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# Report On

Limited FCC Testing of the Sharp CDMA SHI16 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) Multi Mode Cellular Phone with Bluetooth, WLAN, WiMAX, NFC (FeliCa) and GPS In accordance with FCC CFR 47 Part 15C (WLAN)

COMMERCIAL-IN-CONFIDENCE

FCC ID: APYHRO00172

Document 75917214 Report 10 Issue 1 June 2012

Product Service

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**REPORT ON**

Limited FCC Testing of the
Sharp CDMA SHI16 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) Multi Mode Cellular Phone with Bluetooth, WLAN, WiMAX, NFC (FeliCa) and GPS
In accordance with FCC CFR 47 Part 15C (WLAN)

Document 75917214 Report 10 Issue 1

June 2012

**PREPARED FOR**

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**PREPARED BY**

**Natalie Bennett**
Senior Administrator (Technical)

**APPROVED BY**

**Mark Jenkins**
Authorised Signatory

**DATED** 15 June 2012

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);

G Lawler B Airs S Bennett

Product Service

**CONTENTS**

Product Service

**SECTION 1**

**REPORT SUMMARY**

Limited FCC Testing of the
Sharp CDMA SHI16 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) Multi Mode Cellular Phone with Bluetooth, WLAN, WiMAX, NFC (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 the Limited FCC Testing of the Sharp CDMA SHI16 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) Multi Mode Cellular Phone with Bluetooth, WLAN, WiMAX, NFC (FeliCa) and GPS to the requirements of FCC CFR 47 Part 15C.

| | |
|---|---|
| Objective | To perform Limited 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 SHI16 |
| Serial Number(s) | IMEI 004401113862672<br>IMEI 004401113852657<br>IMEI 004401113851006 |
| Number of Samples Tested | 3 |
| Test Specification/Issue/Date | FCC CFR 47 Part 15C (2011) |
| Incoming Release<br>Date | Application Form<br>29 March 2012 |
| Disposal<br>Reference Number<br>Date | Held Pending Disposal<br>Not Applicable<br>Not Applicable |
| Order Number<br>Date | 9096<br>29 March 2012 |
| Start of Test | 13 May 2012 |
| Finish of Test | 13 June 2012 |
| Name of Engineer(s) | G Lawler<br>B Airs<br>S Bennett |
| Related Document(s) | ANSI C63.10: 2009 |

Product Service

## 1.2 BRIEF SUMMARY OF RESULTS

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

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

Product Service

## 1.3 APPLICATION FORM

| EQUIPMENT DESCRIPTION | | |
|---|---|---|
| Model Name/Number | CDMA SHI16 | |
| Part Number | | |
| FCC ID (if applicable) | APYHRO00172 | |
| Industry Canada ID (if applicable) | | |
| Technical Description (Please provide a brief description of the intended use of the equipment) | Dual-Band CDMA(800MHz_BC0, 1900MHz_BC6) and Tri-Band GSM (GSM900MHz, DCS1800MHz, PCS1900MHz) and Dual-band UMTS (2100MHz_FDDI, 850MHz_FDDV) Tri- Mode Cellular Phone with WIMAX, Bluetooth, W-LAN, NFC/ 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 1512.0 MHz | | |

Product Service

| 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: Japan only) |
| | Receiver (Rx) | Yes | (No: Japan only) |
| GI (Guard Interval) ☒ 800 ns ☐ 400 ns | | | |
| Band Width ☒ 20 MHz ☐ 40 MHz | | | |
| ☐ | **Other Technology** | | |
| Direct Sequence ☐ Frequency Hopping ☐ Combined ☐ Other | | | |
| DSSS | Chip Sequence Length | bit | |
| | Spectrum Width | MHz | |
| FHSS | Total Number of Hops | | |
| | Dwell Time | ms | |
| | Bandwidth Per Hop | MHz | |
| | Maximum Separation of Hops | MHz for ETSI EN 300 328 | |
| Other | | | |
| **Medium Access Protocol (Customer Declaration)** | | | |
| "We have implemented IEEE 802.11 (b/g/n) protocol which satisfies the medium access protocol requirement of EN 300 328". | | | |

Product Service

| TRANSMITTER POWER CHARACTERSITICS | | | | | | | |
|---|---|---|---|---|---|---|---|
| **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) | 0.046 (b/0.02(g.n) | W | | | | | |
| Effective radiated power (for equipment with integral antenna) | 0.046 (b/0.02(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 | | | | | | | |

Product Service

| TRANSMITTER POWER SOURCE (3) | | | | | |
|---|---|---|---|---|---|
| ☒ Common power source for transmitter and receiver | | | | | |
| ☐ AC mains | | State voltage | | | |
| AC supply frequency | (Hz) | VAC | | Max Current | Hz |
| ☐ Single phase | | | ☐ Three phase | | |
| And / Or | | | | | |
| ☐ External DC supply | | | | | |
| Nominal voltage | | | Max Current | | A |
| Extreme upper voltage | | | Extreme lower voltage | | |
| Battery | | | | | |
| ☐ Nickel Cadmium | | | | | |
| ☐ Lead acid (Vehicle regulated) | | | | | |
| ☐ Alkaline | | | | | |
| ☒ Lithium | | | | | |
| ☐ Other Details : | | | | | |
| 4.0 Volts nominal. | | | | | |
| End point voltage as quoted by equipment manufacturer | | | 3.8 | V | |

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

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

Product Service

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

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

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

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

Signature: Toshiro Shiomi Name: Toshiroh Shiomi

Position held: Manager Date: 29th March,2012

## 1.4 PRODUCT INFORMATION

### 1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp CDMA SHI16 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) Multi Mode Cellular Phone with Bluetooth, WLAN, WiMAX, NFC (FeliCa) and GPS. A full technical description can be found in the manufacturer's documentation.

## 1.5 TEST CONDITIONS

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

The EUT was powered from a 4.0 V DC supply.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

## 1.6 DEVIATIONS FROM THE STANDARD

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

## 1.7 MODIFICATION RECORD

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

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**SECTION 2**

**TEST DETAILS**

Limited FCC Testing of the
Sharp CDMA SHI16 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) Multi Mode Cellular Phone with Bluetooth, WLAN, WiMAX, NFC (FeliCa) and GPS
In accordance with FCC CFR 47 Part 15C (WLAN)

## 2.1 AC LINE CONDUCTED EMISSIONS

### 2.1.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.207

### 2.1.2 Equipment Under Test and Modification State

CDMA SHI16 S/N: IMEI 004401113862672 - Modification State 0

### 2.1.3 Date of Test

11 June 2012

### 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 is set up on a test table 800mm above a horizontal ground plane. A vertical ground plane is also required and is placed 400mm from the EUT. Where a EUT is floor standing it will be stood on but insulated from the ground plane by up to 12mm.

The EUT is powered through a Line Impedance Stabilisation Network (LISN) which is bonded to the ground plane. The EUT is located so that the distance between the EUT and the LISN is no less than 800mm. Where possible the cable between the mains input of the EUT and the LISN is 1m. Where this is not possible the cable is non inductively bundled with the bundle not exceeding 400mm in length.

A preliminary profile of the Conducted Emissions is obtained over the frequency range 150kHz to 30MHz. Any points of interest are noted for formal measurements.

During formal measurements, the measuring receiver is tuned to the emission of interest where Quasi – Peak and Average measurements are performed in a 9kHz Video and Resolution Bandwidth.

### 2.1.6 Environmental Conditions

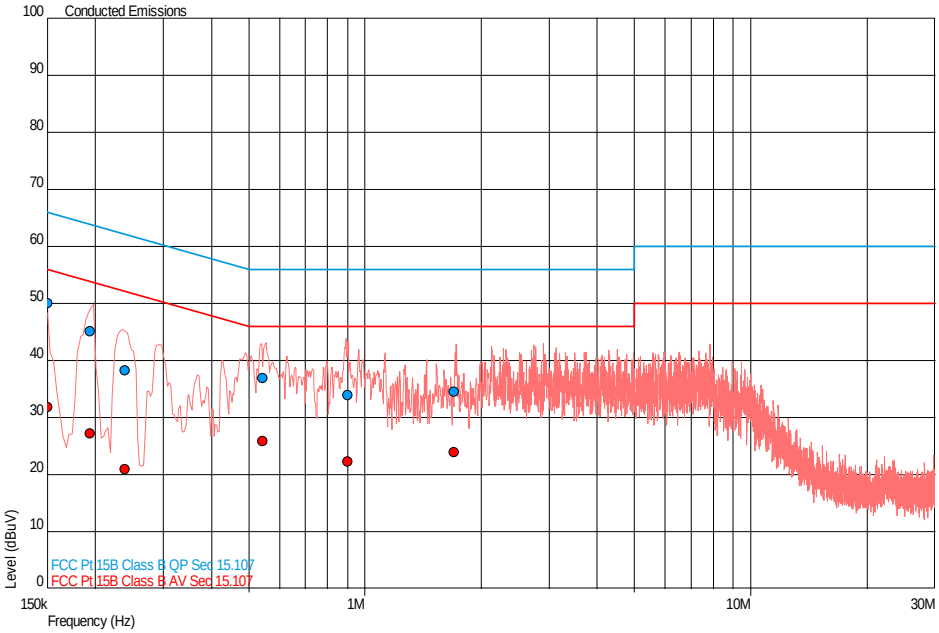
| | |
|---|---|
| Ambient Temperature | 20.1°C |
| Relative Humidity | 48.0% |

Product Service

### 2.1.7 Test Results

802.11(b)

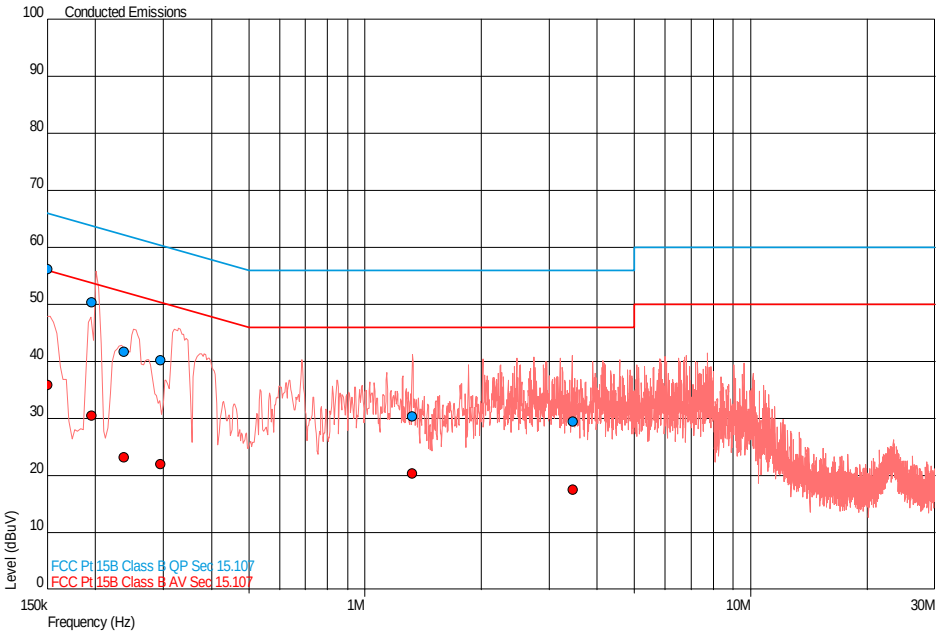
Live Line




| Frequency (MHz) | QP Level (dBµV) | QP Limit (dBµV) | QP Margin (dBµV) | AV Level (dBµV) | AV Limit (dBµV) | AV Margin (dBµV) | |
|---|---|---|---|---|---|---|---|
| 0.150 | 50.1 | 66.0 | -15.9 | 31.8 | 56.0 | -24.2 | |
| 0.194 | 45.1 | 63.9 | -18.7 | 27.2 | 53.9 | -26.7 | |
| 0.238 | 38.3 | 62.2 | -23.8 | 20.9 | 52.2 | -31.2 | |
| 0.542 | 37.0 | 56.0 | -19.0 | 25.9 | 46.0 | -20.1 | |
| 0.900 | 33.9 | 56.0 | -22.1 | 22.4 | 46.0 | -23.6 | |
| 1.701 | 34.6 | 56.0 | -21.4 | 23.9 | 46.0 | -22.1 | |

Product Service

Neutral Line




| Frequency (MHz) | QP Level (dBµV) | QP Limit (dBµV) | QP Margin (dBµV) | AV Level (dBµV) | AV Limit (dBµV) | AV Margin (dBµV) | |
|---|---|---|---|---|---|---|---|
| 0.150 | 56.1 | 66.0 | -9.9 | 35.9 | 56.0 | -20.1 | |
| 0.195 | 50.4 | 63.8 | -13.4 | 30.5 | 53.8 | -23.3 | |
| 0.237 | 41.8 | 62.2 | -20.4 | 23.2 | 52.2 | -29.0 | |
| 0.296 | 40.2 | 60.4 | -20.2 | 22.1 | 50.4 | -28.3 | |
| 1.329 | 30.4 | 56.0 | -25.6 | 20.4 | 46.0 | -25.6 | |
| 3.461 | 29.4 | 56.0 | -26.6 | 17.5 | 46.0 | -28.5 | |

## 2.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER

### 2.2.1 Specification Reference

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

### 2.2.2 Equipment Under Test and Modification State

CDMA SHI16 S/N: IMEI 004401113852657 - Modification State 0

### 2.2.3 Date of Test

17 May 2012, 18 May 2012 & 21 May 2012

### 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 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.

### 2.2.6 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 24.8°C |
| Relative Humidity | 22.2% |

Product Service

### 2.2.7 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 | 18.48 | 18.73 | 17.90 | 70.469 | 74.645 | 61.660 |
| 2 | 18.56 | 18.83 | 16.20 | 71.779 | 76.384 | 41.687 |
| 5.5 | 18.25 | 18.8 | 16.23 | 66.834 | 75.858 | 41.976 |
| 11 | 18.80 | 18.85 | 16.56 | 75.858 | 76.736 | 45.290 |

Limit Clause

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

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

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

802.11(g)

4.0 V DC Supply

| Modulation Data Rate (Mbps) | Maximum Peak Conducted Output Power | | | | | |
|---|---|---|---|---|---|---|
| | dBm | | | mW | | |
| | 2412 MHz | 2437 MHz | 2462 MHz | 2412 MHz | 2437 MHz | 2462 MHz |
| 6 | 22.22 | 22.62 | 21.79 | 166.724 | 182.810 | 151.008 |
| 9 | 21.24 | 21.93 | 20.70 | 133.045 | 155.955 | 117.490 |
| 12 | 21.29 | 21.76 | 20.83 | 134.586 | 134.586 | 149.968 |
| 18 | 21.88 | 21.39 | 21.71 | 154.170 | 137.721 | 148.252 |
| 24 | 21.36 | 21.84 | 20.56 | 136.773 | 152.757 | 113.763 |
| 36 | 21.37 | 21.54 | 20.36 | 137.088 | 142.561 | 108.643 |
| 48 | 21.38 | 21.40 | 20.12 | 137.404 | 138.038 | 102.802 |
| 54 | 21.14 | 21.22 | 19.85 | 130.017 | 132.434 | 96.605 |

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 | 21.95 | 21.86 | 20.76 | 156.675 | 153.462 | 119.124 |
| 13 | 21.38 | 21.97 | 20.69 | 137.404 | 157.398 | 117.220 |
| 19.5 | 22.15 | 22.26 | 21.11 | 164.059 | 168.267 | 129.122 |
| 26 | 22.01 | 22.09 | 20.95 | 158.855 | 161.808 | 124.451 |
| 39 | 21.40 | 21.72 | 20.45 | 138.038 | 148.594 | 110.917 |
| 52 | 22.38 | 21.93 | 20.86 | 172.982 | 155.955 | 121.899 |
| 58.5 | 21.49 | 21.69 | 20.89 | 140.929 | 147.571 | 122.744 |
| 65 | 21.13 | 21.67 | 20.30 | 129.718 | 146.893 | 107.152 |

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.

## 2.3 EIRP PEAK POWER

### 2.3.1 Specification Reference

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

### 2.3.2 Equipment Under Test and Modification State

CDMA SHI16 S/N: IMEI 004401113851006 - Modification State 0

### 2.3.3 Date of Test

13 May 2012

### 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 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.

### 2.3.6 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 17.8°C |
| Relative Humidity | 35.0% |

Product Service

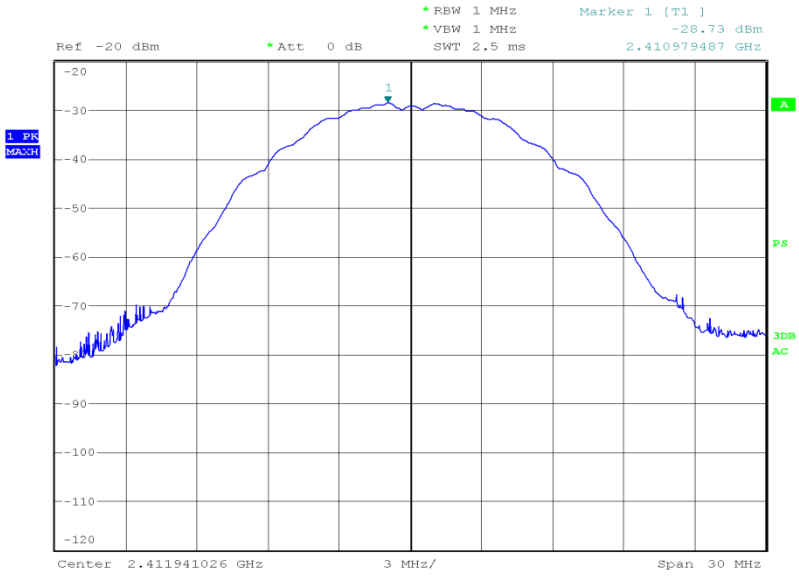
### 2.3.7 Test Results

802.11(b)

4.0 V DC Supply

2412 MHz

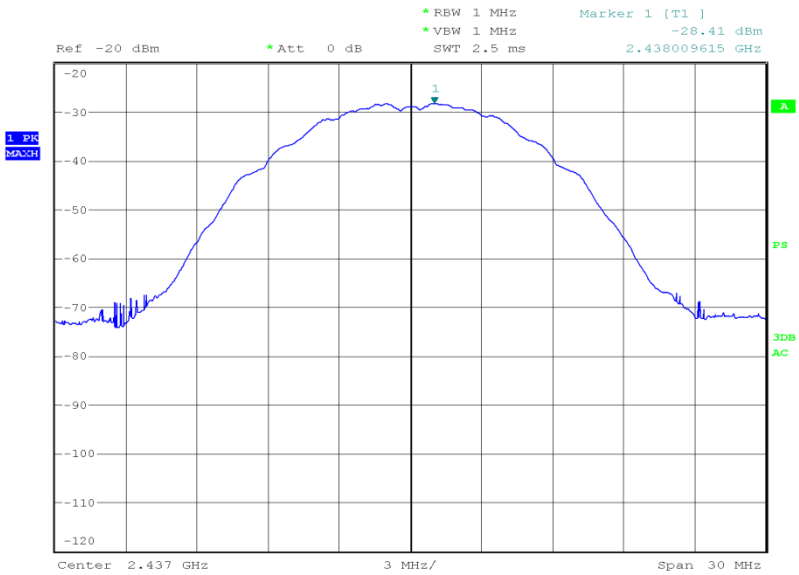
| EIRP (dBm) | EIRP (mW) |
|---|---|
| 20.71 | 117.76 |




Date: 12.MAY.2012 08:19:10

2437 MHz

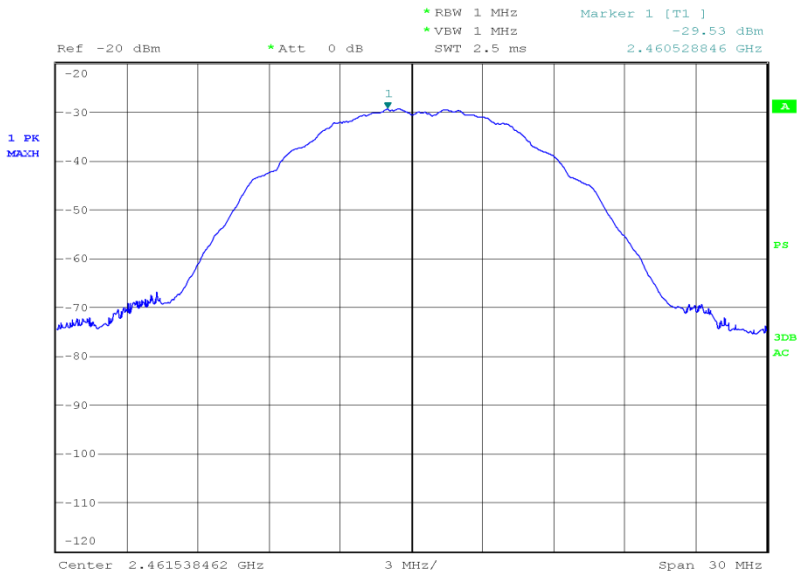
| EIRP (dBm) | EIRP (mW) |
|---|---|
| 20.57 | 114.02 |




Date: 12.MAY.2012 09:23:16

2462 MHz

| EIRP (dBm) | EIRP (mW) |
|---|---|
| 19.50 | 89.13 |




Date: 12.MAY.2012 10:01:33

Limit

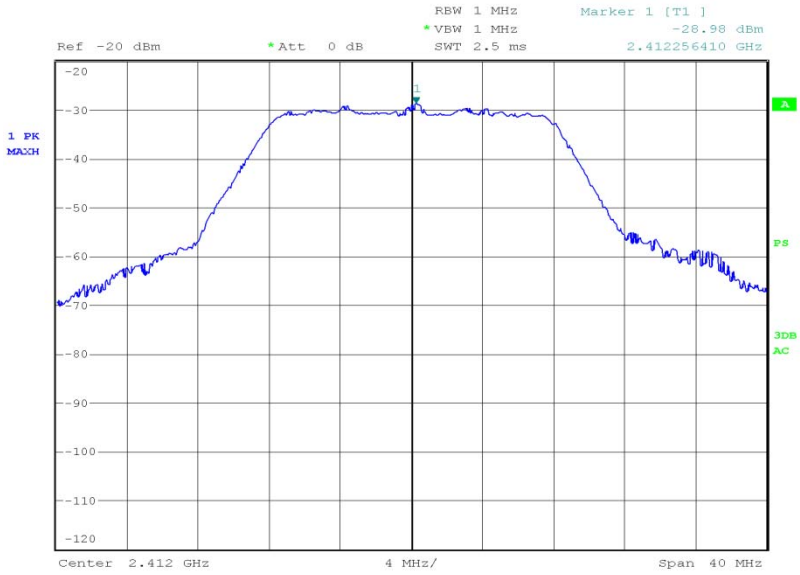
| EIRP (dBm) | EIRP (mW) |
|---|---|
| 36.0 | 4000 |

802.11(g)

4.0 V DC Supply

2412 MHz

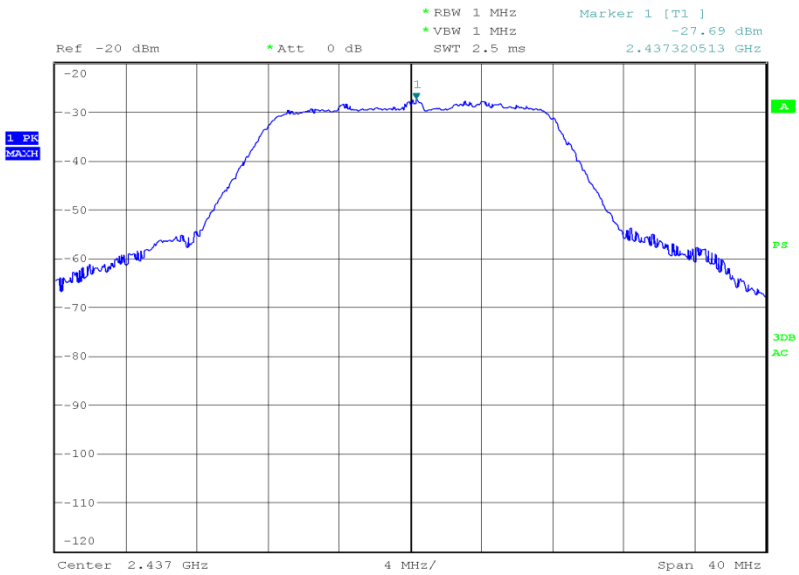
| EIRP (dBm) | EIRP (mW) |
|---|---|
| 24.06 | 254.68 |




Date: 13.MAY.2012 06:23:13

2437 MHz

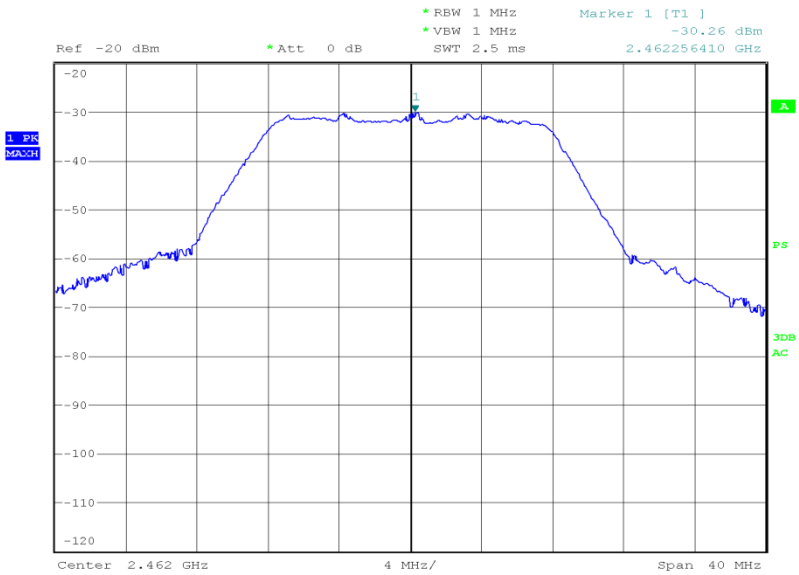
| EIRP (dBm) | EIRP (mW) |
|---|---|
| 24.34 | 271.64 |




Date: 13.MAY.2012 08:14:22

2462 MHz

| EIRP (dBm) | EIRP (mW) |
|---|---|
| 21.87 | 153.82 |




Date: 13.MAY.2012 08:08:15

Limit

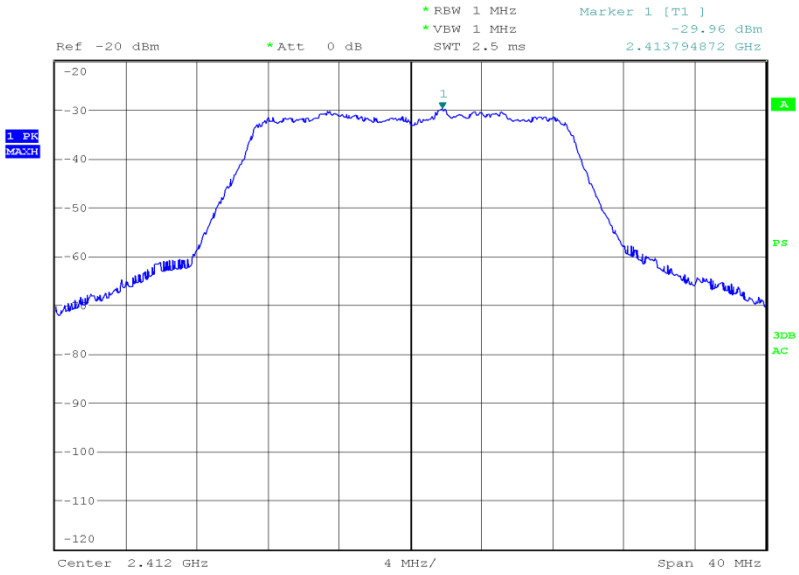
| EIRP (dBm) | EIRP (mW) |
|---|---|
| 36.0 | 4000 |

802.11(n)

4.0 V DC Supply

2412 MHz

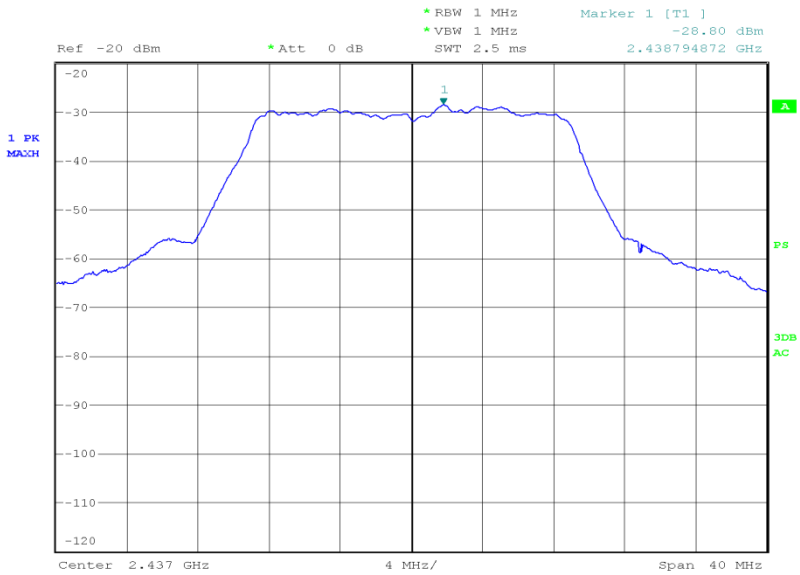
| EIRP (dBm) | EIRP (mW) |
|---|---|
| 23.47 | 222.33 |




Date: 13.MAY.2012 08:21:43

2437 MHz

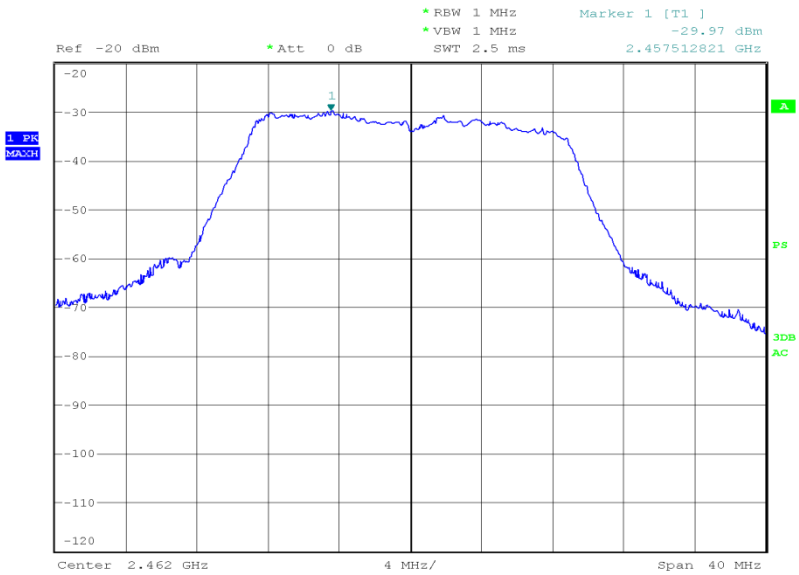
| EIRP (dBm) | EIRP (mW) |
|---|---|
| 24.16 | 260.62 |




Date: 13.MAY.2012 09:32:27

2462 MHz

| EIRP (dBm) | EIRP (mW) |
|---|---|
| 23.05 | 201.84 |




Date: 13.MAY.2012 09:56:15

Limit

| EIRP (dBm) | EIRP (mW) |
|---|---|
| 36.0 | 4000 |

## 2.4 POWER SPECTRAL DENSITY

### 2.4.1 Specification Reference

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

### 2.4.2 Equipment Under Test and Modification State

CDMA SHI16 S/N: IMEI 004401113852657 - Modification State 0

### 2.4.3 Date of Test

17 May 2012, 18 May 2012 & 21 May 2012

### 2.4.4 Test Equipment Used

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

### 2.4.5 Test Procedure

The 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.

### 2.4.6 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 24.8°C |
| Relative Humidity | 22.2% |

Product Service

### 2.4.7 Test Results

802.11(b)

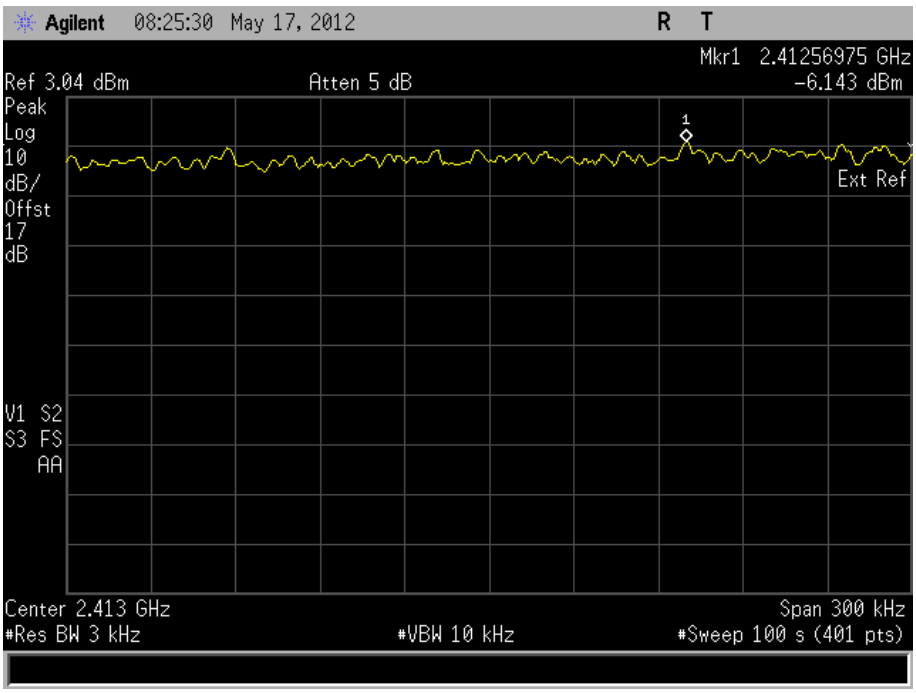
4.0 V DC Supply

| Frequency | Data Rate (Mbps) | Power Spectral Density in 3 kHz Bands (dBm) |
|---|---|---|
| 2412 MHz | 1 | -6.14 |
| | 2 | -6.67 |
| | 5 | -7.34 |
| | 11 | -8.56 |
| 2437 MHz | 1 | -6.07 |
| | 2 | -5.56 |
| | 5 | -6.84 |
| | 11 | -8.16 |
| 2462 MHz | 1 | -7.24 |
| | 2 | -8.87 |
| | 5 | -9.44 |
| | 11 | -9.92 |

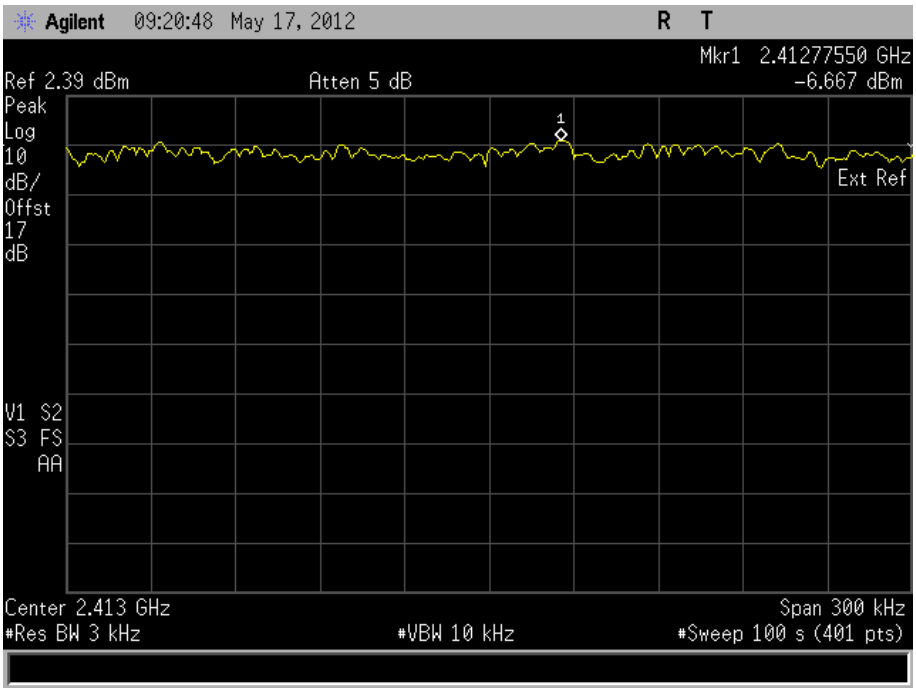
Product Service

2412 MHz

1 Mbps

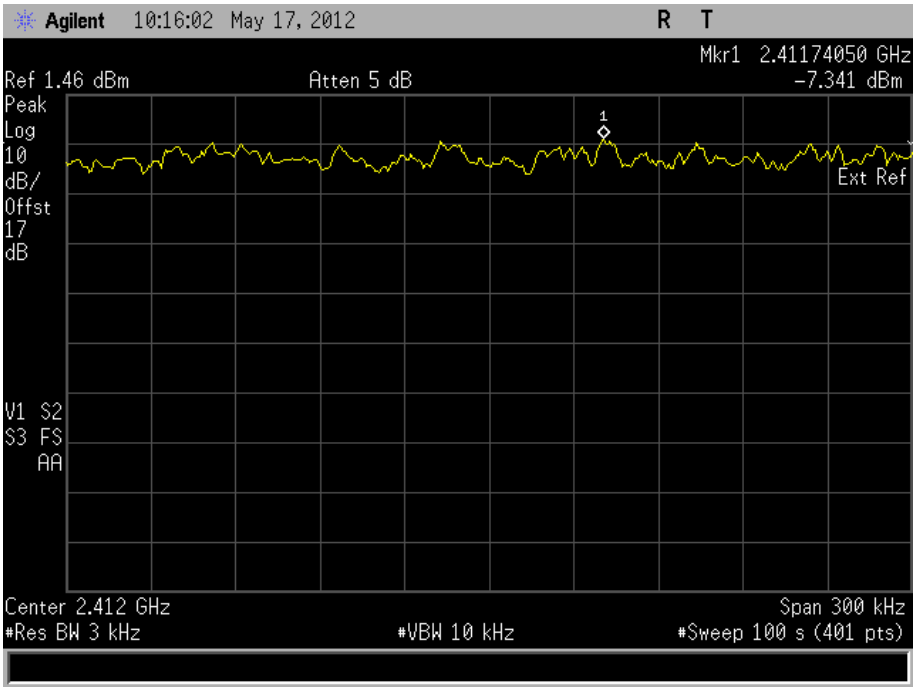



2 Mbps

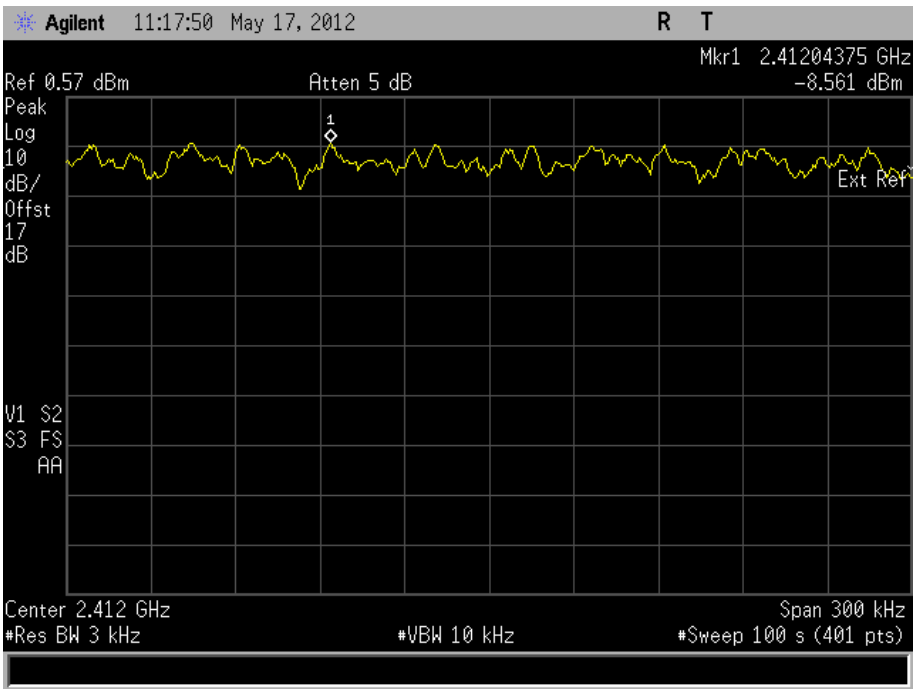


Product Service

5.5 Mbps



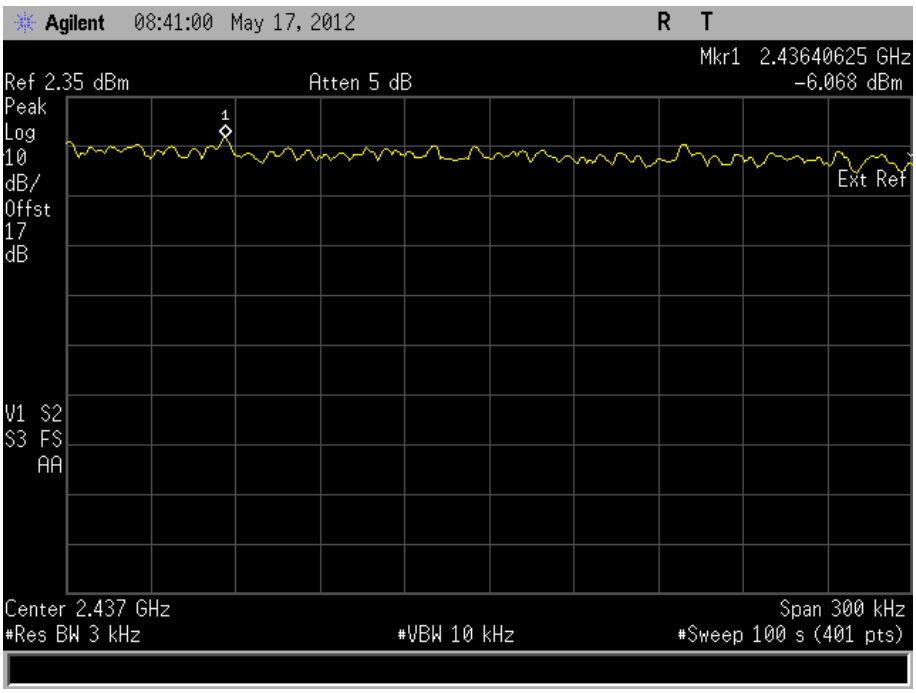

11 Mbps



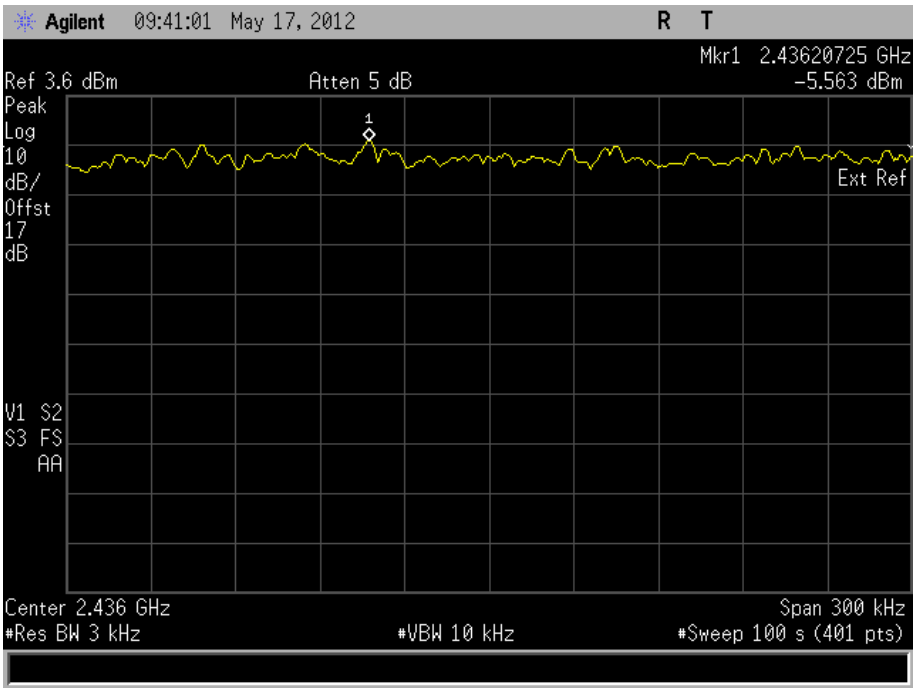
Product Service

2437 MHz

1 Mbps

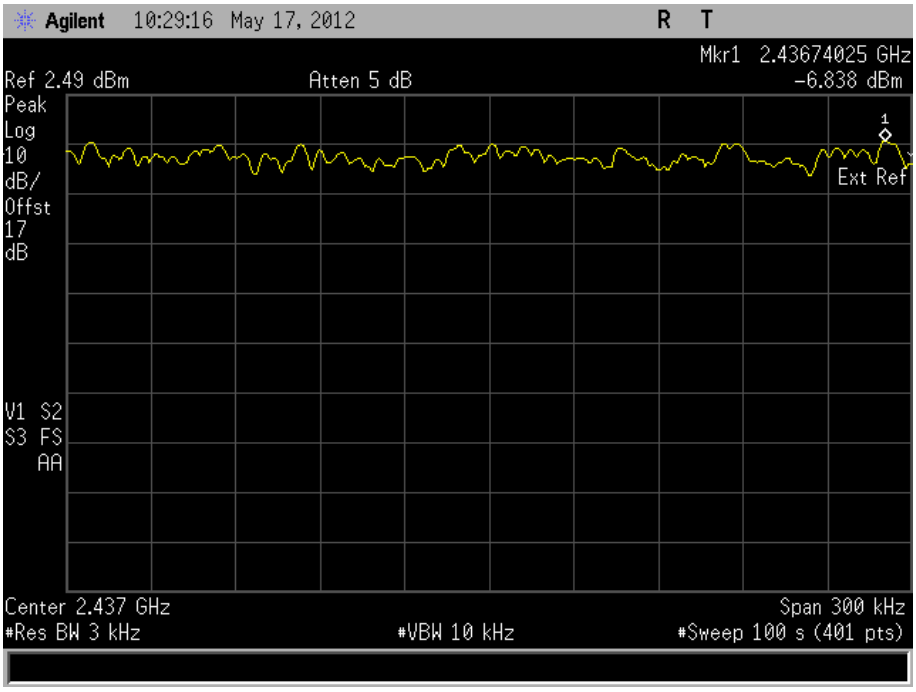



2 Mbps

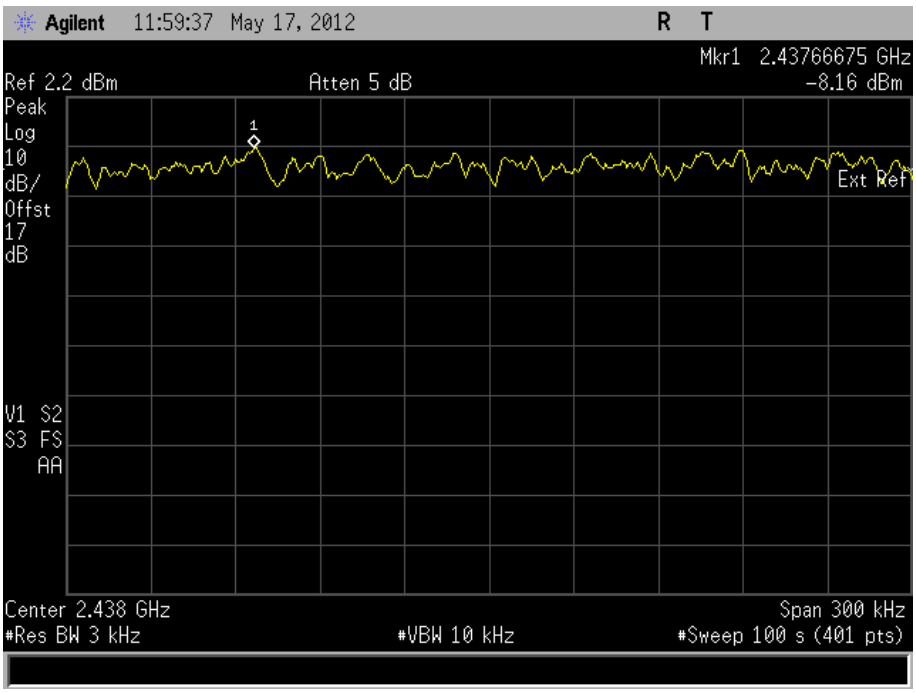


Product Service

5.5 Mbps



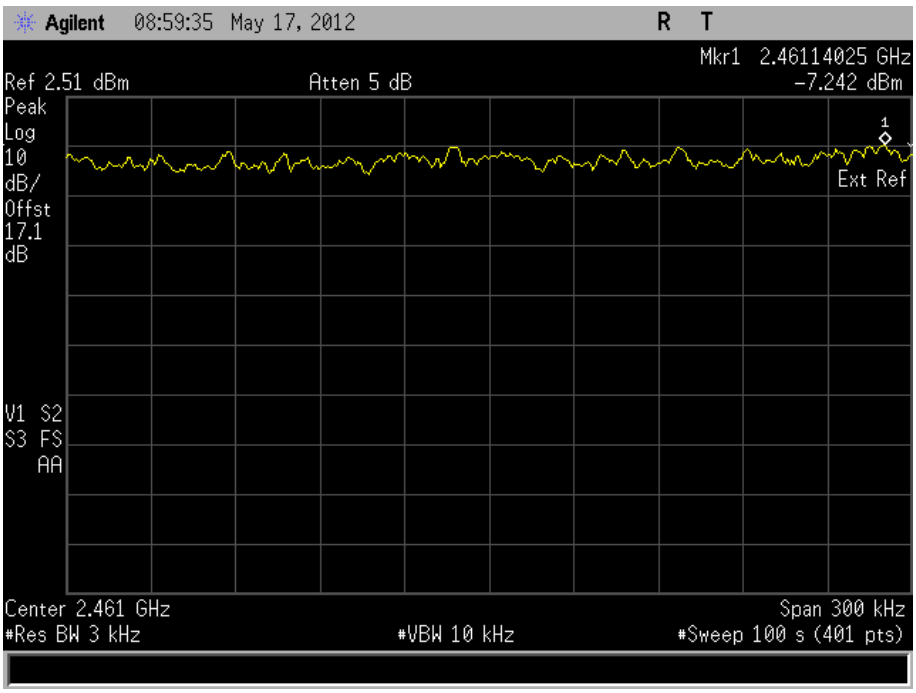

11 Mbps



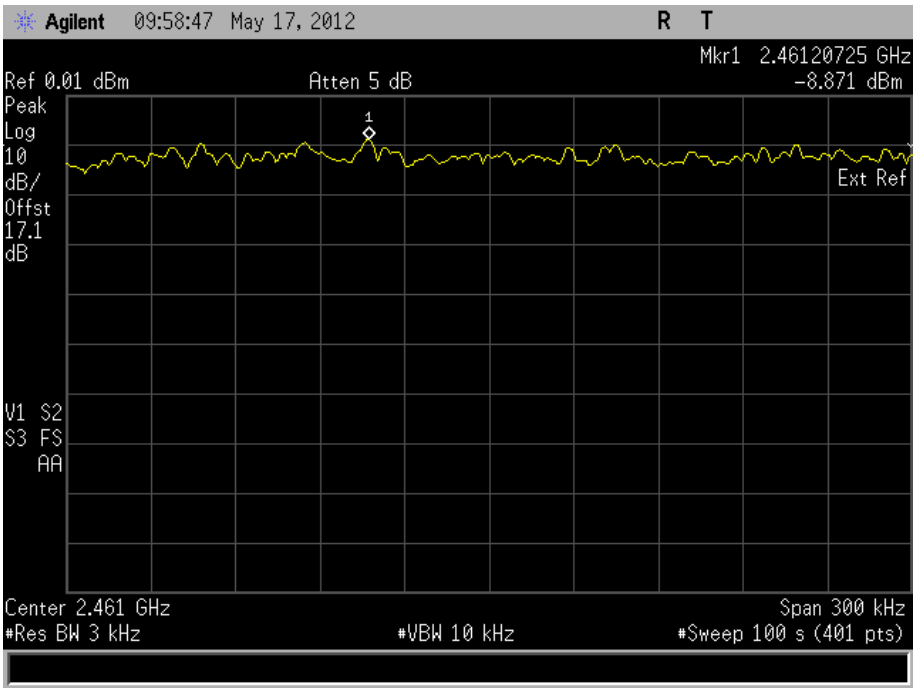
Product Service

2462 MHz

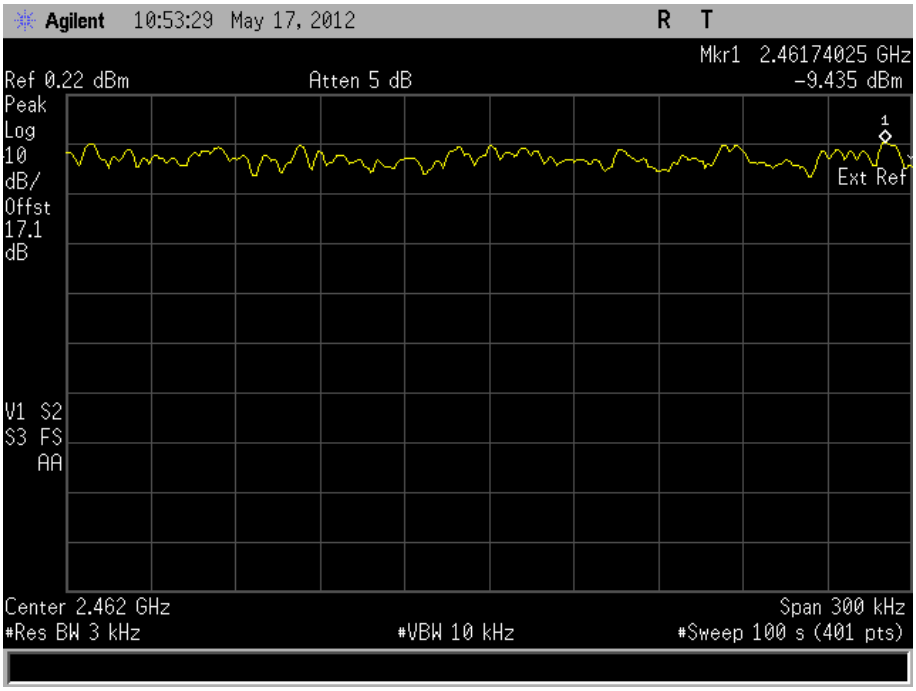
1 Mbps



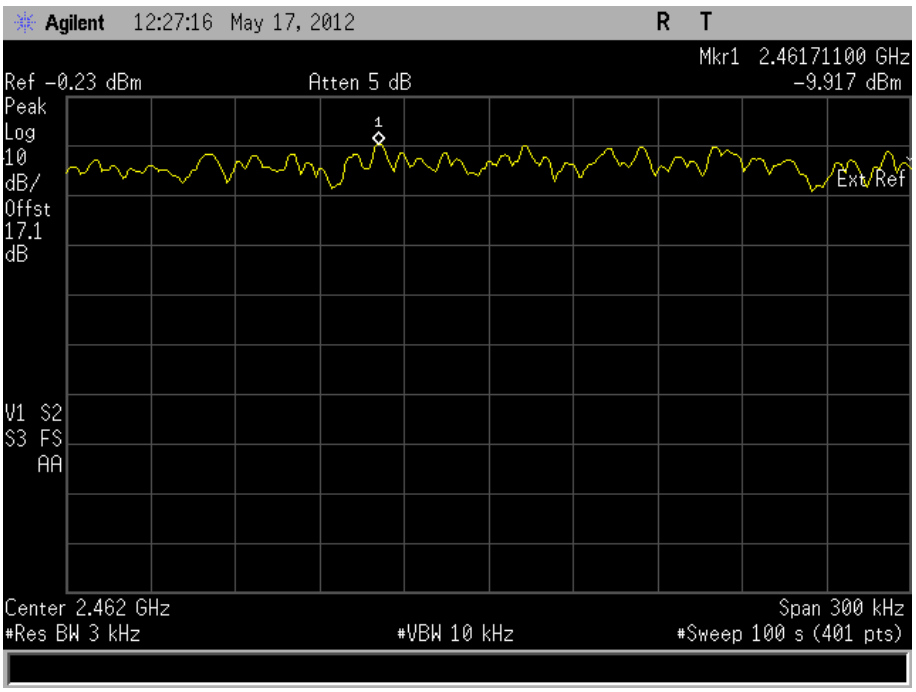

2 Mbps



5.5 Mbps




11 Mbps




Limit Clause

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

802.11(g)

