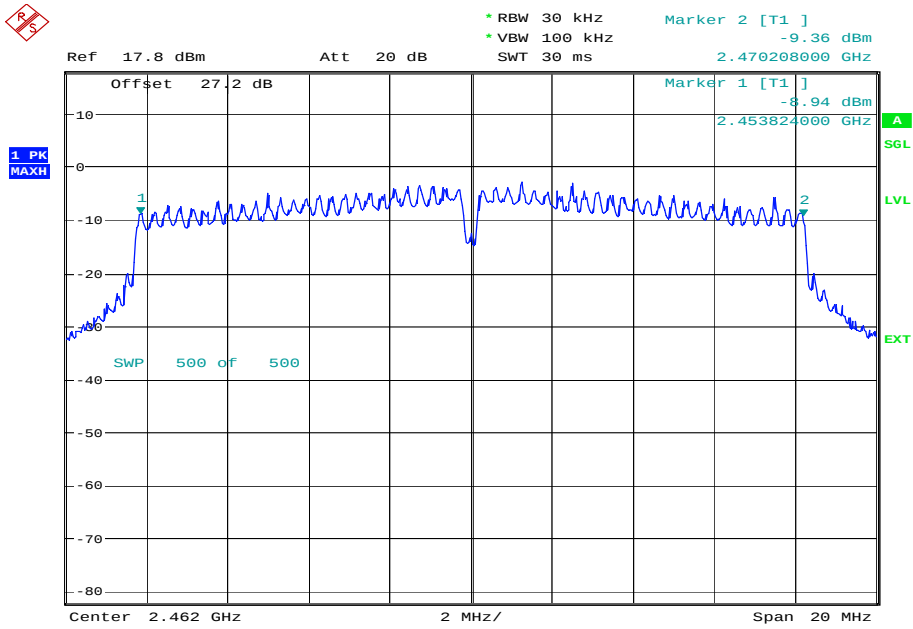
Product Service

12 Mbps



Date: 29.SEP.2011 17:19:45

18 Mbps

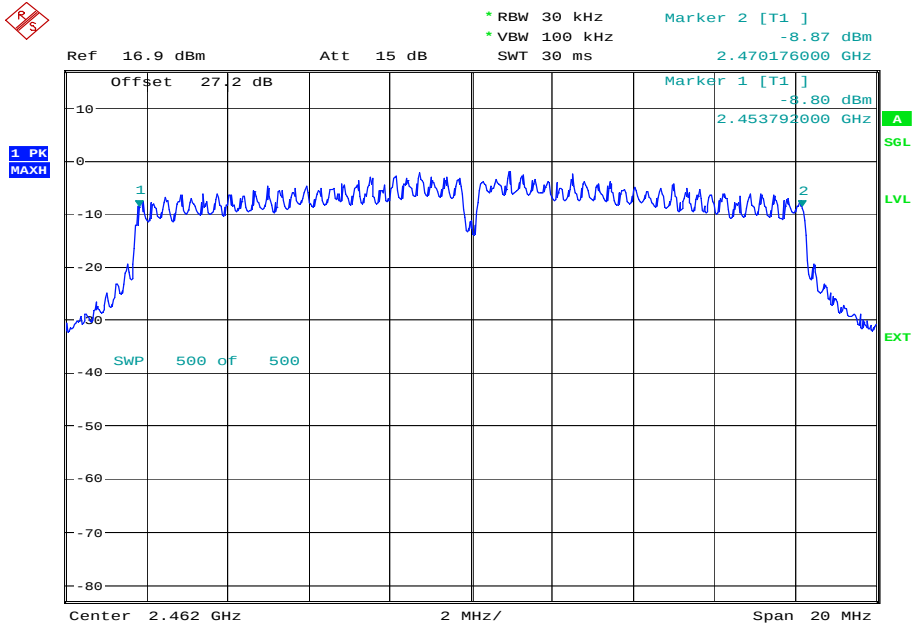


Date: 30.SEP.2011 09:54:41



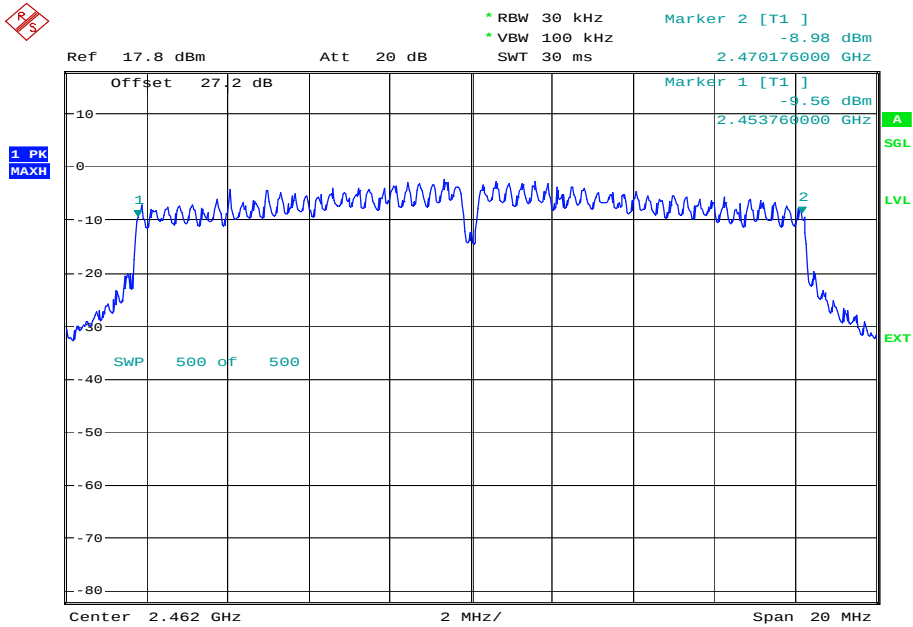
Product Service

24 Mbps



Date: 30.SEP.2011 10:15:55

36 Mbps

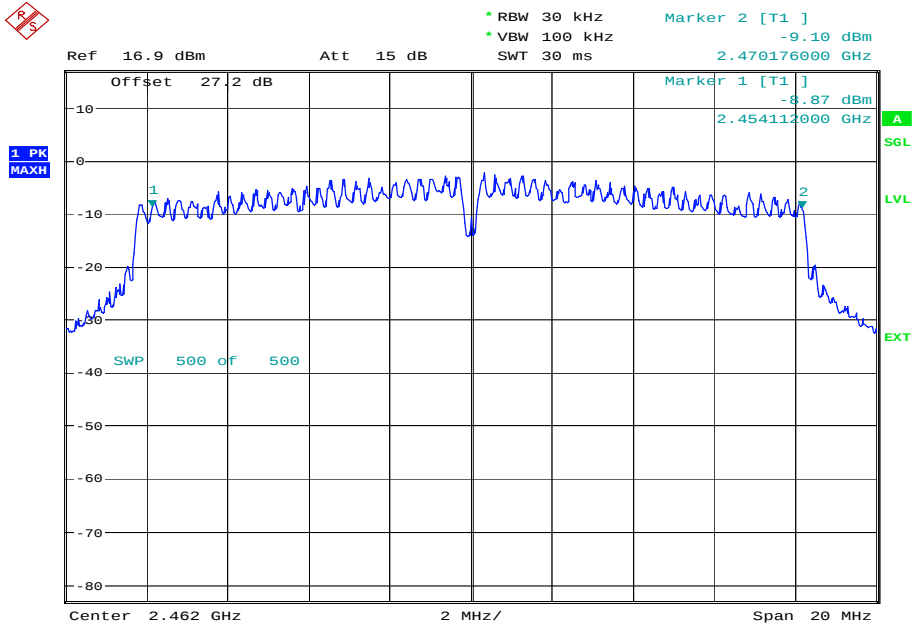


Date: 30.SEP.2011 10:34:09



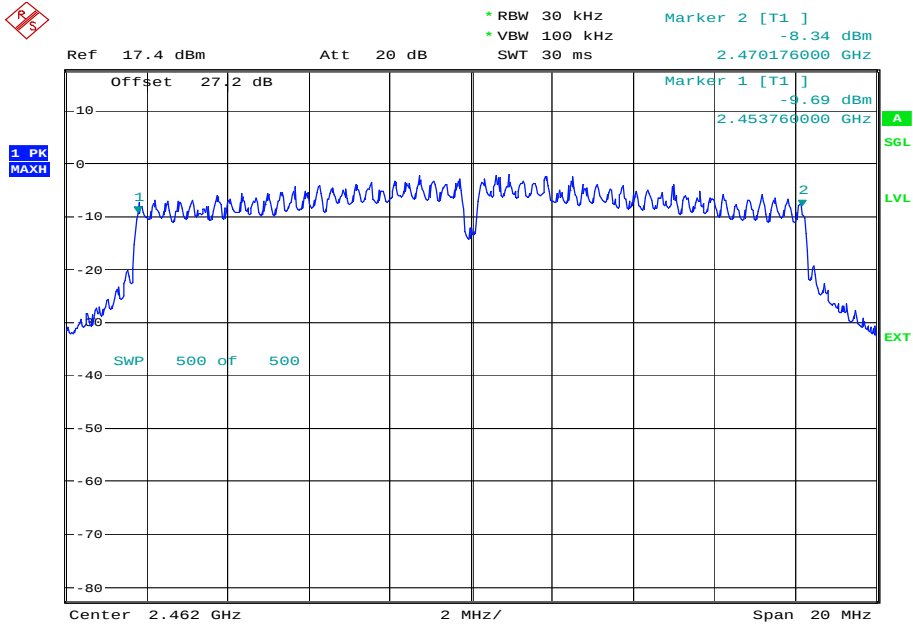
Product Service

48 Mbps



Date: 30.SEP.2011 10:55:15

54 Mbps



Date: 30.SEP.2011 11:30:33

