# Section 5

# Test Report Part 1

## TABLE OF CONTENTS

# Test Equipment List

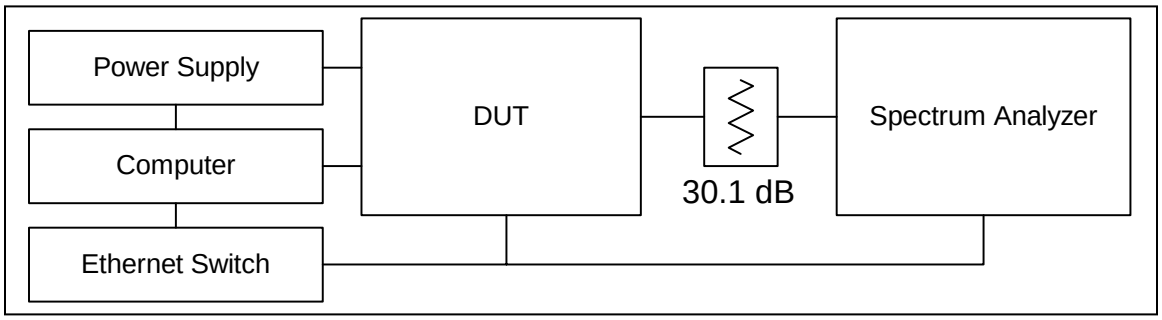
| Test Equipment | Description |
|---|---|
| DUT | NextNet Wireless Residential Subscriber Unit<br>Model No. RSU-2510-S<br>Bd ID No. D151486<br>Revision B |
| Spectrum Analyzer | Agilent E4440A<br>S/N: MY44022791<br>Calibrated: 05/30/2004<br>Calibration due: 05/30/2006 |
| Attenuator/Coaxial Cable (all applicable tests except harmonic frequencies) | Calibrated by user<br>MCE/Weinshel Attenuator 30 dB, 10W<br>Model: 23-10-34, S/N. BN 9845<br>Calibrated by user |
| Filter/Attenuator Assembly (harmonic frequency test only) | High Pass Filter 4-18 GHz, P/N H04G18G2, S/N 89099<br>Microwave Circuits<br>10 dB/10W Attenuator, MCE/Weinshel<br>Model: 23-20-34, S/N BT3845<br>Calibrated by user |
| Computer (NN282) | Dell Inspiron 4000<br>S/N: TW-09C748-12800-17Q-8612<br>Calibration not required |
| Ethernet Switch | D-Link<br>Model: DSS-5+<br>5 port 10/100Mbps<br>S/N: B20544C017136<br>Calibration not required |
| Power Supply, LX (All Tests Except Frequency Stability) | OTE-17-13<br>13V, 1.3A<br>S/N 5305 |
| AC Power Source (Frequency Stability Test Only) | Instek APS-9501<br>S/N: EF844094<br>Calibrated with voltmeter listed below. |
| Digital Voltmeter | HP 34401A<br>S/N: MY45001201<br>Calibrated: 4-9-2005<br>Calibration due: 4-9-2007 |
| Temperature Chamber | Test Equity (N) S/N 10616<br>1000 Series<br>Temperature verified with thermocouple listed below |
| Temperature Sensor | Fluke 89 IV True RMS Multimeter S/N 75760541, with K-Type Thermocouple |

# Test Equipment List (Cont'd)

| Test Equipment | Description |
|---|---|
| Radiation Hazard Meter | General Microwave Corporation<br>RAHAM Model 3<br>Calibrated: 10-20-2005<br>Calibration Due: 10-20-2007<br>Max DC output measured by Fluke 89 IV True RMS Multimeter, S/N 75760541 |

# RF Power Output

| | |
|---|---|
| FCC Rules: | 2.1046, 27.50(h)(2) |
| IC Rules: | RSS-193 clauses 3.2(f), 3.4, 4.3<br>SRSP-302.5 clause 5.3 |
| FCC Requirement: | 33 dBW EIRP (5.5 MHz or 6.0 MHz channel BW) |
| IC Requirement: | < 10 watts conducted<br>< 8.3 dBW (6.7 W) in any 25 kHz bandwidth EIRP |
| Standard: | TIA-603-C<br>TIA Standard, Land Mobile FM or PM Communications Equipment, Measurement and Performance Standards |
| Test Procedure: | The conducted RF output power was measured with a spectrum analyzer utilizing the power measurement function which integrates the total power within the measurement bandwidth. The RF output is applied to an attenuator that is connected to the spectrum analyzer RF input port. The spectrum analyzer is time gated to capture the transmission during the burst. An RMS detector is used to measure the average power during the transmission. The transmitter is enabled in test mode by the attached computer. The RF loss of the attenuator(s) and coax has been measured and is included in the spectrum analyzer offset level and is noted on the block diagram. Measurements are performed at several frequencies across the band for each of the modulation formats available<br>(4-, 16-, and 64-QAM) and channel bandwidths (5.5 and 6.0 MHz). |
| Test Conditions: | Test Frequencies: 2499, 2593, 2687 MHz (5.5 and 6.0 MHz bandwidth)<br>Temperature = 25°C<br>Supply Voltage = 120 VAC / 60 Hz Nominal to DUT Power Supply |




**Conducted RF Power Test Setup**

# Conducted RF Output Test Results

| Maximum (2 W) Power setting | | | | | | | |
|---|---|---|---|---|---|---|---|
| Freq (MHz) | Bandwidth | 4 QAM | | 16 QAM | | 64 QAM | |
| | | (dBm) | (Watts) | (dBm) | (Watts) | (dBm) | (Watts) |
| 2499 | 6.0 | 32.56 | 1.80 | 32.55 | 1.80 | 32.56 | 1.80 |
| 2593 | 6.0 | 32.48 | 1.77 | 32.50 | 1.78 | 32.49 | 1.77 |
| 2687 | 6.0 | 31.77 | 1.50 | 31.78 | 1.51 | 31.79 | 1.51 |
| | | | | | | | |
| 2499 | 5.5 | 32.60 | 1.82 | 32.60 | 1.82 | 32.59 | 1.82 |
| 2593 | 5.5 | 32.53 | 1.79 | 32.54 | 1.79 | 32.54 | 1.79 |
| 2687 | 5.5 | 31.83 | 1.52 | 31.80 | 1.51 | 31.81 | 1.52 |

| Minimum (1 mW) Power setting | | | | | | | |
|---|---|---|---|---|---|---|---|
| Freq (MHz) | Bandwidth | 4 QAM | | 16 QAM | | 64 QAM | |
| | | (dBm) | (Watts) | (dBm) | (Watts) | (dBm) | (Watts) |
| 2499 | 6.0 | 0.63 | 0.0012 | 0.62 | 0.0012 | 0.59 | 0.0011 |
| 2593 | 6.0 | -0.07 | 0.0010 | -0.04 | 0.0010 | -0.04 | 0.0010 |
| 2687 | 6.0 | -0.57 | 0.0009 | -0.57 | 0.0009 | -0.57 | 0.0009 |
| | | | | | | | |
| 2499 | 5.5 | 0.64 | 0.0012 | 0.62 | 0.0012 | 0.63 | 0.0012 |
| 2593 | 5.5 | -0.01 | 0.0010 | -0.03 | 0.0010 | -0.04 | 0.0010 |
| 2687 | 5.5 | -0.54 | 0.0009 | -0.54 | 0.0009 | -0.54 | 0.0009 |

## Test Conclusions

Vertically Polarized Antenna

The vertically polarized 4-element patch array antenna for the transmitting signal has 13 dBi of gain. Therefore the maximum radiated transmit power (EIRP) is as follows:

| 14.29 % maximum Transmit duty cycle | | |
|---|---|---|
| | 5.5 MHz Channel | 6.0 MHz Channel |
| Pmax EIRP= | Ptx + G(antenna) | Ptx + G(antenna) |
| Pmax EIRP= | 33 dBm + 13 dBi = 46 dBm | 33 dBm + 13 dBi = 46 dBm |
| Pmax EIRP= | 39.8 Watts EIRP / 4.96 MHz | 39.8 Watts EIRP / 5.48 MHz |
| Pmax EIRP= | 8.0242 uWatts EIRP / Hz | 7.2628 uWatts EIRP / Hz |
| Pmax EIRP= | 0.2006 Watts EIRP / 25 kHz | 0.1816 Watts EIRP / 25 kHz |
| Pmax EIRP= | -6.98 dBW / 25 kHz | -7.41 dBW / 25 kHz |

Both channel bandwidth radiated power calculations indicate that the product is below the 8.3 dBW / 25 kHz EIRP power limit.

Pass: Transmitted power output requirement with vertically polarized antenna.

Horizontally Polarized Antenna

The horizontally polarized 4-element patch array antenna for the transmitting signal has 12.2 dBi of gain. Therefore the maximum transmitting power (EIRP) is as follows:

| 14.29 % maximum Transmit duty cycle | | |
|---|---|---|
| | 5.5 MHz Channel | 6.0 MHz Channel |
| Pmax EIRP= | Ptx + G(antenna) | Ptx + G(antenna) |
| Pmax EIRP= | 33 dBm + 12.2 dBi = 45.2 dBm | 33 dBm + 12.2 dBi = 45.2 dBm |
| Pmax EIRP= | 33.1 Watts EIRP / 4.96 MHz | 33.1 Watts EIRP / 5.48 MHz |
| Pmax EIRP= | 6.6734 uWatts EIRP / Hz | 6.0401 uWatts EIRP / Hz |
| Pmax EIRP= | 0.1668 Watts EIRP / 25 kHz | 0.1510 Watts EIRP / 25 kHz |
| Pmax EIRP= | -7.777 dBW / 25 kHz | -8.210 dBW / 25 kHz |

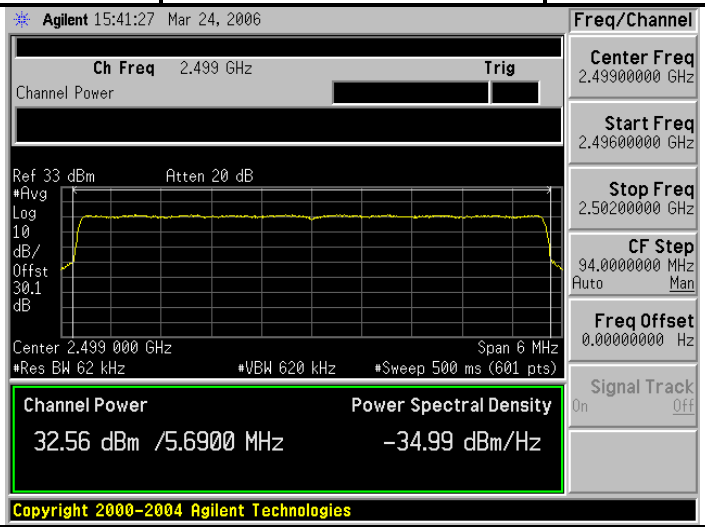
Both channel bandwidth radiated power calculations indicate that the product is below the 8.3 dBW / 25 kHz EIRP power limit.

Pass: Transmitted power output requirement with horizontally polarized antenna.

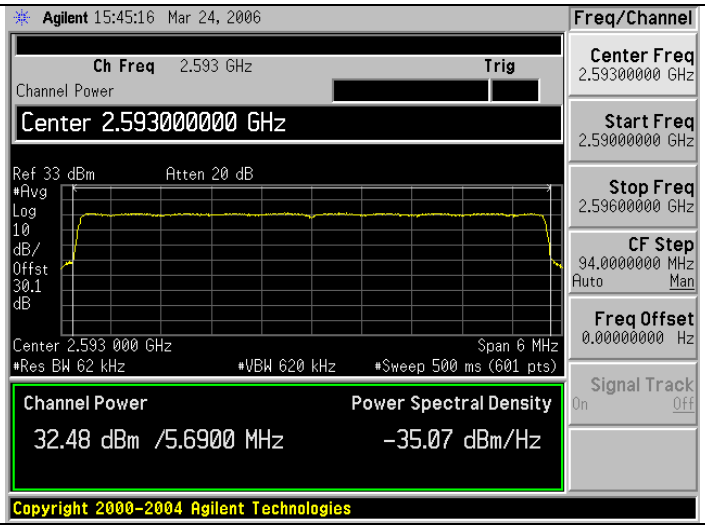
# Conducted RF Power Output Plots

*NOTE: The following are spectrum analyzer plots of the 4 QAM data in the preceding tables. The plots for the 16 and 64 QAM modulation levels are similar and are located in the Appendix.*

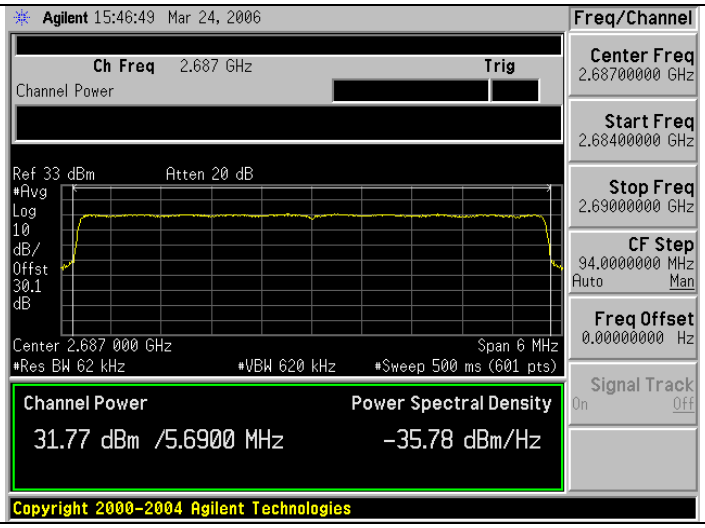
| Bandwidth: 6.0 MHz | RF Power: 2 Watts | Modulation: 4 QAM |
|---|---|---|




**2499 MHz**

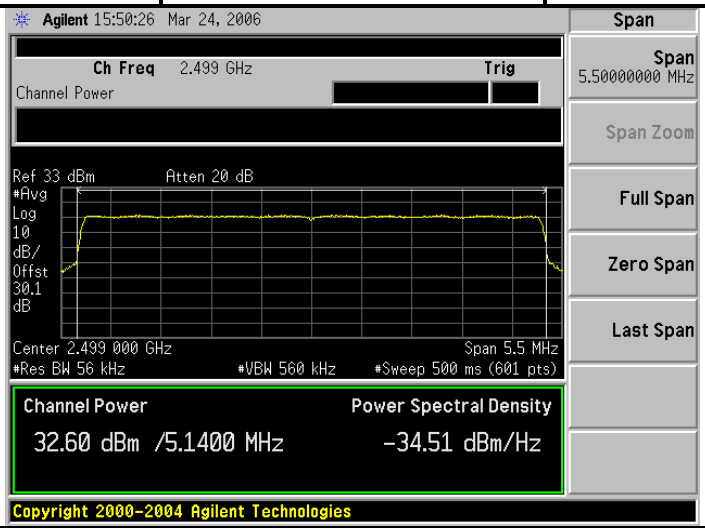



**2593 MHz**

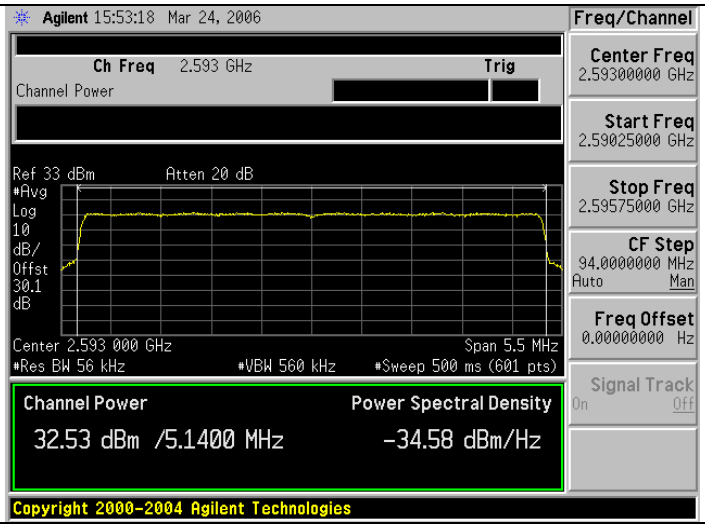



**2687 MHz**

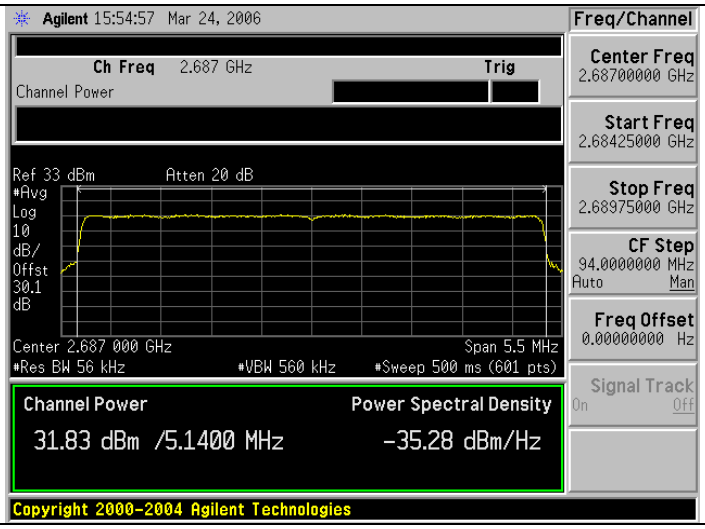
| Bandwidth: 5.5 MHz | RF Power: 2 Watts | Modulation: 4 QAM |
|---|---|---|




