

As per RSS-Gen, Spurious Emissions include intermodulation products. Test procedures are carried out according to the ANSI C63.36-2015. Spurious Emissions requirements are specified in RSS-131 Section 10.5. RSS-131 section 10.3 also states the requirement that the effective radiated power (ERP) of intermodulation products shall not exceed -30dBm in a 10kHz measurement bandwidth. This requirement is related to deployment practice similar to FCC 47 CFR 90.219 which specifies the following good engineering practice. It is not a standard.

"Good engineering practice must be used in regard to the radiation of intermodulation products and noise, such that interference to licensed communications systems is avoided. In the event of harmful interference caused by any given deployment, the FCC may require additional attenuation or filtering of the emissions and/or noise from signal boosters or signal booster systems, as necessary to eliminate the interference."

As part of the system commissioning practice, professional Zone Enhancer installer/field technician measures the intermodulation products by attaching a spectrum analyser to the output of the Remote Unit in the field. Since every deployment is different with different passive distribution network, field technician is required to assess the ERP of the intermodulation products at the antenna by taking into account the total passive component losses and make the necessary adjustments to meet the -30dBm requirement. For some jurisdiction, lower than -30dBm is required.

The intermodulation product of 2 tone is below the -13dBm emission limit with input power

- 0.5 dB below AGC threshold
- 2 dB below AGC threshold
- 3 dB above AGC threshold

Compliant ☒

Non-Compliant ☐

Not Applicable ☐

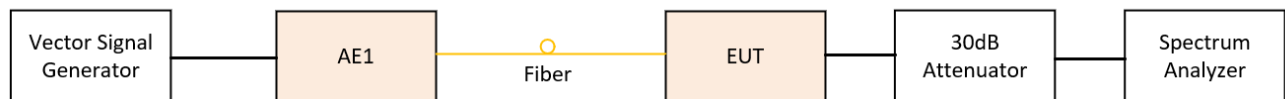
Test setup

The procedure used was ANSI C63.26-2015. Two tones (CW) method was used. The input power to the amplifier was set at maximum drive level by combining the two tones. The two tones were chosen in such a way (1) the third order intermodulation product frequencies are located within the pass band of the DUT and (2) they produce the worst-case emissions out of band.

Based on ANSI C63.26-2015, the two tone was located on either side of the maximum gain frequency in the passing band, and separated with the available spacing, which is 12.5kHz.

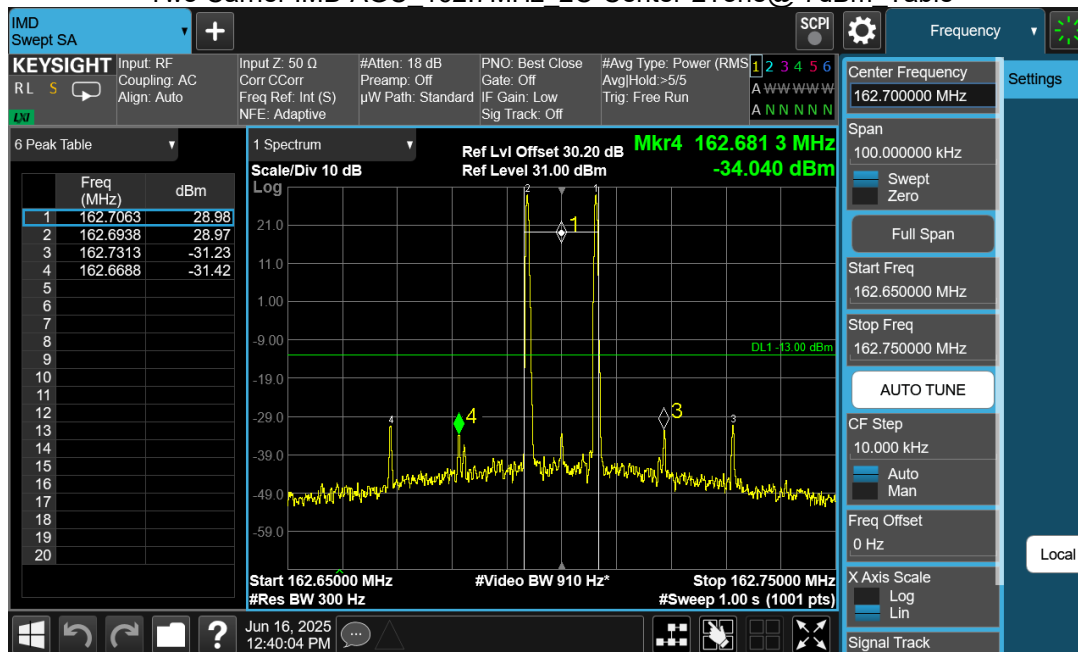
Measurements were performed with modulated -tone at identical input amplitude which produced integrated maximum rated output power.

The EUT was set to **Operation Mode #1 with configuration Mode #1.**

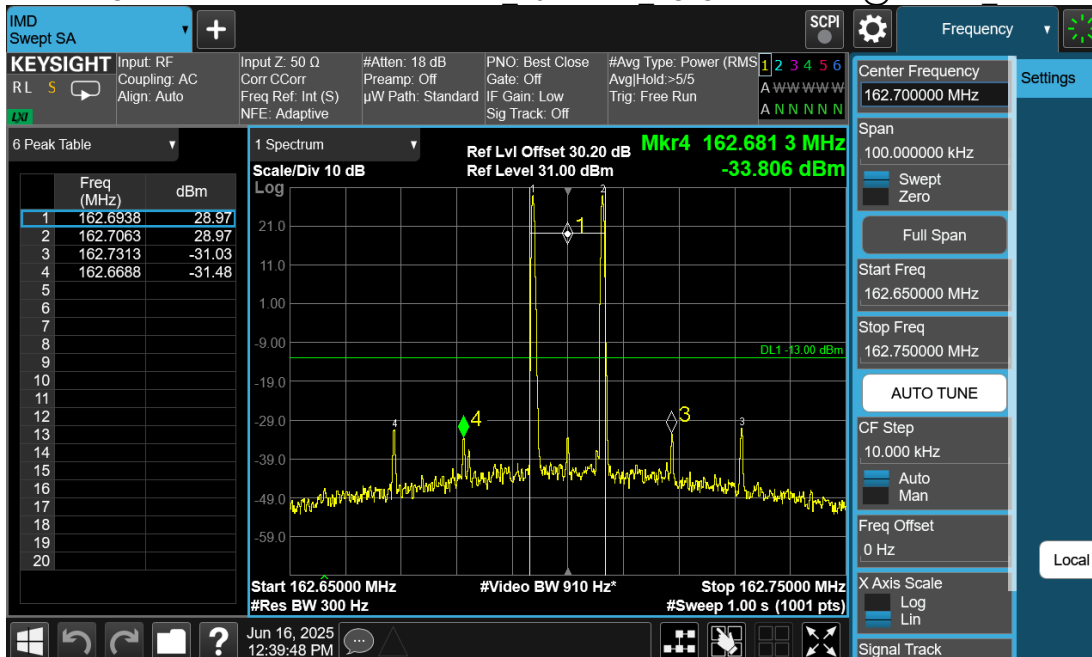


Results

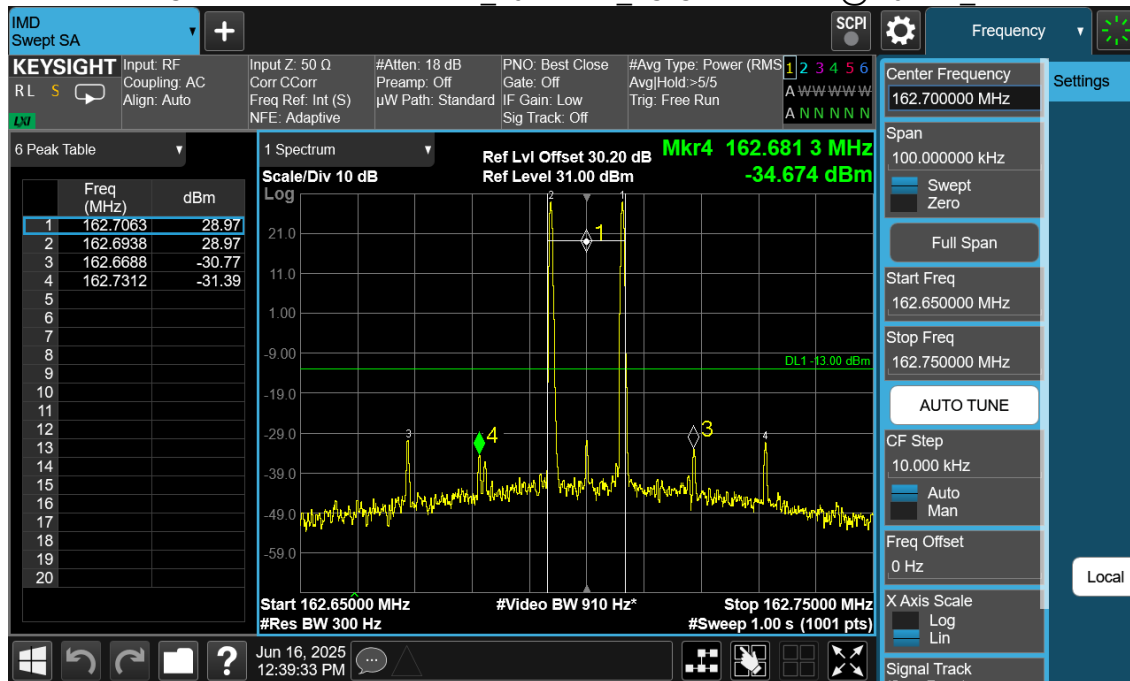
Two Carrier IMD AGC 162.7MHz 2C-Center-2Tone@-7dBm Table



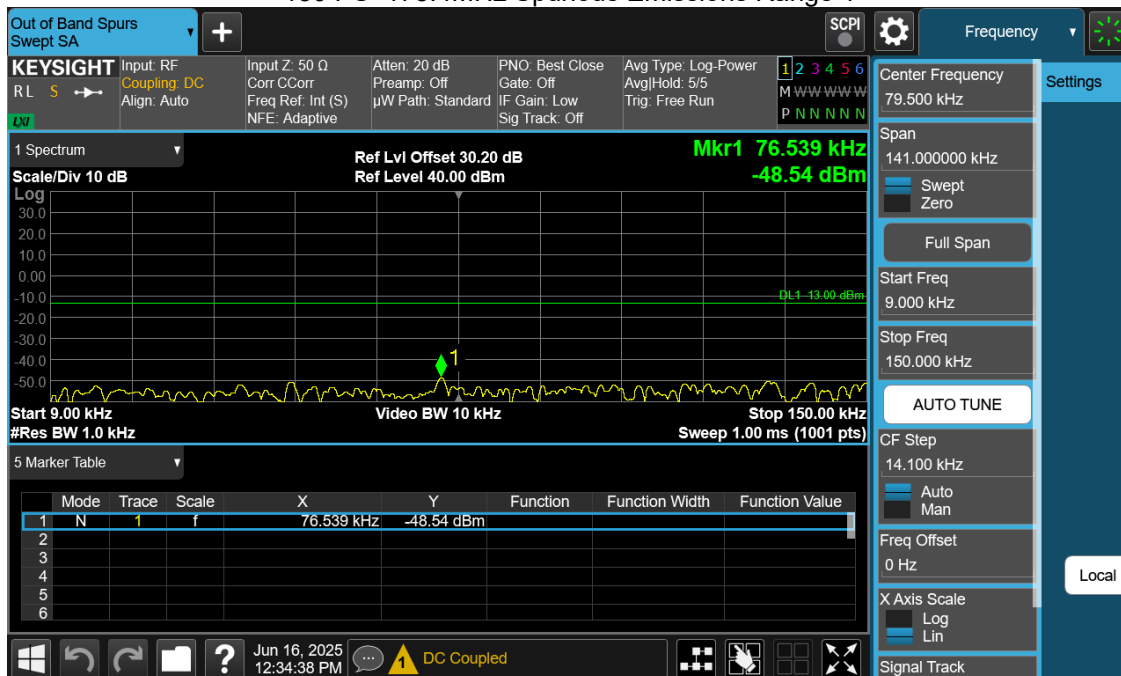
Two Carrier IMD at 2 dB Down Tx Pwr 162.7MHz 2C-Center-2Tone@-12dBm Table



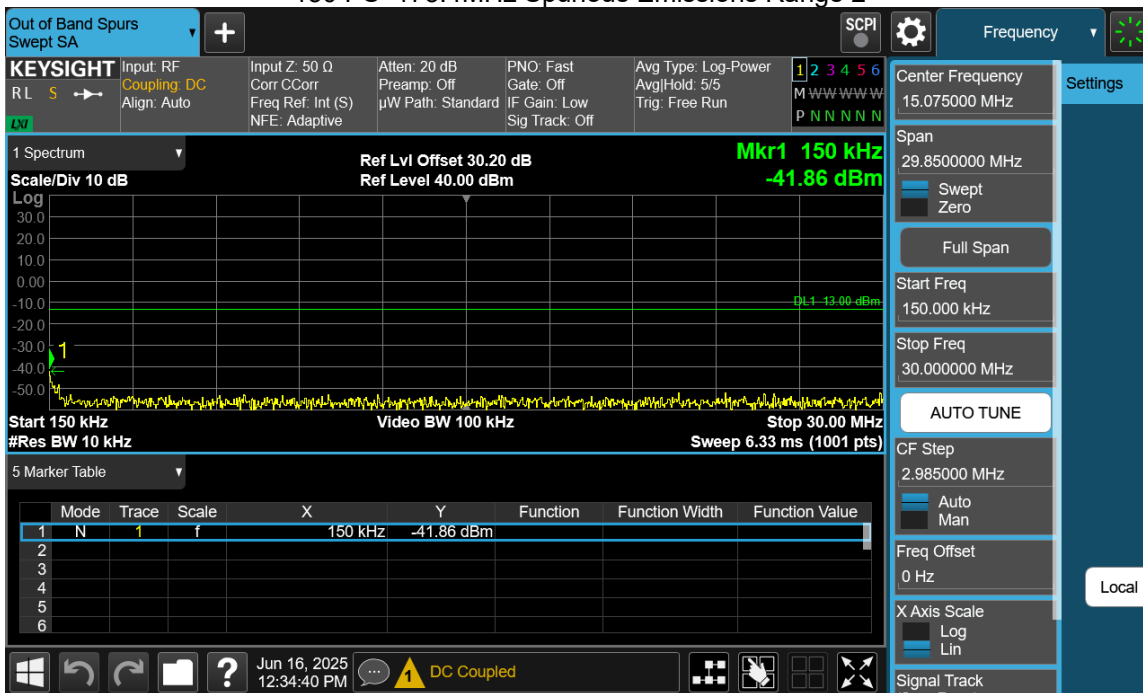
Two Carrier IMD at Max Tx Pwr 162.7MHz 2C-Center-2Tone@-10dBm Table



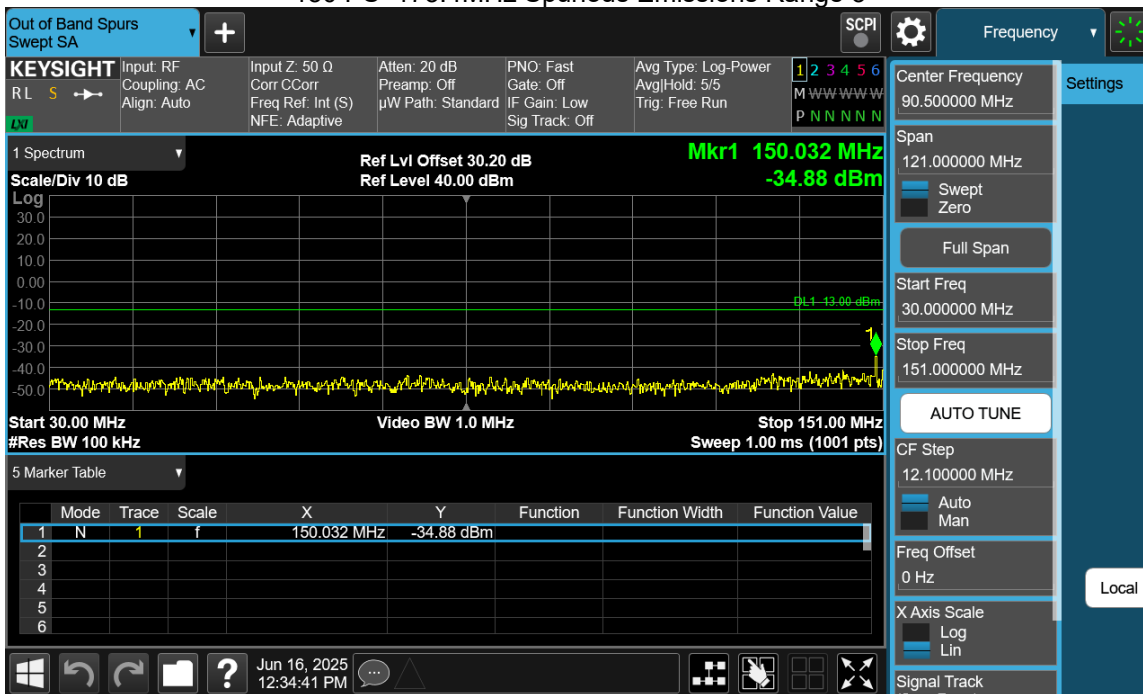
150 PS 173.4MHz Spurious Emissions Range 1



