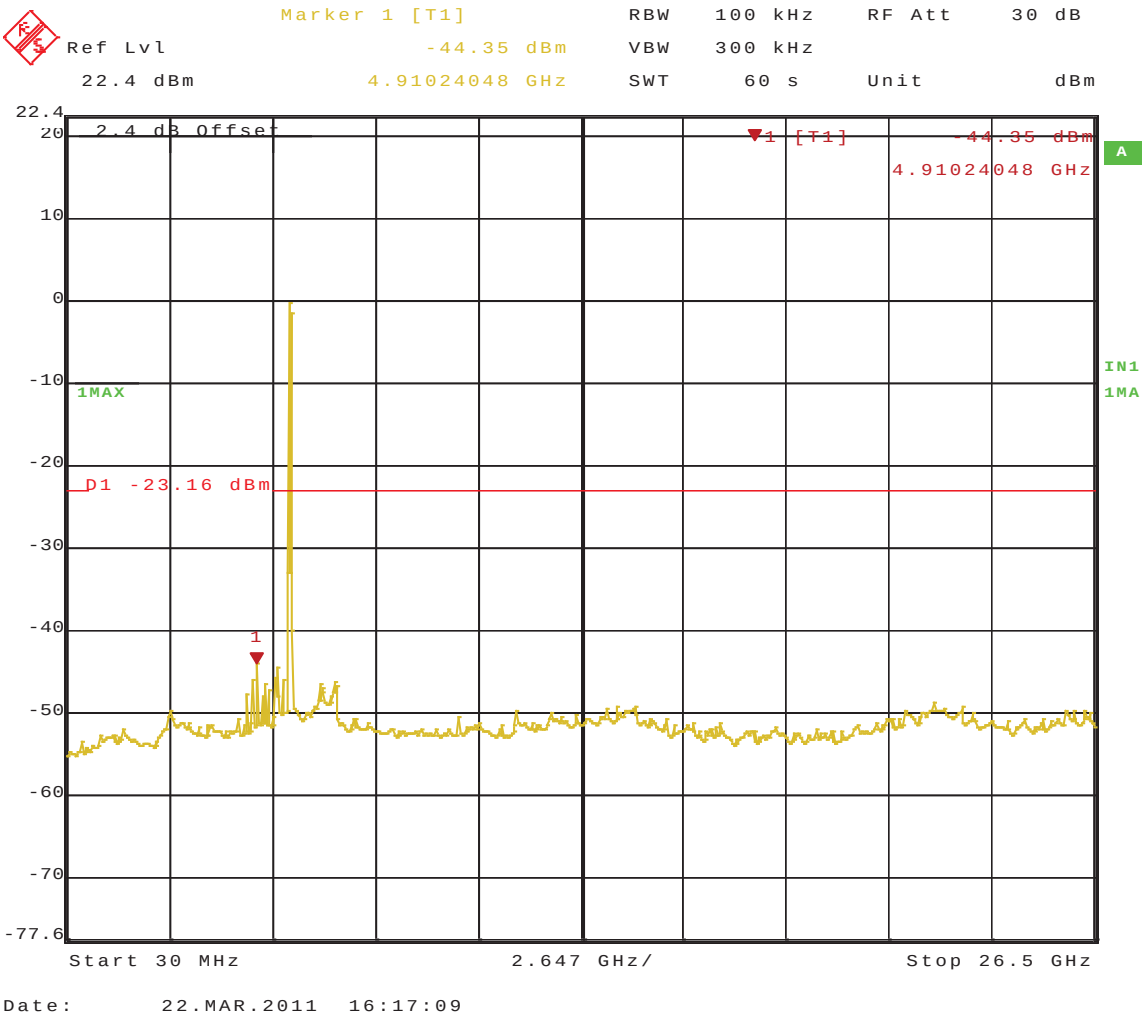



**Figure 510:** Out of Band at 802.11n HT40, 13.5 Mbps 5795 MHz, Chain 1 – Plot 2

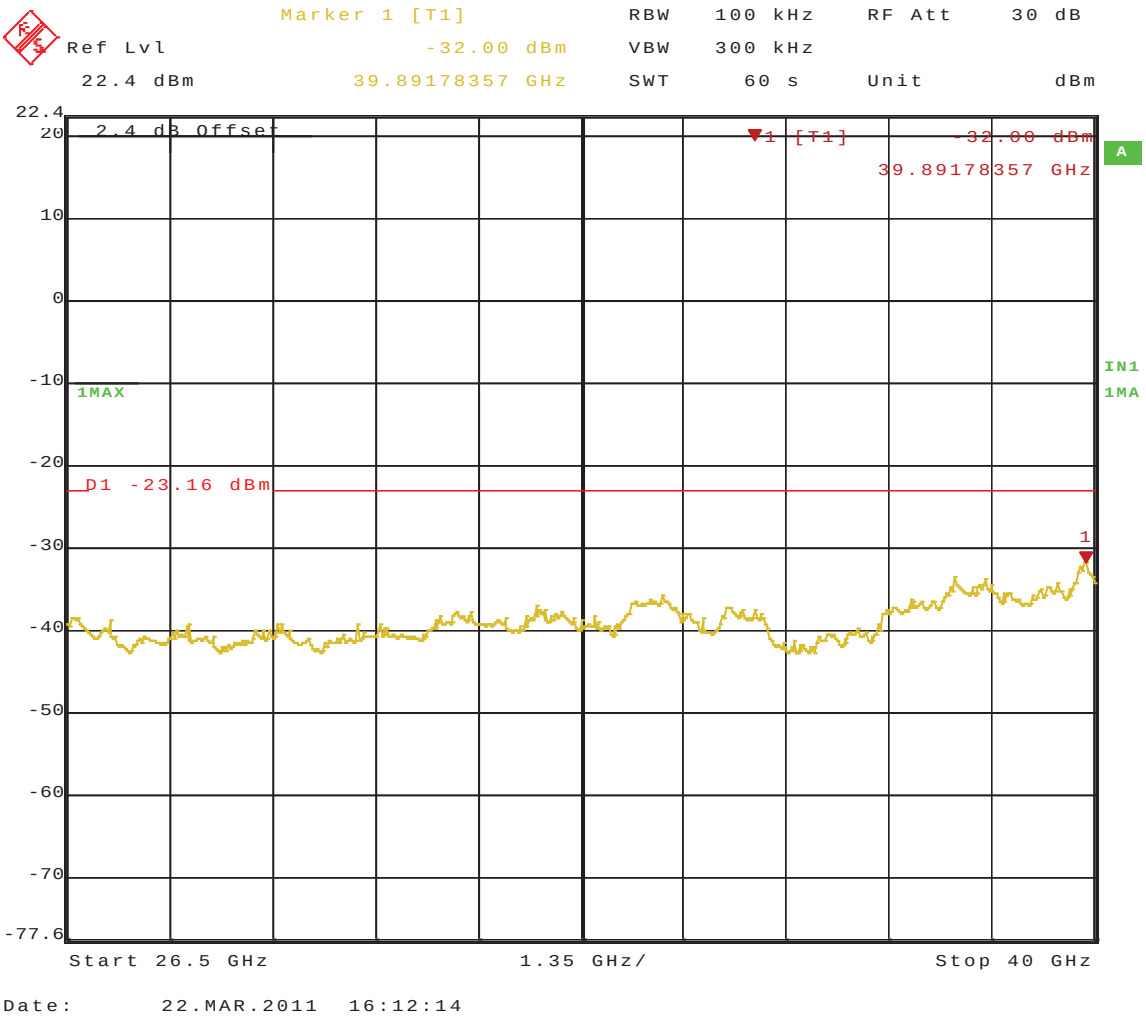



**Figure 511:** Out of Band at 802.11n HT40, 13.5 Mbps 5795 MHz, Chain 1 – Plot 3

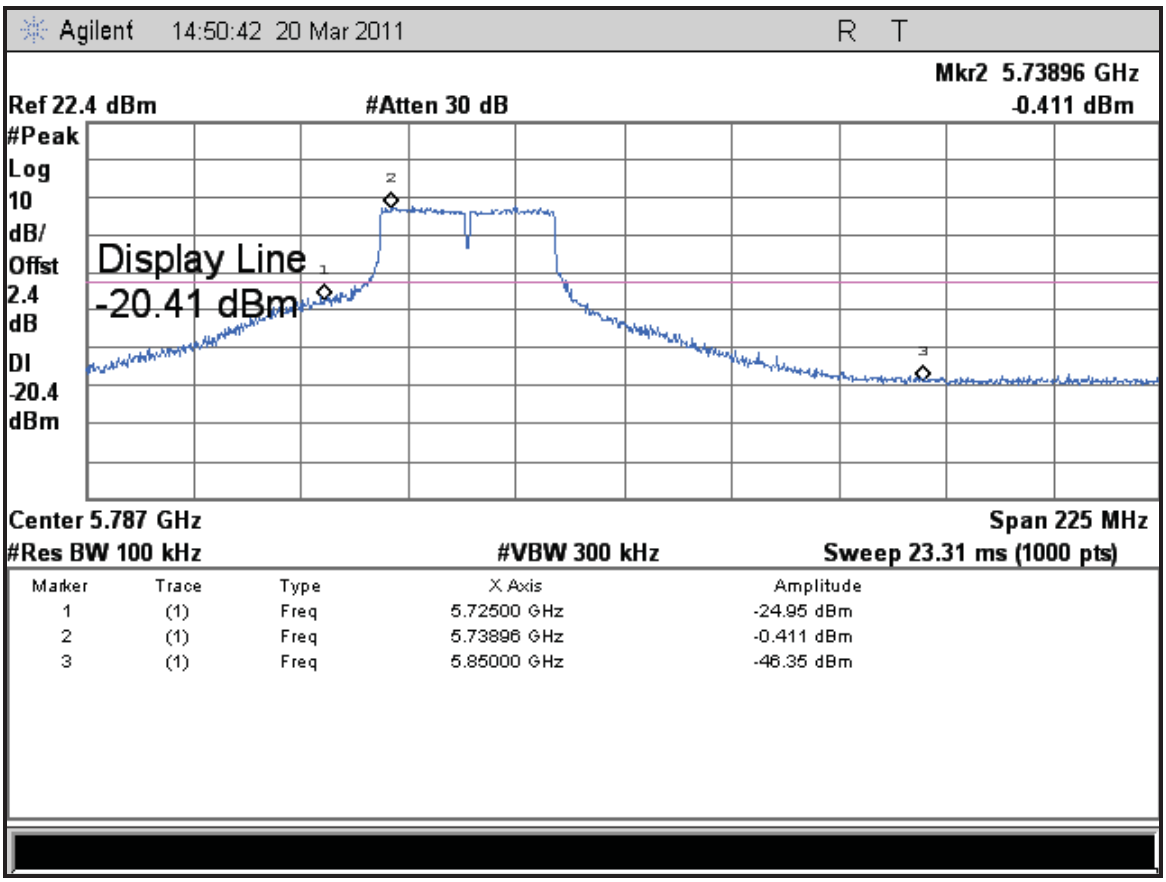



**Figure 512:** Band-edge Requirement at 802.11n HT40, 13.5 Mbps 5755 MHz, Chain 2 – Plot 1

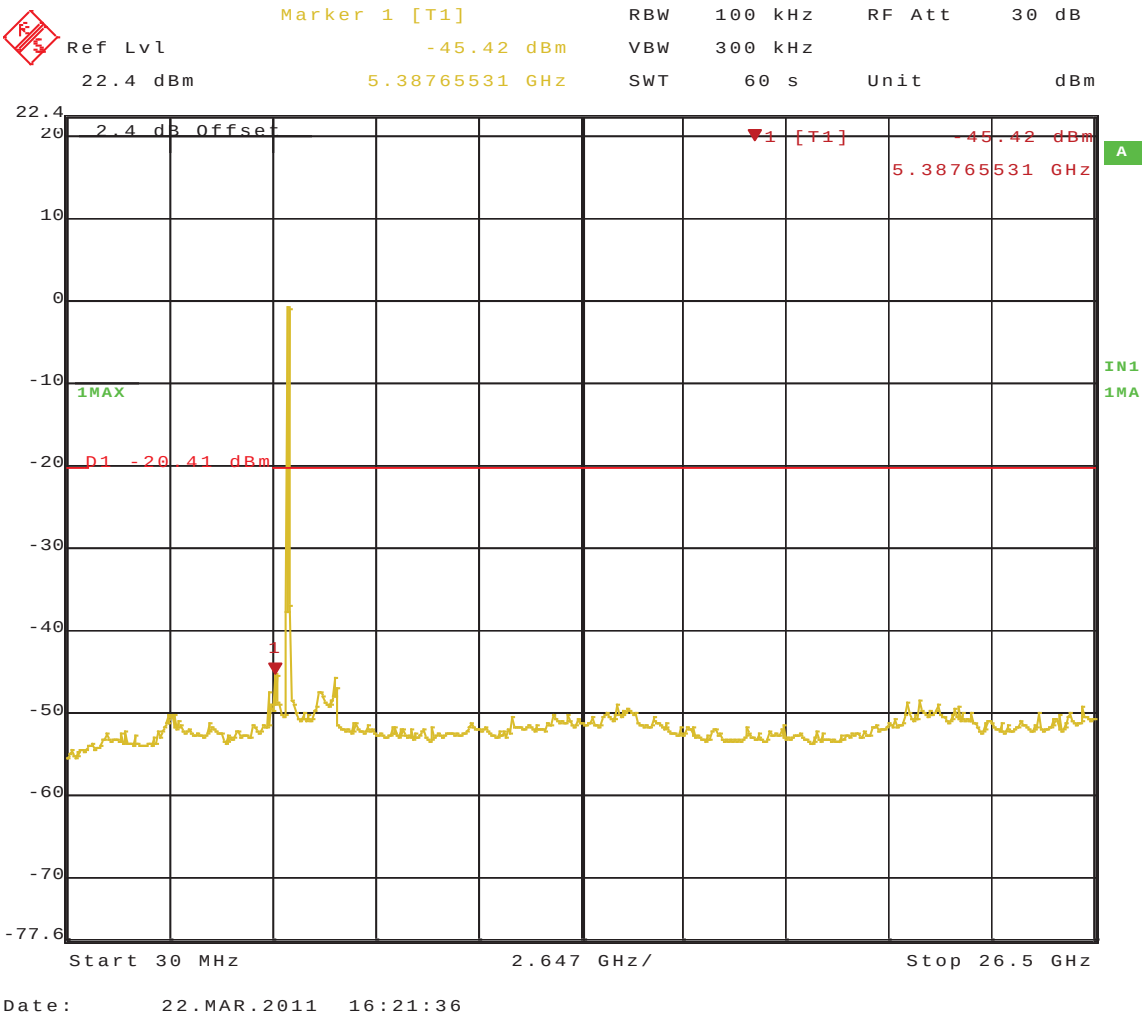



**Figure 513:** Out of Band at 802.11n HT40, 13.5 Mbps 5755 MHz, Chain 2 – Plot 2

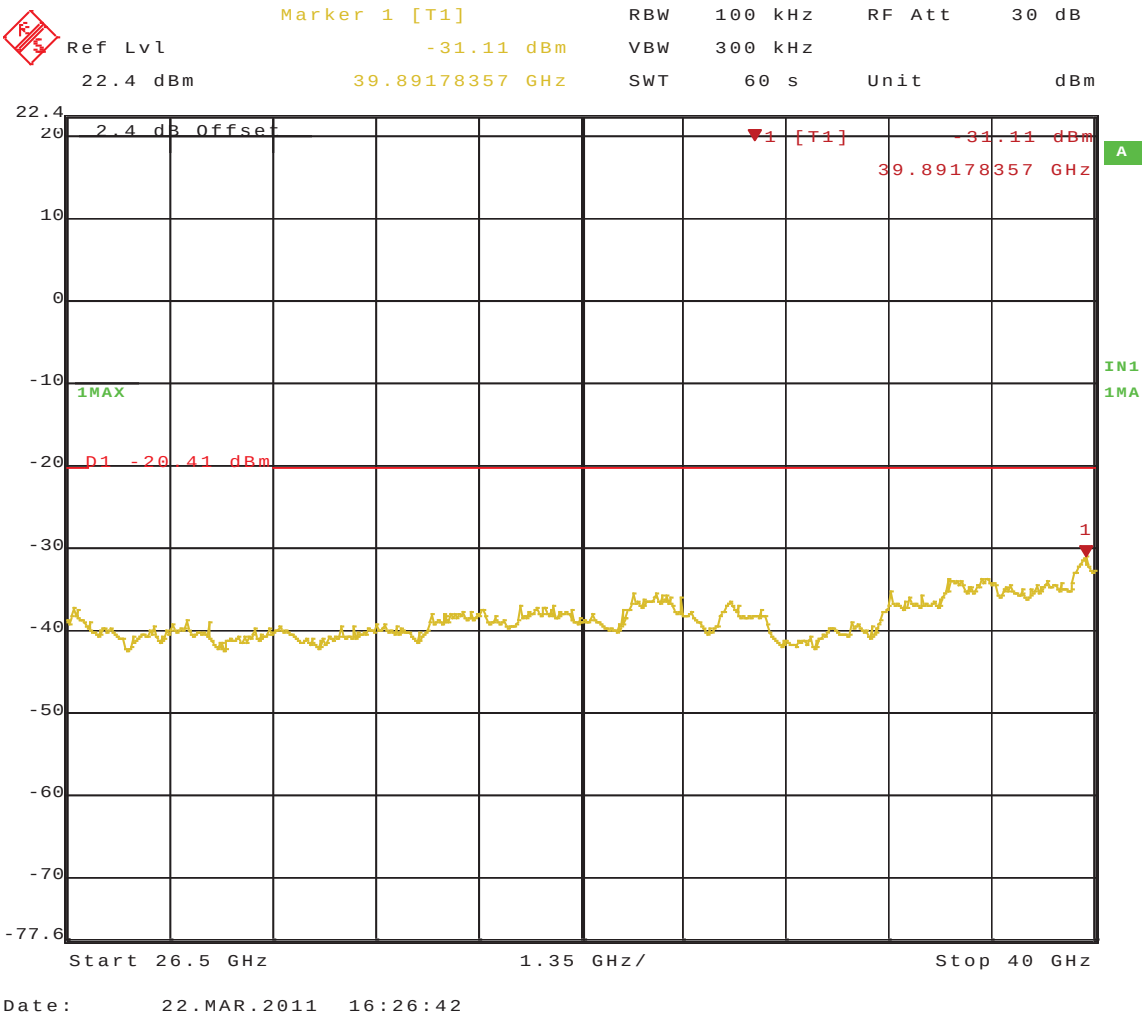



**Figure 514:** Out of Band at 802.11n HT40, 13.5 Mbps 5755 MHz, Chain 2 – Plot 3

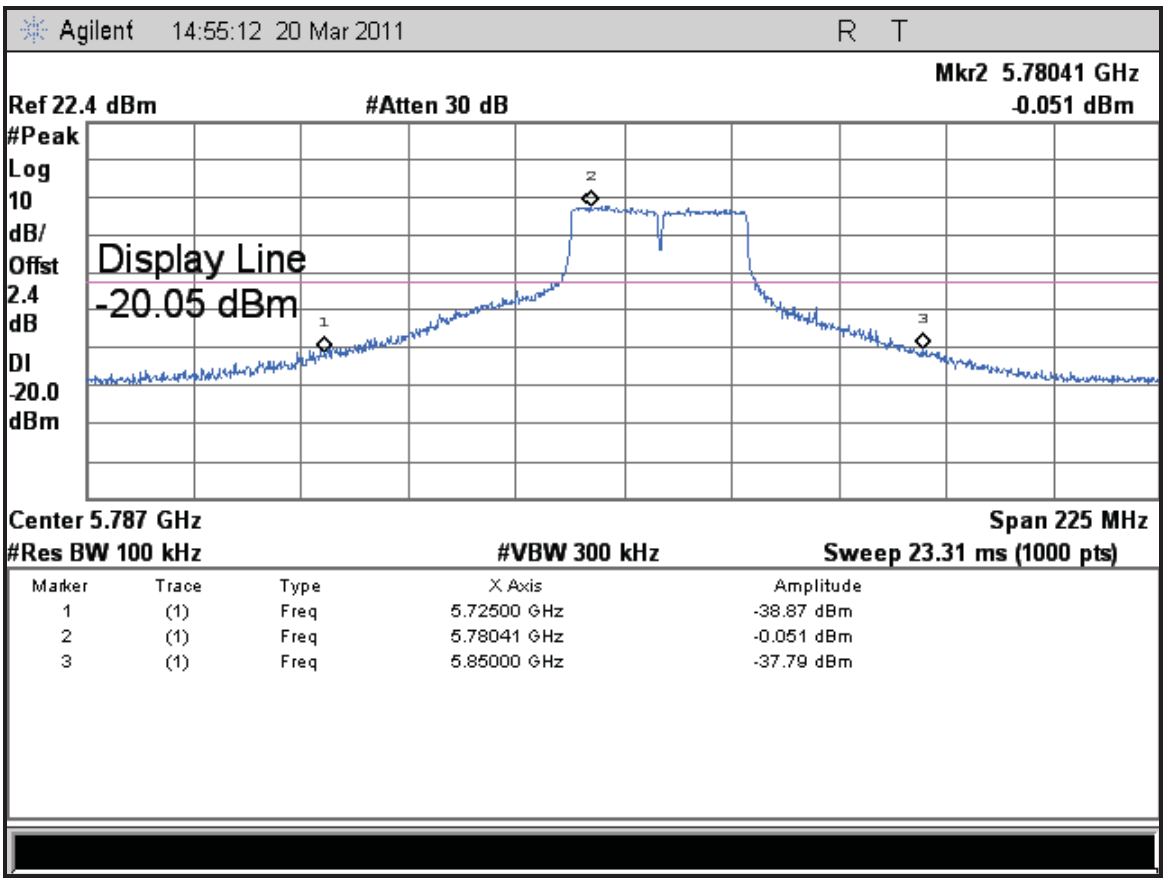



**Figure 515:** Band-edge Requirement at 802.11n HT40, 13.5 Mbps 5795 MHz, Chain 2 – Plot 1

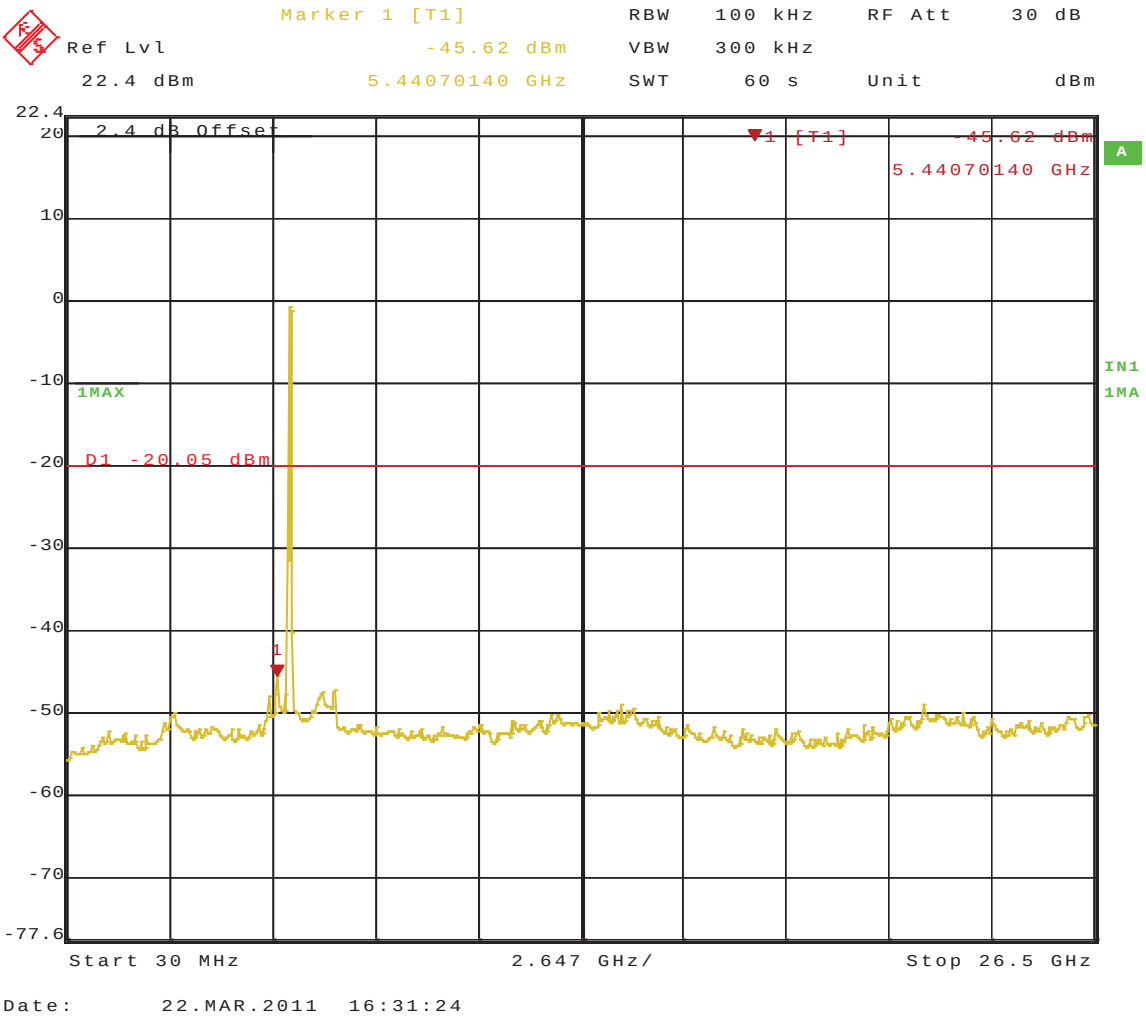



**Figure 516:** Out of Band at 802.11n HT40, 13.5 Mbps 5795 MHz, Chain 2 – Plot 2

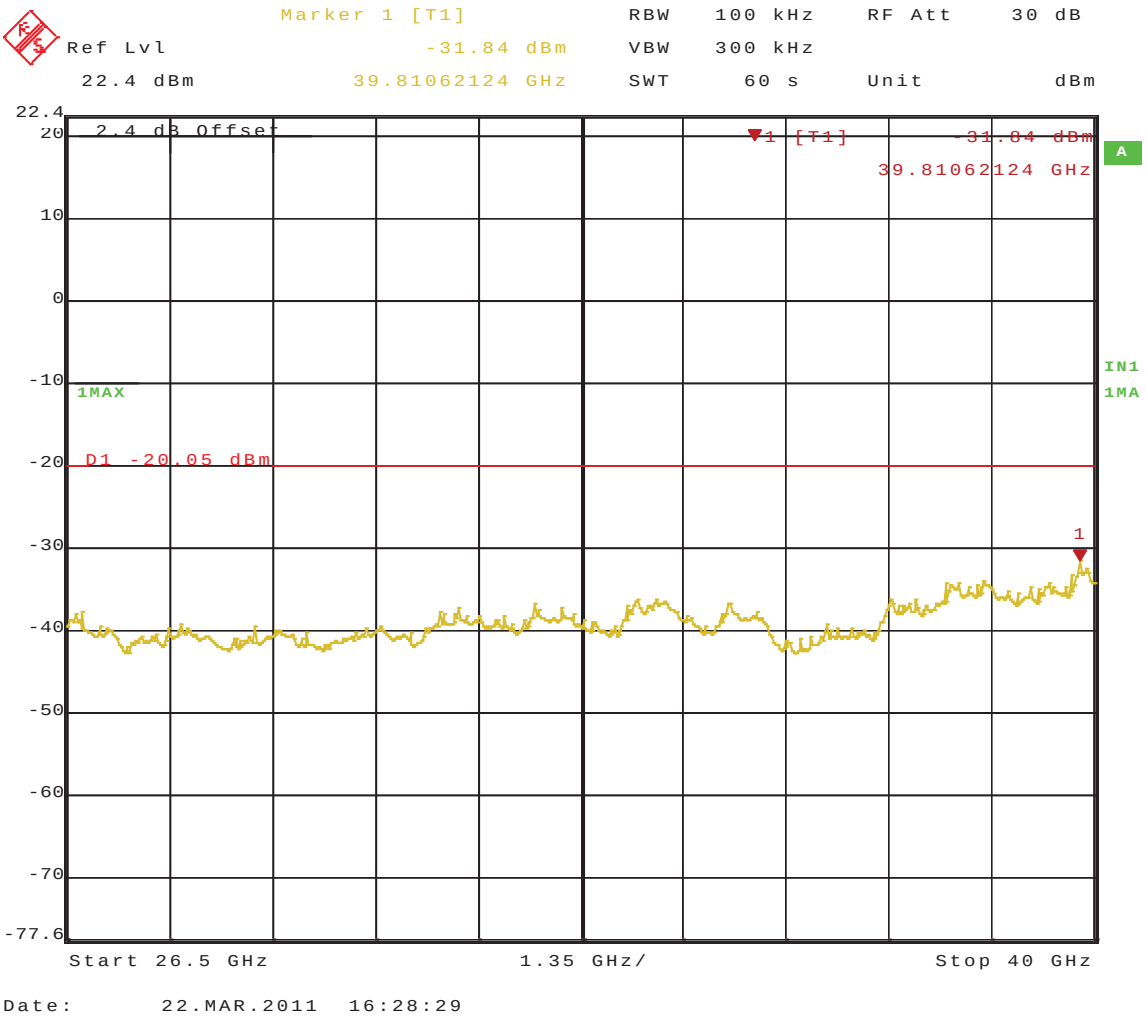



**Figure 517:** Out of Band at 802.11n HT40, 13.5 Mbps 5795 MHz, Chain 2 – Plot 3

## *5.4 Peak Power Spectral Density*

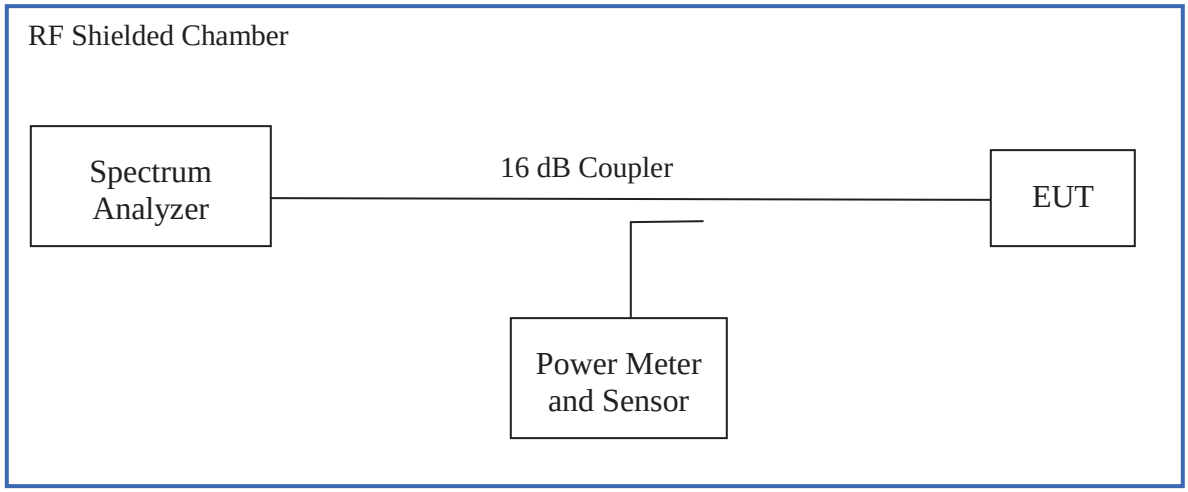
*According to the CFR47 Part 15.247 (e) and RSS 210 (A8.2), the spectral power density output of the antenna port shall be less than 8 dBm in any 3 kHz band during any time interval of continuous transmission.*

### 5.4.1 Test Method

The conducted method was used to measure the channel power output per ANSI C63.10:2009 Section 6.11.2

The measurement was performed with modulation per CFR47 Part 15.247 (e) and RSS 210 (A8.2). This test was conducted on 3 channels in each mode. The worst sample result indicated below.

Test Setup:



### 5.4.2 Results

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

**Table 13:** Peak Power Spectral Density – Test Results

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Test Conditions:** Conducted Measurement, Normal Temperature and Voltage only | | | | | | | | |
| **Antenna Type:** Integrated | | | **Power Setting:** See test plan | | | | | |
| **Max. Antenna Gain:** + 3.2 dBi | | | **Signal State:** Modulated | | | | | |
| **Ambient Temp.:** 22 °C | | | **Relative Humidity:**37% | | | | | |
| **Peak Power Spectral Density** | | | | | | | | |
| **Freq. (MHz)** | **Mode** | **Chain 0 [dBm]** | **Chain 1 [dBm]** | **Chain 2 [dBm]** | **CF [dB]** | **Max. PPSD [dBm]** | **Limit [dBm]** | **Margin [dB]** |
| 5745 | 24Mbps | -8.08 | -8.30 | -7.30 | | -7.30 | 8.00 | -15.30 |
| 5785 | 24Mbps | -8.01 | -8.37 | -7.95 | | -7.95 | 8.00 | -15.95 |
| 5825 | 24Mbps | -6.97 | -8.52 | -7.59 | | -6.97 | 8.00 | -14.97 |
| 5745 | HT20 6.5 Mbps | -6.85 | -6.20 | -8.21 | | -6.20 | 8.00 | -14.20 |
| 5785 | HT20 6.5 Mbps | -6.90 | -5.81 | -8.00 | | -5.81 | 8.00 | -13.81 |
| 5825 | HT20 6.5 Mbps | -7.32 | -5.80 | -7.80 | | -5.80 | 8.00 | -13.80 |
| 5745 | HT20 13 Mbps | -7.90 | -10.07 | | 3.01 | -4.89 | 8.00 | -12.89 |
| 5785 | HT20 13 Mbps | -8.10 | -9.55 | | 3.01 | -5.09 | 8.00 | -13.09 |
| 5825 | HT20 13 Mbps | -8.59 | -8.44 | | 3.01 | -5.43 | 8.00 | -13.43 |
| 5745 | HT20 19.5 Mbps | -8.89 | -9.30 | -9.45 | 4.77 | -4.12 | 8.00 | -12.12 |
| 5785 | HT20 19.5 Mbps | -8.81 | -8.70 | -10.15 | 4.77 | -3.93 | 8.00 | -11.93 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5825 | HT20 19.5 Mbps | -9.57 | -9.31 | -10.22 | 4.77 | -4.54 | 8.00 | -12.54 |
| 5755 | HT40 81 Mbps | -13.55 | -11.69 | -10.43 | | -10.43 | 8.00 | -18.43 |
| 5795 | HT40 81 Mbps | -14.79 | -11.99 | -11.23 | | -11.23 | 8.00 | -19.23 |
| 5755 | HT40 27 Mbps | -12.33 | -12.80 | | 3.01 | -9.32 | 8.00 | -17.32 |
| 5795 | HT40 27 Mbps | -10.73 | -12.41 | | 3.01 | -7.72 | 8.00 | -15.72 |
| 5755 | HT40 40.5 Mbps | -14.95 | -15.04 | -13.55 | 4.77 | -8.78 | 8.00 | -16.78 |
| 5795 | HT40 40.5 Mbps | -14.09 | -14.52 | -11.79 | 4.77 | -7.02 | 8.00 | -15.02 |

**Note:** CF was accounted for the number of data streams being used, 10*Log(N) per KDB 662911; where N is number of outputs.

