

# FCC 47 CFR PART 15 SUBPART E INDUSTRY CANADA RSS-210 ISSUE 8

# **C2PC CERTIFICATION TEST REPORT**

**FOR** 

GSM/CDMA/WCDMA/LTE Phone + Bluetooth & WLAN (2.4GHz & 5GHz) and NFC

MODEL NUMBER: LG-D820, LGD820 and D820

FCC ID: ZNFD820 IC: 2703C-D820

REPORT NUMBER: 13U15778-5, Revision C ISSUE DATE: September 23, 2013

Prepared for

LG ELECTRONICS MOBILECOMM U.S.A., INC. 1000 SYLVAN AVENUE ENGLEWOOD CLIFFS, NJ 07632

Prepared by

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# **Revision History**

| Rev. | Issue<br>Date | Revisions   | Revised By |
|------|---------------|---|------------|
|      | 08/21/13      | Initial Issue   | P. Kim     |
| A    | 9/12/13       | Updated Section 5.4 Software and Firmware   | AAumentado |
| В    | 9/17/13       | Updated Section 9 investigate frequency range;<br>Section 5.2 output power target; Section 9.5 BE for<br>5.8 band | P.Kim      |
| С    | 9/23/13       | Updated the power summary table   | P.Kim      |

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** LG ELECTRONICS MOBLILECOMM USA,INC.

1000 SYLVAN AVENUE

ENGLEWOOD, NJ 07632, USA

**EUT DESCRIPTION:** GSM/CDMA/WCDMA/LTE Phone + Bluetooth &

WLAN (2.4GHz & 5GHz) and NFC

MODEL: LG-D820, LGD820 and D820

**SERIAL NUMBER:** (01EEE7E020C97E30) RADIATED #1

(01EB815C20C97E15) RADIATED #2

**DATE TESTED:** July 29 – Sep 17, 2013

#### APPLICABLE STANDARDS

STANDARD
TEST RESULTS

CFR 47 Part 15 Subpart E
Pass

INDUSTRY CANADA RSS-210 Issue 8 Annex 8
Pass

INDUSTRY CANADA RSS-GEN Issue 3
Pass

UL Verification Services Inc. 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 Verification Services Inc. 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 Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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

120 h.

UL Verification Services Inc. By:

Tested By:

PHILIP KIM

WISE PROGRAM MANAGER UL Verification Services Inc.

STEVEN TRAN

Wise LAB TECHNICIAN UL Verification Services Inc.

# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 06-96, FCC KDB 789033, ANSI C63.10-2009, RSS-GEN Issue 3, FCC KDB 644545 D01, FCC KDB644545 D02 (802.11ac alternative guide V01) and RSS-210 Issue 8.

# 3. FACILITIES AND ACCREDITATION

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

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <a href="http://www.ccsemc.com">http://www.ccsemc.com</a>.

# 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:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB) 36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

## 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 Dual Band phone that also supports BLUETOOTH, WLAN and NFC.

# 5.2. OUTPUT POWER

The transmitter has an maximum conducted output power as follows:

| Frequency Range | Mode          | Output Power | Output Power |
|-----------------|---------------|--------------|--------------|
| (MHz)           |               | (dBm)        | (mW)         |
| 5170-5250       | 802.11a       | 11.88        | 15.42        |
| 5170-5250       | 802.11n HT20  | 10.75        | 11.89        |
| 5170-5250       | 802.11n HT40  | 9.84         | 9.64         |
| 5170-5250       | 802.11ac HT20 | 10.86        | 12.19        |
| 5170-5250       | 802.11ac HT40 | 9.52         | 8.95         |
| 5170-5250       | 802.11ac HT80 | 8.39         | 6.90         |
| 5250-5330       | 802.11a       | 13.3         | 21.38        |
| 5250-5330       | 802.11n HT20  | 12.49        | 17.74        |
| 5250-5330       | 802.11n HT40  | 11.07        | 12.79        |
| 5250-5330       | 802.11ac HT20 | 12.31        | 17.02        |
| 5250-5330       | 802.11ac HT40 | 10.75        | 11.89        |
| 5250-5330       | 802.11ac HT80 | 10.4         | 10.96        |
| 5490-5730       | 802.11a       | 13.24        | 21.09        |
| 5490-5730       | 802.11n HT20  | 12.26        | 16.83        |
| 5490-5730       | 802.11n HT40  | 11.54        | 14.26        |
| 5490-5730       | 802.11ac HT20 | 12.19        | 16.56        |
| 5490-5730       | 802.11ac HT40 | 11.22        | 13.24        |
| 5490-5730       | 802.11ac HT80 | 13.63        | 23.07        |
| 5735-5835       | 802.11a       | 16.63        | 46.03        |
| 5735-5835       | 802.11n HT20  | 15.71        | 37.24        |
| 5735-5835       | 802.11n HT40  | 15.29        | 33.81        |
| 5735-5835       | 802.11ac HT20 | 13.76        | 23.77        |
| 5735-5835       | 802.11ac HT40 | 13.15        | 20.65        |
| 5735-5815       | 802.11ac HT80 | 14.83        | 30.41        |

# 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of -3.26 dBi.

# 5.4. SOFTWARE AND FIRMWARE

Android OS Version: 3.40-gbab8bca-00002-gd1a7716.

Kernel Version: M8974A-0.0.19.0.05.

# 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 X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in the X orientation.

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

802.11a mode: 6 Mbps 802.11n HT20mode: MCS0 802.11n HT40mode: MCS0

# 5.6. DESCRIPTION OF TEST SETUP

# **SUPPORT EQUIPMENT**

| Support Equipment List                              |          |          |             |     |  |  |  |  |
|---|----------|----------|-------------|-----|--|--|--|--|
| Description Manufacturer Model Serial Number FCC ID |          |          |             |     |  |  |  |  |
| AC Adapter  | LG       | MCS.01WR | EAY62768913 | N/A |  |  |  |  |
| Earphone  | QuadBeat | LE 410   | EAB62729001 | N/A |  |  |  |  |

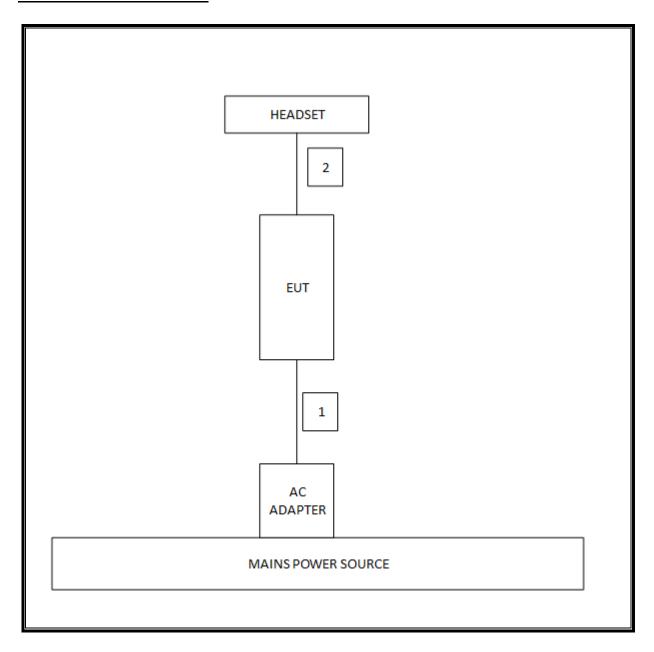
## I/O CABLES

|  | I/O Cable List |       |           |            |            |     |  |  |  |  |
|--|----------------|-------|-----------|------------|------------|-----|--|--|--|--|
| Cable Port # of identical Connector Cable Type Cable Remarks |                |       |           |            |            |     |  |  |  |  |
| No   |                | ports | Туре      |            | Length (m) |     |  |  |  |  |
| 1  | DC Power       | 1     | Mini-USB  | Shielded   | 1.2m       | N/A |  |  |  |  |
| 2  | Audio          | 1     | Mini-Jack | Unshielded | 1.0m       | N/A |  |  |  |  |

## **TEST SETUP**

The EUT is setup as a stand-alone device.

# **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 Due    |  |  |  |
| Spectrum Analyzer, 44 GHz      | Agilent / HP   | E4446A      | C00986 | 4/1/2014   |  |  |  |
| Spectrum Analyzer, 26.5 GHz    | Agilent / HP   | E4440A      | C01179 | 2/26/2014  |  |  |  |
| EMI Test Receiver, 30 MHz      | R&S            | ESHS 20     | N02396 | 8/15/2014  |  |  |  |
| Preamplifier, 1300 MHz         | Agilent / HP   | 8447D       | C00580 | 1/28/2014  |  |  |  |
| Preamplifier, 26.5 GHz         | Agilent / HP   | 8449B       | C01063 | 10/22/2013 |  |  |  |
| Preamplifier, 40 GHz           | Miteq          | NSP4000-SP2 | C00990 | 8/2/2014   |  |  |  |
| Antenna, Bilog, 30MHz-1 GHz    | Sunol Sciences | JB1         | N/A    | 3/6/2014   |  |  |  |
| Antenna, Horn, 18 GHz          | ETS            | 3117        | C01022 | 2/21/2014  |  |  |  |
| Antenna, Horn, 26.5 GHz        | ARA            | MWH-1826/B  | C00589 | 12/17/2013 |  |  |  |
| Peak Power Meter               | Agilent / HP   | E4416A      | C00963 | 12/13/2013 |  |  |  |
| Peak / Average Power Sensor    | Agilent / HP   | E9327A      | C00964 | 12/13/2013 |  |  |  |
| LISN, 30 MHz                   | FCC            | 50/250-25-2 | C00626 | 01/14/14   |  |  |  |
| Reject Filter, 5.725-5.825 GHz | Micro-Tronics  | BRC13192    | N02676 | CNR        |  |  |  |

REPORT NO: 13U15778-5C DATE: September 23, 2013 IC: 2703C-D820 FCC ID: ZNFD820

# 7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

## **LIMITS**

None; for reporting purposes only.

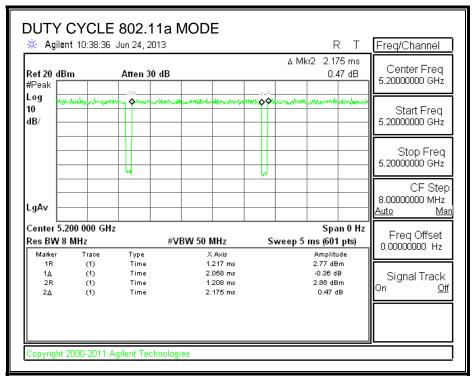
## **PROCEDURE**

KDB 789033 Zero-Span Spectrum Analyzer Method.

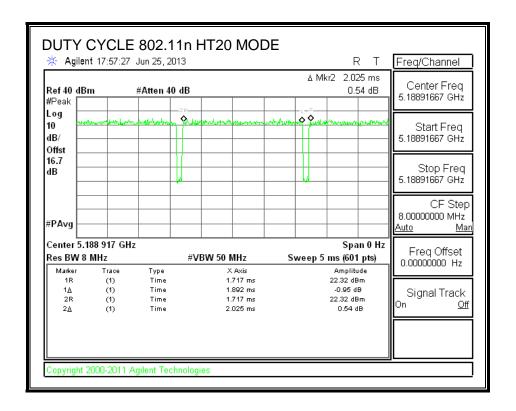
#### 7.1. ON TIME AND DUTY CYCLE RESULTS

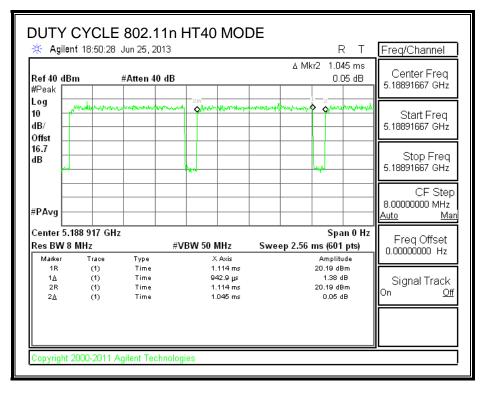
| Mode          | ON Time | Period | <b>Duty Cycle</b> | Duty  | Duty Cycle               | 1/T         |
|---------------|---------|--------|-------------------|-------|--------------------------|-------------|
|               | В       |        | x                 | Cycle | <b>Correction Factor</b> | Minimum VBW |
|               | (msec)  | (msec) | (linear)          | (%)   | (dB)                     | (kHz)       |
| 802.11a       | 2.05    | 2.17   | 0.946             | 94.6% | 0.24                     | 0.488       |
| 802.11ac HT20 | 1.93    | 2      | 0.951             | 95.1% | 0.22                     | 0.517       |
| 802.11ac HT40 | 0.94    | 1      | 0.886             | 88.6% | 0.52                     | 1.070       |
| 802.11ac HT80 | 0.46    | 1      | 0.811             | 81.1% | 0.91                     | 2.193       |
| 802.11n HT20  | 1.91    | 2      | 0.948             | 94.8% | 0.23                     | 0.524       |
| 802.11n HT40  | 0.94    | 1      | 0.900             | 90.0% | 0.46                     | 1.064       |

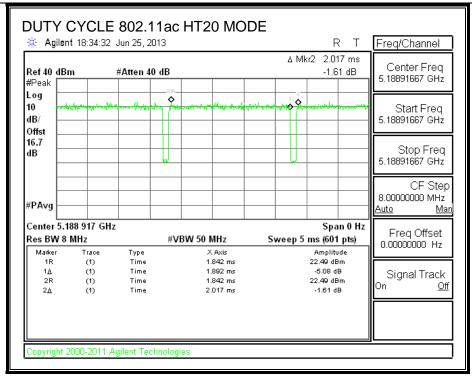
#### 7.2. **DUTY CYCLE PLOTS**

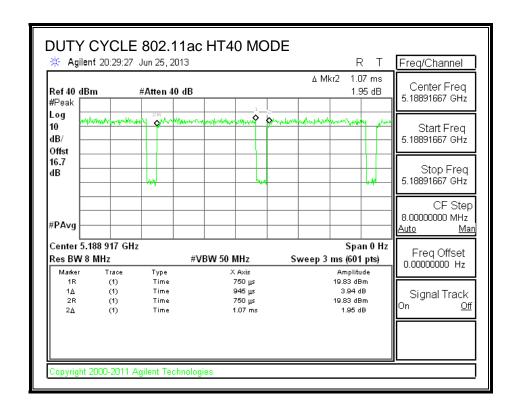


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# 8. MEASUREMENT METHOD

The Duty Cycle is less than 98% and consistent therefore KDB 789033 Method SA-2 is used for .power and PPSD

The Duty Cycle is less than 98% and consistent, KDB 789033 Method AD with Power RMS Averaging and duty cycle correction is used.

# 9. TRANSMITTER ABOVE 1 GHz

## 9.1. LIMITS AND PROCEDURE

# **LIMITS**

FCC §15.205 and §15.209

| Frequency Range (MHz) | Field Strength Limit<br>(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.

Reference to KDB 789033 UNII part H) 6) d) Method AD:

For restricted band edge measurements, when doing peak, above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz and set detector to peak, sweep time to auto, and trace mode to max hold.

For restricted band edge measurements, when doing average, above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz and set detector to RMS, averaging type is set to power or linear voltage averaging, and trace average of 100. The duty correction factor is calculated as  $20\log(1/x)$ , where x is the duty cycle. Please refer to the below table that shows the Duty Cycle Corrector Factors.

| Mode          | ON Time | Period | <b>Duty Cycle</b> | Duty  | Duty Cycle               | 1/T         |
|---------------|---------|--------|-------------------|-------|--------------------------|-------------|
|               | В       |        | x                 | Cycle | <b>Correction Factor</b> | Minimum VBW |
|               | (msec)  | (msec) | (linear)          | (%)   | (dB)                     | (kHz)       |
| 802.11a       | 2.05    | 2.17   | 0.946             | 94.6% | 0.24                     | 0.488       |
| 802.11ac HT20 | 1.93    | 2      | 0.951             | 95.1% | 0.22                     | 0.517       |
| 802.11ac HT40 | 0.94    | 1      | 0.886             | 88.6% | 0.52                     | 1.070       |
| 802.11ac HT80 | 0.46    | 1      | 0.811             | 81.1% | 0.91                     | 2.193       |
| 802.11n HT20  | 1.91    | 2      | 0.948             | 94.8% | 0.23                     | 0.524       |
| 802.11n HT40  | 0.94    | 1      | 0.900             | 90.0% | 0.46                     | 1.064       |

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.

Please note that Peak and Average plots were taken in 2 different chambers. Due to that the reference offset values are not the same."

# For BAND EDGE at 5725 and 5825/5850:

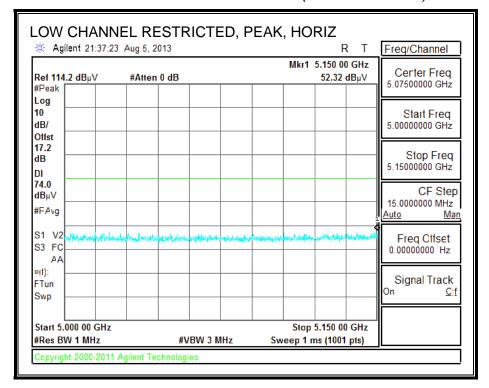
| TEST   | DONE   | RBW      | VBW      | FREQ          | SPAN                   | LIMIT  |  |  |  |
|--|--|----------|----------|---------------|------------------------|--|--|--|--|
| IESI   | DONE   | KDVV     | V DVV    | FREG          | SPAIN                  | LIIVIII  | NOTES  |  |  |
| DIDECT                                       | ILTHOD   | DECTO    | ICTED I  |               | NDEDCE                 | NADIATED EIE   |  |  |  |
| DIRECTIV                                     | DIRECT METHOD – RESTRICTED BAND / BANDEDGE RADIATED FIELD STRENGTH |          |          |               |                        |  |  |  |  |
| ADJACENT<br>RESTRICTED<br>BAND LOW<br>(PEAK) |  | 1<br>MHz | 3<br>MHz | EUT =<br>LOW  | 5350 to<br>5470<br>MHz | 5350 to<br>5460<br>74 dBuV/m<br>Peak<br>5460 to<br>5470<br>-27<br>dBm/MHz<br>EIRP<br>Peak=<br>68.2<br>dBuV/m<br>Peak | Peak Detector; 1001 Points; AMPLITUDE UNITS = dBuV; Atten = 0 dB; RL Offset = AF + Cable - Distance Factor Download Limit Line; Max Hold;  |  |  |
| BANDEDGE<br>HIGH<br>(PEAK)                   |  | 1<br>MHz | 3<br>MHz | EUT =<br>HIGH | 5725 to<br>5825<br>MHz | EIRP:<br>5725 to<br>5825<br>-27<br>dBm/MHz<br>EIRP Peak  | Peak Detector;<br>1001 Points;<br>AMPLITUDE UNITS =<br>dBm<br>Atten = 0 dB;<br>RL Offset = AF +<br>Cable - Distance<br>Factor + 11.8;<br>Display Line = -27<br>dBm;<br>Max Hold; |  |  |

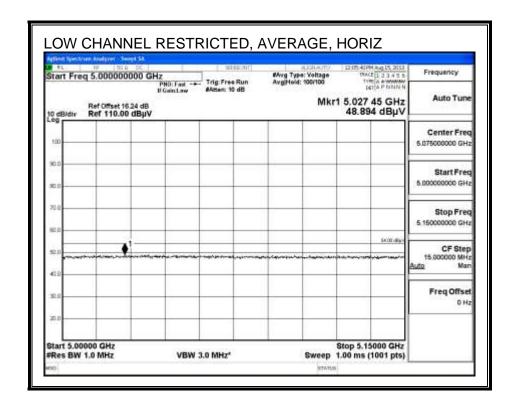
Note: Site factor = +107 (to convert dBm to dBuV) + AF + CL - PA gain (to convert dBuV to dBuV/m) -95.23 (to convert dBuV/m at 3m to dBm eirp) = AF + CL - PA gain +11.8dB

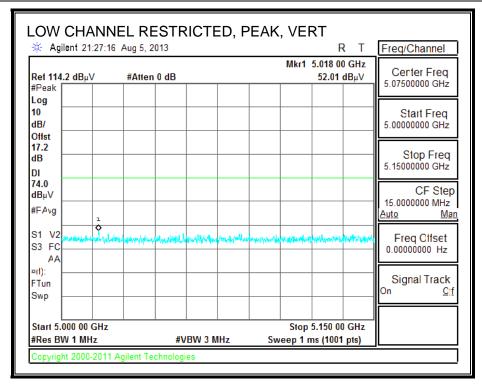
## 9.2. 5.2 GHz

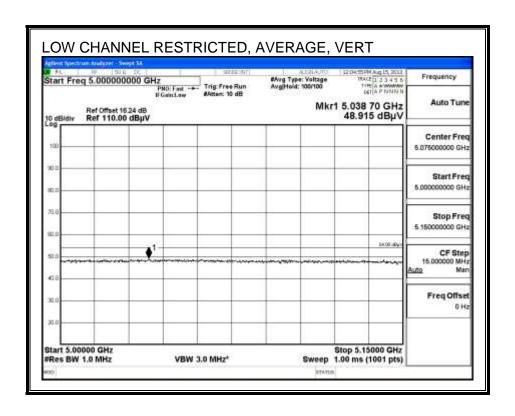
## 9.2.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)



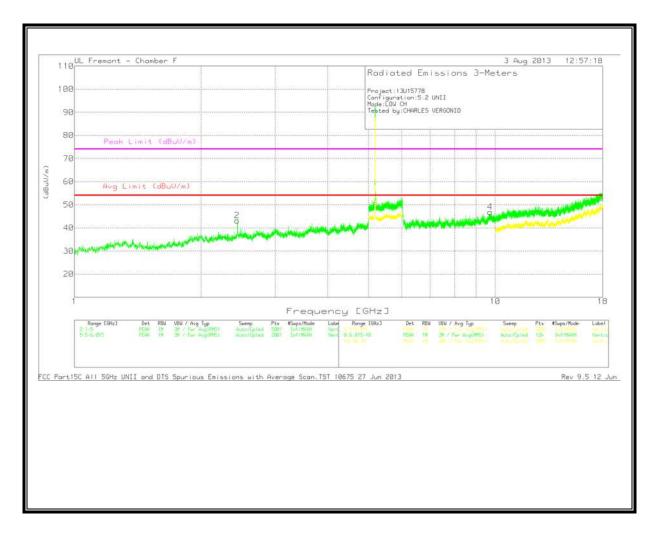






## HARMONICS AND SPURIOUS EMISSIONS

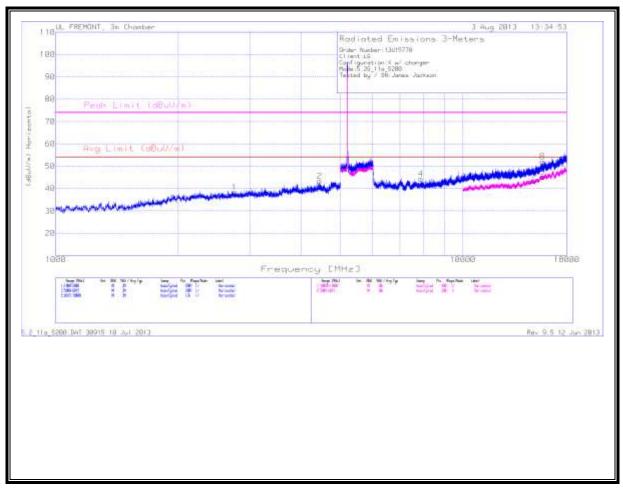
LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

# **LOW CHANNEL DATA**

| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|-------------------|----------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
| 2      | 2.438              | 44.26                      | PK  | 32.3              | -33.4                            | 43.16                            | 53.97                        | -10.81         | 74                            | -30.84         | 0-360             | 201            | V        |
| 4      | 9.721              | 35.16                      | PK  | 37.4              | -25.7                            | 46.86                            | 53.97                        | -7.11          | 74                            | -27.14         | 0-360             | 101            | V        |

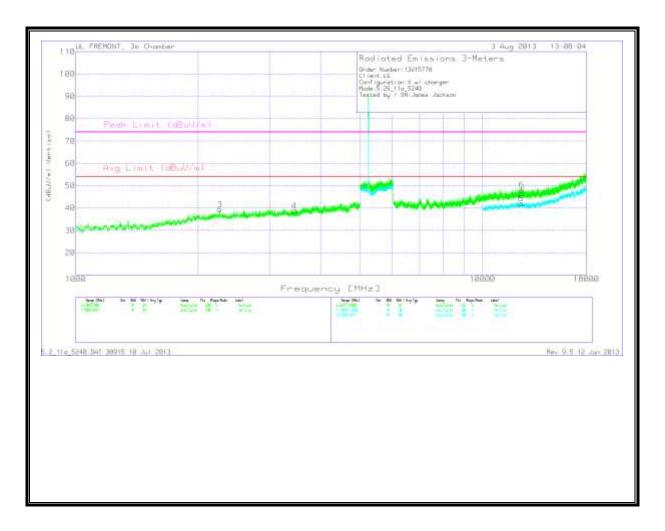


Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

FAX: (510) 661-0888

# MID CHANNEL DATA

| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T344<br>(db/m) | Amp/Cbl/F<br>ltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|-----------------------|----------------|------------------------|----------------|----------------|----------|
| 2.742              | 38.16                      | PK  | 32.9              | -32.7                        | 38.36                            | 53.97                 | -15.61         | 74                     | -35.64         | 201            | Н        |
| 4.446              | 40.49                      | PK  | 34.1              | -31.2                        | 43.39                            | 53.97                 | -10.58         | 74                     | -30.61         | 201            | Н        |
| 7.884              | 36.54                      | PK  | 36                | -28.2                        | 44.34                            | 53.97                 | -9.63          | 74                     | -29.66         | 100            | Н        |
| 14.921             | 29.98                      | PK  | 40                | -26.5                        | 43.48                            | 53.97                 | -10.49         | 74                     | -30.52         | 100            | Н        |
| 15.692             | 29.07                      | PK  | 41.2              | -25                          | 45.27                            | 53.97                 | -8.7           | 74                     | -28.73         | 100            | Н        |