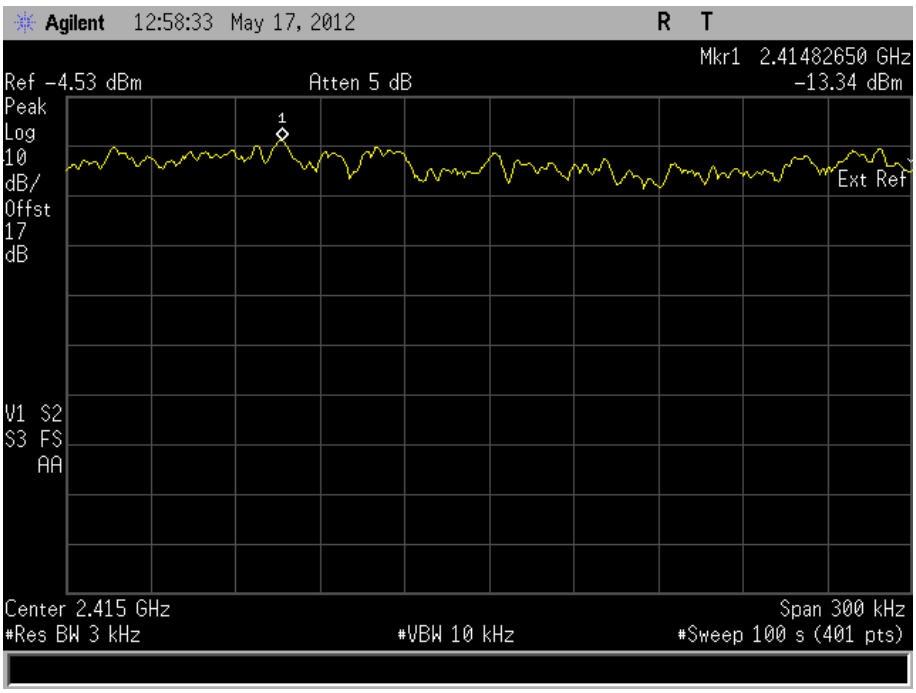
4.0 V DC Supply

| Frequency | Data Rate (Mbps) | Power Spectral Density in 3 kHz Bands (dBm) |
|---|---|---|
| 2412 MHz | 6 | -13.34 |
| | 9 | -13.87 |
| | 12 | -13.50 |
| | 18 | -14.61 |
| | 24 | -13.88 |
| | 36 | -14.83 |
| | 48 | -14.22 |
| | 54 | -12.41 |
| 2437 MHz | 6 | -12.40 |
| | 9 | -12.80 |
| | 12 | -12.61 |
| | 18 | -15.77 |
| | 24 | -13.94 |
| | 36 | -14.97 |
| | 48 | -13.79 |
| | 54 | -12.01 |
| 2462 MHz | 6 | -15.14 |
| | 9 | -14.80 |
| | 12 | -14.58 |
| | 18 | -13.20 |
| | 24 | -15.90 |
| | 36 | -16.83 |
| | 48 | -15.25 |
| | 54 | -12.65 |

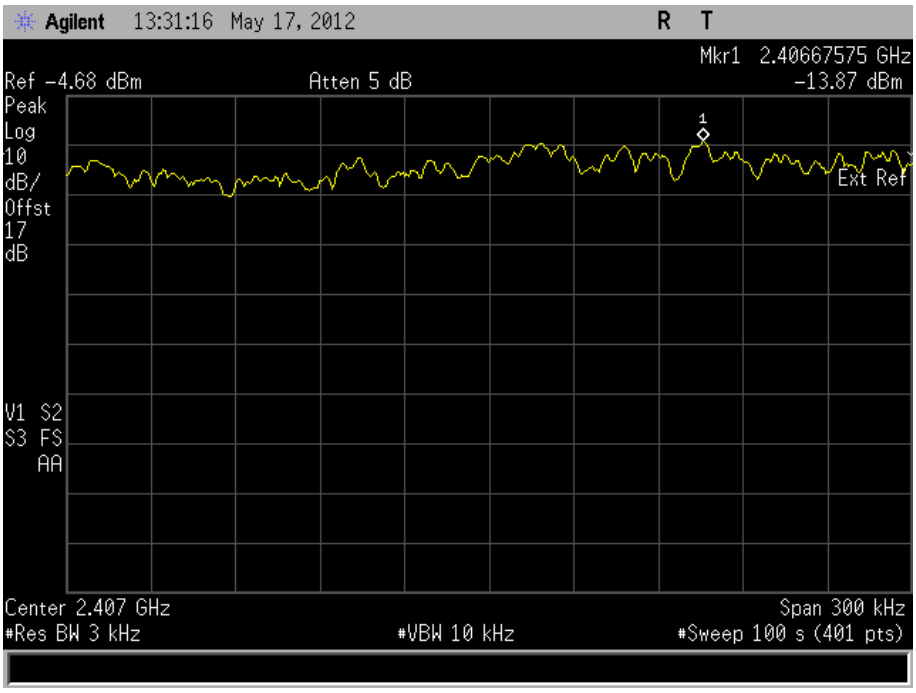
Product Service

2412 MHz

6 Mbps

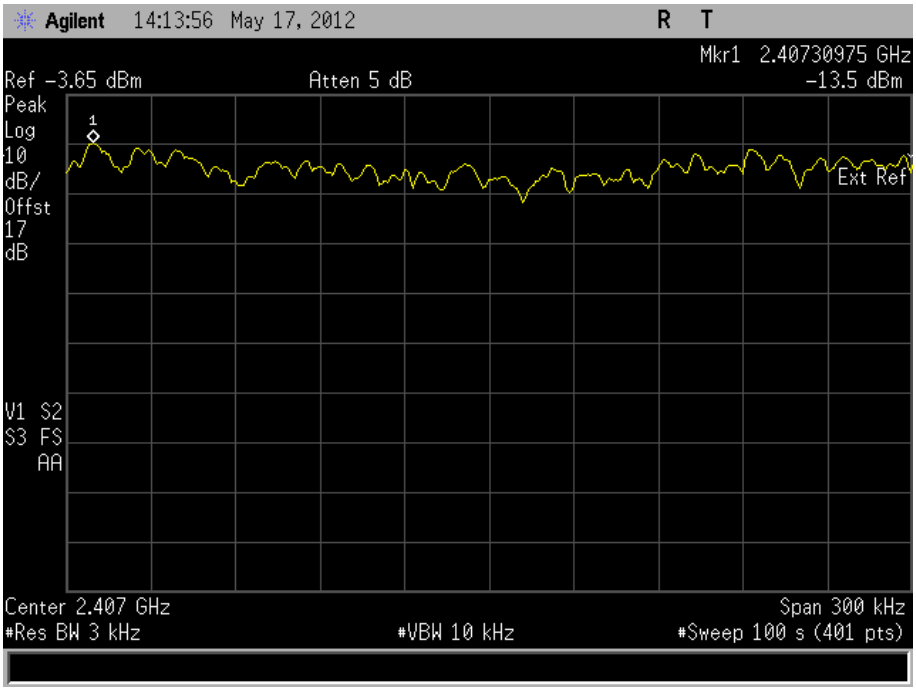



9 Mbps

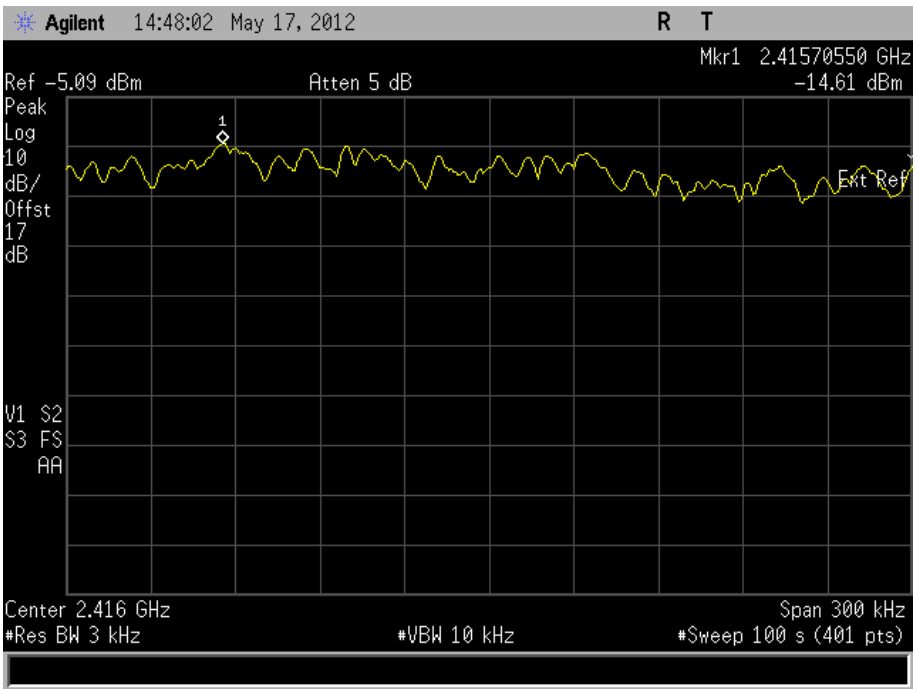


Product Service

12 Mbps

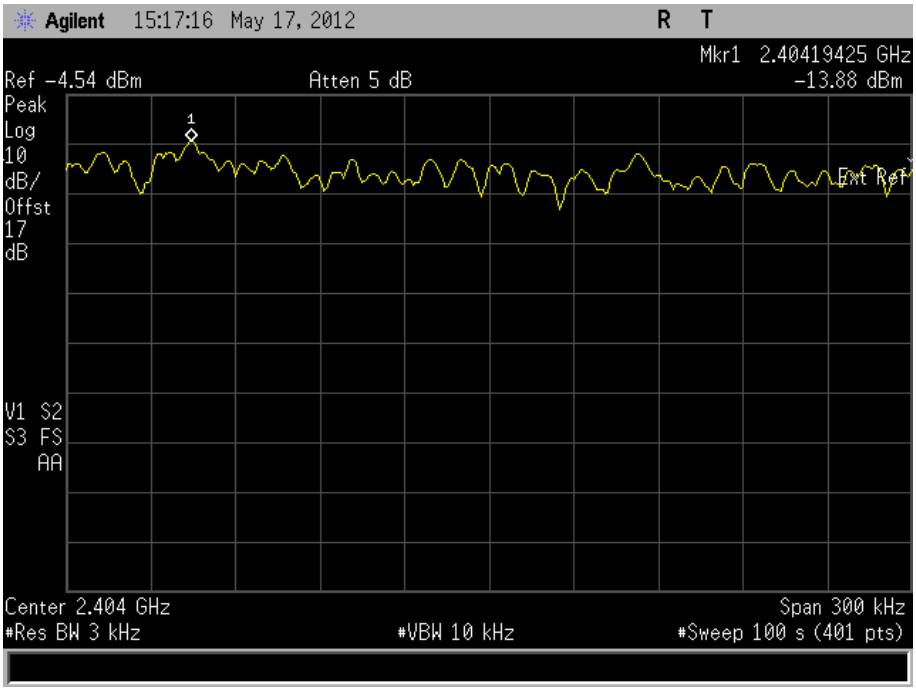



18 Mbps

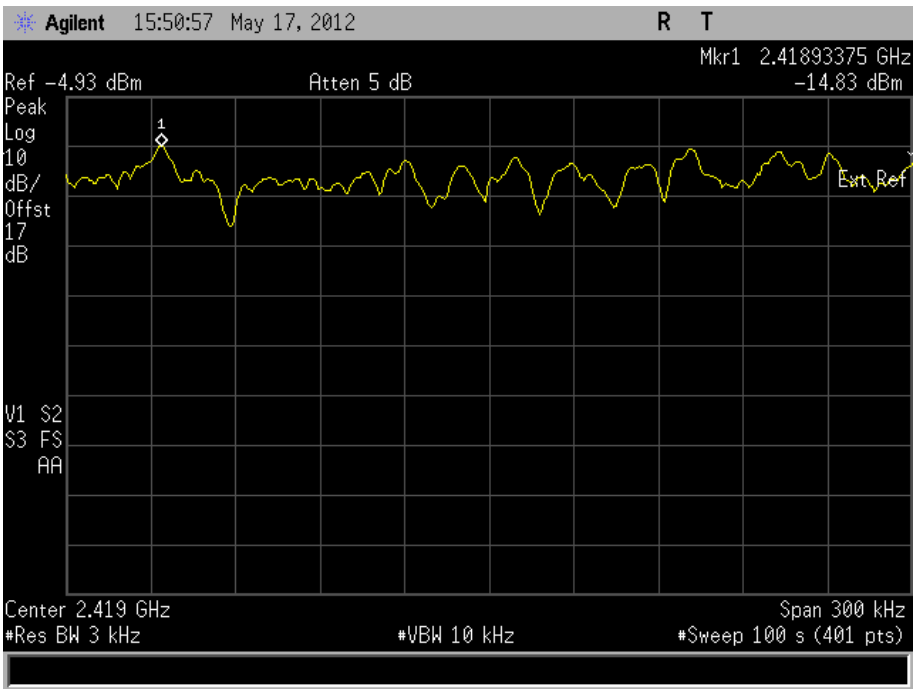


Product Service

24 Mbps

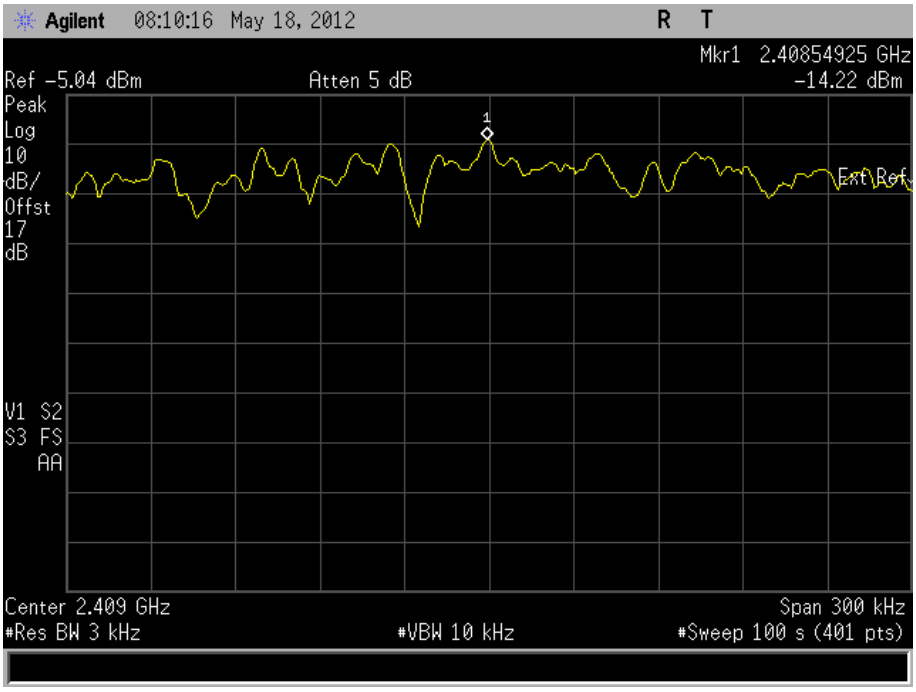



36 Mbps

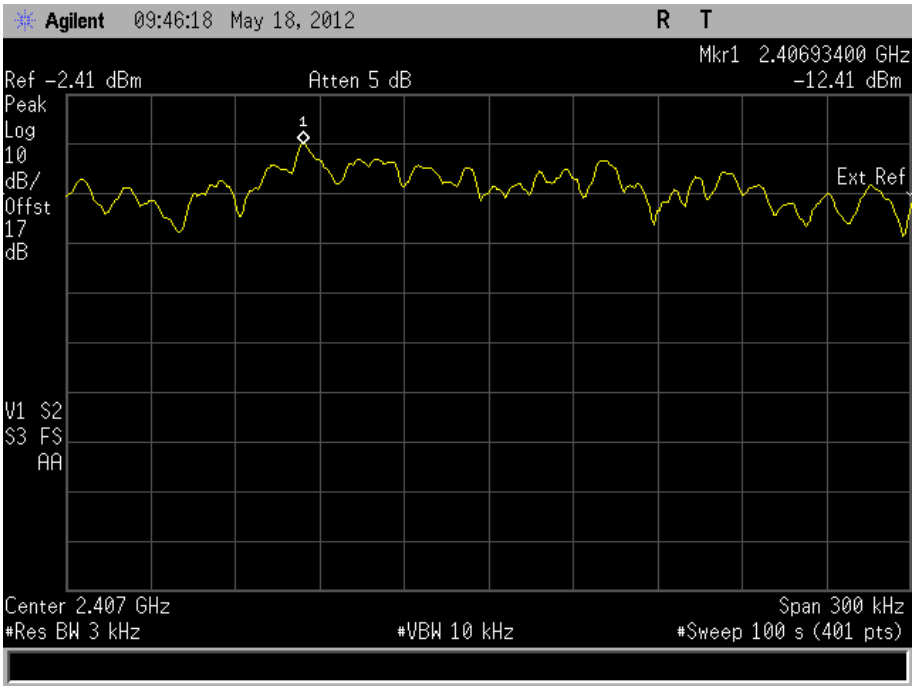


Product Service

48 Mbps



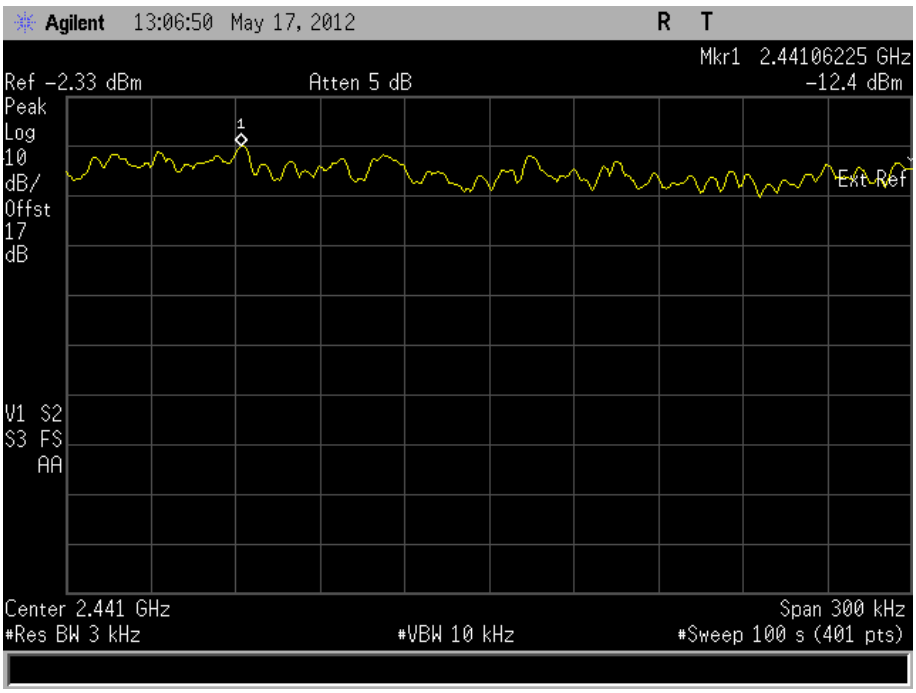

54 Mbps



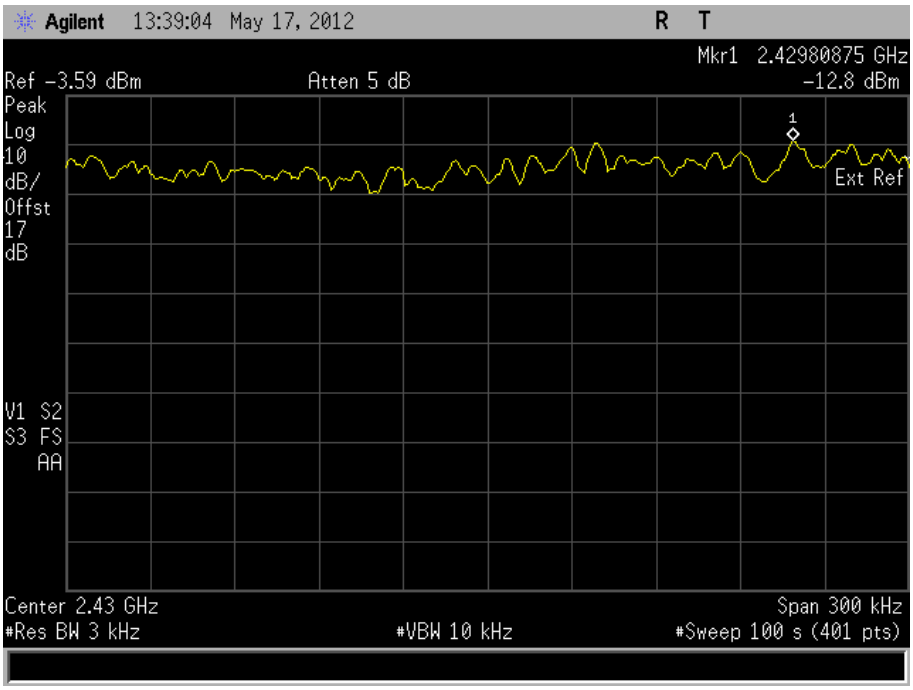
Product Service

2437 MHz

6 Mbps

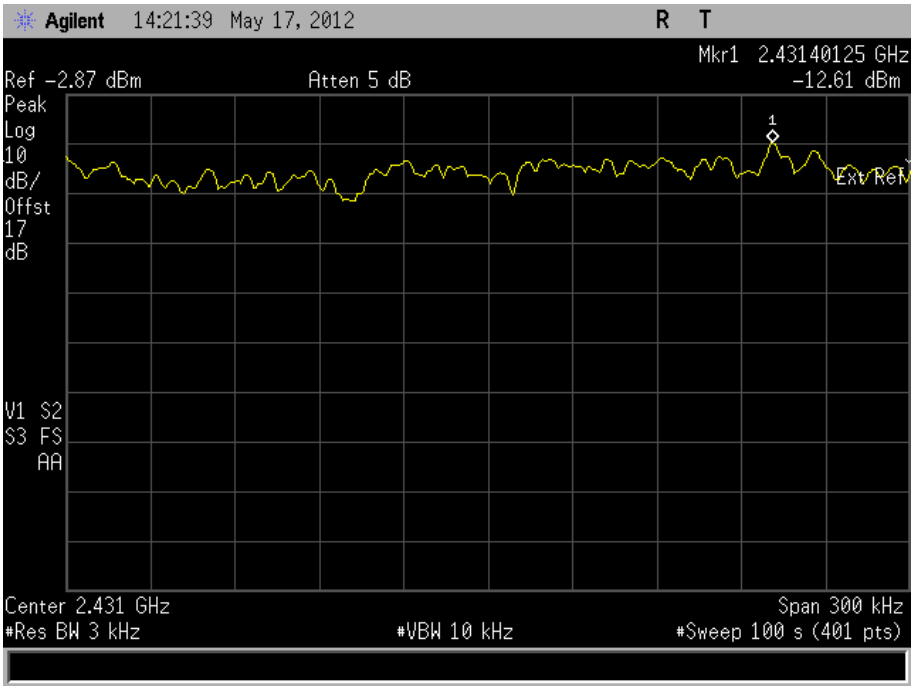



9 Mbps

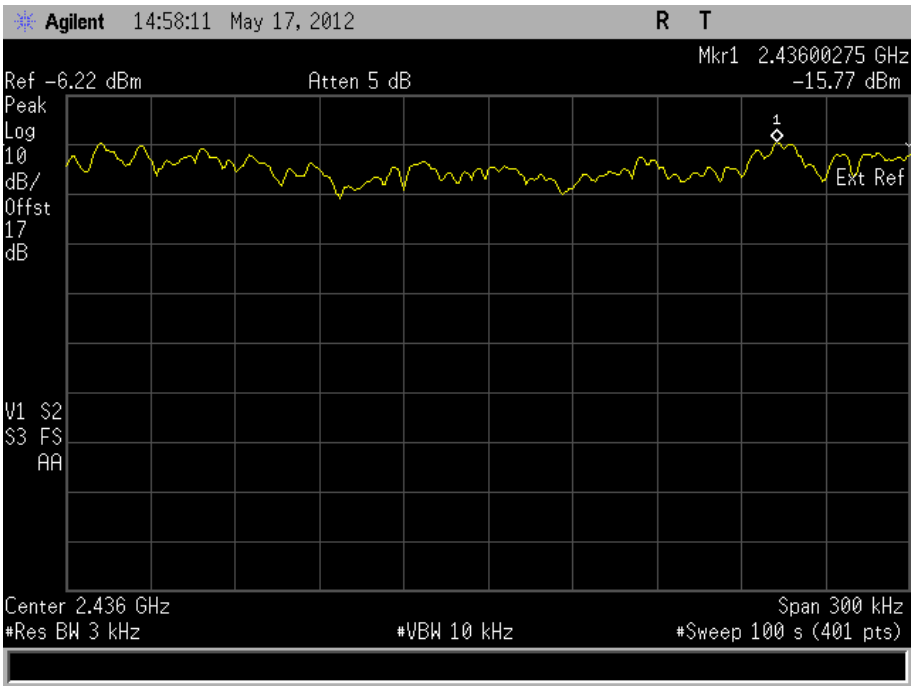


Product Service

12 Mbps

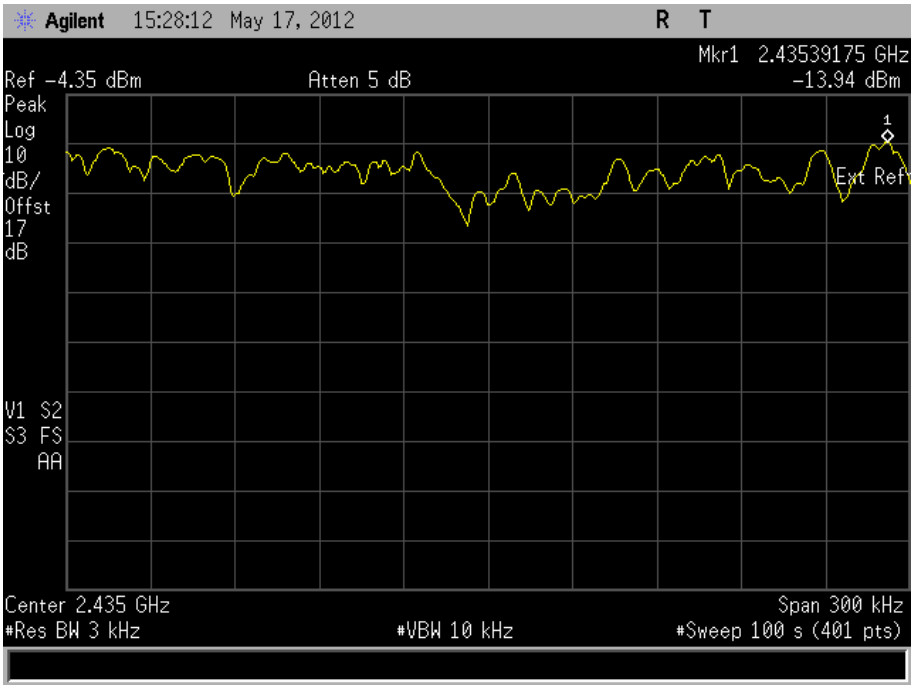



18 Mbps

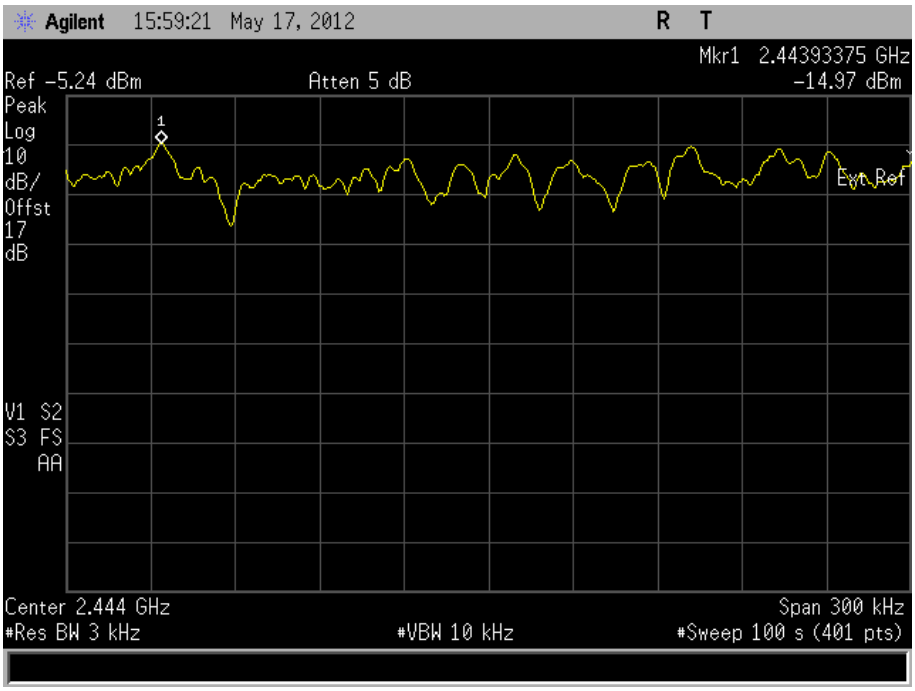


Product Service

24 Mbps

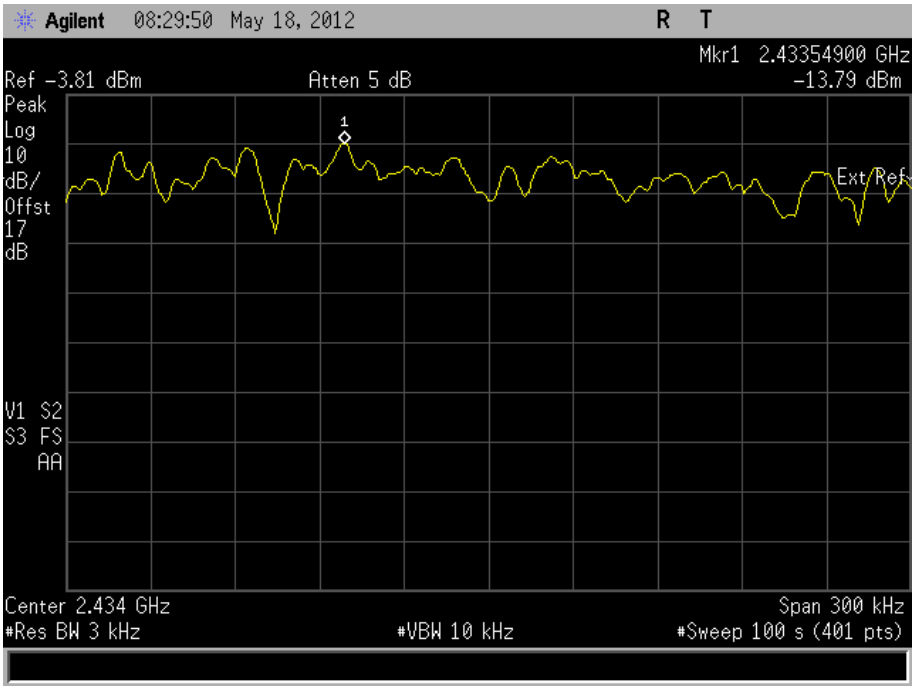



36 Mbps

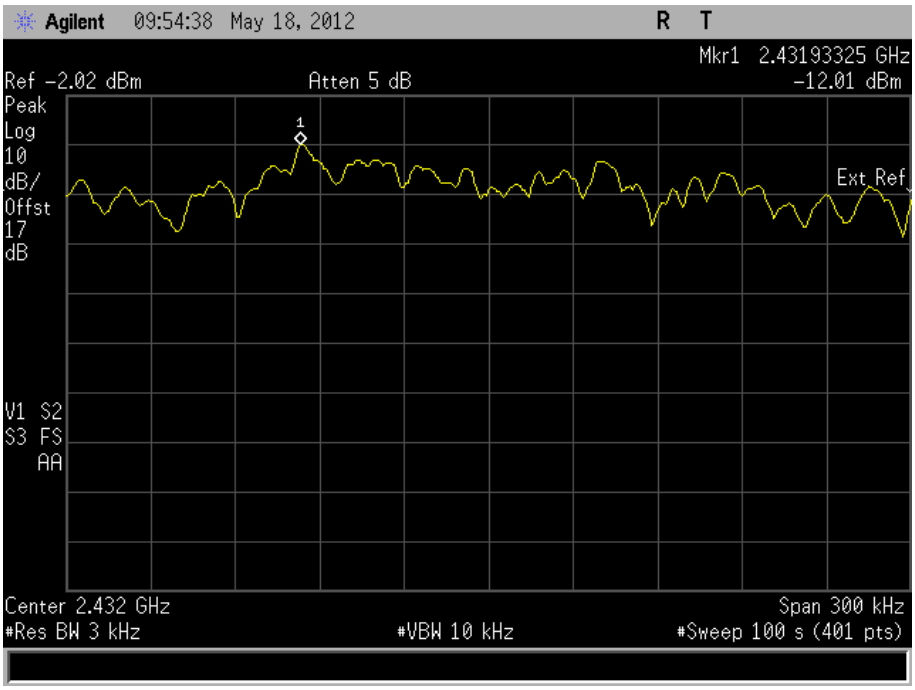


Product Service

48 Mbps



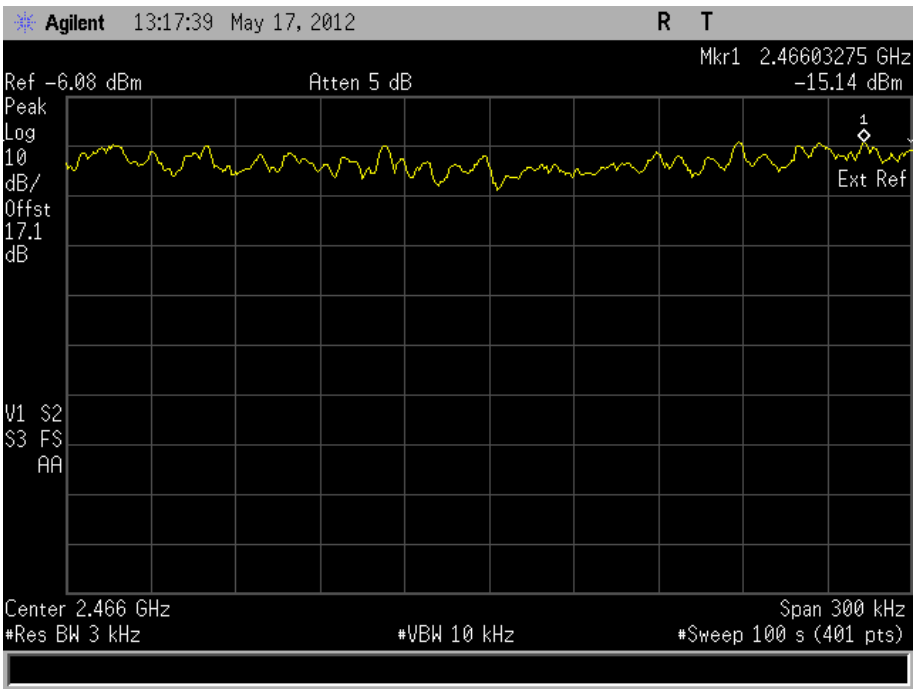

54 Mbps



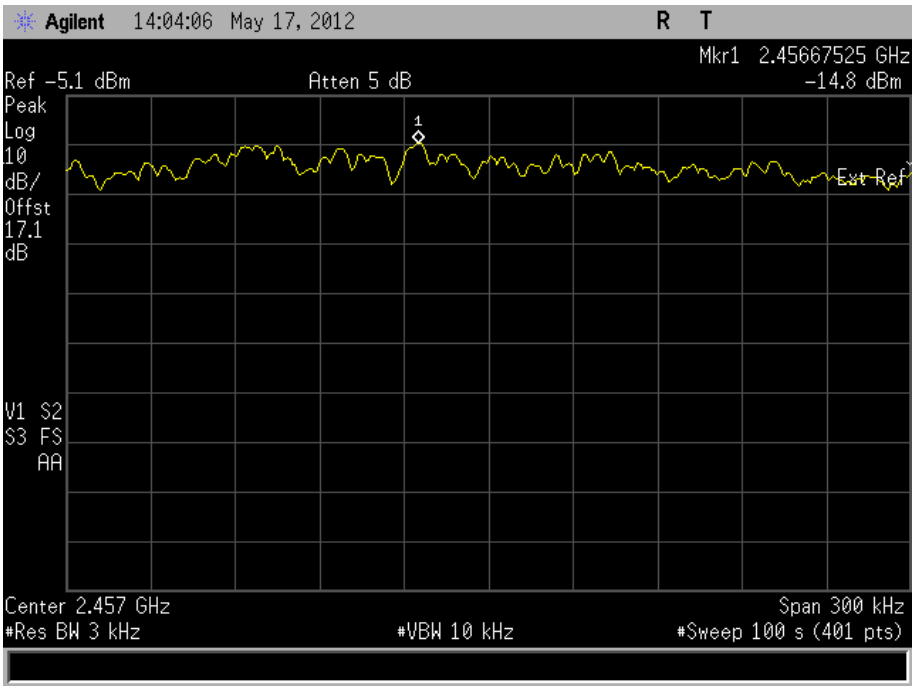
Product Service

2462 MHz

6 Mbps

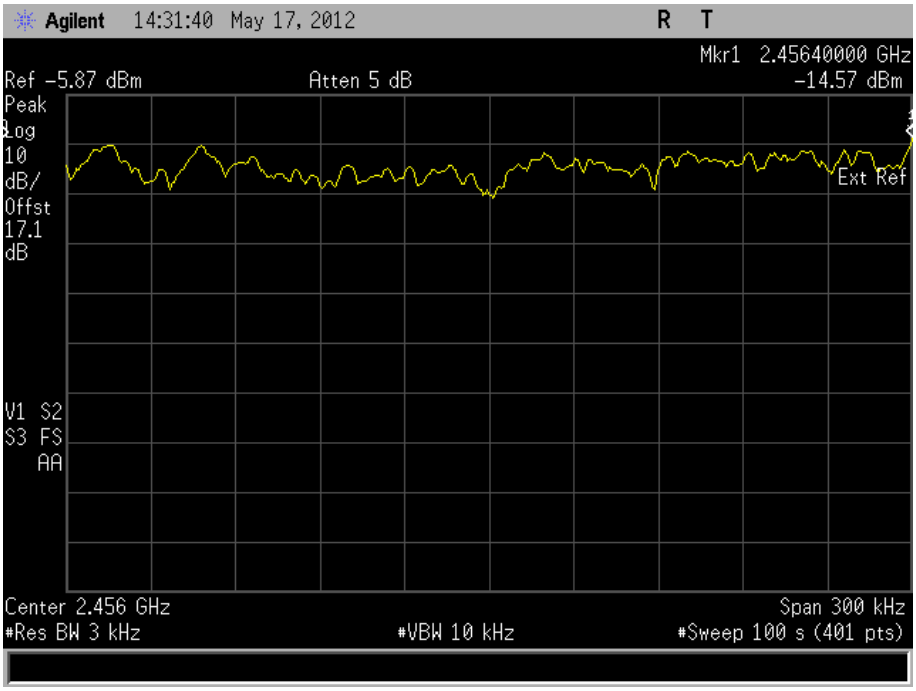



9 Mbps

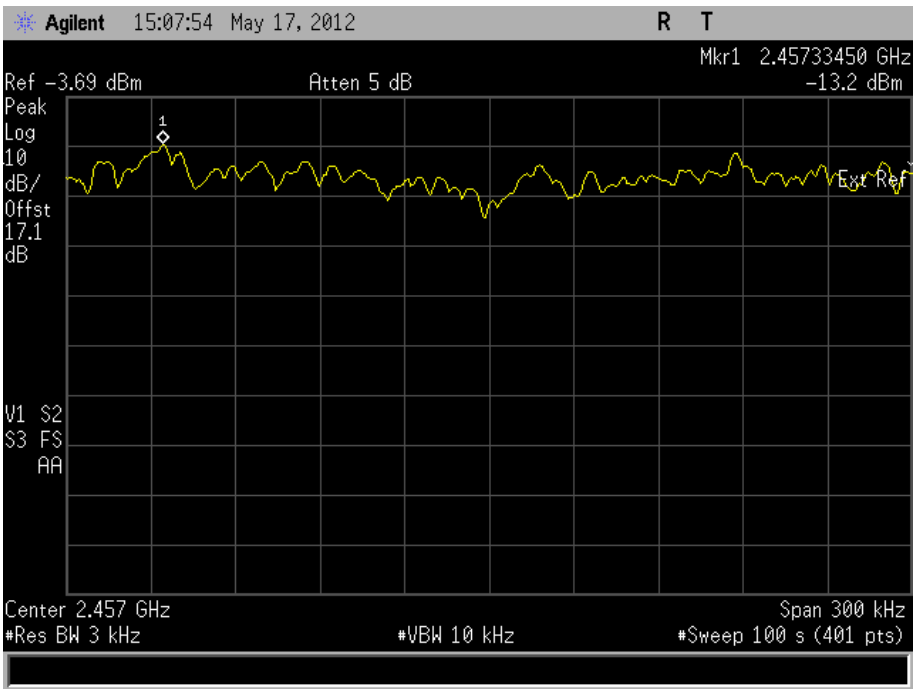


Product Service

12 Mbps

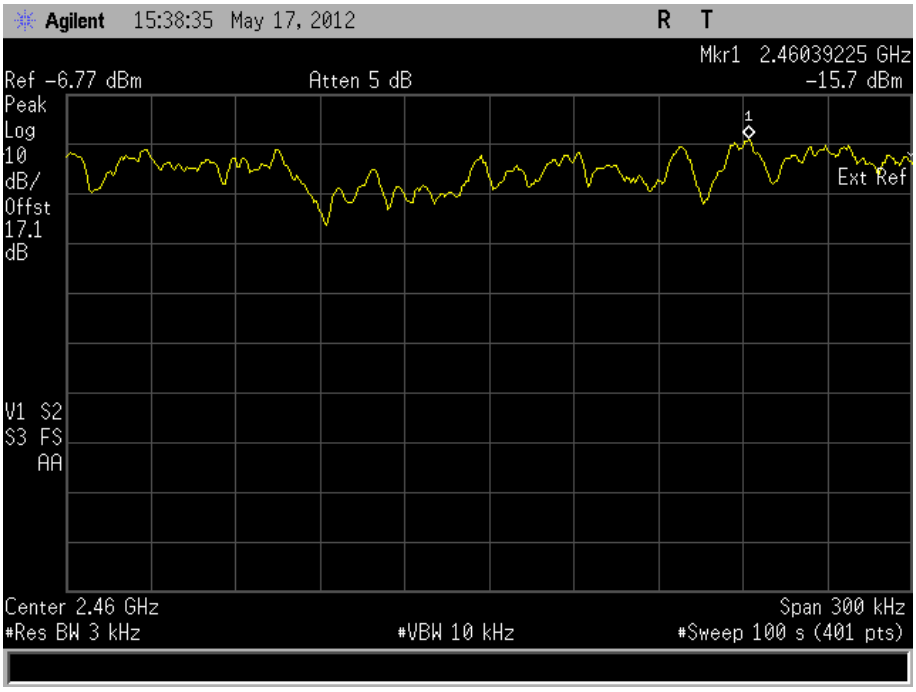



18 Mbps

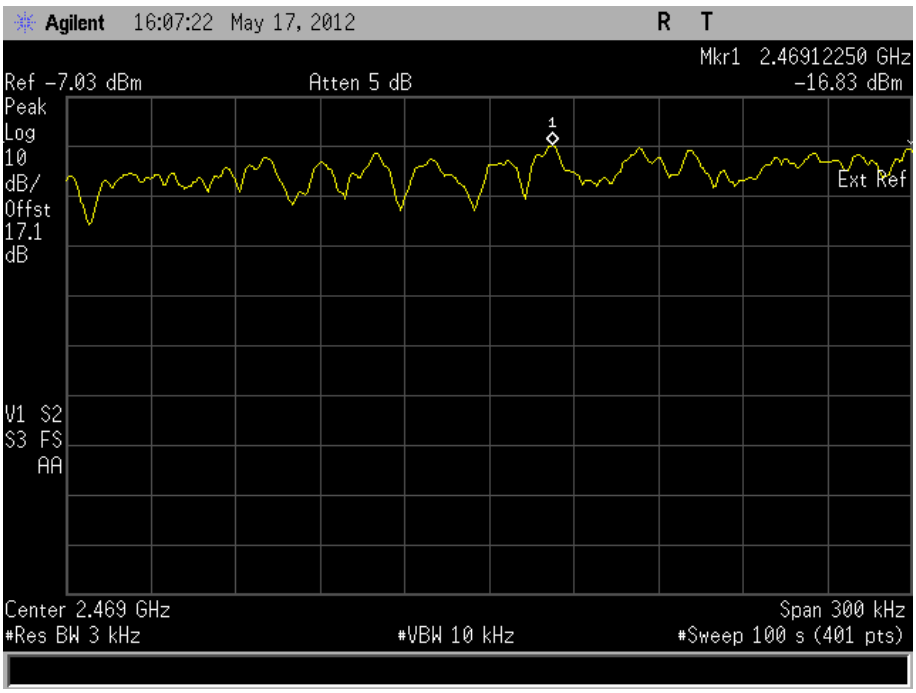


Product Service

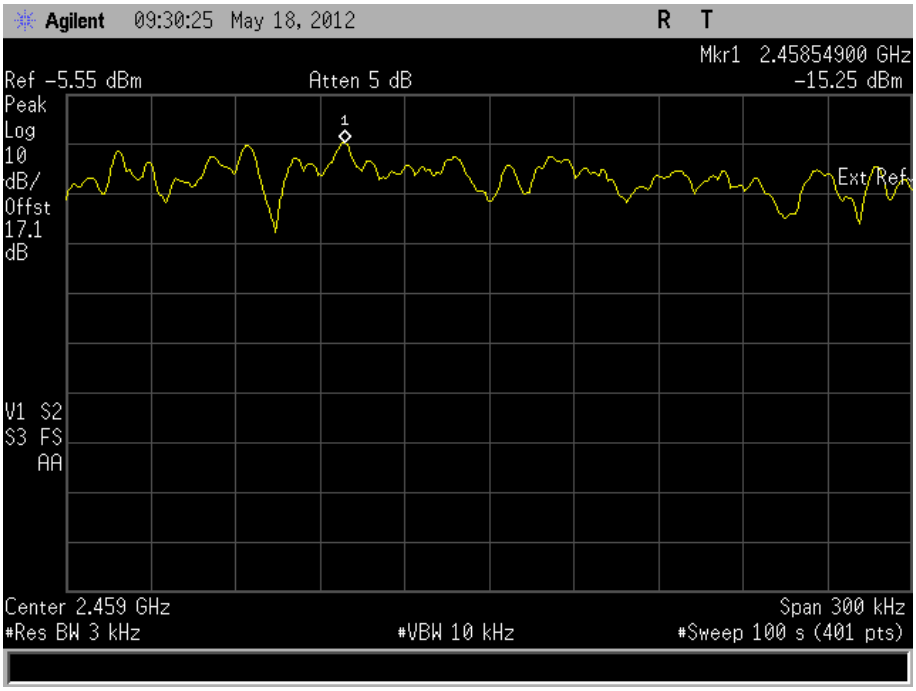
24 Mbps



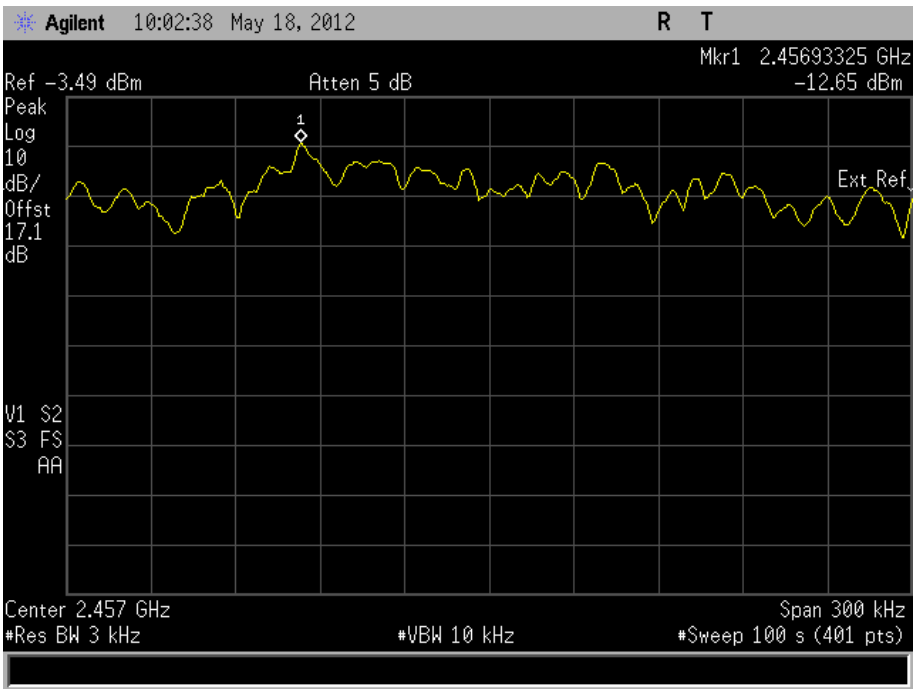

36 Mbps



48 Mbps




54 Mbps




Limit Clause

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

802.11(n)

