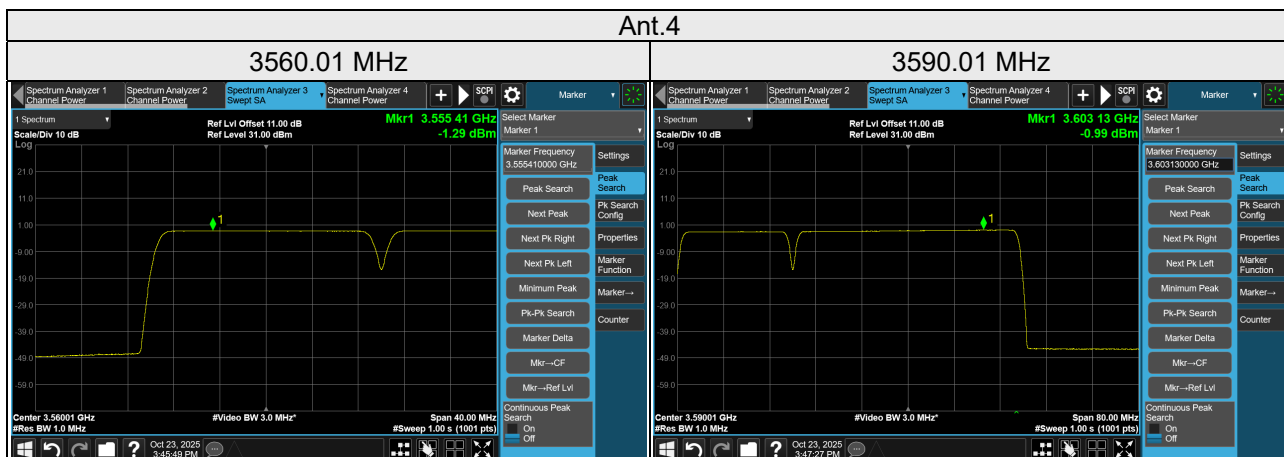


Ant.4



Mode C2 / C3

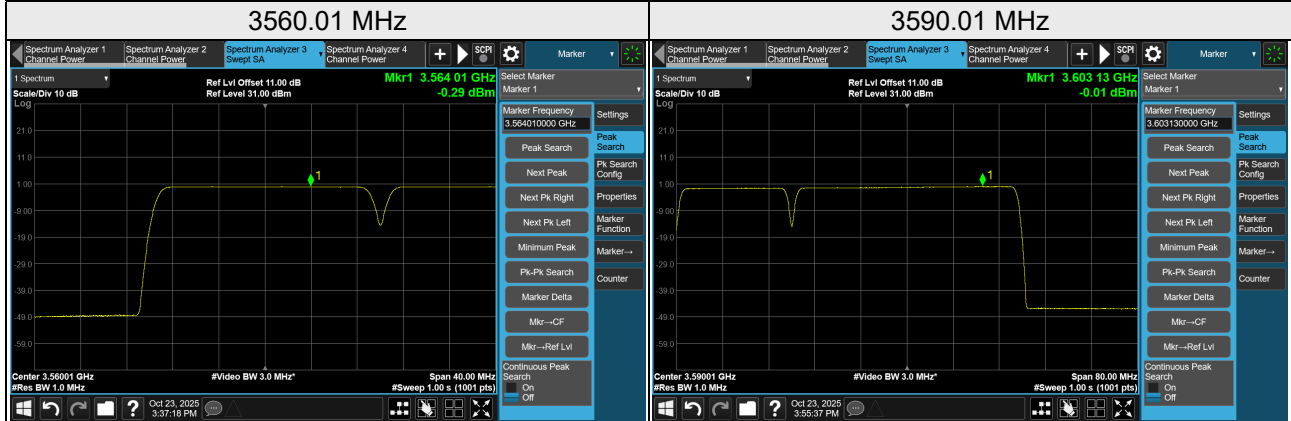
Bandwidth	Frequency (MHz)	Modulation	Carrier	Antenna				Total	EIRP (dBm/MHz)	Verdict
				1	2	3	4			
20M+40M	3560.01+3679.98	QPSK	CC0	0.3	-0.15	-0.57	-0.3	5.85	19.67	PASS
			CC1	-0.57	-1.19	-1.3	-1.09	4.99		
		64QAM	CC0	0.25	-0.21	-0.63	-0.35	5.80	19.62	PASS
			CC1	-0.62	-1.25	-1.35	-1.13	4.94		
		256QAM	CC0	0.21	-0.25	-0.68	-0.39	5.76	19.58	PASS
			CC1	-0.66	-1.3	-1.41	-1.19	4.89		
	3592.5+3667.5	QPSK	CC0	0.35	-0.36	-0.19	-0.99	5.75	19.66	PASS
			CC1	-0.17	-1.44	-0.93	-1.29	5.09		
		64QAM	CC0	0.31	-0.4	-0.25	-1.03	5.70	19.62	PASS
			CC1	-0.23	-1.48	-0.99	-1.33	5.04		
		256QAM	CC0	0.28	-0.45	-0.3	-1.08	5.66	19.57	PASS
			CC1	-0.29	-1.52	-1.03	-1.37	4.99		
	3597.51+3662.52	QPSK	CC0	0.4	-0.33	-0.35	-1.11	5.71	19.54	PASS
			CC1	-0.54	-1.26	-1.35	-1.48	4.88		
		64QAM	CC0	0.35	-0.38	-0.4	-1.17	5.65	19.49	PASS
			CC1	-0.59	-1.32	-1.41	-1.53	4.82		
		256QAM	CC0	0.3	-0.42	-0.45	-1.21	5.61	19.44	PASS
			CC1	-0.64	-1.38	-1.46	-1.59	4.77		
	3560.01+3590.01	QPSK	CC0	-0.29	-0.84	-0.57	-1.29	5.29	19.68	PASS
			CC1	-0.01	-0.52	-0.19	-0.99	5.61		
		64QAM	CC0	-0.34	-0.9	-0.62	-1.33	5.24	19.63	PASS
			CC1	-0.07	-0.56	-0.25	-1.03	5.56		
		256QAM	CC0	-0.39	-0.96	-0.67	-1.39	5.18	19.58	PASS
			CC1	-0.12	-0.62	-0.31	-1.07	5.51		
	3649.98+3679.98	QPSK	CC0	-0.26	-0.79	-1.13	-0.43	5.38	19.67	PASS
			CC1	0.26	-0.95	-1.12	-0.42	5.50		
		64QAM	CC0	-0.3	-0.85	-1.19	-0.48	5.33	19.62	PASS
			CC1	0.23	-0.99	-1.17	-0.48	5.45		
		256QAM	CC0	-0.36	-0.9	-1.25	-0.53	5.27	19.57	PASS
			CC1	0.2	-1.04	-1.22	-0.54	5.41		

Note:

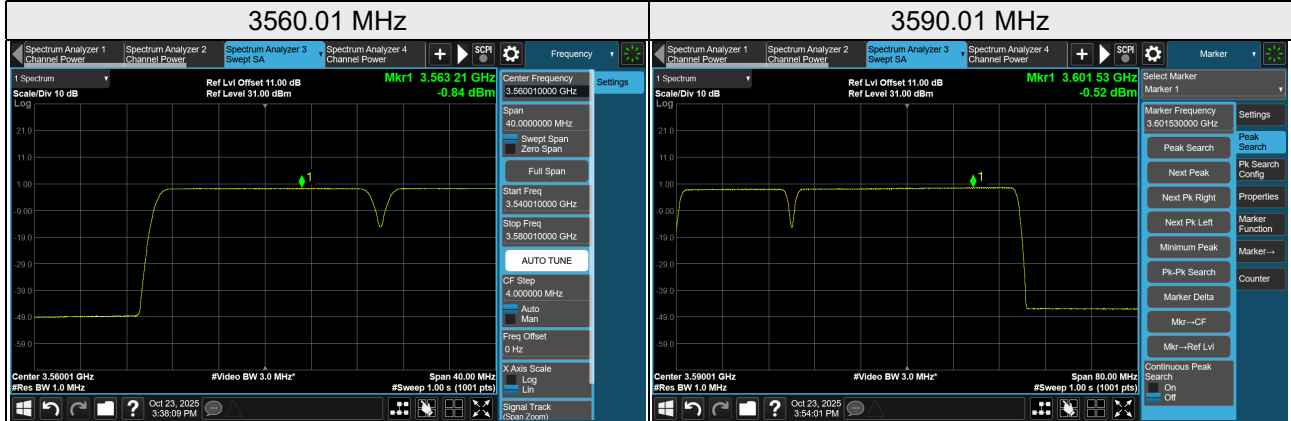
1. Correlated Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{G4/20})^2/4] = 11.22\text{dBi}$
2. EIRP Power Spectral Density (dBm/MHz) = Total Power Spectral Density (dBm/MHz) + Directional Gain

