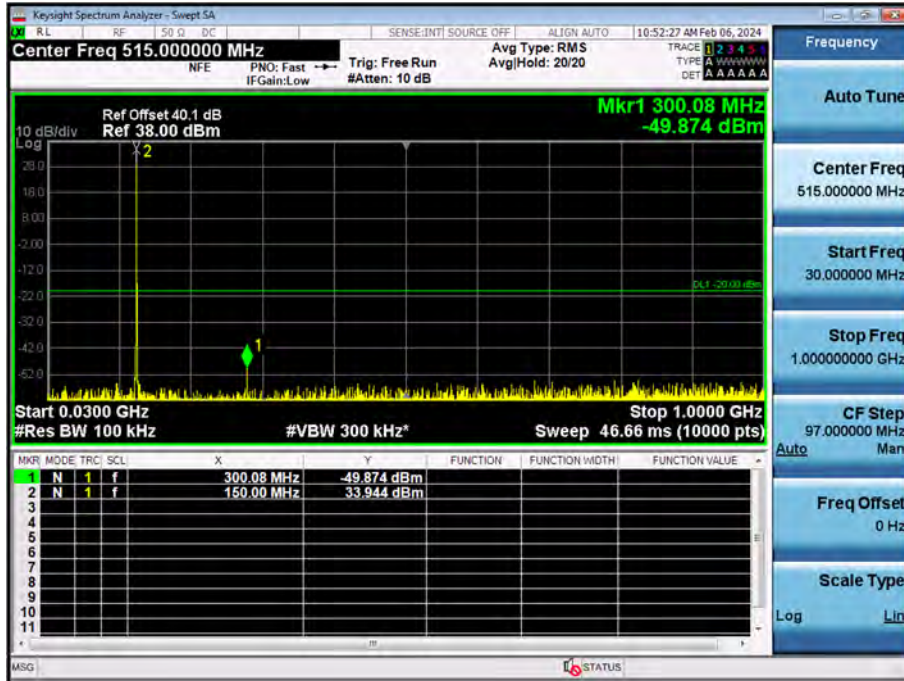
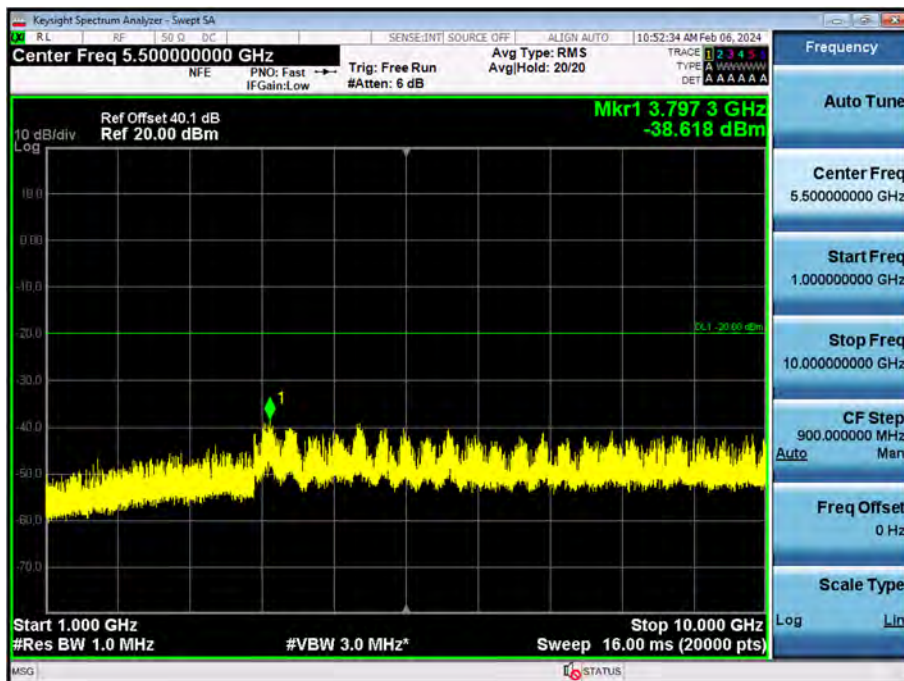