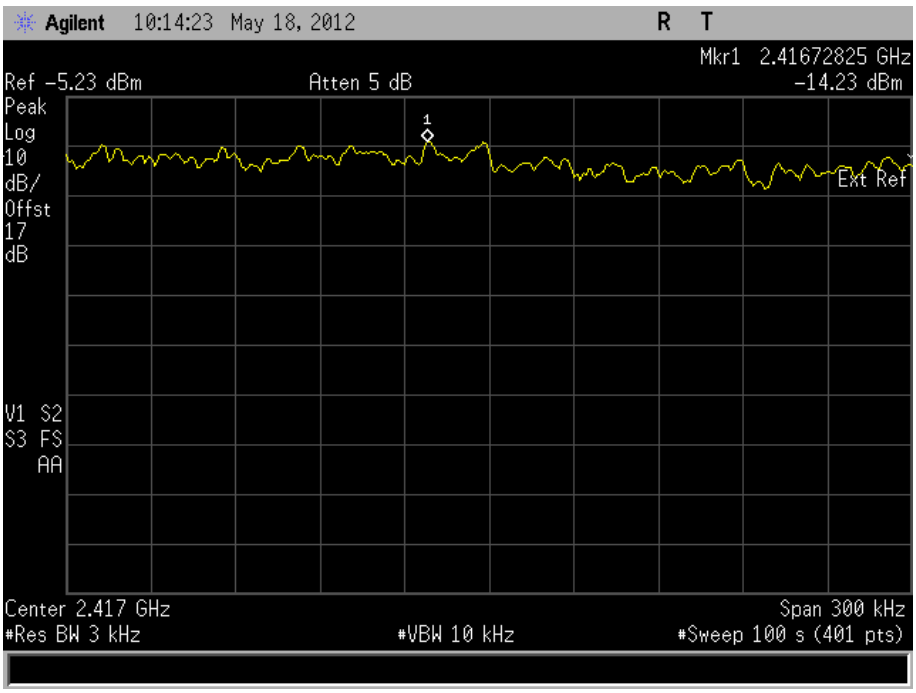
4.0 V DC Supply

| Frequency | Data Rate (Mbps) | Power Spectral Density in 3 kHz Bands (dBm) |
|---|---|---|
| 2412 MHz | 6.5 | -14.23 |
| | 13 | -15.22 |
| | 19.5 | -15.44 |
| | 26 | -14.69 |
| | 39 | -14.27 |
| | 52 | -14.98 |
| | 58.5 | -15.92 |
| | 65 | -16.25 |
| 2437 MHz | 6.5 | -13.58 |
| | 13 | -14.16 |
| | 19.5 | -15.14 |
| | 26 | -12.36 |
| | 39 | -14.82 |
| | 52 | -15.19 |
| | 58.5 | -15.40 |
| | 65 | -15.90 |
| 2462 MHz | 6.5 | -14.48 |
| | 13 | -14.96 |
| | 19.5 | -16.31 |
| | 26 | -13.92 |
| | 39 | -15.68 |
| | 52 | -16.43 |
| | 58.5 | -17.19 |
| | 65 | -17.56 |

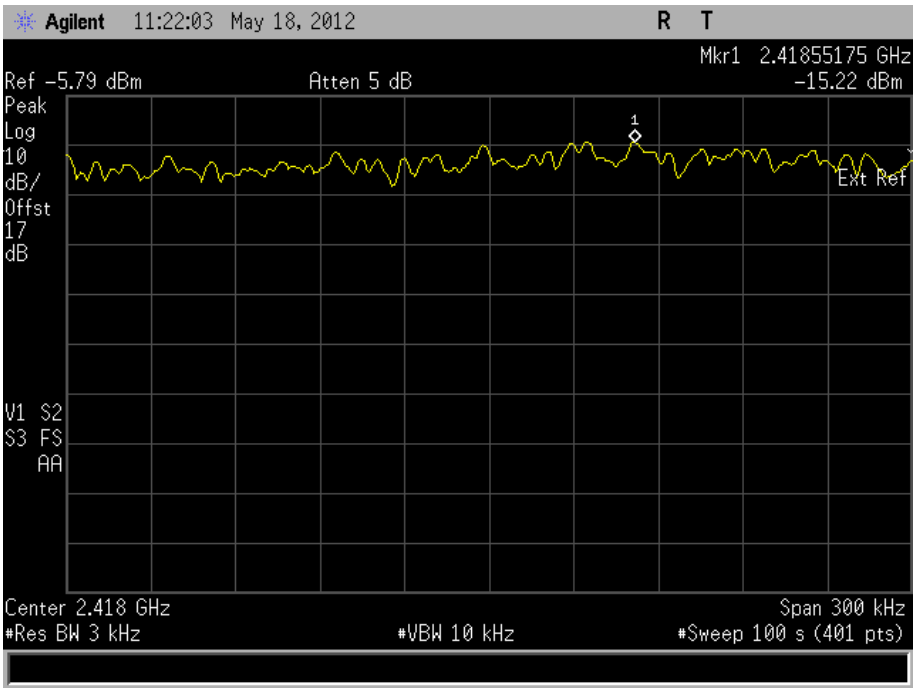
Product Service

2412 MHz

6.5 Mbps

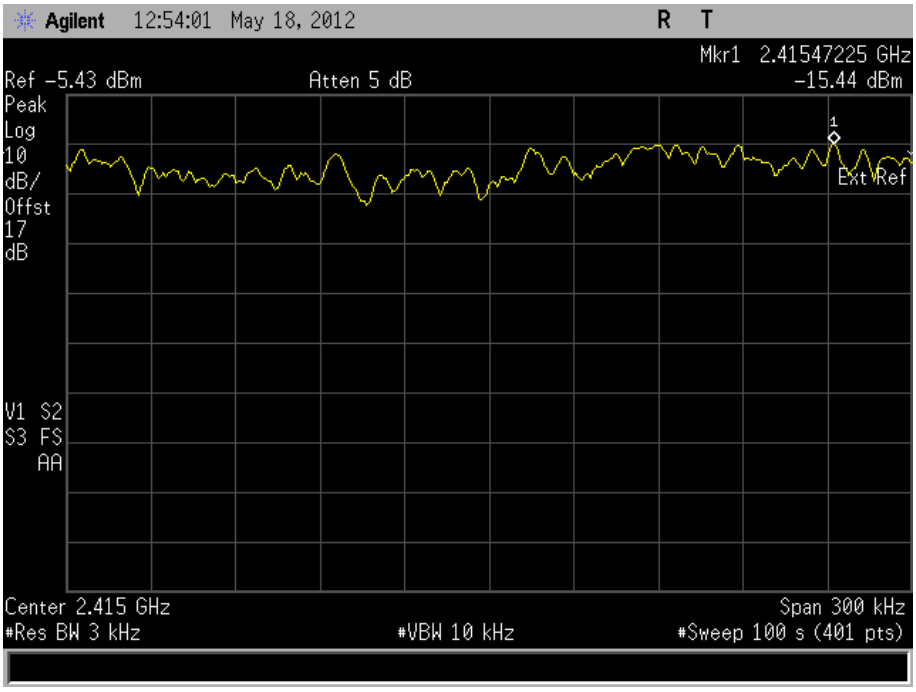



13 Mbps

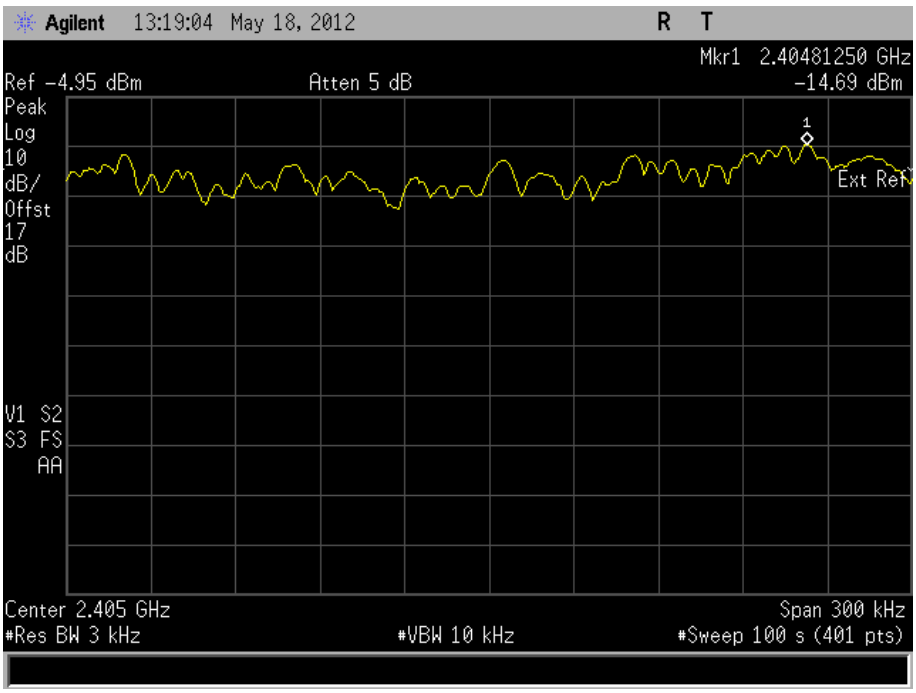


Product Service

19.5 Mbps

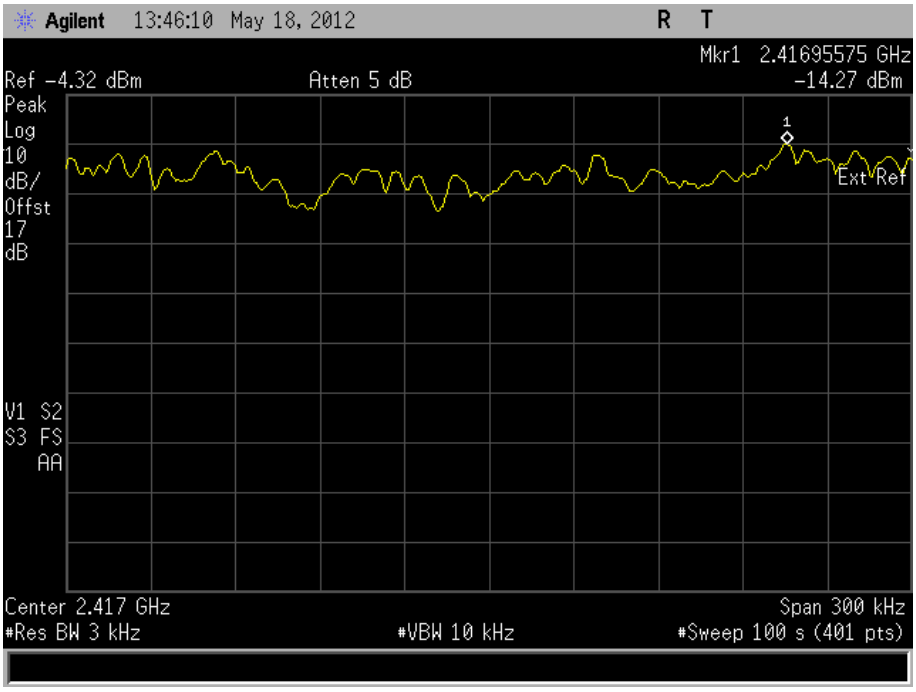



26 Mbps

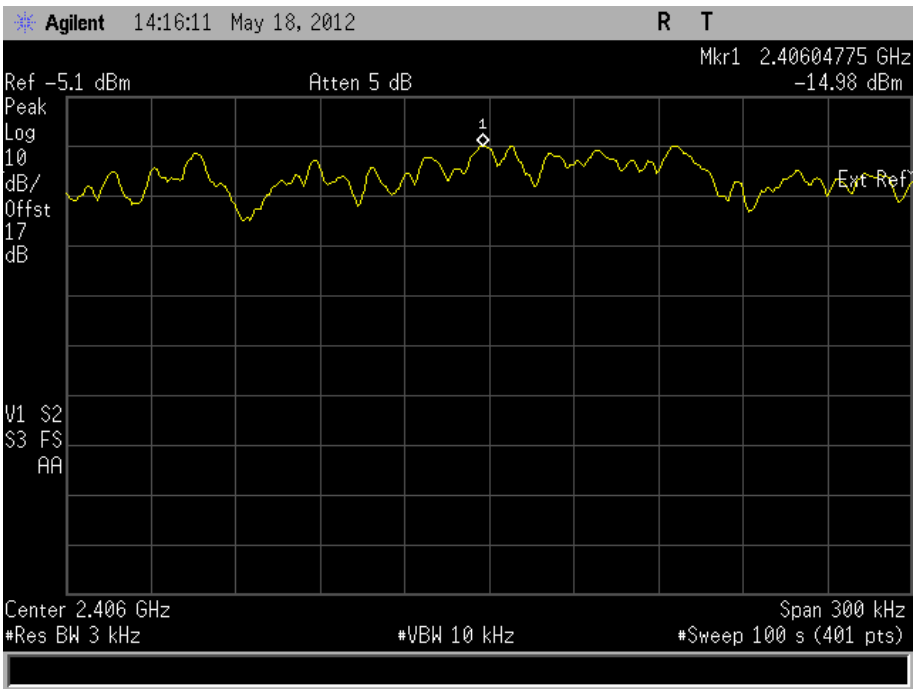


Product Service

39 Mbps

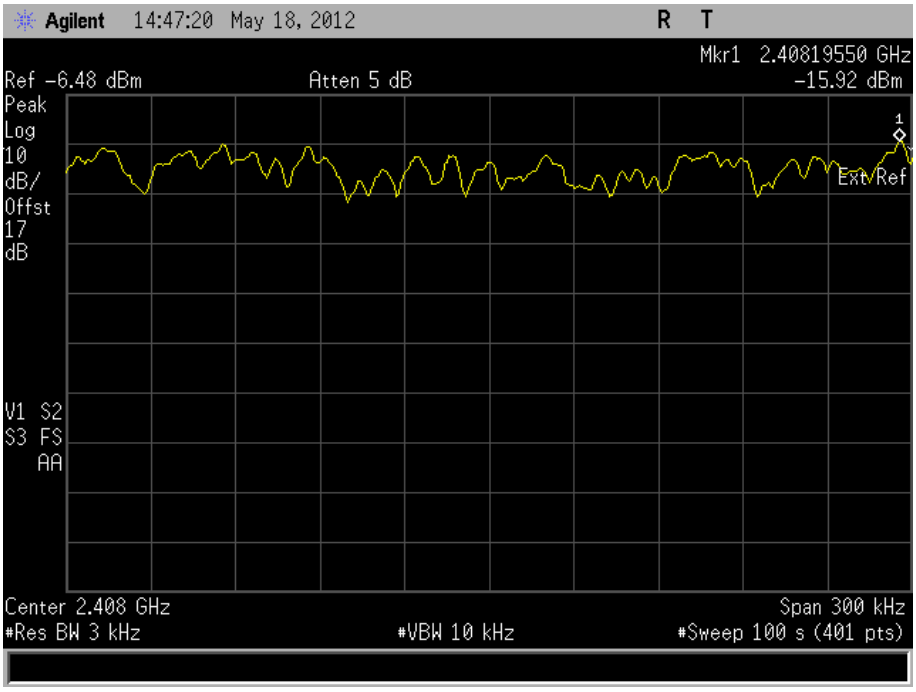



52 Mbps

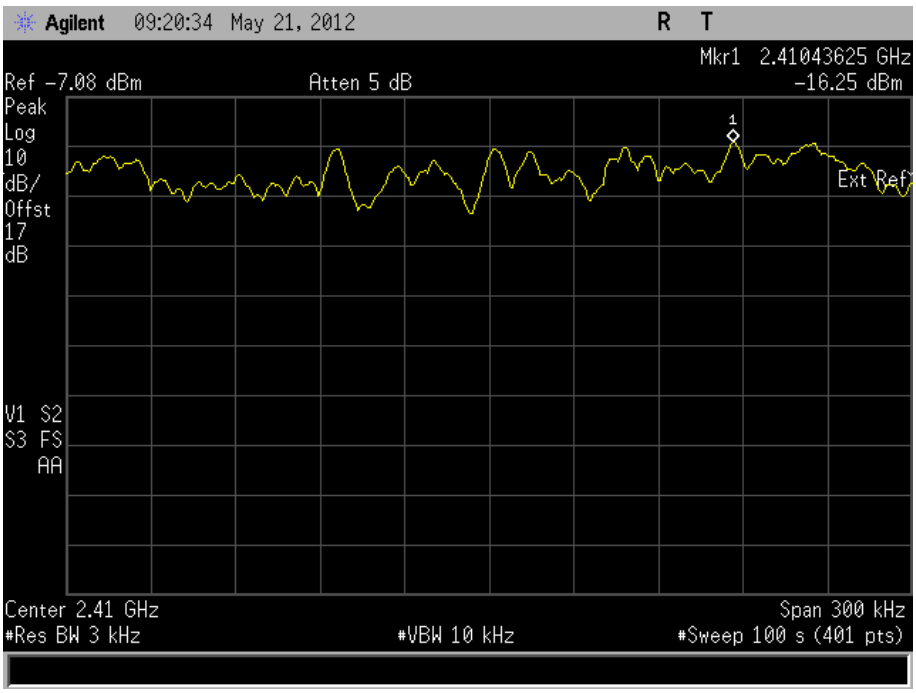


Product Service

58.5 Mbps



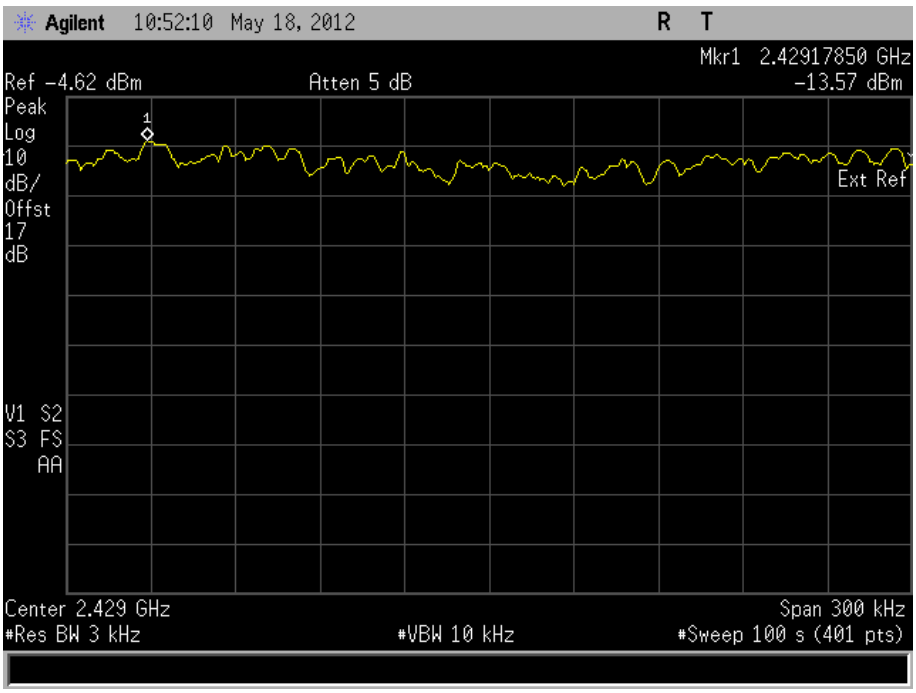

65 Mbps



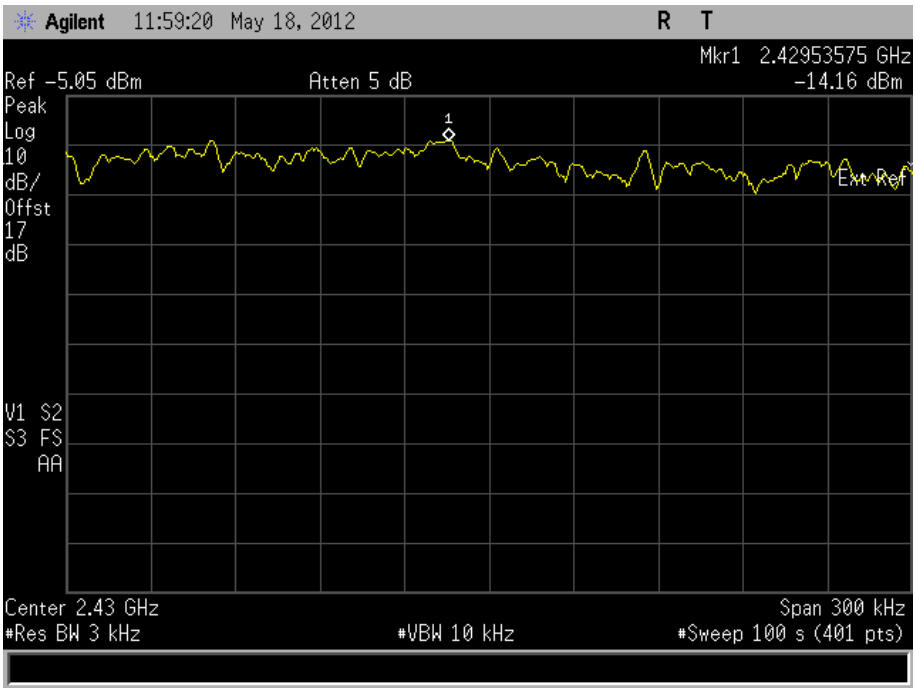
Product Service

2437 MHz

6.5 Mbps

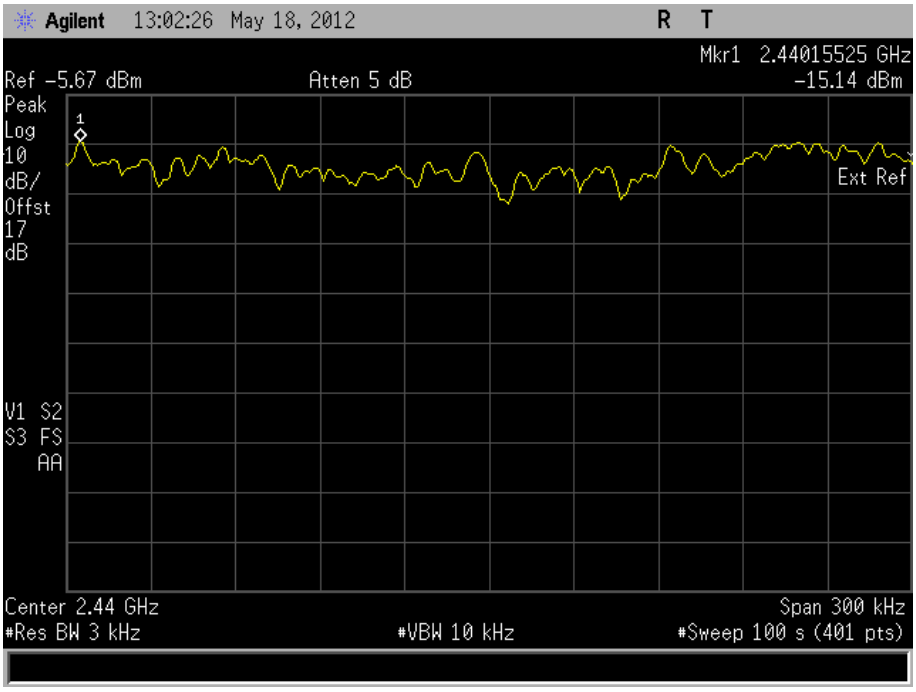



13 Mbps

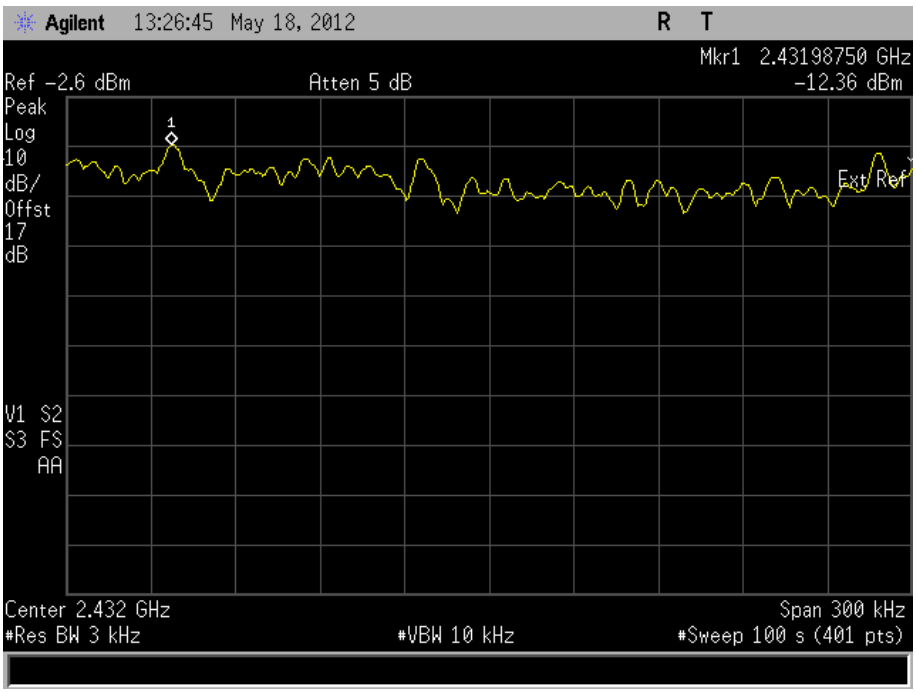


Product Service

19.5 Mbps

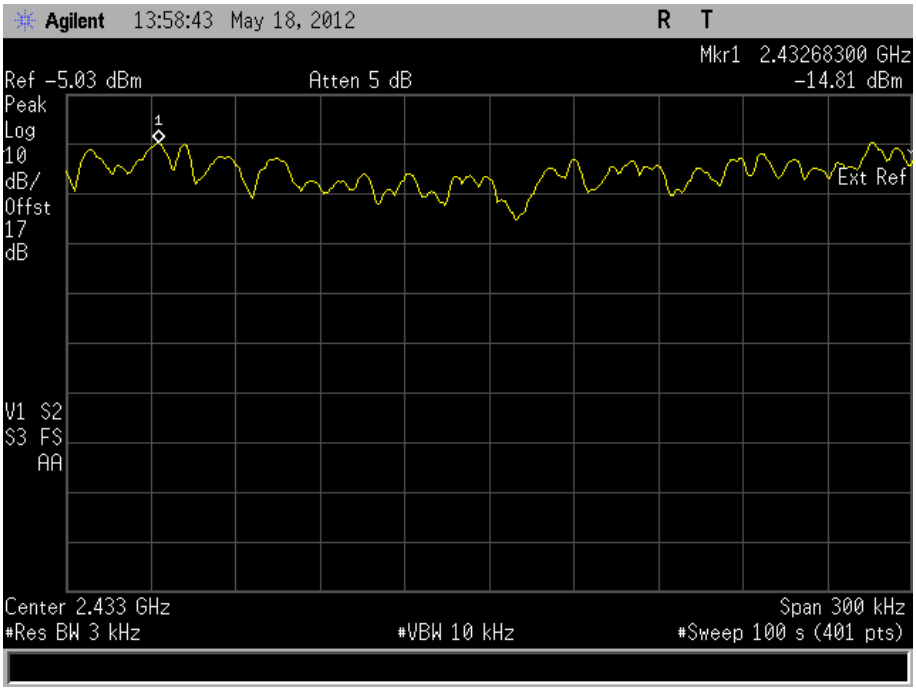



26 Mbps

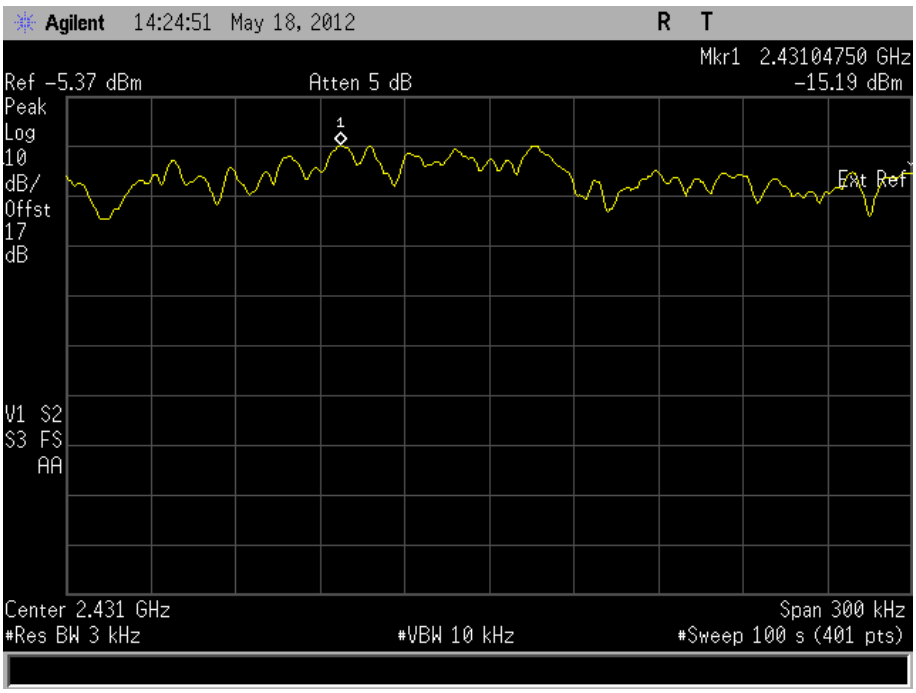


Product Service

39 Mbps

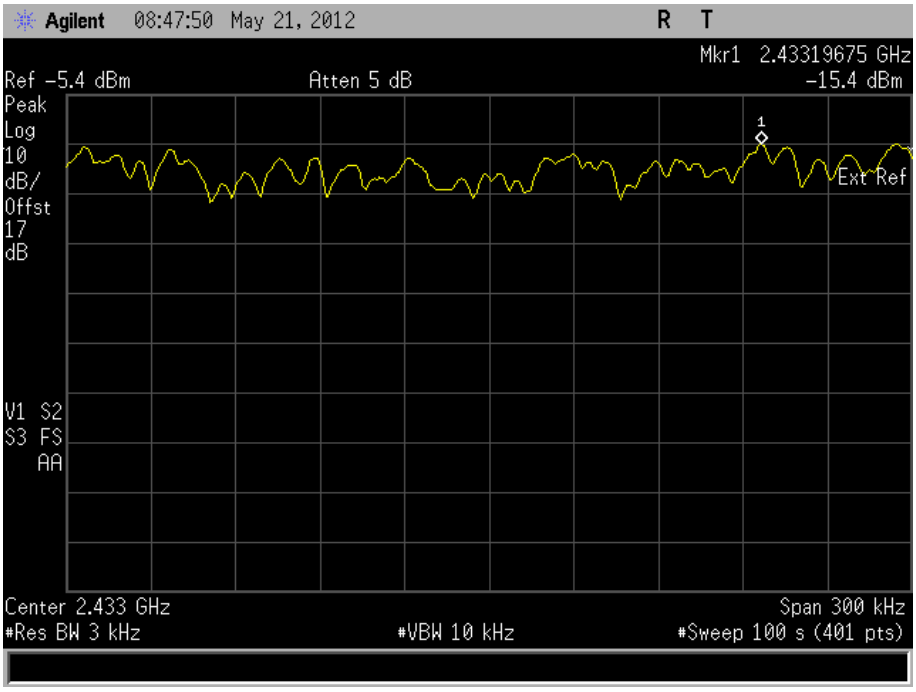



52 Mbps

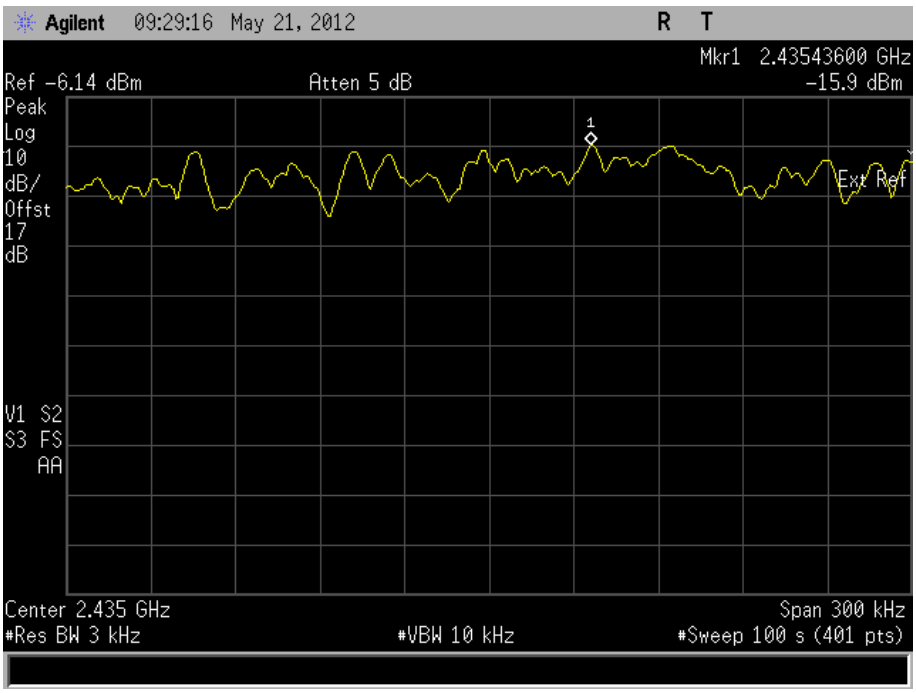


Product Service

58.5 Mbps



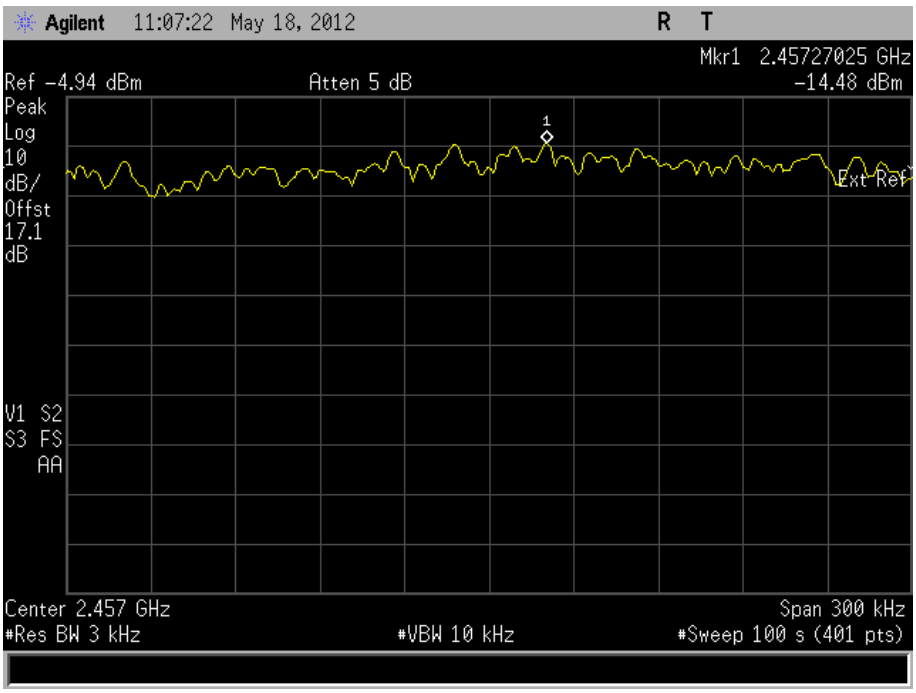

65 Mbps



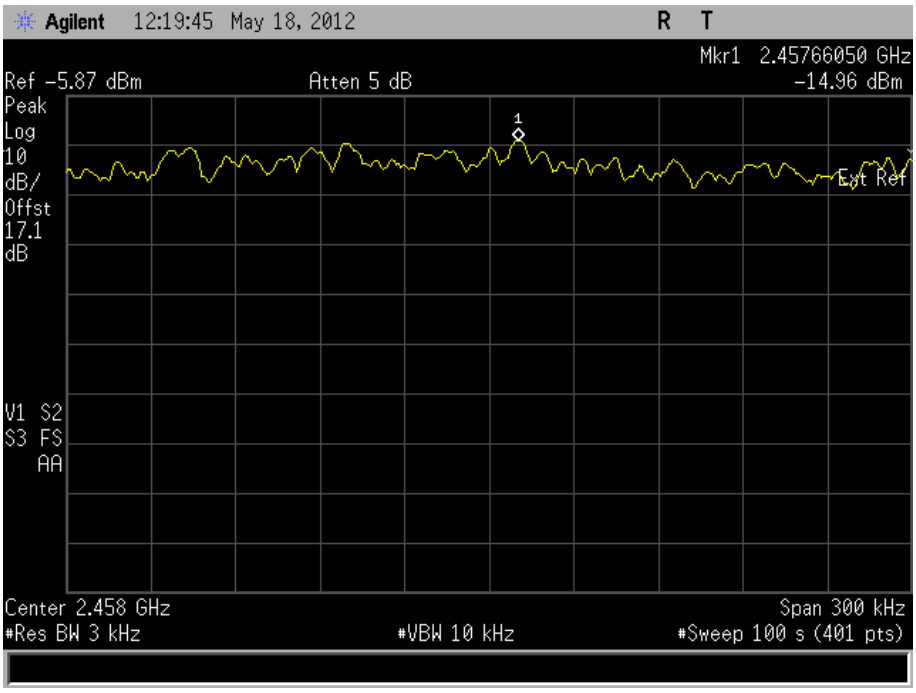
Product Service

2462 MHz

6.5 Mbps

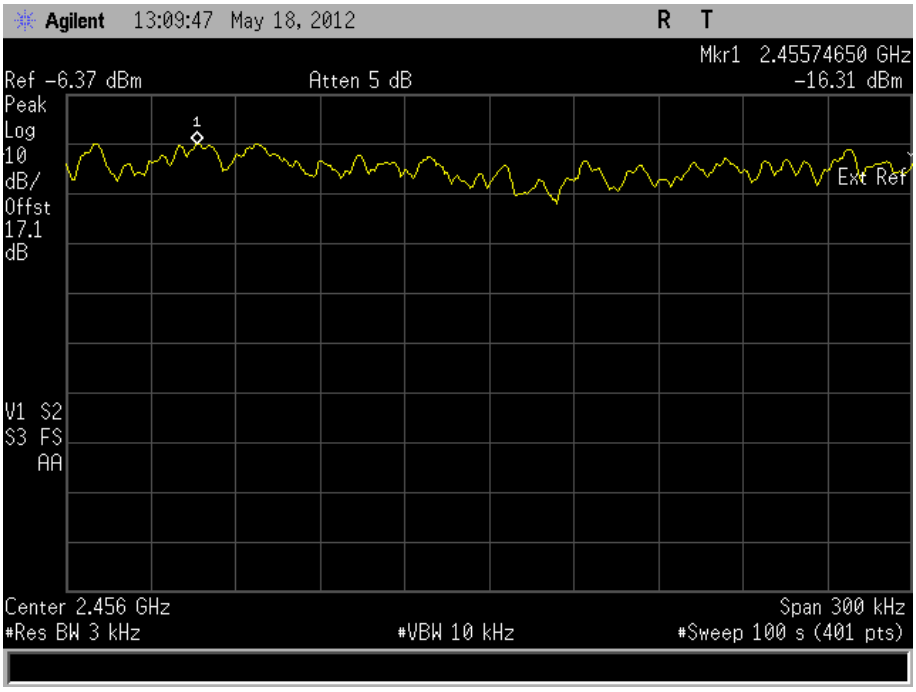



13 Mbps

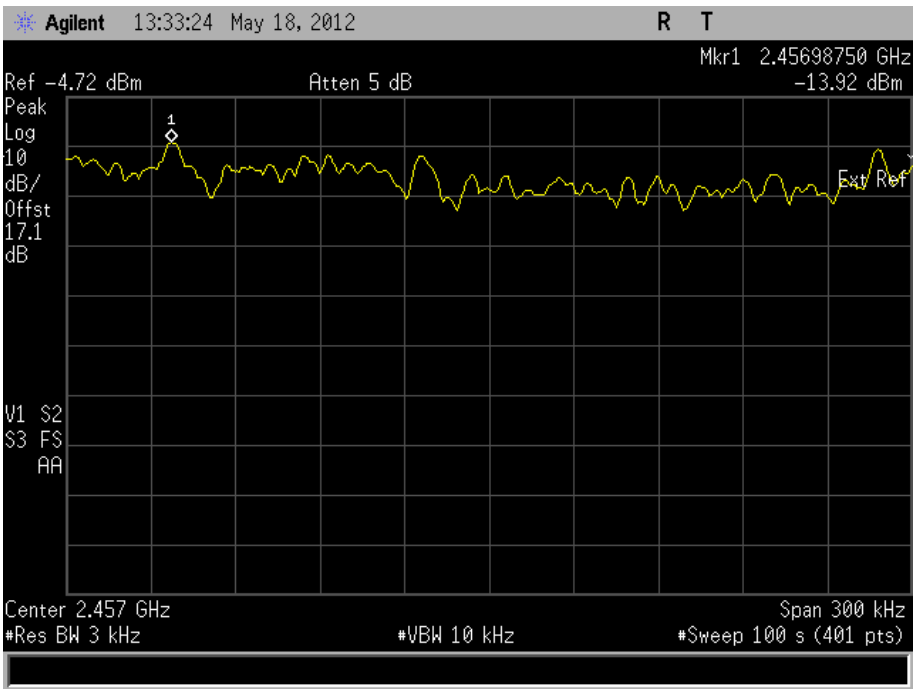


Product Service

19.5 Mbps

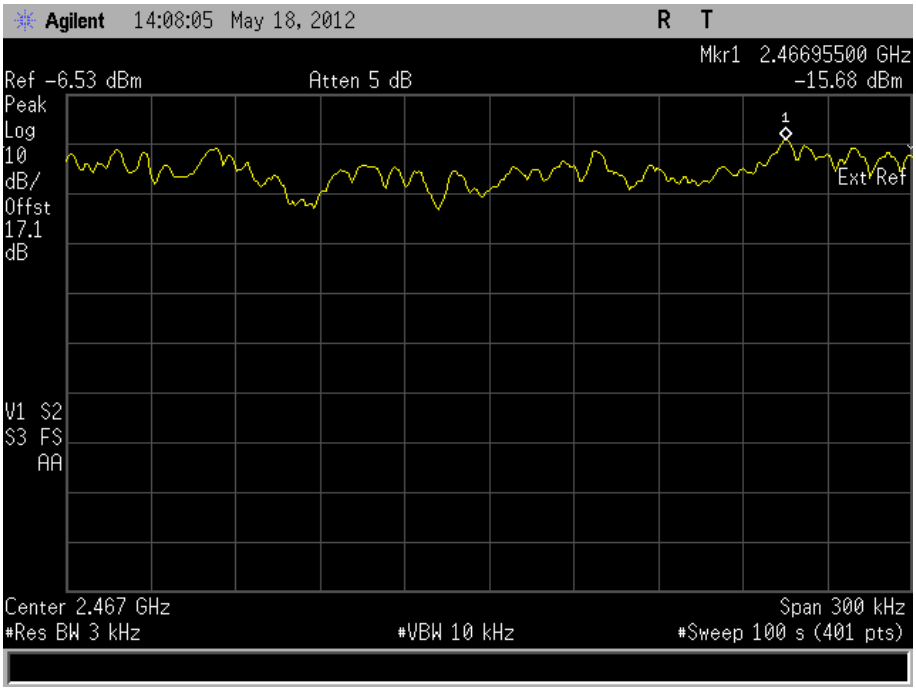



26 Mbps

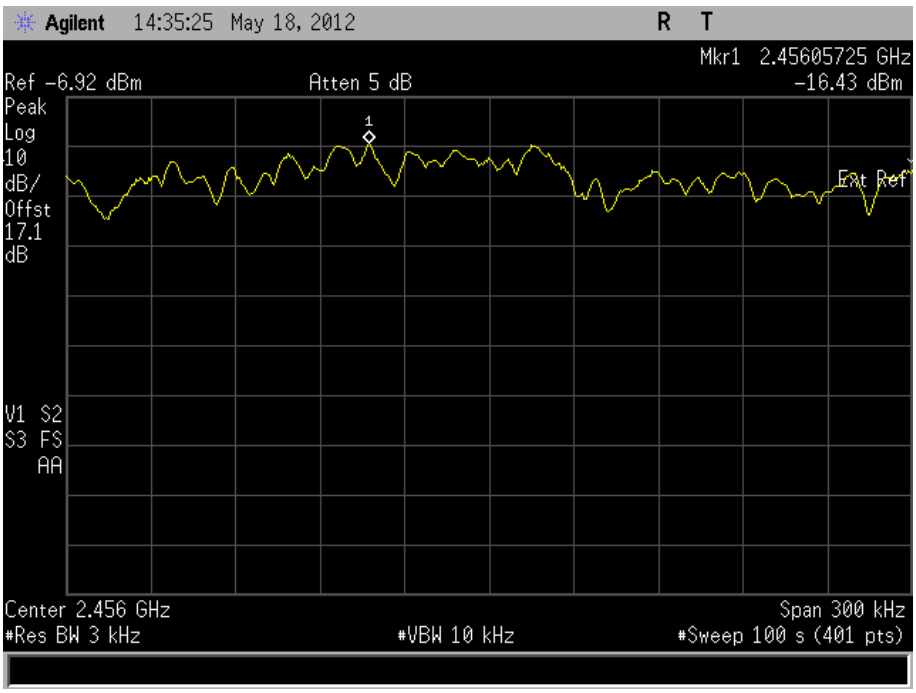


Product Service

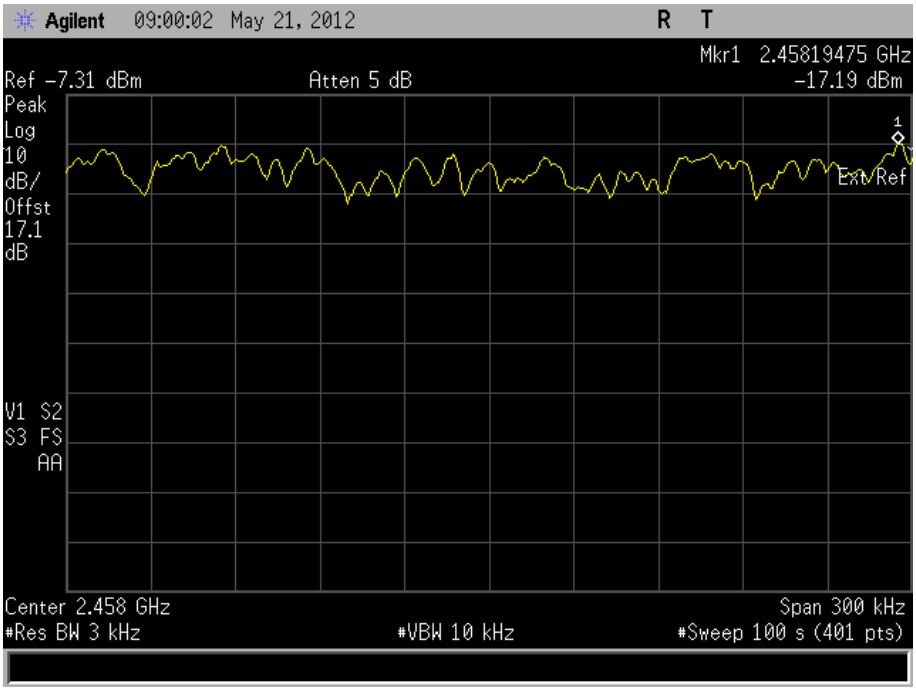
39 Mbps



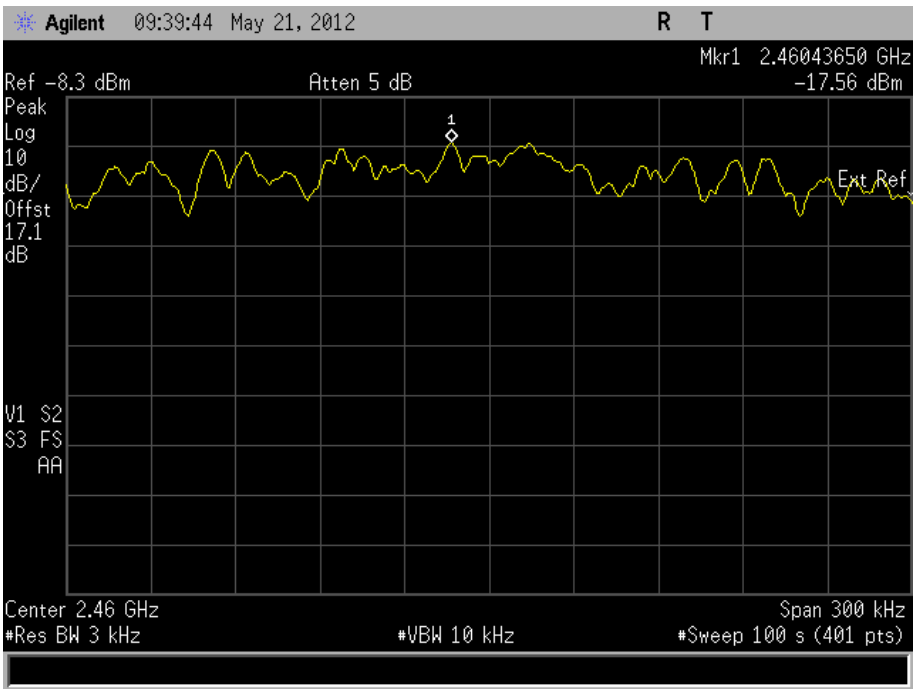

52 Mbps



58.5 Mbps




65 Mbps




Limit Clause

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

## 2.5 SPURIOUS AND BAND EDGE EMISSIONS

### 2.5.1 Specification Reference

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

### 2.5.2 Equipment Under Test and Modification State

CDMA SHI16 S/N: IMEI 004401113852657 - Modification State 0

### 2.5.3 Date of Test

13 May 2012, 10 June 2012, 11 June 2012 & 13 June 2012

### 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

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 shown a -20 dBc limit line on the trace. The measurement path loss in each relevant frequency band was measured and entered a s 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.