Spectrum Plot of Worst Value
20MHz+40MHz / QPSK
3560.01 MHz+ 3590.01 MHz

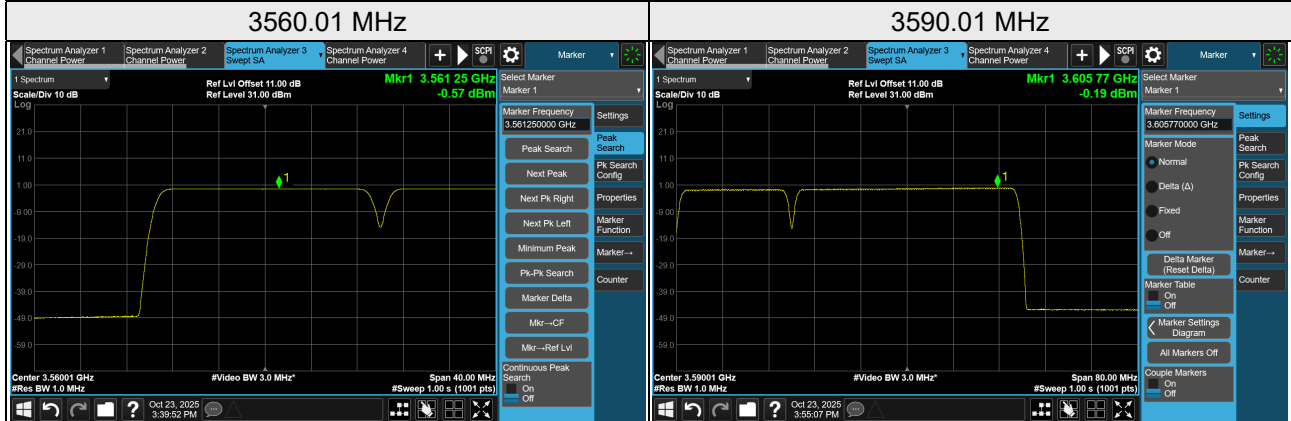
Ant.1

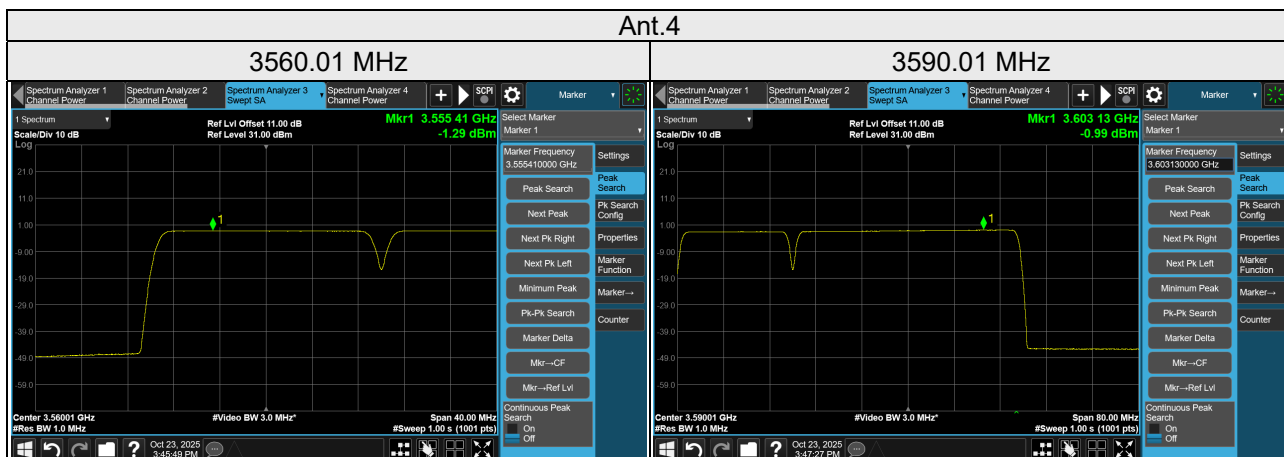


Ant.2



Ant.3





Mode D2 / D3

Bandwidth	Frequency (MHz)	Modulation	Carrier	Antenna				Total	EIRP (dBm/MHz)	Verdict
				1	2	3	4			
20M+40M	3560.01+3679.98	QPSK	CC0	-1.82	-2.07	-3.2	-3.19	3.50	19.82	PASS
			CC1	-2.62	-3.17	-3.9	-3.97	2.64		
		64QAM	CC0	-1.87	-2.12	-3.25	-3.25	3.44	19.77	PASS
			CC1	-2.67	-3.22	-3.95	-4.03	2.59		
		256QAM	CC0	-1.93	-2.17	-3.29	-3.29	3.40	19.72	PASS
			CC1	-2.71	-3.27	-4	-4.08	2.54		
	3592.5+3667.5	QPSK	CC0	-2.03	-2.77	-2.39	-3.69	3.34	19.71	PASS
			CC1	-2.82	-3.91	-3.14	-4	2.58		
		64QAM	CC0	-2.09	-2.83	-2.45	-3.74	3.29	19.66	PASS
			CC1	-2.86	-3.96	-3.18	-4.04	2.54		
		256QAM	CC0	-2.13	-2.89	-2.51	-3.79	3.23	19.61	PASS
			CC1	-2.9	-4.01	-3.23	-4.08	2.49		
	3597.51+3662.52	QPSK	CC0	-2.12	-3.12	-2.68	-3.31	3.24	19.61	PASS
			CC1	-2.95	-3.98	-3.62	-3.68	2.48		
		64QAM	CC0	-2.18	-3.17	-2.74	-3.36	3.18	19.55	PASS
			CC1	-3.01	-4.04	-3.68	-3.72	2.42		
		256QAM	CC0	-2.22	-3.21	-2.78	-3.42	3.14	19.50	PASS
			CC1	-3.07	-4.08	-3.73	-3.76	2.38		
	3560.01+3590.01	QPSK	CC0	-2.55	-3.04	-3.44	-3.65	2.87	19.76	PASS
			CC1	-2.18	-2.76	-2.92	-3.57	3.19		
		64QAM	CC0	-2.61	-3.08	-3.5	-3.69	2.82	19.71	PASS
			CC1	-2.24	-2.8	-2.97	-3.62	3.14		
		256QAM	CC0	-2.66	-3.14	-3.54	-3.73	2.77	19.67	PASS
			CC1	-2.29	-2.85	-3.02	-3.66	3.09		
	3649.98+3679.98	QPSK	CC0	-2.61	-2.8	-2.7	-3.52	3.13	19.94	PASS
			CC1	-1.96	-2.87	-2.76	-3.44	3.30		
		64QAM	CC0	-2.67	-2.86	-2.75	-3.58	3.07	19.89	PASS
			CC1	-2.01	-2.93	-2.81	-3.49	3.24		
		256QAM	CC0	-2.71	-2.92	-2.79	-3.64	3.02	19.84	PASS
			CC1	-2.05	-2.98	-2.86	-3.53	3.20		

Note:

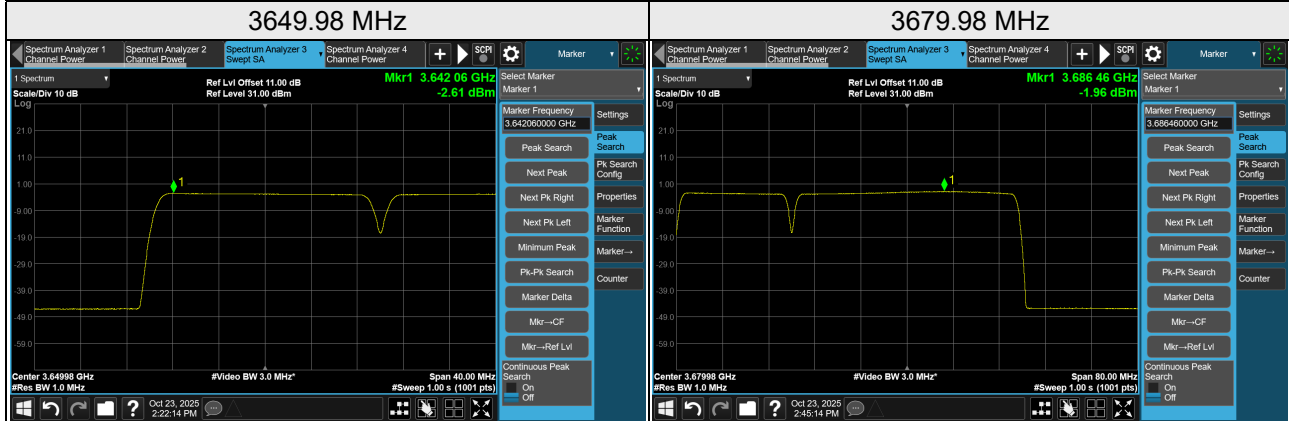
1. Correlated Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{G4/20})^2/4] = 13.72\text{dBi}$
2. EIRP Power Spectral Density (dBm/MHz) = Total Power Spectral Density (dBm/MHz) + Directional Gain