30 MHz~1 GHz



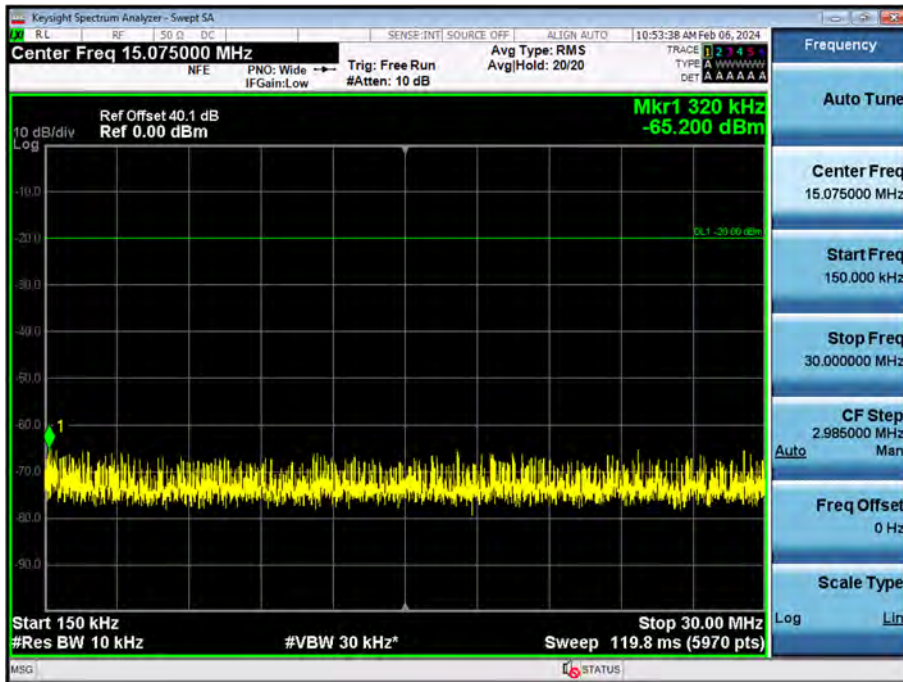
1 GHz~10 GHz



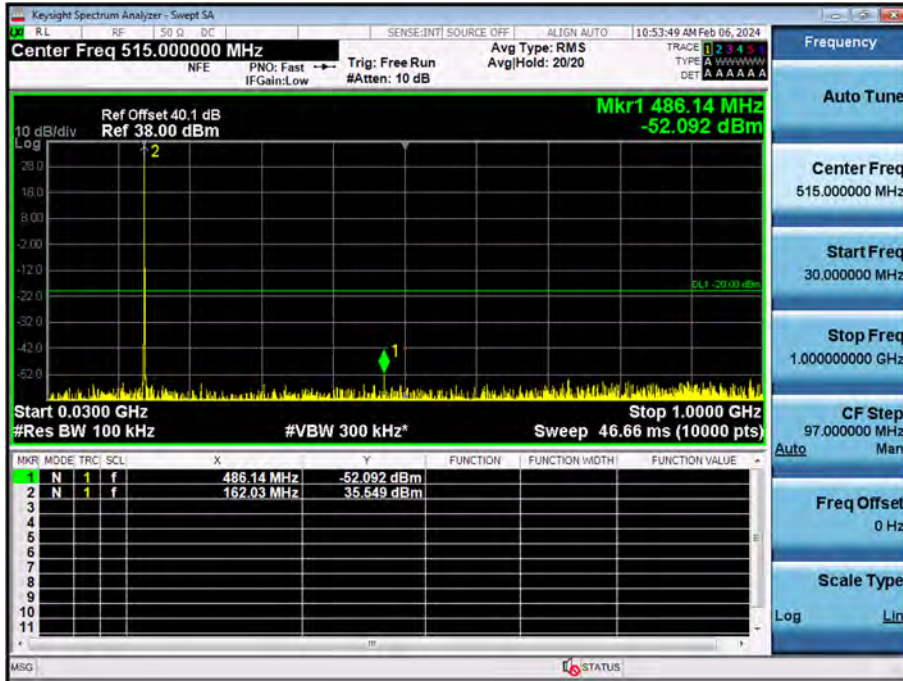
(162.05 MHz)_High
9 kHz~150 kHz



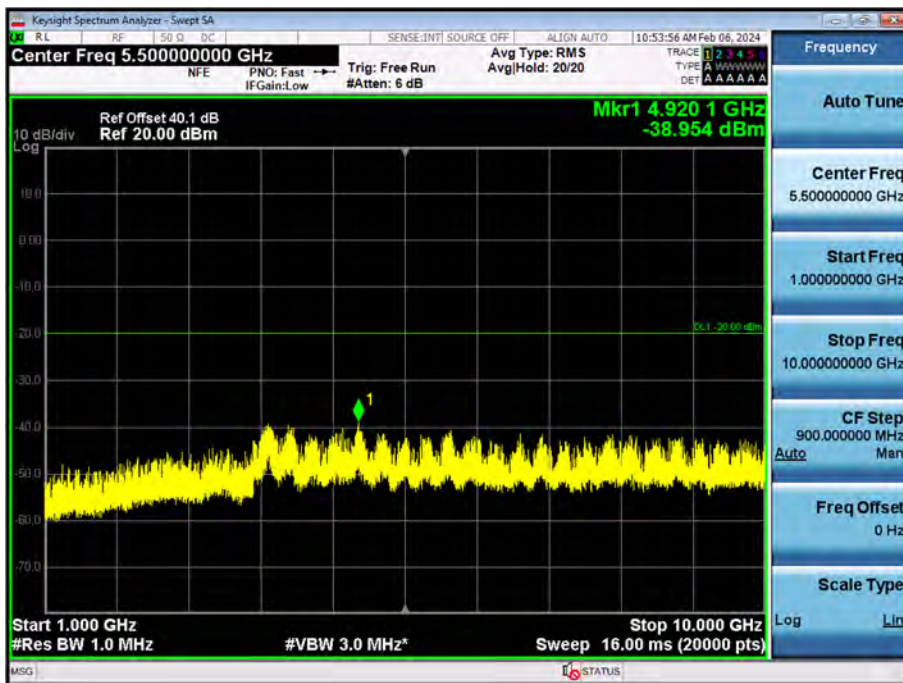
150 kHz~30 MHz



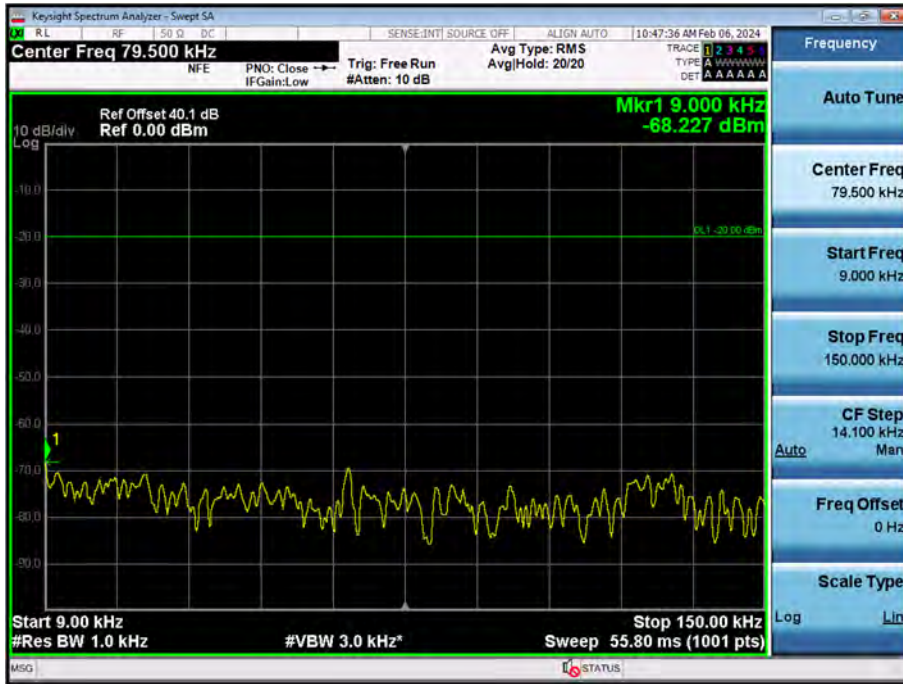
30 MHz~1 GHz



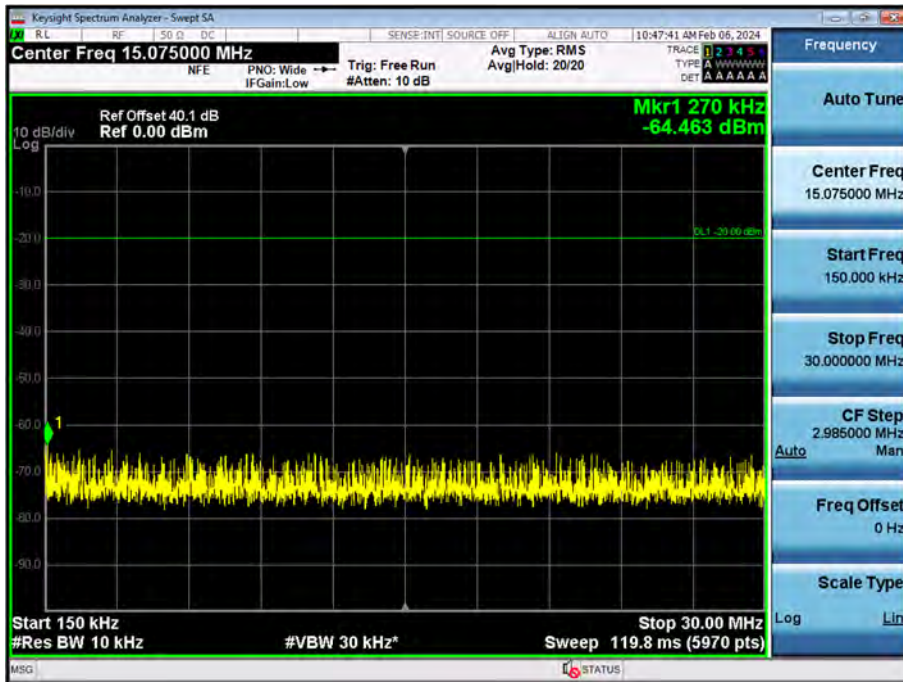
1 GHz~10 GHz



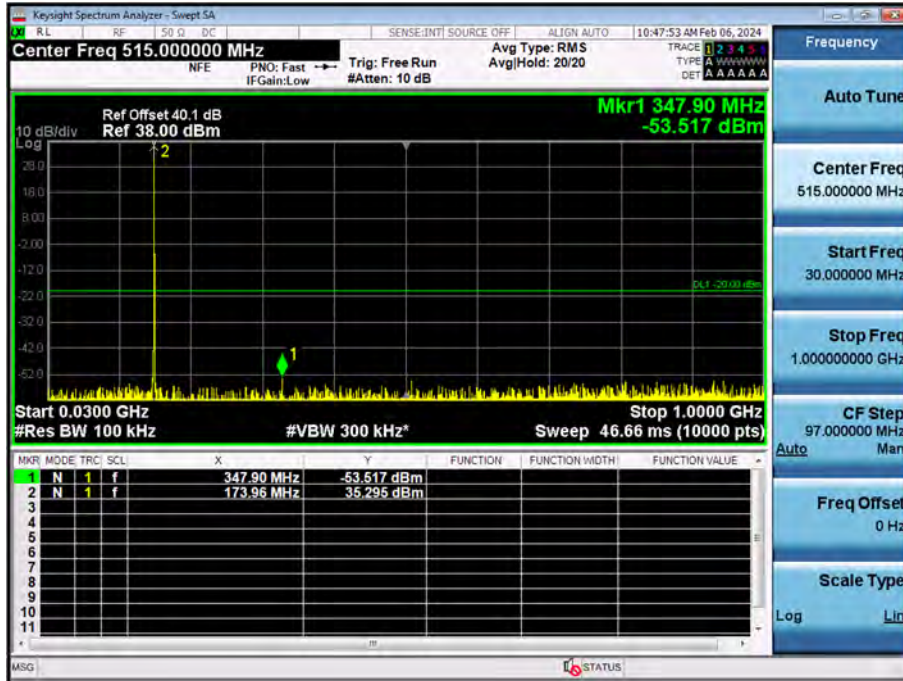
(173.95 MHz)_High
9 kHz~150 kHz



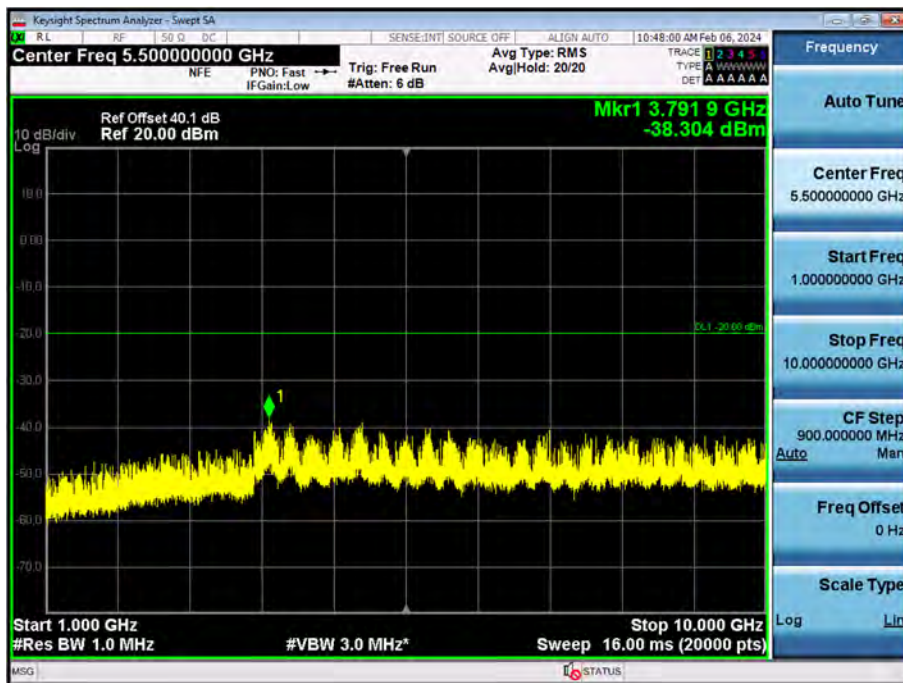
150 kHz~30 MHz



30 MHz~1 GHz



1 GHz~10 GHz

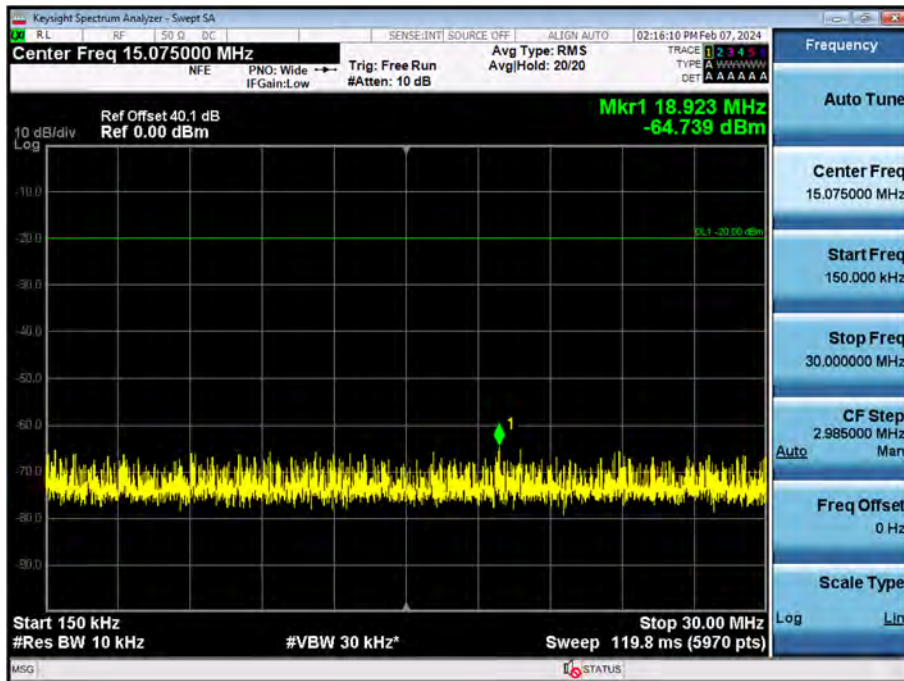


8K30F1E, 8K30F1D, 8K30F7W

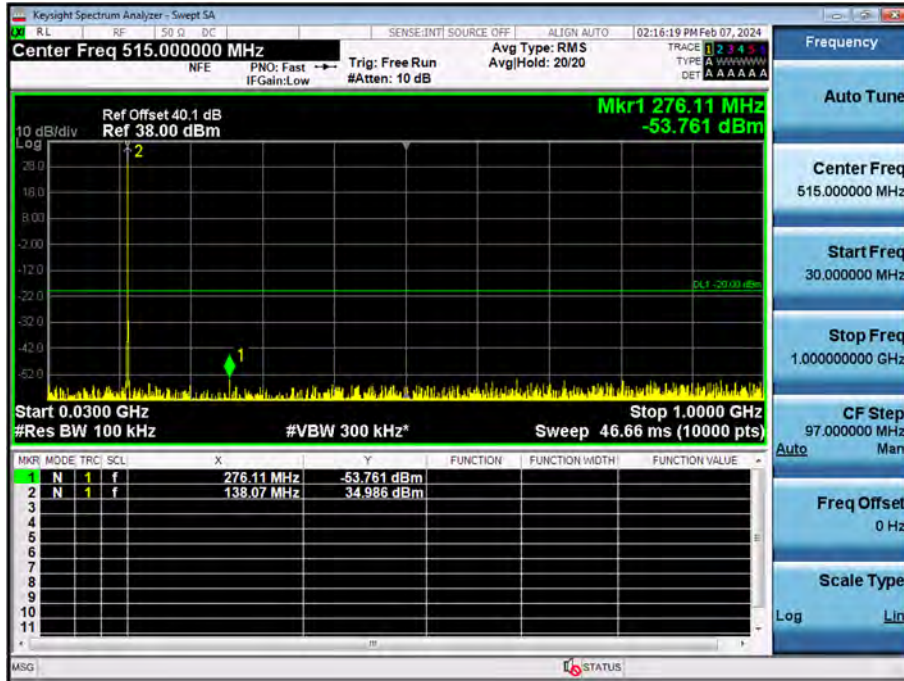
(138.05 MHz)_High
9 kHz~150 kHz