### 2.5.6 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 17.8 - 23.8°C |
| Relative Humidity | 26.8 - 48.0% |

Product Service

### 2.5.7 Test Results

802.11(b)

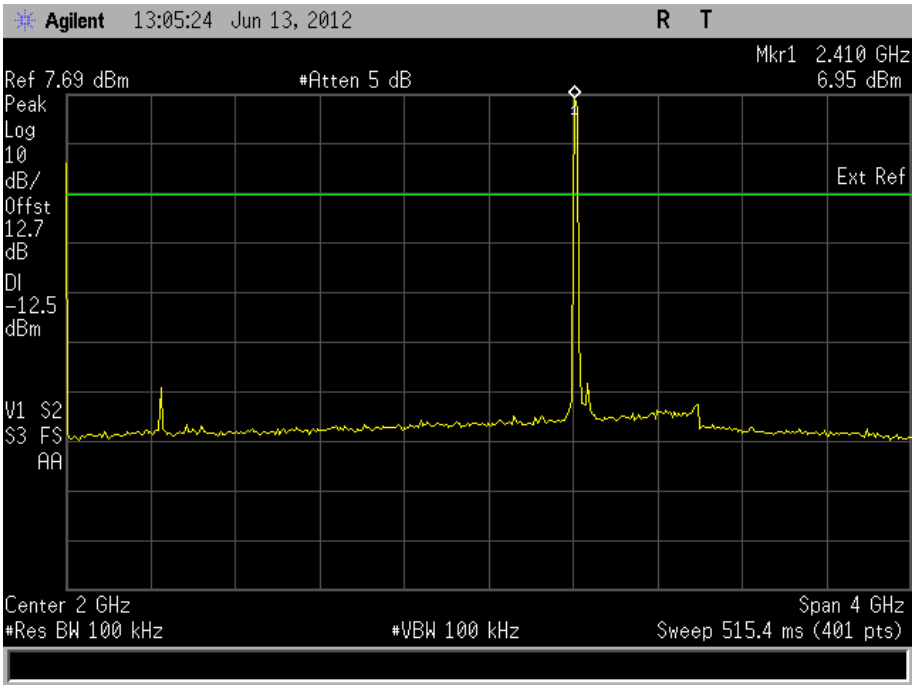
4.0 V DC Supply

Spurious Conducted Emissions

1 Mbps

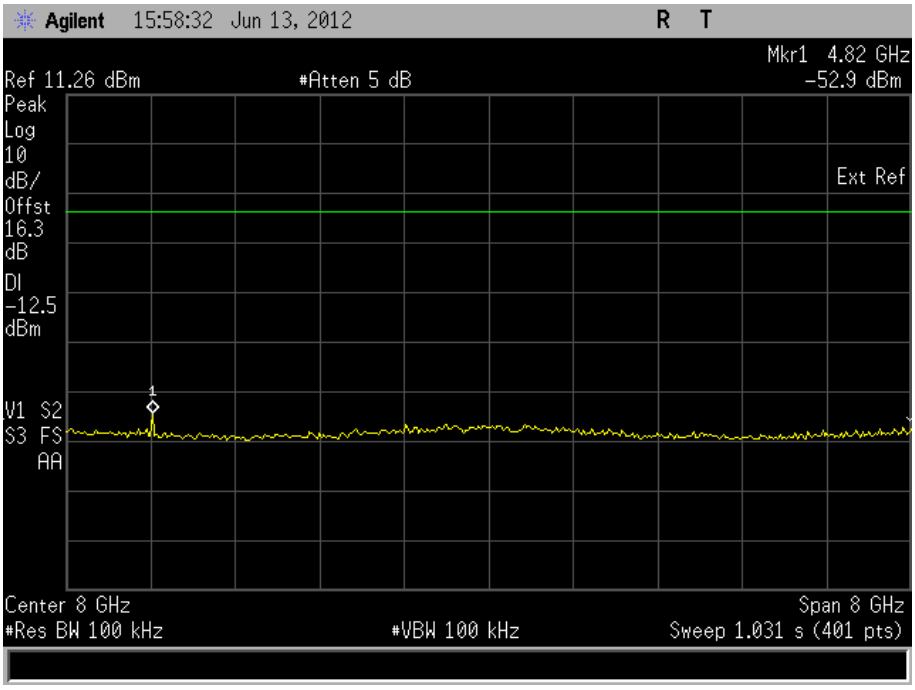
2412 MHz

9 kHz to 4 GHz

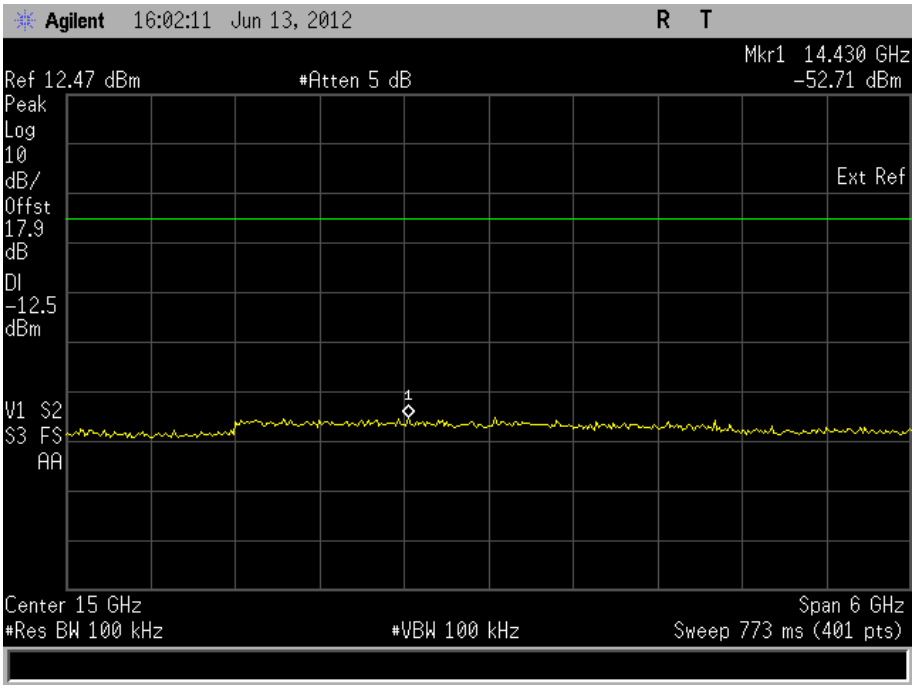


Product Service

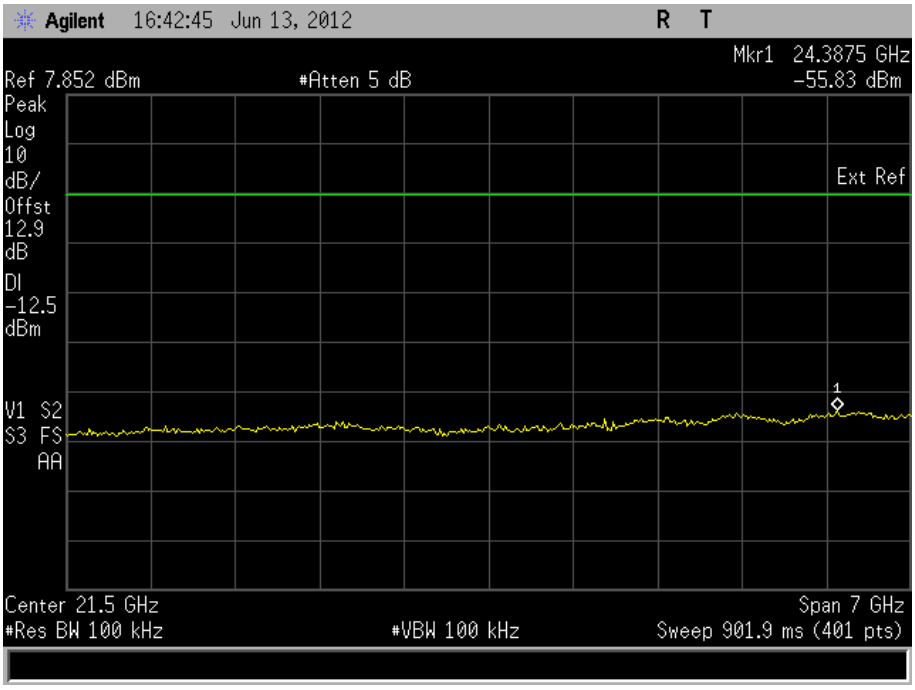
4 GHz to 12 GHz




12 GHz to 18 GHz

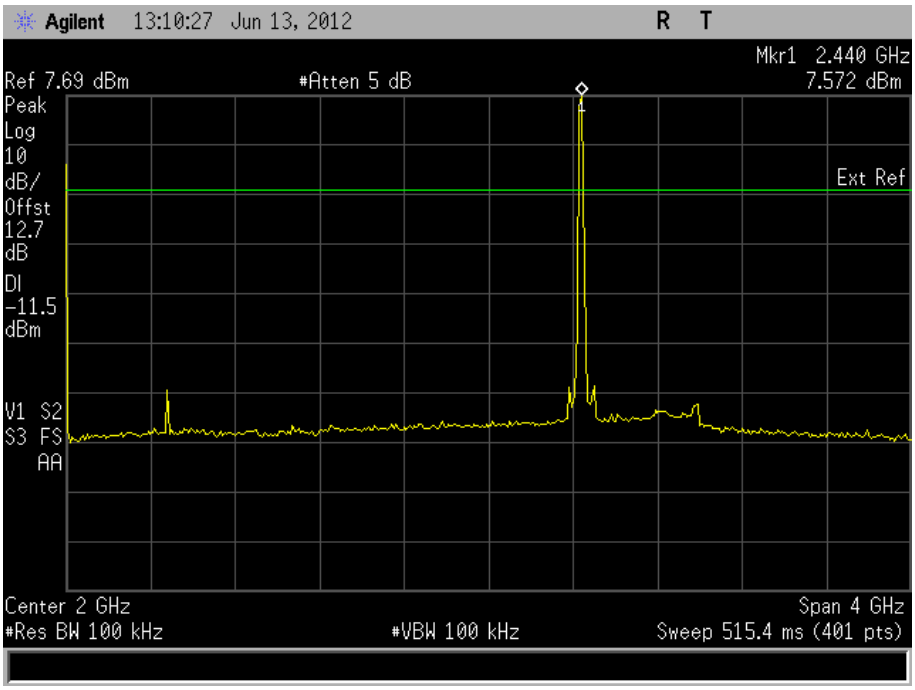


18 GHz to 25 GHz



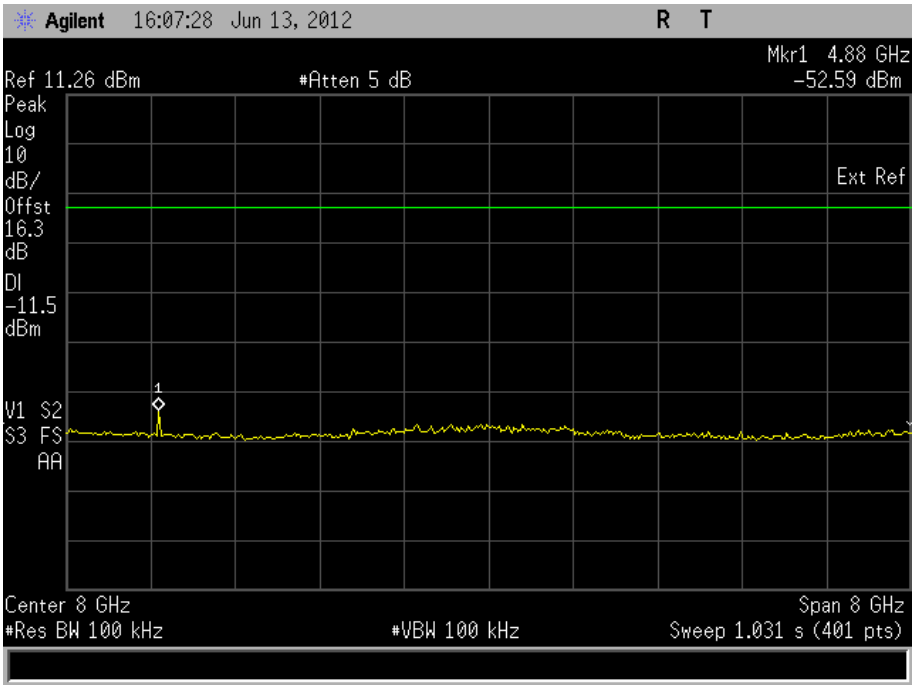

2437 MHz

9 kHz to 4 GHz

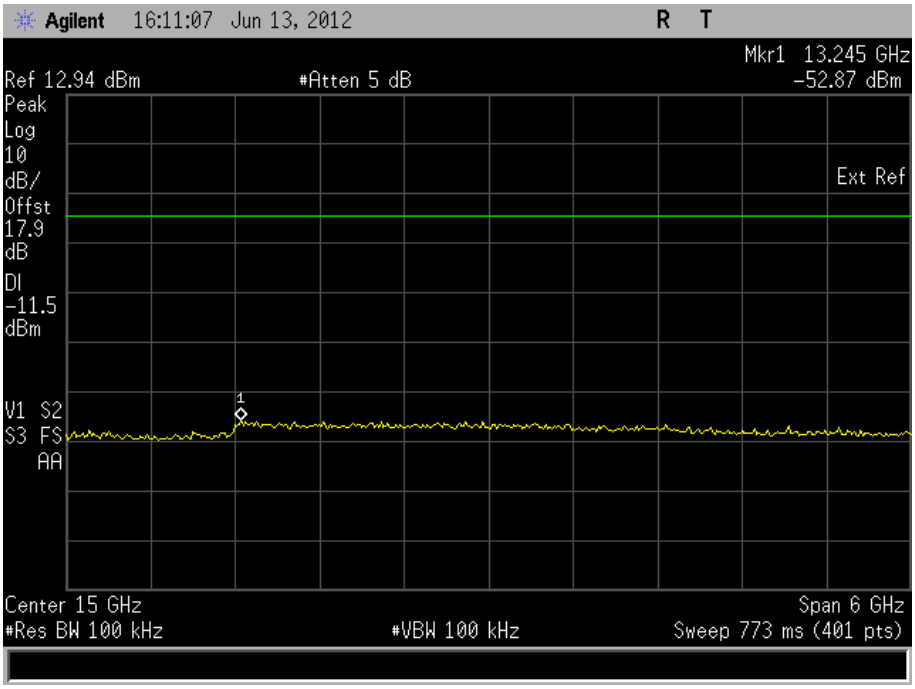


Product Service

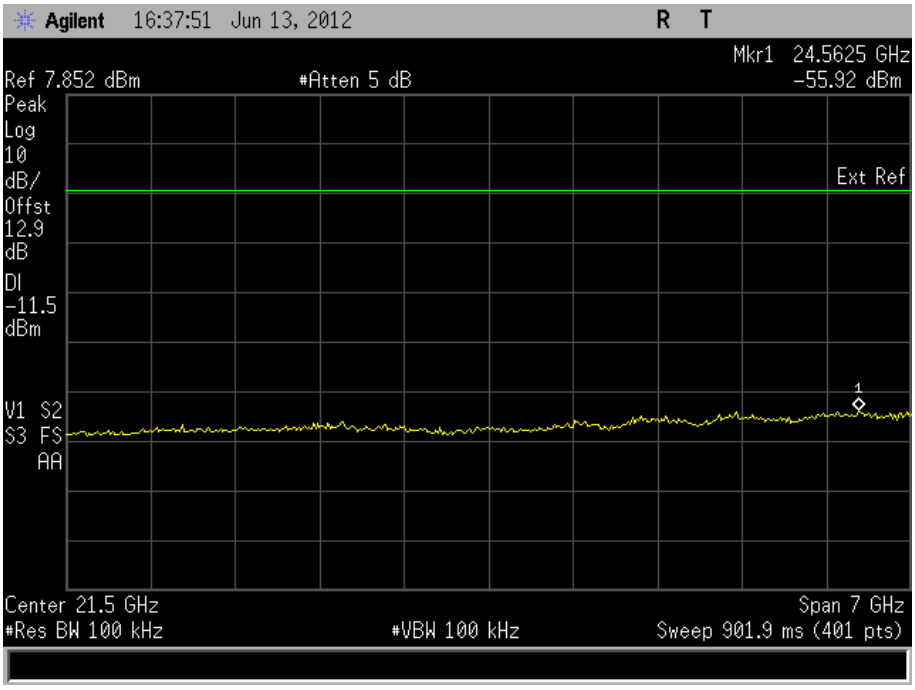
4 GHz to 12 GHz




12 GHz to 18 GHz

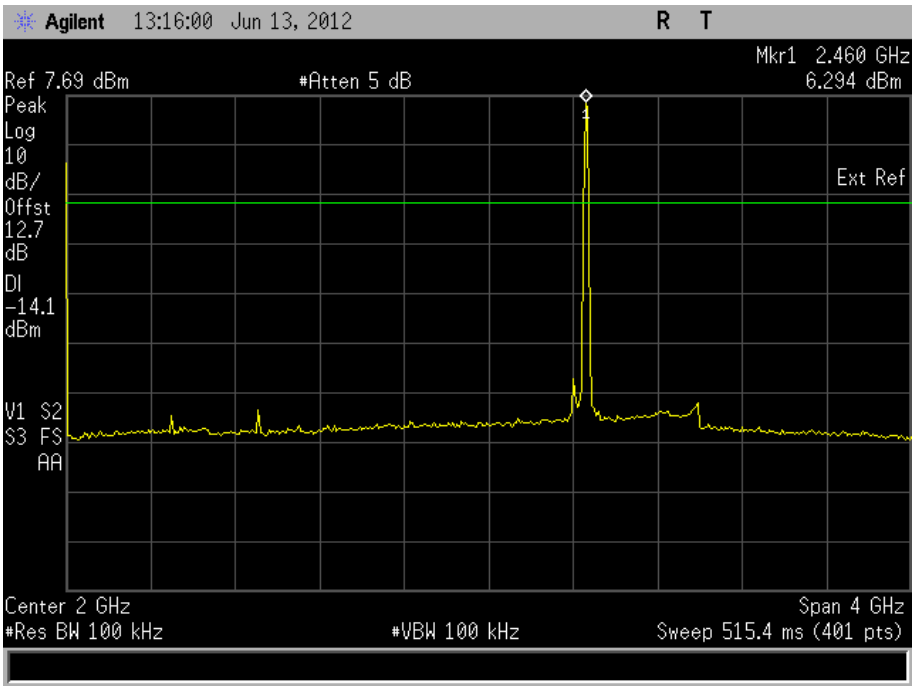


18 GHz to 25 GHz



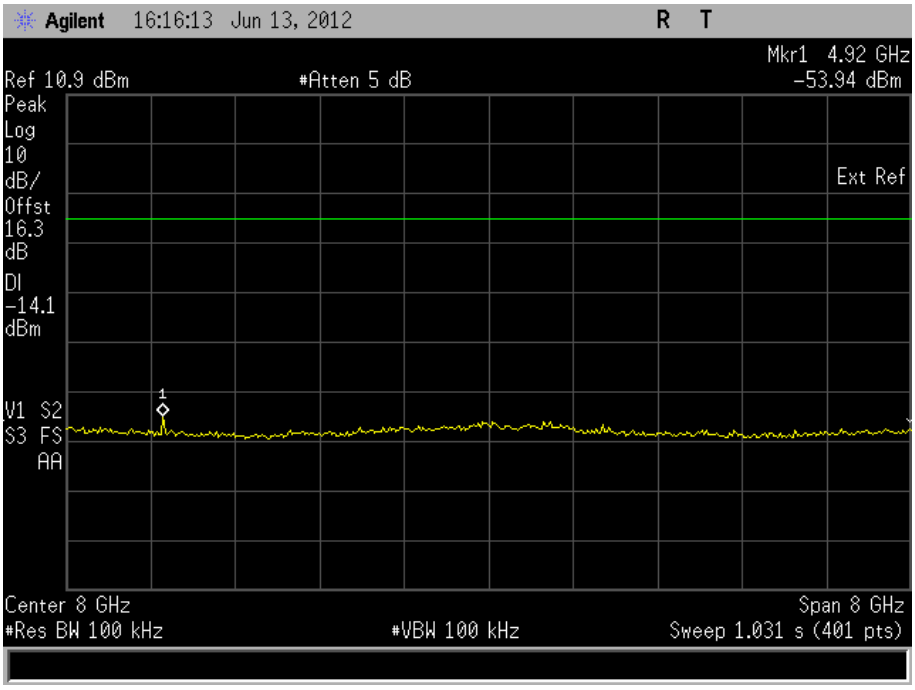

2462 MHz

9 kHz to 4 GHz

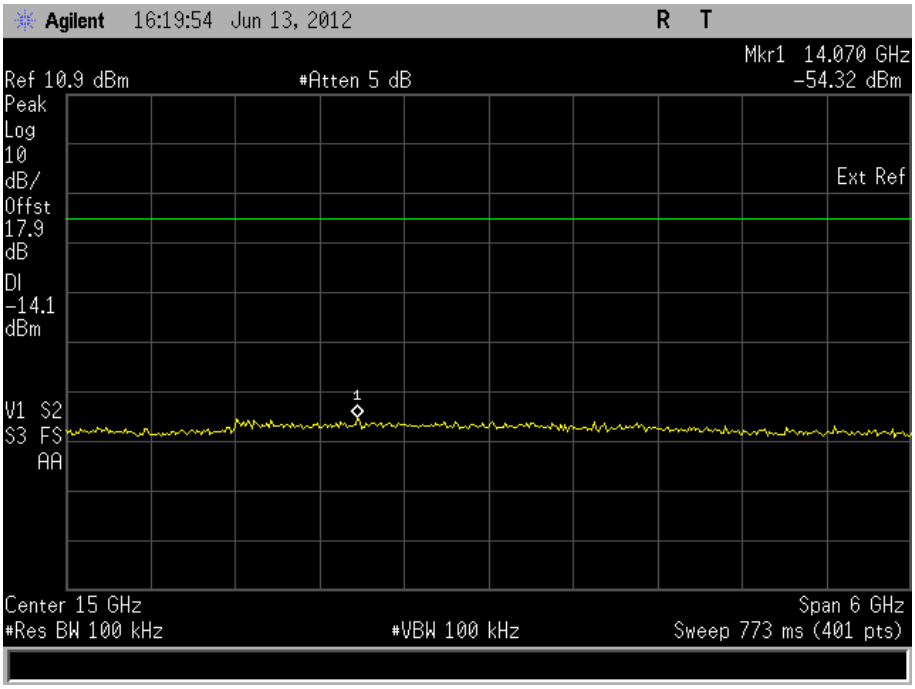


Product Service

4 GHz to 12 GHz

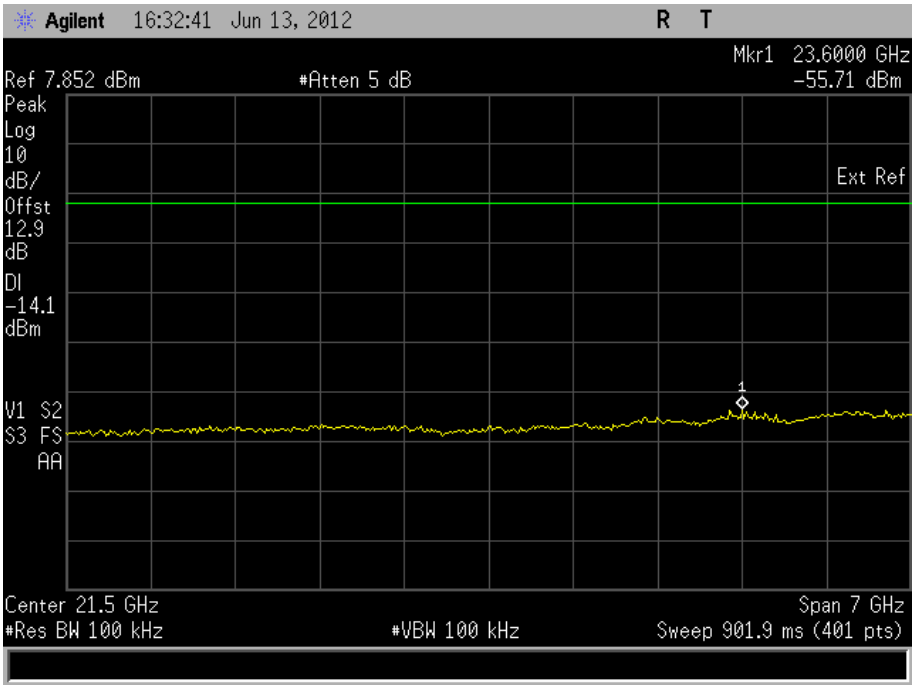



12 GHz to 18 GHz



Product Service

18 GHz to 25 GHz




Limit Clause

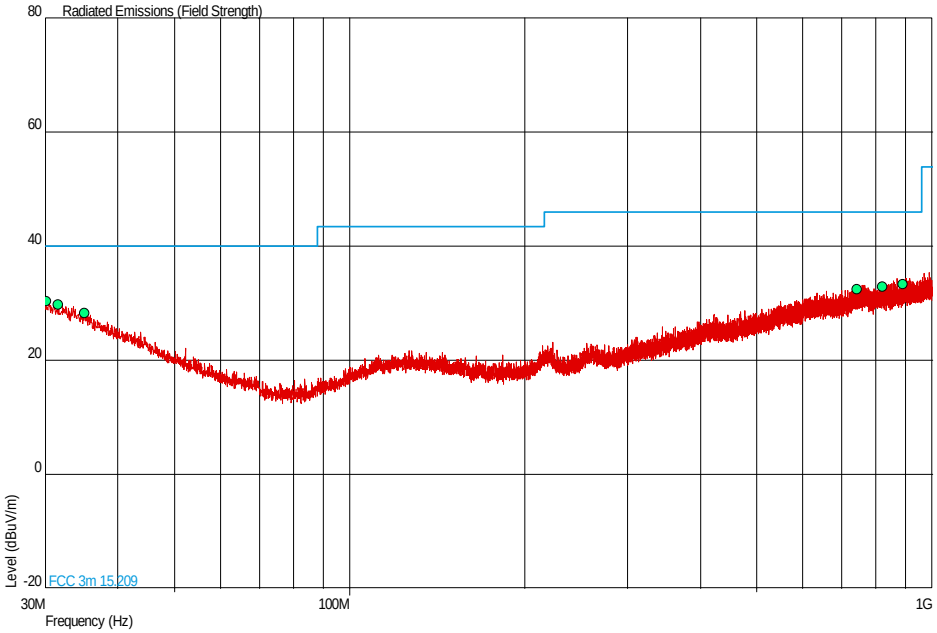
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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.

Spurious Radiated Emissions

2412 MHz

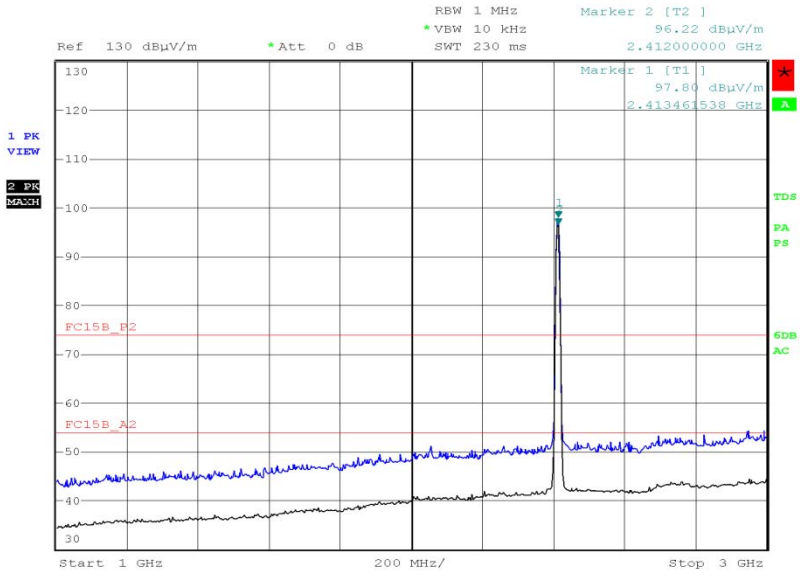
30 MHz to 1 GHz




| Frequency (MHz) | QP Level (dBµV/m) | QP Level (µV/m) | QP Limit (dBµV/m) | QP Limit (µV/m) | QP Margin (dBµV/m) | QP Margin (µV/m) | Angle (Deg) | Height (m) | Polarity | |
|---|---|---|---|---|---|---|---|---|---|---|
| 30.146 | 30.4 | 33.1 | 40.0 | 100 | -9.6 | 66.9 | 180 | 1.00 | Horizontal | |
| 31.649 | 29.8 | 30.9 | 40.0 | 100 | -10.2 | 69.1 | 0 | 1.00 | Vertical | |
| 35.093 | 28.3 | 26.0 | 40.0 | 100 | -11.7 | 74.0 | 90 | 1.00 | Vertical | |
| 742.174 | 32.5 | 42.2 | 46.0 | 200 | -13.5 | 157.8 | 0 | 1.00 | Vertical | |
| 820.744 | 32.9 | 44.2 | 46.0 | 200 | -13.1 | 155.8 | 0 | 1.00 | Vertical | |
| 891.894 | 33.4 | 46.8 | 46.0 | 200 | -12.6 | 153.2 | 0 | 1.00 | Horizontal | |

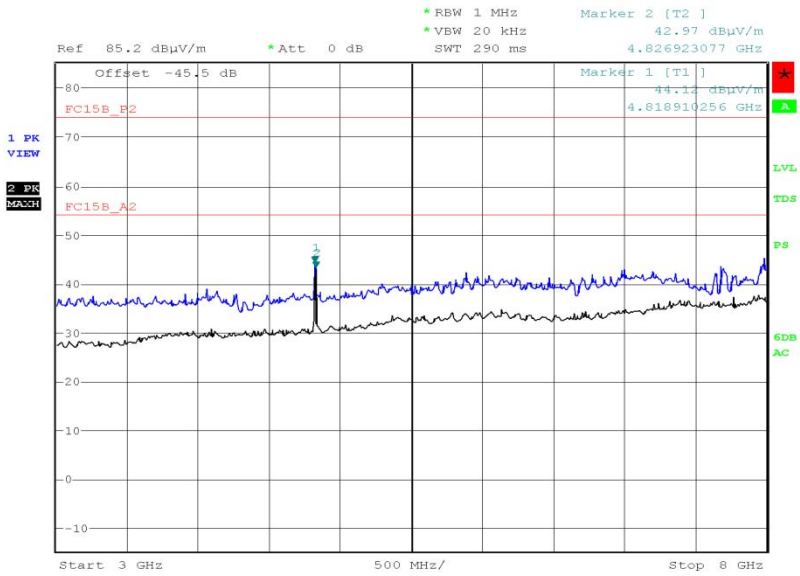
Product Service

1 GHz to 3 GHz




Date: 10.JUN.2012 10:04:59

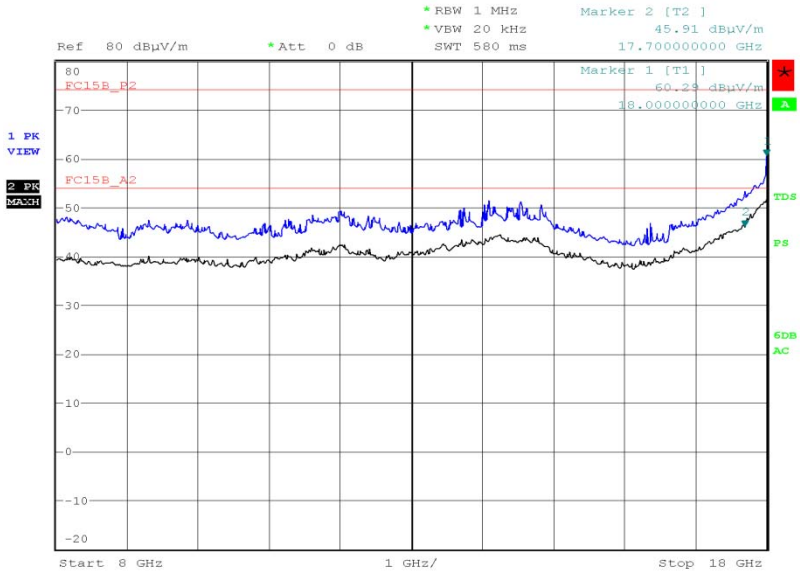
3 GHz to 8 GHz




Date: 9.JUN.2012 17:00:56

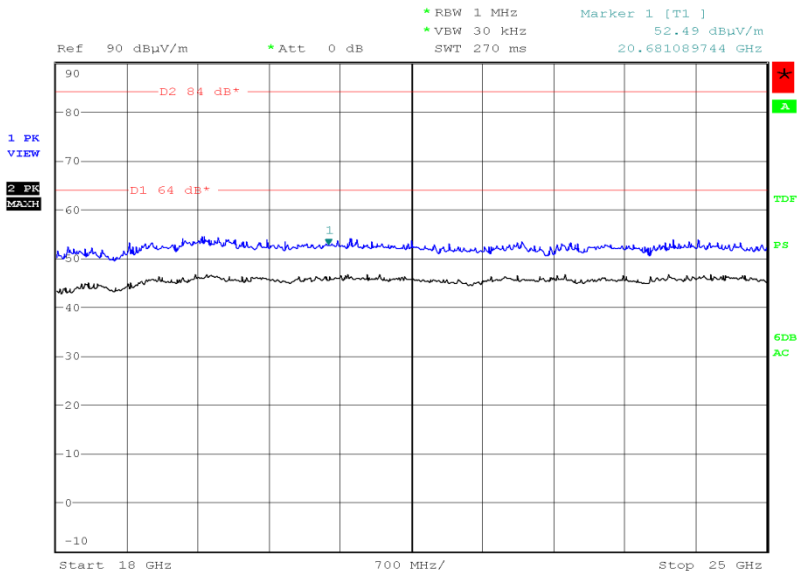
Product Service

8 GHz to 18 GHz




Date: 10.JUN.2012 13:26:28

18 GHz to 25 GHz




Date: 11.JUN.2012 20:32:23

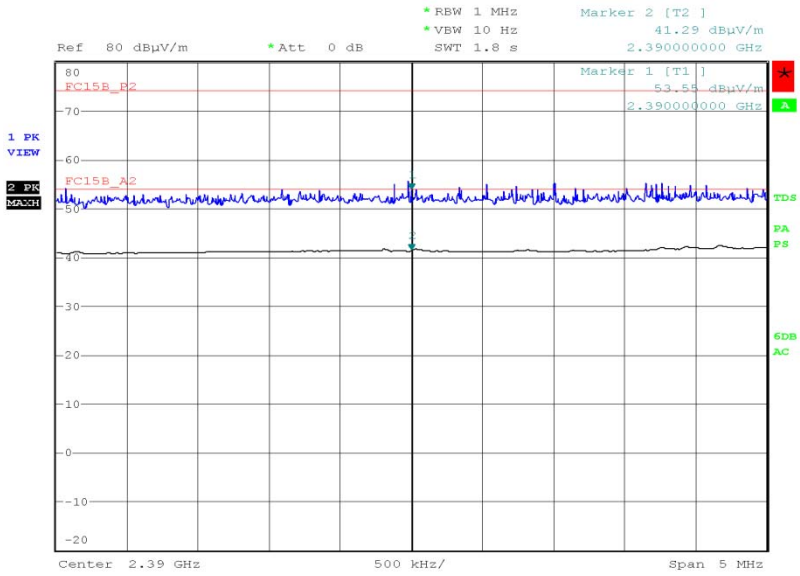
Limit

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

Band Edge Emissions

2412 MHz

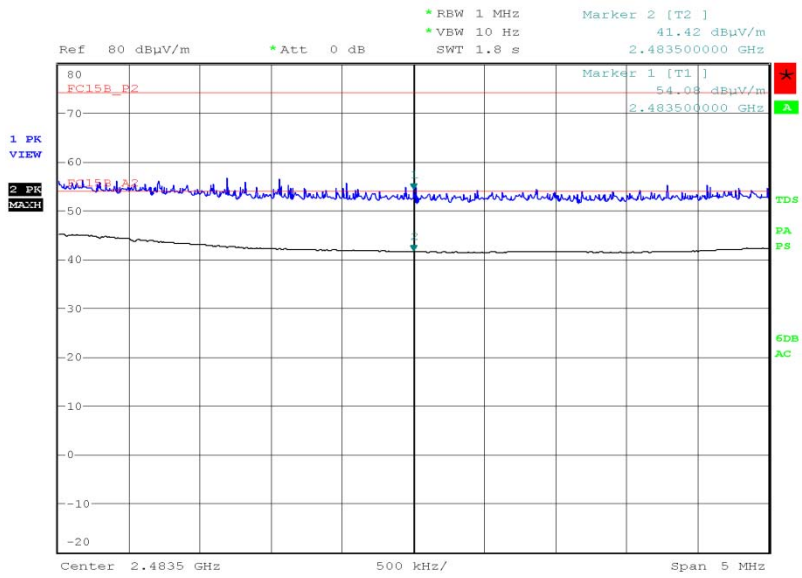
| Polarisation | Final Peak (dBµV/m) | Final Average (dBµV/m) |
|---|---|---|
| Horizontal | 53.55 | 41.29 |




Date: 12.MAY.2012 08:29:48

2462 MHz

| Polarisation | Final Peak (dBµV/m) | Final Average (dBµV/m) |
|---|---|---|
| Horizontal | 54.08 | 41.42 |




Date: 12.MAY.2012 10:09:39

Limit

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

802.11(g)

