

Appendix C

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Smart Garage Door Opener

Trade Mark: atomi

Test Model: AT1348

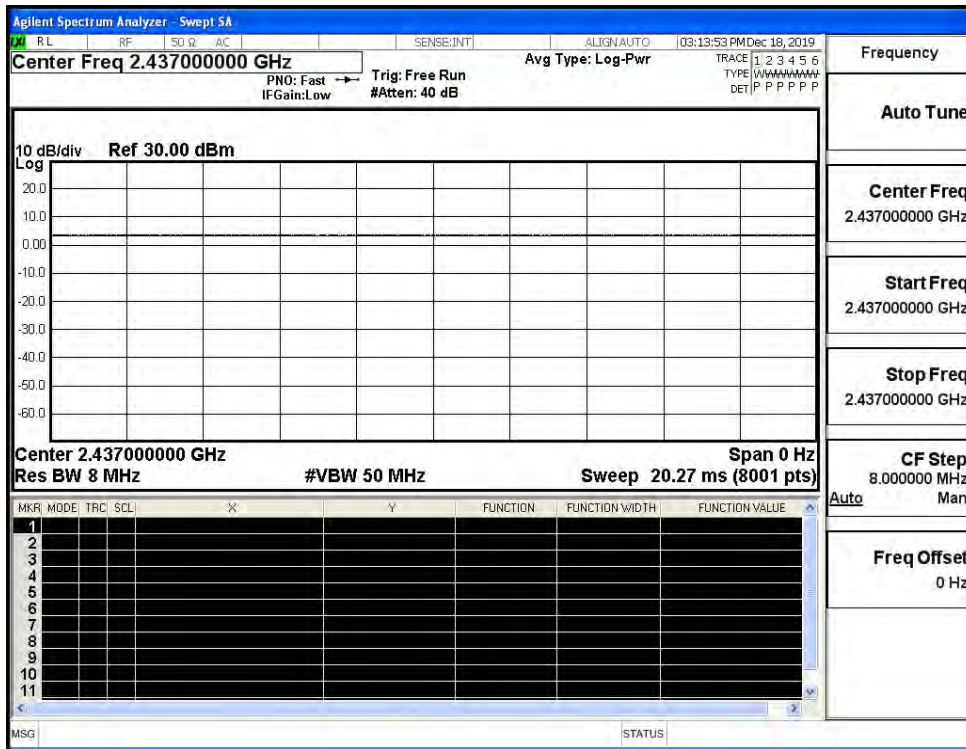
Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 22.6 ° C |
| Relative Humidity: | 52.8% |
| ATM Pressure: | 100.0 kPa |
| Test Engineer: | Zhuo Zhuo |
| Supervised by: | Li Huan |

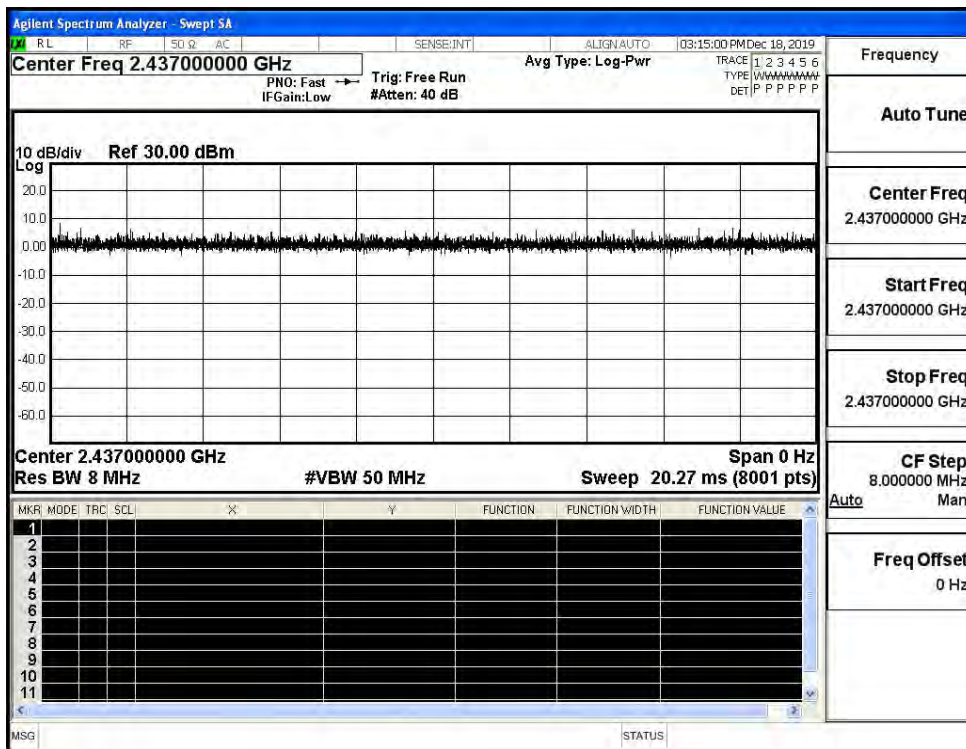
C.1 Duty Cycle

| Test Mode | Test Channel | Ant | Duty Cycle[%] | Verdict |
|-----------|--------------|------|---------------|---------|
| 11B | 2437 | Ant1 | 100 | PASS |
| 11G | 2437 | Ant1 | 100 | PASS |
| 11N20SISO | 2437 | Ant1 | 100 | PASS |

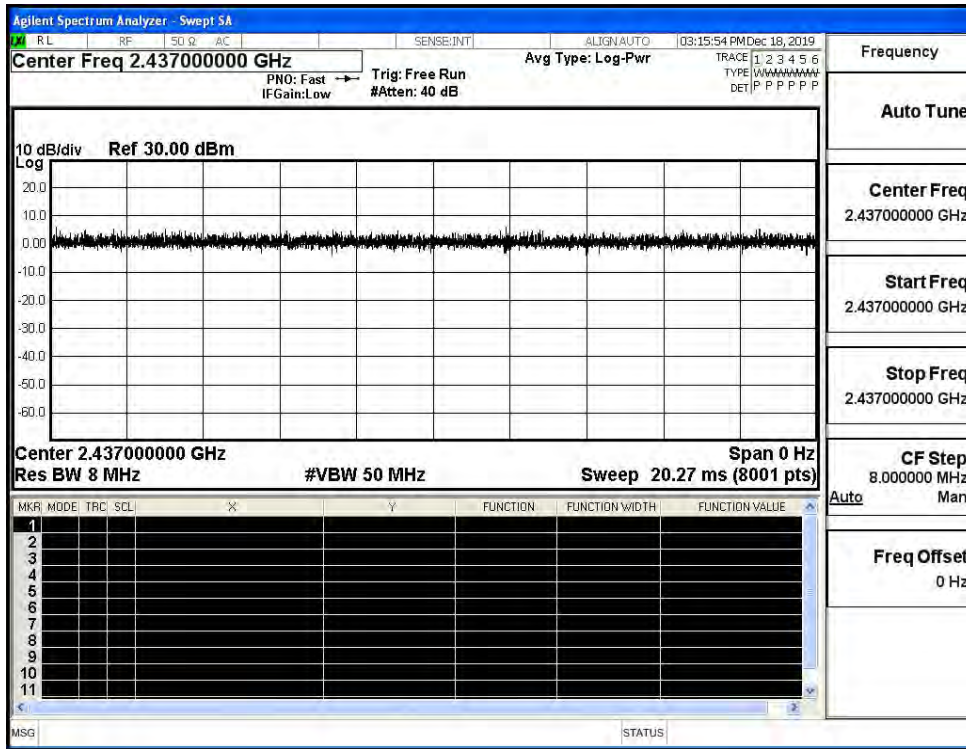
Duty Cycle_11B_2437_Ant1



Duty Cycle_11G_2437_Ant1



Duty Cycle_11N20SISO_2437_Ant1

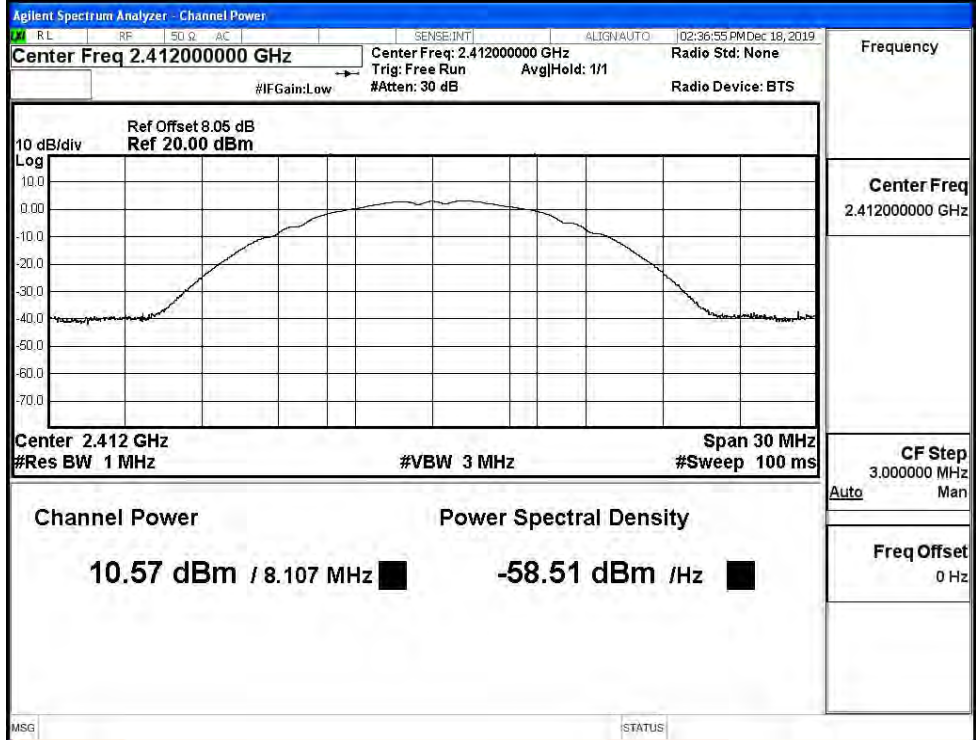


C.2 Maximum Conducted Output Power

| Mode | Channel | Meas.Level [dBm] | Limit [dBm] | Verdict |
|-----------|---------|------------------|-------------|---------|
| 11B | LCH | 10.57 | 30 | PASS |
| | MCH | 10.73 | 30 | PASS |
| | HCH | 11.71 | 30 | PASS |
| 11G | LCH | 13.31 | 30 | PASS |
| | MCH | 13.66 | 30 | PASS |
| | HCH | 14.17 | 30 | PASS |
| 11N20SISO | LCH | 12.22 | 30 | PASS |
| | MCH | 12.48 | 30 | PASS |
| | HCH | 12.97 | 30 | PASS |

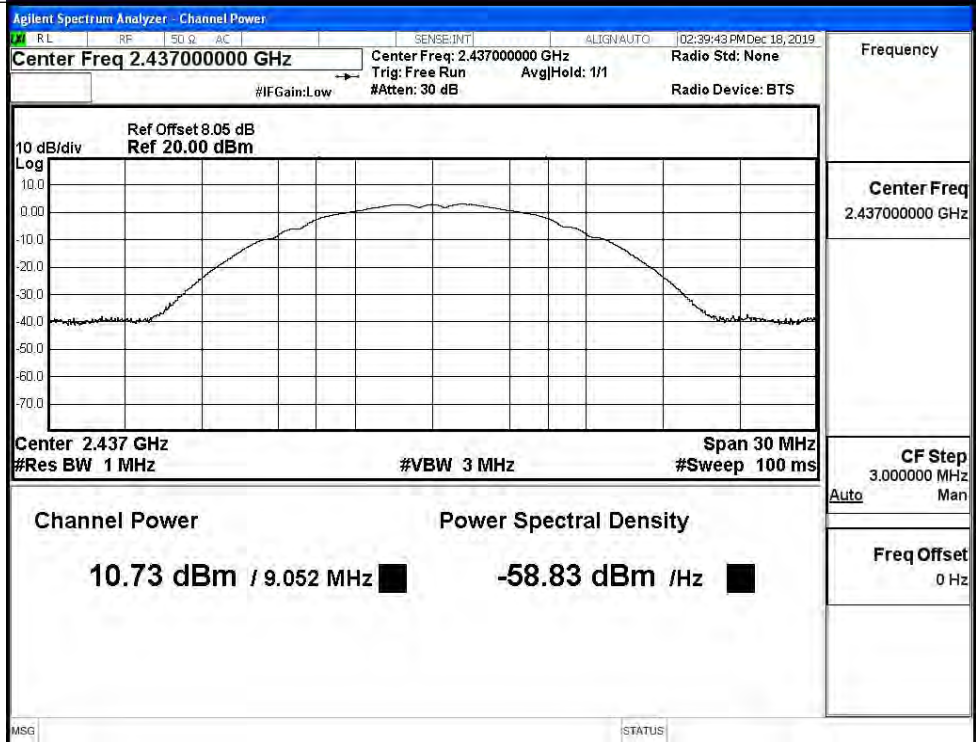
Test Graphs

11B/LCH



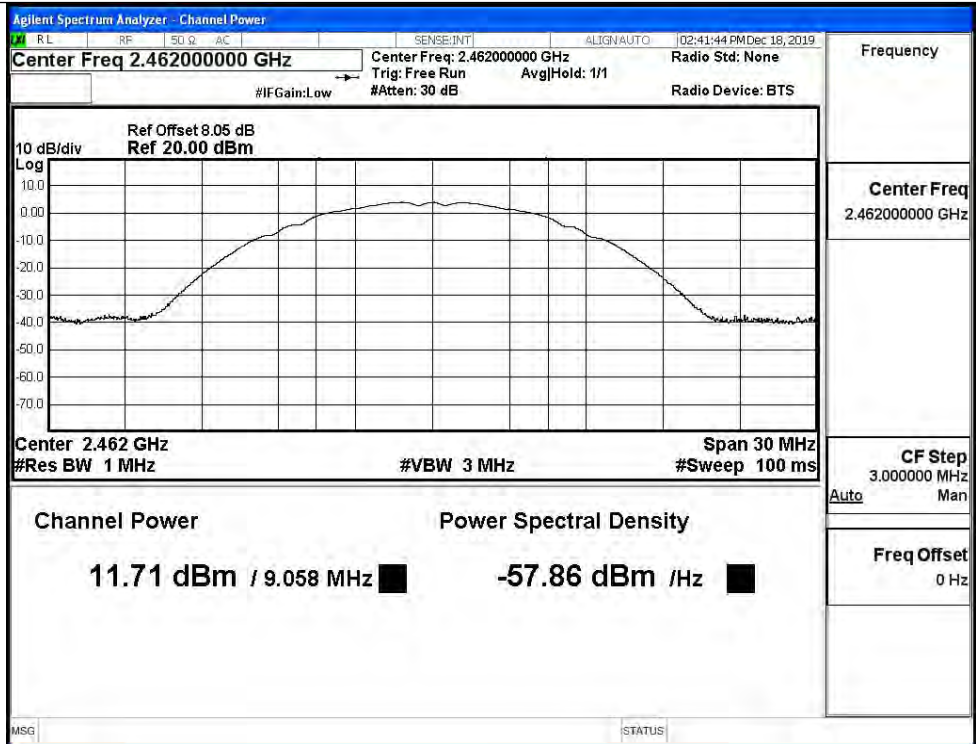
| | |
|-------------|----------------|
| Frequency | 2.41200000 GHz |
| Center Freq | 2.41200000 GHz |
| CF Step | 3.000000 MHz |
| Auto | Man |
| Freq Offset | 0 Hz |

11B/MCH



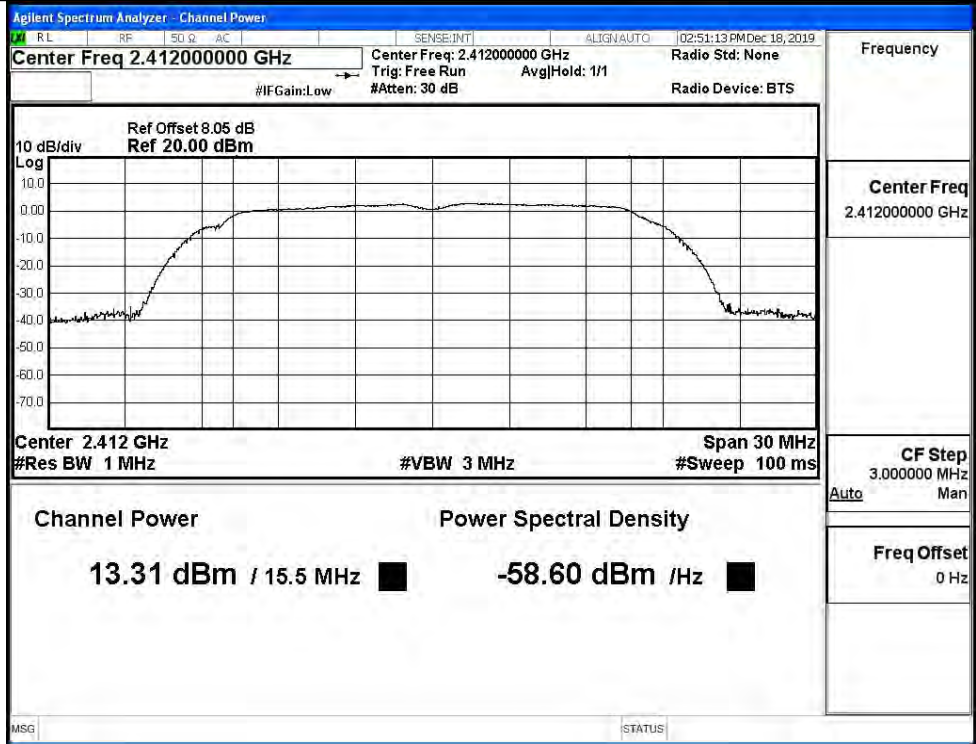
| | |
|-------------|----------------|
| Frequency | 2.43700000 GHz |
| Center Freq | 2.43700000 GHz |
| CF Step | 3.000000 MHz |
| Auto | Man |
| Freq Offset | 0 Hz |

11B/HCH



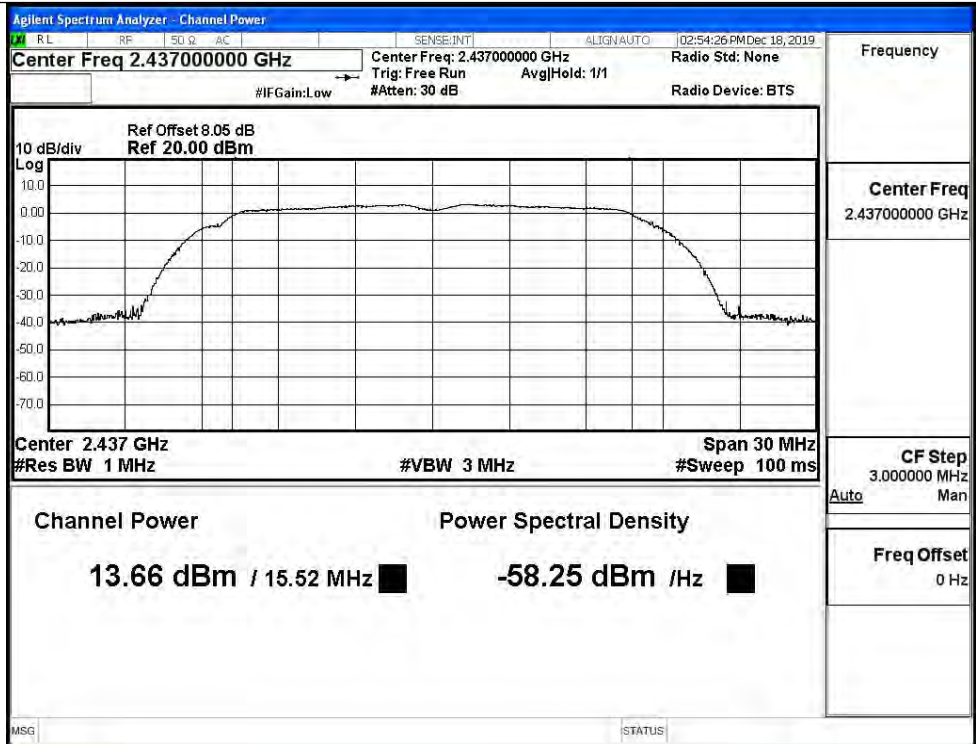
| | |
|-------------|----------------|
| Frequency | 2.46200000 GHz |
| Center Freq | 2.46200000 GHz |
| CF Step | 3.000000 MHz |
| Auto | Man |
| Freq Offset | 0 Hz |

