

## Appendix - 2.4G WIFI

### 1. Duty Cycle

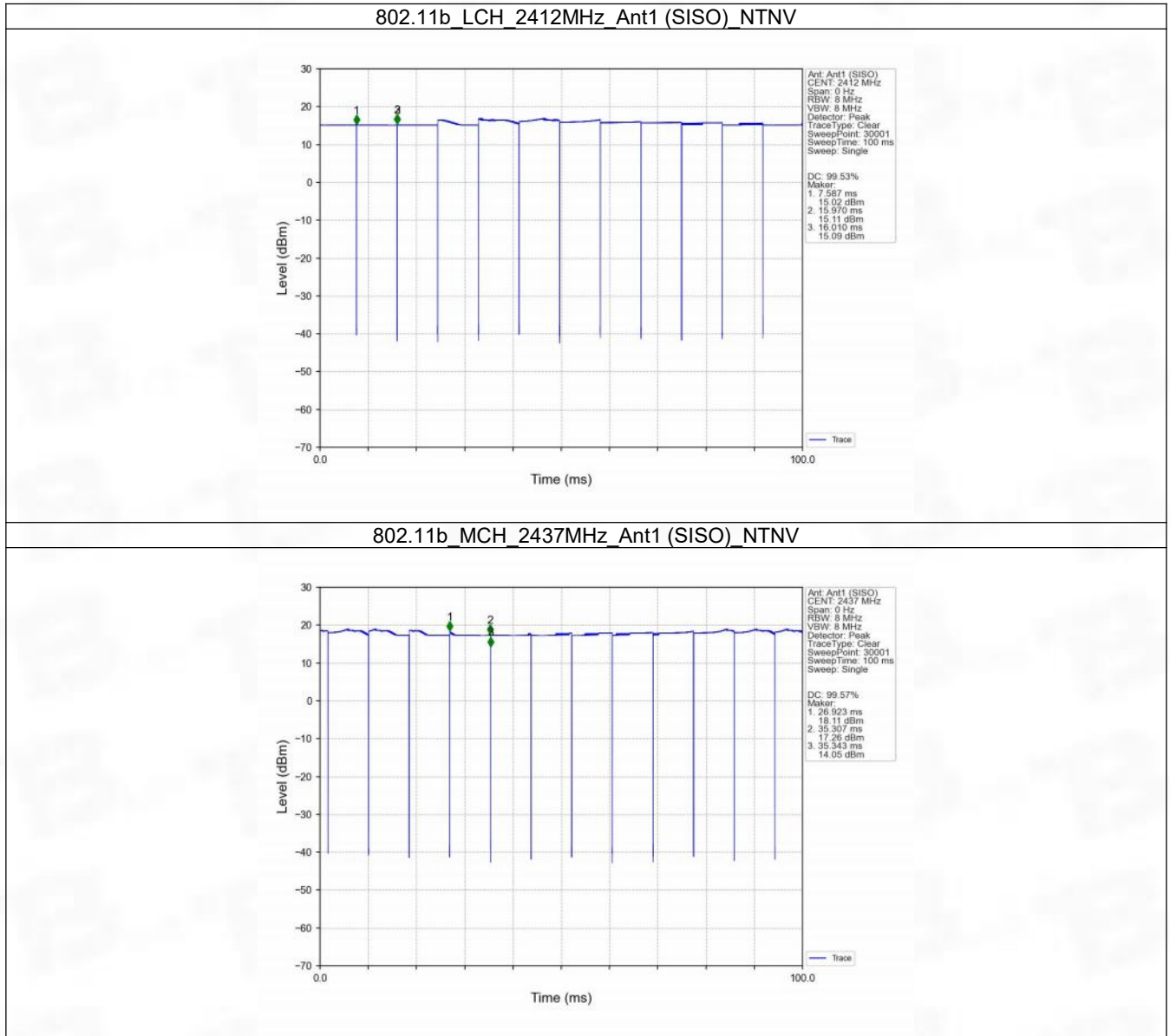
#### 1.1 Test Result

##### 1.1.1 Ant1

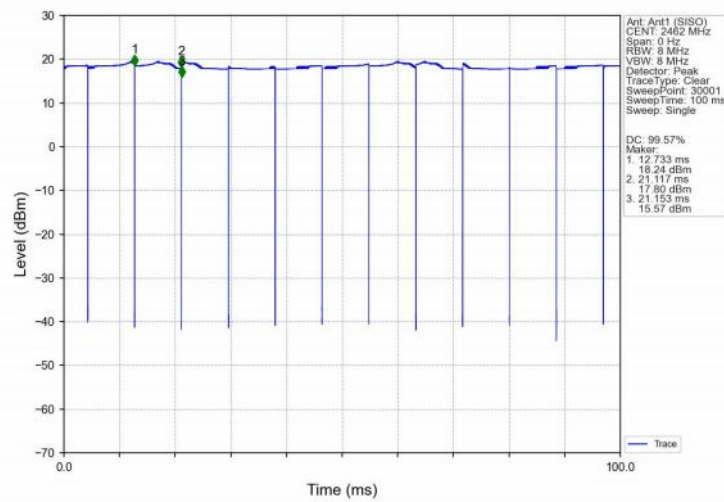
| Ant1           |         |                 |           |             |                |                                   |                       |
|----------------|---------|-----------------|-----------|-------------|----------------|-----------------------------------|-----------------------|
| Mode           | TX Type | Frequency (MHz) | T_on (ms) | Period (ms) | Duty Cycle (%) | Duty Cycle Correction Factor (dB) | Max. DC Variation (%) |
| 802.11b        | SISO    | 2412            | 8.383     | 8.423       | 99.53          | 0.02                              | 0.04                  |
|                |         | 2437            | 8.384     | 8.420       | 99.57          | 0.02                              | 0.04                  |
|                |         | 2462            | 8.384     | 8.420       | 99.57          | 0.02                              | 0.04                  |
| 802.11g        | SISO    | 2412            | 1.392     | 1.436       | 96.94          | 0.14                              | 0.04                  |
|                |         | 2437            | 1.394     | 1.437       | 97.01          | 0.13                              | 0.03                  |
|                |         | 2462            | 1.394     | 1.436       | 97.08          | 0.13                              | 0.03                  |
| 802.11n (HT20) | SISO    | 2412            | 1.300     | 1.344       | 96.73          | 0.14                              | 0.07                  |
|                |         | 2437            | 1.302     | 1.345       | 96.80          | 0.14                              | 0.03                  |
|                |         | 2462            | 1.302     | 1.345       | 96.80          | 0.14                              | 0.03                  |
| 802.11n (HT40) | SISO    | 2422            | 0.650     | 0.693       | 93.80          | 0.28                              | 0.03                  |
|                |         | 2437            | 0.649     | 0.692       | 93.79          | 0.28                              | 0.03                  |
|                |         | 2452            | 0.650     | 0.692       | 93.93          | 0.27                              | 0.04                  |

## 1.2 Test Graph

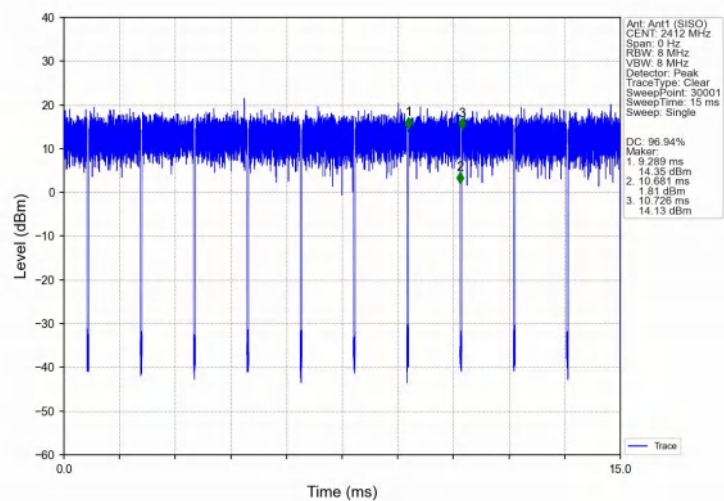
### 1.2.1 Ant1



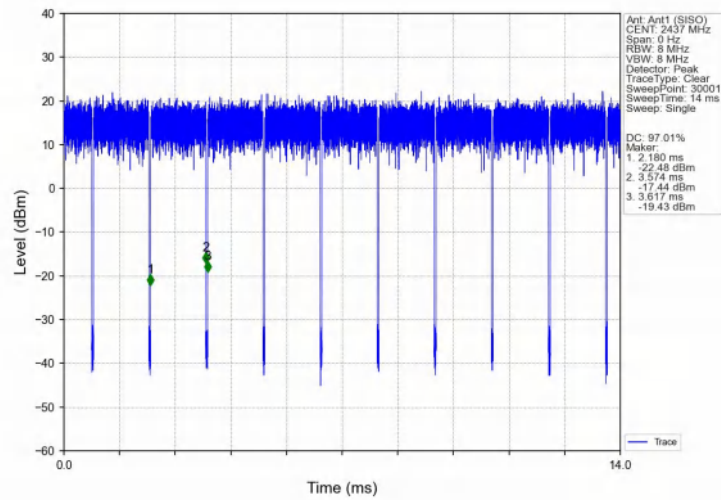
802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



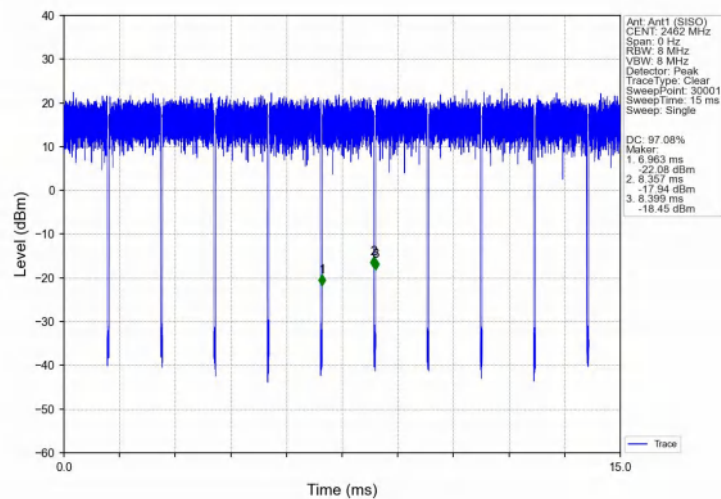
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



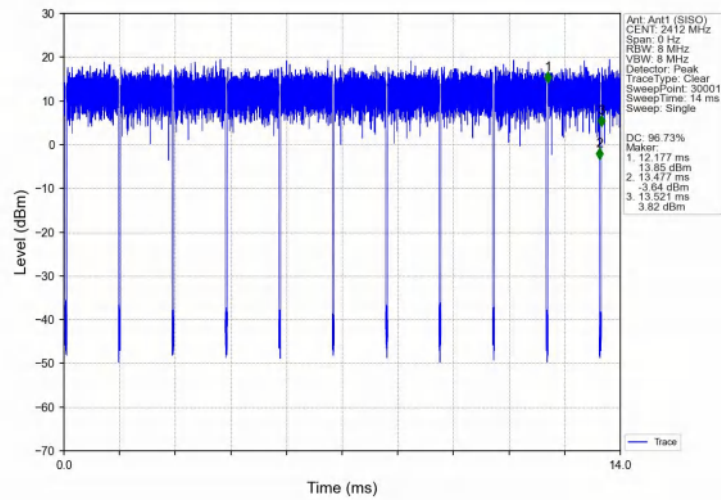
802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



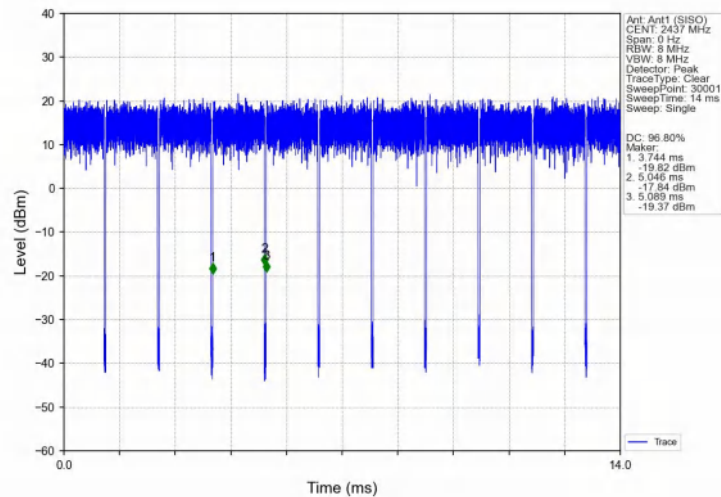
802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



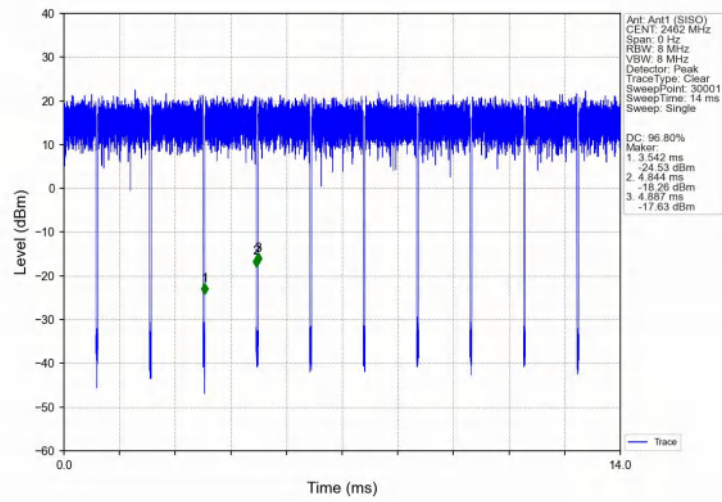
## 802.11n(HT20)\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



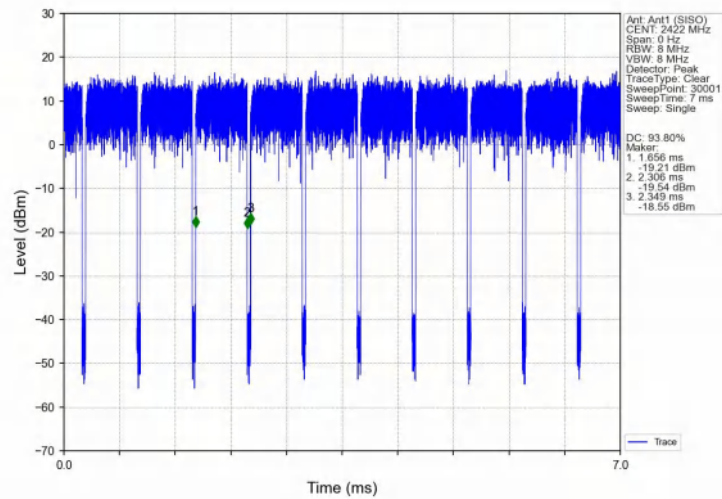
## 802.11n(HT20)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



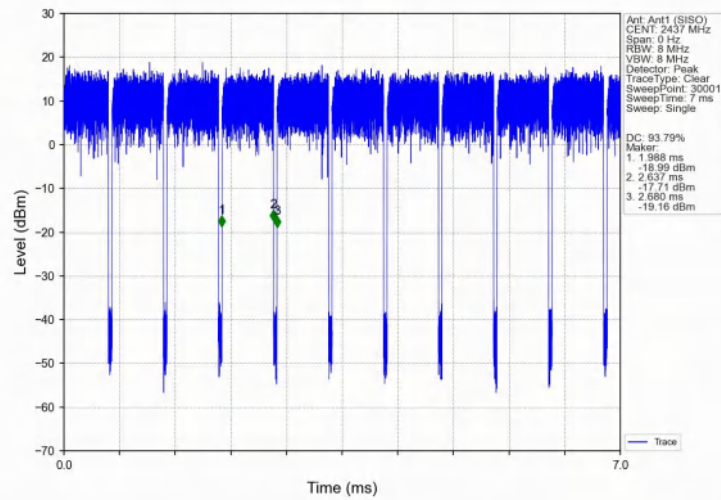
802.11n(HT20)\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



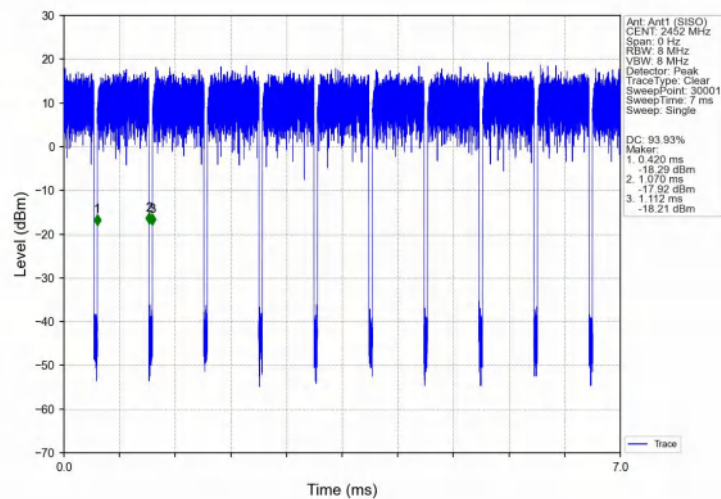
802.11n(HT40)\_LCH\_2422MHz\_Ant1 (SISO)\_NTNV



