

### 3.4 In-Band Emission Measurement

#### 3.4.1 Test Limit

Suppressed by 20 dB at 1 MHz outside of the channel edge. (The channel edge is defined as the -26dB point on either side of the carrier center frequency.)

Suppressed by 28 dB at one channel bandwidth from the channel center.

Suppressed by 40 dB at one- and one-half times the channel bandwidth from the channel center.

#### 3.4.2 Test Procedure

| Test Method                         |                              |
|-------------------------------------|------------------------------|
| ●Conducted Measurement              | ○Radiated Measurement        |
| Test Channels                       |                              |
| ●Lowest, Middle and Highest Channel | ○ Lowest and Highest Channel |
| Environmental conditions            |                              |
| ●Normal                             | ○Normal and Extreme          |
| Note:●:Test    ○:No Test            |                              |

The EUT was directly connected to the tonscend test system

#### 3.4.3 Test Setting

##### Emissions Mask Reference Level Measurement

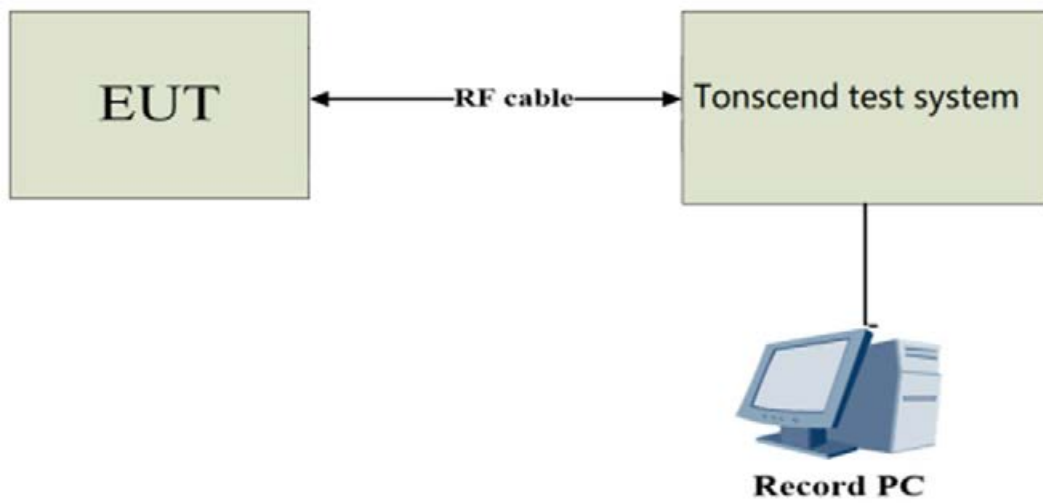
1. Set the span to encompass the entire 26 dB EBW of the signal.
2. Set RBW = same RBW used for 26 dB EBW measurement.
3. Set VBW  $\geq 3 \times$  RBW.
4. Number of points in sweep  $\geq [2 \times \text{span} / \text{RBW}]$ .
5. Sweep time = auto.
6. Detector = RMS.
7. Trace average at least 100 traces in power averaging (rms) mode.
8. Use the peak search function on the instrument to find the peak of the spectrum.

##### In-Band Emission

1. Using the measuring equipment limit line function, develop the emissions mask based on rule.
2. Adjust the span to encompass the entire mask as necessary.
3. Clear trace.
4. Trace average at least 100 traces in power averaging (rms) mode.

Adjust the reference level as necessary so that the crest of the channel touches the top of the emission mask

#### 3.4.4 Test Setup



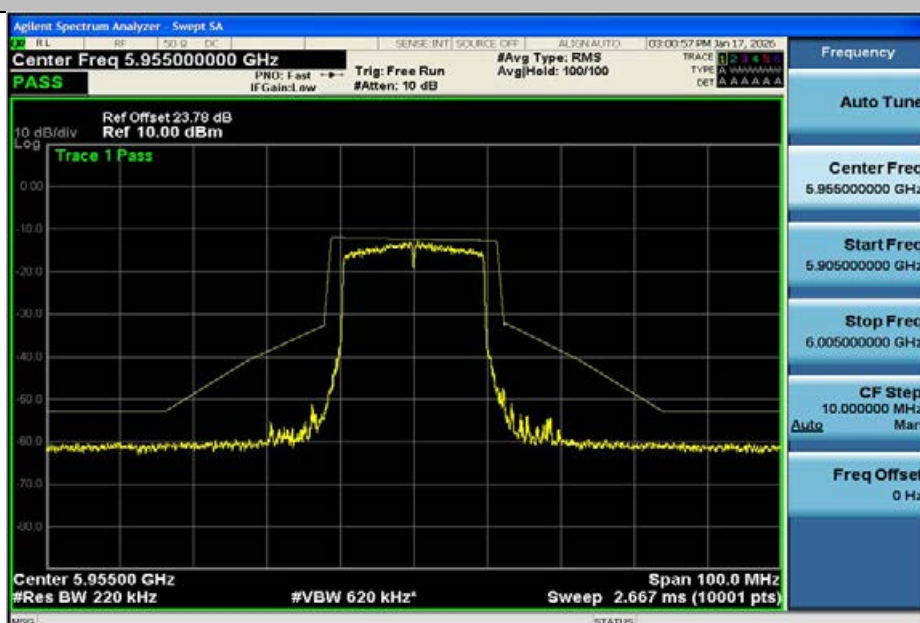
### 3.4.5 The Result

| Test Mode  | Antenna | Frequency[MHz] | Result         | Limit          | Verdict |
|------------|---------|----------------|----------------|----------------|---------|
| 11AX20MIMO | Ant1    | 5955           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant2    | 5955           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant1    | 6175           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant2    | 6175           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant1    | 6415           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant2    | 6415           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant1    | 6435           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant2    | 6435           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant1    | 6475           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant2    | 6475           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant1    | 6515           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant2    | 6515           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant1    | 6535           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant2    | 6535           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant1    | 6695           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant2    | 6695           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant1    | 6855           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant2    | 6855           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant1    | 6875           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant2    | 6875           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant1    | 6895           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant2    | 6895           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant1    | 6995           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant2    | 6995           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant1    | 7115           | See test graph | See test graph | PASS    |
| 11AX20MIMO | Ant2    | 7115           | See test graph | See test graph | PASS    |
| 11AX40MIMO | Ant1    | 5965           | See test graph | See test graph | PASS    |
| 11AX40MIMO | Ant2    | 5965           | See test graph | See test graph | PASS    |
| 11AX40MIMO | Ant1    | 6165           | See test graph | See test graph | PASS    |
| 11AX40MIMO | Ant2    | 6165           | See test graph | See test graph | PASS    |
| 11AX40MIMO | Ant1    | 6405           | See test graph | See test graph | PASS    |
| 11AX40MIMO | Ant2    | 6405           | See test graph | See test graph | PASS    |
| 11AX40MIMO | Ant1    | 6445           | See test graph | See test graph | PASS    |
| 11AX40MIMO | Ant2    | 6445           | See test graph | See test graph | PASS    |
| 11AX40MIMO | Ant1    | 6485           | See test graph | See test graph | PASS    |
| 11AX40MIMO | Ant2    | 6485           | See test graph | See test graph | PASS    |
| 11AX40MIMO | Ant1    | 6525           | See test graph | See test graph | PASS    |
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| 11AX40MIMO | Ant2    | 6685           | See test graph | See test graph | PASS    |
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| 11AX40MIMO | Ant2    | 6845           | See test graph | See test graph | PASS    |

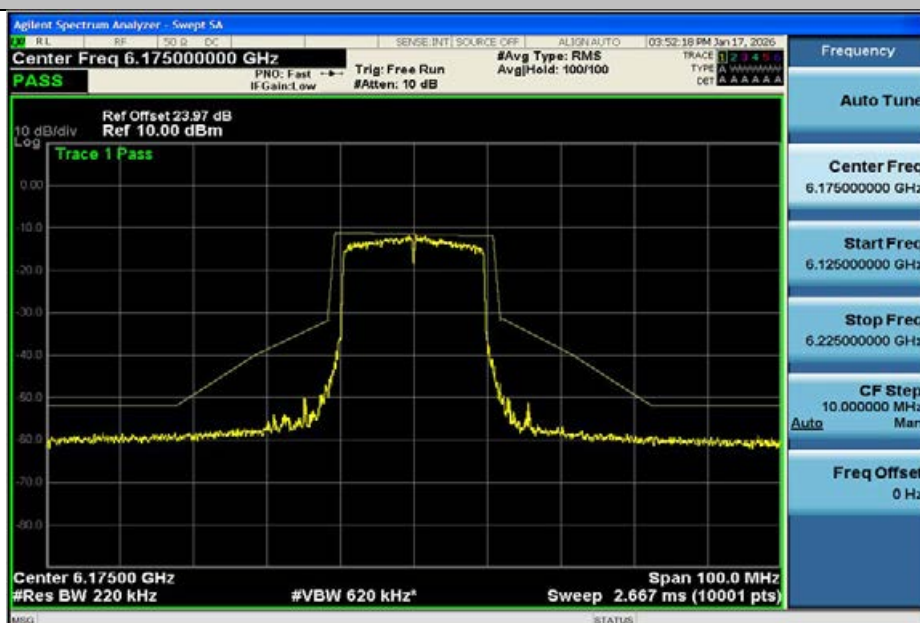
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|------------|------|------|----------------|----------------|------|
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| 11AX40MIMO | Ant2 | 7085 | See test graph | See test graph | PASS |
| 11AX80MIMO | Ant1 | 5985 | See test graph | See test graph | PASS |
| 11AX80MIMO | Ant2 | 5985 | See test graph | See test graph | PASS |
| 11AX80MIMO | Ant1 | 6145 | See test graph | See test graph | PASS |
| 11AX80MIMO | Ant2 | 6145 | See test graph | See test graph | PASS |
| 11AX80MIMO | Ant1 | 6385 | See test graph | See test graph | PASS |
| 11AX80MIMO | Ant2 | 6385 | See test graph | See test graph | PASS |
| 11AX80MIMO | Ant1 | 6465 | See test graph | See test graph | PASS |
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| 11AX80MIMO | Ant1 | 6705 | See test graph | See test graph | PASS |
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| 11AX80MIMO | Ant1 | 6865 | See test graph | See test graph | PASS |
| 11AX80MIMO | Ant2 | 6865 | See test graph | See test graph | PASS |
| 11AX80MIMO | Ant1 | 6945 | See test graph | See test graph | PASS |
| 11AX80MIMO | Ant2 | 6945 | See test graph | See test graph | PASS |
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| 11AX80MIMO | Ant2 | 7025 | See test graph | See test graph | PASS |



