



FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

BAR PHONE WITH 802.11b/g/n WLAN AND BLUETOOTH

MODEL NUMBER: GT-S7710L

FCC ID: A3LGTS7710L

REPORT NUMBER: 12114777-1

ISSUE DATE: JANUARY 24, 2013

Prepared for

SAMSUNG ELECTRONICS CO., LTD.

416, MAETAN 3-DONG, YEONGTONG-GU

SUWON-CITY, GYEONGGI-DO 443-742, SOUTH KOREA

Prepared by

UL CCS

47173 BENICIA STREET

FREMONT, CA 94538, U.S.A.

TEL: (510) 771-1000

FAX: (510) 661-0888



NVLAP LAB CODE 200065-0

Revision Histoy

| <u>Rev.</u> | <u>Issue Date</u> | <u>Revisions</u> | <u>Revised By</u> |
|-------------|-------------------|------------------|-------------------|
| -- | 01/24/13 | Initial Issue | Tim Lee |

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
416, MAETAN 3-DONG, YEONGTONG-GU
SUWON-CITY, GYEONGGI-DO, 443-742, SOUTH KOREA

EUT DESCRIPTION: BAR PHONE WITH WLAN, 802.11b/g/n and Bluetooth

MODEL: GT-S7710L

SERIAL NUMBER: FJ-334-F and FJ-334-H (RADIATED and ANTENNA PORT CONDUCTED)

DATE TESTED: JANUARY 18, 2013 to JANUARY 24, 2013

| APPLICABLE STANDARDS | |
|--------------------------|--------------|
| STANDARD | TEST RESULTS |
| CFR 47 Part 15 Subpart C | Pass |

UL CCS tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL CCS By:

Tested By:



TIM LEE
WISE PROGRAM MANAGER
UL CCS

THANH NGUYEN
EMC ENGINEER
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2003.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER | UNCERTAINTY |
|---------------------------------------|-------------|
| Conducted Disturbance, 0.15 to 30 MHz | 3.52 dB |
| Radiated Disturbance, 30 to 1000 MHz | 4.94 dB |

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a bar-style cell phone featuring 802.11b/g/n WLAN, Bluetooth, GPS and 2.4 GHz mobile hotspot capability.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

| Frequency Range (MHz) | Mode | Output Power (dBm) | Output Power (mW) |
|-----------------------|--------------|--------------------|-------------------|
| 2412 - 2462 | 802.11b | 19.17 | 82.60 |
| 2412 - 2462 | 802.11g | 22.15 | 164.06 |
| 2412 - 2462 | 802.11n HT20 | 20 | 100.00 |

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an F PCB antenna with a maximum gain of -3.54 dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was REV1.0 and the software was S7710L.010.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that the Z-orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z-orientation.

Based on the baseline scan, the worst-case data rates were:

802.11b mode: 1 Mbps
802.11g mode: 6 Mbps
802.11n HT20mode: MCS0

Radiated emissions for EUT with antenna was performed and passed; therefore, antenna port spurious was not performed.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

| Support Equipment List | | | | |
|------------------------|---------------------|------------|---------------|--------|
| Description | Manufacturer | Model | Serial Number | FCC ID |
| AC Adapter | Samsung Electronics | ETA0U80EBE | SC1C401V8 | DoC |
| Headset | Samsung Electronics | EHS61ASFWE | FJ334B | DoC |
| USB Cable | Samsung Electronics | ECC1DU4BBE | None | N/A |

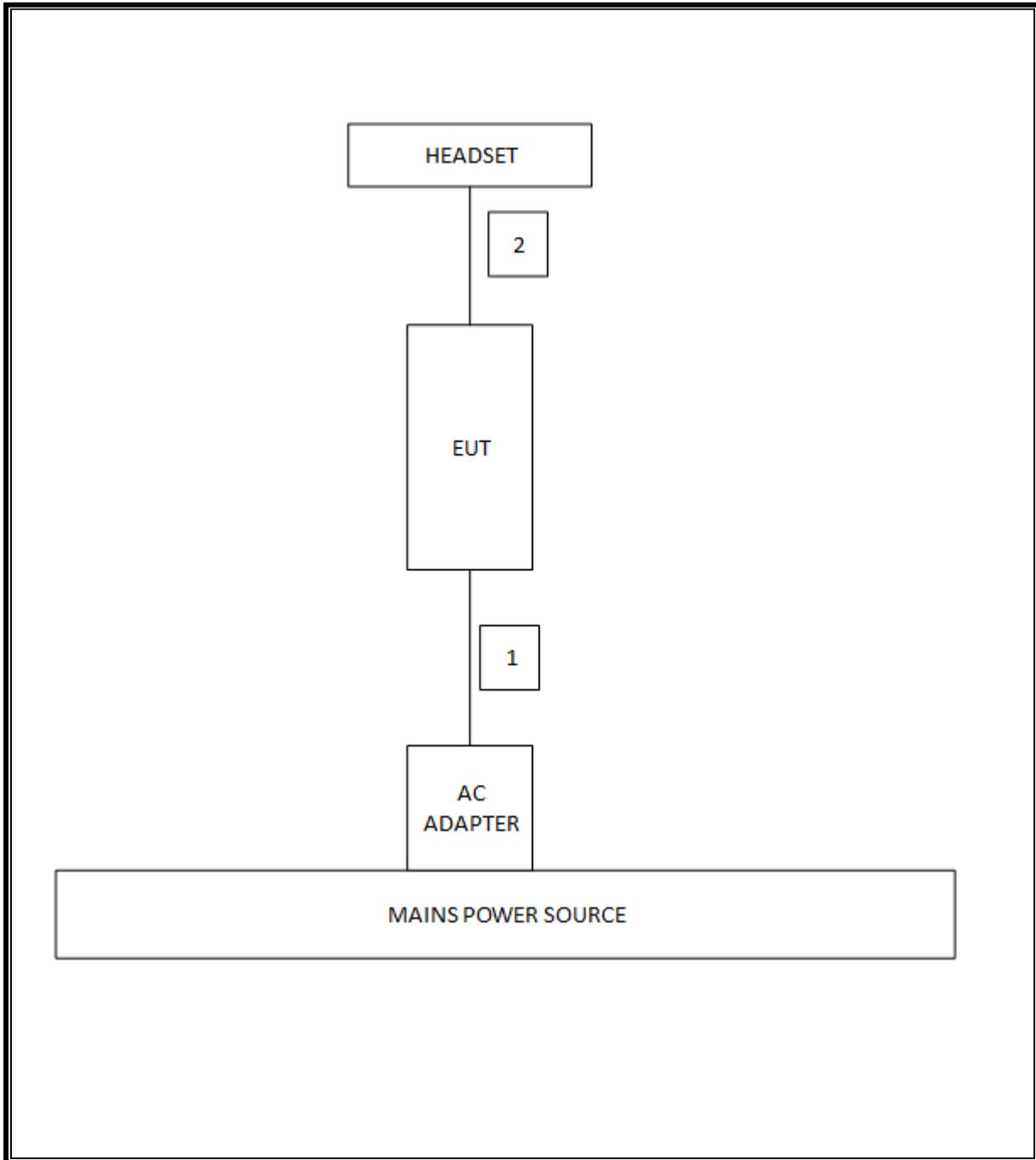
I/O CABLES

| I/O Cable List | | | | | | |
|----------------|---------|----------------------|----------------|------------|------------------|---------|
| Cable No | Port | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1 | USB | 1 | USB | Shielded | 1.5m | N/A |
| 2 | Headset | 1 | Audio | Shielded | 1.5m | N/A |

TEST SETUP

The EUT is a stand-alone unit that was tested in the worst case orientation and configuration, where applicable, during the tests. Test software exercised the radio.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

| Test Equipment List | | | | | |
|---------------------------|--------------|----------------|--------|----------|----------|
| Description | Manufacturer | Model | Asset | Cal Date | Cal Due |
| Antenna, Horn, 18 GHz | EMCO | 3115 | C00872 | 09/20/12 | 09/20/13 |
| Spectrum Analyzer, 44 GHz | Agilent / HP | E4446A | C01012 | 10/21/12 | 10/21/13 |
| Preamplifier, 26.5 GHz | Agilent / HP | 8449B | C00749 | 10/21/12 | 10/21/13 |
| Preamplifier, 1300 MHz | Agilent / HP | 8447D | C00558 | 02/21/12 | 02/21/13 |
| Bilog 30-2000MHz | Sunol | JB1 | C01071 | 07/26/12 | 07/26/13 |
| Power meter | HP | 437B | T226 | 06/25/12 | 06/25/13 |
| Power Sensor | HP | 8481A | T233 | 06/26/12 | 06/26/13 |
| LISN, 30 MHz | FCC | LISN-50/250-25 | N02625 | 01/14/13 | 01/14/14 |
| LISN, 10 kHz ~ 30 MHz | Solar | 8012-50-R-24-B | N02481 | 03/07/12 | 03/07/13 |
| EMI Test Receiver | R&S | ESC20 | N02396 | 08/18/12 | 08/18/13 |
| Antenna, Horn, 26.5 GHz | ARA | MWH-1826/B | C00589 | 07/28/12 | 07/28/13 |

7. MEASUREMENT METHODS

KDB 558074 Measurement Procedure PK2 is used for power and PKPSD is used for power spectral density.

Unwanted emissions within Restricted Bands are measured using traditional radiated procedures.

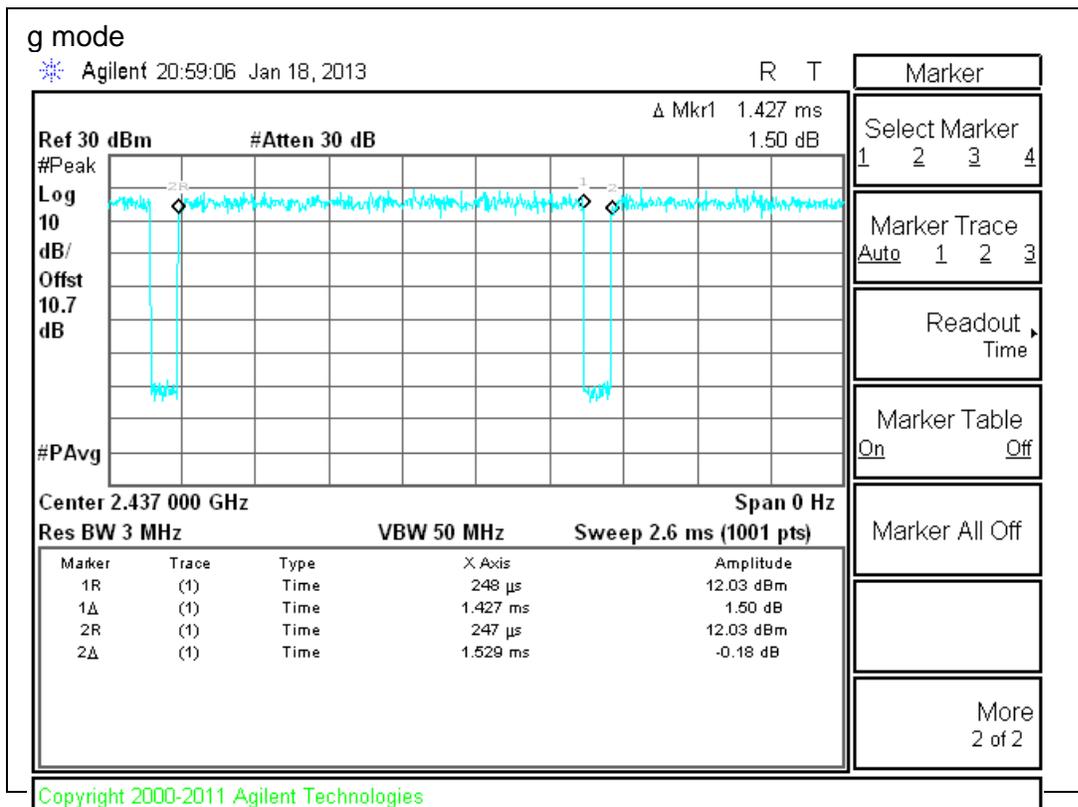
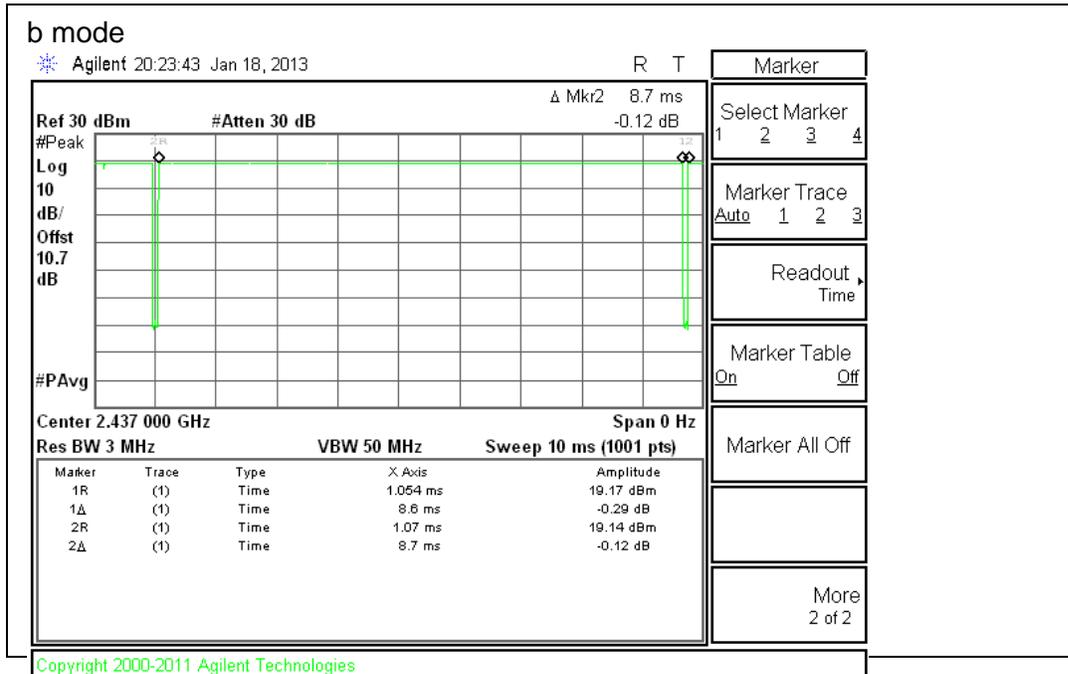
7.1. DUTY CYCLE

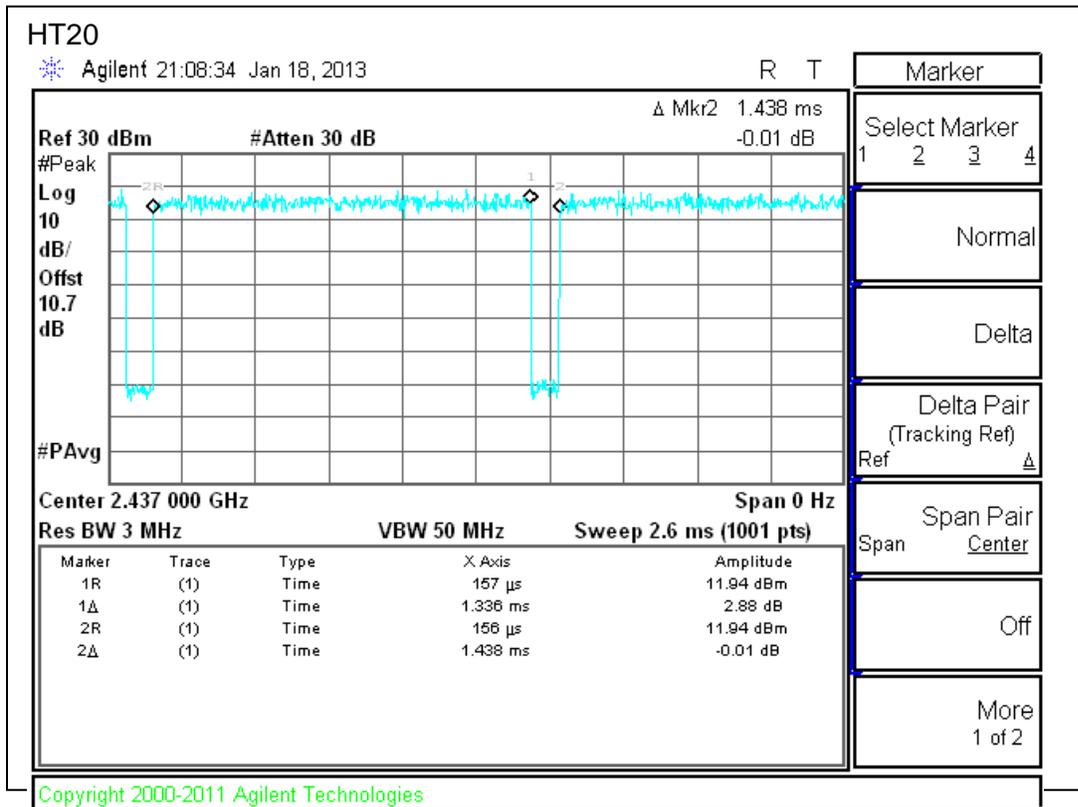
LIMITS

None; for reporting purposes only.

RESULTS

| Mode | Tx on (msec) | Tx on + Tx off (msec) | Duty Cycle (%) | Duty Cycle Correction Factor (dB) |
|--------------|--------------|-----------------------|----------------|-----------------------------------|
| 802.11b | 8.6 | 8.7 | 98.85 | 0.05 |
| 802.11g | 1.427 | 1.529 | 93.33 | 0.30 |
| 802.11n HT20 | 1.336 | 1.438 | 92.91 | 0.32 |





8. ANTENNA PORT TEST RESULTS

8.1. 802.11b MODE IN THE 2.4 GHz BAND

8.1.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

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

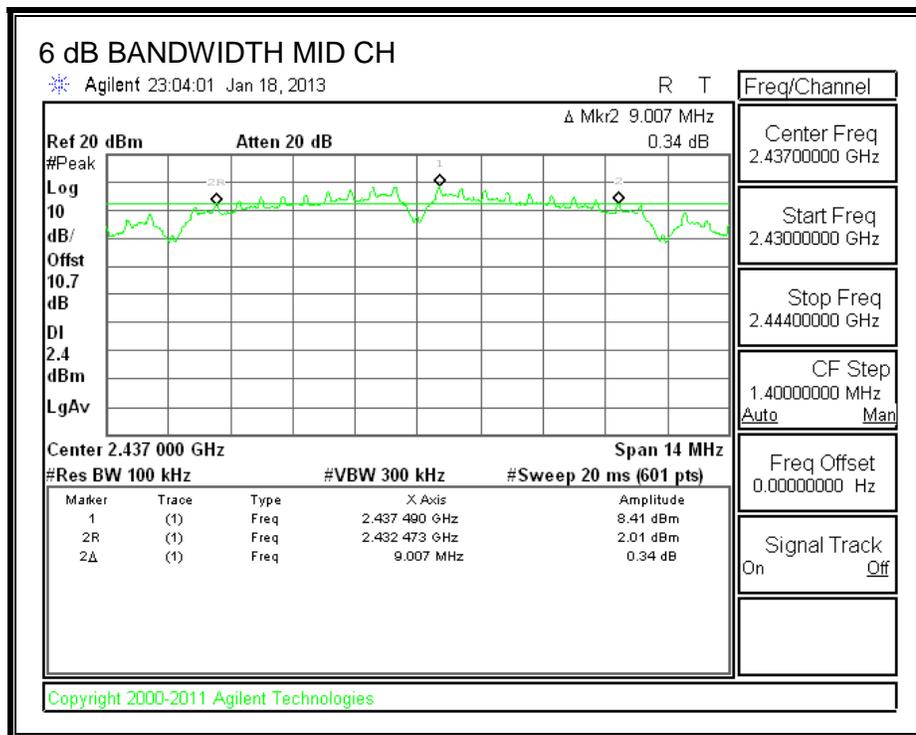
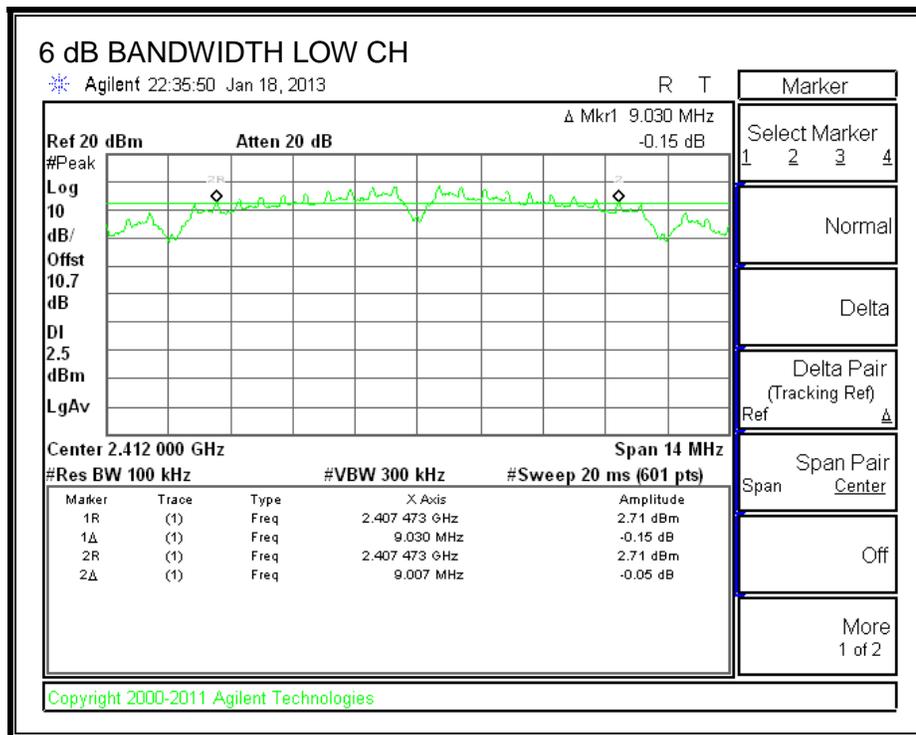
TEST PROCEDURE

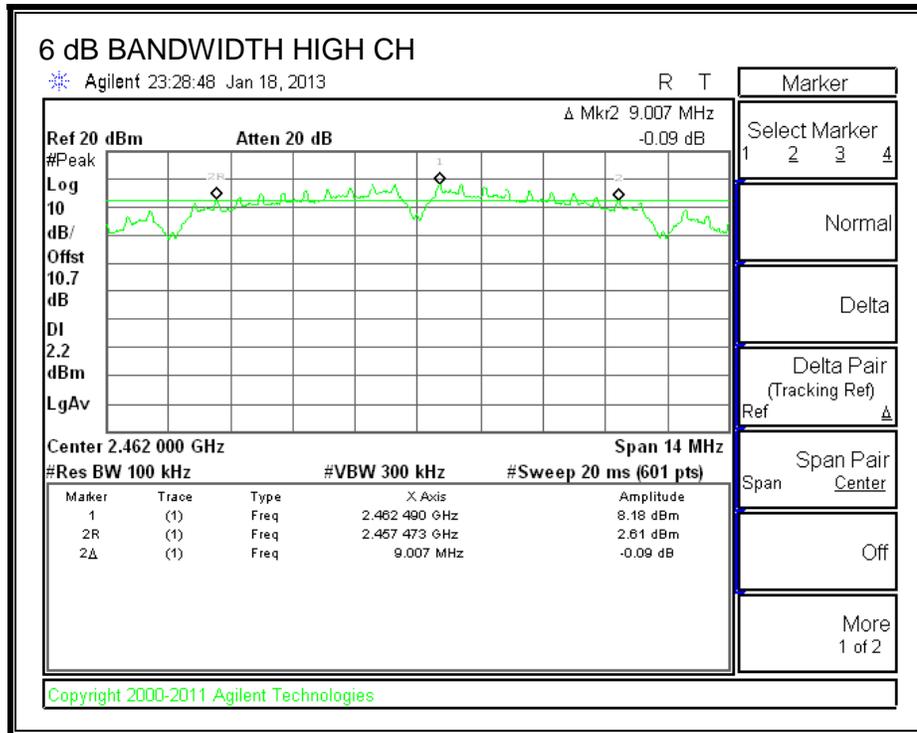
The transmitter output is connected to a spectrum analyzer with the RBW set between 1% and 5% of the EBW, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

RESULTS

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|--------------------|-------------------------|------------------------|
| Low | 2412 | 9.030 | 0.5 |
| Mid | 2437 | 9.007 | 0.5 |
| High | 2462 | 9.007 | 0.5 |

6 dB BANDWIDTH





8.1.2. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10.7dB (including 10 dB pad and .7 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

| Channel | Frequency (MHz) | Power (dBm) |
|---------|-----------------|-------------|
| Low | 2412 | 15.98 |
| Mid | 2437 | 15.67 |
| High | 2462 | 15.85 |