**2499 MHz**

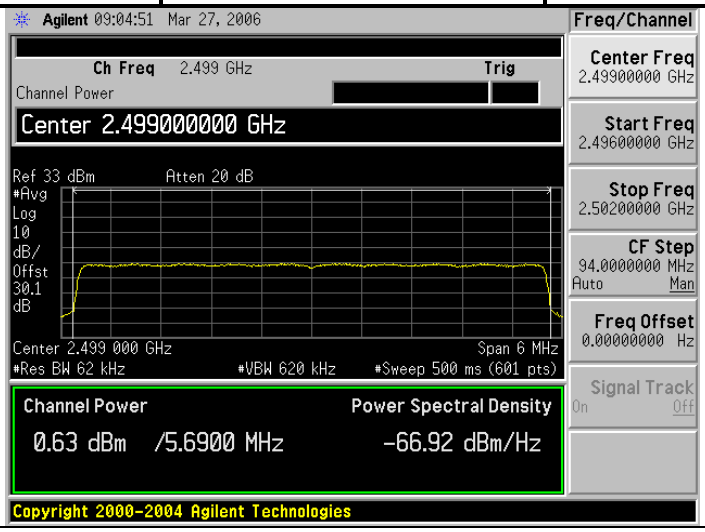



**2593 MHz**

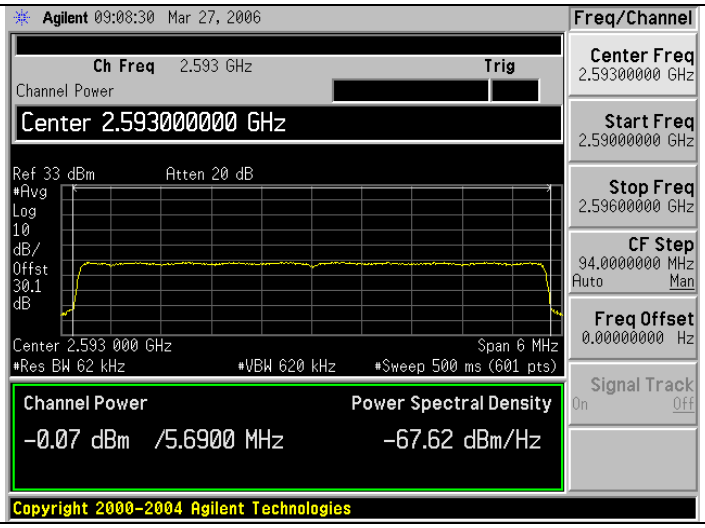



**2687 MHz**

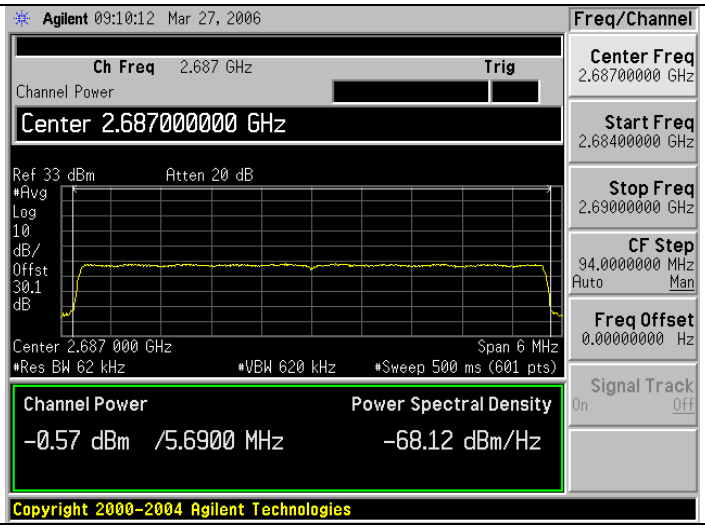
| Bandwidth: 6.0 MHz | RF Power: 1 Milliwatt | Modulation: 4 QAM |
|---|---|---|




**2499 MHz**

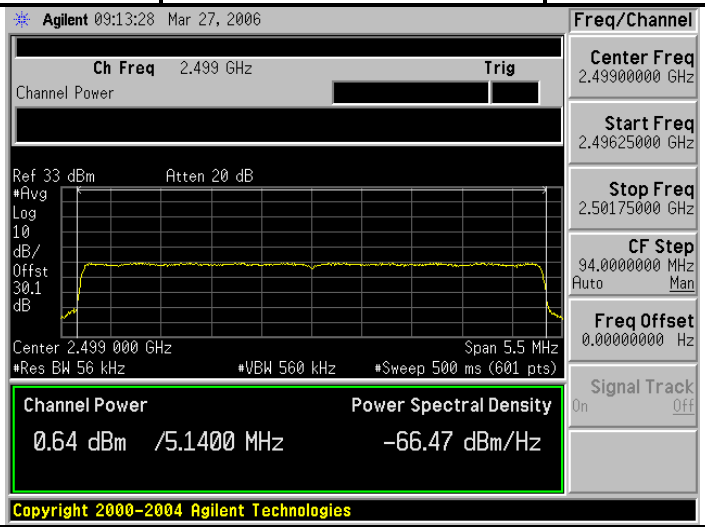



**2593 MHz**

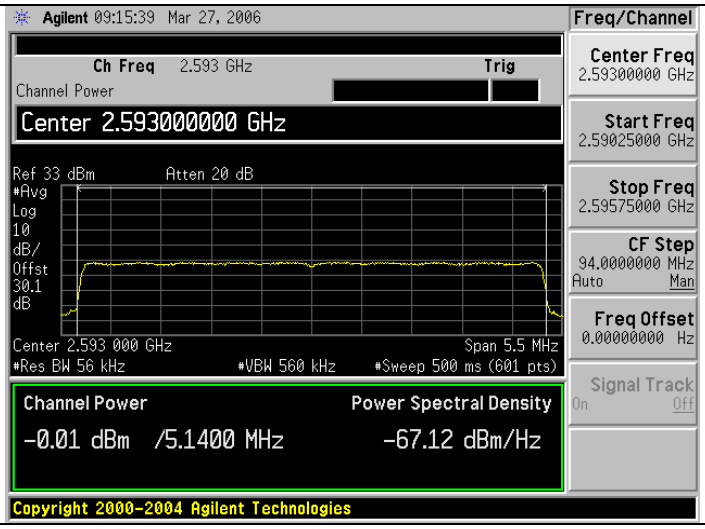



**2687 MHz**

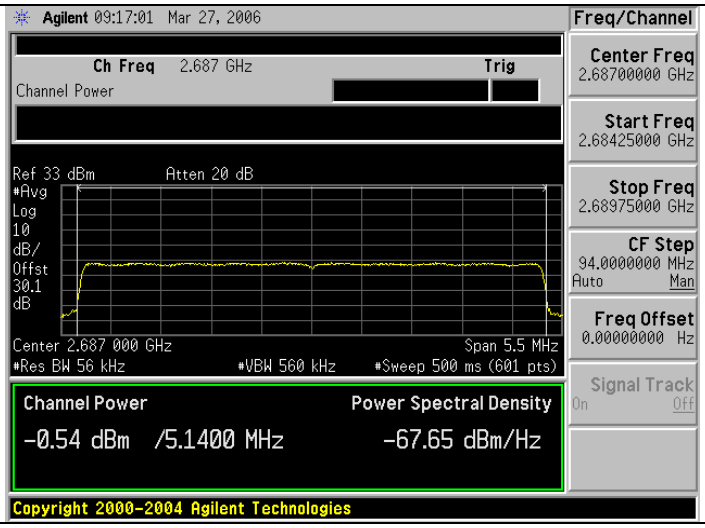
| Bandwidth: 5.5 MHz | RF Power: 1 Milliwatt | Modulation: 4 QAM |
|---|---|---|




**2499 MHz**




**2593 MHz**




**2687 MHz**

# Modulation Characteristics (FCC)

FCC Rules: 2.1047(d), 27.53(l)(2), 27.53(l)(6)

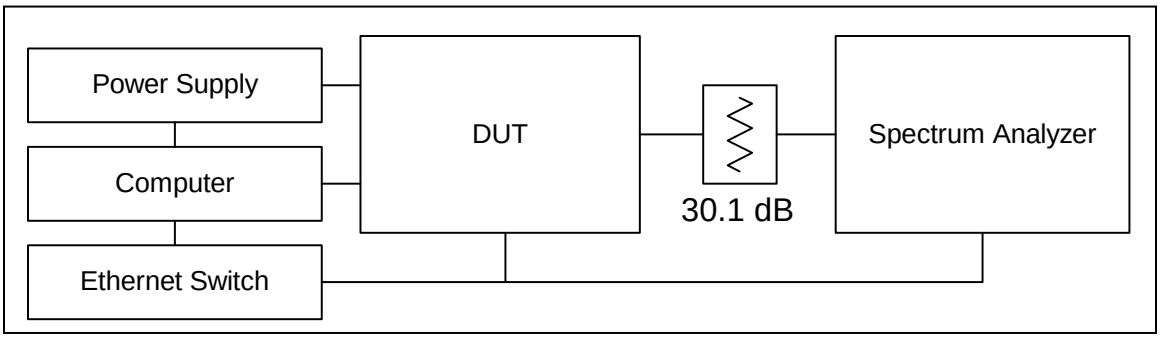
FCC requirement: Temporary Fixed
Attenuation at band edge = 43 + 10*log(P), P= 2 watts
Attenuation at band edge = 43 + 10*log(2) = 43 + 3
Attenuation at band edge = 46 dB (equates to -13 dBm)

Standard: 47CFR27.53(l)(3)

Test Procedure: The Orthogonal Frequency Division Multiplexing (OFDM) modulated Time Division Duplex (TDD) RF signal from the test unit is applied to a spectrum analyzer. An RMS detector is used to measure the average power of the transmission. As allowed per the FCC rules, a measurement bandwidth of 1% or greater was used for the test. The emission power is measured with the power measurement function of the spectrum analyzer. This function integrates all of the energy contained within the 1 MHz span of spectrum being measured. The resolution bandwidth used for each test is noted in the data measurement table. The video bandwidth is set to 10 times the resolution bandwidth.

The transmitter is enabled in test mode with the attached computer. The RF loss of the attenuators and coax was measured and is included in the spectrum analyzer amplitude offset and is noted in the block diagram which follows. Measurements are performed at frequencies across the band, for each of the modulation formats available (4-, 16-, and 64-QAM) and channel bandwidths (5.5 and 6.0 MHz). Data is collected by incrementing the spectrum analyzer in 1 MHz steps and recording the power in the 1 MHz of spectrum being measured. The test frequencies of 2499 and 2593 MHz were chosen because they are at the low and mid band points, and 2687 near the high end of the band was chosen partly for convenience since it allows the same increment (94 MHz) between test channels.

Test Conditions: Test Frequencies: 2499, 2593, 2687 MHz (5.5 and 6.0 MHz bandwidth)
Temperature = 25° C
Supply Voltage = 120 VAC / 60 Hz Nominal
to DUT Power Supply




**Modulation Characteristics Test Setup**

## Modulation Characteristics Test Results Summary

Pass modulation characteristics across frequency band and modulation format.

## 2499 MHz, 6.0 MHz, 2W Channel, 4-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2499 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 6 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2496 | | 4-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2502 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 62 | - 10 MHz bin | 2486.5 | 2486 | 2487 | -38.81002 | -13 | -25.81 | Complies |
| | - 9 MHz bin | 2487.5 | 2487 | 2488 | -37.57182 | -13 | -24.57 | Complies |
| | - 8 MHz bin | 2488.5 | 2488 | 2489 | -35.97115 | -13 | -22.97 | Complies |
| | - 7 MHz bin | 2489.5 | 2489 | 2490 | -34.0816 | -13 | -21.08 | Complies |
| | - 6 MHz bin | 2490.5 | 2490 | 2491 | -31.49634 | -13 | -18.50 | Complies |
| | - 5 MHz bin | 2491.5 | 2491 | 2492 | -26.66169 | -13 | -13.66 | Complies |
| | - 4 MHz bin | 2492.5 | 2492 | 2493 | -22.14207 | -13 | -9.14 | Complies |
| | - 3 MHz bin | 2493.5 | 2493 | 2494 | -19.03855 | -13 | -6.04 | Complies |
| | - 2 MHz bin | 2494.5 | 2494 | 2495 | -16.84289 | -13 | -3.84 | Complies |
| | - 1 MHz bin | 2495.5 | 2495 | 2496 | -14.89138 | -13 | -1.89 | Complies |
| | + 1 MHz bin | 2502.5 | 2502 | 2503 | -14.43837 | -13 | -1.44 | Complies |
| | + 2 MHz bin | 2503.5 | 2503 | 2504 | -16.48469 | -13 | -3.48 | Complies |
| | + 3 MHz bin | 2504.5 | 2504 | 2505 | -18.86413 | -13 | -5.86 | Complies |
| | + 4 MHz bin | 2505.5 | 2505 | 2506 | -22.20107 | -13 | -9.20 | Complies |
| | + 5 MHz bin | 2506.5 | 2506 | 2507 | -26.626 | -13 | -13.63 | Complies |
| | + 6 MHz bin | 2507.5 | 2507 | 2508 | -31.05655 | -13 | -18.06 | Complies |
| | + 7 MHz bin | 2508.5 | 2508 | 2509 | -33.14346 | -13 | -20.14 | Complies |
| | + 8 MHz bin | 2509.5 | 2509 | 2510 | -35.20872 | -13 | -22.21 | Complies |
| | + 9 MHz bin | 2510.5 | 2510 | 2511 | -37.33651 | -13 | -24.34 | Complies |
| | + 10 MHz bin | 2511.5 | 2511 | 2512 | -38.85981 | -13 | -25.86 | Complies |