11G/LCH

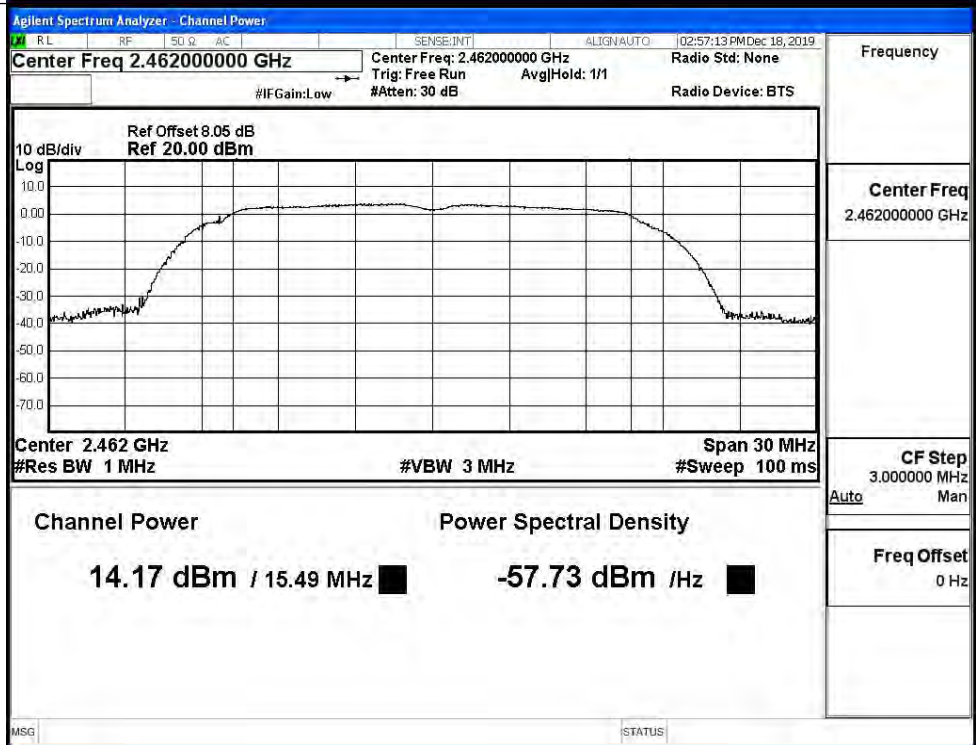


| | |
|-------------|----------------|
| Frequency | 2.41200000 GHz |
| Center Freq | 2.41200000 GHz |
| CF Step | 3.000000 MHz |
| Auto | Man |
| Freq Offset | 0 Hz |

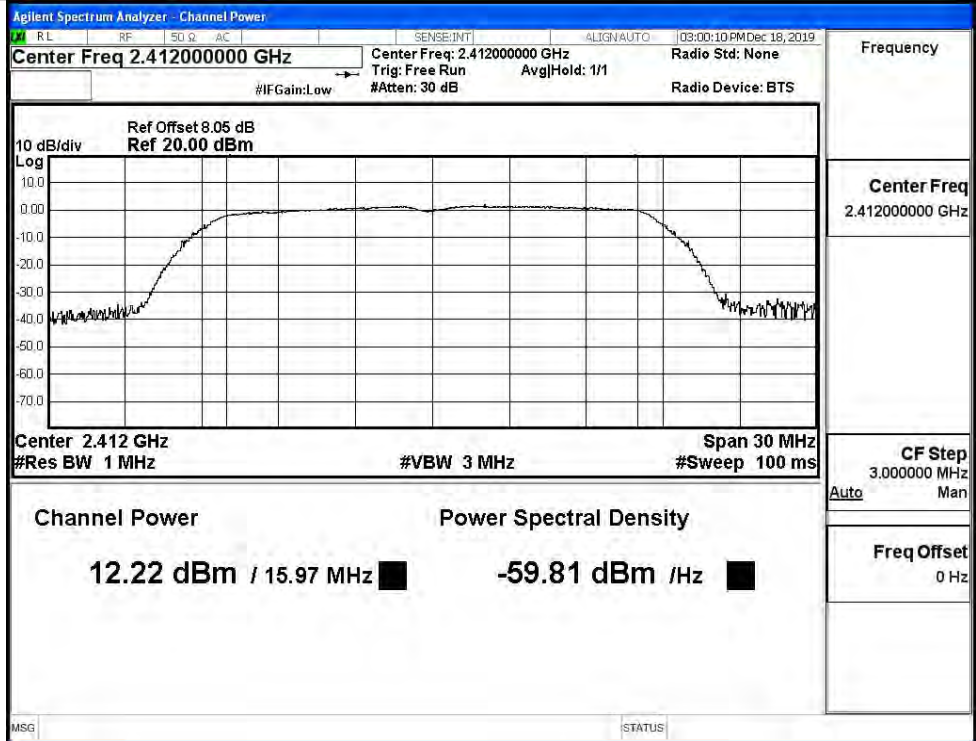
11G/MCH



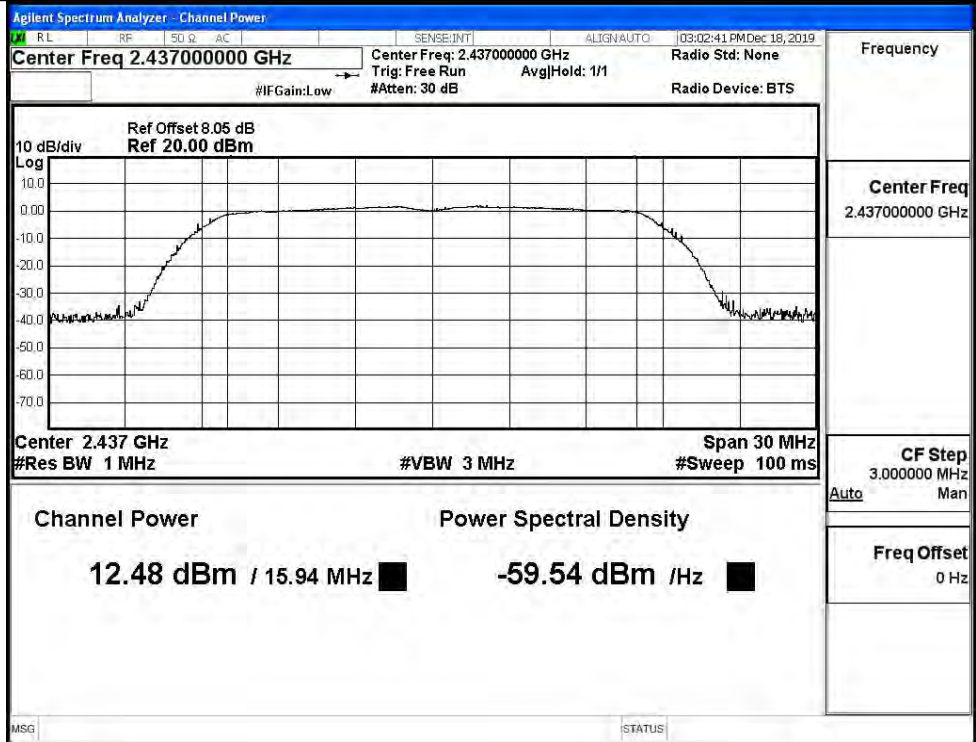
11G/HCH



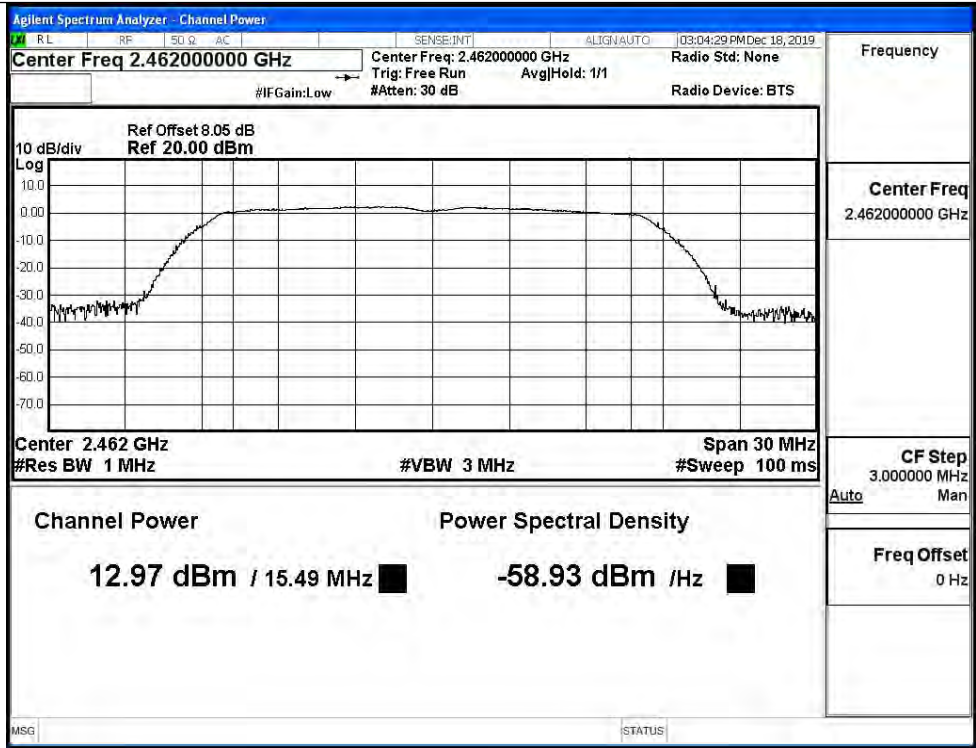
11N20SISO/LCH



11N20SISO/MCH



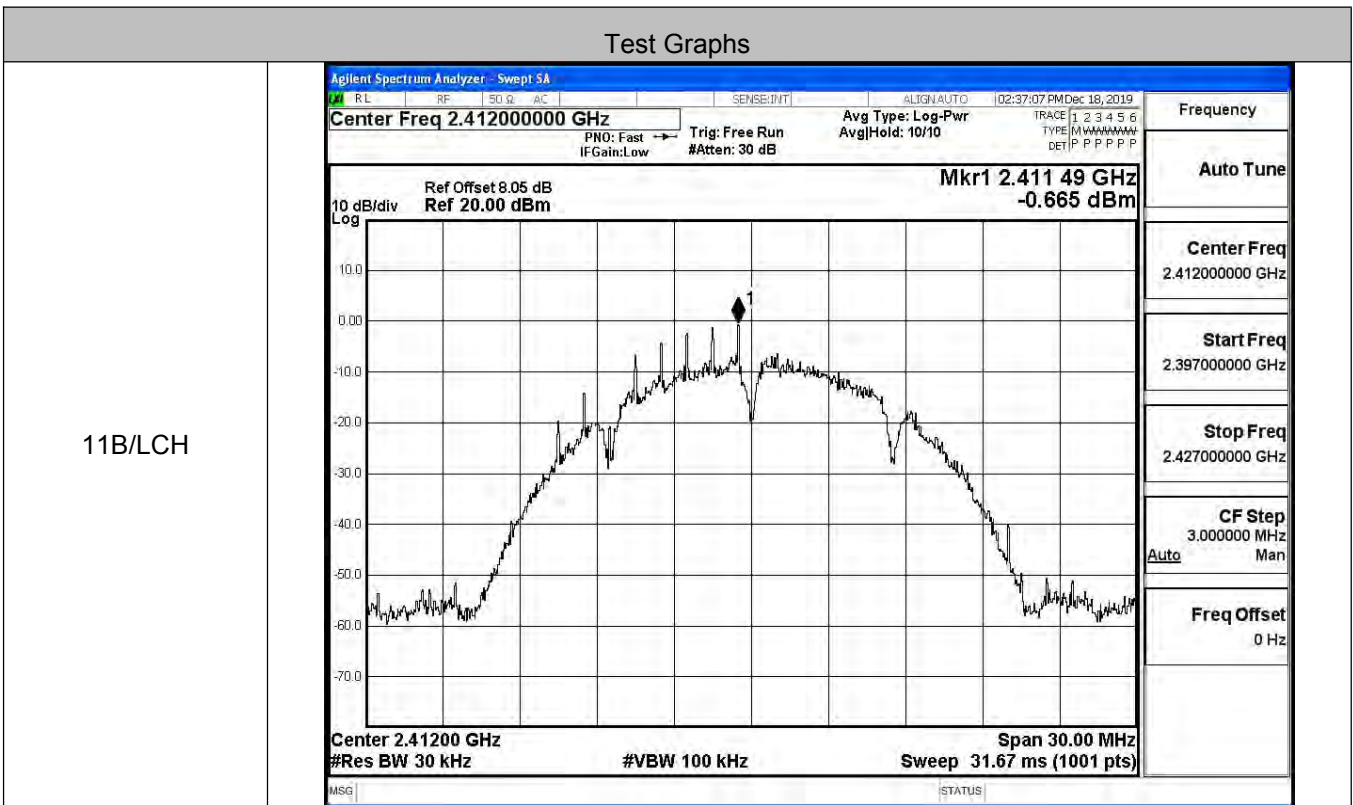
11N20SISO/HCH



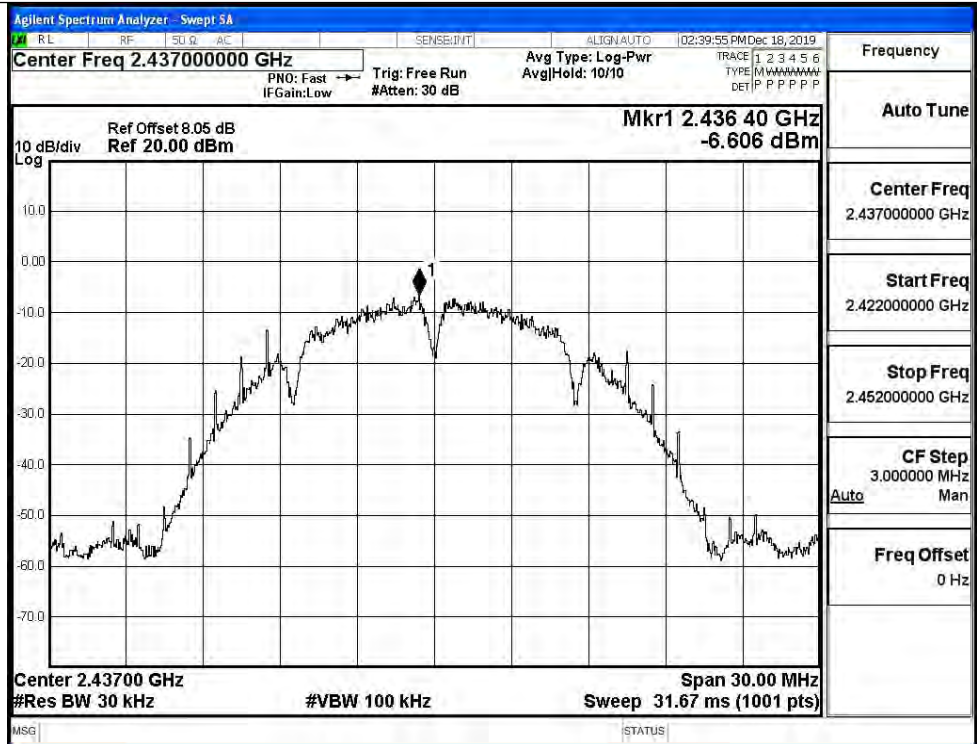
C.3 Maximum Power Spectral Density

| Mode | Channel | Meas.Level [dBm/30KHz] | Limit [dBm/3KHz] | Verdict |
|-----------|---------|------------------------|------------------|---------|
| 11B | LCH | -0.665 | 8 | PASS |
| | MCH | -6.606 | 8 | PASS |
| | HCH | -0.217 | 8 | PASS |
| 11G | LCH | -10.212 | 8 | PASS |
| | MCH | -9.302 | 8 | PASS |
| | HCH | -9.756 | 8 | PASS |
| 11N20SISO | LCH | -10.750 | 8 | PASS |
| | MCH | -10.535 | 8 | PASS |
| | HCH | -9.568 | 8 | PASS |