Spectrum Plot of Worst Value

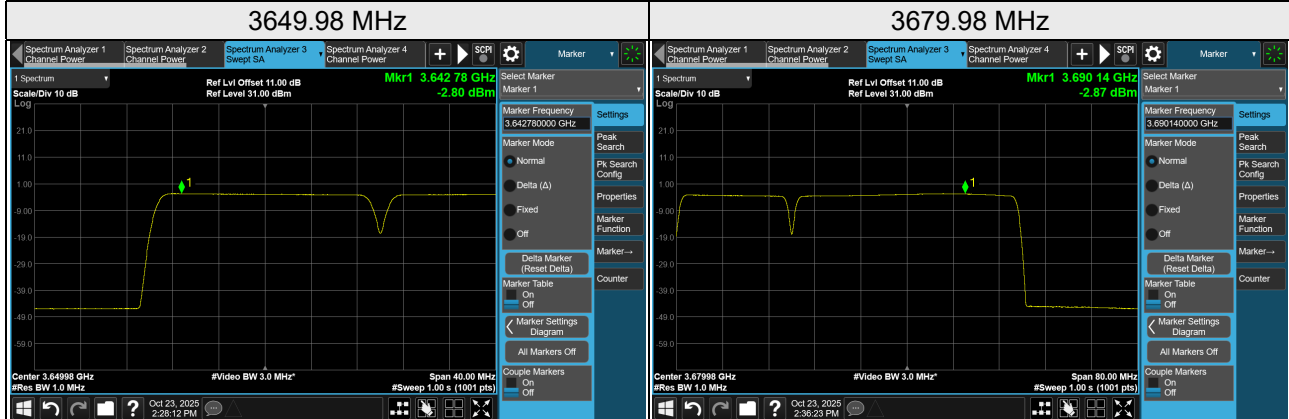
20MHz+40MHz / QPSK

3649.98 MHz+ 3679.98 MHz

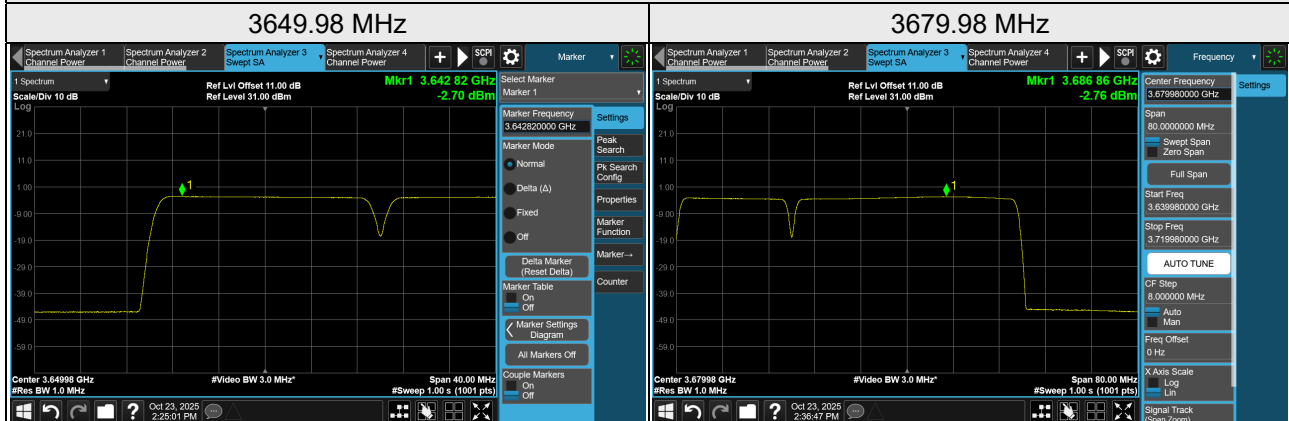
Ant.1

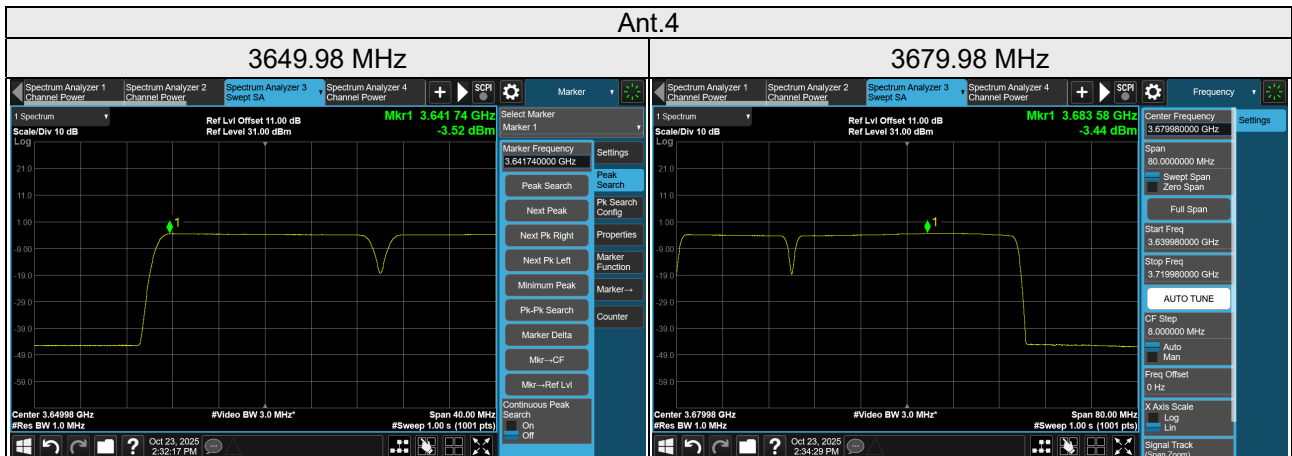


Ant.2



Ant.3



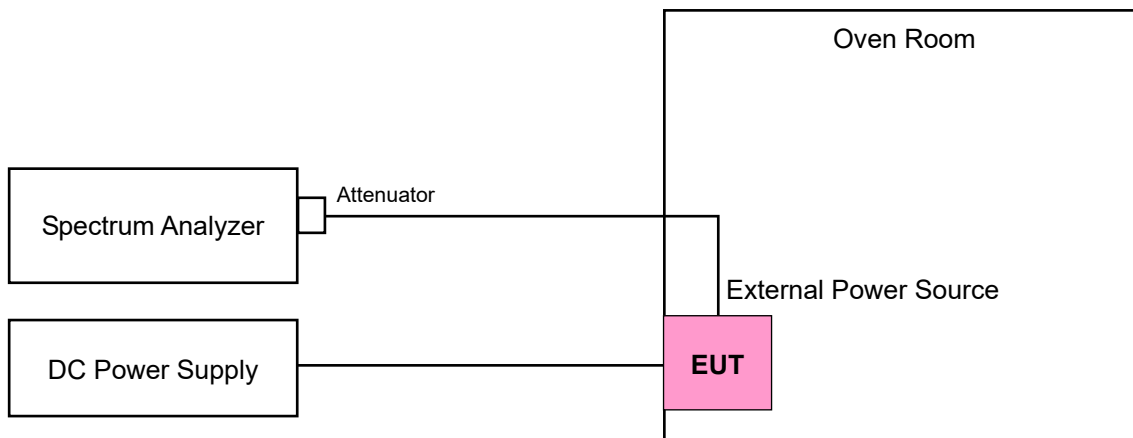


4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency band.

4.3.2 Test Setup



4.3.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
PXA Signal Analyzer Keysight	N9030B	MY57140938	2025/3/24	2026/3/23
STANDARD TEMPERATURE & HUMIDITY CHAMBER TERCHY	MHU-225AU	911033	2024/10/29	2025/10/28
Three-phase coupling / decoupling network TESEQ	CDN 3063	4006	2025/3/6	2026/3/5
DC Power Supply Topward	6306A	727263	NA	NA

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Test date: 2025/10/27

4.3.4 Test Procedure

- Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ± 0.5 °C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

Note: The frequency error was recorded frequency error from the Spectrum Analyzer.

4.3.5 Test Results

Environmental Conditions:	20°C, 73% RH	Tested By:	Noah Chang
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Mode A2

Antenna 1

Frequency Error vs. Voltage

Voltage (Vdc)	NR Band 48, Channel Bandwidth: 20MHz+40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
57	3560.010003	0.000843	3679.979998	-0.000542
56	3560.010002	0.000562	3679.979999	-0.000271
44	3560.010002	0.000562	3679.980004	0.001084

Note: The applicant defined the normal working voltage is from 44Vdc to 57Vdc.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz+40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	3560.009995	-0.001404	3679.979996	-0.001087
-20	3560.009997	-0.000843	3679.980004	0.001084
-10	3560.010001	0.000281	3679.979996	-0.001084
0	3560.010002	0.000562	3679.979997	-0.000813
10	3560.010004	0.001124	3679.979997	-0.000813
20	3560.010005	0.001404	3679.980002	0.000542
30	3560.010004	0.001124	3679.979996	-0.001084
40	3560.010005	0.001404	3679.979996	-0.001084
50	3560.010003	0.000843	3679.979995	-0.001355

Antenna 2

Frequency Error vs. Voltage

Voltage (Vdc)	NR Band 48, Channel Bandwidth: 20MHz+40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
57	3560.010002	0.000562	3679.979997	-0.000813
56	3560.010005	0.001404	3679.980004	0.001084
44	3560.010004	0.001124	3679.980004	0.001084

Note: The applicant defined the normal working voltage is from 44Vdc to 57Vdc.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz+40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	3560.009995	-0.001404	3679.979997	-0.000815
-20	3560.010005	0.001404	3679.980005	0.001355
-10	3560.009998	-0.000562	3679.980004	0.001084
0	3560.010005	0.001404	3679.980002	0.000542
10	3560.010003	0.000843	3679.980002	0.000542
20	3560.010004	0.001124	3679.979997	-0.000813
30	3560.010002	0.000562	3679.979997	-0.000813
40	3560.009996	-0.001124	3679.979998	-0.000542
50	3560.009997	-0.000843	3679.979996	-0.001084

Antenna 3

Frequency Error vs. Voltage

Voltage (Vdc)	NR Band 48, Channel Bandwidth: 20MHz+40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
57	3560.010002	0.000562	3679.979996	-0.001084
56	3560.010001	0.000281	3679.979996	-0.001084
44	3560.010005	0.001404	3679.979999	-0.000271

Note: The applicant defined the normal working voltage is from 44Vdc to 57Vdc.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz+40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	3560.010004	0.001124	3679.980005	0.001359
-20	3560.010001	0.000281	3679.979997	-0.000813
-10	3560.010004	0.001124	3679.979999	-0.000271
0	3560.010001	0.000281	3679.980003	0.000813
10	3560.009995	-0.001404	3679.980005	0.001355
20	3560.010004	0.001124	3679.980002	0.000542
30	3560.010002	0.000562	3679.979998	-0.000542
40	3560.009995	-0.001404	3679.980005	0.001355
50	3560.010001	0.000281	3679.979996	-0.001084

Antenna 4

Frequency Error vs. Voltage

Voltage (Vdc)	NR Band 48, Channel Bandwidth: 20MHz+40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
57	3560.009999	-0.000281	3679.979999	-0.000271
56	3560.010005	0.001404	3679.980003	0.000813
44	3560.010001	0.000281	3679.979999	-0.000271

Note: The applicant defined the normal working voltage is from 44Vdc to 57Vdc.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz+40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	3560.009997	-0.000843	3679.979997	-0.000815
-20	3560.010001	0.000281	3679.979998	-0.000542
-10	3560.010005	0.001404	3679.979998	-0.000542
0	3560.010003	0.000843	3679.980005	0.001355
10	3560.009996	-0.001124	3679.980005	0.001355
20	3560.009997	-0.000843	3679.979996	-0.001084
30	3560.010003	0.000843	3679.979995	-0.001355
40	3560.009997	-0.000843	3679.980003	0.000813
50	3560.009999	-0.000281	3679.979996	-0.001084

Mode A3
Antenna 1

Frequency Error vs. Voltage

Voltage (Vdc)	NR Band 48, Channel Bandwidth: 20MHz+40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
57	3560.009998	-0.000562	3679.979995	-0.001359
56	3560.010003	0.000843	3679.980001	0.000272
44	3560.010002	0.000562	3679.979998	-0.000543

Note: The applicant defined the normal working voltage is from 44Vdc to 57Vdc.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz+40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	3560.009998	-0.000562	3679.979996	-0.001087
-20	3560.009996	-0.001124	3679.980004	0.001087
-10	3560.009999	-0.000281	3679.979996	-0.001087
0	3560.010005	0.001404	3679.980003	0.000815
10	3560.010005	0.001404	3679.980001	0.000272
20	3560.009996	-0.001124	3679.979999	-0.000272
30	3560.010001	0.000281	3679.979999	-0.000272
40	3560.009999	-0.000281	3679.980001	0.000272
50	3560.010003	0.000843	3679.979996	-0.001087

Antenna 2

Frequency Error vs. Voltage

Voltage (Vdc)	NR Band 48, Channel Bandwidth: 20MHz+40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
57	3560.009996	-0.001124	3679.979996	-0.001087
56	3560.010001	0.000281	3679.980003	0.000815
44	3560.010001	0.000281	3679.979997	-0.000815

Note: The applicant defined the normal working voltage is from 44Vdc to 57Vdc.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz+40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	3560.009997	-0.000843	3679.979999	-0.000272
-20	3560.009998	-0.000562	3679.980004	0.001087
-10	3560.010002	0.000562	3679.979998	-0.000543
0	3560.009995	-0.001404	3679.979997	-0.000815
10	3560.009996	-0.001124	3679.980003	0.000815
20	3560.010002	0.000562	3679.980002	0.000543
30	3560.010003	0.000843	3679.979998	-0.000543
40	3560.010003	0.000843	3679.980002	0.000543
50	3560.009996	-0.001124	3679.980003	0.000815

Antenna 3

Frequency Error vs. Voltage

Voltage (Vdc)	NR Band 48, Channel Bandwidth: 20MHz+40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
57	3560.010005	0.001404	3679.980001	0.000272
56	3560.010002	0.000562	3679.979996	-0.001087
44	3560.009998	-0.000562	3679.980005	0.001359

Note: The applicant defined the normal working voltage is from 44Vdc to 57Vdc.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz+40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	3560.010004	0.001124	3679.980004	0.001087
-20	3560.010002	0.000562	3679.980002	0.000543
-10	3560.010003	0.000843	3679.979998	-0.000543
0	3560.010002	0.000562	3679.980005	0.001359
10	3560.010004	0.001124	3679.980003	0.000815
20	3560.010004	0.001124	3679.979999	-0.000272
30	3560.009997	-0.000843	3679.980002	0.000543
40	3560.009999	-0.000281	3679.980003	0.000815
50	3560.010003	0.000843	3679.979995	-0.001359

Antenna 4

Frequency Error vs. Voltage

Voltage (Vdc)	NR Band 48, Channel Bandwidth: 20MHz+40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
57	3560.009997	-0.000843	3679.979996	-0.001087
56	3560.009996	-0.001124	3679.979997	-0.000815
44	3560.009999	-0.000281	3679.980002	0.000543

Note: The applicant defined the normal working voltage is from 44Vdc to 57Vdc.

