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## Annex for 2.4G Wi-Fi

Test Report No.: CTL2506182071-WF03

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## 1. Bandwidth

### 1.1 Test Result

#### 1.1.1 OBW

| Mode           | TX Type | Frequency (MHz) | ANT | 99% Occupied Bandwidth (MHz) |       | Verdict |
|----------------|---------|-----------------|-----|------------------------------|-------|---------|
|                |         |                 |     | Result                       | Limit |         |
| 802.11b        | SISO    | 2412            | 1   | 12.565                       | /     | Pass    |
|                |         | 2437            | 1   | 12.599                       | /     | Pass    |
|                |         | 2462            | 1   | 12.619                       | /     | Pass    |
| 802.11g        | SISO    | 2412            | 1   | 16.925                       | /     | Pass    |
|                |         | 2437            | 1   | 17.743                       | /     | Pass    |
|                |         | 2462            | 1   | 17.810                       | /     | Pass    |
| 802.11n (HT20) | SISO    | 2412            | 1   | 18.046                       | /     | Pass    |
|                |         | 2437            | 1   | 20.300                       | /     | Pass    |
|                |         | 2462            | 1   | 20.339                       | /     | Pass    |
| 802.11n (HT40) | SISO    | 2422            | 1   | 36.136                       | /     | Pass    |
|                |         | 2437            | 1   | 36.088                       | /     | Pass    |
|                |         | 2452            | 1   | 36.150                       | /     | Pass    |

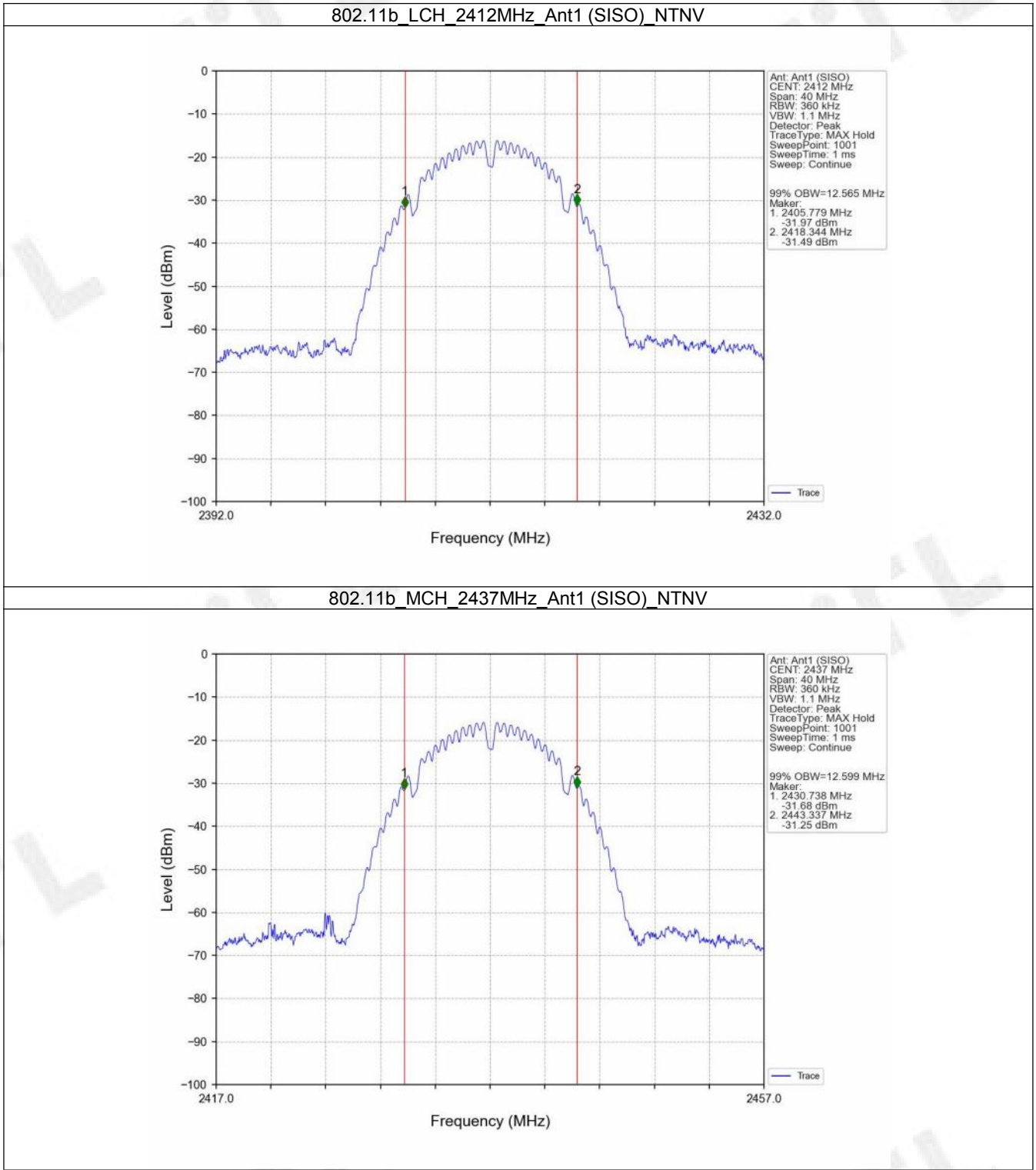
#### 1.1.2 6dB BW

| Mode           | TX Type | Frequency (MHz) | ANT | 6dB Bandwidth (MHz) |            | Verdict |
|----------------|---------|-----------------|-----|---------------------|------------|---------|
|                |         |                 |     | Result              | Limit      |         |
| 802.11b        | SISO    | 2412            | 1   | 8.105               | $\geq 0.5$ | Pass    |
|                |         | 2437            | 1   | 8.115               | $\geq 0.5$ | Pass    |
|                |         | 2462            | 1   | 8.114               | $\geq 0.5$ | Pass    |
| 802.11g        | SISO    | 2412            | 1   | 15.160              | $\geq 0.5$ | Pass    |
|                |         | 2437            | 1   | 16.333              | $\geq 0.5$ | Pass    |
|                |         | 2462            | 1   | 16.352              | $\geq 0.5$ | Pass    |
| 802.11n (HT20) | SISO    | 2412            | 1   | 15.110              | $\geq 0.5$ | Pass    |
|                |         | 2437            | 1   | 15.496              | $\geq 0.5$ | Pass    |
|                |         | 2462            | 1   | 15.303              | $\geq 0.5$ | Pass    |
| 802.11n (HT40) | SISO    | 2422            | 1   | 35.144              | $\geq 0.5$ | Pass    |
|                |         | 2437            | 1   | 35.137              | $\geq 0.5$ | Pass    |
|                |         | 2452            | 1   | 35.136              | $\geq 0.5$ | Pass    |

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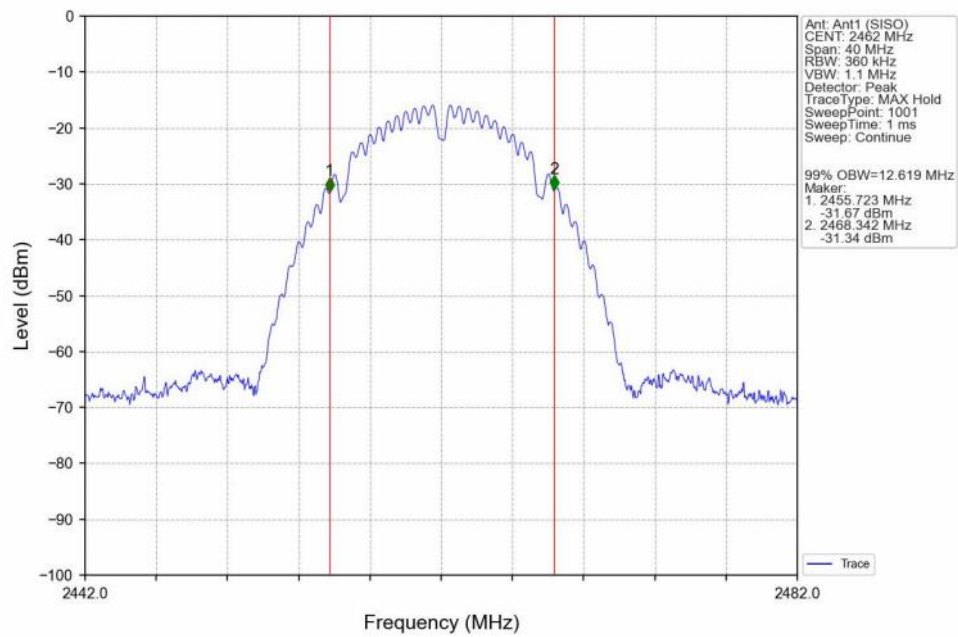
1.2 Test Graph

1.2.1 OBW

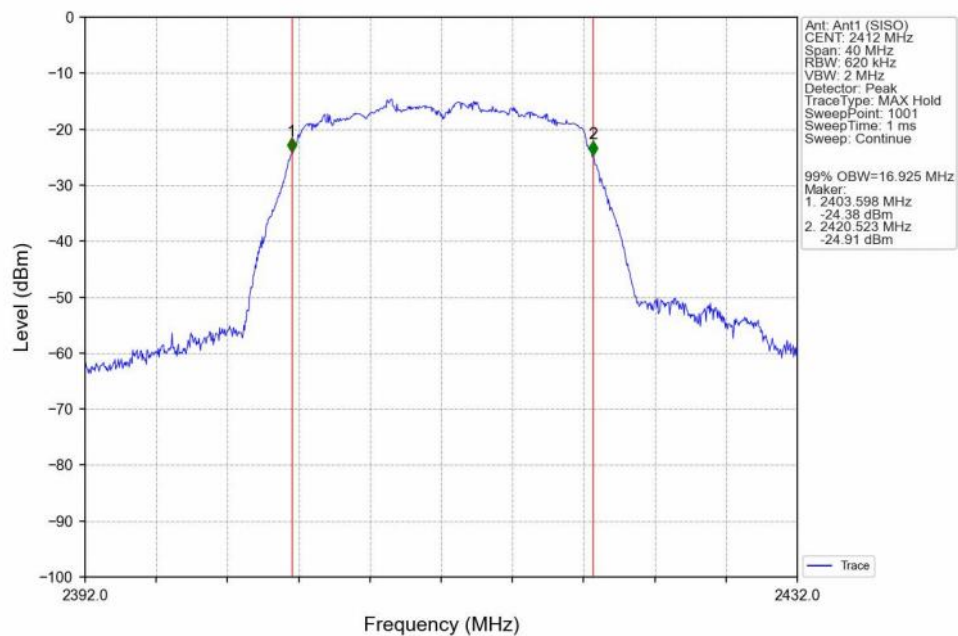


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802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV

