

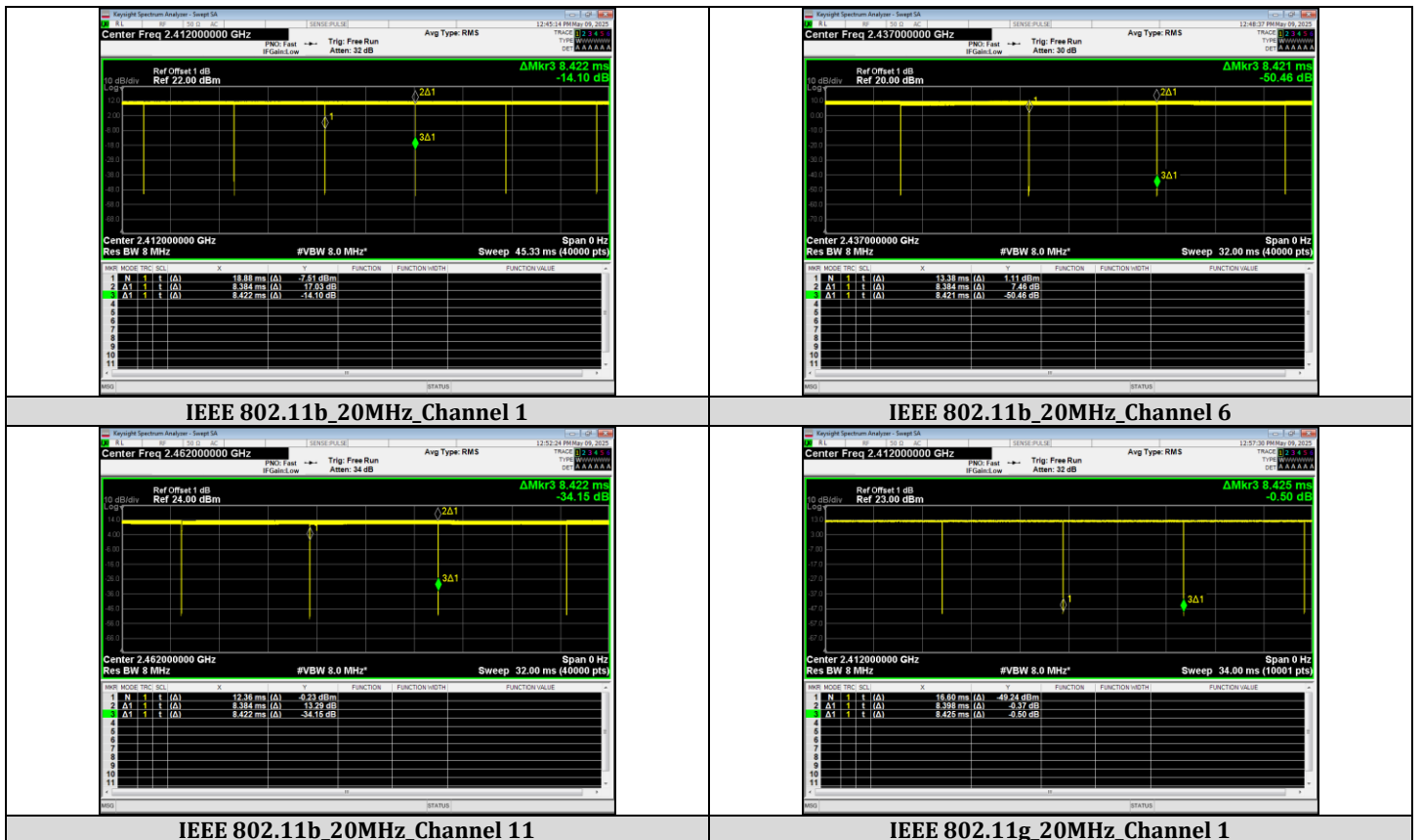
## **Appendix RF test data for WIFI 2.4G**

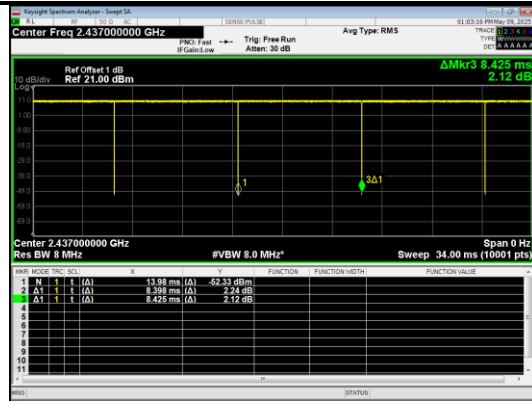
## Duty Cycle

### Test Result

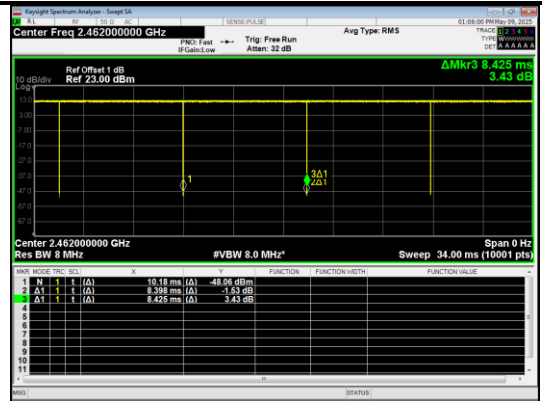
| Mode            | Data rates | Channel | Antenna | On Time (ms) | Period (ms) | Duty Cycle (%) | Duty Cycle (linear) | Duty Cycle Factor (dB) | 1/T    |
|-----------------|------------|---------|---------|--------------|-------------|----------------|---------------------|------------------------|--------|
| IEEE 802.11b    | 1          | 1       | 1       | 8.384        | 8.422       | 99.56          | 0.9956              | 0.0192                 | 0.1193 |
|                 |            | 6       |         | 8.384        | 8.421       | 99.56          | 0.9956              | 0.0192                 | 0.1193 |
|                 |            | 11      |         | 8.384        | 8.422       | 99.55          | 0.9955              | 0.0196                 | 0.1193 |
| IEEE 802.11g    |            | 1       |         | 8.398        | 8.425       | 99.68          | 0.9968              | 0.0139                 | 0.1191 |
|                 |            | 6       |         | 8.398        | 8.425       | 99.68          | 0.9968              | 0.0139                 | 0.1191 |
|                 |            | 11      |         | 8.398        | 8.425       | 99.68          | 0.9968              | 0.0139                 | 0.1191 |
| IEEE 802.11n_20 | MCS 0      | 1       |         | 1.304        | 1.346       | 96.88          | 0.9688              | 0.1377                 | 0.7669 |
|                 |            | 6       |         | 1.303        | 1.346       | 96.86          | 0.9686              | 0.1386                 | 0.7675 |
|                 |            | 11      |         | 1.303        | 1.345       | 96.91          | 0.9691              | 0.1363                 | 0.7675 |
| IEEE 802.11n_40 |            | 3       |         | 0.650        | 0.692       | 93.94          | 0.9394              | 0.2715                 | 1.5385 |
|                 |            | 6       |         | 0.650        | 0.693       | 93.87          | 0.9387              | 0.2747                 | 1.5385 |
|                 |            | 9       |         | 0.651        | 0.693       | 93.92          | 0.9392              | 0.2724                 | 1.5361 |

### Test Graphs

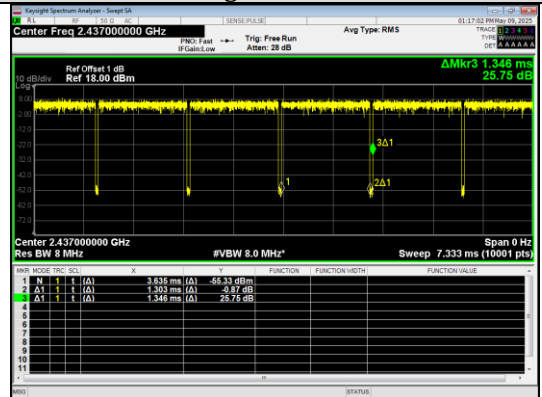
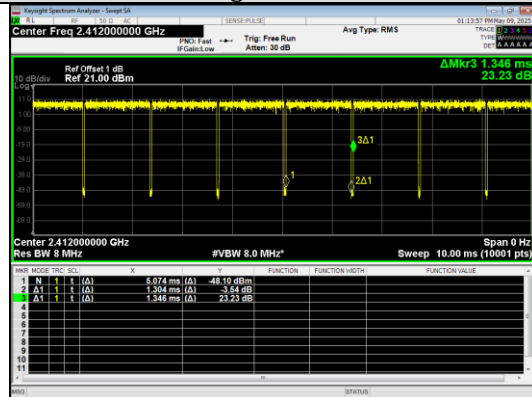