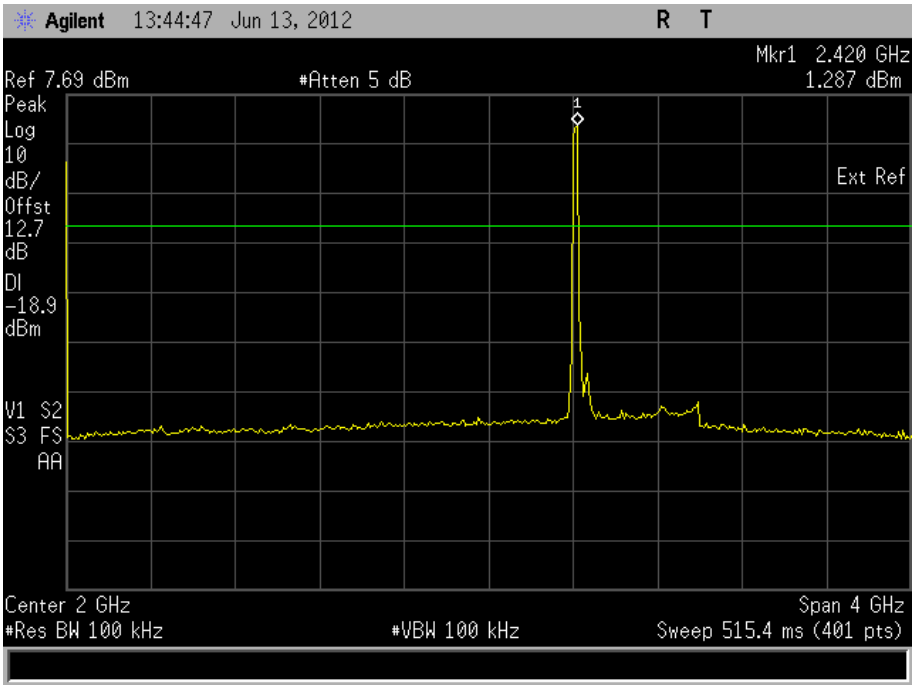
4.0 V DC Supply

Spurious Conducted Emissions

6 Mbps

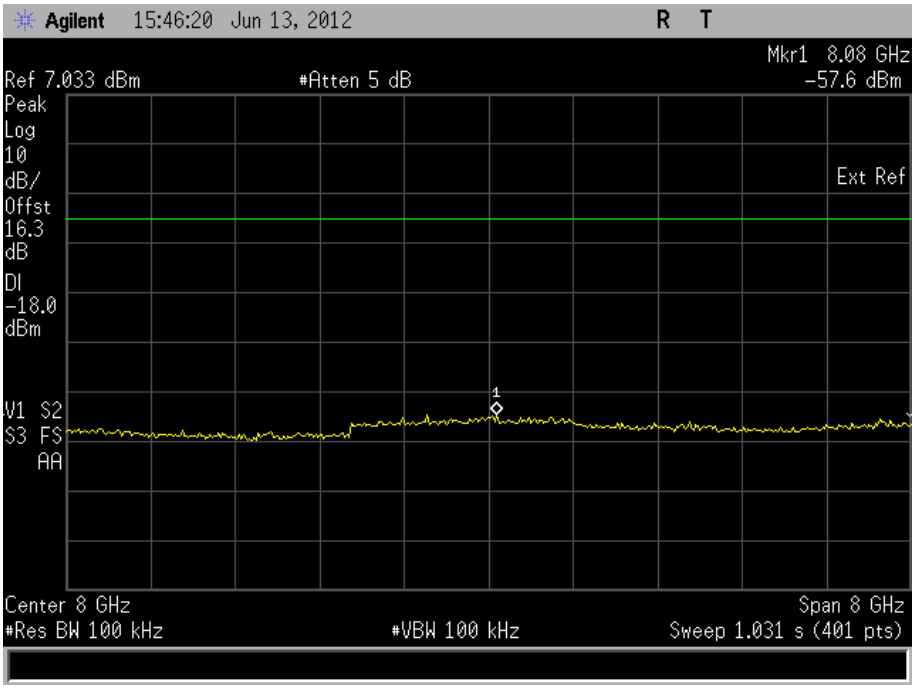
2412 MHz

9 kHz to 4 GHz

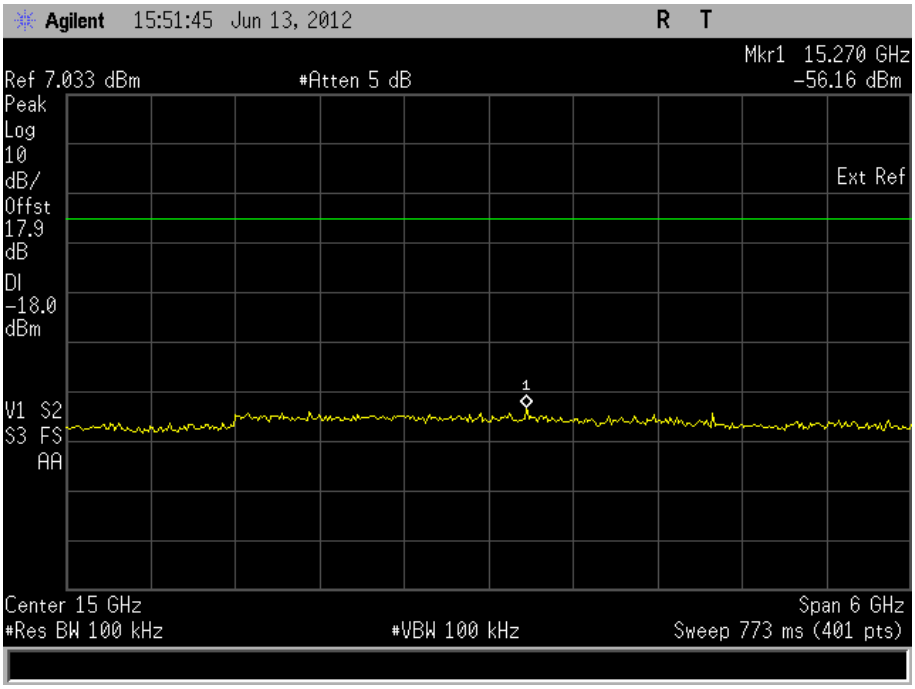


Product Service

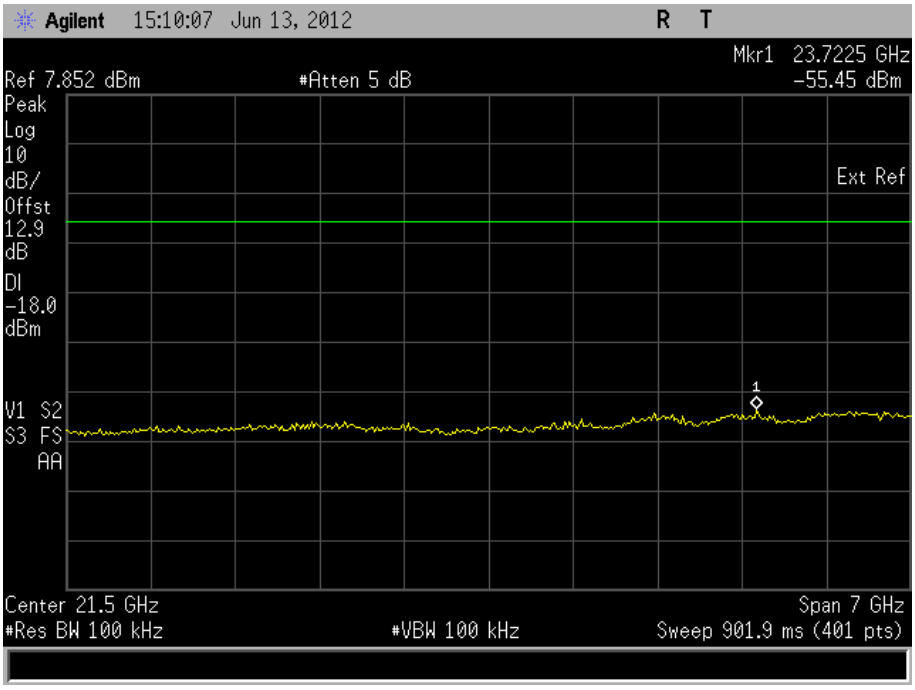
4 GHz to 12 GHz




12 GHz to 18 GHz

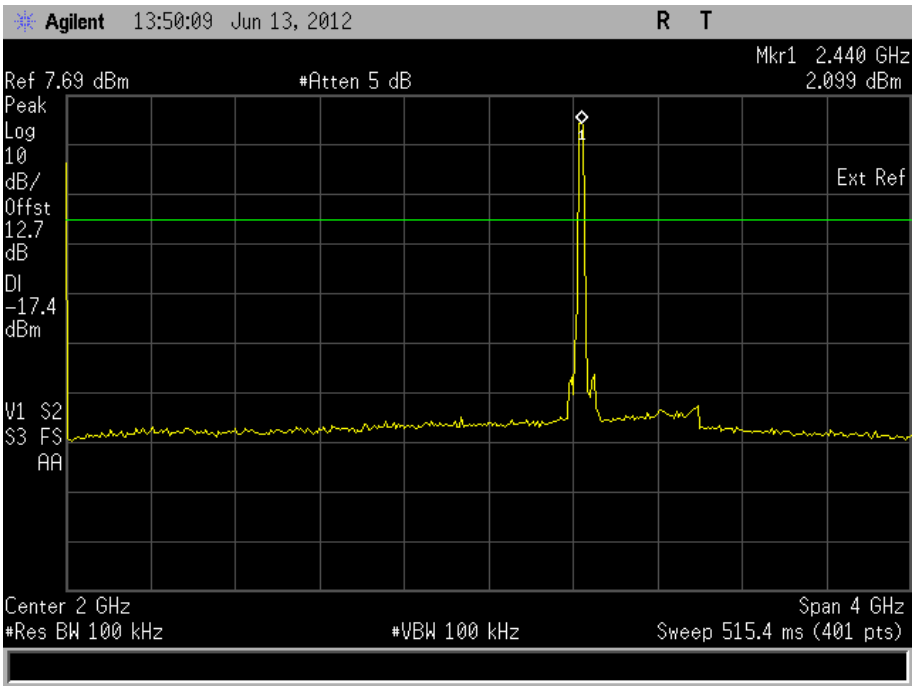


18 GHz to 25 GHz



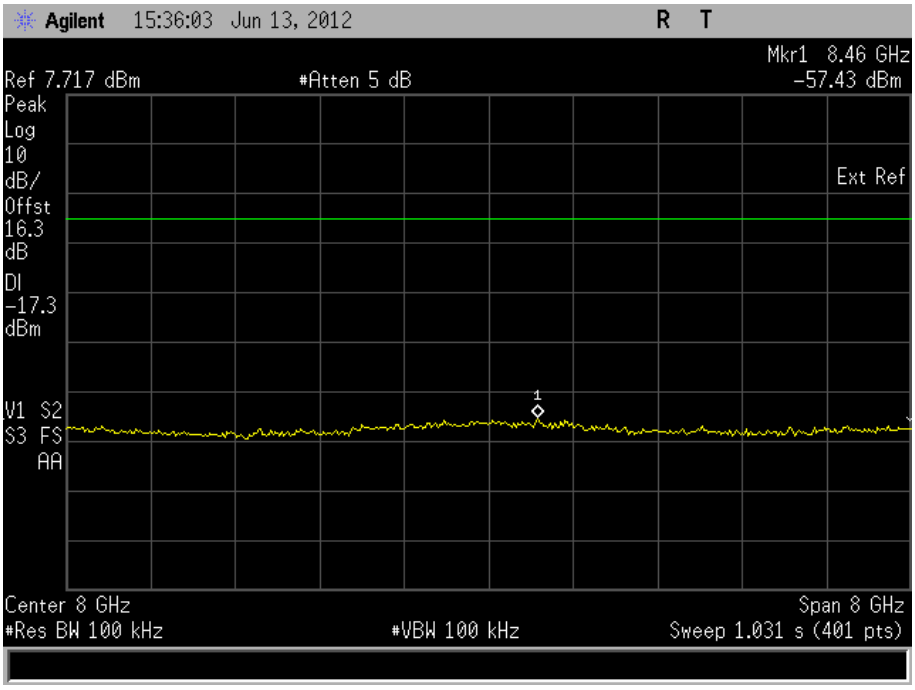

2437 MHz

9 kHz to 4 GHz

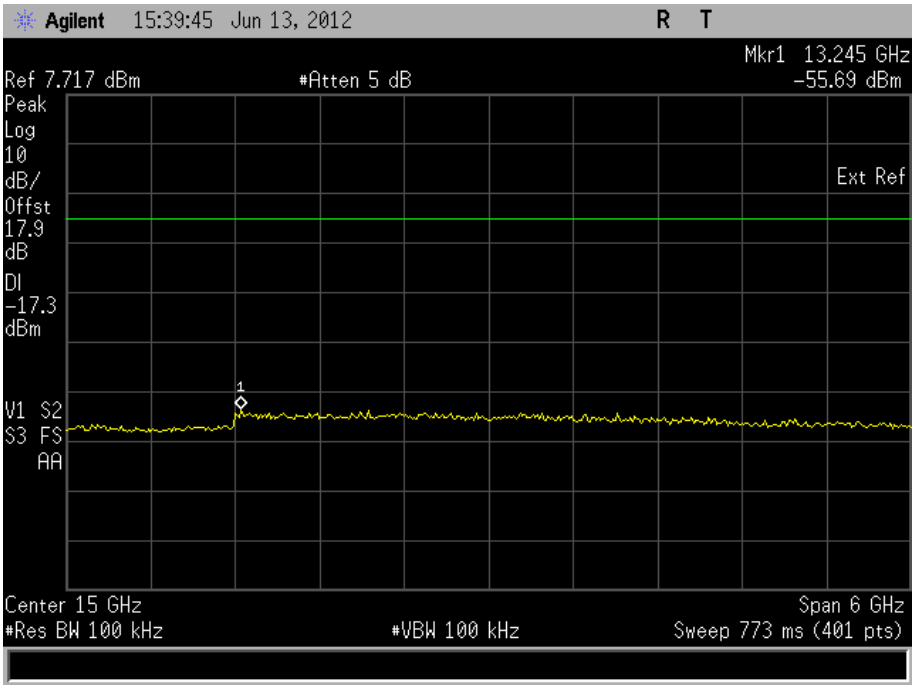


Product Service

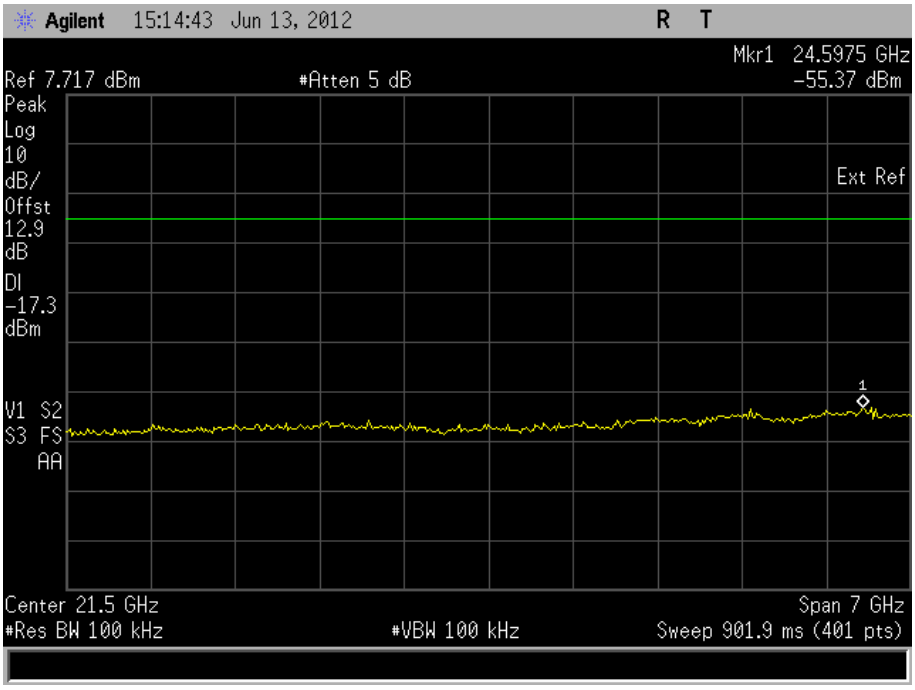
4 GHz to 12 GHz




12 GHz to 18 GHz

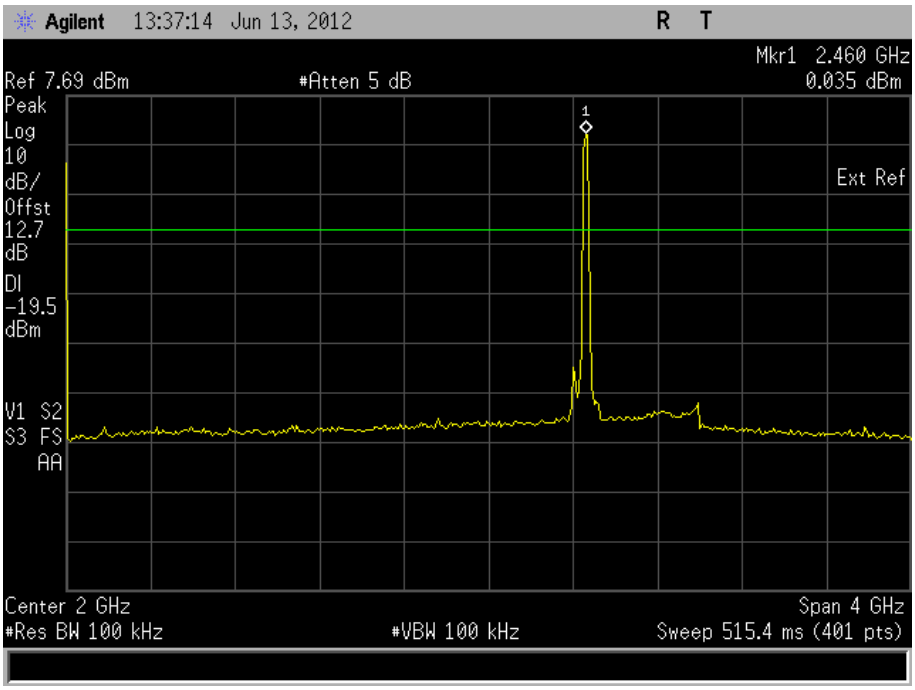


18 GHz to 25 GHz



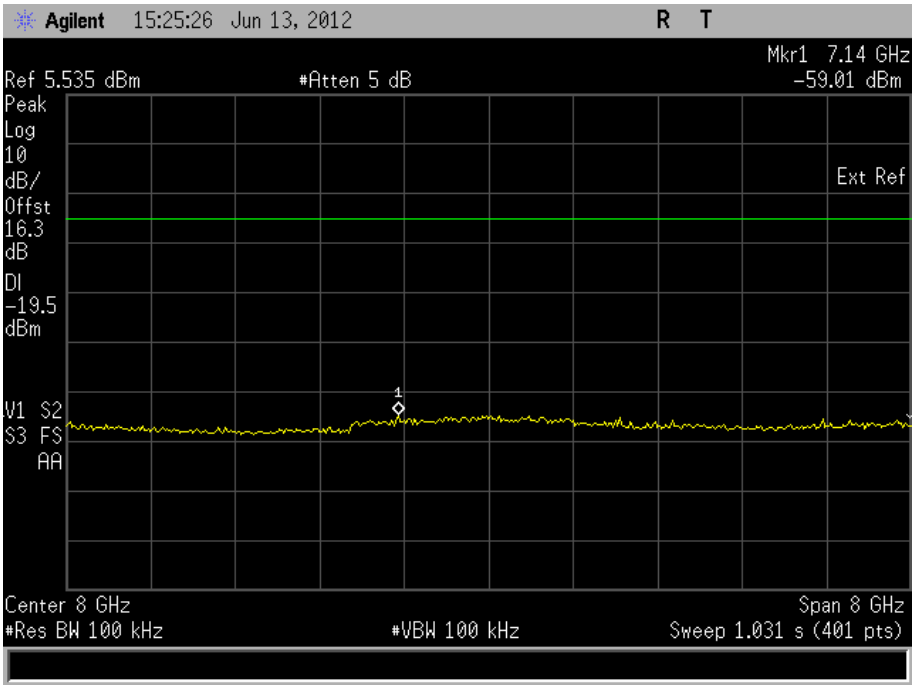

2462 MHz

9 kHz to 4 GHz

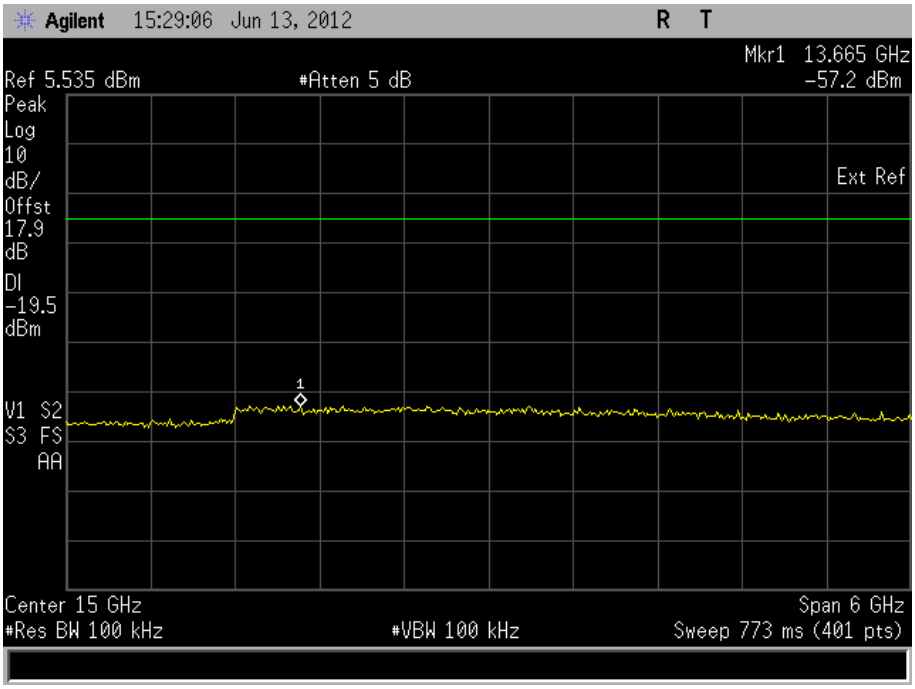


Product Service

4 GHz to 12 GHz

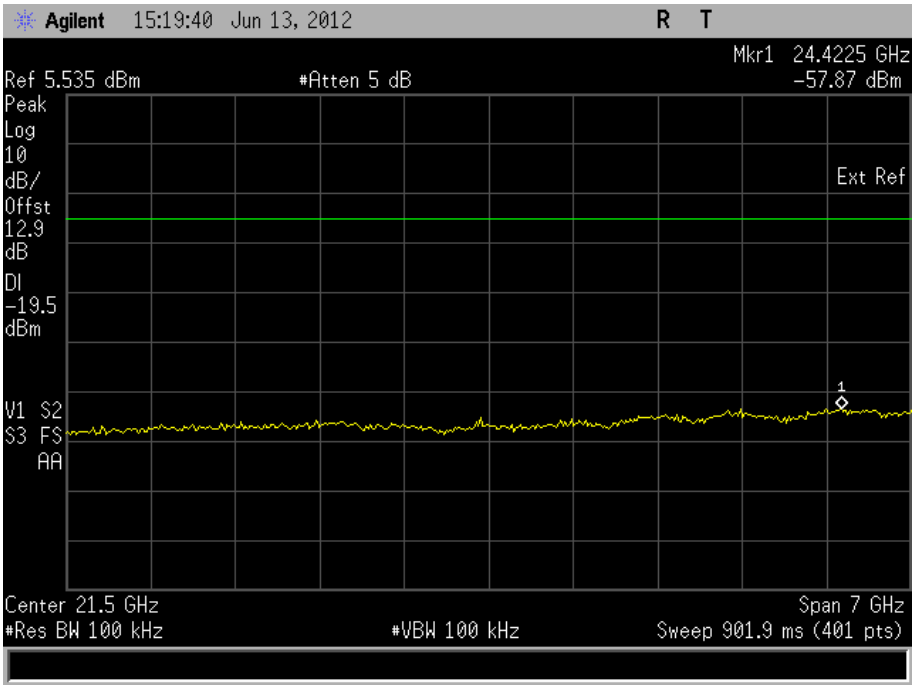



12 GHz to 18 GHz



Product Service

18 GHz to 25 GHz




Limit Clause

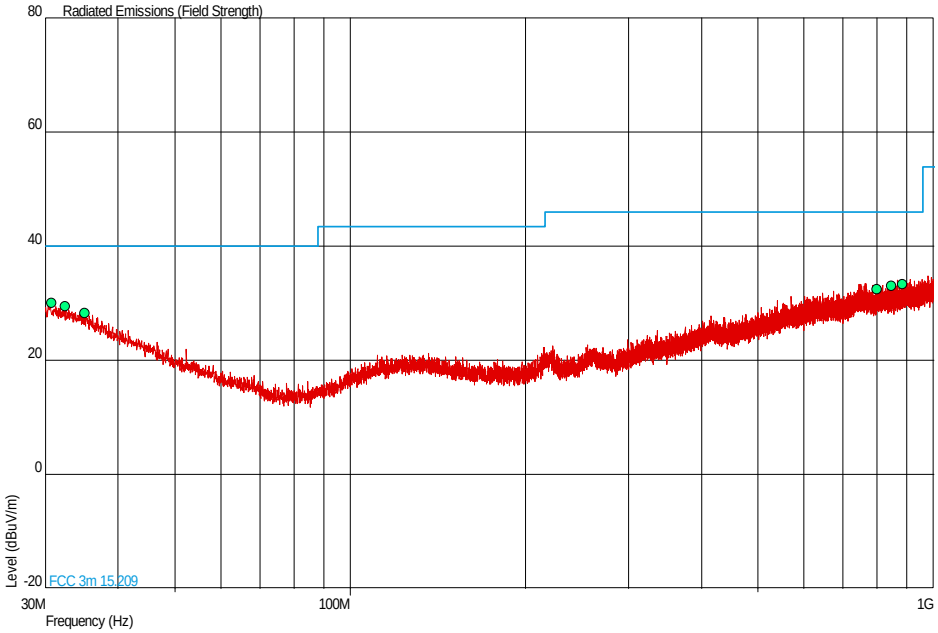
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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.

Spurious Radiated Emissions

2412 MHz

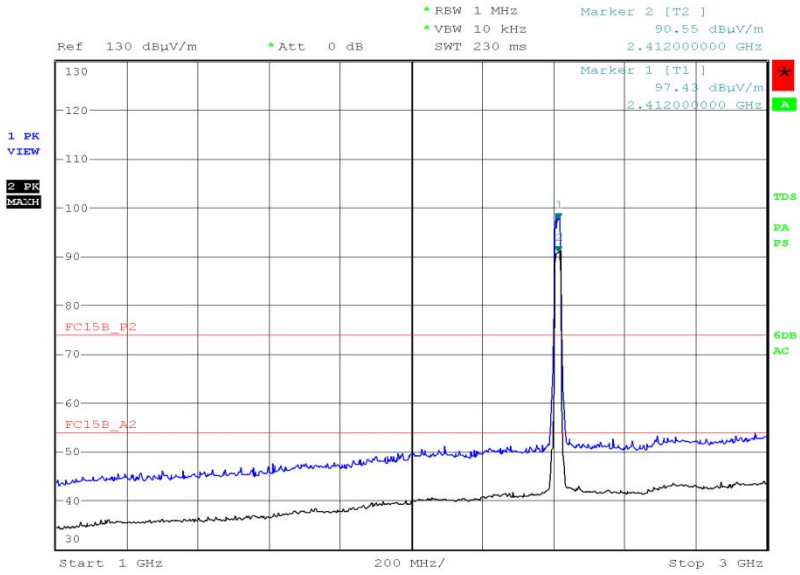
30 MHz to 1 GHz




| Frequency (MHz) | QP Level (dBµV/m) | QP Level (µV/m) | QP Limit (dBµV/m) | QP Limit (µV/m) | QP Margin (dBµV/m) | QP Margin (µV/m) | Angle (Deg) | Height (m) | Polarity | |
|---|---|---|---|---|---|---|---|---|---|---|
| 30.776 | 30.1 | 32.0 | 40.0 | 100 | -9.9 | 68.0 | 180 | 1.00 | Vertical | |
| 32.425 | 29.5 | 29.9 | 40.0 | 100 | -10.5 | 70.1 | 90 | 1.00 | Vertical | |
| 35.093 | 28.3 | 26.0 | 40.0 | 100 | -11.7 | 74.0 | 0 | 1.00 | Vertical | |
| 800.423 | 32.5 | 42.2 | 46.0 | 200 | -13.5 | 157.8 | 180 | 1.00 | Vertical | |
| 848.147 | 33.1 | 45.2 | 46.0 | 200 | -12.9 | 154.8 | 0 | 1.00 | Vertical | |
| 886.025 | 33.3 | 46.2 | 46.0 | 200 | -12.7 | 153.8 | 0 | 1.00 | Vertical | |

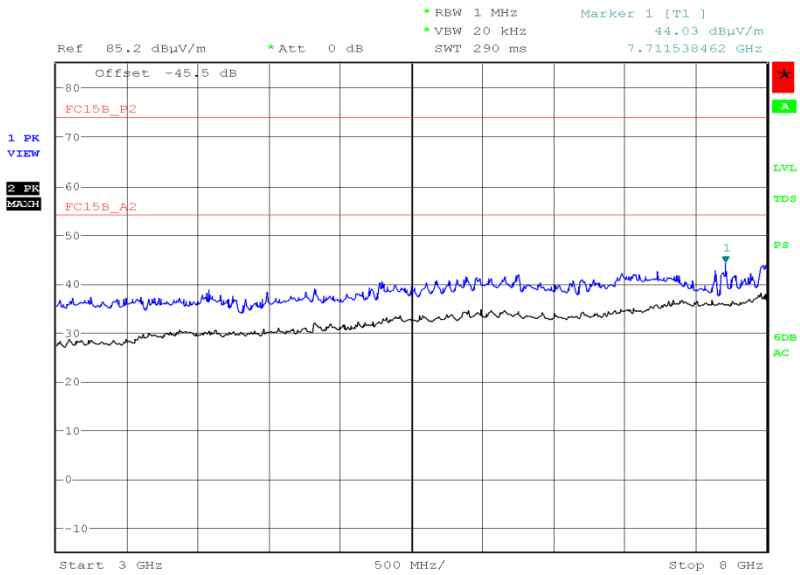
Product Service

1 GHz to 3 GHz




Date: 10.JUN.2012 12:51:38

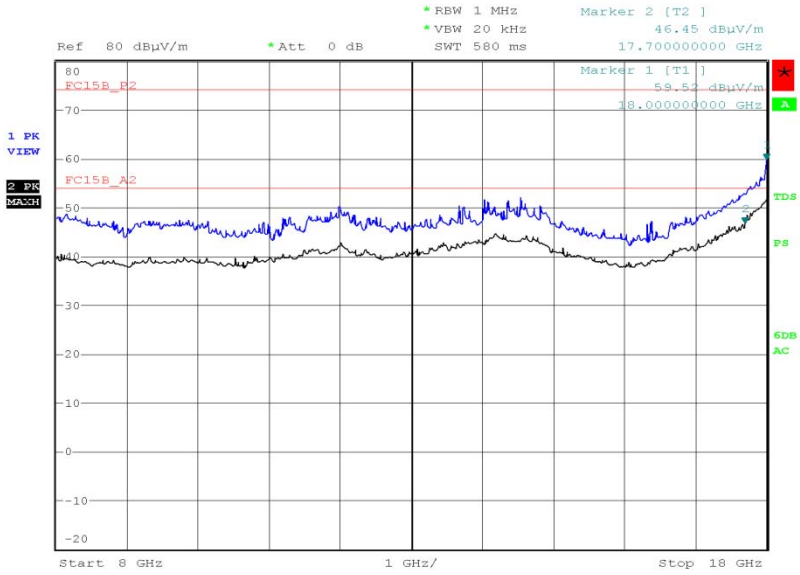
3 GHz to 8 GHz




Date: 9.JUN.2012 17:43:58

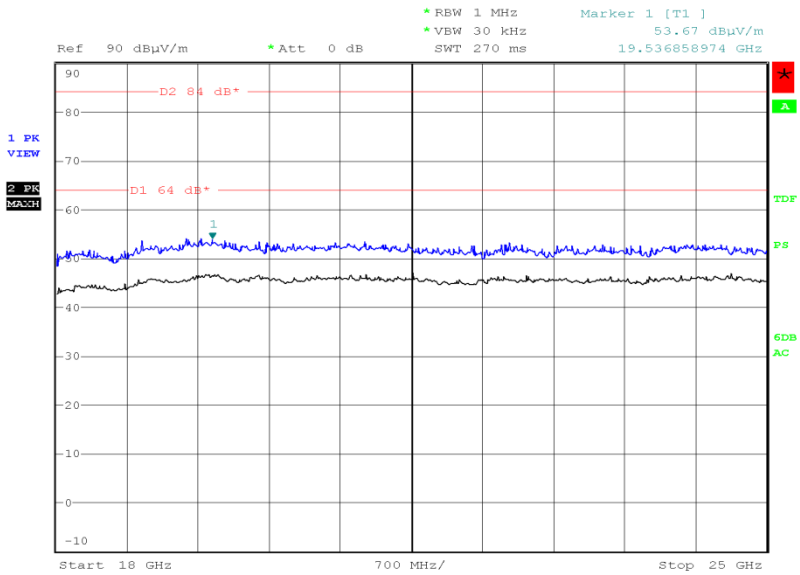
Product Service

8 GHz to 18 GHz




Date: 10.JUN.2012 14:06:54

18 GHz to 25 GHz




Date: 11.JUN.2012 20:11:09

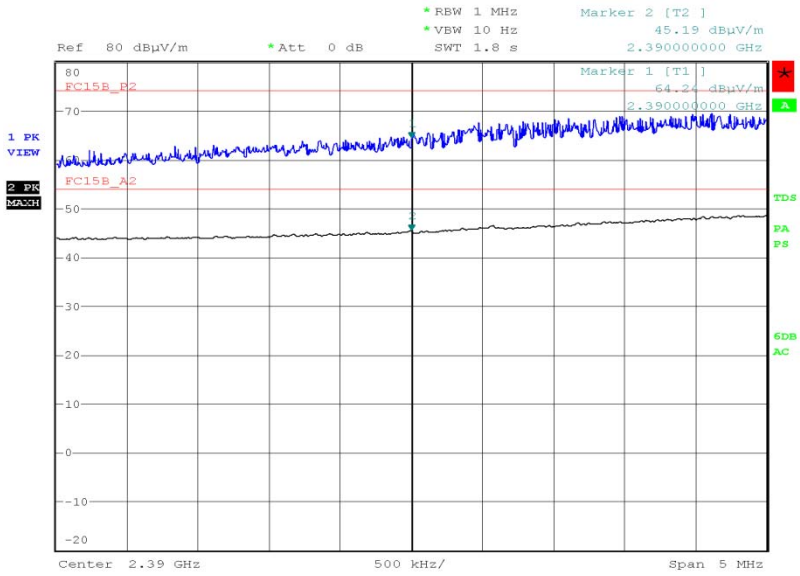
Limit

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

Band Edge Emissions

2412 MHz

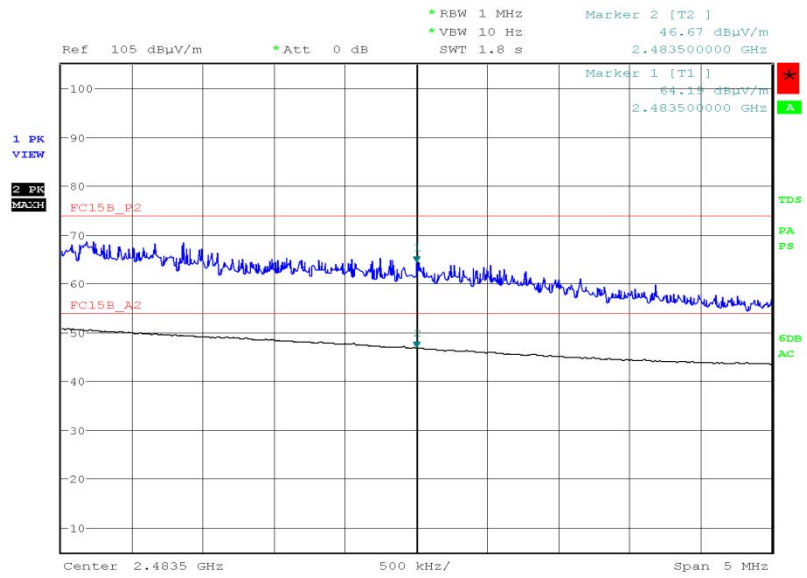
| Polarisation | Final Peak (dBµV/m) | Final Average (dBµV/m) |
|---|---|---|
| Horizontal | 64.24 | 45.19 |




Date: 13.MAY.2012 06:27:41

2462 MHz

| Polarisation | Final Peak (dBµV/m) | Final Average (dBµV/m) |
|---|---|---|
| Horizontal | 64.19 | 46.67 |




Date: 13.MAY.2012 07:58:50

Limit

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

802.11(n)

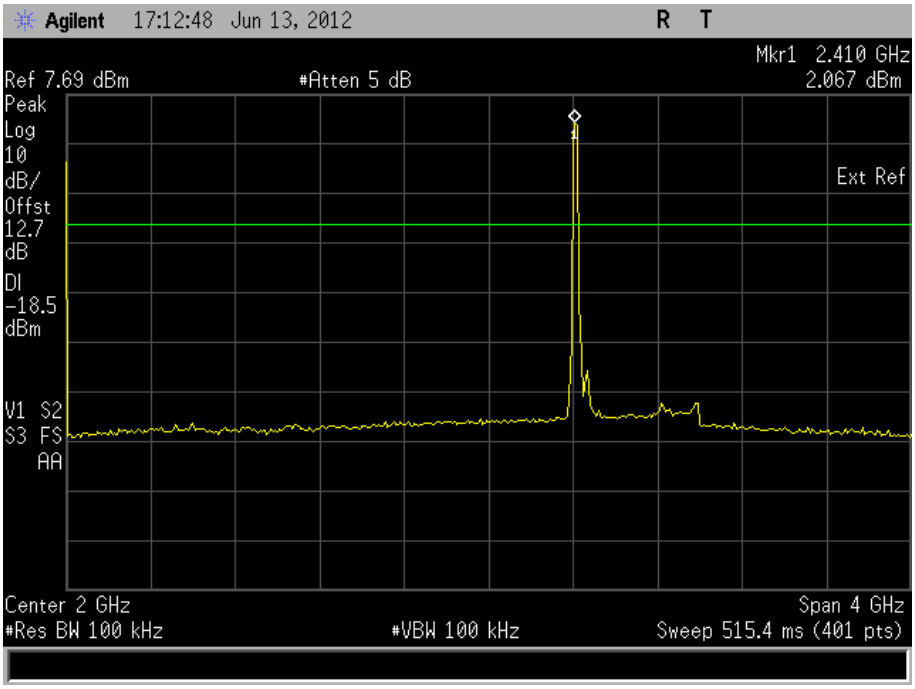
4.0 V DC Supply

Spurious Conducted Emissions

26 Mbps

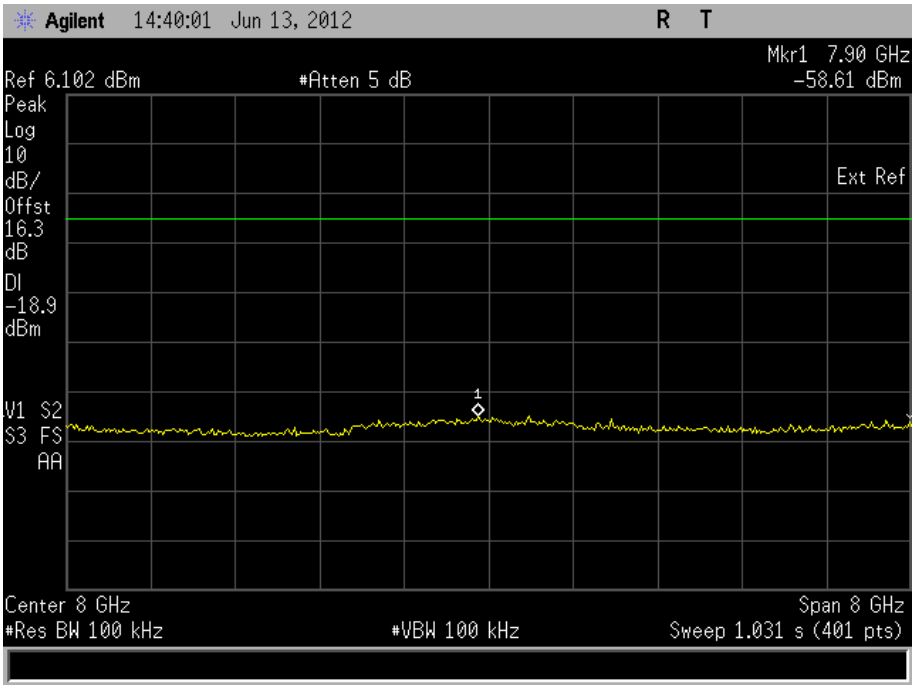
2412 MHz

9 kHz to 4 GHz

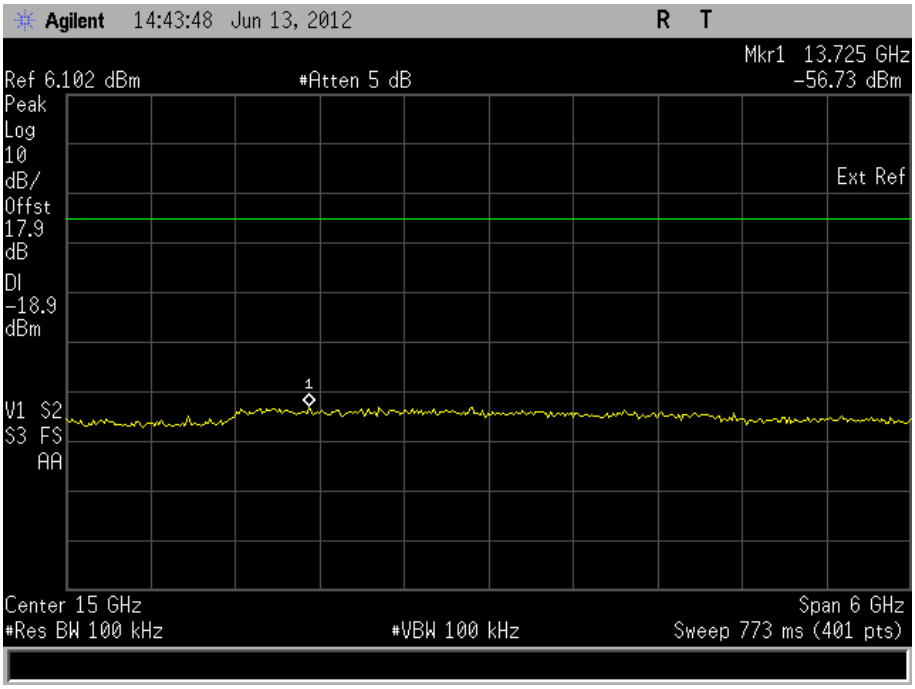


Product Service

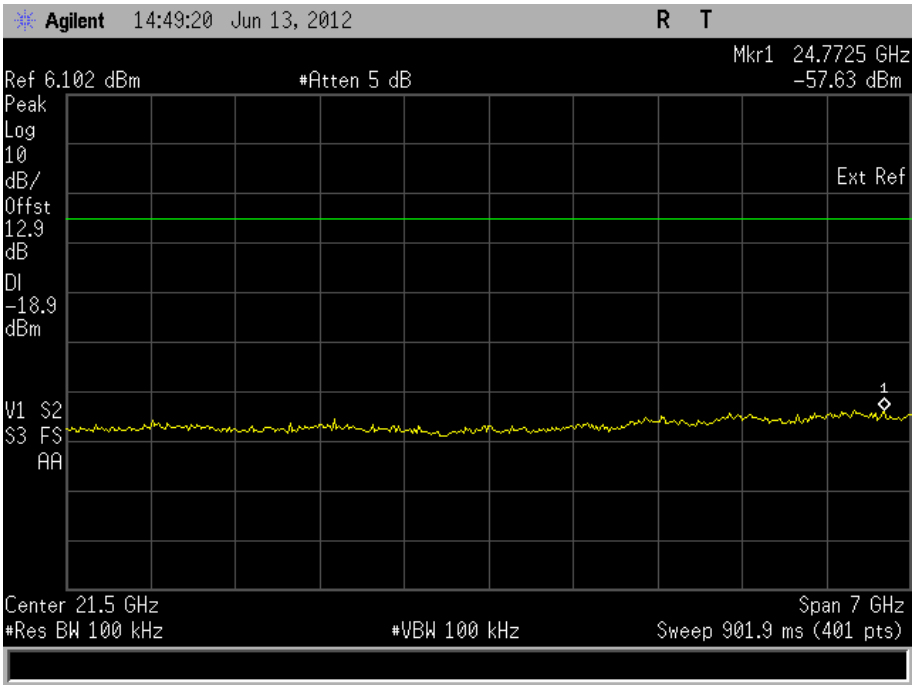
4 GHz to 12 GHz




12 GHz to 18 GHz

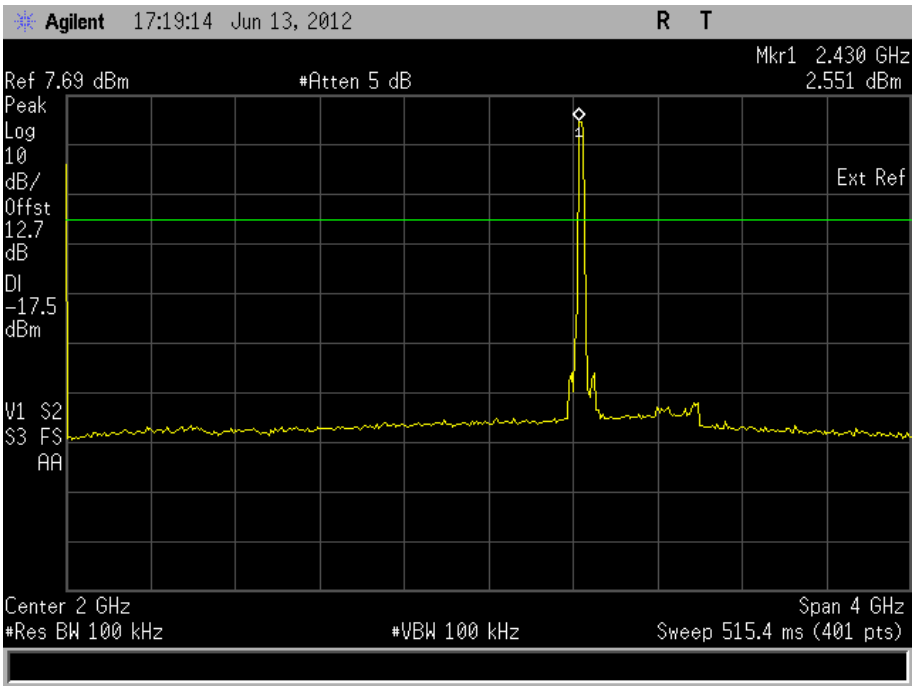


18 GHz to 25 GHz

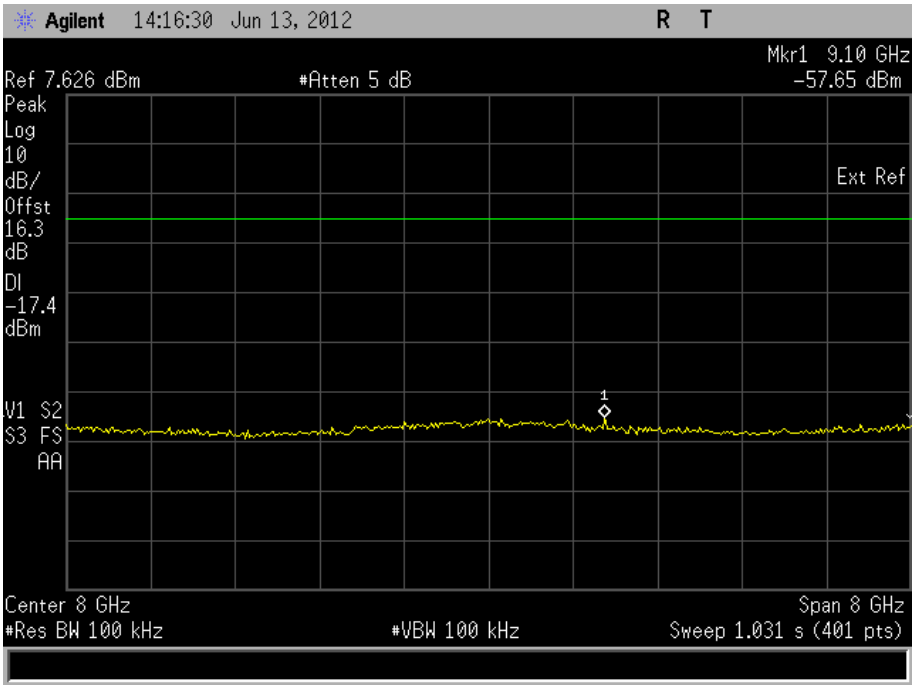



2437 MHz

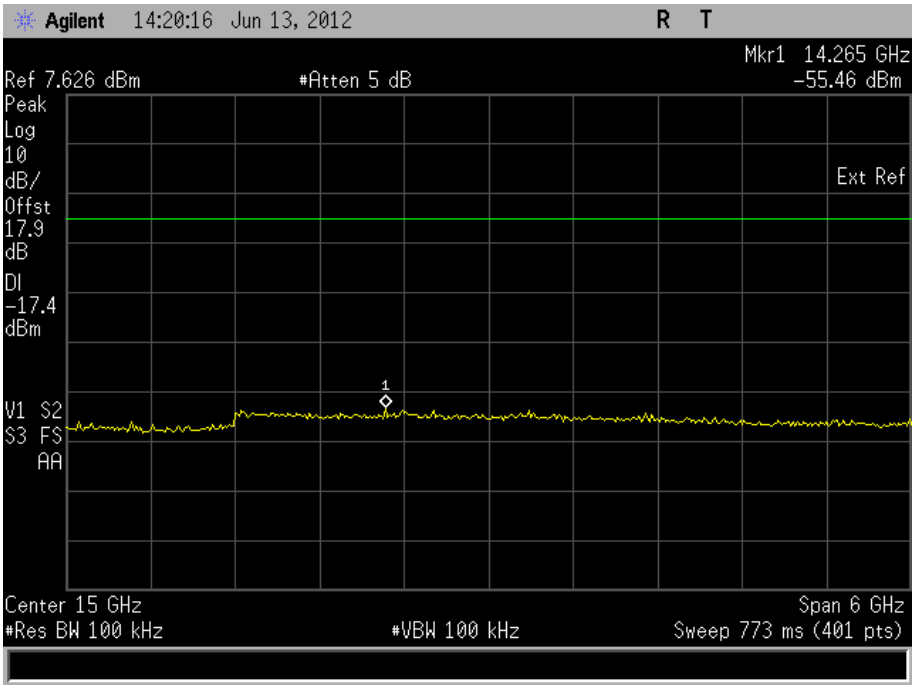
9 kHz to 4 GHz



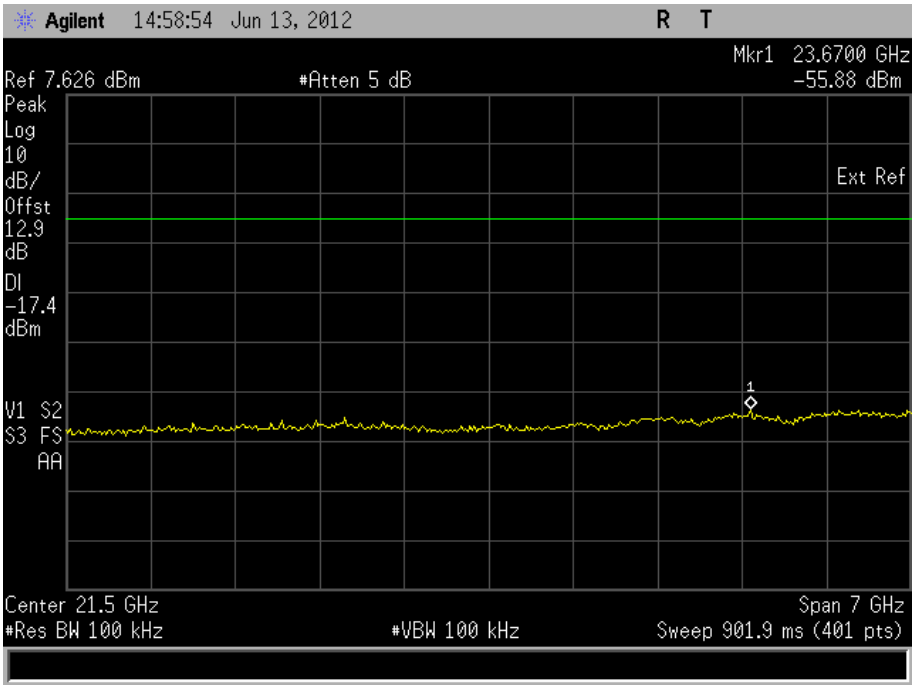
4 GHz to 12 GHz




12 GHz to 18 GHz

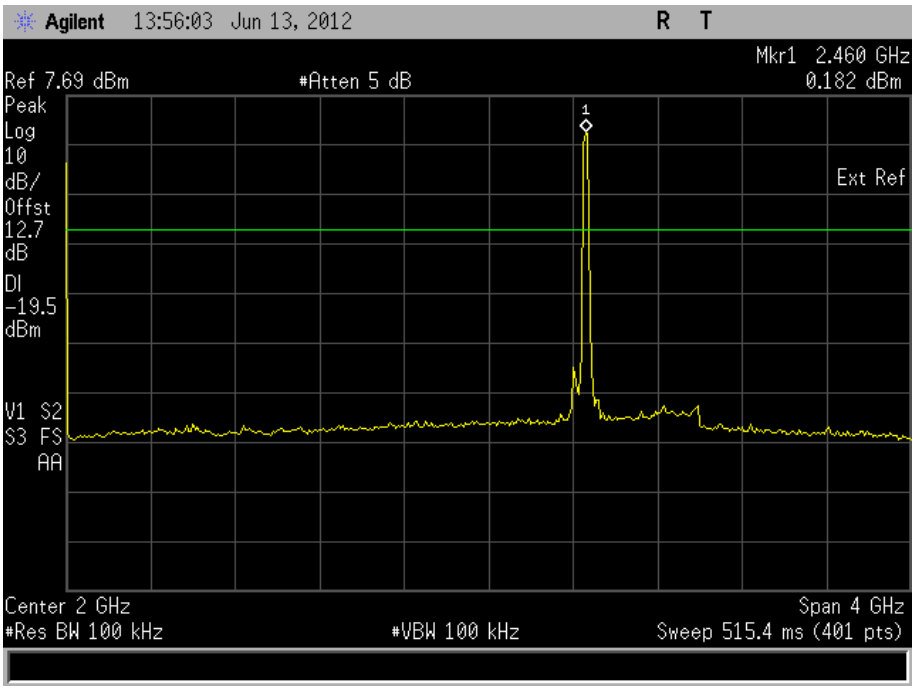


18 GHz to 25 GHz



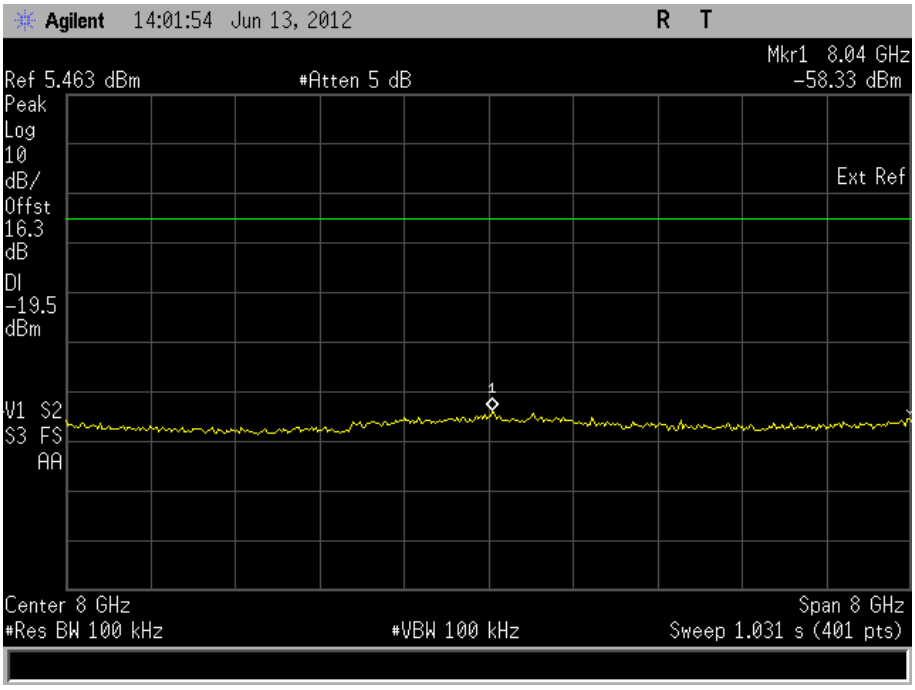

2462 MHz

9 kHz to 4 GHz

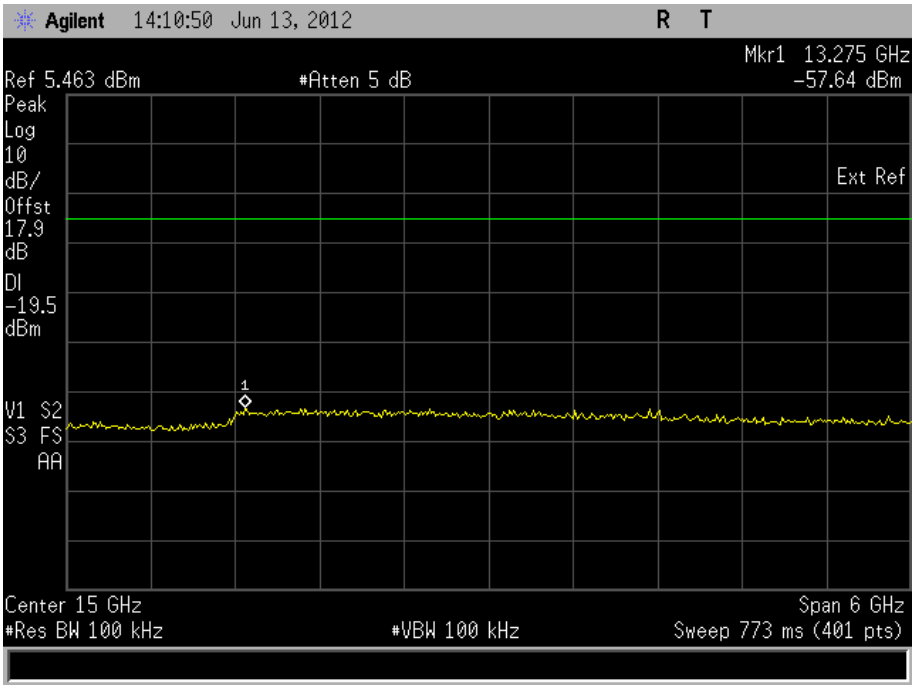


Product Service

4 GHz to 12 GHz

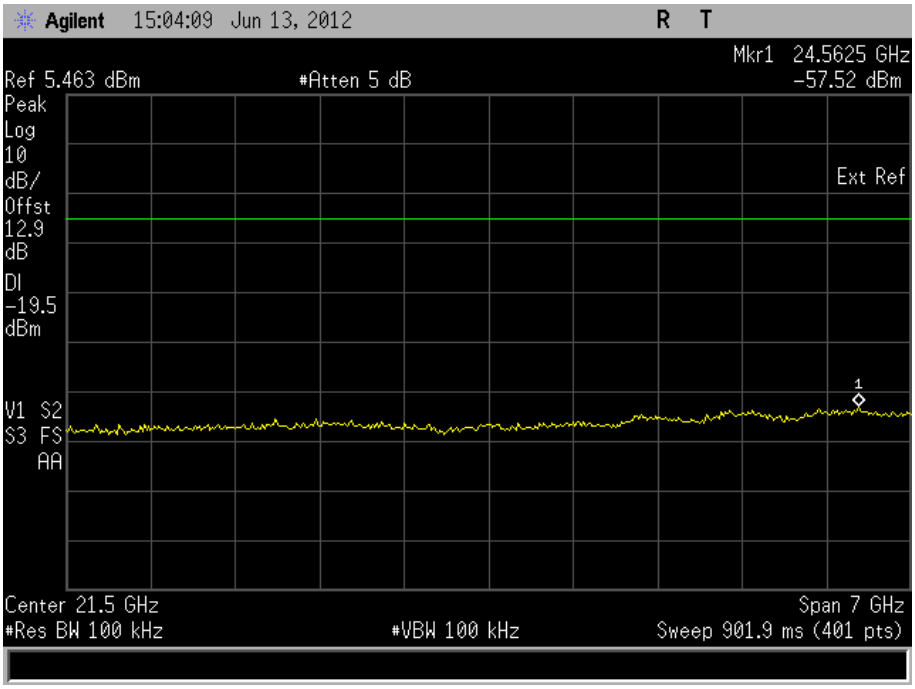



12 GHz to 18 GHz



Product Service

18 GHz to 25 GHz




Limit Clause

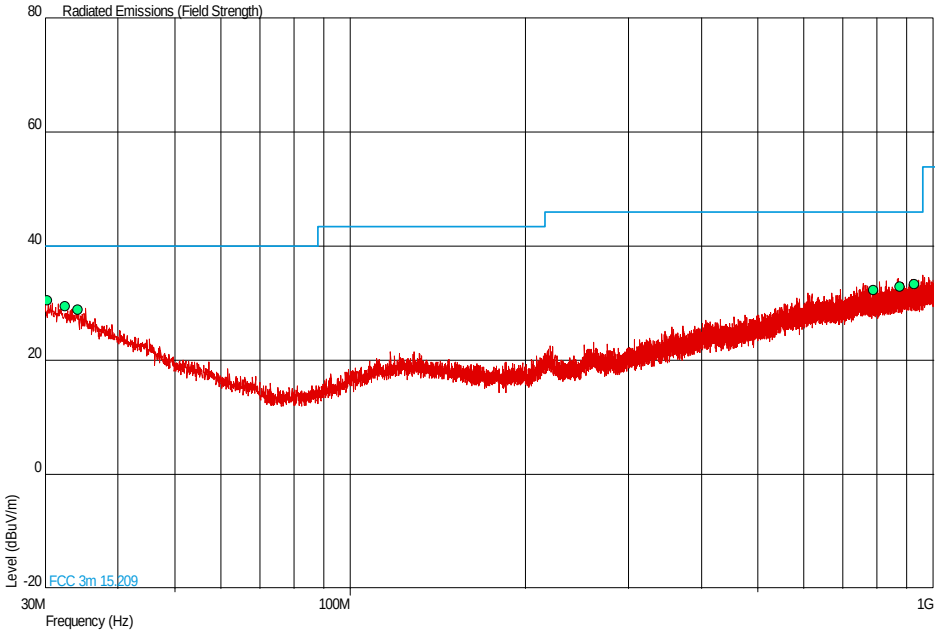
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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.