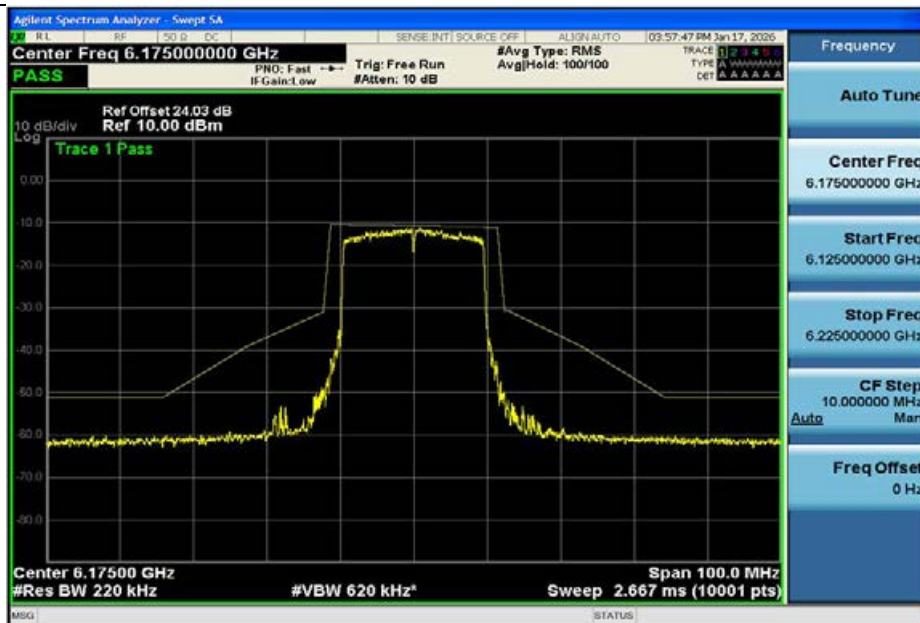
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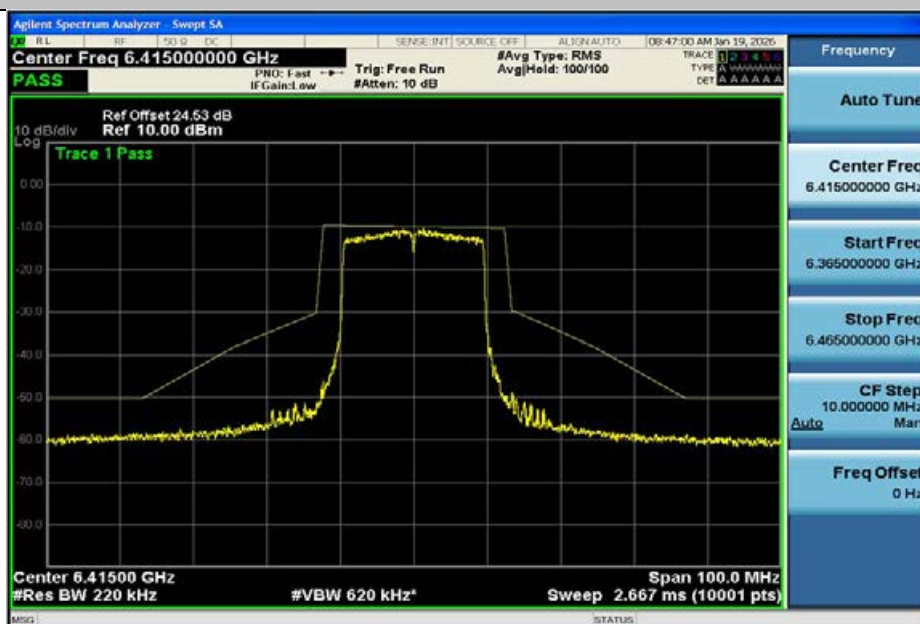
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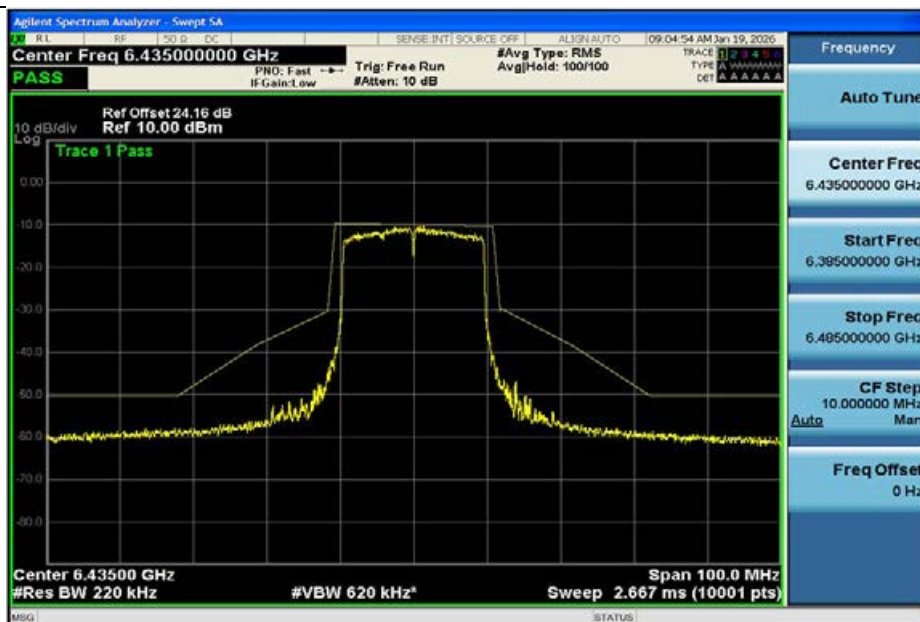
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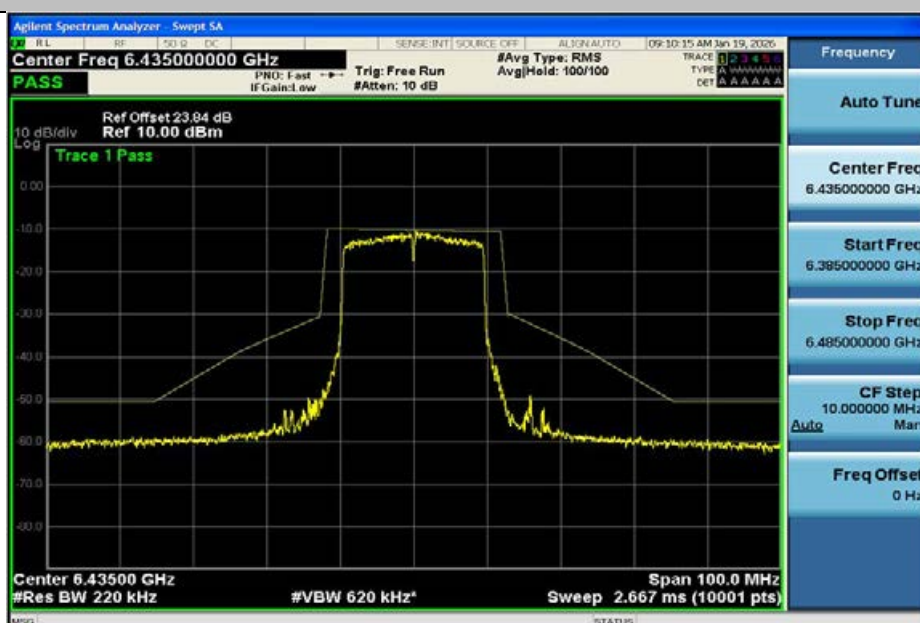
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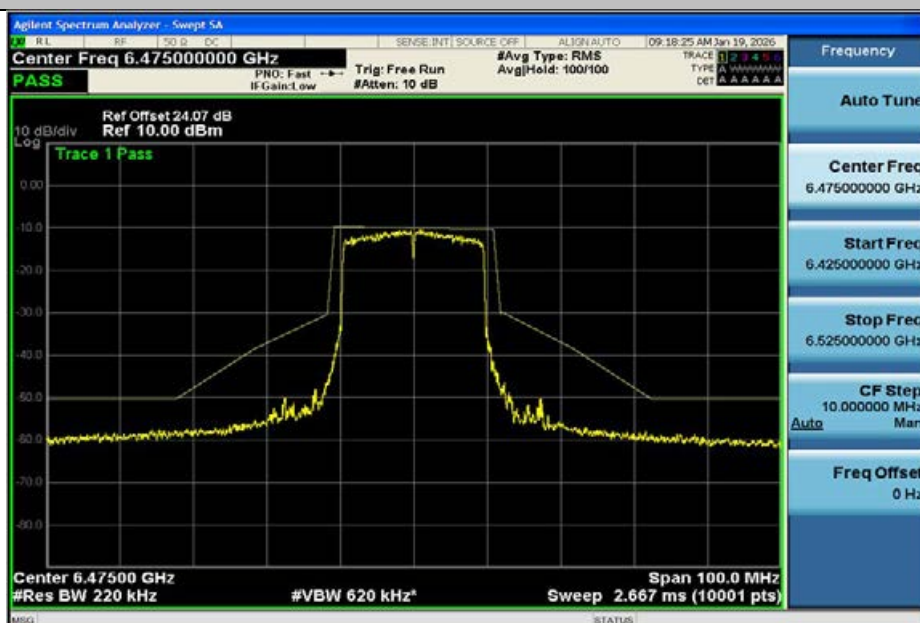
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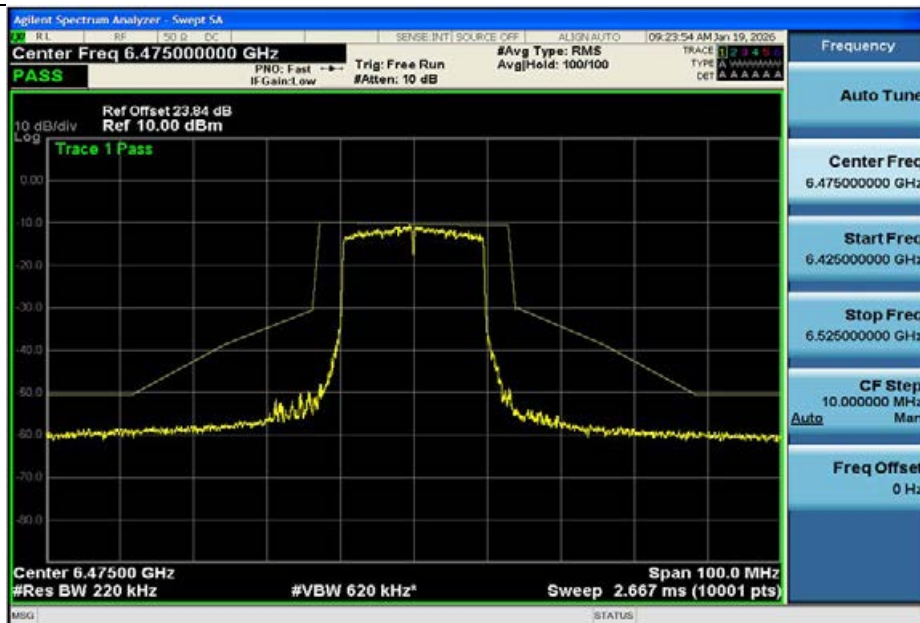
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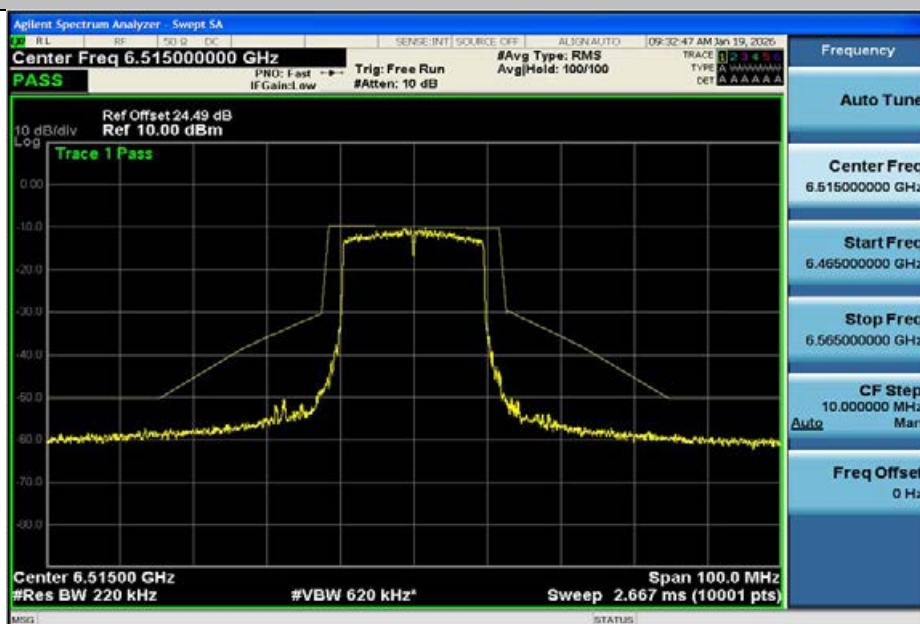
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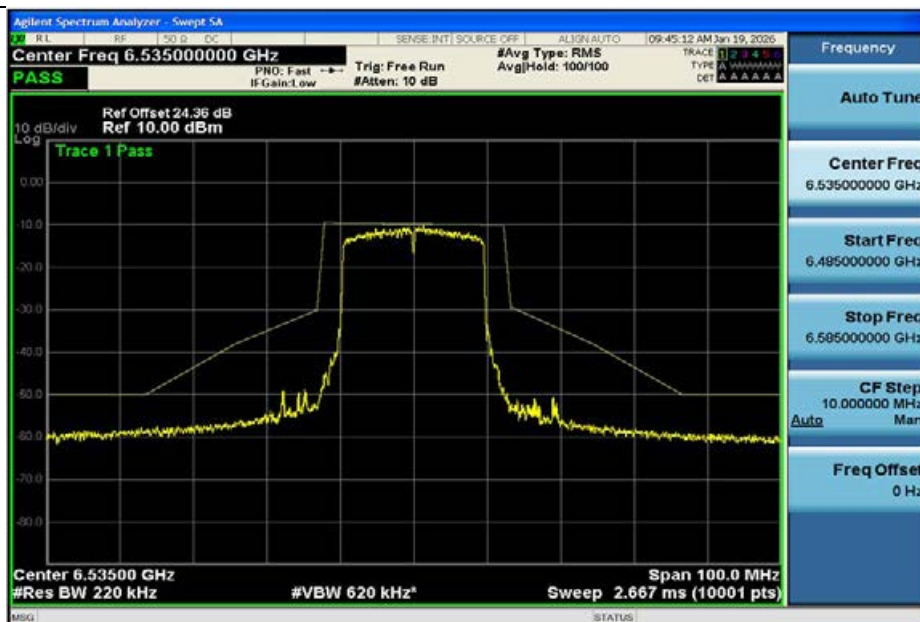
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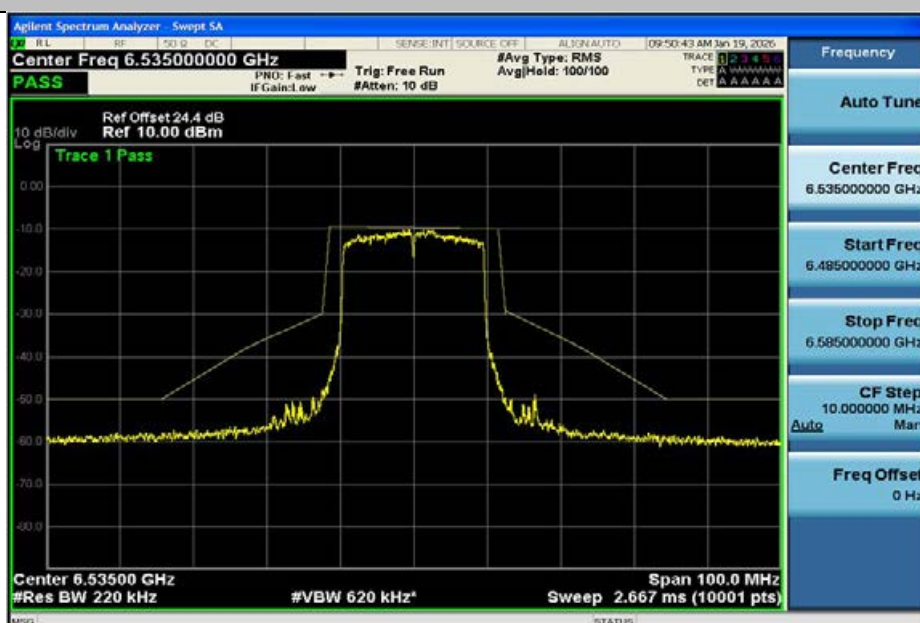
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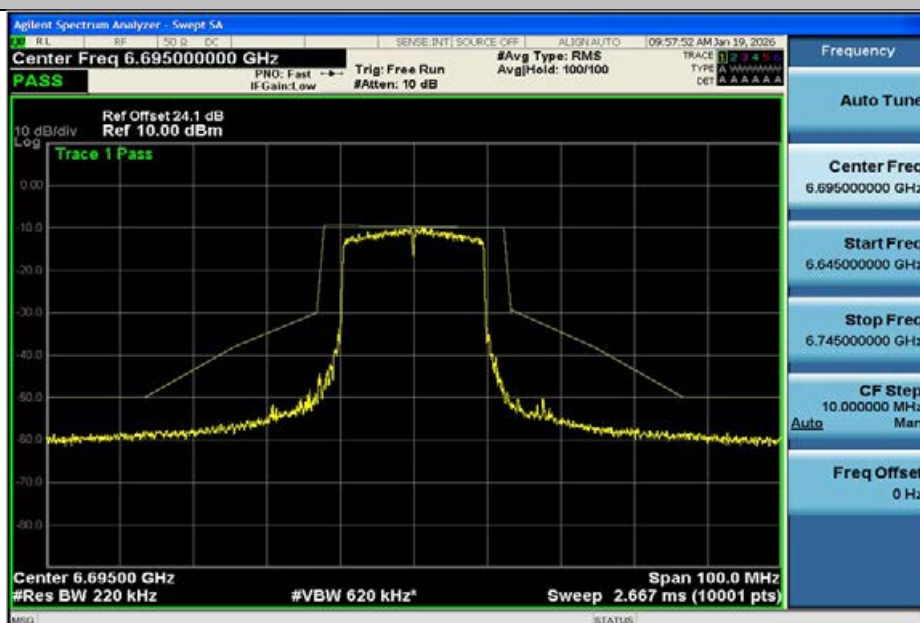
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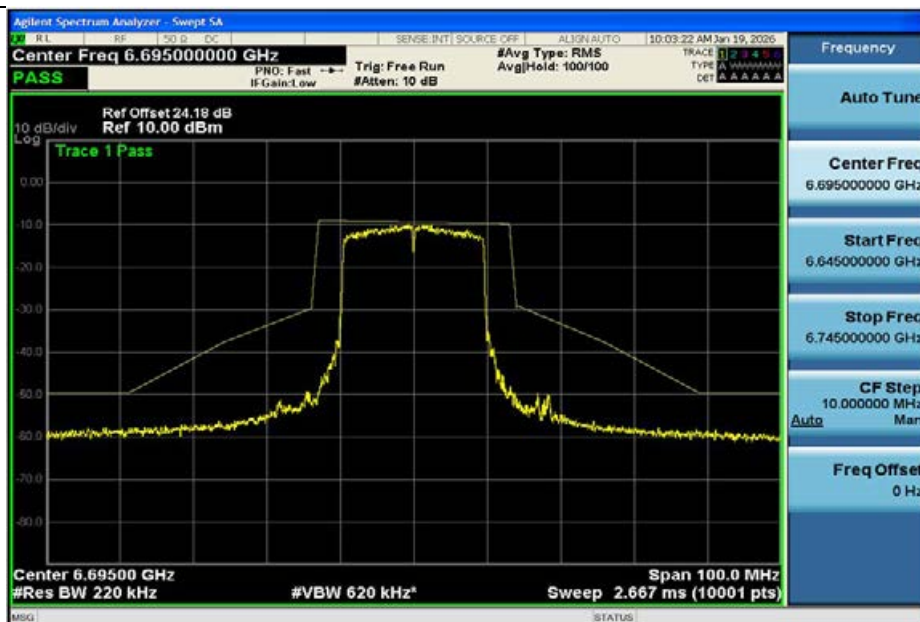
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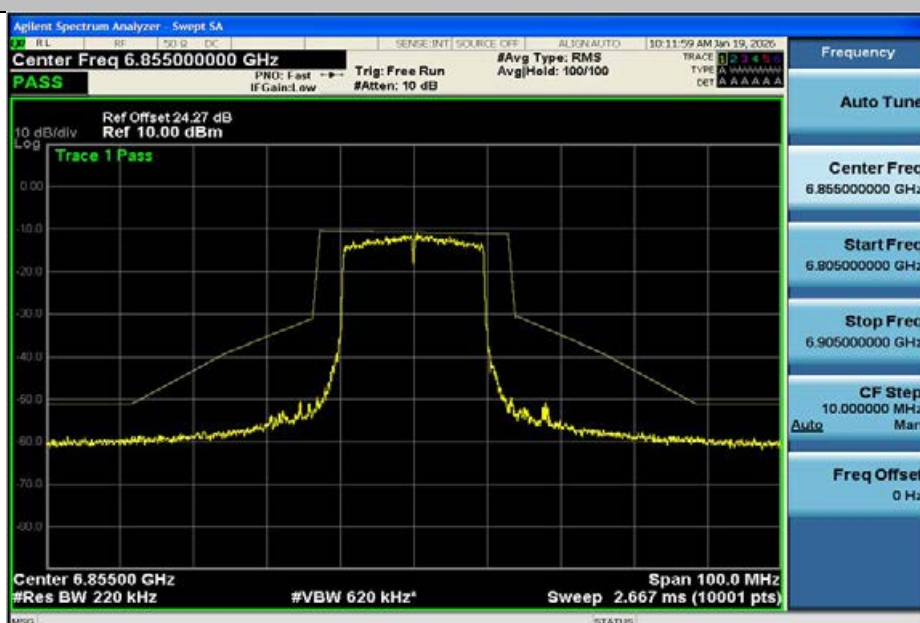
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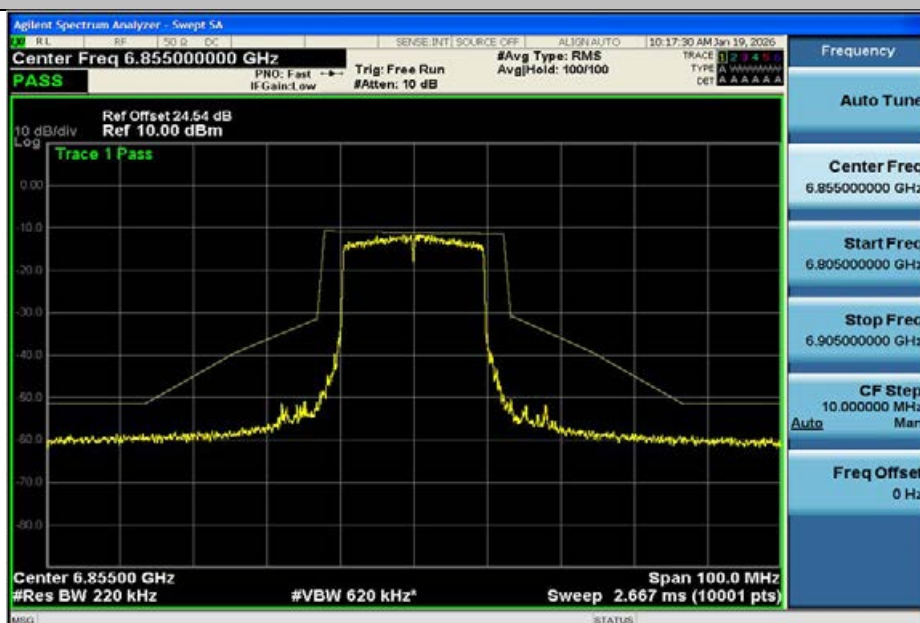