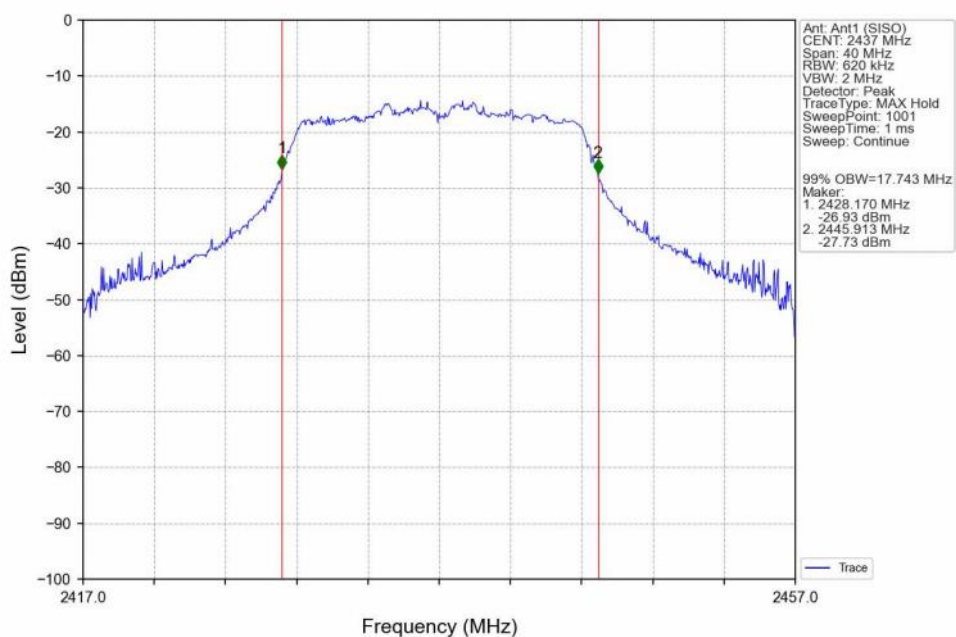


802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV

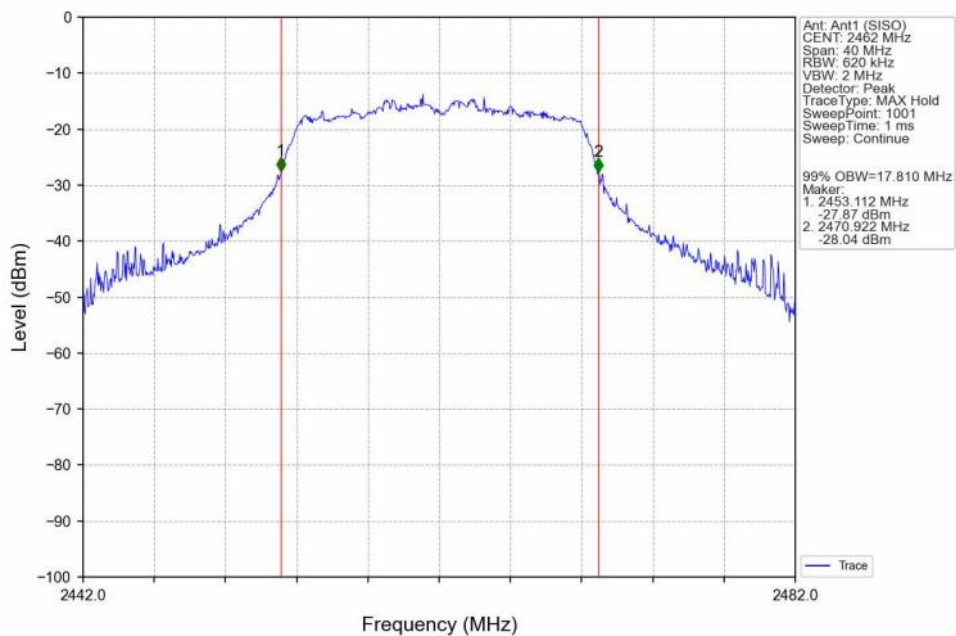


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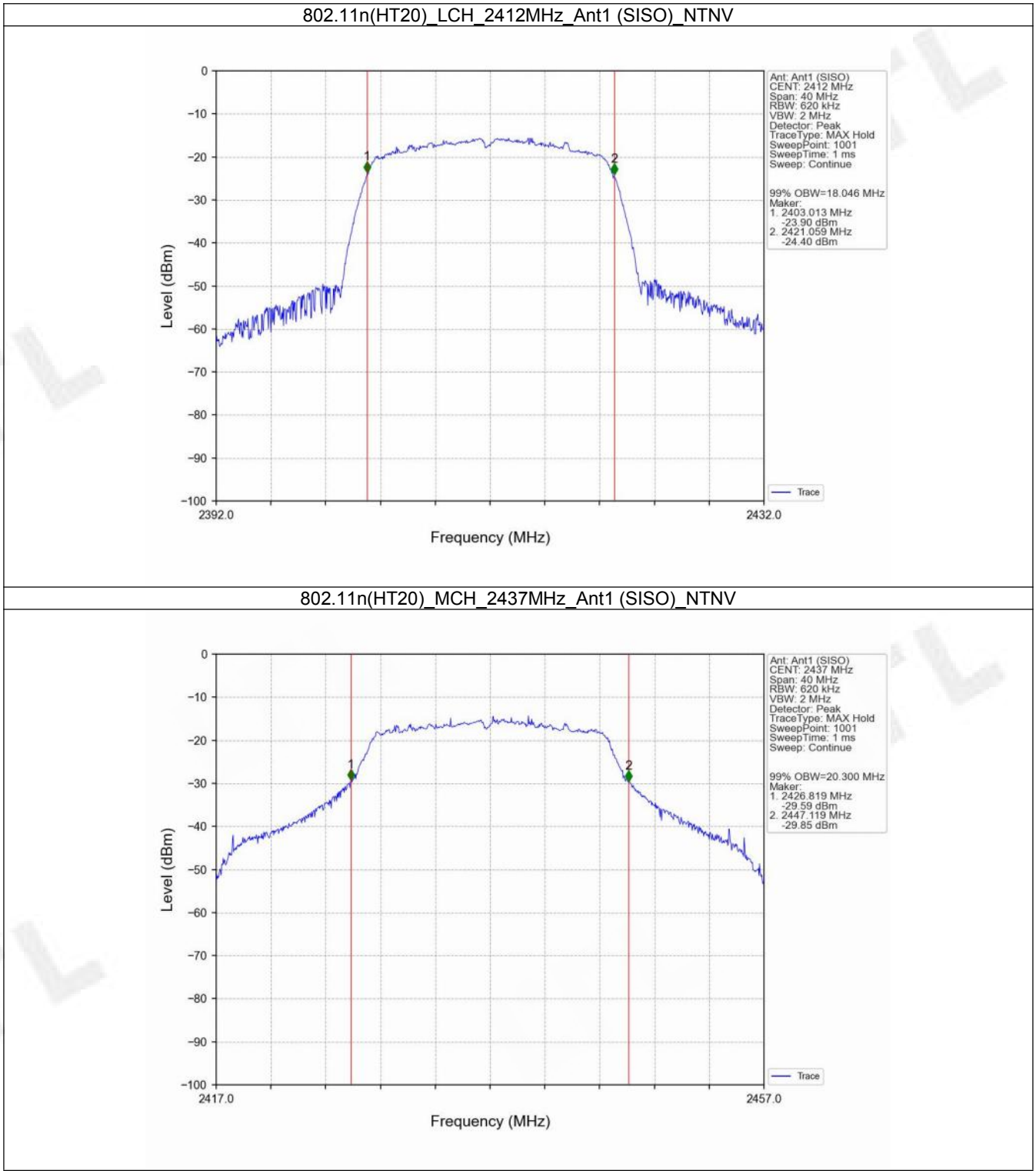
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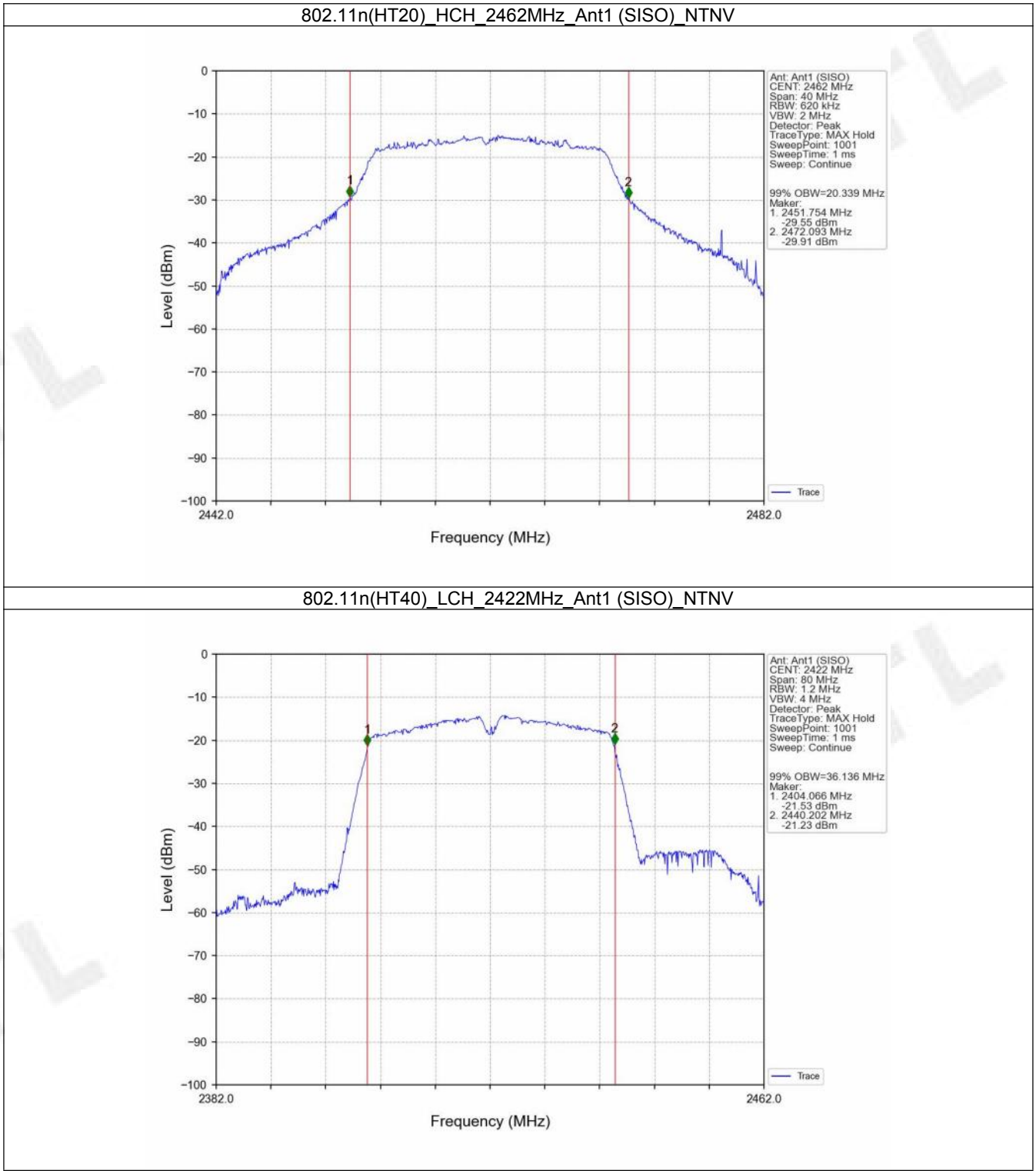
802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



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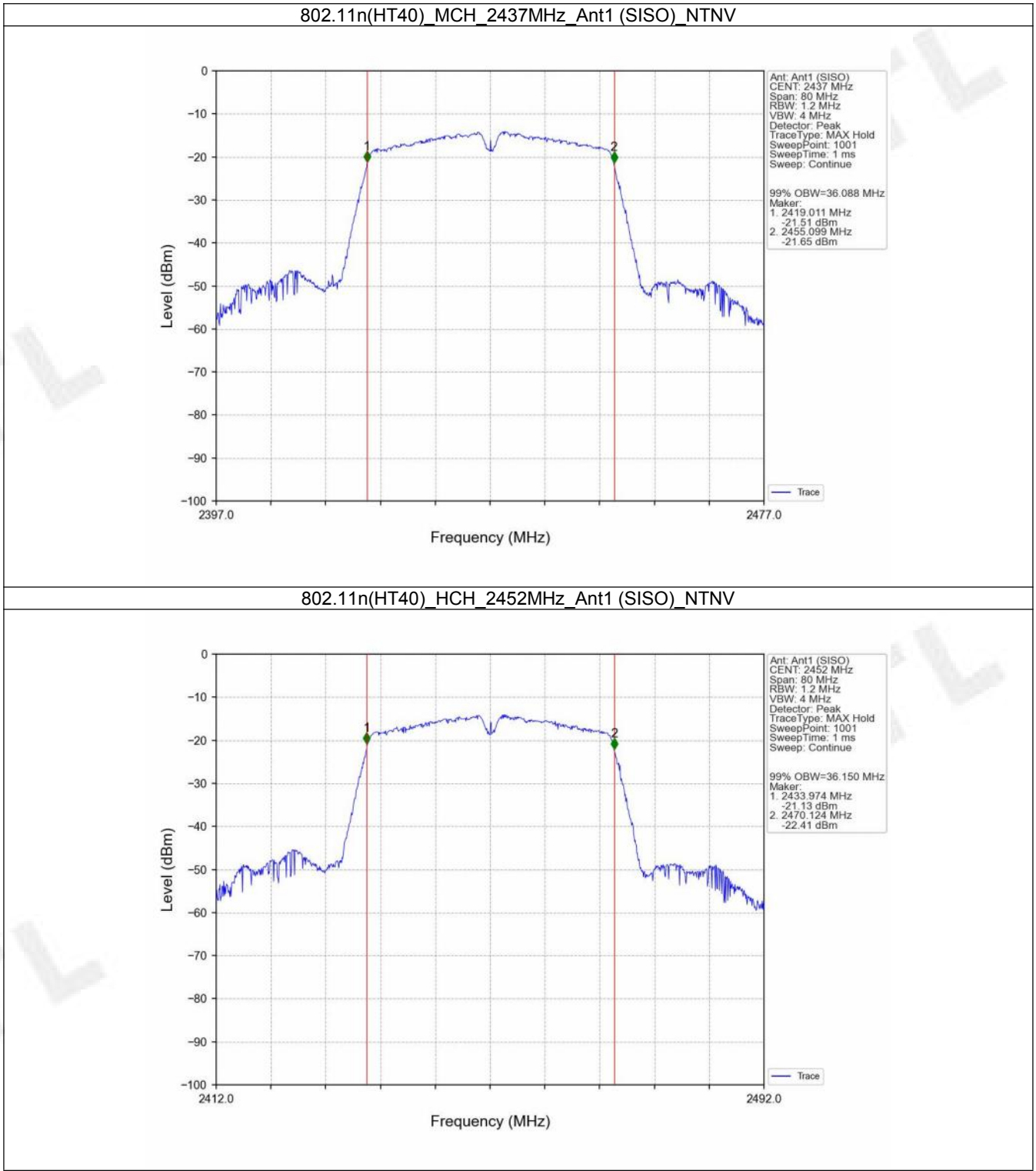


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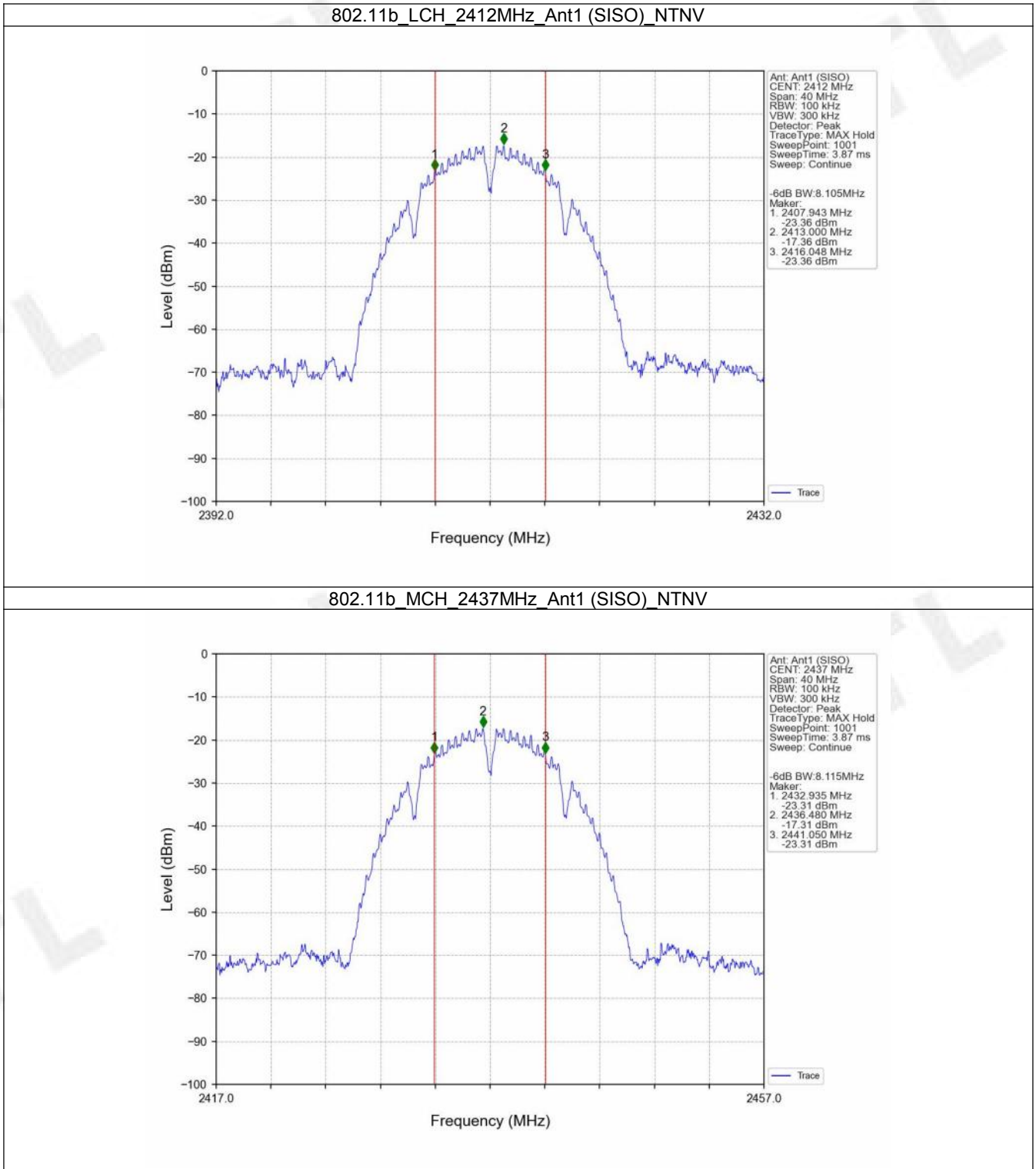


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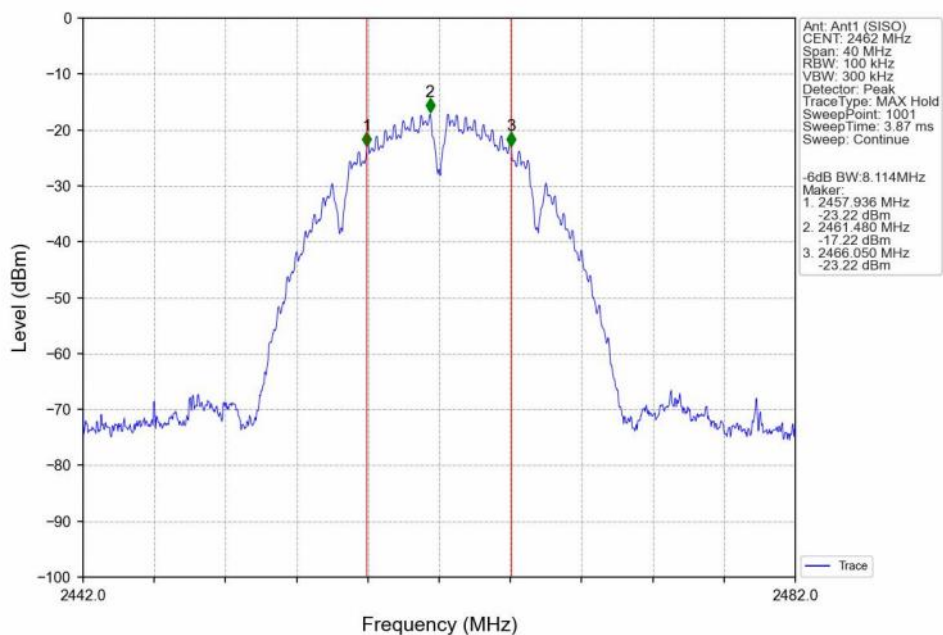
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1.2.2 6dB BW