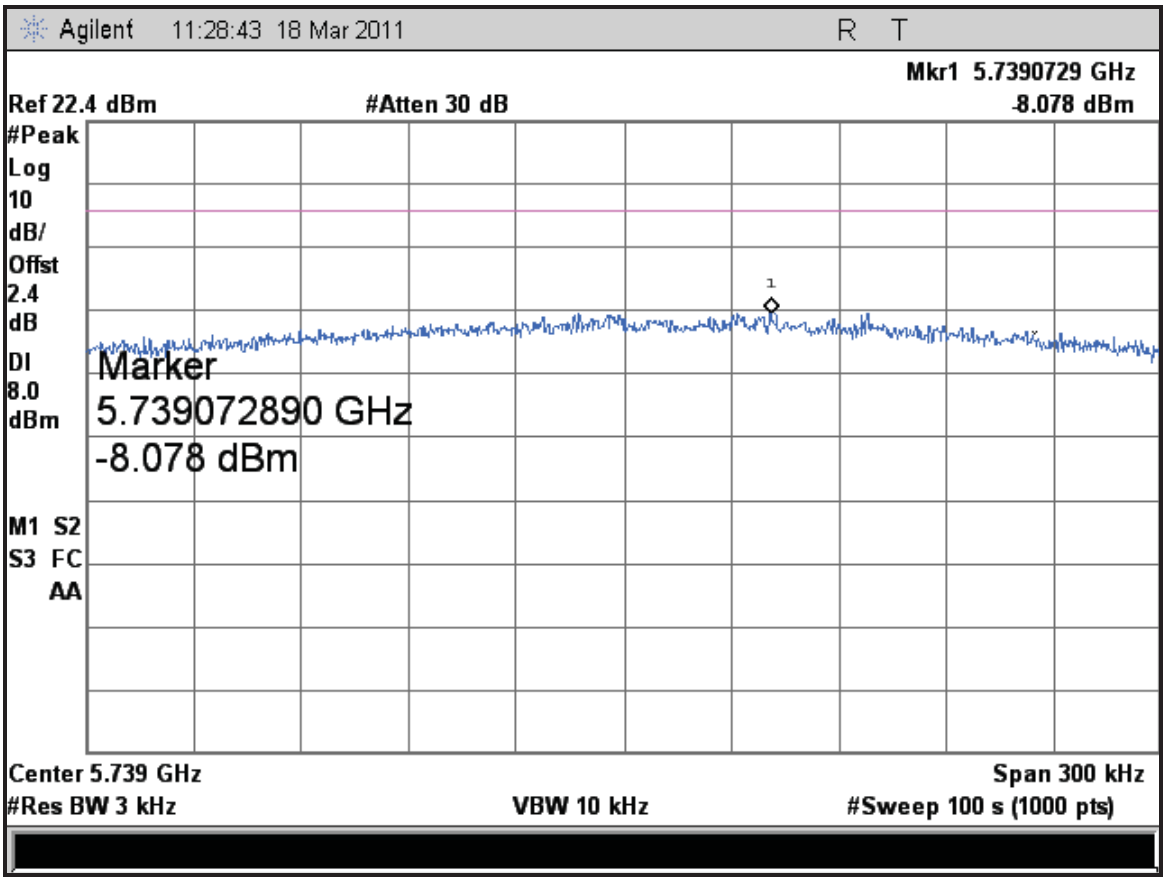



**Figure 518:** Peak Power Spectral Density, 5745 MHz at 802.11a, Chain 0 – 24 Mbps

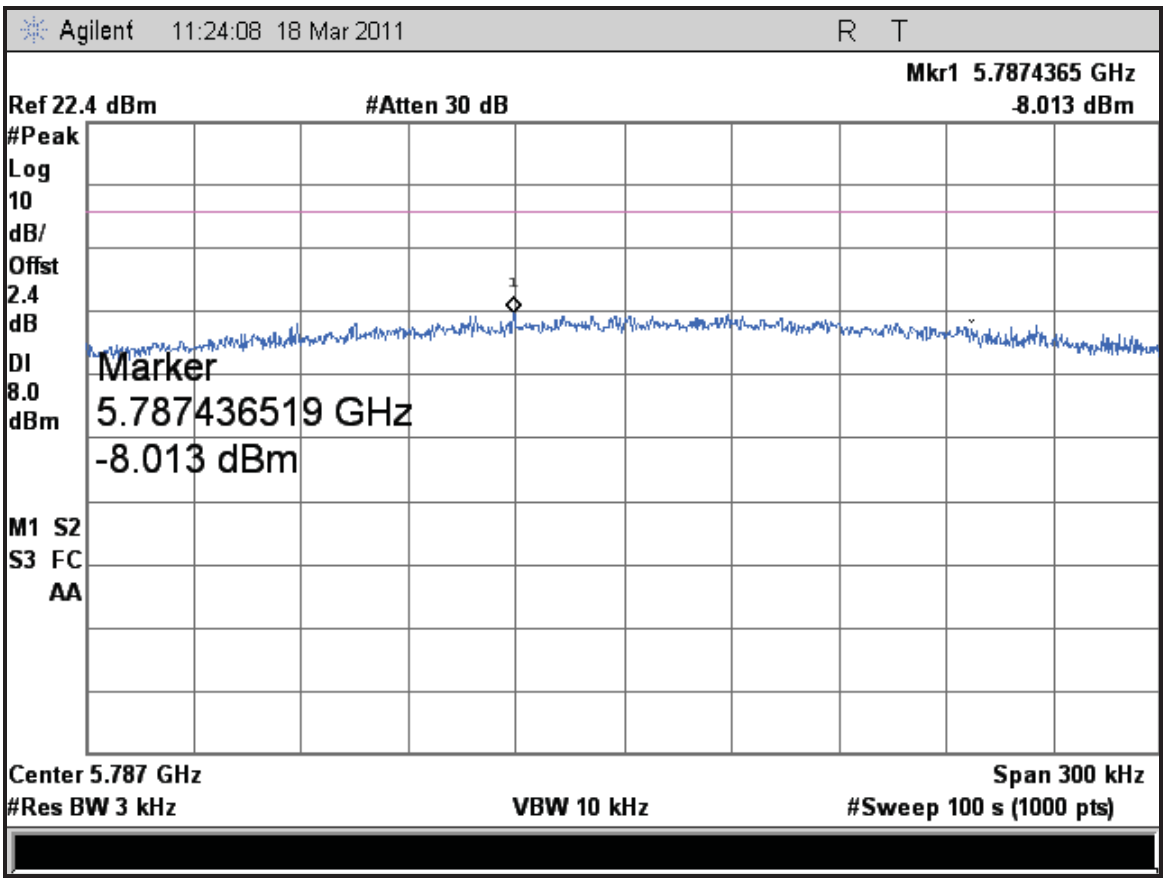



**Figure 519:** Peak Power Spectral Density, 5785 MHz at 802.11a, Chain 0 – 24 Mbps

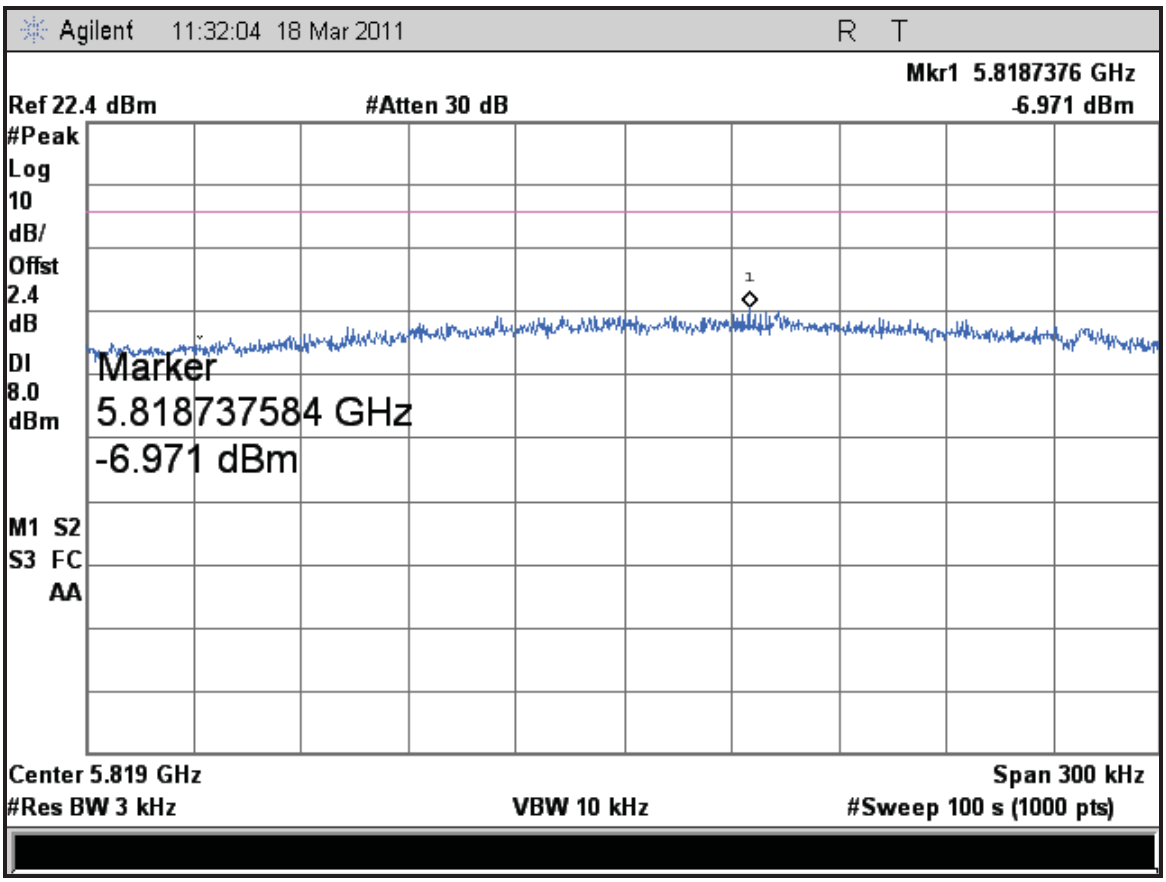



**Figure 520:** Peak Power Spectral Density, 5825 MHz at 802.11a, Chain 0 – 24 Mbps

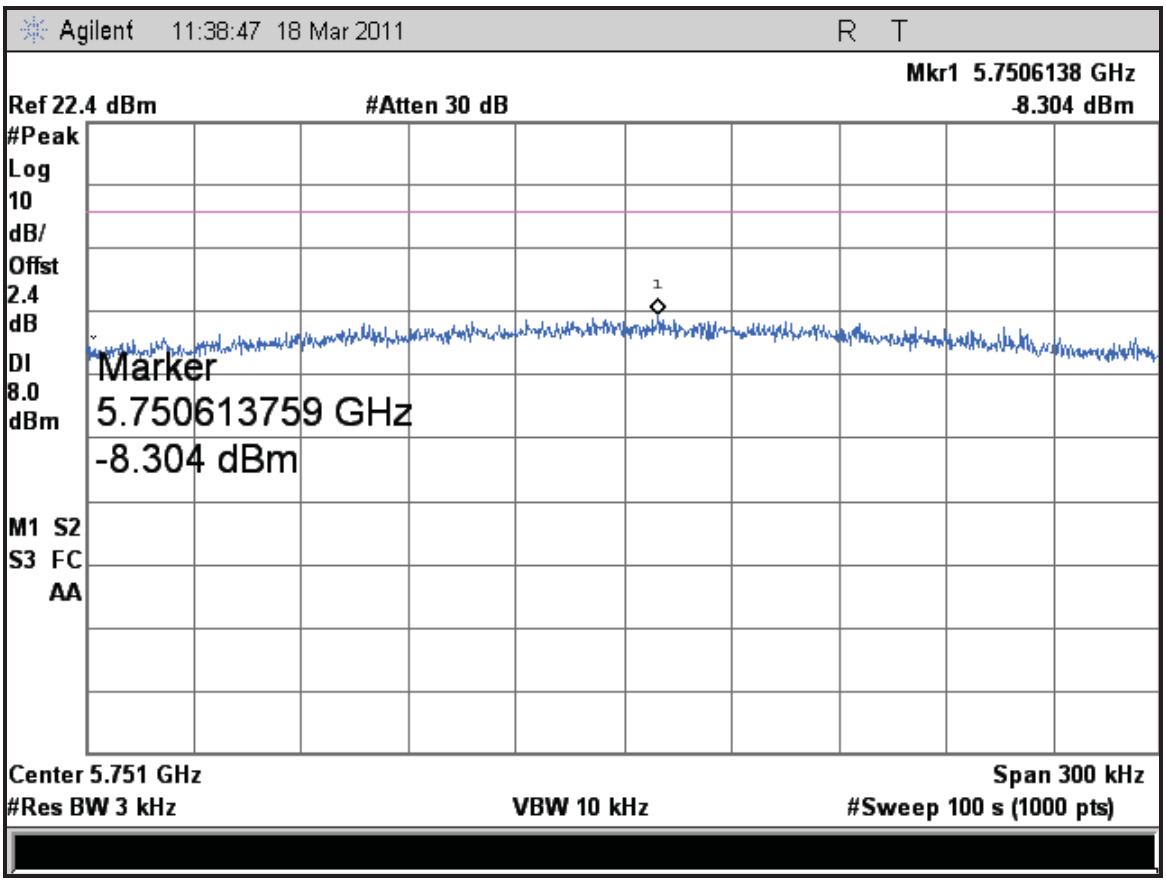



**Figure 521:** Peak Power Spectral Density, 5745 MHz at 802.11a, Chain 1 – 24 Mbps

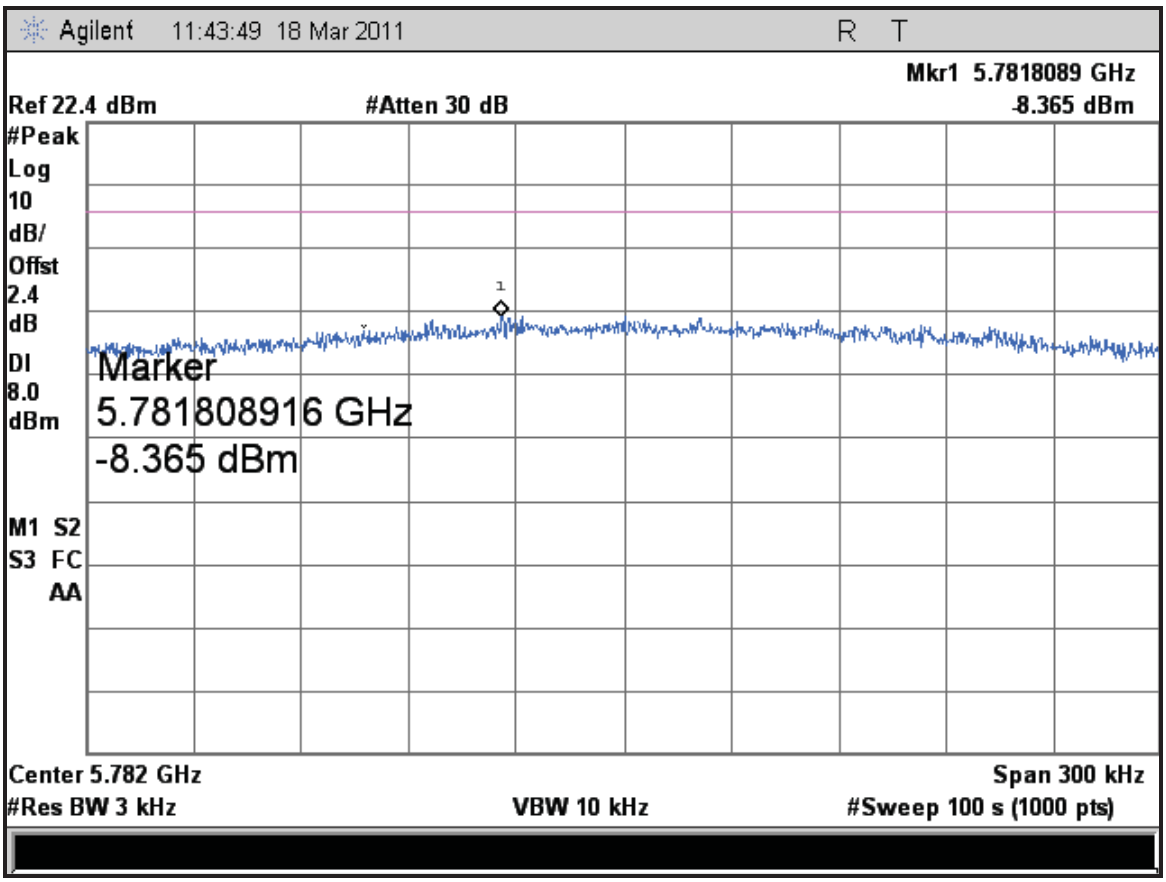



**Figure 522:** Peak Power Spectral Density, 5785 MHz at 802.11a, Chain 1 – 24 Mbps

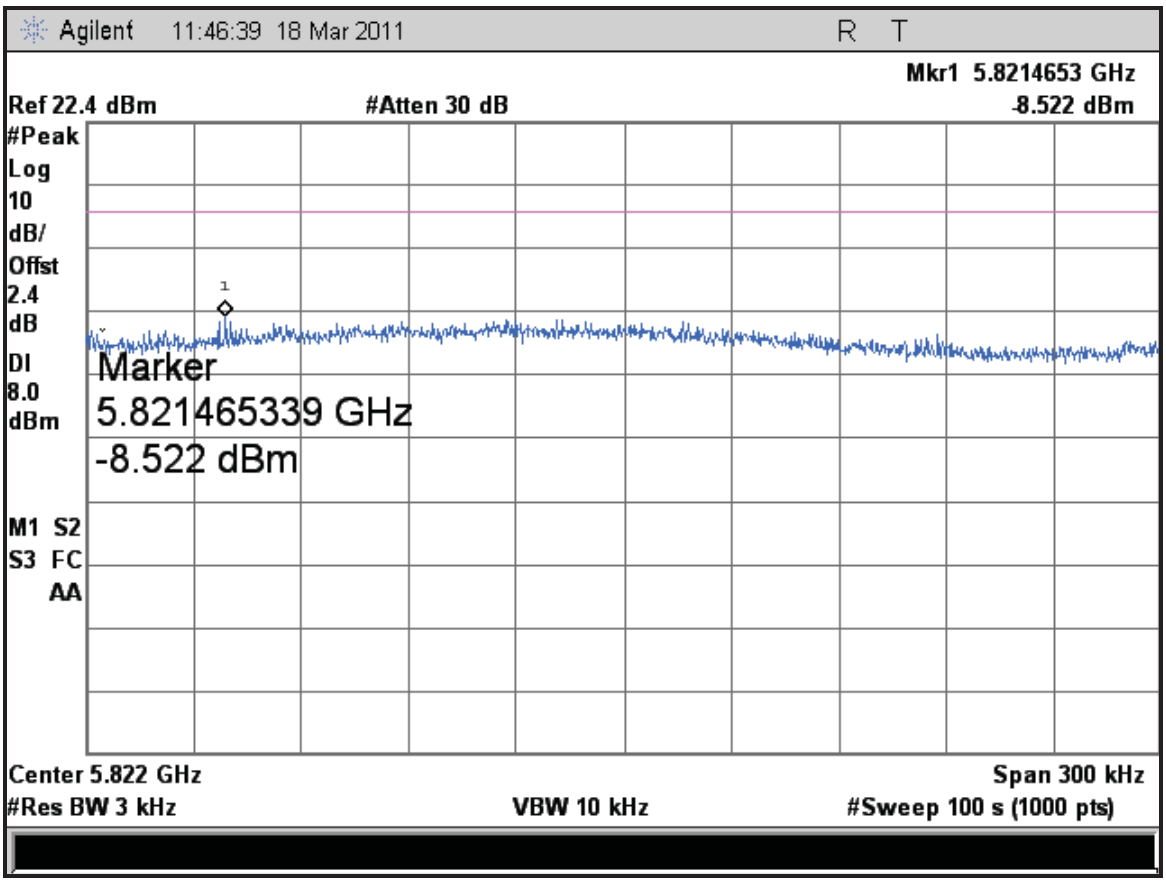



**Figure 523:** Peak Power Spectral Density, 5825 MHz at 802.11a, Chain 1 – 24 Mbps

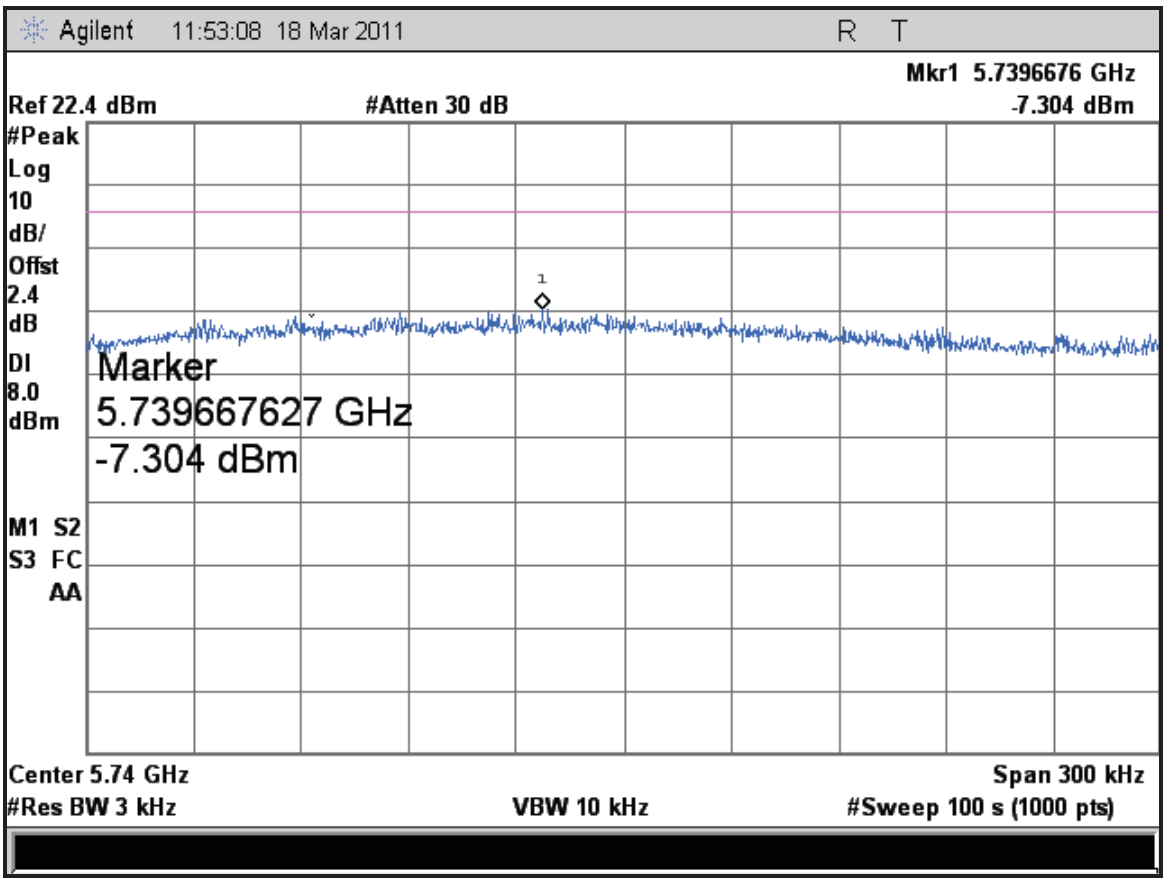



**Figure 524:** Peak Power Spectral Density, 5745 MHz at 802.11a, Chain 2 – 24 Mbps

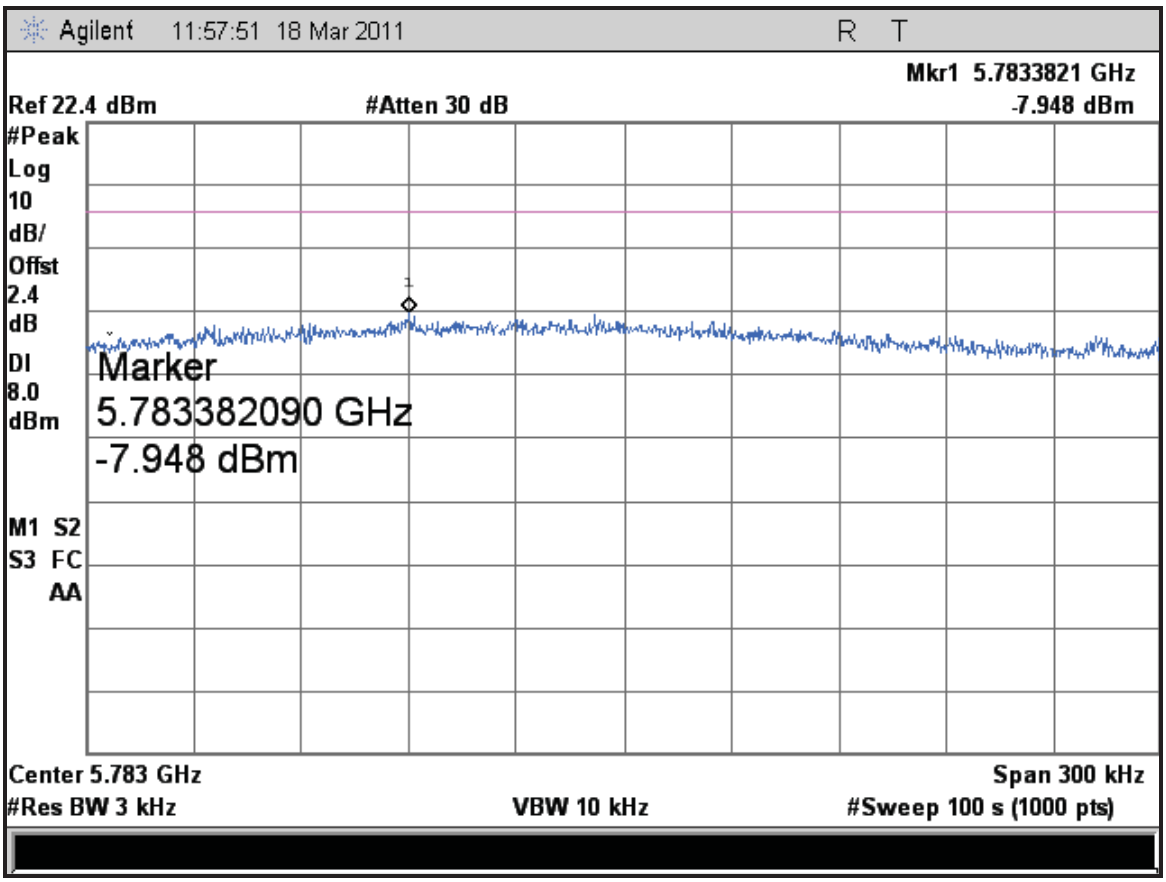



**Figure 525:** Peak Power Spectral Density, 5785 MHz at 802.11a, Chain 2 – 24 Mbps

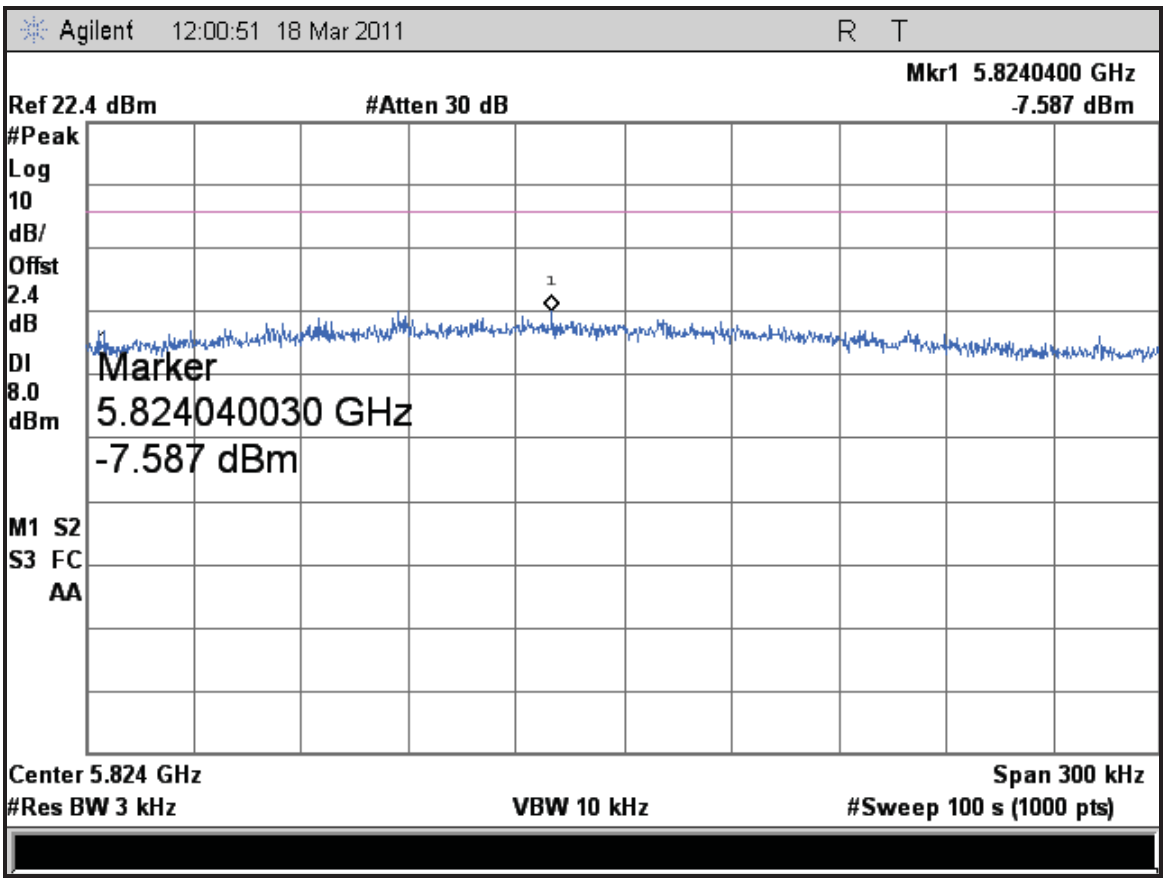



**Figure 526:** Peak Power Spectral Density, 5825 MHz at 802.11a, Chain 2 – 24 Mbps

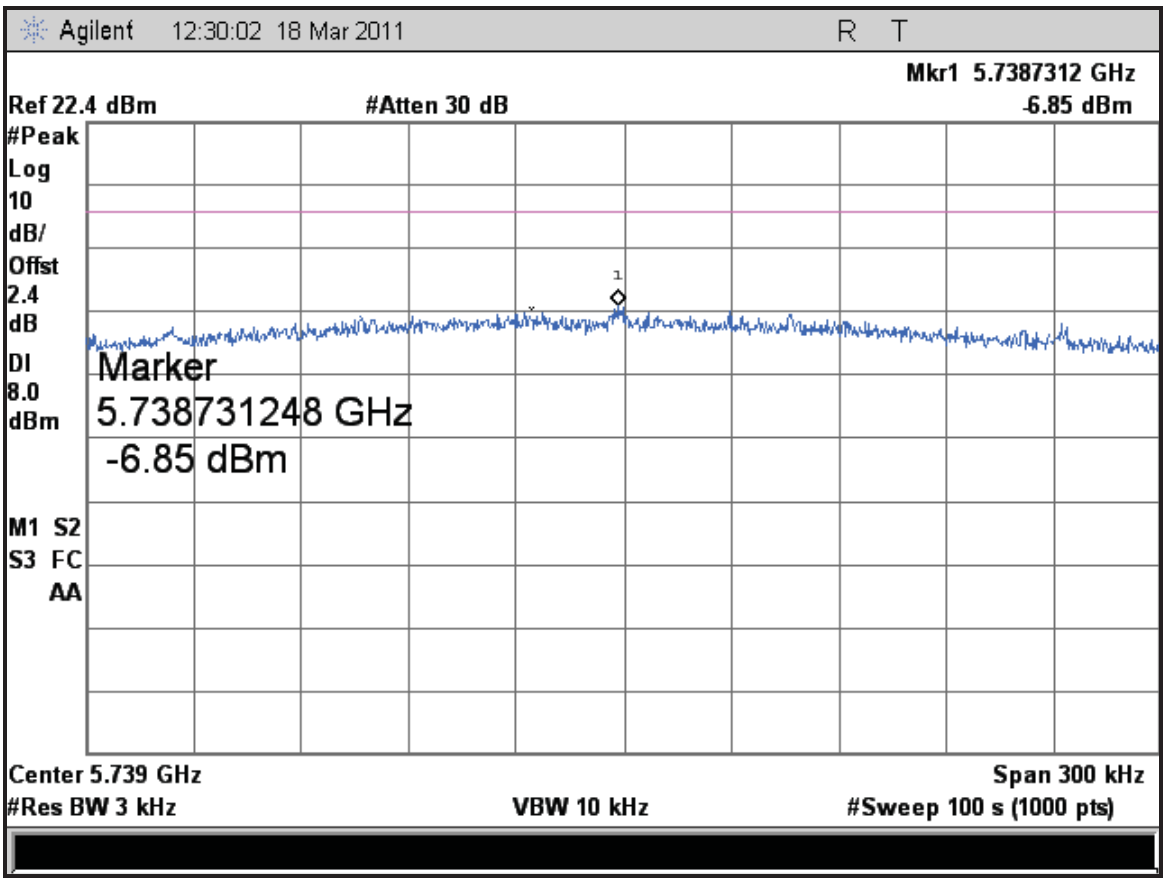



**Figure 527:** Peak Power Spectral Density, 5745 MHz at 802.11n HT20, 1X3, Chain 0 – 6.5 Mbps

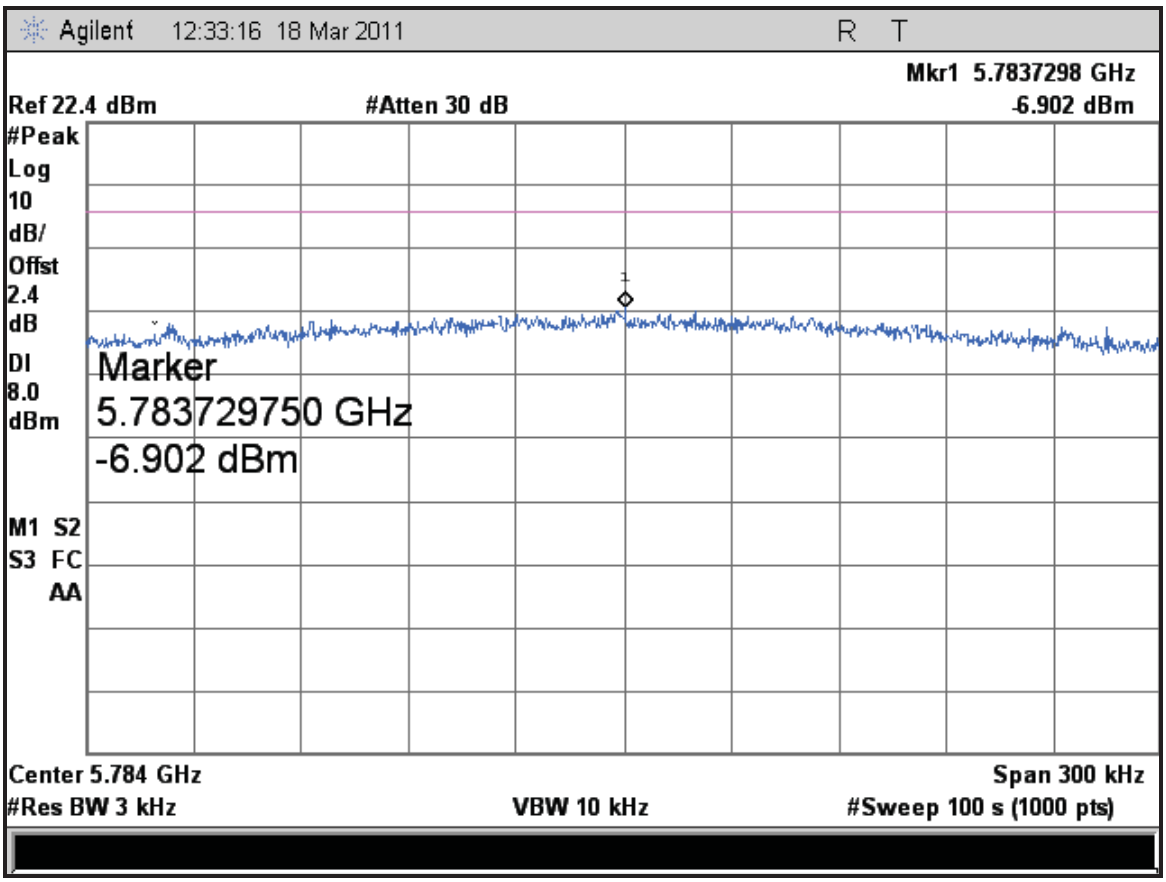



**Figure 528:** Peak Power Spectral Density, 5785 MHz at 802.11n HT20, 1X3, Chain 0 – 6.5 Mbps

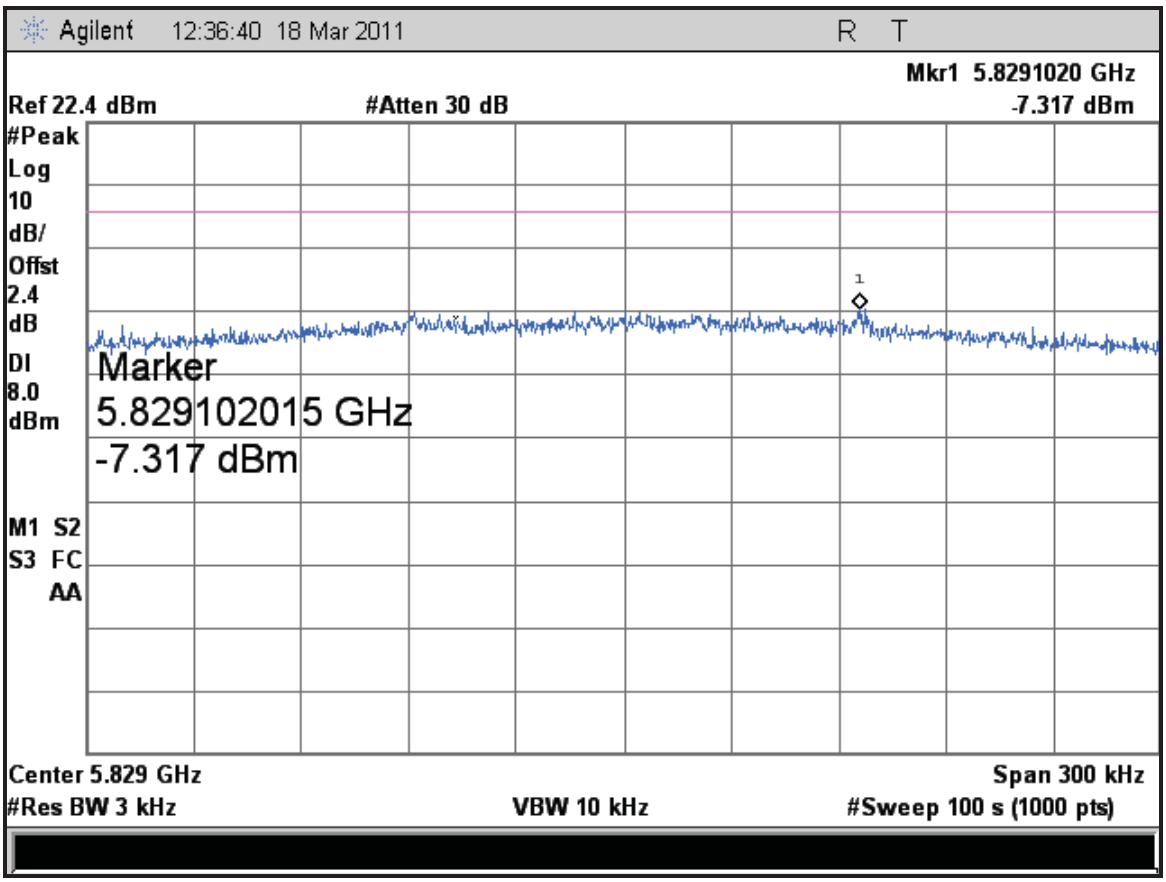



**Figure 529:** Peak Power Spectral Density, 5825 MHz at 802.11n HT20, 1X3, Chain 0 – 6.5 Mbps

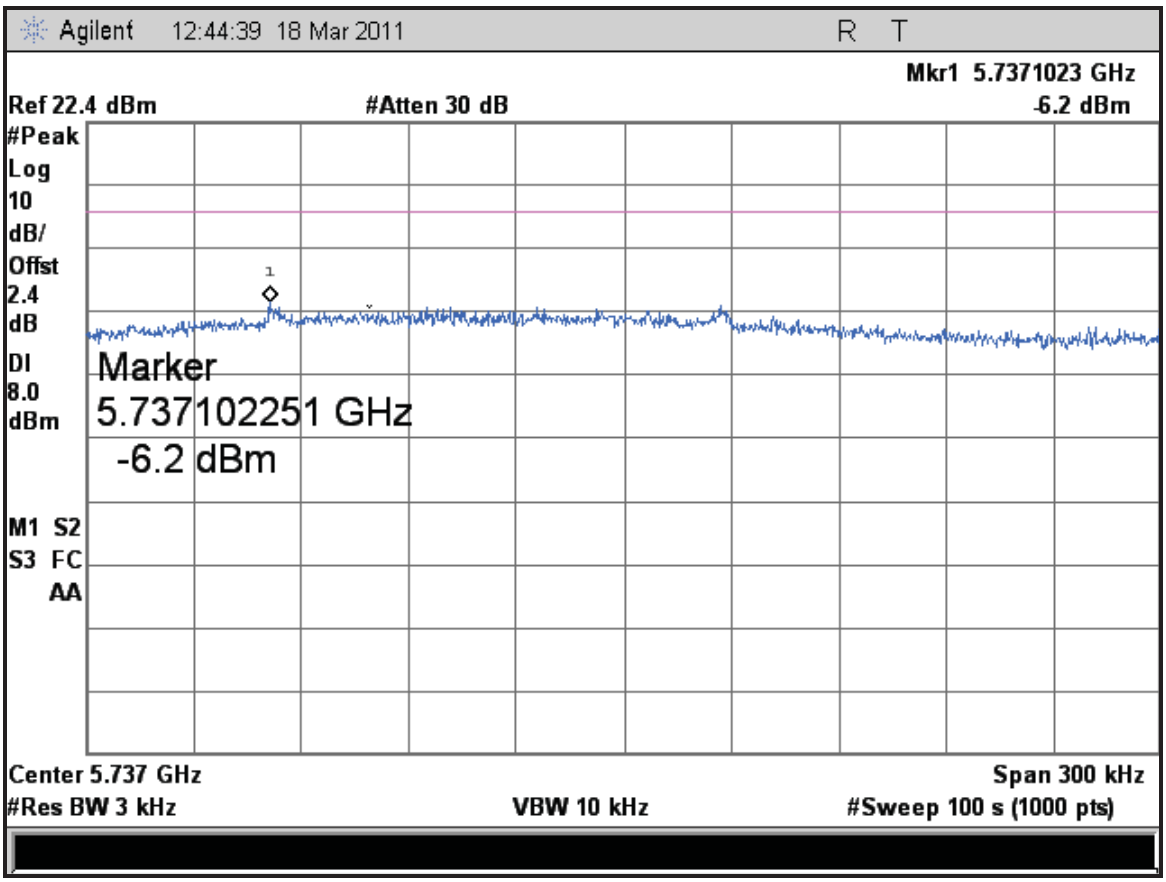



**Figure 530:** Peak Power Spectral Density, 5745 MHz at 802.11n HT20, 1X3, Chain 1 – 6.5 Mbps

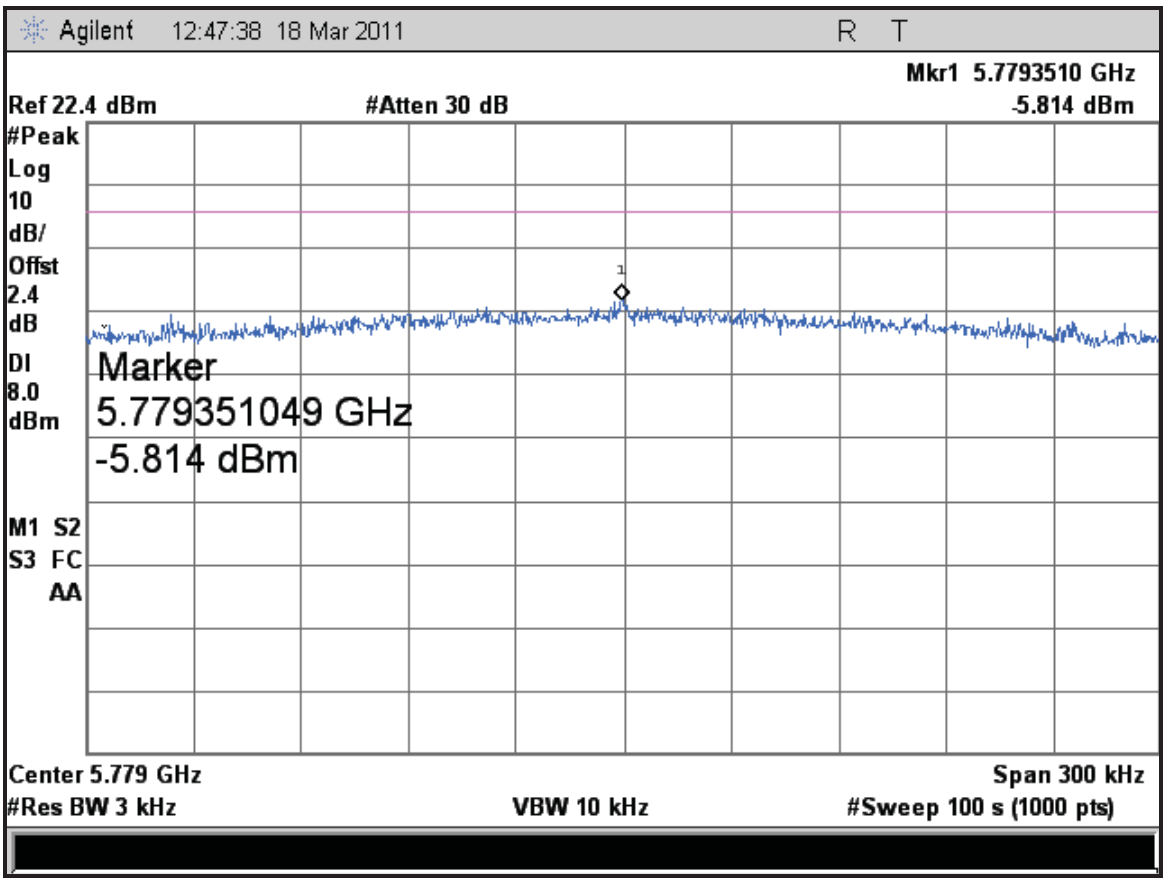



**Figure 531:** Peak Power Spectral Density, 5785 MHz at 802.11n HT20, 1X3, Chain 1 – 6.5 Mbps

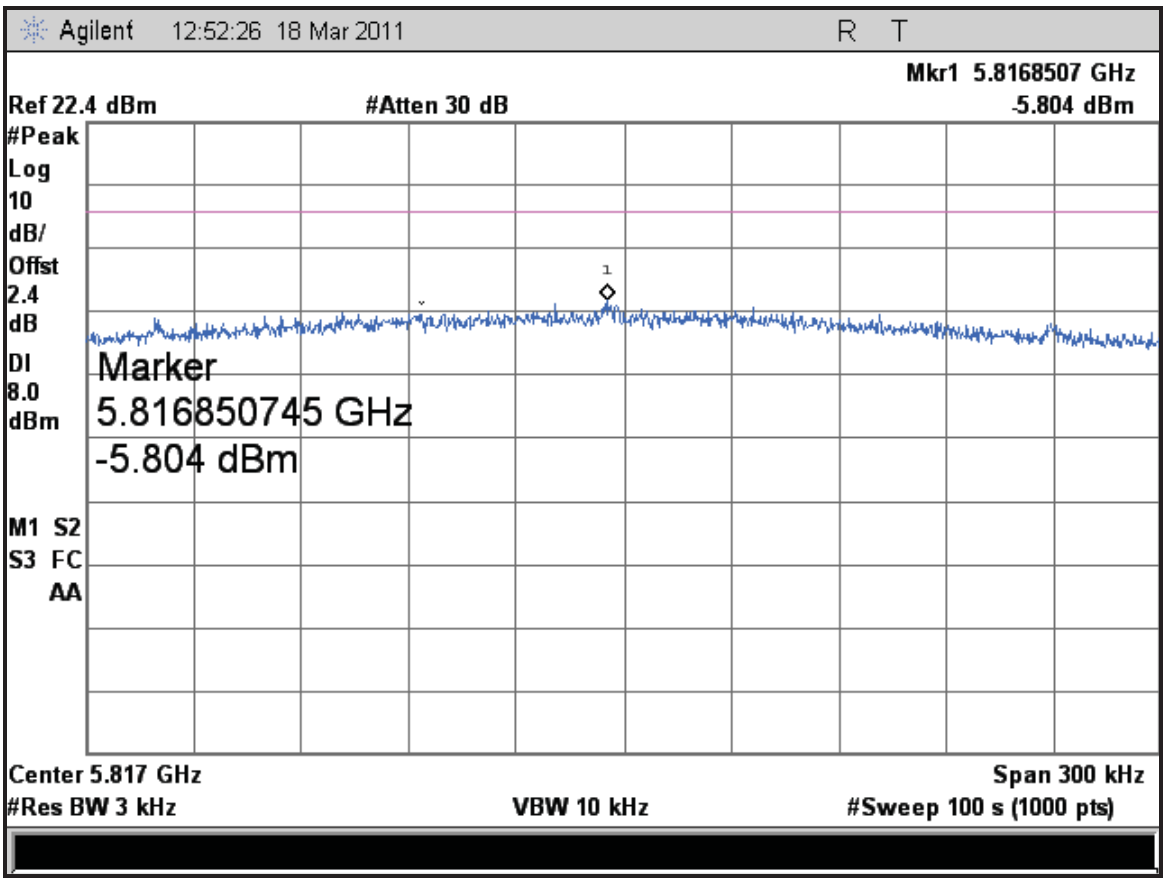



**Figure 532:** Peak Power Spectral Density, 5825 MHz at 802.11n HT20, 1X3, Chain 1 – 6.5 Mbps

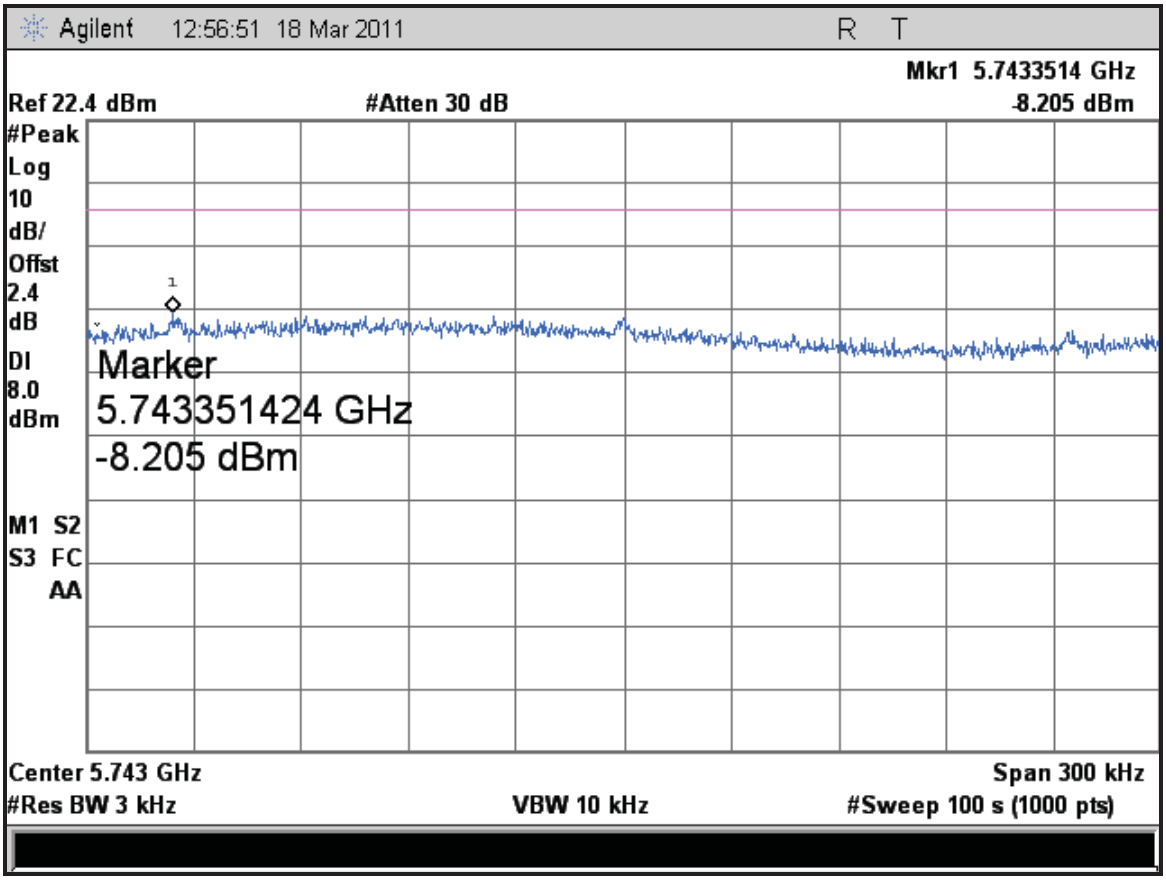



**Figure 533:** Peak Power Spectral Density, 5745 MHz at 802.11n HT20, 1X3, Chain 2 – 6.5 Mbps

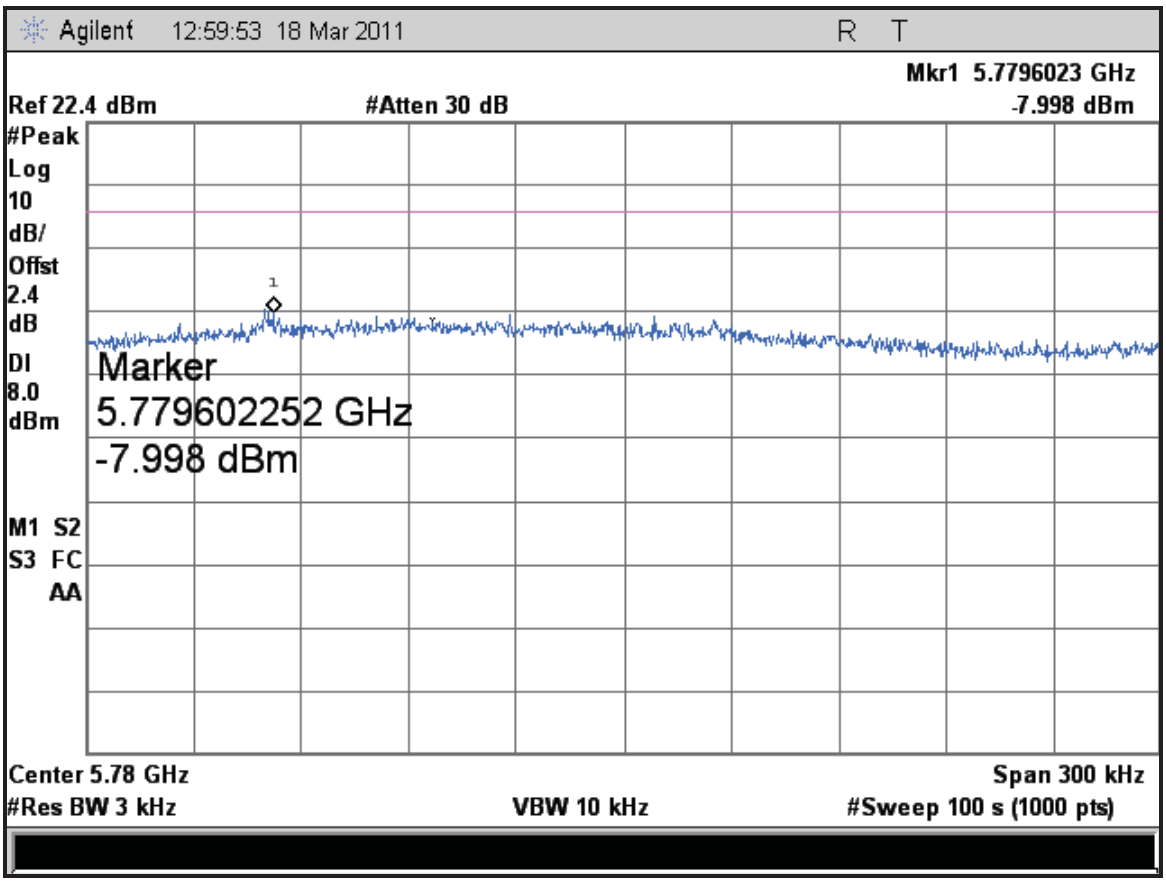



**Figure 534**: Peak Power Spectral Density, 5785 MHz at 802.11n HT20, 1X3, Chain 2 – 6.5 Mbps

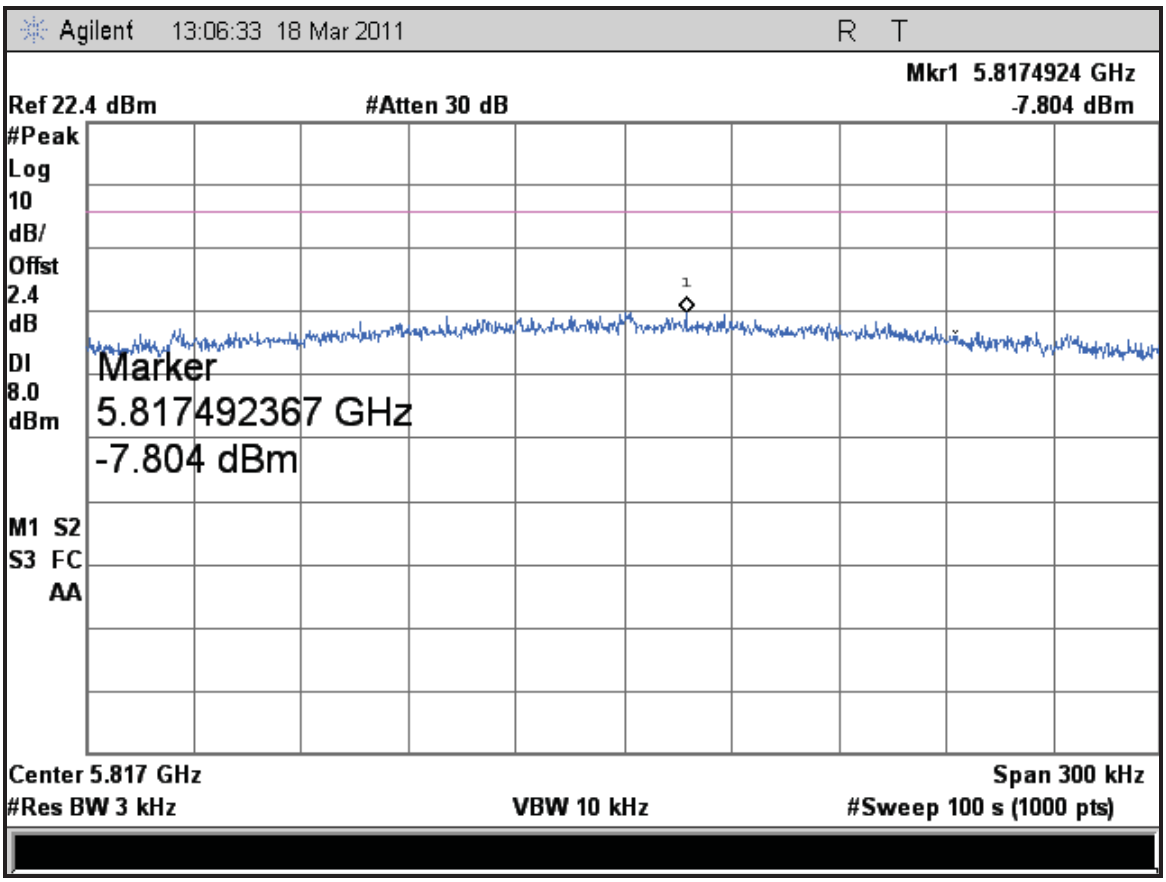



**Figure 535:** Peak Power Spectral Density, 5825 MHz at 802.11n HT20, 1X3, Chain 2 – 6.5 Mbps

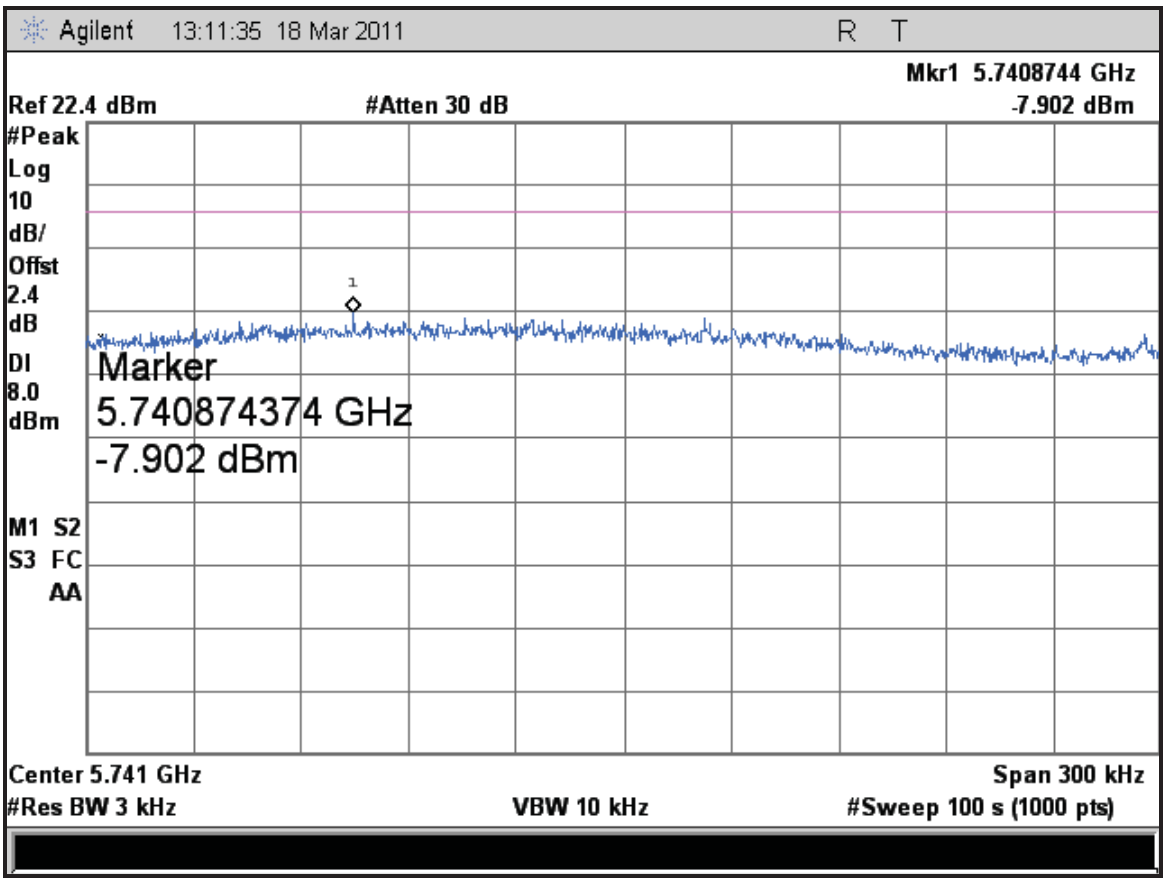



**Figure 536:** Peak Power Spectral Density, 5745 MHz at 802.11n HT20, 2X3, Chain 0 – 13 Mbps

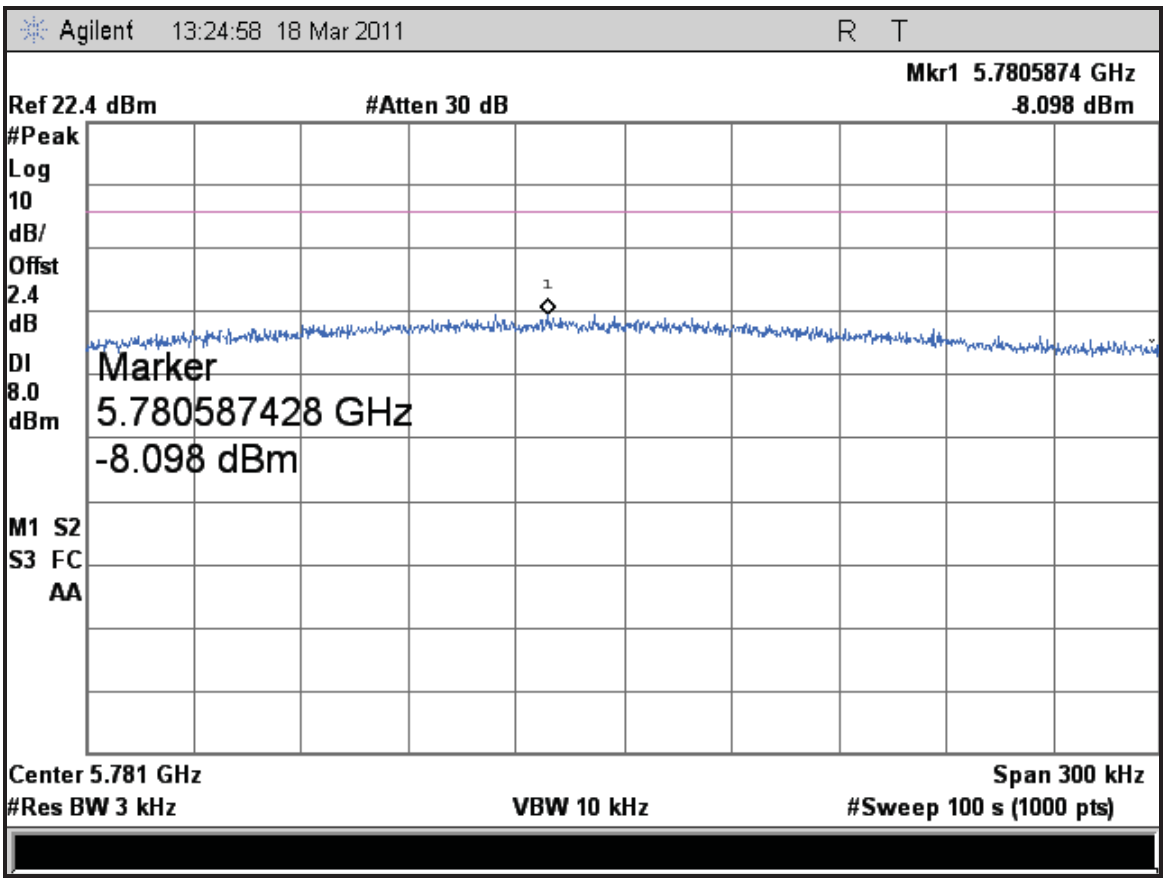



**Figure 537:** Peak Power Spectral Density, 5785 MHz at 802.11n HT20, 2X3, Chain 0 – 13 Mbps

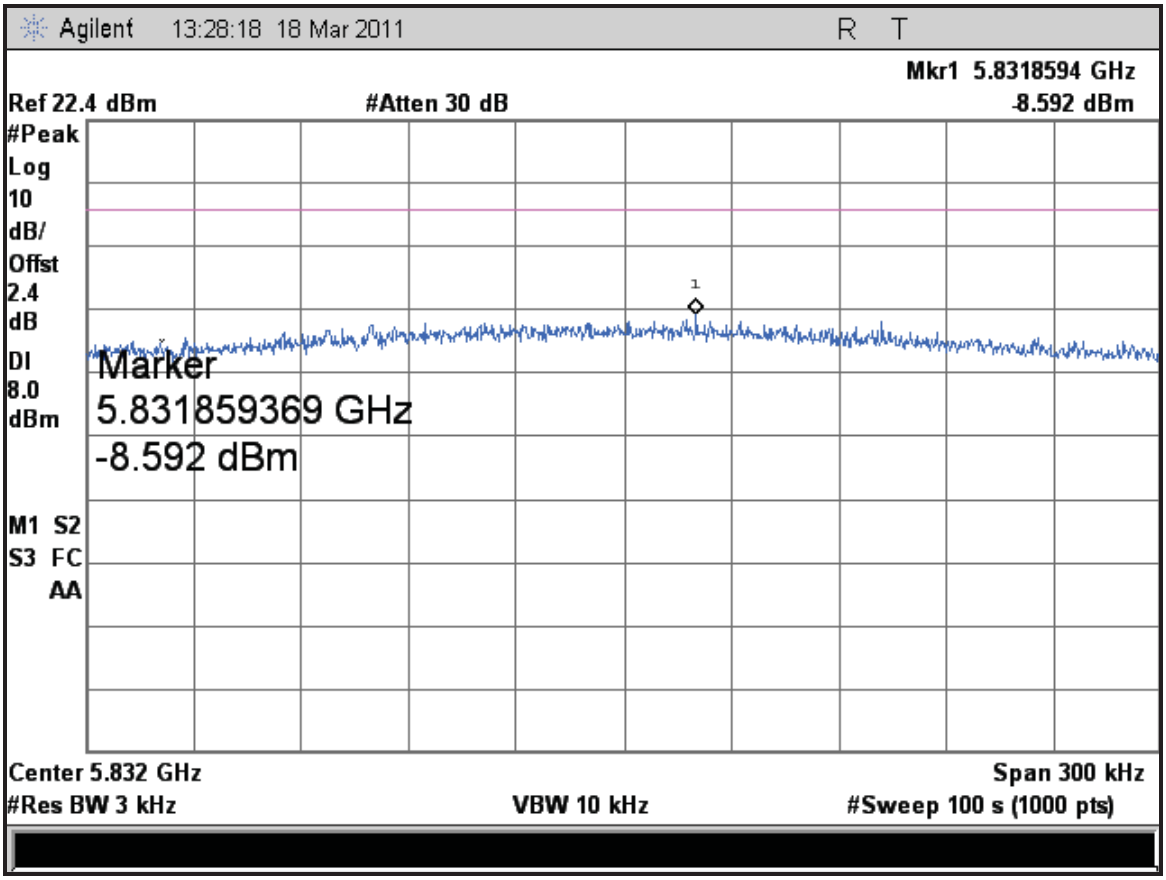



**Figure 538:** Peak Power Spectral Density, 5825 MHz at 802.11n HT20, 2X3, Chain 0 – 13 Mbps

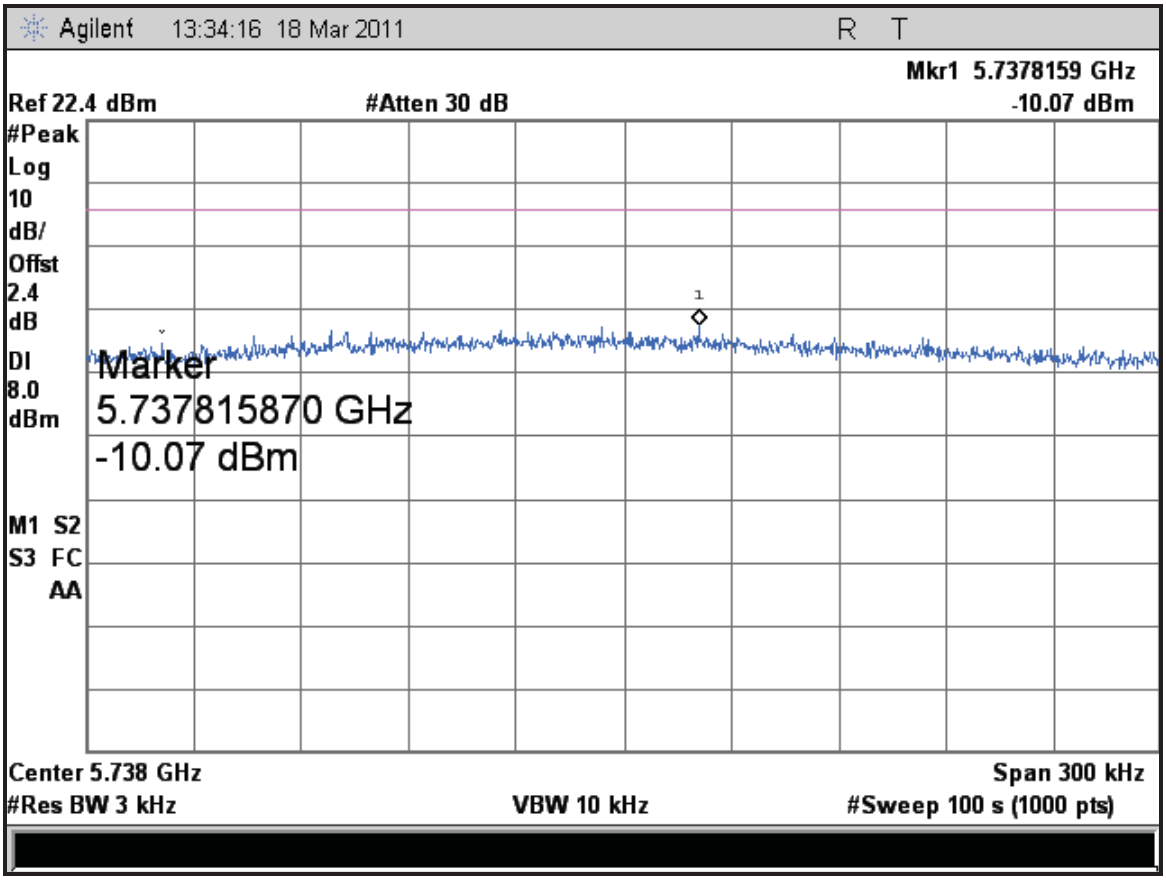



**Figure 539:** Peak Power Spectral Density, 5745 MHz at 802.11n HT20, 2X3, Chain 1 – 13 Mbps

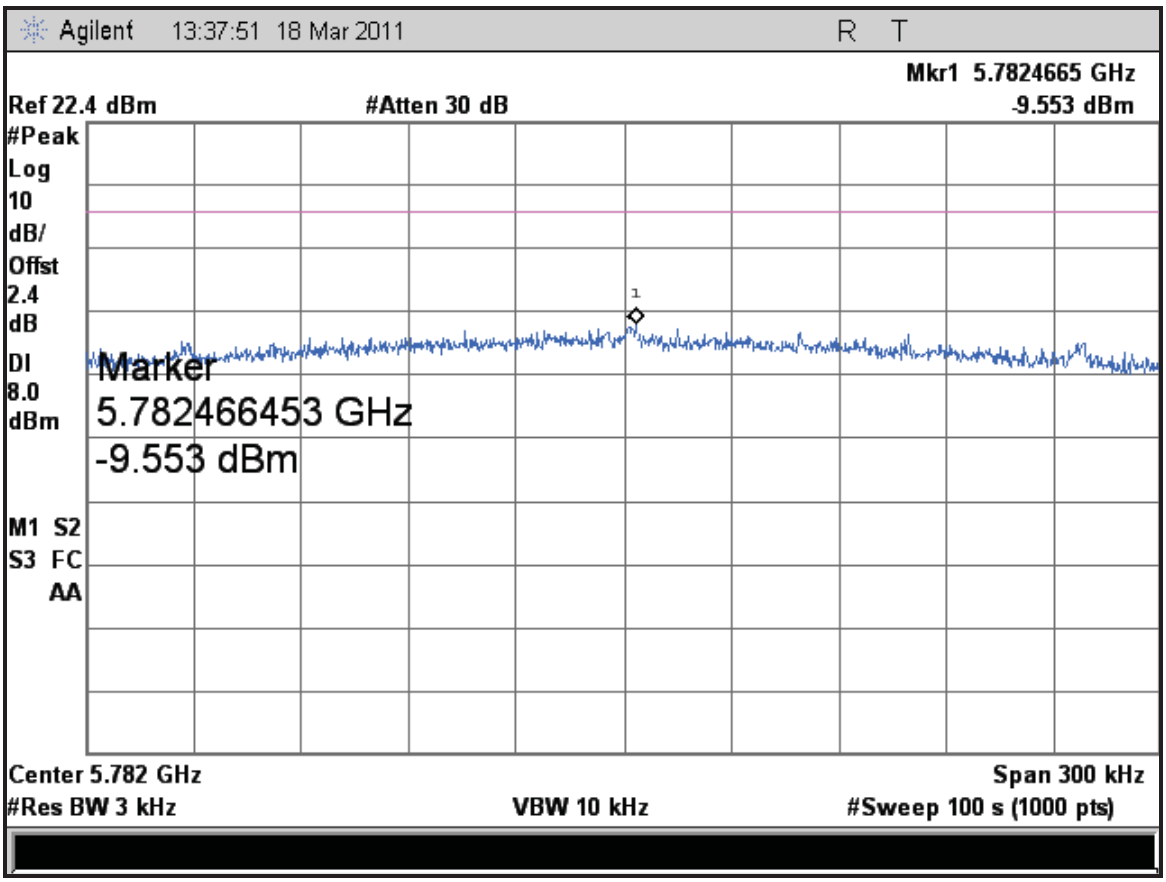



**Figure 540:** Peak Power Spectral Density, 5785 MHz at 802.11n HT20, 2X3, Chain 1 – 13 Mbps

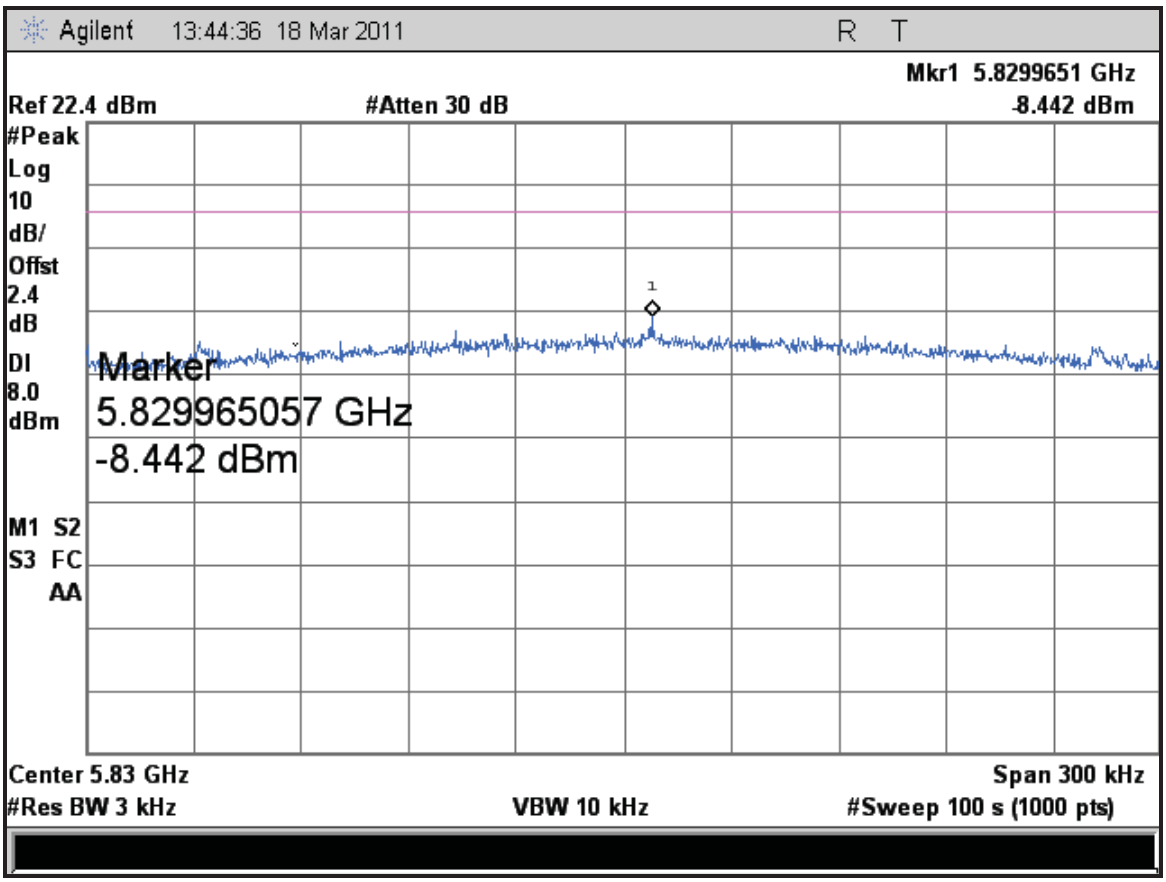



**Figure 541:** Peak Power Spectral Density, 5825 MHz at 802.11n HT20, 2X3, Chain 1 – 13 Mbps

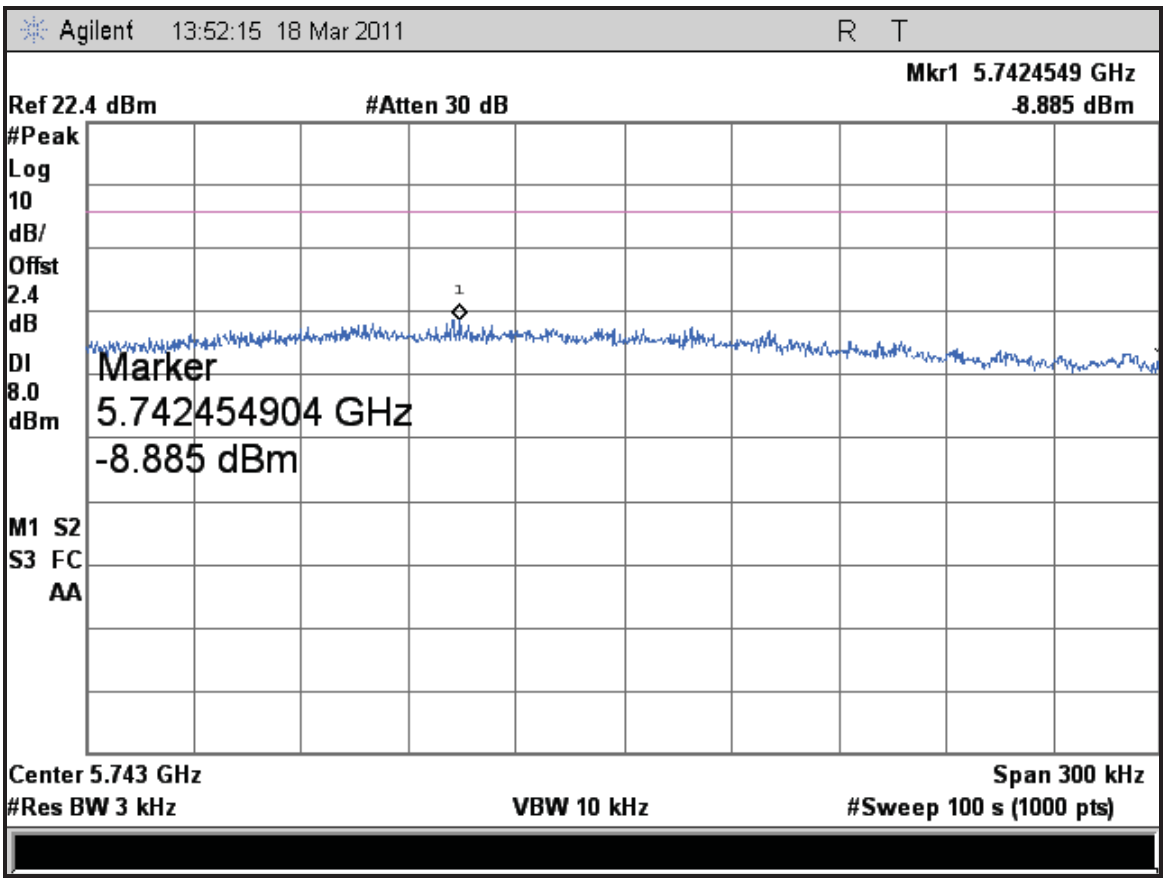



**Figure 542:** Peak Power Spectral Density, 5745 MHz at 802.11n HT20, 3X3, Chain 0 – 19.5 Mbps

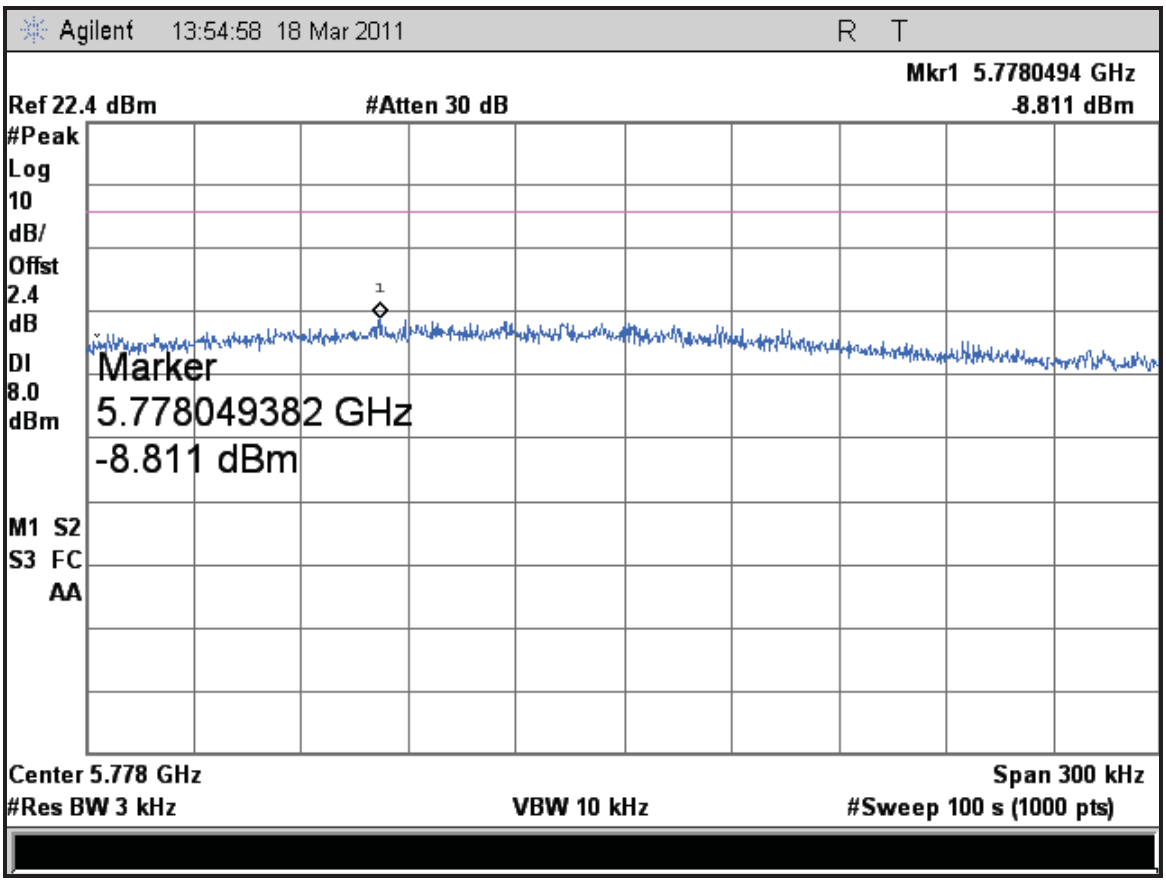



**Figure 543:** Peak Power Spectral Density, 5785 MHz at 802.11n HT20, 3X3, Chain 0 – 19.5 Mbps

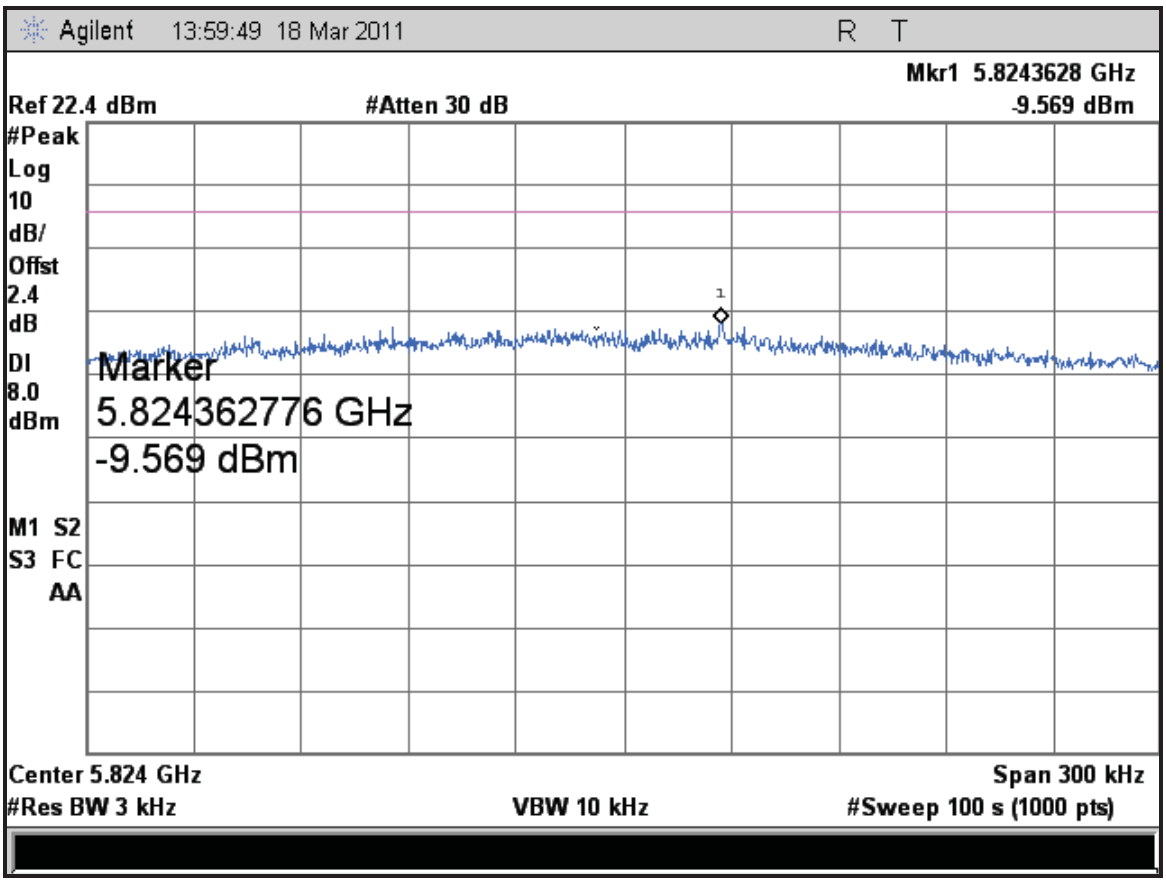



**Figure 544:** Peak Power Spectral Density, 5825 MHz at 802.11n HT20, 3X3, Chain 0 – 19.5 Mbps

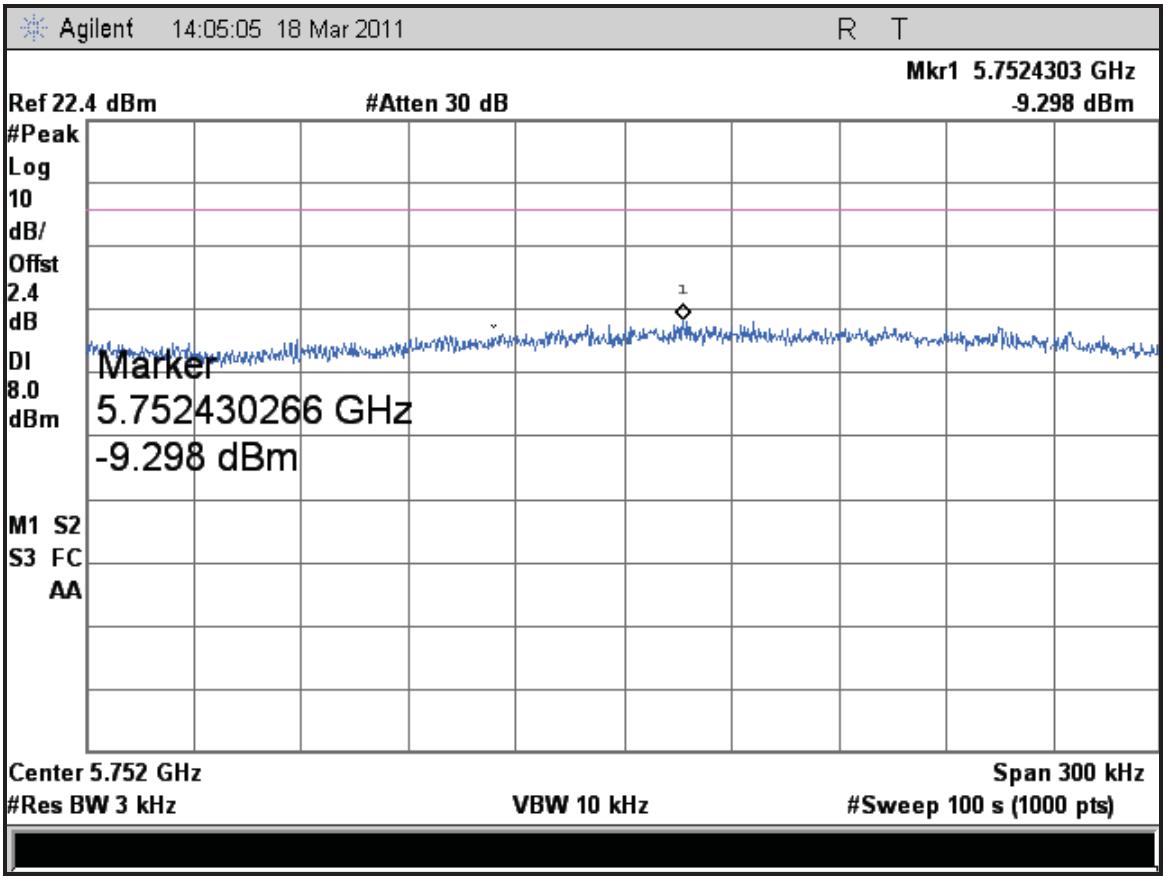



**Figure 545:** Peak Power Spectral Density, 5745 MHz at 802.11n HT20, 3X3, Chain 1 – 19.5 Mbps

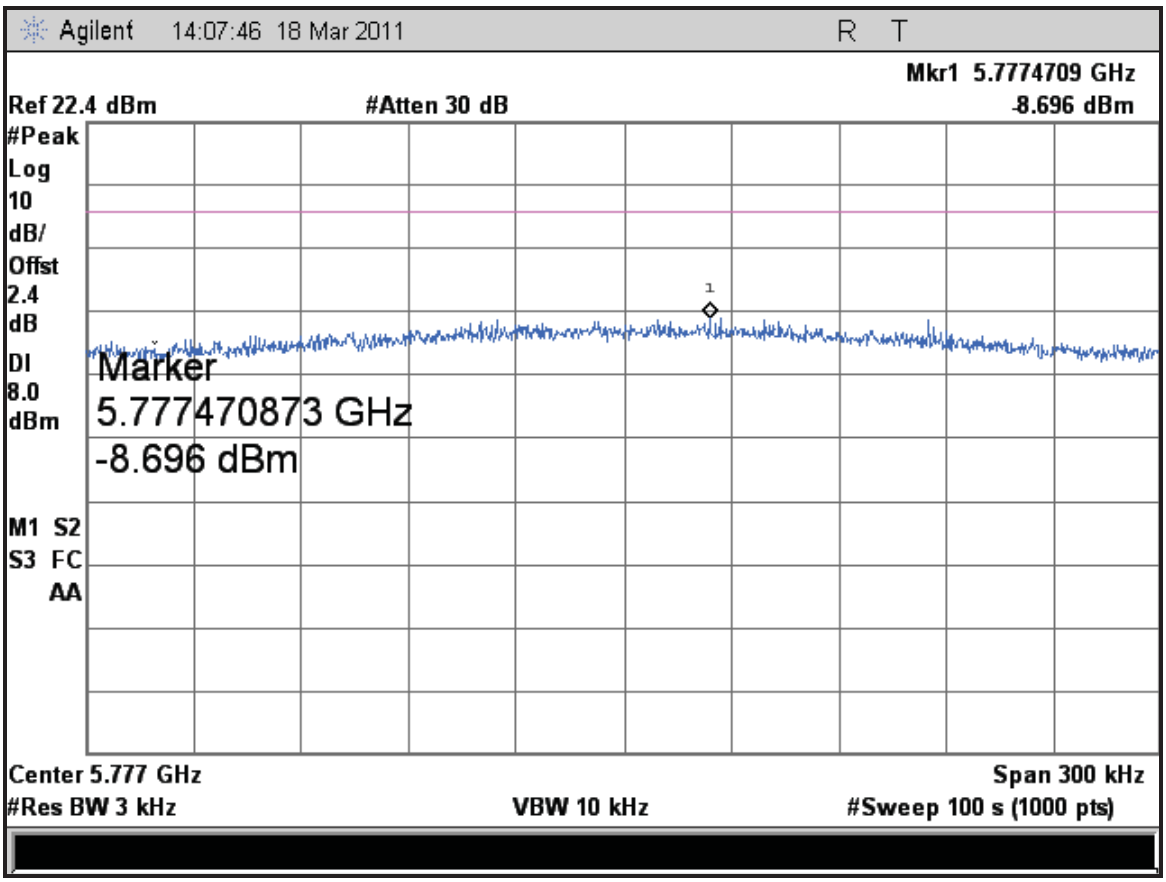



**Figure 546:** Peak Power Spectral Density, 5785 MHz at 802.11n HT20, 3X3, Chain 1 – 19.5 Mbps

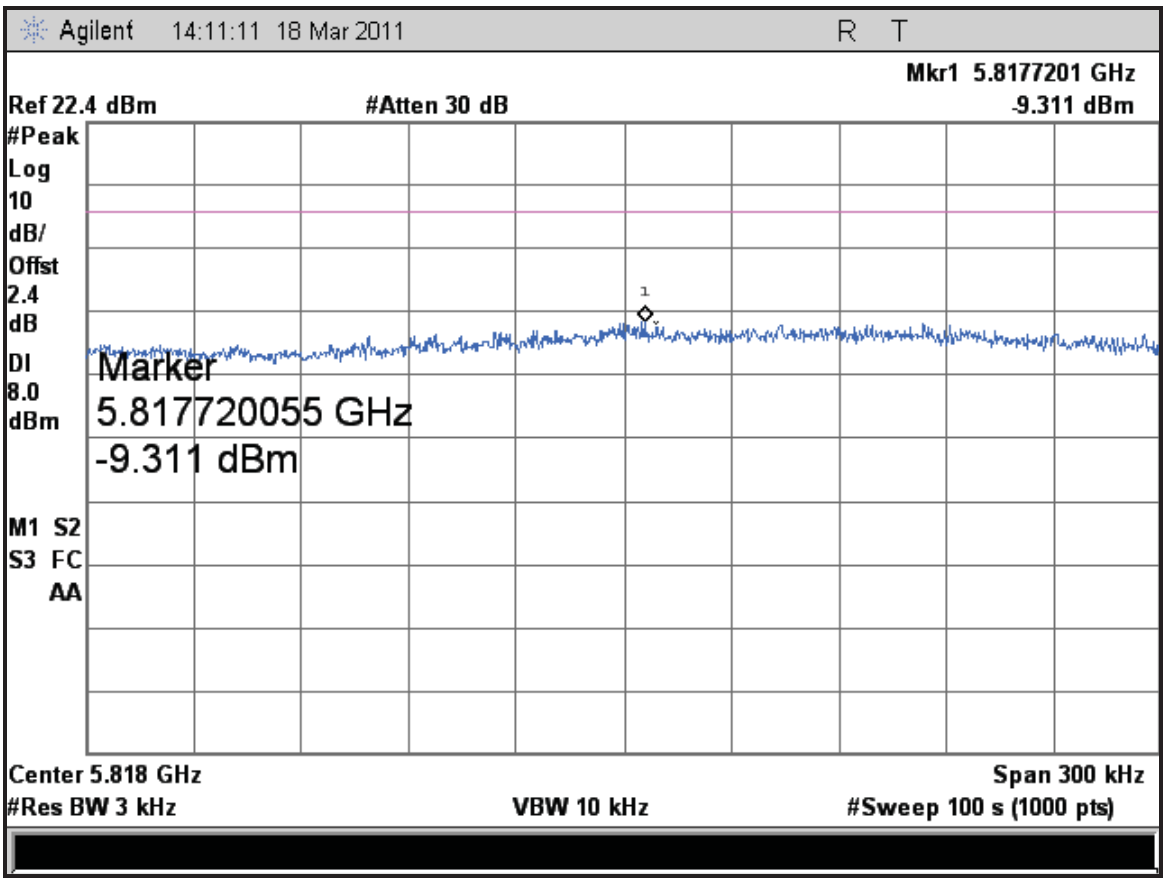