8.1.3. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

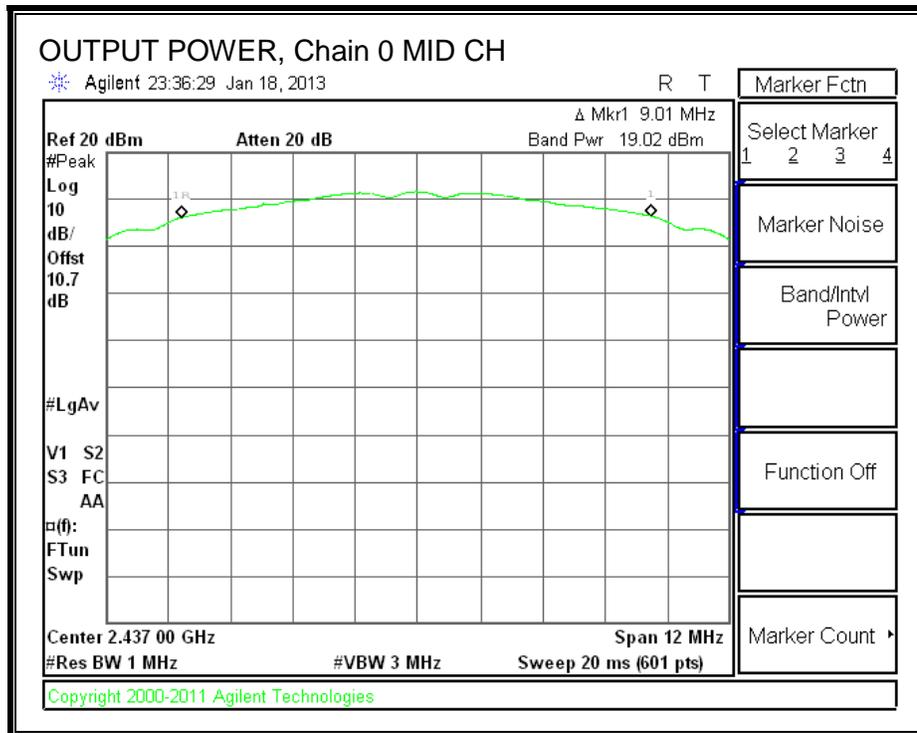
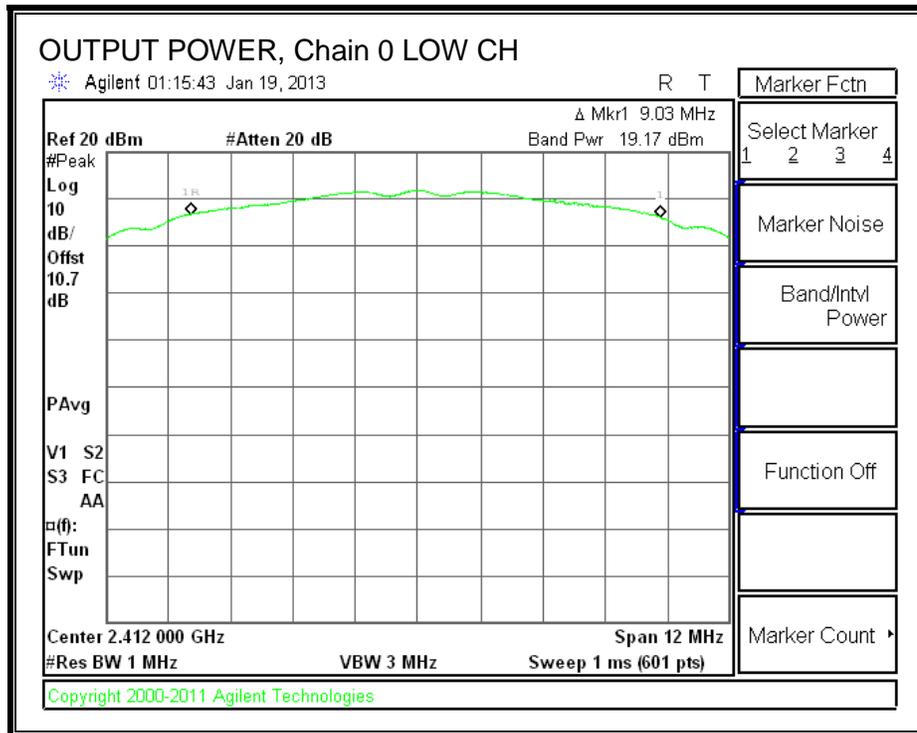
Limits

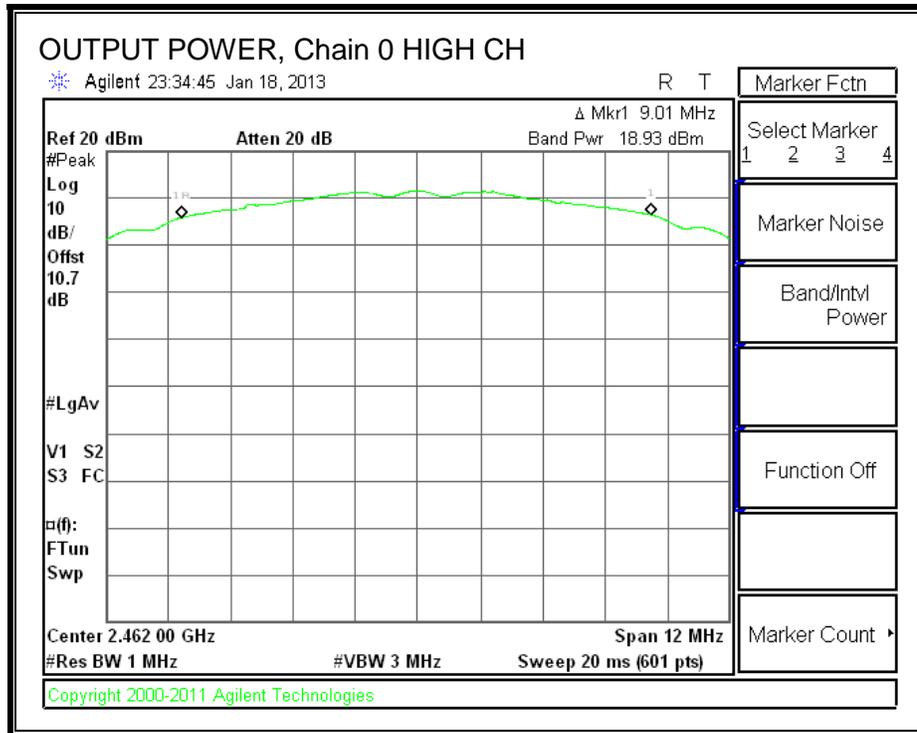
| Channel | Frequency (MHz) | Directional Gain (dBi) | FCC Power Limit (dBm) | IC Power Limit (dBm) | IC EIRP Limit (dBm) | Max Power (dBm) |
|---------|--------------------|------------------------------|--------------------------------|-------------------------------|------------------------------|-----------------------|
| Low | 2412 | -3.54 | 30.00 | 30 | 36 | 30.00 |
| Mid | 2437 | -3.54 | 30.00 | 30 | 36 | 30.00 |
| High | 2462 | -3.54 | 30.00 | 30 | 36 | 30.00 |

Results

| Channel | Frequency (MHz) | Chain 0 Meas Power (dBm) | Total Corr'd Power (dBm) | Power Limit (dBm) | Margin (dB) |
|---------|--------------------|-----------------------------------|-----------------------------------|-------------------------|----------------|
| Low | 2412 | 19.17 | 19.17 | 30.00 | -10.83 |
| Mid | 2437 | 19.02 | 19.02 | 30.00 | -10.98 |
| High | 2462 | 18.93 | 18.93 | 30.00 | -11.07 |

OUTPUT POWER, Chain 0





8.1.4. PSD

LIMITS

FCC §15.247

IC RSS-210 A8.2

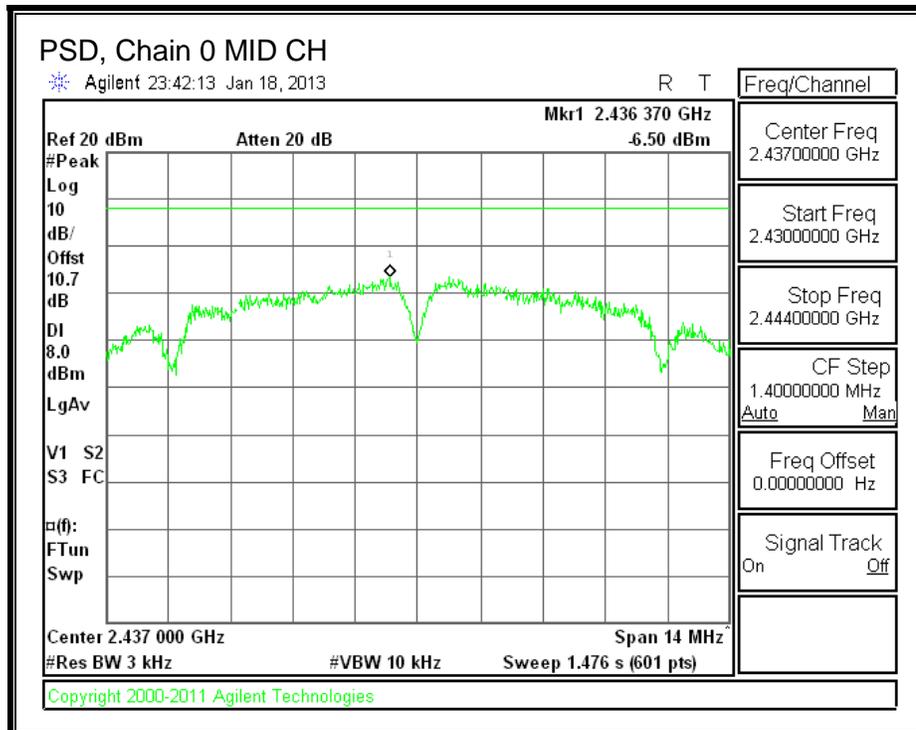
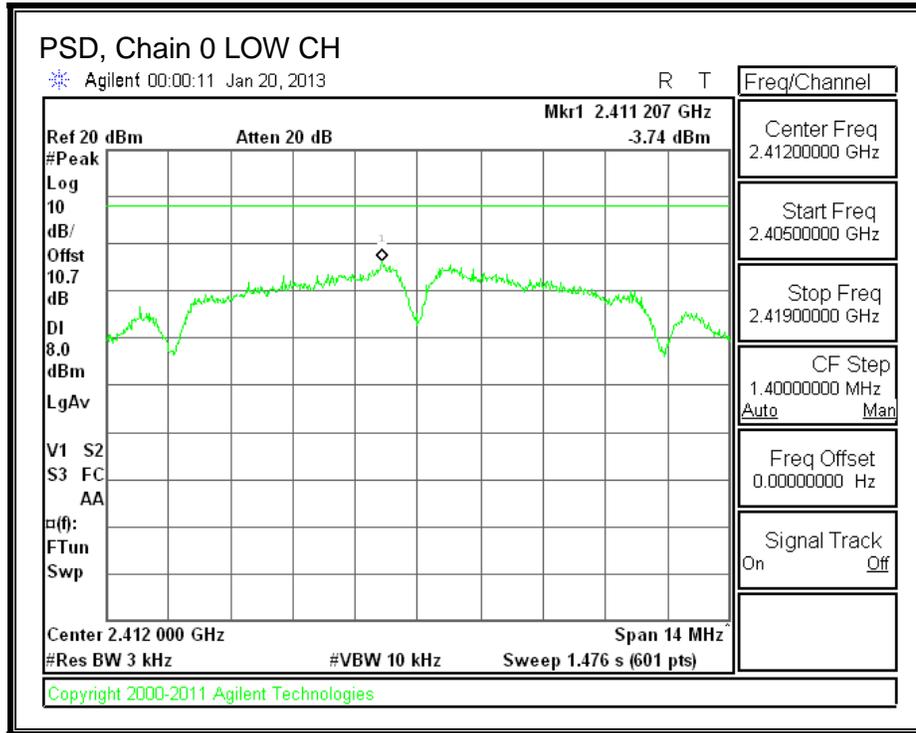
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

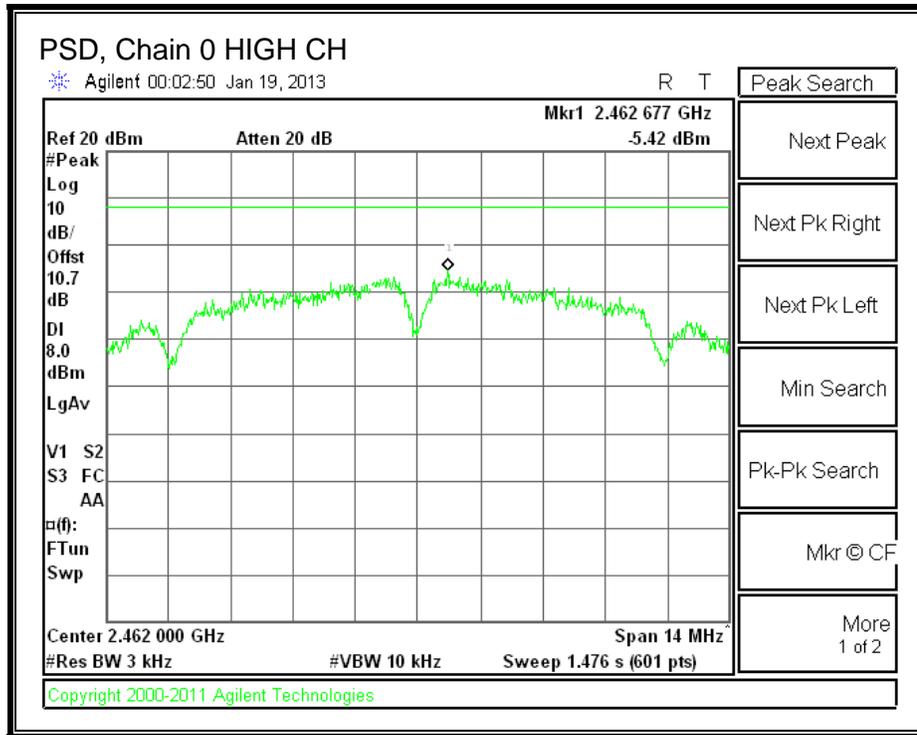
RESULTS

PSD Results

| Channel | Frequency (MHz) | Chain 0 Meas (dBm) | Limit (dBm) | Margin (dB) |
|---------|--------------------|--------------------------|----------------|----------------|
| Low | 2412 | -3.74 | 8.0 | -11.7 |
| Mid | 2437 | -6.50 | 8.0 | -14.5 |
| High | 2462 | -5.42 | 8.0 | -13.4 |

PSD, Chain 0





8.1.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

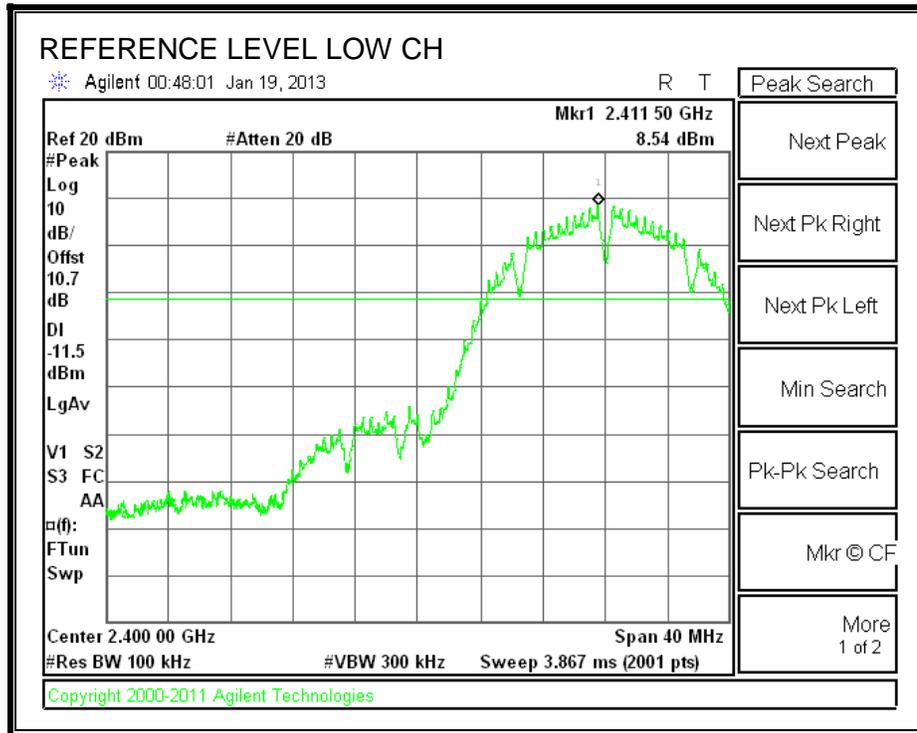
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

TEST PROCEDURE

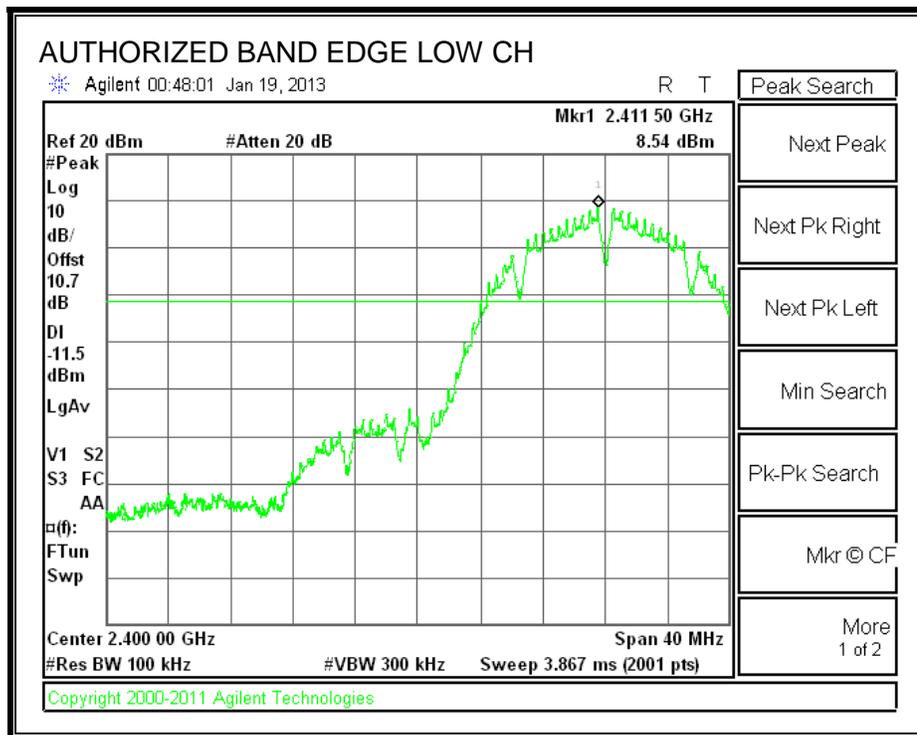
The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

RESULTS

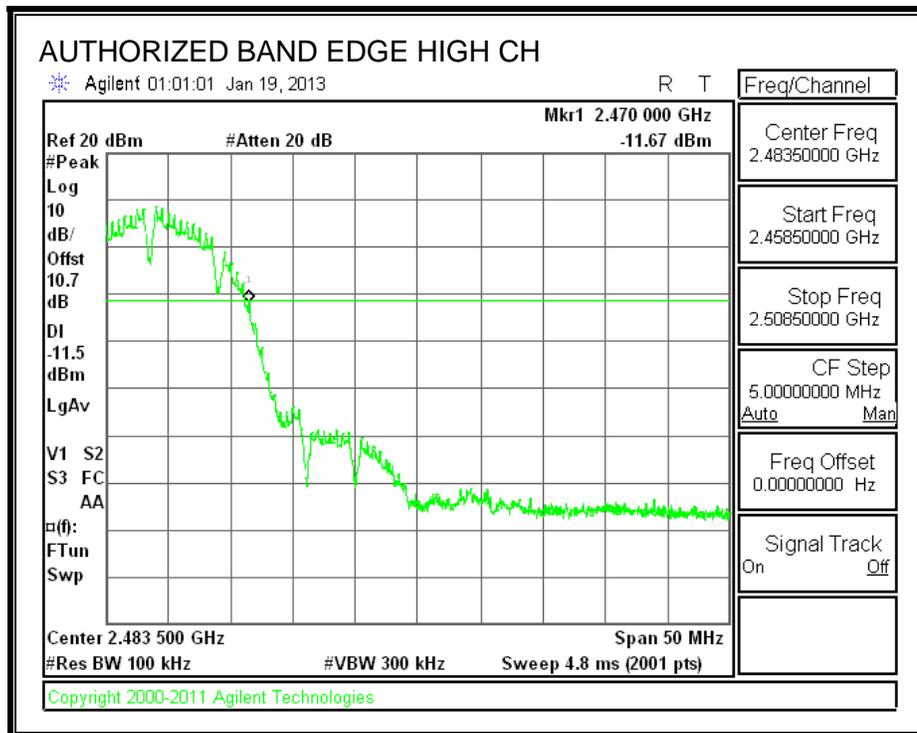
IN-BAND REFERENCE LEVEL



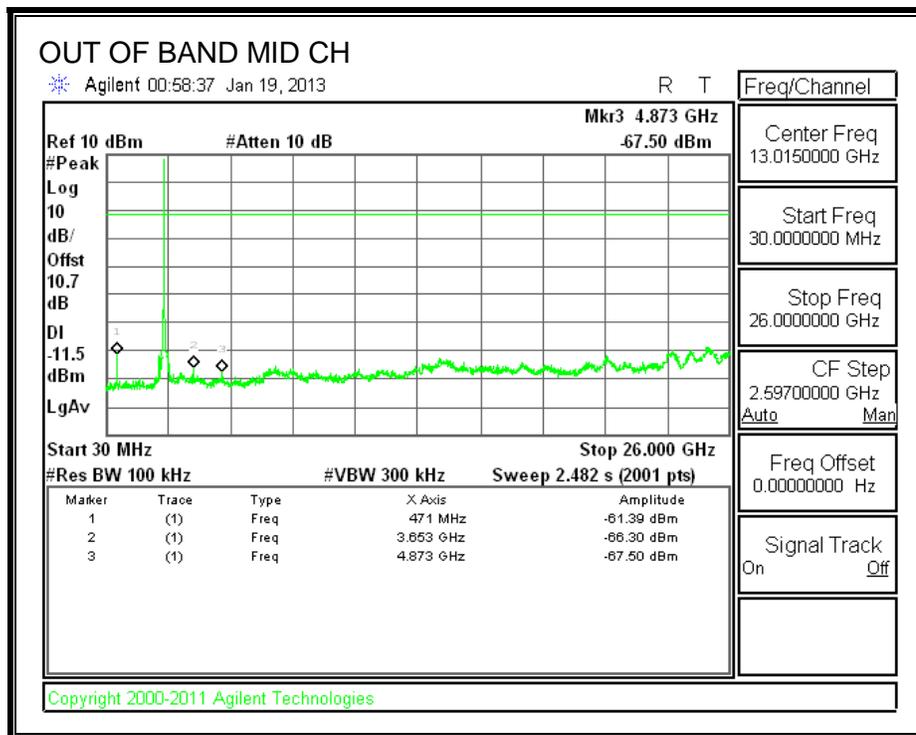
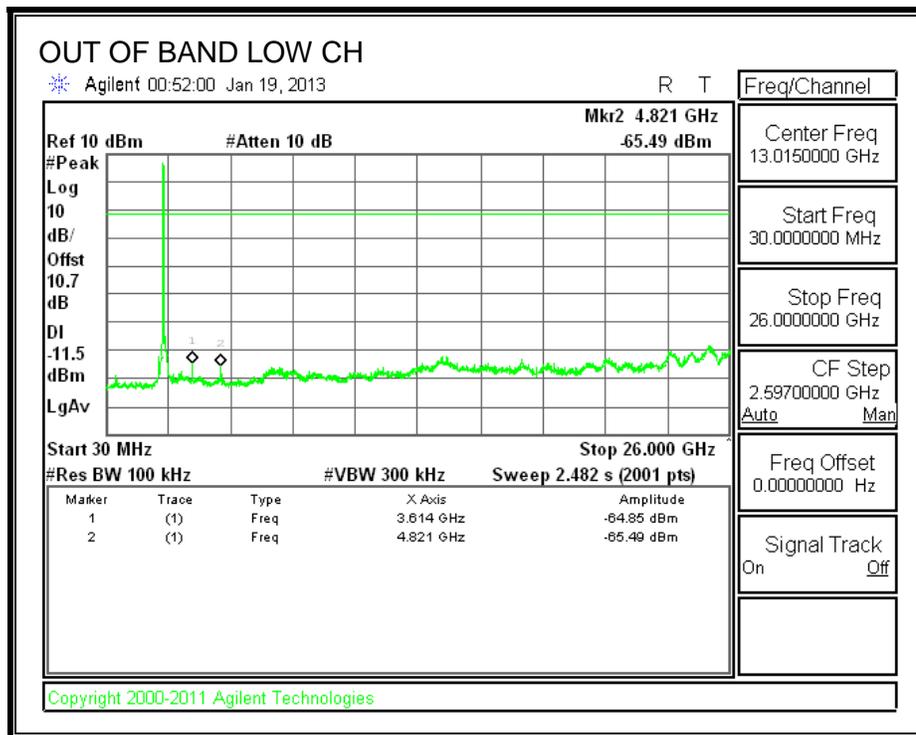
LOW CHANNEL BANDEDGE