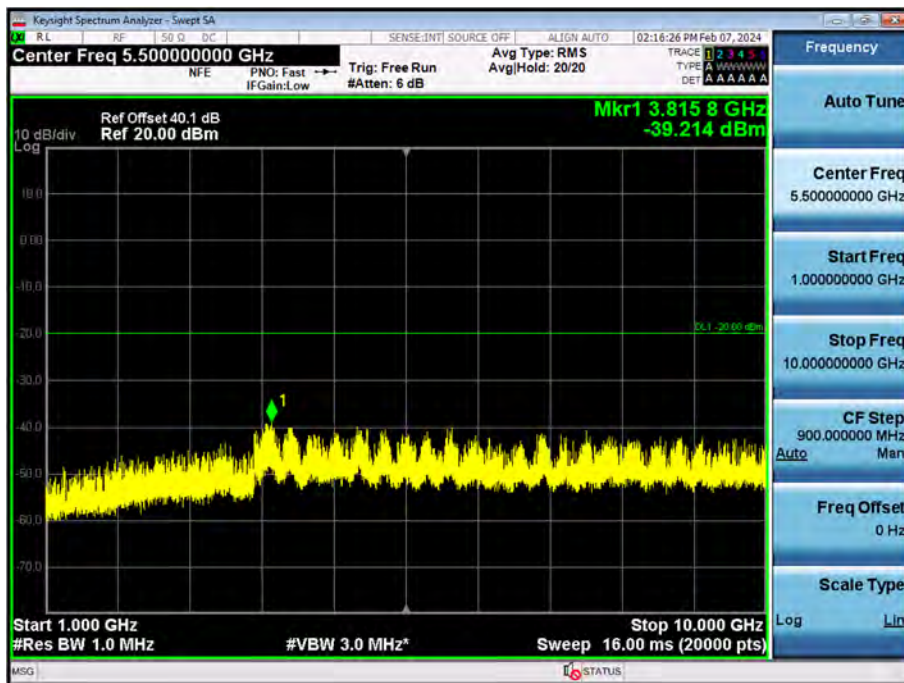
150 kHz~30 MHz



30 MHz~1 GHz



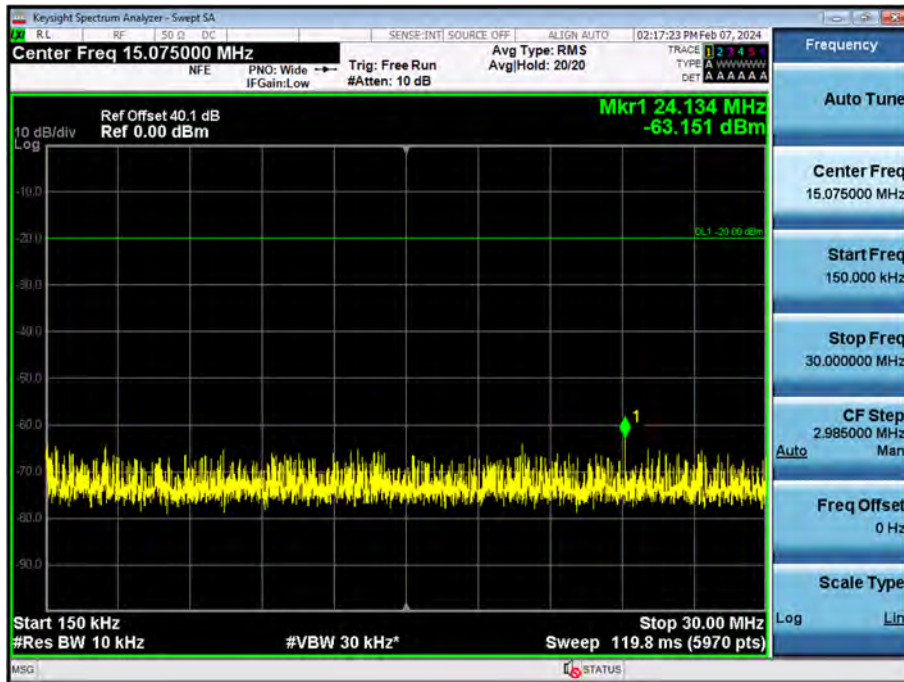
1 GHz~10 GHz



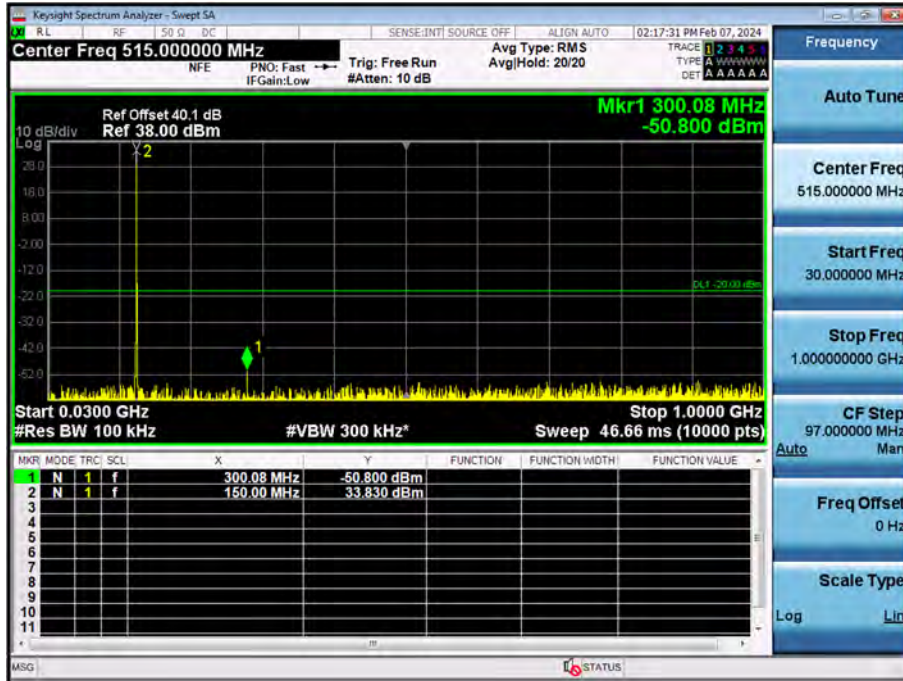
(150.05 MHz)_High
9 kHz~150 kHz



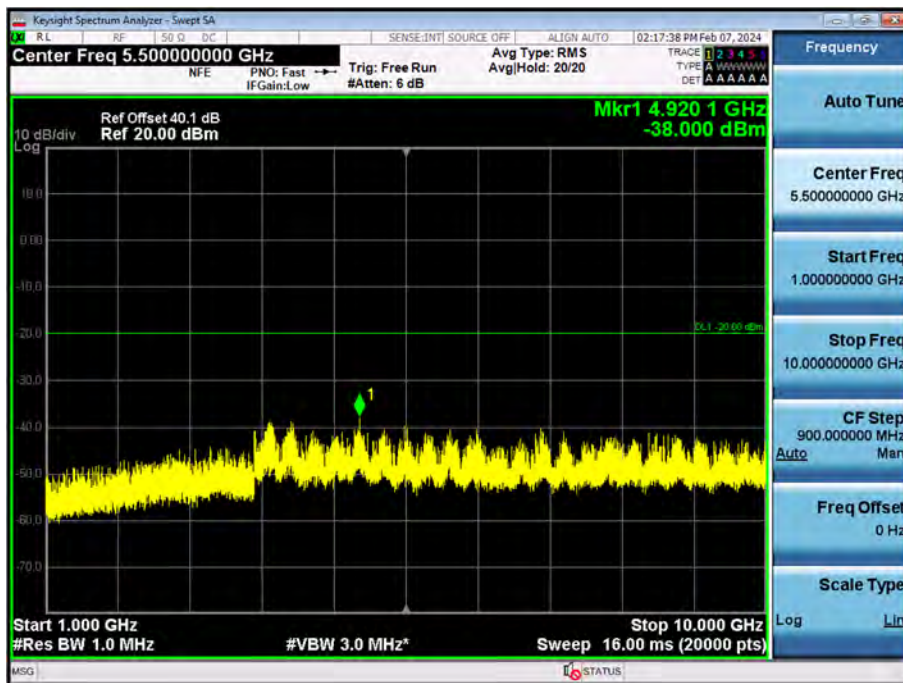
150 kHz~30 MHz



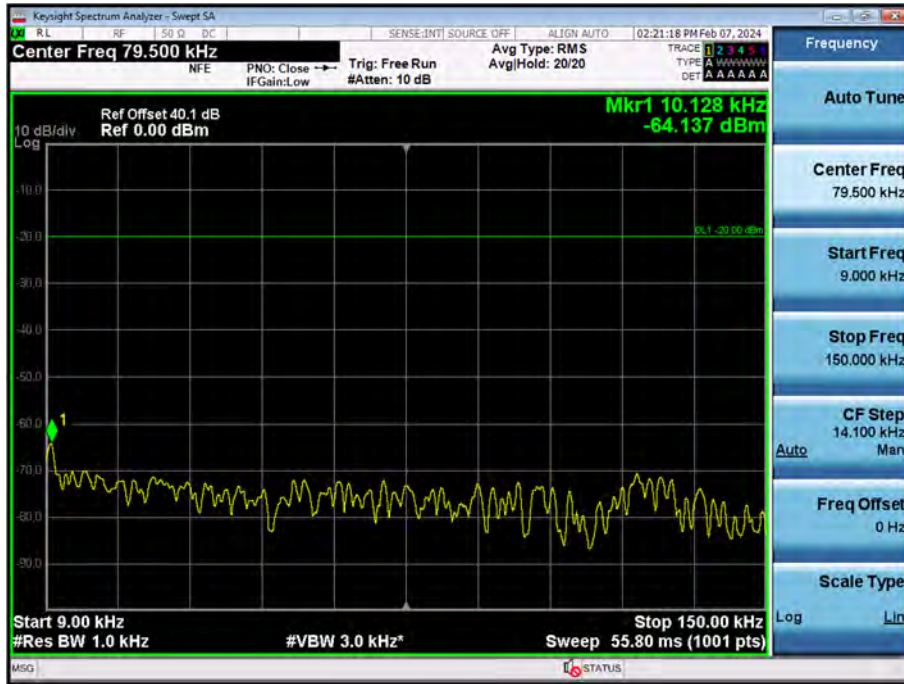
30 MHz~1 GHz



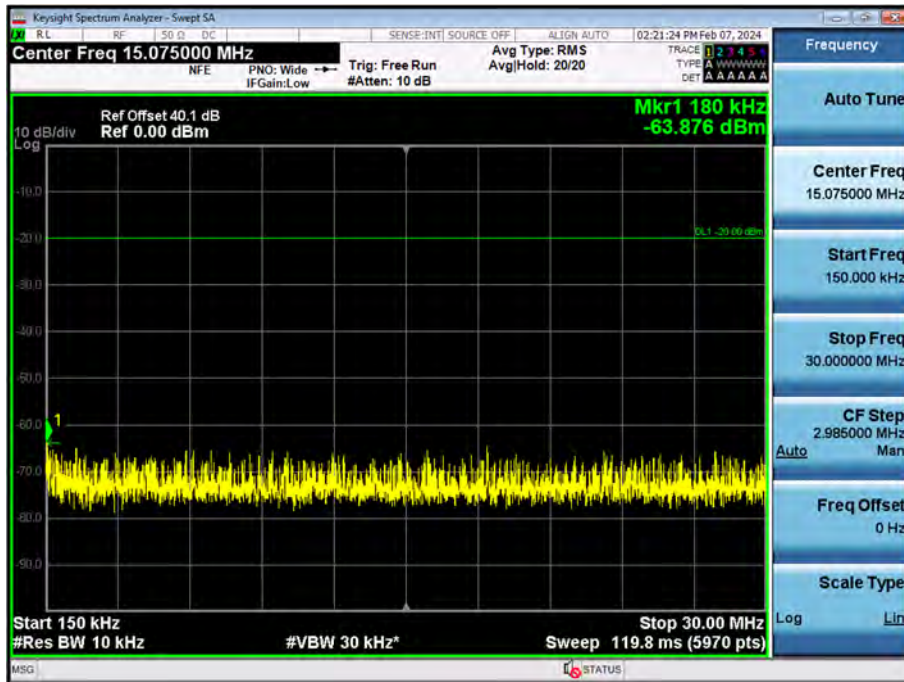
1 GHz~10 GHz



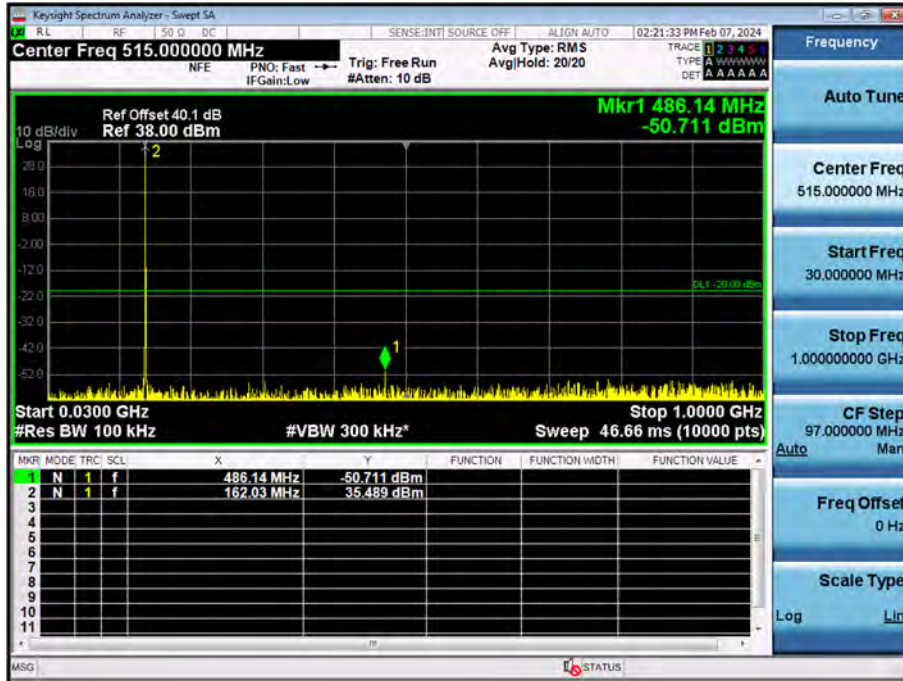
(162.05 MHz)_High
9 kHz~150 kHz



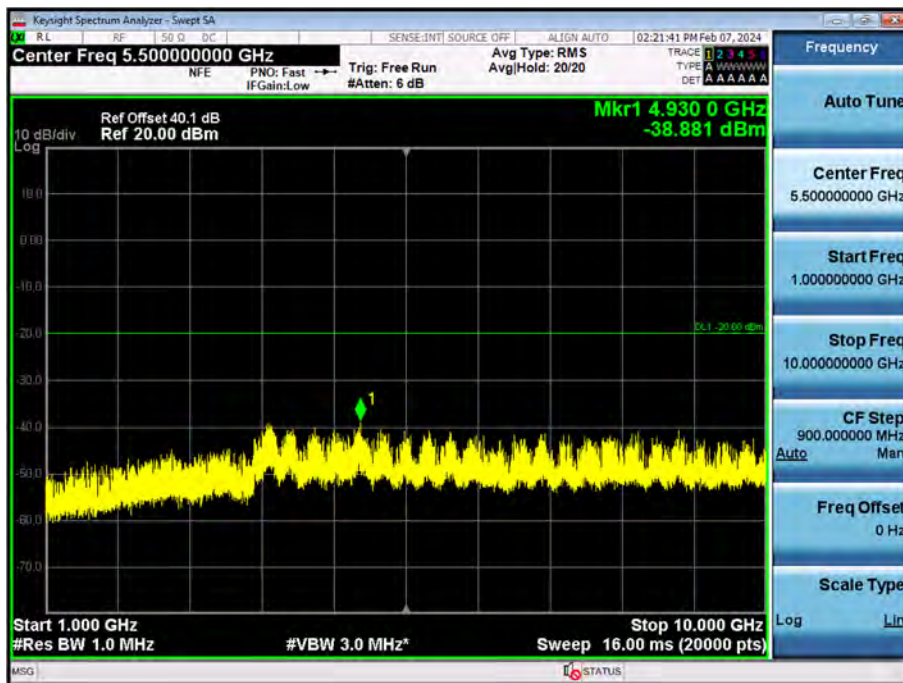
150 kHz~30 MHz



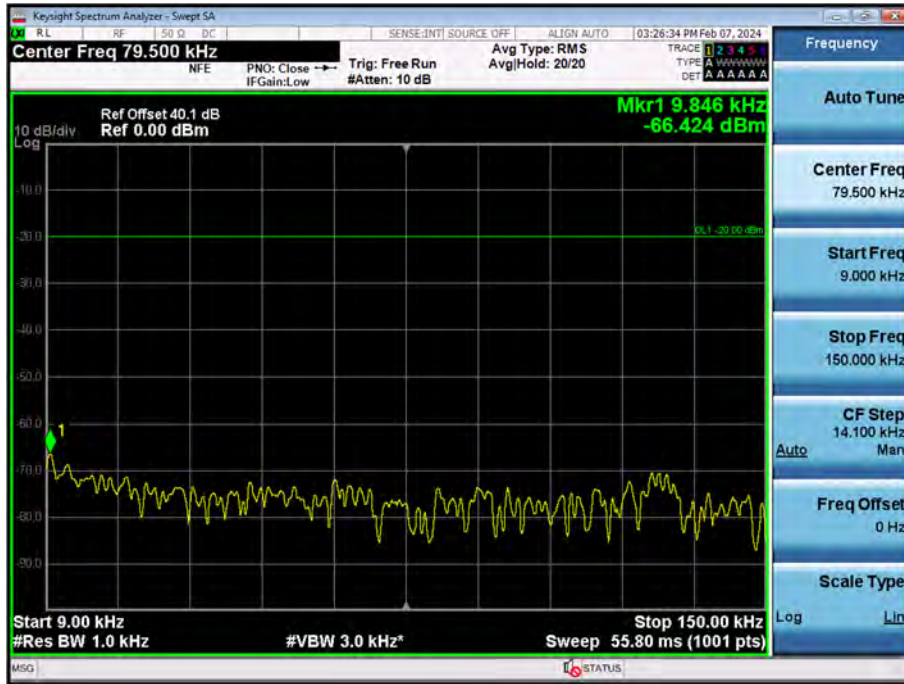
30 MHz~1 GHz



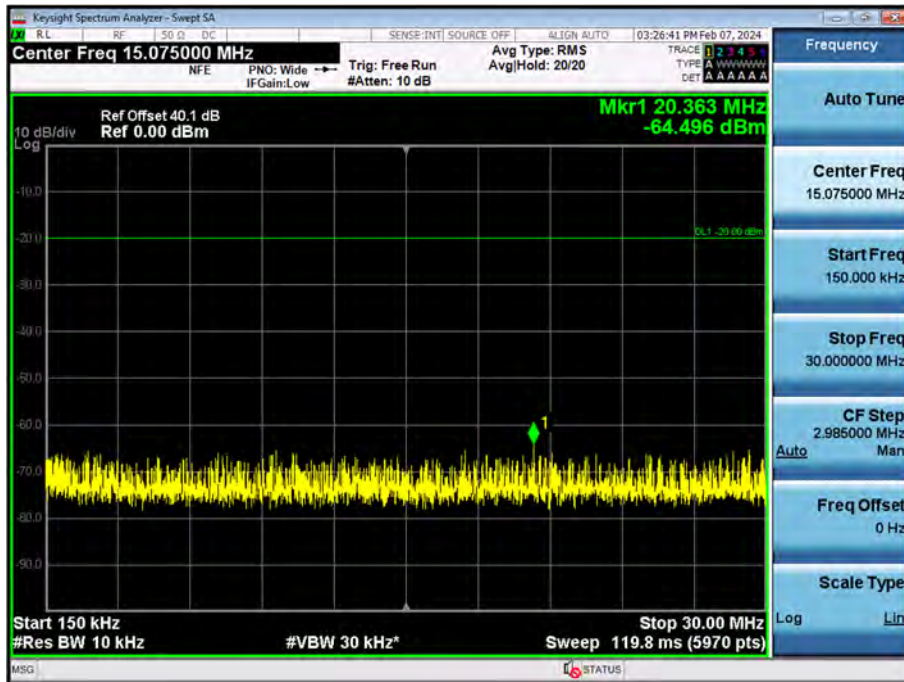
1 GHz~10 GHz



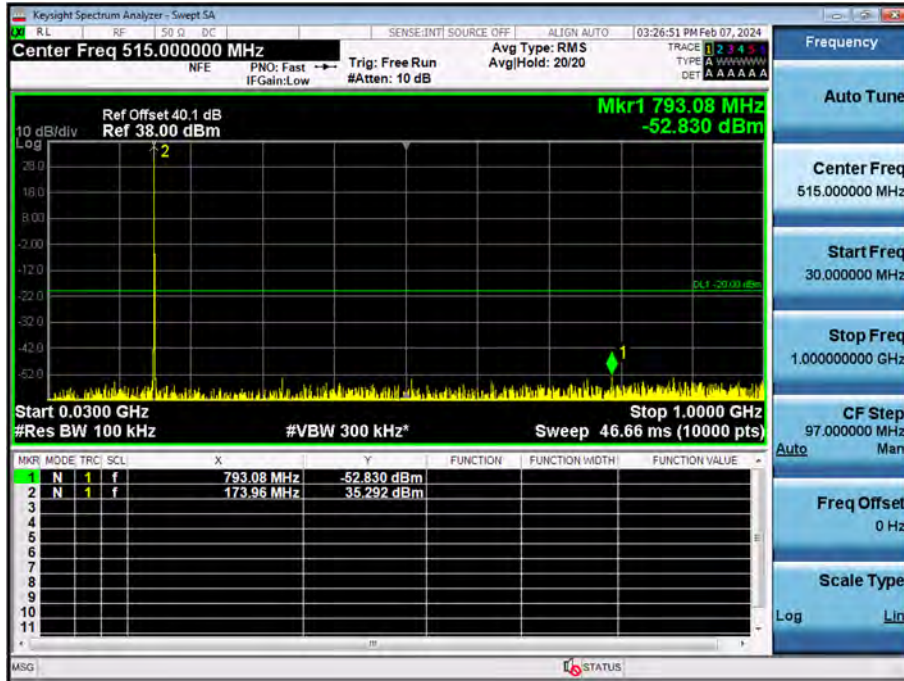