Spurious Radiated Emissions

2412 MHz

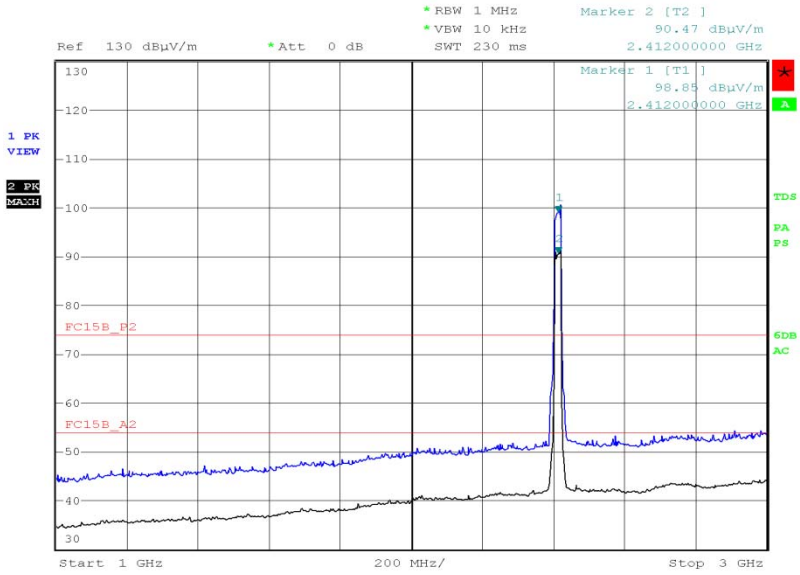
30 MHz to 1 GHz




| Frequency (MHz) | QP Level (dBµV/m) | QP Level (µV/m) | QP Limit (dBµV/m) | QP Limit (µV/m) | QP Margin (dBµV/m) | QP Margin (µV/m) | Angle (Deg) | Height (m) | Polarity | |
|---|---|---|---|---|---|---|---|---|---|---|
| 30.243 | 30.6 | 33.9 | 40.0 | 100 | -9.4 | 66.1 | 0 | 1.00 | Vertical | |
| 32.425 | 29.5 | 29.9 | 40.0 | 100 | -10.5 | 70.1 | 0 | 1.00 | Vertical | |
| 34.123 | 28.9 | 27.9 | 40.0 | 100 | -11.1 | 72.1 | 0 | 1.00 | Vertical | |
| 789.947 | 32.3 | 41.2 | 46.0 | 200 | -13.7 | 158.8 | 0 | 1.00 | Vertical | |
| 874.725 | 32.9 | 44.2 | 46.0 | 200 | -13.1 | 155.8 | 0 | 1.00 | Vertical | |
| 927.299 | 33.4 | 46.8 | 46.0 | 200 | -12.6 | 153.2 | 0 | 1.00 | Vertical | |

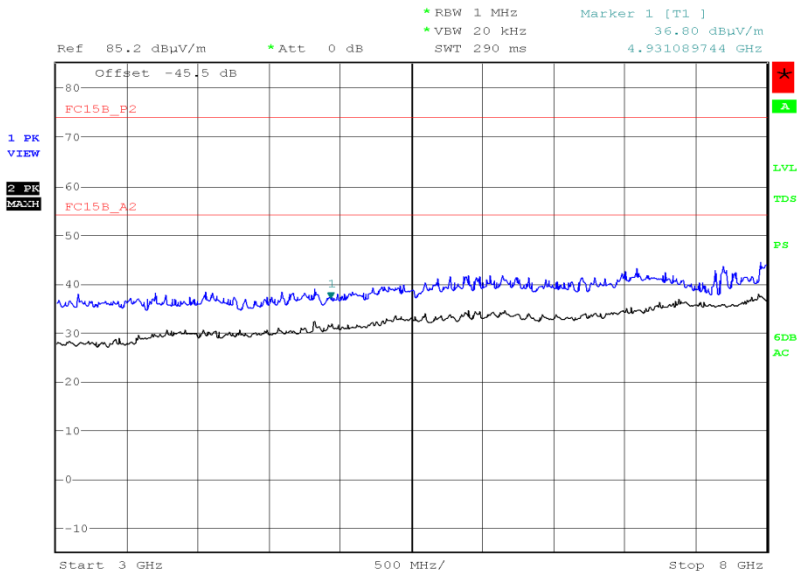
Product Service

1 GHz to 3 GHz




Date: 10.JUN.2012 11:56:12

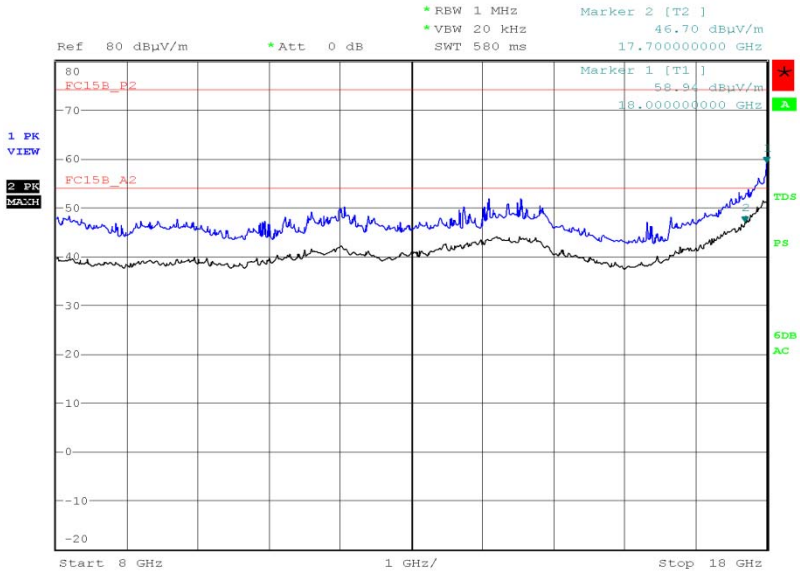
3 GHz to 8 GHz




Date: 9.JUN.2012 17:58:32

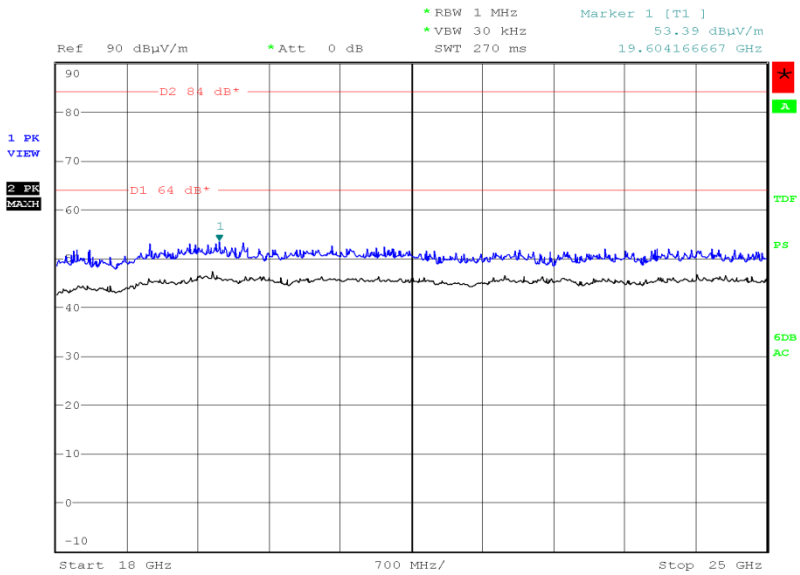
Product Service

8 GHz to 18 GHz




Date: 10.JUN.2012 14:31:08

18 GHz to 25 GHz




Date: 11.JUN.2012 19:54:24

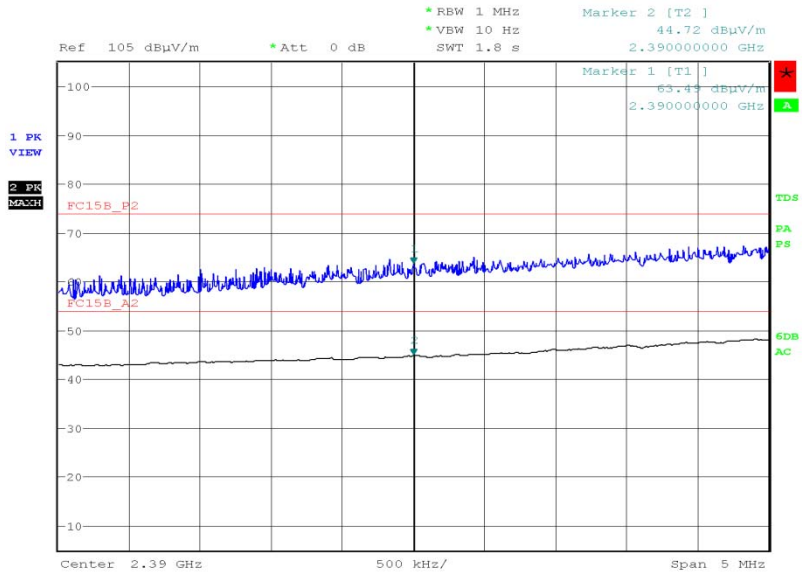
Limit

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

Band Edge Emissions

2412 MHz

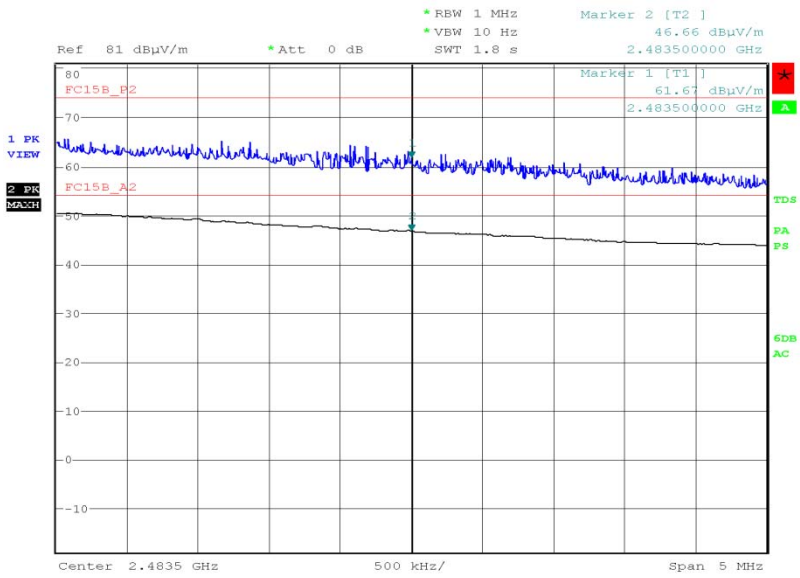
| Polarisation | Final Peak (dBµV/m) | Final Average (dBµV/m) |
|---|---|---|
| Horizontal | 63.49 | 44.72 |




Date: 13.MAY.2012 08:25:55

2462 MHz

| Polarisation | Final Peak (dBµV/m) | Final Average (dBµV/m) |
|---|---|---|
| Horizontal | 61.67 | 46.66 |




Date: 13.MAY.2012 15:21:21

Limit

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

## 2.6 6dB BANDWIDTH

### 2.6.1 Specification Reference

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

### 2.6.2 Equipment Under Test and Modification State

CDMA SHI16 S/N: IMEI 004401113852657 - Modification State 0

### 2.6.3 Date of Test

17 May 2012, 18 May 2012 & 21 May 2012

### 2.6.4 Test Equipment Used

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

### 2.6.5 Test Procedure

The 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.

### 2.6.6 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 24.8°C |
| Relative Humidity | 22.2% |

### 2.6.7 Test Results

802.11(b)

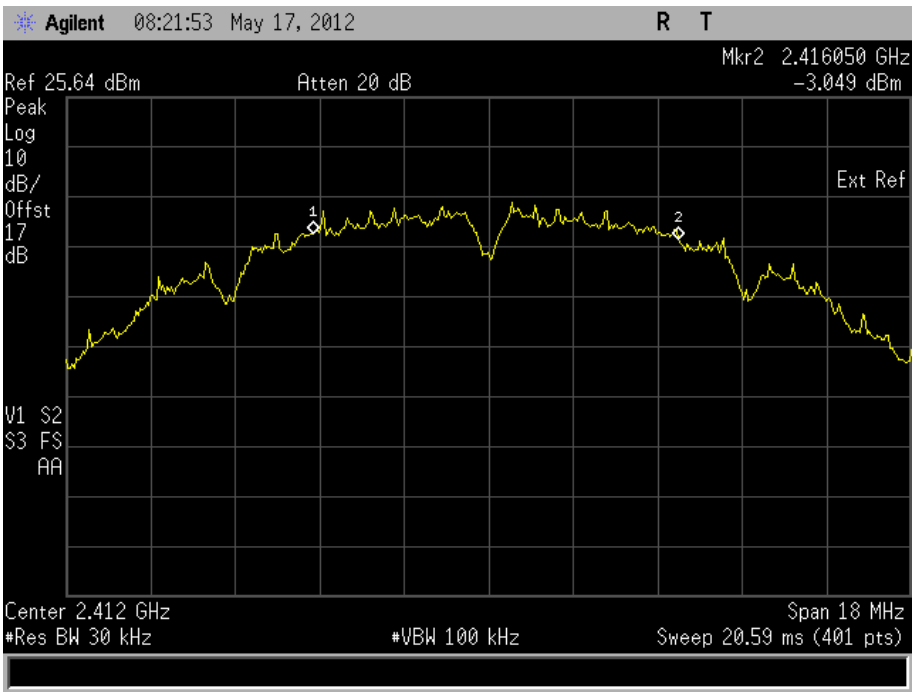
4.0 V DC Supply

| Frequency (MHz) | Data Rate (Mbps) | 6dB Bandwidth (kHz) |
|---|---|---|
| 2412 MHz | 1 | 7785 |
| | 2 | 7695 |
| | 5 | 8190 |
| | 11 | 8865 |
| 2437 MHz | 1 | 7605 |
| | 2 | 7740 |
| | 5 | 8370 |
| | 11 | 8325 |
| 2462 MHz | 1 | 9135 |
| | 2 | 9090 |
| | 5 | 8370 |
| | 11 | 8865 |

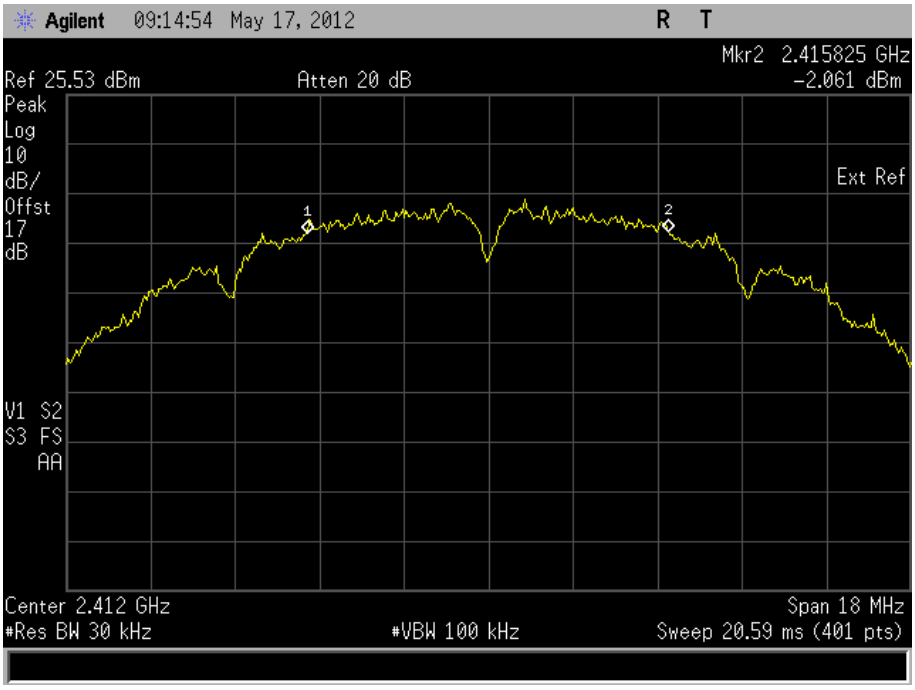
Product Service

2412 MHz

1 Mbps

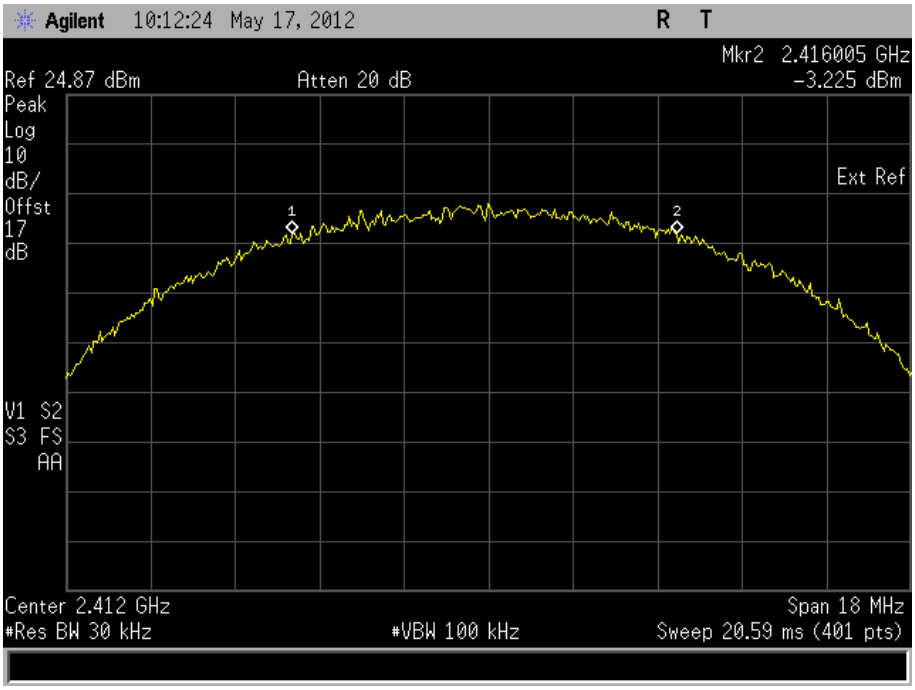



2 Mbps

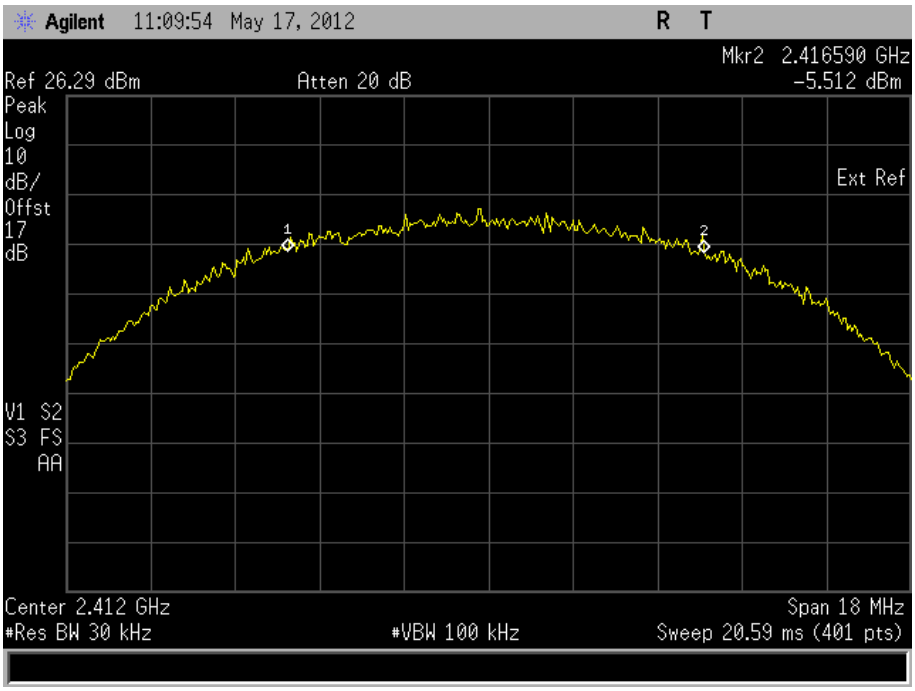


Product Service

5.5 Mbps



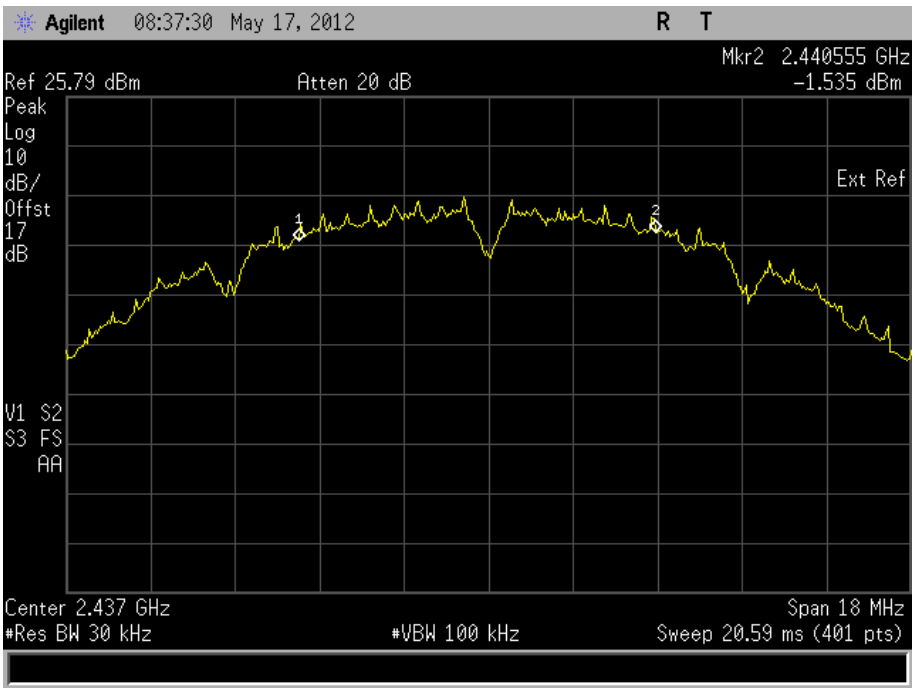

11 Mbps



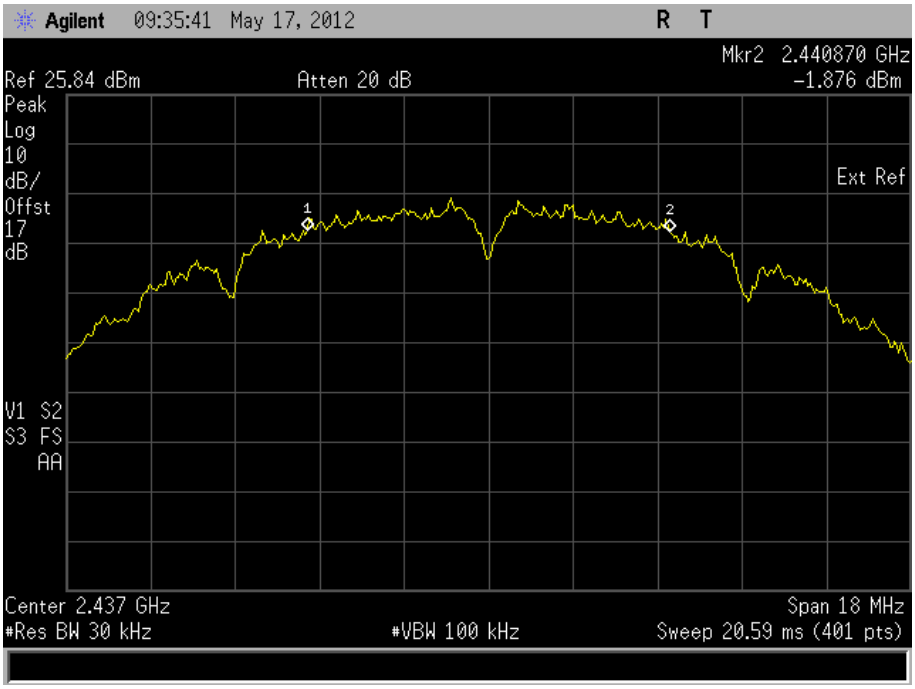
Product Service

2437 MHz

1 Mbps

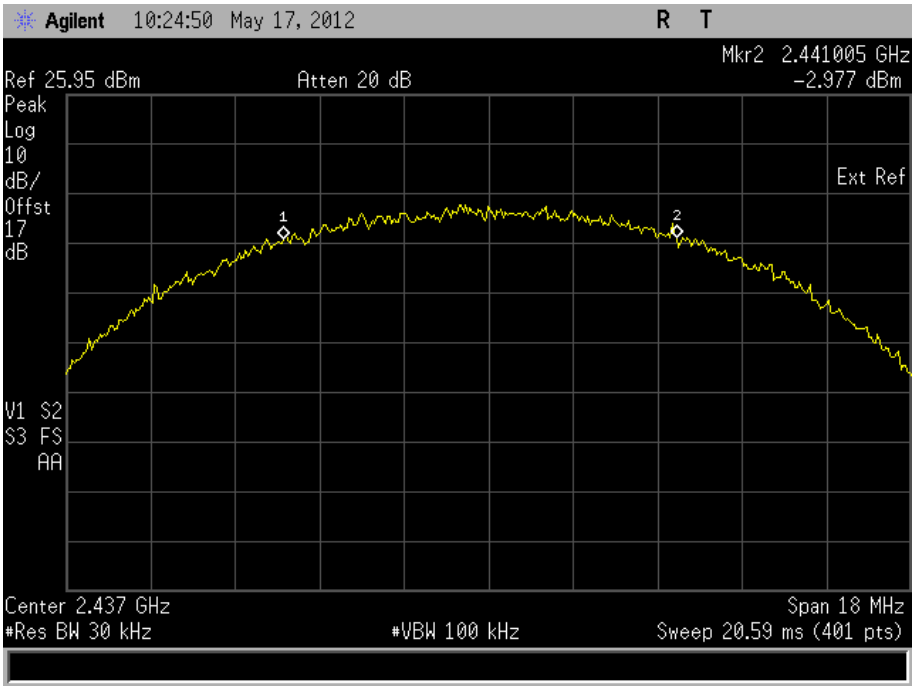



2 Mbps

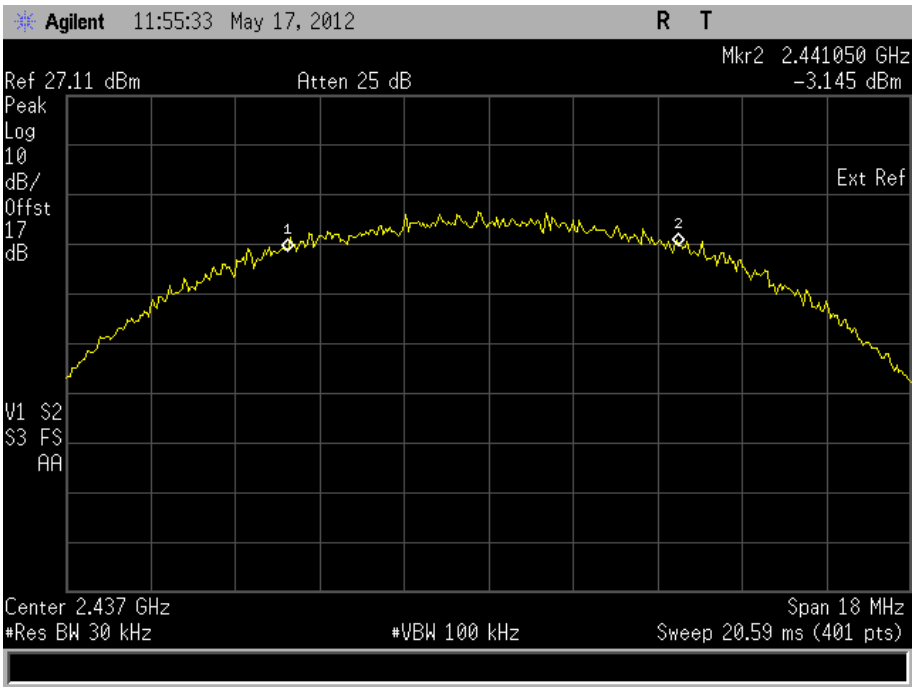


Product Service

5.5 Mbps



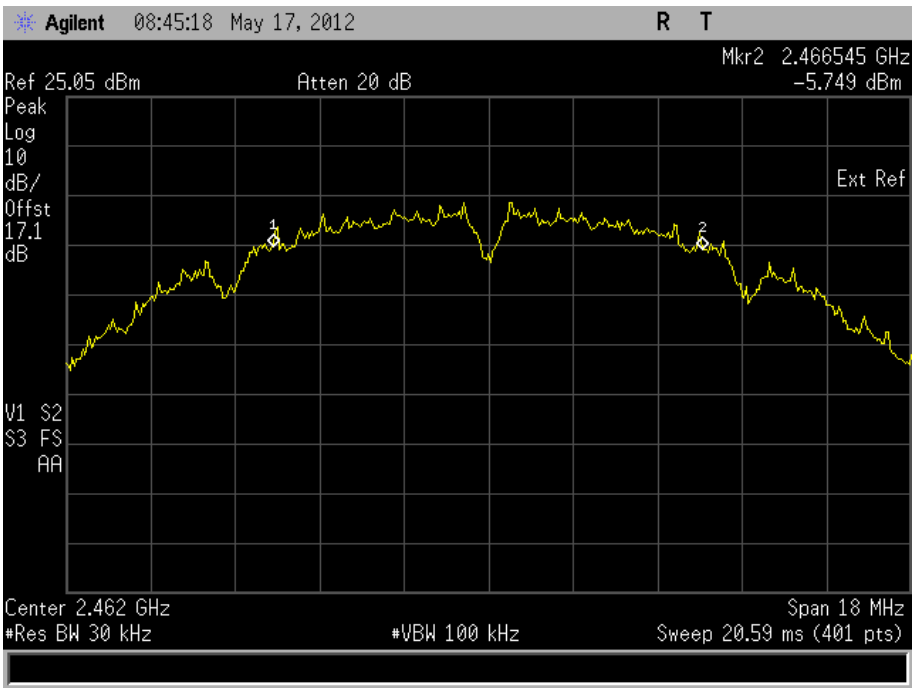

11 Mbps



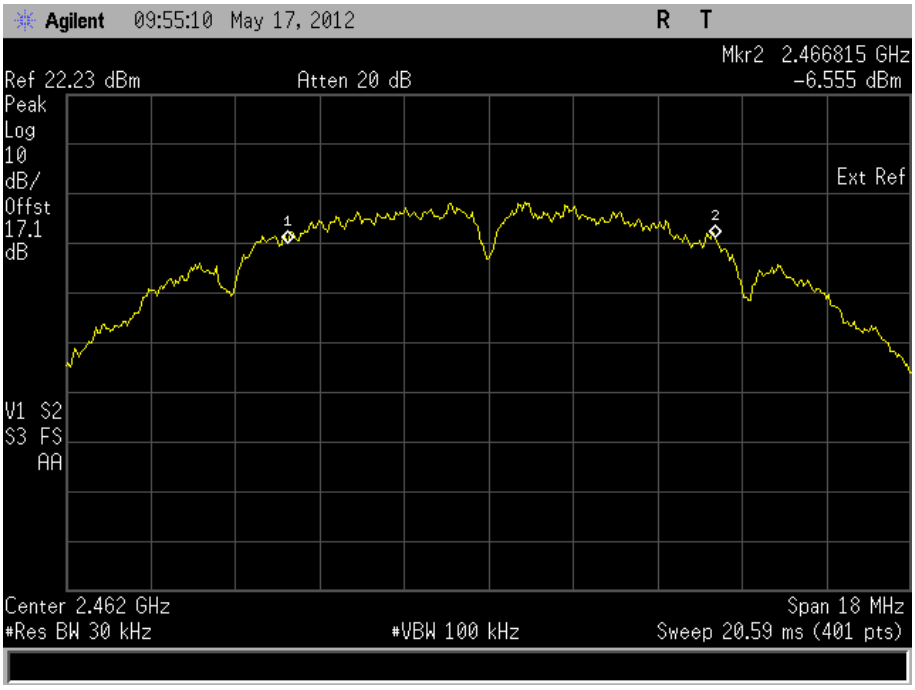
Product Service

2462 MHz

1 Mbps

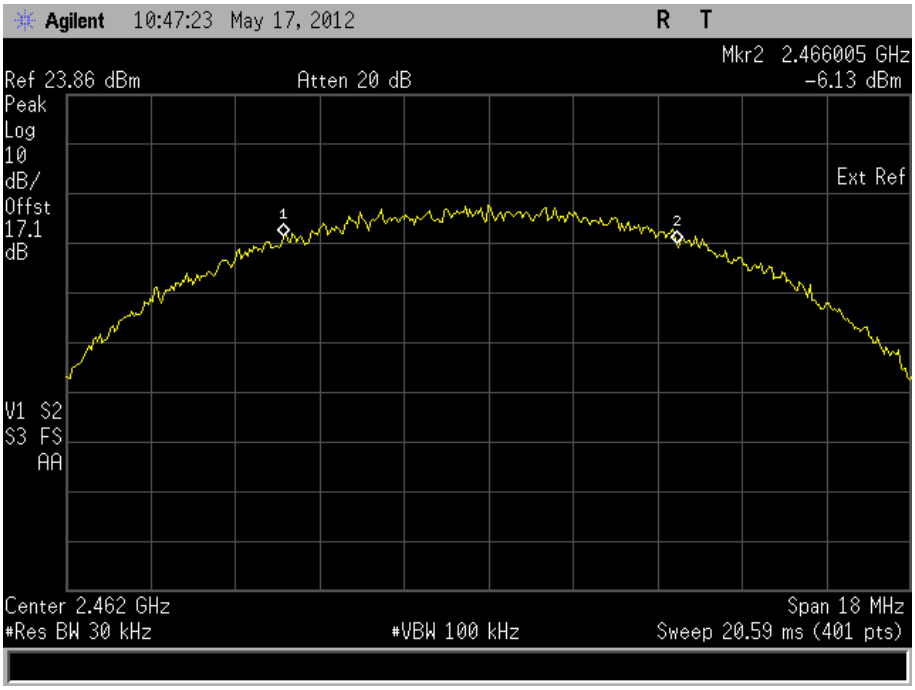



2 Mbps

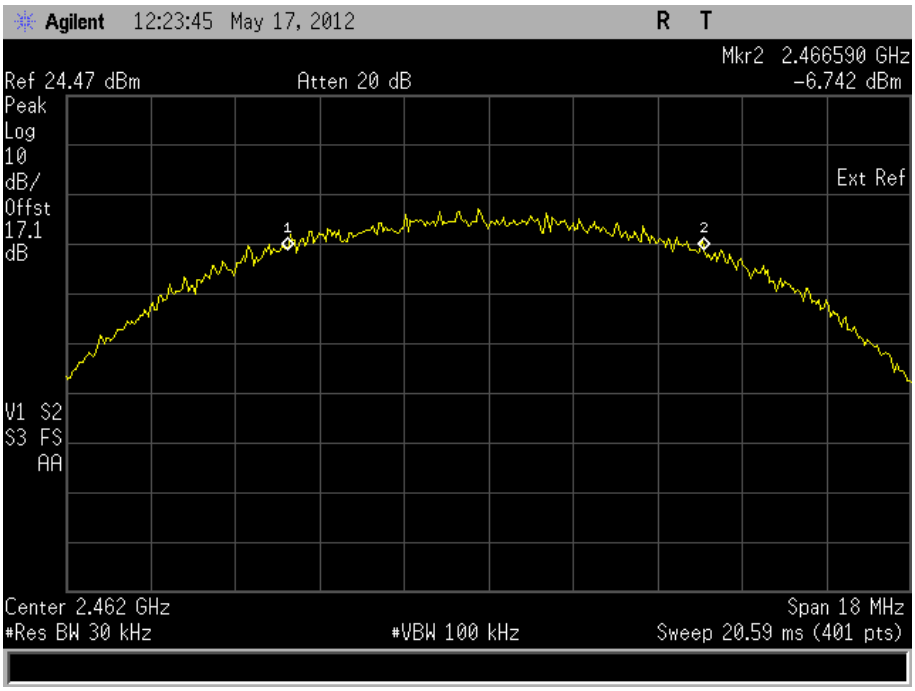


Product Service

5.5 Mbps




11 Mbps




Limit Clause

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

802.11(g)

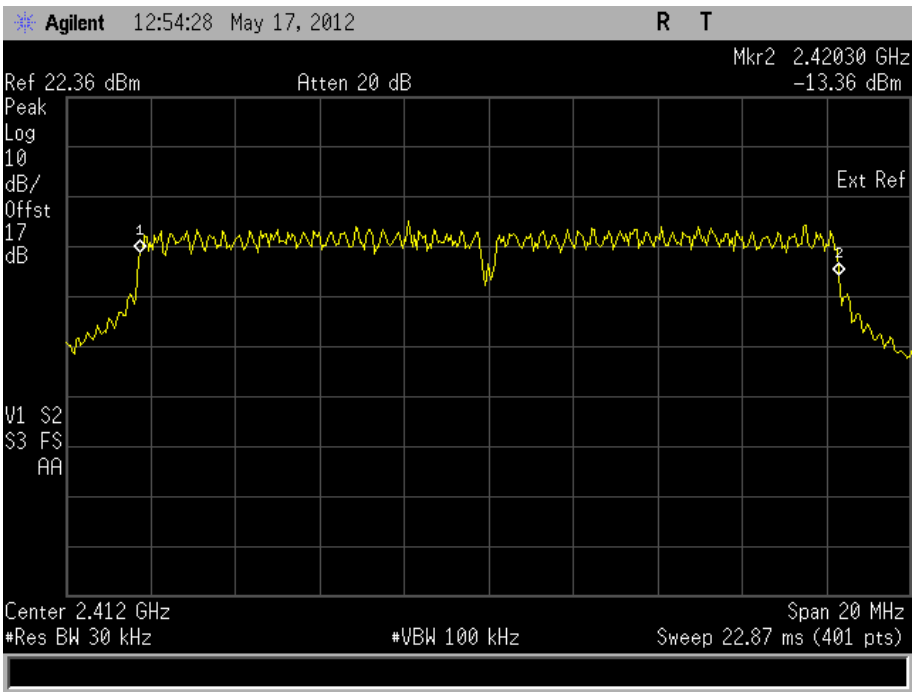
4.0 V DC Supply

| Frequency (MHz) | Data Rate (Mbps) | 6dB Bandwidth (kHz) |
|---|---|---|
| 2412 MHz | 6 | 16600 |
| | 9 | 16550 |
| | 12 | 16550 |
| | 18 | 16550 |
| | 24 | 16550 |
| | 36 | 16500 |
| | 48 | 16550 |
| | 54 | 16500 |
| 2437 MHz | 6 | 16600 |
| | 9 | 16600 |
| | 12 | 16550 |
| | 18 | 16550 |
| | 24 | 16550 |
| | 36 | 16500 |
| | 48 | 16600 |
| | 54 | 16550 |
| 2462 MHz | 6 | 16600 |
| | 9 | 16600 |
| | 12 | 16550 |
| | 18 | 16550 |
| | 24 | 16550 |
| | 36 | 16500 |
| | 48 | 16550 |
| | 54 | 16500 |