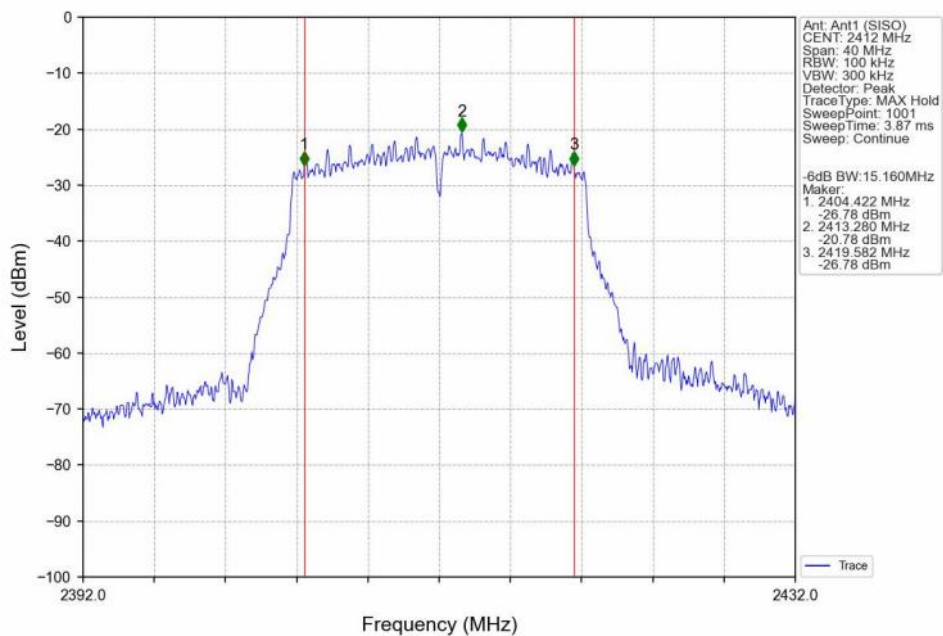


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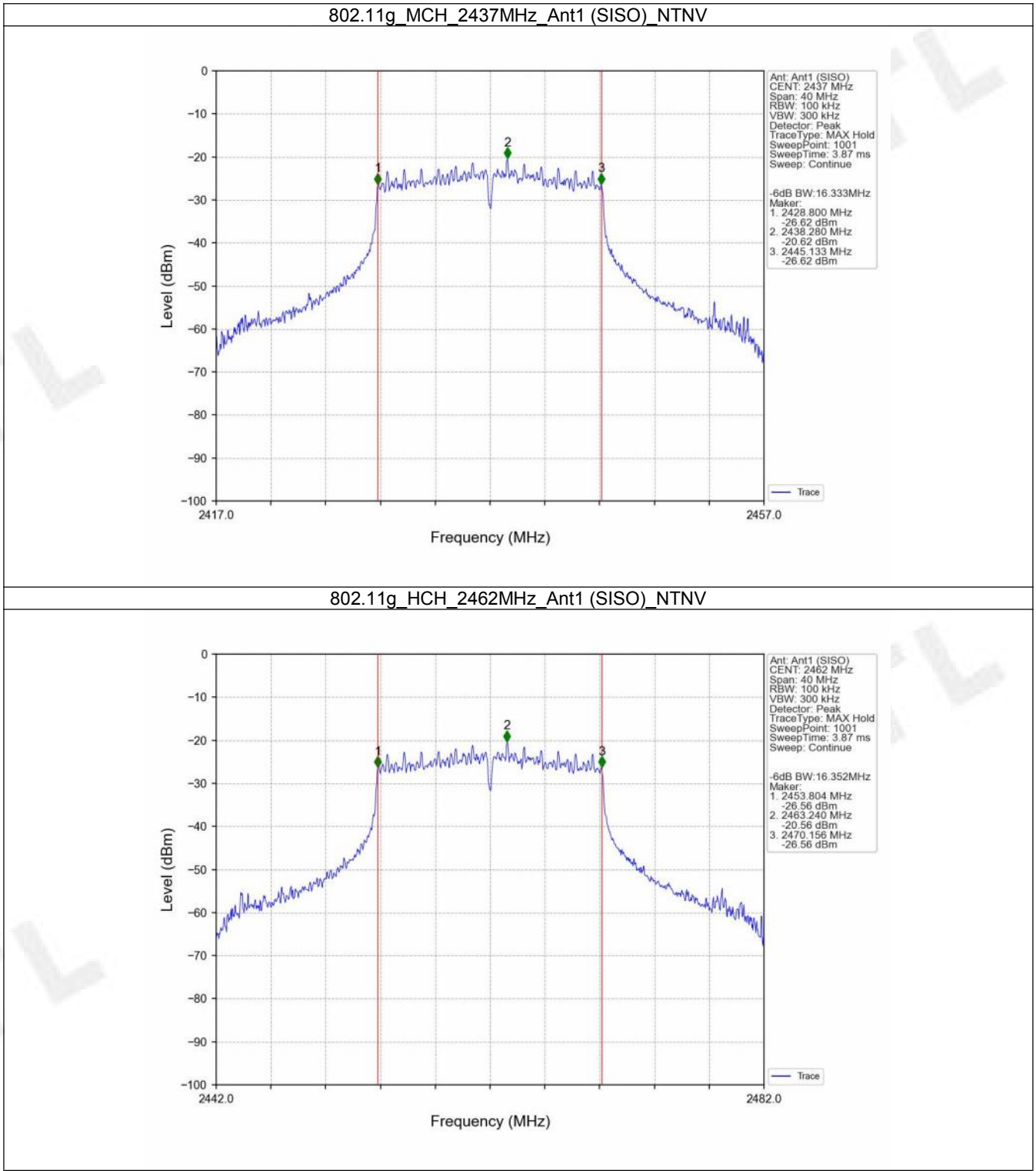
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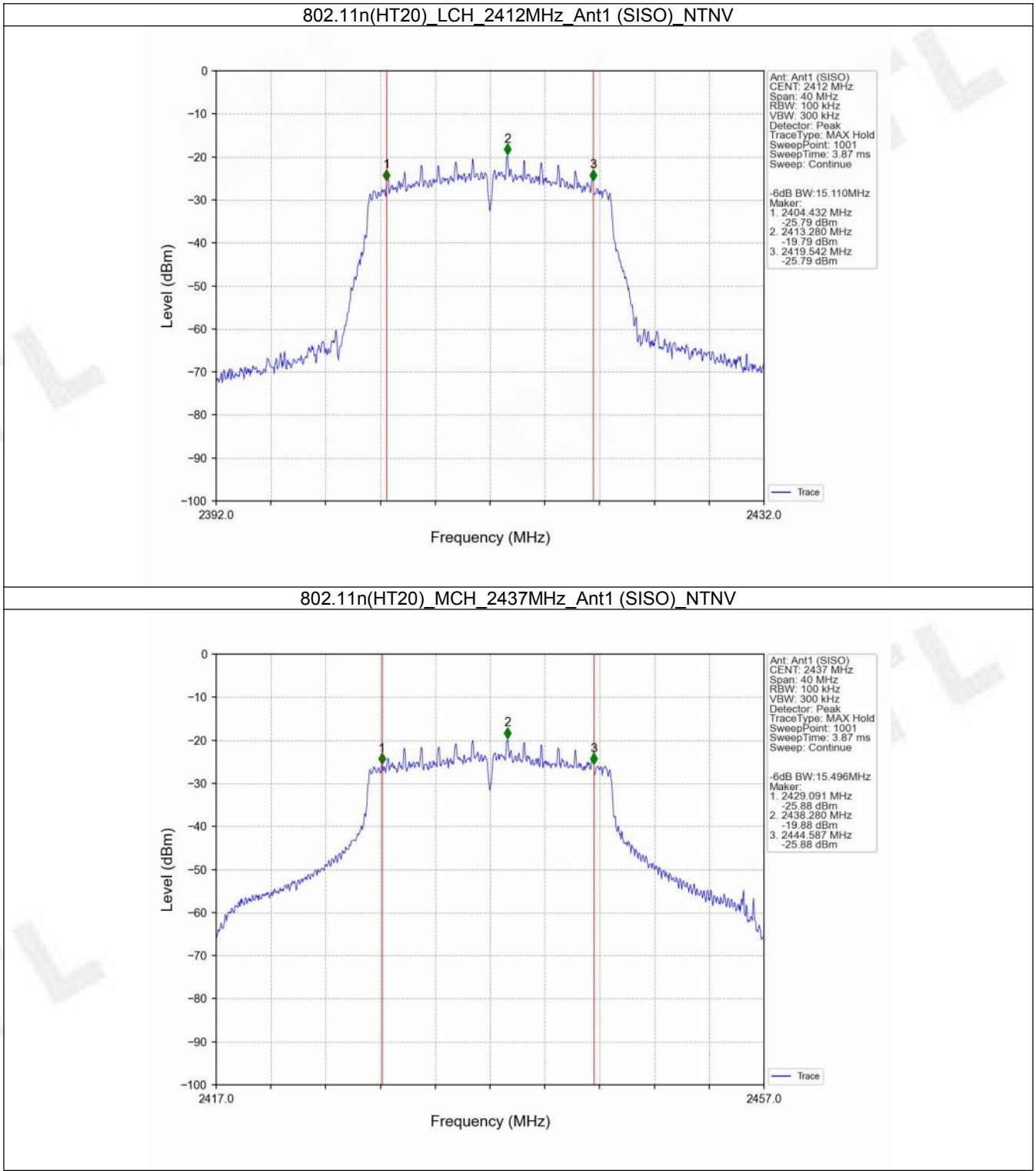
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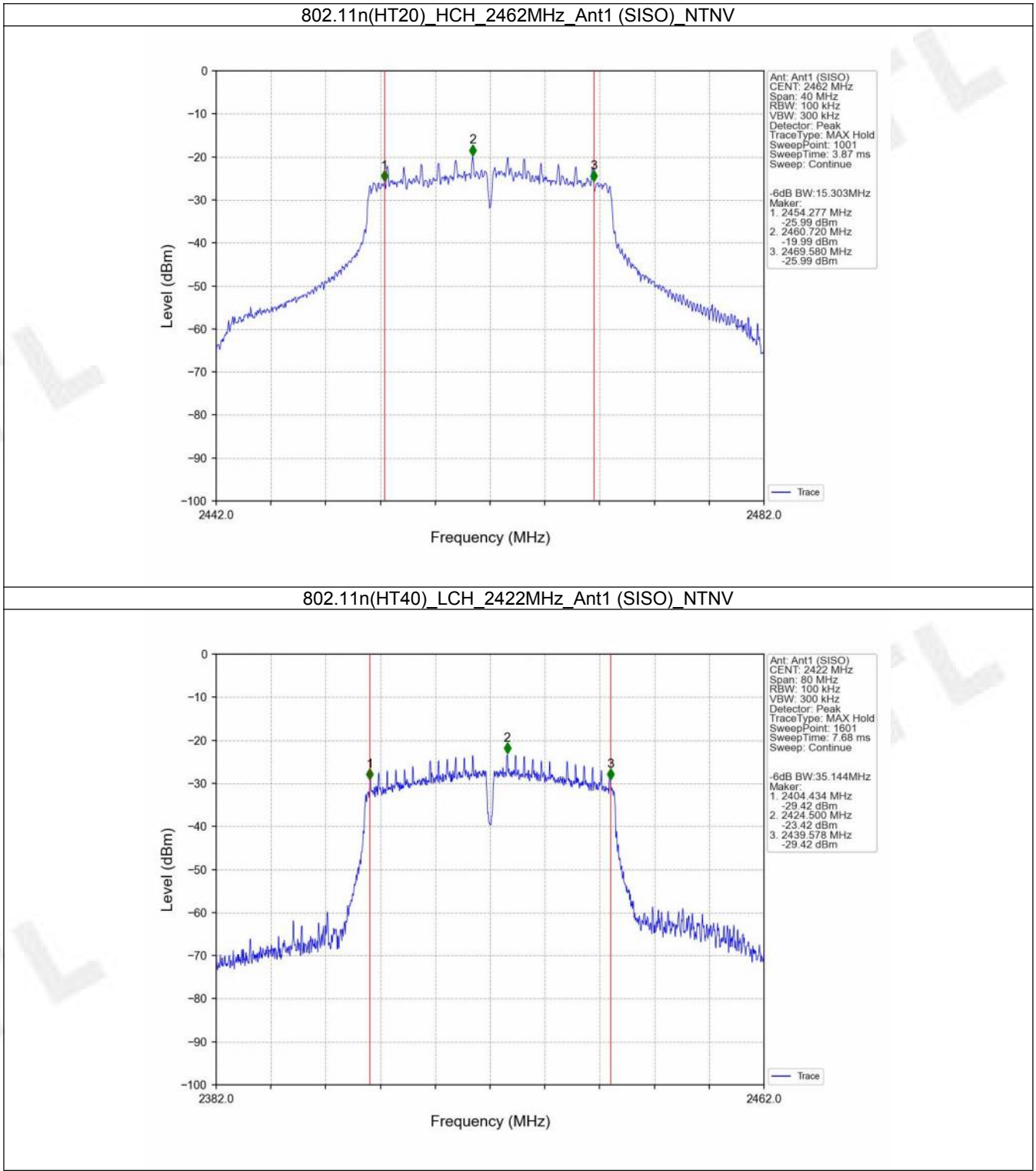


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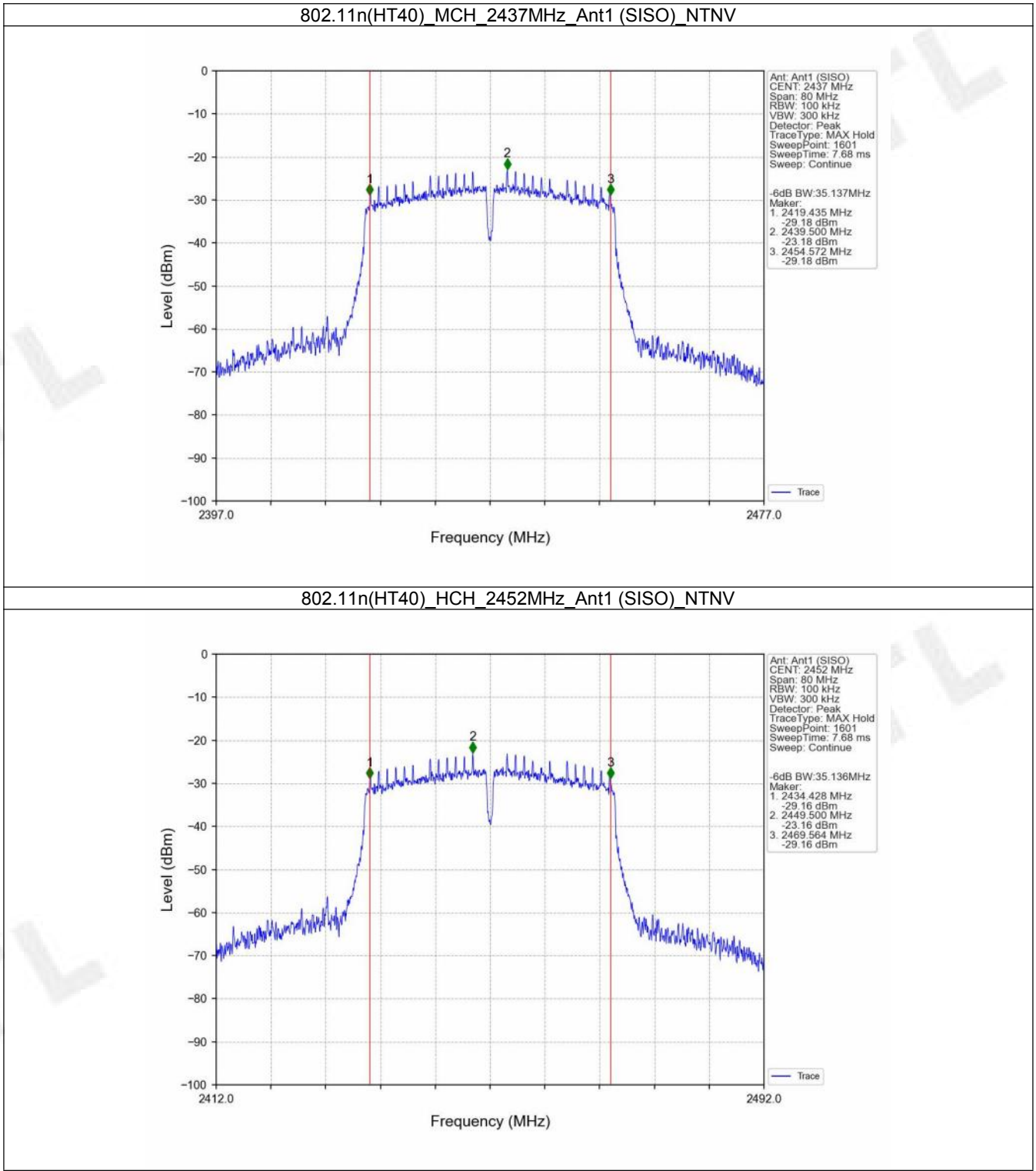




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## 2. Maximum Conducted Output Power

### 2.1 Test Result

#### 2.1.1 Power

| Mode           | TX Type | Frequency (MHz) | Maximum Peak Conducted Output Power (dBm) |       | Verdict |
|----------------|---------|-----------------|-------------------------------------------|-------|---------|
|                |         |                 | ANT1                                      | Limit |         |
| 802.11b        | SISO    | 2412            | -6.11                                     | <=30  | Pass    |
|                |         | 2437            | -5.87                                     | <=30  | Pass    |
|                |         | 2462            | -5.79                                     | <=30  | Pass    |
| 802.11g        | SISO    | 2412            | -2.80                                     | <=30  | Pass    |
|                |         | 2437            | -2.42                                     | <=30  | Pass    |
|                |         | 2462            | -2.27                                     | <=30  | Pass    |
| 802.11n (HT20) | SISO    | 2412            | -2.44                                     | <=30  | Pass    |
|                |         | 2437            | -1.90                                     | <=30  | Pass    |
|                |         | 2462            | -1.92                                     | <=30  | Pass    |
| 802.11n (HT40) | SISO    | 2422            | -2.53                                     | <=30  | Pass    |
|                |         | 2437            | -2.34                                     | <=30  | Pass    |
|                |         | 2452            | -2.30                                     | <=30  | Pass    |

Note1: Antenna Gain: Ant1: 4.81dBi;



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### 3. Maximum Power Spectral Density

