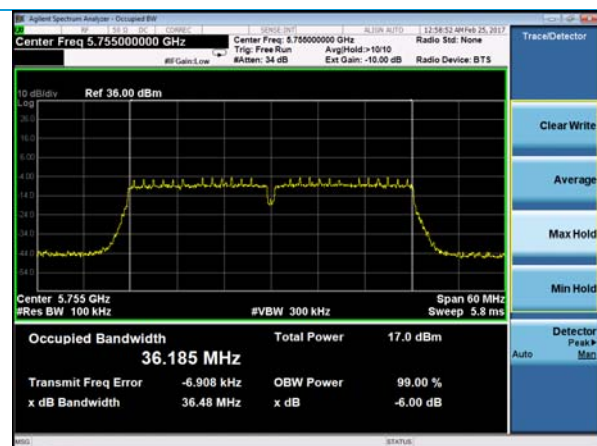
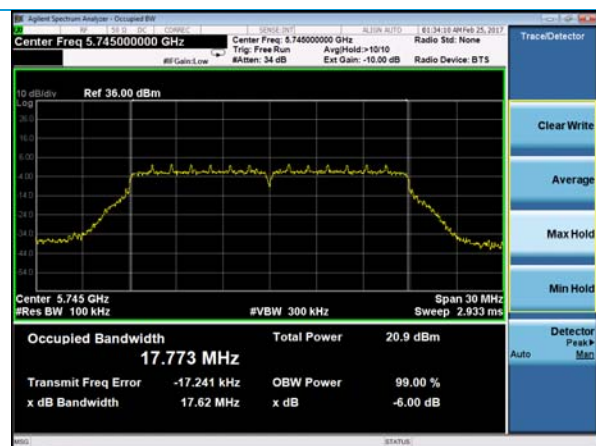


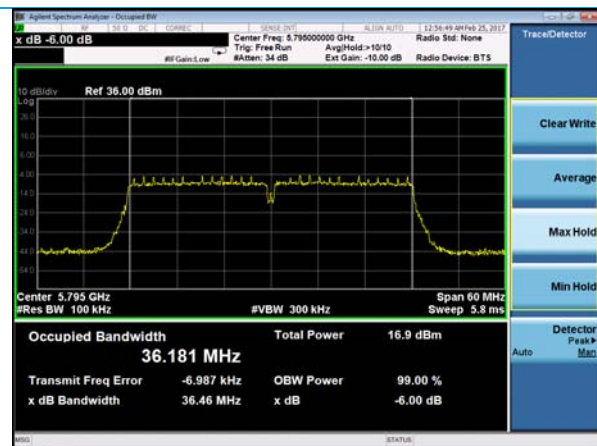
## Plots – U-NII-3 Minimum 6 dB BW, continued



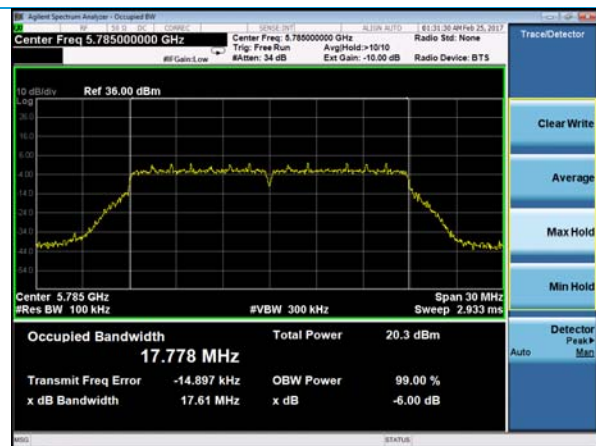
Low Channel – 802.11ac HT-40



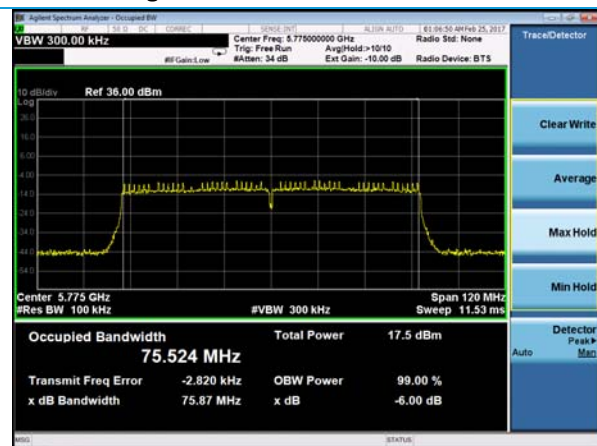
Low Channel – 802.11n HT-20



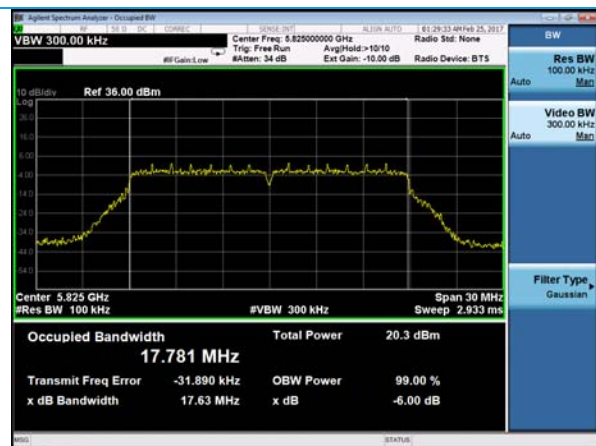
High Channel – 802.11ac HT-40



Mid Channel – 802.11n HT-20



Only Channel – 802.11ac HT-80



High Channel – 802.11n HT-20

Company: LSR a Laird Business

Report: TR 316356 C (U-NII)

Job: C-2602

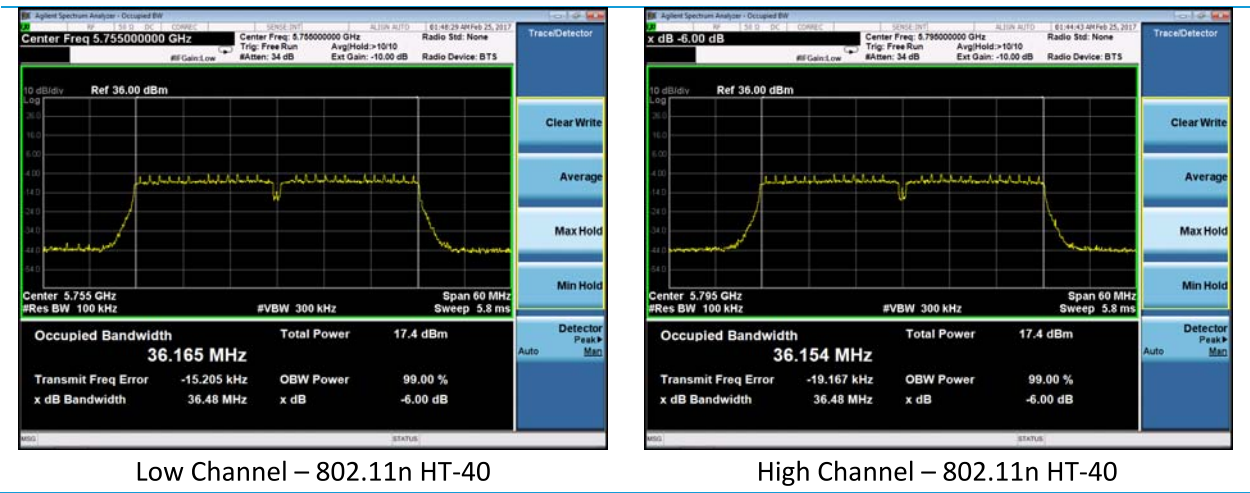
Page 35 of 149

Name: Sterling-LWB5

Model: Sterling-LWB5

Serial: 00008, 00035

Plots – U-NII-3 Minimum 6 dB BW, continued



### 5.1.3 Antenna Port Conducted Emissions – Conducted Output Power

|                     |                                                                                                                                  |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>Operator</b>     | Kimberly Bay                                                                                                                     |
| <b>QA</b>           | Aidi Zainal / Shane Dock                                                                                                         |
| <b>Test Date</b>    | U-NII-1: March 6, 2017; U-NII-2A: March 15, 2017<br>U-NII-2C: March 27, 2017; U-NII-3: February 28, 2017                         |
| <b>Location</b>     | Conducted RF Test Bench                                                                                                          |
| <b>Temp. / R.H.</b> | 21°- 22°C / 30%-53% RH                                                                                                           |
| <b>Requirement</b>  | FCC 15.407 (a)(1)(iv), (a)(2), (a)(3)<br>RSS 247 Issue 2 Sections 6.2.1.1, 6.2.2.1, 6.2.3.1, 6.2.4.1                             |
| <b>Method</b>       | KDB 789033 D02 v01r04 Section II.E.2.d Method SA-2<br>U-NII-2C HT-20 signals: KDB 789033 D02 v01r04 Section II.E.2.b Method SA-1 |

#### Limits:

| U-NII Band | FCC Limit                                                           | ISED Limit                                                                                                                                       |
|------------|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| U-NII-1    | 24 dBm                                                              | Lesser of:<br>23 dBm or $[10\text{dBm} + 10\log(99\%\text{BW})]$<br>e.i.r.p.                                                                     |
| U-NII-2A   | Lesser of:<br>24 dBm or $[11\text{ dBm} + 10\log(26\text{ dB BW})]$ | 1) Lesser of: 24 dBm or $[11\text{ dBm} + 10\log(99\%\text{ BW})]$<br>2) Lesser of: 30 dBm or $[17\text{ dBm} + 10\log(99\%\text{ BW})]$ e.i.r.p |
| U-NII-2C   | Lesser of:<br>24 dBm or $[11\text{ dBm} + 10\log(26\text{ dB BW})]$ | 1) Lesser of: 24 dBm or $[11\text{ dBm} + 10\log(99\%\text{ BW})]$<br>2) Lesser of: 30 dBm or $[17\text{ dBm} + 10\log(99\%\text{ BW})]$ e.i.r.p |
| U-NII-3    | 30 dBm                                                              | 30 dBm                                                                                                                                           |

## Test Parameters

|                            |                                                                                                                                                                                                      |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Settings</b>            | <u>802.11a HT-20, 6 Mbps:</u><br>5180, 5200, 5220 (ISED only), 5240 (FCC only) MHz (U-NII-1)<br>5260, 5300, 5320 MHz (U-NII-2A)<br>5500, 5580, 5700 MHz (U-NII-2C)<br>5745, 5785, 5825 MHz (U-NII-3) |
| <b>Settings</b>            | <u>802.11ac HT-20, MCS0:</u><br>5180, 5200, 5220 (ISED only), 5240 (FCC only)MHz (U-NII-1)<br>5260, 5300, 5320 MHz (U-NII-2A)<br>5500, 5580, 5720 MHz (U-NII-2C)<br>5745, 5785, 5825 MHz (U-NII-3)   |
| <b>Settings</b>            | <u>802.11ac HT-40, MCS0:</u><br>5190, 5230 MHz (U-NII-1); 5270, 5310 MHz (U-NII-2A);<br>5510, 5550, 5710 MHz (U-NII-2C); 5755, 5795 MHz (U-NII-3)                                                    |
| <b>Settings</b>            | <u>802.11ac HT-80, MCS0:</u><br>5210 MHz (U-NII-1); 5290 MHz (U-NII-2A);<br>5530, 5610 (FCC Only), 5690 MHz (U-NII-2C); 5775 MHz (U-NII-3)                                                           |
| <b>Settings</b>            | <u>802.11n HT-20, MCS0:</u><br>5180, 5200, 5220 (ISED only), 5240 (FCC only)MHz (U-NII-1)<br>5260, 5300, 5320 MHz (U-NII-2A)<br>5500, 5580, 5700 MHz (U-NII-2C)<br>5745, 5785, 5825 MHz (U-NII-3)    |
| <b>Settings</b>            | <u>802.11n HT-40, MCS0:</u><br>5190, 5230 MHz, (U-NII-1); 5270, 5310 MHz(U-NII-2A);<br>5510, 5550, 5670 MHz(U-NII-2C); 5755, 5795 MHz (U-NII-3)                                                      |
| <b>Note</b>                | Maximum antenna gain: 4 dBi                                                                                                                                                                          |
| <b>Note</b>                | U-NII-1, U-NII-2A, and U-NII-3 each have only two HT-40 channels and one HT-80 channel. U-NII-2C has only two HT-40 channels in 802.11n mode.                                                        |
| <b>Note</b>                | U-NII-2C 802.11ac HT-80 frequency 5610 MHz tested here, but not used in Canada. U-NII-2C 802.11ac HT-80 has only two available ISED channels.                                                        |
| <b>Example Calculation</b> | ISED EIRP Margin = ISED Limit – (Measured Pout + Correction Factor + Antenna Gain)<br>Ex: 23 dBm – (5.61 dBm + 0.292 + 4 dBi) = 23 dBm (limit) – 9.902 dB = 13.098 dB margin                         |

## Instrumentation



| Date : 6-Feb-2017 |           |                     | Type Test : Conducted RF Measurements |               |            | Job # : C-2602   |              |                     |
|-------------------|-----------|---------------------|---------------------------------------|---------------|------------|------------------|--------------|---------------------|
| Prepared By: Kim  |           |                     | Customer : LSR                        |               |            | Quote # : 316356 |              |                     |
| No.               | Asset #   | Description         | Manufacturer                          | Model #       | Serial #   | Cal Date         | Cal Due Date | Equipment Status    |
| 1                 | EE 960087 | Spectrum Analyzer   | Agilent                               | N9010A        | MY53400236 | 12/22/2016       | 12/22/2017   | Active Calibration  |
| 2                 | AA 960143 | Phasemeter          | Gore                                  | EKD01D01048.0 | 5546519    | 6/26/2015        | 6/25/2017    | Active Calibration  |
| 3                 | AA 960172 | Cable - low loss 1m | A.H. Systems, Inc                     | SAC-28G-1     | 387        | 5/16/2016        | 5/16/2017    | Active Verification |

|                               |                |                      |
|-------------------------------|----------------|----------------------|
| Company: LSR a Laird Business | Page 38 of 149 | Name: Sterling-LWB5  |
| Report: TR 316356 C (U-NII)   |                | Model: Sterling-LWB5 |
| Job: C-2602                   |                | Serial: 00008, 00035 |