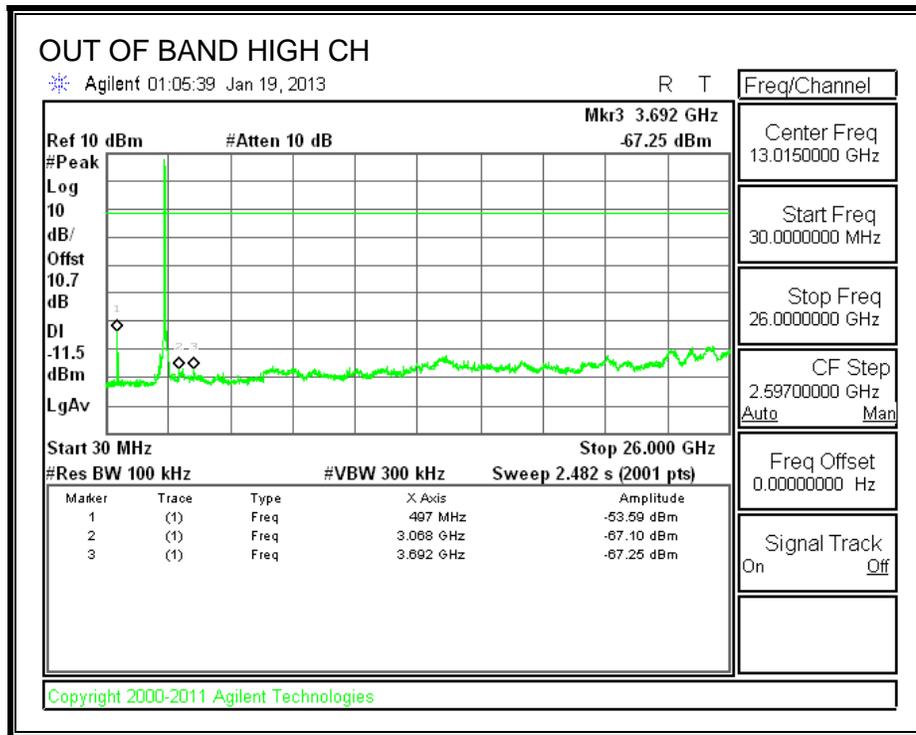


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS





8.2. 802.11g MODE IN THE 2.4 GHz BAND

8.2.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

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

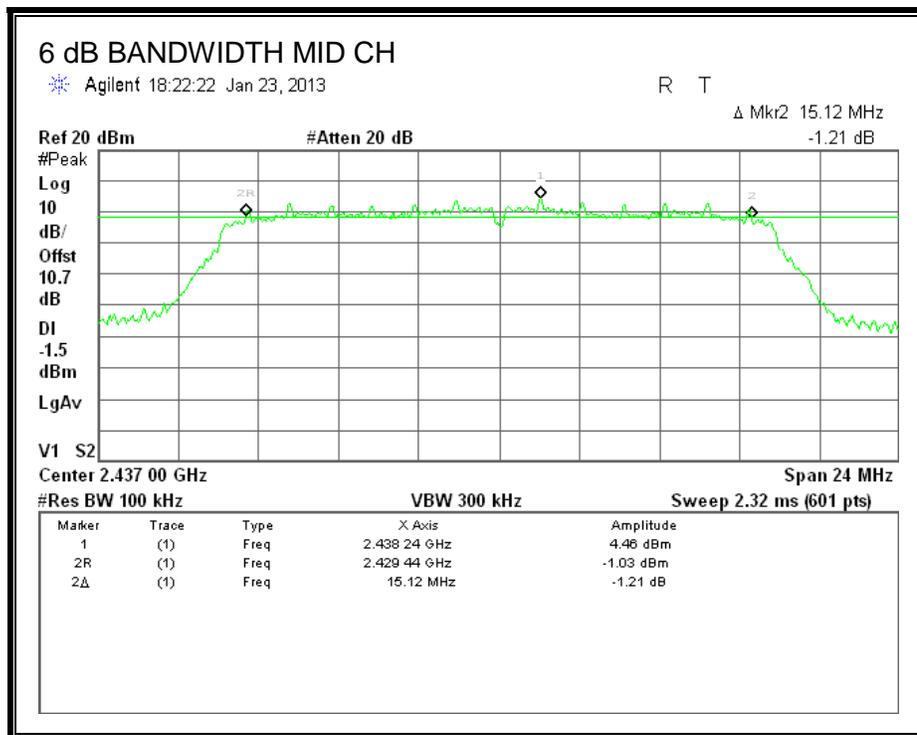
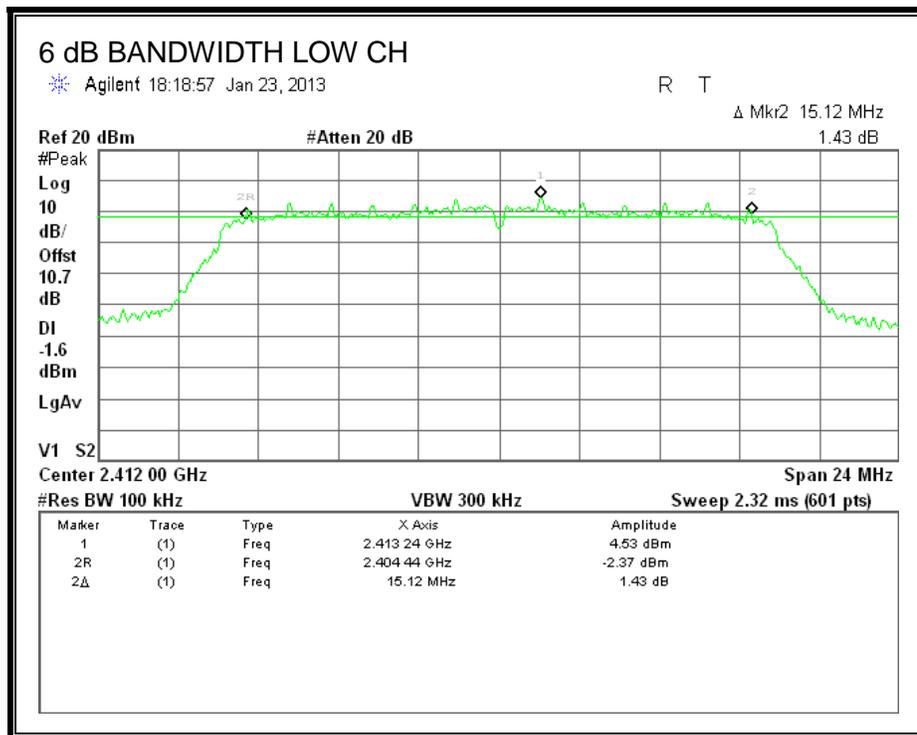
TEST PROCEDURE

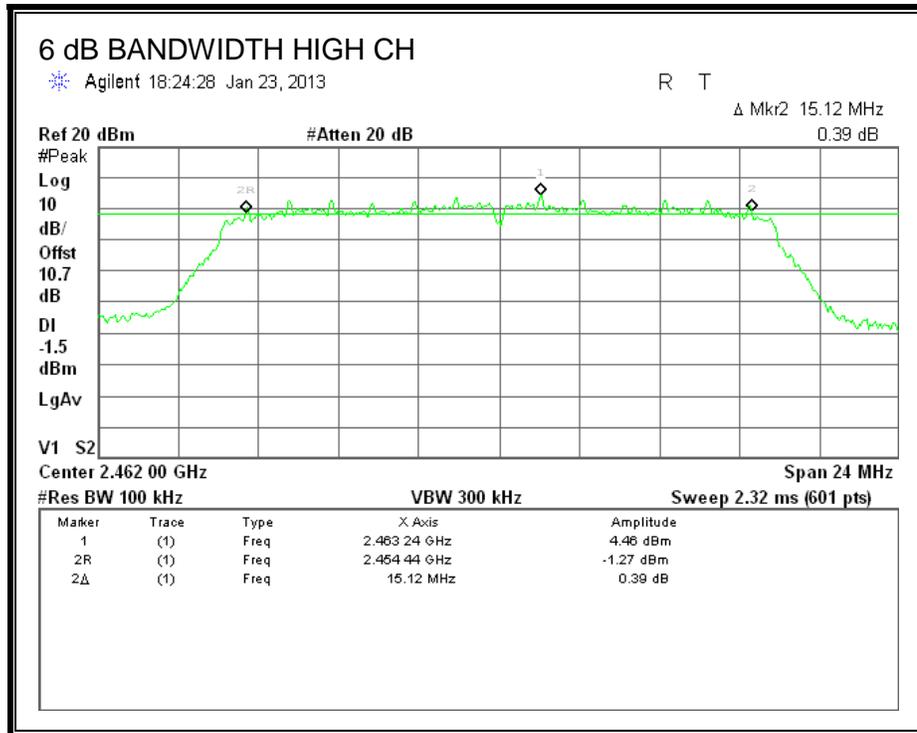
The transmitter output is connected to a spectrum analyzer with the RBW set between 1% and 5% of the EBW, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

RESULTS

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|-----------------|----------------------|---------------------|
| Low | 2412 | 15.12 | 0.5 |
| Mid | 2437 | 15.12 | 0.5 |
| High | 2462 | 15.12 | 0.5 |

6 dB BANDWIDTH





8.2.2. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10.7dB (including 10 dB pad and .7 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

| Channel | Frequency (MHz) | Power (dBm) |
|---------|-----------------|-------------|
| Low | 2412 | 14.35 |
| Mid | 2437 | 14.29 |
| High | 2462 | 14.10 |

8.2.3. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

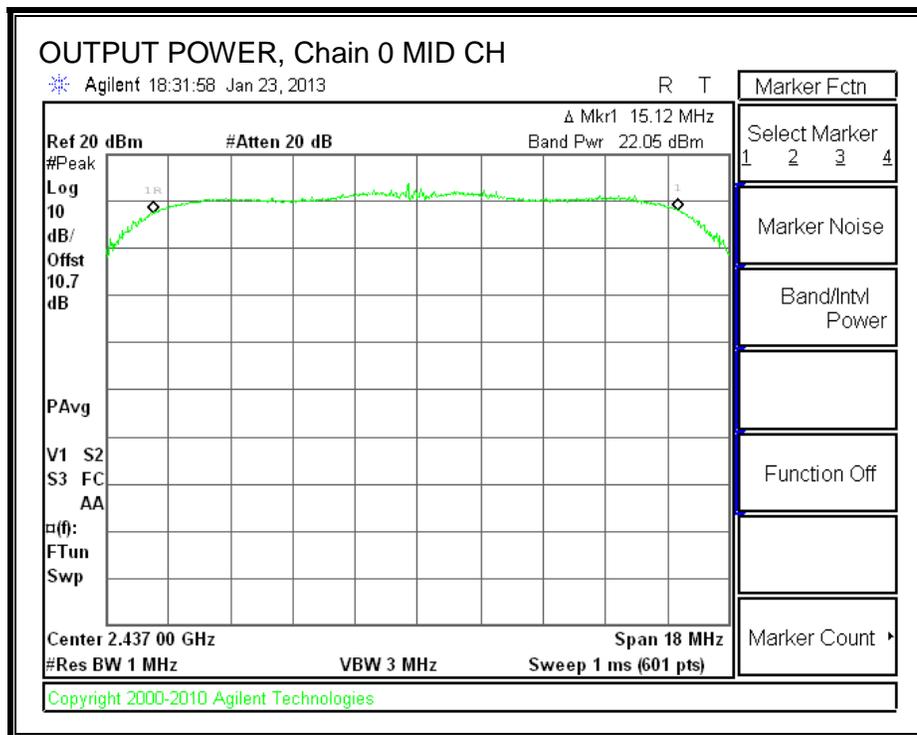
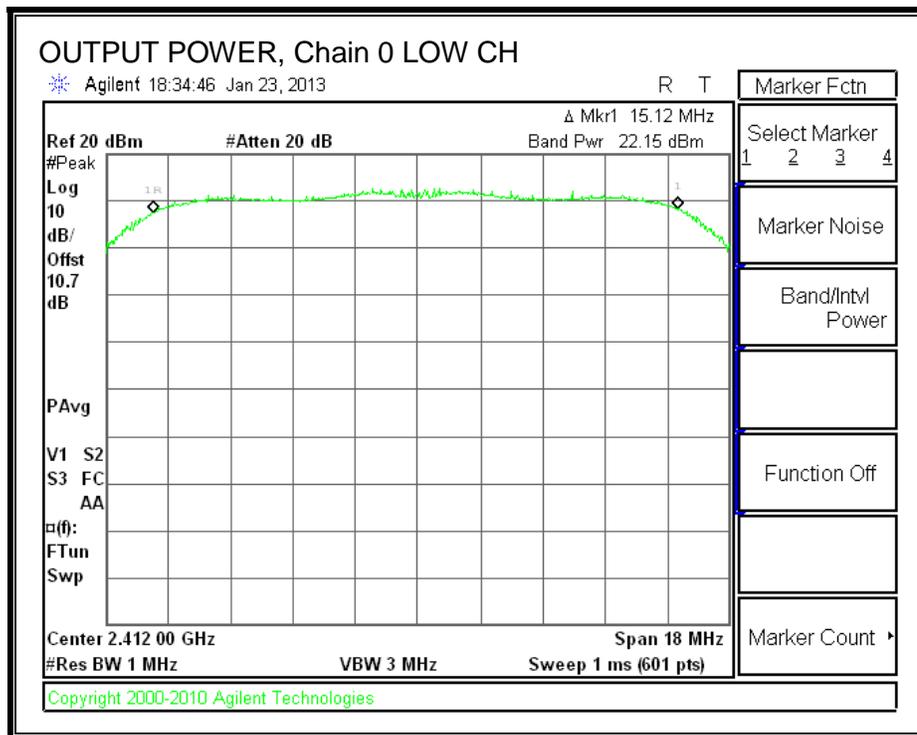
Limits

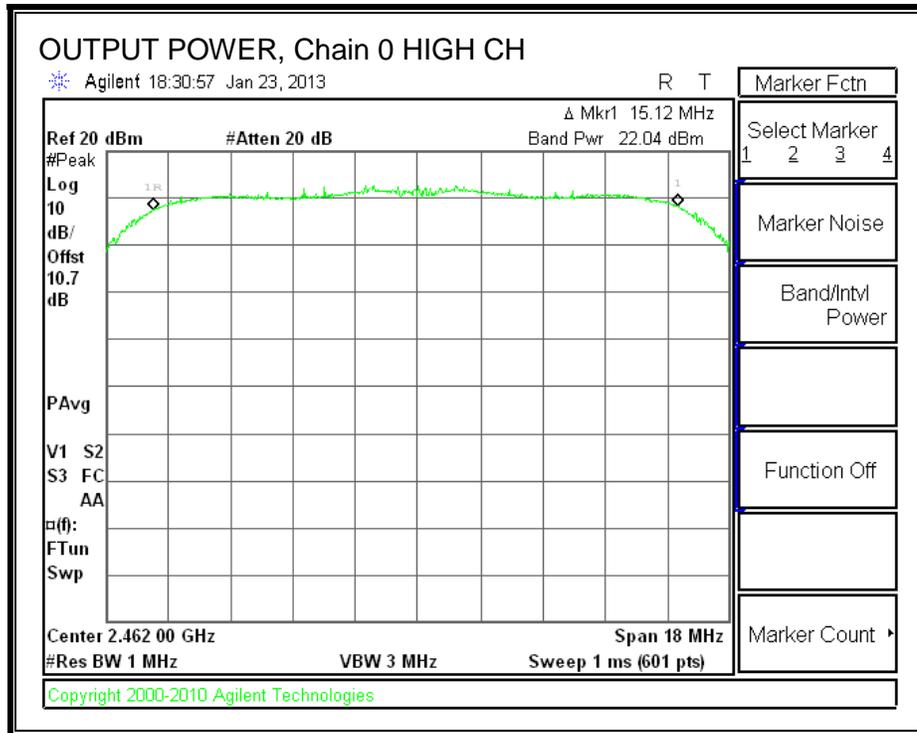
| Channel | Frequency (MHz) | Directional Gain (dBi) | FCC Power Limit (dBm) | IC Power Limit (dBm) | IC EIRP Limit (dBm) | Max Power (dBm) |
|---------|--------------------|------------------------------|--------------------------------|-------------------------------|------------------------------|-----------------------|
| Low | 2412 | -3.54 | 30.00 | 30 | 36 | 30.00 |
| Mid | 2437 | -3.54 | 30.00 | 30 | 36 | 30.00 |
| High | 2462 | -3.54 | 30.00 | 30 | 36 | 30.00 |

Results

| Channel | Frequency (MHz) | Chain 0 Meas Power (dBm) | Total Corr'd Power (dBm) | Power Limit (dBm) | Margin (dB) |
|---------|--------------------|-----------------------------------|-----------------------------------|-------------------------|----------------|
| Low | 2412 | 22.15 | 22.15 | 30.00 | -7.85 |
| Mid | 2437 | 22.05 | 22.05 | 30.00 | -7.95 |
| High | 2462 | 22.04 | 22.04 | 30.00 | -7.96 |

OUTPUT POWER, Chain 0





8.2.4. PSD

LIMITS

FCC §15.247

IC RSS-210 A8.2

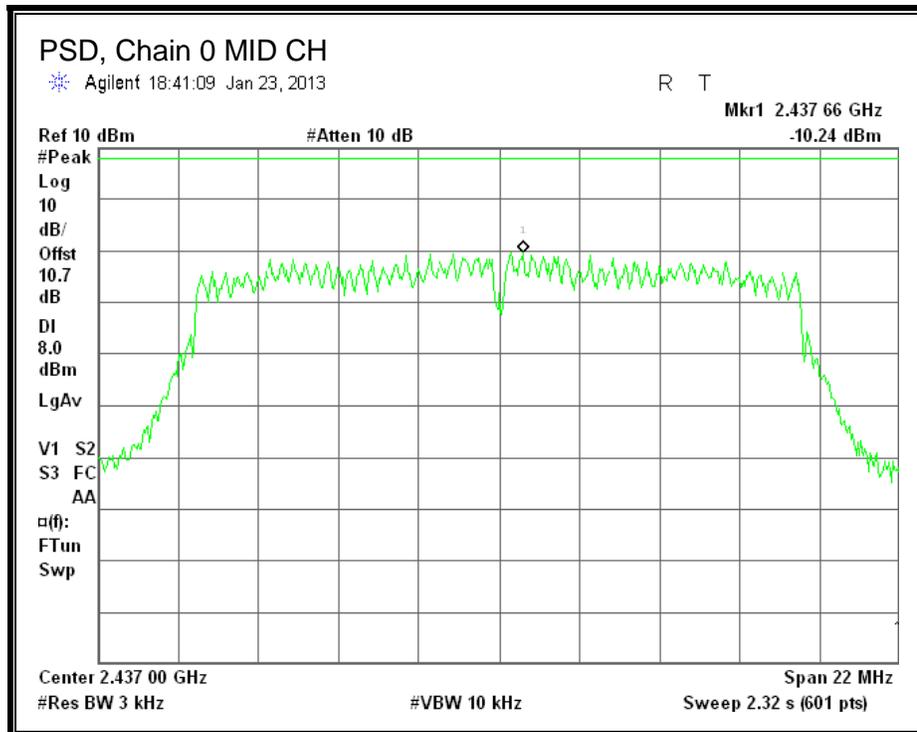
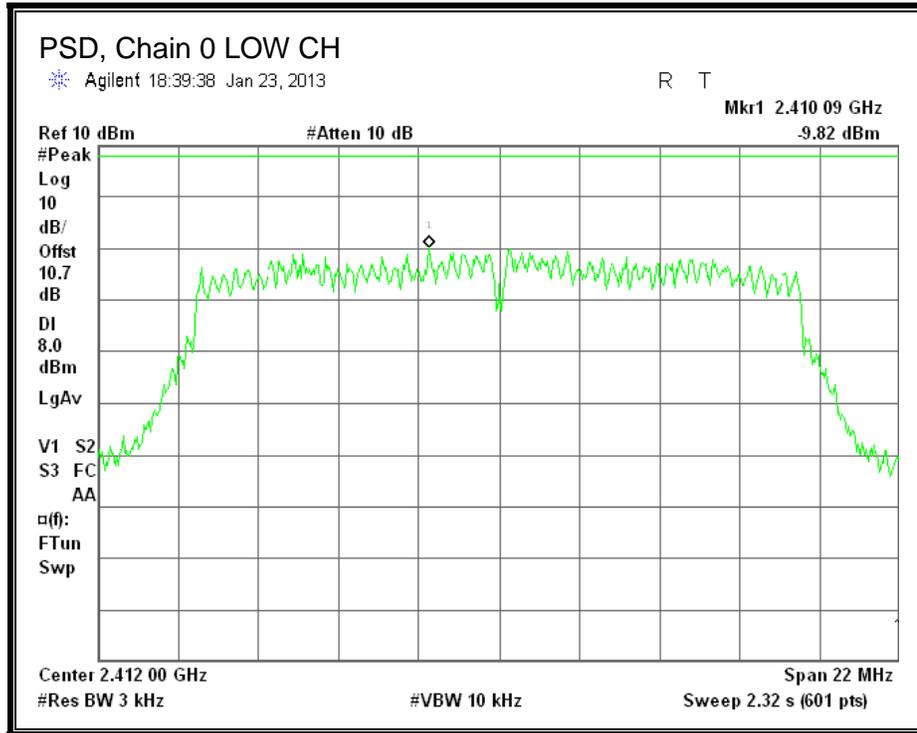
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

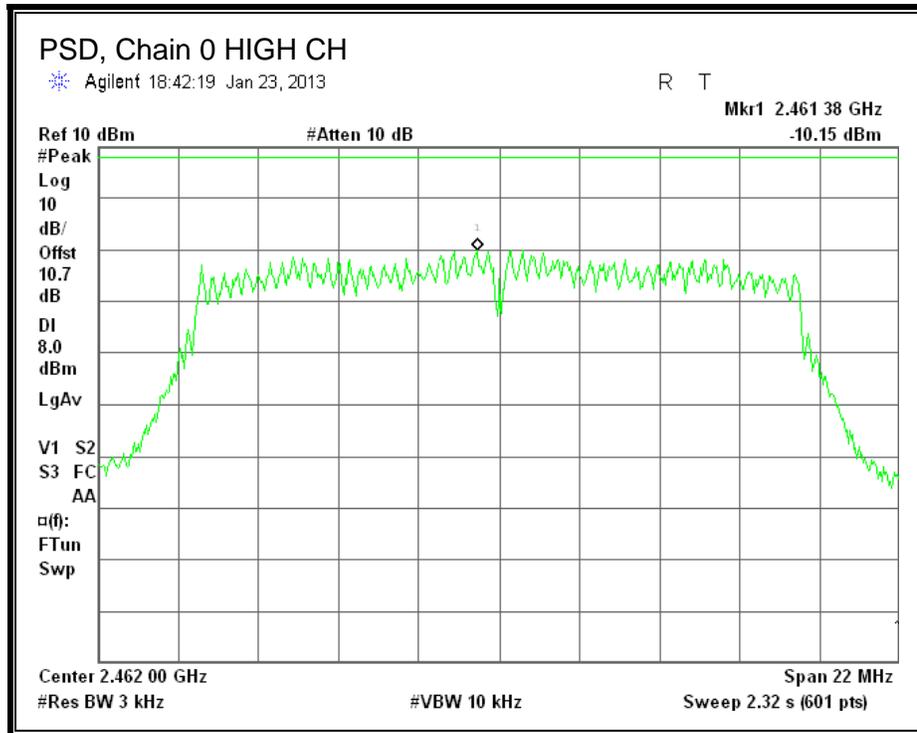
RESULTS

PSD Results

| Channel | Frequency (MHz) | Chain 0 Meas (dBm) | Limit (dBm) | Margin (dB) |
|---------|--------------------|--------------------------|----------------|----------------|
| Low | 2412 | -9.82 | 8.0 | -17.8 |
| Mid | 2437 | -10.24 | 8.0 | -18.2 |
| High | 2462 | -10.15 | 8.0 | -18.2 |