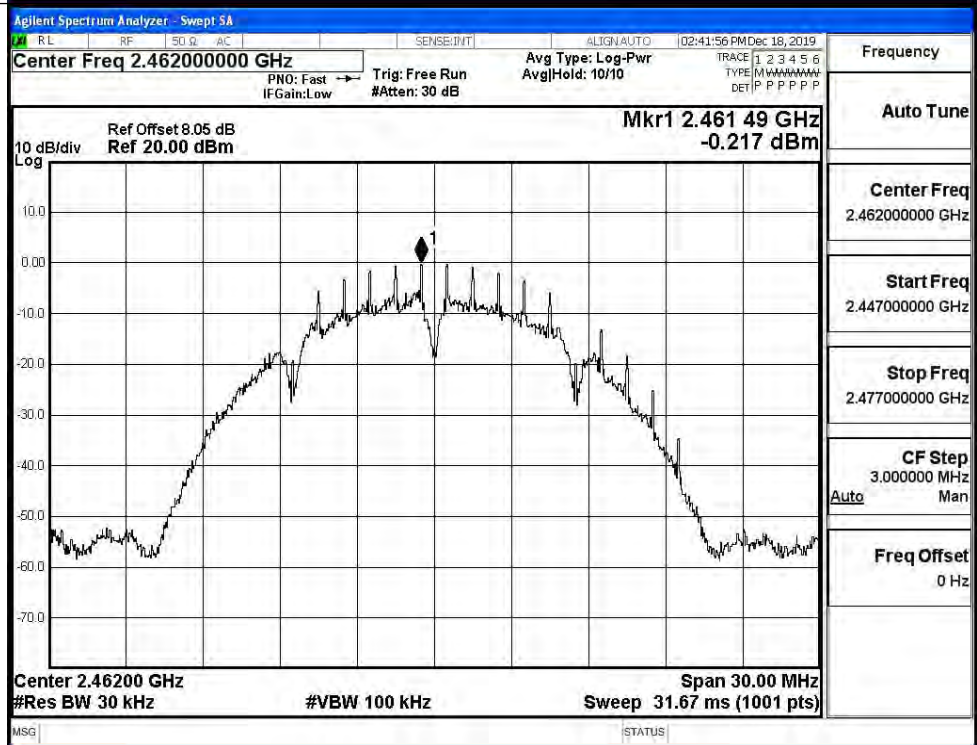
Test Graphs



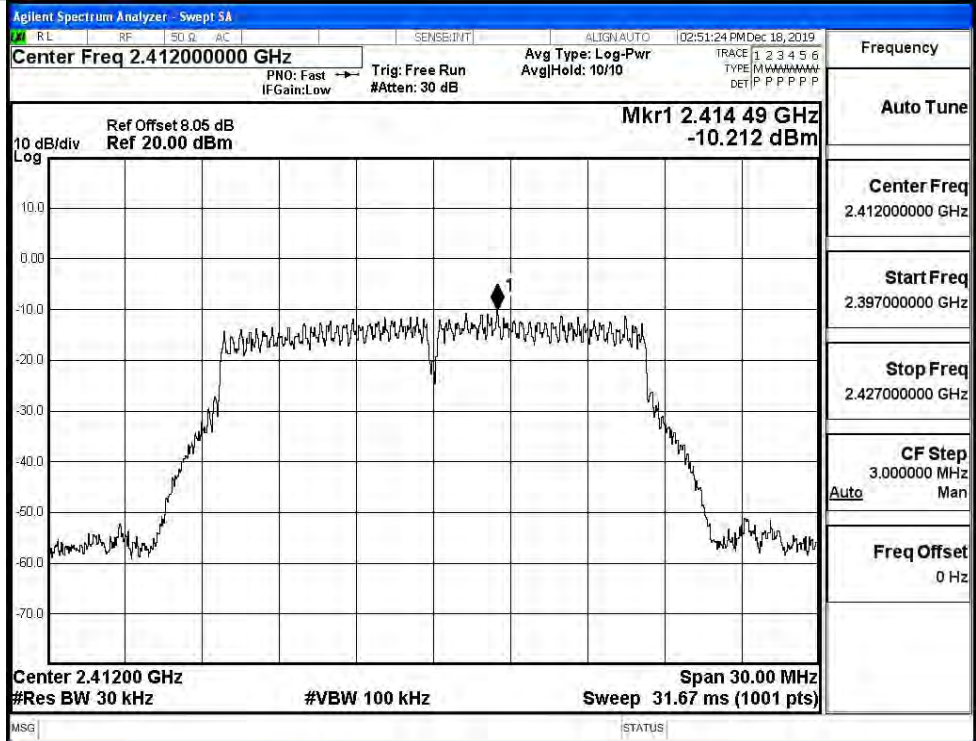
11B/MCH



11B/HCH

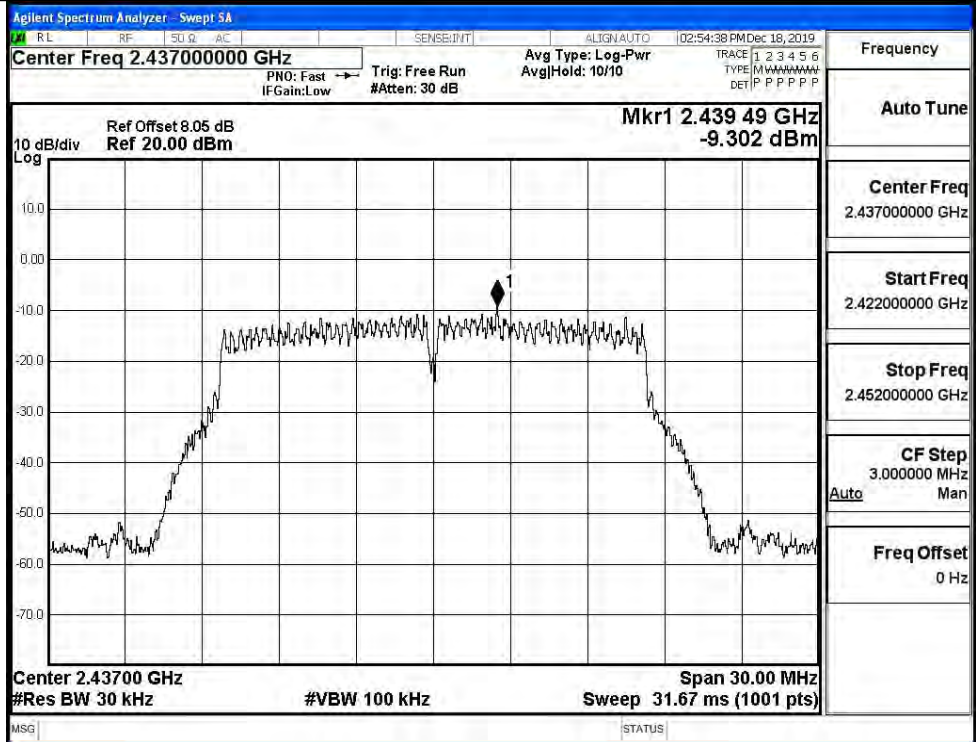


11G/LCH



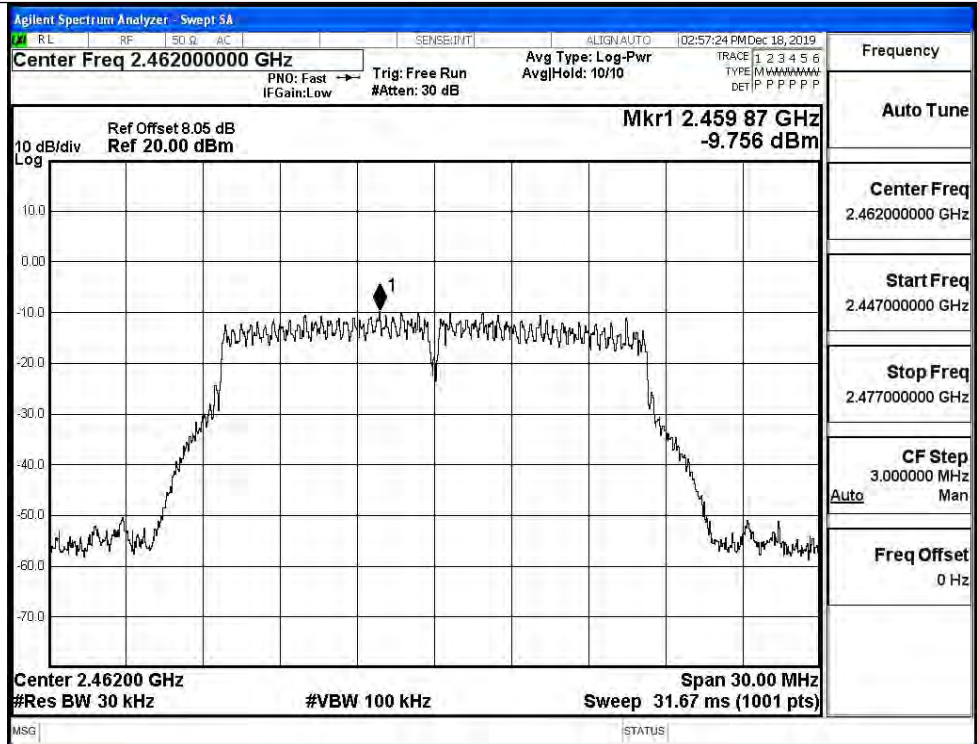
| | |
|-------------|--------------------------|
| Frequency | |
| Auto Tune | |
| Center Freq | 2.41200000 GHz |
| Start Freq | 2.397000000 GHz |
| Stop Freq | 2.427000000 GHz |
| CF Step | 3.000000 MHz Auto Man |
| Freq Offset | 0 Hz |

11G/MCH

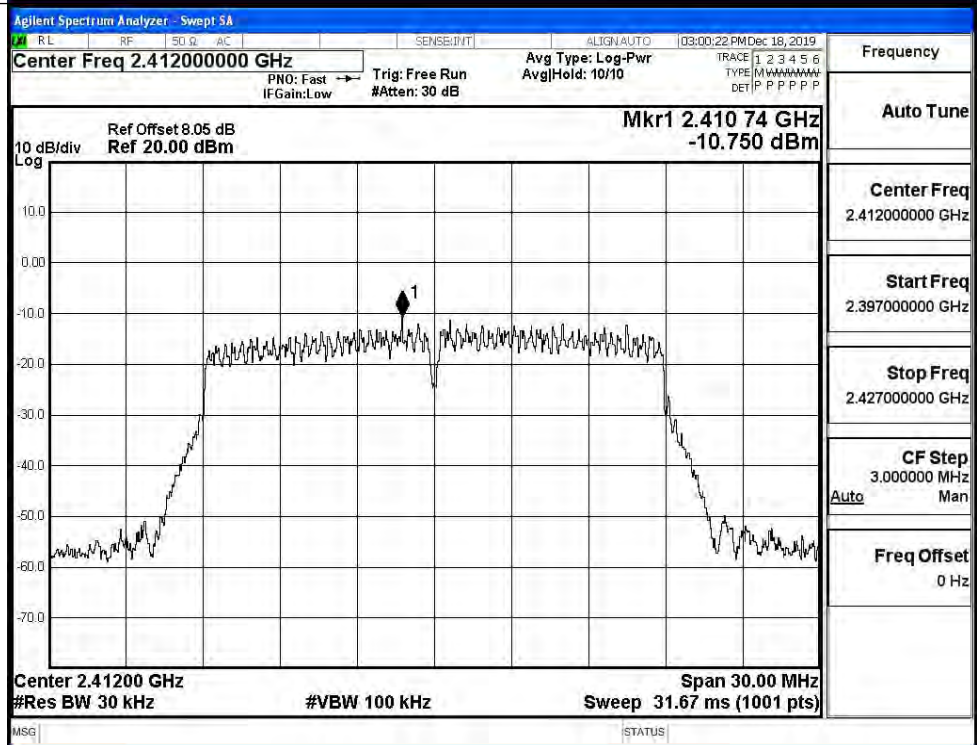


| | |
|-------------|--------------------------|
| Frequency | |
| Auto Tune | |
| Center Freq | 2.437000000 GHz |
| Start Freq | 2.422000000 GHz |
| Stop Freq | 2.452000000 GHz |
| CF Step | 3.000000 MHz Auto Man |
| Freq Offset | 0 Hz |

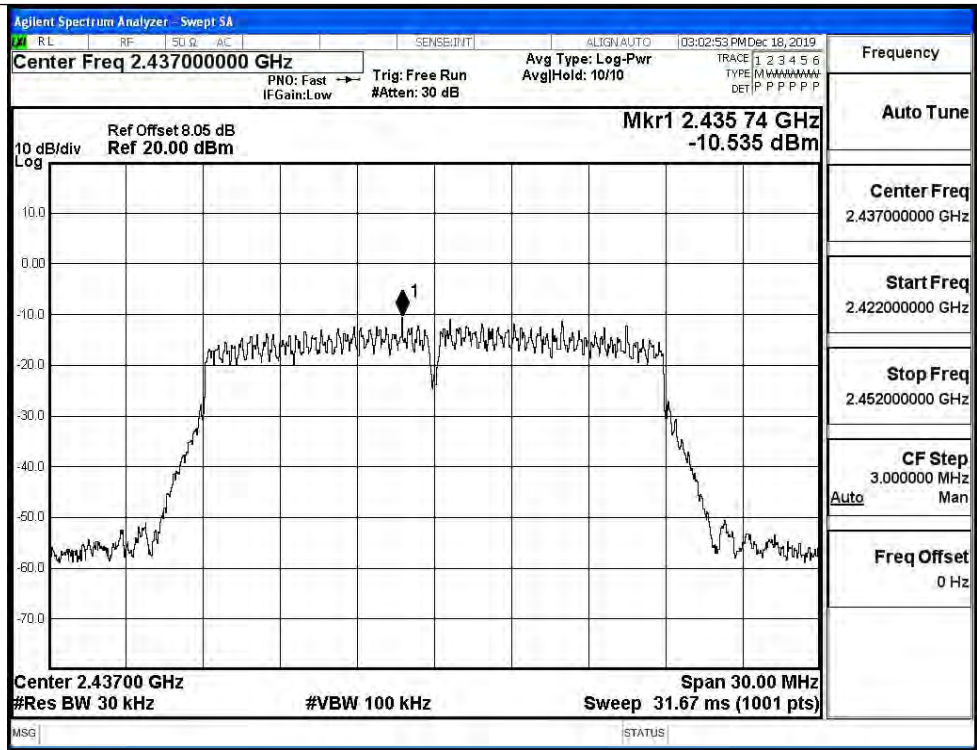
11G/HCH



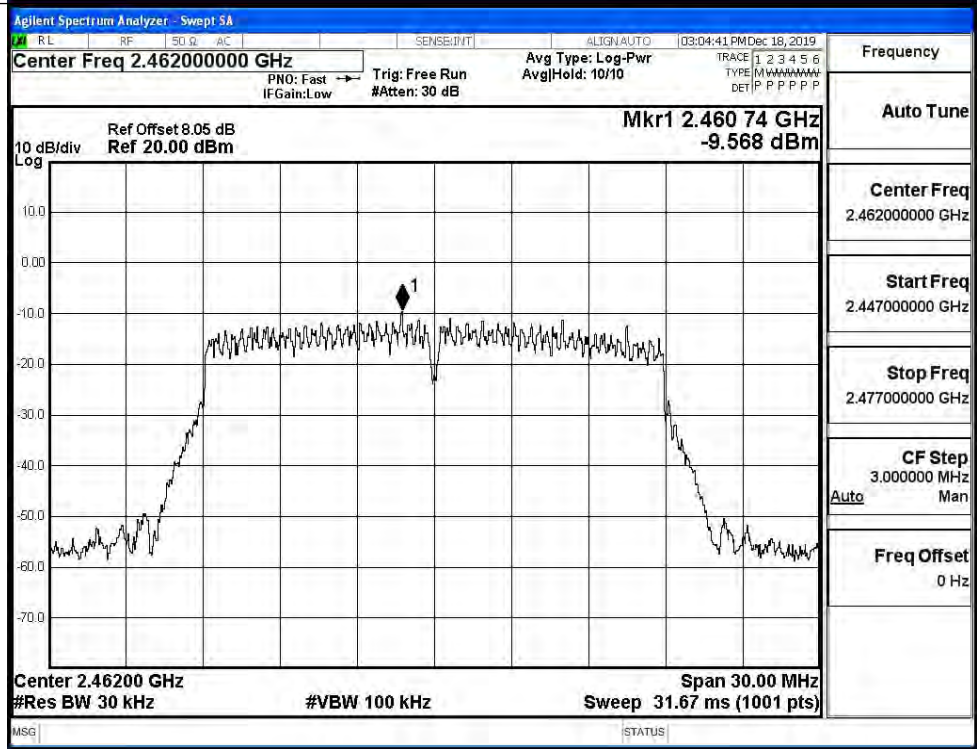
11N20SISO/LCH



11N20SISO/MCH

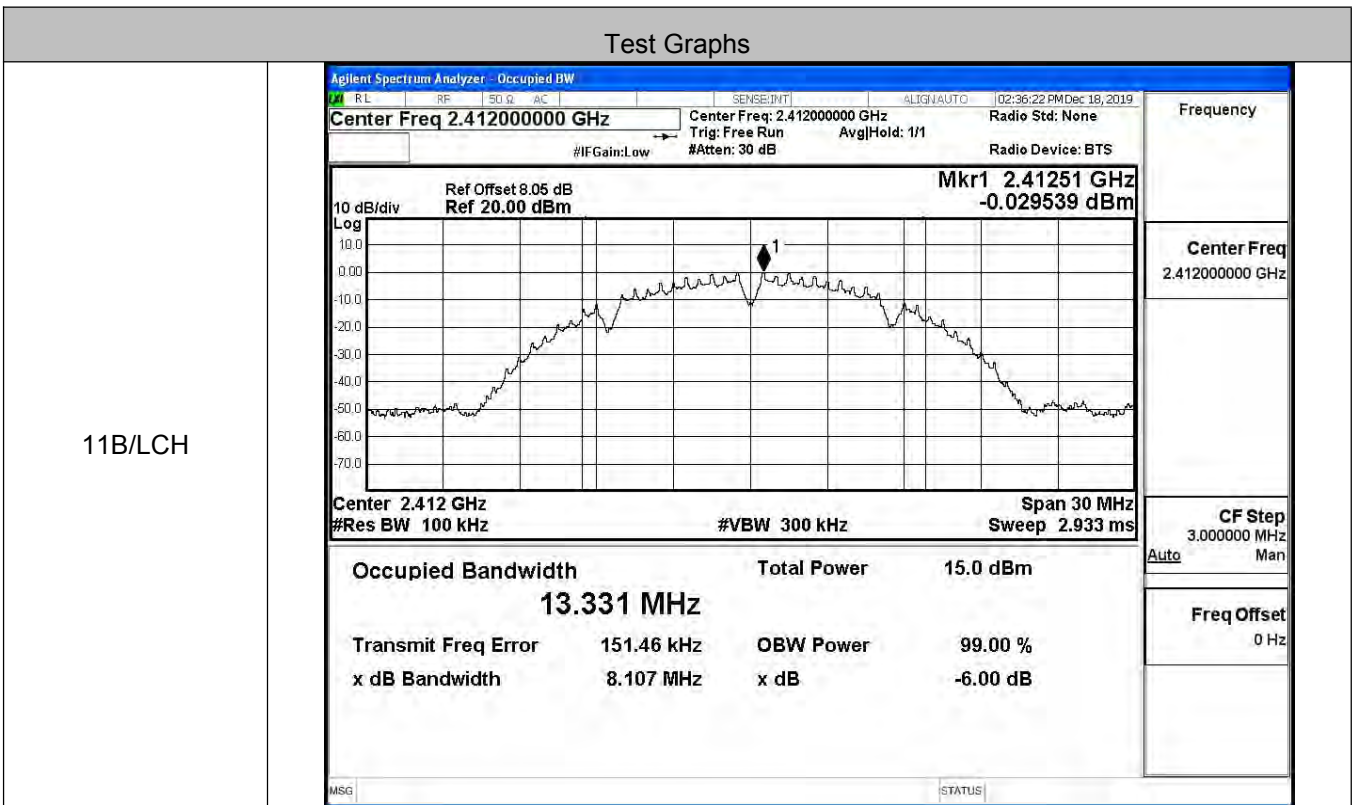


11N20SISO/HCH

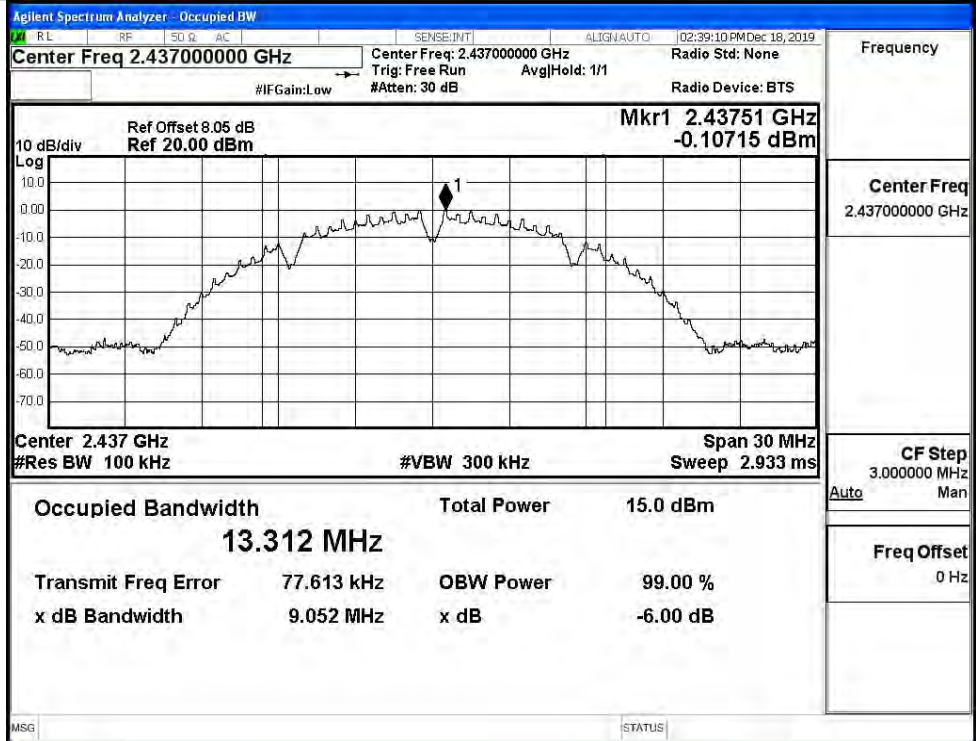


C.4 6dB Bandwidth

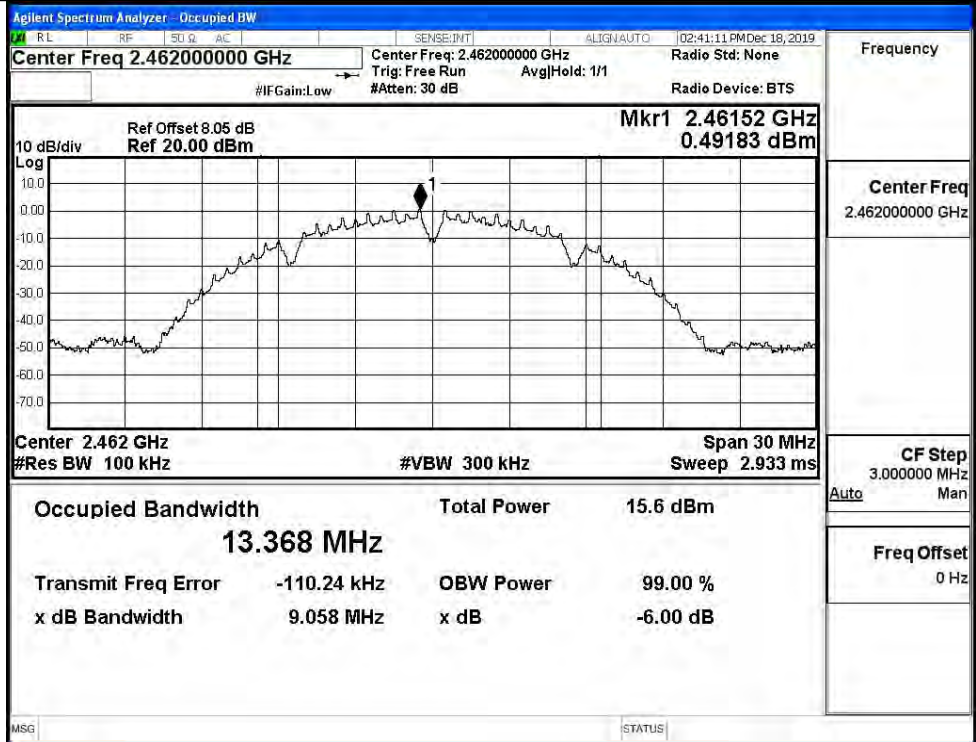
| Mode | Channel | 6dB Bandwidth [MHz] | Limit [MHz] | Verdict |
|-----------|---------|---------------------|-------------|---------|
| 11B | LCH | 8.107 | ≥0.5 | PASS |
| | MCH | 9.052 | ≥0.5 | PASS |
| | HCH | 9.058 | ≥0.5 | PASS |
| 11G | LCH | 15.50 | ≥0.5 | PASS |
| | MCH | 15.52 | ≥0.5 | PASS |
| | HCH | 15.49 | ≥0.5 | PASS |
| 11N20SISO | LCH | 15.97 | ≥0.5 | PASS |
| | MCH | 15.94 | ≥0.5 | PASS |
| | HCH | 15.49 | ≥0.5 | PASS |