## 2499 MHz, 6.0 MHz, 2W Channel, 16-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2499 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 6 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2496 | | 16-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2502 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 62 | - 10 MHz bin | 2486.5 | 2486 | 2487 | -38.72068 | -13 | -25.72 | Complies |
| | - 9 MHz bin | 2487.5 | 2487 | 2488 | -37.66543 | -13 | -24.67 | Complies |
| | - 8 MHz bin | 2488.5 | 2488 | 2489 | -35.88428 | -13 | -22.88 | Complies |
| | - 7 MHz bin | 2489.5 | 2489 | 2490 | -33.86002 | -13 | -20.86 | Complies |
| | - 6 MHz bin | 2490.5 | 2490 | 2491 | -31.70878 | -13 | -18.71 | Complies |
| | - 5 MHz bin | 2491.5 | 2491 | 2492 | -26.64303 | -13 | -13.64 | Complies |
| | - 4 MHz bin | 2492.5 | 2492 | 2493 | -22.22042 | -13 | -9.22 | Complies |
| | - 3 MHz bin | 2493.5 | 2493 | 2494 | -19.0716 | -13 | -6.07 | Complies |
| | - 2 MHz bin | 2494.5 | 2494 | 2495 | -16.75259 | -13 | -3.75 | Complies |
| | - 1 MHz bin | 2495.5 | 2495 | 2496 | -14.85371 | -13 | -1.85 | Complies |
| | + 1 MHz bin | 2502.5 | 2502 | 2503 | -14.26779 | -13 | -1.27 | Complies |
| | + 2 MHz bin | 2503.5 | 2503 | 2504 | -16.57045 | -13 | -3.57 | Complies |
| | + 3 MHz bin | 2504.5 | 2504 | 2505 | -18.97049 | -13 | -5.97 | Complies |
| | + 4 MHz bin | 2505.5 | 2505 | 2506 | -22.11249 | -13 | -9.11 | Complies |
| | + 5 MHz bin | 2506.5 | 2506 | 2507 | -26.65575 | -13 | -13.66 | Complies |
| | + 6 MHz bin | 2507.5 | 2507 | 2508 | -31.03136 | -13 | -18.03 | Complies |
| | + 7 MHz bin | 2508.5 | 2508 | 2509 | -33.2492 | -13 | -20.25 | Complies |
| | + 8 MHz bin | 2509.5 | 2509 | 2510 | -35.36343 | -13 | -22.36 | Complies |
| | + 9 MHz bin | 2510.5 | 2510 | 2511 | -37.28691 | -13 | -24.29 | Complies |
| | + 10 MHz bin | 2511.5 | 2511 | 2512 | -38.94218 | -13 | -25.94 | Complies |

## 2499 MHz, 6.0 MHz, 2W Channel, 64-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2499 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 6 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2496 | | 64-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2502 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 62 | - 10 MHz bin | 2486.5 | 2486 | 2487 | -38.86529 | -13 | -25.87 | Complies |
| | - 9 MHz bin | 2487.5 | 2487 | 2488 | -37.55859 | -13 | -24.56 | Complies |
| | - 8 MHz bin | 2488.5 | 2488 | 2489 | -35.97031 | -13 | -22.97 | Complies |
| | - 7 MHz bin | 2489.5 | 2489 | 2490 | -34.09784 | -13 | -21.10 | Complies |
| | - 6 MHz bin | 2490.5 | 2490 | 2491 | -31.75933 | -13 | -18.76 | Complies |
| | - 5 MHz bin | 2491.5 | 2491 | 2492 | -26.67845 | -13 | -13.68 | Complies |
| | - 4 MHz bin | 2492.5 | 2492 | 2493 | -22.16483 | -13 | -9.16 | Complies |
| | - 3 MHz bin | 2493.5 | 2493 | 2494 | -19.13022 | -13 | -6.13 | Complies |
| | - 2 MHz bin | 2494.5 | 2494 | 2495 | -16.76456 | -13 | -3.76 | Complies |
| | - 1 MHz bin | 2495.5 | 2495 | 2496 | -14.89236 | -13 | -1.89 | Complies |
| | + 1 MHz bin | 2502.5 | 2502 | 2503 | -14.40107 | -13 | -1.40 | Complies |
| | + 2 MHz bin | 2503.5 | 2503 | 2504 | -16.48017 | -13 | -3.48 | Complies |
| | + 3 MHz bin | 2504.5 | 2504 | 2505 | -18.93909 | -13 | -5.94 | Complies |
| | + 4 MHz bin | 2505.5 | 2505 | 2506 | -22.00916 | -13 | -9.01 | Complies |
| | + 5 MHz bin | 2506.5 | 2506 | 2507 | -26.51307 | -13 | -13.51 | Complies |
| | + 6 MHz bin | 2507.5 | 2507 | 2508 | -31.12594 | -13 | -18.13 | Complies |
| | + 7 MHz bin | 2508.5 | 2508 | 2509 | -33.23447 | -13 | -20.23 | Complies |
| | + 8 MHz bin | 2509.5 | 2509 | 2510 | -35.15987 | -13 | -22.16 | Complies |
| | + 9 MHz bin | 2510.5 | 2510 | 2511 | -37.20601 | -13 | -24.21 | Complies |
| | + 10 MHz bin | 2511.5 | 2511 | 2512 | -38.91203 | -13 | -25.91 | Complies |

## 2499 MHz, 5.5 MHz, 2W Channel, 4-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2499 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 5.5 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2496.25 | | 4-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2501.75 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 56 | - 10 MHz bin | 2486.75 | 2486.25 | 2487.25 | -39.46452 | -13 | -26.46 | Complies |
| | - 9 MHz bin | 2487.75 | 2487.25 | 2488.25 | -38.10383 | -13 | -25.10 | Complies |
| | - 8 MHz bin | 2488.75 | 2488.25 | 2489.25 | -36.7575 | -13 | -23.76 | Complies |
| | - 7 MHz bin | 2489.75 | 2489.25 | 2490.25 | -34.85779 | -13 | -21.86 | Complies |
| | - 6 MHz bin | 2490.75 | 2490.25 | 2491.25 | -32.37778 | -13 | -19.38 | Complies |
| | - 5 MHz bin | 2491.75 | 2491.25 | 2492.25 | -28.74417 | -13 | -15.74 | Complies |
| | - 4 MHz bin | 2492.75 | 2492.25 | 2493.25 | -23.26771 | -13 | -10.27 | Complies |
| | - 3 MHz bin | 2493.75 | 2493.25 | 2494.25 | -19.48115 | -13 | -6.48 | Complies |
| | - 2 MHz bin | 2494.75 | 2494.25 | 2495.25 | -16.70862 | -13 | -3.71 | Complies |
| | - 1 MHz bin | 2495.75 | 2495.25 | 2496.25 | -14.7443 | -13 | -1.74 | Complies |
| | + 1 MHz bin | 2502.25 | 2501.75 | 2502.75 | -14.36652 | -13 | -1.37 | Complies |
| | + 2 MHz bin | 2503.25 | 2502.75 | 2503.75 | -16.34943 | -13 | -3.35 | Complies |
| | + 3 MHz bin | 2504.25 | 2503.75 | 2504.75 | -19.35727 | -13 | -6.36 | Complies |
| | + 4 MHz bin | 2505.25 | 2504.75 | 2505.75 | -23.29232 | -13 | -10.29 | Complies |
| | + 5 MHz bin | 2506.25 | 2505.75 | 2506.75 | -28.72249 | -13 | -15.72 | Complies |
| | + 6 MHz bin | 2507.25 | 2506.75 | 2507.75 | -31.83709 | -13 | -18.84 | Complies |
| | + 7 MHz bin | 2508.25 | 2507.75 | 2508.75 | -34.07612 | -13 | -21.08 | Complies |
| | + 8 MHz bin | 2509.25 | 2508.75 | 2509.75 | -36.34809 | -13 | -23.35 | Complies |
| | + 9 MHz bin | 2510.25 | 2509.75 | 2510.75 | -38.14083 | -13 | -25.14 | Complies |
| | + 10 MHz bin | 2511.25 | 2510.75 | 2511.75 | -39.80137 | -13 | -26.80 | Complies |

## 2499 MHz, 5.5 MHz, 2W Channel, 16-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2499 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 5.5 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2496.25 | | 16-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2501.75 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 56 | - 10 MHz bin | 2486.75 | 2486.25 | 2487.25 | -39.35 | -13 | -26.35 | Complies |
| | - 9 MHz bin | 2487.75 | 2487.25 | 2488.25 | -38.28 | -13 | -25.28 | Complies |
| | - 8 MHz bin | 2488.75 | 2488.25 | 2489.25 | -36.79 | -13 | -23.79 | Complies |
| | - 7 MHz bin | 2489.75 | 2489.25 | 2490.25 | -34.97 | -13 | -21.97 | Complies |
| | - 6 MHz bin | 2490.75 | 2490.25 | 2491.25 | -32.38 | -13 | -19.38 | Complies |
| | - 5 MHz bin | 2491.75 | 2491.25 | 2492.25 | -28.95 | -13 | -15.95 | Complies |
| | - 4 MHz bin | 2492.75 | 2492.25 | 2493.25 | -23.29 | -13 | -10.29 | Complies |
| | - 3 MHz bin | 2493.75 | 2493.25 | 2494.25 | -19.57 | -13 | -6.57 | Complies |
| | - 2 MHz bin | 2494.75 | 2494.25 | 2495.25 | -16.84 | -13 | -3.84 | Complies |
| | - 1 MHz bin | 2495.75 | 2495.25 | 2496.25 | -14.87 | -13 | -1.87 | Complies |
| | + 1 MHz bin | 2502.25 | 2501.75 | 2502.75 | -14.40 | -13 | -1.40 | Complies |
| | + 2 MHz bin | 2503.25 | 2502.75 | 2503.75 | -16.65 | -13 | -3.65 | Complies |
| | + 3 MHz bin | 2504.25 | 2503.75 | 2504.75 | -19.36 | -13 | -6.36 | Complies |
| | + 4 MHz bin | 2505.25 | 2504.75 | 2505.75 | -23.27 | -13 | -10.27 | Complies |
| | + 5 MHz bin | 2506.25 | 2505.75 | 2506.75 | -28.52 | -13 | -15.52 | Complies |
| | + 6 MHz bin | 2507.25 | 2506.75 | 2507.75 | -31.85 | -13 | -18.85 | Complies |
| | + 7 MHz bin | 2508.25 | 2507.75 | 2508.75 | -34.17 | -13 | -21.17 | Complies |
| | + 8 MHz bin | 2509.25 | 2508.75 | 2509.75 | -36.22 | -13 | -23.22 | Complies |
| | + 9 MHz bin | 2510.25 | 2509.75 | 2510.75 | -38.18 | -13 | -25.18 | Complies |
| | + 10 MHz bin | 2511.25 | 2510.75 | 2511.75 | -39.78 | -13 | -26.78 | Complies |

## 2499 MHz, 5.5 MHz, 2W Channel, 64-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2499 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 5.5 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2496.25 | | 64-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2501.75 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 56 | - 10 MHz bin | 2486.75 | 2486.25 | 2487.25 | -39.48 | -13 | -26.48 | Complies |
| | - 9 MHz bin | 2487.75 | 2487.25 | 2488.25 | -38.14 | -13 | -25.14 | Complies |
| | - 8 MHz bin | 2488.75 | 2488.25 | 2489.25 | -36.79 | -13 | -23.79 | Complies |
| | - 7 MHz bin | 2489.75 | 2489.25 | 2490.25 | -34.84 | -13 | -21.84 | Complies |
| | - 6 MHz bin | 2490.75 | 2490.25 | 2491.25 | -32.58 | -13 | -19.58 | Complies |
| | - 5 MHz bin | 2491.75 | 2491.25 | 2492.25 | -28.95 | -13 | -15.95 | Complies |
| | - 4 MHz bin | 2492.75 | 2492.25 | 2493.25 | -23.20 | -13 | -10.20 | Complies |
| | - 3 MHz bin | 2493.75 | 2493.25 | 2494.25 | -19.54 | -13 | -6.54 | Complies |
| | - 2 MHz bin | 2494.75 | 2494.25 | 2495.25 | -16.82 | -13 | -3.82 | Complies |
| | - 1 MHz bin | 2495.75 | 2495.25 | 2496.25 | -14.88 | -13 | -1.88 | Complies |
| | + 1 MHz bin | 2502.25 | 2501.75 | 2502.75 | -14.45 | -13 | -1.45 | Complies |
| | + 2 MHz bin | 2503.25 | 2502.75 | 2503.75 | -16.52 | -13 | -3.52 | Complies |
| | + 3 MHz bin | 2504.25 | 2503.75 | 2504.75 | -19.46 | -13 | -6.46 | Complies |
| | + 4 MHz bin | 2505.25 | 2504.75 | 2505.75 | -23.02 | -13 | -10.02 | Complies |
| | + 5 MHz bin | 2506.25 | 2505.75 | 2506.75 | -28.43 | -13 | -15.43 | Complies |
| | + 6 MHz bin | 2507.25 | 2506.75 | 2507.75 | -31.81 | -13 | -18.81 | Complies |
| | + 7 MHz bin | 2508.25 | 2507.75 | 2508.75 | -33.90 | -13 | -20.90 | Complies |
| | + 8 MHz bin | 2509.25 | 2508.75 | 2509.75 | -36.38 | -13 | -23.38 | Complies |
| | + 9 MHz bin | 2510.25 | 2509.75 | 2510.75 | -38.20 | -13 | -25.20 | Complies |
| | + 10 MHz bin | 2511.25 | 2510.75 | 2511.75 | -39.89 | -13 | -26.89 | Complies |

## 2593 MHz, 6.0 MHz, 2W Channel, 4-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2593 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 6 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2590 | | 4-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2596 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 62 | - 10 MHz bin | 2580.5 | 2580 | 2581 | -38.61618 | -13 | -25.62 | Complies |
| | - 9 MHz bin | 2581.5 | 2581 | 2582 | -37.0703 | -13 | -24.07 | Complies |
| | - 8 MHz bin | 2582.5 | 2582 | 2583 | -34.96725 | -13 | -21.97 | Complies |
| | - 7 MHz bin | 2583.5 | 2583 | 2584 | -32.41474 | -13 | -19.41 | Complies |
| | - 6 MHz bin | 2584.5 | 2584 | 2585 | -29.6685 | -13 | -16.67 | Complies |
| | - 5 MHz bin | 2585.5 | 2585 | 2586 | -25.39358 | -13 | -12.39 | Complies |
| | - 4 MHz bin | 2586.5 | 2586 | 2587 | -21.30928 | -13 | -8.31 | Complies |
| | - 3 MHz bin | 2587.5 | 2587 | 2588 | -18.43536 | -13 | -5.44 | Complies |
| | - 2 MHz bin | 2588.5 | 2588 | 2589 | -16.25353 | -13 | -3.25 | Complies |
| | - 1 MHz bin | 2589.5 | 2589 | 2590 | -14.48638 | -13 | -1.49 | Complies |
| | + 1 MHz bin | 2596.5 | 2596 | 2597 | -14.85201 | -13 | -1.85 | Complies |
| | + 2 MHz bin | 2597.5 | 2597 | 2598 | -16.89238 | -13 | -3.89 | Complies |
| | + 3 MHz bin | 2598.5 | 2598 | 2599 | -18.85148 | -13 | -5.85 | Complies |
| | + 4 MHz bin | 2599.5 | 2599 | 2600 | -21.83571 | -13 | -8.84 | Complies |
| | + 5 MHz bin | 2600.5 | 2600 | 2601 | -25.32348 | -13 | -12.32 | Complies |
| | + 6 MHz bin | 2601.5 | 2601 | 2602 | -28.69357 | -13 | -15.69 | Complies |
| | + 7 MHz bin | 2602.5 | 2602 | 2603 | -30.6962 | -13 | -17.70 | Complies |
| | + 8 MHz bin | 2603.5 | 2603 | 2604 | -32.72421 | -13 | -19.72 | Complies |
| | + 9 MHz bin | 2604.5 | 2604 | 2605 | -34.63115 | -13 | -21.63 | Complies |
| | + 10 MHz bin | 2605.5 | 2605 | 2606 | -36.5602 | -13 | -23.56 | Complies |