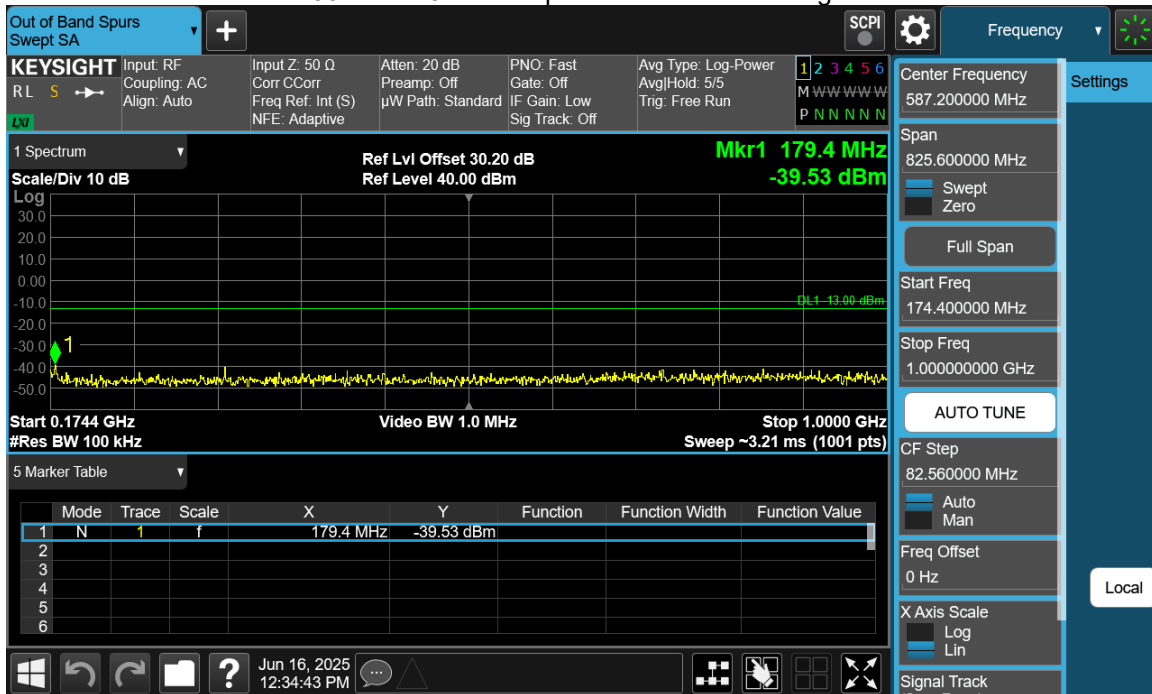
150 PS 173.4MHz Spurious Emissions Range 2



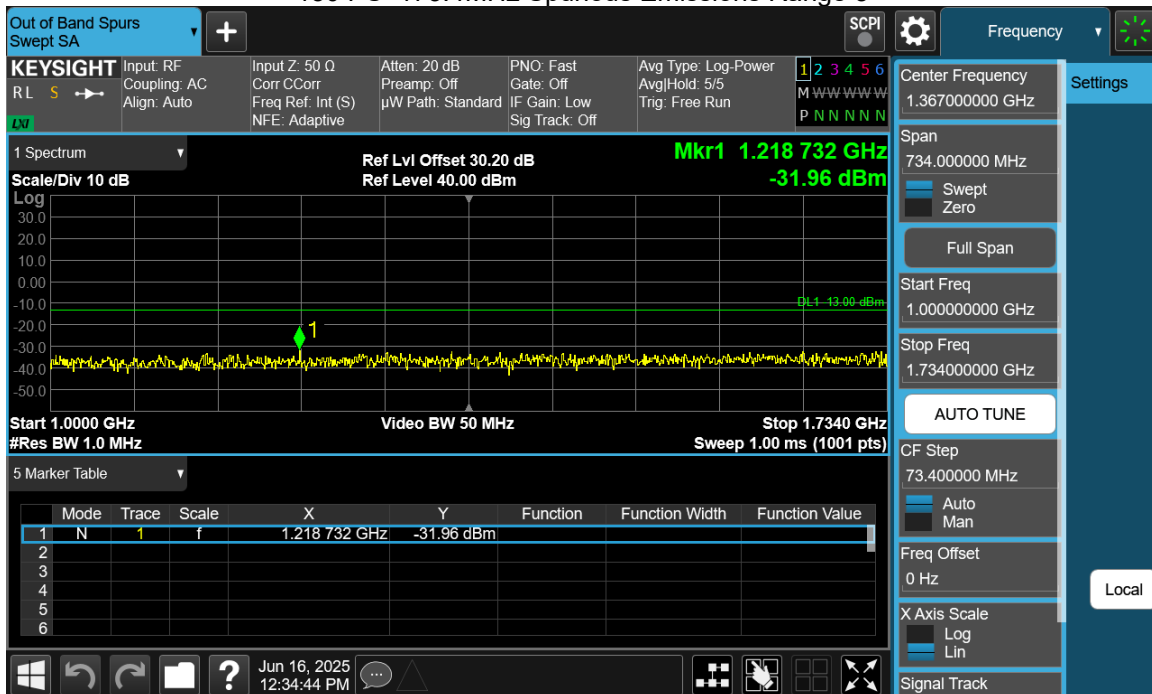
150 PS 173.4MHz Spurious Emissions Range 3



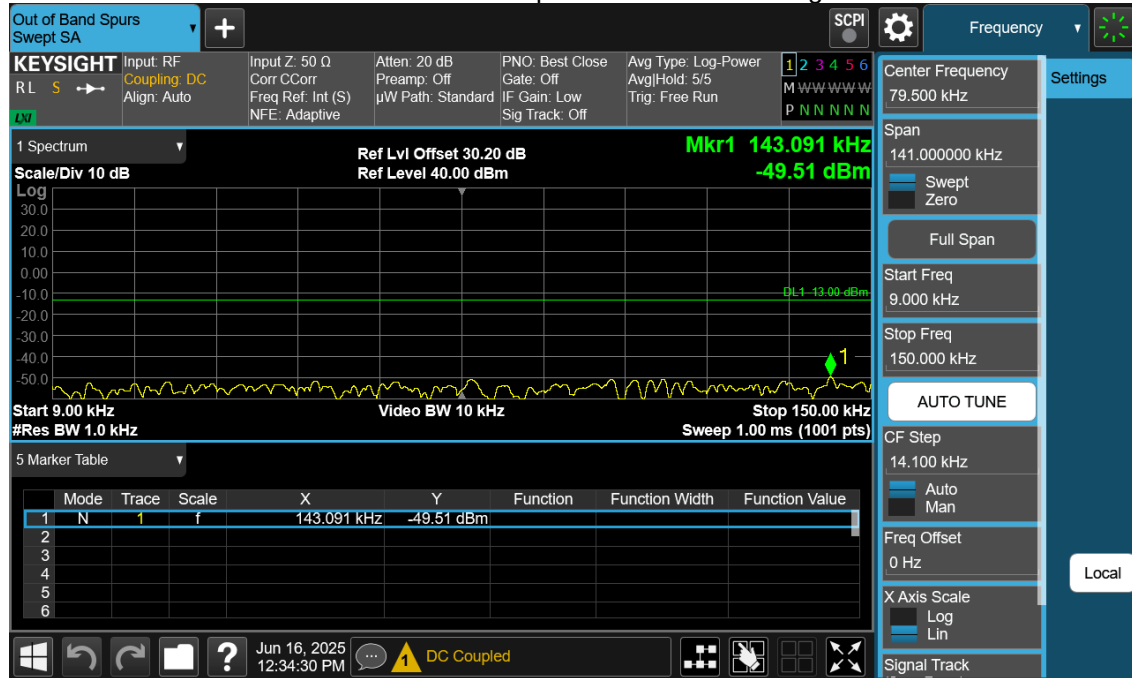
150 PS 173.4MHz Spurious Emissions Range 4



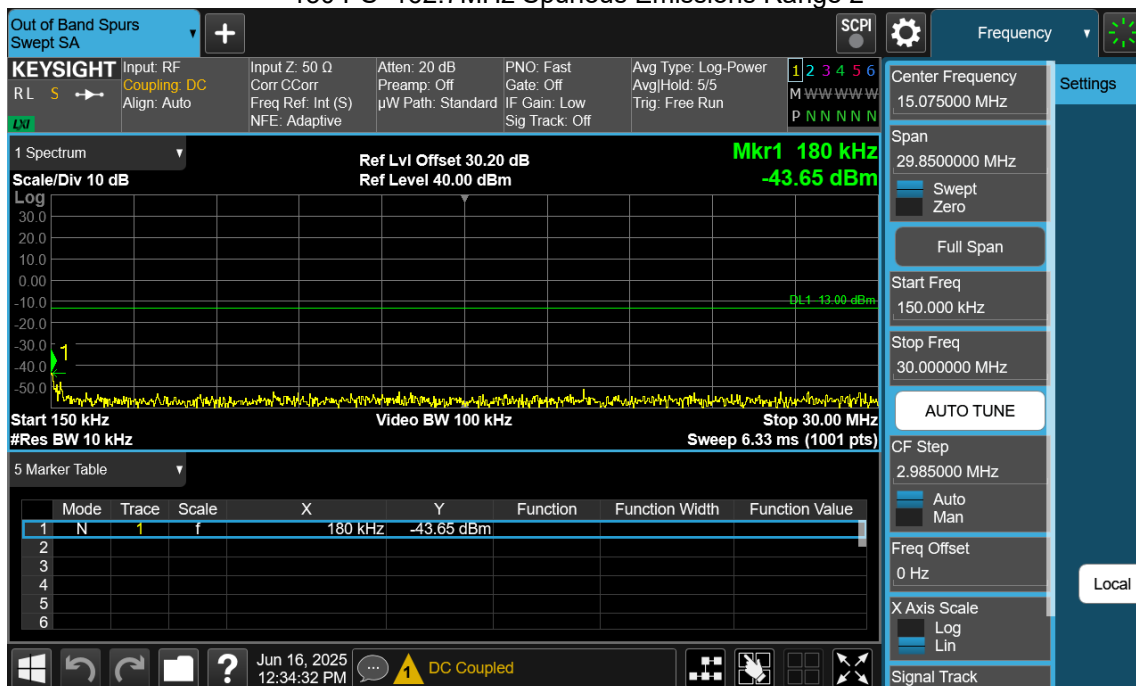
150 PS 173.4MHz Spurious Emissions Range 5



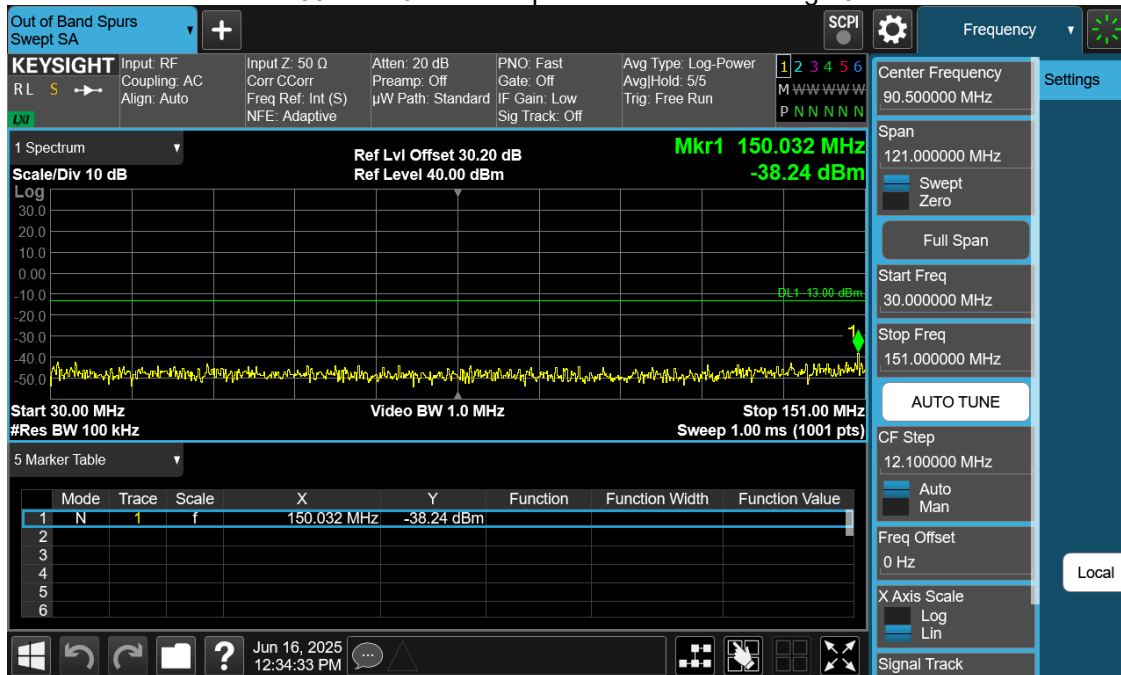
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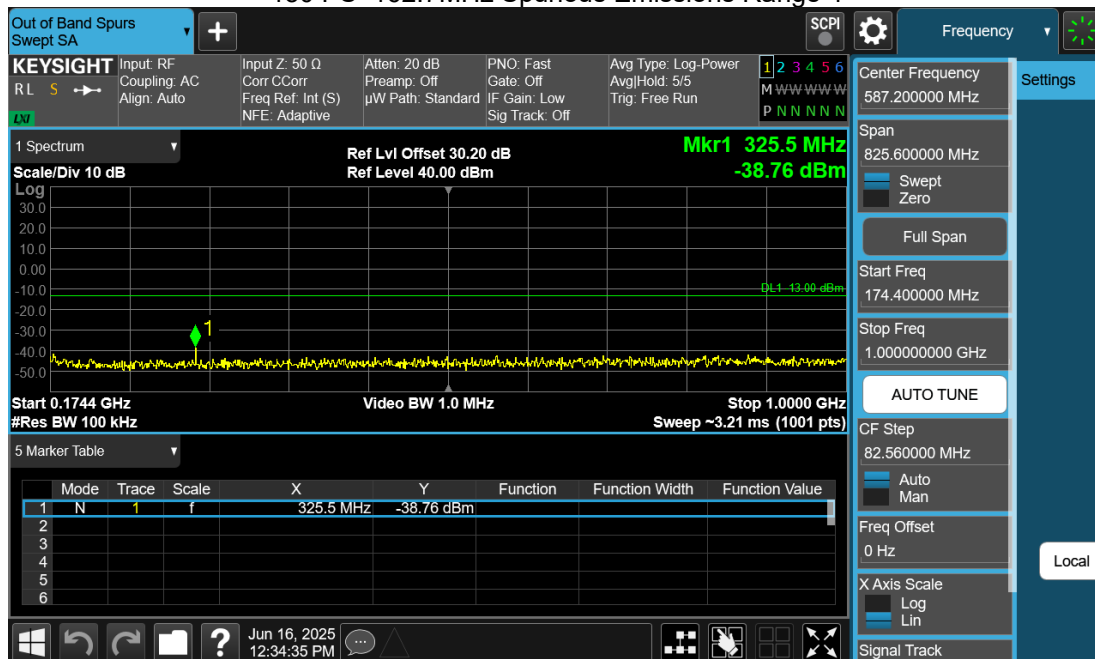
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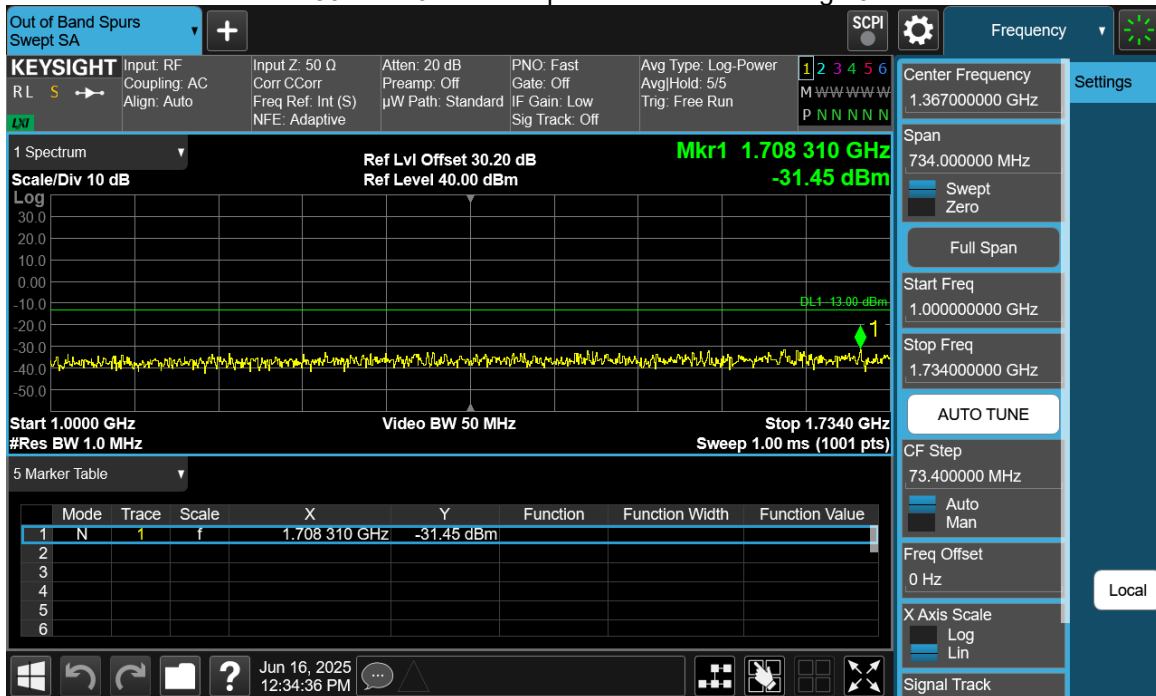
150 PS 162.7MHz Spurious Emissions Range 3