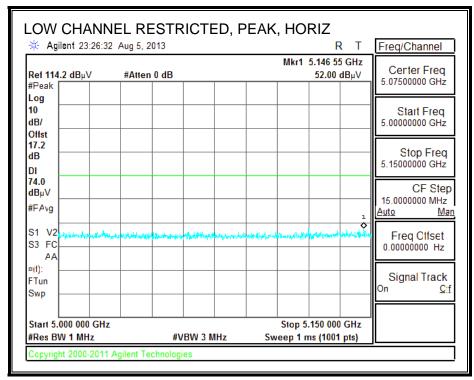


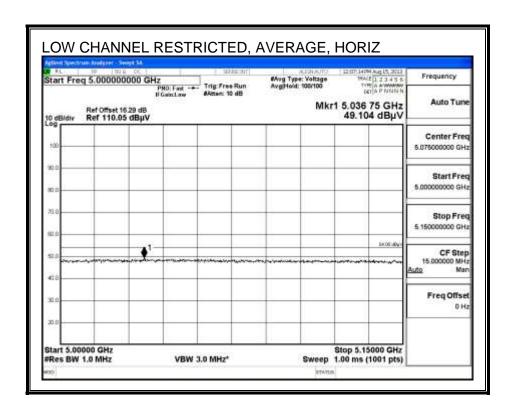
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

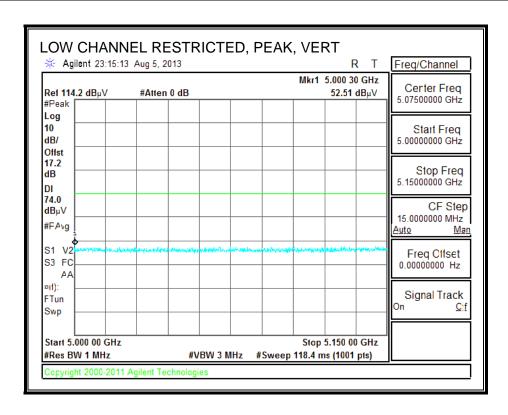
# HIGH CHANNEL DATA

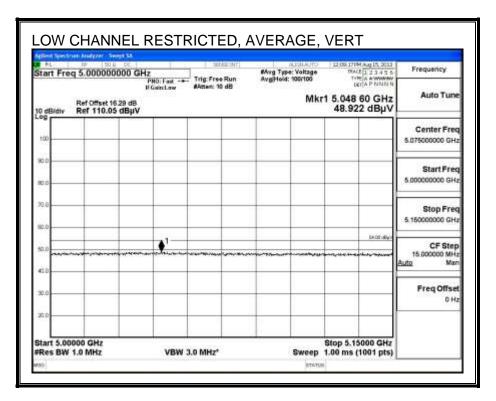
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T344<br>(db/m) | Amp/Cbl<br>/Fltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|-----------------------|----------------|------------------------|----------------|----------------|----------|
| 2.26               | 40.17                      | PK  | 32.4              | -33.3                        | 39.27                            | 53.97                 | -14.7          | 74                     | -34.73         | 100            | V        |
| 3.445              | 38.33                      | PK  | 33.3              | -32.8                        | 38.83                            | 53.97                 | -15.14         | 74                     | -35.17         | 100            | V        |
| 12.444             | 28                         | PK  | 39.2              | -25.2                        | 42                               | 53.97                 | -11.97         | 74                     | -32            | 100            | V        |

# 9.2.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.2 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)



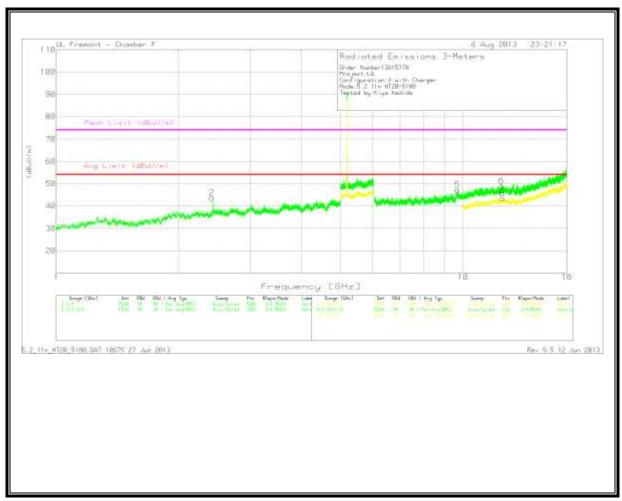






# **HARMONICS AND SPURIOUS EMISSIONS**

LOW CHANNEL **VERTICAL** 

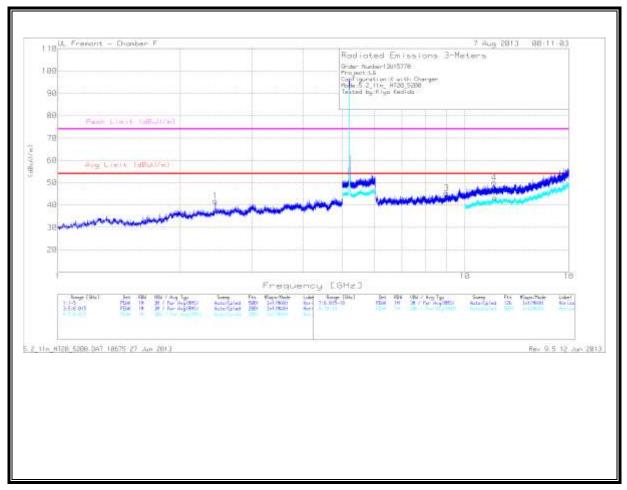


Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

# **LOW CHANNEL DATA**

| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF<br>T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------------|----------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
| 2      | 2.414              | 45.21                      | PK  | 32.2                 | -33.7                            | 43.71                            | 53.97                        | -10.26         | 74                            | -30.29         | 0-360             | 200            | V        |
| 5      | 9.694              | 35.33                      | PK  | 37.4                 | -25.6                            | 47.13                            | 53.97                        | -6.84          | 74                            | -26.87         | 0-360             | 101            | V        |
| 8      | 12.496             | 29.05                      | PK  | 39.4                 | -25.1                            | 43.35                            | 53.97                        | -10.62         | 74                            | -30.65         | 0-360             | 101            | V        |

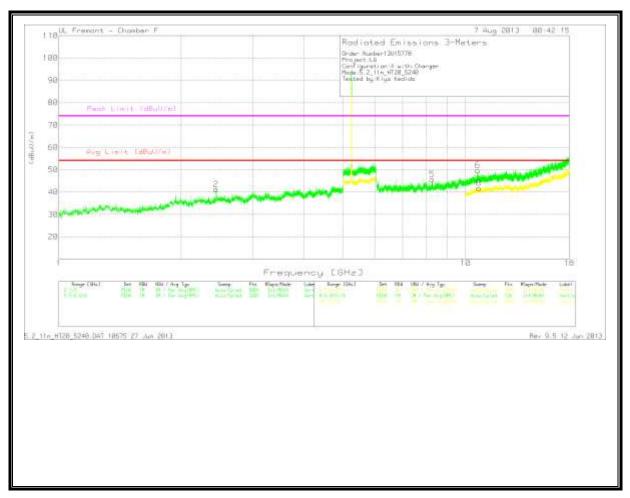
REPORT NO: 13U15778-5C



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

# MID CHANNEL DATA

| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|-------------------|----------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
| 1      | 2.437              | 42.93                      | PK  | 32.3              | -33.4                            | 41.83                            | 53.97                        | -12.14         | 74                            | -32.17         | 0-360             | 199            | Н        |
| 3      | 9.009              | 35.87                      | PK  | 36.4              | -26.9                            | 45.37                            | 53.97                        | -8.6           | 74                            | -28.63         | 0-360             | 100            | Н        |
| 7      | 11.852             | 28.81                      | PK  | 39.3              | -24.9                            | 43.21                            | 53.97                        | -10.76         | 74                            | -30.79         | 0-360             | 199            | Н        |



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

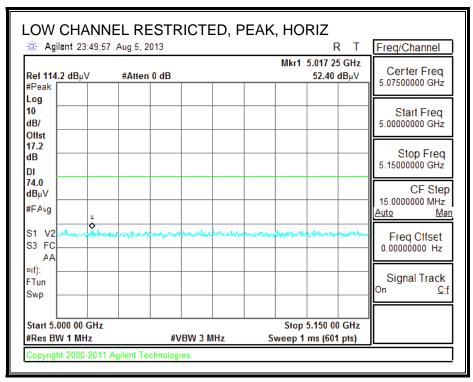
FAX: (510) 661-0888

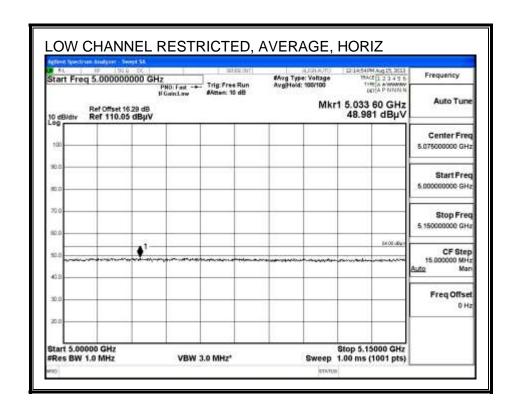
# HIGH CHANNEL DATA

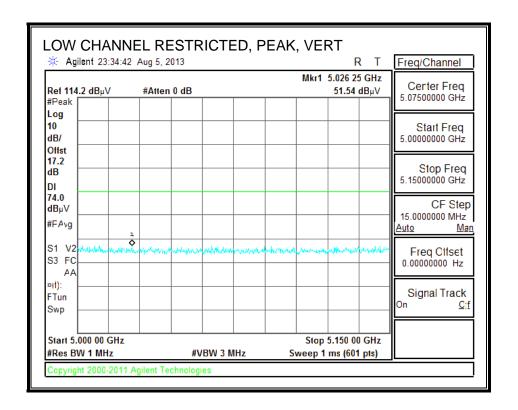
| Marker | Frequency<br>(GHz) | Meter<br>Readin<br>g<br>(dBuV) | Det | AF T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimut<br>h<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|--------------------------------|-----|-------------------|----------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-----------------------|----------------|----------|
| 2      | 2.437              | 42.32                          | PK  | 32.3              | -33.4                            | 41.22                            | 53.97                        | -12.75         | 74                            | -32.78         | 0-360                 | 201            | V        |
| 5      | 8.271              | 37.59                          | PK  | 36                | -27.9                            | 45.69                            | 53.97                        | -8.28          | 74                            | -28.31         | 0-360                 | 201            | V        |
| 8      | 10.784             | 28.37                          | PK  | 38.7              | -25.3                            | 41.77                            | 53.97                        | -12.2          | 74                            | -32.23         | 0-360                 | 101            | V        |

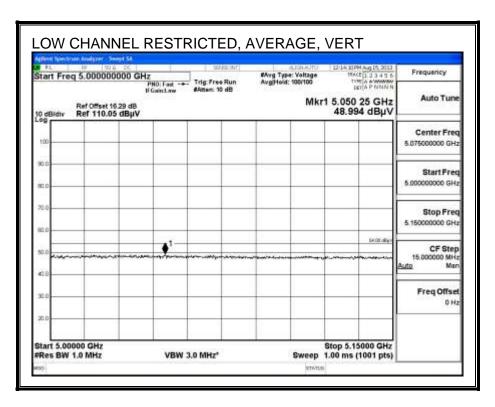
# 9.2.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)



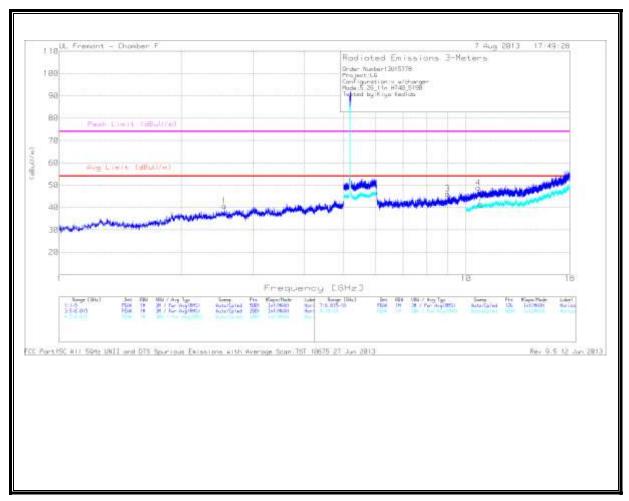






# HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL **HORIZONTAL** 

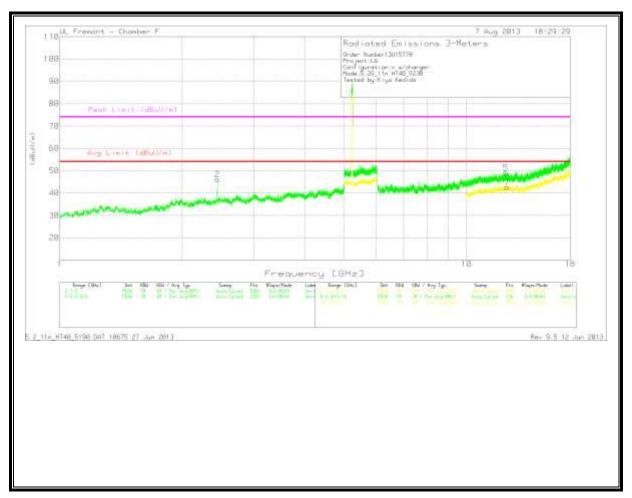


Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

IC: 2703C-D820

# **LOW CHANNEL DATA**

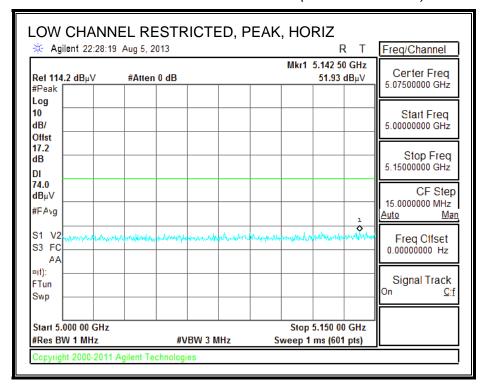
| ı | /larker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|---|---------|--------------------|----------------------------|-----|-------------------|----------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
|   | 1       | 2.546              | 41.27                      | PK  | 32.6              | -33.2                            | 40.67                            | 53.97                        | -13.3          | 74                            | -33.33         | 0-360             | 101            | Н        |
|   | 3       | 9.015              | 36.84                      | PK  | 36.4              | -27                              | 46.24                            | 53.97                        | -7.73          | 74                            | -27.76         | 0-360             | 101            | Н        |
|   | 7       | 10.841             | 28.4                       | PK  | 38.7              | -25.7                            | 41.4                             | 53.97                        | -12.57         | 74                            | -32.6          | 0-360             | 101            | Н        |

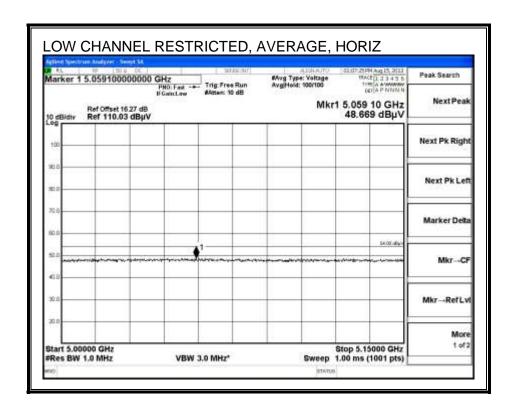


# MID CHANNEL DATA

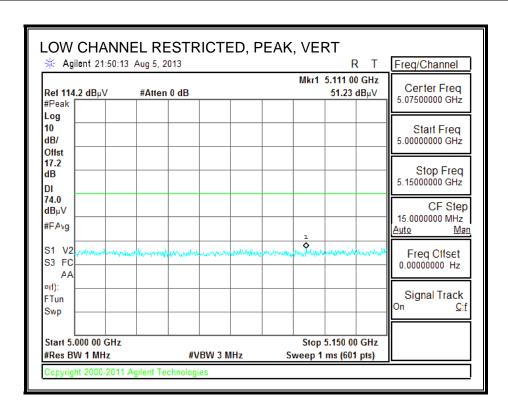
| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|-------------------|----------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
| 2      | 2.44               | 47.18                      | PK  | 32.3              | -33.4                            | 46.08                            | 53.97                        | -7.89          | 74                            | -27.92         | 0-360             | 101            | V        |
| 7      | 12.566             | 29.01                      | PK  | 39.4              | -26                              | 42.41                            | 53.97                        | -11.56         | 74                            | -31.59         | 0-360             | 101            | V        |

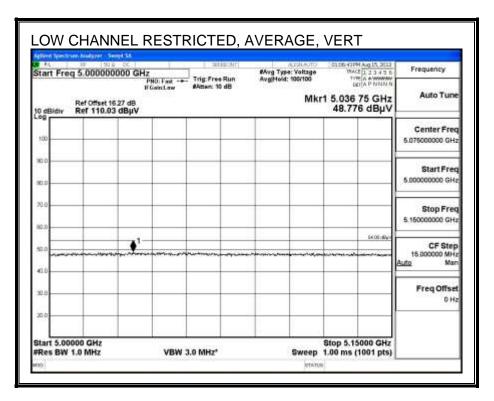
# 9.2.4. TX ABOVE 1 GHz 802.11ac HT20 MODE IN THE 5.2 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)





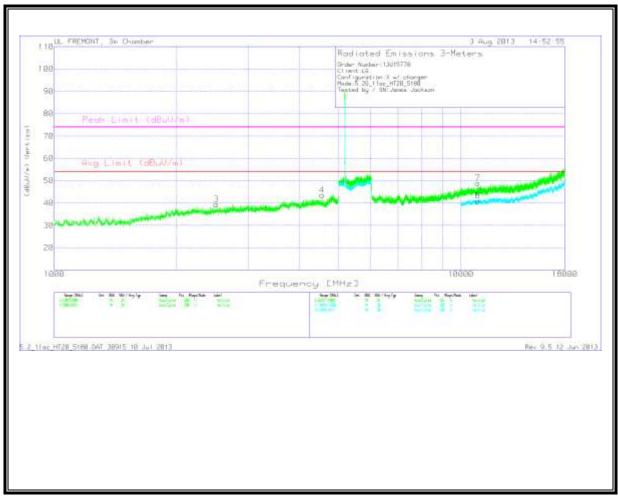
REPORT NO: 13U15778-5C DATE: September 23, 2013 IC: 2703C-D820 FCC ID: ZNFD820





#### HARMONICS AND SPURIOUS EMISSIONS

**LOW CHANNEL VERTICAL** 



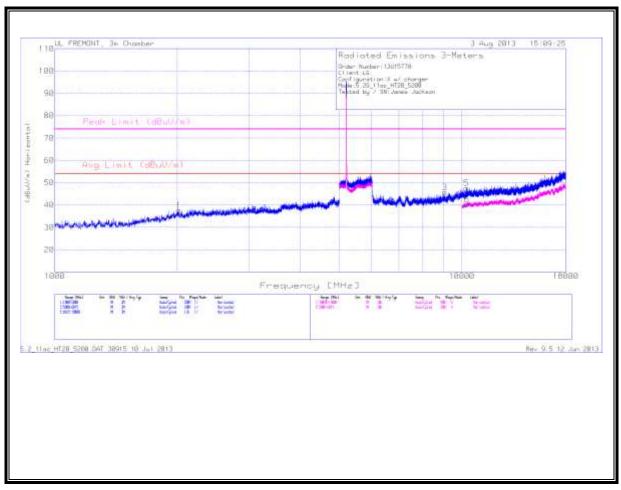
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

FAX: (510) 661-0888

# **LOW CHANNEL DATA**

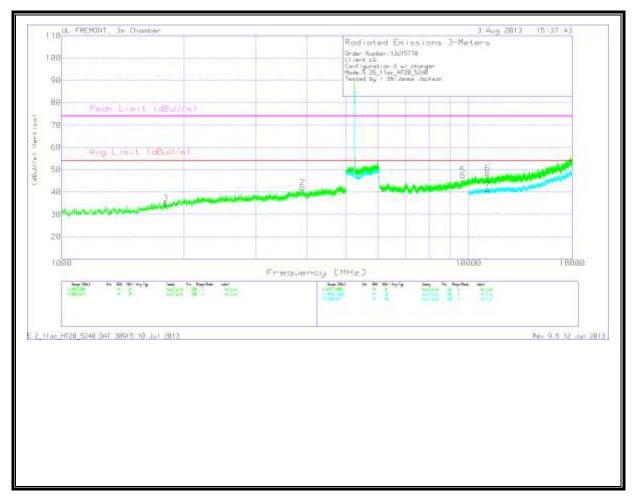
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T344<br>(db/m) | Amp/Cbl<br>/Fltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|-----------------------|----------------|------------------------|----------------|----------------|----------|
| 2.503              | 40.29                      | PK  | 32.4              | -33.2                        | 39.49                            | 53.97                 | -14.48         | 74                     | -34.51         | 201            | V        |
| 4.553              | 40.76                      | PK  | 34.2              | -31.4                        | 43.56                            | 53.97                 | -10.41         | 74                     | -30.44         | 100            | V        |
| 11.002             | 27.97                      | PK  | 38.4              | -25.4                        | 40.97                            | 53.97                 | -13            | 74                     | -33.03         | 201            | V        |

REPORT NO: 13U15778-5C



#### MID CHANNEL DATA

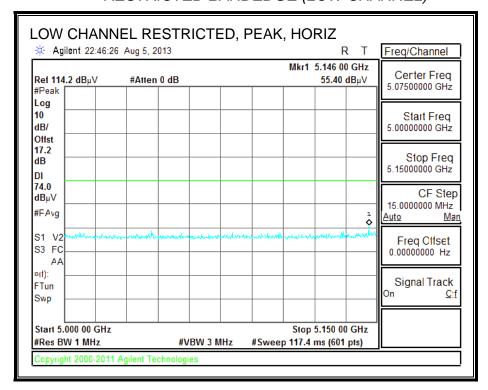
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T344<br>(db/m) | Amp/Cbl<br>/Fltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|-----------------------|----------------|------------------------|----------------|----------------|----------|
| 2.016              | 39.56                      | PK  | 31.7              | -33.6                        | 37.66                            | 53.97                 | -16.31         | 74                     | -36.34         | 100            | Н        |
| 9.077              | 35.77                      | PK  | 36.8              | -26.9                        | 45.67                            | 53.97                 | -8.3           | 74                     | -28.33         | 100            | Н        |
| 10.264             | 35.59                      | PK  | 38.2              | -26.2                        | 47.59                            | 53.97                 | -6.38          | 74                     | -26.41         | 201            | Н        |
| 10.287             | 28.02                      | PK  | 38.2              | -25.8                        | 40.42                            | 53.97                 | -13.55         | 74                     | -33.58         | 201            | Н        |

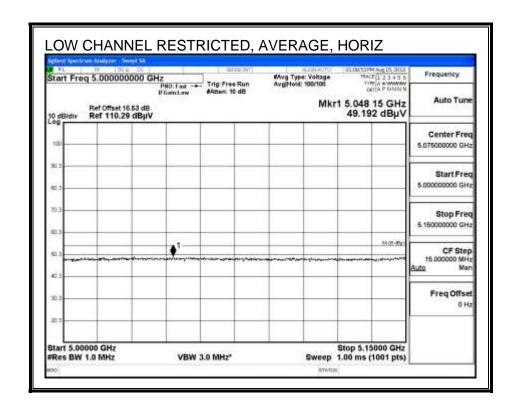


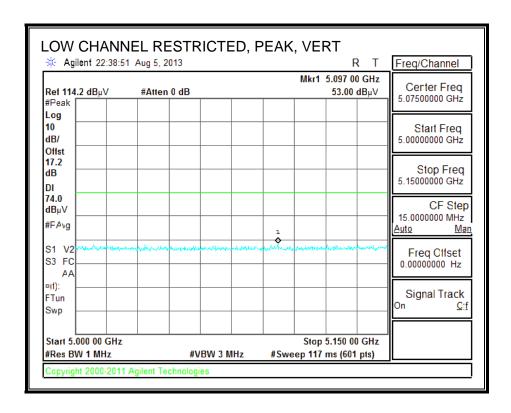
# HIGH CHANNEL DATA

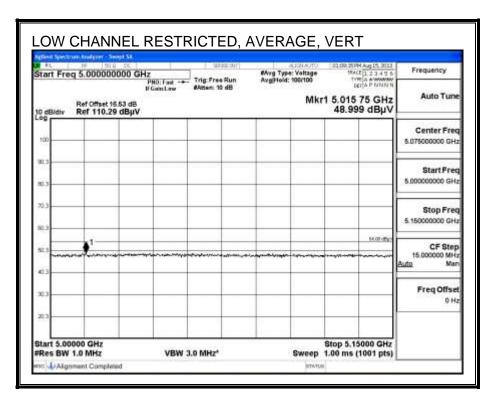
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T344<br>(db/m) | Amp/Cbl<br>/Fltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|-----------------------|----------------|------------------------|----------------|----------------|----------|
| 3.907              | 39.66                      | PK  | 33.8              | -31.5                        | 41.96                            | 53.97                 | -12.01         | 74                     | -32.04         | 201            | V        |
| 1.802              | 39.3                       | PK  | 30.4              | -34.8                        | 34.9                             | 53.97                 | -19.07         | 74                     | -39.1          | 201            | V        |
| 9.675              | 35.96                      | PK  | 37.3              | -25.7                        | 47.56                            | 53.97                 | -6.41          | 74                     | -26.44         | 201            | V        |
| 11.134             | 27.89                      | PK  | 38.4              | -25.2                        | 41.09                            | 53.97                 | -12.88         | 74                     | -32.91         | 100            | V        |