(173.95 MHz)_High
9 kHz~150 kHz



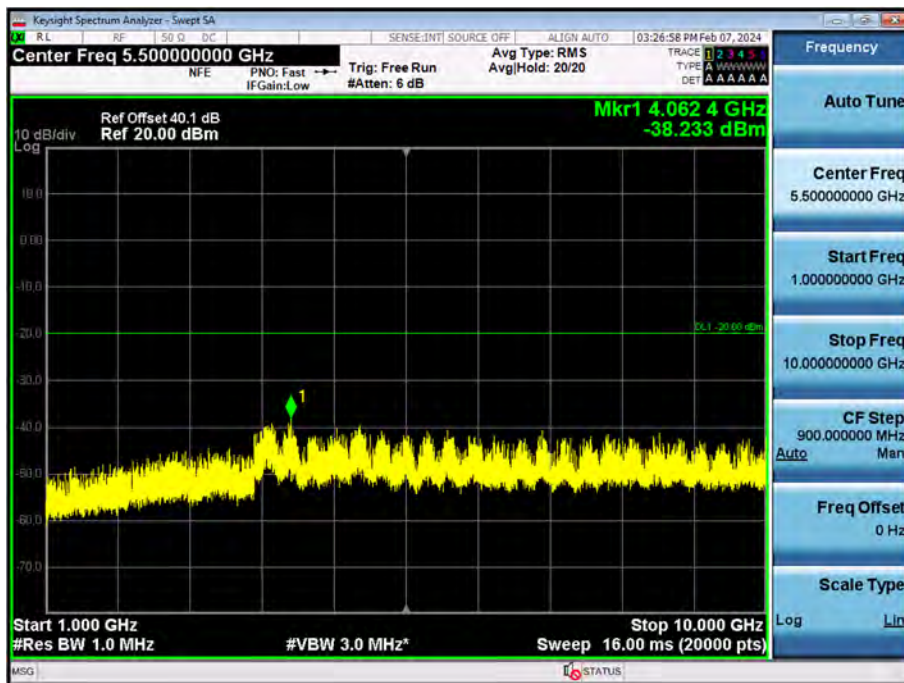
150 kHz~30 MHz



30 MHz~1 GHz

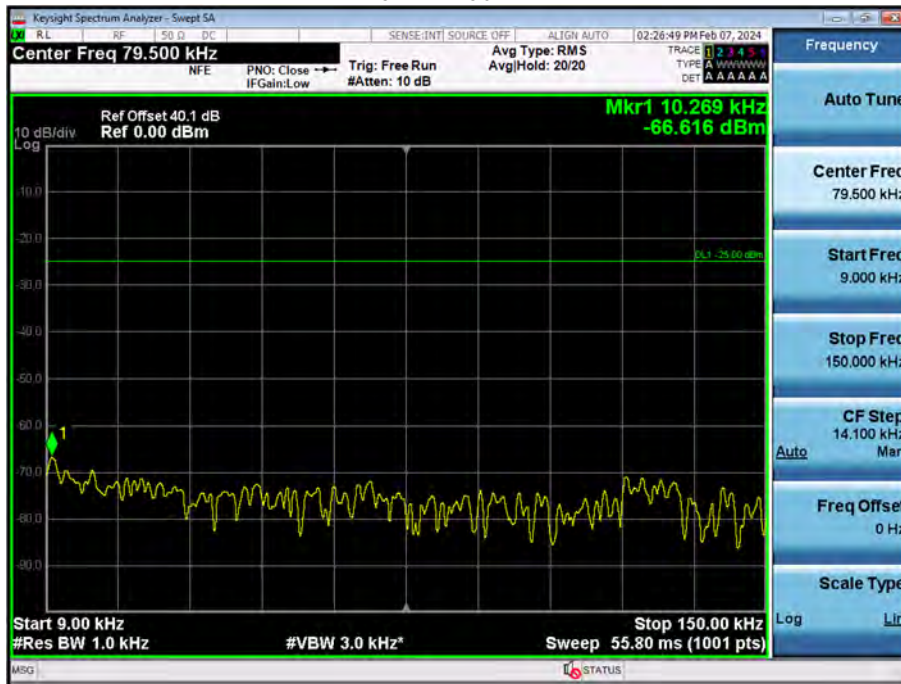


1 GHz~10 GHz

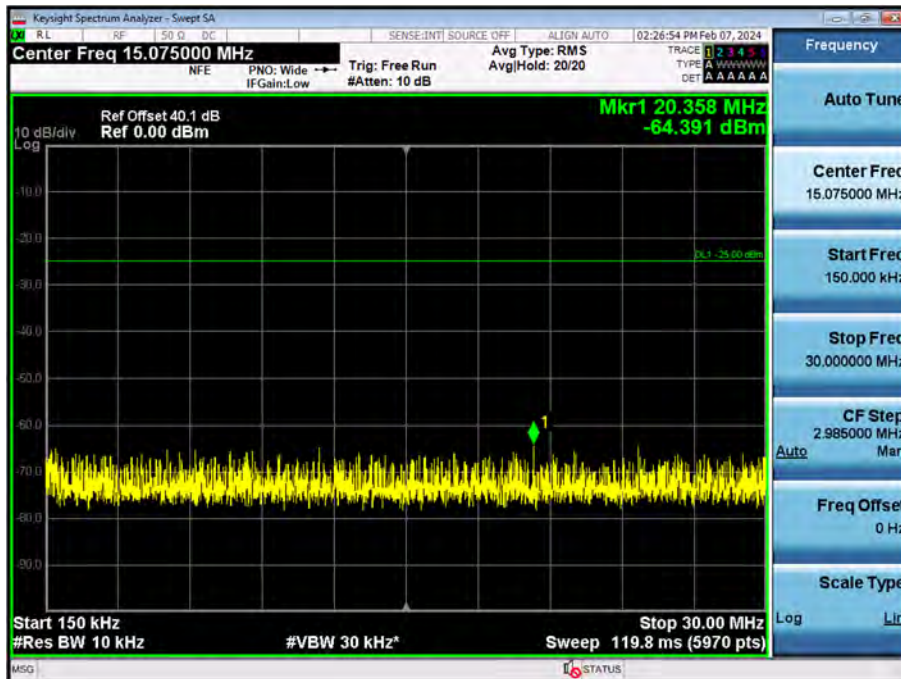


4K00F1E, 4K00F1D, 4K00F7W

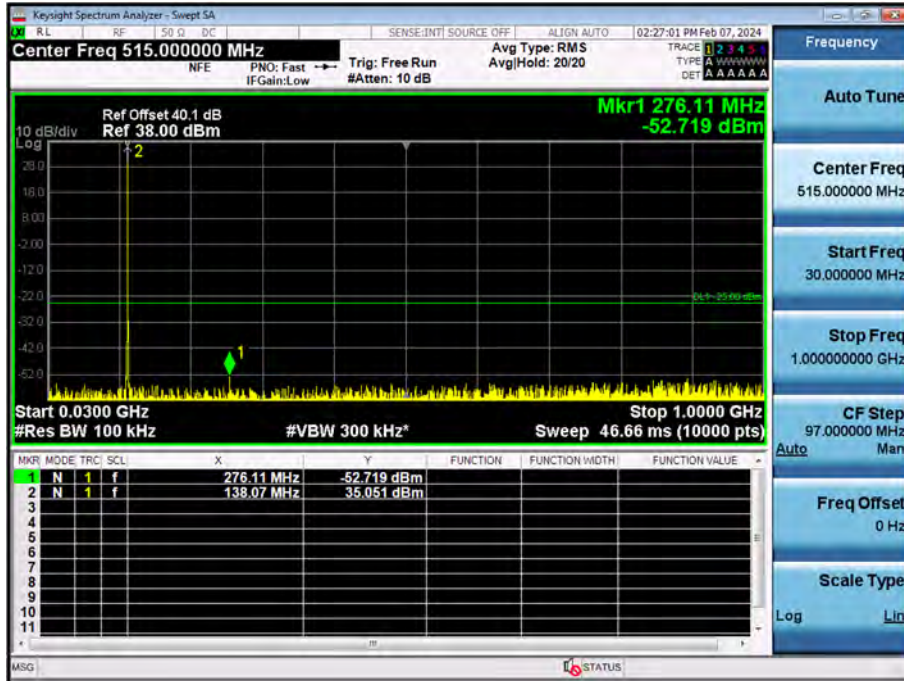
(13.05 MHz)_High
9 kHz~150 kHz



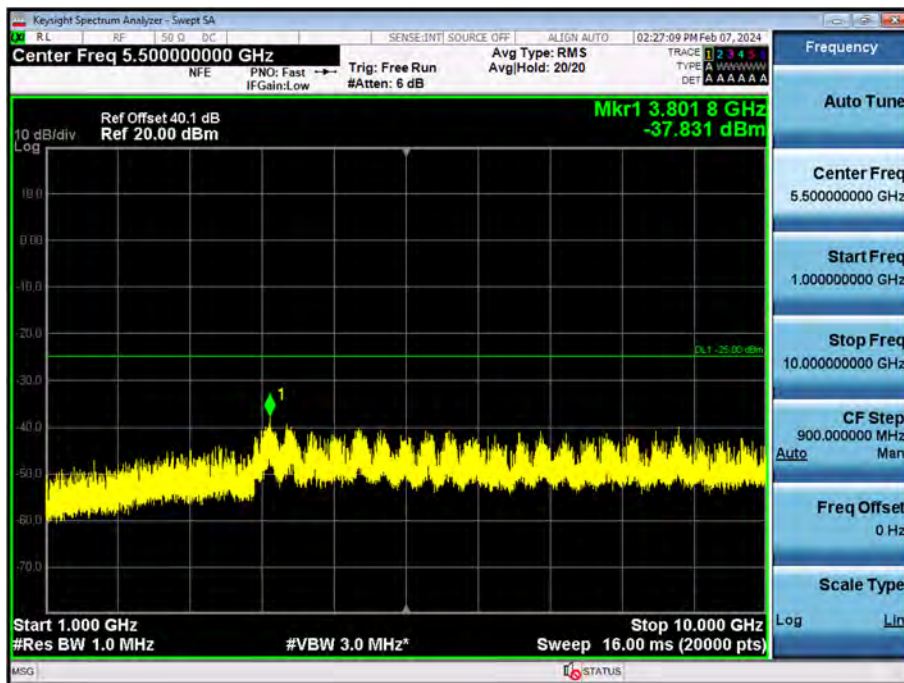
150 kHz~30 MHz



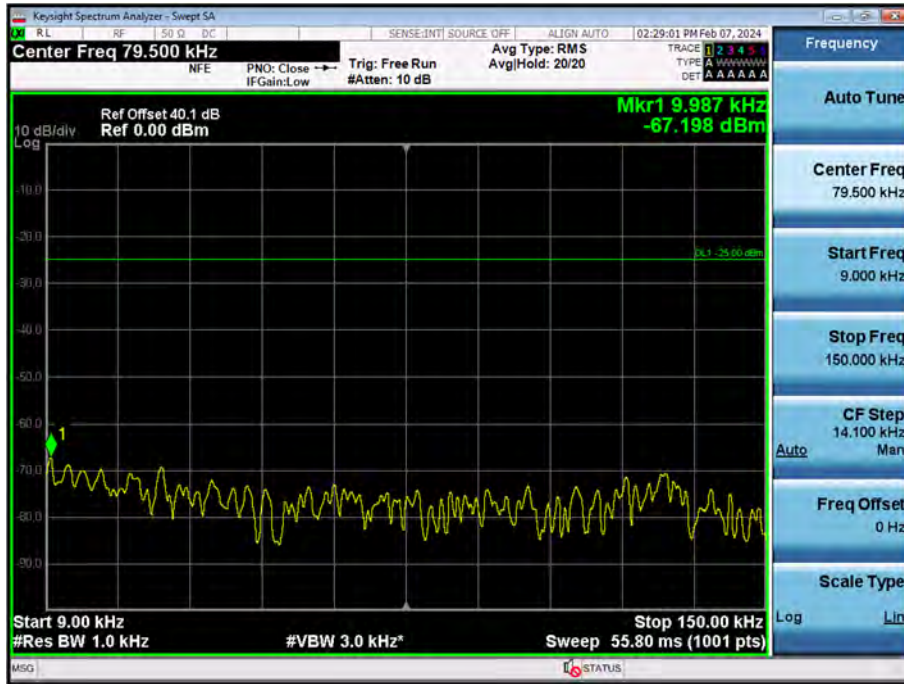
30 MHz~1 GHz



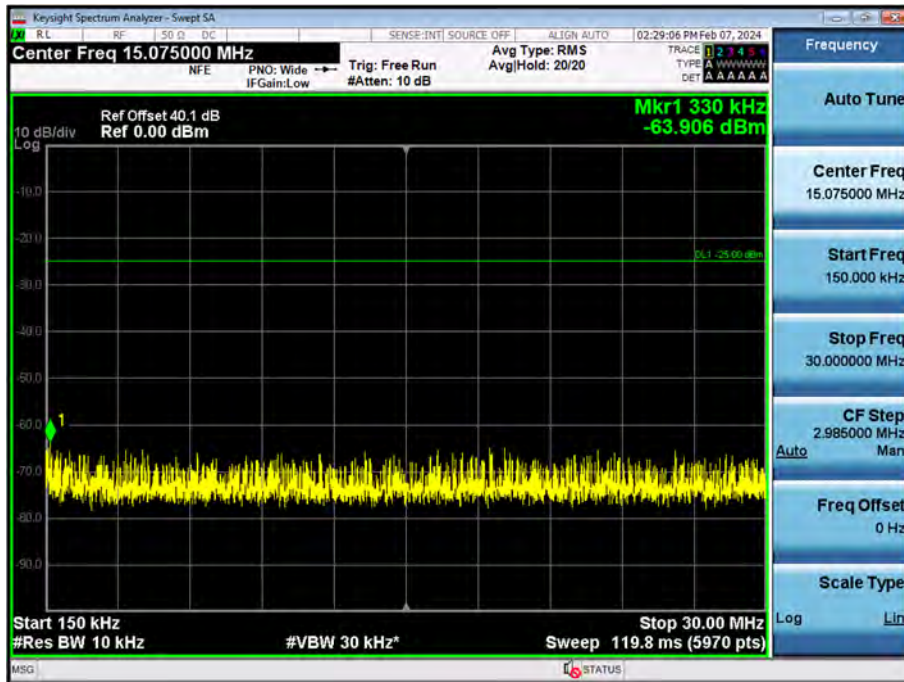
1 GHz~10 GHz



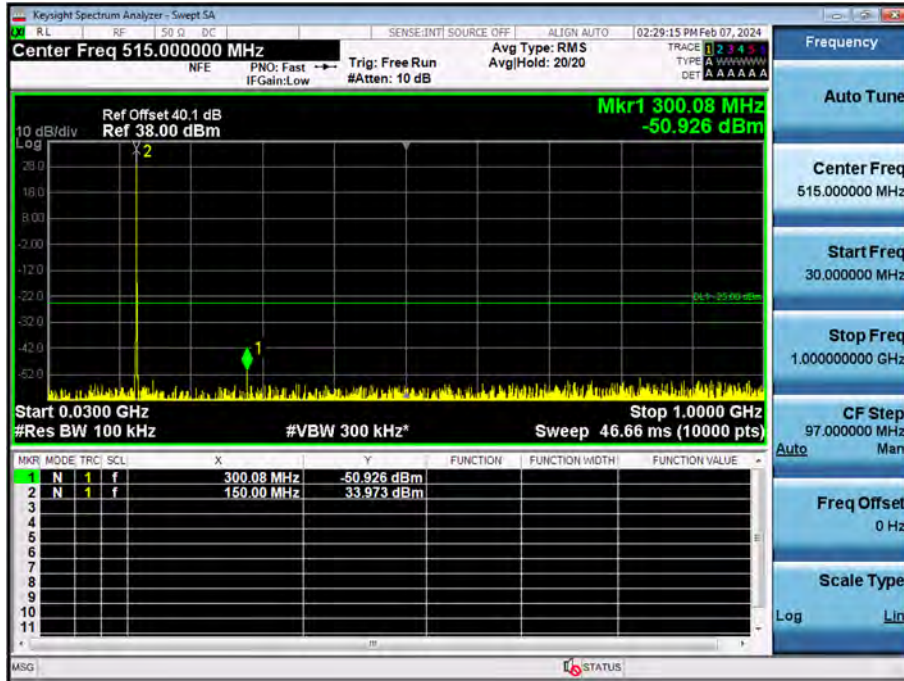
(150.05 MHz)_High
9 kHz~150 kHz



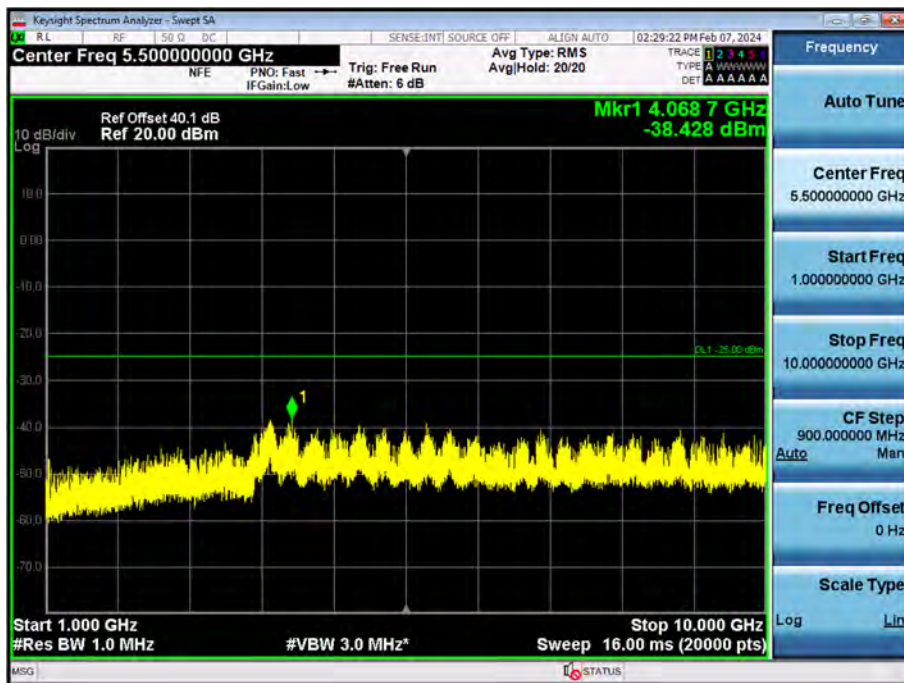
150 kHz~30 MHz



30 MHz~1 GHz



