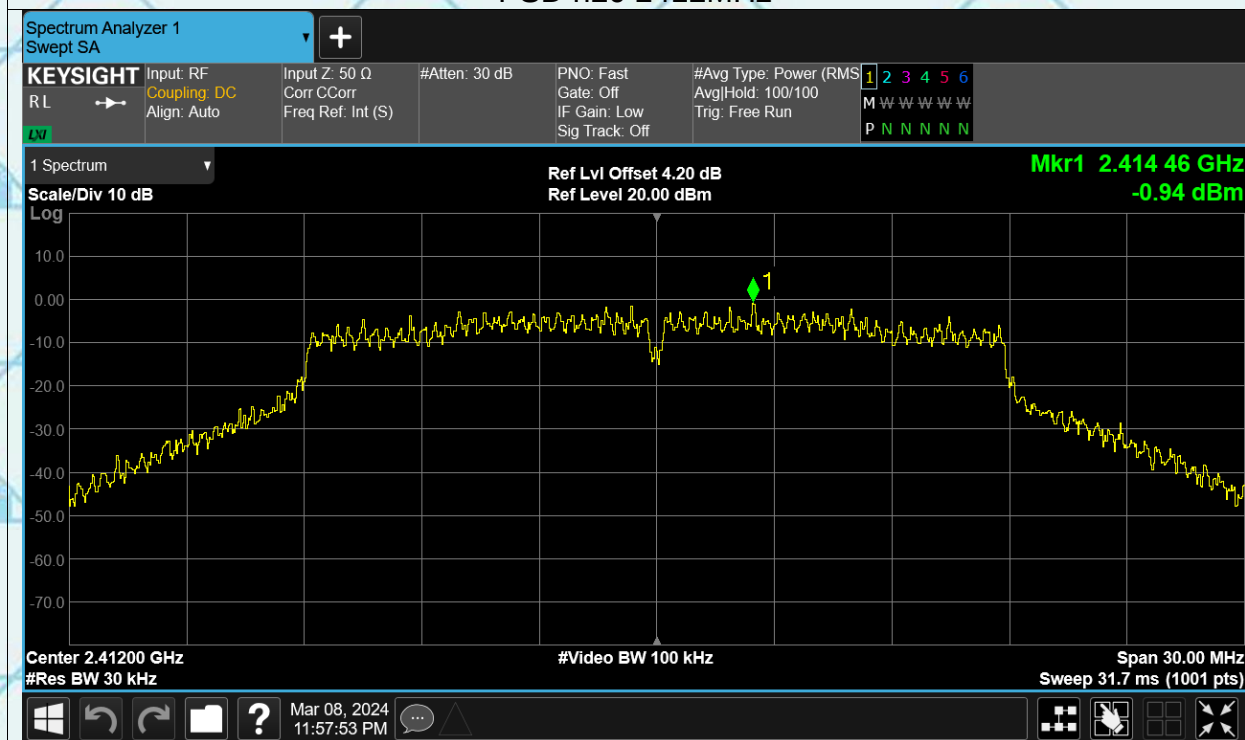
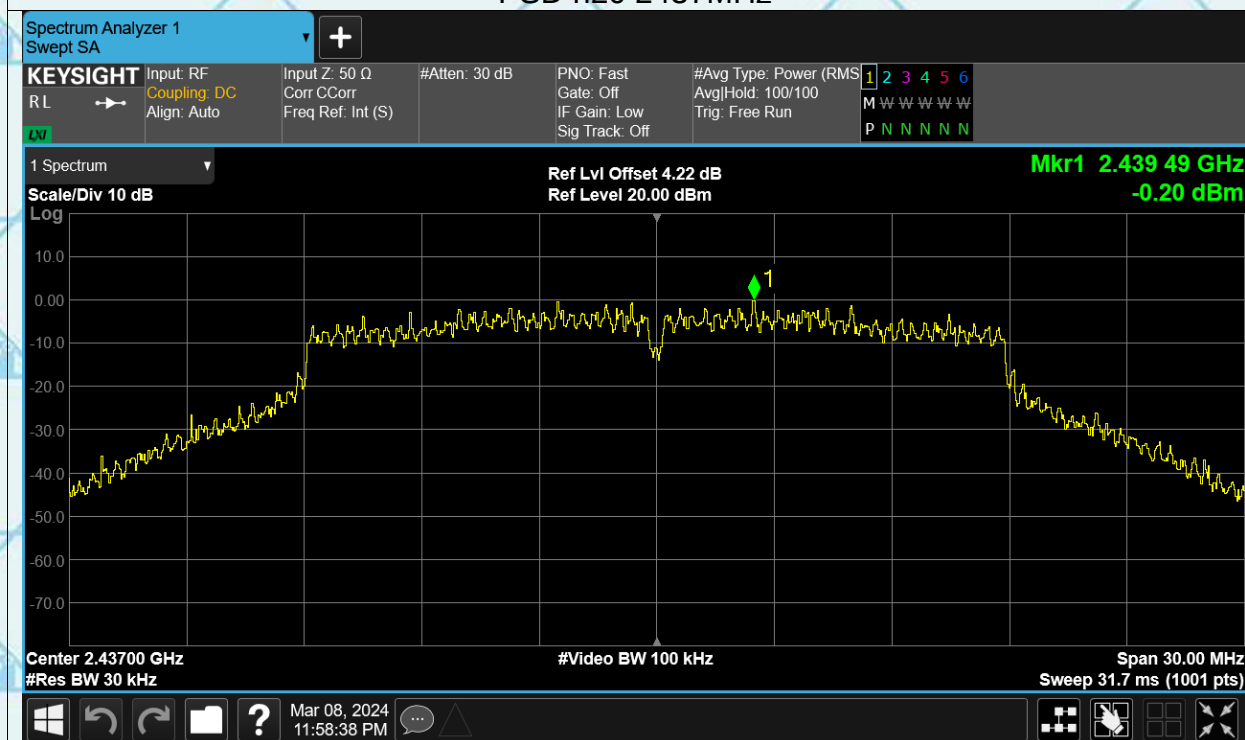