## 2593 MHz, 6.0 MHz, 2W Channel, 16-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2593 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 6 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2590 | | 16-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2596 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 62 | - 10 MHz bin | 2580.5 | 2580 | 2581 | -38.67703 | -13 | -25.68 | Complies |
| | - 9 MHz bin | 2581.5 | 2581 | 2582 | -37.28097 | -13 | -24.28 | Complies |
| | - 8 MHz bin | 2582.5 | 2582 | 2583 | -35.03168 | -13 | -22.03 | Complies |
| | - 7 MHz bin | 2583.5 | 2583 | 2584 | -32.32956 | -13 | -19.33 | Complies |
| | - 6 MHz bin | 2584.5 | 2584 | 2585 | -29.82089 | -13 | -16.82 | Complies |
| | - 5 MHz bin | 2585.5 | 2585 | 2586 | -25.42236 | -13 | -12.42 | Complies |
| | - 4 MHz bin | 2586.5 | 2586 | 2587 | -21.32845 | -13 | -8.33 | Complies |
| | - 3 MHz bin | 2587.5 | 2587 | 2588 | -18.3656 | -13 | -5.37 | Complies |
| | - 2 MHz bin | 2588.5 | 2588 | 2589 | -16.30442 | -13 | -3.30 | Complies |
| | - 1 MHz bin | 2589.5 | 2589 | 2590 | -14.33909 | -13 | -1.34 | Complies |
| | + 1 MHz bin | 2596.5 | 2596 | 2597 | -14.89292 | -13 | -1.89 | Complies |
| | + 2 MHz bin | 2597.5 | 2597 | 2598 | -16.82311 | -13 | -3.82 | Complies |
| | + 3 MHz bin | 2598.5 | 2598 | 2599 | -18.8347 | -13 | -5.83 | Complies |
| | + 4 MHz bin | 2599.5 | 2599 | 2600 | -21.68512 | -13 | -8.69 | Complies |
| | + 5 MHz bin | 2600.5 | 2600 | 2601 | -25.21053 | -13 | -12.21 | Complies |
| | + 6 MHz bin | 2601.5 | 2601 | 2602 | -28.51924 | -13 | -15.52 | Complies |
| | + 7 MHz bin | 2602.5 | 2602 | 2603 | -30.71991 | -13 | -17.72 | Complies |
| | + 8 MHz bin | 2603.5 | 2603 | 2604 | -32.62503 | -13 | -19.63 | Complies |
| | + 9 MHz bin | 2604.5 | 2604 | 2605 | -34.70676 | -13 | -21.71 | Complies |
| | + 10 MHz bin | 2605.5 | 2605 | 2606 | -36.58858 | -13 | -23.59 | Complies |

## 2593 MHz, 6.0 MHz, 2W Channel, 64-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2593 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 6 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2590 | | 64-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2596 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 62 | - 10 MHz bin | 2580.5 | 2580 | 2581 | -38.66765 | -13 | -25.67 | Complies |
| | - 9 MHz bin | 2581.5 | 2581 | 2582 | -37.1307 | -13 | -24.13 | Complies |
| | - 8 MHz bin | 2582.5 | 2582 | 2583 | -34.99313 | -13 | -21.99 | Complies |
| | - 7 MHz bin | 2583.5 | 2583 | 2584 | -32.40117 | -13 | -19.40 | Complies |
| | - 6 MHz bin | 2584.5 | 2584 | 2585 | -29.69296 | -13 | -16.69 | Complies |
| | - 5 MHz bin | 2585.5 | 2585 | 2586 | -25.31017 | -13 | -12.31 | Complies |
| | - 4 MHz bin | 2586.5 | 2586 | 2587 | -21.47171 | -13 | -8.47 | Complies |
| | - 3 MHz bin | 2587.5 | 2587 | 2588 | -18.39181 | -13 | -5.39 | Complies |
| | - 2 MHz bin | 2588.5 | 2588 | 2589 | -16.25056 | -13 | -3.25 | Complies |
| | - 1 MHz bin | 2589.5 | 2589 | 2590 | -14.4505 | -13 | -1.45 | Complies |
| | + 1 MHz bin | 2596.5 | 2596 | 2597 | -14.8249 | -13 | -1.82 | Complies |
| | + 2 MHz bin | 2597.5 | 2597 | 2598 | -16.87464 | -13 | -3.87 | Complies |
| | + 3 MHz bin | 2598.5 | 2598 | 2599 | -18.96557 | -13 | -5.97 | Complies |
| | + 4 MHz bin | 2599.5 | 2599 | 2600 | -21.8348 | -13 | -8.83 | Complies |
| | + 5 MHz bin | 2600.5 | 2600 | 2601 | -25.34606 | -13 | -12.35 | Complies |
| | + 6 MHz bin | 2601.5 | 2601 | 2602 | -28.5445 | -13 | -15.54 | Complies |
| | + 7 MHz bin | 2602.5 | 2602 | 2603 | -30.6942 | -13 | -17.69 | Complies |
| | + 8 MHz bin | 2603.5 | 2603 | 2604 | -32.65953 | -13 | -19.66 | Complies |
| | + 9 MHz bin | 2604.5 | 2604 | 2605 | -34.68277 | -13 | -21.68 | Complies |
| | + 10 MHz bin | 2605.5 | 2605 | 2606 | -36.69103 | -13 | -23.69 | Complies |

## 2593 MHz, 5.5 MHz, 2W Channel, 4-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2593 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 5.5 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2590.25 | | 4-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2595.75 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 56 | - 10 MHz bin | 2580.75 | 2580.25 | 2581.25 | -39.22 | -13 | -26.22 | Complies |
| | - 9 MHz bin | 2581.75 | 2581.25 | 2582.25 | -38.04 | -13 | -25.04 | Complies |
| | - 8 MHz bin | 2582.75 | 2582.25 | 2583.25 | -36.22 | -13 | -23.22 | Complies |
| | - 7 MHz bin | 2583.75 | 2583.25 | 2584.25 | -33.65 | -13 | -20.65 | Complies |
| | - 6 MHz bin | 2584.75 | 2584.25 | 2585.25 | -30.61 | -13 | -17.61 | Complies |
| | - 5 MHz bin | 2585.75 | 2585.25 | 2586.25 | -27.29 | -13 | -14.29 | Complies |
| | - 4 MHz bin | 2586.75 | 2586.25 | 2587.25 | -22.38 | -13 | -9.38 | Complies |
| | - 3 MHz bin | 2587.75 | 2587.25 | 2588.25 | -18.65 | -13 | -5.65 | Complies |
| | - 2 MHz bin | 2588.75 | 2588.25 | 2589.25 | -16.21 | -13 | -3.21 | Complies |
| | - 1 MHz bin | 2589.75 | 2589.25 | 2590.25 | -14.33 | -13 | -1.33 | Complies |
| | + 1 MHz bin | 2596.25 | 2595.75 | 2596.75 | -14.87 | -13 | -1.87 | Complies |
| | + 2 MHz bin | 2597.25 | 2596.75 | 2597.75 | -16.59 | -13 | -3.59 | Complies |
| | + 3 MHz bin | 2598.25 | 2597.75 | 2598.75 | -19.20 | -13 | -6.20 | Complies |
| | + 4 MHz bin | 2599.25 | 2598.75 | 2599.75 | -22.52 | -13 | -9.52 | Complies |
| | + 5 MHz bin | 2600.25 | 2599.75 | 2600.75 | -26.73 | -13 | -13.73 | Complies |
| | + 6 MHz bin | 2601.25 | 2600.75 | 2601.75 | -29.30 | -13 | -16.30 | Complies |
| | + 7 MHz bin | 2602.25 | 2601.75 | 2602.75 | -31.22 | -13 | -18.22 | Complies |
| | + 8 MHz bin | 2603.25 | 2602.75 | 2603.75 | -33.79 | -13 | -20.79 | Complies |
| | + 9 MHz bin | 2604.25 | 2603.75 | 2604.75 | -35.87 | -13 | -22.87 | Complies |
| | + 10 MHz bin | 2605.25 | 2604.75 | 2605.75 | -38.00 | -13 | -25.00 | Complies |

## 2593 MHz, 5.5 MHz, 2W Channel, 16-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2593 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 5.5 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2590.25 | | 16-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2595.75 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 56 | - 10 MHz bin | 2580.75 | 2580.25 | 2581.25 | -39.14 | -13 | -26.14 | Complies |
| | - 9 MHz bin | 2581.75 | 2581.25 | 2582.25 | -38.19 | -13 | -25.19 | Complies |
| | - 8 MHz bin | 2582.75 | 2582.25 | 2583.25 | -36.40 | -13 | -23.40 | Complies |
| | - 7 MHz bin | 2583.75 | 2583.25 | 2584.25 | -33.64 | -13 | -20.64 | Complies |
| | - 6 MHz bin | 2584.75 | 2584.25 | 2585.25 | -30.69 | -13 | -17.69 | Complies |
| | - 5 MHz bin | 2585.75 | 2585.25 | 2586.25 | -27.32 | -13 | -14.32 | Complies |
| | - 4 MHz bin | 2586.75 | 2586.25 | 2587.25 | -22.19 | -13 | -9.19 | Complies |
| | - 3 MHz bin | 2587.75 | 2587.25 | 2588.25 | -18.82 | -13 | -5.82 | Complies |
| | - 2 MHz bin | 2588.75 | 2588.25 | 2589.25 | -16.13 | -13 | -3.13 | Complies |
| | - 1 MHz bin | 2589.75 | 2589.25 | 2590.25 | -14.27 | -13 | -1.27 | Complies |
| | + 1 MHz bin | 2596.25 | 2595.75 | 2596.75 | -14.69 | -13 | -1.69 | Complies |
| | + 2 MHz bin | 2597.25 | 2596.75 | 2597.75 | -16.70 | -13 | -3.70 | Complies |
| | + 3 MHz bin | 2598.25 | 2597.75 | 2598.75 | -19.24 | -13 | -6.24 | Complies |
| | + 4 MHz bin | 2599.25 | 2598.75 | 2599.75 | -22.61 | -13 | -9.61 | Complies |
| | + 5 MHz bin | 2600.25 | 2599.75 | 2600.75 | -26.84 | -13 | -13.84 | Complies |
| | + 6 MHz bin | 2601.25 | 2600.75 | 2601.75 | -29.20 | -13 | -16.20 | Complies |
| | + 7 MHz bin | 2602.25 | 2601.75 | 2602.75 | -31.40 | -13 | -18.40 | Complies |
| | + 8 MHz bin | 2603.25 | 2602.75 | 2603.75 | -33.61 | -13 | -20.61 | Complies |
| | + 9 MHz bin | 2604.25 | 2603.75 | 2604.75 | -35.88 | -13 | -22.88 | Complies |
| | + 10 MHz bin | 2605.25 | 2604.75 | 2605.75 | -37.78 | -13 | -24.78 | Complies |

## 2593 MHz, 5.5 MHz, 2W Channel, 64-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2593 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 5.5 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2590.25 | | 64-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2595.75 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 56 | - 10 MHz bin | 2580.75 | 2580.25 | 2581.25 | -39.15 | -13 | -26.15 | Complies |
| | - 9 MHz bin | 2581.75 | 2581.25 | 2582.25 | -38.10 | -13 | -25.10 | Complies |
| | - 8 MHz bin | 2582.75 | 2582.25 | 2583.25 | -36.49 | -13 | -23.49 | Complies |
| | - 7 MHz bin | 2583.75 | 2583.25 | 2584.25 | -33.71 | -13 | -20.71 | Complies |
| | - 6 MHz bin | 2584.75 | 2584.25 | 2585.25 | -30.68 | -13 | -17.68 | Complies |
| | - 5 MHz bin | 2585.75 | 2585.25 | 2586.25 | -27.31 | -13 | -14.31 | Complies |
| | - 4 MHz bin | 2586.75 | 2586.25 | 2587.25 | -22.33 | -13 | -9.33 | Complies |
| | - 3 MHz bin | 2587.75 | 2587.25 | 2588.25 | -18.76 | -13 | -5.76 | Complies |
| | - 2 MHz bin | 2588.75 | 2588.25 | 2589.25 | -16.33 | -13 | -3.33 | Complies |
| | - 1 MHz bin | 2589.75 | 2589.25 | 2590.25 | -14.19 | -13 | -1.19 | Complies |
| | + 1 MHz bin | 2596.25 | 2595.75 | 2596.75 | -14.84 | -13 | -1.84 | Complies |
| | + 2 MHz bin | 2597.25 | 2596.75 | 2597.75 | -16.66 | -13 | -3.66 | Complies |
| | + 3 MHz bin | 2598.25 | 2597.75 | 2598.75 | -19.18 | -13 | -6.18 | Complies |
| | + 4 MHz bin | 2599.25 | 2598.75 | 2599.75 | -22.56 | -13 | -9.56 | Complies |
| | + 5 MHz bin | 2600.25 | 2599.75 | 2600.75 | -26.72 | -13 | -13.72 | Complies |
| | + 6 MHz bin | 2601.25 | 2600.75 | 2601.75 | -29.27 | -13 | -16.27 | Complies |
| | + 7 MHz bin | 2602.25 | 2601.75 | 2602.75 | -31.40 | -13 | -18.40 | Complies |
| | + 8 MHz bin | 2603.25 | 2602.75 | 2603.75 | -33.67 | -13 | -20.67 | Complies |
| | + 9 MHz bin | 2604.25 | 2603.75 | 2604.75 | -35.98 | -13 | -22.98 | Complies |
| | + 10 MHz bin | 2605.25 | 2604.75 | 2605.75 | -37.90 | -13 | -24.90 | Complies |

## 2687 MHz, 6.0 MHz, 2W Channel, 4-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2687 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 6 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2684 | | 4-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2690 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 62 | - 10 MHz bin | 2674.5 | 2674 | 2675 | -37.95383 | -13 | -24.95 | Complies |
| | - 9 MHz bin | 2675.5 | 2675 | 2676 | -36.61069 | -13 | -23.61 | Complies |
| | - 8 MHz bin | 2676.5 | 2676 | 2677 | -34.61685 | -13 | -21.62 | Complies |
| | - 7 MHz bin | 2677.5 | 2677 | 2678 | -32.57757 | -13 | -19.58 | Complies |
| | - 6 MHz bin | 2678.5 | 2678 | 2679 | -30.38388 | -13 | -17.38 | Complies |
| | - 5 MHz bin | 2679.5 | 2679 | 2680 | -26.48266 | -13 | -13.48 | Complies |
| | - 4 MHz bin | 2680.5 | 2680 | 2681 | -22.57643 | -13 | -9.58 | Complies |
| | - 3 MHz bin | 2681.5 | 2681 | 2682 | -19.64728 | -13 | -6.65 | Complies |
| | - 2 MHz bin | 2682.5 | 2682 | 2683 | -17.73894 | -13 | -4.74 | Complies |
| | - 1 MHz bin | 2683.5 | 2683 | 2684 | -15.89209 | -13 | -2.89 | Complies |
| | + 1 MHz bin | 2690.5 | 2690 | 2691 | -16.49582 | -13 | -3.50 | Complies |
| | + 2 MHz bin | 2691.5 | 2691 | 2692 | -18.78815 | -13 | -5.79 | Complies |
| | + 3 MHz bin | 2692.5 | 2692 | 2693 | -21.11841 | -13 | -8.12 | Complies |
| | + 4 MHz bin | 2693.5 | 2693 | 2694 | -24.00578 | -13 | -11.01 | Complies |
| | + 5 MHz bin | 2694.5 | 2694 | 2695 | -27.34681 | -13 | -14.35 | Complies |
| | + 6 MHz bin | 2695.5 | 2695 | 2696 | -30.40709 | -13 | -17.41 | Complies |
| | + 7 MHz bin | 2696.5 | 2696 | 2697 | -32.24401 | -13 | -19.24 | Complies |
| | + 8 MHz bin | 2697.5 | 2697 | 2698 | -34.37178 | -13 | -21.37 | Complies |
| | + 9 MHz bin | 2698.5 | 2698 | 2699 | -36.18205 | -13 | -23.18 | Complies |
| | + 10 MHz bin | 2699.5 | 2699 | 2700 | -38.33875 | -13 | -25.34 | Complies |