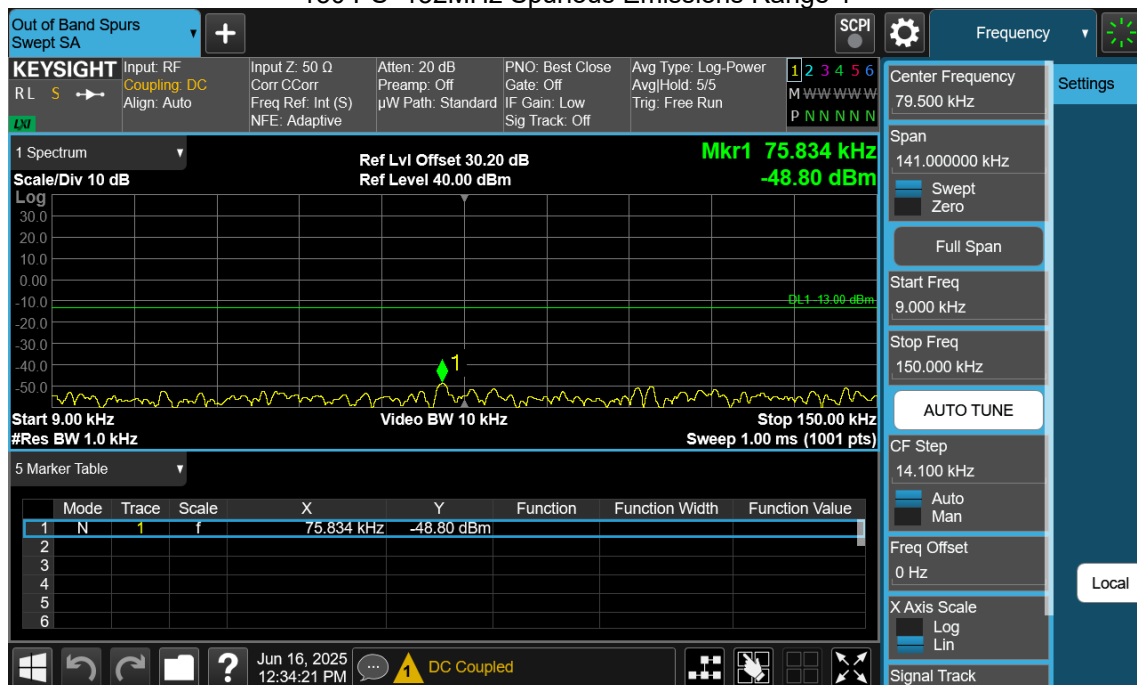
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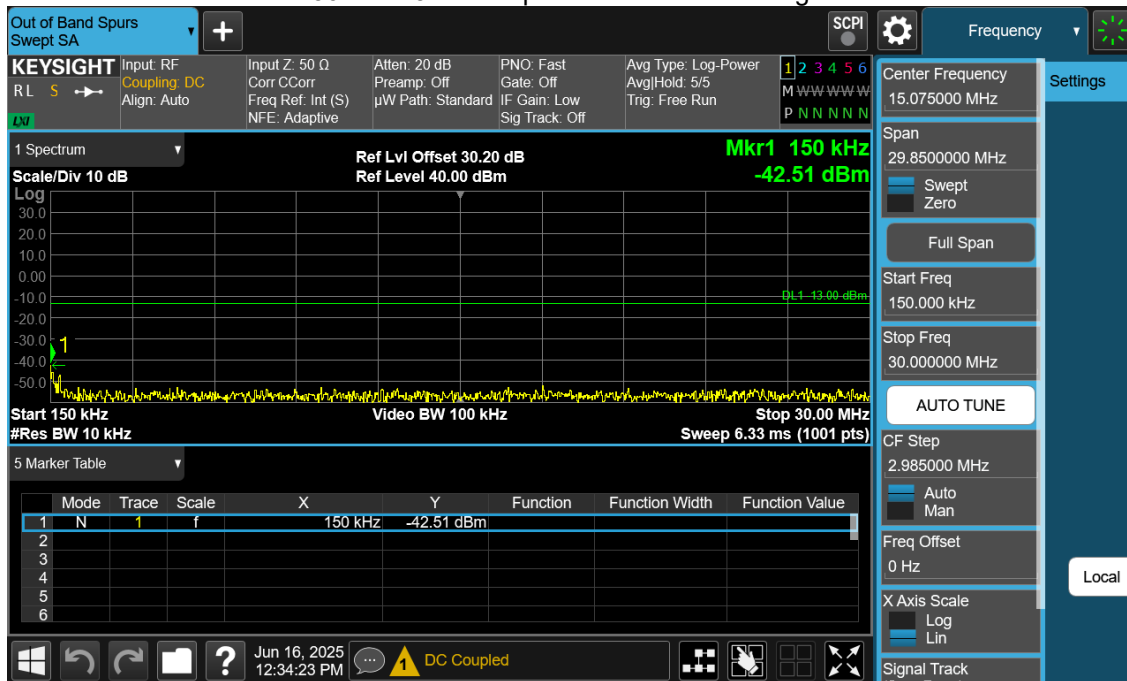
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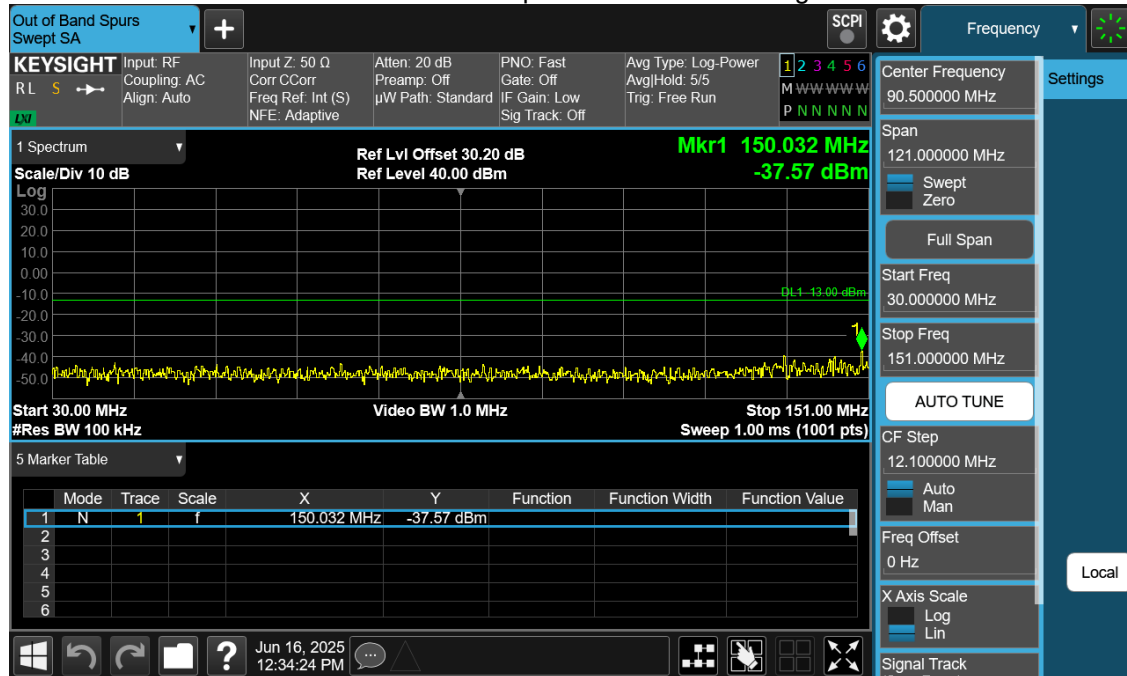
150 PS 152MHz Spurious Emissions Range 1



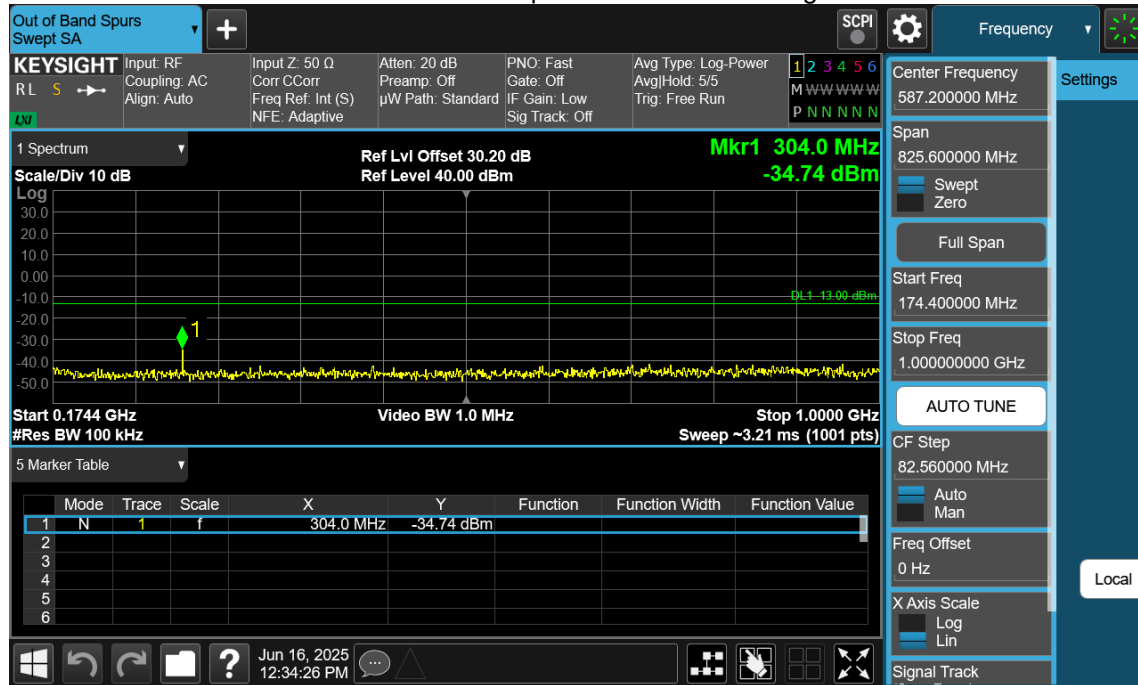
150 PS 152MHz Spurious Emissions Range 2



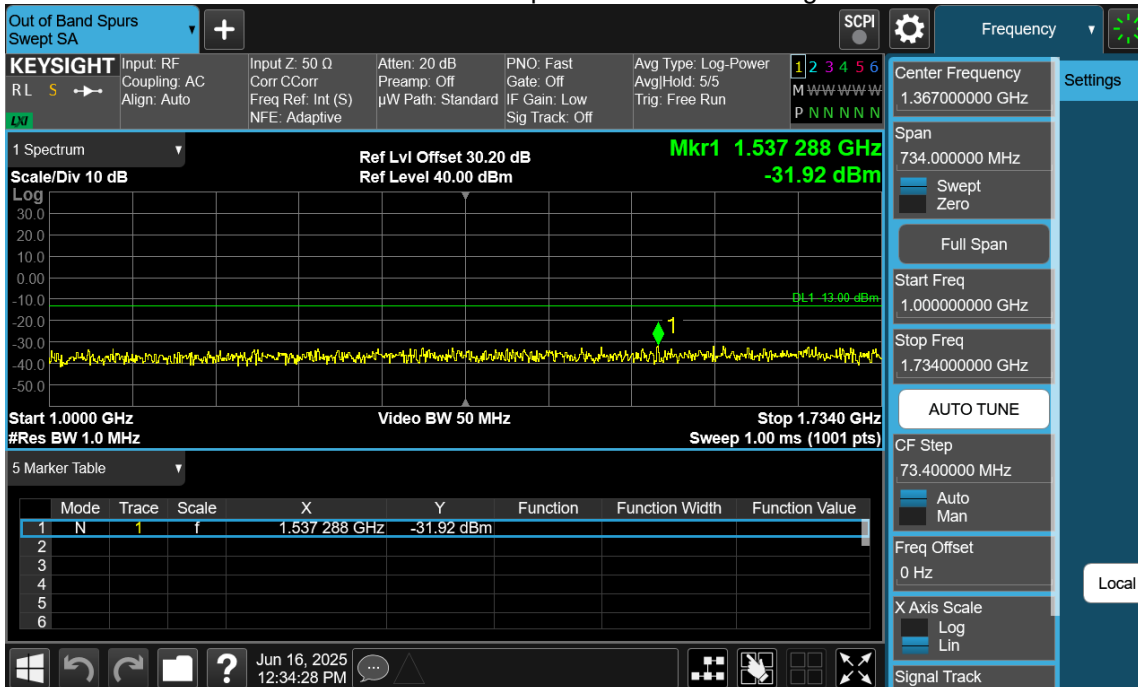
150 PS 152MHz Spurious Emissions Range 3



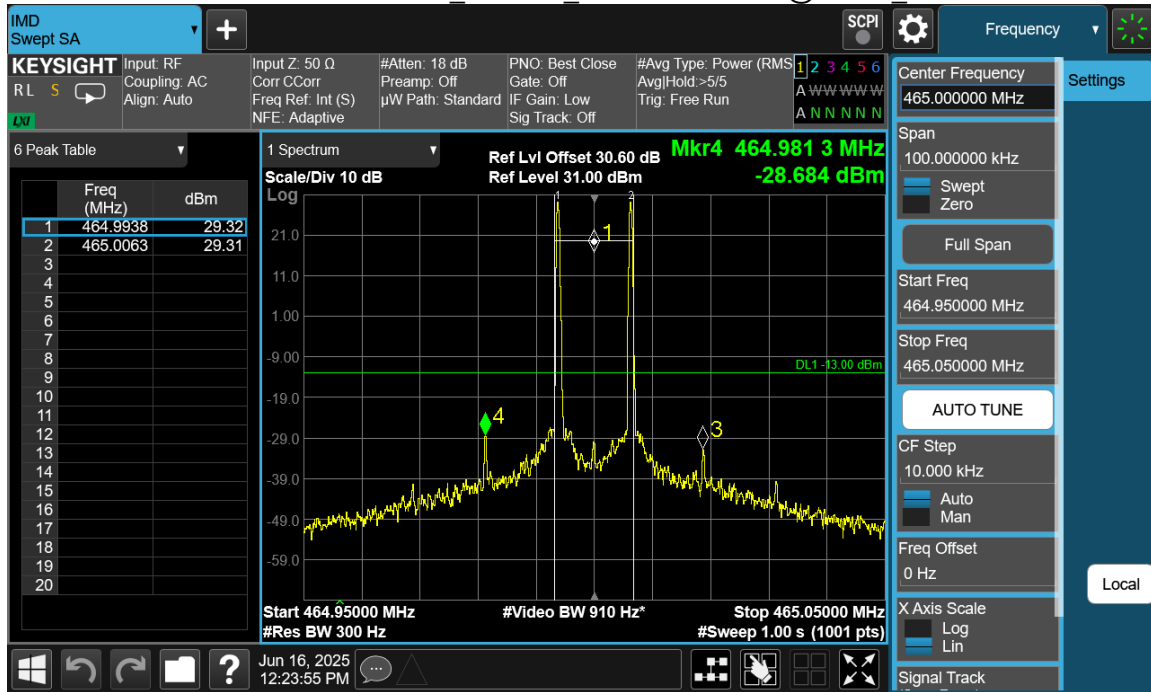
150 PS 152MHz Spurious Emissions Range 4