PSD, Chain 0





8.2.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

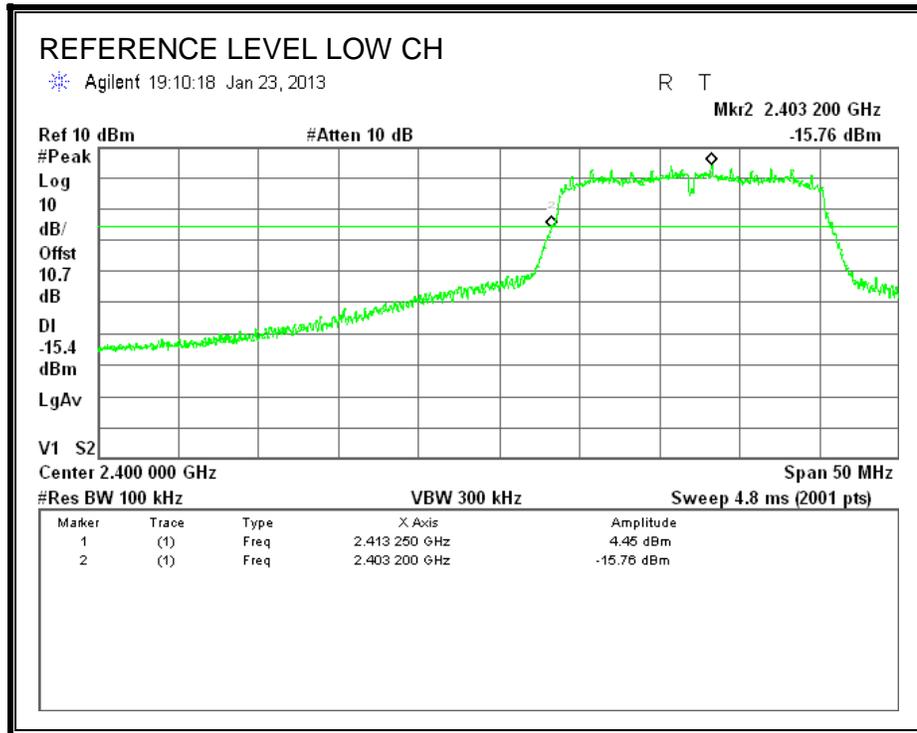
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

TEST PROCEDURE

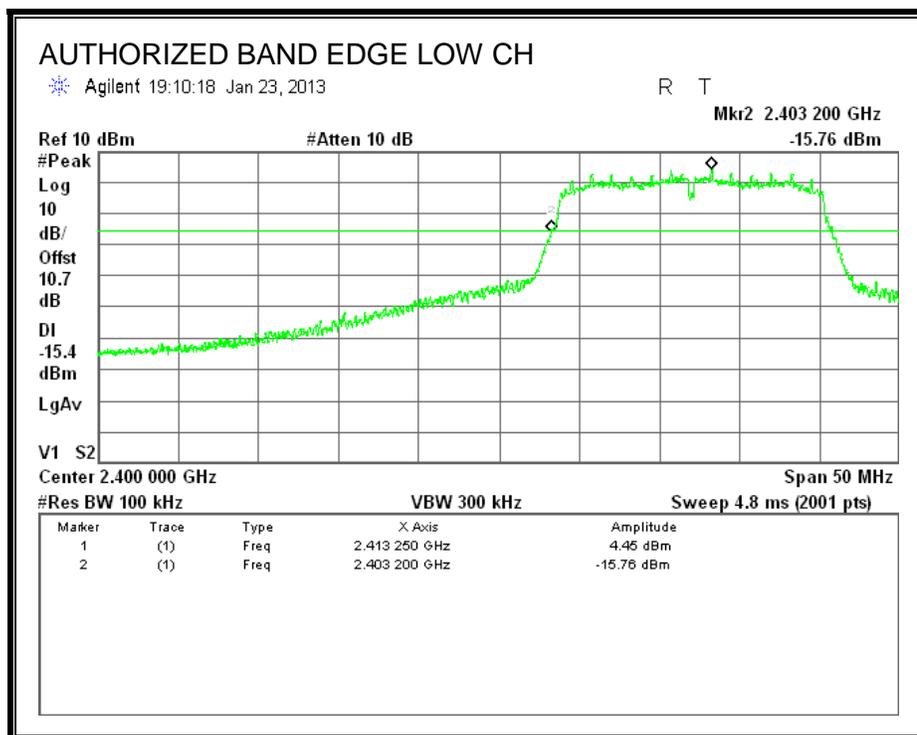
The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

RESULTS

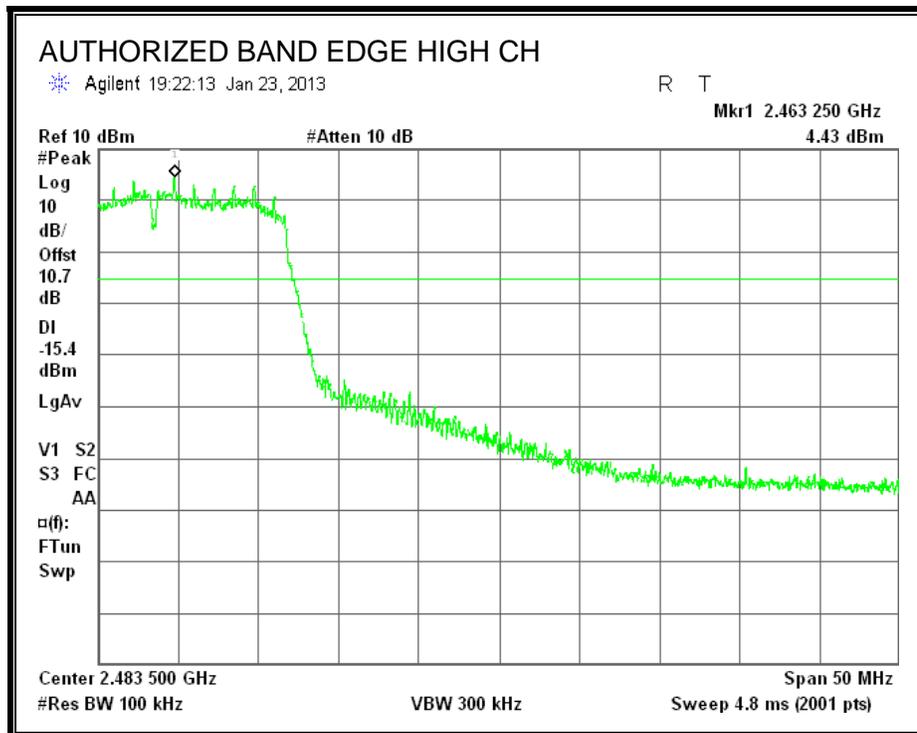
IN-BAND REFERENCE LEVEL



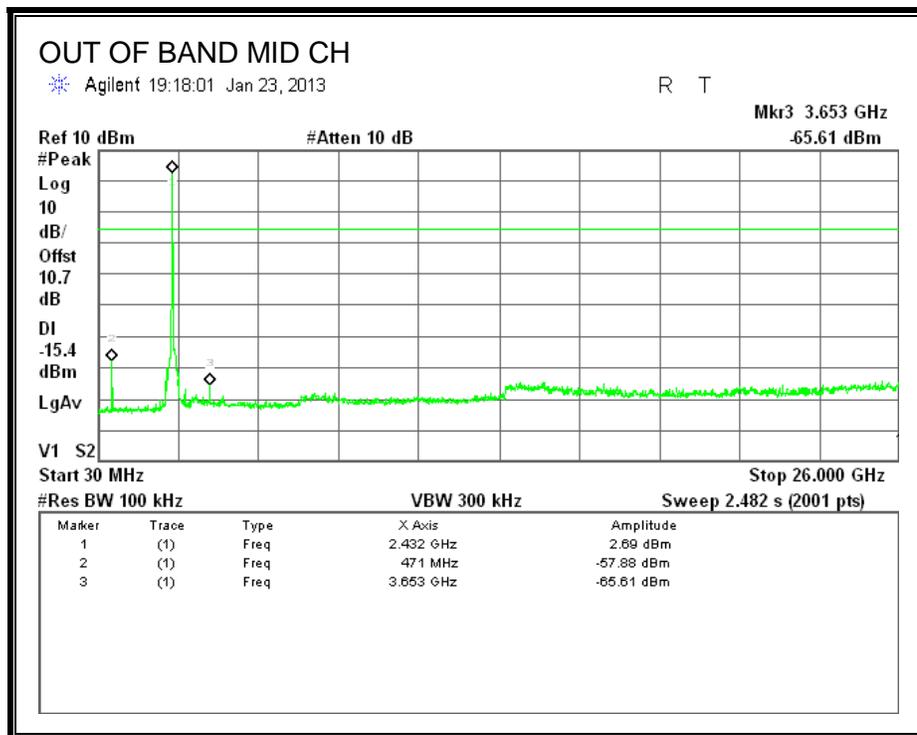
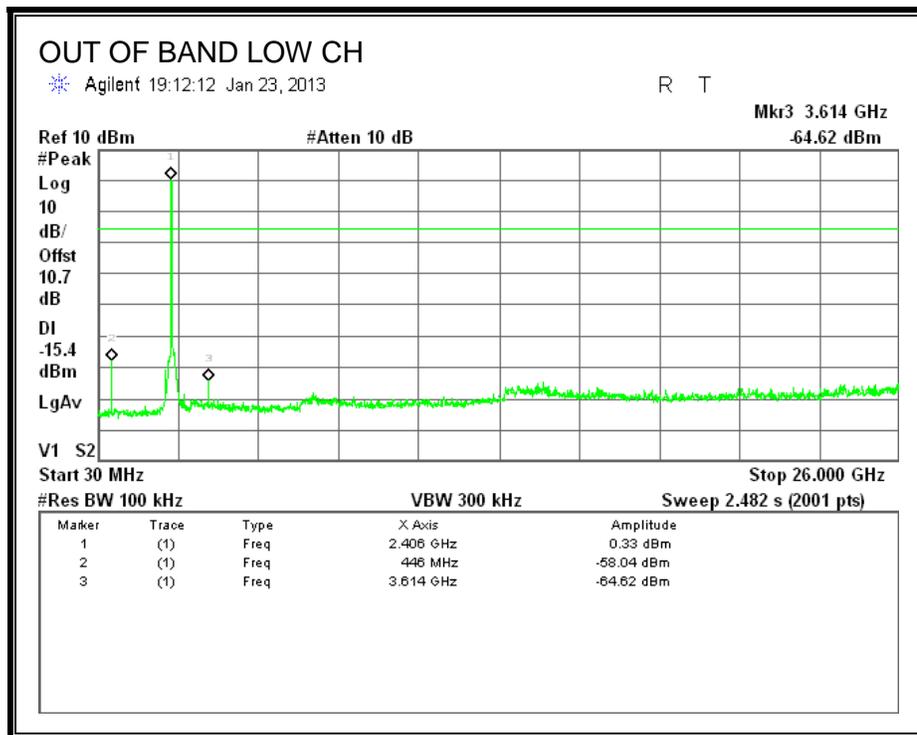
LOW CHANNEL BANDEDGE

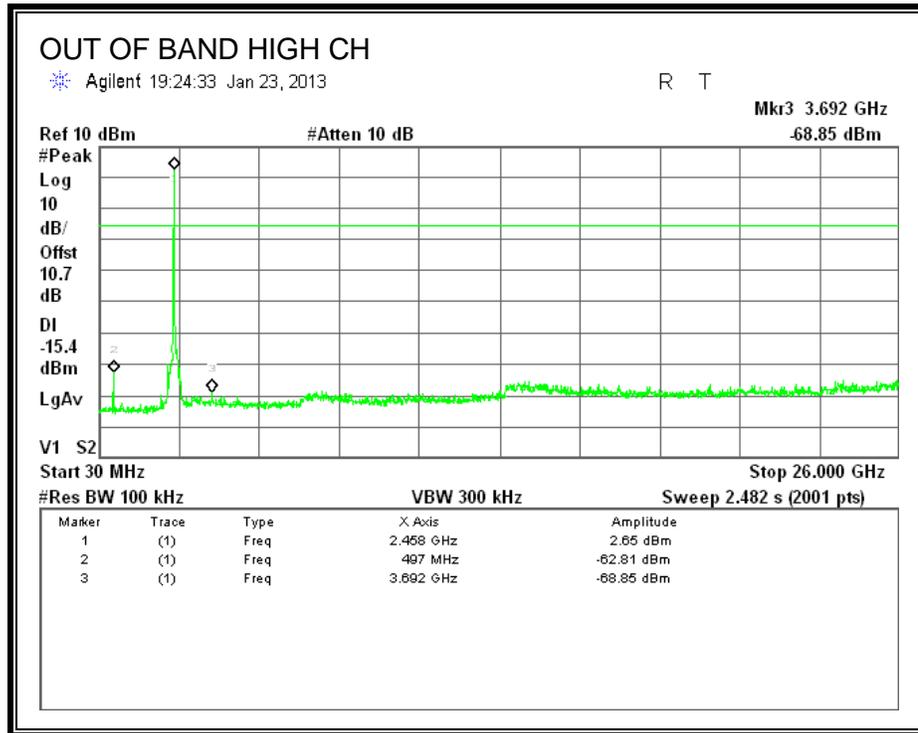


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS





8.1. 802.11n HT20 MODE IN THE 2.4 GHz BAND

8.1.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

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

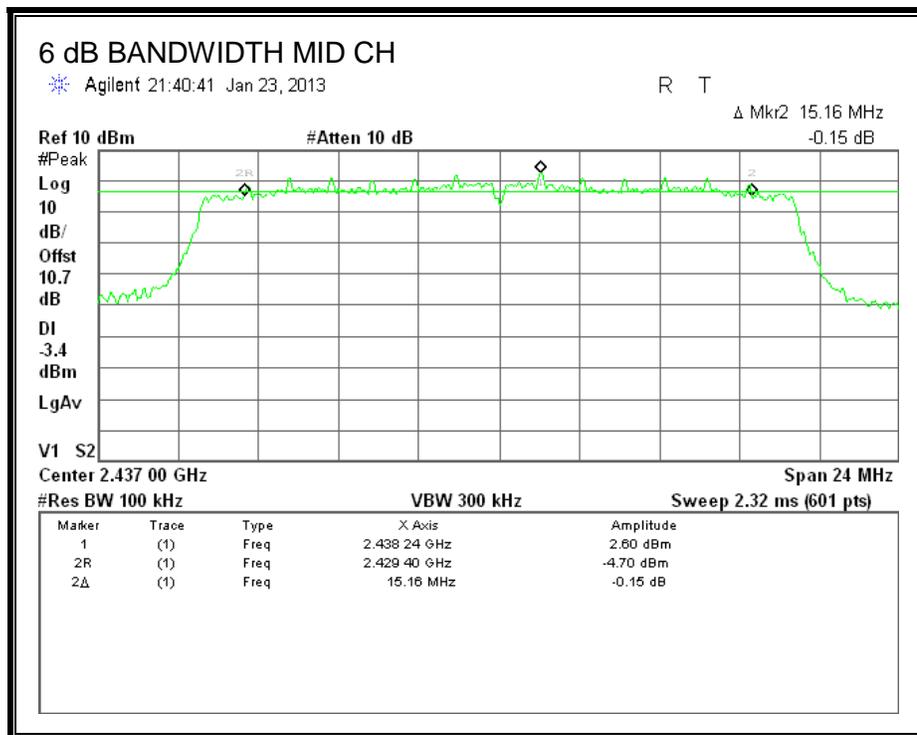
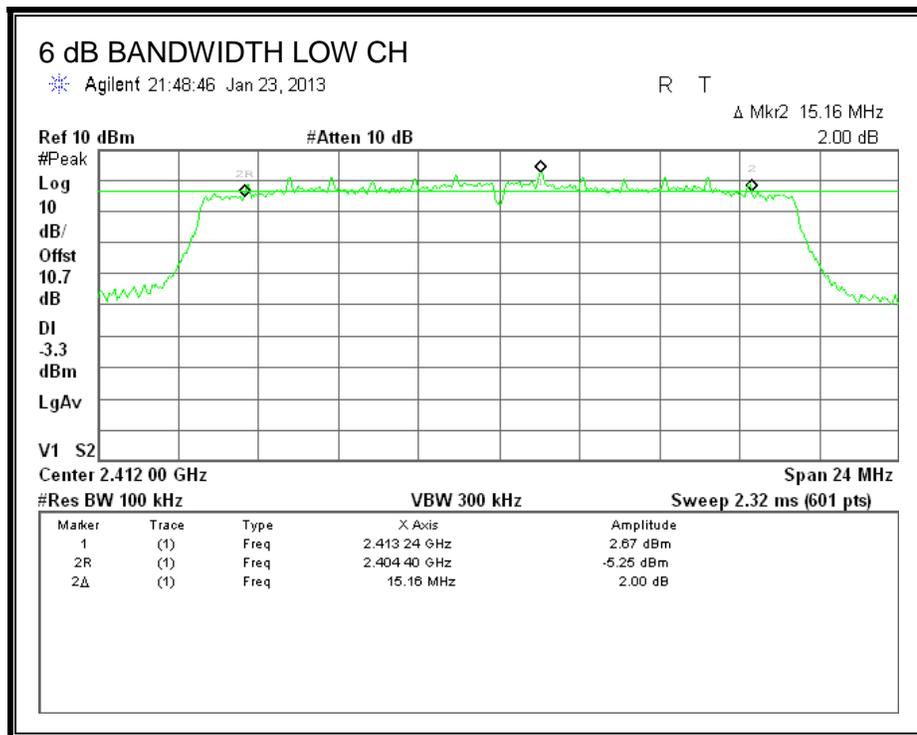
TEST PROCEDURE

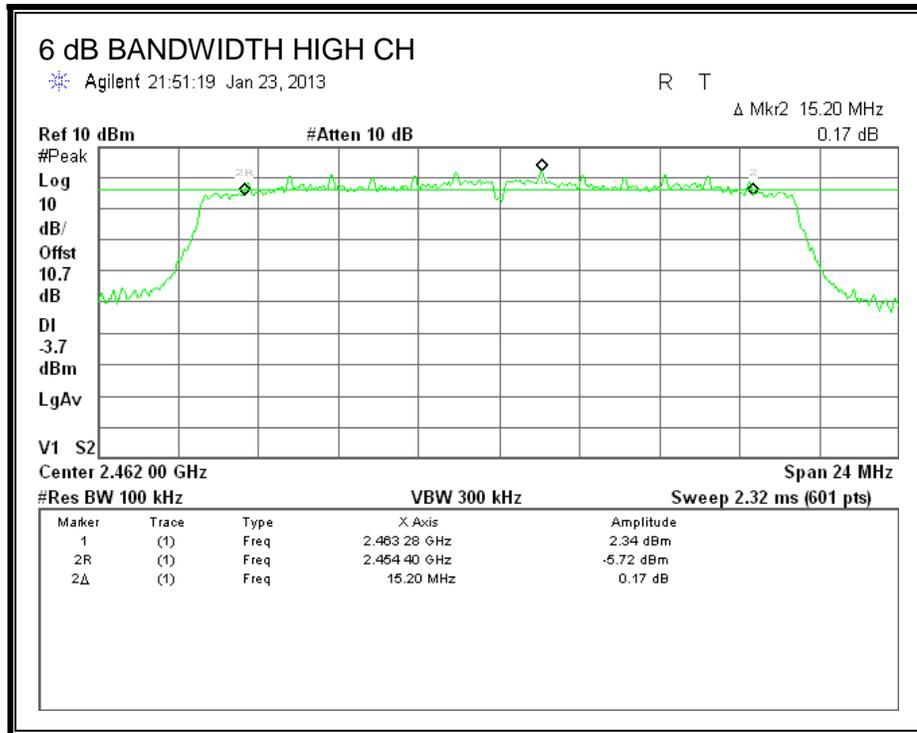
The transmitter output is connected to a spectrum analyzer with the RBW set between 1% and 5% of the EBW, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

RESULTS

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|--------------------|-------------------------|------------------------|
| Low | 2412 | 15.16 | 0.5 |
| Mid | 2437 | 15.16 | 0.5 |
| High | 2462 | 15.20 | 0.5 |

6 dB BANDWIDTH





8.1.2. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10.7dB (including 10 dB pad and .7 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

| Channel | Frequency (MHz) | Power (dBm) |
|---------|-----------------|-------------|
| Low | 2412 | 12.42 |
| Mid | 2437 | 12.32 |
| High | 2462 | 12.12 |

8.1.3. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

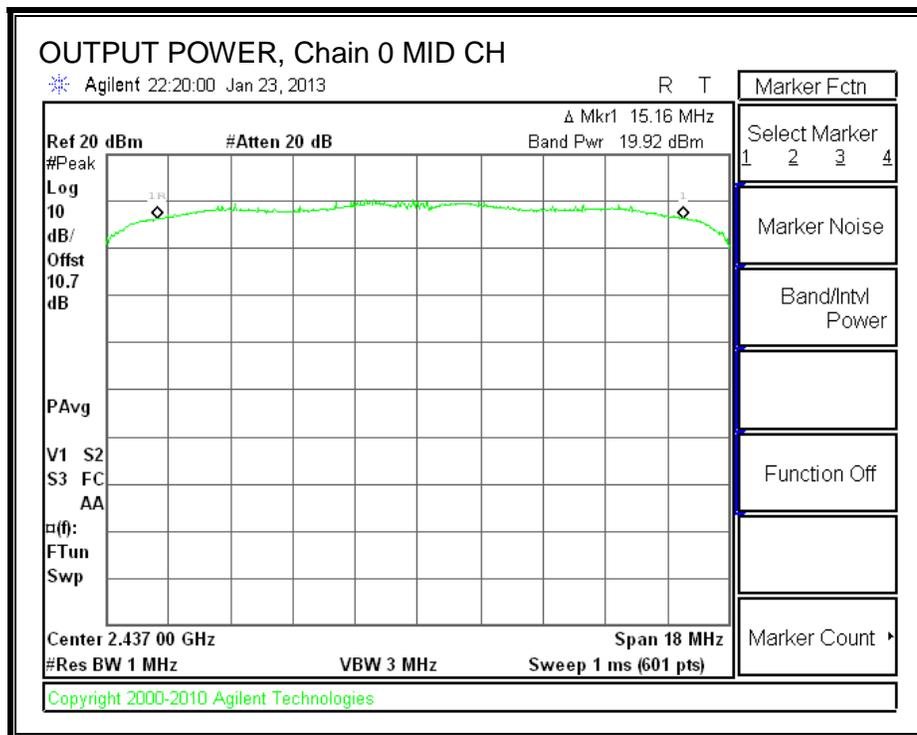
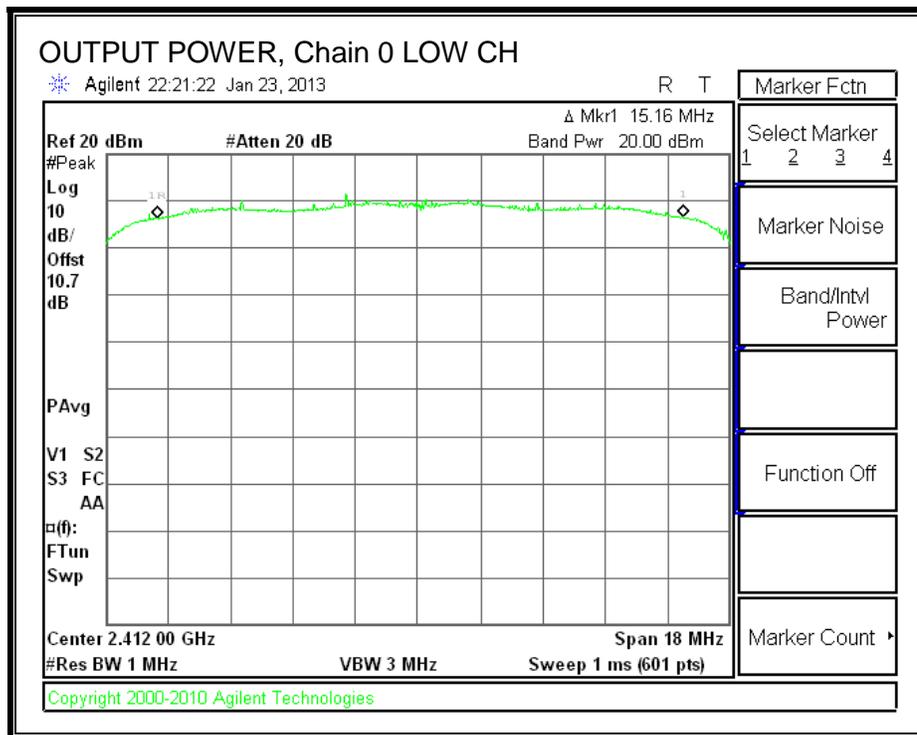
RESULTS

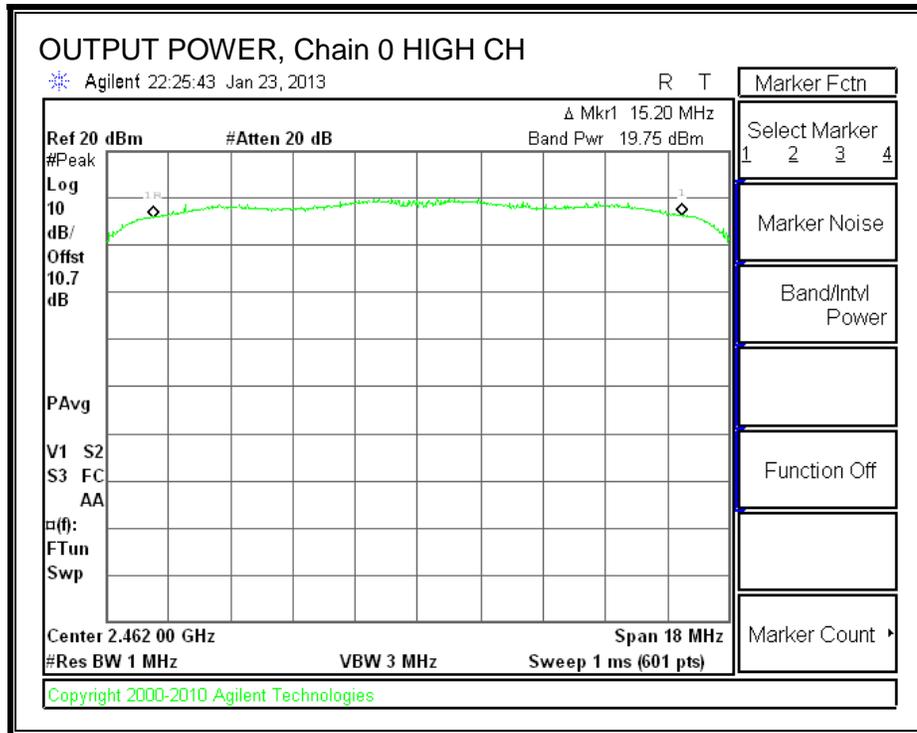
| Channel | Frequency (MHz) | Directional Gain (dBi) | FCC Power Limit (dBm) | IC Power Limit (dBm) | IC EIRP Limit (dBm) | Max Power (dBm) |
|---------|--------------------|------------------------------|--------------------------------|-------------------------------|------------------------------|-----------------------|
| Low | 2412 | -3.54 | 30.00 | 30 | 36 | 30.00 |
| Mid | 2437 | -3.54 | 30.00 | 30 | 36 | 30.00 |
| High | 2462 | -3.54 | 30.00 | 30 | 36 | 30.00 |