Frequency Error vs. Temperature

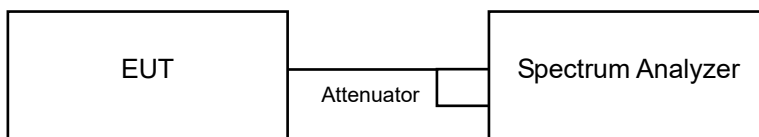
Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz+40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	3560.010004	0.001124	3679.980001	0.000272
-20	3560.009999	-0.000281	3679.979997	-0.000815
-10	3560.010002	0.000562	3679.980002	0.000543
0	3560.009996	-0.001124	3679.979997	-0.000815
10	3560.010004	0.001124	3679.979995	-0.001359
20	3560.009998	-0.000562	3679.980003	0.000815
30	3560.010005	0.001404	3679.979997	-0.000815
40	3560.010002	0.000562	3679.979996	-0.001087
50	3560.009997	-0.000843	3679.979998	-0.000543

4.4 Emission Bandwidth Measurement

4.4.1 Limits of Emission Bandwidth Measurement

According to FCC 47 CFR part 2.1049, the occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5% of the total mean power radiated by a given emission.

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.4.4 Test Procedure

For the 26 dBc bandwidth measurement method, please refer to section 5.4.3 of ANSI C63.26.

- a. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
- b. The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set $\geq 3 \times \text{RBW}$.
- c. Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
- d. The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target “-X dB” requirement, i.e., if the requirement calls for measuring the -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
- e. Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
- f. Determine the following reference values: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
- g. Determine the “-X dB amplitude” as equal to (Reference Value - X). Alternatively, this calculation can be performed on the spectrum analyzer using the delta-marker measurement function.
- h. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “-X dB amplitude” determined in step f).
- i. If a marker is below this “-X dB amplitude” value it should be as close as possible to this value. The OBW is the positive frequency difference between the two markers.
- i. The OBW shall be reported by providing plot(s) of the measuring instrument display, to include markers depicting the relevant frequency and amplitude information (e.g., marker table). The frequency and amplitude axis and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

For the occupied bandwidth measurement method, please refer to section 5.4.4 of ANSI C63.26.

- a. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
- b. The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set $\geq 3 \times \text{RBW}$.
- c. Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
- d. The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target “-X dB” requirement, i.e., if the requirement calls for measuring the -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
- e. Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
- f. Determine the reference value by either of the following:
 - 1) Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
 - 2) Set the EUT to transmit an unmodulated carrier. Set the spectrum analyzer marker to the level of the carrier.
- g. Determine the “-X dB amplitude” as equal to (Reference Value - X). Alternatively, this calculation can be performed on the spectrum analyzer using the delta-marker measurement function.
- h. If the reference value was determined using an unmodulated carrier, turn the EUT modulation on, then either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise the trace from step f) shall be used for step i).
- i. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “-X dB amplitude” determined in step f). If a marker is below this “-X dB amplitude” value it should be as close as possible to this value. The OBW is the positive frequency difference between the two markers. The spectral envelope can cross the “-X dB amplitude” at multiple points. The lowest or highest frequency shall be selected as the frequencies that are the farthest away from the center frequency at which the spectral envelope crosses the “-X dB amplitude.”
- j. The OBW shall be reported by providing plot(s) of the measuring instrument display, to include markers depicting the relevant frequency and amplitude information (e.g., marker table). The frequency and amplitude axis and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

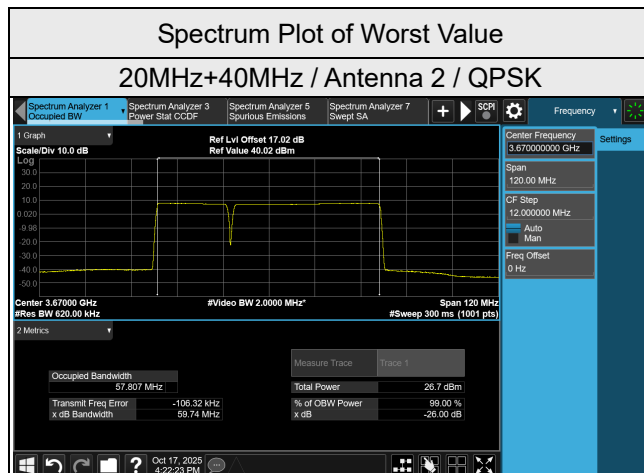
4.4.7 Test Result

Input Power:	12 Vdc	Environmental Conditions:	22°C, 73% RH	Tested By:	Noah Chang
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Mode A2

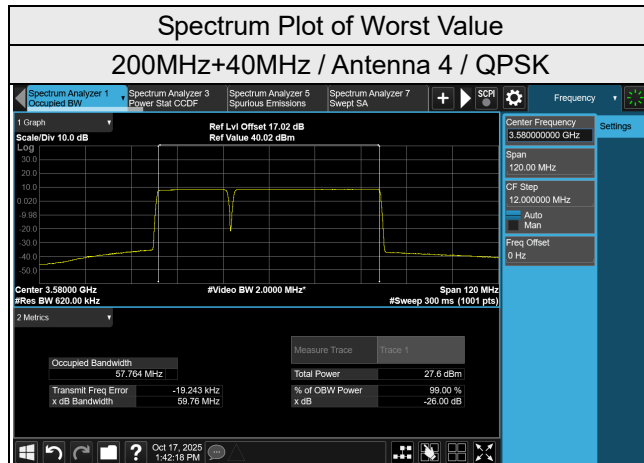
Occupied Bandwidth

NR Band 48, Channel Bandwidth 20MHz+40MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)					
		Antenna 1			Antenna 2		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
637334+639334	3560.01+3590.01	57.742	57.735	57.734	57.717	57.698	57.664
643332+645332	3649.98+3679.98	57.729	57.725	57.733	57.807	57.801	57.795
Channel	Frequency (MHz)	Antenna 3			Antenna 4		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
637334+639334	3560.01+3590.01	57.788	57.725	57.738	57.764	57.742	57.711
643332+645332	3649.98+3679.98	57.745	57.729	57.738	57.752	57.740	57.723



26dB Bandwidth

NR Band 48, Channel Bandwidth 20MHz+40MHz							
Channel	Frequency (MHz)	26dB Bandwidth (MHz)					
		Antenna 1			Antenna 2		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
637334+639334	3560.01+3590.01	59.75	59.74	59.73	59.73	59.72	59.71
643332+645332	3649.98+3679.98	59.73	59.71	59.71	59.74	59.72	59.71
Channel	Frequency (MHz)	Antenna 3			Antenna 4		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
637334+639334	3560.01+3590.01	59.74	59.71	59.72	59.76	59.73	59.74
643332+645332	3649.98+3679.98	59.72	59.72	59.69	59.72	59.72	59.70



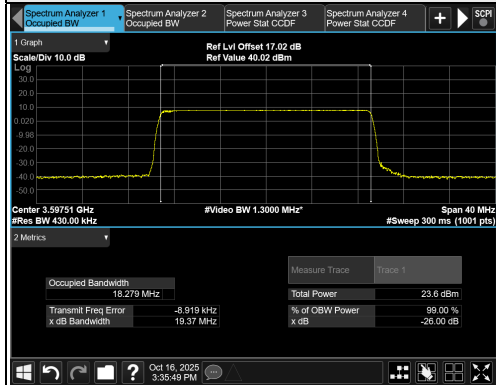
Mode A3
Occupied Bandwidth

Bandwidth	Frequency	Modulation	Antenna	CC0	CC1	Total (MHz)
20M+40M	3560.01+3679.98	QPSK	1	18.288	37.896	56.184
			2	18.284	37.977	56.261
			3	18.289	37.921	56.21
			4	18.288	37.922	56.21
		64QAM	1	18.287	37.89	56.177
			2	18.279	37.955	56.234
			3	18.287	37.916	56.203
			4	18.284	37.905	56.189
		256QAM	1	18.283	37.889	56.172
			2	18.267	37.93	56.197
			3	18.287	37.892	56.179
			4	18.283	37.887	56.17
	3592.5+3667.5	QPSK	1	18.296	38.019	56.315
			2	18.294	38.04	56.334
			3	18.3	38.028	56.328
			4	18.297	38.024	56.321
		64QAM	1	18.295	38.005	56.3
			2	18.294	38.012	56.306
			3	18.293	38.018	56.311
			4	18.295	38.02	56.315
		256QAM	1	18.279	38.013	56.292
			2	18.283	38.029	56.312
			3	18.289	38.025	56.314
			4	18.282	38.014	56.296
	3597.51+3662.52	QPSK	1	18.291	38.029	56.32
			2	18.292	38.032	56.324
			3	18.297	38.033	56.33
			4	18.296	38.017	56.313
		64QAM	1	18.291	38.022	56.313
			2	18.289	38.029	56.318
			3	18.292	38.026	56.318
			4	18.293	38.014	56.307
		256QAM	1	18.289	38.025	56.314
			2	18.279	38.003	57.282
			3	18.282	38.014	56.296
			4	18.279	38.005	56.284