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



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



## 2. Bandwidth

### 2.1 Test Result

#### 2.1.1 OBW

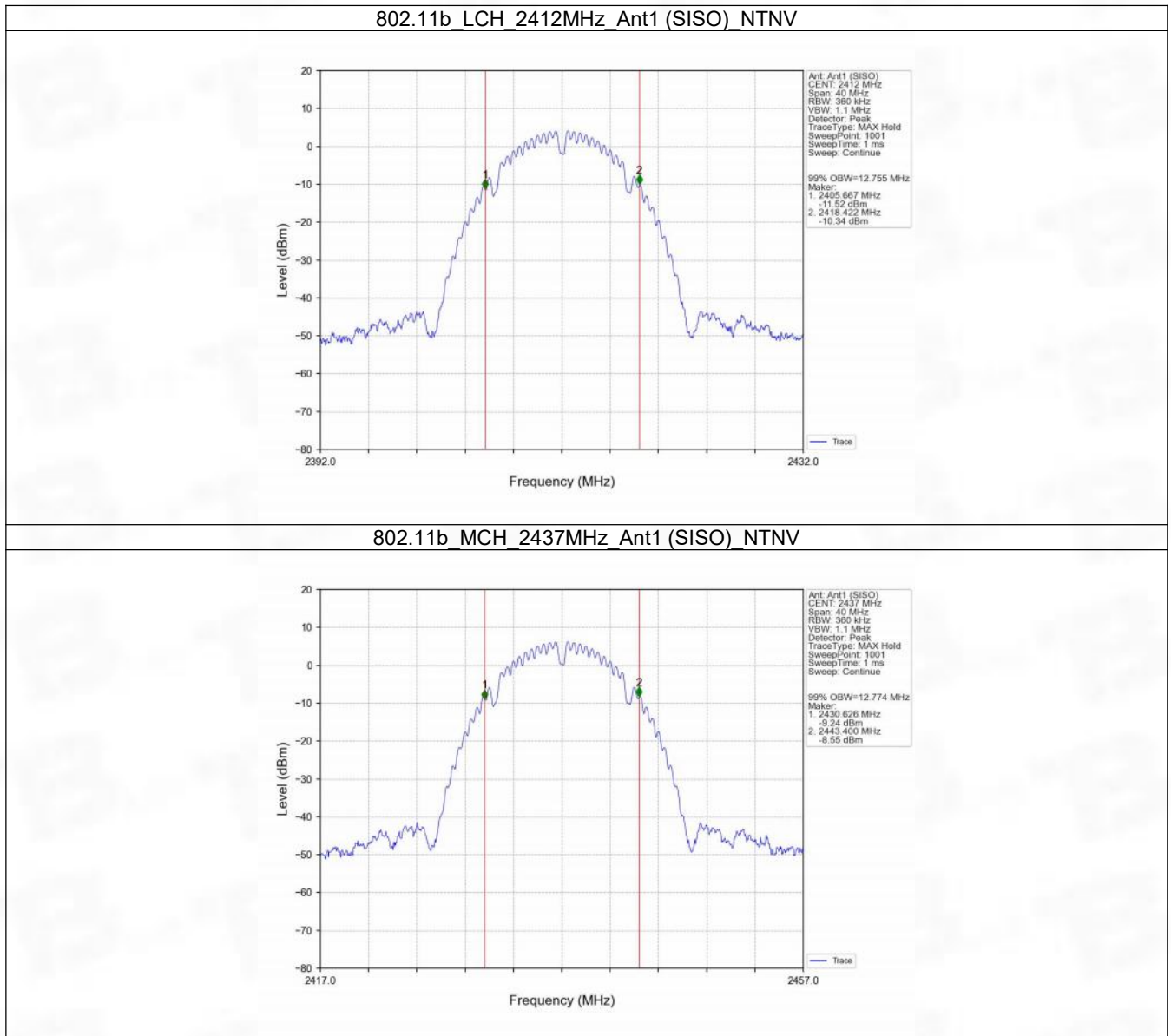
| Mode           | TX Type | Frequency (MHz) | ANT | 99% Occupied Bandwidth (MHz) |       | Verdict |
|----------------|---------|-----------------|-----|------------------------------|-------|---------|
|                |         |                 |     | Result                       | Limit |         |
| 802.11b        | SISO    | 2412            | 1   | 12.755                       | /     | Pass    |
|                |         | 2437            | 1   | 12.774                       | /     | Pass    |
|                |         | 2462            | 1   | 12.802                       | /     | Pass    |
| 802.11g        | SISO    | 2412            | 1   | 17.376                       | /     | Pass    |
|                |         | 2437            | 1   | 17.494                       | /     | Pass    |
|                |         | 2462            | 1   | 17.582                       | /     | Pass    |
| 802.11n (HT20) | SISO    | 2412            | 1   | 18.249                       | /     | Pass    |
|                |         | 2437            | 1   | 18.301                       | /     | Pass    |
|                |         | 2462            | 1   | 18.380                       | /     | Pass    |
| 802.11n (HT40) | SISO    | 2422            | 1   | 36.430                       | /     | Pass    |
|                |         | 2437            | 1   | 36.627                       | /     | Pass    |
|                |         | 2452            | 1   | 36.582                       | /     | Pass    |

#### 2.1.2 6dB BW

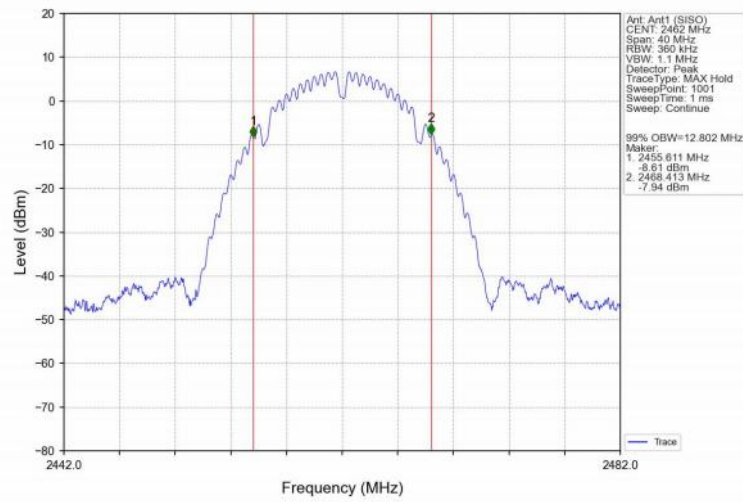
| Mode           | TX Type | Frequency (MHz) | ANT | 6dB Bandwidth (MHz) |            | Verdict |
|----------------|---------|-----------------|-----|---------------------|------------|---------|
|                |         |                 |     | Result              | Limit      |         |
| 802.11b        | SISO    | 2412            | 1   | 8.235               | $\geq 0.5$ | Pass    |
|                |         | 2437            | 1   | 8.236               | $\geq 0.5$ | Pass    |
|                |         | 2462            | 1   | 8.241               | $\geq 0.5$ | Pass    |
| 802.11g        | SISO    | 2412            | 1   | 16.224              | $\geq 0.5$ | Pass    |
|                |         | 2437            | 1   | 16.252              | $\geq 0.5$ | Pass    |
|                |         | 2462            | 1   | 16.280              | $\geq 0.5$ | Pass    |
| 802.11n (HT20) | SISO    | 2412            | 1   | 17.192              | $\geq 0.5$ | Pass    |
|                |         | 2437            | 1   | 17.292              | $\geq 0.5$ | Pass    |
|                |         | 2462            | 1   | 17.237              | $\geq 0.5$ | Pass    |
| 802.11n (HT40) | SISO    | 2422            | 1   | 35.709              | $\geq 0.5$ | Pass    |
|                |         | 2437            | 1   | 35.630              | $\geq 0.5$ | Pass    |
|                |         | 2452            | 1   | 35.234              | $\geq 0.5$ | Pass    |

## 2.2 Test Graph

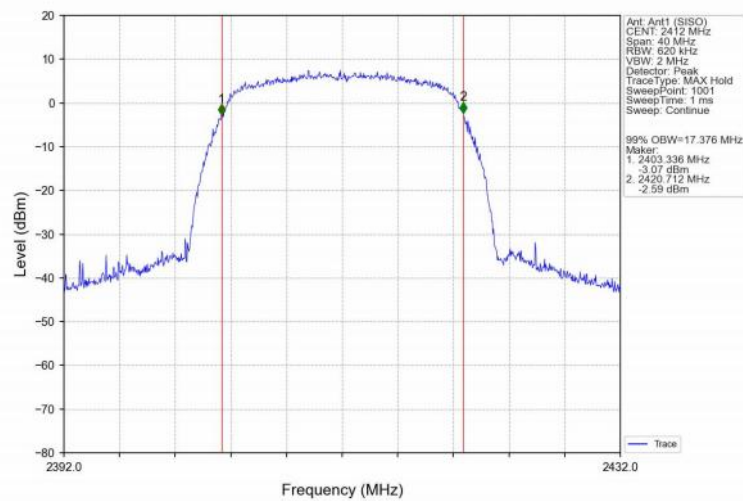
### 2.2.1 OBW



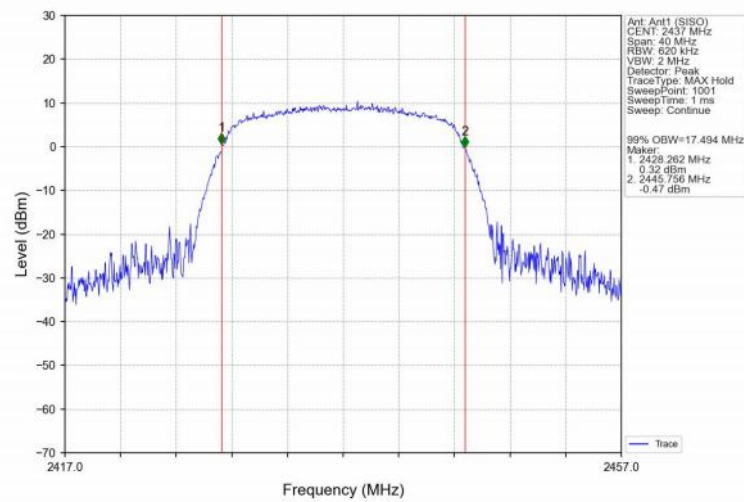
802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



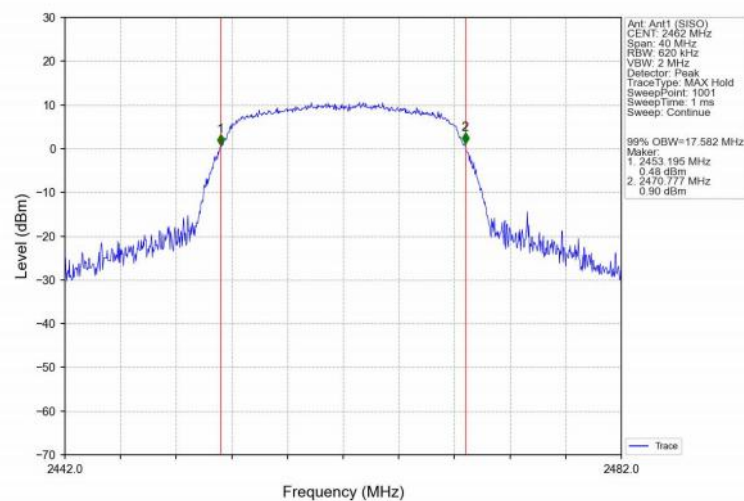
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



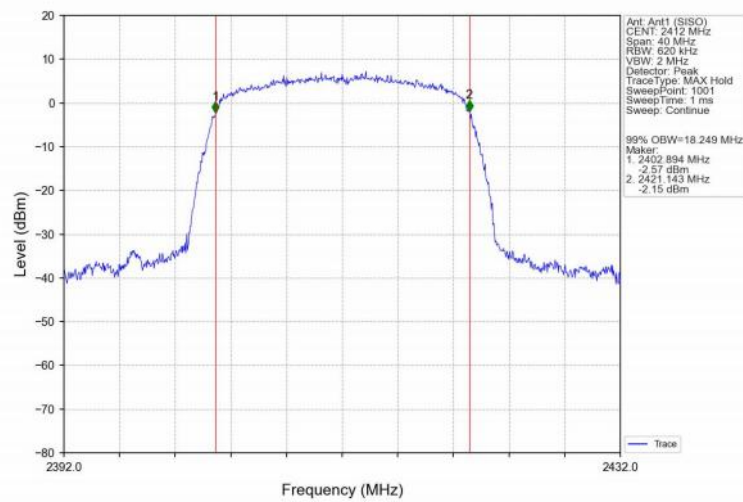
802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



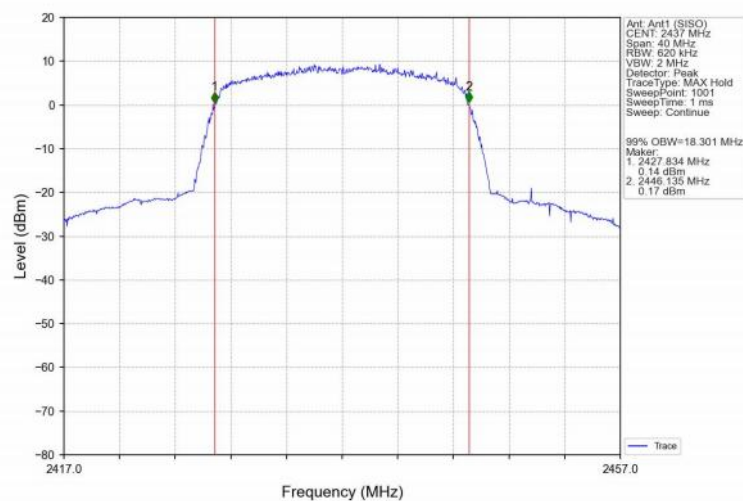
802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



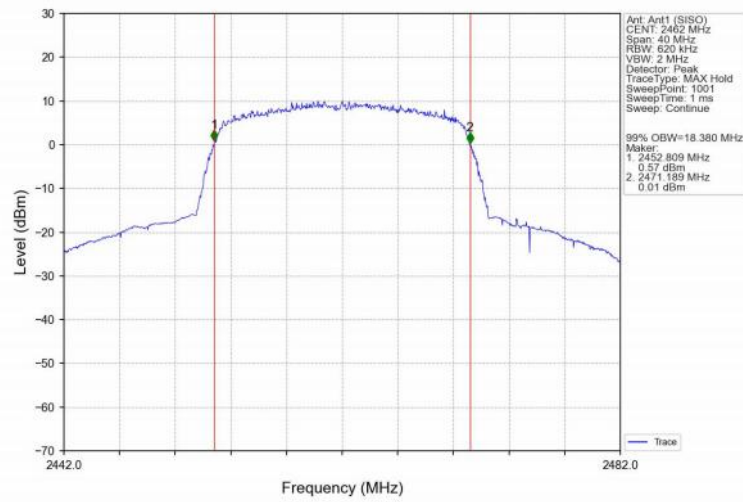
802.11n(HT20)\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



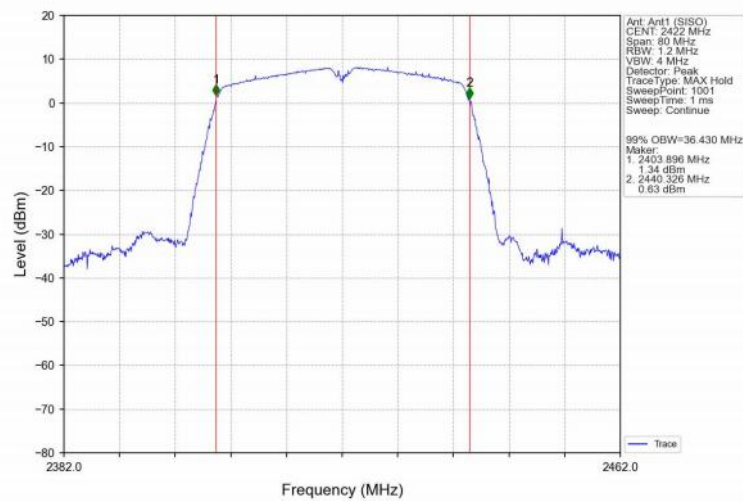
802.11n(HT20)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



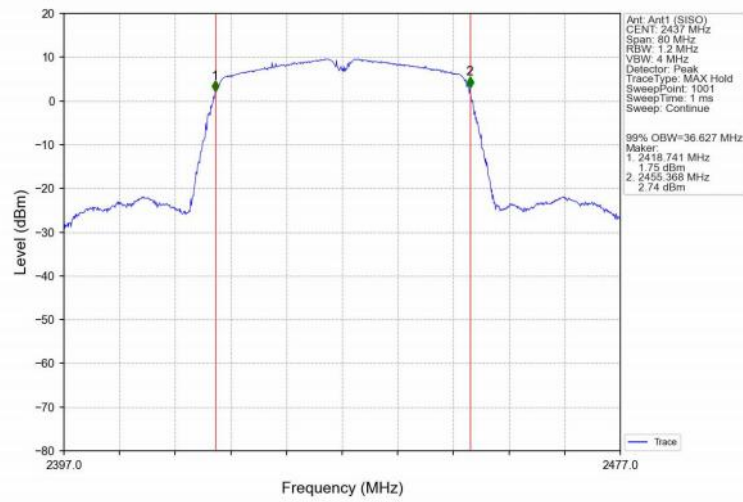
802.11n(HT20)\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



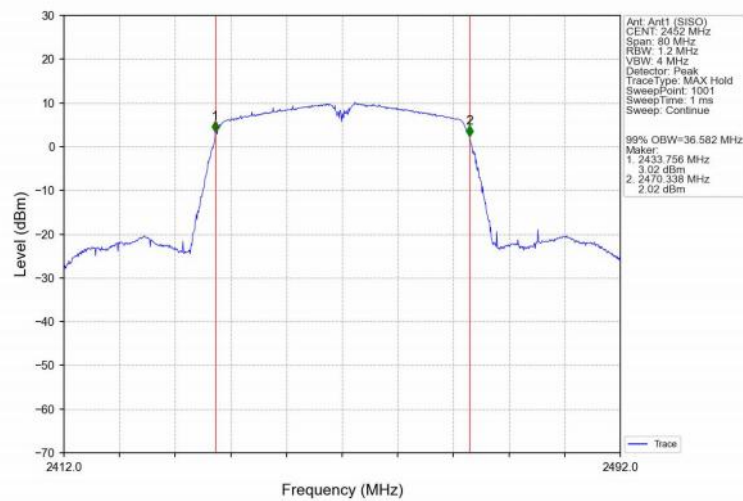
802.11n(HT40)\_LCH\_2422MHz\_Ant1 (SISO)\_NTNV



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

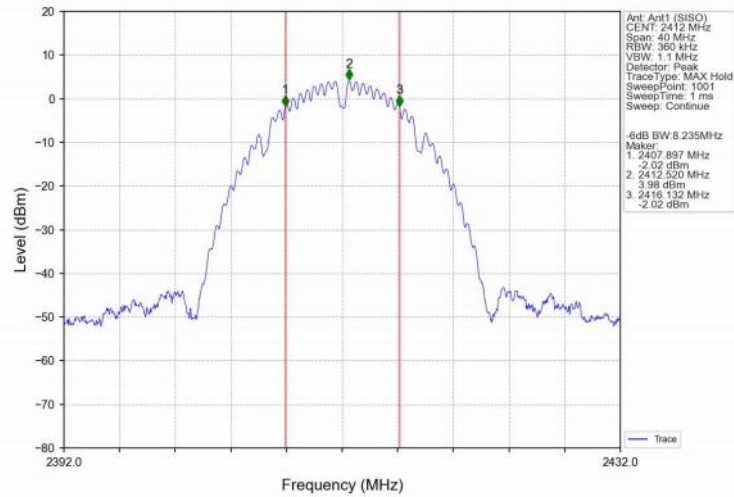


802.11n(HT40)\_HCH\_2452MHz\_Ant1 (SISO)\_NTNV

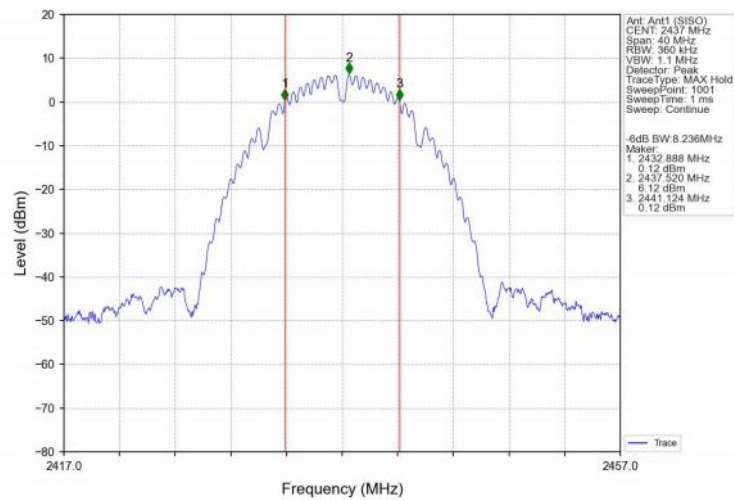


## 2.2.2 6dB BW

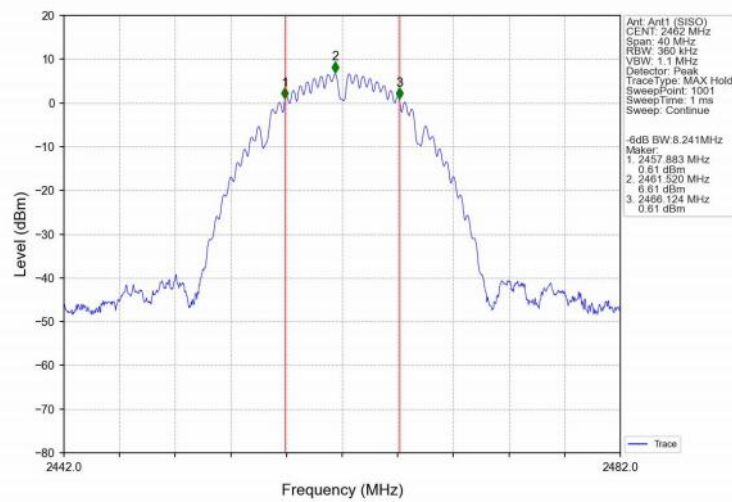
802.11b\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