# 9.2.5. TX ABOVE 1 GHz 802.11ac HT40 MODE IN THE 5.2 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)



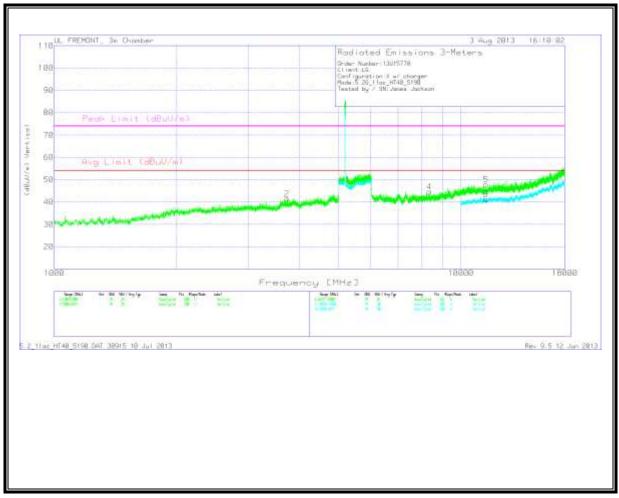






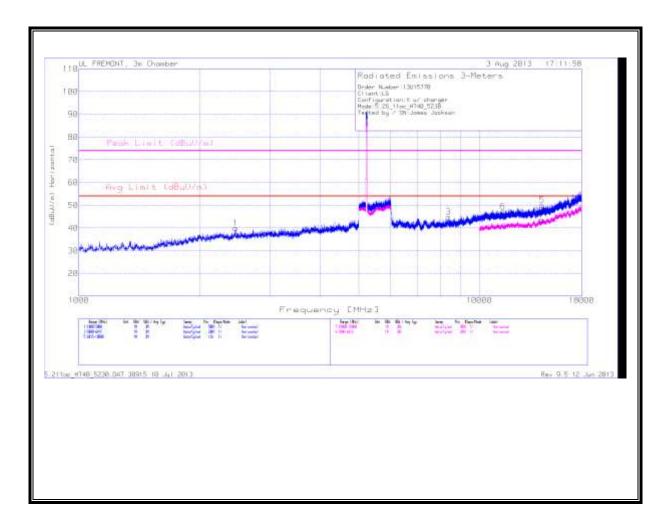
#### HARMONICS AND SPURIOUS EMISSIONS

**LOW CHANNEL VERTICAL** 



# **LOW CHANNEL DATA**

| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T344<br>(db/m) | Amp/Cbl<br>/Fltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|-----------------------|----------------|------------------------|----------------|----------------|----------|
| 3.734              | 40.35                      | PK  | 33.8              | -32.7                        | 41.45                            | 53.97                 | -12.52         | 74                     | -32.55         | 201            | V        |
| 8.358              | 36.57                      | PK  | 36.1              | -28.1                        | 44.57                            | 53.97                 | -9.4           | 74                     | -29.43         | 200            | V        |
| 11.521             | 34.62                      | PK  | 38.7              | -25.5                        | 47.82                            | 53.97                 | -6.15          | 74                     | -26.18         | 200            | V        |
| 11.51              | 28.12                      | PK  | 38.7              | -25.6                        | 41.22                            | 53.97                 | -12.75         | 74                     | -32.78         | 100            | V        |

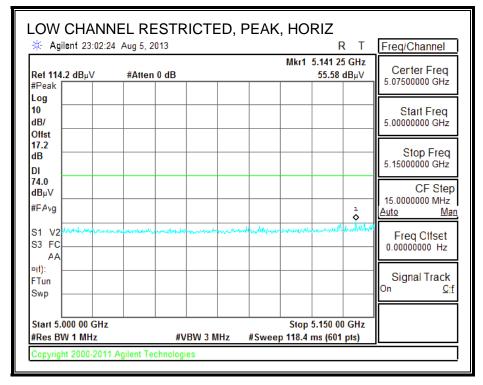


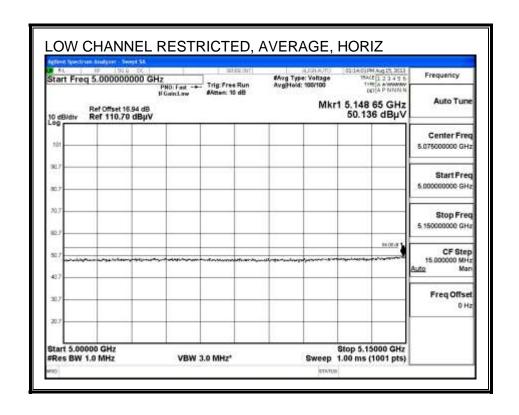
# MID CHANNEL DATA

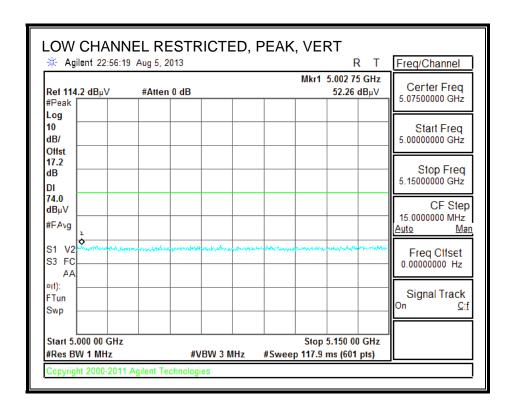
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T344<br>(db/m) | Amp/Cbl<br>/Fltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|-----------------------|----------------|------------------------|----------------|----------------|----------|
| 2.462              | 40.7                       | PK  | 32.4              | -33.2                        | 39.9                             | 53.97                 | -14.07         | 74                     | -34.1          | 201            | Н        |
| 8.376              | 36.87                      | PK  | 36.1              | -28.2                        | 44.77                            | 53.97                 | -9.2           | 74                     | -29.23         | 201            | Н        |
| 11.444             | 34.27                      | PK  | 38.6              | -25.6                        | 47.27                            | 53.97                 | -6.7           | 74                     | -26.73         | 201            | Н        |
| 14.331             | 30.47                      | PK  | 39.8              | -26.8                        | 43.47                            | 53.97                 | -10.5          | 74                     | -30.53         | 201            | Н        |

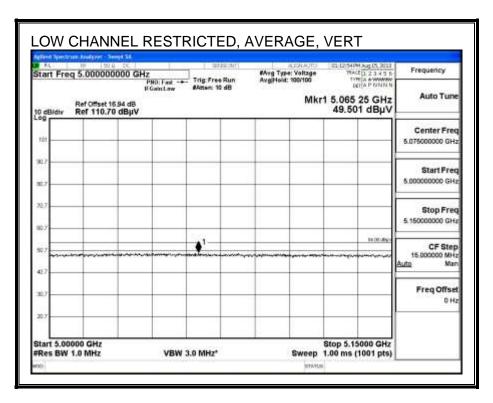
# 9.2.6. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)



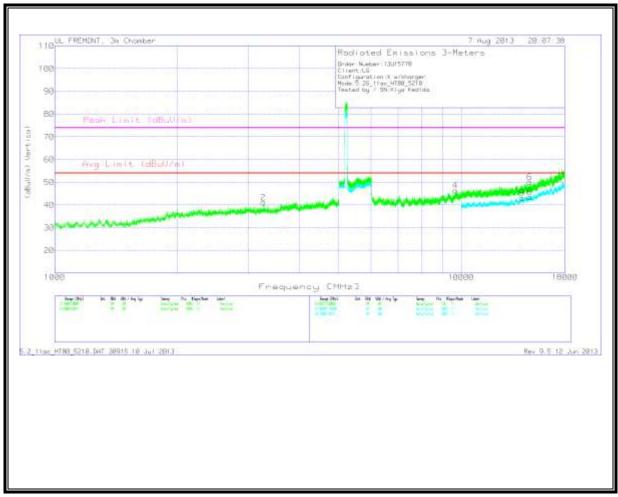






#### HARMONICS AND SPURIOUS EMISSIONS

**LOW CHANNEL VERTICAL** 



# **LOW CHANNEL DATA**

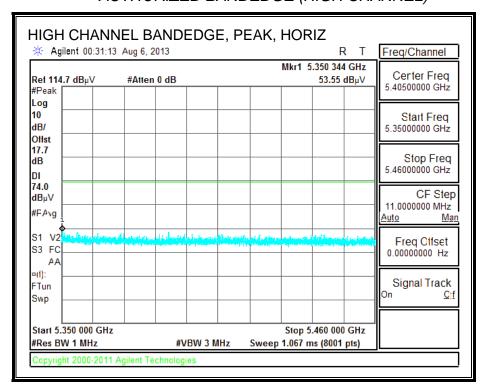
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T344<br>(db/m) | Amp/Cbl<br>/Fltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|-----------------------|----------------|------------------------|----------------|----------------|----------|
| 3.262              | 40.09                      | PK  | 33.3              | -32.3                        | 41.09                            | 53.97                 | -12.88         | 74                     | -32.91         | 100            | V        |
| 9.681              | 34.96                      | PK  | 37.3              | -25.9                        | 46.36                            | 53.97                 | -7.61          | 74                     | -27.64         | 100            | V        |
| 14.759             | 29.42                      | PK  | 39.9              | -25.9                        | 43.42                            | 53.97                 | -10.55         | 74                     | -30.58         | 100            | V        |
| 14.101             | 30.05                      | PK  | 39.5              | -26.4                        | 43.15                            | 53.97                 | -10.82         | 74                     | -30.85         | 100            | V        |

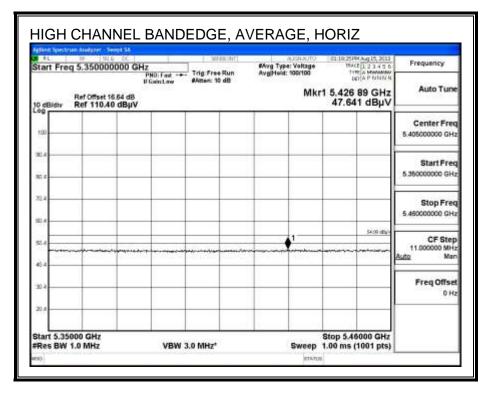
#### 9.3. 5.3 GHz

# 9.3.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND AUTHORIZED BANDEDGE (HIGH CHANNEL)

DATE: September 23, 2013

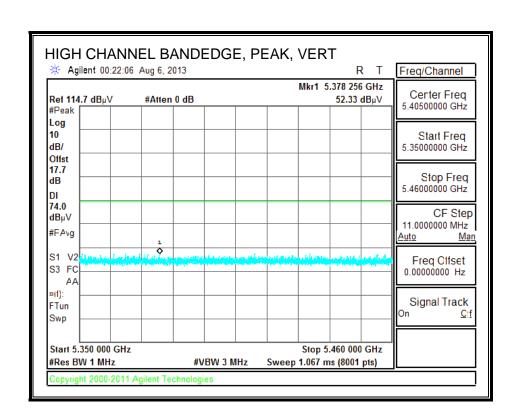
IC: 2703C-D820

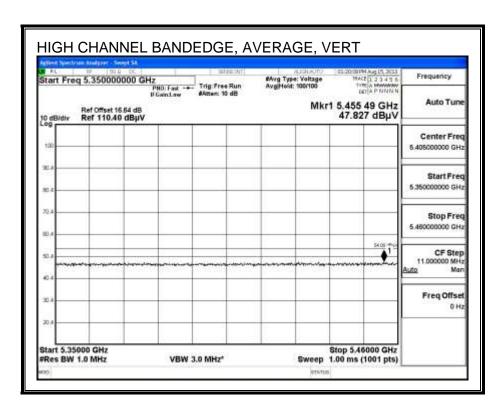




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REPORT NO: 13U15778-5C FCC ID: ZNFD820



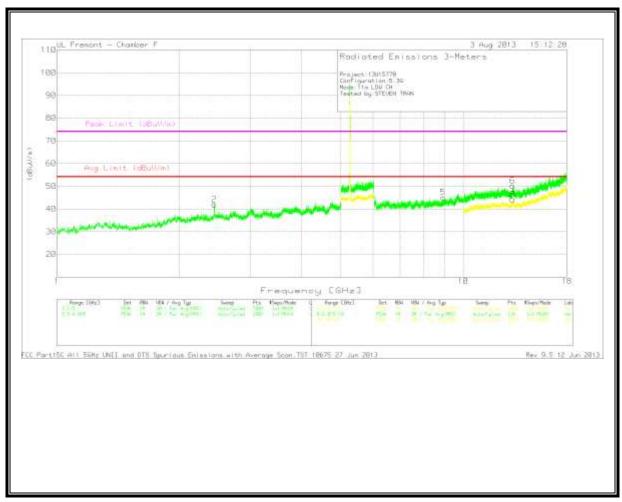


DATE: September 23, 2013

IC: 2703C-D820

#### HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL **VERTICAL** 

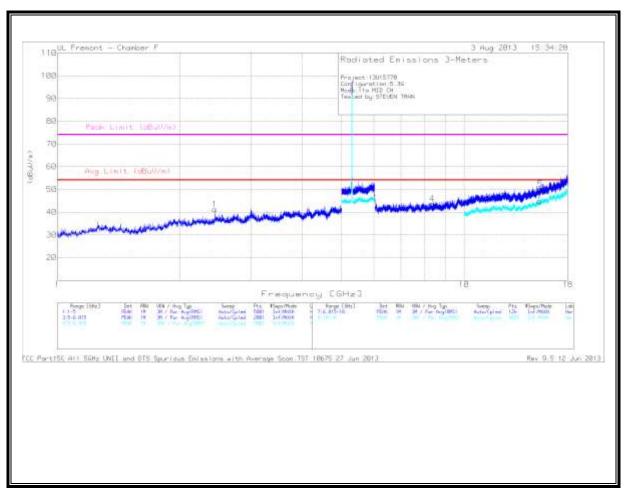


# **LOW CHANNEL DATA**

| Marker | Frequency<br>(GHz) | Meter<br>Readin<br>g<br>(dBuV) | Det | AF T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Av<br>Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|--------------------------------|-----|-------------------|----------------------------------|----------------------------------|------------------------------|----------------------|-------------------------------|----------------|-------------------|----------------|----------|
| 2      | 2.442              | 43.04                          | PK  | 32.3              | -33.4                            | 41.94                            | 54                           | -12.06               | 74                            | -32.06         | 0-360             | 200            | V        |
| 5      | 8.923              | 35.99                          | PK  | 36.3              | -27.2                            | 45.09                            | 54                           | -8.91                | 74                            | -28.91         | 0-360             | 200            | V        |
| 8      | 13.233             | 30.98                          | PK  | 39.2              | -26                              | 44.18                            | 54                           | -9.82                | 74                            | -29.82         | 0-360             | 101            | V        |

HORIZONTAL

REPORT NO: 13U15778-5C



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

FAX: (510) 661-0888

#### MID CHANNEL DATA

| Marker | Frequency<br>(GHz) | Meter<br>Readin<br>g<br>(dBuV) | Det | AF T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Av<br>Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|--------------------------------|-----|-------------------|----------------------------------|----------------------------------|------------------------------|----------------------|-------------------------------|----------------|-------------------|----------------|----------|
| 1      | 2.439              | 42.29                          | PK  | 32.3              | -33.4                            | 41.19                            | 54                           | -12.81               | 74                            | -32.81         | 0-360             | 199            | Н        |
| 4      | 8.356              | 35.72                          | PK  | 36                | -28.1                            | 43.62                            | 54                           | -10.38               | 74                            | -30.38         | 0-360             | 100            | Н        |
| 7      | 15 332             | 29.87                          | PK  | 40.5              | -25.6                            | 44.77                            | 54                           | -9 23                | 74                            | -29.23         | 0-360             | 199            | Н        |



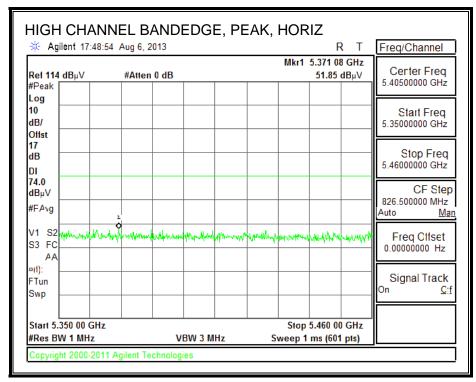
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

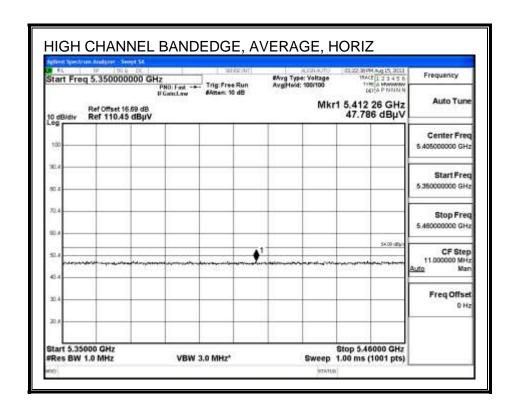
FAX: (510) 661-0888

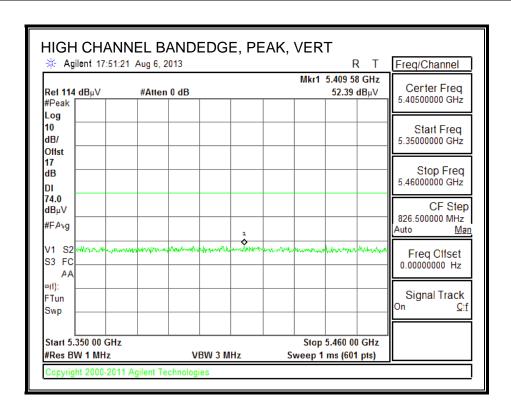
# HIGH CHANNEL DATA

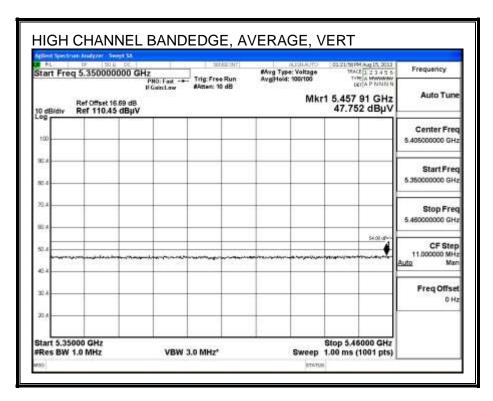
| Marker | Frequency<br>(GHz) | Meter<br>Readin<br>g<br>(dBuV) | Det | AF T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|--------------------------------|-----|-------------------|----------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
| 2      | 2.456              | 41.5                           | PK  | 32.3              | -33.4                            | 40.4                             | 53.97                        | -13.57         | 74                            | -33.6          | 0-360             | 100            | V        |
| 5      | 7.378              | 37.97                          | PK  | 35.7              | -28.6                            | 45.07                            | 53.97                        | -8.9           | 74                            | -28.93         | 0-360             | 201            | V        |
| 8      | 11.699             | 28.65                          | PK  | 39.1              | -25.7                            | 42.05                            | 53.97                        | -11.92         | 74                            | -31.95         | 0-360             | 201            | V        |

# 9.3.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.3 GHz BAND AUTHORIZED BANDEDGE (HIGH CHANNEL)



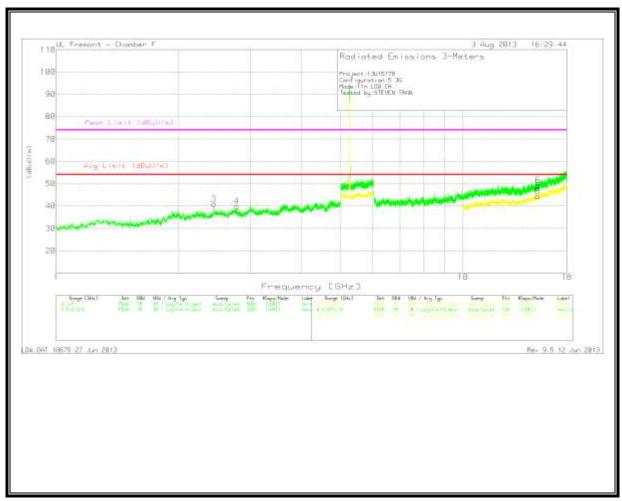






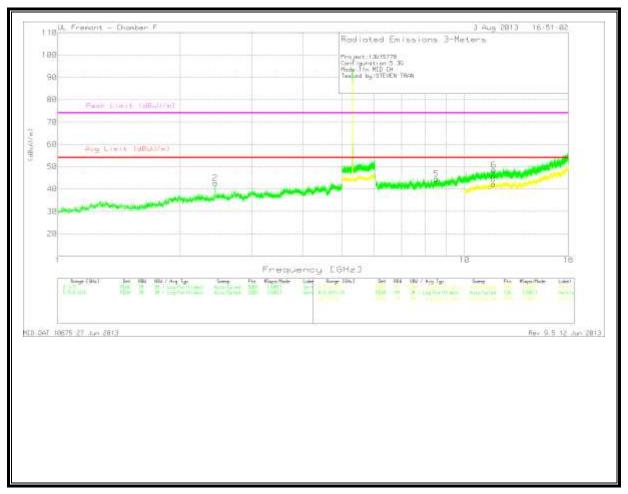
# **HARMONICS AND SPURIOUS EMISSIONS**

**LOW CHANNEL VERTICAL** 



# **LOW CHANNEL DATA**

| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|-------------------|----------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
| 3      | 2.44               | 42                         | PK  | 32.3              | -33.4                            | 40.9                             | 53.97                        | -13.07         | 74                            | -33.1          | 0-360             | 100            | V        |
| 4      | 2.777              | 40.34                      | PK  | 32.7              | -33                              | 40.04                            | 53.97                        | -13.93         | 74                            | -33.96         | 0-360             | 100            | V        |
| 8      | 15.251             | 29.54                      | PK  | 40.4              | -25.6                            | 44.34                            | 53.97                        | -9.63          | 74                            | -29.66         | 0-360             | 101            | V        |

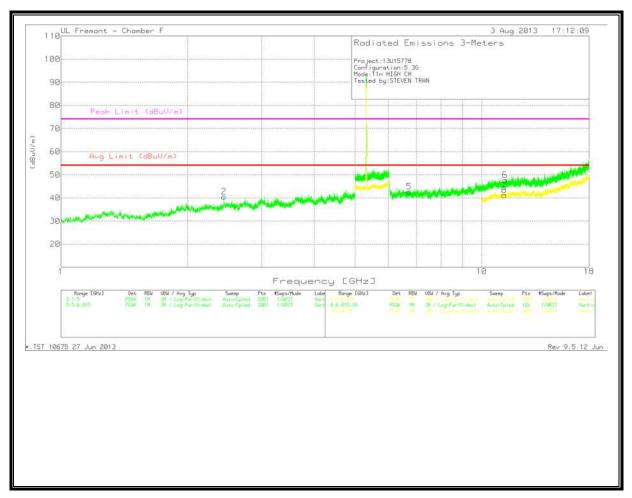


Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

FAX: (510) 661-0888

# MID CHANNEL DATA

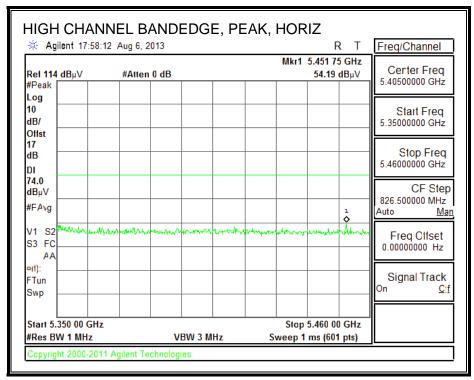
| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF<br>T120<br>(dB/m) | Amp/Cbl<br>/Fltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------------|------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
| 2      | 2.439              | 43.8                       | PK  | 32.3                 | -33.4                        | 42.7                             | 53.97                        | -11.27         | 74                            | -31.3          | 0-360             | 100            | V        |
| 5      | 8.52               | 35.83                      | PK  | 36                   | -27.3                        | 44.53                            | 53.97                        | -9.44          | 74                            | -29.47         | 0-360             | 101            | V        |
| 8      | 11.772             | 28.44                      | PK  | 39.2                 | -25.4                        | 42.24                            | 53.97                        | -11.73         | 74                            | -31.76         | 0-360             | 201            | V        |