#### 3.1 Test Result

##### 3.1.1 PSD

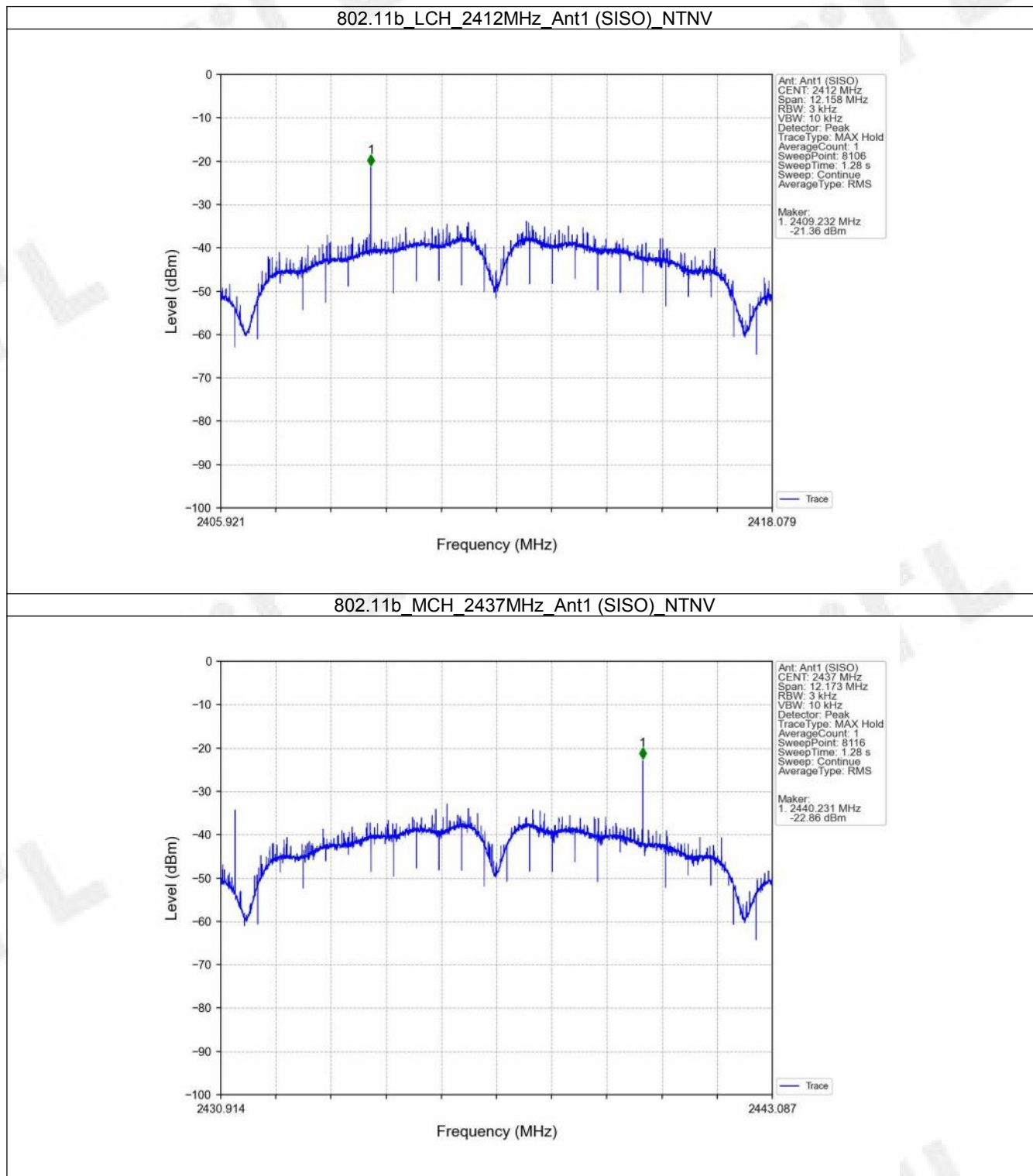
| Mode           | TX Type | Frequency (MHz) | Maximum PSD (dBm/3kHz) |       | Verdict |
|----------------|---------|-----------------|------------------------|-------|---------|
|                |         |                 | ANT1                   | Limit |         |
| 802.11b        | SISO    | 2412            | -21.36                 | <=8   | Pass    |
|                |         | 2437            | -22.86                 | <=8   | Pass    |
|                |         | 2462            | -18.37                 | <=8   | Pass    |
| 802.11g        | SISO    | 2412            | -35.20                 | <=8   | Pass    |
|                |         | 2437            | -35.52                 | <=8   | Pass    |
|                |         | 2462            | -33.84                 | <=8   | Pass    |
| 802.11n (HT20) | SISO    | 2412            | -36.29                 | <=8   | Pass    |
|                |         | 2437            | -36.33                 | <=8   | Pass    |
|                |         | 2462            | -36.60                 | <=8   | Pass    |
| 802.11n (HT40) | SISO    | 2422            | -38.81                 | <=8   | Pass    |
|                |         | 2437            | -39.24                 | <=8   | Pass    |
|                |         | 2452            | -38.99                 | <=8   | Pass    |

Note1: Antenna Gain: Ant1: 4.81dBi;

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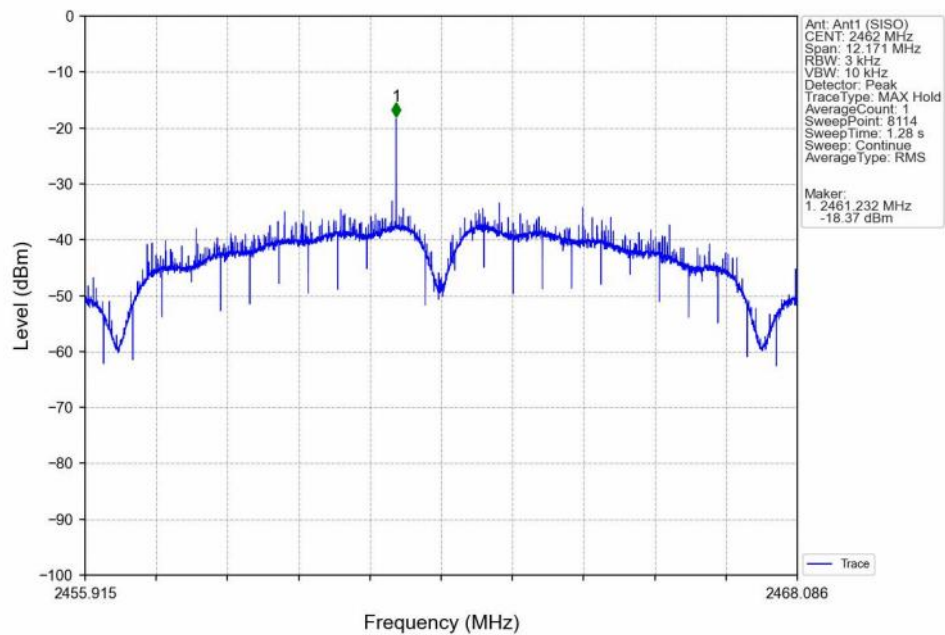
## 3.2 Test Graph

### 3.2.1 PSD

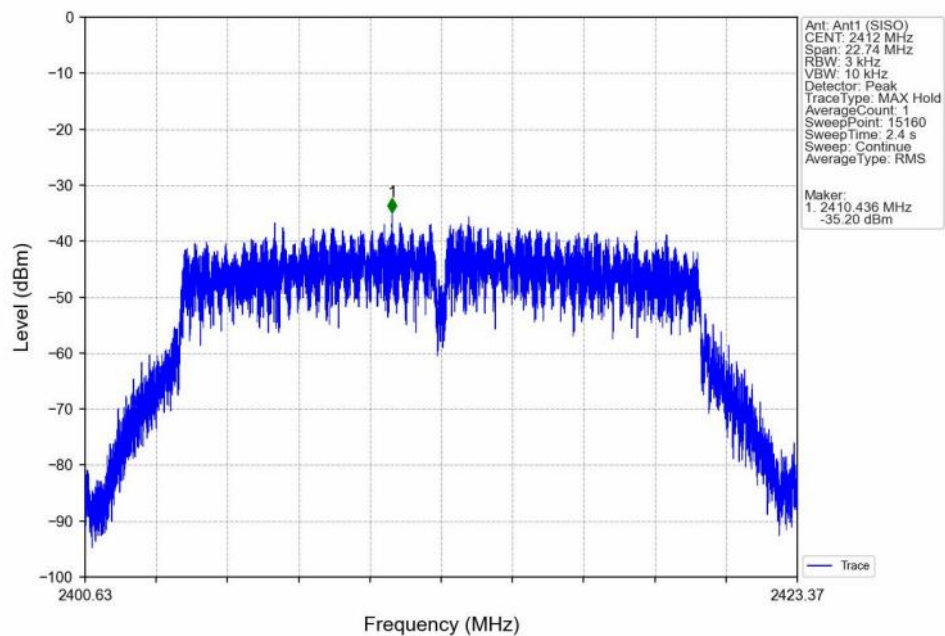


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802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV

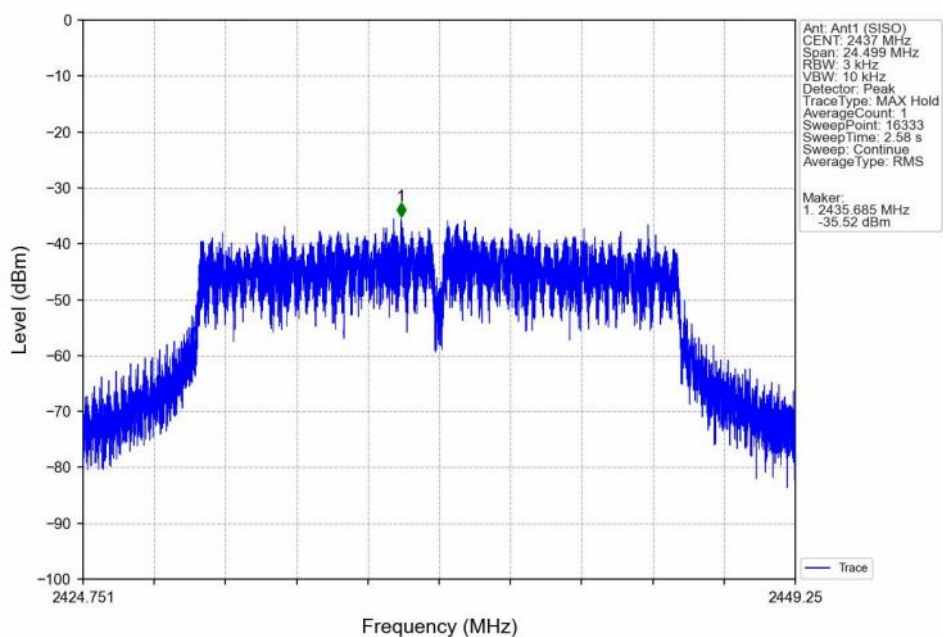


802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV

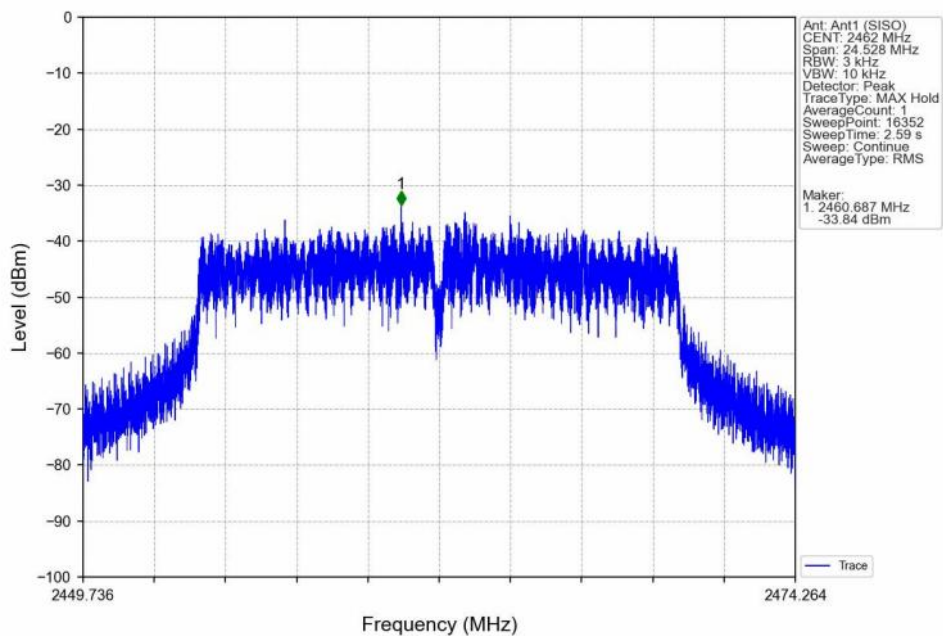


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802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV

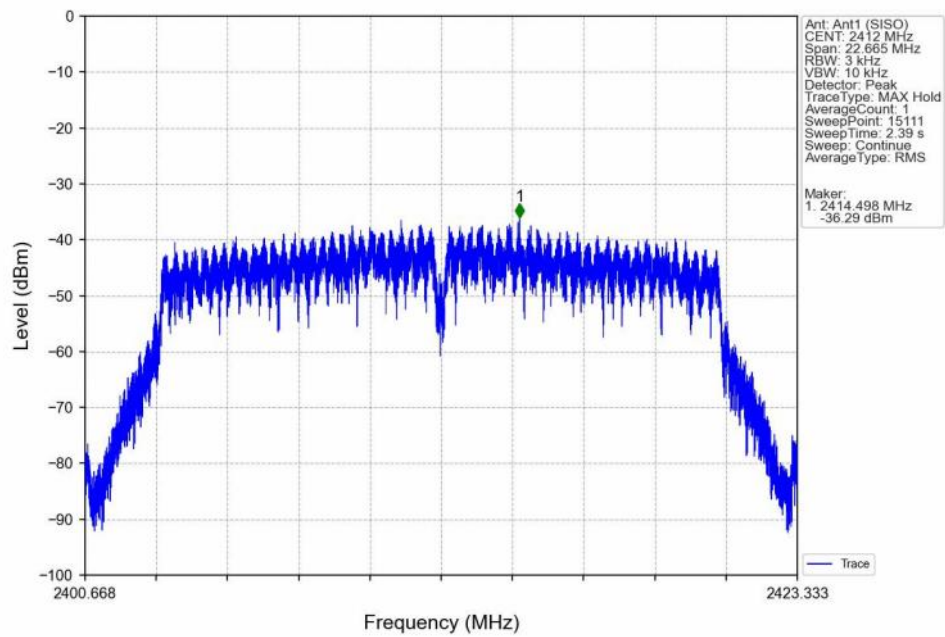


802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV

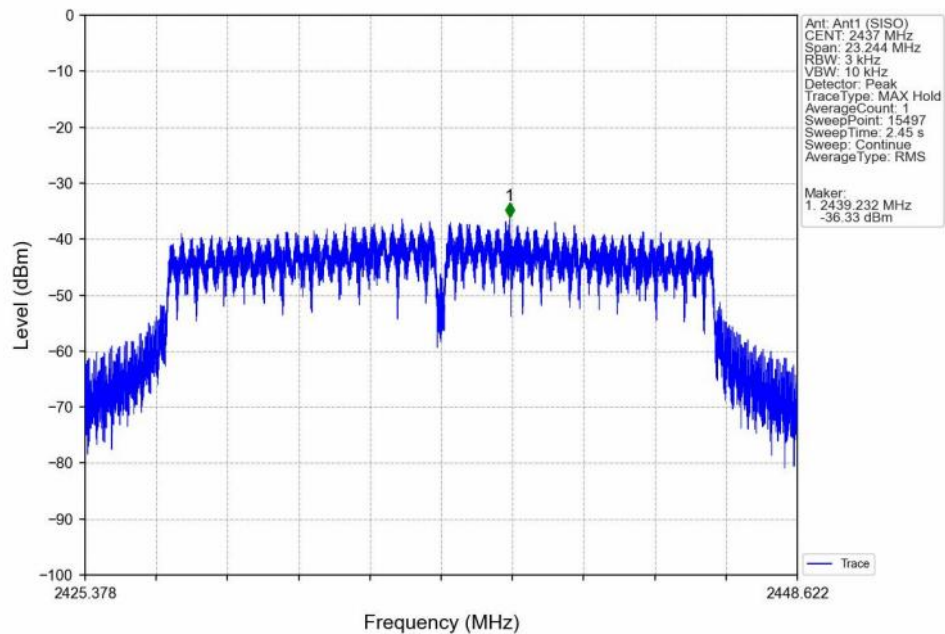


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802.11n(HT20)\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV

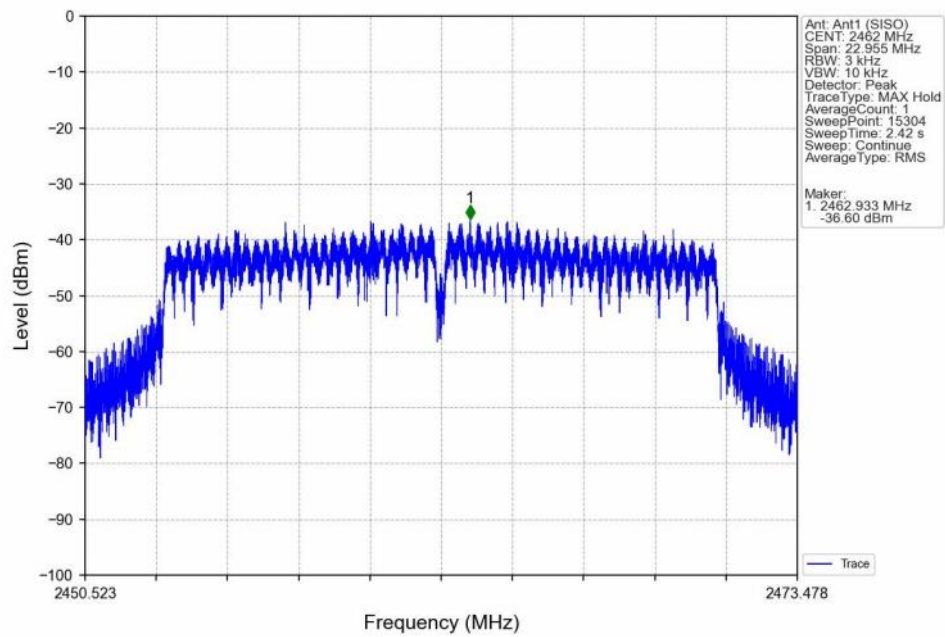


802.11n(HT20)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV

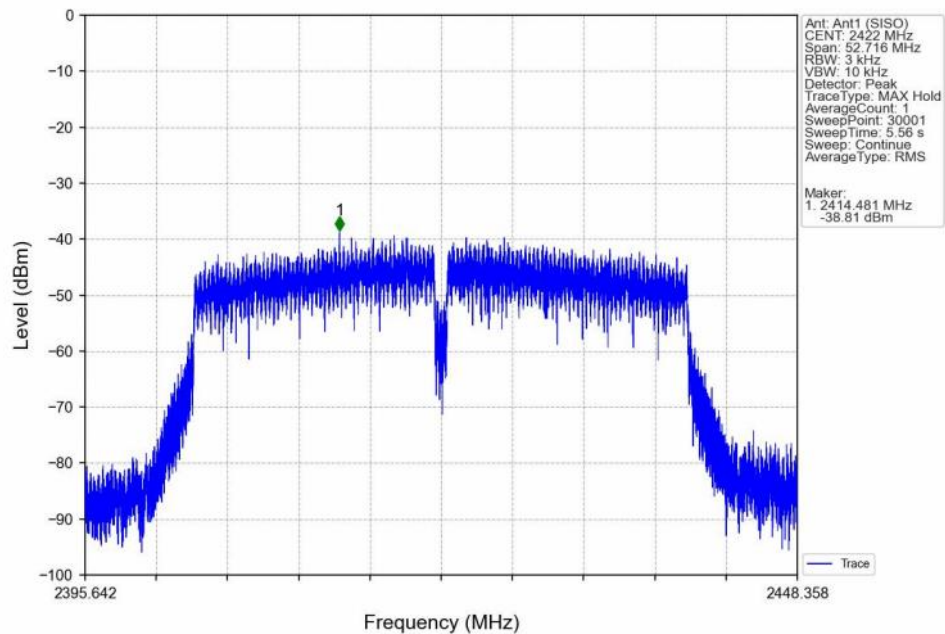


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802.11n(HT20)\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



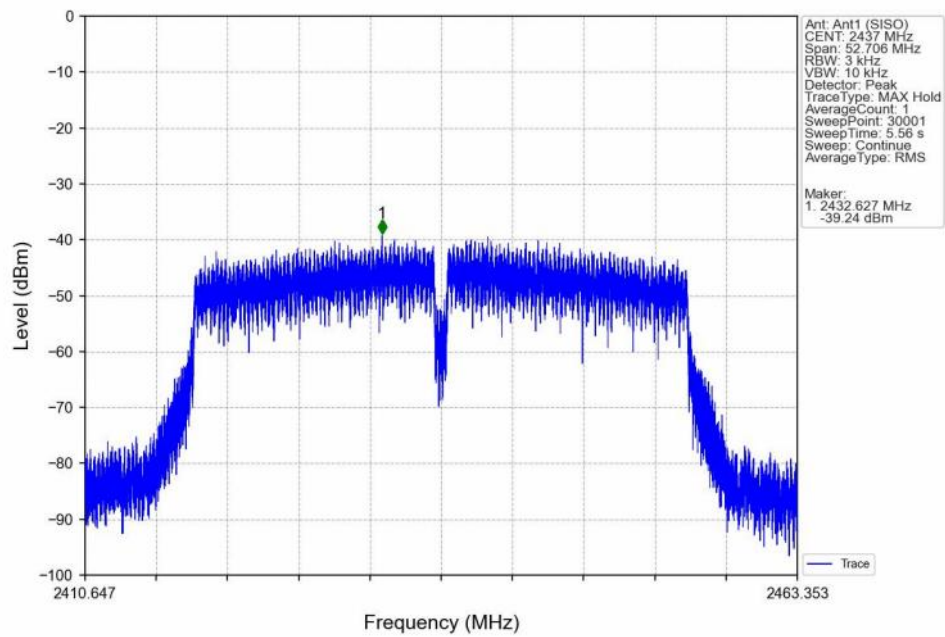
802.11n(HT40)\_LCH\_2422MHz\_Ant1 (SISO)\_NTNV



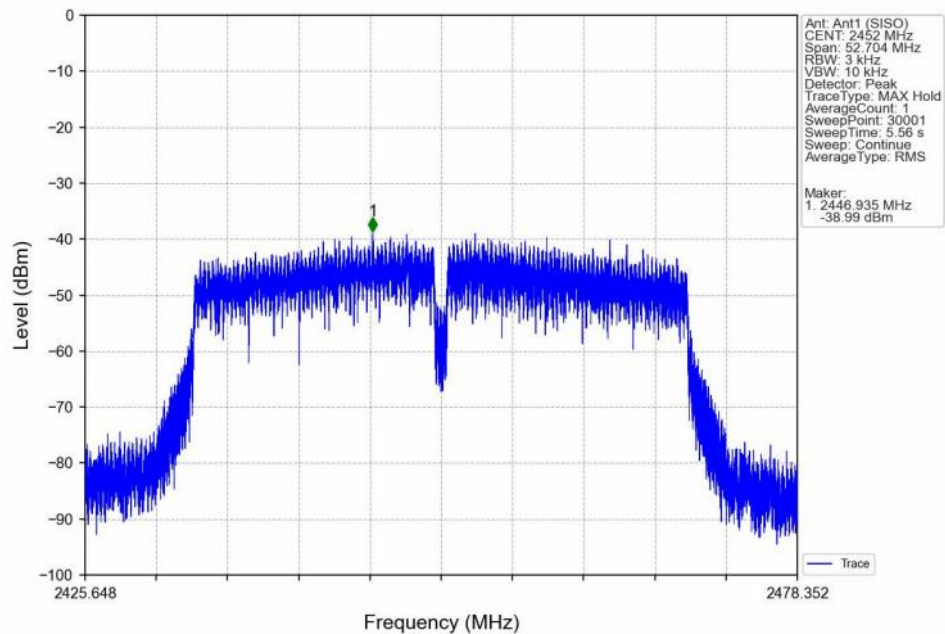


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802.11n(HT40)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



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





FCC ID:2AUARTKMU8A

## 4. Unwanted Emissions In Non-restricted Frequency Bands

### 4.1 Test Result

#### 4.1.1 Ref

| Mode           | Tx Type | Frequency (MHz) | ANT | Level of Reference (dBm) |
|----------------|---------|-----------------|-----|--------------------------|
| 802.11b        | SISO    | 2412            | 1   | -17.35                   |
|                |         | 2437            | 1   | -17.09                   |
|                |         | 2462            | 1   | -17.21                   |
| 802.11g        | SISO    | 2412            | 1   | -20.80                   |
|                |         | 2437            | 1   | -20.63                   |
|                |         | 2462            | 1   | -20.51                   |
| 802.11n (HT20) | SISO    | 2412            | 1   | -19.85                   |
|                |         | 2437            | 1   | -19.38                   |
|                |         | 2462            | 1   | -19.43                   |
| 802.11n (HT40) | SISO    | 2422            | 1   | -23.26                   |
|                |         | 2437            | 1   | -23.12                   |
|                |         | 2452            | 1   | -23.31                   |

Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.

#### 4.1.2 CSE

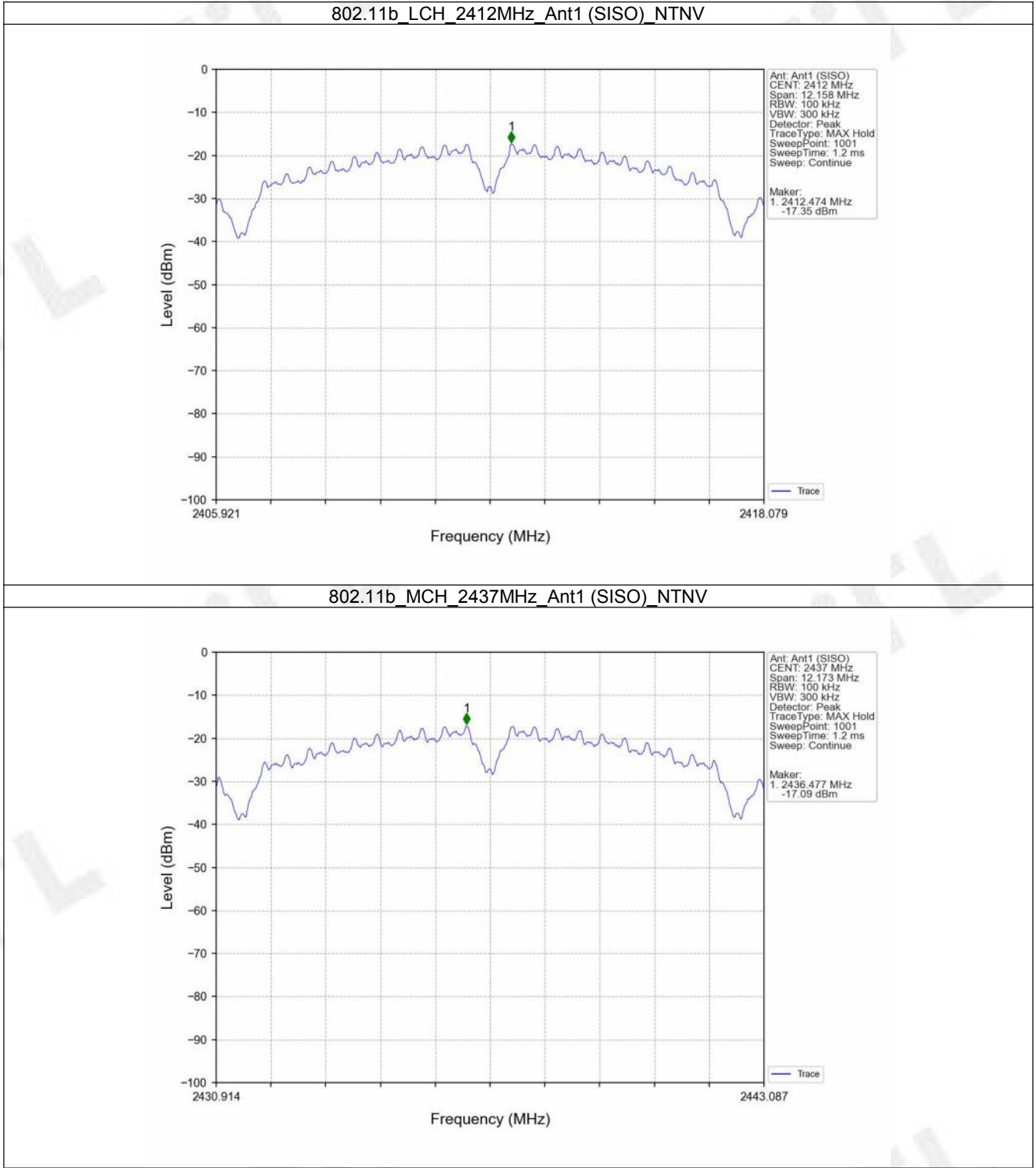
| Mode           | Tx Type | Frequency (MHz) | ANT | Level of Reference (dBm) | Limit (dBm) | Verdict |
|----------------|---------|-----------------|-----|--------------------------|-------------|---------|
| 802.11b        | SISO    | 2412            | 1   | -17.09                   | -37.09      | Pass    |
|                |         | 2437            | 1   | -17.09                   | -37.09      | Pass    |
|                |         | 2462            | 1   | -17.09                   | -37.09      | Pass    |
| 802.11g        | SISO    | 2412            | 1   | -20.51                   | -40.51      | Pass    |
|                |         | 2437            | 1   | -20.51                   | -40.51      | Pass    |
|                |         | 2462            | 1   | -20.51                   | -40.51      | Pass    |
| 802.11n (HT20) | SISO    | 2412            | 1   | -19.38                   | -39.38      | Pass    |
|                |         | 2437            | 1   | -19.38                   | -39.38      | Pass    |
|                |         | 2462            | 1   | -19.38                   | -39.38      | Pass    |
| 802.11n (HT40) | SISO    | 2422            | 1   | -23.12                   | -43.12      | Pass    |
|                |         | 2437            | 1   | -23.12                   | -43.12      | Pass    |
|                |         | 2452            | 1   | -23.12                   | -43.12      | Pass    |

Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.

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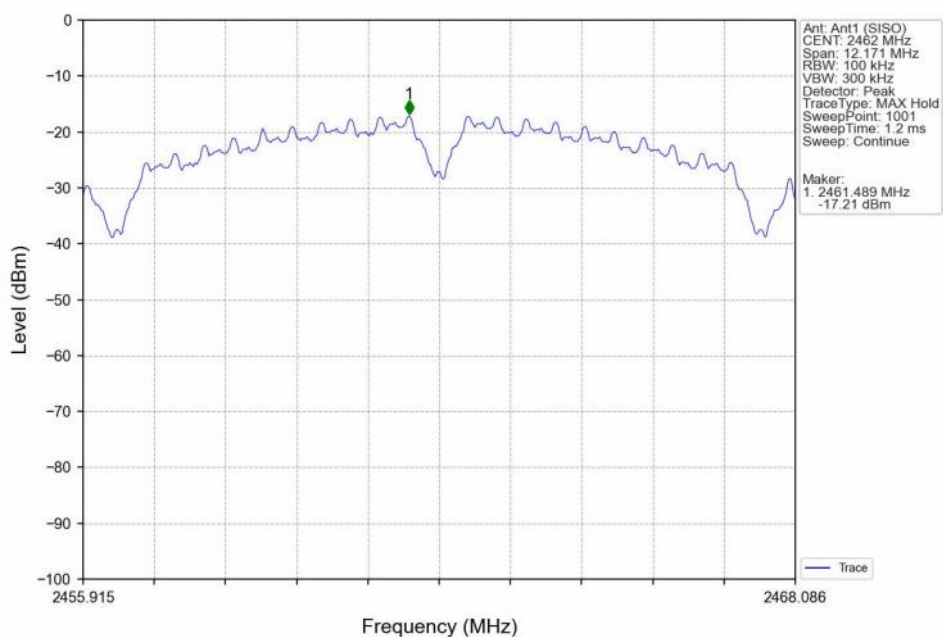
4.2 Test Graph