PSD n20 2412MHz

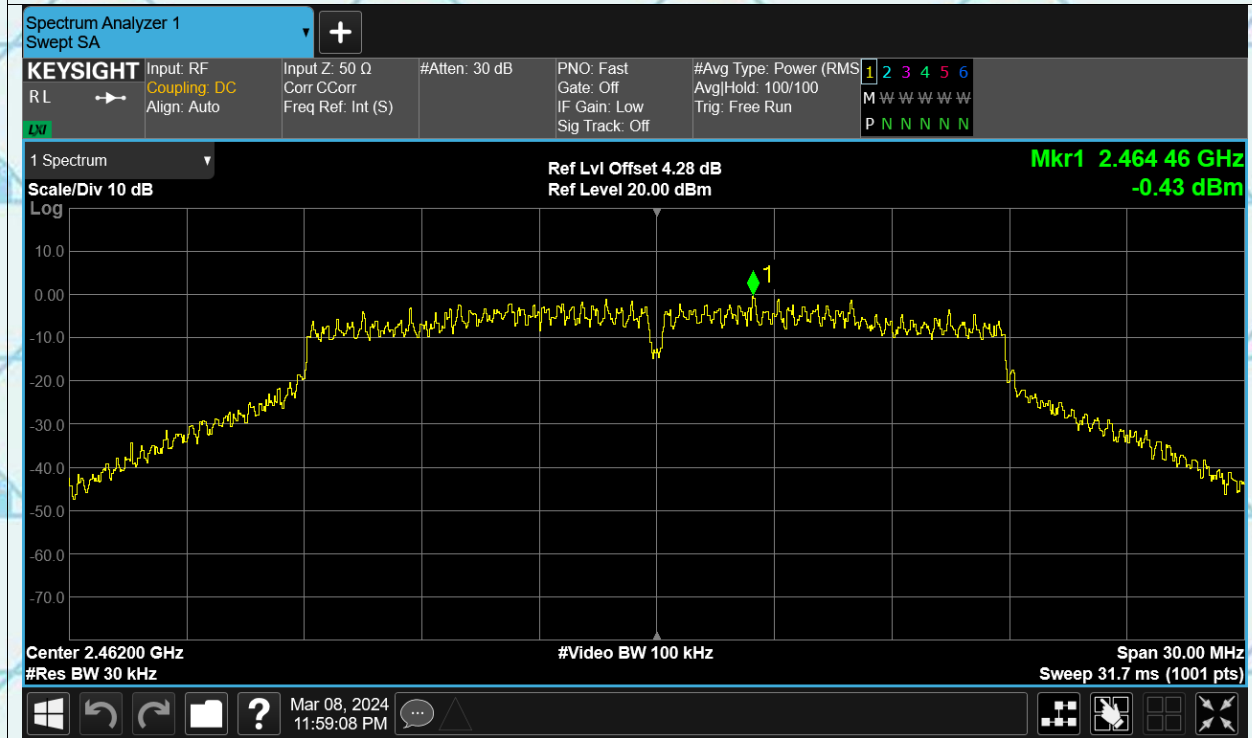


PSD n20 2437MHz

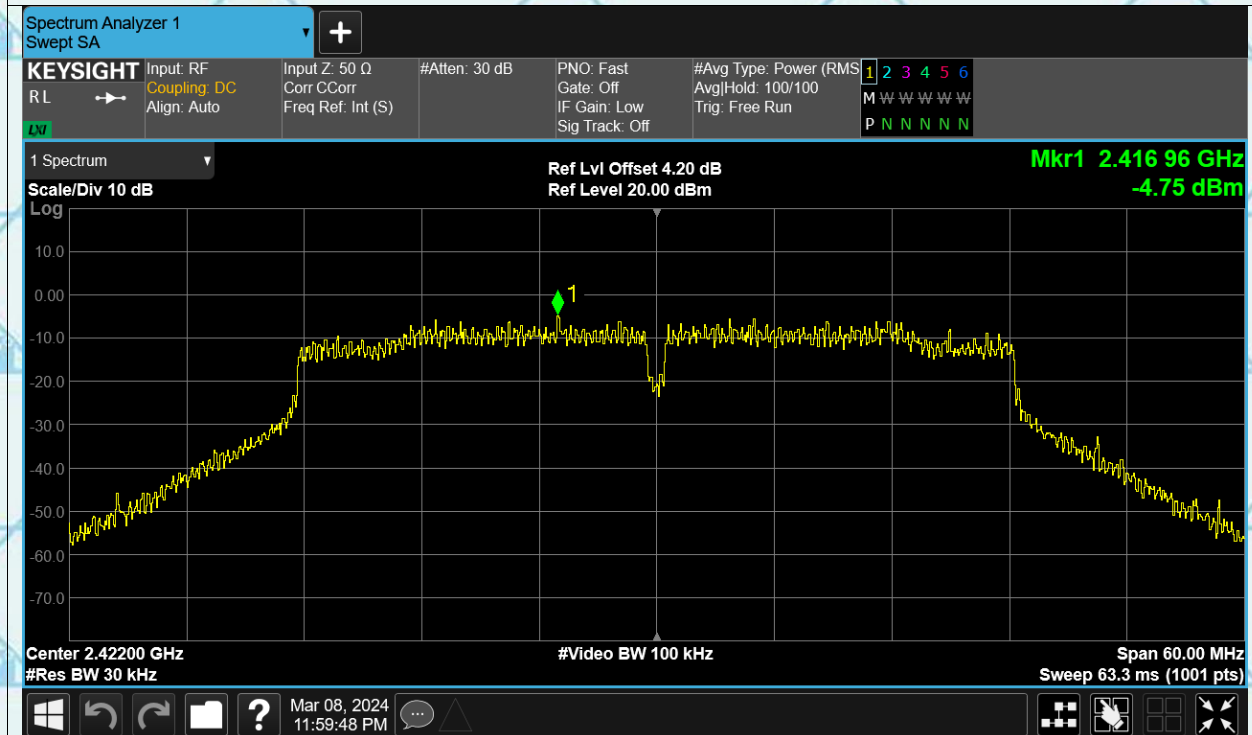




PSD n20 2462MHz

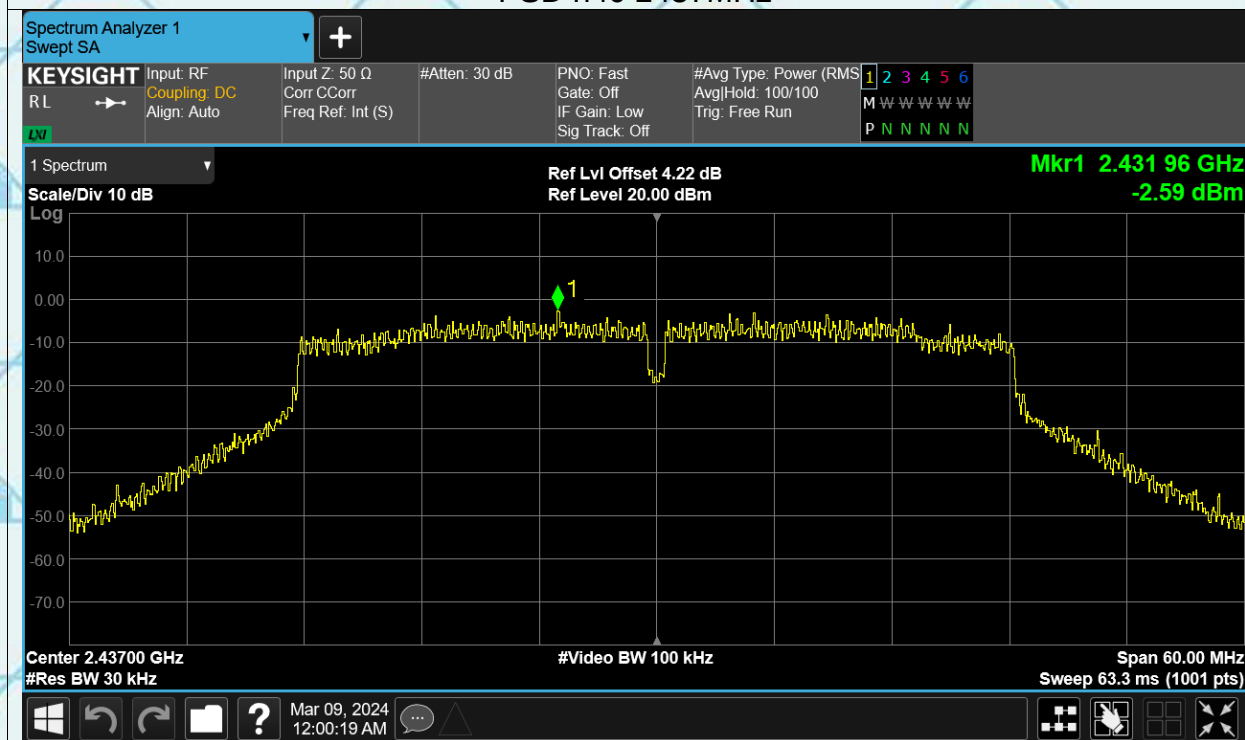


PSD n40 2422MHz

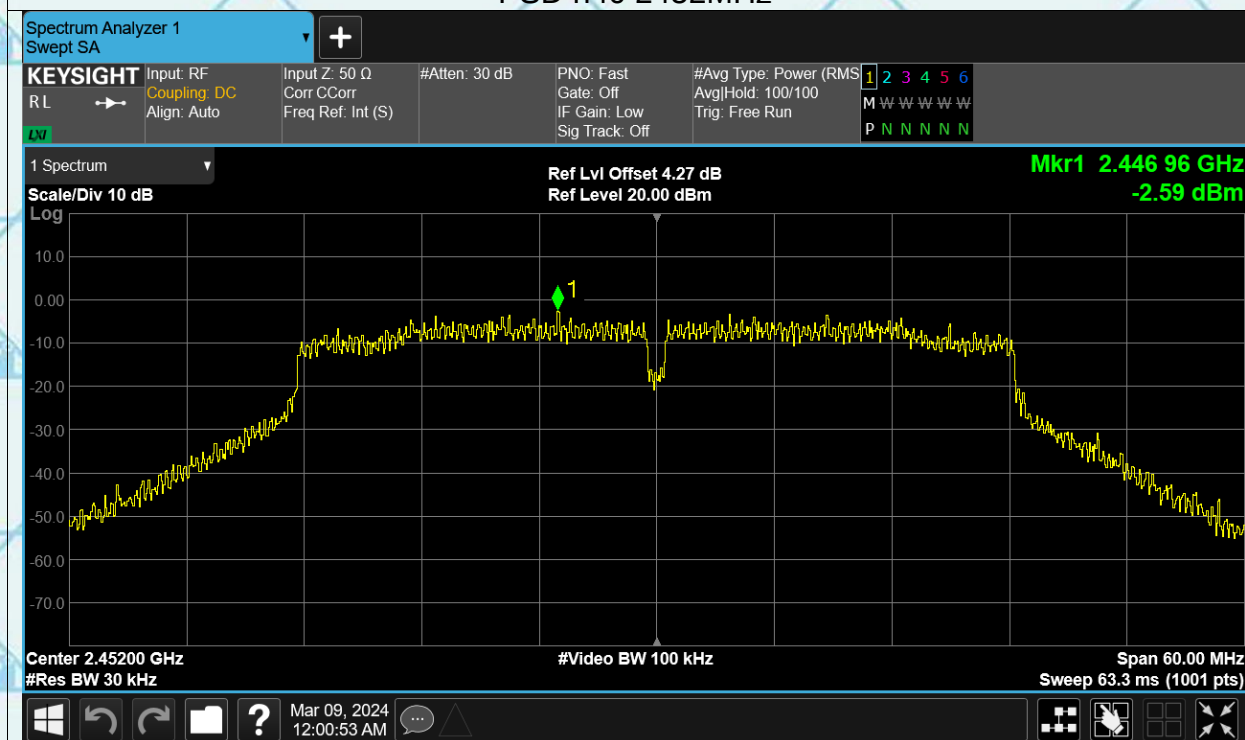




PSD n40 2437MHz

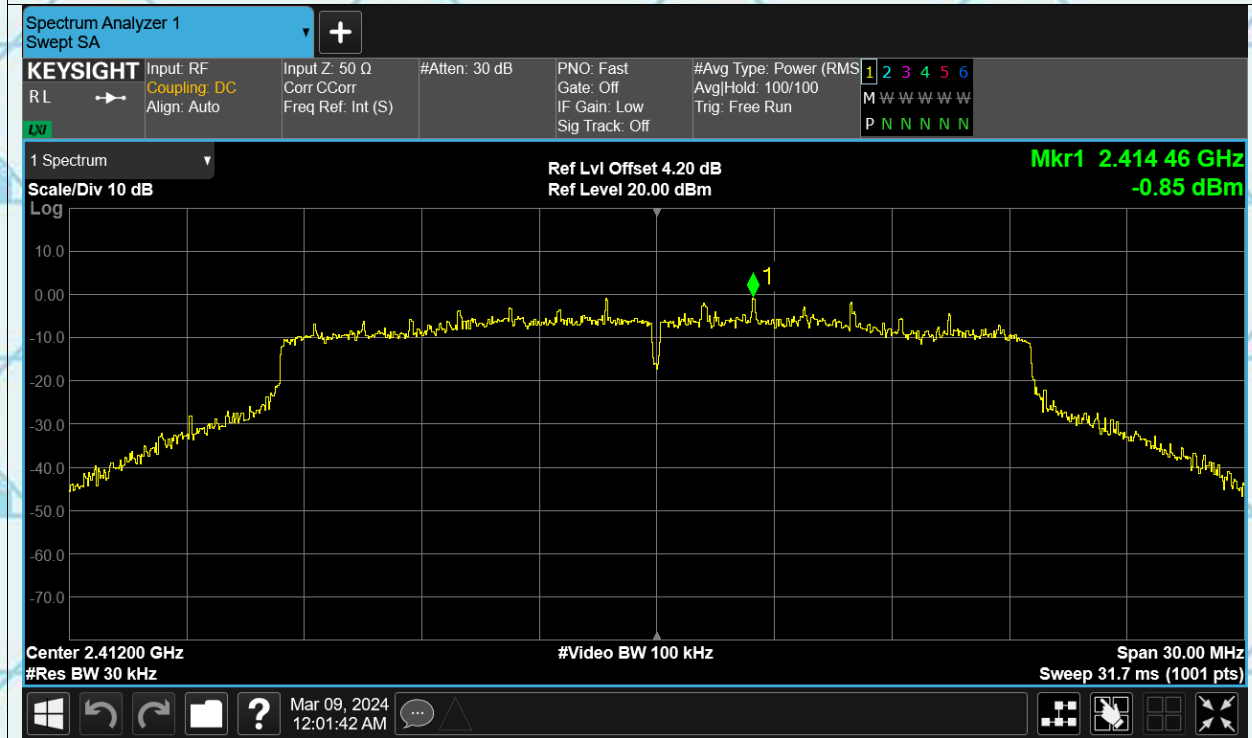


PSD n40 2452MHz

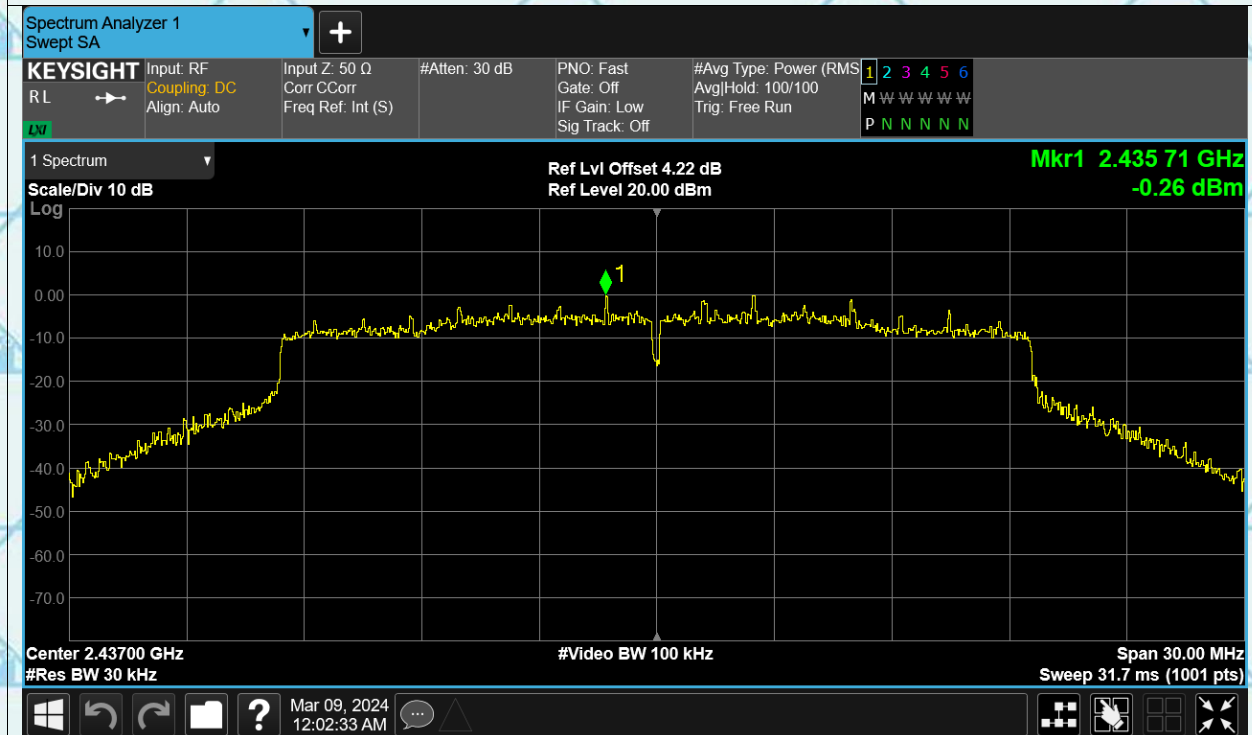




PSD ax20 2412MHz

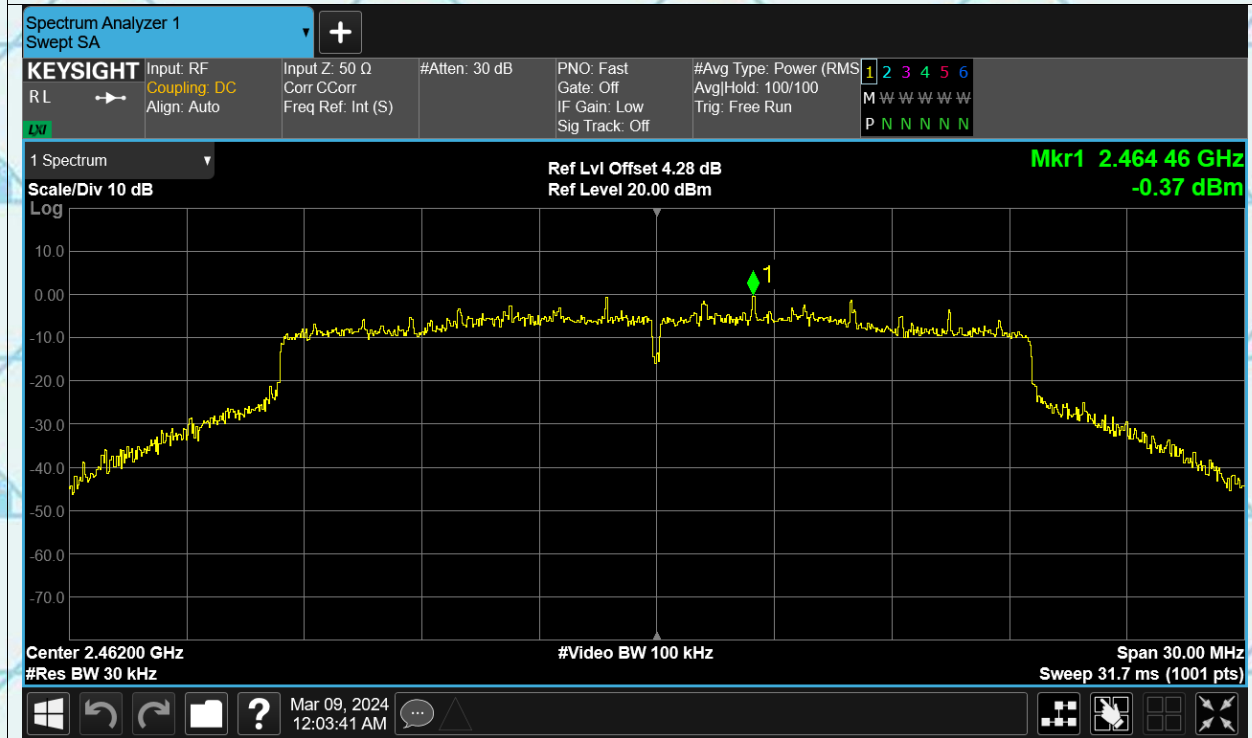


PSD ax20 2437MHz

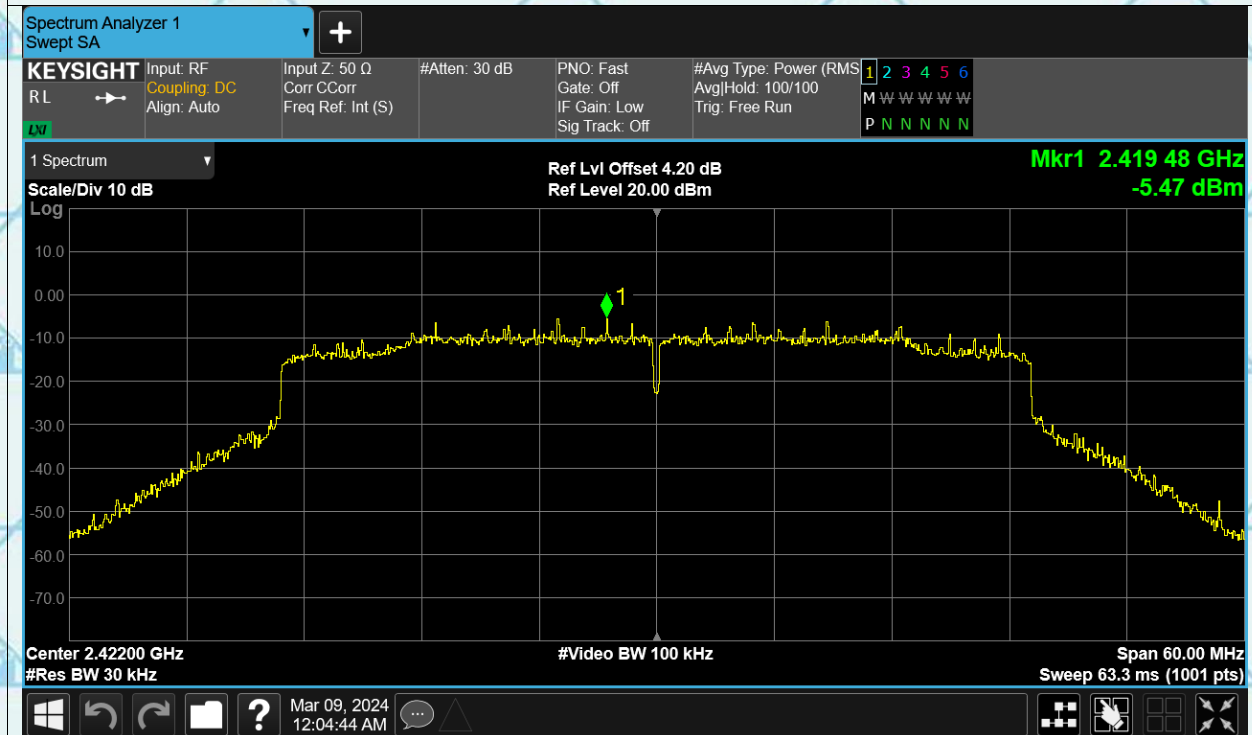




PSD ax20 2462MHz

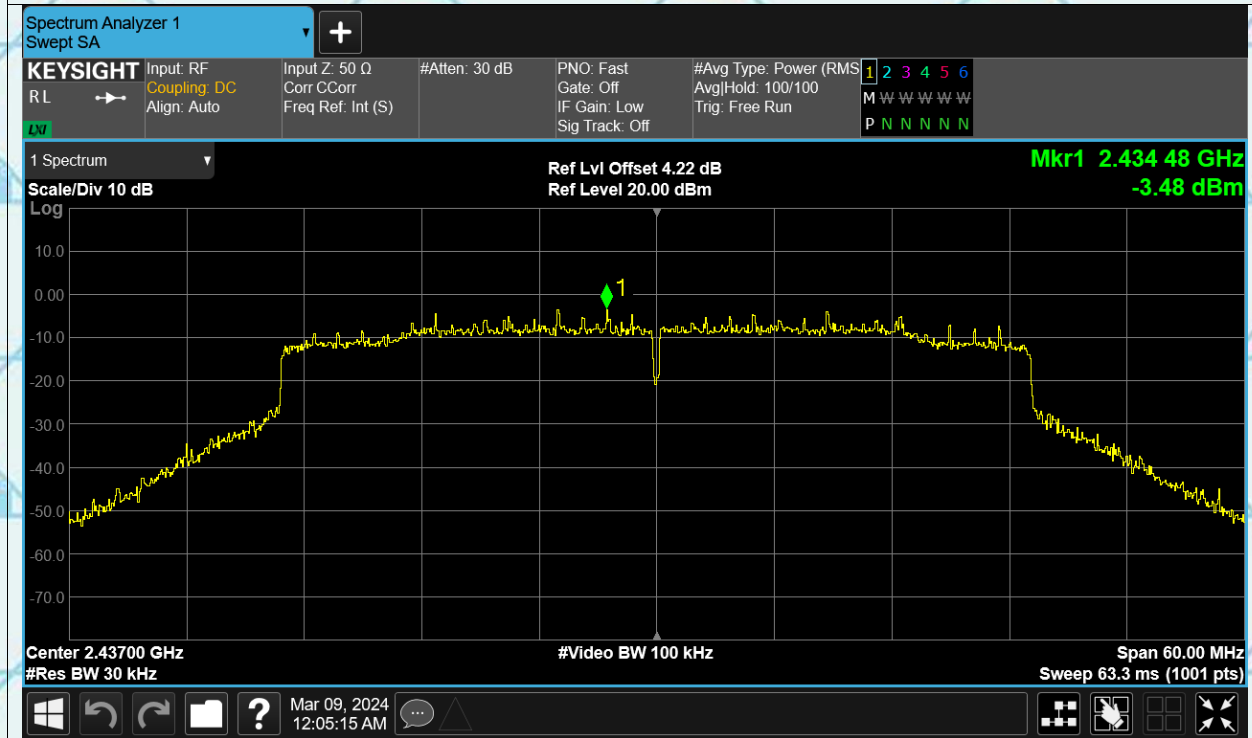


PSD ax40 2422MHz

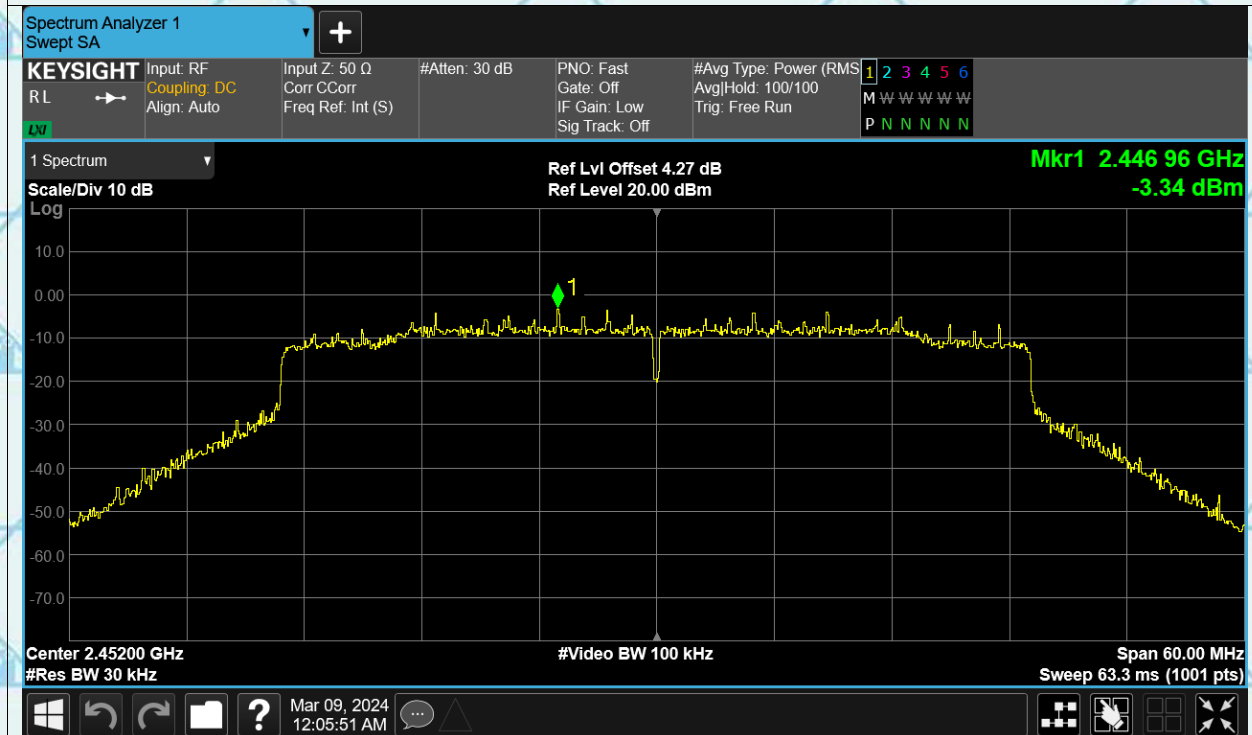




PSD ax40 2437MHz



PSD ax40 2452MHz





6.5. Conducted Band Edge and Spurious Emission Measurement

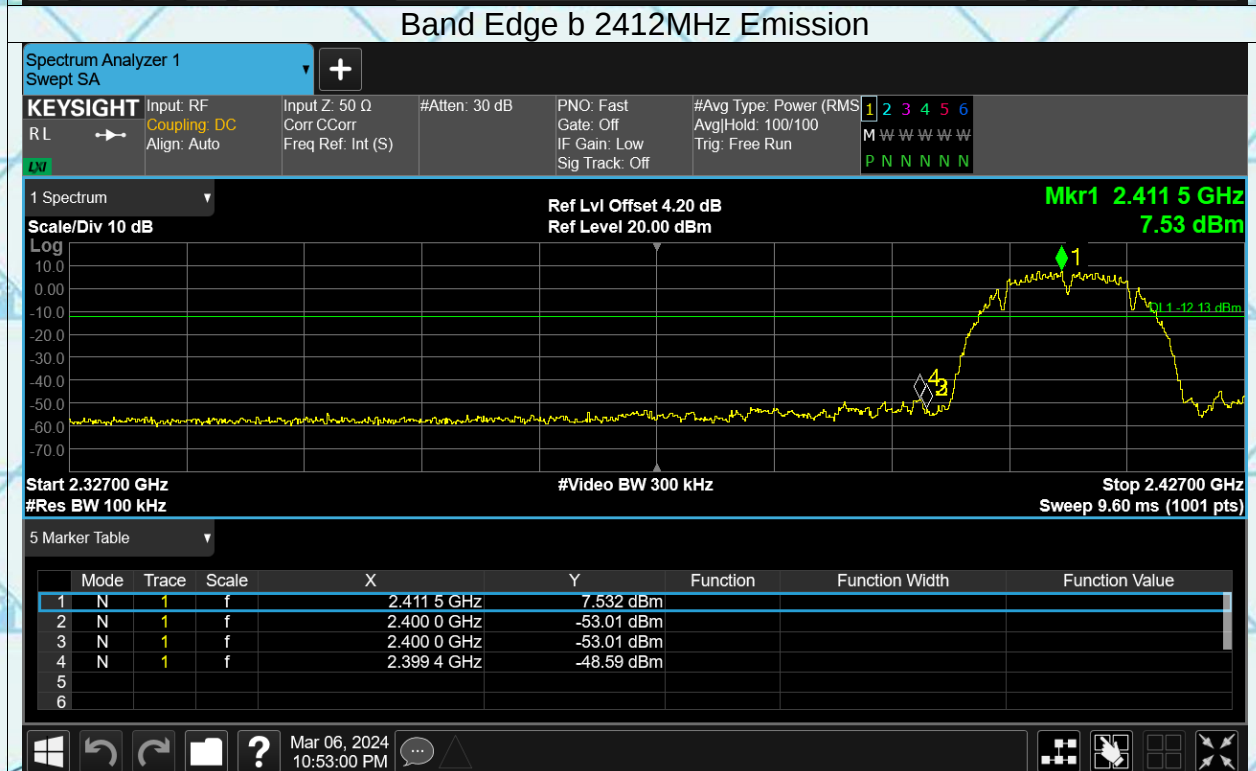
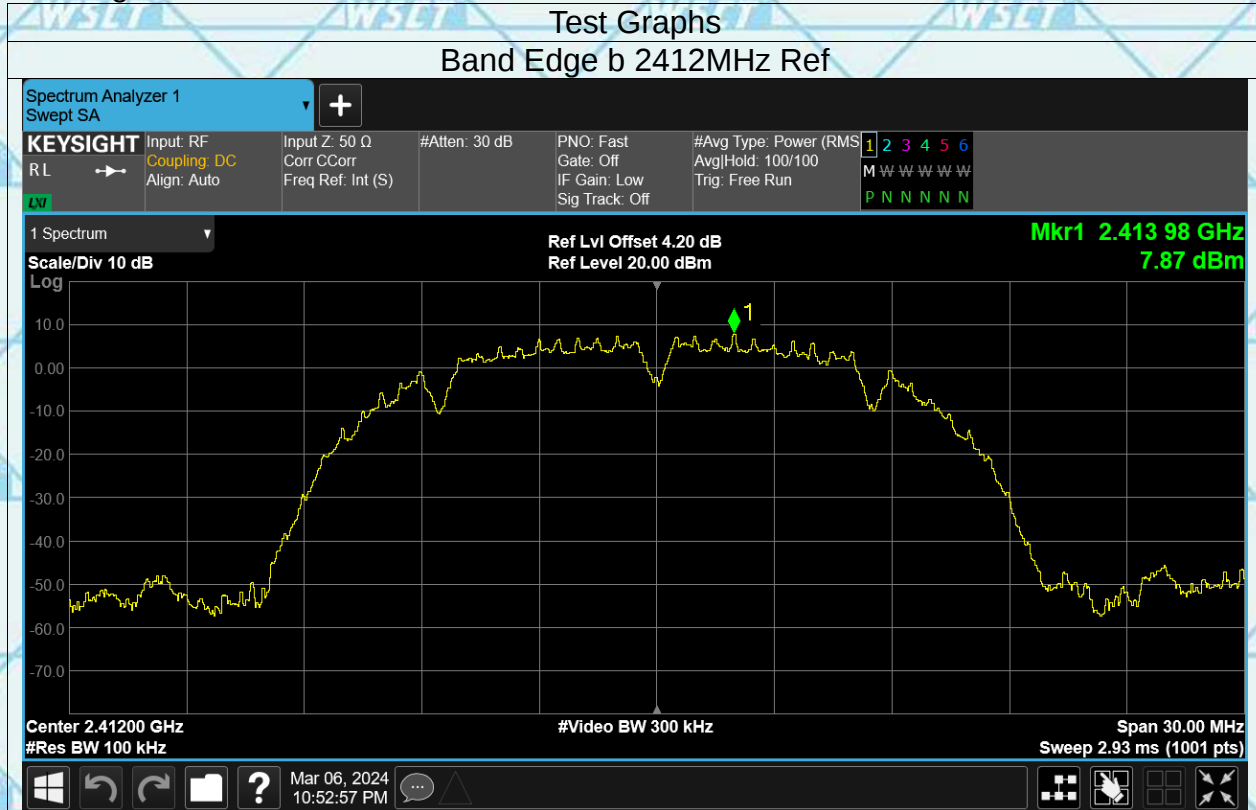
6.5.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074
Limit:	In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).
Test Setup:	 Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04. 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 3. Set to the maximum power setting and enable the EUT transmit continuously. 4. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d). 5. Measure and record the results in the test report. 6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
Test Result:	PASS