Limit Clause

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

802.11(n)

4.0 V DC Supply

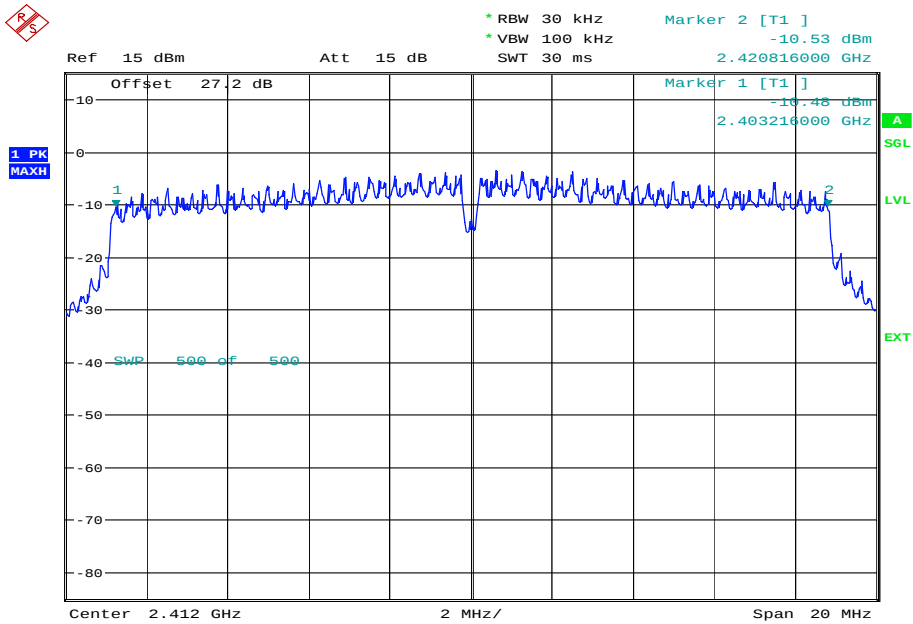
Frequency (MHz)	Data Rate (Mbps)	6dB Bandwidth (kHz)
2412 MHz	6.5	17600
	13	17344
	19.5	17632
	26	17344
	39	17312
	52	17632
	58.5	17664
	65	17600
2437 MHz	6.5	17664
	13	17664
	19.5	17632
	26	17632
	39	17280
	52	17664
	58.5	17600
	65	17664
2462 MHz	6.5	17600
	13	17280
	19.5	17696
	26	17696
	39	17664
	52	17696
	58.5	17696
	65	17568