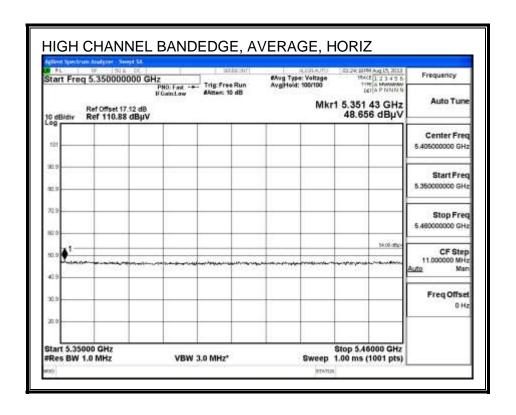


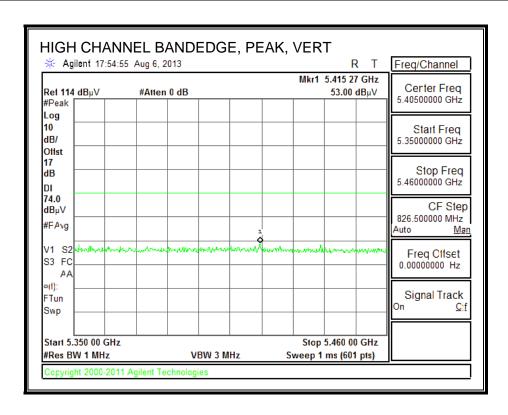
# HIGH CHANNEL DATA

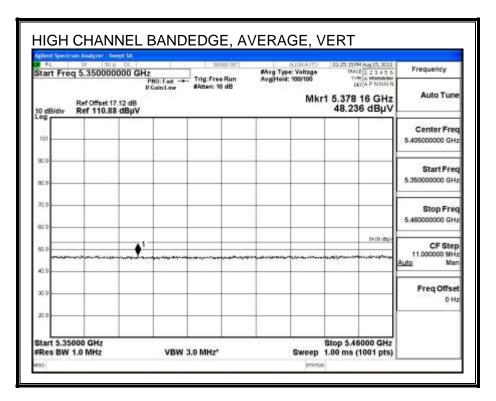
| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|-------------------|----------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
| 1      | 2.448              | 38.33                      | PK  | 32.3              | -33.4                            | 37.23                            | 53.97                        | -16.74         | 74                            | -36.77         | 0-360             | 100            | Н        |
| 3      | 6.24               | 36.43                      | PK  | 35.5              | -30.1                            | 41.83                            | 53.97                        | -12.14         | 74                            | -32.17         | 0-360             | 100            | Н        |
| 7      | 11.772             | 28.46                      | PK  | 39.2              | -25.4                            | 42.26                            | 53.97                        | -11.71         | 74                            | -31.74         | 0-360             | 199            | Н        |

# 9.3.5. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.3 GHz BAND AUTHORIZED BANDEDGE (HIGH CHANNEL)



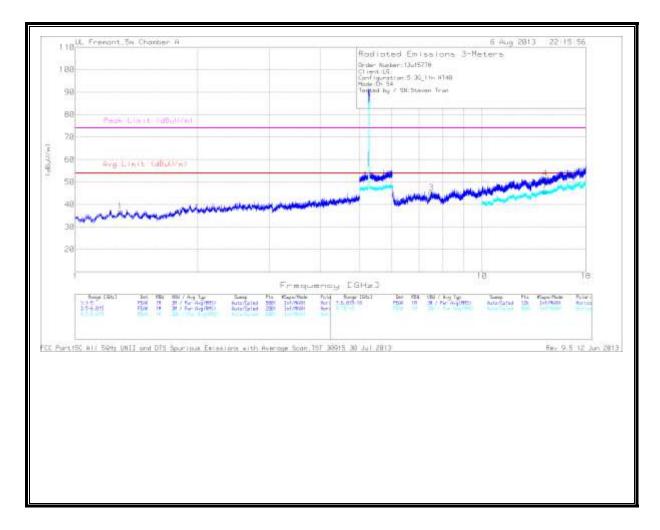






#### HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL **HORIZONTAL** 

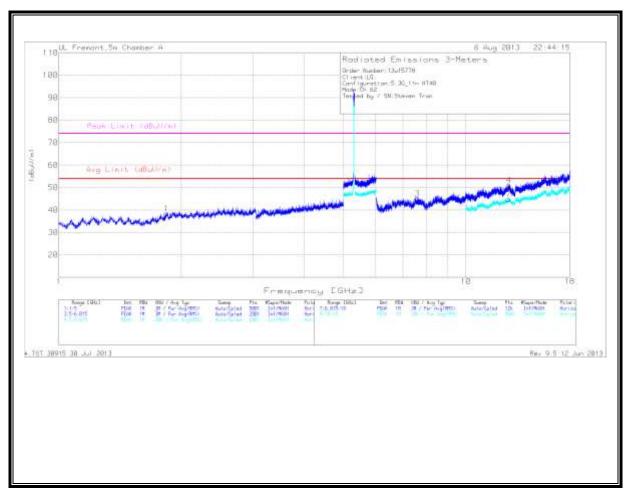


Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

FAX: (510) 661-0888

#### LOW CHANNEL DATA

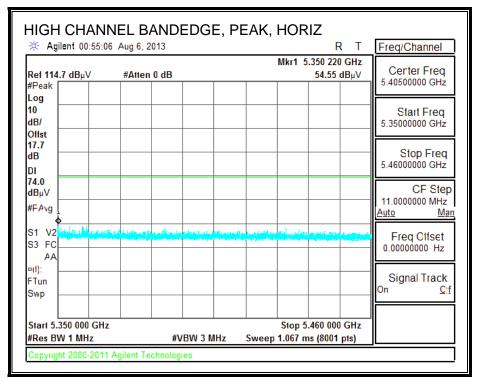
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T136<br>(dB/m) | Amp/Cbl<br>/Fltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/m<br>) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
| 1.29               | 41.94                      | PK  | 30.2              | -35.3                        | 36.84                            | 53.97                        | -17.13         | 74                            | -37.16         | 0-360             | 100            | Н        |
| 7.502              | 34.61                      | PK  | 35.4              | -24.8                        | 45.21                            | 53.97                        | -8.76          | 74                            | -28.79         | 0-360             | 100            | Н        |
| 14.294             | 29.18                      | PK  | 39.6              | -22.8                        | 45.98                            | 53.97                        | -7.99          | 74                            | -28.02         | 0-360             | 100            | Н        |

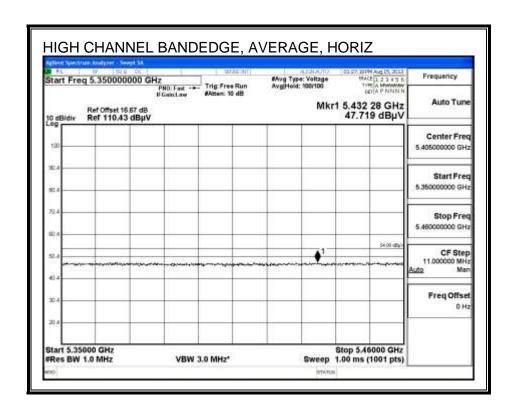


#### MID CHANNEL DATA

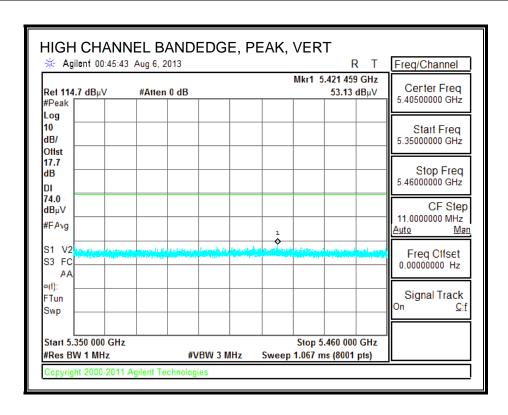
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T136<br>(dB/m) | Amp/Cbl/<br>Fltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/m<br>) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|------------------------------|----------------|---------------------------|----------------|-------------------|----------------|----------|
| 1.837              | 40.78                      | PK  | 30.9              | -33.3                        | 38.38                            | 53.97                        | -15.59         | 74                        | -35.62         | 0-360             | 200            | Н        |
| 7.59               | 35.38                      | PK  | 35.5              | -25.8                        | 45.08                            | 53.97                        | -8.89          | 74                        | -28.92         | 0-360             | 100            | Н        |
| 12.724             | 27.55                      | PK  | 39.2              | -22                          | 44.75                            | 53.97                        | -9.22          | 74                        | -29.25         | 0-360             | 200            | Н        |

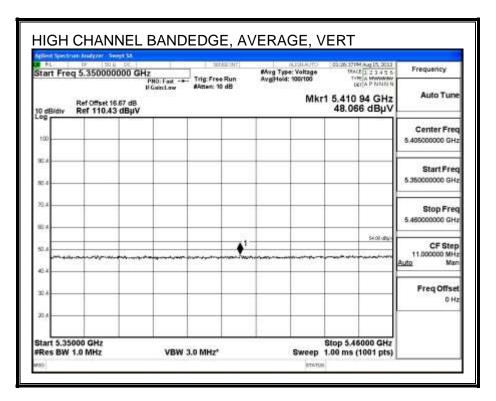
# 9.3.7. TX ABOVE 1 GHz 802.11ac HT20 MODE IN THE 5.3 GHz BAND AUTHORIZED BANDEDGE (HIGH CHANNEL)





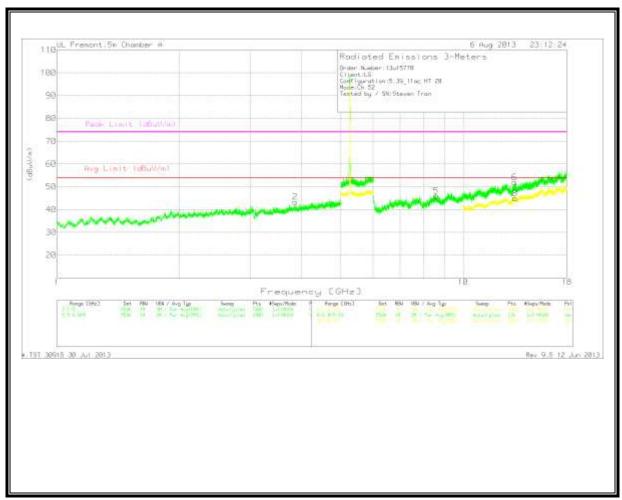
REPORT NO: 13U15778-5C DATE: September 23, 2013 IC: 2703C-D820 FCC ID: ZNFD820





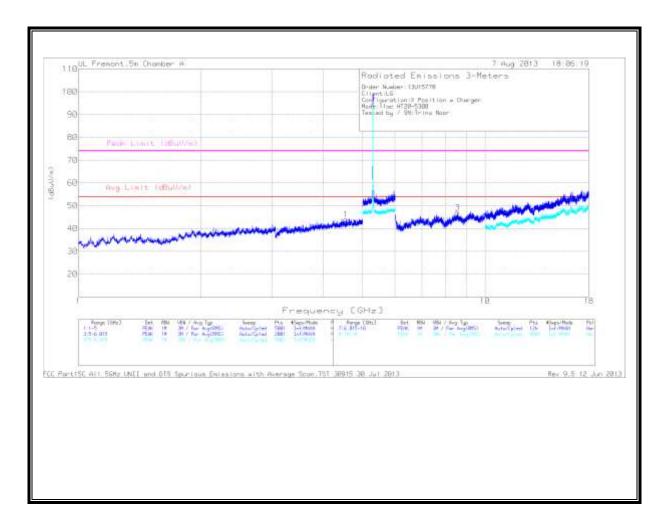
# **HARMONICS AND SPURIOUS EMISSIONS**

LOW CHANNEL VERTICAL



# **LOW CHANNEL DATA**

| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T136<br>(dB/m) | Amp/<br>Cbl/Fl<br>tr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|----------------------------------|----------------------------------|-----------------------|----------------|---------------------------|----------------|-------------------|----------------|----------|
| 3.859              | 40.03                      | PK  | 33.6              | -30.3                            | 43.33                            | 53.97                 | -10.64         | 74                        | -30.67         | 0-360             | 100            | V        |
| 8.578              | 36.03                      | PK  | 35.7              | -25.8                            | 45.93                            | 53.97                 | -8.04          | 74                        | -28.07         | 0-360             | 200            | V        |
| 13.417             | 28.36                      | PK  | 39.1              | -22.6                            | 44.86                            | 53.97                 | -9.11          | 74                        | -29.14         | 0-360             | 200            | V        |

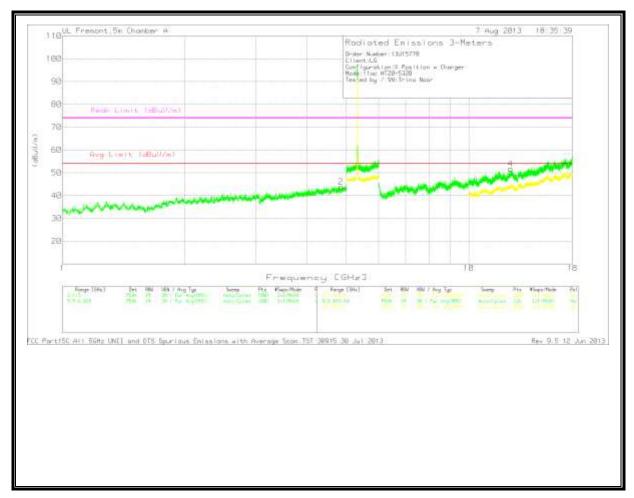


Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

FAX: (510) 661-0888

#### MID CHANNEL DATA

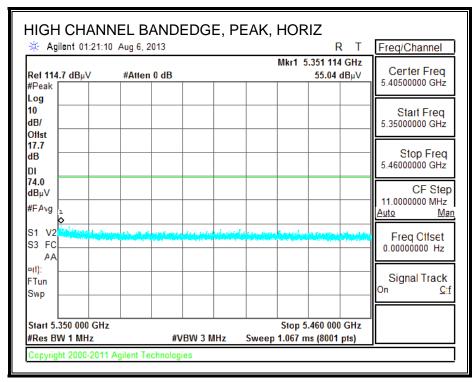
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T136<br>(dB/m) | Amp/<br>Cbl/Fl<br>tr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|----------------------------------|----------------------------------|-----------------------|----------------|---------------------------|----------------|-------------------|----------------|----------|
| 4.548              | 39.01                      | PK  | 33.8              | -28.9                            | 43.91                            | 53.97                 | -10.06         | 74                        | -30.09         | 0-360             | 100            | Н        |
| 8.556              | 36.58                      | PK  | 35.7              | -25.4                            | 46.88                            | 53.97                 | -7.09          | 74                        | -27.12         | 0-360             | 100            | Н        |

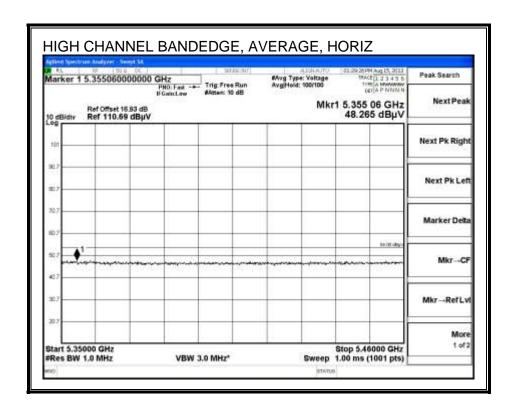


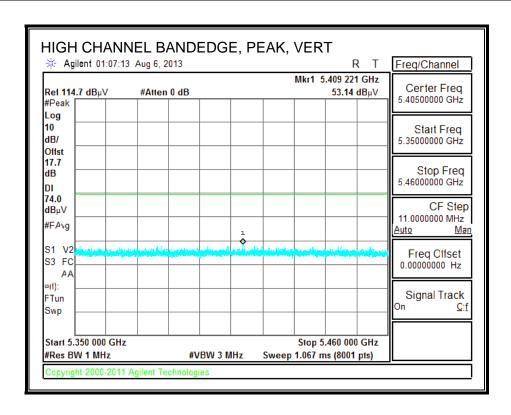
# HIGH CHANNEL DATA

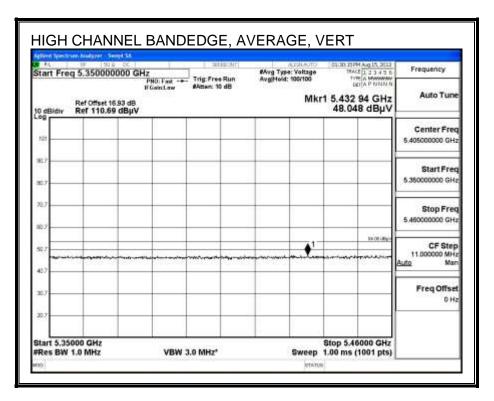
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T136<br>(dB/m) | Amp/<br>Cbl/Fl<br>tr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|----------------------------------|----------------------------------|-----------------------|----------------|---------------------------|----------------|-------------------|----------------|----------|
| 4.849              | 37.47                      | PK  | 33.9              | -27.6                            | 43.77                            | 53.97                 | -10.2          | 74                        | -30.23         | 0-360             | 200            | V        |
| 12.675             | 34.92                      | PK  | 39.2              | -22.4                            | 51.72                            | 53.97                 | -2.25          | 74                        | -22.28         | 0-360             | 200            | V        |

# 9.3.9. TX ABOVE 1 GHz 802.11ac HT40 MODE IN THE 5.3 GHz BAND AUTHORIZED BANDEDGE (HIGH CHANNEL)



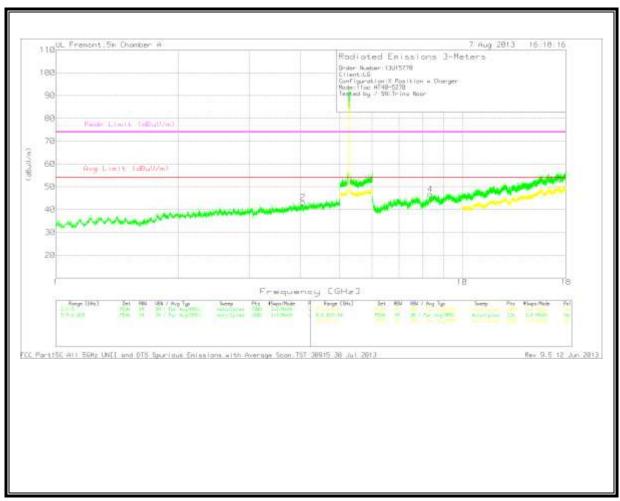






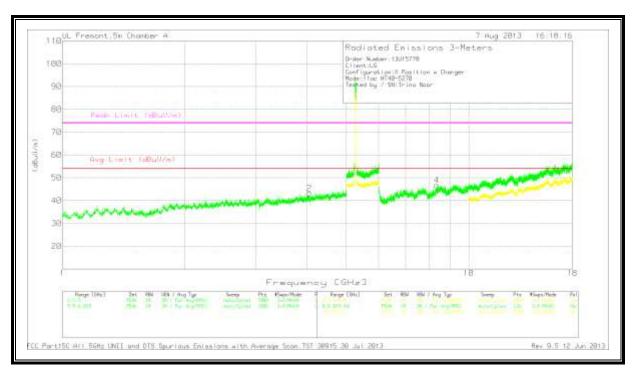
#### HARMONICS AND SPURIOUS EMISSIONS

**LOW CHANNEL VERTICAL** 



# **LOW CHANNEL DATA**

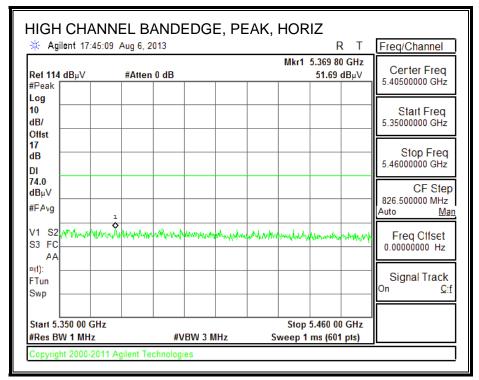
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T136<br>(dB/m) | Amp/Cbl/<br>Fltr/Pad<br>(dB) | Correcte<br>d<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|--------------------------------------|-----------------------|----------------|---------------------------|----------------|-------------------|----------------|----------|
| 4.057              | 39.13                      | PK  | 33.8              | -29.8                        | 43.13                                | 53.97                 | -10.84         | 74                        | -30.87         | 0-360             | 200            | V        |
| 8.353              | 36.63                      | PK  | 35.7              | -25.6                        | 46.73                                | 53.97                 | -7.24          | 74                        | -27.27         | 0-360             | 100            | V        |

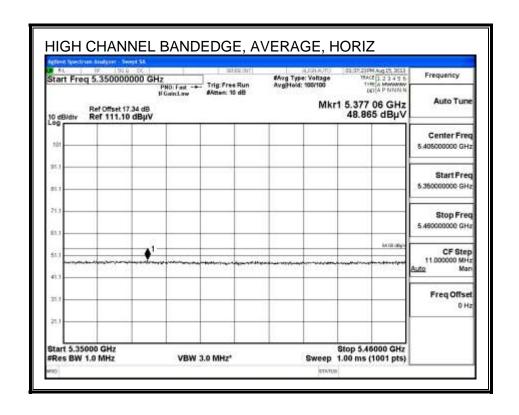


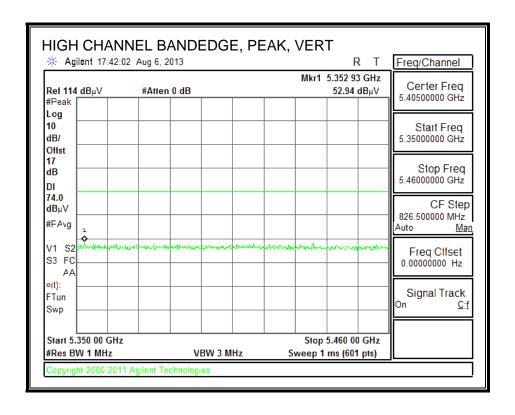
# MID CHANNEL DATA

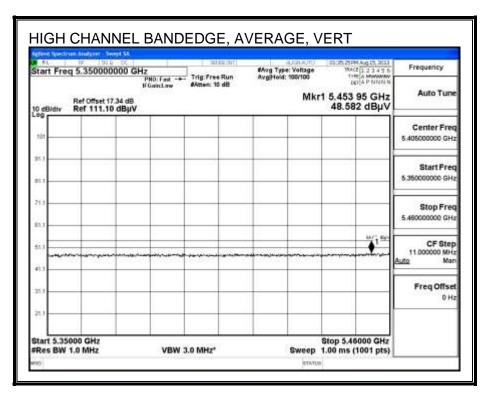
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T136<br>(dB/m) | Amp/C<br>bl/Fltr/P<br>ad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|----------------------------------|----------------------------------|-----------------------|----------------|---------------------------|----------------|-------------------|----------------|----------|
| 4.057              | 39.13                      | PK  | 33.8              | -29.8                            | 43.13                            | 53.97                 | -10.84         | 74                        | -30.87         | 0-360             | 200            | V        |
| 8.353              | 36.63                      | PK  | 35.7              | -25.6                            | 46.73                            | 53.97                 | -7.24          | 74                        | -27.27         | 0-360             | 100            | V        |