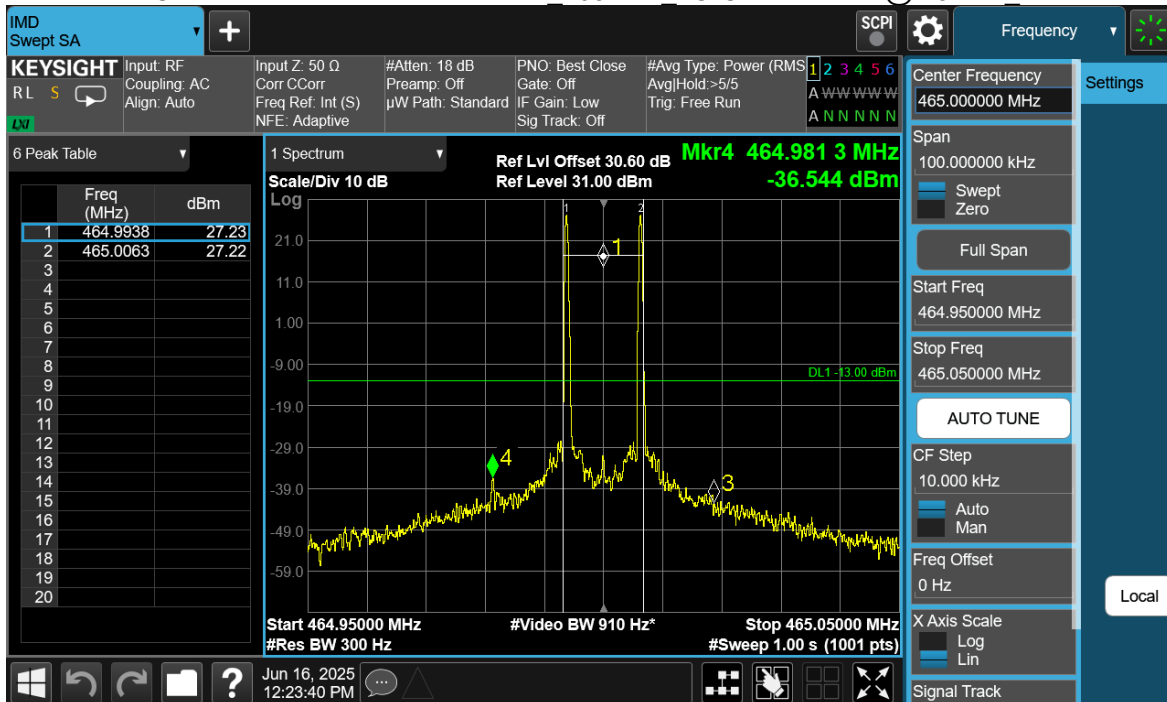
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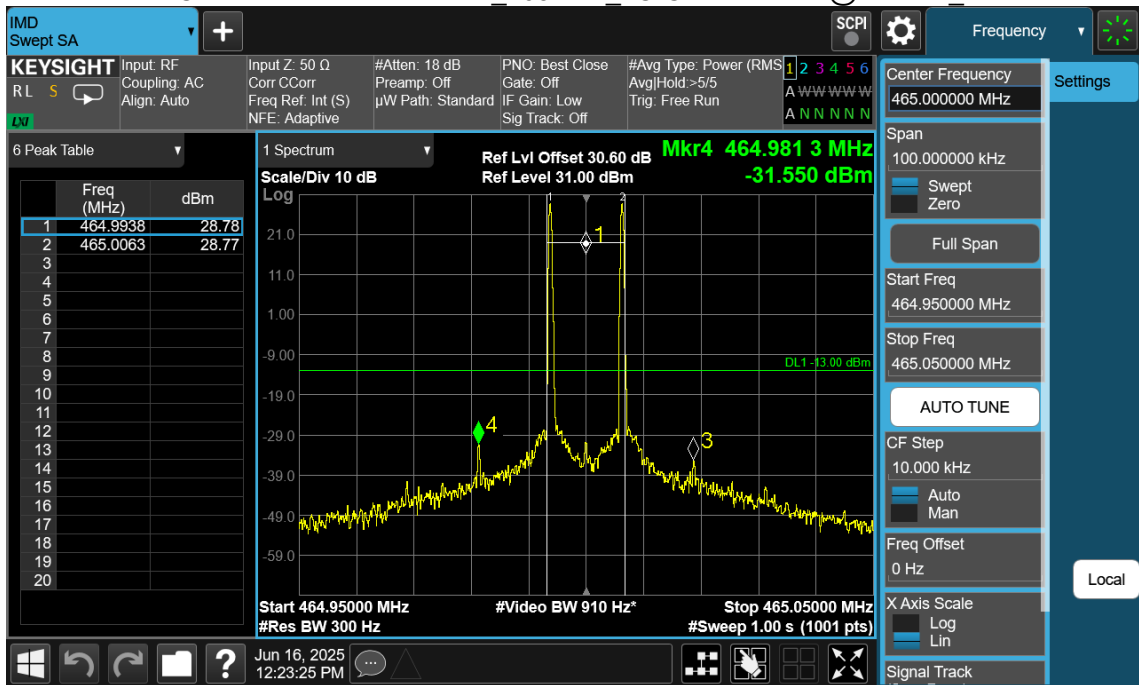
Two Carrier IMD AGC 465MHz 2C-Center-2Tone@-8dBm Table



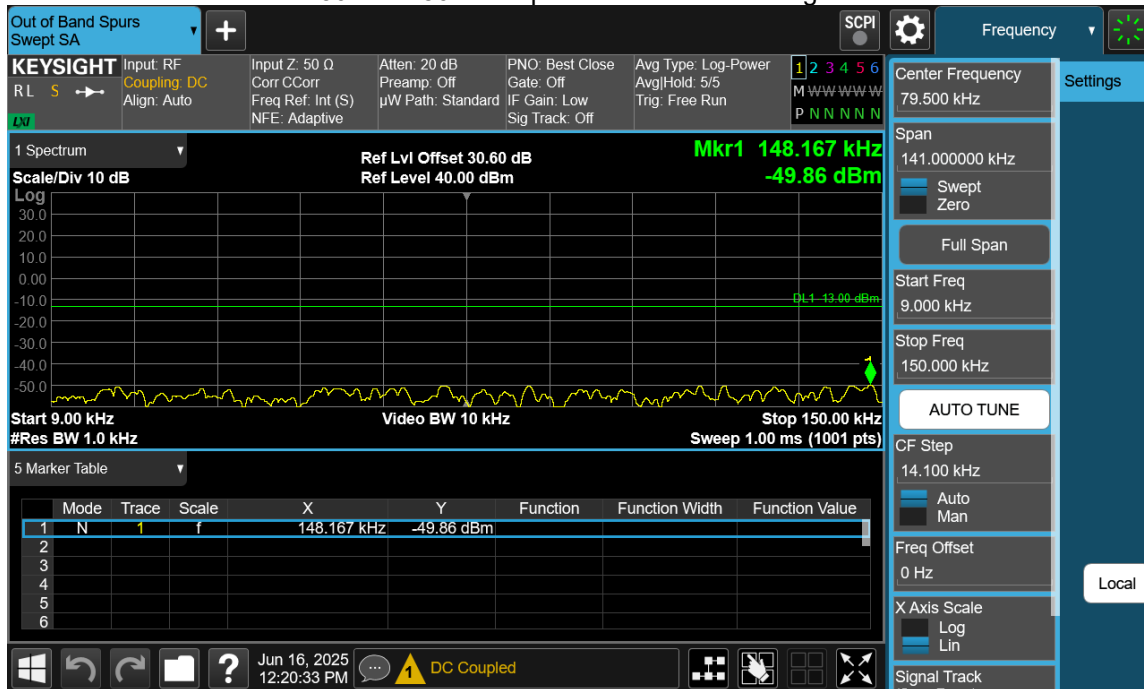
Two Carrier IMD at 2 dB Down Tx Pwr 465MHz 2C-Center-2Tone@-13dBm Table



Two Carrier IMD at Max Tx Pwr 465MHz 2C-Center-2Tone@-12dBm Table



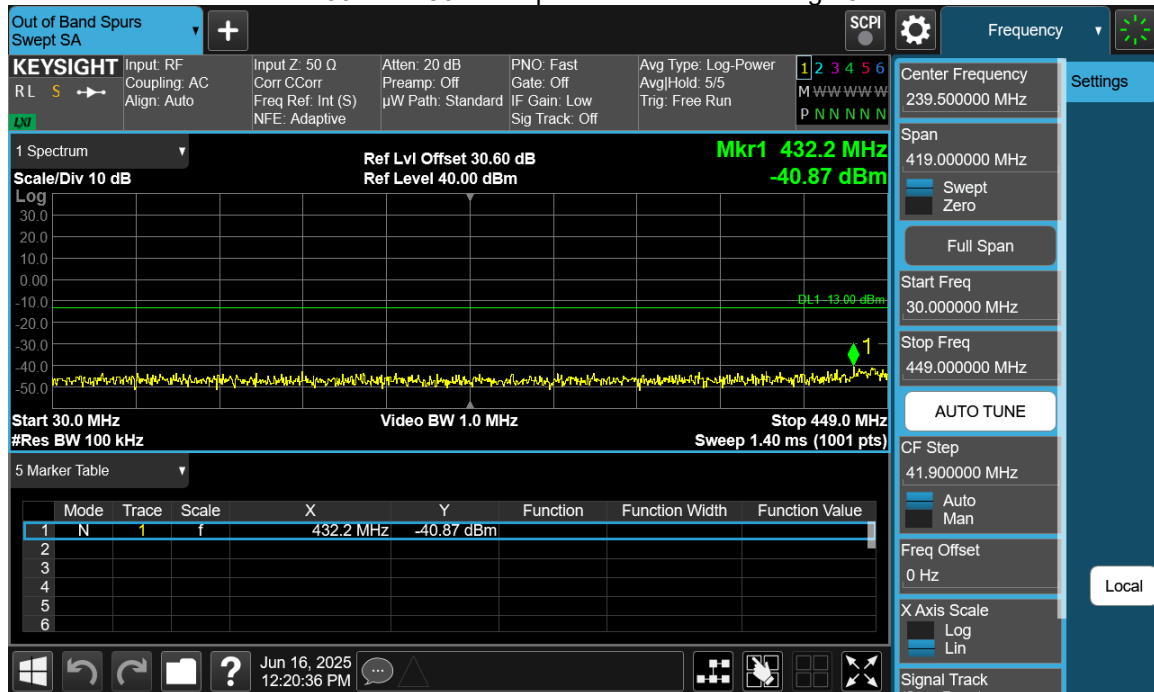
450 PS 480MHz Spurious Emissions Range 1



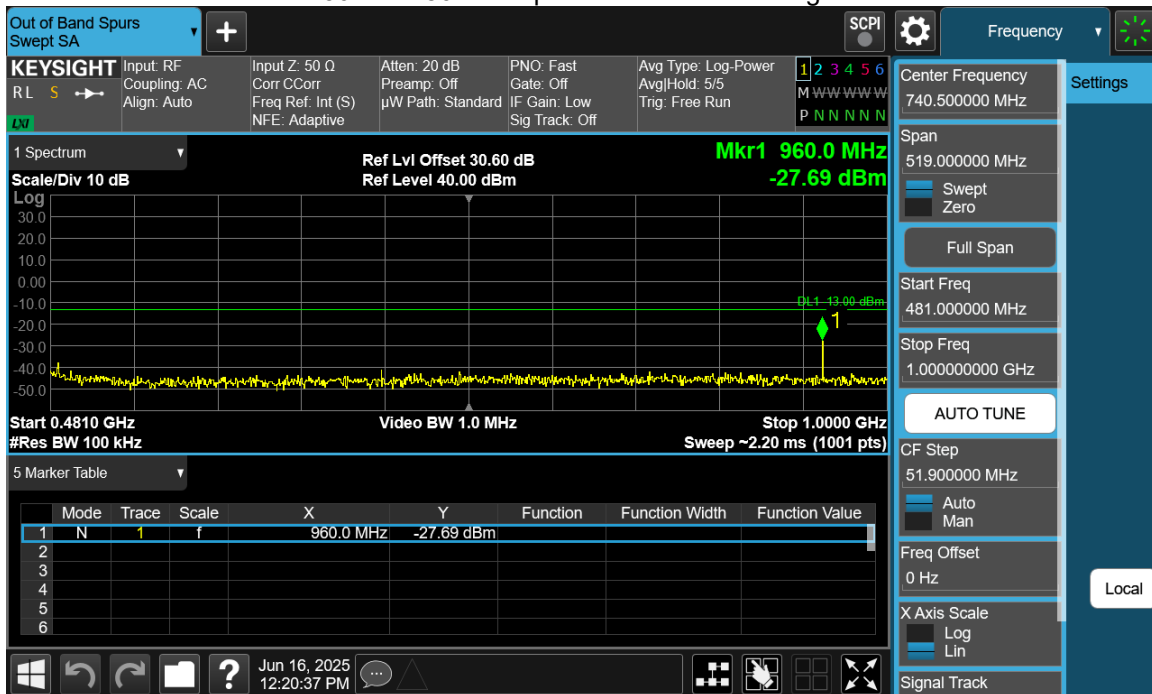
450 PS 480MHz Spurious Emissions Range 2



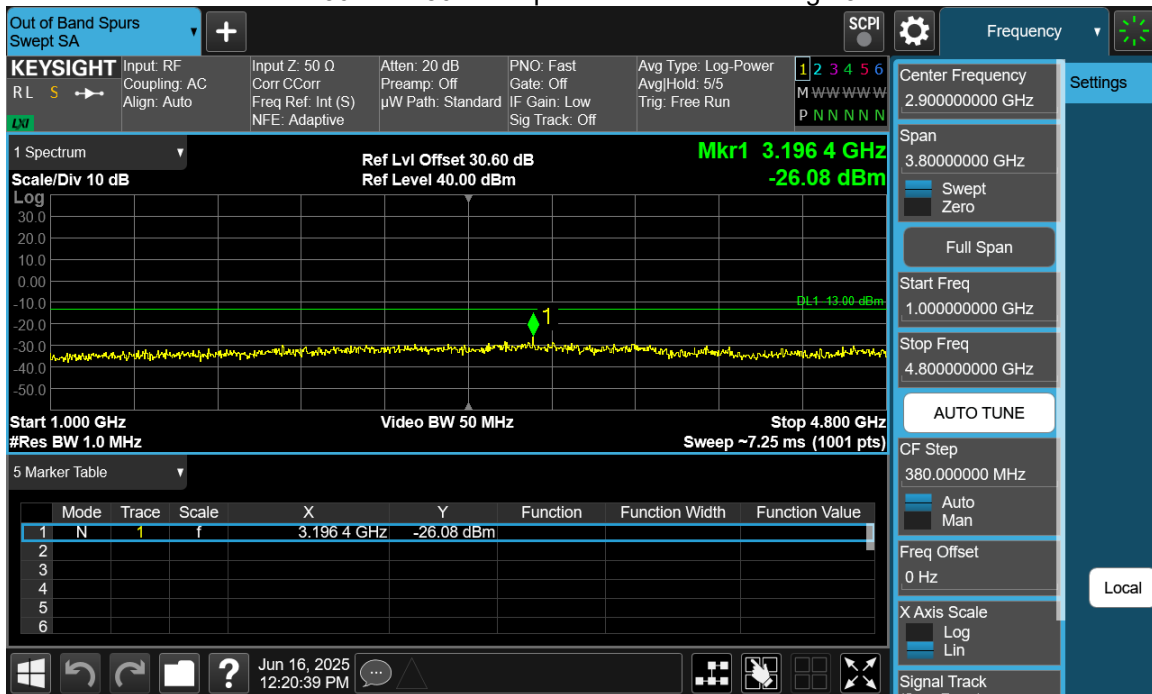
450 PS 480MHz Spurious Emissions Range 3



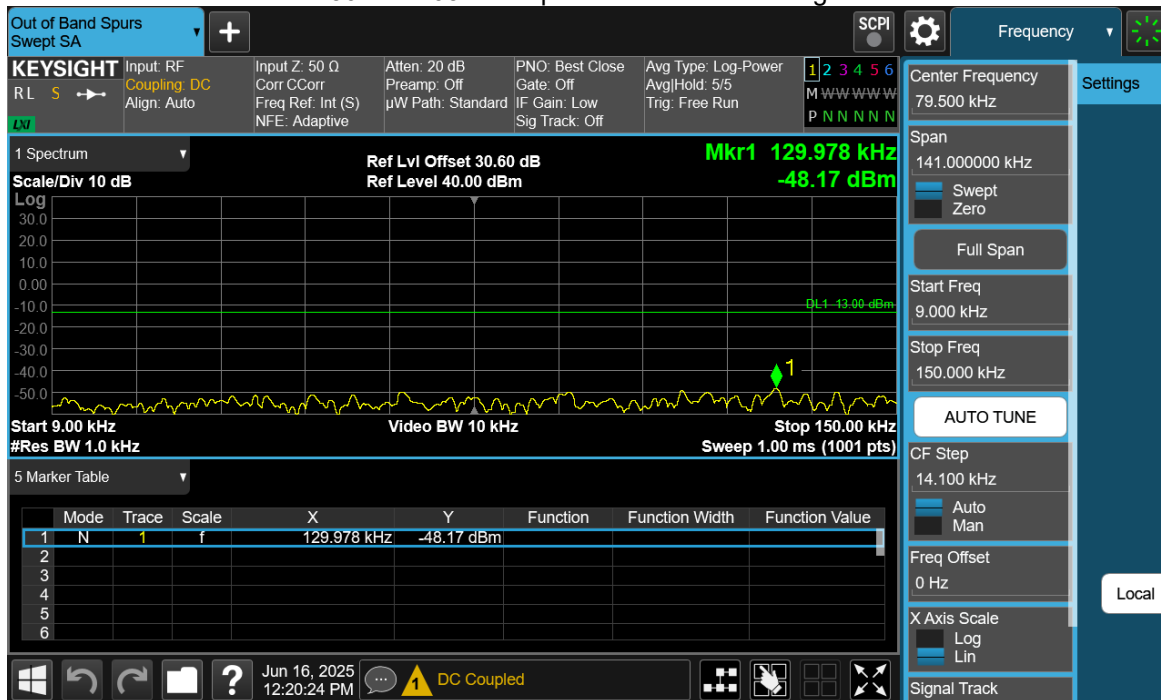
450 PS 480MHz Spurious Emissions Range 4