**Table – U-NII-1 Conducted Output Power**

| Mode     | Frequency (MHz) | Data Rate | BW    | Correction Factor (dB) | Pout Measured (dBm) | Pout (dBm) | FCC Limit (dBm) | FCC Margin (dB) | ISED EIRP Limit (dBm) | ISED EIRP margin (dB) |
|----------|-----------------|-----------|-------|------------------------|---------------------|------------|-----------------|-----------------|-----------------------|-----------------------|
| 802.11a  | 5180            | 6 Mbps    | HT-20 | 0.132                  | 11.69               | 11.82      | 24.00           | 12.18           | 22.26                 | 6.44                  |
| 802.11a  | 5200            | 6 Mbps    | HT-20 | 0.132                  | 11.36               | 11.49      | 24.00           | 12.51           | 22.26                 | 6.77                  |
| 802.11a  | 5220 (ISED)     | 6 Mbps    | HT-20 | 0.132                  | 11.20               | 11.33      | 24.00           | 12.67           | 22.25                 | 6.92                  |
| 802.11a  | 5240 (FCC)      | 6 Mbps    | HT-20 | 0.132                  | 10.94               | 11.07      | 24.00           | 12.93           | 22.26                 | 7.19                  |
| 802.11ac | 5180            | MCS0      | HT-20 | 0.132                  | 9.47                | 9.61       | 24.00           | 14.40           | 22.55                 | 8.95                  |
| 802.11ac | 5200            | MCS0      | HT-20 | 0.132                  | 9.09                | 9.23       | 24.00           | 14.78           | 22.55                 | 9.33                  |
| 802.11ac | 5220 (ISED)     | MCS0      | HT-20 | 0.132                  | 8.88                | 9.01       | 24.00           | 14.99           | 22.55                 | 9.54                  |
| 802.11ac | 5240 (FCC)      | MCS0      | HT-20 | 0.132                  | 8.83                | 8.97       | 24.00           | 15.04           | 22.55                 | 9.58                  |
| 802.11ac | 5190            | MCS0      | HT-40 | 0.292                  | 5.61                | 5.91       | 24.00           | 18.09           | 23.00                 | 13.09                 |
| 802.11ac | 5230            | MCS0      | HT-40 | 0.292                  | 5.13                | 5.42       | 24.00           | 18.58           | 23.00                 | 13.58                 |
| 802.11ac | 5210            | MCS0      | HT-80 | 0.555                  | 4.90                | 5.46       | 24.00           | 18.54           | 23.00                 | 13.54                 |
| 802.11n  | 5180            | MCS0      | HT-20 | 0.132                  | 9.53                | 9.67       | 24.00           | 14.34           | 22.55                 | 8.88                  |
| 802.11n  | 5200            | MCS0      | HT-20 | 0.132                  | 9.28                | 9.41       | 24.00           | 14.59           | 22.55                 | 9.13                  |
| 802.11n  | 5220 (ISED)     | MCS0      | HT-20 | 0.132                  | 9.10                | 9.24       | 24.00           | 14.76           | 22.54                 | 9.31                  |
| 802.11n  | 5240 (FCC)      | MCS0      | HT-20 | 0.132                  | 8.86                | 9.00       | 24.00           | 15.00           | 22.54                 | 9.55                  |
| 802.11n  | 5190            | MCS0      | HT-40 | 0.292                  | 5.74                | 6.04       | 24.00           | 17.97           | 23.00                 | 12.97                 |
| 802.11n  | 5230            | MCS0      | HT-40 | 0.292                  | 5.35                | 5.64       | 24.00           | 18.36           | 23.00                 | 13.36                 |

**Table – U-NII-2A Conducted Output Power**

| Mode     | Frequency (MHz) | Data Rate | BW    | Correction Factor (dB) | Pout Measured (dBm) | Pout (dBm) | FCC Limit (dBm) | FCC Margin (dB) | ISED Limit (dBm) | ISED Margin (dB) | ISED EIRP Limit (dBm) | ISED EIRP margin (dB) |
|----------|-----------------|-----------|-------|------------------------|---------------------|------------|-----------------|-----------------|------------------|------------------|-----------------------|-----------------------|
| 802.11a  | 5260            | 6 Mbps    | HT-20 | 0.132                  | 13.66               | 13.79      | 24.00           | 10.21           | 23.27            | 9.48             | 29.27                 | 11.48                 |
| 802.11a  | 5300            | 6 Mbps    | HT-20 | 0.132                  | 13.63               | 13.76      | 24.00           | 10.24           | 23.31            | 9.54             | 29.31                 | 11.54                 |
| 802.11a  | 5320            | 6 Mbps    | HT-20 | 0.132                  | 12.38               | 12.51      | 24.00           | 11.49           | 23.29            | 10.77            | 29.29                 | 12.77                 |
| 802.11ac | 5260            | MCS0      | HT-20 | 0.177                  | 11.64               | 11.81      | 24.00           | 12.19           | 23.55            | 11.74            | 29.55                 | 13.74                 |
| 802.11ac | 5300            | MCS0      | HT-20 | 0.177                  | 11.52               | 11.70      | 24.00           | 12.30           | 23.58            | 11.88            | 29.58                 | 13.88                 |
| 802.11ac | 5320            | MCS0      | HT-20 | 0.177                  | 11.39               | 11.57      | 24.00           | 12.43           | 23.57            | 12.00            | 29.57                 | 14.00                 |
| 802.11ac | 5270            | MCS0      | HT-40 | 0.386                  | 7.66                | 8.05       | 24.00           | 15.95           | 24.00            | 15.95            | 30.00                 | 17.95                 |
| 802.11ac | 5310            | MCS0      | HT-40 | 0.386                  | 7.43                | 7.81       | 24.00           | 16.19           | 24.00            | 16.19            | 30.00                 | 18.19                 |
| 802.11ac | 5290            | MCS0      | HT-80 | 0.580                  | 7.14                | 7.72       | 24.00           | 16.28           | 24.00            | 16.28            | 30.00                 | 18.28                 |
| 802.11n  | 5260            | MCS0      | HT-20 | 0.223                  | 11.50               | 11.73      | 24.00           | 12.27           | 23.57            | 11.85            | 29.57                 | 13.85                 |
| 802.11n  | 5300            | MCS0      | HT-20 | 0.223                  | 11.38               | 11.60      | 24.00           | 12.40           | 23.56            | 11.96            | 29.56                 | 13.96                 |
| 802.11n  | 5320            | MCS0      | HT-20 | 0.223                  | 11.50               | 11.73      | 24.00           | 12.28           | 23.56            | 11.84            | 29.56                 | 13.84                 |
| 802.11n  | 5270            | MCS0      | HT-40 | 0.339                  | 7.64                | 7.98       | 24.00           | 16.02           | 24.00            | 16.02            | 30.00                 | 18.02                 |
| 802.11n  | 5310            | MCS0      | HT-40 | 0.339                  | 7.37                | 7.71       | 24.00           | 16.29           | 24.00            | 16.29            | 30.00                 | 18.29                 |

**Table – U-NII-2C Conducted Output Power**

| Mode     | Frequency (MHz) | Data Rate | BW    | Correction Factor (dB) | Pout Measured (dBm) | Pout (dBm) | FCC Limit (dBm) | FCC Margin (dB) | ISED Limit (dBm) | ISED Margin (dB) | ISED EIRP Limit (dBm) | ISED EIRP margin (dB) |
|----------|-----------------|-----------|-------|------------------------|---------------------|------------|-----------------|-----------------|------------------|------------------|-----------------------|-----------------------|
| 802.11a  | 5500            | 6 Mbps    | HT-20 | 0.00                   | 14.13               | 14.13      | 24.00           | 9.87            | 23.25            | 9.12             | 29.25                 | 11.12                 |
| 802.11a  | 5580            | 6 Mbps    | HT-20 | 0.00                   | 15.15               | 15.15      | 24.00           | 8.85            | 23.26            | 8.10             | 29.26                 | 10.10                 |
| 802.11a  | 5700            | 6 Mbps    | HT-20 | 0.00                   | 15.02               | 15.02      | 24.00           | 8.98            | 23.27            | 8.25             | 29.27                 | 10.25                 |
| 802.11ac | 5500            | MCS0      | HT-20 | 0.00                   | 13.15               | 13.15      | 24.00           | 10.85           | 23.56            | 10.41            | 29.56                 | 12.41                 |
| 802.11ac | 5580            | MCS0      | HT-20 | 0.00                   | 12.80               | 12.80      | 24.00           | 11.20           | 23.55            | 10.75            | 29.55                 | 12.75                 |
| 802.11ac | 5710            | MCS0      | HT-20 | 0.00                   | 12.93               | 12.93      | 24.00           | 11.08           | 23.55            | 10.62            | 29.55                 | 12.62                 |
| 802.11ac | 5510            | MCS0      | HT-40 | 0.315                  | 9.06                | 9.38       | 24.00           | 14.62           | 24.00            | 14.62            | 30.00                 | 16.63                 |
| 802.11ac | 5550            | MCS0      | HT-40 | 0.315                  | 8.85                | 9.16       | 24.00           | 14.84           | 24.00            | 14.84            | 30.00                 | 16.84                 |
| 802.11ac | 5710            | MCS0      | HT-40 | 0.315                  | 9.36                | 9.68       | 24.00           | 14.32           | 24.00            | 14.32            | 30.00                 | 16.33                 |
| 802.11ac | 5530            | MCS0      | HT-80 | 0.580                  | 8.43                | 9.01       | 24.00           | 14.99           | 24.00            | 14.99            | 30.00                 | 16.99                 |
| 802.11ac | 5610            | MCS0      | HT-80 | 0.580                  | 8.87                | 9.45       | 24.00           | 14.55           | 24.00            | 14.55            | 30.00                 | 16.55                 |
| 802.11ac | 5690            | MCS0      | HT-80 | 0.580                  | 9.06                | 9.64       | 24.00           | 14.36           | 24.00            | 14.36            | 30.00                 | 16.36                 |
| 802.11n  | 5500            | MCS0      | HT-20 | 0.00                   | 13.17               | 13.17      | 24.00           | 10.83           | 23.55            | 10.38            | 29.55                 | 12.38                 |
| 802.11n  | 5580            | MCS0      | HT-20 | 0.00                   | 12.81               | 12.81      | 24.00           | 11.19           | 23.56            | 10.75            | 29.56                 | 12.75                 |
| 802.11n  | 5700            | MCS0      | HT-20 | 0.00                   | 12.90               | 12.90      | 24.00           | 11.10           | 23.55            | 10.65            | 29.55                 | 12.65                 |
| 802.11n  | 5510            | MCS0      | HT-40 | 0.315                  | 9.16                | 9.48       | 24.00           | 14.52           | 24.00            | 14.52            | 30.00                 | 16.52                 |
| 802.11n  | 5550            | MCS0      | HT-40 | 0.315                  | 8.77                | 9.09       | 24.00           | 14.91           | 24.00            | 14.91            | 30.00                 | 16.91                 |
| 802.11n  | 5670            | MCS0      | HT-40 | 0.315                  | 8.87                | 9.19       | 24.00           | 14.81           | 24.00            | 14.81            | 30.00                 | 16.81                 |

**Table – U-NII-3 Conducted Output Power**

| Mode     | Frequency (MHz) | Data Rate | BW    | Correction Factor (dB) | Pout Measured (dBm) | Pout (dBm) | Limit (dBm) | Margin (dB) |
|----------|-----------------|-----------|-------|------------------------|---------------------|------------|-------------|-------------|
| 802.11a  | 5745            | 6 Mbps    | HT-20 | 0.132                  | 15.64               | 15.77      | 30.0        | 14.23       |
| 802.11a  | 5785            | 6 Mbps    | HT-20 | 0.132                  | 15.13               | 15.26      | 30.0        | 14.74       |
| 802.11a  | 5825            | 6 Mbps    | HT-20 | 0.132                  | 15.16               | 15.29      | 30.0        | 14.71       |
| 802.11ac | 5745            | MCS0      | HT-20 | 0.155                  | 13.47               | 13.63      | 30.0        | 16.37       |
| 802.11ac | 5785            | MCS0      | HT-20 | 0.155                  | 12.81               | 12.96      | 30.0        | 17.04       |
| 802.11ac | 5825            | MCS0      | HT-20 | 0.155                  | 12.92               | 13.07      | 30.0        | 16.93       |
| 802.11ac | 5755            | MCS0      | HT-40 | 0.315                  | 9.81                | 10.12      | 30.0        | 19.88       |
| 802.11ac | 5795            | MCS0      | HT-40 | 0.315                  | 9.23                | 9.54       | 30.0        | 20.46       |
| 802.11ac | 5775            | MCS0      | HT-80 | 0.555                  | 9.22                | 9.77       | 30.0        | 20.23       |
| 802.11n  | 5745            | MCS0      | HT-20 | 0.177                  | 13.56               | 13.74      | 30.0        | 16.26       |
| 802.11n  | 5785            | MCS0      | HT-20 | 0.177                  | 12.84               | 13.02      | 30.0        | 16.98       |
| 802.11n  | 5825            | MCS0      | HT-20 | 0.177                  | 13.05               | 13.23      | 30.0        | 16.77       |
| 802.11n  | 5755            | MCS0      | HT-40 | 0.315                  | 9.69                | 10.01      | 30.0        | 19.99       |
| 802.11n  | 5795            | MCS0      | HT-40 | 0.315                  | 9.38                | 9.69       | 30.0        | 20.31       |

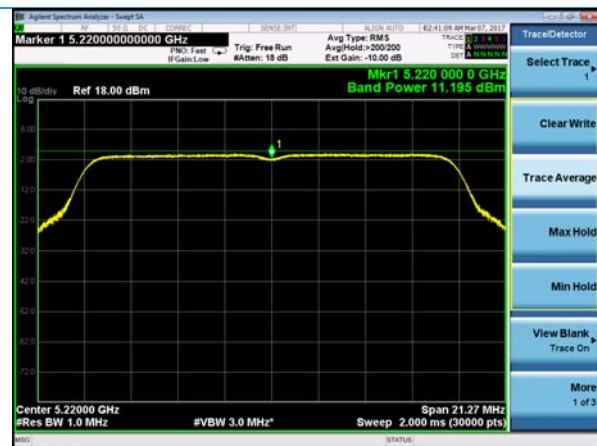
## Plots – U-NII-1 Conducted Output Power



Low Channel – 802.11a HT-20



Mid Channel – 802.11a HT-20



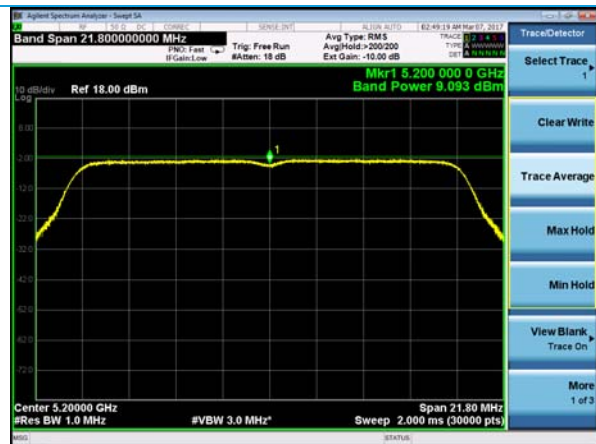
ISSED High Channel – 802.11a HT-20



FCC High Channel – 802.11a HT-20



Low Channel – 802.11ac HT-20



Mid Channel – 802.11ac HT-20

Company: LSR a Laird Business

Report: TR 316356 C (U-NII)