# 9.3.11. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.3 GHz BAND AUTHORIZED BANDEDGE (HIGH CHANNEL)



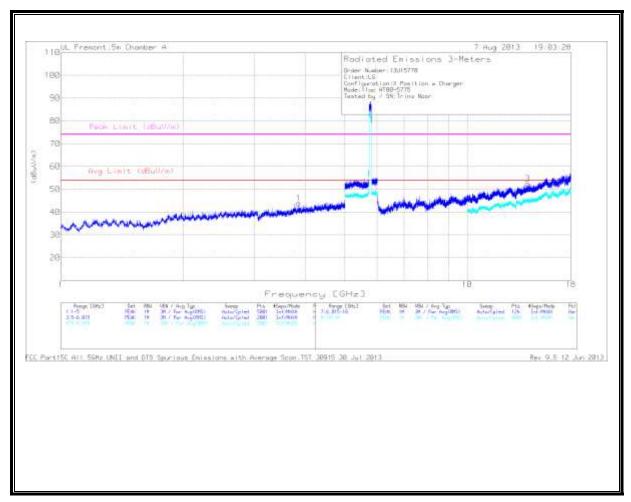


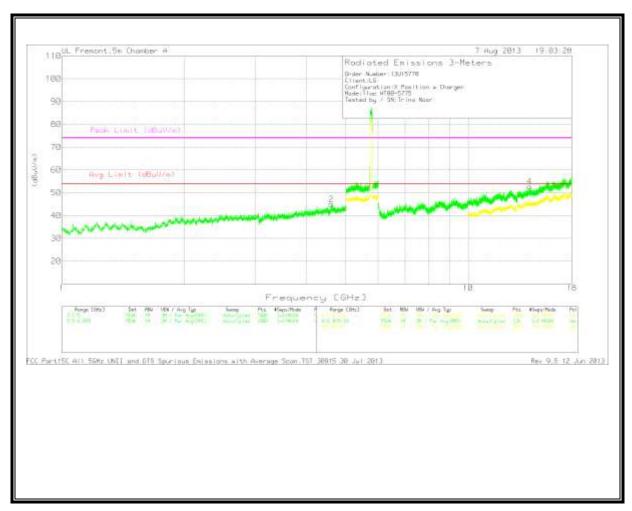




#### HARMONICS AND SPURIOUS EMISSIONS

**LOW CHANNEL HORIZONTAL** 





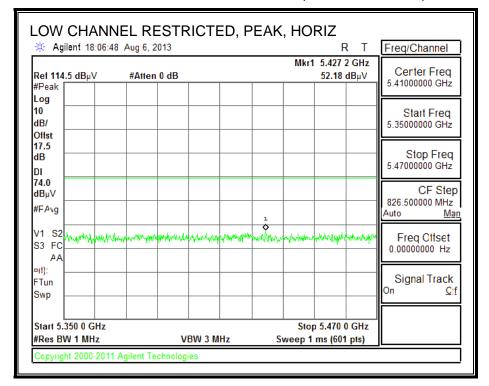
# **LOW CHANNEL DATA**

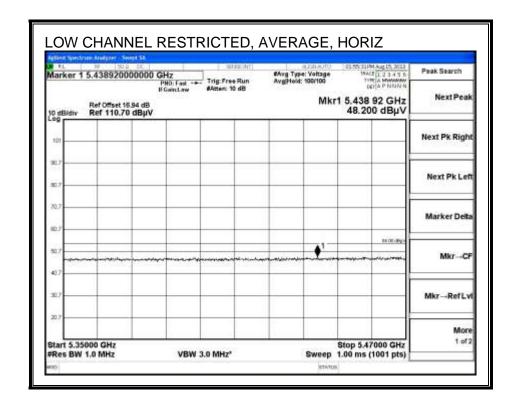
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T136<br>(dB/m) | Amp/<br>Cbl/Fl<br>tr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|----------------------------------|----------------------------------|-----------------------|----------------|---------------------------|----------------|-------------------|----------------|----------|
| 3.85               | 40.53                      | PK  | 33.6              | -30.3                            | 43.83                            | 53.97                 | -10.14         | 74                        | -30.17         | 0-360             | 200            | Н        |
| 4.608              | 38.82                      | PK  | 33.9              | -27.8                            | 44.92                            | 53.97                 | -9.05          | 74                        | -29.08         | 0-360             | 100            | V        |
| 14.094             | 35.6                       | PK  | 39.2              | -22.5                            | 52.3                             | 53.97                 | -1.67          | 74                        | -21.7          | 0-360             | 100            | Н        |
| 14.165             | 35.69                      | PK  | 39.3              | -22.3                            | 52.69                            | 53.97                 | -1.28          | 74                        | -21.31         | 0-360             | 100            | V        |

#### 9.4. 5.5-5.6 GHz

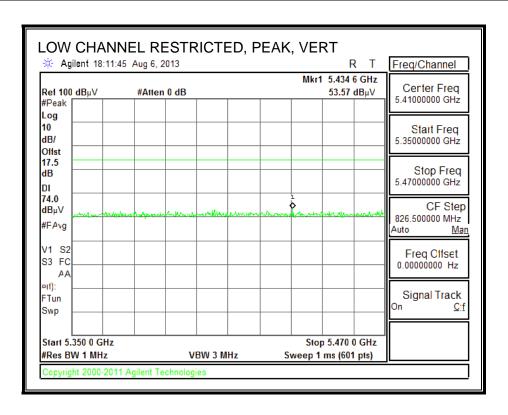
#### 9.4.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.5 GHz BAND

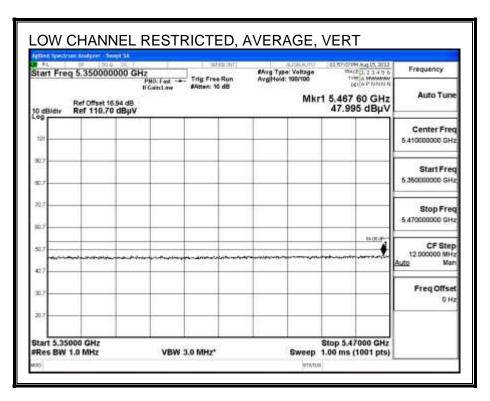
RESTRICTED BANDEDGE (LOW CHANNEL)





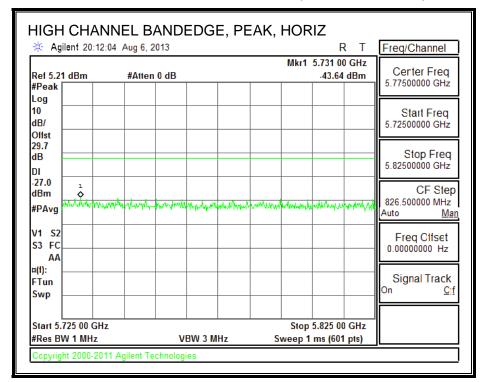
REPORT NO: 13U15778-5C DATE: September 23, 2013 IC: 2703C-D820 FCC ID: ZNFD820



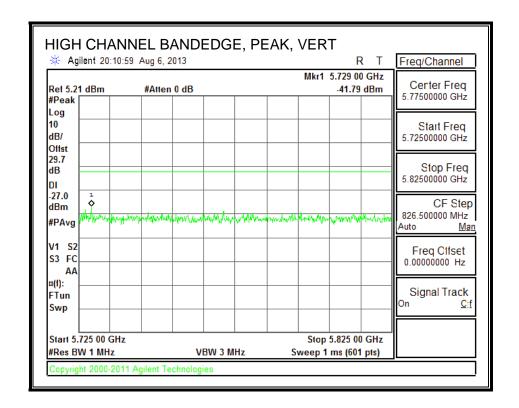


REPORT NO: 13U15778-5C DATE: September 23, 2013 IC: 2703C-D820 FCC ID: ZNFD820

# AUTHORIZED BANDEDGE (HIGH CHANNEL)

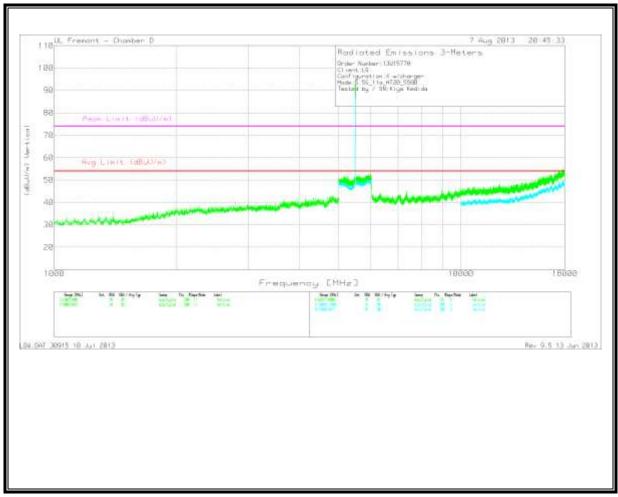


REPORT NO: 13U15778-5C FCC ID: ZNFD820



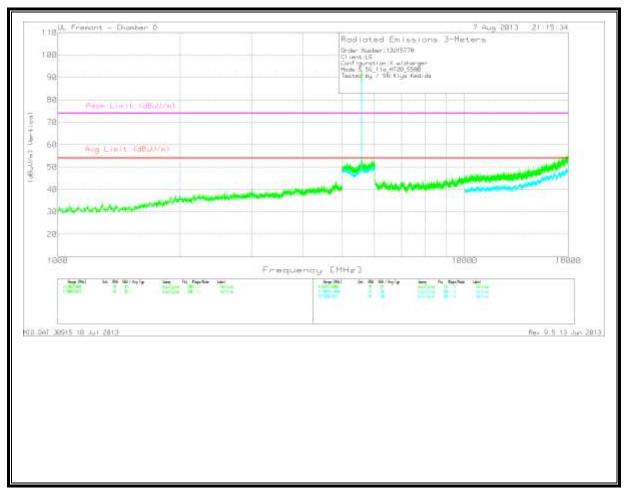
#### HARMONICS AND SPURIOUS EMISSIONS

**LOW CHANNEL VERTICAL** 



# **LOW CHANNEL DATA**

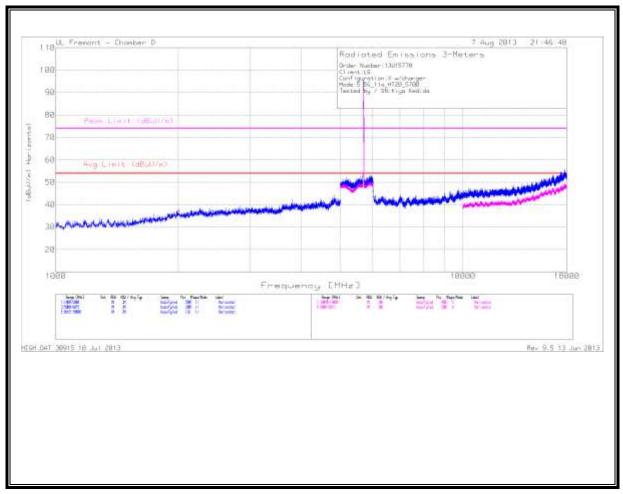
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T344<br>(db/m) | Amp/Cbl<br>/Fltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|-----------------------|----------------|------------------------|----------------|----------------|----------|
| 2.79               | 40.35                      | PK  | 32.9              | -33.1                        | 40.15                            | 53.97                 | -13.82         | 74                     | -33.85         | 201            | V        |
| 9.322              | 35.14                      | PK  | 37                | -26.1                        | 46.04                            | 53.97                 | -7.93          | 74                     | -27.96         | 100            | V        |
| 12.407             | 27.59                      | PK  | 39.2              | -25.7                        | 41.09                            | 53.97                 | -12.88         | 74                     | -32.91         | 201            | V        |



# MID CHANNEL DATA

| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T344<br>(db/m) | Amp/Cbl/F<br>ltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|-----------------------|----------------|------------------------|----------------|----------------|----------|
| 3.026              | 39.47                      | PK  | 33.1              | -32.3                        | 40.27                            | 53.97                 | -13.7          | 74                     | -33.73         | 201            | V        |
| 8.582              | 36.04                      | PK  | 36.3              | -27.5                        | 44.84                            | 53.97                 | -9.13          | 74                     | -29.16         | 201            | V        |
| 14.375             | 29.8                       | PK  | 39.8              | -26.3                        | 43.3                             | 53.97                 | -10.67         | 74                     | -30.7          | 100            | V        |

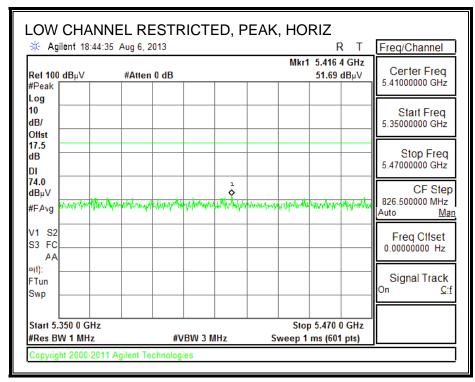
REPORT NO: 13U15778-5C

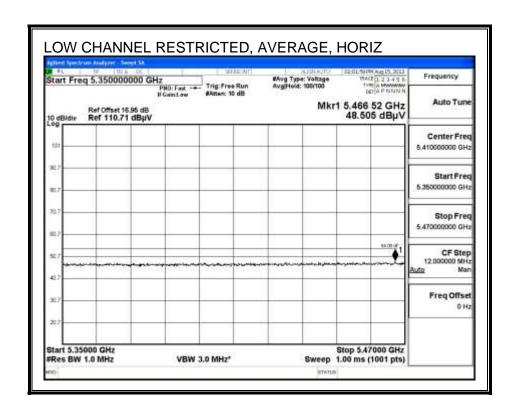


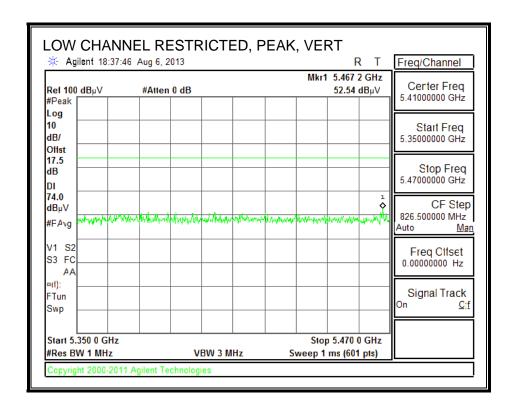
# HIGH CHANNEL DATA

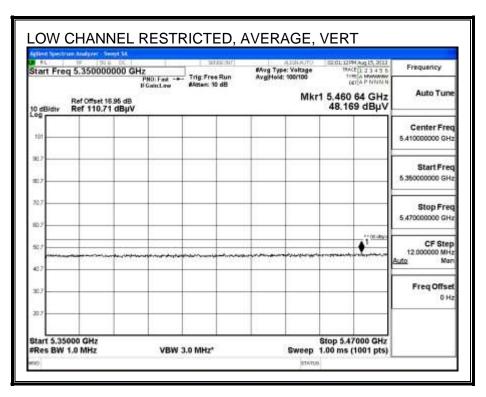
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T344<br>(db/m) | Amp/Cbl/F<br>ltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|-----------------------|----------------|------------------------|----------------|----------------|----------|
| 3.801              | 41.15                      | PK  | 33.8              | -32.4                        | 42.55                            | 53.97                 | -11.42         | 74                     | -31.45         | 100            | Н        |
| 7.019              | 37.74                      | PK  | 35.9              | -29                          | 44.64                            | 53.97                 | -9.33          | 74                     | -29.36         | 201            | Н        |
| 12.348             | 28.18                      | PK  | 39.2              | -26.1                        | 41.28                            | 53.97                 | -12.69         | 74                     | -32.72         | 100            | Н        |

# 9.4.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.5 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

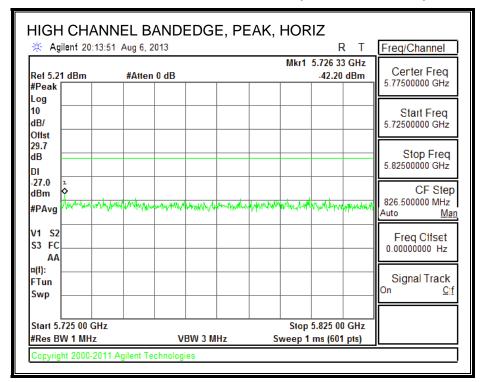




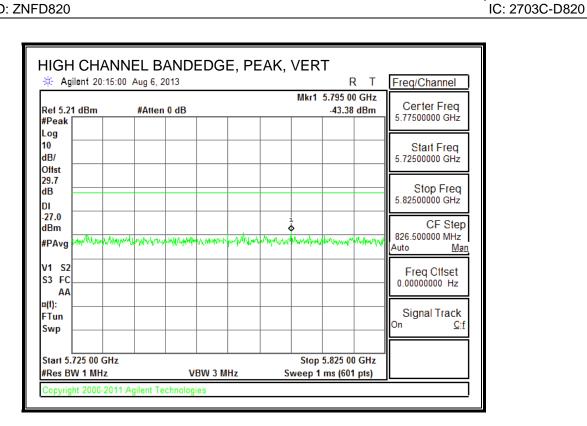




## **AUTHORIZED BANDEDGE (HIGH CHANNEL)**



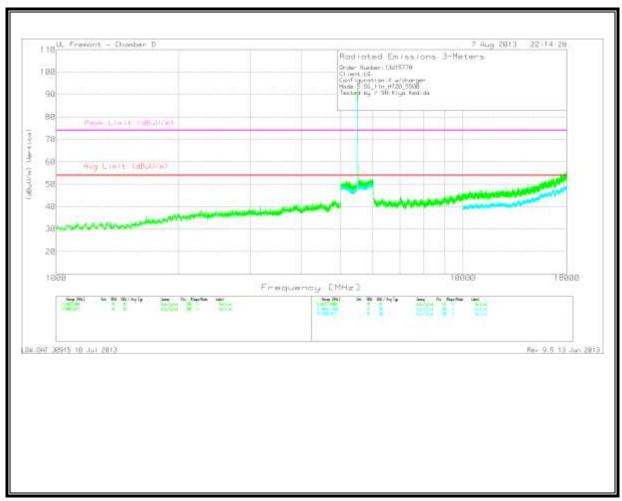
REPORT NO: 13U15778-5C FCC ID: ZNFD820



DATE: September 23, 2013

## **HARMONICS AND SPURIOUS EMISSIONS**

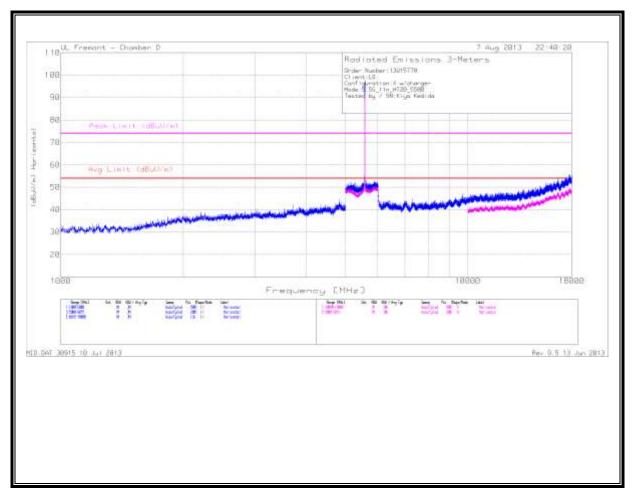
**LOW CHANNEL VERTICAL** 



## **LOW CHANNEL DATA**

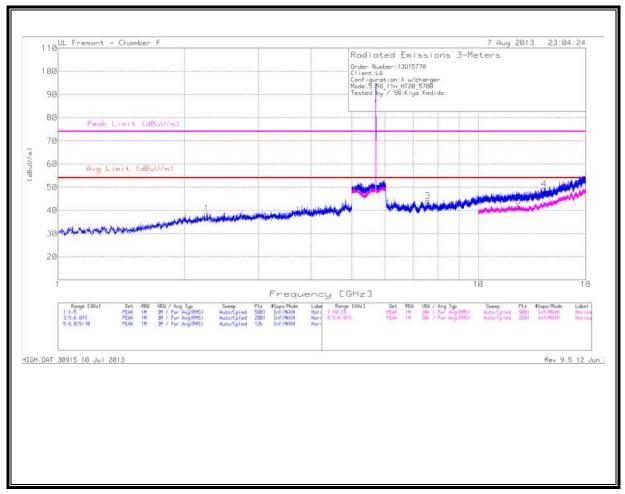
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T344<br>(db/m) | Amp/Cbl<br>/Fltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|-----------------------|----------------|------------------------|----------------|----------------|----------|
| 3.178              | 40.86                      | PK  | 33.2              | -33.4                        | 40.66                            | 53.97                 | -13.31         | 74                     | -33.34         | 100            | V        |
| 7.316              | 37.14                      | PK  | 35.9              | -28.7                        | 44.34                            | 53.97                 | -9.63          | 74                     | -29.66         | 200            | V        |
| 14.31              | 30.16                      | PK  | 39.7              | -26.7                        | 43.16                            | 53.97                 | -10.81         | 74                     | -30.84         | 100            | V        |

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### MID CHANNEL DATA

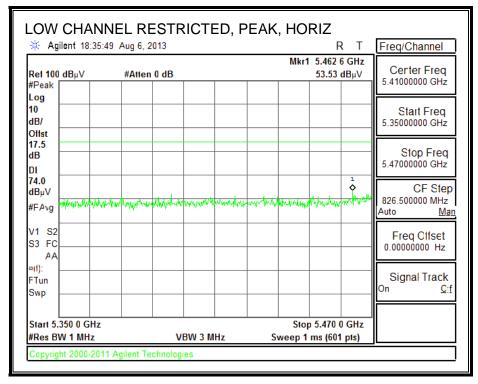
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T344<br>(db/m) | Amp/Cbl/F<br>ltr/Pad<br>(dB) | Correcte<br>d<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|--------------------------------------|-----------------------|----------------|------------------------|----------------|----------------|----------|
| 3.721              | 40.79                      | PK  | 33.7              | -32.4                        | 42.09                                | 53.97                 | -11.88         | 74                     | -31.91         | 100            | Н        |
| 7.313              | 37.99                      | PK  | 35.9              | -28.8                        | 45.09                                | 53.97                 | -8.88          | 74                     | -28.91         | 201            | Н        |
| 13.696             | 29.7                       | PK  | 39.2              | -26.4                        | 42.5                                 | 53.97                 | -11.47         | 74                     | -31.5          | 100            | Н        |
| 11.77              | 28.12                      | PK  | 38.9              | -25.4                        | 41.62                                | 53.97                 | -12.35         | 74                     | -32.38         | 100            | Н        |

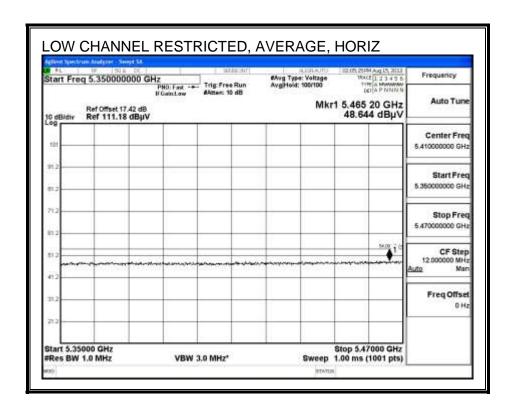


## HIGH CHANNEL DATA

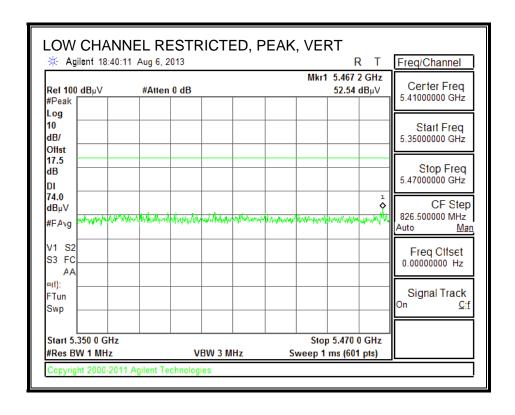
| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF<br>T344<br>(db/m) | Amp/Cb<br>I/Fltr/Pa<br>d<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------------|----------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
| 1      | 2.259              | 39.51                      | PK  | 32.4                 | -33.3                            | 38.61                            | 53.97                        | -15.36         | 74                            | -35.39         | 0-360             | 100            | Н        |
| 3      | 7.58               | 37.03                      | PK  | 36                   | -29                              | 44.03                            | 53.97                        | -9.94          | 74                            | -29.97         | 0-360             | 201            | Н        |
| 6      | 12.462             | 27.64                      | PK  | 39.2                 | -25.1                            | 41.74                            | 53.97                        | -12.23         | 74                            | -32.26         | 0-360             | 100            | H        |

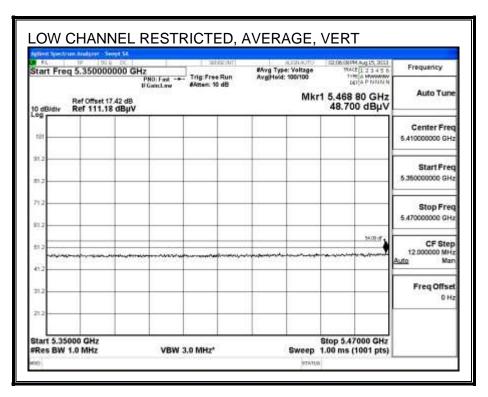
# 9.4.5. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.5 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)





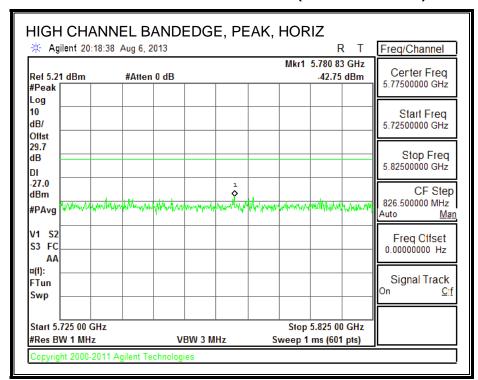
REPORT NO: 13U15778-5C DATE: September 23, 2013 IC: 2703C-D820 FCC ID: ZNFD820