**Figure 547:** Peak Power Spectral Density, 5825 MHz at 802.11n HT20, 3X3, Chain 1 – 19.5 Mbps

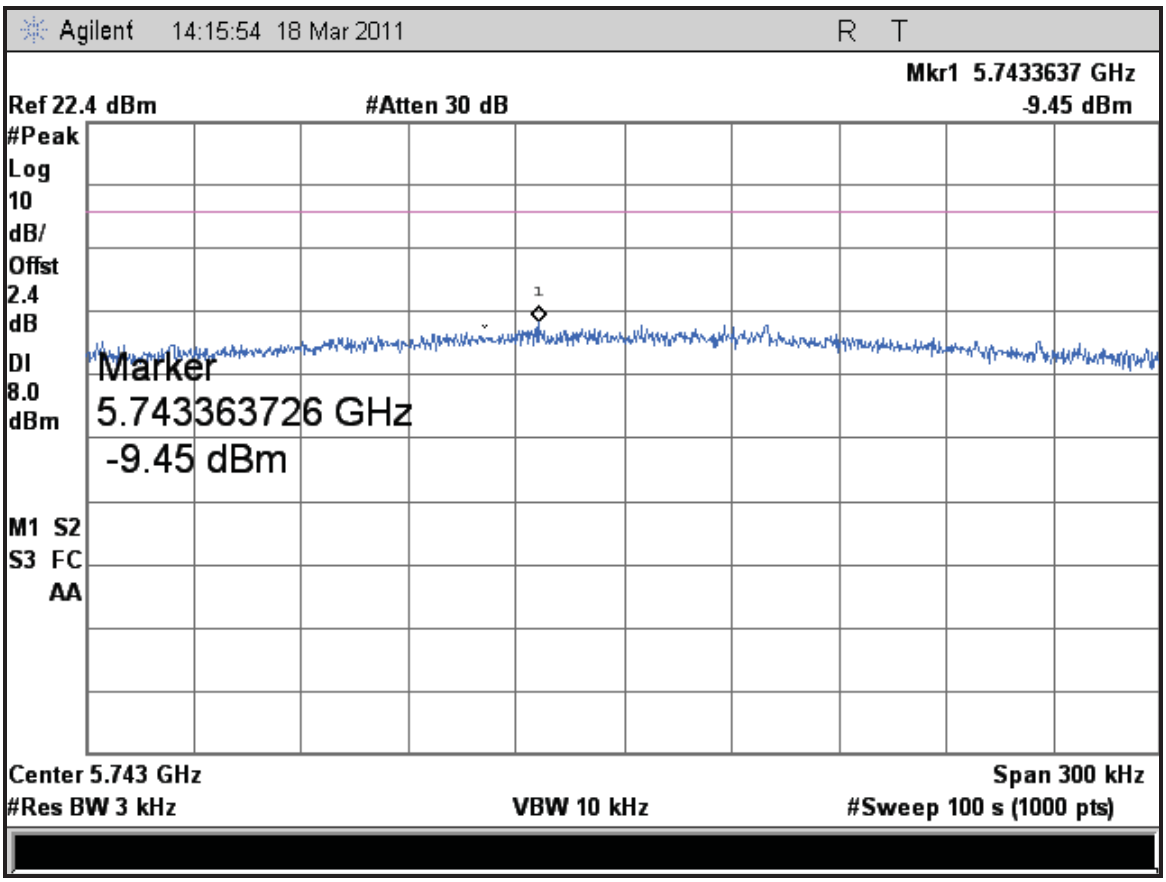



**Figure 548:** Peak Power Spectral Density, 5745 MHz at 802.11n HT20, 3X3, Chain 2 – 19.5 Mbps

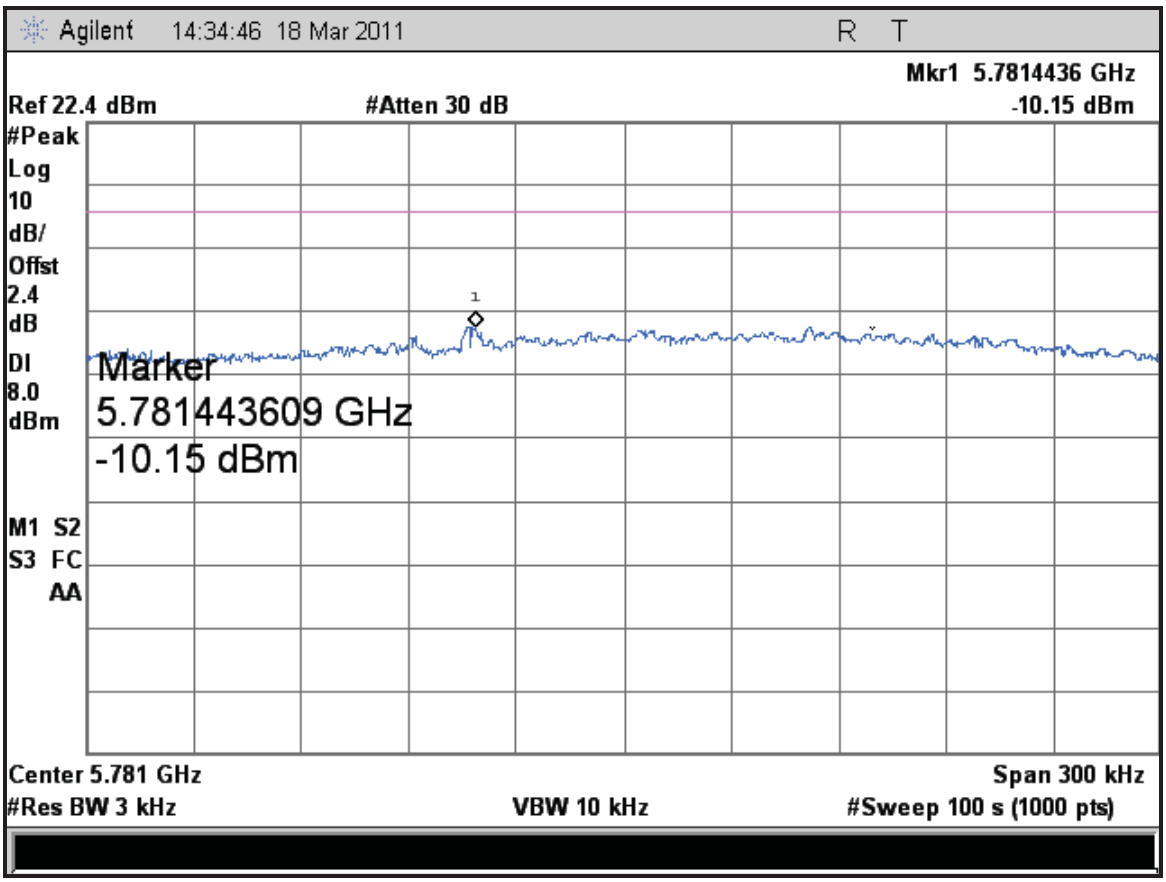



**Figure 549:** Peak Power Spectral Density, 5785 MHz at 802.11n HT20, 3X3, Chain 2 – 19.5 Mbps

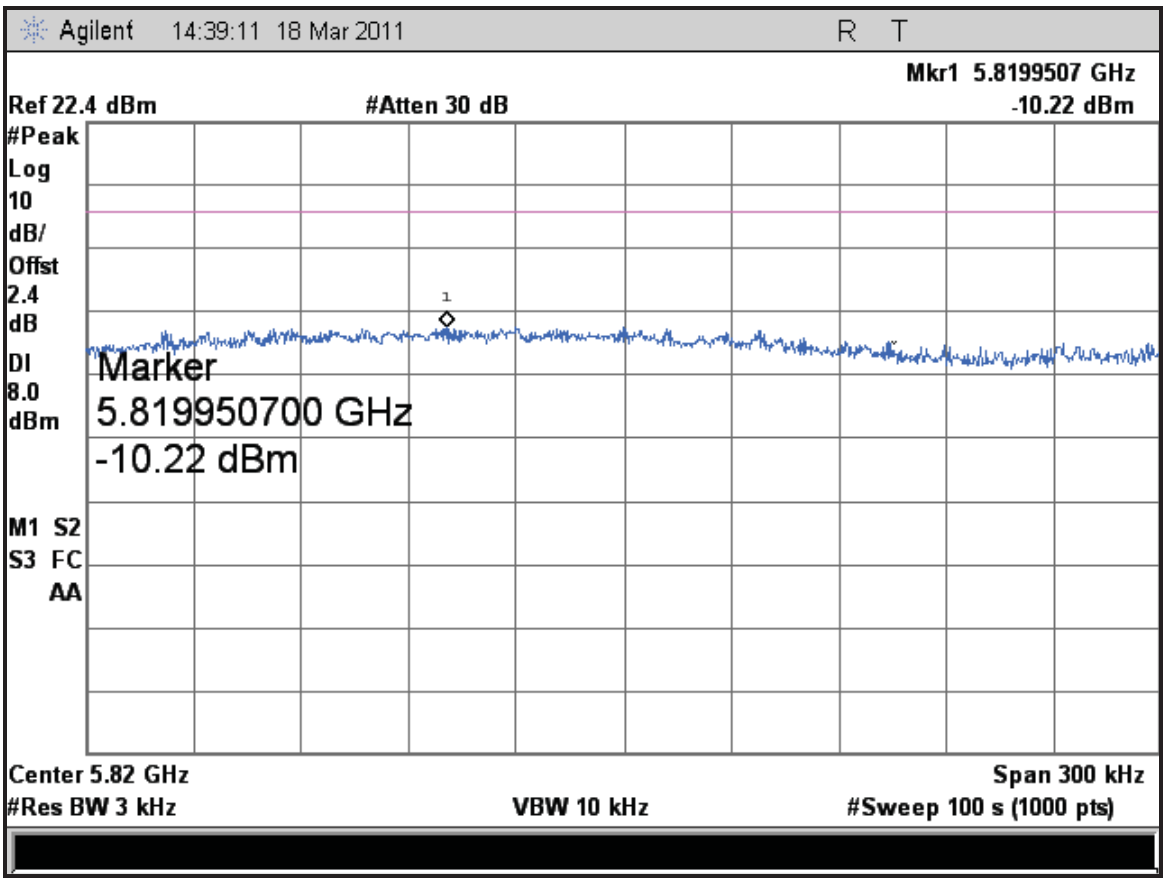



**Figure 550:** Peak Power Spectral Density, 5825 MHz at 802.11n HT20, 3X3, Chain 2 – 19.5 Mbps

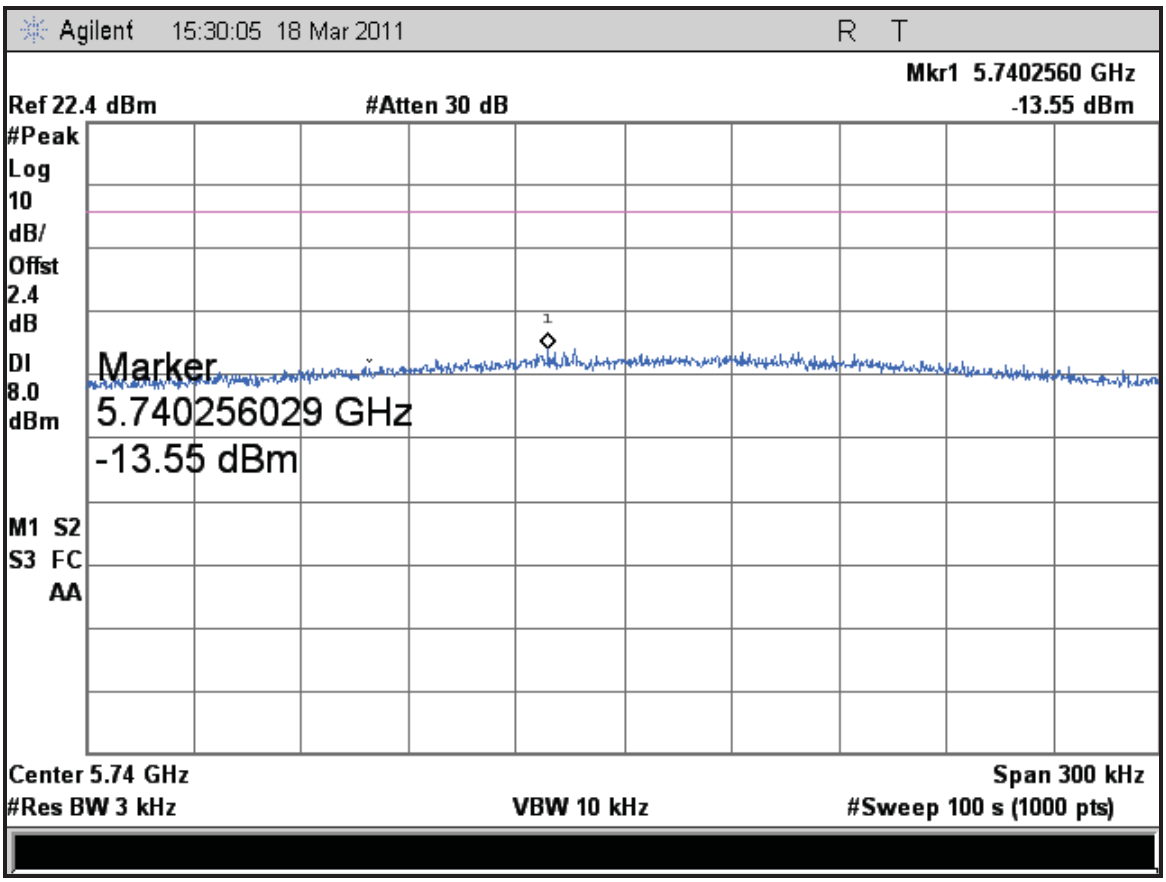



**Figure 551:** Peak Power Spectral Density, 5755 MHz at 802.11n HT40, 1X3, Chain 0 – 81 Mbps

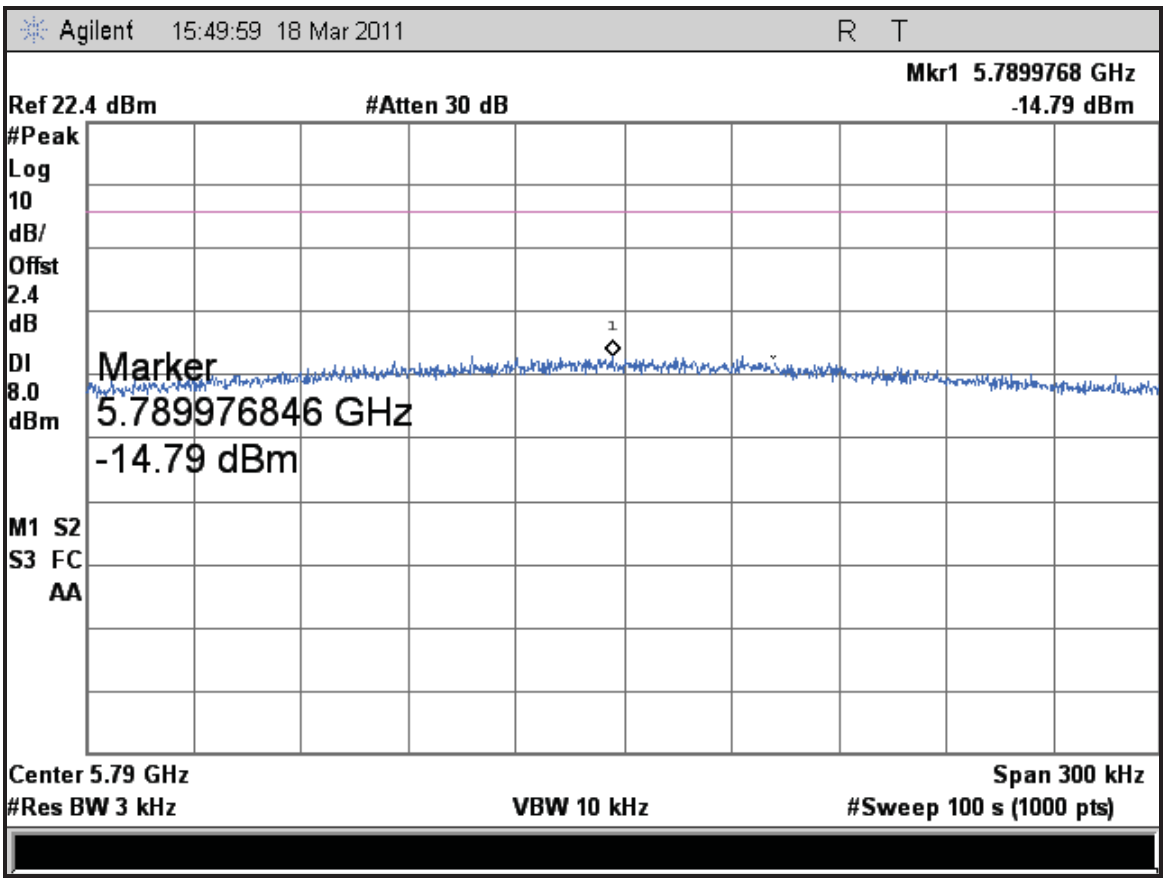



**Figure 552:** Peak Power Spectral Density, 5795 MHz at 802.11n HT40, 1X3, Chain 0 – 81 Mbps

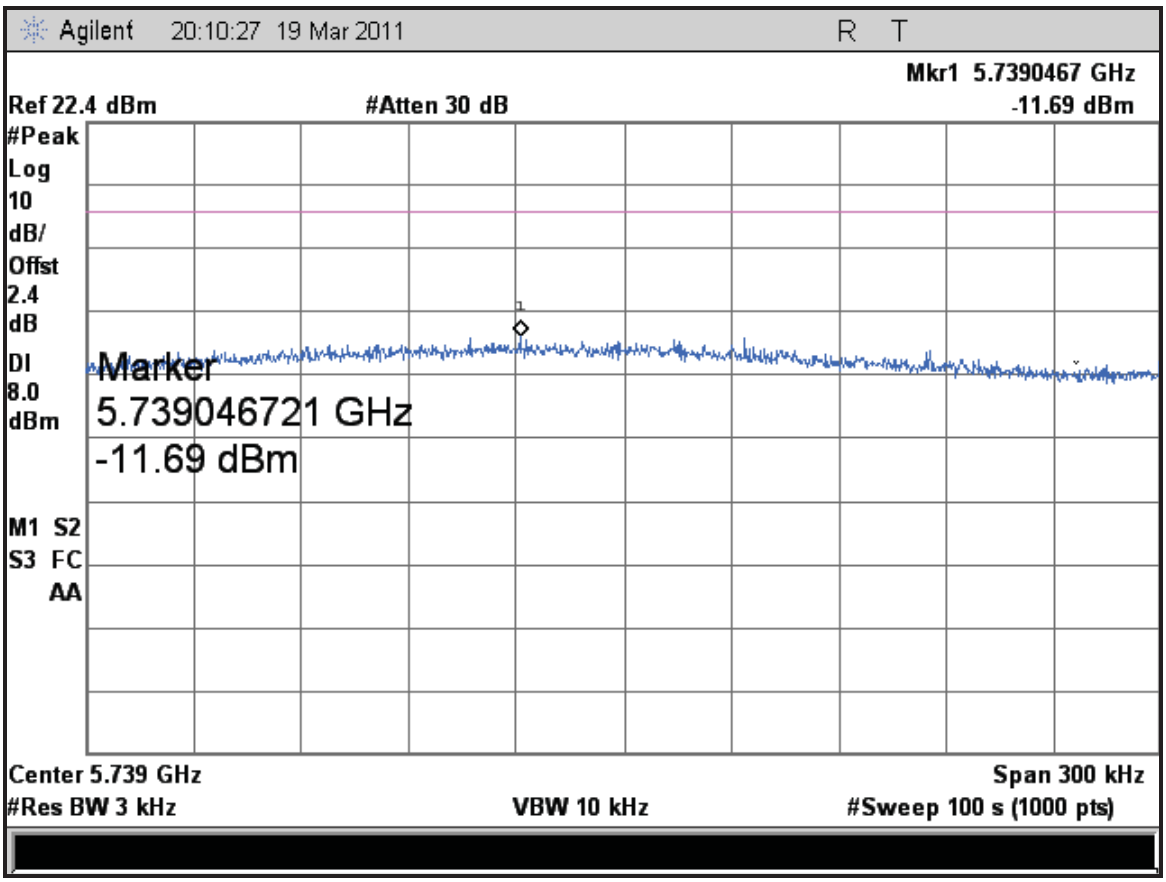



**Figure 553:** Peak Power Spectral Density, 5755 MHz at 802.11n HT40, 1X3, Chain 1 – 81 Mbps

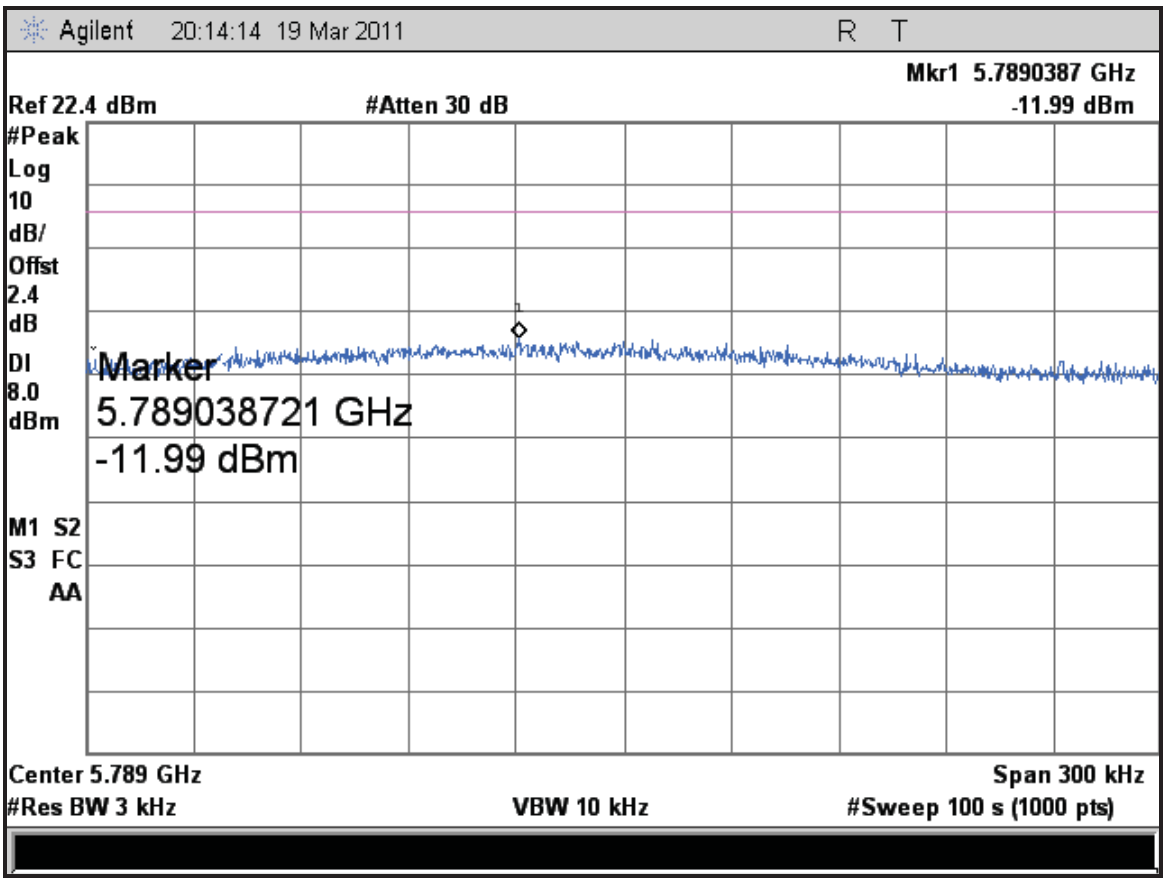



**Figure 554:** Peak Power Spectral Density, 5795 MHz at 802.11n HT40, 1X3, Chain 1 – 81 Mbps

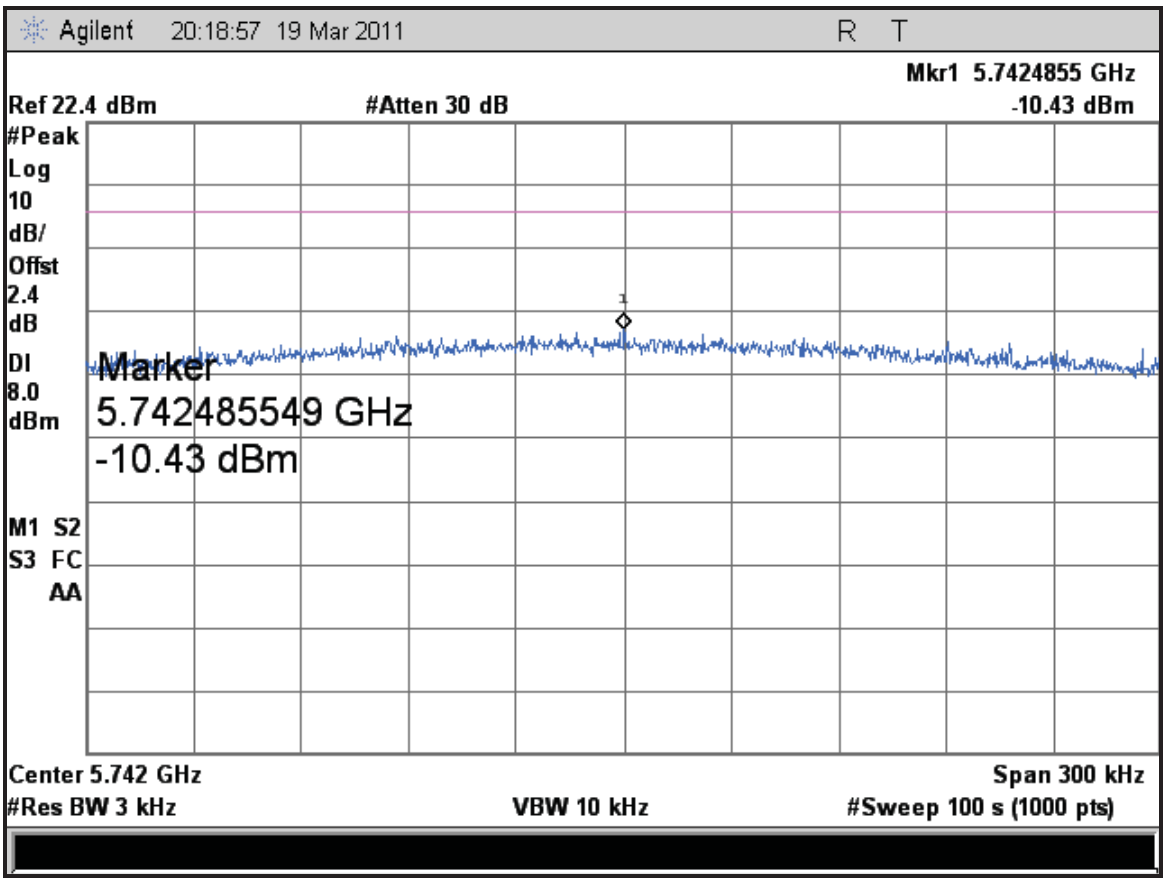



**Figure 555:** Peak Power Spectral Density, 5755 MHz at 802.11n HT40, 1X3, Chain 2 – 81 Mbps

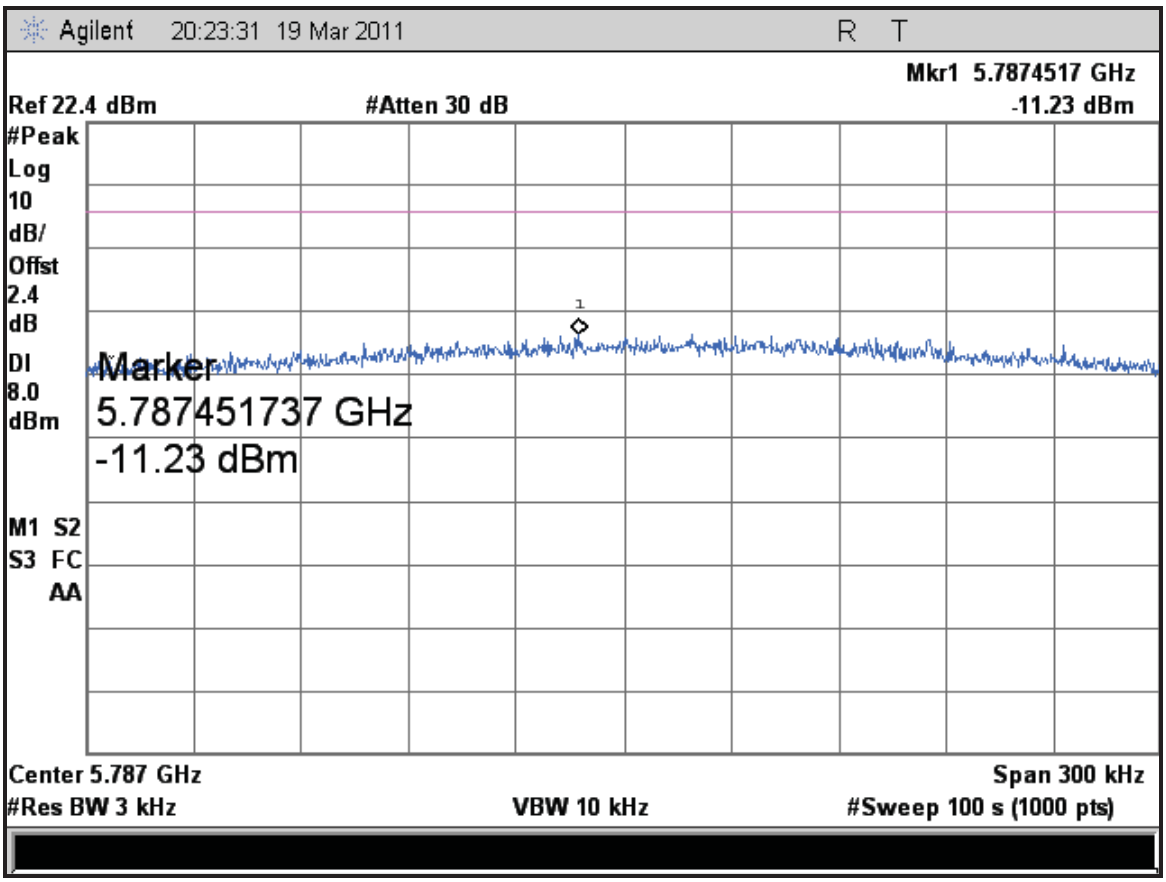



**Figure 556:** Peak Power Spectral Density, 5795 MHz at 802.11n HT40, 1X3, Chain 2 – 81 Mbps

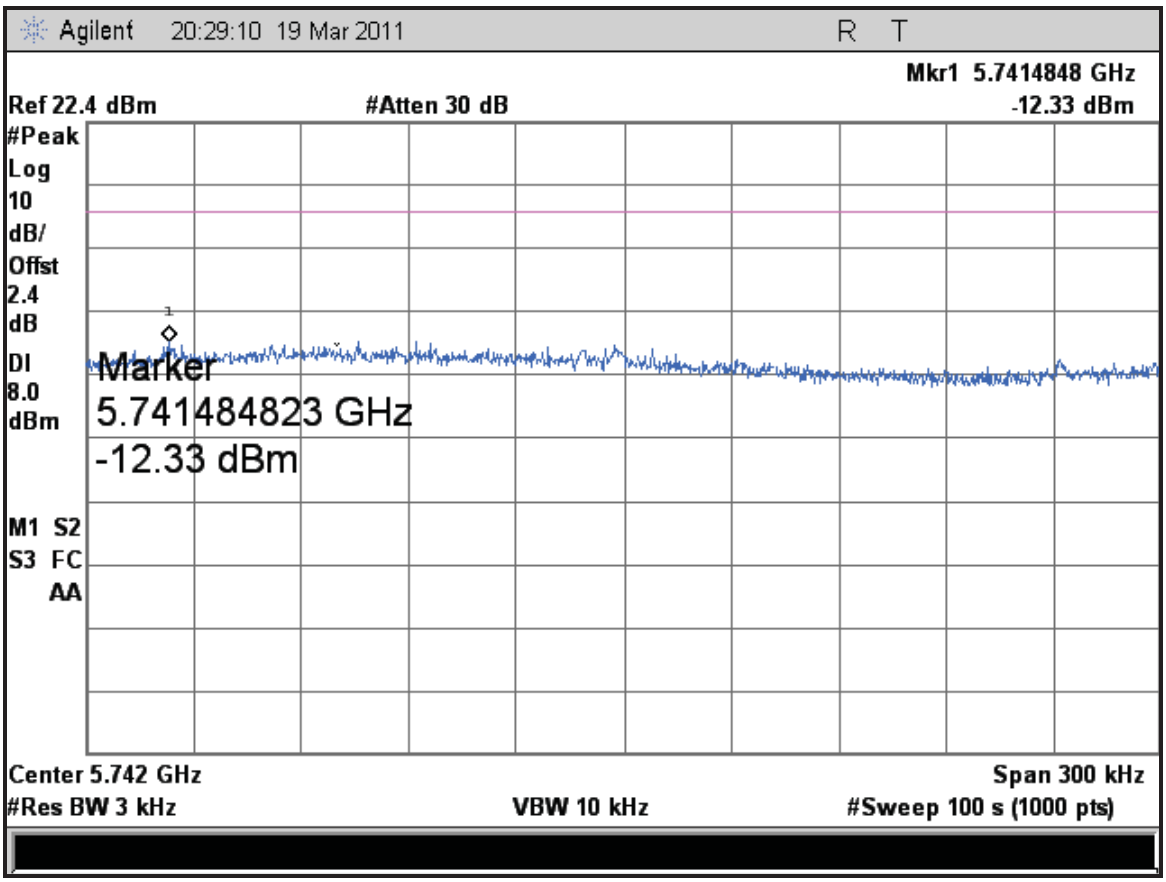



**Figure 557:** Peak Power Spectral Density, 5755 MHz at 802.11n HT40, 2X3, Chain 0 – 27 Mbps

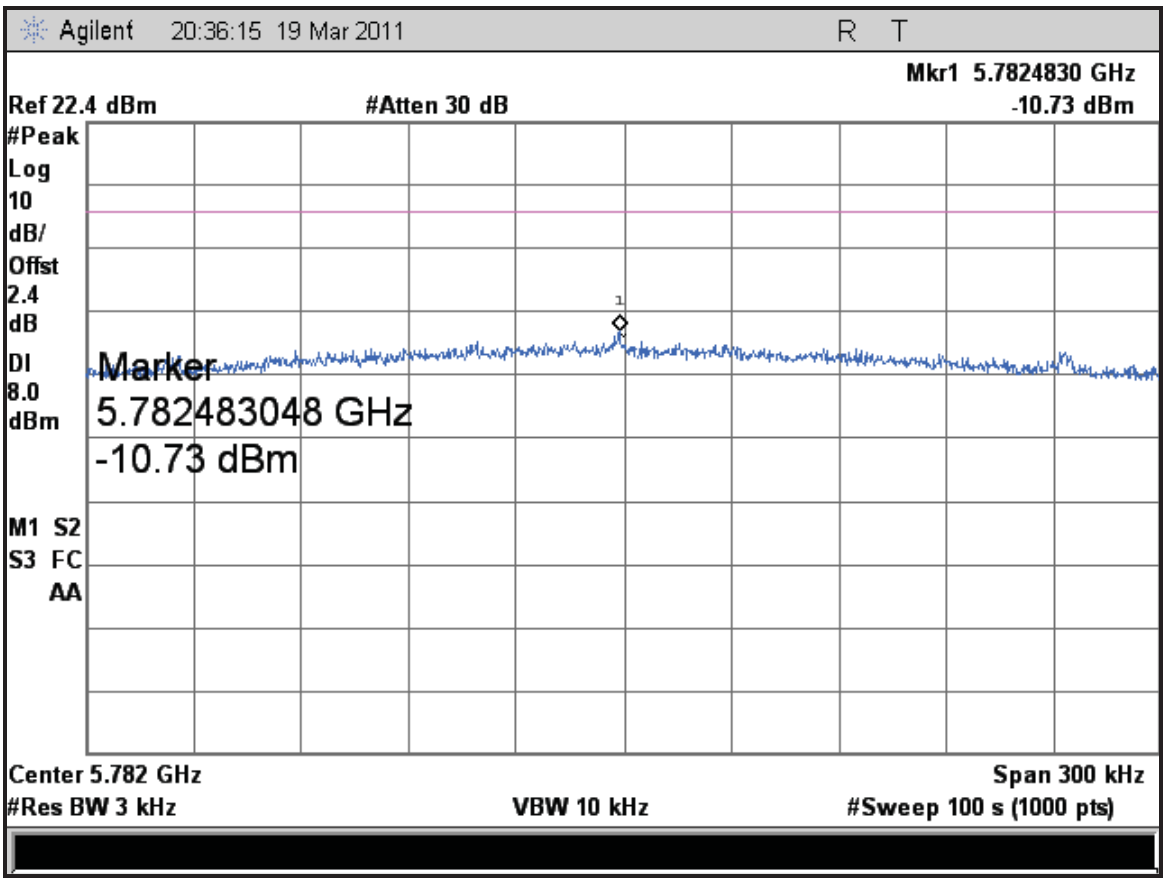



**Figure 558:** Peak Power Spectral Density, 5795 MHz at 802.11n HT40, 2X3, Chain 0 – 27 Mbps

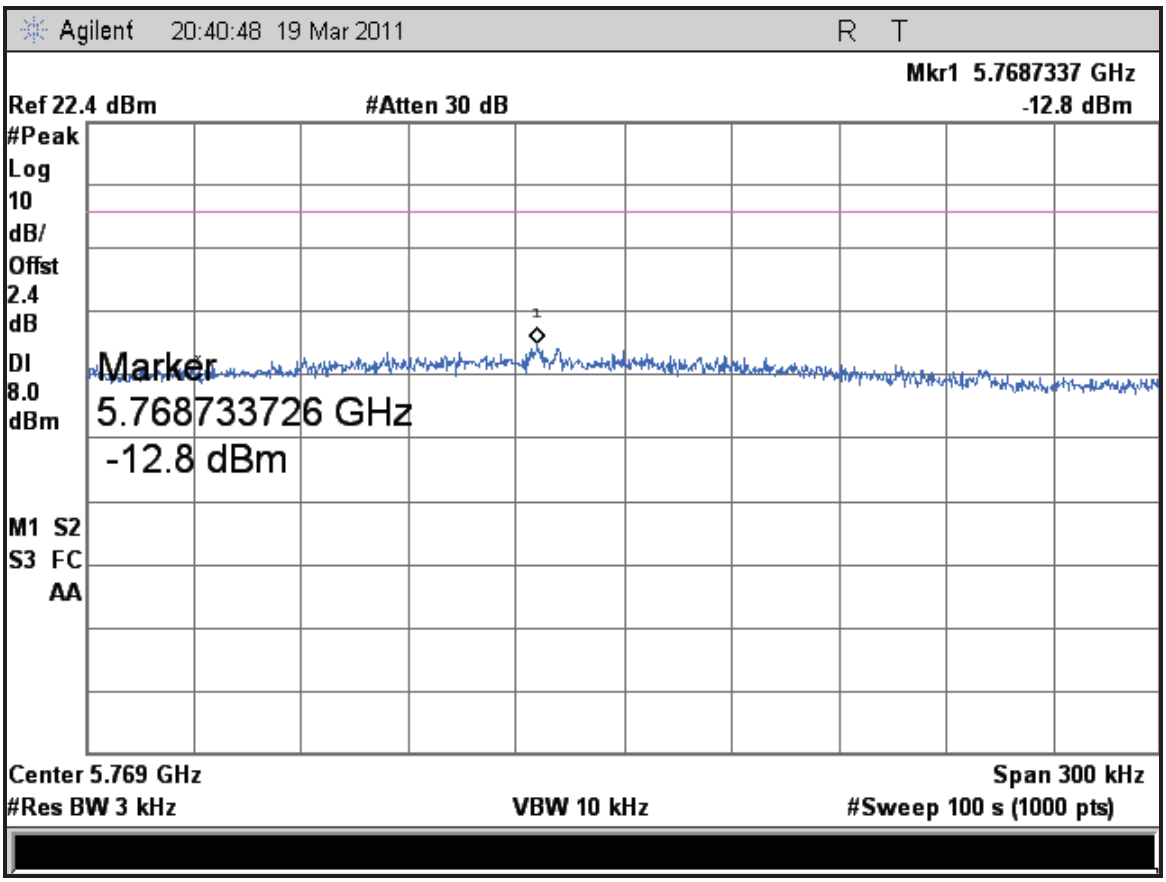



**Figure 559:** Peak Power Spectral Density, 5755 MHz at 802.11n HT40, 2X3, Chain 1 – 27 Mbps

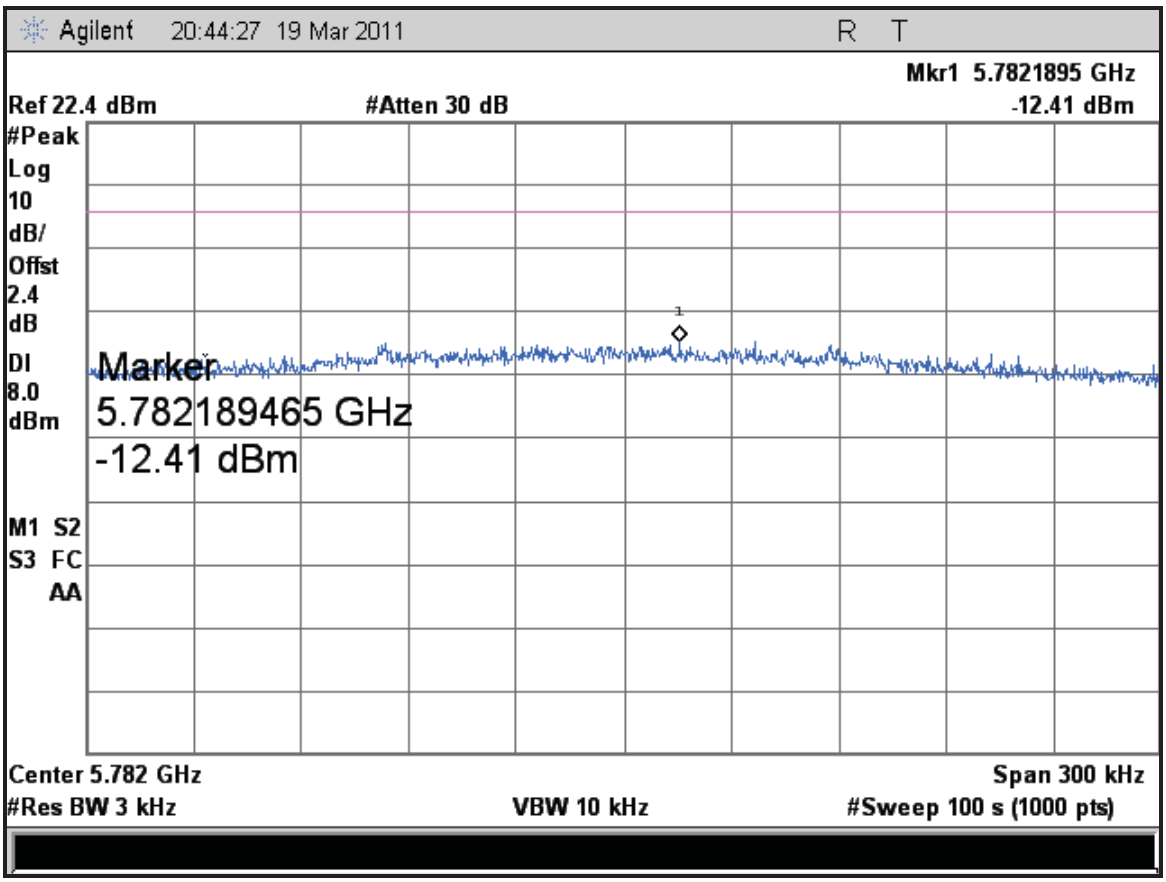



**Figure 560:** Peak Power Spectral Density, 5795 MHz at 802.11n HT40, 2X3, Chain 1 – 27 Mbps

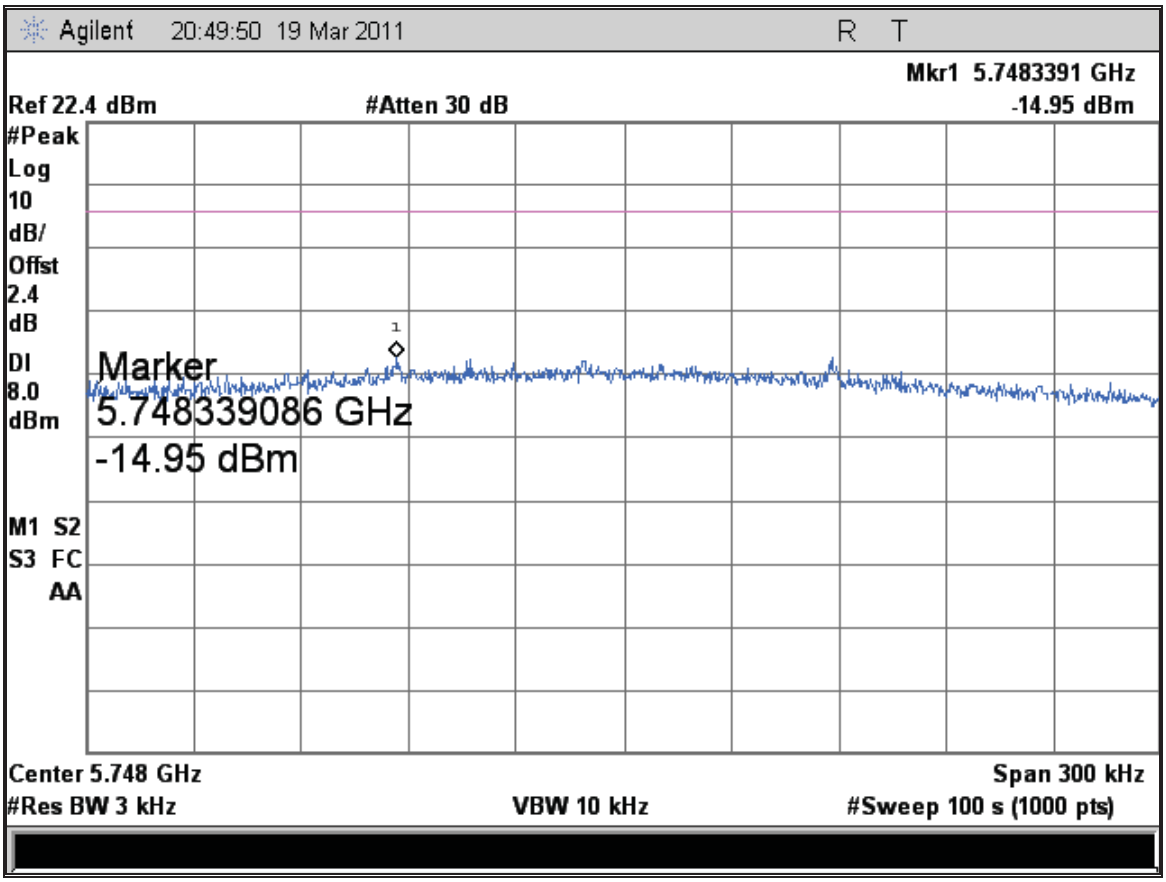



**Figure 561:** Peak Power Spectral Density, 5755 MHz at 802.11n HT40, 3X3, Chain 0 – 40.5 Mbps

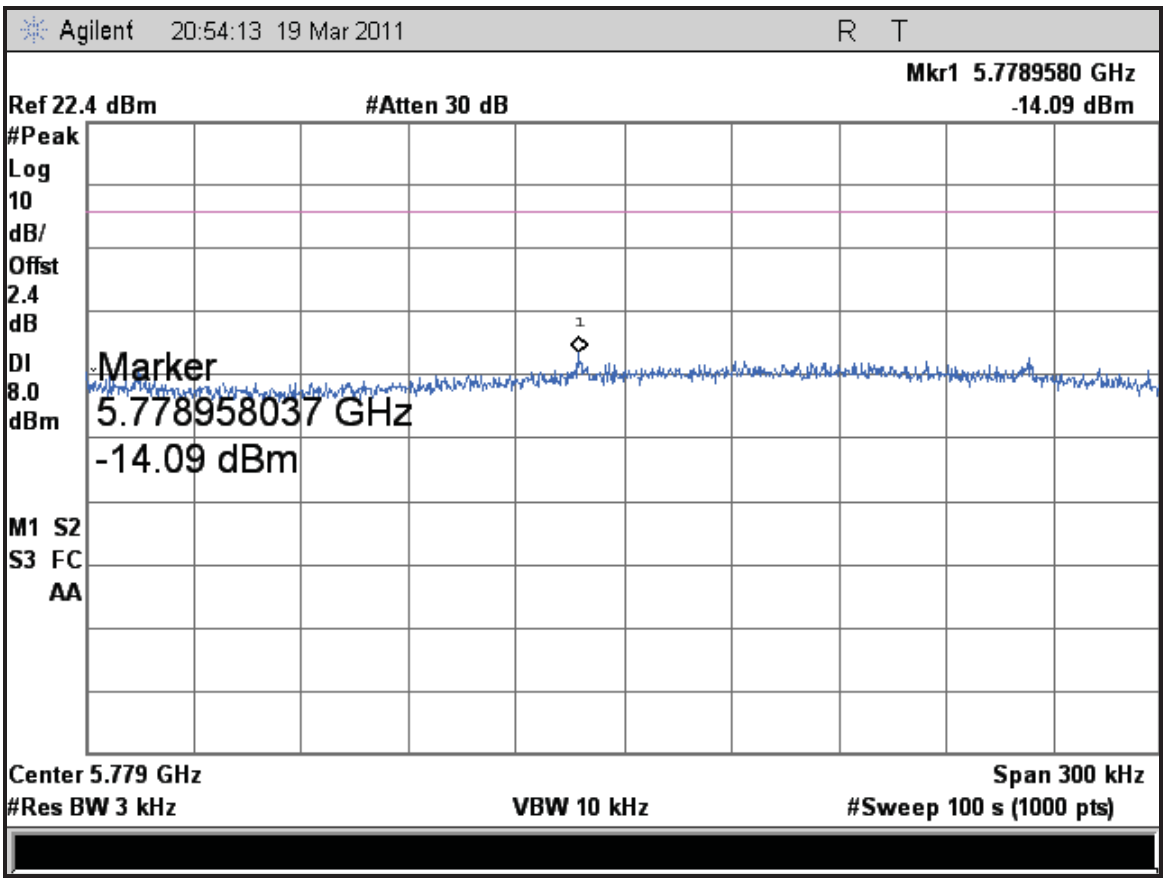



**Figure 562:** Peak Power Spectral Density, 5795 MHz at 802.11n HT40, 3X3, Chain 0 – 40.5 Mbps

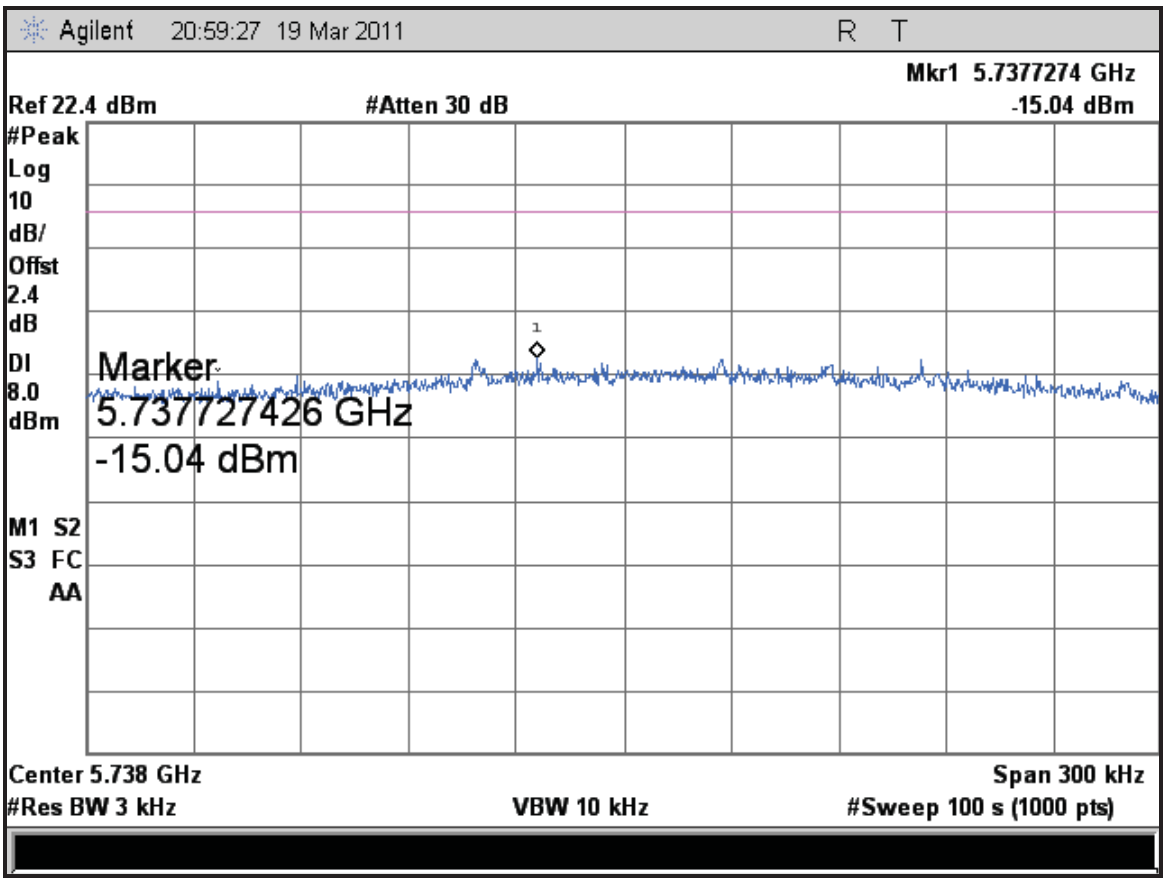



**Figure 563:** Peak Power Spectral Density, 5755 MHz at 802.11n HT40, 3X3, Chain 1 – 40.5 Mbps

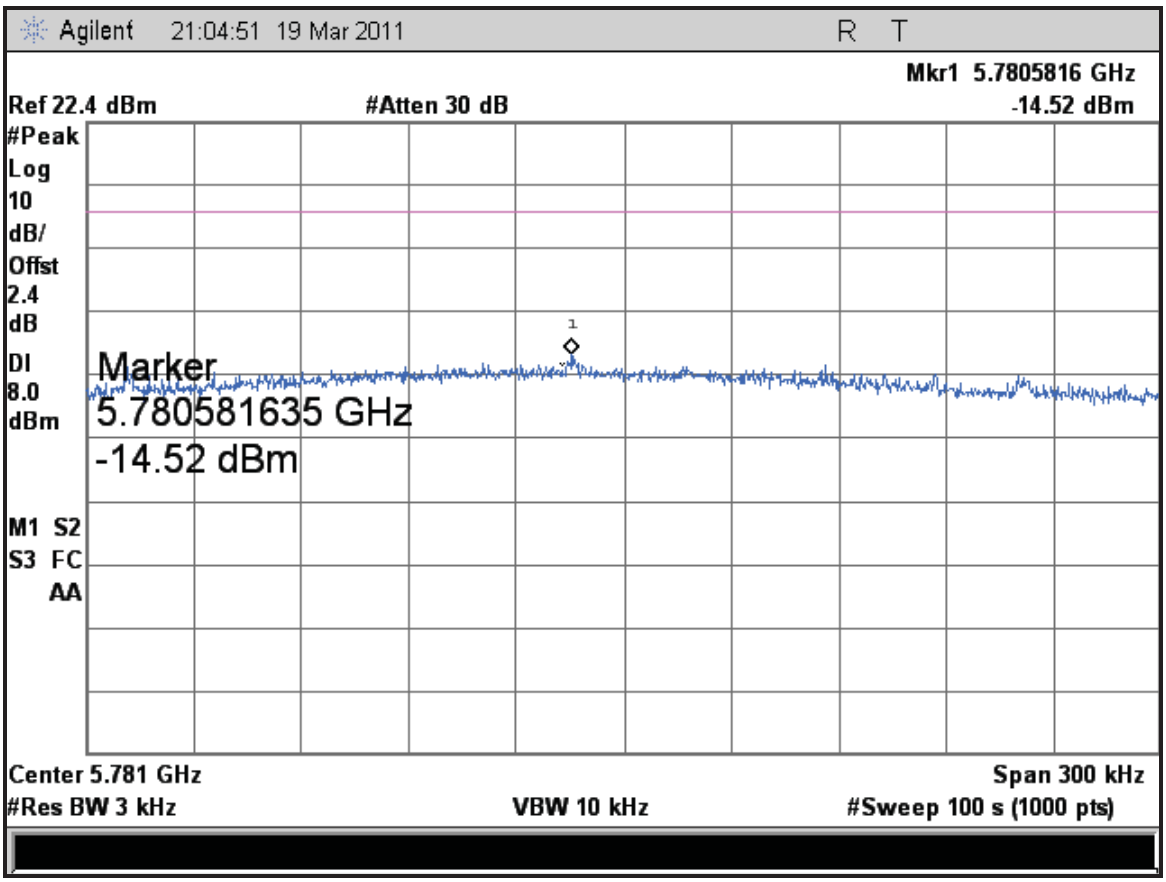



**Figure 564:** Peak Power Spectral Density, 5795 MHz at 802.11n HT40, 3X3, Chain 1 – 40.5 Mbps

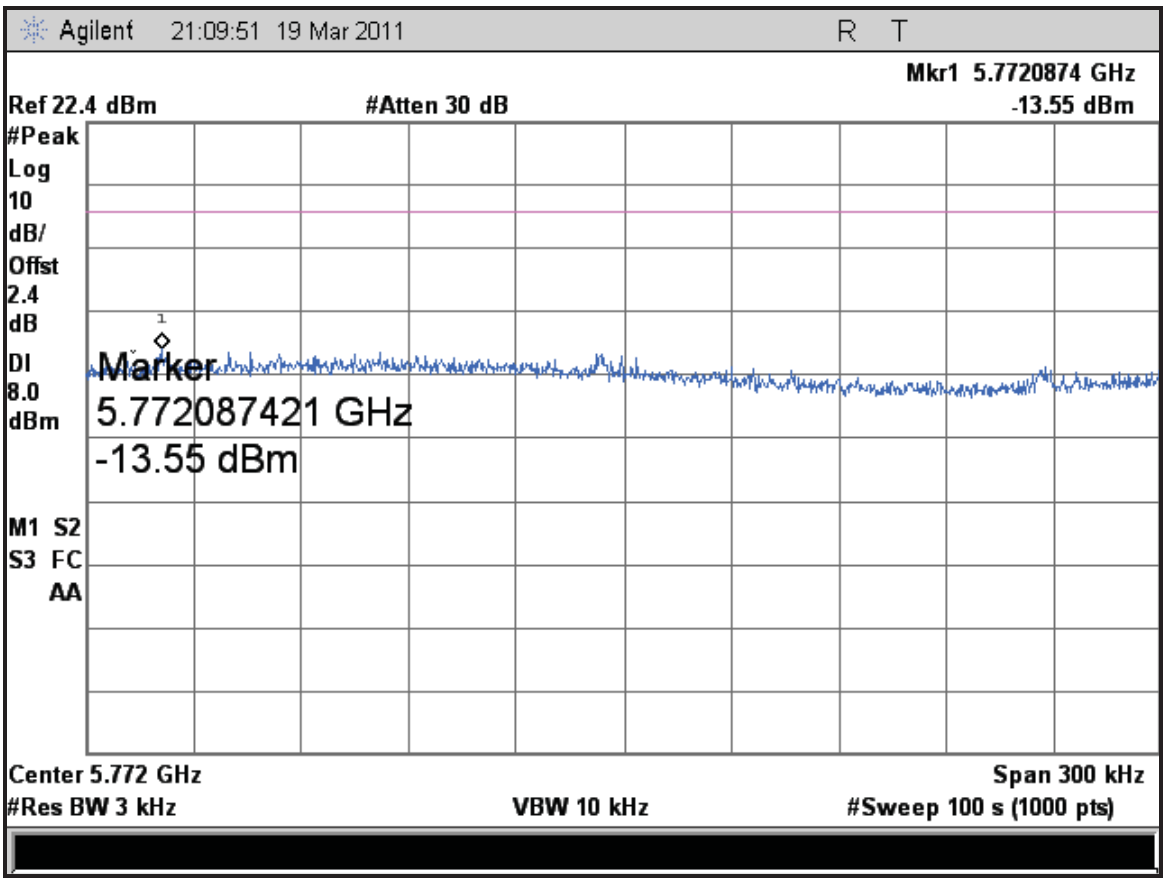



**Figure 565:** Peak Power Spectral Density, 5755 MHz at 802.11n HT40, 3X3, Chain 2 – 40.5 Mbps

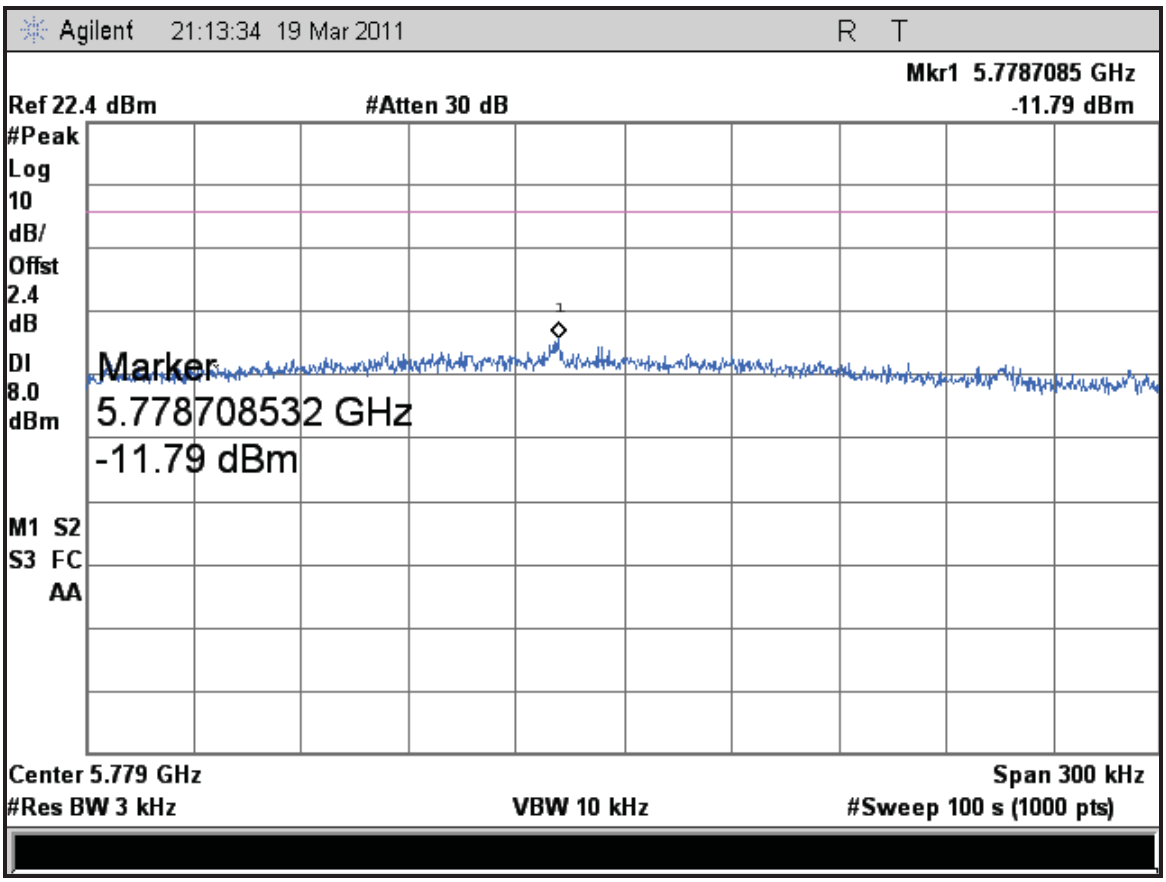



**Figure 566:** Peak Power Spectral Density, 5795 MHz at 802.11n HT40, 3X3, Chain 2 – 40.5 Mbps

## 5.5 Transmitter Spurious Emissions

*Transmitter spurious emissions are emissions outside the frequency range of the equipment when the equipment is in transmit mode; per requirement of CFR47 15.205, 15.209, 15.247(d), RSS 210 Sect. A.8.5*

### 5.5.1 Test Methodology

#### *5.5.1.1 Preliminary Test*

A test program that controls instrumentation and data logging was used to automate the preliminary RF emission test procedure. The frequency range of interest was divided into sub-ranges to yield a frequency resolution of approximately 1 MHz and provide a reading at each frequency for no more than 12° of turntable rotation. For each frequency sub-range the turntable was rotated 360° while peak emission data was recorded and plotted over the frequency range of interest in horizontal and vertical antenna polarization's.

Preliminary emission profile testing was performed inside the anechoic chamber. The EUT was placed on a 1.0m x 1.5m non-conductive table 80cm above the floor. The EUT was positioned as shown in the setup photographs. The receiving antenna was placed at a distance of 3m at a fixed height of 1m. Measurement equipment was located outside of the chamber. A video camera was placed inside the chamber to view the EUT.