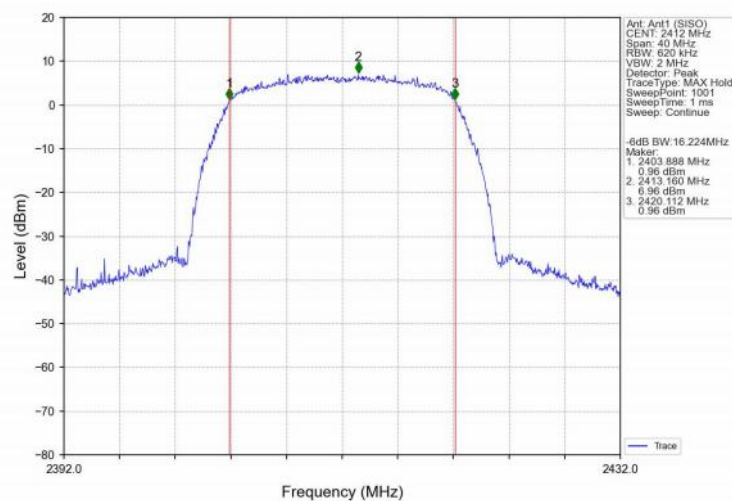
802.11b\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



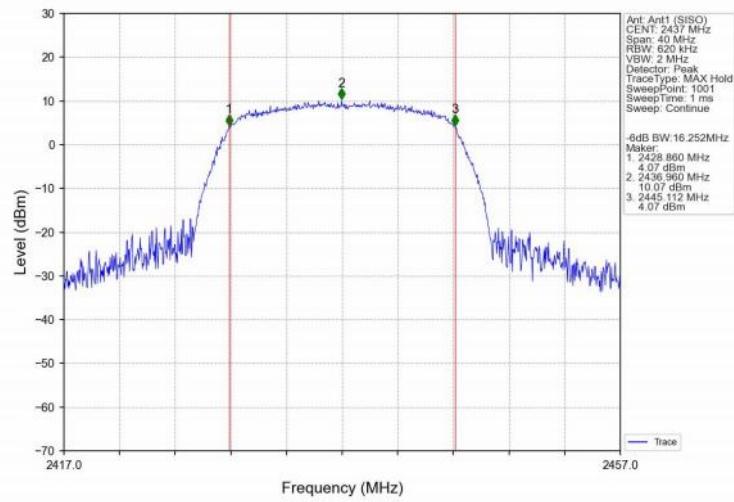
802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



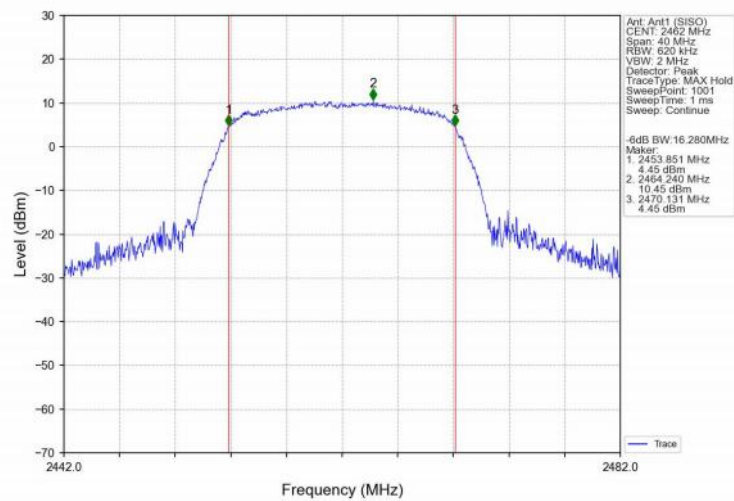
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



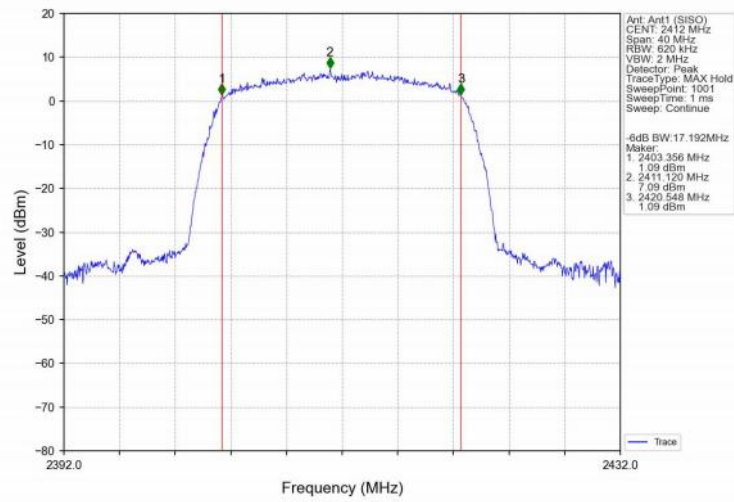
802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



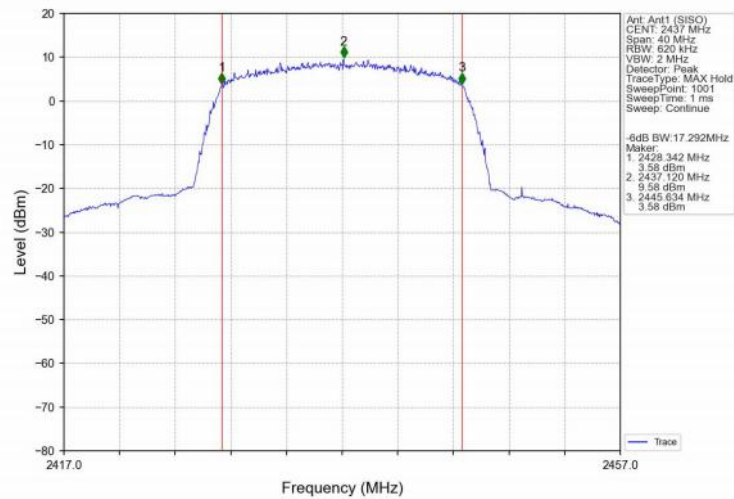
802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



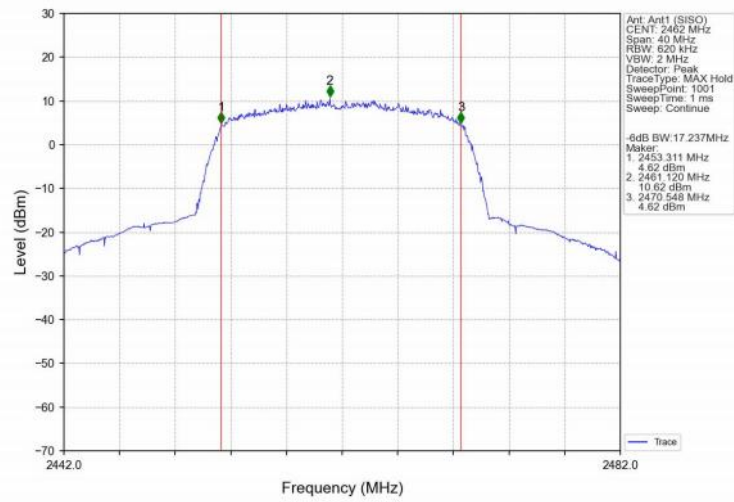
802.11n(HT20)\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



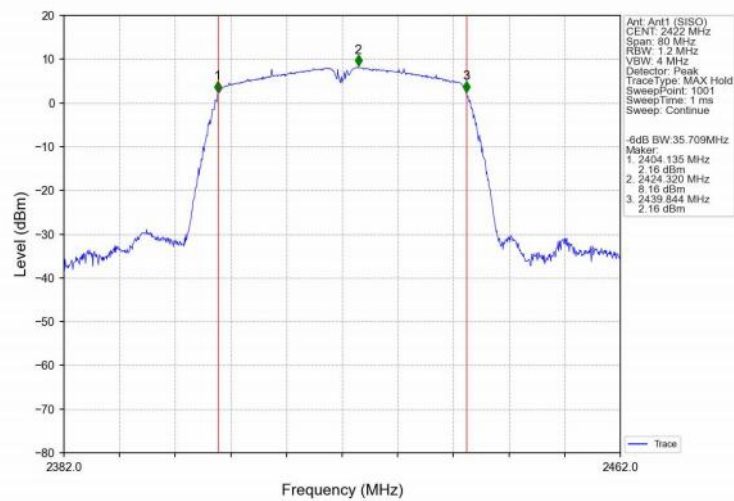
802.11n(HT20)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



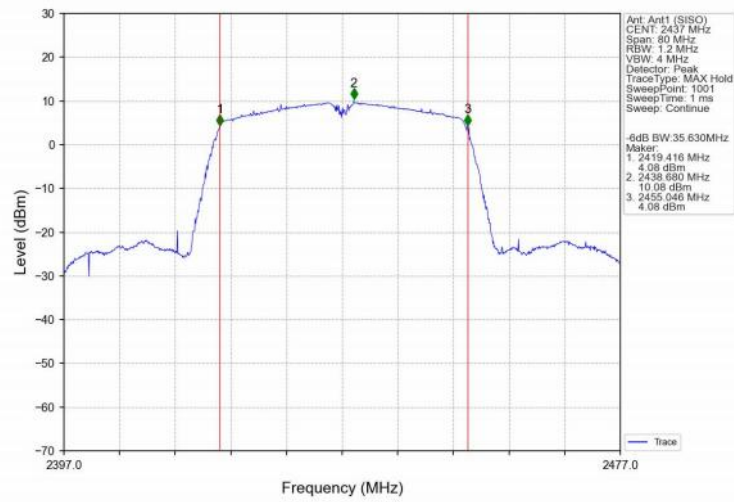
802.11n(HT20)\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



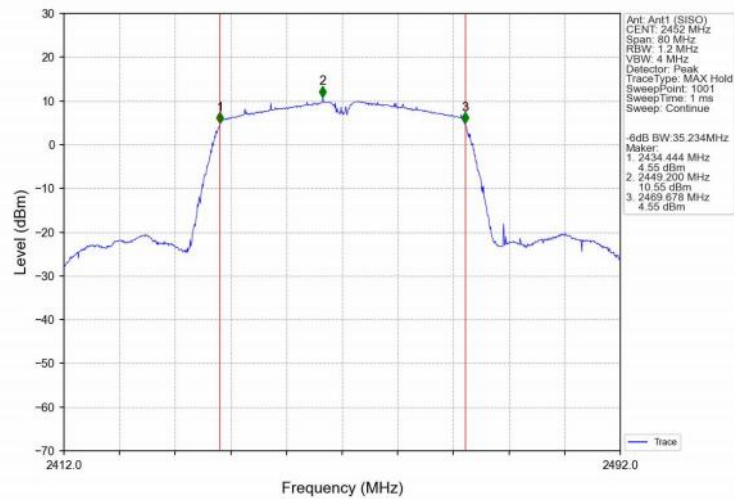
802.11n(HT40)\_LCH\_2422MHz\_Ant1 (SISO)\_NTNV



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



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



### 3. Maximum Conducted Output Power

#### 3.1 Test Result

##### 3.1.1 Power

| Mode           | TX Type | Frequency (MHz) | Maximum Average Conducted Output Power (dBm) |       | Verdict |
|----------------|---------|-----------------|----------------------------------------------|-------|---------|
|                |         |                 | ANT1                                         | Limit |         |
| 802.11b        | SISO    | 2412            | 11.63                                        | <=30  | Pass    |
|                |         | 2437            | 13.77                                        | <=30  | Pass    |
|                |         | 2462            | 14.30                                        | <=30  | Pass    |
| 802.11g        | SISO    | 2412            | 11.60                                        | <=30  | Pass    |
|                |         | 2437            | 13.90                                        | <=30  | Pass    |
|                |         | 2462            | 14.64                                        | <=30  | Pass    |
| 802.11n (HT20) | SISO    | 2412            | 11.28                                        | <=30  | Pass    |
|                |         | 2437            | 13.71                                        | <=30  | Pass    |
|                |         | 2462            | 14.52                                        | <=30  | Pass    |
| 802.11n (HT40) | SISO    | 2422            | 12.14                                        | <=30  | Pass    |
|                |         | 2437            | 13.63                                        | <=30  | Pass    |
|                |         | 2452            | 13.82                                        | <=30  | Pass    |

Note1: Antenna Gain: Ant1: 2.00dBi;

### 4. Maximum Power Spectral Density

#### 4.1 Test Result

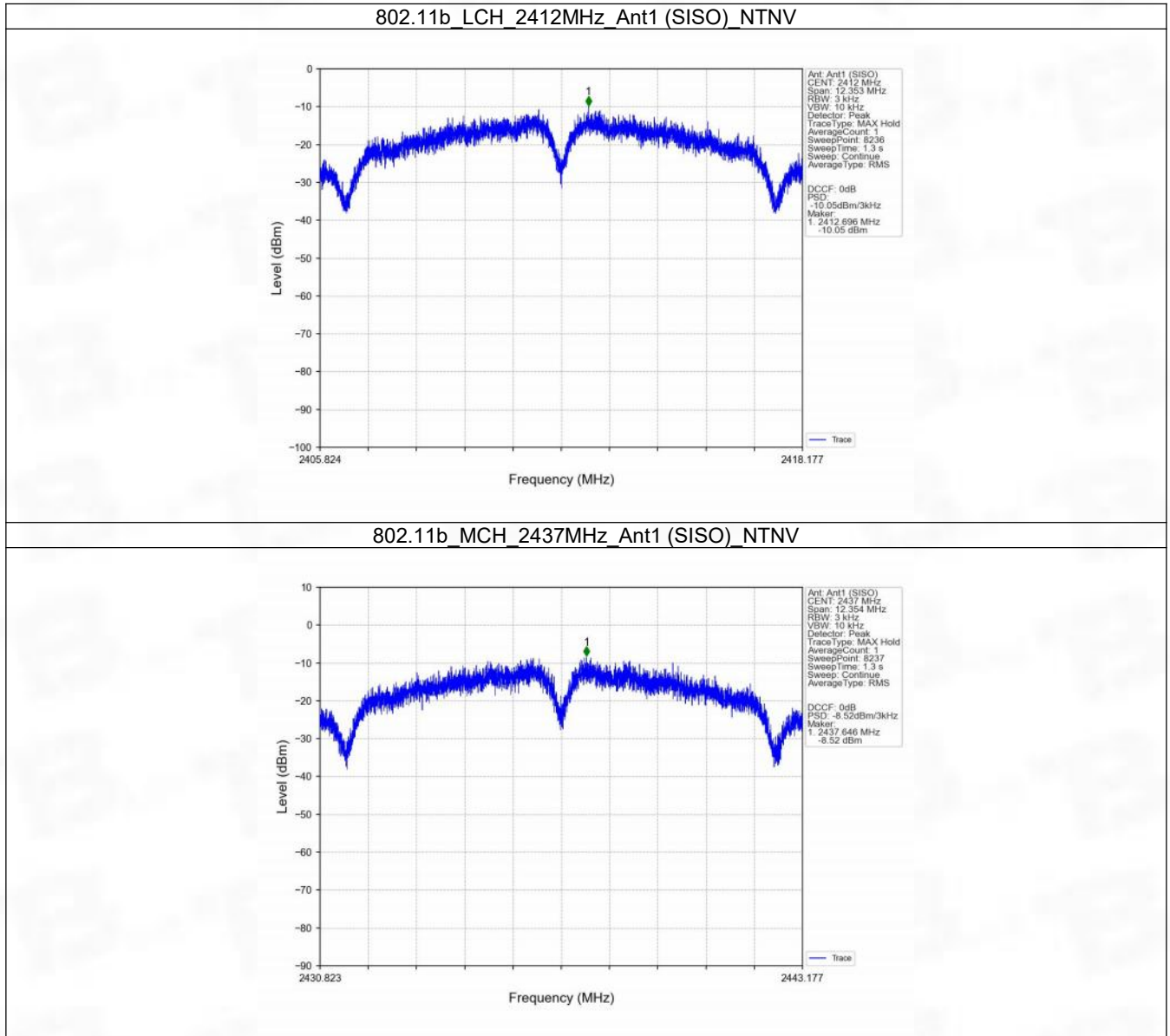
##### 4.1.1 PSD

| Mode           | TX Type | Frequency (MHz) | Maximum PSD (dBm/3kHz) |       | Verdict |
|----------------|---------|-----------------|------------------------|-------|---------|
|                |         |                 | ANT1                   | Limit |         |
| 802.11b        | SISO    | 2412            | -10.05                 | <=8   | Pass    |
|                |         | 2437            | -8.52                  | <=8   | Pass    |
|                |         | 2462            | -7.10                  | <=8   | Pass    |
| 802.11g        | SISO    | 2412            | -12.99                 | <=8   | Pass    |
|                |         | 2437            | -9.05                  | <=8   | Pass    |
|                |         | 2462            | -9.65                  | <=8   | Pass    |
| 802.11n (HT20) | SISO    | 2412            | -12.91                 | <=8   | Pass    |
|                |         | 2437            | -11.20                 | <=8   | Pass    |
|                |         | 2462            | -10.13                 | <=8   | Pass    |
| 802.11n (HT40) | SISO    | 2422            | -15.37                 | <=8   | Pass    |
|                |         | 2437            | -13.70                 | <=8   | Pass    |
|                |         | 2452            | -12.97                 | <=8   | Pass    |

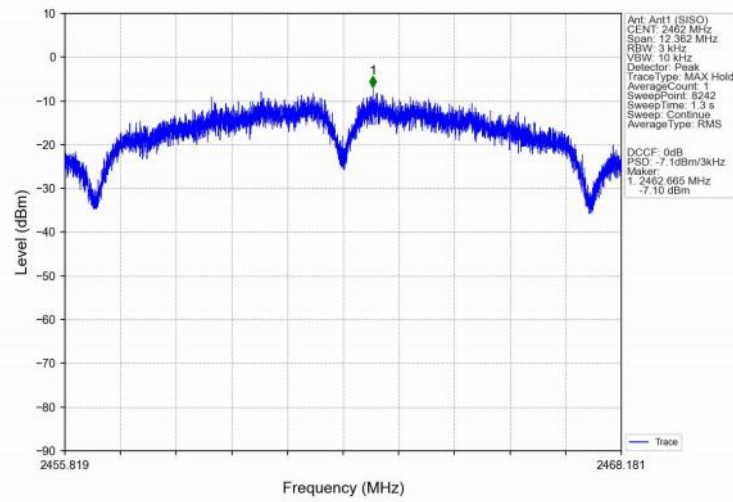
Note1: Antenna Gain: Ant1: 2.00dBi;