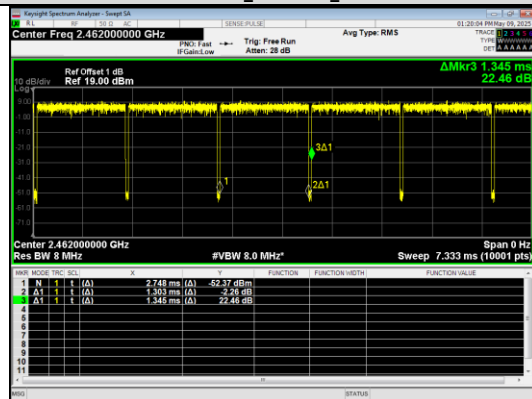
IEEE 802.11g 20MHz\_Channel 6



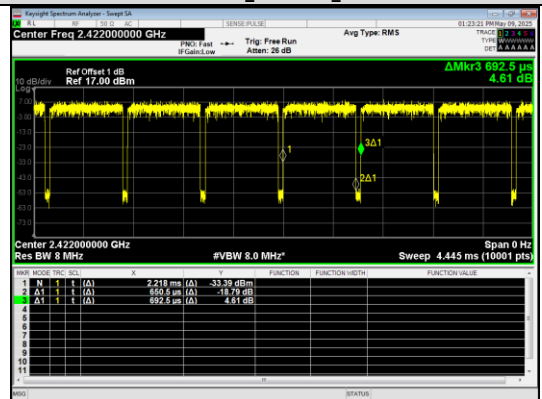
IEEE 802.11g 20MHz\_Channel 11



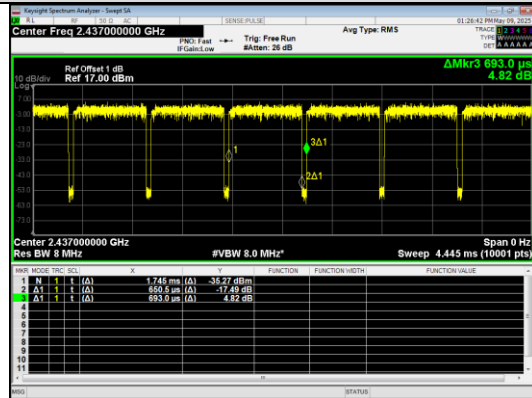
IEEE 802.11g 20MHz\_Channel 11



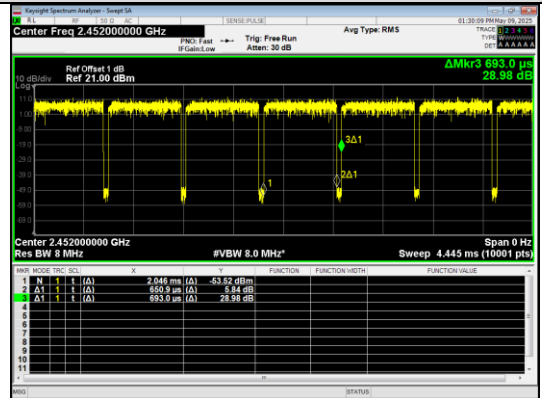
IEEE 802.11n 20MHz\_Channel 1



IEEE 802.11n 20MHz\_Channel 6



IEEE 802.11n 20MHz\_Channel 11



IEEE 802.11n 40MHz\_Channel 3

**Conducted Output Power****Test Result**

## Conducted Output Power

| Mode               | Channel | Ant. 0<br>(dBm) | Ant. 1<br>(dBm) | Ant. 2<br>(dBm) | Ant. 3<br>(dBm) | Total<br>(dBm) | Limit<br>(dBm) | Result |
|--------------------|---------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|--------|
| IEEE<br>802.11b    | 1       | 13.24           |                 |                 |                 | N/A            | ≤30            | PASS   |
|                    | 6       | 11.99           |                 |                 |                 | N/A            | ≤30            | PASS   |
|                    | 11      | 15.76           |                 |                 |                 | N/A            | ≤30            | PASS   |
| IEEE<br>802.11g    | 1       | 15.33           |                 |                 |                 | N/A            | ≤30            | PASS   |
|                    | 6       | 13.55           |                 |                 |                 | N/A            | ≤30            | PASS   |
|                    | 11      | 15.57           |                 |                 |                 | N/A            | ≤30            | PASS   |
| IEEE<br>802.11n_20 | 1       | 16.15           |                 |                 |                 | N/A            | ≤30            | PASS   |
|                    | 6       | 14.66           |                 |                 |                 | N/A            | ≤30            | PASS   |
|                    | 11      | 16.27           |                 |                 |                 | N/A            | ≤30            | PASS   |
| IEEE<br>802.11n_40 | 3       | 15.29           |                 |                 |                 | N/A            | ≤30            | PASS   |
|                    | 6       | 16.08           |                 |                 |                 | N/A            | ≤30            | PASS   |
|                    | 9       | 15.72           |                 |                 |                 | N/A            | ≤30            | PASS   |

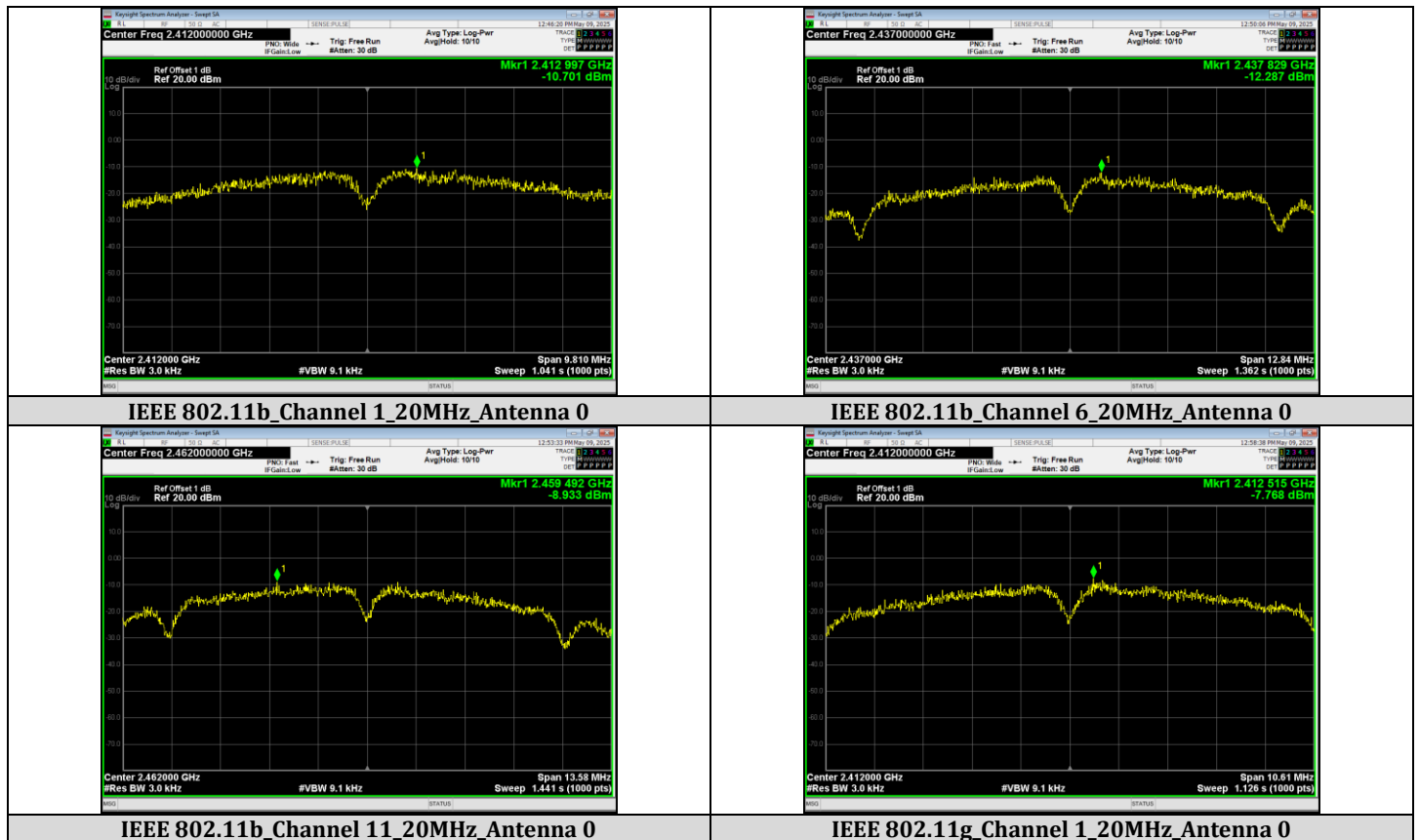


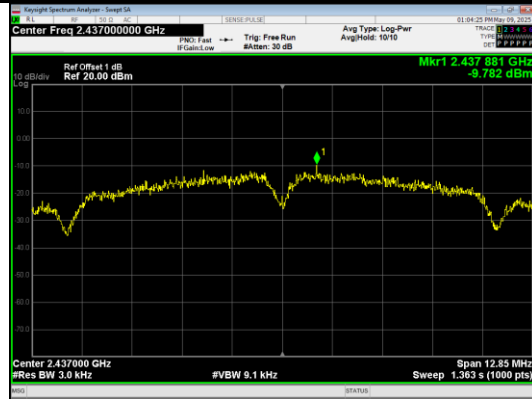
## Power Spectral Density

### Test Result

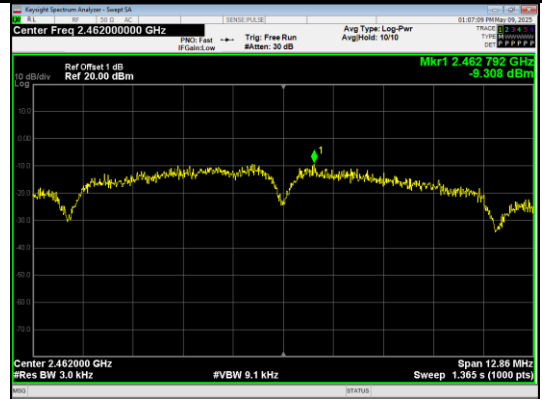
| Mode            | Channel | PSD<br>(dBm/3kHz)<br>Ant. 0 | Limit<br>(dBm/3kHz) | Result |
|-----------------|---------|-----------------------------|---------------------|--------|
| IEEE 802.11b    | 1       | -10.701                     | ≤8                  | PASS   |
|                 | 6       | -12.287                     |                     | PASS   |
|                 | 11      | -8.933                      |                     | PASS   |
| IEEE 802.11g    | 1       | -7.768                      |                     | PASS   |
|                 | 6       | -9.782                      |                     | PASS   |
|                 | 11      | -9.308                      |                     | PASS   |
| IEEE 802.11n_20 | 1       | -14.434                     |                     | PASS   |
|                 | 6       | -17.153                     |                     | PASS   |
|                 | 11      | -14.287                     |                     | PASS   |
| IEEE 802.11n_40 | 3       | -16.270                     |                     | PASS   |
|                 | 6       | -15.848                     |                     | PASS   |
|                 | 9       | -14.992                     |                     | PASS   |