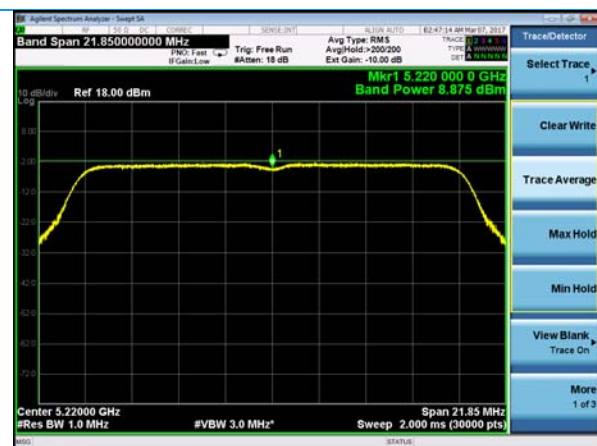
Job: C-2602

Name: Sterling-LWB5

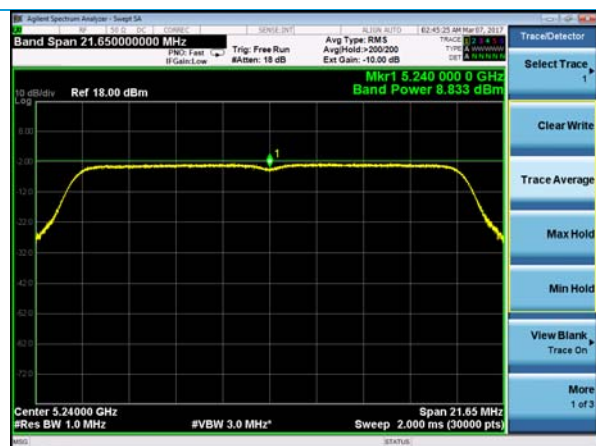
Model: Sterling-LWB5

Serial: 00008, 00035

## Plots – U-NII-1 Conducted Output Power, continued



ISED High Channel – 802.11ac HT-20



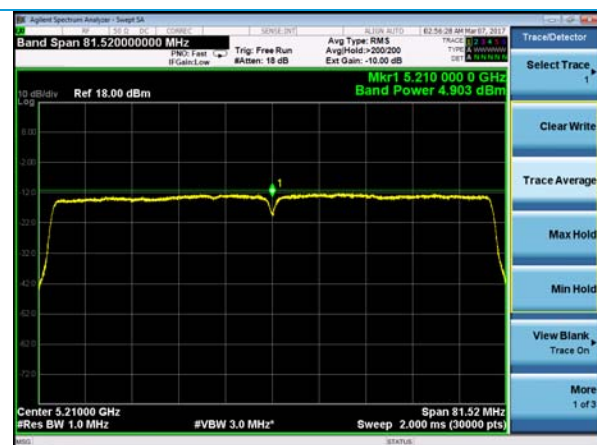
FCC High Channel – 802.11ac HT-20



Low Channel – 802.11ac HT-40



High Channel – 802.11ac HT-40



Only Channel – 802.11ac HT-40

Company: LSR a Laird Business

Report: TR 316356 C (U-NII)

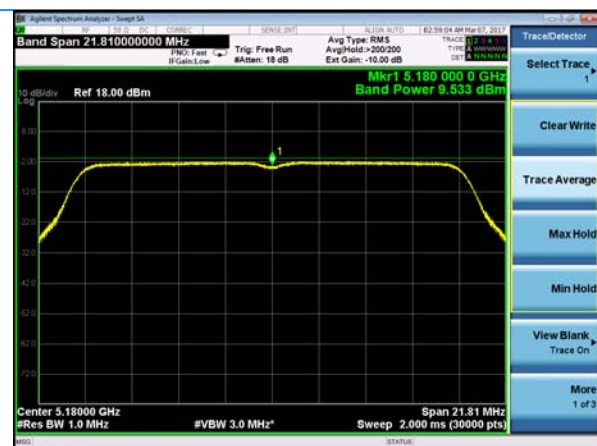
Job: C-2602

Name: Sterling-LWB5

Model: Sterling-LWB5

Serial: 00008, 00035

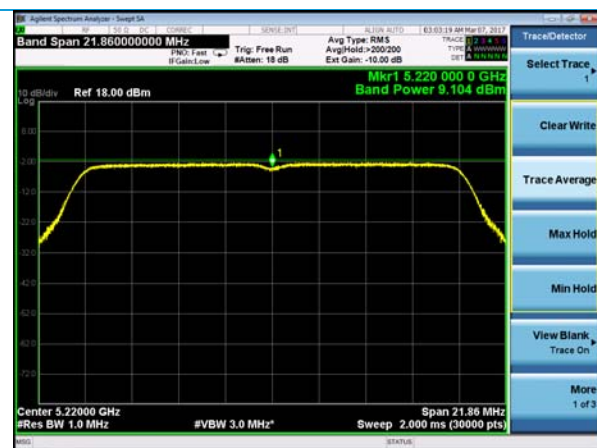
## Plots – U-NII-1 Conducted Output Power, continued



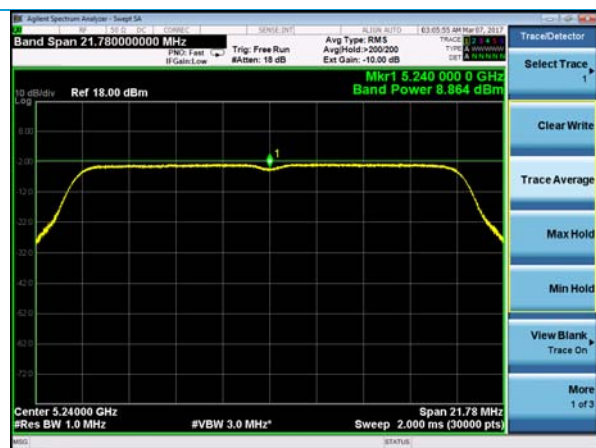
Low Channel – 802.11n HT-20



Mid Channel – 802.11n HT-20



ISD High Channel – 802.11n HT-20



FCC High Channel – 802.11n HT-20



Low Channel – 802.11n HT-40



High Channel – 802.11n HT-40

Company: LSR a Laird Business

Report: TR 316356 C (U-NII)

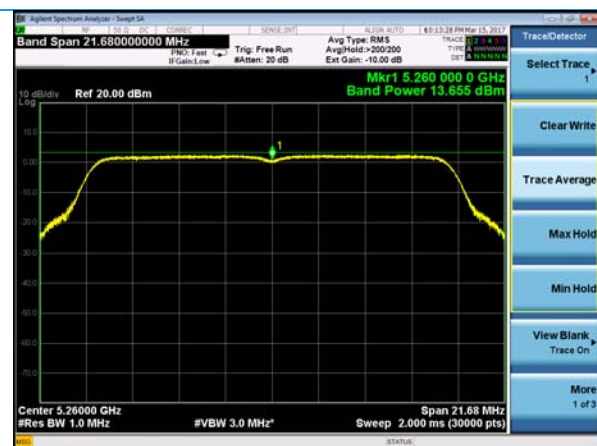
Job: C-2602

Name: Sterling-LWB5

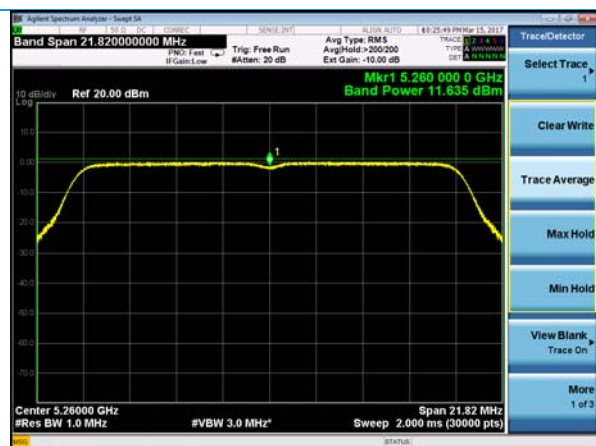
Model: Sterling-LWB5

Serial: 00008, 00035

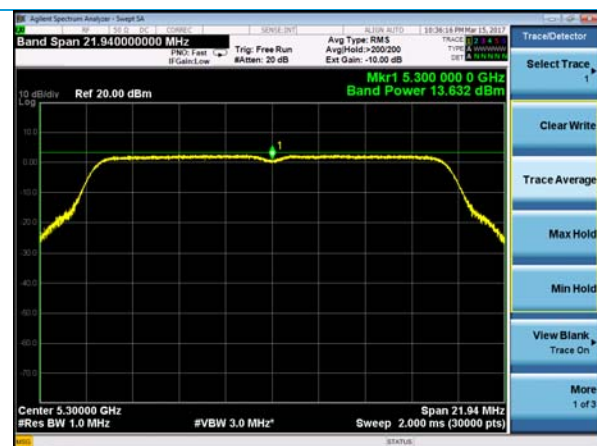
## Plots – U-NII-2A Conducted Output Power



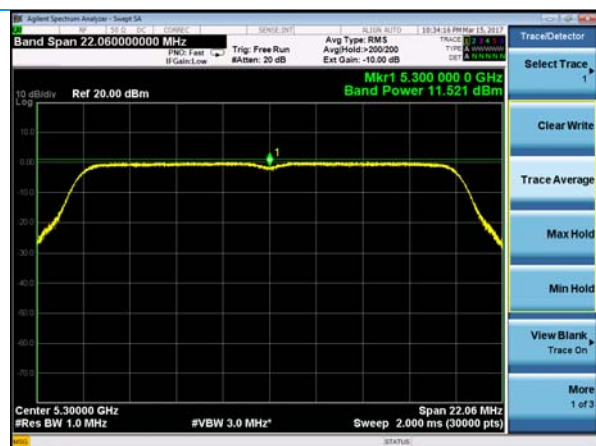
Low Channel – 802.11a HT-20



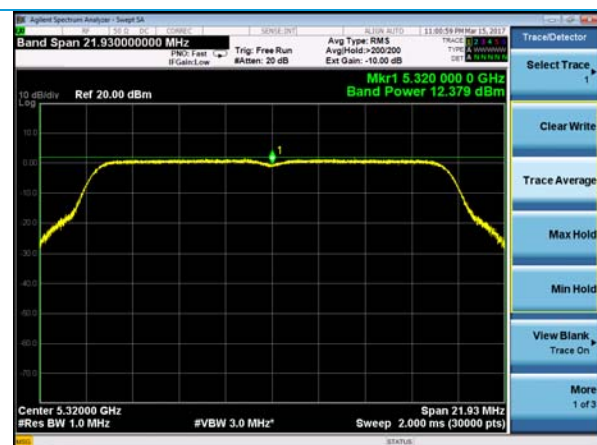
Low Channel 802.11ac HT-20



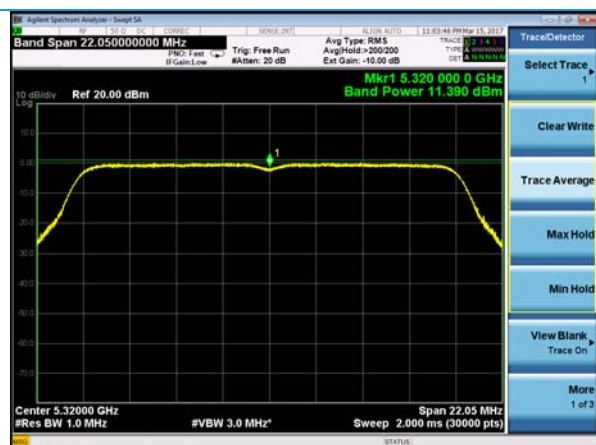
Mid Channel – 802.11a HT-20



Mid Channel – 802.11ac HT-20



High Channel – 802.11a HT-20



High Channel – 802.11ac HT-20

Company: LSR a Laird Business

Report: TR 316356 C (U-NII)

Job: C-2602

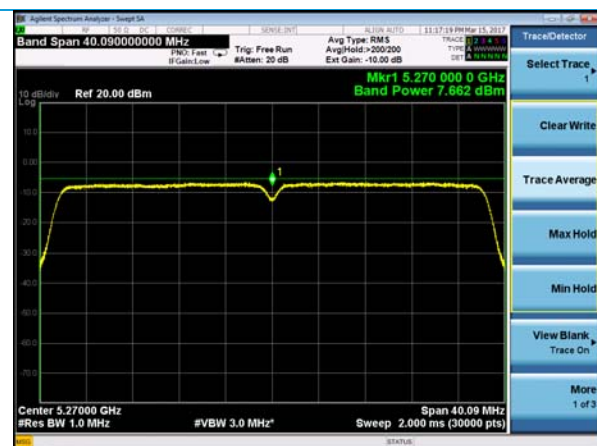
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Name: Sterling-LWB5

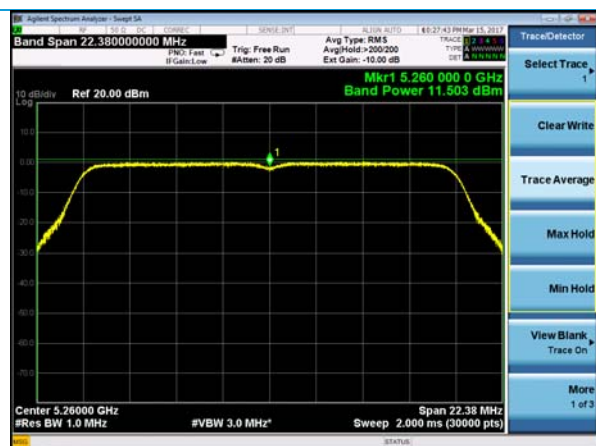
Model: Sterling-LWB5

Serial: 00008, 00035

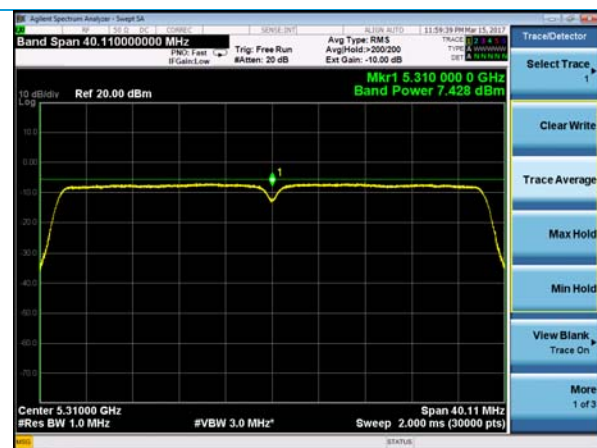
## Plots – U-NII-2A Conducted Output Power, continued



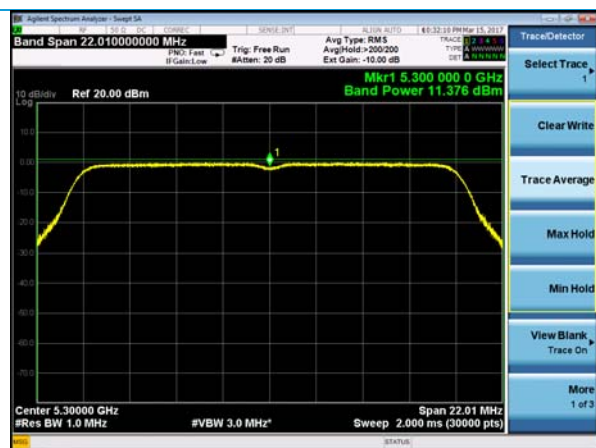
Low Channel – 802.11ac HT-40



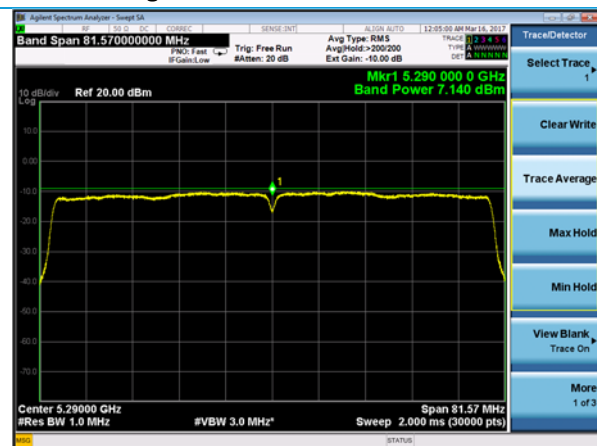
Low Channel – 802.11n HT-20



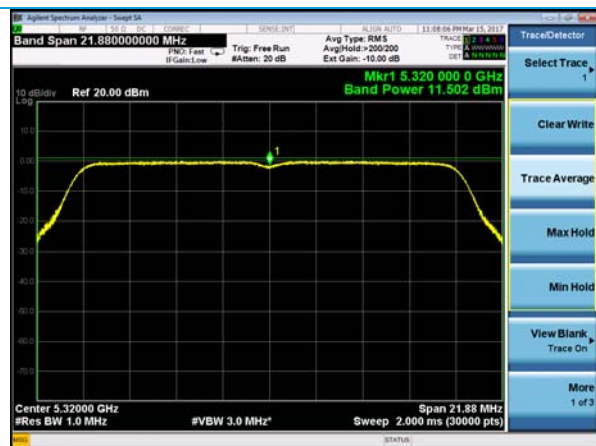
High Channel – 802.11ac HT-40



Mid Channel – 802.11n HT-20



Only Channel – 802.11ac HT-40



High Channel – 802.11n HT-20

Company: LSR a Laird Business

Report: TR 316356 C (U-NII)