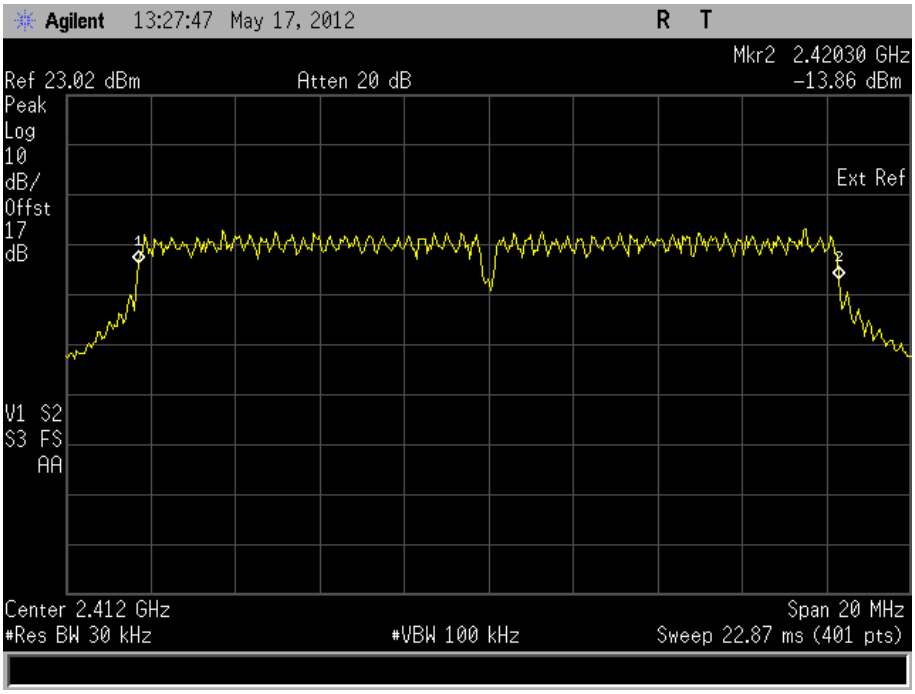
Product Service

2412 MHz

6 Mbps

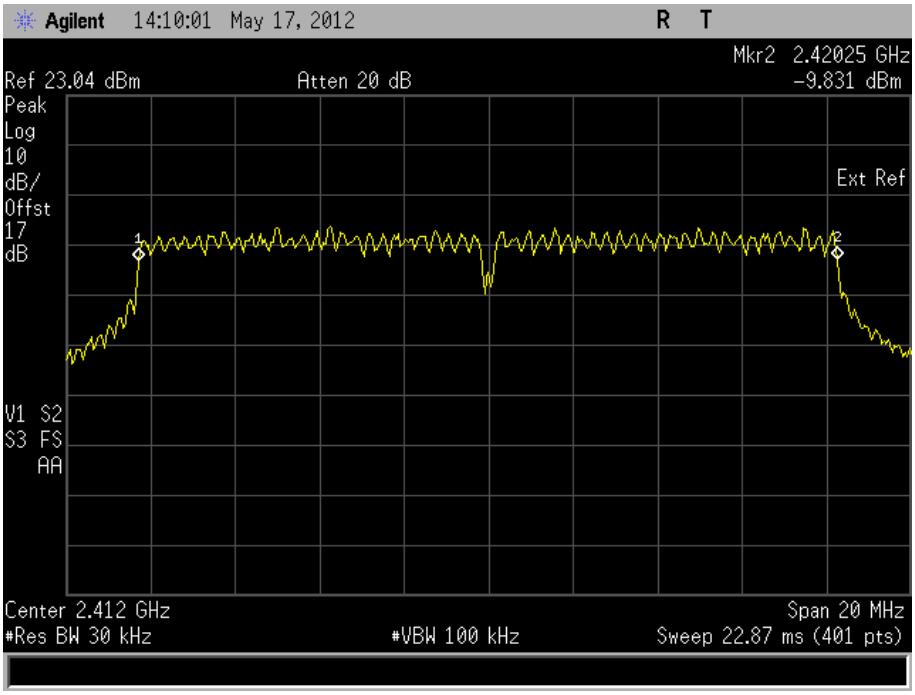



9 Mbps

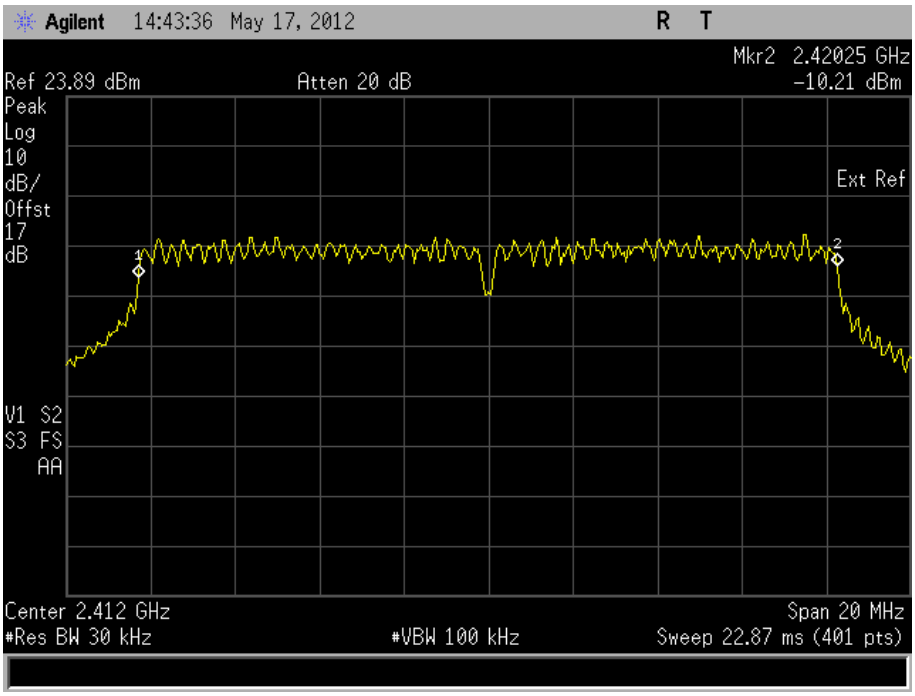


Product Service

12 Mbps

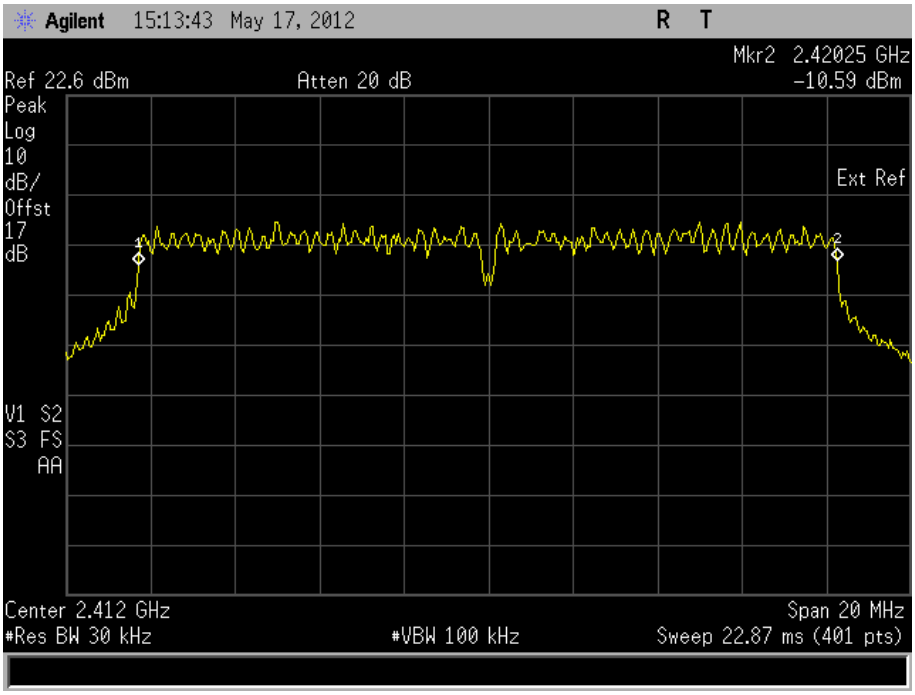



18 Mbps

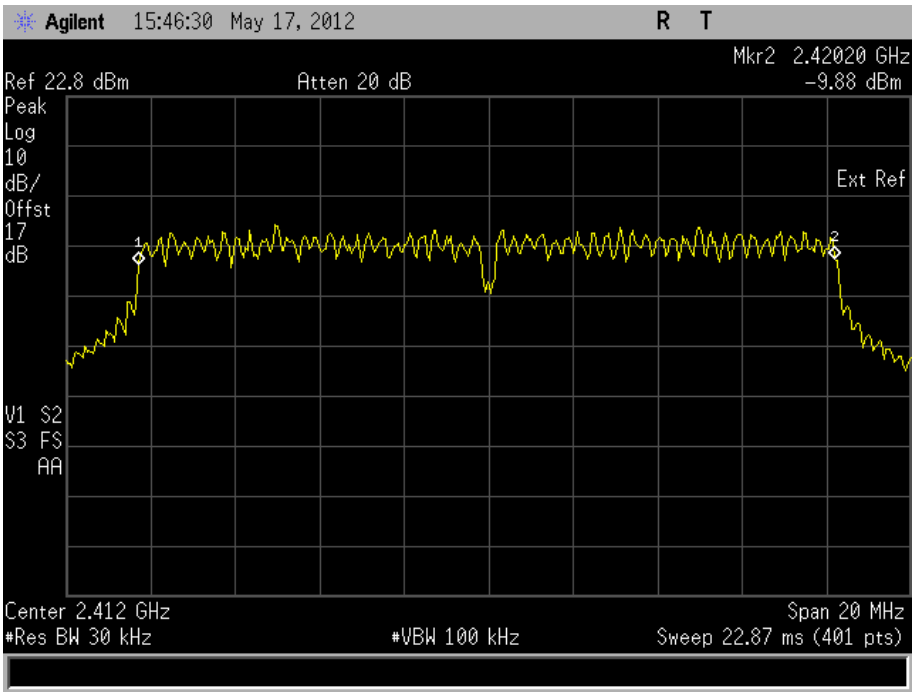


Product Service

24 Mbps

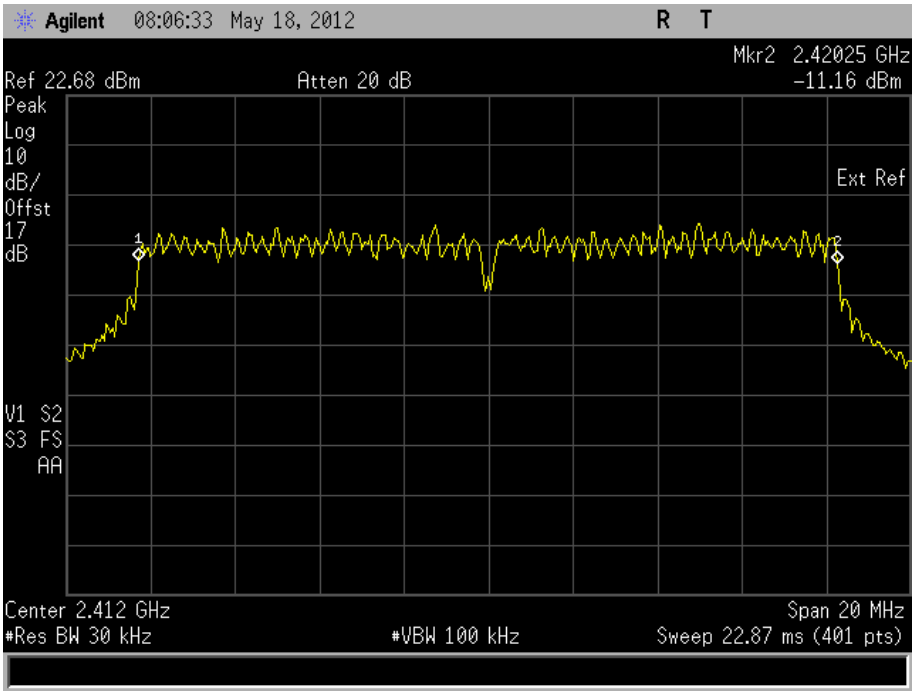



36 Mbps

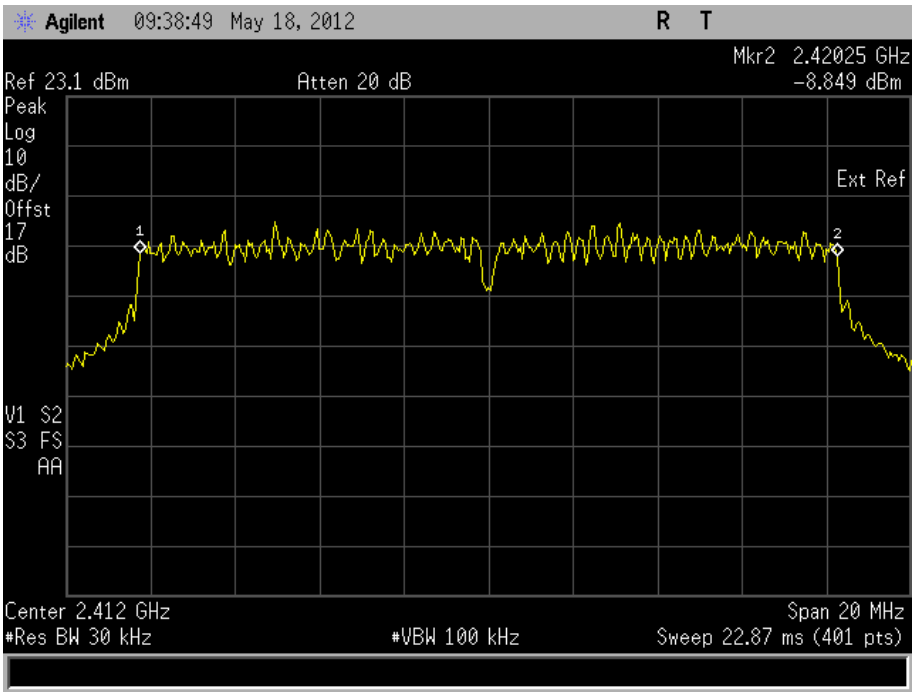


Product Service

48 Mbps



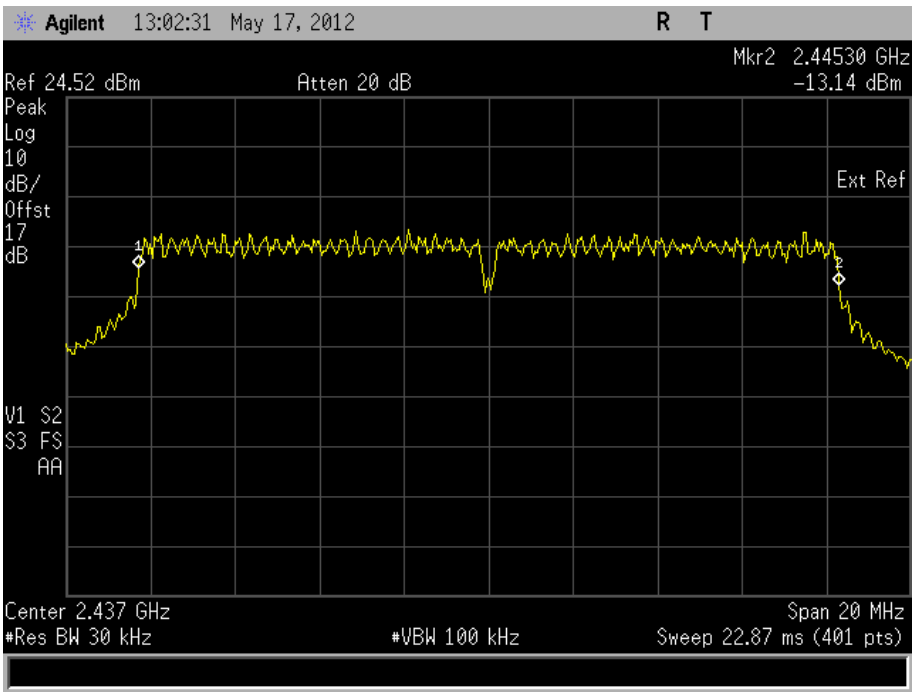

54 Mbps



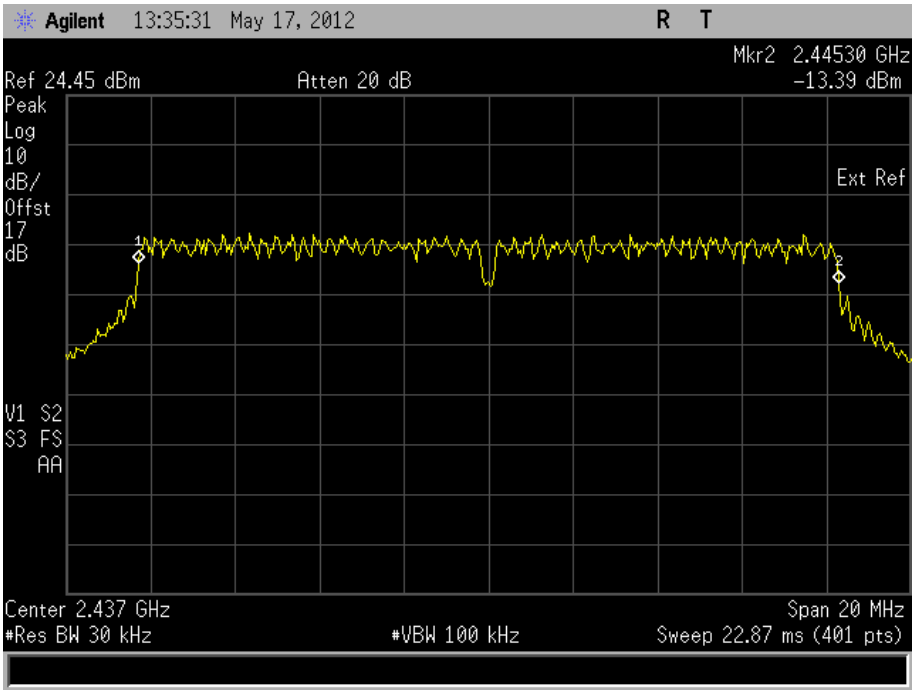
Product Service

2437 MHz

6 Mbps

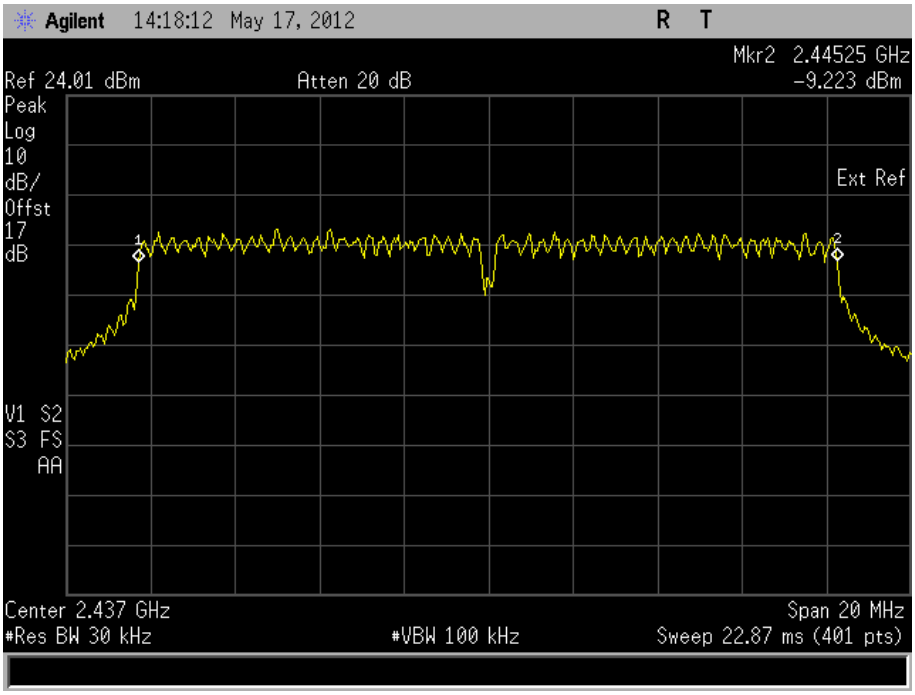



9 Mbps

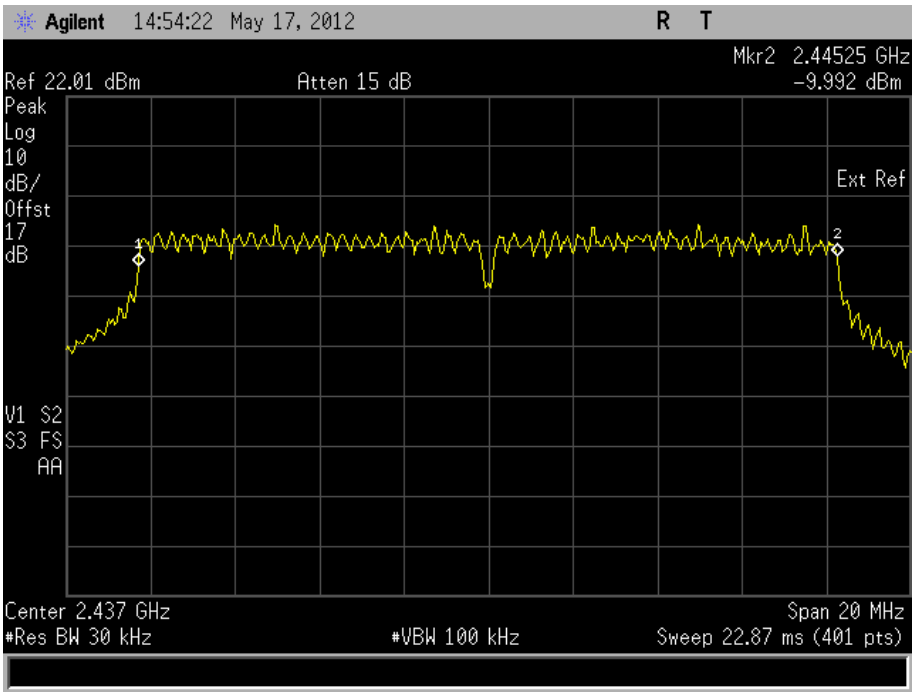


Product Service

12 Mbps

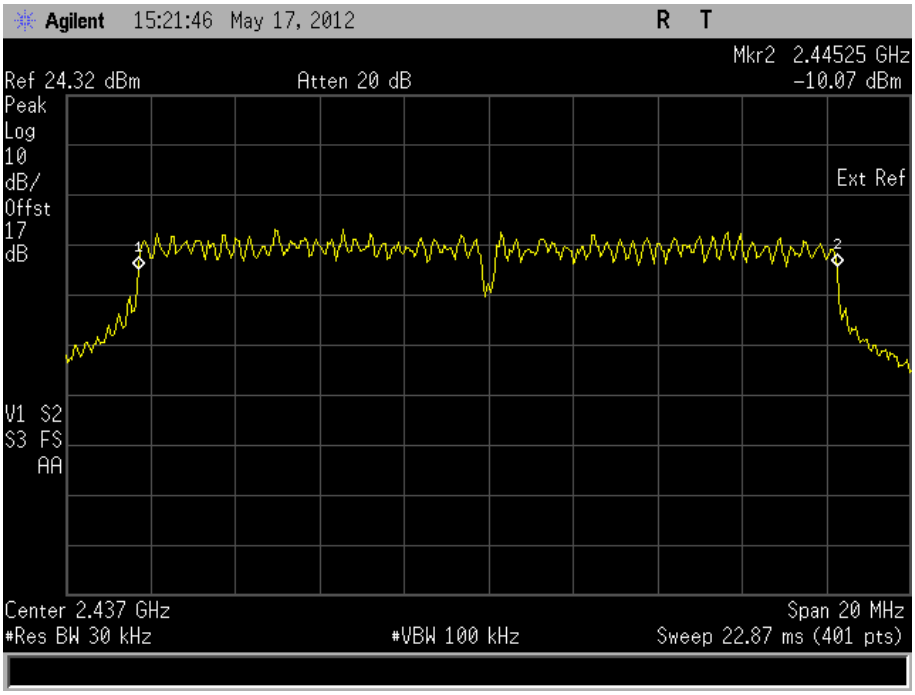



18 Mbps

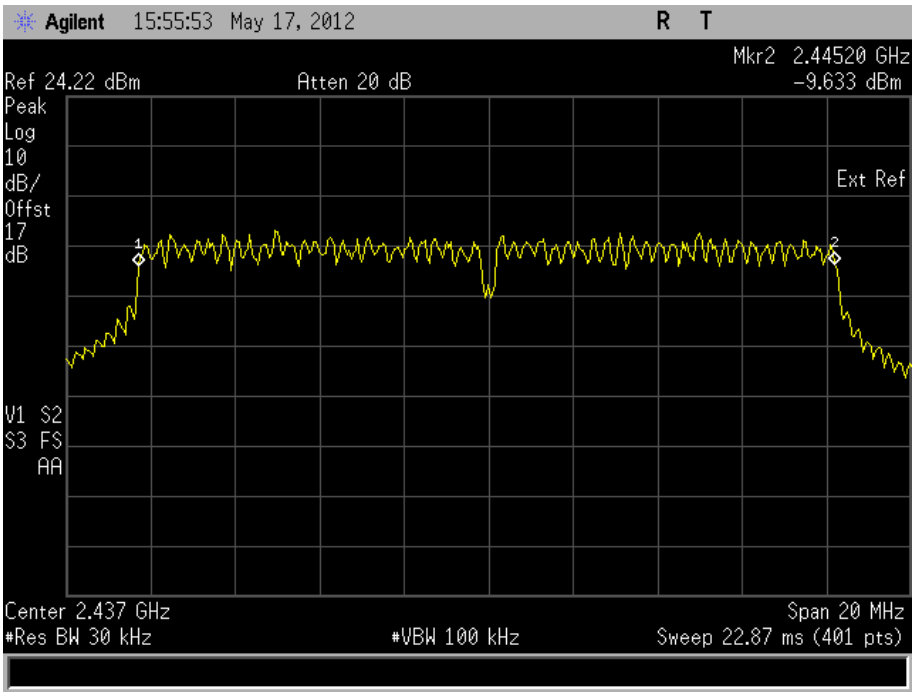


Product Service

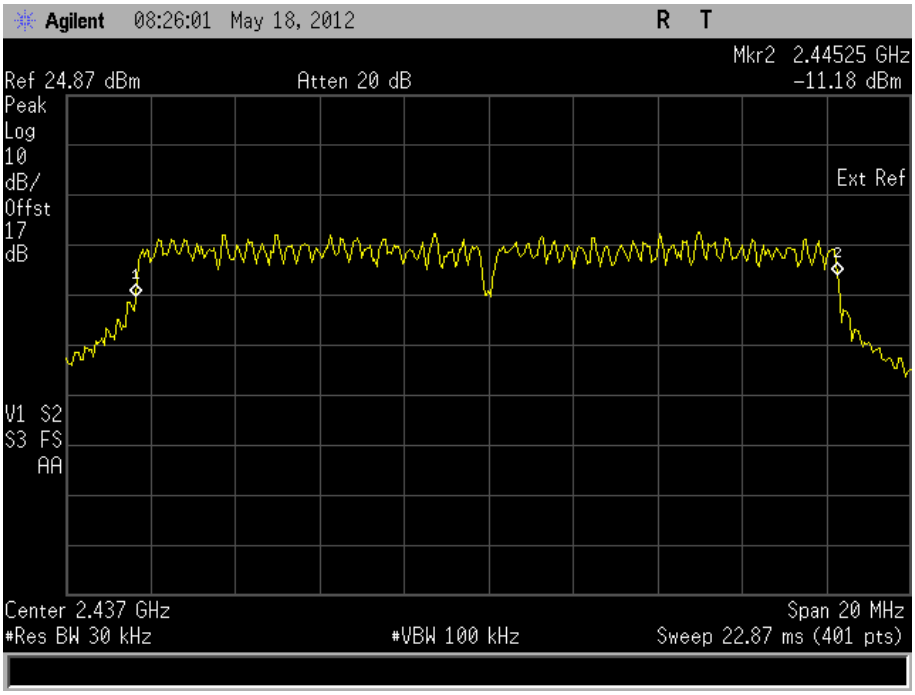
24 Mbps



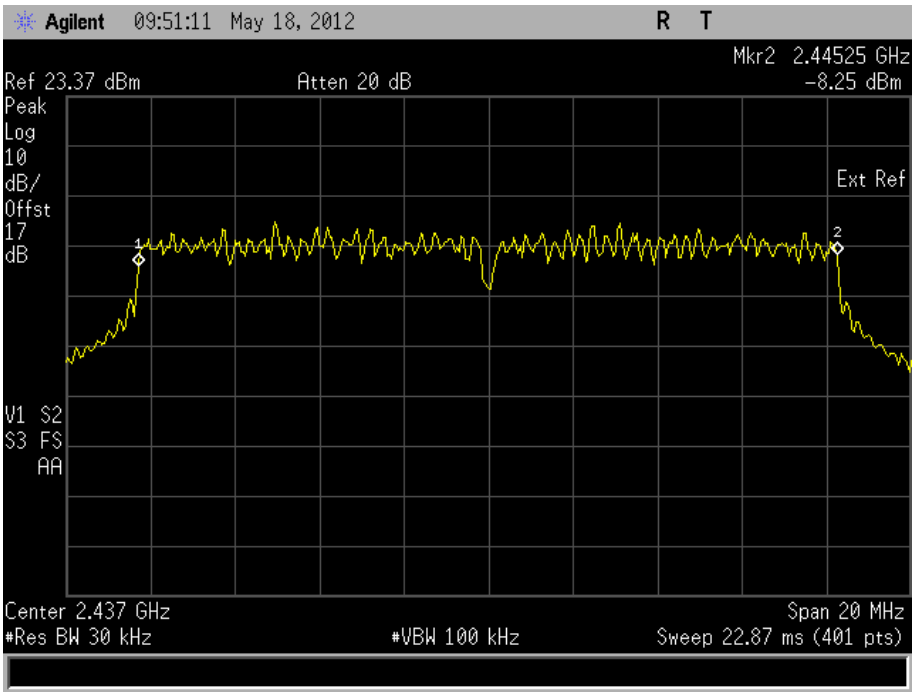

36 Mbps



48 Mbps



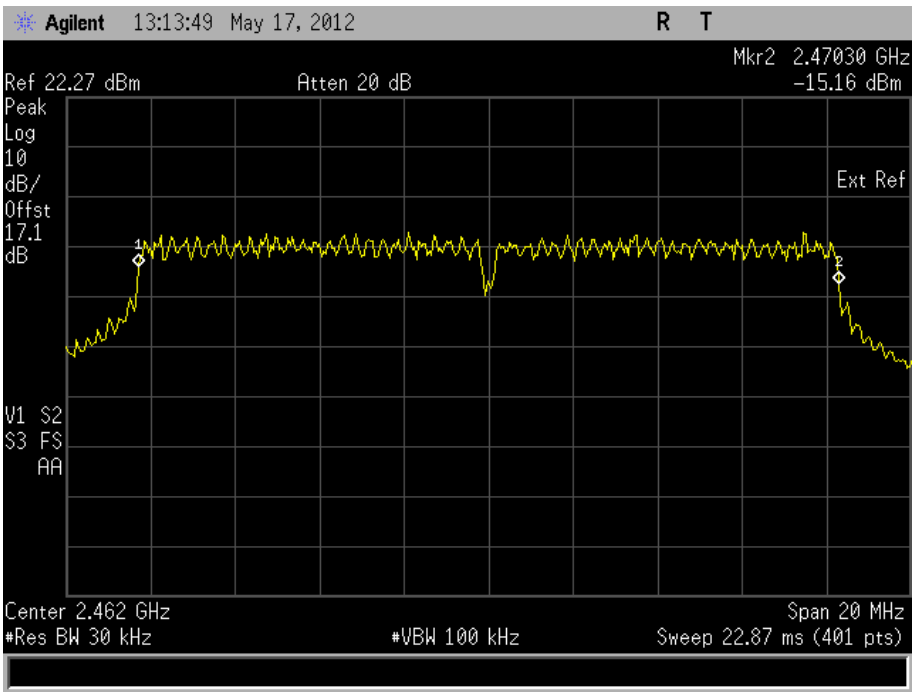

54 Mbps



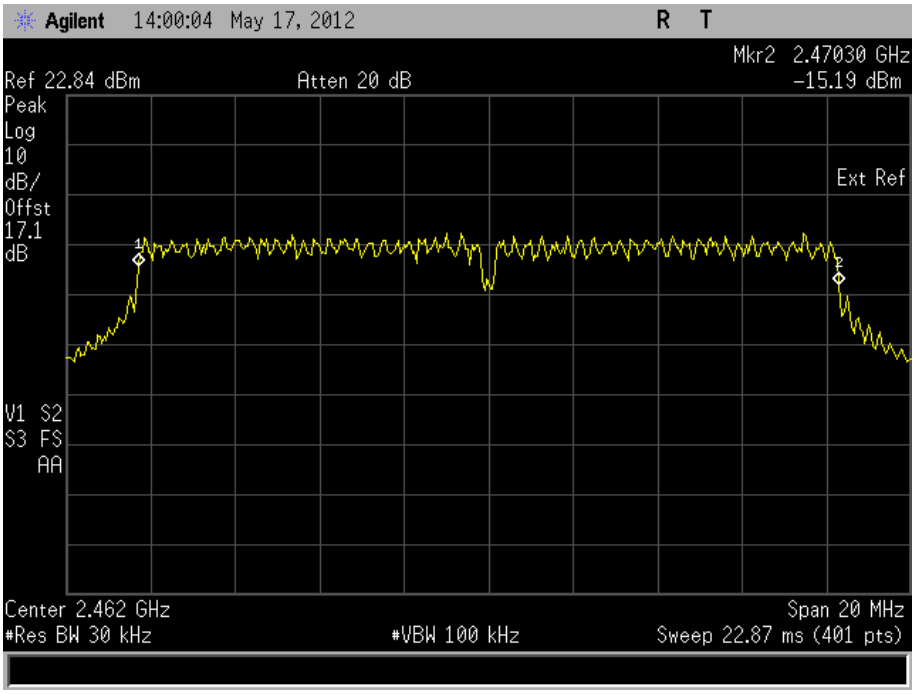
Product Service

2462 MHz

6 Mbps

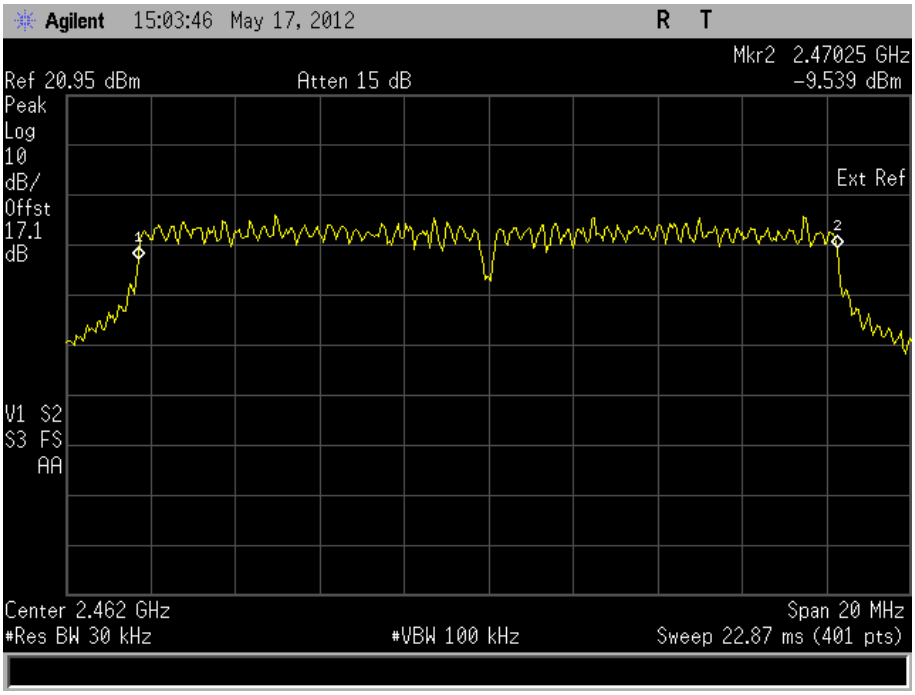



9 Mbps

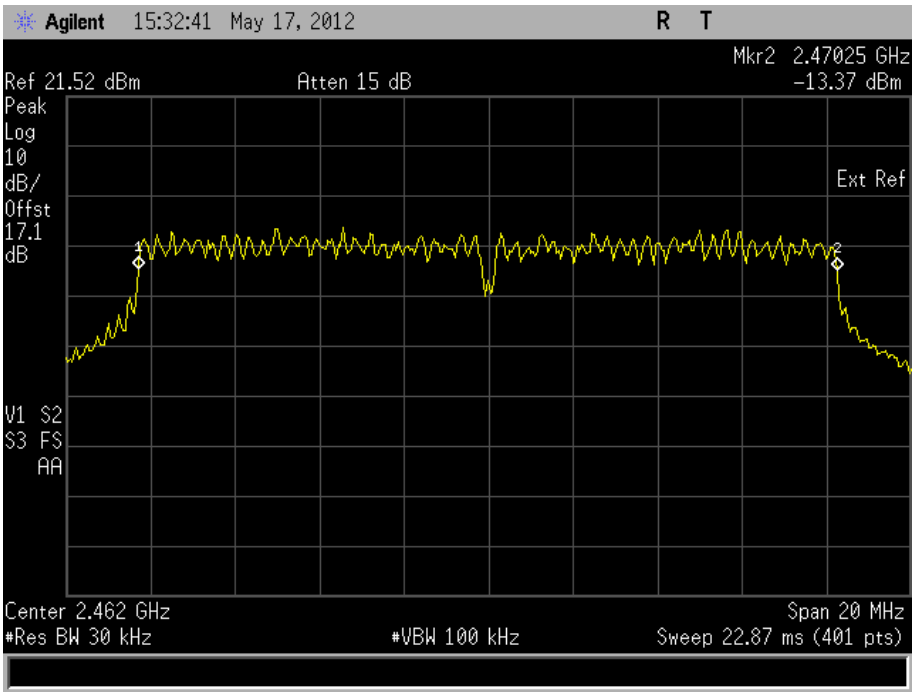


Product Service

12 Mbps

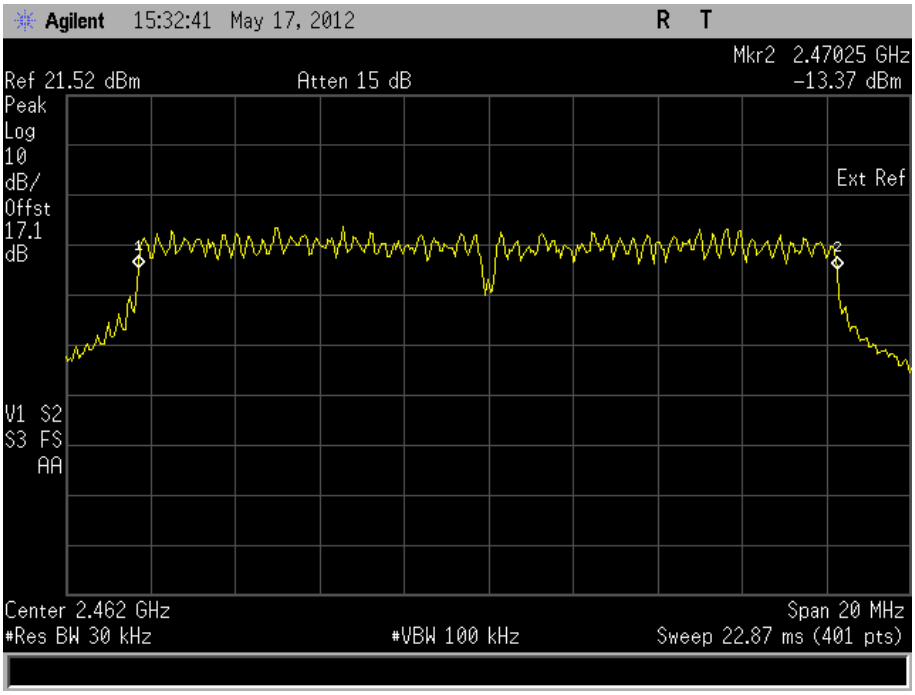



18 Mbps

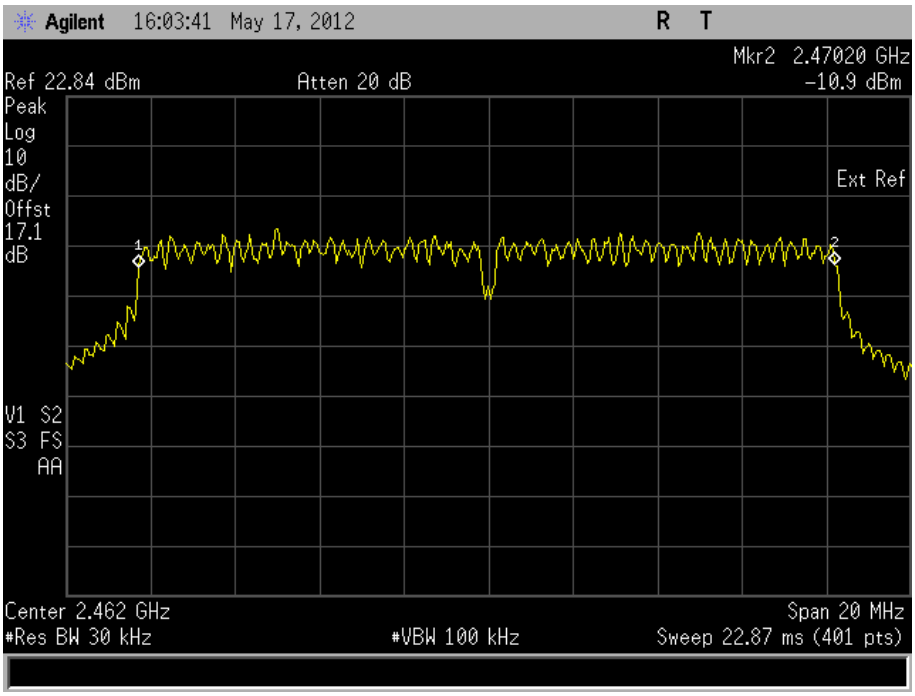


Product Service

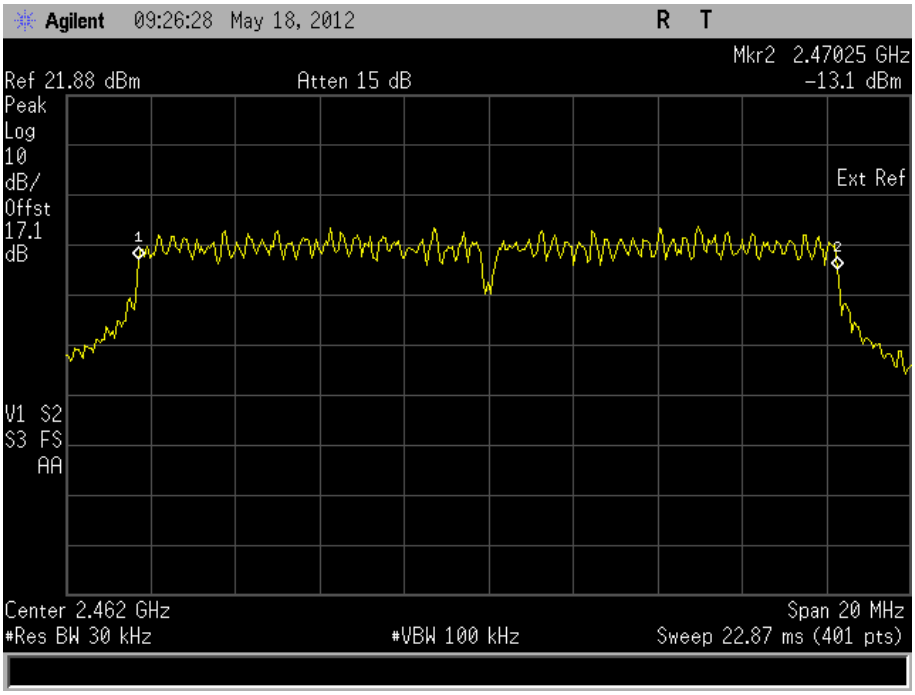
24 Mbps



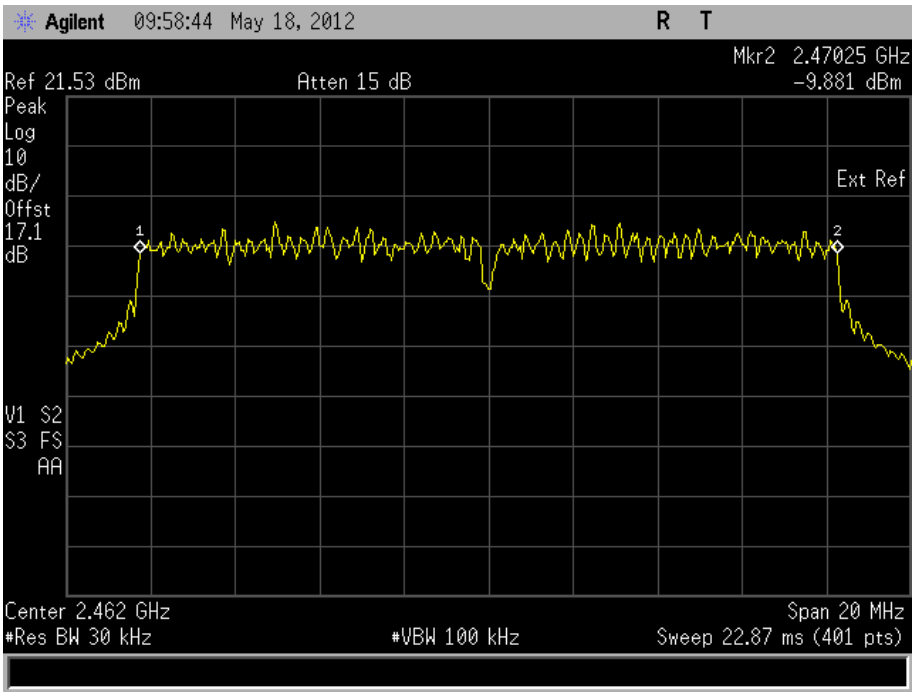

36 Mbps



48 Mbps




54 Mbps




Limit Clause

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

802.11(n)

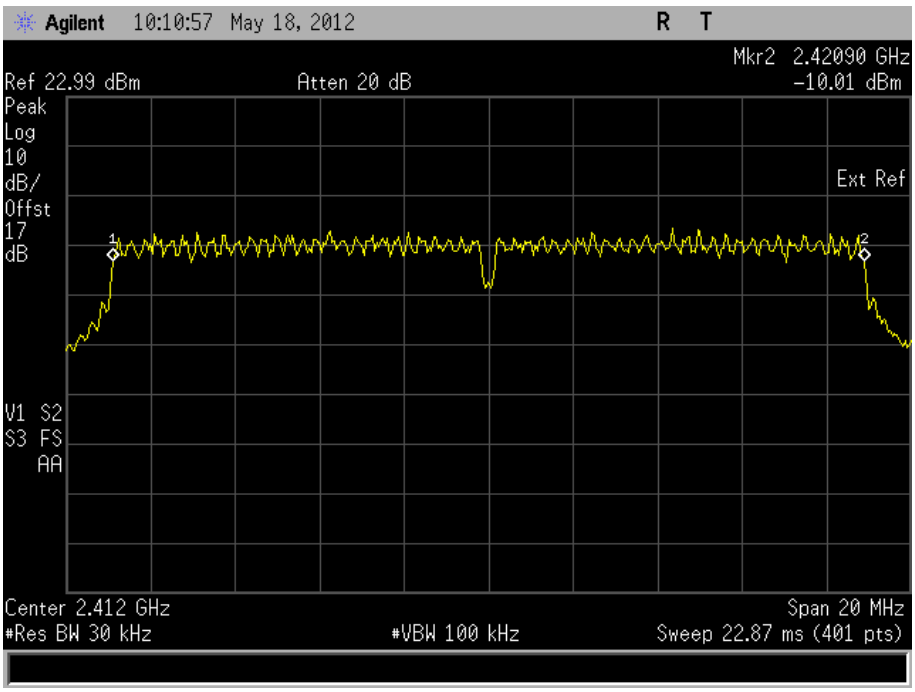
4.0 V DC Supply

| Frequency (MHz) | Data Rate (Mbps) | 6dB Bandwidth (kHz) |
|---|---|---|
| 2412 MHz | 6.5 | 17800 |
| | 13 | 17800 |
| | 19.5 | 17750 |
| | 26 | 17700 |
| | 39 | 17750 |
| | 52 | 17800 |
| | 58.5 | 17800 |
| | 65 | 17750 |
| 2437 MHz | 6.5 | 17850 |
| | 13 | 17800 |
| | 19.5 | 17800 |
| | 26 | 17750 |
| | 39 | 17750 |
| | 52 | 17750 |
| | 58.5 | 17800 |
| | 65 | 17750 |
| 2462 MHz | 6.5 | 17850 |
| | 13 | 17800 |
| | 19.5 | 17750 |
| | 26 | 17650 |
| | 39 | 17700 |
| | 52 | 17750 |
| | 58.5 | 17750 |
| | 65 | 17750 |