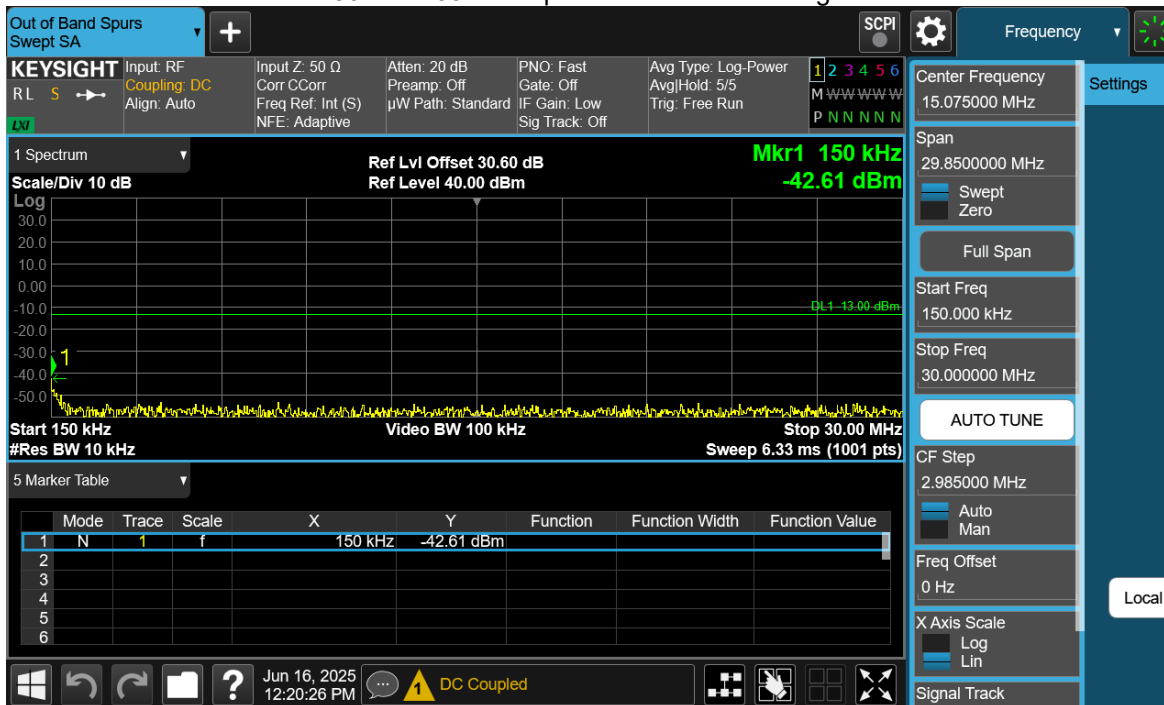
450 PS 480MHz Spurious Emissions Range 5



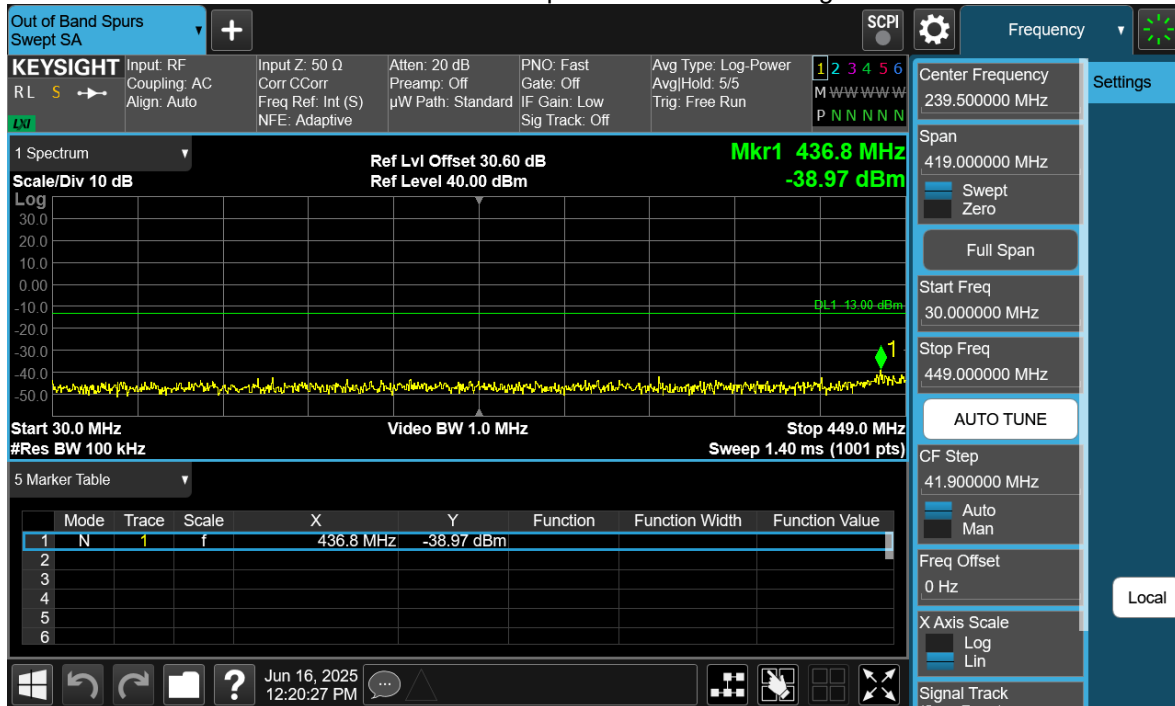
450 PS 465MHz Spurious Emissions Range 1



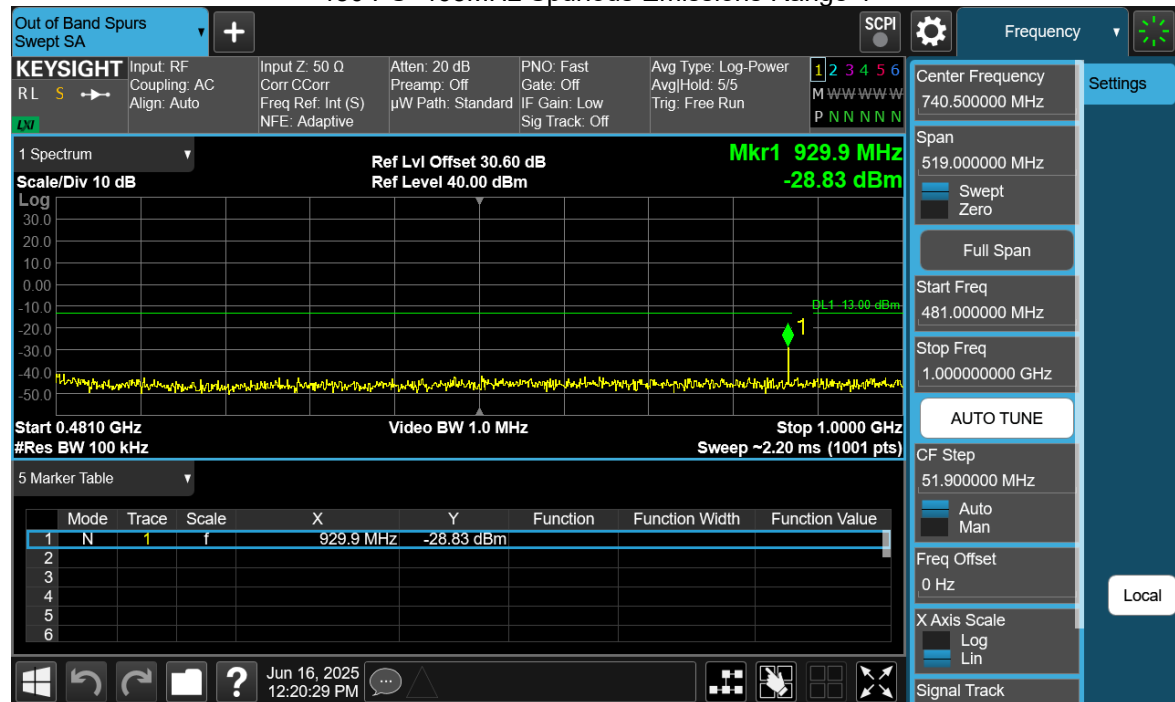
450 PS 465MHz Spurious Emissions Range 2



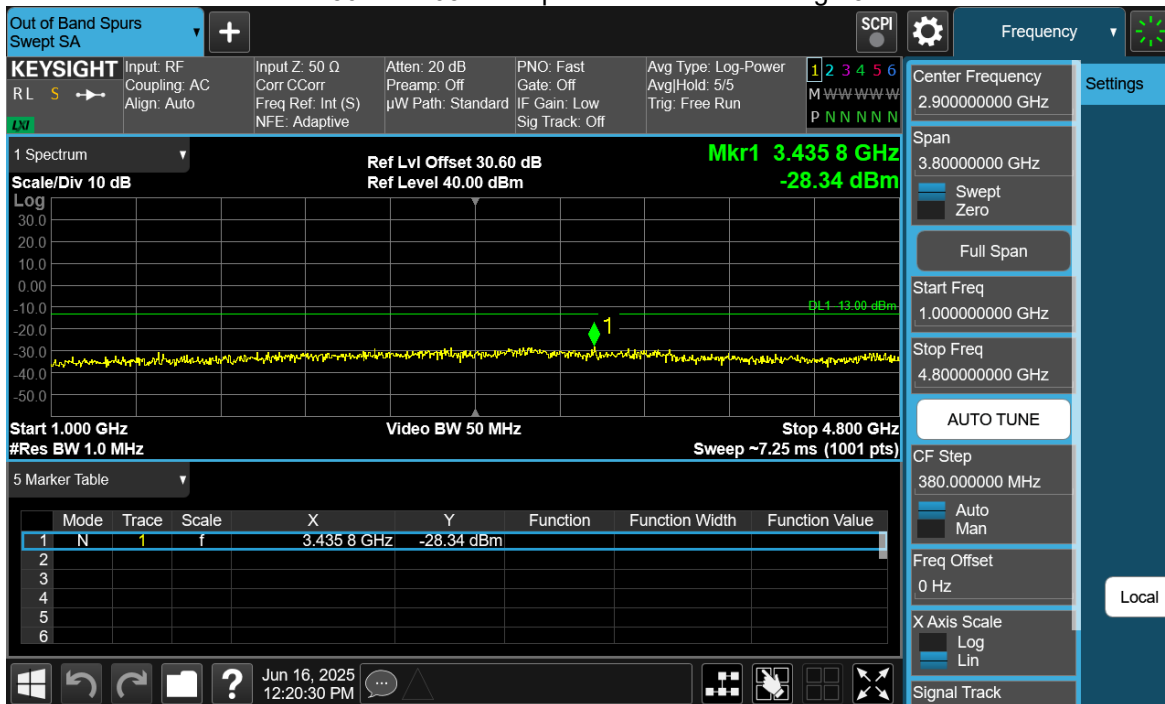
450 PS 465MHz Spurious Emissions Range 3



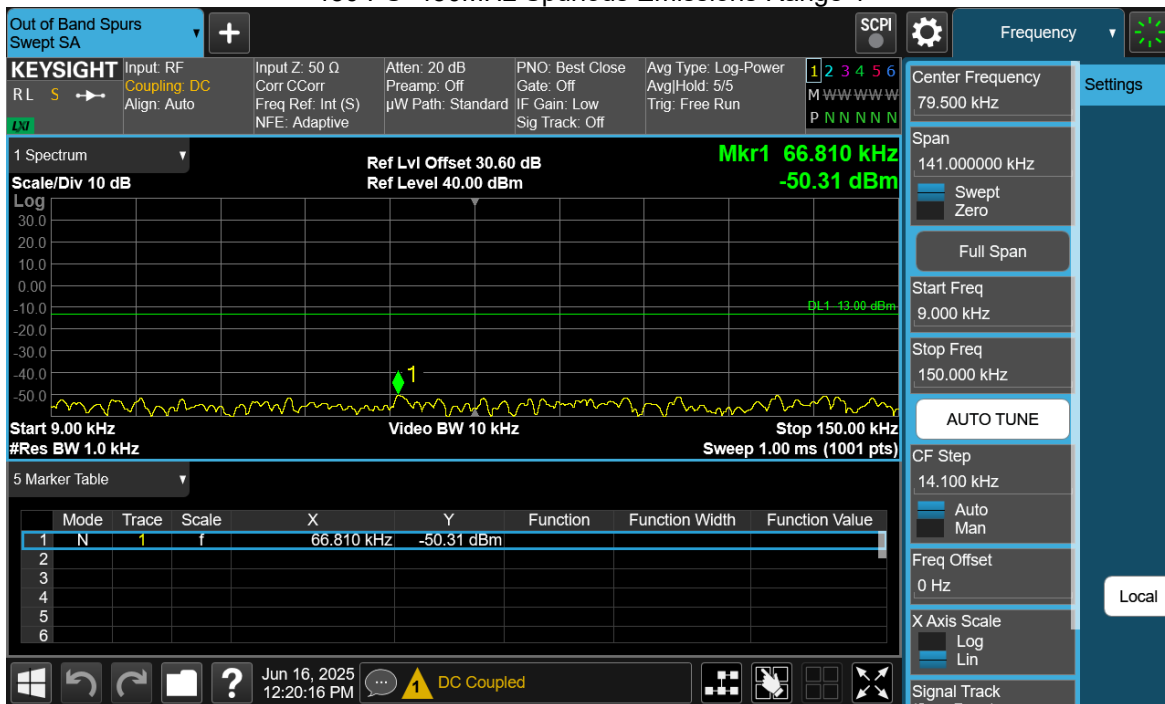
450 PS 465MHz Spurious Emissions Range 4



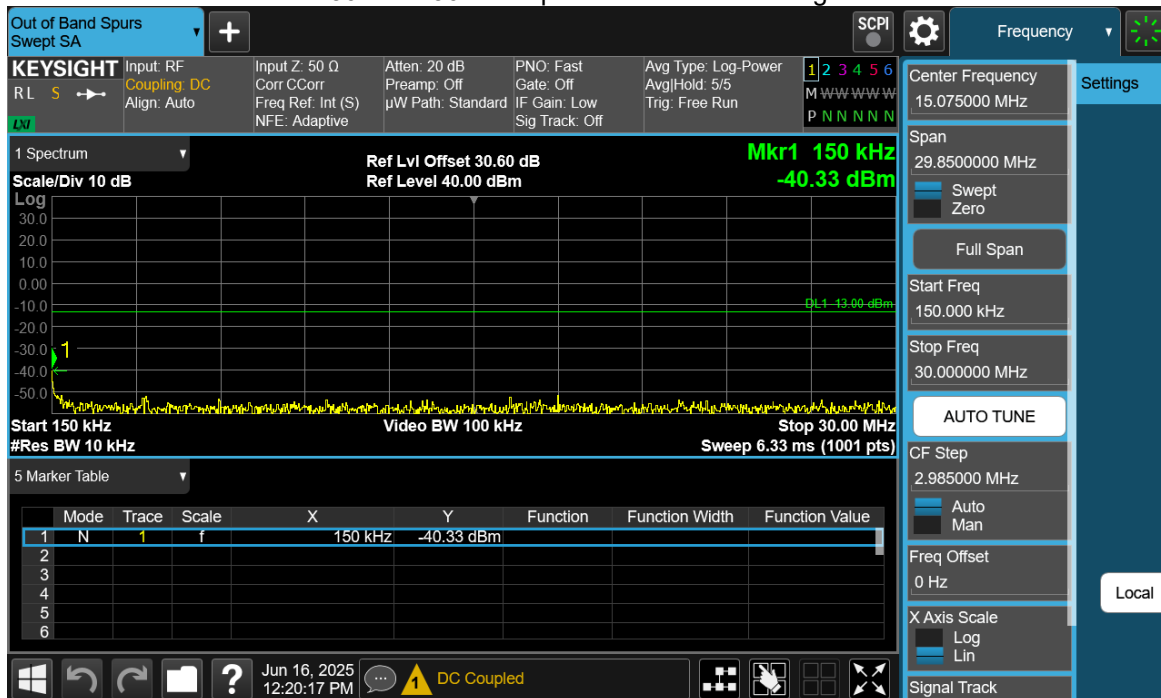
450 PS 465MHz Spurious Emissions Range 5



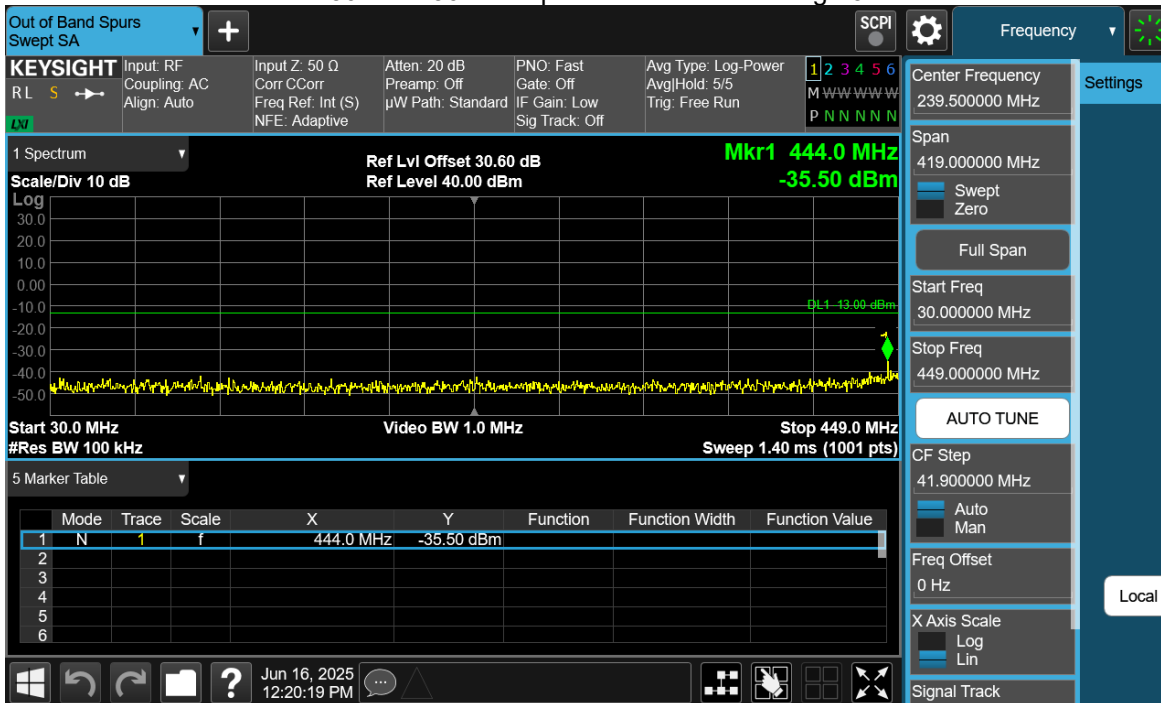
450 PS 450MHz Spurious Emissions Range 1