Job: C-2602

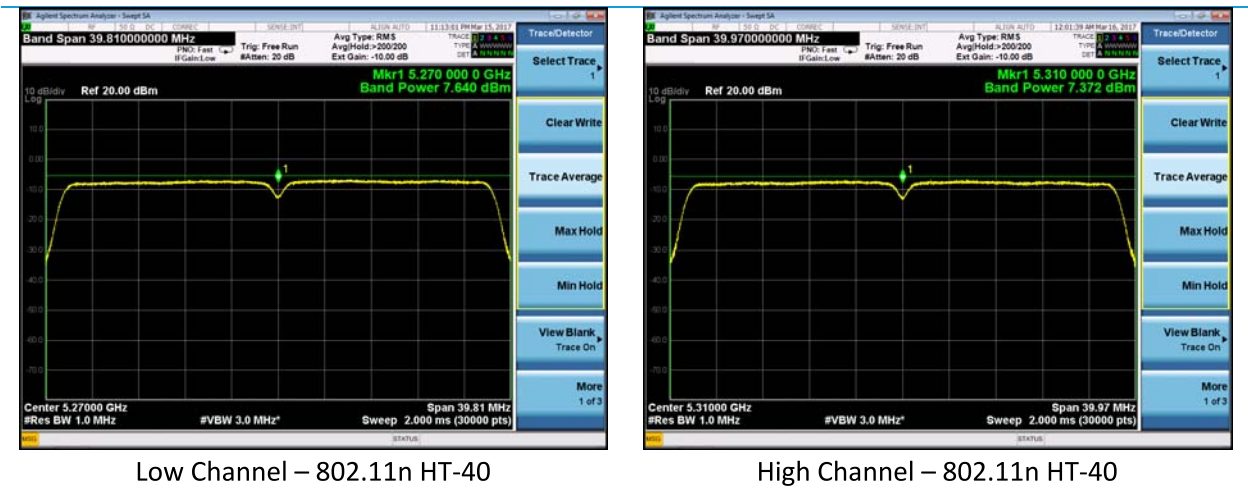
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Name: Sterling-LWB5

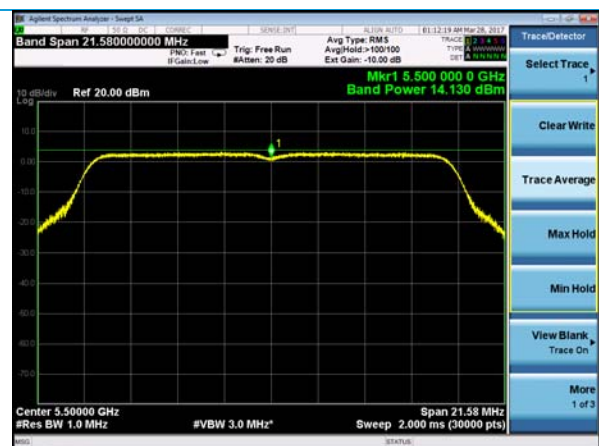
Model: Sterling-LWB5

Serial: 00008, 00035

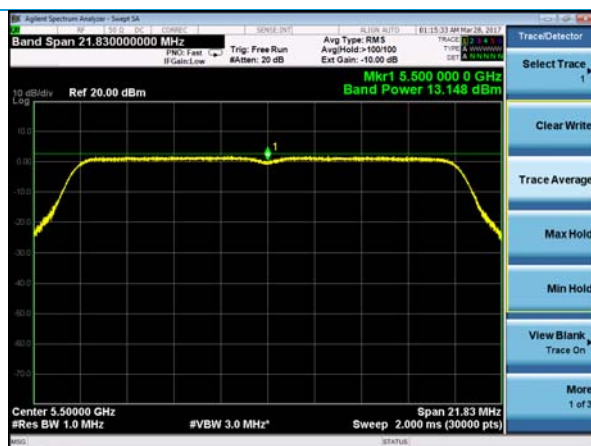
Plots – U-NII-2A Conducted Output Power, continued



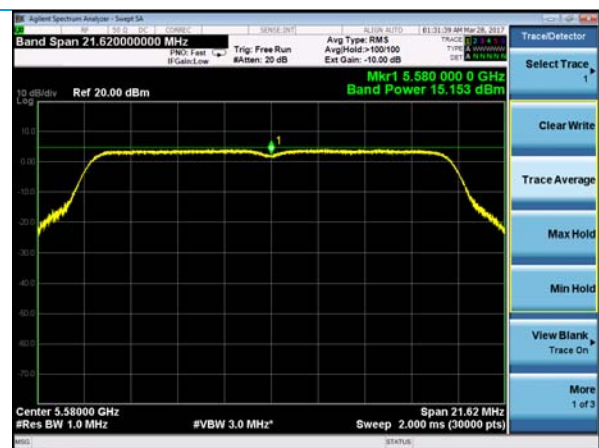
## Plots – U-NII-2C Conducted Output Power



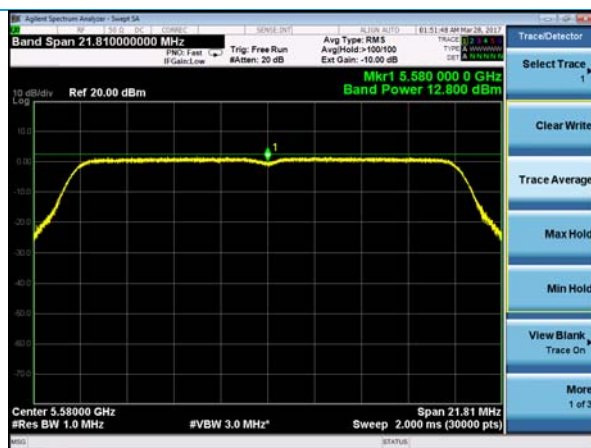
Low Channel – 802.11a HT-20



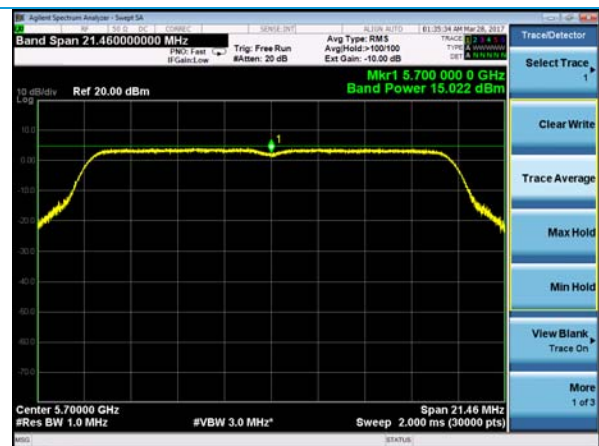
Low Channel – 802.11ac HT-20



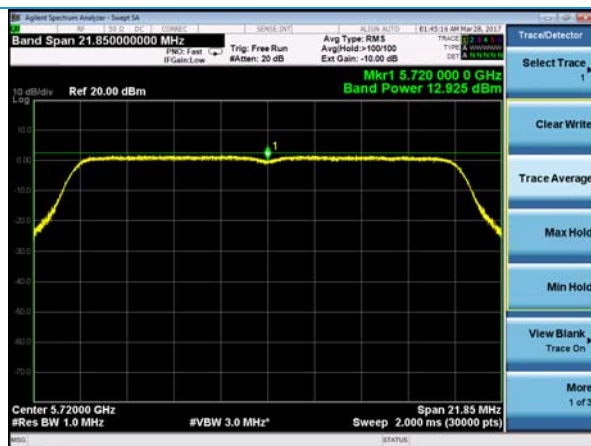
Mid Channel – 802.11a HT-20



Mid Channel – 802.11ac HT-20



High Channel – 802.11a HT-20



High Channel – 802.11ac HT-20

Company: LSR a Laird Business

Report: TR 316356 C (U-NII)

Job: C-2602

Name: Sterling-LWB5

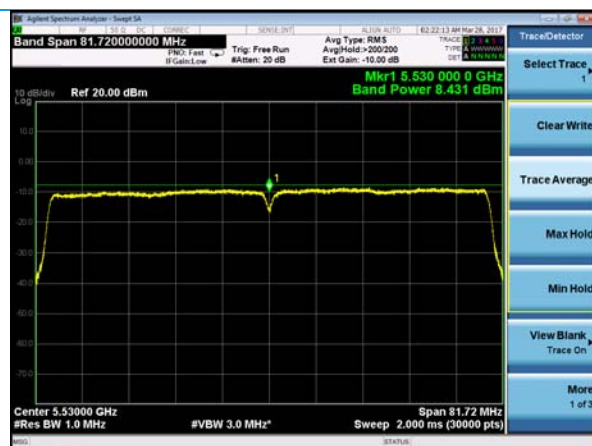
Model: Sterling-LWB5

Serial: 00008, 00035

## Plots – U-NII-2C Conducted Output Power, continued



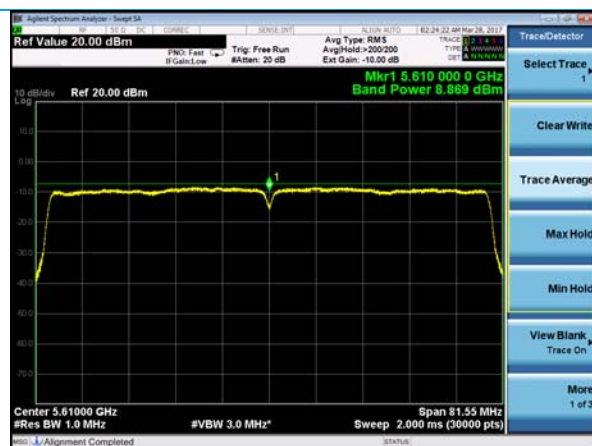
Low Channel – 802.11ac HT-40



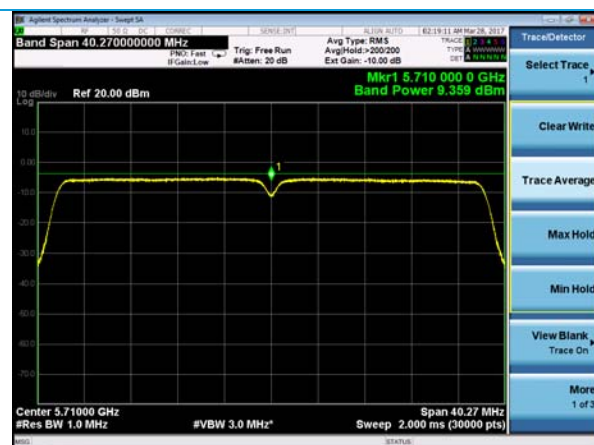
Low Channel – 802.11ac HT-80



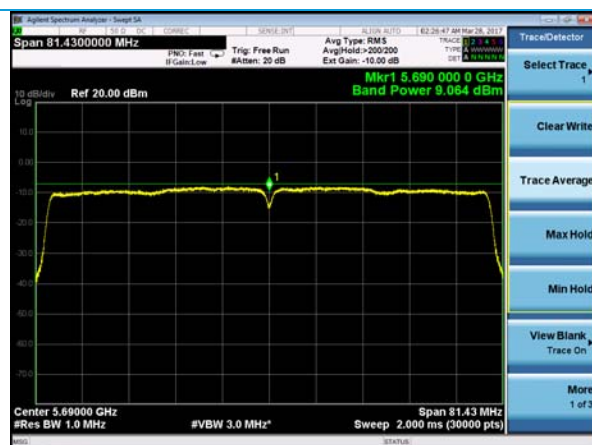
Mid Channel – 802.11ac HT-40



Mid Channel – 802.11ac HT-80



High Channel – 802.11ac HT-40



High Channel – 802.11ac HT-80

Company: LSR a Laird Business

Report: TR 316356 C (U-NII)

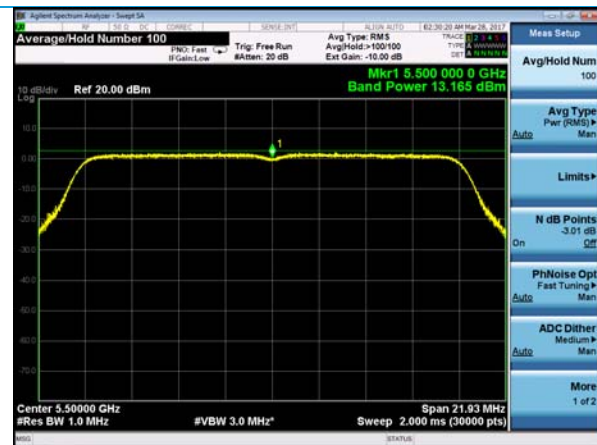
Job: C-2602

Name: Sterling-LWB5

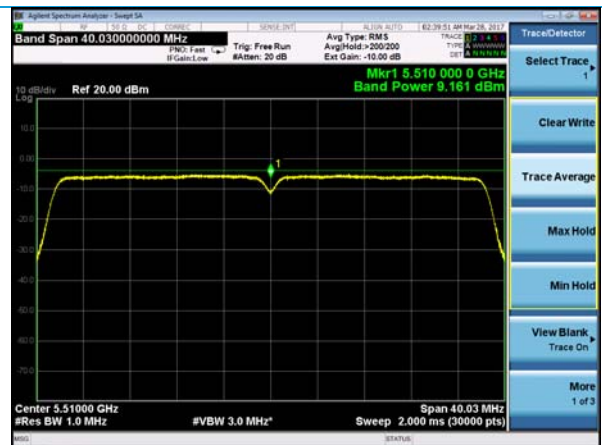
Model: Sterling-LWB5

Serial: 00008, 00035

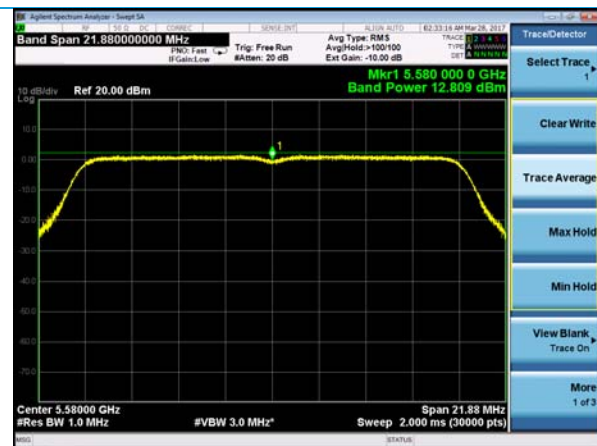
### Plots – U-NII-2C Conducted Output Power, continued



