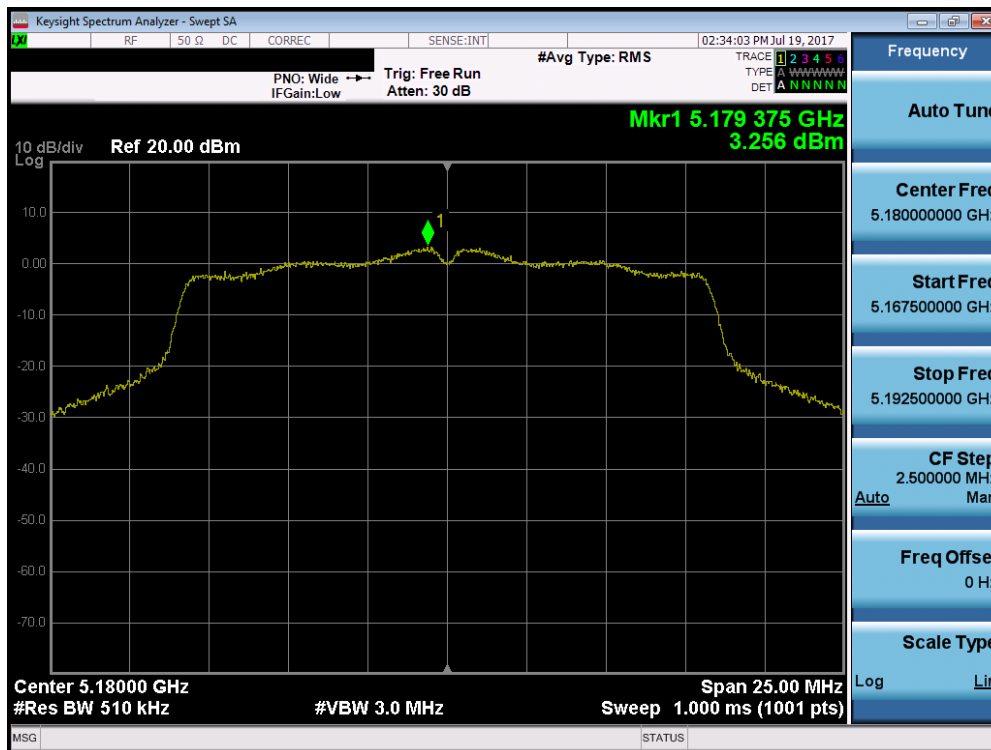


## Antenna-2 Power Spectral Density Measurements

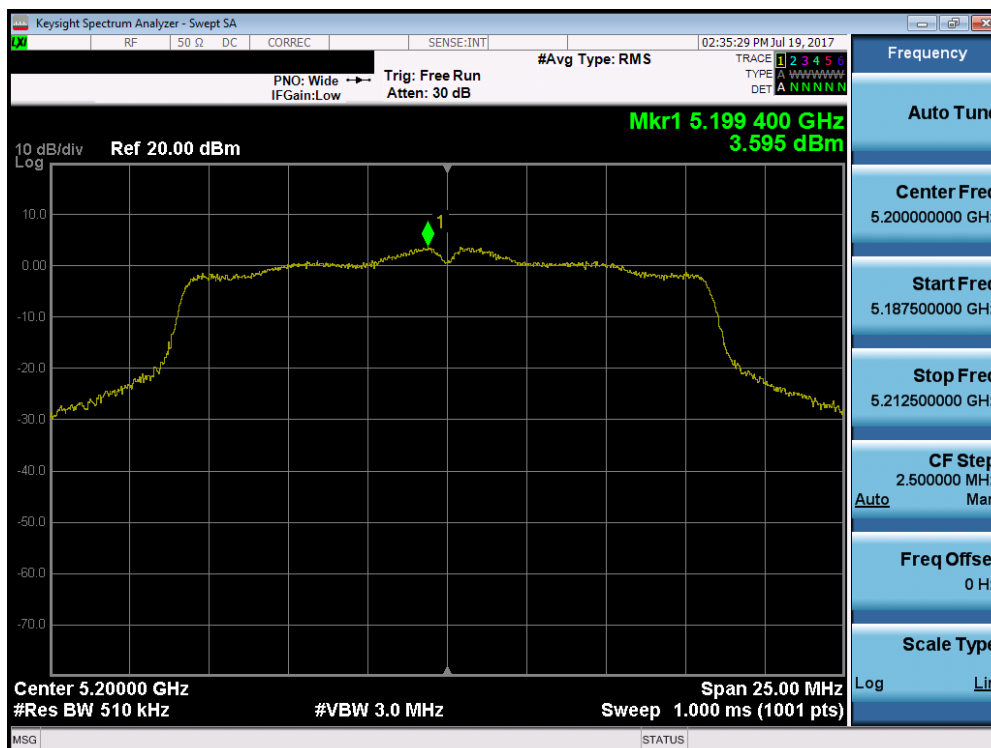
|         | Frequency [MHz] | Channel No. | 802.11 Mode | Data Rate [Mbps] | Measured Power Density [dBm] | Max Permissible Power Density [dBm/MHz] | Margin [dB] |
|---------|-----------------|-------------|-------------|------------------|------------------------------|-----------------------------------------|-------------|
| Band 1  | 5180            | 36          | a           | 6                | 3.26                         | 11.0                                    | -7.74       |
|         | 5200            | 40          | a           | 6                | 3.60                         | 11.0                                    | -7.41       |
|         | 5240            | 48          | a           | 6                | 3.13                         | 11.0                                    | -7.87       |
|         | 5180            | 36          | n (20MHz)   | 6.5/7.2 (MCS0)   | 3.01                         | 11.0                                    | -7.99       |
|         | 5200            | 40          | n (20MHz)   | 6.5/7.2 (MCS0)   | 3.03                         | 11.0                                    | -7.97       |
|         | 5240            | 48          | n (20MHz)   | 6.5/7.2 (MCS0)   | 3.29                         | 11.0                                    | -7.71       |
|         | 5190            | 38          | n (40MHz)   | 13.5/15 (MCS0)   | -3.29                        | 11.0                                    | -14.29      |
|         | 5230            | 46          | n (40MHz)   | 13.5/15 (MCS0)   | -0.56                        | 11.0                                    | -11.56      |
|         | 5210            | 42          | ac (80MHz)  | 29.3/32.5 (MCS0) | -6.74                        | 11.0                                    | -17.74      |
| Band 2A | 5260            | 52          | a           | 6                | 3.44                         | 11.0                                    | -7.56       |
|         | 5280            | 56          | a           | 6                | 3.68                         | 11.0                                    | -7.32       |
|         | 5320            | 64          | a           | 6                | 3.63                         | 11.0                                    | -7.37       |
|         | 5260            | 52          | n (20MHz)   | 6.5/7.2 (MCS0)   | 2.93                         | 11.0                                    | -8.07       |
|         | 5280            | 56          | n (20MHz)   | 6.5/7.2 (MCS0)   | 3.10                         | 11.0                                    | -7.90       |
|         | 5320            | 64          | n (20MHz)   | 6.5/7.2 (MCS0)   | 2.87                         | 11.0                                    | -8.13       |
|         | 5270            | 54          | n (40MHz)   | 13.5/15 (MCS0)   | -0.52                        | 11.0                                    | -11.52      |
|         | 5310            | 62          | n (40MHz)   | 13.5/15 (MCS0)   | -2.66                        | 11.0                                    | -13.66      |
|         | 5290            | 58          | ac (80MHz)  | 29.3/32.5 (MCS0) | -8.61                        | 11.0                                    | -19.61      |
| Band 2C | 5500            | 100         | a           | 6                | 3.40                         | 11.0                                    | -7.60       |
|         | 5580            | 116         | a           | 6                | 3.56                         | 11.0                                    | -7.44       |
|         | 5720            | 144         | a           | 6                | 3.40                         | 11.0                                    | -7.60       |
|         | 5500            | 100         | n (20MHz)   | 6.5/7.2 (MCS0)   | 2.87                         | 11.0                                    | -8.13       |
|         | 5580            | 116         | n (20MHz)   | 6.5/7.2 (MCS0)   | 3.22                         | 11.0                                    | -7.78       |
|         | 5720            | 144         | n (20MHz)   | 6.5/7.2 (MCS0)   | 3.07                         | 11.0                                    | -7.93       |
|         | 5510            | 102         | n (40MHz)   | 13.5/15 (MCS0)   | -2.45                        | 11.0                                    | -13.45      |
|         | 5550            | 110         | n (40MHz)   | 13.5/15 (MCS0)   | -0.91                        | 11.0                                    | -11.91      |
|         | 5710            | 142         | n (40MHz)   | 13.5/15 (MCS0)   | -1.02                        | 11.0                                    | -12.02      |
|         | 5530            | 106         | ac (80MHz)  | 29.3/32.5 (MCS0) | -6.81                        | 11.0                                    | -17.81      |
|         | 5690            | 138         | ac (80MHz)  | 29.3/32.5 (MCS0) | -7.30                        | 11.0                                    | -18.30      |

**Table 7-20. Conducted Power Spectral Density Measurements**

|                                            |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                          |                                                                                       | Page 86 of 209                  |

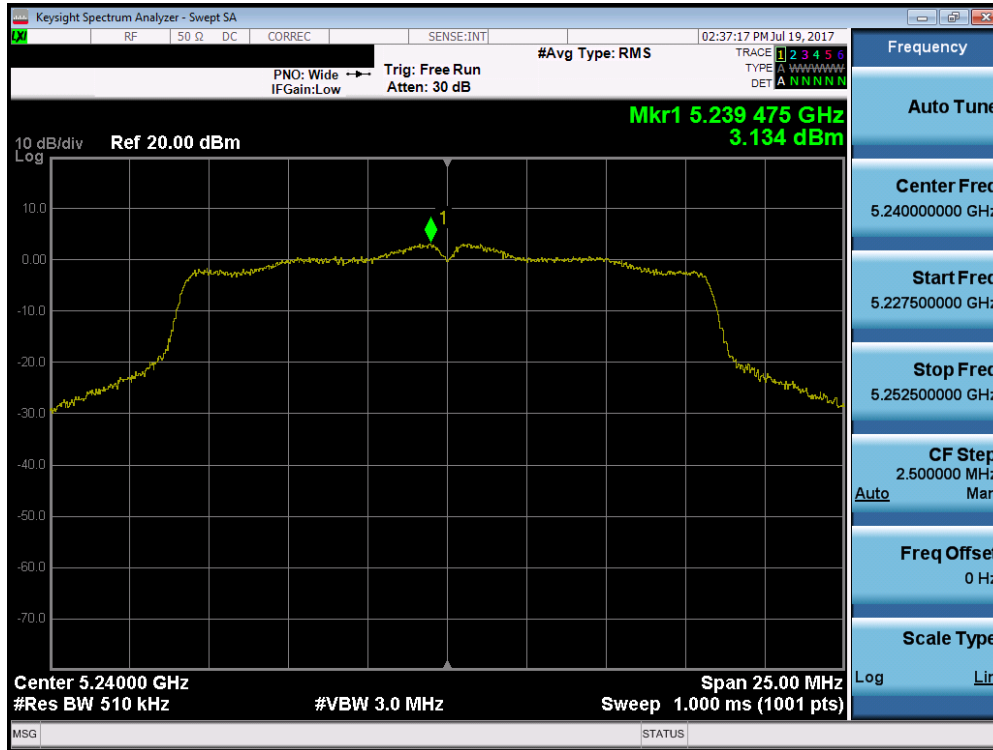


Plot 7-115. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)

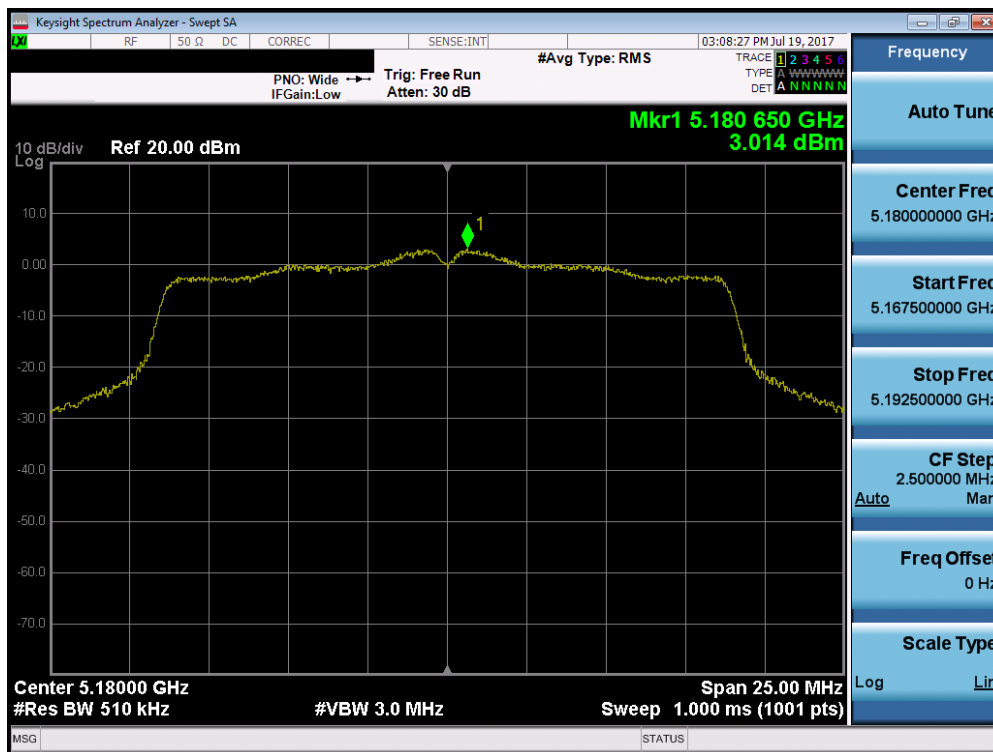


Plot 7-116. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)

|                                            |                                               |                                                                        |  |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |  | Page 87 of 209                  |



Plot 7-117. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)



Plot 7-118. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)

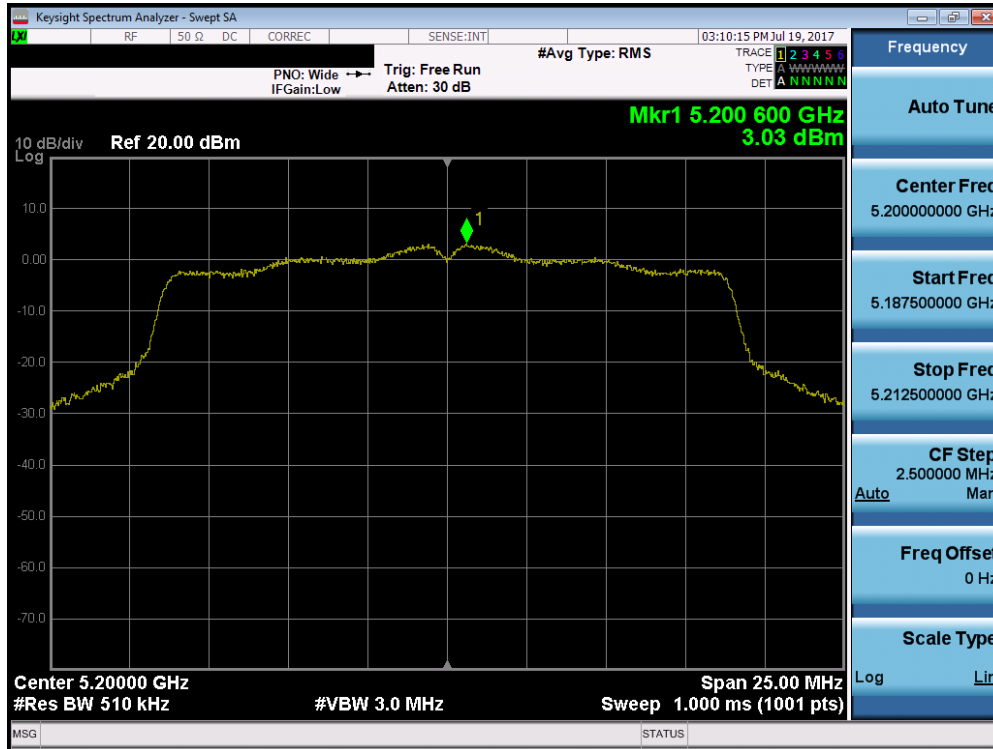
|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 88 of 209                  |

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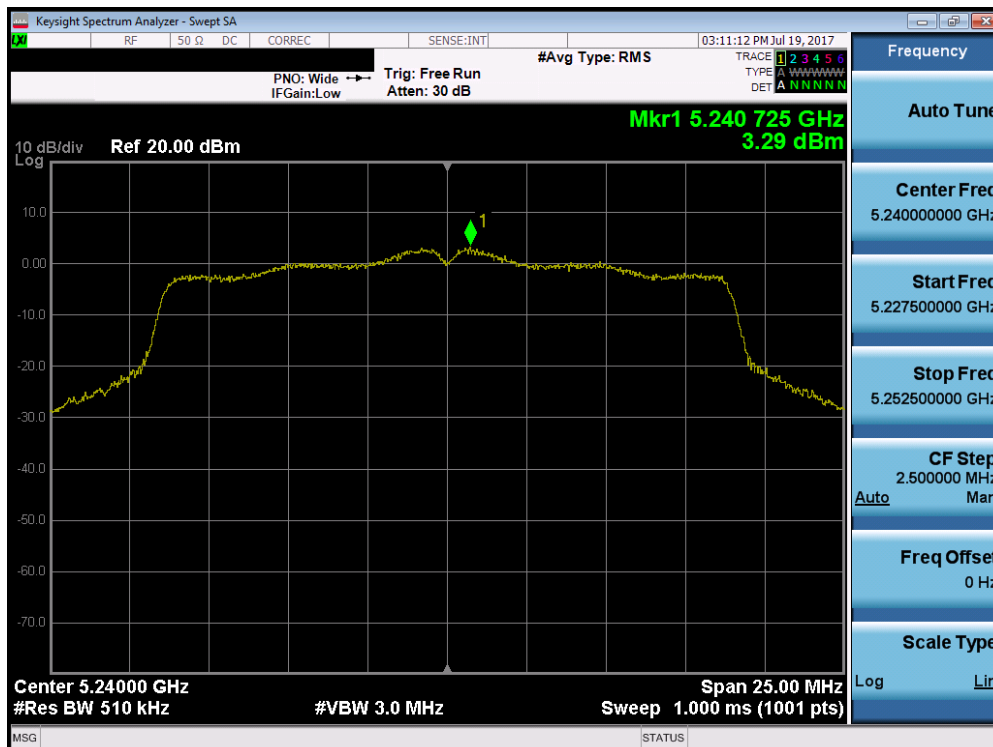
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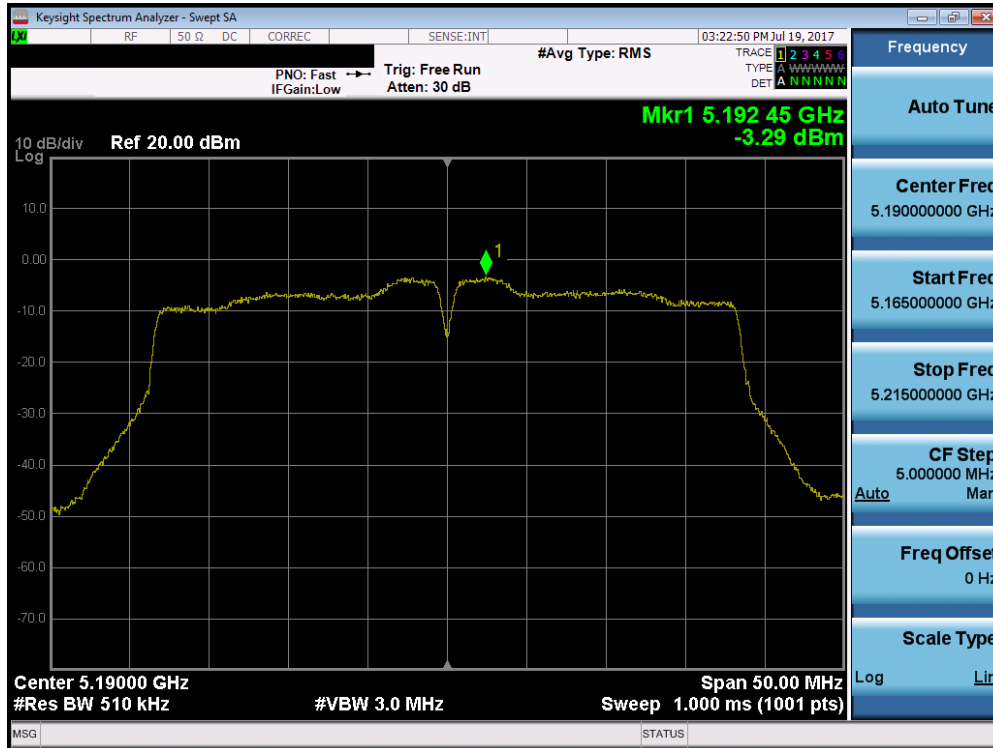


Plot 7-119. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)

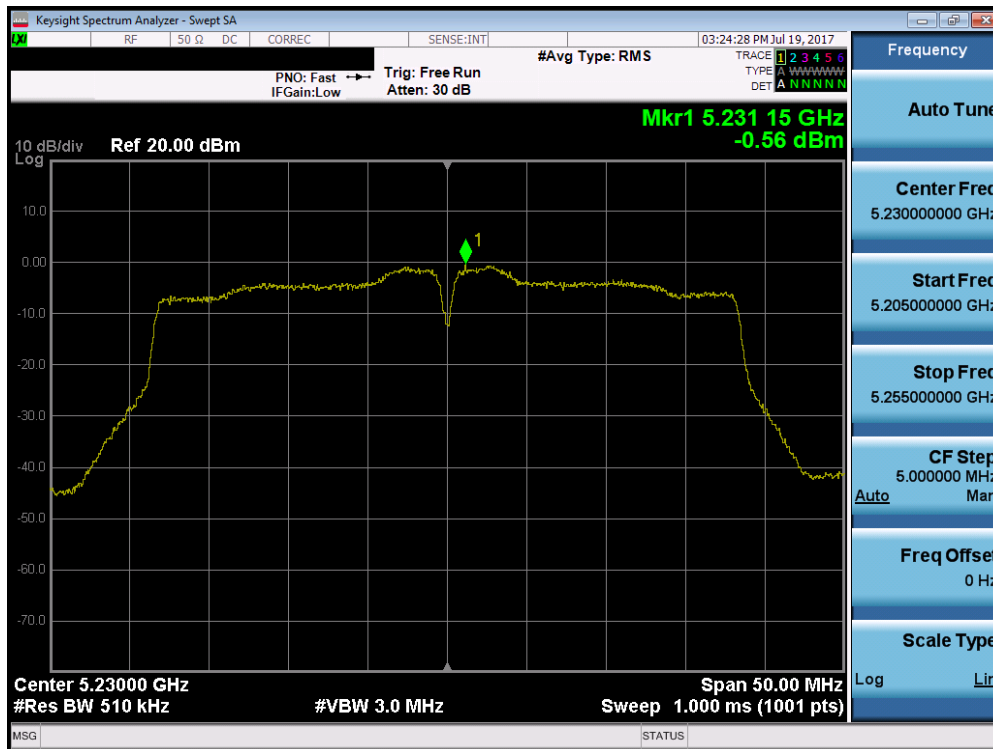


Plot 7-120. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 89 of 209                  |

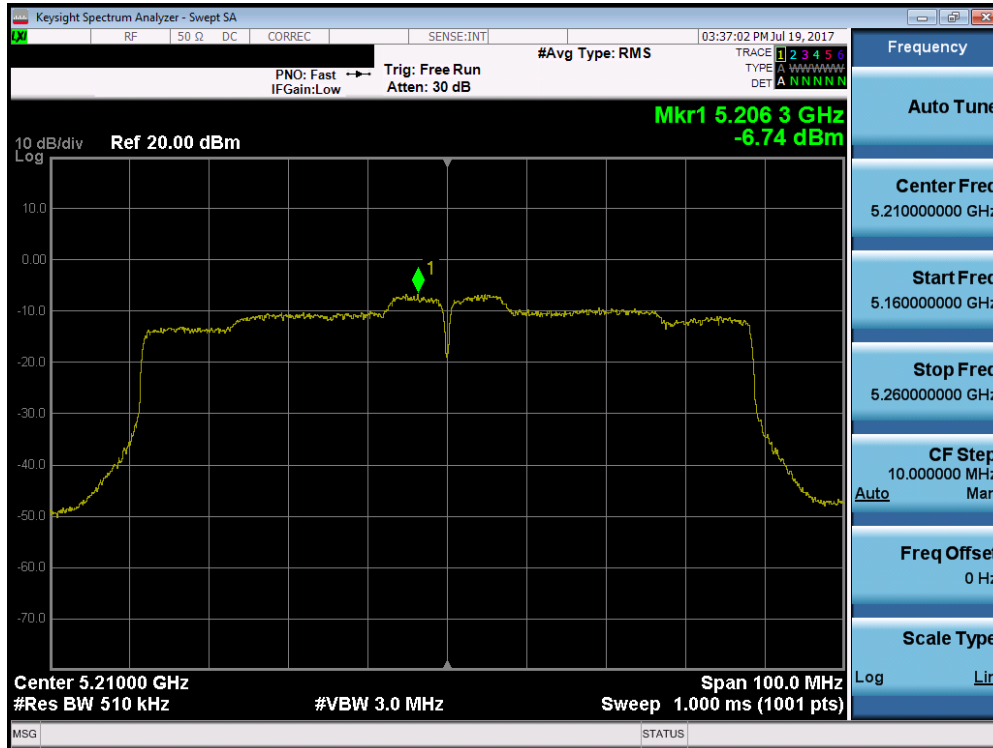


Plot 7-121. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)

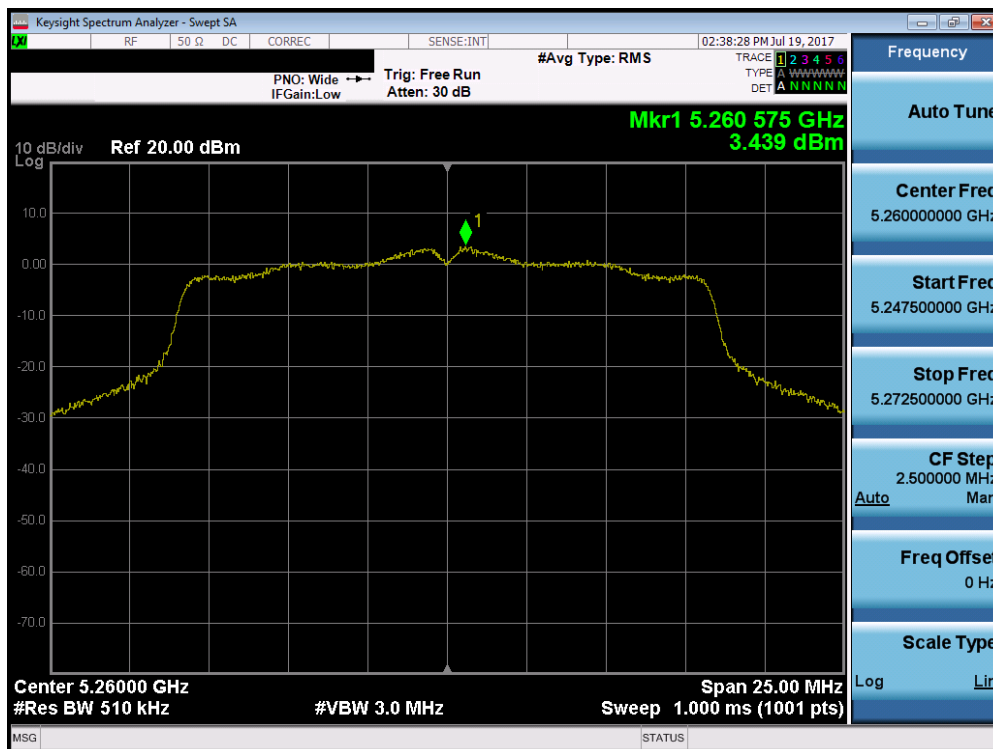


Plot 7-122. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 90 of 209                  |

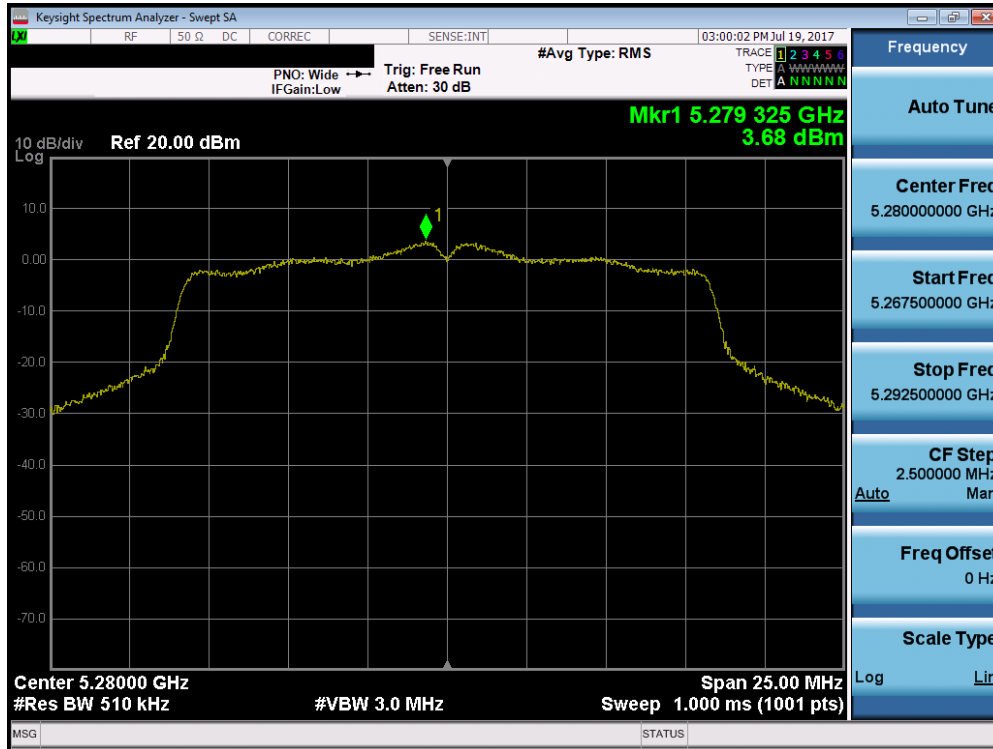


Plot 7-123. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)

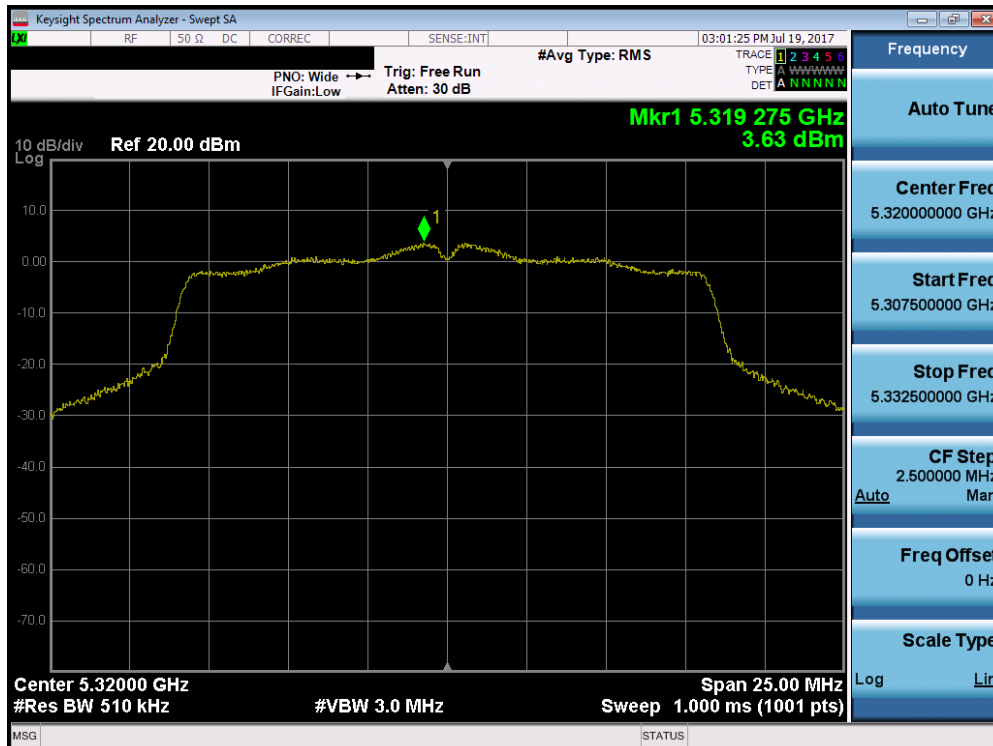


Plot 7-124. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 52)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 91 of 209                  |

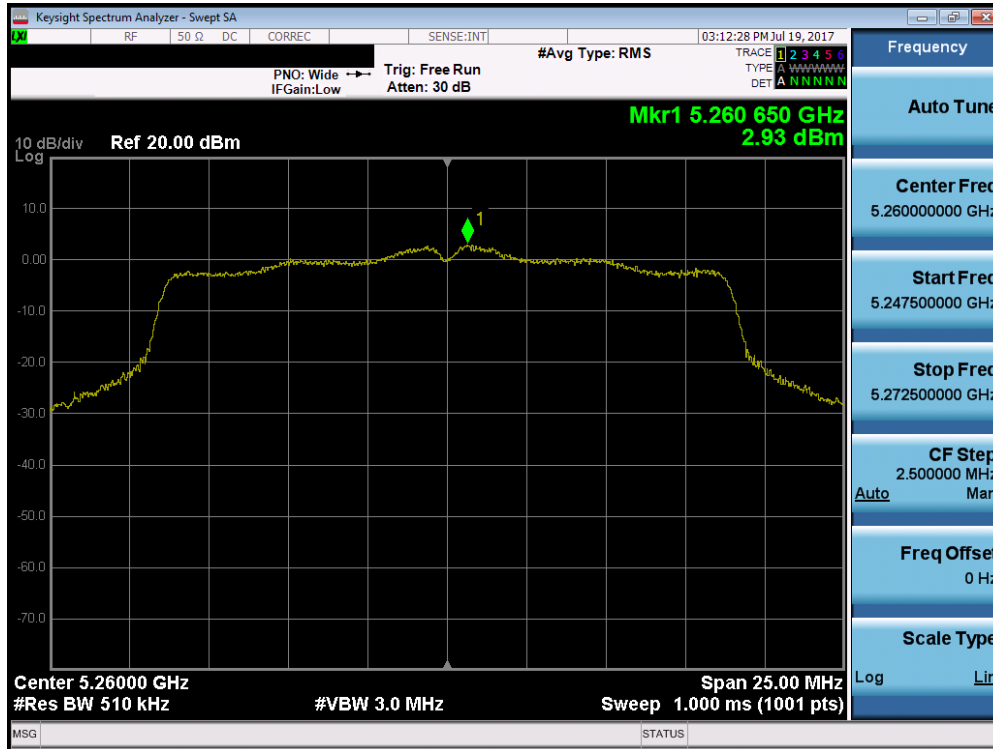


Plot 7-125. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)

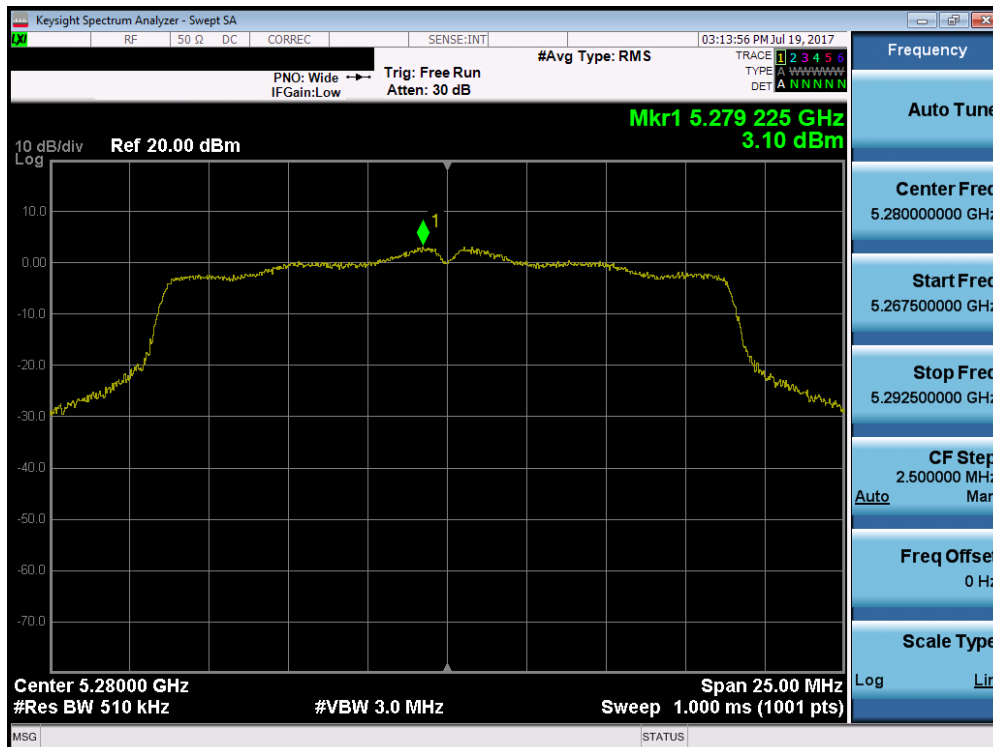


Plot 7-126. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)

|                                            |                                               |                                                                        |  |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |  | Page 92 of 209                  |

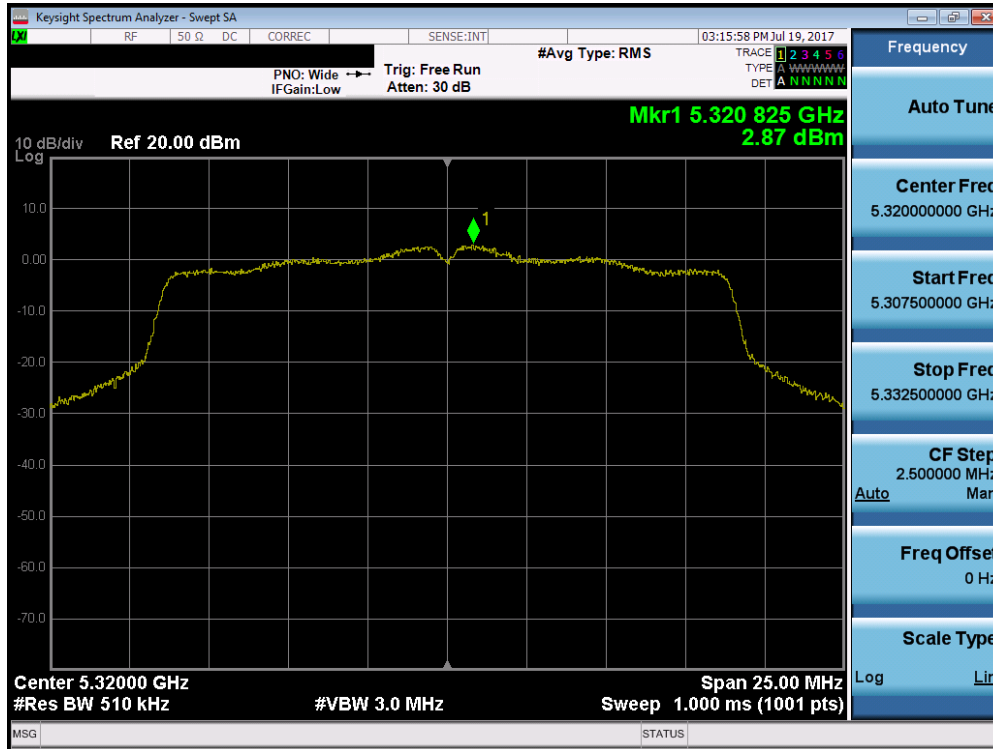


Plot 7-127. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)

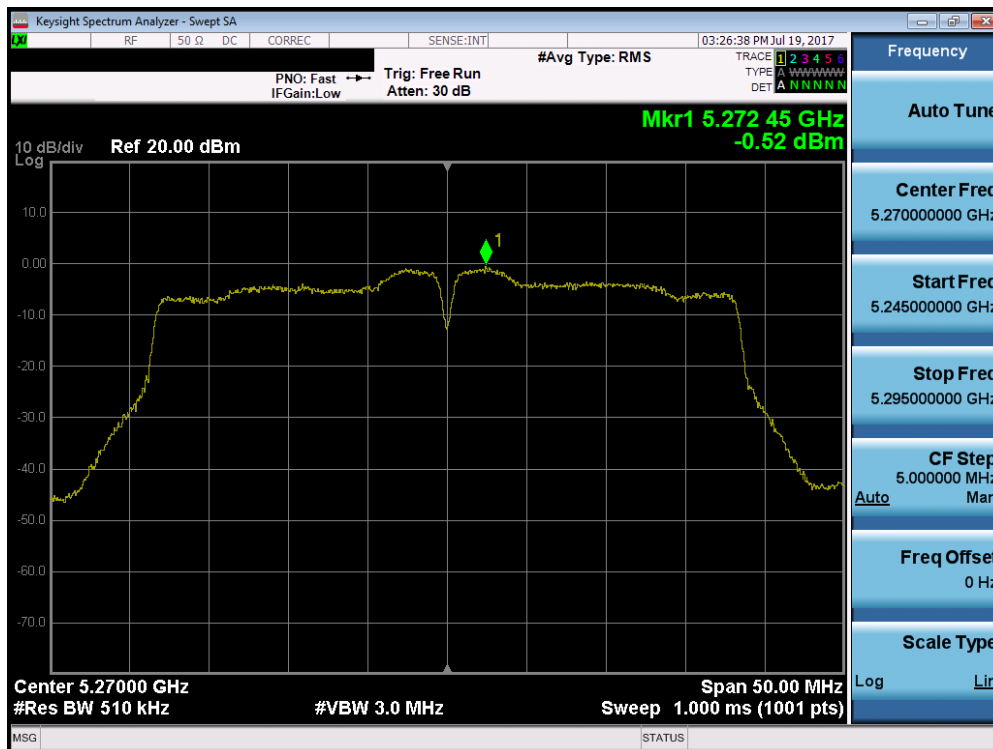


Plot 7-128. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

|                                            |                                               |                                                                        |  |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |  | Page 93 of 209                  |

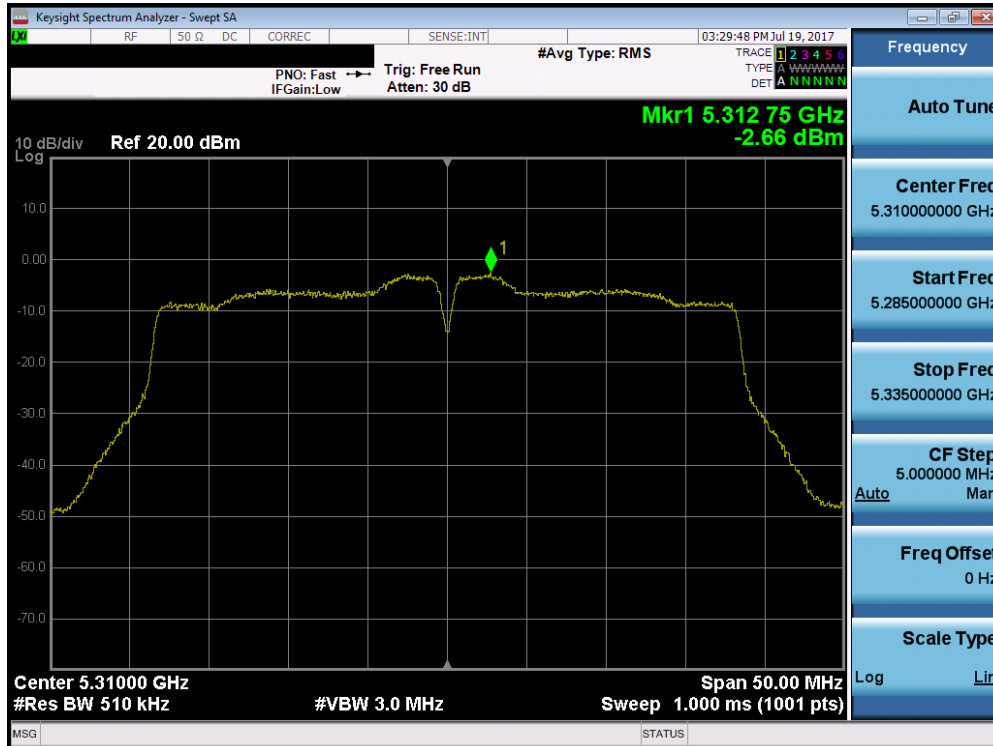


Plot 7-129. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)

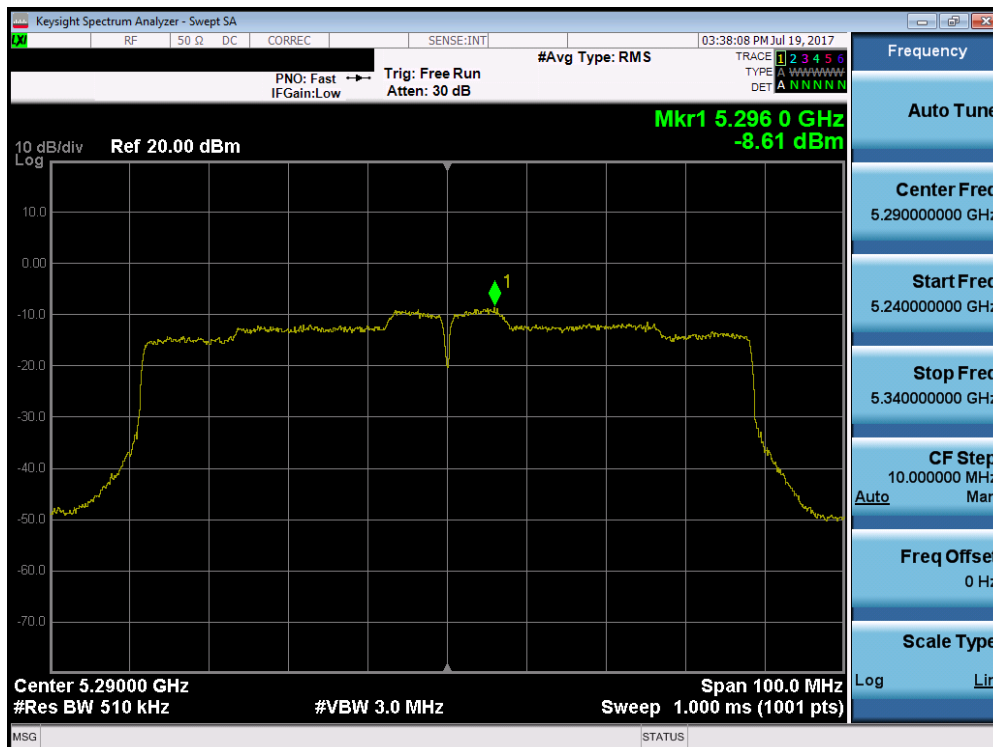


Plot 7-130. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

|                                            |                                               |                                                                        |  |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |  | Page 94 of 209                  |

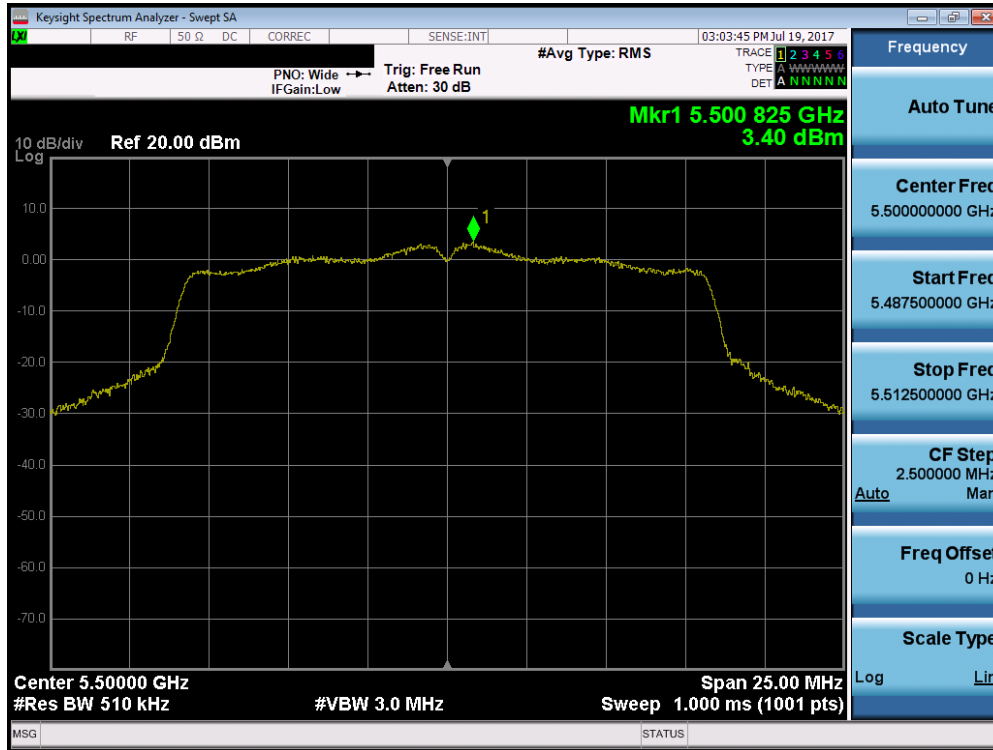


Plot 7-131. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)

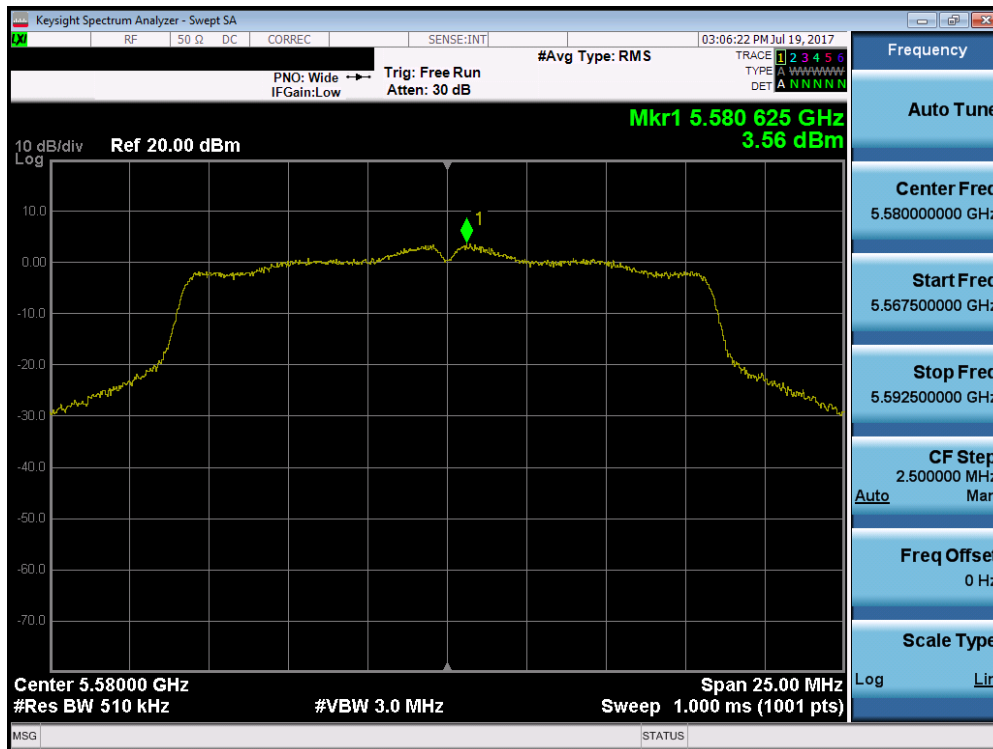


Plot 7-132. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)

|                                            |                                               |                                                                        |  |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |  | Page 95 of 209                  |

