

## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240200030903

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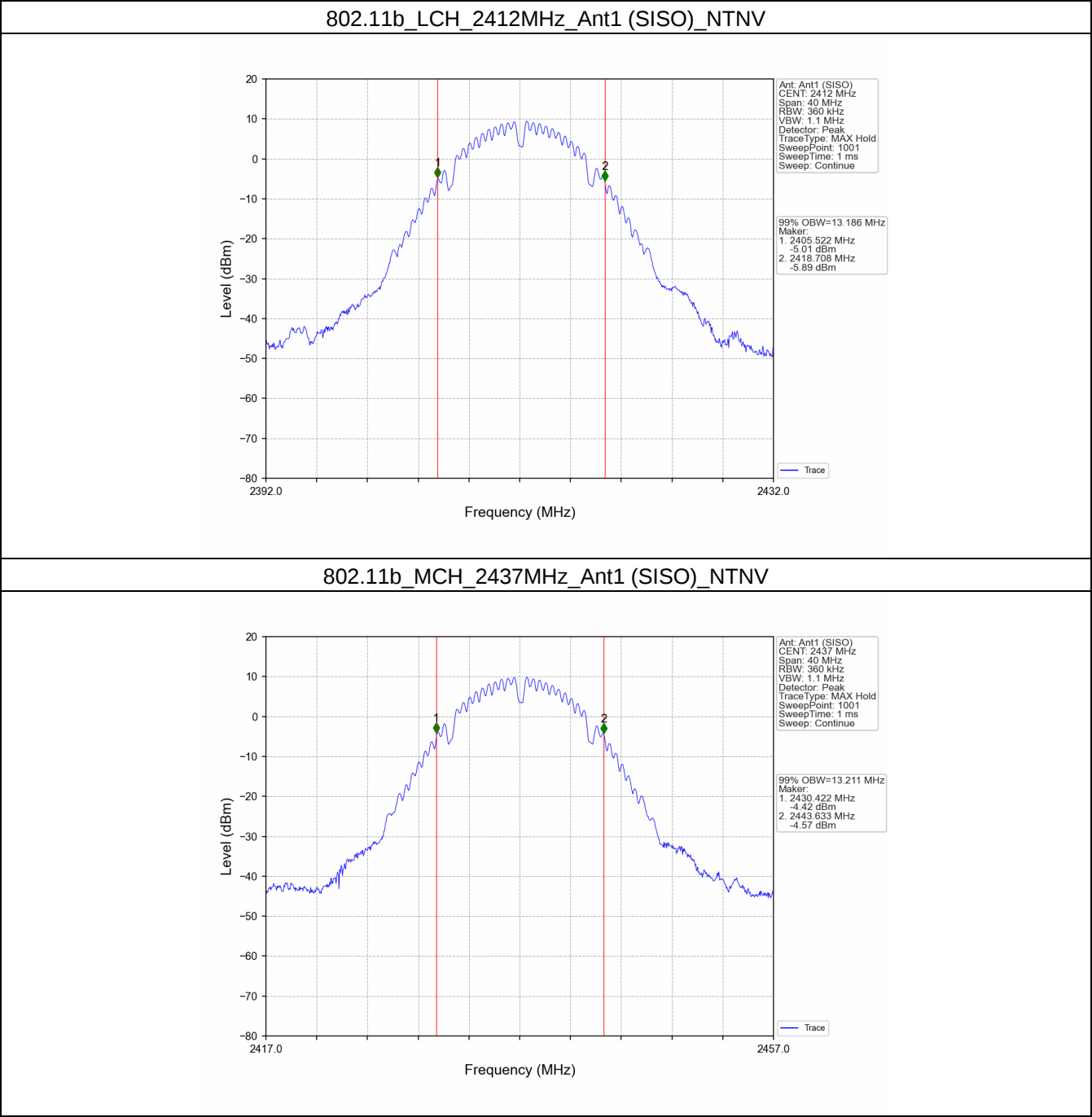
## 2. Bandwidth

### 2.1 OBW

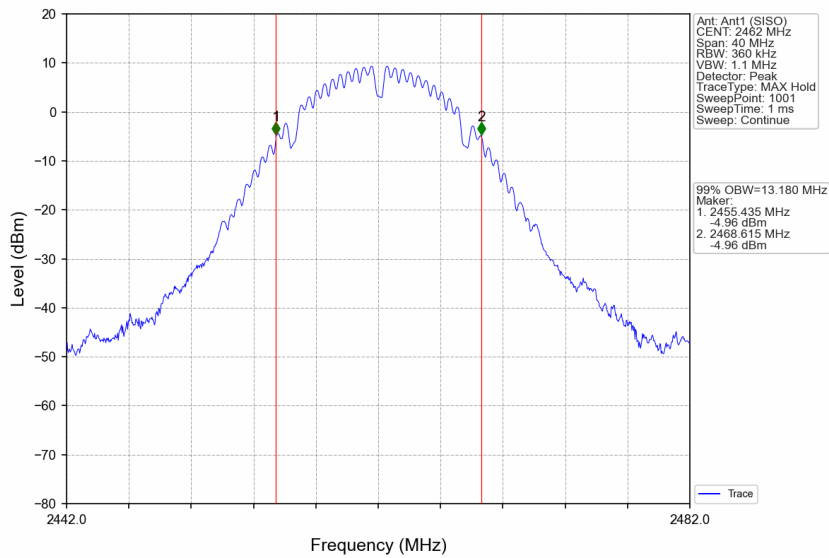
#### 2.1.1 Test Result

| Mode             | TX Type | Frequency (MHz) | RU    | RU Pos | ANT | 99% Occupied Bandwidth (MHz) |       | Verdict |
|------------------|---------|-----------------|-------|--------|-----|------------------------------|-------|---------|
|                  |         |                 |       |        |     | Result                       | Limit |         |
| 802.11b          | SISO    | 2412            | /     | /      | 1   | 13.186                       | /     | Pass    |
|                  |         | 2437            | /     | /      | 1   | 13.211                       | /     | Pass    |
|                  |         | 2462            | /     | /      | 1   | 13.180                       | /     | Pass    |
| 802.11g          | SISO    | 2412            | /     | /      | 1   | 16.915                       | /     | Pass    |
|                  |         | 2437            | /     | /      | 1   | 16.921                       | /     | Pass    |
|                  |         | 2462            | /     | /      | 1   | 16.952                       | /     | Pass    |
| 802.11n (HT20)   | MIMO    | 2412            | /     | /      | 1   | 18.020                       | /     | Pass    |
|                  |         | 2437            | /     | /      | 1   | 18.014                       | /     | Pass    |
|                  |         | 2462            | /     | /      | 1   | 18.057                       | /     | Pass    |
| 802.11n (HT40)   | MIMO    | 2422            | /     | /      | 1   | 36.263                       | /     | Pass    |
|                  |         | 2437            | /     | /      | 1   | 36.329                       | /     | Pass    |
|                  |         | 2452            | /     | /      | 1   | 36.412                       | /     | Pass    |
| 802.11ax (HEW20) | MIMO    | 2412            | RU242 | Left   | 1   | 19.202                       | /     | Pass    |
|                  |         | 2437            | RU242 | Left   | 1   | 19.205                       | /     | Pass    |
|                  |         | 2462            | RU242 | Left   | 1   | 19.244                       | /     | Pass    |
| 802.11ax (HEW40) | MIMO    | 2422            | RU484 | Left   | 1   | 38.064                       | /     | Pass    |
|                  |         | 2437            | RU484 | Left   | 1   | 38.098                       | /     | Pass    |
|                  |         | 2452            | RU484 | Left   | 1   | 38.124                       | /     | Pass    |

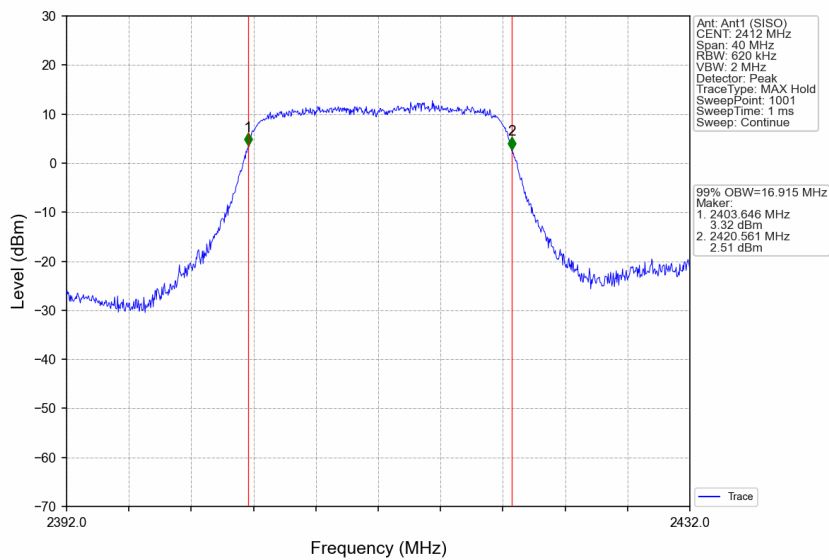
### 2.1.2 Test Graph



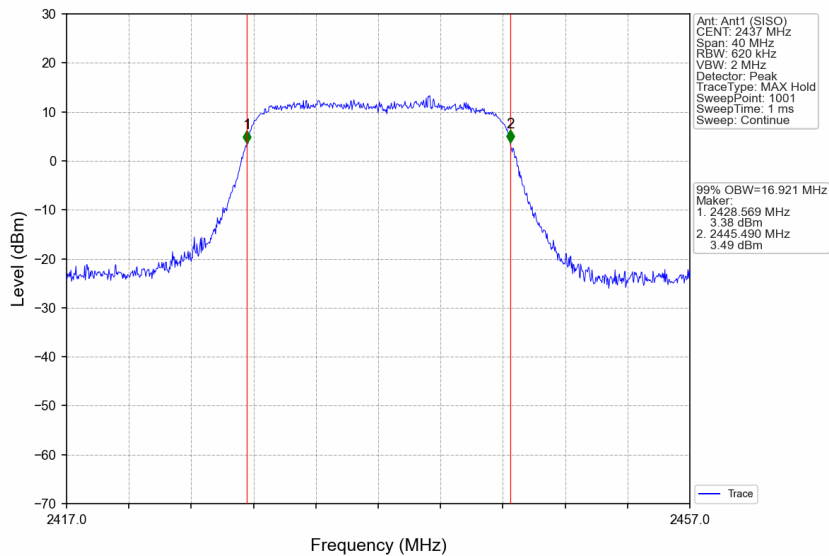
802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



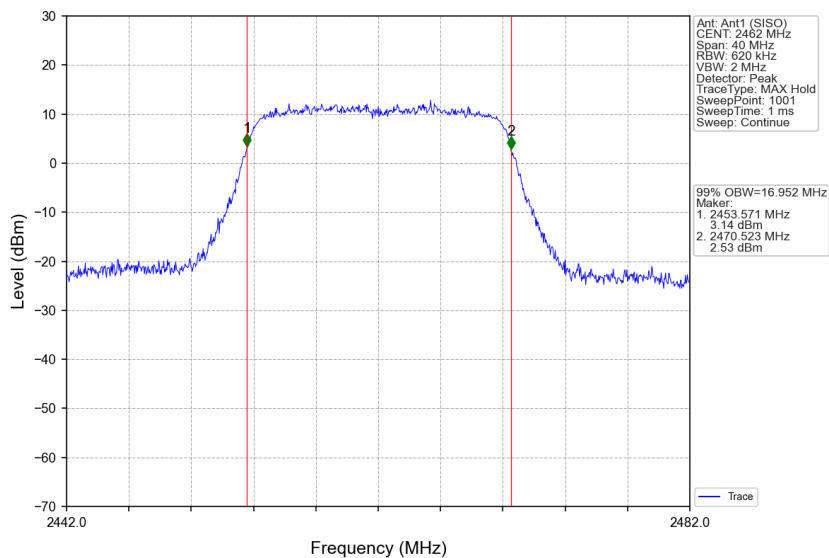
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



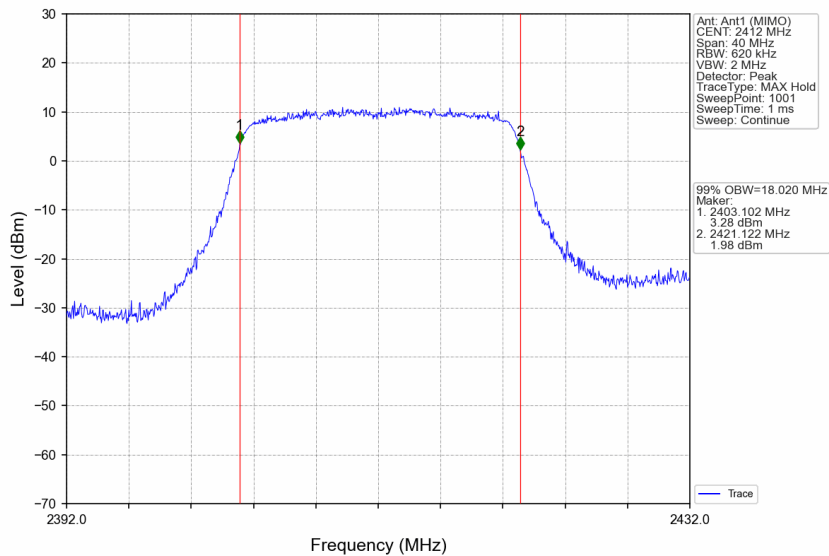
802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



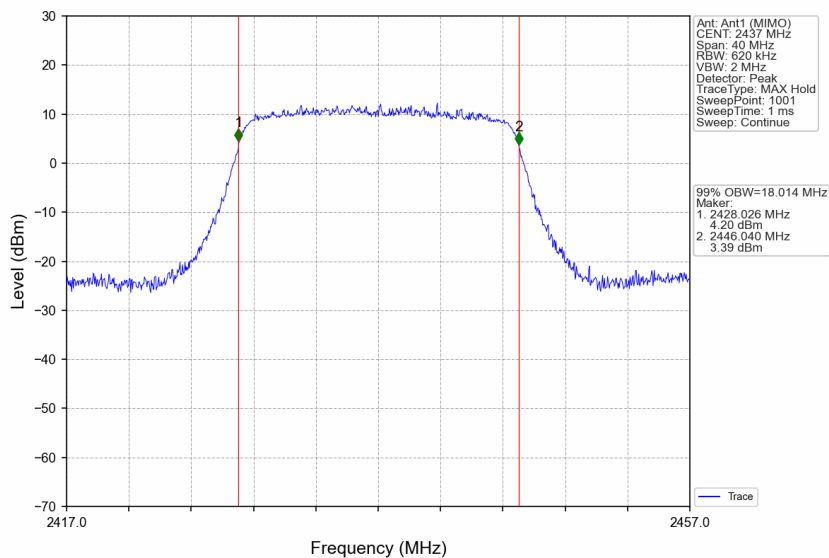
802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



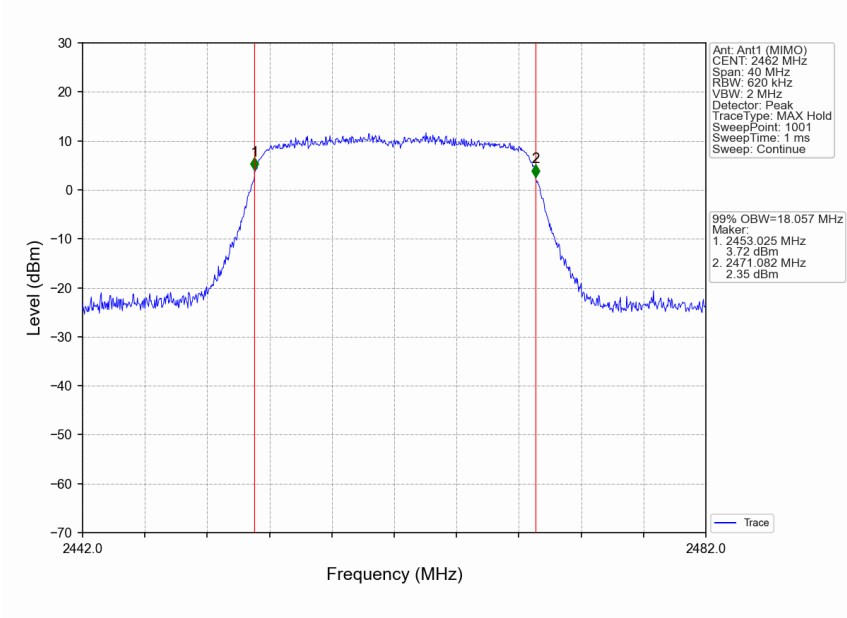
802.11n(HT20)\_LCH\_2412MHz\_Ant1 (MIMO)\_NTNV



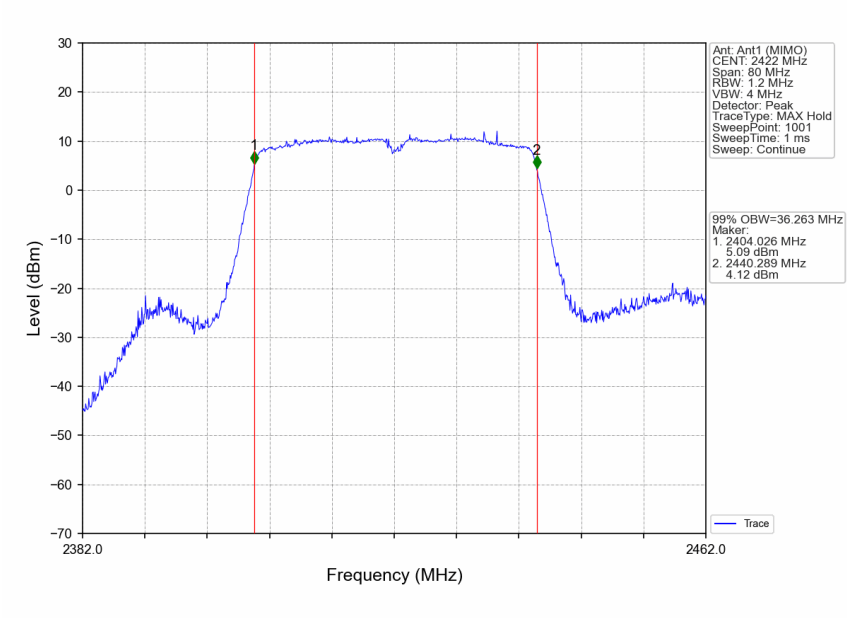
802.11n(HT20)\_MCH\_2437MHz\_Ant1 (MIMO)\_NTNV