Results

| Channel | Frequency (MHz) | Chain 0 Meas Power (dBm) | Total Corr'd Power (dBm) | Power Limit (dBm) | Margin (dB) |
|---------|--------------------|-----------------------------------|-----------------------------------|-------------------------|----------------|
| Low | 2412 | 20.00 | 20.00 | 30.00 | -10.00 |
| Mid | 2437 | 19.92 | 19.92 | 30.00 | -10.08 |
| High | 2462 | 19.75 | 19.75 | 30.00 | -10.25 |

OUTPUT POWER, Chain 0





8.1.4. PSD

LIMITS

FCC §15.247

IC RSS-210 A8.2

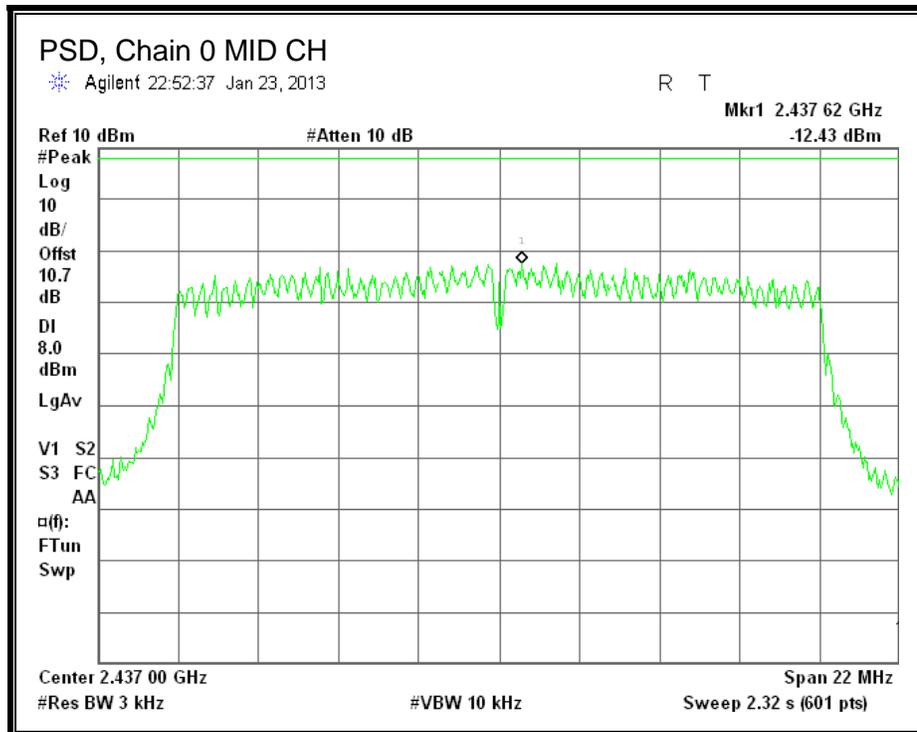
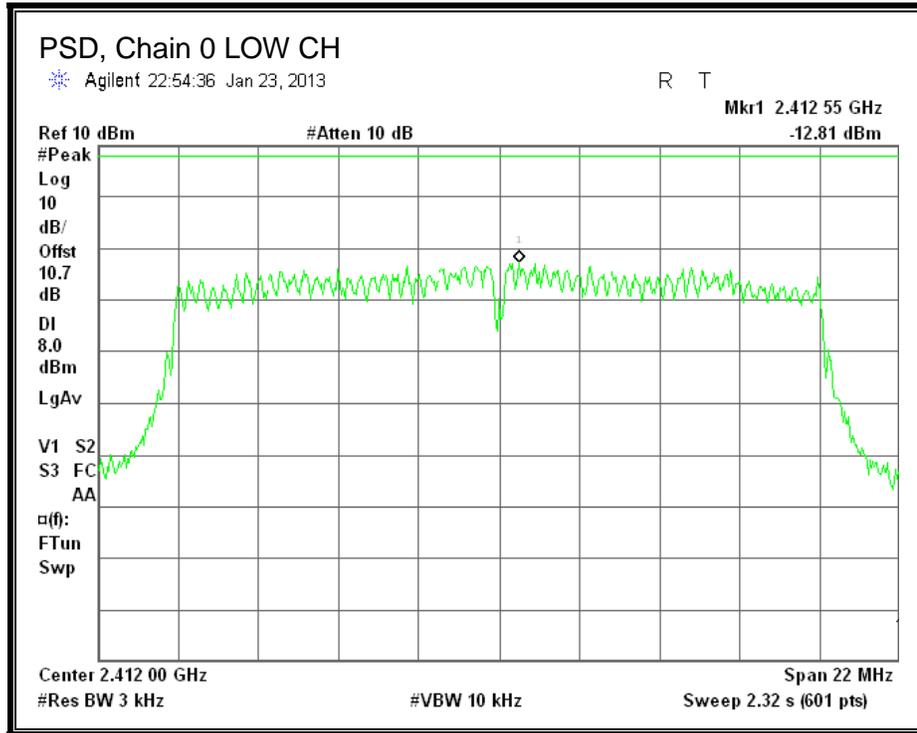
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

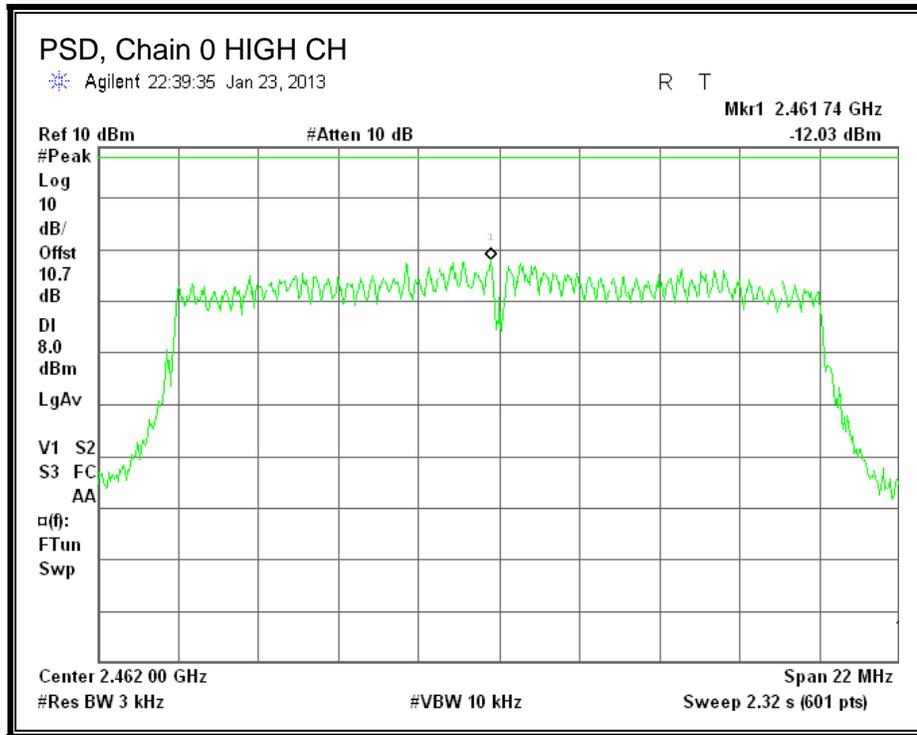
RESULTS

PSD Results

| Channel | Frequency (MHz) | Chain 0 Meas (dBm) | Limit (dBm) | Margin (dB) |
|---------|--------------------|--------------------------|----------------|----------------|
| Low | 2412 | -12.81 | 8.0 | -20.8 |
| Mid | 2437 | -12.43 | 8.0 | -20.4 |
| High | 2462 | -12.03 | 8.0 | -20.0 |

PSD, Chain 0





8.1.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

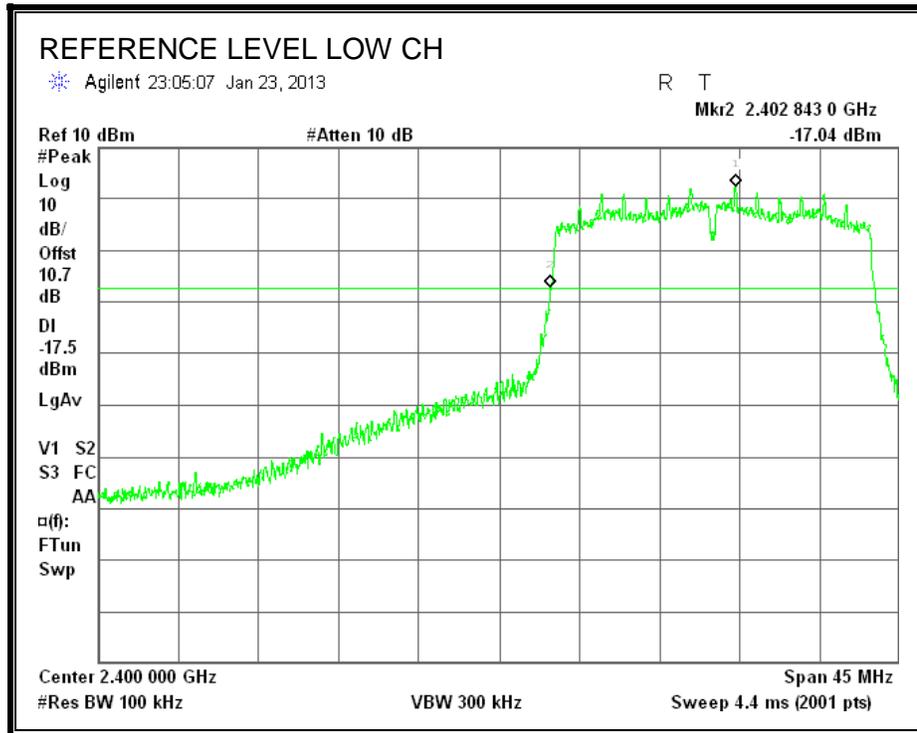
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

TEST PROCEDURE

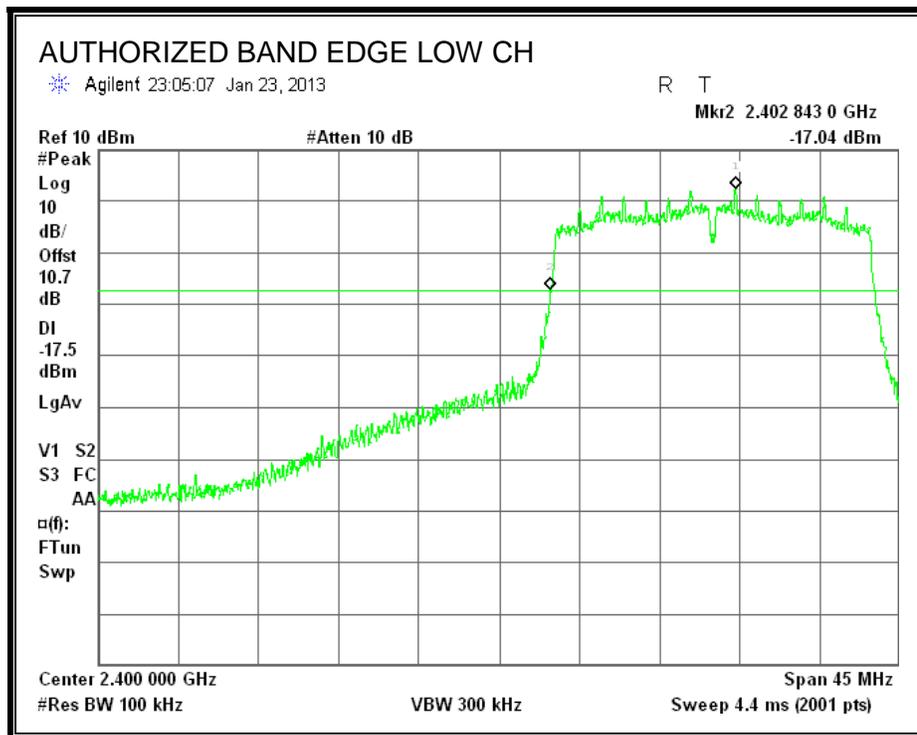
The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

RESULTS

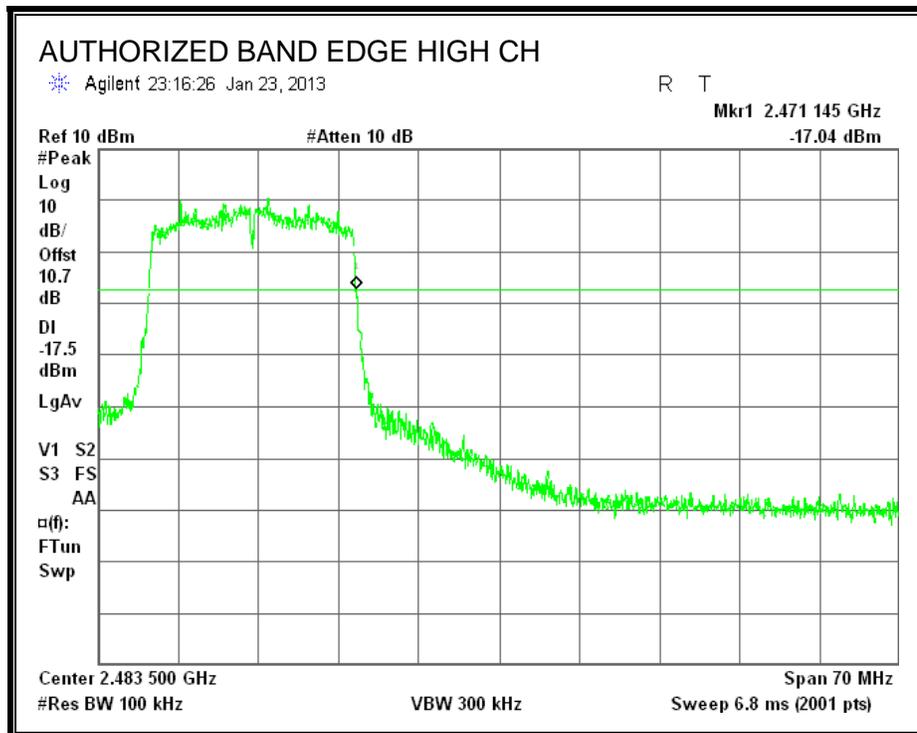
IN-BAND REFERENCE LEVEL



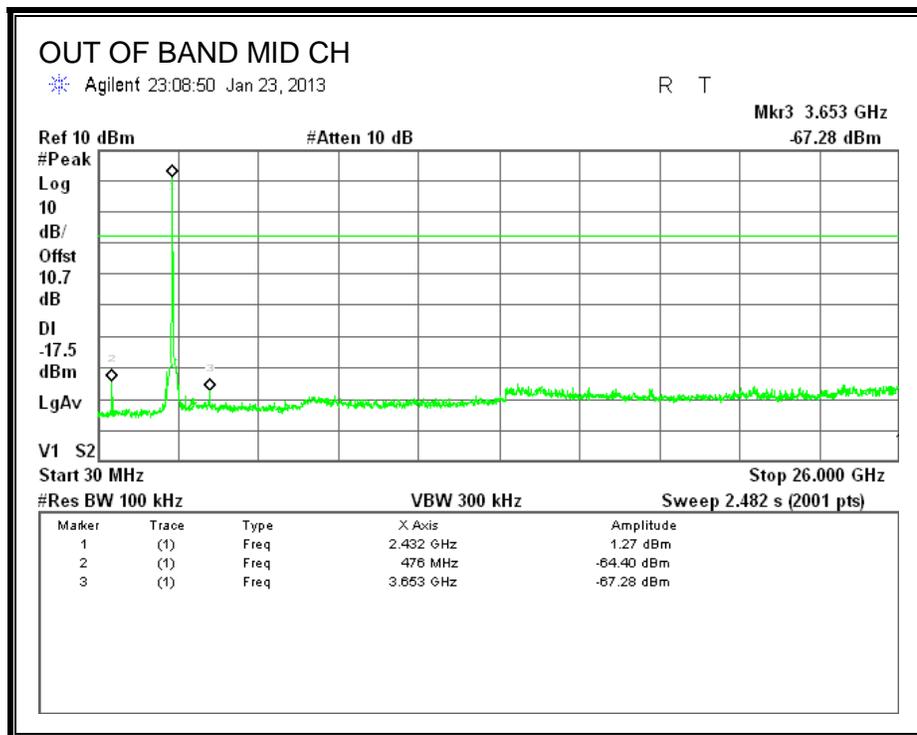
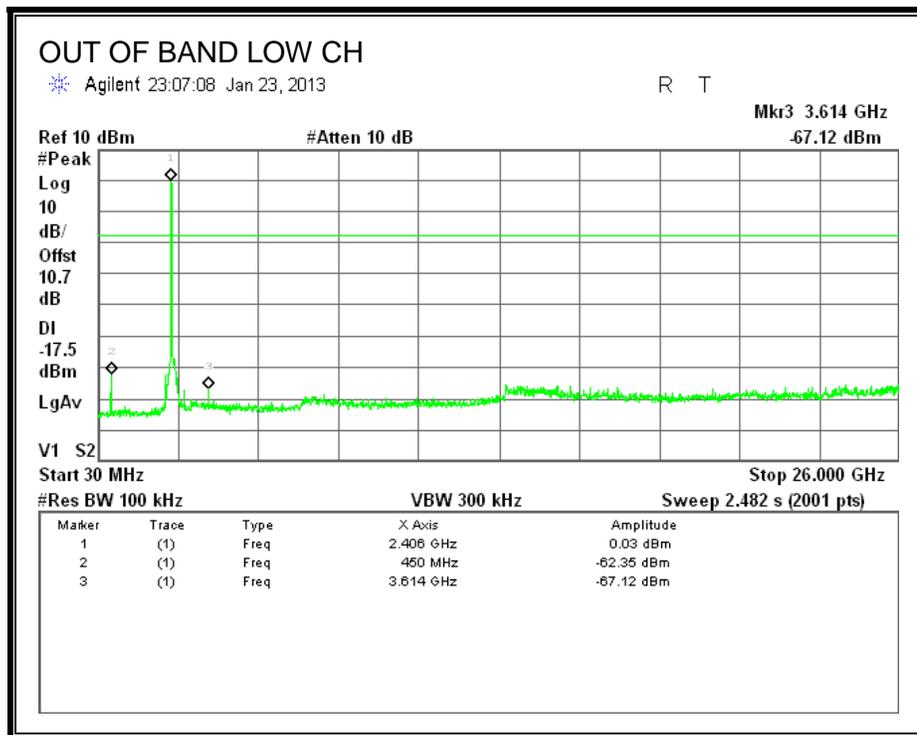
LOW CHANNEL BANDEDGE

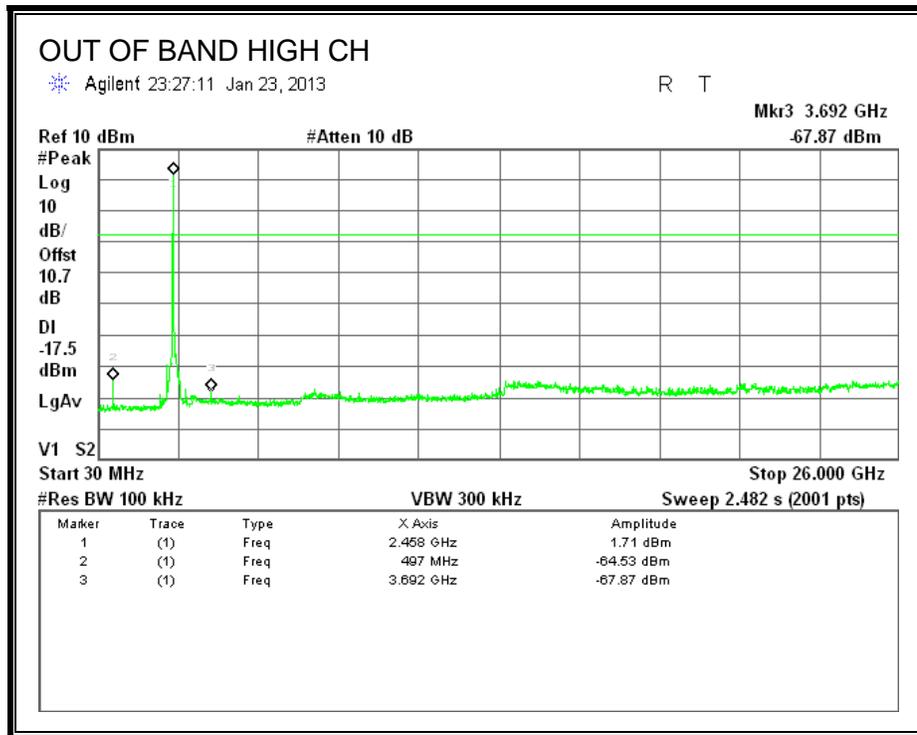


HIGH CHANNEL BANDEDGE



OUT-OF-BAND EMISSIONS





8.2. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

| Frequency Range (MHz) | Field Strength Limit (uV/m) at 3 m | Field Strength Limit (dBuV/m) at 3 m |
|-----------------------|------------------------------------|--------------------------------------|
| 30 - 88 | 100 | 40 |
| 88 - 216 | 150 | 43.5 |
| 216 - 960 | 200 | 46 |
| Above 960 | 500 | 54 |

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 1 MHz for peak measurements and as applicable for average measurements.