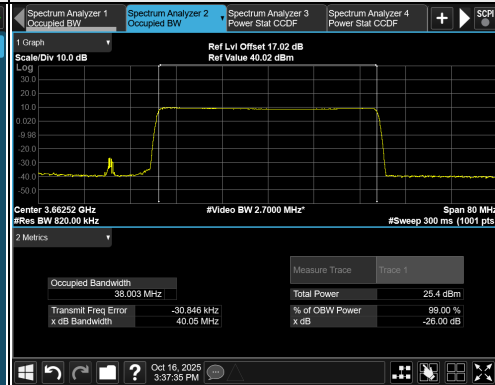
Spectrum Plot of Worst Value

20MHz+40MHz / Antenna 2 / 256QAM

3597.51 MHz



3662.52 MHz



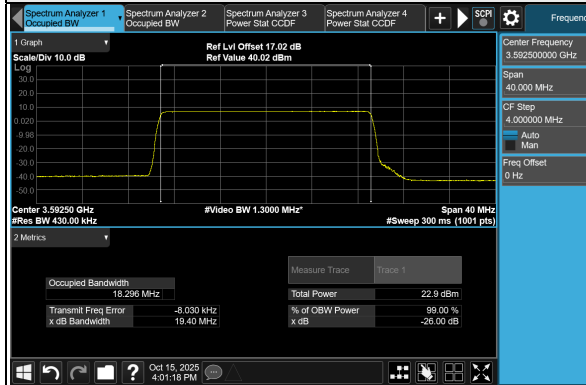
26dB Bandwidth

Bandwidth	Frequency	Modulation	Antenna	CC0	CC1	Total (MHz)
20M+40M	3560.01+3679.98	QPSK	1	19.39	40.02	59.41
			2	19.4	40.05	59.45
			3	19.4	40.03	59.43
			4	19.41	40.04	59.45
		64QAM	1	19.38	40.02	59.4
			2	19.38	40.04	59.42
			3	19.38	40.01	59.39
			4	19.38	40.01	59.39
		256QAM	1	19.38	40.02	59.4
			2	19.37	40.02	59.39
			3	19.38	40	59.38
			4	19.37	40.04	59.41
	3592.5+3667.5	QPSK	1	19.4	40.07	59.47
			2	19.39	40.07	59.46
			3	19.4	40.07	59.47
			4	19.4	40.06	59.46
		64QAM	1	19.38	40.06	59.44
			2	19.38	40.05	59.43
			3	19.39	40.05	59.44
			4	19.39	40.06	59.45
		256QAM	1	19.38	40.07	59.45
			2	19.37	40.04	59.41
			3	19.37	40.04	59.41
			4	19.36	40.06	59.42
	3597.51+3662.52	QPSK	1	19.39	40.06	59.45
			2	19.39	40.06	59.45
			3	19.4	40.07	59.47
			4	19.4	40.06	59.46
		64QAM	1	19.39	40.05	59.44
			2	19.38	40.02	59.4
			3	19.38	40.06	59.44
			4	19.38	40.05	59.43
		256QAM	1	19.37	40.05	59.42
			2	19.37	40.05	59.42
			3	19.36	40.06	59.42
			4	19.38	40.07	59.45

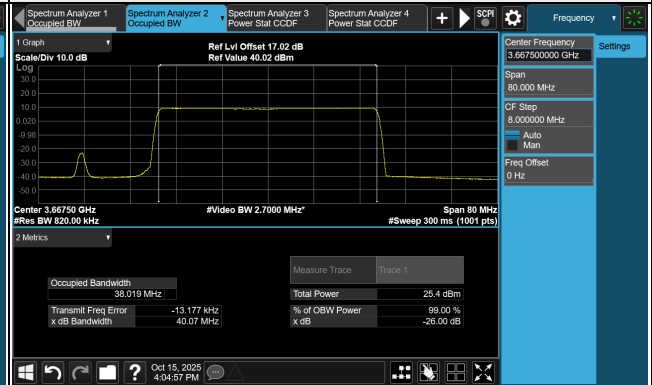
Spectrum Plot of Worst Value

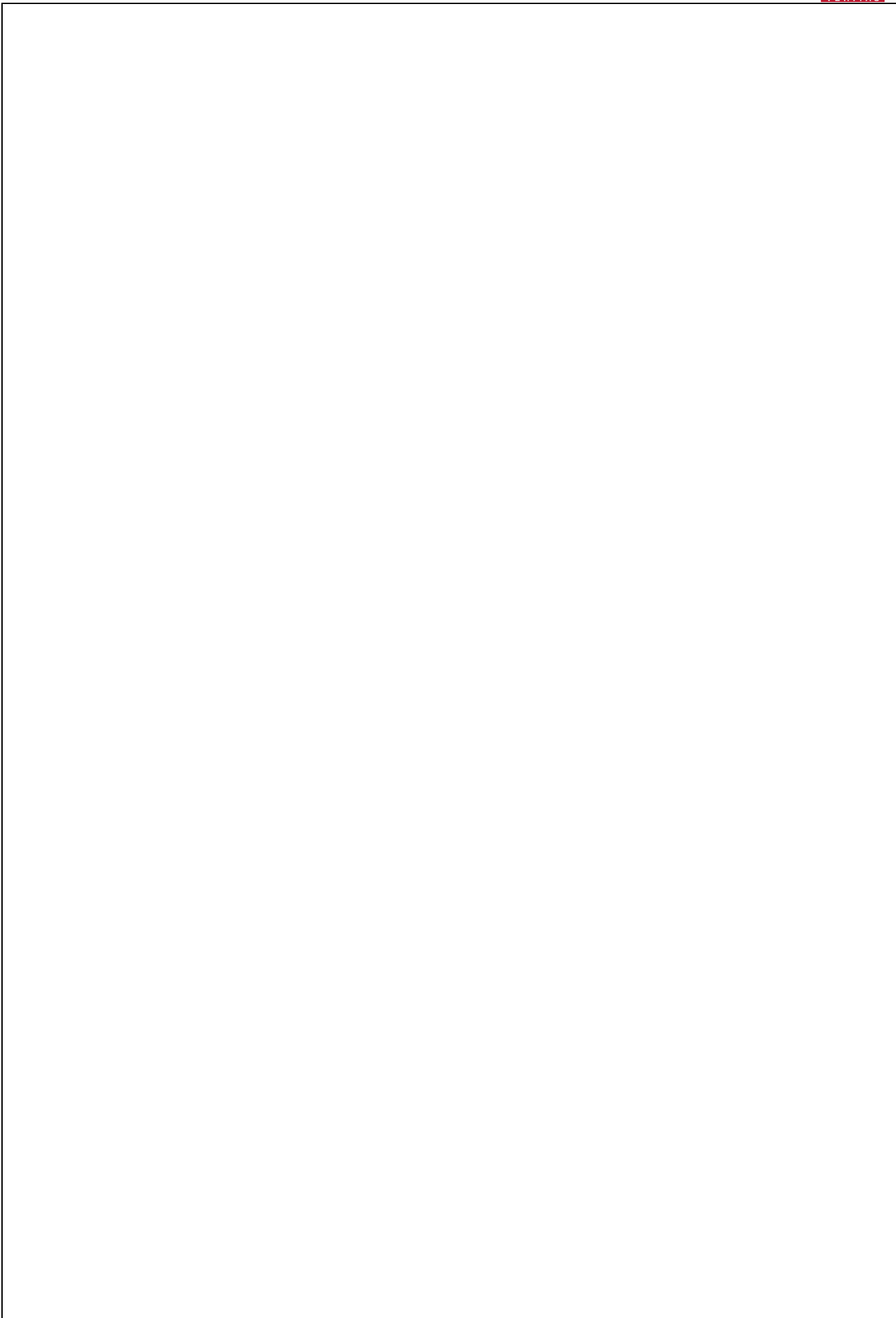
20MHz+40MHz / Antenna 0 / QPSK

3592.5 MHz



3667.5 MHz



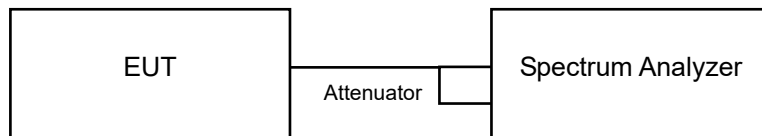


4.5 Peak to Average Ratio Measurement

4.5.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.5.4 Test Procedures

- Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
- Set the number of counts to a value that stabilizes the measured CCDF curve;
- Record the maximum PAPR level associated with a probability of 0.1%.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

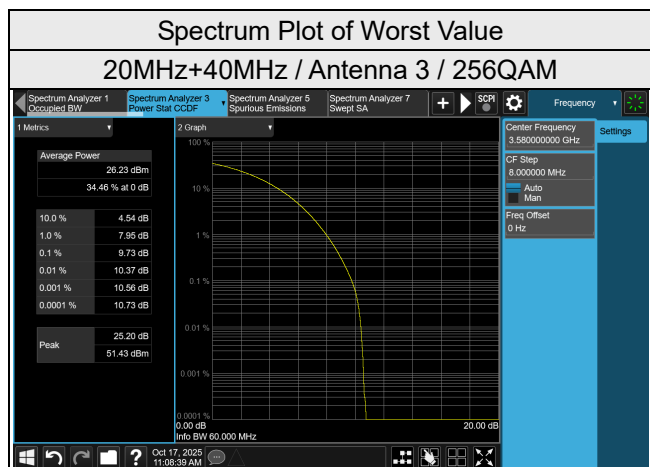
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.5.7 Test Results

Input Power:	12 Vdc	Environmental Conditions:	22°C, 73% RH	Tested By:	Noah Chang
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Mode A2

NR Band 48, Channel Bandwidth 20MHz+40MHz							
Channel	Frequency (MHz)	Peak To Average Ratio (dB)					
		Antenna 1			Antenna 2		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
637334+639334	3560.01+3590.01	8.82	8.84	9.37	8.93	9.21	9.35
643332+645332	3649.98+3679.98	8.82	9.10	9.24	8.89	9.11	9.35
Channel	Frequency (MHz)	Antenna 3			Antenna 4		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
637334+639334	3560.01+3590.01	8.95	9.15	9.73	8.94	9.30	9.56
643332+645332	3649.98+3679.98	9.13	9.35	9.55	8.82	9.19	9.39