802.11n(HT20)\_HCH\_2462MHz\_Ant1 (MIMO)\_NTNV



802.11n(HT40)\_LCH\_2422MHz\_Ant1 (MIMO)\_NTNV



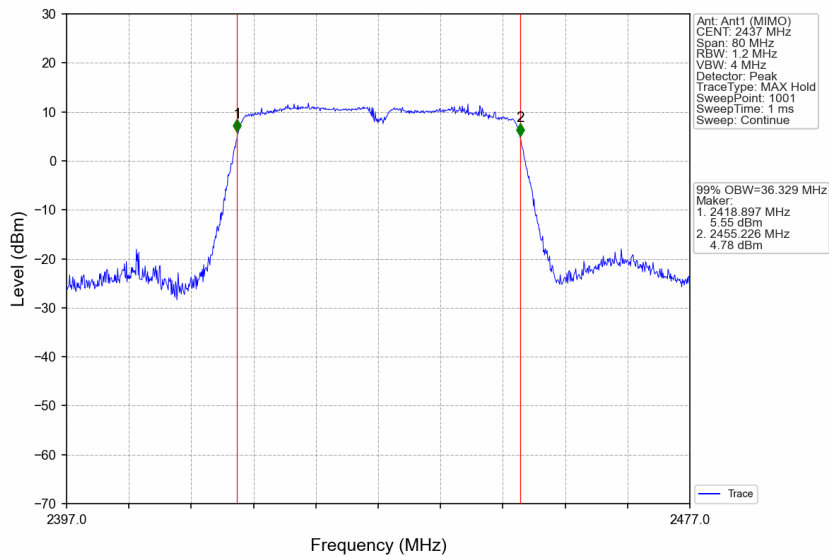
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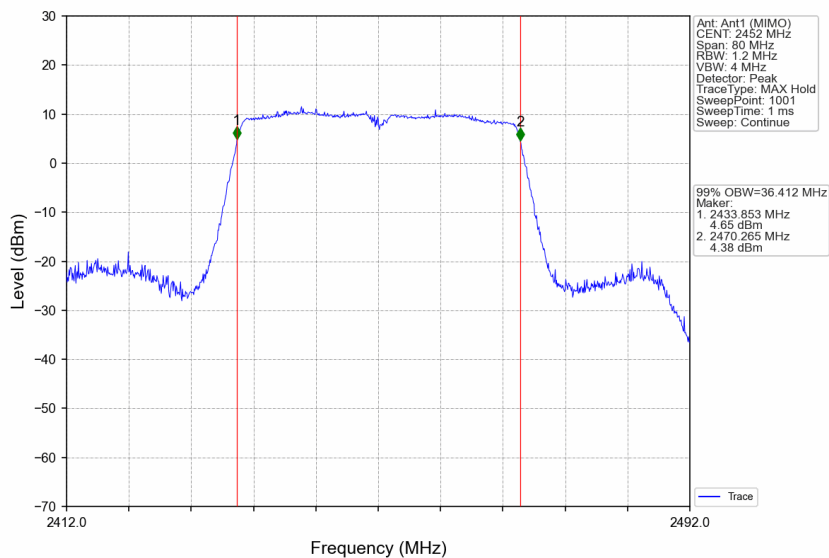
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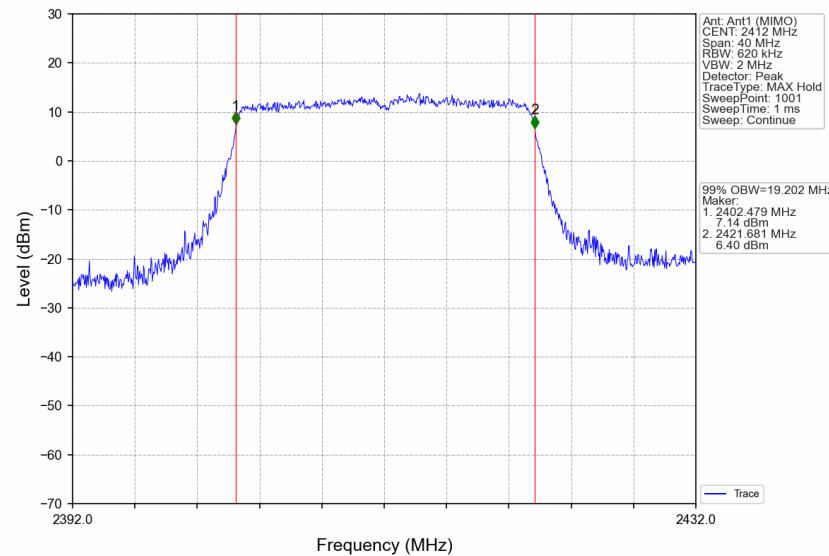
802.11n(HT40)\_MCH\_2437MHz\_Ant1 (MIMO)\_NTNV



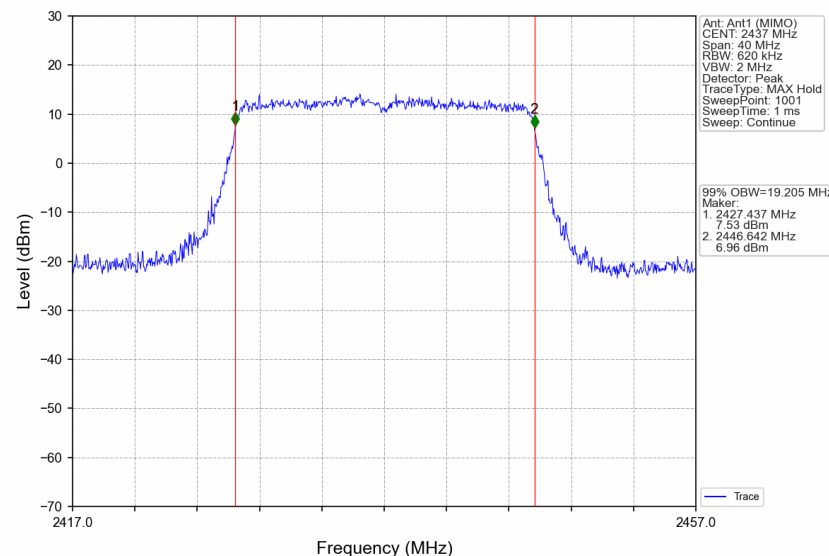
802.11n(HT40)\_HCH\_2452MHz\_Ant1 (MIMO)\_NTNV



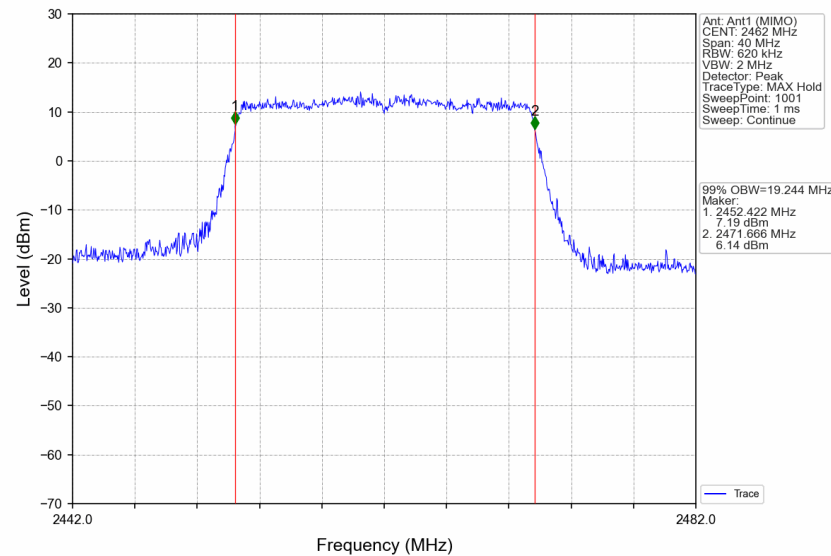
### 802.11ax(HEW20)\_LCH\_2412MHz\_RU242\_Left\_Ant1 (MIMO)\_NTNV



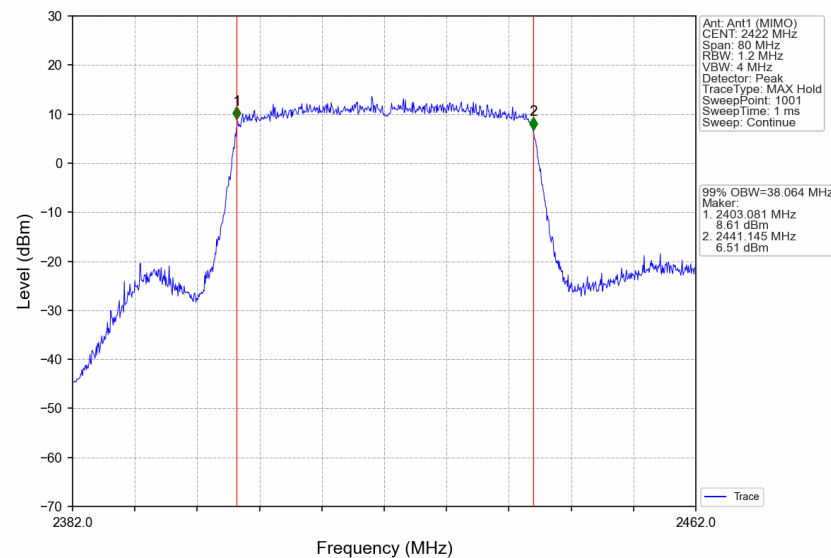
### 802.11ax(HEW20)\_MCH\_2437MHz\_RU242\_Left\_Ant1 (MIMO)\_NTNV



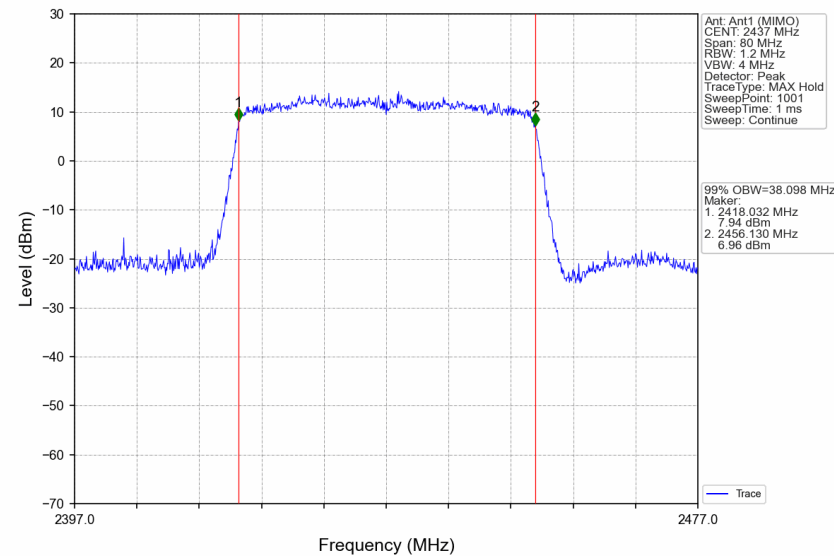
### 802.11ax(HEW20)\_HCH\_2462MHz\_RU242\_Left\_Ant1 (MIMO)\_NTNV



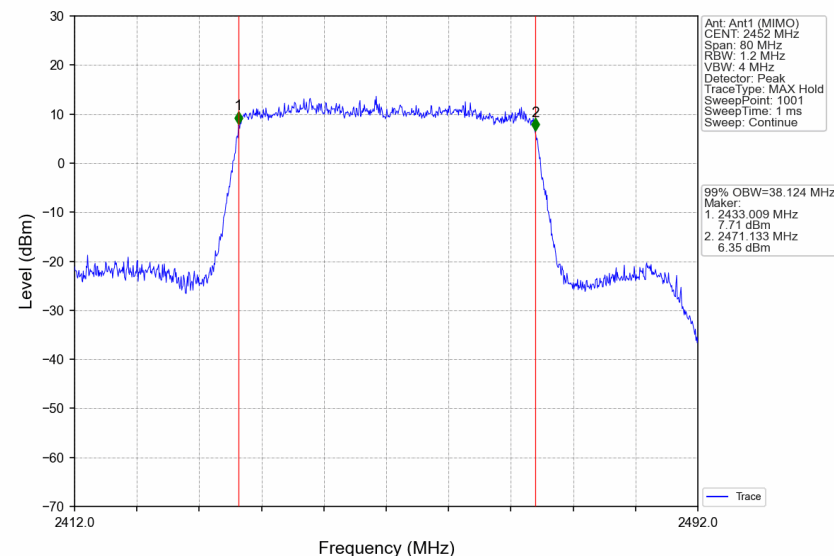
### 802.11ax(HEW40)\_LCH\_2422MHz\_RU484\_Left\_Ant1 (MIMO)\_NTNV



802.11ax(HEW40)\_MCH\_2437MHz\_RU484\_Left\_Ant1 (MIMO)\_NTNV



802.11ax(HEW40)\_HCH\_2452MHz\_RU484\_Left\_Ant1 (MIMO)\_NTNV



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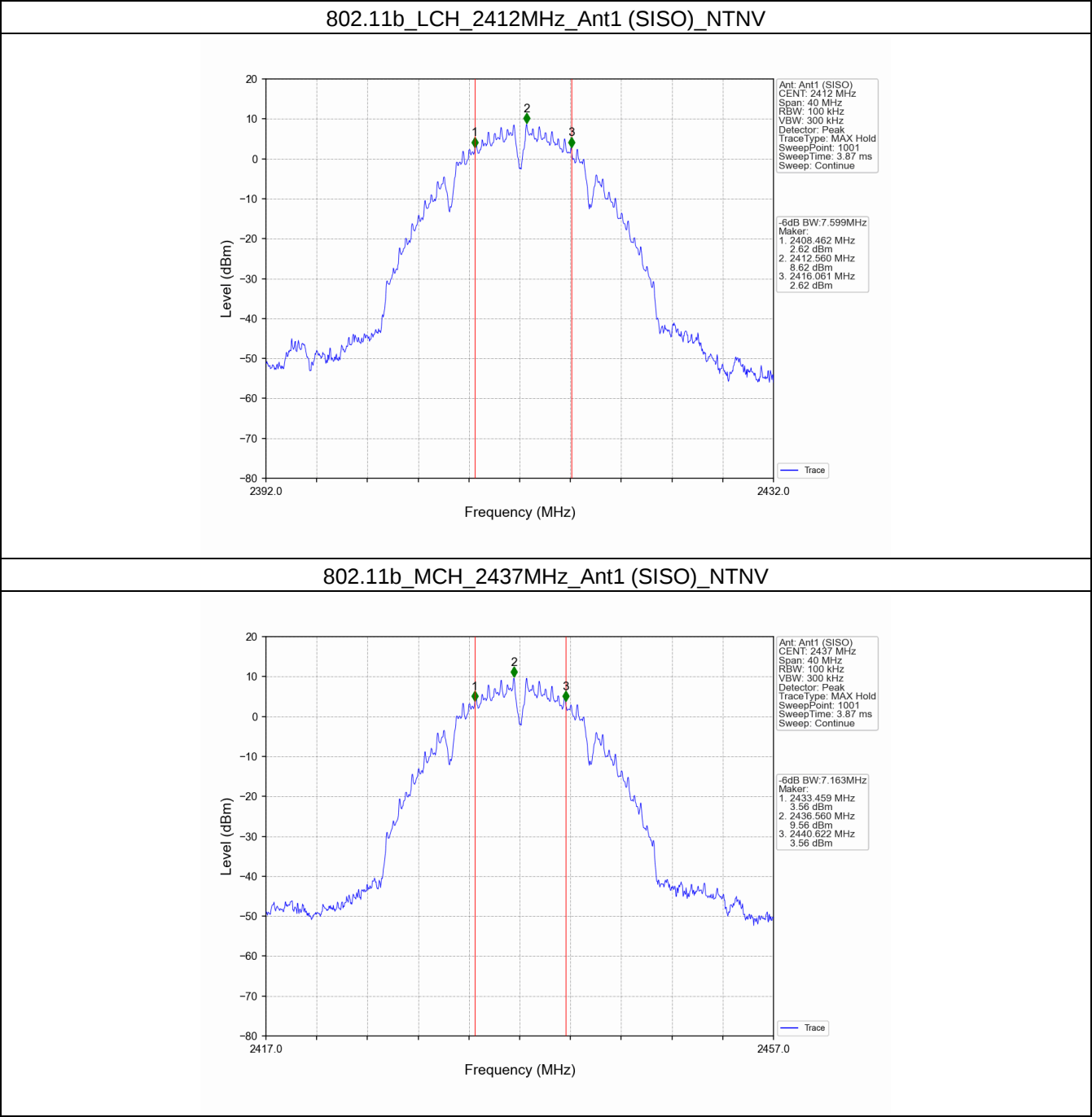
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### 2.2 6dB BW

#### 2.2.1 Test Result

| Mode             | TX Type | Frequency (MHz) | RU    | RU Pos | ANT | 6dB Bandwidth (MHz) |            | Verdict |
|------------------|---------|-----------------|-------|--------|-----|---------------------|------------|---------|
|                  |         |                 |       |        |     | Result              | Limit      |         |
| 802.11b          | SISO    | 2412            | /     | /      | 1   | 7.599               | $\geq 0.5$ | Pass    |
|                  |         | 2437            | /     | /      | 1   | 7.163               | $\geq 0.5$ | Pass    |
|                  |         | 2462            | /     | /      | 1   | 7.630               | $\geq 0.5$ | Pass    |
| 802.11g          | SISO    | 2412            | /     | /      | 1   | 16.355              | $\geq 0.5$ | Pass    |
|                  |         | 2437            | /     | /      | 1   | 16.364              | $\geq 0.5$ | Pass    |
|                  |         | 2462            | /     | /      | 1   | 16.352              | $\geq 0.5$ | Pass    |
| 802.11n (HT20)   | MIMO    | 2412            | /     | /      | 1   | 17.323              | $\geq 0.5$ | Pass    |
|                  |         | 2437            | /     | /      | 1   | 17.328              | $\geq 0.5$ | Pass    |
|                  |         | 2462            | /     | /      | 1   | 17.538              | $\geq 0.5$ | Pass    |
| 802.11n (HT40)   | MIMO    | 2422            | /     | /      | 1   | 35.668              | $\geq 0.5$ | Pass    |
|                  |         | 2437            | /     | /      | 1   | 35.411              | $\geq 0.5$ | Pass    |
|                  |         | 2452            | /     | /      | 1   | 35.935              | $\geq 0.5$ | Pass    |
| 802.11ax (HEW20) | MIMO    | 2412            | RU242 | Left   | 1   | 18.778              | $\geq 0.5$ | Pass    |
|                  |         | 2437            | RU242 | Left   | 1   | 18.930              | $\geq 0.5$ | Pass    |
|                  |         | 2462            | RU242 | Left   | 1   | 18.977              | $\geq 0.5$ | Pass    |
| 802.11ax (HEW40) | MIMO    | 2422            | RU484 | Left   | 1   | 37.754              | $\geq 0.5$ | Pass    |
|                  |         | 2437            | RU484 | Left   | 1   | 37.534              | $\geq 0.5$ | Pass    |
|                  |         | 2452            | RU484 | Left   | 1   | 37.883              | $\geq 0.5$ | Pass    |