#### *5.5.1.2 Final Test*

For each frequency measured, the peak emission was maximized by manipulating the receiving antenna from 1 to 4 meters above the ground plane and placing it at the position that produced the maximum signal strength reading. The turntable was then rotated through 360° while observing the peak signal and placing the EUT at the position that produced maximum radiation. The six highest emissions relative to the limit were measured unless such emissions were more than 20 dB below the limit. If less than six emissions are within 20 dB of the limit, than the noise level of the receiver is measured at frequencies where emissions are expected. Multiples of all oscillator and microprocessor frequencies were also checked.

Final testing was performed on an NSA compliant test site. The EUT was placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane. The placement of EUT and cables were the same as for preliminary testing and is shown in the setup photographs.

The final scans performed on the worst axis, Y-Axis, for three operating channels;

6Mbit/s for 802.11a mode: 5745MHz, 5785MHz, and 5825MHz.

6.5Mbit/s for 802.11n HT20 Mode: 5745MHz, 5785MHz, and 5825MHz.

40.5Mbit/s for 802.11n HT40 Mode: 5755MHz, and 5795MHz.

#### *5.5.1.3 Deviations*

None.

### 5.5.2 Transmitter Spurious Emission Limit

The spurious emissions of the transmitter shall not exceed the values in CFR47 Part 15.205, 15.209: 2009 and RSS 210 A1.1.2 2010.

| Frequency (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|---|---|---|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100 ** | 3 |
| 88-216 | 150 ** | 3 |
| 216-960 | 200 ** | 3 |
| Above 960 | 500 | 3 |

All harmonics and spurious emission which are outside of the restricted band shall be 20 dB below the in-band emission.

### 5.5.3 Test Results

The final measurement data was taken under the worst case operating modes, configurations, and/or cable positions. It also reflects the results including any modifications and/or special accessories listed in Sections 1.4 and test plan.

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

**Table 14:** Transmit Spurious Emission at Band-Edge Requirements

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Test Conditions:** Radiated Measurement, Normal Temperature and Voltage only | | | | | | | |
| **Antenna Type:** Integrated | | | **Power Setting:** See test plan | | | | |
| **Max. Antenna Gain:** + 3.2 dBi | | | **Signal State:** Modulated | | | | |
| **Ambient Temp.:** 22 °C | | | **Relative Humidity:**34% | | | | |
| **Band-Edge Results** | | | | | | | |
| **Operating Channel** | **Mode** | **Polarity** | **Pk Plots** | **Pk Limit (dBr)** | **Ave. Plots** | **Ave. Limit** | **Result** |
| 5745 MHz | 802.11a, 6Mbps | Horz. | 567 | 20 dB | 568 | | Pass |
| 5745 MHz | 802.11a, 6Mbps | Vert. | 569 | 20 dB | 570 | | Pass |
| 5785 MHz | 802.11a, 6Mbps | Horz. | 571 | 20 dB | 572 | | Pass |
| 5785 MHz | 802.11a, 6Mbps | Vert. | 573 | 20 dB | 574 | | Pass |
| 5825 MHz | 802.11a, 6Mbps | Horz. | 575 | 20 dB | 576 | | Pass |
| 5825 MHz | 802.11a, 6Mbps | Vert. | 577 | 20 dB | 578 | | Pass |
| 5745 MHz | HT20, 19.5Mbps | Horz. | 579 | 20 dB | 580 | | Pass |
| 5745 MHz | HT20, 19.5Mbps | Vert. | 581 | 20 dB | 582 | | Pass |
| 5785 MHz | HT20, 19.5Mbps | Horz. | 583 | 20 dB | 584 | | Pass |
| 5785 MHz | HT20, 19.5Mbps | Vert. | 585 | 20 dB | 586 | | Pass |
| 5825 MHz | HT20, 19.5Mbps | Horz. | 587 | 20 dB | 588 | | Pass |
| 5825 MHz | HT20, 19.5Mbps | Vert. | 589 | 20 dB | 590 | | Pass |
| 5755 MHz | HT40, 13.5Mbps | Horz. | 591 | 20 dB | 592 | | Pass |
| 5755 MHz | HT40, 13.5Mbps | Vert. | 593 | 20 dB | 594 | | Pass |
| 5795 MHz | HT40, 13.5Mbps | Horz. | 595 | 20 dB | 596 | | Pass |
| 5795 MHz | HT40, 13.5Mbps | Vert. | 597 | 20 dB | 598 | | Pass |

**Note:**

1. Since the upper and lower band-edge of 5725 MHz – 5850 MHz are not in the restricted band per Section CFR47 15.205, the out of band emission must be at least 20 dBr below the in-band signal.
2. Worst cases were observed at
   802.11a - 6 Mbps, 1 data stream
   802.11n HT20 – 19.5 Mbps, 3 data streams
   802.11n HT40 – 13.5 Mbps, 1 data stream