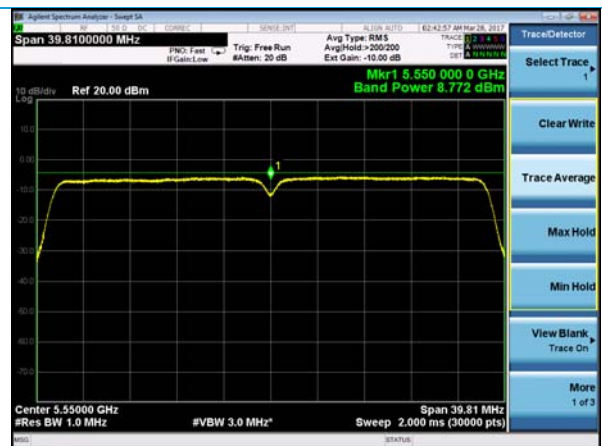
Low Channel – 802.11n HT-20



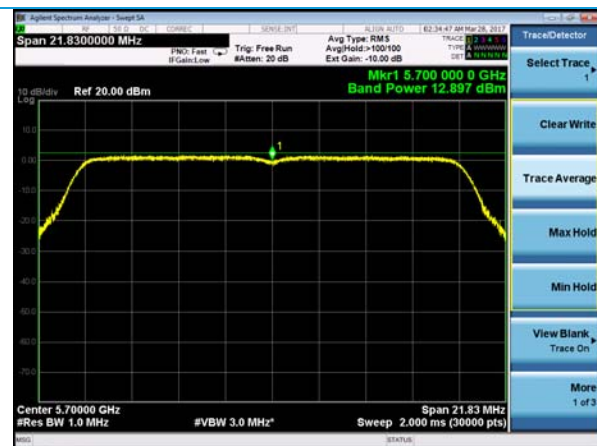
Low Channel – 802.11n HT-40



Mid Channel – 802.11n HT-20



Mid Channel – 802.11n HT-40

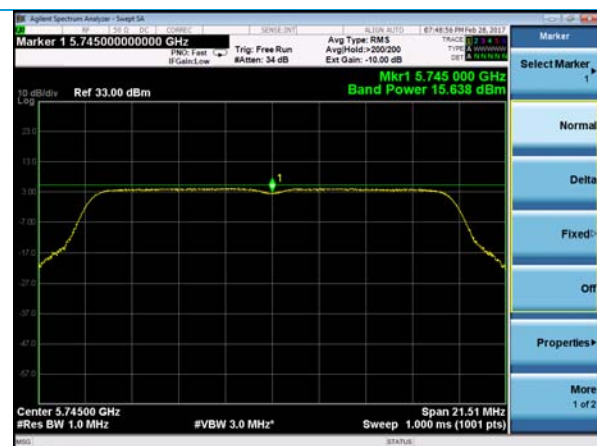


High Channel – 802.11n HT-20



High Channel – 802.11n HT-40

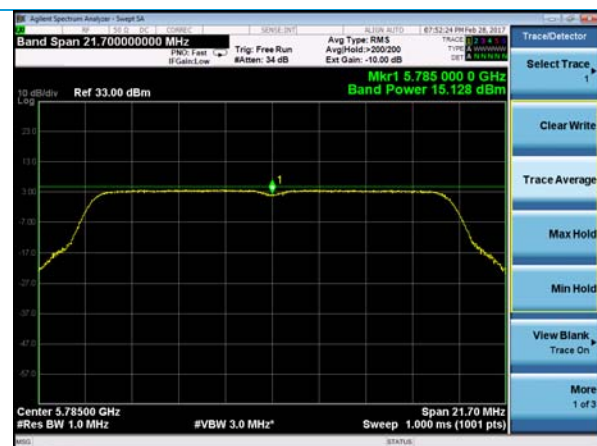
## Plots – U-NII-3 Conducted Output Power



Low Channel – 802.11a HT-20



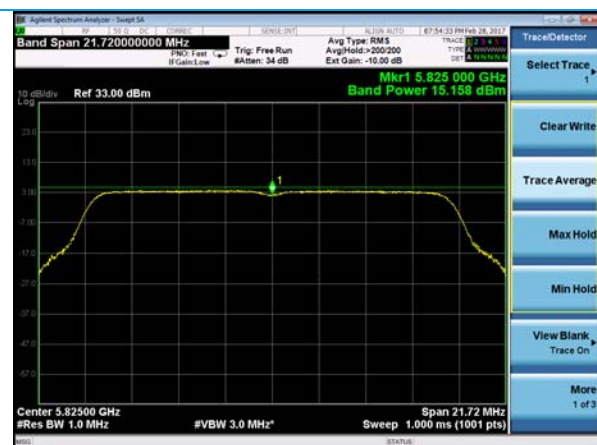
Low Channel – 802.11ac HT-20



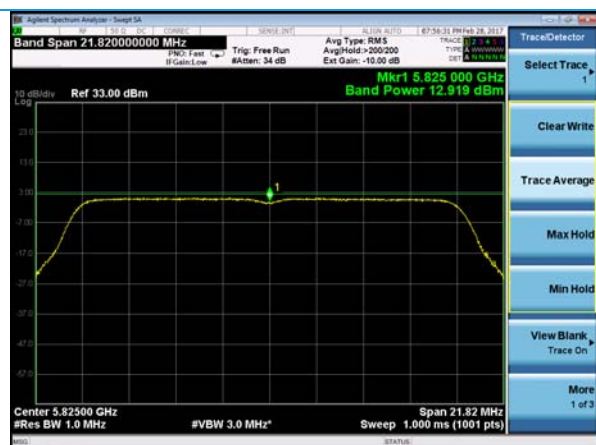
Mid Channel – 802.11a HT-20



Mid Channel – 802.11ac HT-20



High Channel – 802.11a HT-20



High Channel – 802.11ac HT-20

Company: LSR a Laird Business

Report: TR 316356 C (U-NII)

Job: C-2602

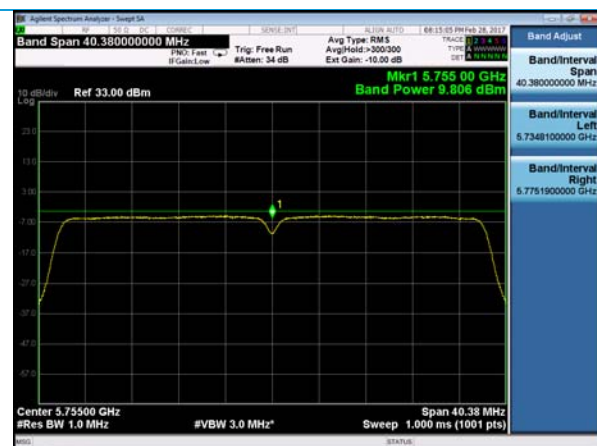
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Name: Sterling-LWB5

Model: Sterling-LWB5

Serial: 00008, 00035

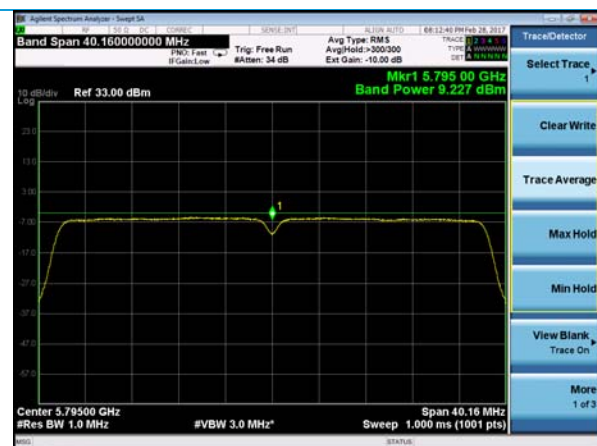
## Plots – U-NII-3 Conducted Output Power, continued



Low Channel – 802.11ac HT-40



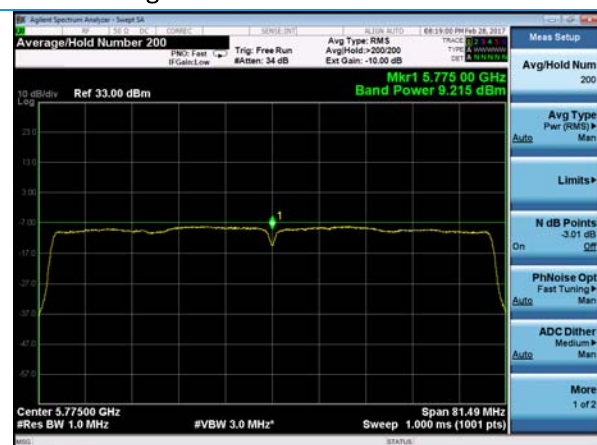
Low Channel – 802.11n HT-20



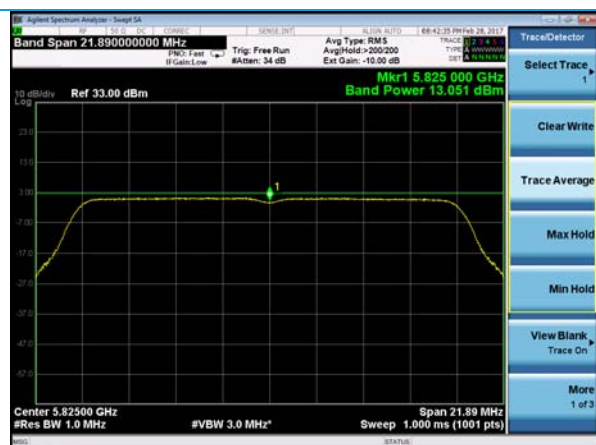
High Channel – 802.11ac HT-40



Mid Channel – 802.11n HT-20



Only Channel – 802.11ac HT-40



High Channel – 802.11n HT-20

Company: LSR a Laird Business

Report: TR 316356 C (U-NII)

Job: C-2602

Name: Sterling-LWB5

Model: Sterling-LWB5

Serial: 00008, 00035

Plots – U-NII-3 Conducted Output Power, continued



Low Channel – 802.11n HT-40



High Channel – 802.11n HT-40

#### 5.1.4 Antenna Port Conducted Emissions – Power Spectral Density (PSD)

|                     |                                                                                                             |
|---------------------|-------------------------------------------------------------------------------------------------------------|
| <b>Operator</b>     | Kimberly Bay                                                                                                |
| <b>QA</b>           | Aidi Zainal / Shane Dock                                                                                    |
| <b>Test Date</b>    | U-NII-1: March 7, 2017; U-NII-2A: March 15, 2017<br>U-NII-2C: March 27-28, 2017; U-NII-3: February 28, 2017 |
| <b>Location</b>     | Conducted RF Test Bench                                                                                     |
| <b>Temp. / R.H.</b> | 21°- 22°C / 30%-43% RH                                                                                      |
| <b>Requirement</b>  | FCC 15.407 (a)(5)<br>RSS 247 Issue 2 Sections 6.2.1.1, 6.2.2.1, 6.2.3.1, 6.2.4.1                            |
| <b>Method</b>       | KDB 789033 D02 v01r04 Section II.F                                                                          |

#### Limits:

| U-NII Band | FCC Limit         | ISED Limit               |
|------------|-------------------|--------------------------|
| U-NII-1    | 11 dBm in 1 MHz   | 10 dBm in 1 MHz e.i.r.p. |
| U-NII-2A   | 11 dBm in 1 MHz   | 11 dBm in 1 MHz          |
| U-NII-2C   | 11 dBm in 1 MHz   | 11 dBm in 1 MHz          |
| U-NII-3    | 30 dBm in 500 kHz | 30 dBm in 500 kHz        |

## Test Parameters

|                                    |                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Settings</b>                    | <u>802.11a HT-20, 6 Mbps:</u><br>5180, 5200, 5220 (ISED only), 5240 (FCC only) MHz (U-NII-1)<br>5260, 5300, 5320 MHz (U-NII-2A)<br>5500, 5580, 5700 MHz (U-NII-2C)<br>5745, 5785, 5825 MHz (U-NII-3)                                                                                                                                                                        |
| <b>Settings</b>                    | <u>802.11ac HT-20, MCS0 :</u><br>5180, 5200, 5220 (ISED only), 5240 (FCC only)MHz (U-NII-1)<br>5260, 5300, 5320 MHz (U-NII-2A)<br>5500, 5580, 5720 MHz (U-NII-2C)<br>5745, 5785, 5825 MHz (U-NII-3)                                                                                                                                                                         |
| <b>Settings</b>                    | <u>802.11ac HT-40, MCS0:</u><br>5190, 5230 MHz (U-NII-1); 5270, 5310 MHz (U-NII-2A);<br>5510, 5550, 5710 MHz (U-NII-2C); 5755, 5795 MHz (U-NII-3)                                                                                                                                                                                                                           |
| <b>Settings</b>                    | <u>802.11ac HT-80, MCS0:</u><br>5210 MHz (U-NII-1); 5290 MHz (U-NII-2A);<br>5530, 5610 (FCC Only), 5690 MHz (U-NII-2C); 5775 MHz (U-NII-3)                                                                                                                                                                                                                                  |
| <b>Settings</b>                    | <u>802.11n HT-20, MCS0:</u><br>5180, 5200, 5220 (ISED only), 5240 (FCC only)MHz (U-NII-1)<br>5260, 5300, 5320 MHz (U-NII-2A)<br>5500, 5580, 5700 MHz (U-NII-2C)<br>5745, 5785, 5825 MHz (U-NII-3)                                                                                                                                                                           |
| <b>Settings</b>                    | <u>802.11n HT-40, MCS0:</u><br>5190, 5230 MHz, (U-NII-1); 5270, 5310 MHz(U-NII-2A);<br>5510, 5550, 5670 MHz(U-NII-2C); 5755, 5795 MHz (U-NII-3)                                                                                                                                                                                                                             |
| <b>Note</b>                        | Maximum antenna gain: 4 dBi                                                                                                                                                                                                                                                                                                                                                 |
| <b>Note</b>                        | <u>U-NII-3 RBW Adjustment</u> = $10 \log (500\text{kHz}/\text{RBW})$ to adjust for RBW setting of 100 kHz, rather than 500 kHz. Unable to set analyzer RBW to 500 kHz.                                                                                                                                                                                                      |
| <b>Note</b>                        | U-NII-1, U-NII-2A, and U-NII-3 each have only two HT-40 channels and one HT-80 channel.                                                                                                                                                                                                                                                                                     |
| <b>Note</b>                        | U-NII-2C 802.11ac HT-80 channel 5610 MHz tested here, but not used in Canada. U-NII-2C 802.11ac HT-80 has only two available ISED channels.                                                                                                                                                                                                                                 |
| <b>Example Calculations</b>        | <u>FCC Margin:</u> FCC PSD Limit – (PSD measurement + correction factor)<br>Ex: $11 \text{ dBm/MHz} - (3.853 \text{ dBm} + 0.132) = 7.015 \text{ dB FCC margin}$<br><u>ISED Margin:</u> ISED EIRP PSD Limit – (PSD measurement + correction factor + antenna gain)<br>Ex: $10 \text{ dBm/MHz} - (3.853 \text{ dBm} + 0.132 + 4 \text{ dBi}) = 2.015 \text{ dB ISED margin}$ |
| <b>U-NII-3 Example Calculation</b> | <u>Margin:</u> PSD Limit – (PSD measurement + correction factor + RWB adjustment [see note above])<br>Ex: $30 \text{ dBm}/500 \text{ kHz} - (-4.395 + 0.132 + 7) = 27.263 \text{ dB margin}$                                                                                                                                                                                |