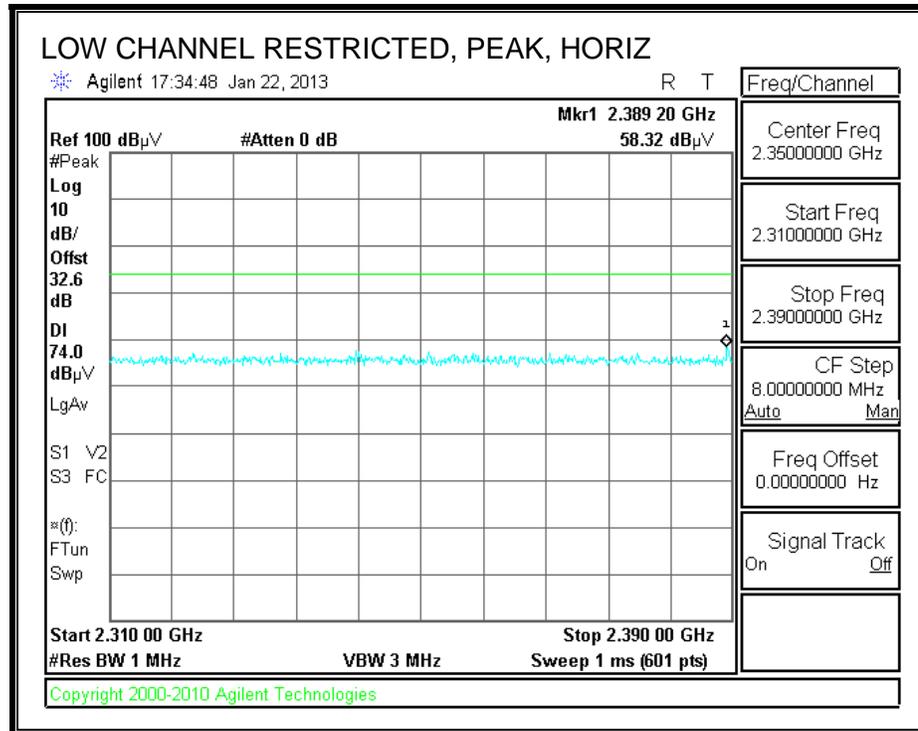
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

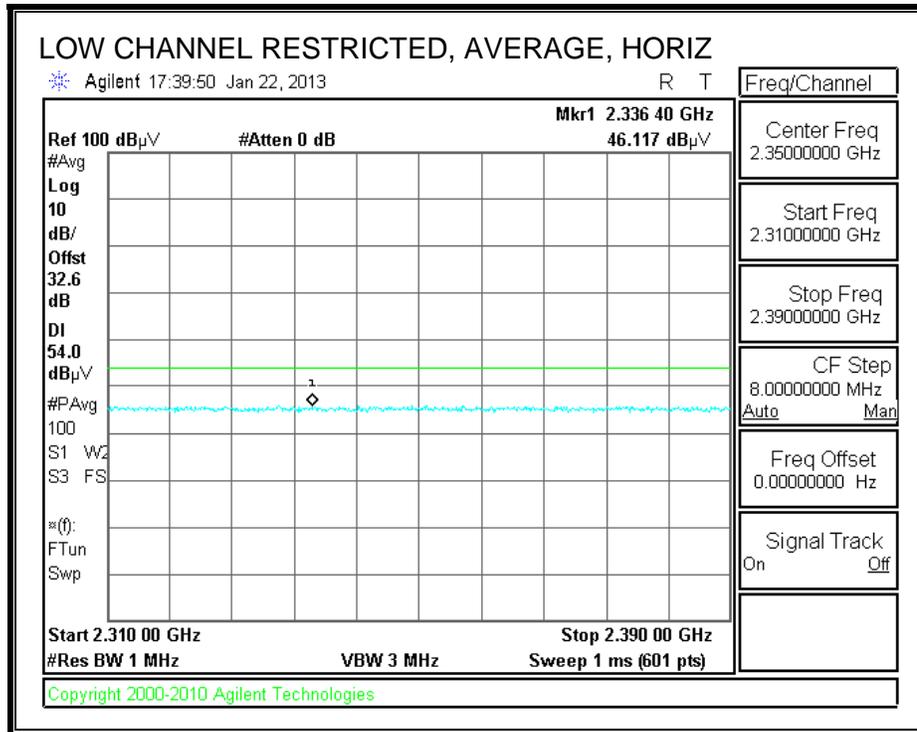
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

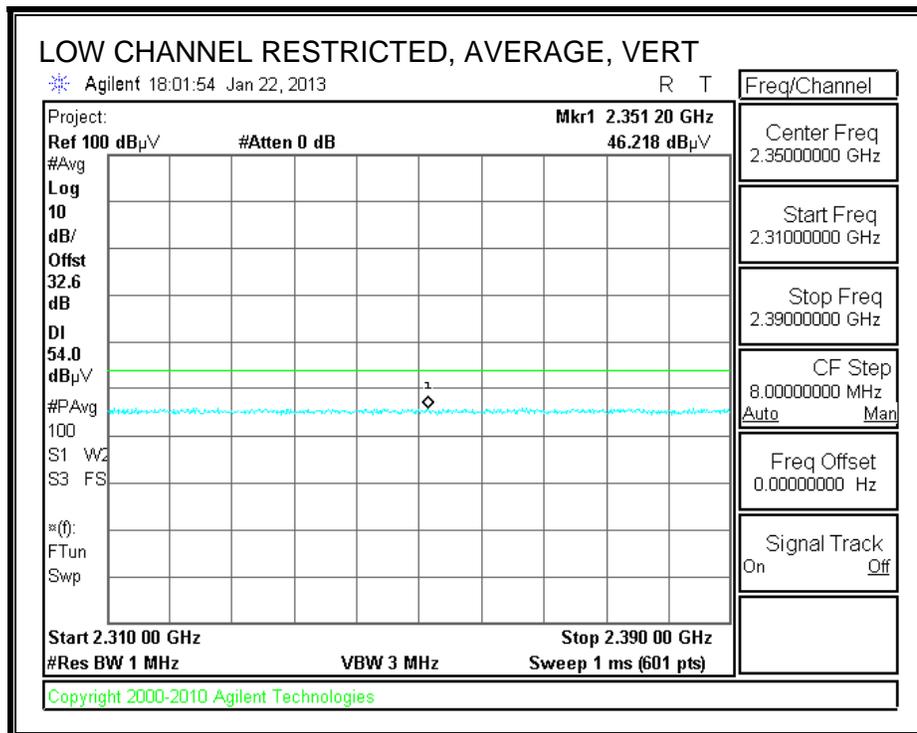
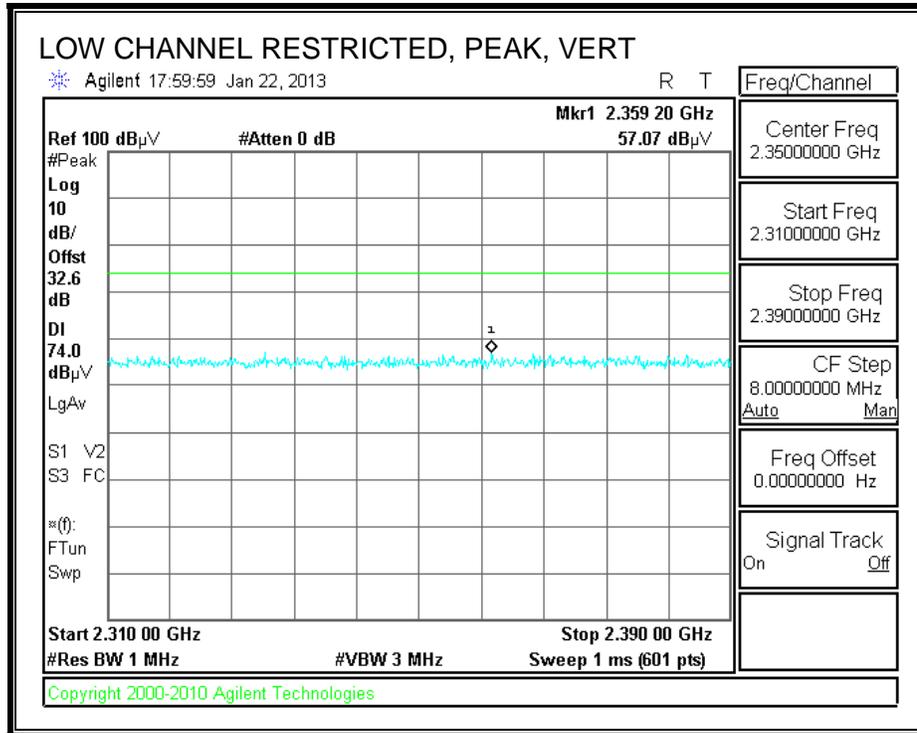
8.3. TRANSMITTER ABOVE 1 GHz

8.3.1. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND

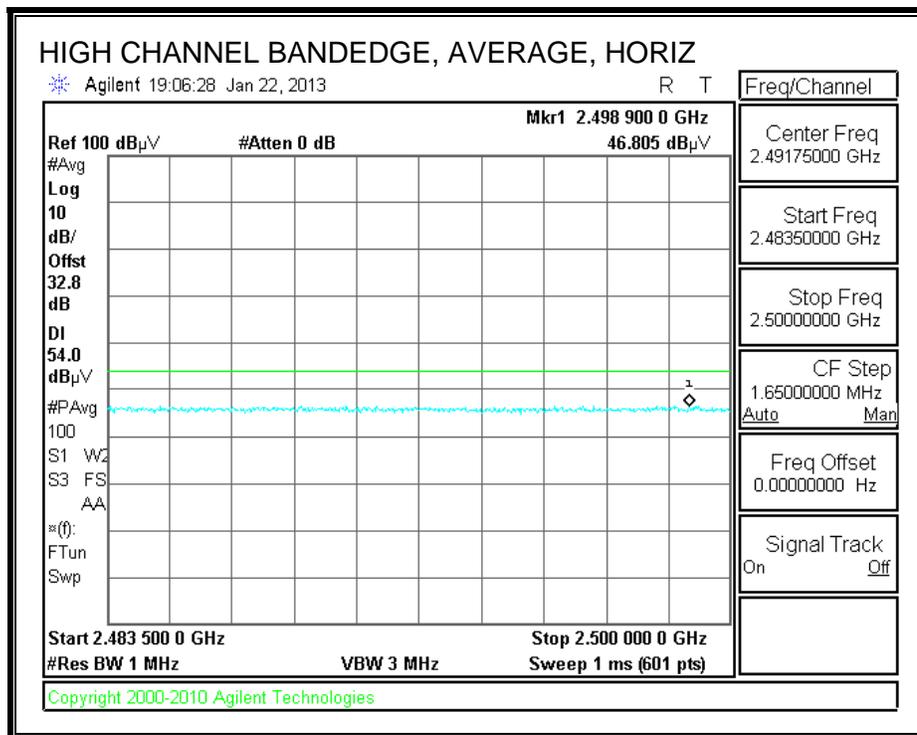
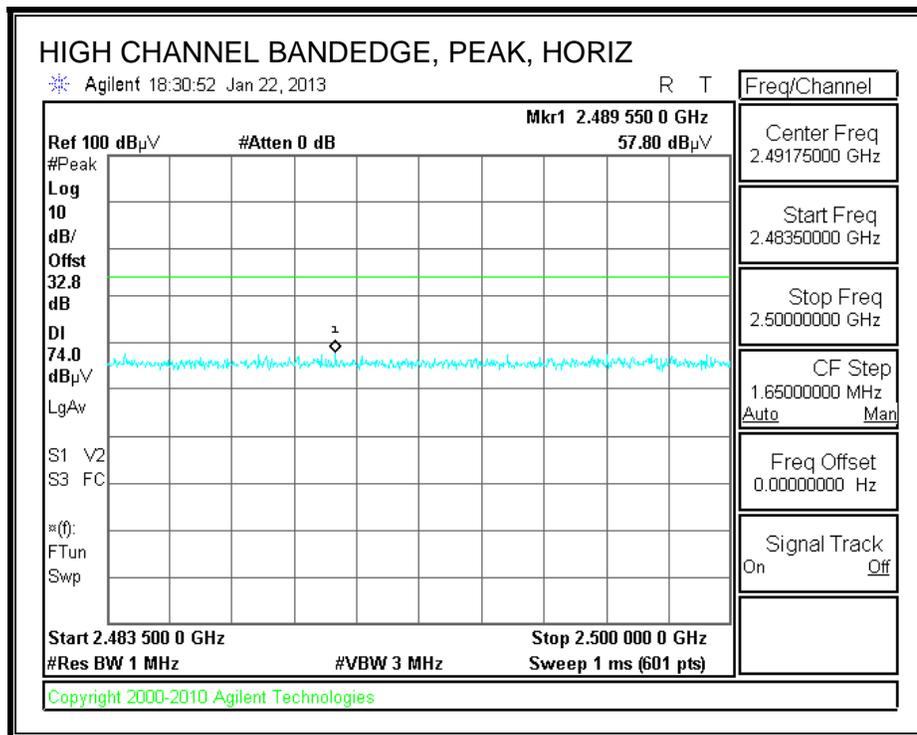
RESTRICTED BANDEDGE (LOW CHANNEL)

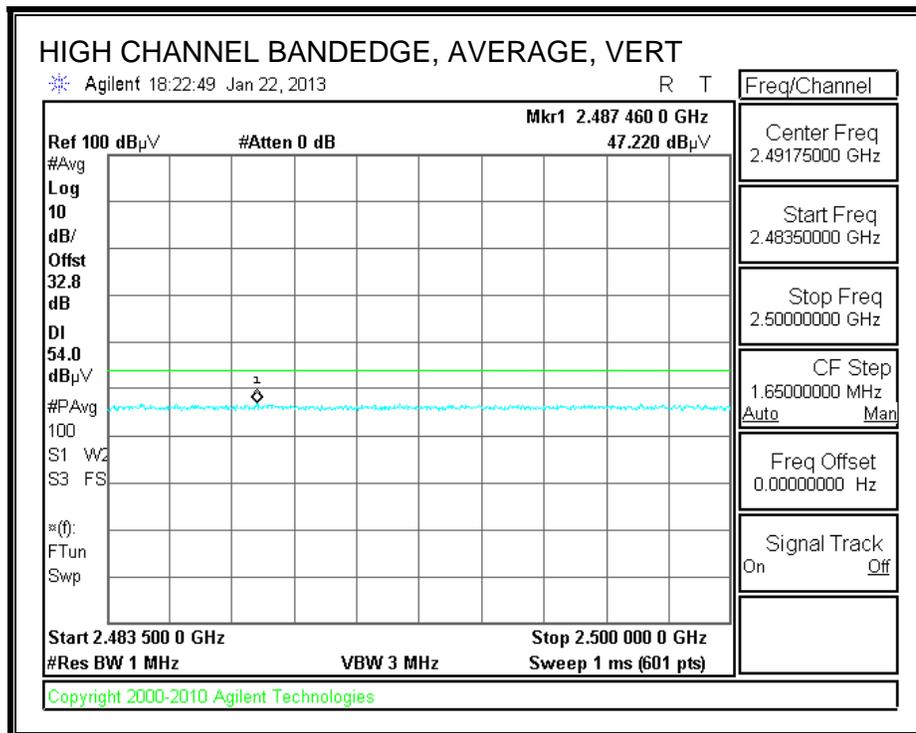
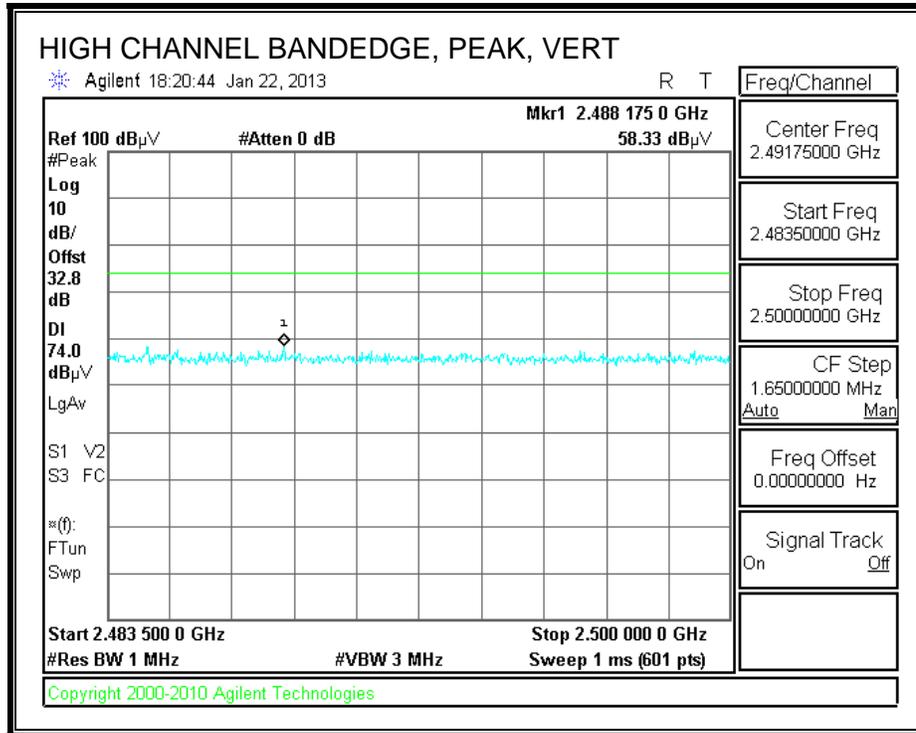






AUTHORIZED BANDEDGE (HIGH CHANNEL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
 Compliance Certification Services, Fremont 5m Chamber

Test Engr: Tom Chen
 Date: 01/23/13
 Project #: 12I14777
 Company: Samsung
 Test Target: FCC Class B
 Mode Oper: 802.11b TX mode

f Measurement Frequency Amp Preamp Gain Average Field Strength Limit
 Dist Distance to Antenna D Corr Distance Correct to 3 meters Peak Field Strength Limit
 Read Analyzer Reading Avg Average Field Strength @ 3 m Margin vs. Average Limit
 AF Antenna Factor Peak Calculated Peak Field Strength Margin vs. Peak Limit
 CL Cable Loss HPF High Pass Filter

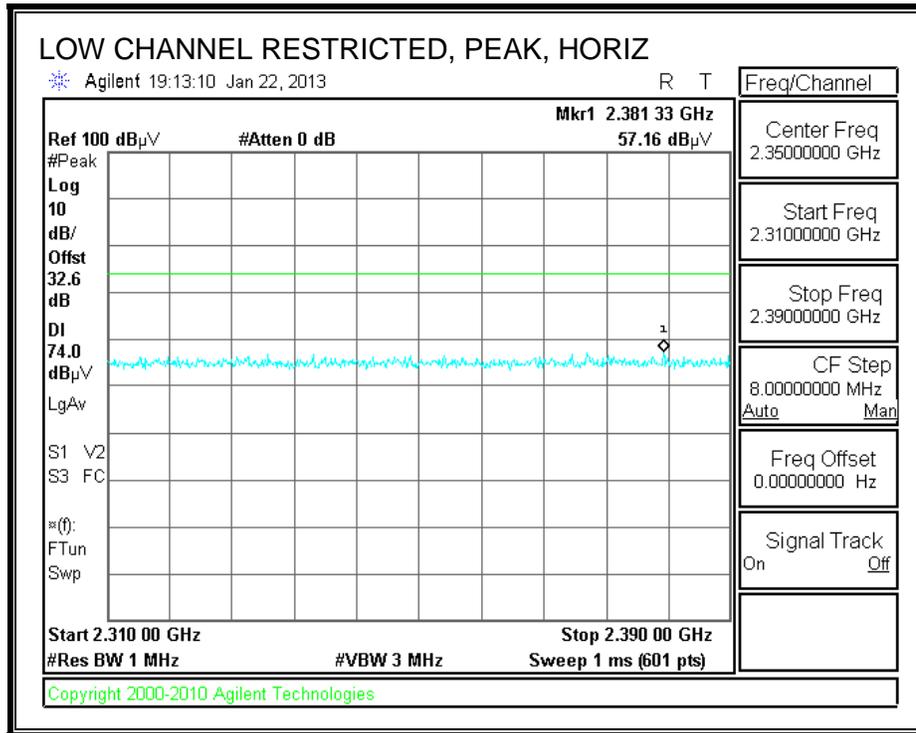
| f GHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fltr dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Notes |
|------------------------|-------------|--------------|------------|----------|-----------|--------------|------------|-----------------|-----------------|--------------|------------------|----------------|-------|
| 2412 MHz b mode | | | | | | | | | | | | | |
| 4.824 | 3.0 | 48.5 | 33.1 | 6.8 | -34.1 | 0.0 | 0.0 | 54.3 | 74.0 | -19.7 | V | P | |
| 4.824 | 3.0 | 46.2 | 33.1 | 6.8 | -34.1 | 0.0 | 0.0 | 52.0 | 54.0 | -2.0 | V | A | |
| 4.824 | 3.0 | 49.9 | 33.1 | 6.8 | -34.1 | 0.0 | 0.0 | 55.8 | 74.0 | -18.2 | H | P | |
| 4.824 | 3.0 | 47.9 | 33.1 | 6.8 | -34.1 | 0.0 | 0.0 | 53.7 | 54.0 | -0.3 | H | A | |
| 2437 MHz b mode | | | | | | | | | | | | | |
| 4.874 | 3.0 | 48.9 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 54.8 | 74.0 | -19.2 | H | P | |
| 4.874 | 3.0 | 47.8 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 53.7 | 54.0 | -0.3 | H | A | |
| 4.874 | 3.0 | 45.6 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 51.6 | 74.0 | -22.4 | V | P | |
| 4.874 | 3.0 | 42.7 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 48.7 | 54.0 | -5.3 | V | A | |
| 2462 MHz b mode | | | | | | | | | | | | | |
| 4.924 | 3.0 | 43.0 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 49.0 | 74.0 | -25.0 | V | P | |
| 4.924 | 3.0 | 39.9 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 45.9 | 54.0 | -8.1 | V | A | |
| 4.924 | 3.0 | 47.6 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 53.6 | 74.0 | -20.4 | H | P | |
| 4.924 | 3.0 | 44.6 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 50.6 | 54.0 | -3.4 | H | A | |

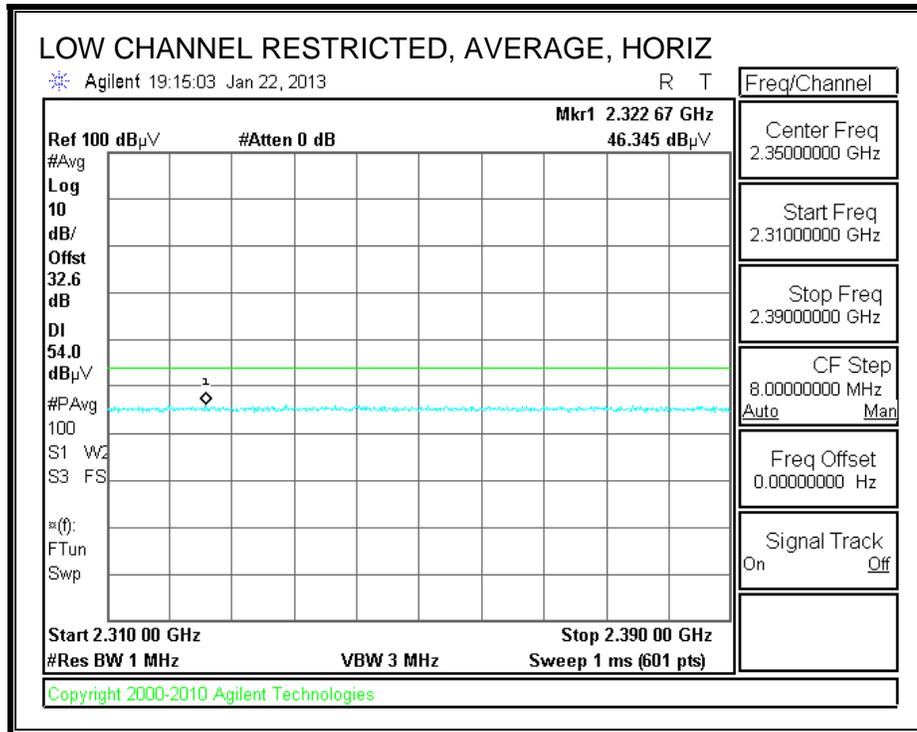
Rev. 4.1.2.7

Note: No other emissions were detected above the system noise floor.