## 2687 MHz, 6.0 MHz, 2W Channel, 16-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2687 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 6 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2684 | | 16-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2690 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 62 | - 10 MHz bin | 2674.5 | 2674 | 2675 | -37.9735 | -13 | -24.97 | Complies |
| | - 9 MHz bin | 2675.5 | 2675 | 2676 | -36.43113 | -13 | -23.43 | Complies |
| | - 8 MHz bin | 2676.5 | 2676 | 2677 | -34.65889 | -13 | -21.66 | Complies |
| | - 7 MHz bin | 2677.5 | 2677 | 2678 | -32.58062 | -13 | -19.58 | Complies |
| | - 6 MHz bin | 2678.5 | 2678 | 2679 | -30.39541 | -13 | -17.40 | Complies |
| | - 5 MHz bin | 2679.5 | 2679 | 2680 | -26.48075 | -13 | -13.48 | Complies |
| | - 4 MHz bin | 2680.5 | 2680 | 2681 | -22.53685 | -13 | -9.54 | Complies |
| | - 3 MHz bin | 2681.5 | 2681 | 2682 | -19.59368 | -13 | -6.59 | Complies |
| | - 2 MHz bin | 2682.5 | 2682 | 2683 | -17.64734 | -13 | -4.65 | Complies |
| | - 1 MHz bin | 2683.5 | 2683 | 2684 | -15.84509 | -13 | -2.85 | Complies |
| | + 1 MHz bin | 2690.5 | 2690 | 2691 | -16.45501 | -13 | -3.46 | Complies |
| | + 2 MHz bin | 2691.5 | 2691 | 2692 | -18.78951 | -13 | -5.79 | Complies |
| | + 3 MHz bin | 2692.5 | 2692 | 2693 | -21.18634 | -13 | -8.19 | Complies |
| | + 4 MHz bin | 2693.5 | 2693 | 2694 | -24.03885 | -13 | -11.04 | Complies |
| | + 5 MHz bin | 2694.5 | 2694 | 2695 | -27.46042 | -13 | -14.46 | Complies |
| | + 6 MHz bin | 2695.5 | 2695 | 2696 | -30.38663 | -13 | -17.39 | Complies |
| | + 7 MHz bin | 2696.5 | 2696 | 2697 | -32.31755 | -13 | -19.32 | Complies |
| | + 8 MHz bin | 2697.5 | 2697 | 2698 | -34.29182 | -13 | -21.29 | Complies |
| | + 9 MHz bin | 2698.5 | 2698 | 2699 | -36.29284 | -13 | -23.29 | Complies |
| | + 10 MHz bin | 2699.5 | 2699 | 2700 | -38.14373 | -13 | -25.14 | Complies |

## 2687 MHz, 6.0 MHz, 2W Channel, 64-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2687 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 6 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2684 | | 64-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2690 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 62 | - 10 MHz bin | 2674.5 | 2674 | 2675 | -37.95289 | -13 | -24.95 | Complies |
| | - 9 MHz bin | 2675.5 | 2675 | 2676 | -36.39564 | -13 | -23.40 | Complies |
| | - 8 MHz bin | 2676.5 | 2676 | 2677 | -34.62204 | -13 | -21.62 | Complies |
| | - 7 MHz bin | 2677.5 | 2677 | 2678 | -32.64616 | -13 | -19.65 | Complies |
| | - 6 MHz bin | 2678.5 | 2678 | 2679 | -30.53134 | -13 | -17.53 | Complies |
| | - 5 MHz bin | 2679.5 | 2679 | 2680 | -26.44163 | -13 | -13.44 | Complies |
| | - 4 MHz bin | 2680.5 | 2680 | 2681 | -22.44674 | -13 | -9.45 | Complies |
| | - 3 MHz bin | 2681.5 | 2681 | 2682 | -19.5848 | -13 | -6.58 | Complies |
| | - 2 MHz bin | 2682.5 | 2682 | 2683 | -17.68414 | -13 | -4.68 | Complies |
| | - 1 MHz bin | 2683.5 | 2683 | 2684 | -15.95803 | -13 | -2.96 | Complies |
| | + 1 MHz bin | 2690.5 | 2690 | 2691 | -16.27835 | -13 | -3.28 | Complies |
| | + 2 MHz bin | 2691.5 | 2691 | 2692 | -18.72813 | -13 | -5.73 | Complies |
| | + 3 MHz bin | 2692.5 | 2692 | 2693 | -21.22945 | -13 | -8.23 | Complies |
| | + 4 MHz bin | 2693.5 | 2693 | 2694 | -24.06593 | -13 | -11.07 | Complies |
| | + 5 MHz bin | 2694.5 | 2694 | 2695 | -27.26411 | -13 | -14.26 | Complies |
| | + 6 MHz bin | 2695.5 | 2695 | 2696 | -30.39877 | -13 | -17.40 | Complies |
| | + 7 MHz bin | 2696.5 | 2696 | 2697 | -32.36826 | -13 | -19.37 | Complies |
| | + 8 MHz bin | 2697.5 | 2697 | 2698 | -34.24886 | -13 | -21.25 | Complies |
| | + 9 MHz bin | 2698.5 | 2698 | 2699 | -36.17358 | -13 | -23.17 | Complies |
| | + 10 MHz bin | 2699.5 | 2699 | 2700 | -38.15138 | -13 | -25.15 | Complies |

## 2687 MHz, 5.5 MHz, 2W Channel, 4-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2687 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 5.5 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2684.25 | | 4-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2689.75 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 56 | - 10 MHz bin | 2674.75 | 2674.25 | 2675.25 | -38.69 | -13 | -25.69 | Complies |
| | - 9 MHz bin | 2675.75 | 2675.25 | 2676.25 | -37.38 | -13 | -24.38 | Complies |
| | - 8 MHz bin | 2676.75 | 2676.25 | 2677.25 | -35.59 | -13 | -22.59 | Complies |
| | - 7 MHz bin | 2677.75 | 2677.25 | 2678.25 | -33.40 | -13 | -20.40 | Complies |
| | - 6 MHz bin | 2678.75 | 2678.25 | 2679.25 | -31.13 | -13 | -18.13 | Complies |
| | - 5 MHz bin | 2679.75 | 2679.25 | 2680.25 | -28.17 | -13 | -15.17 | Complies |
| | - 4 MHz bin | 2680.75 | 2680.25 | 2681.25 | -23.36 | -13 | -10.36 | Complies |
| | - 3 MHz bin | 2681.75 | 2681.25 | 2682.25 | -20.04 | -13 | -7.04 | Complies |
| | - 2 MHz bin | 2682.75 | 2682.25 | 2683.25 | -17.63 | -13 | -4.63 | Complies |
| | - 1 MHz bin | 2683.75 | 2683.25 | 2684.25 | -15.80 | -13 | -2.80 | Complies |
| | + 1 MHz bin | 2690.25 | 2689.75 | 2690.75 | -16.51 | -13 | -3.51 | Complies |
| | + 2 MHz bin | 2691.25 | 2690.75 | 2691.75 | -18.70 | -13 | -5.70 | Complies |
| | + 3 MHz bin | 2692.25 | 2691.75 | 2692.75 | -21.42 | -13 | -8.42 | Complies |
| | + 4 MHz bin | 2693.25 | 2692.75 | 2693.75 | -24.85 | -13 | -11.85 | Complies |
| | + 5 MHz bin | 2694.25 | 2693.75 | 2694.75 | -28.46 | -13 | -15.46 | Complies |
| | + 6 MHz bin | 2695.25 | 2694.75 | 2695.75 | -31.01 | -13 | -18.01 | Complies |
| | + 7 MHz bin | 2696.25 | 2695.75 | 2696.75 | -33.02 | -13 | -20.02 | Complies |
| | + 8 MHz bin | 2697.25 | 2696.75 | 2697.75 | -35.18 | -13 | -22.18 | Complies |
| | + 9 MHz bin | 2698.25 | 2697.75 | 2698.75 | -37.32 | -13 | -24.32 | Complies |
| | + 10 MHz bin | 2699.25 | 2698.75 | 2699.75 | -39.32 | -13 | -26.32 | Complies |

## 2687 MHz, 5.5 MHz, 2W Channel, 16-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2687 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 5.5 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2684.25 | | 16-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2689.75 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 56 | - 10 MHz bin | 2674.75 | 2674.25 | 2675.25 | -38.82 | -13 | -25.82 | Complies |
| | - 9 MHz bin | 2675.75 | 2675.25 | 2676.25 | -37.30 | -13 | -24.30 | Complies |
| | - 8 MHz bin | 2676.75 | 2676.25 | 2677.25 | -35.61 | -13 | -22.61 | Complies |
| | - 7 MHz bin | 2677.75 | 2677.25 | 2678.25 | -33.45 | -13 | -20.45 | Complies |
| | - 6 MHz bin | 2678.75 | 2678.25 | 2679.25 | -31.13 | -13 | -18.13 | Complies |
| | - 5 MHz bin | 2679.75 | 2679.25 | 2680.25 | -28.35 | -13 | -15.35 | Complies |
| | - 4 MHz bin | 2680.75 | 2680.25 | 2681.25 | -23.53 | -13 | -10.53 | Complies |
| | - 3 MHz bin | 2681.75 | 2681.25 | 2682.25 | -19.85 | -13 | -6.85 | Complies |
| | - 2 MHz bin | 2682.75 | 2682.25 | 2683.25 | -17.59 | -13 | -4.59 | Complies |
| | - 1 MHz bin | 2683.75 | 2683.25 | 2684.25 | -15.90 | -13 | -2.90 | Complies |
| | + 1 MHz bin | 2690.25 | 2689.75 | 2690.75 | -16.49 | -13 | -3.49 | Complies |
| | + 2 MHz bin | 2691.25 | 2690.75 | 2691.75 | -18.73 | -13 | -5.73 | Complies |
| | + 3 MHz bin | 2692.25 | 2691.75 | 2692.75 | -21.32 | -13 | -8.32 | Complies |
| | + 4 MHz bin | 2693.25 | 2692.75 | 2693.75 | -24.83 | -13 | -11.83 | Complies |
| | + 5 MHz bin | 2694.25 | 2693.75 | 2694.75 | -28.65 | -13 | -15.65 | Complies |
| | + 6 MHz bin | 2695.25 | 2694.75 | 2695.75 | -30.87 | -13 | -17.87 | Complies |
| | + 7 MHz bin | 2696.25 | 2695.75 | 2696.75 | -33.15 | -13 | -20.15 | Complies |
| | + 8 MHz bin | 2697.25 | 2696.75 | 2697.75 | -35.20 | -13 | -22.20 | Complies |
| | + 9 MHz bin | 2698.25 | 2697.75 | 2698.75 | -37.30 | -13 | -24.30 | Complies |
| | + 10 MHz bin | 2699.25 | 2698.75 | 2699.75 | -39.36 | -13 | -26.36 | Complies |

## 2687 MHz, 5.5 MHz, 2W Channel, 64-QAM

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Channel Center Freq (MHz) | | | 2687 | | 3/27/2006 | | |
| | Channel BW (MHz) | | | 5.5 | | 13 VDC Nom | | |
| | Channel Bandedge - Low (MHz) | | | 2684.25 | | 64-QAM | | |
| | Channel Bandedge - High (MHz) | | | 2689.75 | | | | |
| Resolution Bandwidth (kHz) | | 1 MHz Band Center Freq (MHz) | 1 MHz Band Low Freq (MHz) | 1 MHz Band High Freq (MHz) | Emission Power in 1 MHz BW (dBm) | Spec (dBm/MHz) | Margin (dB) | Result |
| 56 | - 10 MHz bin | 2674.75 | 2674.25 | 2675.25 | -38.67 | -13 | -25.67 | Complies |
| | - 9 MHz bin | 2675.75 | 2675.25 | 2676.25 | -37.34 | -13 | -24.34 | Complies |
| | - 8 MHz bin | 2676.75 | 2676.25 | 2677.25 | -35.40 | -13 | -22.40 | Complies |
| | - 7 MHz bin | 2677.75 | 2677.25 | 2678.25 | -33.49 | -13 | -20.49 | Complies |
| | - 6 MHz bin | 2678.75 | 2678.25 | 2679.25 | -31.12 | -13 | -18.12 | Complies |
| | - 5 MHz bin | 2679.75 | 2679.25 | 2680.25 | -28.31 | -13 | -15.31 | Complies |
| | - 4 MHz bin | 2680.75 | 2680.25 | 2681.25 | -23.41 | -13 | -10.41 | Complies |
| | - 3 MHz bin | 2681.75 | 2681.25 | 2682.25 | -19.90 | -13 | -6.90 | Complies |
| | - 2 MHz bin | 2682.75 | 2682.25 | 2683.25 | -17.66 | -13 | -4.66 | Complies |
| | - 1 MHz bin | 2683.75 | 2683.25 | 2684.25 | -15.69 | -13 | -2.69 | Complies |
| | + 1 MHz bin | 2690.25 | 2689.75 | 2690.75 | -16.25 | -13 | -3.25 | Complies |
| | + 2 MHz bin | 2691.25 | 2690.75 | 2691.75 | -18.75 | -13 | -5.75 | Complies |
| | + 3 MHz bin | 2692.25 | 2691.75 | 2692.75 | -21.49 | -13 | -8.49 | Complies |
| | + 4 MHz bin | 2693.25 | 2692.75 | 2693.75 | -24.88 | -13 | -11.88 | Complies |
| | + 5 MHz bin | 2694.25 | 2693.75 | 2694.75 | -28.52 | -13 | -15.52 | Complies |
| | + 6 MHz bin | 2695.25 | 2694.75 | 2695.75 | -30.80 | -13 | -17.80 | Complies |
| | + 7 MHz bin | 2696.25 | 2695.75 | 2696.75 | -32.96 | -13 | -19.96 | Complies |
| | + 8 MHz bin | 2697.25 | 2696.75 | 2697.75 | -35.16 | -13 | -22.16 | Complies |
| | + 9 MHz bin | 2698.25 | 2697.75 | 2698.75 | -37.39 | -13 | -24.39 | Complies |
| | + 10 MHz bin | 2699.25 | 2698.75 | 2699.75 | -39.37 | -13 | -26.37 | Complies |

# Unwanted Emissions (Industry Canada)

IC Rules: RSS-193, section 6.3(c)(i)
SRSP-302.5, section 5.5

IC Requirement: In any 100 kHz bandwidth, the minimum attenuation of the emission spectral density that is relative to the inland spectral density, found outside the sub-band, shall be: (a) 25 dB at the sub-band edge, 40 dB at 250 kHz from the sub-band edge, 60 dB at 3 MHz from the sub-band edge, and linearly interpolated in between; (b) 60 dB over the rest of the out-of-band domain.

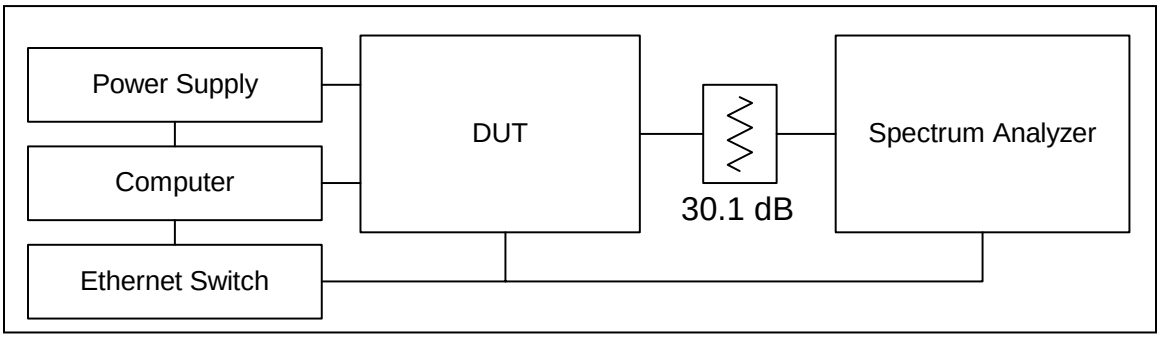
Test Procedure: The measurement of the emission mask for compliance to the RSS-193 "Wideband Digital Modulation – Emission Mask C" was performed under the guidance of "The Measurement of Power Spectral Density for Industry Canada Radio Standard Specification Compliance", prepared by, Brian Kasper, Certification and Engineering Bureau, Industry Canada. A copy of this document can be found at: http://strategis.ic.gc.ca/epic/internet/inceb-bhst.nsf/en/h_tt00032e.html

The Orthogonal Frequency Division Multiplexing (OFDM) modulated Time Division Duplex (TDD) RF signal from the test unit is applied to a spectrum analyzer. The spectrum analyzer is configured with the following settings:

RF Span = 100 kHz
Resolution BW = 100 kHz
Video BW = 1 MHz
Sweep = 50 msec
Detector = Sample
RF Path Attenuation = 30.1 dB

The transmitter is enabled in test mode with the attached computer and the power adjusted to 33 dBm +0/-1 dB.