### 2.2.2 Test Graph



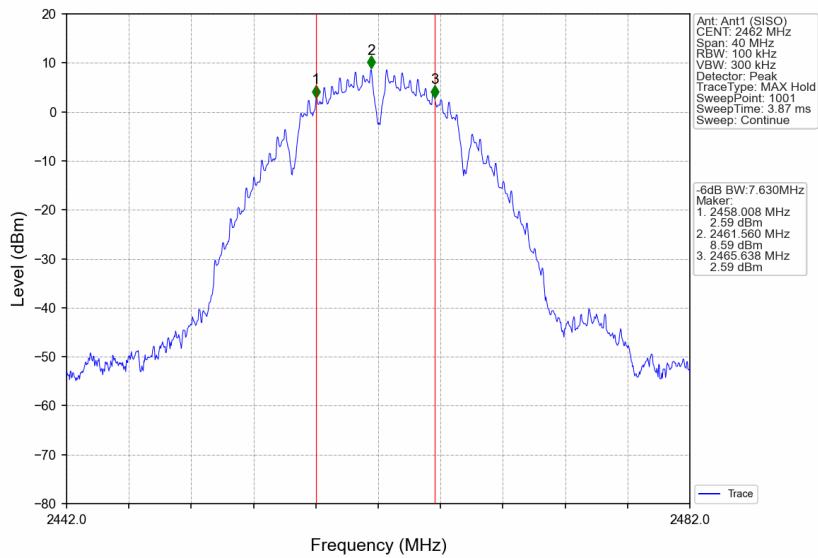
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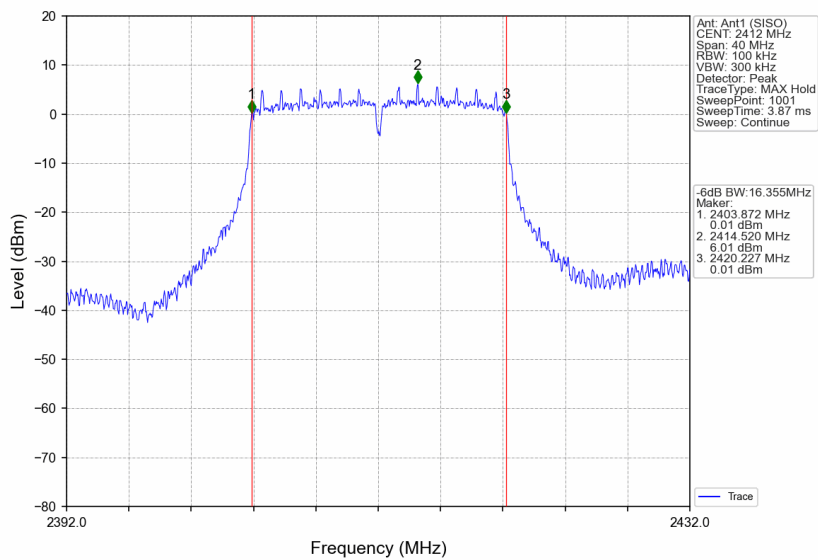
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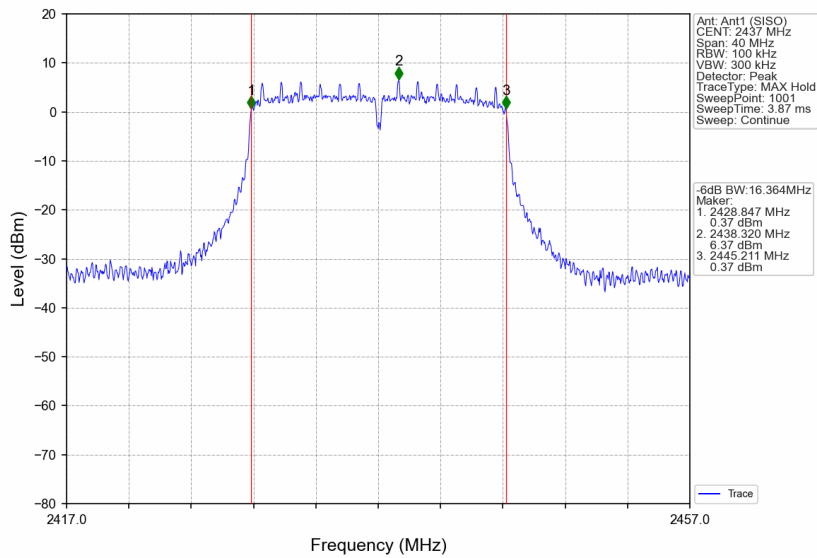
802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



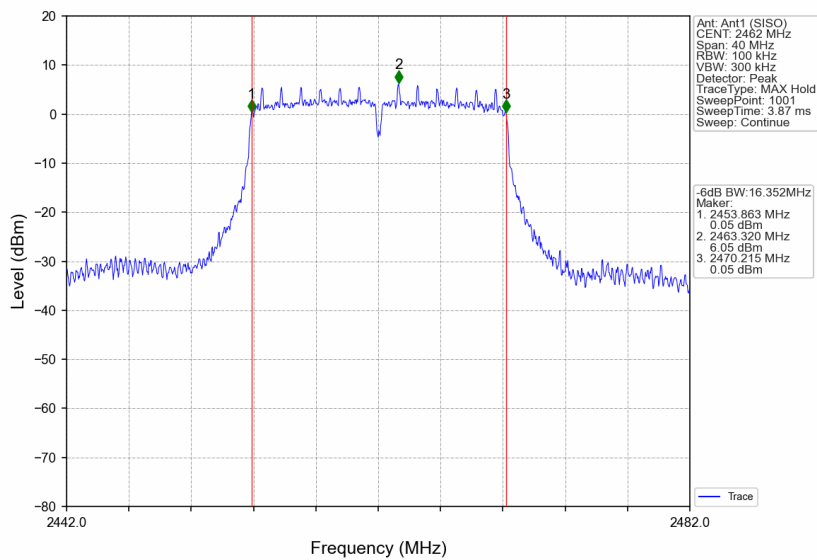
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



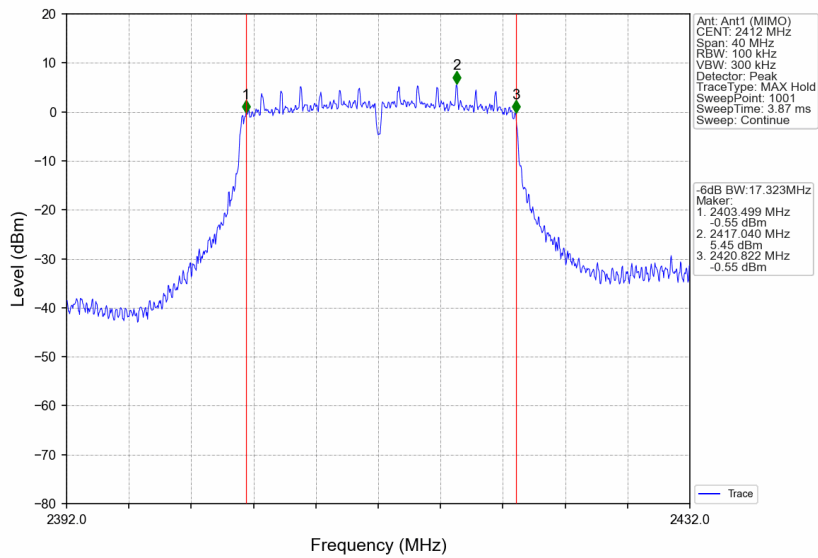
### 802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



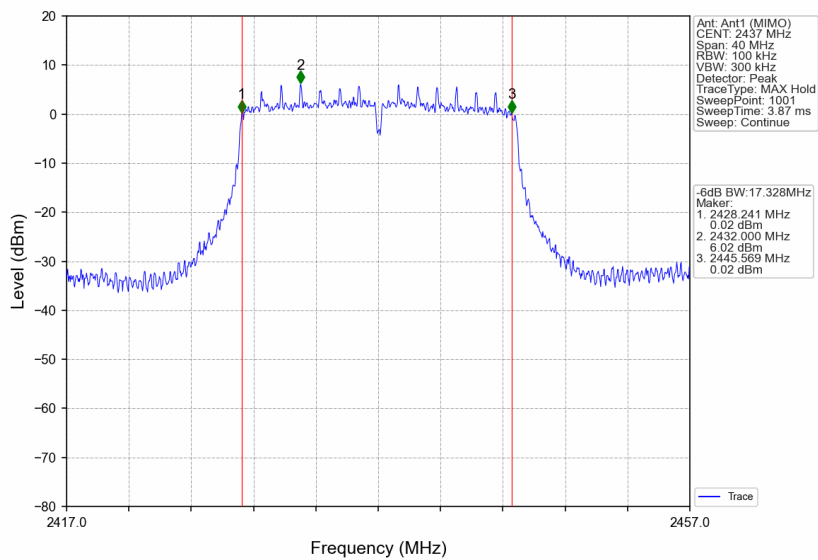
### 802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



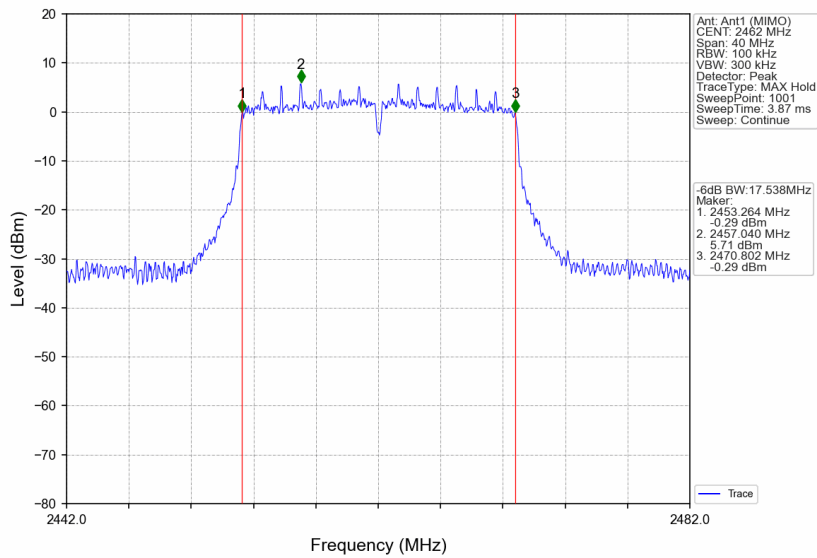
802.11n(HT20)\_LCH\_2412MHz\_Ant1 (MIMO)\_NTNV



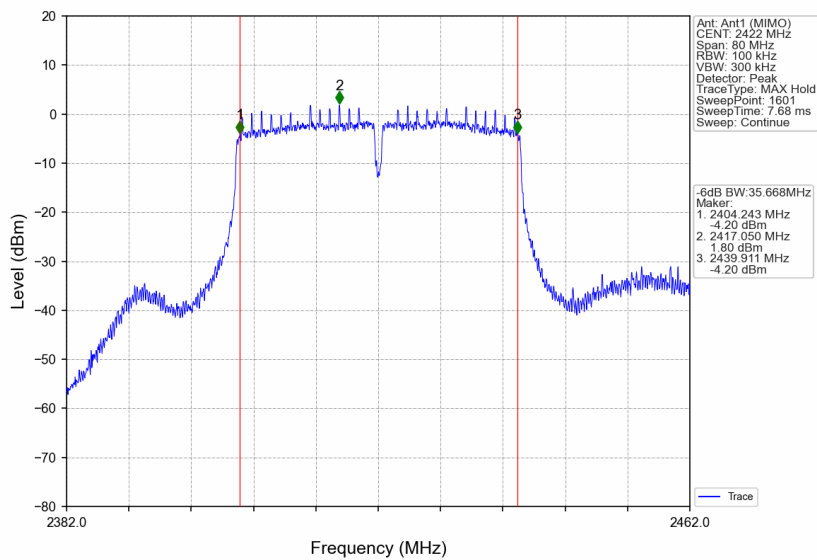
802.11n(HT20)\_MCH\_2437MHz\_Ant1 (MIMO)\_NTNV



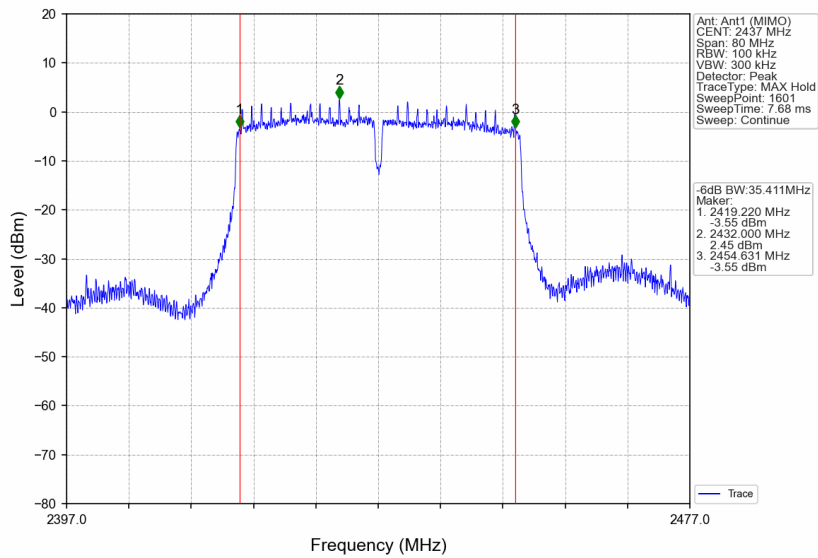
802.11n(HT20)\_HCH\_2462MHz\_Ant1 (MIMO)\_NTNV



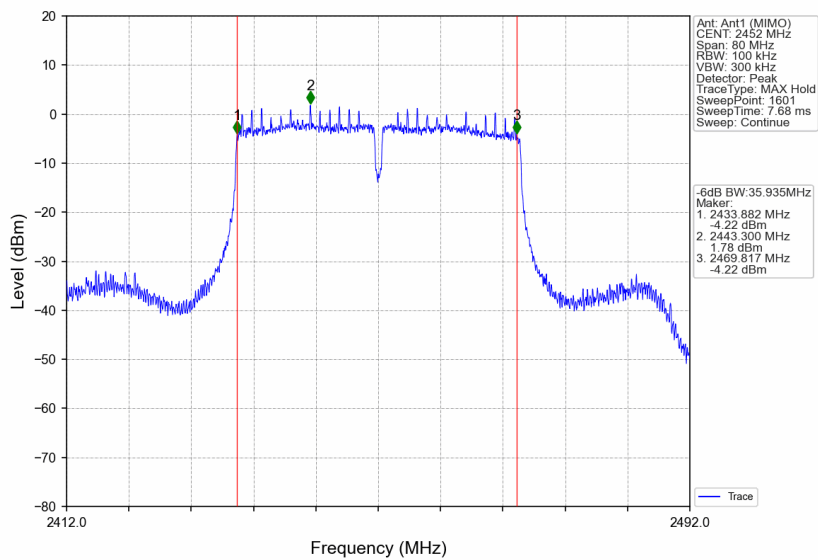
802.11n(HT40)\_LCH\_2422MHz\_Ant1 (MIMO)\_NTNV



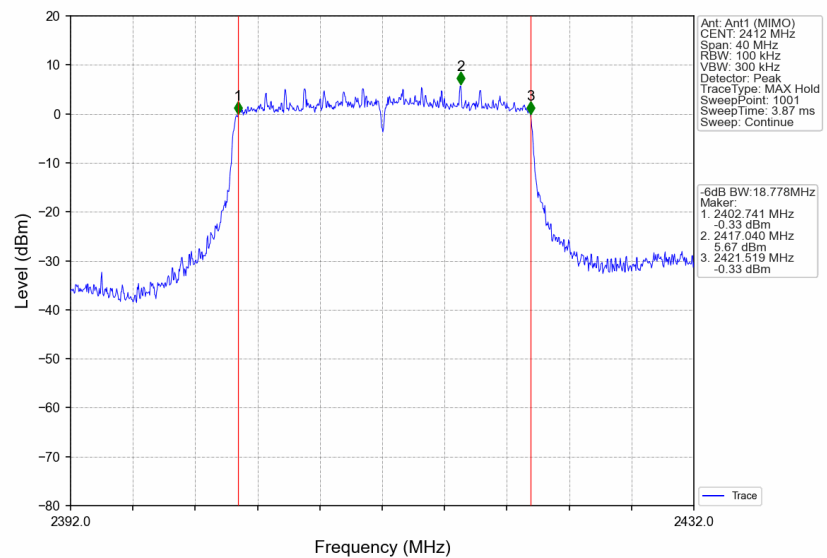
### 802.11n(HT40)\_MCH\_2437MHz\_Ant1 (MIMO)\_NTNV



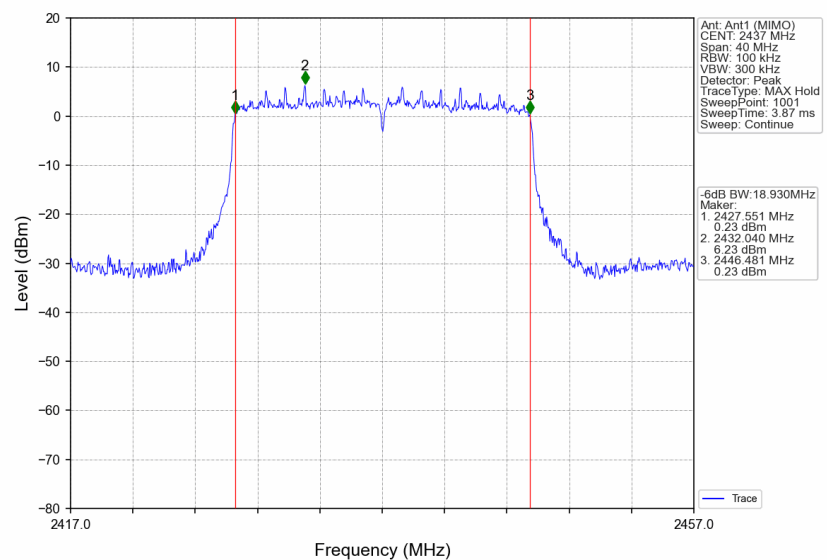
### 802.11n(HT40)\_HCH\_2452MHz\_Ant1 (MIMO)\_NTNV



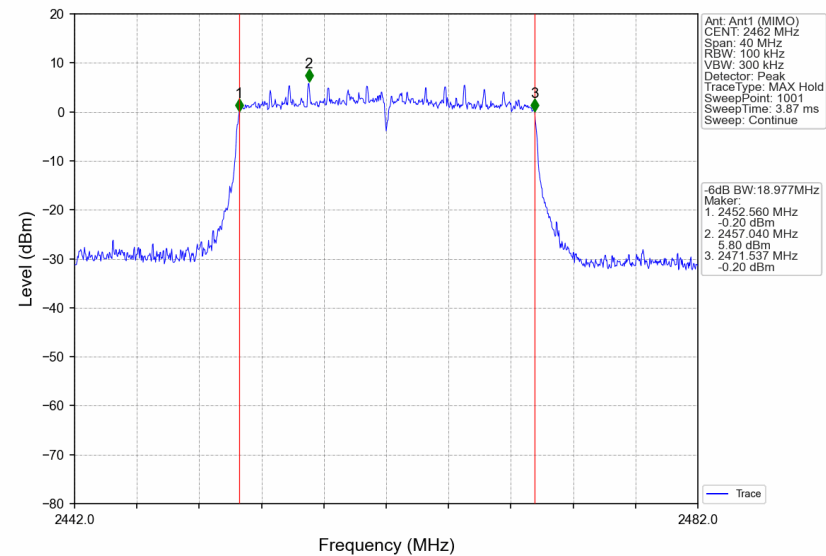
### 802.11ax(HEW20)\_LCH\_2412MHz\_RU242\_Left\_Ant1 (MIMO)\_NTNV



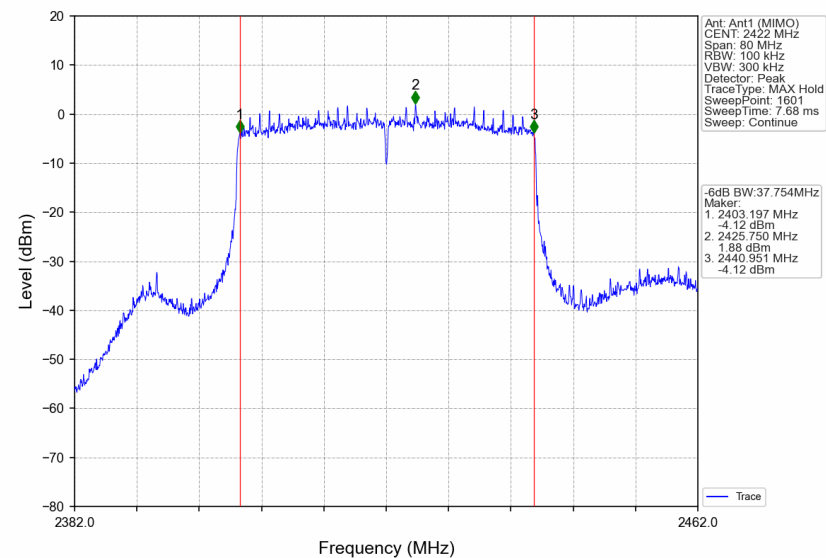
### 802.11ax(HEW20)\_MCH\_2437MHz\_RU242\_Left\_Ant1 (MIMO)\_NTNV