### Test Graphs

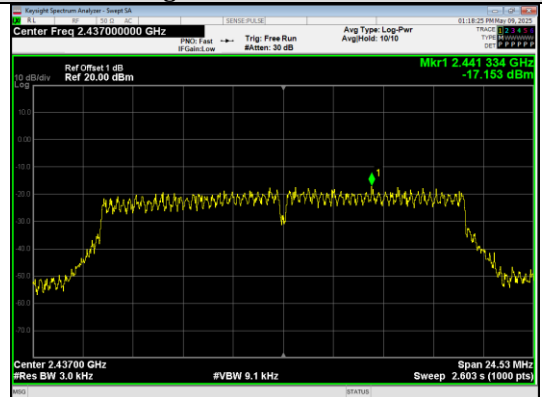
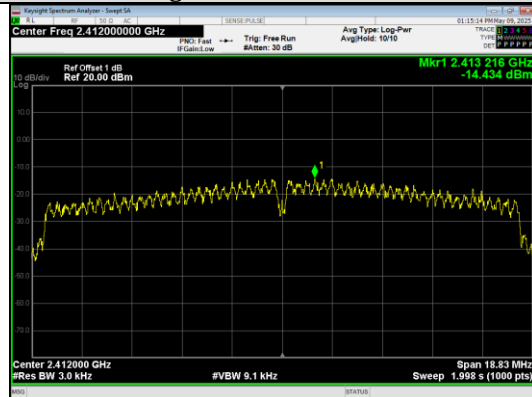




IEEE 802.11g\_Channel 6\_20MHz\_Antenna 0

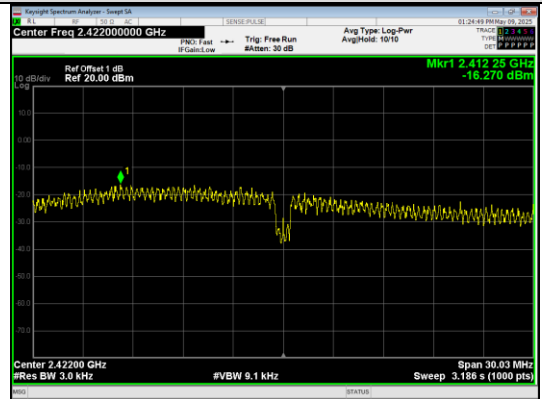
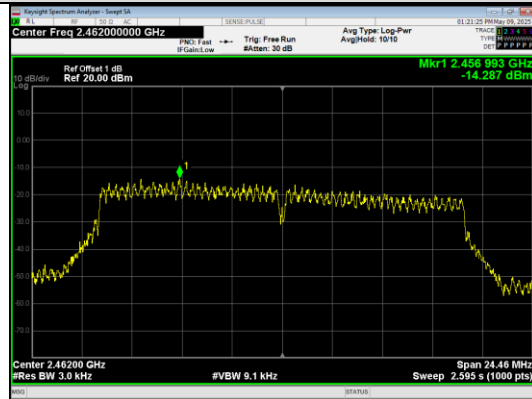


IEEE 802.11g\_Channel 11\_20MHz\_Antenna 0



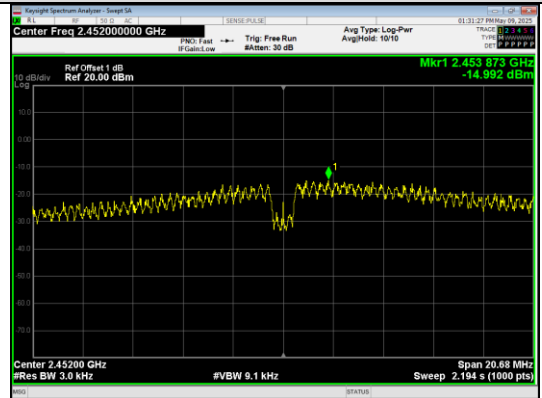
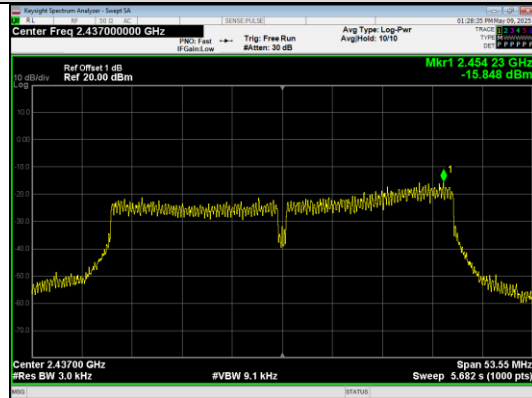
IEEE 802.11n\_Channel 1\_20MHz\_Antenna 0

IEEE 802.11n\_Channel 6\_20MHz\_Antenna 0



IEEE 802.11n\_Channel 11\_20MHz\_Antenna 0

IEEE 802.11n\_Channel 3\_40MHz\_Antenna 0

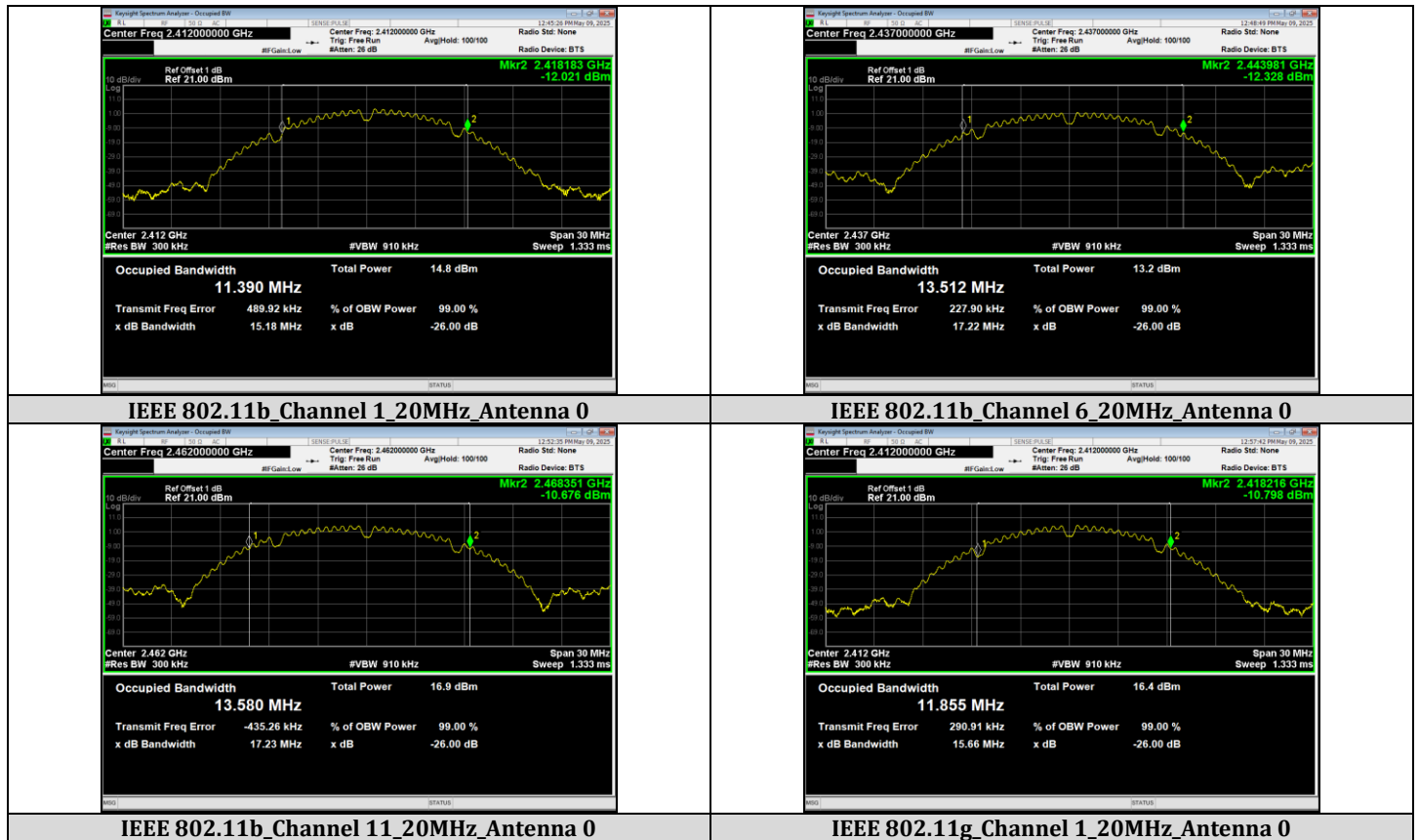


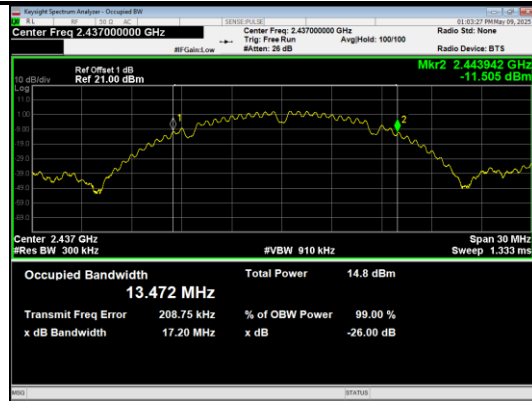
IEEE 802.11n\_Channel 6\_40MHz\_Antenna 0