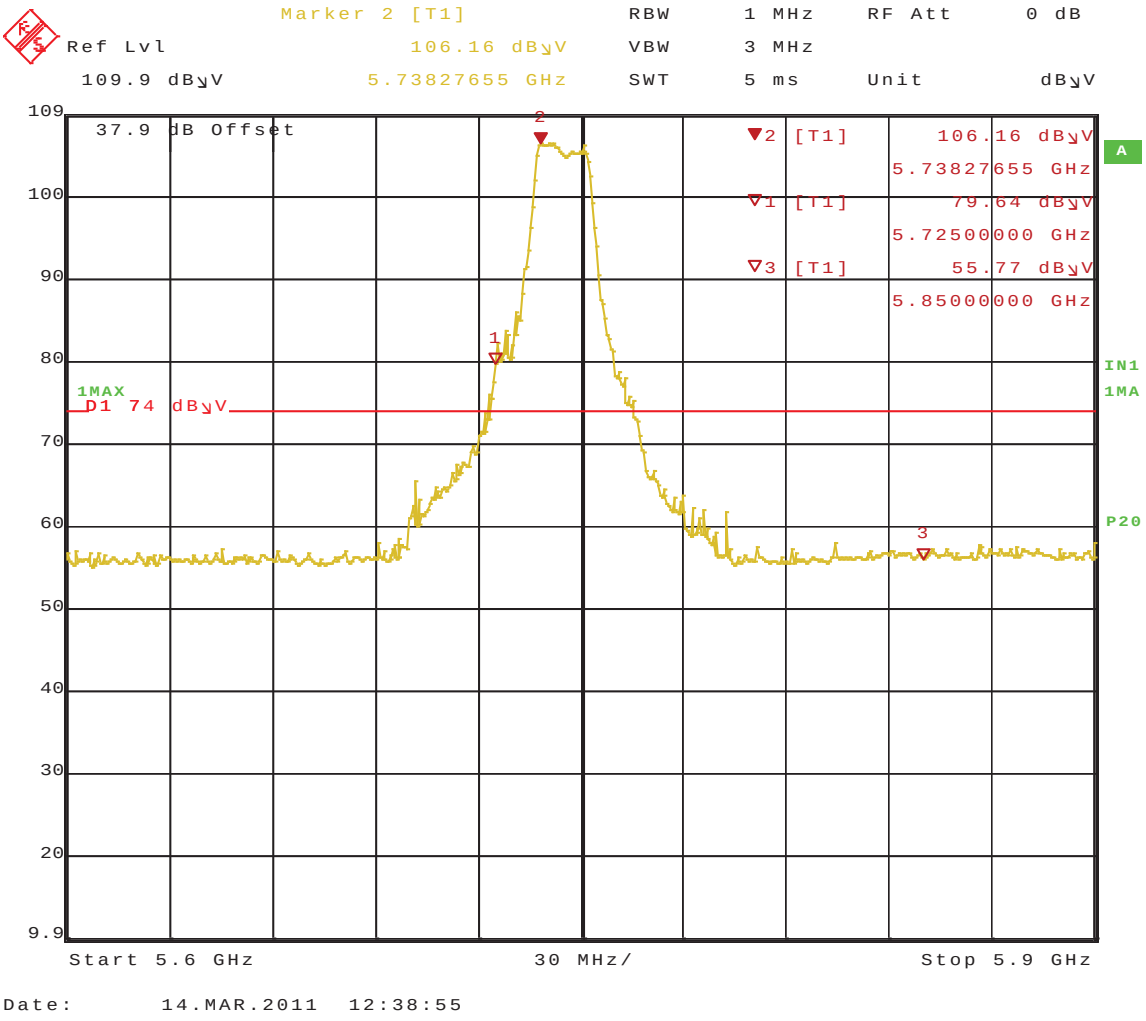



**Figure 567:** Radiated Emission at the Edge for 5745MHz at 6Mbps – Horz. (Peak)

**Note:** Band-edge at 5725MHz is not in the restricted band; therefore 20 dBr is applied.

Marker #1 is has more than 20 dBr from Marker #2

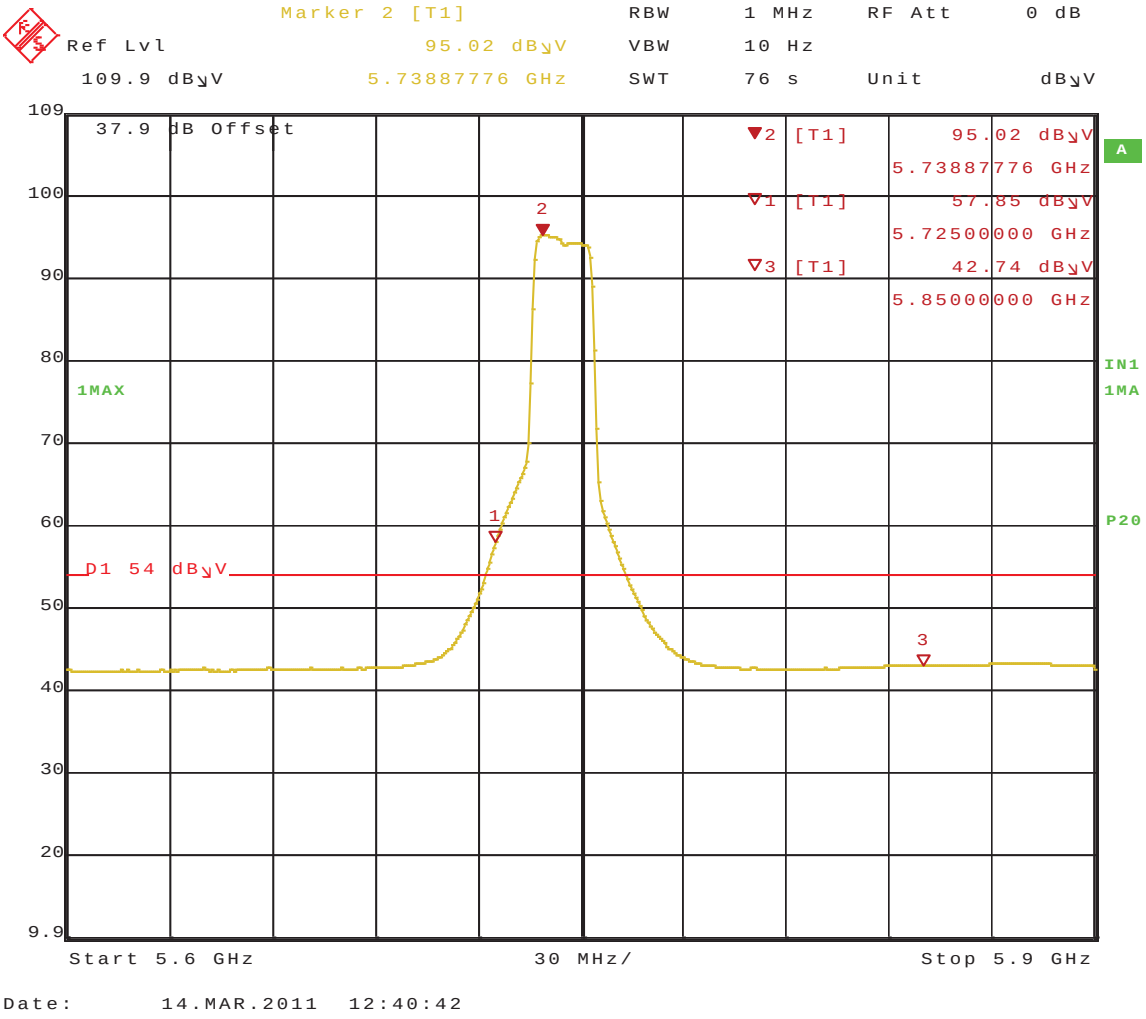



**Figure 568:** Radiated Emission at the Edge for 5745MHz at 6Mbps – Horz. (Ave.)

**Note:** Band-edge at 5725MHz is not in the restricted band; therefore 20 dBr is applied.

Marker #1 is has more than 20 dBr from Marker #2

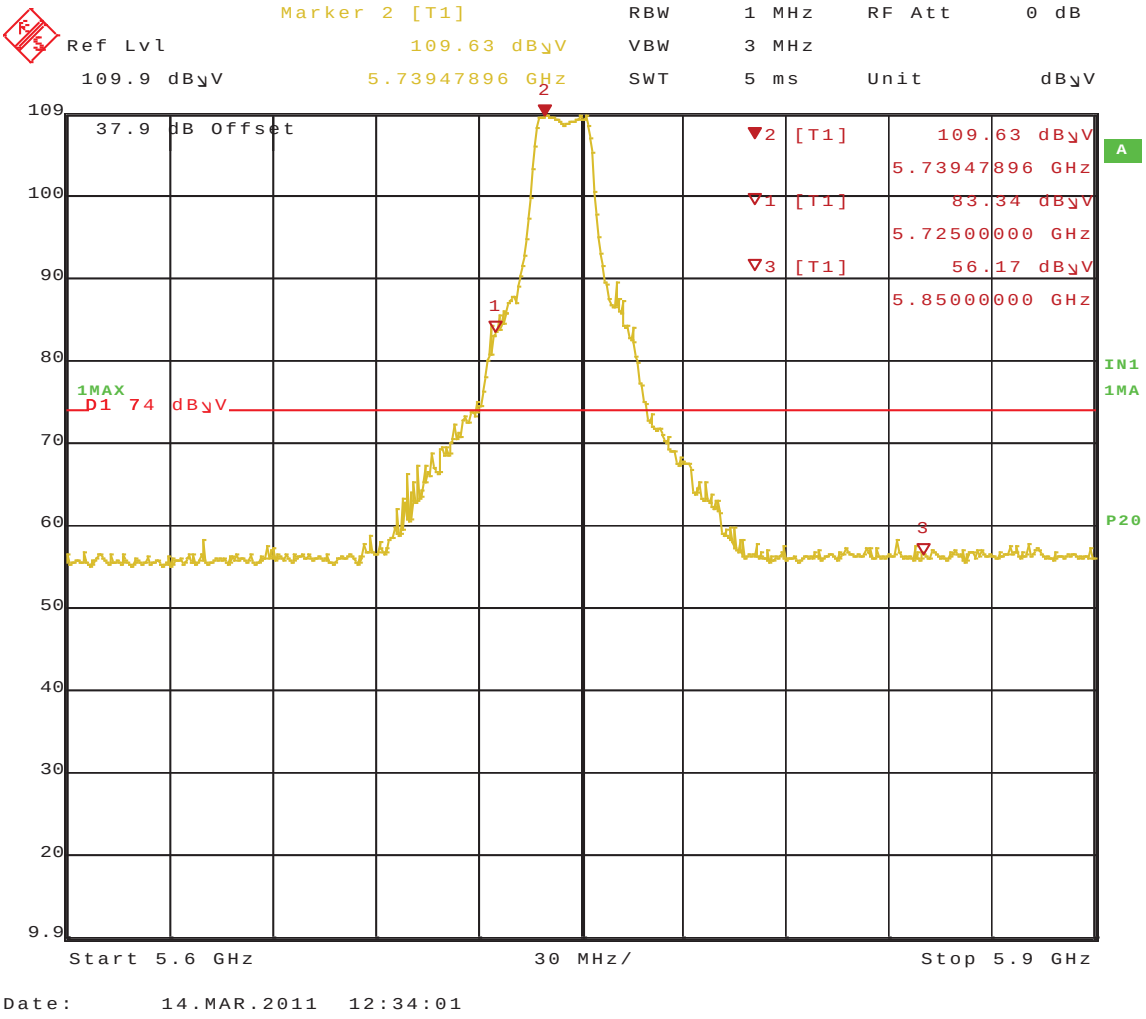



**Figure 569:** Radiated Emission at the Edge for 5745MHz at 6Mbps – Vert. (Peak)

**Note:** Band-edge at 5725MHz is not in the restricted band; therefore 20 dBr is applied.

Marker #1 is has more than 20 dBr from Marker #2

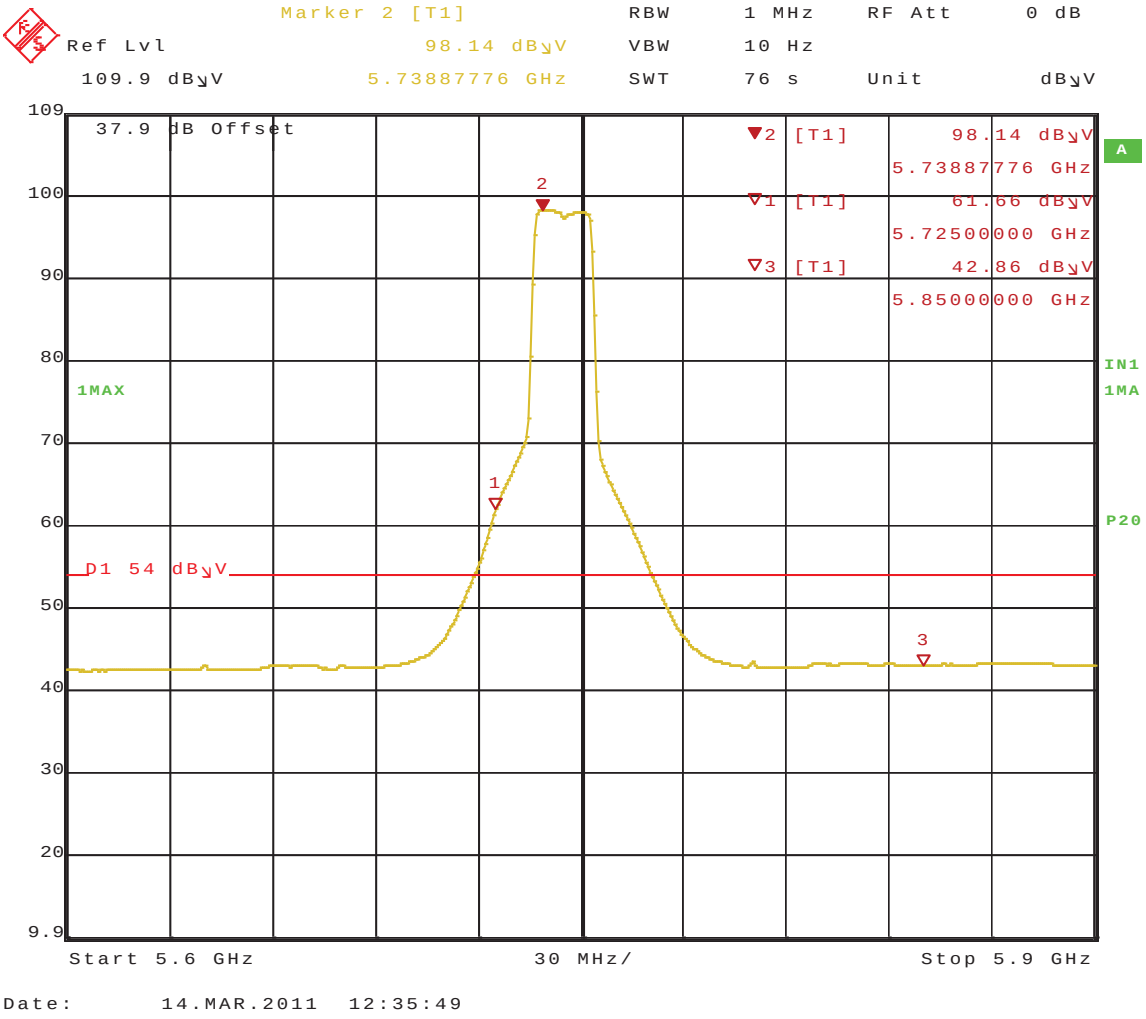



**Figure 570:** Radiated Emission at the Edge for 5745MHz at 6Mbps – Vert. (Ave.)

**Note:** Band-edge at 5725MHz is not in the restricted band; therefore 20 dBr is applied.

Marker #1 is has more than 20 dBr from Marker #2

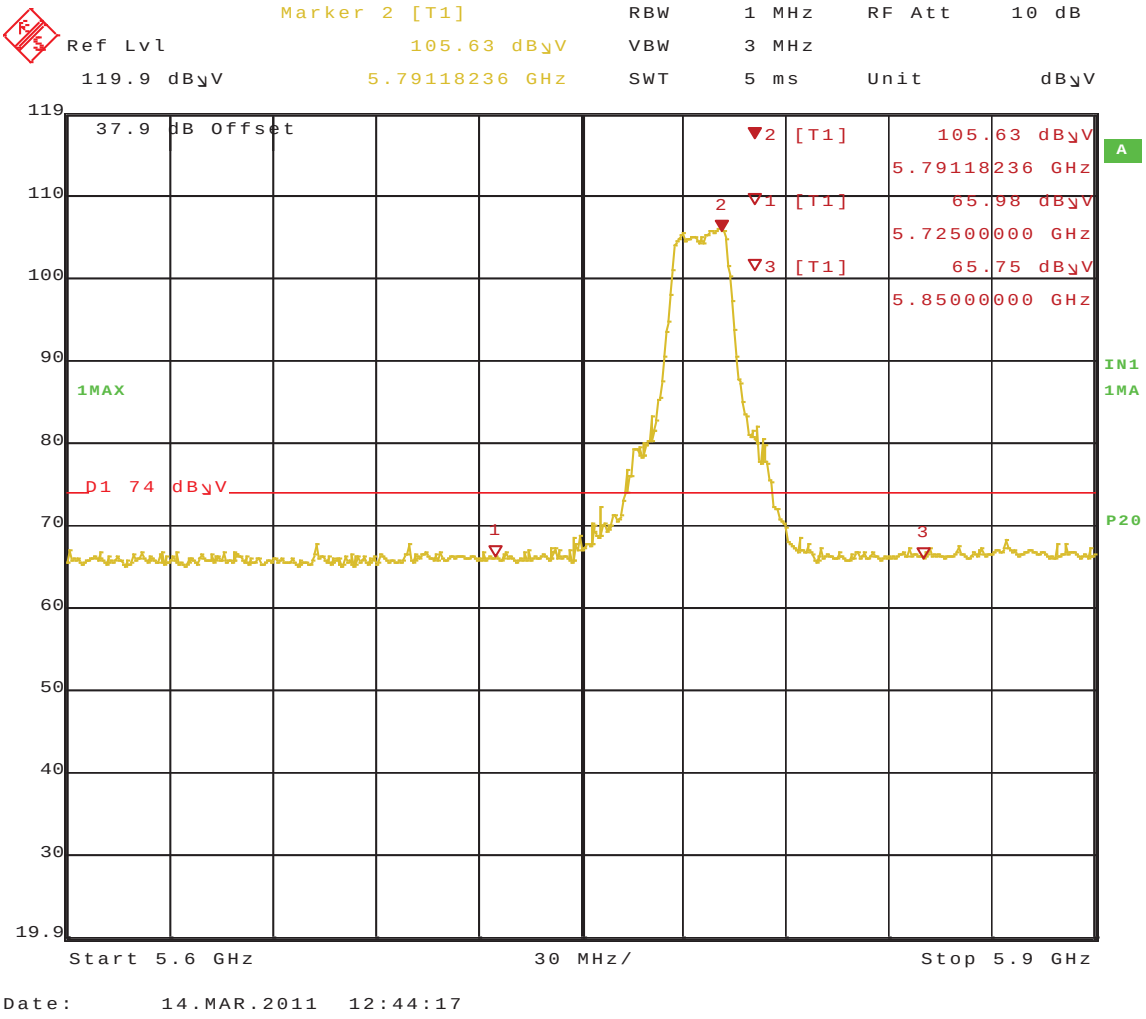



**Figure 571:** Radiated Emission at the Edge for 5785MHz at 6Mbps – Horz. (Peak)

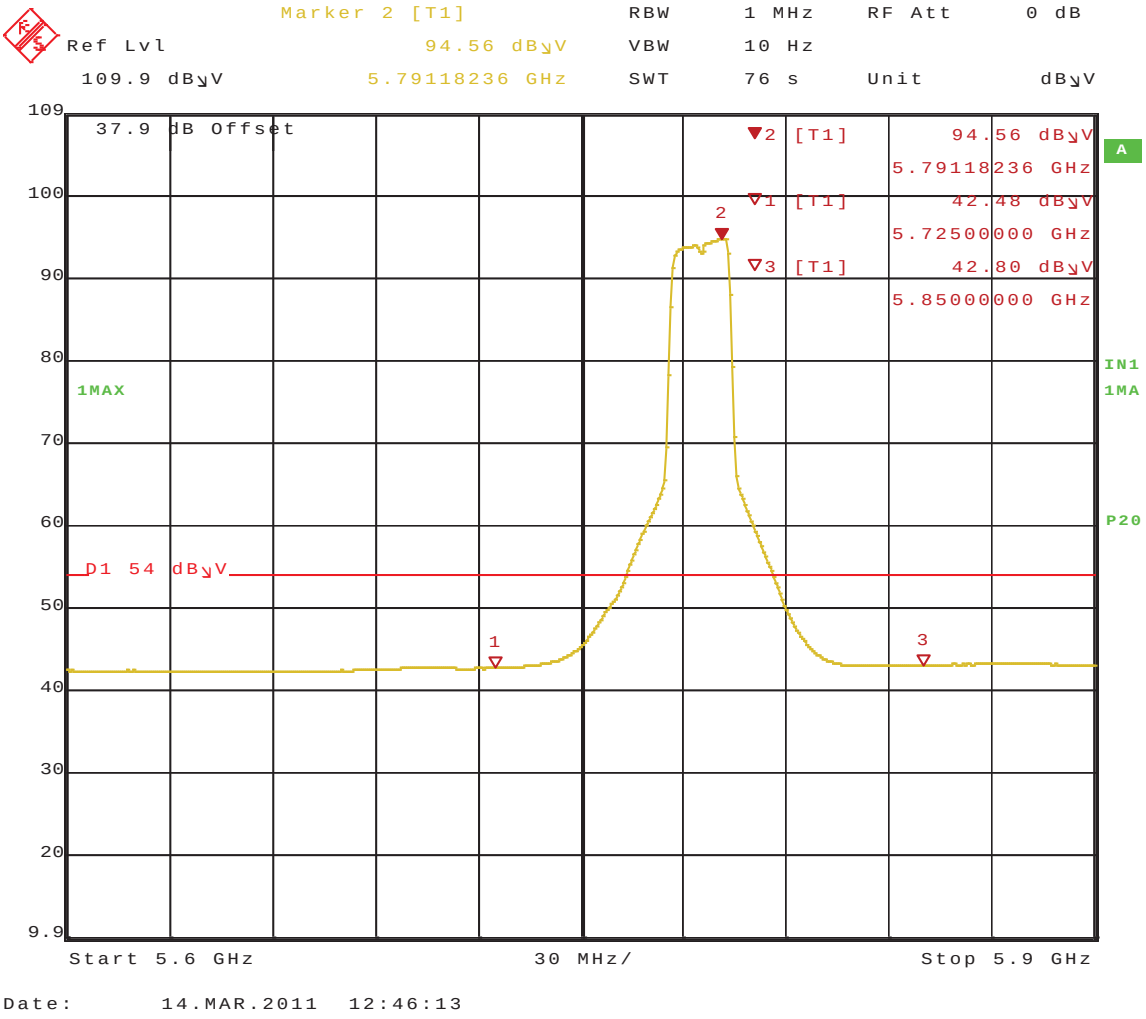



**Figure 572:** Radiated Emission at the Edge for 5785MHz at 6Mbps – Horz. (Ave.)

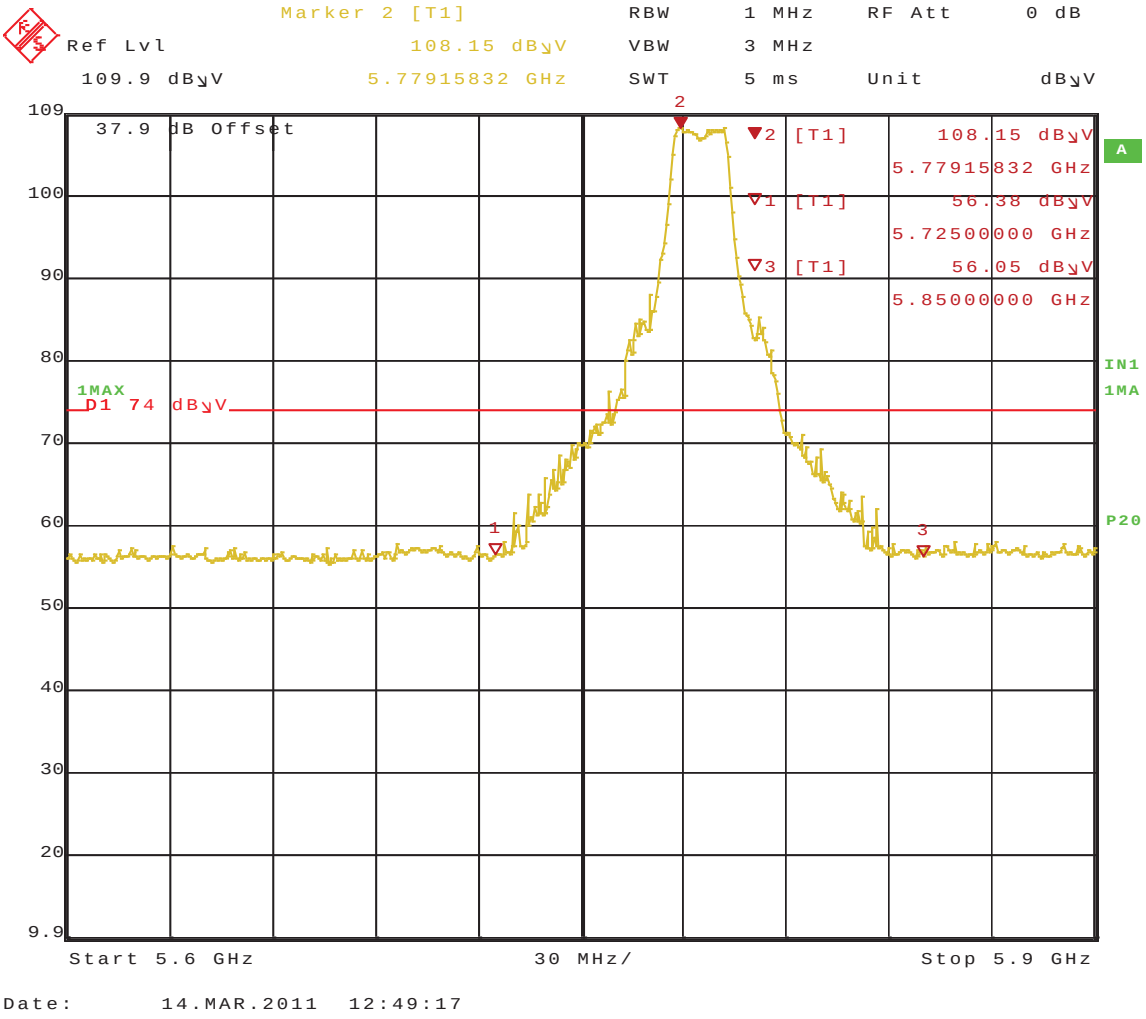



**Figure 573:** Radiated Emission at the Edge for 5785MHz at 6Mbps – Vert. (Peak)

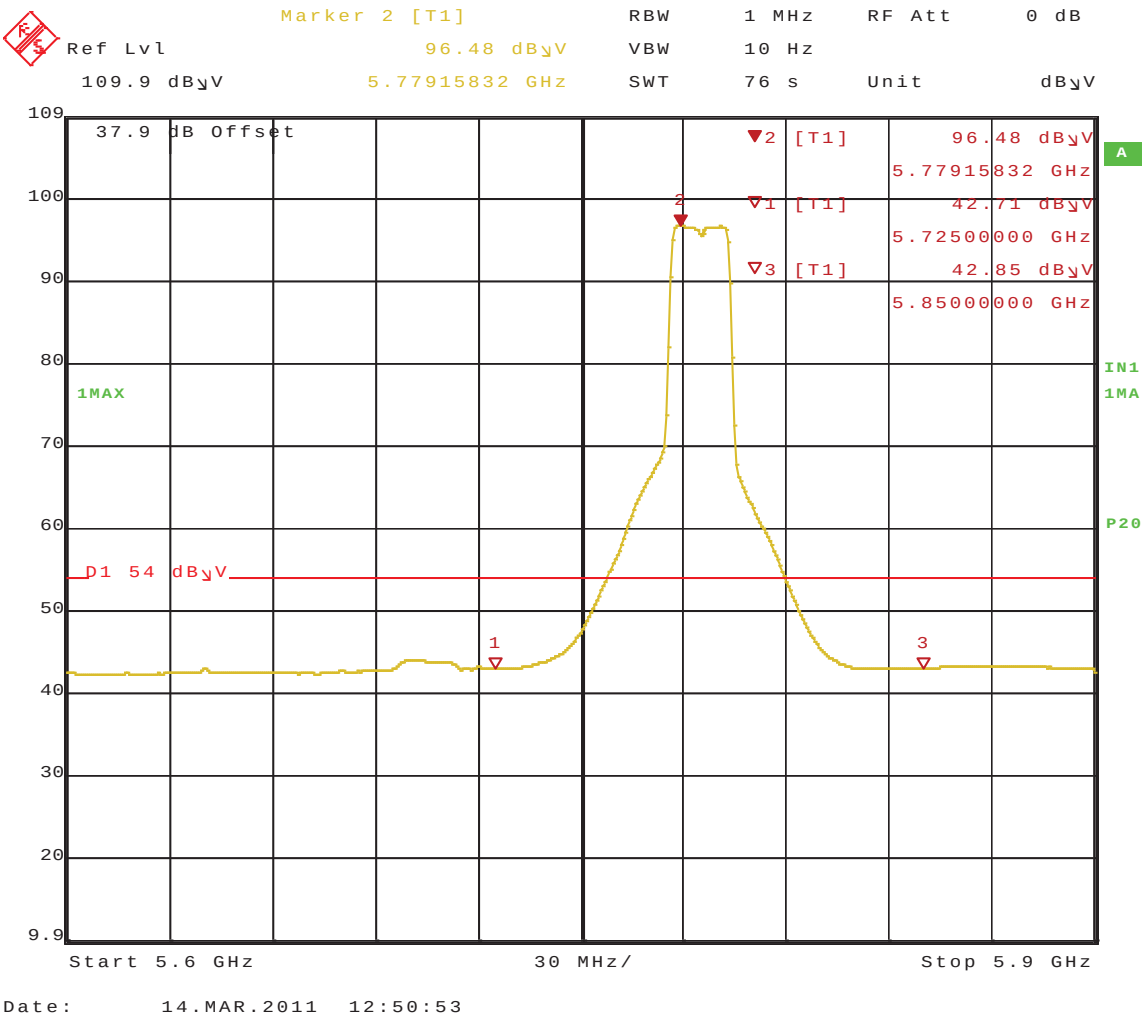



**Figure 574:** Radiated Emission at the Edge for 5785MHz at 6Mbps – Vert. (Ave.)

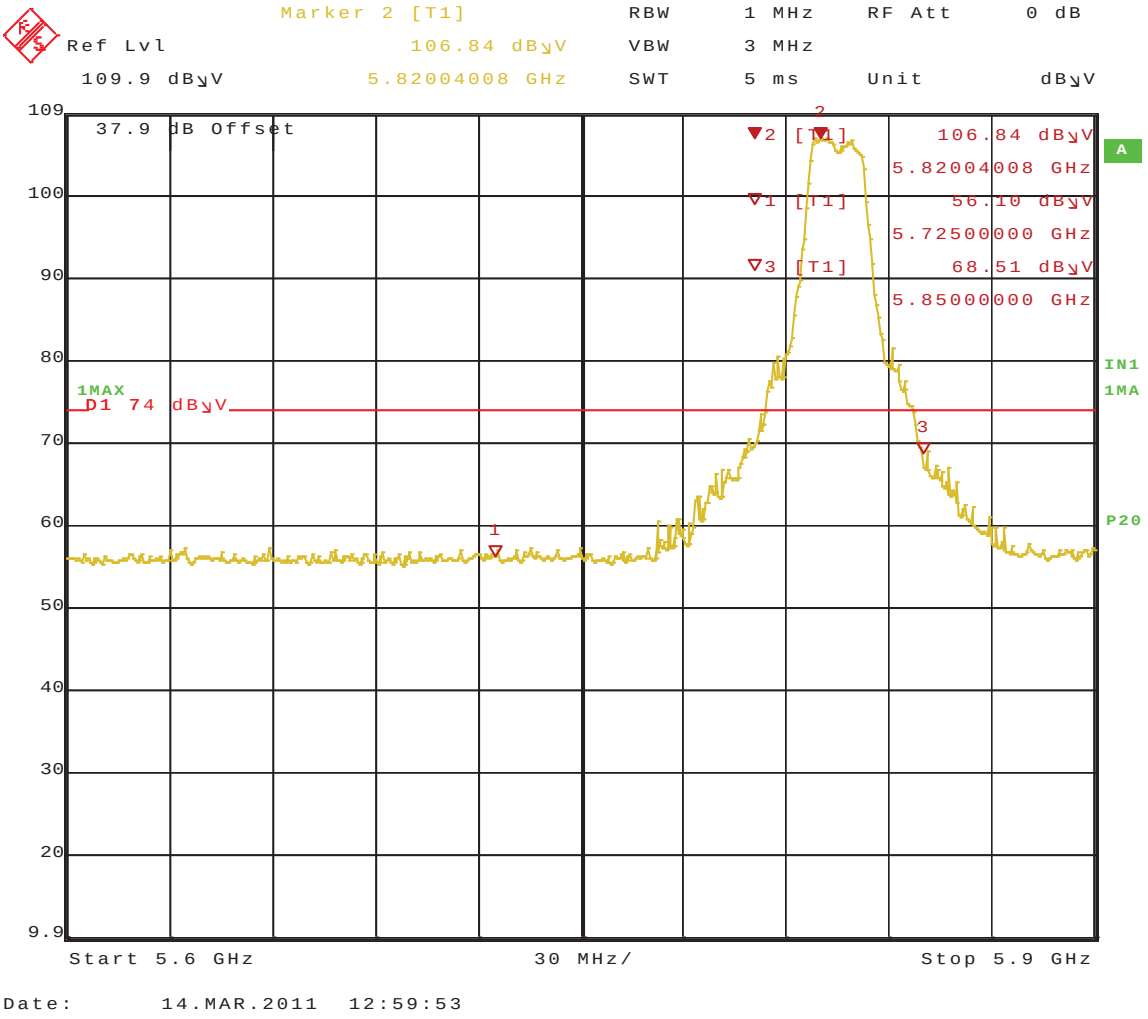



**Figure 575:** Radiated Emission at the Edge for 5825MHz at 6Mbps – Horz. (Peak)

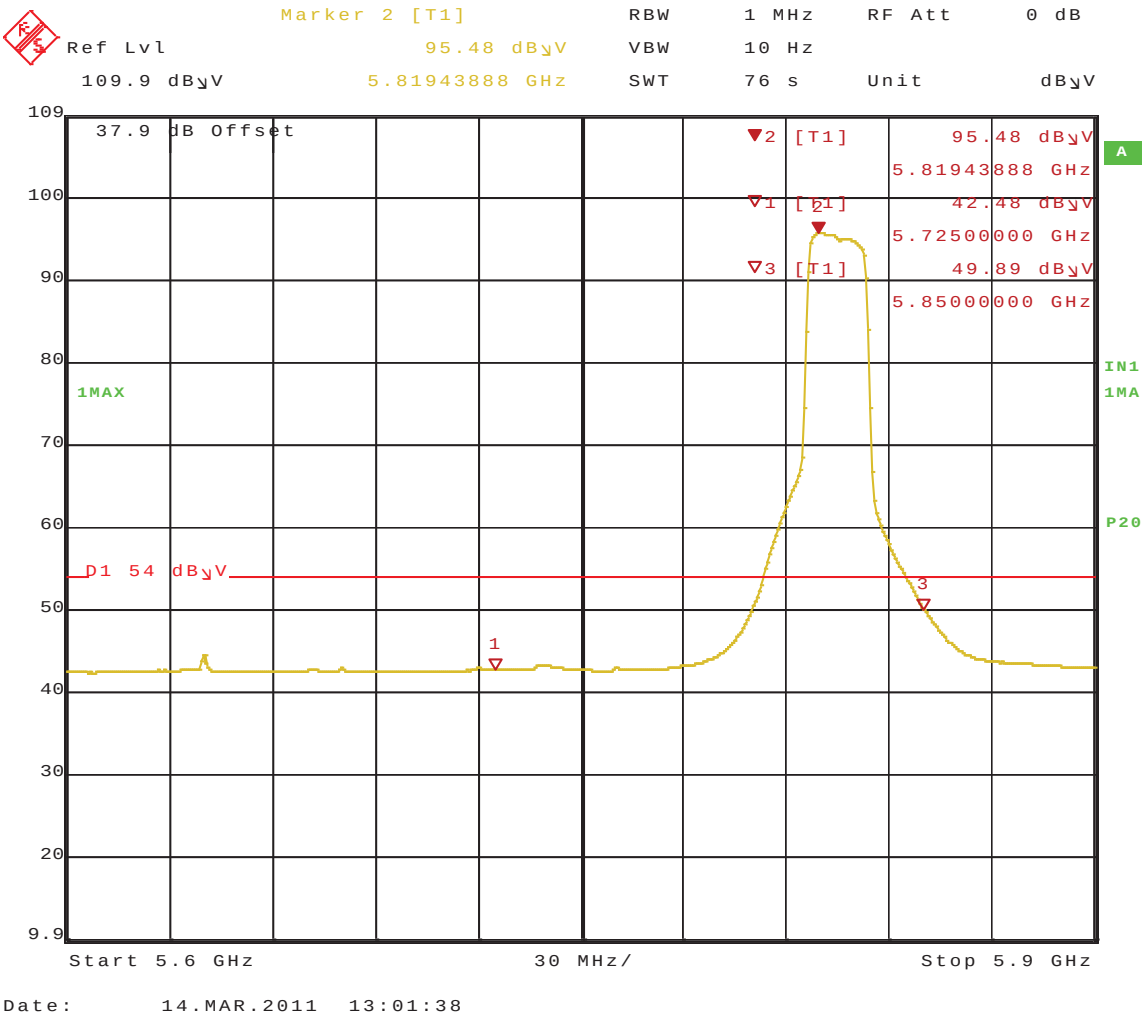



**Figure 576:** Radiated Emission at the Edge for 5825MHz at 6Mbps – Horz. (Ave.)

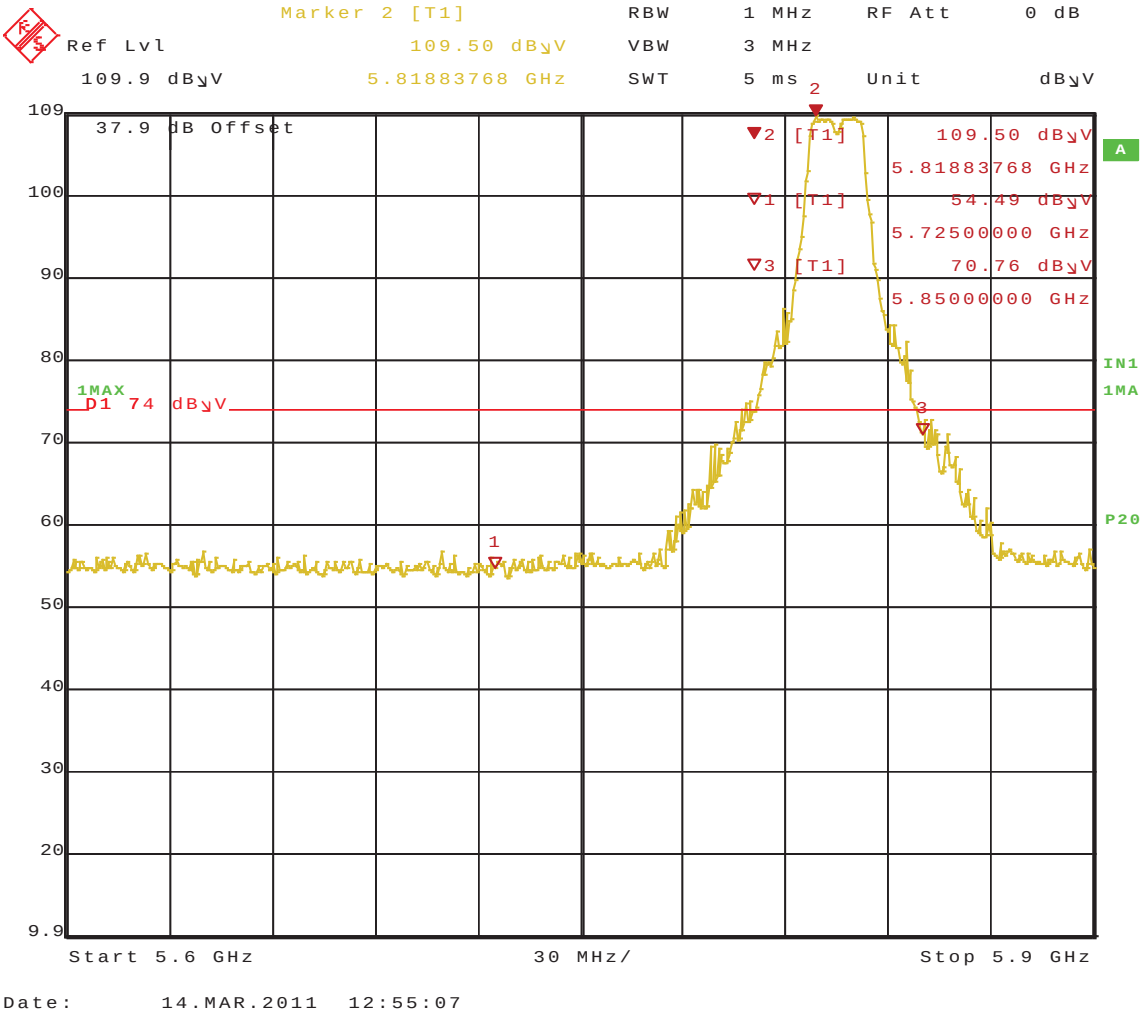



**Figure 577:** Radiated Emission at the Edge for 5825MHz at 6Mbps – Vert. (Peak)

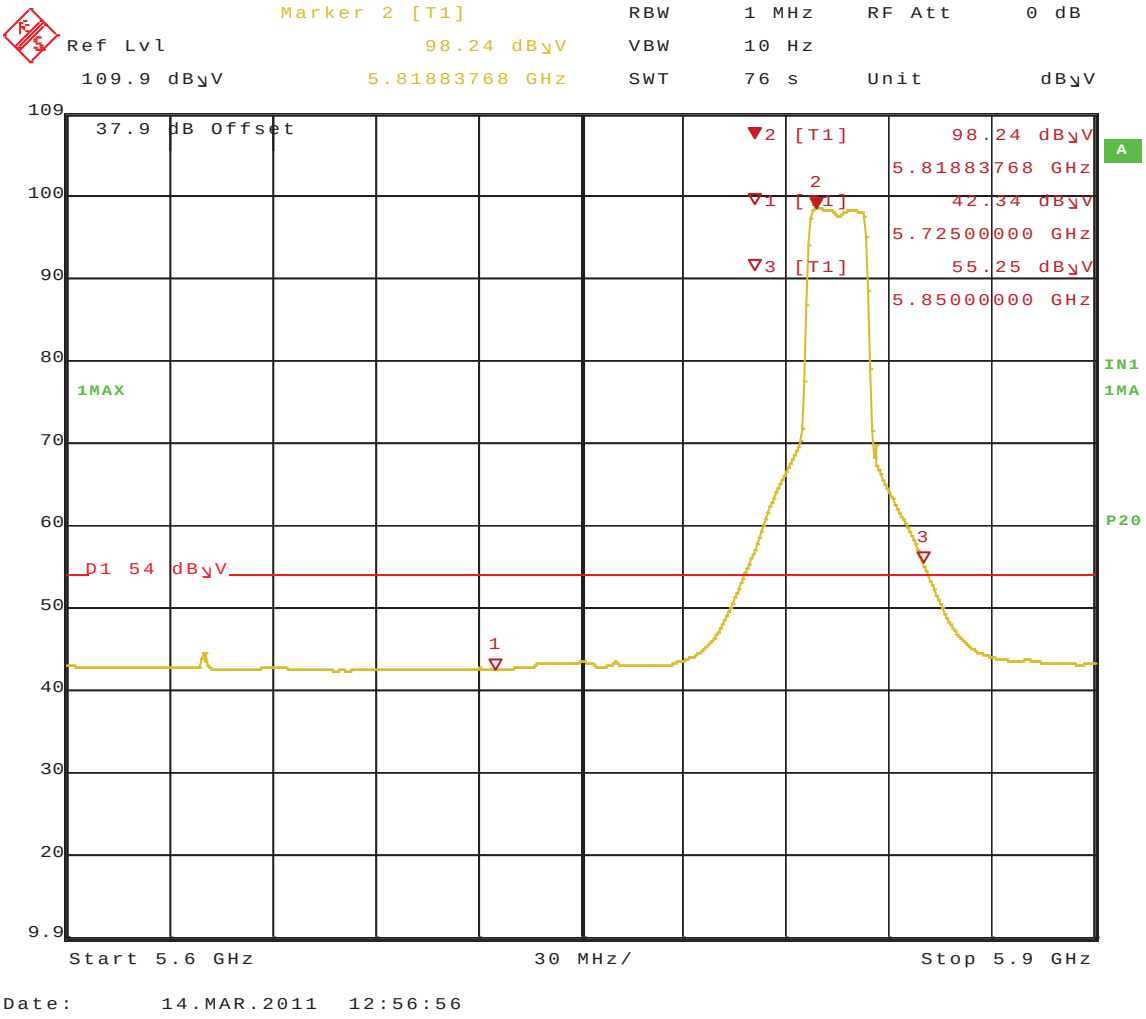



**Figure 578:** Radiated Emission at the Edge for 5825MHz at 6Mbps – Vert. (Ave.)

**Note:** Band-edge at 5850 MHz is not in the restricted band; therefore 20 dBr is applied.

Marker #3 is has more than 20 dBr from Marker #2

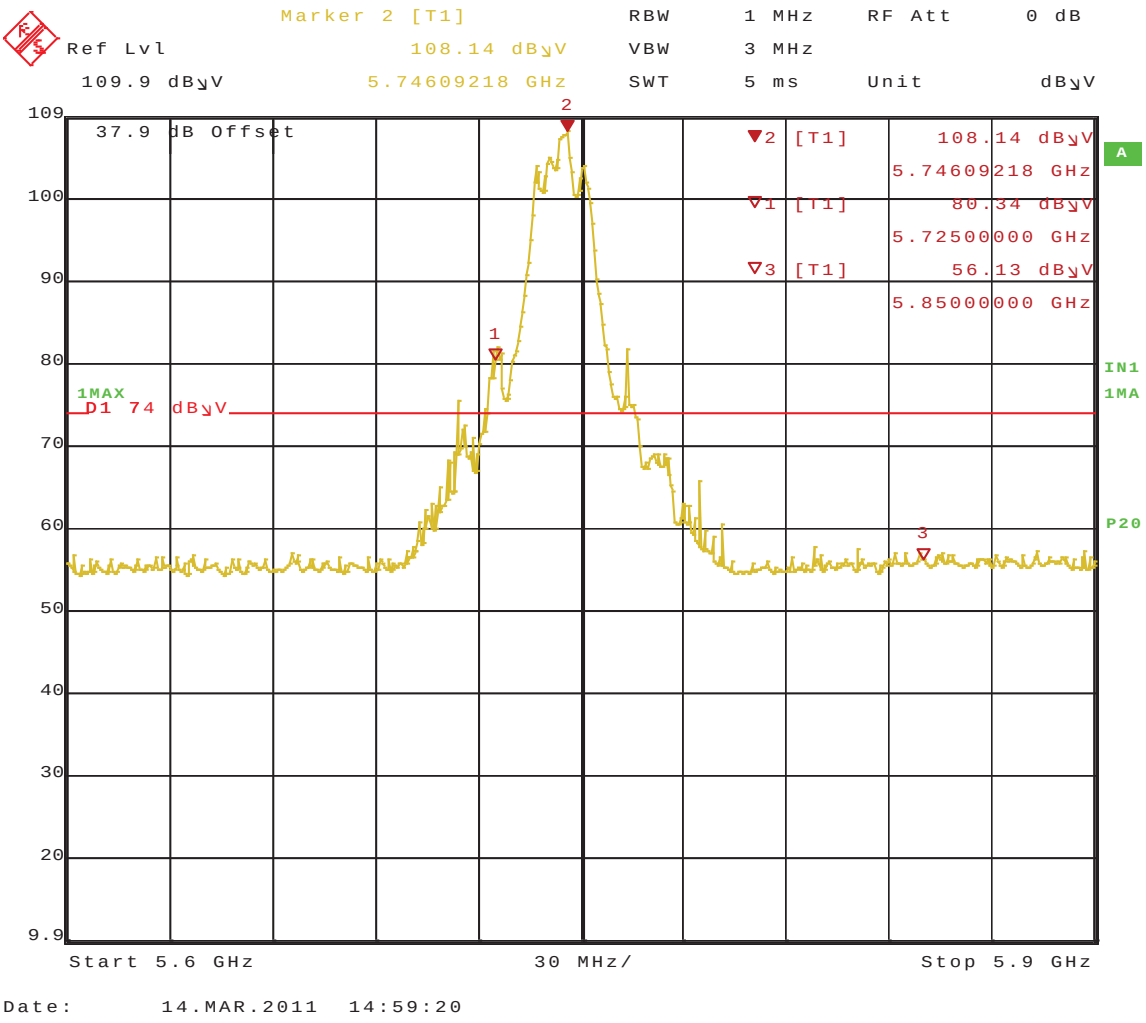



**Figure 579:** Radiated Emission at the Edge for 5745MHz at 19.5Mbps – Horz. (Peak)

**Note:** Band-edge at 5725MHz is not in the restricted band; therefore 20 dBr is applied.

Marker #1 is has more than 20 dBr from Marker #2

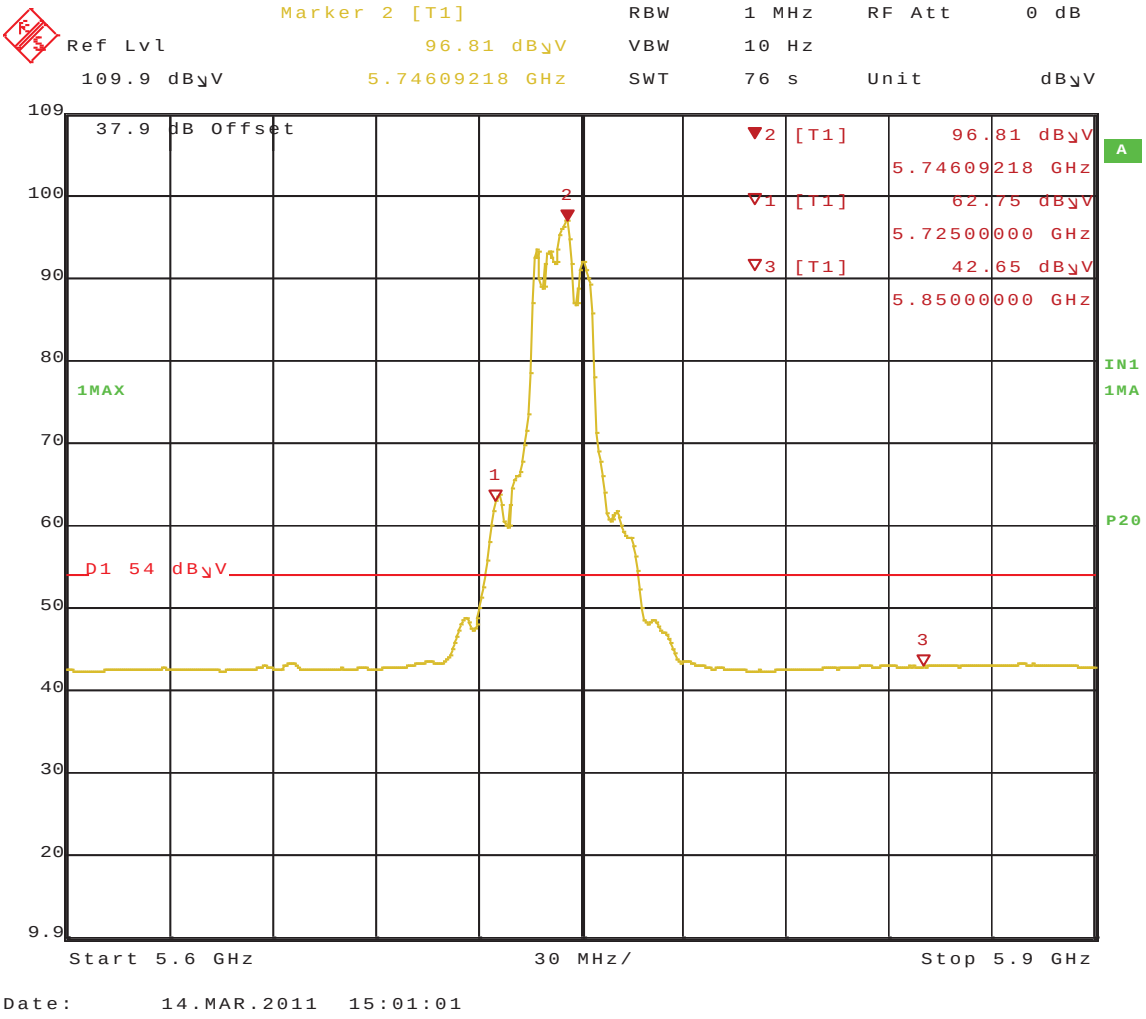



**Figure 580:** Radiated Emission at the Edge for 5745MHz at 19.5Mbps – Horz. (Ave.)

**Note:** Band-edge at 5725MHz is not in the restricted band; therefore 20 dBr is applied.

Marker #1 is has more than 20 dBr from Marker #2

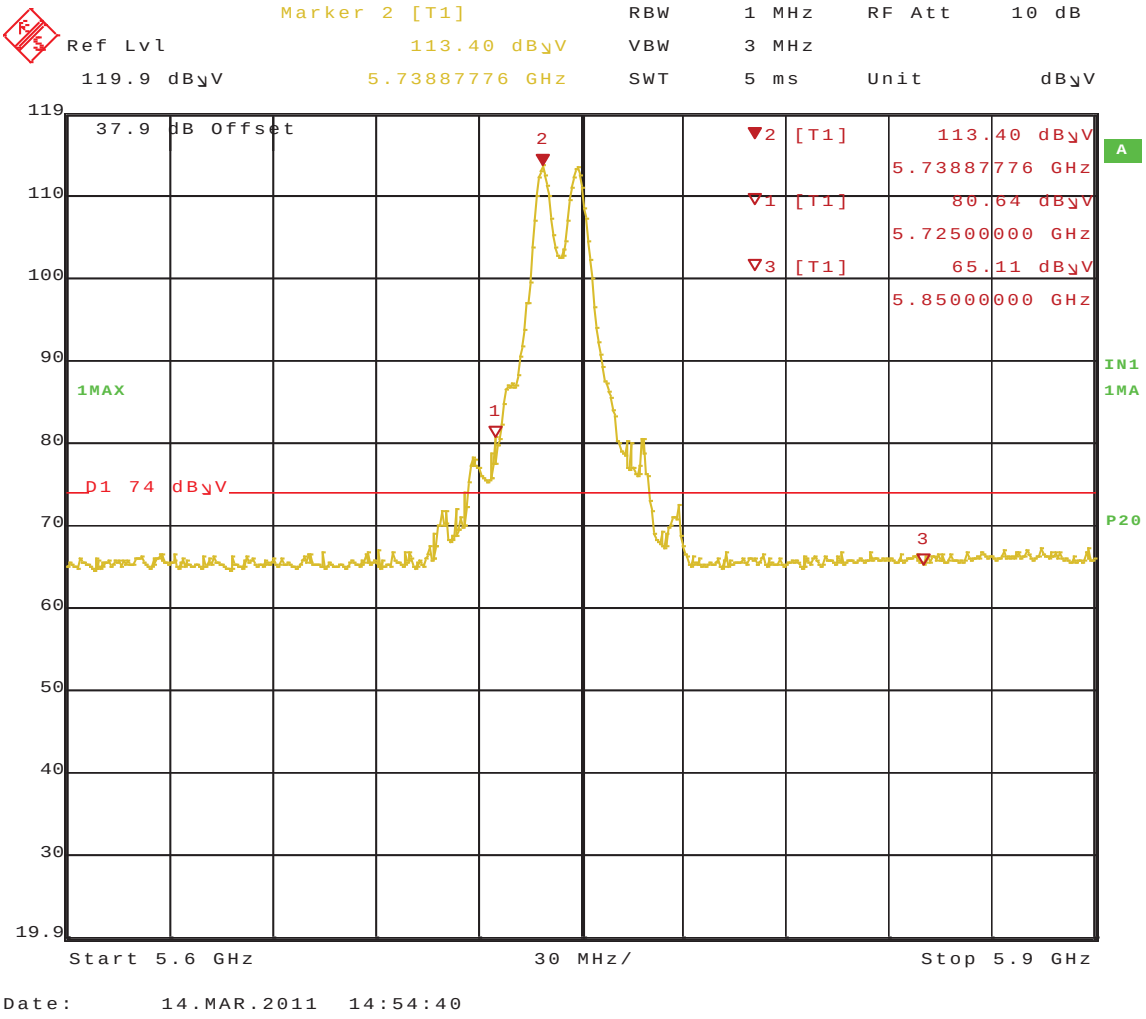



**Figure 581:** Radiated Emission at the Edge for 5745MHz at 19.5Mbps – Vert. (Peak)

**Note:** Band-edge at 5725MHz is not in the restricted band; therefore 20 dBr is applied.

Marker #1 is has more than 20 dBr from Marker #2

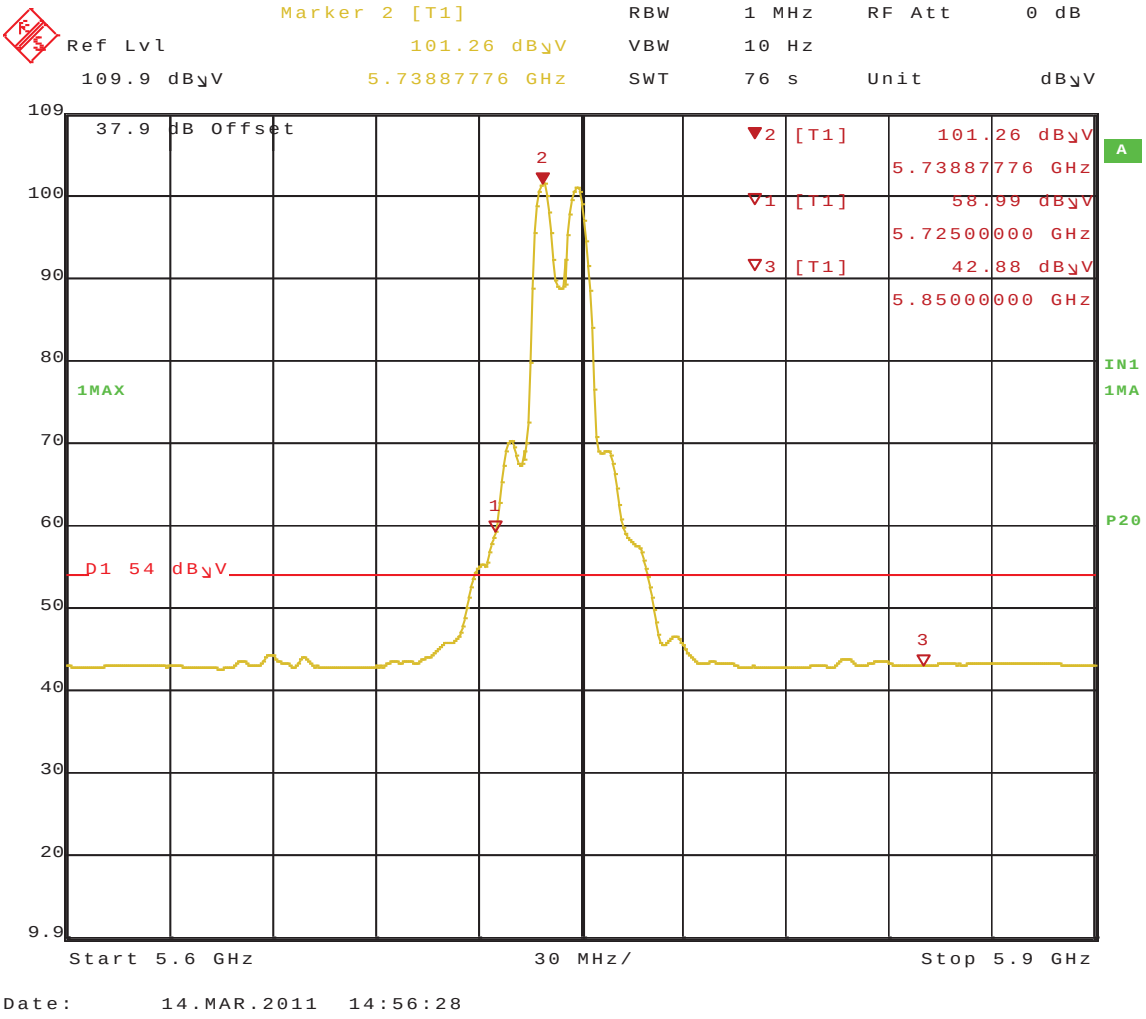



**Figure 582:** Radiated Emission at the Edge for 5745MHz at 19.5Mbps – Vert. (Ave.)

**Note:** Band-edge at 5725MHz is not in the restricted band; therefore 20 dBr is applied.

Marker #1 is has more than 20 dBr from Marker #2

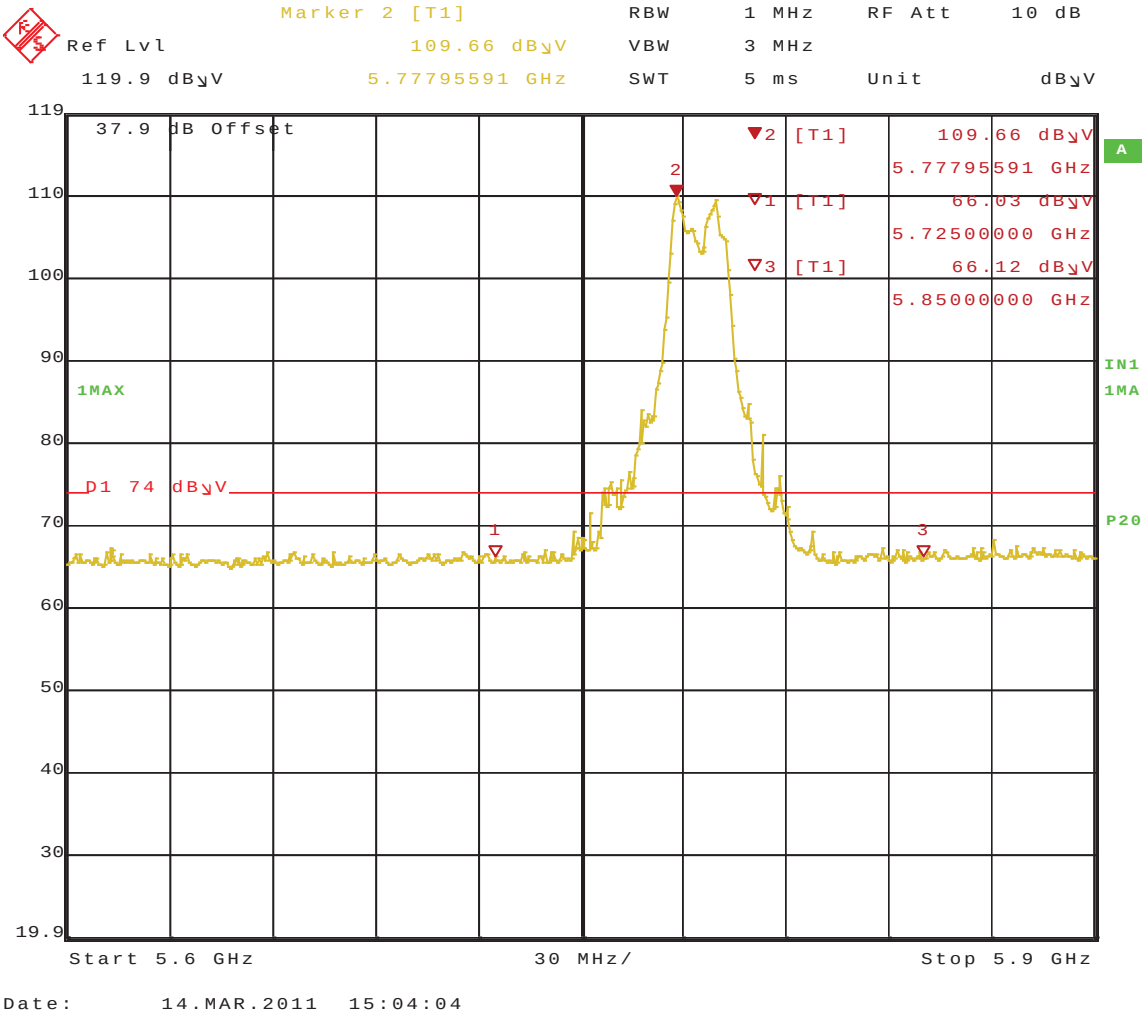



**Figure 583:** Radiated Emission at the Edge for 5785MHz at 19.5Mbps – Horz. (Peak)

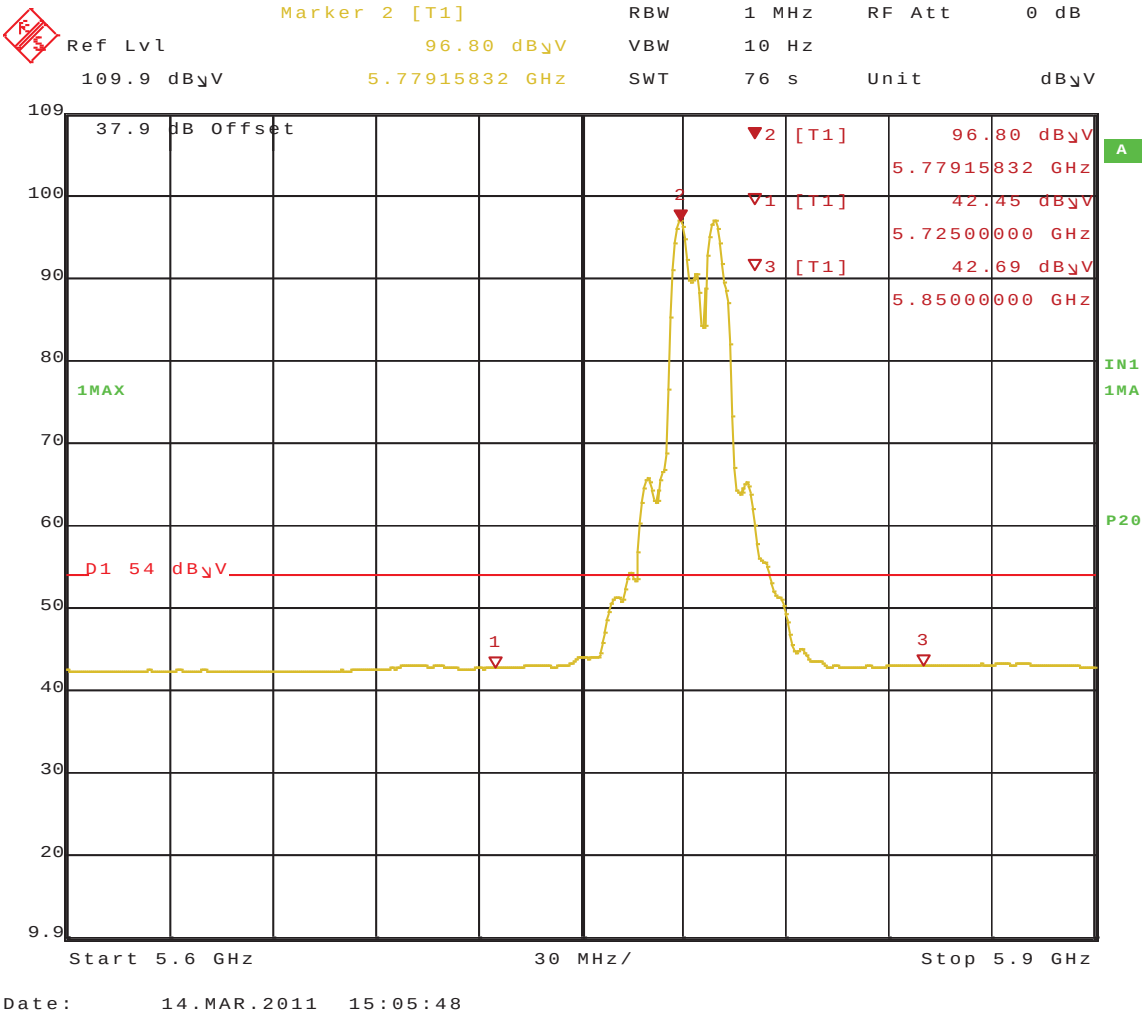



**Figure 584:** Radiated Emission at the Edge for 5785MHz at 19.5Mbps – Horz. (Ave.)

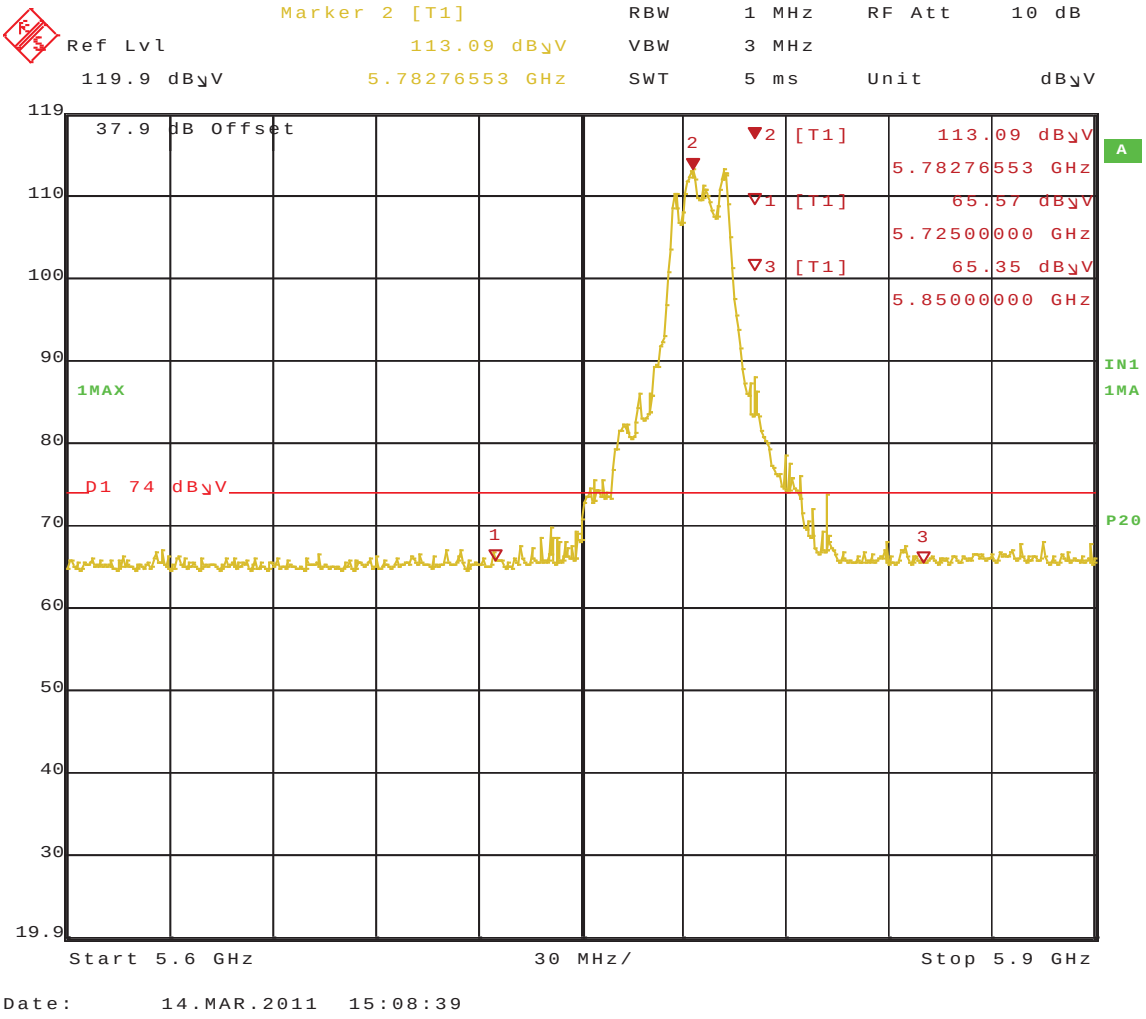



**Figure 585:** Radiated Emission at the Edge for 5785MHz at 19.5Mbps – Vert. (Peak)

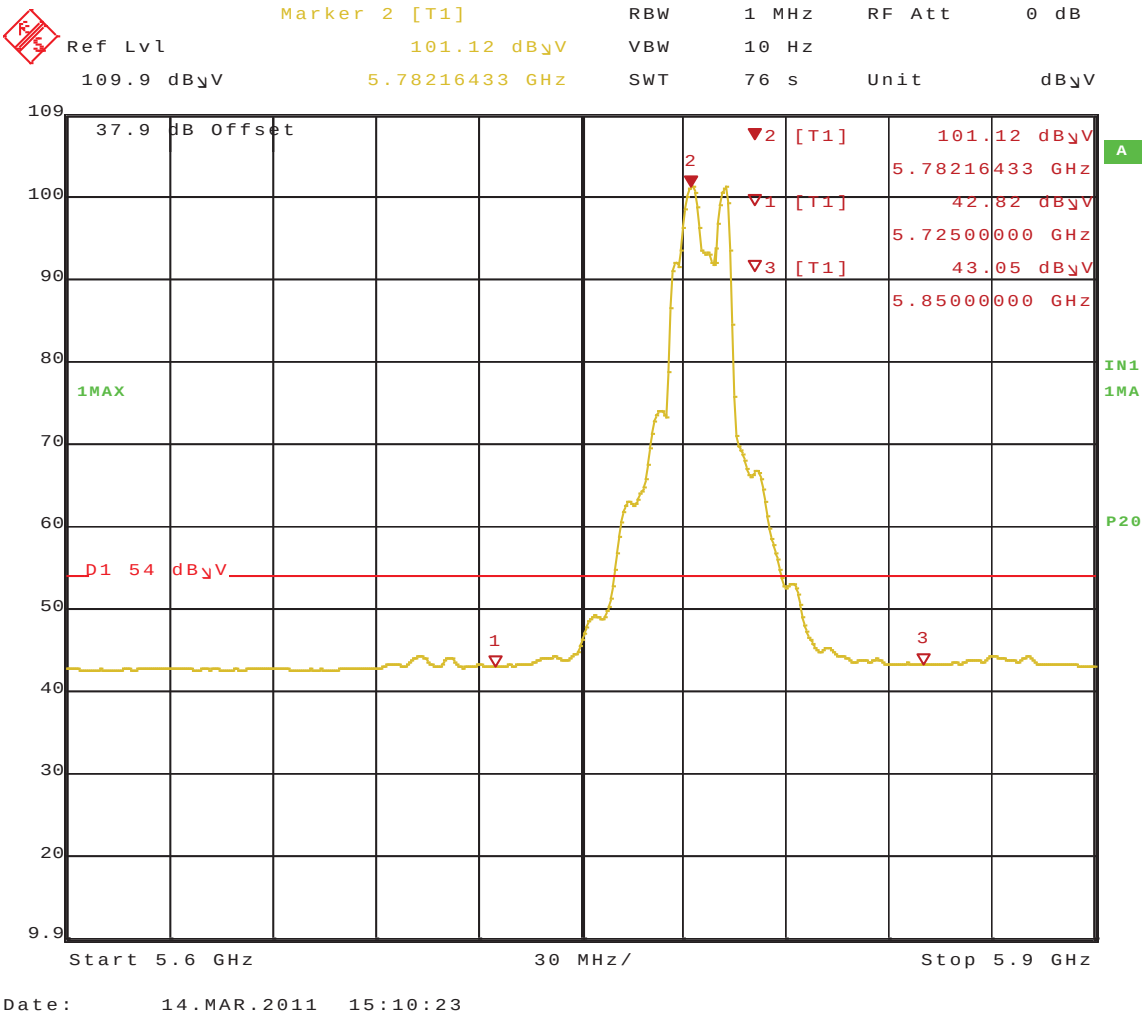



**Figure 586:** Radiated Emission at the Edge for 5785MHz at 19.5Mbps – Vert. (Ave.)

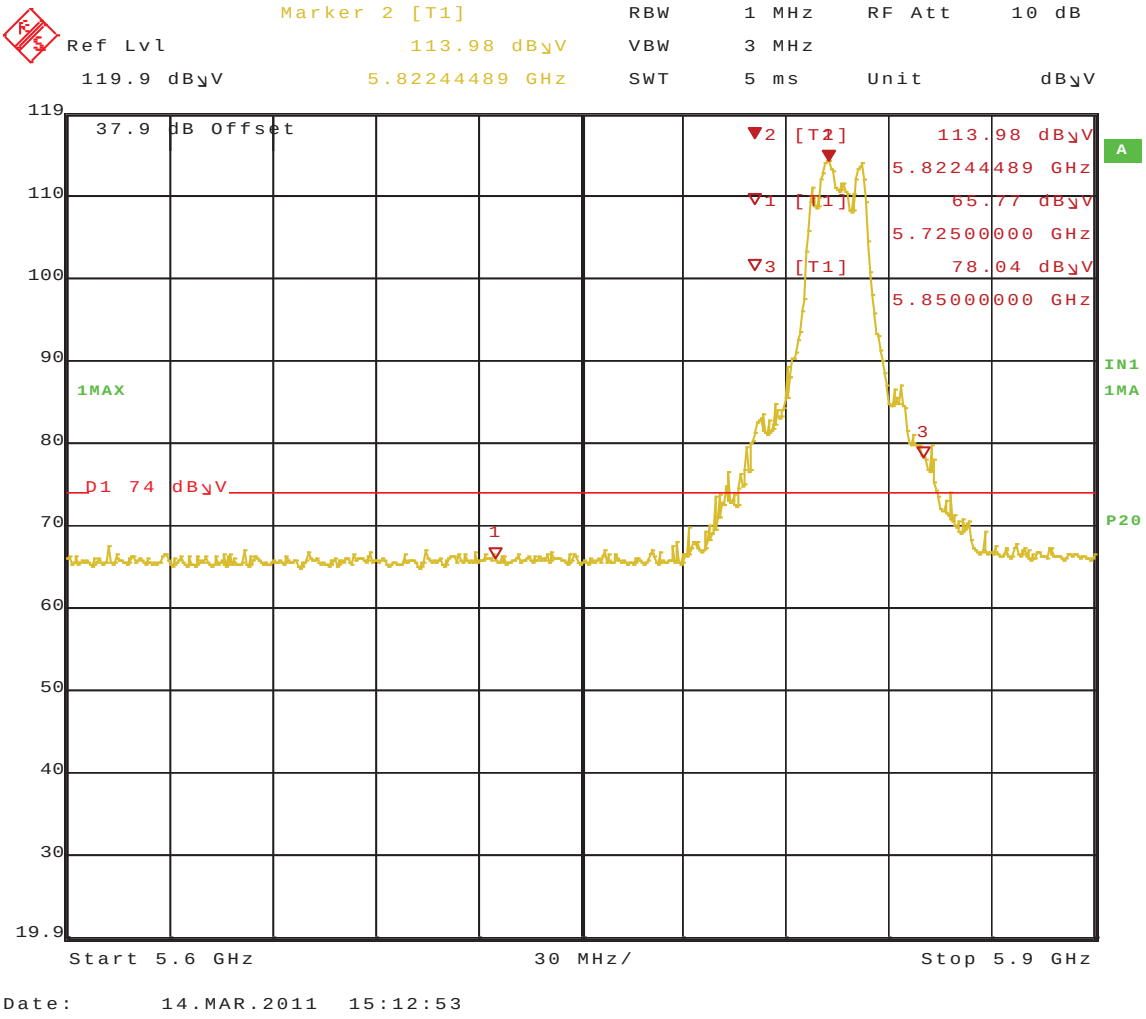



**Figure 587:** Radiated Emission at the Edge for 5825MHz at 19.5Mbps – Horz. (Peak)

**Note:** Band-edge at 5850 MHz is not in the restricted band; therefore 20 dBr is applied.

Marker #3 is has more than 20 dBr from Marker #2

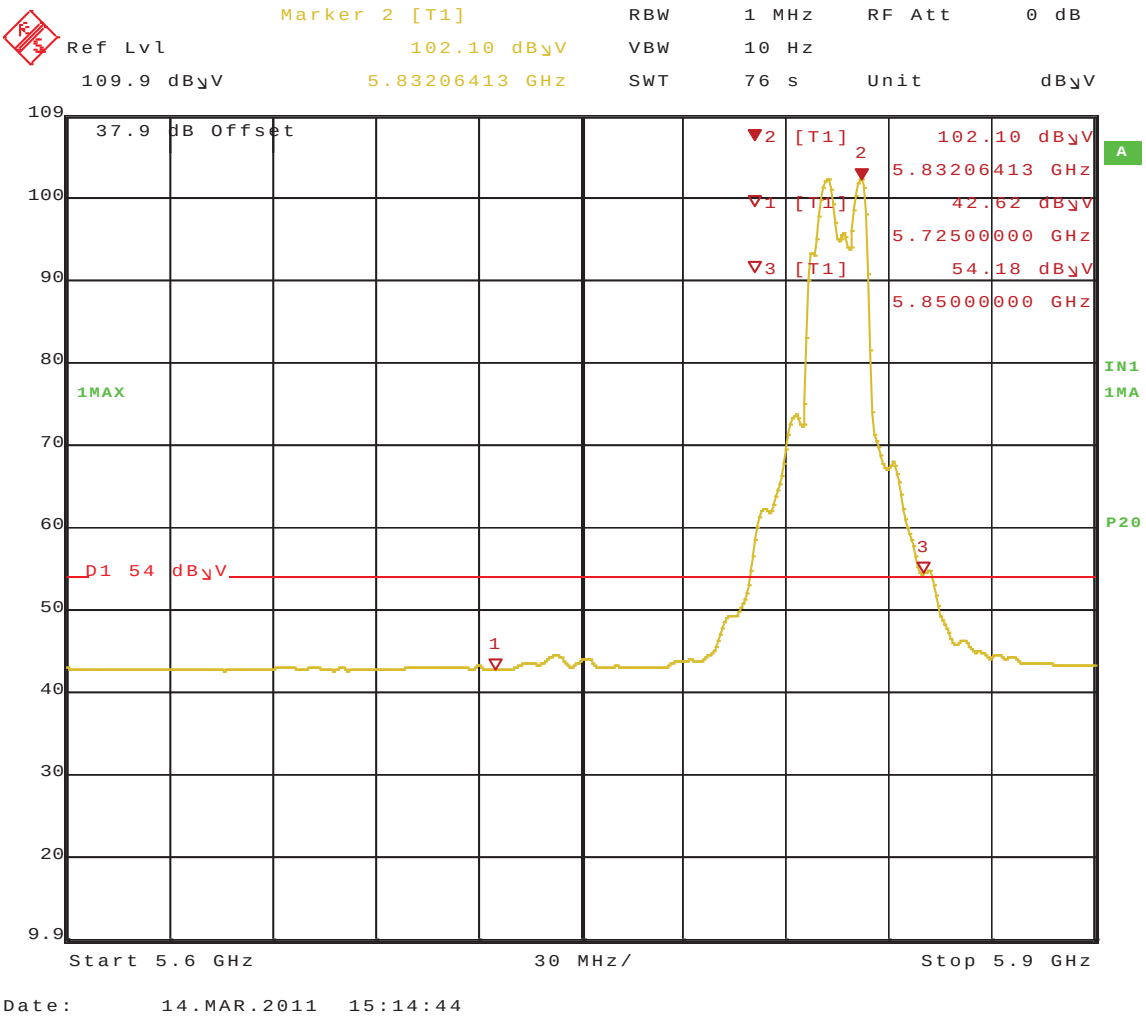



**Figure 588:** Radiated Emission at the Edge for 5825MHz at 19.5Mbps – Horz. (Ave.)

**Note:** Band-edge at 5850 MHz is not in the restricted band; therefore 20 dBr is applied.

Marker #3 is has more than 20 dBr from Marker #2

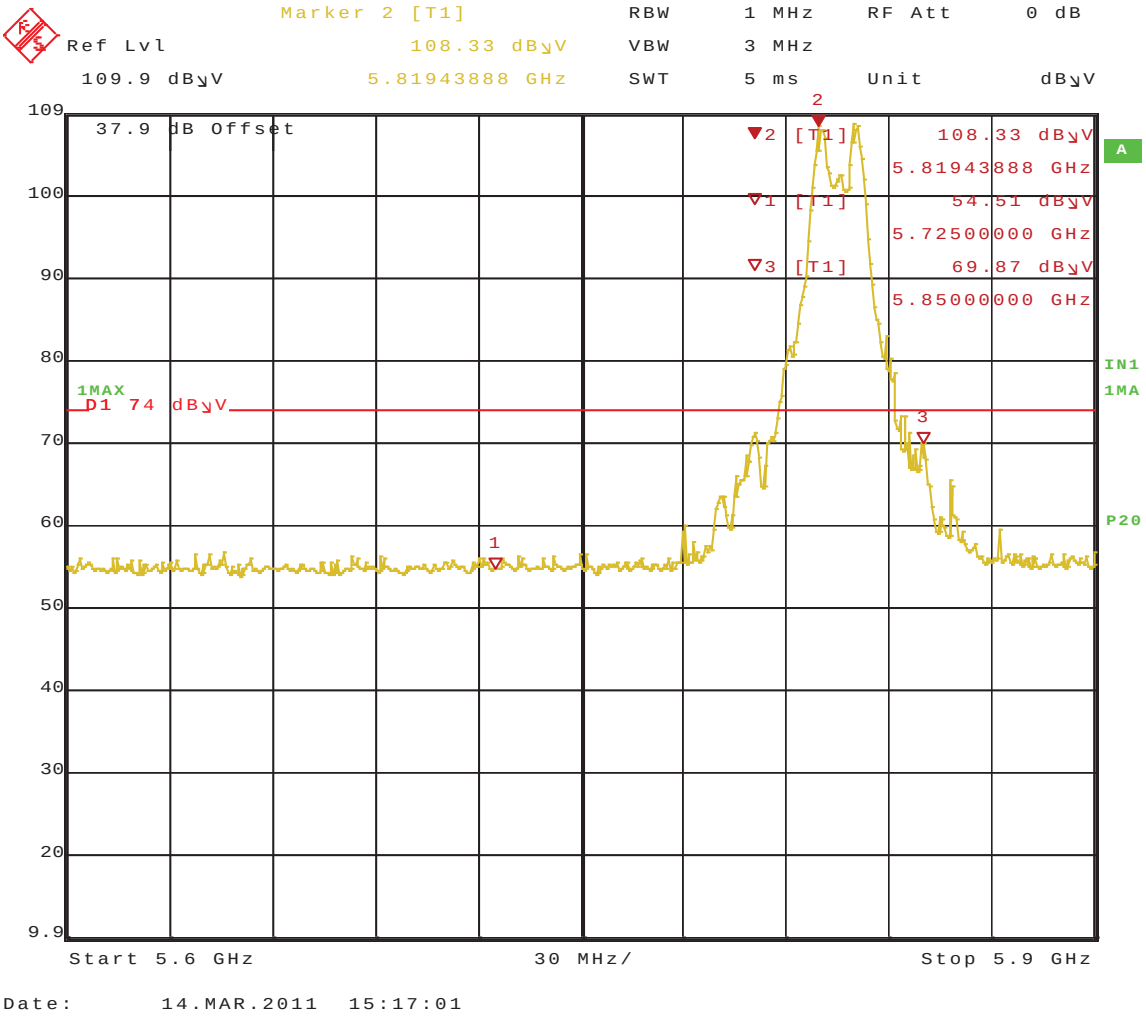



**Figure 589:** Radiated Emission at the Edge for 5825MHz at 19.5Mbps – Vert. (Peak)

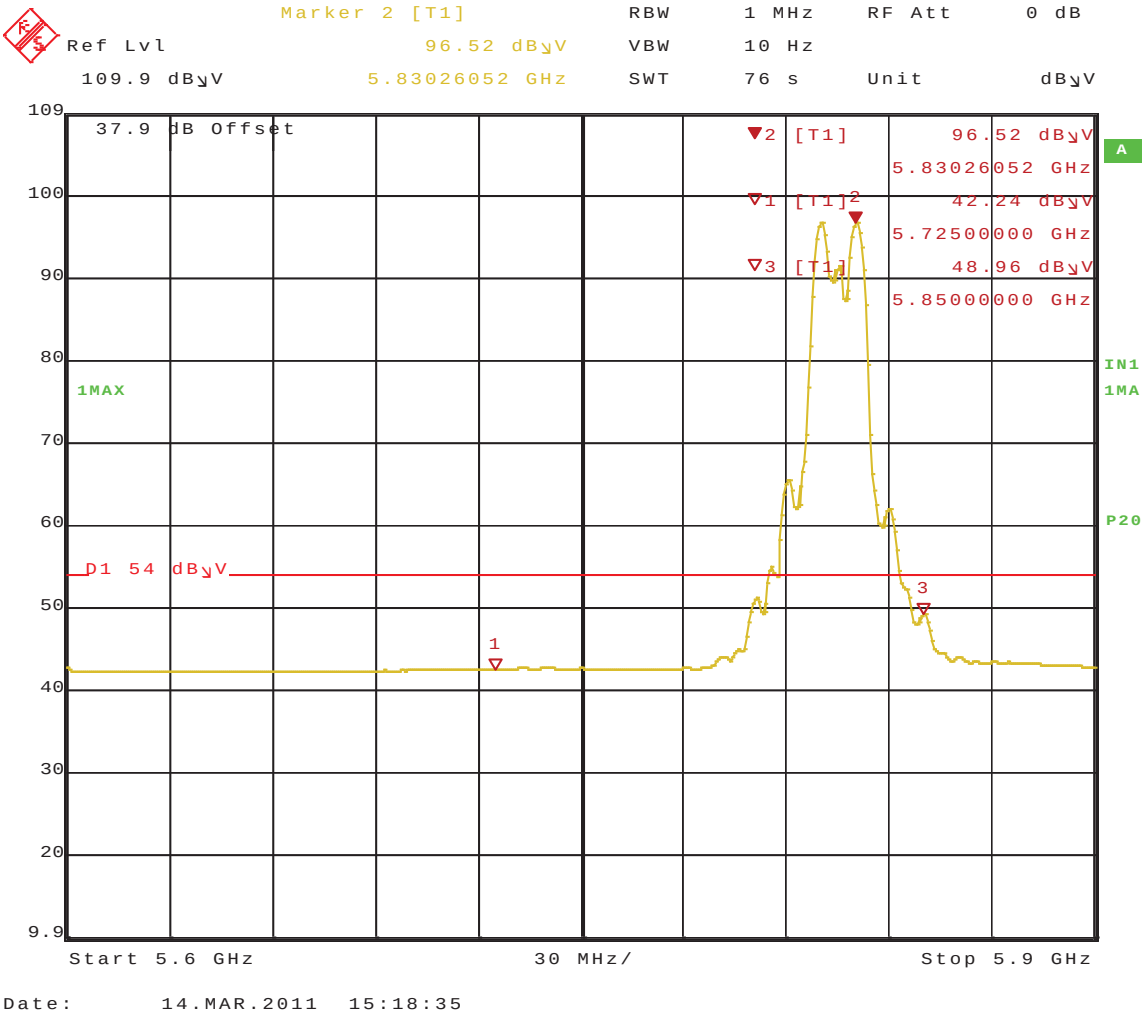



**Figure 590:** Radiated Emission at the Edge for 5825MHz at 19.5Mbps – Vert. (Ave.)

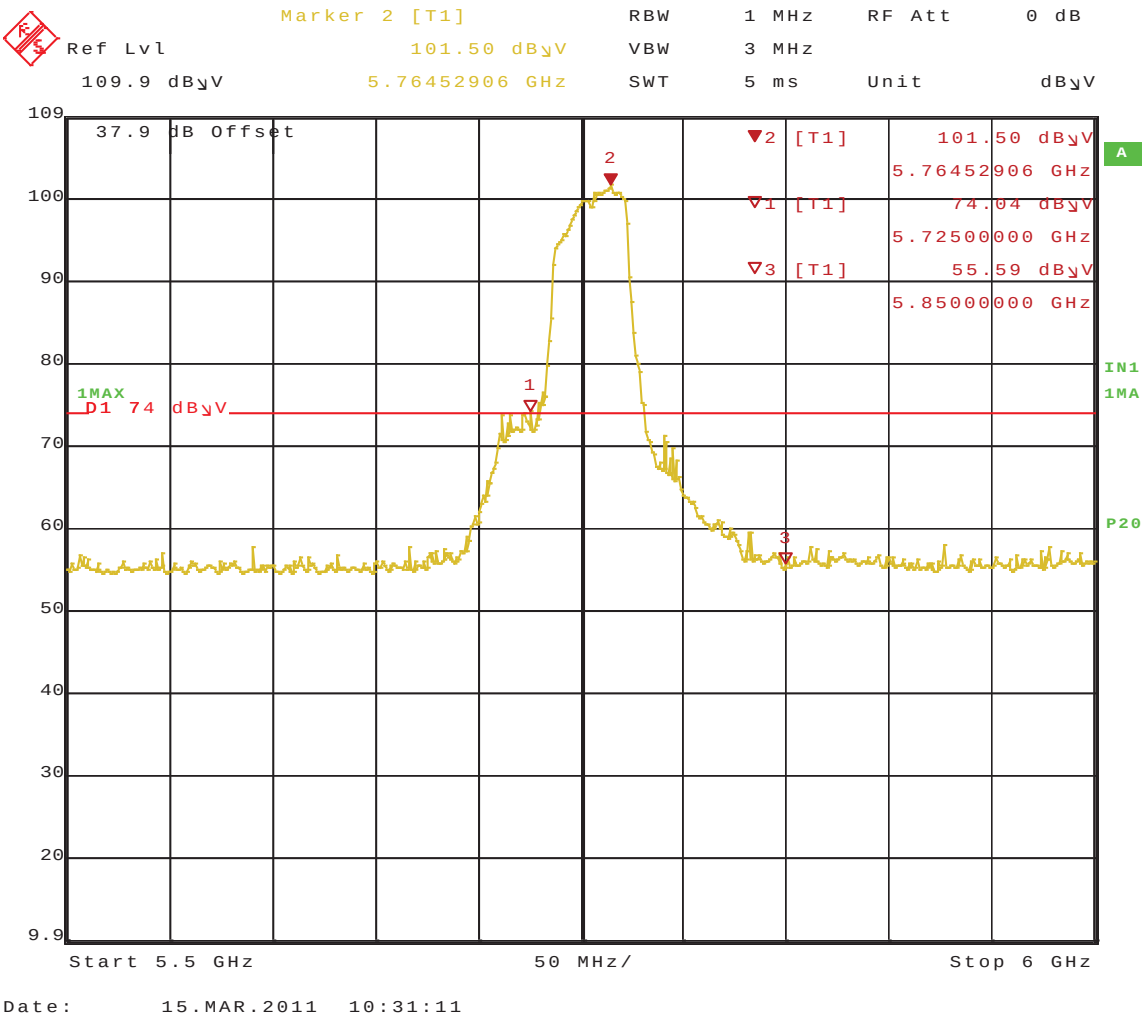



**Figure 591:** Radiated Emission at the Edge for 5755MHz at 13.5Mbps – Horz. (Peak)

**Note:** Band-edge at 5725MHz is not in the restricted band; therefore 20 dBr is applied.

Marker #1 is has more than 20 dBr from Marker #2

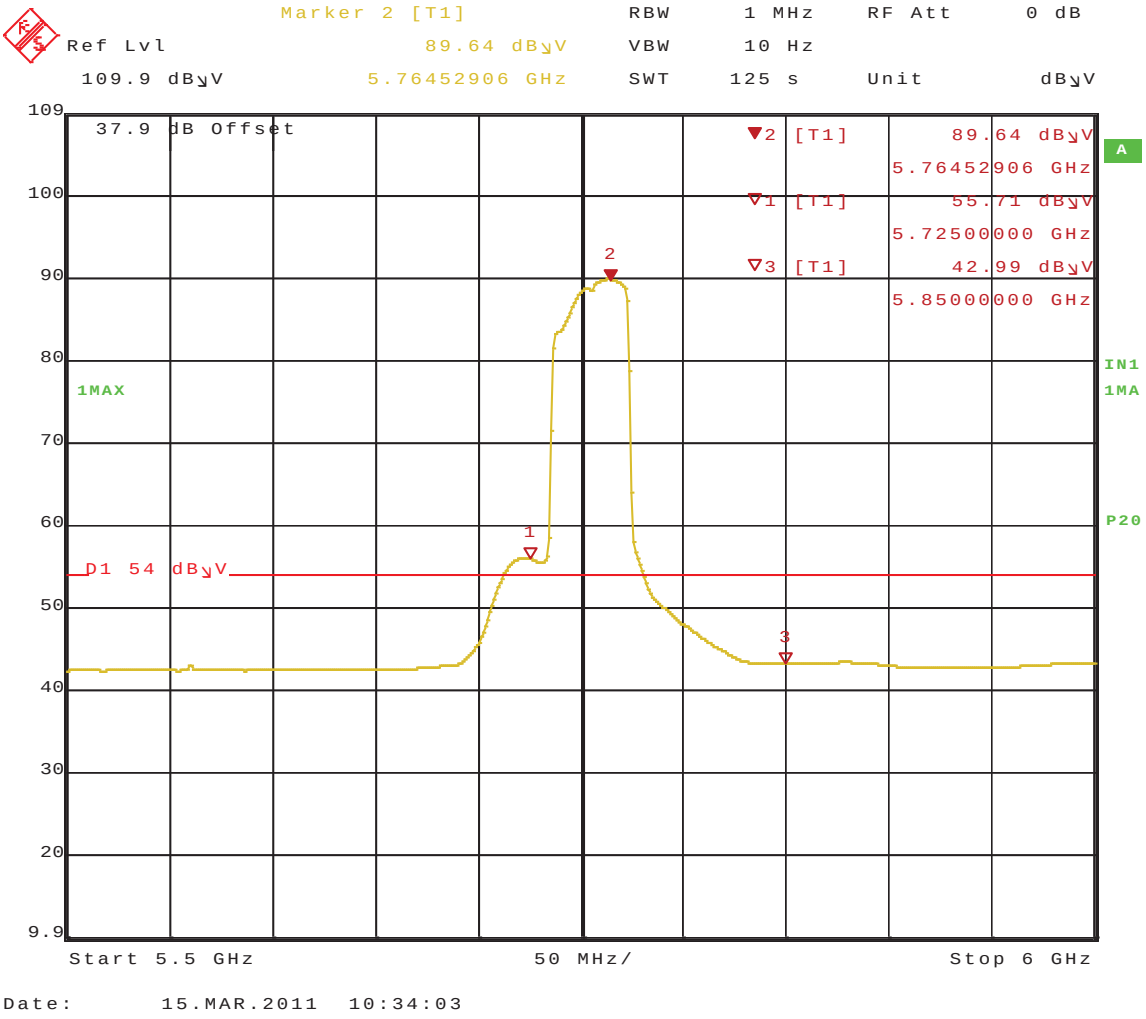



**Figure 592:** Radiated Emission at the Edge for 5755MHz at 13.5Mbps – Horz. (Ave.)

**Note:** Band-edge at 5725MHz is not in the restricted band; therefore 20 dBr is applied.

Marker #1 is has more than 20 dBr from Marker #2

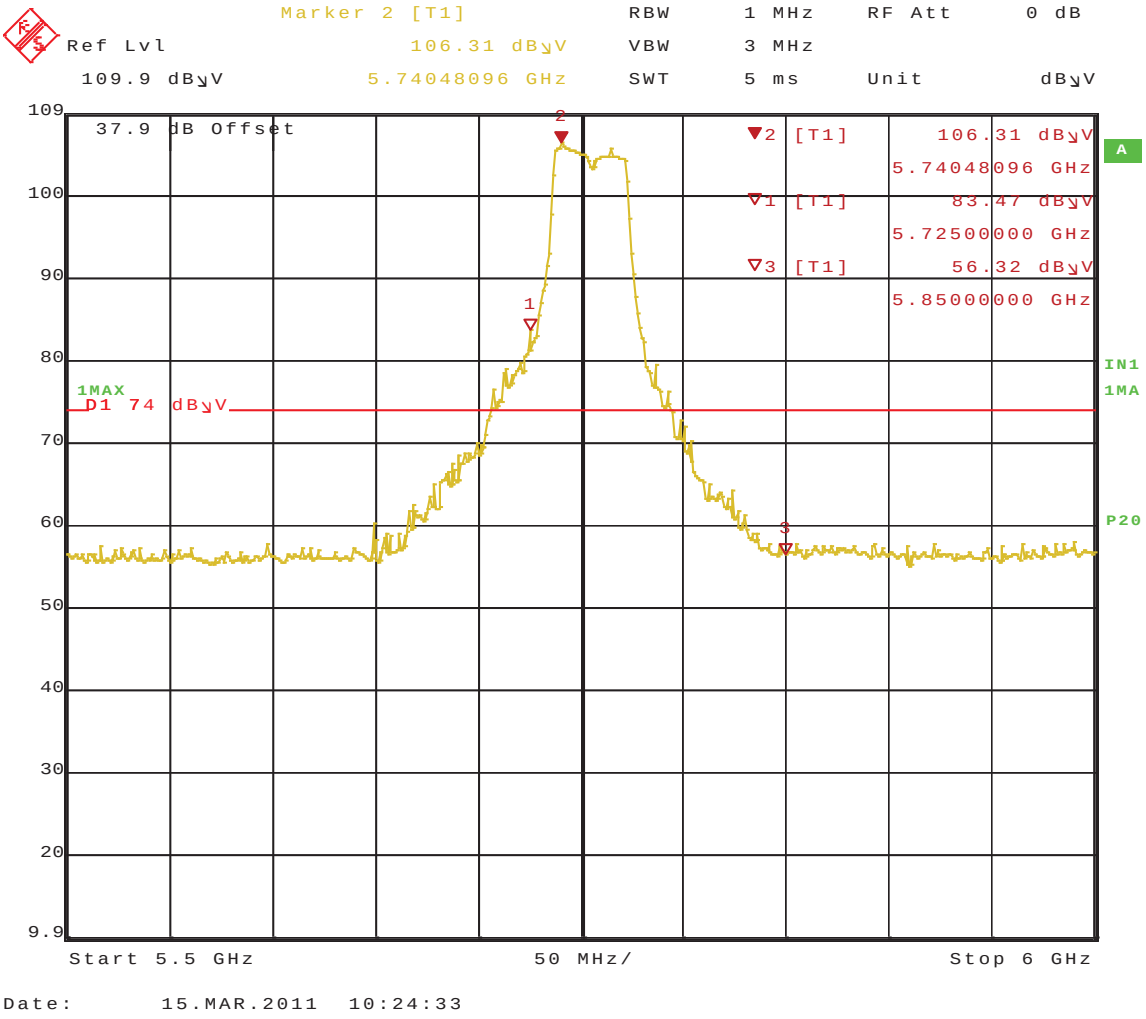



**Figure 593:** Radiated Emission at the Edge for 5755MHz at 13.5Mbps – Vert. (Peak)

**Note:** Band-edge at 5725MHz is not in the restricted band; therefore 20 dBr is applied.

Marker #1 is has more than 20 dBr from Marker #2

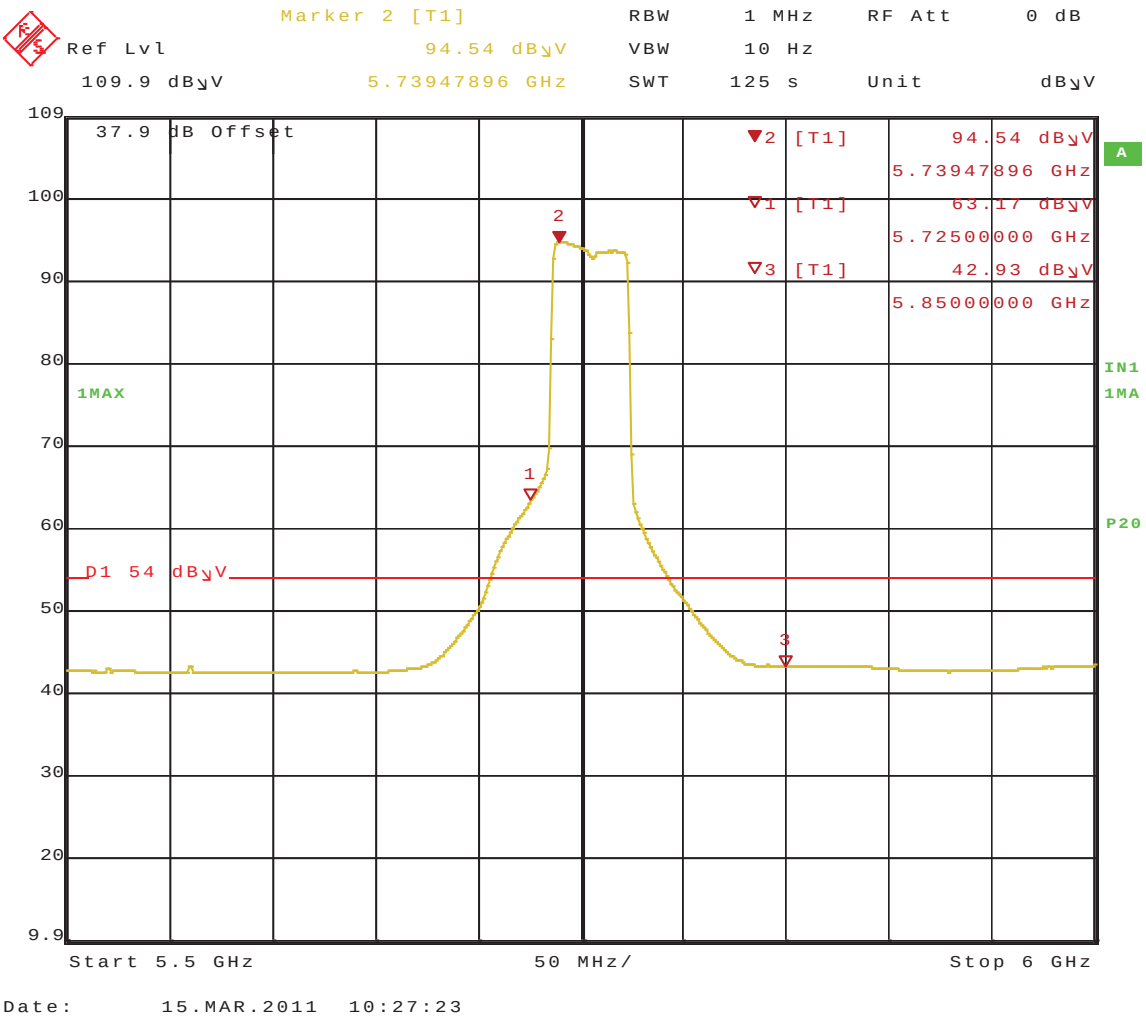



**Figure 594:** Radiated Emission at the Edge for 5755MHz at 13.5Mbps – Vert. (Ave.)

**Note:** Band-edge at 5725MHz is not in the restricted band; therefore 20 dBr is applied.

Marker #1 is has more than 20 dBr from Marker #2

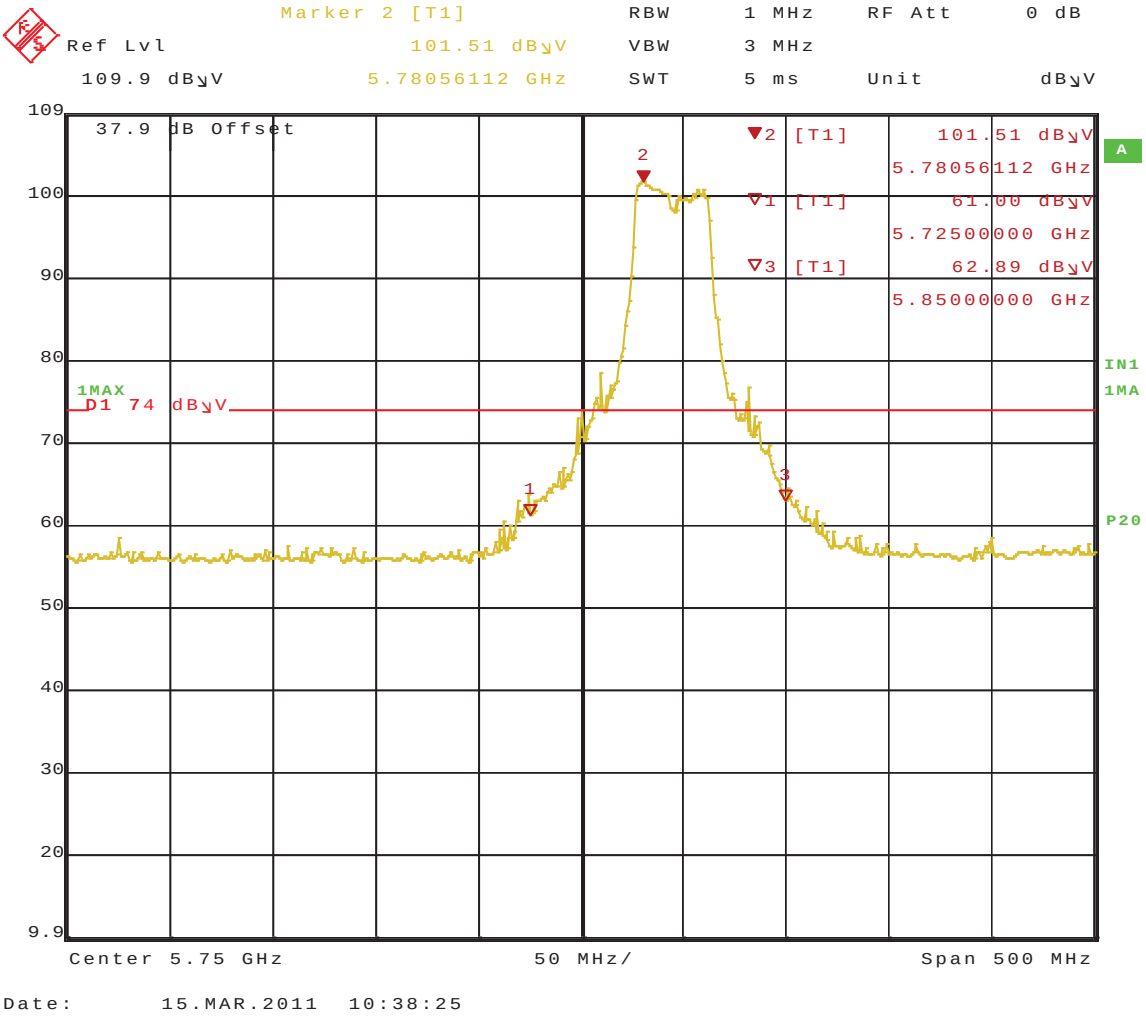



**Figure 595:** Radiated Emission at the Edge for 5795MHz at 13.5Mbps – Horz. (Peak)

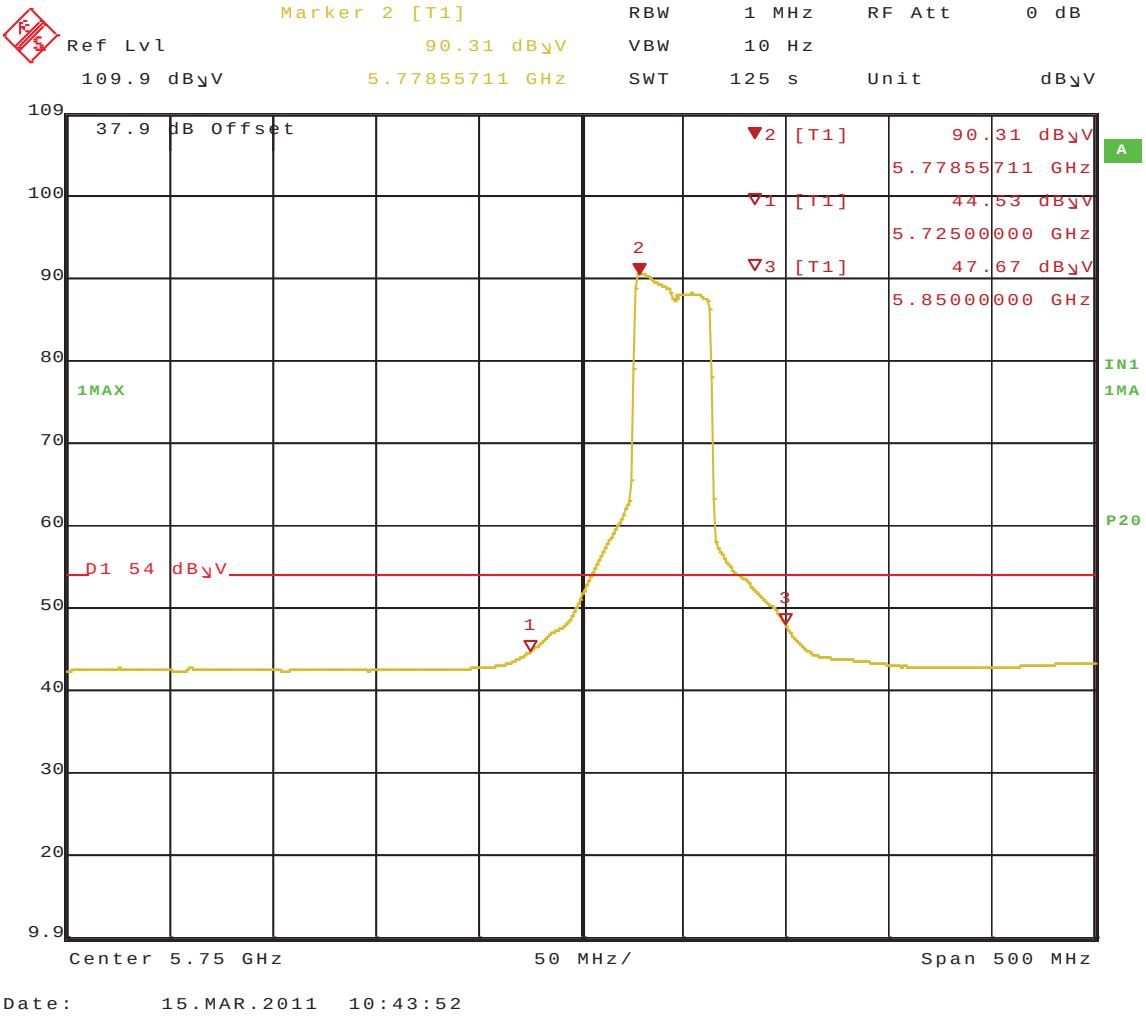



**Figure 596:** Radiated Emission at the Edge for 5795MHz at 13.5Mbps – Horz. (Ave.)

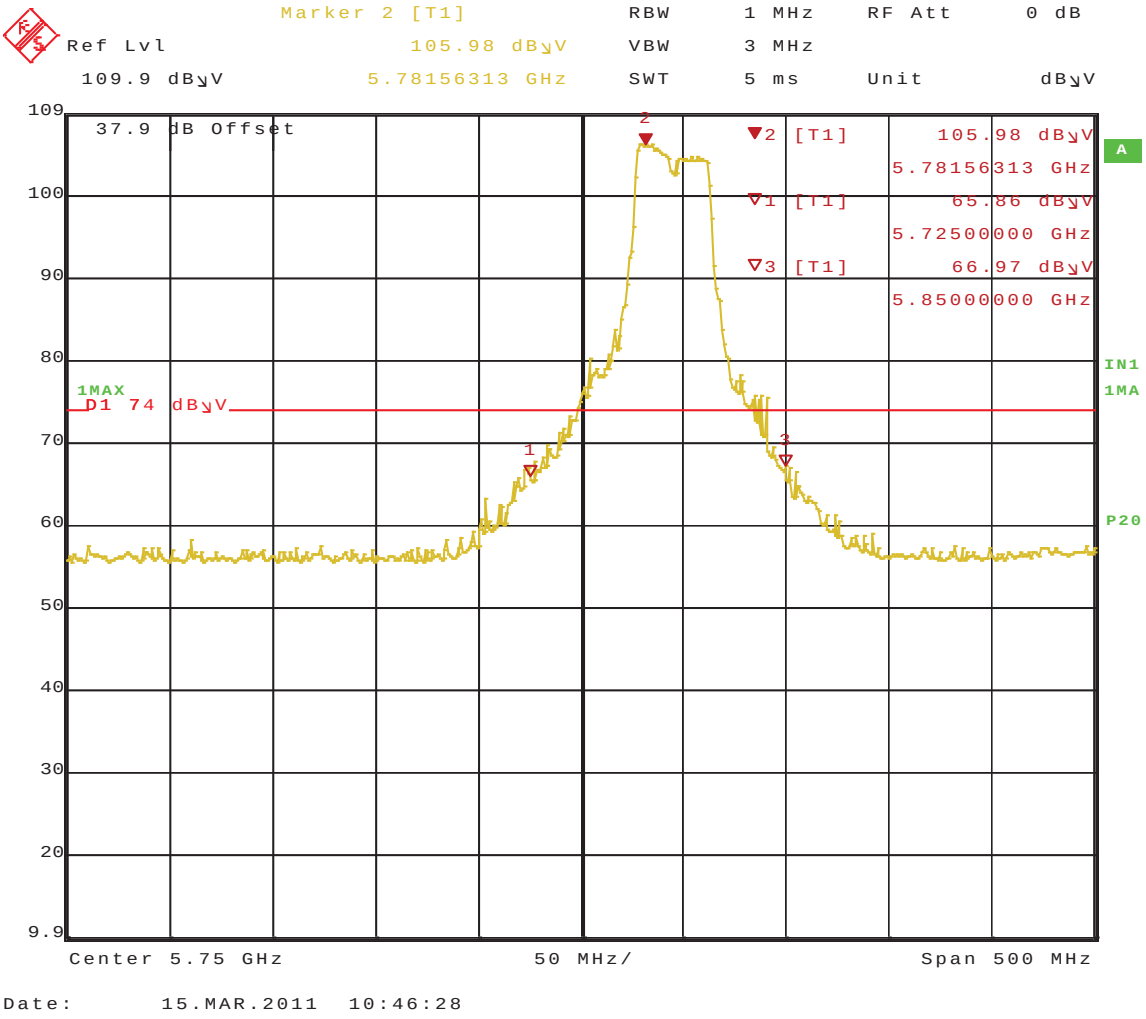



**Figure 597:** Radiated Emission at the Edge for 5795MHz at 13.5Mbps – Vert. (Peak)

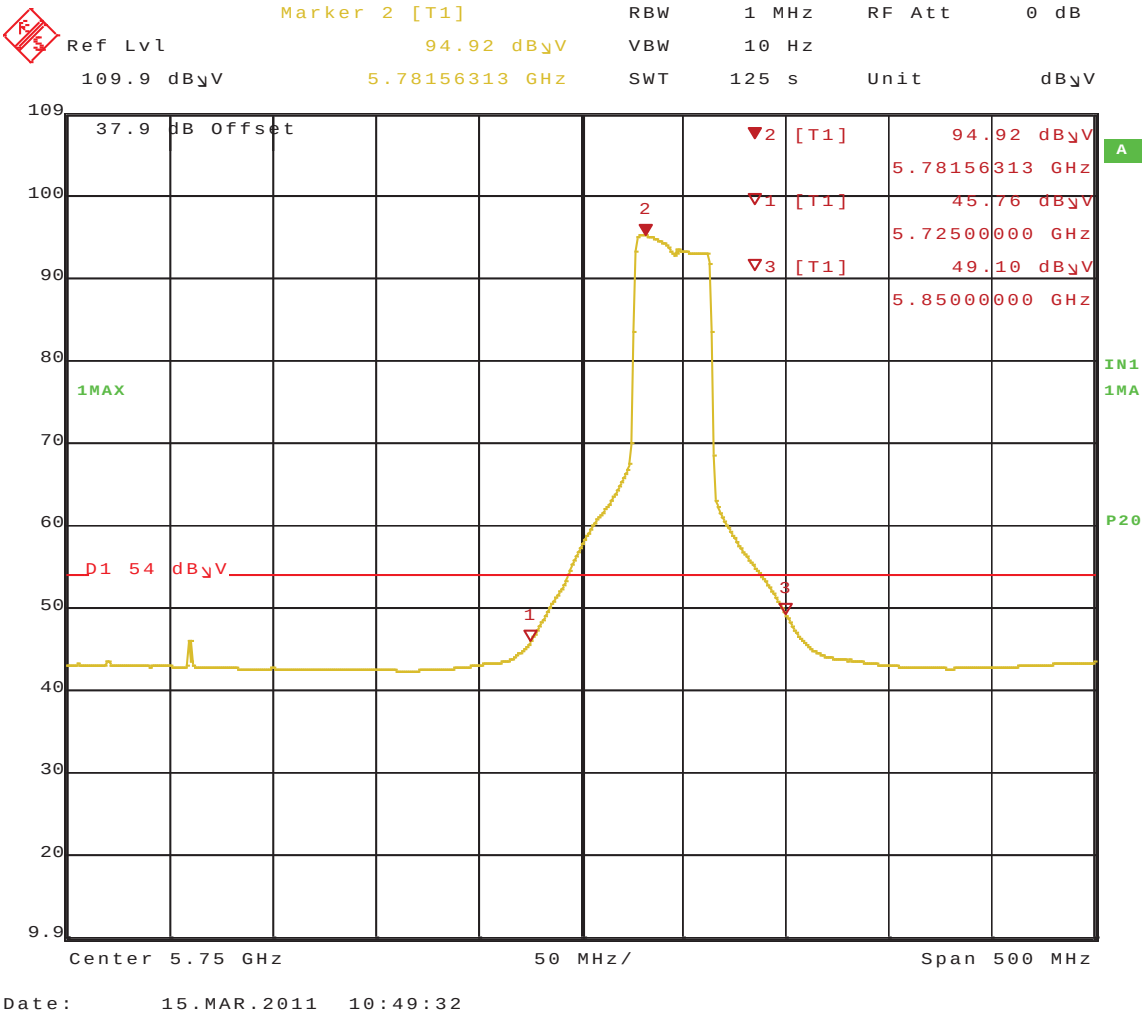



**Figure 598:** Radiated Emission at the Edge for 5795MHz at 13.5Mbps – Vert. (Ave.)

**SOP 1** Radiated Emissions

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| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | February 10, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 33%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11a at 6Mbps | **Line AC / Freq** | 120Vac/60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1 MHz/ 3 MHz |
| **Dist/Ant Used** | 3m / EMCO3115 / 1m - RA42-K-F-4B-C | **Performed by** | Jeremy Luong |

| Emission Freq (MHz) | ANT Polar (H/V) | ANT Pos (cm) | Table Pos (deg) | FIM (Pk) Pk (dBuV/m) | FIM Ave (dBuV/m) | Total CF dBuV | E-Field Ave (dBuV/m) | Spec Limit (dBuV/m) | Spec Margin (dB) | Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Transmitted Data at 5745MHz @ 13 dBm | | | | | | | | | | |
| 1120.11 | H | 117 | 39 | 61.92 | 51.29 | -8.62 | 42.67 | 53.98 | -11.31 | Spurious |
| 1861.27 | H | 127 | 258 | 59.02 | 45.18 | -4.94 | 40.24 | 53.98 | -13.74 | Spurious |
| 2392.60 | H | 160 | 201 | 58.07 | 36.40 | -3.01 | 33.39 | 53.98 | -20.59 | Spurious |
| 4840.06 | V | 201 | 167 | 49.80 | 44.01 | 2.50 | 46.51 | 53.98 | -7.47 | Spurious |
| 5000.06 | V | 169 | 98 | 48.47 | 42.18 | 2.84 | 45.02 | 53.98 | -8.96 | Spurious |
| 11490.70 | V | 100 | 176 | 43.32 | 28.47 | 12.54 | 41.01 | 53.98 | -12.97 | Harmonic |
| 11491.20 | H | 150 | 189 | 40.49 | 27.17 | 12.54 | 39.71 | 53.98 | -14.27 | Harmonic |
| Transmitted Data at 5785MHz @ 13dBm | | | | | | | | | | |
| 1120.29 | V | 202 | 90 | 59.42 | 45.80 | -8.62 | 37.18 | 53.98 | -16.80 | Spurious |