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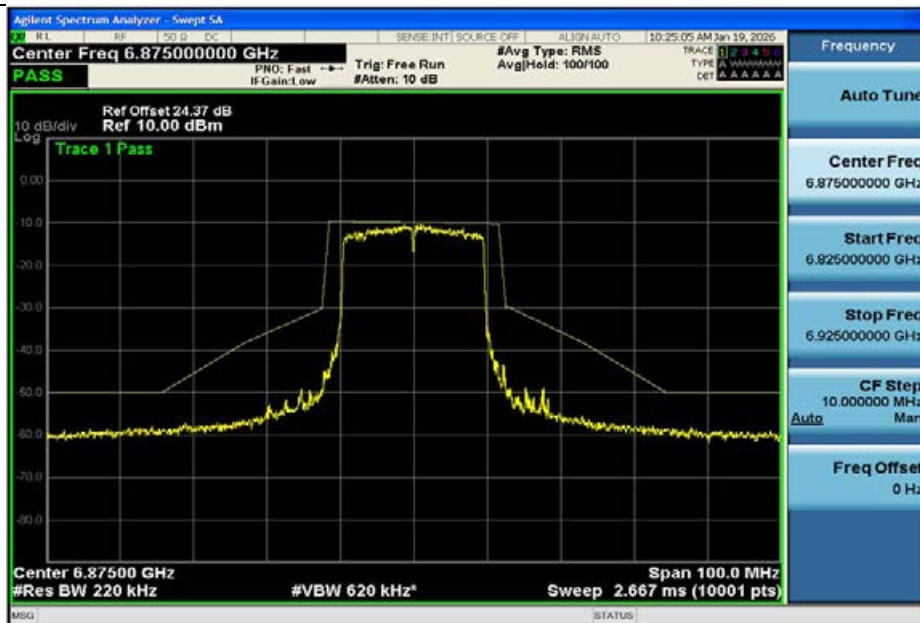
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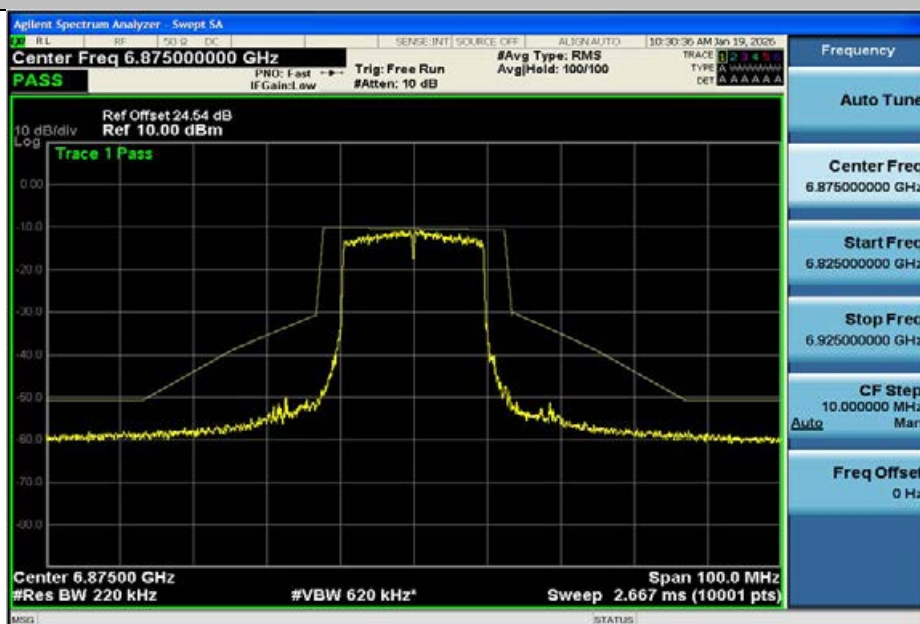
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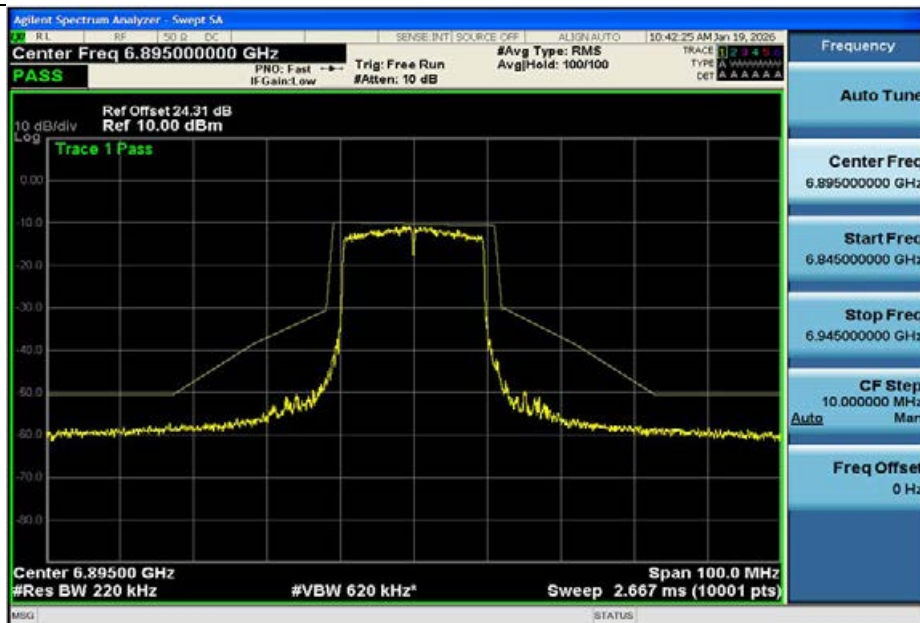
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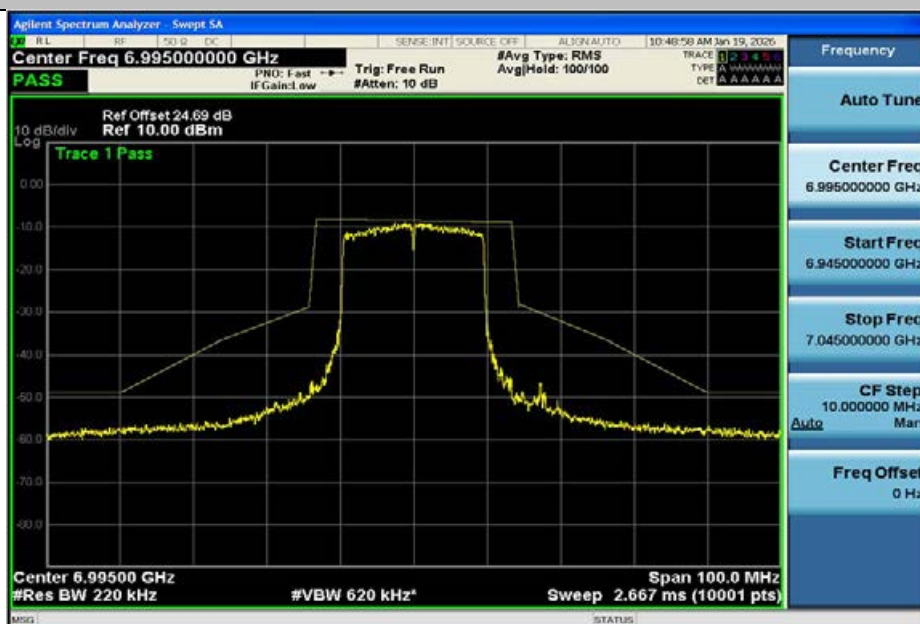
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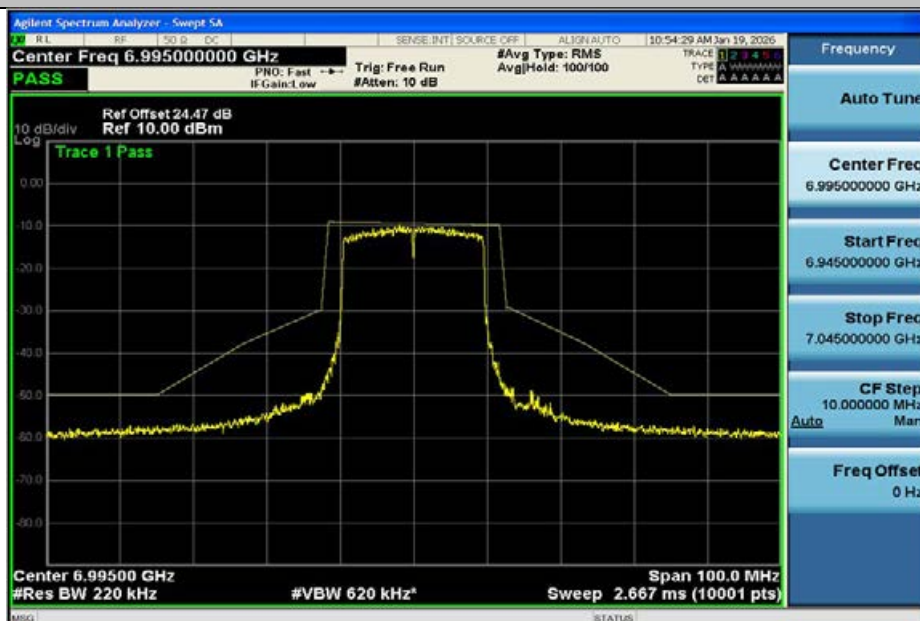
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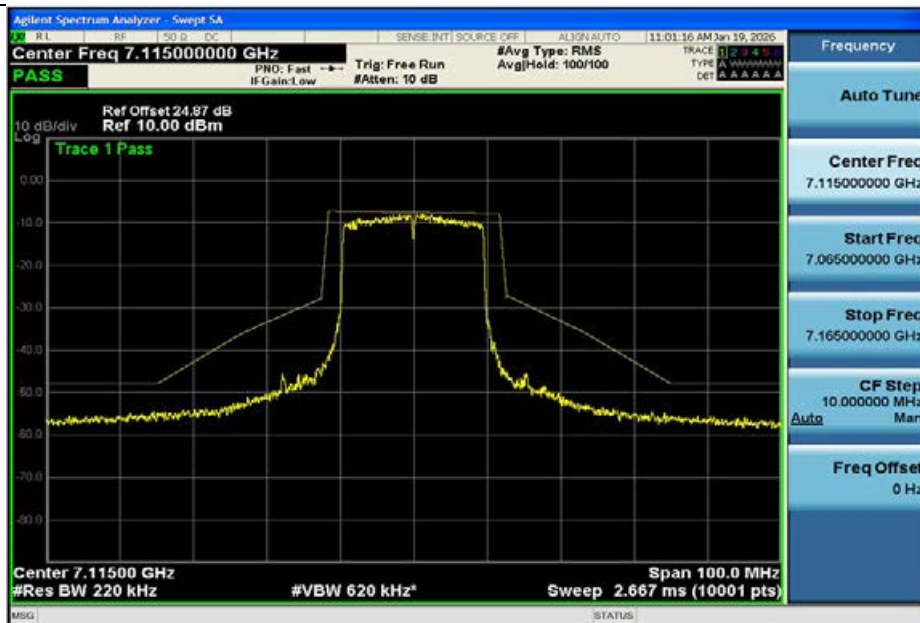
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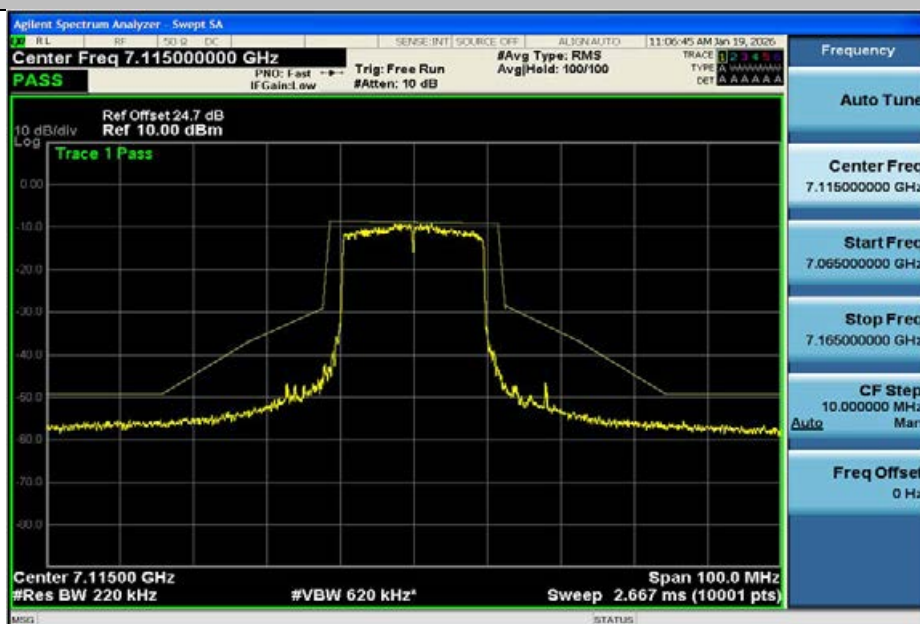
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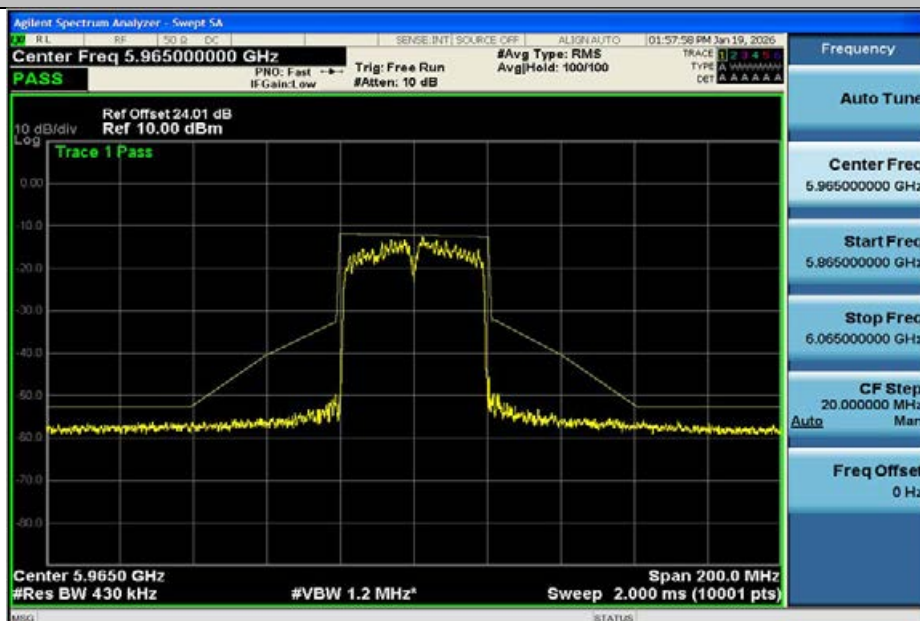
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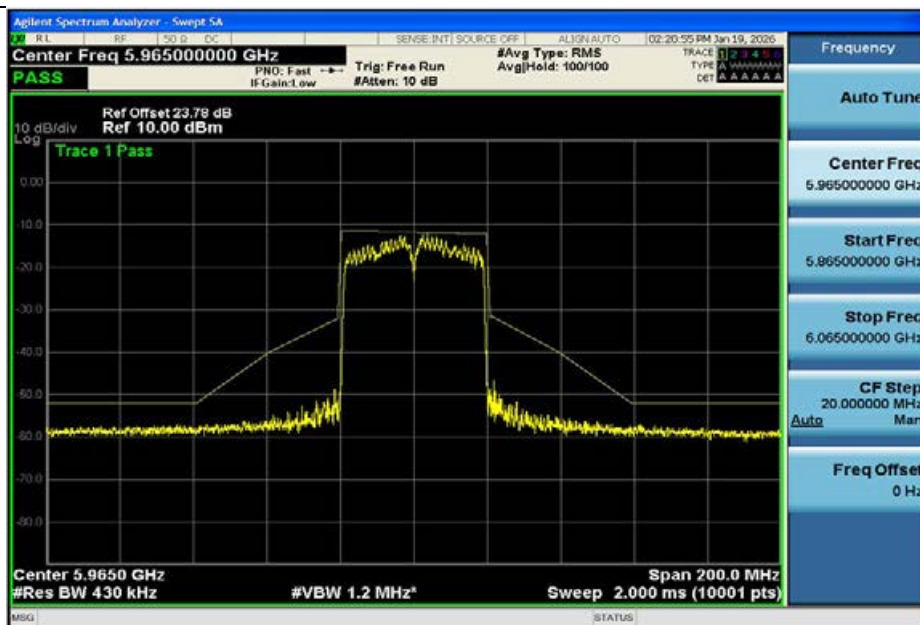
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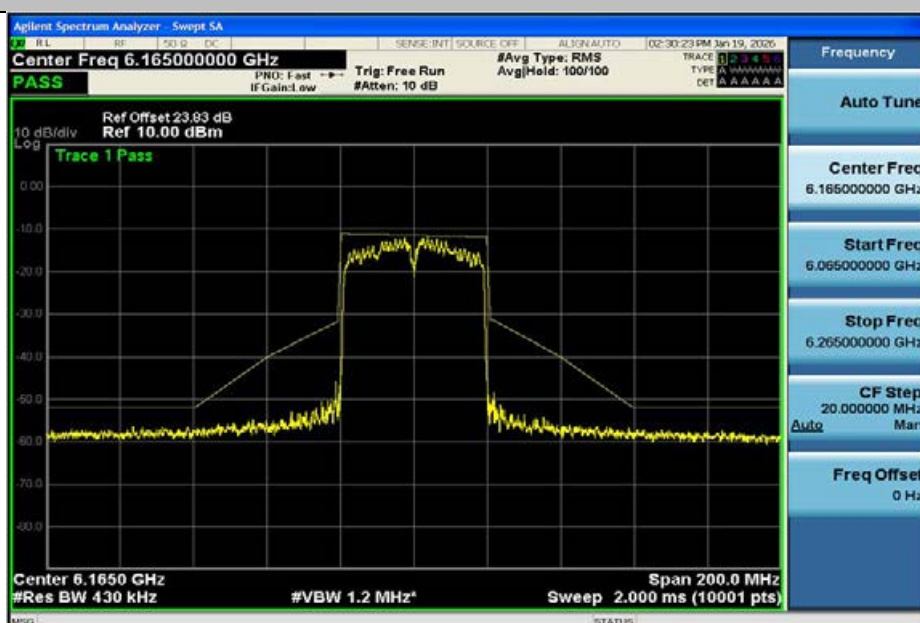
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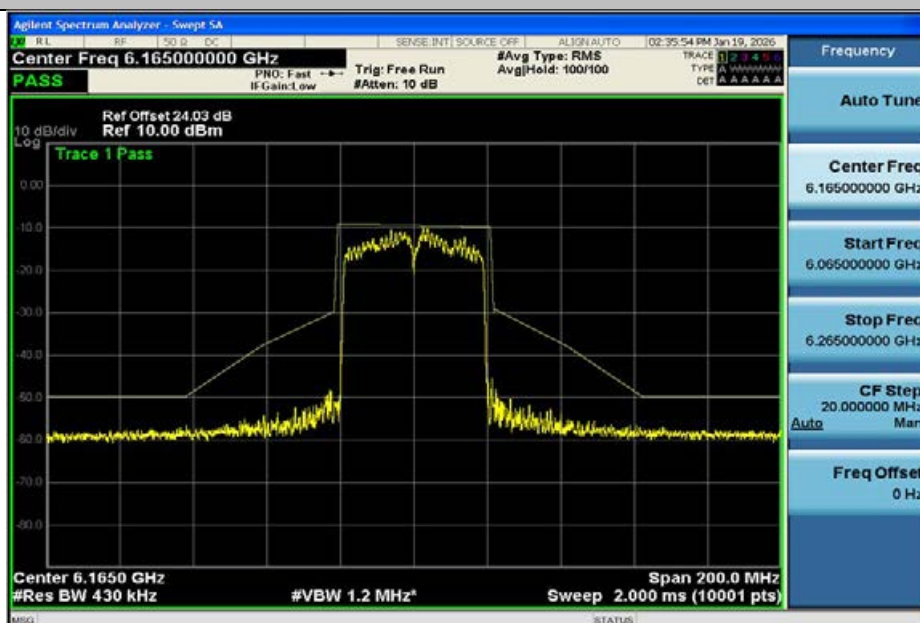
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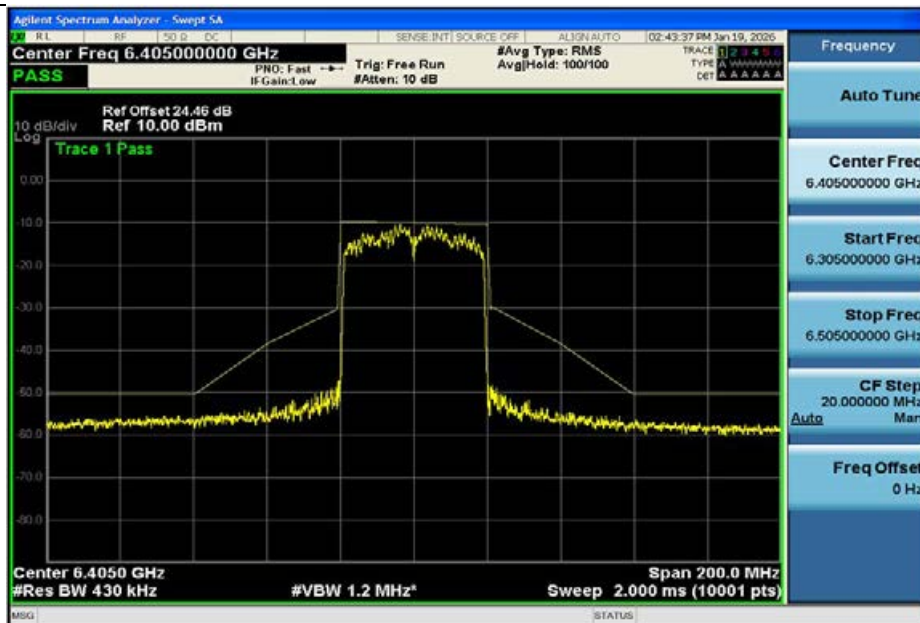
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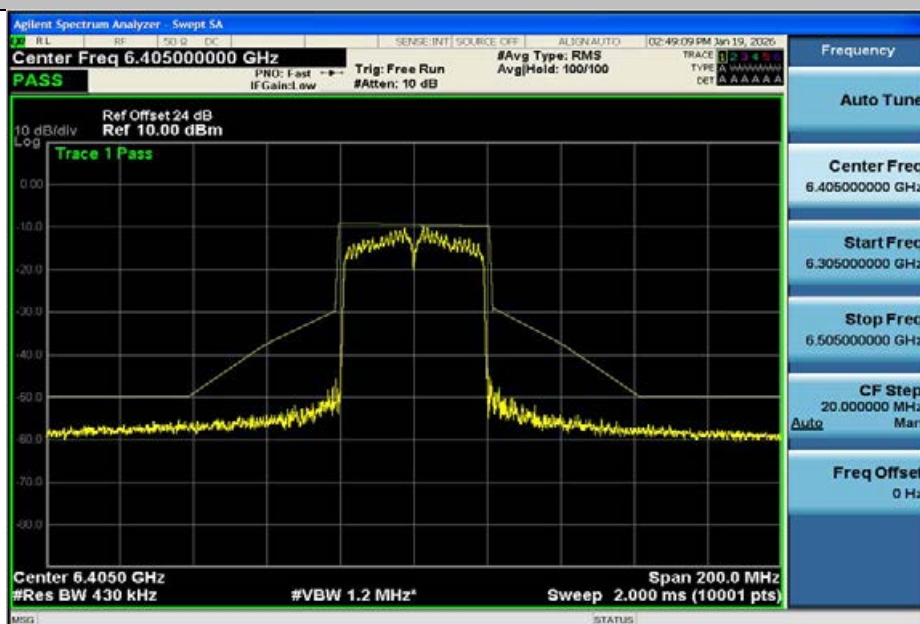