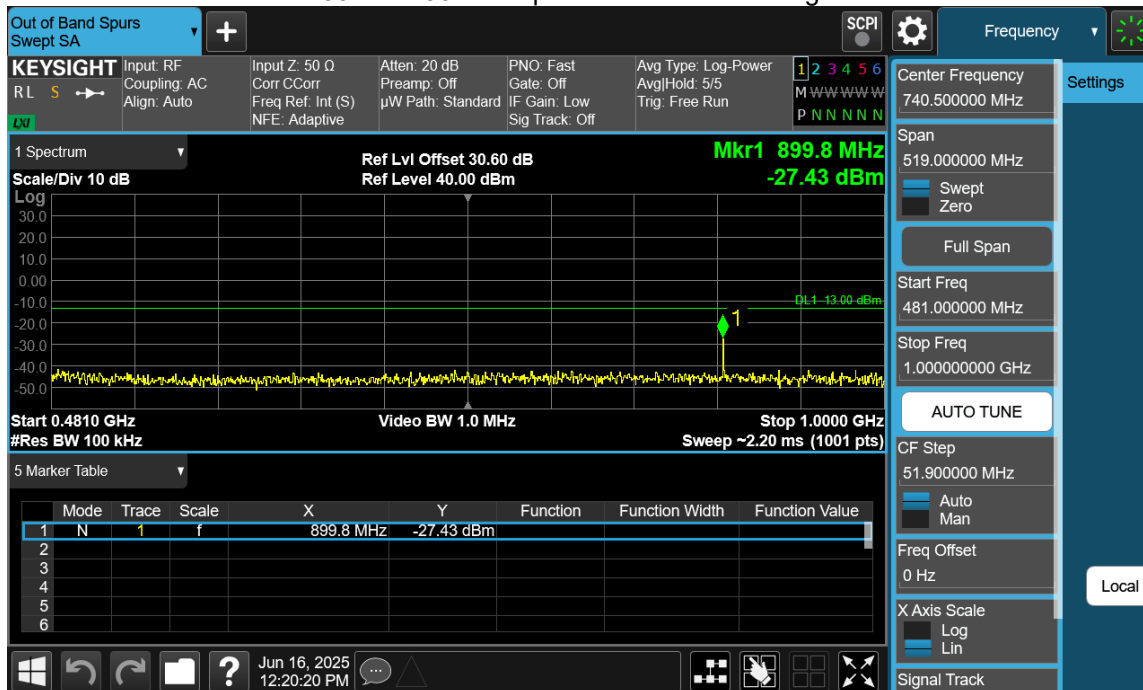
450 PS 450MHz Spurious Emissions Range 2



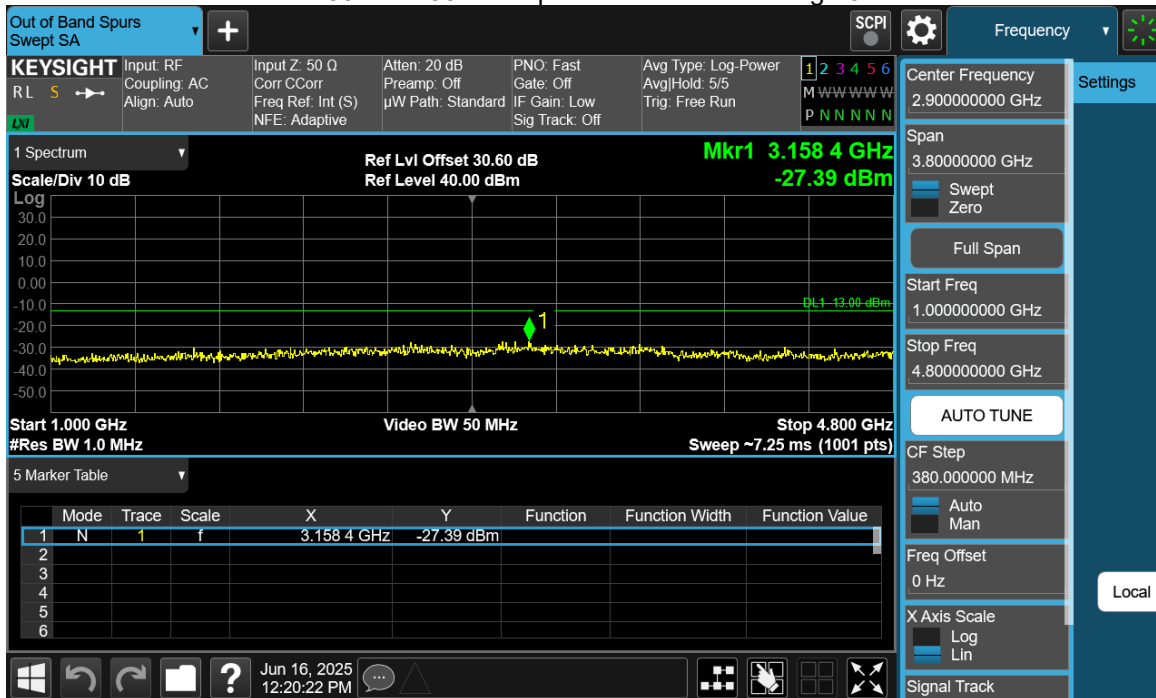
450 PS 450MHz Spurious Emissions Range 3



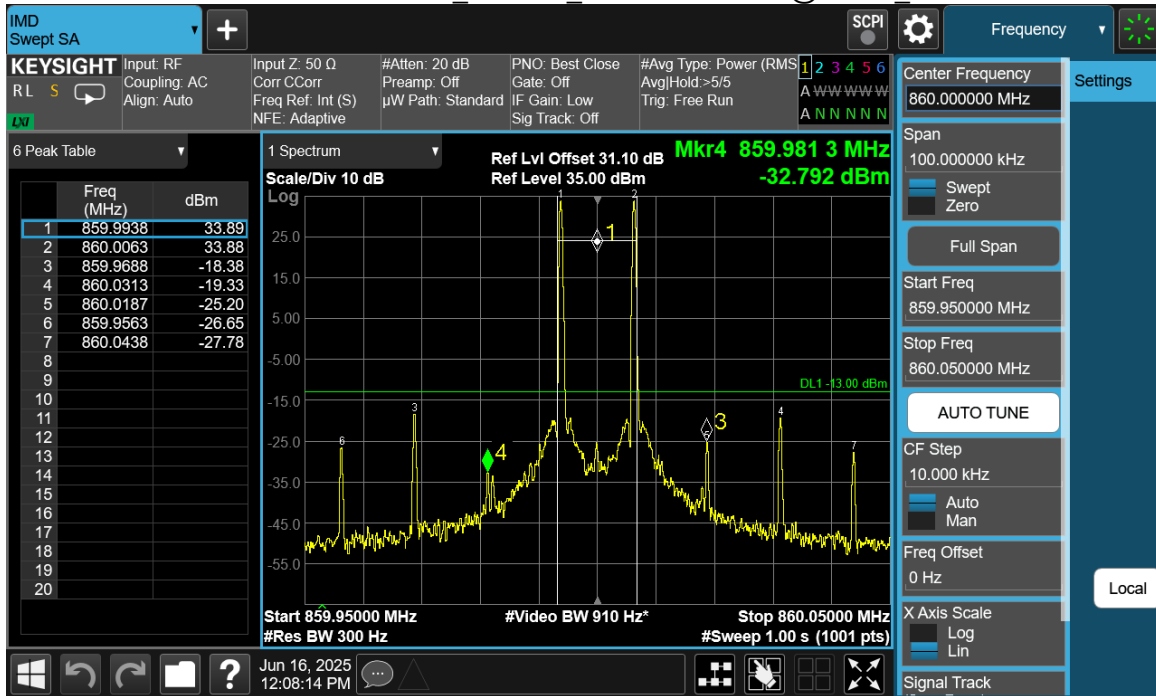
450 PS 450MHz Spurious Emissions Range 4



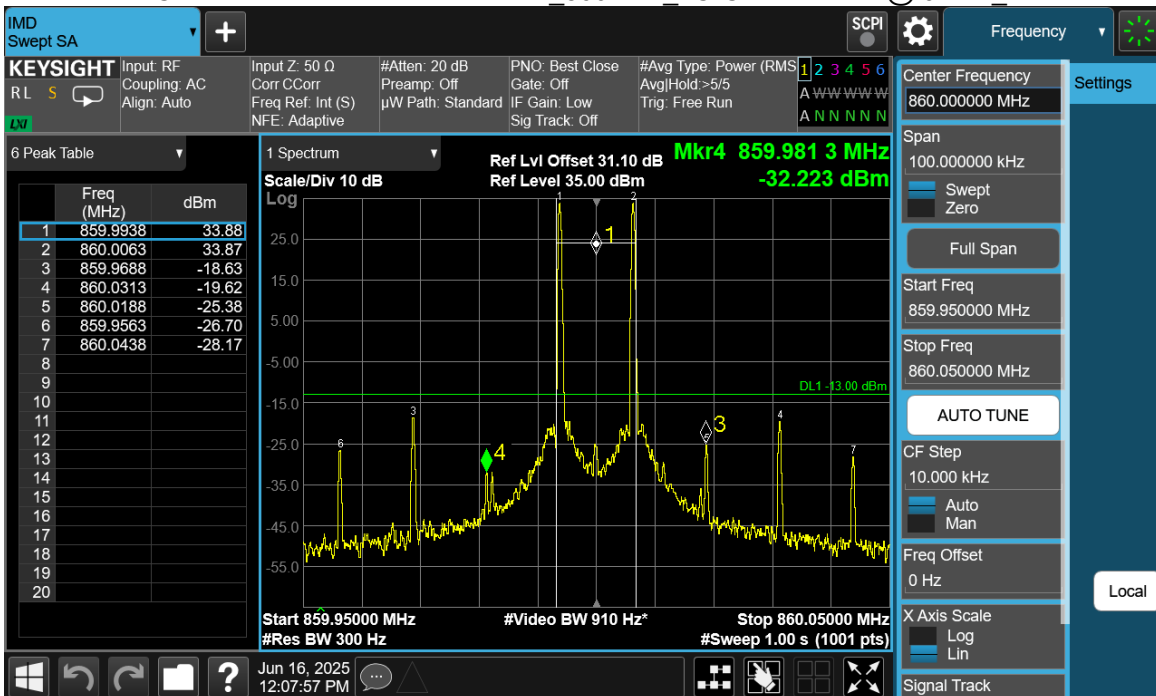
450 PS 450MHz Spurious Emissions Range 5



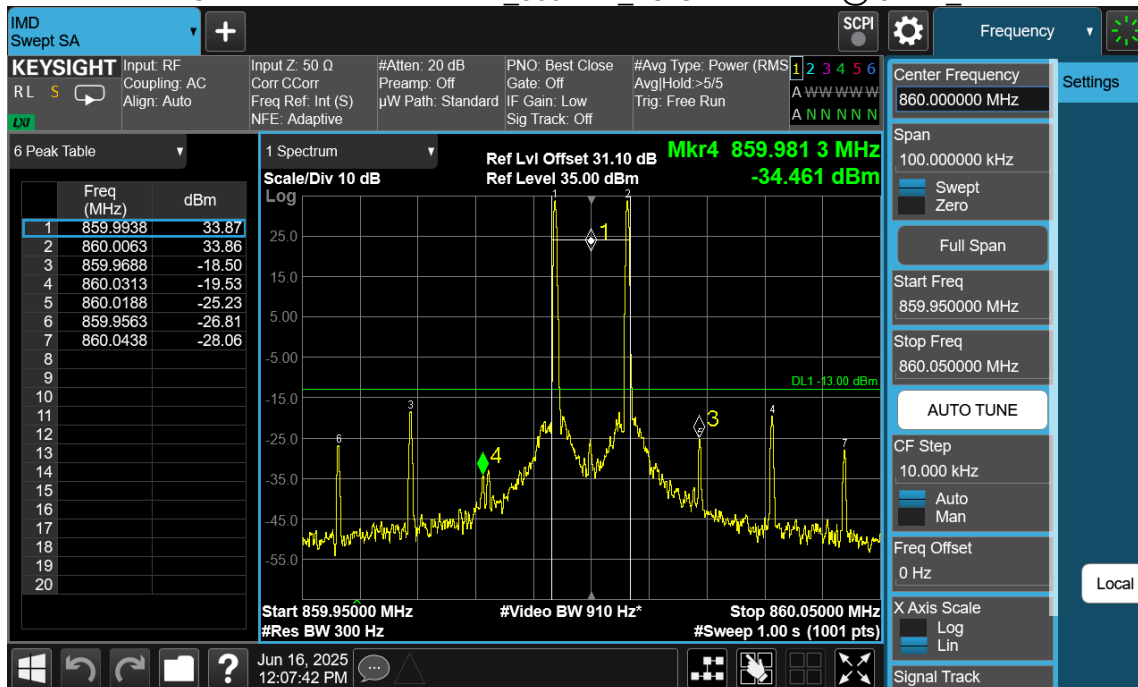
Two Carrier IMD AGC 860MHz 2C-Center-2Tone@-4dBm Table



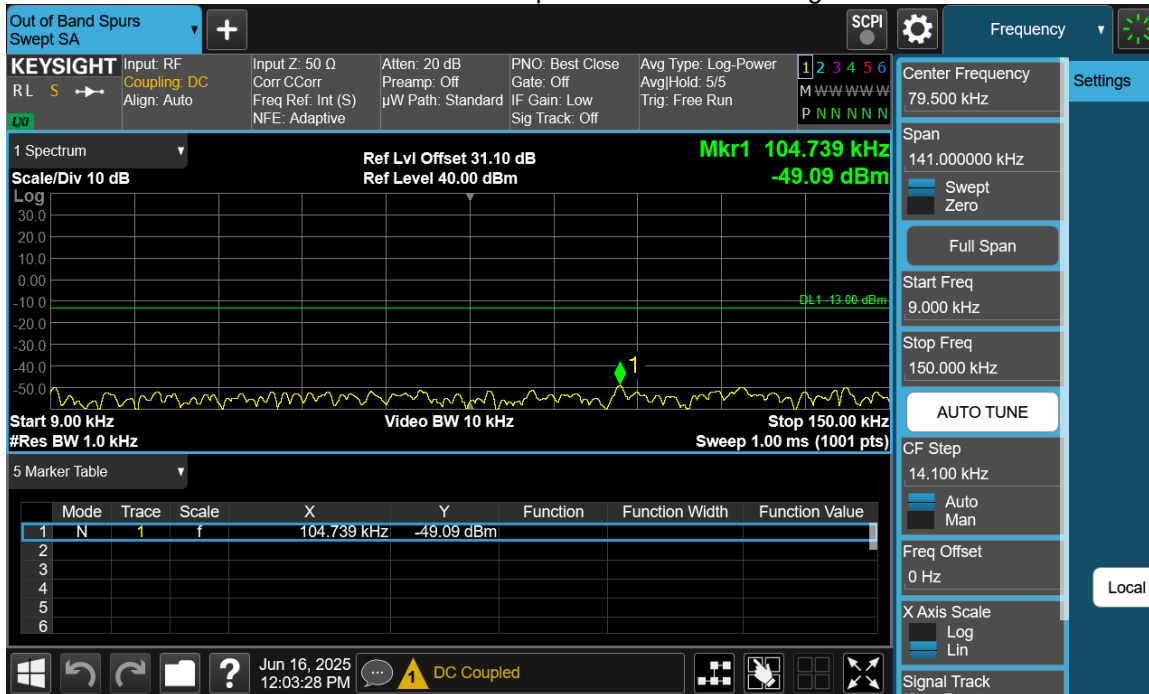
Two Carrier IMD at 2 dB Down Tx Pwr 860MHz 2C-Center-2Tone@-9dBm Table