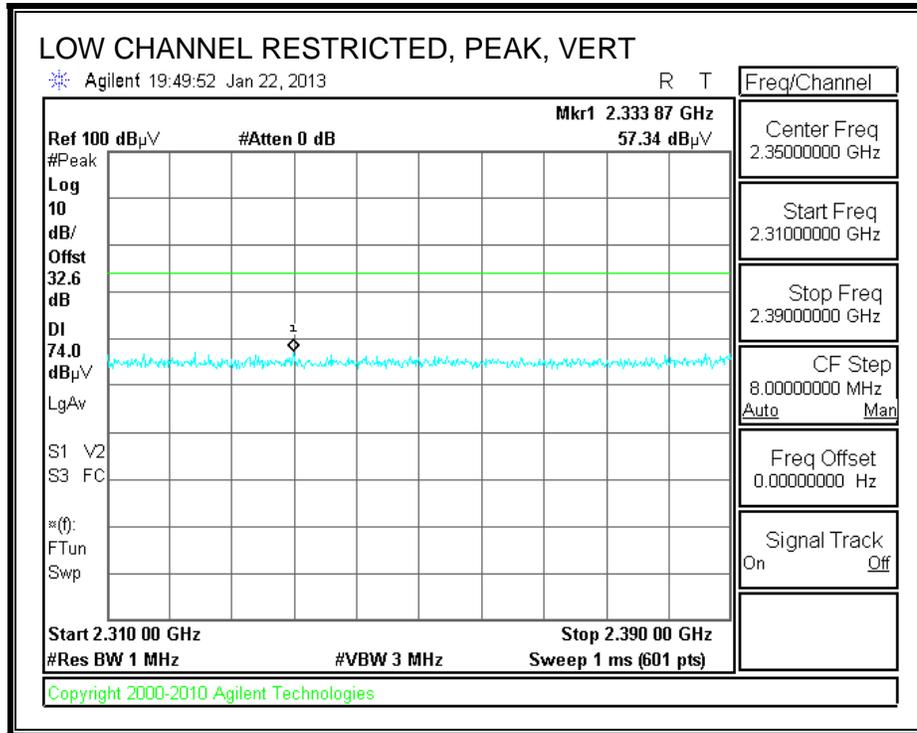
8.3.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND

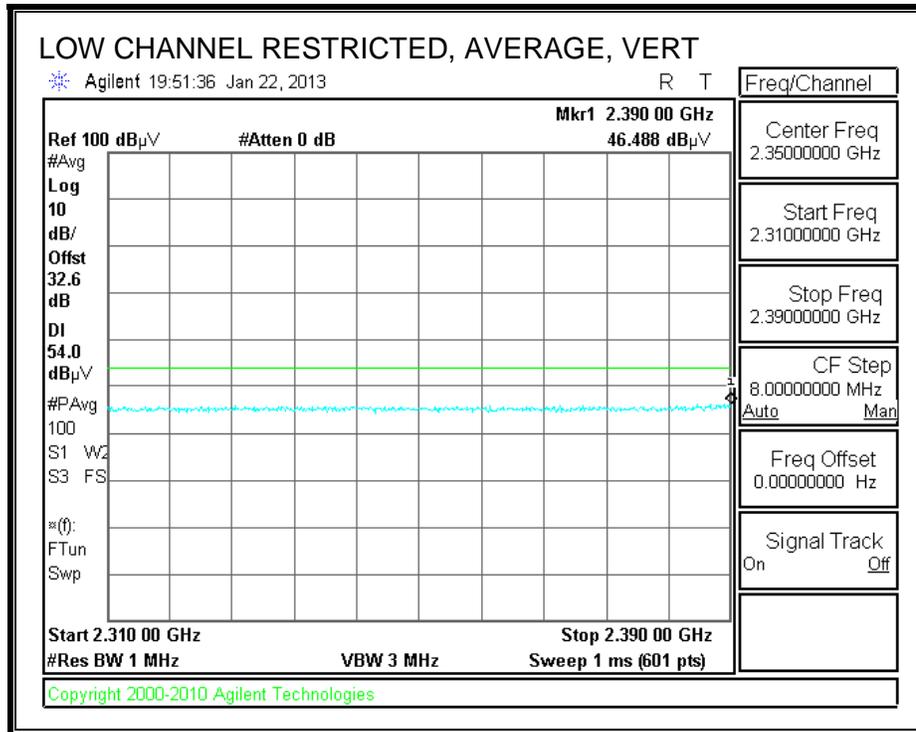
RESTRICTED BANDEDGE (LOW CHANNEL)





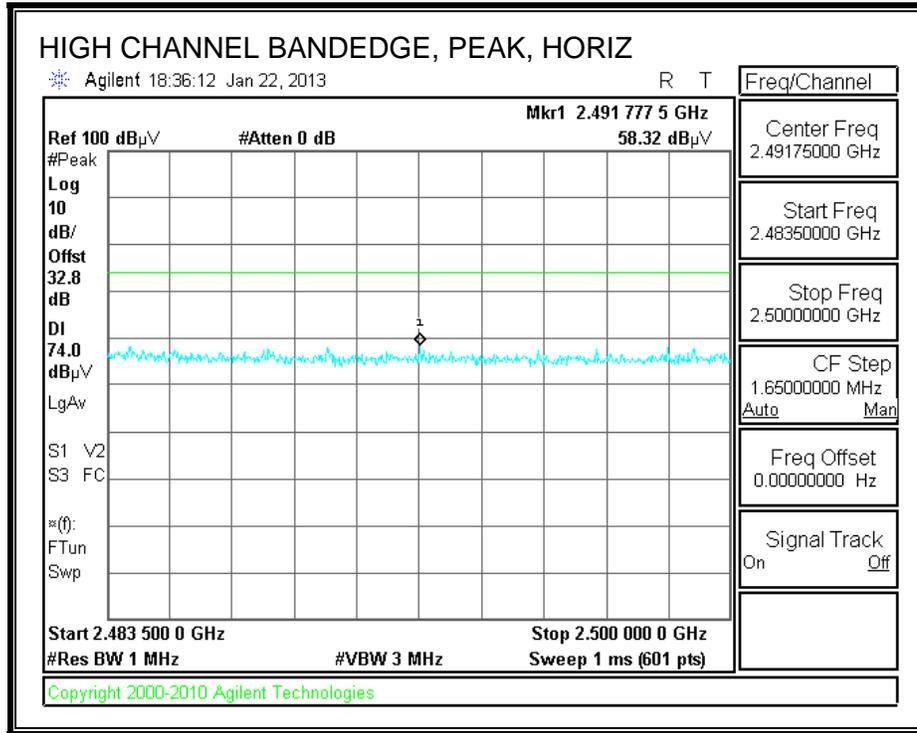
Actual Average = Measured Average + Correction Factor
 = 46.345 dB μ V + 0.3
 = 46.645 dB μ V

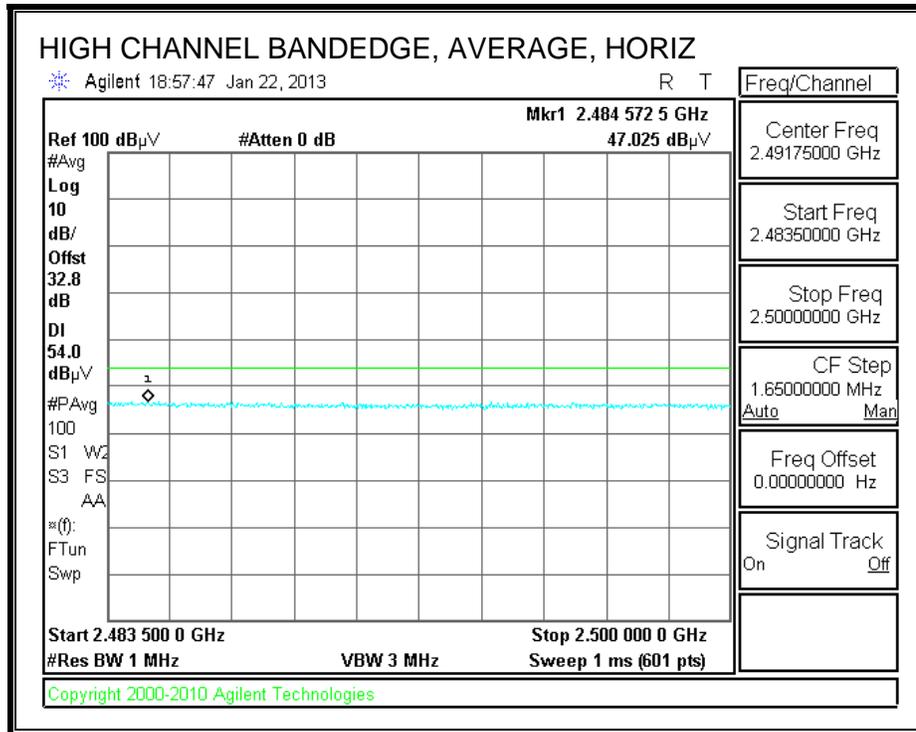




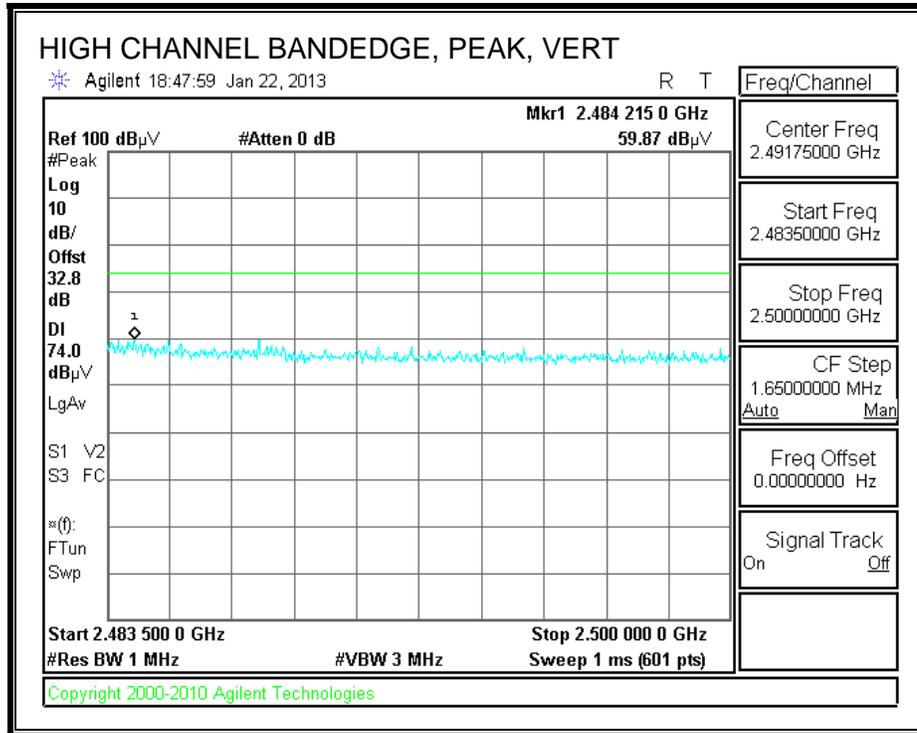
Actual Average = Measured Average + Correction Factor
 = 46.488 dB μ V + 0.3
 = 46.788 dB μ V

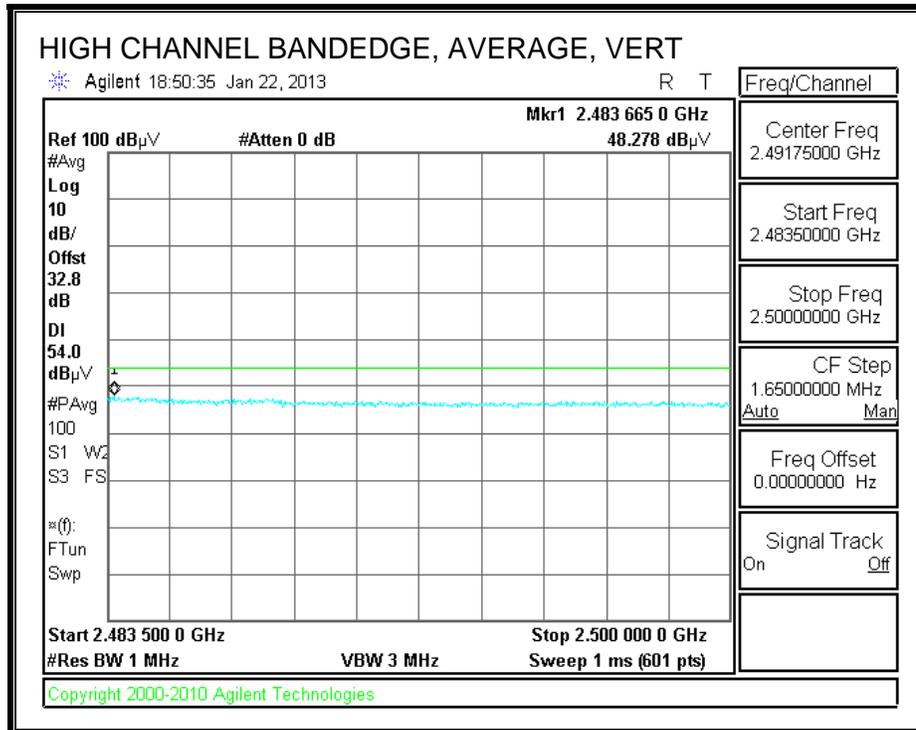
AUTHORIZED BANDEDGE (HIGH CHANNEL)





Actual Average = Measured Average + Correction Factor
 = 47.025 dBuV + 0.3
 = 47.325 dBuV





Actual Average = Measured Average + Correction Factor
 = 48.278 dBuV + 0.3
 = 48.578 dBuV

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
 Compliance Certification Services, Fremont 5m Chamber

Test Engr: Tom Chen
 Date: 01/23/13
 Project #: 12I14777
 Company: Samsung
 Test Target: FCC Class B
 Mode Oper: 802.11g TX mode

f Measurement Frequency Amp Preamp Gain Average Field Strength Limit
 Dist Distance to Antenna D Corr Distance Correct to 3 meters Peak Field Strength Limit
 Read Analyzer Reading Avg Average Field Strength @ 3 m Margin vs. Average Limit
 AF Antenna Factor Peak Calculated Peak Field Strength Margin vs. Peak Limit
 CL Cable Loss HPF High Pass Filter

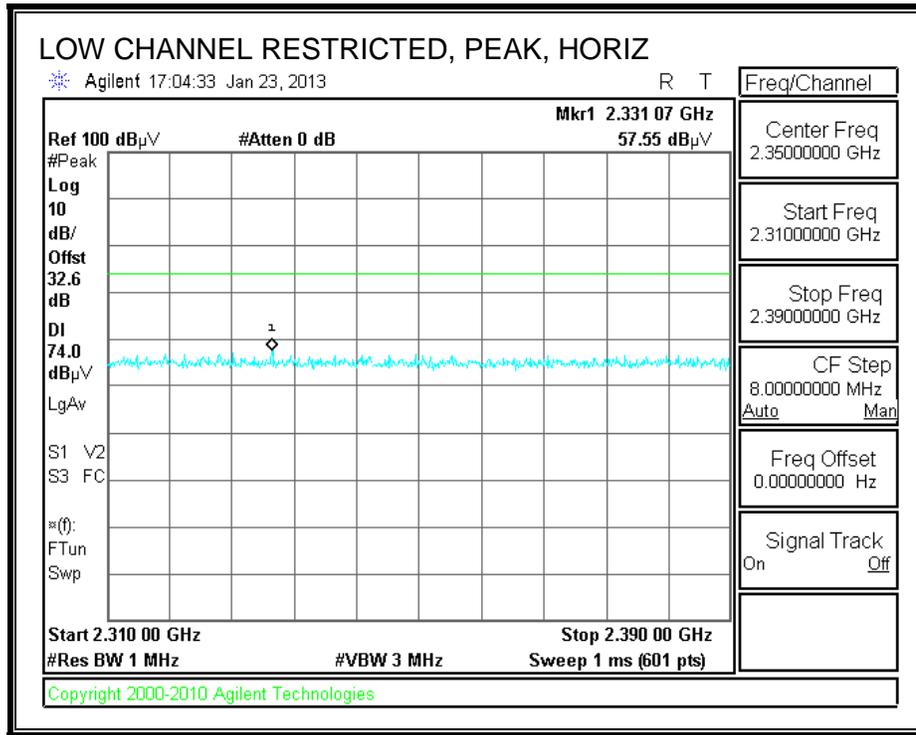
| f GHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fltr dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Notes |
|------------------------|----------|-----------|---------|-------|--------|-----------|---------|--------------|--------------|-----------|---------------|-------------|-------|
| 2412 MHz g mode | | | | | | | | | | | | | |
| 4.824 | 3.0 | 44.6 | 33.1 | 6.8 | -34.1 | 0.0 | 0.0 | 50.4 | 74.0 | -23.6 | V | P | |
| 4.824 | 3.0 | 29.7 | 33.1 | 6.8 | -34.1 | 0.0 | 0.0 | 35.6 | 54.0 | -18.4 | V | A | |
| 4.824 | 3.0 | 45.7 | 33.1 | 6.8 | -34.1 | 0.0 | 0.0 | 51.6 | 74.0 | -22.4 | H | P | |
| 4.824 | 3.0 | 31.9 | 33.1 | 6.8 | -34.1 | 0.0 | 0.0 | 37.7 | 54.0 | -16.3 | H | A | |
| 2437 MHz g mode | | | | | | | | | | | | | |
| 4.874 | 3.0 | 44.3 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 50.3 | 74.0 | -23.7 | H | P | |
| 4.874 | 3.0 | 32.6 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 38.5 | 54.0 | -15.5 | H | A | |
| 4.874 | 3.0 | 41.1 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 47.0 | 74.0 | -27.0 | V | P | |
| 4.874 | 3.0 | 30.5 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 36.4 | 54.0 | -17.6 | V | A | |
| 2462 MHz g mode | | | | | | | | | | | | | |
| 4.924 | 3.0 | 44.6 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 50.6 | 74.0 | -23.4 | H | P | |
| 4.924 | 3.0 | 32.8 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 38.8 | 54.0 | -15.2 | H | A | |
| 4.924 | 3.0 | 41.2 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 47.2 | 74.0 | -26.8 | V | P | |
| 4.924 | 3.0 | 30.4 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 36.5 | 54.0 | -17.5 | V | A | |

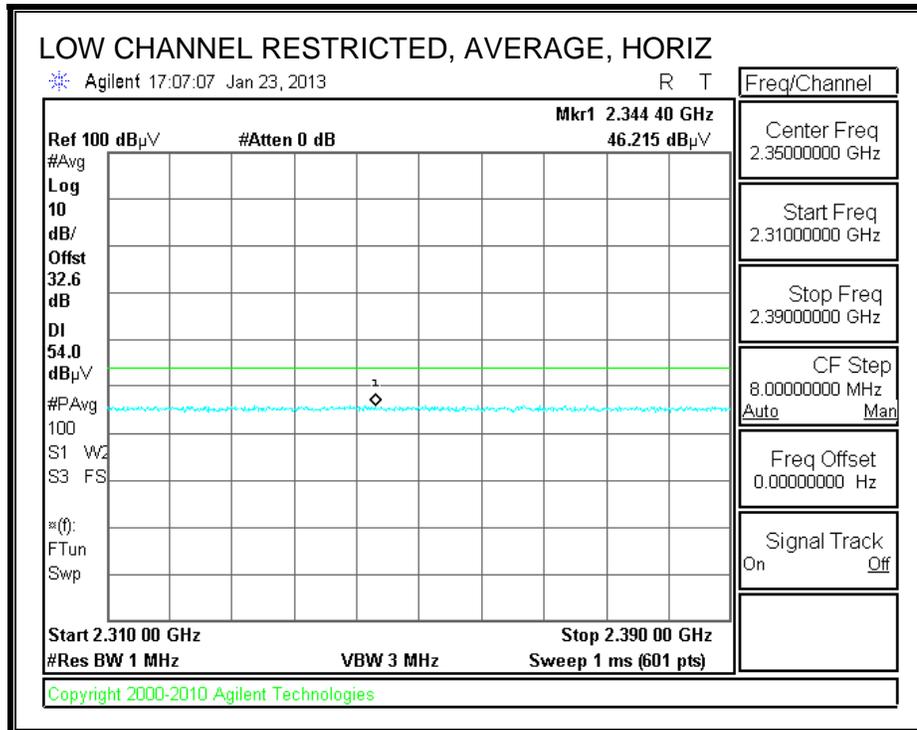
Rev. 4.1.2.7

Note: No other emissions were detected above the system noise floor.

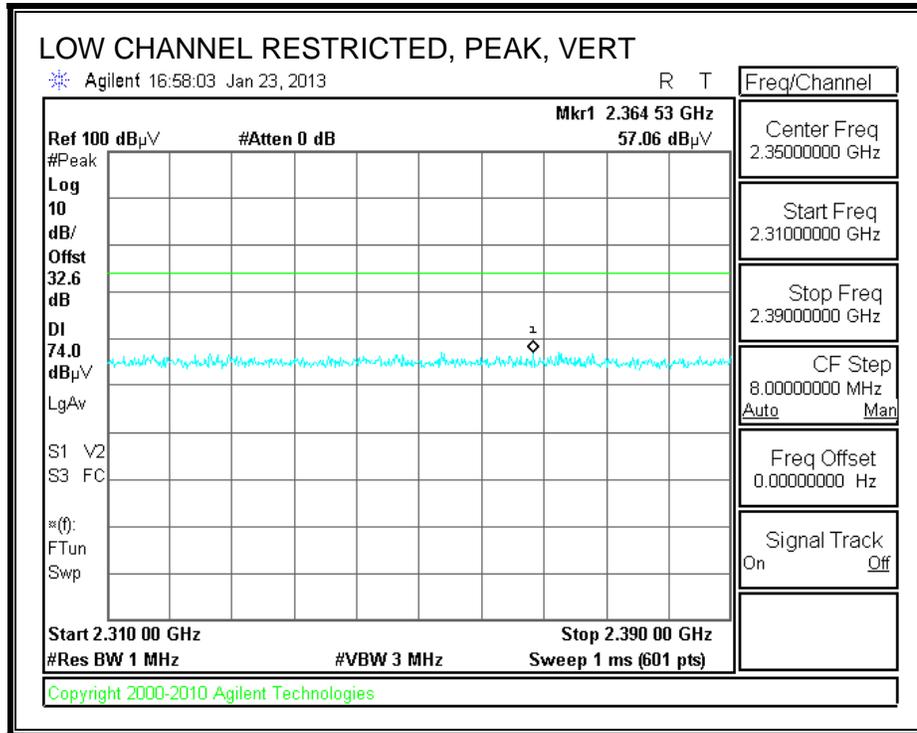
8.3.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND

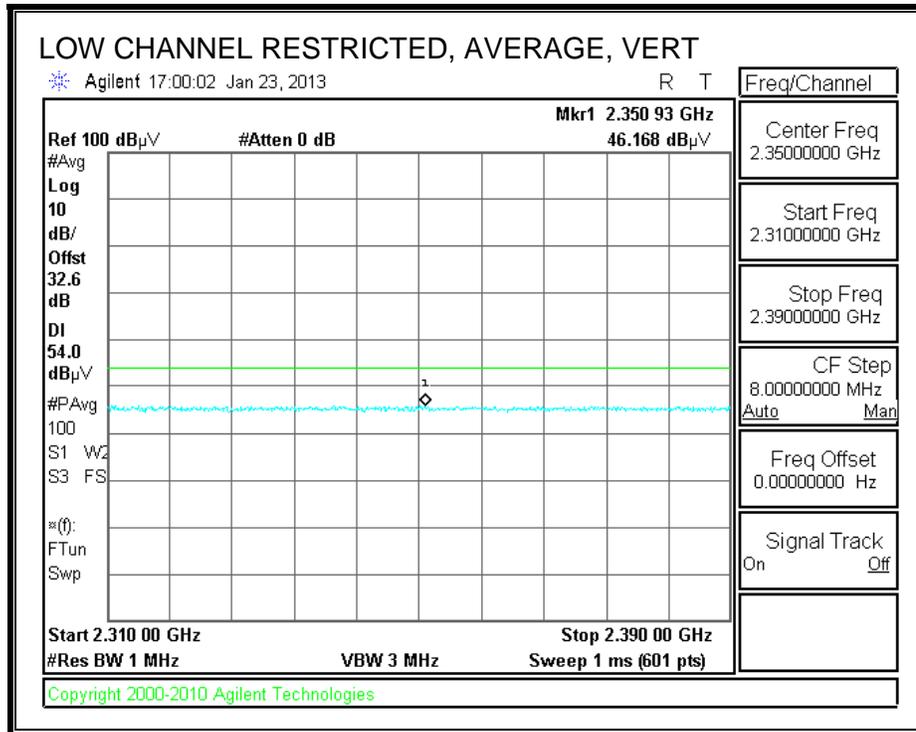
RESTRICTED BANDEDGE (LOW CHANNEL)





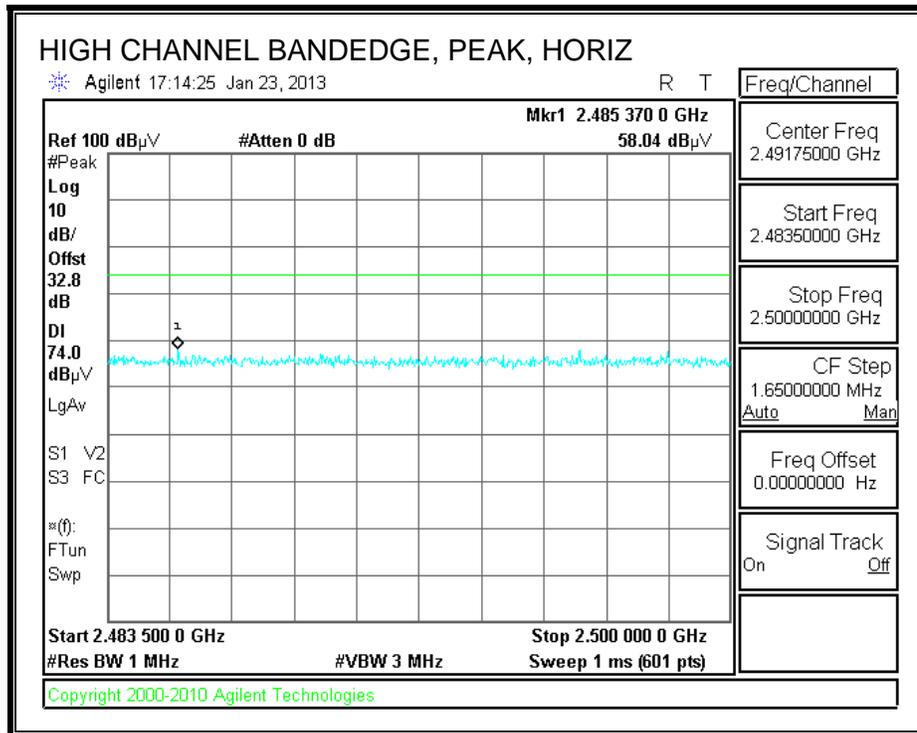
Actual Average = Measured Average + Correction Factor
 = 46.215 dBuV + 0.32
 = 46.535 dBuV