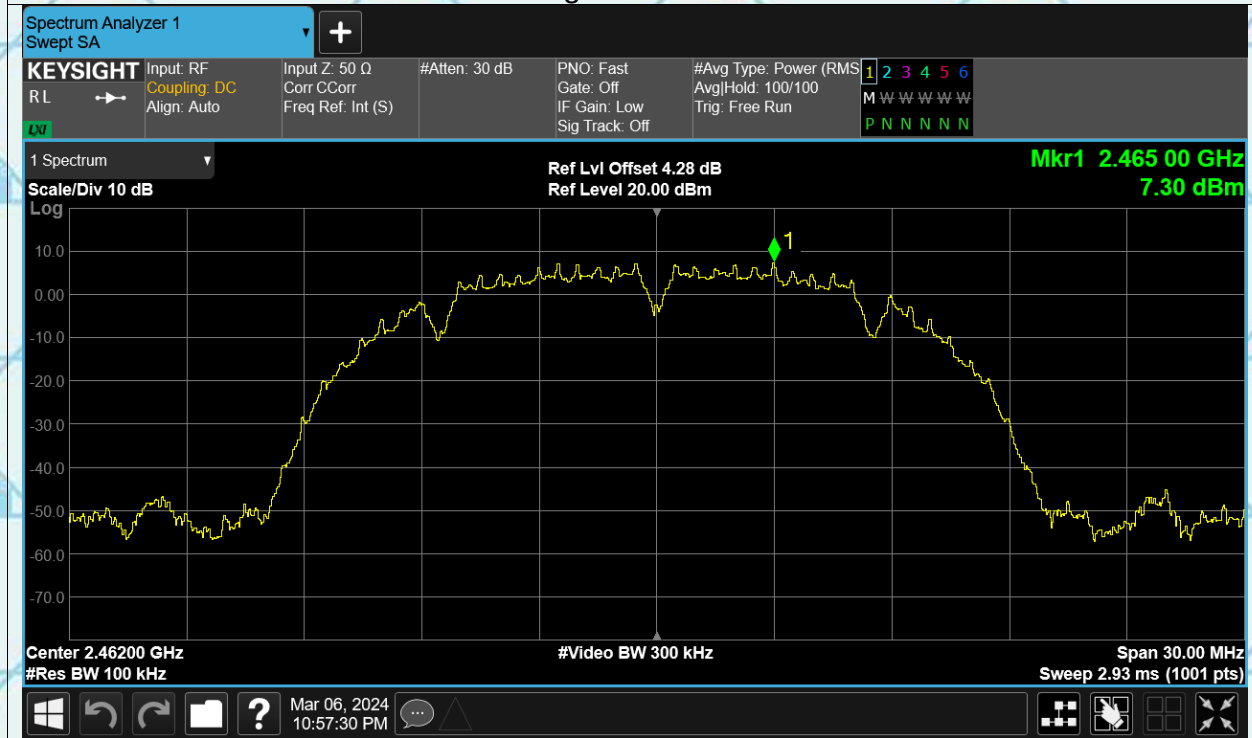
6.5.2. Test Data

Band Edge

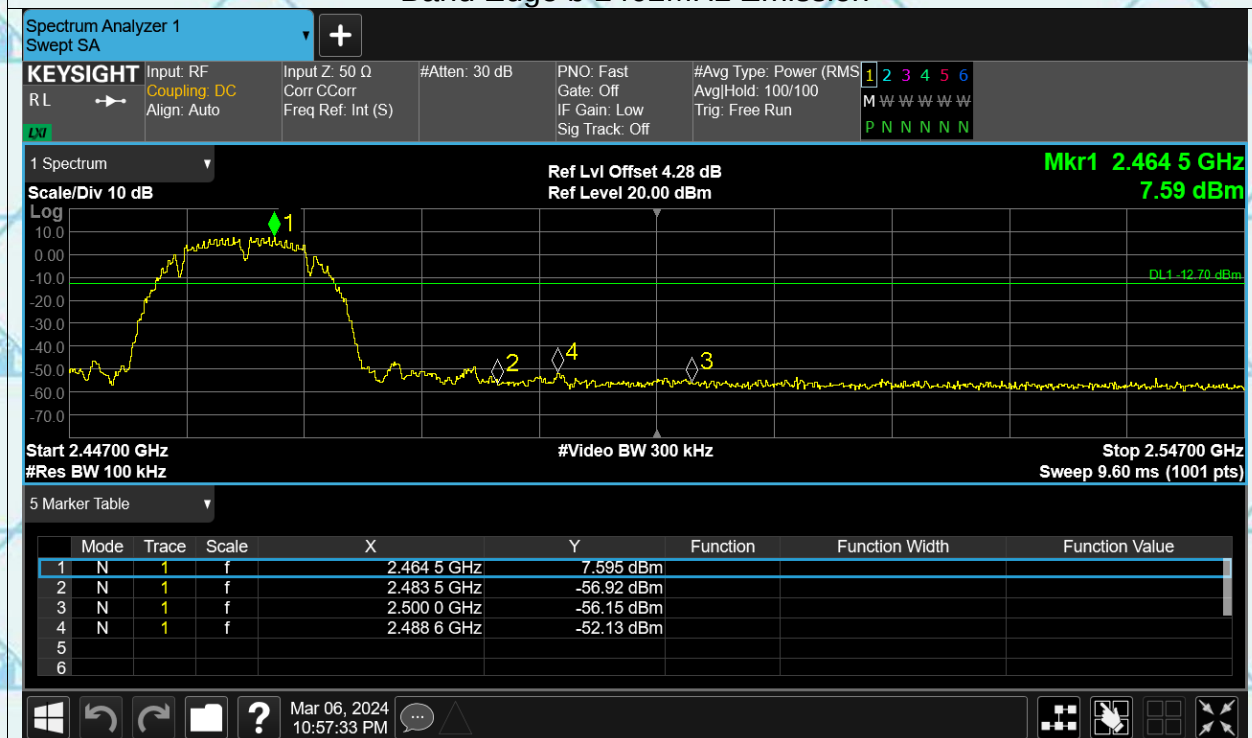




Band Edge b 2462MHz Ref

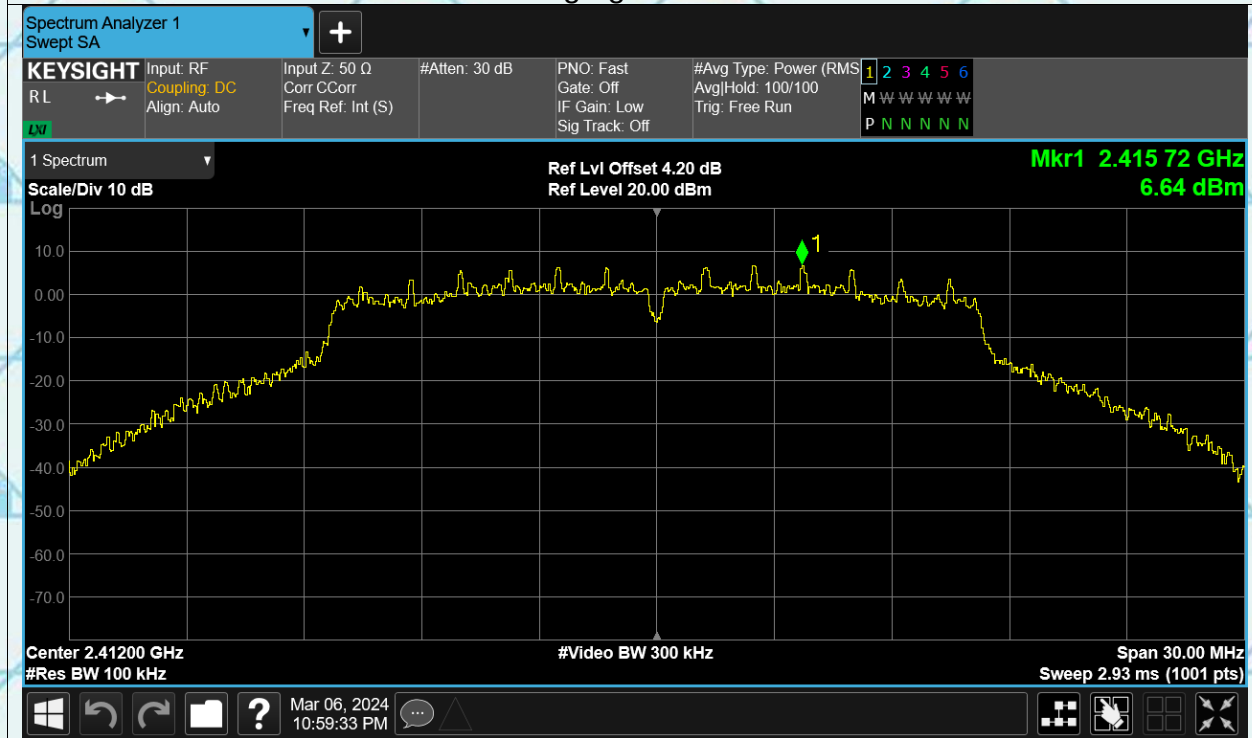


Band Edge b 2462MHz Emission

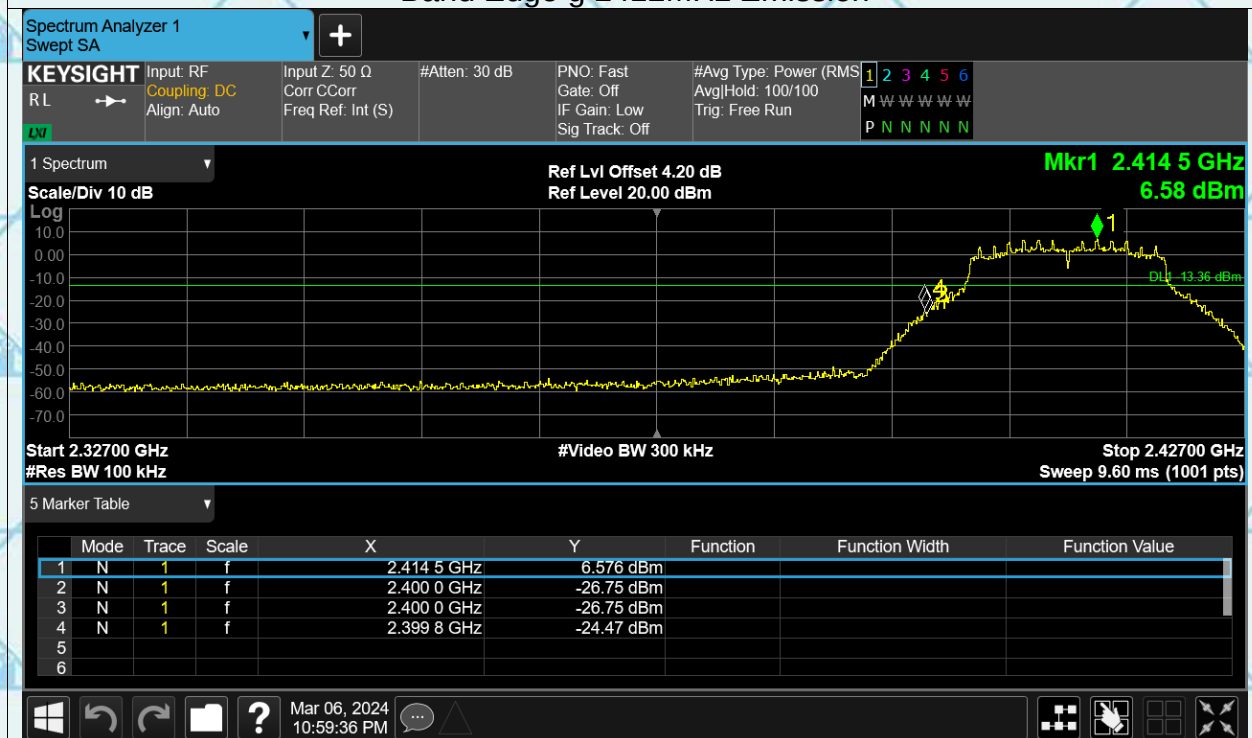




Band Edge g 2412MHz Ref

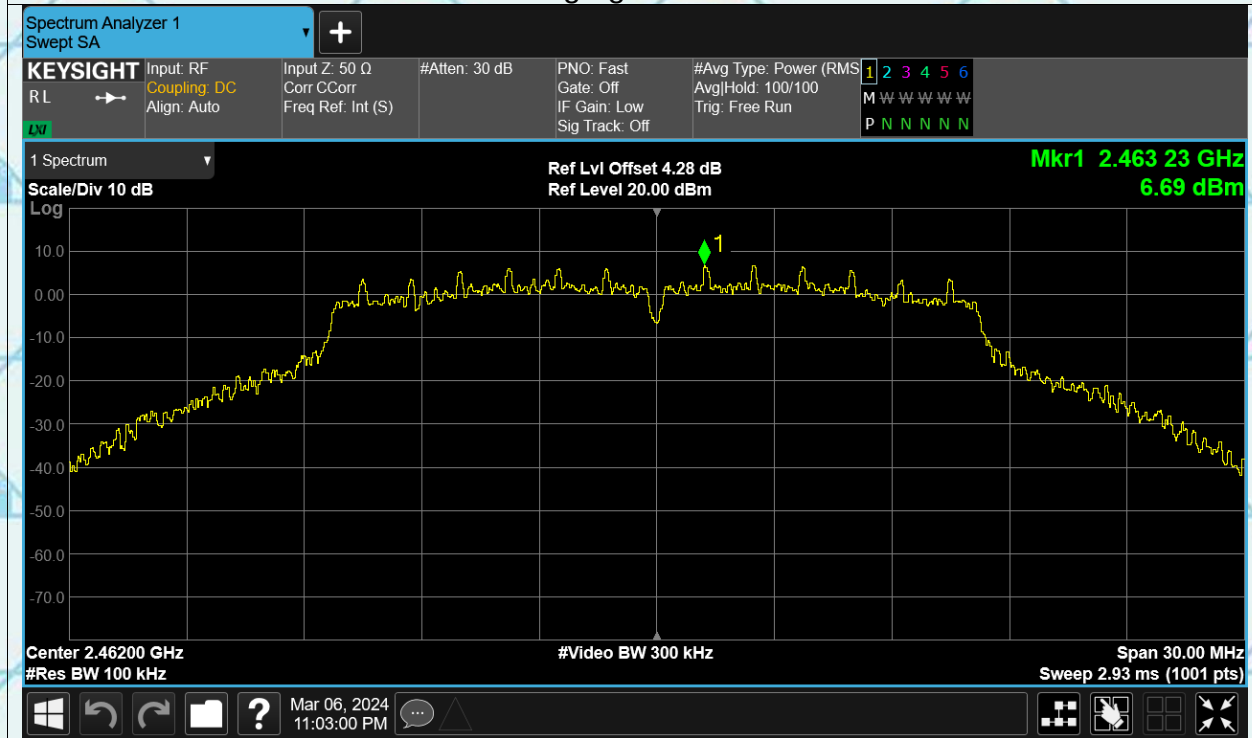


Band Edge g 2412MHz Emission

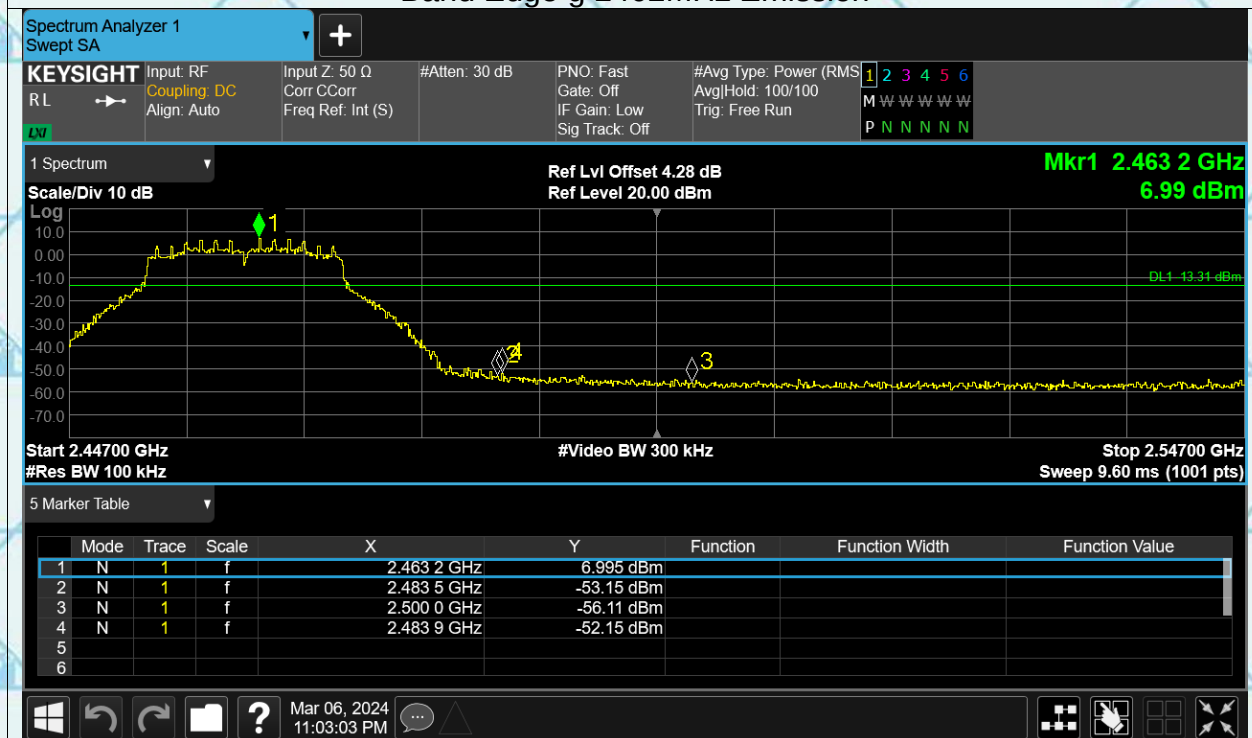




Band Edge g 2462MHz Ref

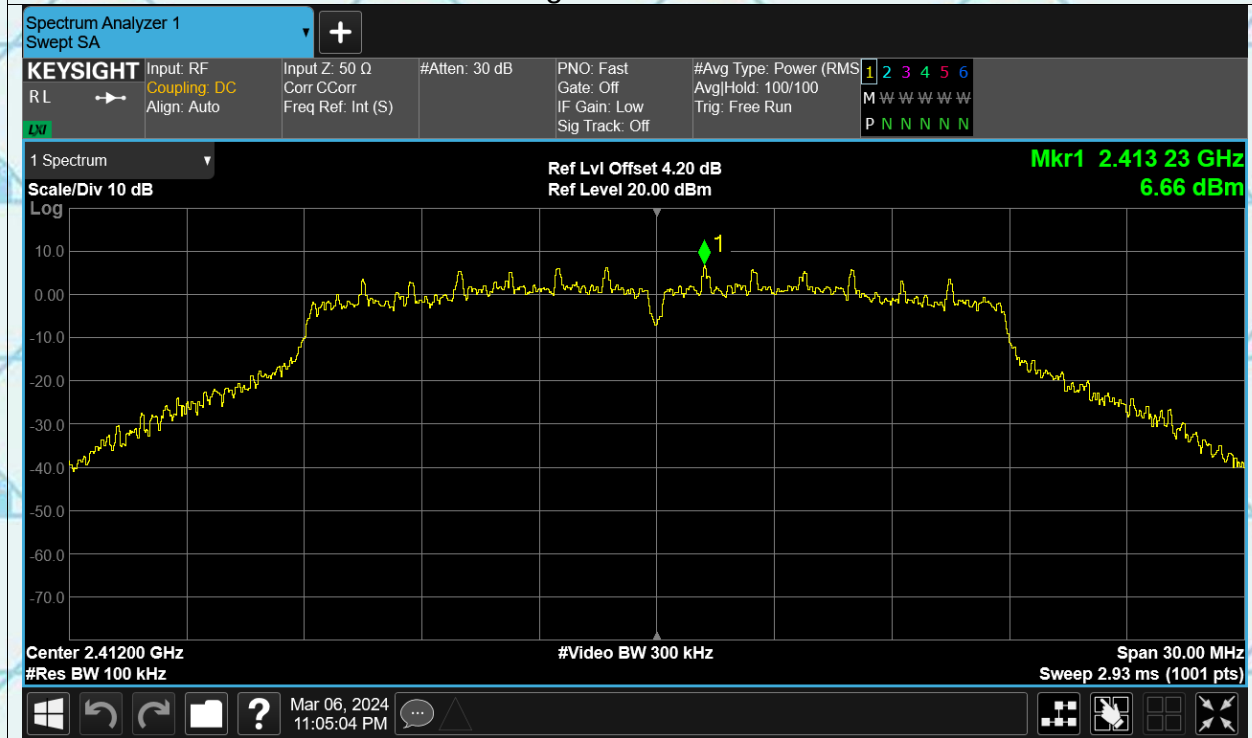


Band Edge g 2462MHz Emission

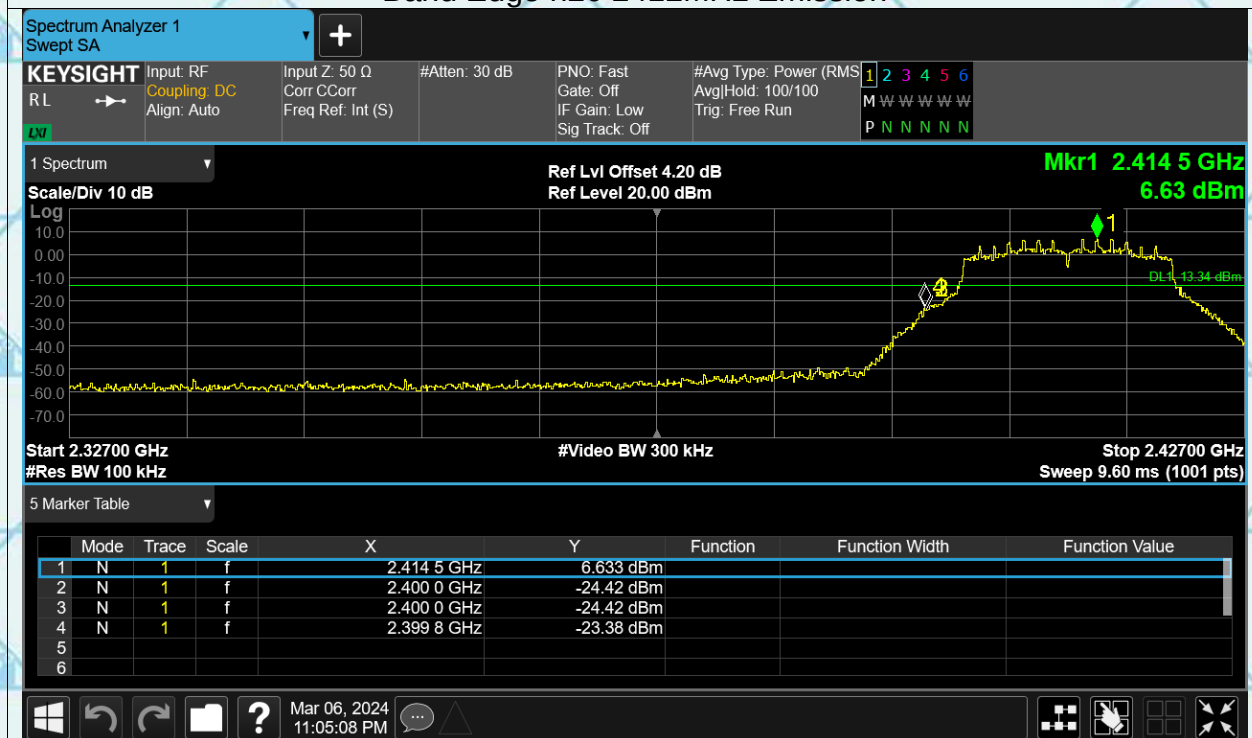




Band Edge n20 2412MHz Ref

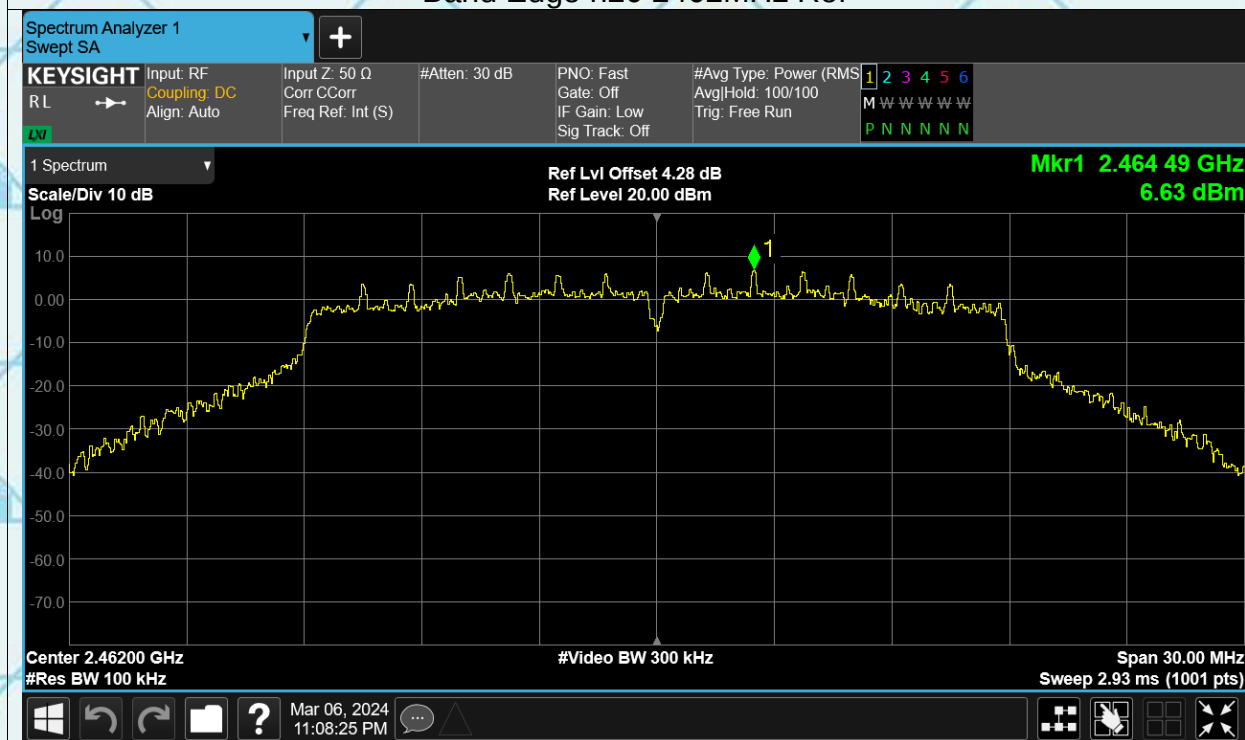


Band Edge n20 2412MHz Emission

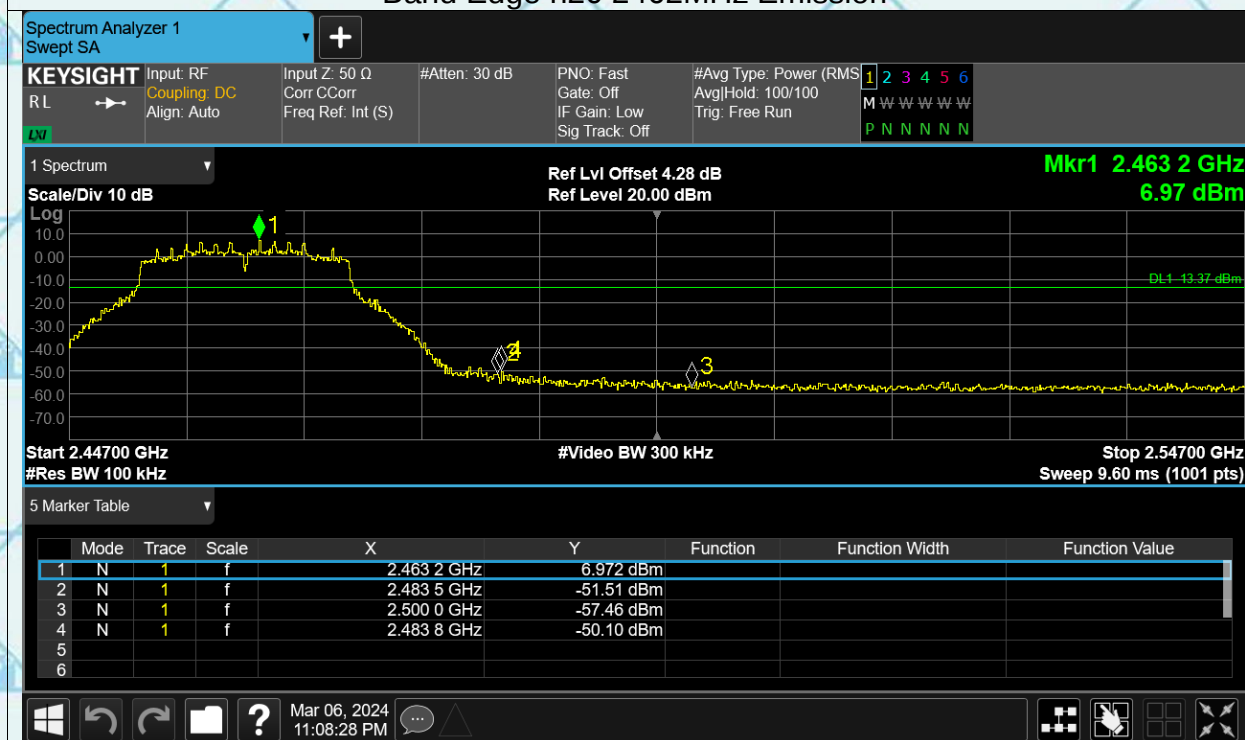




Band Edge n20 2462MHz Ref

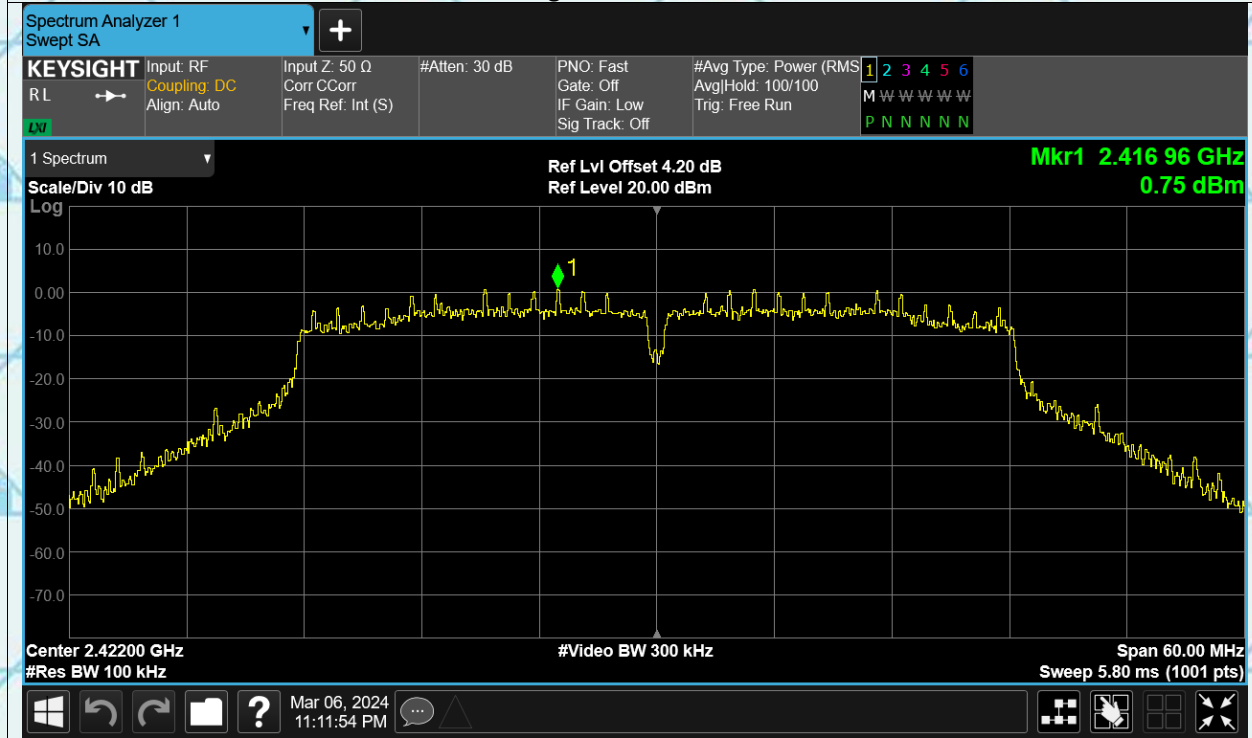


Band Edge n20 2462MHz Emission

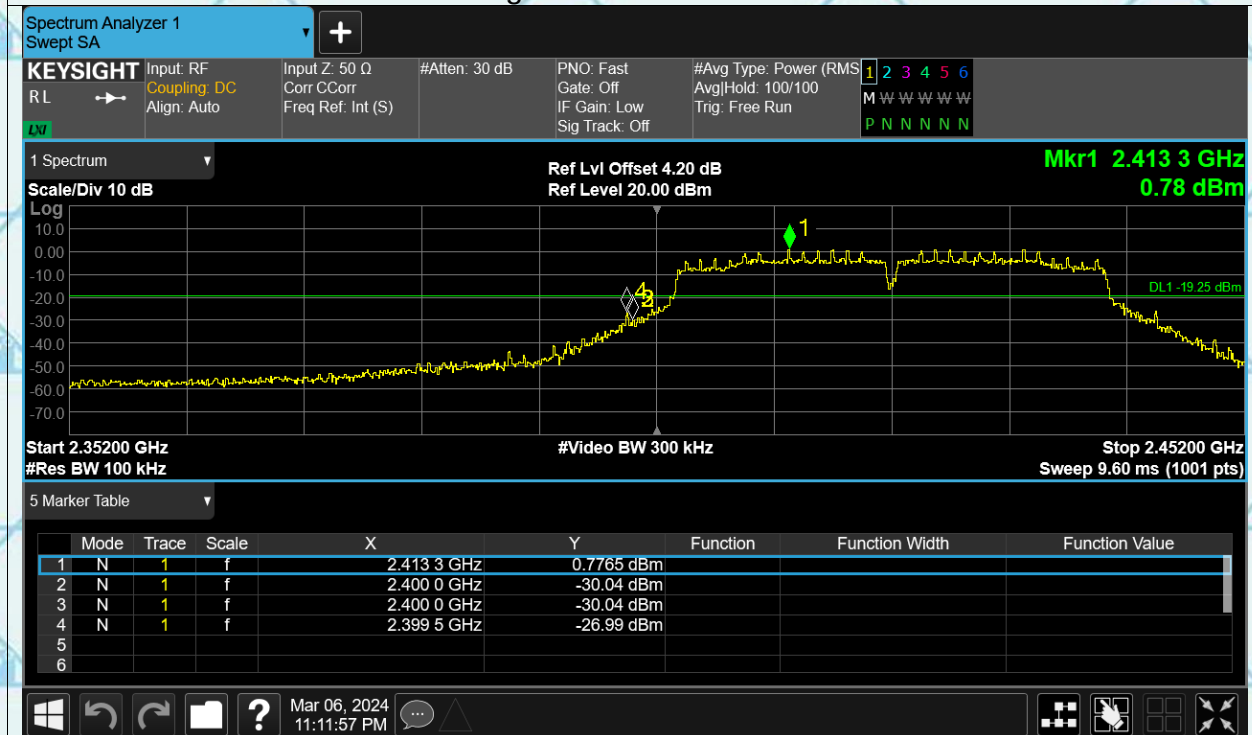




Band Edge n40 2422MHz Ref

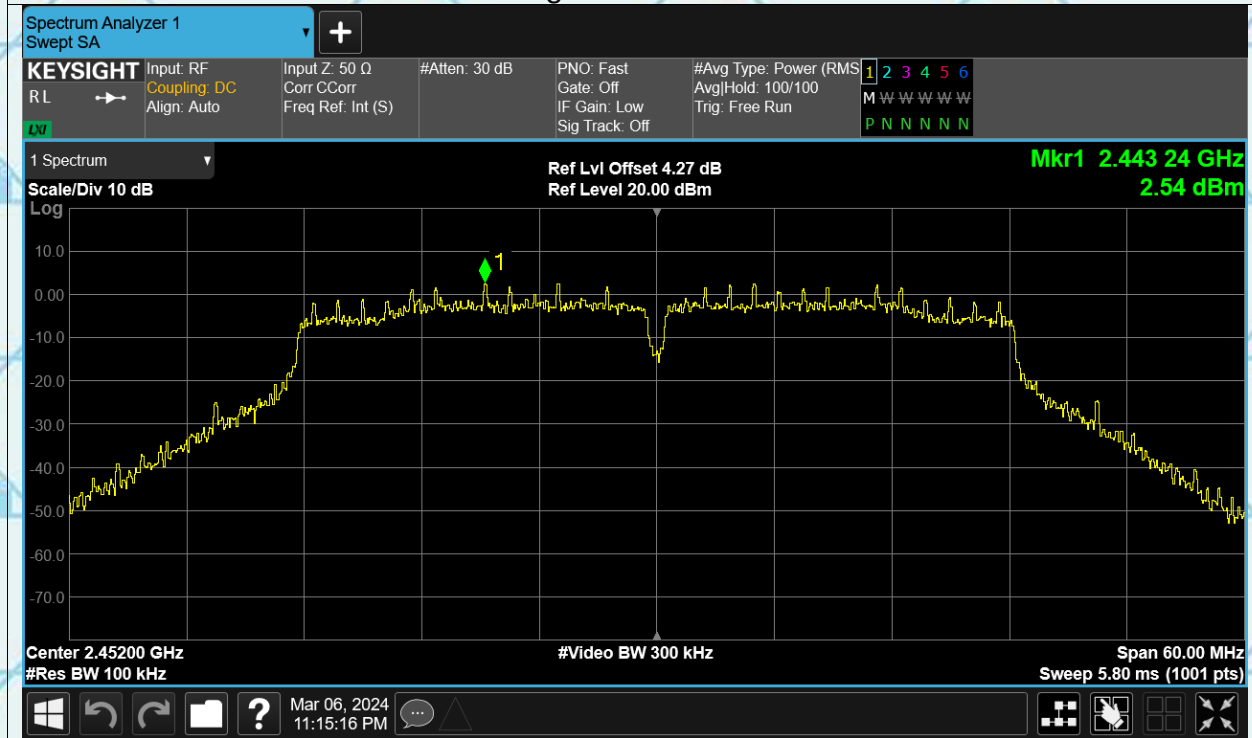