### 802.11ax(HEW20)\_HCH\_2462MHz\_RU242\_Left\_Ant1 (MIMO)\_NTNV



### 802.11ax(HEW40)\_LCH\_2422MHz\_RU484\_Left\_Ant1 (MIMO)\_NTNV



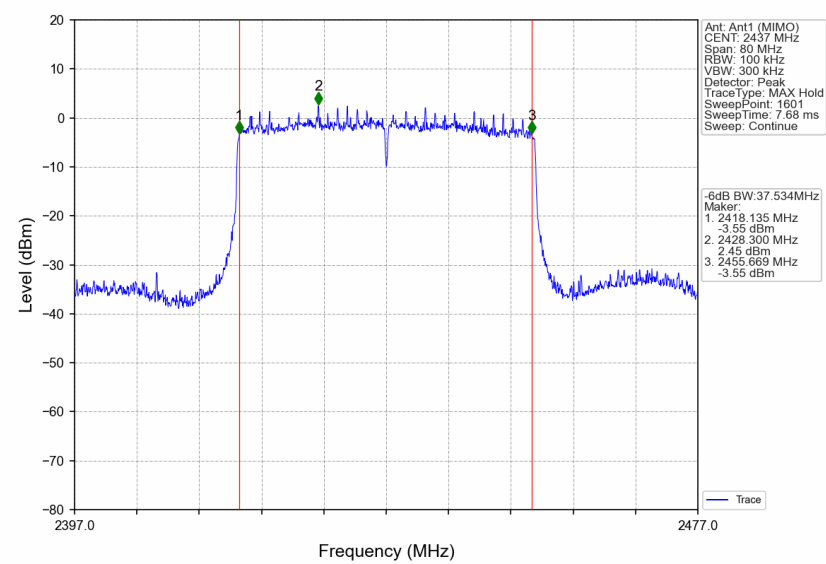
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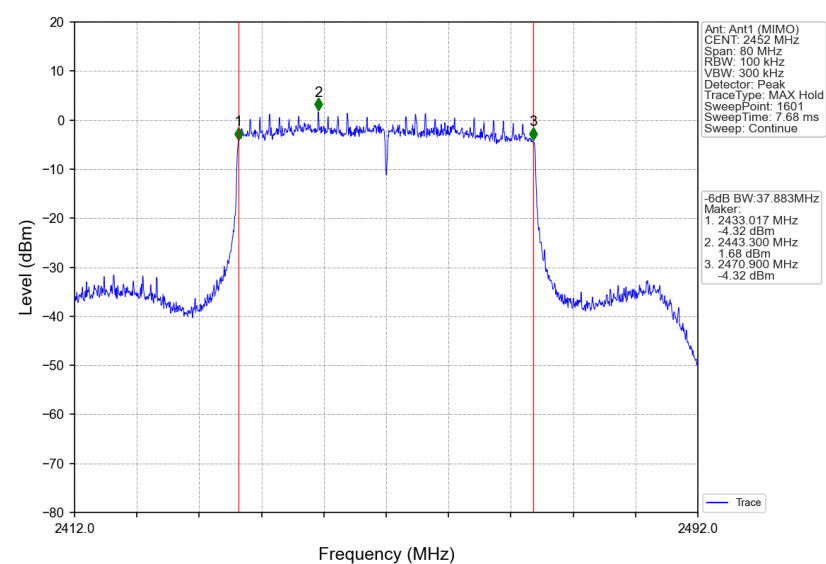
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802.11ax(HEW40)\_MCH\_2437MHz\_RU484\_Left\_Ant1 (MIMO)\_NTNV

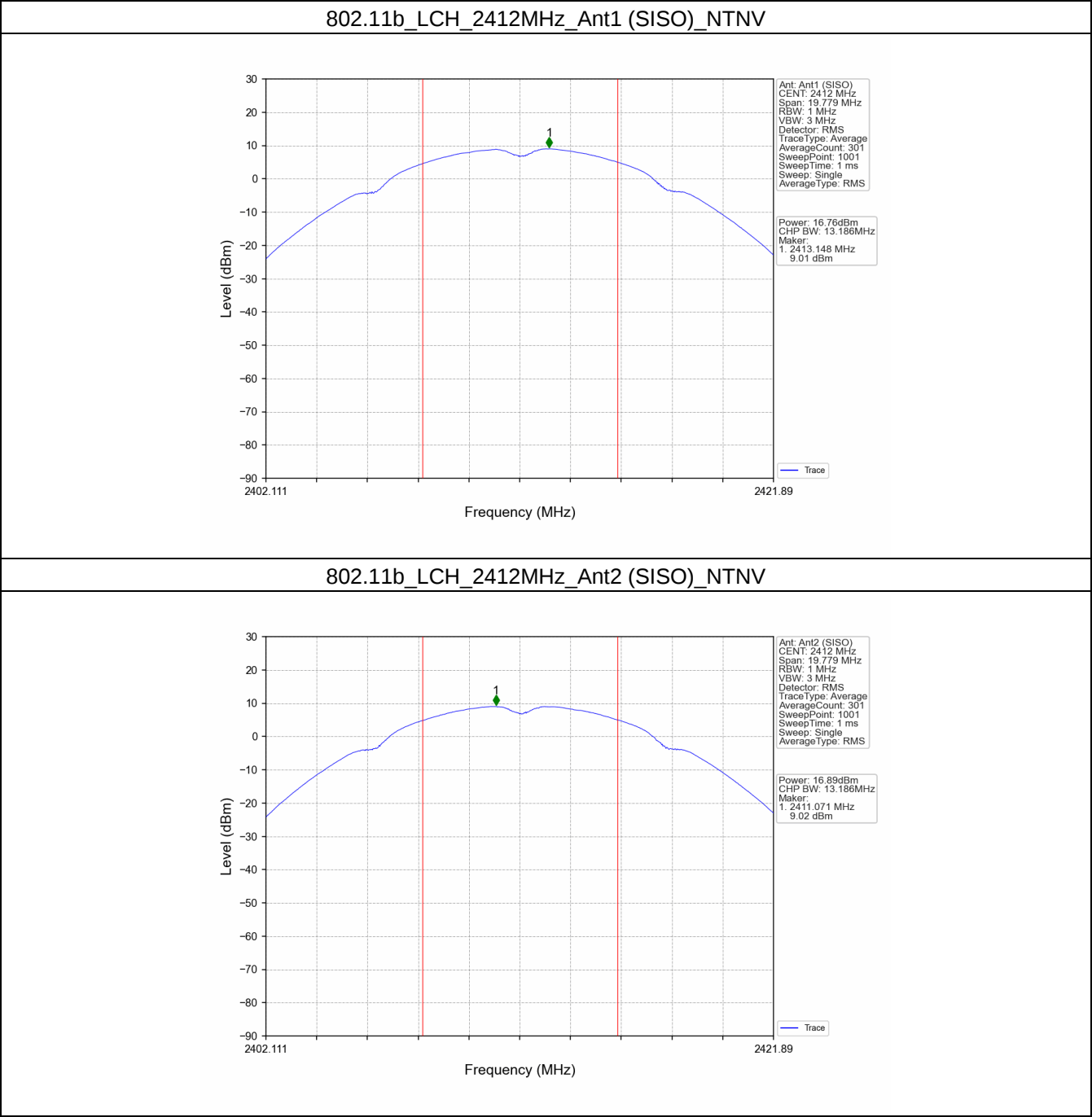


802.11ax(HEW40)\_HCH\_2452MHz\_RU484\_Left\_Ant1 (MIMO)\_NTNV

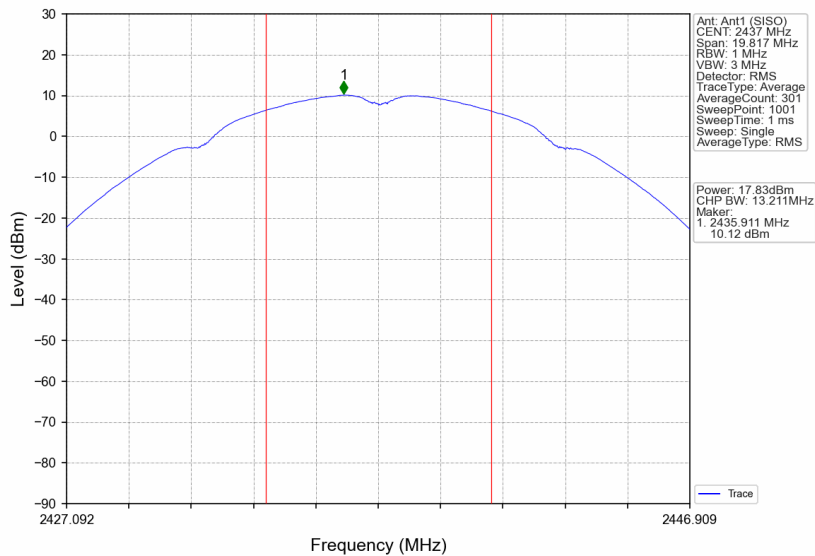


| Mode                                                                               | TX Type | Frequency (MHz) | RU    | RU Pos | Maximum Average Conducted Output Power (dBm) |       |       |       | Verdict |
|------------------------------------------------------------------------------------|---------|-----------------|-------|--------|----------------------------------------------|-------|-------|-------|---------|
|                                                                                    |         |                 |       |        | ANT1                                         | ANT2  | MIMO  | Limit |         |
| 802.11b                                                                            | SISO    | 2412            | /     | /      | 16.76                                        | 16.89 | /     | <=30  | Pass    |
|                                                                                    |         | 2437            | /     | /      | 17.83                                        | 17.45 | /     | <=30  | Pass    |
|                                                                                    |         | 2462            | /     | /      | 16.80                                        | 16.72 | /     | <=30  | Pass    |
| 802.11g                                                                            | SISO    | 2412            | /     | /      | 16.77                                        | 16.78 | /     | <=30  | Pass    |
|                                                                                    |         | 2437            | /     | /      | 17.66                                        | 17.38 | /     | <=30  | Pass    |
|                                                                                    |         | 2462            | /     | /      | 14.54                                        | 14.21 | /     | <=30  | Pass    |
| 802.11n (HT20)                                                                     | MIMO    | 2412            | /     | /      | 15.95                                        | 15.98 | 18.98 | <=30  | Pass    |
|                                                                                    |         | 2437            | /     | /      | 16.05                                        | 16.16 | 19.12 | <=30  | Pass    |
|                                                                                    |         | 2462            | /     | /      | 13.16                                        | 13.14 | 16.16 | <=30  | Pass    |
| 802.11n (HT40)                                                                     | MIMO    | 2422            | /     | /      | 12.27                                        | 11.78 | 15.04 | <=30  | Pass    |
|                                                                                    |         | 2437            | /     | /      | 16.33                                        | 16.01 | 19.18 | <=30  | Pass    |
|                                                                                    |         | 2452            | /     | /      | 11.35                                        | 11.67 | 14.52 | <=30  | Pass    |
| 802.11ax (HEW20)                                                                   | MIMO    | 2412            | RU242 | Left   | 14.08                                        | 14.17 | 17.14 | <=30  | Pass    |
|                                                                                    |         | 2437            | RU242 | Left   | 17.23                                        | 17.18 | 20.22 | <=30  | Pass    |
|                                                                                    |         | 2462            | RU242 | Left   | 12.11                                        | 12.26 | 15.20 | <=30  | Pass    |
| 802.11ax (HEW40)                                                                   | MIMO    | 2422            | RU484 | Left   | 12.15                                        | 11.77 | 14.97 | <=30  | Pass    |
|                                                                                    |         | 2437            | RU484 | Left   | 16.23                                        | 15.99 | 19.12 | <=30  | Pass    |
|                                                                                    |         | 2452            | RU484 | Left   | 11.77                                        | 11.99 | 14.89 | <=30  | Pass    |
| Note1: Antenna Gain: Ant1: 3.1dBi; Ant2: 3dBi;<br>Note2: Directional Gain: 3.05dBi |         |                 |       |        |                                              |       |       |       |         |

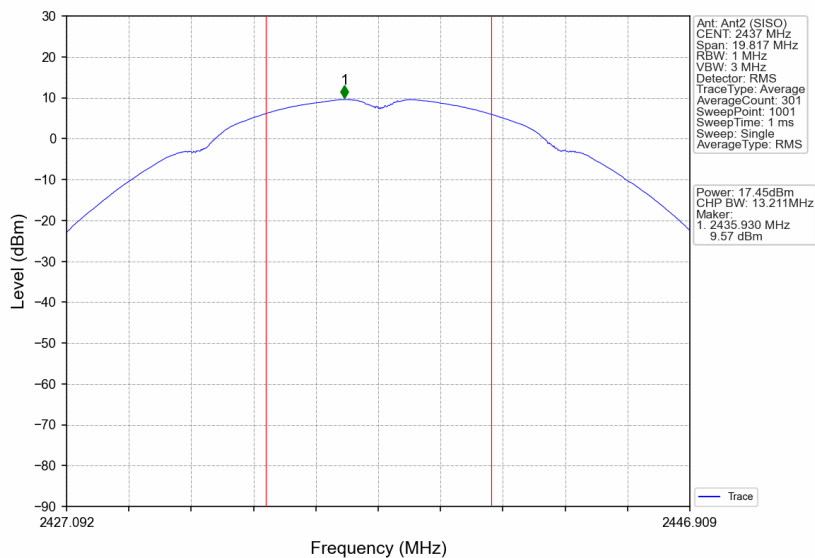
### 3.1.2 Test Graph



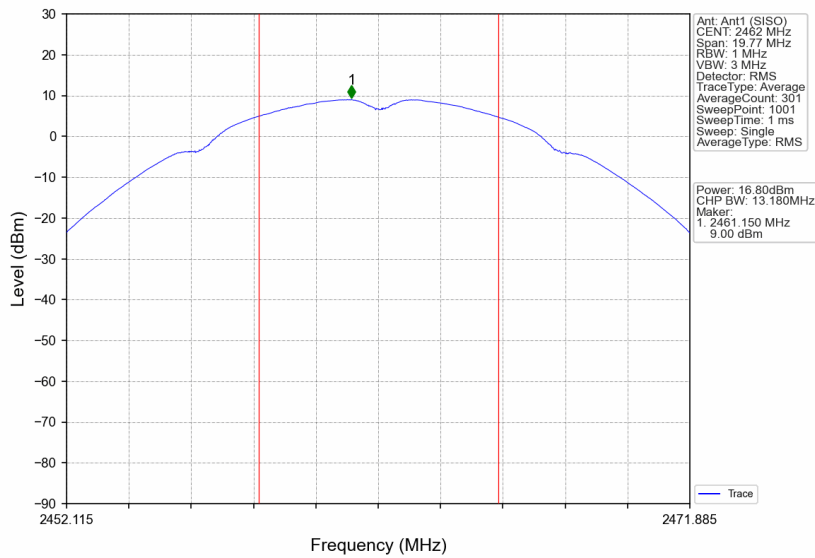
802.11b\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



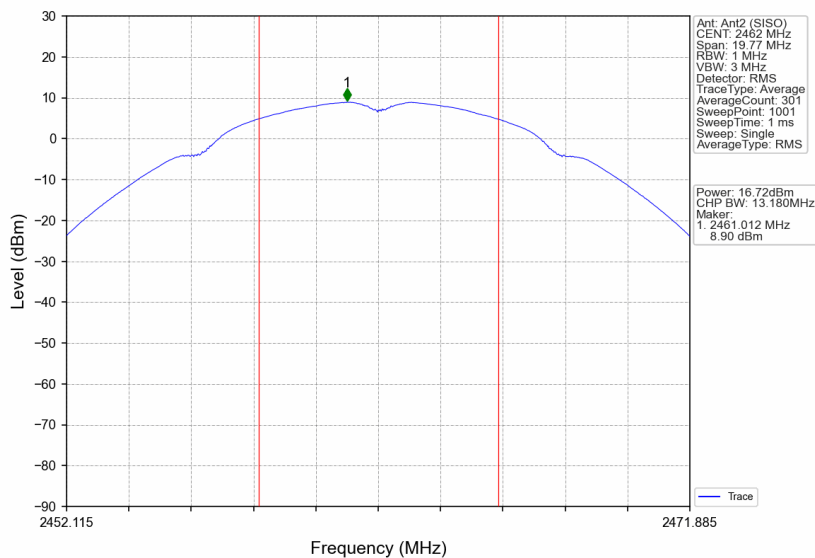
802.11b\_MCH\_2437MHz\_Ant2 (SISO)\_NTNV



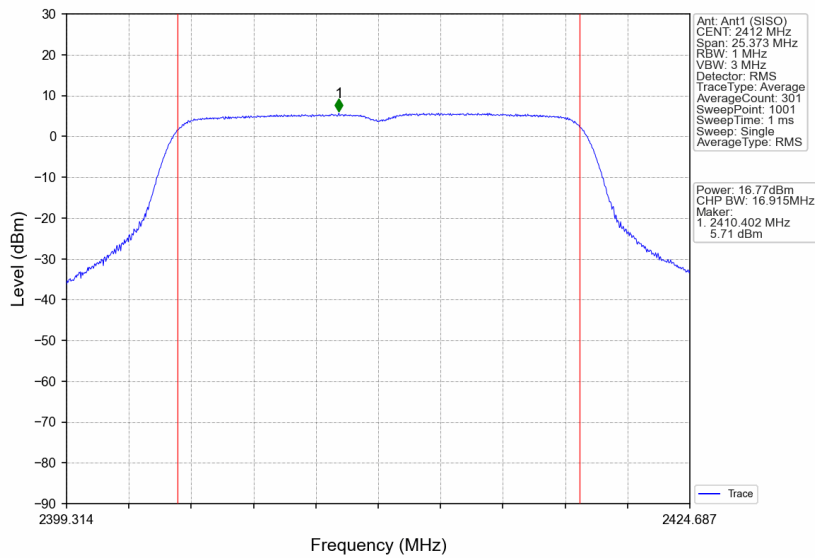
802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



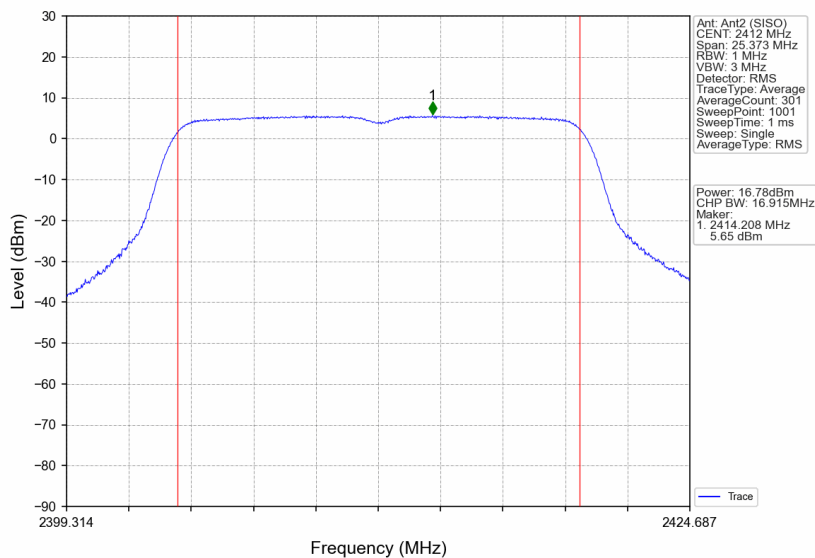
802.11b\_HCH\_2462MHz\_Ant2 (SISO)\_NTNV