4.2.1 Ref

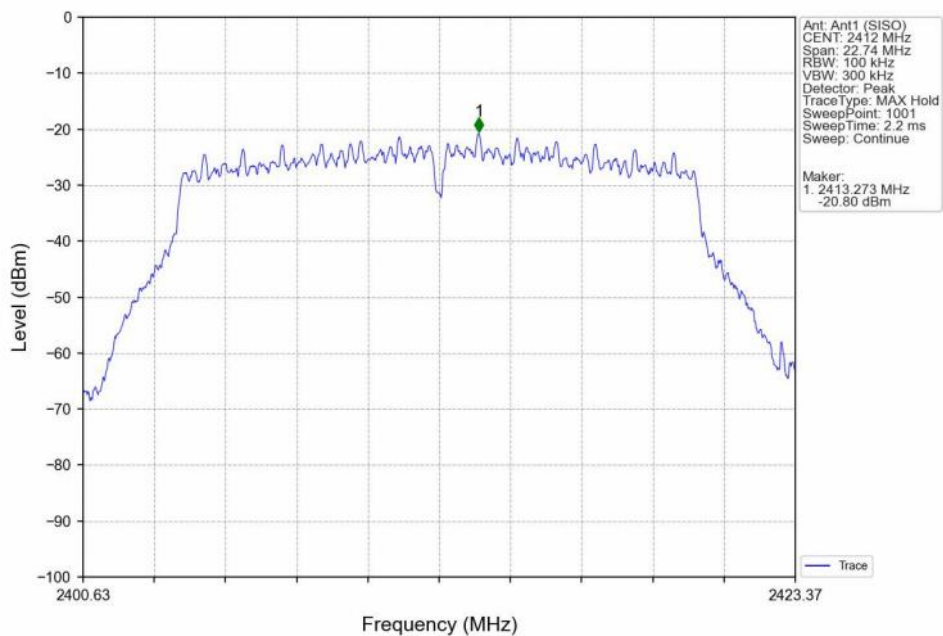


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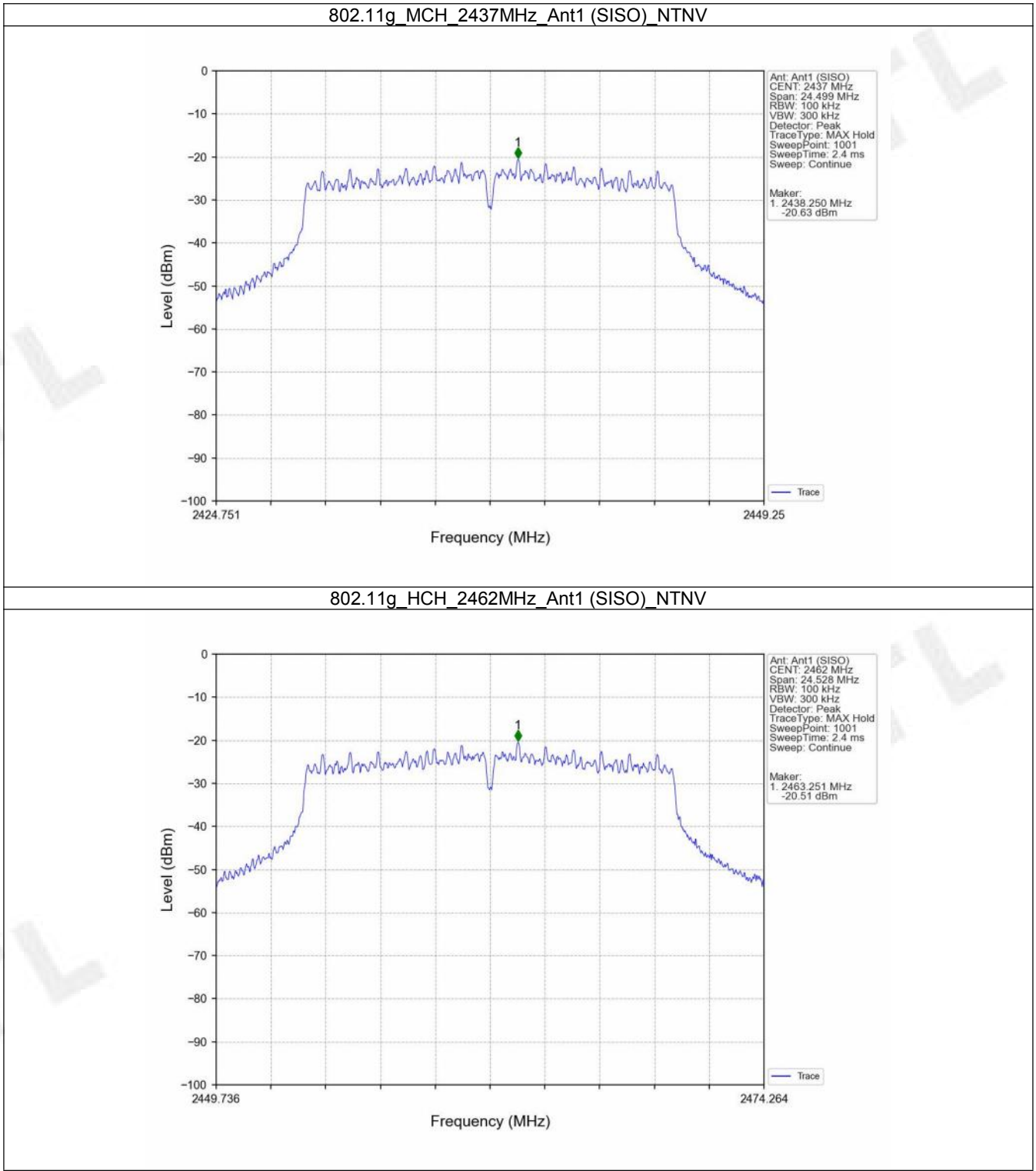
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802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV

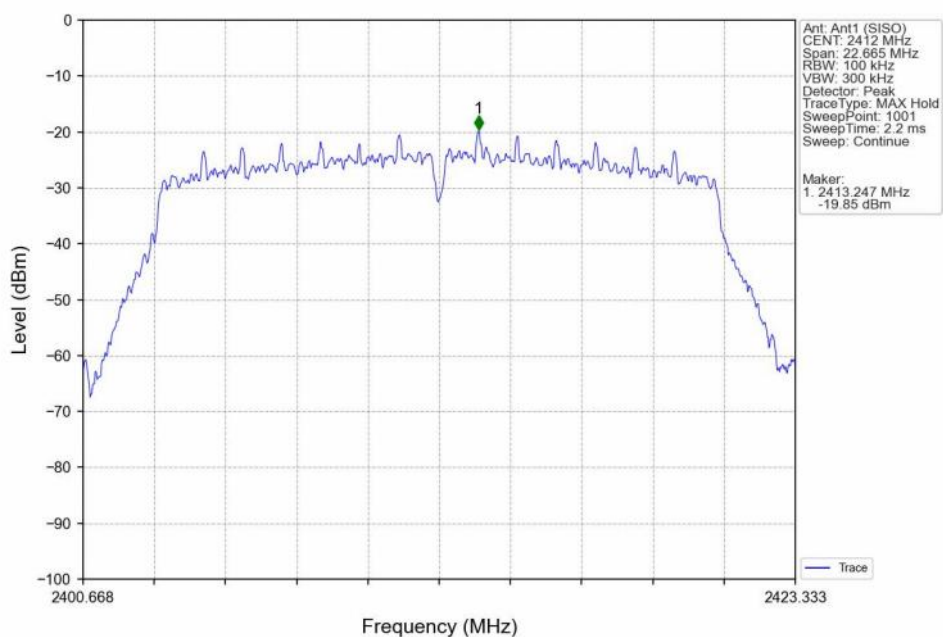


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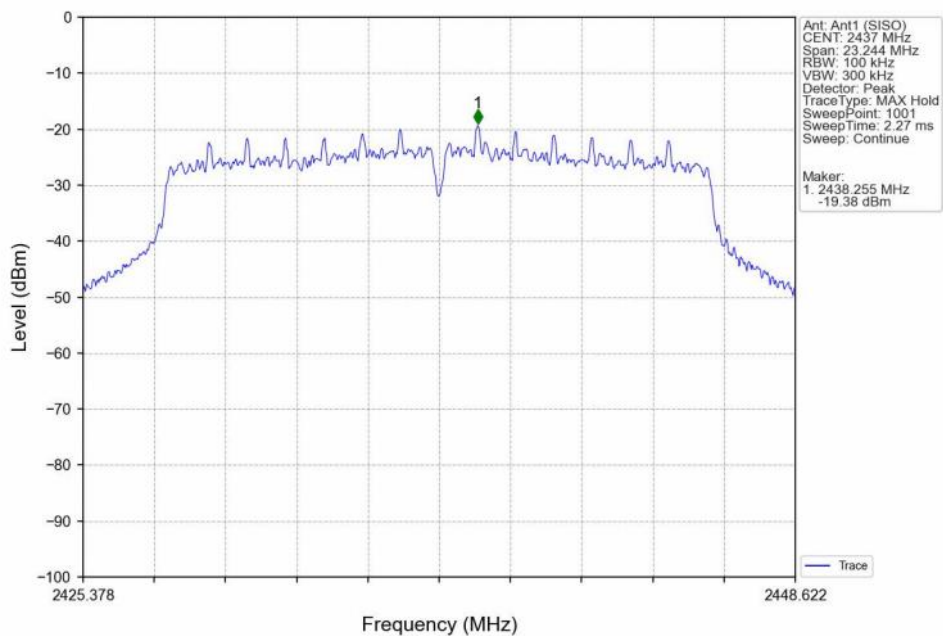


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802.11n(HT20)\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV

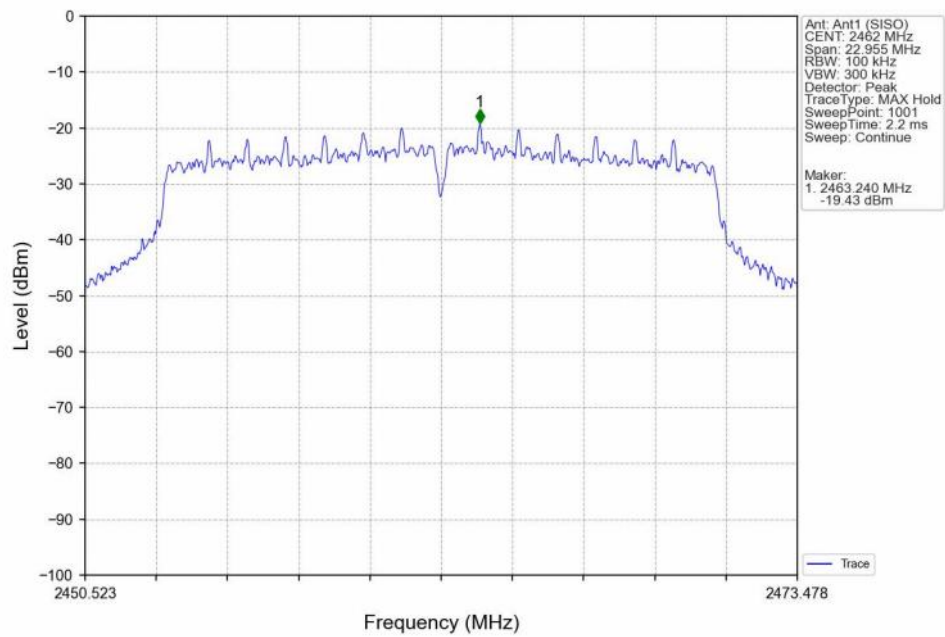


802.11n(HT20)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV

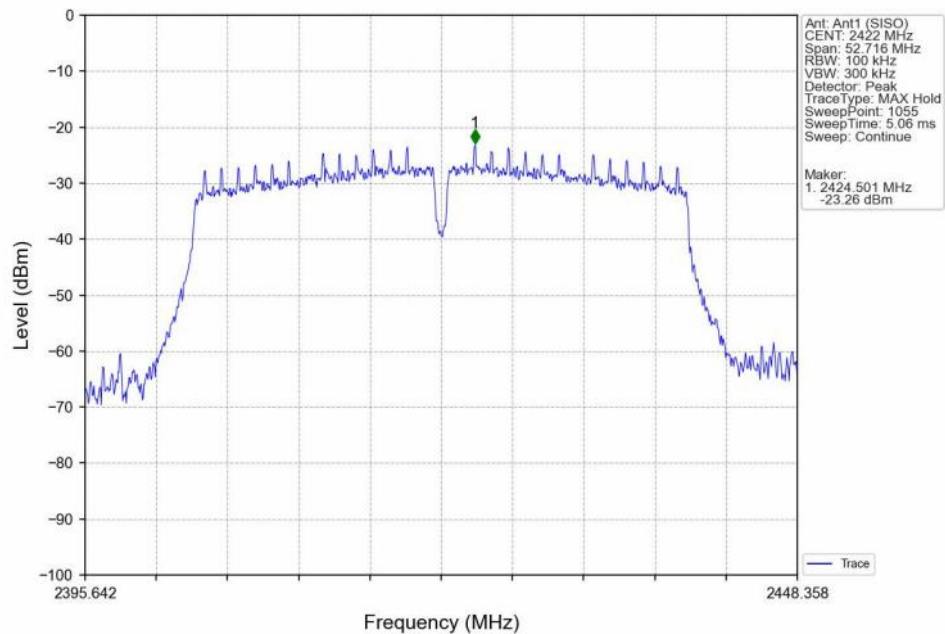


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802.11n(HT20)\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



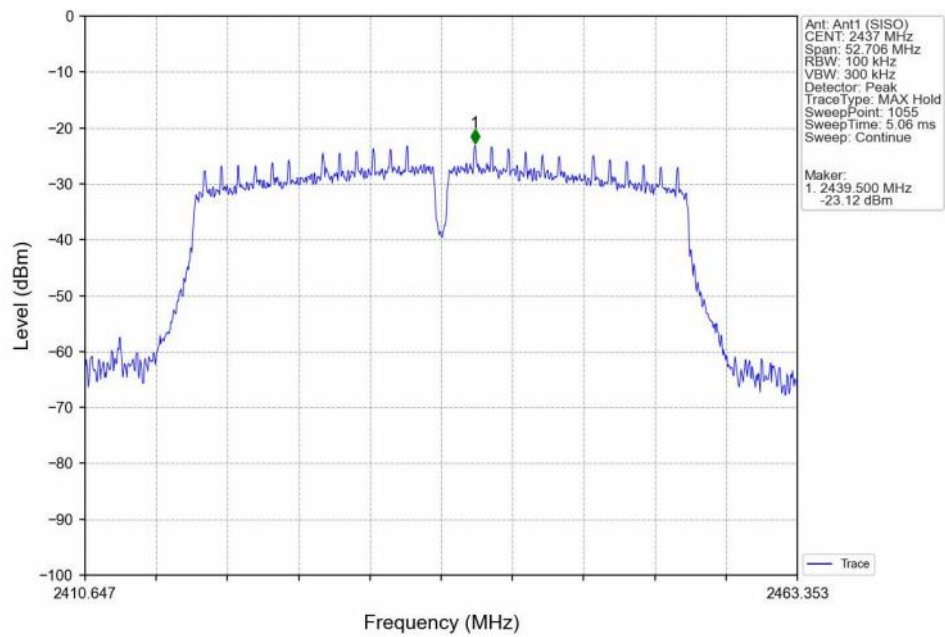
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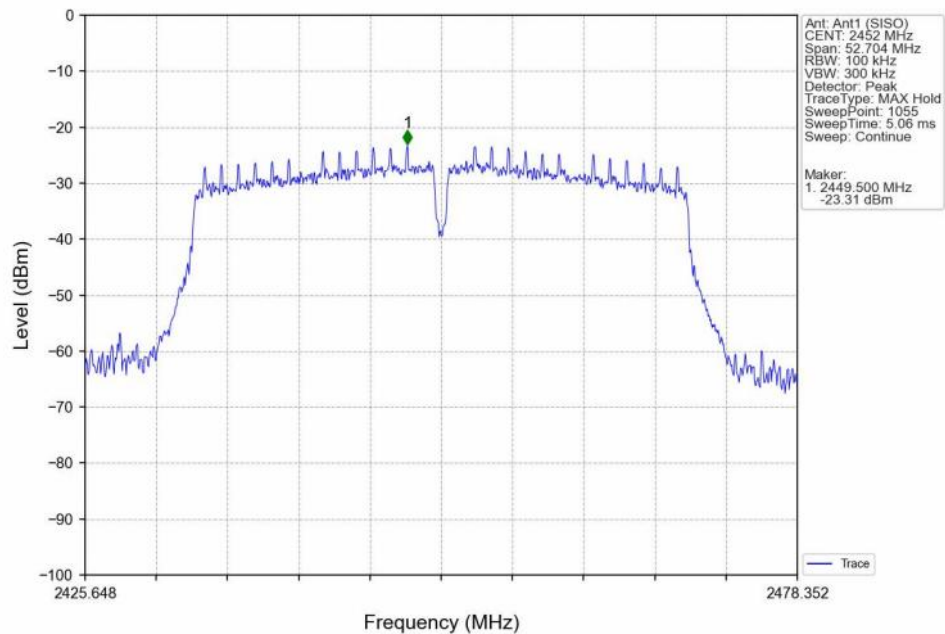


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802.11n(HT40)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV

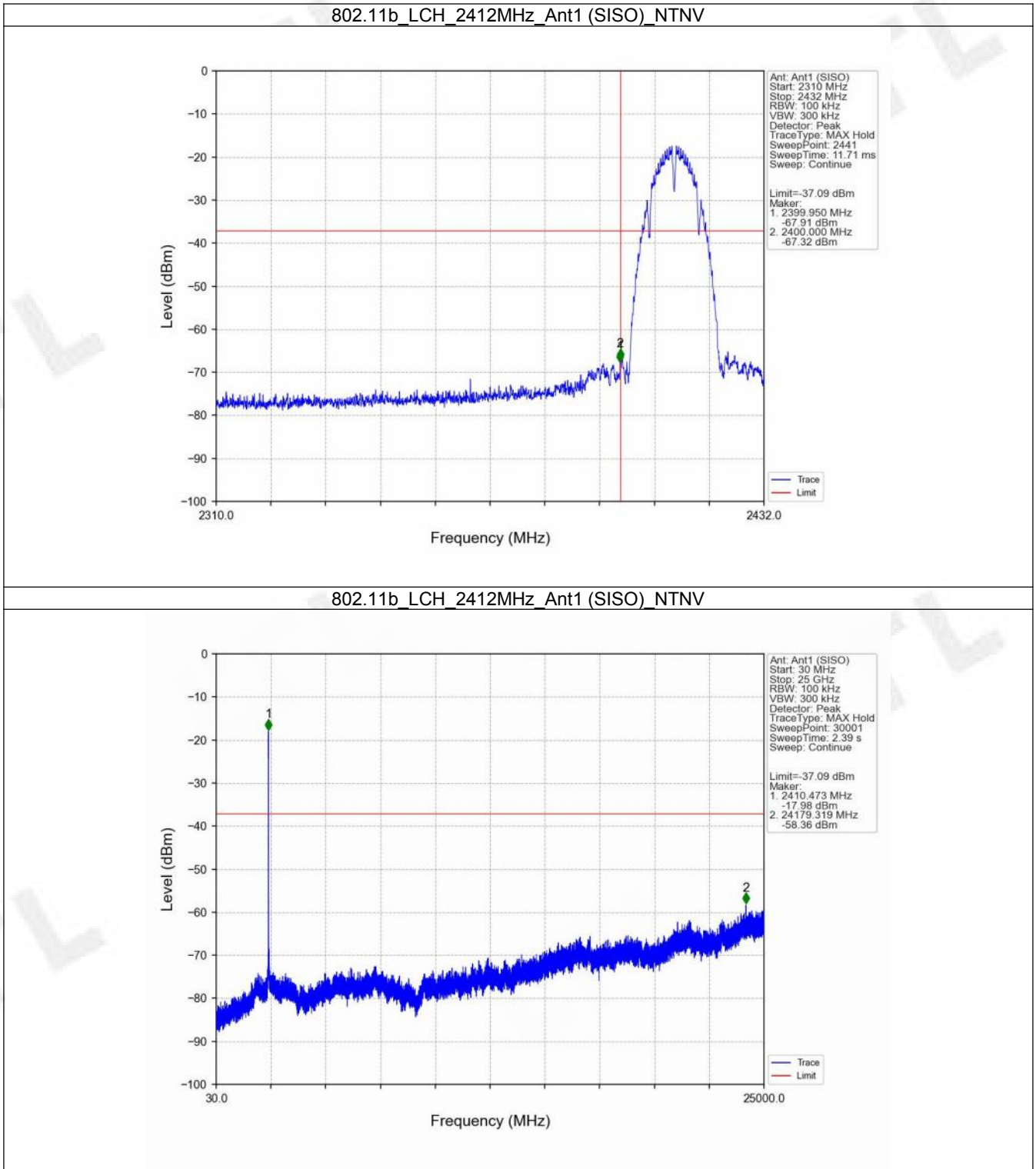


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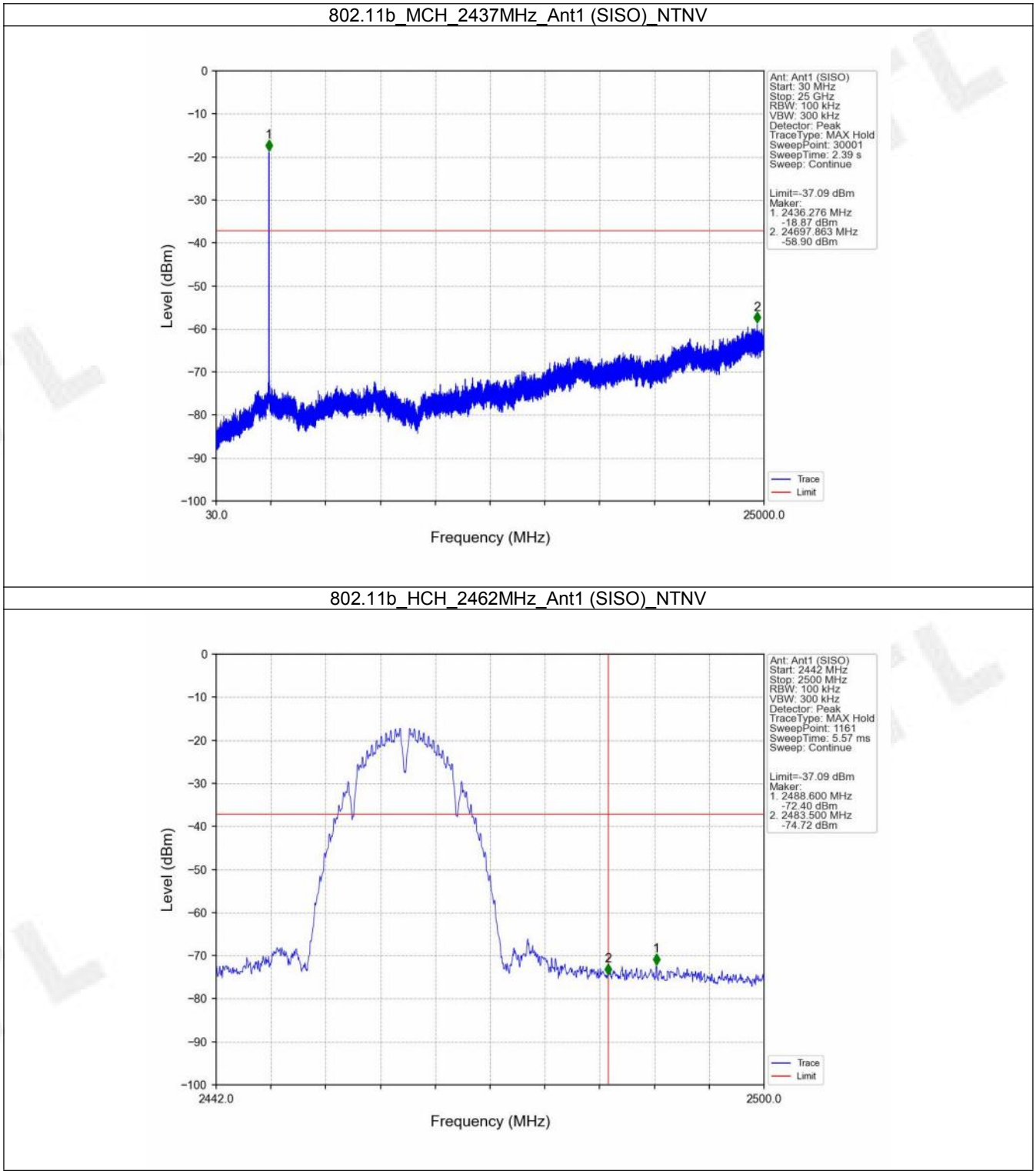


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4.2.2 CSE

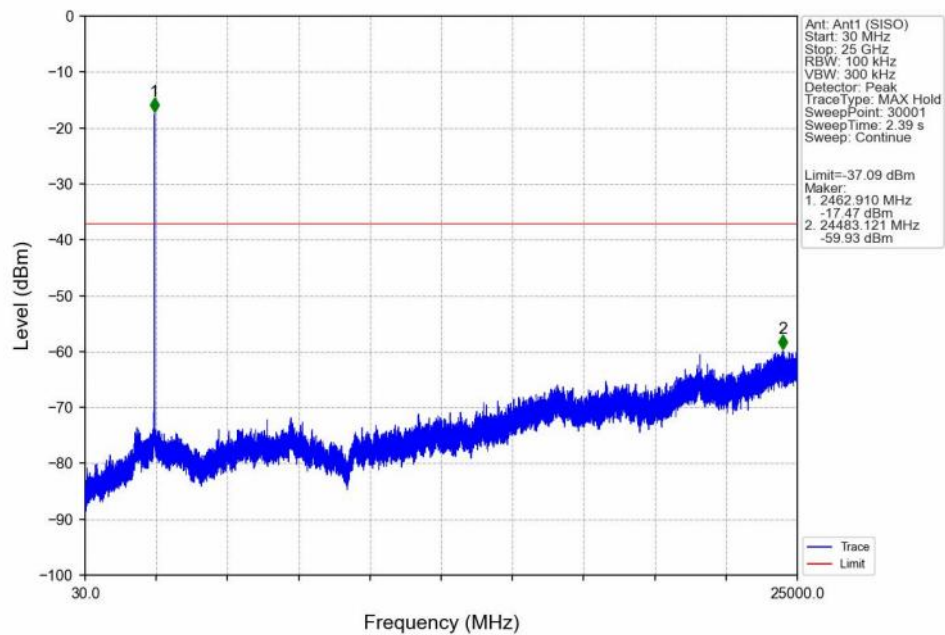


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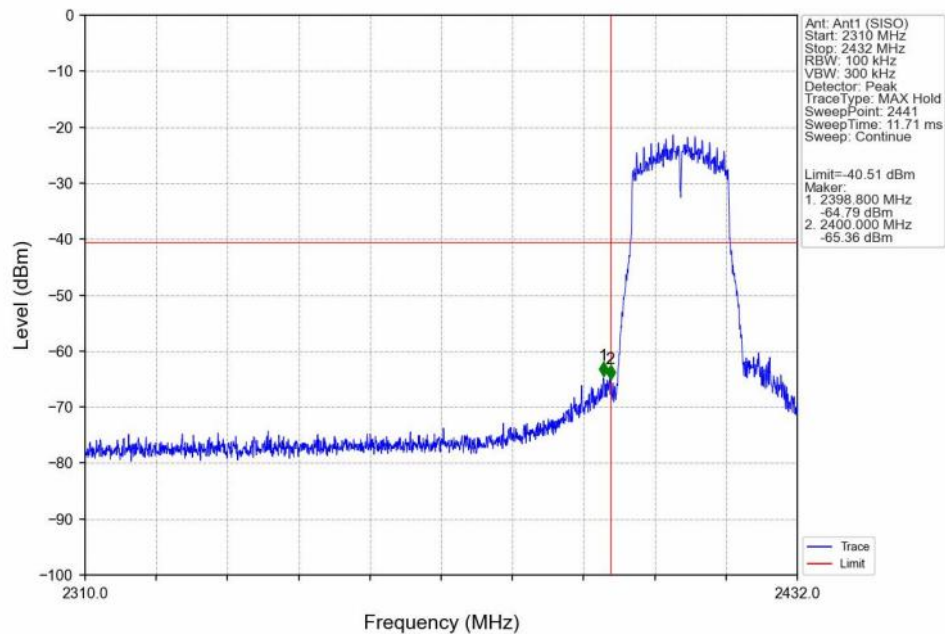


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802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV

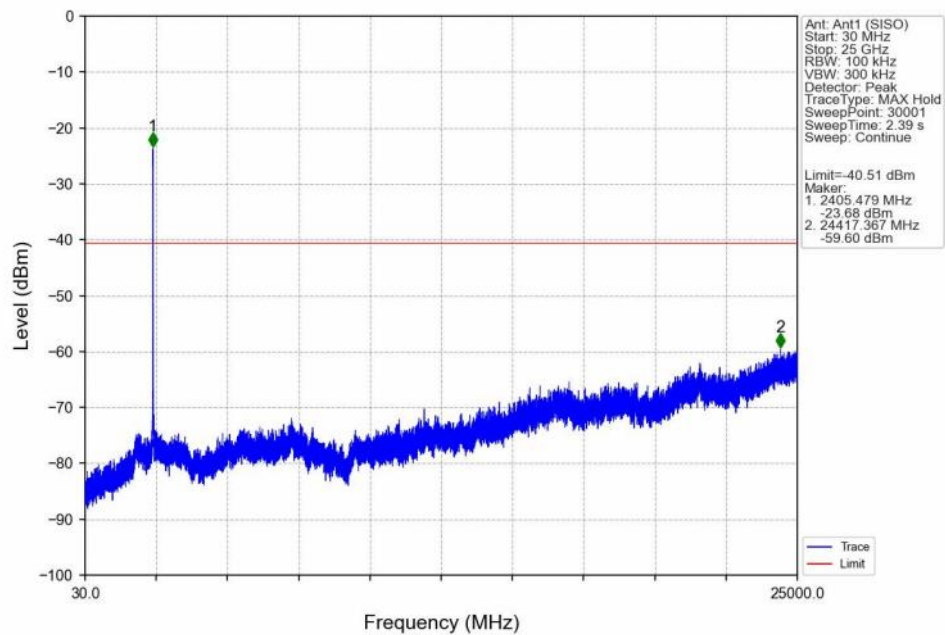


802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV

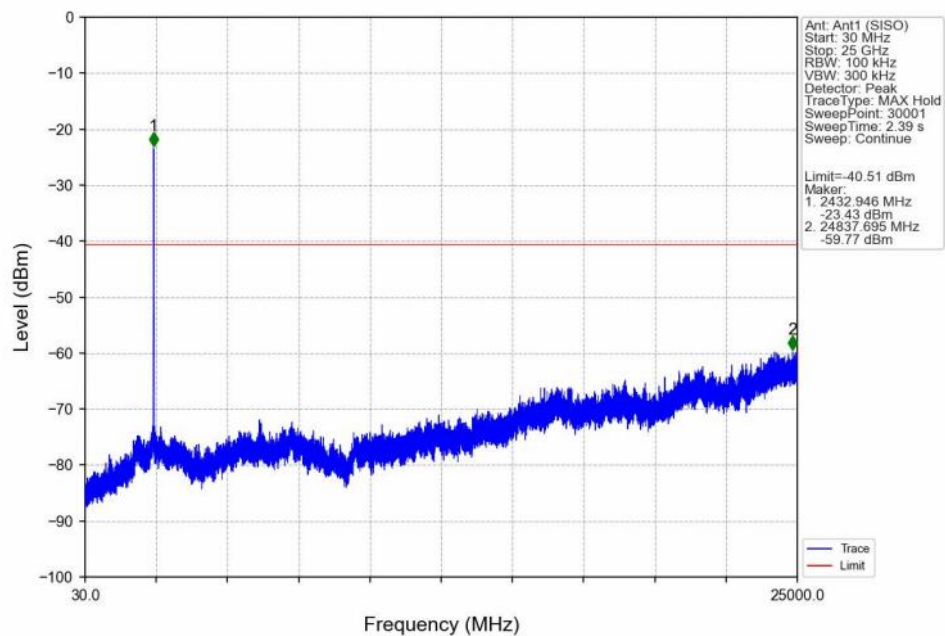


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802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV