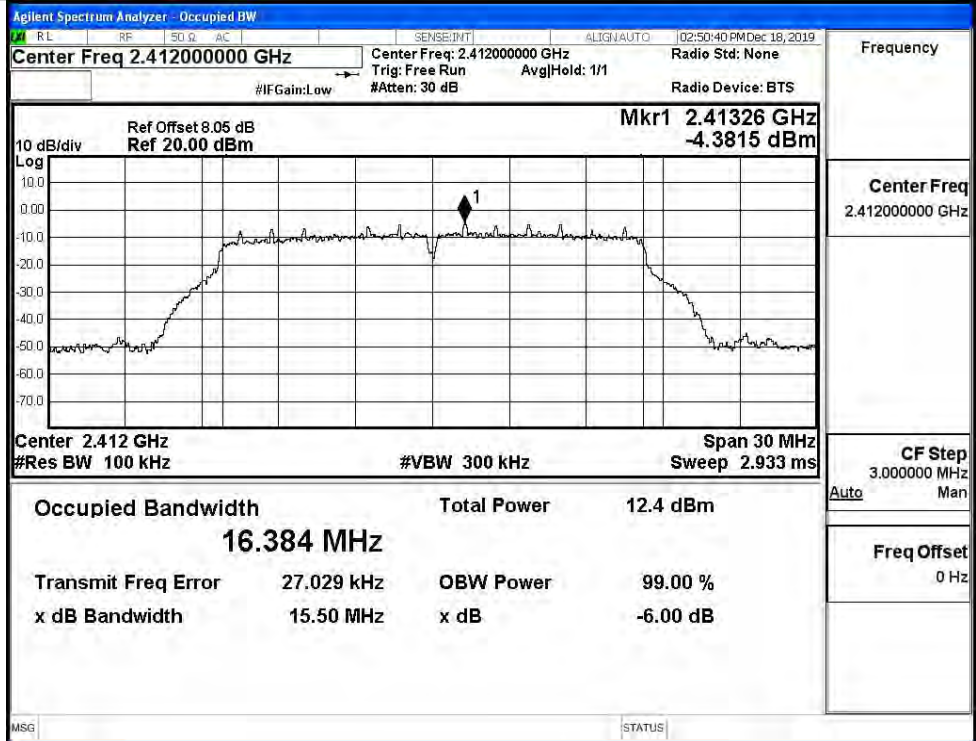
11B/MCH



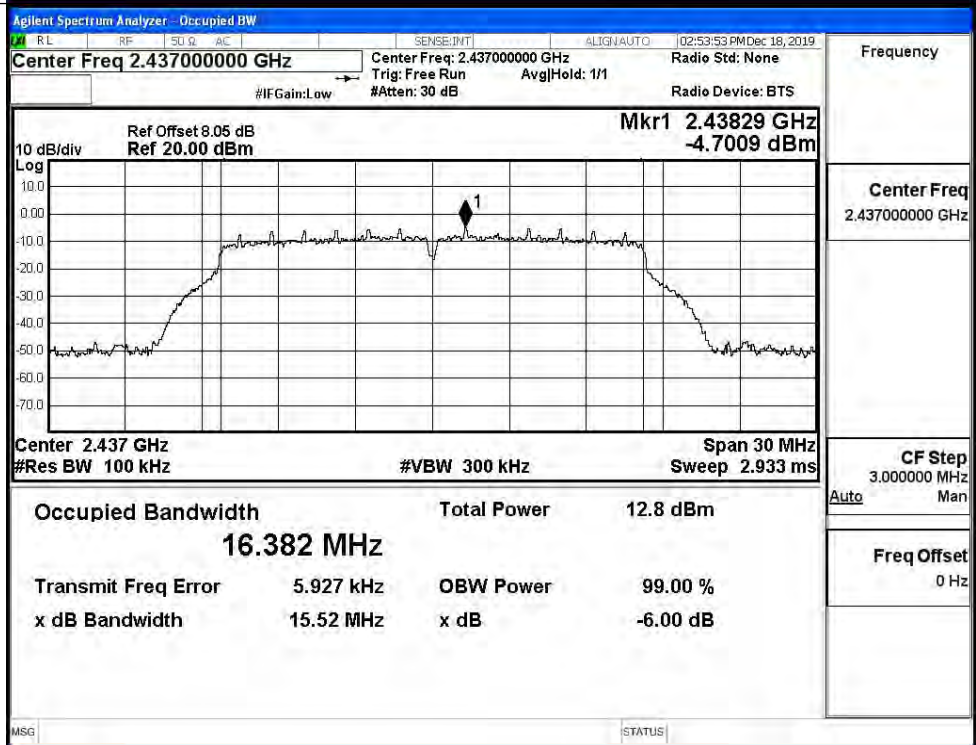
11B/HCH



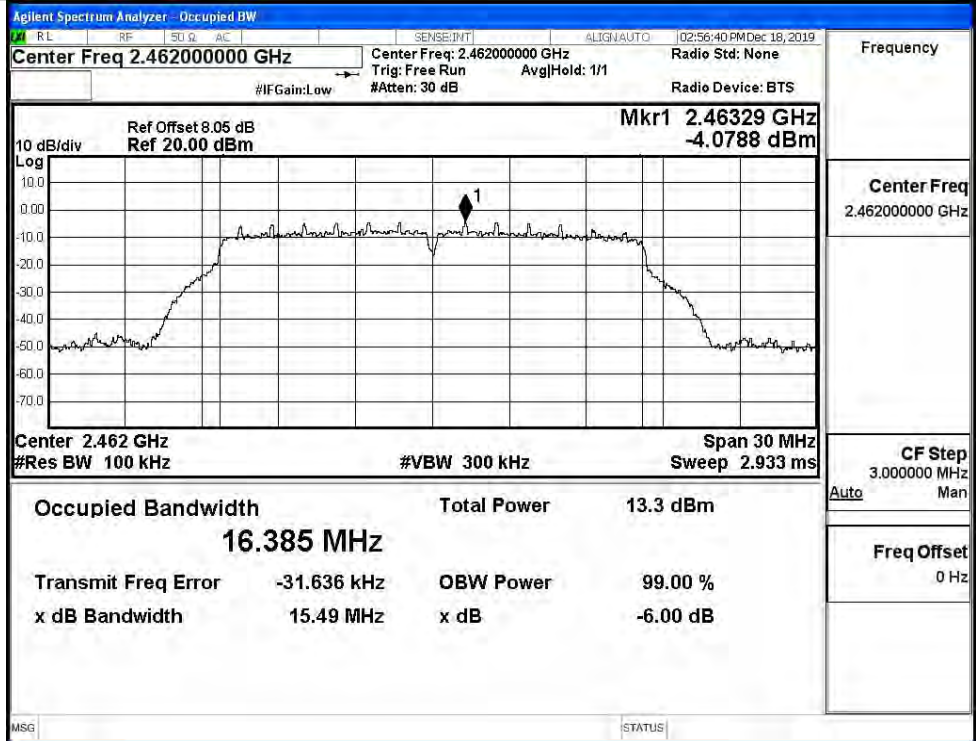
11G/LCH



11G/MCH

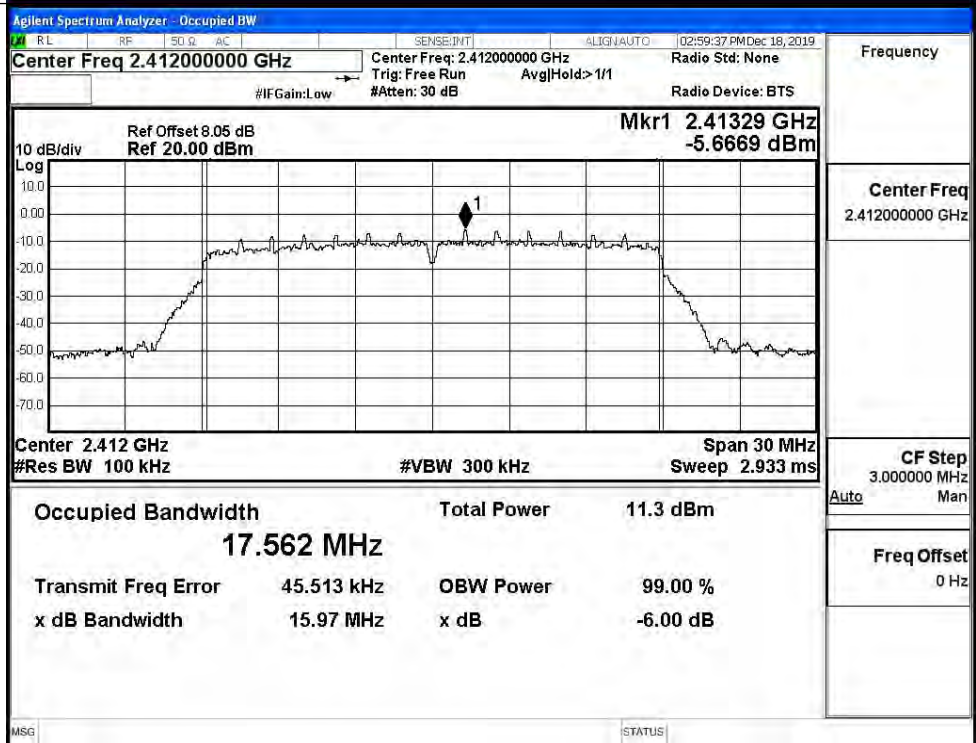


11G/HCH



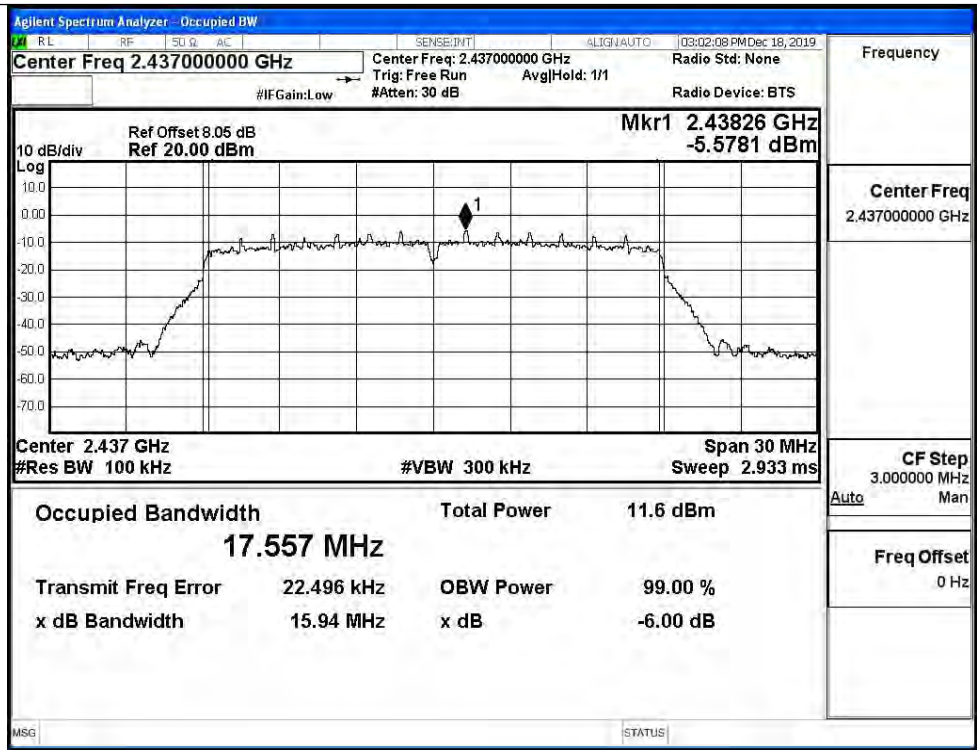
| | |
|-------------|----------------|
| Frequency | 2.46200000 GHz |
| Center Freq | 2.46200000 GHz |
| CF Step | 3.000000 MHz |
| Auto | Man |
| Freq Offset | 0 Hz |

11N20SISO/LCH

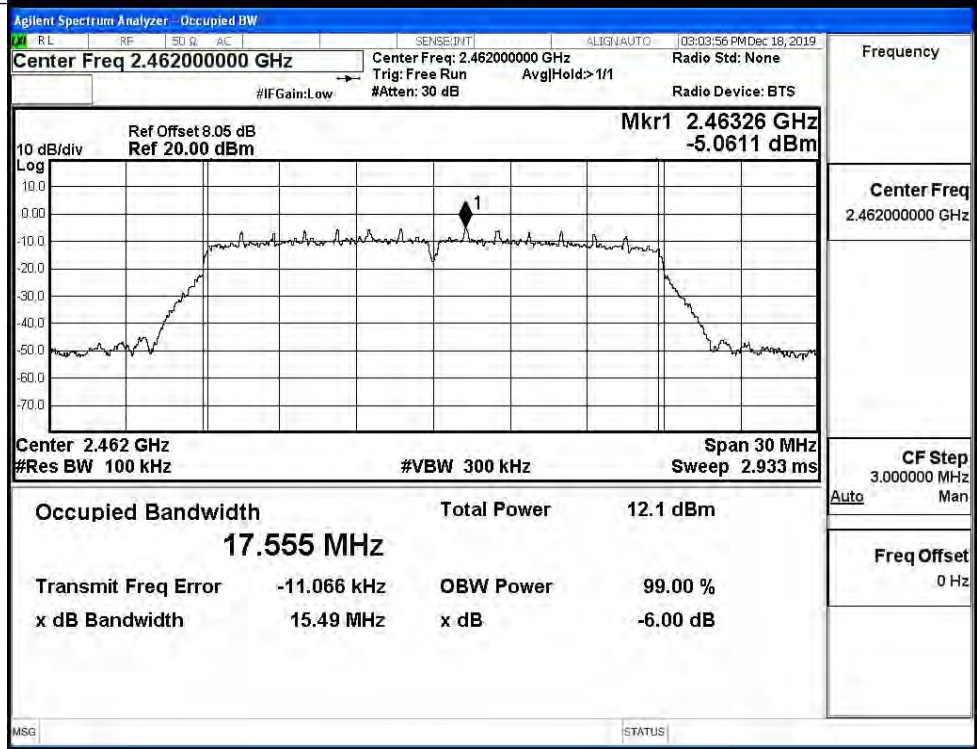


| | |
|-------------|----------------|
| Frequency | 2.41200000 GHz |
| Center Freq | 2.41200000 GHz |
| CF Step | 3.000000 MHz |
| Auto | Man |
| Freq Offset | 0 Hz |

11N20SISO/MCH



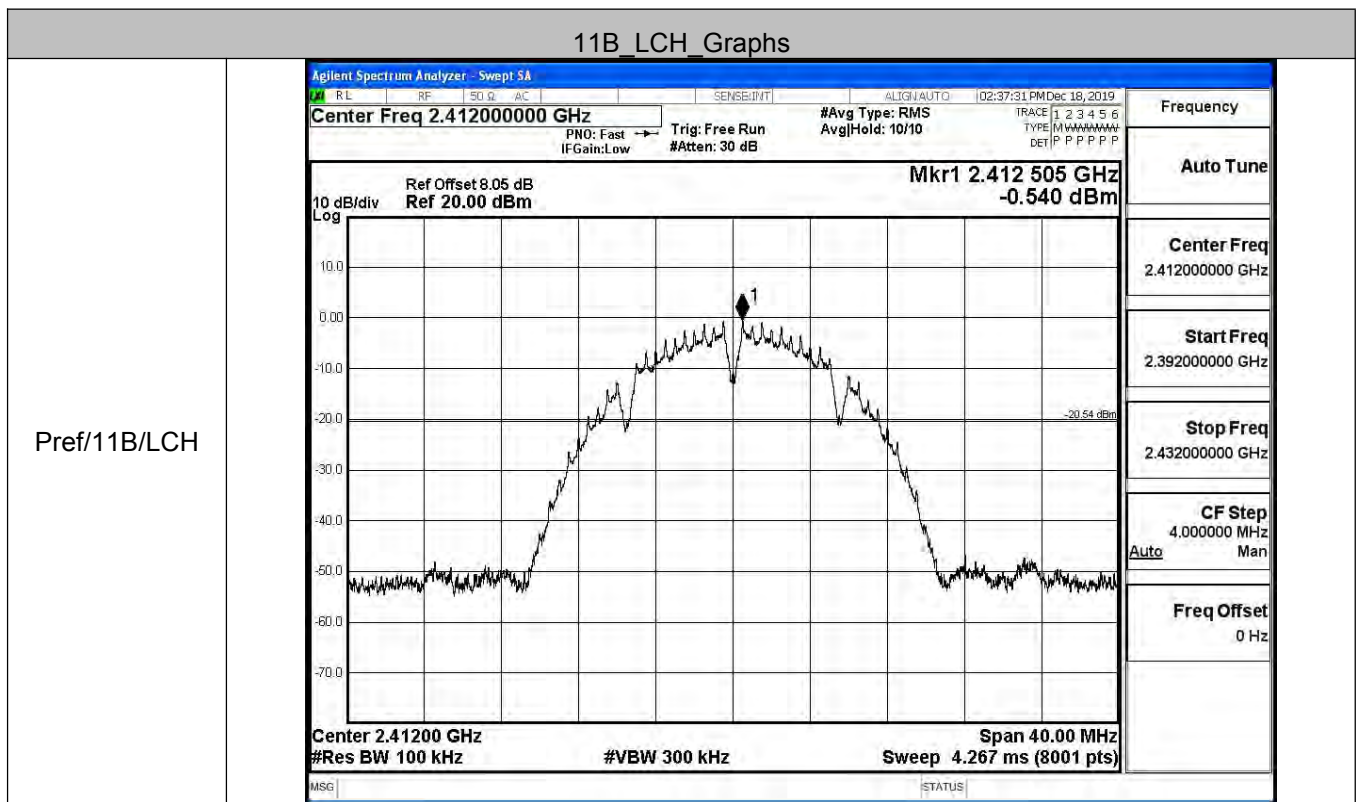
11N20SISO/HCH



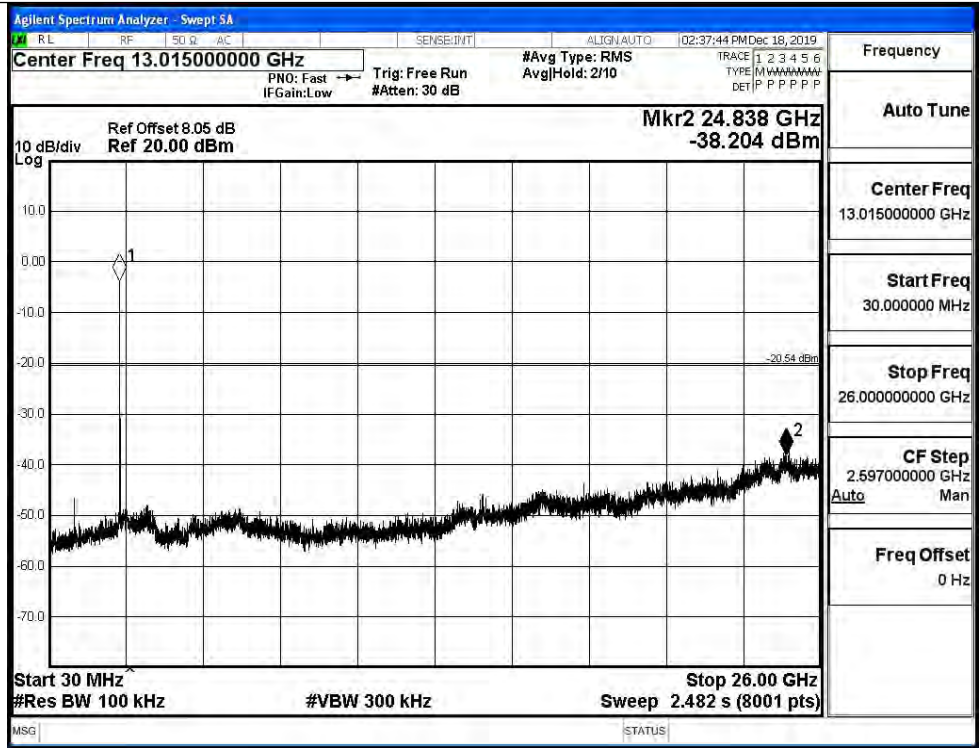
C.5 RF Conducted Spurious Emissions

| Mode | Channel | Pref [dBm] | Max. Level [dBm] | Limit [dBm] | Verdict |
|------------|---------|------------|------------------|-------------|---------|
| 11B | LCH | -0.54 | -38.204 | -20.540 | PASS |
| | MCH | 0.022 | -37.981 | -19.978 | PASS |
| | HCH | 0.166 | -37.318 | -19.834 | PASS |
| 11G | LCH | -5.366 | -36.814 | -25.366 | PASS |
| | MCH | -4.147 | -37.313 | -24.147 | PASS |
| | HCH | -4.168 | -37.174 | -24.168 | PASS |
| 11N20 SISO | LCH | -5.545 | -35.923 | -25.545 | PASS |
| | MCH | -5.536 | -37.830 | -25.536 | PASS |
| | HCH | -5.016 | -37.570 | -25.016 | PASS |