## 4.2 Test Graph

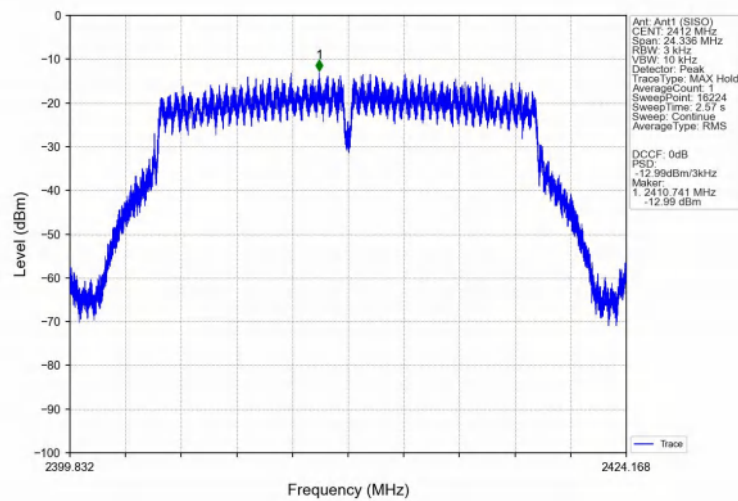
### 4.2.1 PSD



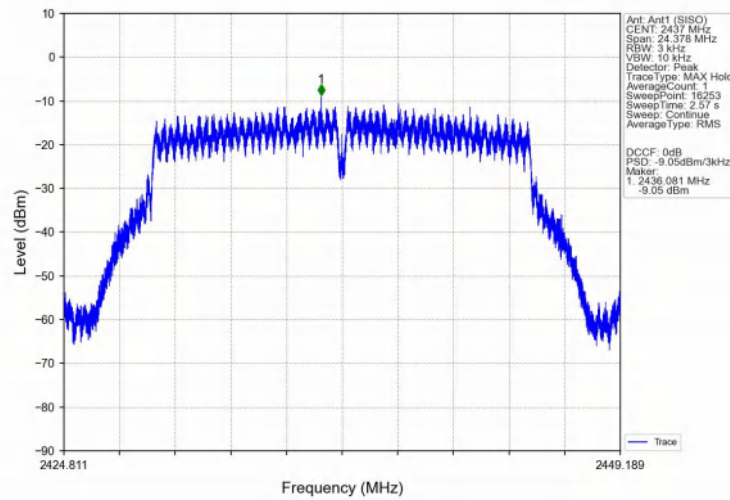
802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



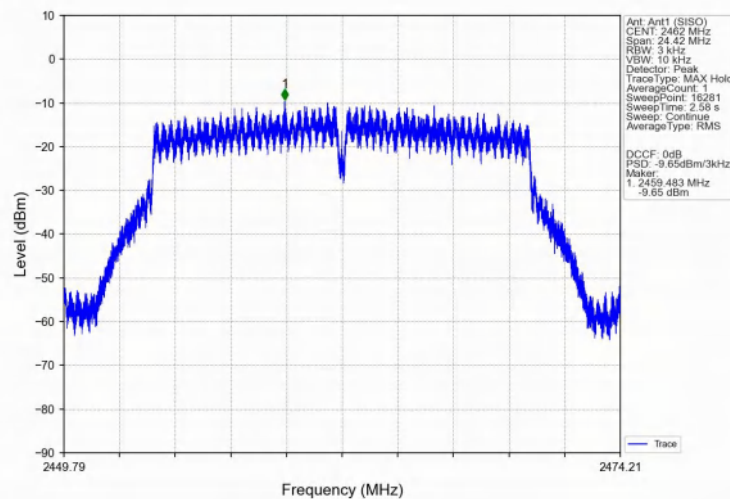
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



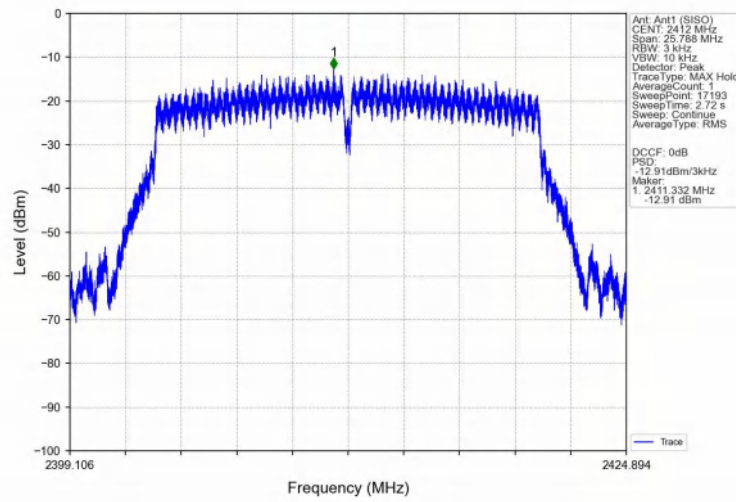
802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



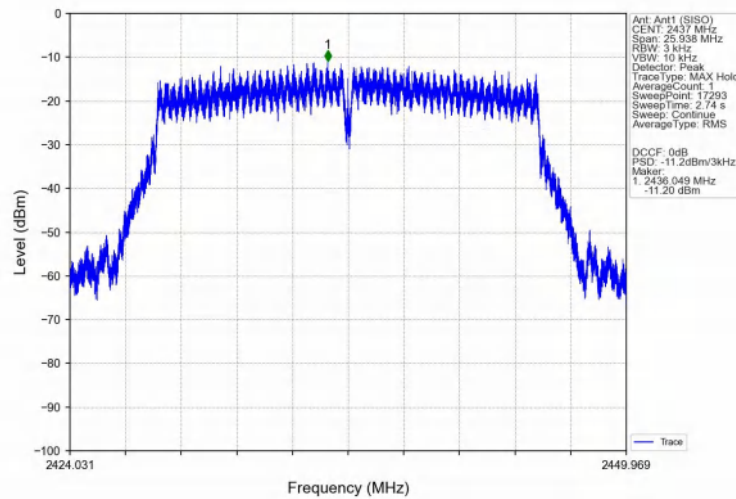
802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



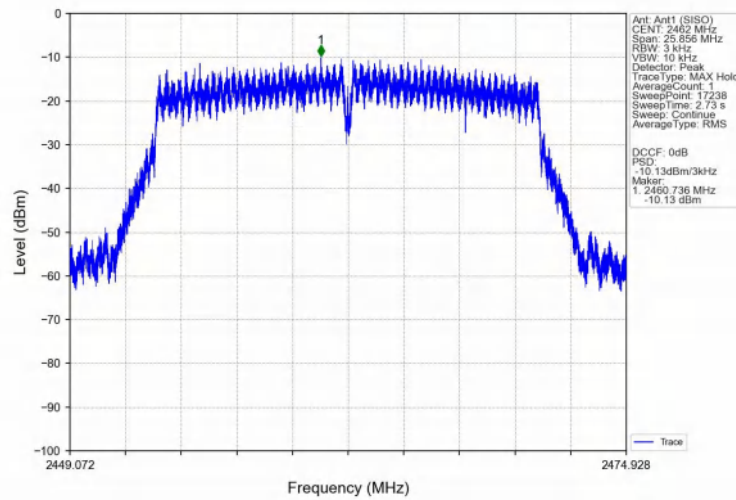
802.11n(HT20)\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



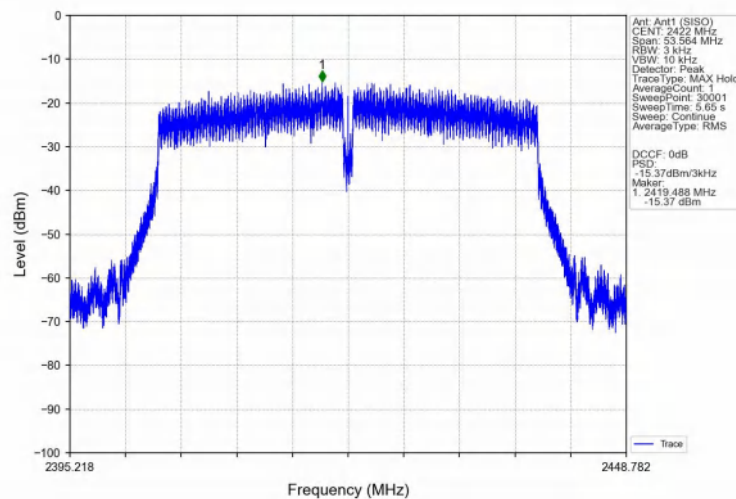
802.11n(HT20)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



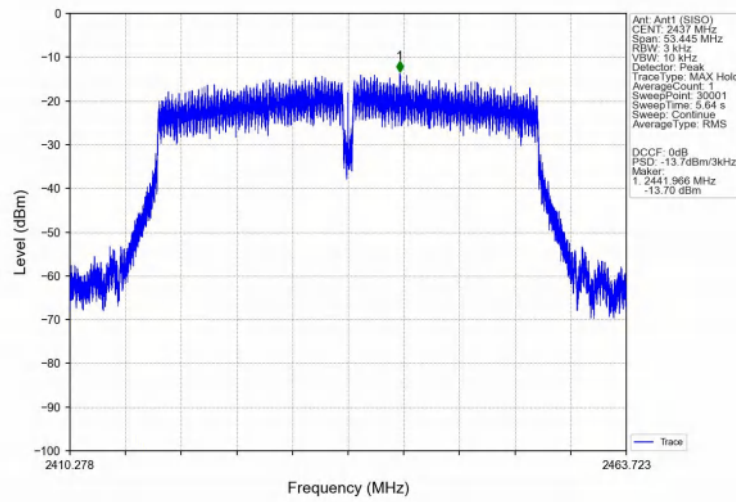
802.11n(HT20)\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



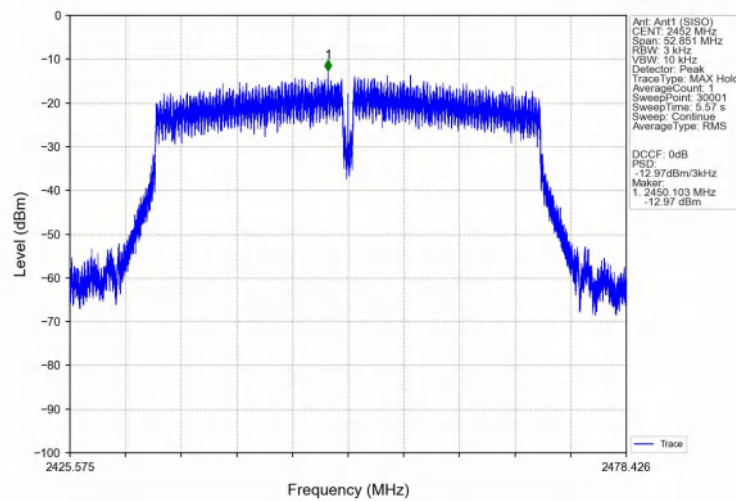
802.11n(HT40)\_LCH\_2422MHz\_Ant1 (SISO)\_NTNV



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



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



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

### 5.1 Test Result

#### 5.1.1 Ref

| Mode           | TX Type | Frequency (MHz) | ANT | Level of Reference (dBm) |
|----------------|---------|-----------------|-----|--------------------------|
| 802.11b        | SISO    | 2412            | 1   | 3.57                     |
|                |         | 2437            | 1   | 5.69                     |
|                |         | 2462            | 1   | 6.29                     |
| 802.11g        | SISO    | 2412            | 1   | 0.54                     |
|                |         | 2437            | 1   | 3.71                     |
|                |         | 2462            | 1   | 3.86                     |
| 802.11n (HT20) | SISO    | 2412            | 1   | 1.14                     |
|                |         | 2437            | 1   | 3.65                     |
|                |         | 2462            | 1   | 4.40                     |
| 802.11n (HT40) | SISO    | 2422            | 1   | -0.98                    |
|                |         | 2437            | 1   | 0.50                     |
|                |         | 2452            | 1   | 0.70                     |

Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.

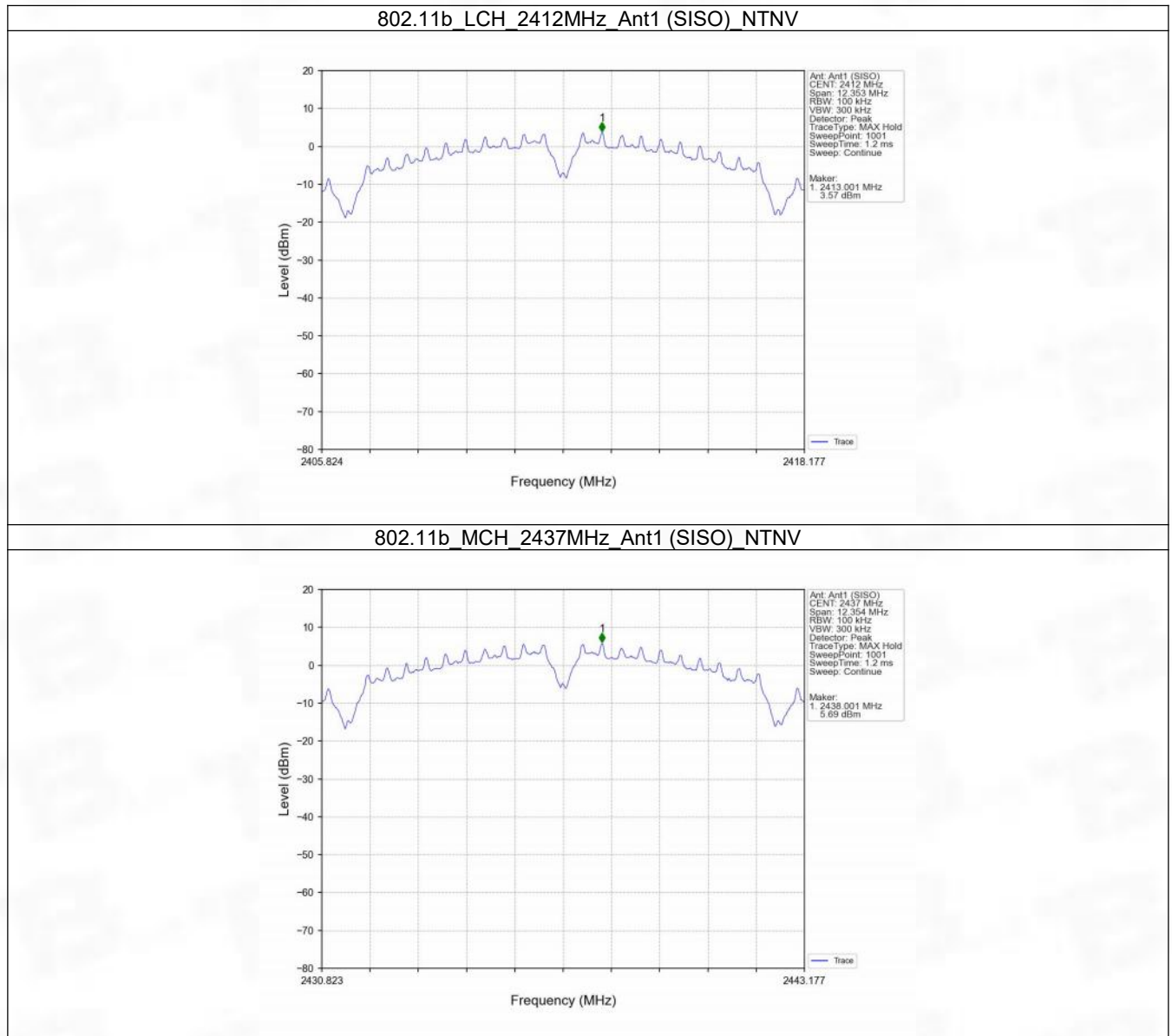
#### 5.1.2 CSE

| Mode           | TX Type | Frequency (MHz) | ANT | Level of Reference (dBm) | Limit (dBm) | Verdict |
|----------------|---------|-----------------|-----|--------------------------|-------------|---------|
| 802.11b        | SISO    | 2412            | 1   | 6.29                     | -23.71      | Pass    |
|                |         | 2437            | 1   | 6.29                     | -23.71      | Pass    |
|                |         | 2462            | 1   | 6.29                     | -23.71      | Pass    |
| 802.11g        | SISO    | 2412            | 1   | 3.86                     | -26.14      | Pass    |
|                |         | 2437            | 1   | 3.86                     | -26.14      | Pass    |
|                |         | 2462            | 1   | 3.86                     | -26.14      | Pass    |
| 802.11n (HT20) | SISO    | 2412            | 1   | 4.40                     | -25.60      | Pass    |
|                |         | 2437            | 1   | 4.40                     | -25.60      | Pass    |
|                |         | 2462            | 1   | 4.40                     | -25.60      | Pass    |
| 802.11n (HT40) | SISO    | 2422            | 1   | 0.70                     | -29.30      | Pass    |
|                |         | 2437            | 1   | 0.70                     | -29.30      | Pass    |
|                |         | 2452            | 1   | 0.70                     | -29.30      | Pass    |

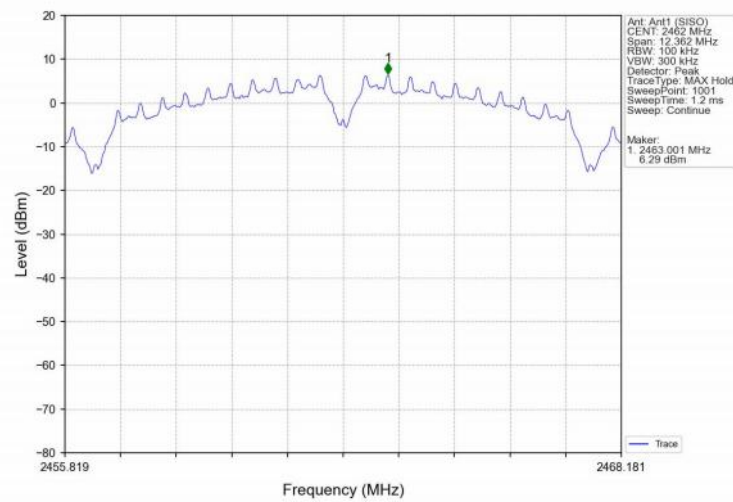
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.