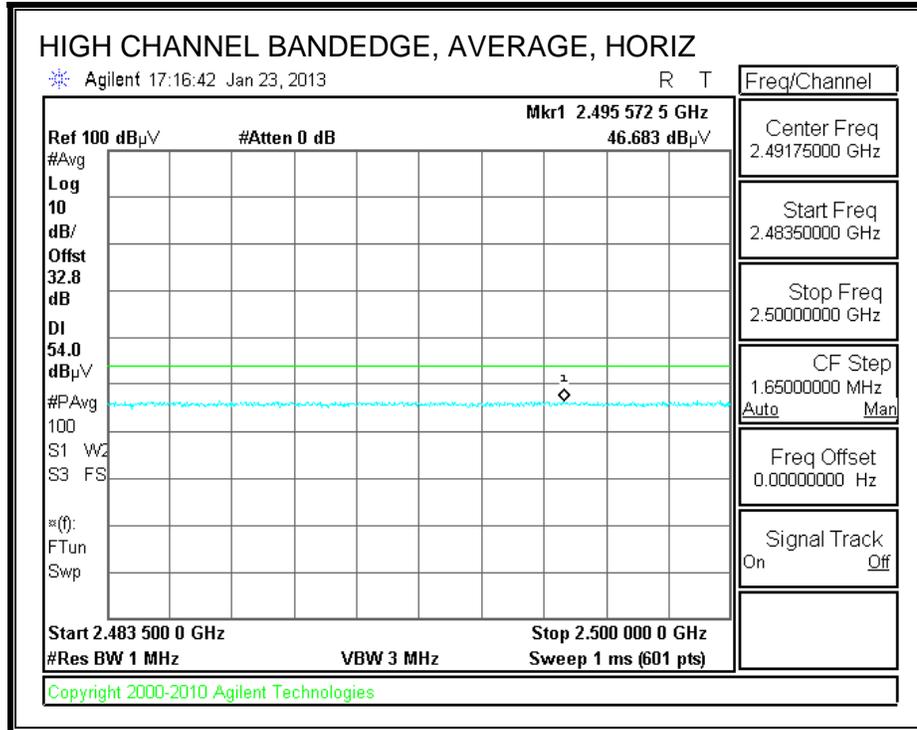




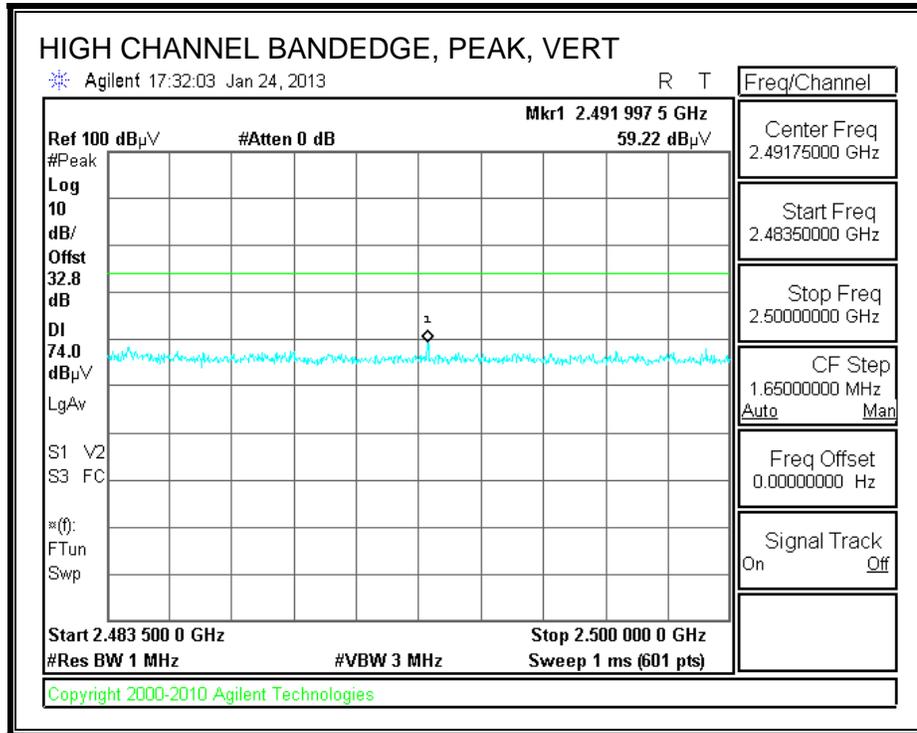
$$\begin{aligned}
 \text{Actual Average} &= \text{Measured Average} + \text{Correction Factor} \\
 &= 46.168 \text{ dB}\mu\text{V} + 0.32 \\
 &= 46.488 \text{ dB}\mu\text{V}
 \end{aligned}$$

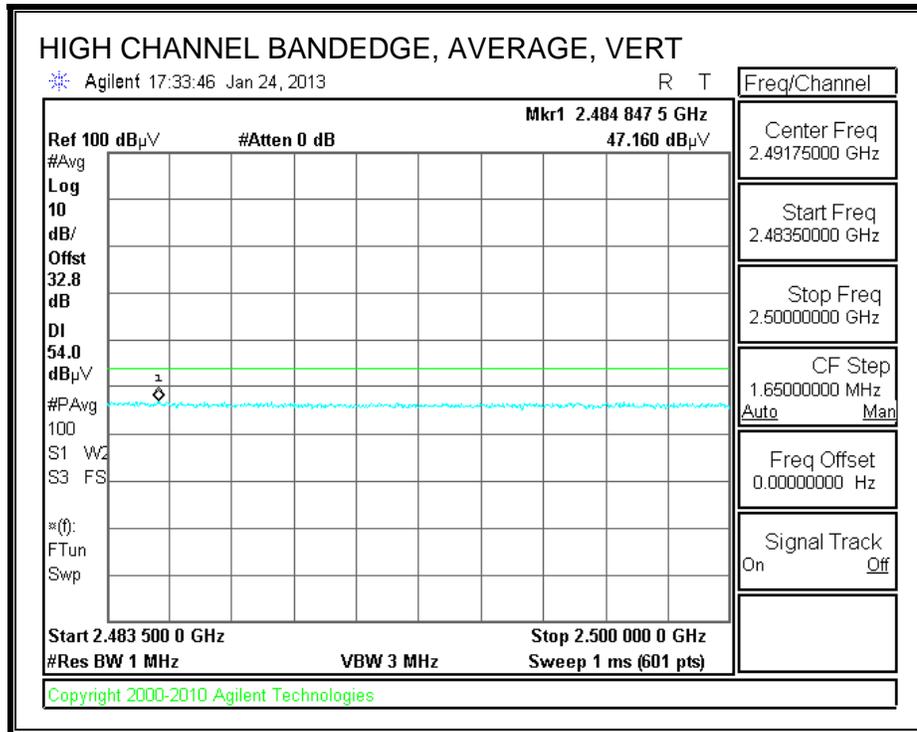
AUTHORIZED BANDEDGE (HIGH CHANNEL)





Actual Average = Measured Average + Correction Factor
 = 46.683 dBuV + 0.32
 = 47.003 dBuV





Actual Average = Measured Average + Correction Factor
 = 47.160 dBuV + 0.32
 = 47.480 dBuV

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
 Compliance Certification Services, Fremont 5m Chamber

Test Engr: Tom Chen
 Date: 01/23/13
 Project #: 12I14777
 Company: Samsung
 Test Target: FCC Class B
 Mode Oper: 802.11n TX mode

f Measurement Frequency Amp Preamp Gain Average Field Strength Limit
 Dist Distance to Antenna D Corr Distance Correct to 3 meters Peak Field Strength Limit
 Read Analyzer Reading Avg Average Field Strength @ 3 m Margin vs. Average Limit
 AF Antenna Factor Peak Calculated Peak Field Strength Margin vs. Peak Limit
 CL Cable Loss HPF High Pass Filter

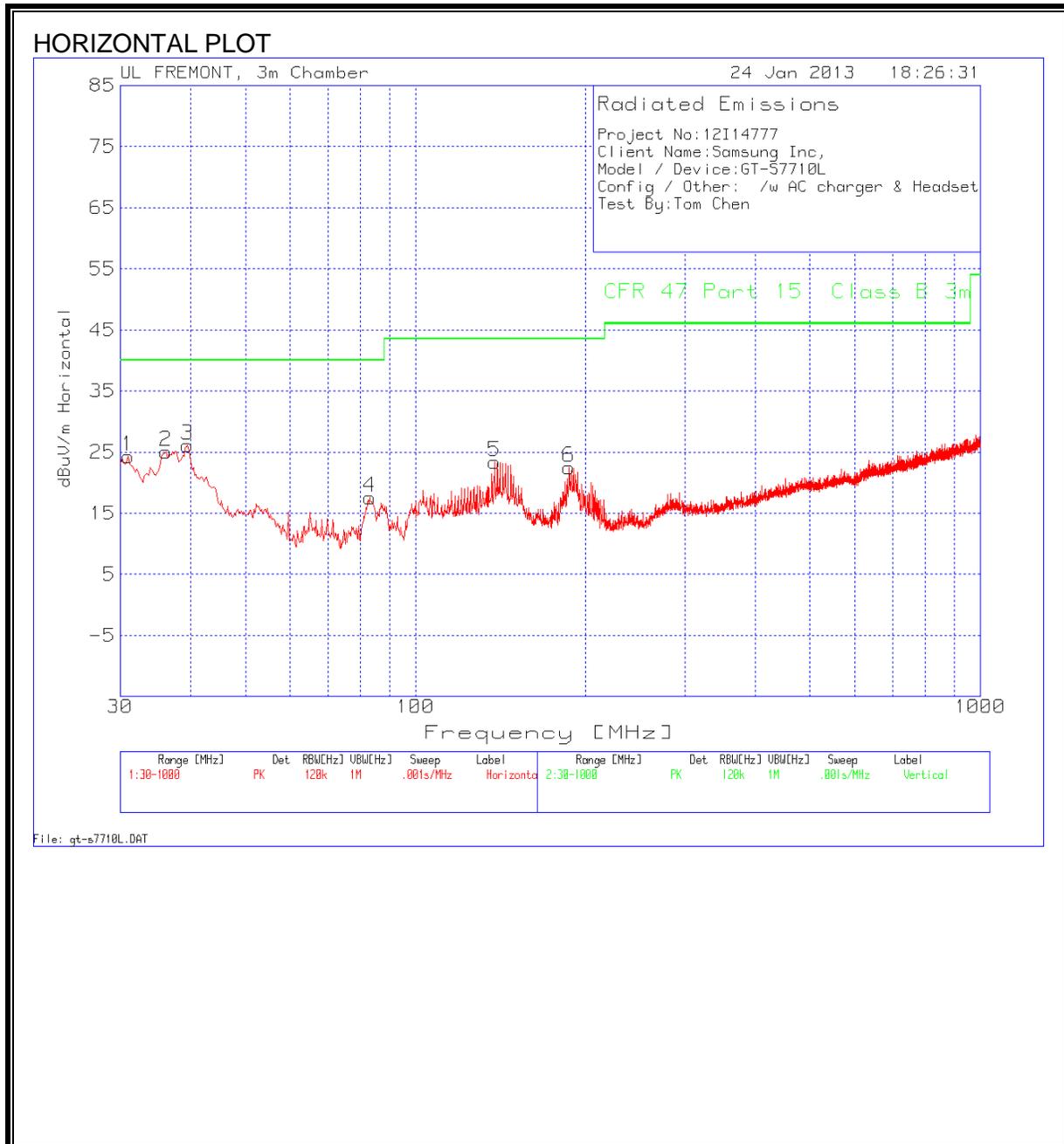
| f GHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fltr dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Notes |
|---------------------------|----------|-----------|---------|-------|--------|-----------|---------|--------------|--------------|-----------|---------------|-------------|-------|
| 2412 MHz HT20 MCS0 | | | | | | | | | | | | | |
| 4.824 | 3.0 | 45.9 | 33.1 | 6.8 | -34.1 | 0.0 | 0.0 | 51.8 | 74.0 | -22.2 | H | P | |
| 4.824 | 3.0 | 33.7 | 33.1 | 6.8 | -34.1 | 0.0 | 0.0 | 39.6 | 54.0 | -14.4 | H | A | |
| 4.824 | 3.0 | 43.1 | 33.1 | 6.8 | -34.1 | 0.0 | 0.0 | 48.9 | 74.0 | -25.1 | V | P | |
| 4.824 | 3.0 | 34.2 | 33.1 | 6.8 | -34.1 | 0.0 | 0.0 | 40.1 | 54.0 | -13.9 | V | A | |
| 2437 MHz HT20 MCS0 | | | | | | | | | | | | | |
| 4.874 | 3.0 | 41.9 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 47.9 | 74.0 | -26.1 | V | P | |
| 4.874 | 3.0 | 30.7 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 36.6 | 54.0 | -17.4 | V | A | |
| 4.874 | 3.0 | 45.8 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 51.7 | 74.0 | -22.3 | H | P | |
| 4.874 | 3.0 | 29.6 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 35.5 | 54.0 | -18.5 | H | A | |
| 2462 MHz HT20 MCS0 | | | | | | | | | | | | | |
| 4.924 | 3.0 | 42.9 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 48.9 | 74.0 | -25.1 | H | P | |
| 4.924 | 3.0 | 31.1 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 37.1 | 54.0 | -16.9 | H | A | |
| 4.924 | 3.0 | 39.4 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 45.4 | 74.0 | -28.6 | V | P | |
| 4.924 | 3.0 | 29.7 | 33.2 | 6.8 | -34.0 | 0.0 | 0.0 | 35.7 | 54.0 | -18.3 | V | A | |

Rev. 4.1.2.7

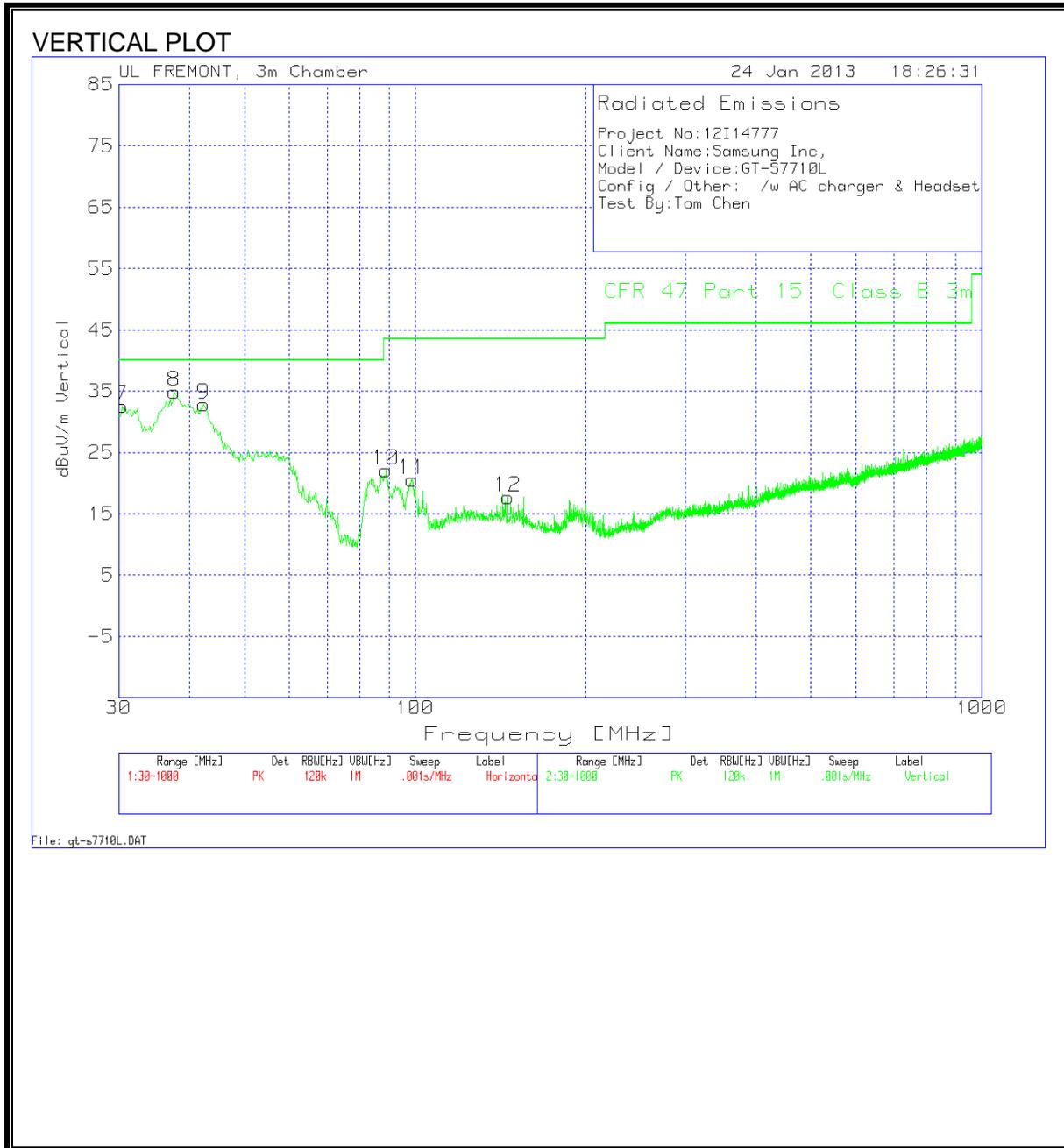
Note: No other emissions were detected above the system noise floor.

8.4. WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)



SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)



HORIZONTAL AND VERTICAL DATA

Project No:12I14777
 Client Name:Samsung Inc,
 Model / Device:GT-S7710L
 Config / Other: /w AC charger & Headset
 Test By:Tom Chen

Horizontal 30 - 1000MHz

| Marker No. | Test Frequency | Meter Reading | Detector | 25MHz-1GHz Chambr 3m Amplified (dB) | Antenna T185 (dB) | dBuV/m | CFR 47 Part 15 Class B 3m | Margin | Polarity |
|------------|----------------|---------------|----------|-------------------------------------|-------------------|--------|---------------------------|--------|----------|
| 1 | 30.9692 | 31.31 | PK | -27.5 | 20.5 | 24.31 | 40 | -15.69 | Horz |
| 2 | 36.203 | 35.82 | PK | -27.4 | 16.6 | 25.02 | 40 | -14.98 | Horz |
| 3 | 39.4984 | 39.3 | PK | -27.4 | 14.2 | 26.1 | 40 | -13.9 | Horz |
| 4 | 82.9197 | 37.06 | PK | -27 | 7.5 | 17.56 | 40 | -22.44 | Horz |
| 5 | 137.9716 | 36.56 | PK | -26.5 | 13.3 | 23.36 | 43.5 | -20.14 | Horz |
| 6 | 187.2082 | 37.45 | PK | -25.9 | 10.9 | 22.45 | 43.5 | -21.05 | Horz |

Vertical 30 - 1000MHz

| Marker No. | Test Frequency | Meter Reading | Detector | 25MHz-1GHz Chambr 3m Amplified (dB) | Antenna T185 (dB) | dBuV/m | CFR 47 Part 15 Class B 3m | Margin | Polarity |
|------------|----------------|---------------|----------|-------------------------------------|-------------------|--------|---------------------------|--------|----------|
| 7 | 30.3877 | 39.17 | PK | -27.5 | 20.9 | 32.57 | 40 | -7.43 | Vert |
| 8 | 37.56 | 46.74 | PK | -27.4 | 15.6 | 34.94 | 40 | -5.06 | Vert |
| 9 | 42.4061 | 48.26 | PK | -27.4 | 12 | 32.86 | 40 | -7.14 | Vert |
| 10 | 88.9289 | 41.61 | PK | -27 | 7.5 | 22.11 | 43.5 | -21.39 | Vert |
| 11 | 98.8149 | 37.92 | PK | -26.9 | 9.5 | 20.52 | 43.5 | -22.98 | Vert |
| 12 | 145.9193 | 31.67 | PK | -26.4 | 12.5 | 17.77 | 43.5 | -25.73 | Vert |

9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

| Frequency of Emission (MHz) | Conducted Limit (dBuV) | |
|-----------------------------|------------------------|----------|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 | 56 to 46 |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

*Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

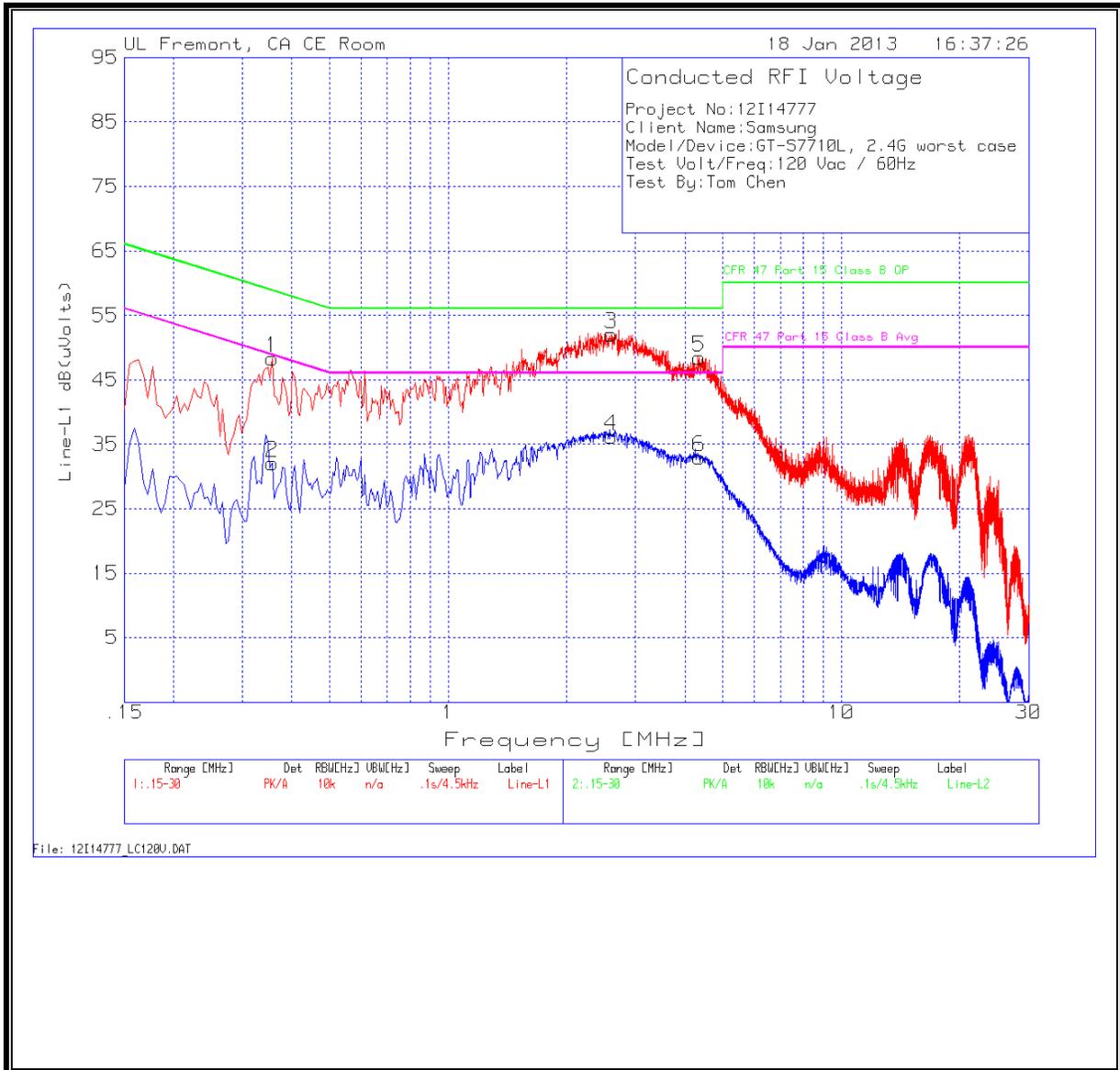
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

6 WORST EMISSIONS

| Project No:12I14777 | | | | | | | | | |
|---|---------------|----------|--------------------|------------------------|------------|---------------------------|--------|----------------------------|--------|
| Client Name:Samsung | | | | | | | | | |
| Model/Device:GT-S7710L, 2.4G worst case | | | | | | | | | |
| Test Volt/Freq:120 Vac / 60Hz | | | | | | | | | |
| Test By:Tom Chen | | | | | | | | | |
| Line-L1 .15 - 30MHz | | | | | | | | | |
| Test Frequency | Meter Reading | Detector | T24 IL L1.TXT (dB) | LC Cables 1&3.TXT (dB) | dB(uVolts) | CFR 47 Part 15 Class B QP | Margin | CFR 47 Part 15 Class B Avg | Margin |
| 0.357 | 48.24 | PK | 0.1 | 0 | 48.34 | 58.8 | -10.46 | - | - |
| 0.357 | 31.93 | Av | 0.1 | 0 | 32.03 | - | - | 48.8 | -16.77 |
| 2.598 | 51.81 | PK | 0.1 | 0.1 | 52.01 | 56 | -3.99 | - | - |
| 2.598 | 36.06 | Av | 0.1 | 0.1 | 36.26 | - | - | 46 | -9.74 |
| 4.3575 | 48.2 | PK | 0.1 | 0.1 | 48.4 | 56 | -7.6 | - | - |
| 4.3575 | 32.75 | Av | 0.1 | 0.1 | 32.95 | - | - | 46 | -13.05 |
| Line-L2 .15 - 30MHz | | | | | | | | | |
| Test Frequency | Meter Reading | Detector | T24 IL L2.TXT (dB) | LC Cables 2&3.TXT (dB) | dB(uVolts) | CFR 47 Part 15 Class B QP | Margin | CFR 47 Part 15 Class B Avg | Margin |
| 0.654 | 44.17 | PK | 0.1 | 0 | 44.27 | 56 | -11.73 | - | - |
| 0.654 | 31.22 | Av | 0.1 | 0 | 31.32 | - | - | 46 | -14.68 |
| 2.877 | 51.35 | PK | 0.1 | 0.1 | 51.55 | 56 | -4.45 | - | - |
| 2.877 | 33.01 | Av | 0.1 | 0.1 | 33.21 | - | - | 46 | -12.79 |
| 4.3035 | 48.7 | PK | 0.1 | 0.1 | 48.9 | 56 | -7.1 | - | - |
| 4.3035 | 28.91 | Av | 0.1 | 0.1 | 29.11 | - | - | 46 | -16.89 |

LINE 1 RESULTS



LINE 2 RESULTS