## Instrumentation



Date : 6-Feb-2017 Type Test : Conducted RF Measurements Job # : C-2602  
Prepared By: Kim Customer : LSR Quote #: 316356

| No. | Asset #   | Description         | Manufacturer      | Model #       | Serial #   | Cal Date   | Cal Due Date | Equipment Status    |
|-----|-----------|---------------------|-------------------|---------------|------------|------------|--------------|---------------------|
| 1   | EE 960087 | Spectrum Analyzer   | Agilent           | N9010A        | MY53400236 | 12/22/2016 | 12/22/2017   | Active Calibration  |
| 2   | AA 960143 | Phasemeter          | Gore              | EKD01D01048.0 | 5546519    | 6/26/2015  | 6/25/2017    | Active Calibration  |
| 3   | AA 960172 | Cable - low loss 1m | A.H. Systems, Inc | SAC-26G-1     | 387        | 5/16/2016  | 5/16/2017    | Active Verification |

**Table – U-NII-1 PSD**

| Mode     | Data Rate | BW    | Frequency (MHz) | Correction Factor (dB) | PSD Measured (dBm) | PSD (dB) | FCC Limit (dBm/MHz) | FCC Margin (dB) | ISED EIRP Limit (dBm/MHz) | ISED Margin (dB) |
|----------|-----------|-------|-----------------|------------------------|--------------------|----------|---------------------|-----------------|---------------------------|------------------|
| 802.11a  | 6 Mbps    | HT-20 | 5180            | 0.132                  | 3.853              | 3.985    | 11                  | 7.015           | 10                        | 2.015            |
| 802.11a  | 6 Mbps    | HT-20 | 5200            | 0.132                  | 3.784              | 3.916    | 11                  | 7.084           | 10                        | 2.084            |
| 802.11a  | 6 Mbps    | HT-20 | 5220 (ISED)     | 0.132                  | 3.736              | 3.868    | 11                  | 7.132           | 10                        | 2.132            |
| 802.11a  | 6 Mbps    | HT-20 | 5240 (FCC)      | 0.132                  | 3.530              | 3.662    | 11                  | 7.338           | 10                        | 2.338            |
| 802.11ac | MCS0      | HT-20 | 5180            | 0.132                  | 1.388              | 1.52     | 11                  | 9.48            | 10                        | 4.48             |
| 802.11ac | MCS0      | HT-20 | 5200            | 0.132                  | 1.412              | 1.544    | 11                  | 9.456           | 10                        | 4.456            |
| 802.11ac | MCS0      | HT-20 | 5220 (ISED)     | 0.132                  | 1.308              | 1.44     | 11                  | 9.56            | 10                        | 4.56             |
| 802.11ac | MCS0      | HT-20 | 5240 (FCC)      | 0.132                  | 1.169              | 1.301    | 11                  | 9.699           | 10                        | 4.699            |
| 802.11ac | MCS0      | HT-40 | 5190            | 0.292                  | -5.013             | -4.721   | 11                  | 15.721          | 10                        | 10.721           |
| 802.11ac | MCS0      | HT-40 | 5230            | 0.292                  | -4.972             | -4.68    | 11                  | 15.68           | 10                        | 10.68            |
| 802.11ac | MCS0      | HT-80 | 5210            | 0.555                  | -8.393             | -7.838   | 11                  | 18.838          | 10                        | 13.838           |
| 802.11n  | MCS0      | HT-20 | 5180            | 0.132                  | 1.472              | 1.604    | 11                  | 9.396           | 10                        | 4.396            |
| 802.11n  | MCS0      | HT-20 | 5200            | 0.132                  | 1.55               | 1.682    | 11                  | 9.318           | 10                        | 4.318            |
| 802.11n  | MCS0      | HT-20 | 5220 (ISED)     | 0.132                  | 1.498              | 1.63     | 11                  | 9.37            | 10                        | 4.37             |
| 802.11n  | MCS0      | HT-20 | 5240 (FCC)      | 0.132                  | 1.412              | 1.544    | 11                  | 9.456           | 10                        | 4.456            |
| 802.11n  | MCS0      | HT-40 | 5190            | 0.292                  | -5.036             | -4.744   | 11                  | 15.744          | 10                        | 10.744           |
| 802.11n  | MCS0      | HT-40 | 5230            | 0.292                  | -5.381             | -5.089   | 11                  | 16.089          | 10                        | 11.089           |

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Name: Sterling-LWB5

Model: Sterling-LWB5

Serial: 00008, 00035

**Table – U-NII-2A PSD**

| Mode     | Data Rate | BW    | Frequency (MHz) | Correction Factor (dB) | PSD Measured (dBm) | PSD (dB) | PSD Limit (dBm/MHz) | PSD Margin (dB) |
|----------|-----------|-------|-----------------|------------------------|--------------------|----------|---------------------|-----------------|
| 802.11a  | 6 Mbps    | HT-20 | 5260            | 0.132                  | 2.554              | 2.686    | 11                  | 8.314           |
| 802.11a  | 6 Mbps    | HT-20 | 5300            | 0.132                  | 2.736              | 2.868    | 11                  | 8.132           |
| 802.11a  | 6 Mbps    | HT-20 | 5320            | 0.132                  | 1.564              | 1.696    | 11                  | 9.304           |
| 802.11ac | MCS0      | HT-20 | 5260            | 0.177                  | 0.458              | 0.635    | 11                  | 10.365          |
| 802.11ac | MCS0      | HT-20 | 5300            | 0.177                  | 0.067              | 0.244    | 11                  | 10.756          |
| 802.11ac | MCS0      | HT-20 | 5320            | 0.177                  | 0.181              | 0.358    | 11                  | 10.642          |
| 802.11ac | MCS0      | HT-40 | 5270            | 0.386                  | -6.597             | -6.211   | 11                  | 17.211          |
| 802.11ac | MCS0      | HT-40 | 5310            | 0.386                  | -6.662             | -6.276   | 11                  | 17.276          |
| 802.11ac | MCS0      | HT-80 | 5290            | 0.580                  | -9.794             | -9.214   | 11                  | 20.214          |
| 802.11n  | MCS0      | HT-20 | 5260            | 0.223                  | 0.262              | 0.485    | 11                  | 10.515          |
| 802.11n  | MCS0      | HT-20 | 5300            | 0.223                  | 0.138              | 0.361    | 11                  | 10.639          |
| 802.11n  | MCS0      | HT-20 | 5320            | 0.223                  | 0.253              | 0.476    | 11                  | 10.524          |
| 802.11n  | MCS0      | HT-40 | 5270            | 0.339                  | -6.639             | -6.300   | 11                  | 17.300          |
| 802.11n  | MCS0      | HT-40 | 5310            | 0.339                  | -6.703             | -6.364   | 11                  | 17.364          |

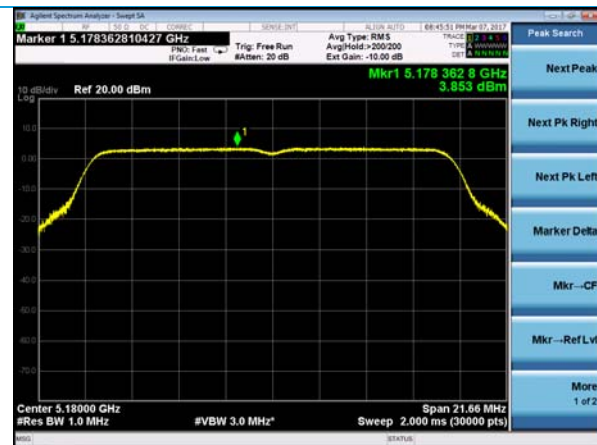
**Table – U-NII- 2C PSD**

| Mode     | Data Rate | BW    | Frequency (MHz) | Correction Factor (dB) | PSD Measured (dBm) | PSD (dB) | PSD Limit (dBm/MHz) | PSD Margin (dB) |
|----------|-----------|-------|-----------------|------------------------|--------------------|----------|---------------------|-----------------|
| 802.11a  | 6 Mbps    | HT-20 | 5500            | 0.000                  | 3.362              | 3.362    | 11                  | 7.638           |
| 802.11a  | 6 Mbps    | HT-20 | 5580            | 0.000                  | 4.458              | 4.458    | 11                  | 6.542           |
| 802.11a  | 6 Mbps    | HT-20 | 5700            | 0.000                  | 4.382              | 4.382    | 11                  | 6.618           |
| 802.11ac | MCS0      | HT-20 | 5500            | 0.000                  | 1.410              | 1.41     | 11                  | 9.590           |
| 802.11ac | MCS0      | HT-20 | 5580            | 0.000                  | 1.755              | 1.755    | 11                  | 9.245           |
| 802.11ac | MCS0      | HT-20 | 5710            | 0.000                  | 2.166              | 2.166    | 11                  | 8.834           |
| 802.11ac | MCS0      | HT-40 | 5510            | 0.315                  | -5.467             | -5.152   | 11                  | 16.152          |
| 802.11ac | MCS0      | HT-40 | 5550            | 0.315                  | -5.435             | -5.12    | 11                  | 16.120          |
| 802.11ac | MCS0      | HT-40 | 5710            | 0.315                  | -5.520             | -5.205   | 11                  | 16.205          |
| 802.11ac | MCS0      | HT-80 | 5530            | 0.580                  | -8.509             | -7.929   | 11                  | 18.929          |
| 802.11ac | MCS0      | HT-80 | 5610            | 0.580                  | -8.238             | -7.658   | 11                  | 18.658          |
| 802.11ac | MCS0      | HT-80 | 5690            | 0.580                  | -8.204             | -7.624   | 11                  | 18.624          |
| 802.11n  | MCS0      | HT-20 | 5500            | 0.000                  | 1.979              | 1.979    | 11                  | 9.021           |
| 802.11n  | MCS0      | HT-20 | 5580            | 0.000                  | 2.143              | 2.143    | 11                  | 8.857           |
| 802.11n  | MCS0      | HT-20 | 5700            | 0.000                  | 1.807              | 1.807    | 11                  | 9.193           |
| 802.11n  | MCS0      | HT-40 | 5510            | 0.315                  | -5.742             | -5.427   | 11                  | 16.427          |
| 802.11n  | MCS0      | HT-40 | 5550            | 0.315                  | -5.342             | -5.027   | 11                  | 16.027          |
| 802.11n  | MCS0      | HT-40 | 5670            | 0.315                  | -5.360             | -5.045   | 11                  | 16.045          |

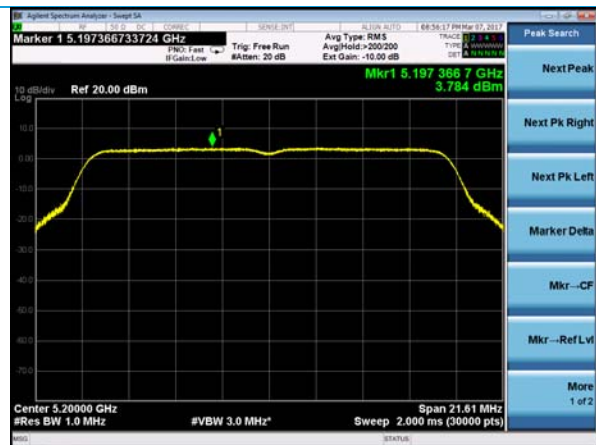
**Table – U-NII-3 PSD**

| Mode     | Data Rate | BW    | Frequency (MHz) | Correction Factor (dB) | PSD Measured (dBm) | RBW Adjustment (dB) | PSD (dB) | PSD Limit (dBm/500 kHz) | PSD Margin (dB) |
|----------|-----------|-------|-----------------|------------------------|--------------------|---------------------|----------|-------------------------|-----------------|
| 802.11a  | 6 Mbps    | HT-20 | 5745            | 0.132                  | -4.395             | 7                   | 2.737    | 30                      | 27.263          |
| 802.11a  | 6 Mbps    | HT-20 | 5785            | 0.132                  | -4.817             | 7                   | 2.315    | 30                      | 27.685          |
| 802.11a  | 6 Mbps    | HT-20 | 5825            | 0.132                  | -4.788             | 7                   | 2.344    | 30                      | 27.656          |
| 802.11ac | MCS0      | HT-20 | 5745            | 0.155                  | -7.566             | 7                   | -0.411   | 30                      | 30.411          |
| 802.11ac | MCS0      | HT-20 | 5785            | 0.155                  | -7.873             | 7                   | -0.718   | 30                      | 30.718          |
| 802.11ac | MCS0      | HT-20 | 5825            | 0.155                  | -7.924             | 7                   | -0.769   | 30                      | 30.769          |
| 802.11ac | MCS0      | HT-40 | 5755            | 0.315                  | -14.062            | 7                   | -6.747   | 30                      | 36.747          |
| 802.11ac | MCS0      | HT-40 | 5795            | 0.315                  | -14.367            | 7                   | -7.052   | 30                      | 37.052          |
| 802.11ac | MCS0      | HT-80 | 5775            | 0.555                  | -17.138            | 7                   | -9.583   | 30                      | 39.583          |
| 802.11n  | MCS0      | HT-20 | 5745            | 0.177                  | -7.323             | 7                   | -0.146   | 30                      | 30.146          |
| 802.11n  | MCS0      | HT-20 | 5785            | 0.177                  | -7.815             | 7                   | -0.638   | 30                      | 30.638          |
| 802.11n  | MCS0      | HT-20 | 5825            | 0.177                  | -7.615             | 7                   | -0.438   | 30                      | 30.438          |
| 802.11n  | MCS0      | HT-40 | 5755            | 0.315                  | -13.982            | 7                   | -6.667   | 30                      | 36.667          |
| 802.11n  | MCS0      | HT-40 | 5795            | 0.315                  | -14.371            | 7                   | -7.056   | 30                      | 37.056          |