## 5.2 Test Graph

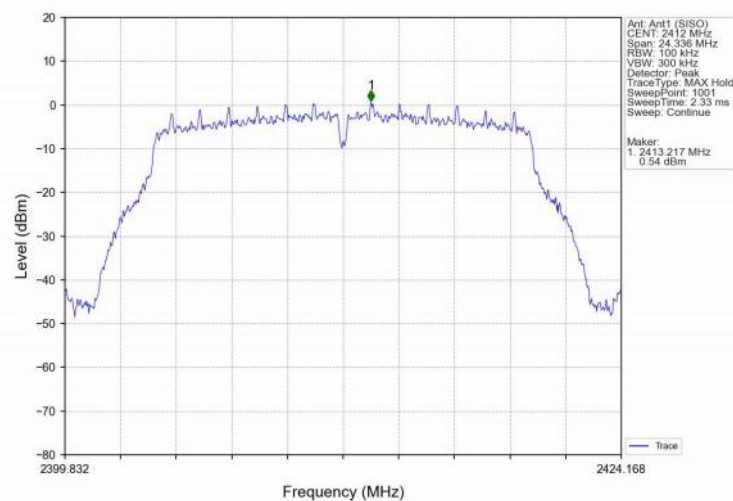
### 5.2.1 Ref



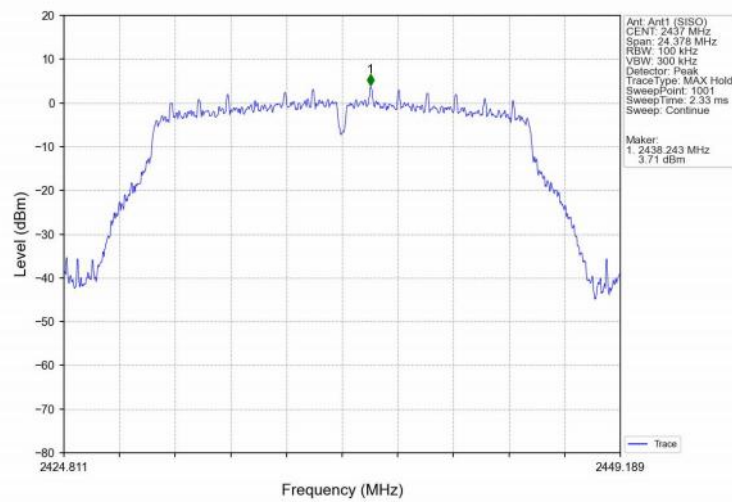
802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



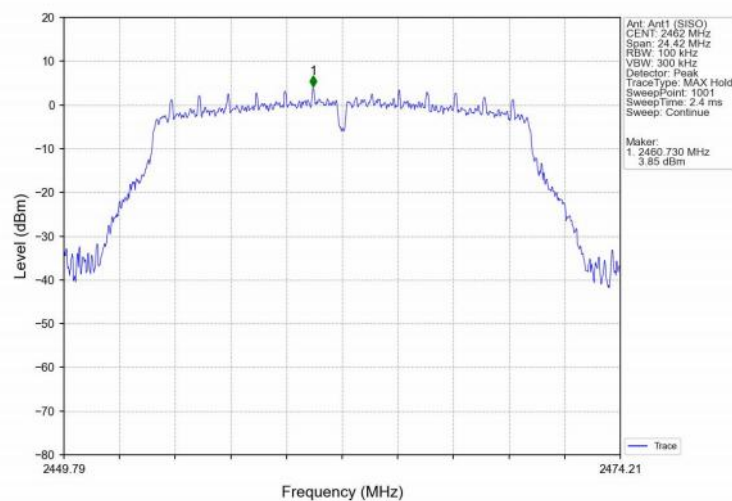
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



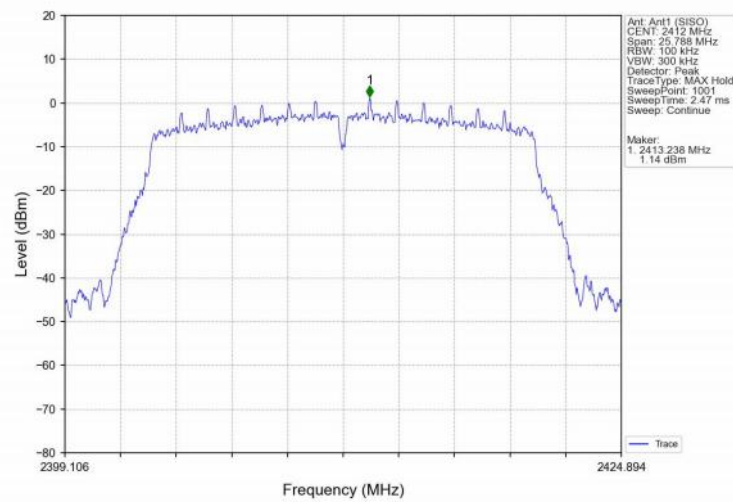
802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



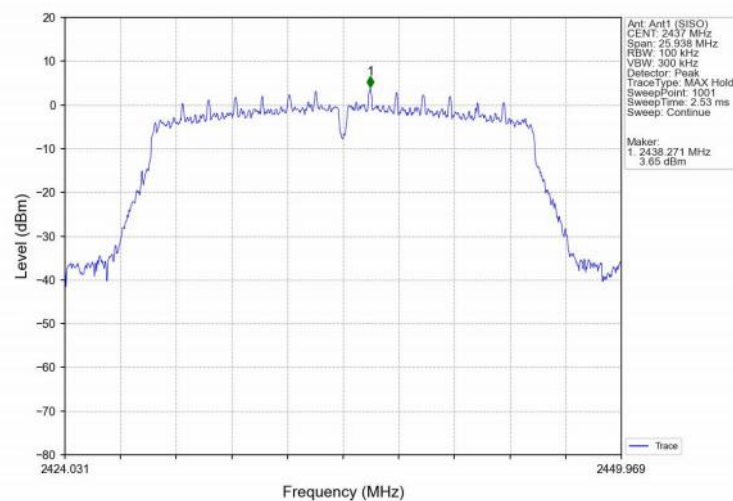
802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



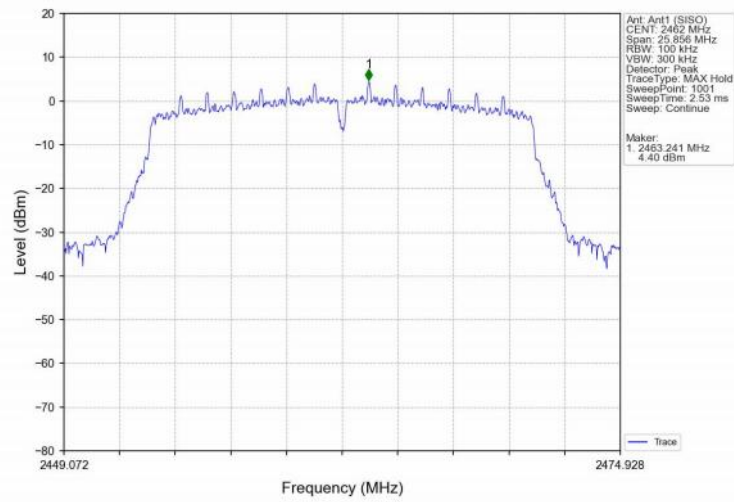
## 802.11n(HT20)\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



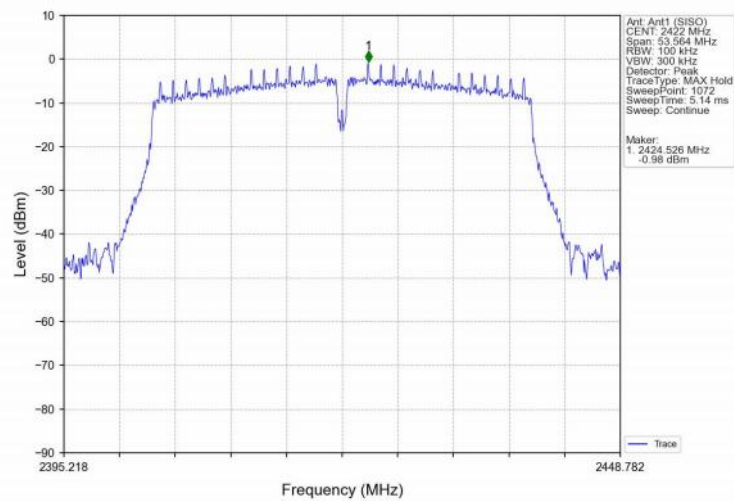
## 802.11n(HT20)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



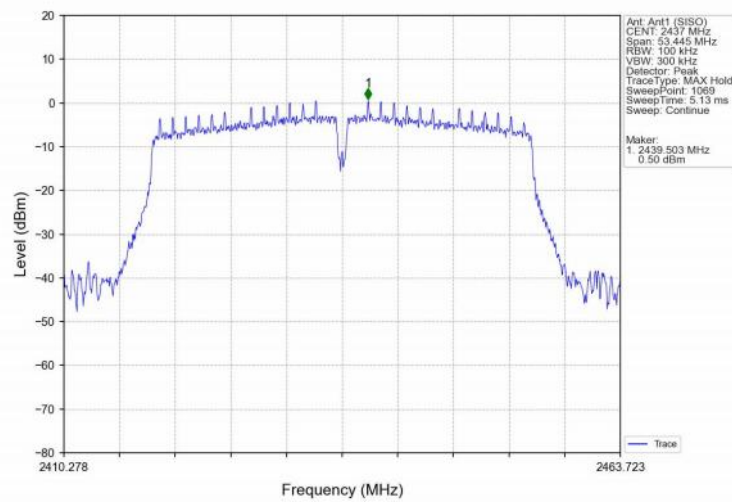
802.11n(HT20)\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



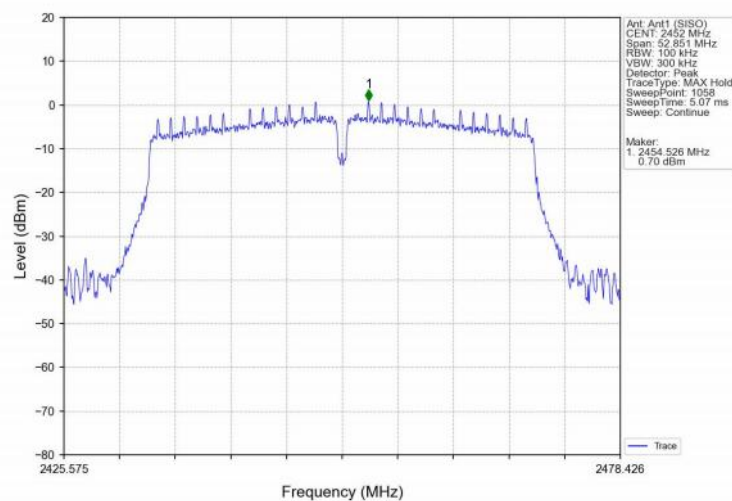
802.11n(HT40)\_LCH\_2422MHz\_Ant1 (SISO)\_NTNV



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

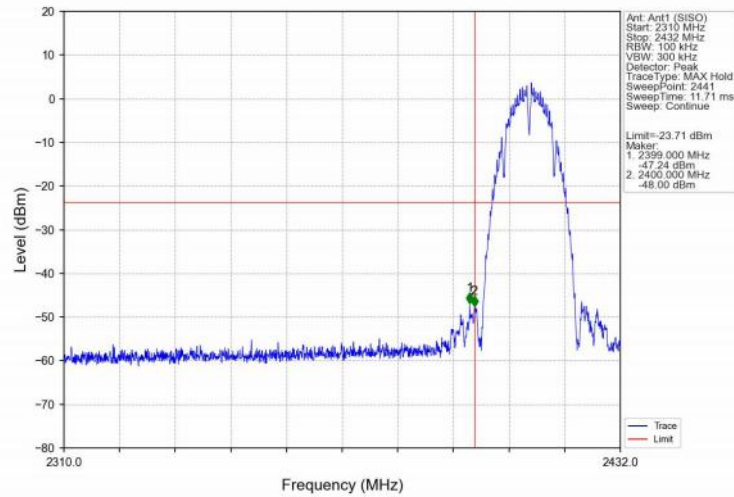


802.11n(HT40)\_HCH\_2452MHz\_Ant1 (SISO)\_NTNV

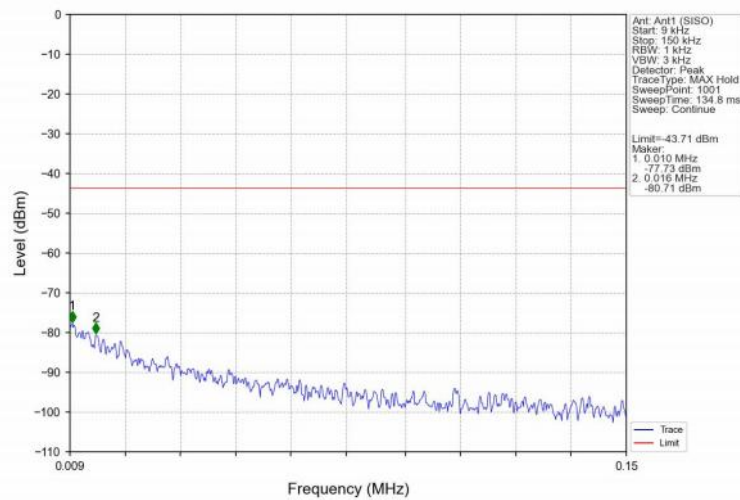


## 5.2.2 CSE

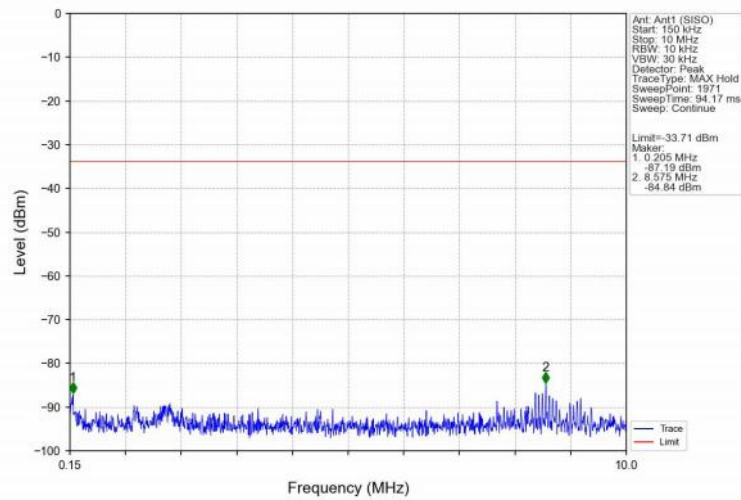
802.11b\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



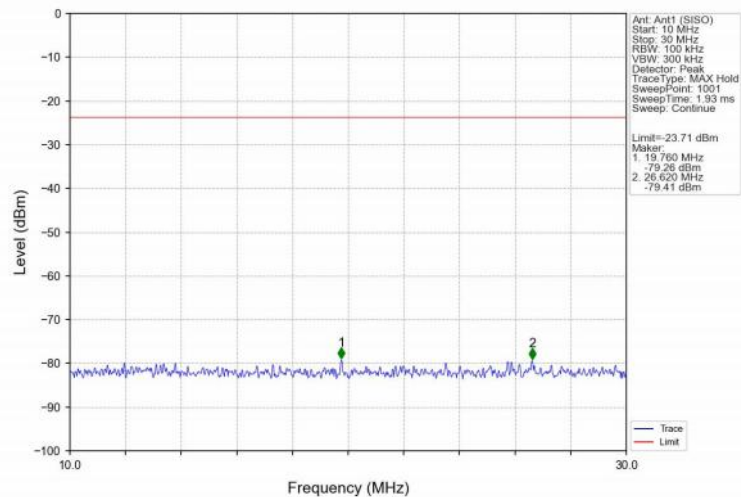
802.11b\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



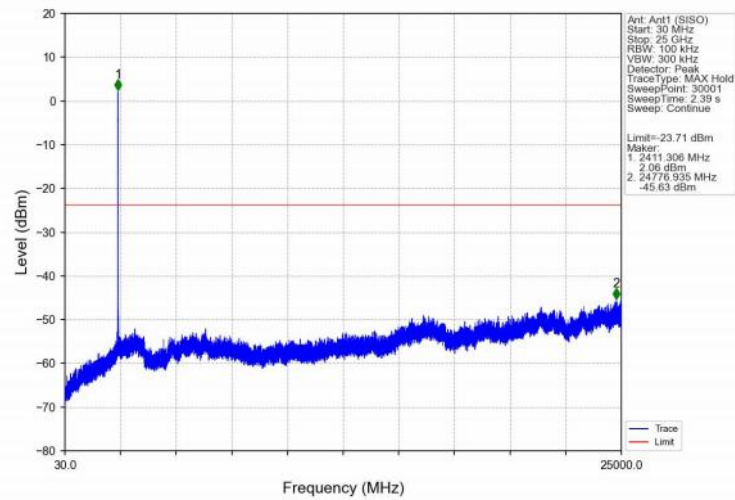
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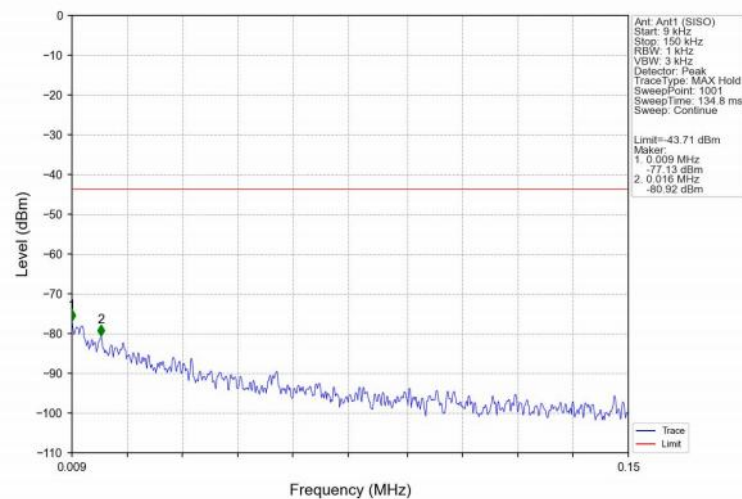
## 802.11b\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



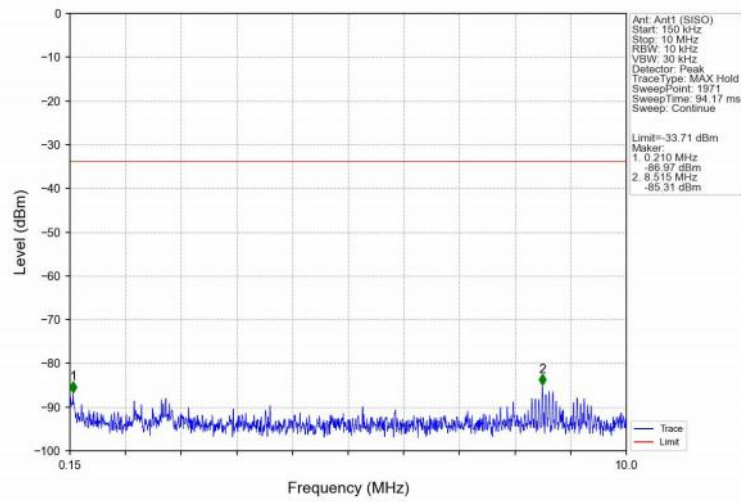
## 802.11b\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



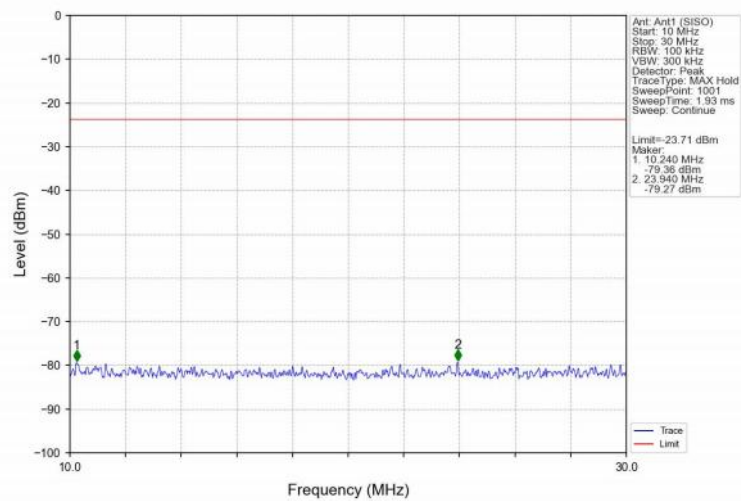
## 802.11b\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