Product Service

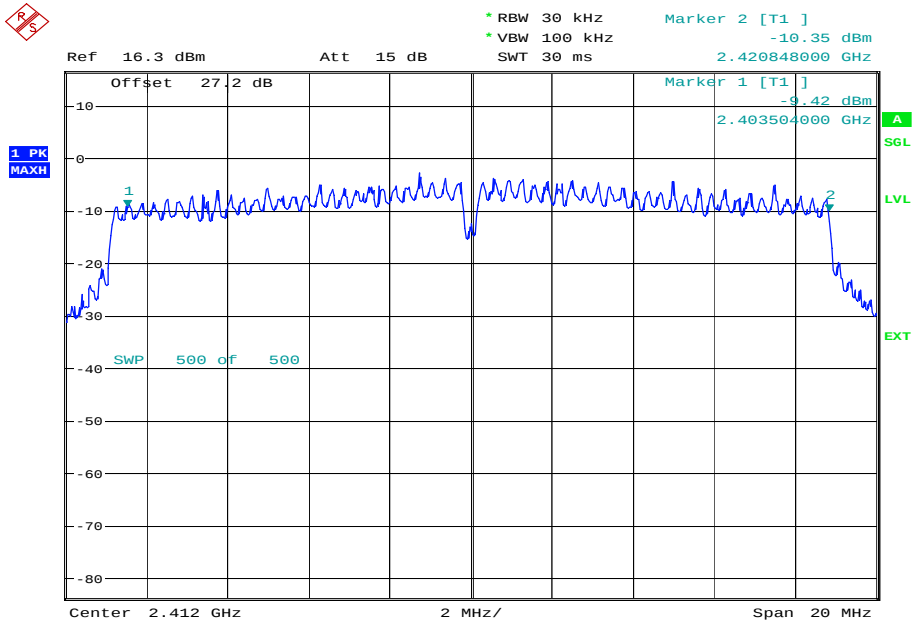
2412 MHz

6.5 Mbps



Date: 30.SEP.2011 11:38:22

13 Mbps

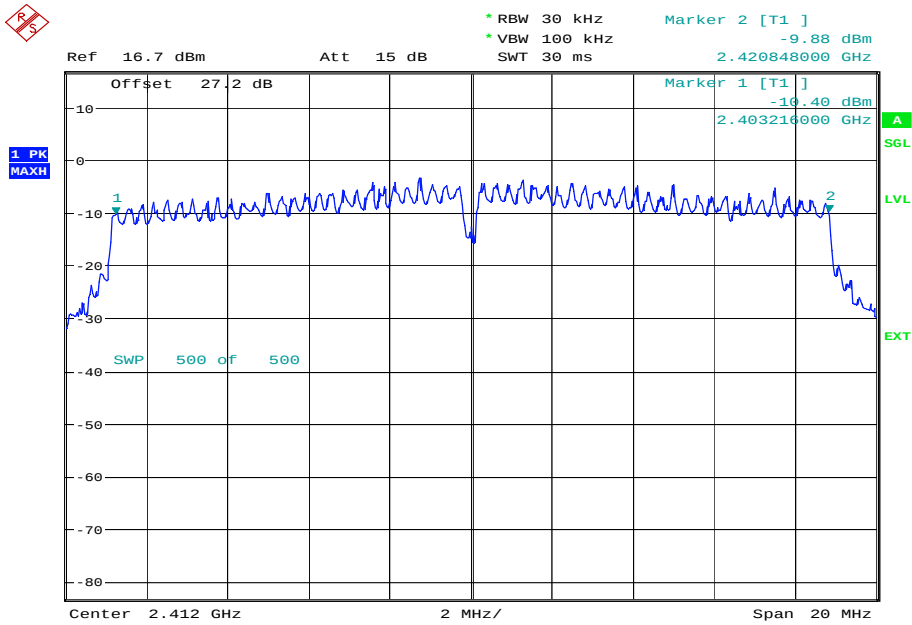


Date: 30.SEP.2011 12:02:24



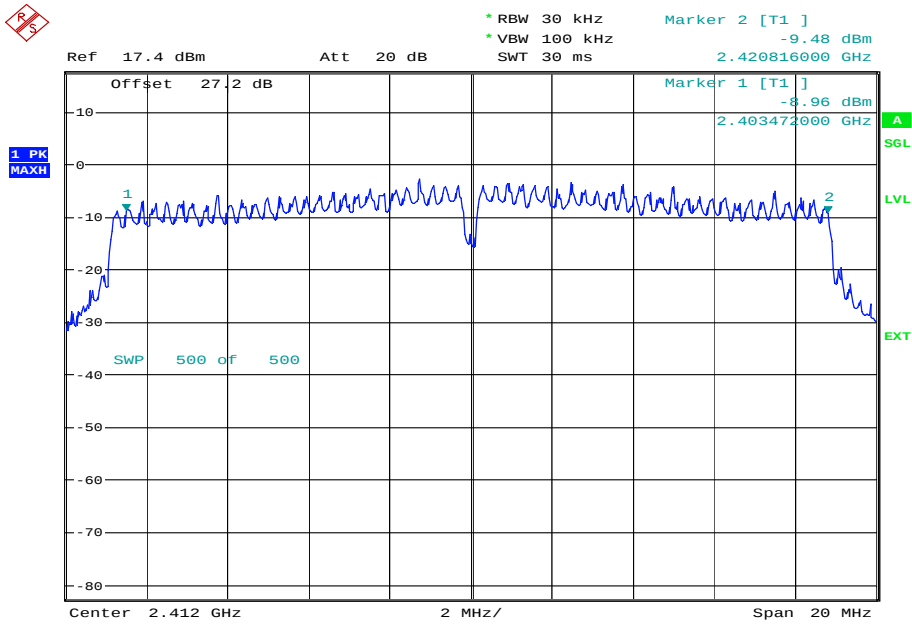
Product Service

19.5 Mbps



Date: 30.SEP.2011 12:19:27

26 Mbps

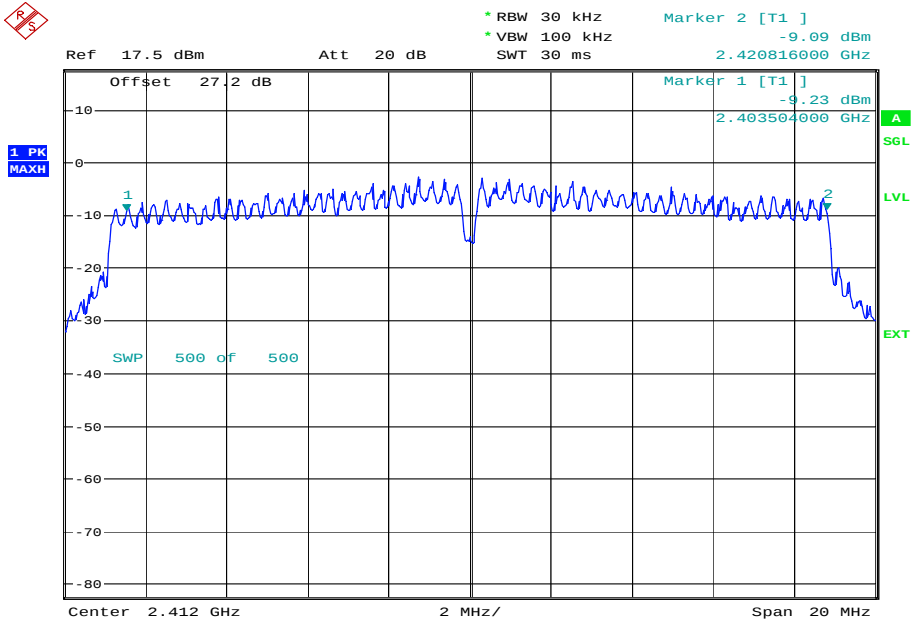


Date: 30.SEP.2011 14:36:41



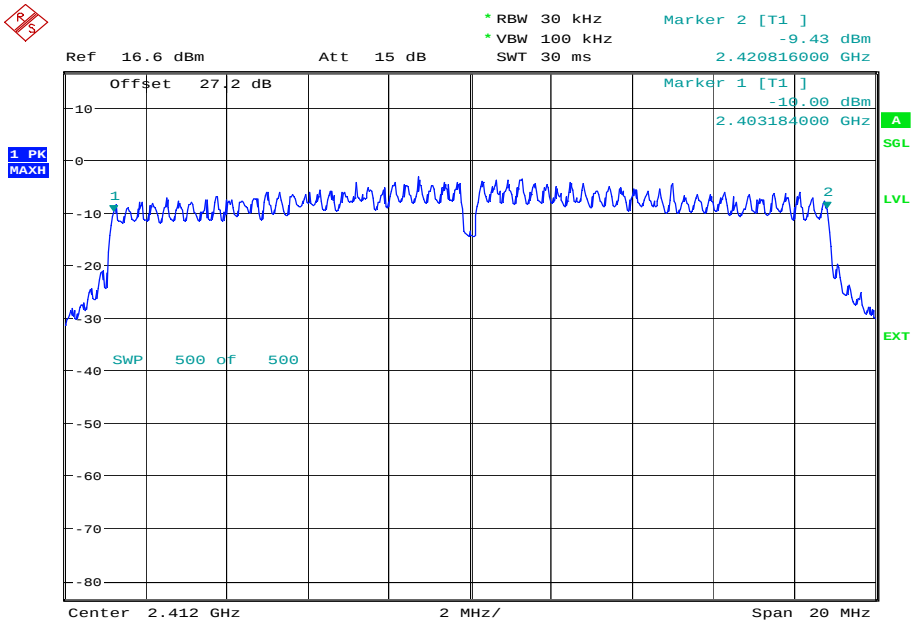
Product Service

39 Mbps



Date: 30.SEP.2011 14:59:03

52 Mbps

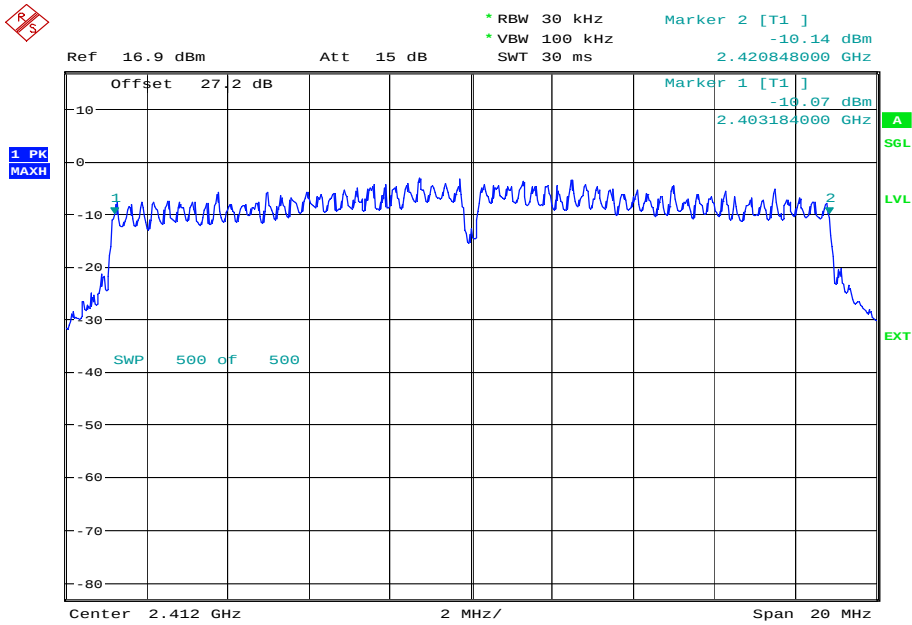


Date: 30.SEP.2011 15:20:55



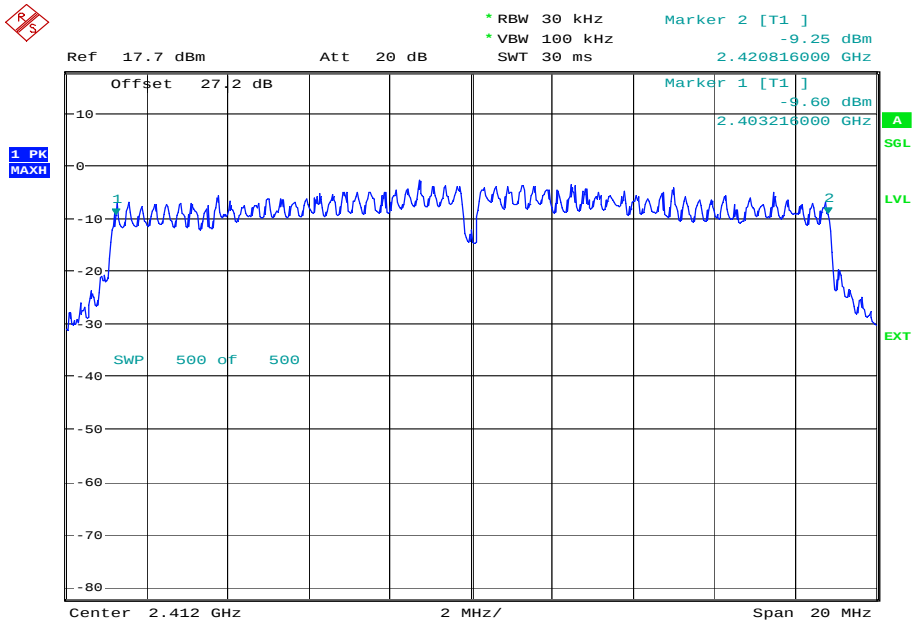
Product Service

58.5 Mbps



Date: 30.SEP.2011 15:45:27

65 Mbps



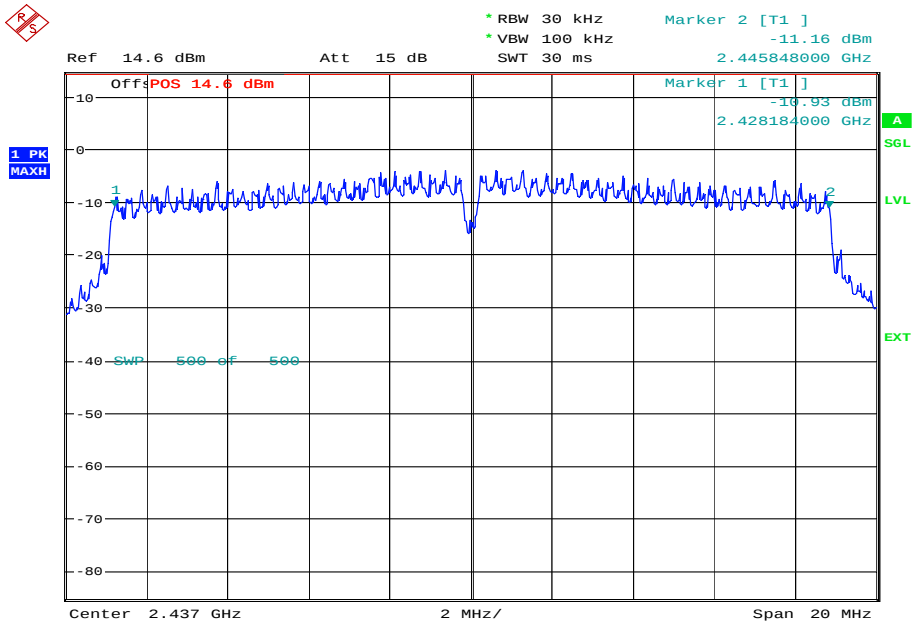
Date: 30.SEP.2011 16:04:04



Product Service

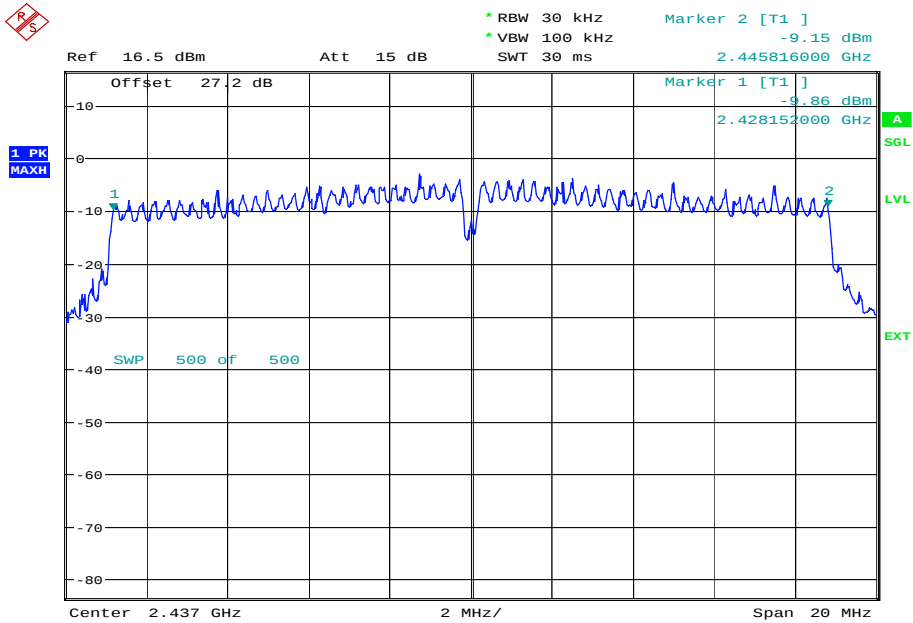
2437 MHz

6.5 Mbps



Date: 30.SEP.2011 11:48:57

13 Mbps

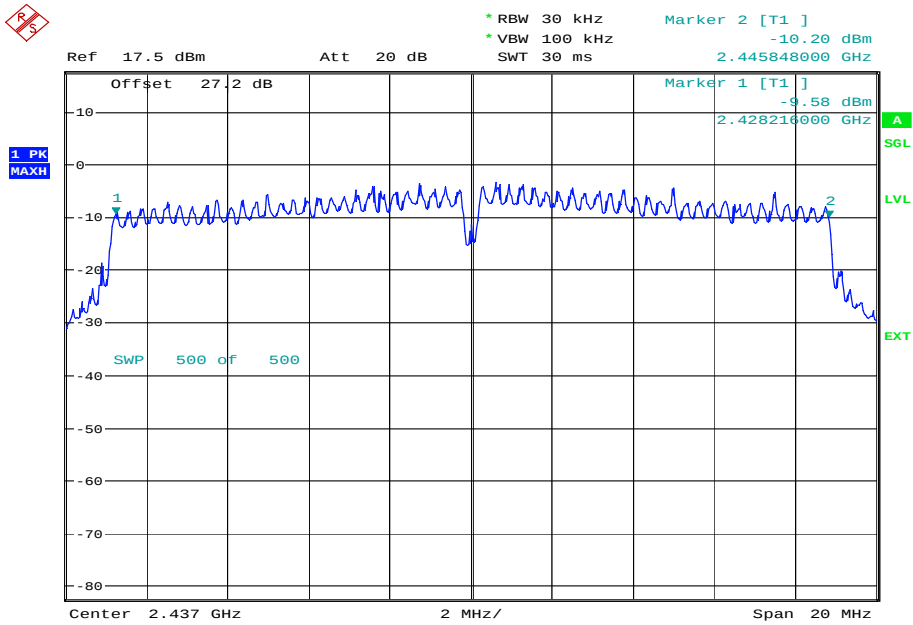


Date: 30.SEP.2011 12:07:14



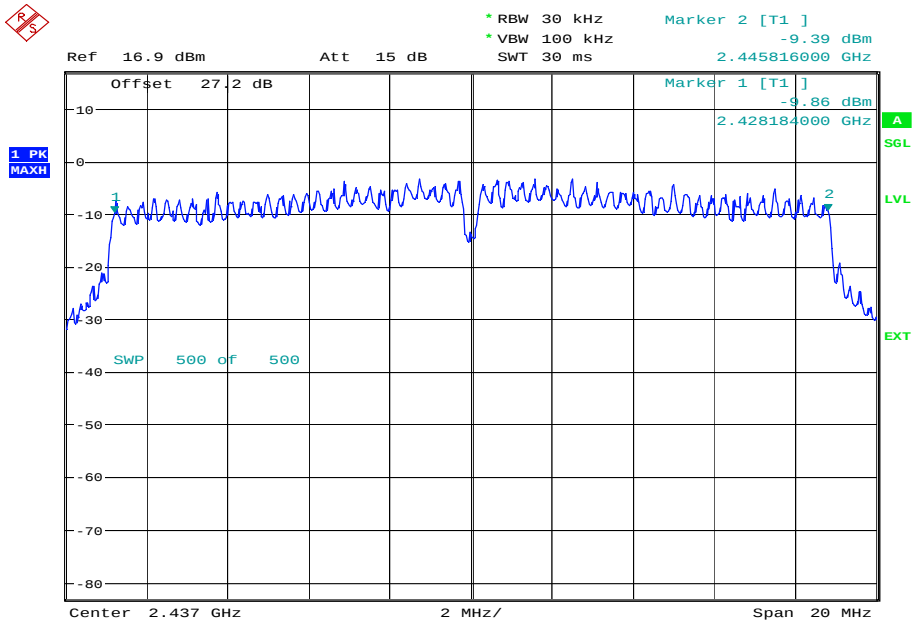
Product Service

19.5 Mbps



Date: 30.SEP.2011 12:28:30

26 Mbps

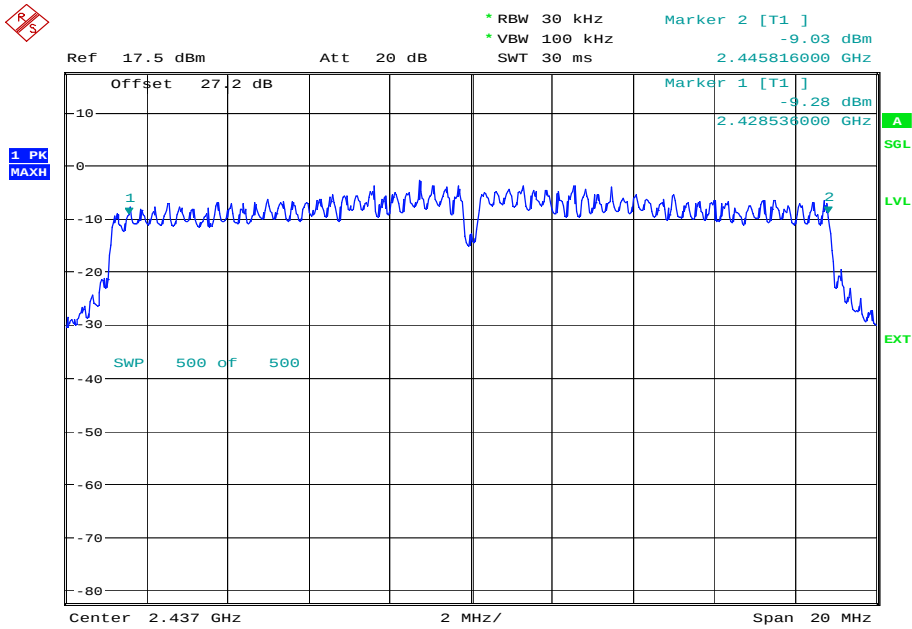


Date: 30.SEP.2011 14:44:07



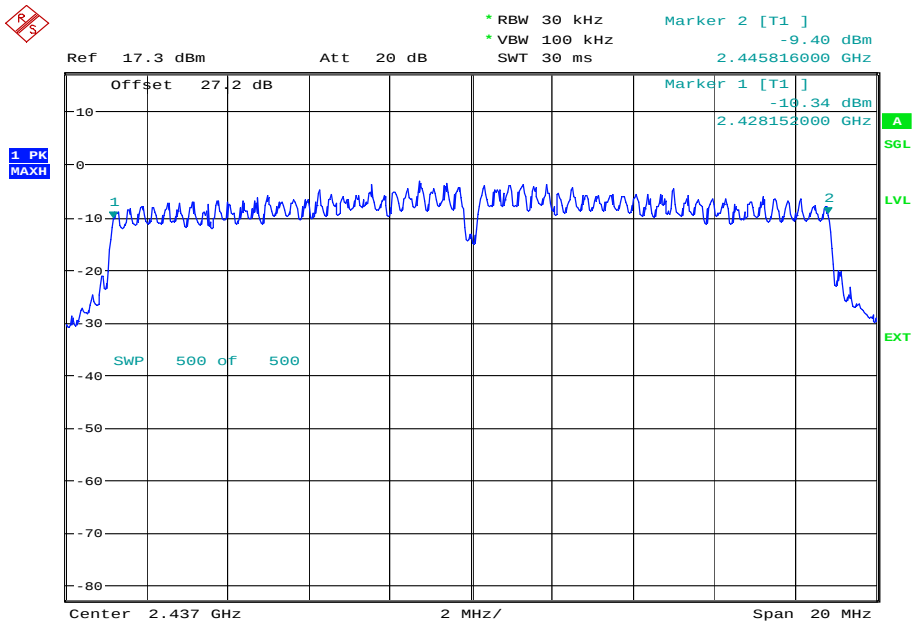
Product Service

39 Mbps



Date: 30.SEP.2011 15:04:41

52 Mbps

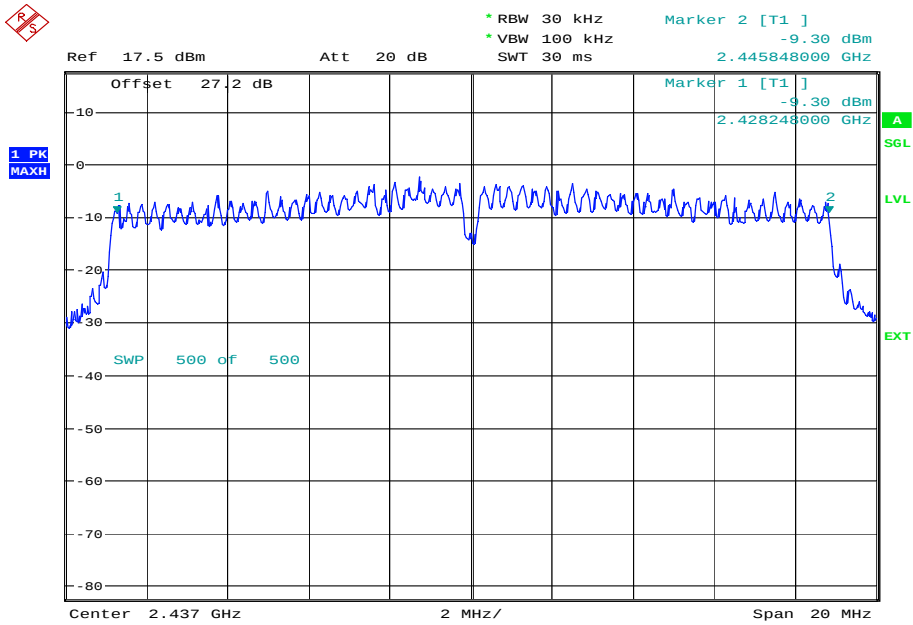


Date: 30.SEP.2011 15:31:19