Band Edge n40 2422MHz Emission

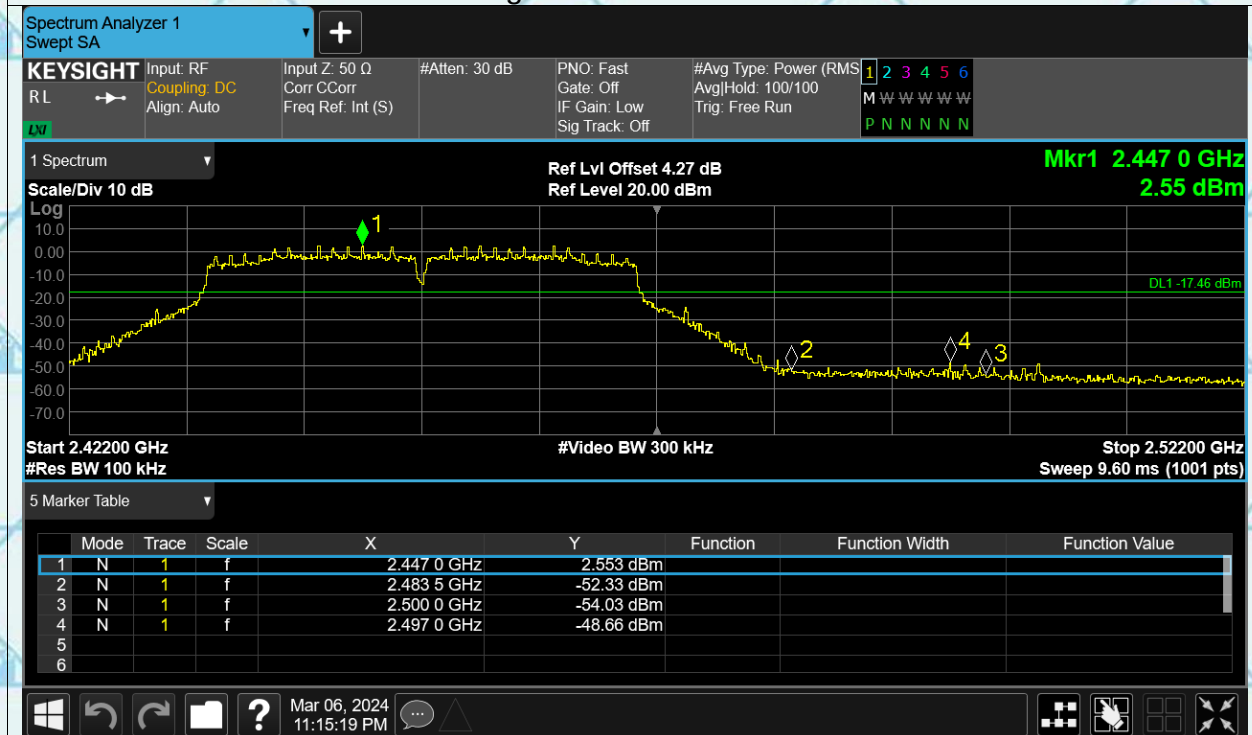




Band Edge n40 2452MHz Ref

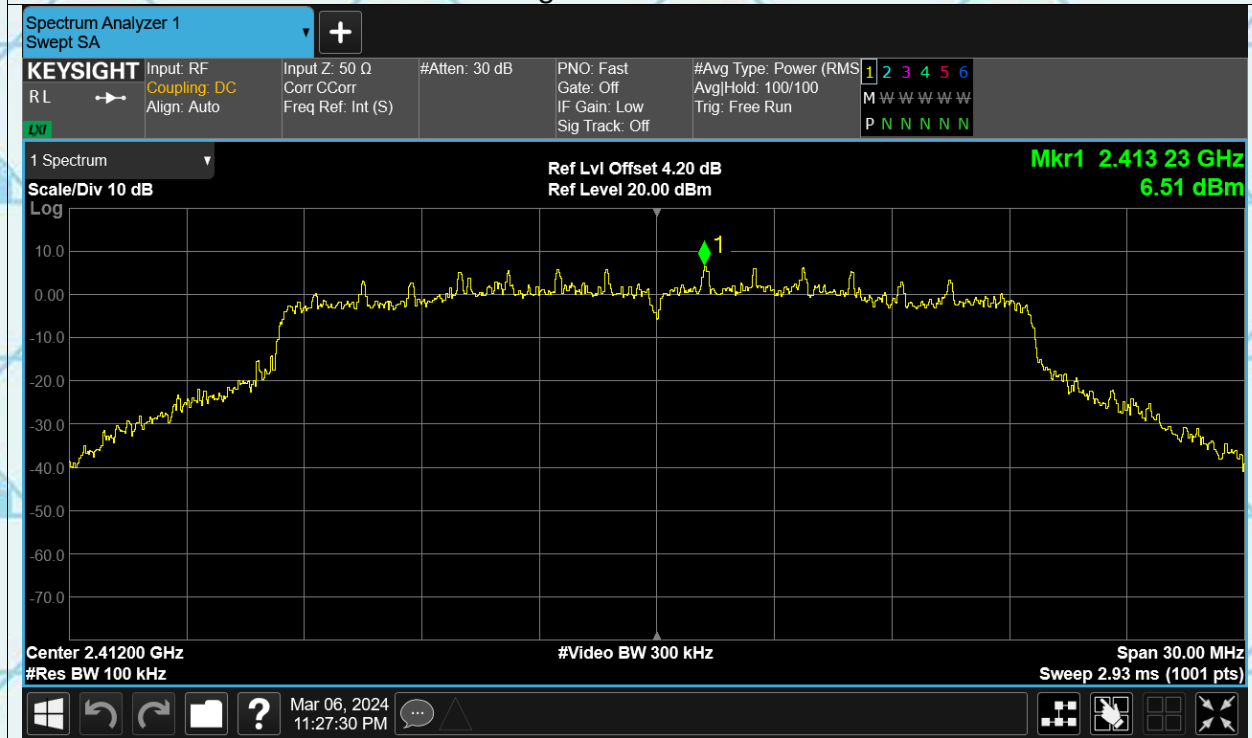


Band Edge n40 2452MHz Emission

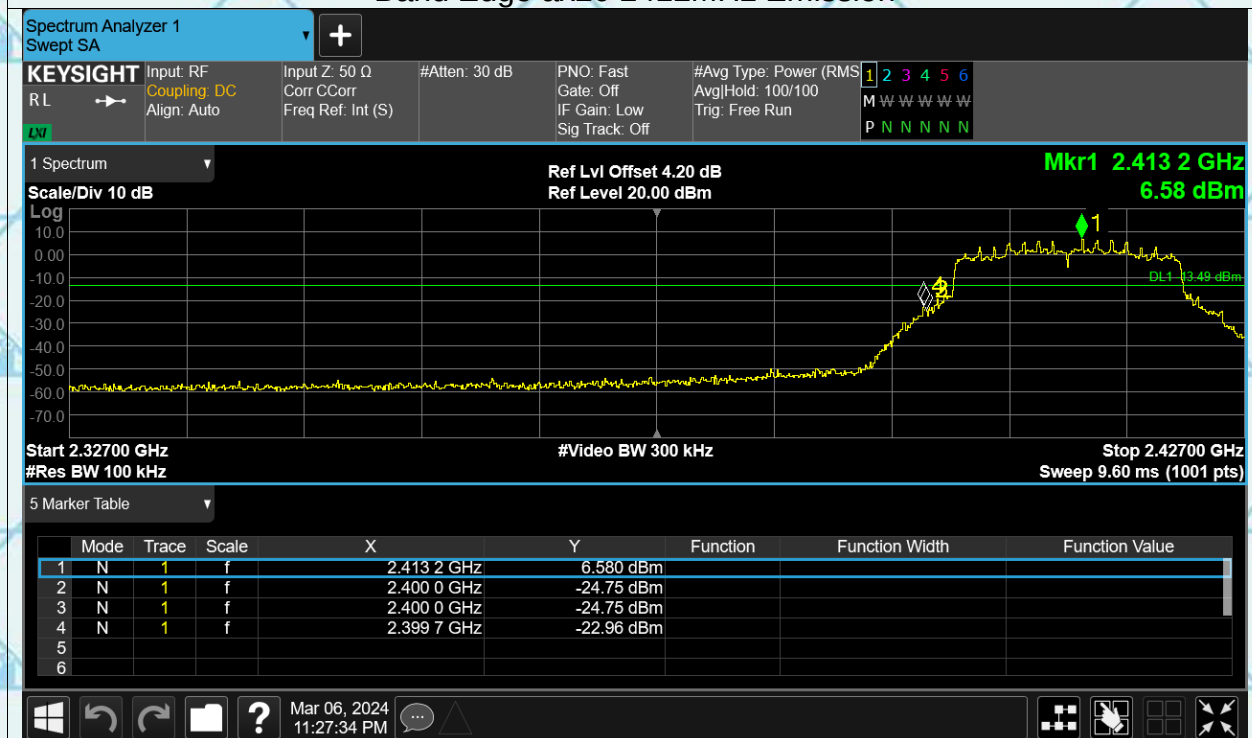




Band Edge ax20 2412MHz Ref

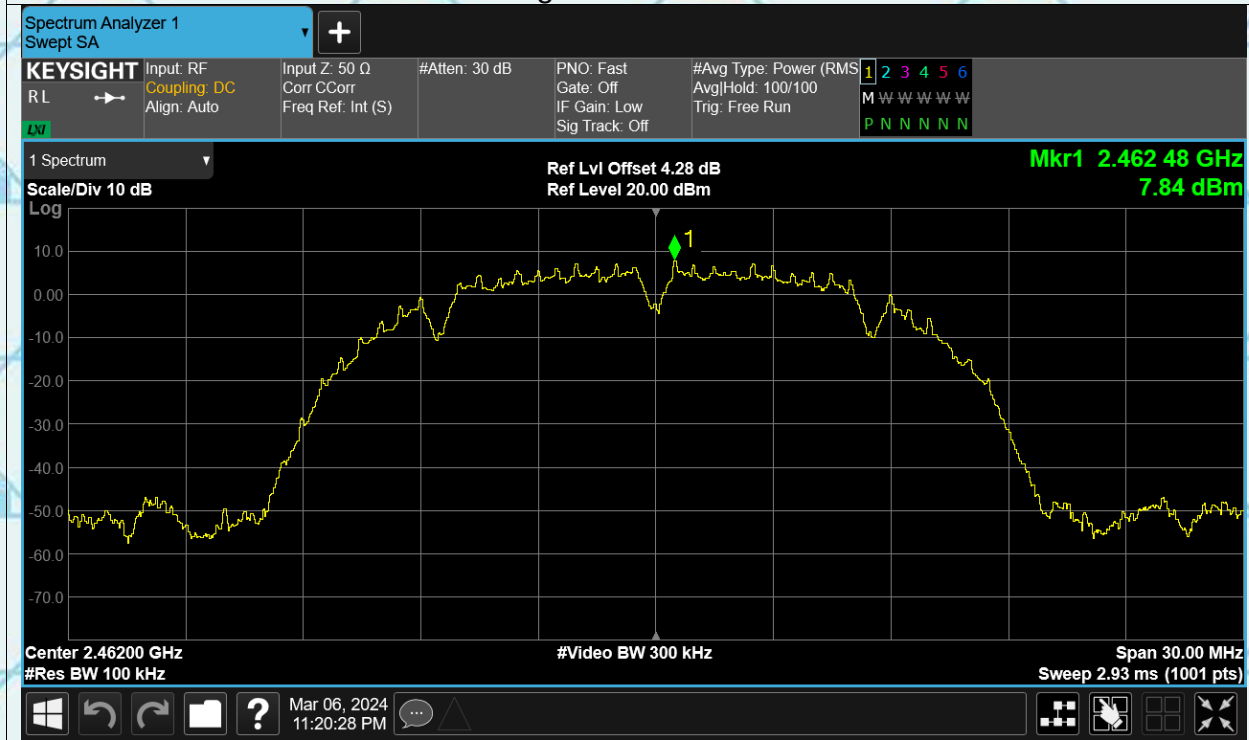


Band Edge ax20 2412MHz Emission

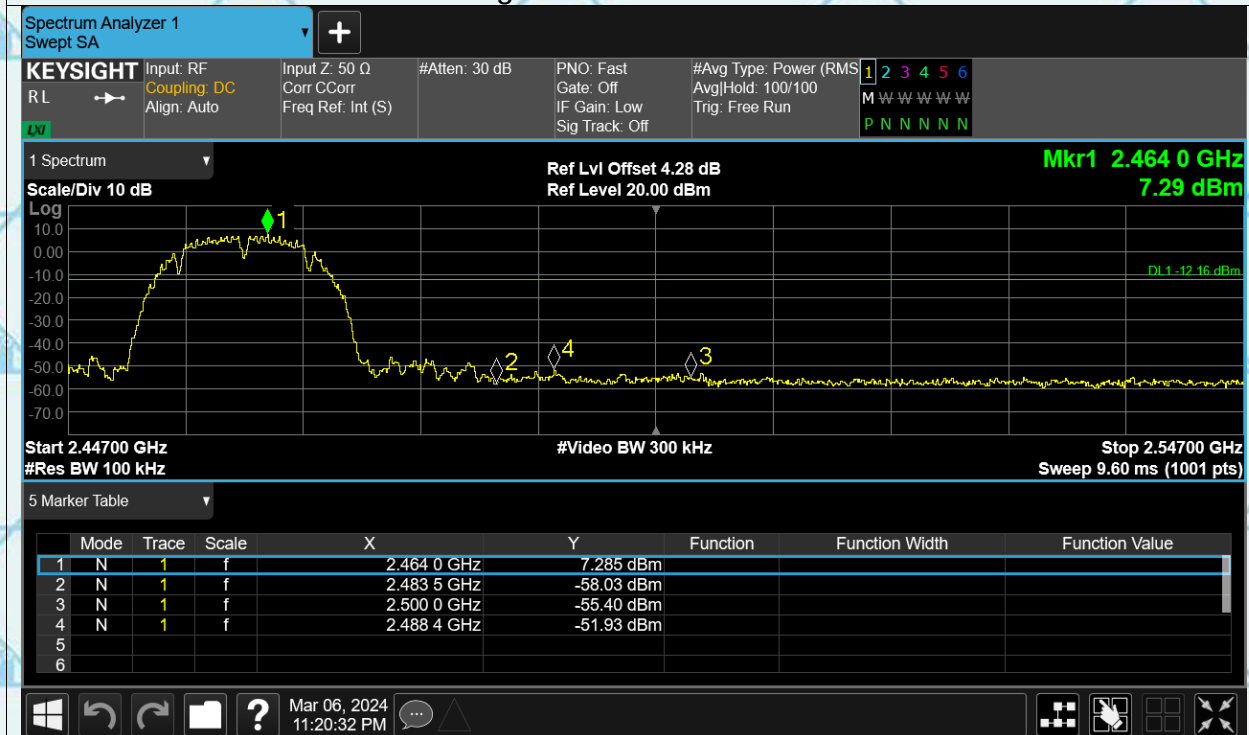




Band Edge ax20 2462MHz Ref

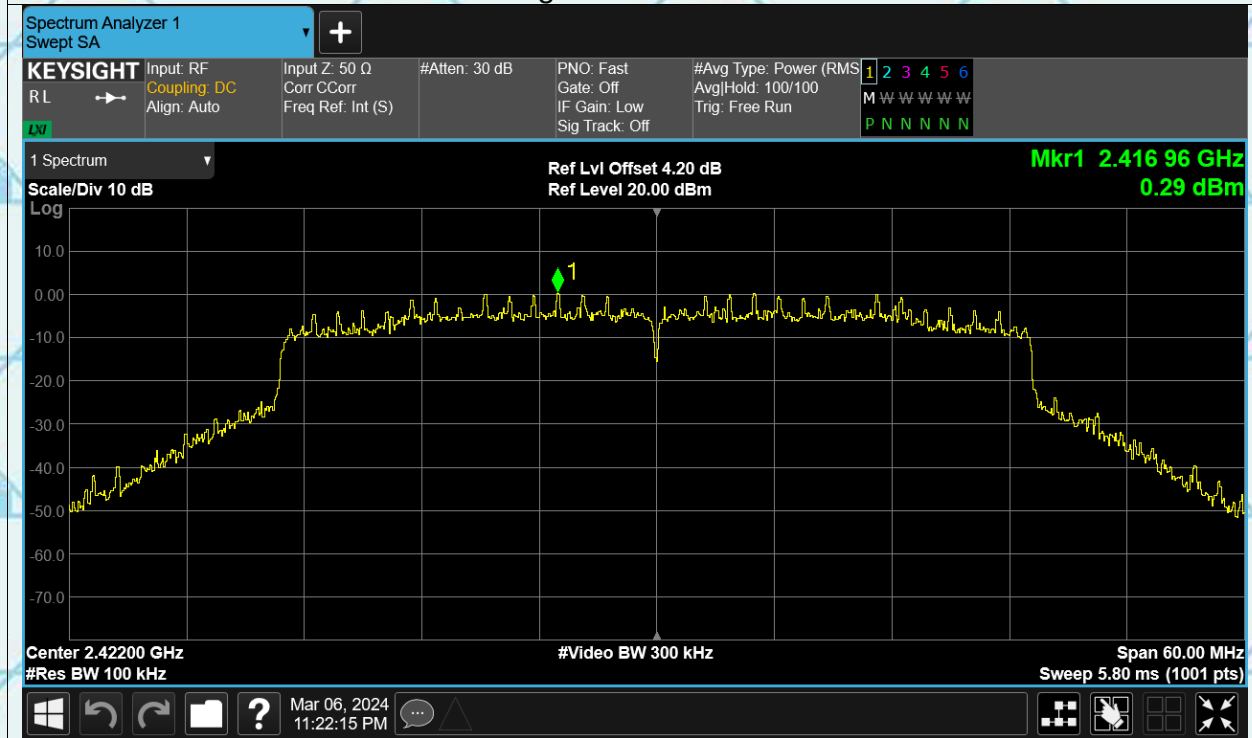


Band Edge ax20 2462MHz Emission

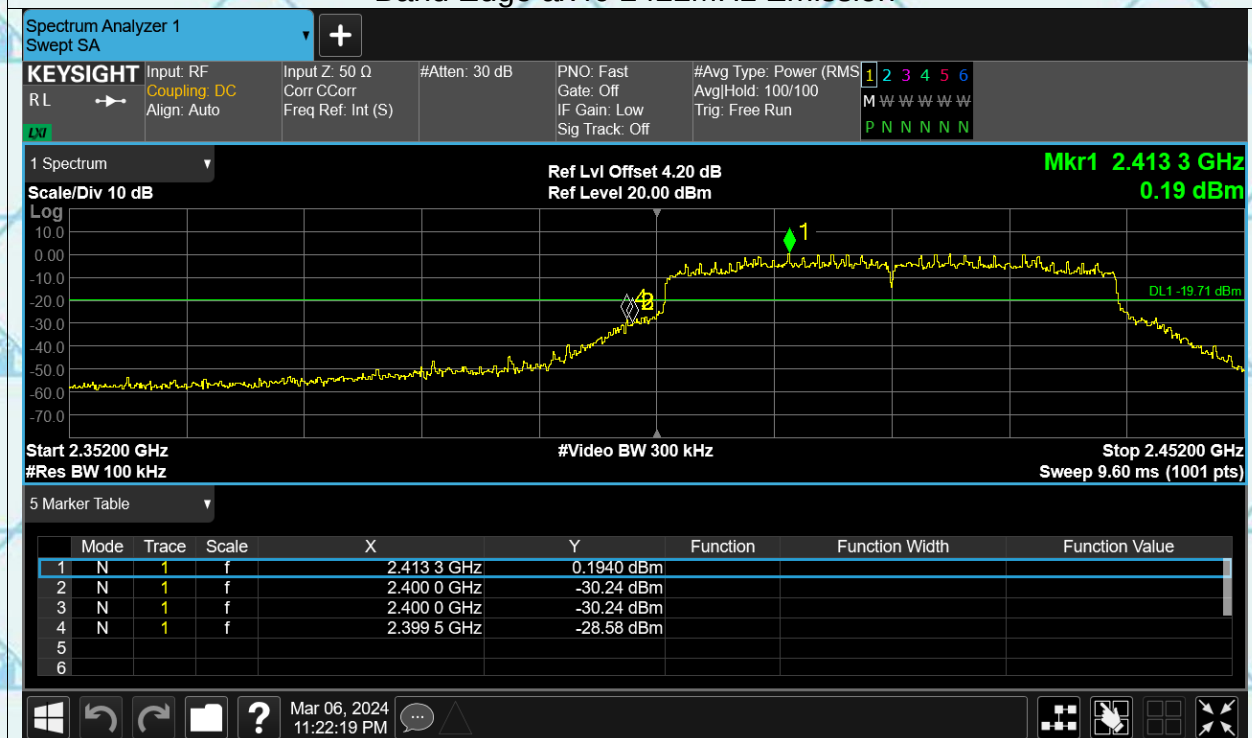




Band Edge ax40 2422MHz Ref

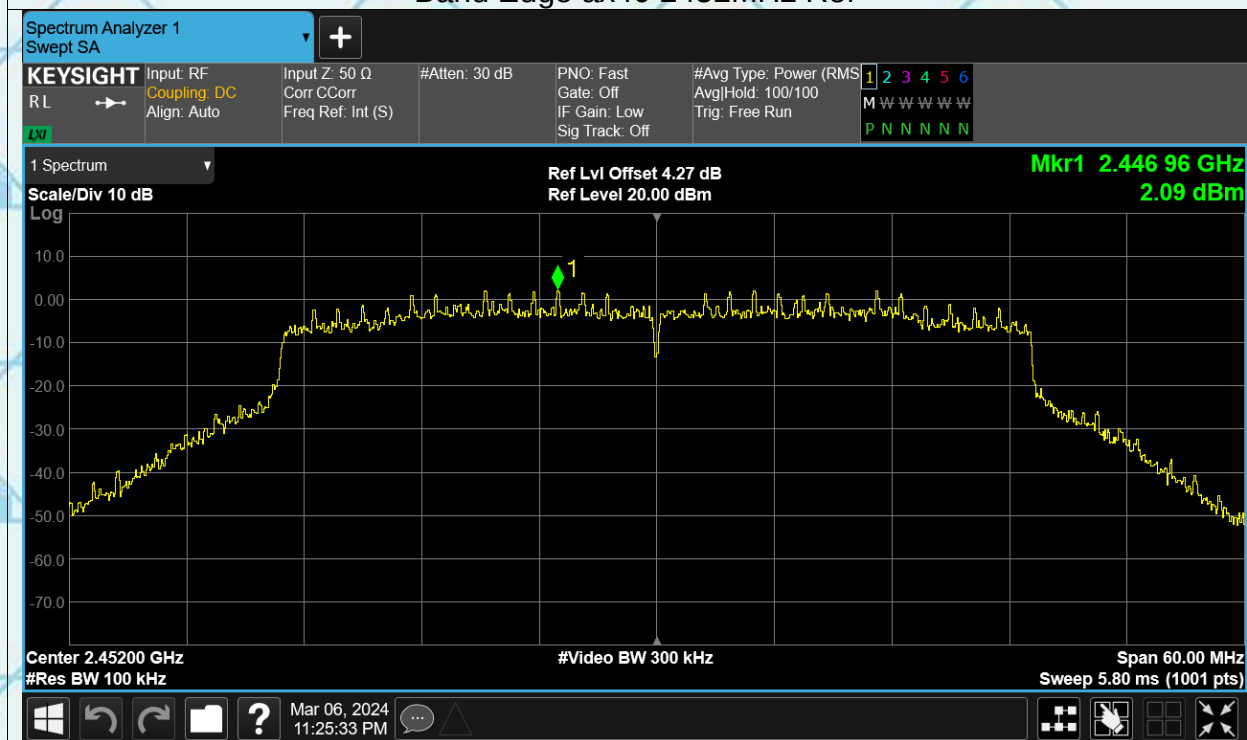


Band Edge ax40 2422MHz Emission

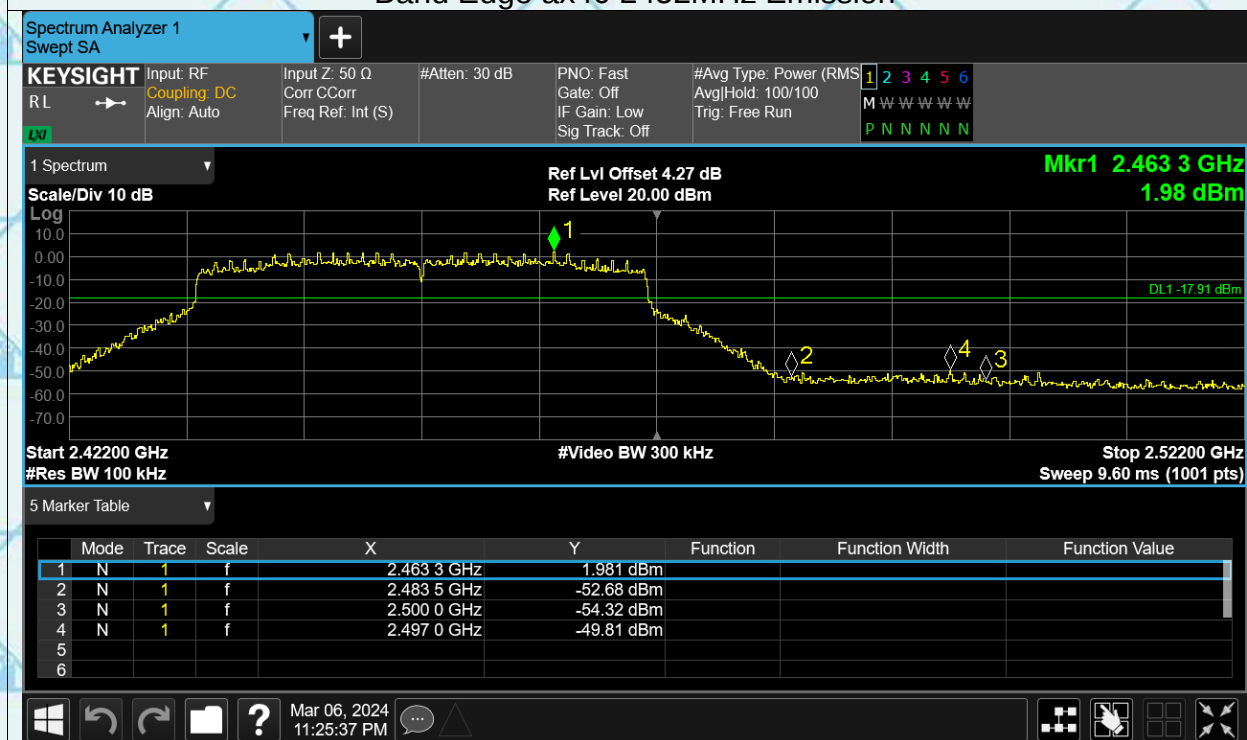




Band Edge ax40 2452MHz Ref



Band Edge ax40 2452MHz Emission

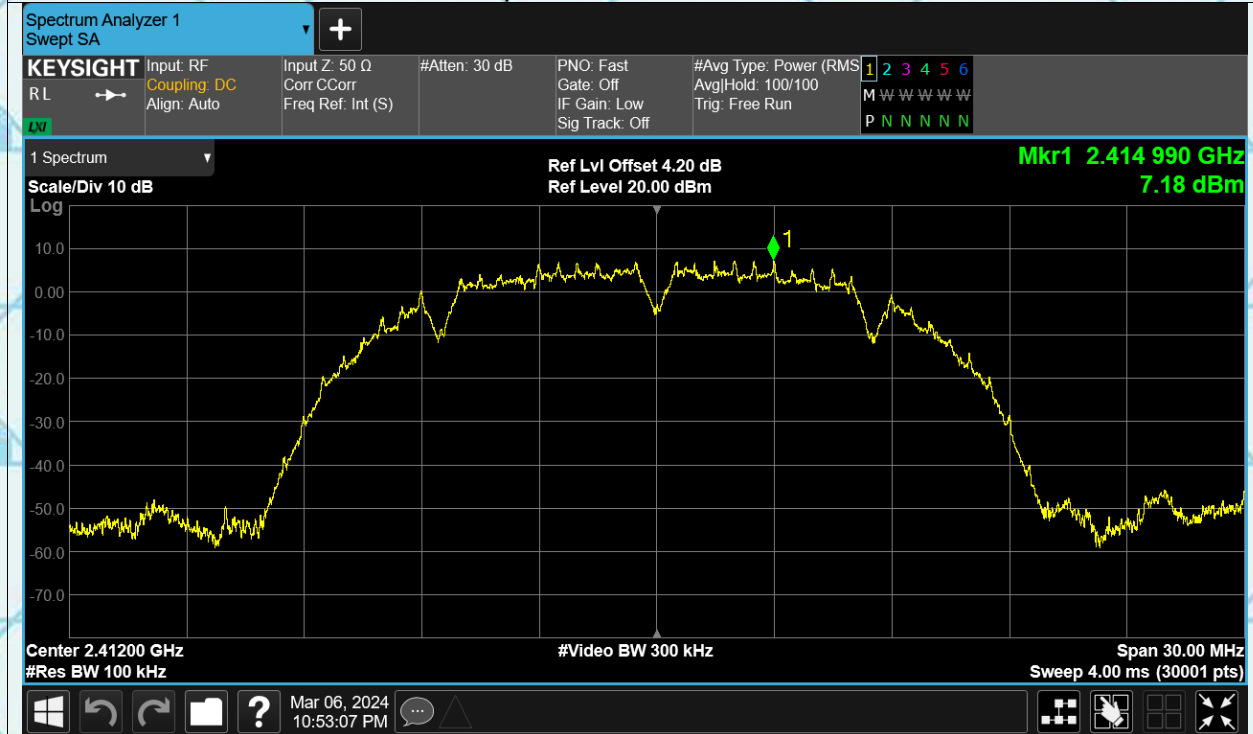




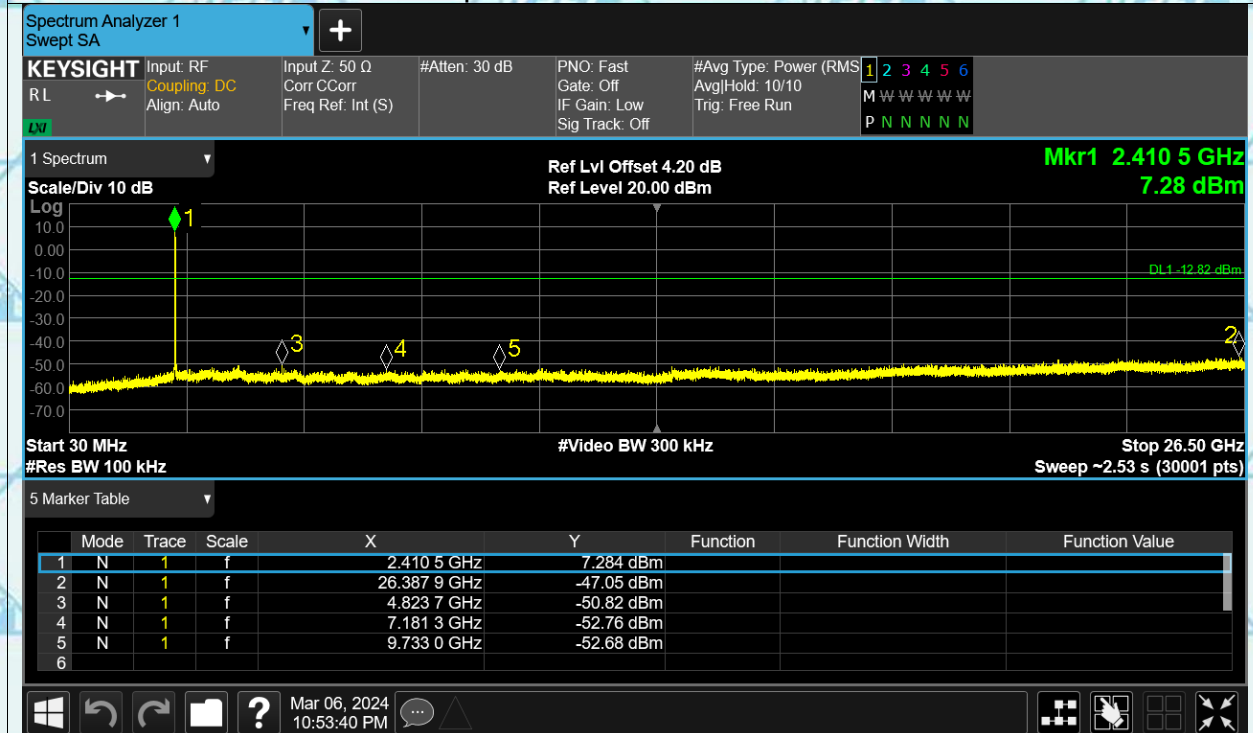
Conducted RF Spurious Emission

Test Graphs

Tx. Spurious b 2412MHz Ref