| 1861.21 | H | 136 | 187 | 60.07 | 45.73 | -4.94 | 40.79 | 53.98 | -13.19 | Spurious |
| 2392.44 | H | 225 | 242 | 54.14 | 34.21 | -3.01 | 31.20 | 53.98 | -22.78 | Spurious |
| 4840.06 | V | 222 | 171 | 49.99 | 44.62 | 2.50 | 47.12 | 53.98 | -6.86 | Spurious |
| 5000.06 | V | 206 | 55 | 48.58 | 43.39 | 2.84 | 46.23 | 53.98 | -7.75 | Spurious |
| 11570.60 | H | 152 | 161 | 42.18 | 26.92 | 12.41 | 39.33 | 53.98 | -14.65 | Harmonic |
| 11570.80 | V | 110 | 175 | 43.23 | 28.81 | 12.41 | 41.23 | 53.98 | -12.75 | Harmonic |
| Transmitted Data at 5825MHz @ 13dBm | | | | | | | | | | |
| 1120.23 | H | 122 | 44 | 63.08 | 50.93 | -8.62 | 42.31 | 53.98 | -11.67 | Spurious |
| 1120.28 | V | 217 | 180 | 60.36 | 46.80 | -8.62 | 38.18 | 53.98 | -15.80 | Spurious |
| 1861.21 | H | 129 | 259 | 58.31 | 45.48 | -4.94 | 40.54 | 53.98 | -13.44 | Spurious |
| 4840.07 | V | 218 | 474 | 50.96 | 45.36 | 2.50 | 47.86 | 53.98 | -6.12 | Spurious |
| 5000.06 | V | 211 | 178 | 51.27 | 45.80 | 2.84 | 48.64 | 53.98 | -5.34 | Spurious |
| 11649.60 | H | 154 | 191 | 42.92 | 28.81 | 12.85 | 41.66 | 53.98 | -12.32 | Harmonic |
| 11651.00 | V | 145 | 188 | 42.15 | 29.22 | 12.85 | 42.06 | 53.98 | -11.92 | Harmonic |

Spec Margin = E-Field QP - Limit, E-Field QP = FIM QP+ Total CF ± Uncertainty
Total CF= Amp Gain + Cable Loss + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 3.2 dB Expanded Uncertainty $U = ku_c(y)$ $k$ = 2 for 95% confidence

Notes: Worst case was observed on Y-axis, 6Mbps.

**SOP 1** Radiated Emissions — Tracking # 31053887.001 Page 2 of 19

| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 11, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 38%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11n HT20 at 6.5Mbps | **Line AC / Freq** | 120Vac/60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1 MHz/ 3 MHz |
| **Dist/Ant Used** | 3m / EMCO3115 / 1m - RA42-K-F-4B-C | **Performed by** | Jeremy Luong |

| Emission Freq (MHz) | ANT Polar (H/V) | ANT Pos (cm) | Table Pos (deg) | FIM (Pk) Pk (dBuV/m) | FIM Ave (dBuV/m) | Total CF dBuV | E-Field Ave (dBuV/m) | Spec Limit (dBuV/m) | Spec Margin (dB) | Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Transmitted Data at 5745MHz @ 14.5dBm | | | | | | | | | | |
| 1040.05 | H | 115 | 44 | 56.71 | 53.85 | -9.08 | 44.77 | 53.98 | -9.21 | Spurious |
| 1120.19 | H | 113 | 395 | 63.18 | 51.81 | -8.62 | 43.19 | 53.98 | -10.79 | Spurious |
| 1596.07 | H | 182 | 253 | 62.25 | 41.17 | -6.83 | 34.34 | 53.98 | -19.64 | Spurious |
| 1861.14 | H | 131 | 194 | 58.79 | 45.29 | -4.94 | 40.35 | 53.98 | -13.63 | Spurious |
| 5040.03 | V | 156 | 106 | 47.45 | 40.60 | 2.91 | 43.52 | 53.98 | -10.46 | Spurious |
| 5359.96 | V | 173 | 374 | 50.68 | 38.48 | 3.87 | 42.35 | 53.98 | -11.63 | Spurious |
| 11485.70 | H | 175 | 154 | 46.16 | 30.20 | 12.58 | 42.78 | 53.98 | -11.20 | Harmonic |
| 11489.00 | V | 174 | 152 | 44.62 | 30.94 | 12.55 | 43.49 | 53.98 | -10.49 | Harmonic |
| Transmitted Data at 5785MHz @ 14.5dBm | | | | | | | | | | |
| 1120.23 | H | 201 | 322 | 61.23 | 47.92 | -8.62 | 39.30 | 53.98 | -14.68 | Spurious |
| 1495.28 | H | 103 | 136 | 60.75 | 42.07 | -7.69 | 34.38 | 53.98 | -19.60 | Spurious |
| 4760.02 | V | 239 | 142 | 48.40 | 43.44 | 2.18 | 45.61 | 53.98 | -8.37 | Spurious |
| 11569.60 | V | 144 | 57 | 41.18 | 27.46 | 12.41 | 39.88 | 53.98 | -14.10 | Harmonic |
| 11570.20 | H | 187 | 158 | 43.23 | 28.26 | 12.41 | 40.67 | 53.98 | -13.31 | Harmonic |
| Transmitted Data at 5825MHz @ 14.5dBm | | | | | | | | | | |
| 1200.02 | H | 182 | 154 | 60.19 | 41.71 | -8.00 | 33.71 | 53.98 | -20.27 | Spurious |
| 1594.75 | H | 130 | 253 | 62.14 | 41.70 | -6.84 | 34.86 | 53.98 | -19.12 | Spurious |
| 2393.97 | H | 120 | 176 | 56.86 | 36.28 | -3.00 | 33.28 | 53.98 | -20.70 | Spurious |
| 4880.05 | V | 255 | 127 | 50.11 | 44.82 | 2.51 | 47.33 | 53.98 | -6.65 | Spurious |
| 5297.22 | V | 231 | 84 | 50.17 | 37.42 | 3.59 | 41.01 | 53.98 | -12.97 | Spurious |
| 11649.00 | V | 254 | 57 | 45.52 | 31.22 | 12.84 | 44.06 | 53.98 | -9.92 | Harmonic |
| 11649.80 | H | 121 | 341 | 48.40 | 33.06 | 12.85 | 45.91 | 53.98 | -8.07 | Harmonic |

Spec Margin = E-Field QP - Limit, E-Field QP = FIM QP+ Total CF ± Uncertainty
Total CF= Amp Gain + Cable Loss + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 3.2 dB Expanded Uncertainty $U = ku_c(y)$ $k$ = 2 for 95% confidence

Notes: Worst case was observed on Y-axis, 6.5Mbps.

**SOP 1** Radiated Emissions — Tracking # 31053887.001 Page 3 of 19

| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 11, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 39%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11n HT40 at 40.5Mbps | **Line AC / Freq** | 120Vac/60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1 MHz/ 3 MHz |
| **Dist/Ant Used** | 3m / EMCO3115 / 1m - RA42-K-F-4B-C | **Performed by** | Jeremy Luong |

| Emission Freq (MHz) | ANT Polar (H/V) | ANT Pos (cm) | Table Pos (deg) | FIM (Pk) Pk (dBuV/m) | FIM Ave (dBuV/m) | Total CF dBuV | E-Field Ave (dBuV/m) | Spec Limit (dBuV/m) | Spec Margin (dB) | Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Transmitted Data at 5755MHz @ 12.5dBm | | | | | | | | | | |
| 1200.06 | H | 221 | 321 | 54.16 | 47.38 | -8.00 | 39.38 | 53.98 | -14.60 | Spurious |
| 1595.13 | H | 141 | 197 | 60.20 | 42.45 | -6.83 | 35.62 | 53.98 | -18.36 | Spurious |
| 2393.00 | H | 246 | 124 | 56.04 | 36.94 | -3.00 | 33.94 | 53.98 | -20.04 | Spurious |
| 4840.04 | V | 233 | 87 | 49.36 | 45.18 | 2.50 | 47.68 | 53.98 | -6.30 | Spurious |
| 11510.10 | V | 154 | 174 | 40.48 | 27.35 | 12.47 | 39.82 | 53.98 | -14.16 | Harmonic |
| 11512.40 | H | 131 | 164 | 39.61 | 25.08 | 12.47 | 37.55 | 53.98 | -16.43 | Harmonic |
| Transmitted Data at 5795MHz @ 12.5dBm | | | | | | | | | | |
| 1200.03 | H | 220 | 325 | 54.22 | 47.11 | -8.00 | 39.11 | 53.98 | -14.87 | Spurious |
| 1861.27 | H | 141 | 165 | 59.34 | 45.48 | -4.94 | 40.54 | 53.98 | -13.44 | Spurious |
| 2393.06 | H | 195 | 128 | 57.62 | 37.34 | -3.00 | 34.34 | 53.98 | -19.64 | Spurious |
| 4840.01 | V | 220 | 156 | 50.88 | 46.82 | 2.50 | 49.32 | 53.98 | -4.66 | Spurious |
| 11590.10 | H | 136 | 324 | 38.29 | 25.02 | 12.36 | 37.38 | 53.98 | -16.60 | Harmonic |
| 11590.60 | V | 143 | 168 | 41.43 | 27.58 | 12.36 | 39.94 | 53.98 | -14.04 | Harmonic |

Spec Margin = E-Field QP - Limit, E-Field QP = FIM QP+ Total CF ± Uncertainty
Total CF= Amp Gain + Cable Loss + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 3.2 dB Expanded Uncertainty $U = ku_c(y)$ $k$ = 2 for 95% confidence

Notes: Worst case was observed on Y-axis, 40.5Mbps, 3 streams.

## **SOP 1** Radiated Emissions

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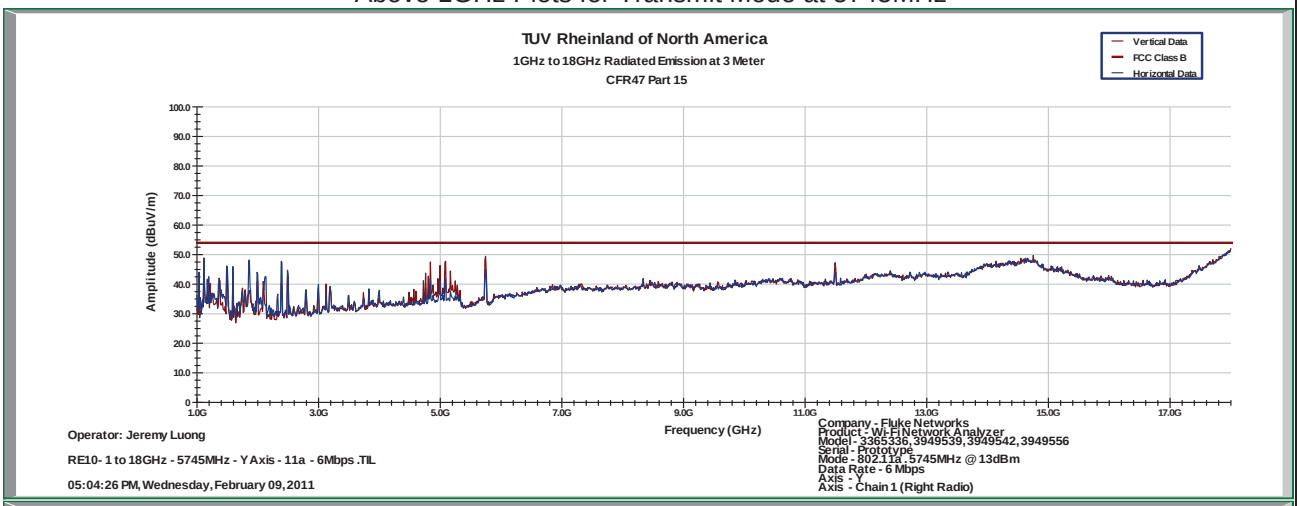
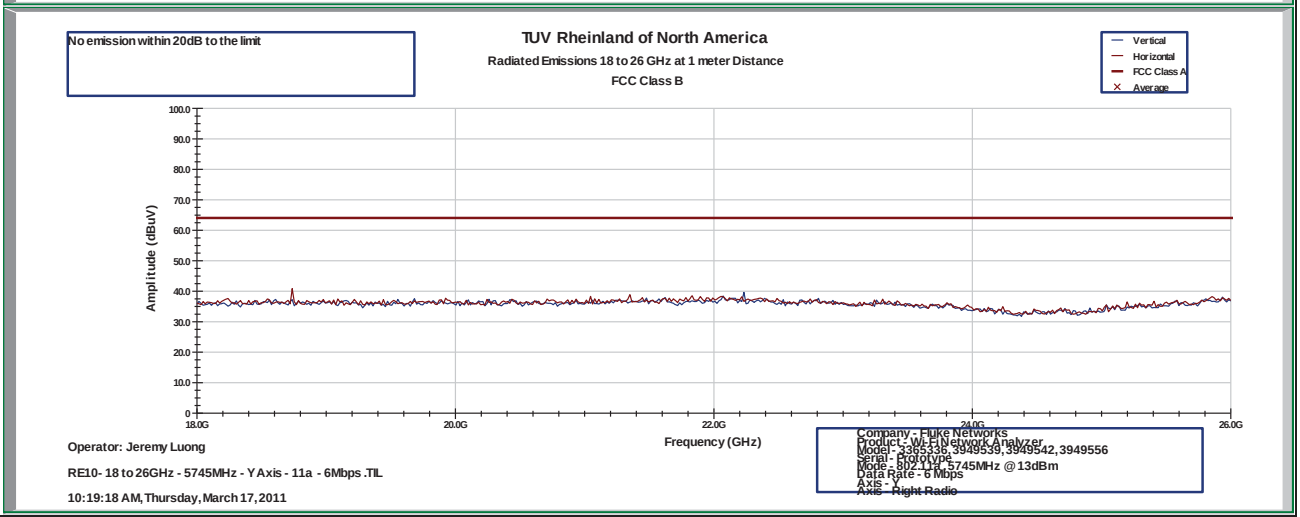
| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 17, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 40%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11a at 6Mbps | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m - EMCO3115 / 1m - RA42-K-F-4B-C | **Performed by** | Jeremy Luong |

Above 1GHz Plots for Transmit Mode at 5745MHz




Notes: Limit was extrapolated to 1m distance for 18GHz – 40GHz range.

## SOP 1 Radiated Emissions

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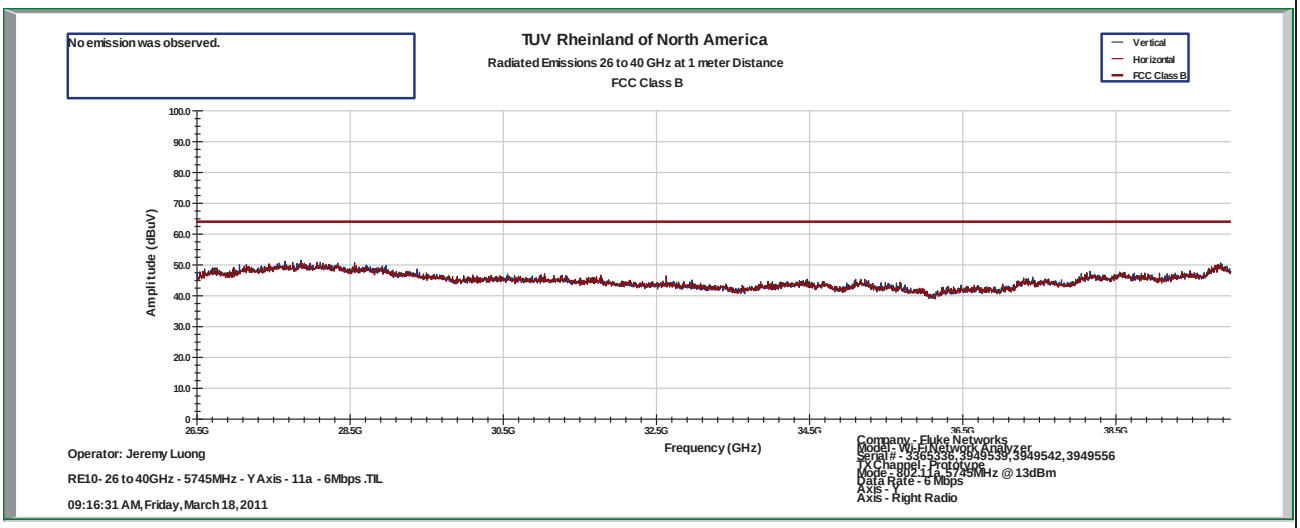
| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 18, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 39%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11a at 6Mbps | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m - EMCO3115 / 1m - RA28-K-F-4B-C | **Performed by** | Jeremy Luong |

Above 1GHz Plots for Transmit Mode at 5745MHz




Notes: Limit was extrapolated to 1m distance for 18GHz – 40GHz range.