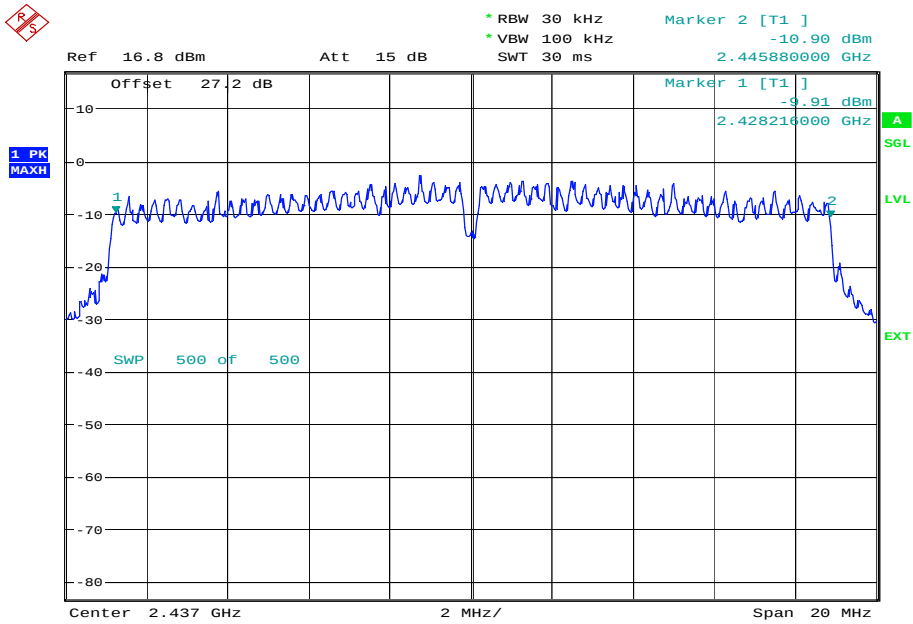
Product Service

58.5 Mbps



Date: 30.SEP.2011 15:50:29

65 Mbps



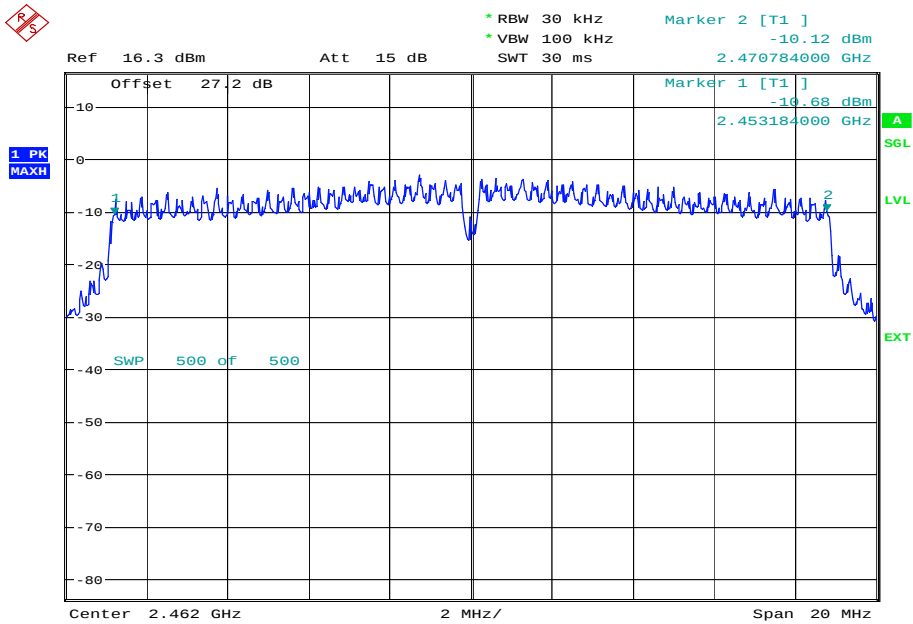
Date: 30.SEP.2011 16:09:23



Product Service

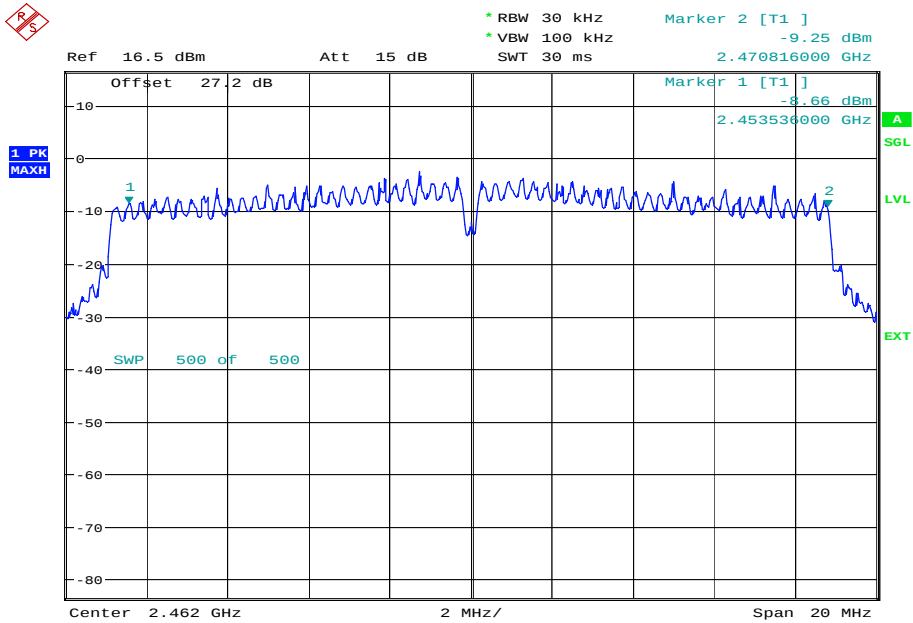
2462 MHz

6.5 Mbps



Date: 30.SEP.2011 11:55:48

13 Mbps

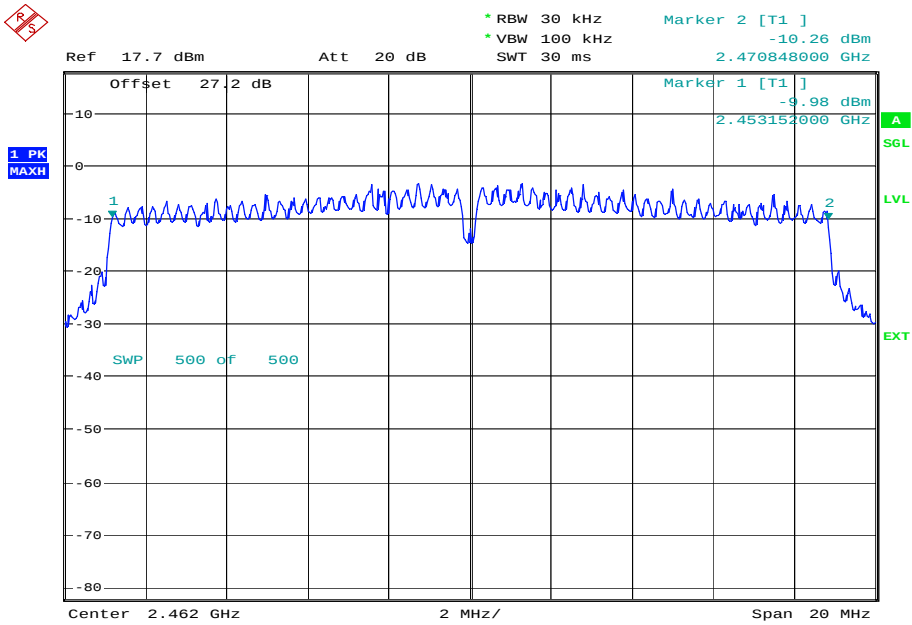


Date: 30.SEP.2011 12:12:33



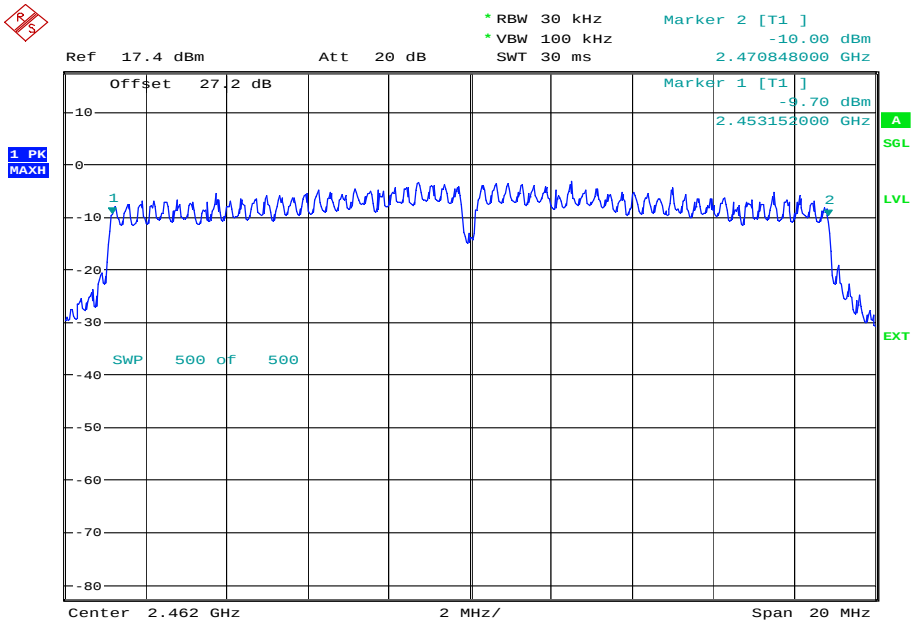
Product Service

19.5 Mbps



Date: 30.SEP.2011 12:51:06

26 Mbps

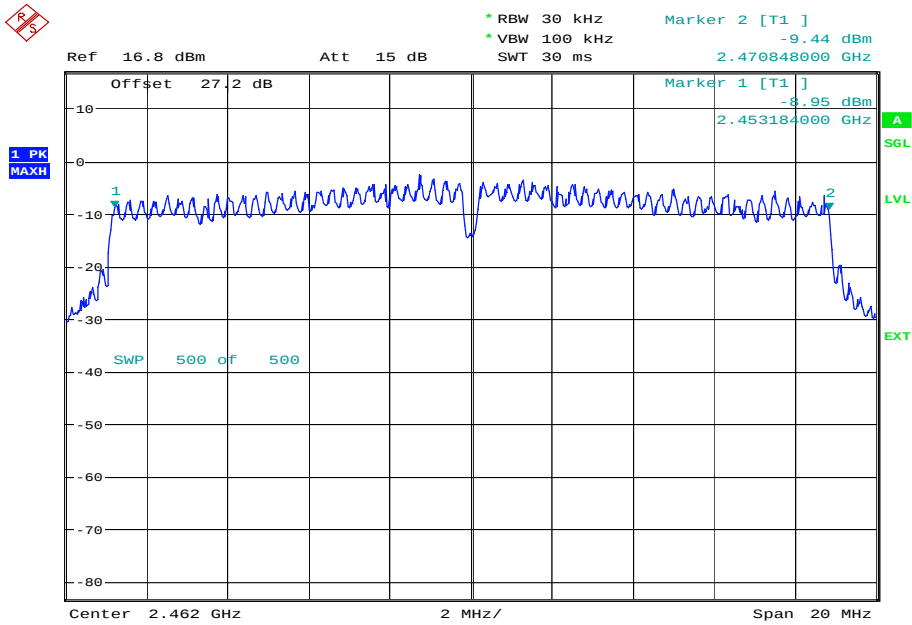


Date: 30.SEP.2011 14:50:01



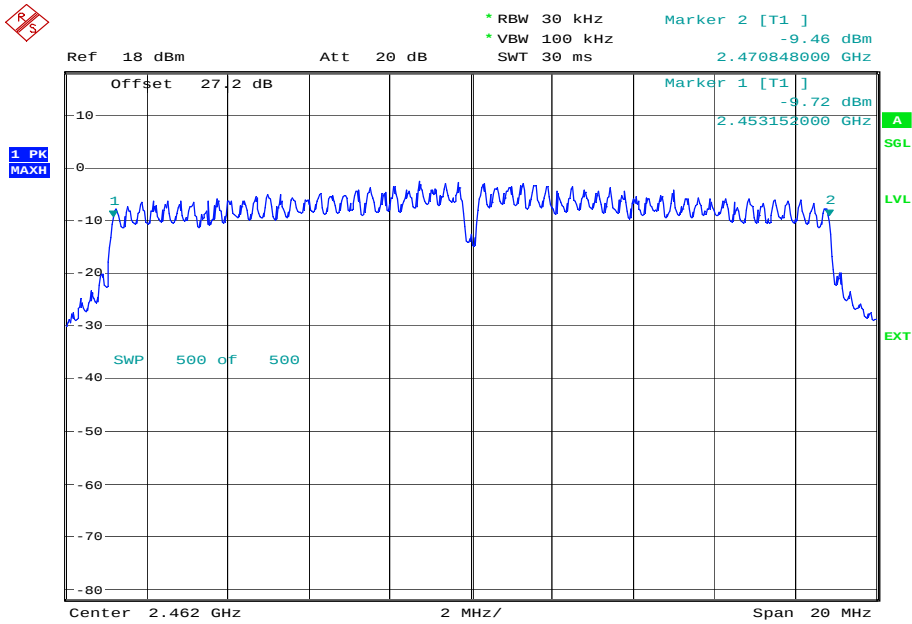
Product Service

39 Mbps



Date: 30.SEP.2011 15:15:15

52 Mbps

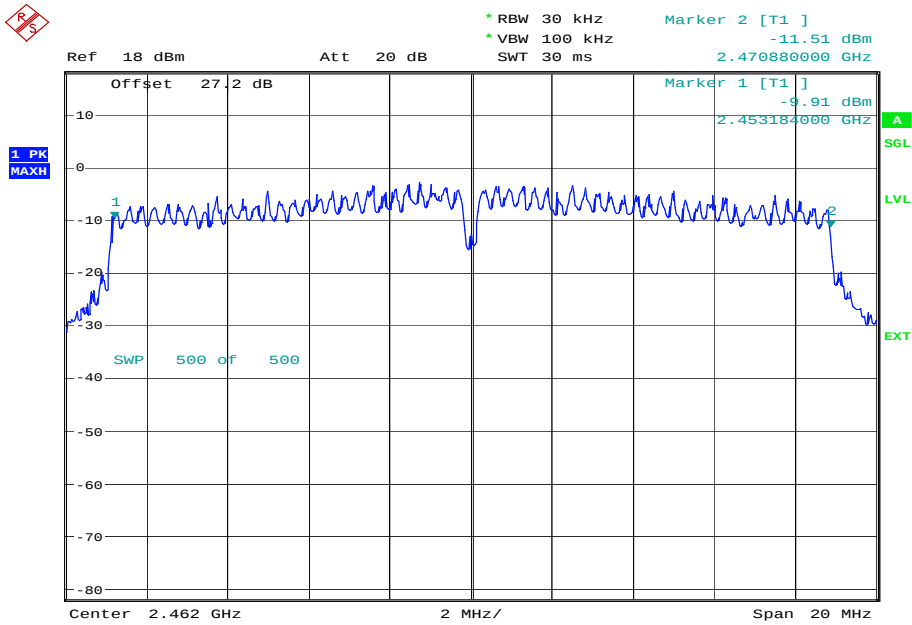


Date: 30.SEP.2011 15:38:20



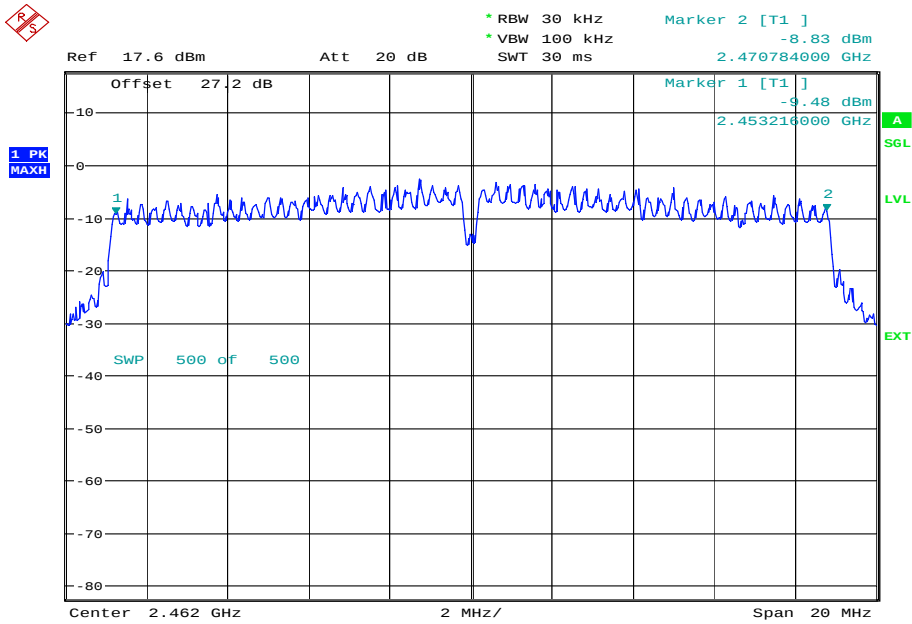
Product Service

58.5 Mbps



Date: 30.SEP.2011 15:56:36

65 Mbps



Date: 30.SEP.2011 16:15:26

Limit Clause

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



Product Service

SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

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

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 - Maximum Peak Conducted Output Power					
Antenna (Double Ridge Guide)	EMCO	3115	34	12	22-Jul-2012
Spectrum Analyser	Rohde & Schwarz	FSEM	37	12	18-Apr-2012