IEEE 802.11n\_Channel 9\_40MHz\_Antenna 0

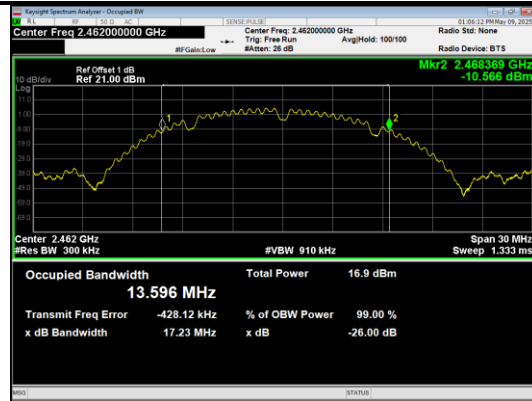
**99% Bandwidth****Test Result**

| Mode            | Channel | Ant. | Center Frequency (MHz) | 99% BW (MHz) |
|-----------------|---------|------|------------------------|--------------|
| IEEE 802.11b    | 1       | 0    | 2412                   | 11.390       |
|                 | 6       |      | 2437                   | 13.512       |
|                 | 11      |      | 2462                   | 13.580       |
| IEEE 802.11g    | 1       |      | 2412                   | 11.855       |
|                 | 6       |      | 2437                   | 13.472       |
|                 | 11      |      | 2462                   | 13.596       |
| IEEE 802.11n_20 | 1       |      | 2412                   | 17.265       |
|                 | 6       |      | 2437                   | 17.905       |
|                 | 11      |      | 2462                   | 17.796       |
| IEEE 802.11n_40 | 3       |      | 2422                   | 35.561       |
|                 | 6       |      | 2437                   | 36.803       |
|                 | 9       |      | 2452                   | 35.133       |

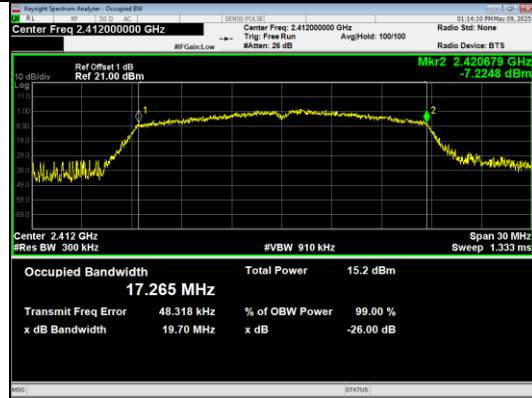
**Test Graphs**



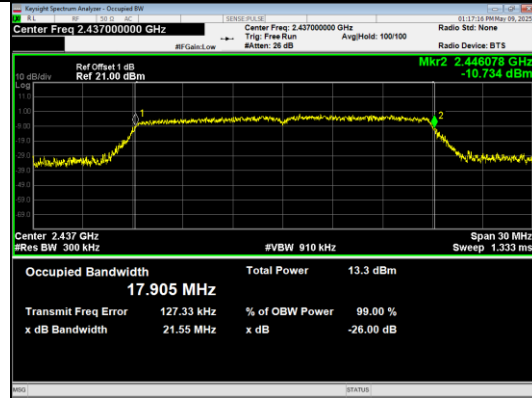
IEEE 802.11g\_Channel 6\_20MHz\_Antenna 0



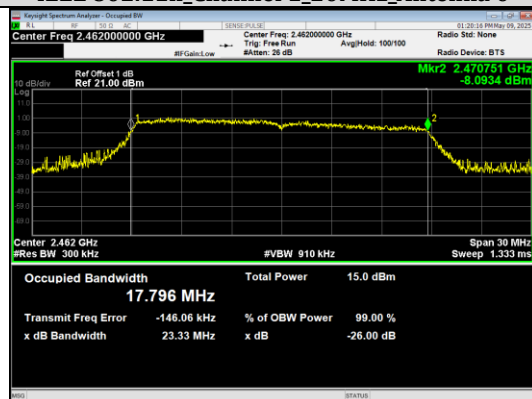
IEEE 802.11g\_Channel 11\_20MHz\_Antenna 0



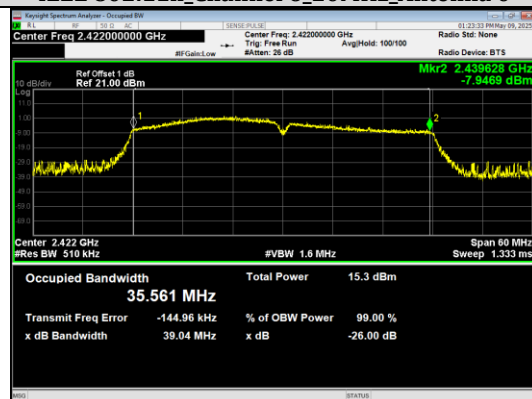
IEEE 802.11g\_Channel 6\_20MHz\_Antenna 0



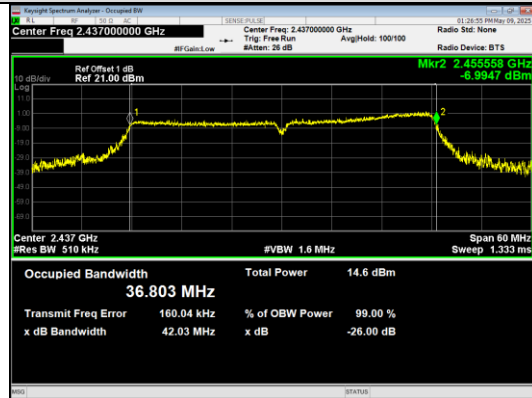
IEEE 802.11g\_Channel 11\_20MHz\_Antenna 0



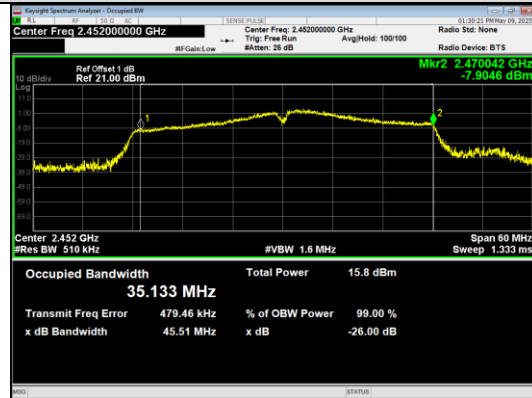
IEEE 802.11n\_Channel 1\_20MHz\_Antenna 0



IEEE 802.11n\_Channel 6\_20MHz\_Antenna 0



IEEE 802.11n\_Channel 11\_20MHz\_Antenna 0



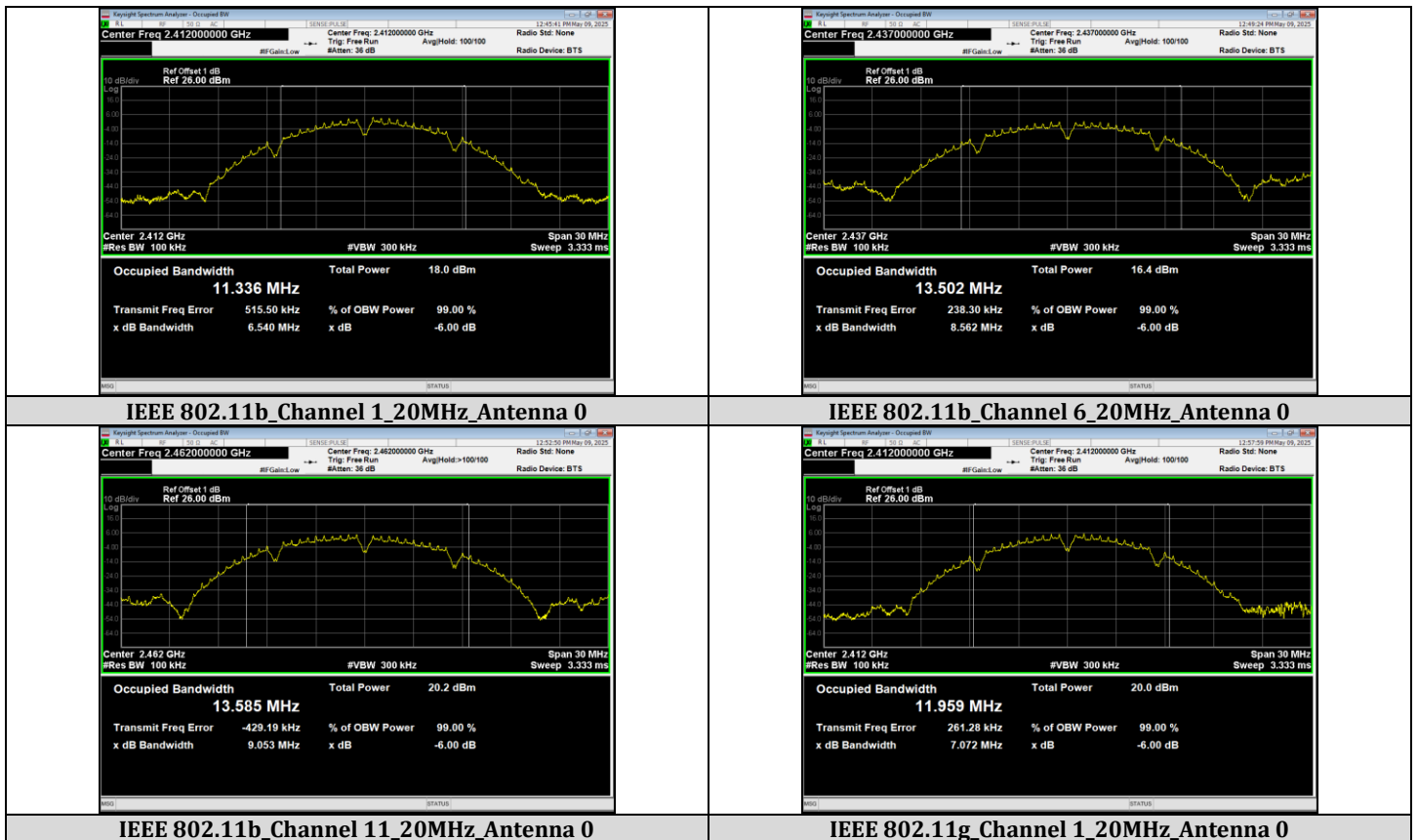
IEEE 802.11n\_Channel 3\_40MHz\_Antenna 0