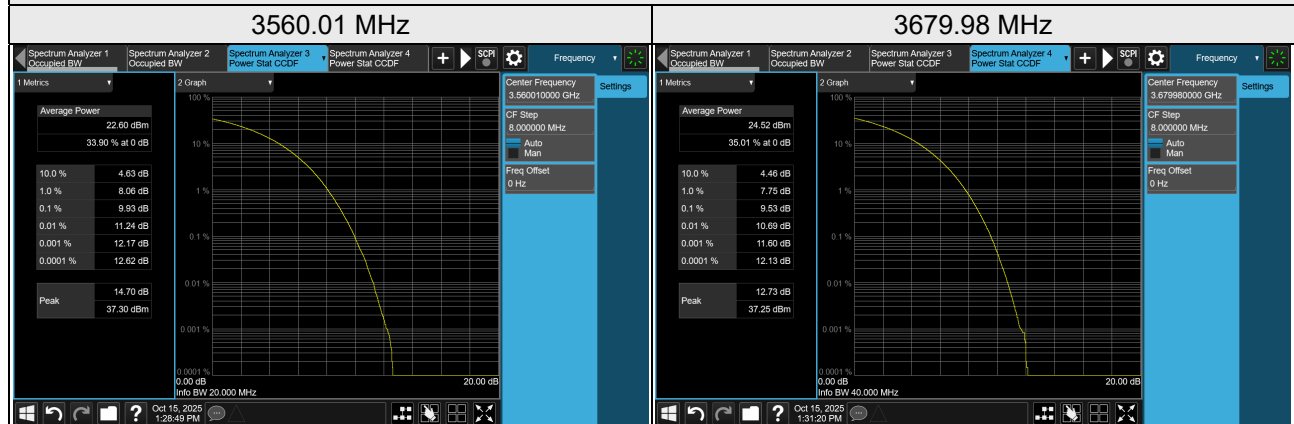
Mode A3

NR Band 48, Channel Bandwidth 20MHz+40MHz

Channel	Frequency (MHz)	Peak To Average Ratio (dB)											
		Antenna 1						Antenna 2					
		QPSK		64QAM		256QAM		QPSK		64QAM		256QAM	
		CC0	CC1	CC0	CC1	CC0	CC1	CC0	CC1	CC0	CC1	CC0	CC1
637334+ 645332	3560.01+ 3679.98	8.90	9.25	9.16	9.46	9.93	9.53	9.01	9.24	9.03	9.27	9.28	9.52
639500+ 644500	3592.5+ 3667.5	9.05	9.39	9.24	9.46	9.44	9.63	9.18	9.36	9.31	9.40	9.53	9.58
639834+ 644168	3597.51+ 3662.52	9.15	9.20	9.29	9.35	9.41	9.73	9.04	9.36	9.29	9.43	9.70	9.44
Channel	Frequency (MHz)	Antenna 3						Antenna 4					
		QPSK		64QAM		256QAM		QPSK		64QAM		256QAM	
		CC0	CC1	CC0	CC1	CC0	CC1	CC0	CC1	CC0	CC1	CC0	CC1
		CC0	CC1	CC0	CC1	CC0	CC1	CC0	CC1	CC0	CC1	CC0	CC1
637334+ 645332	3560.01+ 3679.98	8.96	9.18	8.98	9.28	9.09	9.61	8.89	9.36	8.95	9.42	9.41	9.58
639500+ 644500	3592.5+ 3667.5	8.92	9.11	9.24	9.27	9.01	9.57	9.23	9.22	9.38	9.45	9.72	9.66
639834+ 644168	3597.51+ 3662.52	9.01	9.43	9.02	9.63	9.91	9.60	9.21	9.41	9.56	9.52	9.74	9.57

Spectrum Plot of Worst Value

20MHz+40MHz / Antenna 1 / 256QAM

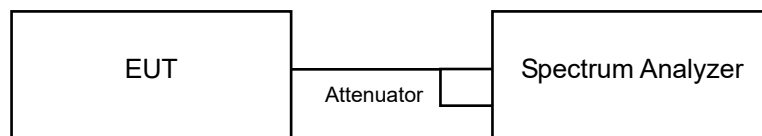


4.6 Conducted Spurious Emissions

4.6.1 Limits of Conducted Spurious Emissions Measurement

Power of any emissions outside the Fundamental	Limit
Within 0-10MHz above the Assigned Channel	-13 dBm/MHz
Within 0-10MHz below the Assigned Channel	
Greater than 10MHz above the Assigned Channel	-25 dBm/MHz
Greater than 10MHz below the Assigned Channel	
Power of any emission below 3530MHz	-40 dBm/MHz
Power of any emission above 3720MHz	

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.6.4 Test Procedure

- a. Measurement refer to ANSI C63.26 section 5.7.
- b. All measurements were done at 3 channels: low, middle and high operational frequency range.
- c. Measuring frequency range is from 9 kHz up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. 20 dB attenuation pad is connected with spectrum.
- d. The fundamental frequency above 1 GHz, the spectrum set RBW = 1 MHz, VBW = 3 MHz, Detector = Average.
- e. The fundamental frequency below 1 GHz, the spectrum set RBW $\geq$ 100 kHz, VBW $\geq$ 3 x RBW, Detector = Average.
- f. Measuring frequency band edge, narrow RBW (no less than 1% of the OBW) is used for conducted emission measurement.
- g. For the emissions measurement method, certain channel BW modes demonstrate compliance by integrating with the smaller RBW allowed by the rule.
For example: Where Reference RBW = 1 MHz and a smaller RBW = 100 kHz is used, worst-case integrated BW power = [Max Measured Value (dBm) with RBW = 100 kHz] + $10 \cdot \log(1000/100)$. To compensate for this integration before comparison to the value, the adjusted reference level offset was increase by 10 dB accordingly.
- h. The device has MIMO function, so the limit of conducted spurious emissions need to be measurement add $10\log(\text{Numbers}_{\text{ANT}})$ according to FCC KDB 662911 D01 guidance. Therefore, the $10\log(\text{Numbers}_{\text{ANT}})$ value is added to the spectrum Ref. level offset during testing. For example, the band edge and conducted spurious emission plots for the MIMO (4TX) WWAN bands show that a reference level offset of 17.02 dB is used (11 dB includes attenuation and cable loss + $10 \cdot \log(4)$ to account for MIMO WWAN bands reference level = $11 + 6.02 = 17.02$ dB).
- i. Record the maximum power value test plot.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Conditions

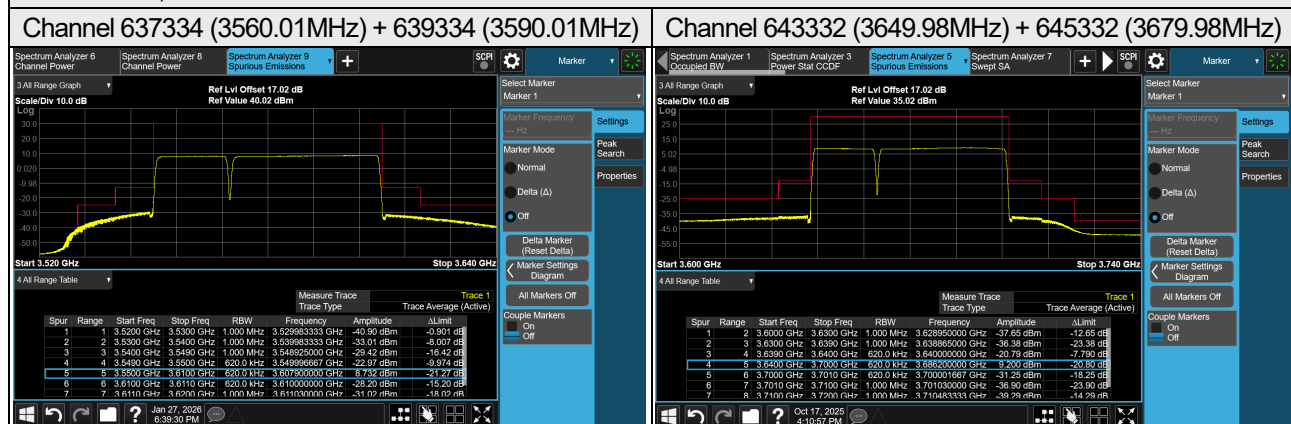
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.6.7 Test Results

Input Power:	12 Vdc	Environmental Conditions:	22°C, 73% RH	Tested By:	Noah Chang
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Mode A2 Antenna 1

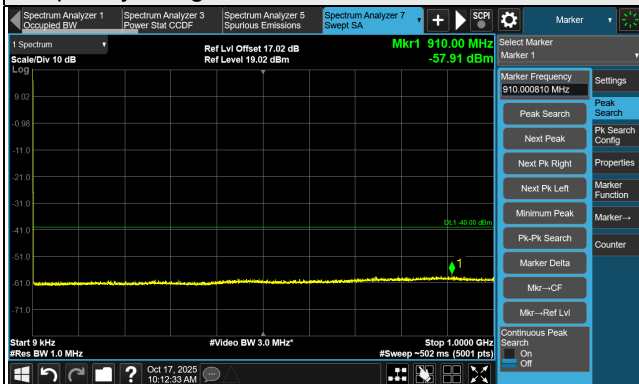
NR Band 48, Channel Bandwidth 20MHz+40MHz



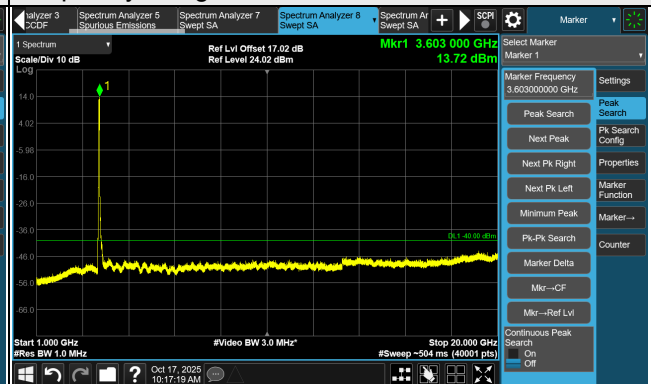
Channel Band width: 20MHz+40MHz

Channel 637334 (3560.01MHz) + 639334 (3590.01MHz)

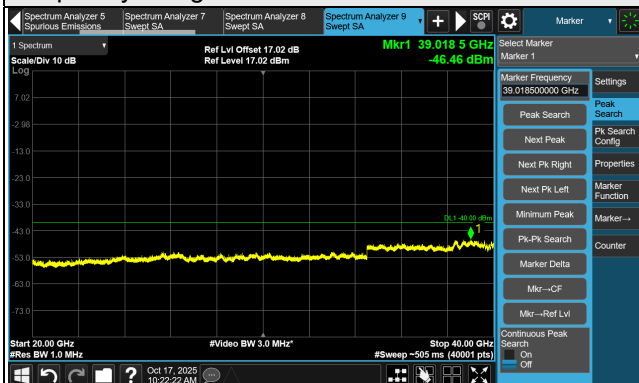
Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 20GHz



Frequency Range : 20GHz ~ 40GHz

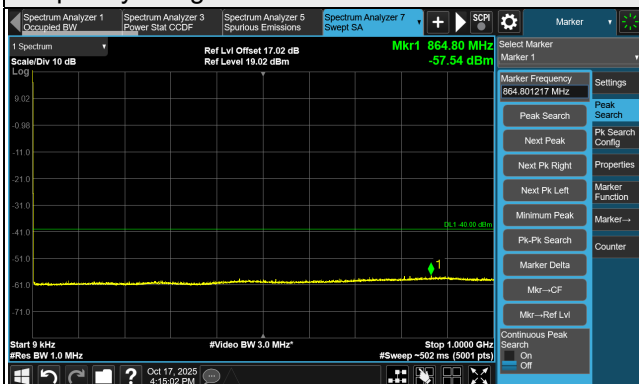


Note: The signal at 9 kHz is IF signal from spectrum analyzer.