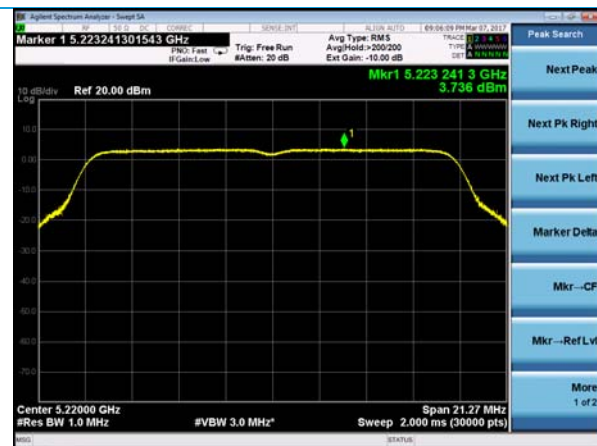
## Plots – U-NII-1 PSD



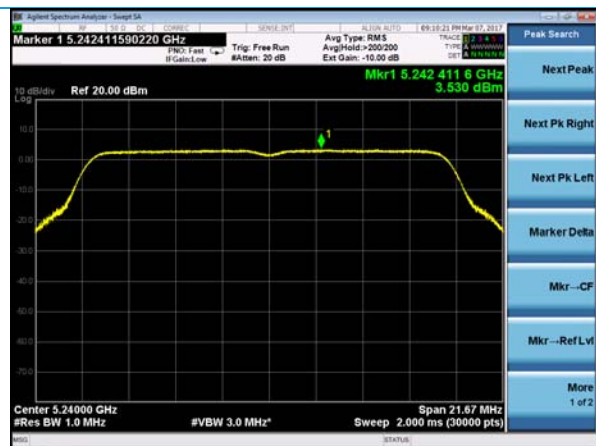
Low Channel – 802.11a HT-20



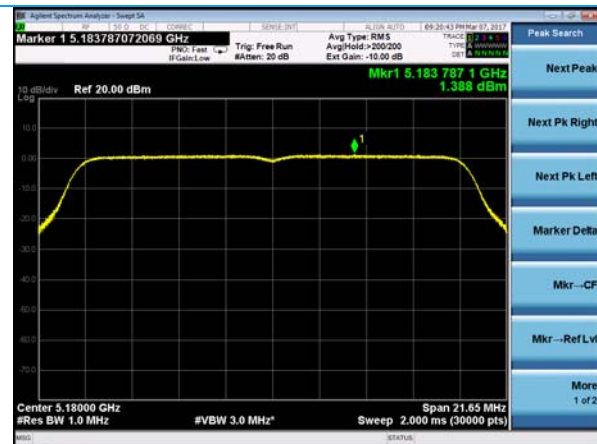
Mid Channel – 802.11a HT-20



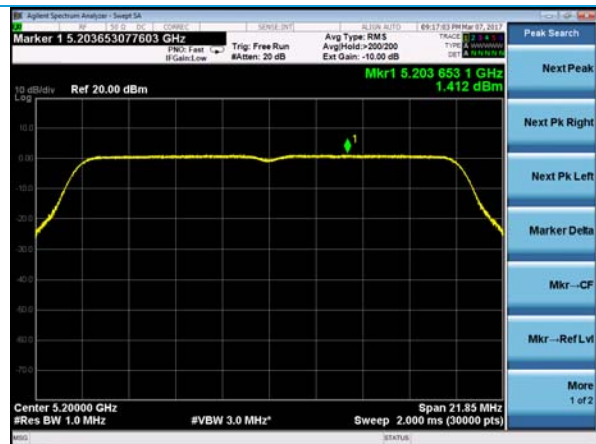
ISED High Channel – 802.11a HT-20



FCC High Channel – 802.11a HT-20



Low Channel – 802.11ac HT-20



Mid Channel – 802.11ac HT-20

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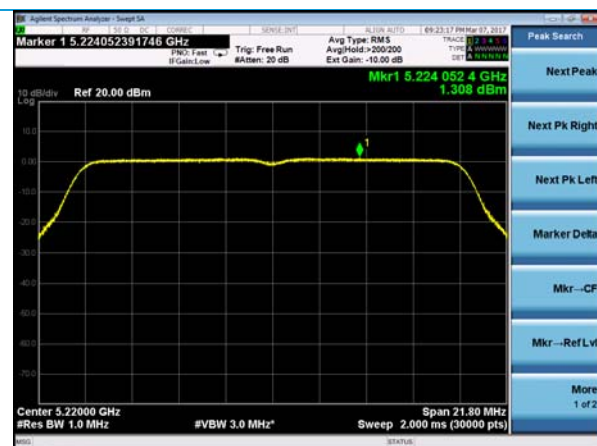
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Name: Sterling-LWB5

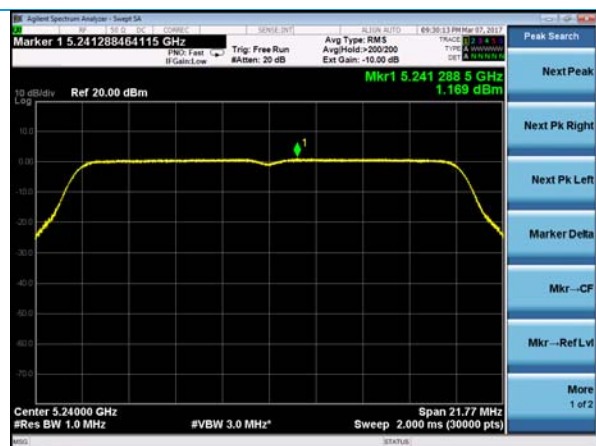
Model: Sterling-LWB5

Serial: 00008, 00035

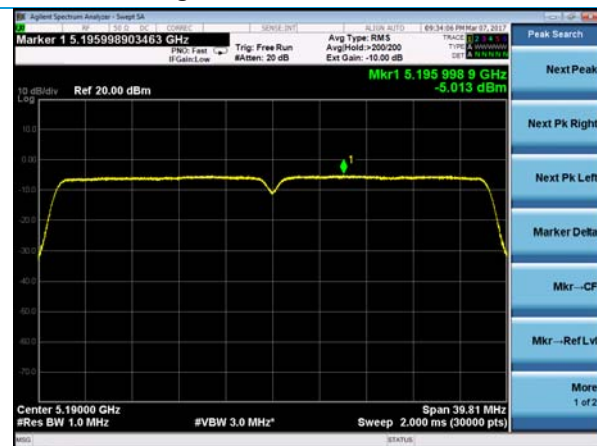
## Plots – U-NII-1 PSD, continued



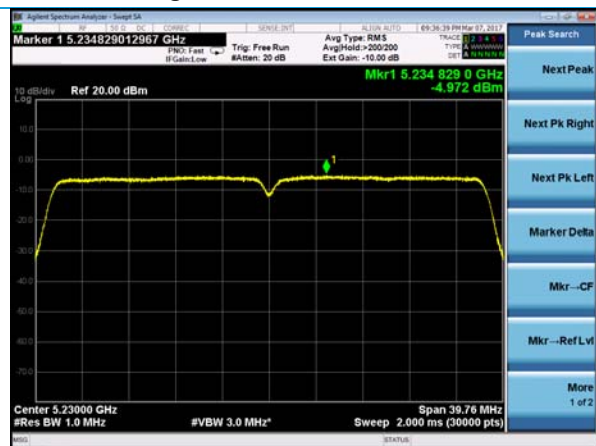
ISD High Channel – 802.11ac HT-20



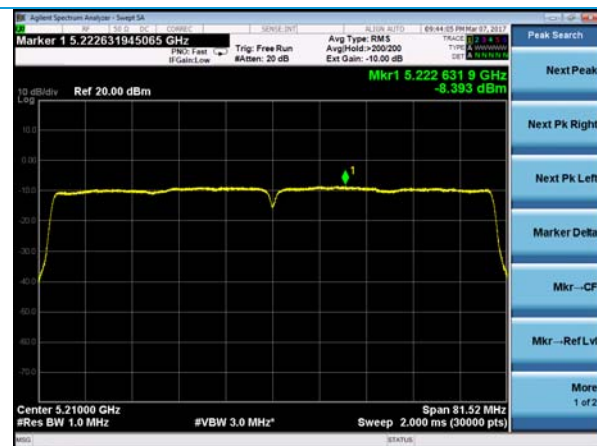
FCC High Channel – 802.11ac HT-20



Low Channel – 802.11ac HT-40



High Channel – 802.11ac HT-40



Only Channel – 802.11ac HT-40

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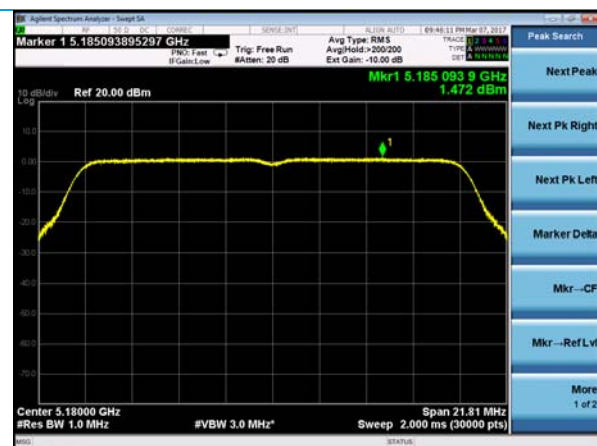
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Name: Sterling-LWB5

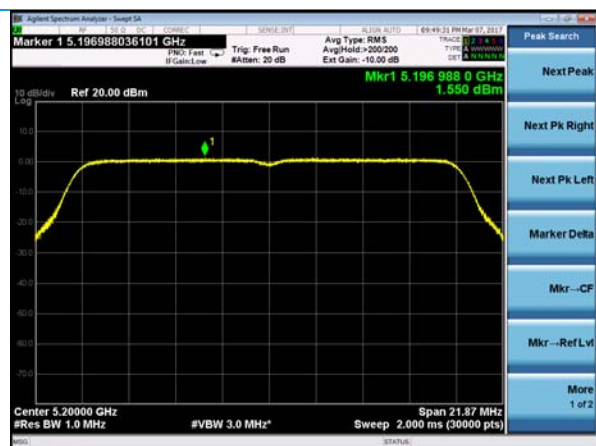
Model: Sterling-LWB5

Serial: 00008, 00035

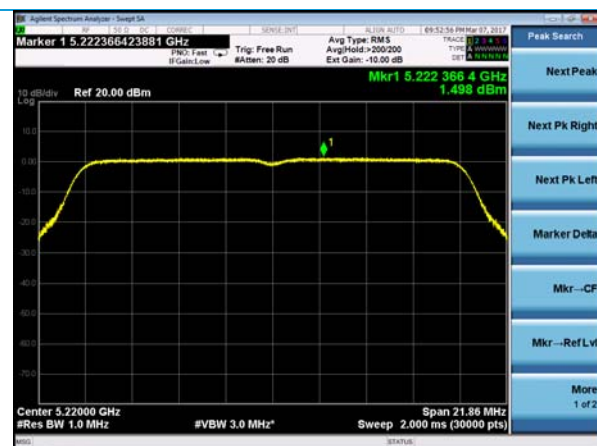
## Plots – U-NII-1 PSD, continued



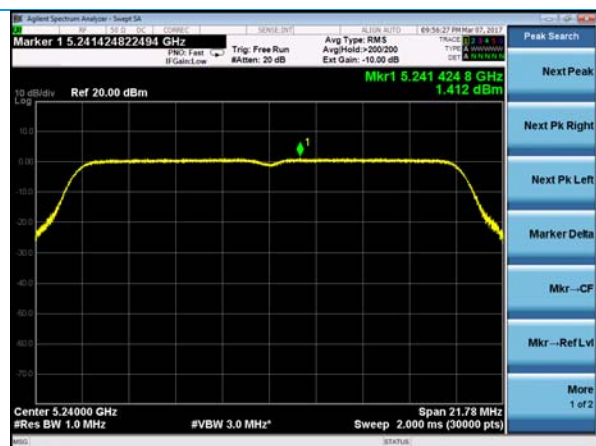
Low Channel – 802.11n HT-20



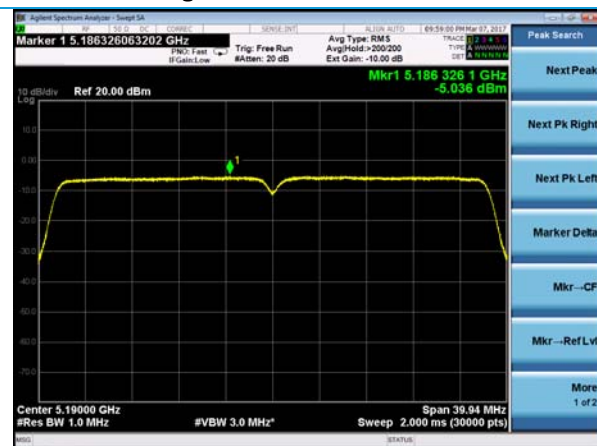
Mid Channel – 802.11n HT-20



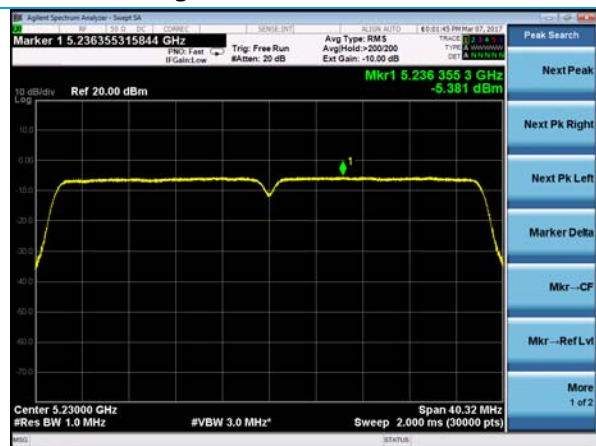
ISED High Channel – 802.11n HT-20



FCC High Channel – 802.11n HT-20



Low Channel – 802.11n HT-40



High Channel – 802.11n HT-40

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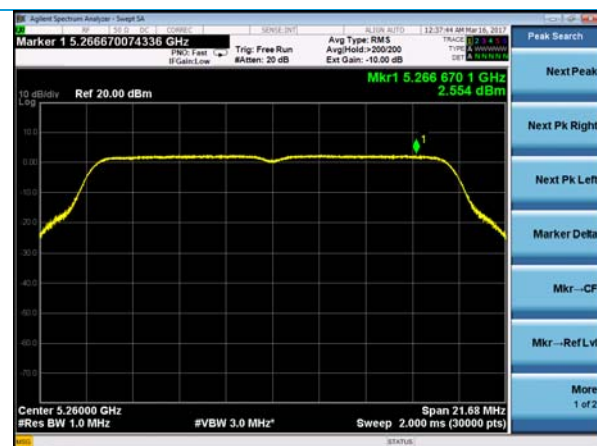
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Name: Sterling-LWB5