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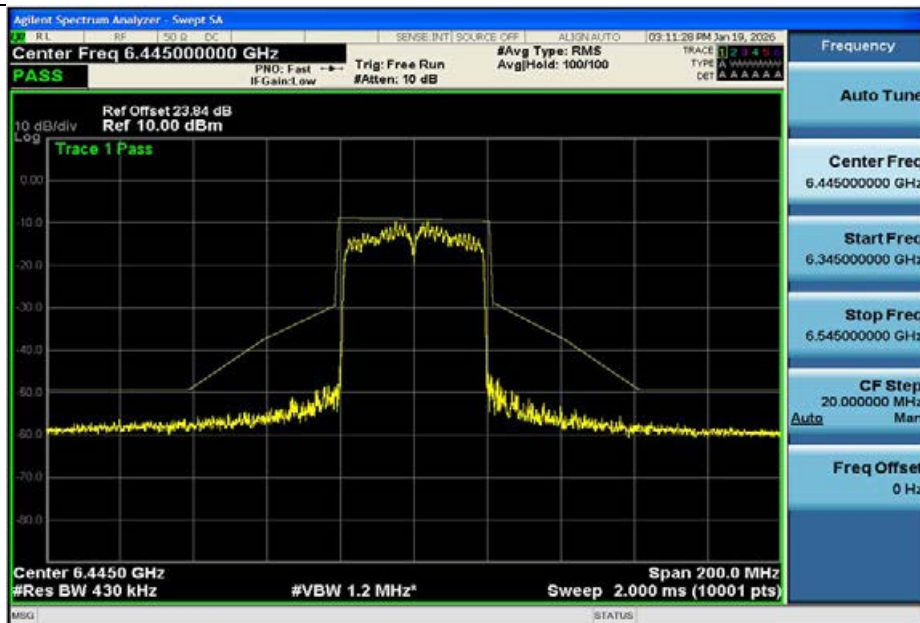
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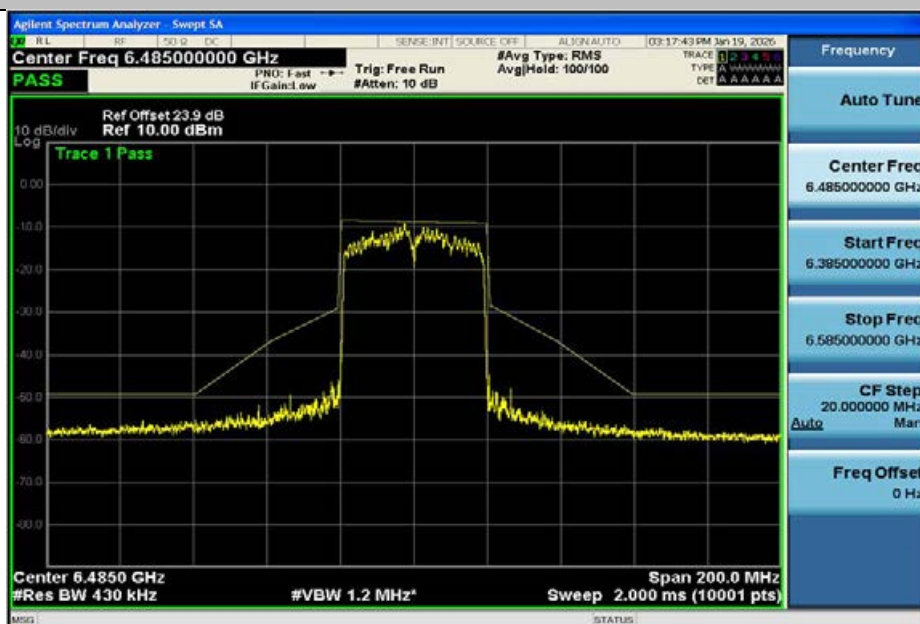
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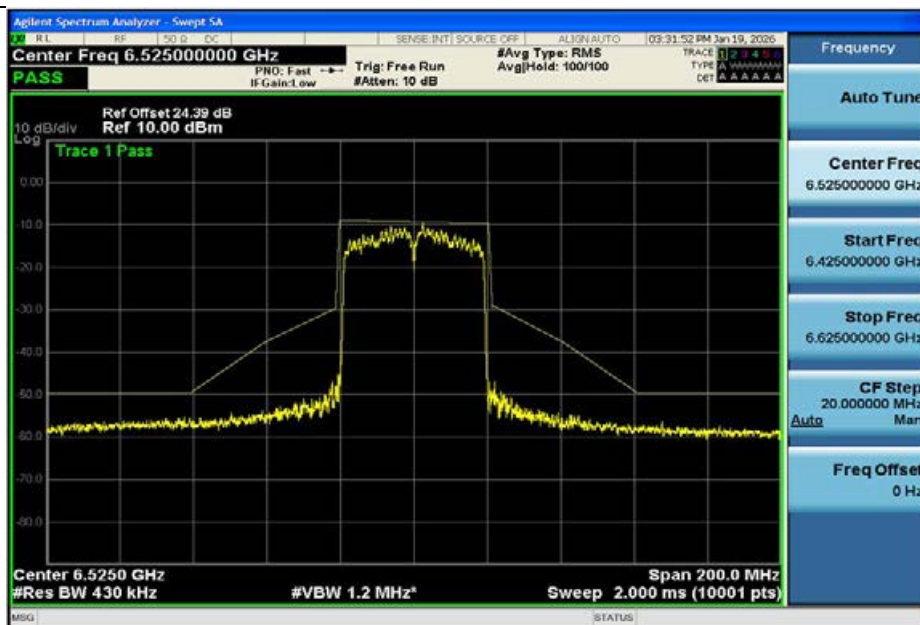
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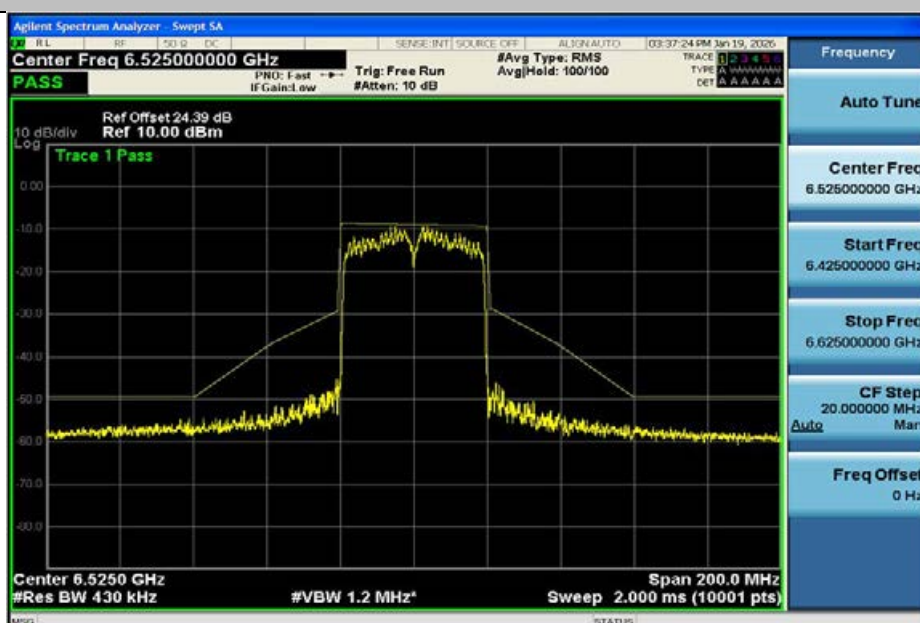
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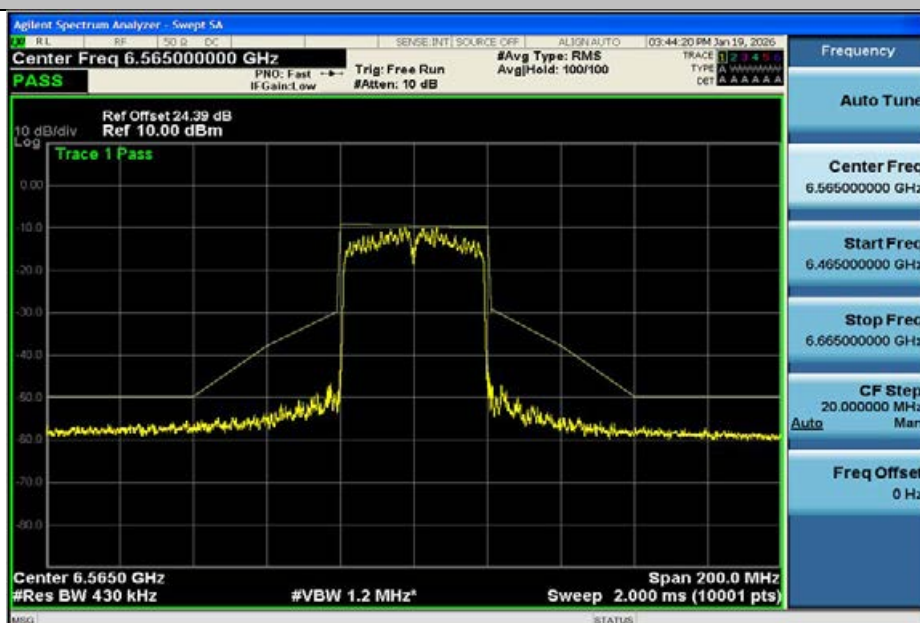
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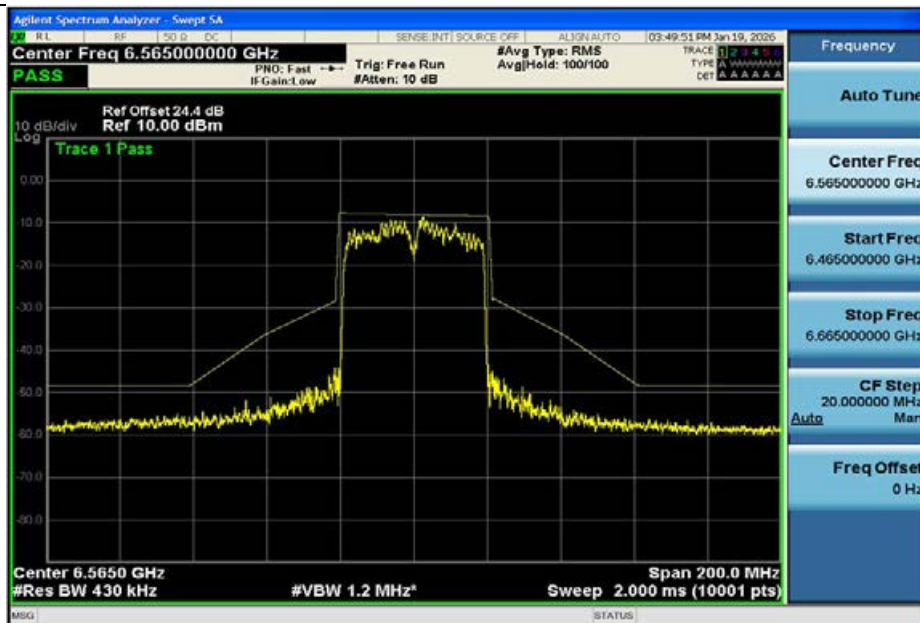
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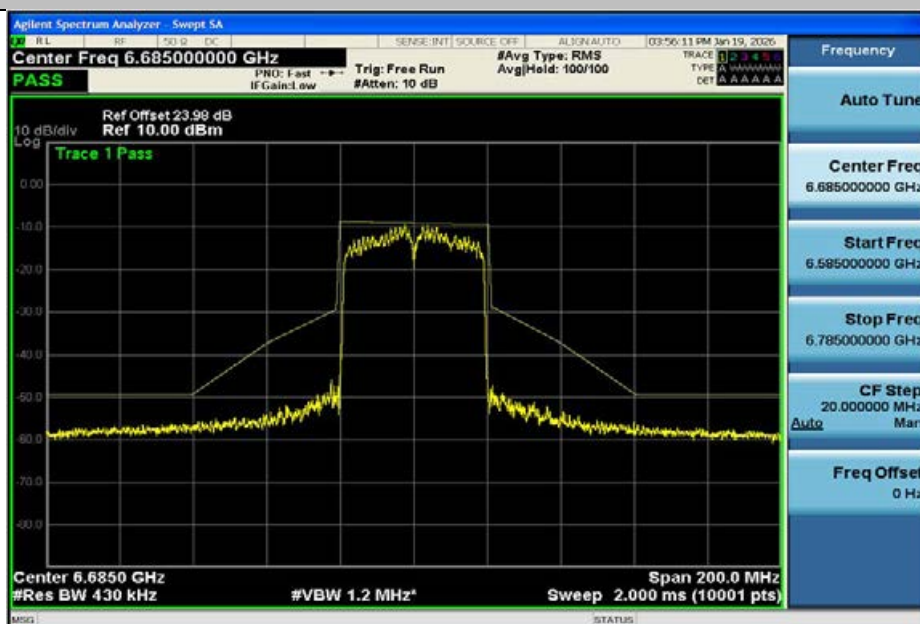
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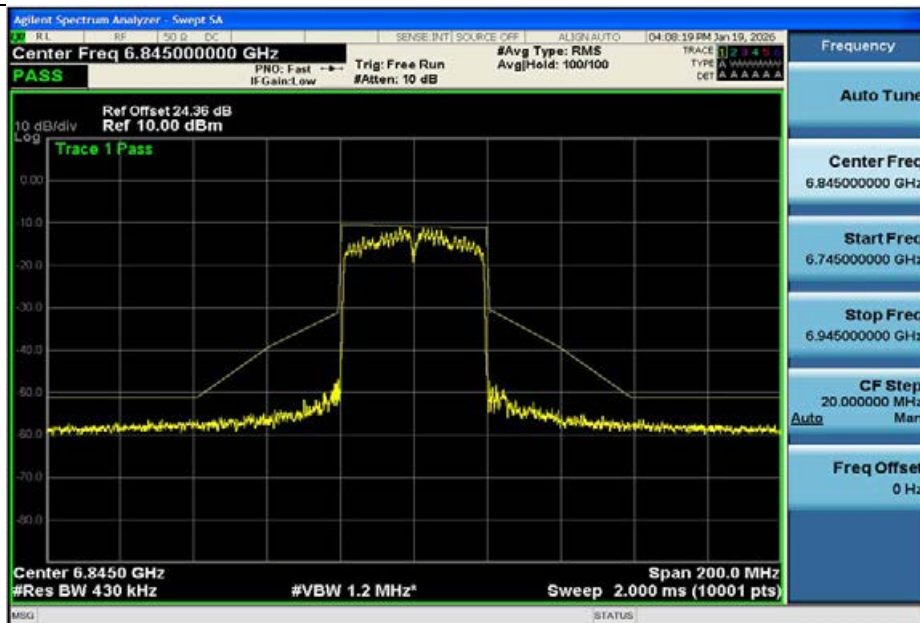
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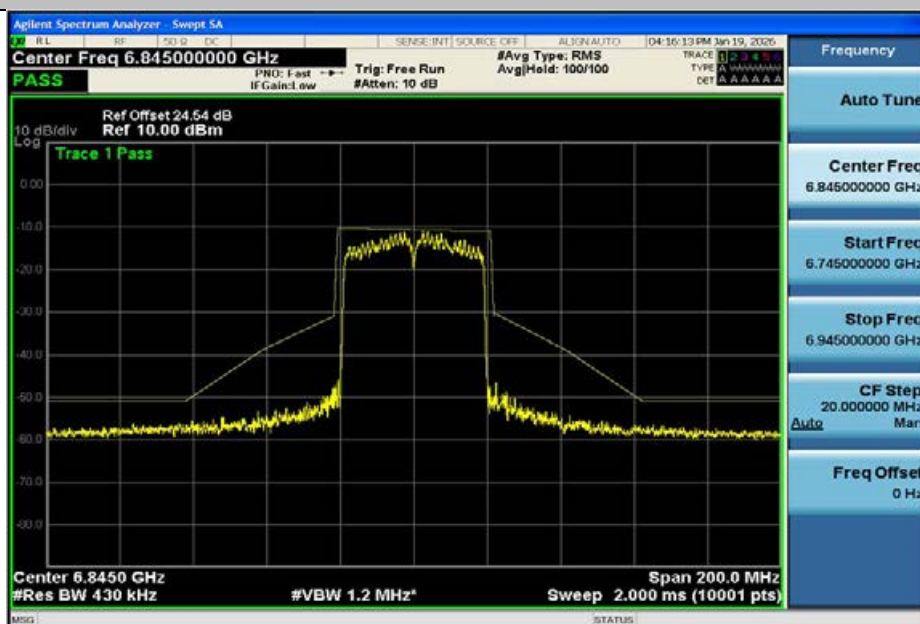
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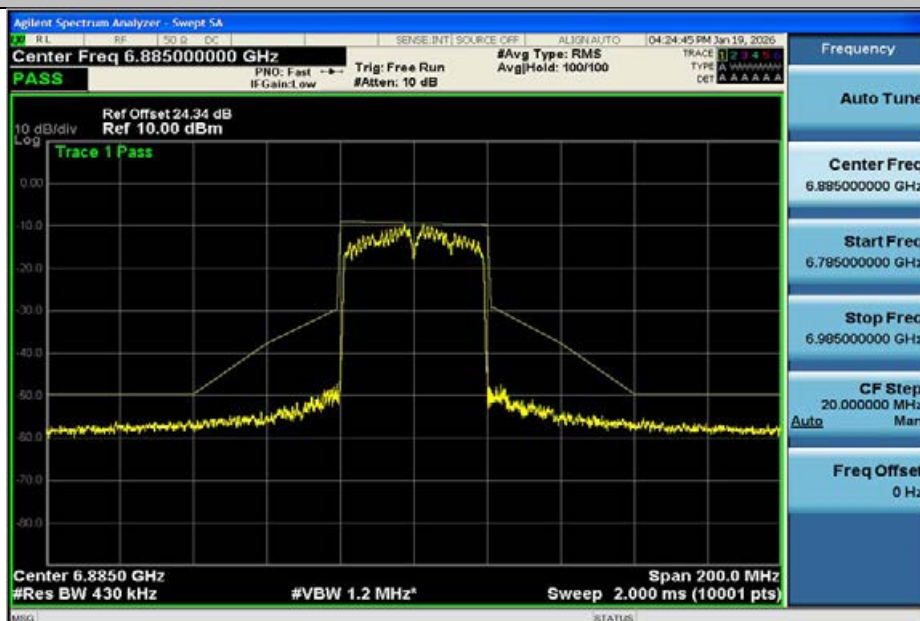
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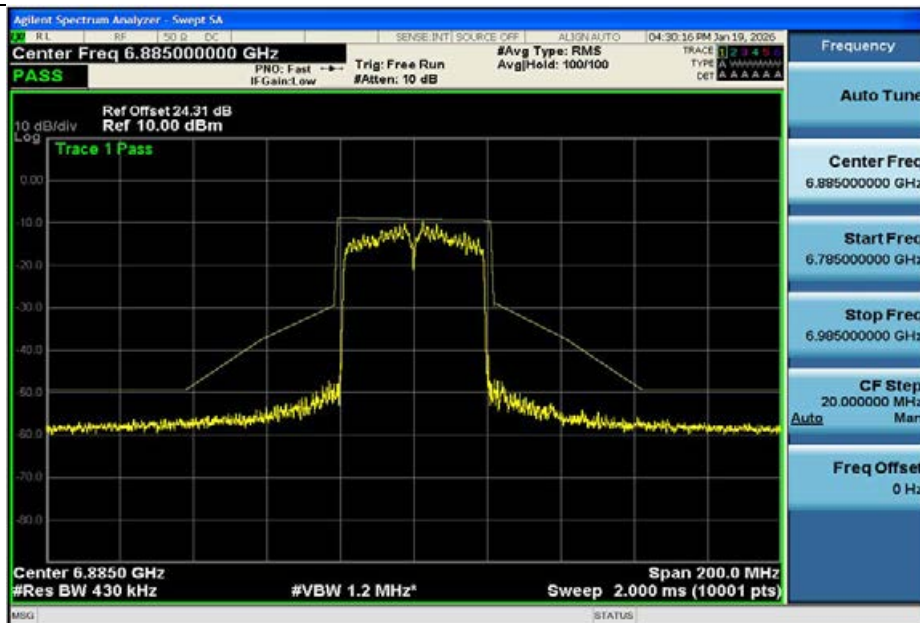
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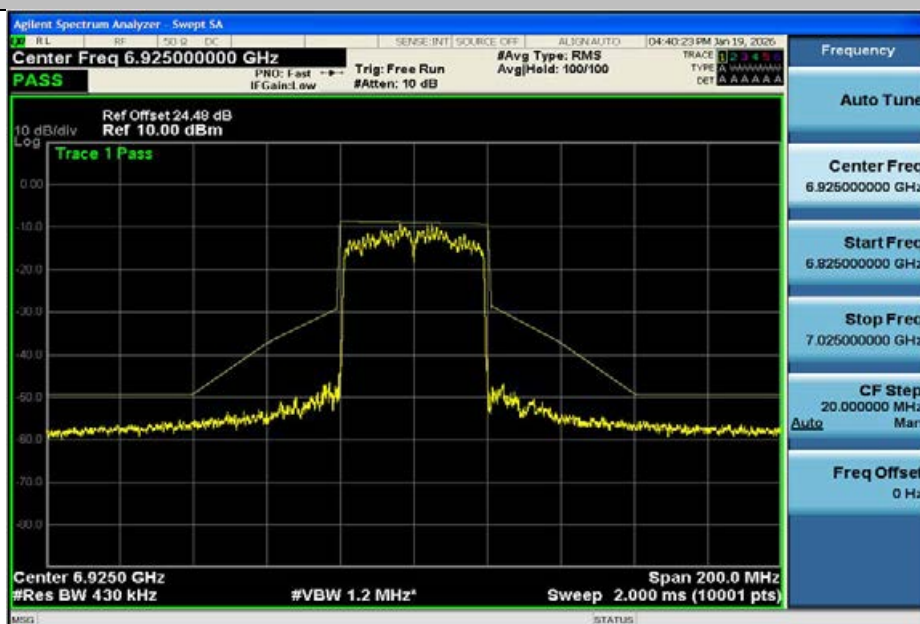
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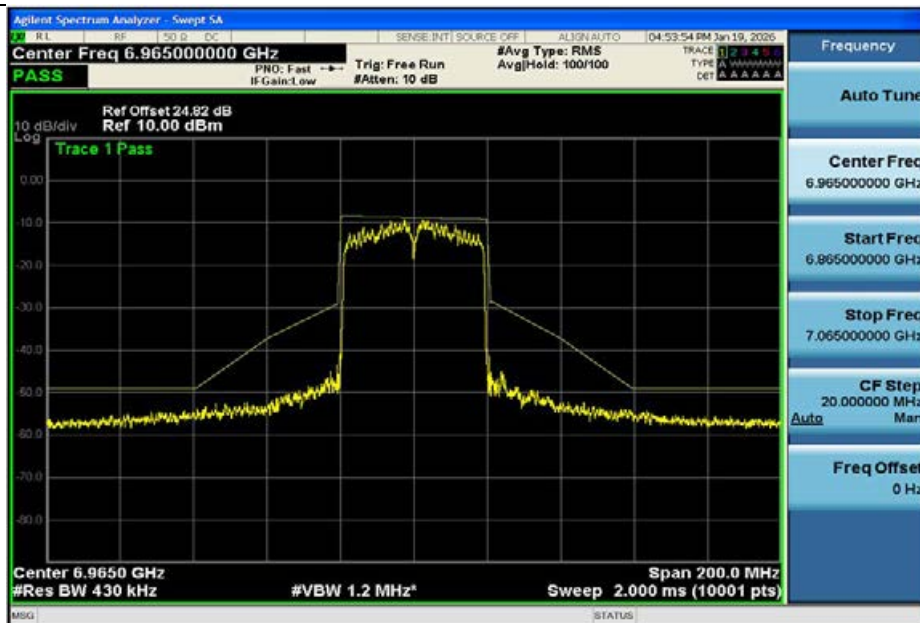