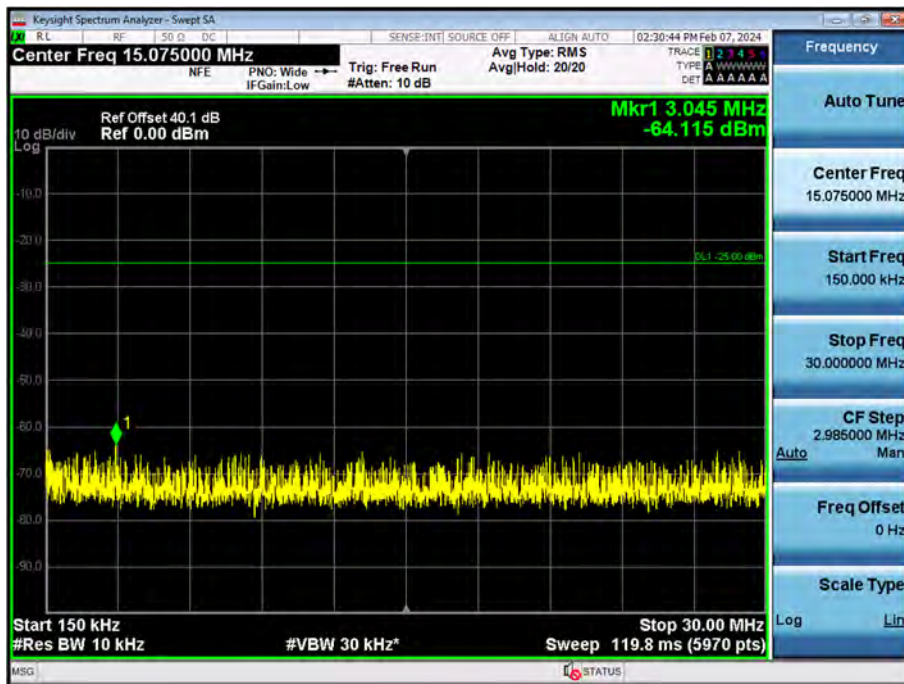
1 GHz~10 GHz



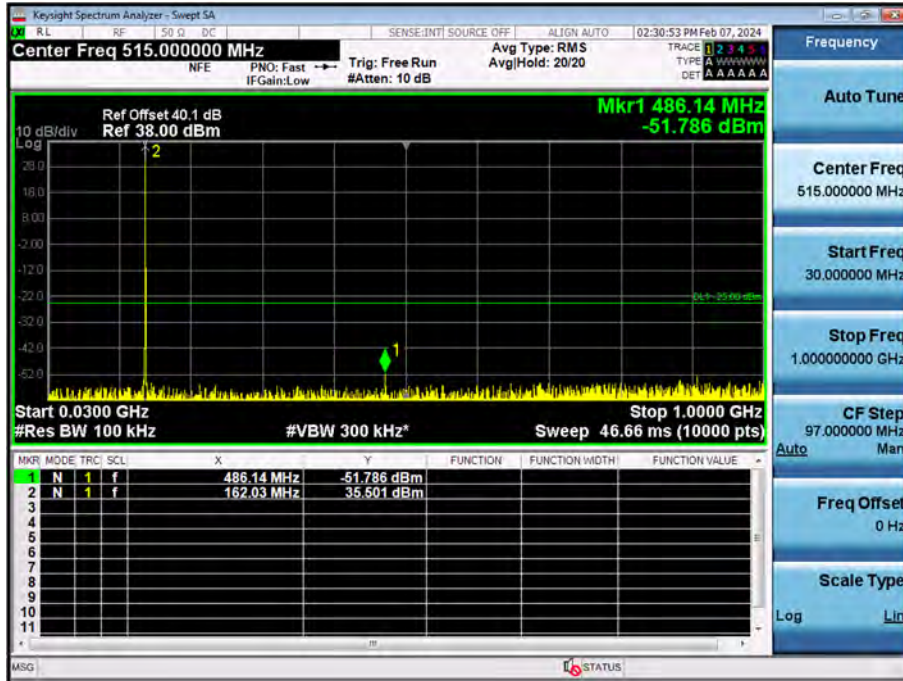
(162.05 MHz)_High
9 kHz~150 kHz



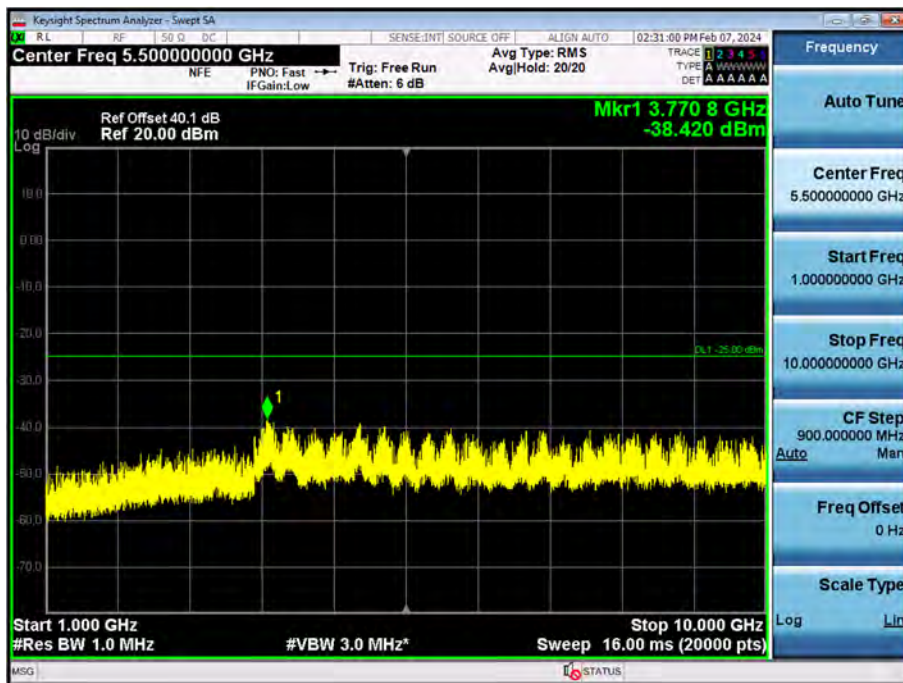
150 kHz~30 MHz



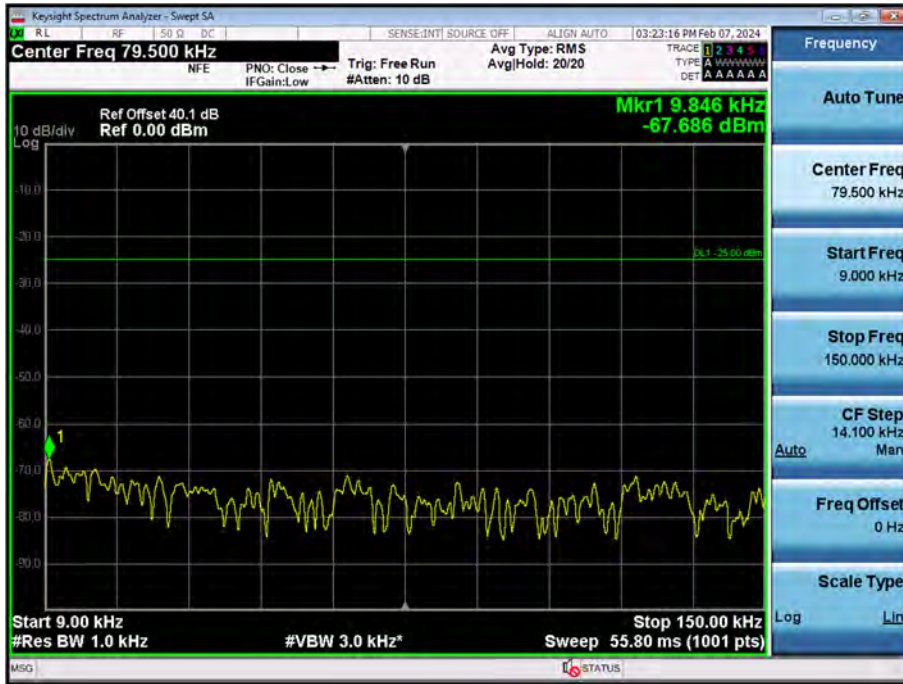
30 MHz~1 GHz



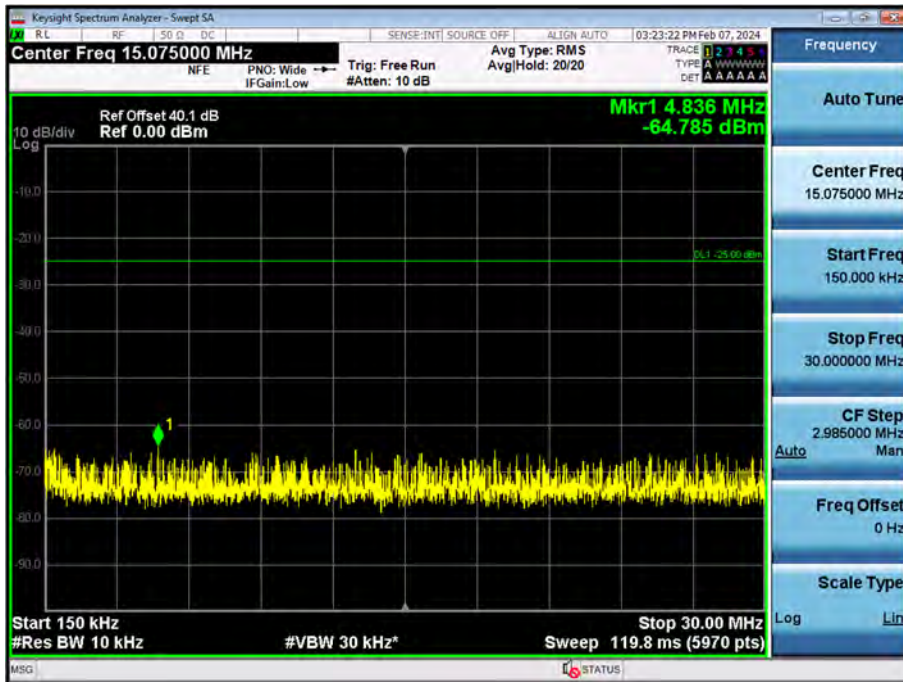
1 GHz~10 GHz



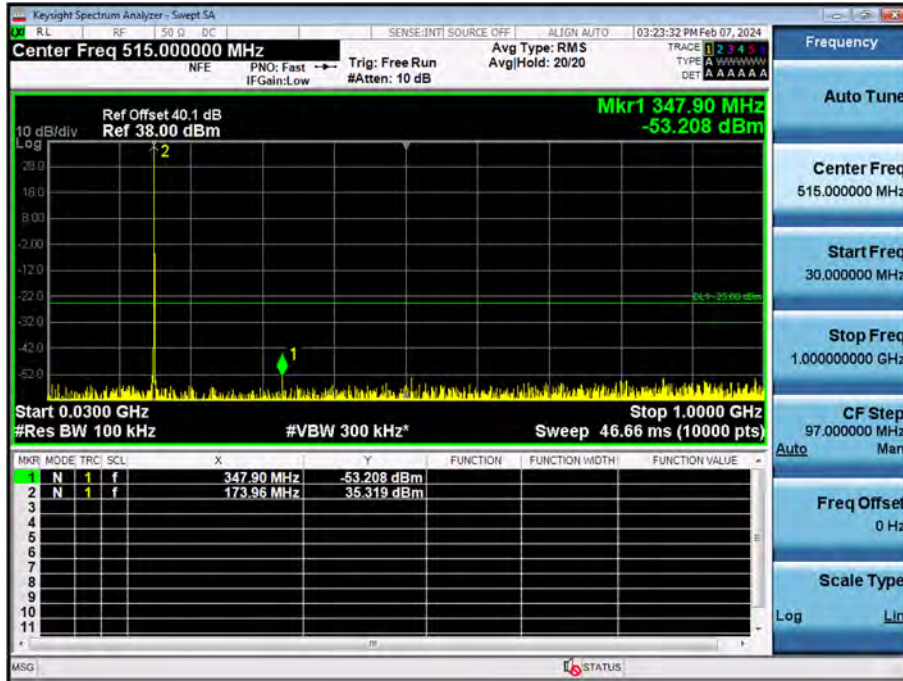
(173.95 MHz)_High
9 kHz~150 kHz



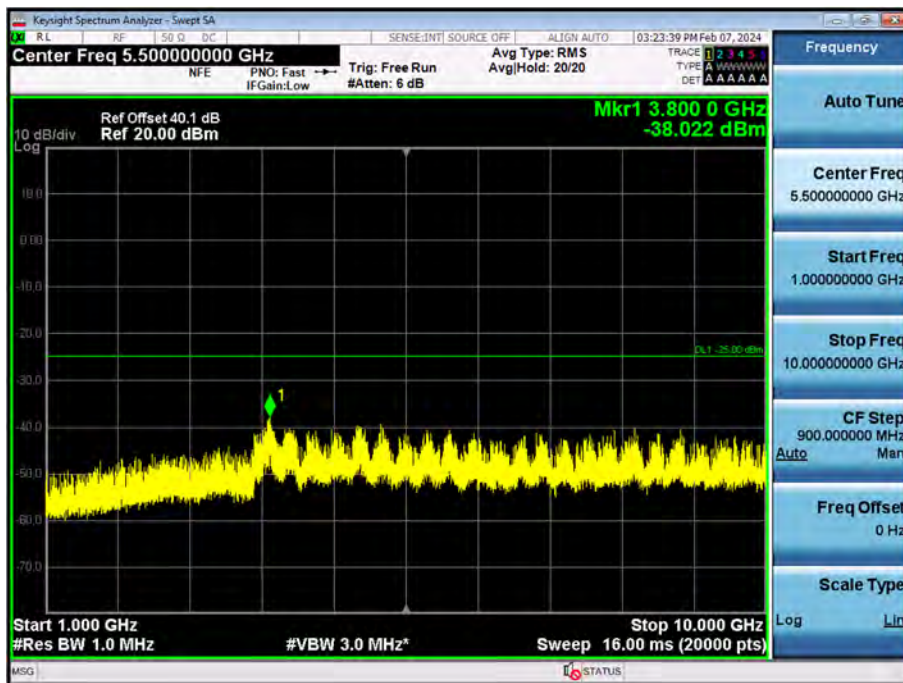
150 kHz~30 MHz



30 MHz~1 GHz

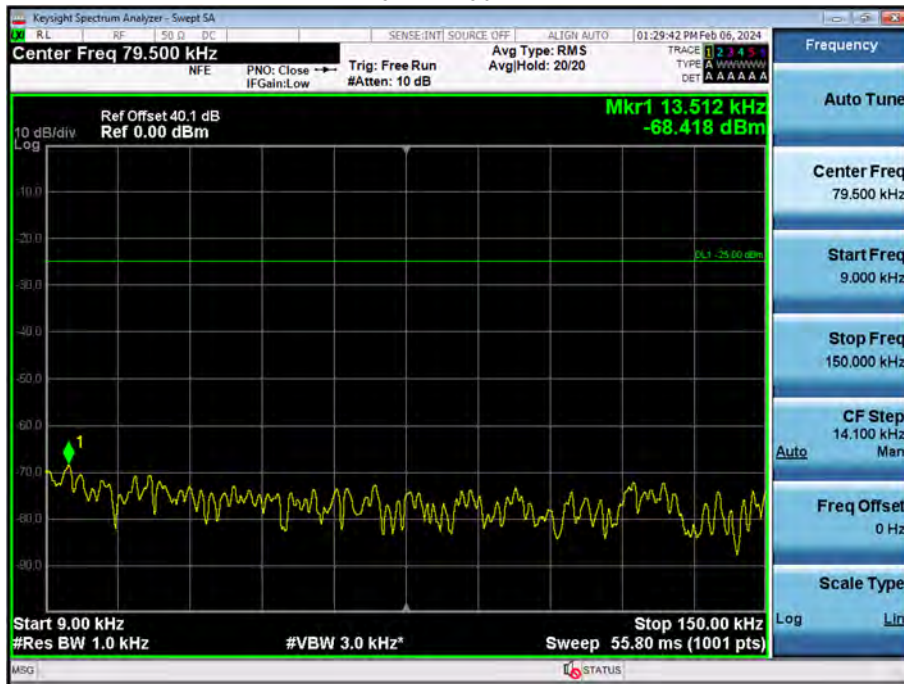


1 GHz~10 GHz

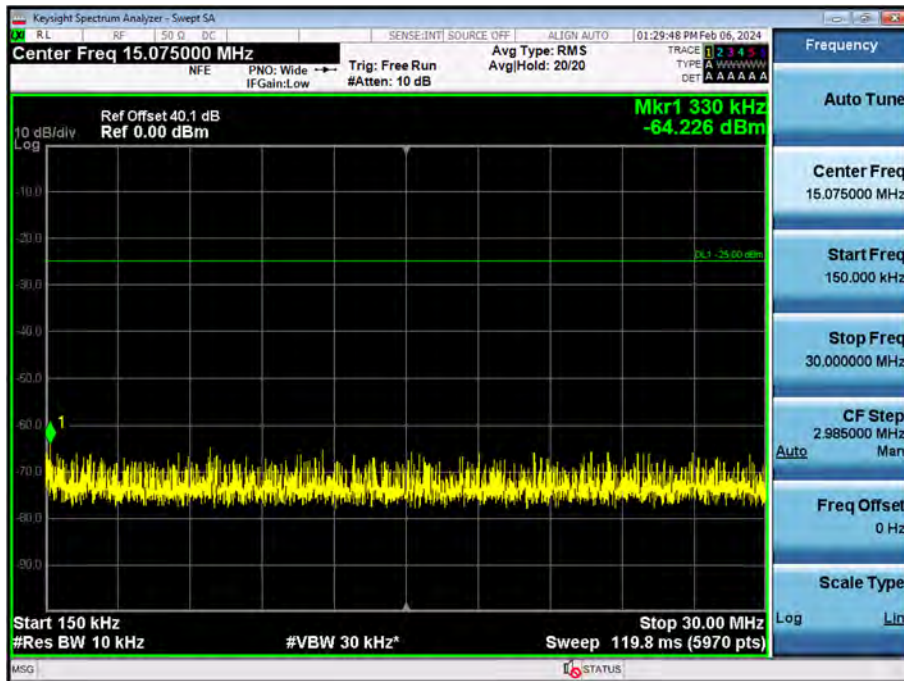


4K00F2D

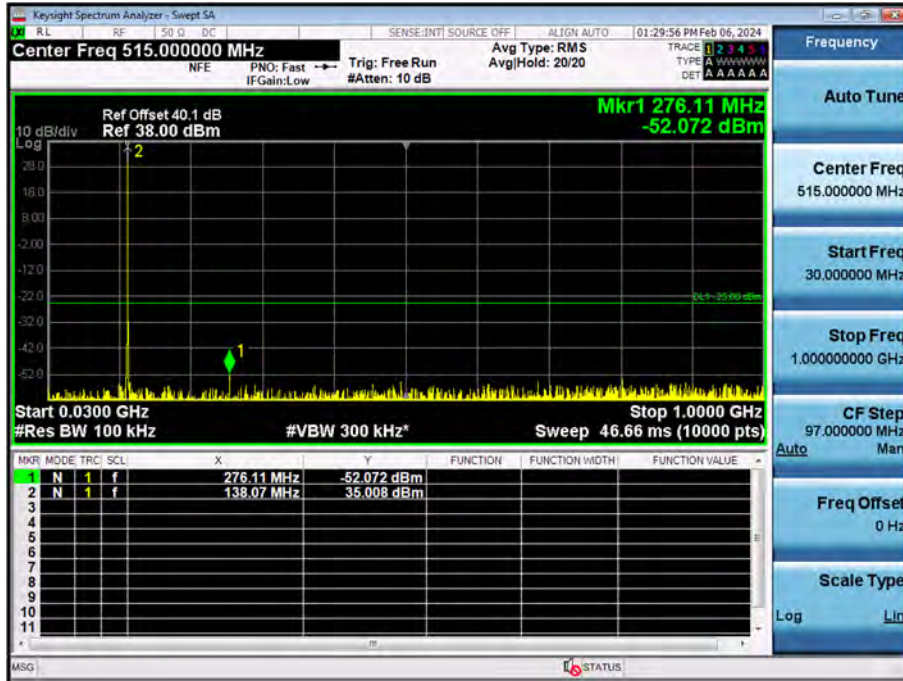
(138.05 MHz)_High
9 kHz~150 kHz



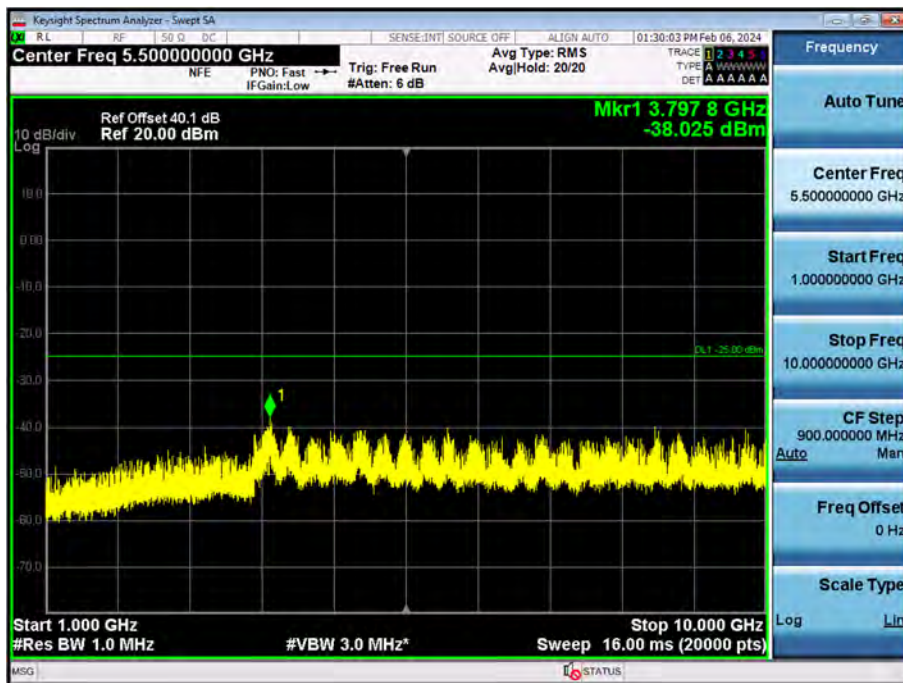