Test Conditions: Channel Frequencies = 2509 and 2587 MHz, (5.5 and 6.0 MHz Bandwidth)
Temperature = 25°C
Supply Voltage = 120 VAC / 60 Hz Nominal
to DUT Power Supply

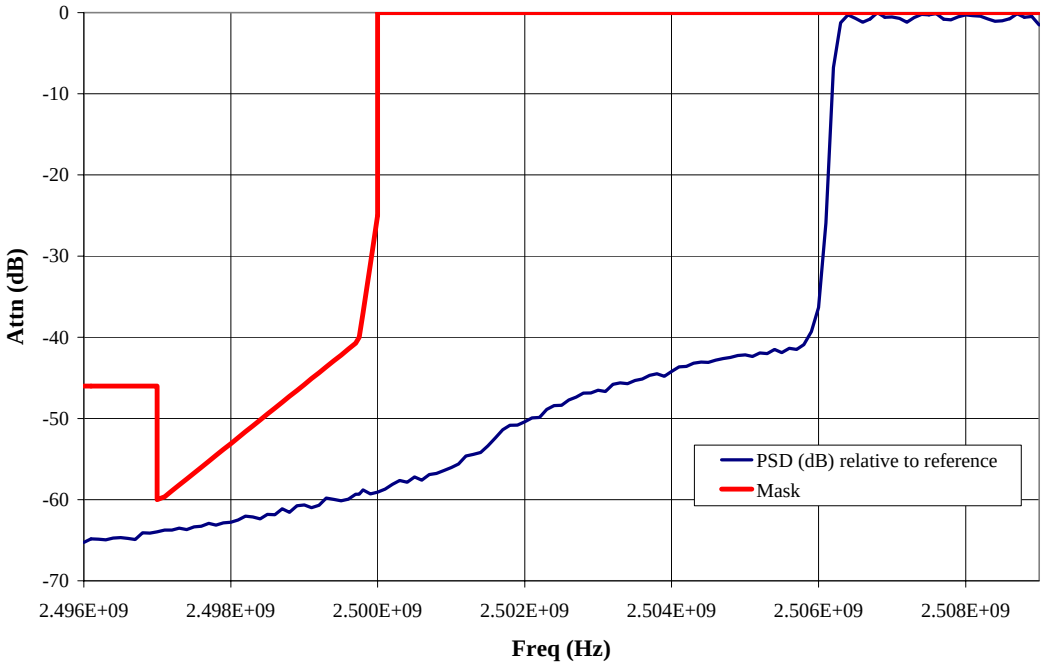



**Unwanted Emissions Test Setup**

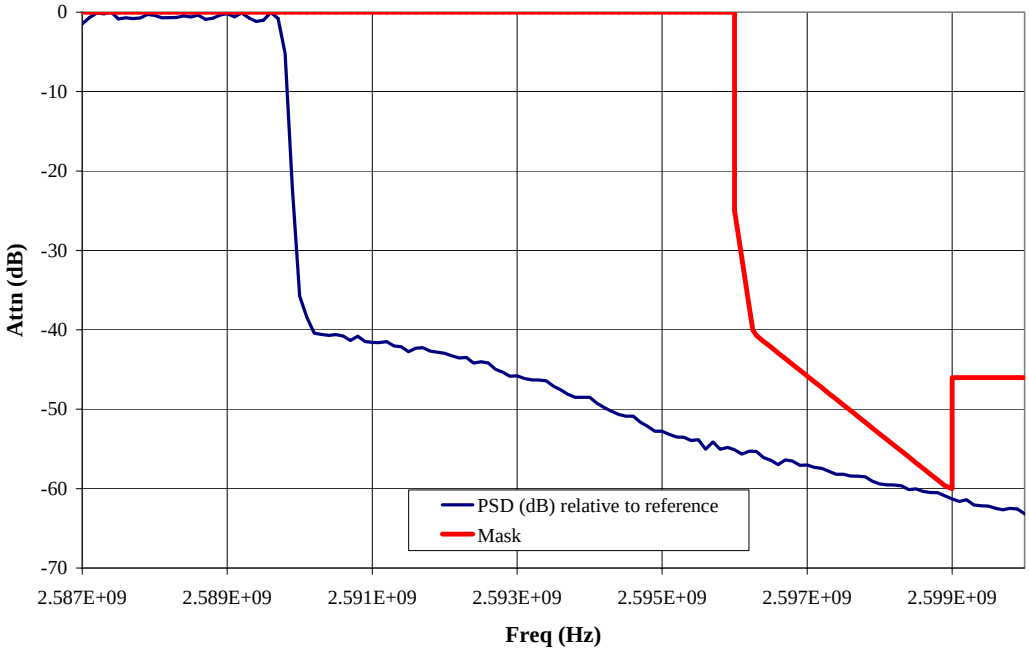
# Unwanted Emissions Test Results

## 4QAM, 6.0 MHz Bandwidth

**Modulation Mask at 2500 MHz Band Edge**
**4-QAM**

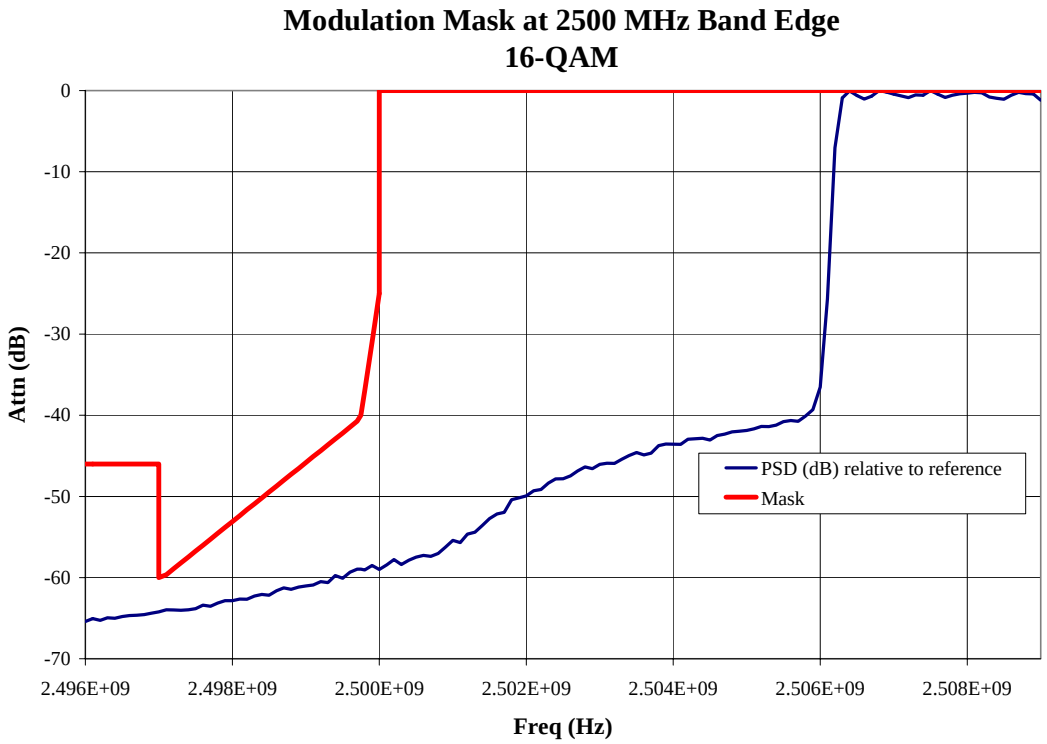



**Modulation Mask at 2596 MHz Band Edge**
**4-QAM**

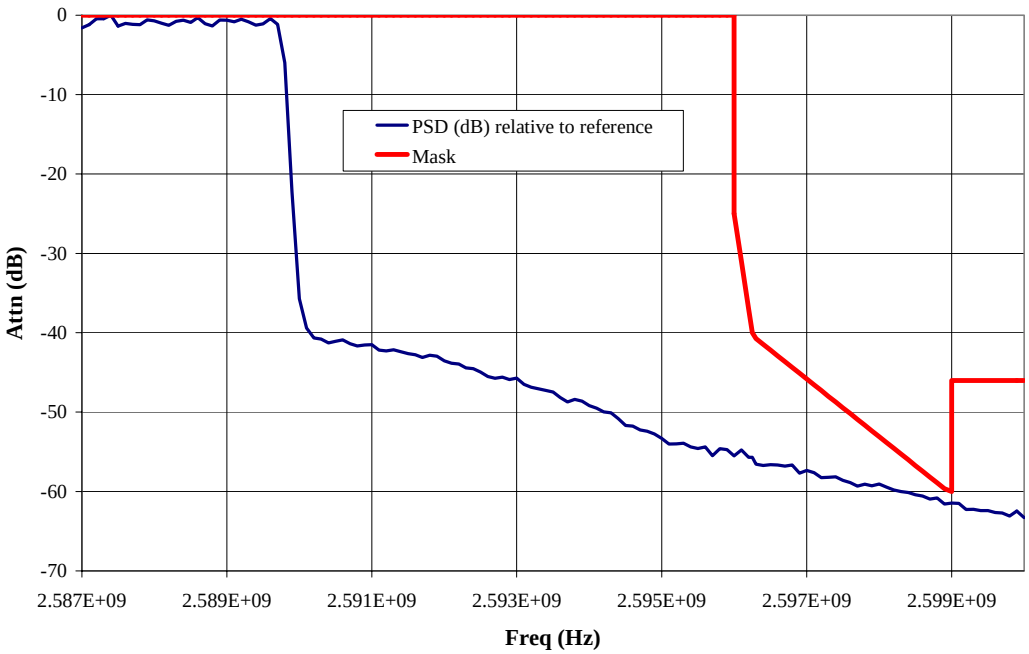


# Unwanted Emissions Results (Cont'd)

## 16 QAM, 6.0 MHz Bandwidth



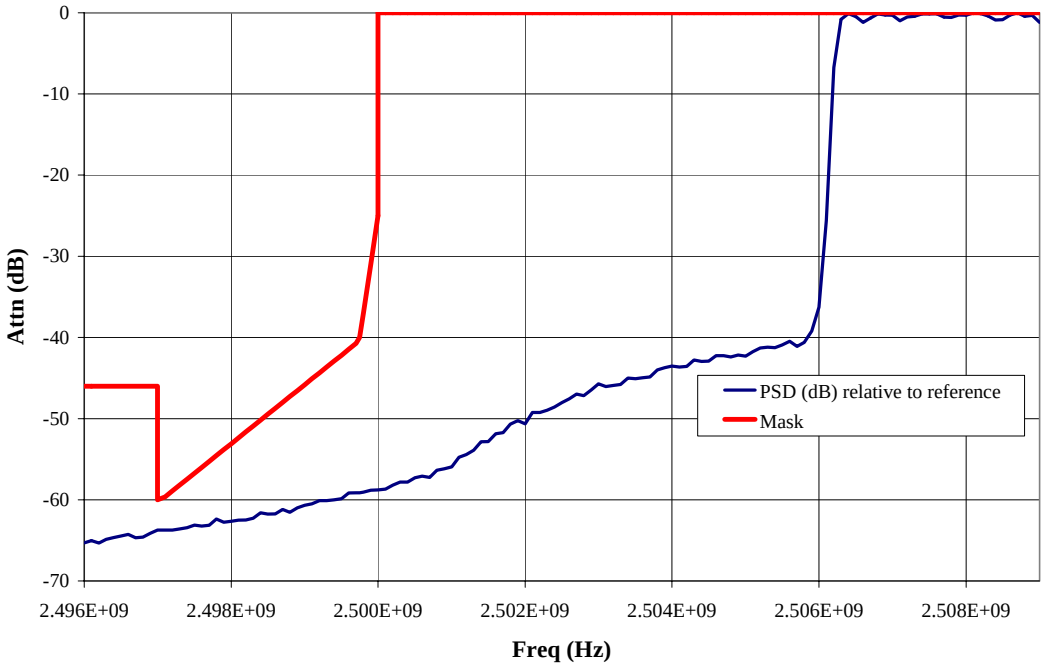
**Modulation Mask at 2596 MHz Band Edge**
**16-QAM**



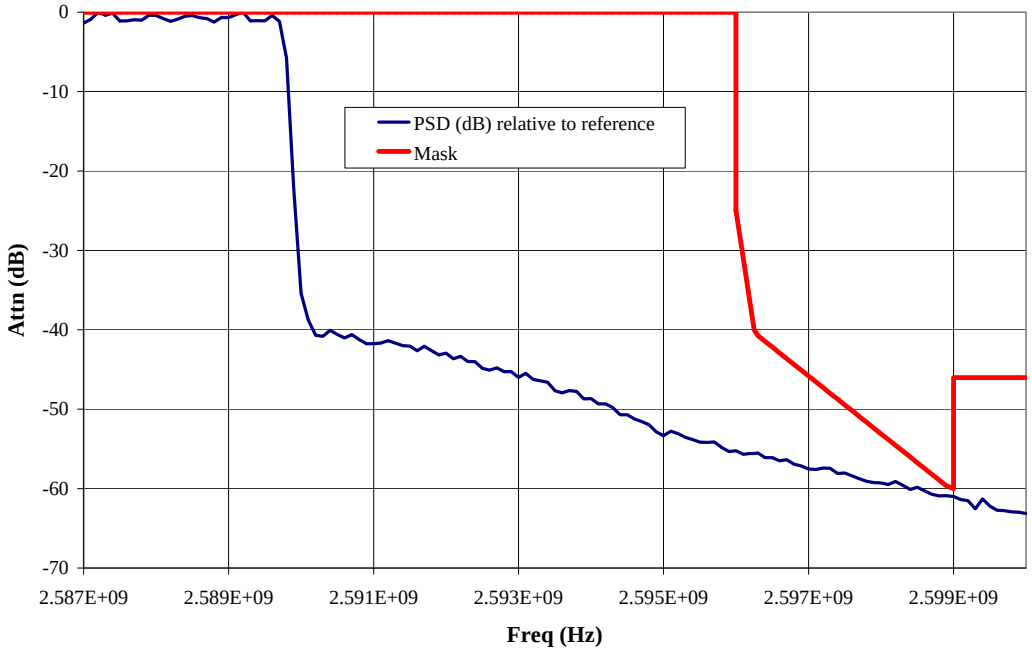
# Unwanted Emissions Results (Cont'd)