## SOP 1 Radiated Emissions

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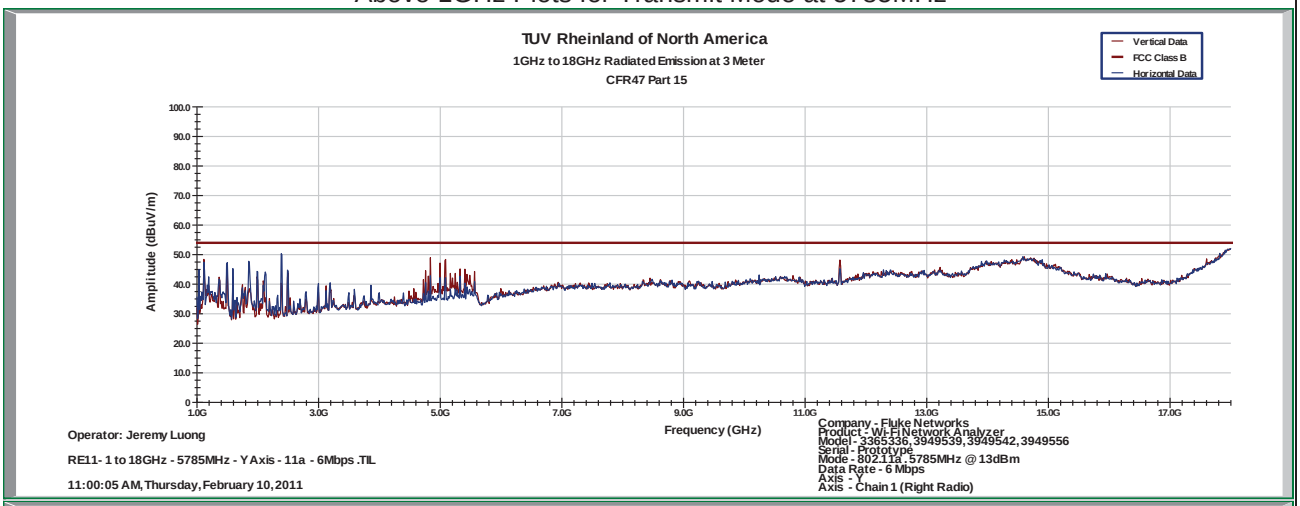
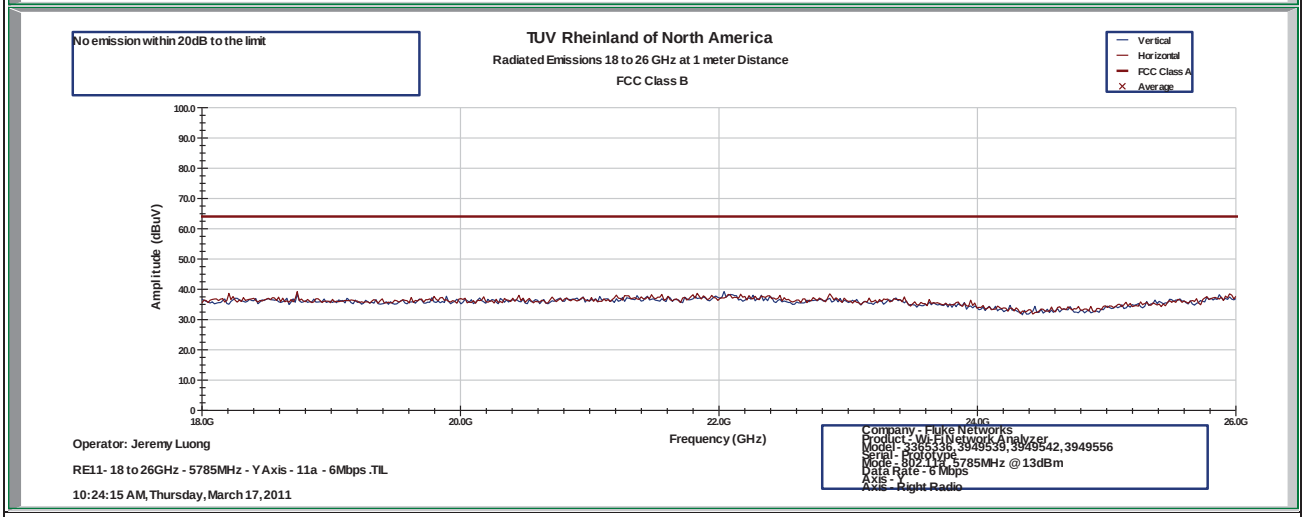
| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 17, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 40%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11a at 6Mbps | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m - EMCO3115 / 1m - RA42-K-F-4B-C | **Performed by** | Jeremy Luong |

Above 1GHz Plots for Transmit Mode at 5785MHz




Notes: Limit was extrapolated to 1m distance for 18GHz – 40GHz range.

**SOP 1** Radiated Emissions

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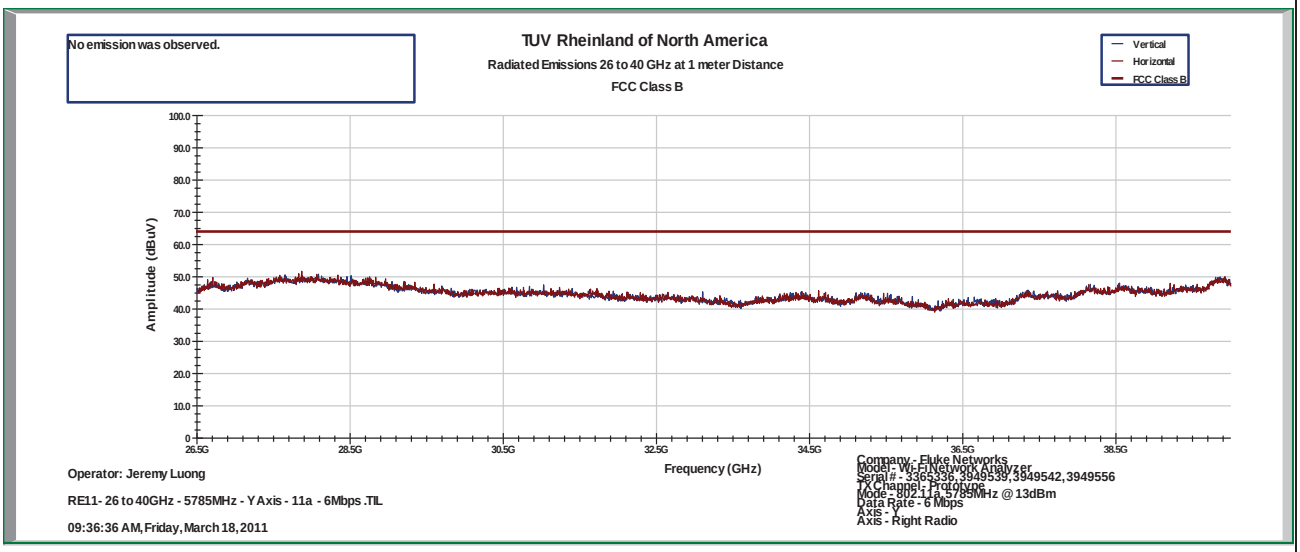
| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 18, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 39%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11a at 6Mbps | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m - EMCO3115 / 1m - RA28-K-F-4B-C | **Performed by** | Jeremy Luong |

Above 1GHz Plots for Transmit Mode at 5785MHz




Notes: Limit was extrapolated to 1m distance for 18GHz – 40GHz range.

## SOP 1 Radiated Emissions

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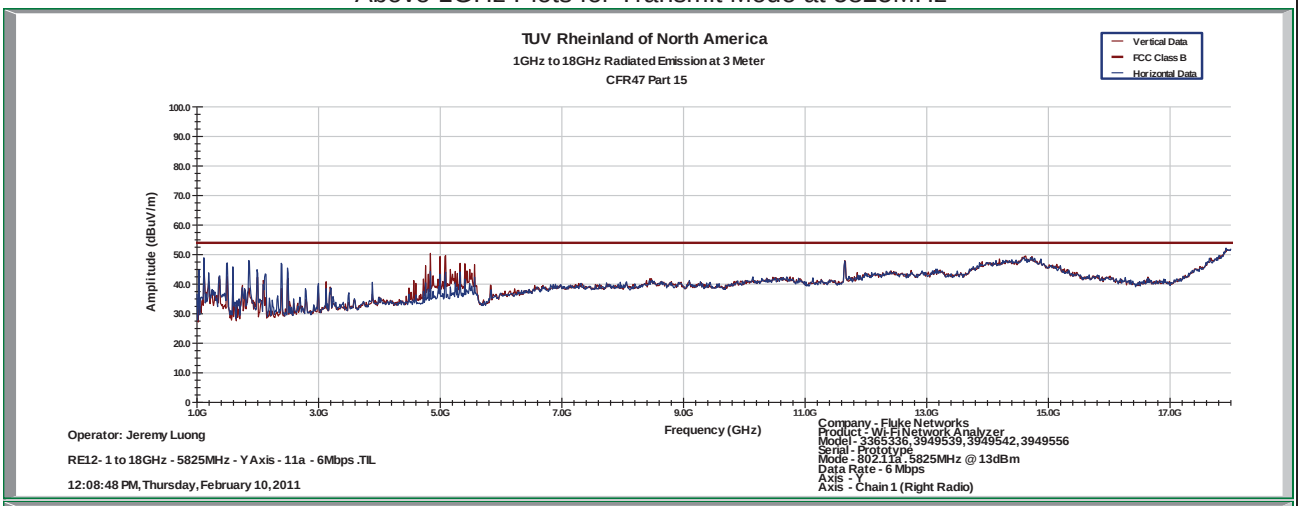
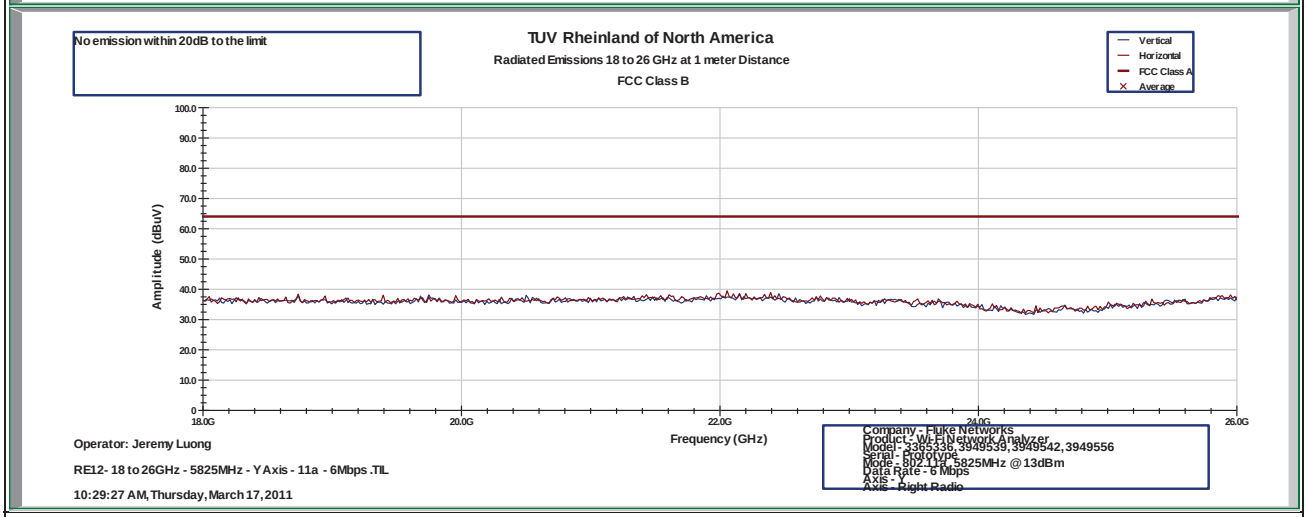
| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 17, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 40%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11a at 6Mbps | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m - EMCO3115 / 1m - RA42-K-F-4B-C | **Performed by** | Jeremy Luong |

Above 1GHz Plots for Transmit Mode at 5825MHz




Notes: Limit was extrapolated to 1m distance for 18GHz – 40GHz range.

**SOP 1** Radiated Emissions

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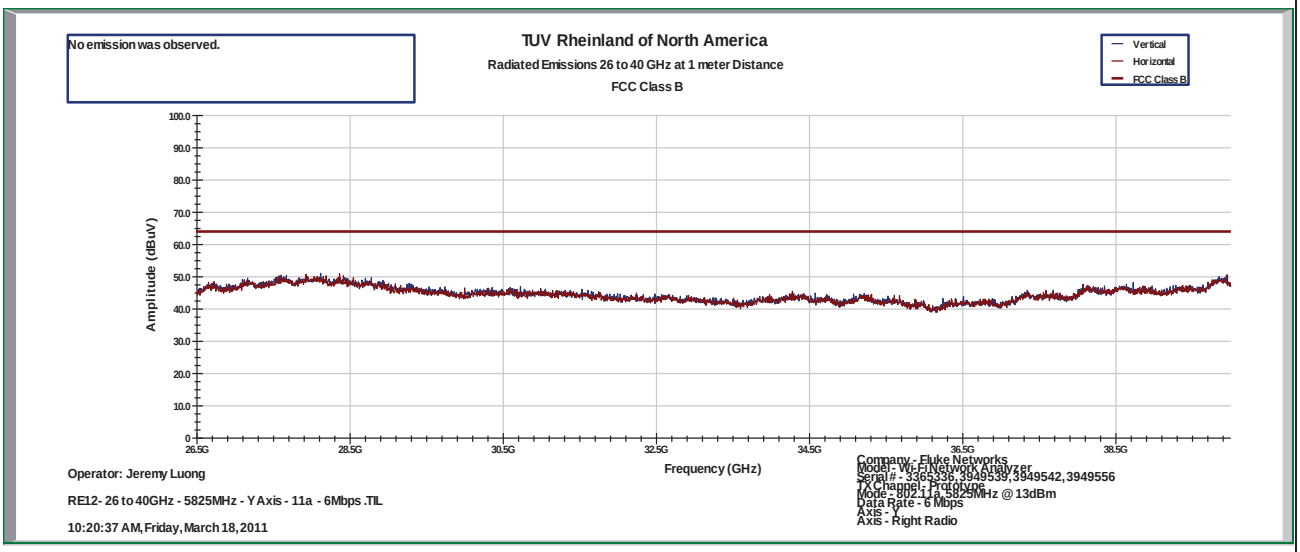
| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 18, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 40%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11a at 6Mbps | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m - EMCO3115 / 1m - RA28-K-F-4B-C | **Performed by** | Jeremy Luong |

Above 1GHz Plots for Transmit Mode at 5825MHz




Notes: Limit was extrapolated to 1m distance for 18GHz – 40GHz range.

## SOP 1 Radiated Emissions

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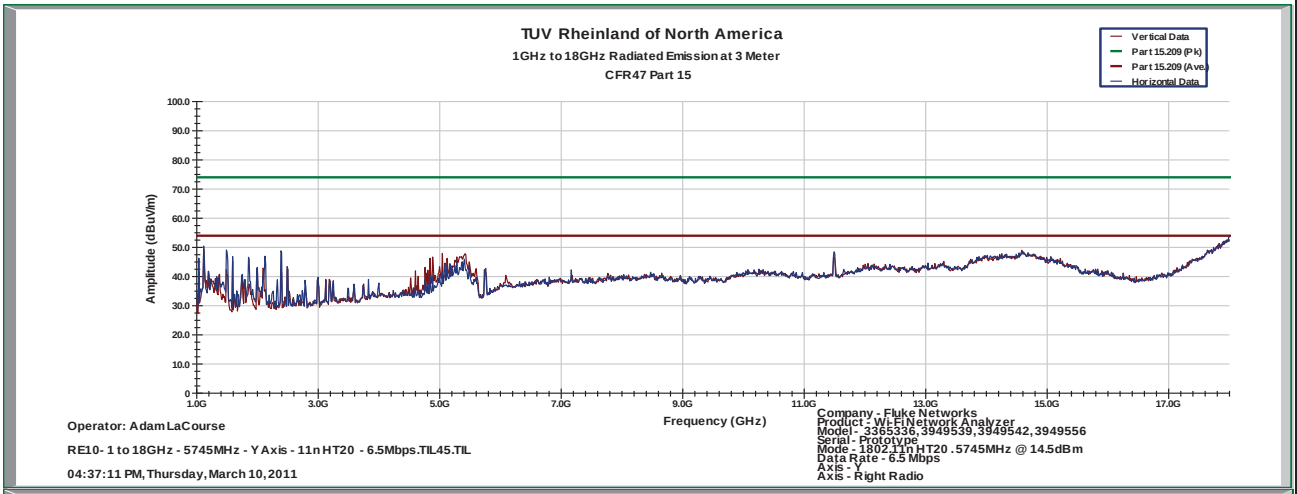
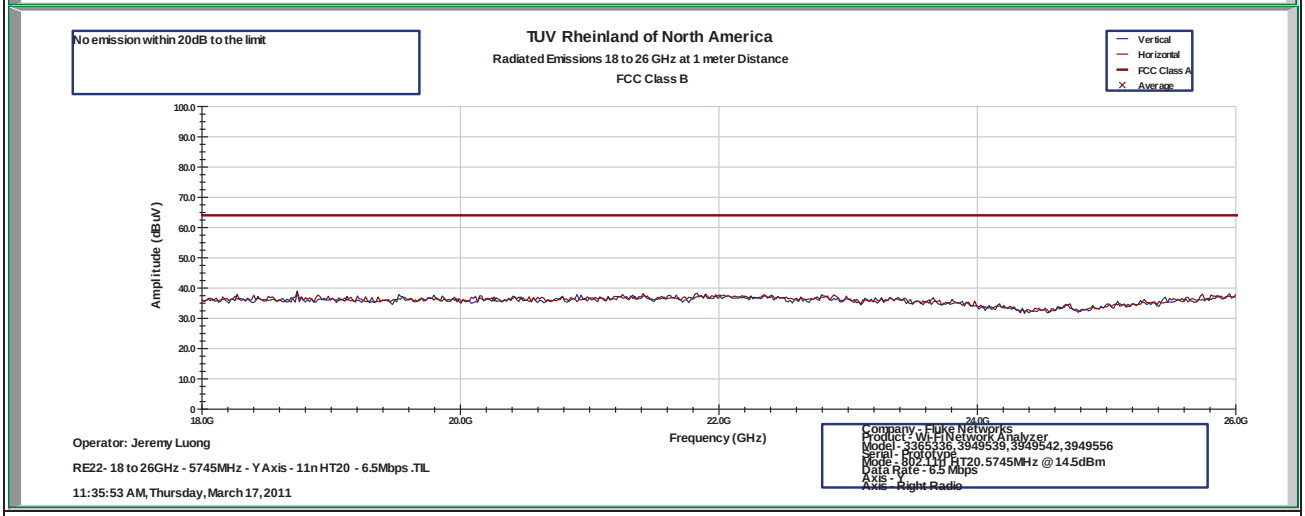
| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 17, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 40%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11n HT20 at 6.5Mbps | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m - EMCO3115 / 1m - RA42-K-F-4B-C | **Performed by** | Jeremy Luong |

Above 1GHz Plots for Transmit Mode at 5745MHz




Notes: Limit was extrapolated to 1m distance for 18GHz – 40GHz range.

## SOP 1 Radiated Emissions

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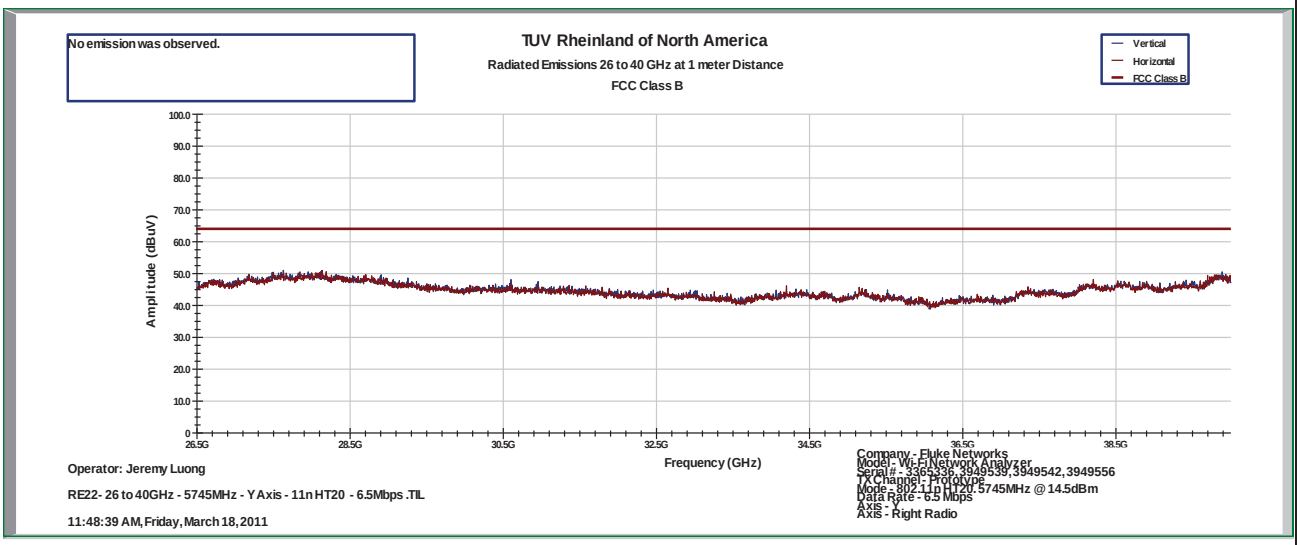
| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 18, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 40%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11n HT20 at 6.5Mbps | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m - EMCO3115 / 1m - RA28-K-F-4B-C | **Performed by** | Jeremy Luong |

Above 1GHz Plots for Transmit Mode at 5745MHz




Notes: Limit was extrapolated to 1m distance for 18GHz – 40GHz range.

## SOP 1 Radiated Emissions

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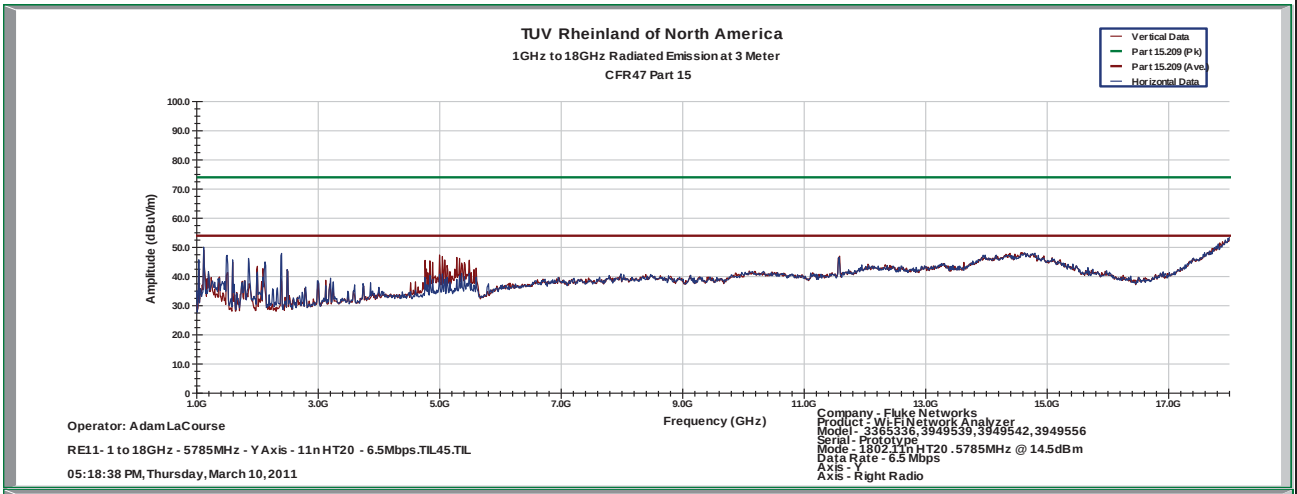
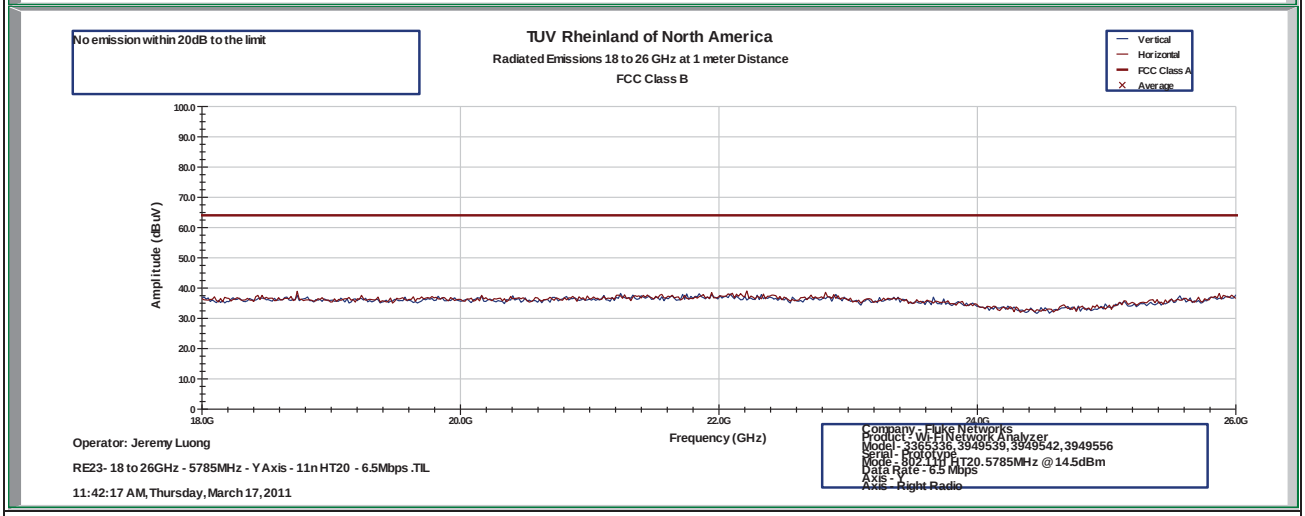
| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 17, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 39%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11n HT20 at 6.5Mbps | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m - EMCO3115 / 1m - RA42-K-F-4B-C | **Performed by** | Jeremy Luong |

Above 1GHz Plots for Transmit Mode at 5785MHz




Notes: Limit was extrapolated to 1m distance for 18GHz – 40GHz range.

**SOP 1** Radiated Emissions

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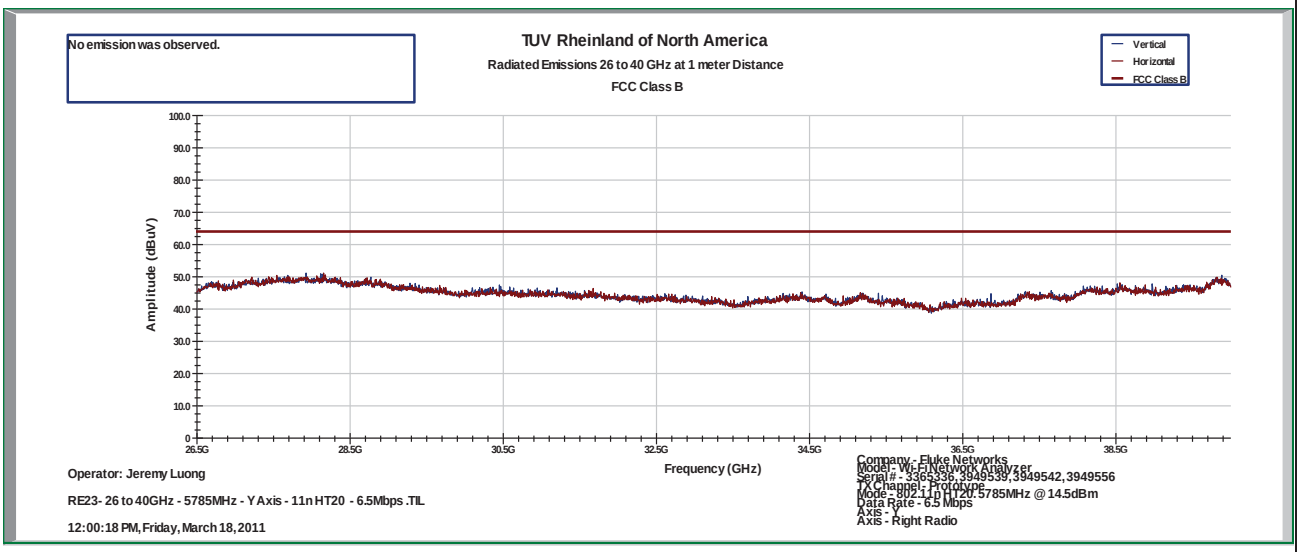
| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 18, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 40%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11n HT20 at 6.5Mbps | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m - EMCO3115 / 1m - RA28-K-F-4B-C | **Performed by** | Jeremy Luong |

Above 1GHz Plots for Transmit Mode at 5745MHz




Notes: Limit was extrapolated to 1m distance for 18GHz – 40GHz range.

## SOP 1 Radiated Emissions

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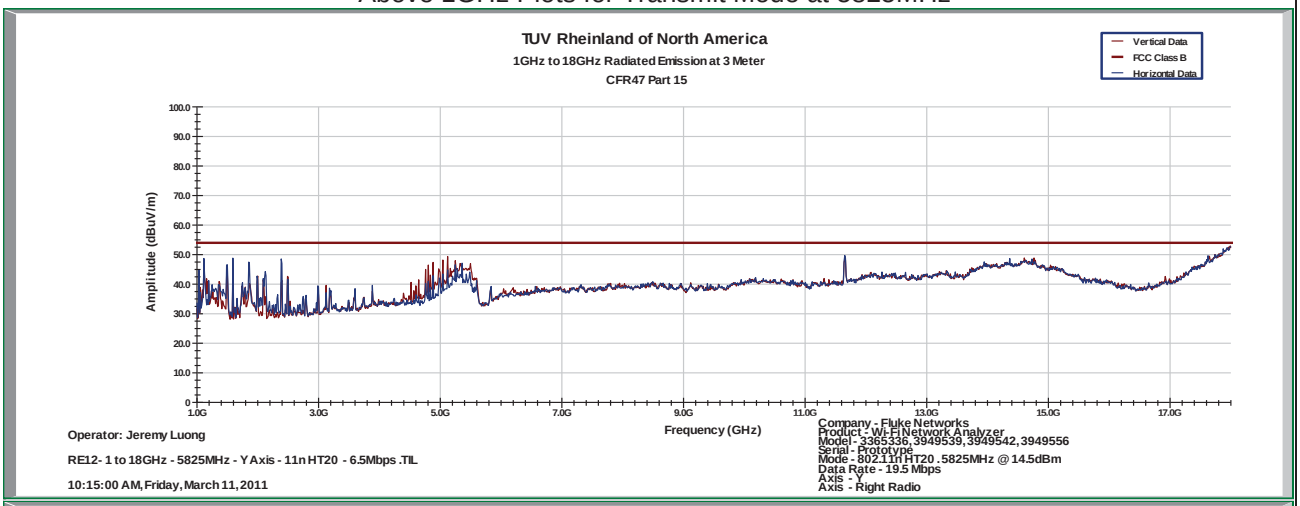
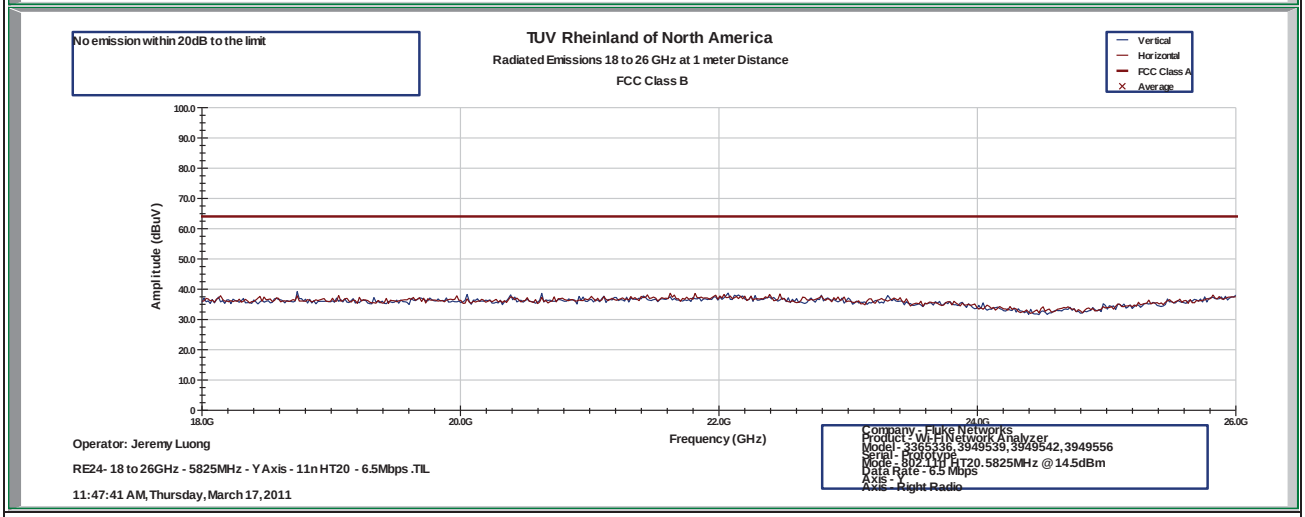
| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 17, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 39%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11n HT20 at 6.5Mbps | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m - EMCO3115 / 1m - RA42-K-F-4B-C | **Performed by** | Jeremy Luong |

Above 1GHz Plots for Transmit Mode at 5825MHz




Notes: Limit was extrapolated to 1m distance for 18GHz – 40GHz range.

**SOP 1** Radiated Emissions

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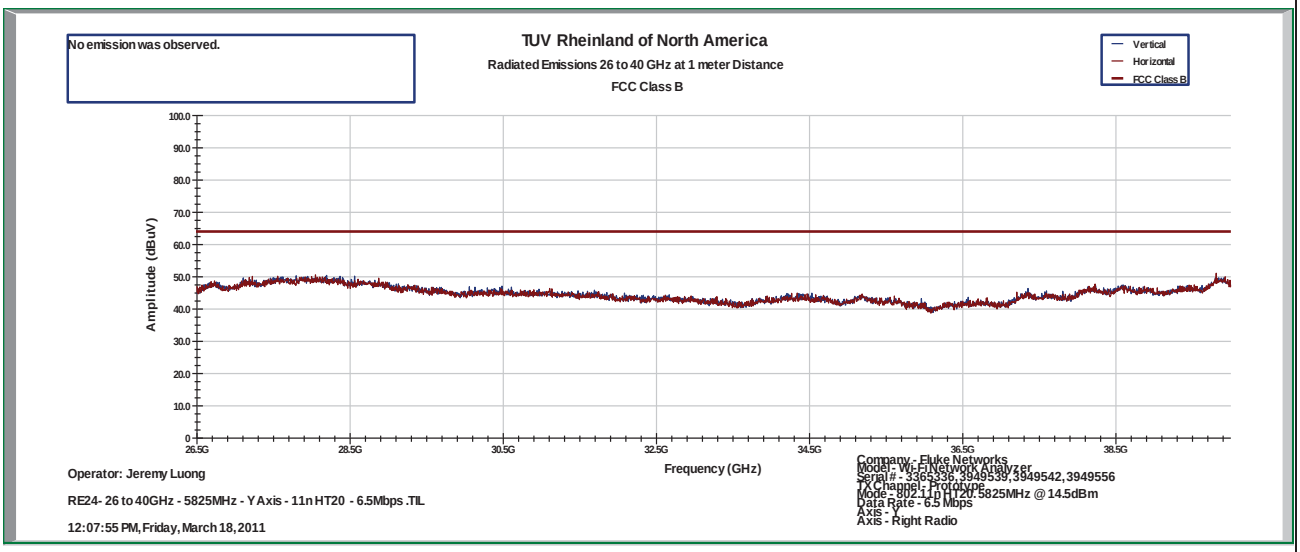
| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 18, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 40%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11n HT20 at 6.5Mbps | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m - EMCO3115 / 1m - RA28-K-F-4B-C | **Performed by** | Jeremy Luong |

Above 1GHz Plots for Transmit Mode at 5825MHz



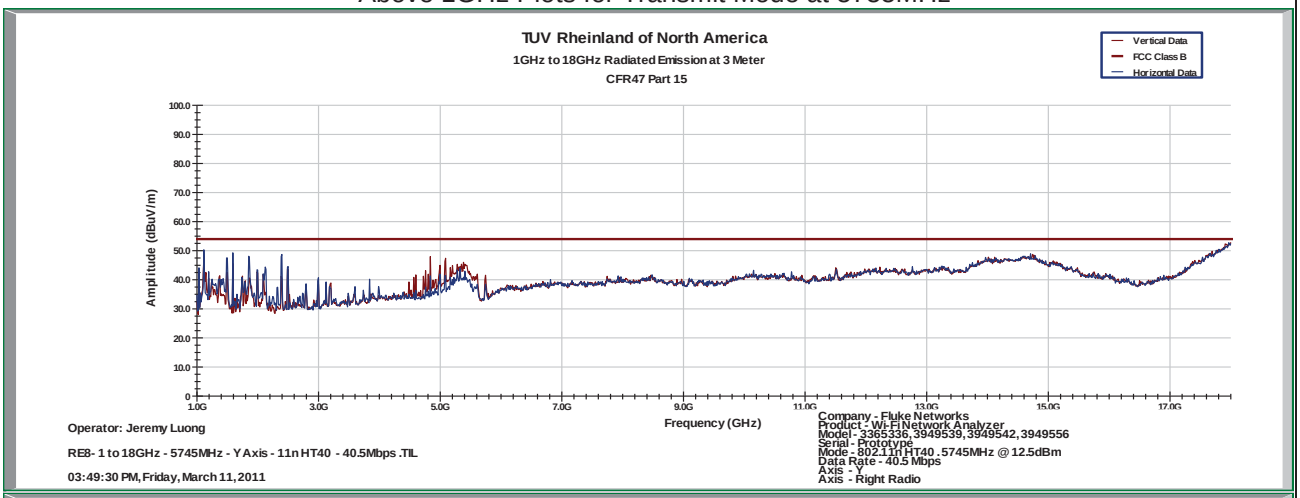

Notes: Limit was extrapolated to 1m distance for 18GHz – 40GHz range.

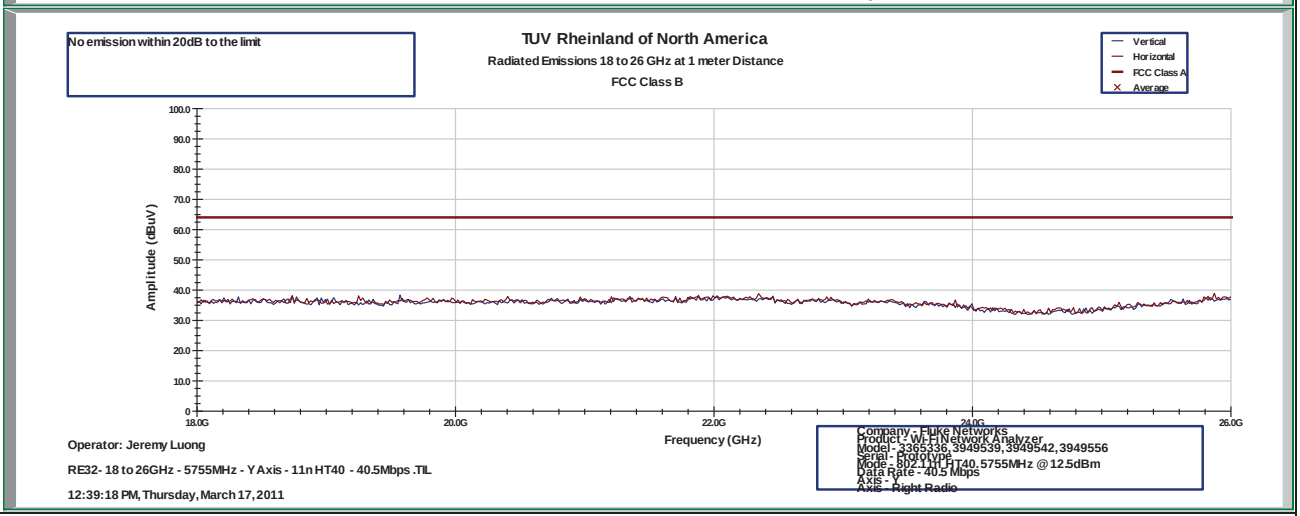
## SOP 1 Radiated Emissions

Tracking # 31053887.001 Page 16 of 19

| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 17, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 39%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11n HT40 at 40.5Mbps | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m - EMCO3115 / 1m - RA42-K-F-4B-C | **Performed by** | Jeremy Luong |

Above 1GHz Plots for Transmit Mode at 5755MHz




Notes: Limit was extrapolated to 1m distance for 18GHz – 40GHz range.

**SOP 1** Radiated Emissions

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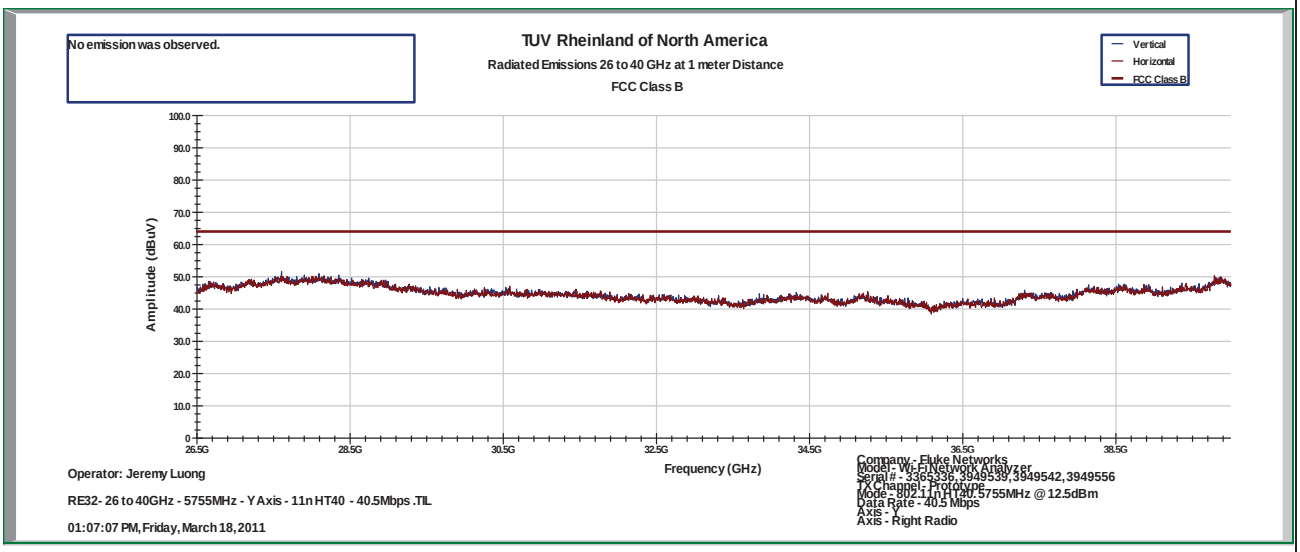
| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 18, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 40%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11n HT40 at 40.5Mbps | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m - EMCO3115 / 1m - RA28-K-F-4B-C | **Performed by** | Jeremy Luong |

Above 1GHz Plots for Transmit Mode at 5755MHz




Notes: Limit was extrapolated to 1m distance for 18GHz – 40GHz range.

## SOP 1 Radiated Emissions

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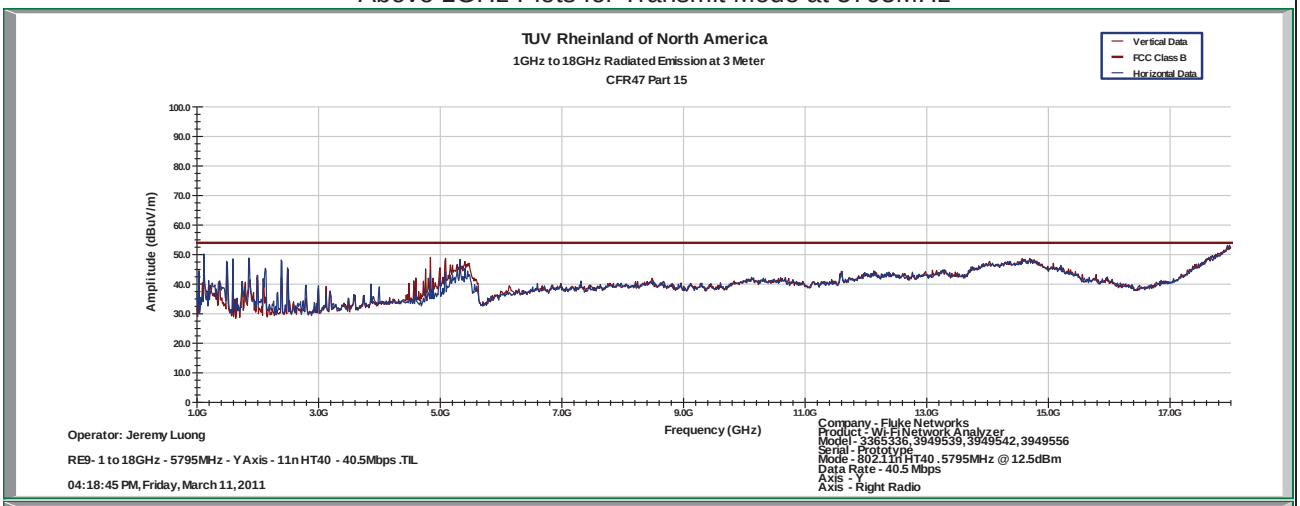
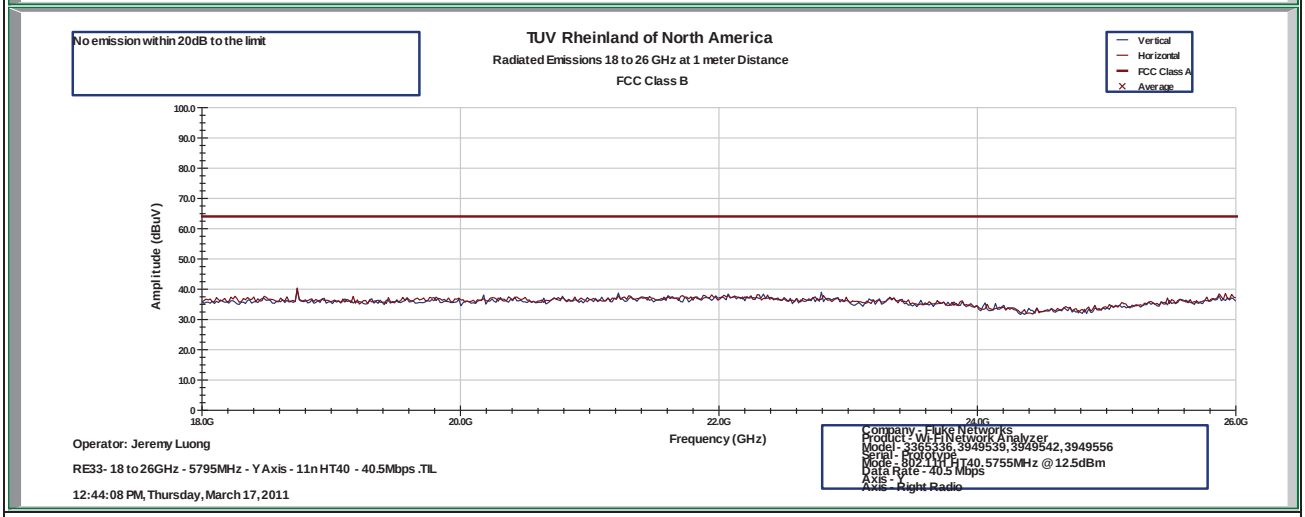
| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 17, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 39%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11n HT40 at 40.5Mbps | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m - EMCO3115 / 1m - RA42-K-F-4B-C | **Performed by** | Jeremy Luong |

Above 1GHz Plots for Transmit Mode at 5795MHz

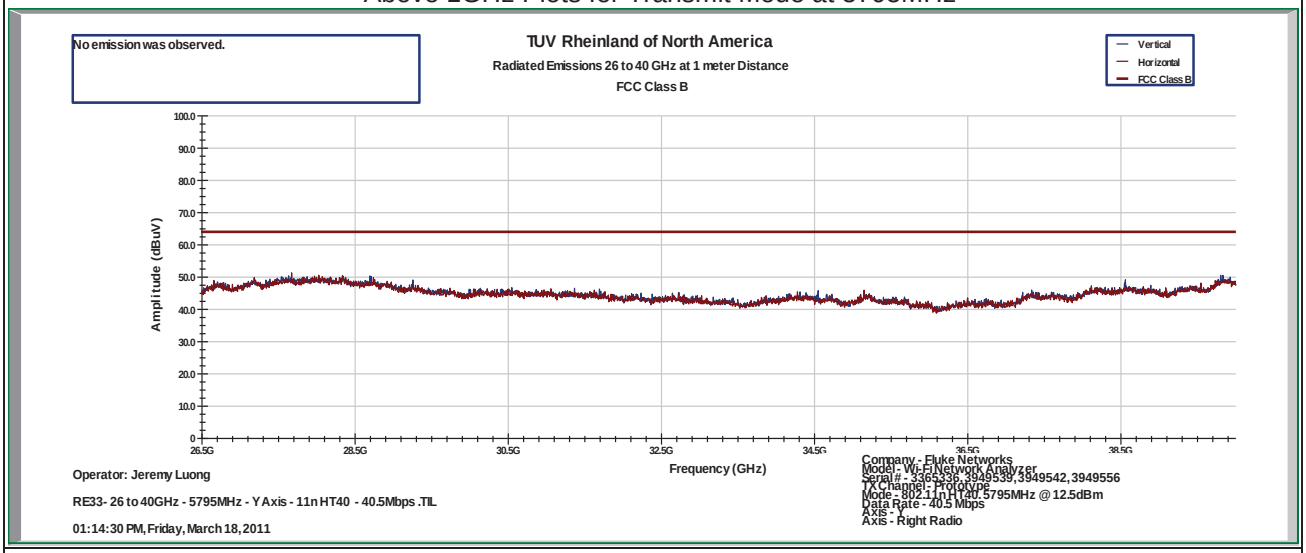



Notes: Limit was extrapolated to 1m distance for 18GHz – 40GHz range.

| **SOP 1** Radiated Emissions | | Tracking # 31053887.001 Page 19 of 19 | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 18, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 40%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, 802.11n HT40 at 40.5Mbps | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart C | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m - EMCO3115 / 1m - RA28-K-F-4B-C | **Performed by** | Jeremy Luong |

Above 1GHz Plots for Transmit Mode at 5795MHz




Notes: Limit was extrapolated to 1m distance for 18GHz – 40GHz range.

### 5.5.4 Sample Calculation

The field strength is calculated by subtracting the Amplifier Gain and adding the Cable Loss and Antenna Correction Factor to the measured reading. The basic equation is as follows:

$$\text{Field Strength } (dB\mu V/m) = FIM - AMP + CBL + ACF$$

Where: FIM = Field Intensity Meter ($dB\mu V$)
AMP = Amplifier Gain (dB)
CBL = Cable Loss (dB)
ACF = Antenna Correction Factor (dB/m)

$$\mu V/m = 10^{\frac{dB\mu V/m}{20}}$$

## 5.6 Receiver Spurious Emissions

Receiver spurious emissions are emissions at any frequency when the equipment is in receive mode.

The spurious emissions of the receiver shall not exceed the values in CFR47 Part 15.109 and RSS GEN Sect 6.1.

### 5.6.1 Test Methodology

#### 5.6.1.1 Preliminary Test

A test program that controls instrumentation and data logging was used to automate the preliminary RF emission test procedure. The frequency range of interest was divided into sub-ranges to yield a frequency resolution of approximately 120 kHz and provide a reading at each frequency for no more than 12° of turntable rotation. For each frequency sub-range the turntable was rotated 360° while peak emission data was recorded and plotted over the frequency range of interest in horizontal and vertical antenna polarization's.

Preliminary emission profile testing was performed inside the anechoic chamber. The EUT was placed on a 1.0m x 1.5m non-conductive table 80cm above the floor. The EUT was positioned as shown in the setup photographs. The receiving antenna was placed at a distance of 3m at a fixed height of 1m. Measurement equipment was located outside of the chamber. A video camera was placed inside the chamber to view the EUT.

#### 5.6.1.2 Final Test

For each frequency measured, the peak emission was maximized by manipulating the receiving antenna from 1 to 4 meters above the ground plane and placing it at the position that produced the maximum signal strength reading. The turntable was then rotated through 360° while observing the peak signal and placing the EUT at the position that produced maximum radiation. The six highest emissions relative to the limit were measured unless such emissions were more than 20 dB below the limit. If less than six emissions are within 20 dB of the limit, than the noise level of the receiver is measured at frequencies where emissions are expected. Multiples of all oscillator and microprocessor frequencies were also checked.

Final testing was performed on an NSA compliant test site. The EUT was placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane. The placement of EUT and cables were the same as for preliminary testing and is shown in the setup photographs.

The final scans were performed at

5785MHz at 802.11n HT20 (20 MHz Bandwidth)

5795MHz at 802.11n HT40 (40 MHz Bandwidth)

#### 5.6.1.3 Deviations

None.

### 5.6.2 Receiver Spurious Emission Limit

The spurious emissions of the receiver shall not exceed the values in CFR47 Part 15.109: 2009 and RSS GEN: 2010 Sect 6.1.

| Frequency (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|---|---|---|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100 ** | 3 |
| 88-216 | 150 ** | 3 |
| 216-960 | 200 ** | 3 |
| Above 960 | 500 | 3 |

### 5.6.3 Test Results

The final measurement data indicates the worst case operating modes, configurations, and/or cable positions. It also reflects the results including any modifications and/or special accessories listed in Sections 1.4 and 1.5.

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

#### *5.6.3.1 Final Data*

The data recorded in this section contains the final results under the worst-case conditions and without any modifications or special accessories implemented as the manufacturer intends.

**SOP 1** Radiated Emissions

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| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 18, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 22°C / 40%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, RX at 5785MHz | **Line AC / Freq** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart b | **RBW / VBW** | See Note |
| **Dist/Ant Used** | 3m / JB3 & EMCO3115 | **Performed by** | Jeremy Luong |

| Emission Freq (MHz) | ANT Polar (H/V) | ANT Pos (cm) | Table Pos (deg) | FIM (Pk) Pk (dBuV/m) | FIM QP (dBuV/m) | Total CF dBuV | E-Field QP (dBuV/m) | Spec Limit (dBuV/m) | Spec Margin (dB) | Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Receive Mode at 20 MHz Bandwidth | | | | | | | | | | |
| 84.70 | V | 114 | 321 | 65.81 | 64.15 | -18.52 | 45.63 | 49.54 | -3.91 | Spurious |
| 85.65 | V | 107 | 253 | 65.93 | 64.06 | -18.40 | 45.66 | 49.54 | -3.88 | Spurious |
| 400.01 | V | 121 | 354 | 48.75 | 47.94 | -9.15 | 38.79 | 56.90 | -18.11 | Spurious |
| 500.02 | V | 107 | 354 | 46.28 | 43.42 | -7.57 | 35.85 | 56.90 | -21.05 | Spurious |
| 871.32 | V | 109 | 193 | 47.57 | 46.10 | -1.99 | 44.11 | 56.90 | -12.79 | Spurious |
| 874.17 | V | 110 | 199 | 46.14 | 45.81 | -1.88 | 43.93 | 56.90 | -12.97 | Spurious |
| 84.76 | H | 236 | 334 | 62.60 | 60.76 | -18.39 | 42.37 | 49.54 | -7.17 | Spurious |
| 85.91 | H | 243 | 316 | 62.85 | 59.73 | -18.43 | 41.30 | 49.54 | -8.24 | Spurious |
| 500.02 | H | 147 | 175 | 49.67 | 46.26 | -7.17 | 39.09 | 56.90 | -17.81 | Spurious |
| 625.00 | H | 104 | 192 | 47.00 | 46.00 | -5.29 | 40.71 | 56.90 | -16.19 | Spurious |
| 750.05 | H | 161 | 157 | 44.13 | 37.92 | -3.18 | 34.74 | 56.90 | -22.16 | Spurious |
| 1200.03 | H | 112 | 26 | 55.99 | 48.71 | -8.00 | 40.71 | 53.98 | -13.27 | Spurious |
| 1595.37 | H | 117 | 190 | 59.10 | 40.27 | -6.83 | 33.44 | 53.98 | -20.54 | Spurious |
| 1861.21 | H | 97 | 198 | 60.10 | 47.33 | -4.94 | 42.39 | 53.98 | -11.59 | Spurious |
| 2392.85 | H | 162 | 187 | 56.80 | 36.04 | -3.00 | 33.04 | 53.98 | -20.94 | Spurious |
| 4993.03 | V | 103 | 136 | 40.40 | 24.53 | 2.83 | 27.35 | 53.98 | -26.63 | Spurious |

Spec Margin = E-Field QP - Limit, E-Field QP = FIM QP+ Total CF ± Uncertainty
Total CF= Amp Gain + Cable Loss + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 3.2dB Expanded Uncertainty $U = ku_c(y)$ $k$ = 2 for 95% confidence

Notes: Tested at 802.11n HT20.
30 MHz to 1GHz range was tested as FCC Class A device.