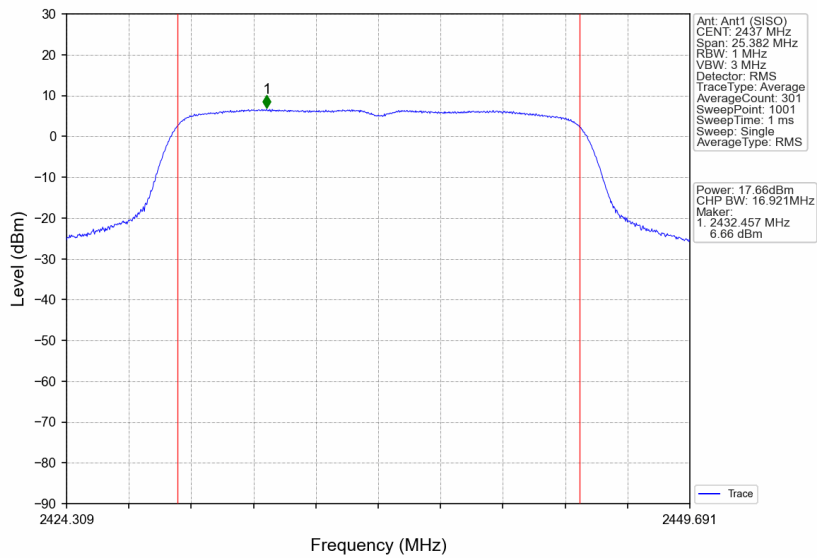
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



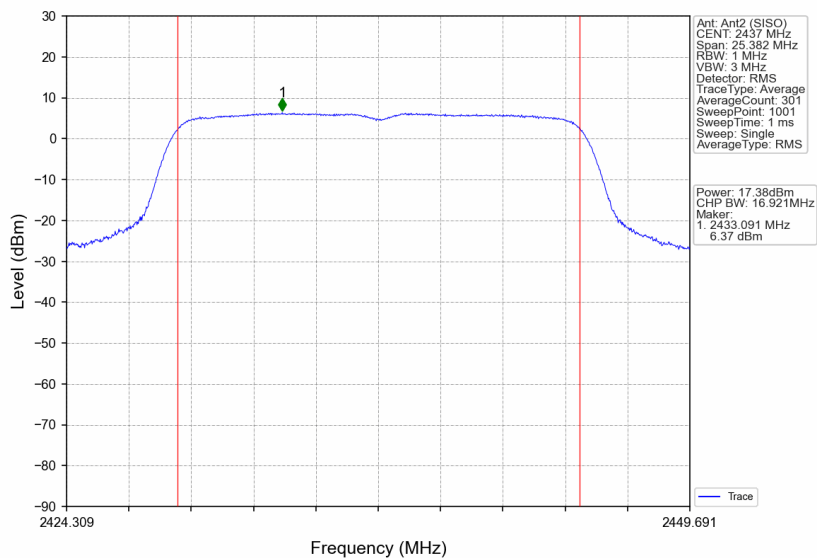
802.11g\_LCH\_2412MHz\_Ant2 (SISO)\_NTNV



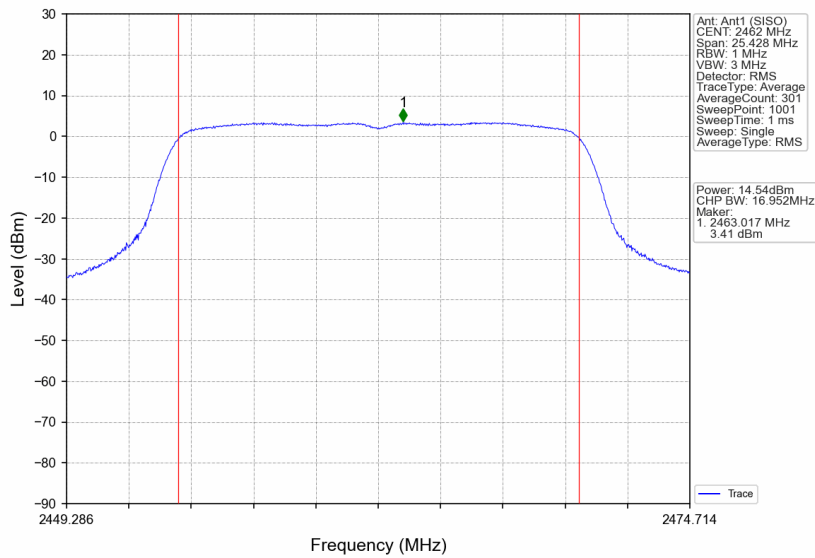
802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



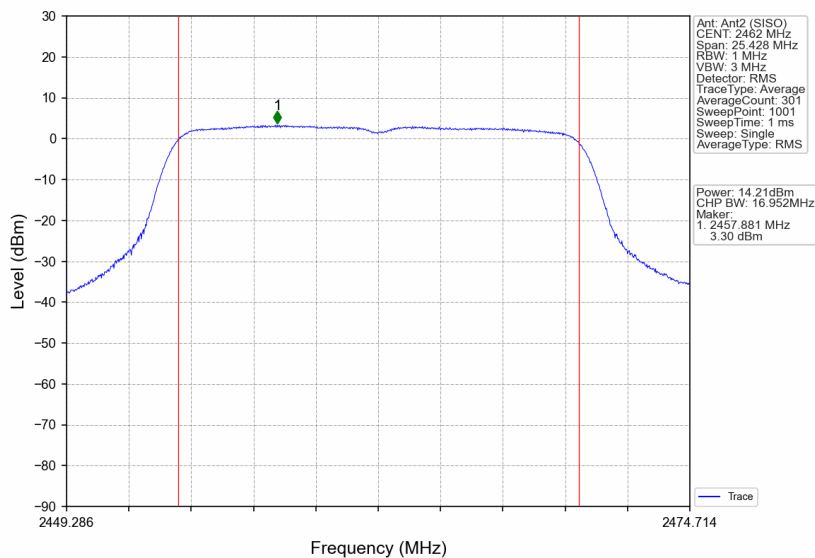
802.11g\_MCH\_2437MHz\_Ant2 (SISO)\_NTNV



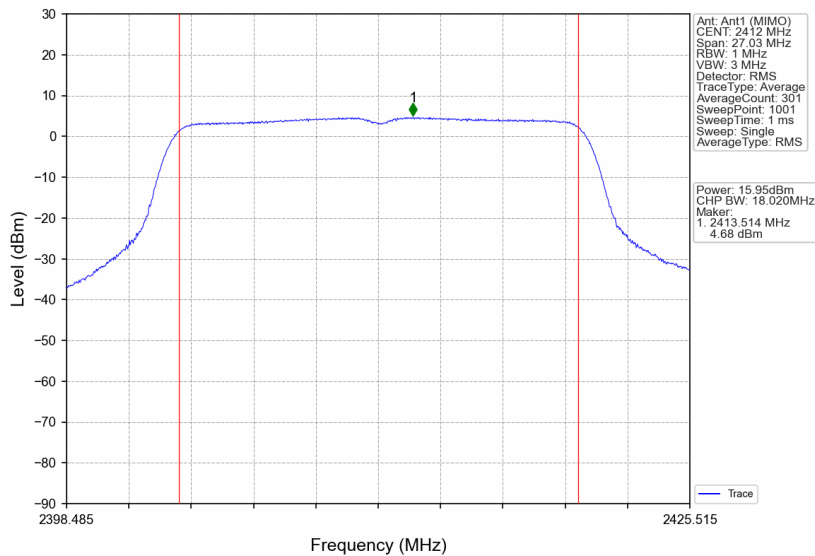
802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



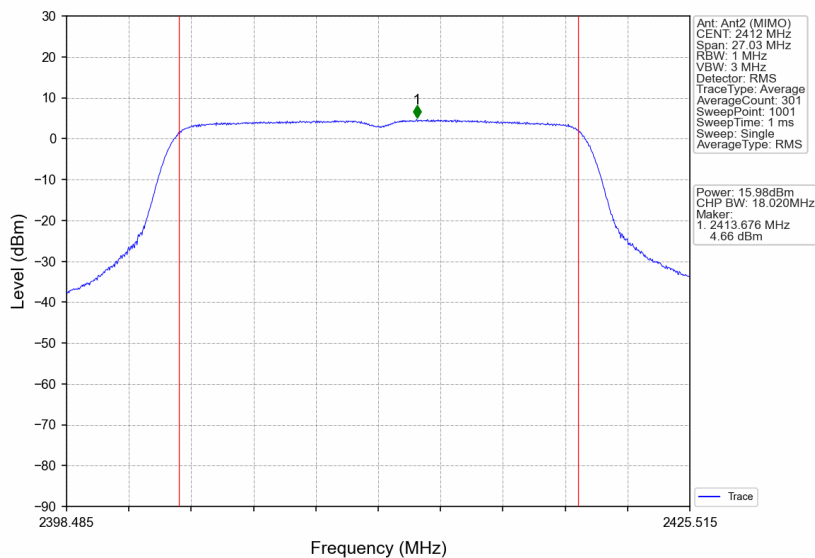
802.11g\_HCH\_2462MHz\_Ant2 (SISO)\_NTNV



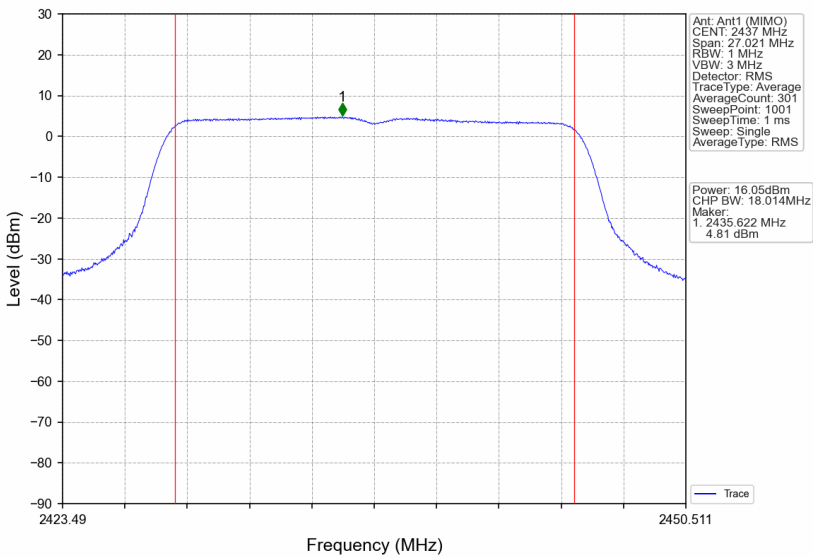
802.11n(HT20)\_LCH\_2412MHz\_Ant1 (MIMO)\_NTNV



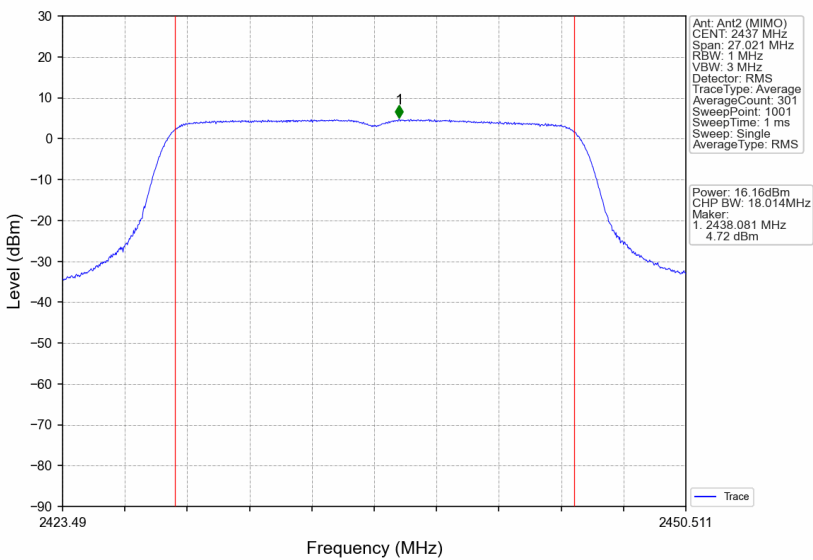
802.11n(HT20)\_LCH\_2412MHz\_Ant2 (MIMO)\_NTNV



802.11n(HT20)\_MCH\_2437MHz\_Ant1 (MIMO)\_NTNV



802.11n(HT20)\_MCH\_2437MHz\_Ant2 (MIMO)\_NTNV



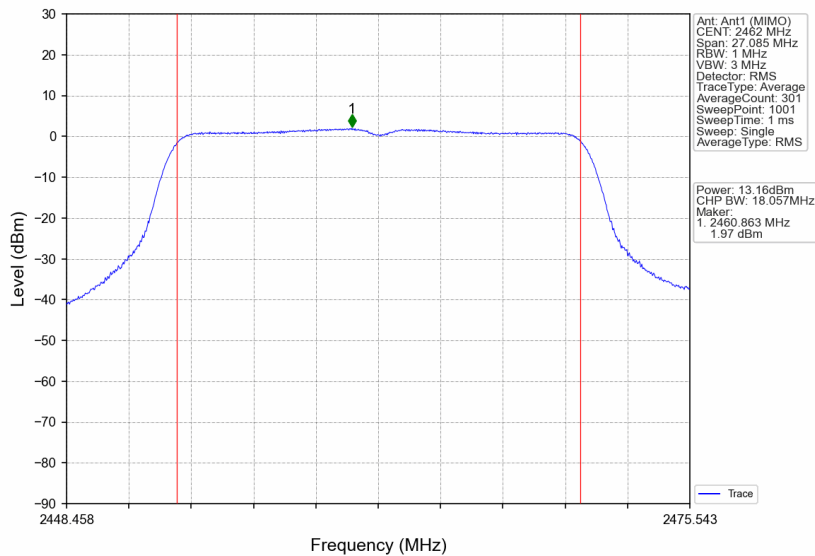
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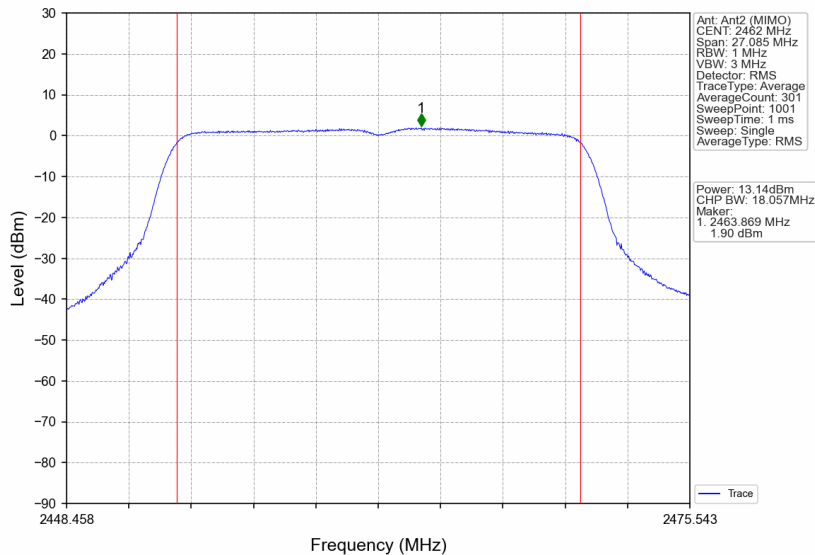
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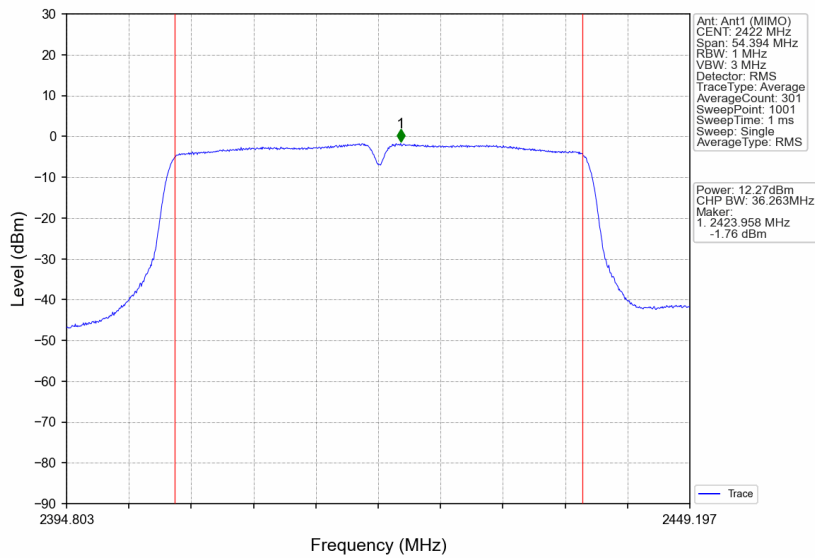
802.11n(HT20)\_HCH\_2462MHz\_Ant1 (MIMO)\_NTNV



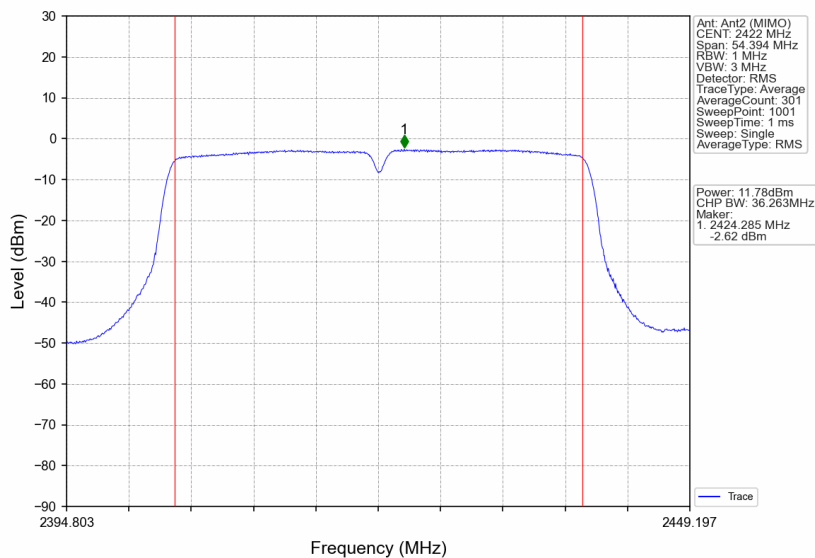
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802.11n(HT40)\_LCH\_2422MHz\_Ant1 (MIMO)\_NTNV



802.11n(HT40)\_LCH\_2422MHz\_Ant2 (MIMO)\_NTNV



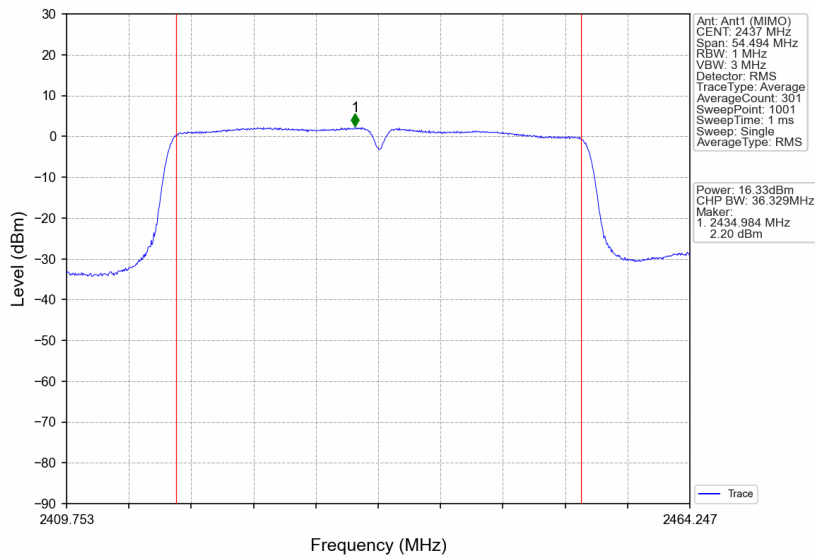
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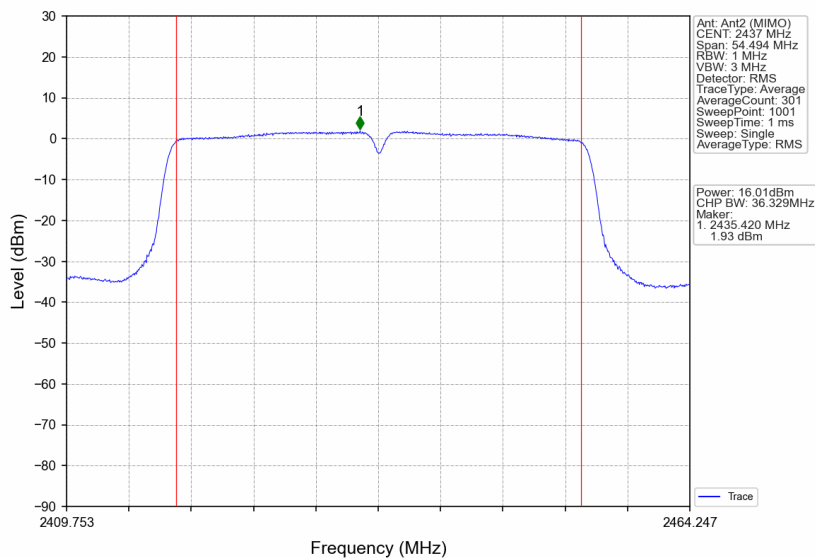
Report No.: KSCR240200030903