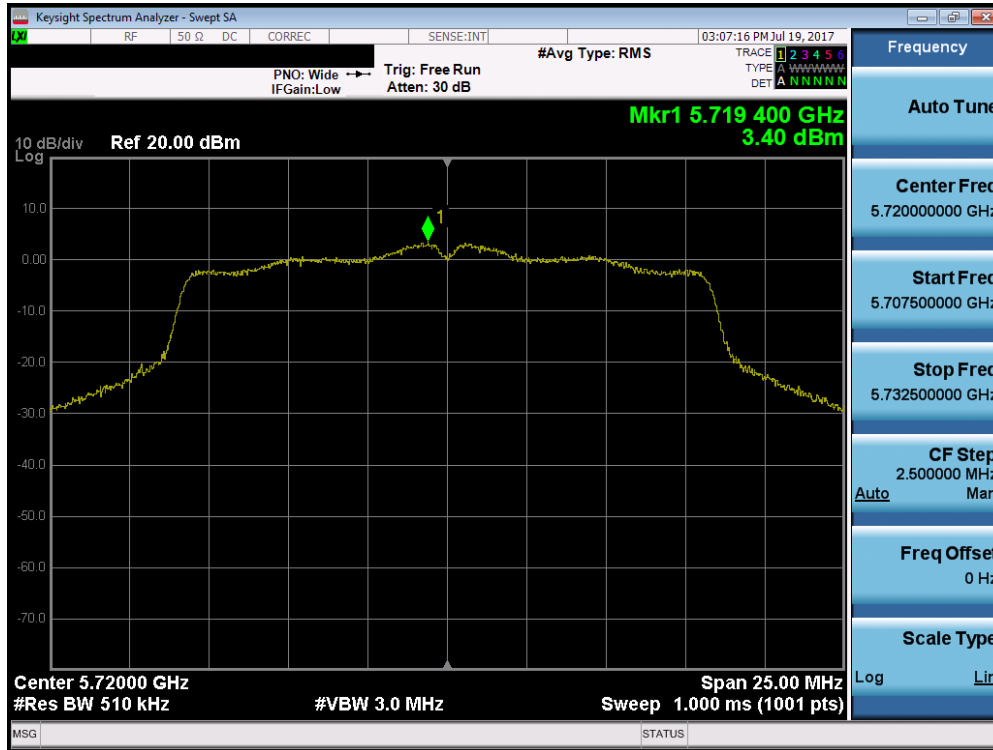


Plot 7-133. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 100)

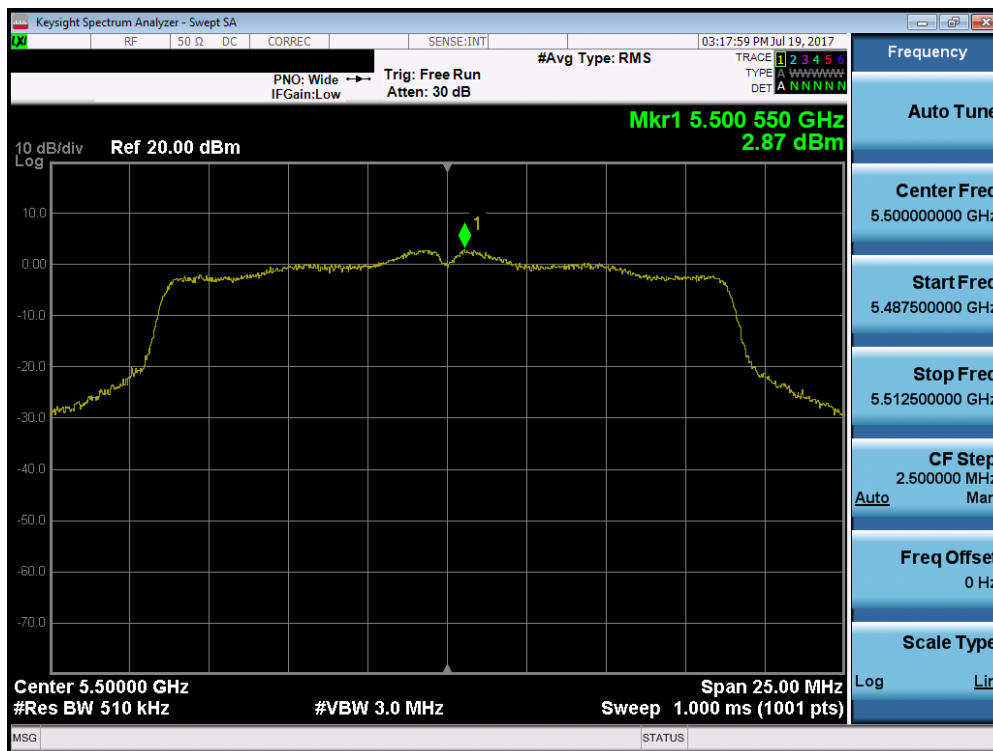


Plot 7-134. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 116)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 96 of 209                  |



Plot 7-135. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)

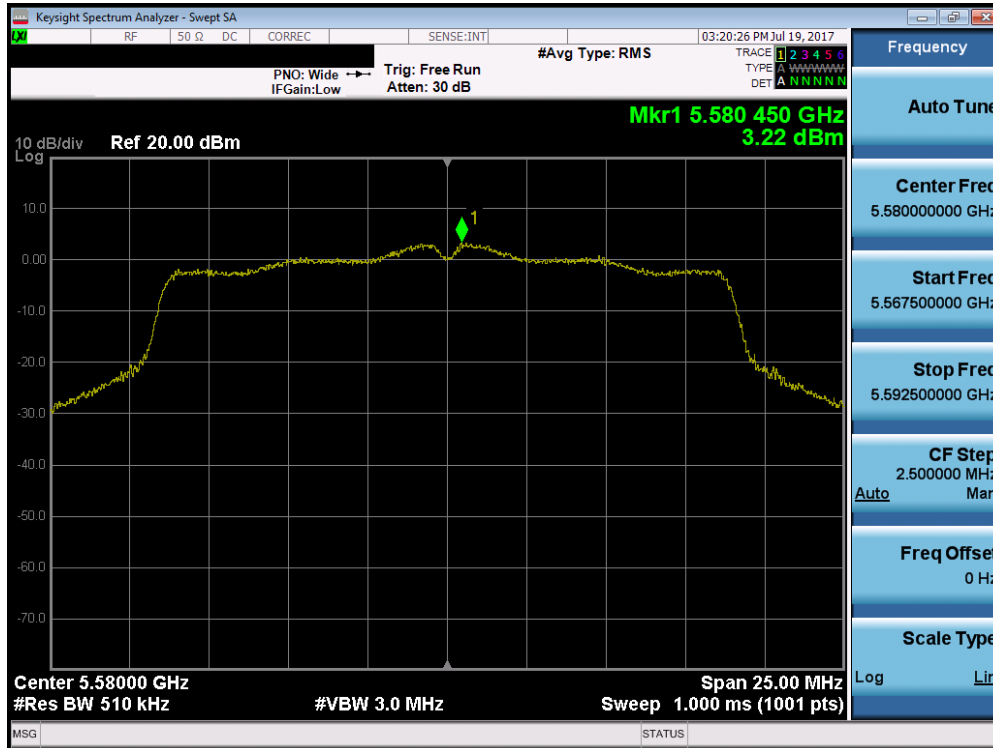


Plot 7-136. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)

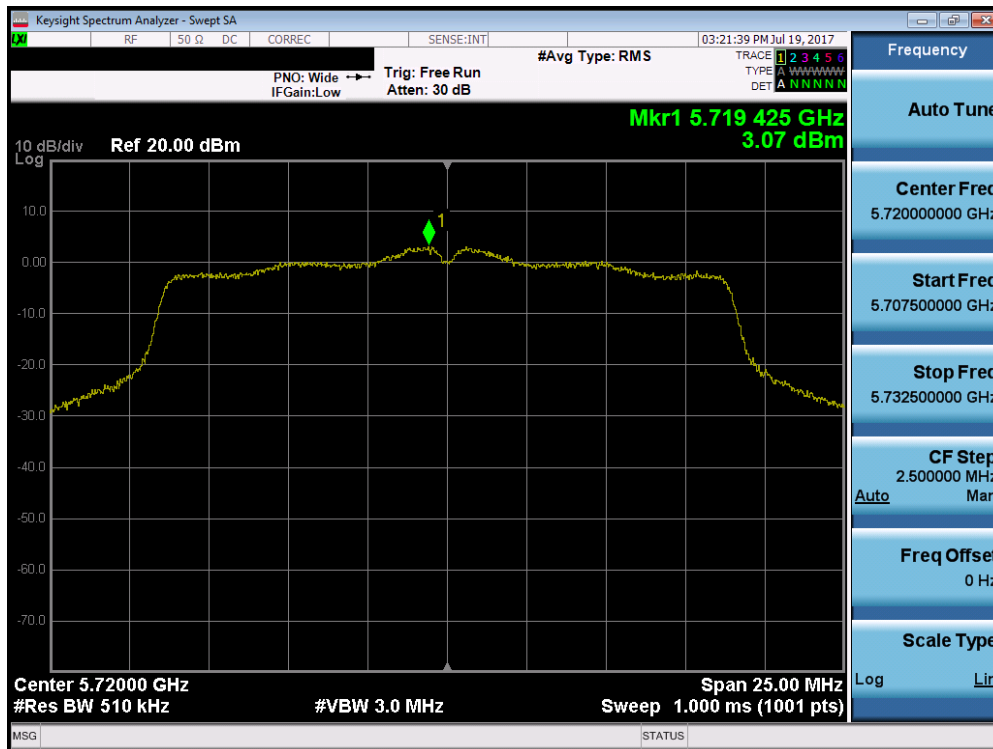
|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 97 of 209                  |

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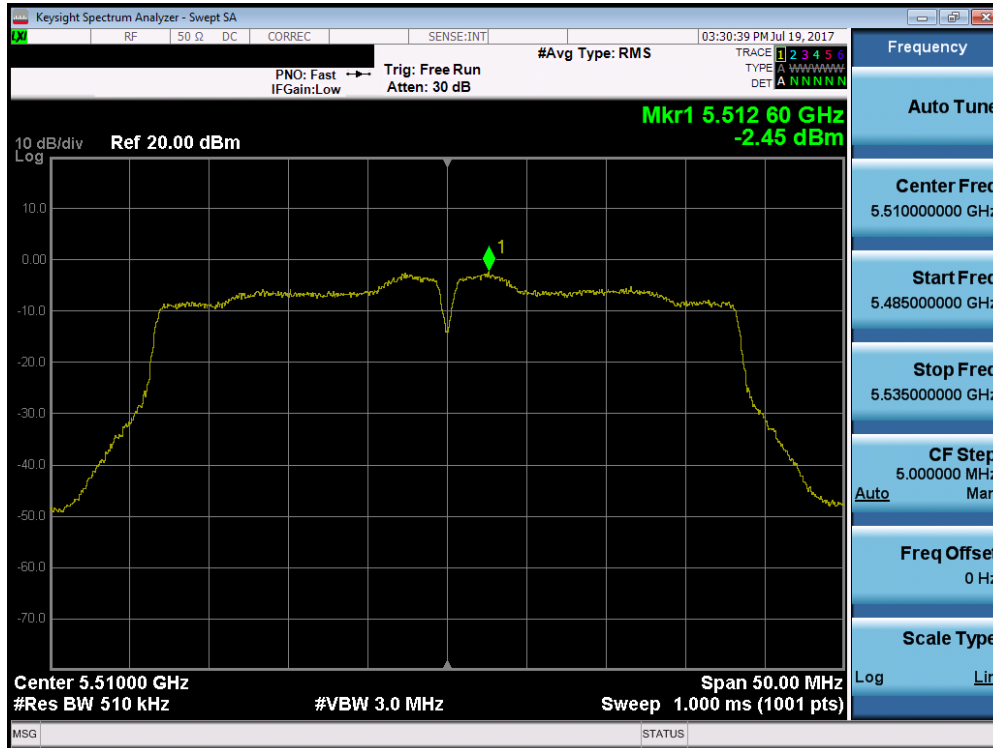


Plot 7-137. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 116)

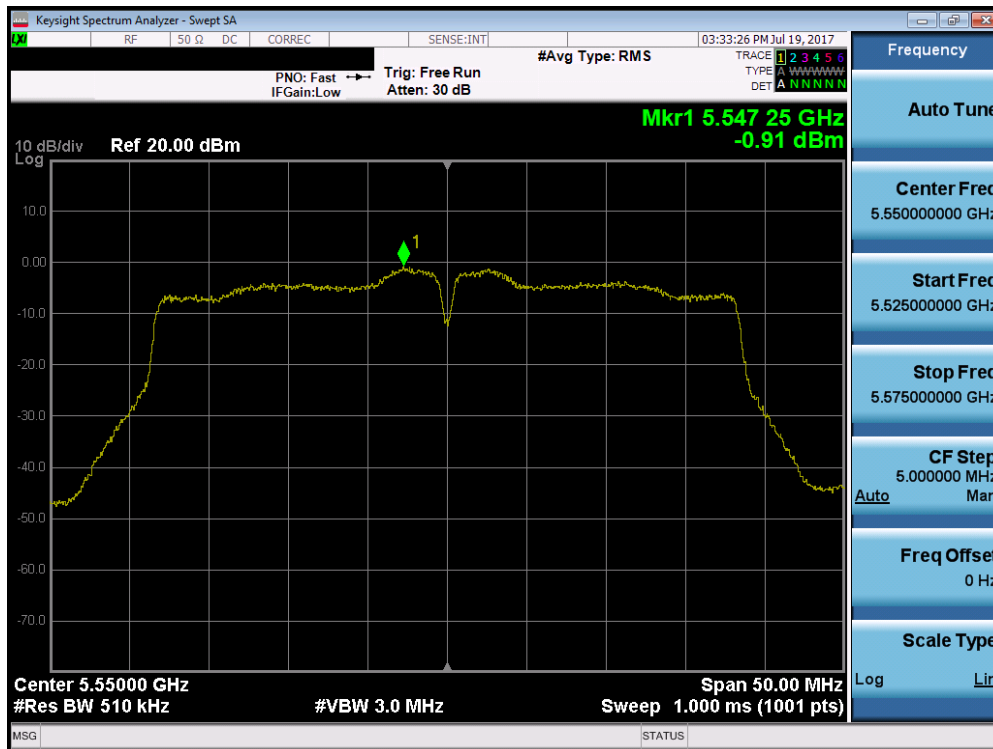


Plot 7-138. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 98 of 209                  |

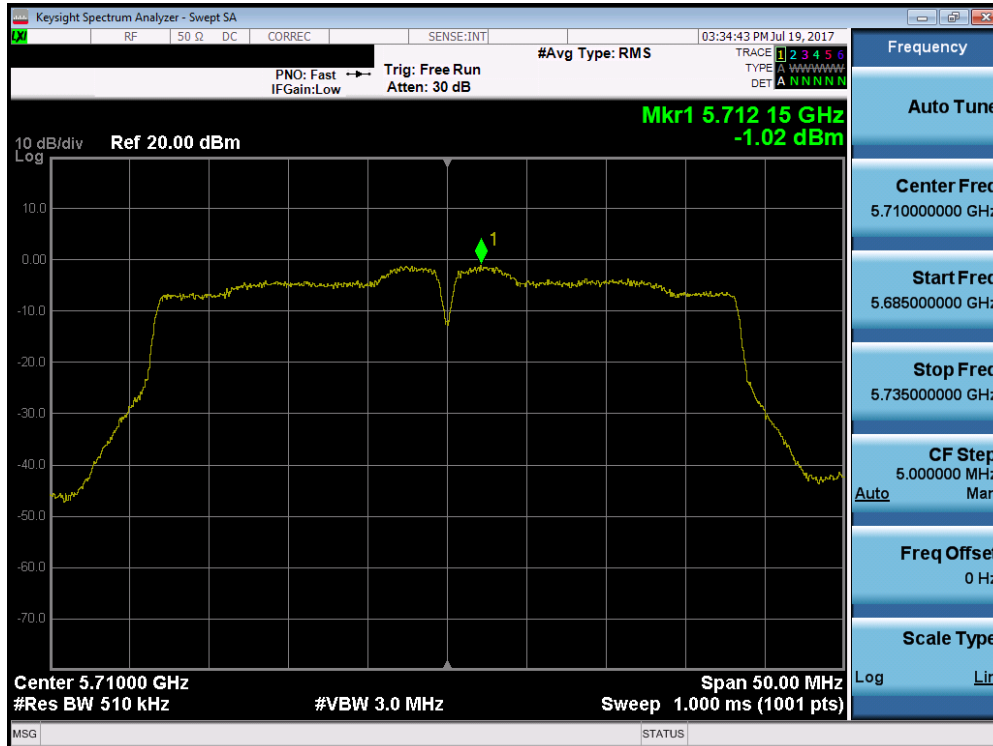


Plot 7-139. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)

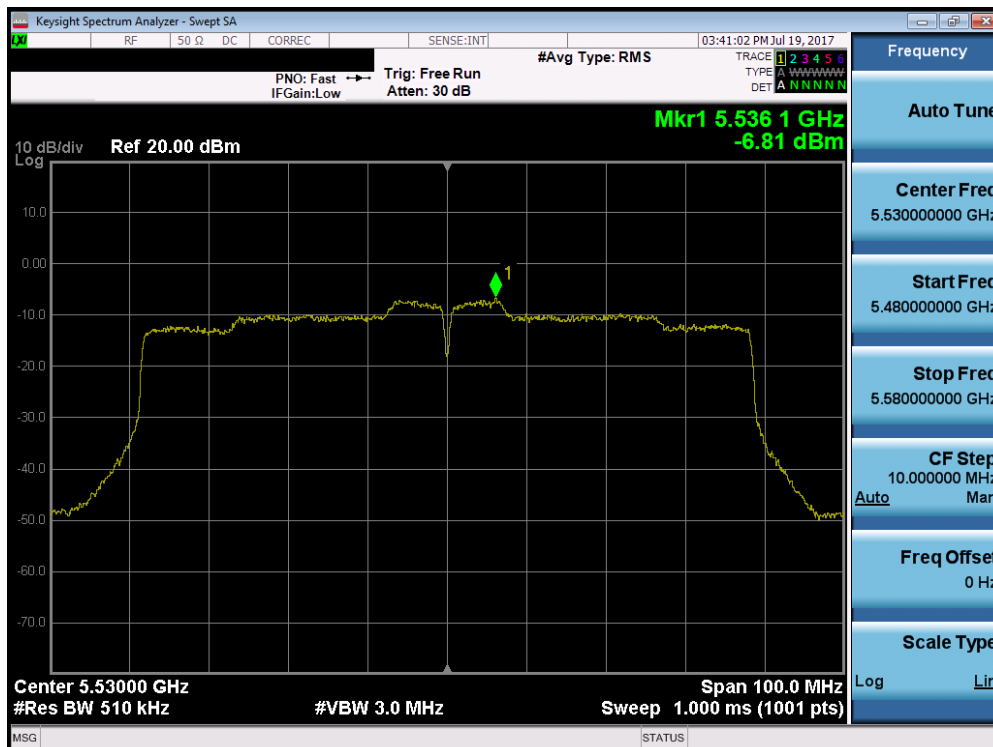


Plot 7-140. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 110)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 99 of 209                  |

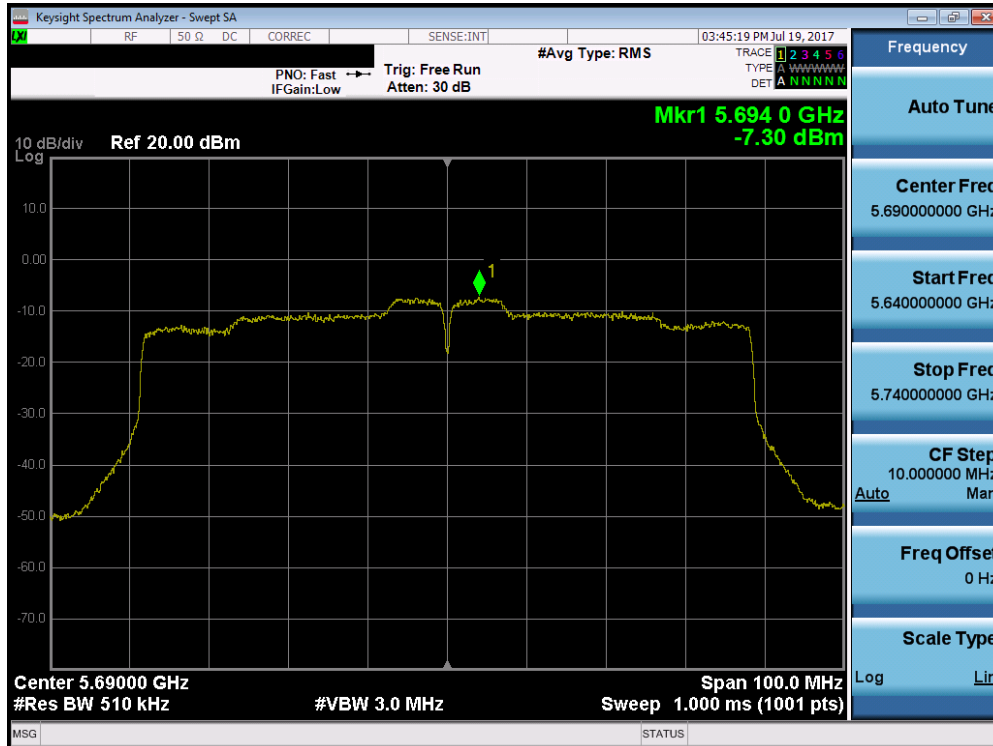


Plot 7-141. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)



Plot 7-142. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)

|                                            |                                               |                                                                        |  |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |  | Page 100 of 209                 |



Plot 7-143. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 101 of 209                 |

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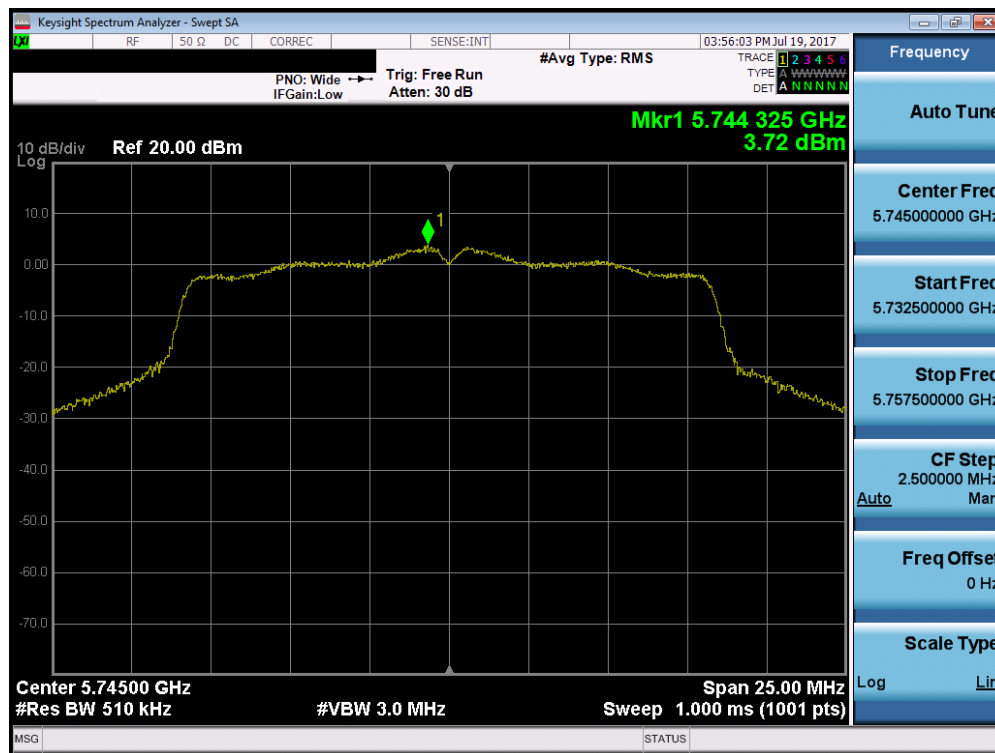
V 6.7

06/23/2017

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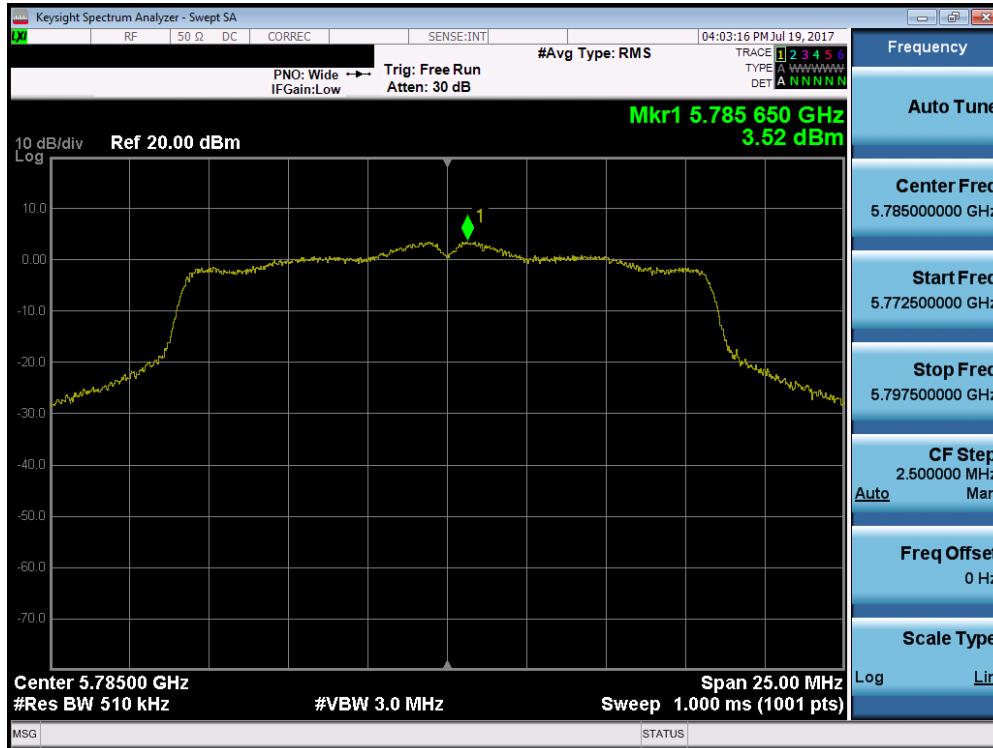
|               | Frequency [MHz] | Channel No. | 802.11 Mode | Data Rate [Mbps] | Measured Power Density [dBm] | Max Permissible Power Density [dBm/500kHz] | Margin [dB] |
|---------------|-----------------|-------------|-------------|------------------|------------------------------|--------------------------------------------|-------------|
| <b>Band 3</b> | 5745            | 149         | a           | 6                | 3.72                         | 30.0                                       | -26.28      |
|               | 5785            | 157         | a           | 6                | 3.52                         | 30.0                                       | -26.48      |
|               | 5825            | 165         | a           | 6                | 3.42                         | 30.0                                       | -26.58      |
|               | 5745            | 149         | n (20MHz)   | 6.5/7.2 (MCS0)   | 3.26                         | 30.0                                       | -26.74      |
|               | 5785            | 157         | n (20MHz)   | 6.5/7.2 (MCS0)   | 3.64                         | 30.0                                       | -26.36      |
|               | 5825            | 165         | n (20MHz)   | 6.5/7.2 (MCS0)   | 3.78                         | 30.0                                       | -26.22      |
|               | 5755            | 151         | n (40MHz)   | 13.5/15 (MCS0)   | -0.44                        | 30.0                                       | -30.44      |
|               | 5795            | 159         | n (40MHz)   | 13.5/15 (MCS0)   | -0.64                        | 30.0                                       | -30.64      |
|               | 5775            | 155         | ac (80MHz)  | 29.3/32.5 (MCS0) | -7.36                        | 30.0                                       | -37.36      |

**Table 7-21. Band 3 Conducted Power Spectral Density Measurements**

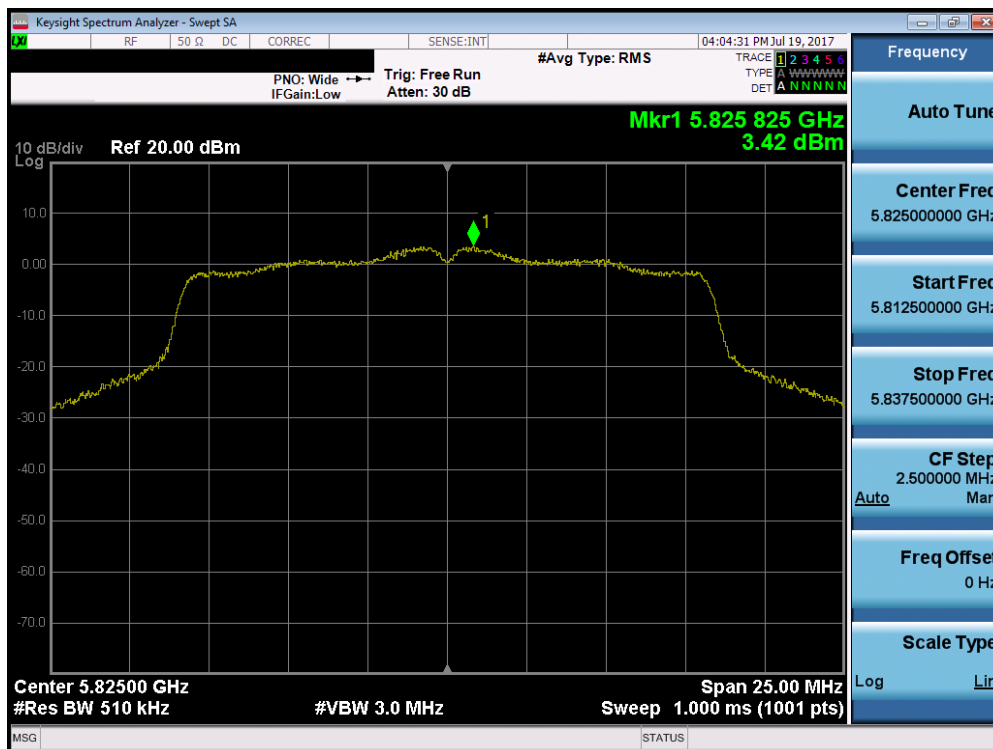


**Plot 7-144. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 149)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 102 of 209                 |

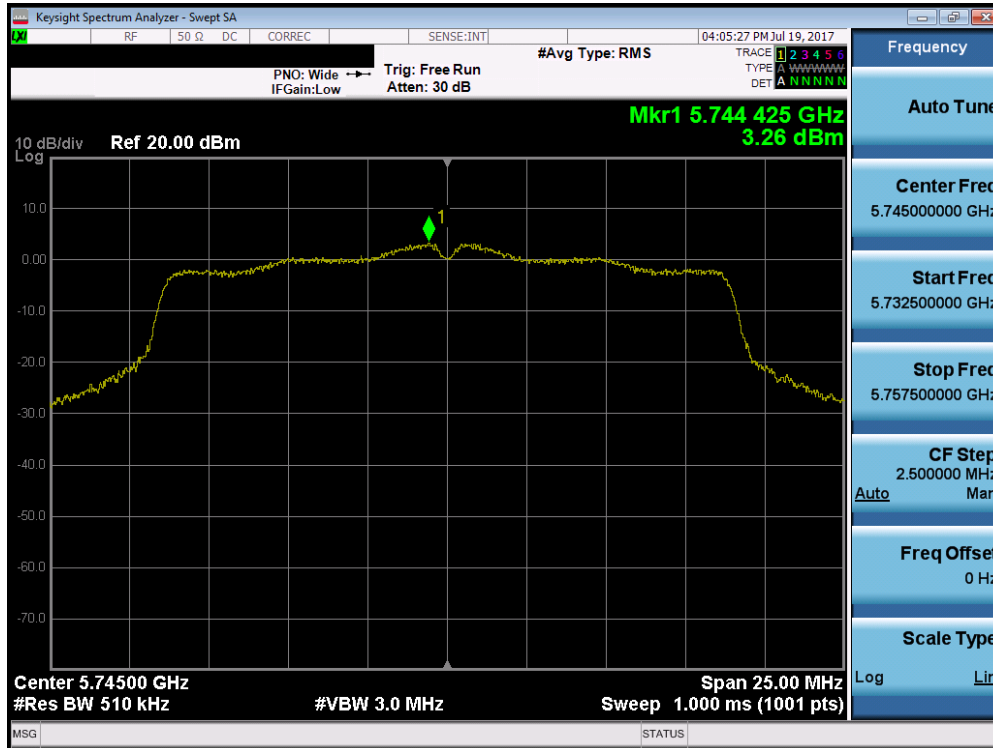


Plot 7-145. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 157)

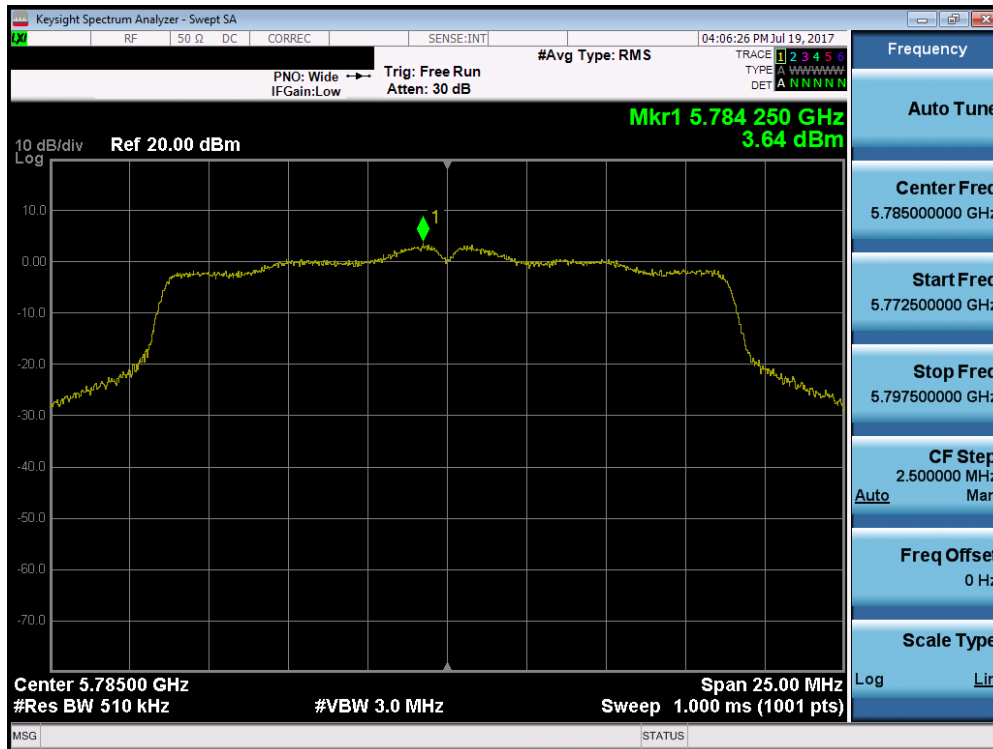


Plot 7-146. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 165)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 103 of 209                 |

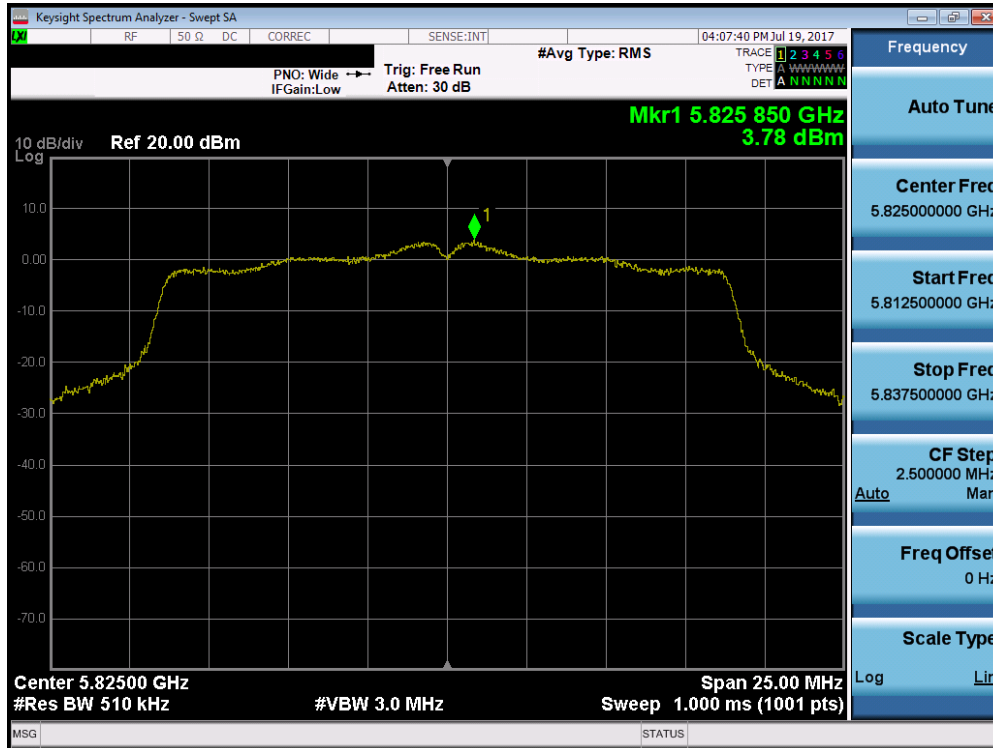


Plot 7-147. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)

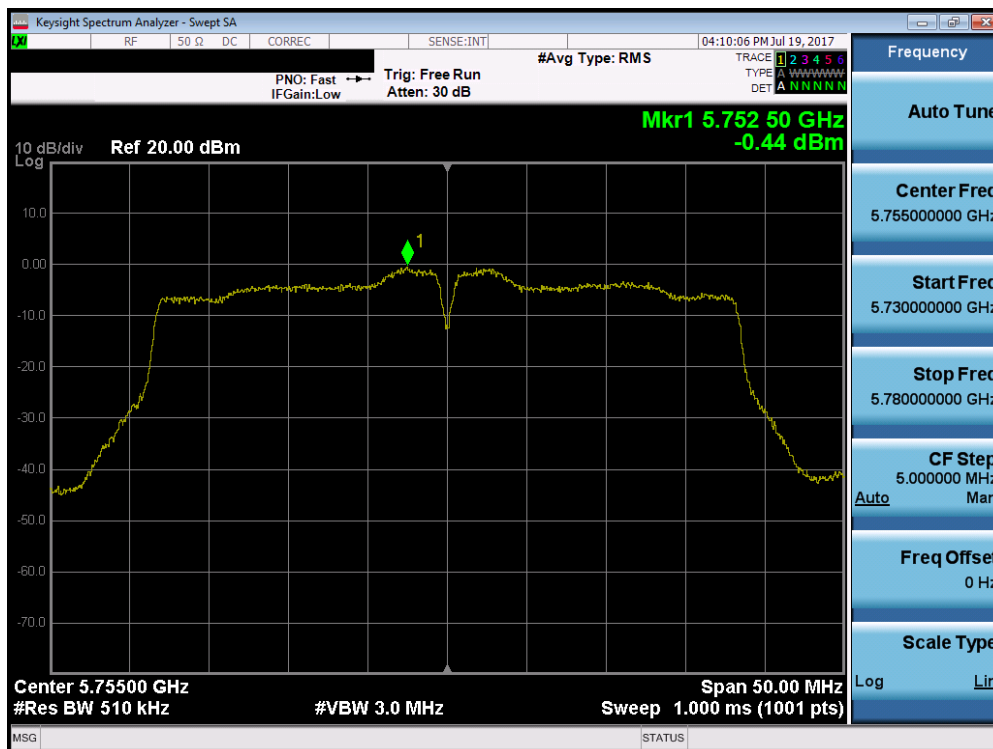


Plot 7-148. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 104 of 209                 |

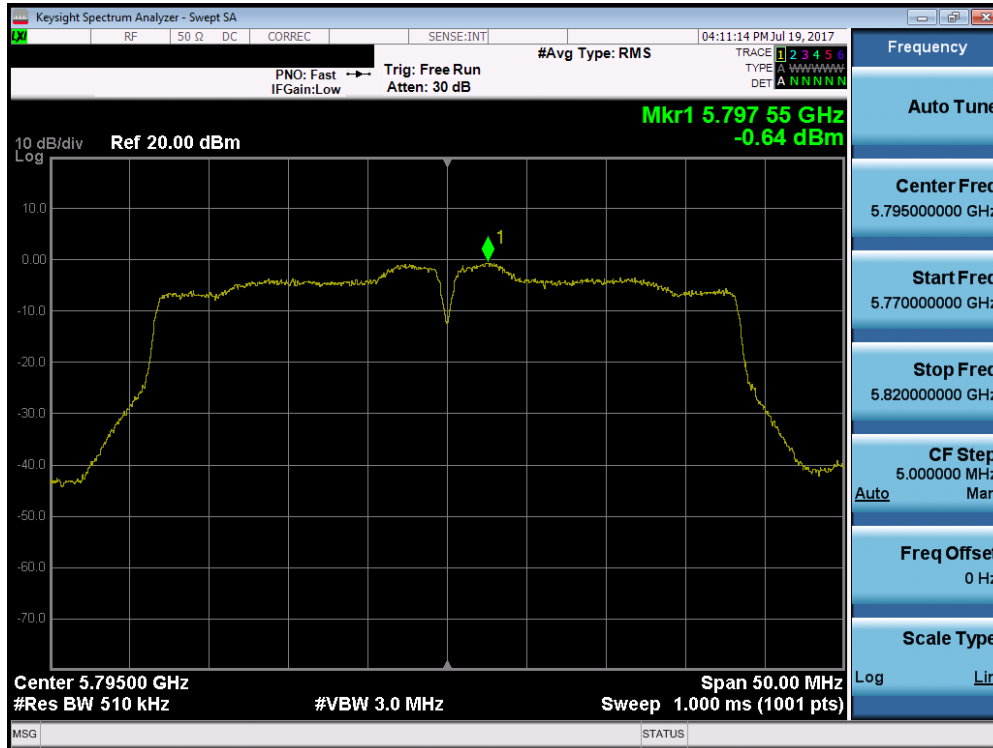


Plot 7-149. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)

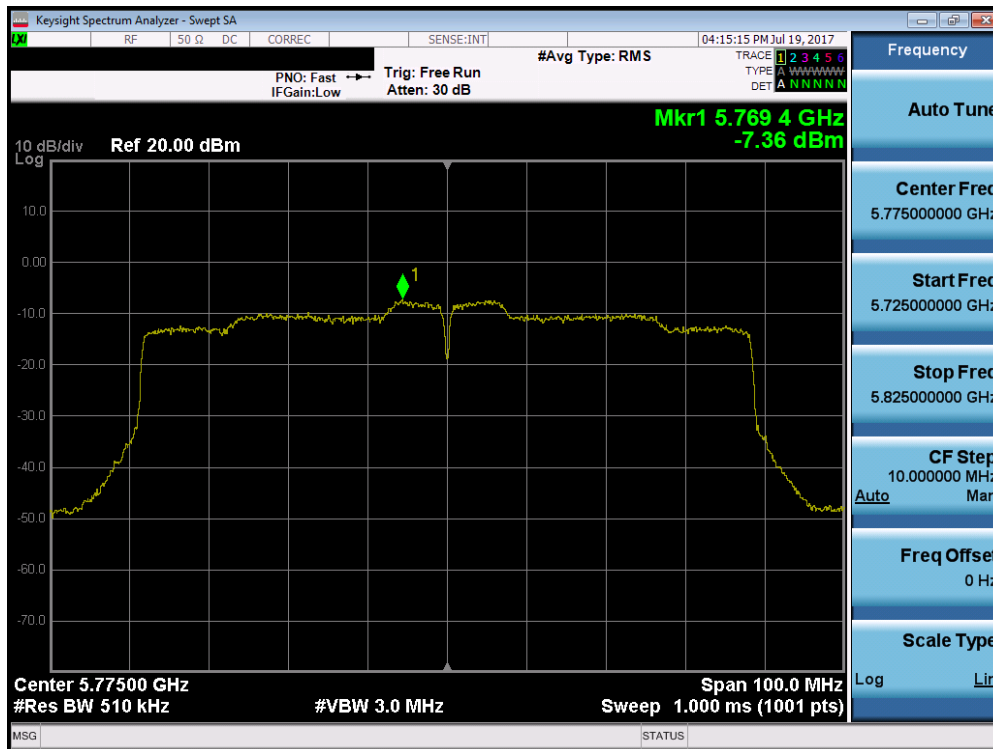


Plot 7-150. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 151)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 105 of 209                 |



Plot 7-151. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 159)



Plot 7-152. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 155)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 106 of 209                 |

## Summed MIMO Power Spectral Density Measurements

|         | Frequency [MHz] | Channel No. | 802.11 Mode | Data Rate [Mbps] | Antenn-1 Power Density [dBm] | Antenn-2 Power Density [dBm] | Summed MIMO Power Density [dBm] | Max Permissible Power Density [dBm/MHz] | Margin [dB] |
|---------|-----------------|-------------|-------------|------------------|------------------------------|------------------------------|---------------------------------|-----------------------------------------|-------------|
| Band 1  | 5180            | 36          | a           | 6.5/7.2 (MCS0)   | 7.20                         | 3.26                         | 8.67                            | 11.0                                    | -2.33       |
|         | 5200            | 40          | a           | 6.5/7.2 (MCS0)   | 7.50                         | 3.60                         | 8.98                            | 11.0                                    | -2.02       |
|         | 5240            | 48          | a           | 6.5/7.2 (MCS0)   | 7.20                         | 3.13                         | 8.64                            | 11.0                                    | -2.36       |
|         | 5180            | 36          | n (20MHz)   | 6.5/7.2 (MCS0)   | 6.94                         | 3.01                         | 8.41                            | 11.0                                    | -2.59       |
|         | 5200            | 40          | n (20MHz)   | 6.5/7.2 (MCS0)   | 6.85                         | 3.03                         | 8.36                            | 11.0                                    | -2.64       |
|         | 5240            | 48          | n (20MHz)   | 6.5/7.2 (MCS0)   | 7.13                         | 3.29                         | 8.63                            | 11.0                                    | -2.37       |
|         | 5190            | 38          | n (40MHz)   | 13.5/15 (MCS0)   | 0.32                         | -3.29                        | 1.89                            | 11.0                                    | -9.11       |
|         | 5230            | 46          | n (40MHz)   | 13.5/15 (MCS0)   | 3.13                         | -0.56                        | 4.67                            | 11.0                                    | -6.33       |
| Band 2A | 5210            | 42          | ac (80MHz)  | 29.3/32.5 (MCS0) | -2.31                        | -6.74                        | -0.97                           | 11.0                                    | -11.97      |
|         | 5260            | 52          | a           | 6.5/7.2 (MCS0)   | 7.37                         | 3.44                         | 8.85                            | 11.0                                    | -2.15       |
|         | 5280            | 56          | a           | 6.5/7.2 (MCS0)   | 7.56                         | 3.68                         | 9.05                            | 11.0                                    | -1.95       |
|         | 5320            | 64          | a           | 6.5/7.2 (MCS0)   | 7.68                         | 3.63                         | 9.12                            | 11.0                                    | -1.88       |
|         | 5260            | 52          | n (20MHz)   | 6.5/7.2 (MCS0)   | 6.86                         | 2.93                         | 8.34                            | 11.0                                    | -2.66       |
|         | 5280            | 56          | n (20MHz)   | 6.5/7.2 (MCS0)   | 7.13                         | 3.10                         | 8.58                            | 11.0                                    | -2.42       |
|         | 5320            | 64          | n (20MHz)   | 6.5/7.2 (MCS0)   | 7.04                         | 2.87                         | 8.45                            | 11.0                                    | -2.55       |
|         | 5270            | 54          | n (40MHz)   | 13.5/15 (MCS0)   | 3.03                         | -0.52                        | 4.62                            | 11.0                                    | -6.38       |
| Band 2C | 5310            | 62          | n (40MHz)   | 13.5/15 (MCS0)   | 0.97                         | -2.66                        | 2.53                            | 11.0                                    | -8.47       |
|         | 5290            | 58          | ac (80MHz)  | 29.3/32.5 (MCS0) | -4.65                        | -8.61                        | -3.19                           | 11.0                                    | -14.19      |
|         | 5500            | 100         | a           | 6.5/7.2 (MCS0)   | 7.31                         | 3.40                         | 8.79                            | 11.0                                    | -2.21       |
|         | 5580            | 116         | a           | 6.5/7.2 (MCS0)   | 7.19                         | 3.56                         | 8.76                            | 11.0                                    | -2.24       |
|         | 5720            | 144         | a           | 6.5/7.2 (MCS0)   | 6.78                         | 3.40                         | 8.42                            | 11.0                                    | -2.58       |
|         | 5500            | 100         | n (20MHz)   | 6.5/7.2 (MCS0)   | 7.09                         | 2.87                         | 8.49                            | 11.0                                    | -2.51       |
|         | 5580            | 116         | n (20MHz)   | 6.5/7.2 (MCS0)   | 6.93                         | 3.22                         | 8.47                            | 11.0                                    | -2.53       |
|         | 5720            | 144         | n (20MHz)   | 6.5/7.2 (MCS0)   | 6.57                         | 3.07                         | 8.17                            | 11.0                                    | -2.83       |
|         | 5510            | 102         | n (40MHz)   | 13.5/15 (MCS0)   | 1.07                         | -2.45                        | 2.67                            | 11.0                                    | -8.33       |
|         | 5550            | 110         | n (40MHz)   | 13.5/15 (MCS0)   | 2.80                         | -0.91                        | 4.34                            | 11.0                                    | -6.66       |
|         | 5710            | 142         | n (40MHz)   | 13.5/15 (MCS0)   | 2.23                         | -1.02                        | 3.91                            | 11.0                                    | -7.09       |
|         | 5530            | 106         | ac (80MHz)  | 29.3/32.5 (MCS0) | -3.10                        | -6.81                        | -1.56                           | 11.0                                    | -12.56      |
|         | 5690            | 138         | ac (80MHz)  | 29.3/32.5 (MCS0) | -4.04                        | -7.30                        | -2.36                           | 11.0                                    | -13.36      |

**Table 7-22. Bands 1, 2A, 2C MIMO Conducted Power Spectral Density Measurements**

|        | Frequency [MHz] | Channel No. | 802.11 Mode | Data Rate [Mbps] | Antenn-1 Power Density [dBm] | Antenn-2 Power Density [dBm] | Summed MIMO Power Density [dBm] | Max Permissible Power Density [dBm/500kHz] | Margin [dB] |
|--------|-----------------|-------------|-------------|------------------|------------------------------|------------------------------|---------------------------------|--------------------------------------------|-------------|
| Band 3 | 5745            | 149         | a           | 6.5/7.2 (MCS0)   | 4.38                         | 3.72                         | 7.07                            | 30.0                                       | -22.93      |
|        | 5785            | 157         | a           | 6.5/7.2 (MCS0)   | 4.46                         | 3.52                         | 7.03                            | 30.0                                       | -22.97      |
|        | 5825            | 165         | a           | 6.5/7.2 (MCS0)   | 4.58                         | 3.42                         | 7.05                            | 30.0                                       | -22.95      |
|        | 5745            | 149         | n (20MHz)   | 6.5/7.2 (MCS0)   | 4.36                         | 3.26                         | 6.86                            | 30.0                                       | -23.14      |
|        | 5785            | 157         | n (20MHz)   | 6.5/7.2 (MCS0)   | 4.58                         | 3.64                         | 7.15                            | 30.0                                       | -22.85      |
|        | 5825            | 165         | n (20MHz)   | 6.5/7.2 (MCS0)   | 4.15                         | 3.78                         | 6.98                            | 30.0                                       | -23.02      |
|        | 5755            | 151         | n (40MHz)   | 13.5/15 (MCS0)   | 0.29                         | -0.44                        | 2.95                            | 30.0                                       | -27.05      |
|        | 5795            | 159         | n (40MHz)   | 13.5/15 (MCS0)   | -0.01                        | -0.64                        | 2.70                            | 30.0                                       | -27.30      |
|        | 5775            | 155         | ac (80MHz)  | 29.3/32.5 (MCS0) | -6.21                        | -7.36                        | -3.74                           | 30.0                                       | -33.74      |

**Table 7-23. Band 3 MIMO Conducted Power Spectral Density Measurements**

### Note:

Per KDB 662911 v02r01 Section E)2), the power spectral density at Antenna 1 and Antenna 2 were first measured separately as shown in the section above. The measured values were then summed in linear power units then converted back to dBm.