Signal Generator	Hewlett Packard	ESG4000A	38	12	18-May-2012
Signal Generator	Hewlett Packard	ESG4000A	61	12	18-May-2012
Power Meter	Hewlett Packard	436A	94	12	11-Oct-2011
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Multimeter	White Gold	WG022	190	12	26-Oct-2011
30V/5A Power Supply	Farnell	L30-5	191	-	O/P Mon
Load (50ohm, 30W)	Weinschel	50T-054	350	12	9-Jun-2012
Temperature Chamber	Montford	2F3	467	-	O/P Mon
Broadband Resistive Power Divider	Weinschel	1506A	605	12	6-Sep-2012
Power Supply Unit	Farnell	D302T	609	-	O/P Mon
Multimeter	Fluke	79 Series III	611	12	5-Aug-2012
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	13-Mar-2012
Power Sensor	Hewlett Packard	8481A	1338	12	22-Dec-2011
Screened Room (8)	Rainford	Rainford	1548	-	TU
Multimeter	Iso-tech	IDM101	2419	12	14-Sep-2012
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	12-Nov-2011
Power Supply Unit	Weir	460	2754	-	TU
Hygrometer	Rotronic	I-1000	2882	12	5-Aug-2012
Attenuator (20dB, 2W)	Pasternack	PE 7004-20	2943	12	23-Mar-2012
Antenna (DRG Horn)	ETS-LINDGREN	3115	3125	12	27-Apr-2012
Thermocouple Thermometer	Fluke	51	3172	12	23-Jul-2012
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
Power Divider	Weinschel	1506A	3345	12	4-May-2012
ESA-E Series Spectrum Analyser	Agilent	E4402B	3348	12	6-Jun-2012