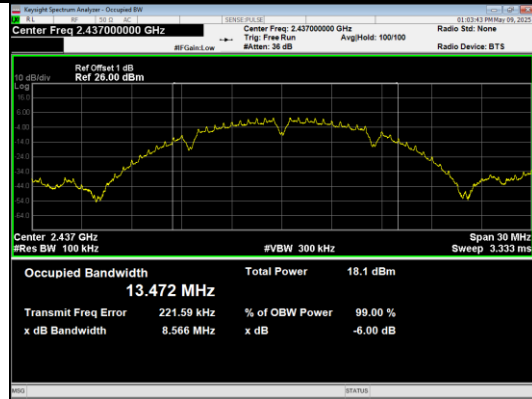
## 6dB Bandwidth

### Test Result

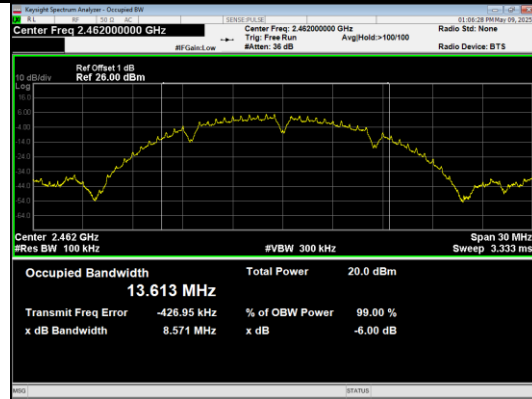
| Mode            | Channel | Ant. | Center Frequency (MHz) | 6 dB Bandwidth (MHz) | Limit (MHz) | Result |
|-----------------|---------|------|------------------------|----------------------|-------------|--------|
| IEEE 802.11b    | 1       | 0    | 2412                   | 6.540                | ≥0.5        | PASS   |
|                 | 6       |      | 2437                   | 8.562                |             | PASS   |
|                 | 11      |      | 2462                   | 9.053                |             | PASS   |
| IEEE 802.11g    | 1       |      | 2412                   | 7.072                |             | PASS   |
|                 | 6       |      | 2437                   | 8.566                |             | PASS   |
|                 | 11      |      | 2462                   | 8.571                |             | PASS   |
| IEEE 802.11n_20 | 1       |      | 2412                   | 12.55                |             | PASS   |
|                 | 6       |      | 2437                   | 16.35                |             | PASS   |
|                 | 11      |      | 2462                   | 16.31                |             | PASS   |
| IEEE 802.11n_40 | 3       |      | 2422                   | 20.02                |             | PASS   |
|                 | 6       |      | 2437                   | 35.70                |             | PASS   |
|                 | 9       |      | 2452                   | 13.79                |             | PASS   |

### Test Graphs

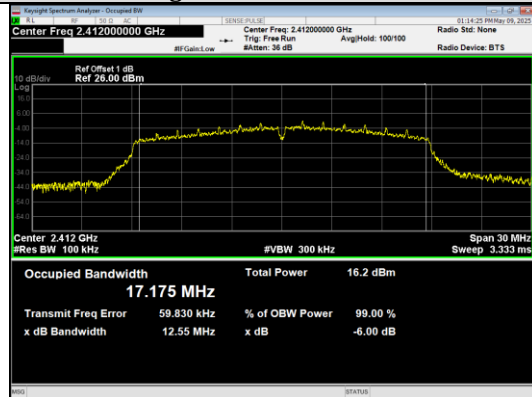




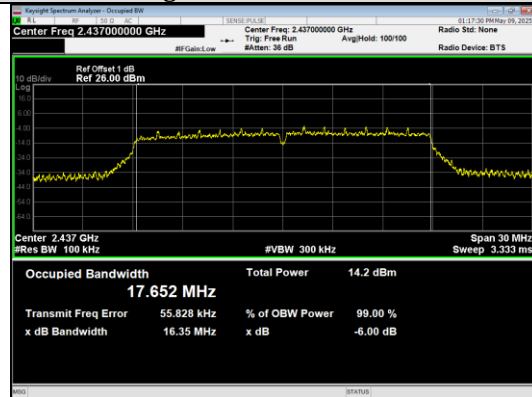
IEEE 802.11g\_Channel 6\_20MHz\_Antenna 0



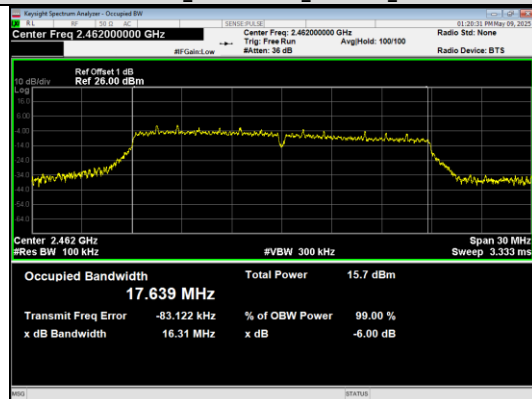
IEEE 802.11g\_Channel 11\_20MHz\_Antenna 0



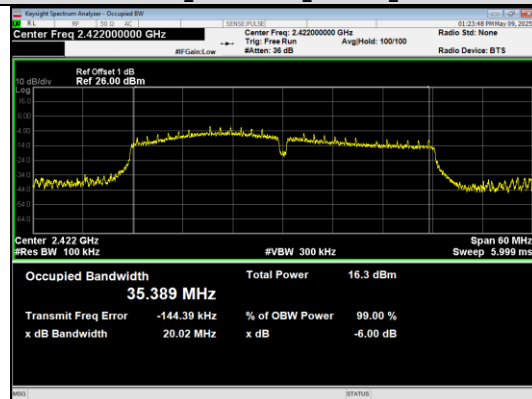
IEEE 802.11n\_Channel 1\_20MHz\_Antenna 0



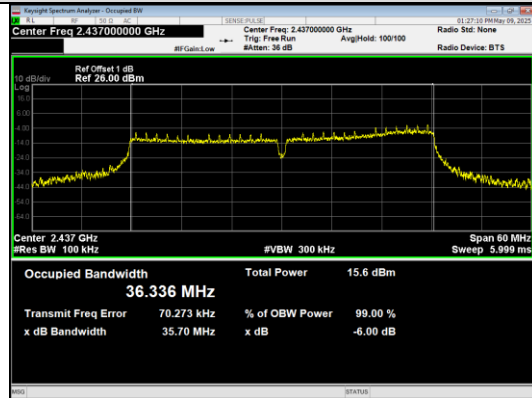
IEEE 802.11n\_Channel 6\_20MHz\_Antenna 0



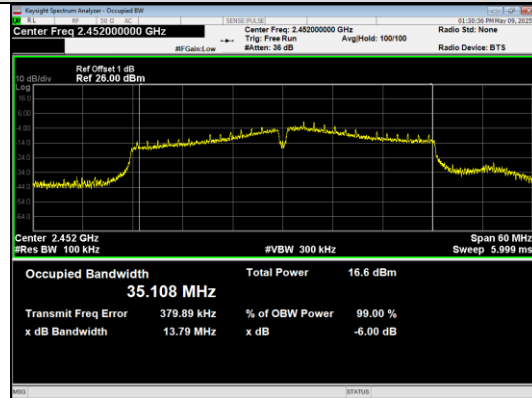
IEEE 802.11n\_Channel 11\_20MHz\_Antenna 0