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
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### Sample MIMO Calculation:

At 5180MHz the average conducted power spectral density was measured to be 6.94 dBm for Antenna-1 and 3.01 dBm for Antenna-2.

Antenna 1 + Antenna 2 = MIMO

$$(6.94 \text{ dBm} + 3.01 \text{ dBm}) = (4.94 \text{ mW} + 2.00 \text{ mW}) = 6.94 \text{ mW} = 8.41 \text{ dBm}$$

|                                            |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
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## 7.6 Frequency Stability

### §15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,180,000,000 Hz  
 CHANNEL: 36  
 REFERENCE VOLTAGE: 3.85 VDC

| VOLTAGE (%)    | POWER (VDC) | TEMP (°C)  | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|-------------|------------|----------------|-----------------|---------------|
| 100 %          | 3.85        | + 20 (Ref) | 5,180,000,124  | 124             | 0.00000239    |
| 100 %          |             | - 30       | 5,179,999,930  | -70             | -0.00000135   |
| 100 %          |             | - 20       | 5,180,000,200  | 200             | 0.00000386    |
| 100 %          |             | - 10       | 5,180,000,226  | 226             | 0.00000436    |
| 100 %          |             | 0          | 5,180,000,213  | 213             | 0.00000411    |
| 100 %          |             | + 10       | 5,179,999,892  | -108            | -0.00000208   |
| 100 %          |             | + 20       | 5,180,000,086  | 86              | 0.00000166    |
| 100 %          |             | + 30       | 5,180,000,179  | 179             | 0.00000346    |
| 100 %          |             | + 40       | 5,179,999,909  | -91             | -0.00000176   |
| 100 %          |             | + 50       | 5,180,000,036  | 36              | 0.00000069    |
| BATT. ENDPOINT | 3.45        | + 20       | 5,180,000,069  | 69              | 0.00000133    |

**Table 7-24. Frequency Stability Measurements for UNII Band 1 (Ch. 36)**

#### **Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

|                                            |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                          |                                                                                       | Page 109 of 209                 |

## Frequency Stability

**§15.407(g)**

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,260,000,000 Hz  
 CHANNEL: 52  
 REFERENCE VOLTAGE: 3.85 VDC

| VOLTAGE (%)    | POWER (VDC) | TEMP (°C)  | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|-------------|------------|----------------|-----------------|---------------|
| 100 %          | 3.85        | + 20 (Ref) | 5,259,999,830  | -170            | -0.00000323   |
| 100 %          |             | - 30       | 5,260,000,380  | 380             | 0.00000722    |
| 100 %          |             | - 20       | 5,259,999,963  | -37             | -0.00000070   |
| 100 %          |             | - 10       | 5,260,000,134  | 134             | 0.00000255    |
| 100 %          |             | 0          | 5,259,999,871  | -129            | -0.00000245   |
| 100 %          |             | + 10       | 5,260,000,055  | 55              | 0.00000105    |
| 100 %          |             | + 20       | 5,260,000,039  | 39              | 0.00000074    |
| 100 %          |             | + 30       | 5,260,000,076  | 76              | 0.00000144    |
| 100 %          |             | + 40       | 5,259,999,686  | -314            | -0.00000597   |
| 100 %          |             | + 50       | 5,260,000,011  | 11              | 0.00000021    |
| BATT. ENDPOINT | 3.45        | + 20       | 5,259,999,670  | -330            | -0.00000627   |

**Table 7-25. Frequency Stability Measurements for UNII Band 2A (Ch. 52)**

### Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

|                                            |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                          | Page 110 of 209                                                                       |                                 |

## Frequency Stability

**\$15.407(g)**

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,500,000,000 Hz  
 CHANNEL: 100  
 REFERENCE VOLTAGE: 3.85 VDC

| VOLTAGE (%)    | POWER (VDC) | TEMP (°C)  | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|-------------|------------|----------------|-----------------|---------------|
| 100 %          | 3.85        | + 20 (Ref) | 5,500,000,094  | 94              | 0.00000171    |
| 100 %          |             | - 30       | 5,500,000,362  | 362             | 0.00000658    |
| 100 %          |             | - 20       | 5,499,999,979  | -21             | -0.00000038   |
| 100 %          |             | - 10       | 5,500,000,166  | 166             | 0.00000302    |
| 100 %          |             | 0          | 5,500,000,033  | 33              | 0.00000060    |
| 100 %          |             | + 10       | 5,499,999,991  | -9              | -0.00000016   |
| 100 %          |             | + 20       | 5,500,000,041  | 41              | 0.00000075    |
| 100 %          |             | + 30       | 5,500,000,213  | 213             | 0.00000387    |
| 100 %          |             | + 40       | 5,500,000,246  | 246             | 0.00000447    |
| 100 %          |             | + 50       | 5,500,000,022  | 22              | 0.00000040    |
| BATT. ENDPOINT | 3.45        | + 20       | 5,500,000,084  | 84              | 0.00000153    |

**Table 7-26. Frequency Stability Measurements for UNII Band 2C (Ch. 100)**

### Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

|                                            |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                          | Page 111 of 209                                                                       |                                 |

## Frequency Stability

**\$15.407(g)**

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,745,000,000 Hz  
 CHANNEL: 149  
 REFERENCE VOLTAGE: 3.85 VDC

| VOLTAGE (%)    | POWER (VDC) | TEMP (°C)  | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|-------------|------------|----------------|-----------------|---------------|
| 100 %          | 3.85        | + 20 (Ref) | 5,745,000,048  | 48              | 0.00000084    |
| 100 %          |             | - 30       | 5,744,999,971  | -29             | -0.00000050   |
| 100 %          |             | - 20       | 5,744,999,966  | -34             | -0.00000059   |
| 100 %          |             | - 10       | 5,744,999,969  | -31             | -0.00000054   |
| 100 %          |             | 0          | 5,745,000,197  | 197             | 0.00000343    |
| 100 %          |             | + 10       | 5,744,999,669  | -331            | -0.00000576   |
| 100 %          |             | + 20       | 5,745,000,152  | 152             | 0.00000265    |
| 100 %          |             | + 30       | 5,745,000,044  | 44              | 0.00000077    |
| 100 %          |             | + 40       | 5,745,000,409  | 409             | 0.00000712    |
| 100 %          |             | + 50       | 5,744,999,801  | -199            | -0.00000346   |
| BATT. ENDPOINT | 3.45        | + 20       | 5,744,999,987  | -13             | -0.00000023   |

**Table 7-27. Frequency Stability Measurements for UNII Band 3 (Ch. 149)**

### **Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

|                                            |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                          | Page 112 of 209                                                                       |                                 |

## 7.7 Radiated Spurious Emission Measurements – Above 1GHz

**§15.407(b) §15.205 §15.209**

### **Test Overview and Limit**

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033 D02 v01r04, and at the appropriate frequencies. All channels, modes (e.g. 802.11a, 802.11n (20MHz BW), 802.11n (40MHz BW), and 802.11ac (80MHz)), and modulations/data rates were investigated among all UNII bands. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

***For transmitters operating in the 5.15-5.25 GHz and 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.***

***For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.***

***For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.***

***All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 7-28 per Section 15.209.***

| Frequency       | Field Strength<br>[μV/m] | Measured Distance<br>[Meters] |
|-----------------|--------------------------|-------------------------------|
| Above 960.0 MHz | 500                      | 3                             |

**Table 7-28. Radiated Limits**

### **Test Procedures Used**

KDB 789033 D02 v01r04 – Section G

### **Test Settings**

#### **Average Measurements above 1GHz (Method AD)**

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be  $\geq 2 \times \text{span/RBW}$ )
6. Averaging type = power (RMS)
7. Sweep time = auto couple
8. Trace was averaged over 100 sweeps

#### **Peak Measurements above 1GHz**

|                                            |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                          | Page 113 of 209                                                                       |                                 |

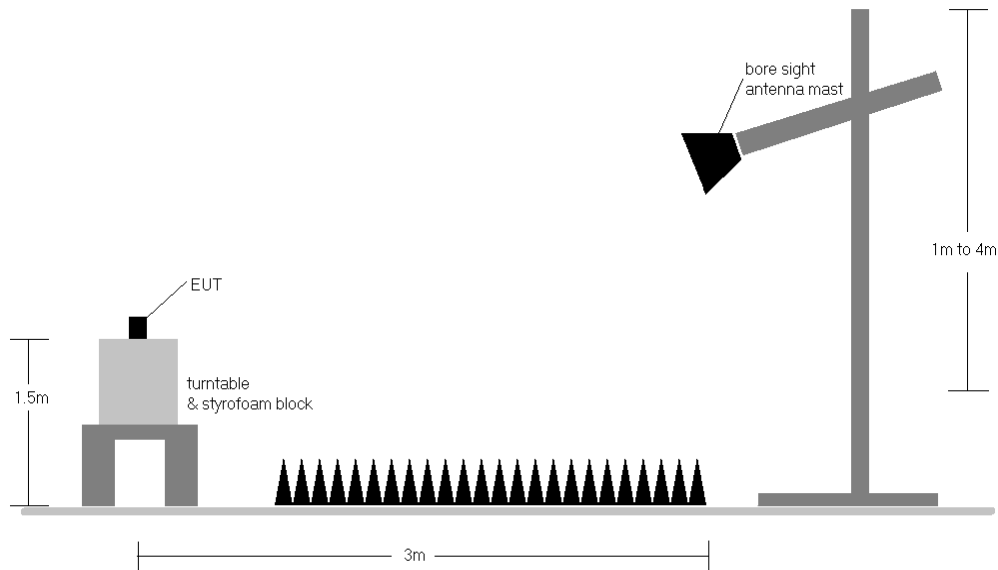
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

#### **Peak Measurements below 1GHz**

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = 120kHz
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

#### **Test Setup**

The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 7-5. Test Instrument & Measurement Setup**

|                                                   |                                               |                                                                                |                                        |
|---------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------|
| <b>FCC ID:</b> ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | <b>FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br/>(CERTIFICATION)</b> | <b>Approved by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>1M1707110215-05-R1.ZNF | <b>Test Dates:</b><br>7/12/2017-8/8/2017      | <b>EUT Type:</b><br>Portable Handset                                           | Page 114 of 209                        |

## Test Notes

1. All radiated spurious emissions levels were measured in a radiated test setup per the guidance of KDB 789033 D02 v01r04 Section G.
2. All emissions that lie in the restricted bands (denoted by a \* next to the frequency) specified in §15.205 are below the limit shown in Table 7-28.
3. All spurious emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 7-28. All spurious emissions that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.
4. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
5. This unit was tested with its standard battery.
6. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
7. Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
8. Radiated spurious emissions were investigated while operating in MIMO mode, however, it was determined that single antenna operation produced the worst case emissions. Since the emissions produced from MIMO operation were found to be more than 20dB below the limit, the MIMO emissions are not reported.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section. Rohde & Schwarz EMC32, Version 9.15.00 automated test software was used to perform the Radiated Spurious Emissions Pre-Scan testing.
10. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

|                                            |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                          |                                                                                       | Page 115 of 209                 |

## Sample Calculations

### Determining Spurious Emissions Levels

- Field Strength Level  $[\text{dB}\mu\text{V}/\text{m}] = \text{Analyzer Level } [\text{dBm}] + 107 + \text{AFCL } [\text{dB}/\text{m}]$
- $\text{AFCL } [\text{dB}/\text{m}] = \text{Antenna Factor } [\text{dB}/\text{m}] + \text{Cable Loss } [\text{dB}]$
- $\text{Margin } [\text{dB}] = \text{Field Strength Level } [\text{dB}\mu\text{V}/\text{m}] - \text{Limit } [\text{dB}\mu\text{V}/\text{m}]$

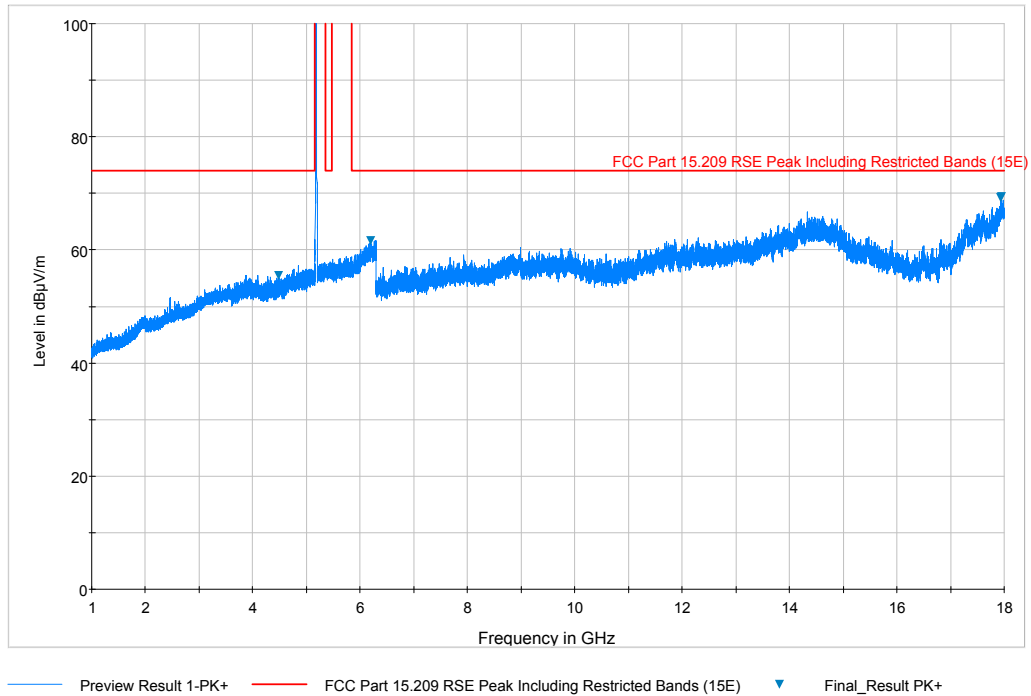
### Radiated Band Edge Measurement Offset

- The amplitude offset shown in the radiated restricted band edge plots in Section 7.7 was calculated using the formula:

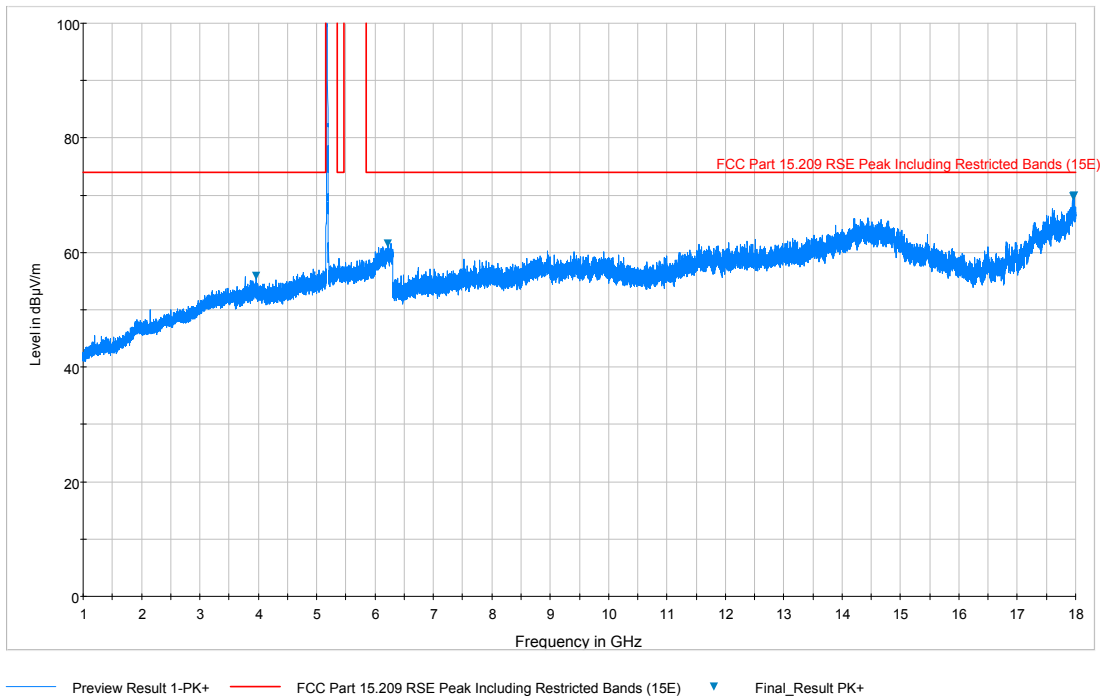
$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$$

|                                            |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
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## 7.7.1 Antenna-1 Radiated Spurious Emission Measurements

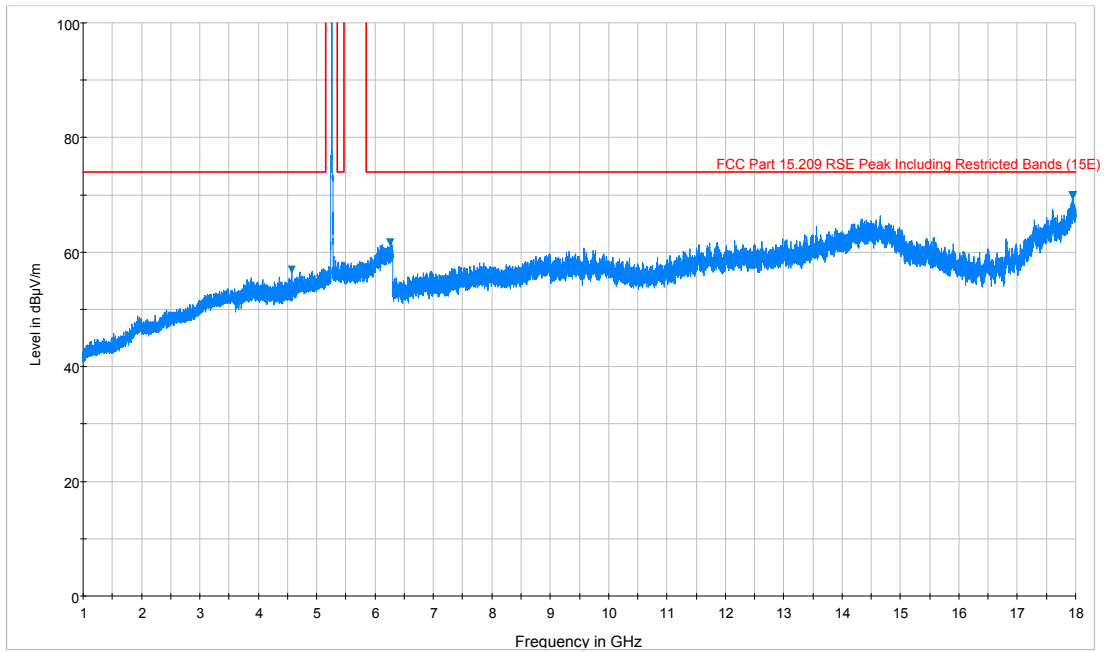


**Plot 7-153. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)**

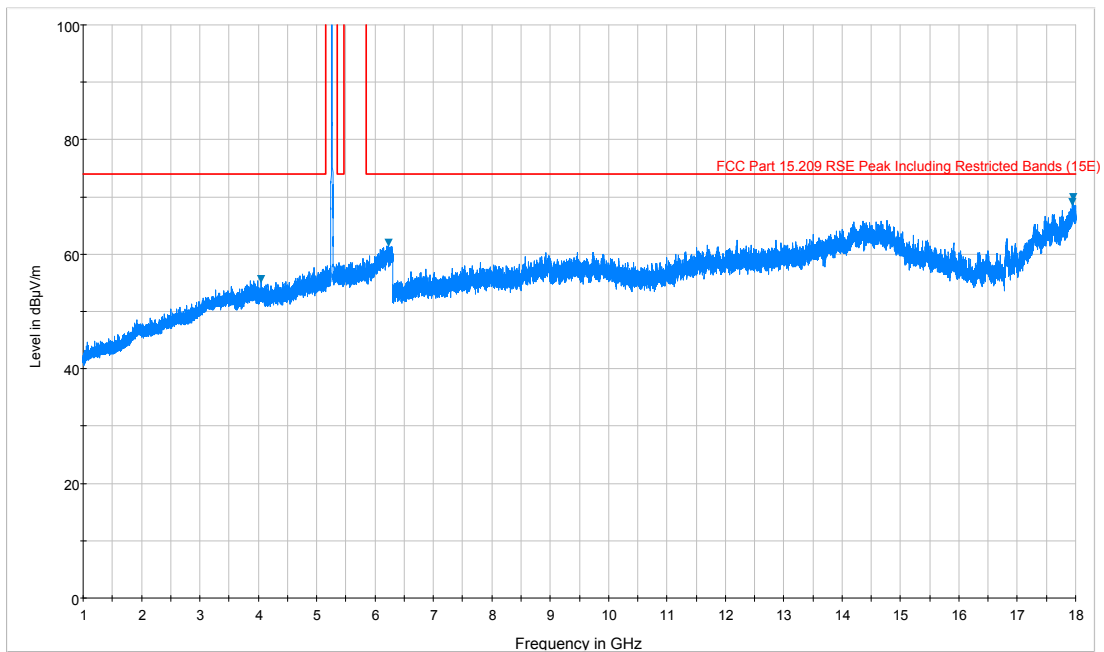


**Plot 7-154. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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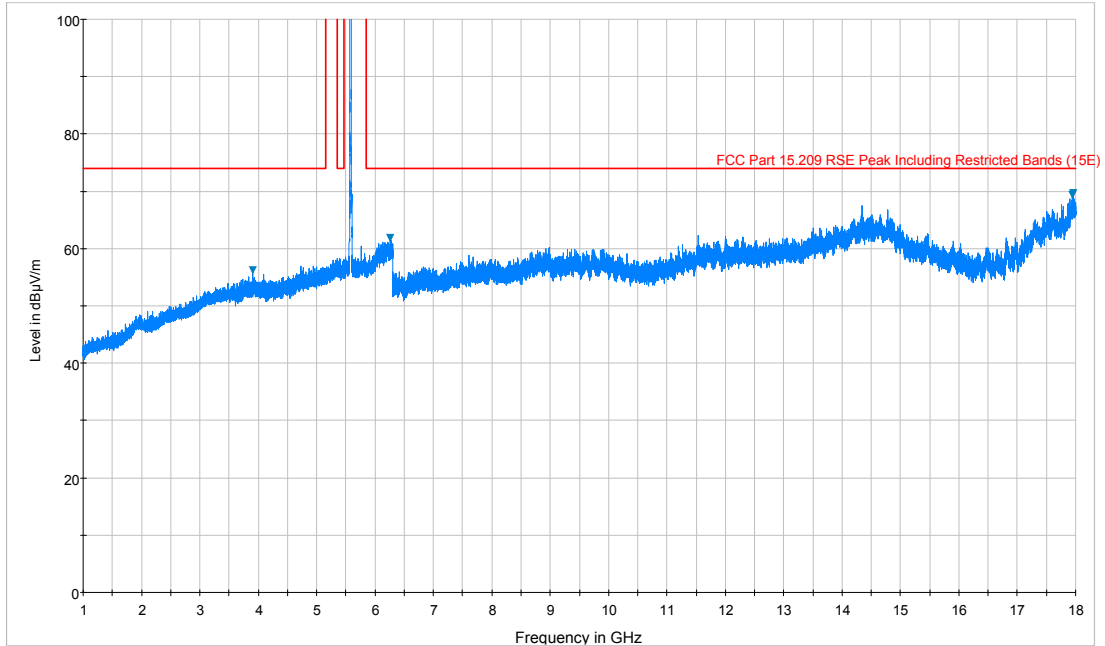


**Plot 7-155. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)**



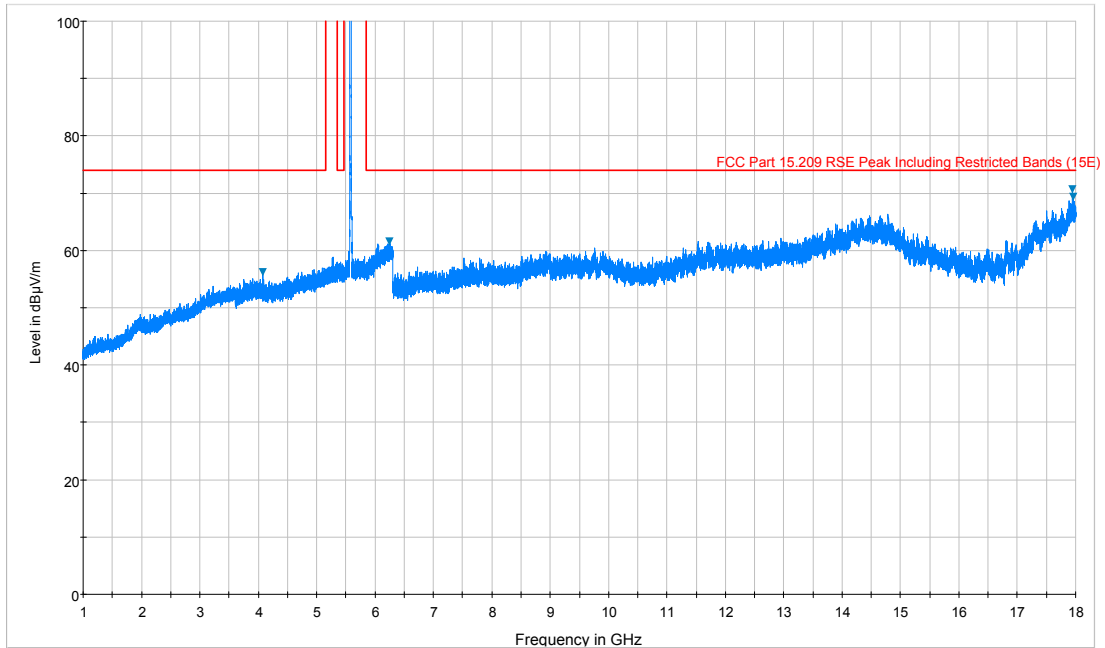
**Plot 7-156. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 118 of 209                 |



Preview Result 1-PK+    FCC Part 15.209 RSE Peak Including Restricted Bands (15E)    Final\_Result PK+

**Plot 7-157. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. H)**



Preview Result 1-PK+    FCC Part 15.209 RSE Peak Including Restricted Bands (15E)    Final\_Result PK+

**Plot 7-158. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. V)**

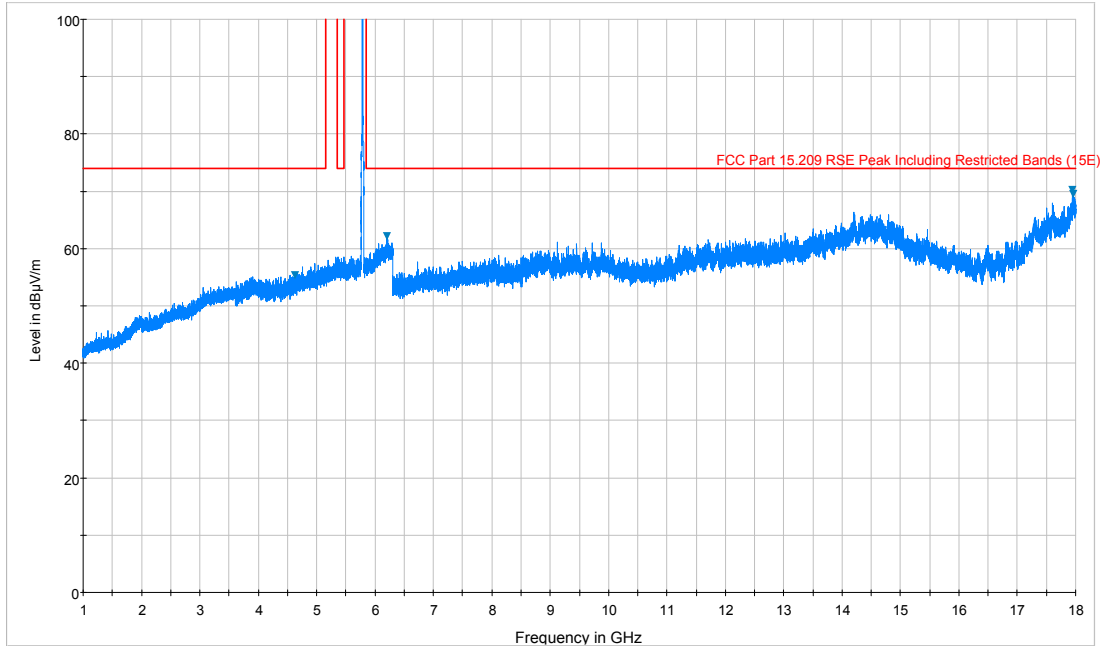
|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 119 of 209                 |

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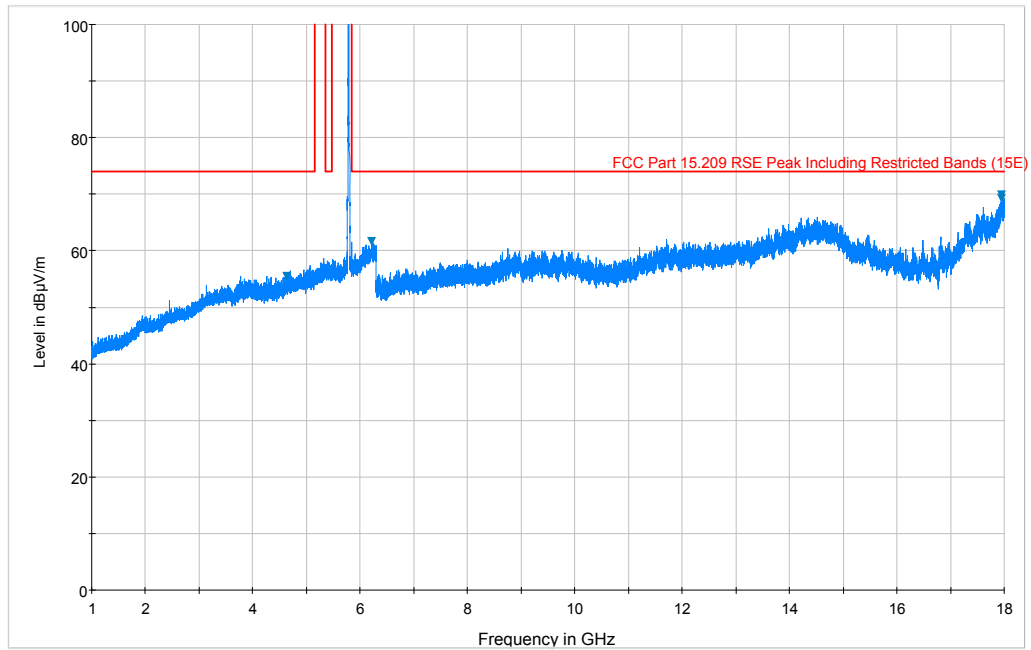
V 6.7

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**Plot 7-159. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)**

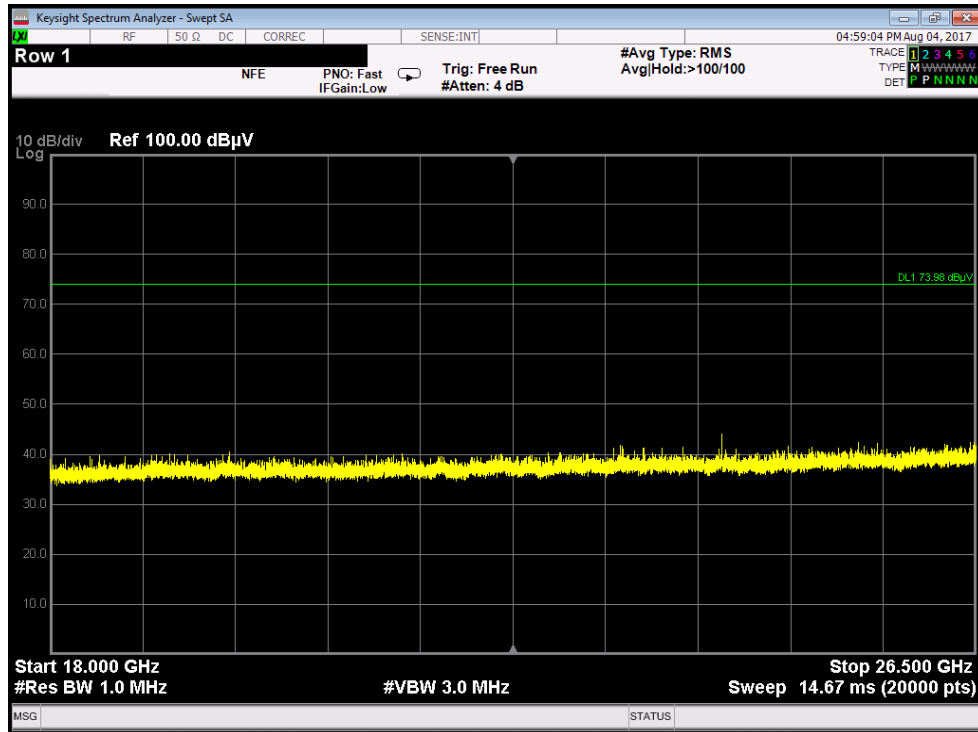


**Plot 7-160. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)**

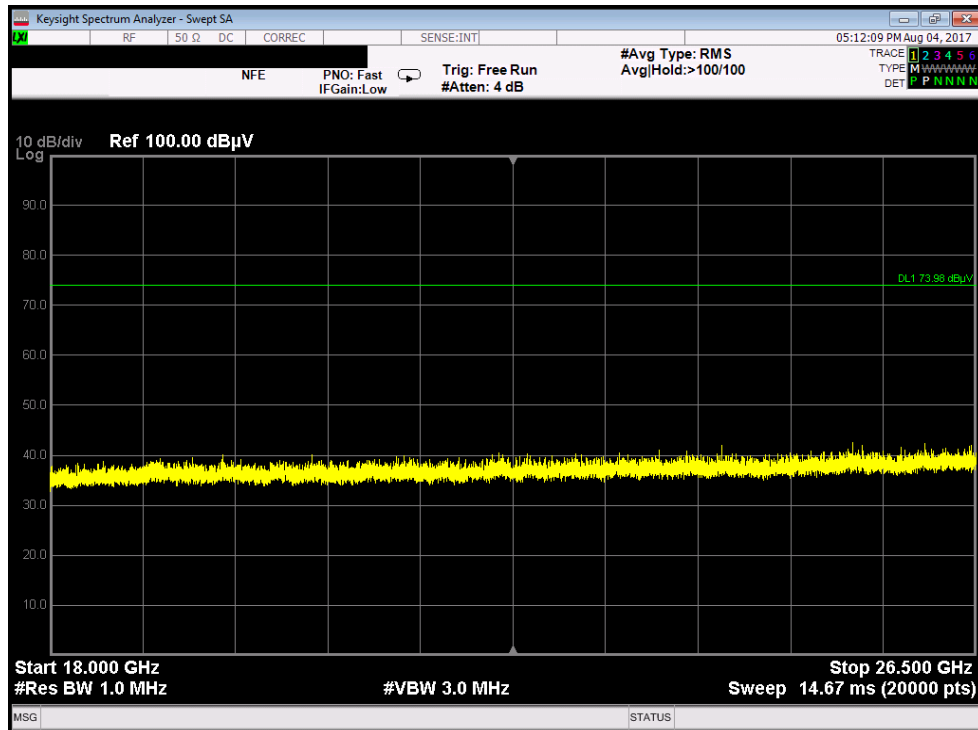
|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
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## Antenna-1 Radiated Spurious Emissions Measurements (Above 18GHz)

**\$15.209**



**Plot 7-161. Radiated Spurious Plot 18GHz - 26.5GHz (802.11a – Ant. Pol. H)**



**Plot 7-162. Radiated Spurious Plot above 18GHz - 26.5GHz (802.11a – Ant. Pol. V)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 121 of 209                 |

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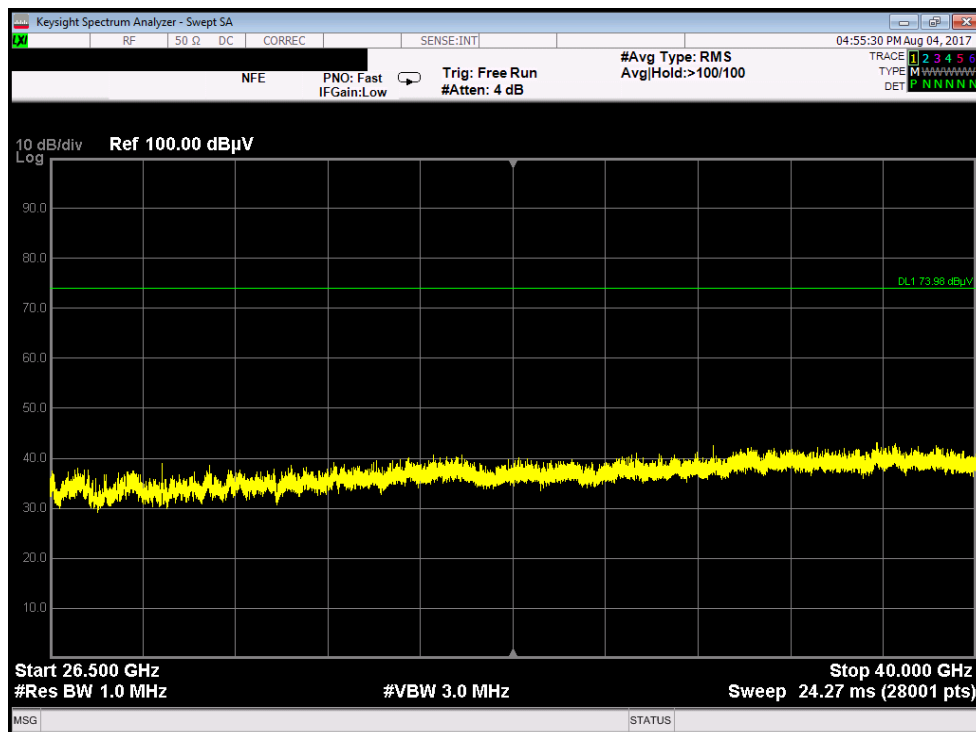
V 6.7

06/23/2017

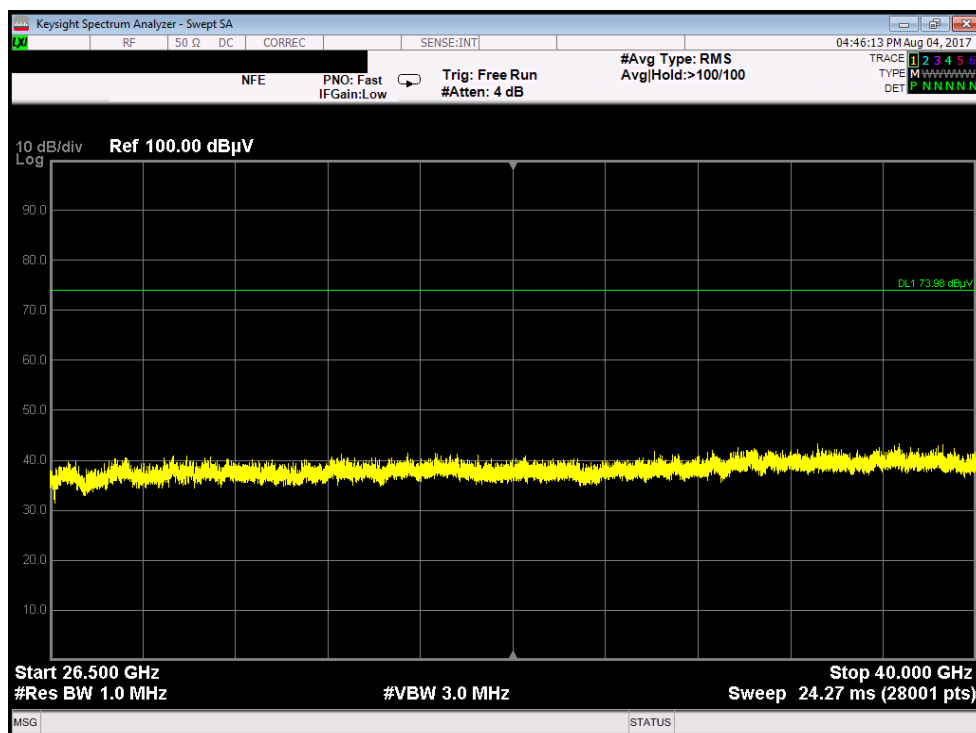
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## Antenna-1 Radiated Spurious Emissions Measurements (Above 18GHz)

**\$15.209**



**Plot 7-163. Radiated Spurious Plot 26.5GHz - 40GHz (802.11a – Ant. Pol. H)**



**Plot 7-164. Radiated Spurious Plot above 26.5GHz - 40GHz (802.11a – Ant. Pol. V)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 122 of 209                 |

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## Antenna-1 Radiated Spurious Emission Measurements

§15.247(d) §15.205 & §15.209

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5180MHz  
Channel: 36

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| 10360.00        | Peak     | H               | 100                 | 62                         | -66.87               | 12.13       | -9.54                           | 42.72                   | 68.20          | -25.48      |
| * 15540.00      | Average  | H               | -                   | -                          | -70.85               | 14.49       | -9.54                           | 41.10                   | 53.98          | -12.88      |
| * 15540.00      | Peak     | H               | -                   | -                          | -68.96               | 14.49       | -9.54                           | 42.99                   | 73.98          | -30.99      |
| * 20720.00      | Average  | H               | -                   | -                          | -74.75               | 7.94        | -9.54                           | 30.64                   | 53.98          | -23.34      |
| * 20720.00      | Peak     | H               | -                   | -                          | -63.80               | 7.94        | -9.54                           | 41.59                   | 73.98          | -32.39      |
| 25900.00        | Peak     | H               | -                   | -                          | -61.72               | 8.46        | -9.54                           | 44.20                   | 68.20          | -24.00      |

Table 7-29. Radiated Measurements

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5200MHz  
Channel: 40

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| 10400.00        | Peak     | H               | 100                 | 66                         | -67.28               | 12.12       | -9.54                           | 42.30                   | 68.20          | -25.90      |
| * 15600.00      | Average  | H               | -                   | -                          | -70.49               | 14.31       | -9.54                           | 41.28                   | 53.98          | -12.70      |
| * 15600.00      | Peak     | H               | -                   | -                          | -68.34               | 14.31       | -9.54                           | 43.43                   | 73.98          | -30.55      |
| * 20800.00      | Average  | H               | -                   | -                          | -75.60               | 7.95        | -9.54                           | 29.81                   | 53.98          | -24.17      |
| * 20800.00      | Peak     | H               | -                   | -                          | -63.12               | 7.95        | -9.54                           | 42.29                   | 73.98          | -31.69      |
| 26000.00        | Peak     | H               | -                   | -                          | -62.06               | 8.60        | -9.54                           | 44.00                   | 68.20          | -24.20      |

Table 7-30. Radiated Measurements

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 123 of 209                 |

Worst Case Mode: 802.11a  
 Worst Case Transfer Rate: 6 Mbps  
 Distance of Measurements: 1 Meter  
 Operating Frequency: 5240MHz  
 Channel: 48

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| 10480.00        | Peak     | H               | 100                 | 220                        | -68.06               | 12.09       | -9.54                           | 41.49                   | 68.20          | -26.71      |
| * 15720.00      | Average  | H               | -                   | -                          | -70.65               | 14.02       | -9.54                           | 40.83                   | 53.98          | -13.15      |
| * 15720.00      | Peak     | H               | -                   | -                          | -68.63               | 14.02       | -9.54                           | 42.85                   | 73.98          | -31.13      |
| * 20960.00      | Average  | H               | -                   | -                          | -73.99               | 7.91        | -9.54                           | 31.38                   | 53.98          | -22.60      |
| * 20960.00      | Peak     | H               | -                   | -                          | -63.69               | 7.91        | -9.54                           | 41.68                   | 73.98          | -32.30      |
| 26200.00        | Peak     | H               | -                   | -                          | -60.53               | 8.62        | -9.54                           | 45.55                   | 68.20          | -22.65      |

**Table 7-31. Radiated Measurements**

Worst Case Mode: 802.11a  
 Worst Case Transfer Rate: 6 Mbps  
 Distance of Measurements: 1 Meter  
 Operating Frequency: 5200MHz  
 Channel: 40

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| 10400.00        | Peak     | H               | 100                 | 61                         | -63.72               | 12.12       | -9.54                           | 45.86                   | 68.20          | -22.34      |
| * 15600.00      | Average  | H               | -                   | -                          | -70.29               | 14.31       | -9.54                           | 41.48                   | 53.98          | -12.50      |
| * 15600.00      | Peak     | H               | -                   | -                          | -54.39               | 14.31       | -9.54                           | 57.38                   | 73.98          | -16.60      |
| * 20800.00      | Average  | H               | -                   | -                          | -70.76               | 7.95        | -9.54                           | 34.66                   | 53.98          | -19.32      |
| * 20800.00      | Peak     | H               | -                   | -                          | -62.30               | 7.95        | -9.54                           | 43.12                   | 73.98          | -30.86      |
| 26000.00        | Peak     | H               | -                   | -                          | -60.24               | 8.60        | -9.54                           | 45.82                   | 68.20          | -22.38      |

**Table 7-32. Radiated Measurements with WCP**

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 124 of 209                 |

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5260MHz  
Channel: 52

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| 10520.00        | Peak     | H               | 100                 | 268                        | -66.84               | 12.16       | -9.54                           | 42.78                   | 68.20          | -25.42      |
| * 15780.00      | Average  | H               | -                   | -                          | -70.21               | 14.03       | -9.54                           | 41.28                   | 53.98          | -12.70      |
| * 15780.00      | Peak     | H               | -                   | -                          | -67.98               | 14.03       | -9.54                           | 43.51                   | 73.98          | -30.47      |
| * 21040.00      | Average  | H               | -                   | -                          | -74.22               | 7.92        | -9.54                           | 31.16                   | 53.98          | -22.82      |
| * 21040.00      | Peak     | H               | -                   | -                          | -62.76               | 7.92        | -9.54                           | 42.62                   | 73.98          | -31.36      |
| 26300.00        | Peak     | H               | -                   | -                          | -60.02               | 8.73        | -9.54                           | 46.17                   | 68.20          | -22.03      |

**Table 7-33. Radiated Measurements**

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5280MHz  
Channel: 56

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| 10560.00        | Peak     | H               | 100                 | 270                        | -67.72               | 12.04       | -9.54                           | 41.78                   | 68.20          | -26.42      |
| * 15840.00      | Average  | H               | -                   | -                          | -70.30               | 14.25       | -9.54                           | 41.40                   | 53.98          | -12.58      |
| * 15840.00      | Peak     | H               | -                   | -                          | -68.27               | 14.25       | -9.54                           | 43.43                   | 73.98          | -30.55      |
| * 21120.00      | Average  | H               | -                   | -                          | -74.58               | 7.96        | -9.54                           | 30.84                   | 53.98          | -23.14      |
| * 21120.00      | Peak     | H               | -                   | -                          | -62.87               | 7.96        | -9.54                           | 42.55                   | 73.98          | -31.43      |
| 26400.00        | Peak     | H               | -                   | -                          | -61.25               | 8.94        | -9.54                           | 45.15                   | 68.20          | -23.05      |

**Table 7-34. Radiated Measurements**

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 125 of 209                 |

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5320MHz  
Channel: 64

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 10640.00      | Average  | H               | 100                 | 270                        | -69.44               | 12.06       | -9.54                           | 40.08                   | 53.98          | -13.90      |
| * 10640.00      | Peak     | H               | 100                 | 270                        | -67.41               | 12.06       | -9.54                           | 42.11                   | 73.98          | -31.87      |
| * 15960.00      | Average  | H               | -                   | -                          | -70.49               | 14.55       | -9.54                           | 41.52                   | 53.98          | -12.46      |
| * 15960.00      | Peak     | H               | -                   | -                          | -68.30               | 14.55       | -9.54                           | 43.71                   | 73.98          | -30.27      |
| * 21280.00      | Average  | H               | -                   | -                          | -75.50               | 8.04        | -9.54                           | 30.00                   | 53.98          | -23.98      |
| * 21280.00      | Peak     | H               | -                   | -                          | -64.13               | 8.04        | -9.54                           | 41.36                   | 73.98          | -32.62      |
| 26600.00        | Peak     | H               | -                   | -                          | -55.94               | -8.30       | -9.54                           | 33.22                   | 68.20          | -34.98      |

**Table 7-35. Radiated Measurements**

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5320MHz  
Channel: 64

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 10640.00      | Average  | H               | 100                 | 245                        | -69.62               | 12.06       | -9.54                           | 39.90                   | 53.98          | -14.08      |
| * 10640.00      | Peak     | H               | 100                 | 245                        | -64.39               | 12.06       | -9.54                           | 45.13                   | 73.98          | -28.85      |
| * 15960.00      | Average  | H               | -                   | -                          | -73.75               | 14.55       | -9.54                           | 38.26                   | 53.98          | -15.72      |
| * 15960.00      | Peak     | H               | -                   | -                          | -63.24               | 14.55       | -9.54                           | 48.77                   | 73.98          | -25.21      |
| * 21280.00      | Average  | H               | -                   | -                          | -72.58               | 8.04        | -9.54                           | 32.92                   | 53.98          | -21.06      |
| * 21280.00      | Peak     | H               | -                   | -                          | -62.20               | 8.04        | -9.54                           | 43.29                   | 73.98          | -30.69      |
| 26600.00        | Peak     | H               | -                   | -                          | -54.76               | -8.30       | -9.54                           | 34.39                   | 68.20          | -33.81      |

**Table 7-36. Radiated Measurements with WCP**

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 126 of 209                 |

Worst Case Mode: 802.11a  
 Worst Case Transfer Rate: 6 Mbps  
 Distance of Measurements: 1 Meter  
 Operating Frequency: 5500MHz  
 Channel: 100

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11000.00      | Average  | H               | 100                 | 270                        | -70.78               | 12.87       | -9.54                           | 39.55                   | 53.98          | -14.43      |
| * 11000.00      | Peak     | H               | 100                 | 270                        | -67.37               | 12.87       | -9.54                           | 42.96                   | 73.98          | -31.02      |
| 16500.00        | Peak     | H               | -                   | -                          | -67.85               | 16.61       | -9.54                           | 46.22                   | 68.20          | -21.98      |
| 22000.00        | Peak     | H               | -                   | -                          | -62.46               | 8.43        | -9.54                           | 43.43                   | 68.20          | -24.77      |
| 27500.00        | Peak     | H               | -                   | -                          | -53.05               | -8.80       | -9.54                           | 35.61                   | 68.20          | -32.59      |

**Table 7-37. Radiated Measurements**

Worst Case Mode: 802.11a  
 Worst Case Transfer Rate: 6 Mbps  
 Distance of Measurements: 1 Meter  
 Operating Frequency: 5580MHz  
 Channel: 116