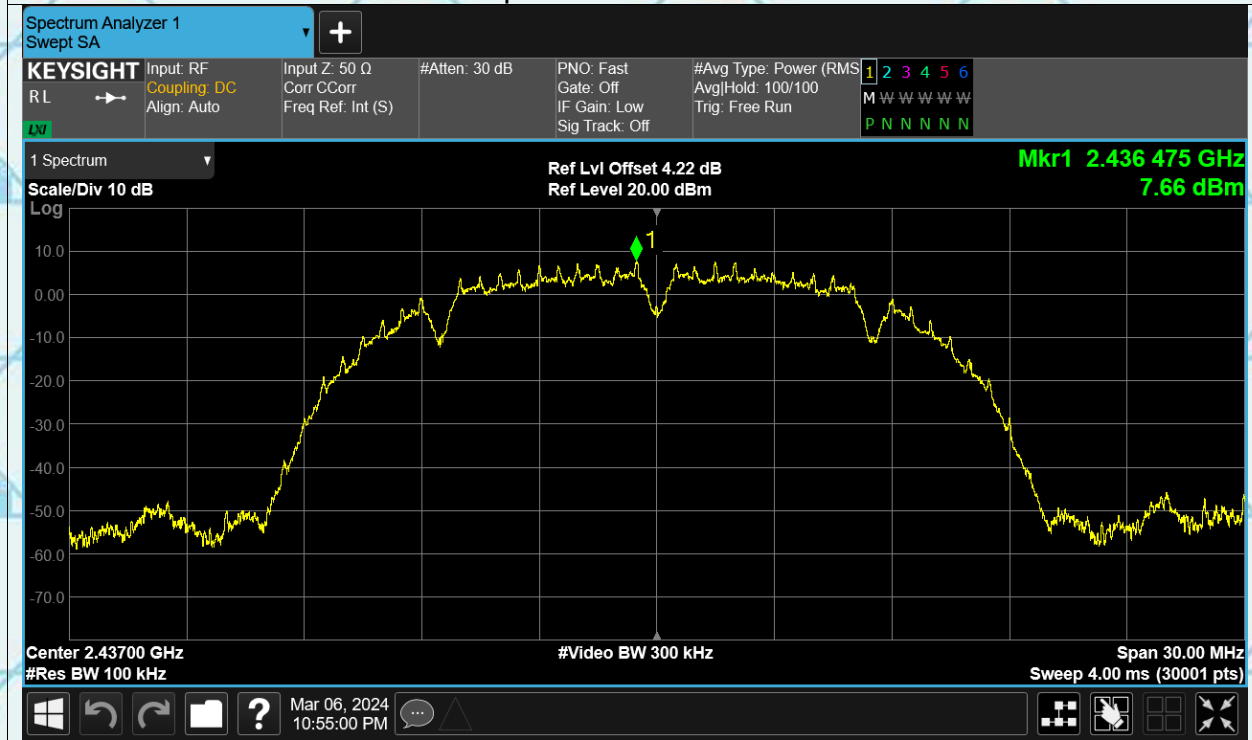


Tx. Spurious b 2412MHz Emission

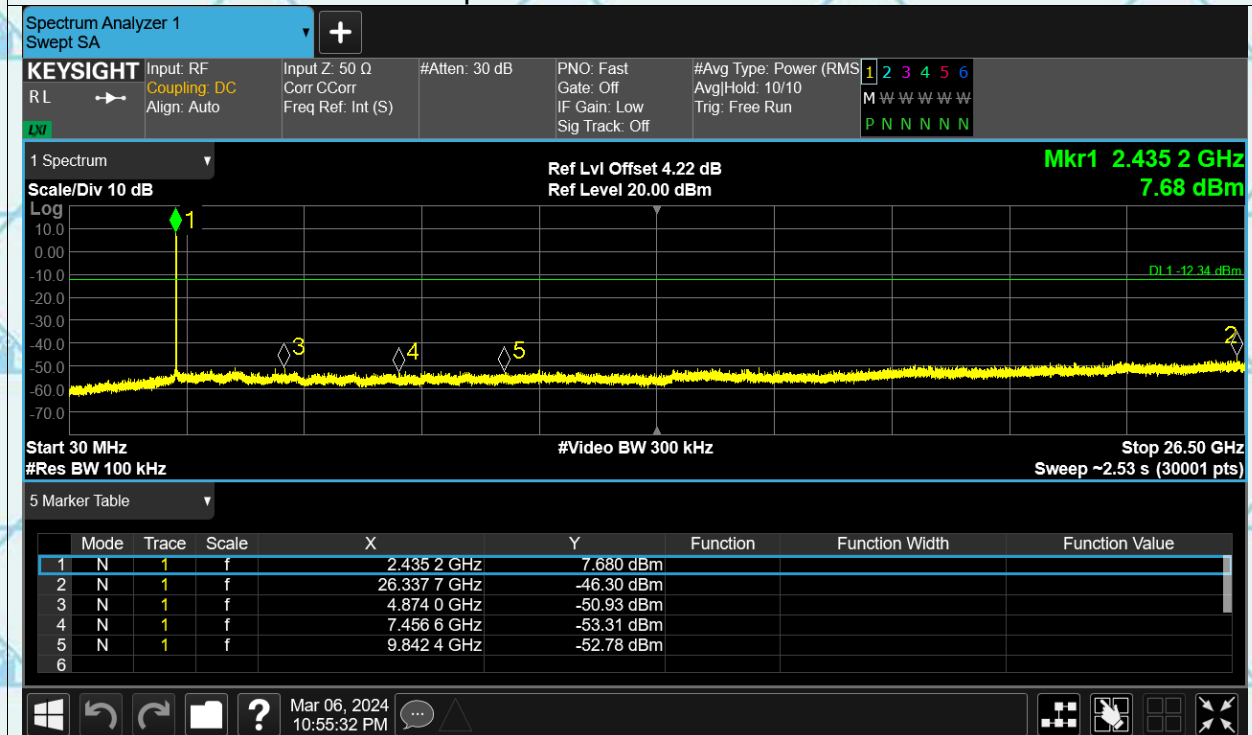




Tx. Spurious b 2437MHz Ref

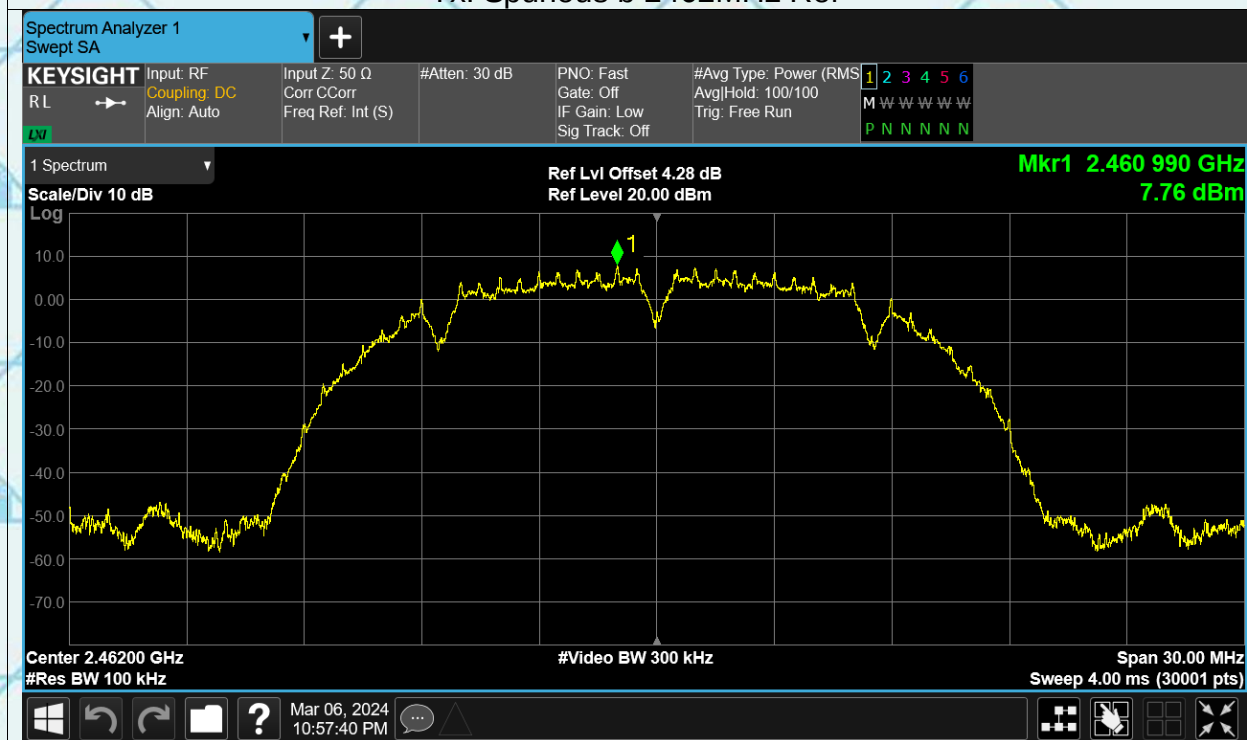


Tx. Spurious b 2437MHz Emission

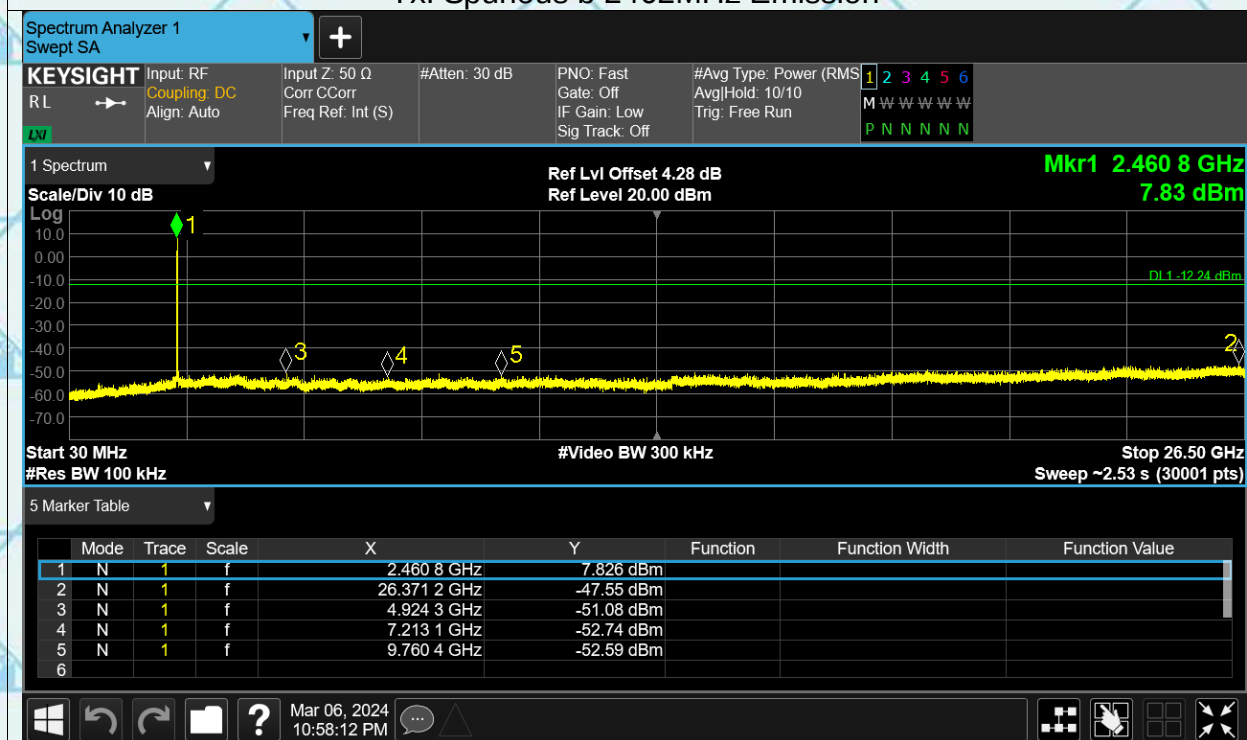




Tx. Spurious b 2462MHz Ref

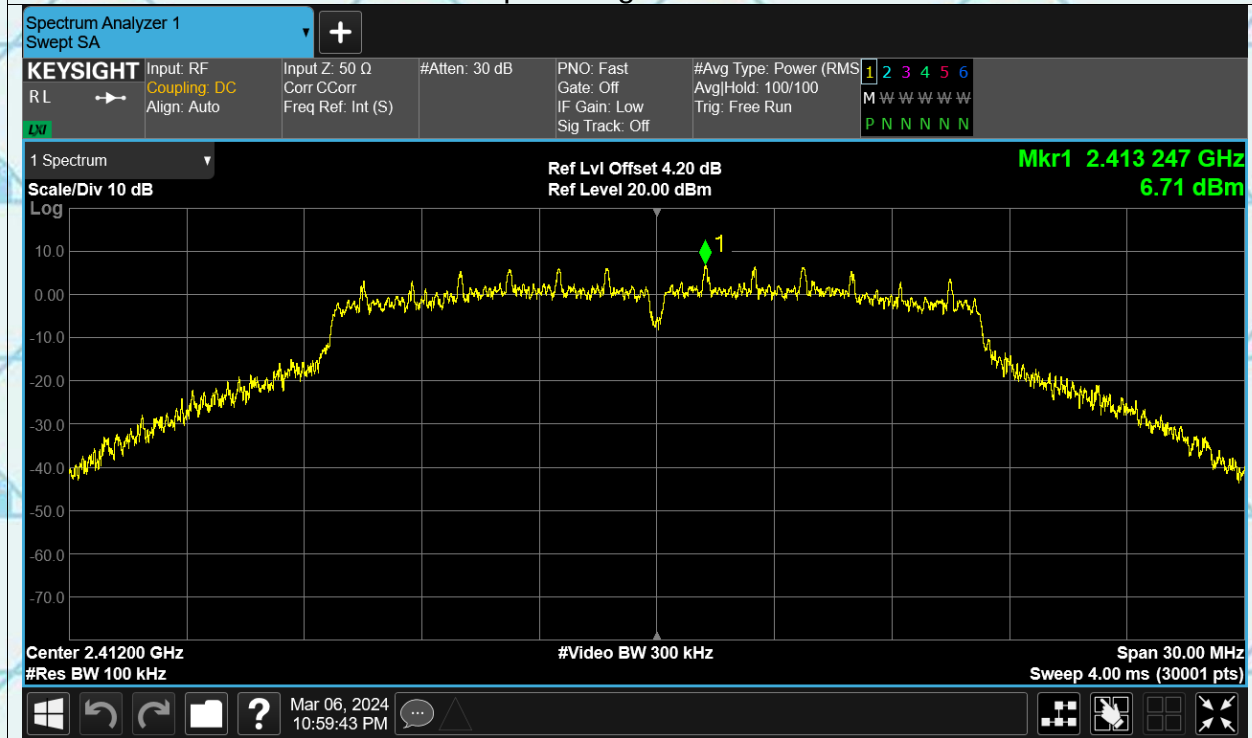


Tx. Spurious b 2462MHz Emission

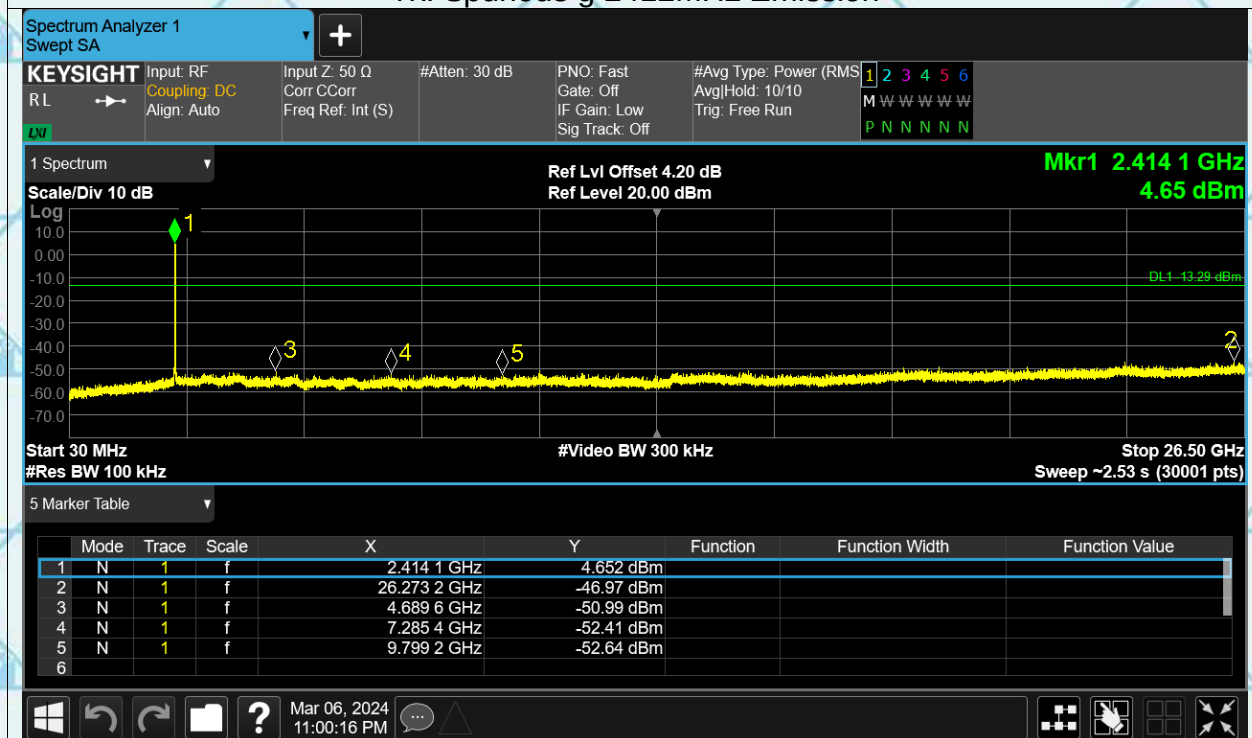




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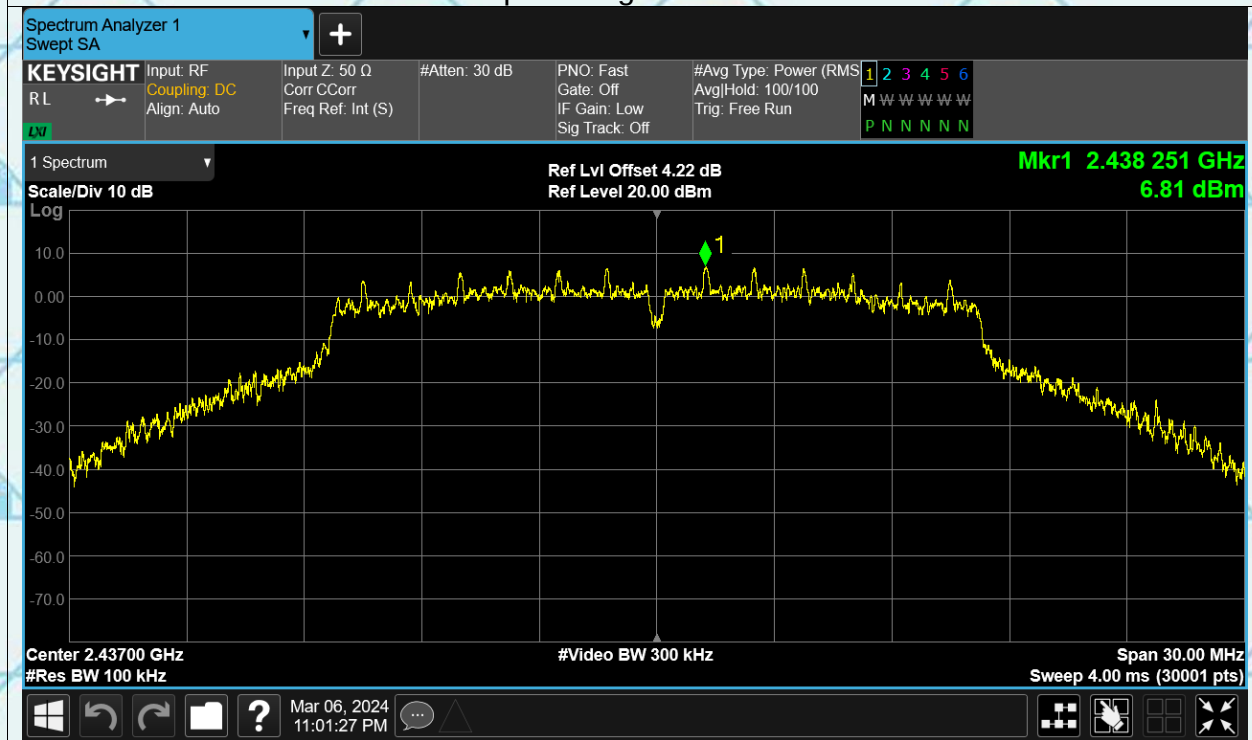


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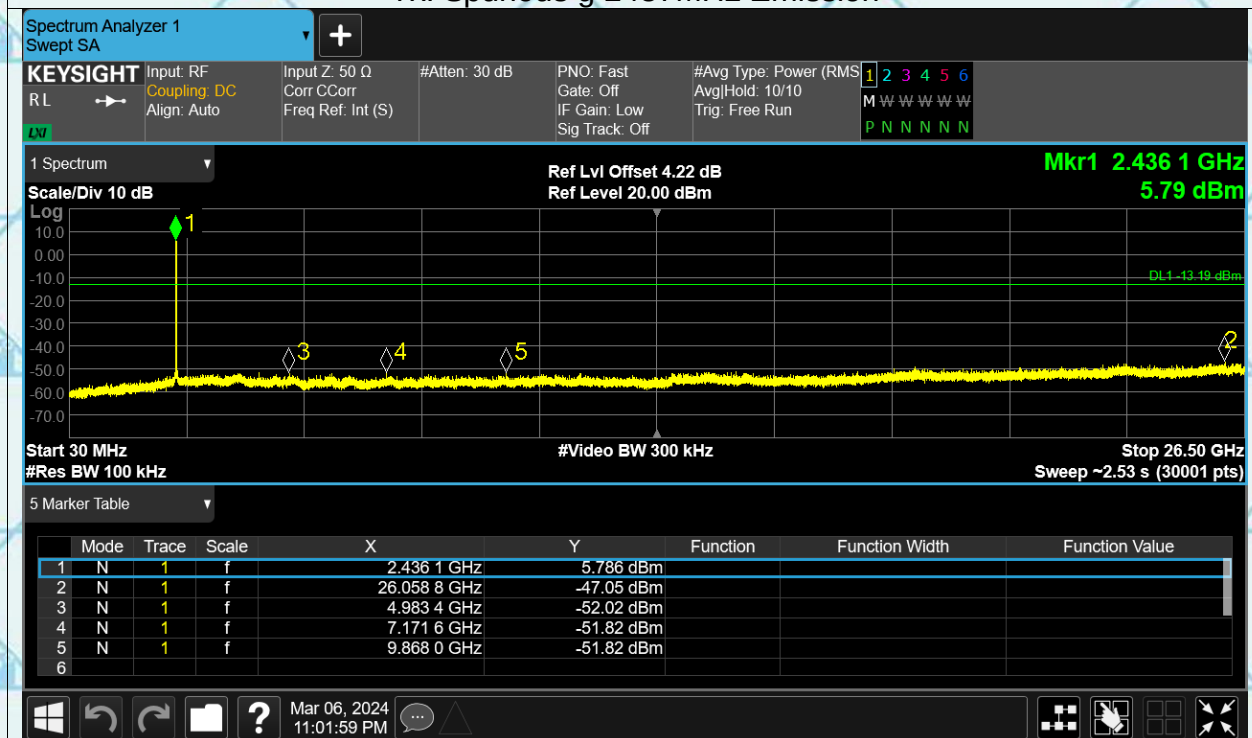




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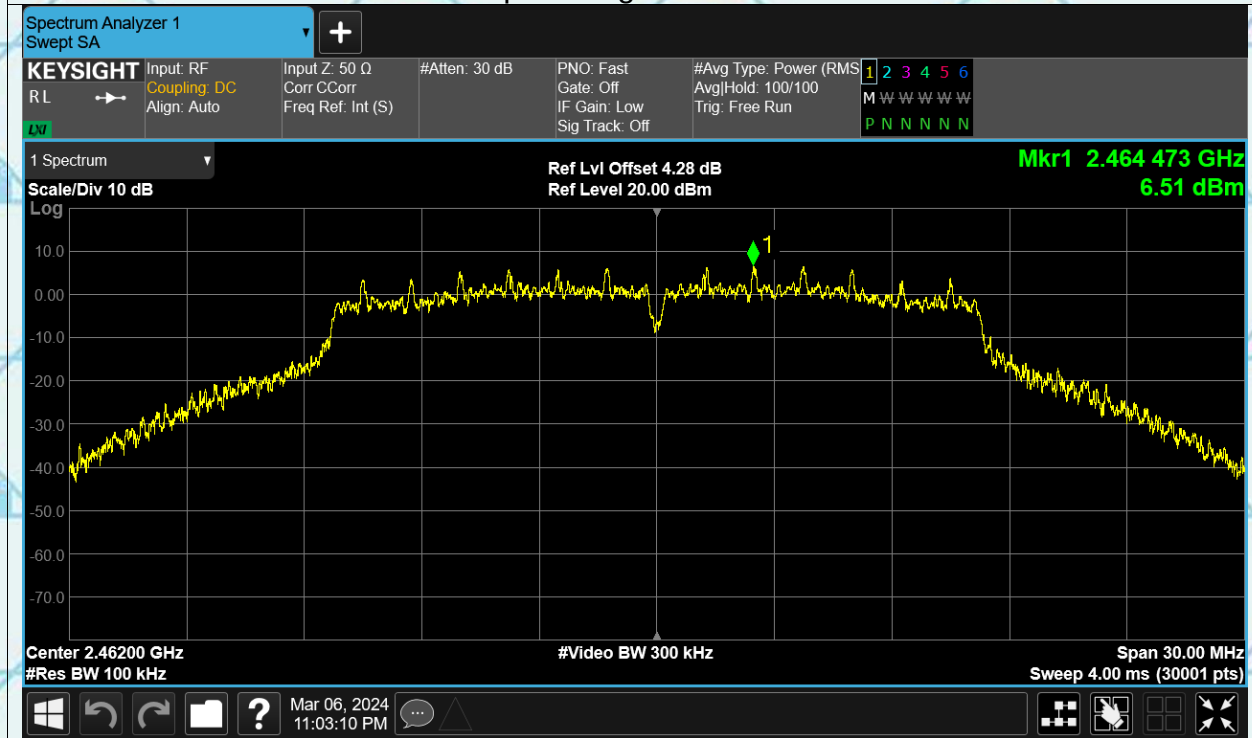


Tx. Spurious g 2437MHz Emission

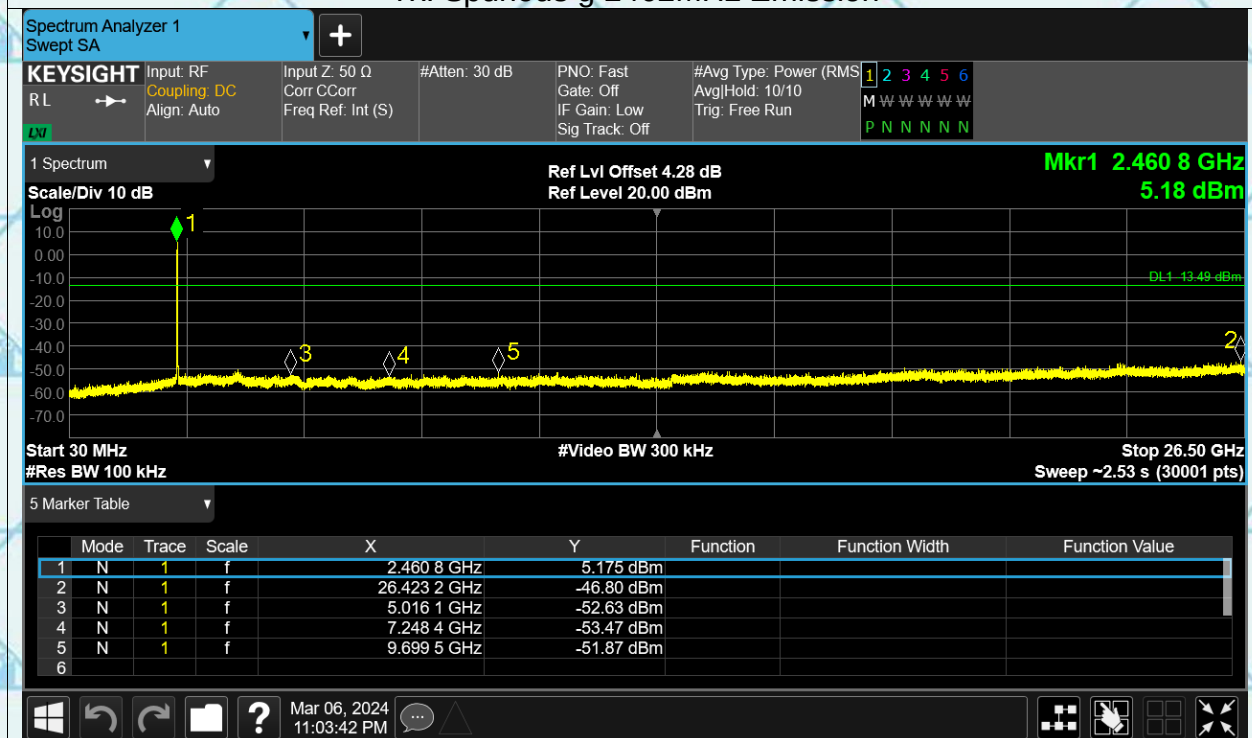




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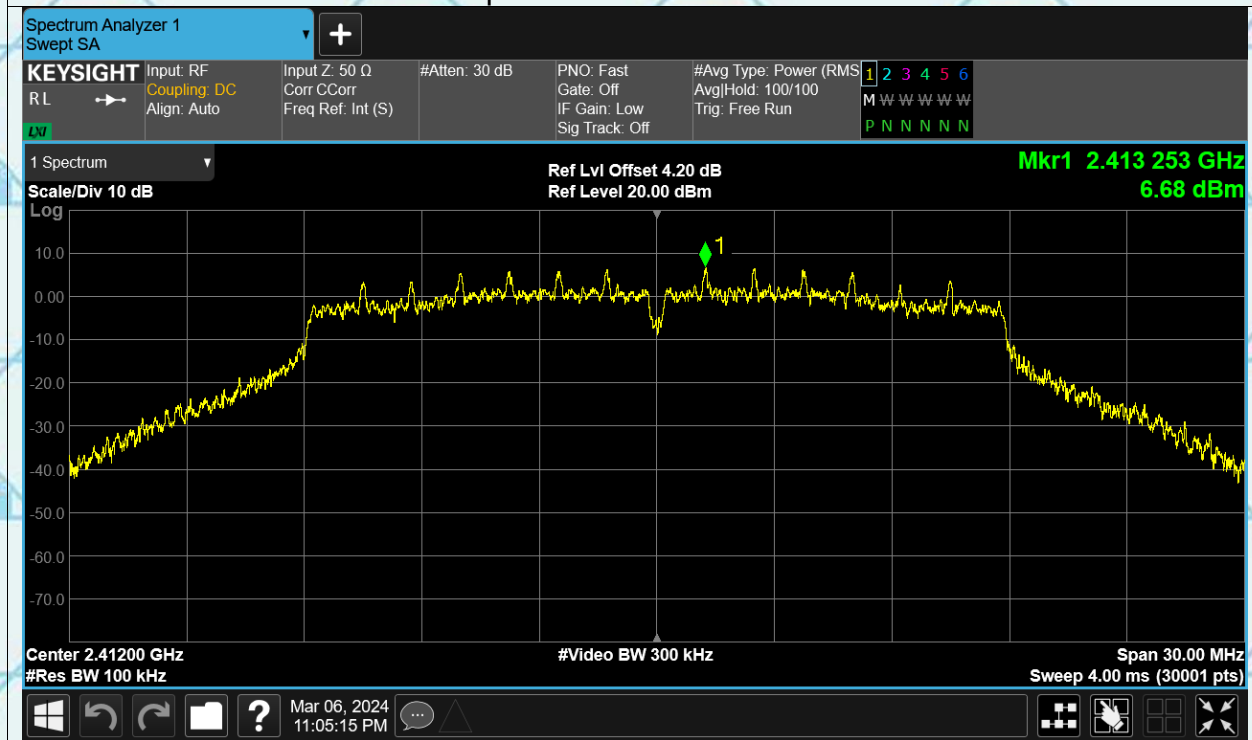