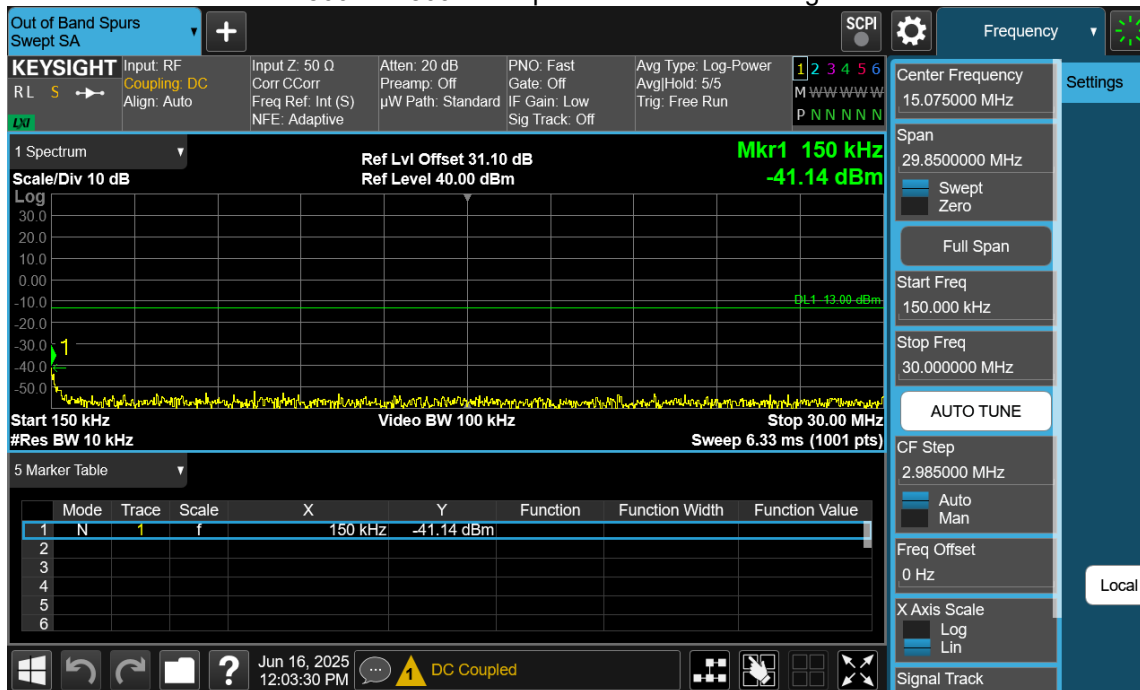
Two Carrier IMD at Max Tx Pwr_860MHz_2C-Center-2Tone@-8dBm_Table



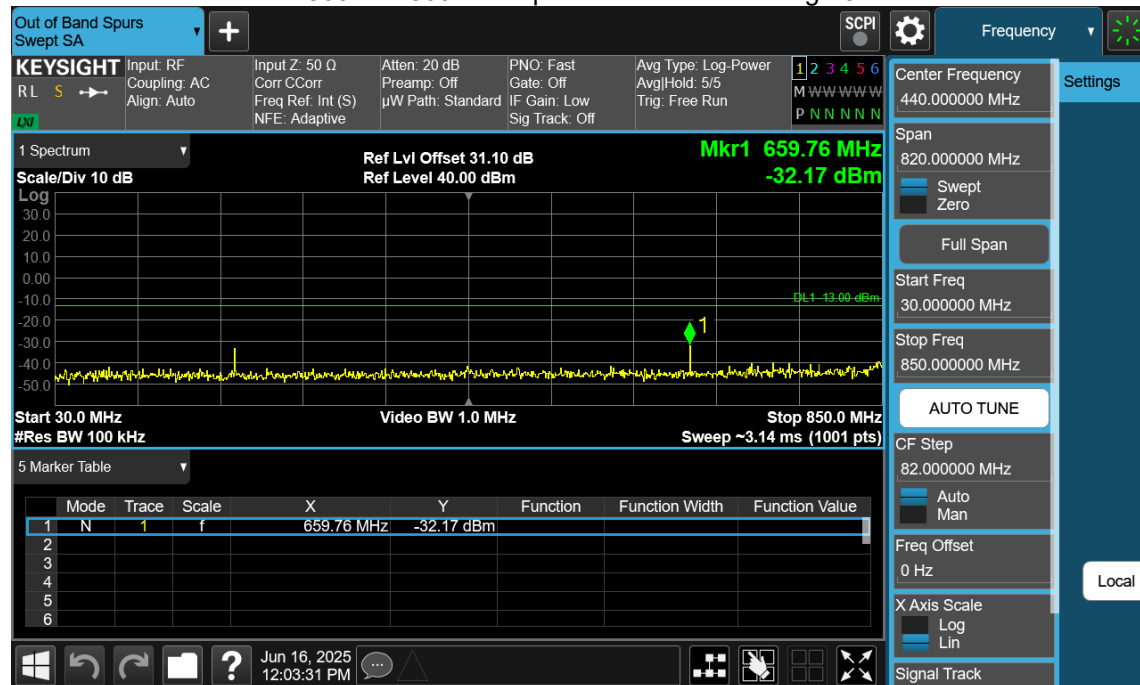
800 PS 869MHz Spurious Emissions Range 1



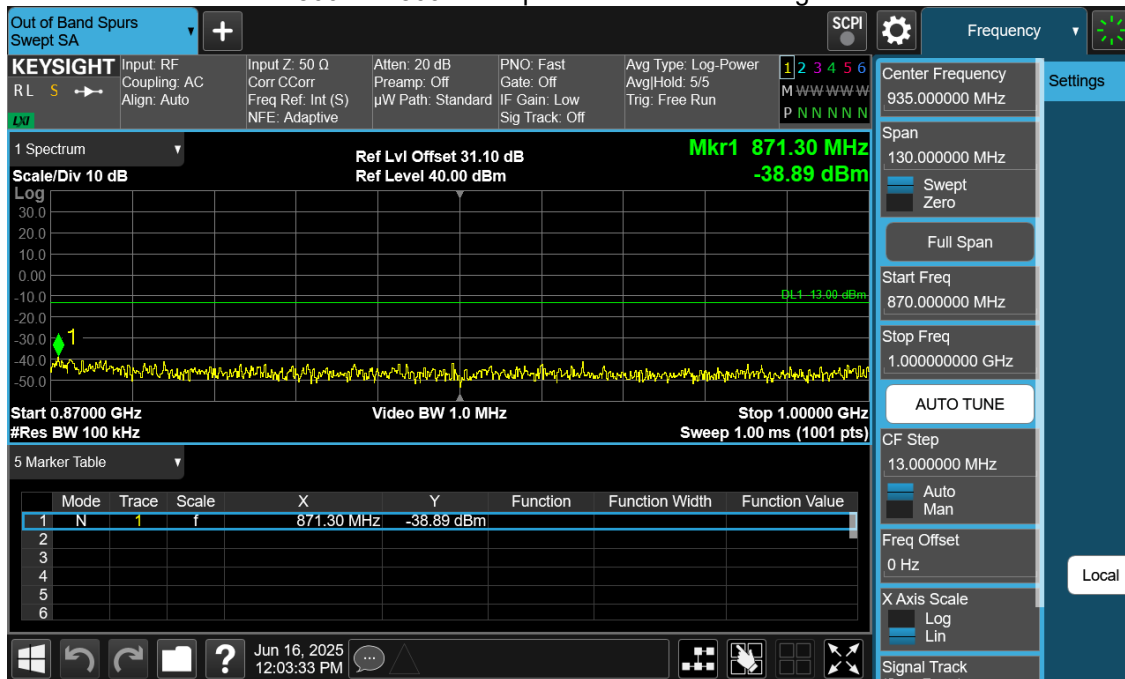
800 PS 869MHz Spurious Emissions Range 2



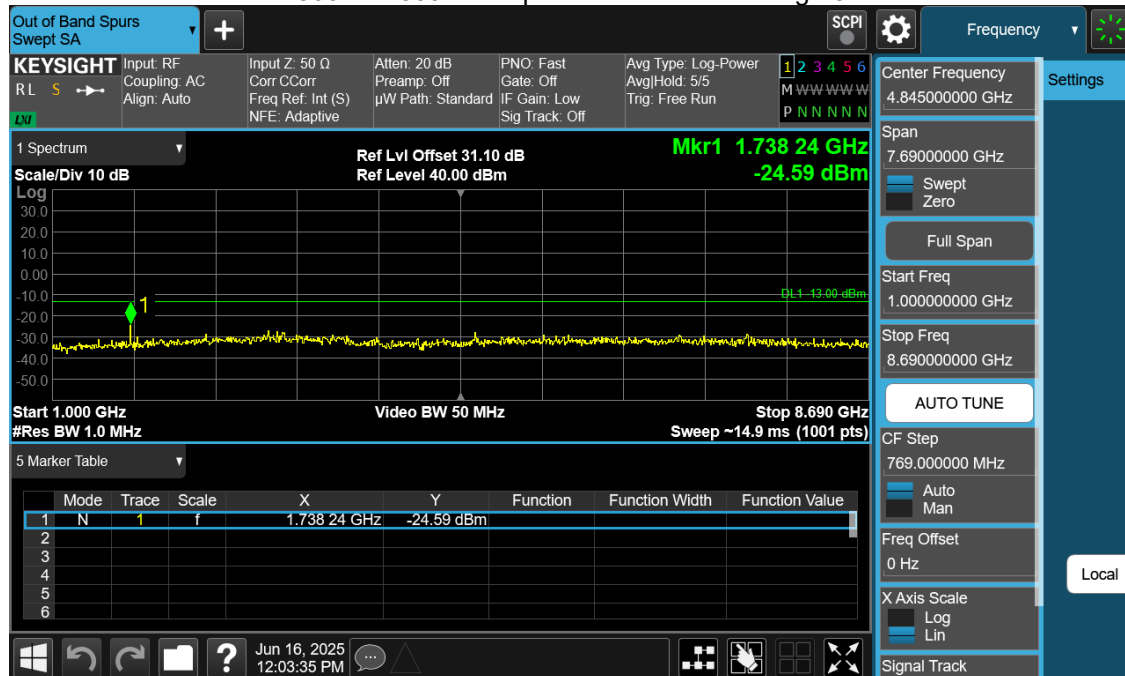
800 PS 869MHz Spurious Emissions Range 3



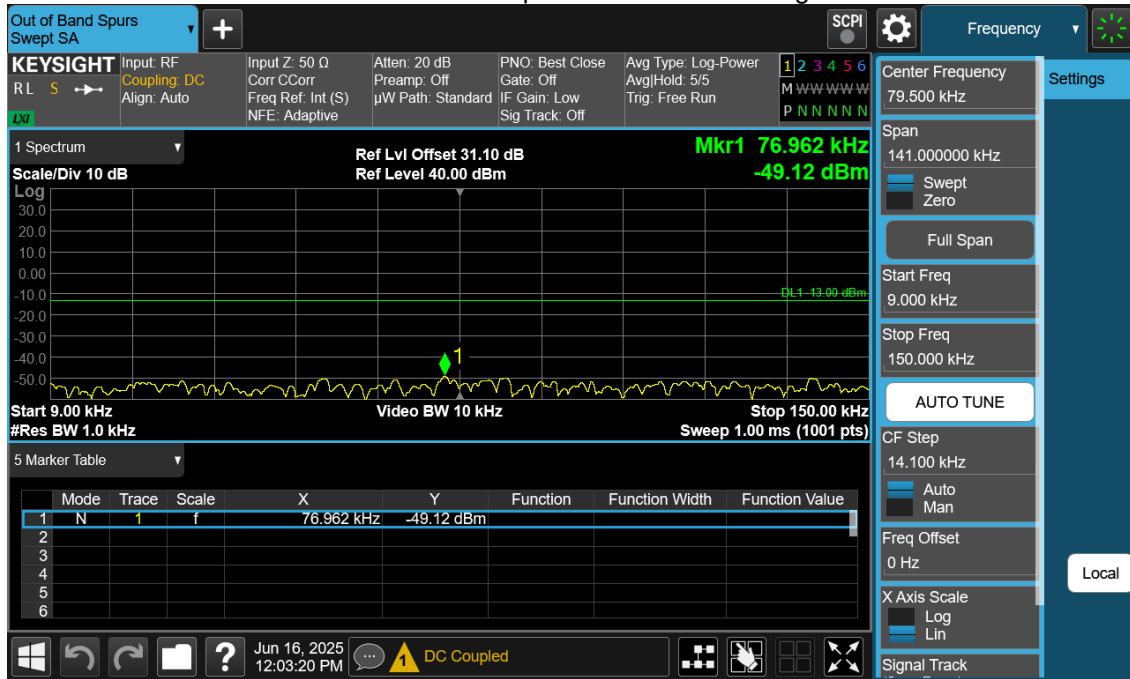
800 PS 869MHz Spurious Emissions Range 4



800 PS 869MHz Spurious Emissions Range 5



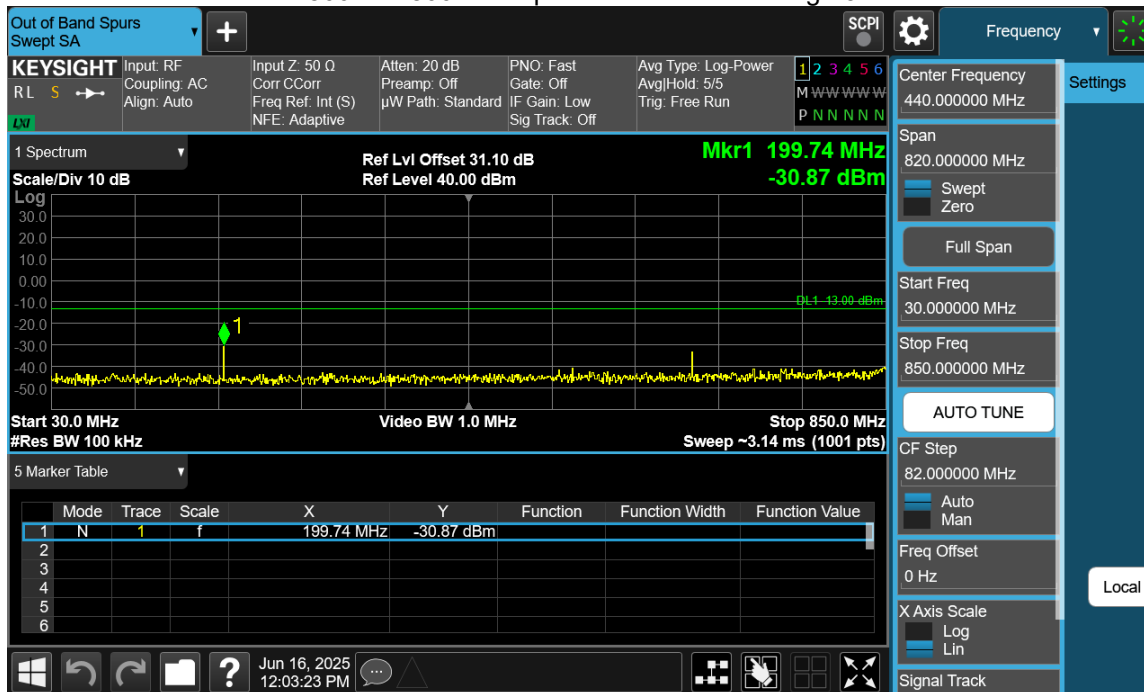
800 PS 860MHz Spurious Emissions Range 1



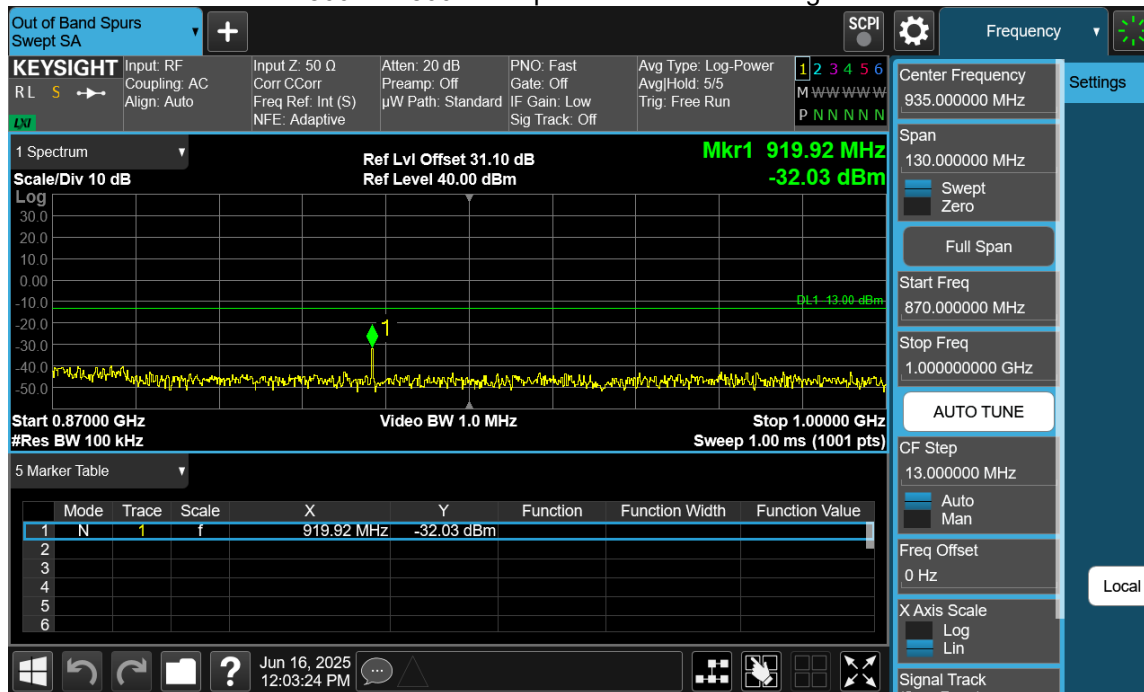
800 PS 860MHz Spurious Emissions Range 2