150 kHz~30 MHz



30 MHz~1 GHz



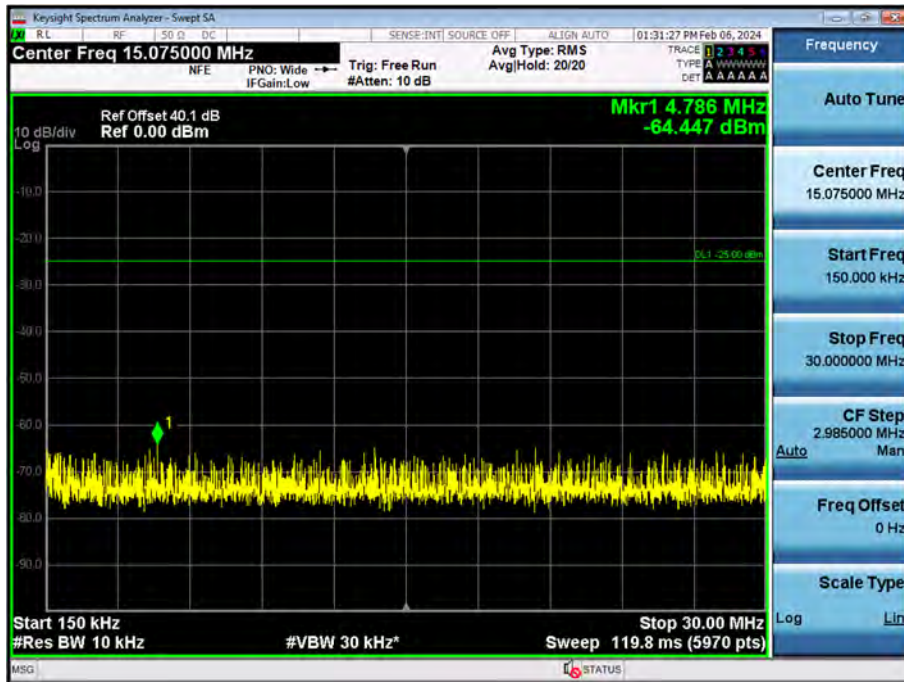
1 GHz~10 GHz



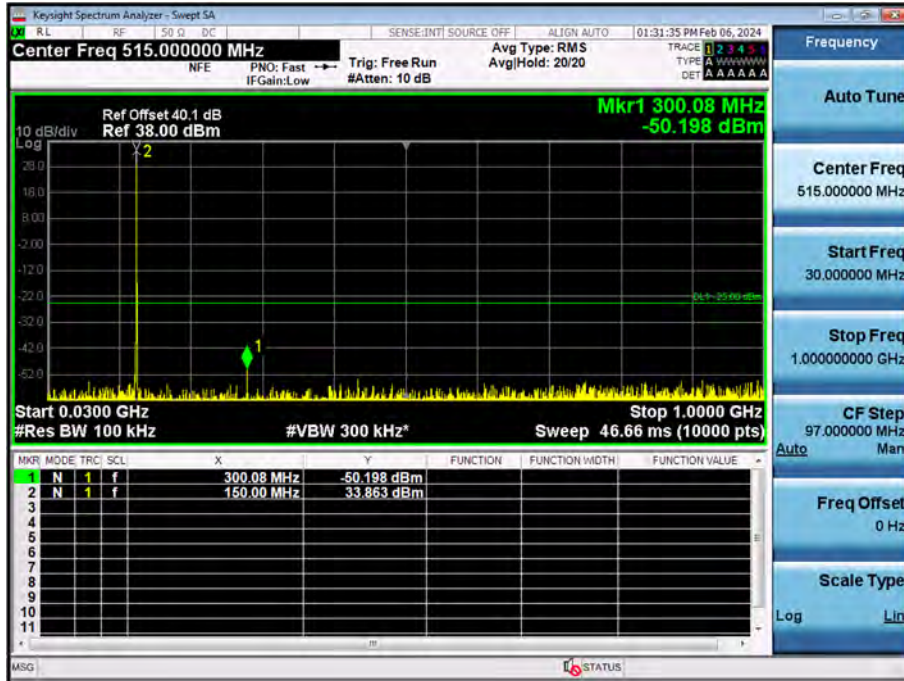
(150.05 MHz)_High
9 kHz~150 kHz



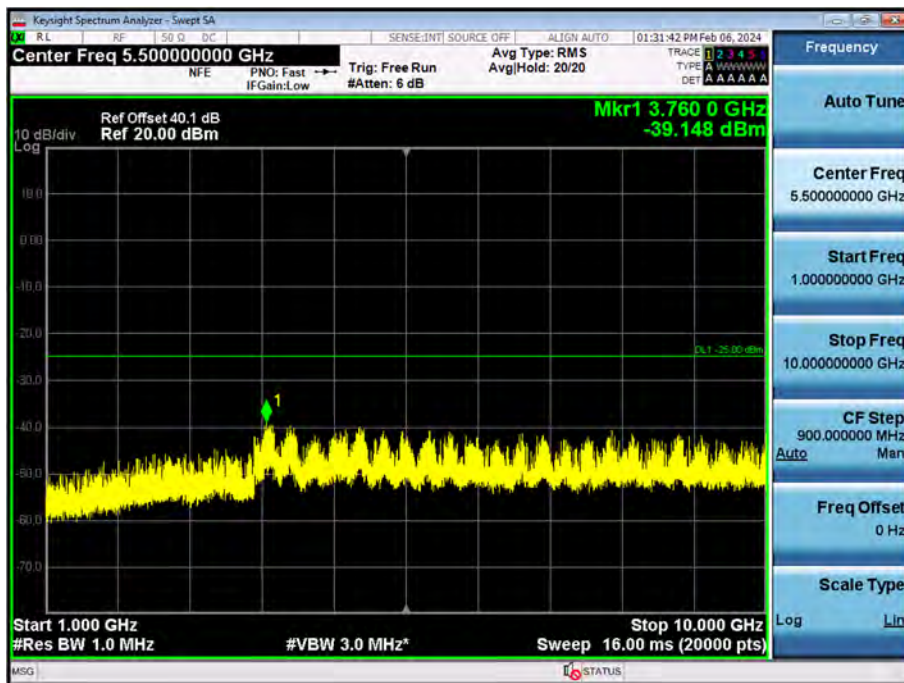
150 kHz~30 MHz



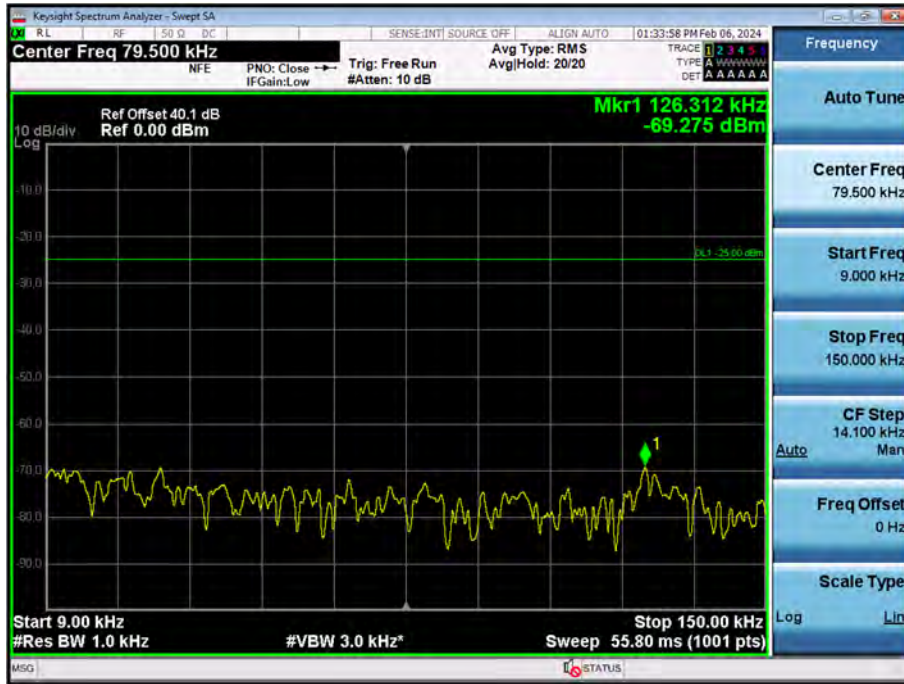
30 MHz~1 GHz



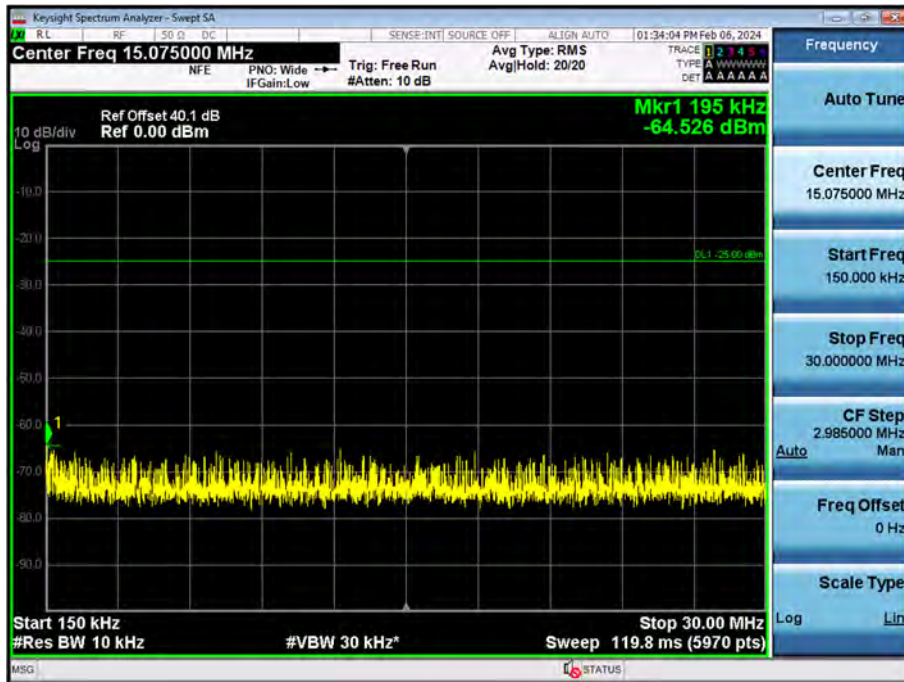
1 GHz~10 GHz



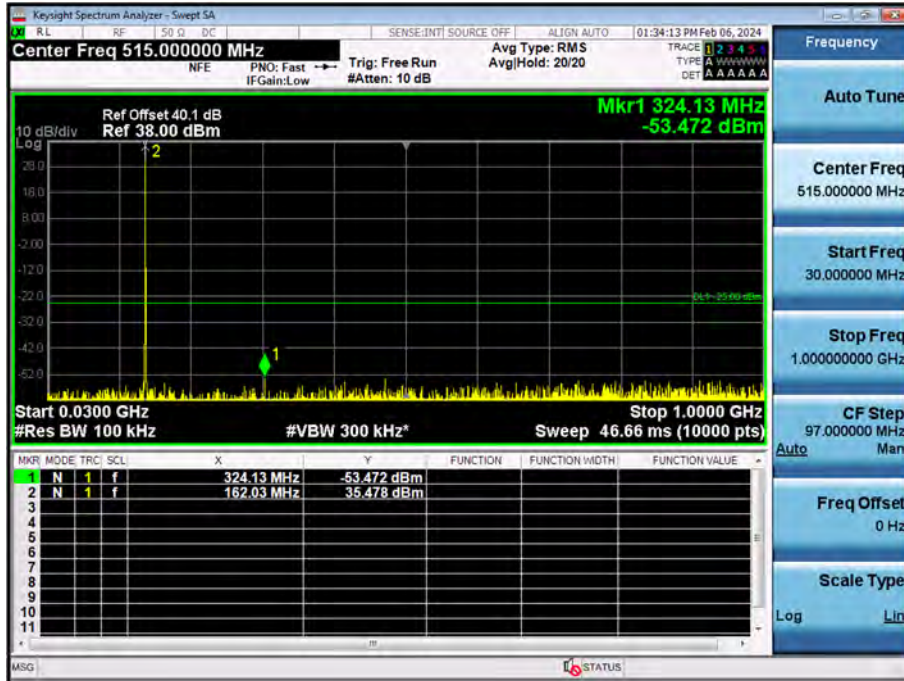
(162.05 MHz)_High
9 kHz~150 kHz



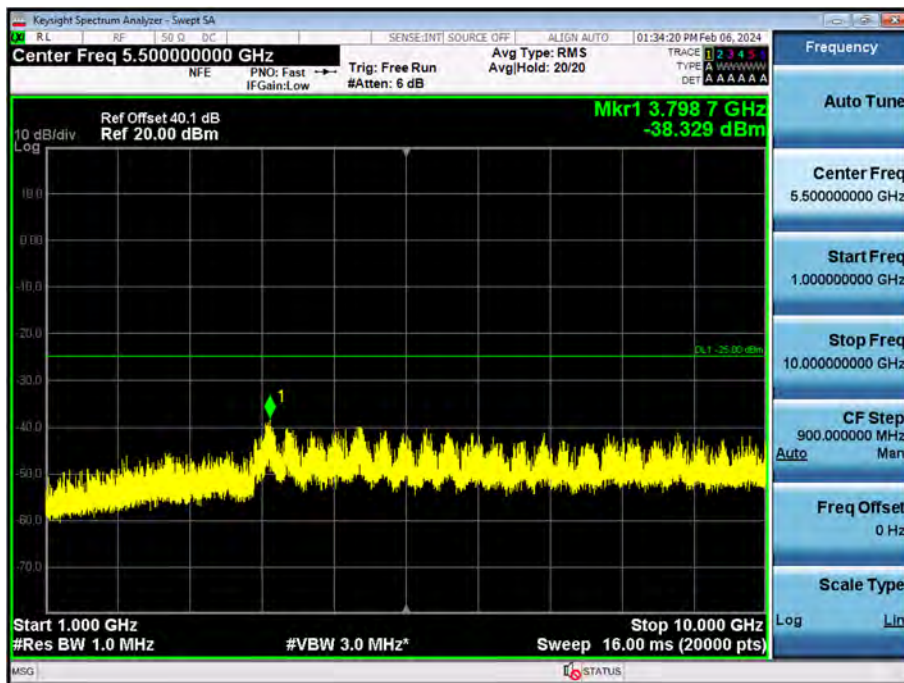
150 kHz~30 MHz



30 MHz~1 GHz



1 GHz~10 GHz

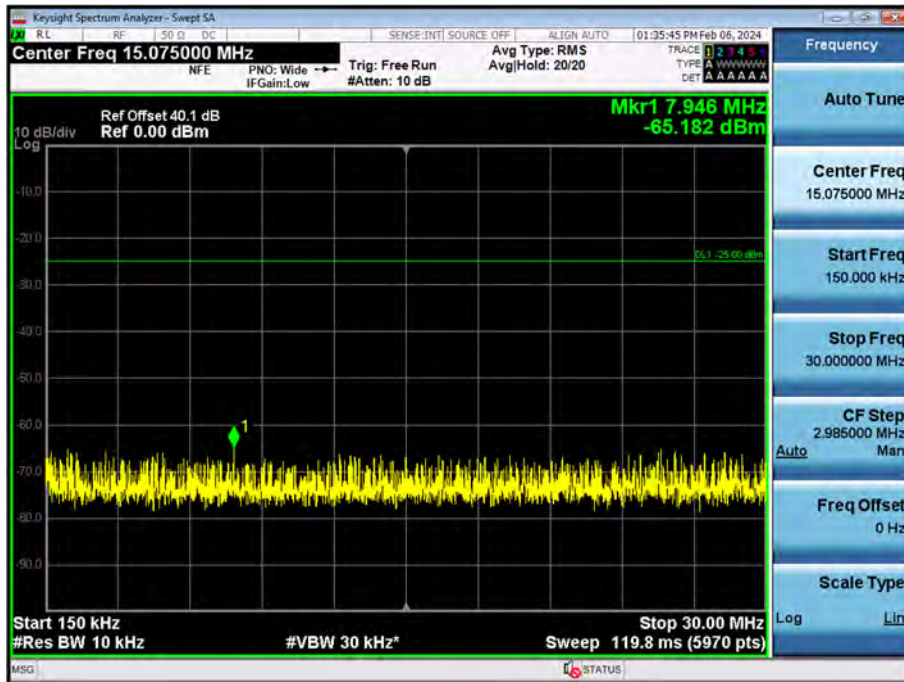


(173.95 MHz)_High

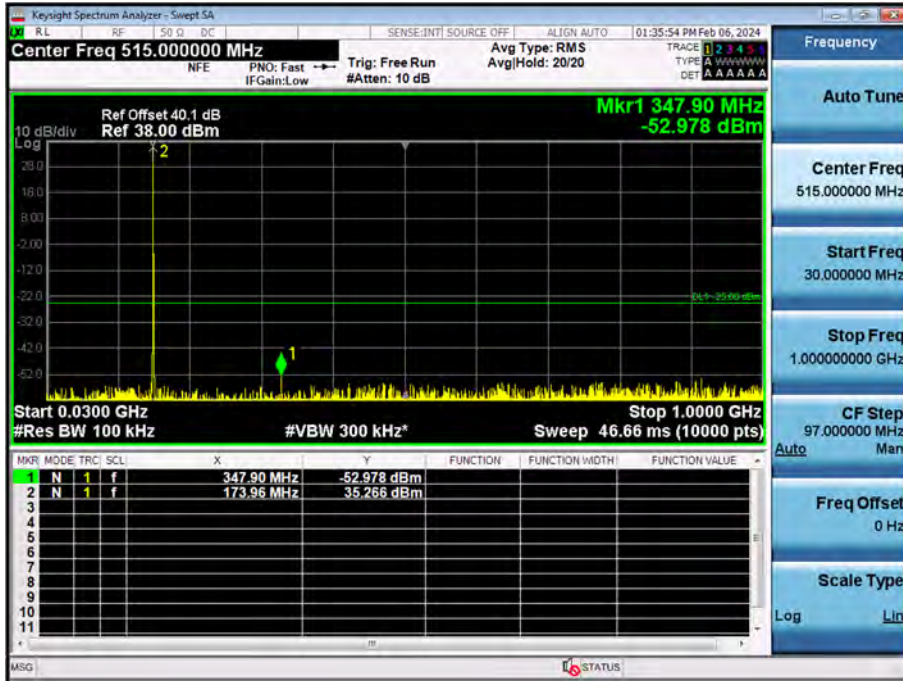
9 kHz~150 kHz