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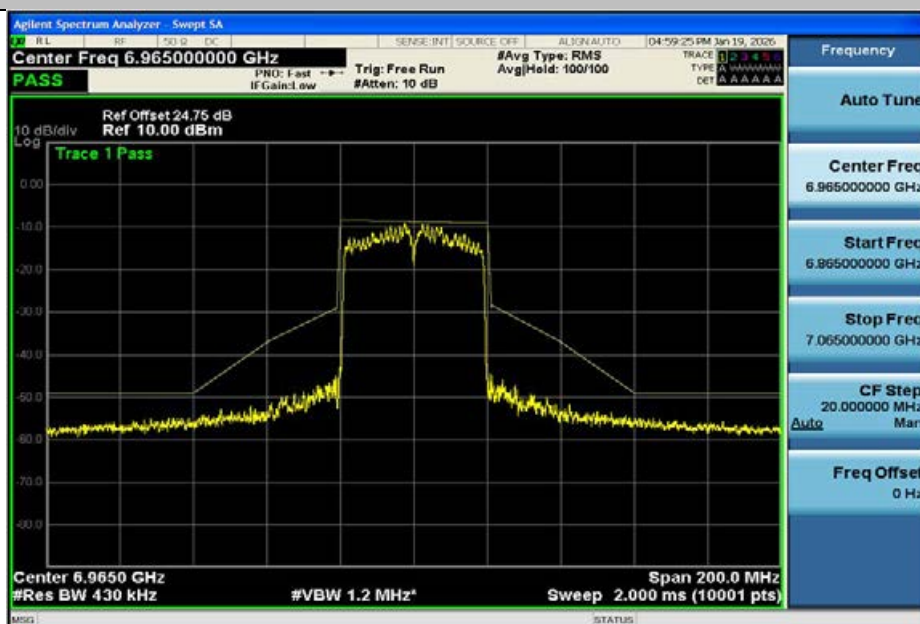
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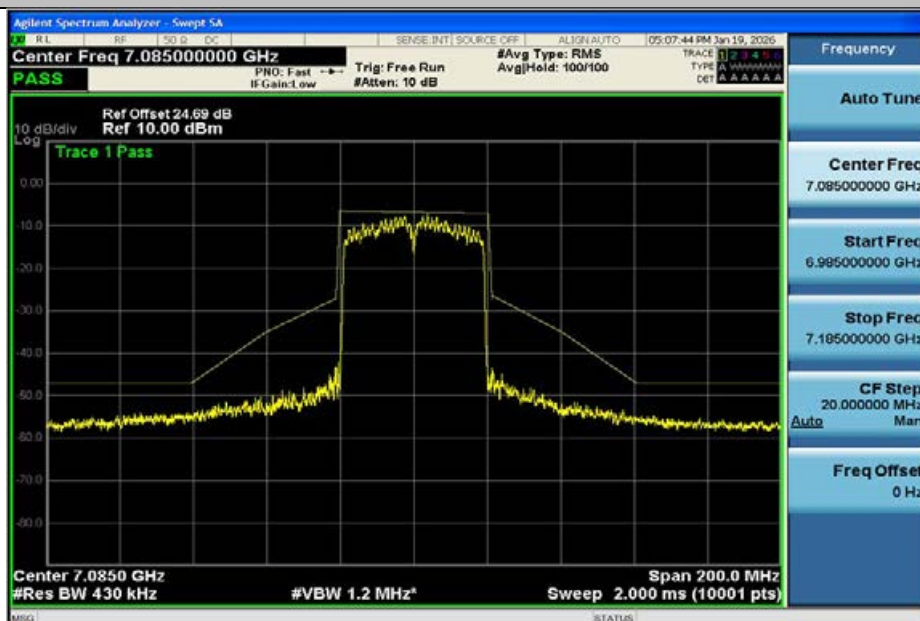
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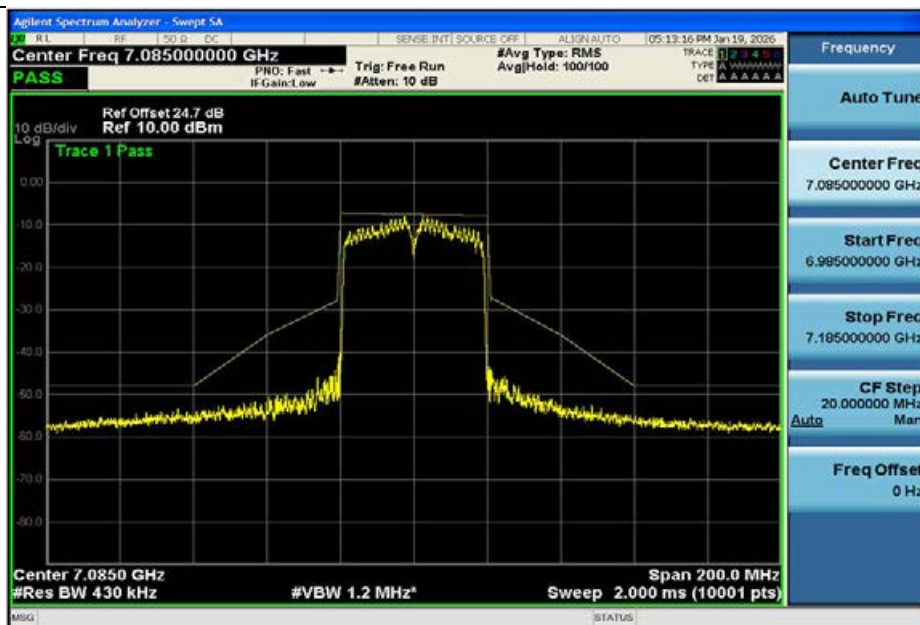
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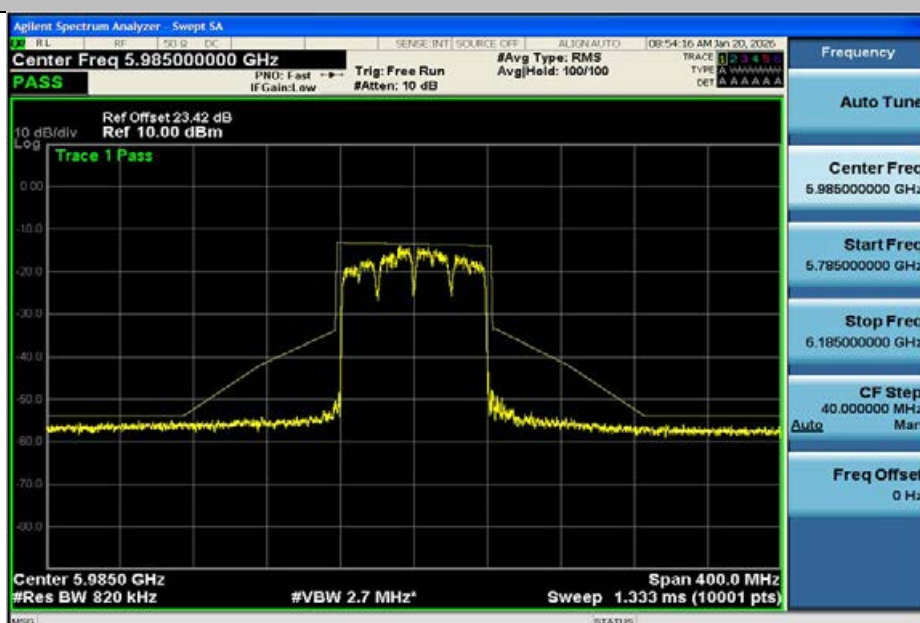
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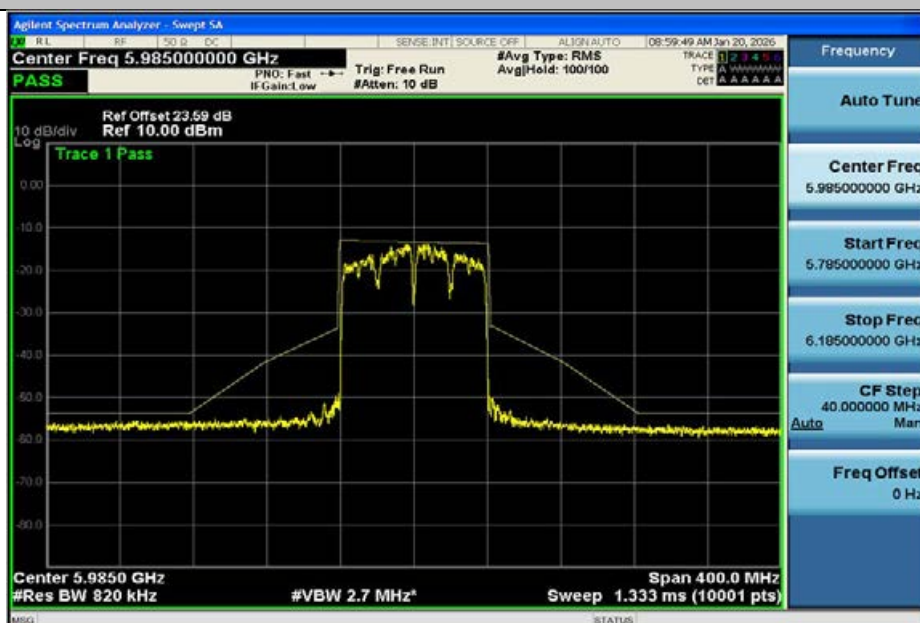
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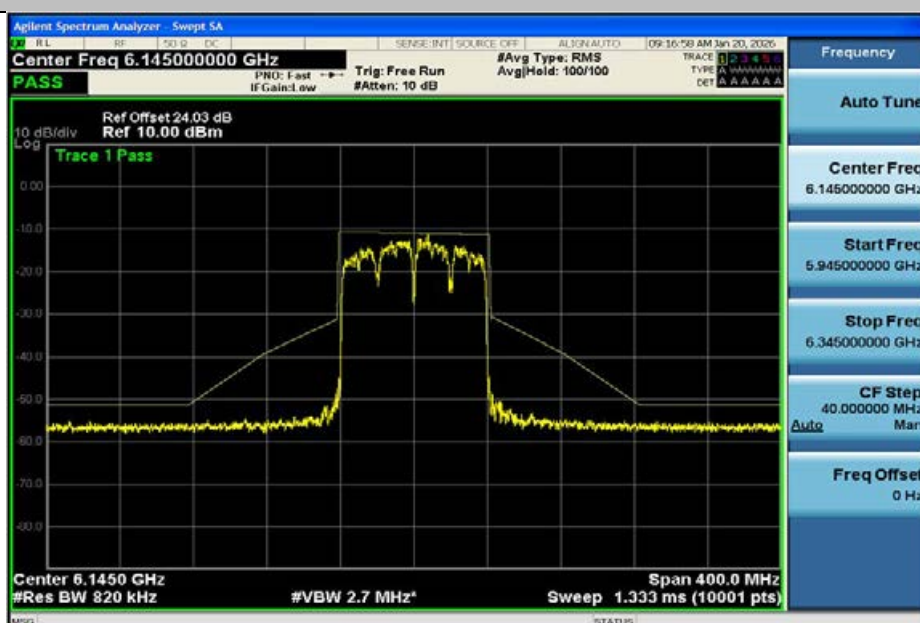
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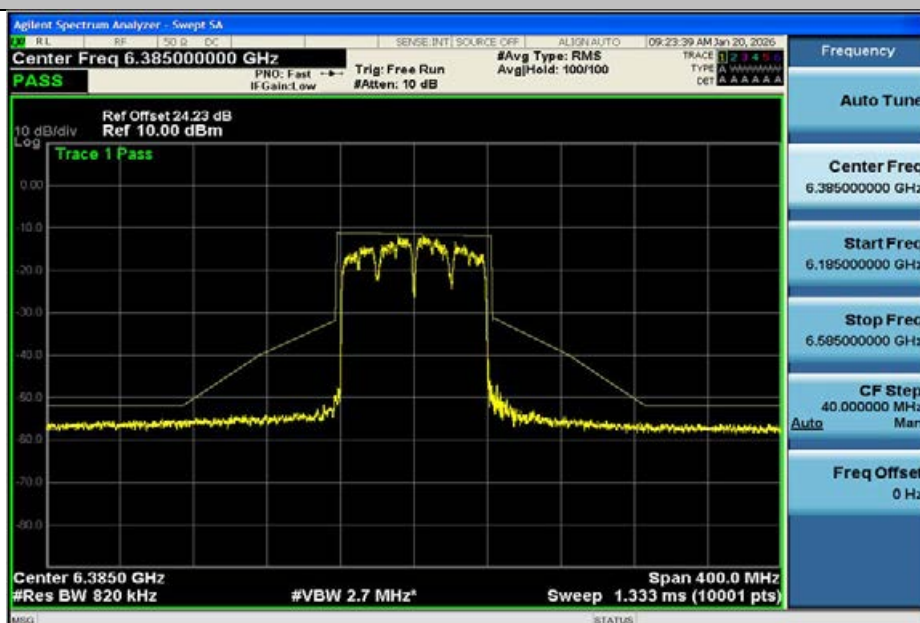
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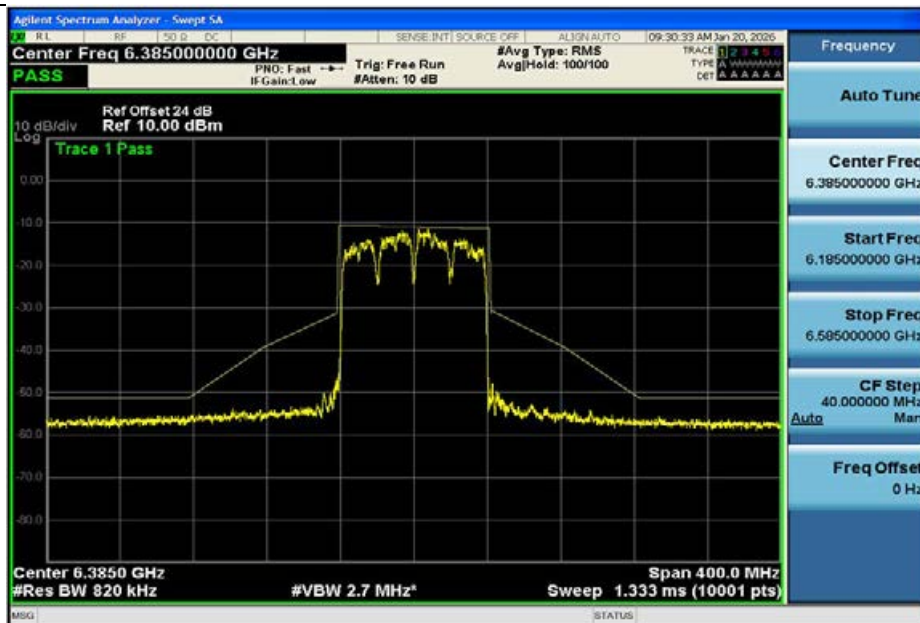
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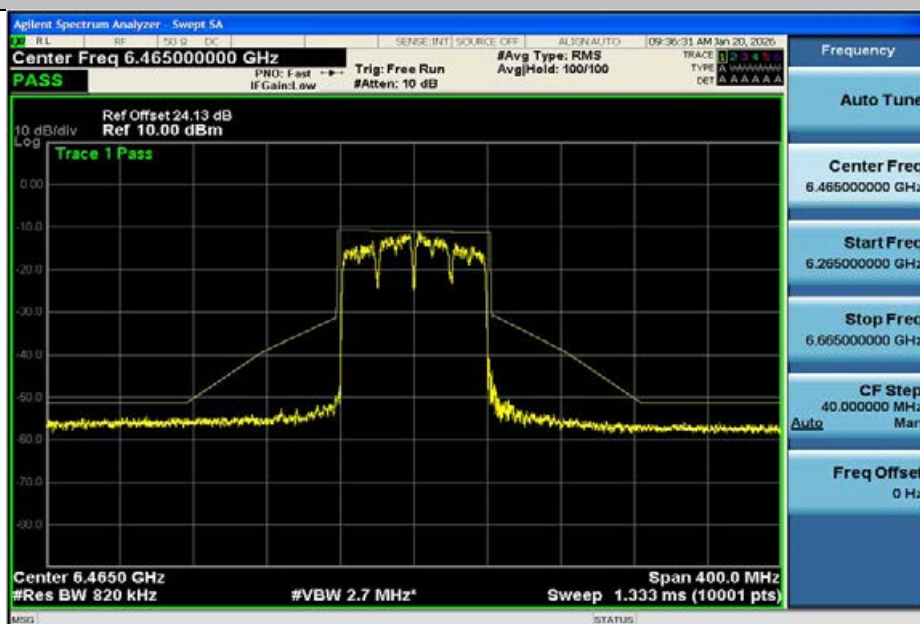
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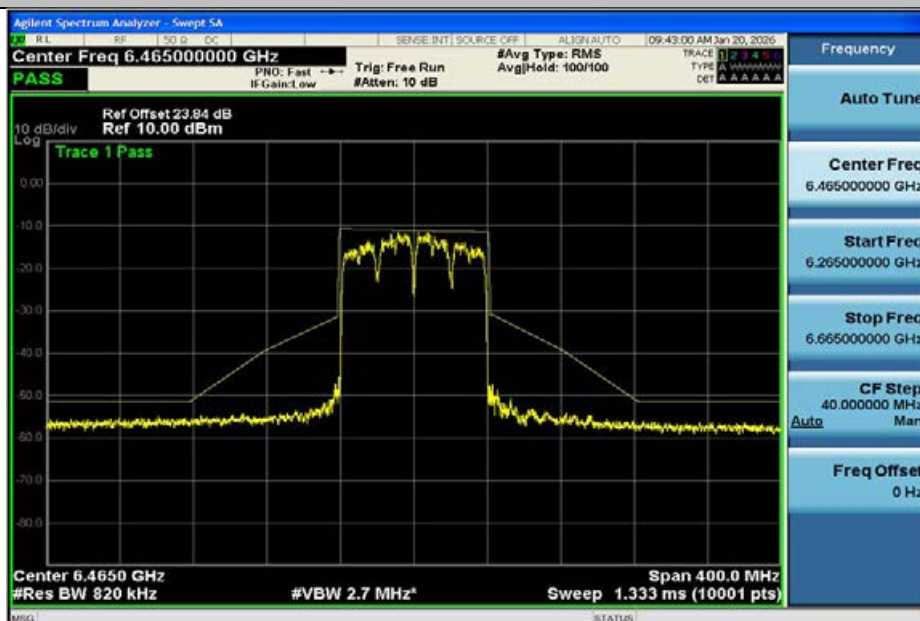
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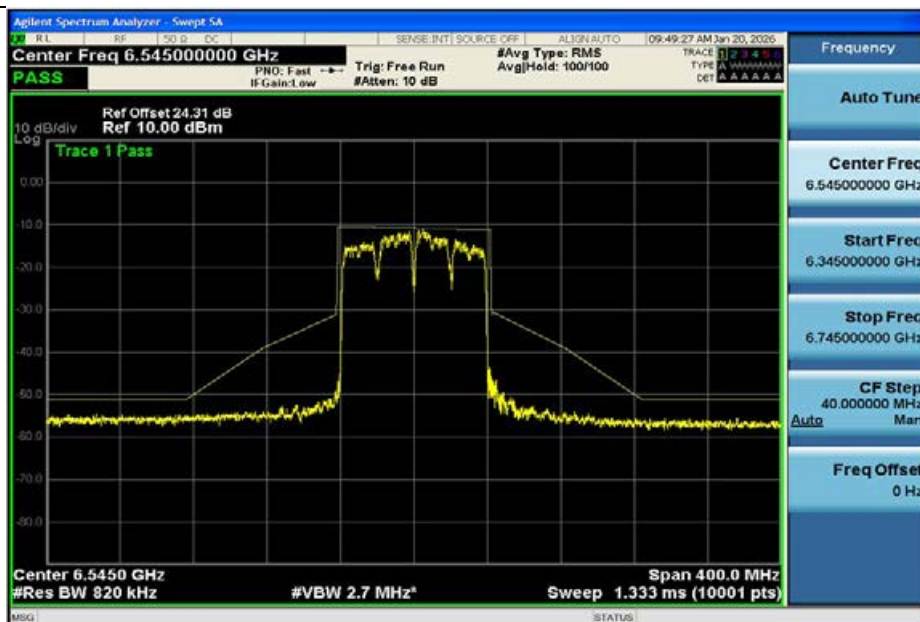
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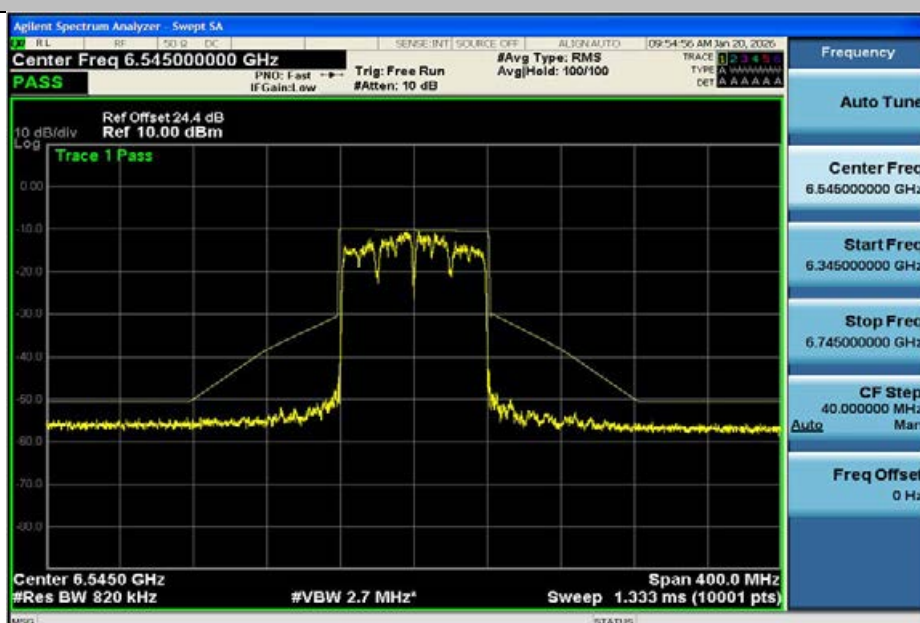
NTNV-11AX80MIMO-Ant1-6465-PASS