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11160.00      | Average  | H               | 100                 | 264                        | -69.39               | 12.64       | -9.54                           | 40.71                   | 53.98          | -13.27      |
| * 11160.00      | Peak     | H               | 100                 | 264                        | -67.63               | 12.64       | -9.54                           | 42.47                   | 73.98          | -31.51      |
| 16740.00        | Peak     | H               | -                   | -                          | -67.54               | 16.21       | -9.54                           | 46.13                   | 68.20          | -22.07      |
| * 22320.00      | Average  | H               | -                   | -                          | -71.32               | 8.08        | -9.54                           | 34.22                   | 53.98          | -19.76      |
| * 22320.00      | Peak     | H               | -                   | -                          | -62.13               | 8.08        | -9.54                           | 43.41                   | 73.98          | -30.57      |
| 27900.00        | Peak     | H               | -                   | -                          | -54.84               | -9.08       | -9.54                           | 33.54                   | 68.20          | -34.66      |

**Table 7-38. Radiated Measurements**

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 127 of 209                 |

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5720MHz  
Channel: 144

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11400.00      | Average  | H               | 100                 | 270                        | -71.22               | 12.47       | -9.54                           | 38.71                   | 53.98          | -15.27      |
| * 11400.00      | Peak     | H               | 100                 | 270                        | -69.08               | 12.47       | -9.54                           | 40.85                   | 73.98          | -33.13      |
| 17100.00        | Peak     | H               | -                   | -                          | -68.57               | 18.06       | -9.54                           | 46.95                   | 68.20          | -21.25      |
| * 22800.00      | Average  | H               | -                   | -                          | -62.25               | 8.37        | -9.54                           | 43.58                   | 53.98          | -10.39      |
| * 22800.00      | Peak     | H               | -                   | -                          | -62.11               | 8.37        | -9.54                           | 43.72                   | 73.98          | -30.26      |
| 28500.00        | Peak     | H               | -                   | -                          | -52.96               | -8.95       | -9.54                           | 35.55                   | 68.20          | -32.65      |

**Table 7-39. Radiated Measurements**

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5720MHz  
Channel: 144

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11400.00      | Average  | H               | -                   | -                          | -76.74               | 12.47       | -9.54                           | 33.18                   | 53.98          | -20.80      |
| * 11400.00      | Peak     | H               | -                   | -                          | -69.98               | 12.47       | -9.54                           | 39.95                   | 73.98          | -34.03      |
| 17100.00        | Peak     | H               | -                   | -                          | -65.41               | 18.06       | -9.54                           | 50.11                   | 68.20          | -18.09      |
| * 22800.00      | Average  | H               | -                   | -                          | -71.07               | 8.37        | -9.54                           | 34.76                   | 53.98          | -19.21      |
| * 22800.00      | Peak     | H               | -                   | -                          | -62.32               | 8.37        | -9.54                           | 43.51                   | 73.98          | -30.47      |
| 28500.00        | Peak     | H               | -                   | -                          | -51.71               | -8.95       | -9.54                           | 36.80                   | 68.20          | -31.40      |

**Table 7-40. Radiated Measurements with WCP**

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 128 of 209                 |

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5745MHz  
Channel: 149

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11490.00      | Average  | H               | 100                 | 270                        | -71.15               | 12.43       | -9.54                           | 38.74                   | 53.98          | -15.24      |
| * 11490.00      | Peak     | H               | 100                 | 270                        | -67.88               | 12.43       | -9.54                           | 42.01                   | 73.98          | -31.97      |
| 17235.00        | Peak     | H               | -                   | -                          | -67.62               | 18.61       | -9.54                           | 48.45                   | 68.20          | -19.75      |
| * 22980.00      | Average  | H               | -                   | -                          | -74.99               | 8.16        | -9.54                           | 30.63                   | 53.98          | -23.35      |
| * 22980.00      | Peak     | H               | -                   | -                          | -63.39               | 8.16        | -9.54                           | 42.23                   | 73.98          | -31.75      |
| 28725.00        | Peak     | H               | -                   | -                          | -52.85               | -9.24       | -9.54                           | 35.36                   | 68.20          | -32.84      |

**Table 7-41. Radiated Measurements**

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5785MHz  
Channel: 157

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11570.00      | Average  | H               | -                   | -                          | -71.14               | 12.54       | -9.54                           | 38.86                   | 53.98          | -15.12      |
| * 11570.00      | Peak     | H               | -                   | -                          | -68.91               | 12.54       | -9.54                           | 41.09                   | 73.98          | -32.89      |
| 17355.00        | Peak     | H               | -                   | -                          | -67.65               | 18.73       | -9.54                           | 48.54                   | 68.20          | -19.66      |
| 23140.00        | Peak     | H               | -                   | -                          | -62.54               | 8.37        | -9.54                           | 43.29                   | 68.20          | -24.91      |
| 28925.00        | Peak     | H               | -                   | -                          | -52.79               | -9.65       | -9.54                           | 35.01                   | 68.20          | -33.19      |

**Table 7-42. Radiated Measurements**

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 129 of 209                 |

Worst Case Mode: 802.11a  
 Worst Case Transfer Rate: 6 Mbps  
 Distance of Measurements: 1 Meter  
 Operating Frequency: 5825MHz  
 Channel: 165

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11650.00      | Average  | H               | -                   | -                          | -71.47               | 12.99       | -9.54                           | 38.97                   | 53.98          | -15.01      |
| * 11650.00      | Peak     | H               | -                   | -                          | -69.38               | 12.99       | -9.54                           | 41.06                   | 73.98          | -32.92      |
| 17475.00        | Peak     | H               | -                   | -                          | -68.29               | 19.25       | -9.54                           | 48.41                   | 68.20          | -19.79      |
| 23300.00        | Peak     | H               | -                   | -                          | -62.49               | 8.50        | -9.54                           | 43.46                   | 68.20          | -24.74      |
| 29125.00        | Peak     | H               | -                   | -                          | -51.44               | -9.87       | -9.54                           | 36.15                   | 68.20          | -32.05      |

**Table 7-43. Radiated Measurements**

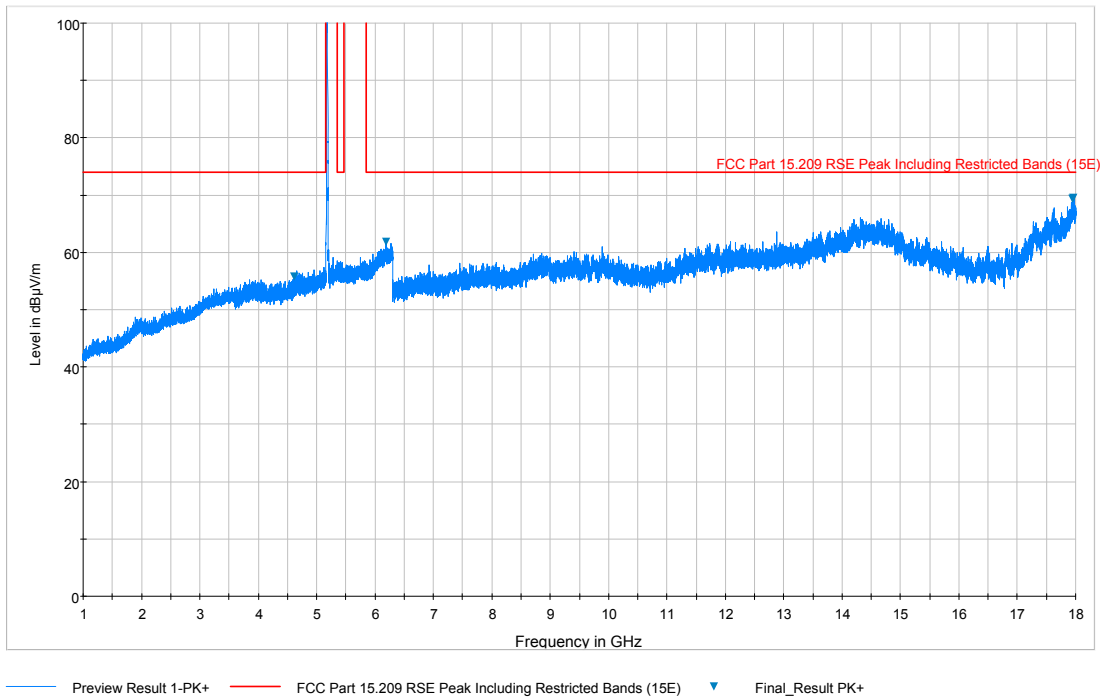
Worst Case Mode: 802.11a  
 Worst Case Transfer Rate: 6 Mbps  
 Distance of Measurements: 1 Meter  
 Operating Frequency: 5825MHz  
 Channel: 165

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11650.00      | Average  | H               | -                   | -                          | -69.49               | 12.99       | -9.54                           | 40.96                   | 53.98          | -13.02      |
| * 11650.00      | Peak     | H               | -                   | -                          | -65.67               | 12.99       | -9.54                           | 44.78                   | 73.98          | -29.20      |
| 17475.00        | Peak     | H               | -                   | -                          | -64.10               | 19.25       | -9.54                           | 52.60                   | 68.20          | -15.60      |
| 23300.00        | Peak     | H               | -                   | -                          | -61.92               | 8.50        | -9.54                           | 44.04                   | 68.20          | -24.16      |
| 29125.00        | Peak     | H               | -                   | -                          | -55.19               | -9.87       | -9.54                           | 32.39                   | 68.20          | -35.81      |

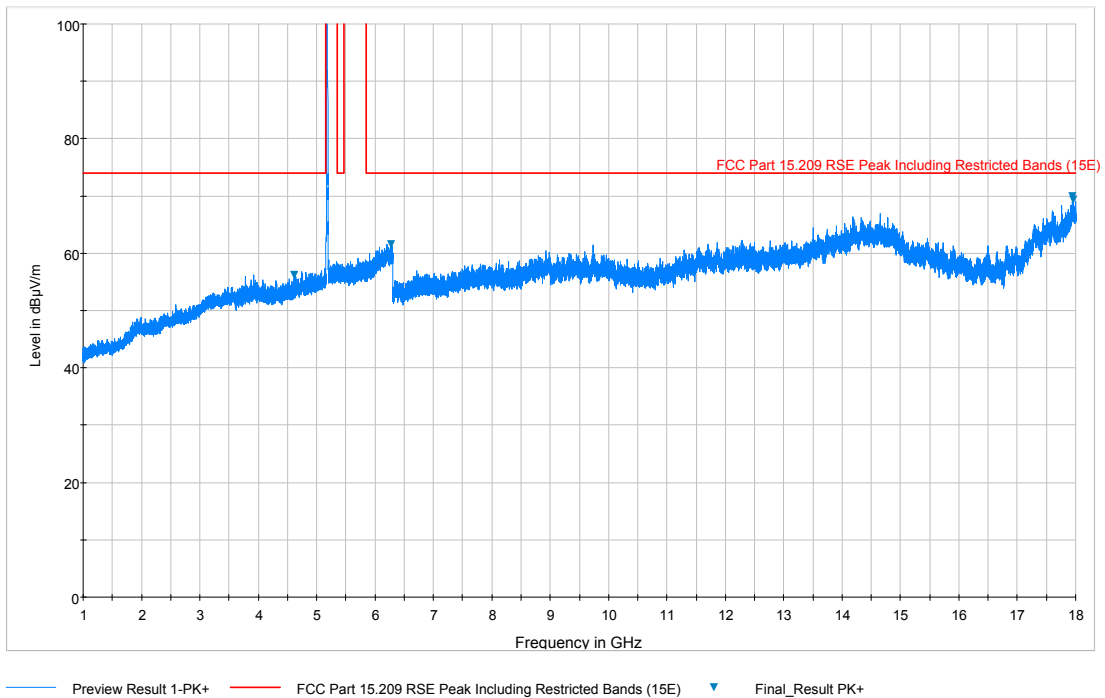
**Table 7-44. Radiated Measurements with WCP**

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 130 of 209                 |

## 7.7.2 Antenna-2 Radiated Spurious Emission Measurements

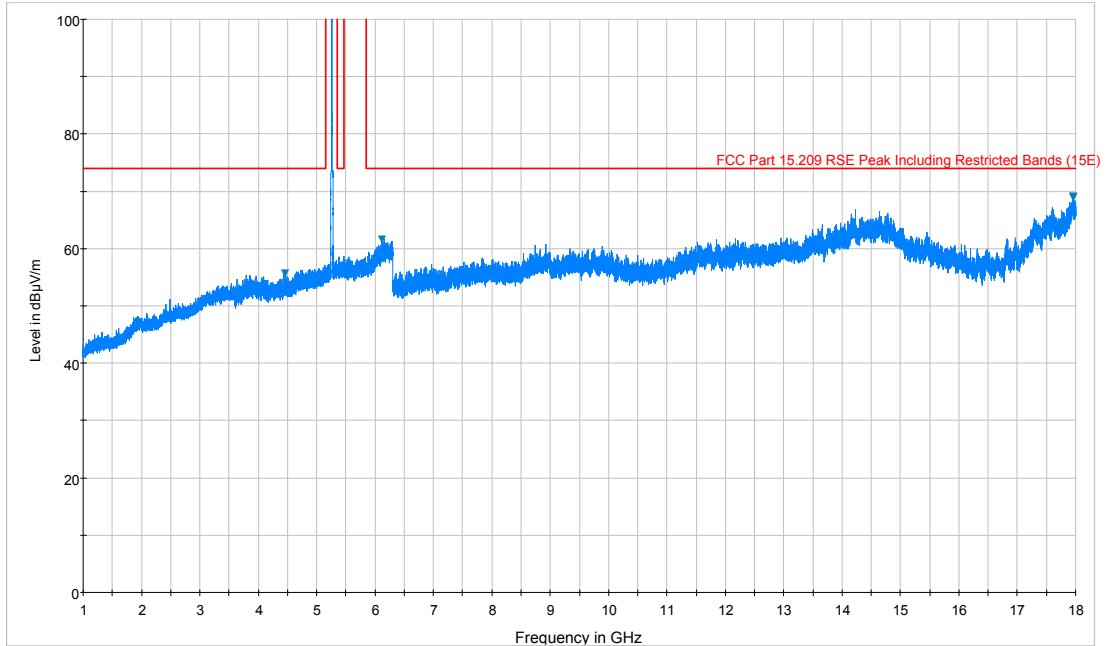


**Plot 7-165. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. H)**

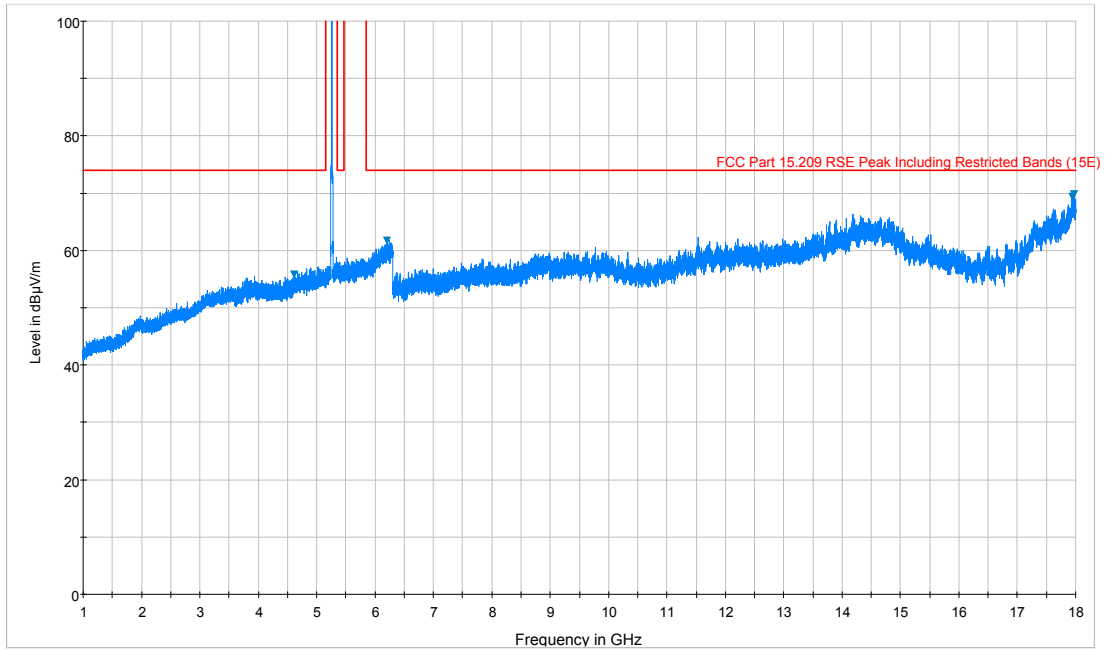


**Plot 7-166. Radiated Spurious Plot above 1GHz (802.11a – U1 Ch. 40, Ant. Pol. V)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 131 of 209                 |

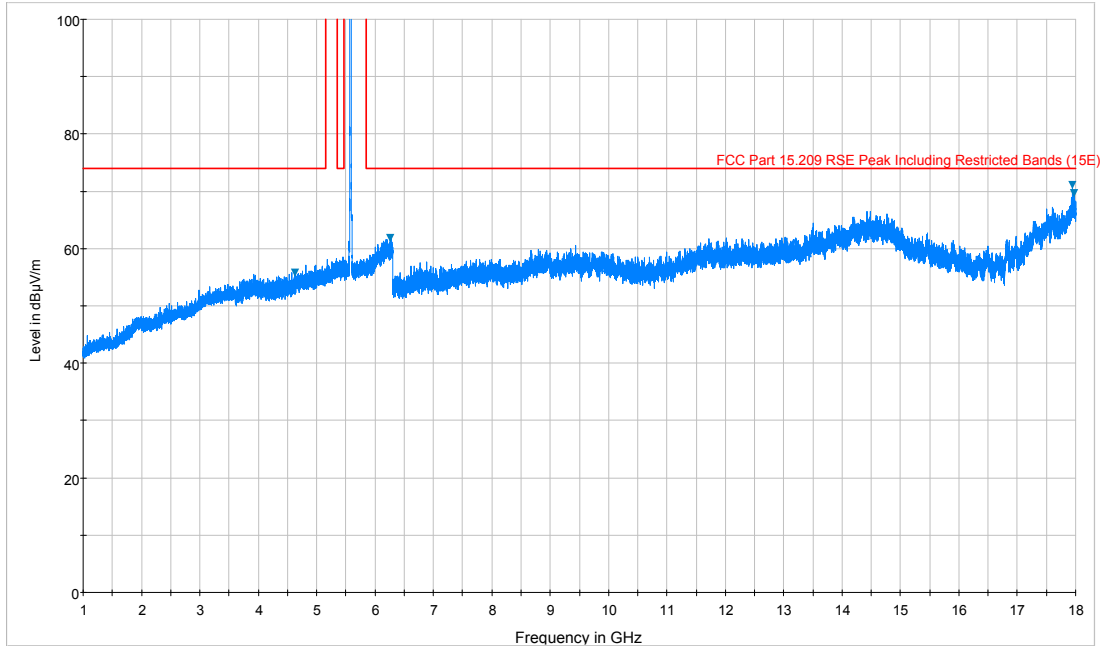


**Plot 7-167. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)**



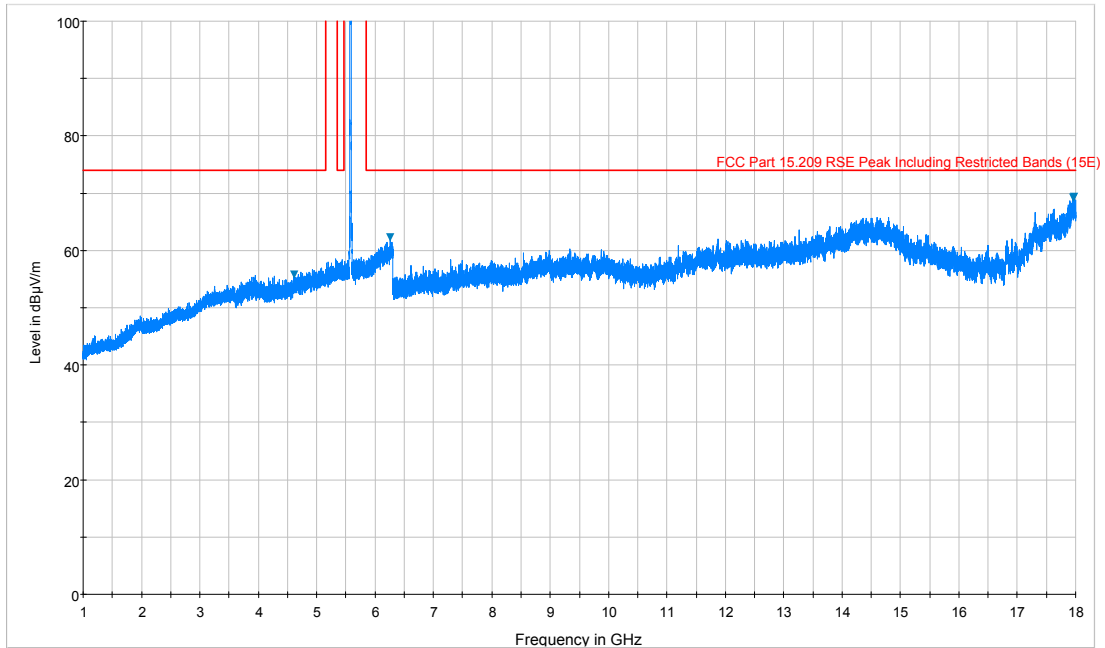
**Plot 7-168. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 132 of 209                 |



Preview Result 1-PK+ FCC Part 15.209 RSE Peak Including Restricted Bands (15E) Final\_Result PK+

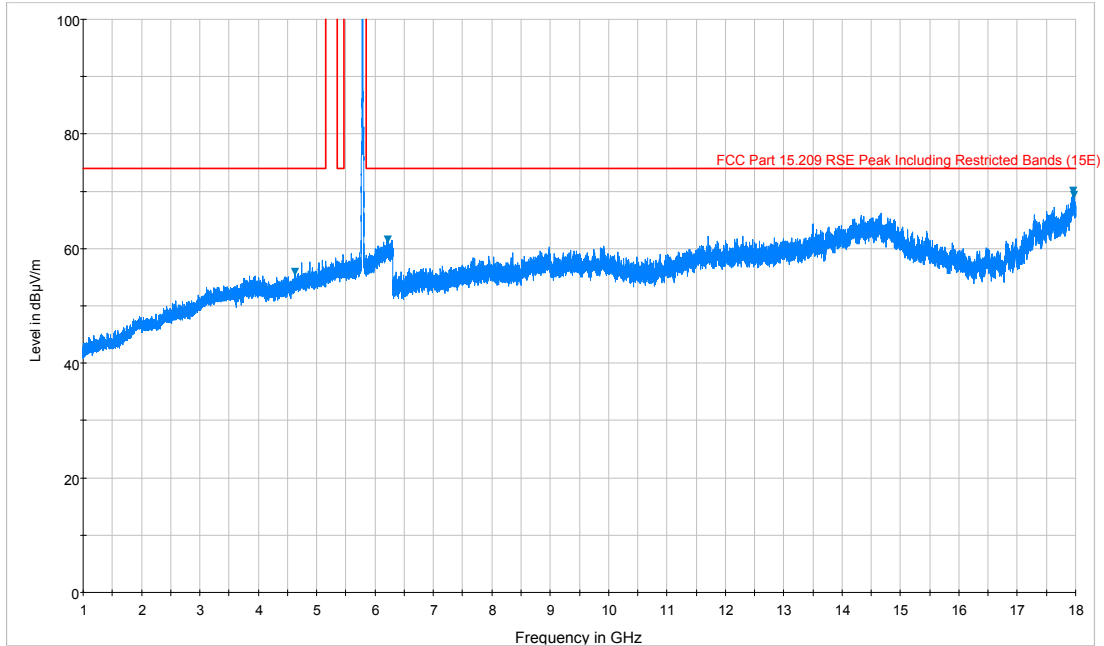
**Plot 7-169. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. H)**



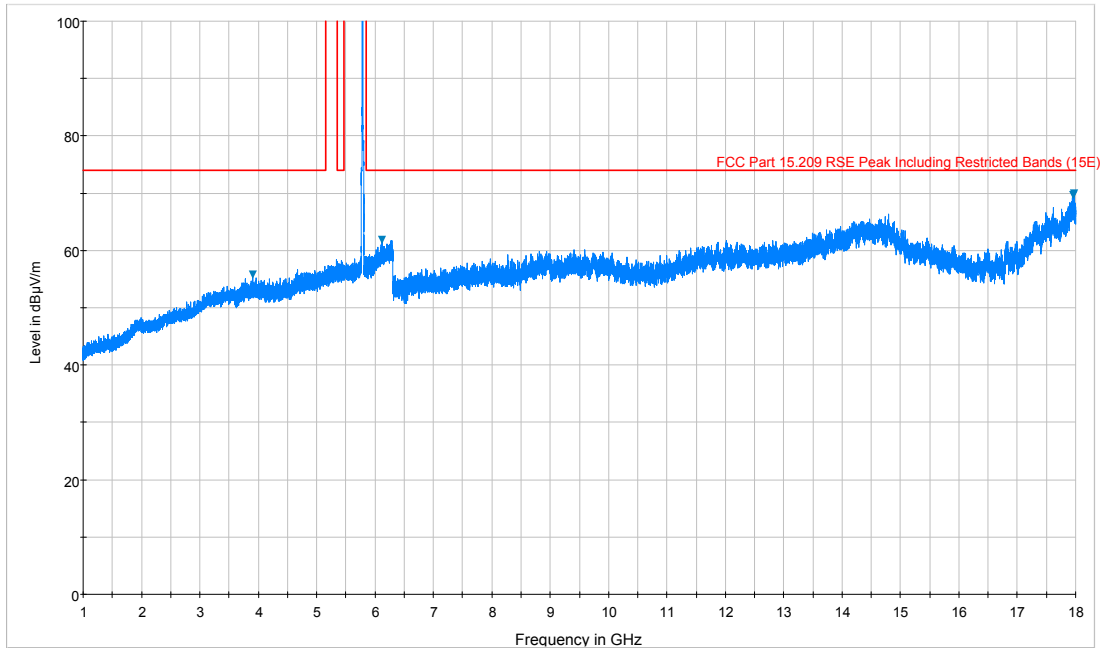
Preview Result 1-PK+ FCC Part 15.209 RSE Peak Including Restricted Bands (15E) Final\_Result PK+

**Plot 7-170. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 116, Ant. Pol. V)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 133 of 209                 |



Plot 7-171. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)

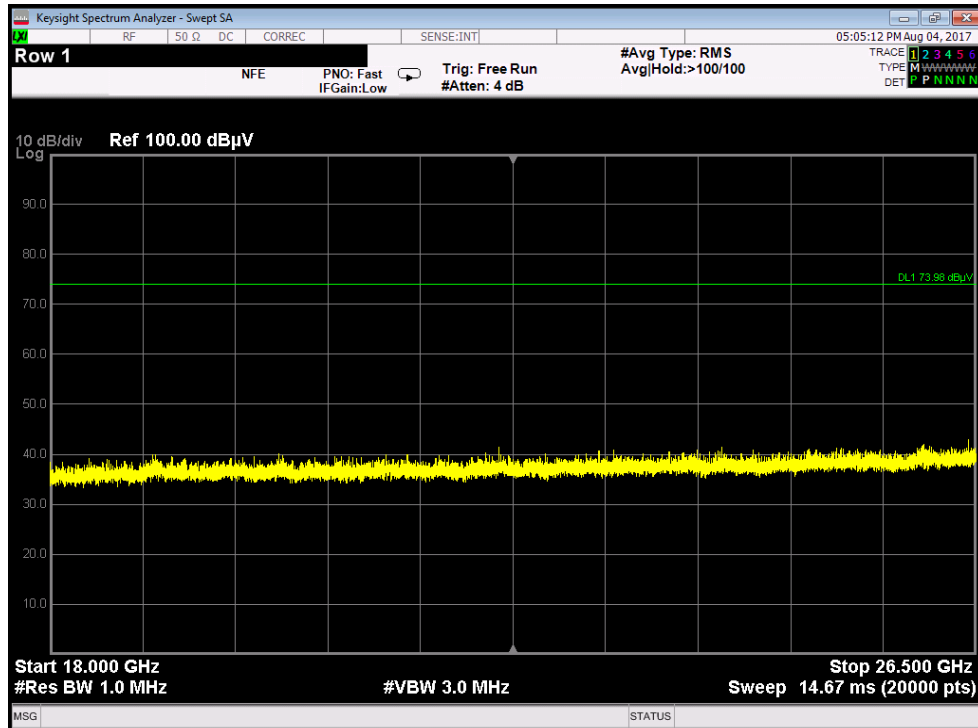


Plot 7-172. Radiated Spurious Plot above 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)

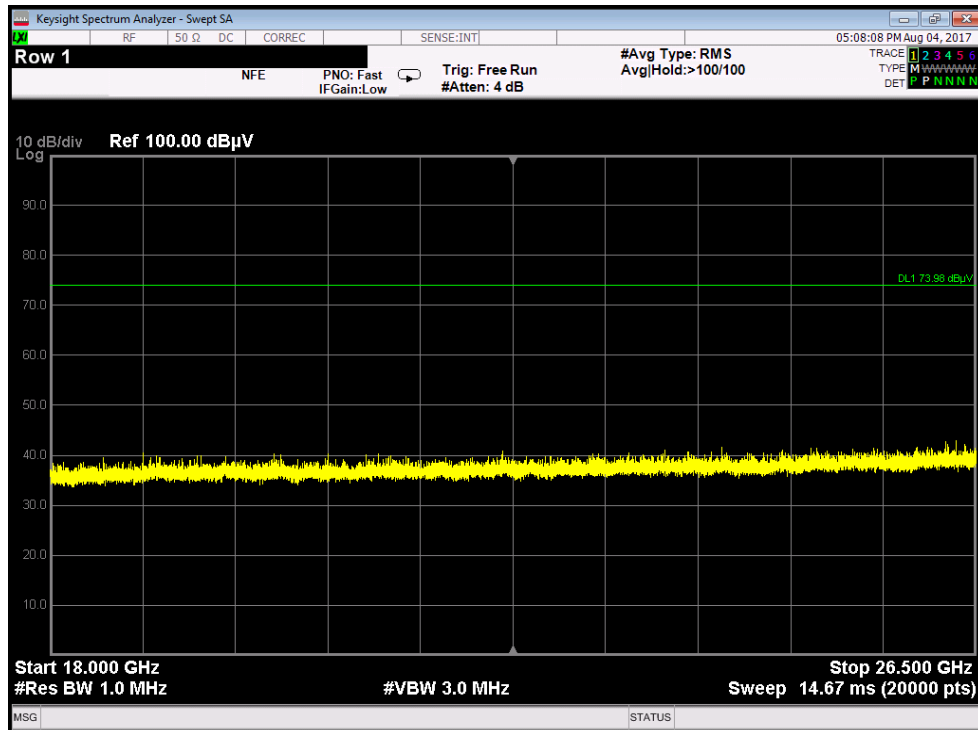
|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 134 of 209                 |

## Antenna-2 Radiated Spurious Emissions Measurements (Above 18GHz)

**\$15.209**



**Plot 7-173. Radiated Spurious Plot above 18GHz - 26.5GHz (802.11a – Ant. Pol. H)**



**Plot 7-174. Radiated Spurious Plot above 18GHz - 26.5GHz (802.11a – Ant. Pol. V)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 135 of 209                 |

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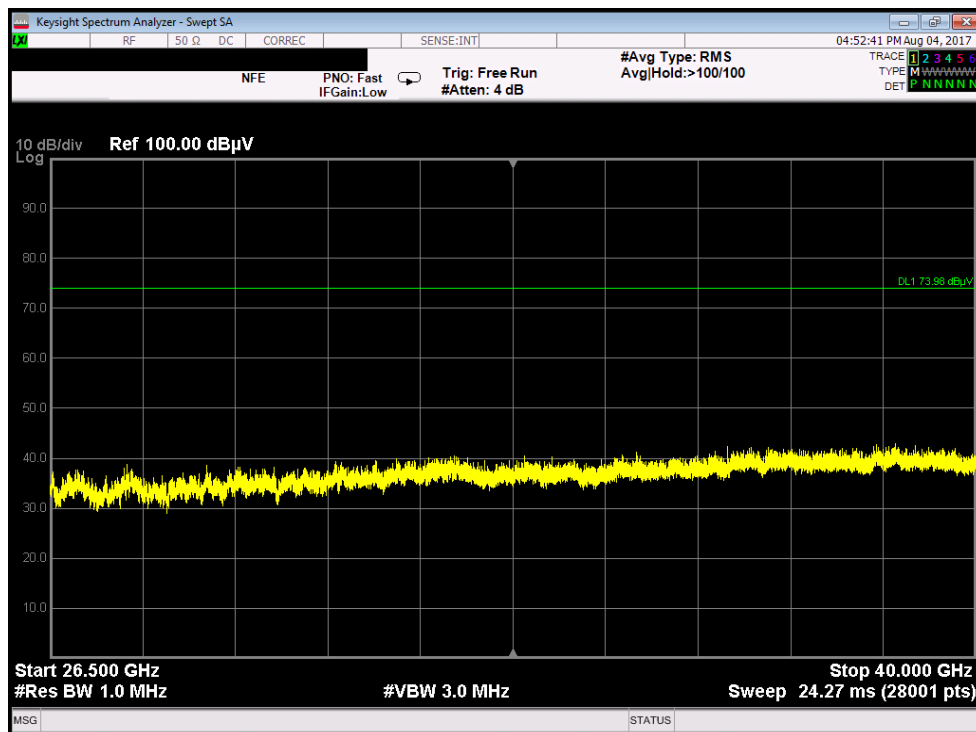
V 6.7

06/23/2017

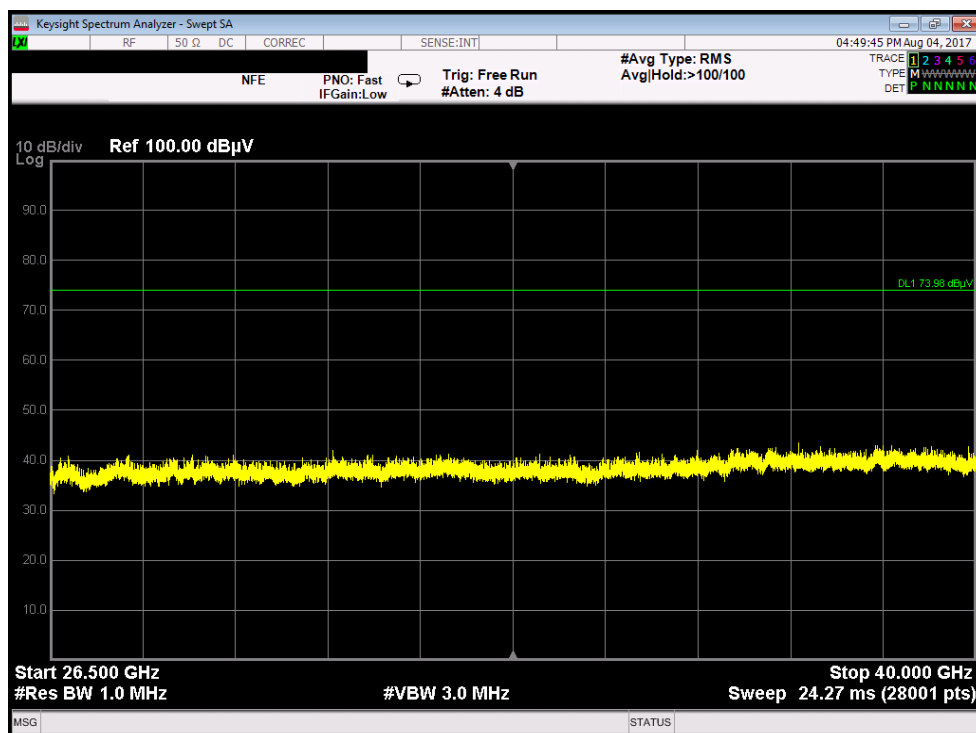
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## Antenna-2 Radiated Spurious Emissions Measurements (Above 18GHz)

**\$15.209**



**Plot 7-175. Radiated Spurious Plot 26.5GHz - 40GHz (802.11a – Ant. Pol. H)**



**Plot 7-176. Radiated Spurious Plot above 26.5GHz - 40GHz (802.11a – Ant. Pol. V)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 136 of 209                 |

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## Antenna-2 Radiated Spurious Emission Measurements

§15.247(d) §15.205 & §15.209

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5180MHz  
Channel: 36

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| 10360.00        | Peak     | H               | 100                 | 147                        | -66.05               | 12.13       | -9.54                           | 43.54                   | 68.20          | -24.66      |
| * 15540.00      | Average  | H               | -                   | -                          | -71.60               | 14.49       | -9.54                           | 40.35                   | 53.98          | -13.63      |
| * 15540.00      | Peak     | H               | -                   | -                          | -68.51               | 14.49       | -9.54                           | 43.44                   | 73.98          | -30.54      |
| * 20720.00      | Average  | H               | -                   | -                          | -71.28               | 7.94        | -9.54                           | 34.12                   | 53.98          | -19.86      |
| * 20720.00      | Peak     | H               | -                   | -                          | -62.00               | 7.94        | -9.54                           | 43.40                   | 73.98          | -30.58      |
| 25900.00        | Peak     | H               | -                   | -                          | -60.75               | 8.46        | -9.54                           | 45.17                   | 68.20          | -23.03      |

Table 7-45. Radiated Measurements

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5200MHz  
Channel: 40

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| 10400.00        | Peak     | H               | 100                 | 278                        | -65.15               | 12.12       | -9.54                           | 44.43                   | 68.20          | -23.77      |
| * 15600.00      | Average  | H               | -                   | -                          | -70.77               | 14.31       | -9.54                           | 41.00                   | 53.98          | -12.98      |
| * 15600.00      | Peak     | H               | -                   | -                          | -68.75               | 14.31       | -9.54                           | 43.02                   | 73.98          | -30.96      |
| * 20800.00      | Average  | H               | -                   | -                          | -73.42               | 7.95        | -9.54                           | 31.99                   | 53.98          | -21.99      |
| * 20800.00      | Peak     | H               | -                   | -                          | -63.19               | 7.95        | -9.54                           | 42.23                   | 73.98          | -31.75      |
| 26000.00        | Peak     | H               | -                   | -                          | -60.99               | 8.60        | -9.54                           | 45.07                   | 68.20          | -23.13      |

Table 7-46. Radiated Measurements

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 137 of 209                 |

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5240MHz  
Channel: 48

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| 10480.00        | Peak     | H               | 100                 | 135                        | -65.63               | 12.09       | -9.54                           | 43.92                   | 68.20          | -24.28      |
| * 15720.00      | Average  | H               | -                   | -                          | -70.73               | 14.02       | -9.54                           | 40.75                   | 53.98          | -13.23      |
| * 15720.00      | Peak     | H               | -                   | -                          | -68.35               | 14.02       | -9.54                           | 43.13                   | 73.98          | -30.85      |
| * 20960.00      | Average  | H               | -                   | -                          | -70.85               | 7.91        | -9.54                           | 34.52                   | 53.98          | -19.46      |
| * 20960.00      | Peak     | H               | -                   | -                          | -61.46               | 7.91        | -9.54                           | 43.91                   | 73.98          | -30.07      |
| 26200.00        | Peak     | H               | -                   | -                          | -60.29               | 8.62        | -9.54                           | 45.79                   | 68.20          | -22.41      |

**Table 7-47. Radiated Measurements**

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5200MHz  
Channel: 40

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| 10400.00        | Peak     | H               | 100                 | 128                        | -64.65               | 12.12       | -9.54                           | 44.93                   | 68.20          | -23.27      |
| * 15600.00      | Average  | H               | -                   | -                          | -73.99               | 14.31       | -9.54                           | 37.77                   | 53.98          | -16.21      |
| * 15600.00      | Peak     | H               | -                   | -                          | -64.72               | 14.31       | -9.54                           | 47.05                   | 73.98          | -26.93      |
| * 20800.00      | Average  | H               | -                   | -                          | -71.58               | 7.95        | -9.54                           | 33.83                   | 53.98          | -20.15      |
| * 20800.00      | Peak     | H               | -                   | -                          | -62.64               | 7.95        | -9.54                           | 42.77                   | 73.98          | -31.21      |
| 26000.00        | Peak     | H               | -                   | -                          | -59.21               | 8.60        | -9.54                           | 46.84                   | 68.20          | -21.36      |

**Table 7-48. Radiated Measurements with WCP**

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 138 of 209                 |

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5260MHz  
Channel: 52

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| 10520.00        | Peak     | H               | 100                 | 153                        | -66.33               | 12.16       | -9.54                           | 43.29                   | 68.20          | -24.91      |
| * 15780.00      | Average  | H               | -                   | -                          | -71.18               | 14.03       | -9.54                           | 40.31                   | 53.98          | -13.67      |
| * 15780.00      | Peak     | H               | -                   | -                          | -68.28               | 14.03       | -9.54                           | 43.21                   | 73.98          | -30.77      |
| * 21040.00      | Average  | H               | -                   | -                          | -71.17               | 7.92        | -9.54                           | 34.21                   | 53.98          | -19.77      |
| * 21040.00      | Peak     | H               | -                   | -                          | -61.91               | 7.92        | -9.54                           | 43.47                   | 73.98          | -30.51      |
| 26300.00        | Peak     | H               | -                   | -                          | -60.18               | 8.73        | -9.54                           | 46.01                   | 68.20          | -22.19      |

**Table 7-49. Radiated Measurements**

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5280MHz  
Channel: 56

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| 10560.00        | Peak     | H               | 100                 | 60                         | -66.70               | 12.04       | -9.54                           | 42.80                   | 68.20          | -25.40      |
| * 15840.00      | Average  | H               | -                   | -                          | -70.44               | 14.25       | -9.54                           | 41.26                   | 53.98          | -12.72      |
| * 15840.00      | Peak     | H               | -                   | -                          | -67.53               | 14.25       | -9.54                           | 44.17                   | 73.98          | -29.81      |
| * 21120.00      | Average  | H               | -                   | -                          | -71.42               | 7.96        | -9.54                           | 34.00                   | 53.98          | -19.97      |
| * 21120.00      | Peak     | H               | -                   | -                          | -61.80               | 7.96        | -9.54                           | 43.62                   | 73.98          | -30.36      |
| 26400.00        | Peak     | H               | -                   | -                          | -60.54               | 8.94        | -9.54                           | 45.86                   | 68.20          | -22.34      |

**Table 7-50. Radiated Measurements**

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 139 of 209                 |

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5320MHz  
Channel: 64

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 10640.00      | Average  | H               | 100                 | 152                        | -69.53               | 12.06       | -9.54                           | 39.99                   | 53.98          | -13.99      |
| * 10640.00      | Peak     | H               | 100                 | 152                        | -66.98               | 12.06       | -9.54                           | 42.54                   | 73.98          | -31.44      |
| * 15960.00      | Average  | H               | -                   | -                          | -70.72               | 14.55       | -9.54                           | 41.29                   | 53.98          | -12.69      |
| * 15960.00      | Peak     | H               | -                   | -                          | -67.97               | 14.55       | -9.54                           | 44.04                   | 73.98          | -29.94      |
| * 21280.00      | Average  | H               | -                   | -                          | -72.13               | 8.04        | -9.54                           | 33.36                   | 53.98          | -20.62      |
| * 21280.00      | Peak     | H               | -                   | -                          | -62.63               | 8.04        | -9.54                           | 42.87                   | 73.98          | -31.11      |
| 26600.00        | Peak     | H               | -                   | -                          | -53.31               | -8.30       | -9.54                           | 35.85                   | 68.20          | -32.35      |

**Table 7-51. Radiated Measurements**

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5320MHz  
Channel: 64

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 10640.00      | Average  | H               | -                   | -                          | -73.46               | 12.06       | -9.54                           | 36.06                   | 53.98          | -17.92      |
| * 10640.00      | Peak     | H               | -                   | -                          | -64.56               | 12.06       | -9.54                           | 44.96                   | 73.98          | -29.02      |
| * 15960.00      | Average  | H               | -                   | -                          | -73.45               | 14.55       | -9.54                           | 38.55                   | 53.98          | -15.43      |
| * 15960.00      | Peak     | H               | -                   | -                          | -63.58               | 14.55       | -9.54                           | 48.43                   | 73.98          | -25.55      |
| * 21280.00      | Average  | H               | -                   | -                          | -71.20               | 8.04        | -9.54                           | 34.30                   | 53.98          | -19.68      |
| * 21280.00      | Peak     | H               | -                   | -                          | -62.85               | 8.04        | -9.54                           | 42.64                   | 73.98          | -31.34      |
| 26600.00        | Peak     | H               | -                   | -                          | -53.31               | -8.30       | -9.54                           | 35.85                   | 68.20          | -32.35      |

**Table 7-52. Radiated Measurements with WCP**

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 140 of 209                 |

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5500MHz  
Channel: 100

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11000.00      | Average  | H               | 100                 | 152                        | -71.58               | 12.87       | -9.54                           | 38.75                   | 53.98          | -15.23      |
| * 11000.00      | Peak     | H               | 100                 | 152                        | -69.08               | 12.87       | -9.54                           | 41.25                   | 73.98          | -32.73      |
| 16500.00        | Peak     | H               | -                   | -                          | -67.57               | 16.61       | -9.54                           | 46.50                   | 68.20          | -21.70      |
| 22000.00        | Peak     | H               | -                   | -                          | -62.56               | 8.43        | -9.54                           | 43.32                   | 68.20          | -24.88      |
| 27500.00        | Peak     | H               | -                   | -                          | -51.28               | -8.80       | -9.54                           | 37.38                   | 68.20          | -30.82      |

**Table 7-53. Radiated Measurements**

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5580MHz  
Channel: 116

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11160.00      | Average  | H               | 100                 | 159                        | -70.49               | 12.64       | -9.54                           | 39.61                   | 53.98          | -14.37      |
| * 11160.00      | Peak     | H               | 100                 | 159                        | -68.04               | 12.64       | -9.54                           | 42.06                   | 73.98          | -31.92      |
| 16740.00        | Peak     | H               | -                   | -                          | -67.74               | 16.21       | -9.54                           | 45.93                   | 68.20          | -22.27      |
| * 22320.00      | Average  | H               | -                   | -                          | -70.69               | 8.08        | -9.54                           | 34.85                   | 53.98          | -19.13      |
| * 22320.00      | Peak     | H               | -                   | -                          | -62.06               | 8.08        | -9.54                           | 43.48                   | 73.98          | -30.50      |
| 27900.00        | Peak     | H               | -                   | -                          | -51.45               | -9.08       | -9.54                           | 36.94                   | 68.20          | -31.26      |

**Table 7-54. Radiated Measurements**

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 141 of 209                 |

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5720MHz  
Channel: 144

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11400.00      | Average  | H               | -                   | -                          | -71.82               | 12.47       | -9.54                           | 38.11                   | 53.98          | -15.87      |
| * 11400.00      | Peak     | H               | -                   | -                          | -68.98               | 12.47       | -9.54                           | 40.95                   | 73.98          | -33.03      |
| 17100.00        | Peak     | H               | -                   | -                          | -67.94               | 18.06       | -9.54                           | 47.58                   | 68.20          | -20.62      |
| * 22800.00      | Average  | H               | -                   | -                          | -70.17               | 8.37        | -9.54                           | 35.66                   | 53.98          | -18.32      |
| * 22800.00      | Peak     | H               | -                   | -                          | -61.81               | 8.37        | -9.54                           | 44.02                   | 73.98          | -29.96      |
| 28500.00        | Peak     | H               | -                   | -                          | -50.05               | -8.95       | -9.54                           | 38.46                   | 68.20          | -29.74      |

**Table 7-55. Radiated Measurements**

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5580MHz  
Channel: 116

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11160.00      | Average  | H               | -                   | -                          | -73.17               | 12.64       | -9.54                           | 36.93                   | 53.98          | -17.05      |
| * 11160.00      | Peak     | H               | -                   | -                          | -64.87               | 12.64       | -9.54                           | 45.23                   | 73.98          | -28.75      |
| 16740.00        | Peak     | H               | -                   | -                          | -65.20               | 16.21       | -9.54                           | 48.47                   | 68.20          | -19.73      |
| * 22320.00      | Average  | H               | -                   | -                          | -70.33               | 8.08        | -9.54                           | 35.21                   | 53.98          | -18.77      |
| * 22320.00      | Peak     | H               | -                   | -                          | -62.30               | 8.08        | -9.54                           | 43.24                   | 73.98          | -30.74      |
| 27900.00        | Peak     | H               | -                   | -                          | -53.36               | -9.08       | -9.54                           | 35.02                   | 68.20          | -33.18      |

**Table 7-56. Radiated Measurements with WCP**

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 142 of 209                 |

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5745MHz  
Channel: 149

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11490.00      | Average  | H               | 100                 | 270                        | -70.97               | 12.43       | -9.54                           | 38.92                   | 53.98          | -15.06      |
| * 11490.00      | Peak     | H               | 100                 | 270                        | -68.73               | 12.43       | -9.54                           | 41.16                   | 73.98          | -32.82      |
| 17235.00        | Peak     | H               | -                   | -                          | -67.42               | 18.61       | -9.54                           | 48.65                   | 68.20          | -19.55      |
| * 22980.00      | Average  | H               | -                   | -                          | -72.13               | 8.16        | -9.54                           | 33.49                   | 53.98          | -20.49      |
| * 22980.00      | Peak     | H               | -                   | -                          | -61.15               | 8.16        | -9.54                           | 44.47                   | 73.98          | -29.51      |
| 28725.00        | Peak     | H               | -                   | -                          | -50.67               | -9.24       | -9.54                           | 37.55                   | 68.20          | -30.65      |

**Table 7-57. Radiated Measurements**

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 Meter  
Operating Frequency: 5785MHz  
Channel: 157

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11570.00      | Average  | H               | 100                 | 269                        | -71.36               | 12.54       | -9.54                           | 38.64                   | 53.98          | -15.34      |
| * 11570.00      | Peak     | H               | 100                 | 269                        | -68.75               | 12.54       | -9.54                           | 41.25                   | 73.98          | -32.73      |
| 17355.00        | Peak     | H               | -                   | -                          | -67.25               | 18.73       | -9.54                           | 48.94                   | 68.20          | -19.26      |
| 23140.00        | Peak     | H               | -                   | -                          | -61.58               | 8.37        | -9.54                           | 44.25                   | 68.20          | -23.95      |
| 28925.00        | Peak     | H               | -                   | -                          | -51.06               | -9.65       | -9.54                           | 36.75                   | 68.20          | -31.45      |

**Table 7-58. Radiated Measurements**

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 143 of 209                 |

Worst Case Mode: 802.11a  
 Worst Case Transfer Rate: 6 Mbps  
 Distance of Measurements: 1 Meter  
 Operating Frequency: 5825MHz  
 Channel: 165

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11650.00      | Average  | H               | -                   | -                          | -71.31               | 12.99       | -9.54                           | 39.13                   | 53.98          | -14.85      |
| * 11650.00      | Peak     | H               | -                   | -                          | -69.98               | 12.99       | -9.54                           | 40.46                   | 73.98          | -33.52      |
| 17475.00        | Peak     | H               | -                   | -                          | -67.95               | 19.25       | -9.54                           | 48.75                   | 68.20          | -19.45      |
| 23300.00        | Peak     | H               | -                   | -                          | -61.57               | 8.50        | -9.54                           | 44.38                   | 68.20          | -23.82      |
| 29125.00        | Peak     | H               | -                   | -                          | -51.37               | -9.87       | -9.54                           | 36.22                   | 68.20          | -31.98      |

**Table 7-59. Radiated Measurements**

Worst Case Mode: 802.11a  
 Worst Case Transfer Rate: 6 Mbps  
 Distance of Measurements: 1 Meter  
 Operating Frequency: 5825MHz  
 Channel: 165