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2011
Power Meter	Rohde & Schwarz	NRP	3491	12	19-Apr-2012
Wideband Power Sensor, 50MHz - 18GHz	Rohde & Schwarz	NRP-Z81	3492	12	19-Apr-2012
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	28-Jan-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	11-Jan-2012
DC - 12.4 GHz 10 dB Attenuator 1 W	Suhner	6810.17.A	3964	12	24-Jun-2012
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	24-Jun-2012
P-Series Power Meter	Agilent	N1911A	3980	12	12-Sep-2012
P-Series Power Meter	Agilent	N1911A	3981	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3982	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3983	12	12-Sep-2012



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.2 – EIRP Peak Power					
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
Screened Room (5)	Rainford	Rainford	1545	36	3-Feb-2014
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2011
Signal Generator, 9kHz to 3GHz	Rohde & Schwarz	SMA 100A	3494	12	25-Jan-2012
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	19-Sep-2011
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	26-Aug-2012
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
Section 2.3 - Power Spectral Density					
Power Divider	Weinschel	1506A	3345	12	4-May-2012
ESA-E Series Spectrum Analyser	Agilent	E4402B	3348	12	6-Jun-2012
'2.92mm' - '2.92mm' RF Cable (2m)	Rhophase	KPS-1503-2000-KPS	3694	12	TU
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	11-Jan-2012
Section 2.4 - Spurious and Band Edge Emissions					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	12-Nov-2011
Dual Power Supply Unit	Thurlby	PL320	288	-	TU
Antenna (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	2-Aug-2012
Pre-Amplifier	Phase One	PS04-0086	1533	12	20-Sep-2012
Pre-Amplifier	Phase One	PS04-0087	1534	12	26-Sep-2012
Screened Room (5)	Rainford	Rainford	1545	36	3-Feb-2014
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Test Receiver	Rohde & Schwarz	ESIB26	2085	12	14-Dec-2011
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
Comb Generator	Schaffner	RSG1000	3034	-	TU
Amplifier (1 - 8GHz)	Phase One	PS06-0060	3175	12	5-Jul-2012
Amplifier (8 - 18GHz)	Phase One	PS06-0061	3176	12	5-Jul-2012
Compliance 5 Emissions	Schaffner	C5e Software V.5.00.00	3275	-	N/A - Software
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2011
Signal Generator, 9kHz - 3GHz	Rohde & Schwarz	SMA 100A	3504	12	19-Aug-2012
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
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	26-Aug-2012
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
Low Noise Amplifier	Wright Technologies	APS04-0085	3969	12	8-Jul-2012



Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.5 - 6dB Bandwidth					
Load (50ohm, 30W)	Weinschel	50T-054	350	12	9-Jun-2012
Broadband Resistive Power Divider	Weinschel	1506A	605	12	6-Sep-2012
Power Supply Unit	Farnell	D302T	609	-	O/P Mon
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	13-Mar-2012
Multimeter	Iso-tech	IDM101	2419	12	14-Sep-2012
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	12-Nov-2011
Attenuator (20dB, 2W)	Pasternack	PE 7004-20	2943	12	23-Mar-2012
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2011
Power Meter	Rohde & Schwarz	NRP	3491	12	19-Apr-2012
Wideband Power Sensor, 50MHz - 18GHz	Rohde & Schwarz	NRP-Z81	3492	12	19-Apr-2012

TU – Traceability Unscheduled

O/P MON – Output Monitored with Calibrated Equipment



3.2 MEASUREMENT UNCERTAINTY

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

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



Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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

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

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

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