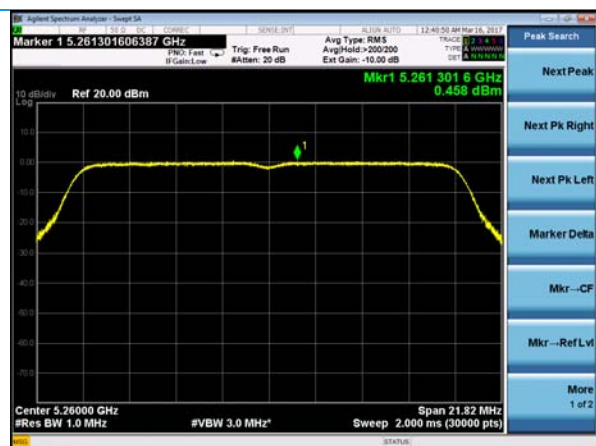
Model: Sterling-LWB5

Serial: 00008, 00035

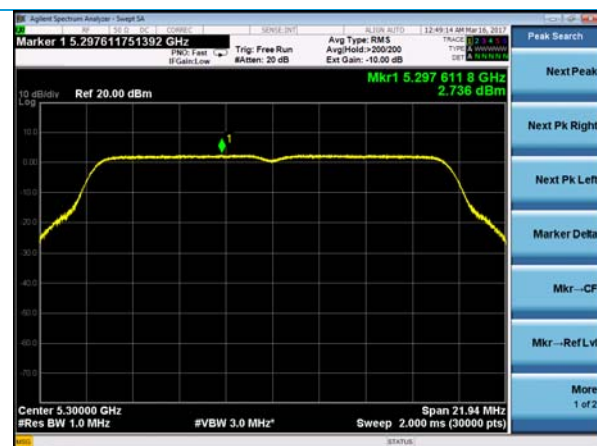
## Plots – U-NII-2A PSD



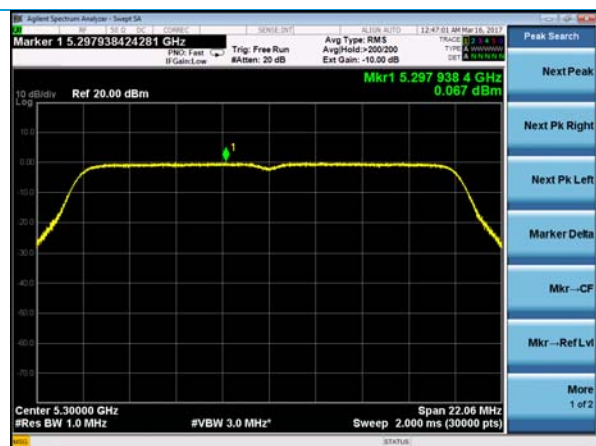
Low Channel – 802.11a HT-20



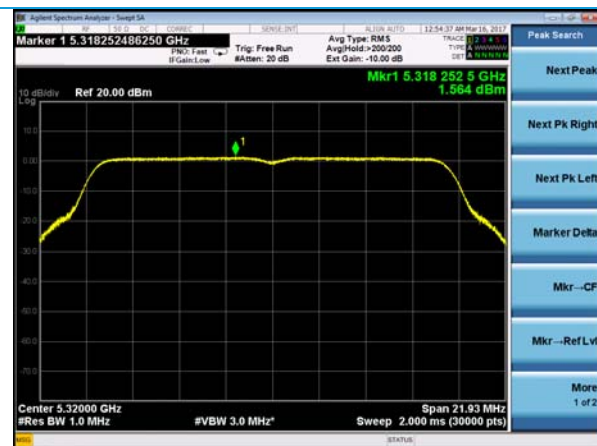
Low Channel 802.11ac HT-20



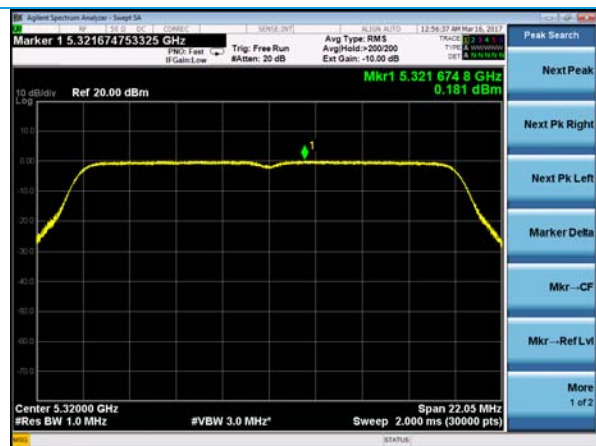
Mid Channel – 802.11a HT-20



Mid Channel – 802.11ac HT-20



High Channel – 802.11a HT-20



High Channel – 802.11ac HT-20

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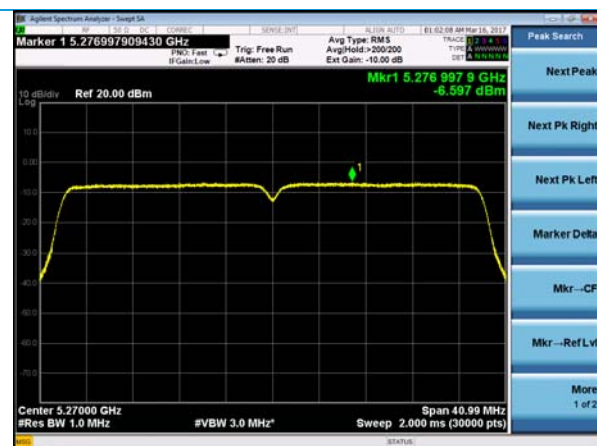
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Name: Sterling-LWB5

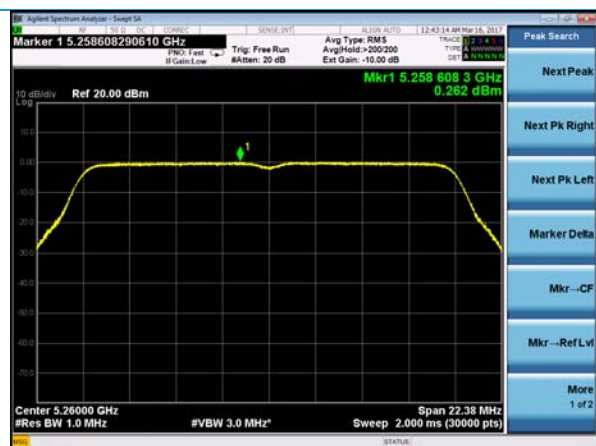
Model: Sterling-LWB5

Serial: 00008, 00035

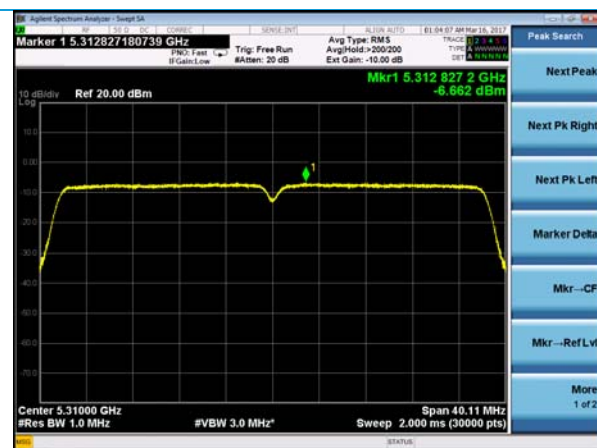
## Plots – U-NII-2A PSD, continued



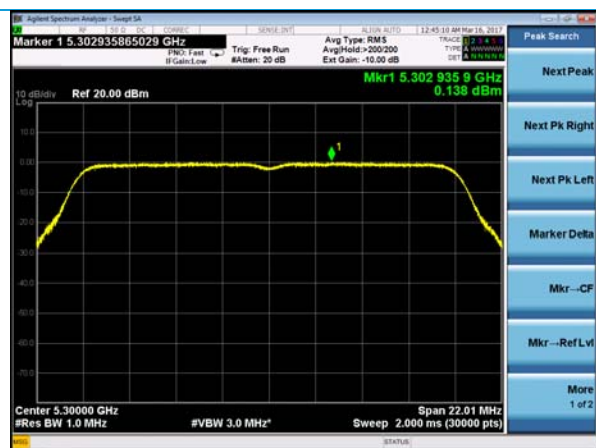
Low Channel – 802.11ac HT-40



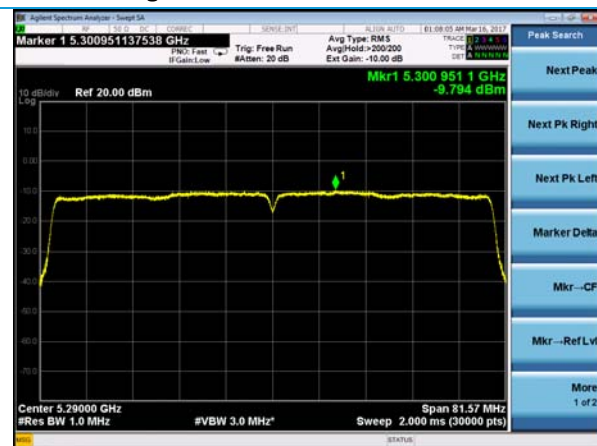
Low Channel – 802.11n HT-20



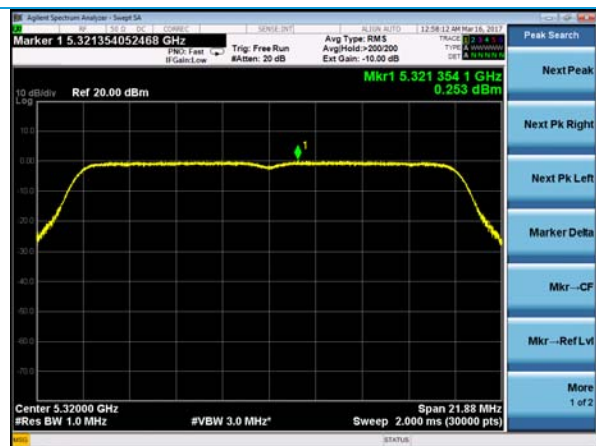
High Channel – 802.11ac HT-40



Mid Channel – 802.11n HT-20



Only Channel – 802.11ac HT-40



High Channel – 802.11n HT-20

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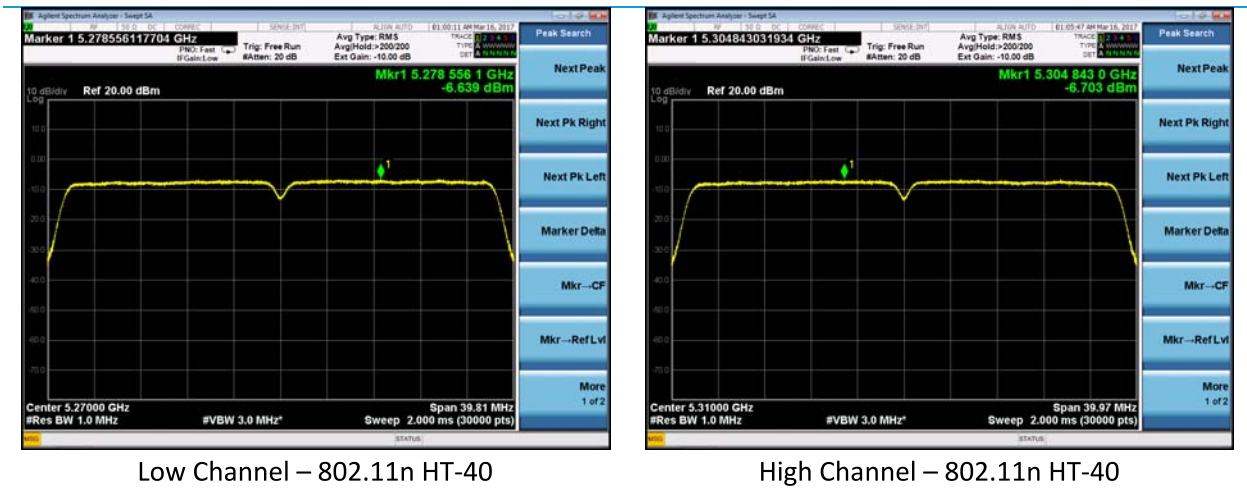
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Name: Sterling-LWB5

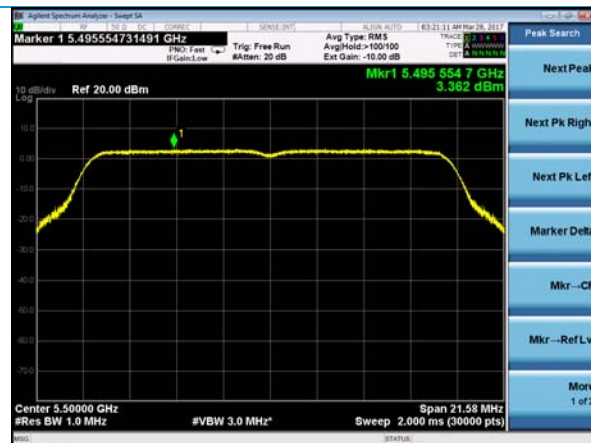
Model: Sterling-LWB5

Serial: 00008, 00035

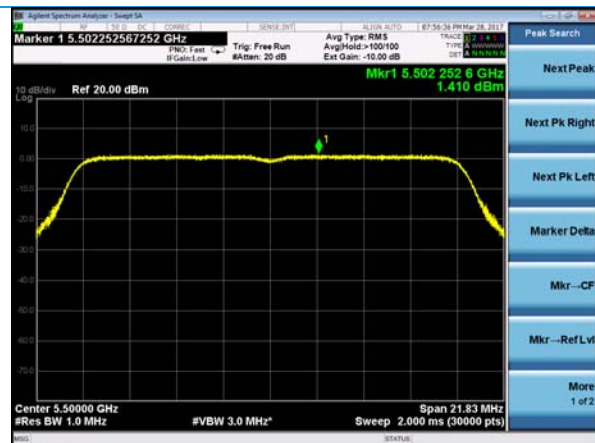
Plots – U-NII-2A PSD, continued



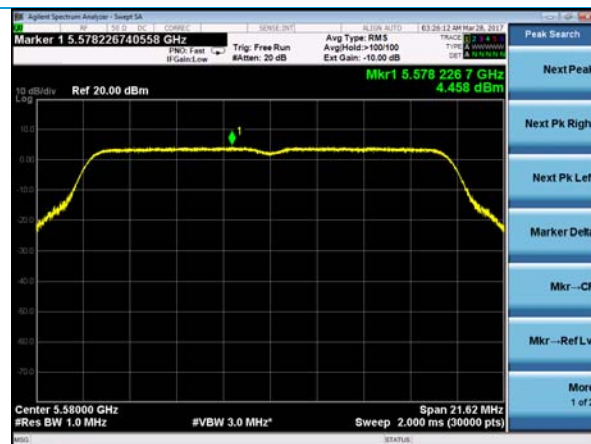
## Plots – U-NII-2C PSD



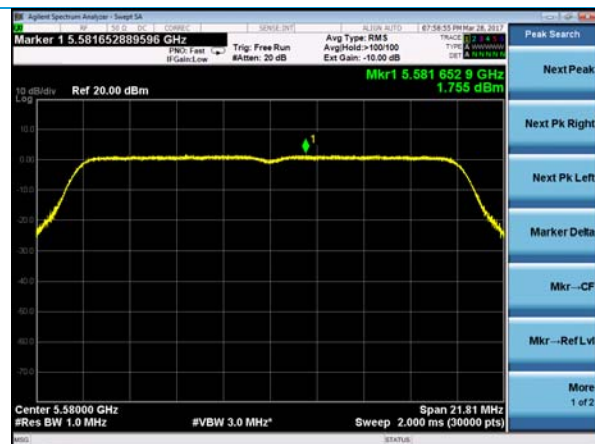
Low Channel – 802.11a HT-20



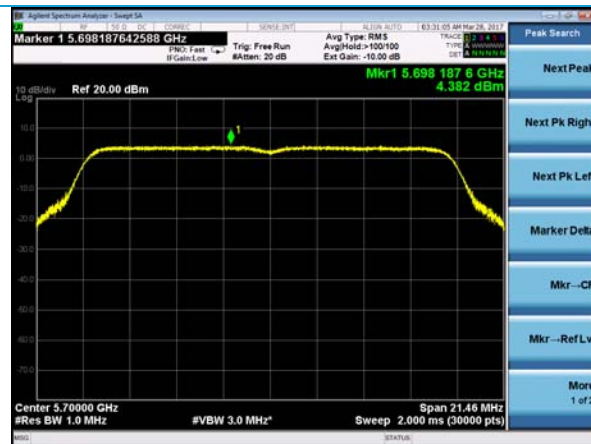
Low Channel – 802.11ac HT-20



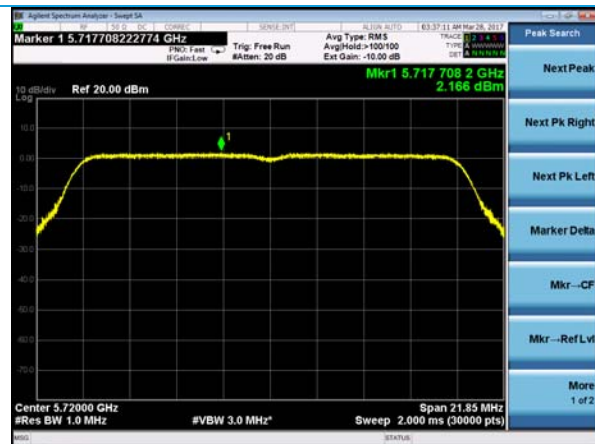
Mid Channel – 802.11a HT-20



Mid Channel – 802.11ac HT-20



High Channel – 802.11a HT-20



High Channel – 802.11ac HT-20

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