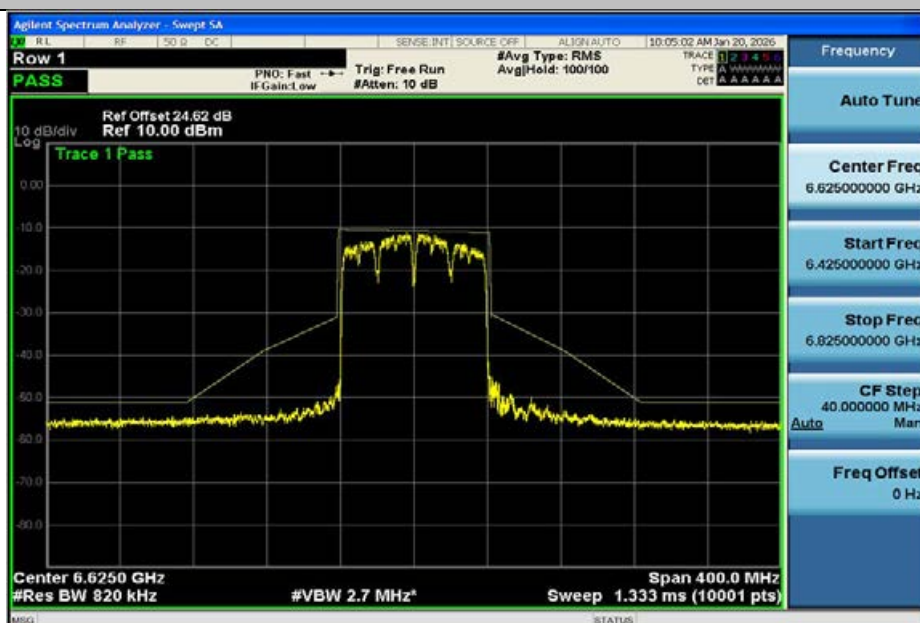
NTNV-11AX80MIMO-Ant2-6465-PASS



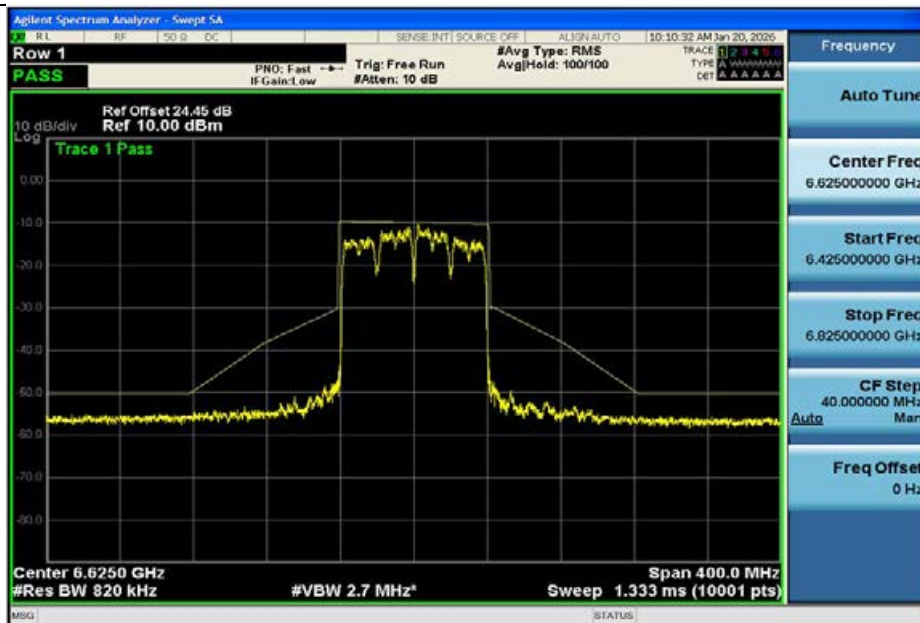
NTNV-11AX80MIMO-Ant1-6545-PASS



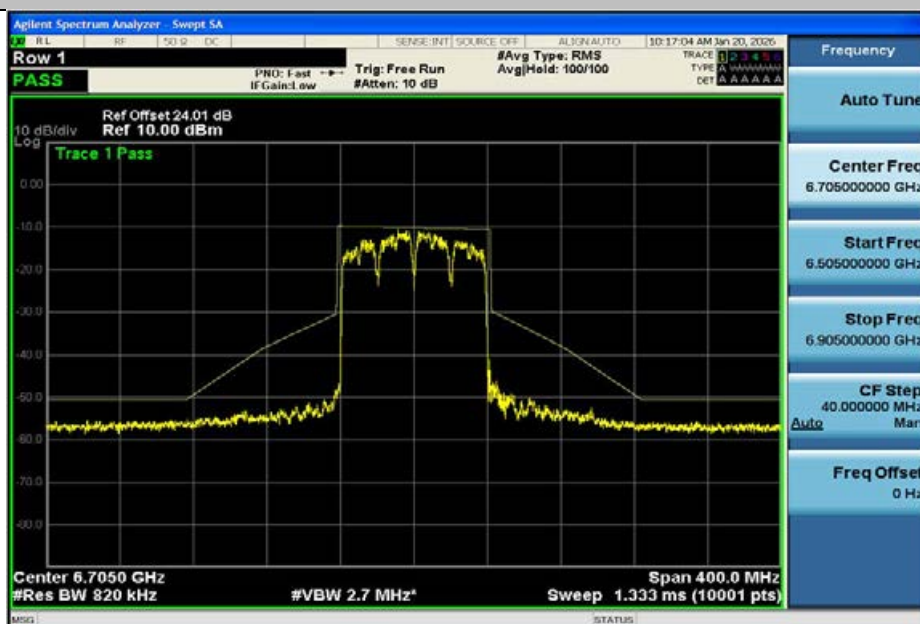
NTNV-11AX80MIMO-Ant2-6545-PASS



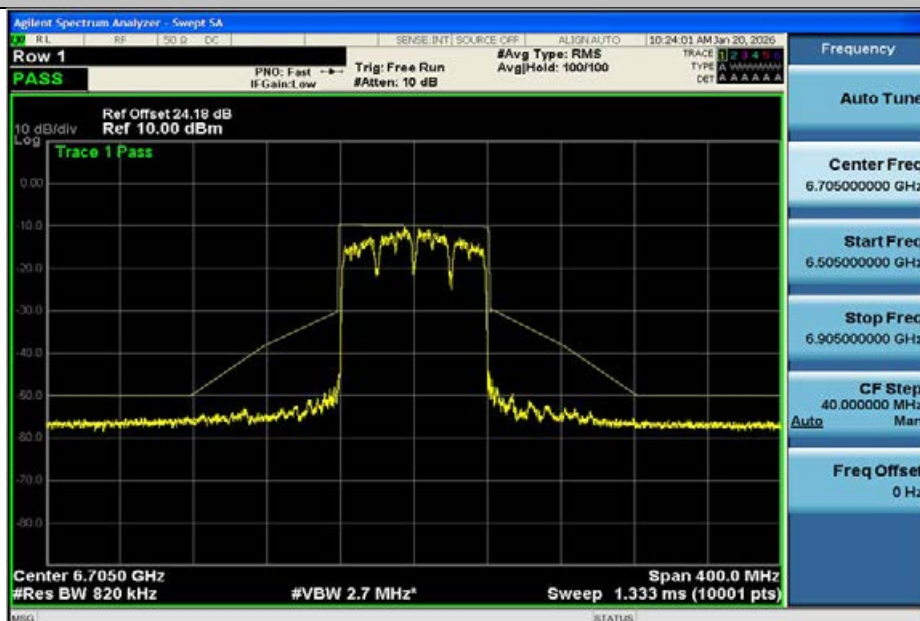
NTNV-11AX80MIMO-Ant1-6625-PASS



NTNV-11AX80MIMO-Ant2-6625-PASS



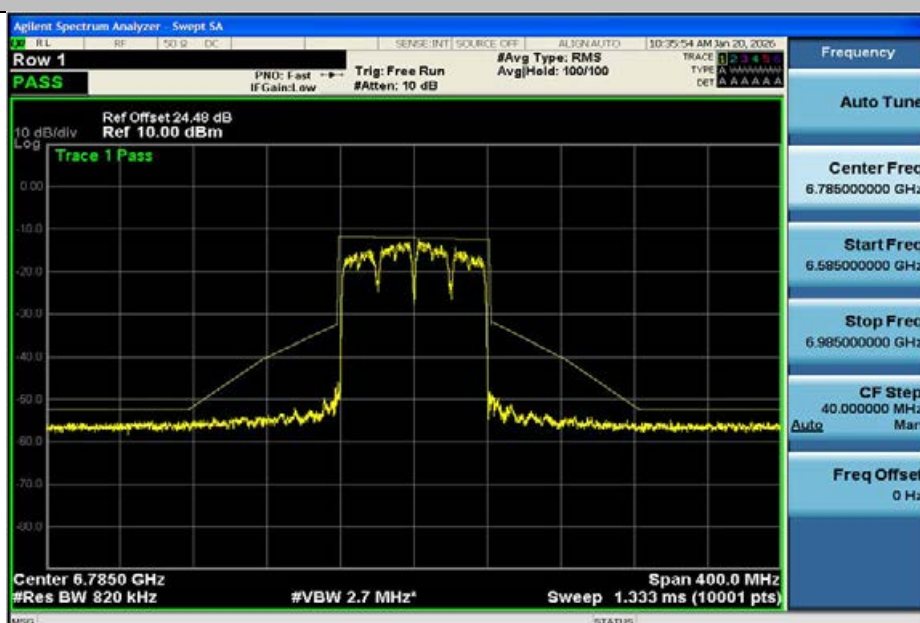
NTNV-11AX80MIMO-Ant1-6705-PASS



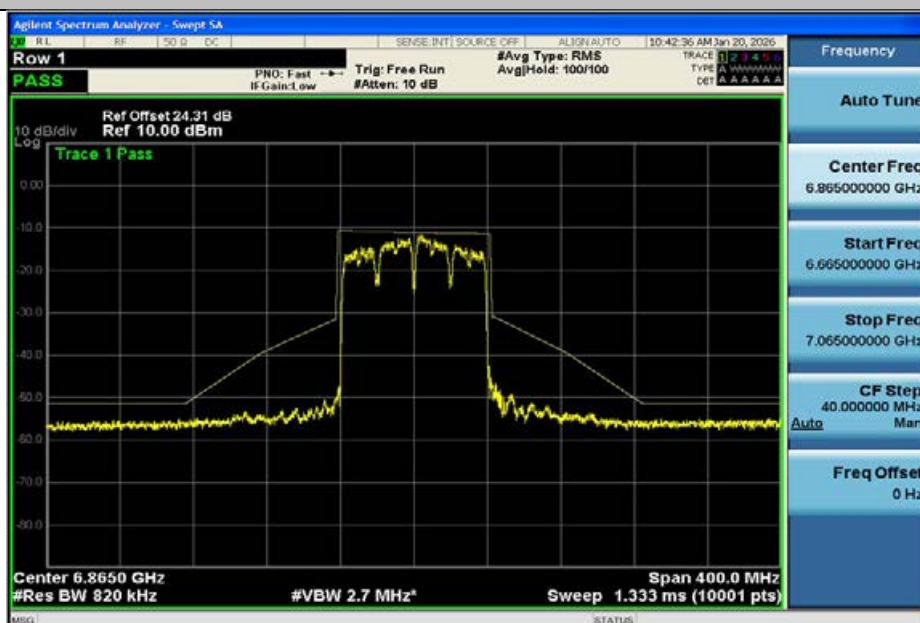
NTNV-11AX80MIMO-Ant2-6705-PASS



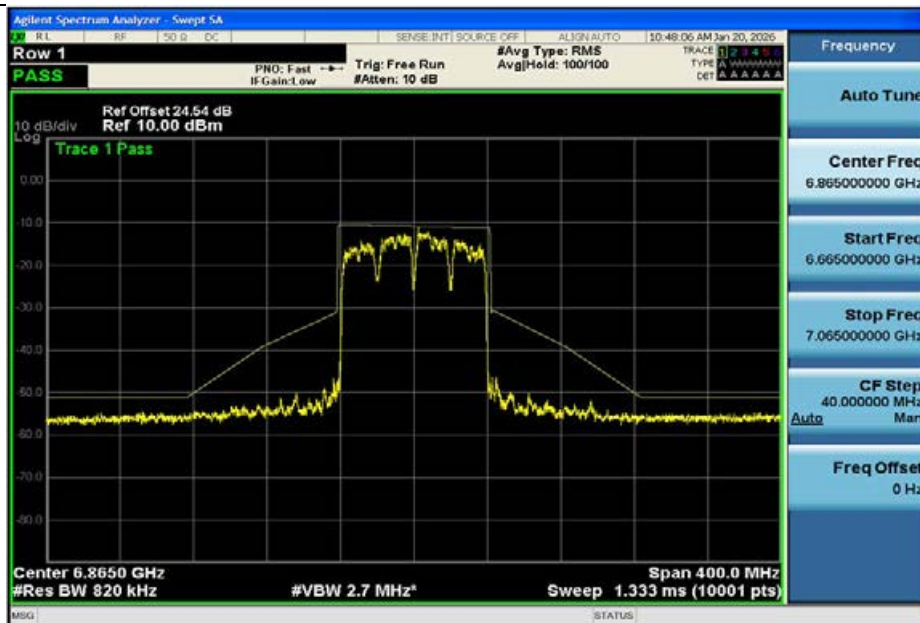
NTNV-11AX80MIMO-Ant1-6785-PASS



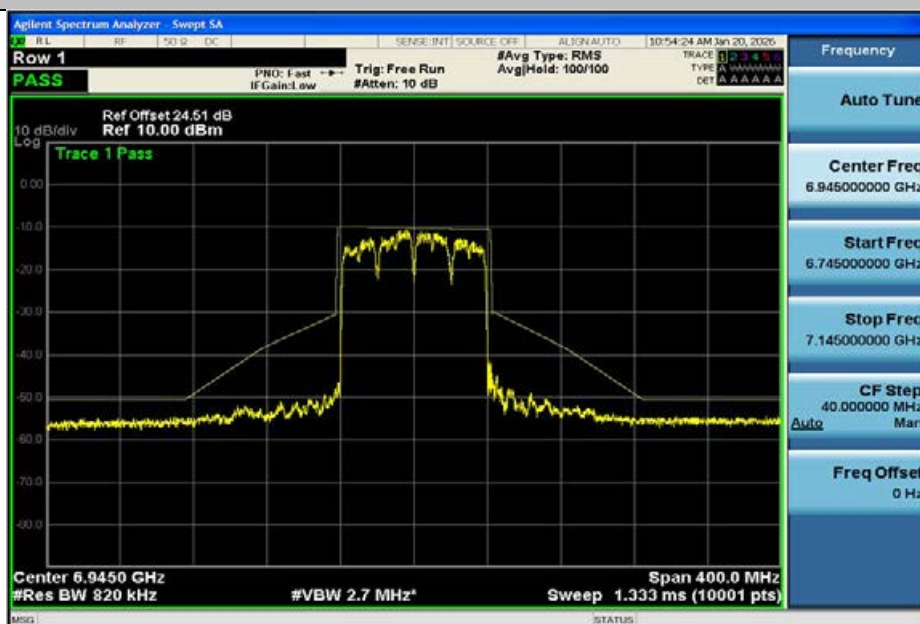
NTNV-11AX80MIMO-Ant2-6785-PASS



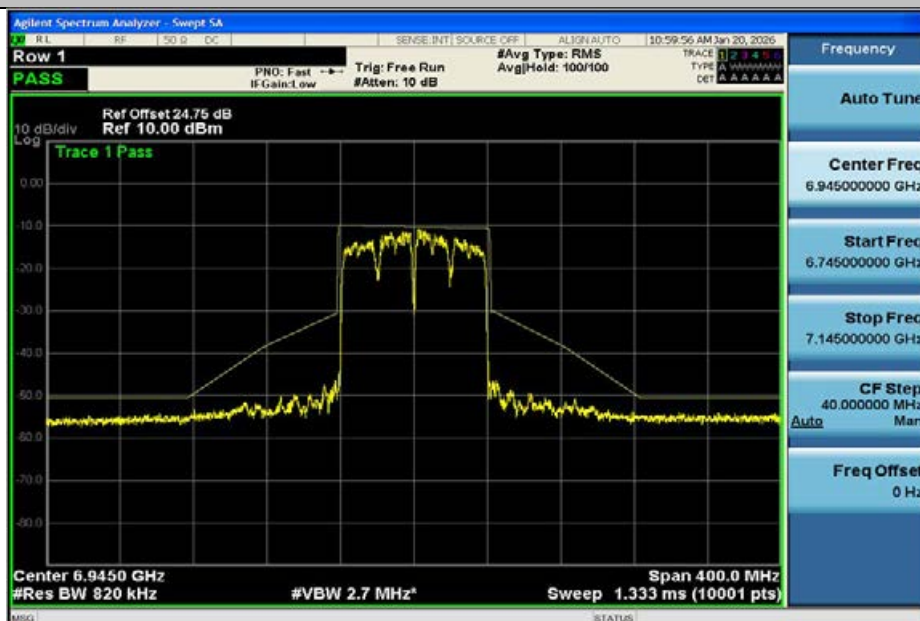
NTNV-11AX80MIMO-Ant1-6865-PASS



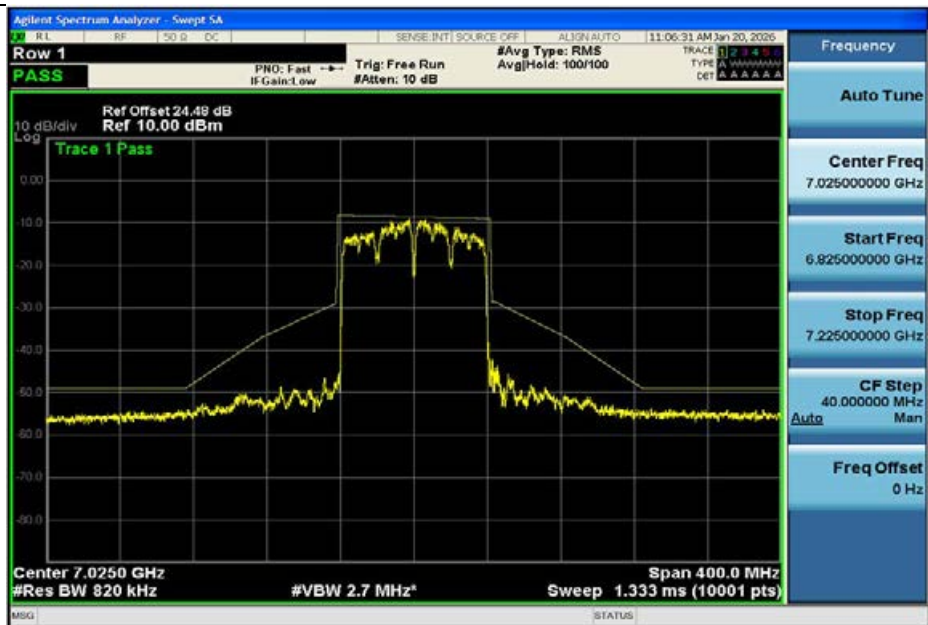
NTNV-11AX80MIMO-Ant2-6865-PASS



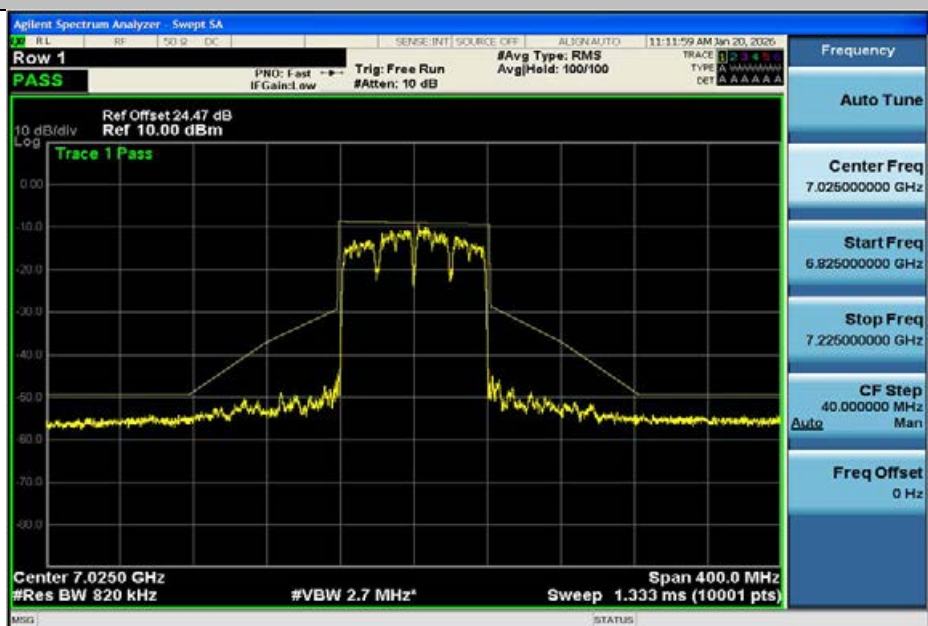
NTNV-11AX80MIMO-Ant1-6945-PASS



NTNV-11AX80MIMO-Ant2-6945-PASS



NTNV-11AX80MIMO-Ant1-7025-PASS



NTNV-11AX80MIMO-Ant2-7025-PASS

## 3.5 Contention Based Protocol Measurement

### 3.5.1 Test Limit

Unlicensed indoor low power device must detect co-channel radio frequency power that is at least -62dBm (The threshold is referenced to a 0dBi antenna gain.) or low.

Indoor low power device must detect an AWGN signal with 90% (or better) level of certainty.

### 3.5.2 Test Procedure

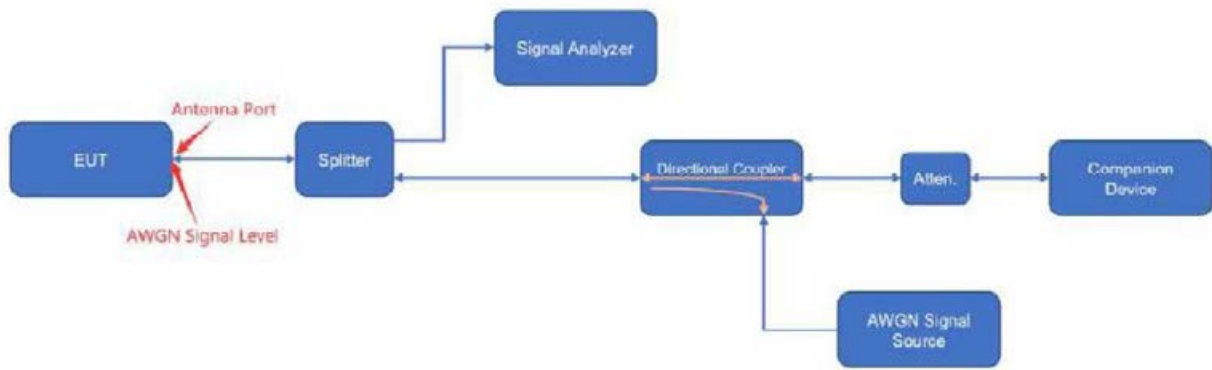
| Test Method                         |                              |
|-------------------------------------|------------------------------|
| ●Conducted Measurement              | ○Radiated Measurement        |
| Test Channels                       |                              |
| ●Lowest, Middle and Highest Channel | ○ Lowest and Highest Channel |
| Environmental conditions            |                              |
| ●Normal                             | ○Normal and Extreme          |
| Note:●:Test    ○:No Test            |                              |

Test was performed in accordance with method of KDB 987594 D02v01- Section I

### 3.5.3 Test Setting

1. Configure the EUT to transmit with a constant duty cycle.
2. Set the operating parameters of the EUT including power level, operating frequency, modulation and bandwidth.
3. Set the signal analyzer center frequency to the nominal EUT channel center frequency. The span range of the signal analyzer shall be between two times and five times the OBW of the EUT.  
Connect the output port of the EUT to the signal analyzer 2. Ensure that the attenuator 2 provides enough attenuation to not overload the signal analyzer 2 receiver.
4. Monitoring the signal analyzer 2, verify the EUT is operating and transmitting with the parameters set at step two.
5. Using an AWGN signal source, generate a 10 MHz-wide AWGN signal. Use Table 1 of KDB 987594 to determine the center frequency of the 10 MHz AWGN signal relative to the EUT's channel bandwidth and center frequency.
6. Set the AWGN signal power to an extremely low level. Connect the AWGN signal source, via a 3-dB splitter, to the signal analyzer 1 and the EUT as shown in below figure.
7. Transmit the AWGN signal (RF ON) and verify its characteristics on the signal analyzer 1.
8. Monitor the signal analyzer 2 to verify if the AWGN signal has been detected and the EUT has ceased transmission. If the EUT continues to transmit, then incrementally increase the AWGN signal power level until the EUT stops transmitting.
9. Determine and record the AWGN signal power level (at the EUT's antenna port) at which the EUT ceased transmission. Repeat the procedure at least 10 times to verify the EUT can detect an AWGN signal with 90% (or better) level of certainty.
10. Refer to Table 1 to determine number of times the detection threshold testing needs to be repeated. If testing is required more than once, then go back to step 5, choose a different center frequency for the AWGN signal and repeat the process.

### 3.5.4 Test Setup



### 3.5.5 Test Result

| Test Channel            | Bandwidth (MHz) | Freq. (MHz) | Interference Freq.(MHz) | Incumbent Signal Level (Refer to 0dBi Antenna) (dBm) | Antenna Gain (dBi) | AWGN Signal Level (at Antenna Port) (dBm) | Detected Number | Detection Probability (%) | Limit (%) | Test Result |
|-------------------------|-----------------|-------------|-------------------------|------------------------------------------------------|--------------------|-------------------------------------------|-----------------|---------------------------|-----------|-------------|
| Operation Band: U-NII 5 |                 |             |                         |                                                      |                    |                                           |                 |                           |           |             |
| 37                      | 20              | 6135        | 6135                    | -75.94                                               | 3.40               | -72.54                                    | 10              | 100                       | 90        | Pass        |
| 39                      | 80              | 6145        | 6110                    | -69.21                                               | 3.40               | -65.81                                    | 10              | 100                       | 90        | Pass        |
| 39                      | 80              | 6145        | 6145                    | -70.23                                               | 3.40               | -66.83                                    | 10              | 100                       | 90        | Pass        |
| 39                      | 80              | 6145        | 6180                    | -68.83                                               | 3.40               | -65.43                                    | 10              | 100                       | 90        | Pass        |
| Operation Band: U-NII 6 |                 |             |                         |                                                      |                    |                                           |                 |                           |           |             |
| 101                     | 20              | 6455        | 6455                    | -74.63                                               | 3.40               | -71.23                                    | 10              | 100                       | 90        | Pass        |
| 103                     | 80              | 6465        | 6430                    | -68.81                                               | 3.40               | -65.41                                    | 10              | 100                       | 90        | Pass        |
| 103                     | 80              | 6465        | 6465                    | -70.93                                               | 3.40               | -67.53                                    | 10              | 100                       | 90        | Pass        |
| 103                     | 80              | 6465        | 6500                    | -69.32                                               | 3.40               | -65.92                                    | 10              | 100                       | 90        | Pass        |
| Operation Band: U-NII 7 |                 |             |                         |                                                      |                    |                                           |                 |                           |           |             |
| 149                     | 20              | 6695        | 6695                    | -75.32                                               | 3.40               | -71.92                                    | 10              | 100                       | 90        | Pass        |
| 151                     | 80              | 6705        | 6670                    | -71.63                                               | 3.40               | -68.23                                    | 10              | 100                       | 90        | Pass        |
| 151                     | 80              | 6705        | 6705                    | -70.94                                               | 3.40               | -67.54                                    | 10              | 100                       | 90        | Pass        |
| 151                     | 80              | 6705        | 6740                    | -69.35                                               | 3.40               | -65.95                                    | 10              | 100                       | 90        | Pass        |
| Operation Band: U-NII 8 |                 |             |                         |                                                      |                    |                                           |                 |                           |           |             |
| 213                     | 20              | 7015        | 7015                    | -74.68                                               | 3.40               | -71.28                                    | 10              | 100                       | 90        | Pass        |
| 215                     | 80              | 7025        | 6990                    | -71.76                                               | 3.40               | -68.36                                    | 10              | 100                       | 90        | Pass        |
| 215                     | 80              | 7025        | 7025                    | -70.94                                               | 3.40               | -67.54                                    | 10              | 100                       | 90        | Pass        |
| 215                     | 80              | 7025        | 7060                    | -71.94                                               | 3.40               | -68.54                                    | 10              | 100                       | 90        | Pass        |

Note 1: Incumbent Signal Level = AWGN Signal Level (at Antenna port) – Antenna Gain, it's equivalent to incumbent signal level with reference to a 0dBi antenna gain, and this power level is less than or equal to the detection threshold (-62 dBm).

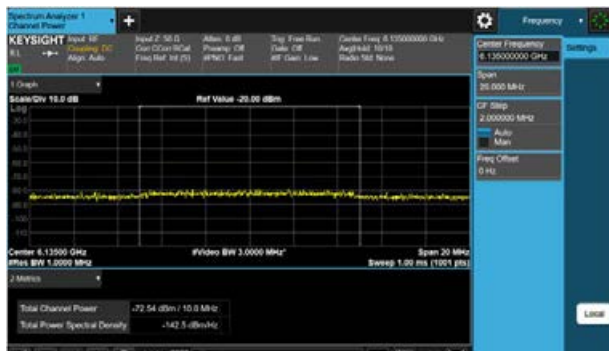
Note 2: AWGN Signal Level at antenna port is the actual injected level at antenna port

Note 3: All transmit signals are completely uncorrelated with each other; Directional gain = 3.40dBi

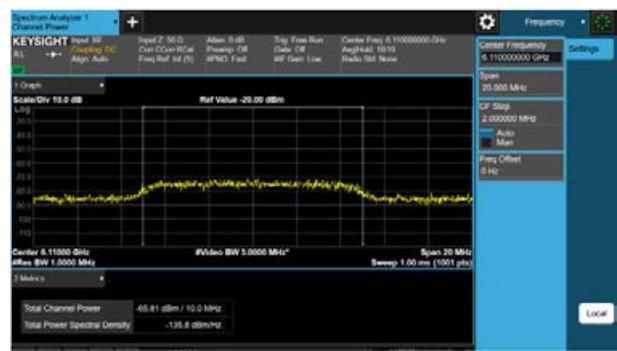
| Test Channel            | Bandwidth (MHz) | Freq. (MHz) | Interference Freq. (MHz) | AWGN Signal Level (at Antenna Port) (dBm) | EUT Status                  |
|-------------------------|-----------------|-------------|--------------------------|-------------------------------------------|-----------------------------|
| Operation Band: U-NII 5 |                 |             |                          |                                           |                             |
| 37                      | 20              | 6135        | 6135                     | -72.54                                    | Stop transmission           |
|                         |                 |             |                          | -73.72                                    | Stop but with Beacon signal |
| 39                      | 80              | 6145        | 6110                     | -65.81                                    | Stop transmission           |
|                         |                 |             |                          | -67.25                                    | Stop but with Beacon signal |
| 39                      | 80              | 6145        | 6185                     | -66.83                                    | Stop transmission           |
|                         |                 |             |                          | -68.37                                    | Stop but with Beacon signal |
| 39                      | 80              | 6145        | 6180                     | -65.43                                    | Stop transmission           |
|                         |                 |             |                          | -67.21                                    | Stop but with Beacon signal |
| Operation Band: U-NII 6 |                 |             |                          |                                           |                             |
| 101                     | 20              | 6455        | 6455                     | -71.23                                    | Stop transmission           |
|                         |                 |             |                          | -73.79                                    | Stop but with Beacon signal |
| 103                     | 80              | 6465        | 6430                     | -65.41                                    | Stop transmission           |
|                         |                 |             |                          | -68.48                                    | Stop but with Beacon signal |
| 103                     | 80              | 6465        | 6465                     | -67.53                                    | Stop transmission           |
|                         |                 |             |                          | -69.17                                    | Stop but with Beacon signal |
| 103                     | 80              | 6465        | 6500                     | -65.92                                    | Stop transmission           |
|                         |                 |             |                          | -67.61                                    | Stop but with Beacon signal |
| Operation Band: U-NII 7 |                 |             |                          |                                           |                             |
| 149                     | 20              | 6695        | 6695                     | -71.92                                    | Stop transmission           |
|                         |                 |             |                          | -73.48                                    | Stop but with Beacon signal |
| 151                     | 80              | 6705        | 6670                     | -68.23                                    | Stop transmission           |
|                         |                 |             |                          | -69.75                                    | Stop but with Beacon signal |
| 151                     | 80              | 6705        | 6705                     | -67.54                                    | Stop transmission           |
|                         |                 |             |                          | -69.43                                    | Stop but with Beacon signal |
| 151                     | 80              | 6705        | 6740                     | -65.95                                    | Stop transmission           |
|                         |                 |             |                          | -67.57                                    | Stop but with Beacon signal |
| Operation Band: U-NII 8 |                 |             |                          |                                           |                             |
| 213                     | 20              | 7015        | 7015                     | -71.28                                    | Stop transmission           |
|                         |                 |             |                          | -73.76                                    | Stop but with Beacon signal |
| 215                     | 80              | 7025        | 6990                     | -68.36                                    | Stop transmission           |
|                         |                 |             |                          | -69.59                                    | Stop but with Beacon signal |
| 215                     | 80              | 7025        | 7025                     | -67.54                                    | Stop transmission           |
|                         |                 |             |                          | -69.91                                    | Stop but with Beacon signal |
| 215                     | 80              | 7025        | 7060                     | -68.54                                    | Stop transmission           |
|                         |                 |             |                          | -69.63                                    | Stop but with Beacon signal |

# AWGN Signal Level (at Antenna Port) Calibration Plots (NII-5 Band)

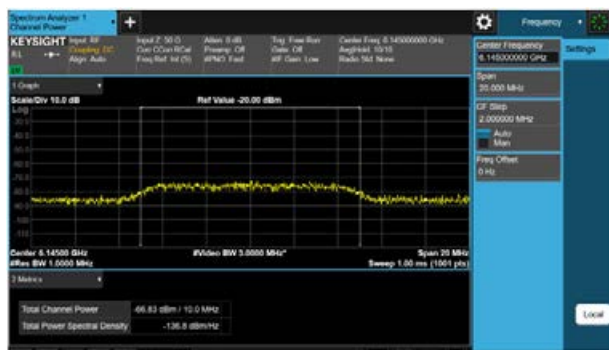
802.11ax-HE20 / CH37



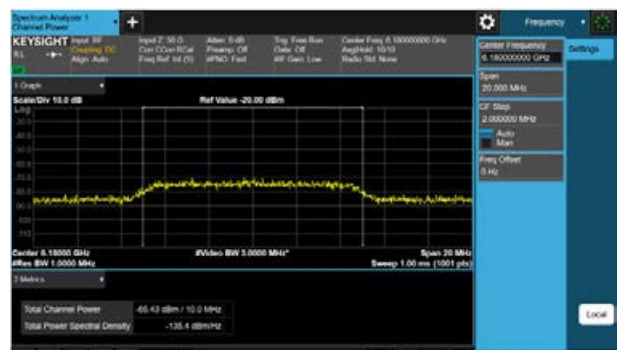
802.11ax-HE80 / CH39 (Low Edge)



802.11ax-HE80 / CH39 (Middle)

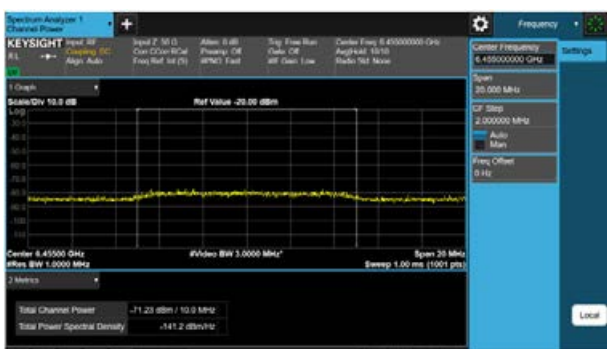


802.11ax-HE80 / CH39 (High Edge)