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11650.00      | Average  | H               | -                   | -                          | -73.63               | 12.99       | -9.54                           | 36.81                   | 53.98          | -17.17      |
| * 11650.00      | Peak     | H               | -                   | -                          | -64.32               | 12.99       | -9.54                           | 46.13                   | 73.98          | -27.85      |
| 17475.00        | Peak     | H               | -                   | -                          | -63.77               | 19.25       | -9.54                           | 52.93                   | 68.20          | -15.27      |
| 23300.00        | Peak     | H               | -                   | -                          | -60.67               | 8.50        | -9.54                           | 45.29                   | 68.20          | -22.91      |
| 29125.00        | Peak     | H               | -                   | -                          | -52.01               | -9.87       | -9.54                           | 35.57                   | 68.20          | -32.63      |

**Table 7-60. Radiated Measurements with WCP**

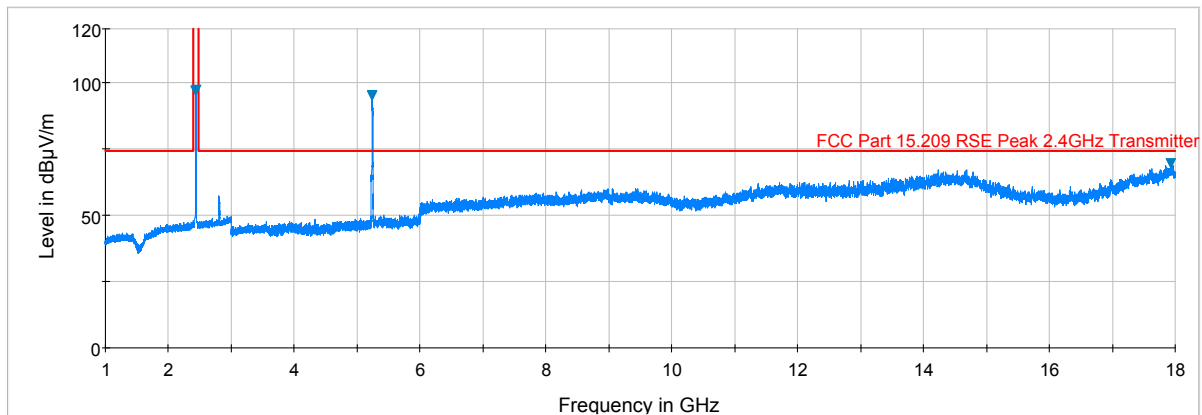
|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 144 of 209                 |

### 7.7.3 Simultaneous Tx Radiated Spurious Emissions Measurements

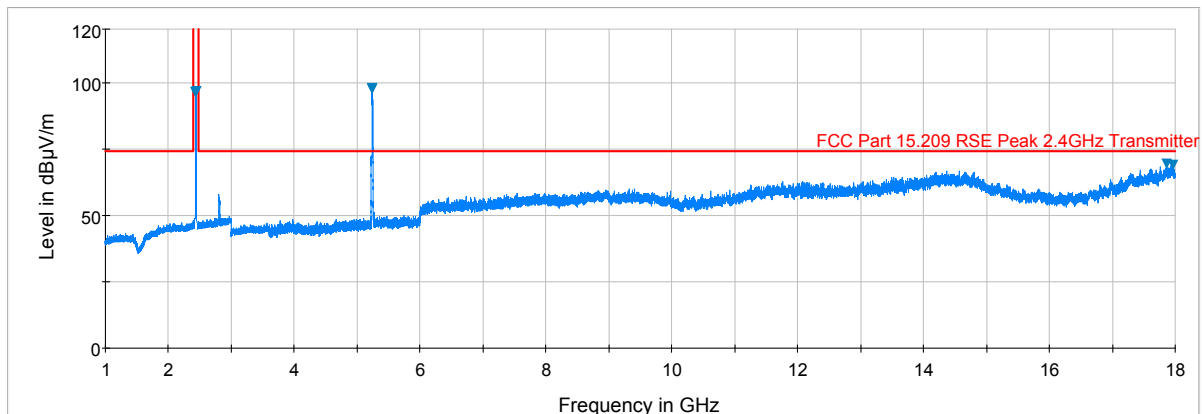
§15.247(d) §15.205 & §15.209

| Description               | 2.4 GHz Emission | 5 GHz Emission |
|---------------------------|------------------|----------------|
| Antenna                   | 1                | 2              |
| Channel                   | 2                | 48             |
| Operating Frequency (MHz) | 2417             | 5240           |
| Data Rate (Mbps)          | 1                | 6              |
| Mode                      | b                | a              |

**Table 7-61. Config-1 (ANT1 2.4GHz & ANT2 5GHz)**

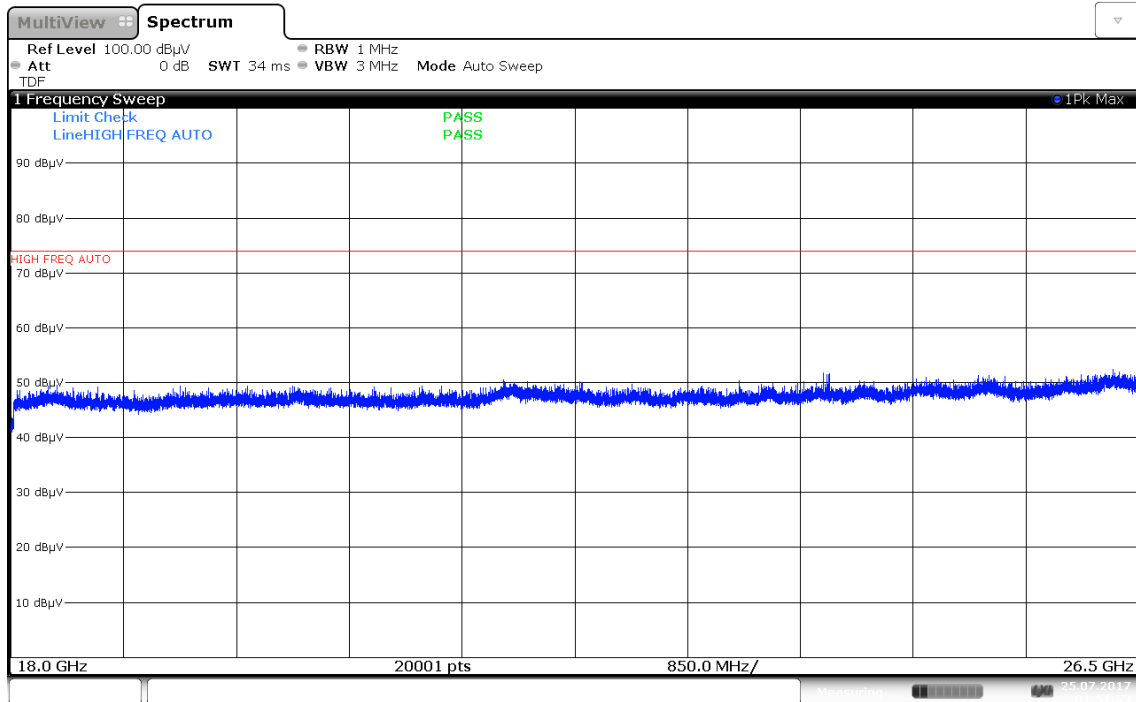


**Plot 7-177. Radiated Spurious Plot above 1GHz (2.4GHz – 5GHz, Ant. Pol. H)**



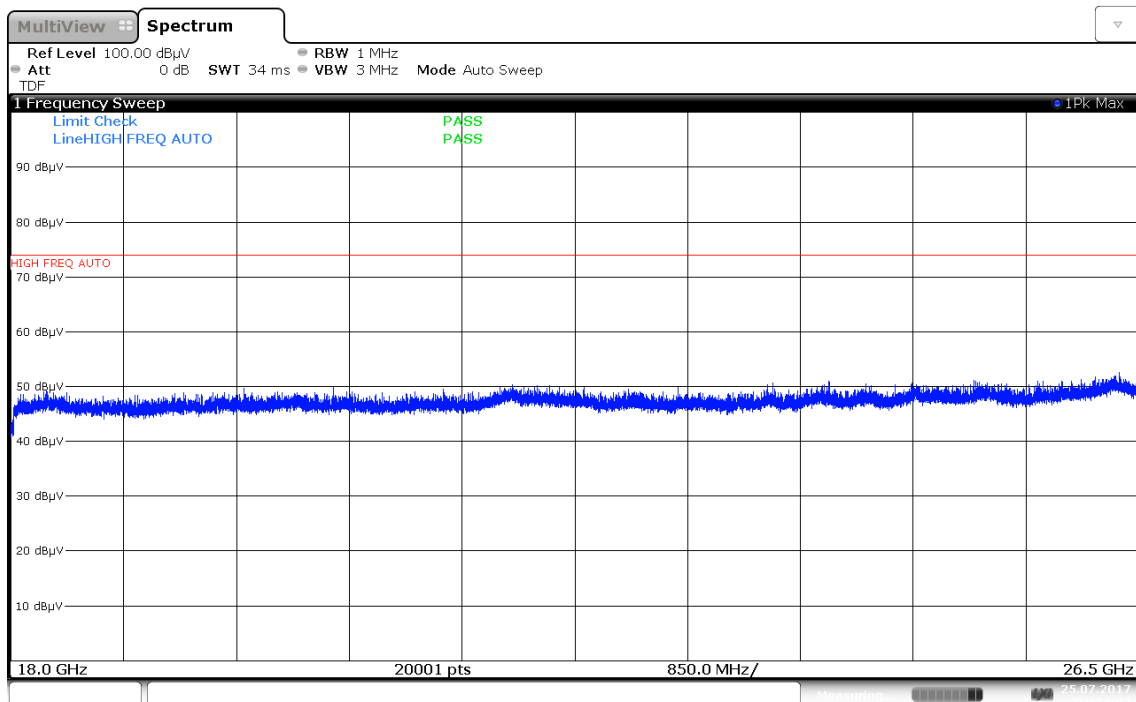
**Plot 7-178. Radiated Spurious Plot above 1GHz (2.4GHz – 5GHz, Ant. Pol. V)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 145 of 209                 |



01:51:54 25.07.2017

**Plot 7-179. Radiated Spurious Plot 18-26.5GHz (2.4GHz – 5GHz, Ant. Pol. H)**



01:54:02 25.07.2017

**Plot 7-180. Radiated Spurious Plot 18-26.5GHz (2.4GHz – 5GHz, Ant. Pol. V)**

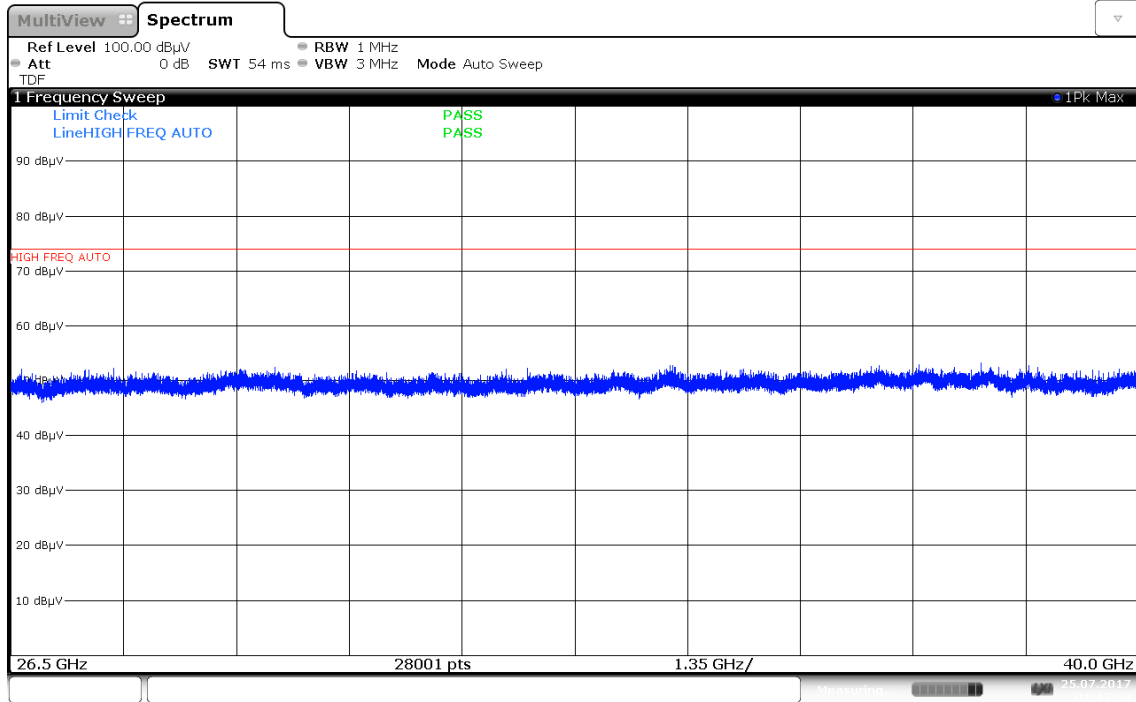
|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 146 of 209                 |

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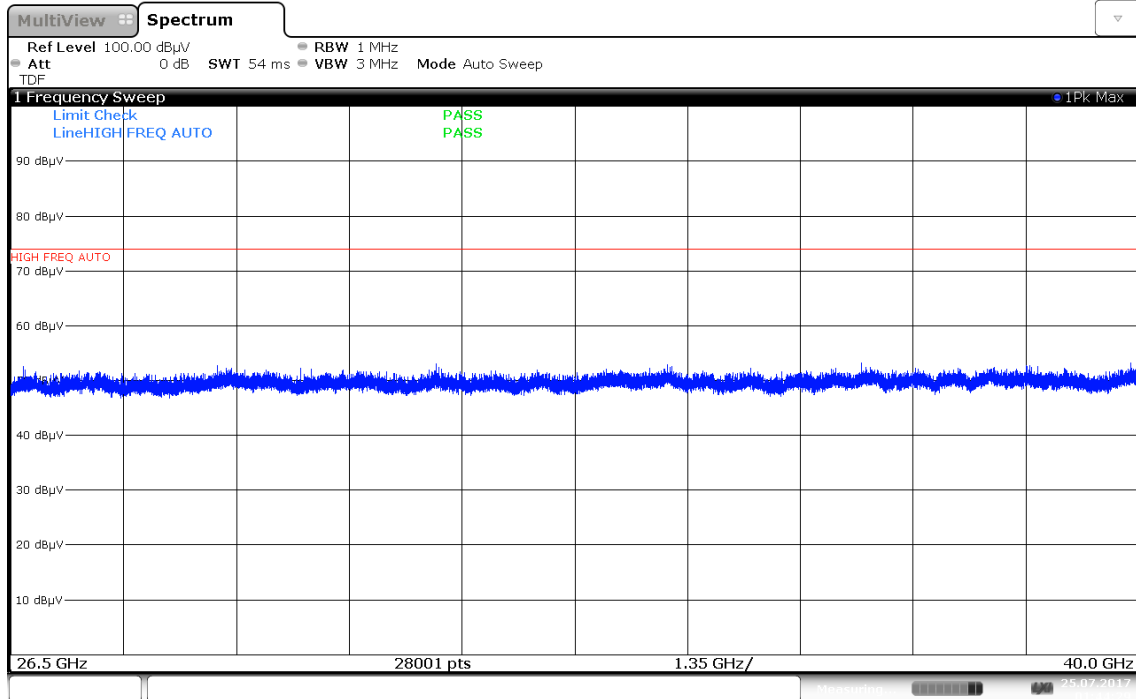
06/23/2017

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01:47:55 25.07.2017

**Plot 7-181. Radiated Spurious Plot 26.5-40 GHz (2.4GHz – 5GHz, Ant. Pol. H)**



01:44:30 25.07.2017

**Plot 7-182. Radiated Spurious Plot 26.5-40 GHz (2.4GHz – 5GHz, Ant. Pol. V)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 147 of 209                 |

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## 7.7.4 Antenna-1 Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

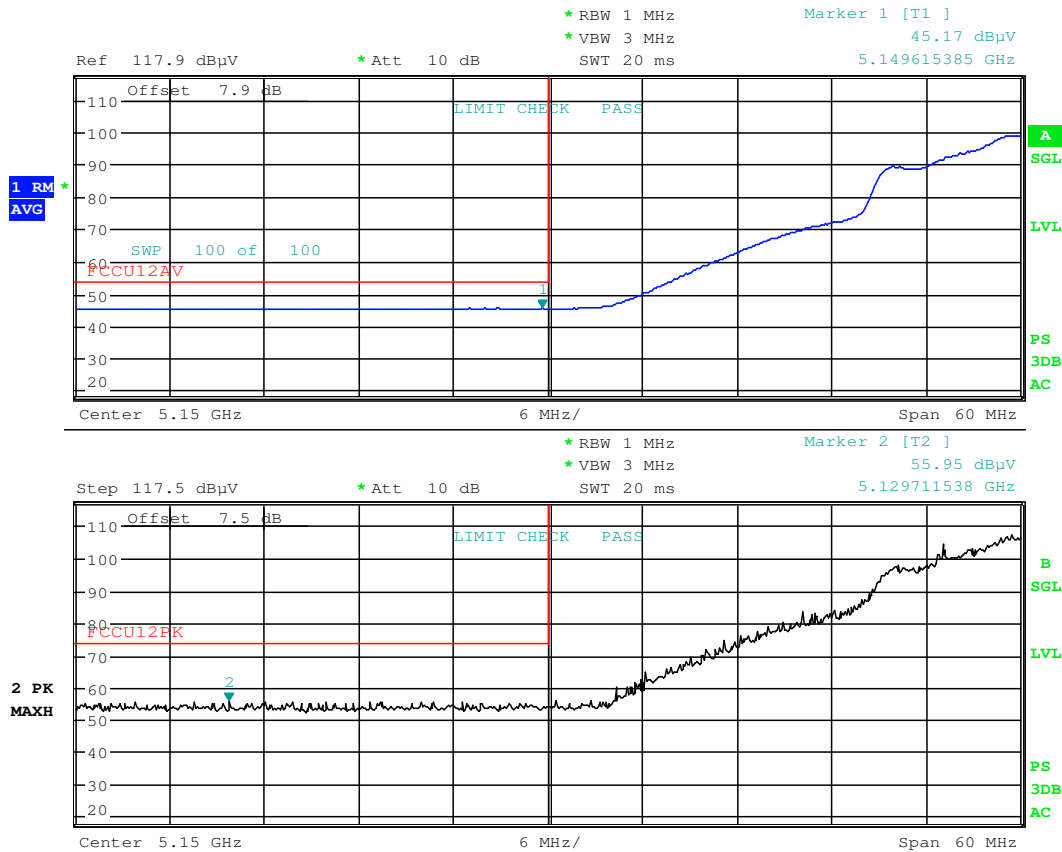
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5180MHz

Channel: 36



Date: 18.JUL.2017 02:43:20

**Plot 7-183. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 148 of 209                 |

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## Antenna-1 Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

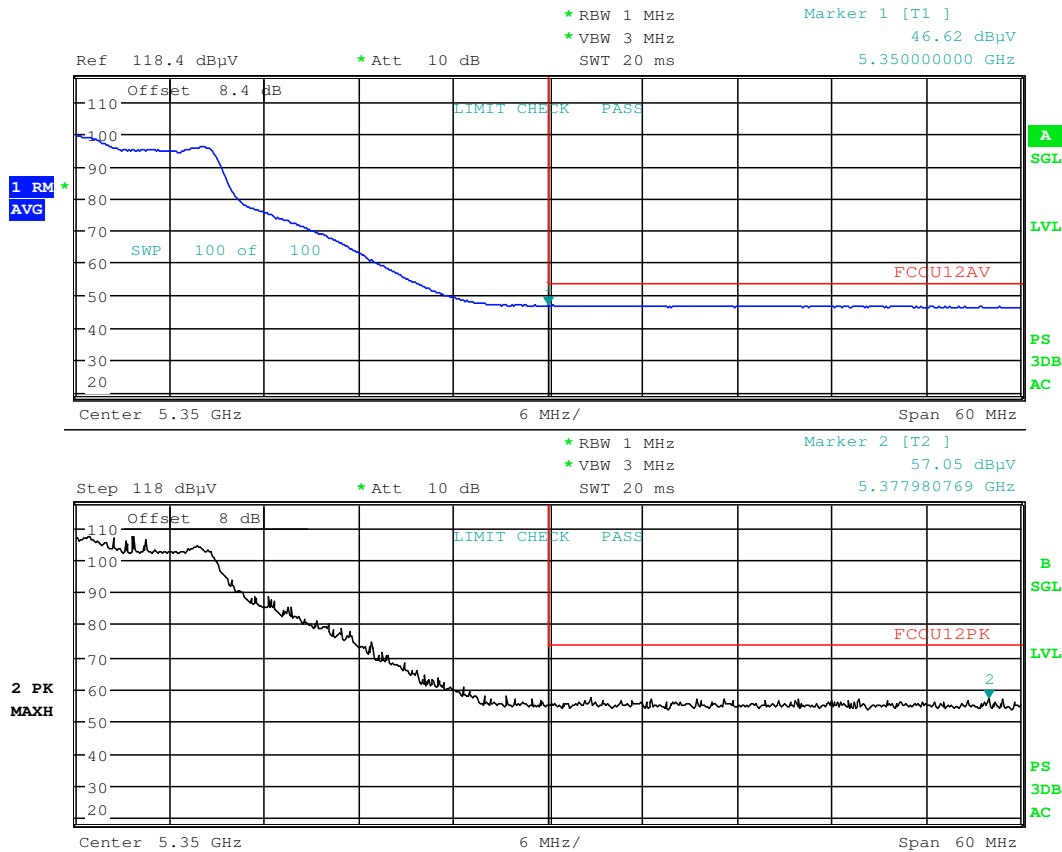
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5320MHz

Channel: 64



Date: 18.JUL.2017 02:50:25

### Plot 7-184. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 149 of 209                 |

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## Antenna-1 Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

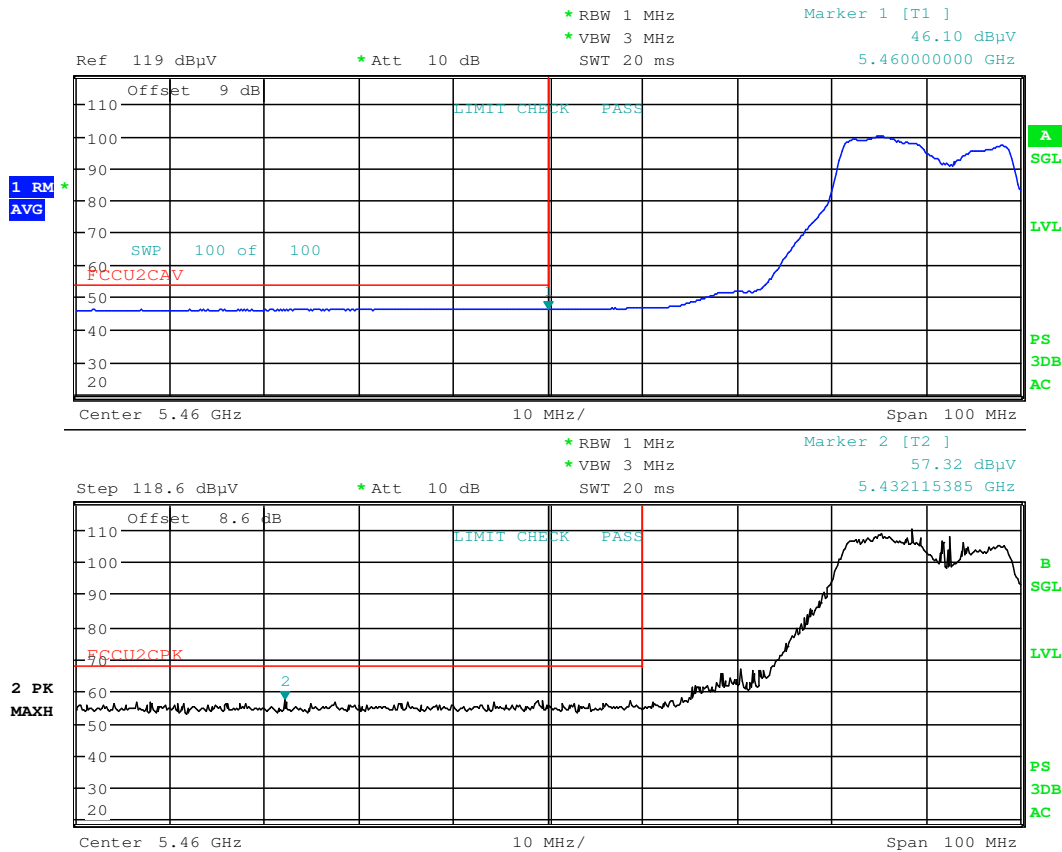
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5500MHz

Channel: 100



Date: 18.JUL.2017 02:57:56

### Plot 7-185. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 150 of 209                 |

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## Antenna-1 Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

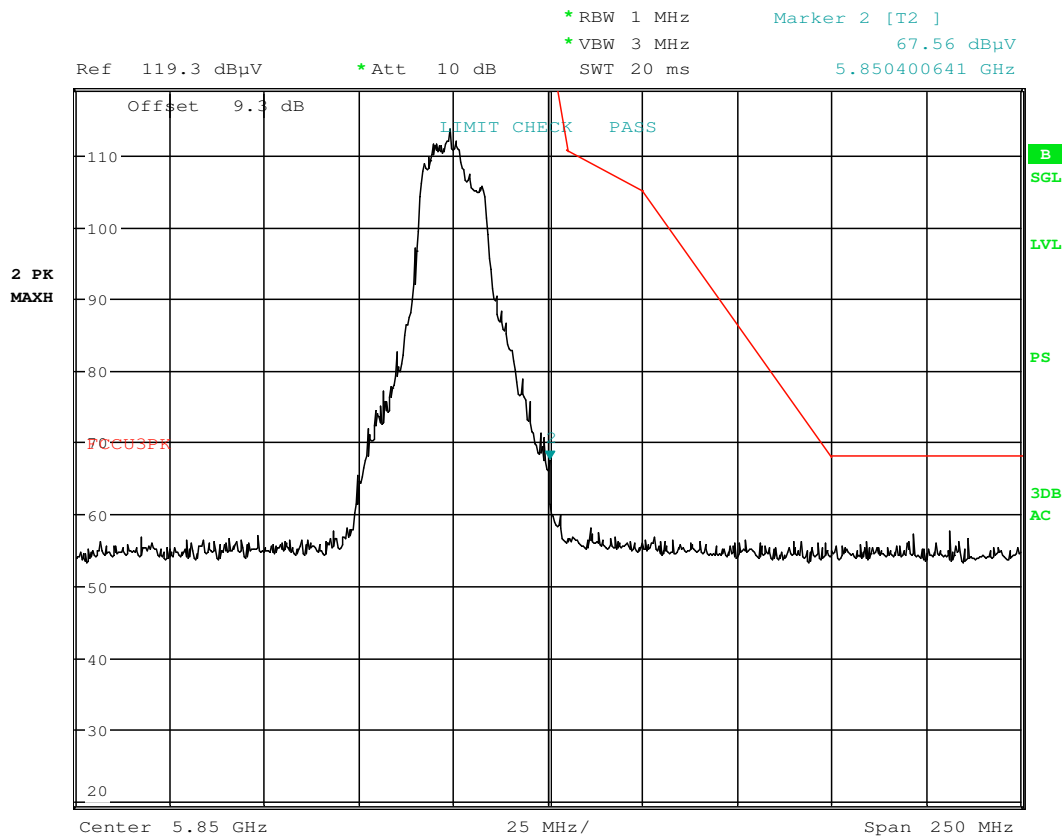
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5825MHz

Channel: 165



Date: 18.JUL.2017 03:04:21

**Plot 7-186. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 151 of 209                 |

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## Antenna-1 WCP Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

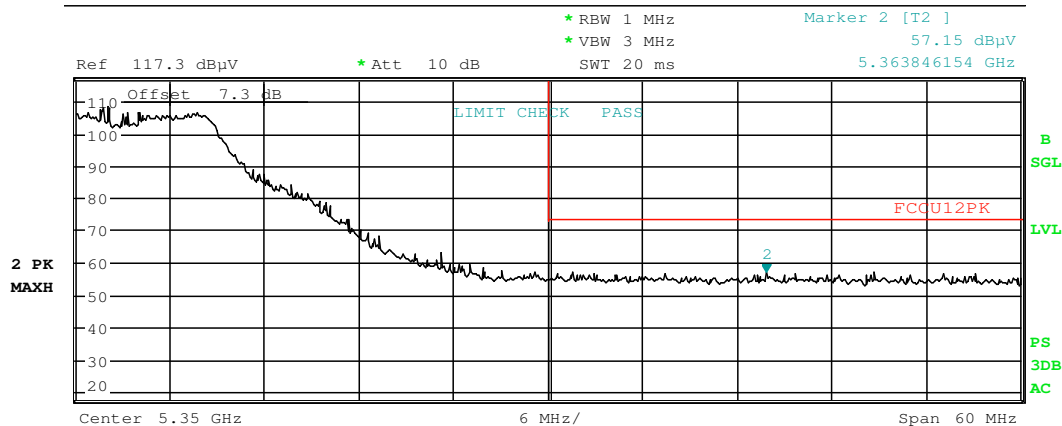
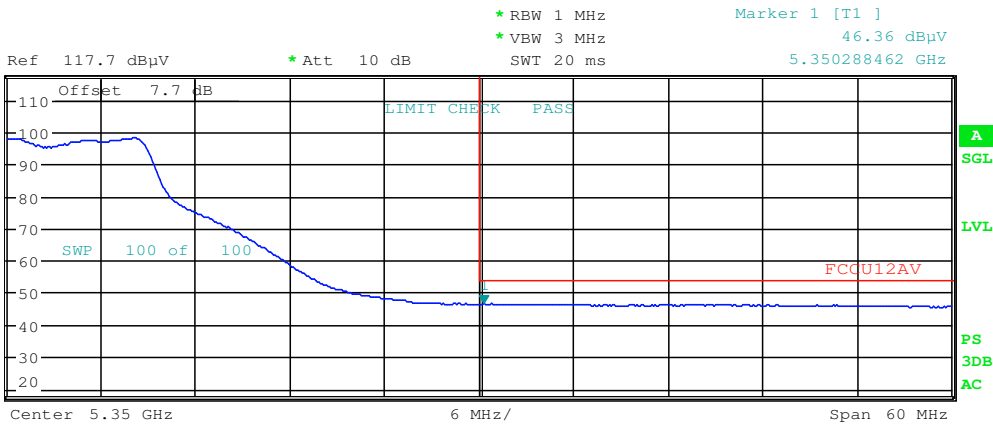
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5320MHz

Channel: 64



Date: 18.JUL.2017 18:38:37

**Plot 7-187. Radiated Restricted Band Edge Plot with WCP**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 152 of 209                 |

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## 7.7.5 Antenna-1 Radiated Band Edge Measurements (40MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

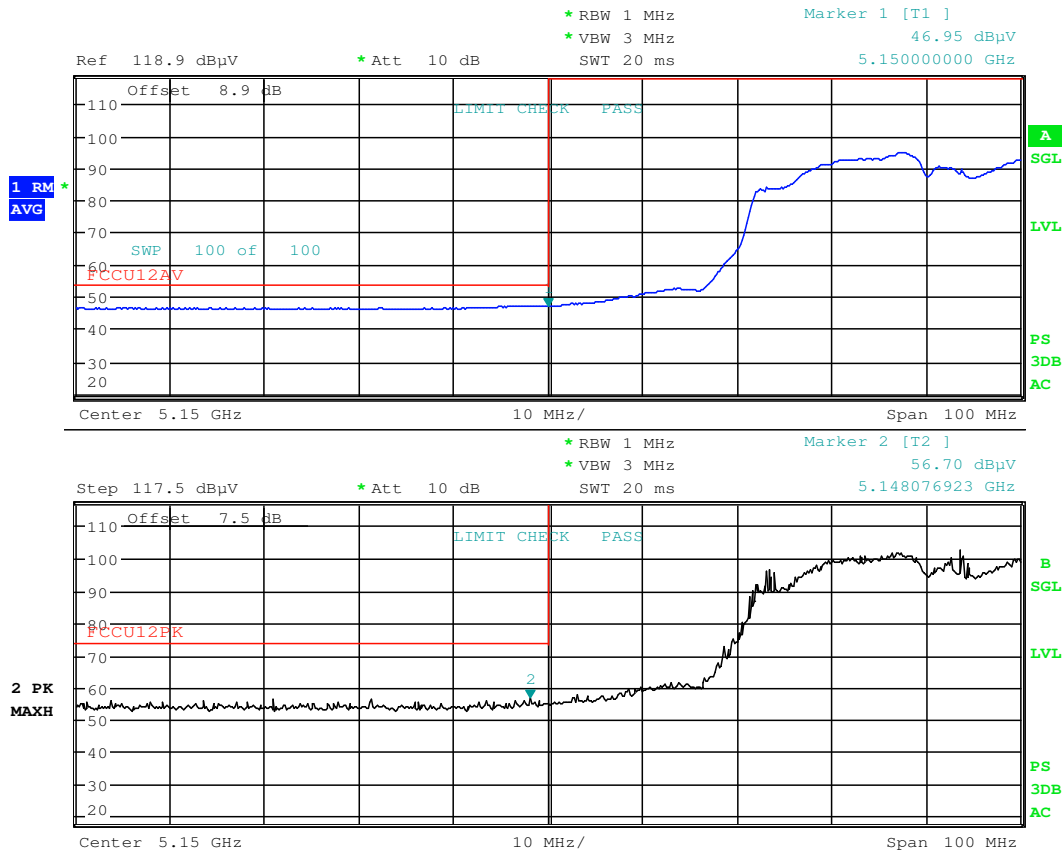
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5190MHz

Channel: 38



Date: 18.JUL.2017 02:44:34

**Plot 7-188. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 153 of 209                 |

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## Antenna-1 Radiated Band Edge Measurements (40MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

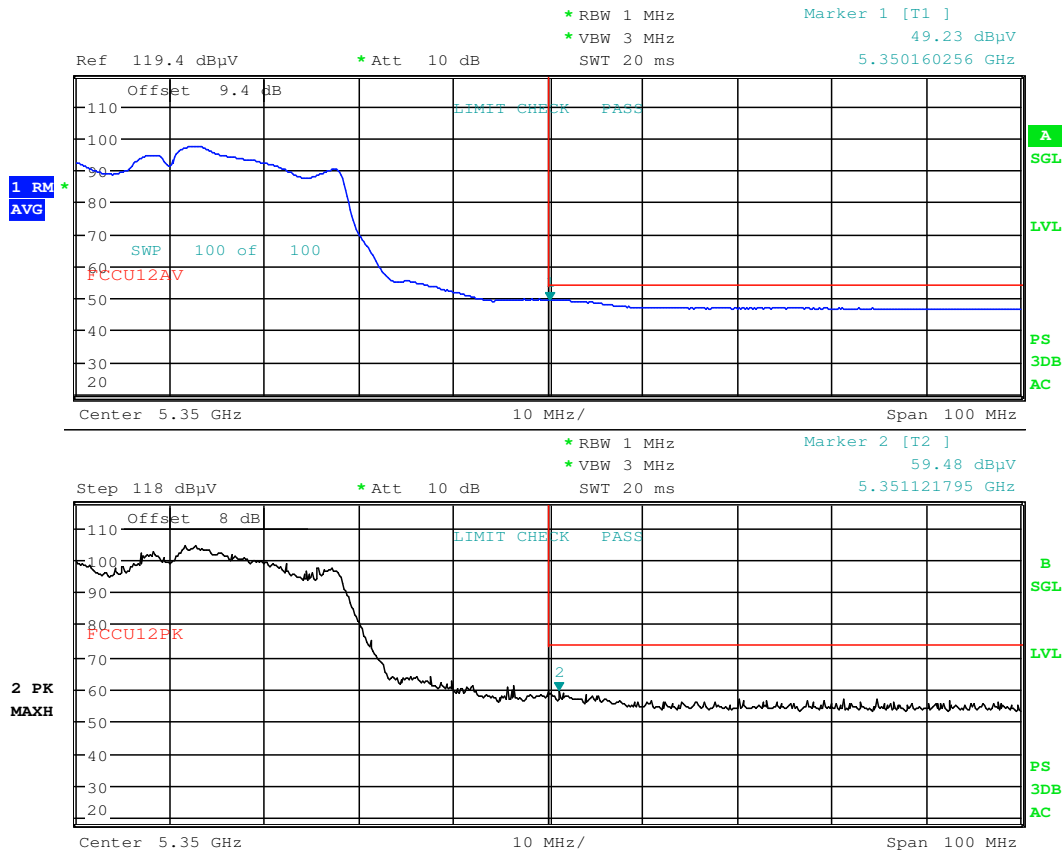
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5310MHz

Channel: 62



Date: 18.JUL.2017 02:51:35

### Plot 7-189. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 154 of 209                 |

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## Antenna-1 Radiated Band Edge Measurements (40MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

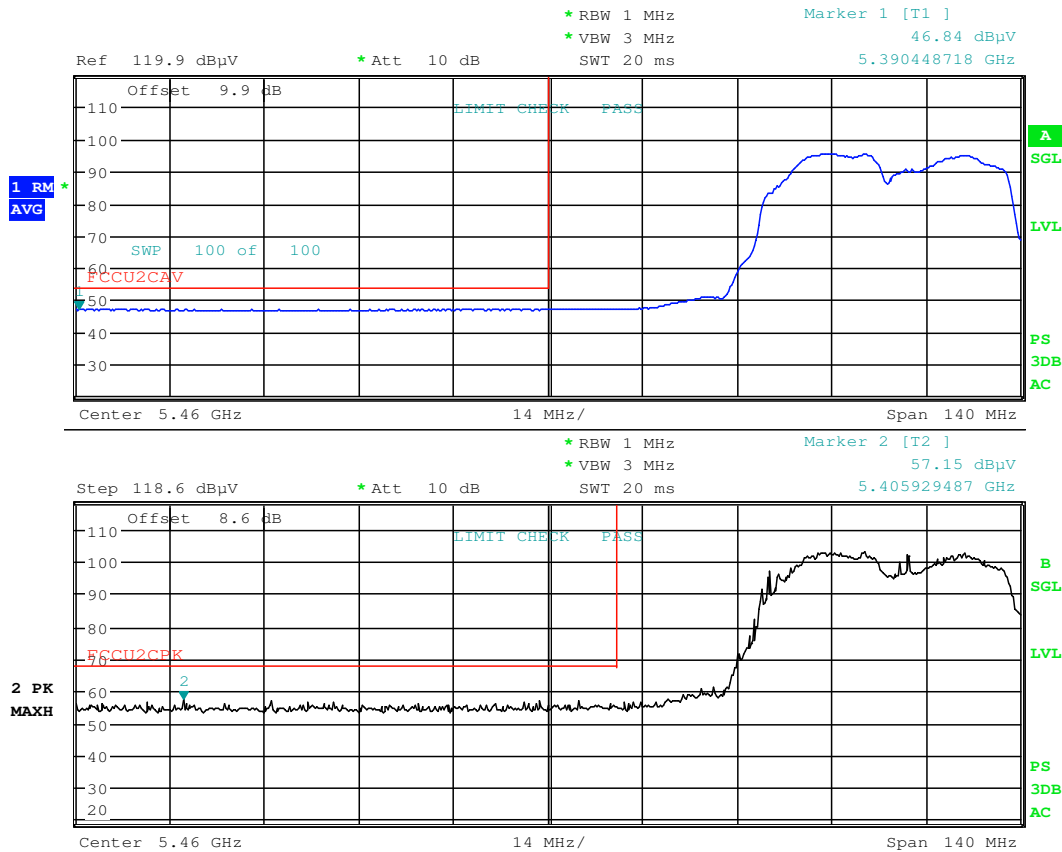
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5510MHz

Channel: 102



Date: 18.JUL.2017 02:59:12

### Plot 7-190. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 155 of 209                 |

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## Antenna-1 Radiated Band Edge Measurements (40MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

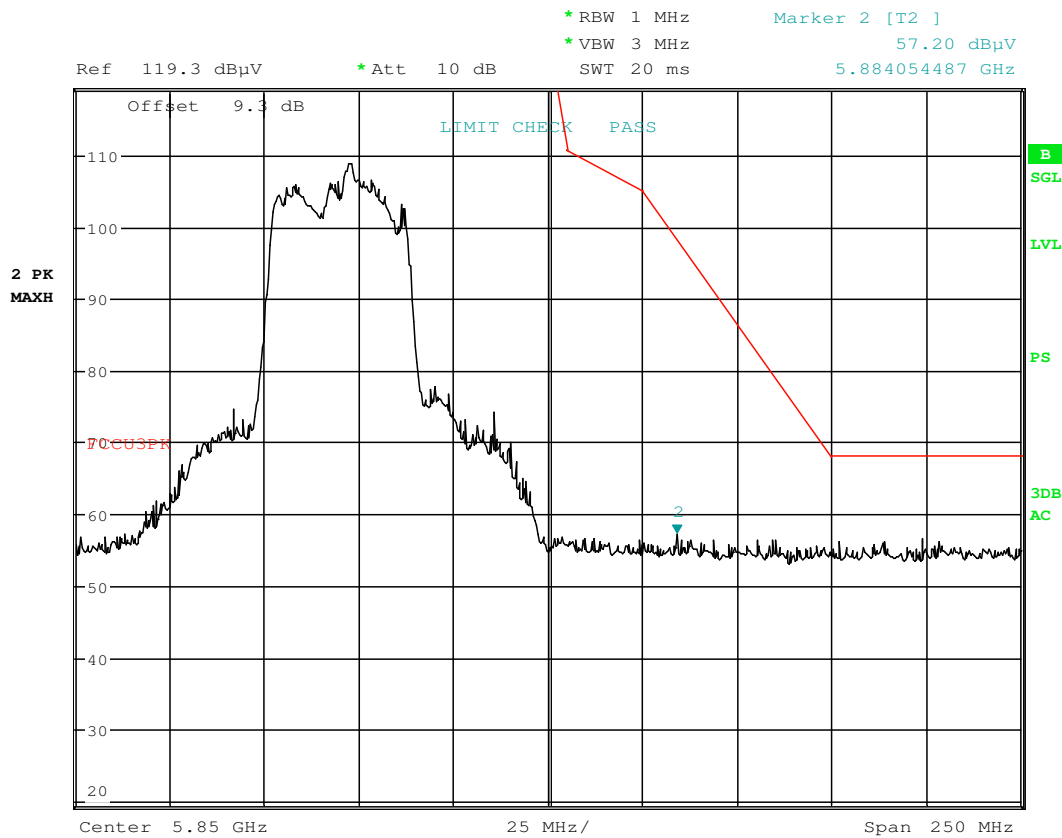
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5795MHz

Channel: 159



Date: 18.JUL.2017 03:05:37

**Plot 7-191. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 156 of 209                 |

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## Antenna-1 WCP Radiated Band Edge Measurements (40MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

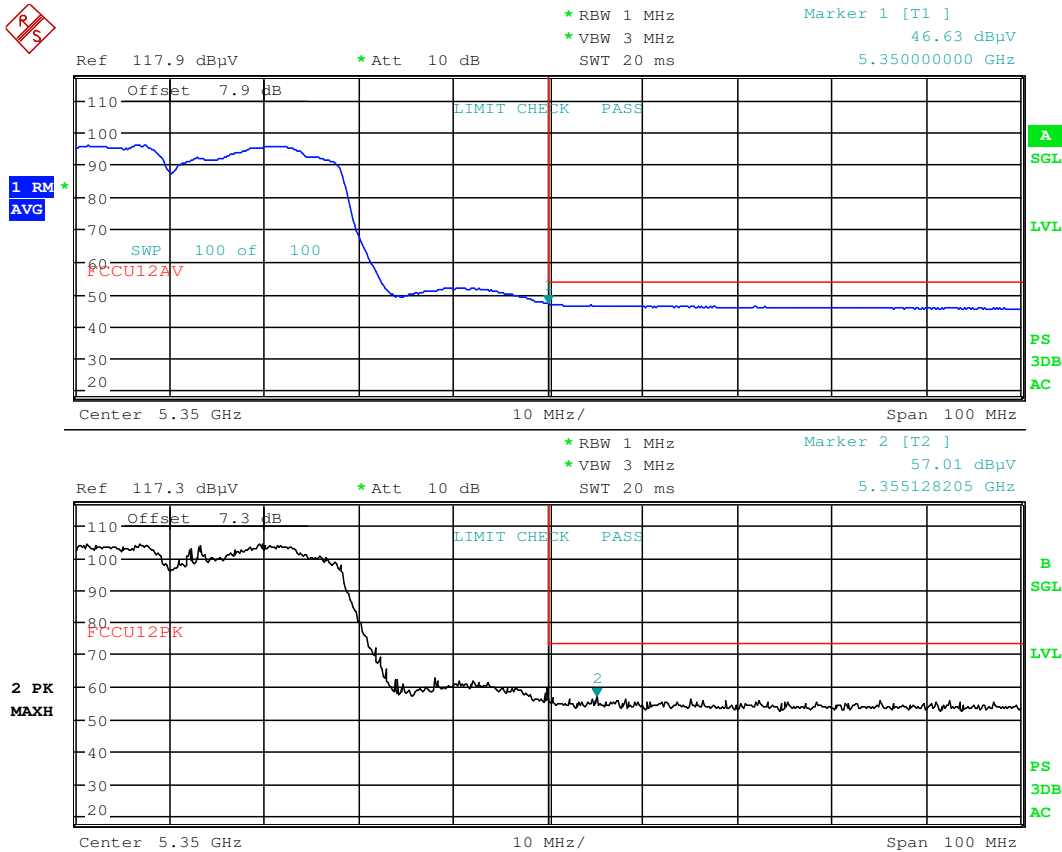
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5310MHz

Channel: 62



Date: 18.JUL.2017 18:42:11

**Plot 7-192. Radiated Restricted Band Edge Plot with WCP**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 157 of 209                 |

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## 7.7.6 Antenna-1 Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

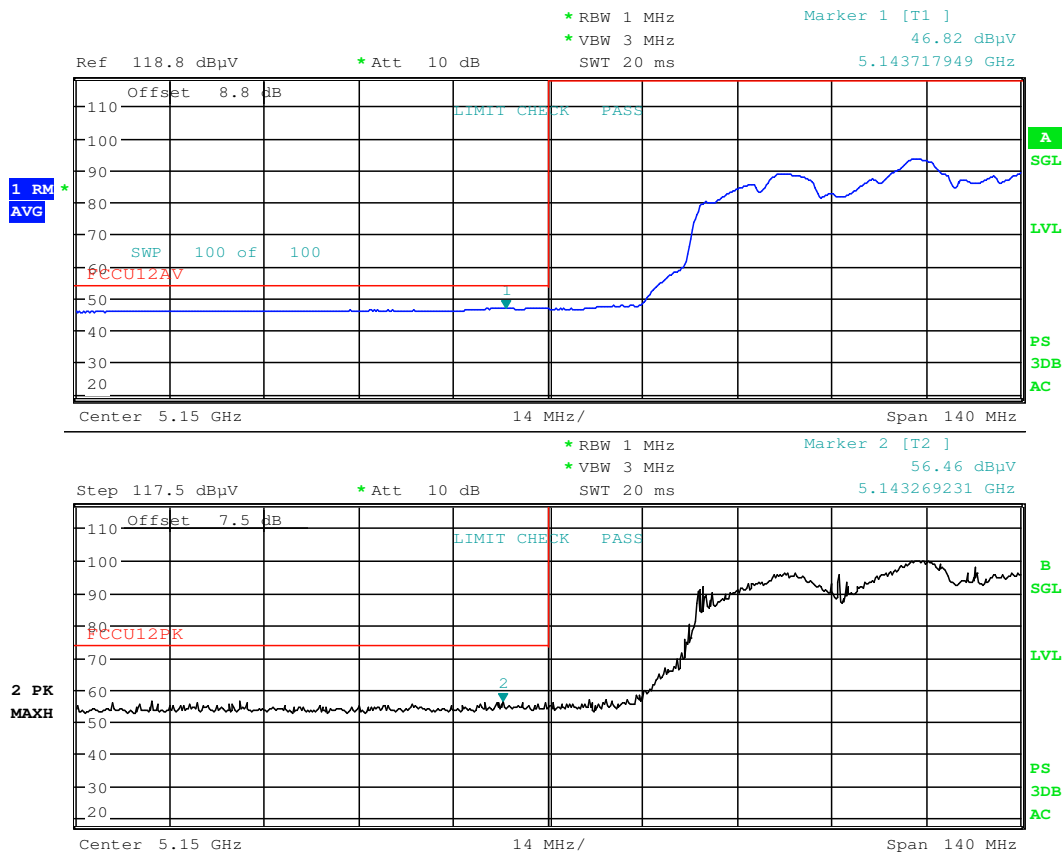
Worst Case Mode: 802.11n (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5210MHz

Channel: 42



Date: 18.JUL.2017 02:45:45

**Plot 7-193. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 158 of 209                 |

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## Antenna-1 Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

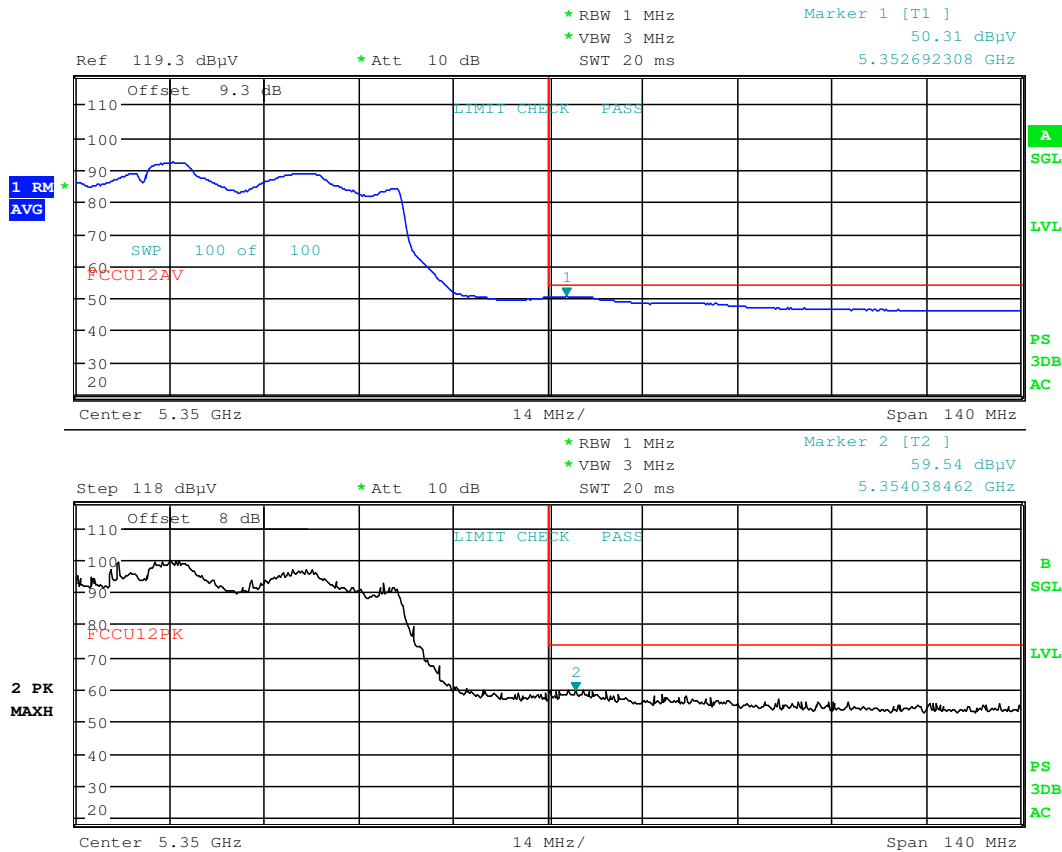
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5290MHz