11B_LCH_Graphs

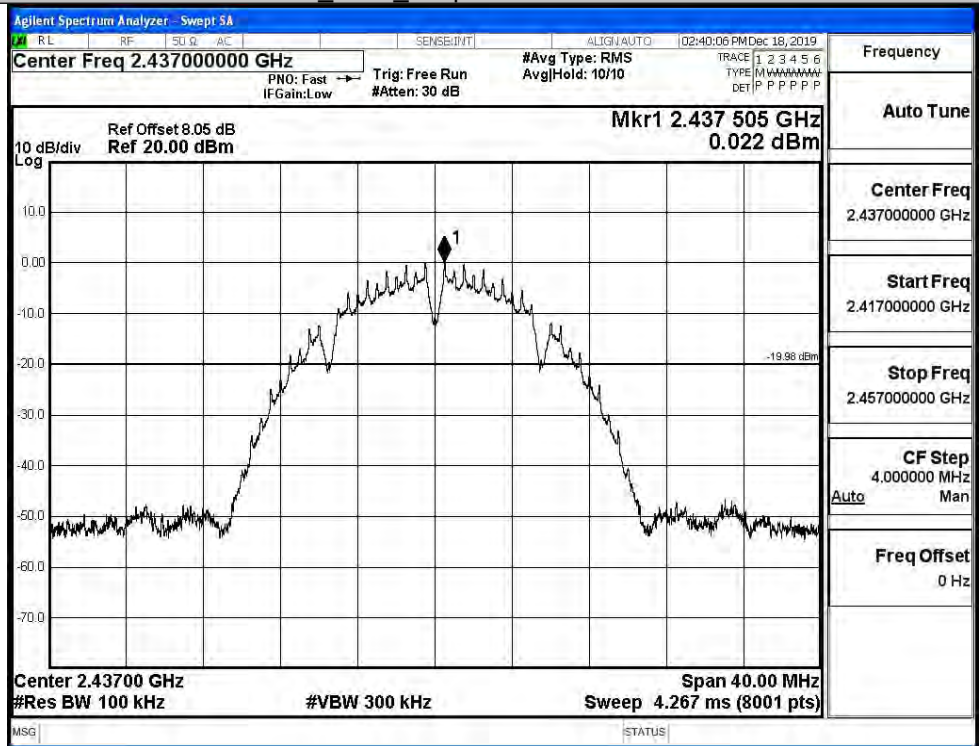


Puw/11B/LCH

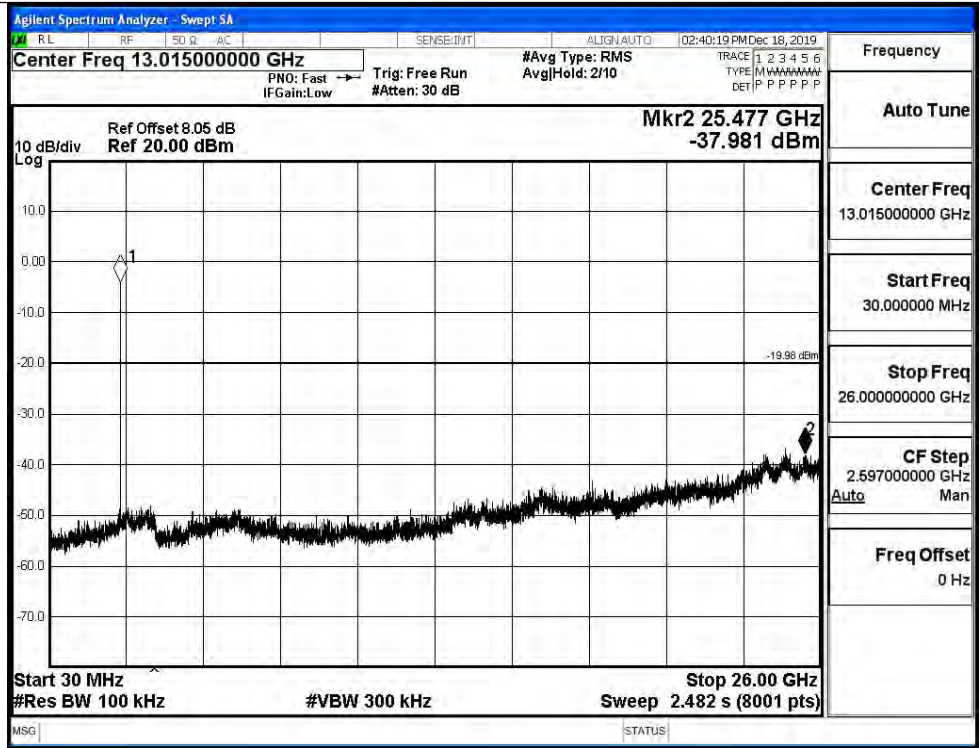


11B_MCH_Graphs

Pref/11B/MCH

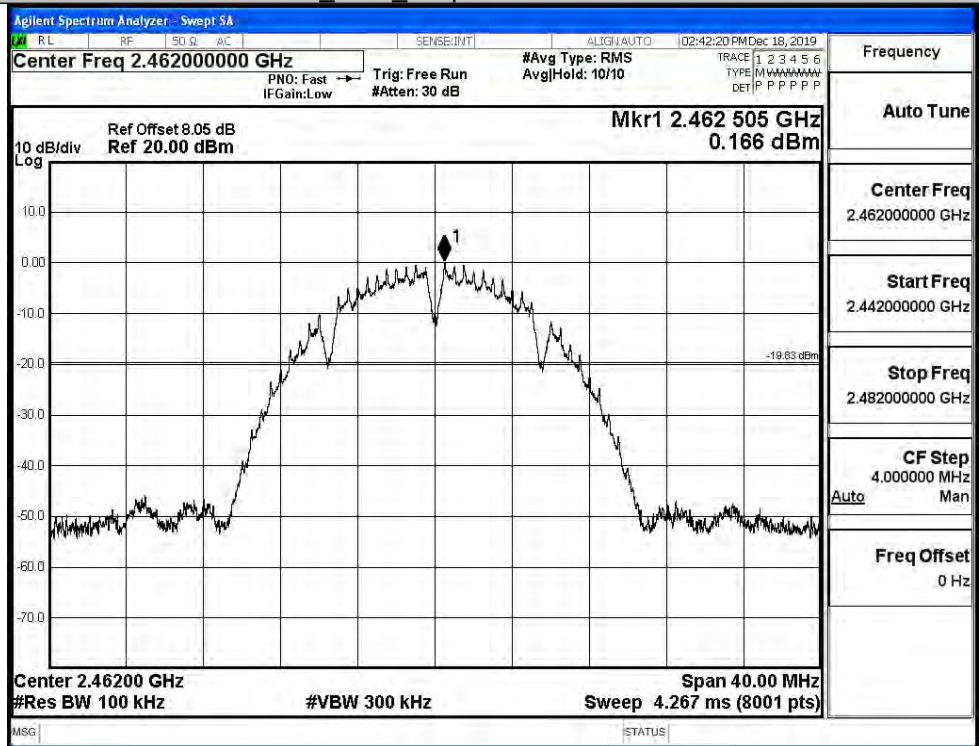


Puw/11B/MCH

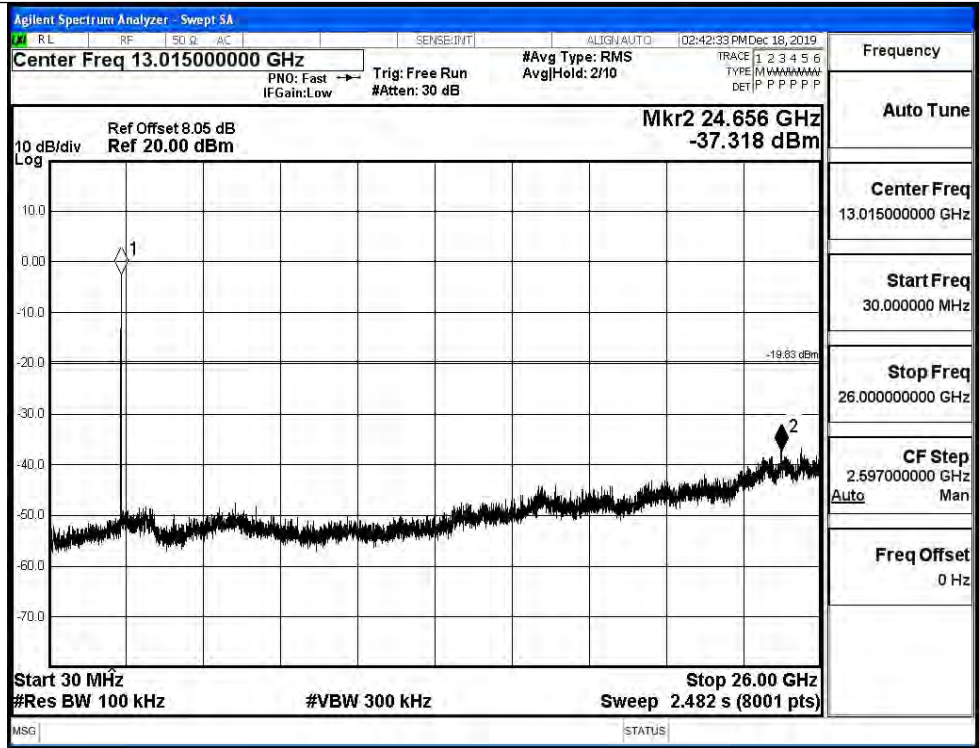


11B_HCH_Graphs

Pref/11B/HCH

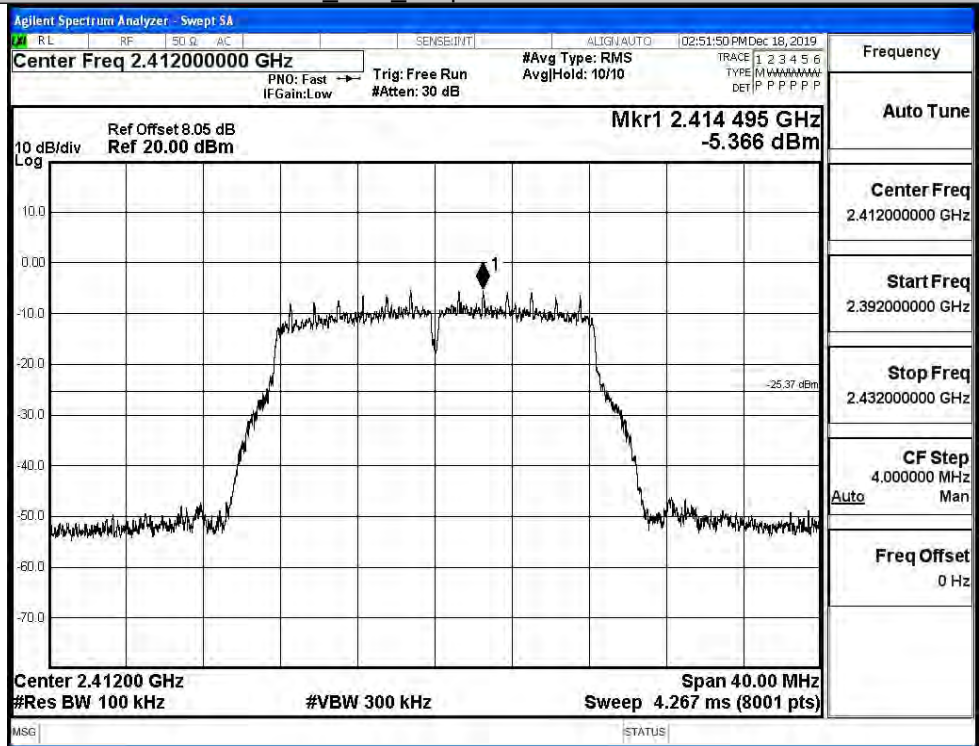


Puw/11B/HCH

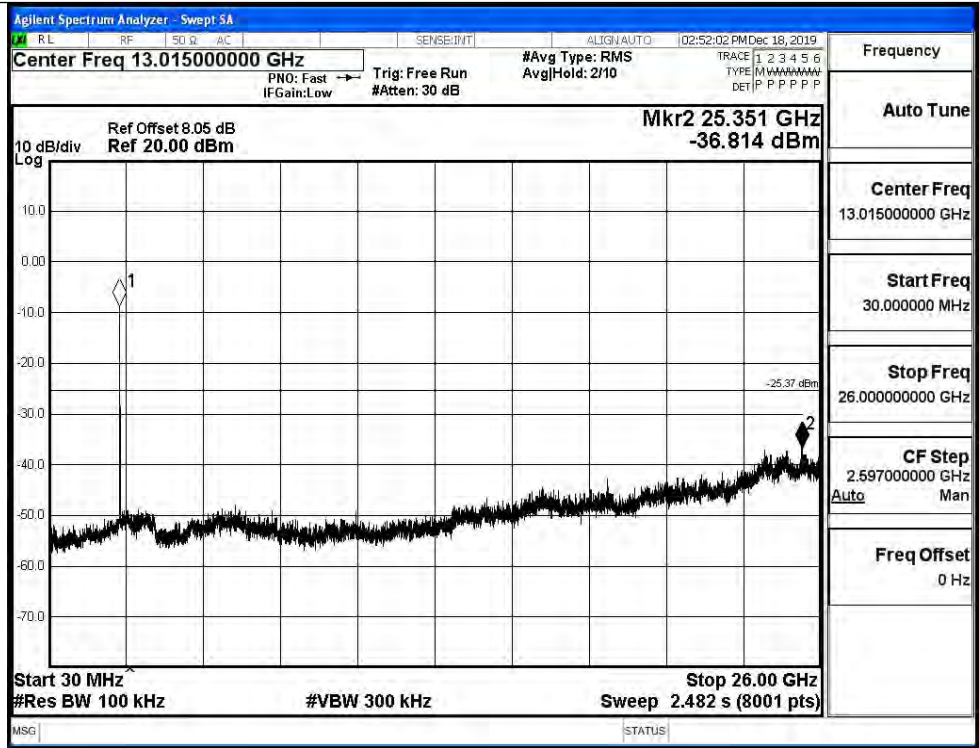


11G_LCH_Graphs

Pref/11G/LCH

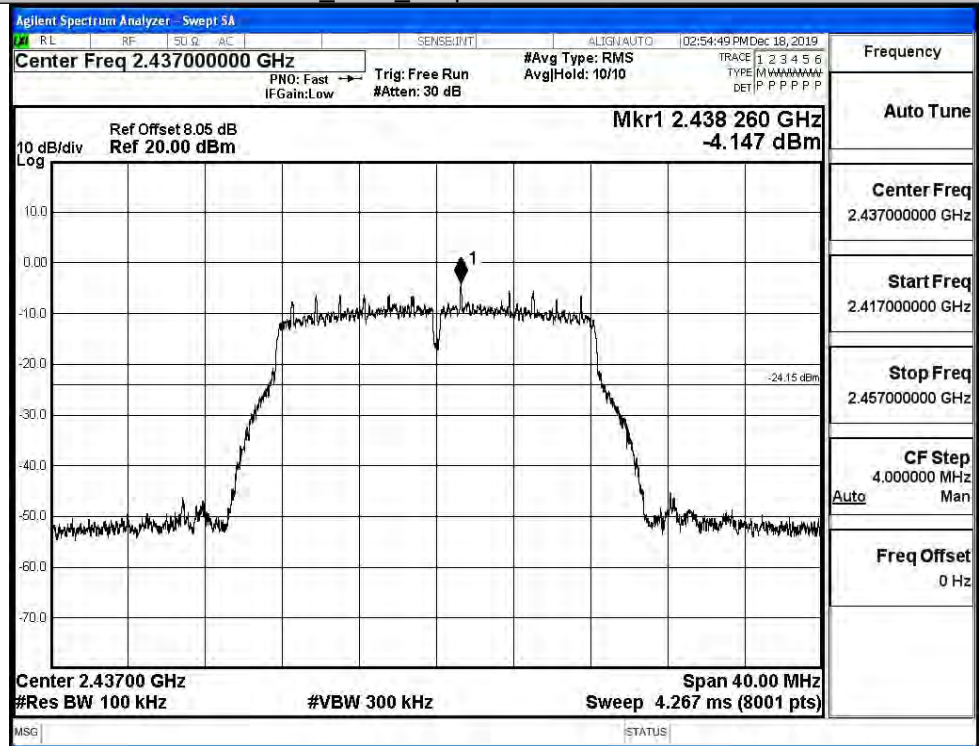


Puw/11G/LCH

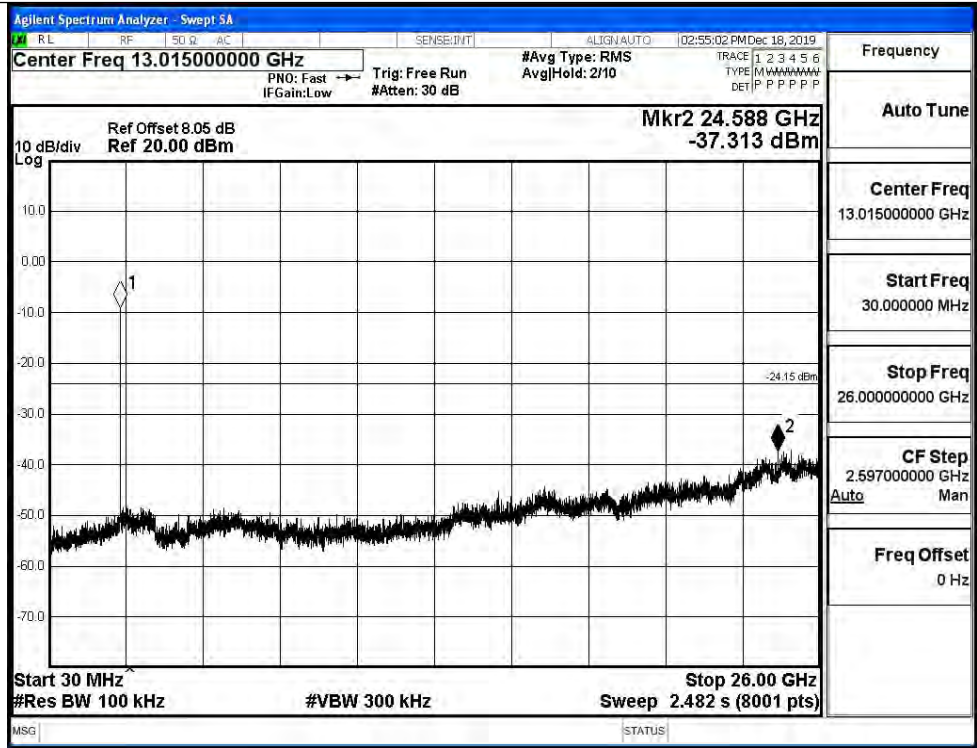


11G_MCH_Graphs

Pref/11G/MCH

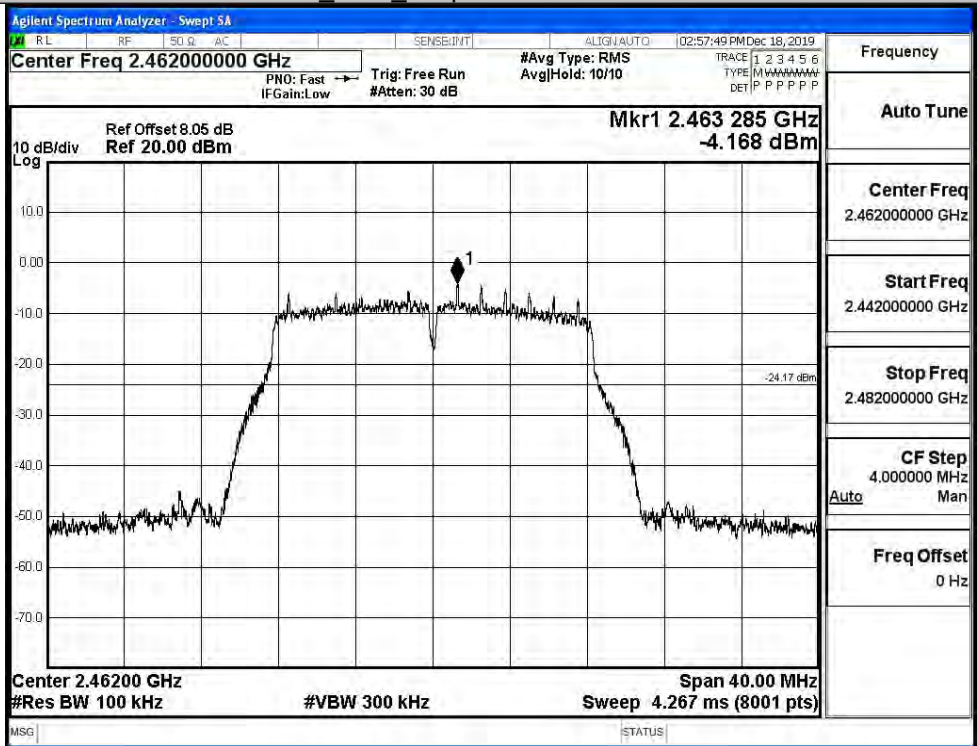


Puw/11G/MCH

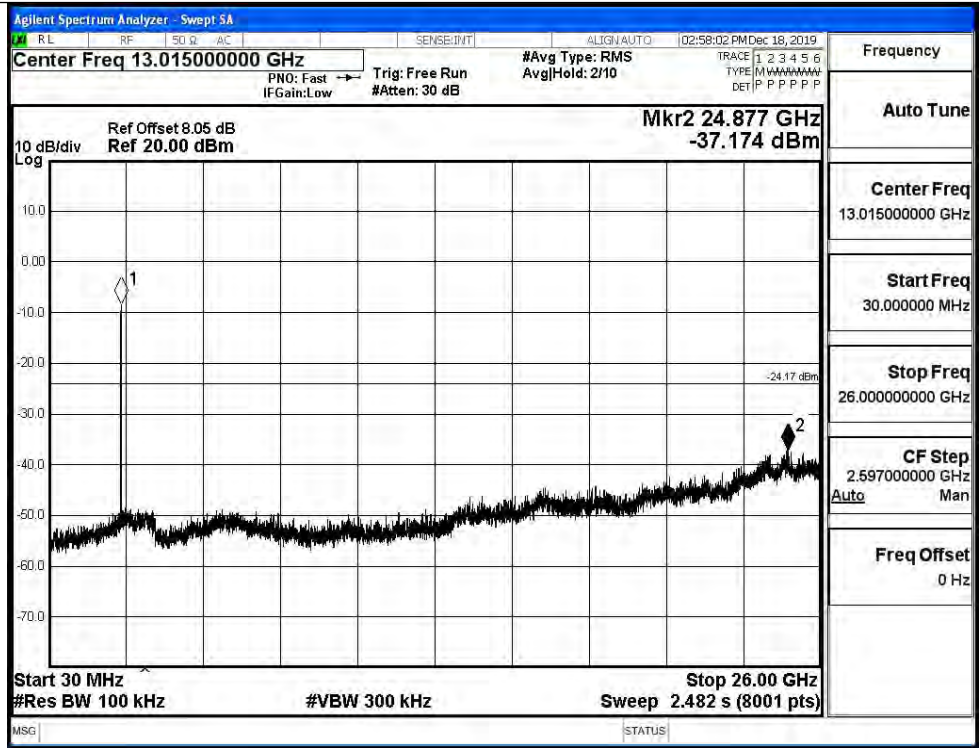


11G_HCH_Graphs

Pref/11G/HCH

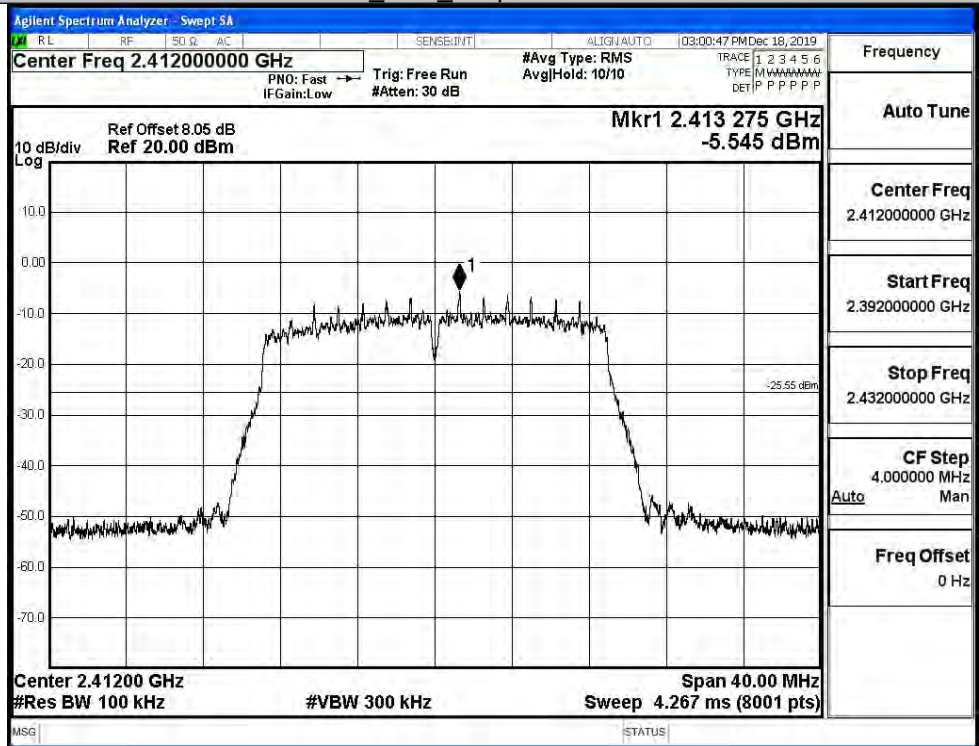


Puw/11G/HCH

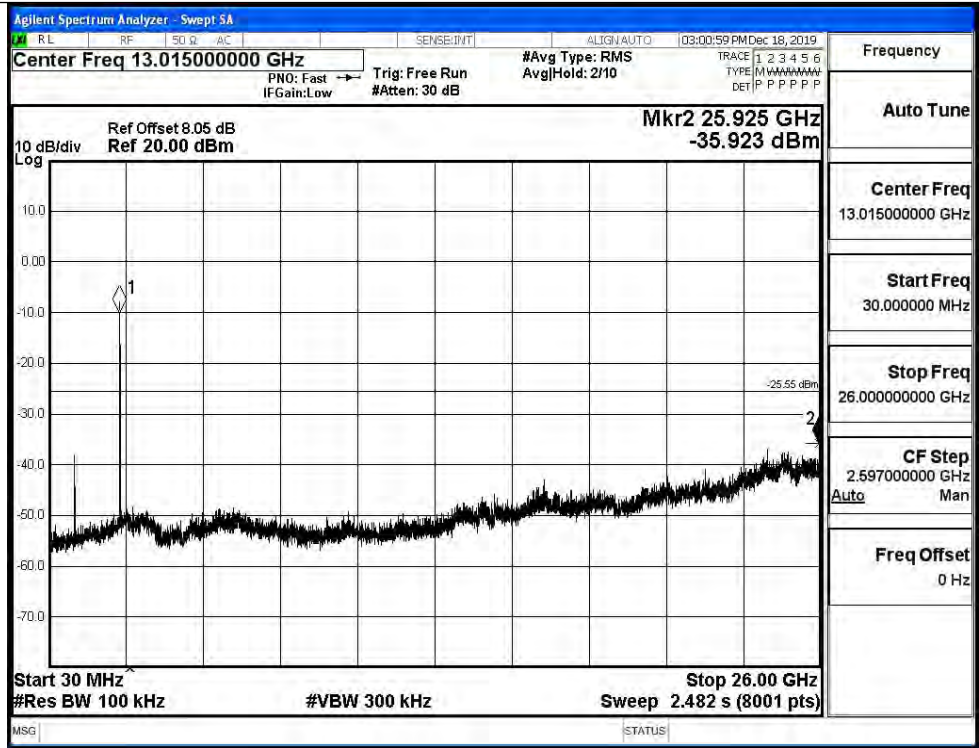


11N20SISO_LCH_Graphs

Pref/11N20SISO
O/LCH

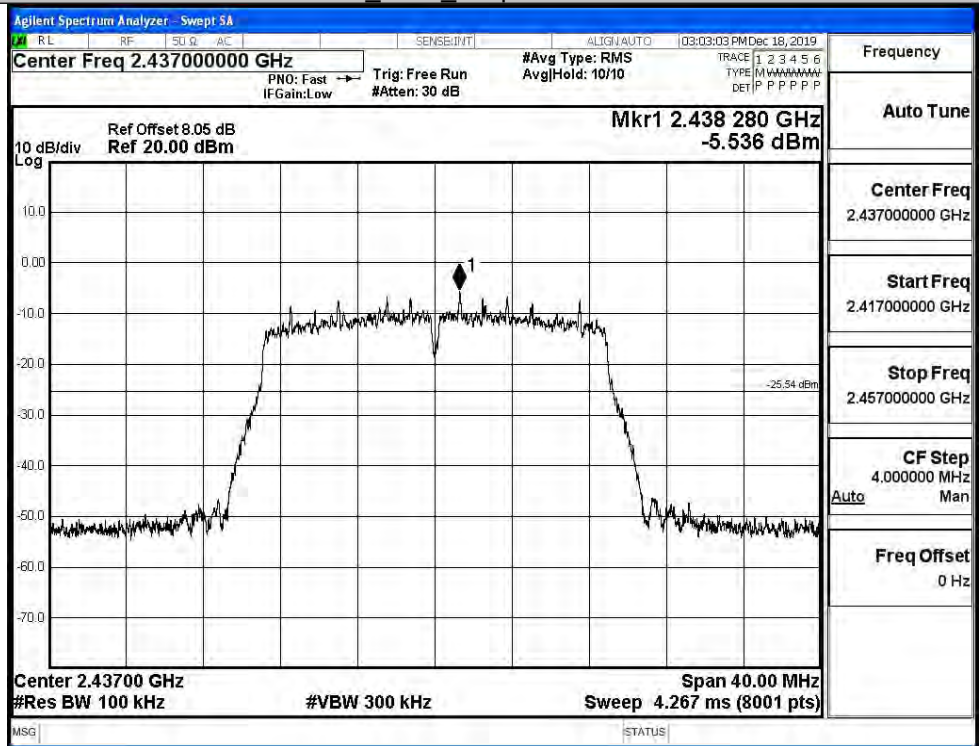


Puw/11N20
SISO/LCH

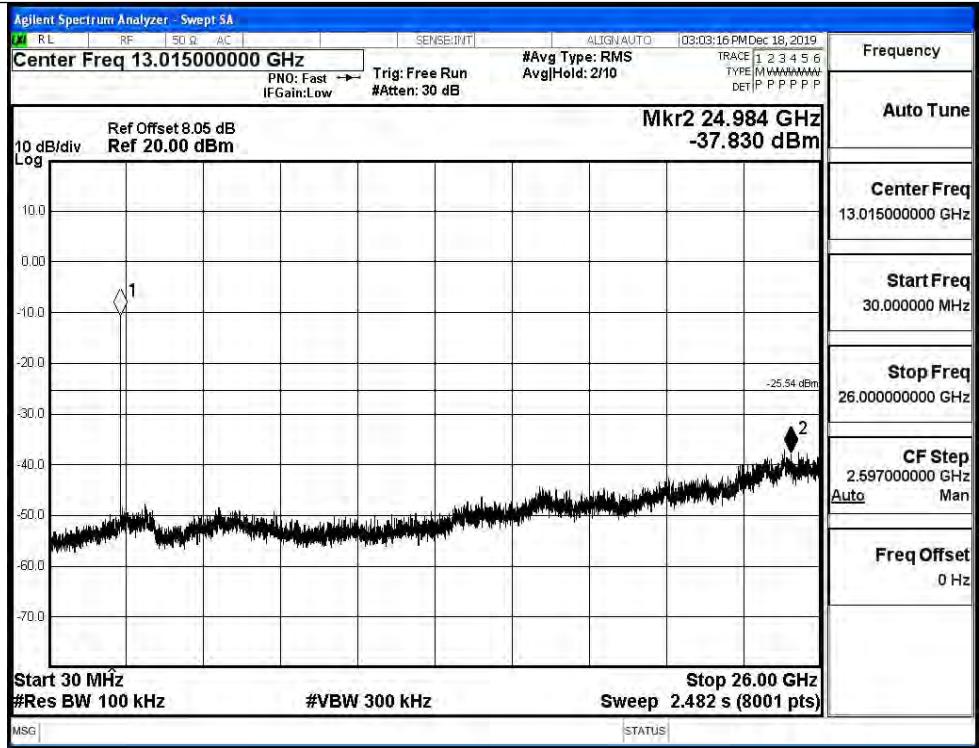


11N20SISO_MCH_Graphs

Pref/11N20
SISO/MCH

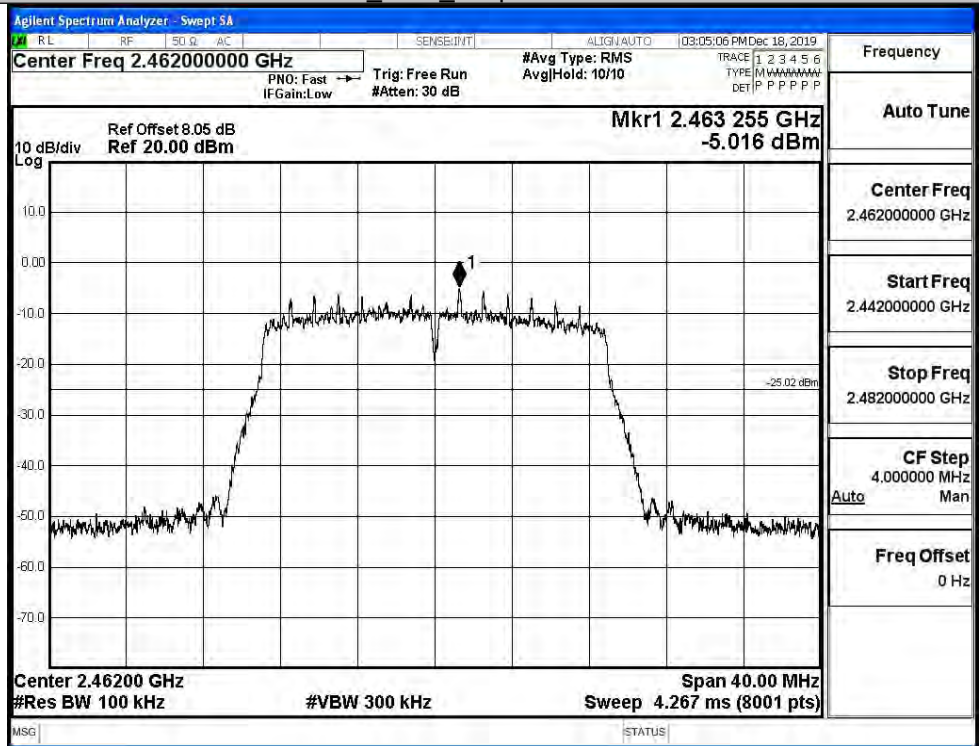


Puw/11N20
SISO/MCH

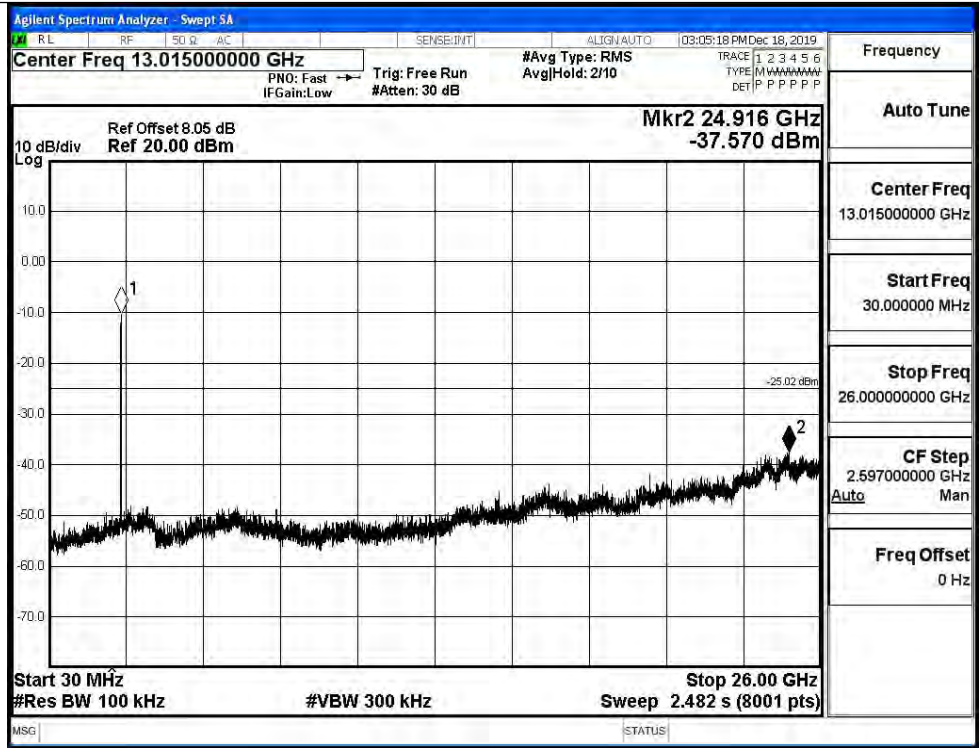


11N20SISO_HCH_Graphs

Pref/11N20
SISO/HCH

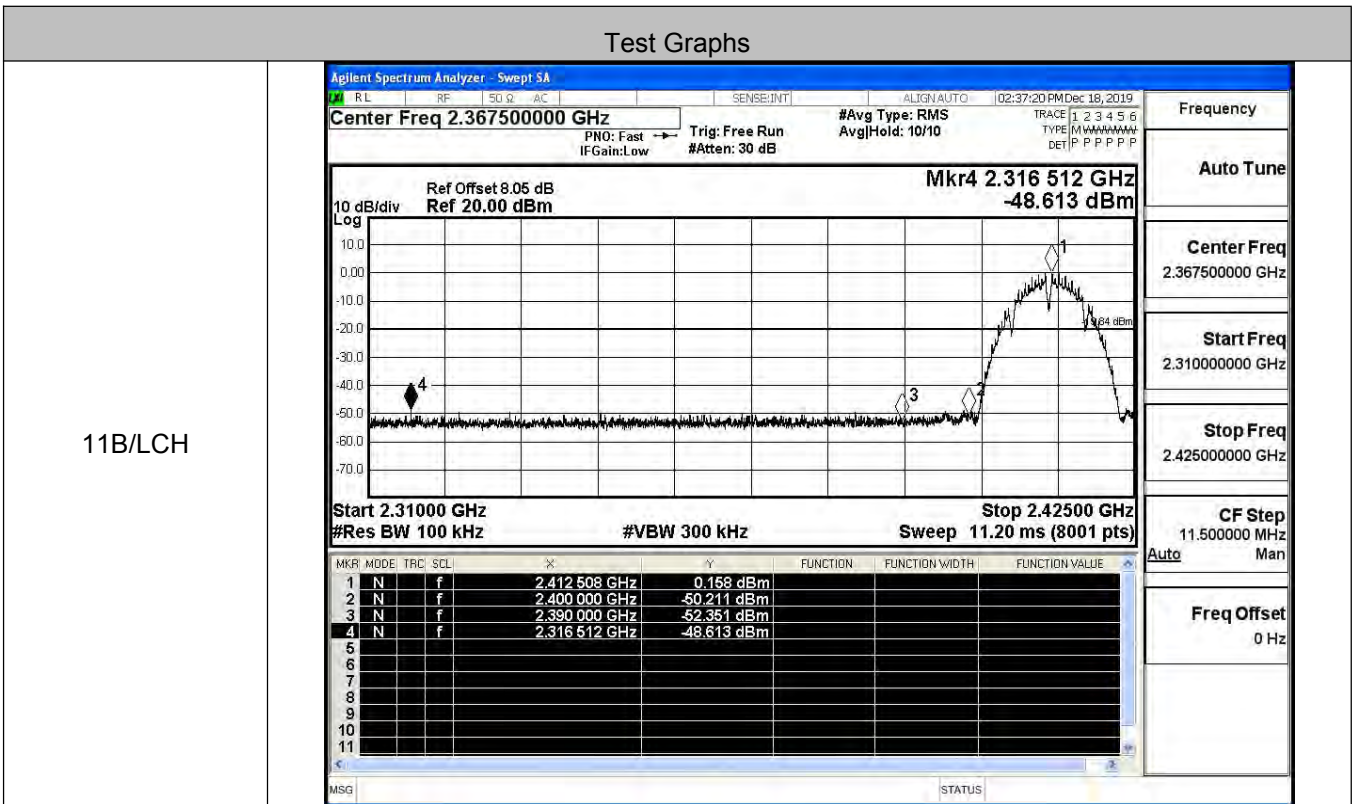


Puw/11N20
SISO/HCH

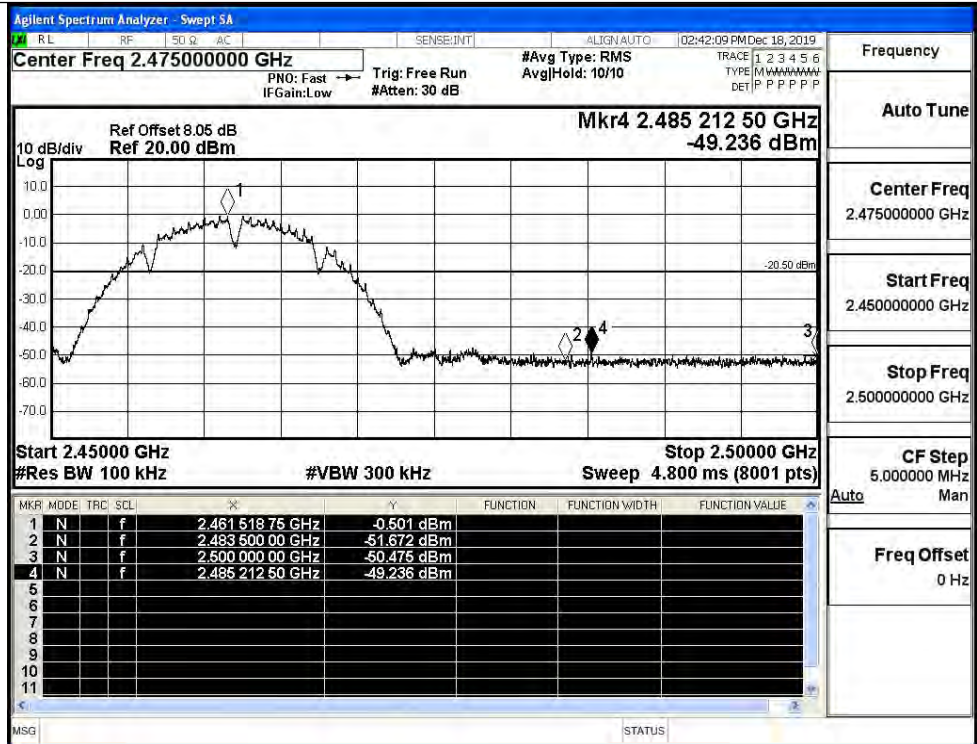


C.6 Band-edge for RF Conducted Emissions

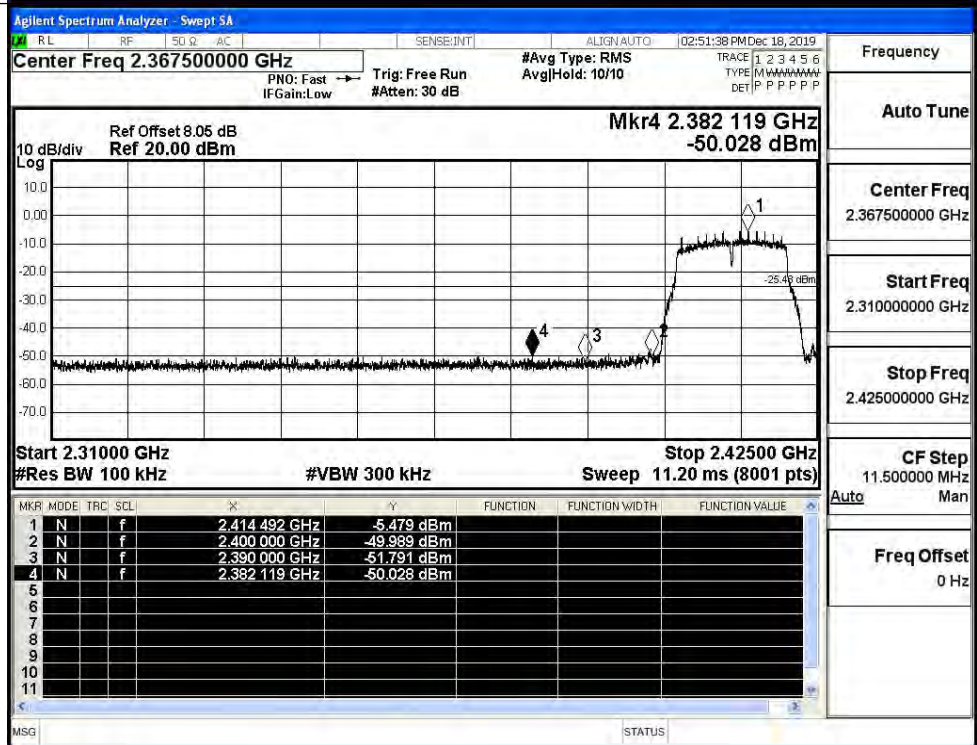
| Mode | Channel | Carrier Power[dBm] | Max.Spurious Level [dBm] | Limit [dBm] | Verdict |
|-----------|---------|--------------------|--------------------------|-------------|---------|
| 11B | LCH | 0.158 | -48.613 | -19.84 | PASS |