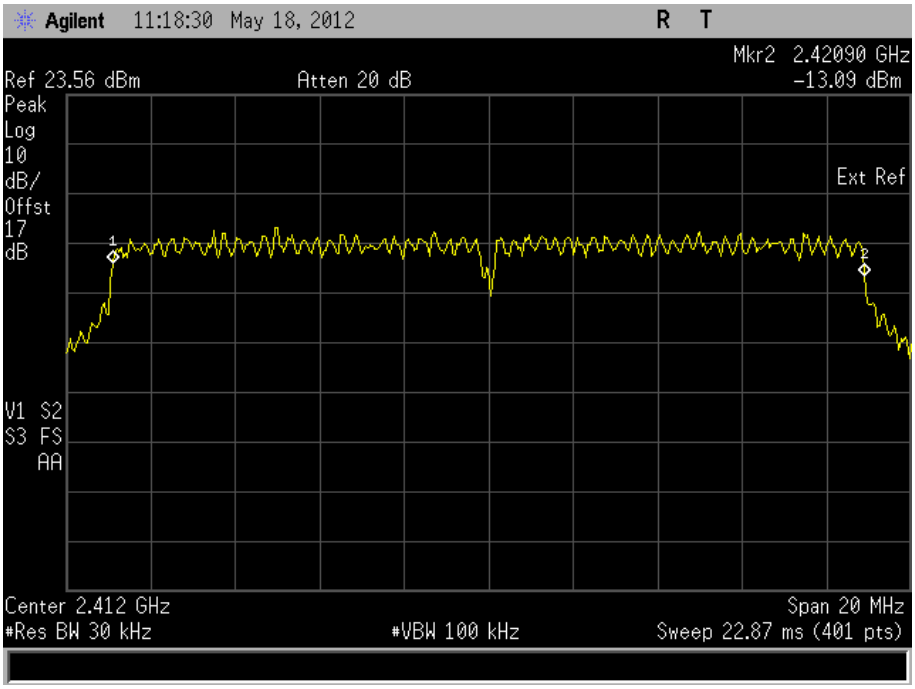
Product Service

2412 MHz

6.5 Mbps

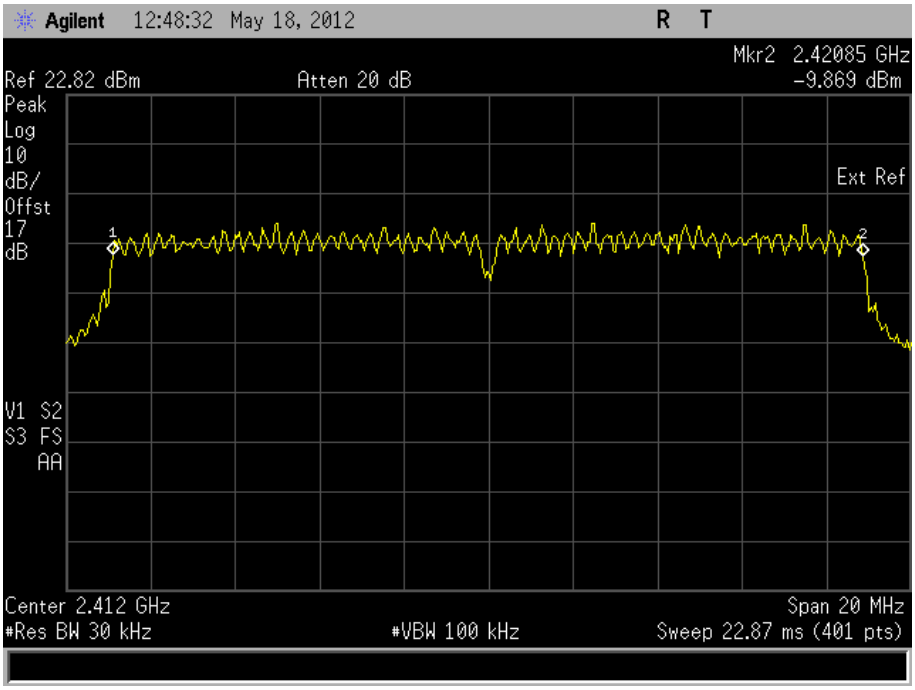



13 Mbps

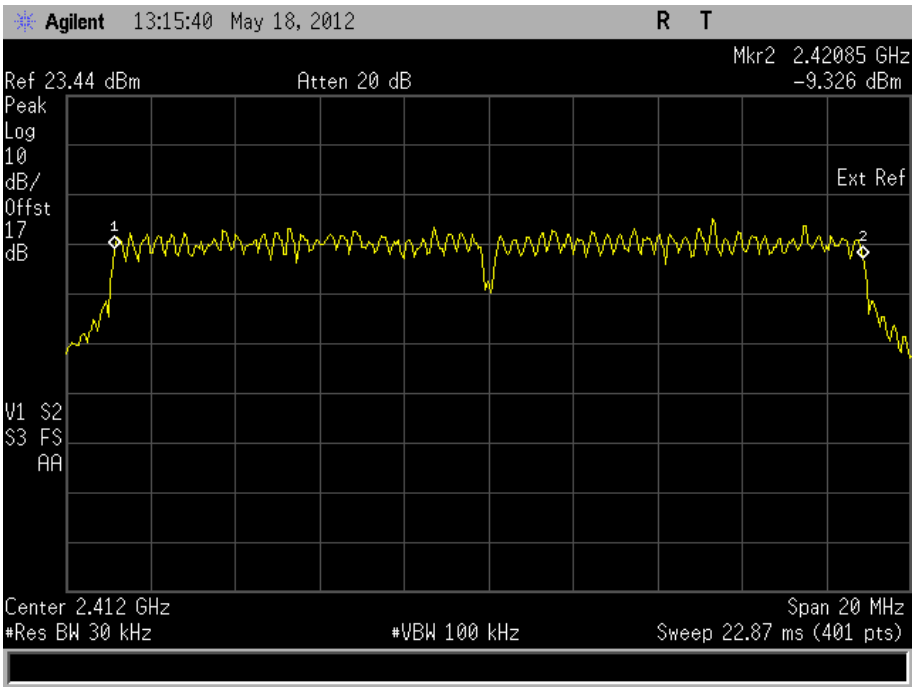


Product Service

19.5 Mbps

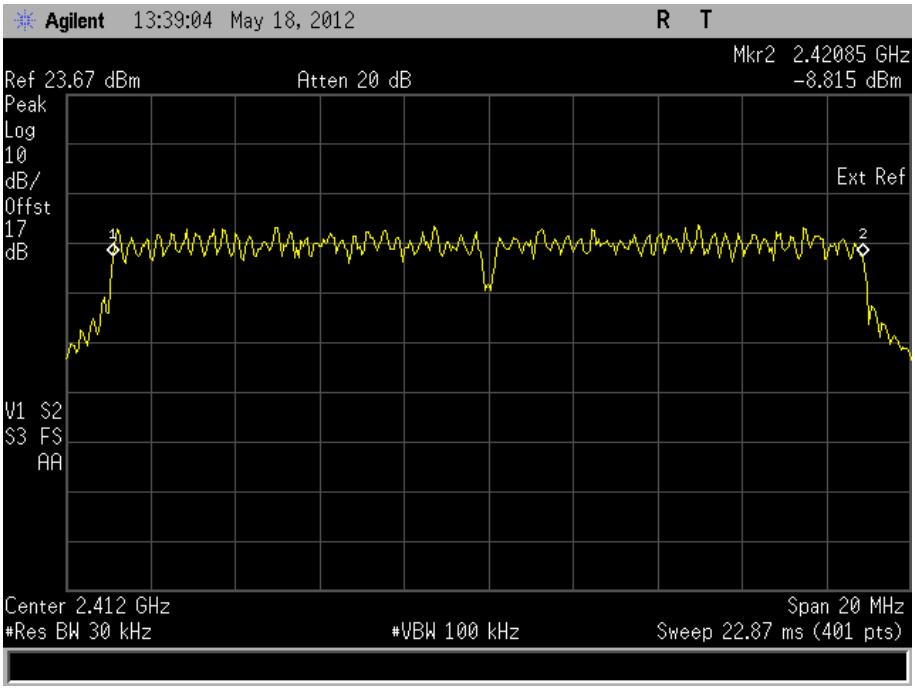



26 Mbps

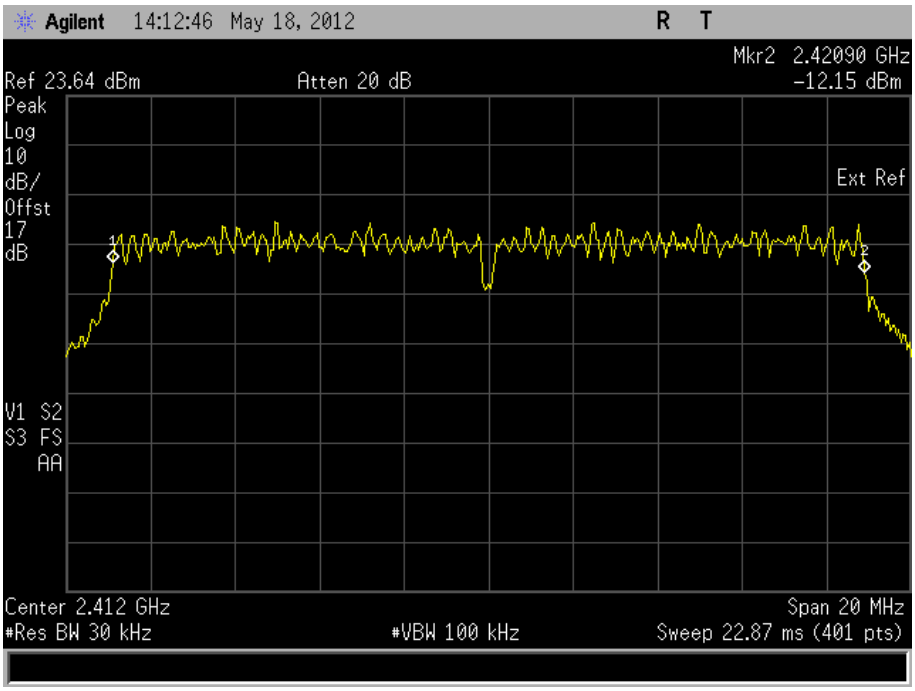


Product Service

39 Mbps

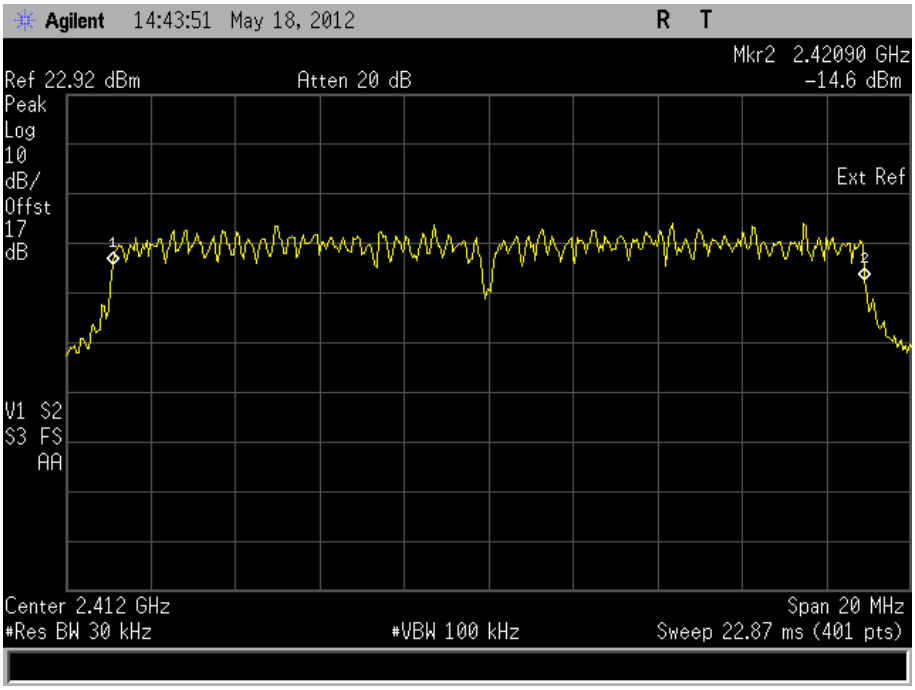



52 Mbps

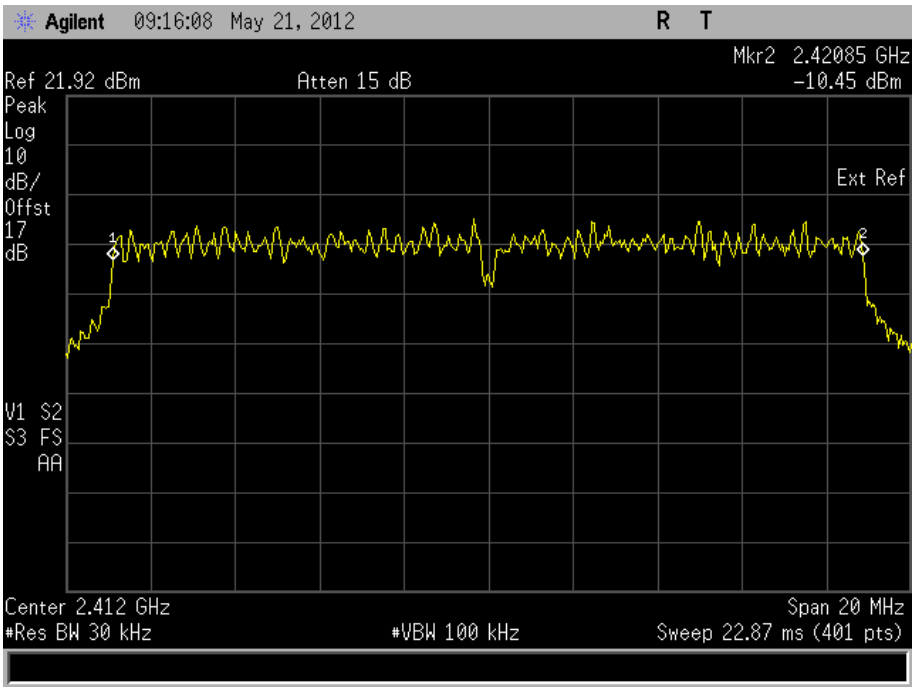


Product Service

58.5 Mbps

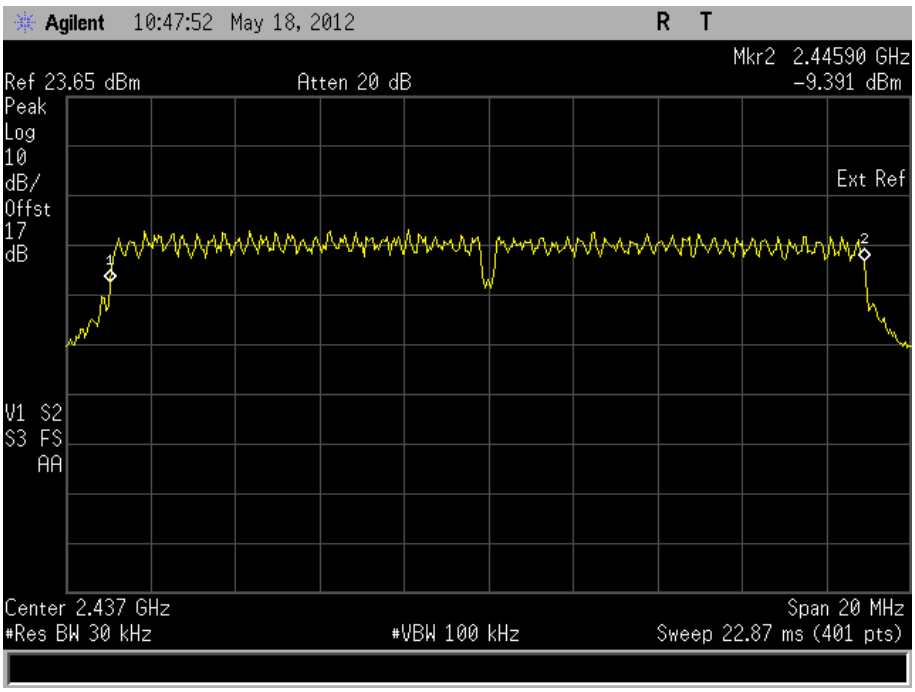



65 Mbps

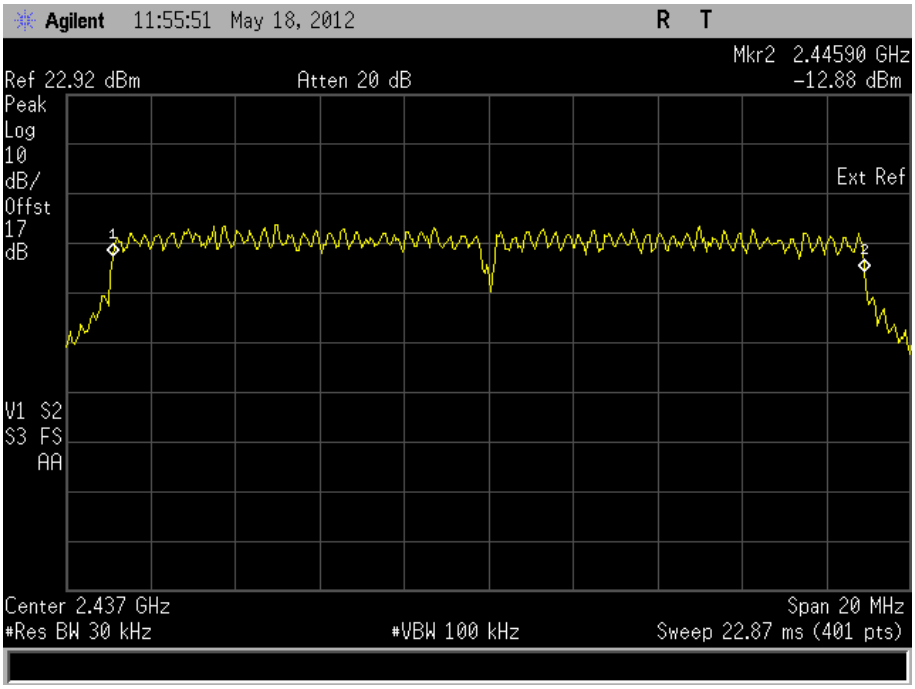


2437 MHz

6.5 Mbps

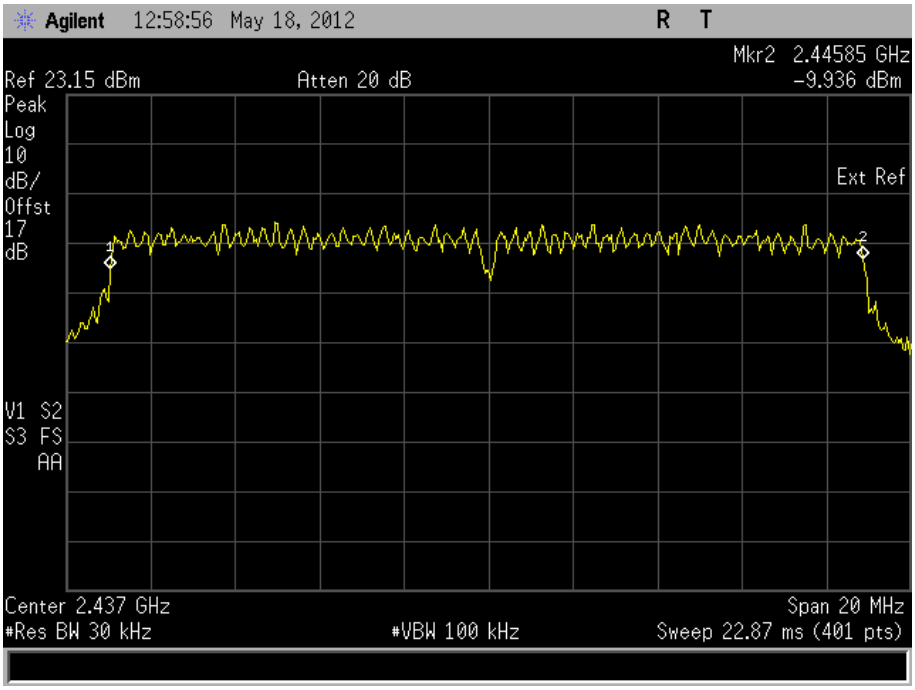



13 Mbps

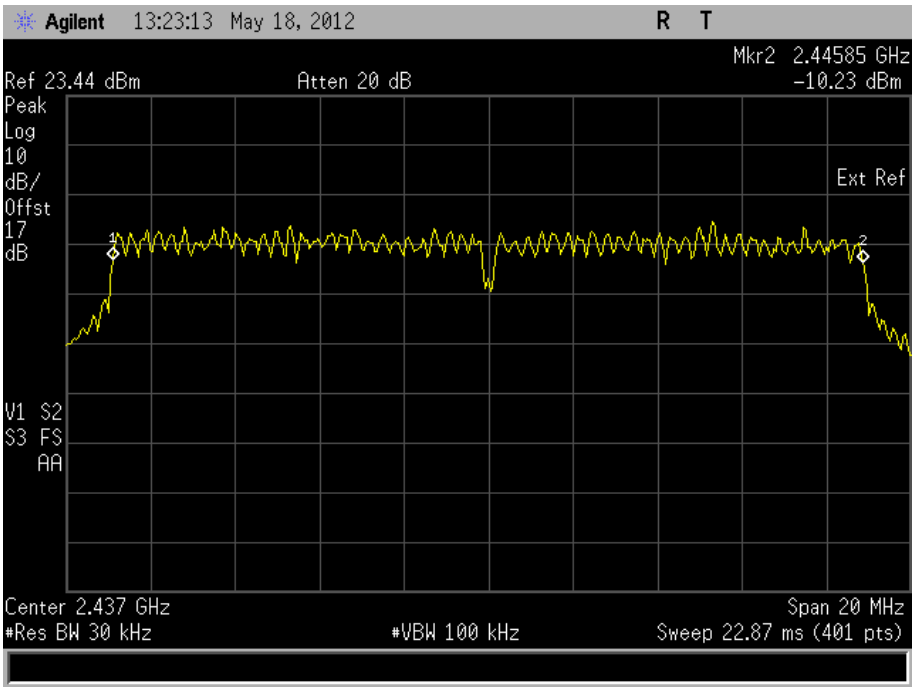


Product Service

19.5 Mbps

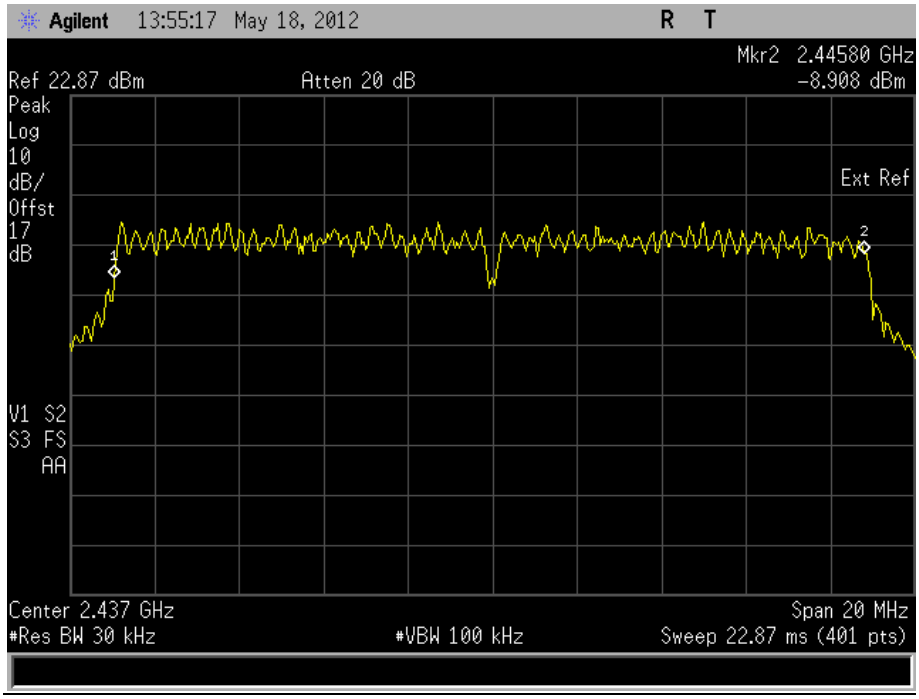



26 Mbps

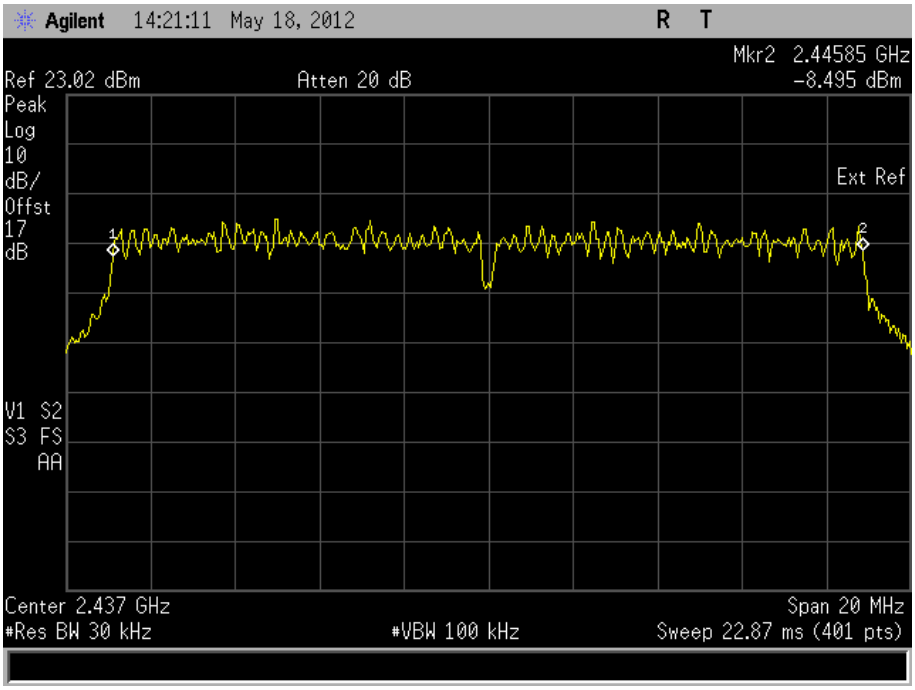


Product Service

39 Mbps

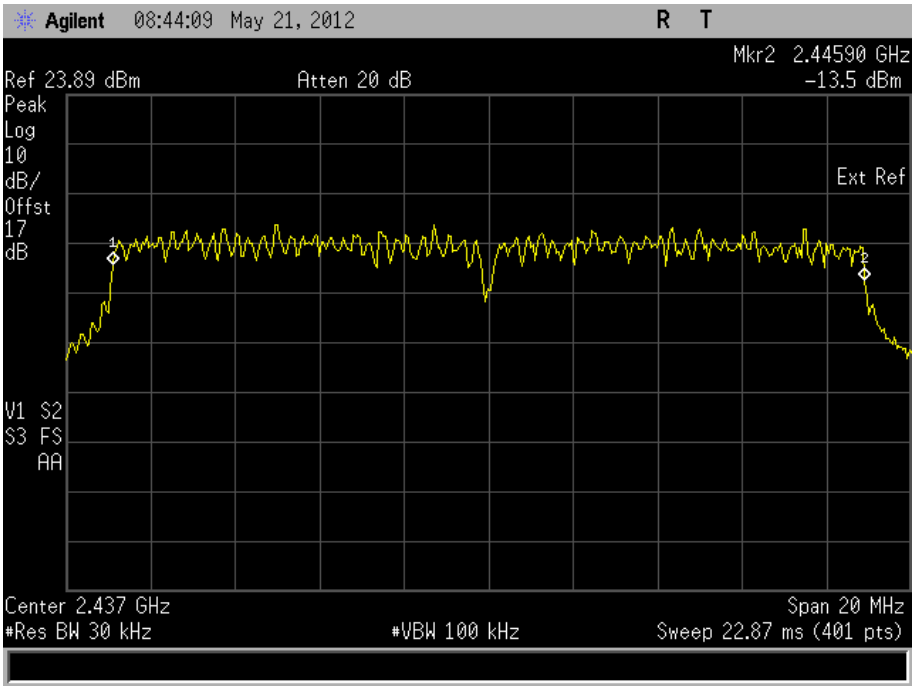



52 Mbps

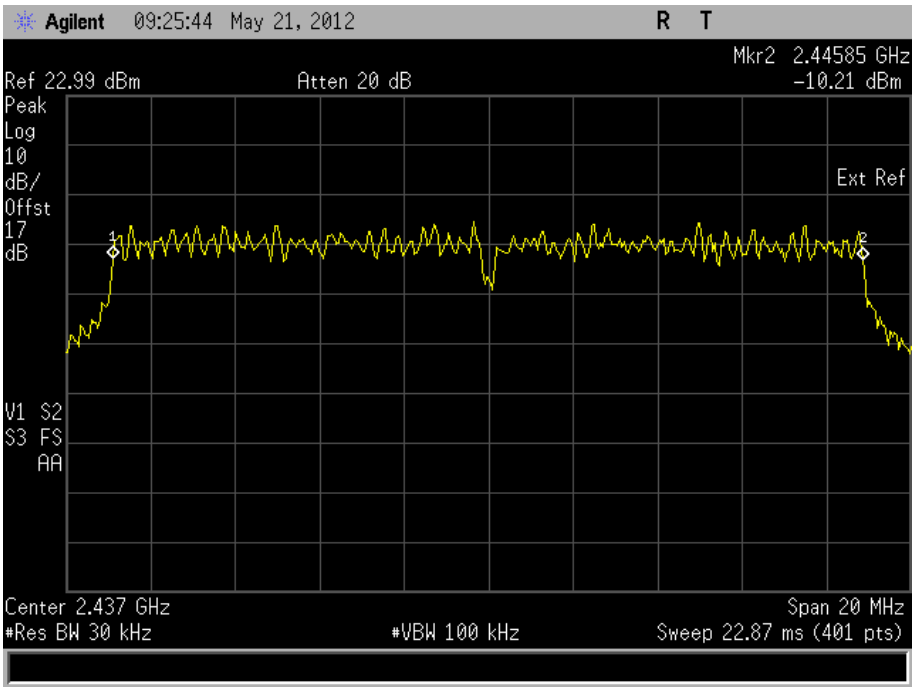


Product Service

58.5 Mbps



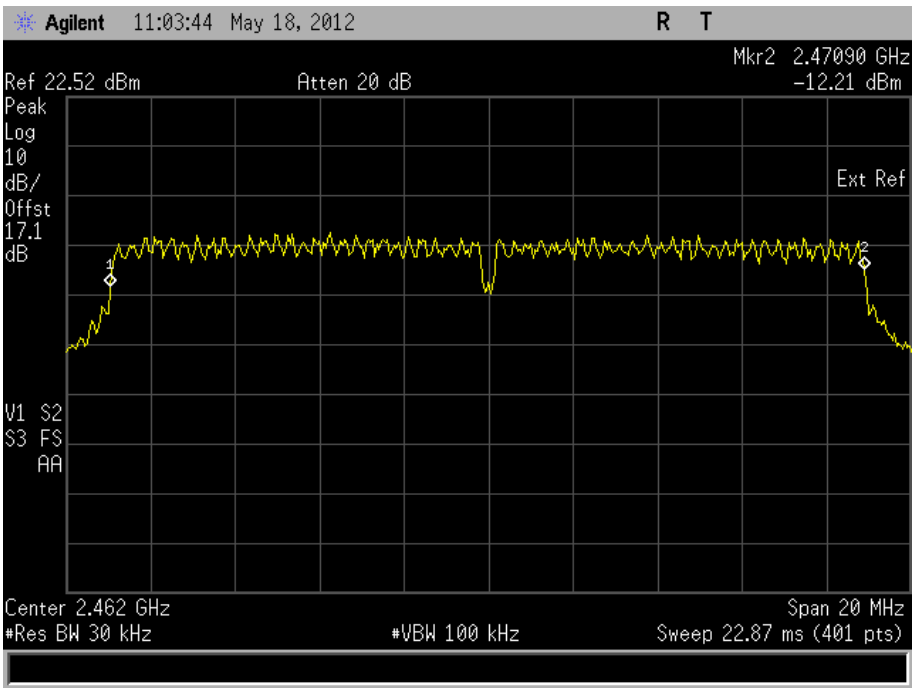

65 Mbps



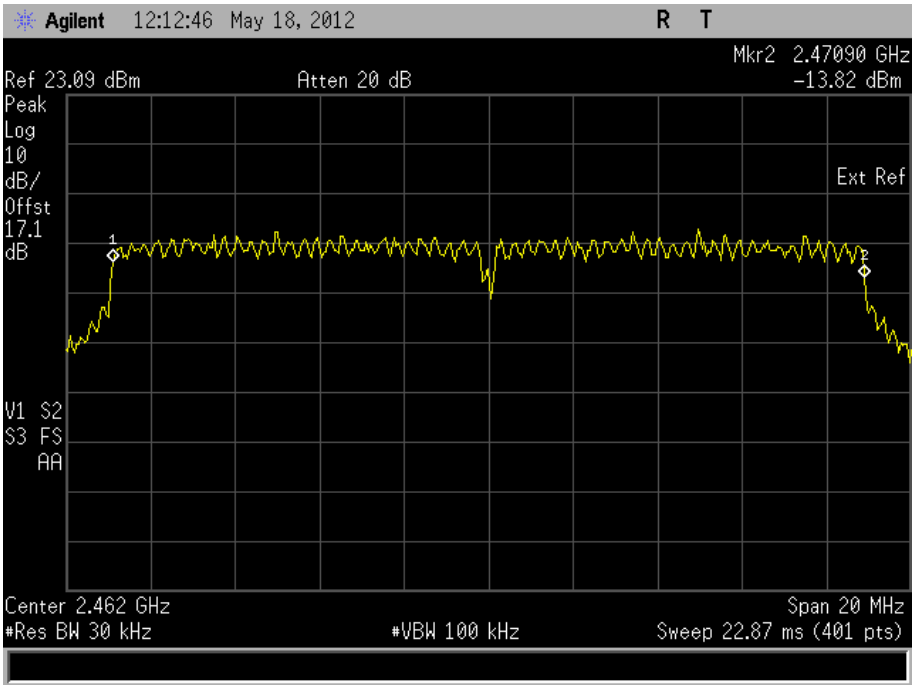
Product Service

2462 MHz

6.5 Mbps

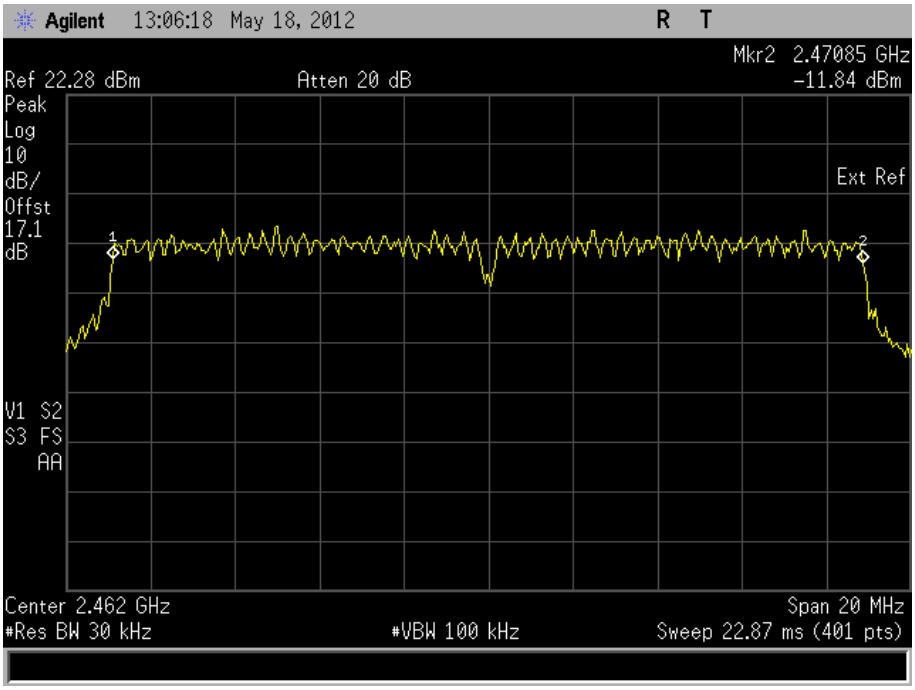



13 Mbps

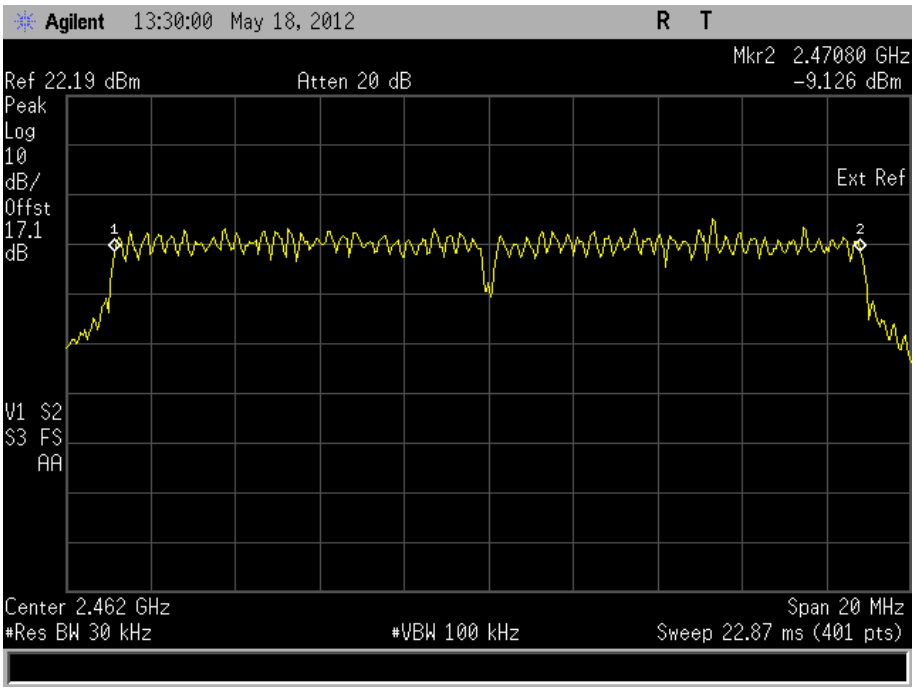


Product Service

19.5 Mbps

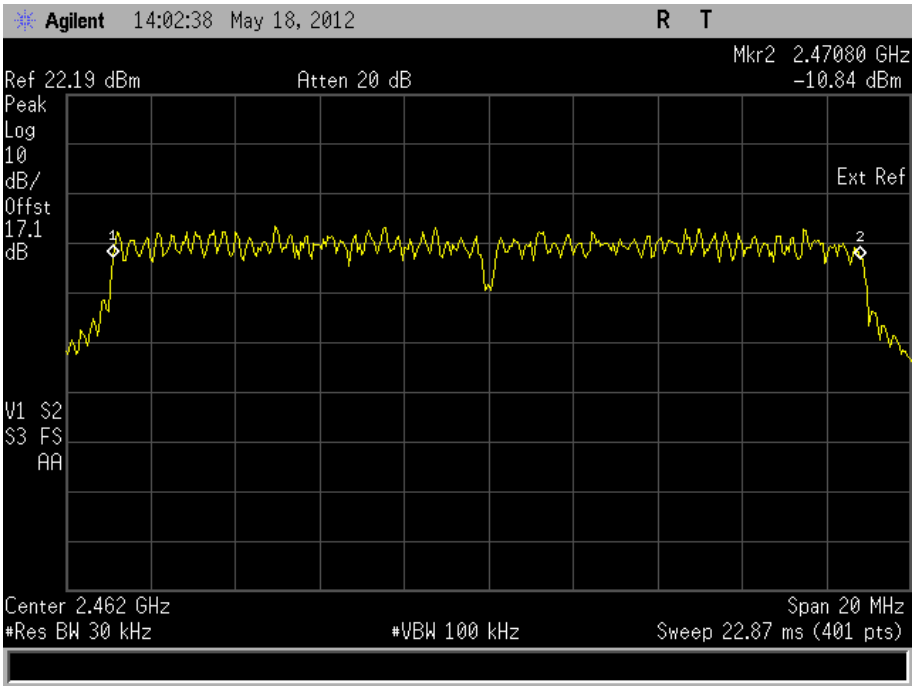



26 Mbps

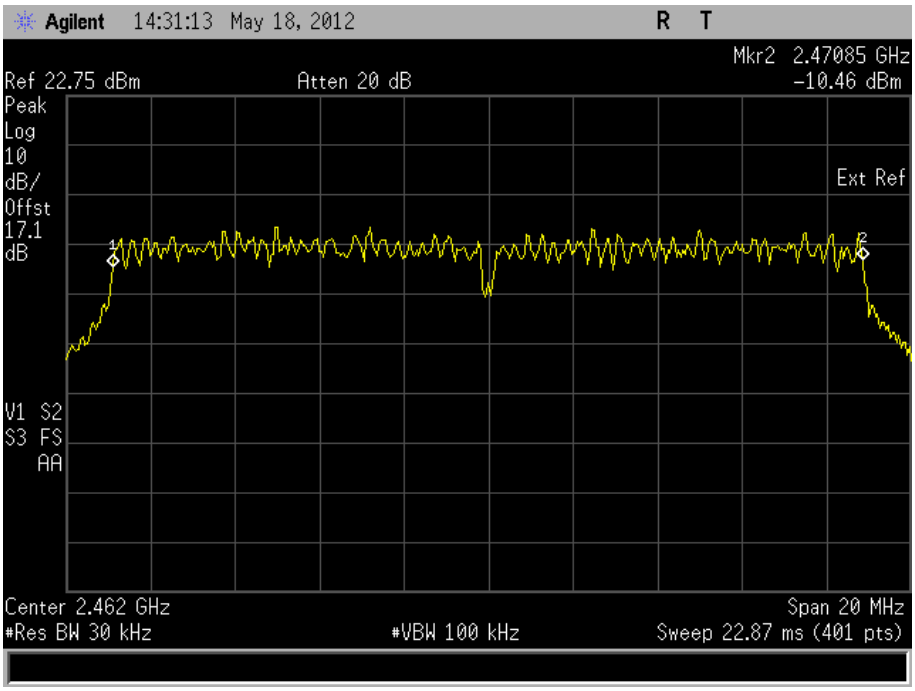


Product Service

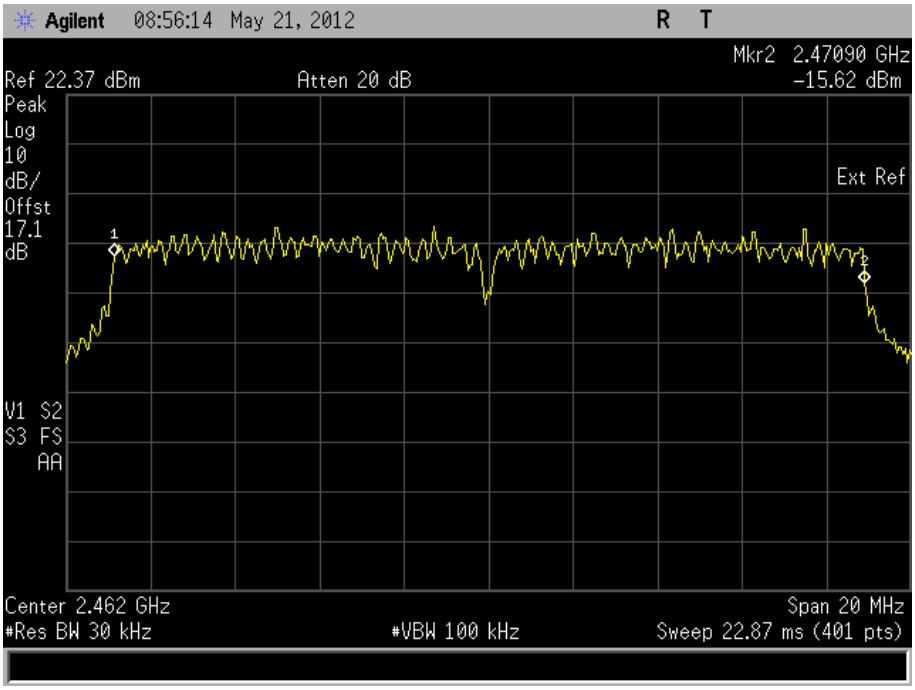
39 Mbps



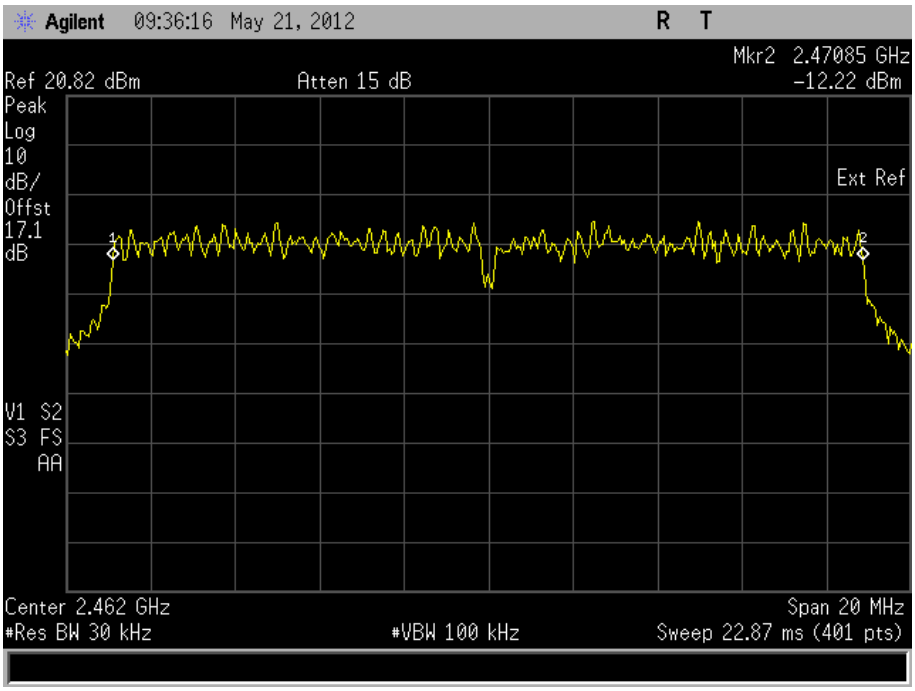

52 Mbps



58.5 Mbps




65 Mbps




Limit Clause

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

Product Service

**SECTION 3**

**TEST EQUIPMENT USED**

Product Service

## 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 – AC Line Conducted Emissions** | | | | | |
| Transient Limiter | Hewlett Packard | 11947A | 15 | 12 | 1-Dec-2012 |
| LISN (1 Phase) | Chase | MN 2050 | 336 | 12 | 23-Mar-2013 |
| Transient Limiter | Hewlett Packard | 11947A | 1032 | 12 | 22-Jun-2012 |
| Screened Room (5) | Rainford | Rainford | 1545 | 36 | 3-Feb-2014 |
| EMI Test Receiver | Rohde & Schwarz | ESU40 | 3506 | 12 | 29-Sep-2012 |
| 7m Armoured RF Cable | SSI Cable Corp. | 1501-13-13-7m WA(-) | 3600 | - | TU |
| **Section 2.2 – Maximum Peak Conducted Output Power** | | | | | |
| Dual programable power supply | Thurlby | T-1000 | 418 | - | TU |
| Multimeter | Fluke | 75 Mk3 | 455 | 12 | 16-Jan-2013 |
| Attenuator (10dB, 10W) | Weinschel | 23-10-34 | 470 | 12 | 23-Jun-2012 |
| Attenuator (10dB) | Weinschel | 47-10-34 | 481 | 12 | 27-Mar-2013 |
| Attenuator (20dB/ 2W) | Pasternack | PE7004-20 | 489 | 12 | 21-Sep-2012 |
| Power Divider | Weinschel | 1506A | 604 | 12 | 19-Mar-2013 |
| Power Splitter | Weinschel | 1506A | 606 | 12 | 19-Dec-2012 |
| Spectrum Analyser | Hewlett Packard | E4407B | 1154 | 12 | 28-Jun-2012 |
| GPS Frequency Standard | Rapco | GPS-804/3 | 1312 | 12 | 13-Sep-2012 |
| Hygromer | Rotronic | A1 | 2677 | 12 | 7-Feb-2013 |
| Radio Communications Test Set | Rohde & Schwarz | CMU 200 | 3035 | 12 | 7-Oct-2012 |
| Power Meter | Rohde & Schwarz | NRP | 3491 | 12 | 19-Apr-2013 |
| Wideband Power Sensor, 50MHz - 18GHz | Rohde & Schwarz | NRP-Z81 | 3492 | 12 | 19-Apr-2013 |
| Vector Signal Generator | Rohde & Schwarz | SMU 200A | 3493 | 12 | 20-Sep-2012 |
| Network Analyser | Rohde & Schwarz | ZVA 40 | 3548 | 12 | 13-Mar-2013 |
| '3.5mm' - '3.5mm' RF Cable (1m) | Rhophase | 3PS-1803-1000-3PS | 3696 | 12 | 27-Jan-2013 |
| DC - 12.4 GHz 10 dB Attenuator | Suhner | 6810.17.A | 3965 | 12 | 24-Jun-2012 |
| P-Series Power Meter | Agilent | N1911A | 3981 | 12 | 12-Sep-2012 |
| 50 MHz-18 GHz Wideband Power Sensor | Agilent | N1921A | 3983 | 12 | 12-Sep-2012 |
| True RMS Multimeter | Fluke | 179 | 4007 | 12 | 16-Feb-2013 |
| Temperature Humidy Meter | Radio Spares | 1260 | 4020 | 12 | 23-Nov-2012 |

| Instrument | Manufacturer | Type No. | TE No. | Calibration Period (months) | Calibration Due |
|---|---|---|---|---|---|
| **Section 2.3 – EIRP Peak Power** | | | | | |
| Radiocommunications Tester | Rohde & Schwarz | CMU 200 | 39 | 12 | 9-Dec-2012 |
| Peak Power Analyser | Hewlett Packard | 8990A | 107 | 12 | 10-Feb-2013 |
| Antenna (Double Ridge Guide, 1GHz-18GHz) | EMCO | 3115 | 234 | 12 | 8-Dec-2012 |
| Antenna (Double Ridge Guide, 1GHz-18GHz) | EMCO | 3115 | 235 | 12 | 14-Nov-2012 |
| Signal Generator (10MHz to 40GHz) | Rohde & Schwarz | SMR40 | 1002 | 12 | 29-Jul-2012 |
| Test Receiver | Rohde & Schwarz | ESIB40 | 1006 | 12 | 23-Feb-2013 |
| Screened Room (5) | Rainford | Rainford | 1545 | 36 | 3-Feb-2014 |
| Mast Controller | Inn-Co GmbH | CO 1000 | 1606 | - | TU |
| Power Sensor | Hewlett Packard | 84812A | 2743 | - | TU |
| Antenna (DRG Horn) | ETS-LINDGREN | 3115 | 3125 | 12 | 24-May-2013 |
| Signal Generator (10MHz to 40GHz) | Rohde & Schwarz | SMR40 | 3171 | 12 | 22-Aug-2012 |
| Signal Generator: 10MHz to 20GHz | Rohde & Schwarz | SMR20 | 3475 | 12 | 20-Dec-2012 |
| EMI Test Receiver | Rohde & Schwarz | ESU40 | 3506 | 12 | 29-Sep-2012 |
| 7m Armoured RF Cable | SSI Cable Corp. | 1501-13-13-7m WA(-) | 3600 | - | TU |
| '3.5mm' - '3.5mm' RF Cable (2m) | Rhophase | 3PS-1803-2000-3PS | 3702 | 12 | 27-Jan-2013 |
| '3.5mm' - '3.5mm' RF Cable (2m) | Rhophase | 3PS-1803-2000-3PS | 3703 | - | TU |
| 9m RF Cable (N Type) | Rhophase | NPS-2303-9000-NPS | 3791 | 12 | 26-Aug-2012 |
| Tilt Antenna Mast | maturo Gmbh | TAM 4.0-P | 3916 | - | TU |
| Mast Controller | maturo Gmbh | NCD | 3917 | - | TU |
| **Section2.4 - Peak Power Spectral Density** | | | | | |
| Dual programable power supply | Thurlby | T-1000 | 418 | - | TU |
| Power Splitter | Weinschel | 1506A | 606 | 12 | 19-Dec-2012 |
| Rubidium Standard | Rohde & Schwarz | XRSM | 1316 | 12 | 13-Sep-2012 |
| Hygromer | Rotronic | A1 | 2677 | 12 | 7-Feb-2013 |
| Power Meter | Rohde & Schwarz | NRP | 3491 | 12 | 19-Apr-2013 |
| Wideband Power Sensor, 50MHz - 18GHz | Rohde & Schwarz | NRP-Z81 | 3492 | 12 | 19-Apr-2013 |
| Vector Signal Generator | Rohde & Schwarz | SMU 200A | 3493 | 12 | 20-Sep-2012 |
| DC - 12.4 GHz 10 dB Attenuator | Suhner | 6810.17.A | 3965 | 12 | 24-Jun-2012 |
| True RMS Multimeter | Fluke | 179 | 4007 | 12 | 16-Feb-2013 |
| **Section 2.5 – Spurious and Band Edge Emissions** | | | | | |
| Radiocommunications Tester | Rohde & Schwarz | CMU 200 | 39 | 12 | 9-Dec-2012 |
| Antenna (Double Ridge Guide) | Link Microtek Ltd | AM180HA-K-TU2 | 230 | 24 | 13-Sep-2013 |
| Antenna (Double Ridge Guide, 1GHz-18GHz) | EMCO | 3115 | 234 | 12 | 8-Dec-2012 |
| Antenna (Double Ridge Guide, 1GHz-18GHz) | EMCO | 3115 | 235 | 12 | 14-Nov-2012 |
| Attenuator 20dB 5W | Marconi | 56534-904H | 377 | 12 | 8-May-2013 |
| Dual programable power supply | Thurlby | T-1000 | 418 | - | TU |
| Multimeter | Fluke | 75 Mk3 | 455 | 12 | 16-Jan-2013 |
| Multimeter | Iso-tech | IDM-101 | 466 | 12 | 5-Mar-2013 |
| Attenuator (10dB, 10W) | Weinschel | 23-10-34 | 470 | 12 | 23-Jun-2012 |
| Attenuator (10dB) | Weinschel | 47-10-34 | 481 | 12 | 27-Mar-2013 |
| Attenuator (20dB/ 2W) | Pasternack | PE7004-20 | 489 | 12 | 21-Sep-2012 |
| Broadband Resistive Power Divider | Weinschel | 1506A | 601 | 12 | 2-Dec-2012 |
| Power Divider | Weinschel | 1506A | 604 | 12 | 19-Mar-2013 |
| Power Splitter | Weinschel | 1506A | 606 | 12 | 19-Dec-2012 |
| Signal Generator (10MHz to 40GHz) | Rohde & Schwarz | SMR40 | 1002 | 12 | 29-Jul-2012 |

Product Service

| Instrument | Manufacturer | Type No. | TE No. | Calibration Period (months) | Calibration Due |
|---|---|---|---|---|---|
| **Section 2.5 – Spurious and Band Edge Emissions** | | | | | |
| Spectrum Analyser | Hewlett Packard | E4407B | 1154 | 12 | 28-Jun-2012 |
| GPS Frequency Standard | Rapco | GPS-804/3 | 1312 | 12 | 13-Sep-2012 |
| Rubidium Standard | Rohde & Schwarz | XSRM | 1316 | 12 | 13-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 | 20-Sep-2012 |
| Pre-Amplifier | Phase One | PSO4-0087 | 1534 | 12 | 26-Sep-2012 |
| Screened Room (5) | Rainford | Rainford | 1545 | 36 | 3-Feb-2014 |
| Mast Controller | Inn-Co GmbH | CO 1000 | 1606 | - | TU |
| Hygromer | Rotronic | A1 | 2677 | 12 | 7-Feb-2013 |
| High Pass Filter (4GHz) | RLC Electronics | F-100-4000-5-R | 2773 | 12 | 20-Sep-2012 |
| Filter | Daden Anthony Ass | MH-1500-7SS | 2778 | 12 | 21-Dec-2012 |
| Antenna (Bilog) | Chase | CBL6143 | 2904 | 24 | 12-May-2013 |
| Attenuator (20dB, 20W) | Weinschel | 1 | 3032 | 12 | TU |
| Radio Communications Test Set | Rohde & Schwarz | CMU 200 | 3035 | 12 | 7-Oct-2012 |
| Signal Generator (10MHz to 40GHz) | Rohde & Schwarz | SMR40 | 3171 | 12 | 22-Aug-2012 |
| High Pass Filter (3GHz) | RLC Electronics | F-100-3000-5-R | 3349 | 12 | 27-May-2012 |
| Power Supply | Farnell | ET30/2 | 3423 | - | TU |
| Signal Generator: 10MHz to 20GHz | Rohde & Schwarz | SMR20 | 3475 | 12 | 20-Dec-2012 |
| Charge Amplifier | Endevco | 133 | 3478 | 12 | 15-Jul-2012 |
| Wideband Power Sensor, 50MHz - 18GHz | Rohde & Schwarz | NRP-Z81 | 3492 | 12 | 19-Apr-2013 |
| Vector Signal Generator | Rohde & Schwarz | SMU 200A | 3493 | 12 | 20-Sep-2012 |
| EMI Test Receiver | Rohde & Schwarz | ESU40 | 3506 | 12 | 29-Sep-2012 |
| Network Analyser | Rohde & Schwarz | ZVA 40 | 3548 | 12 | 13-Mar-2013 |
| 3 GHz High Pass Filter | K&L Microwave | 11SH10-3000/X18000-O/O | 3552 | 12 | 16-Apr-2013 |
| 7m Armoured RF Cable | SSI Cable Corp. | 1501-13-13-7m WA(-) | 3600 | - | TU |
| DC - 8 GHz Attenuator | Lucas Weinschel | 24-30-33 | 3963 | 12 | 24-Jun-2012 |
| '2.92mm' - '2.92mm' RF Cable (2m) | Rhophase | KPS-1503-2000-KPS | 3694 | 12 | TU |
| '2.92mm' - '2.92mm' RF Cable (2m) | Rhophase | KPS-1503-2000-KPS | 3695 | 12 | TU |
| '3.5mm' - '3.5mm' RF Cable (1m) | Rhophase | 3PS-1803-1000-3PS | 3696 | 12 | 27-Jan-2013 |
| 'N' - 'N' RF Cable (1m) | Rhophase | NPS-1803-1000-NPS | 3700 | 12 | 12-Jan-2013 |
| 'N' - 'N' RF Cable (1m) | Rhophase | NPS-1803-1000-NPS | 3701 | 12 | 12-Jan-2013 |
| '3.5mm' - '3.5mm' RF Cable (2m) | Rhophase | 3PS-1803-2000-3PS | 3702 | 12 | 27-Jan-2013 |
| '3.5mm' - '3.5mm' RF Cable (2m) | Rhophase | 3PS-1803-2000-3PS | 3703 | - | TU |
| 9m RF Cable (N Type) | Rhophase | NPS-2303-9000-NPS | 3791 | 12 | 26-Aug-2012 |
| Tilt Antenna Mast | maturo Gmbh | TAM 4.0-P | 3916 | - | TU |
| Mast Controller | maturo Gmbh | NCD | 3917 | - | TU |
| Low Noise Amplifier | Wright Technologies | APS04-0085 | 3969 | 12 | 8-Jul-2012 |
| True RMS Multimeter | Fluke | 179 | 4007 | 12 | 16-Feb-2013 |
| Temperature Humidy Meter | Radio Spares | 1260 | 4020 | 12 | 23-Nov-2012 |

Product Service

| Instrument | Manufacturer | Type No. | TE No. | Calibration Period (months) | Calibration Due |
|---|---|---|---|---|---|
| **Section 2.6 – 6dB Bandwidth** | | | | | |
| Dual programable power supply | Thurlby | T-1000 | 418 | - | TU |
| Multimeter | Fluke | 75 Mk3 | 455 | 12 | 16-Jan-2013 |
| Attenuator (10dB, 10W) | Weinschel | 23-10-34 | 470 | 12 | 23-Jun-2012 |
| Attenuator (10dB) | Weinschel | 47-10-34 | 481 | 12 | 27-Mar-2013 |
| Attenuator (20dB/ 2W) | Pasternack | PE7004-20 | 489 | 12 | 21-Sep-2012 |
| Power Divider | Weinschel | 1506A | 604 | 12 | 19-Mar-2013 |
| Power Splitter | Weinschel | 1506A | 606 | 12 | 19-Dec-2012 |
| Spectrum Analyser | Hewlett Packard | E4407B | 1154 | 12 | 28-Jun-2012 |
| GPS Frequency Standard | Rapco | GPS-804/3 | 1312 | 12 | 13-Sep-2012 |
| Hygromer | Rotronic | A1 | 2677 | 12 | 7-Feb-2013 |
| Spectrum Analyser | Rohde & Schwarz | FSU26 | 2747 | 12 | 18-Nov-2012 |
| Radio Communications Test Set | Rohde & Schwarz | CMU 200 | 3035 | 12 | 7-Oct-2012 |
| Thermocouple Thermometer | Fluke | 51 | 3174 | 12 | 6-Sep-2012 |
| Vector Signal Generator | Rohde & Schwarz | SMU 200A | 3493 | 12 | 20-Sep-2012 |
| Network Analyser | Rohde & Schwarz | ZVA 40 | 3548 | 12 | 13-Mar-2013 |
| '3.5mm' - '3.5mm' RF Cable (1m) | Rhophase | 3PS-1803-1000-3PS | 3696 | 12 | 27-Jan-2013 |
| DC - 12.4 GHz 10 dB Attenuator | Suhner | 6810.17.A | 3965 | 12 | 24-Jun-2012 |
| True RMS Multimeter | Fluke | 179 | 4007 | 12 | 16-Feb-2013 |
| Temperature Humidy Meter | Radio Spares | 1260 | 4020 | 12 | 23-Nov-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 |
|---|---|
| 6dB Bandwidth | ± 212.114 kHz |
| EIRP Peak Power | 30MHz to 1GHz: ± 5.1 dB<br>1GHz to 40GHz: ± 6.3 dB |
| Maximum Peak Conducted Output Power | ± 0.70 dB |
| Spurious and Band Edge Emissions | 30MHz to 1GHz: ± 5.1 dB<br>1GHz to 40GHz: ± 6.3 dB |
| Power Spectral Density | ± 3.0 dB |
| AC Line Conducted Emissions | ± 3.2 dB |

Product Service

## SECTION 4

## ACCREDITATION, DISCLAIMERS AND COPYRIGHT

## 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).