IEEE 802.11n\_Channel 3\_40MHz\_Antenna 0



IEEE 802.11n\_Channel 6\_40MHz\_Antenna 0



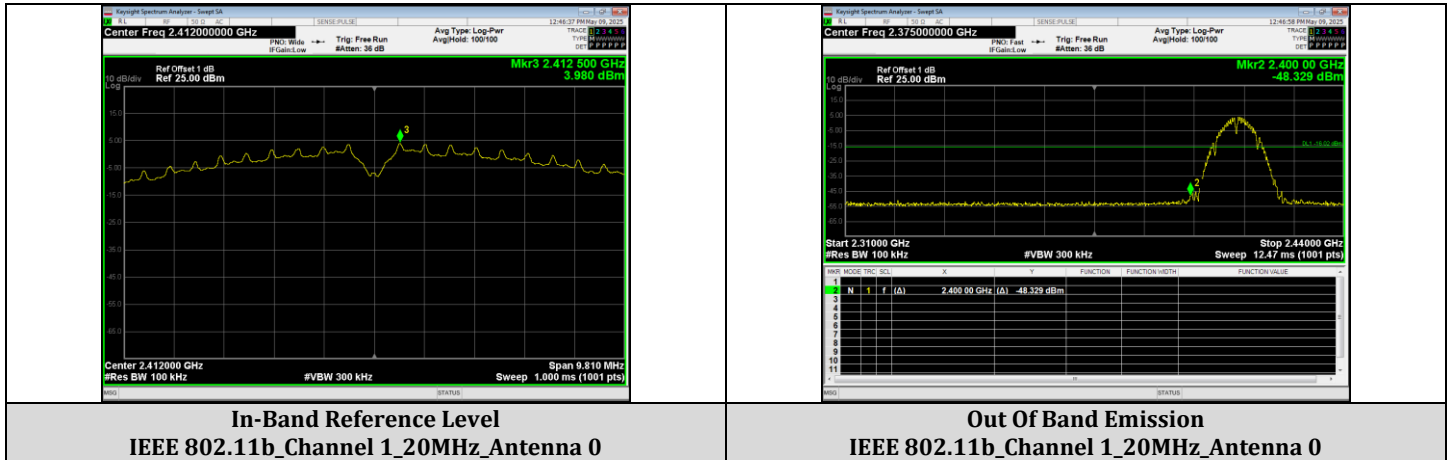
IEEE 802.11n\_Channel 9\_40MHz\_Antenna 0

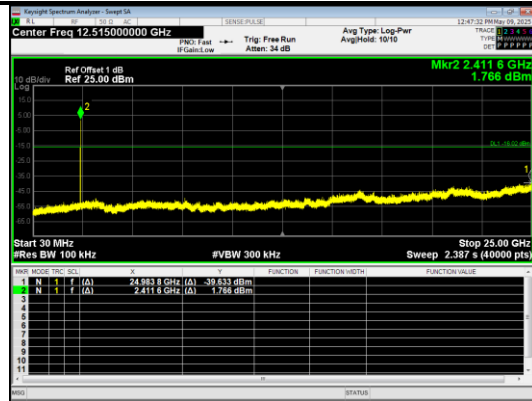
## Conducted Out Of Band Emission

### Test Result

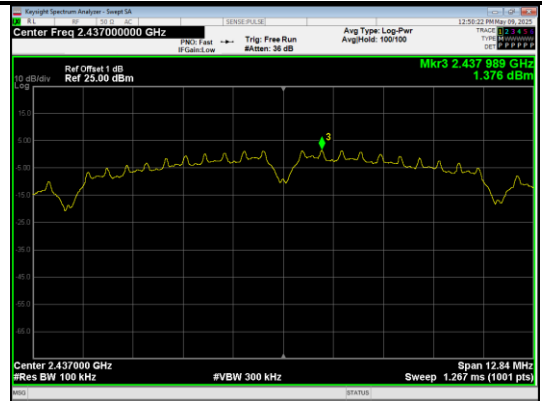
| Mode               | Channel | Ant.    | OOB<br>Emission<br>Frequency<br>(MHz) | OOB<br>Emission<br>Level<br>(dBm) | Limit<br>(dBm) | Over Limit<br>(dB) | Result |
|--------------------|---------|---------|---------------------------------------|-----------------------------------|----------------|--------------------|--------|
| IEEE 802.11b       | 1       | 0       | 2400.00                               | -48.329                           | -16.02         | -32.309            | PASS   |
|                    | 6       |         | 24983.8                               | -39.633                           | -16.02         | -23.613            | PASS   |
|                    |         |         | 24982.5                               | -38.084                           | -18.62         | -19.464            | PASS   |
|                    |         |         | 2483.50                               | -52.595                           | -14.77         | -37.825            | PASS   |
|                    |         |         | 24975.0                               | -40.510                           | -14.77         | -25.740            | PASS   |
| IEEE 802.11g       | 1       |         | 2400.00                               | -46.017                           | -14.51         | -31.507            | PASS   |
|                    | 6       |         | 24981.9                               | -38.254                           | -14.51         | -23.744            | PASS   |
|                    |         |         | 24992.5                               | -39.784                           | -16.87         | -22.914            | PASS   |
|                    |         |         | 2483.50                               | -51.388                           | -15.06         | -36.328            | PASS   |
|                    |         |         | 24993.8                               | -39.020                           | -15.06         | -23.960            | PASS   |
| IEEE<br>802.11n_20 | 1       |         | 2398.27                               | -39.853                           | -18.74         | -21.113            | PASS   |
|                    | 6       |         | 2400.00                               | -41.655                           | -18.74         | -22.915            | PASS   |
|                    |         |         | 2672.50                               | -27.930                           | -18.74         | -9.190             | PASS   |
|                    |         |         | 24964.4                               | -39.674                           | -22.51         | -17.164            | PASS   |
|                    |         |         | 2483.50                               | -45.582                           | -19.92         | -25.662            | PASS   |
| IEEE<br>802.11n_40 | 3       |         | 3536.50                               | -26.944                           | -19.92         | -7.024             | PASS   |
|                    |         |         | 2398.40                               | -35.461                           | -21.08         | -14.381            | PASS   |
|                    |         |         | 2400.00                               | -36.051                           | -21.08         | -14.971            | PASS   |
|                    | 6       | 24400.7 | -39.659                               | -21.08                            | -18.579        | PASS               |        |
|                    |         | 24905.7 | -40.088                               | -21.54                            | -18.548        | PASS               |        |
|                    |         | 2483.50 | -39.559                               | -19.45                            | -20.109        | PASS               |        |
|                    |         | 9       | 24940.1                               | -38.946                           | -19.45         | -19.496            | PASS   |

### Test Graphs

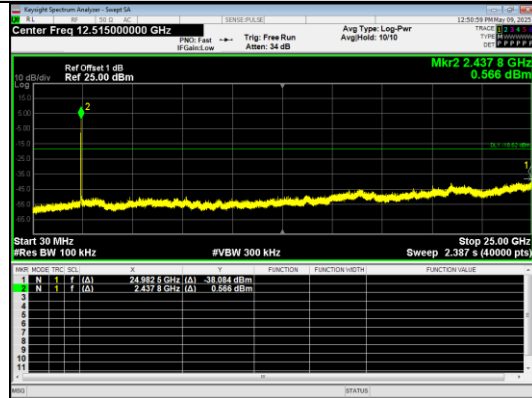




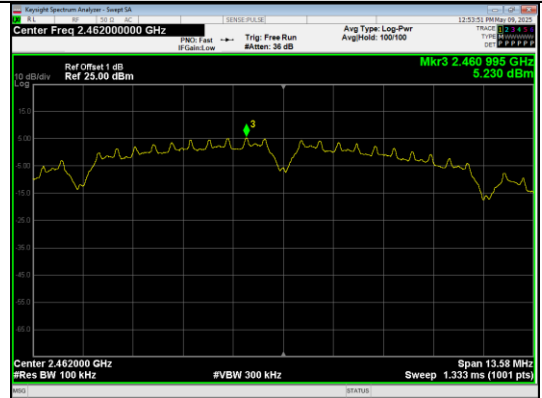
30.0 MHz - 25000.0 MHz  
IEEE 802.11b\_Channel 1\_20MHz\_Antenna 0



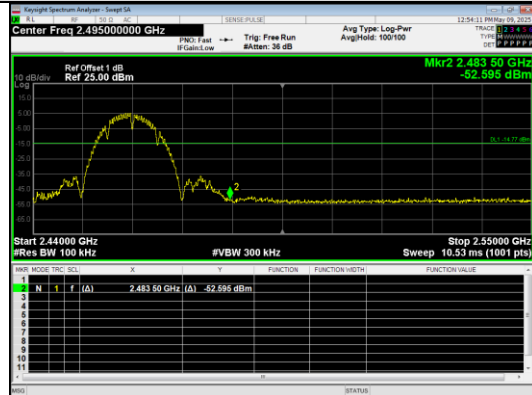
In-Band Reference Level  
IEEE 802.11b\_Channel 6\_20MHz\_Antenna 0



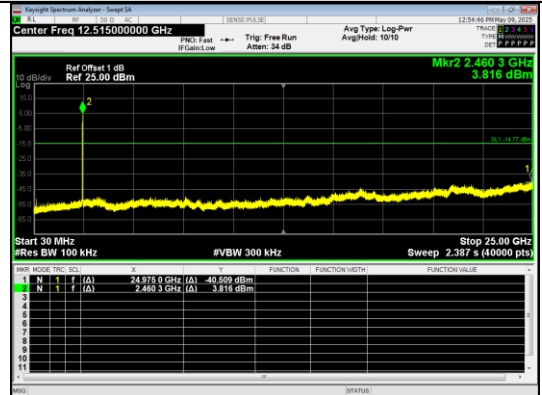
30.0 MHz - 25000.0 MHz  
IEEE 802.11b\_Channel 6\_20MHz\_Antenna 0



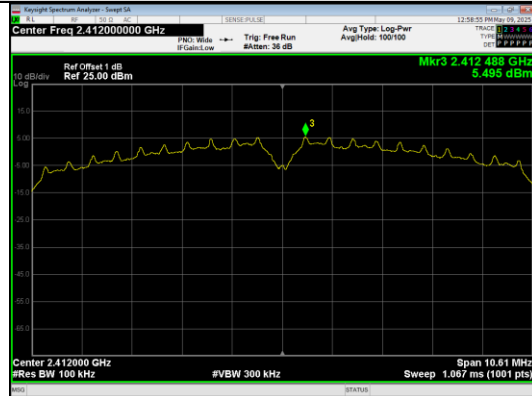
In-Band Reference Level  
IEEE 802.11b\_Channel 11\_20MHz\_Antenna 0