Channel: 58



Date: 18.JUL.2017 02:53:34

### Plot 7-194. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 159 of 209                 |

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## Antenna-1 Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

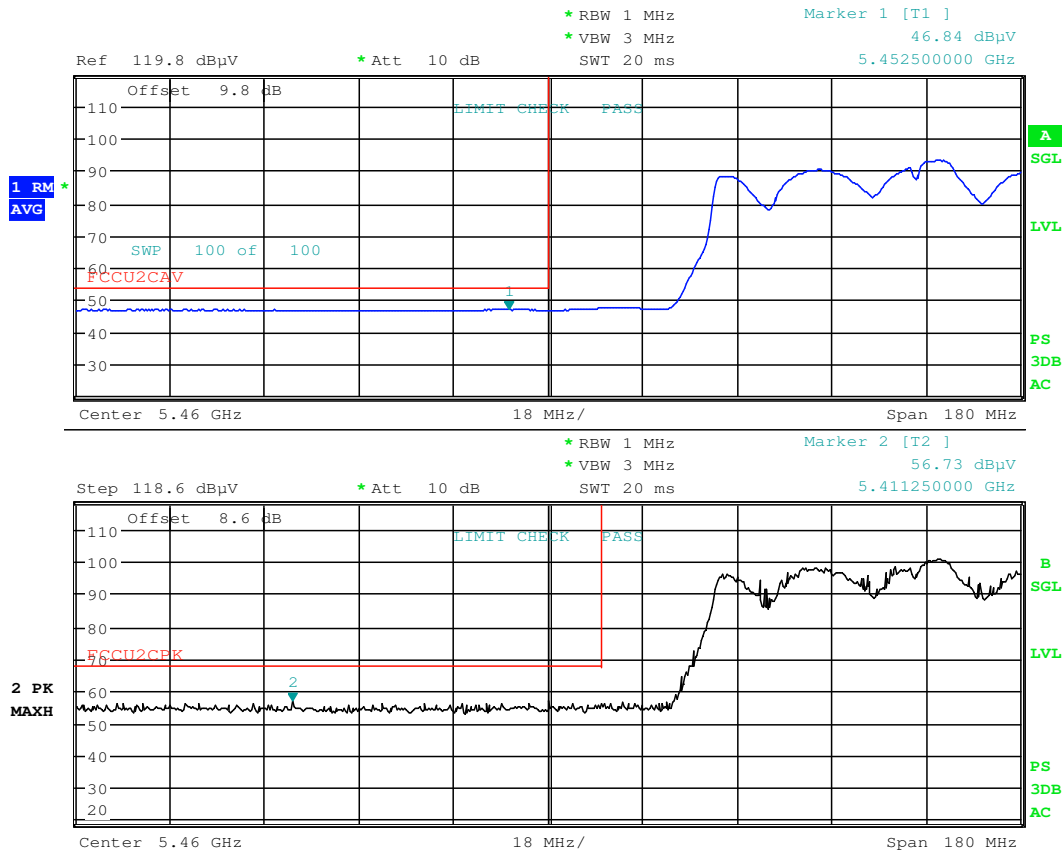
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5530MHz

Channel: 106



Date: 18.JUL.2017 03:00:25

### Plot 7-195. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 160 of 209                 |

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## Antenna-1 Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

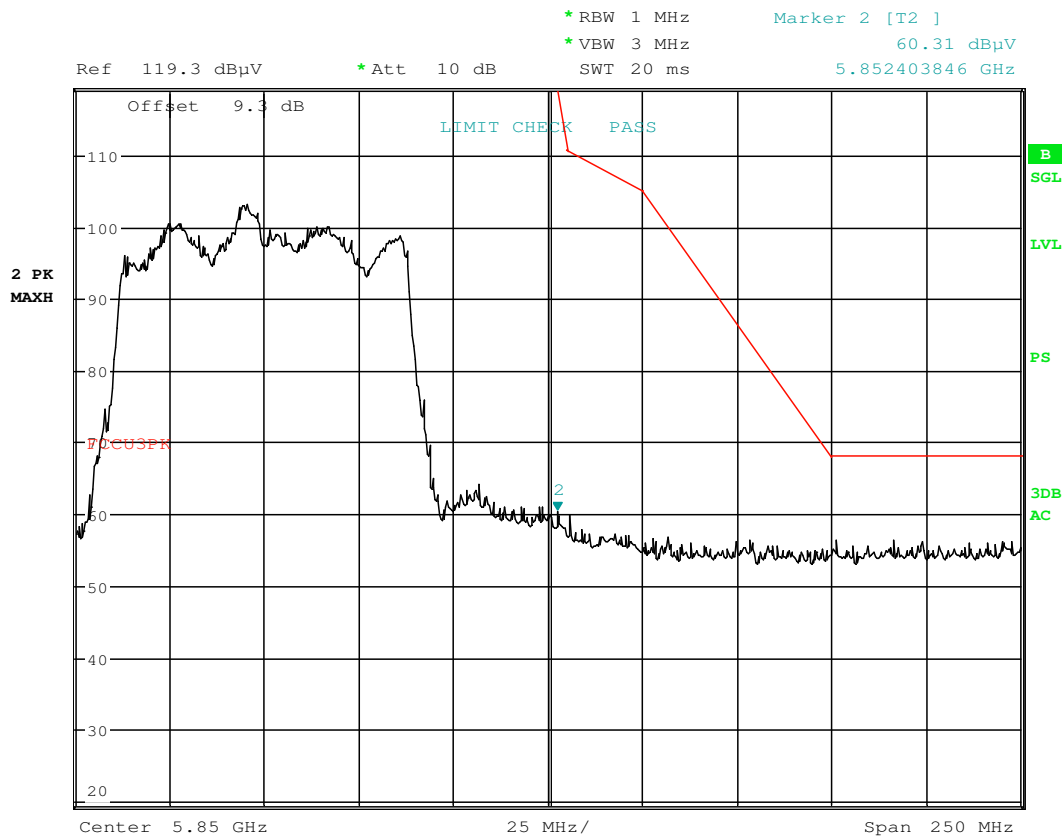
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5775MHz

Channel: 155



Date: 18.JUL.2017 03:06:57

**Plot 7-196. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 161 of 209                 |

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## Antenna-1 WCP Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

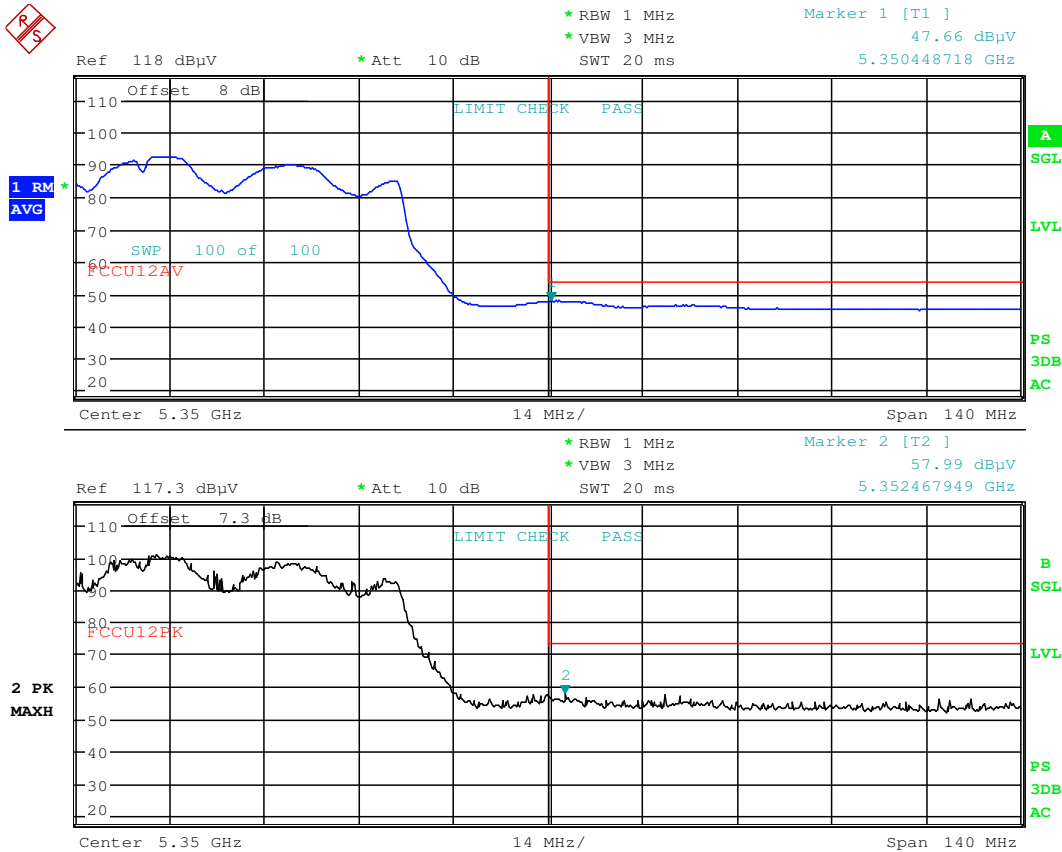
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5290MHz

Channel: 58



Date: 18.JUL.2017 18:47:39

**Plot 7-197. Radiated Restricted Band Edge Plot with WCP**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 162 of 209                 |

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## 7.7.7 Antenna-2 Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

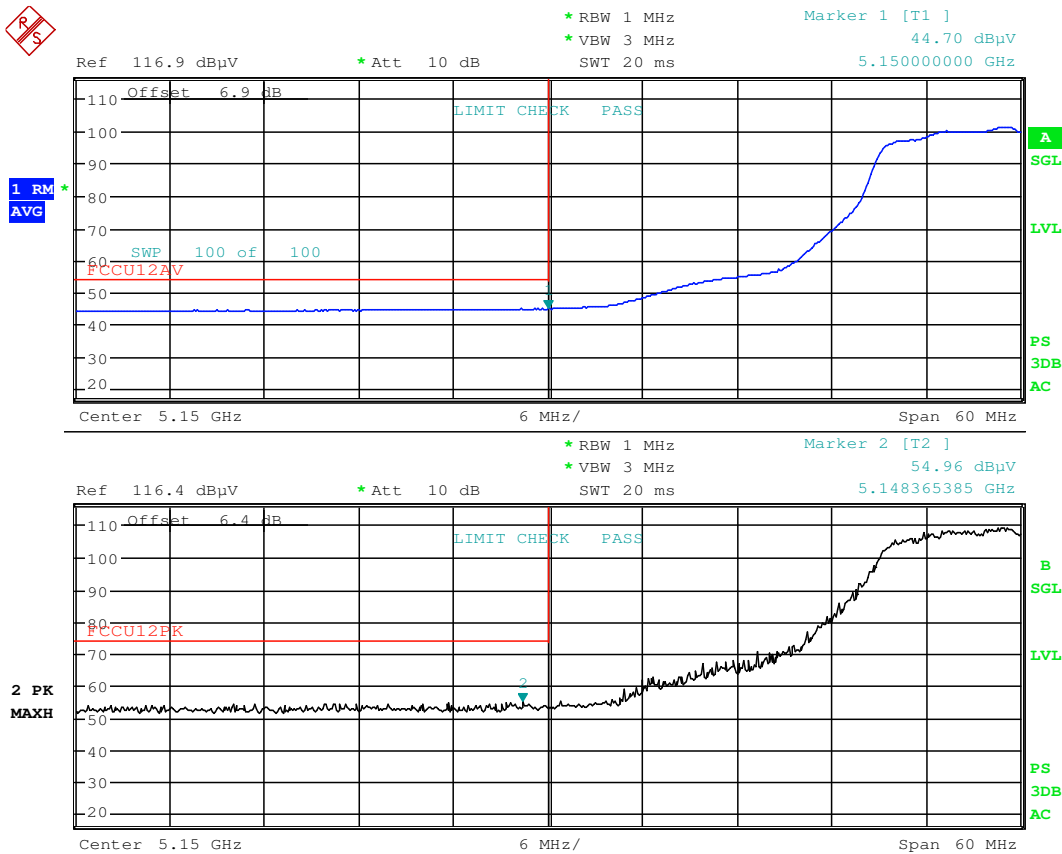
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5180MHz

Channel: 36



Date: 18.JUL.2017 17:42:10

**Plot 7-198. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 163 of 209                 |

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## Antenna-2 Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

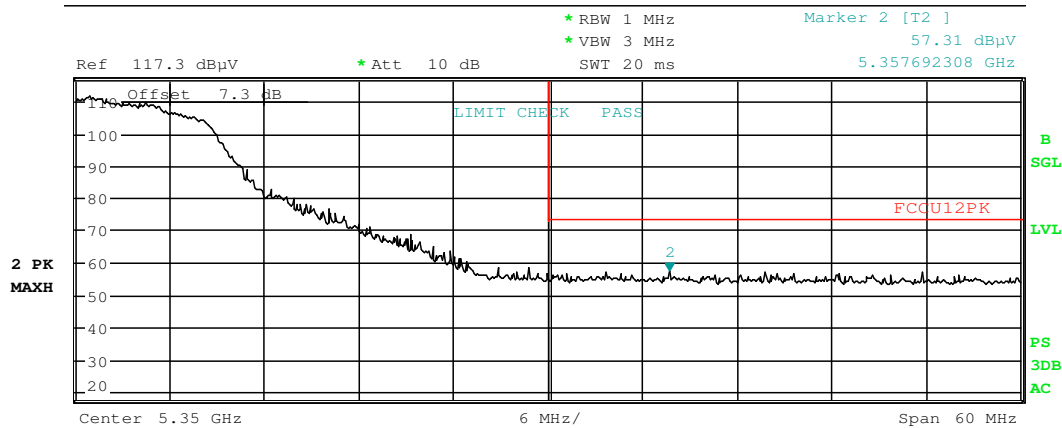
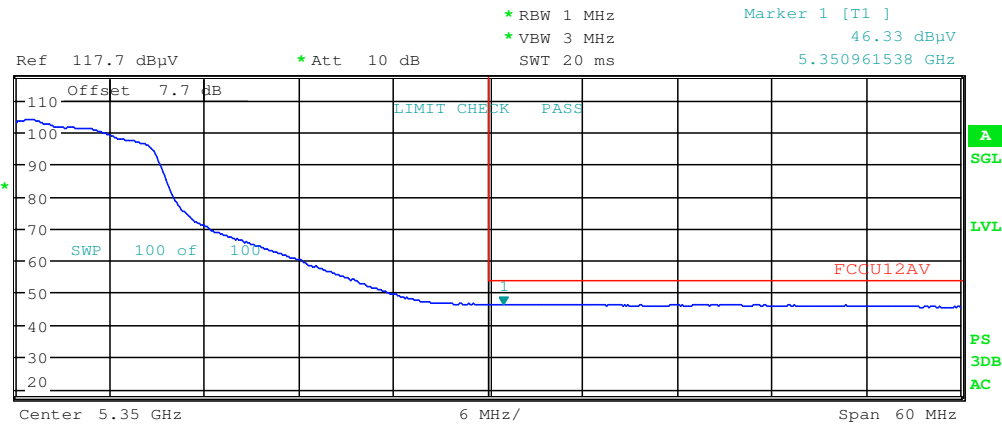
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5320MHz

Channel: 64



Date: 18.JUL.2017 17:57:23

### Plot 7-199. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 164 of 209                 |

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## Antenna-2 Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

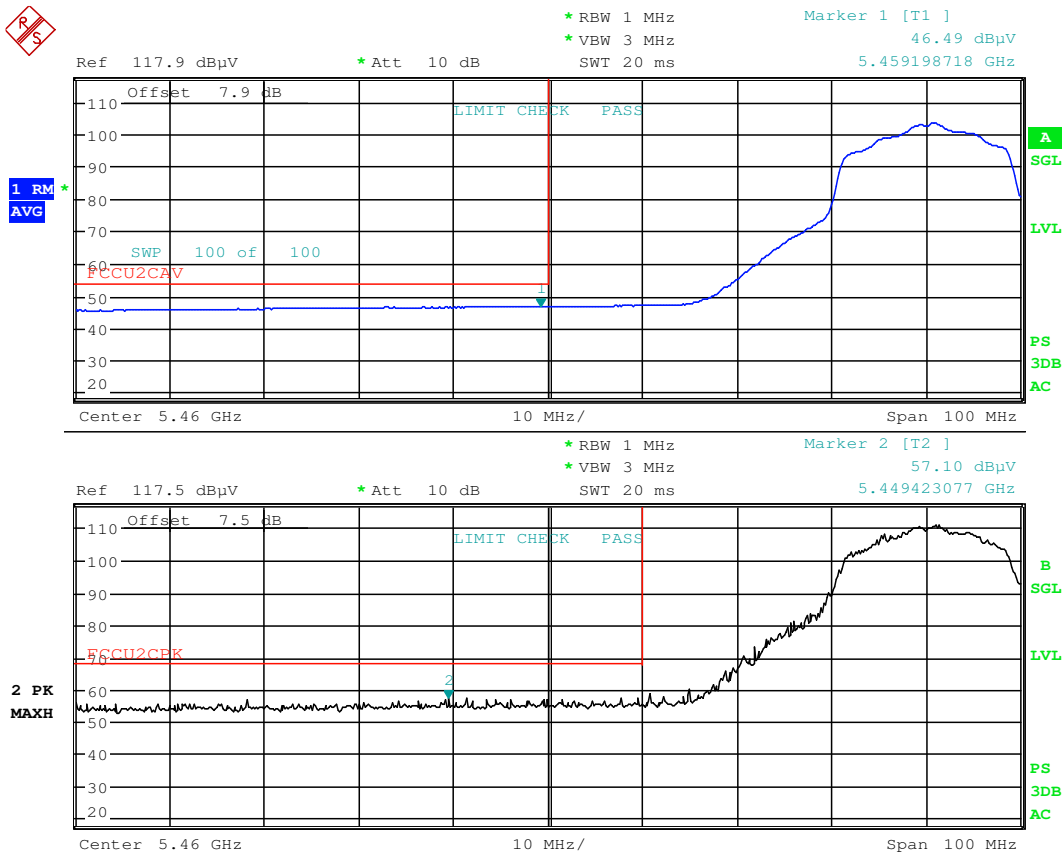
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5500MHz

Channel: 100



Date: 18.JUL.2017 18:09:24

### Plot 7-200. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 165 of 209                 |

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## Antenna-2 Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

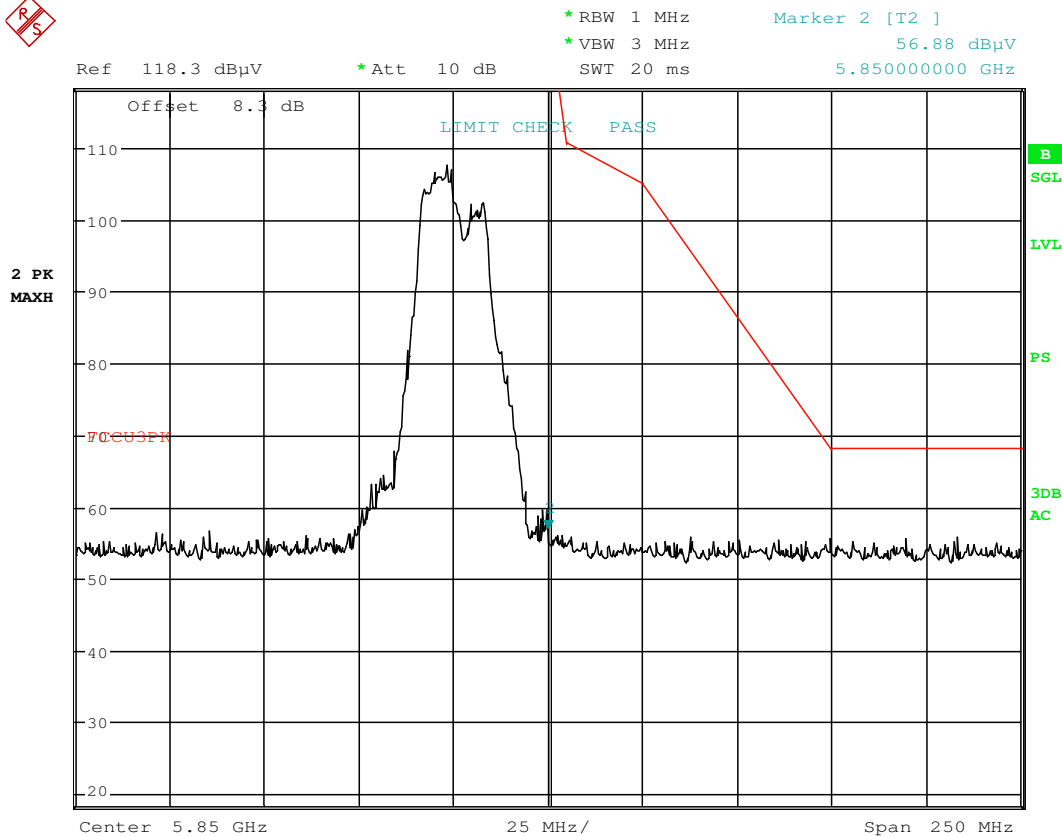
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5825MHz

Channel: 165



Date: 18.JUL.2017 18:21:32

**Plot 7-201. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 166 of 209                 |

## Antenna-2 WCP Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

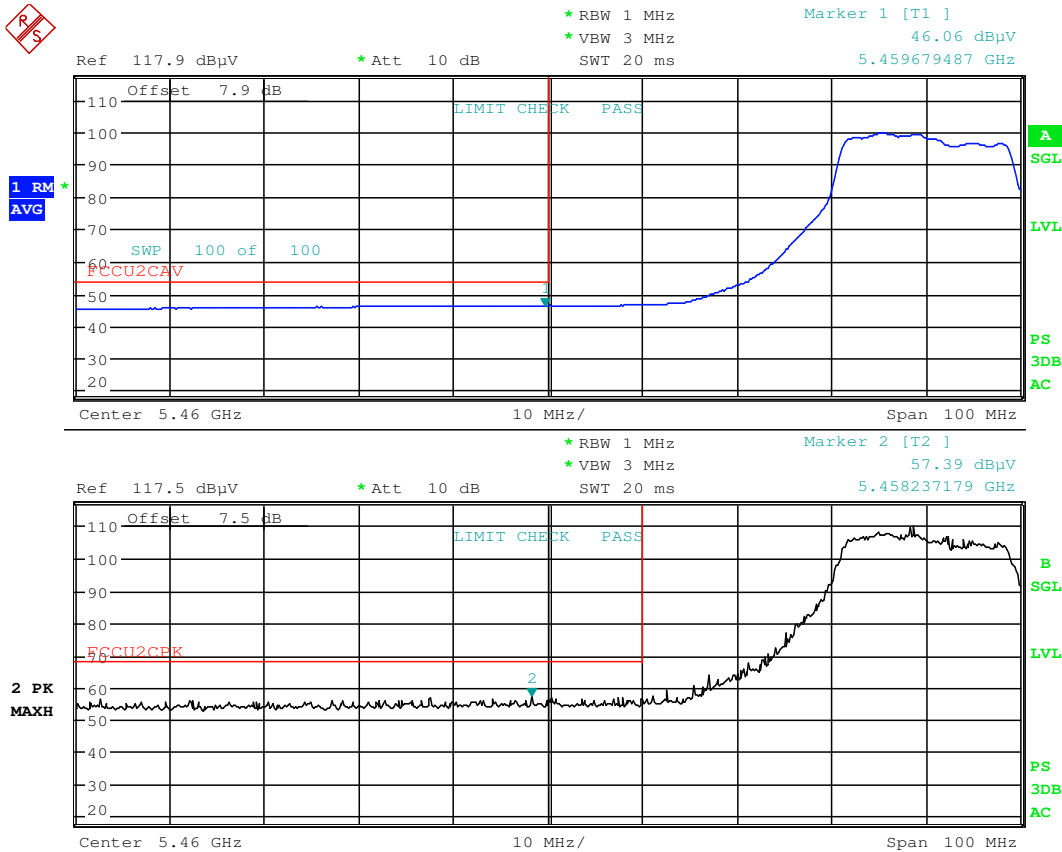
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5500MHz

Channel: 100



Date: 18.JUL.2017 18:52:54

**Plot 7-202. Radiated Restricted Band Edge Plot with WCP**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 167 of 209                 |

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## 7.7.8 Antenna-2 Radiated Band Edge Measurements (40MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

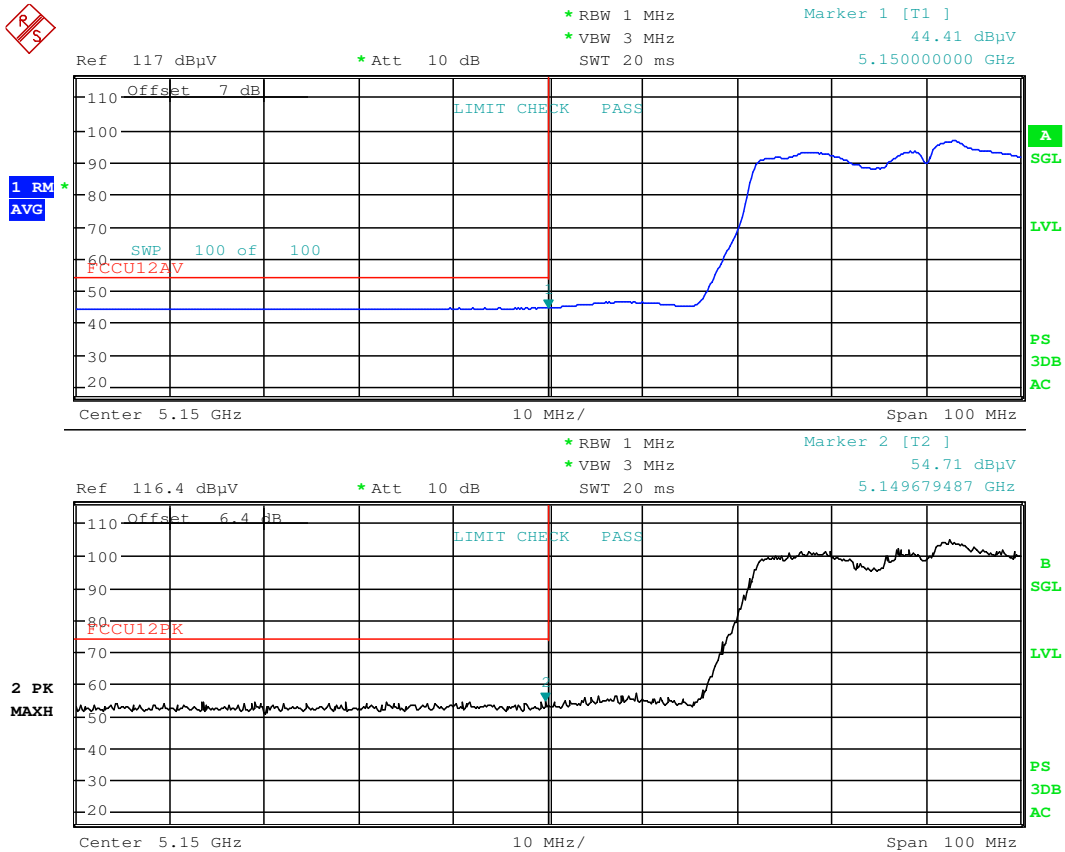
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5190MHz

Channel: 38



Date: 18.JUL.2017 17:49:15

**Plot 7-203. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 168 of 209                 |

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## Antenna-2 Radiated Band Edge Measurements (40MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

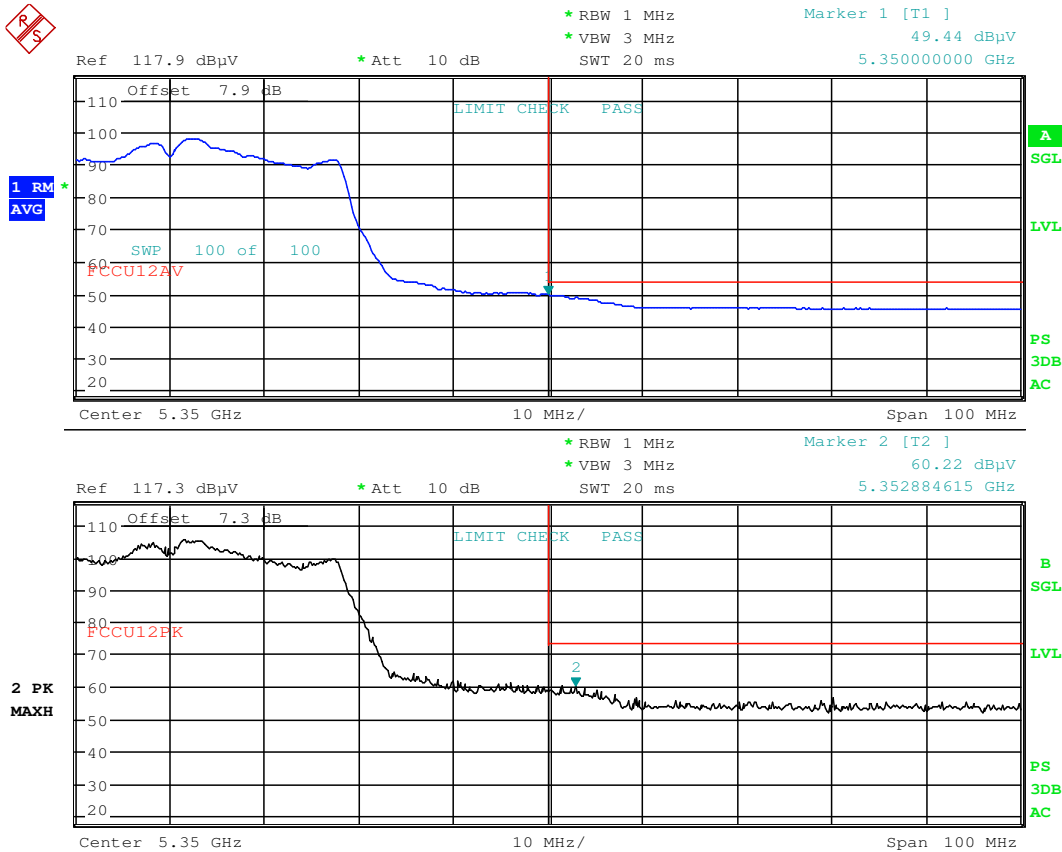
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5310MHz

Channel: 62



Date: 18.JUL.2017 18:00:17

### Plot 7-204. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 169 of 209                 |

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## Antenna-2 Radiated Band Edge Measurements (40MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

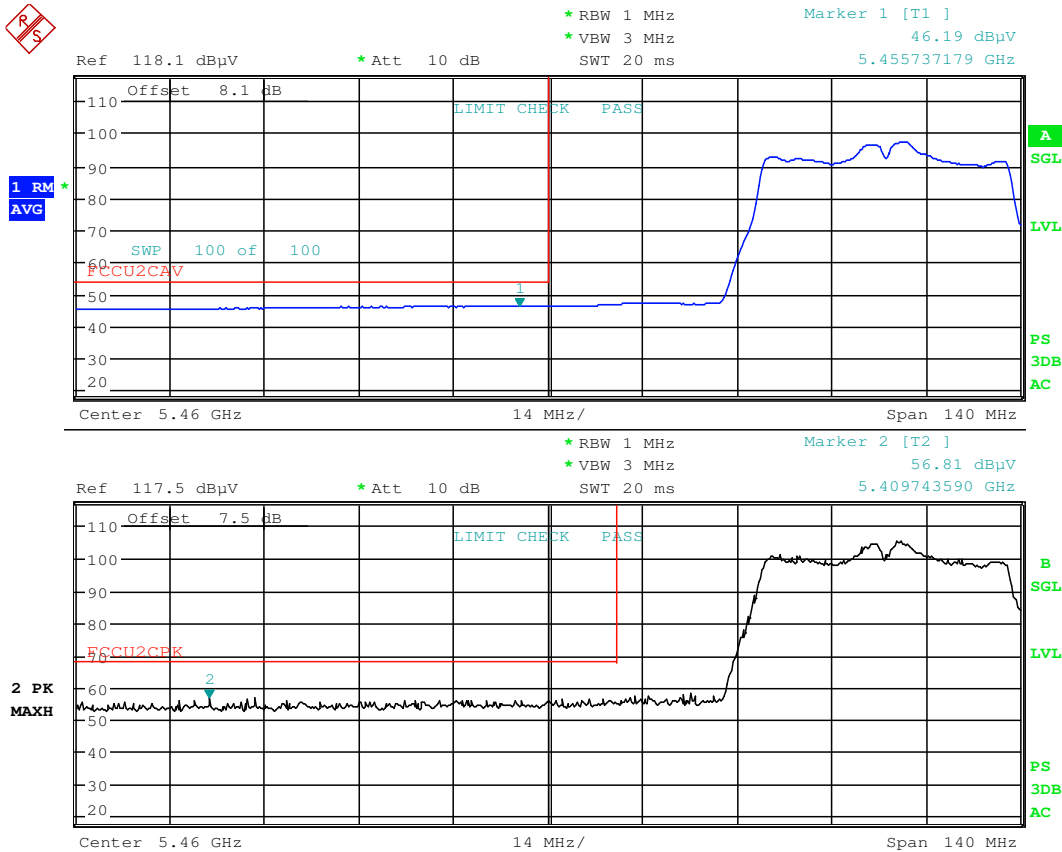
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5510MHz

Channel: 102



Date: 18.JUL.2017 18:12:49

### Plot 7-205. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 170 of 209                 |

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## Antenna-2 Radiated Band Edge Measurements (40MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

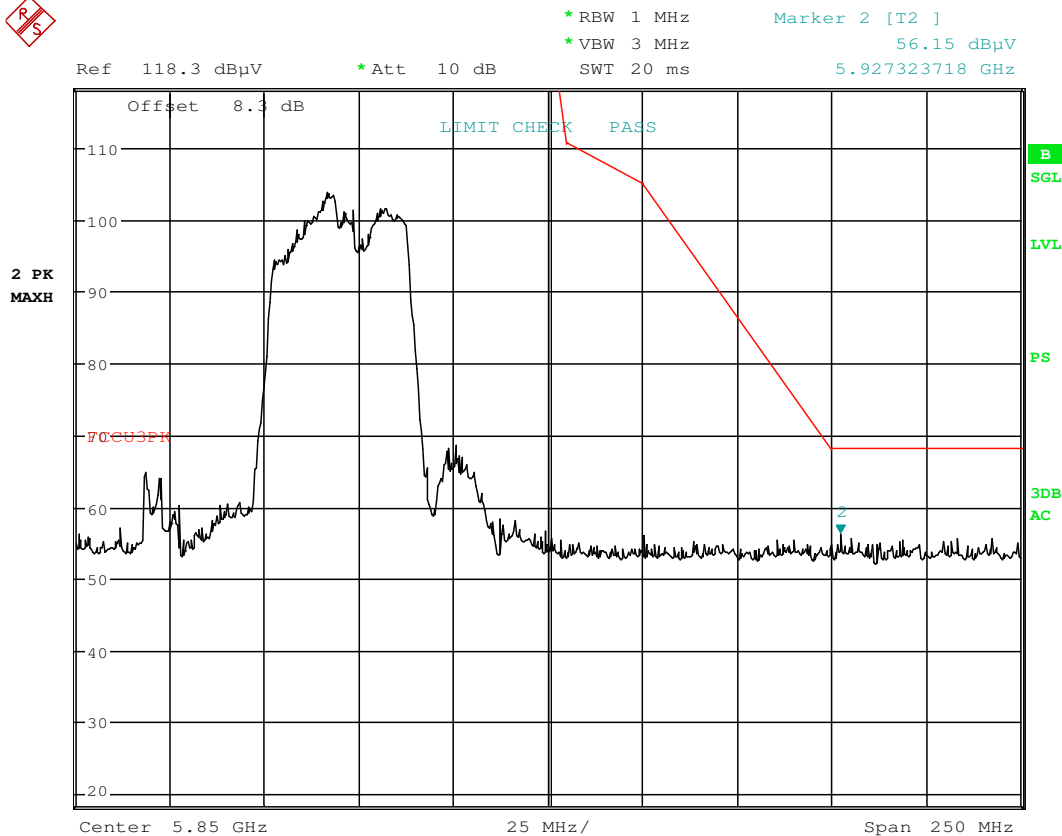
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5795MHz

Channel: 159



Date: 18.JUL.2017 18:24:07

**Plot 7-206. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 171 of 209                 |

## Antenna-2 WCP Radiated Band Edge Measurements (40MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

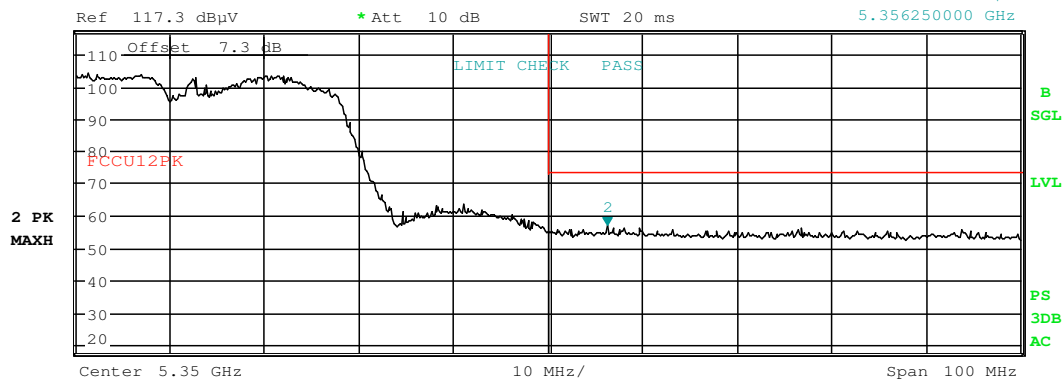
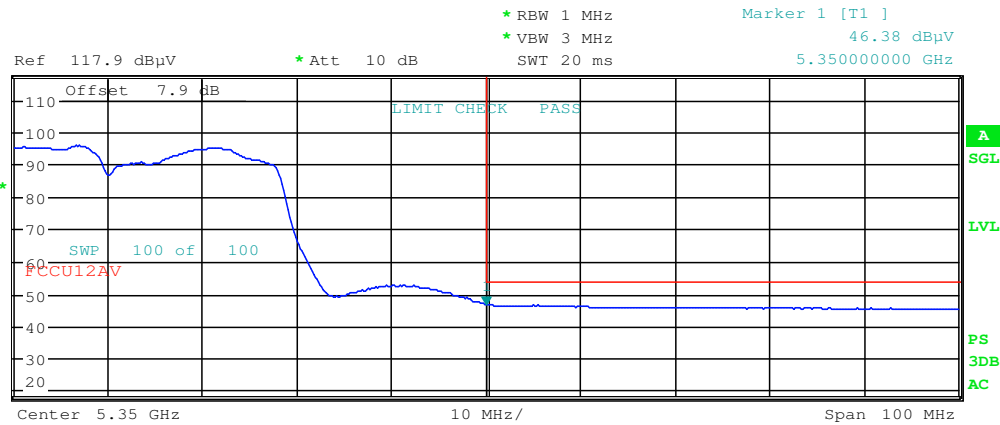
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5310MHz

Channel: 62



Date: 18.JUL.2017 18:59:20

**Plot 7-207. Radiated Restricted Band Edge Plot with WCP**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 172 of 209                 |

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## 7.7.9 Antenna-2 Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

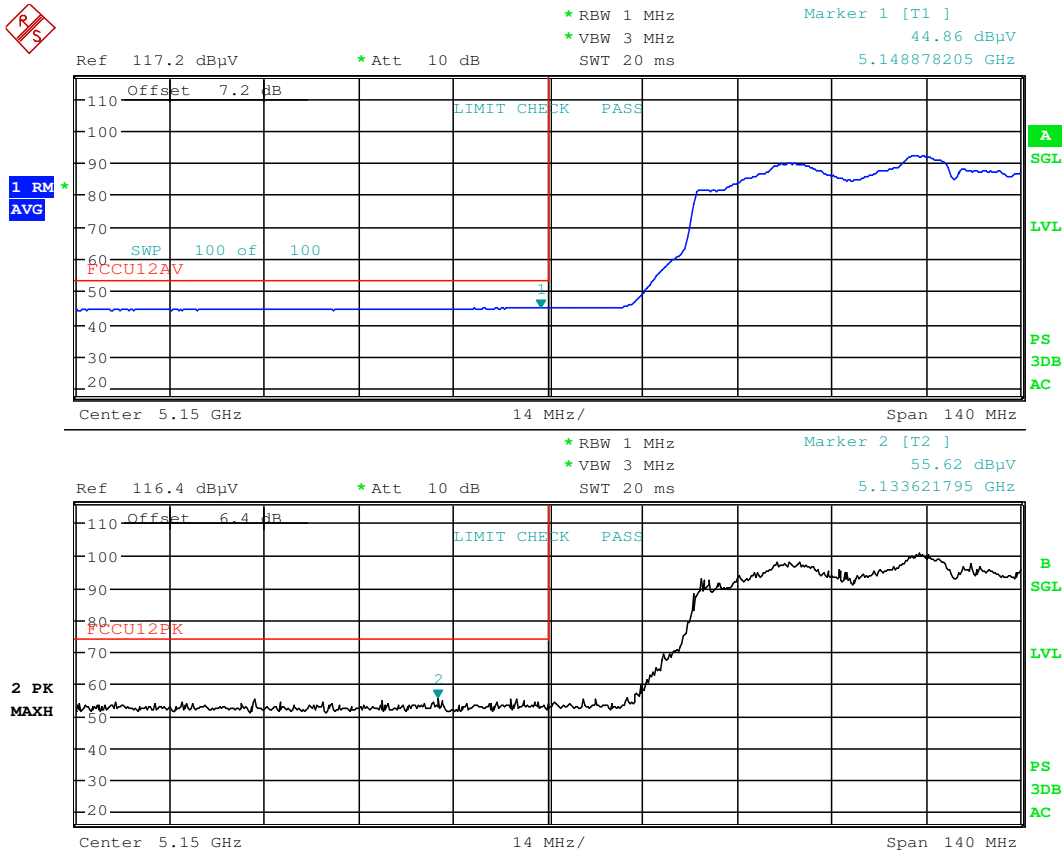
Worst Case Mode: 802.11n (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5210MHz

Channel: 42



Date: 18.JUL.2017 17:50:29

**Plot 7-208. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 173 of 209                 |

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## Antenna-2 Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

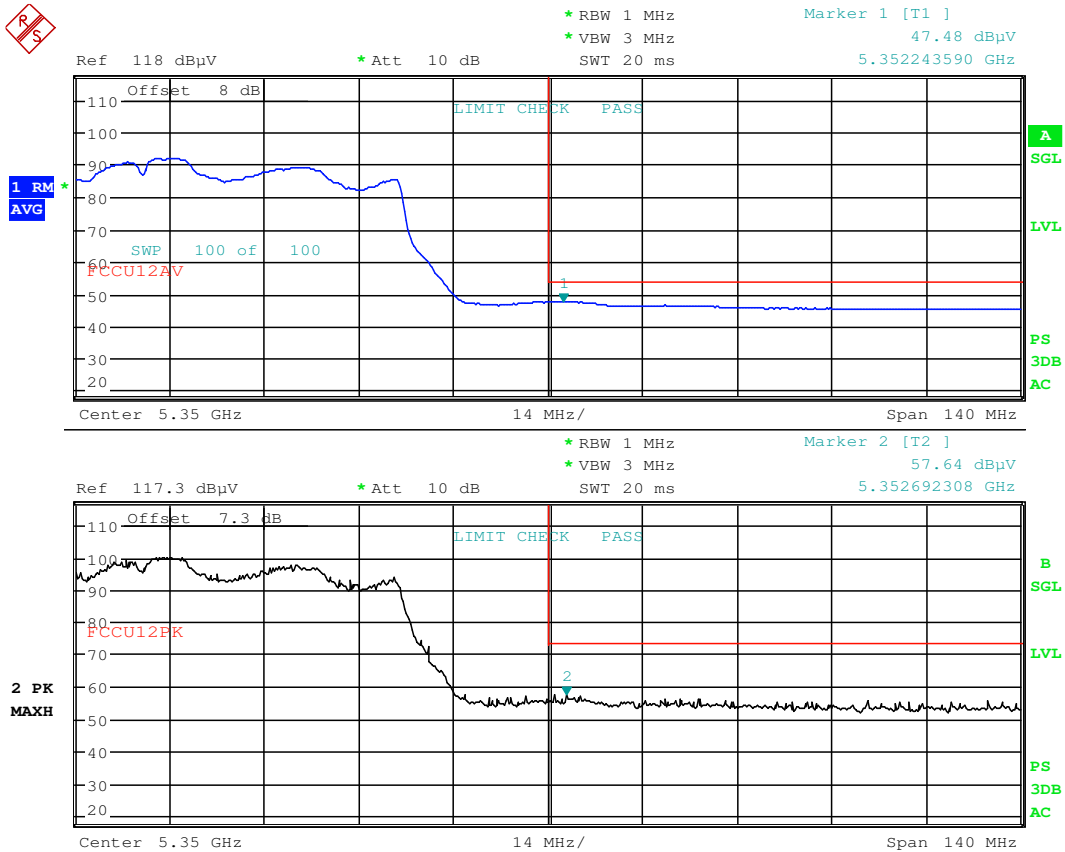
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5290MHz

Channel: 58



Date: 18.JUL.2017 18:02:51

### Plot 7-209. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 174 of 209                 |

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## Antenna-2 Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

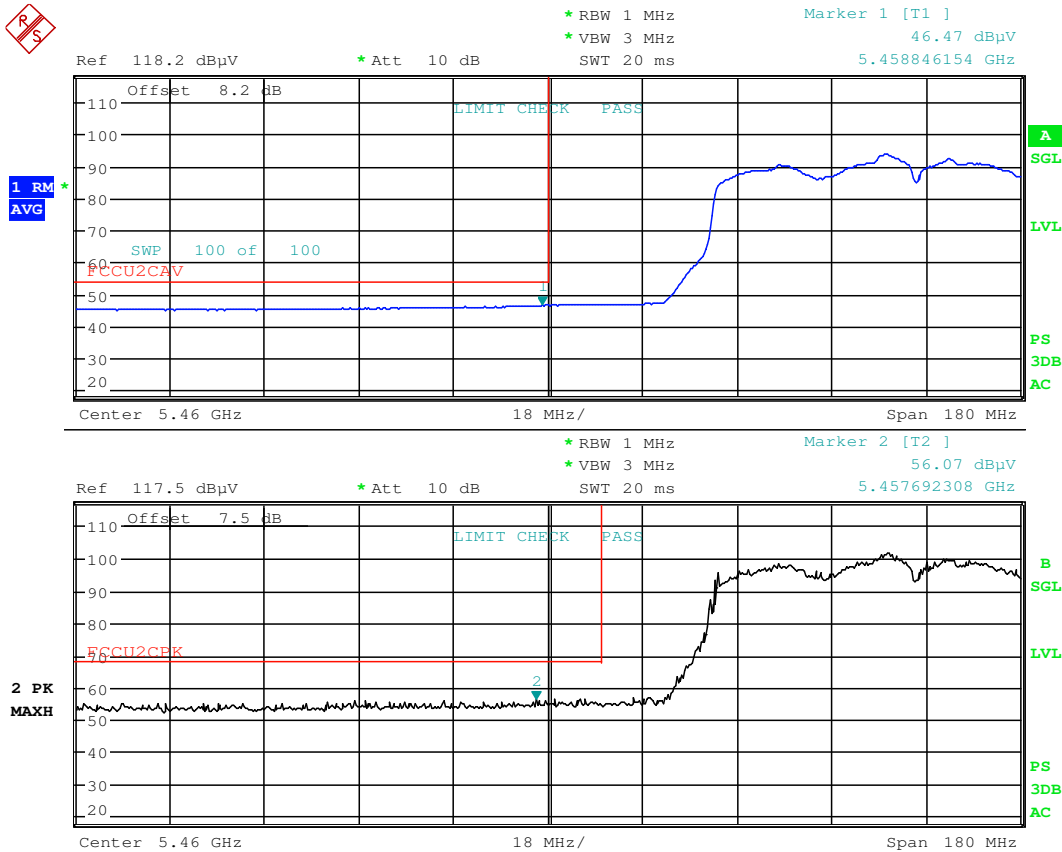
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5530MHz

Channel: 106



Date: 18.JUL.2017 18:17:16

### Plot 7-210. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 175 of 209                 |

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## Antenna-2 Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

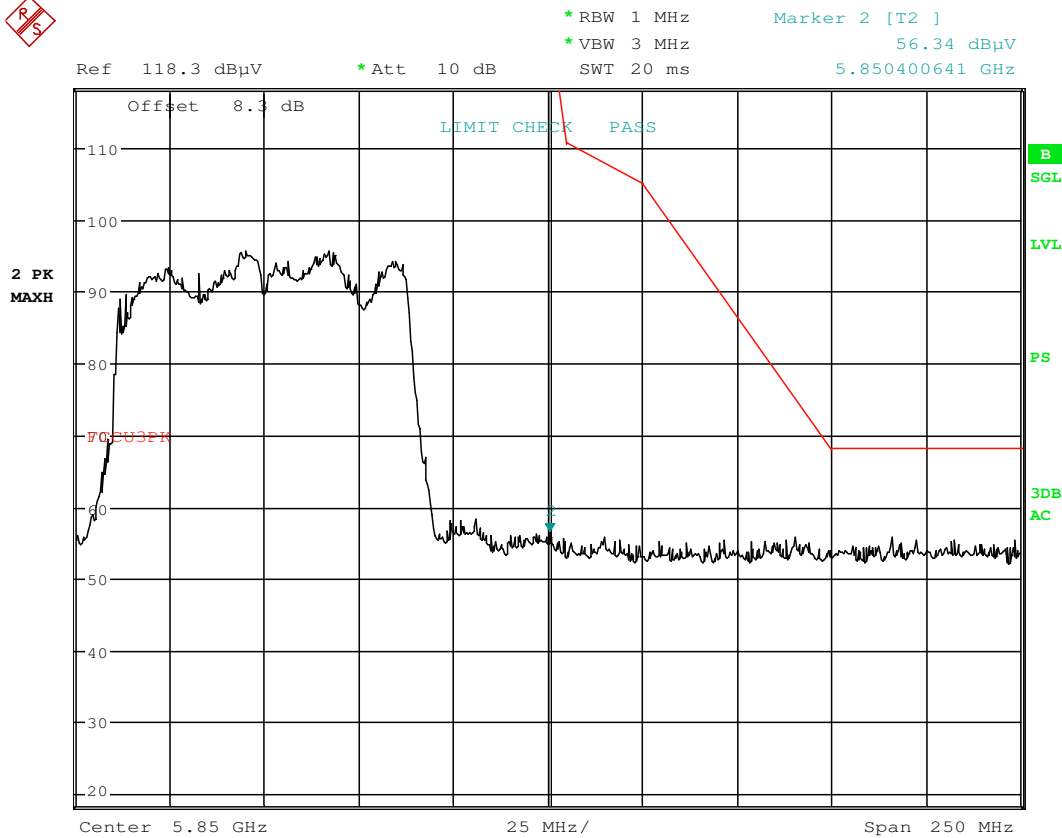
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5775MHz

Channel: 155



Date: 18.JUL.2017 18:25:48

**Plot 7-211. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 176 of 209                 |

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## Antenna-2 WCP Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