**SOP 1** Radiated Emissions

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| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 18, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 22°C / 40%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, RX at 5795MHz | **Line AC / Freq** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart b | **RBW / VBW** | See Note |
| **Dist/Ant Used** | 3m / JB3 & EMCO3115 | **Performed by** | Jeremy Luong |

| Emission Freq (MHz) | ANT Polar (H/V) | ANT Pos (cm) | Table Pos (deg) | FIM (Pk) Pk (dBuV/m) | FIM QP (dBuV/m) | Total CF dBuV | E-Field QP (dBuV/m) | Spec Limit (dBuV/m) | Spec Margin (dB) | Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Receive Mode at 40 MHz Bandwidth | | | | | | | | | | |
| 84.86 | H | 291 | 312 | 61.41 | 59.56 | -18.40 | 41.16 | 49.54 | -8.38 | Spurious |
| 85.77 | H | 266 | 337 | 62.99 | 61.26 | -18.43 | 42.83 | 49.54 | -6.71 | Spurious |
| 500.04 | H | 173 | 197 | 48.05 | 46.19 | -7.17 | 39.02 | 56.90 | -17.88 | Spurious |
| 625.01 | H | 111 | 190 | 47.12 | 46.11 | -5.29 | 40.82 | 56.90 | -16.08 | Spurious |
| 750.05 | H | 103 | 168 | 44.94 | 38.79 | -3.18 | 35.61 | 56.90 | -21.29 | Spurious |
| 84.58 | V | 105 | 7 | 65.34 | 63.53 | -18.52 | 45.01 | 49.54 | -4.53 | Spurious |
| 85.42 | V | 108 | 308 | 65.79 | 64.15 | -18.44 | 45.71 | 49.54 | -3.83 | Spurious |
| 400.00 | V | 132 | 355 | 48.85 | 47.64 | -9.15 | 38.49 | 56.90 | -18.41 | Spurious |
| 500.05 | V | 110 | 349 | 46.32 | 43.10 | -7.57 | 35.53 | 56.90 | -21.37 | Spurious |
| 871.36 | V | 121 | 196 | 46.69 | 44.79 | -1.99 | 42.80 | 56.90 | -14.10 | Spurious |
| 874.17 | V | 106 | 191 | 46.83 | 46.24 | -1.88 | 44.36 | 56.90 | -12.54 | Spurious |
| 1200.09 | H | 113 | 29 | 54.77 | 47.85 | -8.00 | 39.85 | 53.98 | -14.13 | Spurious |
| 1495.19 | H | 120 | 143 | 61.12 | 41.34 | -7.69 | 33.65 | 53.98 | -20.33 | Spurious |
| 1595.37 | H | 138 | 251 | 61.67 | 40.66 | -6.83 | 33.83 | 53.98 | -20.15 | Spurious |
| 1861.15 | H | 142 | 208 | 60.41 | 47.07 | -4.94 | 42.13 | 53.98 | -11.85 | Spurious |
| 2393.03 | H | 159 | 130 | 54.59 | 35.00 | -3.00 | 32.00 | 53.98 | -21.98 | Spurious |
| 2490.56 | H | 204 | 242 | 53.49 | 32.56 | -2.68 | 29.88 | 53.98 | -24.10 | Spurious |

Spec Margin = E-Field QP - Limit, E-Field QP = FIM QP+ Total CF ± Uncertainty
Total CF= Amp Gain + Cable Loss + ANT Factor

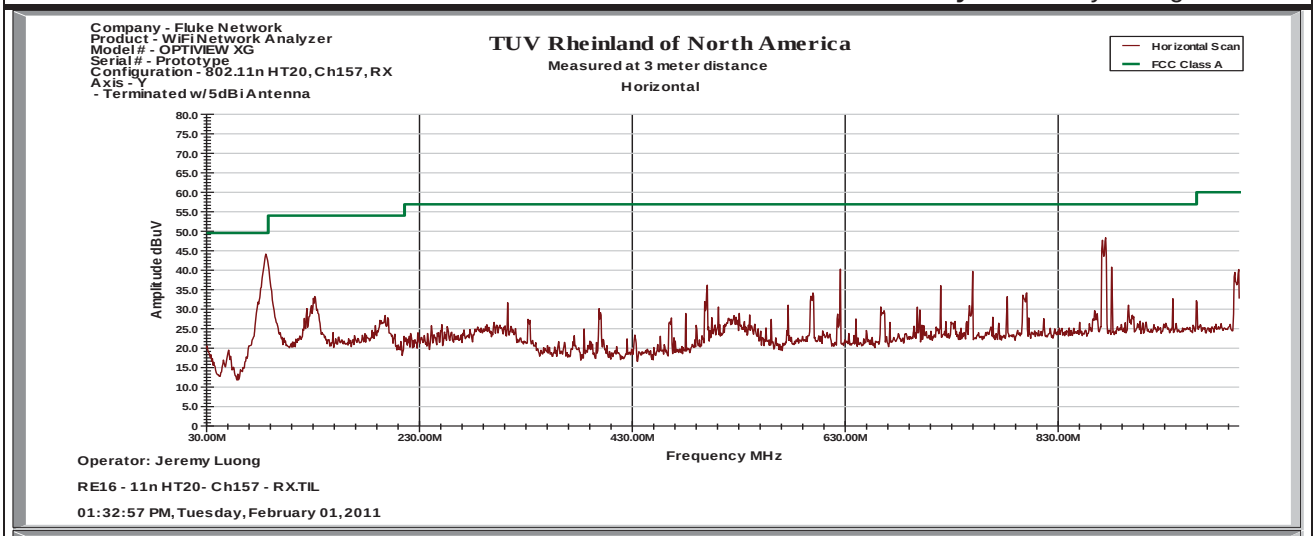
Combined Standard Uncertainty $u_c(y)$ = ± 3.2dB Expanded Uncertainty $U = ku_c(y)$ $k$ = 2 for 95% confidence

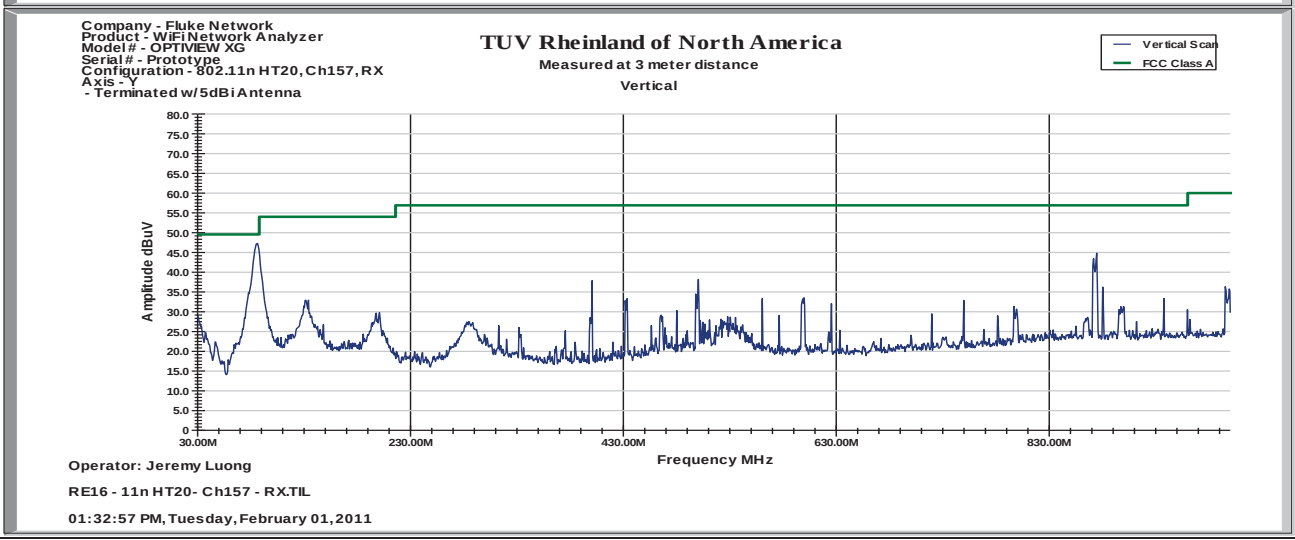
Notes: Tested at 802.11n HT40.
30 MHz to 1GHz range was tested as FCC Class A device.

## SOP 1 Radiated Emissions

Tracking # 31053887.001 Page 3 of 8

| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | February 1, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 21°C / 42%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, RX at 5785MHz | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart b | **RBW / VBW** | 120 kHz / 300 kHz |
| **Dist/Ant Used** | 3m / JB3 | **Performed by** | Jeremy Luong |



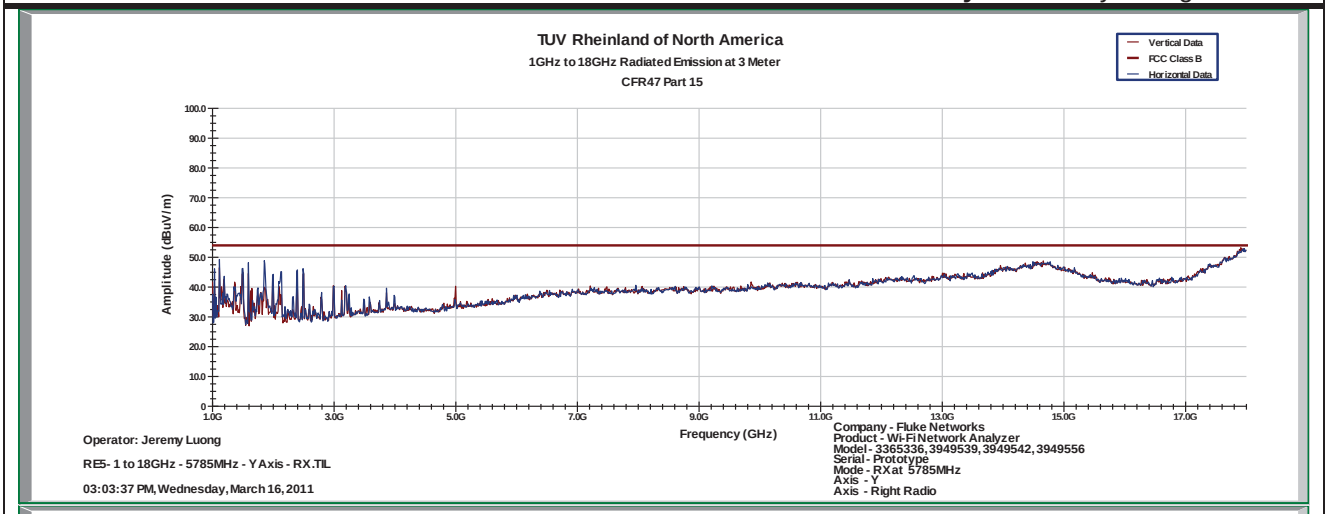



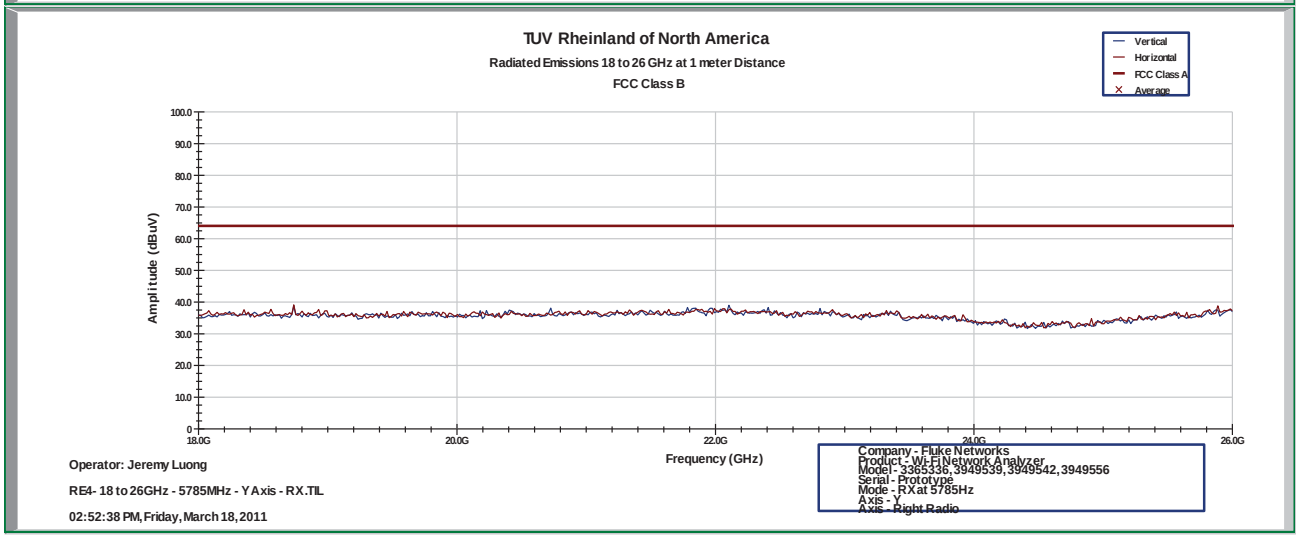

Notes: Tested with a Bandwidth of 20 MHz. FCC Class A Device.

## SOP 1 Radiated Emissions

Tracking # 31053887.001 Page 4 of 8

| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 18, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 39%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, RX at 5785MHz | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart b | **RBW / VBW** | 120 kHz / 300 kHz |
| **Dist/Ant Used** | 3m / EMCO3115 & RA42-K-F-4B-C | **Performed by** | Jeremy Luong |



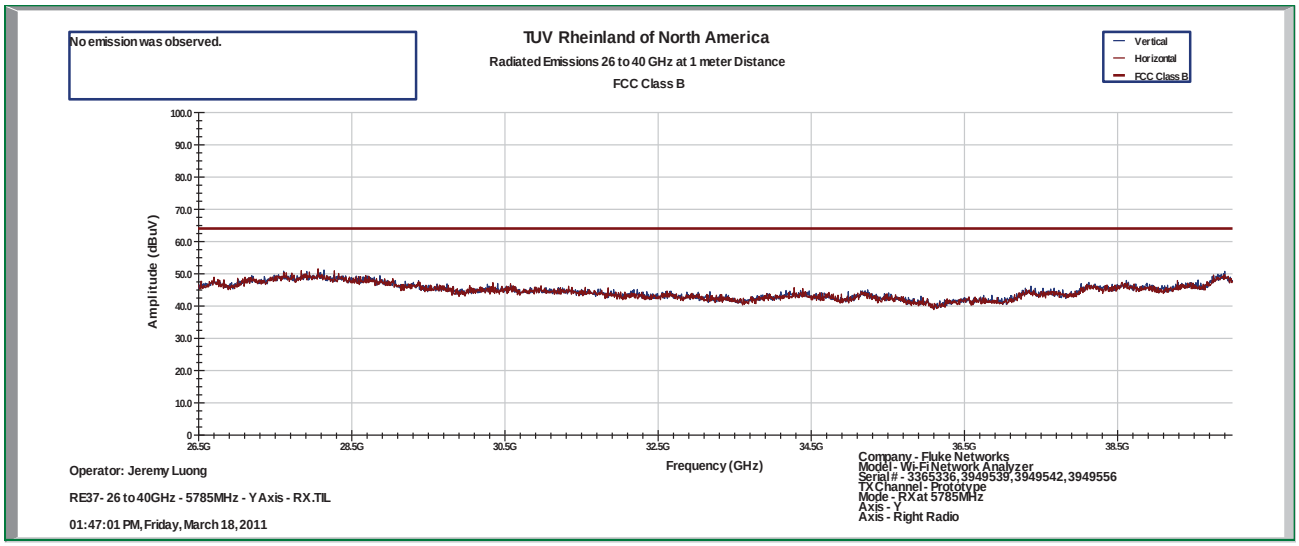




Notes: Tested with a Bandwidth of 20 MHz

## SOP 1 Radiated Emissions

Tracking # 31053887.001 Page 5 of 8

| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 18, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 40%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, RX at 5785MHz | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart b | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m / RA28-K-F-4B-C | **Performed by** | Jeremy Luong |

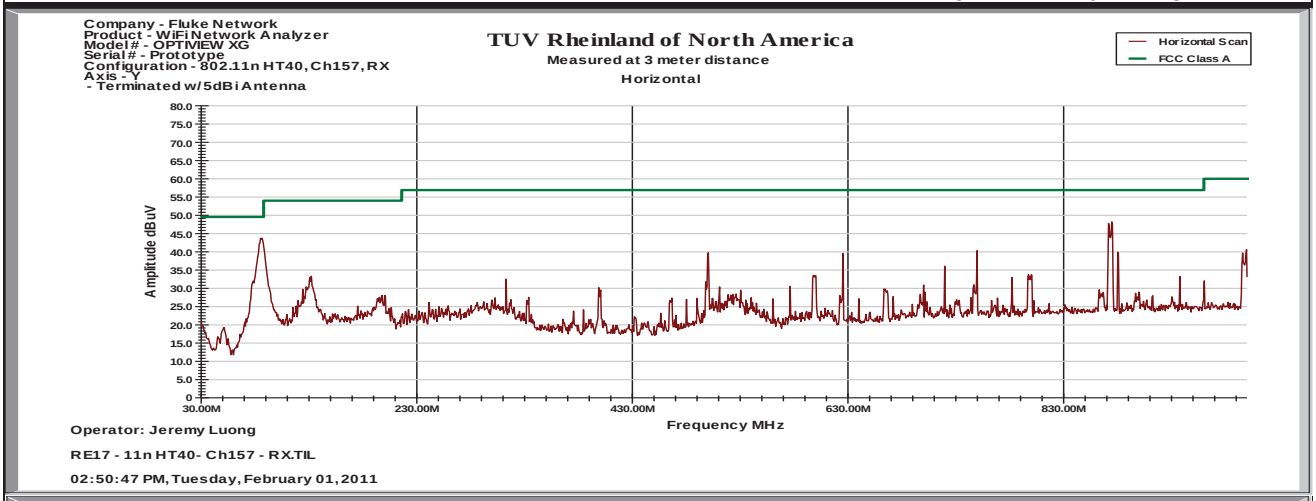


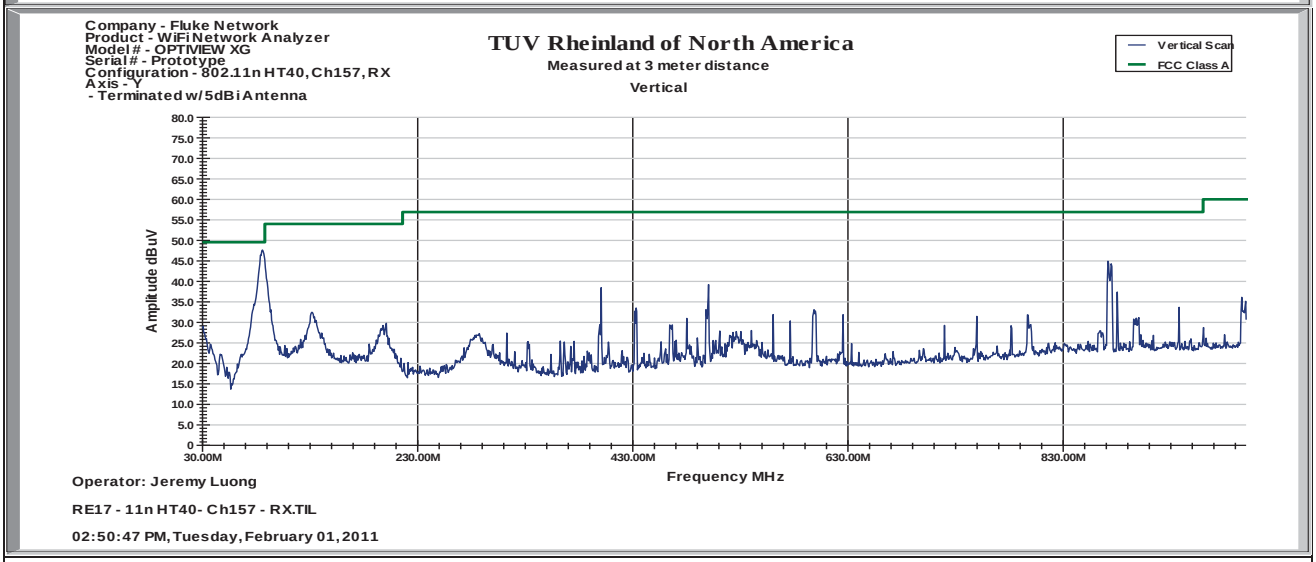

Notes: Tested with a Bandwidth of 20 MHz

## SOP 1 Radiated Emissions

Tracking # 31053887.001 Page 6 of 8

| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | February 1, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 21°C / 42%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, RX at 5795MHz | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart b | **RBW / VBW** | 120 kHz / 300 kHz |
| **Dist/Ant Used** | 3m / JB3 | **Performed by** | Jeremy Luong |




Notes: Tested with a Bandwidth of 40 MHz. FCC Class A Device

## SOP 1 Radiated Emissions

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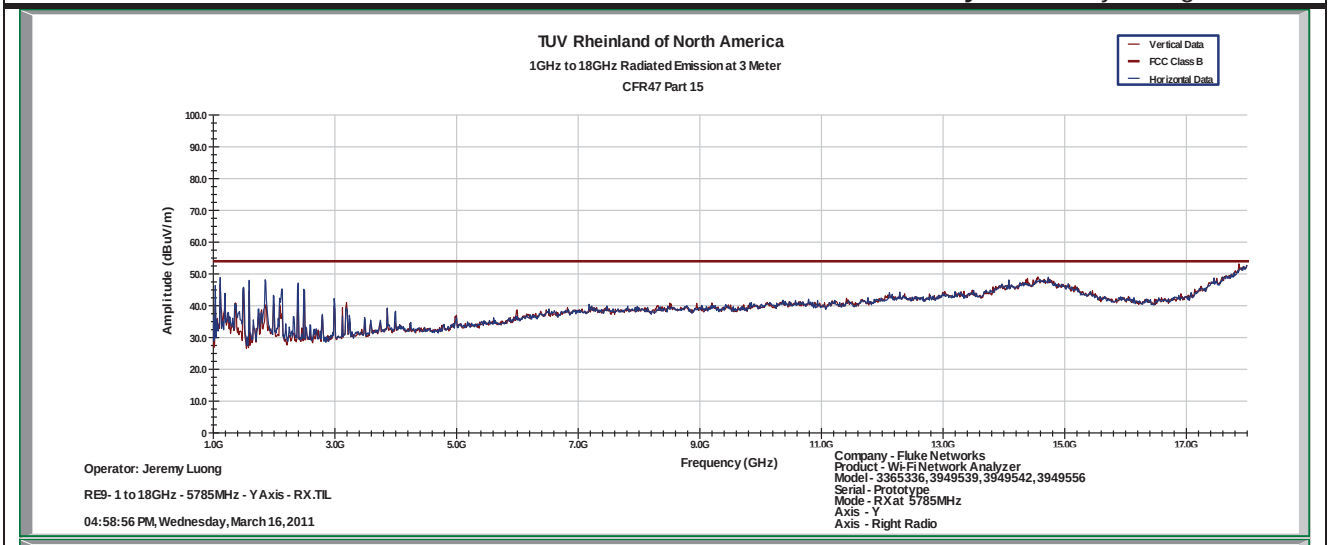
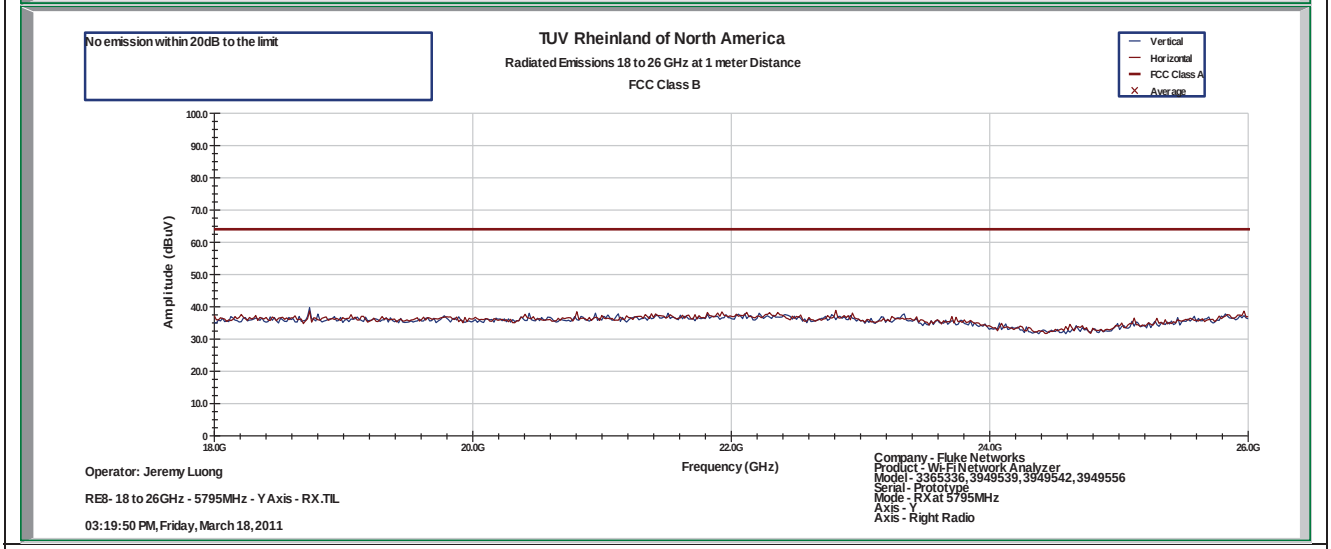
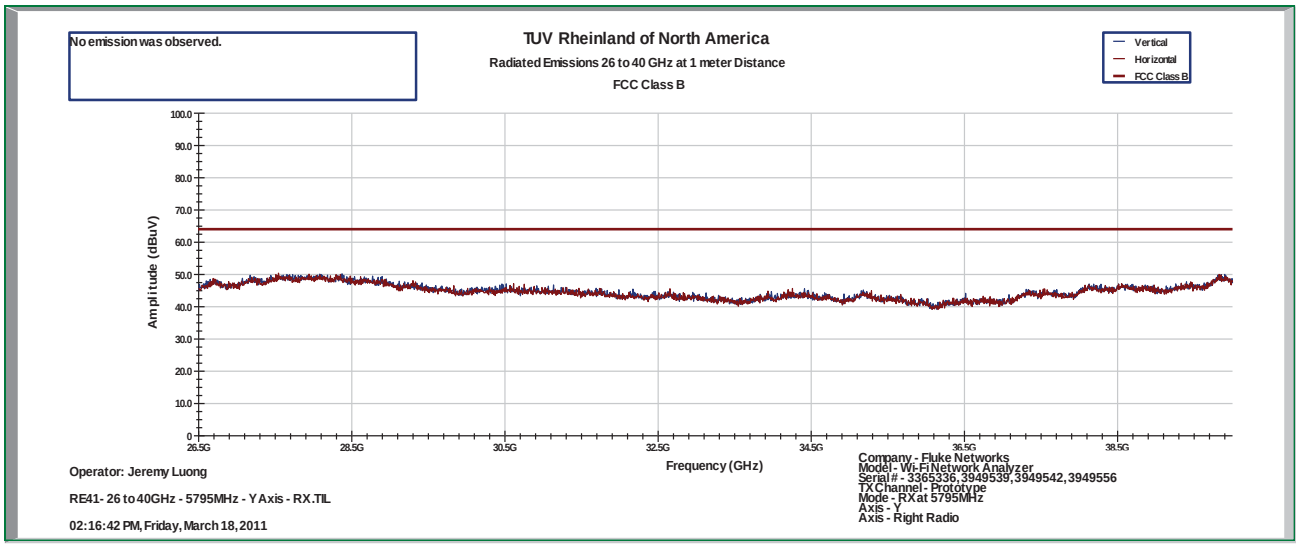
| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 18, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 39%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, RX at 5795MHz | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart b | **RBW / VBW** | 120 kHz / 300 kHz |
| **Dist/Ant Used** | 3m / EMCO3115 & RA42-K-F-4B-C | **Performed by** | Jeremy Luong |




Notes: Tested with a Bandwidth of 40 MHz

| **SOP 1** Radiated Emissions | | Tracking # 31053887.001 Page 8 of 8 | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 18, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23°C / 40%rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Y-Axis, RX at 5795MHz | **Line AC** | 120Vac 60Hz |
| **Standard** | CFR47 Part 15 Subpart b | **RBW / VBW** | 1MHz / 3MHz |
| **Dist/Ant Used** | 3m / RA28-K-F-4B-C | **Performed by** | Jeremy Luong |




Notes: Tested with a Bandwidth of 40 MHz

### 5.6.4 Sample Calculation

The field strength is calculated by subtracting the Amplifier Gain and adding the Cable Loss and Antenna Correction Factor to the measured reading. The basic equation is as follows:

Field Strength (dBμV/m) = FIM - AMP + CBL + ACF

Where: FIM = Field Intensity Meter (dBμV)
AMP = Amplifier Gain (dB)
CBL = Cable Loss (dB)
ACF = Antenna Correction Factor (dB/m)

$$\mu V/m = 10^{\frac{dB\mu V/m}{20}}$$

## 5.7 AC Conducted Emissions

Testing was performed in accordance with ANSI C63.4-2009. These test methods are listed under the laboratory's NVLAP Scope of Accreditation.

This test measures the levels emanating from the EUT's AC input port, thus evaluating the potential for the EUT to cause radio frequency interference to other electronic devices.

The AC conducted emissions of equipment under test shall not exceed the values in CFR47 Part 15.207: 2009 and RSS 210: 2010.

### 5.7.1 Test Methodology

A test program that controls instrumentation and data logging was used to automate the AC Power Line Conducted emission test procedure. The frequency range of interest was divided into sub-ranges such as to yield a frequency resolution of 9 kHz. Each phase and neutral of the AC power line were measured with respect to ground. Measurements were performed using a set of 50μH / 50Ω LISNs.

Testing is either performed in Lab 5. The setup photographs clearly identify which site was used. The vertical ground plane used in the semi-anechoic chamber is a 2m x 2m solid aluminum frame and panel, and it is bonded to the horizontal ground plane.

In the case of tabletop equipment, the EUT is placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane and 40cm from a vertical ground reference plane. The rear of the EUT was positioned flush with the backside of the table and directly over the LISNs. The power and I/O cables were routed over the edge of the table and bundled approximately 40cm from the ground plane. Support equipment was powered from a separate LISN.

#### *5.7.1.1 Deviations*

There were no deviations from this test methodology.

### 5.7.2 Test Results

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

**Table 15:** AC Conducted Emissions – Test Results

| **Test Conditions:** Conducted Measurement at Normal Conditions only | | |
|---|---|---|
| **Antenna Type:** Attached | **Power Level:** See Test Plan | |
| **AC Power:** 120 Vac/60 Hz | **Configuration:** Tabletop | |
| **Ambient Temperature:** 23° C | **Relative Humidity:** 34% RH | |
| **Configuration** | **Frequency Range** | **Test Result** |
| Line 1 (Hot) | 0.15 to 30 MHz | Pass |

| | | |
|---|---|---|
| Line 2 (Neutral) | 0.15 to 30 MHz | Pass |

**SOP 2** Conducted Emissions

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| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 10, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23° C / 34% rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Attached Antenna | **Line AC / Freq** | 120Vac/60Hz |
| **Standard** | CFR47 Part 15.207 | **RBW / VBW** | 9kHz / 30 kHz |
| **Lab/LISN** | Lab #5 / Solar 9348-50-R-24-BNC, Line 1 | **Performed by** | Jeremy Luong |

| Frequency | Quasi-Peak | QP Limit | QP Margin | Average | Ave Limit | Ave Margin |
|---|---|---|---|---|---|---|
| MHz | dBuV | dBuV | dB | dBuV | dBuV | dB |
| 0.150 | 44.47 | 66.00 | -21.53 | 27.81 | 56.00 | -28.19 |
| 0.151 | 44.44 | 66.00 | -21.56 | 27.89 | 56.00 | -28.11 |
| 0.197 | 47.90 | 64.65 | -16.75 | 23.23 | 54.65 | -31.43 |
| 0.198 | 24.72 | 64.64 | -39.92 | -4.05 | 54.64 | -58.69 |
| 9.750 | 35.24 | 60.00 | -24.76 | 29.14 | 50.00 | -20.86 |
| 14.949 | 37.80 | 60.00 | -22.20 | 32.17 | 50.00 | -17.83 |
| 15.436 | 38.21 | 60.00 | -21.79 | 32.60 | 50.00 | -17.40 |
| 15.658 | 38.15 | 60.00 | -21.85 | 32.30 | 50.00 | -17.70 |
| 20.976 | 32.49 | 60.00 | -27.51 | 26.99 | 50.00 | -23.01 |

Spec Margin = QP./Ave. - Limit, ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.2 dB Expanded Uncertainty $U = ku_c(y)$ $k$ = 2 for 95% confidence

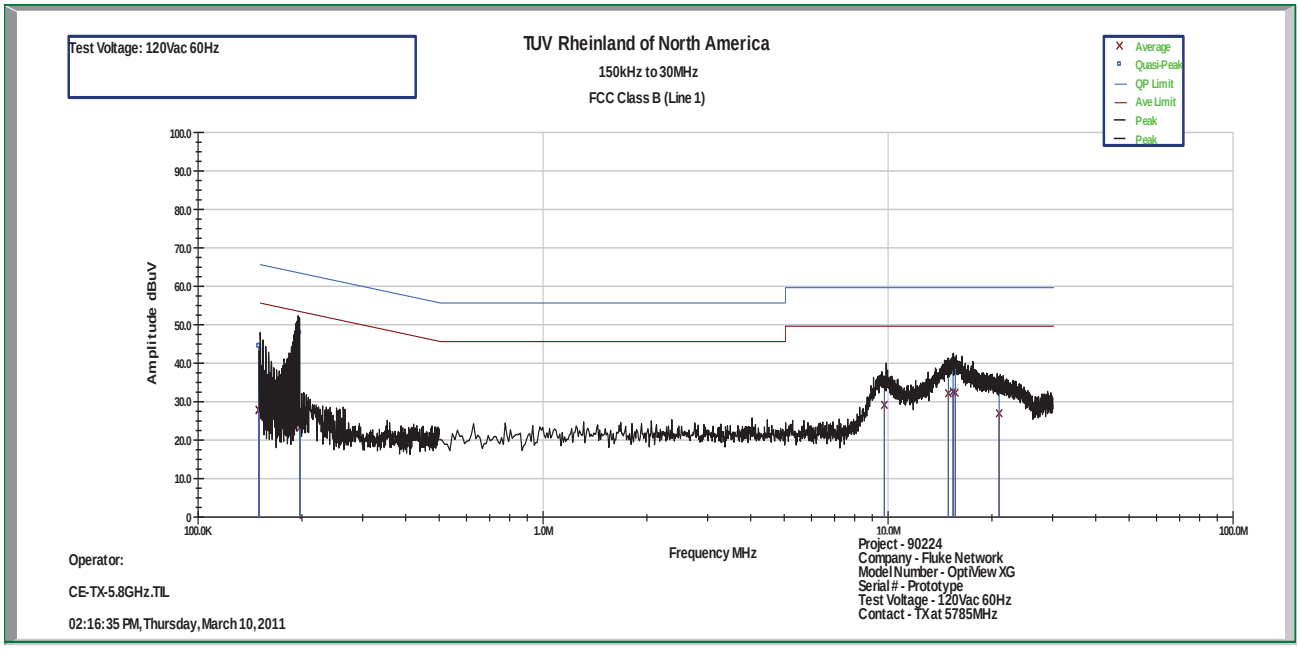
Notes: EUT was setup as table top equipment and transmitted at 5785MHz in HT20 at 6.5Mbps

## **SOP 2** Conducted Emissions

Tracking # 31053887.001 Page 2 of 4

| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 10, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23° C / 34% rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Attached Antenna | **Line AC** | 120Vac/60Hz |
| **Standard** | CFR47 Part 15.207 | **RBW / VBW** | 9kHz / 30 kHz |
| **Lab/LISN** | Lab #5 / Solar 9348-50-R-24-BNC, Line 1 | **Performed by** | Jeremy Luong |

150 kHz to 30 MHz Plot for Line 1 (Hot)




Notes: Meet FCC Class B limit.

**SOP 2** Conducted Emissions

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| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 10, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23° C / 34% rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Attached Antenna | **Line AC / Freq** | 120Vac/60Hz |
| **Standard** | CFR47 Part 15.107 | **RBW / VBW** | 9kHz / 30 kHz |
| **Lab/LISN** | Lab #5 / Solar 9348-50-R-24-BNC, Line 2 | **Performed by** | Jeremy Luong |

| Frequency | Quasi-Peak | QP Limit | QP Margin | Average | Ave Limit | Ave Margin |
|---|---|---|---|---|---|---|
| MHz | dBuV | dBuV | dB | dBuV | dBuV | dB |
| 0.150 | 42.48 | 66.00 | -23.52 | 25.15 | 56.00 | -30.85 |
| 0.197 | 48.40 | 64.65 | -16.25 | 23.83 | 54.65 | -30.82 |
| 0.197 | 48.45 | 64.64 | -16.19 | 23.98 | 54.64 | -30.67 |
| 9.832 | 32.19 | 60.00 | -27.81 | 26.13 | 50.00 | -23.88 |
| 9.951 | 33.45 | 60.00 | -26.55 | 27.36 | 50.00 | -22.64 |
| 14.815 | 39.95 | 60.00 | -20.05 | 34.38 | 50.00 | -15.63 |
| 15.064 | 40.40 | 60.00 | -19.60 | 34.75 | 50.00 | -15.25 |
| 15.756 | 40.26 | 60.00 | -19.74 | 34.62 | 50.00 | -15.38 |
| 20.486 | 34.38 | 60.00 | -25.62 | 28.90 | 50.00 | -21.10 |

Spec Margin = QP./Ave. - Limit, ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.2 dB Expanded Uncertainty $U = ku_c(y)$ $k$ = 2 for 95% confidence

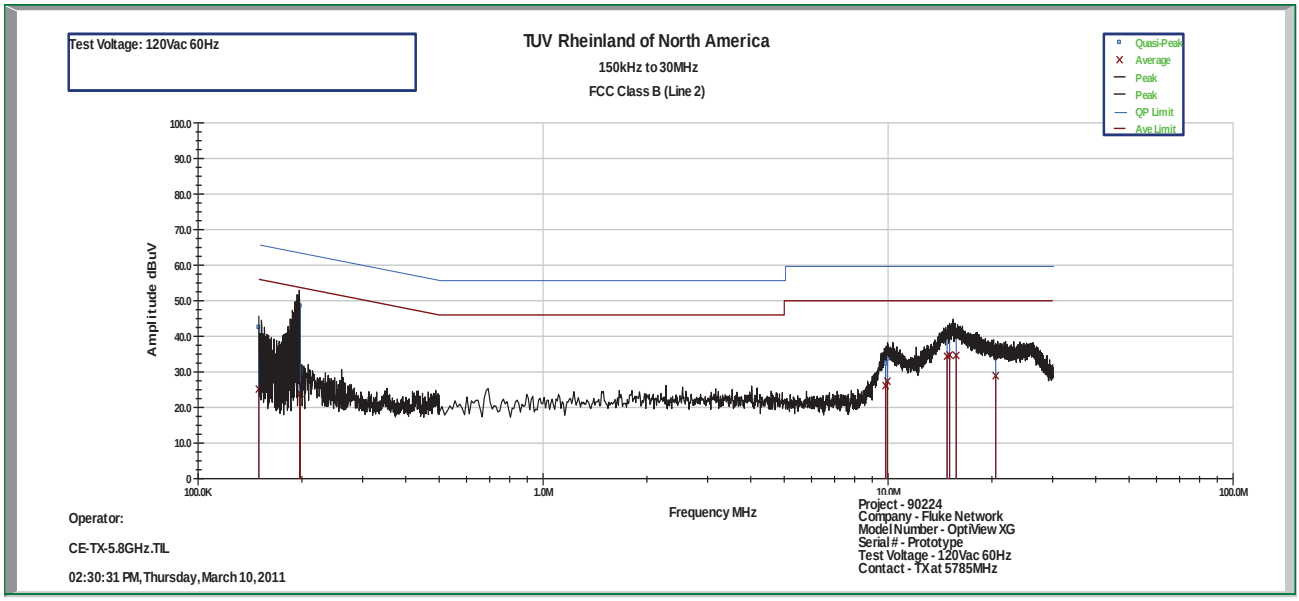
Notes: EUT was setup as table top equipment and transmitted at 5785MHz in HT20 at 6.5Mbps

**SOP 2** Conducted Emissions

Tracking # 31053887.001 Page 4 of 4

| | | | |
|---|---|---|---|
| **EUT Name** | OPTIVIEW XG, OPVXG, OPTIVIEW XG-10G, OPVXG-10G, OPVXGPRO, OPVXG-EXPT, OPTIVIEW XG-LAN, OPVXG-LAN, OPVXG-LAN-10G, OPTIVIEW XG WLAN, OPVXG-WLAN | **Date** | March 10, 2011 |
| **EUT Model** | 3365336, 3949539, 3949542, 3949556, 3949616, 4020634 | **Temp / Hum in** | 23° C / 34% rh |
| **EUT Serial** | Prototype | **Temp / Hum out** | N/A |
| **EUT Config.** | Attached Antenna | **Line AC** | 120Vac/60Hz |
| **Standard** | CFR47 Part 15.107 | **RBW / VBW** | 9kHz / 30 kHz |
| **Lab/LISN** | Lab #5/ Solar 9348-50-R-24-BNC, Line 2 | **Performed by** | Jeremy Luong |

150 kHz to 30 MHz Plot for Line 2 (Neutral)




Note: Meet FCC Class B Limit.

# 6 Test Equipment Use List

## *6.1 Equipment List*

| Equipment | Manufacturer | Model # | Serial/Inst # | Last Cal dd/mm/yy | Next Cal dd/mm/yy |
|---|---|---|---|---|---|
| Bilog Antenna | Sunol Science | JB3 | A102606 | 2/18/2010 | 2/18/2012 |
| Horn Antenna | Sunol Scienece | DRH-118 | A040806 | 9/29/2010 | 9/29/2012 |
| Antenna (18-26GHz) | CMT | RA42-K-F-4B-C | 020131-004 | 10/15/2010 | 10/15/2011 |
| Antenna (26-40GHz) | CMT | RA28-K-F-4B-C | 011469R-003 | 10/15/2010 | 10/15/2011 |
| EMI Receiver | Hewlett Packard | 8546A | 3807A00445 | 2/5/2011 | 2/5/2012 |
| Preselector | Hewlett Packard | 85460A | 3704A00407 | 2/5/2011 | 2/5/2012 |
| Amplifier | Hewlett Packard | 8447D | 2944A07996 | 1/17/2011 | 1/17/2012 |
| Spectrum Analyzer | Rhode&Schwarz | ESIB | 832427/002 | 1/18/2011 | 1/18/2012 |
| Amplifier | Rhode&Schwarz | TS-PR18 | 3545.7008.03 | 9/29/2010 | 9/29/2012 |
| Amplifier | Rhode&Schwarz | TS-PR26 | 100011 | 10/15/2010 | 10/15/2011 |
| Amplifier | Rhode&Schwarz | TS-PR40 | 100012 | 10/15/2010 | 10/15/2011 |
| Signal Generator | Anritsu | MG3694A | 42803 | 1/26/2011 | 1/26/2012 |
| Notch Filter | Micro-Tronics | BRM50702 | 37 | 1/19/2011 | 1/19/2012 |
| Notch Filter | Micro-Tronics | BRC50705 | 9 | 1/19/2011 | 1/19/2012 |
| High Pass Filter (3.5 GHz) | Hewlett Packard | 84300-80038 | 820004 | 1/19/2011 | 1/19/2012 |
| High Pass Filter (8.5 GHz) | Micro-Tronics | HPM50107 | 4 | 1/19/2011 | 1/19/2012 |
| Power Supplier | Kikosui | PCR8000W | CM000912 | 1/19/2011 | 1/19/2012 |
| Digital Multimeter | Fluke | 177 | 92780314 | 1/18/2011 | 1/18/2012 |
| Power Meter | Agilent | E4418B | MY45103902 | 1/18/2011 | 1/18/2012 |
| Power Sensor | Hewlett Packard | 8482A | 55-5131 | 10/27/2010 | 10/27/2011 |
| EMI Receiver | Hewlett Packard | 8546A | 3942A00514 | 11/22/2010 | 11/22/2011 |
| Preselector | Hewlett Packard | 85460A | 3704A00485 | 11/22/2010 | 11/22/2011 |
| LISN | Solar Electronics | Type 9348-50-R-24-BNC | 68509 | 1/17/2011 | 1/17/2012 |
| Thermometer | Fluke | 52II | 96480034 | 9/17/2010 | 9/17/2011 |
| Signal Generator | Anritsu | MG3694A | 42803 | 1/26/2011 | 1/26/2012 |
| Thermo Chamber | Associated Environmental | SK-3102 | 5999 | VBU | VBU |
| Spectrum Analyzer | Rhode&Schwarz | FSL6 | 100169 | 10/13/2010 | 10/13/2011 |
| Spectrum Analyzer | Agilent | E4404B | MY41440636 | 8/19/2010 | 8/19/2011 |

* Calibration of equipment past due for re-calibration will be performed expeditiously. If any equipment is found to be out of tolerance at that time, affected customers will be notified accordingly.

# 7 EMC Test Plan

## 7.1 Introduction

This section provides a description of the Equipment Under Test (EUT), configurations, operating conditions, and performance acceptance criteria. It is an overview of information provided by the manufacturer so that the test laboratory may perform the requested testing.

## 7.2 Customer

**Table 16:** Customer Information

| | |
|---|---|
| **Company Name** | Fluke Networks |
| **Address** | 6920 Seaway Blvd |
| **City, State, Zip** | Everett, WA 98203 |
| **Country** | USA |
| **Phone** | (719) 330-7471 |
| **Fax** | (719) 330-7471 |

**Table 17:** Technical Contact Information

| | |
|---|---|
| **Name** | Bradley Harper |
| **E-mail** | brad.harper@flukenetworks.com |
| **Phone** | (719) 330-7471 |
| **Fax** | (719) 330-7471 |

## *7.3 Equipment Under Test (EUT)*

**Table 18:** EUT Specifications

| EUT Specification | |
|---|---|
| OptiView XG Dimensions | 12.4” x 9.5” x 2.0” |
| AC Adapter<br>( XP Power M/N: VEH90PS19) | Input Voltage: 100-240Vac 50-60Hz<br>Input Current: 1200mA<br>Output Voltage: 19VDC<br>Output Current: 4.74A |
| Environment | Indoor and Outdoor |
| Operating Temperature Range: | 0 to 50 degrees C |
| Multiple Feeds: | ☐ Yes and how many<br>☒ No |
| Hardware Version | Rev. 9 |
| Part Number | 3799739 |
| RF Software Version | ART2.13 |
| Radio Module 2 802.11-radio modules | |
| Operating Mode | 802.11b, g, HT20, and HT40 |
| Transmitter Frequency Band | 2.412 GHz to 2.462 GHz<br>5.15 GHz to 5.25 GHz (Indoor Use)<br>5.25 GHz to 5.35 GHz<br>5.47 GHz to 5.725 GHz<br>5.725 GHz to 5.85 GHz |
| Max. Rated Power Output | See Channel Planning Table. |
| Power Setting @<br>Operating Channel | See Channel Planning Table. |
| Antenna Type | PCB Mounted Antenna (3 per module)<br>External antenna for receive only. (5dBi Dipole or 7dBi Omni Antenna) |
| Modulation Type | ☐ AM ☐ FM ☒ DSSS ☒ OFDM<br>☐ Other describe: |

| | |
|---|---|
| Date Rate | 802.11b: 1, 2, 5.5, 11 Mbps at 1 Spatial Stream<br>802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps at 1 Spatial Stream<br>802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps at 1 Spatial Stream<br>802.11n HT20:<br>1 Spatial Stream: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65 Mbps<br>2 Spatial Streams: 13, 26, 39, 58, 78, 104, 117, 130 Mbps<br>3 Spatial Streams: 19.5, 39, 58.5, 78, 117, 156, 175.5, 195 Mbps<br>802.11n HT40:<br>1 Spatial Stream: 13.5, 27, 40.5, 54, 81, 108, 121.5, 135 Mbps<br>2 Spatial Streams: 27, 54, 81, 108, 162, 216, 243, 270 Mbps<br>3 Spatial Streams: 40.5, 81, 121.5, 162, 243, 324, 364.5, 405 Mbps |
| TX/RX Chain (s) | MIMO (3x3) |
| Directional Gain Type | ☒ Uncorrelated ☒ No Beam-Forming<br>☐ Other describe: |
| Type of Equipment | ☐ Table Top ☐ Wall-mount ☐ Floor standing cabinet<br>☒ Other *describe OptiView XG is portable device with 2 plug-in radio cards.* |
| **Note:** The right radio was selected for all RF evaluations due to its additional feature of the external antenna selection for receiving. | |

**Table 19:** EUT Channel Power Specifications

| No. | Frequency (MHz) | Target Power Value | | | | |
|---|---|---|---|---|---|---|
| | | 802.11b | 802.11g | 802.11a | 802.11n HT20 | 802.11n HT40 |
| 1 | 2412 | 12 | 12 | | 12.5 | 8 |
| 2 | 2417 | 12 | 12 | | 12.5 | 8 |
| 3 | 2422 | 12 | 12 | | 12.5 | 8 |
| 4 | 2427 | 12 | 12 | | 12.5 | 8 |
| 5 | 2432 | 12 | 12 | | 12.5 | 8 |
| 6 | 2437 | 12 | 12 | | 12.5 | 8 |
| 7 | 2442 | 12 | 12 | | 12.5 | 8 |
| 8 | 2447 | 12 | 12 | | 12.5 | |
| 9 | 2452 | 12 | 12 | | 12.5 | |
| 10 | 2457 | 12 | 12 | | 12.5 | |
| 11 | 2462 | 12 | 12 | | 12.5 | |
| 36 | 5180 | | | 11 | 11.5 | 11 |
| 40 | 5200 | | | 11 | 11.5 | |
| 44 | 5220 | | | 11 | 11.5 | 11 |
| 48 | 5240 | | | 11 | 11.5 | |
| 52 | 5260 | | | 16 | 14.5 | 13.5 |
| 56 | 5280 | | | 16 | 14.5 | |
| 60 | 5300 | | | 16 | 14.5 | 11 |
| 64 | 5320 | | | 14 | 14.5 | |
| 100 | 5500 | | | 14 | 10 | 10 |
| 104 | 5520 | | | 14 | 10 | |
| 108 | 5540 | | | 14 | 10 | 10 |
| 112 | 5560 | | | 14 | 10 | |
| 116 | 5580 | | | 14 | 14.5 | 12.5 |
| 120 | 5600 | | | 14 | 14.5 | |
| 124 | 5620 | | | 14 | 14.5 | 12.5 |
| 128 | 5640 | | | 14 | 14.5 | |
| 132 | 5660 | | | 13 | 14.5 | 12.5 |
| 136 | 5680 | | | 13 | 14.5 | |
| 140 | 5700 | | | 13 | 14.5 | |
| 149 | 5745 | | | 13 | 14.5 | 12.5 |
| 153 | 5765 | | | 13 | 14.5 | |
| 157 | 5785 | | | 13 | 14.5 | 12.5 |
| 159 | 5795 | | | 13 | 14.5 | |
| 161 | 5805 | | | 13 | 14.5 | |
| 165 | 5825 | | | 13 | 14.5 | |

**Note:** 1. The center operating frequency is shifted upward by 10 MHz for HT40.

2. The adjusted power target values are updated at the evaluated frequencies.
3. This report is only documented for frequency ranges, 2400-2483.5MHz and 5725-5850 MHz.

**Table 20:** Interface Specifications

| Interface Type | Cabled with what type of cable? | Is the cable shielded? | Maximum potential length of the cable? | Metallic (M), Coax (C), Fiber (F), or Not Applicable? |
|---|---|---|---|---|
| USB x2 | Unterminated | ☐ No | ☐ Metric: 1.8m | ☒ M |
| MGM | Unterminated | ☐ No | ☐ Metric: 1.8m | ☒ M |
| RJ45 (x2) | Unterminated | ☐ No | ☐ Metric: 10 m | ☒ M |
| SFP (x2) | Unterminated | ☐ No | ☐ Metric: 3 m | ☒ Fiber |
| Video | Unterminated | ☐ No | ☐ Metric: 1.8m | ☒ M |
| eSATA | Unterminated | ☐ No | ☐ Metric: 1 m | ☒ M |

**Table 21:** Supported Equipment

| Equipment | Manufacturer | Model | Serial | Used for |
|---|---|---|---|---|
| Access Point | Cisco | Air-RM1252G-A-k9 | FTX123493DS | DFS Testing |
| Note: None. | | | | |

**Table 22:** Description of Sample used for Testing

| Device | Serial | RF Connection | CFR47 Part 15.247 |
|---|---|---|---|
| OptiView XG | Prototype #1 | Integrated Antenna | TX Emission,<br>RX Emission,<br>AC Conducted Emission |
| | Prototype #2 | Direct via SMA | RF Power Output,<br>Out of Band Emission,<br>Peak Power Spectral Density,<br>Occupied Bandwidth |

**Table 23:** Description of Test Configuration used for Radiated Measurement.

| Device | Antenna | Mode | Setup Photo (X-Axis) | Setup Photo (Y-Axis) | Setup Photo (Z-Axis) |
|---|---|---|---|---|---|
| OptiView XG | Integrated | * Transmit<br>* Receive | LCD faced up. | LCD faced sideways | Holding Side faced upward. |
| **Note:** Pre-scans were performed in 3 orthogonal axis, and Y-Axis was worst. | | | | | |

**Table 24:** Final Test Mode for 2400 MHz to 2483.5MHz Band

| Test | 802.11b | 802.11g | 802.11n HT20 | 802.11n HT40 |
|---|---|---|---|---|
| Occupied Bandwidth | 2412, 2437, 2462 MHz @ 1Mbps | 2412, 2437, 2462 MHz @ 6Mbps | 2412, 2437, 2462 MHz @ 1 Stream – 6.5Mbps | 2422, 2437, 2452 MHz @ 1 Stream – 13.5Mbps |
| Output Power | 2412, 2437, 2462 MHz @ 1Mbps | 2412, 2437, 2462 MHz @ 6Mbps | 2412, 2437, 2462 MHz @ 1 Stream – 6.5Mbps 2 Streams – 13Mbps 3 Streams – 19.5Mbps | 2422, 2437, 2452 MHz @ 1 Stream – 13.5Mbps 2 Streams – 27Mbps 3 Streams – 40.5Mbps |
| Peak Power Spectral Density | 2412, 2437, 2462 MHz @ 1Mbps | 2412, 2437, 2462 MHz @ 6Mbps | 2412, 2437, 2462 MHz @ 1 Stream – 6.5Mbps 2 Streams – 13Mbps 3 Streams – 19.5Mbps | 2422, 2437, 2452 MHz @ 1 Stream – 13.5Mbps 2 Streams – 27Mbps 3 Streams – 40.5Mbps |
| Out-of-Band (-20 dBr) | 2412, 2437, 2462 MHz @ 11Mbps | 2412, 2437, 2462 MHz @ 6Mbps | 2412, 2437, 2462 MHz @ 1 Stream – 6.5Mbps | 2422, 2437, 2452 MHz @ 1 Stream – 13.5Mbps |
| Band-Edge (Radiated) | 2412, 2437, 2462 MHz @ 1Mbps | 2412, 2437, 2462 MHz @ 9Mbps | 2412, 2437, 2462 MHz @ 1 Stream – 58.5Mbps 2 Streams – 13Mbps 3 Streams – 39Mbps | 2422, 2437, 2452 MHz @ 1 Stream – 40.5Mbps 2 Streams – 54Mbps 3 Streams – 405Mbps |
| Transmitted Spurious Emission | 2412, 2437, 2462 MHz @ 1Mbps | 2412, 2437, 2462 MHz @ 6Mbps | 2412, 2437, 2462 MHz @ 1 Stream – 6.5Mbps | 2422, 2437, 2452 MHz @ 1 Stream – 13.5Mbps |
| Received Spurious Emission | 2437 MHz | 2437 MHz | 2437 MHz | 2437 MHz |
| AC Conducted Emission | 2437MHz @ 1Mbps | | | |

**Note:** 1. All radiated emission performed on Y-Axis.
2. At single data stream, all 3 transmitted chains were verified. Since Chain 1 output was highest, all final testing performed with Chain 1 active.
3. All tests were pre-scanned for worst case before final testing.
4. 7dBi Omni directional antenna was attached for testing; pre-scan was worst with omni antenna vs. monopole antenna
5. AC Conducted Emissions were verified for all modes with battery charging and without battery. Worst mode was selected for final test.

**Table 25:** Final Test Mode for 5725 MHz to 5850 MHz Band

| Test | 802.11a | 802.11n HT20 | 802.11n HT40 |
|---|---|---|---|
| Occupied Bandwidth | 5745, 5785, 5825MHz @ 6Mbps | 5745, 5785, 5825MHz @ 1 Stream – 39Mbps | 5755, 5795MHz @ 1 Stream – 13.5Mbps |
| Output Power | 5745, 5785, 5825MHz @ 24Mbps | 5745, 5785, 5825MHz @ 1 Stream – 6.5Mbps 2 Streams – 13Mbps 3 Streams – 19.5Mbps | 5755, 5795MHz @ 1 Stream – 81Mbps 2 Streams – 27Mbps 3 Streams – 40.5Mbps |
| Peak Power Spectral Density | 5745, 5785, 5825MHz @ 24Mbps | 5745, 5785, 5825MHz @ 1 Stream – 6.5Mbps 2 Streams – 13Mbps 3 Streams – 19.5Mbps | 5755, 5795MHz @ 1 Stream – 81Mbps 2 Streams – 27Mbps 3 Streams – 40.5Mbps |
| Out-of-Band (-20 dBr) | 5745, 5785, 5825MHz @ 24Mbps | 5745, 5785, 5825MHz @ 1 Stream – 6.5Mbps | 5755, 5795MHz @ 1 Stream – 13.5Mbps |
| Band-Edge (Radiated) | 5745, 5785, 5825MHz @ 6Mbps | 5745, 5785, 5825MHz @ 1 Stream – 6.5Mbps | 5755, 5795MHz @ 1 Stream – 13.5Mbps |
| Transmitted Spurious Emission | 5745, 5785, 5825MHz @ 6Mbps | 5745, 5785, 5825MHz @ 1 Stream – 6.5Mbps | 5755, 5795MHz @ 3 Stream – 40.5Mbps |
| Received Spurious Emission | | 5785 MHz | 5795 MHz |
| AC Conducted Emission | | 5785 MHz @ 1 Stream - 6.5Mbps | |

**Note:** 1. All radiated emission performed on Y-Axis.
2. At single data stream, all 3 transmitted chains were verified. Since Chain 1 output was highest, all final testing performed with Chain 1 active.
3. All tests were pre-scanned for worst case before final testing.
4. 7dBi Omni directional antenna was attached for testing; pre-scan was worst with omni antenna vs. monopole antenna
5. AC Conducted Emissions were verified for all modes with battery charging and without battery. Worst mode was selected for final test.

## 7.4 Test Specifications

Testing requirements

**Table 26:** Test Specifications

| **Emissions and Immunity** | |
|---|---|
| Standard | Requirement |
| CFR 47 Part 15.247: 2009 | All |
| RSS 210 Issue 8, 2010 | All |

FLUKE networks.

# OPTIVIEW XG models

**TO WHOM IT MAY CONCERN:**

OptiViewXG is a family name for all the product hardware described below, each model is the same from a WiFi radio standpoint and the only difference is SW options that do not affect the RF hardware.

| Model Number | Item Number |
|---|---|
| **MAINFRAMES AND BUNDLES** | |
| OPVXG, NETWORK ANALYSIS TABLET (GIG) | 3365336 |
| OPVXG-10G, NETWORK ANALYSIS TABLET (10 GIG) | 3949542 |
| OPVXGPRO, Network Analysis Tablet (GIG) with WiFi Analyzer and Spectrum XT | 3949602 |
| OPVXG-EXPT, Network Analysis Tablet (10 GIG) with WiFi Analyzer and Spectrum XT | 3949616 |
| OPVXG–LAN, OPVXG-LAN,OPTIVIEW XG - LAN, NETWORK ANALYSIS TABLET | 3949556 |
| OPVXG-LAN-10G, OPTIVIEW XG NETWORK ANALYSIS TABLET ( 10 GIG) | 4020634 |
| OPVXG-WLAN, OPTIVIEW XG WLAN, NETWORK ANALYSIS TABLET | 3949539 |

Sincerely,

Date: 20 April 2011

By: Brad Harper

Signature — Printed Name

Title: Project Manager Tel.No: 719-272-8675