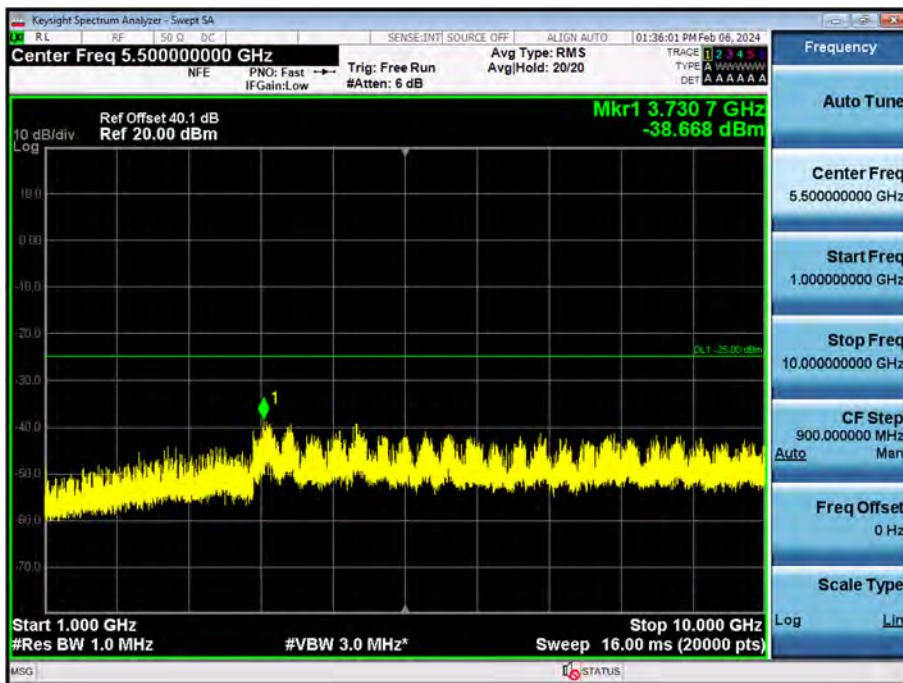
150 kHz~30 MHz



30 MHz~1 GHz



1 GHz~10 GHz



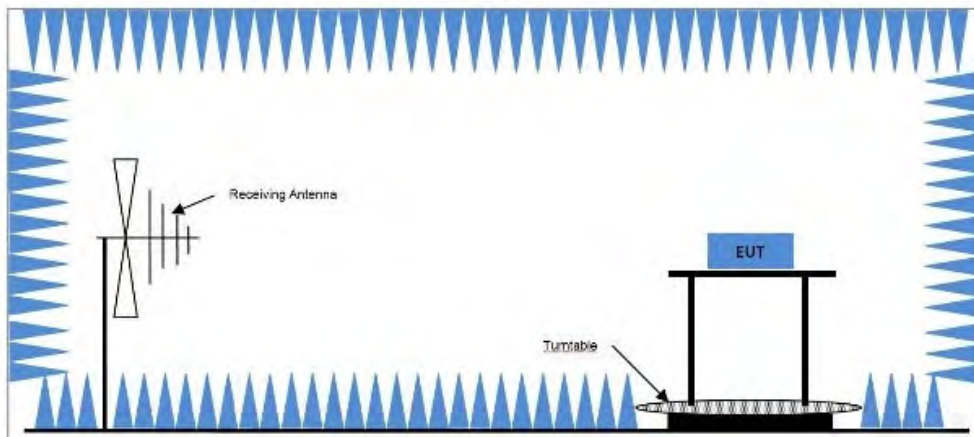
8.9 Unwanted Emissions : Radiated Spurious Emission

▣ Definition

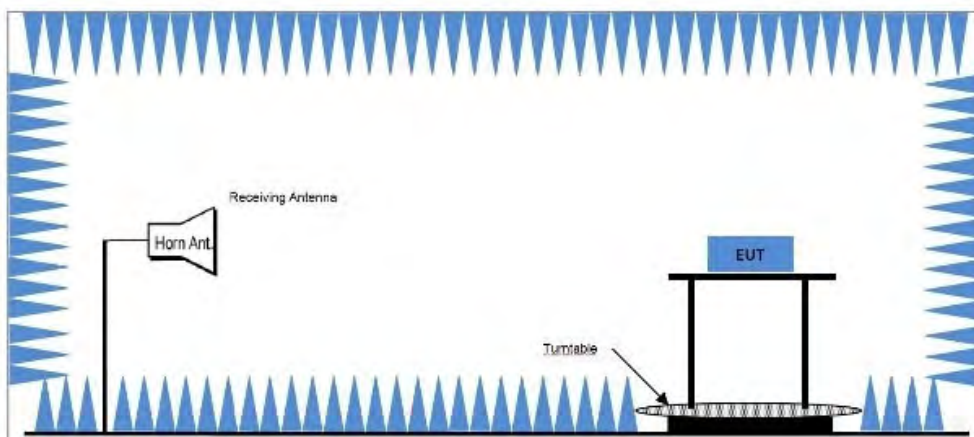
Radiated spurious emissions are emissions from the equipment when transmitting into a non-radiating load on a frequency or frequencies that are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communications desired.

▣ TEST CONFIGURATION

Below 30 MHz



Above 1 GHz



TEST PROCEDURE USED

Radiated tests are performed in the Fully-anechoic chamber.

Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA-603E-2016.