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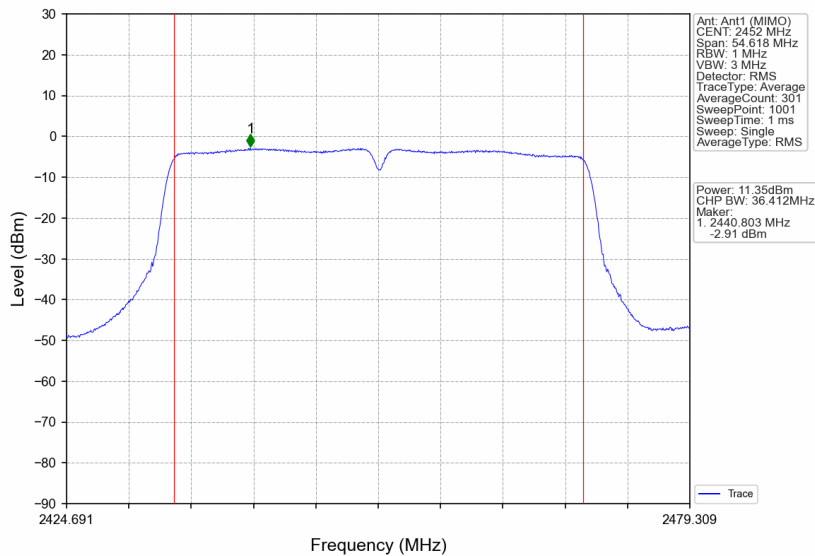
802.11n(HT40)\_MCH\_2437MHz\_Ant1 (MIMO)\_NTNV



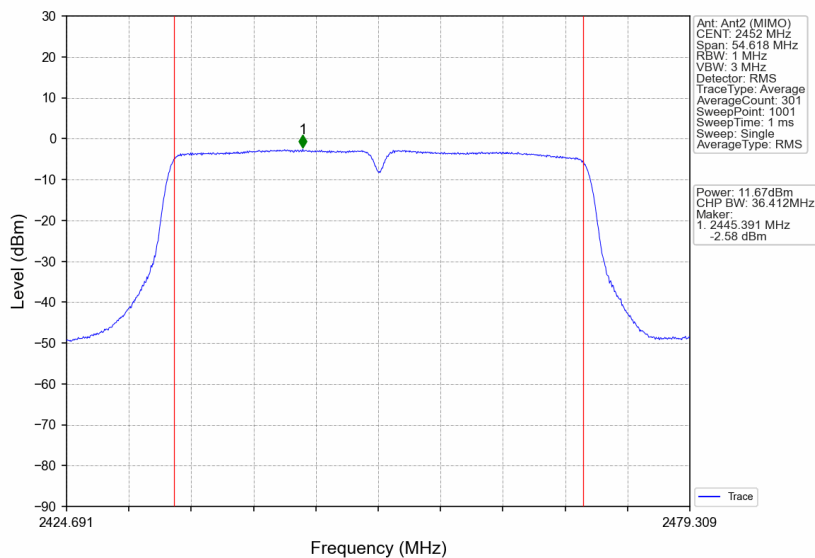
802.11n(HT40)\_MCH\_2437MHz\_Ant2 (MIMO)\_NTNV



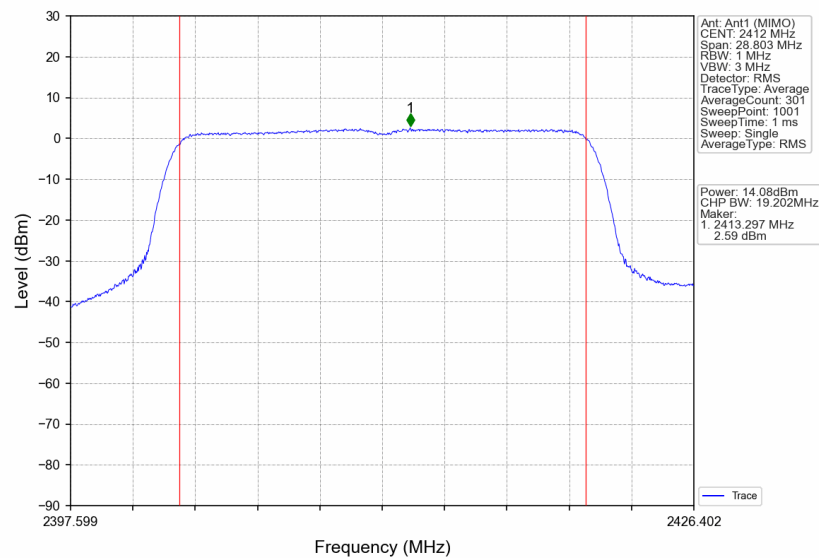
802.11n(HT40)\_HCH\_2452MHz\_Ant1 (MIMO)\_NTNV



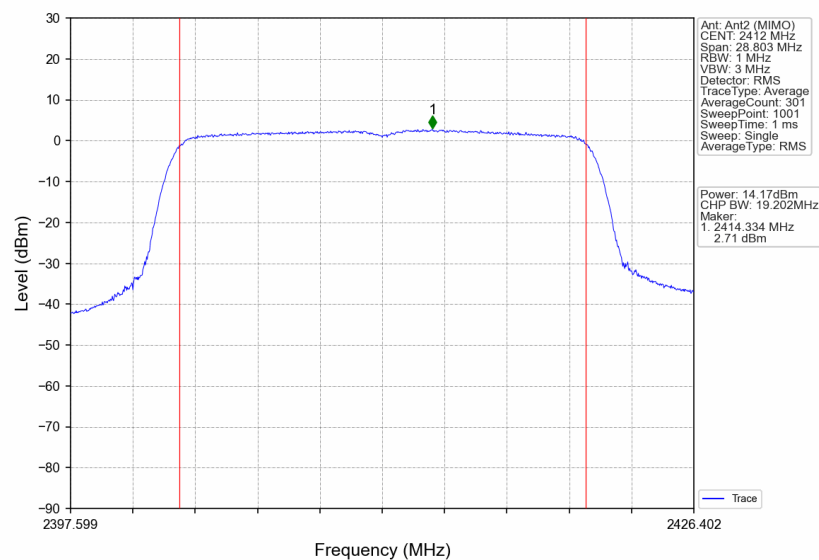
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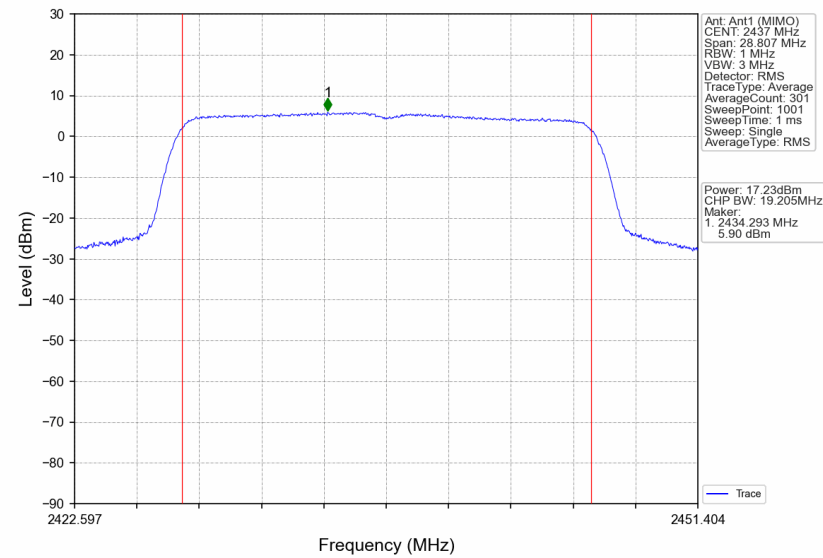
### 802.11ax(HEW20)\_LCH\_2412MHz\_RU242\_Left\_Ant1 (MIMO)\_NTNV



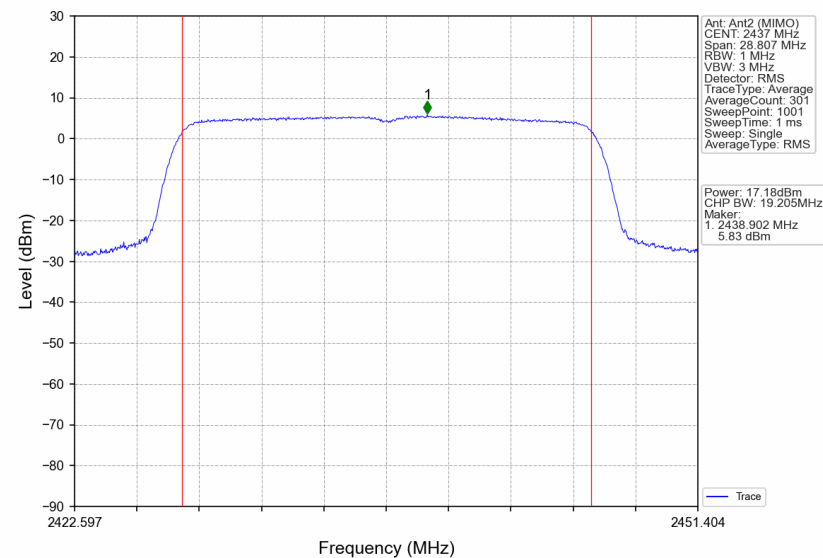
### 802.11ax(HEW20)\_LCH\_2412MHz\_RU242\_Left\_Ant2 (MIMO)\_NTNV



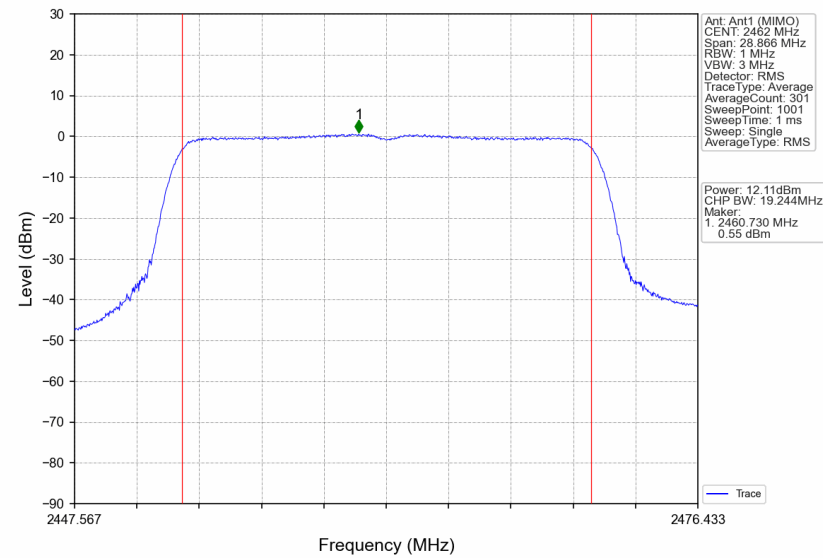
### 802.11ax(HEW20)\_MCH\_2437MHz\_RU242\_Left\_Ant1 (MIMO)\_NTNV



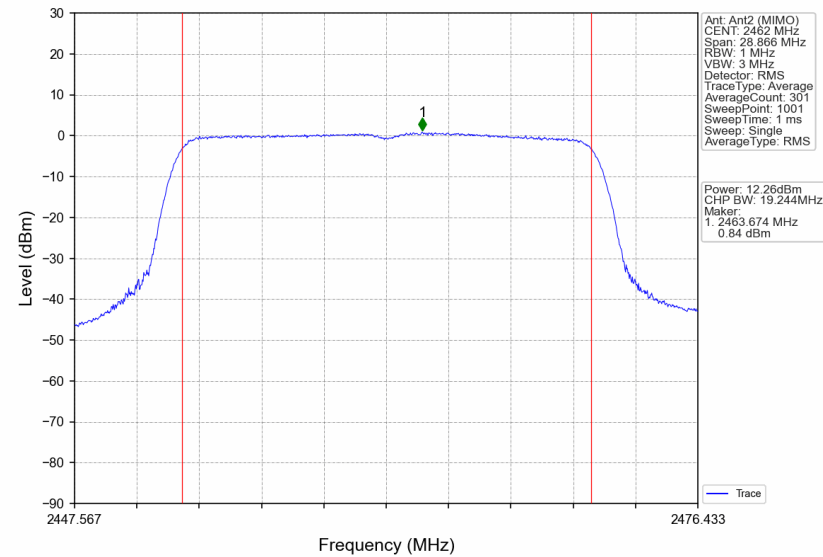
### 802.11ax(HEW20)\_MCH\_2437MHz\_RU242\_Left\_Ant2 (MIMO)\_NTNV



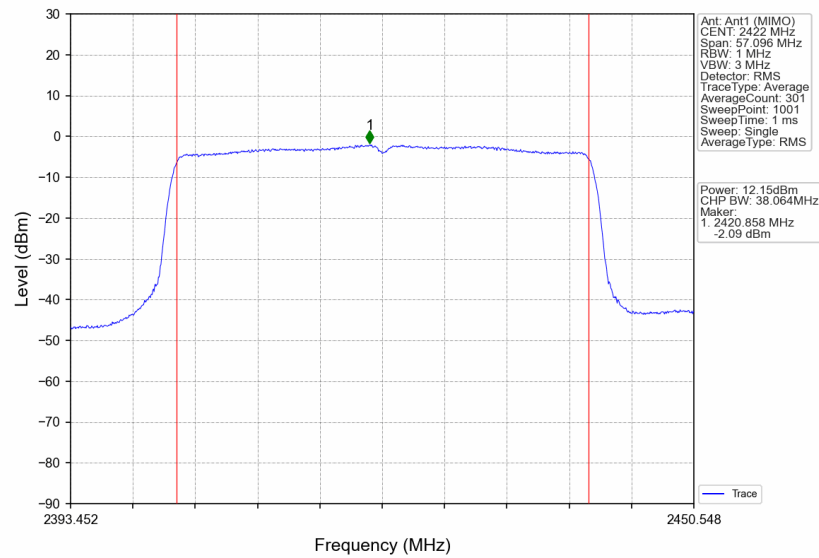
### 802.11ax(HEW20)\_HCH\_2462MHz\_RU242\_Left\_Ant1 (MIMO)\_NTNV



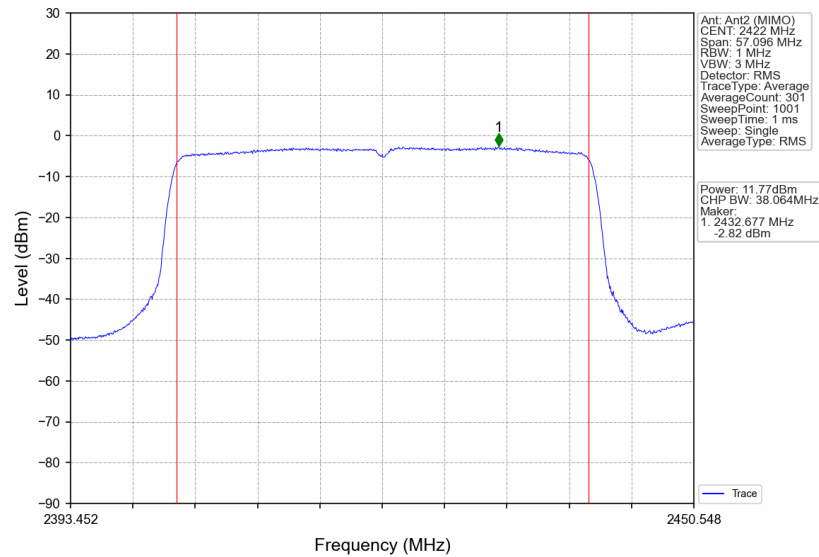
### 802.11ax(HEW20)\_HCH\_2462MHz\_RU242\_Left\_Ant2 (MIMO)\_NTNV



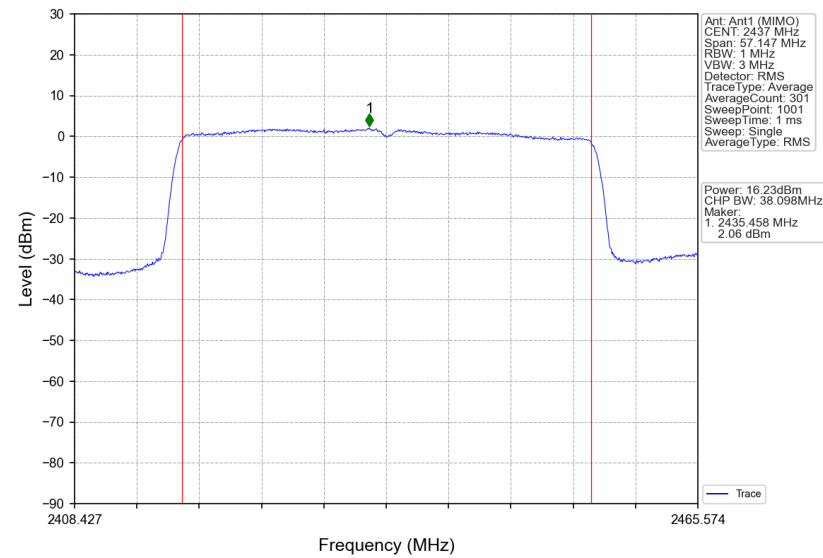
### 802.11ax(HEW40)\_LCH\_2422MHz\_RU484\_Left\_Ant1 (MIMO)\_NTNV



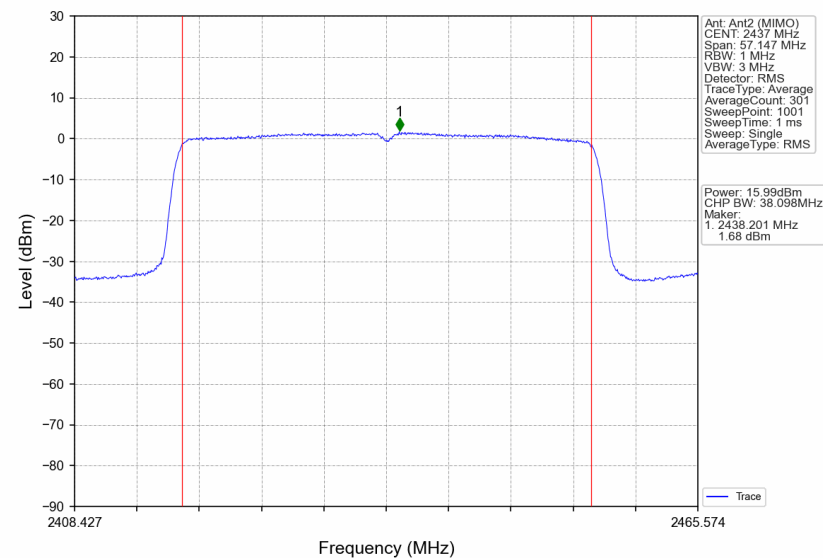
### 802.11ax(HEW40)\_LCH\_2422MHz\_RU484\_Left\_Ant2 (MIMO)\_NTNV