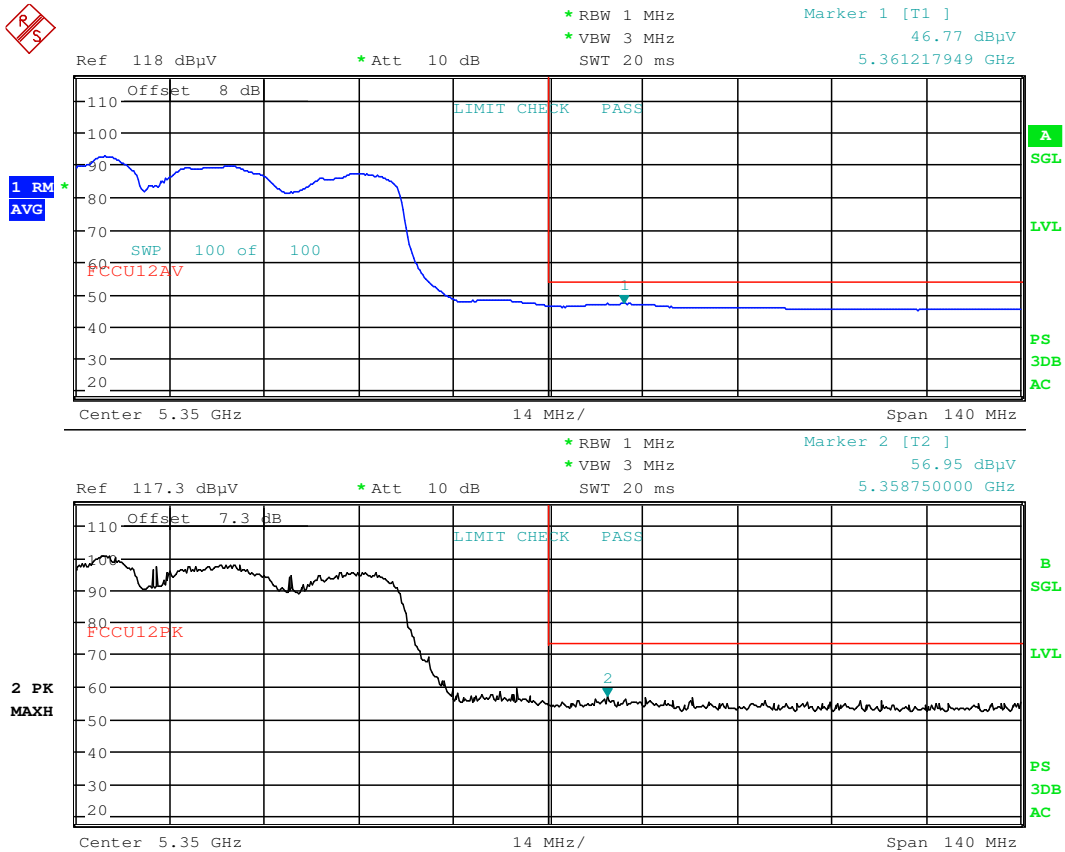
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5290MHz

Channel: 58



Date: 18.JUL.2017 19:03:12

**Plot 7-212. Radiated Restricted Band Edge Plot with WCP**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 177 of 209                 |

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## 7.7.10 MIMO Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

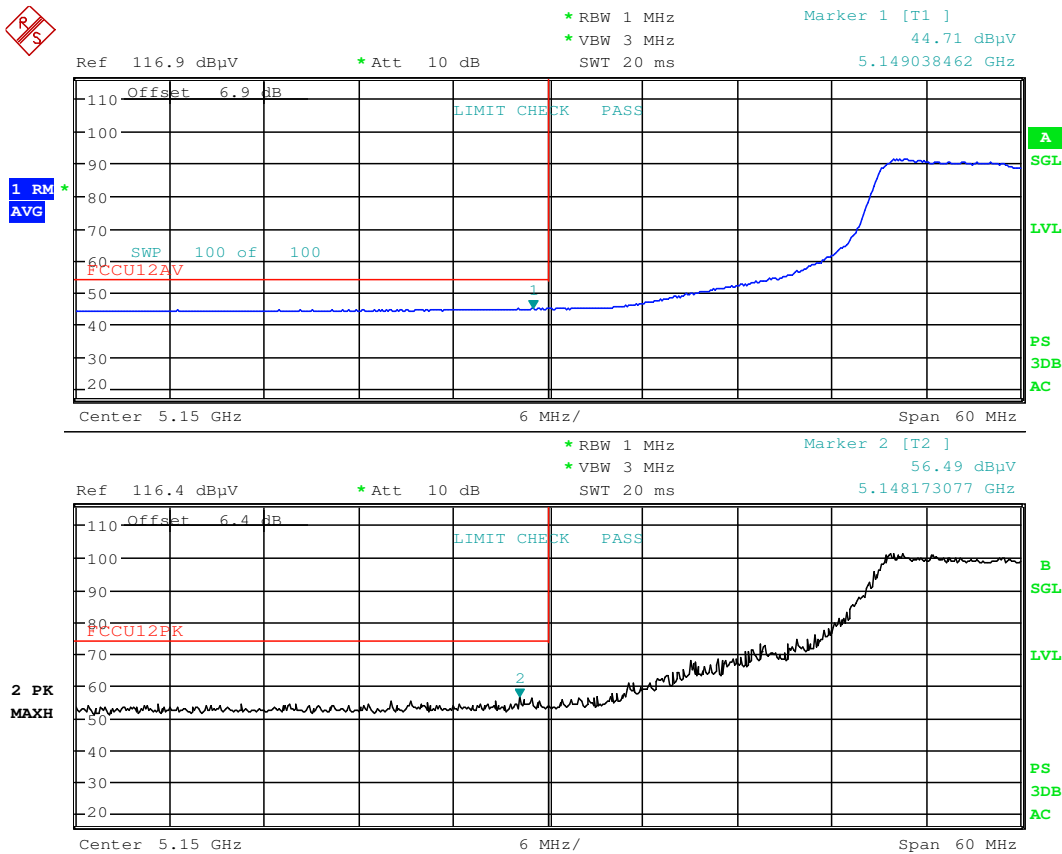
Worst Case Mode: 802.11n (20MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5180MHz

Channel: 36



Date: 18.JUL.2017 20:12:33

**Plot 7-213. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 178 of 209                 |

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## MIMO Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

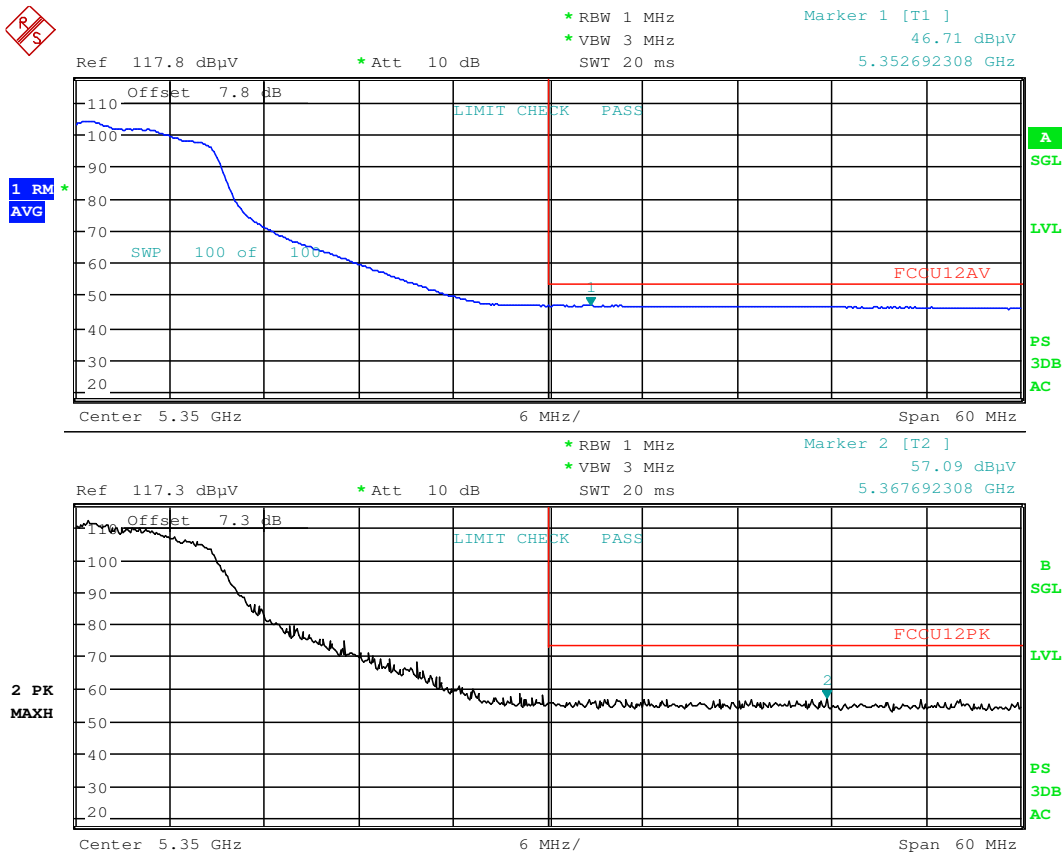
Worst Case Mode: 802.11n (20MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5320MHz

Channel: 64



Date: 18.JUL.2017 20:20:36

**Plot 7-214. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 179 of 209                 |

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## MIMO Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

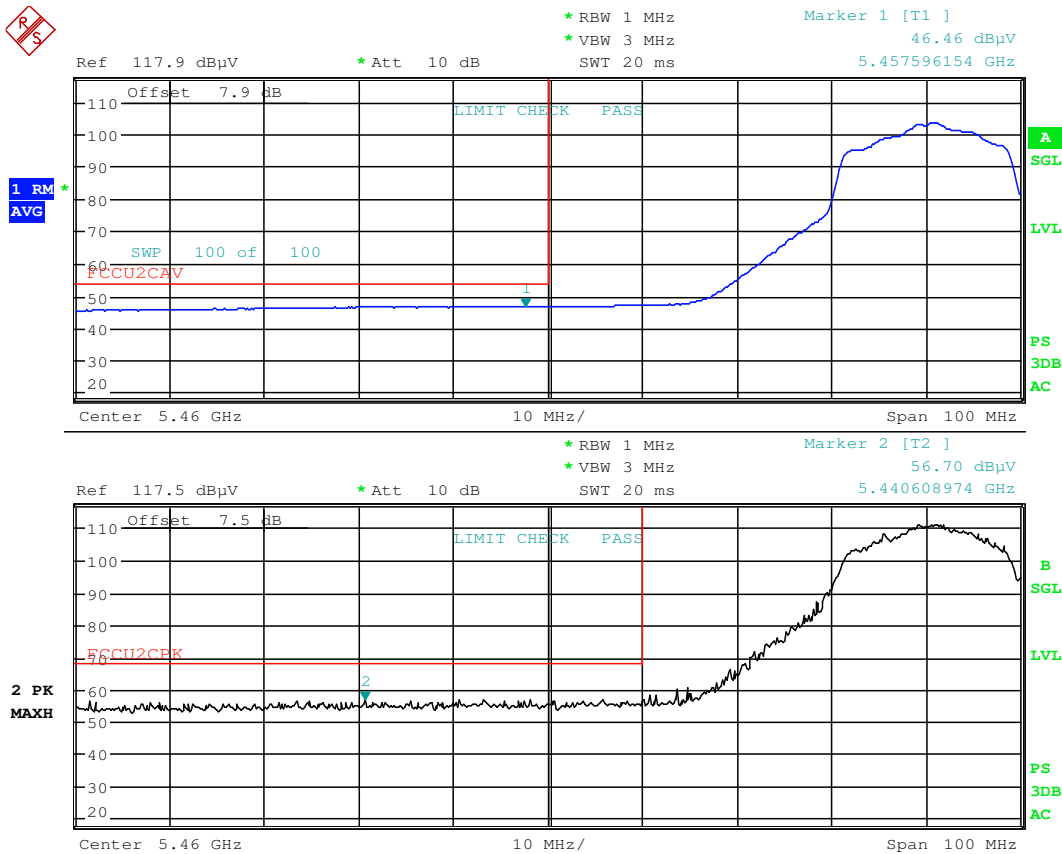
Worst Case Mode: 802.11n (20MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5500MHz

Channel: 100



Date: 18.JUL.2017 20:35:32

**Plot 7-215. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 180 of 209                 |

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## MIMO Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

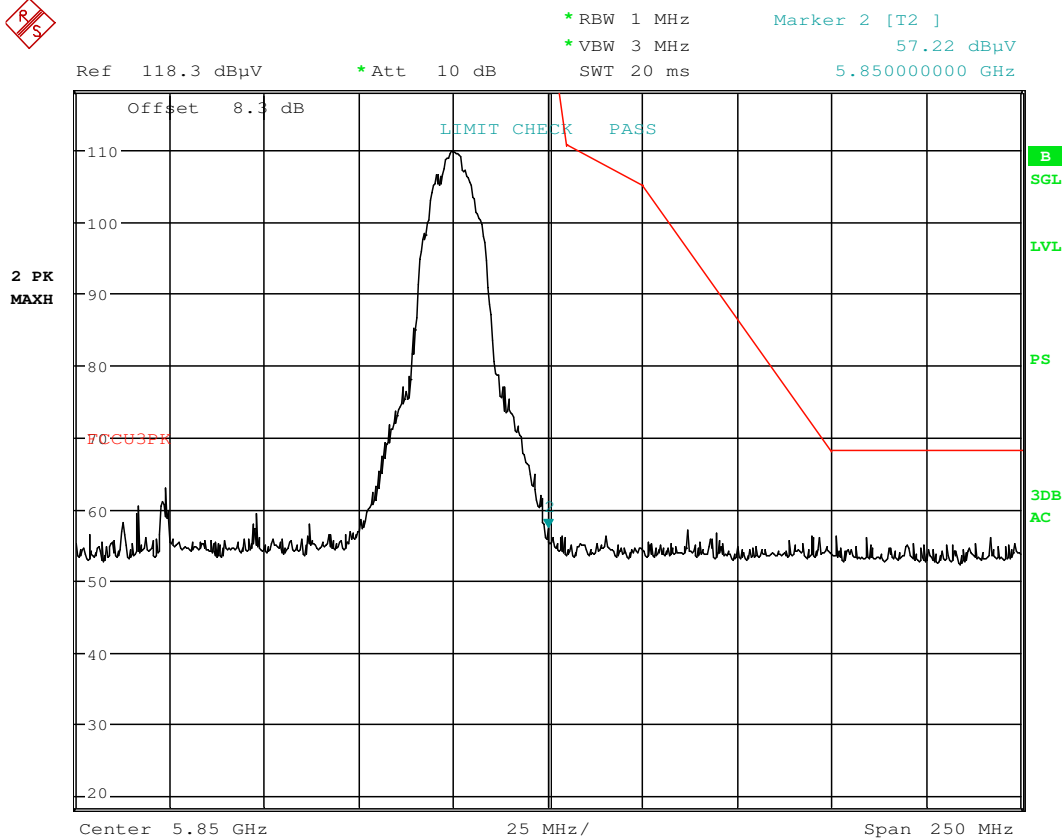
Worst Case Mode: 802.11n (20MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5825MHz

Channel: 165



Date: 18.JUL.2017 20:50:07

**Plot 7-216. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 181 of 209                 |

## MIMO WCP Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

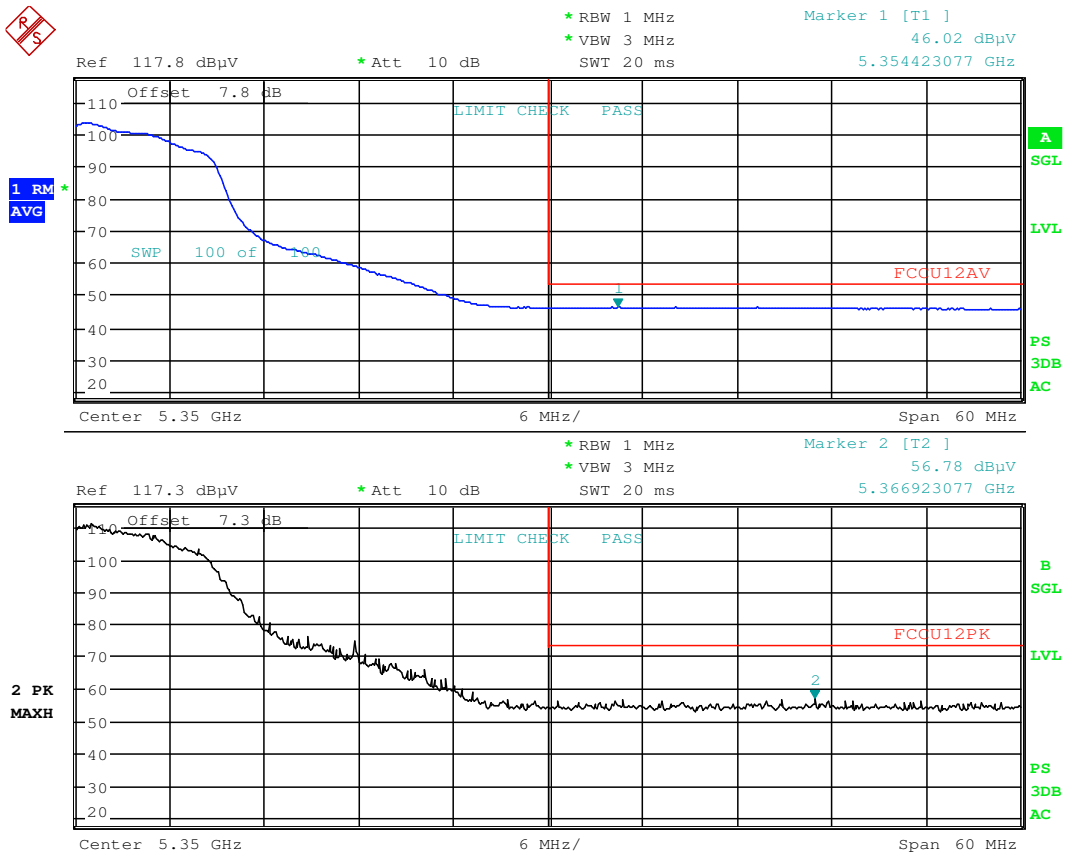
Worst Case Mode: 802.11n (20MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5320MHz

Channel: 64



Date: 18.JUL.2017 21:09:45

**Plot 7-217. Radiated Restricted Band Edge Plot with WCP**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 182 of 209                 |

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## 7.7.11 MIMO Radiated Band Edge Measurements (40MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

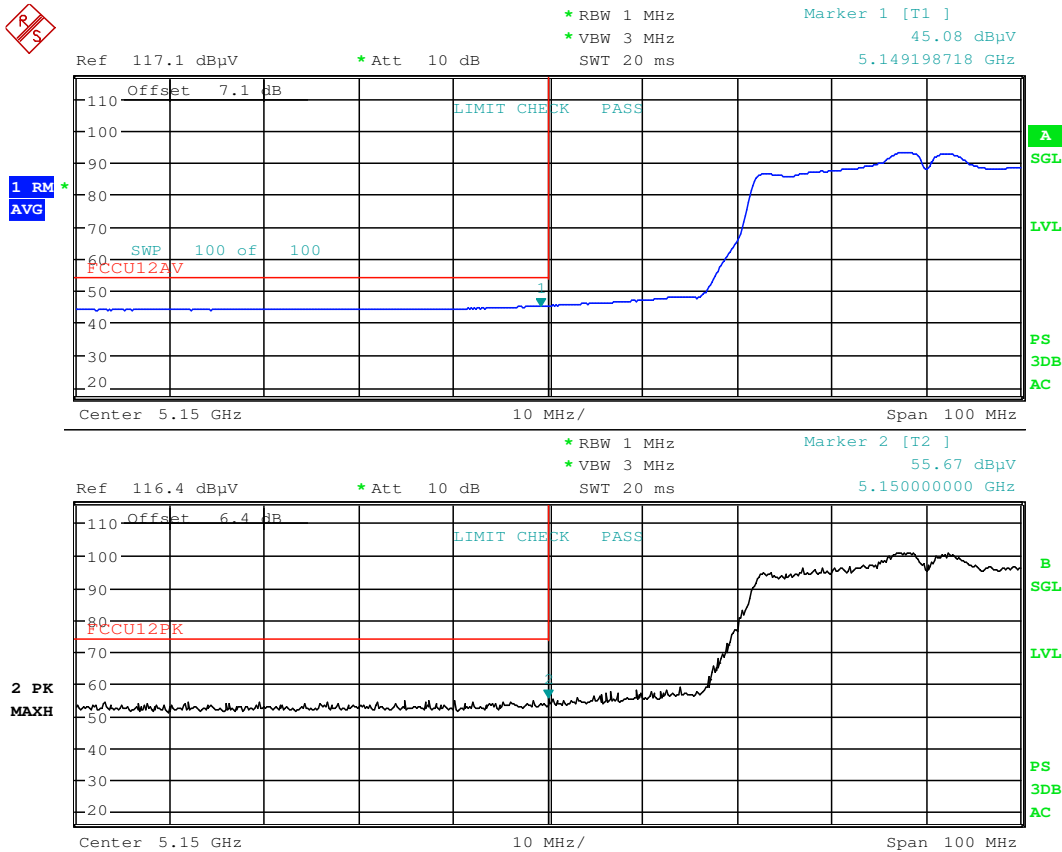
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5190MHz

Channel: 38



Date: 18.JUL.2017 20:14:07

**Plot 7-218. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 183 of 209                 |

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## MIMO Radiated Band Edge Measurements (40MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

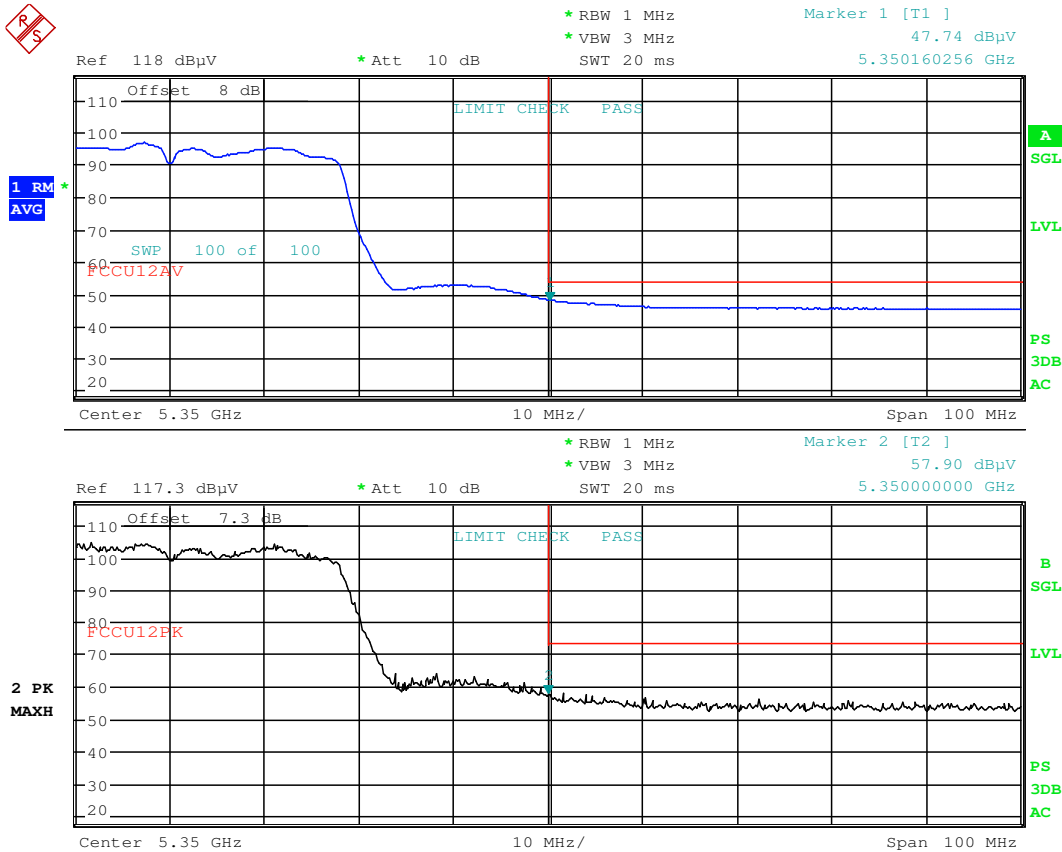
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5310MHz

Channel: 62



Date: 18.JUL.2017 20:24:15

**Plot 7-219. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 184 of 209                 |

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## MIMO Radiated Band Edge Measurements (40MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

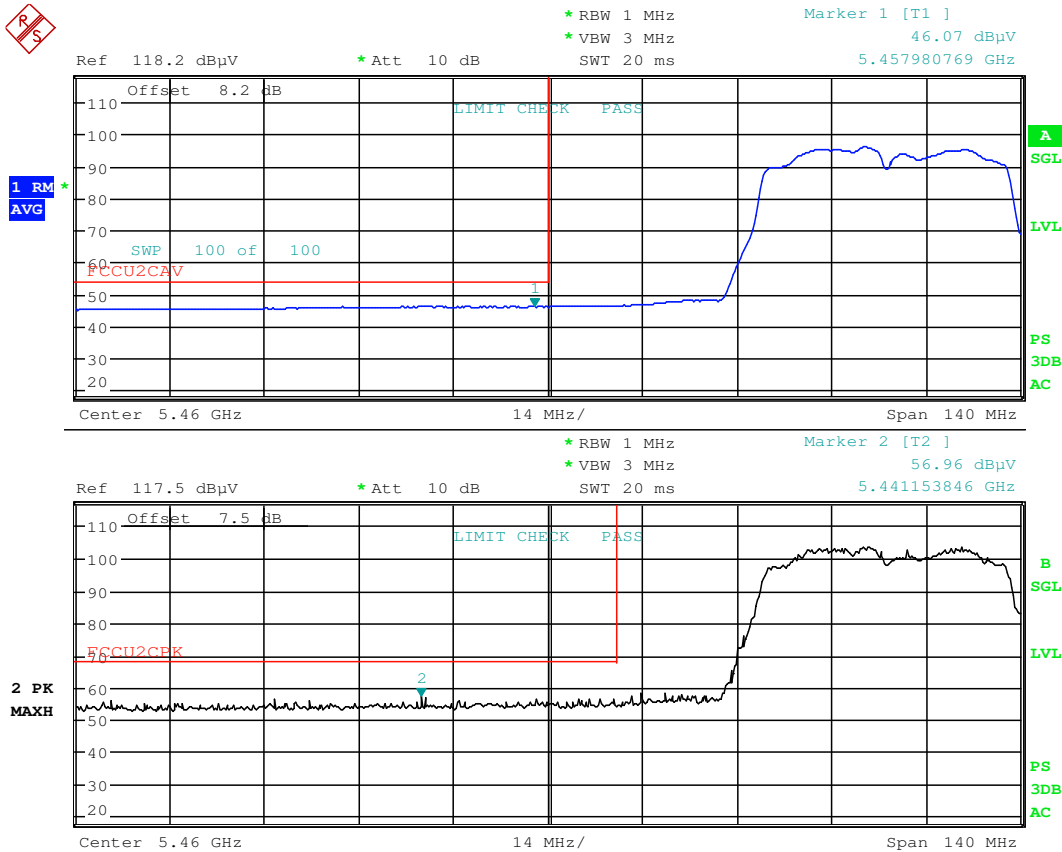
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5510MHz

Channel: 102



Date: 18.JUL.2017 20:38:12

**Plot 7-220. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 185 of 209                 |

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## MIMO Radiated Band Edge Measurements (40MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

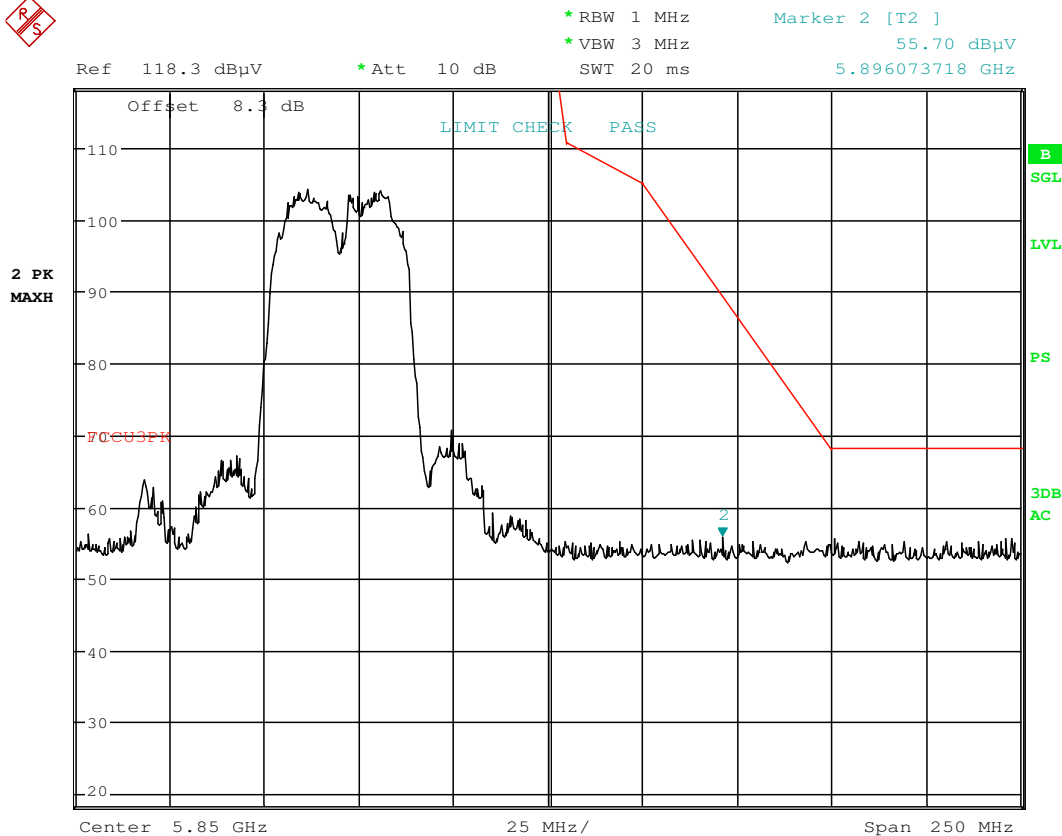
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5795MHz

Channel: 159



Date: 18.JUL.2017 20:53:17

**Plot 7-221. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 186 of 209                 |

## MIMO WCP Radiated Band Edge Measurements (40MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

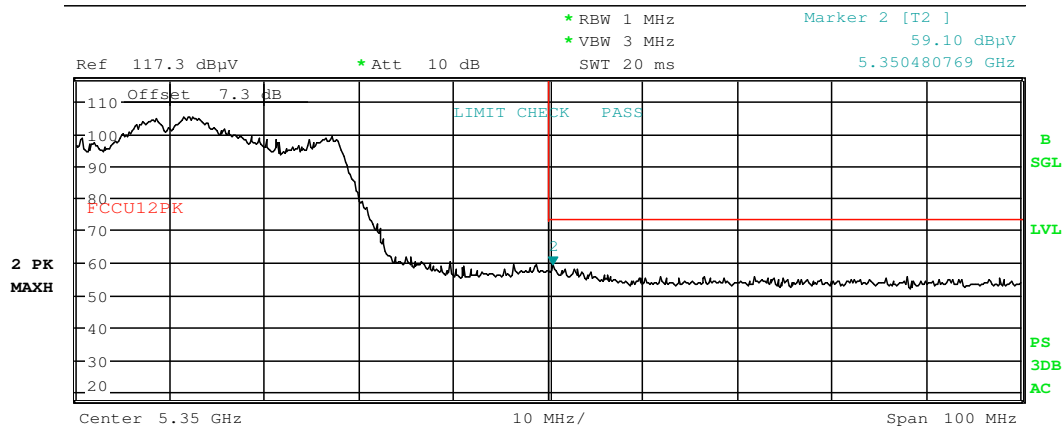
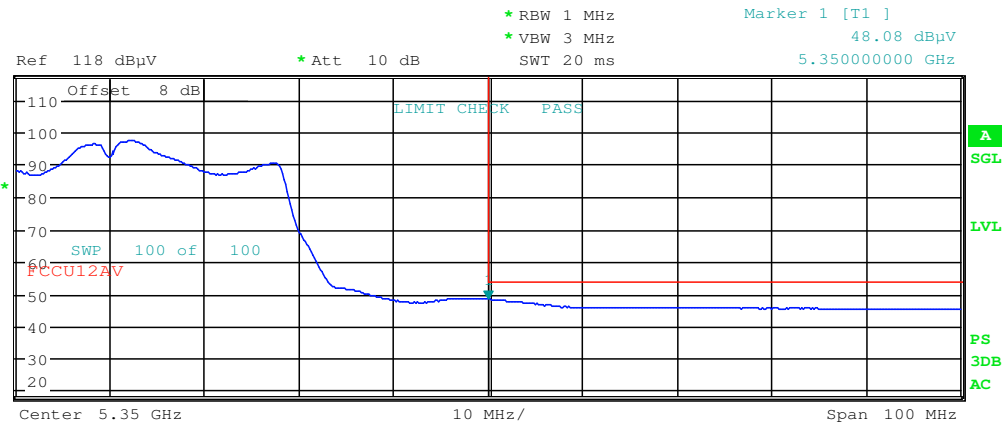
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5310MHz

Channel: 62



Date: 18.JUL.2017 21:20:31

**Plot 7-222. Radiated Restricted Band Edge Plot with WCP**

|                                            |                                               |                                                                        |  |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |  | Page 187 of 209                 |

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## 7.7.12 MIMO Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

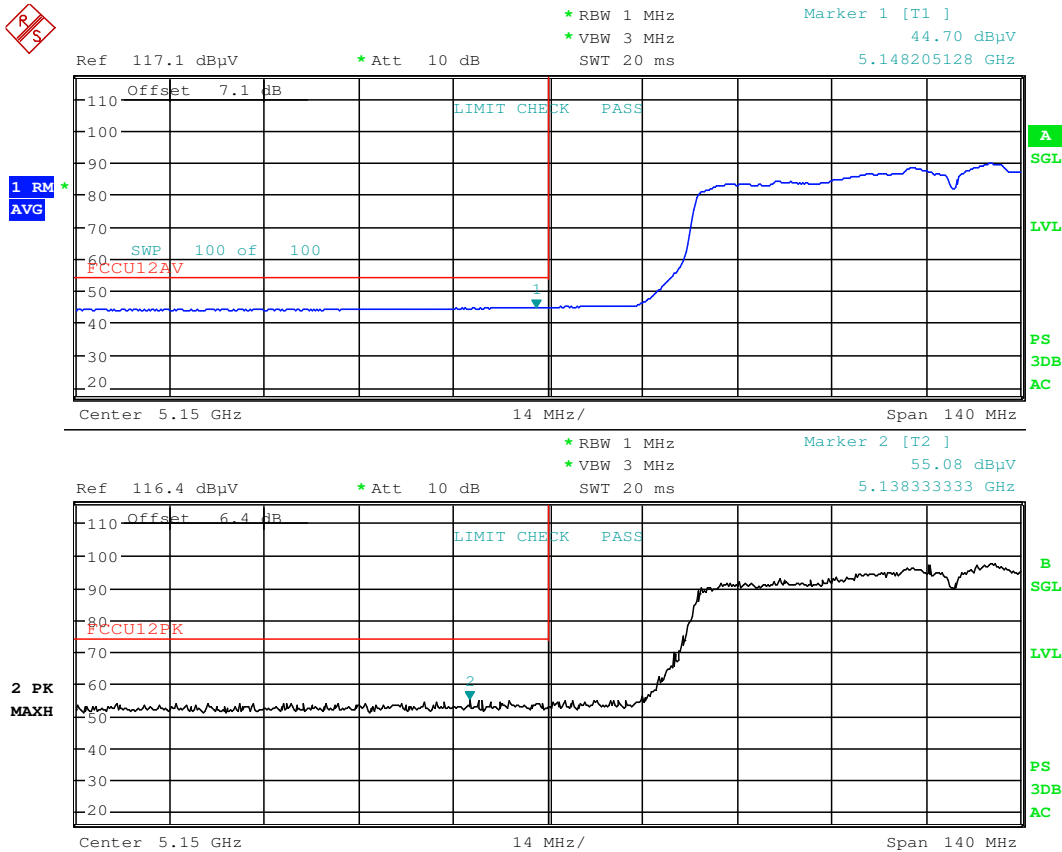
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5210MHz

Channel: 42



Date: 18.JUL.2017 20:15:27

**Plot 7-223. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 188 of 209                 |

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## MIMO Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

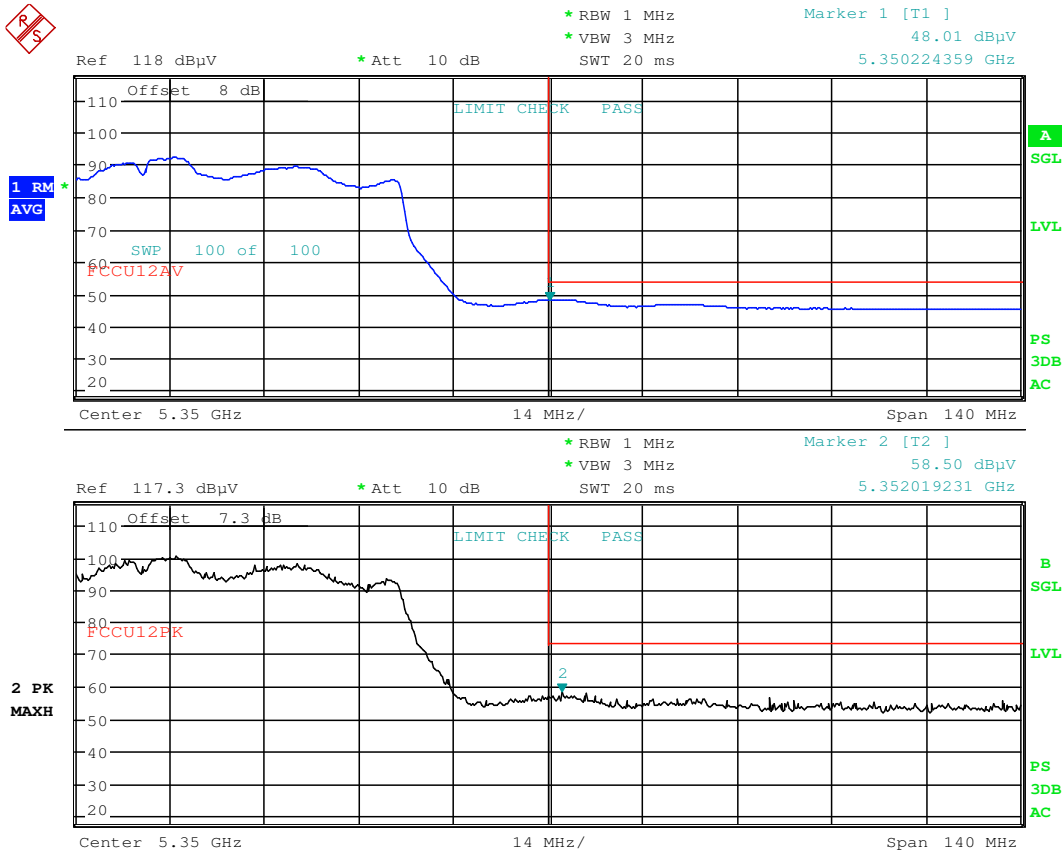
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5290MHz

Channel: 58



Date: 18.JUL.2017 20:29:56

**Plot 7-224. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 189 of 209                 |

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## MIMO Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

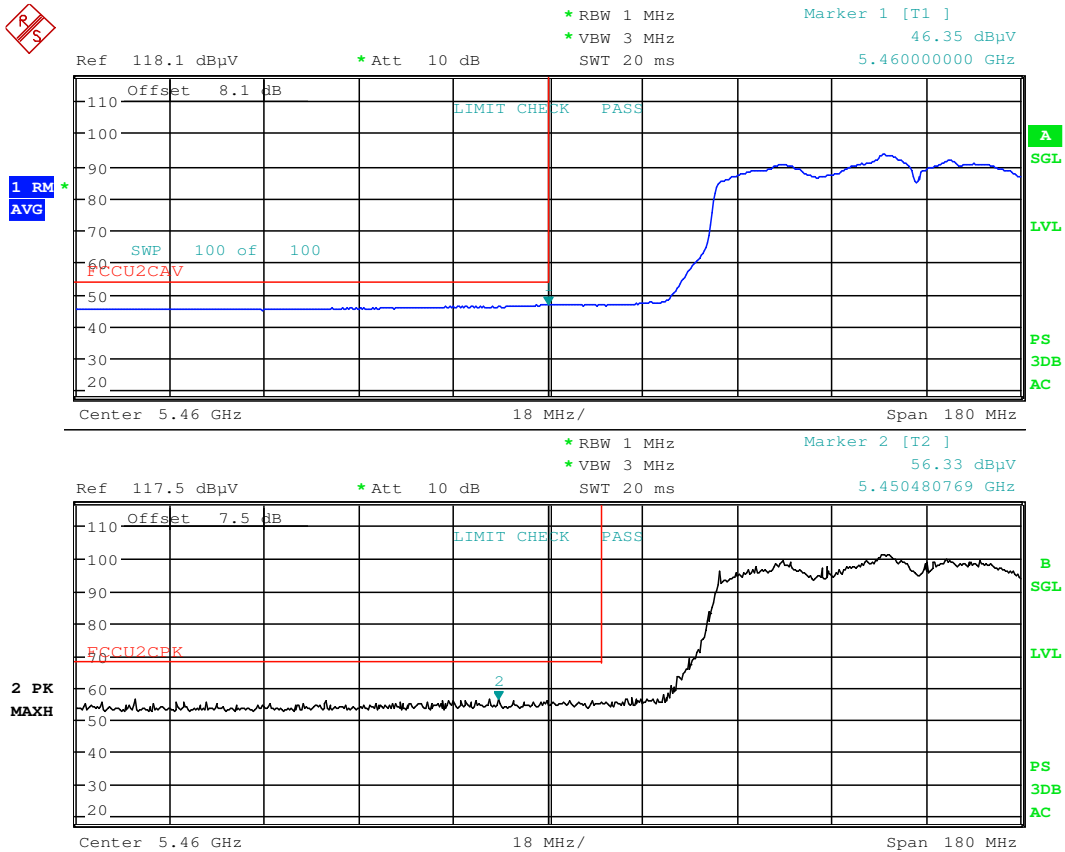
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5530MHz

Channel: 106



Date: 18.JUL.2017 20:44:04

**Plot 7-225. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 190 of 209                 |

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## MIMO Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

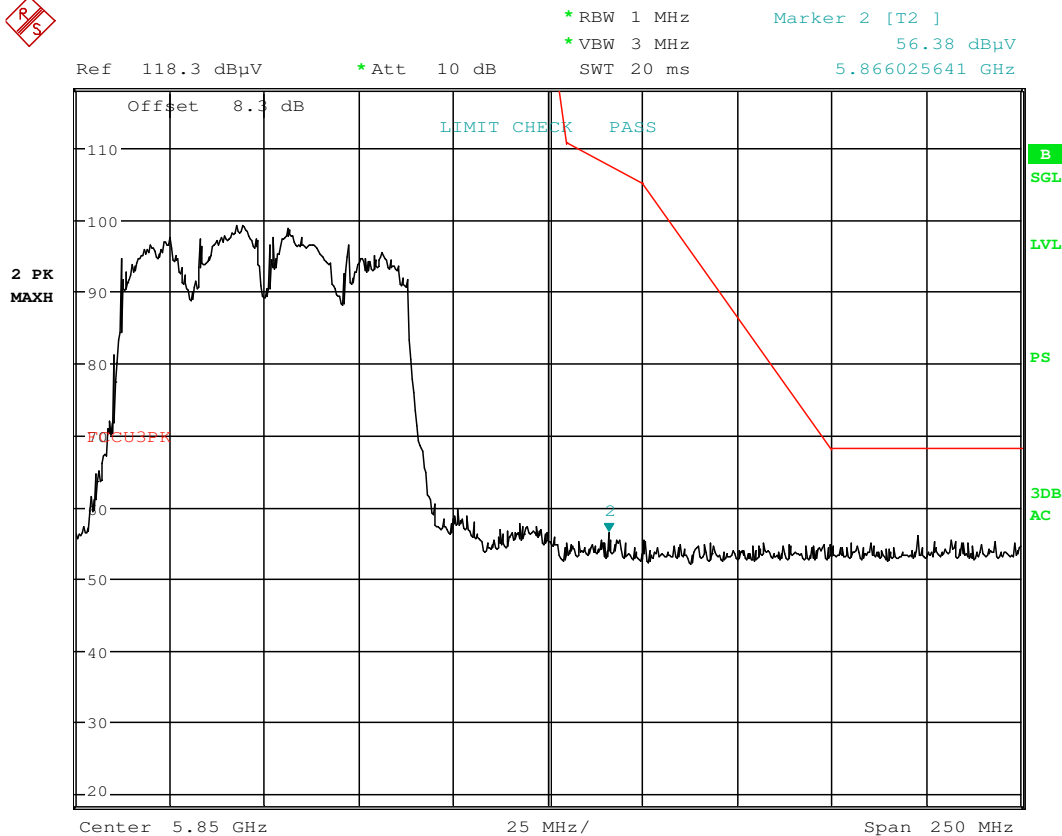
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5775MHz

Channel: 155



Date: 18.JUL.2017 20:58:54

**Plot 7-226. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 191 of 209                 |

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## MIMO WCP Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

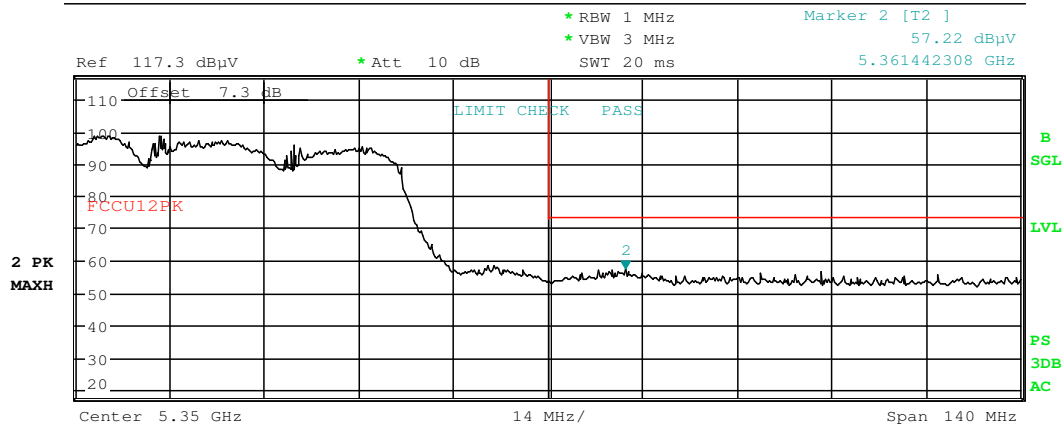
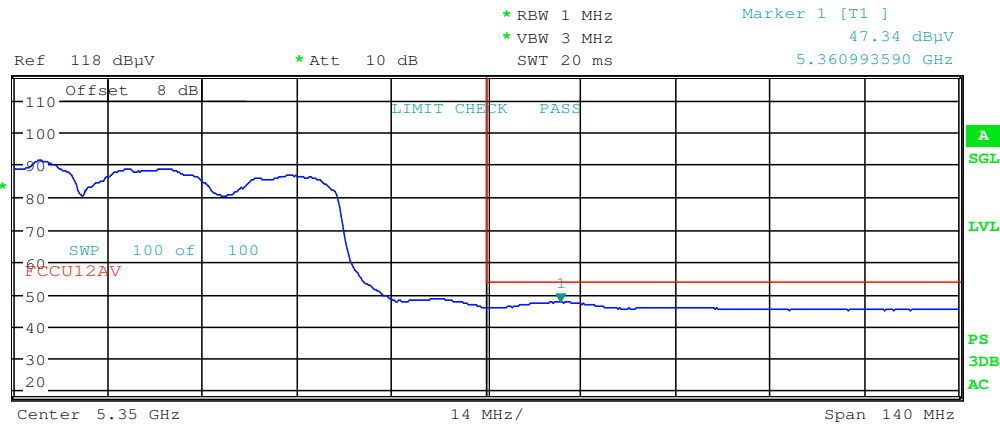
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5290MHz

Channel: 58



Date: 18.JUL.2017 21:23:24

**Plot 7-227. Radiated Restricted Band Edge Plot with WCP**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 192 of 209                 |

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## 7.7.13 CDD Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

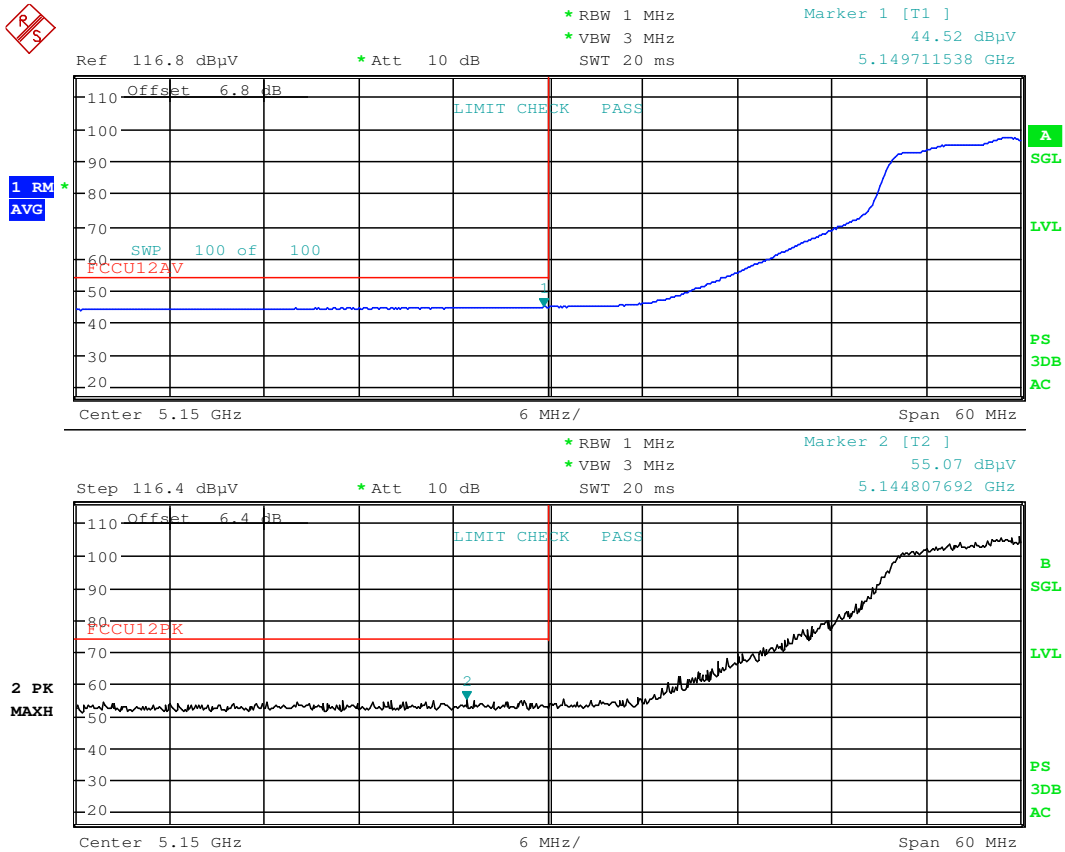
Worst Case Mode: 802.11a (20MHz)

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5180MHz

Channel: 36



Date: 4.AUG.2017 20:28:03

**Plot 7-228. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 1)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 193 of 209                 |

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## CDD Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