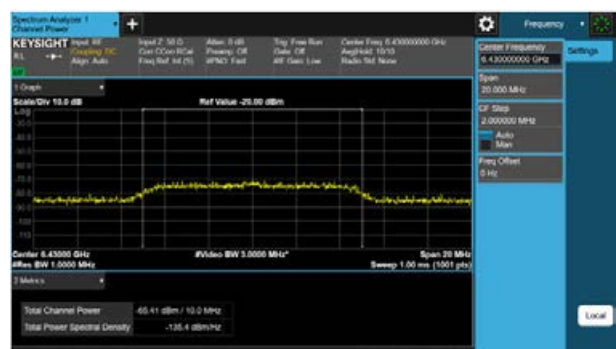


# AWGN Signal Level (at Antenna Port) Calibration Plots (NII-6 Band)

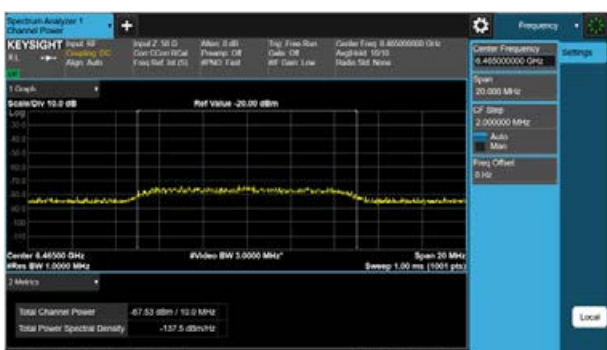
802.11ax-HE20 / CH101



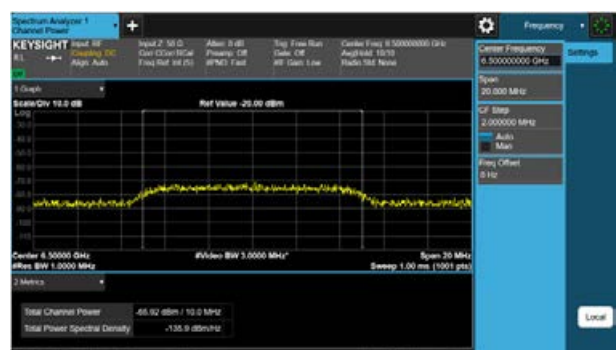
802.11ax-HE80 / CH103 (Low Edge)



802.11ax-HE80 / CH103 (Middle)

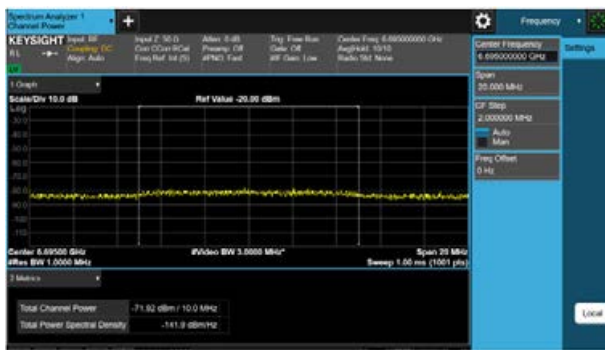


802.11ax-HE80 / CH103 (High Edge)

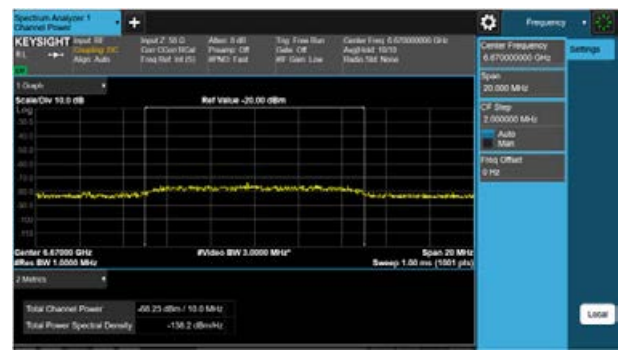


# AWGN Signal Level (at Antenna Port) Calibration Plots (NII-7 Band)

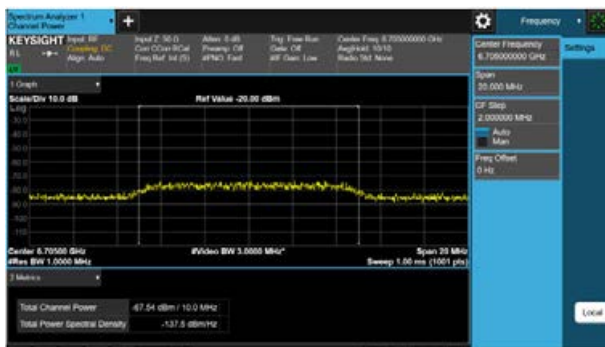
802.11ax-HE20 / CH149



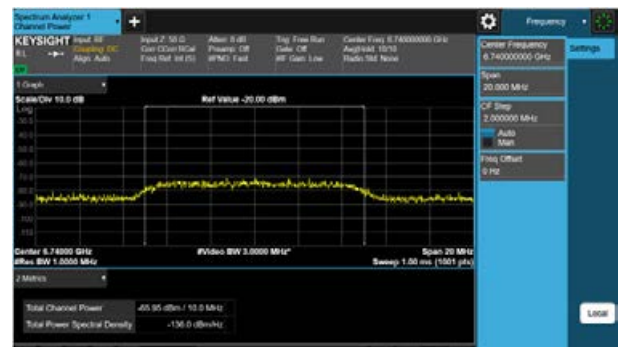
802.11ax-HE80 / CH151 (Low Edge)



802.11ax-HE80 / CH151 (Middle)

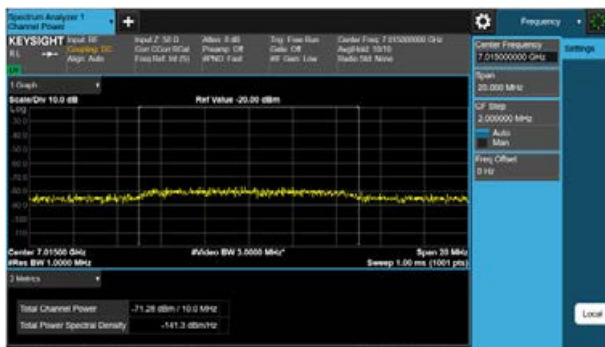


802.11ax-HE80 / CH151 (High Edge)

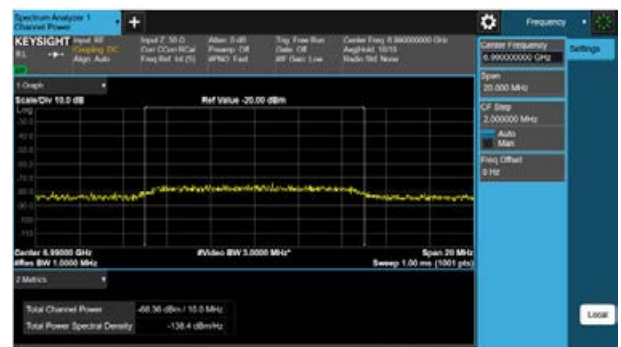


# AWGN Signal Level (at Antenna Port) Calibration Plots (NII-8 Band)

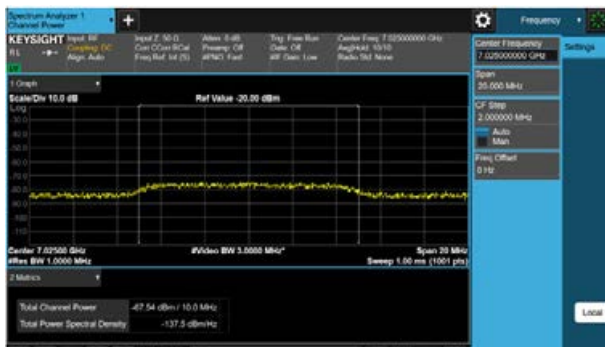
802.11ax-HE20 / CH213



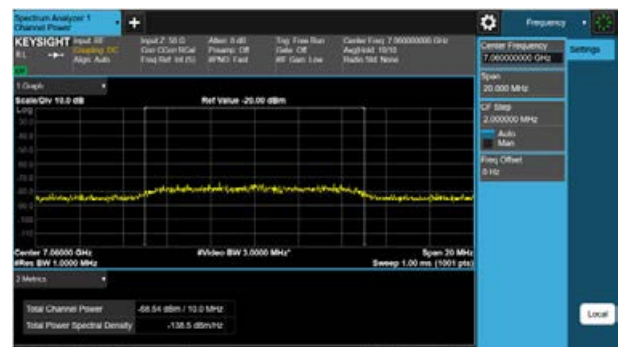
802.11ax-HE80 / CH215 (Low Edge)



802.11ax-HE80 / CH215 (Middle)



802.11ax-HE80 / CH215 (High Edge)

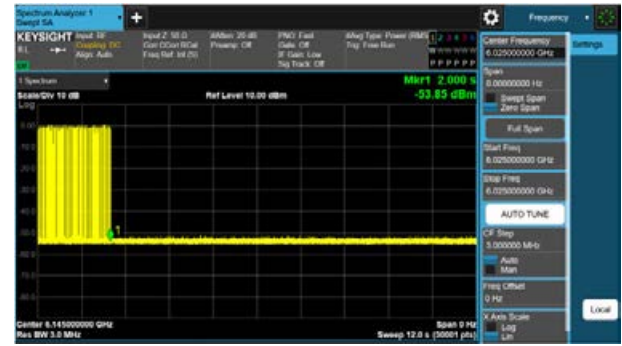


EUT TX stop

802.11ax-HE20 / CH37



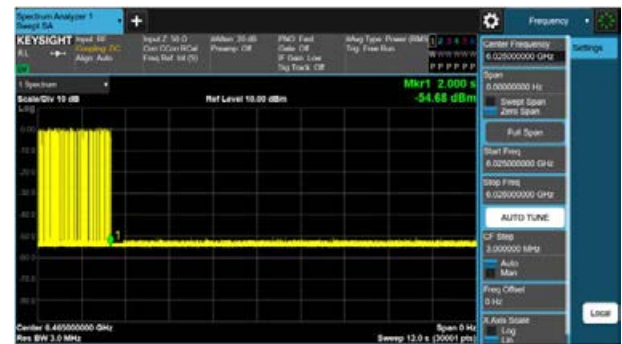
802.11ax-HE80 / CH39



802.11ax-HE20 / CH101



802.11ax-HE80 / CH103



802.11ax-HE20 / CH149



802.11ax-HE80 / CH151



802.11ax-HE20 / CH213



802.11ax-HE80 / CH215



## 3.6 Radiated Spurious Emission Measurement

### 3.6.1 Test Limit

For 15.407(b)(6) requirement

For transmitters operating within the 5.925-7.125 GHz band: Any emissions outside of the 5.925-7.125 GHz band must not exceed an e.i.r.p. of -27 dBm/MHz.

Refer to 987594 D02 U-NII 6GHz EMC Measurement v01 clause G

Use guidance in KDB 789033 for measurements below 1000 MHz and above 1000 MHz. Unwanted emissions outside of restricted bands are measured with a RMS detector. In addition, 15.35(b) applies where the peak emissions must be limited to no more than 20 dB above the average limit.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47CFR must not exceed the limits shown in Table per Section 15.209.

| Frequency [MHz] | Field Strength [uV/m] | Measured Distance [Meters] |
|-----------------|-----------------------|----------------------------|
| 0.009 - 0.490   | 2400/F (kHz)          | 300                        |
| 0.490 - 1.705   | 24000/F (kHz)         | 30                         |
| 1.705 - 30      | 30                    | 30                         |
| 30 - 88         | 100                   | 3                          |
| 88 - 216        | 150                   | 3                          |
| 216 - 960       | 200                   | 3                          |
| Above 960       | 500                   | 3                          |

### 3.6.2 Test Procedure

| Test Method                                                                 |                                                       |
|-----------------------------------------------------------------------------|-------------------------------------------------------|
| <input type="radio"/> Conducted Measurement                                 | <input checked="" type="radio"/> Radiated Measurement |
| Test Channels                                                               |                                                       |
| <input checked="" type="radio"/> Lowest, Middle and Highest Channel         | <input type="radio"/> Lowest and Highest Channel      |
| Environmental conditions                                                    |                                                       |
| <input checked="" type="radio"/> Normal                                     | <input type="radio"/> Normal and Extreme              |
| Note: <input checked="" type="radio"/> :Test <input type="radio"/> :No Test |                                                       |

### 3.6.3 Test Setting

Table 1 - RBW as a function of frequency

| Frequency     | RBW           |
|---------------|---------------|
| 9 ~ 150 kHz   | 200 ~ 300 Hz  |
| 0.15 ~ 30 MHz | 9 ~ 10 kHz    |
| 30 ~ 1000 MHz | 100 ~ 120 kHz |
| > 1000MHz     | 1MHz          |

#### **Quasi-Peak Measurements below 1GHz**

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = as specified in Table 1
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

#### **Peak Measurements above 1GHz**

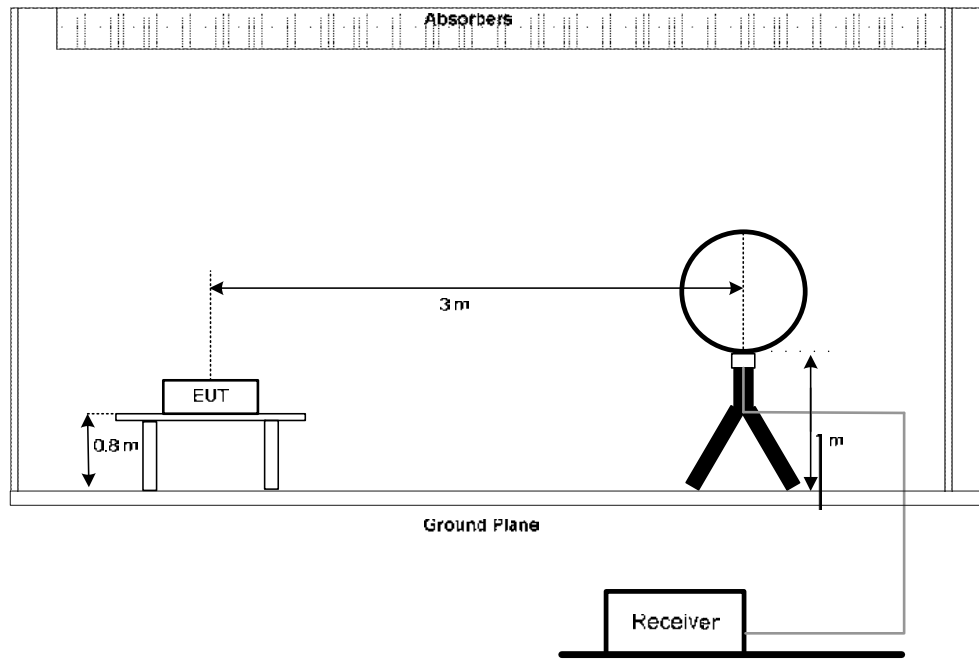
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

#### **Average Measurements above 1GHz (Method VB)**

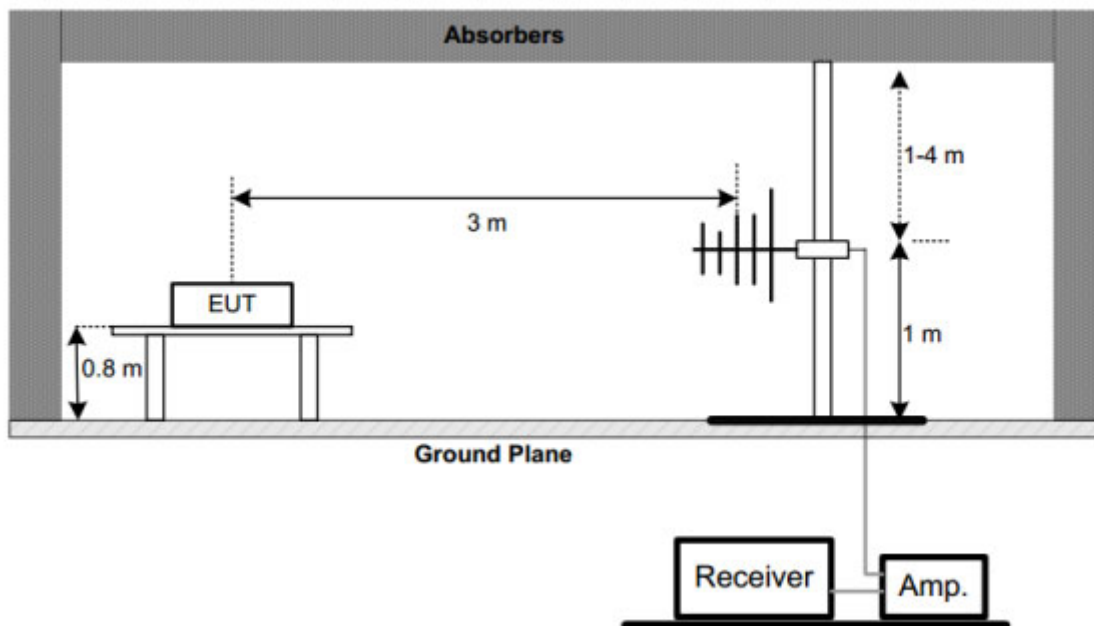
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; If the EUT is configured to transmit with duty cycle  $\geq 98\%$ , set VBW = 10 Hz.  
If the EUT duty cycle is  $< 98\%$ , set  $\text{VBW} \geq 1/T$ . T is the minimum transmission duration.
4. Detector = Peak
5. Sweep time = auto
6. Trace mode = max hold
7. Trace was allowed to stabilize

### 3.6.4 Test Setup

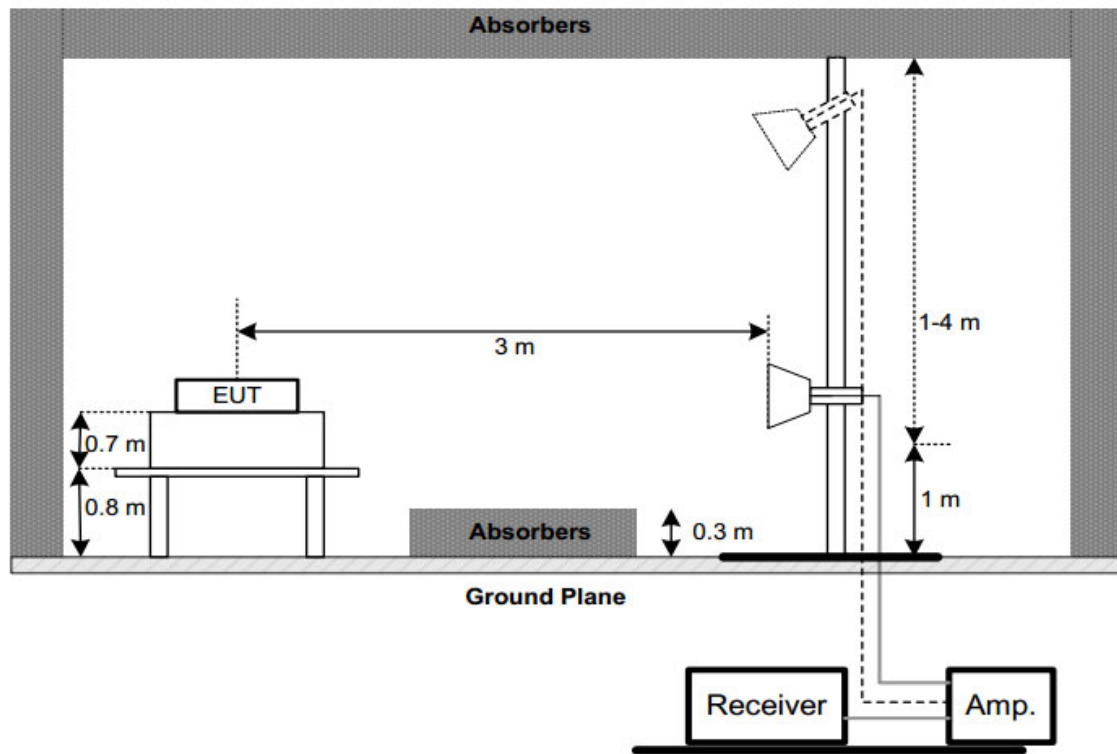
#### (A) Radiated Emission Test Set-Up Frequency Below 30 MHz



#### (B) Radiated Emission Test Set-Up Frequency 30 MHz-1000 MHz



### (C) Radiated Emission Test Set-Up Frequency Above 1 GHz



#### 3.6.5 Test Result

##### 1) Radiated emission: 9kHz-30MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not recorded in this report.

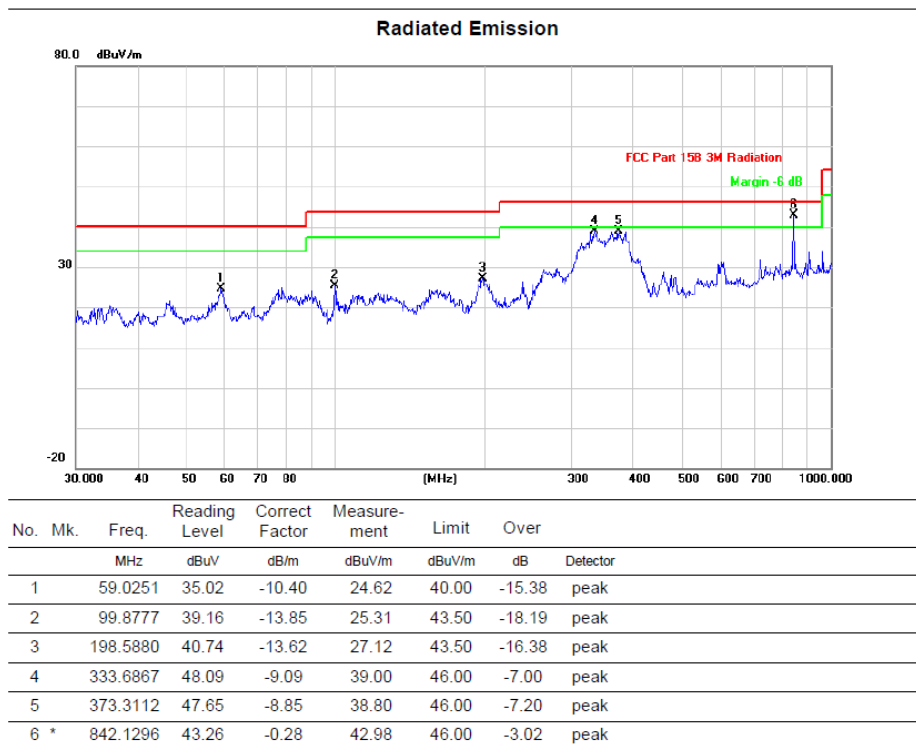
##### 2) Radiated emission: 30MHz-1GHz

###### Note:

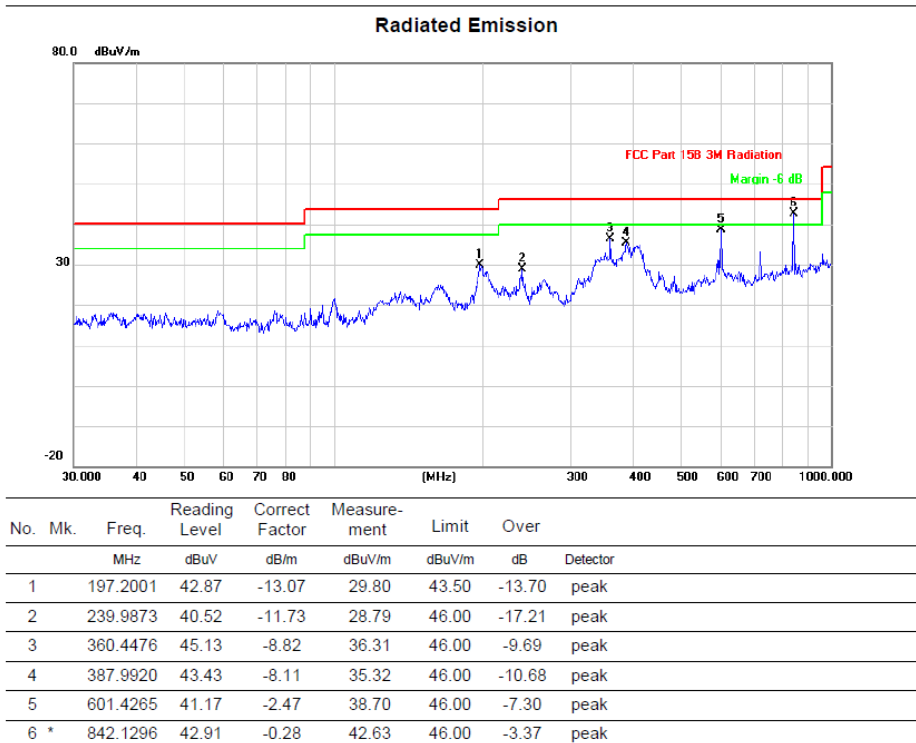
1. Measurement = Reading + Correct Factor.
2. Over = Measurement – Limit