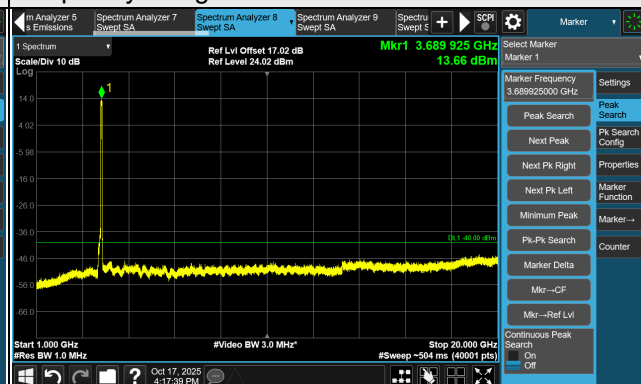
Channel Band width: 20MHz+40MHz

Channel 643332 (3649.98MHz) + 645332 (3679.98MHz)

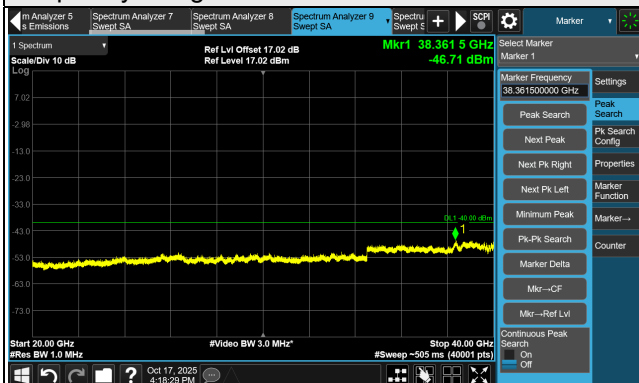
Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 20GHz



Frequency Range : 20GHz ~ 40GHz

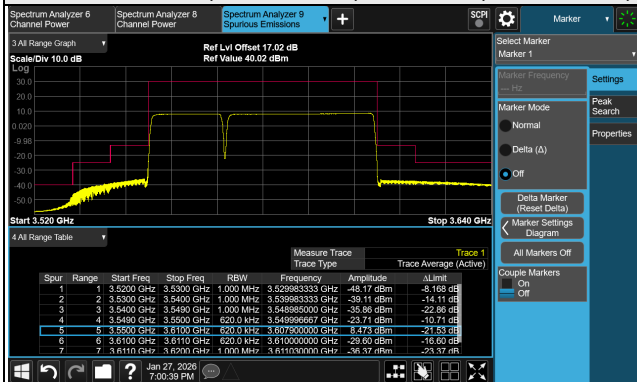


Note: The signal at 9 kHz is IF signal from spectrum analyzer.

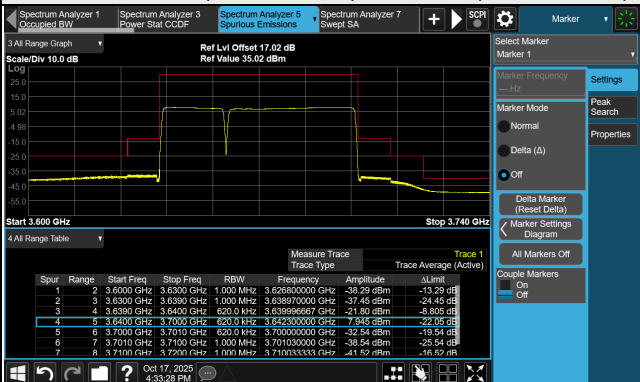
Antenna 2

NR Band 48, Channel Bandwidth 20MHz+40MHz

Channel 637334 (3560.01MHz) + 639334 (3590.01MHz)



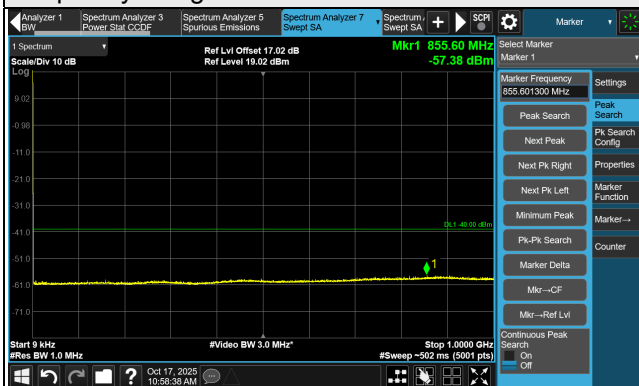
Channel 643332 (3649.98MHz) + 645332 (3679.98MHz)



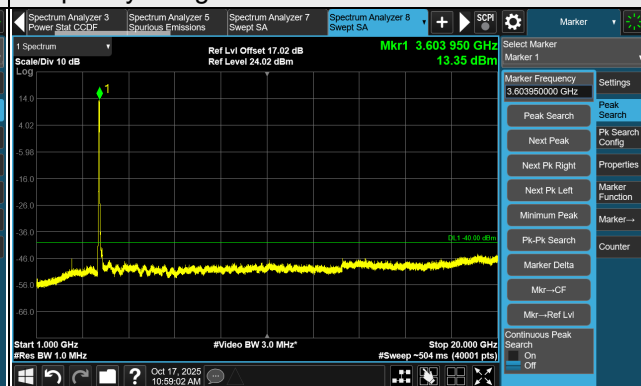
Channel Band width: 20MHz+40MHz

Channel 637334 (3560.01MHz) + 639334 (3590.01MHz)

Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 20GHz



Frequency Range : 20GHz ~ 40GHz

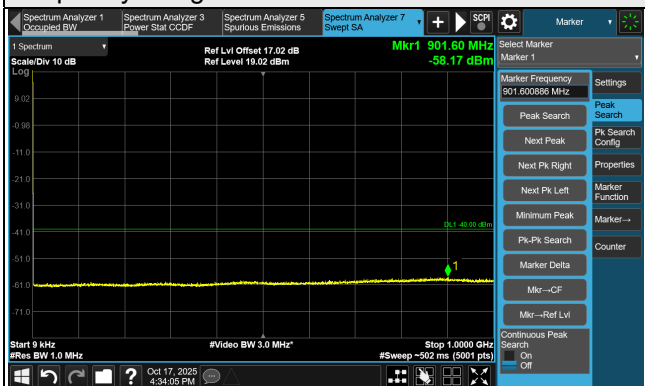


Note: The signal at 9 kHz is IF signal from spectrum analyzer.

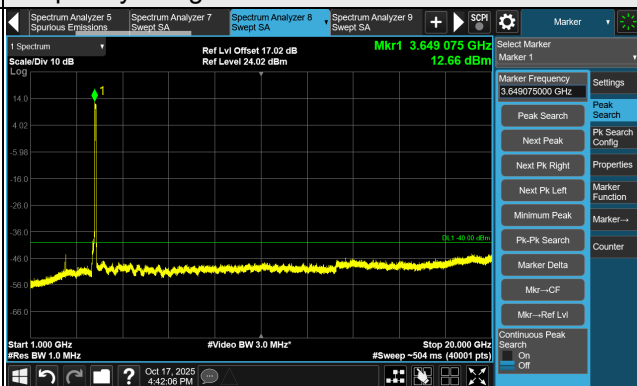
Channel Band width: 20MHz+40MHz

Channel 643332 (3649.98MHz) + 645332 (3679.98MHz)

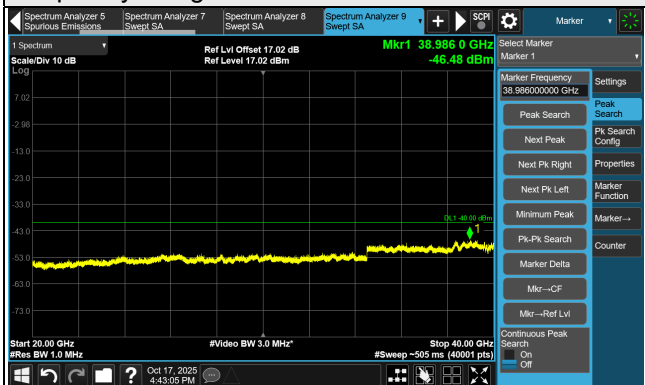
Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 20GHz



Frequency Range : 20GHz ~ 40GHz

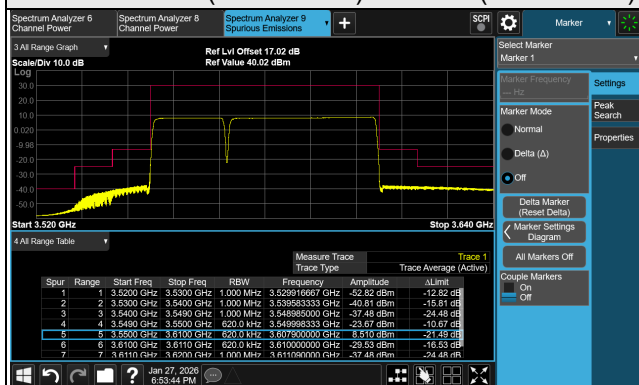


Note: The signal at 9 kHz is IF signal from spectrum analyzer.

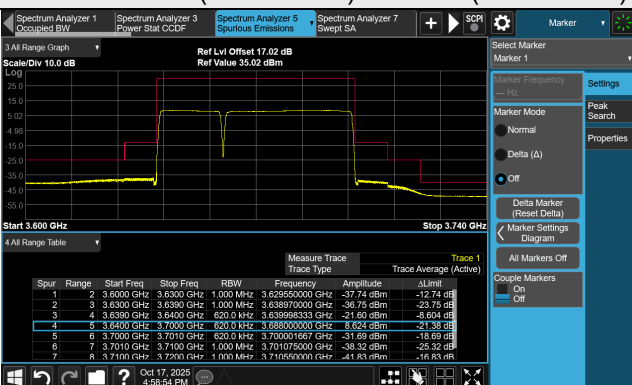
Antenna 3

NR Band 48, Channel Bandwidth 20MHz+40MHz

Channel 637334 (3560.01MHz) + 639334 (3590.01MHz)



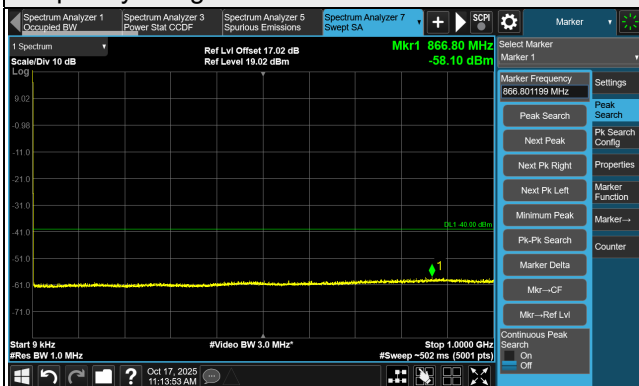
Channel 643332 (3649.98MHz) + 645332 (3679.98MHz)