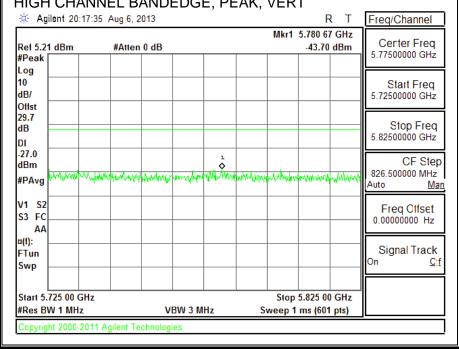


REPORT NO: 13U15778-5C DATE: September 23, 2013 IC: 2703C-D820 FCC ID: ZNFD820

## **AUTHORIZED BANDEDGE (HIGH CHANNEL)**



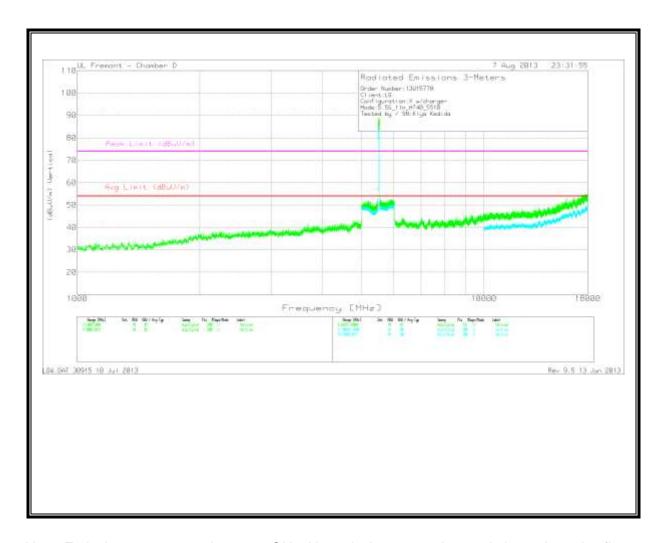
REPORT NO: 13U15778-5C FCC ID: ZNFD820



DATE: September 23, 2013

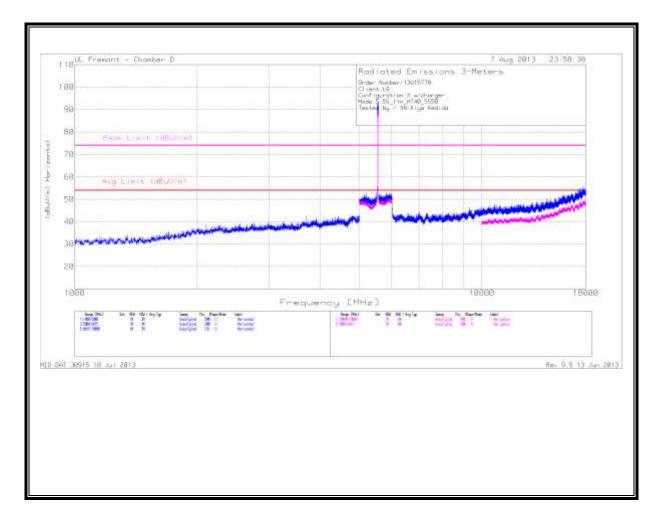
## **HARMONICS AND SPURIOUS EMISSIONS**

**LOW CHANNEL VERTICAL** 



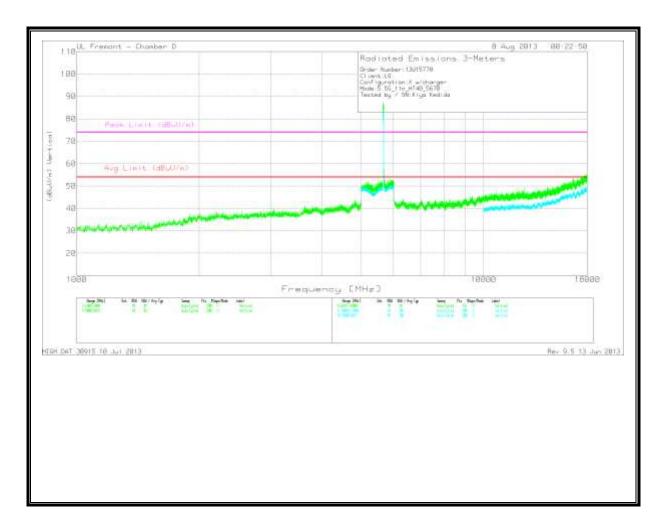
## **LOW CHANNEL DATA**

| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T344<br>(db/m) | Amp/Cbl/F<br>ltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|-----------------------|----------------|------------------------|----------------|----------------|----------|
| 3.706              | 40.04                      | PK  | 33.7              | -32.3                        | 41.44                            | 53.97                 | -12.53         | 74                     | -32.56         | 201            | V        |
| 9.054              | 35.73                      | PK  | 36.7              | -27                          | 45.43                            | 53.97                 | -8.54          | 74                     | -28.57         | 100            | V        |
| 13.731             | 29.62                      | PK  | 39.2              | -26.6                        | 42.22                            | 53.97                 | -11.75         | 74                     | -31.78         | 201            | V        |



### MID CHANNEL DATA

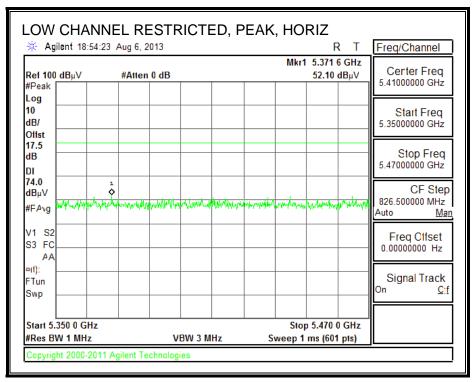
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T344<br>(db/m) | Amp/Cbl/F<br>ltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|-----------------------|----------------|------------------------|----------------|----------------|----------|
| 3.701              | 41.2                       | PK  | 33.7              | -32.2                        | 42.7                             | 53.97                 | -11.27         | 74                     | -31.3          | 201            | Н        |
| 9.322              | 35.65                      | PK  | 37                | -26.1                        | 46.55                            | 53.97                 | -7.42          | 74                     | -27.45         | 200            | Н        |
| 12.463             | 27.86                      | PK  | 39.2              | -25.1                        | 41.96                            | 53.97                 | -12.01         | 74                     | -32.04         | 201            | Н        |

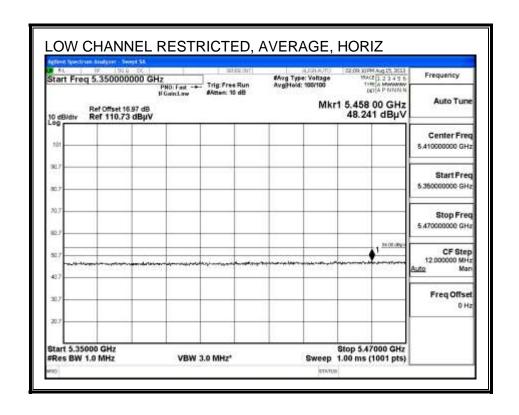


## HIGH CHANNEL DATA

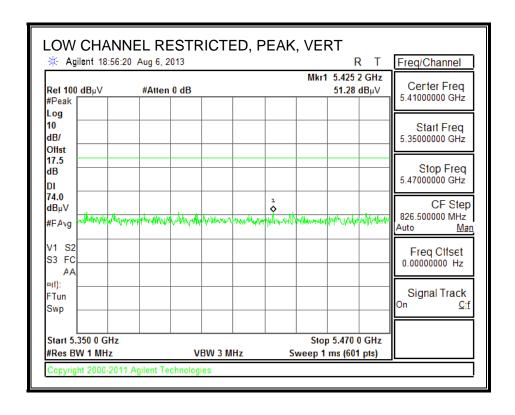
| Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T344<br>(db/m) | Amp/Cbl/F<br>ltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|-------------------|------------------------------|----------------------------------|-----------------------|----------------|------------------------|----------------|----------------|----------|
| 3.048              | 39.33                      | PK  | 33.1              | -32.5                        | 39.93                            | 53.97                 | -14.04         | 74                     | -34.07         | 201            | V        |
| 8.085              | 36.63                      | PK  | 36                | -28.5                        | 44.13                            | 53.97                 | -9.84          | 74                     | -29.87         | 201            | V        |

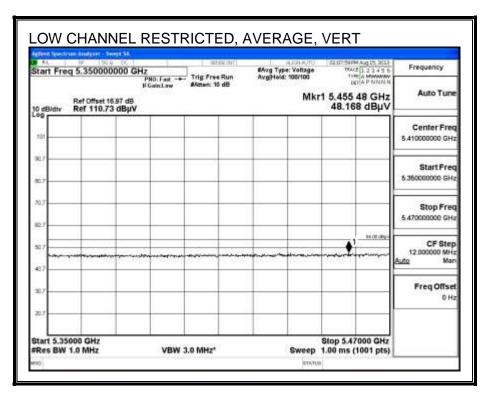
# 9.4.7. TX ABOVE 1 GHz 802.11ac HT20 MODE IN THE 5.5 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)





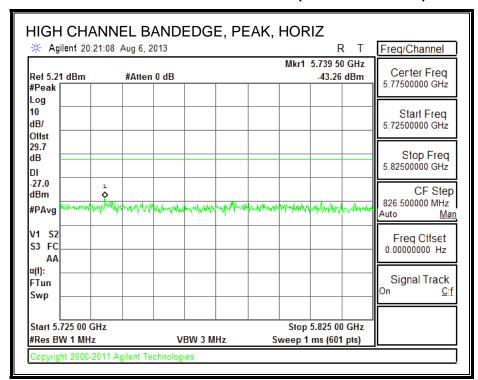
REPORT NO: 13U15778-5C DATE: September 23, 2013 IC: 2703C-D820 FCC ID: ZNFD820





REPORT NO: 13U15778-5C DATE: September 23, 2013 IC: 2703C-D820 FCC ID: ZNFD820

## **AUTHORIZED BANDEDGE (HIGH CHANNEL)**



REPORT NO: 13U15778-5C FCC ID: ZNFD820

FTun

Swp

Start 5.725 00 GHz

Copyright 2000-2011 Agilent Technologies

#Res BW 1 MHz

VBW 3 MHz

Stop 5.825 00 GHz

Sweep 1 ms (601 pts)

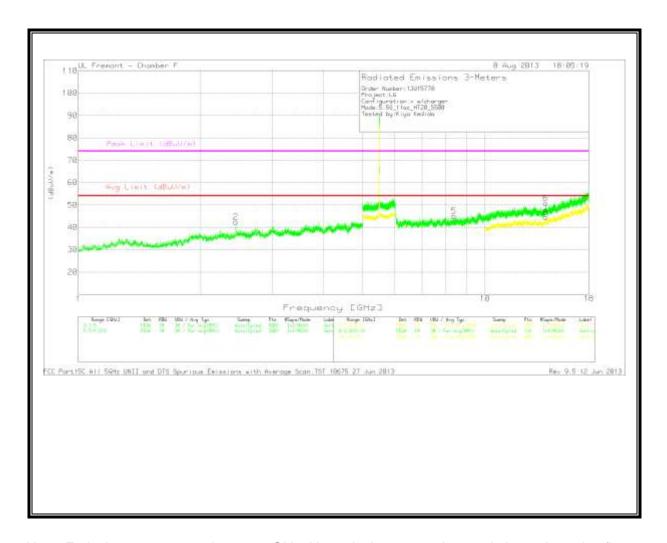
DATE: September 23, 2013

<u>C:f</u>

IC: 2703C-D820

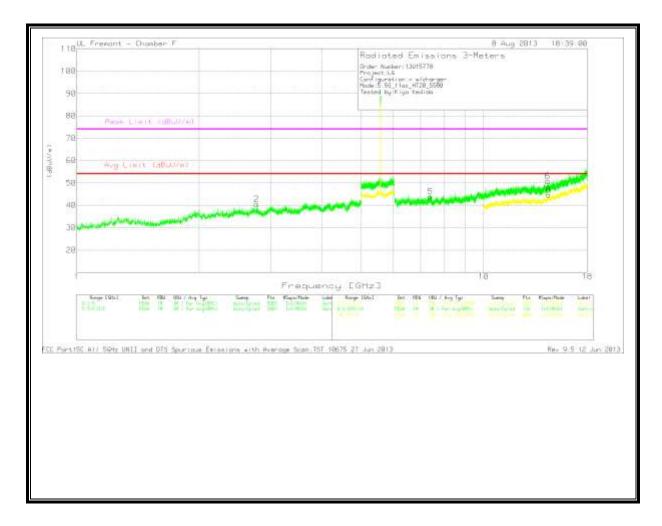
## **HARMONICS AND SPURIOUS EMISSIONS**

**LOW CHANNEL VERTICAL** 



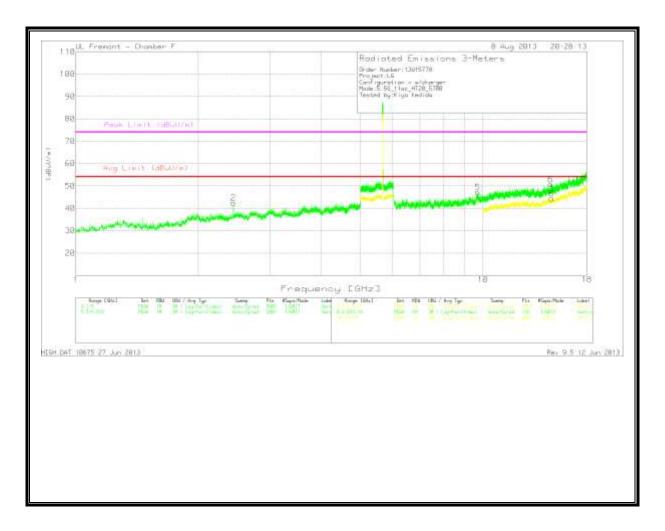
## **LOW CHANNEL DATA**

| Marker | Frequency<br>(GHz) | Meter<br>Readin<br>g<br>(dBuV) | Det | AF T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|--------------------------------|-----|-------------------|----------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
| 2      | 2.439              | 43.58                          | PK  | 32.3              | -33.4                            | 42.48                            | 53.97                        | -11.49         | 74                            | -31.52         | 0-360             | 199            | V        |
| 5      | 8.38               | 37.18                          | PK  | 36                | -28.2                            | 44.98                            | 53.97                        | -8.99          | 74                            | -29.02         | 0-360             | 100            | V        |
| 8      | 14.102             | 31.51                          | PK  | 39.4              | -26.4                            | 44.51                            | 53.97                        | -9.46          | 74                            | -29.49         | 0-360             | 100            | V        |



## MID CHANNEL DATA

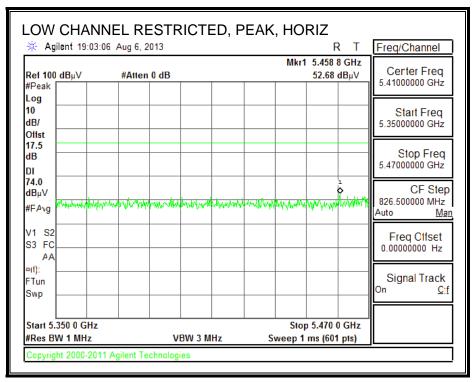
| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|-------------------|----------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
| 2      | 2.769              | 40.66                      | PK  | 32.7              | -32.9                            | 40.46                            | 53.97                        | -13.51         | 74                            | -33.54         | 0-360             | 101            | V        |
| 5      | 7.398              | 37.05                      | PK  | 35.7              | -28.8                            | 43.95                            | 53.97                        | -10.02         | 74                            | -30.05         | 0-360             | 101            | V        |
| 8      | 14.44              | 31.35                      | PK  | 39.9              | -26.5                            | 44.75                            | 53.97                        | -9.22          | 74                            | -29.25         | 0-360             | 200            | V        |

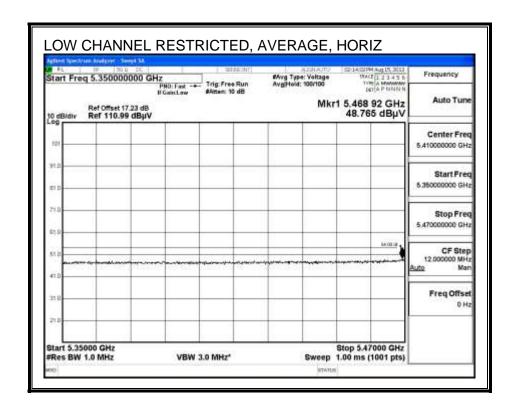


## HIGH CHANNEL DATA

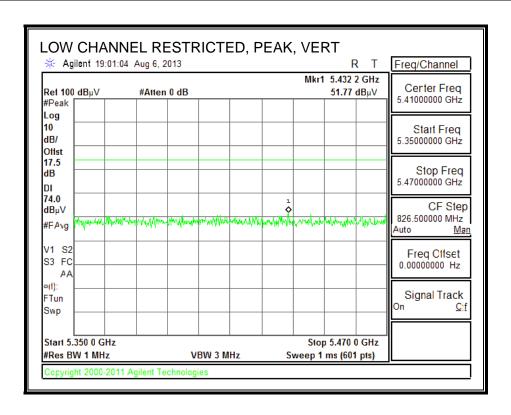
| Ma | arker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|----|-------|--------------------|----------------------------|-----|-------------------|----------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
|    | 2     | 2.438              | 43.53                      | PK  | 32.3              | -33.4                            | 42.43                            | 53.97                        | -11.54         | 74                            | -31.57         | 0-360             | 101            | V        |
|    | 5     | 9.708              | 35.57                      | PK  | 37.4              | -25.8                            | 47.17                            | 53.97                        | -6.8           | 74                            | -26.83         | 0-360             | 100            | V        |
|    | 8     | 14.759             | 30.22                      | PK  | 40.1              | -25.9                            | 44.42                            | 53.97                        | -9.55          | 74                            | -29.58         | 0-360             | 201            | V        |

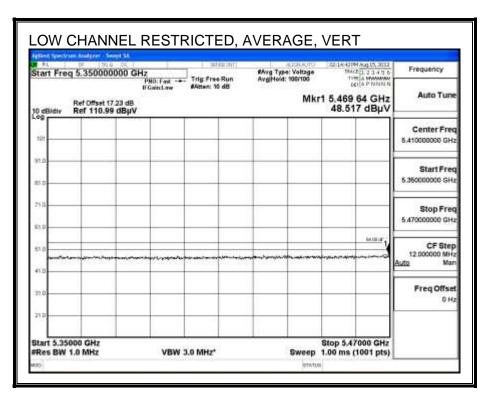
# 9.4.9. TX ABOVE 1 GHz 802.11ac HT40 MODE IN THE 5.5 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)





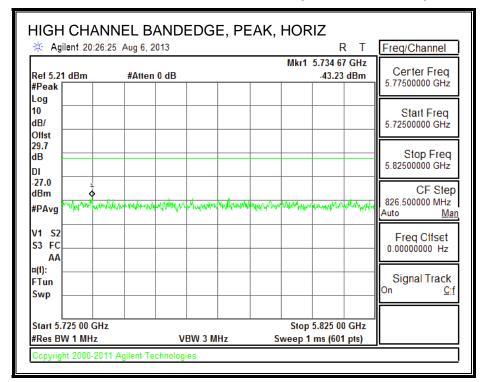
REPORT NO: 13U15778-5C DATE: September 23, 2013 IC: 2703C-D820 FCC ID: ZNFD820



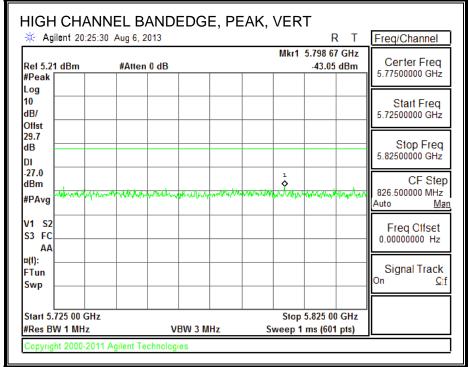


REPORT NO: 13U15778-5C DATE: September 23, 2013 IC: 2703C-D820 FCC ID: ZNFD820

## **AUTHORIZED BANDEDGE (HIGH CHANNEL)**

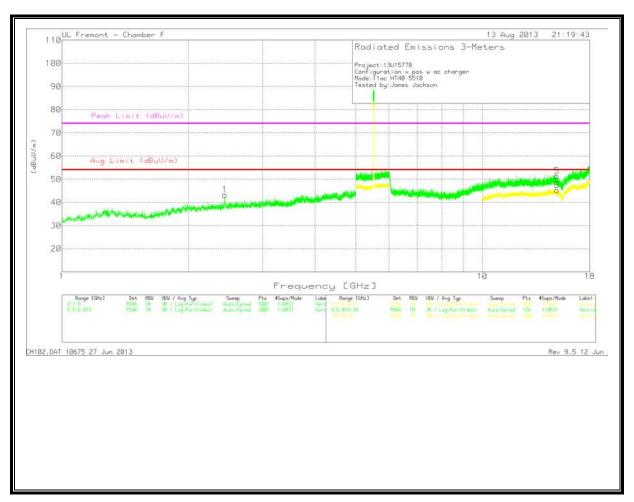


REPORT NO: 13U15778-5C



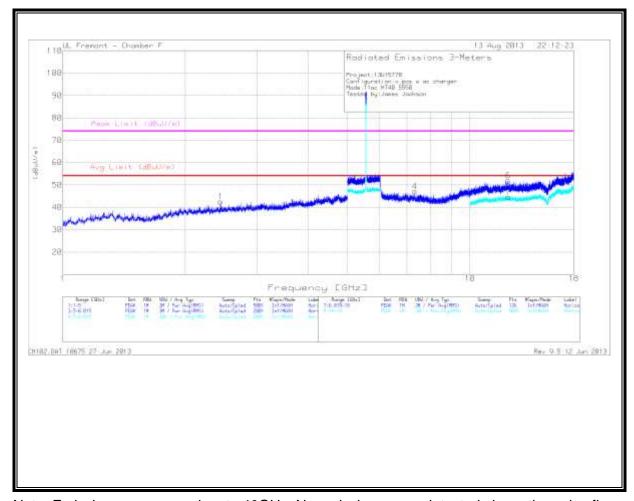
### HARMONICS AND SPURIOUS EMISSIONS

**LOW CHANNEL** VERTICAL



### LOW CHANNEL DATA

| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|-------------------|----------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
| 1      | 2.44               | 42.01                      | PK  | 32.3              | -31                              | 43.31                            | 53.97                        | -10.66         | 74                            | -30.69         | 0-360             | 201            | V        |
| 6      | 15.036             | 30.38                      | PK  | 40.1              | -25.2                            | 45.28                            | 53.97                        | -8.69          | 74                            | -28.72         | 0-360             | 201            | V        |

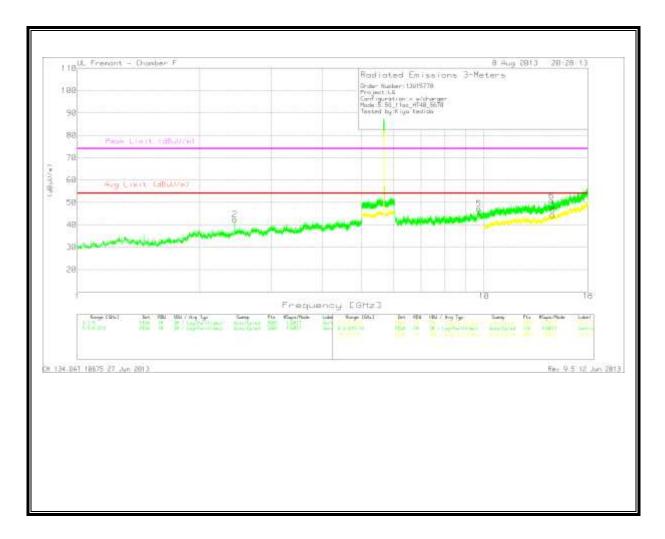


REPORT NO: 13U15778-5C DATE: September 23, 2013 FCC ID: ZNFD820 IC: 2703C-D820

#### MID CHANNEL DATA

| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF<br>T120<br>(dB/m) | Amp/Cbl<br>/Fltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------------|------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
| 1      | 2.439              | 41.29                      | PK  | 32.3                 | -31                          | 42.59                            | 53.97                        | -11.38         | 74                            | -31.41         | 0-360             | 199            | Н        |
| 4      | 7.324              | 37.72                      | PK  | 35.7                 | -26.3                        | 47.12                            | 53.97                        | -6.85          | 74                            | -26.88         | 0-360             | 199            | Н        |
| 7      | 12.425             | 28.65                      | PK  | 39.3                 | -23.3                        | 44.65                            | 53.97                        | -9.32          | 74                            | -29.35         | 0-360             | 100            | Н        |

#### HIGH CHANNEL VERTICAL

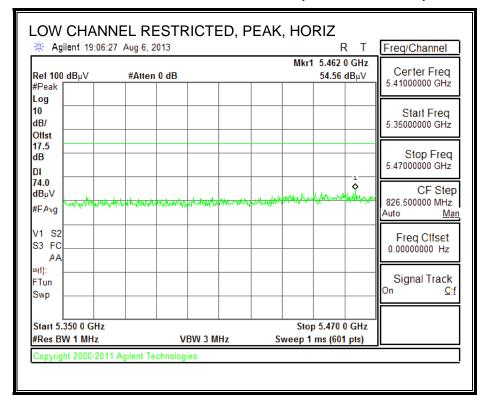


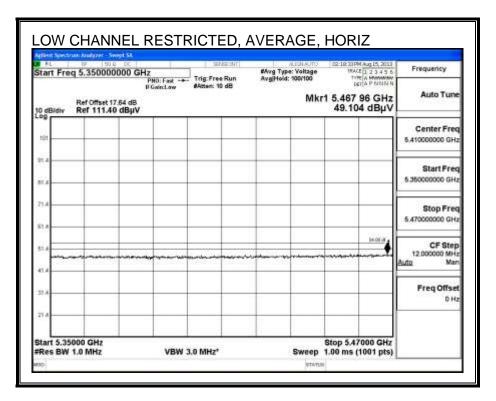
REPORT NO: 13U15778-5C DATE: September 23, 2013 FCC ID: ZNFD820 IC: 2703C-D820