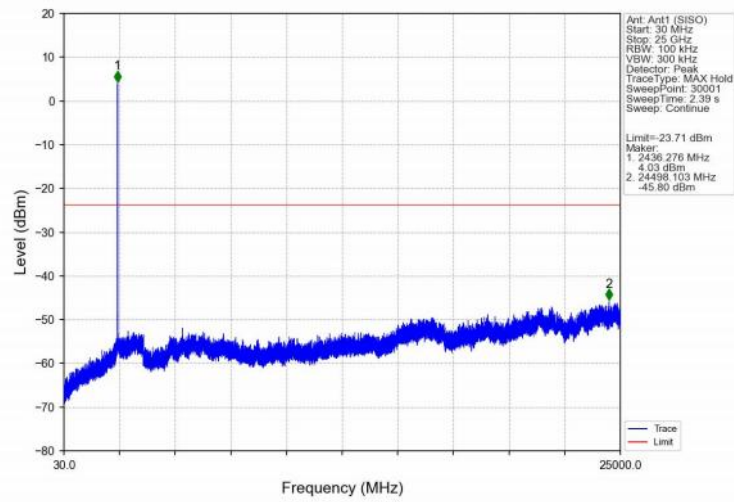
## 802.11b\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



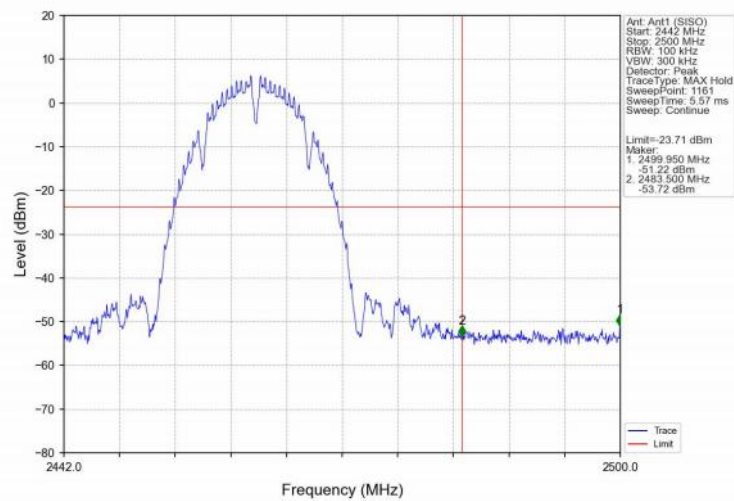
## 802.11b\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



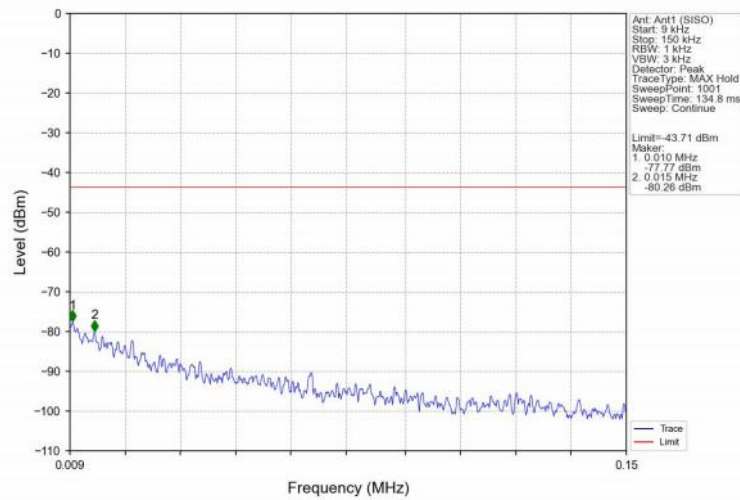
## 802.11b\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



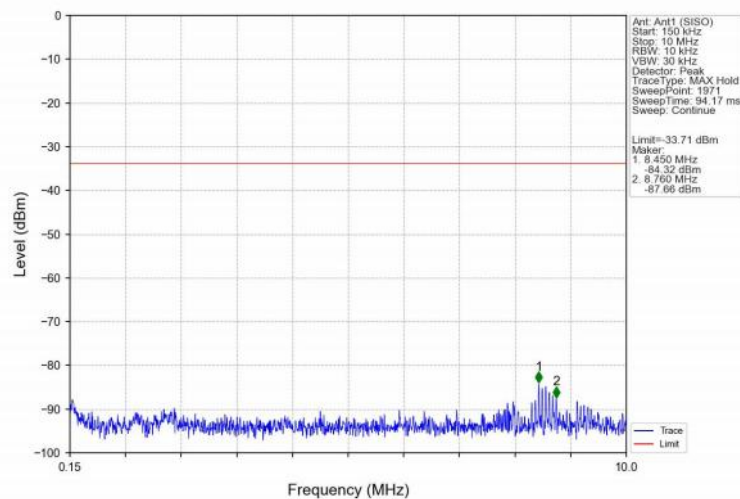
## 802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



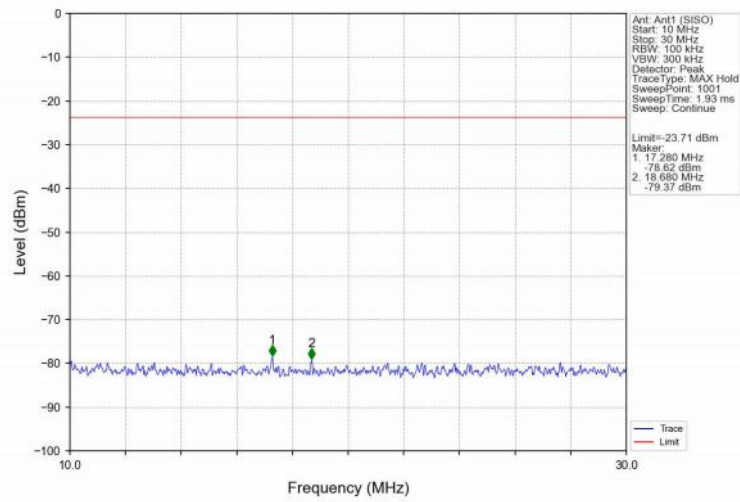
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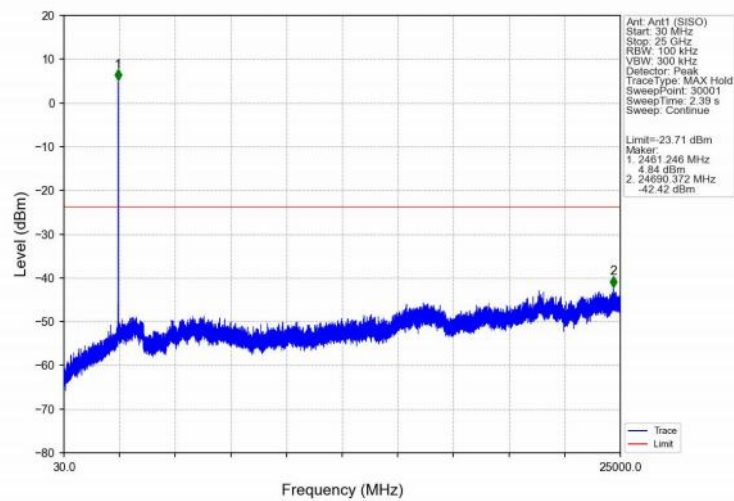
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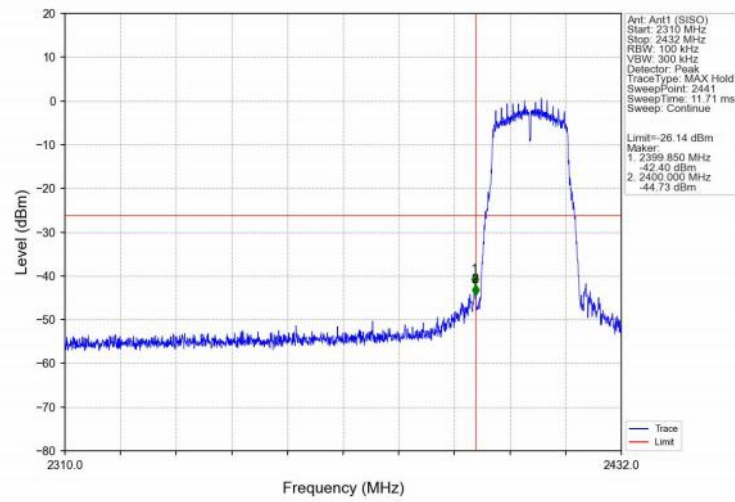
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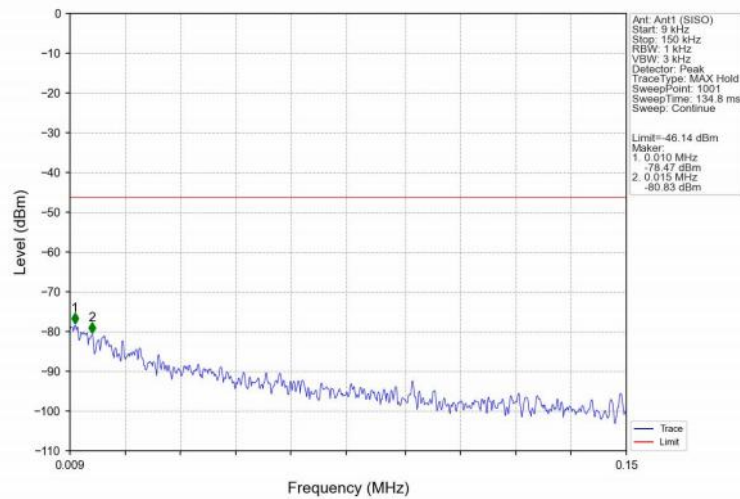
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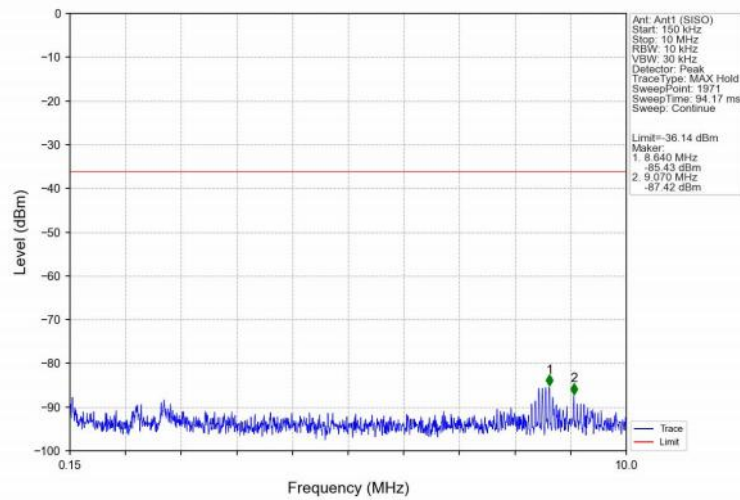
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



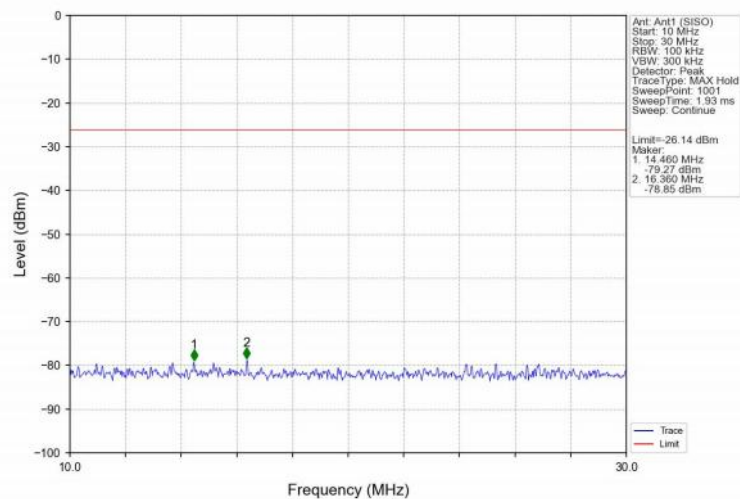
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



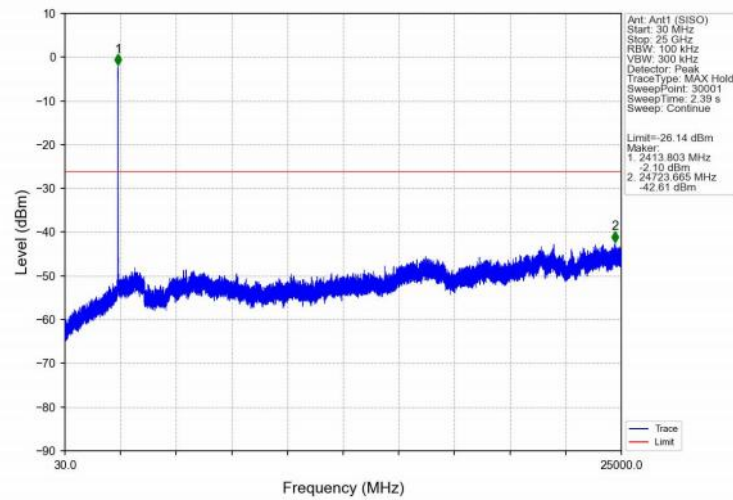
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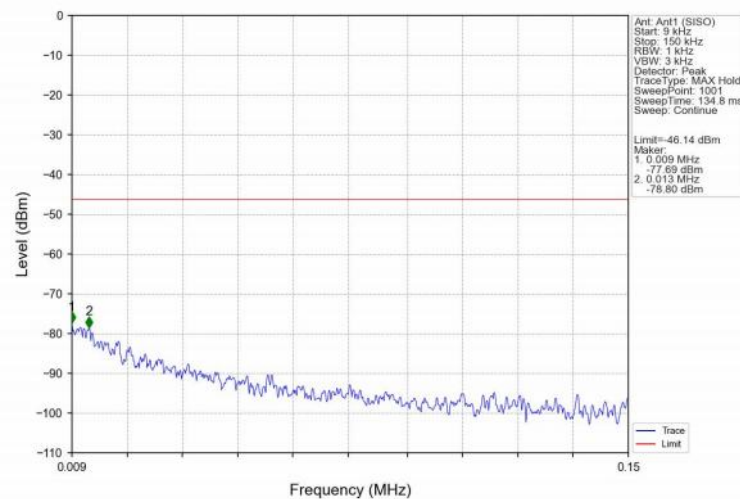
## 802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



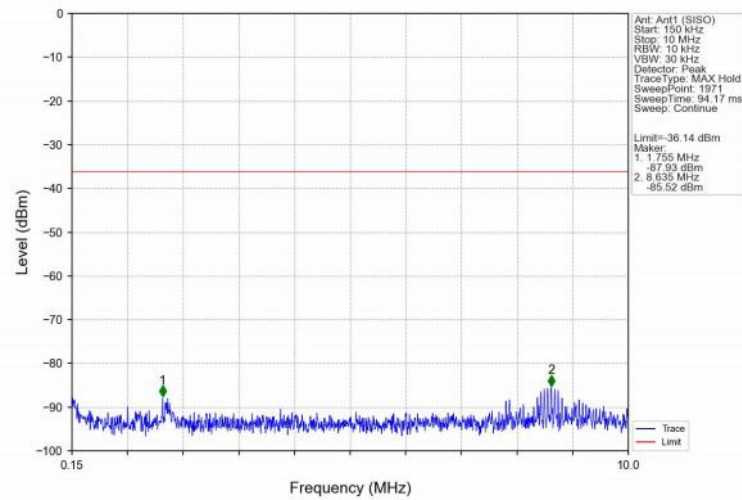
## 802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



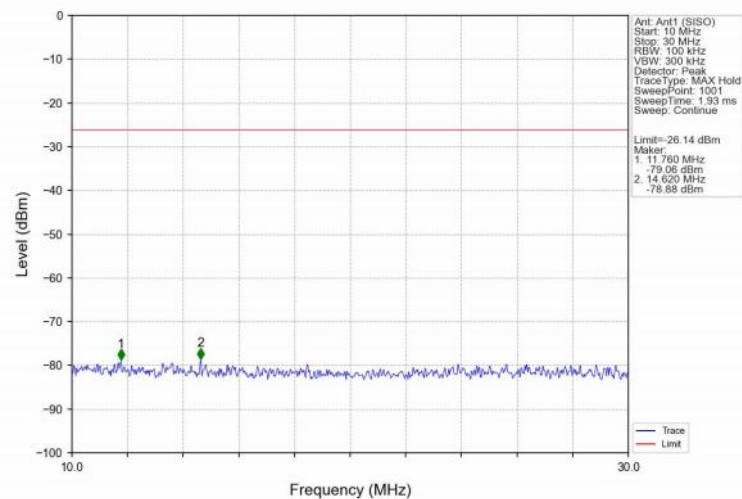
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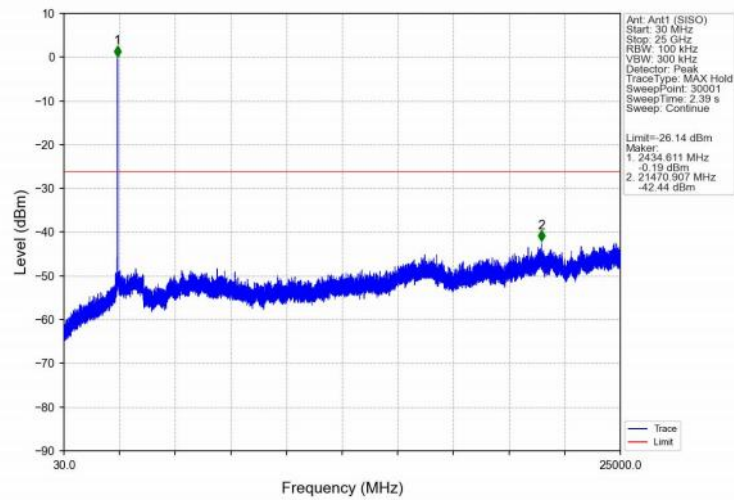
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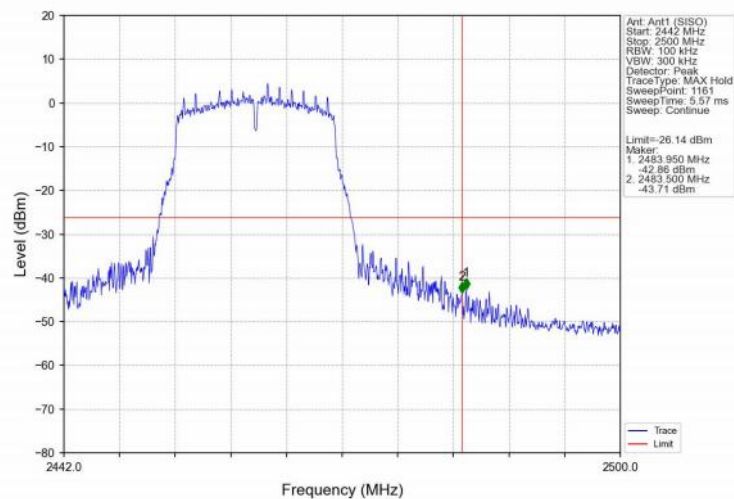
## 802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