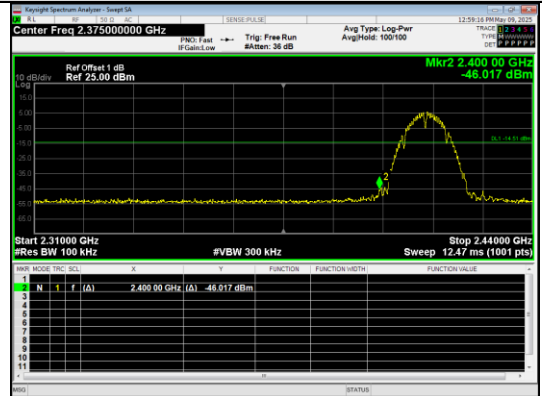
Out Of Band Emission  
IEEE 802.11b\_Channel 11\_20MHz\_Antenna 0



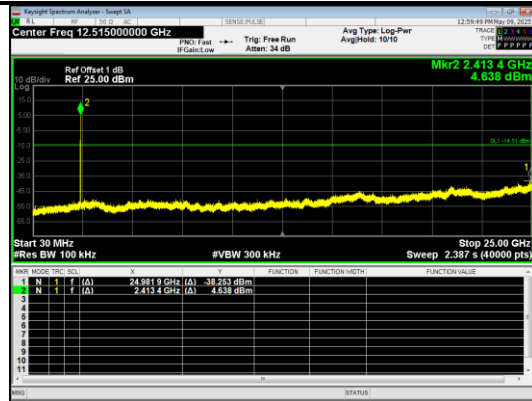
30.0 MHz - 25000.0 MHz  
IEEE 802.11b\_Channel 11\_20MHz\_Antenna 0



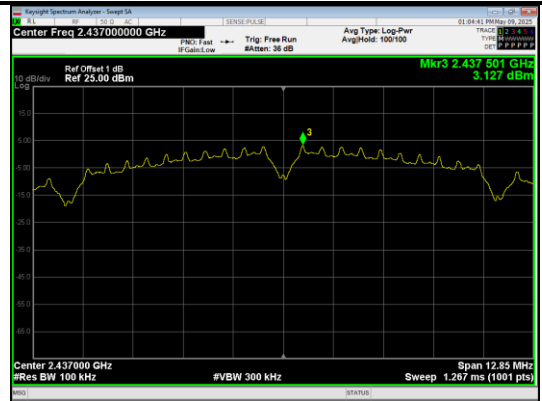
In-Band Reference Level  
IEEE 802.11g\_Channel 1\_20MHz\_Antenna 0



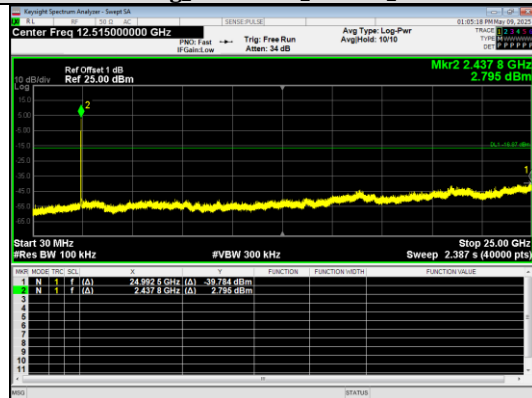
Out Of Band Emission  
IEEE 802.11g\_Channel 1\_20MHz\_Antenna 0



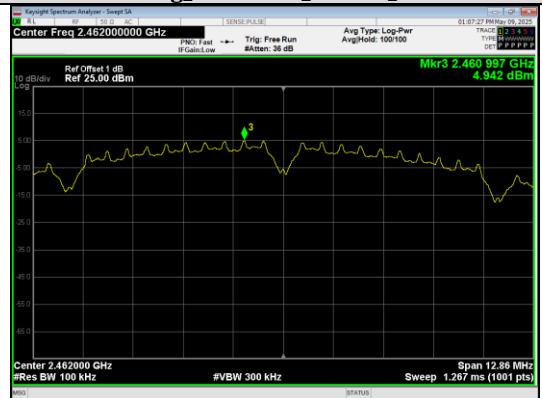
30.0 MHz - 25000.0 MHz  
IEEE 802.11g\_Channel 1\_20MHz\_Antenna 0



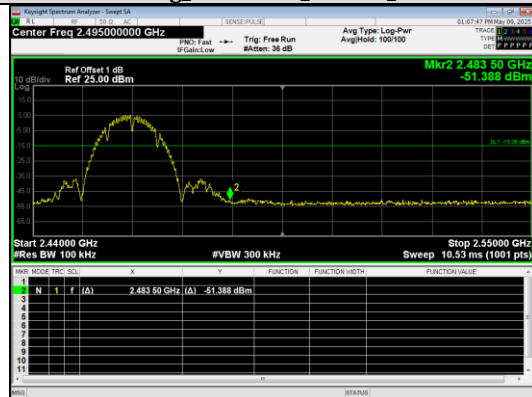
In-Band Reference Level  
IEEE 802.11g\_Channel 6\_20MHz\_Antenna 0



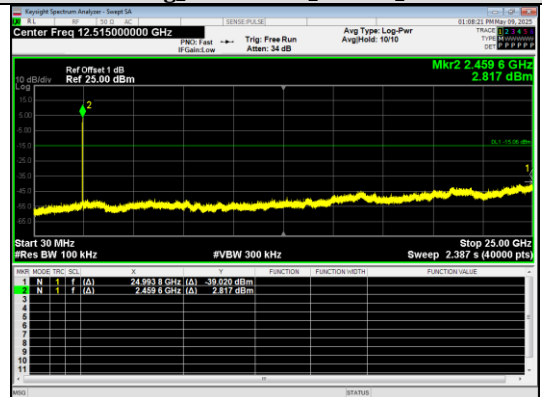
30.0 MHz - 25000.0 MHz  
IEEE 802.11g\_Channel 6\_20MHz\_Antenna 0



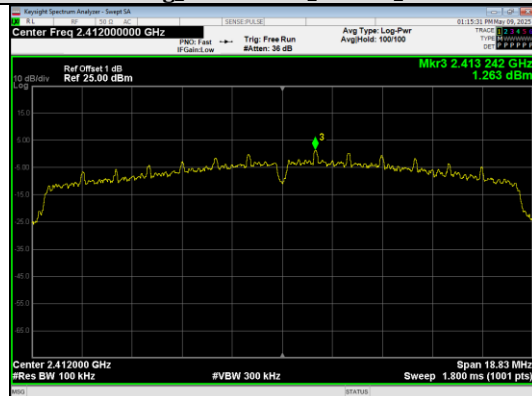
In-Band Reference Level  
IEEE 802.11g\_Channel 11\_20MHz\_Antenna 0



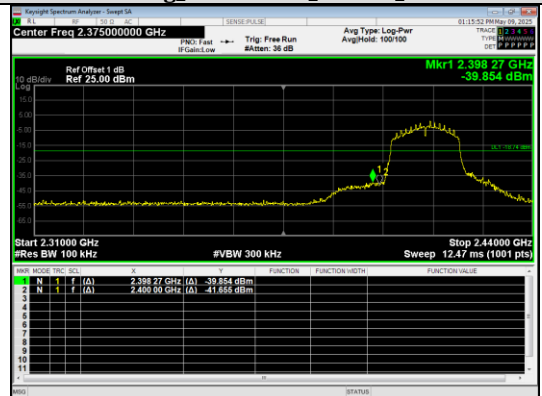
Out Of Band Emission  
IEEE 802.11g\_Channel 11\_20MHz\_Antenna 0



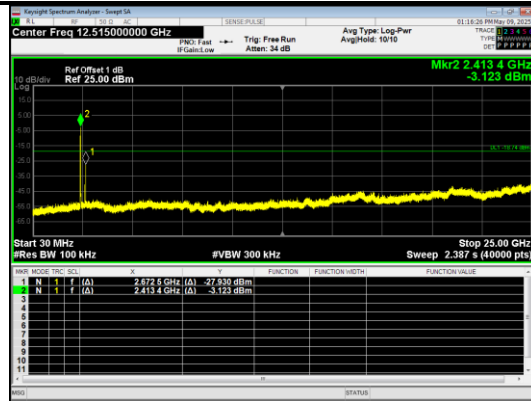
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IEEE 802.11g\_Channel 11\_20MHz\_Antenna 0



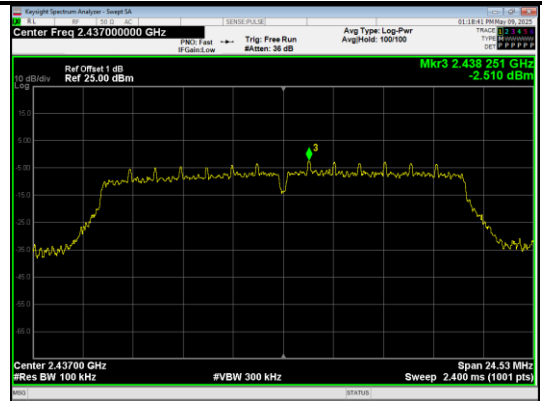
In-Band Reference Level  
IEEE 802.11n\_Channel 1\_20MHz\_Antenna 0