## 64 QAM, 6.0 MHz Bandwidth

**Modulation Mask at 2500 MHz Band Edge**
**64-QAM**



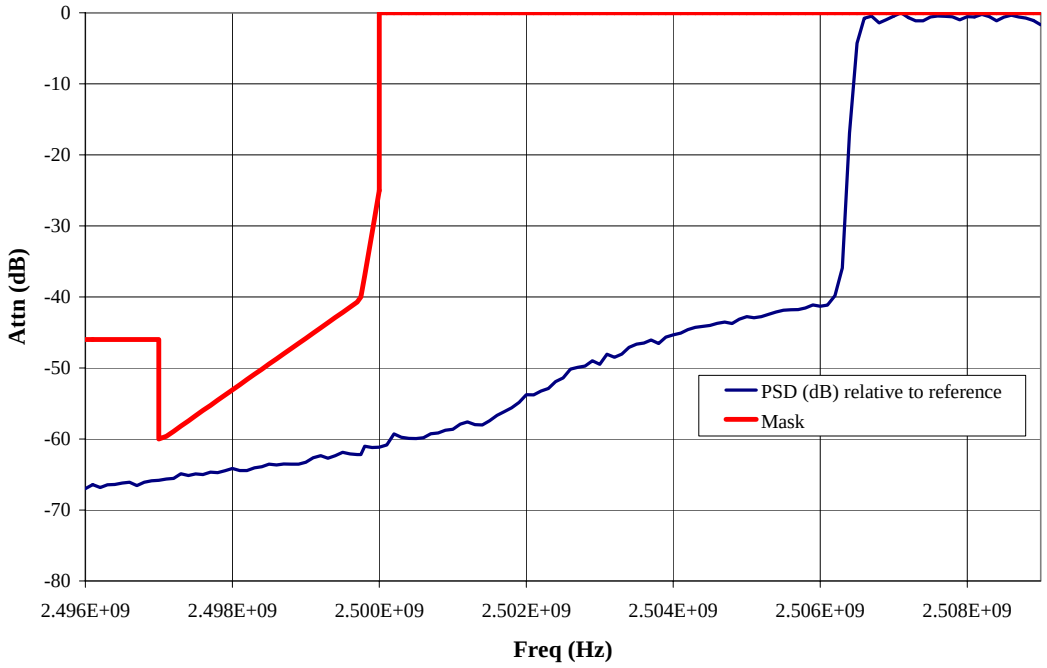

**Modulation Mask at 2596 MHz Band Edge**
**64-QAM**



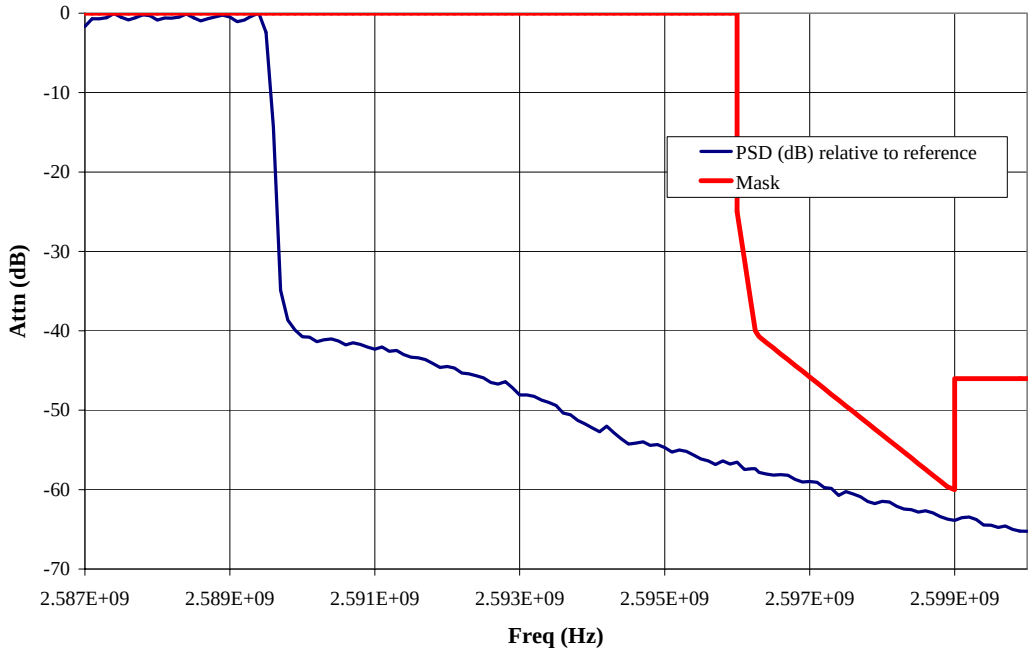
# Unwanted Emissions Results (Cont'd)

## 4 QAM, 5.5 MHz Bandwidth

**Modulation Mask at 2500 MHz Band Edge**
**4-QAM**



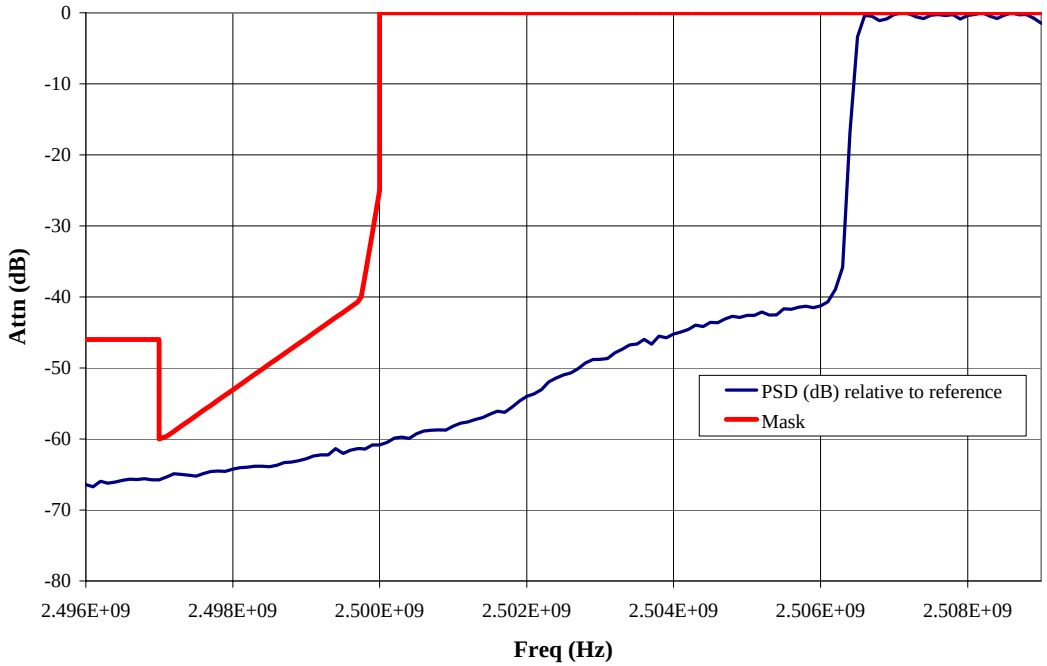

**Modulation Mask at 2596 MHz Band Edge**
**4-QAM**



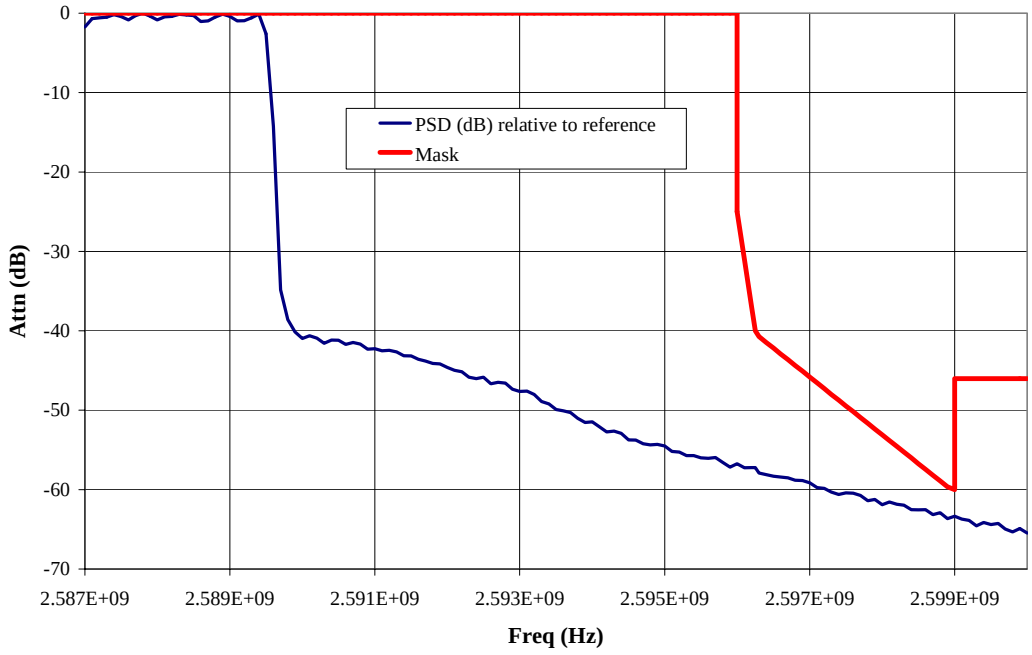
# Unwanted Emissions Results (Cont'd)

## 16 QAM, 5.5 MHz Bandwidth

**Modulation Mask at 2500 MHz Band Edge**
**16-QAM**



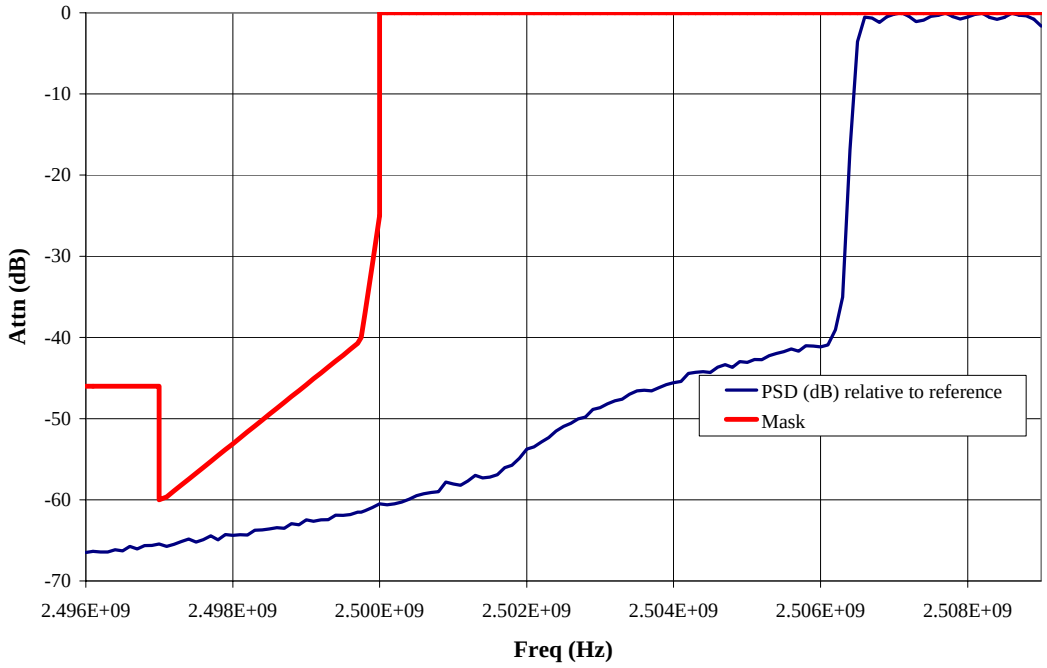

**Modulation Mask at 2596 MHz Band Edge**
**16-QAM**



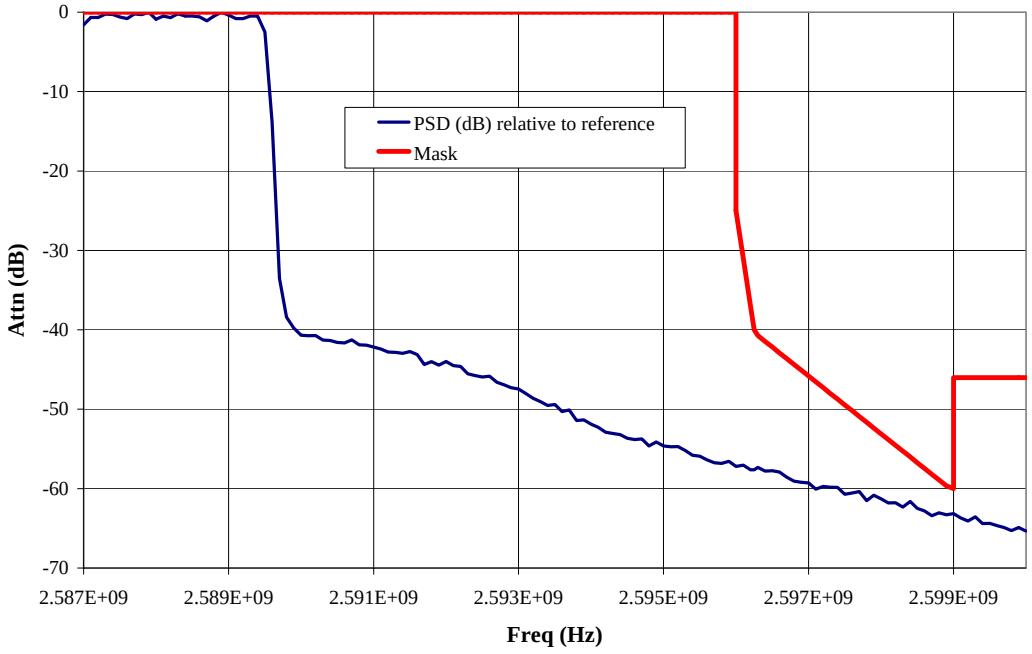
# Unwanted Emissions Results (Cont'd)

## 64 QAM, 5.5 MHz Bandwidth

**Modulation Mask at 2500 MHz Band Edge**
**64-QAM**




**Modulation Mask at 2596 MHz Band Edge**
**64-QAM**



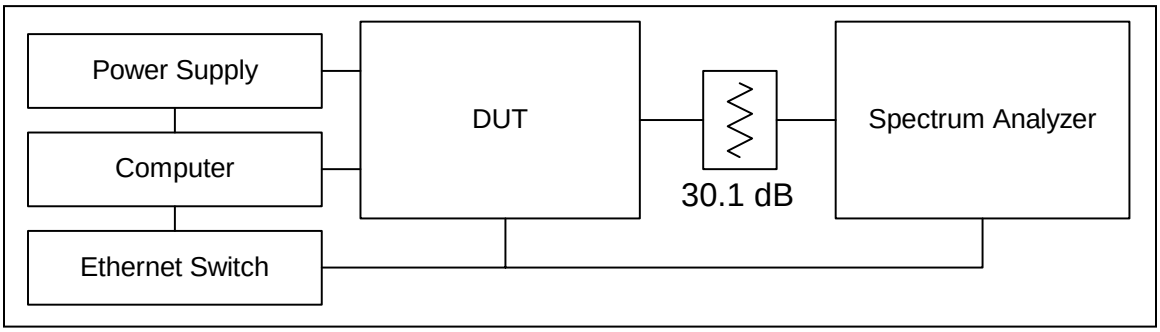
# Occupied Bandwidth and Emission Bandwidth

*NOTE: Occupied Bandwidth (99.0 %/20 dB) applies to both FCC and Industry Canada tests, and Emission Bandwidth (99.75%/26 dB) applies to FCC tests only.*

| | |
|---|---|
| FCC Rules: | 2.1049, 27.53(l)(6) |
| IC Rules: | RSS-193 clause 3.2(h) |

| | |
|---|---|
| FCC Requirements: | Report Results |
| IC requirements: | Report Results |

| | |
|---|---|
| Standard: | ANSI C63.4-2003<br>American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz. |
| Test Procedure: | The measurement of the Occupied Bandwidth was performed under the guidance of "Occupied Bandwidth Measurement", prepared by, Brian Kasper, Certification and Engineering Bureau, Industry Canada. A copy of this document can be found at: http://strategis.ic.gc.ca/epic/internet/inceb-bhst.nsf/en/h_tt00032e.html<br><br>The Orthogonal Frequency Division Multiplexing (OFDM) modulated Time Division Duplex (TDD) RF signal from the test unit is applied to a spectrum analyzer. The bandwidth of the signal is recorded by measuring the modulation bandwidth with the built in measurement function in the spectrum analyzer. The transmitter is enabled in test mode with the attached computer. The RF loss of the attenuators and coax has been measured and is included in the spectrum analyzer offset level. Measurements are performed at frequencies across the band, for each of the modulation formats available (4, 16, and 64-QAM) and channel bandwidths (5.5 MHz and 6 MHz). |
| Test Conditions: | Test Frequencies: 2499, 2593, 2687 MHz (5.5 and 6.0 MHz bandwidth)<br>Temperature = 25°C<br>Supply Voltage = 120 VAC / 60 Hz Nominal to DUT Power Supply |