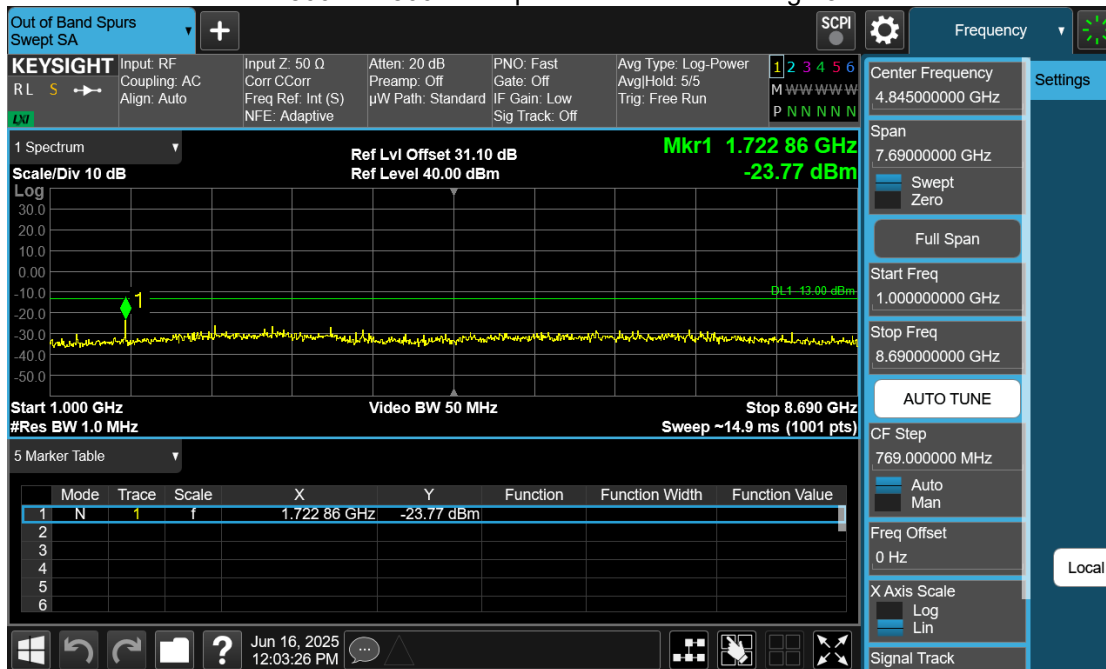
800 PS 860MHz Spurious Emissions Range 3



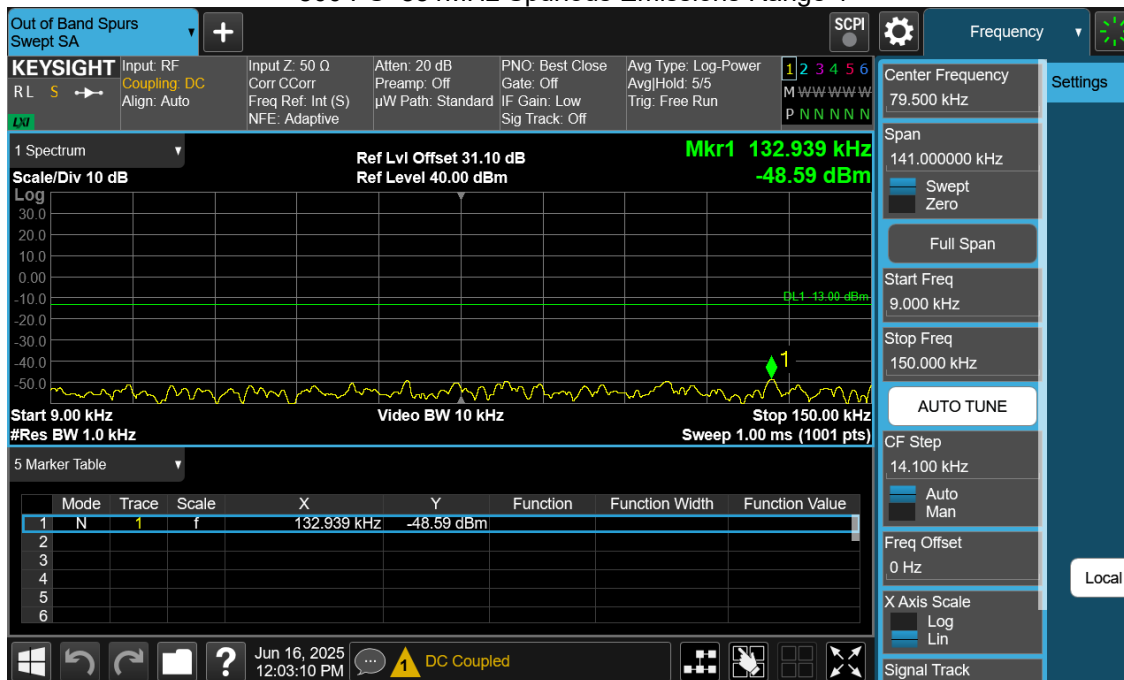
800 PS 860MHz Spurious Emissions Range 4



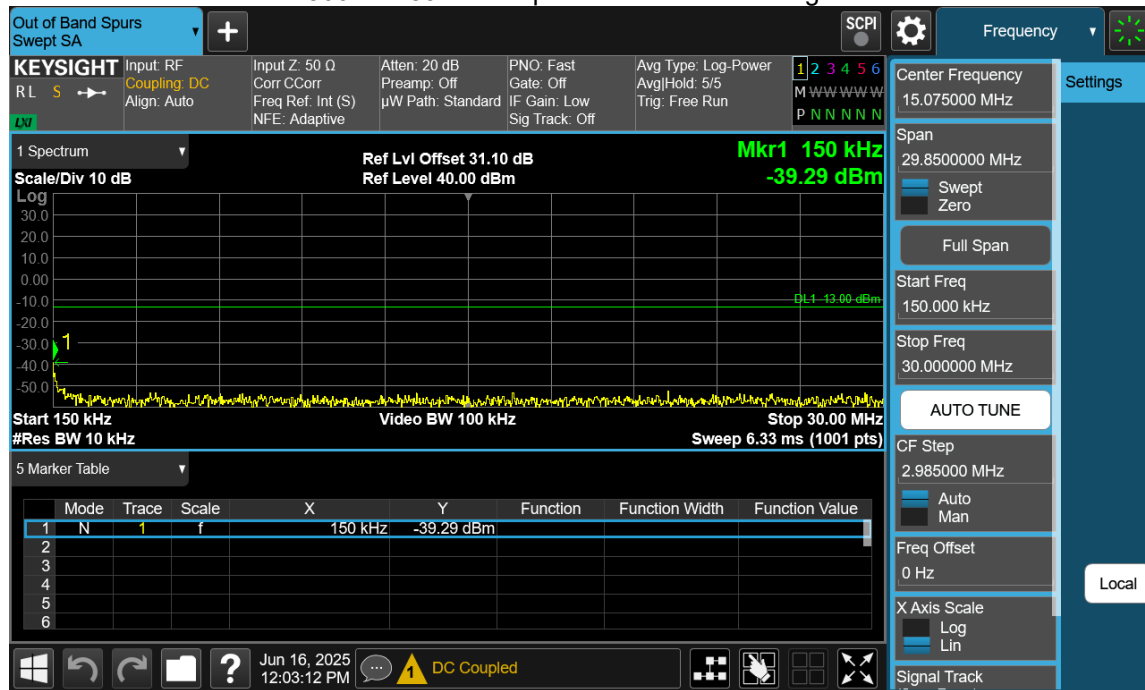
800 PS 860MHz Spurious Emissions Range 5



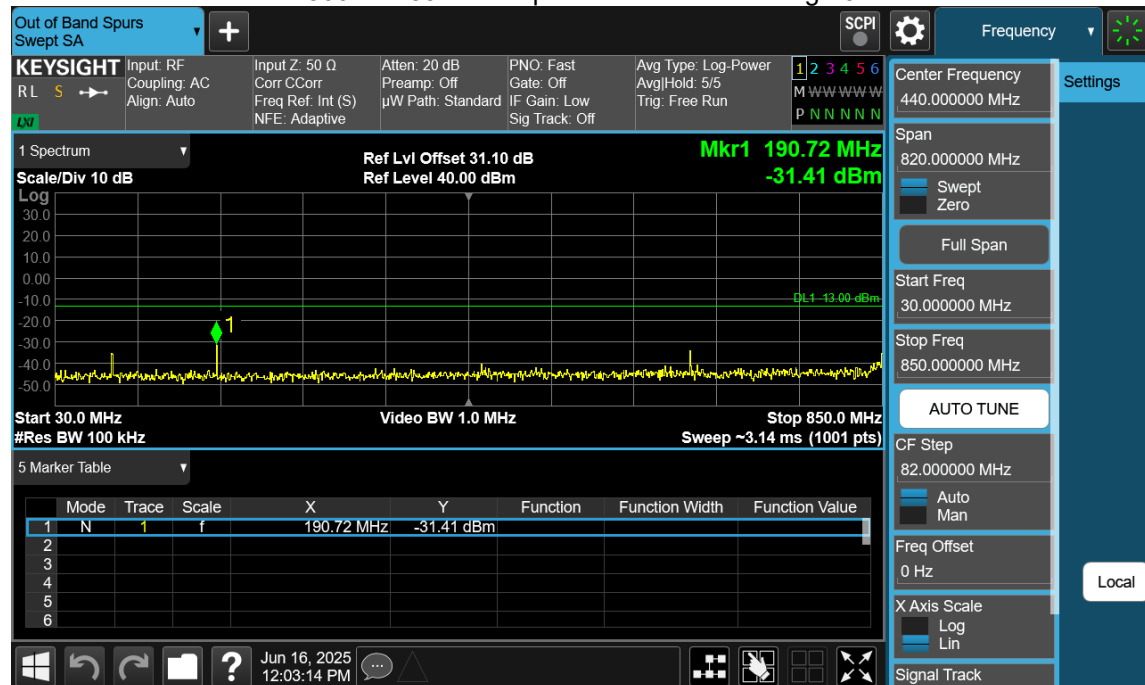
800 PS 851MHz Spurious Emissions Range 1



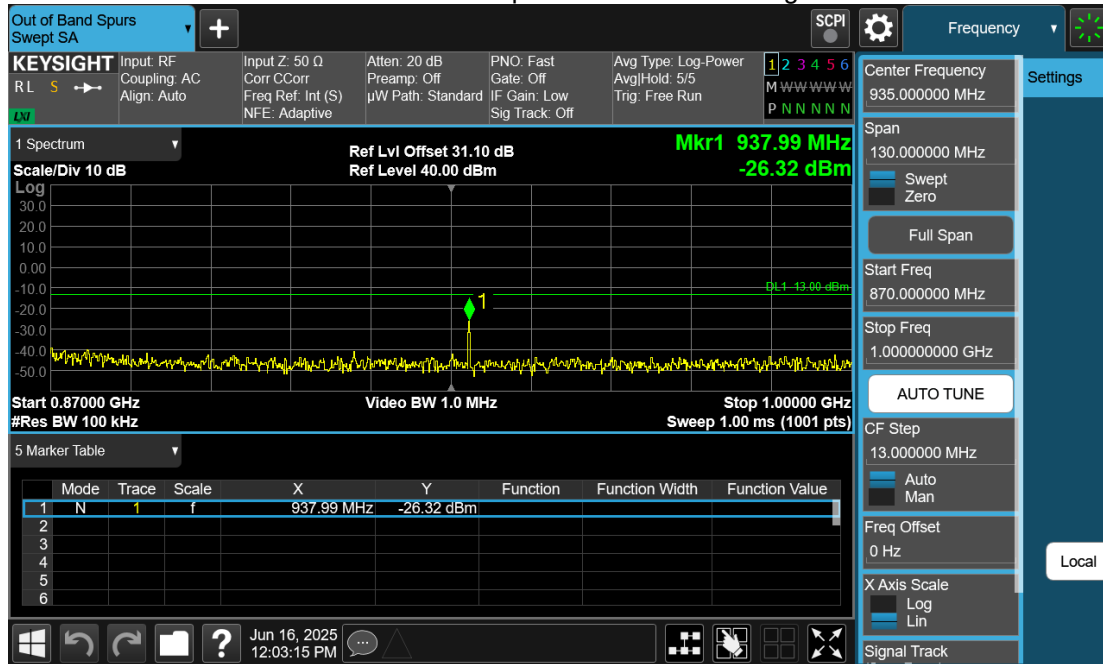
800 PS 851MHz Spurious Emissions Range 2



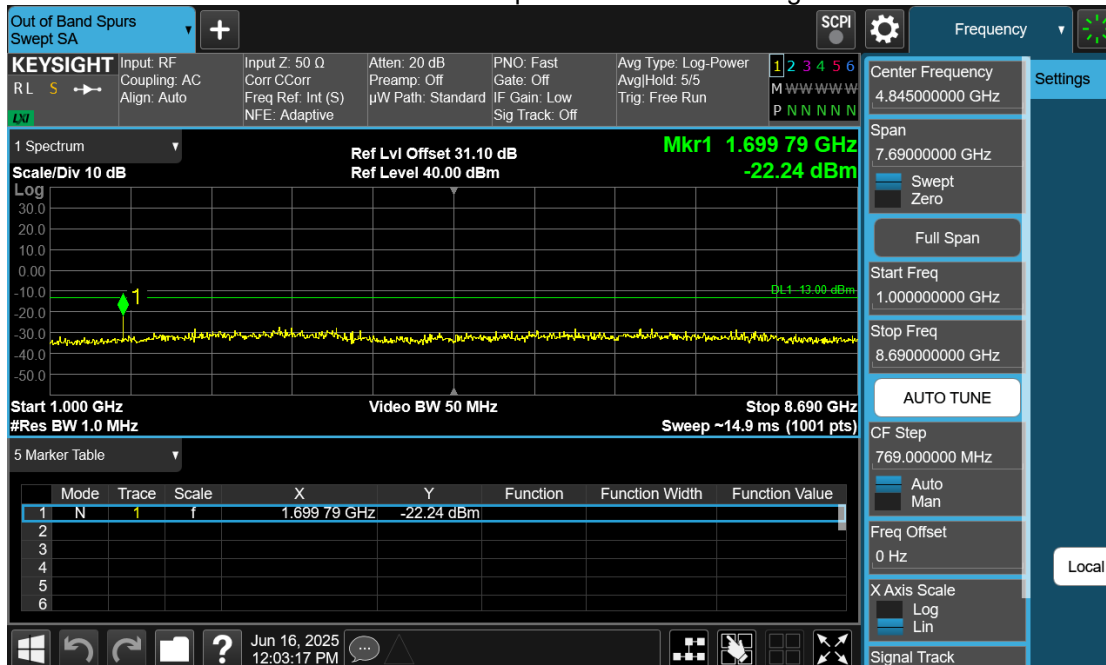
800 PS 851MHz Spurious Emissions Range 3



800 PS 851MHz Spurious Emissions Range 4



800 PS 851MHz Spurious Emissions Range 5



3.7 Noise Figure

Governing Doc	RSS-119, Issue 12 2015, Amendment (April 1, 2022) RSS-Gen, Issue 5 2018 FCC Part 90	Room Temperature (°C)	20.5		
Test Procedure	ANSI C63.26-2015, Section 7.2.3.5 KDB 935210 D05, v01r04, Clause 4.6	Relative Humidity (%)	38.6		
Test Location	Bench top, Richmond Lab	Barometric Pressure (kPa)	101.8		
Test Engineer	Zara Vali	Date	June 16, 2025		
EUT Voltage	<input checked="" type="checkbox"/> +48VDC <input type="checkbox"/> 120VAC @ 60Hz				
Test Equipment Used	Manufacturer	Model	Serial Number	Calibration date	Calibration due
Signal Generator	Keysight	N5172B-506	MY53050270	Dec 12, 2023	Dec 12, 2026
Spectrum Analyzer	Keysight	N9020B-526	MY62153079	Aug 1, 2023	Aug 1, 2025
Frequency Range:	<input checked="" type="checkbox"/> 2 times of the passband on each band				
Detector:	<input checked="" type="checkbox"/> Average				
RBW:	<input checked="" type="checkbox"/> 910 kHz				
Type of Facility:	<input checked="" type="checkbox"/> Tabletop				
Distance:	<input checked="" type="checkbox"/> Direct				
Noise Figure on each band is less than the 9 dB required.					
Compliant <input checked="" type="checkbox"/> Non-Compliant <input type="checkbox"/> Not Applicable <input type="checkbox"/>					

Test setup

Based on ANSI C63.26: 2015, the system maximum gain and the noise density is measured. Measurements were performed within the EUT's passband.

The noise figure is then calculated by $NF = NP - Gain + KTB \text{ Noise}$; where NP is in band noise power per Herz, Gain is measured at the maximum noise frequency with -55 dBm input signal in UL. KTB Noise is 174dB/Hz.

The EUT was set to **Operation Mode #1 with configuration Mode #1**.



Results

Test Band	Gain (dB)	kTB (dBm/Hz)	Measured Value (dBm/Hz)	Noise Figure (dB)
150 PS	55.4	174	-113	5.54
450 PS	55.3	174	-112.6	6.11
800 PS	53.4	174	-113	6.07