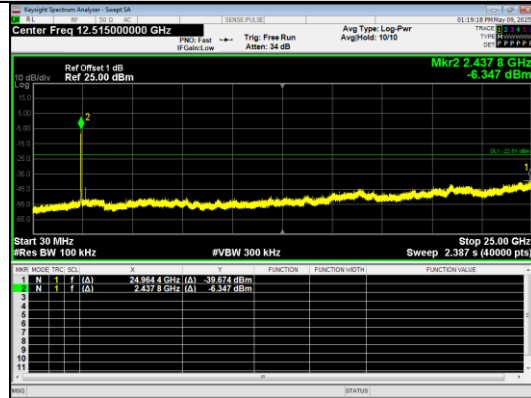
Out Of Band Emission  
IEEE 802.11n\_Channel 1\_20MHz\_Antenna 0



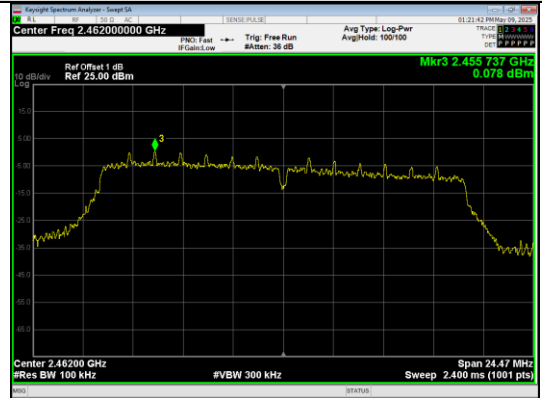
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IEEE 802.11n\_Channel 1\_20MHz\_Antenna 0



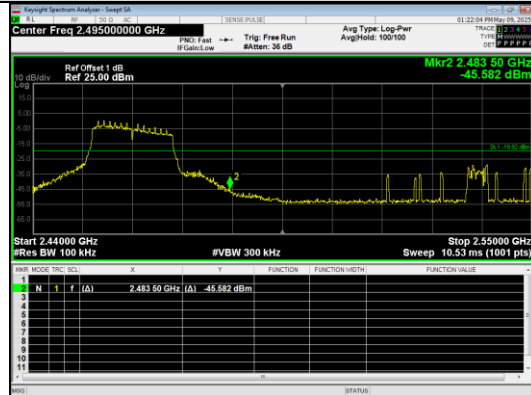
In-Band Reference Level  
IEEE 802.11n\_Channel 6\_20MHz\_Antenna 0



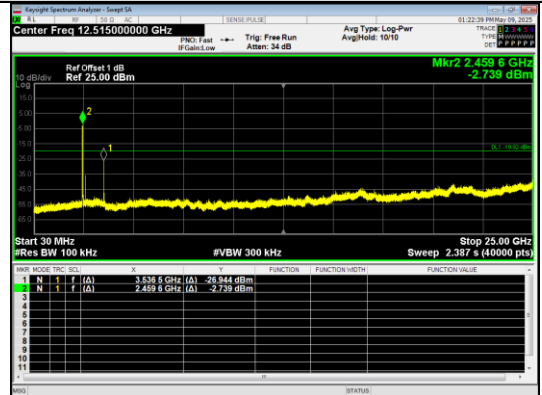
30.0 MHz - 25000.0 MHz  
IEEE 802.11n\_Channel 6\_20MHz\_Antenna 0



In-Band Reference Level  
IEEE 802.11n\_Channel 11\_20MHz\_Antenna 0



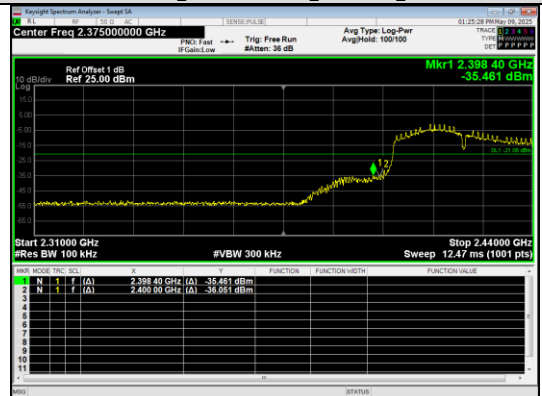
Out Of Band Emission  
IEEE 802.11n\_Channel 11\_20MHz\_Antenna 0



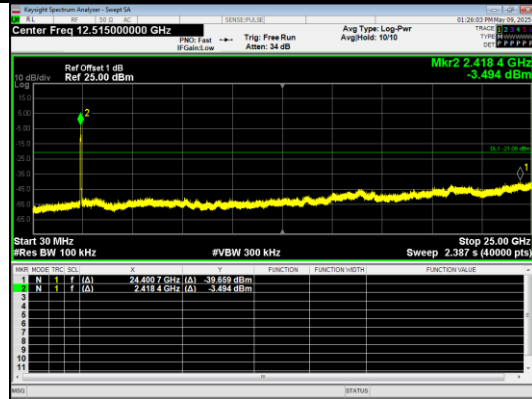
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IEEE 802.11n\_Channel 11\_20MHz\_Antenna 0



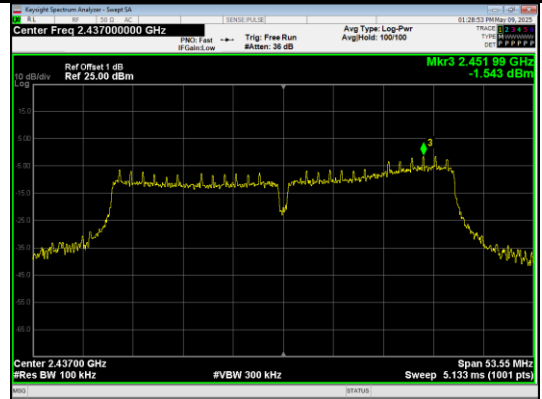
In-Band Reference Level  
IEEE 802.11n\_Channel 3\_40MHz\_Antenna 0



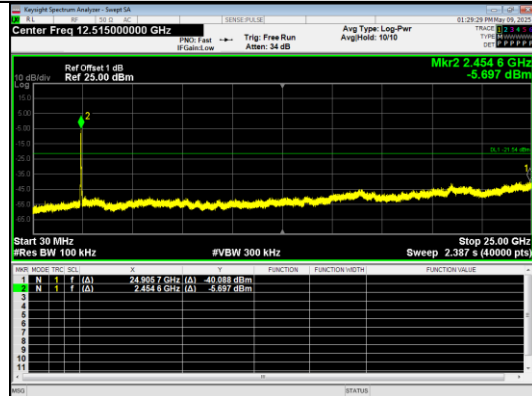
Out Of Band Emission  
IEEE 802.11n\_Channel 3\_40MHz\_Antenna 0



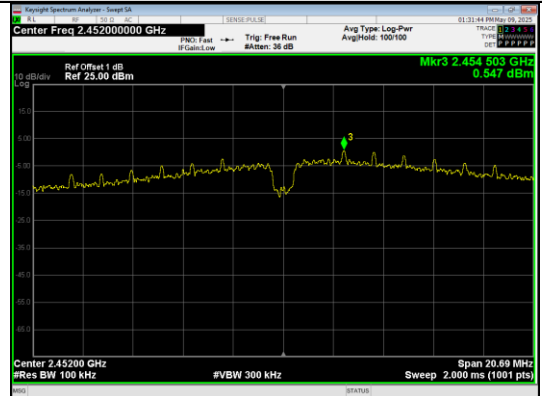
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IEEE 802.11n\_Channel 3\_40MHz\_Antenna 0



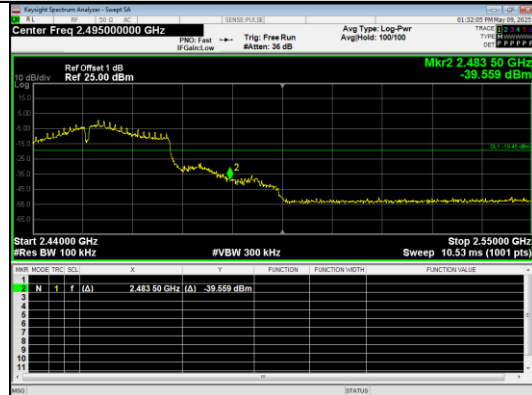
In-Band Reference Level  
IEEE 802.11n\_Channel 6\_40MHz\_Antenna 0



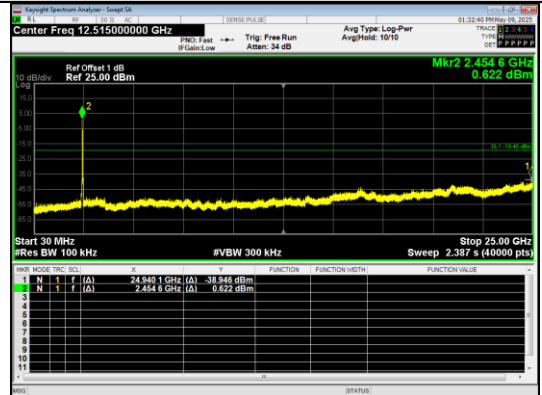
30.0 MHz - 25000.0 MHz  
IEEE 802.11n\_Channel 3\_40MHz\_Antenna 0



In-Band Reference Level  
IEEE 802.11n\_Channel 6\_40MHz\_Antenna 0



Out Of Band Emission  
IEEE 802.11n\_Channel 9\_40MHz\_Antenna 0



30.0 MHz - 25000.0 MHz  
IEEE 802.11n\_Channel 9\_40MHz\_Antenna 0

\*\*\*\*\* End of Report \*\*\*\*\*