**Test Setup**

## Occupied and Emission Bandwidth Test Results Summary

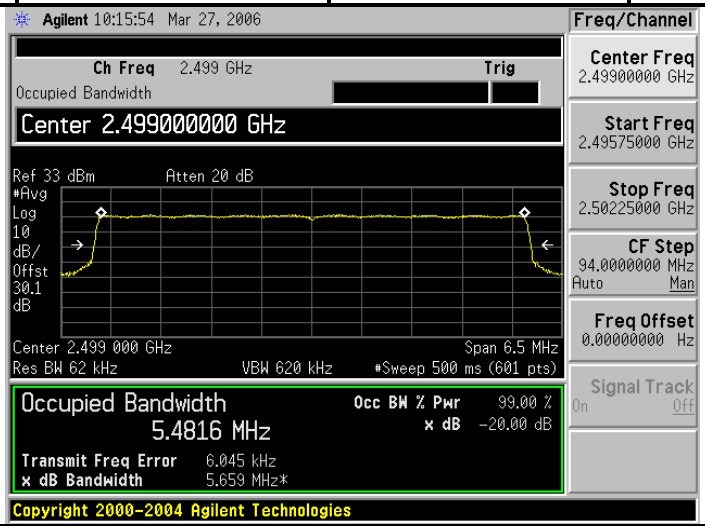
| Occupied Bandwidth (MHz) For 99.0 % (–20 dB) | | | | |
|---|---|---|---|---|
| **Freq (MHz)** | **Bandwidth** | **4 QAM** | **16 QAM** | **64 QAM** |
| 2499 | 6.0 | 5.4816 | 5.4781 | 5.4803 |
| 2593 | 6.0 | 5.4834 | 5.4803 | 5.4802 |
| 2687 | 6.0 | 5.4808 | 5.4807 | 5.4794 |
| | | | | |
| 2499 | 5.5 | 4.9605 | 4.9575 | 4.9596 |
| 2593 | 5.5 | 4.9583 | 4.9582 | 4.9603 |
| 2687 | 5.5 | 4.9569 | 4.9594 | 4.9549 |

| Emission Bandwidth (MHz) For 99.75% (–26 dB) | | | | |
|---|---|---|---|---|
| **Freq (MHz)** | **Bandwidth** | **4 QAM** | **16 QAM** | **64 QAM** |
| 2499 | 6.0 | 5.5507 | 5.5466 | 5.5490 |
| 2593 | 6.0 | 5.5493 | 5.5491 | 5.5496 |
| 2687 | 6.0 | 5.5496 | 5.5485 | 5.5460 |
| | | | | |
| 2499 | 5.5 | 5.0197 | 5.0223 | 5.0201 |
| 2593 | 5.5 | 5.0209 | 5.0213 | 5.0216 |
| 2687 | 5.5 | 5.0199 | 5.0217 | 5.0193 |

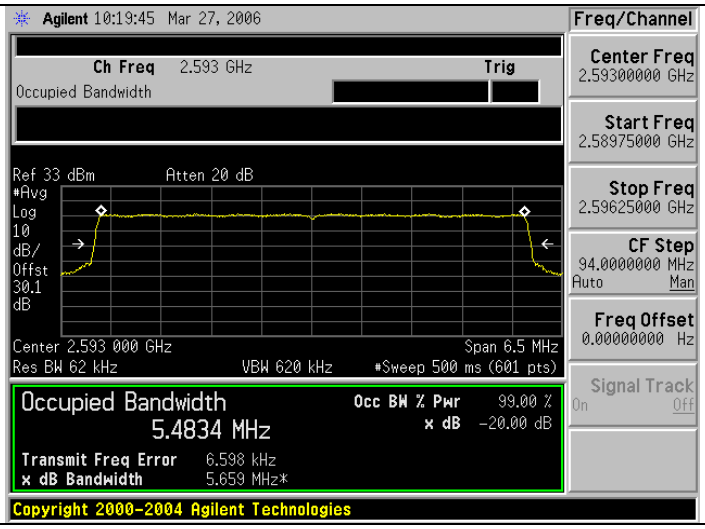
## Occupied Bandwidth Spectrum Analyzer Plots

*NOTE: The following are spectrum analyzer plots of the 4 QAM data in the preceding tables. The plots for the 16 and 64 QAM modulation levels are similar and are shown in the Appendix.*

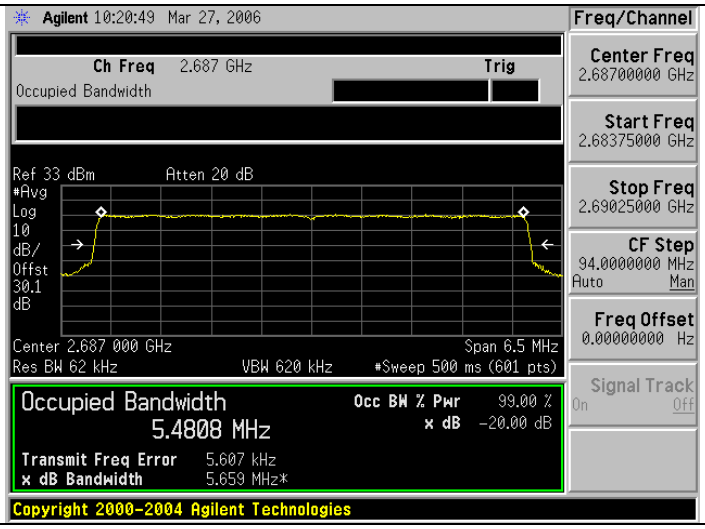
| Occupied BW | Bandwidth: 6.0 MHz | RF Power: 2 Watts | Modulation: 4 QAM |
|---|---|---|---|




**2499 MHz**

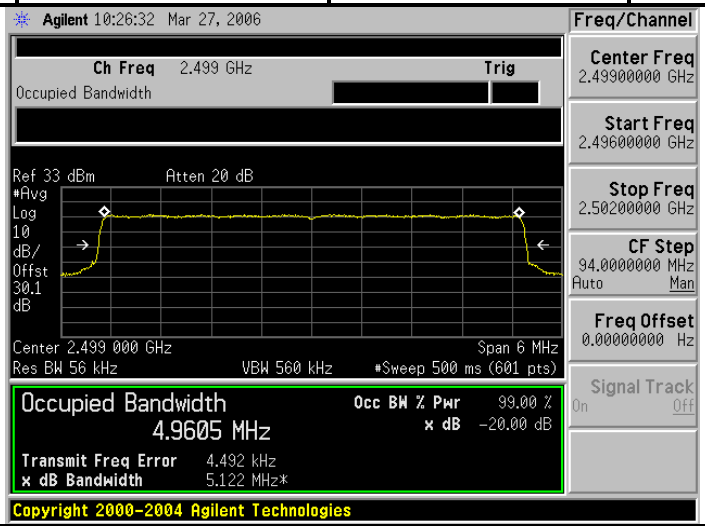



**2593 MHz**

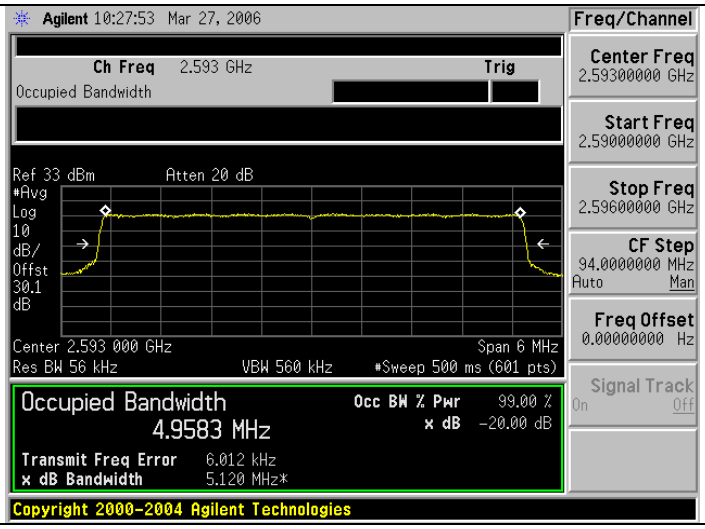



**2687 MHz**

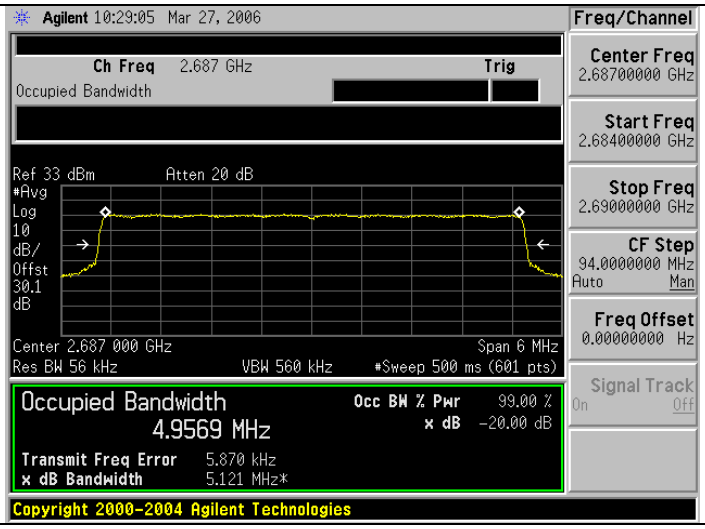
| Occupied BW | Bandwidth: 5.5 MHz | RF Power: 2 Watts | Modulation: 4 QAM |
|---|---|---|---|




**2499 MHz**

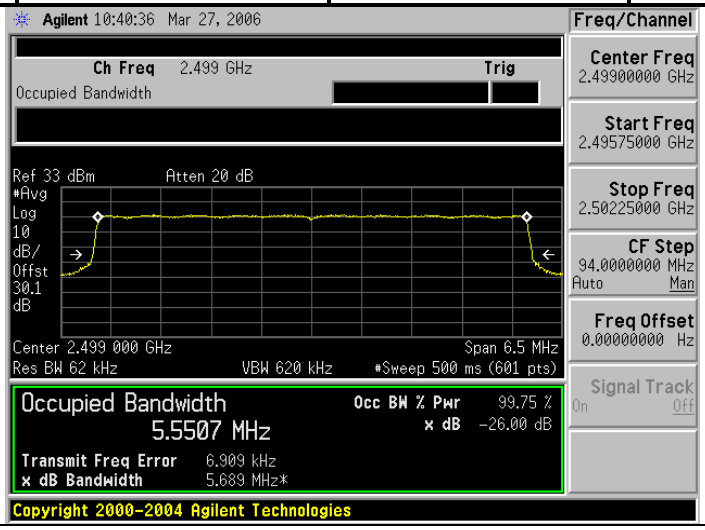



**2593 MHz**

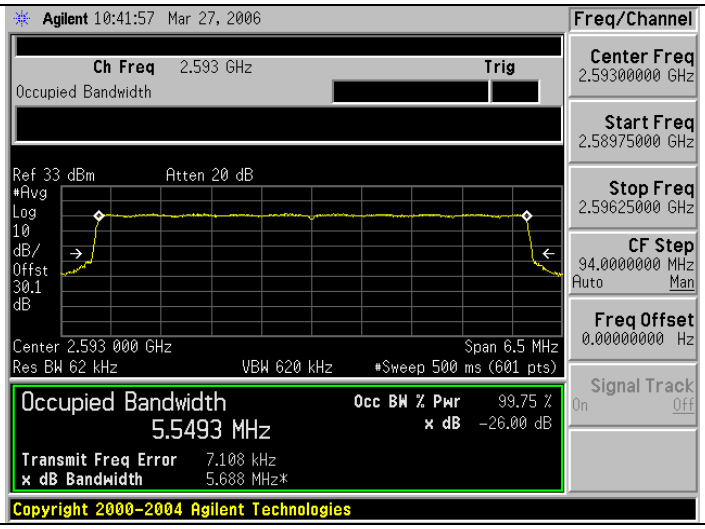



**2687 MHz**

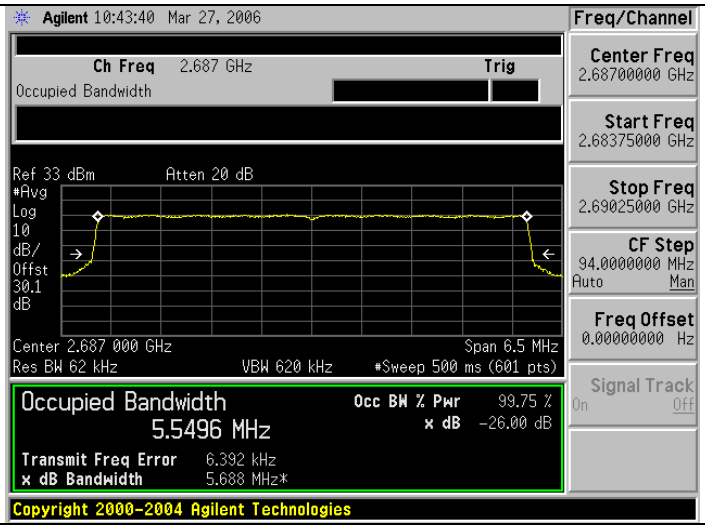
| Emission BW | Bandwidth: 6.0 MHz | RF Power: 2 Watts | Modulation: 4 QAM |
|---|---|---|---|




**2499 MHz**

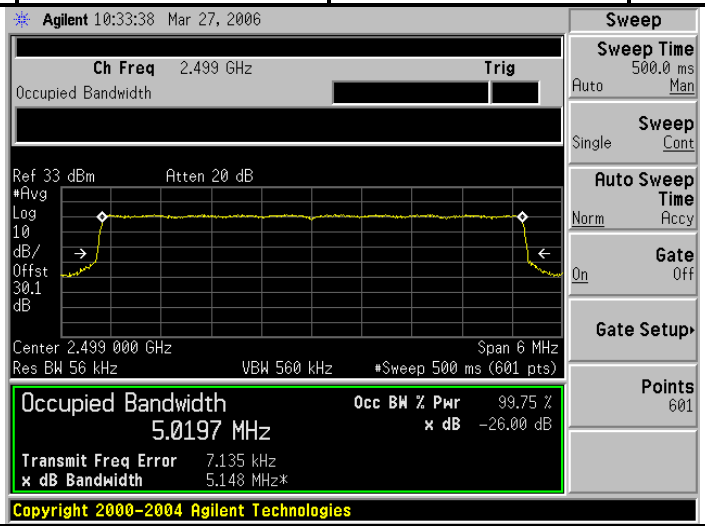



**2593 MHz**

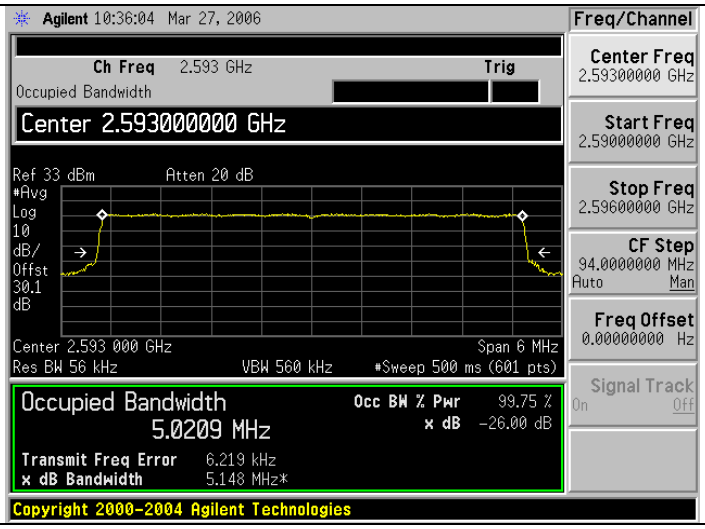



**2687 MHz**

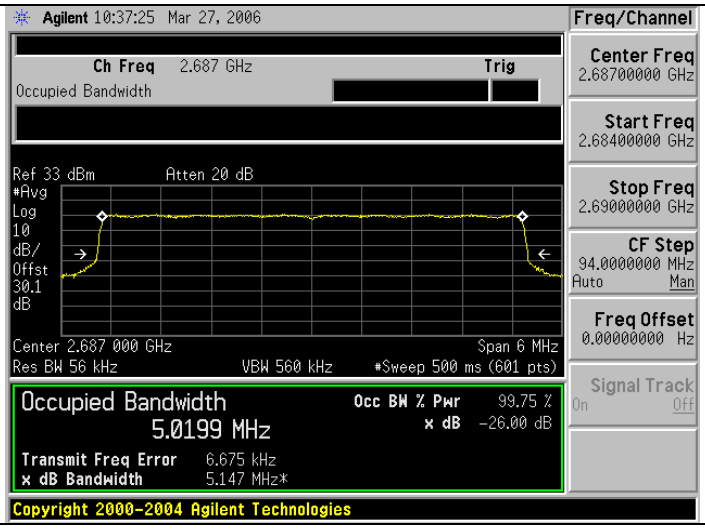
| Emission BW | Bandwidth: 5.5 MHz | RF Power: 2 Watts | Modulation: 4 QAM |
|---|---|---|---|




**2499 MHz**




**2593 MHz**




**2687 MHz**