| | HCH | -0.501 | -49.236 | -20.5 | PASS |
| 11G | LCH | -5.479 | -50.028 | -25.48 | PASS |
| | HCH | -4.394 | -49.676 | -24.39 | PASS |
| 11N20SISO | LCH | -6.882 | -49.359 | -26.88 | PASS |
| | HCH | -4.935 | -49.635 | -24.94 | PASS |



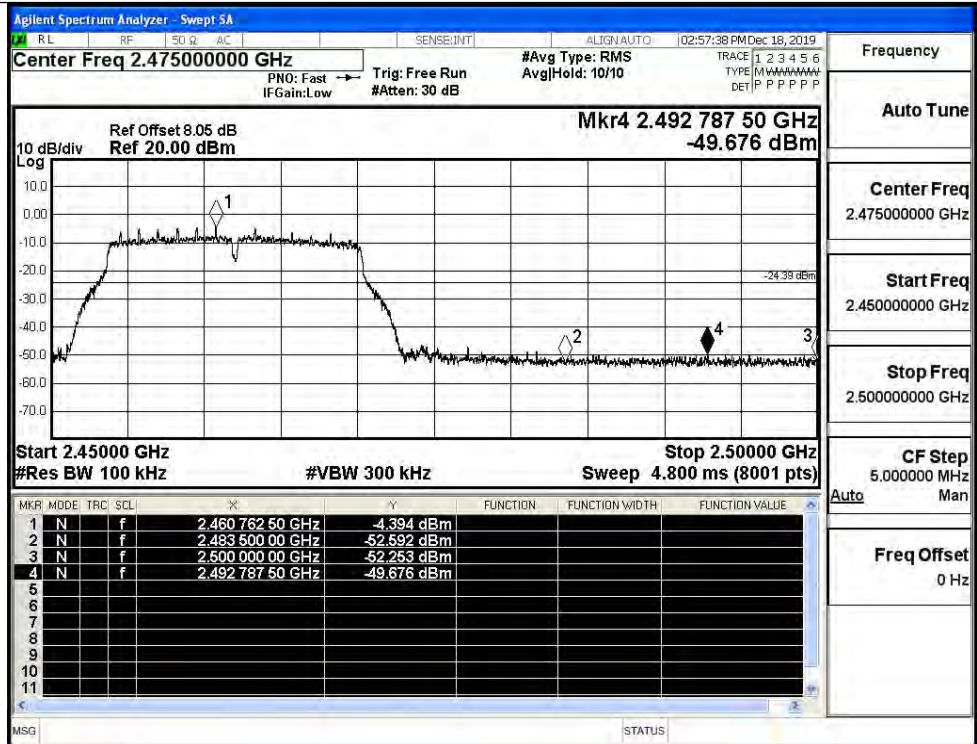
11B/HCH



11G/LCH

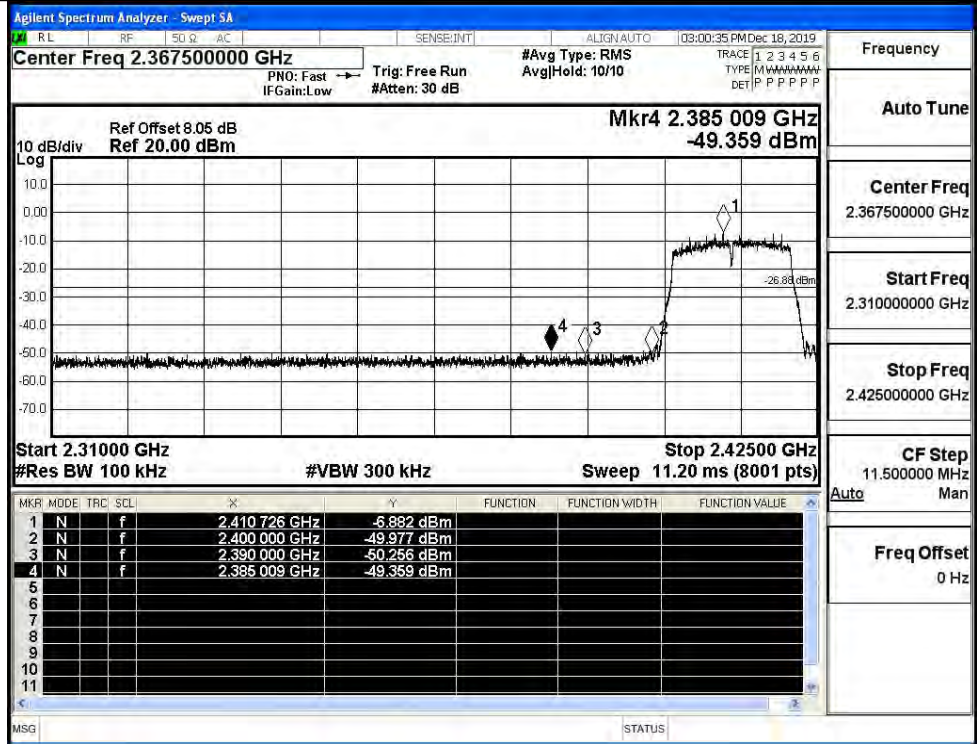


11G/HCH



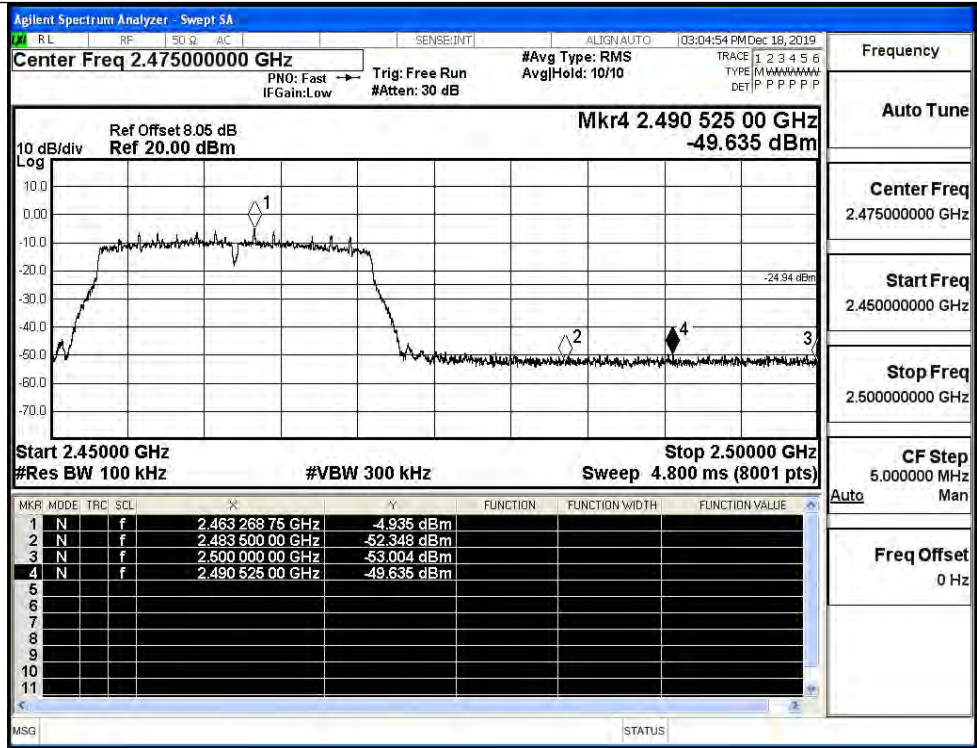
| | |
|-------------|----------------|
| Frequency | |
| Auto Tune | |
| Center Freq | 2.47500000 GHz |
| Start Freq | 2.45000000 GHz |
| Stop Freq | 2.50000000 GHz |
| CF Step | 5.000000 MHz |
| Freq Offset | 0 Hz |

11N20SISO/LCH



| | |
|-------------|----------------|
| Frequency | |
| Auto Tune | |
| Center Freq | 2.36750000 GHz |
| Start Freq | 2.31000000 GHz |
| Stop Freq | 2.42500000 GHz |
| CF Step | 11.500000 MHz |
| Freq Offset | 0 Hz |

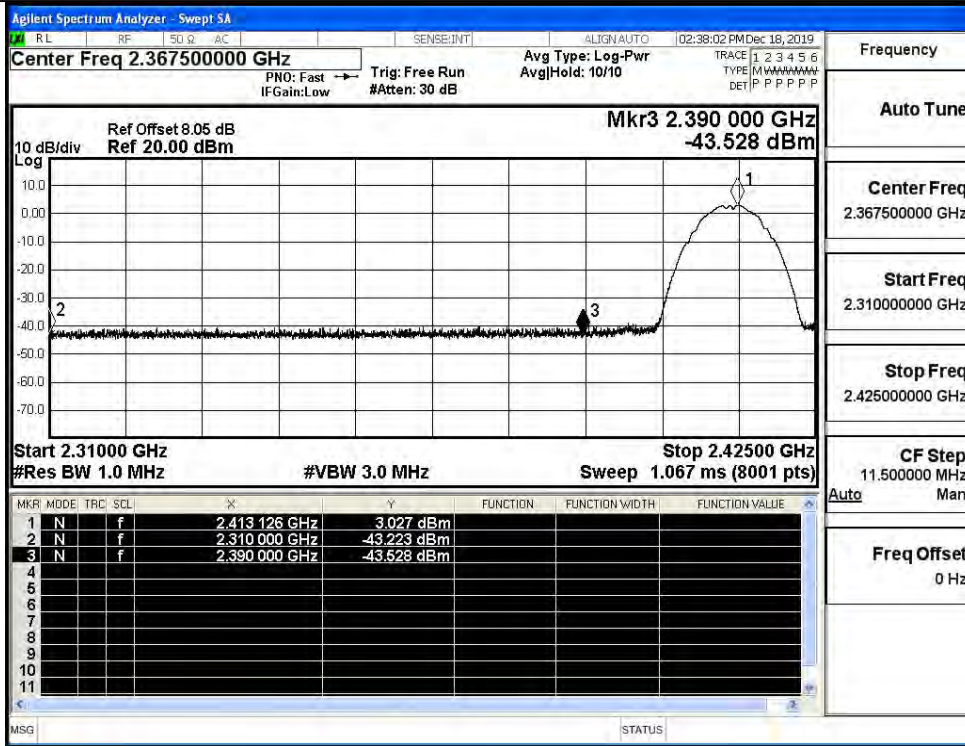
11N20SISO/HCH



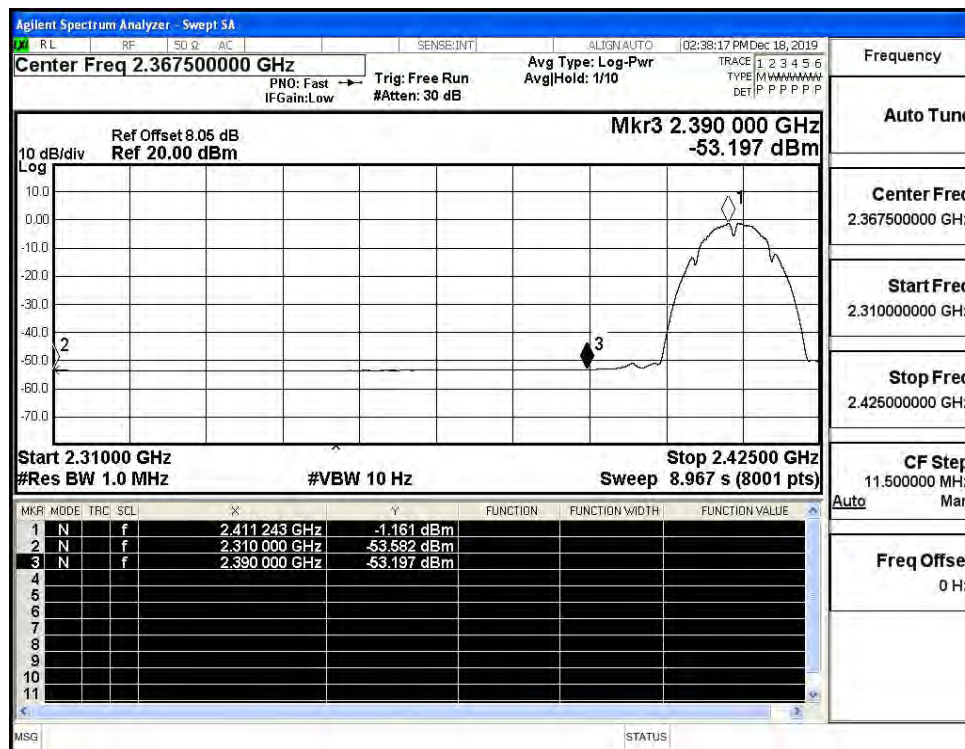
C.7 Restrict-band band-edge measurements

| Test Mode | Test Channel | Ant | Freq. | Power [dBm] | Gain | Ground Factor | E [dBuV/m] | Detector | Limit [dBu V/m] | Verdict |
|---------------|--------------|------|--------|-------------|------|---------------|------------|----------|-----------------|---------|
| 11B | 2412 | Ant1 | 2310.0 | -43.22 | 2.5 | 0 | 49.51 | PEAK | 74 | PASS |
| | 2412 | Ant1 | 2310.0 | -53.58 | 2.5 | 0 | 39.15 | AV | 54 | PASS |
| | 2412 | Ant1 | 2390.0 | -43.53 | 2.5 | 0 | 49.2 | PEAK | 74 | PASS |