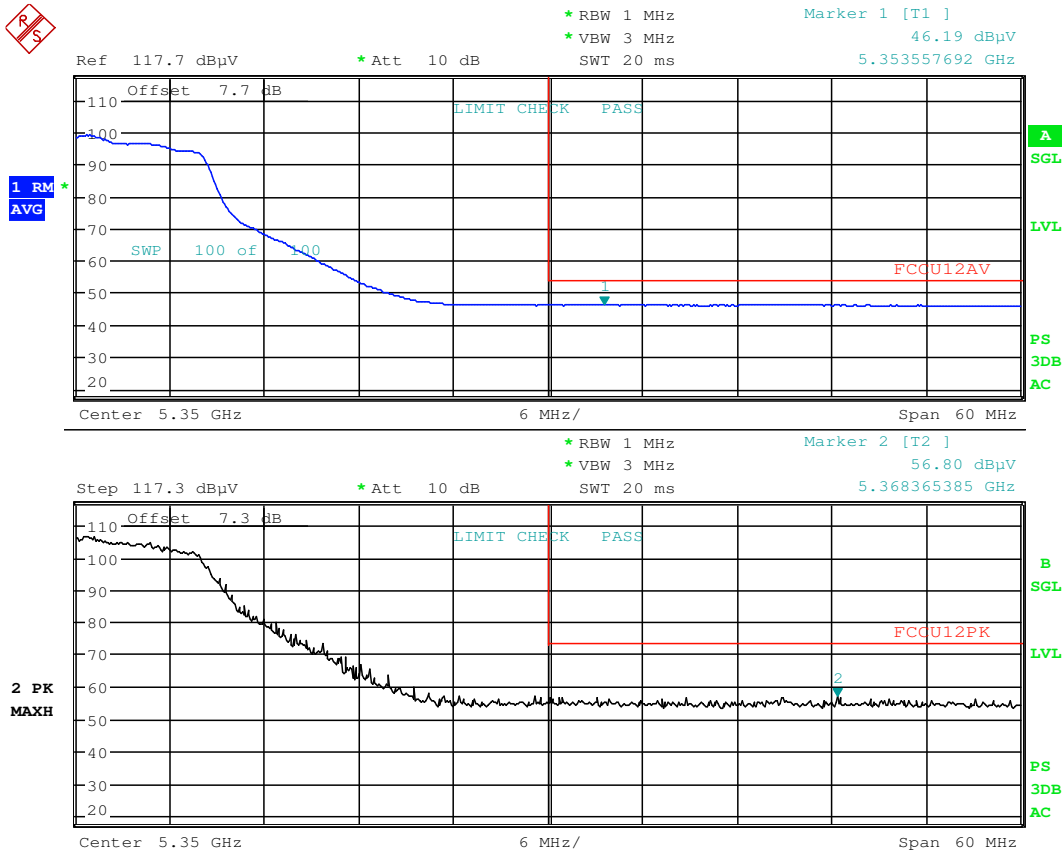
Worst Case Mode: 802.11a (20MHz)

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5320MHz

Channel: 64



Date: 4.AUG.2017 20:32:02

**Plot 7-229. Radiated Restricted Upper Band Edge Plot (Average & Peak – UNII Band 2A)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 194 of 209                 |

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## CDD Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

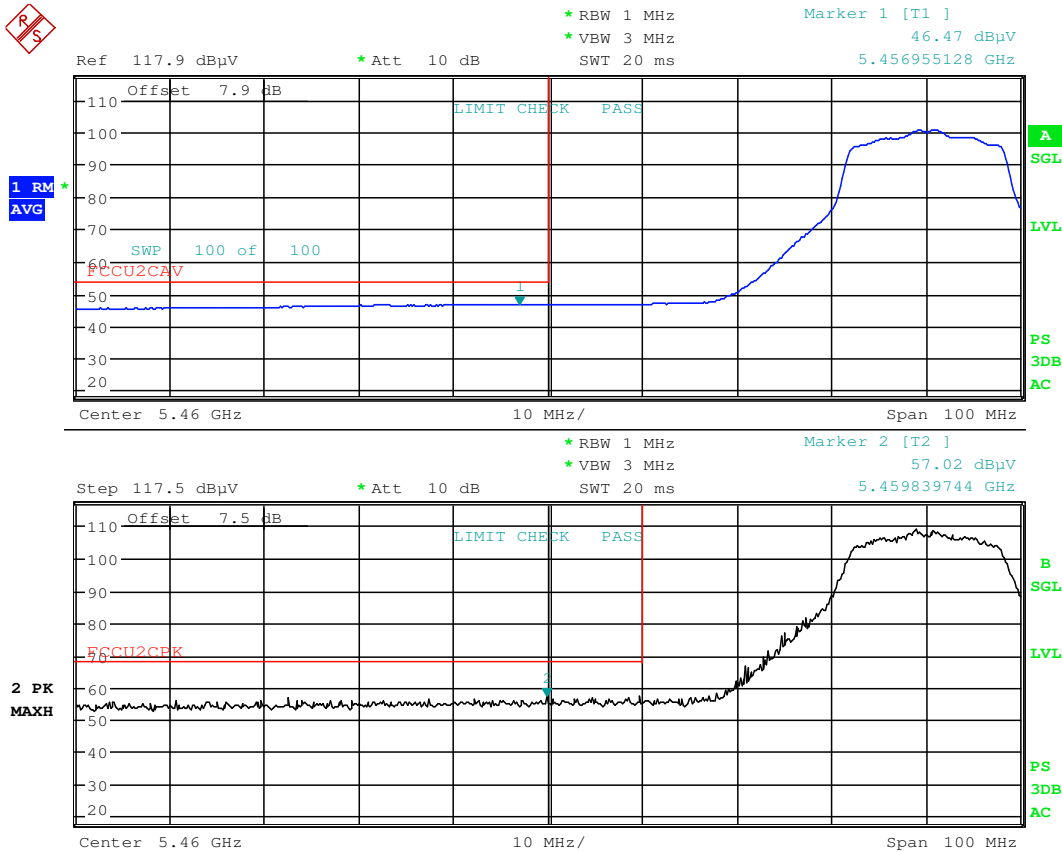
Worst Case Mode: 802.11a (20MHz)

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5500MHz

Channel: 100



Date: 4.AUG.2017 20:35:45

### Plot 7-230. Radiated Restricted Lower Band Edge Plot (Average & Peak – UNII Band 2C)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFH932                            | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 195 of 209                 |

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## CDD Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

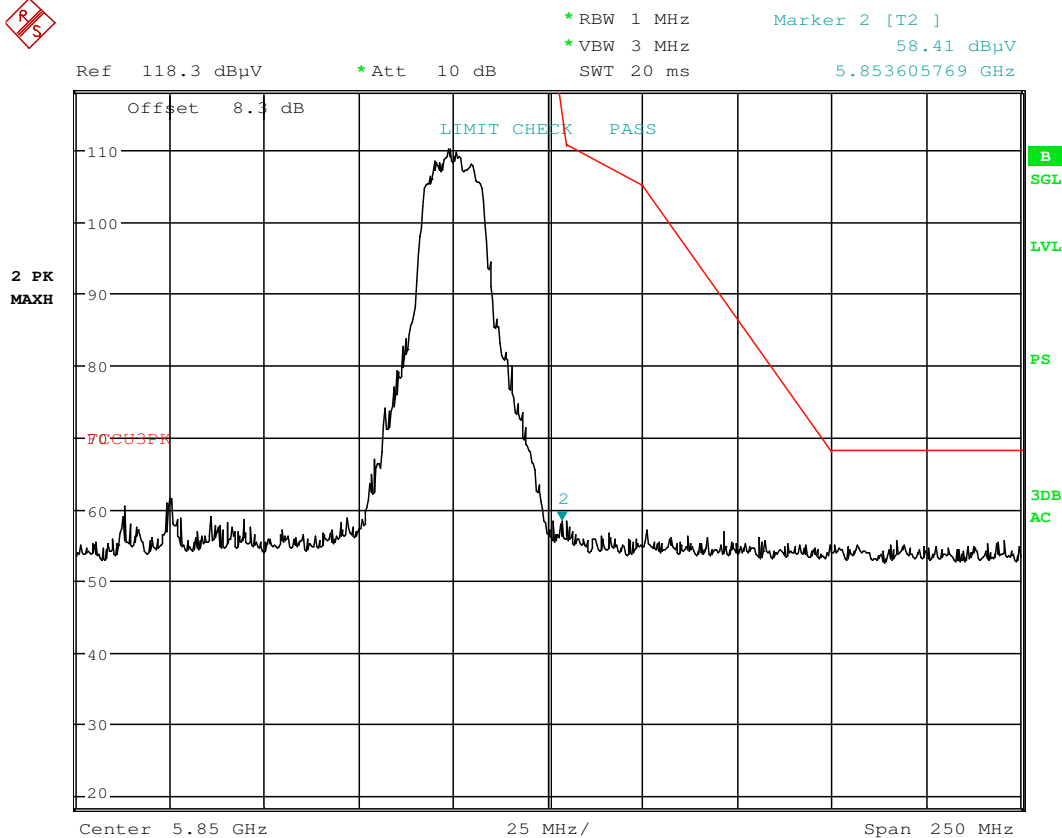
Worst Case Mode: 802.11a (20MHz)

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5825MHz

Channel: 165



Date: 4.AUG.2017 20:44:47

**Plot 7-231. Radiated Upper Band Edge Plot (Peak – UNII Band 3)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 196 of 209                 |

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## CDD WCP Radiated Band Edge Measurements (20MHz BW)

\$15.407(b.1)(b.2) \$15.205 \$15.209

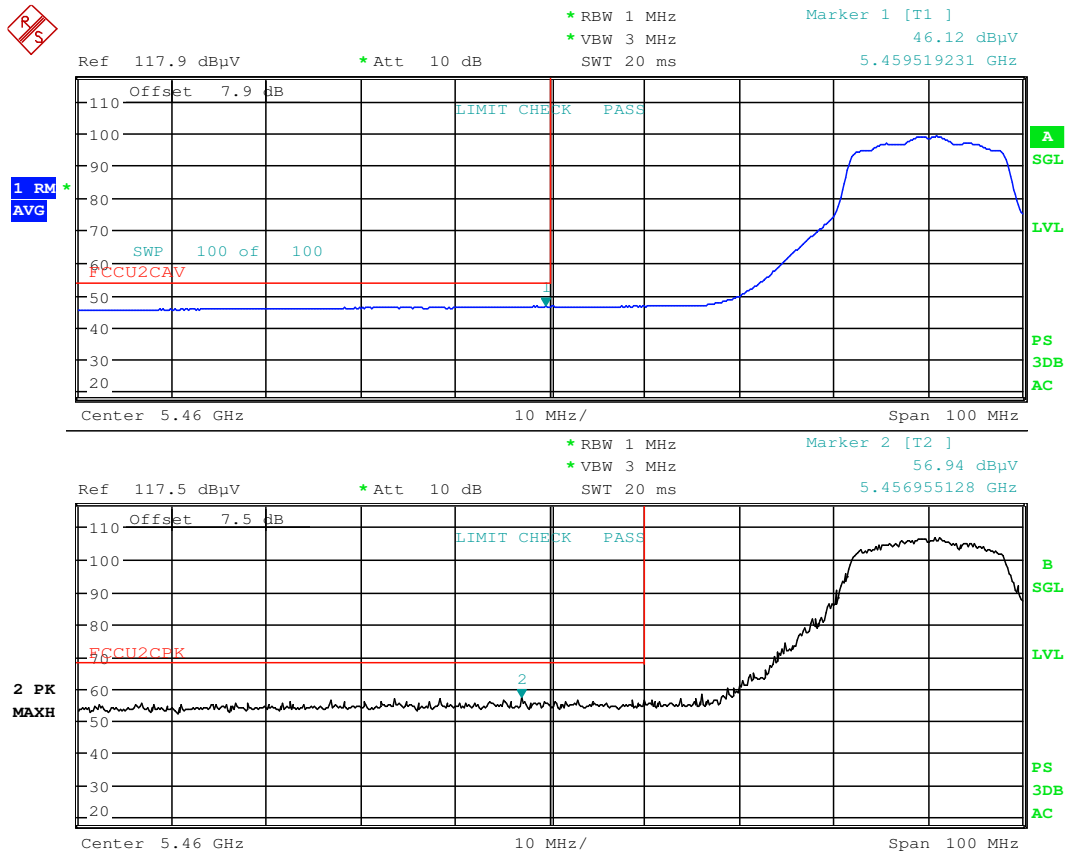
Worst Case Mode: 802.11a (20MHz)

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5500MHz

Channel: 100



Date: 4.AUG.2017 20:41:02

**Plot 7-232. Radiated Restricted Band Edge Plot with WCP**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 197 of 209                 |

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## 7.8 Radiated Spurious Emissions Measurements – Below 1GHz

**§15.209**

### Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

***All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 7-62 per Section 15.209.***

| Frequency         | Field Strength<br>[ $\mu$ V/m] | Measured Distance<br>[Meters] |
|-------------------|--------------------------------|-------------------------------|
| 0.009 – 0.490 MHz | 2400/F (kHz)                   | 300                           |
| 0.490 – 1.705 MHz | 24000/F (kHz)                  | 30                            |
| 1.705 – 30.00 MHz | 30                             | 30                            |
| 30.00 – 88.00 MHz | 100                            | 3                             |
| 88.00 – 216.0 MHz | 150                            | 3                             |
| 216.0 – 960.0 MHz | 200                            | 3                             |
| Above 960.0 MHz   | 500                            | 3                             |

**Table 7-62. Radiated Limits**

### Test Procedures Used

ANSI C63.10-2013

### Test Settings

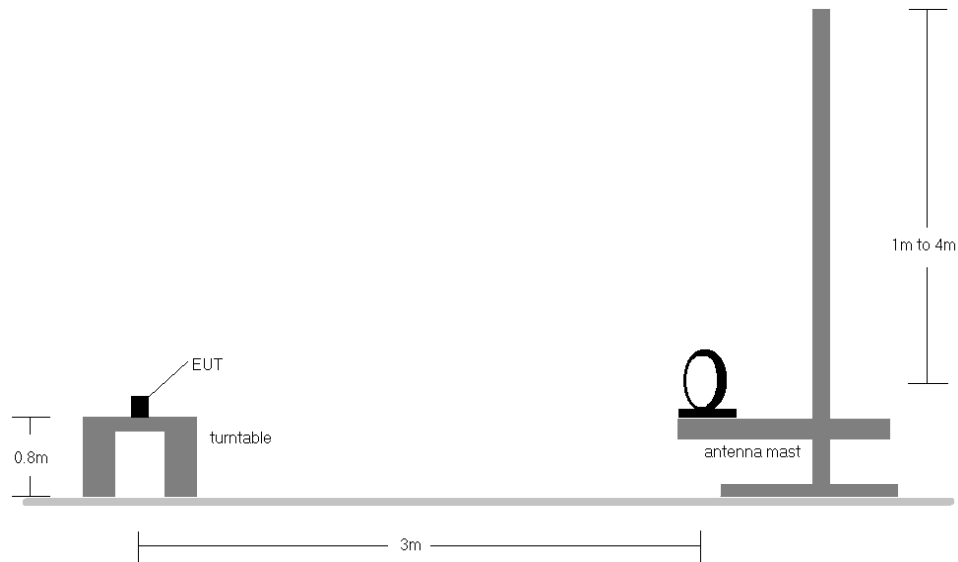
#### Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 120kHz (for emissions from 30MHz – 1GHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

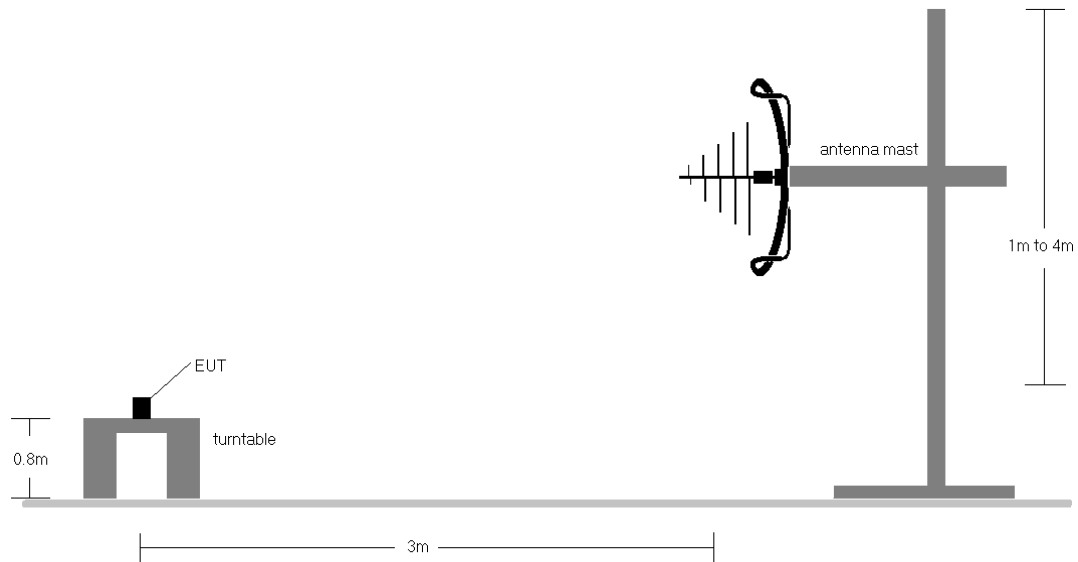
|                                            |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFH932                            |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                          |                                                                                       | Page 198 of 209                 |

## Test Setup

The EUT and measurement equipment were set up as shown in the diagrams below.



**Figure 7-6. Radiated Test Setup < 30MHz**



**Figure 7-7. Radiated Test Setup < 1GHz**

|                                                   |                                                                                     |                                                                                |                                                                                       |                                        |
|---------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|
| <b>FCC ID:</b> ZNFH932                            |  | <b>FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | <b>Approved by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>1M1707110215-05-R1.ZNF | <b>Test Dates:</b><br>7/12/2017-8/8/2017                                            | <b>EUT Type:</b><br>Portable Handset                                           |                                                                                       | Page 199 of 209                        |

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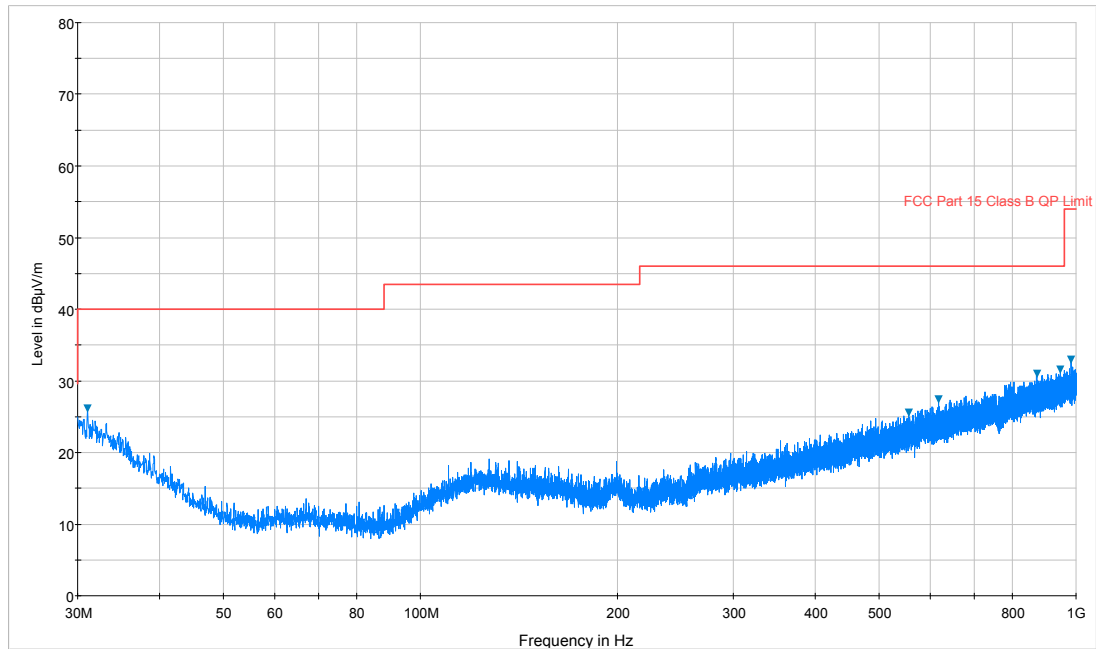
## Test Notes

1. All emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 7-62.
2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
3. This unit was tested with its standard battery.
4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
5. Emissions were measured at a 3 meter test distance.
6. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
7. No spurious emissions were detected within 20dB of the limit below 30MHz.
8. The results recorded using the broadband antenna is known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. There were no emissions detected in the 30MHz – 1GHz frequency range, as shown in the subsequent plots.

|                                            |                                   |                                                                                                                                                            |  |                                                                                       |                                 |
|--------------------------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017 | EUT Type:<br>Portable Handset                                                                                                                              |  |                                                                                       | Page 200 of 209                 |

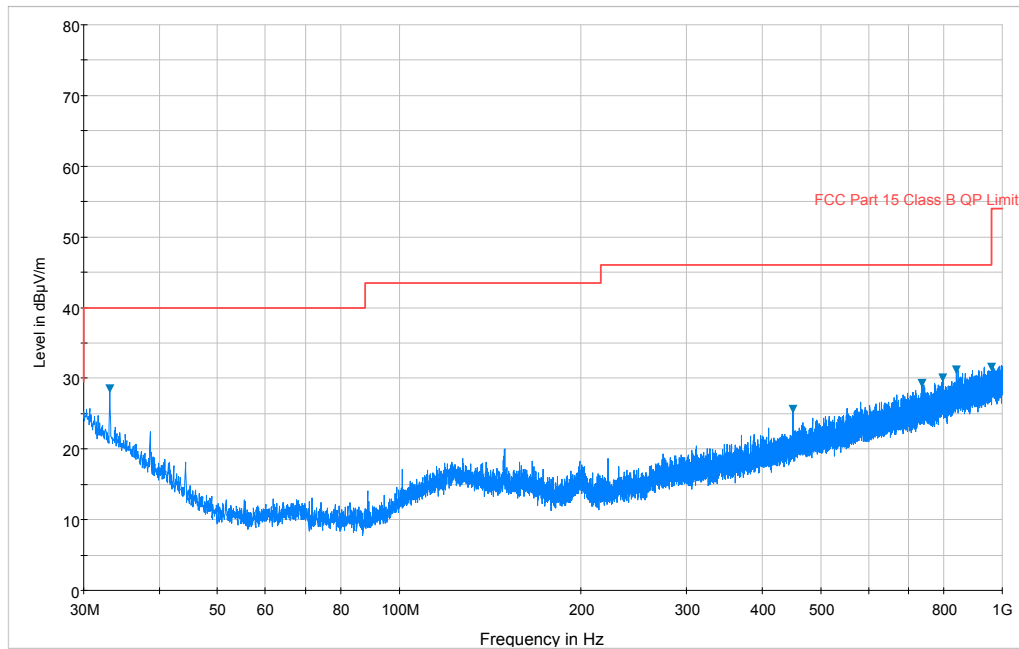
## Antenna-1 Radiated Spurious Emissions Measurements (Below 1GHz)

**\$15.209**



Preview Result 1H-PK+    FCC Part 15 Class B QP Limit    Final\_Result PK+

**Plot 7-233. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)**



Preview Result 1H-PK+    FCC Part 15 Class B QP Limit    Final\_Result PK+

**Plot 7-234. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 201 of 209                 |

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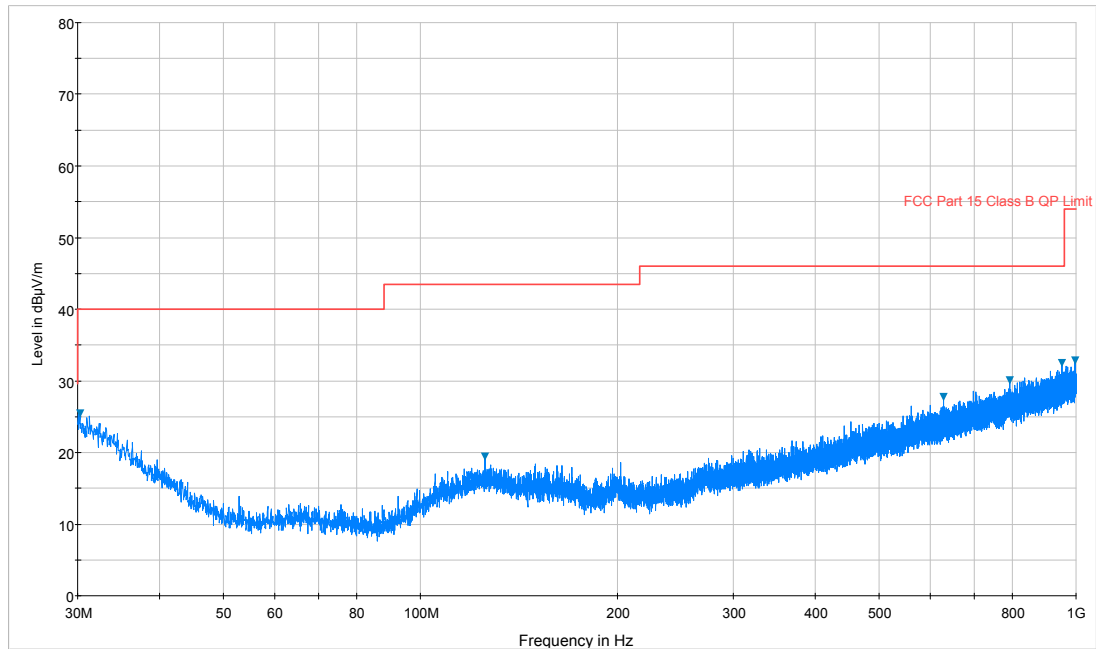
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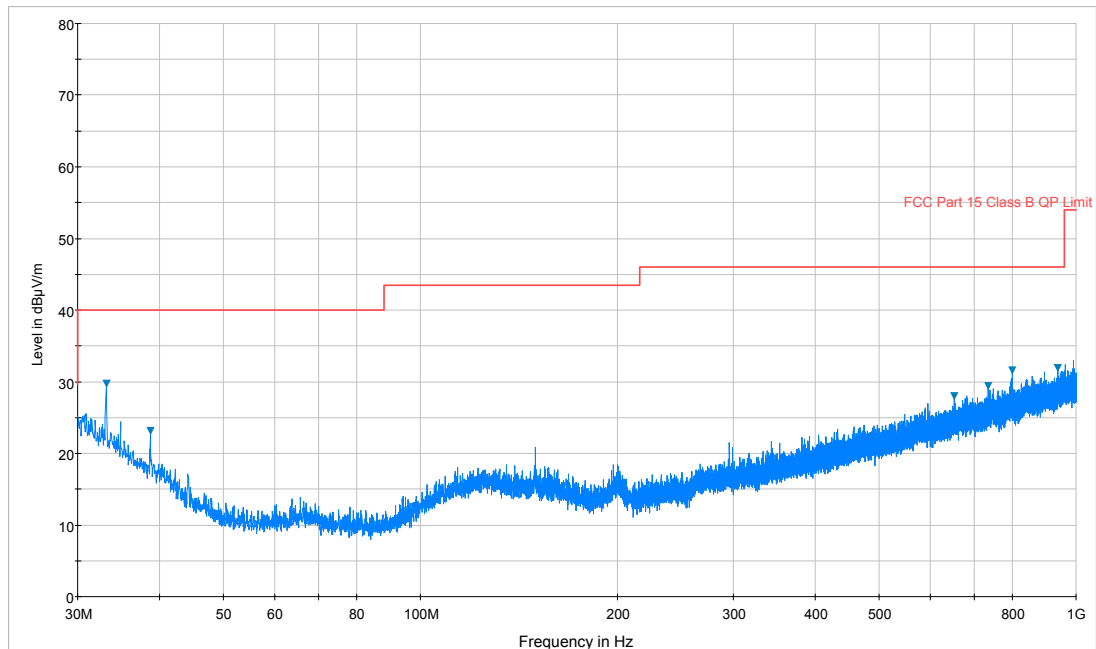
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## Antenna-2 Radiated Spurious Emissions Measurements (Below 1GHz)

**\$15.209**



**Plot 7-235. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. H)**



**Plot 7-236. Radiated Spurious Plot below 1GHz (802.11a – U3 Ch. 157, Ant. Pol. V)**

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 202 of 209                 |

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## 7.9 Line-Conducted Test Data

**\$15.407**

### Test Overview and Limit

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.

***All conducted emissions must not exceed the limits shown in the table below, per Section 15.207.***

| Frequency of emission (MHz) | Conducted Limit (dB $\mu$ V) |           |
|-----------------------------|------------------------------|-----------|
|                             | Quasi-peak                   | Average   |
| 0.15 – 0.5                  | 66 to 56*                    | 56 to 46* |
| 0.5 – 5                     | 56                           | 46        |
| 5 – 30                      | 60                           | 50        |

**Table 7-63. Conducted Limits**

\*Decreases with the logarithm of the frequency.

### Test Procedures Used

ANSI C63.10-2013, Section 6.2

### Test Settings

#### Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

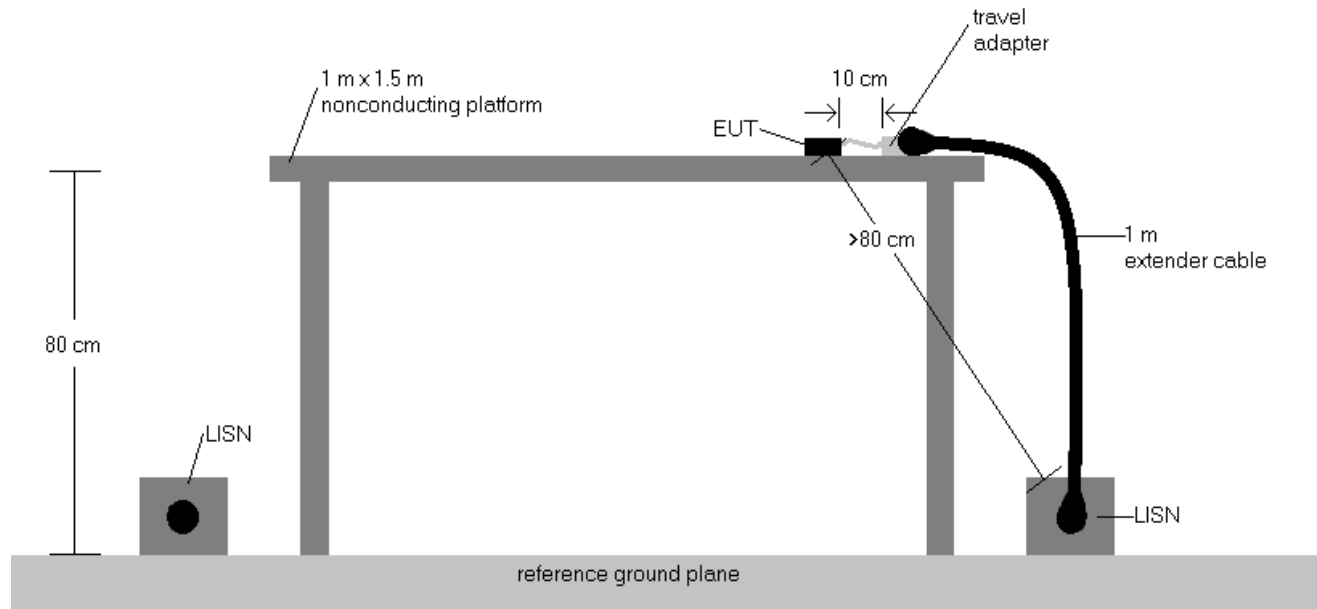
#### Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = RMS
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

|                                            |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 203 of 209                 |

## Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 7-8. Test Instrument & Measurement Setup**

## Test Notes

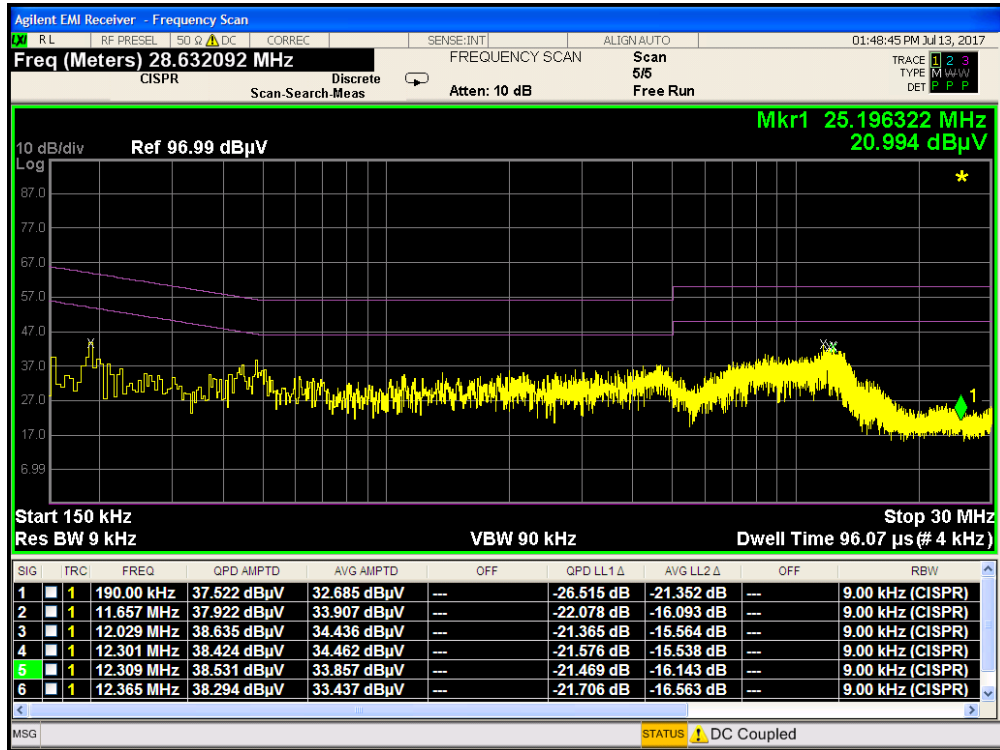
1. All modes of operation were investigated and the worst-case emissions are reported using mid channel. The emissions found were not affected by the choice of channel used during testing.
2. The limit for an intentional radiator from 150kHz to 30MHz are specified in 15.207.
3.  $\text{Corr. (dB)} = \text{Cable loss (dB)} + \text{LISN insertion factor (dB)}$
4.  $\text{QP/AV Level (dB}\mu\text{V)} = \text{QP/AV Analyzer/Receiver Level (dB}\mu\text{V)} + \text{Corr. (dB)}$
5.  $\text{Margin (dB)} = \text{QP/AV Limit (dB}\mu\text{V)} - \text{QP/AV Level (dB}\mu\text{V)}$
6. Traces shown in plot are made using a peak detector.
7. Deviations to the Specifications: None.

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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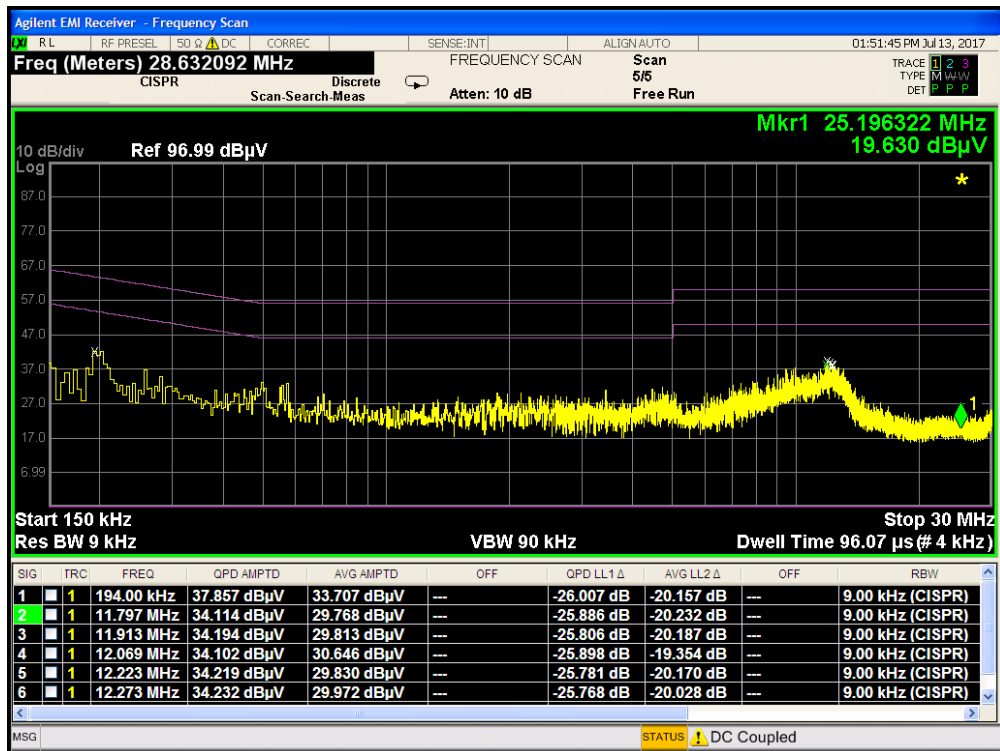
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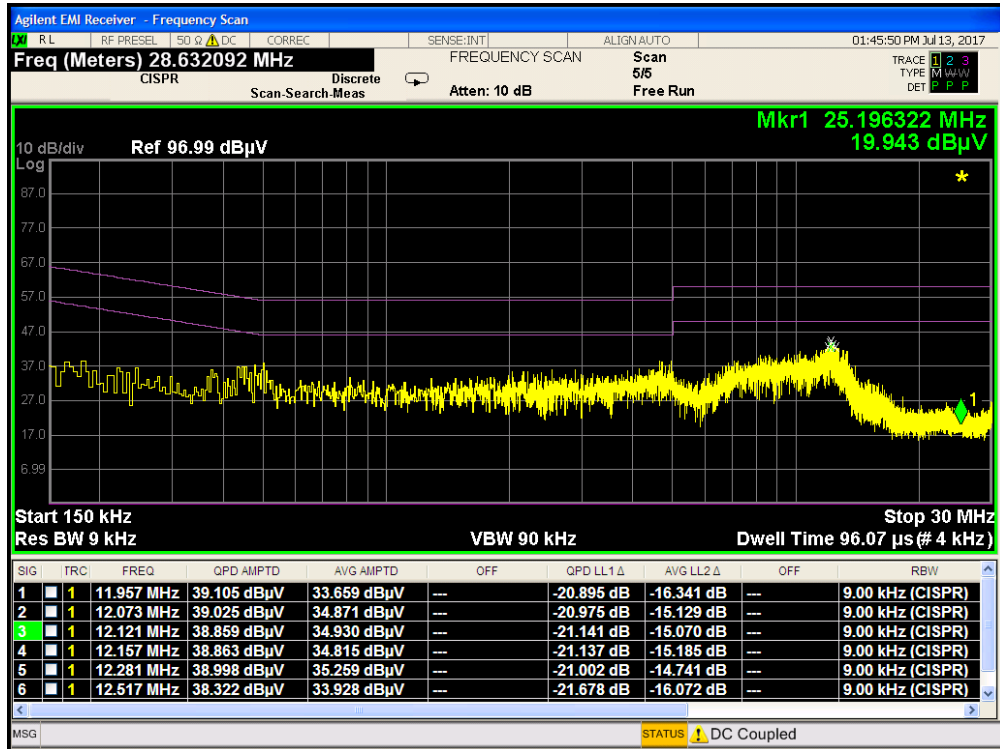


Plot 7-237. Line Conducted Plot with 802.11a UNII Band 1 (L1)

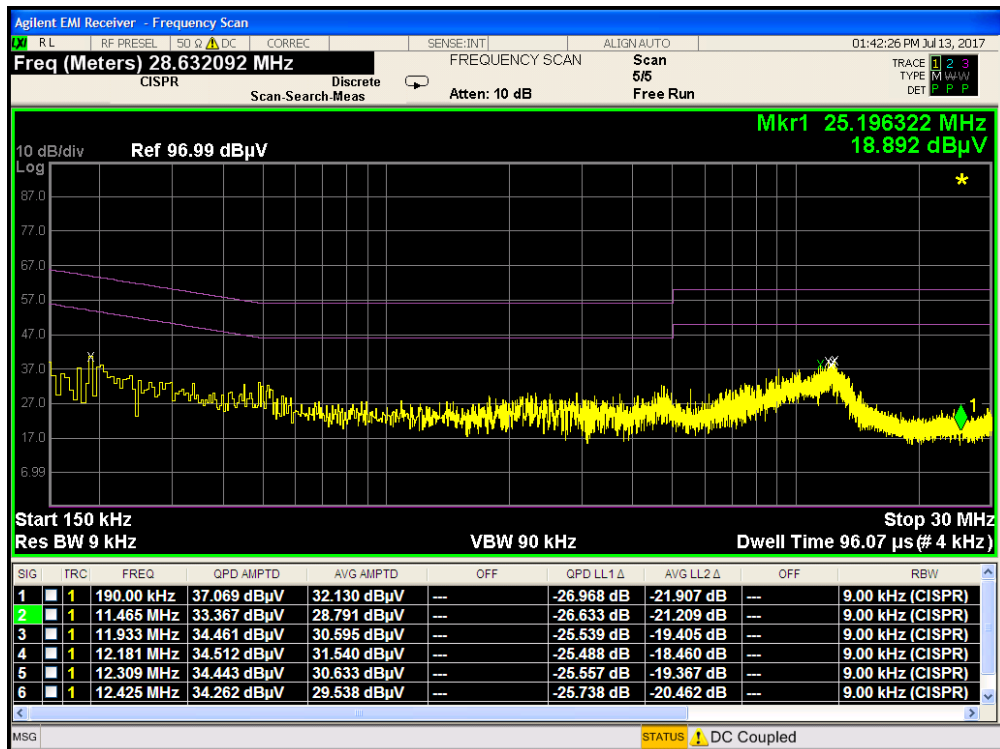


Plot 7-238. Line Conducted Plot with 802.11a UNII Band 1 (N)

|                                            |                                   |                                                                        |  |                                 |
|--------------------------------------------|-----------------------------------|------------------------------------------------------------------------|--|---------------------------------|
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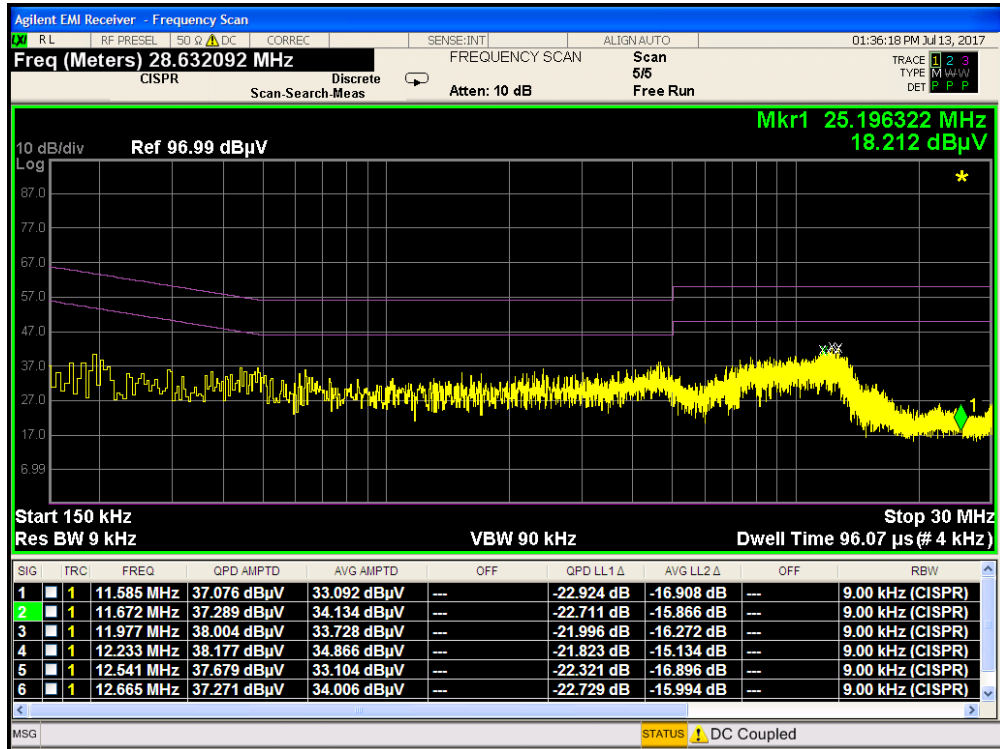


Plot 7-239. Line Conducted Plot with 802.11a UNII Band 2A (L1)

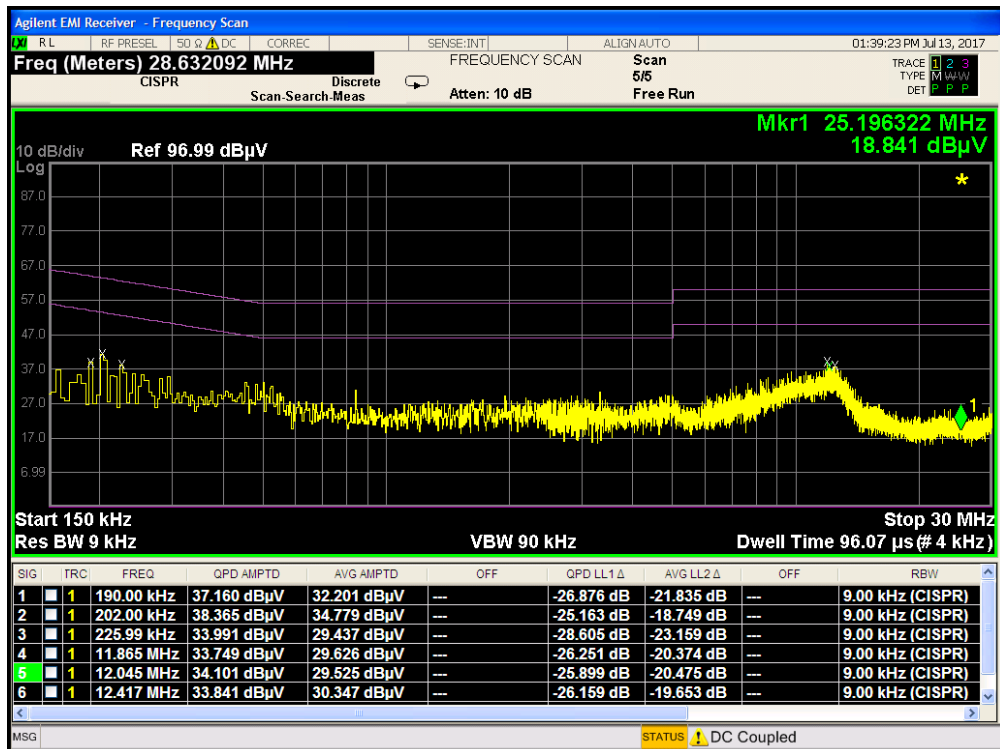


Plot 7-240. Line Conducted Plot with 802.11a UNII Band 2A (N)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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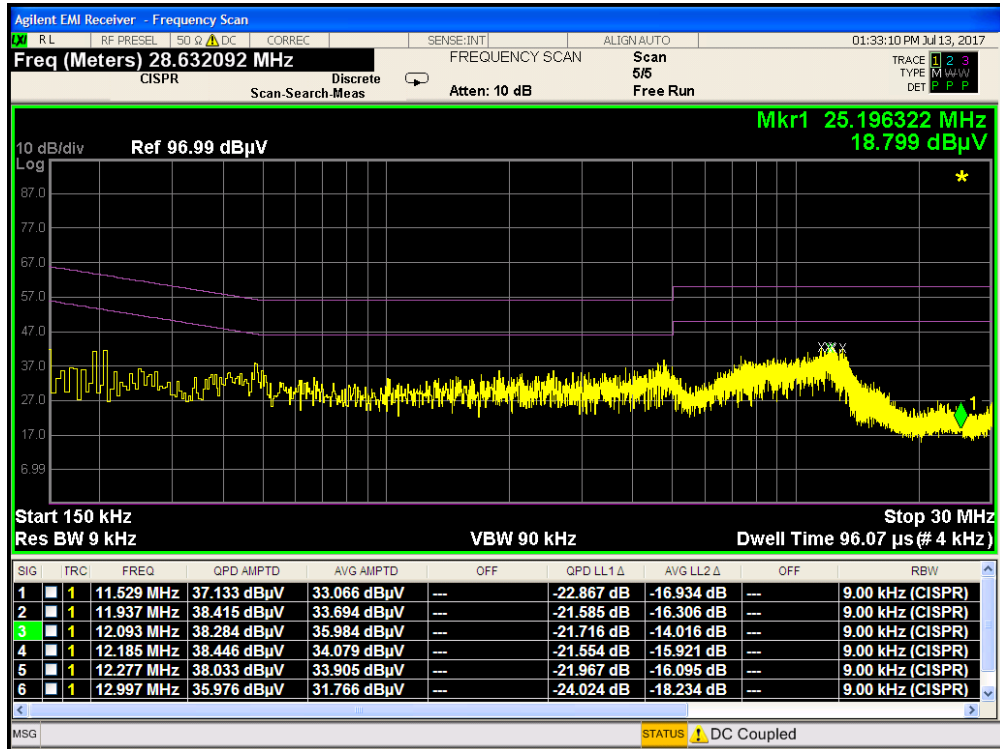


Plot 7-241. Line Conducted Plot with 802.11a UNII Band 2C (L1)

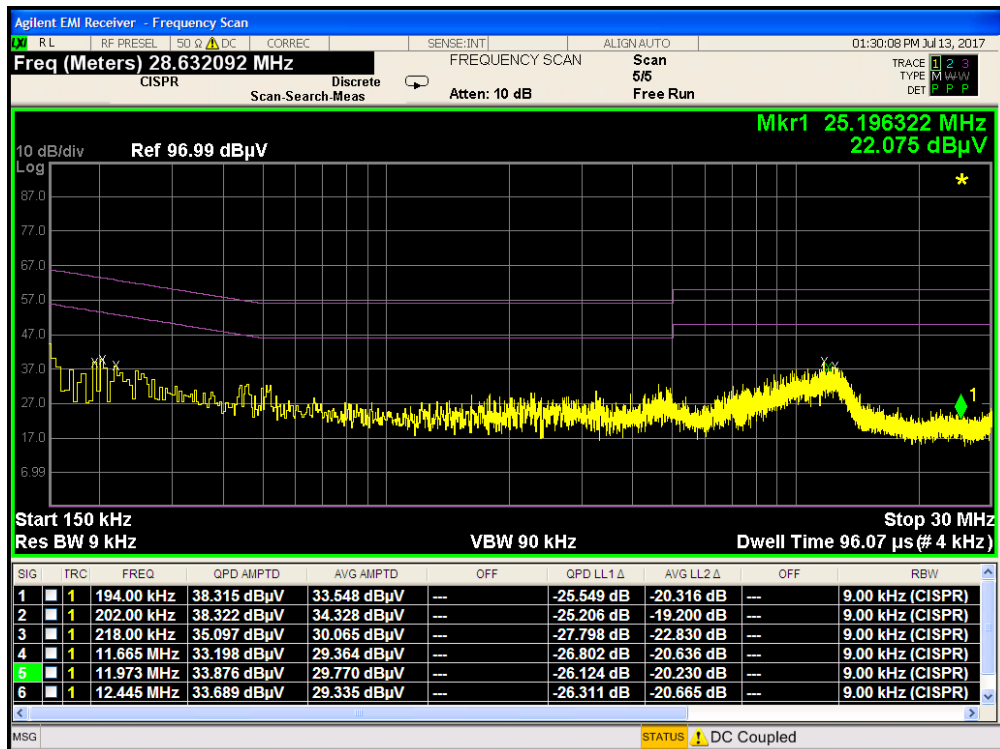


Plot 7-242. Line Conducted Plot with 802.11a UNII Band 2C (N)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017             | EUT Type:<br>Portable Handset                                          |           | Page 207 of 209                 |



Plot 7-243. Line Conducted Plot with 802.11a UNII Band 3 (L1)



Plot 7-244. Line Conducted Plot with 802.11a UNII Band 3 (N)

|                                            |                                               |                                                                        |           |                                 |
|--------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
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## 8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFH932** is in compliance with Part 15E of the FCC Rules.

|                                            |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
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| Test Report S/N:<br>1M1707110215-05-R1.ZNF | Test Dates:<br>7/12/2017-8/8/2017                                                   | EUT Type:<br>Portable Handset                                          | Page 209 of 209                                                                       |                                 |