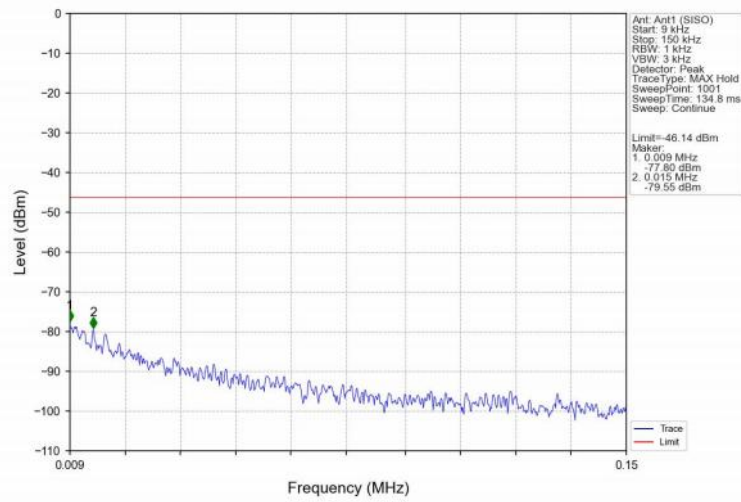
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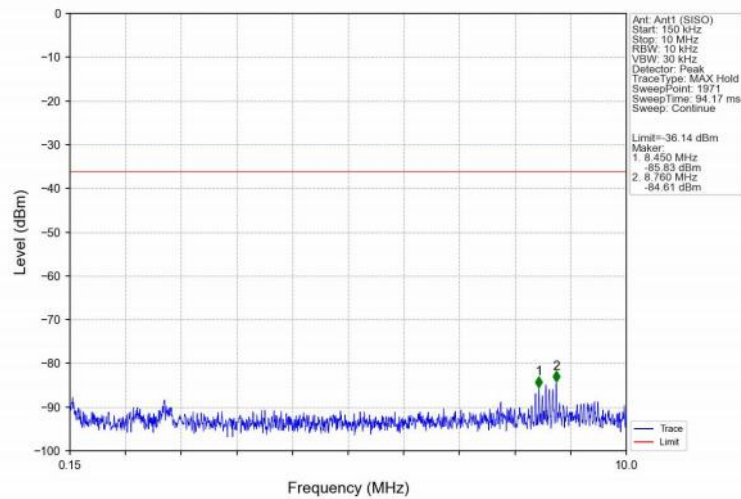
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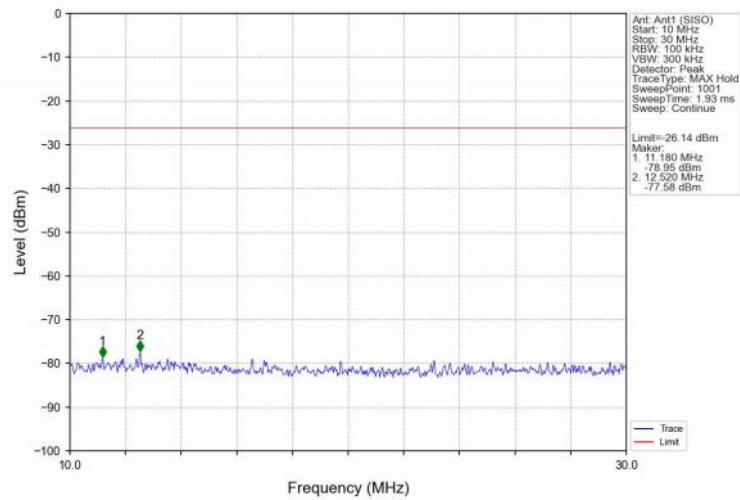
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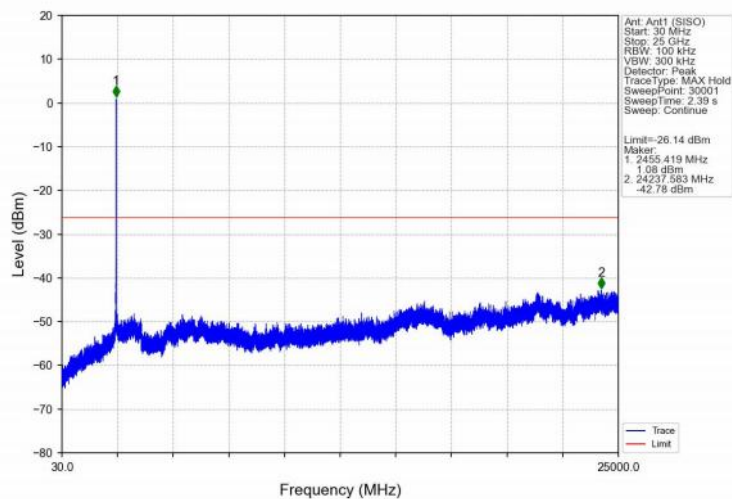
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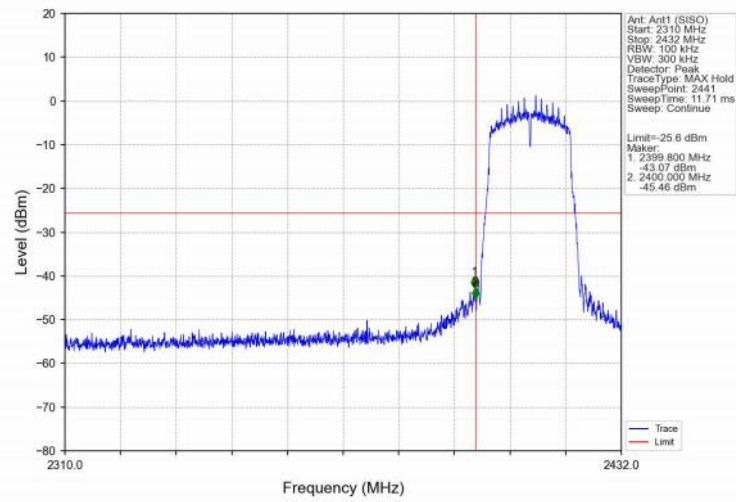
802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



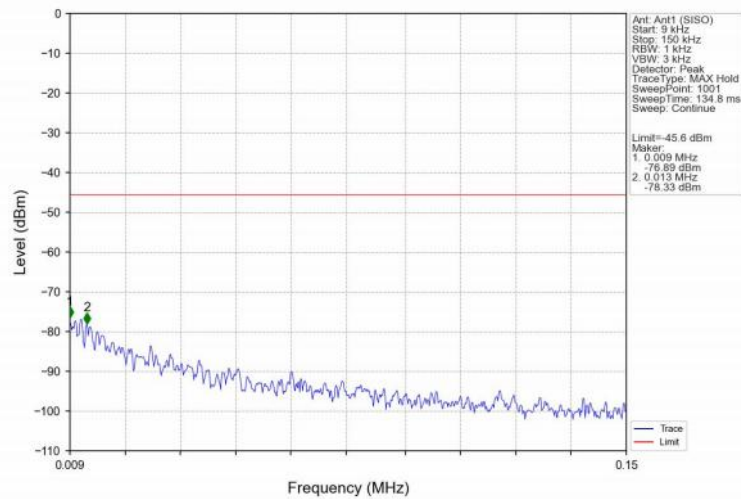
802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



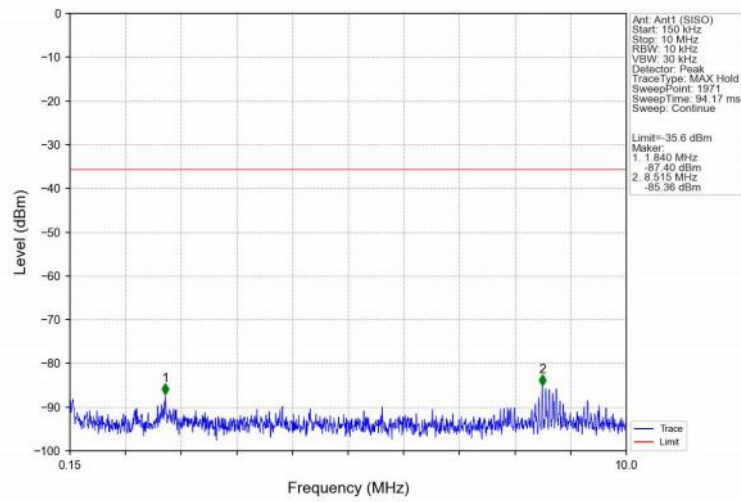
## 802.11n(HT20)\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



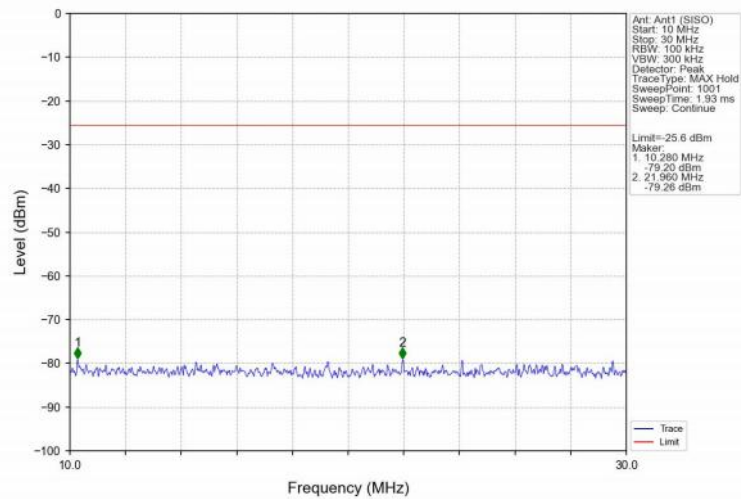
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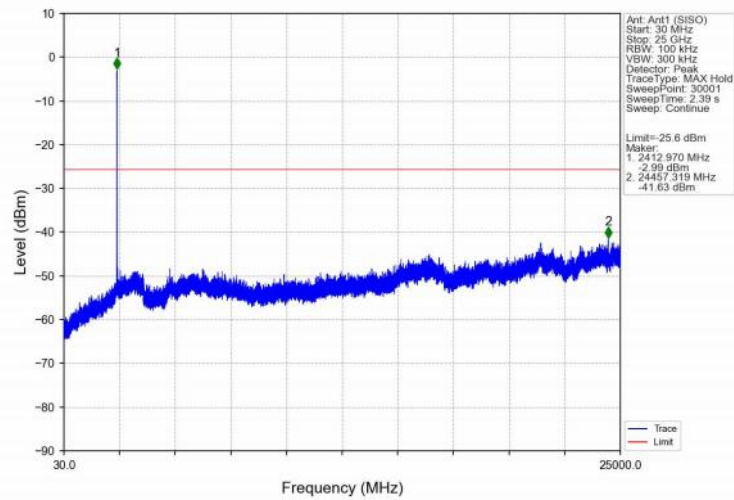
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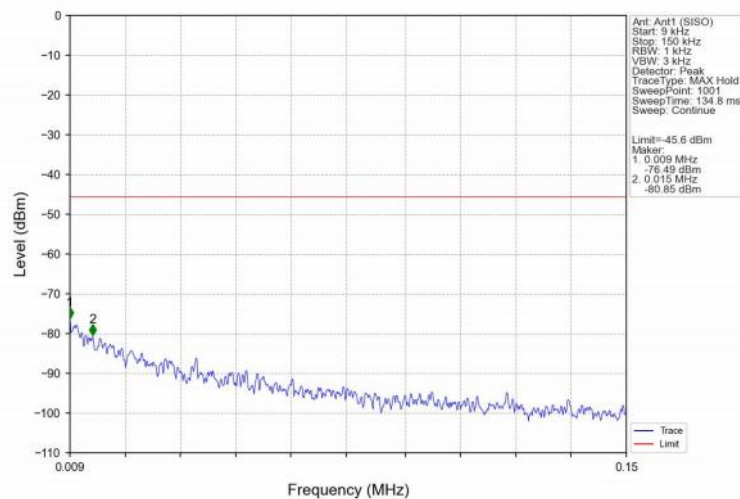
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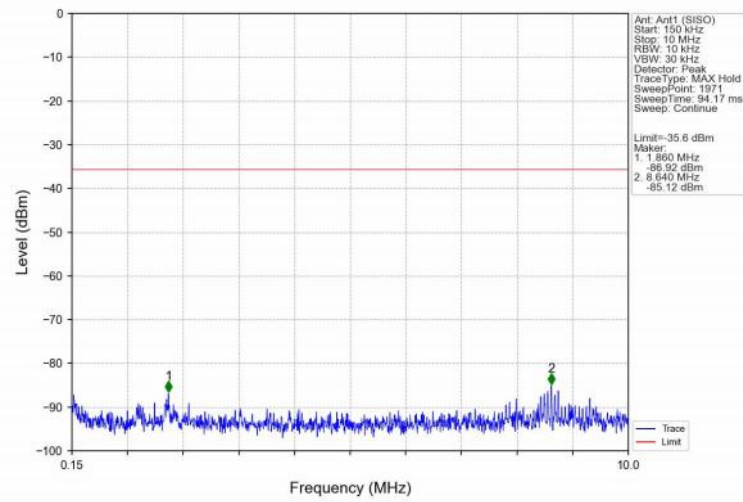
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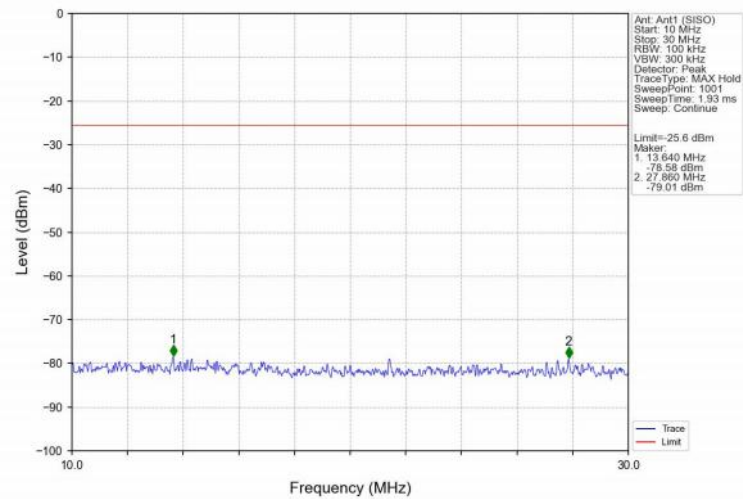
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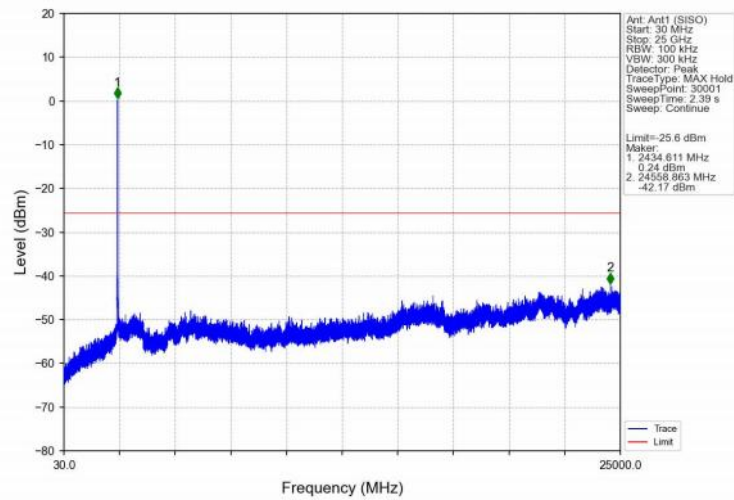
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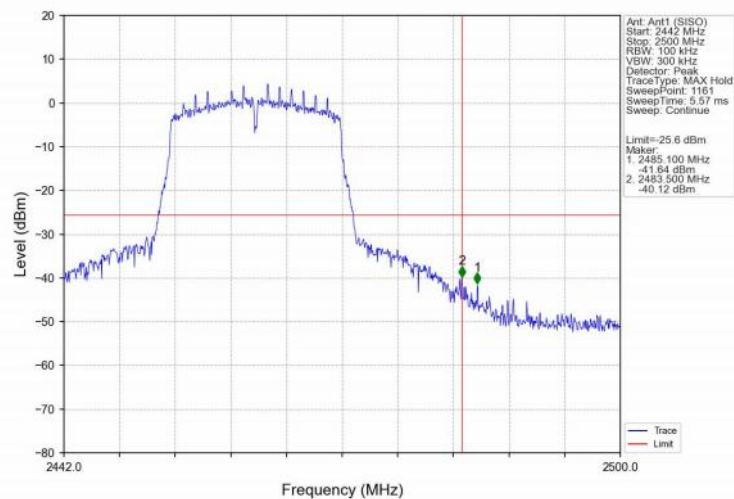
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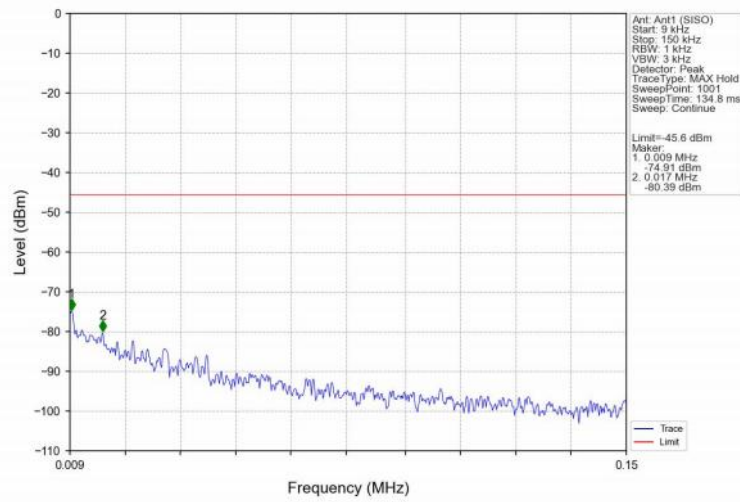
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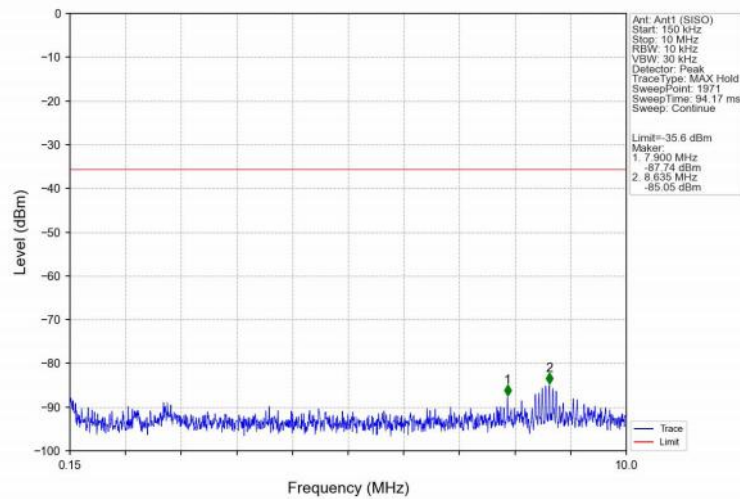
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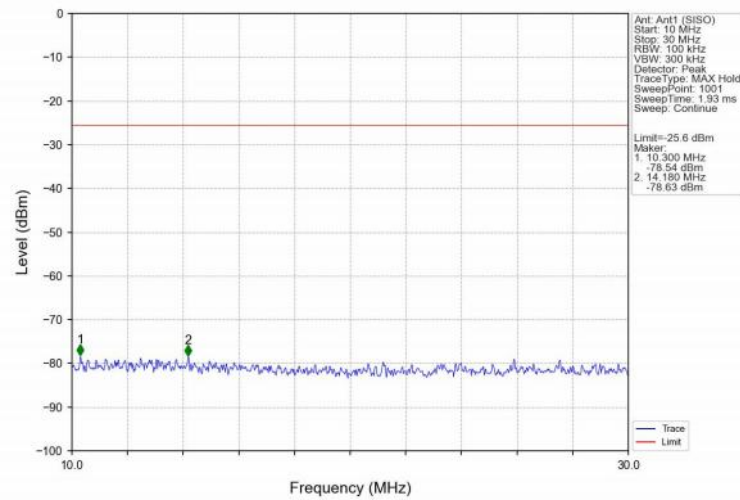
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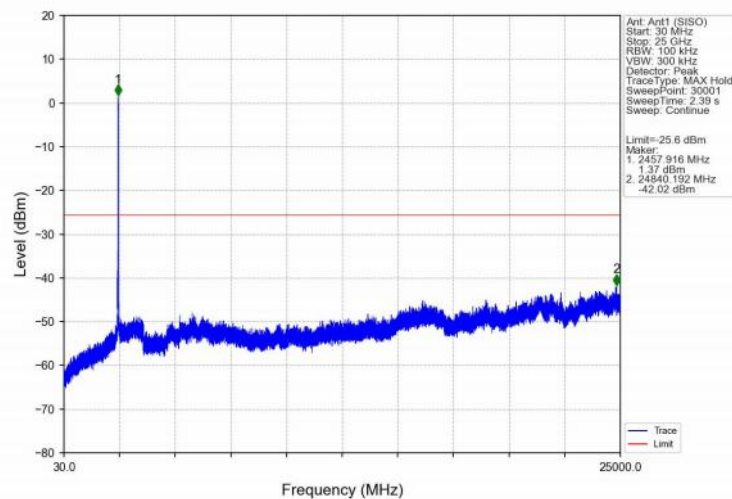
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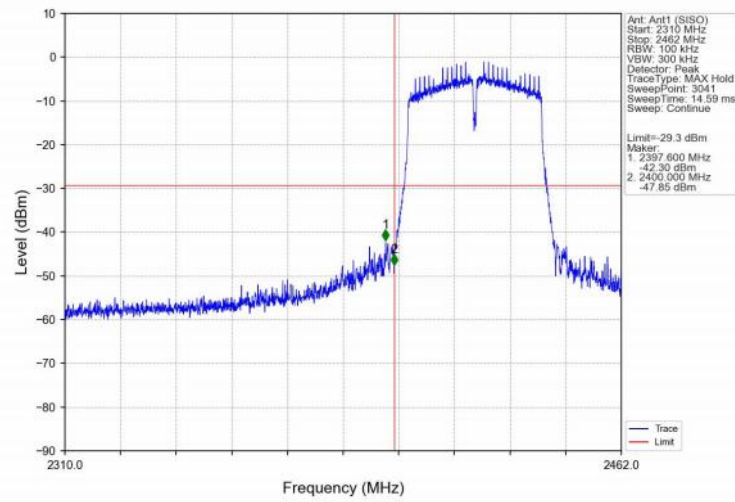
802.11n(HT20)\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