# HIGH CHANNEL DATA

| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | AF T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|-------------------|----------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
| 2      | 2.438              | 43.53                      | PK  | 32.3              | -33.4                            | 42.43                            | 53.97                        | -11.54         | 74                            | -31.57         | 0-360             | 101            | V        |
| 5      | 9.708              | 35.57                      | PK  | 37.4              | -25.8                            | 47.17                            | 53.97                        | -6.8           | 74                            | -26.83         | 0-360             | 100            | V        |
| 8      | 14.759             | 30.22                      | PK  | 40.1              | -25.9                            | 44.42                            | 53.97                        | -9.55          | 74                            | -29.58         | 0-360             | 201            | V        |

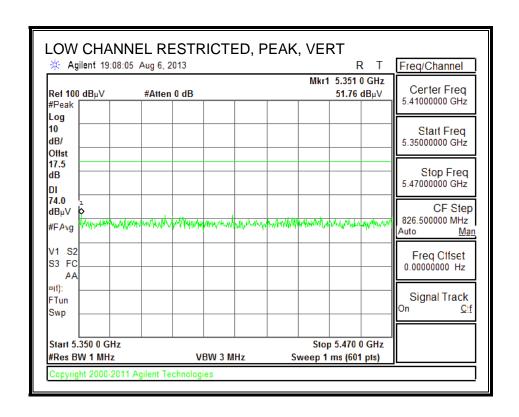
# 9.4.11. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.5 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

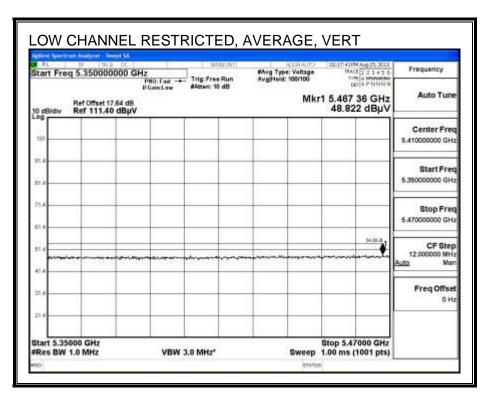




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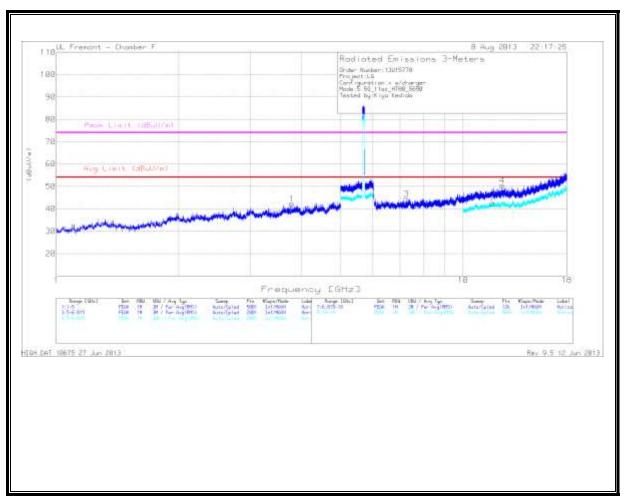


DATE: September 23, 2013

IC: 2703C-D820

#### HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL **HORIZONTAL** 



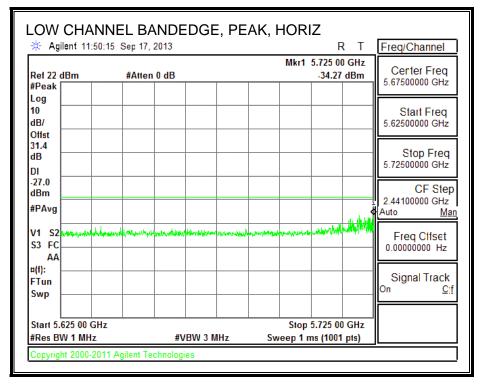
REPORT NO: 13U15778-5C DATE: September 23, 2013 FCC ID: ZNFD820 IC: 2703C-D820

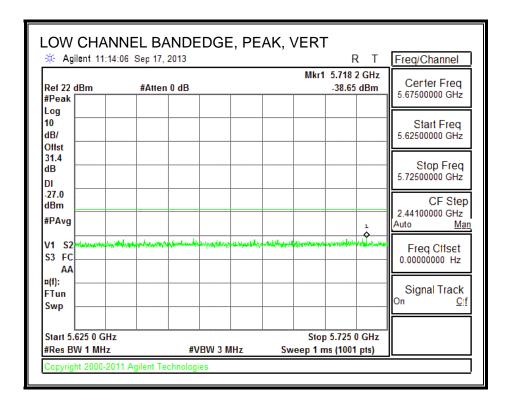
#### LOW CHANNEL DATA

| Marker | Frequency<br>(GHz) | Meter<br>Readin<br>g<br>(dBuV) | Det | AF T120<br>(dB/m) | Amp/C<br>bl/Fltr/<br>Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|--------------------------------|-----|-------------------|----------------------------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|-------------------|----------------|----------|
| 1      | 3.794              | 41.11                          | PK  | 33.6              | -32.5                            | 42.21                            | 53.97                        | -11.76         | 74                            | -31.79         | 0-360             | 199            | Н        |
| 3      | 7.252              | 38.01                          | PK  | 35.7              | -29.3                            | 44.41                            | 53.97                        | -9.56          | 74                            | -29.59         | 0-360             | 199            | Н        |
| 7      | 11.817             | 28.41                          | PK  | 39.2              | -25.1                            | 42.51                            | 53.97                        | -11.46         | 74                            | -31.49         | 0-360             | 100            | Н        |

#### 9.5. 5.8 GHz

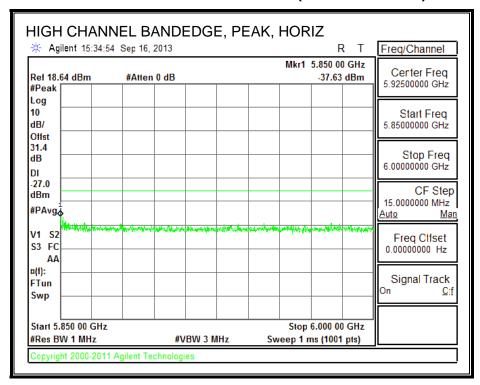
# 9.5.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.8 GHz BAND **AUTHORIZED BANDEDGE (LOW CHANNEL)**

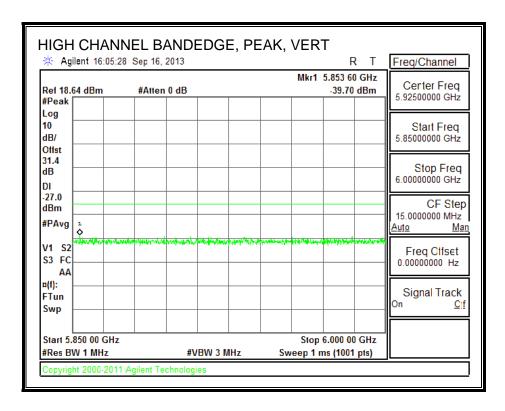




REPORT NO: 13U15778-5C DATE: September 23, 2013 IC: 2703C-D820 FCC ID: ZNFD820

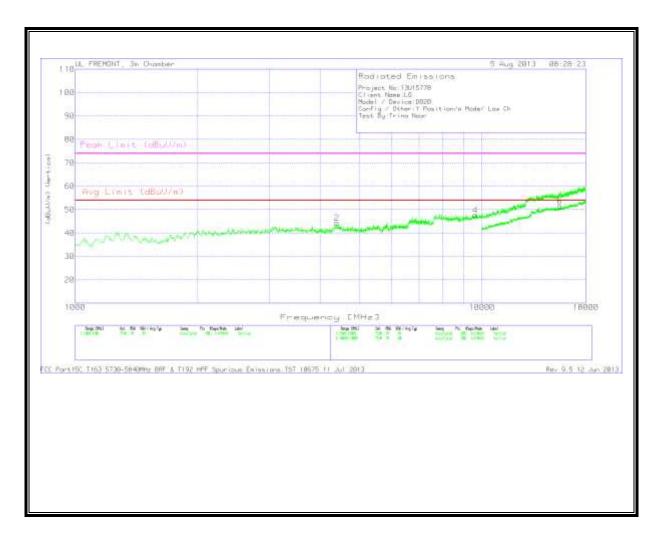
# **AUTHORIZED BANDEDGE (HIGH CHANNEL)**





#### HARMONICS AND SPURIOUS EMISSIONS

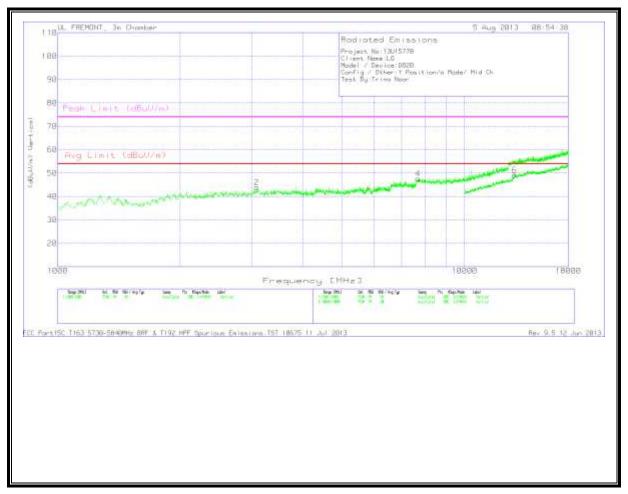
LOW CHANNEL **VERTICAL** 



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# **LOW CHANNEL DATA**

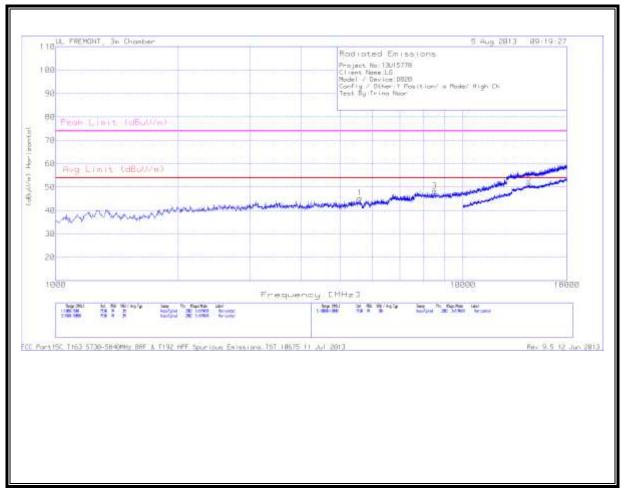
| Marker | Frequency<br>(GHz) | Meter<br>Readin<br>g<br>(dBuV) | Det | T119<br>AF<br>(dB/m) | Amp/<br>Cbl<br>(dB) | Fitr<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------|--------------------|--------------------------------|-----|----------------------|---------------------|--------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|----------------|----------|
| 2      | 4.397              | 36.38                          | PK  | 33.7                 | -25.8               | .1           | 44.38                            | 54                           | -9.62          | 74                            | -29.62         | 200            | Vert     |
| 4      | 9.632              | 32.28                          | PK  | 36.8                 | -21.8               | .3           | 47.58                            | 54                           | -6.42          | 74                            | -26.42         | 201            | Vert     |
| 6      | 15.549             | 27.03                          | PK  | 40.3                 | -16.5               | .6           | 51.43                            | 54                           | -2.57          | 74                            | -22.57         | 201            | Vert     |



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# MID CHANNEL DATA

| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | T119<br>AF<br>(dB/m) | Amp/<br>Cbl<br>(dB) | Fltr<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------------|---------------------|--------------|----------------------------------|-----------------------|----------------|-------------------------------|----------------|----------------|----------|
| 2      | 3.085              | 39.08                      | PK  | 33                   | -28.3               | .1           | 43.88                            | 54                    | -10.12         | 74                            | -30.12         | 201            | Vert     |
| 4      | 7.688              | 34                         | PK  | 35.8                 | -22.7               | .5           | 47.6                             | 54                    | -6.4           | 74                            | -26.4          | 201            | Vert     |
| 6      | 13.27              | 26.21                      | PK  | 39.1                 | -16.7               | .6           | 49.21                            | 54                    | -4.79          | 74                            | -24.79         | 201            | Vert     |

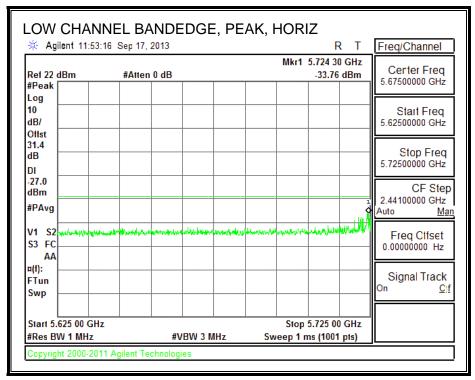


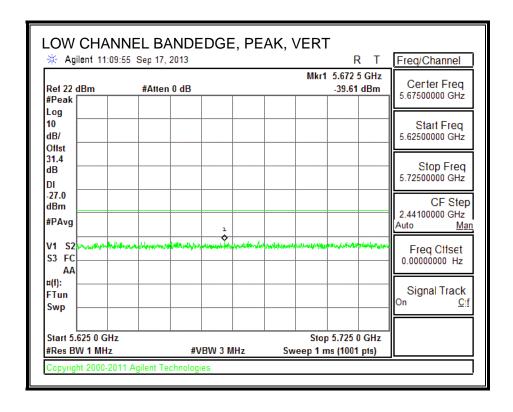
REPORT NO: 13U15778-5C DATE: September 23, 2013 FCC ID: ZNFD820 IC: 2703C-D820

# HIGH CHANNEL DATA

| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | T119<br>AF<br>(dB/m) | Amp/<br>Cbl<br>(dB) | Fitr<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------------|---------------------|--------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|----------------|----------|
| 1      | 5.585              | 34.82                      | PK  | 34.8                 | -24.4               | .2           | 45.42                            | 54                           | -8.58          | 74                            | -28.58         | 201            | Horz     |
| 3      | 8.52               | 34.22                      | PK  | 35.8                 | -22.1               | .4           | 48.32                            | 54                           | -5.68          | 74                            | -25.68         | 99             | Horz     |

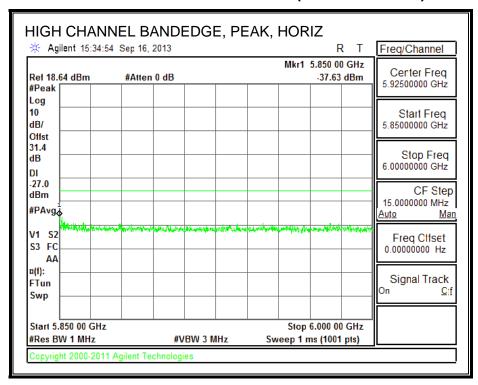
# 9.5.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.8 GHz BAND **AUTHORIZED BANDEDGE (LOW CHANNEL)**

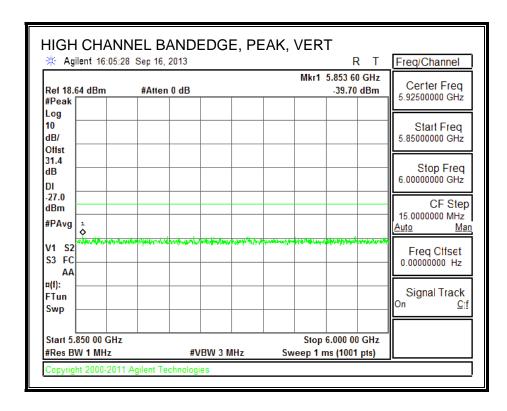




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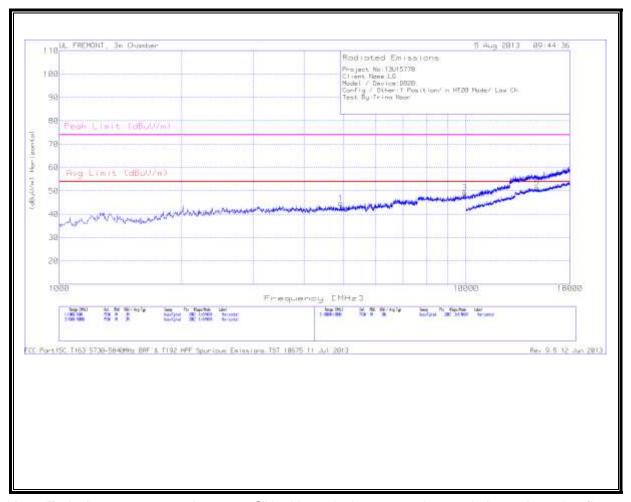
# **AUTHORIZED BANDEDGE (HIGH CHANNEL)**





#### **HARMONICS AND SPURIOUS EMISSIONS**

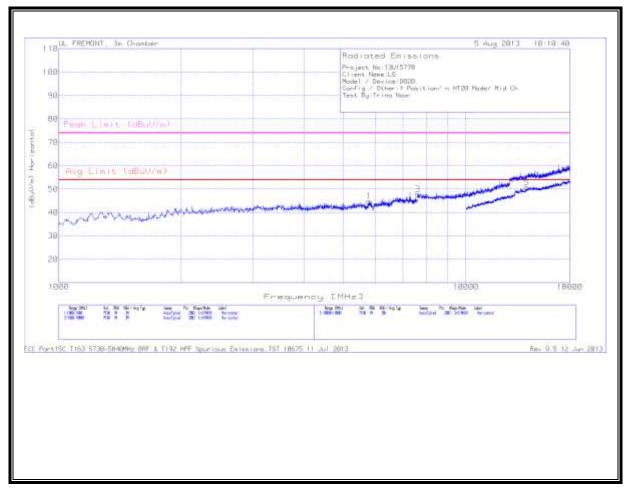
LOW CHANNEL **HORIZONTAL** 



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#### LOW CHANNEL DATA

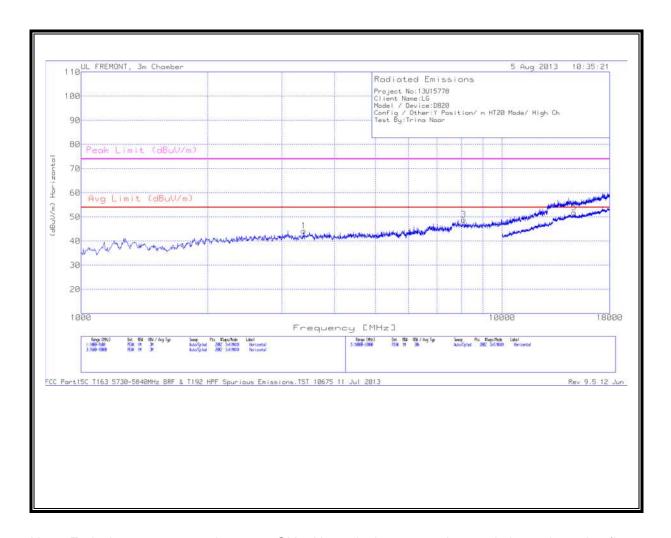
| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | T119<br>AF<br>(dB/m) | Amp/Cb<br>I<br>(dB) | Fltr<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------------|---------------------|--------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|----------------|----------|
| 1      | 4.918              | 35.72                      | PK  | 34                   | -25.1               | .1           | 44.72                            | 54                           | -9.28          | 74                            | -29.28         | 99             | Horz     |
| 3      | 9.923              | 33.42                      | PK  | 36.9                 | -21.5               | .4           | 49.22                            | 54                           | -4.78          | 74                            | -24.78         | 201            | Horz     |



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#### MID CHANNEL DATA

| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | T119<br>AF<br>(dB/m) | Amp/Cb<br>I<br>(dB) | Fltr<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------------|---------------------|--------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|----------------|----------|
| 1      | 5.776              | 34.03                      | PK  | 34.9                 | -24.3               | .2           | 44.83                            | 54                           | -9.17          | 74                            | -29.17         | 201            | Horz     |
| •      | 7.61               | 34.32                      | PK  | 35.7                 | -22.8               | ^            | 47.82                            | 54                           | -6.18          | 74                            | -26.18         | 201            | Horz     |

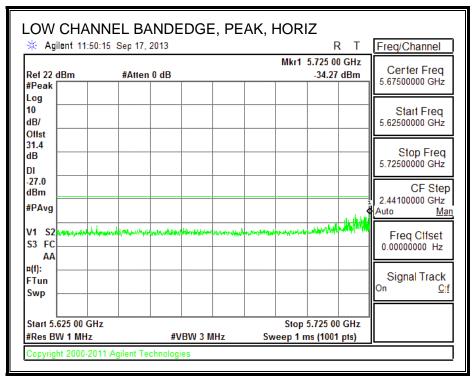


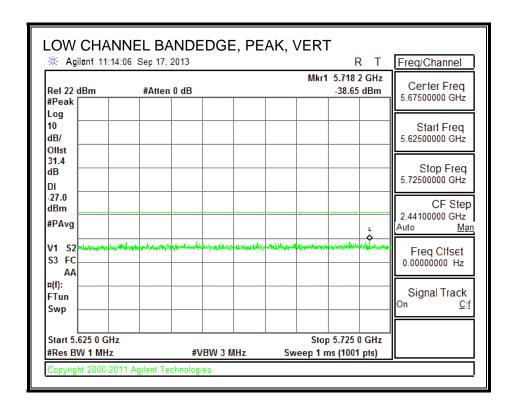
REPORT NO: 13U15778-5C DATE: September 23, 2013 FCC ID: ZNFD820 IC: 2703C-D820

# HIGH CHANNEL DATA

| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | T119<br>AF<br>(dB/m) | Amp/Cb<br>I<br>(dB) | Fltr<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------------|---------------------|--------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|----------------|----------|
| 1      | 3.381              | 38.7                       | PK  | 32.9                 | -27.6               | .2           | 44.2                             | 54                           | -9.8           | 74                            | -29.8          | 201            | Horz     |
| 3      | 8.104              | 35.06                      | PK  | 35.7                 | -22.3               | .4           | 48.86                            | 54                           | -5.14          | 74                            | -25.14         | 99             | Horz     |

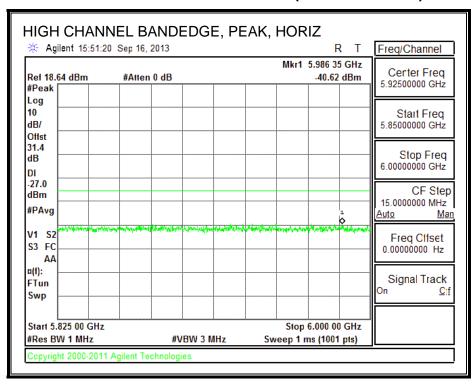
# 9.5.2. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.8 GHz BAND **AUTHORIZED BANDEDGE (LOW CHANNEL)**

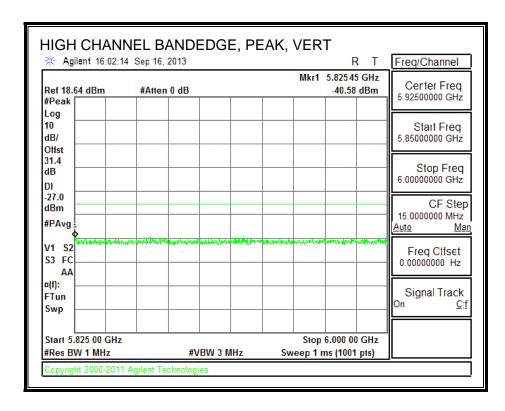




REPORT NO: 13U15778-5C DATE: September 23, 2013 IC: 2703C-D820 FCC ID: ZNFD820

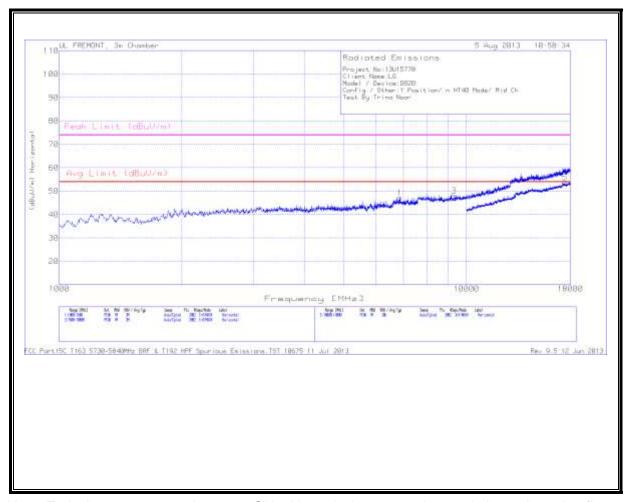
# **AUTHORIZED BANDEDGE (HIGH CHANNEL)**





#### HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL **HORIZONTAL** 

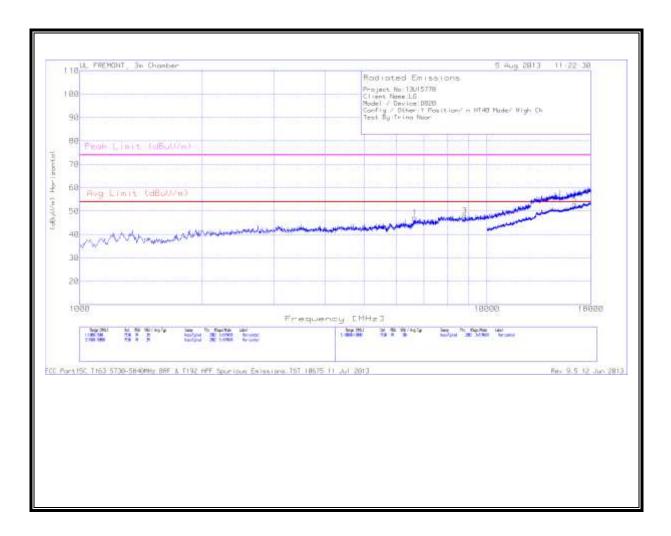


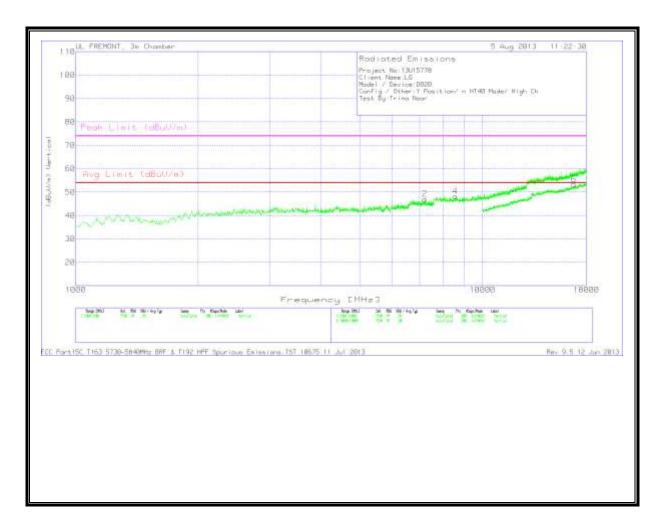
REPORT NO: 13U15778-5C DATE: September 23, 2013 FCC ID: ZNFD820 IC: 2703C-D820

#### LOW CHANNEL DATA

| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | T119<br>AF<br>(dB/m) | Amp/Cb<br>I<br>(dB) | Fltr<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------------|---------------------|--------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|----------------|----------|
| 1      | 6.861              | 34.55                      | PK  | 35.6                 | -23.2               | .2           | 47.15                            | 54                           | -6.85          | 74                            | -26.85         | 201            | Horz     |
| _      | 9.315              | 33.18                      | PK  | 36.3                 | -21.9               |              | 47.98                            | 54                           | -6.02          | 74                            | -26.02         | 99             | Horz     |

REPORT NO: 13U15778-5C



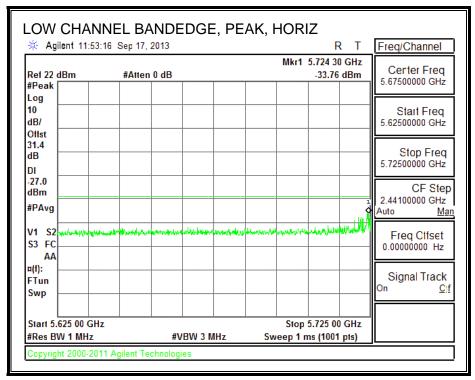


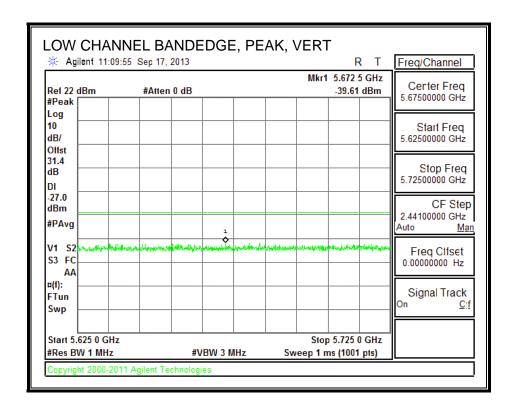
REPORT NO: 13U15778-5C DATE: September 23, 2013 FCC ID: ZNFD820 IC: 2703C-D820

# HIGH CHANNEL DATA

| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | T119<br>AF<br>(dB/m) | Amp/Cb<br>I<br>(dB) | Fltr<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------------|---------------------|--------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|----------------|----------|
| 1      | 6.647              | 34.76                      | PK  | 35.6                 | -23.4               | .2           | 47.16                            | 54                           | -6.84          | 74                            | -26.84         | 99             | Horz     |
| 2      | 7.211              | 34.51                      | PK  | 35.6                 | -23.1               | .1           | 47.11                            | 54                           | -6.89          | 74                            | -26.89         | 100            | Vert     |
| 3      | 8.816              | 33.92                      | PK  | 36                   | -22.1               | .3           | 48.12                            | 54                           | -5.88          | 74                            | -25.88         | 201            | Horz     |
| 4      | 8.562              | 34.16                      | PK  | 35.8                 | -22.1               | .4           | 48.26                            | 54                           | -5.74          | 74                            | -25.74         | 100            | Vert     |
| 5      | 16.433             | 26.99                      | PK  | 41                   | -15.9               | .8           | 52.89                            | 54                           | -1.11          | 74                            | -21.11         | 201            | Horz     |
| 6      | 16.781             | 26.8                       | PK  | 41.1                 | -15.2               | .7           | 53.4                             | 54                           | 6              | 74                            | -20.6          | 100            | Vert     |

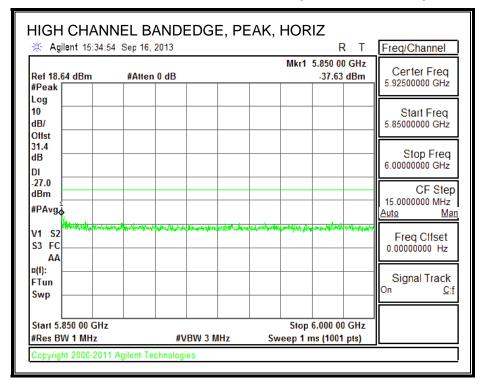
# 9.5.2. TX ABOVE 1 GHz 802.11ac HT20 MODE IN THE 5.8 GHz BAND **AUTHORIZED BANDEDGE (LOW CHANNEL)**

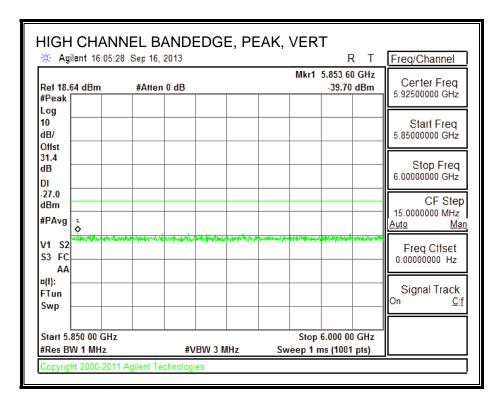




REPORT NO: 13U15778-5C DATE: September 23, 2013 FCC ID: ZNFD820 IC: 2703C-D820

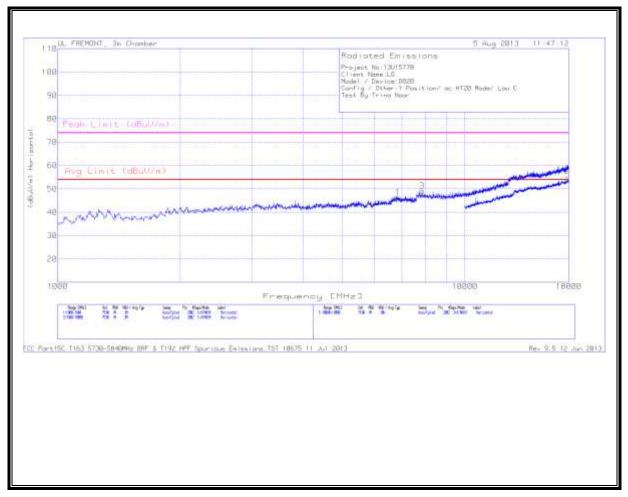
# **AUTHORIZED BANDEDGE (HIGH CHANNEL)**





#### **HARMONICS AND SPURIOUS EMISSIONS**

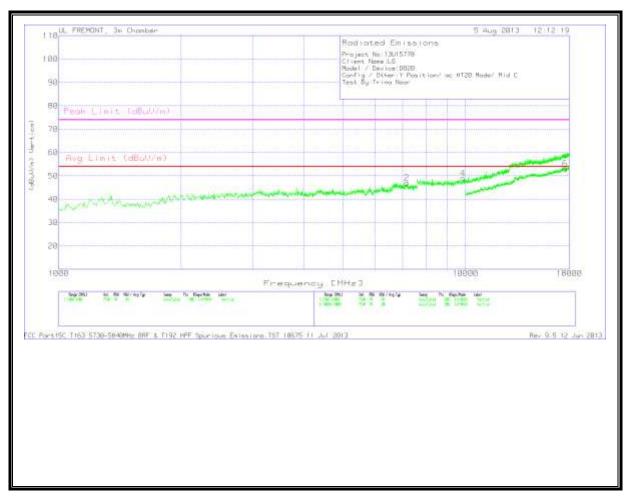
LOW CHANNEL **HORIZONTAL** 



REPORT NO: 13U15778-5C DATE: September 23, 2013 FCC ID: ZNFD820 IC: 2703C-D820

#### LOW CHANNEL DATA

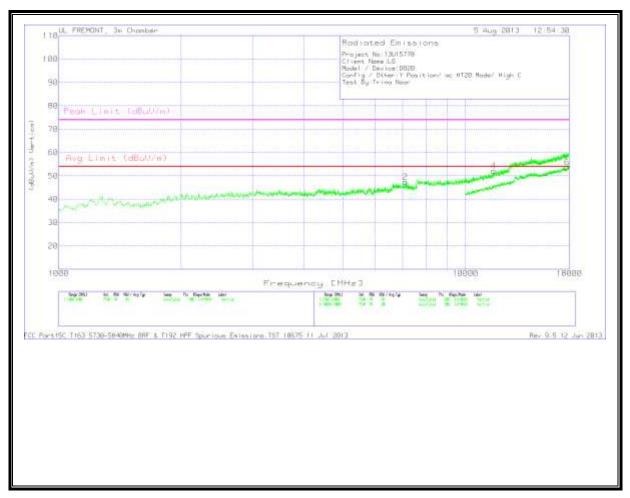
| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | T119<br>AF<br>(dB/m) | Amp/Cb<br>I<br>(dB) | Fltr<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------------|---------------------|--------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|----------------|----------|
| 1      | 6.831              | 33.92                      | PK  | 35.6                 | -23.3               | .2           | 46.42                            | 54                           | -7.58          | 74                            | -27.58         | 201            | Horz     |
| 3      | 7.849              | 35.69                      | PK  | 35.8                 | -22.7               | .4           | 49.19                            | 54                           | -4.81          | 74                            | -24.81         | 99             | Horz     |



## MID CHANNEL DATA

| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | T119<br>AF<br>(dB/m) | Amp/Cb<br>I<br>(dB) | Fltr<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------------|---------------------|--------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|----------------|----------|
| 2      | 7.171              | 34.35                      | PK  | 35.6                 | -23.1               | .2           | 47.05                            | 54                           | -6.95          | 74                            | -26.95         | 100            | Vert     |

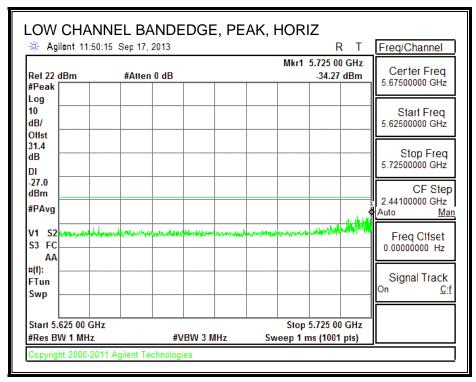
### HIGH CHANNEL **VERTICAL**

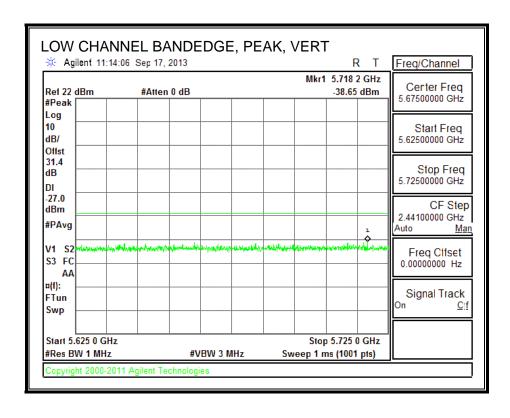


## HIGH CHANNEL DATA

| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | T119<br>AF<br>(dB/m) | Amp/Cb<br>I<br>(dB) | Fltr<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Height<br>(cm) | Polarity | l |
|--------|--------------------|----------------------------|-----|----------------------|---------------------|--------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|----------------|----------|---|
| 2      | 7.109              | 34.73                      | PK  | 35.6                 | -23.1               | .2           | 47.43                            | 54                           | -6.57          | 74                            | -26.57         | 99             | Vert     |   |

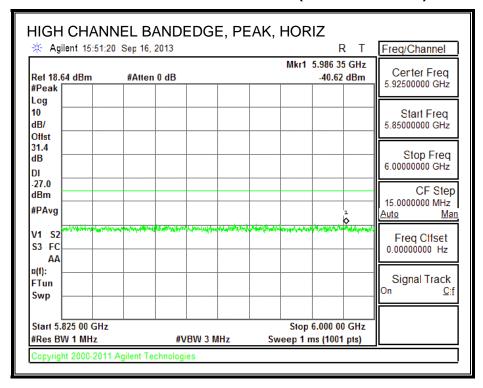
# 9.5.1. TX ABOVE 1 GHz 802.11ac HT40 MODE IN THE 5.8 GHz BAND **AUTHORIZED BANDEDGE (LOW CHANNEL)**

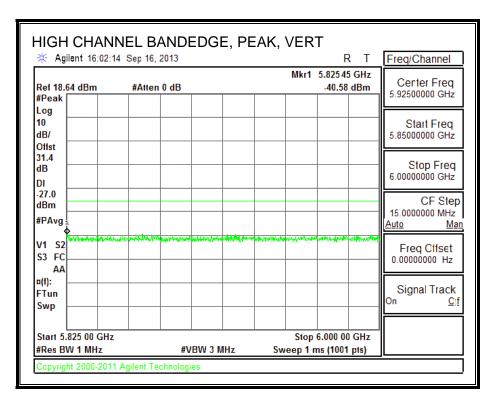




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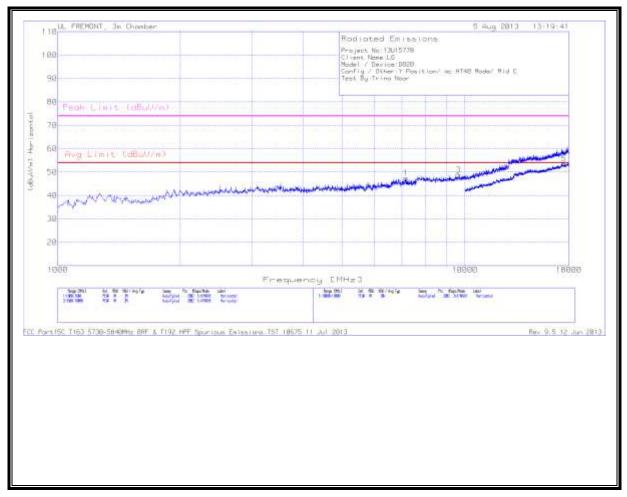
# **AUTHORIZED BANDEDGE (HIGH CHANNEL)**





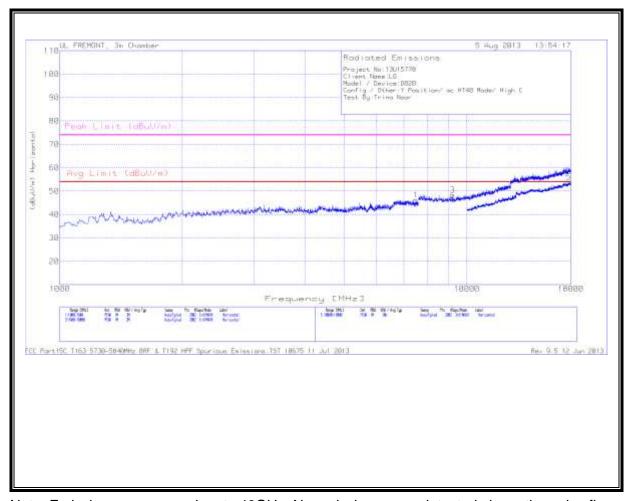
### **HARMONICS AND SPURIOUS EMISSIONS**

LOW CHANNEL **HORIZONTAL** 



### LOW CHANNEL DATA

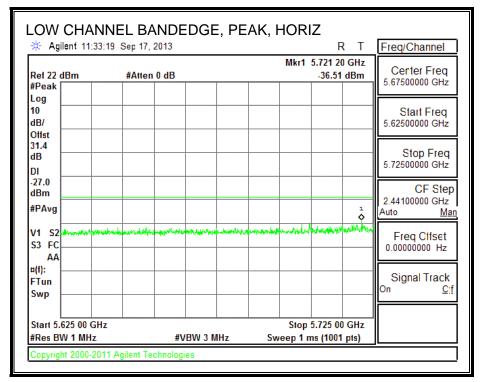
| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | T119<br>AF<br>(dB/m) | Amp/Cb<br>I<br>(dB) | Fltr<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------------|---------------------|--------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|----------------|----------|
| 1      | 7.158              | 34.9                       | PK  | 35.6                 | -23.1               | .1           | 47.5                             | 54                           | -6.5           | 74                            | -26.5          | 201            | Horz     |

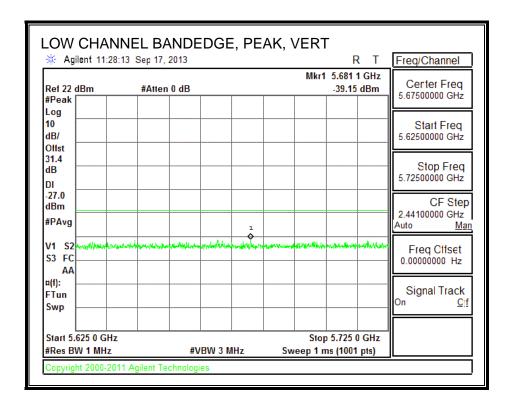


## HIGH CHANNEL DATA

| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | T119<br>AF<br>(dB/m) | Amp/Cb<br>I<br>(dB) | Fltr<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------------|---------------------|--------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|----------------|----------|
| 1      | 7.491              | 33.19                      | PK  | 35.7                 | -22.9               | .2           | 46.19                            | 54                           | -7.81          | 74                            | -27.81         | 99             | Horz     |

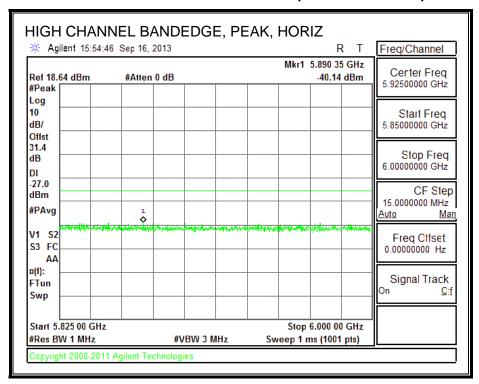
# 9.5.1. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.8 GHz BAND AUTHORIZED BANDEDGE (LOW CHANNEL)

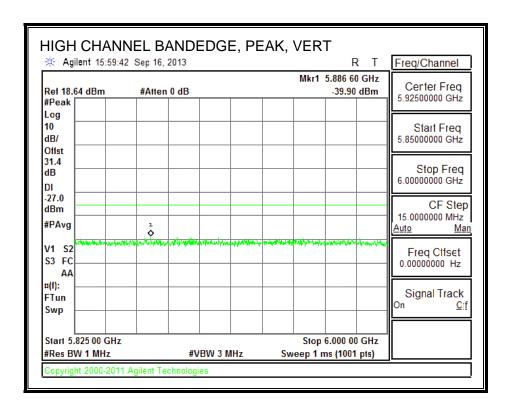




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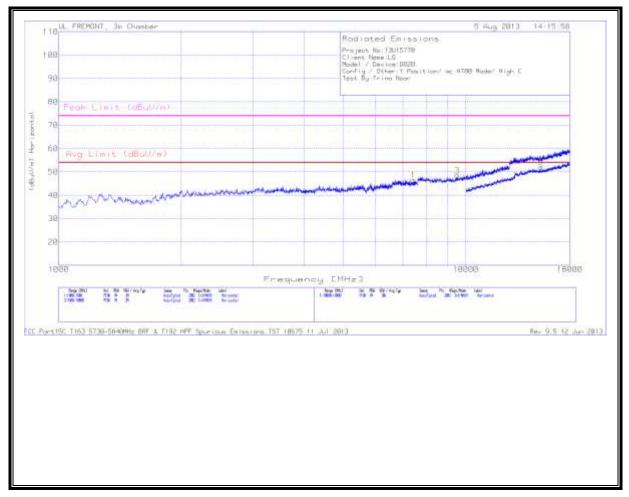
# **AUTHORIZED BANDEDGE (HIGH CHANNEL)**





### **HARMONICS AND SPURIOUS EMISSIONS**

**HIGH CHANNEL HORIZONTAL** 

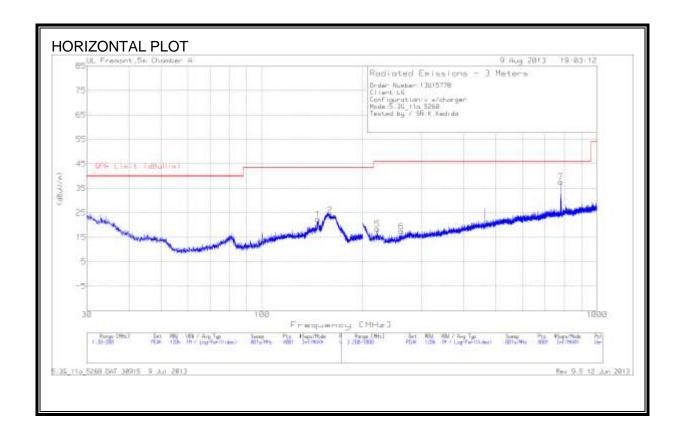


## HIGH CHANNEL DATA

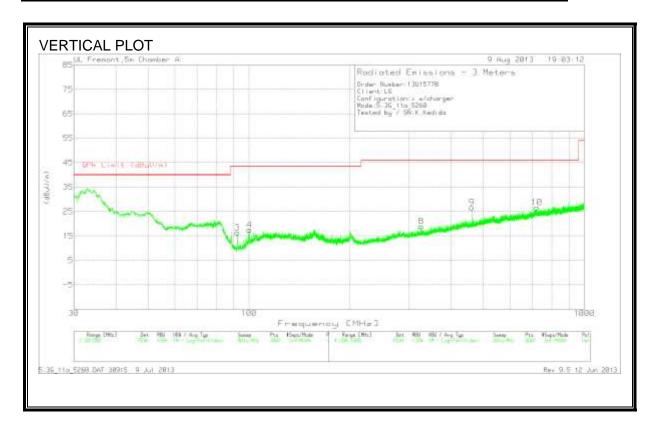
| Marker | Frequency<br>(GHz) | Meter<br>Reading<br>(dBuV) | Det | T119<br>AF<br>(dB/m) | Amp/Cb<br>I<br>(dB) | Fltr<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | Avg<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/<br>m) | Margin<br>(dB) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------------|---------------------|--------------|----------------------------------|------------------------------|----------------|-------------------------------|----------------|----------------|----------|
| 1      | 7.419              | 33.6                       | PK  | 35.7                 | -23                 | .2           | 46.5                             | 54                           | -7.5           | 74                            | -27.5          | 201            | Horz     |

# 10. WORST-CASE BELOW 1 GHz (in the 5.3 GHz Band)

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



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



## Worst Case Data

| Frequency<br>(MHz) | Meter<br>Reading<br>(dBuV) | Det | AF T477 (dB/m) | Amp/Cbl/Fltr/Pad<br>(dB) | Corrected<br>Reading<br>(dBuV/m) | QPk Limit<br>(dBuV/m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------------------|----------------------------|-----|----------------|--------------------------|----------------------------------|-----------------------|----------------|-------------------|----------------|----------|
| 146.9175           | 36.52                      | PK  | 12.4           | -26.6                    | 22.32                            | 43.52                 | -21.2          | 0-360             | 200            | Н        |
| 160.0075           | 38.29                      | PK  | 12.2           | -26.5                    | 23.99                            | 43.52                 | -19.53         | 0-360             | 200            | Н        |
| 92.135             | 35.21                      | PK  | 8.1            | -26.9                    | 16.41                            | 43.52                 | -27.11         | 0-360             | 100            | V        |
| 100.2525           | 33.99                      | PK  | 10.4           | -26.9                    | 17.49                            | 43.52                 | -26.03         | 0-360             | 100            | V        |
| 221.2              | 33.8                       | PK  | 10.5           | -26                      | 18.3                             | 46.02                 | -27.72         | 0-360             | 100            | Н        |
| 260.9              | 30.93                      | PK  | 12.2           | -25.7                    | 17.43                            | 46.02                 | -28.59         | 0-360             | 100            | Н        |
| 779.7              | 39.63                      | PK  | 20.5           | -22.6                    | 37.53                            | 46.02                 | -8.49          | 0-360             | 100            | Н        |
| 326.1              | 30.54                      | PK  | 13.8           | -25.4                    | 18.94                            | 46.02                 | -27.08         | 0-360             | 400            | V        |
| 461.5              | 34.68                      | PK  | 16.7           | -24.7                    | 26.68                            | 46.02                 | -19.34         | 0-360             | 200            | V        |
| 721 1              | 20.37                      | PK  | 20.2           | -22 Q                    | 26.67                            | 46.02                 | -10 35         | 0-360             | 300            | \/       |