We only recorded the data of the worst mode. Please see the following:

## VERTICAL



## HORIZONTAL



## 3) Radiated emission: Above 1GHz

| Frequency (MHz) | Read Level (dBμV) | Polarization | Factor (dB/m) | Measurement (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector |
|-----------------|-------------------|--------------|---------------|----------------------|----------------|-------------|----------|
| 11AX20 TX CH01  |                   |              |               |                      |                |             |          |
| 5925.00         | 51.43             | H            | 7.13          | 58.56                | 88.00          | 29.44       | peak     |
| 11910.00        | 38.00             | H            | 7.69          | 45.69                | 74.00          | 28.31       | peak     |
| 5925.00         | 52.00             | V            | 7.13          | 59.13                | 88.00          | 28.87       | peak     |
| 11910.00        | 38.82             | V            | 7.69          | 46.51                | 74.00          | 27.49       | peak     |
| 11AX20 TX CH49  |                   |              |               |                      |                |             |          |
| 12390.00        | 38.01             | H            | 7.83          | 45.84                | 74.00          | 28.16       | peak     |
| 12390.00        | 38.83             | V            | 7.83          | 46.66                | 74.00          | 27.34       | peak     |
| 11AX20 TX CH93  |                   |              |               |                      |                |             |          |
| 12830.00        | 36.94             | H            | 9.12          | 46.06                | 68.20          | 22.14       | peak     |
| 12830.00        | 37.70             | V            | 9.12          | 46.82                | 68.20          | 21.38       | peak     |
| 11AX20 TX CH97  |                   |              |               |                      |                |             |          |
| 12870.00        | 36.76             | H            | 9.07          | 45.83                | 68.20          | 22.37       | peak     |
| 12870.00        | 37.71             | V            | 9.07          | 46.78                | 68.20          | 21.42       | peak     |
| 11AX20 TX CH105 |                   |              |               |                      |                |             |          |
| 12950.00        | 36.94             | H            | 8.97          | 45.91                | 68.20          | 22.29       | peak     |
| 12950.00        | 37.72             | V            | 8.97          | 46.69                | 68.20          | 21.51       | peak     |
| 11AX20 TX CH113 |                   |              |               |                      |                |             |          |
| 13030.00        | 36.72             | H            | 8.91          | 45.63                | 68.20          | 22.57       | peak     |
| 13030.00        | 37.50             | V            | 8.91          | 46.41                | 68.20          | 21.79       | peak     |
| 11AX20 TX CH117 |                   |              |               |                      |                |             |          |
| 13070.00        | 36.61             | H            | 8.94          | 45.55                | 68.20          | 22.65       | peak     |
| 13070.00        | 37.43             | V            | 8.94          | 46.37                | 68.20          | 21.83       | peak     |
| 11AX20 TX CH153 |                   |              |               |                      |                |             |          |
| 13430.00        | 36.68             | H            | 9.06          | 45.74                | 68.20          | 22.46       | peak     |
| 13430.00        | 37.39             | V            | 9.06          | 46.45                | 68.20          | 21.75       | peak     |
| 11AX20 TX CH185 |                   |              |               |                      |                |             |          |
| 13750.00        | 36.82             | H            | 9.15          | 45.97                | 68.20          | 22.23       | peak     |
| 13750.00        | 37.58             | V            | 9.15          | 46.73                | 68.20          | 21.47       | peak     |
| 11AX20 TX CH189 |                   |              |               |                      |                |             |          |
| 13790.00        | 36.45             | H            | 9.36          | 45.81                | 68.20          | 22.39       | peak     |
| 13790.00        | 37.22             | V            | 9.36          | 46.58                | 68.20          | 21.62       | peak     |
| 11AX20 TX CH213 |                   |              |               |                      |                |             |          |
| 14030.00        | 37.01             | H            | 9.04          | 46.05                | 68.20          | 22.15       | peak     |
| 14030.00        | 38.18             | V            | 9.04          | 47.22                | 68.20          | 20.98       | peak     |
| 11AX20 TX CH233 |                   |              |               |                      |                |             |          |
| 7125.00         | 55.59             | H            | 13.09         | 68.68                | 88.00          | 19.32       | peak     |
| 7125.00         | 44.40             | H            | 13.09         | 57.49                | 68.00          | 10.51       | AV       |
| 14230.00        | 37.18             | H            | 8.64          | 45.82                | 68.20          | 22.38       | peak     |
| 7125.00         | 56.44             | V            | 13.09         | 69.53                | 88.00          | 18.47       | peak     |
| 7125.00         | 45.07             | V            | 13.09         | 58.16                | 68.00          | 9.84        | AV       |
| 14230.00        | 37.96             | V            | 8.64          | 46.60                | 68.20          | 21.60       | peak     |
| 11AX40 TX CH03  |                   |              |               |                      |                |             |          |

|                 |       |   |       |       |       |       |      |
|-----------------|-------|---|-------|-------|-------|-------|------|
| 5925.00         | 51.11 | H | 7.13  | 58.24 | 88.00 | 29.76 | peak |
| 11930.00        | 38.19 | H | 7.69  | 45.88 | 74.00 | 28.12 | peak |
| 5925.00         | 51.93 | V | 7.13  | 59.06 | 88.00 | 28.94 | peak |
| 11930.00        | 39.30 | V | 7.69  | 46.99 | 74.00 | 27.01 | peak |
| 11AX40 TX CH51  |       |   |       |       |       |       |      |
| 12410.00        | 37.86 | H | 7.88  | 45.74 | 74.00 | 28.26 | peak |
| 12410.00        | 39.19 | V | 7.88  | 47.07 | 74.00 | 26.93 | peak |
| 11AX40 TX CH91  |       |   |       |       |       |       |      |
| 12810.00        | 37.16 | H | 9.15  | 46.31 | 68.20 | 21.89 | peak |
| 12810.00        | 38.42 | V | 9.15  | 47.57 | 68.20 | 20.63 | peak |
| 11AX40 TX CH99  |       |   |       |       |       |       |      |
| 12890.00        | 37.43 | H | 9.04  | 46.47 | 68.20 | 21.73 | peak |
| 12890.00        | 38.57 | V | 9.04  | 47.61 | 68.20 | 20.59 | peak |
| 11AX40 TX CH107 |       |   |       |       |       |       |      |
| 12970.00        | 37.35 | H | 8.94  | 46.29 | 68.20 | 21.91 | peak |
| 12970.00        | 38.42 | V | 8.94  | 47.36 | 68.20 | 20.84 | peak |
| 11AX40 TX CH115 |       |   |       |       |       |       |      |
| 13050.00        | 37.84 | H | 8.93  | 46.77 | 68.20 | 21.43 | peak |
| 13050.00        | 39.02 | V | 8.93  | 47.95 | 68.20 | 20.25 | peak |
| 11AX40 TX CH123 |       |   |       |       |       |       |      |
| 13130.00        | 38.01 | H | 8.81  | 46.82 | 68.20 | 21.38 | peak |
| 13130.00        | 39.06 | V | 8.81  | 47.87 | 68.20 | 20.33 | peak |
| 11AX40 TX CH147 |       |   |       |       |       |       |      |
| 13370.00        | 37.63 | H | 8.89  | 46.52 | 68.20 | 21.68 | peak |
| 13370.00        | 38.75 | V | 8.89  | 47.64 | 68.20 | 20.56 | peak |
| 11AX40 TX CH179 |       |   |       |       |       |       |      |
| 13690.00        | 37.57 | H | 8.84  | 46.41 | 68.20 | 21.79 | peak |
| 13690.00        | 38.94 | V | 8.84  | 47.78 | 68.20 | 20.42 | peak |
| 11AX40 TX CH187 |       |   |       |       |       |       |      |
| 13770.00        | 36.93 | H | 9.25  | 46.18 | 68.20 | 22.02 | peak |
| 13770.00        | 38.06 | V | 9.25  | 47.31 | 68.20 | 20.89 | peak |
| 11AX40 TX CH211 |       |   |       |       |       |       |      |
| 14010.00        | 37.20 | H | 9.06  | 46.26 | 68.20 | 21.94 | peak |
| 14010.00        | 38.31 | V | 9.06  | 47.37 | 68.20 | 20.83 | peak |
| 11AX40 TX CH227 |       |   |       |       |       |       |      |
| 7125.00         | 47.19 | H | 13.09 | 60.28 | 88.00 | 27.72 | peak |
| 14170.00        | 37.14 | H | 8.63  | 45.77 | 68.20 | 22.43 | peak |
| 7125.00         | 48.07 | V | 13.09 | 61.16 | 88.00 | 26.84 | peak |
| 14170.00        | 38.38 | V | 8.63  | 47.01 | 68.20 | 21.19 | peak |
| 11AX80 TX CH07  |       |   |       |       |       |       |      |
| 5925.00         | 52.05 | H | 7.13  | 59.18 | 88.00 | 28.82 | peak |
| 11970.00        | 38.81 | H | 7.70  | 46.51 | 74.00 | 27.49 | peak |
| 5925.00         | 52.52 | V | 7.13  | 59.65 | 88.00 | 28.35 | peak |
| 11970.00        | 39.87 | V | 7.70  | 47.57 | 74.00 | 26.43 | peak |
| 11AX80 TX CH55  |       |   |       |       |       |       |      |
| 12450.00        | 37.90 | H | 8.07  | 45.97 | 74.00 | 28.03 | peak |
| 12450.00        | 38.96 | V | 8.07  | 47.03 | 74.00 | 26.97 | peak |

| 11AX80 TX CH87  |       |   |       |       |       |       |      |
|-----------------|-------|---|-------|-------|-------|-------|------|
| 12770.00        | 37.20 | H | 9.15  | 46.35 | 68.20 | 21.85 | peak |
| 12770.00        | 38.60 | V | 9.15  | 47.75 | 68.20 | 20.45 | peak |
| 11AX80 TX CH103 |       |   |       |       |       |       |      |
| 12930.00        | 37.59 | H | 8.99  | 46.58 | 68.20 | 21.62 | peak |
| 12930.00        | 38.82 | V | 8.99  | 47.81 | 68.20 | 20.39 | peak |
| 11AX80 TX CH119 |       |   |       |       |       |       |      |
| 13090.00        | 37.78 | H | 8.94  | 46.72 | 68.20 | 21.48 | peak |
| 13090.00        | 38.69 | V | 8.94  | 47.63 | 68.20 | 20.57 | peak |
| 11AX80 TX CH135 |       |   |       |       |       |       |      |
| 13250.00        | 38.09 | H | 8.56  | 46.65 | 68.20 | 21.55 | peak |
| 13250.00        | 39.23 | V | 8.56  | 47.79 | 68.20 | 20.41 | peak |
| 11AX80 TX CH151 |       |   |       |       |       |       |      |
| 13410.00        | 37.46 | H | 9.01  | 46.47 | 68.20 | 21.73 | peak |
| 13410.00        | 38.63 | V | 9.01  | 47.64 | 68.20 | 20.56 | peak |
| 11AX80 TX CH167 |       |   |       |       |       |       |      |
| 13570.00        | 38.31 | H | 8.68  | 46.99 | 68.20 | 21.21 | peak |
| 13570.00        | 39.39 | V | 8.68  | 48.07 | 68.20 | 20.13 | peak |
| 11AX80 TX CH183 |       |   |       |       |       |       |      |
| 13730.00        | 38.08 | H | 9.04  | 47.12 | 68.20 | 21.08 | peak |
| 13730.00        | 39.18 | V | 9.04  | 48.22 | 68.20 | 19.98 | peak |
| 11AX80 TX CH199 |       |   |       |       |       |       |      |
| 13890.00        | 37.41 | H | 9.53  | 46.94 | 68.20 | 21.26 | peak |
| 13890.00        | 38.30 | V | 9.53  | 47.83 | 68.20 | 20.37 | peak |
| 11AX80 TX CH215 |       |   |       |       |       |       |      |
| 7125.00         | 46.75 | H | 13.09 | 59.84 | 88.00 | 28.16 | peak |
| 14050.00        | 37.89 | H | 9.02  | 46.91 | 68.20 | 21.29 | peak |
| 7125.00         | 47.17 | V | 13.09 | 60.26 | 88.00 | 27.74 | peak |
| 14050.00        | 38.83 | V | 9.02  | 47.85 | 68.20 | 20.35 | peak |

**Note:** 1. The other emission levels were very low against the limit.

2. Measurement = Reading Level+ Correct Factor, Margin = Limit- Measurement

## 3.7 AC Conducted Emissions Measurement

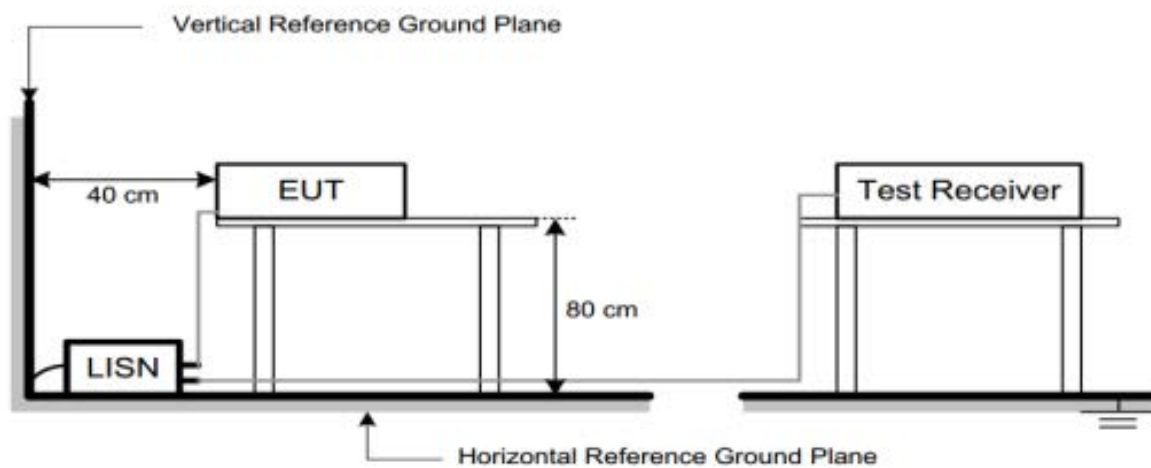
### 3.7.1 Test Limit

| Limits          |           |           |
|-----------------|-----------|-----------|
| Frequency (MHz) | QP (dBuV) | AV (dBuV) |
| 0.15 - 0.50     | 66 - 56   | 56 - 46   |
| 0.50 - 5.0      | 56        | 46        |
| 5.0 - 30        | 60        | 50        |

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

### 3.7.2 Test Setup

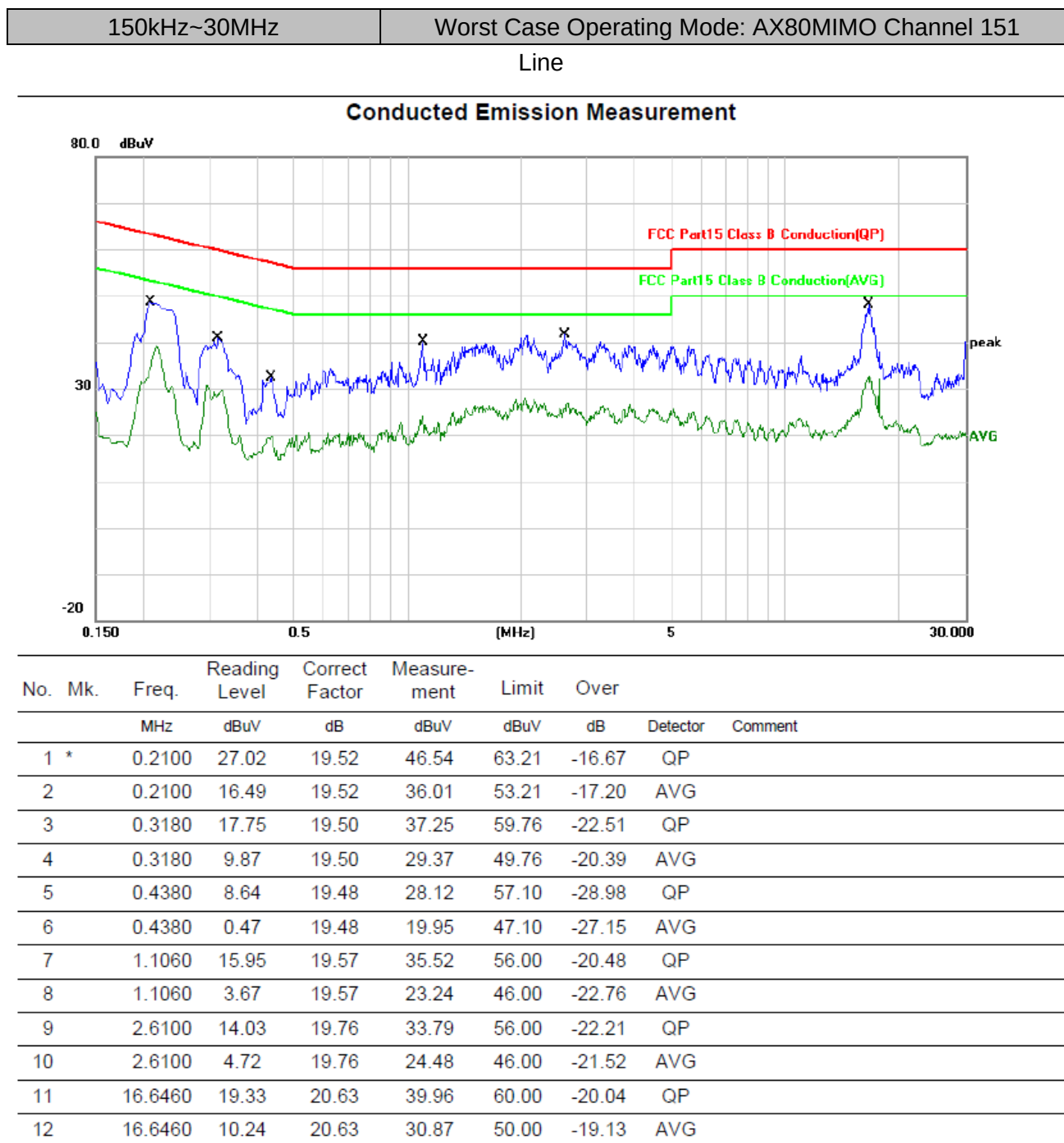


### 3.7.3 Test Result

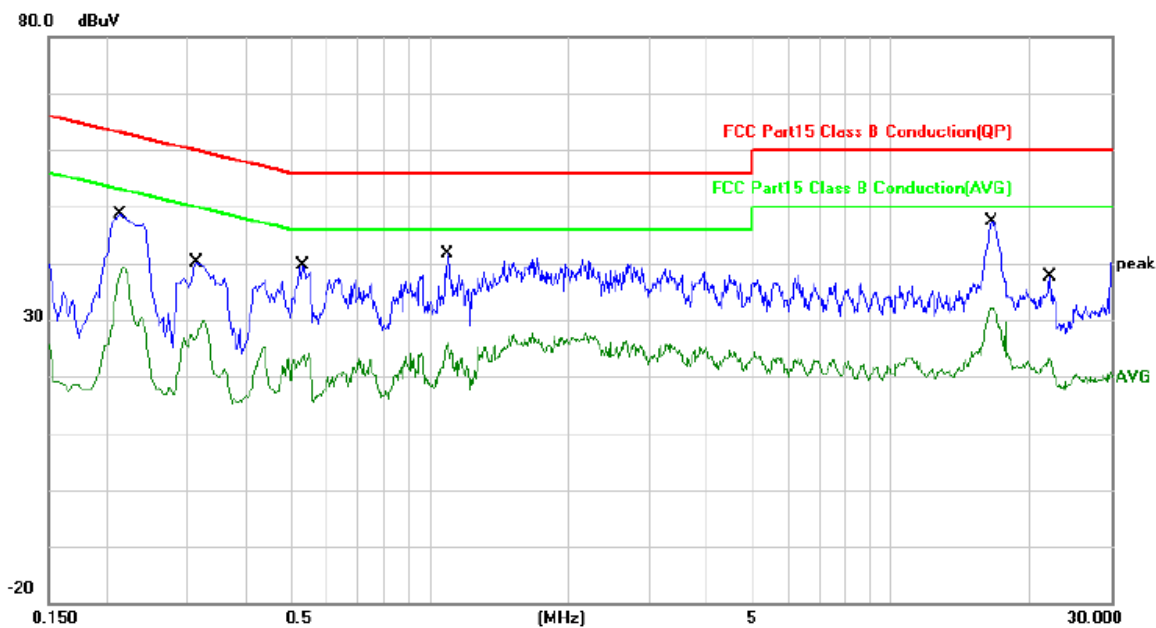
#### Note:

1. Correct Factor = LISN Factor + Cable Loss + Pulse Limiter Factor, the value was added to Original Receiver Reading by the software automatically.
2. Measurement = Reading + Correct Factor.
3. Over = Measurement – Limit

Note: This adapter has been tested the conducted emission with the EUT separately. We only recorded the data of the worst mode. Please see the following:



## Conducted Emission Measurement



| No. | Mk. | Freq.   | Reading Level | Correct Factor | Measurement | Limit | Over   |          |         |
|-----|-----|---------|---------------|----------------|-------------|-------|--------|----------|---------|
|     |     | MHz     | dBuV          | dB             | dBuV        | dBuV  | dB     | Detector | Comment |
| 1   |     | 0.2140  | 27.78         | 19.55          | 47.33       | 63.05 | -15.72 | QP       |         |
| 2   | *   | 0.2140  | 19.46         | 19.55          | 39.01       | 53.05 | -14.04 | AVG      |         |
| 3   |     | 0.3140  | 17.52         | 19.51          | 37.03       | 59.86 | -22.83 | QP       |         |
| 4   |     | 0.3140  | 8.31          | 19.51          | 27.82       | 49.86 | -22.04 | AVG      |         |
| 5   |     | 0.5340  | 14.51         | 19.54          | 34.05       | 56.00 | -21.95 | QP       |         |
| 6   |     | 0.5340  | 3.59          | 19.54          | 23.13       | 46.00 | -22.87 | AVG      |         |
| 7   |     | 1.0940  | 14.53         | 19.55          | 34.08       | 56.00 | -21.92 | QP       |         |
| 8   |     | 1.0940  | 4.60          | 19.55          | 24.15       | 46.00 | -21.85 | AVG      |         |
| 9   |     | 16.4900 | 19.31         | 20.62          | 39.93       | 60.00 | -20.07 | QP       |         |
| 10  |     | 16.4900 | 9.72          | 20.62          | 30.34       | 50.00 | -19.66 | AVG      |         |
| 11  |     | 22.1220 | 8.31          | 20.93          | 29.24       | 60.00 | -30.76 | QP       |         |
| 12  |     | 22.1220 | 0.30          | 20.93          | 21.23       | 50.00 | -28.77 | AVG      |         |

## Statement

1. The report is invalid without the official seal or special seal of Shenzhen Haiyun Standard Technical Co., Ltd. (hereinafter referred to as the unit).
2. The report is invalid without the signature of the approver.
3. The report is invalid if altered arbitrarily.
4. The report shall not be partially copied without the written approval of the unit.
5. The reported test results are only valid for the tested samples.
6. If there is any objection to the test report, it shall be submitted to the test unit within 15 days from the date of receiving the report, and the overdue shall not be accepted.

## Shenzhen Haiyun Standard Technical Co., Ltd.

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(END OF REPORT)