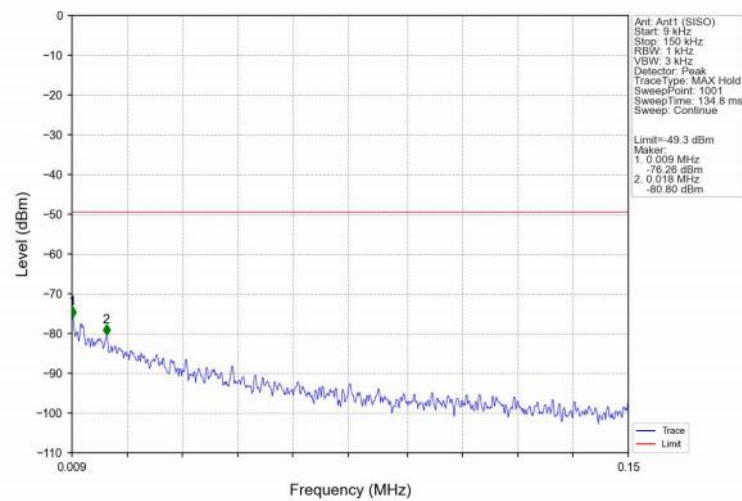
802.11n(HT20)\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



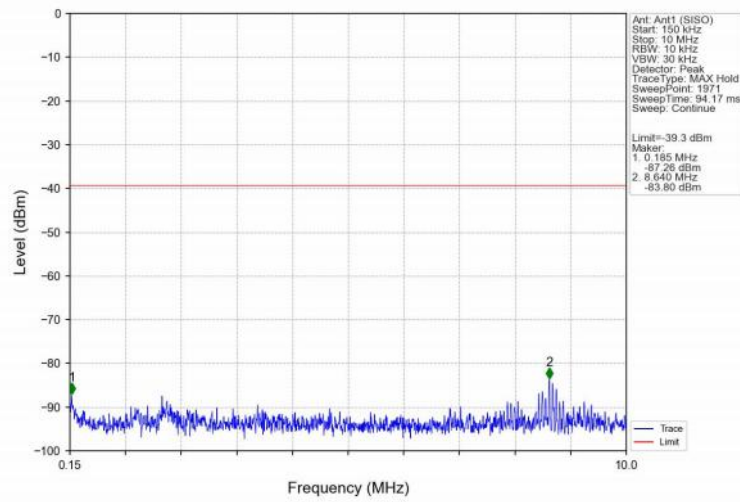
802.11n(HT40)\_LCH\_2422MHz\_Ant1 (SISO)\_NTNV



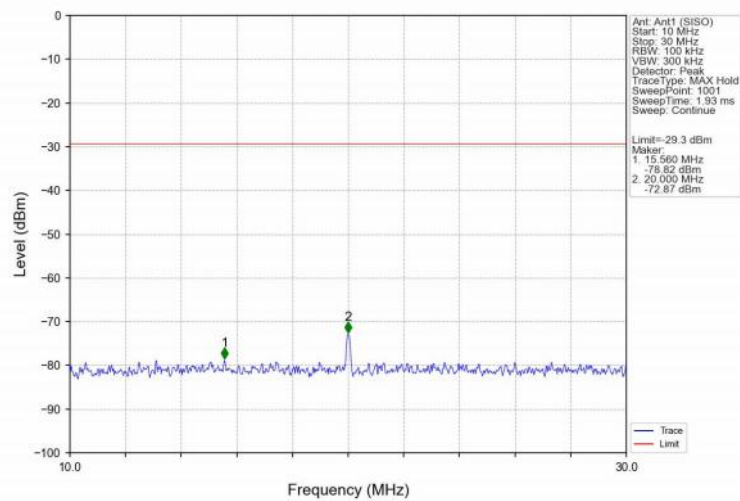
802.11n(HT40)\_LCH\_2422MHz\_Ant1 (SISO)\_NTNV



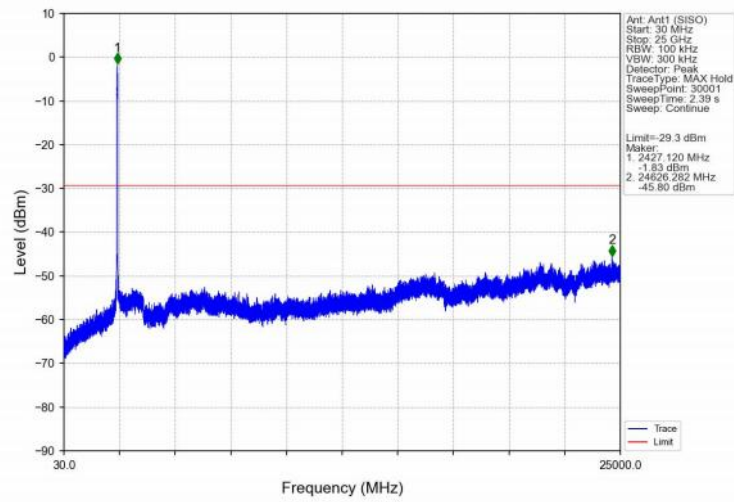
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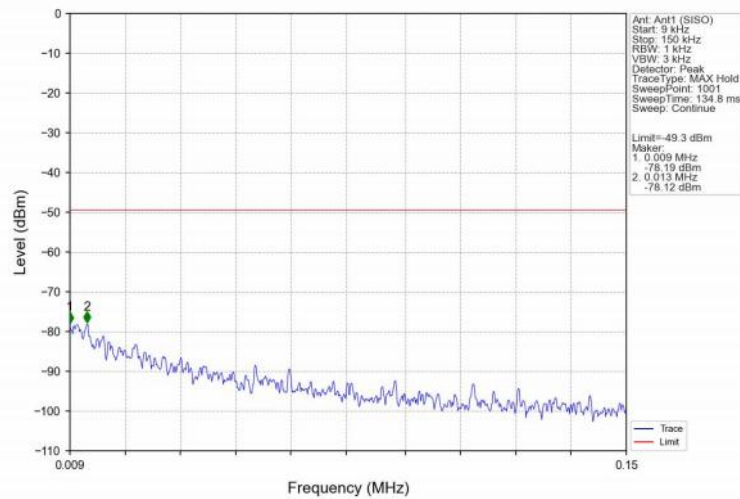
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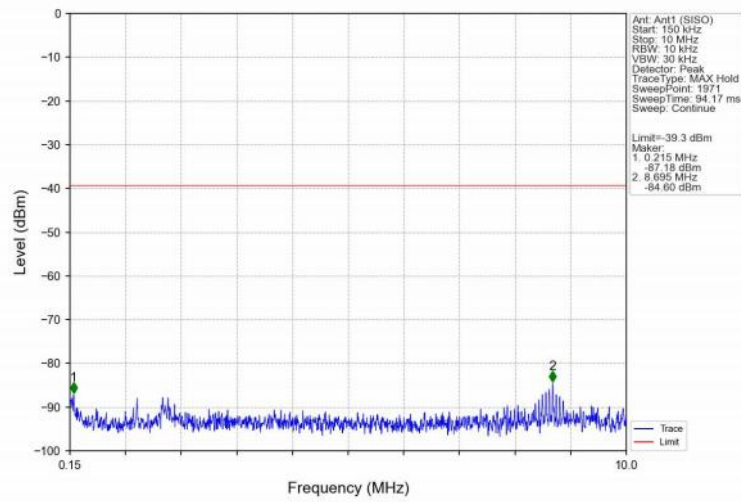
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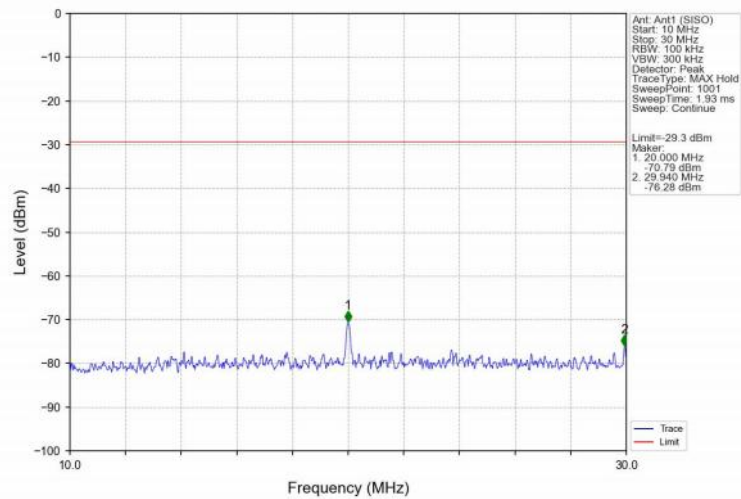
## 802.11n(HT40)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



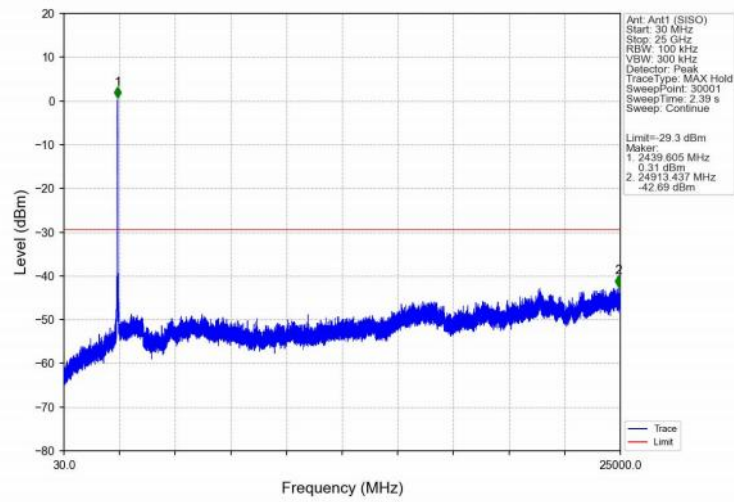
802.11n(HT40)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



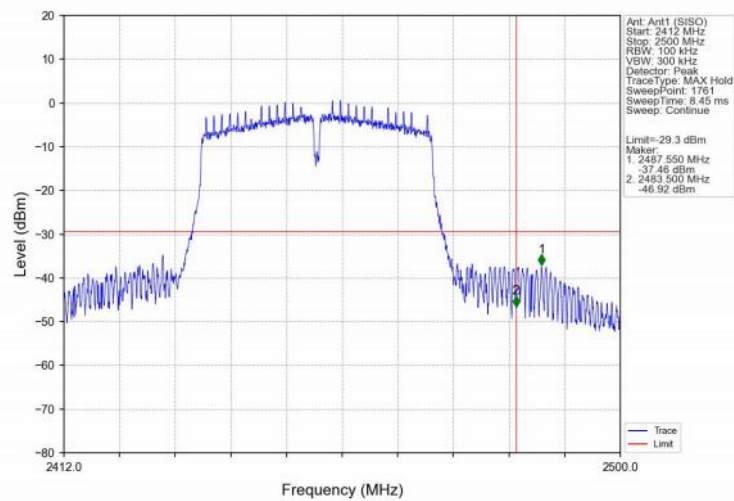
802.11n(HT40)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



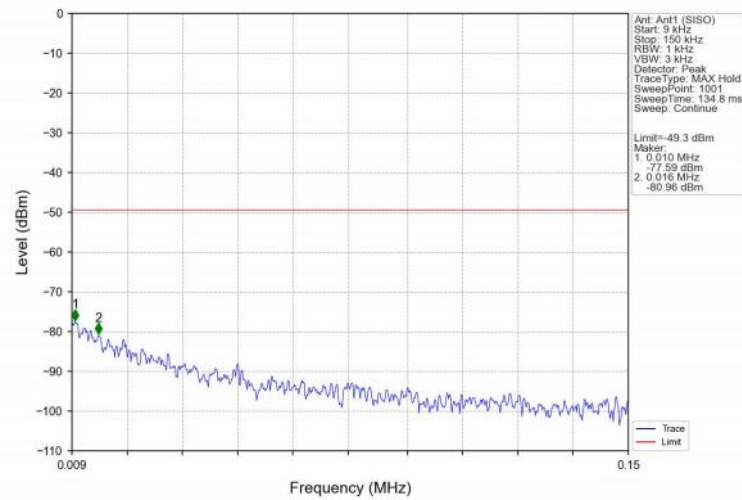
802.11n(HT40)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



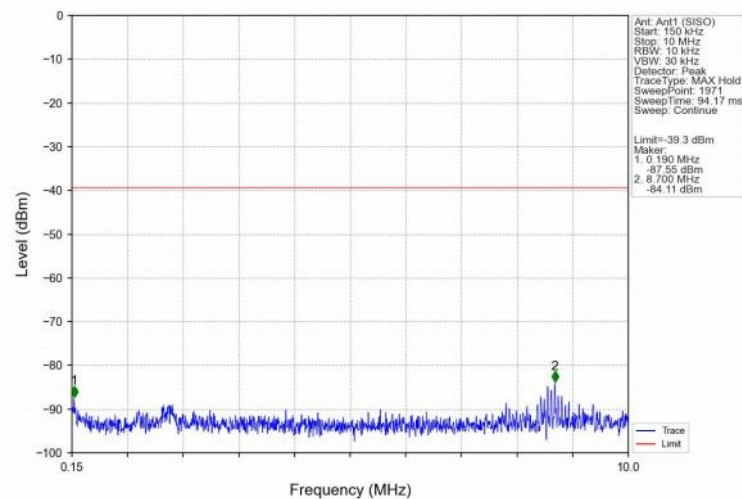
802.11n(HT40)\_HCH\_2452MHz\_Ant1 (SISO)\_NTNV



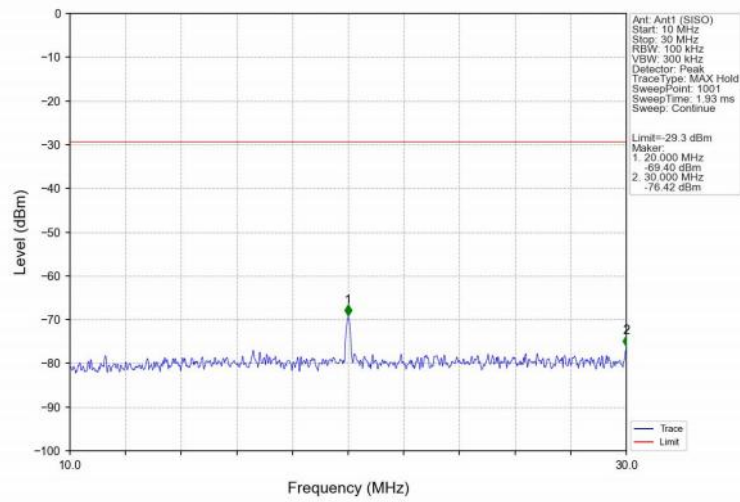
## 802.11n(HT40)\_HCH\_2452MHz\_Ant1 (SISO)\_NTNV



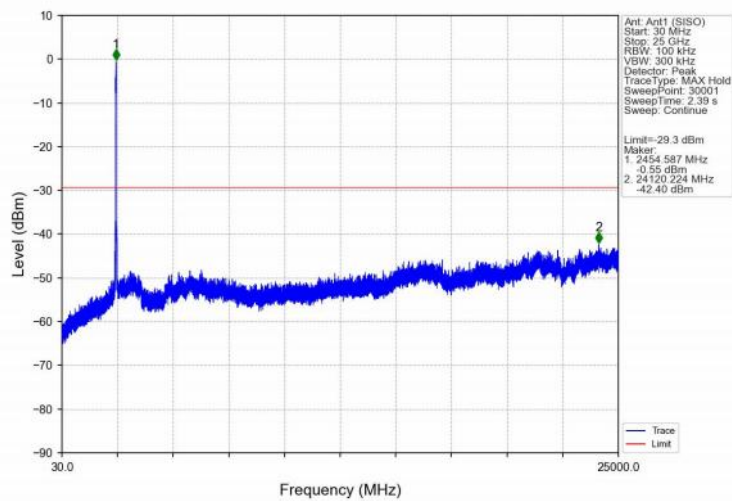
## 802.11n(HT40)\_HCH\_2452MHz\_Ant1 (SISO)\_NTNV



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



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



## 6. Form731

### 6.1 Test Result

#### 6.1.1 Form731

| Lower Freq (MHz) | High Freq (MHz) | MAX Power (W) | MAX Power (dBm) |
|------------------|-----------------|---------------|-----------------|
| 2412             | 2462            | 0.0291        | 14.64           |
| 2422             | 2452            | 0.0241        | 13.82           |