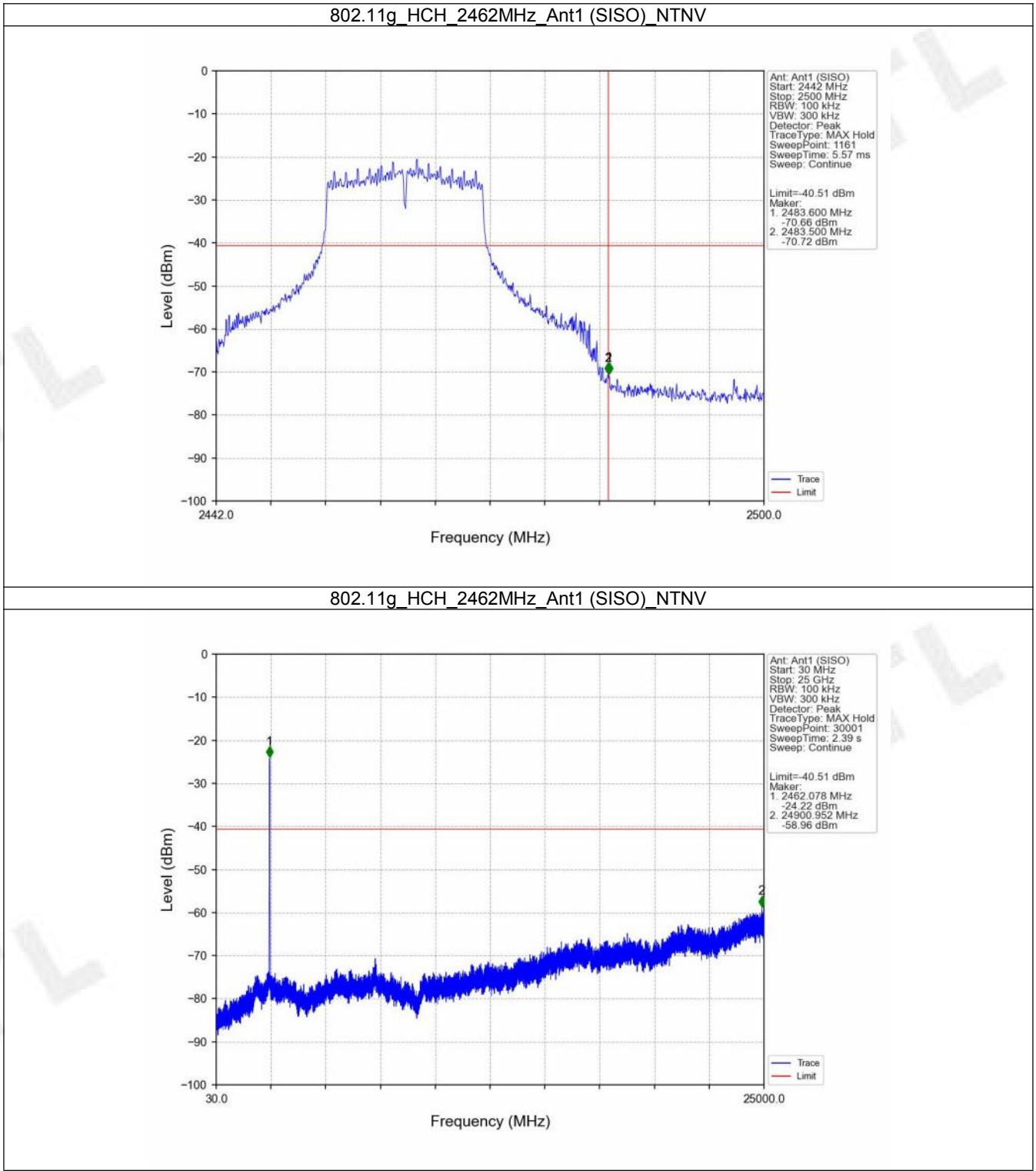


802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV





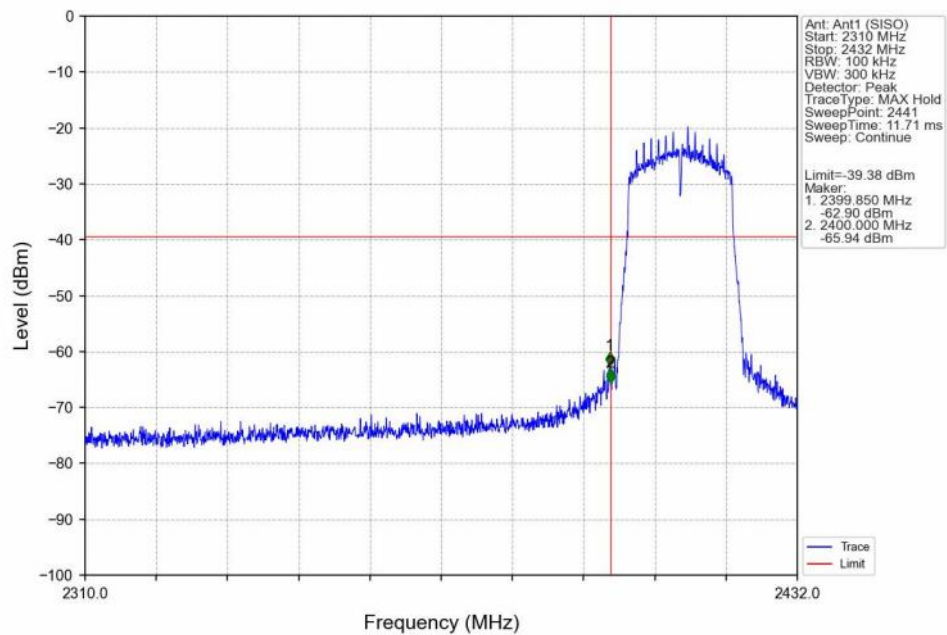
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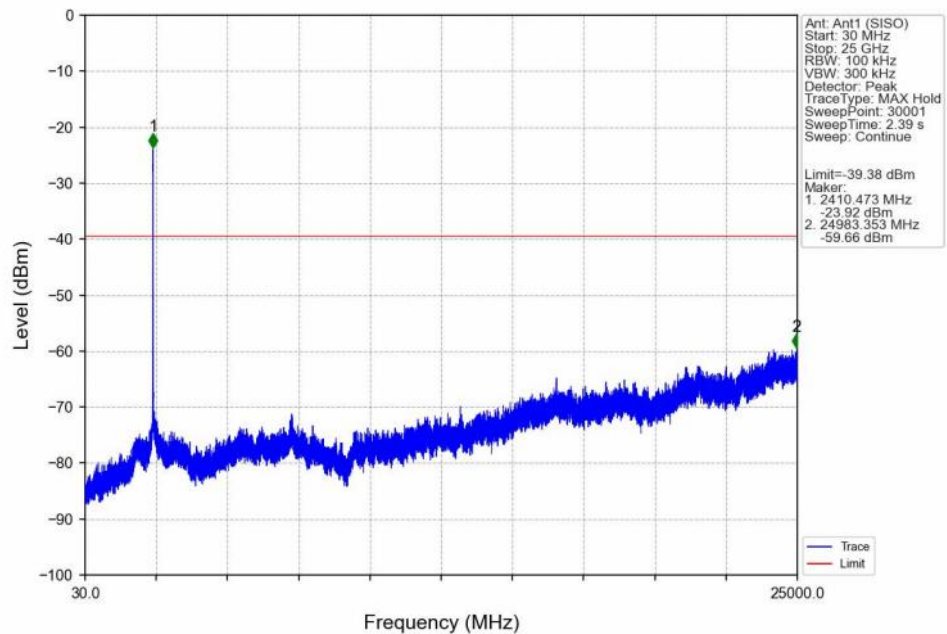


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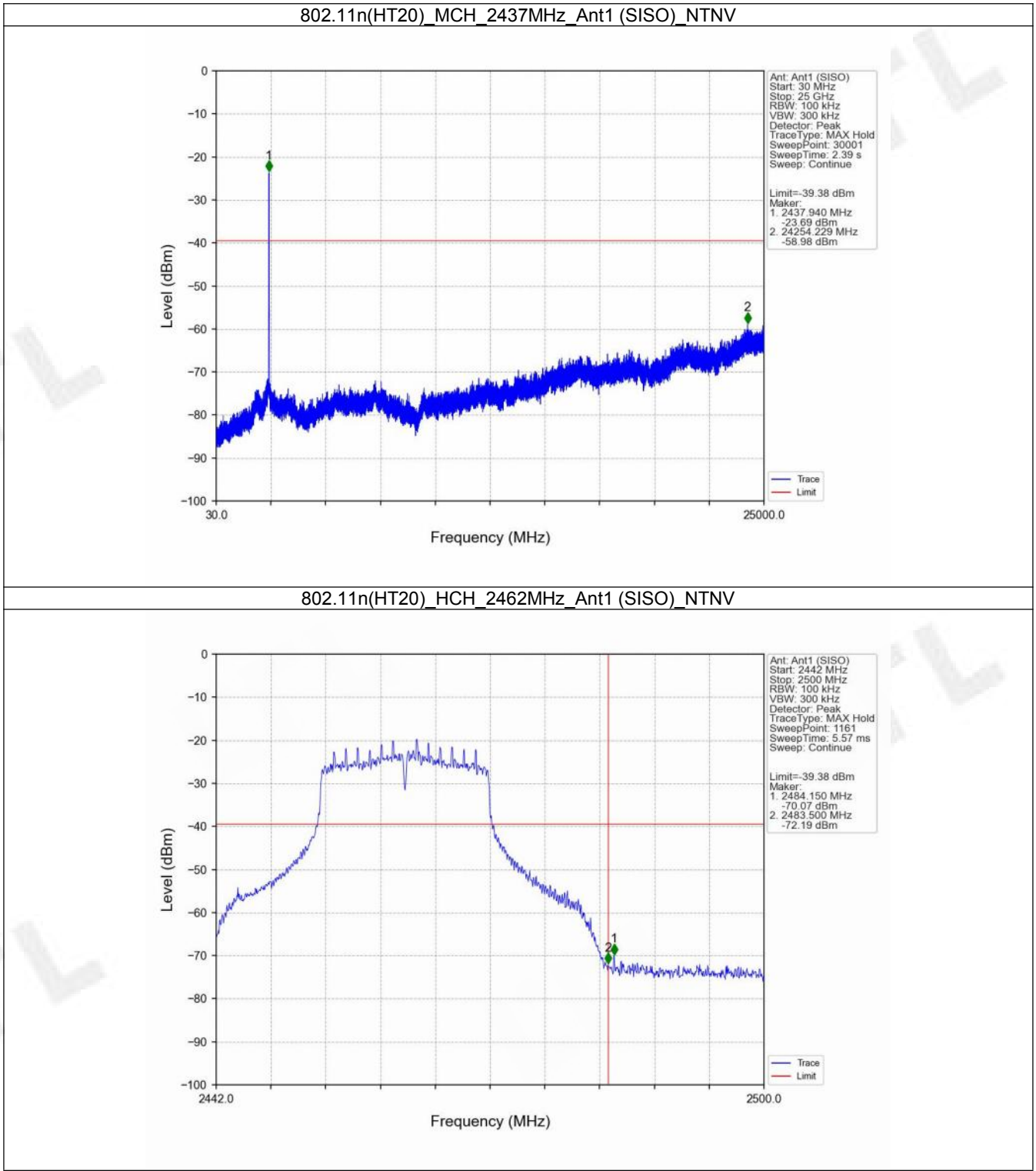
802.11n(HT20)\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



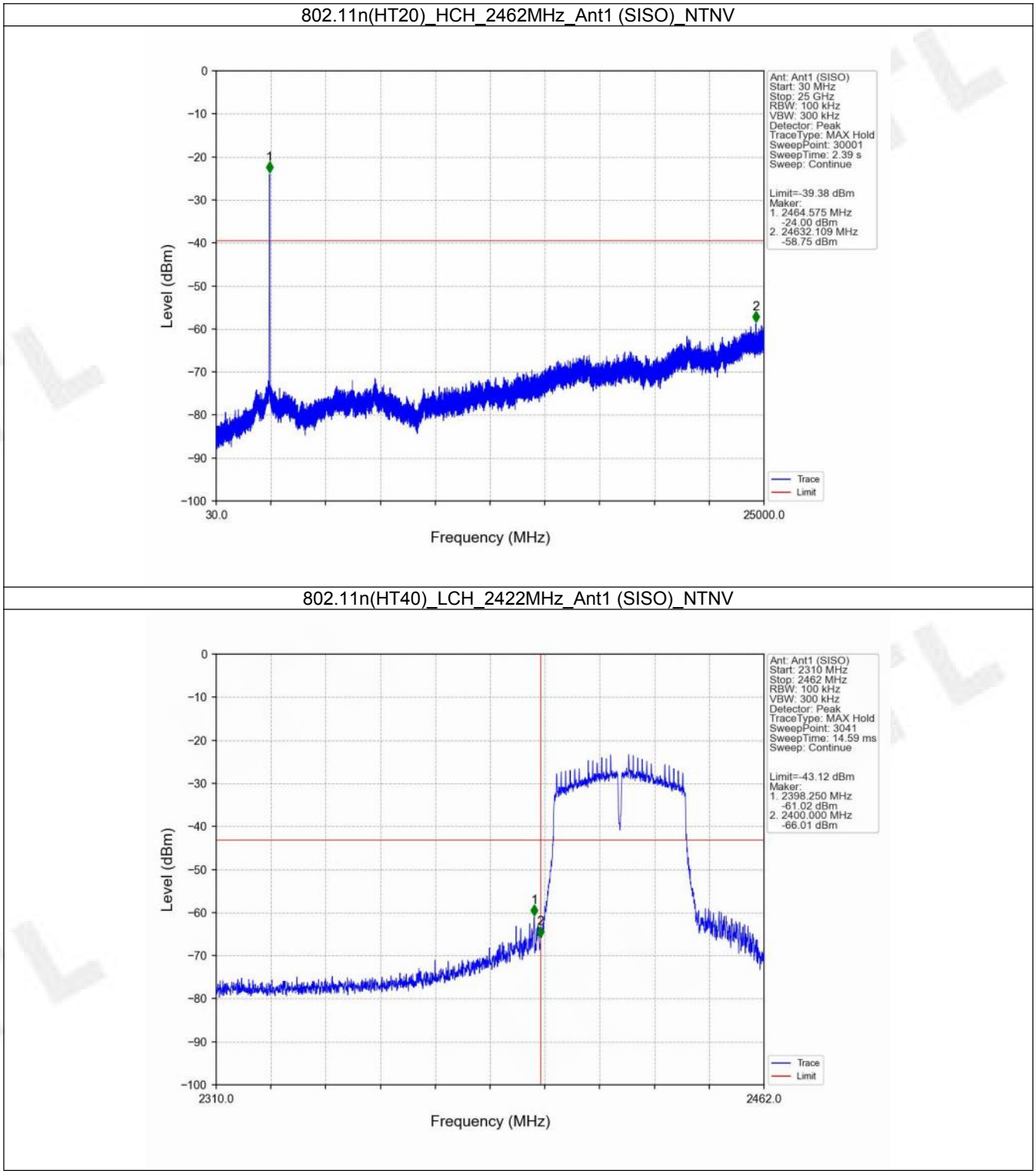
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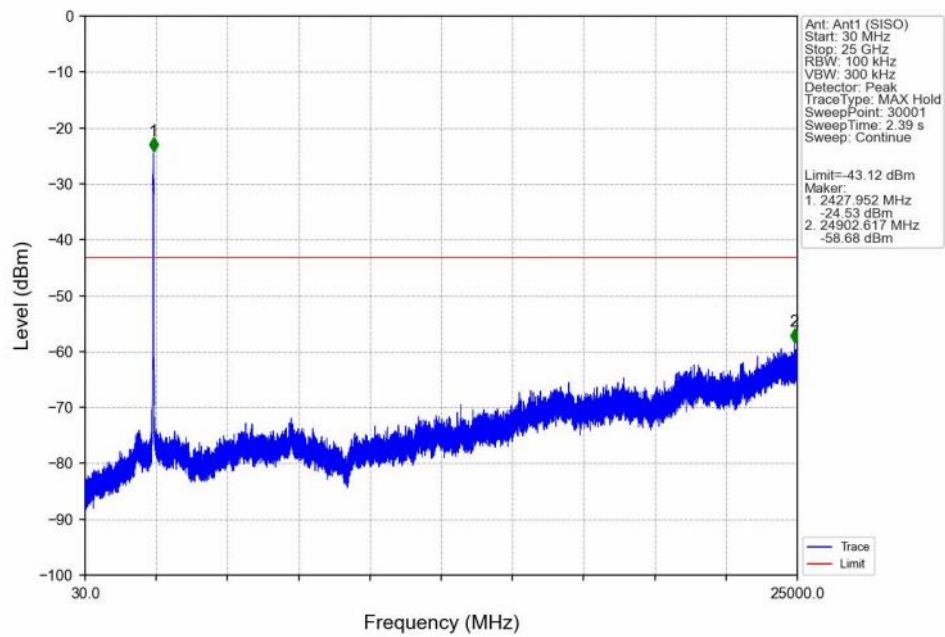


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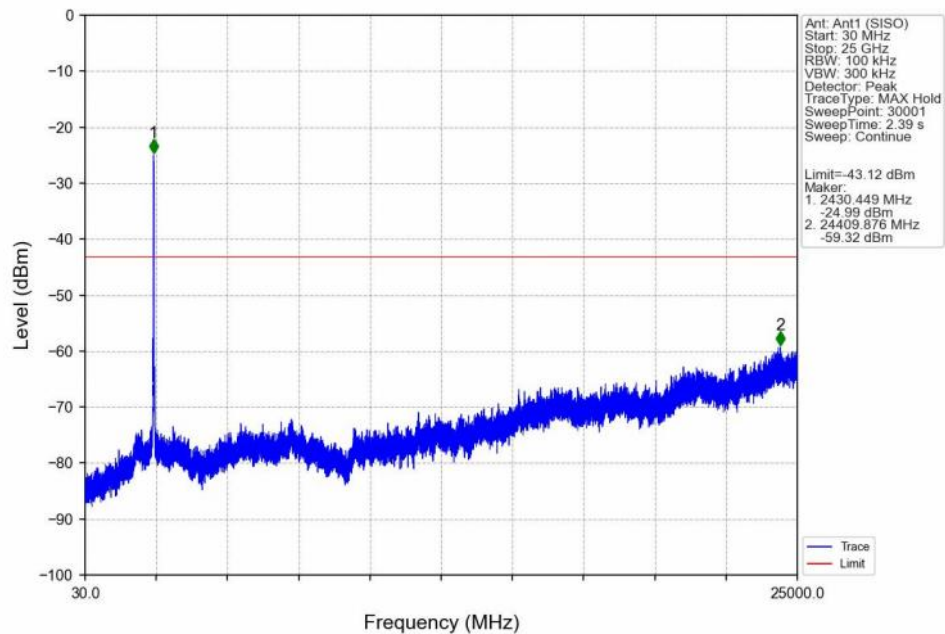


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802.11n(HT40)\_LCH\_2422MHz\_Ant1 (SISO)\_NTNV



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



FCC ID:2AUARTKMU8A