- a) The Resolution Bandwidth for scanning Radiated Emission below 1 GHz is 100 kHz with Video Bandwidth = 300 kHz and Resolution Bandwidth for above 1 GHz is 1 MHz with Video Bandwidth = 3 MHz.
 - b) Detector mode is peak.
 - c) In the fully-anechoic chamber, setup as illustrated above the DUT placed on the 2.5m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization.
The “Read Value” is the spectrum reading the maximum power value.
 - d) The substitution antenna is substituted for DUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be rotated vertical and horizontal polarization to find the maximum radiation power.
Record the power level of maximum radiation power from spectrum.
So, the measured Factor value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.
- 4) Result(dBm) = “Reading” + Factor

TEST RESULTS

16K0F3E

Test Frequency (MHz)	Measured Frequency (MHz)	Reading (dBm)	Factor (dB)	Pol	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
138.05	276.10	-65.55	28.46	H	-37.09	-13.00	24.09	Peak
	414.15	-61.77	31.47	V	-30.30	-13.00	17.30	Peak
	552.20	-77.31	33.85	H	-43.46	-13.00	30.46	Peak
	690.25	-83.92	36.19	H	-47.73	-13.00	34.73	Peak
	828.30	-76.12	37.74	V	-38.38	-13.00	25.38	Peak
	966.35	-89.36	39.32	V	-50.04	-13.00	37.04	Peak
	1104.40	-43.50	-2.32	V	-45.82	-13.00	32.82	Peak
	1242.45	-44.52	-1.76	H	-46.28	-13.00	33.28	Peak
	1380.50	-41.88	-1.47	V	-43.35	-13.00	30.35	Peak

Test Frequency (MHz)	Measured Frequency (MHz)	Reading (dBm)	Factor (dB)	Pol	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
150.05	300.10	-61.39	29.25	H	-32.14	-13.00	19.14	Peak
	450.15	-66.03	32.44	V	-33.59	-13.00	20.59	Peak
	600.20	-85.92	35.05	H	-50.87	-13.00	37.87	Peak
	750.25	-78.20	37.49	H	-40.71	-13.00	27.71	Peak
	900.30	-86.59	38.33	V	-48.26	-13.00	35.26	Peak
	1050.35	-39.40	-2.30	H	-41.70	-13.00	28.70	Peak
	1200.40	-41.55	-2.24	V	-43.79	-13.00	30.79	Peak
	1350.45	-42.68	-1.18	V	-43.86	-13.00	30.86	Peak
	1500.50	-47.23	-1.11	V	-48.34	-13.00	35.34	Peak

Test Frequency (MHz)	Measured Frequency (MHz)	Reading (dBm)	Factor (dB)	Pol	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
162.05	324.10	-61.01	29.99	H	-31.02	-13.00	18.02	Peak
	486.15	-70.10	32.70	H	-37.40	-13.00	24.40	Peak
	648.20	-89.23	35.45	H	-53.78	-13.00	40.78	Peak
	810.25	-75.25	37.61	H	-37.64	-13.00	24.64	Peak
	972.30	-89.25	39.39	V	-49.86	-13.00	36.86	Peak
	1134.35	-43.93	-2.04	V	-45.97	-13.00	32.97	Peak
	1296.40	-44.96	-1.32	V	-46.28	-13.00	33.28	Peak
	1458.45	-49.77	-0.77	V	-50.54	-13.00	37.54	Peak
	1620.50	-53.98	-1.83	V	-55.81	-13.00	42.81	Peak

Test Frequency (MHz)	Measured Frequency (MHz)	Reading (dBm)	Factor (dB)	Pol	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
173.95	347.90	-60.90	30.31	H	-30.59	-13.00	17.59	Peak
	521.85	-69.86	33.65	H	-36.21	-13.00	23.21	Peak
	695.80	-90.62	36.20	H	-54.42	-13.00	41.42	Peak
	869.75	-76.35	37.72	V	-38.63	-13.00	25.63	Peak
	1043.70	-47.36	-2.90	V	-50.26	-13.00	37.26	Peak
	1217.65	-47.78	-2.49	V	-50.27	-13.00	37.27	Peak
	1391.60	-47.87	-1.58	V	-49.45	-13.00	36.45	Peak
	1565.55	-56.89	-0.96	H	-57.85	-13.00	44.85	Peak
	1739.50	-57.40	-0.74	H	-58.14	-13.00	45.14	Peak

8K30F1E, 8K30F1D, 8K30F7W

Test Frequency (MHz)	Measured Frequency (MHz)	Reading (dBm)	Factor (dB)	Pol	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
138.05	276.10	-66.33	28.46	H	-37.87	-20.00	17.87	Peak
	414.15	-65.80	31.47	H	-34.33	-20.00	14.33	Peak
	552.20	-85.05	33.85	H	-51.20	-20.00	31.20	Peak
	690.25	-86.12	36.19	H	-49.93	-20.00	29.93	Peak
	828.30	-77.06	37.74	V	-39.32	-20.00	19.32	Peak
	966.35	-89.97	39.32	V	-50.65	-20.00	30.65	Peak
	1104.40	-42.71	-2.32	V	-45.03	-20.00	25.03	Peak
	1242.45	-43.75	-1.76	H	-45.51	-20.00	25.51	Peak
	1380.50	-40.51	-1.47	V	-41.98	-20.00	21.98	Peak

Test Frequency (MHz)	Measured Frequency (MHz)	Reading (dBm)	Factor (dB)	Pol	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
150.05	300.10	-61.77	29.25	H	-32.52	-20.00	12.52	Peak
	450.15	-68.81	32.44	H	-36.37	-20.00	16.37	Peak
	600.20	-83.30	35.05	H	-48.25	-20.00	28.25	Peak
	750.25	-79.68	37.49	H	-42.19	-20.00	22.19	Peak
	900.30	-85.90	38.33	V	-47.57	-20.00	27.57	Peak
	1050.35	-41.15	-2.30	H	-43.45	-20.00	23.45	Peak
	1200.40	-40.03	-2.24	V	-42.27	-20.00	22.27	Peak
	1350.45	-40.77	-1.18	V	-41.95	-20.00	21.95	Peak
	1500.50	-46.83	-1.11	V	-47.94	-20.00	27.94	Peak

Test Frequency (MHz)	Measured Frequency (MHz)	Reading (dBm)	Factor (dB)	Pol	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
162.05	324.10	-61.77	29.99	H	-31.78	-20.00	11.78	Peak
	486.15	-70.01	32.70	H	-37.31	-20.00	17.31	Peak
	648.20	-88.62	35.45	H	-53.17	-20.00	33.17	Peak
	810.25	-75.47	37.61	V	-37.86	-20.00	17.86	Peak
	972.30	-89.02	39.39	H	-49.63	-20.00	29.63	Peak
	1134.35	-45.20	-2.04	V	-47.24	-20.00	27.24	Peak
	1296.40	-45.54	-1.32	H	-46.86	-20.00	26.86	Peak
	1458.45	-50.62	-0.77	V	-51.39	-20.00	31.39	Peak
	1620.50	-54.84	-1.83	V	-56.67	-20.00	36.67	Peak

Test Frequency (MHz)	Measured Frequency (MHz)	Reading (dBm)	Factor (dB)	Pol	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
173.95	347.90	-59.82	30.31	H	-29.51	-20.00	9.51	Peak
	521.85	-68.13	33.65	H	-34.48	-20.00	14.48	Peak
	695.80	-88.19	36.20	V	-51.99	-20.00	31.99	Peak
	869.75	-75.66	37.72	H	-37.94	-20.00	17.94	Peak
	1043.70	-46.72	-2.90	V	-49.62	-20.00	29.62	Peak
	1217.65	-48.69	-2.49	V	-51.18	-20.00	31.18	Peak
	1391.60	-47.96	-1.58	V	-49.54	-20.00	29.54	Peak
	1565.55	-55.67	-0.96	H	-56.63	-20.00	36.63	Peak
		1739.50	-54.52	-0.74	H	-55.26	-20.00	35.26

4K00F1E, 4K00F1D, 4K00F7W

Test Frequency (MHz)	Measured Frequency (MHz)	Reading (dBm)	Factor (dB)	Pol	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
138.05	276.10	-65.51	28.46	H	-37.05	-25.00	12.05	Peak
	414.15	-63.94	31.47	V	-32.47	-25.00	7.47	Peak
	552.20	-84.59	33.85	H	-50.74	-25.00	25.74	Peak
	690.25	-85.35	36.19	V	-49.16	-25.00	24.16	Peak
	828.30	-76.80	37.74	H	-39.06	-25.00	14.06	Peak
	966.35	-89.52	39.32	H	-50.20	-25.00	25.20	Peak
	1104.40	-41.98	-2.32	V	-44.30	-25.00	19.30	Peak
	1242.45	-45.46	-1.76	H	-47.22	-25.00	22.22	Peak
	1380.50	-41.06	-1.47	V	-42.53	-25.00	17.53	Peak

Test Frequency (MHz)	Measured Frequency (MHz)	Reading (dBm)	Factor (dB)	Pol	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
150.05	300.10	-60.87	29.25	H	-31.62	-25.00	6.62	Peak
	450.15	-68.58	32.44	H	-36.14	-25.00	11.14	Peak
	600.20	-80.00	35.05	H	-44.95	-25.00	19.95	Peak
	750.25	-78.78	37.49	H	-41.29	-25.00	16.29	Peak
	900.30	-85.31	38.33	V	-46.98	-25.00	21.98	Peak
	1050.35	-40.66	-2.30	H	-42.96	-25.00	17.96	Peak
	1200.40	-41.14	-2.24	H	-43.38	-25.00	18.38	Peak
	1350.45	-40.97	-1.18	V	-42.15	-25.00	17.15	Peak
		1500.50	-46.50	-1.11	V	-47.61	-25.00	22.61

Test Frequency (MHz)	Measured Frequency (MHz)	Reading (dBm)	Factor (dB)	Pol	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
162.05	324.10	-62.13	29.99	H	-32.14	-25.00	7.14	Peak
	486.15	-71.77	32.70	H	-39.07	-25.00	14.07	Peak
	648.20	-87.50	35.45	H	-52.05	-25.00	27.05	Peak
	810.25	-75.36	37.61	v	-37.75	-25.00	12.75	Peak
	972.30	-88.41	39.39	V	-49.02	-25.00	24.02	Peak
	1134.35	-45.77	-2.04	V	-47.81	-25.00	22.81	Peak
	1296.40	-45.80	-1.32	V	-47.12	-25.00	22.12	Peak
	1458.45	-52.00	-0.77	V	-52.77	-25.00	27.77	Peak
	1620.50	-54.97	-1.83	V	-56.80	-25.00	31.80	Peak

Test Frequency (MHz)	Measured Frequency (MHz)	Reading (dBm)	Factor (dB)	Pol	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
173.95	347.90	-59.93	30.31	H	-29.62	-25.00	4.62	Peak
	521.85	-68.98	33.65	H	-35.33	-25.00	10.33	Peak
	695.80	-90.78	36.20	H	-54.58	-25.00	29.58	Peak
	869.75	-75.87	37.72	V	-38.15	-25.00	13.15	Peak
	1043.70	-46.80	-2.90	H	-49.70	-25.00	24.70	Peak
	1217.65	-47.50	-2.49	V	-49.99	-25.00	24.99	Peak
	1391.60	-48.08	-1.58	H	-49.66	-25.00	24.66	Peak
	1565.55	-55.53	-0.96	V	-56.49	-25.00	31.49	Peak
		1739.50	-55.43	-0.74	H	-56.17	-25.00	31.17

8.10 Unwanted Emissions : Receiver Radiated Spurious Emission

Test Settings

ISED Rule(s)	RSS-Gen(7.0)
Chamber	Semi Anechoic Chamber
Operating conditions:	Under normal test conditions
Operation Mode:	Receive
Method of testing:	Radiated
S/A. Settings:	F < 1 GHz: RBW: 120 kHz, VBW: 300 kHz (Quasi-Peak) F > 1 GHz: RBW: 1 MHz, VBW: 1 MHz (Average)
Mode of operation:	Receive

Test Limit

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$ at 3 meters)
30 – 88	100
88 - 216	150
216 – 960	200
Above 960	500

Test Result

Frequency Range : 30 MHz ~ 1 GHz

Frequency	Reading	Ant. factor+Cable loss- Amp Gain	Ant. POL	Total	Limit	Margin
MHz	dB μV	dB /m	(H/V)	dB $\mu\text{V}/\text{m}$	dB $\mu\text{V}/\text{m}$	dB

No Peak Found

Frequency Range : Above 1 GHz

Frequency	Reading	Ant. factor+Cable loss- Amp Gain	Ant. POL	Total	Limit	Margin
MHz	dB μV	dB /m	(H/V)	dB $\mu\text{V}/\text{m}$	dB $\mu\text{V}/\text{m}$	dB

No Peak Found

8.11 Necessary Bandwidth Calculations

Modulation : 16K0F3E (Authorized Bandwidth 20 kHz)	
Maximum Modulation (M), kHz	3
Maximum Deviation (D), kHz	5
Constant Factor (K)	1
Necessary Bandwidth (BN), kHz	$(2 \times M) + (2 \times D \times K) = 16.0$

Modulation : 11K0F3E (Authorized Bandwidth 11.25 kHz)	
Maximum Modulation (M), kHz	3
Maximum Deviation (D), kHz	2.5
Constant Factor (K)	1
Necessary Bandwidth (BN), kHz	$(2 \times M) + (2 \times D \times K) = 11.0$

Modulation : 8K30F1E, 8K30F1D, 8K30F7W (4Level FSK / 9600bps, Authorized Bandwidth 11.25 kHz)	
Digital information rate (R), bps	9600
Maximum Deviation (D), kHz	3.391
Signaling States (S)	4
Numerical factor (K)	0.516
Necessary Bandwidth (BN), kHz	$(R / \log_2 S) + 2DK = 8.3$

Modulation : 4K00F1E, 4K00F1D, 4K00F7W (4Level FSK / 4800bps, Authorized Bandwidth 6 kHz)	
Digital information rate (R), bps	4800
Maximum Deviation (D), kHz	1.55
Signaling States (S)	4
Numerical factor (K)	0.516
Necessary Bandwidth (BN), kHz	$(R / \log_2 S) + 2DK = 4.0$

Modulation : 4K00F2D (CWID, Authorized Bandwidth 6 kHz)	
Maximum Modulation (M), kHz	0.8
Maximum Deviation (D), kHz	1.2
Numerical factor (K)	1
Necessary Bandwidth (BN), kHz	$(2 \times M) + (2 \times D \times K) = 4.0$

9. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Calibration Due	Serial No.
Agilent	N9030B / Signal Analyzer	2023-03-13	Annual	2024-04-13	MY52350879
Hewlett Packard	E3632A / DC Power Supply	2023-06-09	Annual	2024-06-09	KR75303960
Agilent	N1911A/Power Meter	2023-03-06	Annual	2024-03-06	MY45100523
Agilent	N1921A /POWER SENSOR	2023-03-06	Annual	2024-03-06	MY57820067
TEKTRONIX	RSA3408A/SPECTRUM ANALYZER	2023-08-18	Annual	2024-08-18	B010198
Hewlett Packard	8903B/Audio Analyzer	2023-08-25	Annual	2024-08-25	3413A13913
Hewlett Packard	8901B/Modulation Analyzer	2023-08-29	Annual	2024-08-29	3438A05231
HUBER+SUHNER	5930_SMA-50-010/ 30 dB Attenuator	2023-09-18	Annual	2024-09-18	36
SENSORVIEW	Attenuator/ 10 dB Attenuator	2023-06-02	Annual	2024-06-02	ATT10FC001
ESPEC	SU-642 / Chamber	2023-02-22	Annual	2024-02-22	0093008124
Schwarzbeck	BBHA 9120D/ Horn Antenna	2022-03-21	Biennial	2024-03-21	02289
Schwarzbeck	BBHA 9120D/ Horn Antenna	2023-04-27	Biennial	2025-04-27	9120D-1299
Schwarzbeck	VULB9160/ Bilog Antenna	2023-03-09	Biennial	2025-03-09	3150
Schwarzbeck	VULB9160/ Hybrid Antenna	2023-02-24	Biennial	2025-02-24	760
T&M SYSTEM	FBSR-06B (1G HPF + LNA)/ RF Switching System	2023-05-22	Annual	2024-05-22	F3L1
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR	2023-06-22	Annual	2024-06-22	177633
REOHDE & SCHWARZ	FSV40/ Spectrum Analyzer	2023-02-22	Annual	2024-02-22	101436

10. ANNEX A_ TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2402-FI004-P