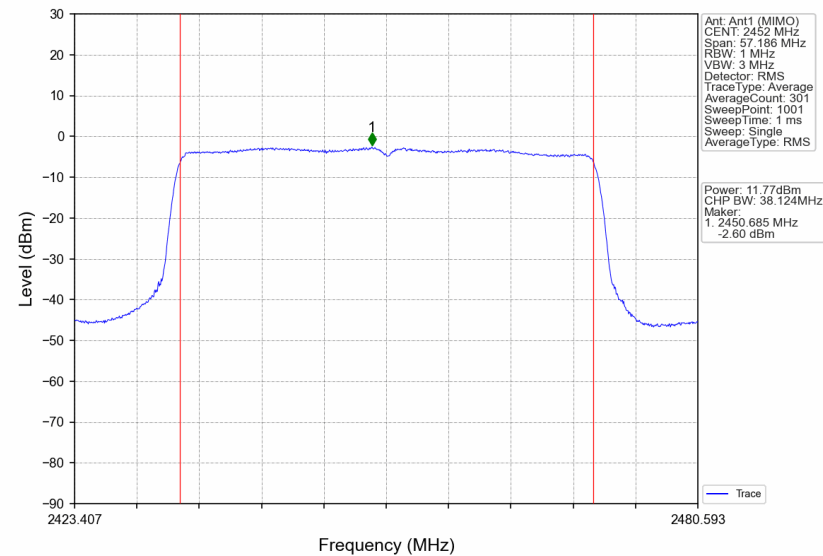
802.11ax(HEW40)\_MCH\_2437MHz\_RU484\_Left\_Ant1 (MIMO)\_NTNV



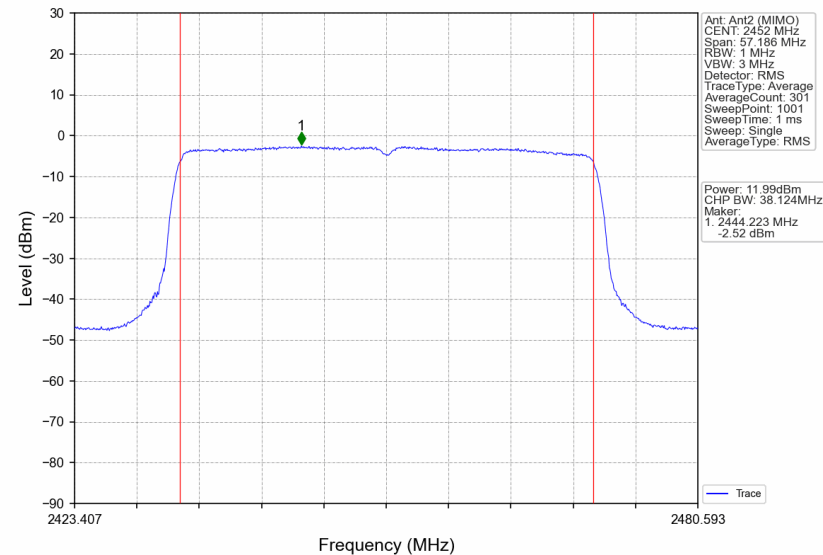
802.11ax(HEW40)\_MCH\_2437MHz\_RU484\_Left\_Ant2 (MIMO)\_NTNV



### 802.11ax(HEW40)\_HCH\_2452MHz\_RU484\_Left\_Ant1 (MIMO)\_NTNV



### 802.11ax(HEW40)\_HCH\_2452MHz\_RU484\_Left\_Ant2 (MIMO)\_NTNV



## 4. Maximum Power Spectral Density

### 4.1 PSD

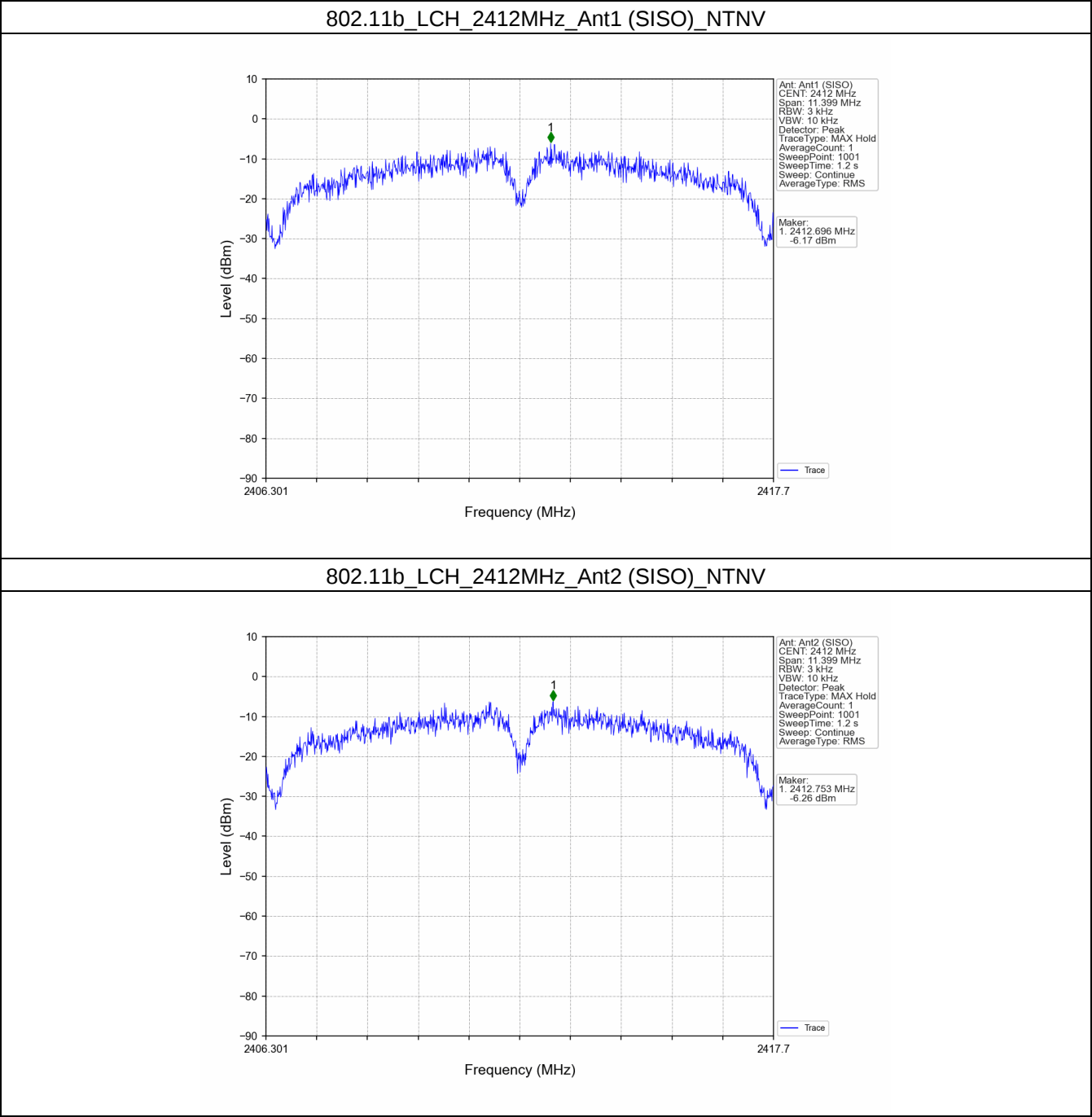
#### 4.1.1 Test Result

| Mode             | TX Type | Frequency (MHz) | RU    | RU Pos | Maximum PSD (dBm/3kHz) |        |        |       | Verdict |
|------------------|---------|-----------------|-------|--------|------------------------|--------|--------|-------|---------|
|                  |         |                 |       |        | ANT1                   | ANT2   | MIMO   | Limit |         |
| 802.11b          | SISO    | 2412            | /     | /      | -6.17                  | -6.26  | /      | <=8   | Pass    |
|                  |         | 2437            | /     | /      | -4.41                  | -4.52  | /      | <=8   | Pass    |
|                  |         | 2462            | /     | /      | -6.54                  | -7.03  | /      | <=8   | Pass    |
| 802.11g          | SISO    | 2412            | /     | /      | -8.72                  | -9.01  | /      | <=8   | Pass    |
|                  |         | 2437            | /     | /      | -8.26                  | -8.20  | /      | <=8   | Pass    |
|                  |         | 2462            | /     | /      | -10.94                 | -11.17 | /      | <=8   | Pass    |
| 802.11n (HT20)   | MIMO    | 2412            | /     | /      | -10.01                 | -10.04 | -7.35  | <=8   | Pass    |
|                  |         | 2437            | /     | /      | -8.56                  | -11.31 | -7.74  | <=8   | Pass    |
|                  |         | 2462            | /     | /      | -11.71                 | -12.30 | -9.77  | <=8   | Pass    |
| 802.11n (HT40)   | MIMO    | 2422            | /     | /      | -16.30                 | -16.77 | -14.48 | <=8   | Pass    |
|                  |         | 2437            | /     | /      | -11.94                 | -12.53 | -10.33 | <=8   | Pass    |
|                  |         | 2452            | /     | /      | -16.74                 | -16.39 | -14.50 | <=8   | Pass    |
| 802.11ax (HEW20) | MIMO    | 2412            | RU242 | Left   | -13.18                 | -11.57 | -10.43 | <=8   | Pass    |
|                  |         | 2437            | RU242 | Left   | -7.48                  | -9.30  | -6.46  | <=8   | Pass    |
|                  |         | 2462            | RU242 | Left   | -13.59                 | -14.69 | -12.24 | <=8   | Pass    |
| 802.11ax (HEW40) | MIMO    | 2422            | RU484 | Left   | -16.58                 | -16.80 | -14.67 | <=8   | Pass    |
|                  |         | 2437            | RU484 | Left   | -13.36                 | -12.92 | -11.16 | <=8   | Pass    |
|                  |         | 2452            | RU484 | Left   | -17.59                 | -17.04 | -14.84 | <=8   | Pass    |

Note1: Antenna Gain: Ant1: 3.1dBi; Ant2: 3dBi;

Note2: Directional Gain: 3.05dBi

### 4.1.2 Test Graph



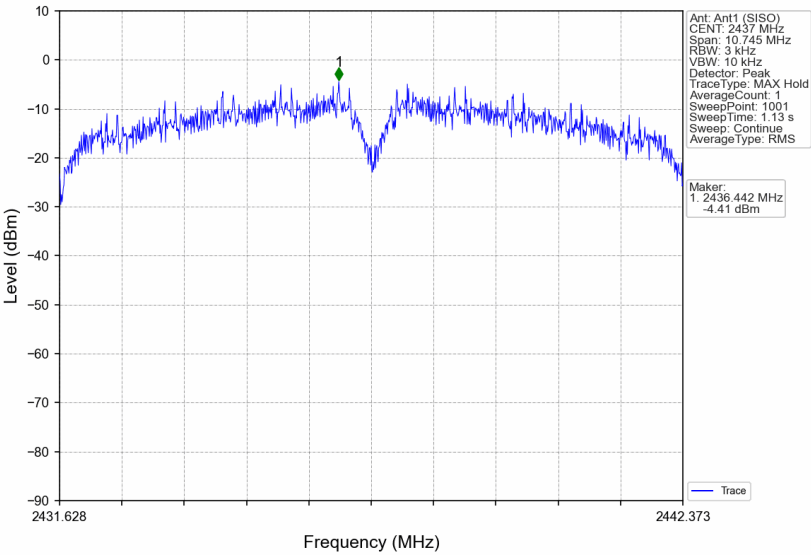
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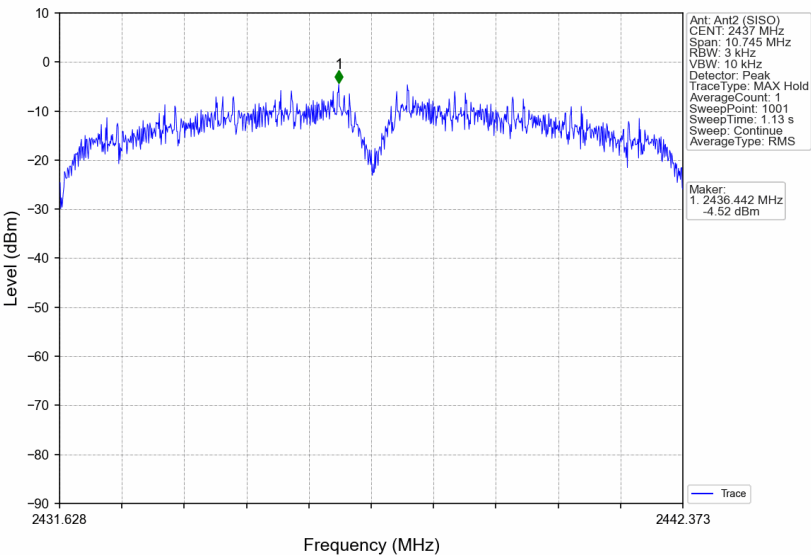
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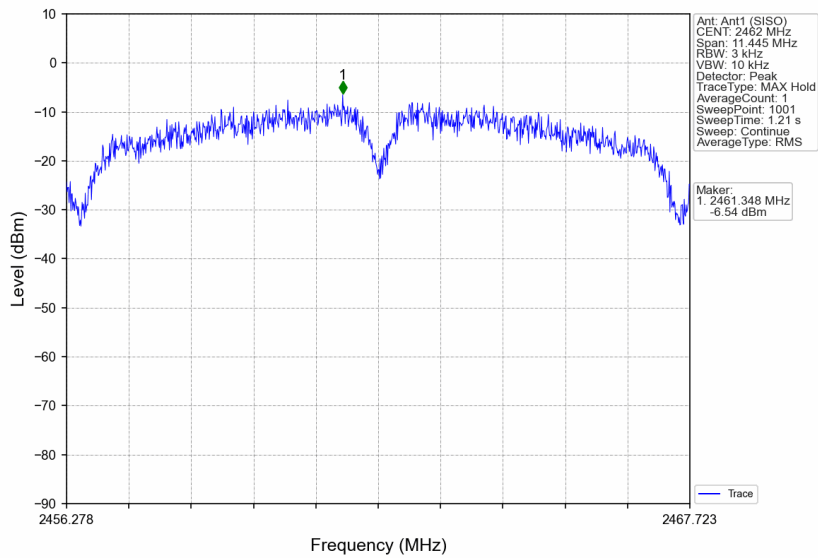
802.11b\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



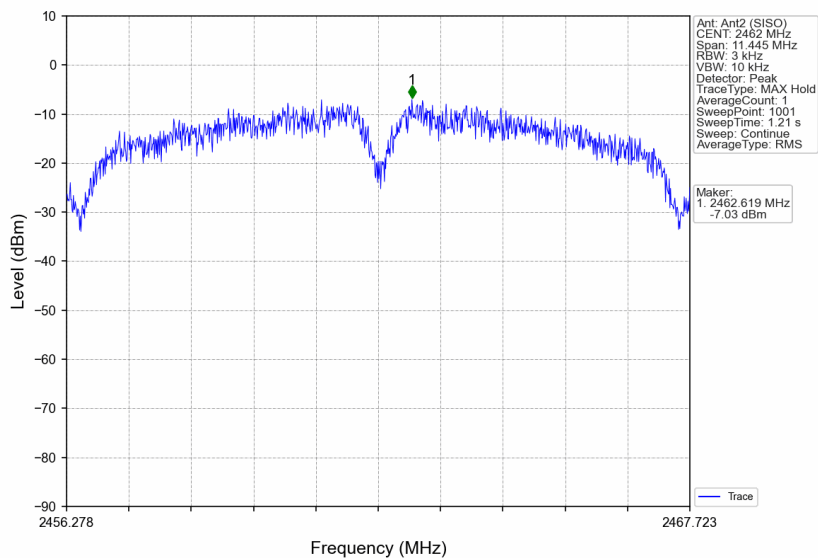
802.11b\_MCH\_2437MHz\_Ant2 (SISO)\_NTNV



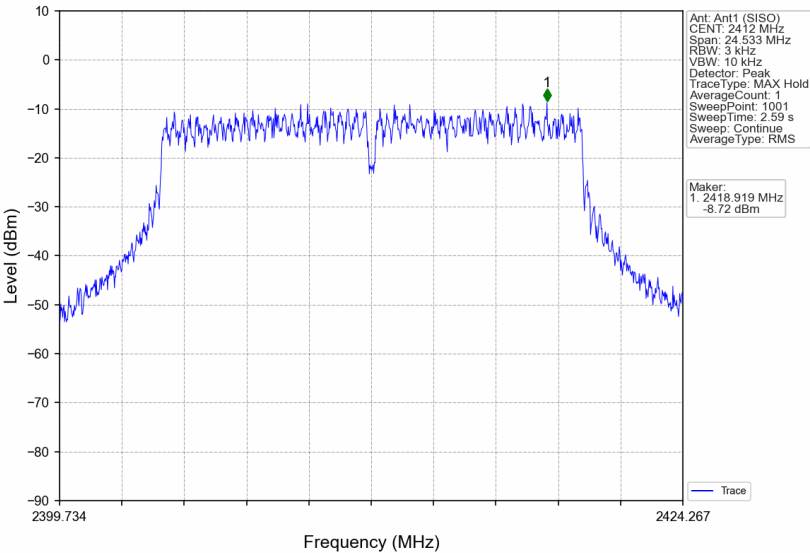
802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



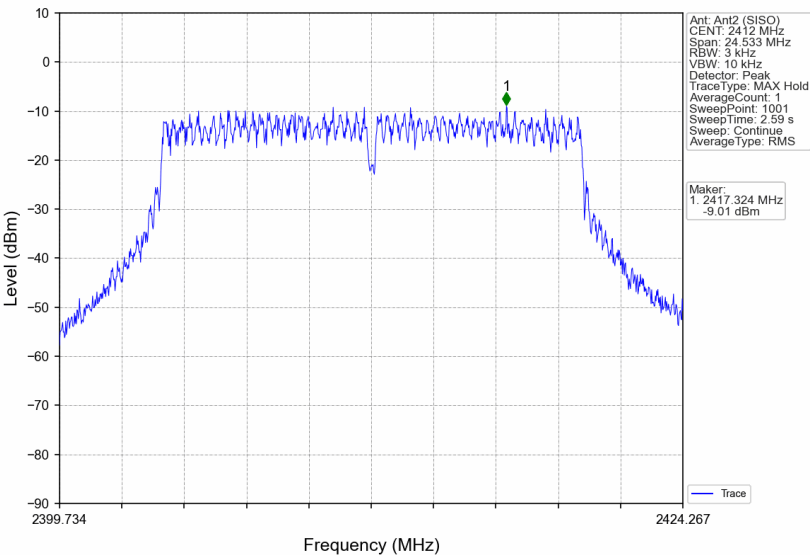
802.11b\_HCH\_2462MHz\_Ant2 (SISO)\_NTNV