Tx. Spurious g 2462MHz Emission

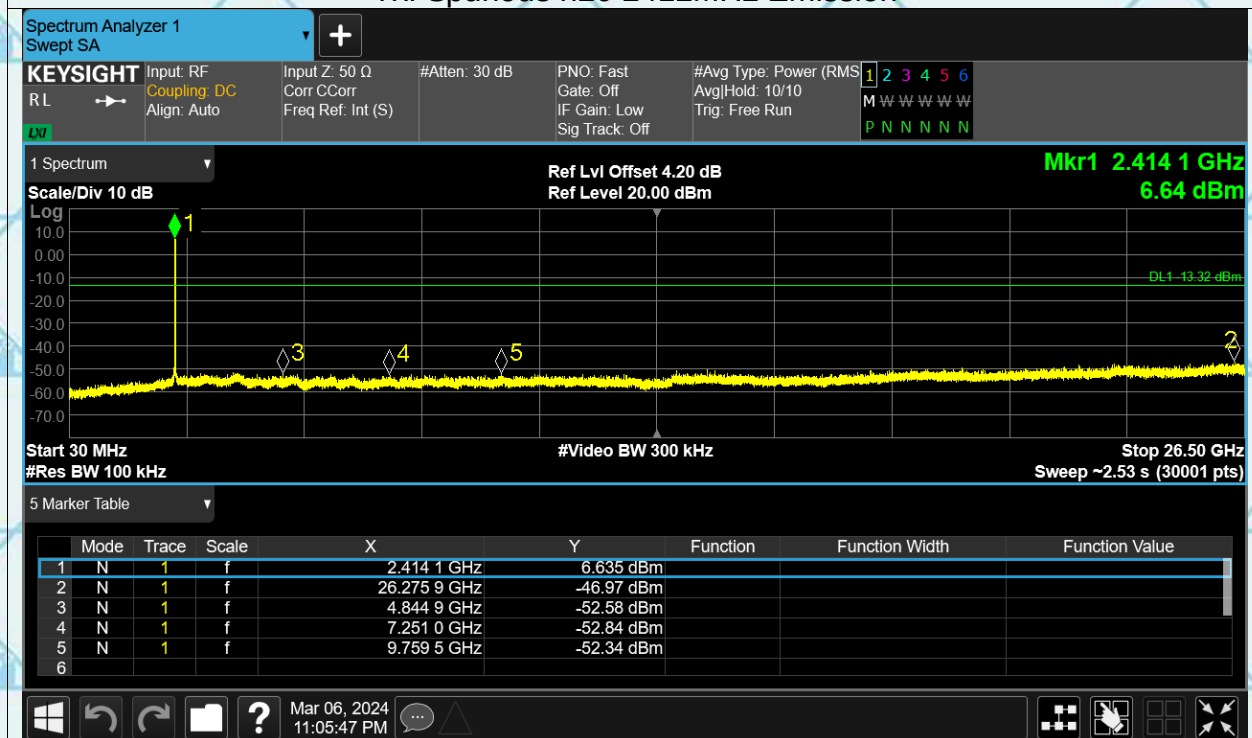




Tx. Spurious n20 2412MHz Ref

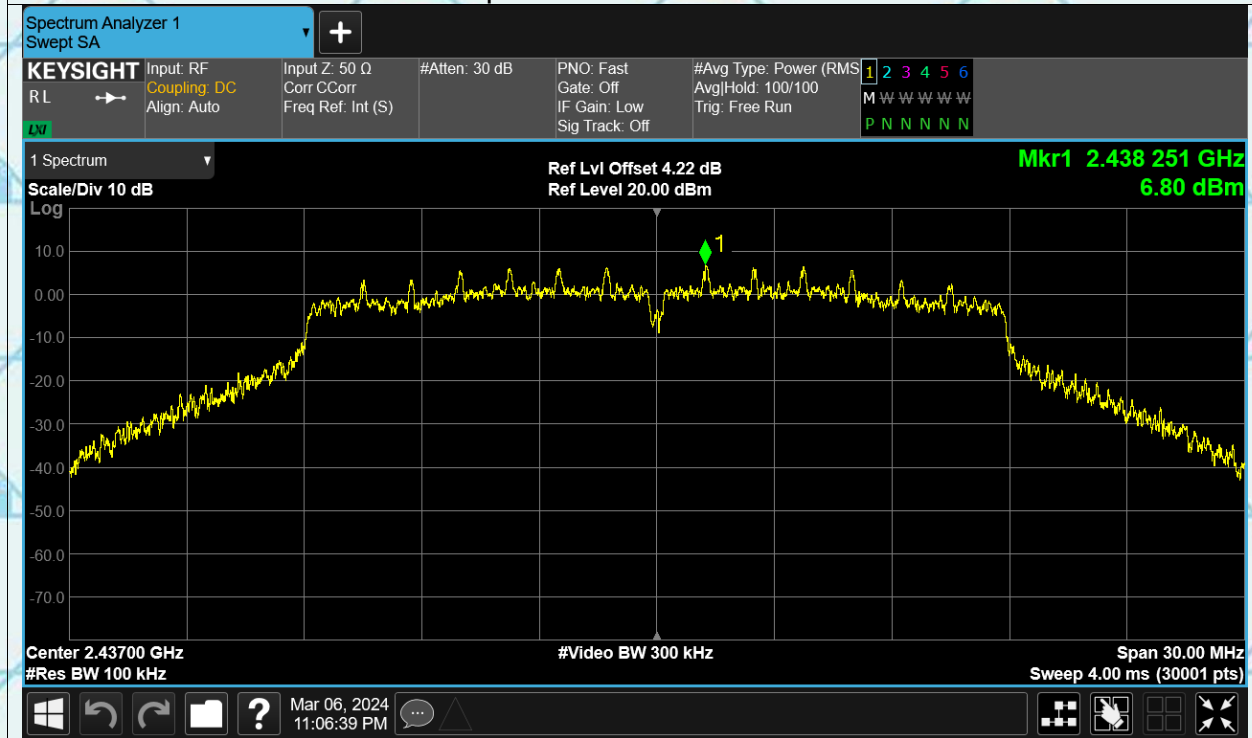


Tx. Spurious n20 2412MHz Emission

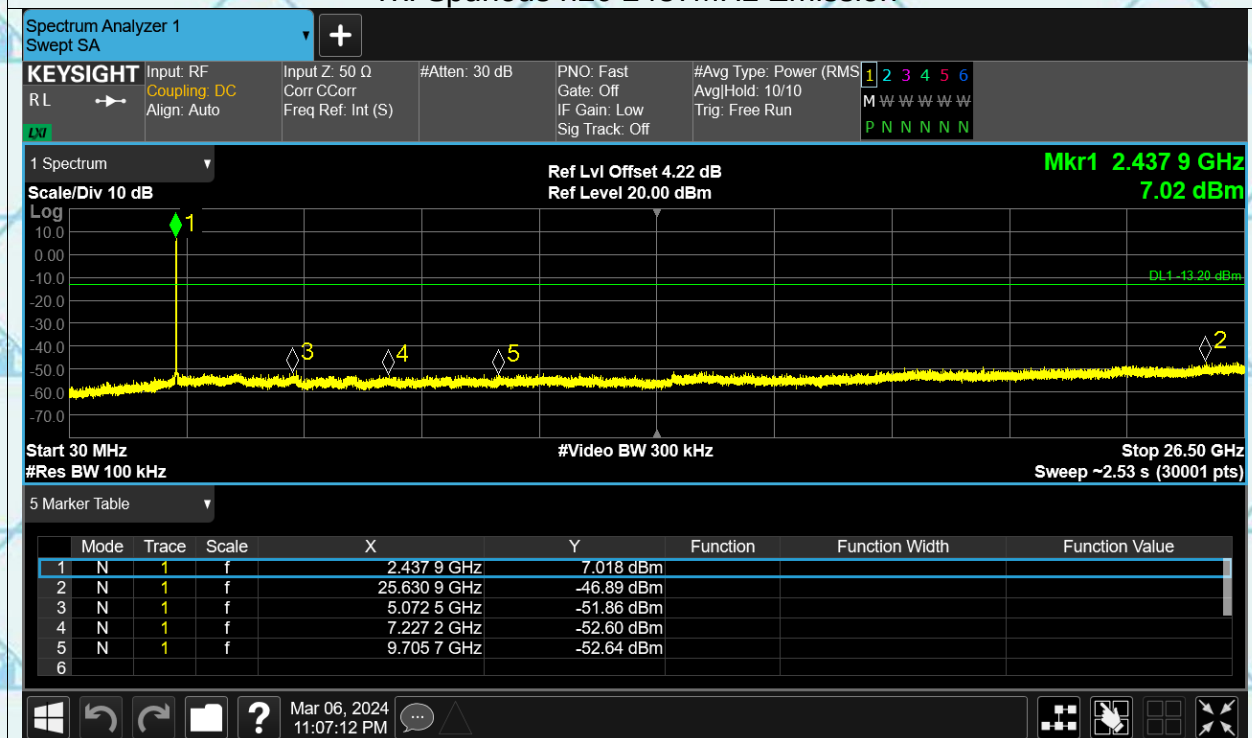




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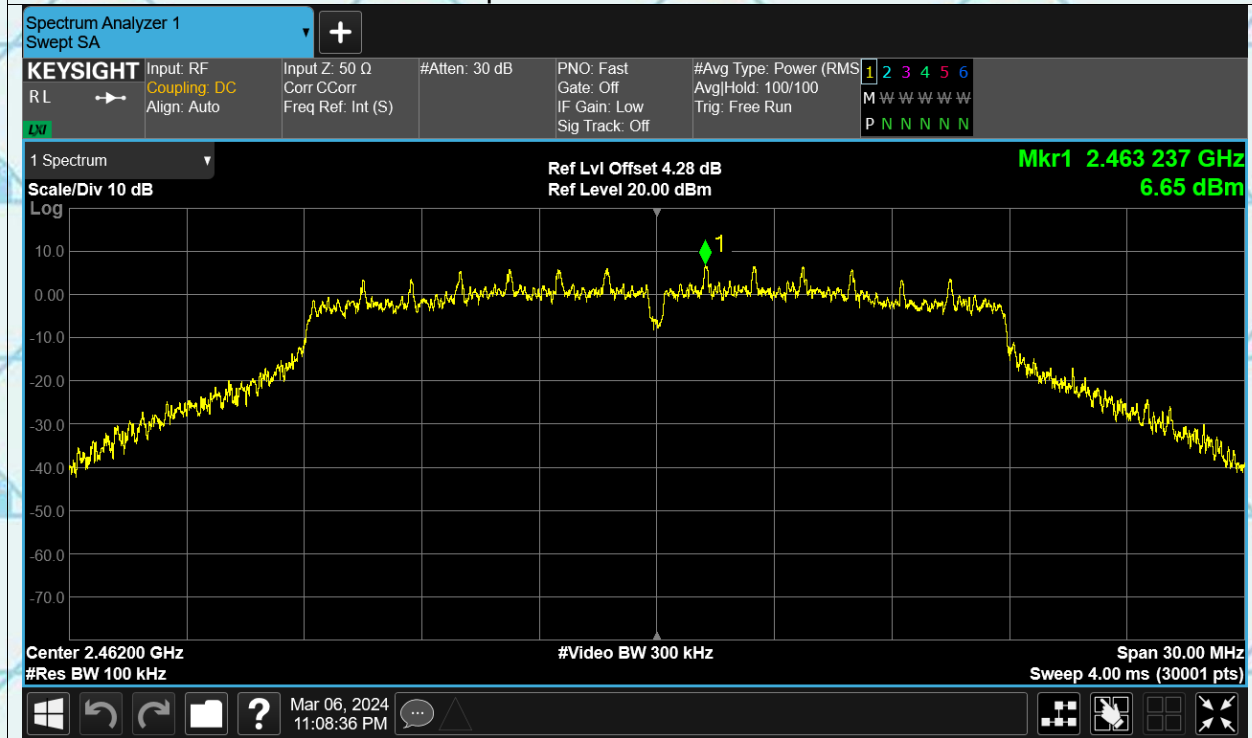