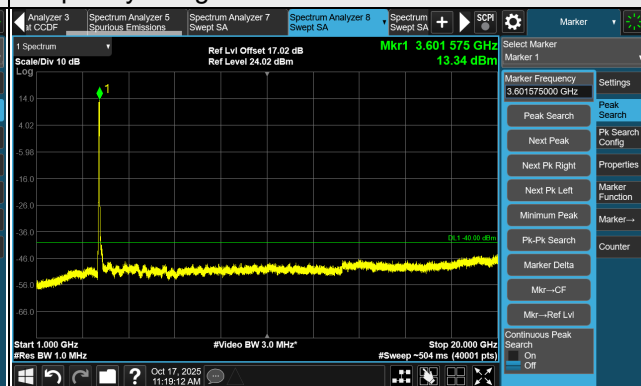
Channel Band width: 20MHz+40MHz

Channel 637334 (3560.01MHz) + 639334 (3590.01MHz)

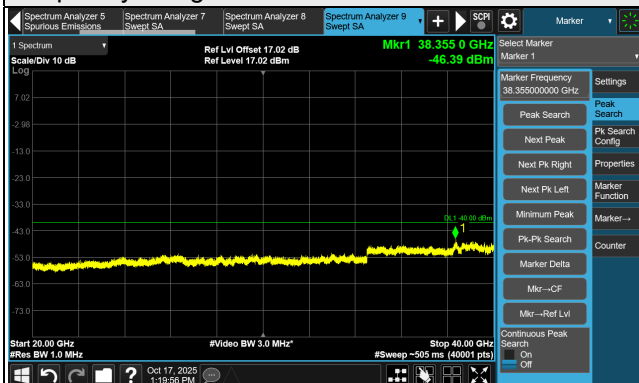
Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 20GHz



Frequency Range : 20GHz ~ 40GHz

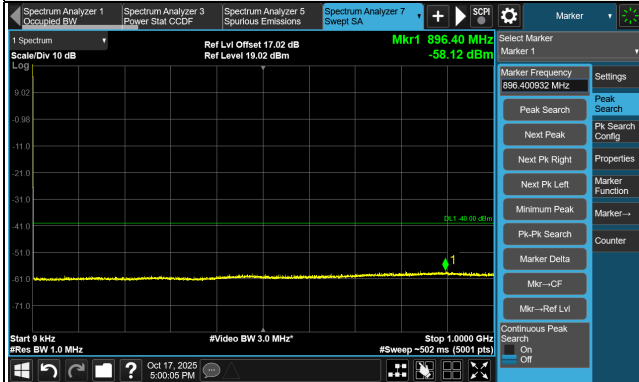


Note: The signal at 9 kHz is IF signal from spectrum analyzer.

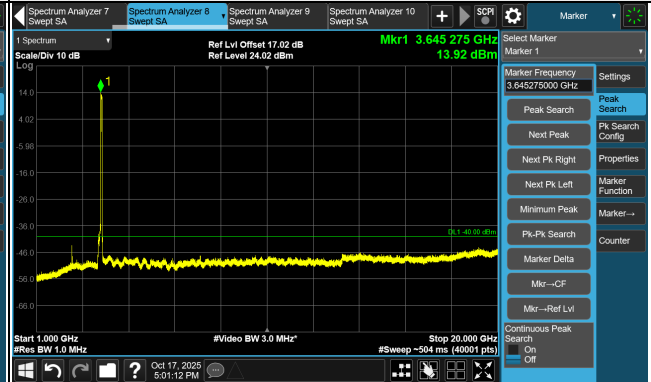
Channel Band width: 20MHz+40MHz

Channel 643332 (3649.98MHz) + 645332 (3679.98MHz)

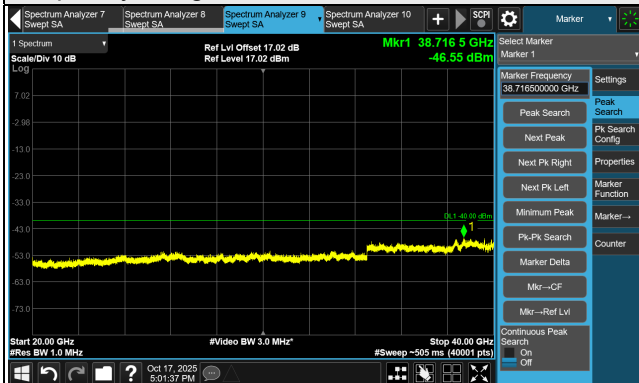
Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 20GHz



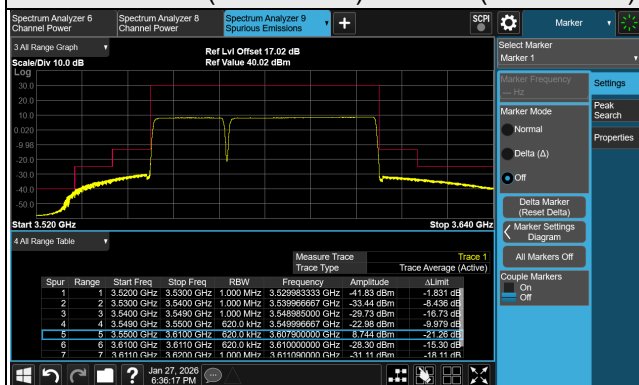
Frequency Range : 20GHz ~ 40GHz



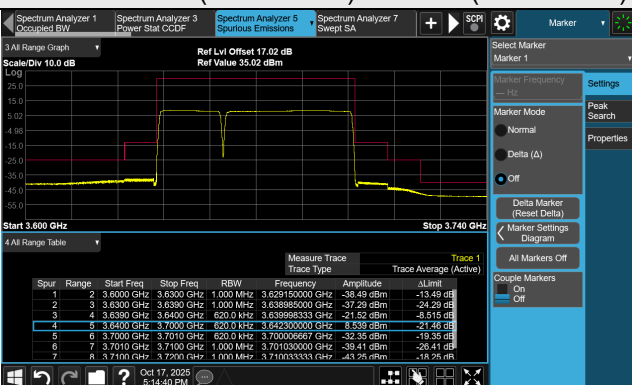
Antenna 4

NR Band 48, Channel Bandwidth 20MHz+40MHz

Channel 637334 (3560.01MHz) + 639334 (3590.01MHz)



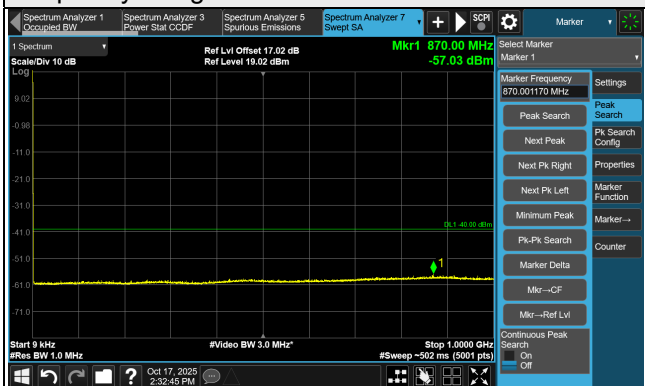
Channel 643332 (3649.98MHz) + 645332 (3679.98MHz)



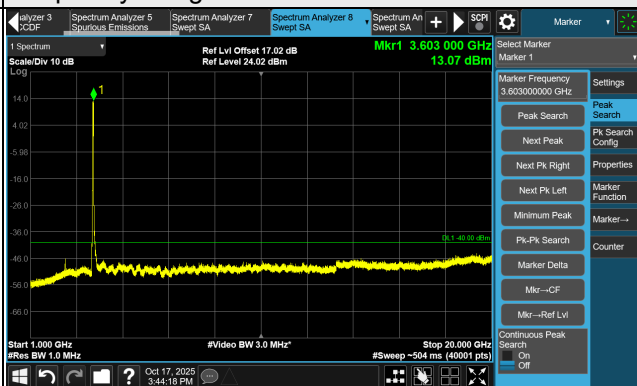
Channel Band width: 20MHz+40MHz

Channel 637334 (3560.01MHz) + 639334 (3590.01MHz)

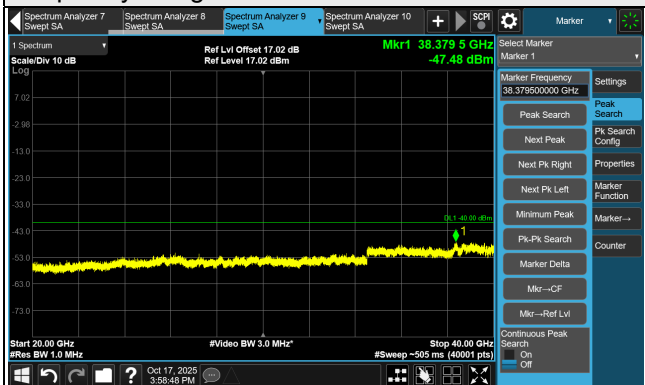
Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 20GHz



Frequency Range : 20GHz ~ 40GHz

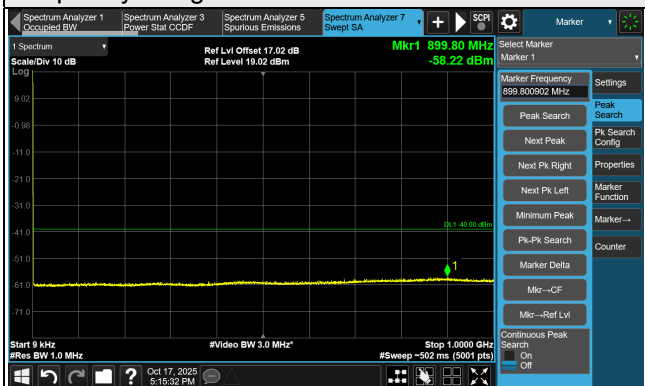


Note: The signal at 9 kHz is IF signal from spectrum analyzer.

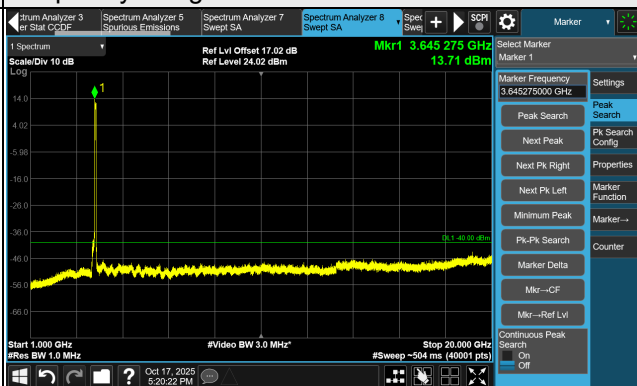
Channel Band width: 20MHz+40MHz

Channel 643332 (3649.98MHz) + 645332 (3679.98MHz)

Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 20GHz



Frequency Range : 20GHz ~ 40GHz