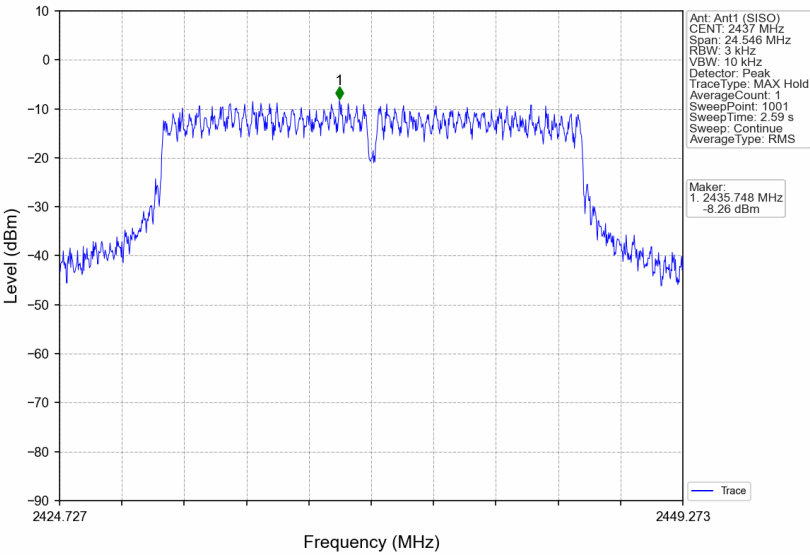
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



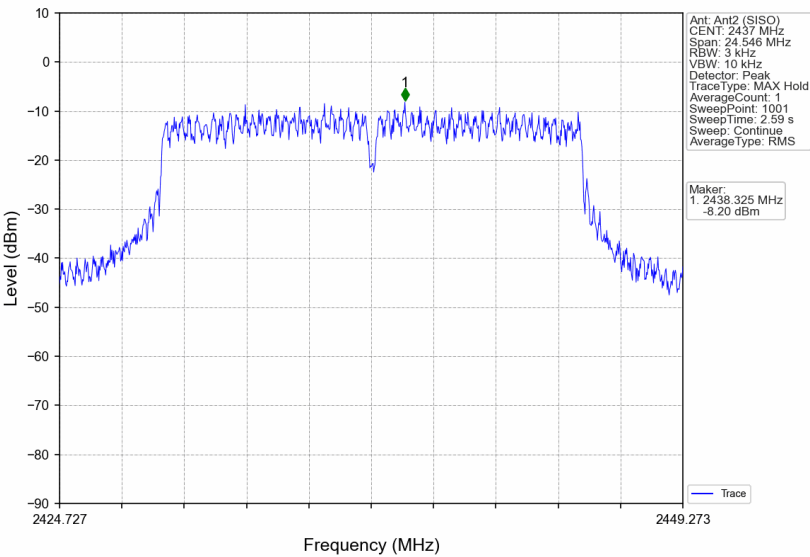
802.11g\_LCH\_2412MHz\_Ant2 (SISO)\_NTNV



802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



802.11g\_MCH\_2437MHz\_Ant2 (SISO)\_NTNV



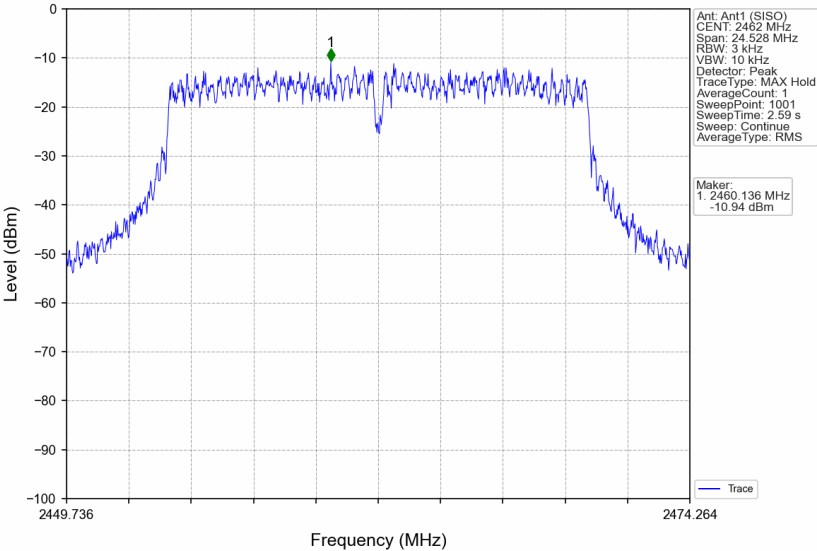
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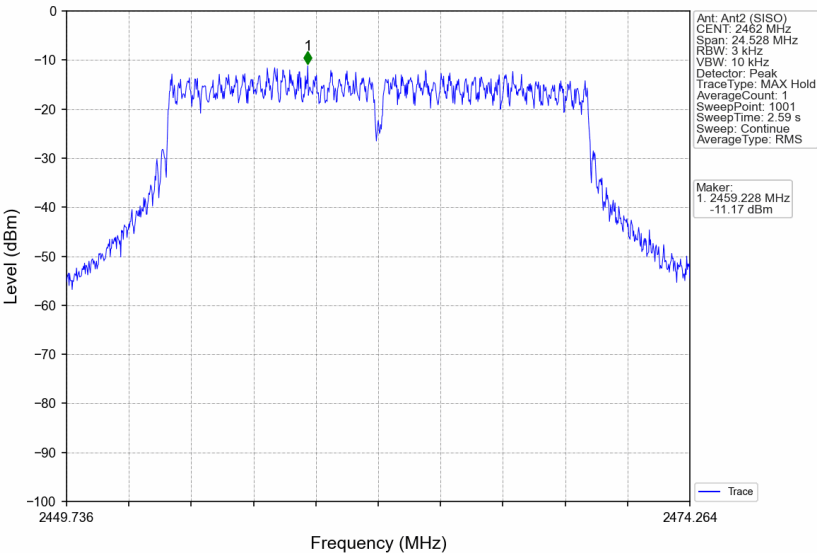
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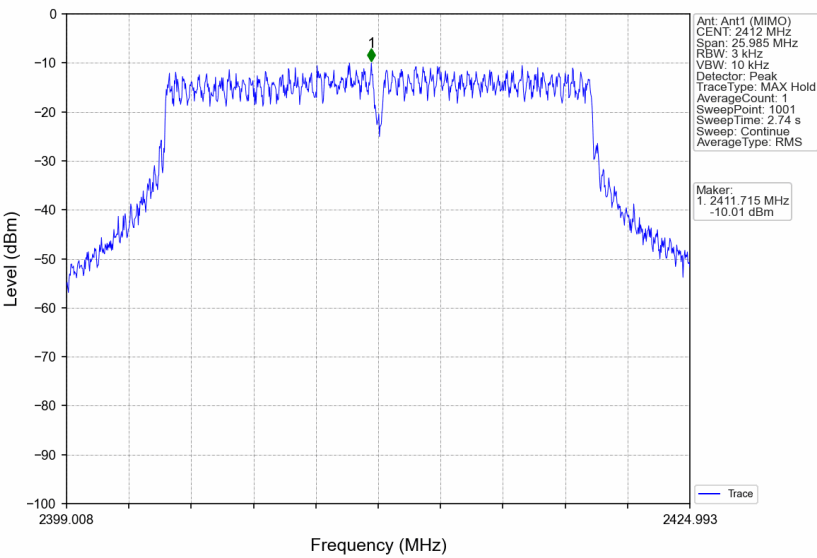
802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



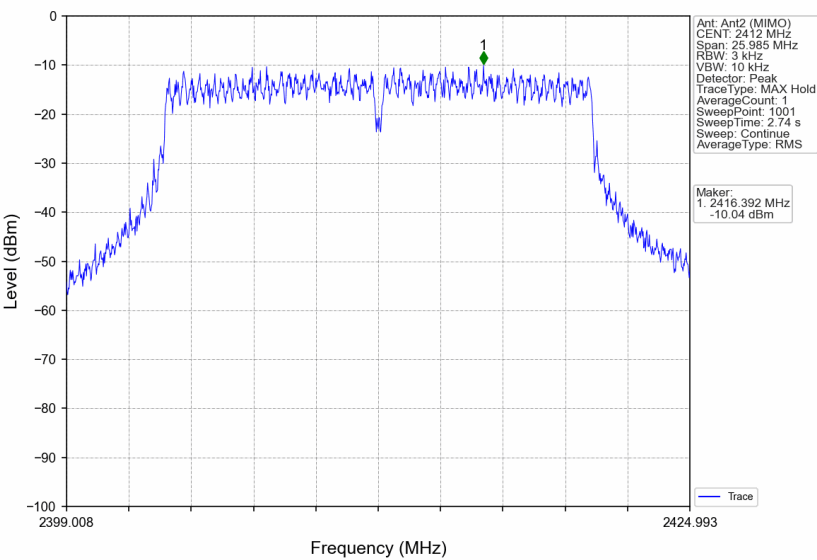
802.11g\_HCH\_2462MHz\_Ant2 (SISO)\_NTNV



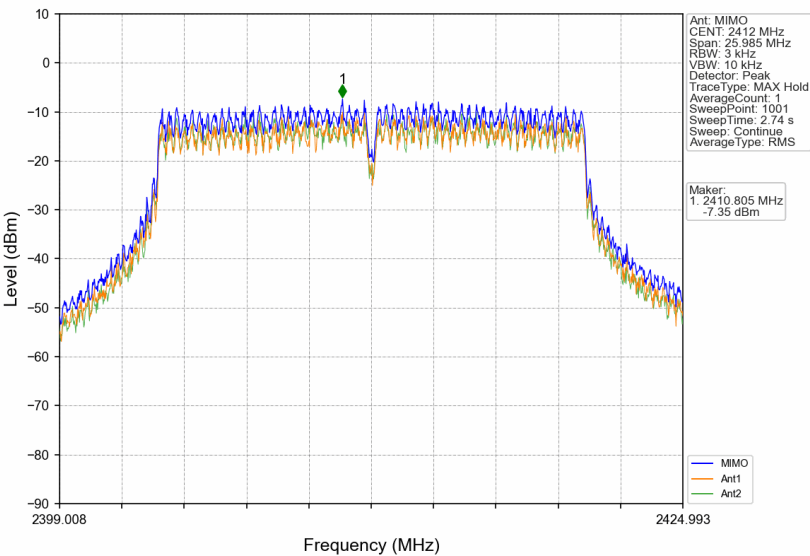
802.11n(HT20)\_LCH\_2412MHz\_Ant1 (MIMO)\_NTNV



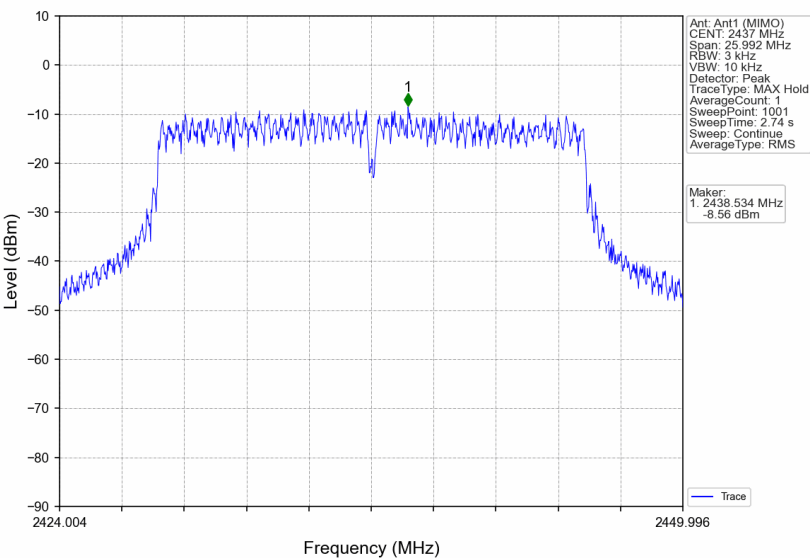
802.11n(HT20)\_LCH\_2412MHz\_Ant2 (MIMO)\_NTNV



802.11n(HT20)\_LCH\_2412MHz\_MIMO\_NTNV



802.11n(HT20)\_MCH\_2437MHz\_Ant1 (MIMO)\_NTNV



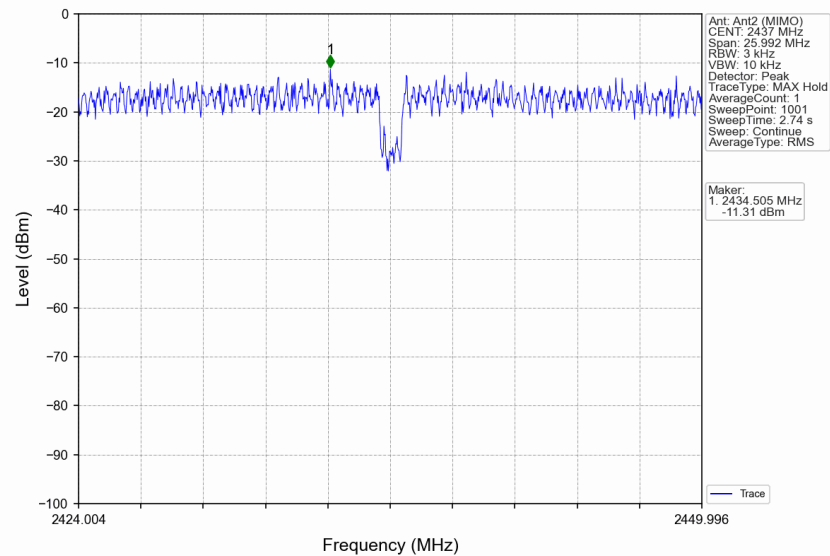
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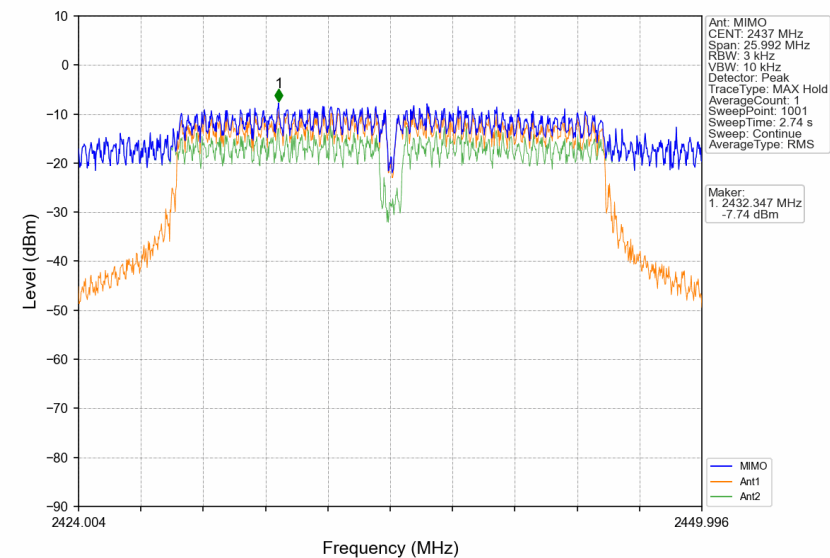
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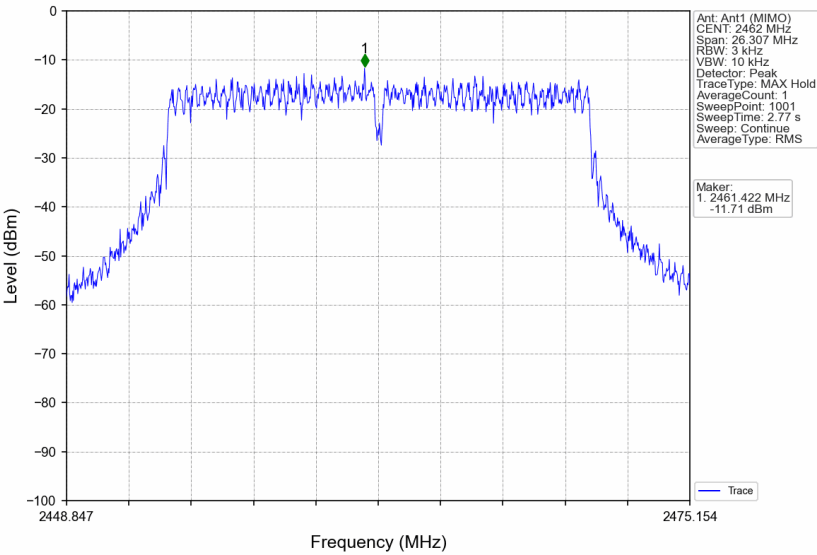
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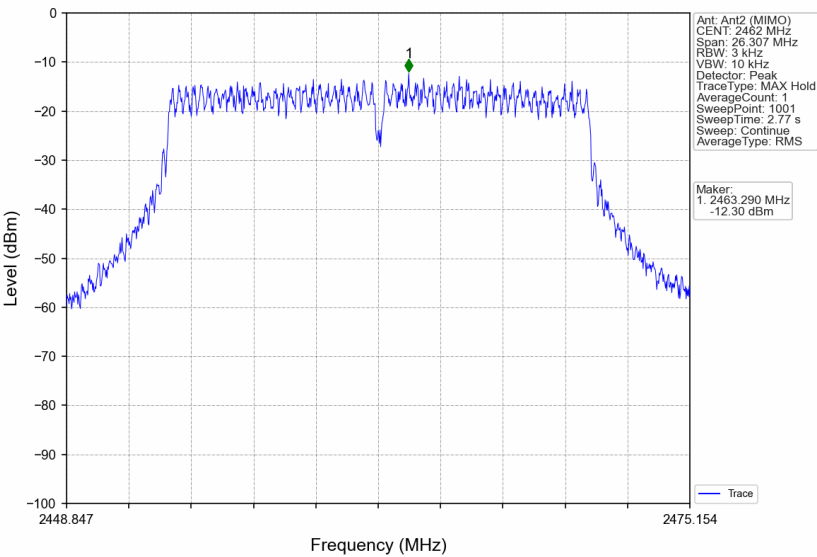
802.11n(HT20)\_MCH\_2437MHz\_MIMO\_NTNV



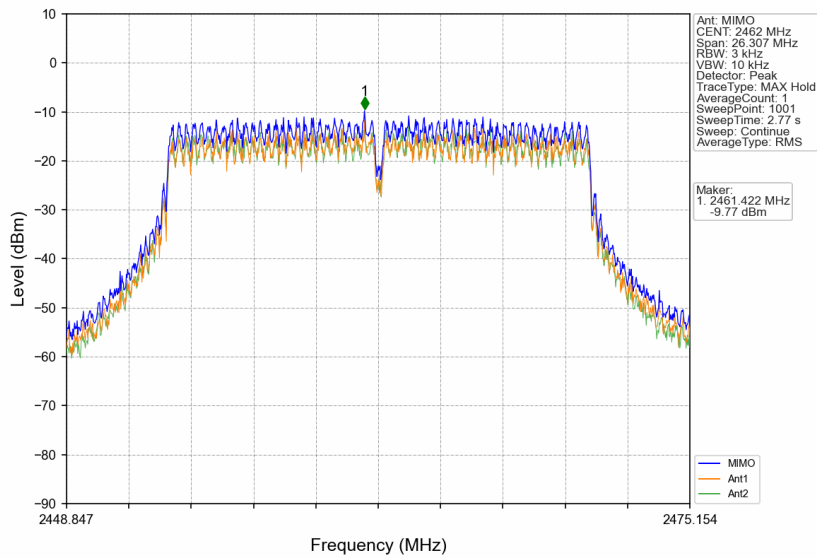
802.11n(HT20)\_HCH\_2462MHz\_Ant1 (MIMO)\_NTNV



802.11n(HT20)\_HCH\_2462MHz\_Ant2 (MIMO)\_NTNV



802.11n(HT20)\_HCH\_2462MHz\_MIMO\_NTNV



802.11n(HT40)\_LCH\_2422MHz\_Ant1 (MIMO)\_NTNV