| | 2412 | Ant1 | 2390.0 | -53.20 | 2.5 | 0 | 39.53 | AV | 54 | PASS |
| | 2462 | Ant1 | 2483.5 | -42.29 | 2.5 | 0 | 50.44 | PEAK | 74 | PASS |
| | 2462 | Ant1 | 2483.5 | -52.82 | 2.5 | 0 | 39.91 | AV | 54 | PASS |
| | 2462 | Ant1 | 2500.0 | -41.35 | 2.5 | 0 | 51.38 | PEAK | 74 | PASS |
| | 2462 | Ant1 | 2500.0 | -52.56 | 2.5 | 0 | 40.17 | AV | 54 | PASS |
| 11G | 2412 | Ant1 | 2310.0 | -42.57 | 2.5 | 0 | 50.16 | PEAK | 74 | PASS |
| | 2412 | Ant1 | 2310.0 | -53.58 | 2.5 | 0 | 39.15 | AV | 54 | PASS |
| | 2412 | Ant1 | 2390.0 | -43.31 | 2.5 | 0 | 49.42 | PEAK | 74 | PASS |
| | 2412 | Ant1 | 2390.0 | -53.11 | 2.5 | 0 | 39.62 | AV | 54 | PASS |
| | 2462 | Ant1 | 2483.5 | -41.93 | 2.5 | 0 | 50.8 | PEAK | 74 | PASS |
| | 2462 | Ant1 | 2483.5 | -52.60 | 2.5 | 0 | 40.13 | AV | 54 | PASS |
| | 2462 | Ant1 | 2500.0 | -42.53 | 2.5 | 0 | 50.2 | PEAK | 74 | PASS |
| | 2462 | Ant1 | 2500.0 | -52.54 | 2.5 | 0 | 40.19 | AV | 54 | PASS |
| 11N20 SISO | 2412 | Ant1 | 2310.0 | -43.77 | 2.5 | 0 | 48.96 | PEAK | 74 | PASS |
| | 2412 | Ant1 | 2310.0 | -53.64 | 2.5 | 0 | 39.09 | AV | 54 | PASS |
| | 2412 | Ant1 | 2390.0 | -40.65 | 2.5 | 0 | 52.08 | PEAK | 74 | PASS |
| | 2412 | Ant1 | 2390.0 | -53.11 | 2.5 | 0 | 39.62 | AV | 54 | PASS |
| | 2462 | Ant1 | 2483.5 | -42.26 | 2.5 | 0 | 50.47 | PEAK | 74 | PASS |
| | 2462 | Ant1 | 2483.5 | -52.67 | 2.5 | 0 | 40.06 | AV | 54 | PASS |
| | 2462 | Ant1 | 2500.0 | -42.68 | 2.5 | 0 | 50.05 | PEAK | 74 | PASS |
| | 2462 | Ant1 | 2500.0 | -52.53 | 2.5 | 0 | 40.20 | AV | 54 | PASS |