Tx. Spurious n20 2437MHz Emission

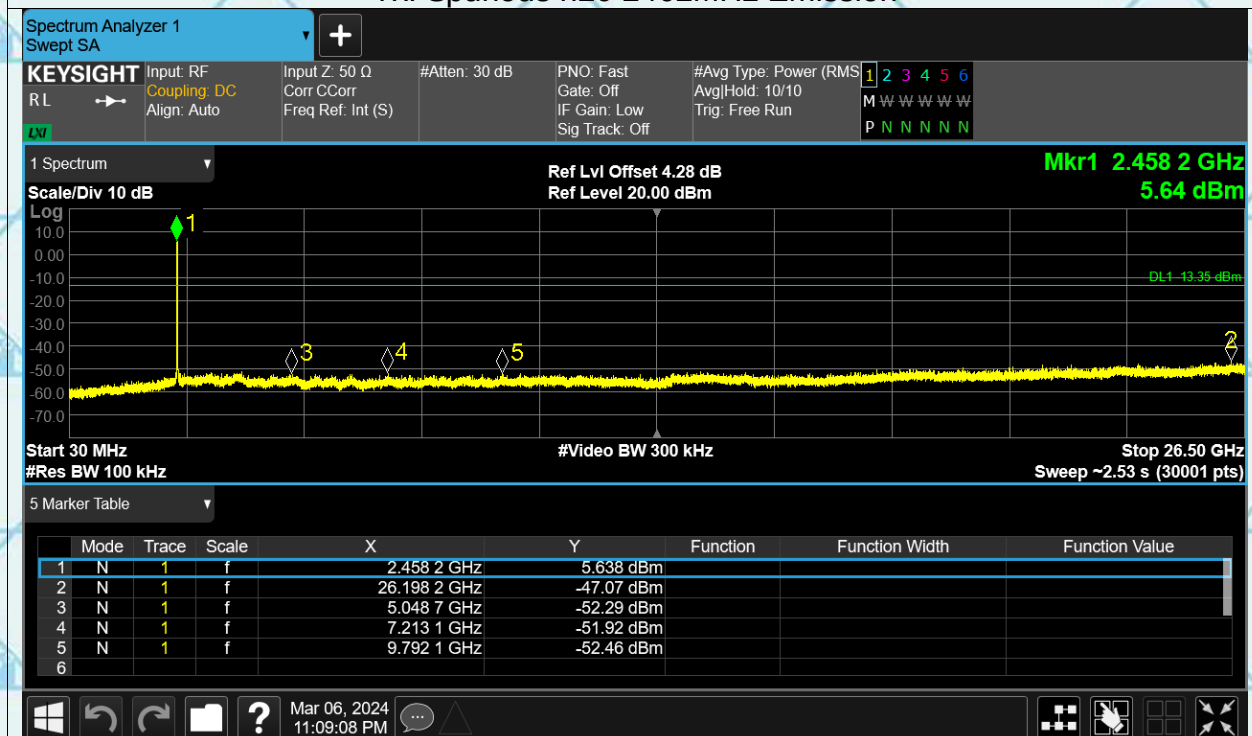




Tx. Spurious n20 2462MHz Ref

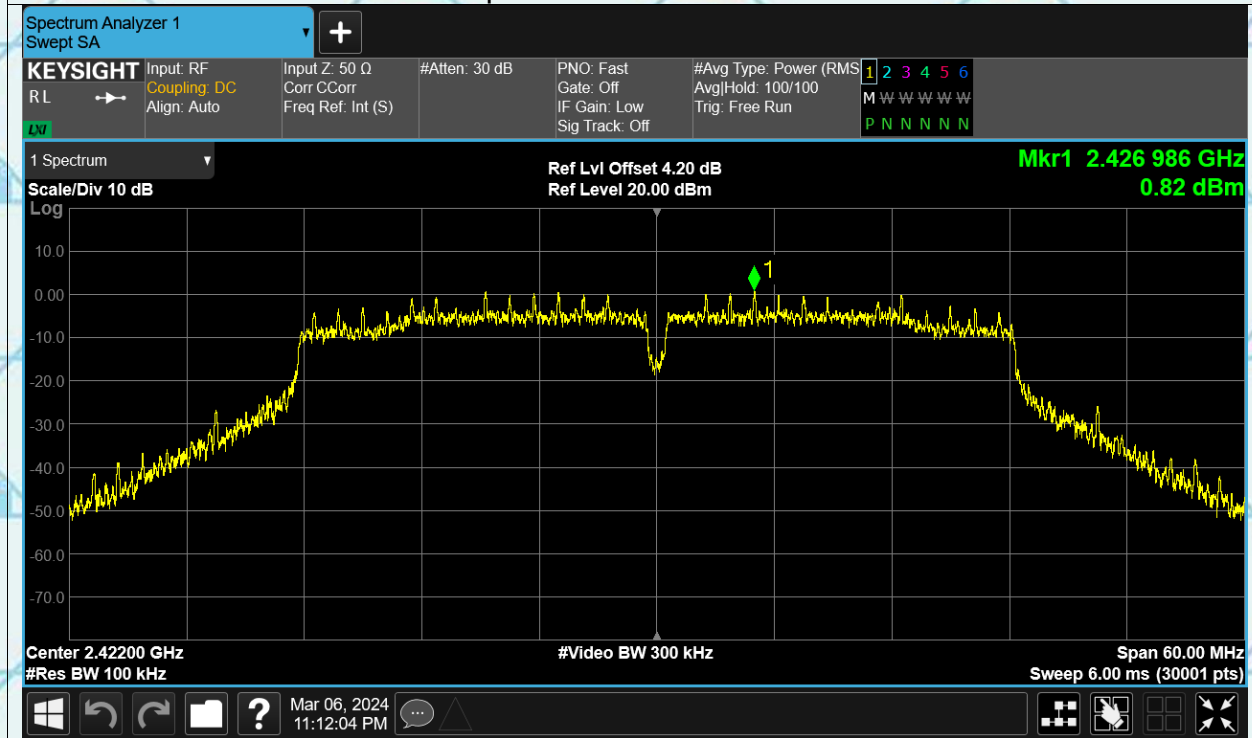


Tx. Spurious n20 2462MHz Emission

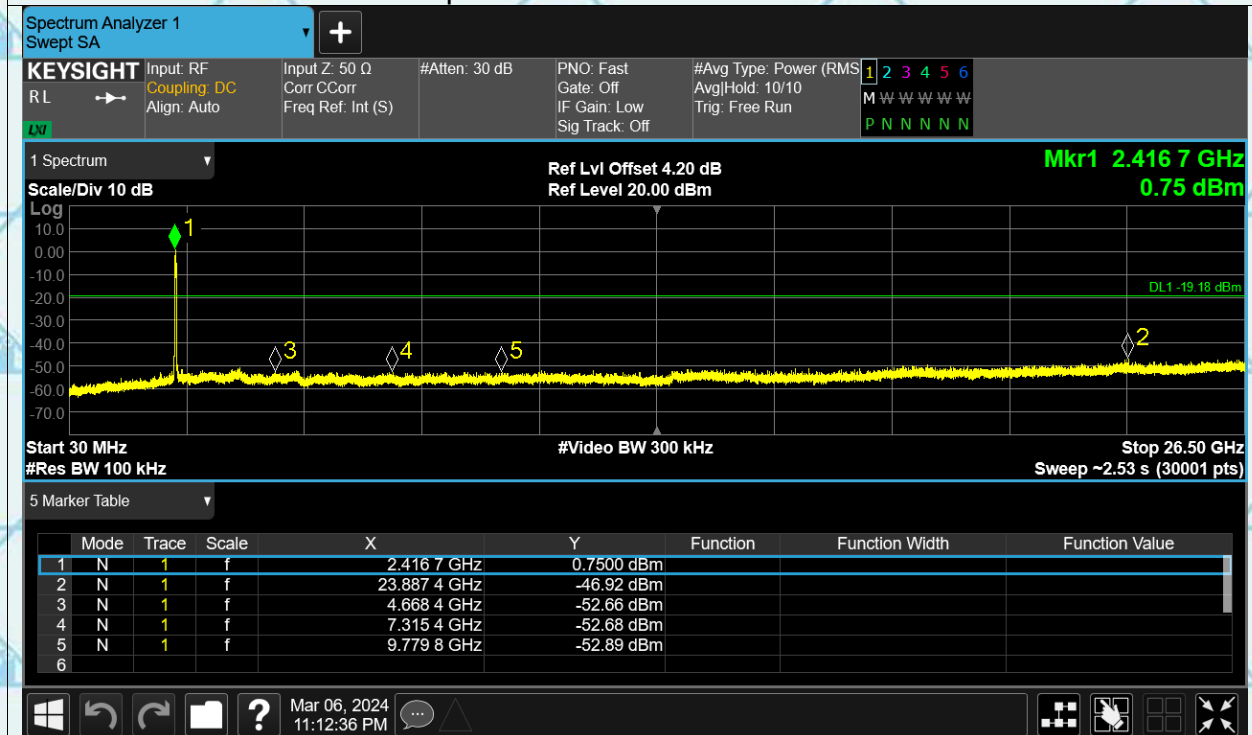




Tx. Spurious n40 2422MHz Ref

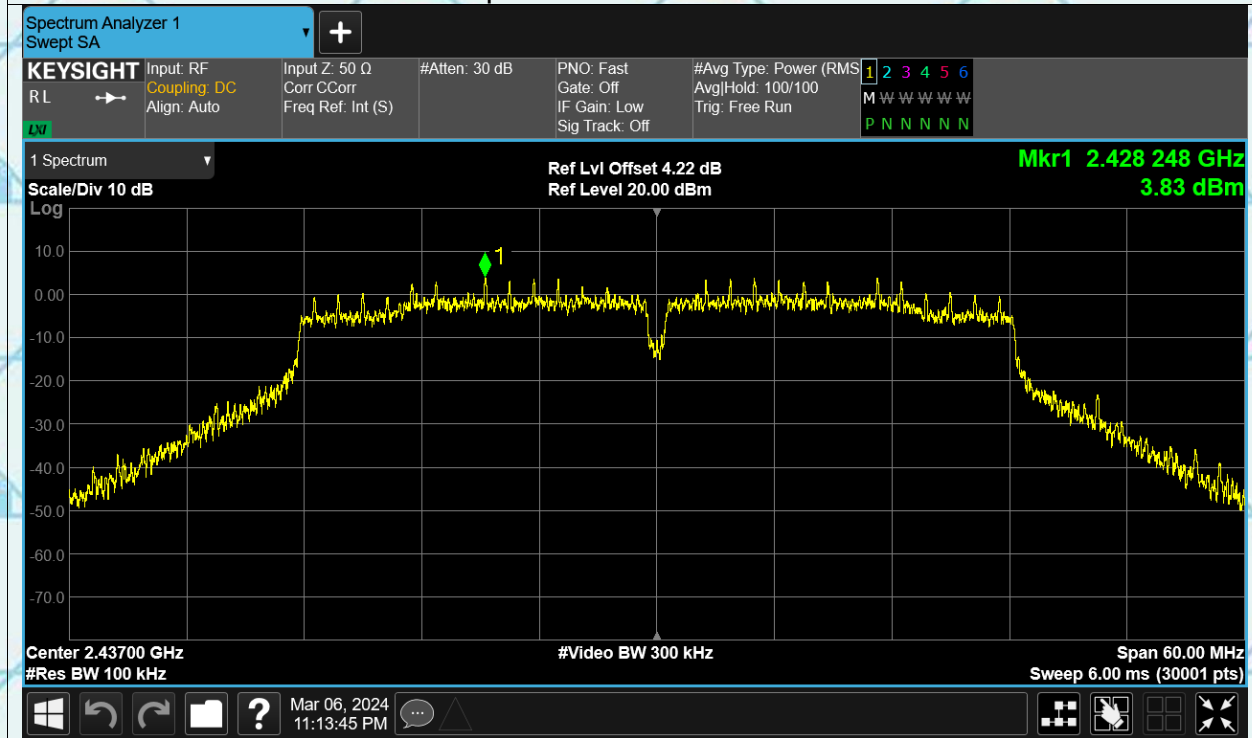


Tx. Spurious n40 2422MHz Emission

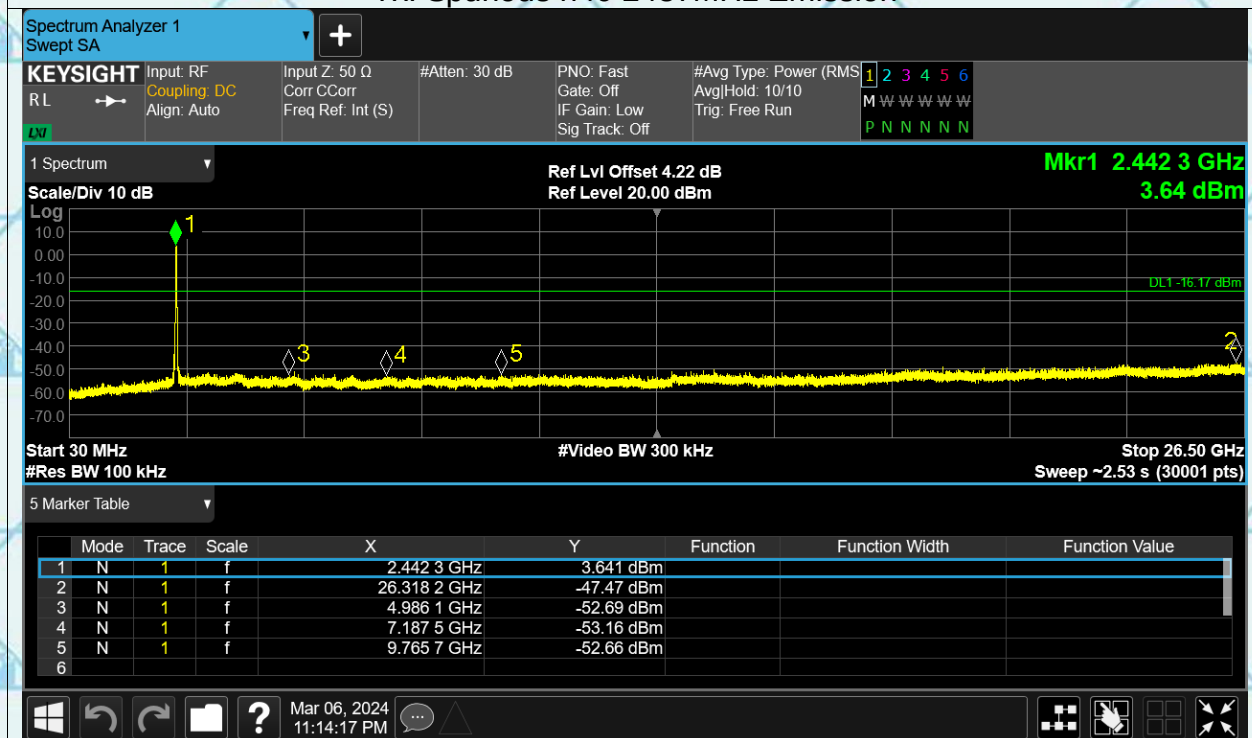




Tx. Spurious n40 2437MHz Ref

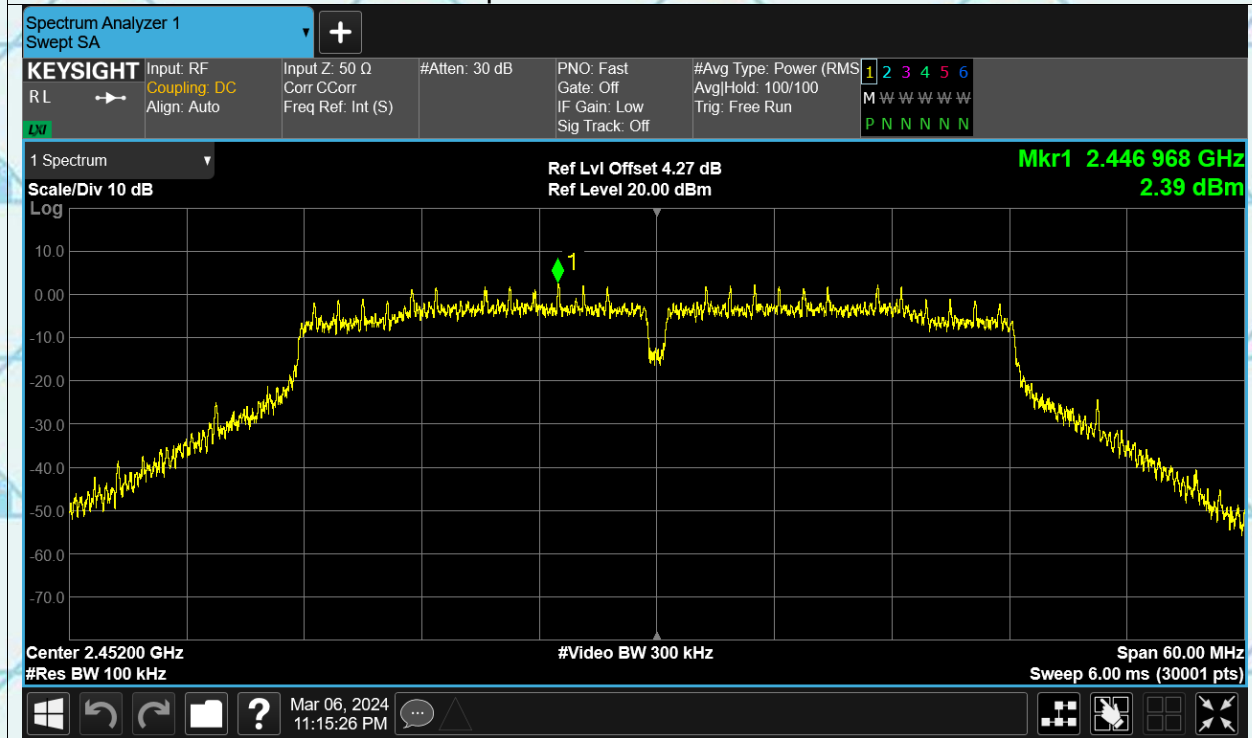


Tx. Spurious n40 2437MHz Emission

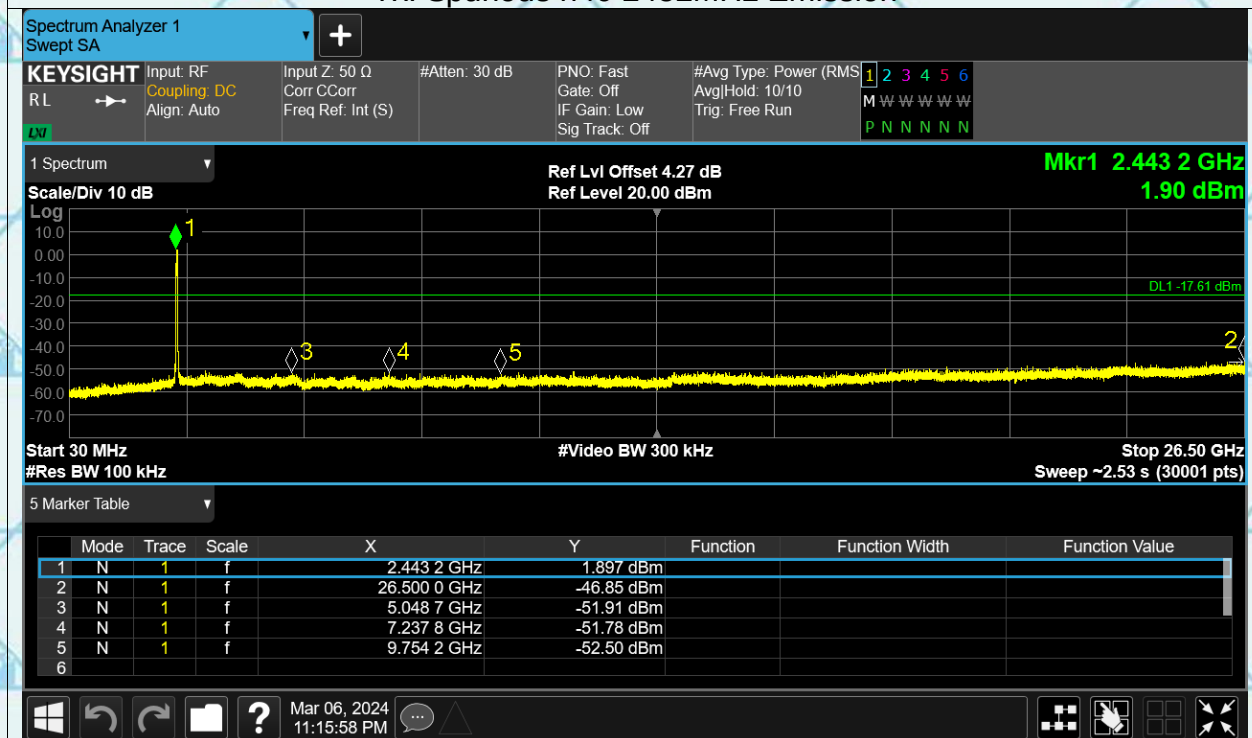




Tx. Spurious n40 2452MHz Ref

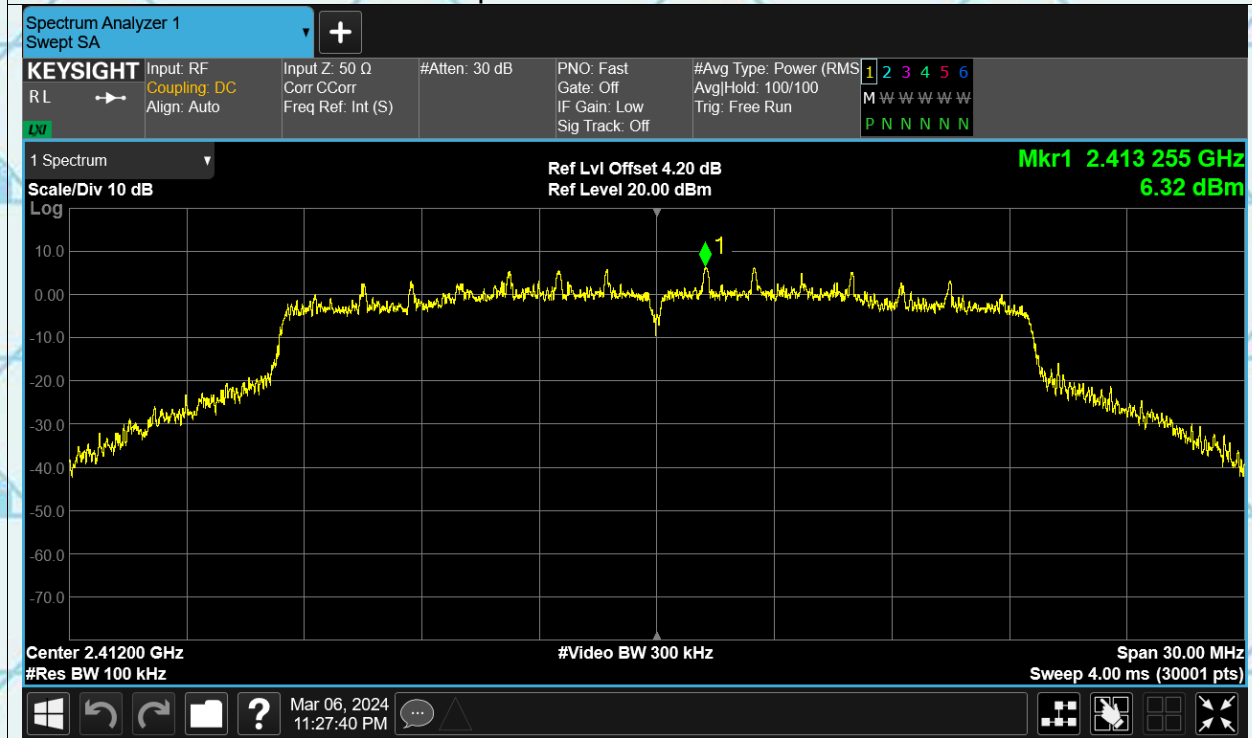


Tx. Spurious n40 2452MHz Emission

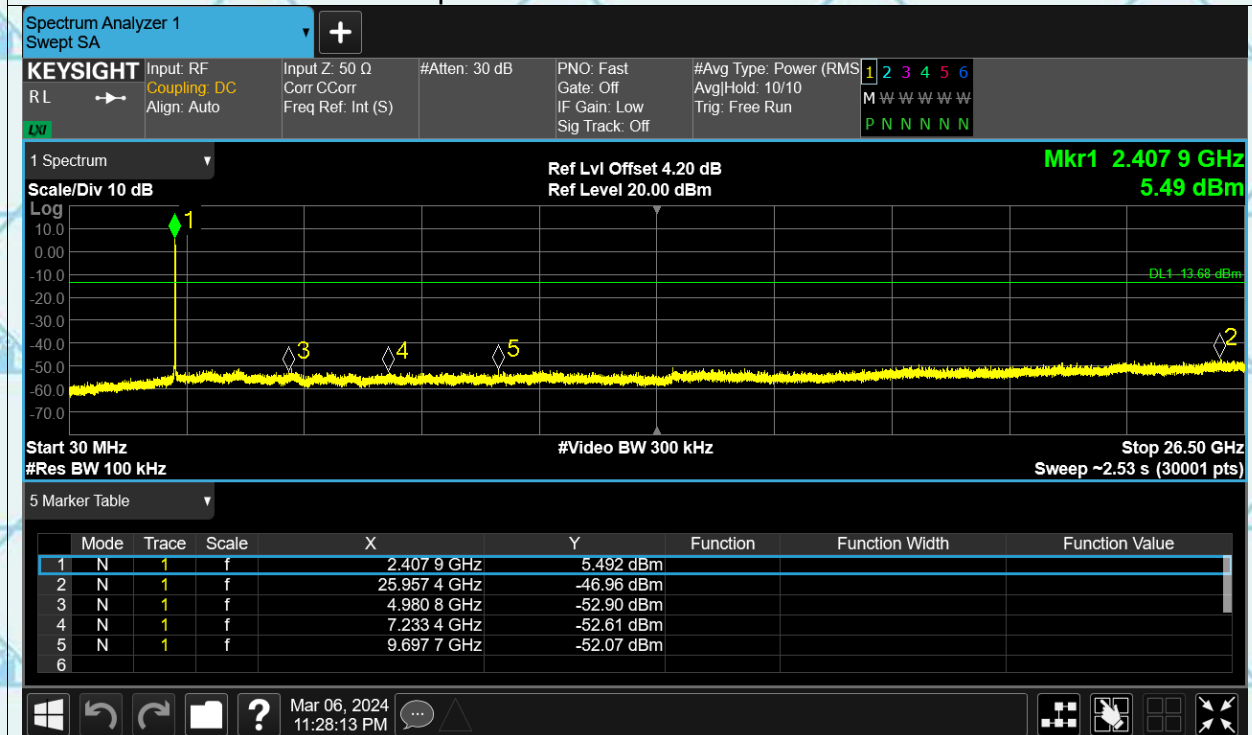




Tx. Spurious ax20 2412MHz Ref

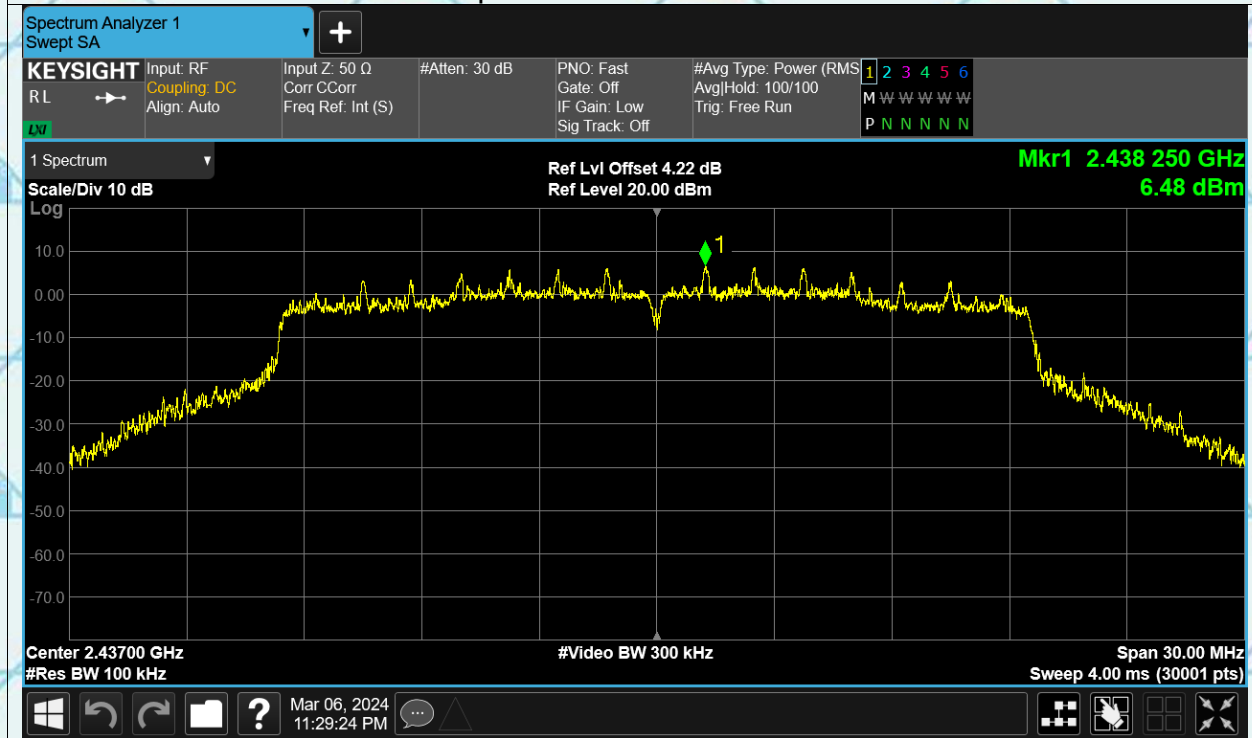


Tx. Spurious ax20 2412MHz Emission

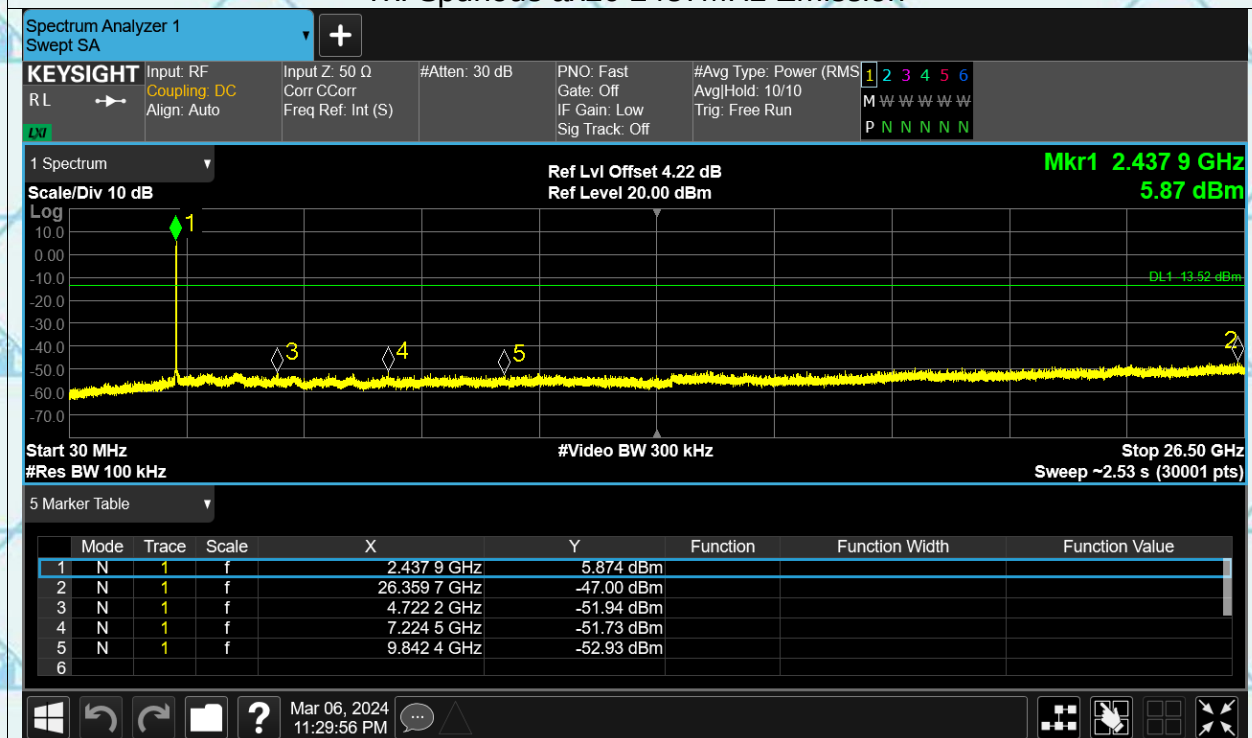




Tx. Spurious ax20 2437MHz Ref

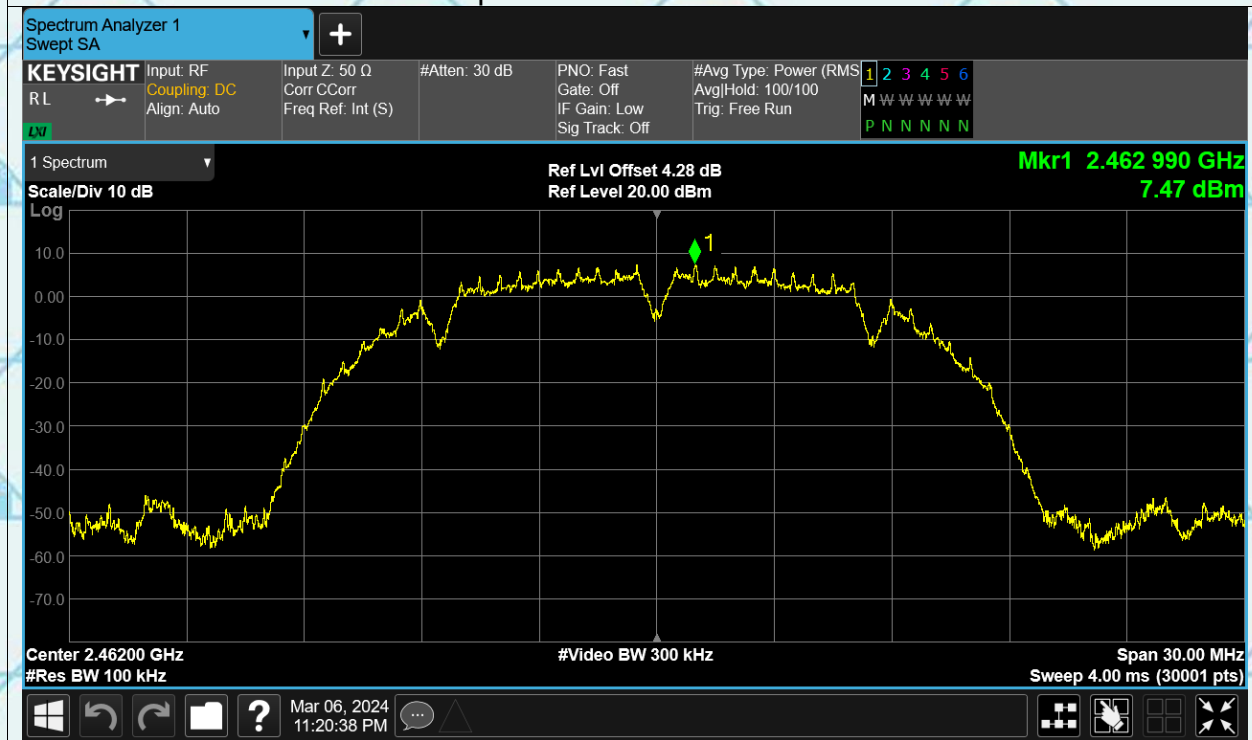


Tx. Spurious ax20 2437MHz Emission

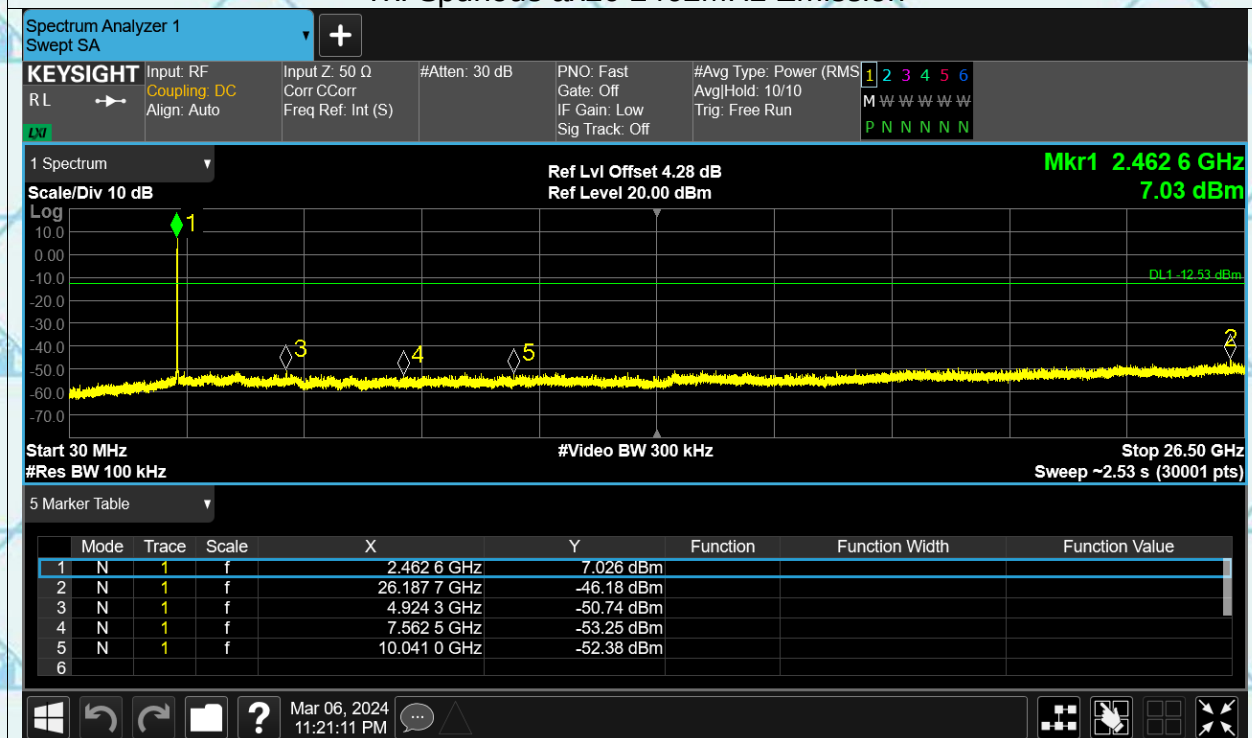




Tx. Spurious ax20 2462MHz Ref

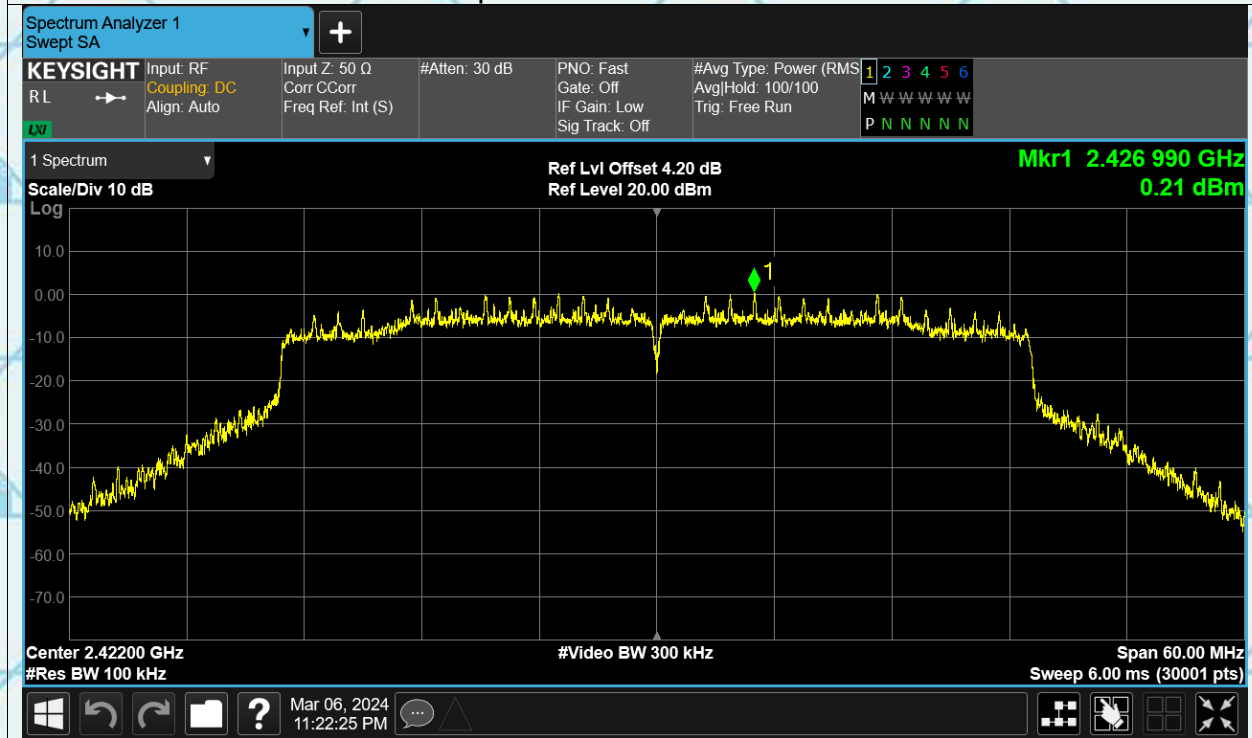


Tx. Spurious ax20 2462MHz Emission

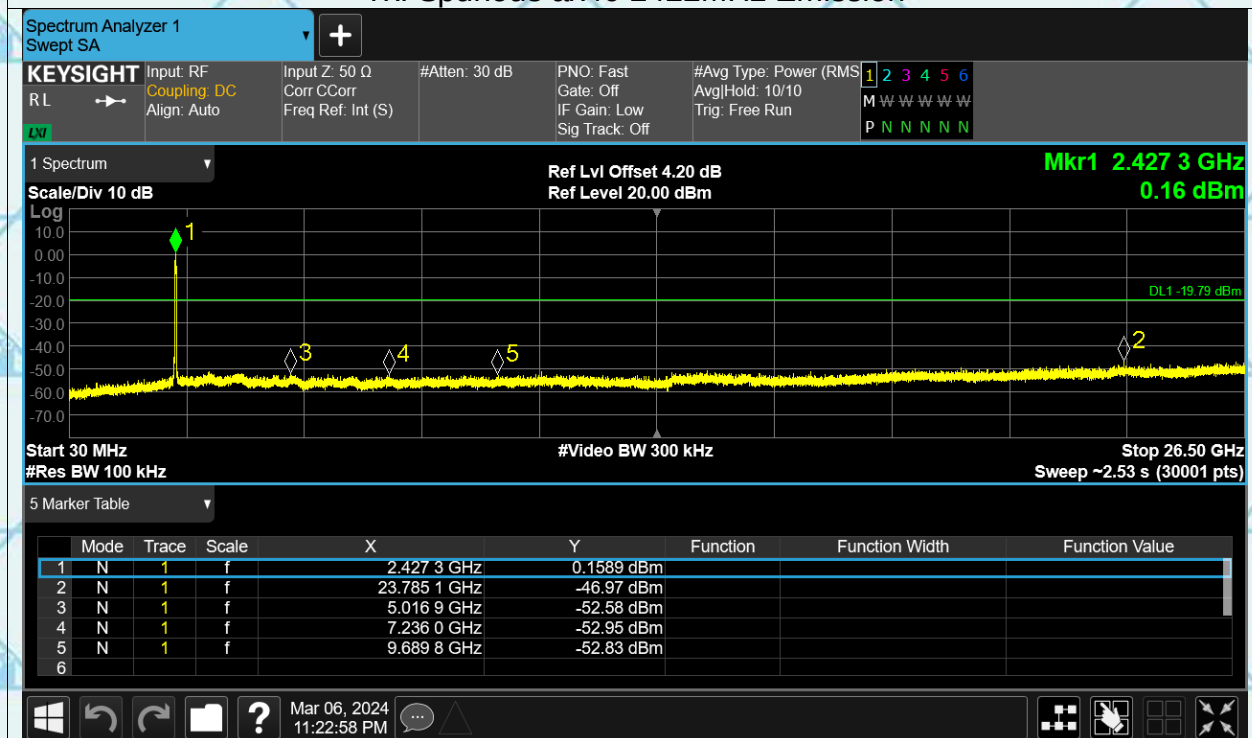




Tx. Spurious ax40 2422MHz Ref

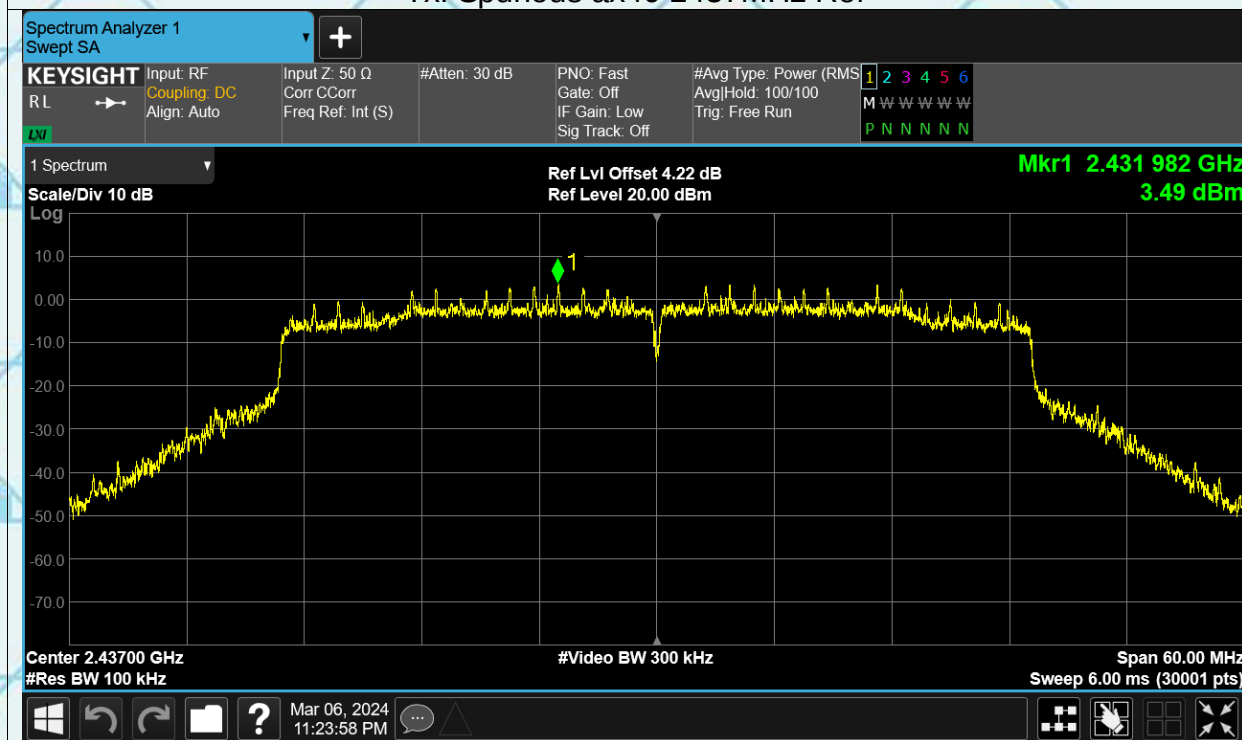


Tx. Spurious ax40 2422MHz Emission

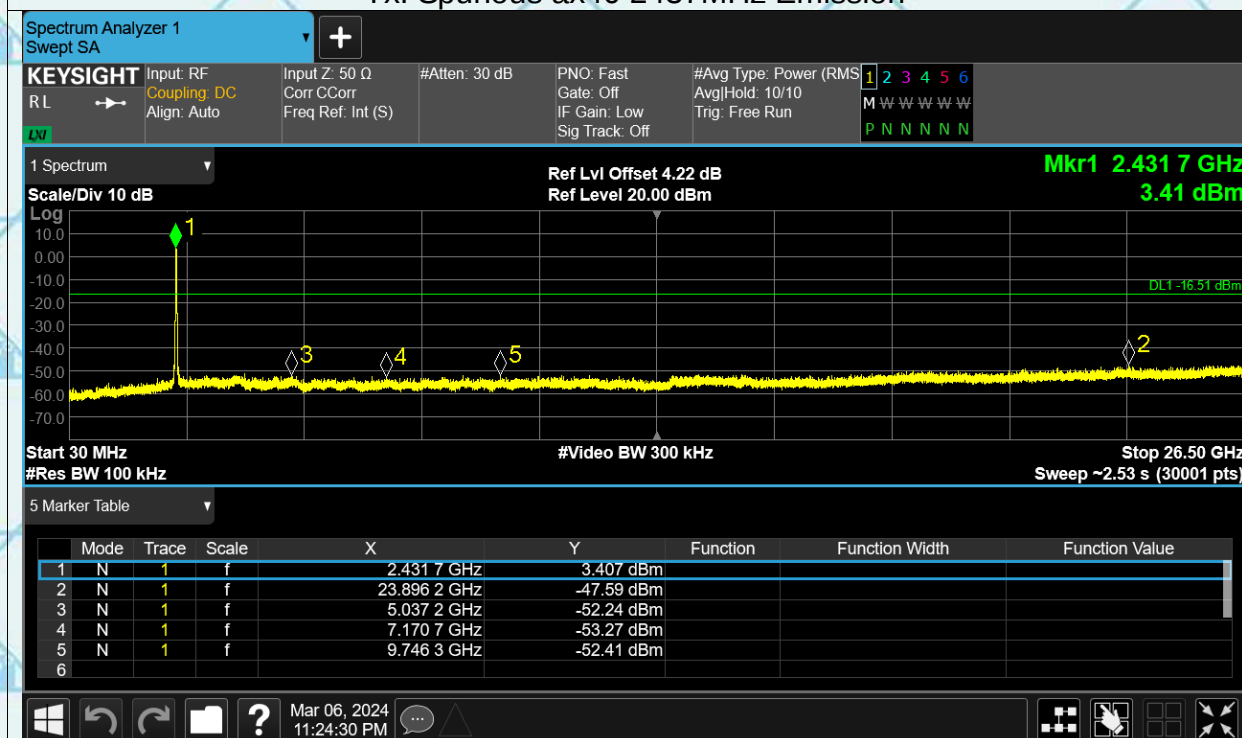




Tx. Spurious ax40 2437MHz Ref

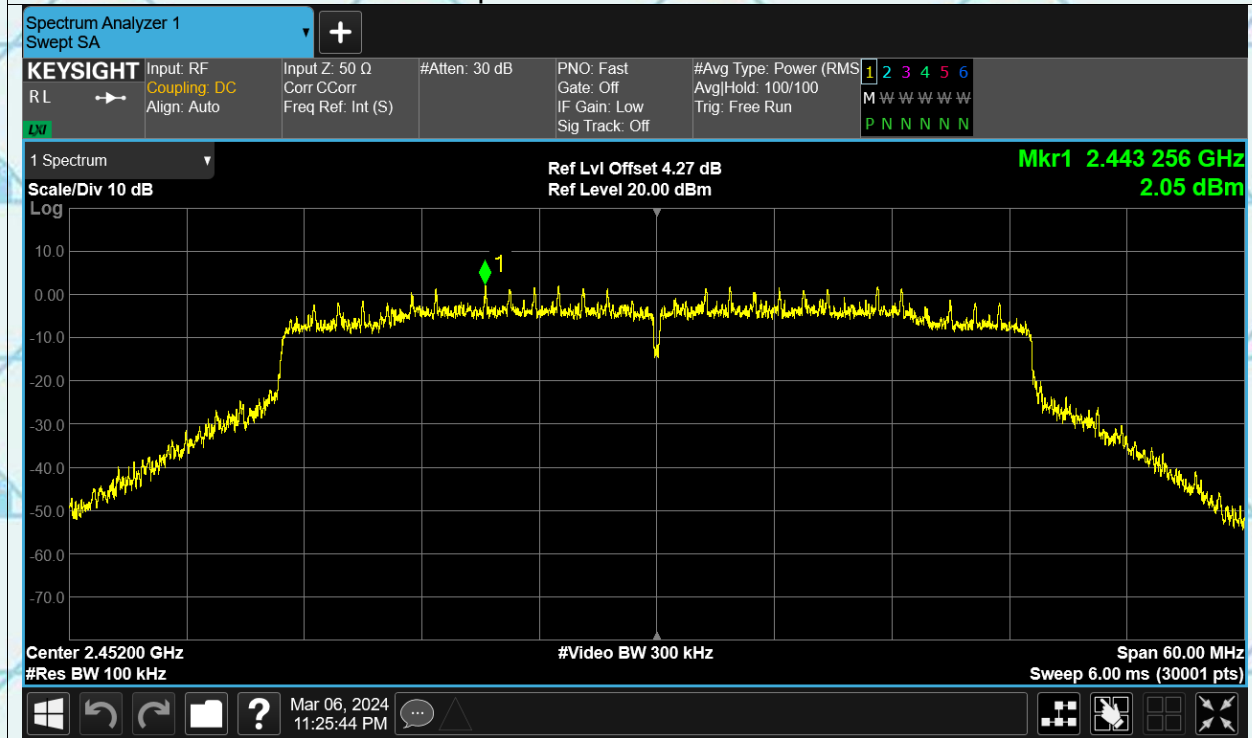


Tx. Spurious ax40 2437MHz Emission

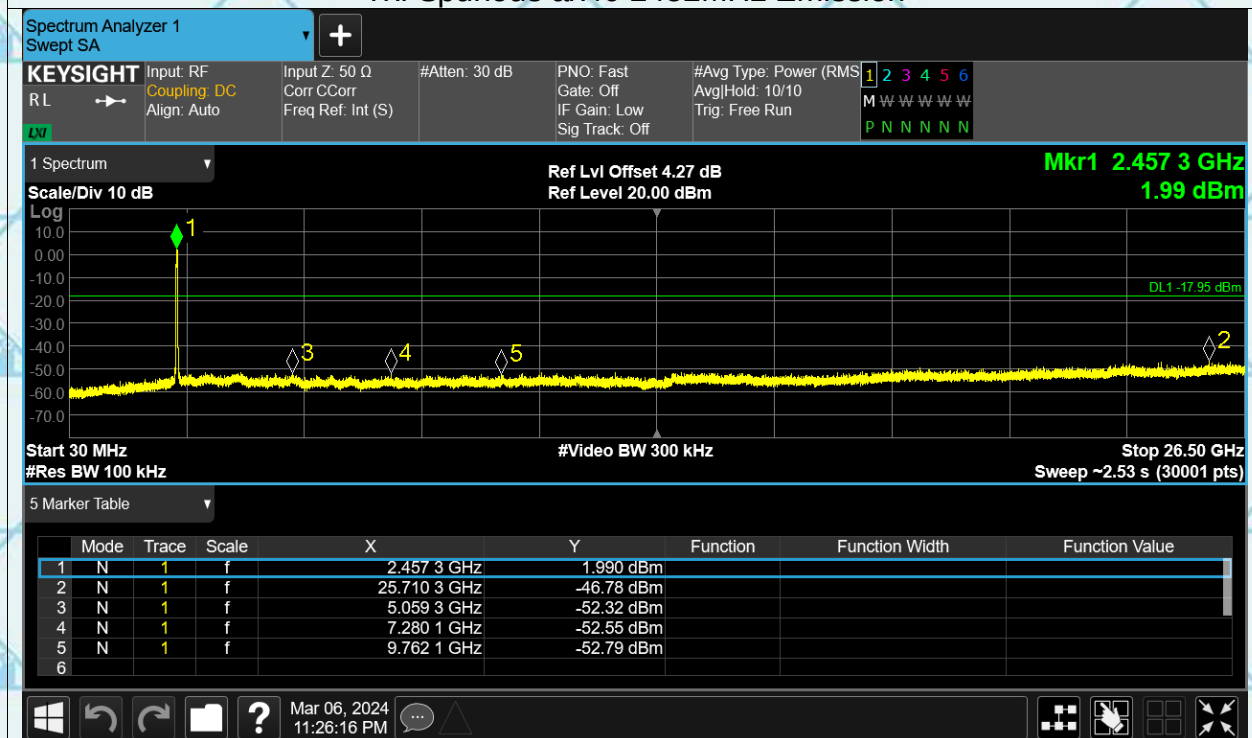




Tx. Spurious ax40 2452MHz Ref



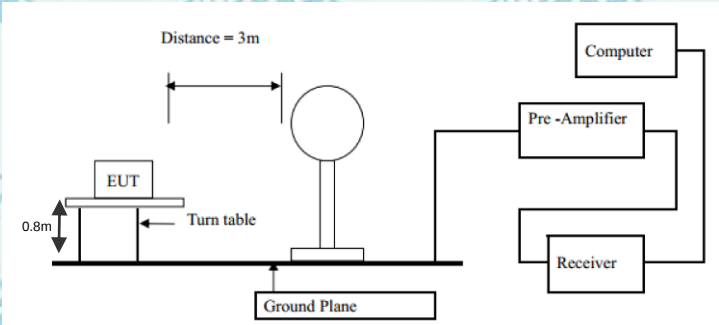
Tx. Spurious ax40 2452MHz Emission

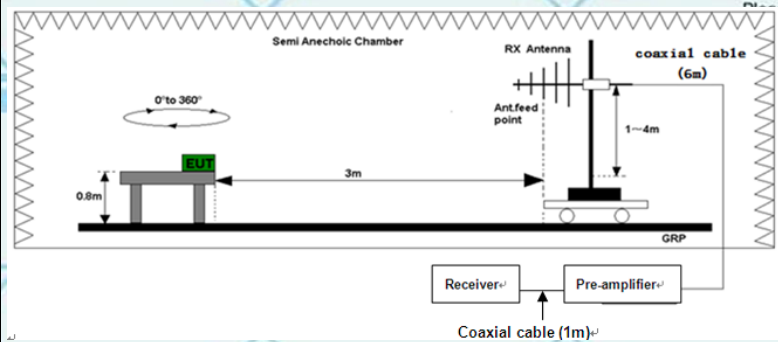




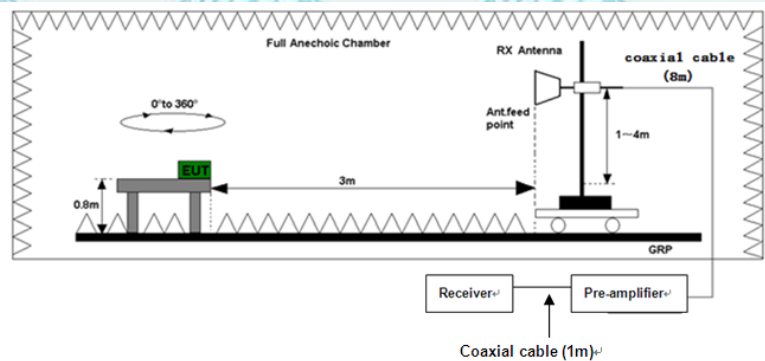
6.6. Radiated Spurious Emission Measurement

6.6.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10: 2014				
Frequency Range:	9 kHz to 25 GHz				
Measurement Distance:	3 m				
Antenna Polarization:	Horizontal & Vertical				
Operation mode:	Transmitting mode with modulation				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
Peak		1MHz	10Hz	Average Value	
Limit:	Frequency		Field Strength (microvolts/meter)		Measurement 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
	Frequency		Field Strength (microvolts/meter)	Measurement Distance (meters)	Detector
	Above 1GHz	500	3	Average	
5000		3	Peak		
Test setup:	For radiated emissions below 30MHz				
					
	30MHz to 1GHz				



Above 1GHz



Test Procedure:

- For the radiated emission test below 1GHz:
The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.
- For the radiated emission test above 1GHz:
Place the measurement antenna on a turntable with 1.5 meter above ground, which is away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.



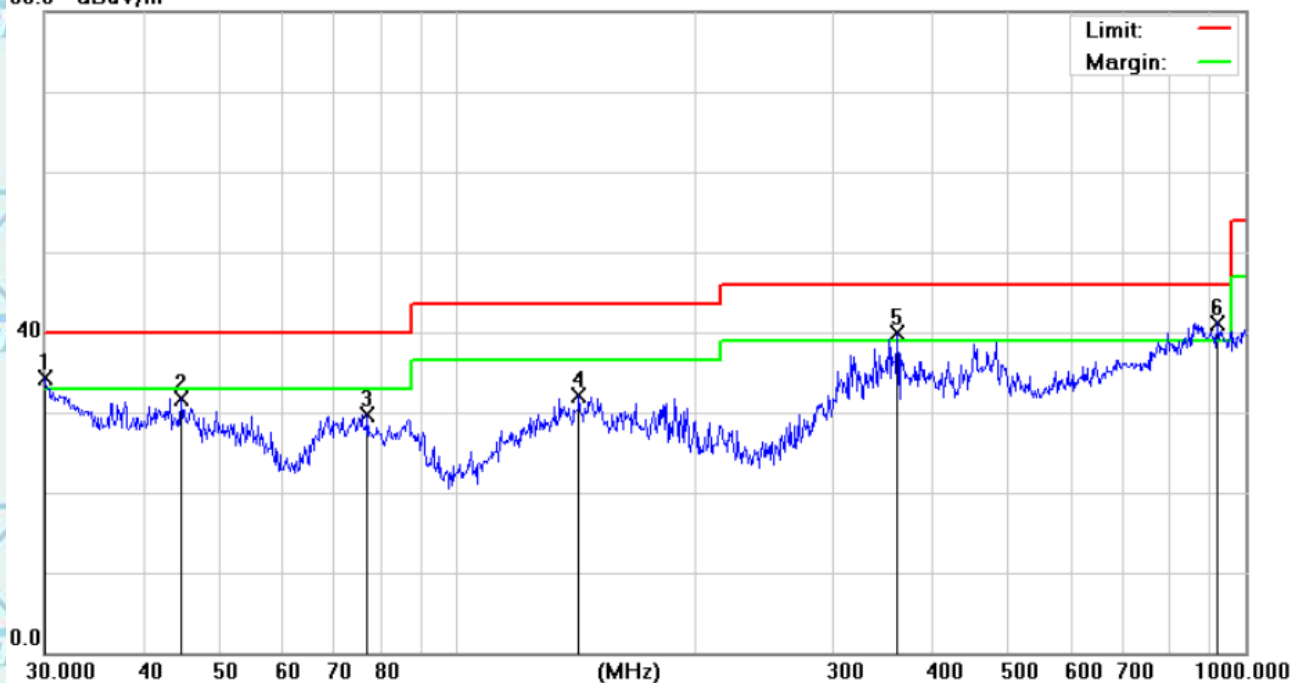
	3. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level 4. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported. 5. Use the following spectrum analyzer settings: (1) Span shall wide enough to fully capture the emission being measured; (2) Set RBW=100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold; (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement. For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Test results:	PASS



6.6.2. Test Data(worst)

Please refer to following diagram for individual
The worst mode is MIMO802.11n(H20)
Below 1GHz

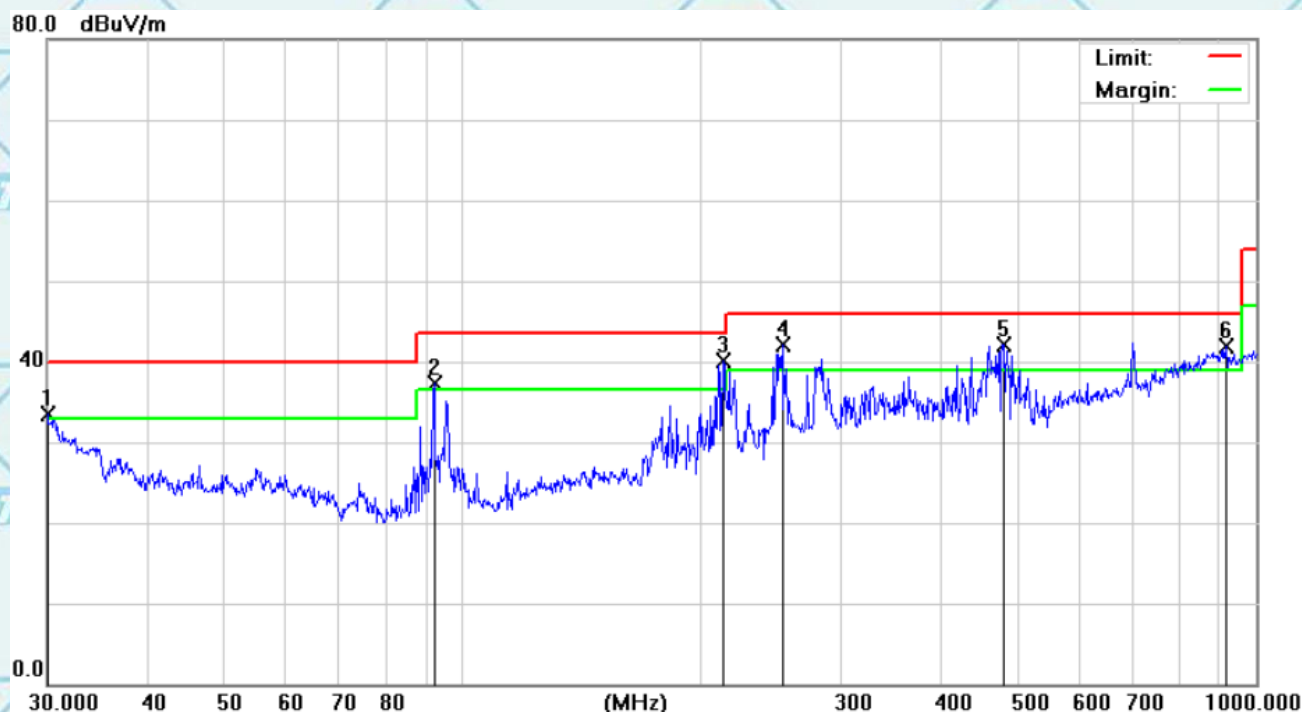
Horizontal:
80.0 dBuV/m



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	!	30.0000	36.05	-1.73	34.32	40.00	-5.68	QP
2		44.7433	32.74	-0.99	31.75	40.00	-8.25	QP
3		77.0505	34.27	-4.53	29.74	40.00	-10.26	QP
4		142.8243	32.40	-0.38	32.02	43.50	-11.48	QP
5	!	361.7139	38.28	1.67	39.95	46.00	-6.05	QP
6	*	919.2866	27.74	13.46	41.20	46.00	-4.80	QP



Vertical:



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	!	30.0000	35.26	-1.73	33.53	40.00	-6.47	QP
2	!	92.1388	41.93	-4.59	37.34	43.50	-6.16	QP
3	*	213.0151	43.29	-3.28	40.01	43.50	-3.49	QP
4	!	252.9482	43.64	-1.60	42.04	46.00	-3.96	QP
5	!	480.5276	37.30	4.85	42.15	46.00	-3.85	QP
6	!	916.0687	28.56	13.36	41.92	46.00	-4.08	QP

Note1:

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss - Amplifier factor.

Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)

Limit (dBuV) = Limit stated in standard

Margin (dB) = Measurement (dBuV) - Limits (dBuV)



Above 1GHz

The worst mode is MIMO802.11n20 802.11b

Freq. (MHz)	Low channel: 2412MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4824	V	59.11	41.84	74	54	-14.89	-12.16
7236	V	59.48	39.04	74	54	-14.52	-14.96
4824	H	59.76	40.81	74	54	-14.24	-13.19
7236	H	58.70	39.70	74	54	-15.30	-14.30
Freq. (MHz)	Middle channel: 2437MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4874	V	60.72	41.93	74	54	-13.28	-12.07
7311	V	59.42	40.14	74	54	-14.58	-13.86
4874	H	59.94	39.87	74	54	-14.06	-14.13