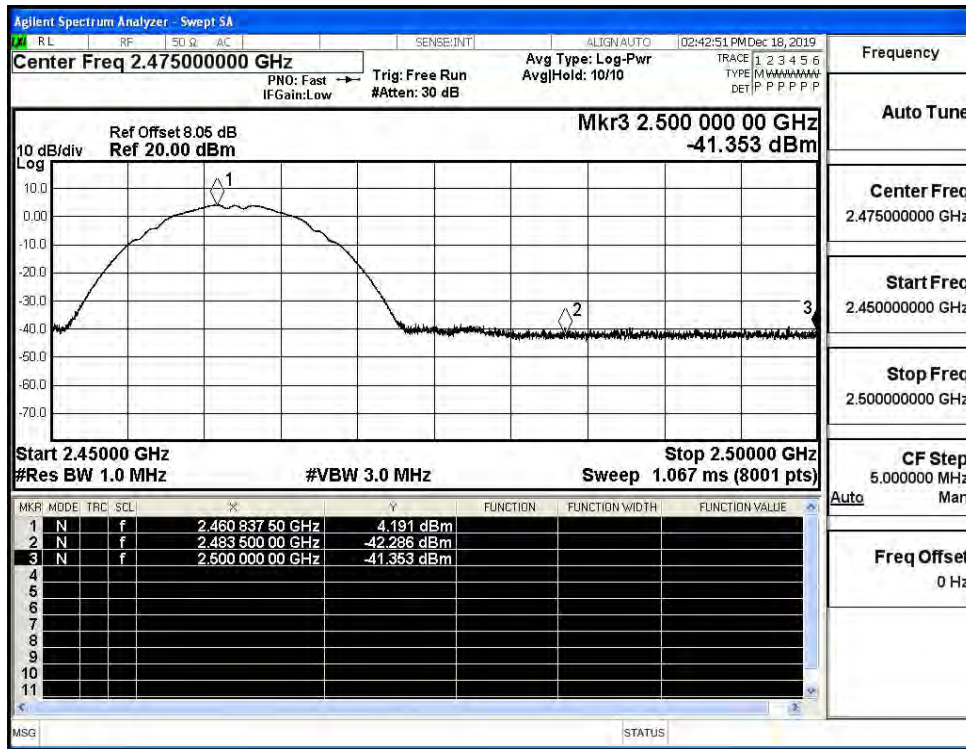
Restrict-band band-edge measurements_11B_2412_Ant1_PEAK



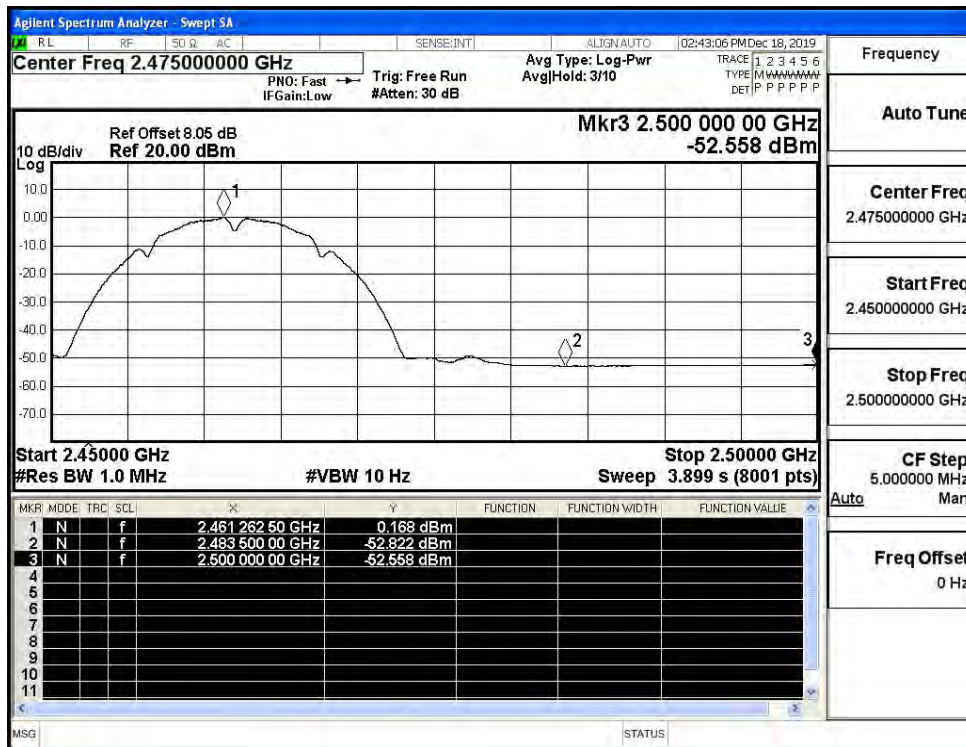
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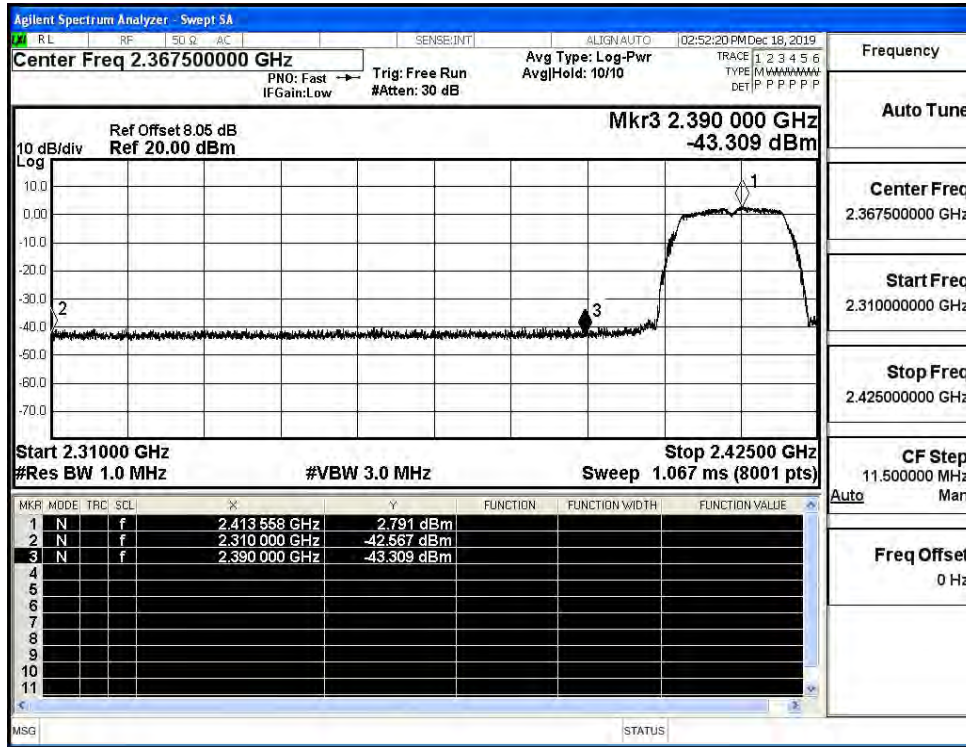
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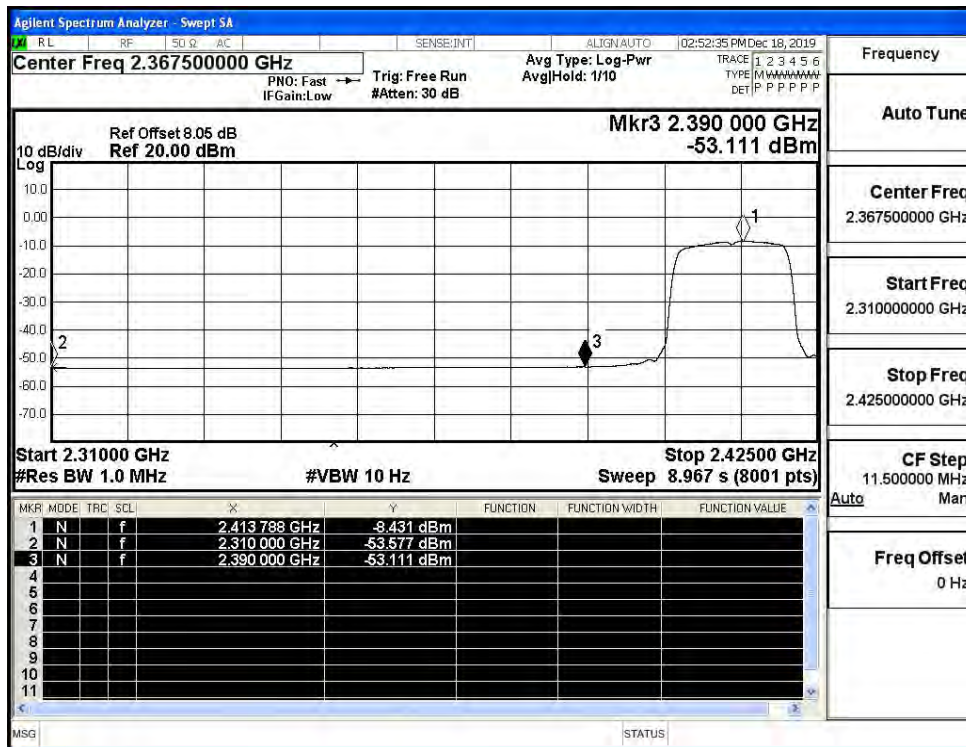
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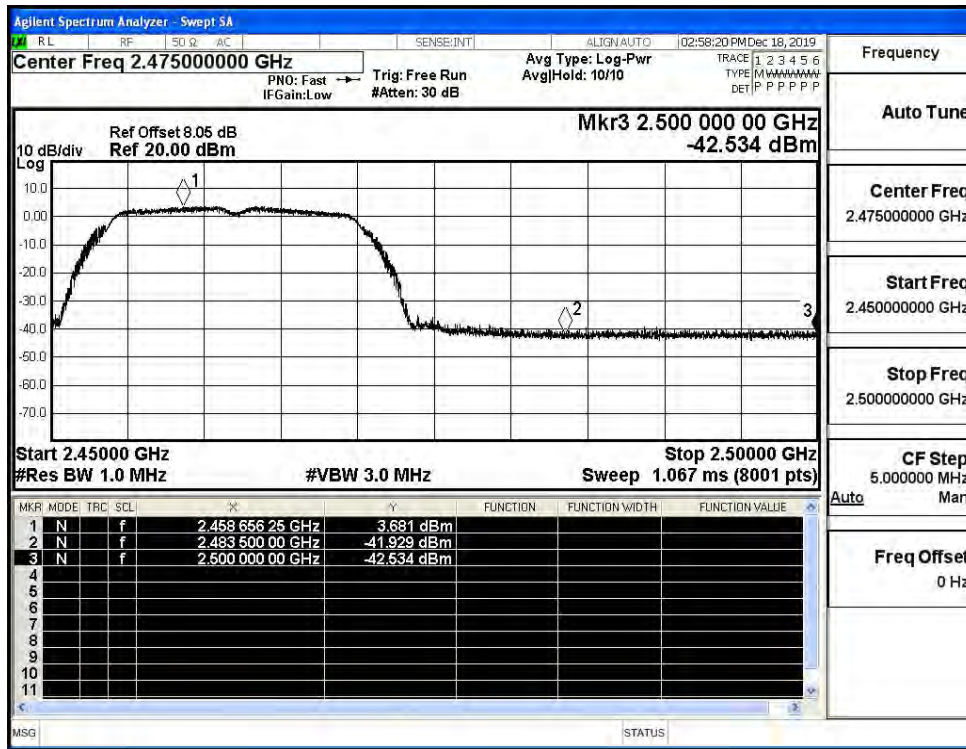
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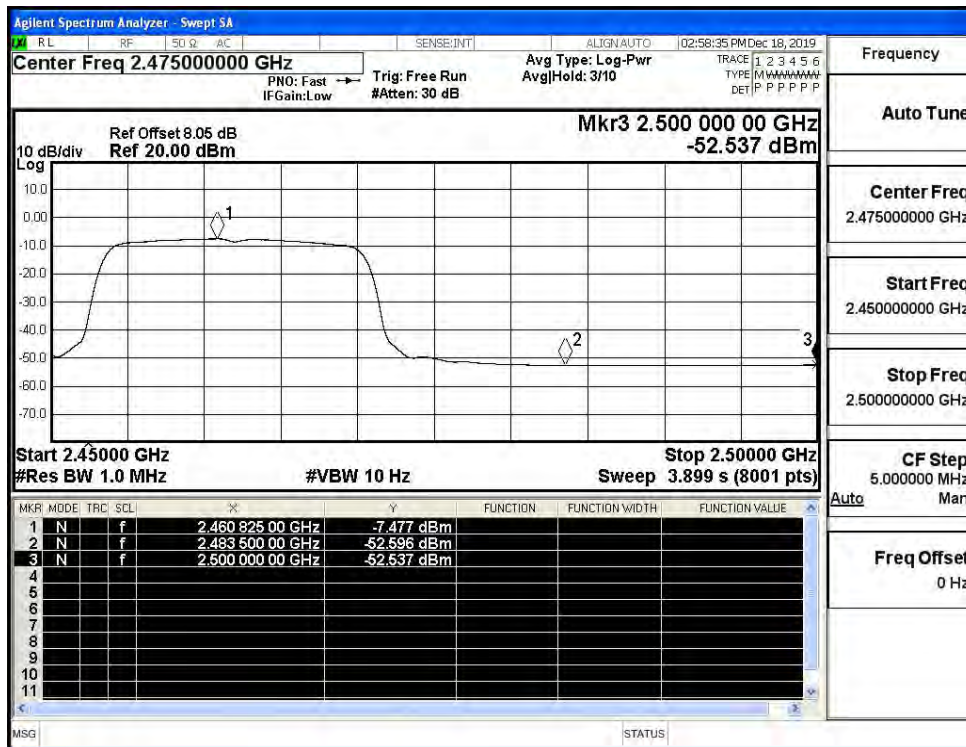
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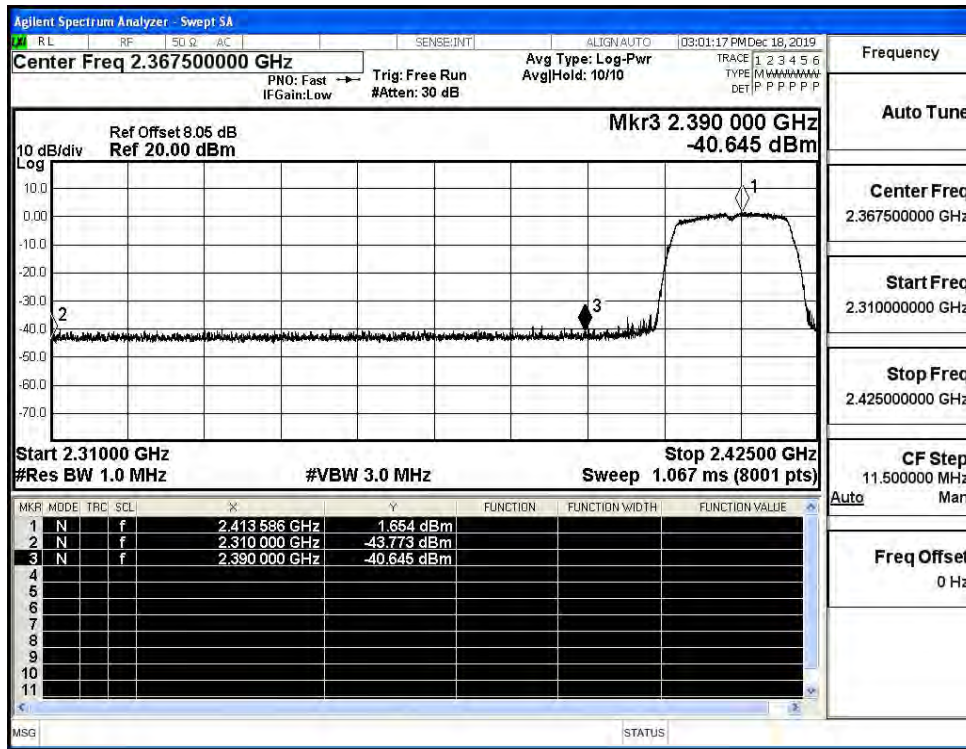
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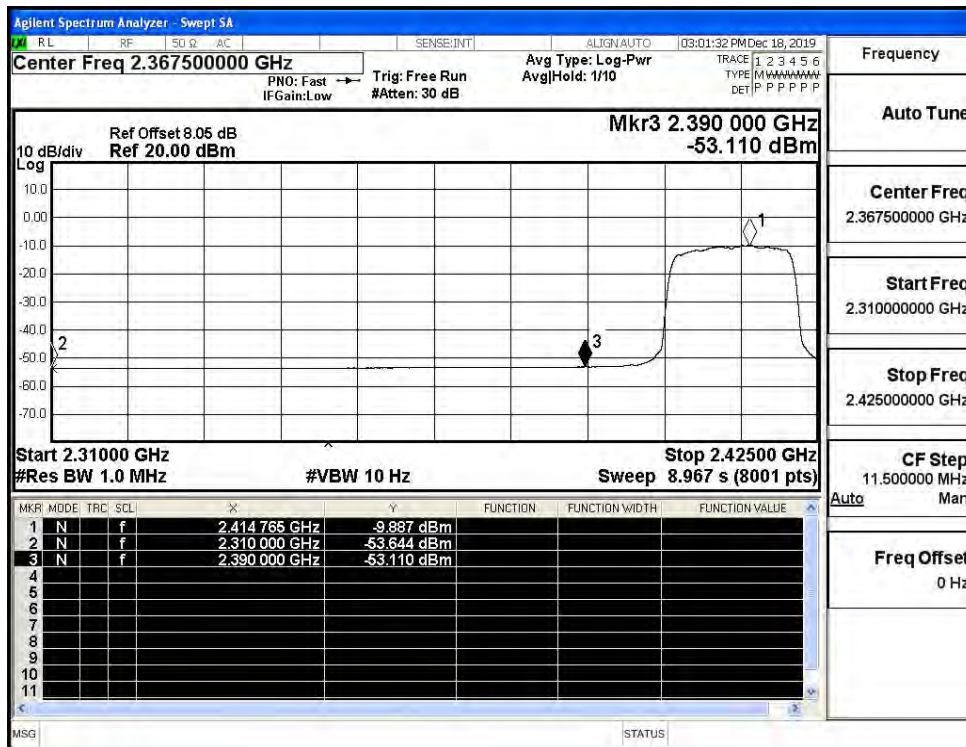
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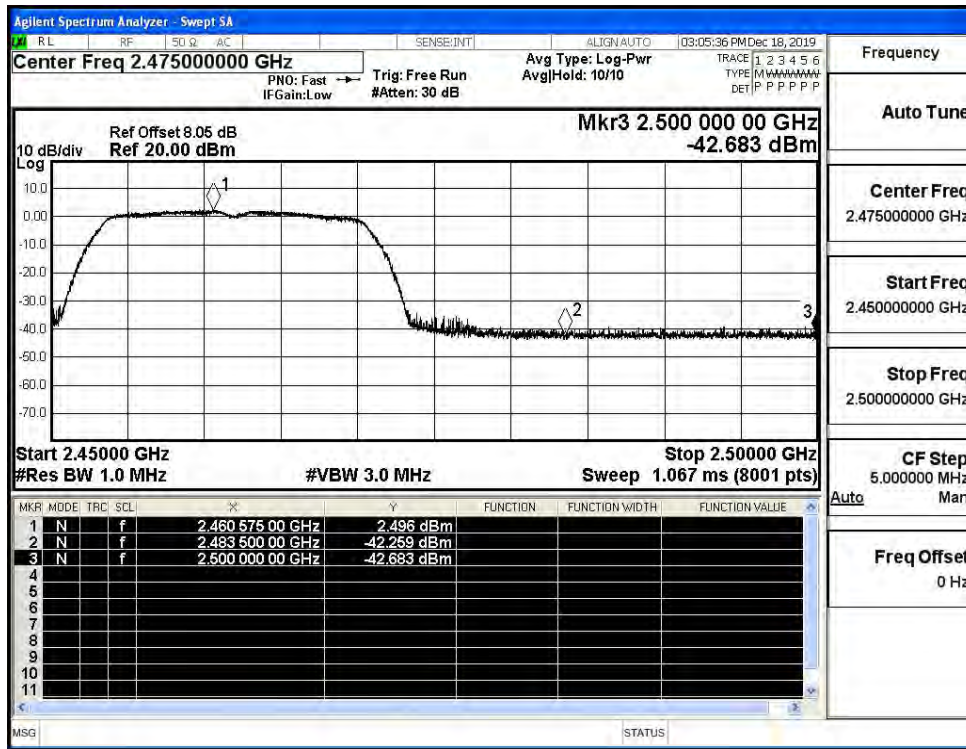
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Restrict-band band-edge measurements_11N20SISO_2412_Ant1_AV



Restrict-band band-edge measurements_11N20SISO_2462_Ant1_PEAK



Restrict-band band-edge measurements_11N20SISO_2462_Ant1_AV