7311	H	59.49	40.49	74	54	-14.51	-13.51
Freq. (MHz)	High channel: 2462MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4924	V	59.03	40.34	74	54	-14.97	-13.66
7386	V	58.28	39.52	74	54	-15.72	-14.48
4924	H	59.91	40.24	74	54	-14.09	-13.76
7386	H	58.49	39.49	74	54	-15.51	-14.51

802.11g

Freq. (MHz)	Low channel: 2412MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4824	V	59.07	41.49	74	54	-14.93	-12.51
7236	V	59.83	40.62	74	54	-14.17	-13.38
4824	H	58.79	40.17	74	54	-15.21	-13.83
7236	H	59.87	40.87	74	54	-14.13	-13.13
Freq. (MHz)	Middle channel: 2437MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4874	V	60.53	41.70	74	54	-13.47	-12.30
7311	V	58.66	39.23	74	54	-15.34	-14.77
4874	H	59.09	39.06	74	54	-14.91	-14.94
7311	H	59.81	40.81	74	54	-14.19	-13.19
Freq. (MHz)	High channel: 2462MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4924	V	60.80	40.65	74	54	-13.20	-13.35
7386	V	59.65	39.34	74	54	-14.35	-14.66
4924	H	58.97	40.75	74	54	-15.03	-13.25
7386	H	59.85	40.85	74	54	-14.15	-13.15



20MHz(802.11n)

Freq. (MHz)	Low channel: 2412MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4824	V	60.92	41.11	74	54	-13.08	-12.89
7236	V	59.57	39.78	74	54	-14.43	-14.22
4824	H	59.28	39.81	74	54	-14.72	-14.19
7236	H	58.04	39.04	74	54	-15.96	-14.96
Freq. (MHz)	Middle channel: 2437MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4874	V	59.66	41.01	74	54	-14.34	-12.99
7311	V	58.02	39.27	74	54	-15.98	-14.73
4874	H	58.23	40.67	74	54	-15.77	-13.33
7311	H	59.95	40.95	74	54	-14.05	-13.05
Freq. (MHz)	High channel: 2462MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4924	V	60.88	40.15	74	54	-13.12	-13.85
7386	V	58.74	40.57	74	54	-15.26	-13.43
4924	H	59.55	39.30	74	54	-14.45	-14.70
7386	H	58.57	39.57	74	54	-15.43	-14.43

20MHz(802.11ax)

Freq. (MHz)	Low channel: 2412MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4824	V	58.98	40.21	74	54	-15.02	-13.79
7236	V	58.53	39.15	74	54	-15.47	-14.85
4824	H	59.91	39.68	74	54	-14.09	-14.32
7236	H	59.94	40.94	74	54	-14.06	-13.06
Freq. (MHz)	Middle channel: 2437MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4874	V	61.00	39.31	74	54	-13.00	-14.69
7311	V	58.03	40.82	74	54	-15.97	-13.18
4874	H	59.53	39.41	74	54	-14.47	-14.59
7311	H	58.38	39.38	74	54	-15.62	-14.62
Freq. (MHz)	High channel: 2462MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4924	V	58.30	41.96	74	54	-15.70	-12.04
7386	V	59.58	40.49	74	54	-14.42	-13.51
4924	H	58.63	39.36	74	54	-15.37	-14.64
7386	H	59.76	40.76	74	54	-14.24	-13.24



40MHz(802.11n)

Freq. (MHz)	Low channel: 2412MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4824	V	58.32	41.40	74	54	-15.68	-12.60
7236	V	58.95	39.56	74	54	-15.05	-14.44
4824	H	58.14	39.49	74	54	-15.86	-14.51
7236	H	58.55	39.55	74	54	-15.45	-14.45

Freq. (MHz)	Middle channel: 2437MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4874	V	60.36	39.09	74	54	-13.64	-14.91
7311	V	59.91	40.97	74	54	-14.09	-13.03
4874	H	59.95	39.16	74	54	-14.05	-14.84
7311	H	59.40	40.40	74	54	-14.60	-13.60

Freq. (MHz)	High channel: 2462MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4924	V	58.36	39.68	74	54	-15.64	-14.32
7386	V	59.57	39.23	74	54	-14.43	-14.77
4924	H	58.05	40.36	74	54	-15.95	-13.64
7386	H	58.60	39.60	74	54	-15.40	-14.40

40MHz(802.11ax)

Freq. (MHz)	Low channel: 2412MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4824	V	60.96	40.55	74	54	-13.04	-13.45
7236	V	59.67	40.54	74	54	-14.33	-13.46
4824	H	58.16	40.07	74	54	-15.84	-13.93
7236	H	58.44	39.44	74	54	-15.56	-14.56
Freq. (MHz)	Middle channel: 2437MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4874	V	60.27	40.39	74	54	-13.73	-13.61
7311	V	58.91	39.47	74	54	-15.09	-14.53
4874	H	59.47	39.24	74	54	-14.53	-14.76
7311	H	59.95	40.95	74	54	-14.05	-13.05
Freq. (MHz)	High channel: 2462MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4924	V	58.42	40.75	74	54	-15.58	-13.25
7386	V	58.40	40.24	74	54	-15.60	-13.76
4924	H	58.27	40.38	74	54	-15.73	-13.62
7386	H	59.70	40.70	74	54	-14.30	-13.30



Note:

1. All emissions not reported were more than 20dB below the specified limit or in the noise floor.
2. Emission Level= Reading Level+ Probe Factor +Cable Loss.
3. Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Restricted Bands Requirements

Test result for 802.11b Mode (the worst case)

Frequency	Reading	Correct Factor	Emission Level	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel							
2390	69.76	-8.73	61.03	74	-12.97	H	PK
2390	49.54	-8.73	40.81	54	-13.19	H	AV
2390	69.21	-8.73	60.48	74	-13.52	V	PK
2390	49.29	-8.73	40.56	54	-13.44	V	AV
High Channel							
2483.5	69.41	-8.17	61.24	74	-12.76	H	PK
2483.5	45.02	-8.17	36.85	54	-17.15	H	AV
2483.5	65.91	-8.17	57.74	74	-16.26	V	PK
2483.5	47.31	-8.17	39.14	54	-14.86	V	AV

*****END OF REPORT*****