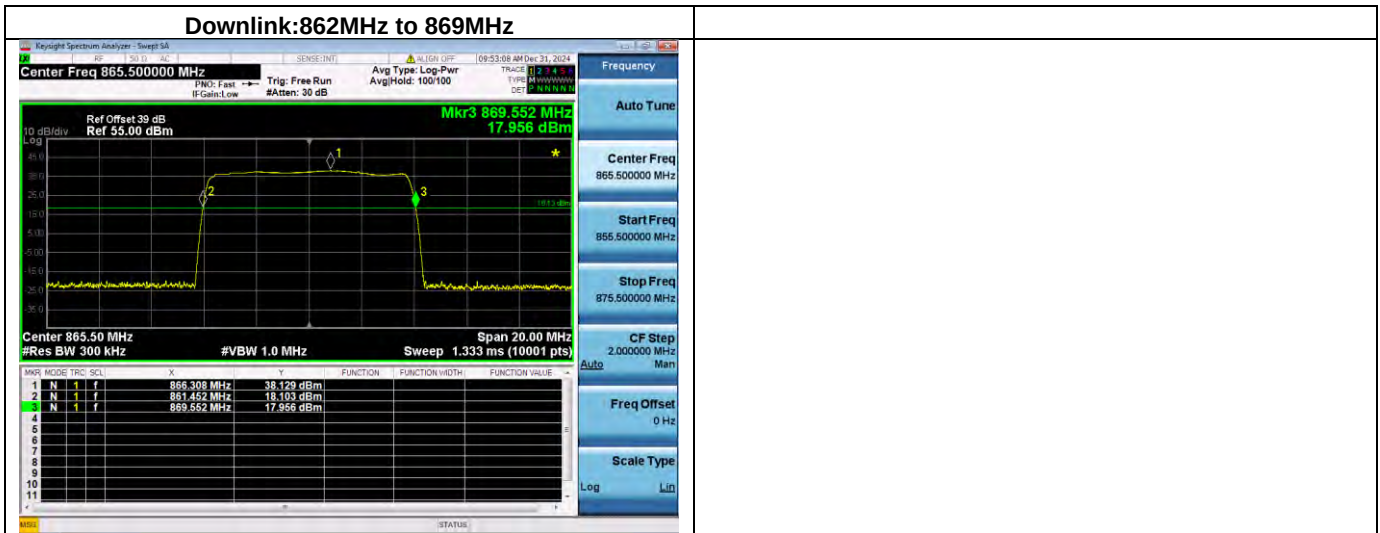


1. Out of band rejection



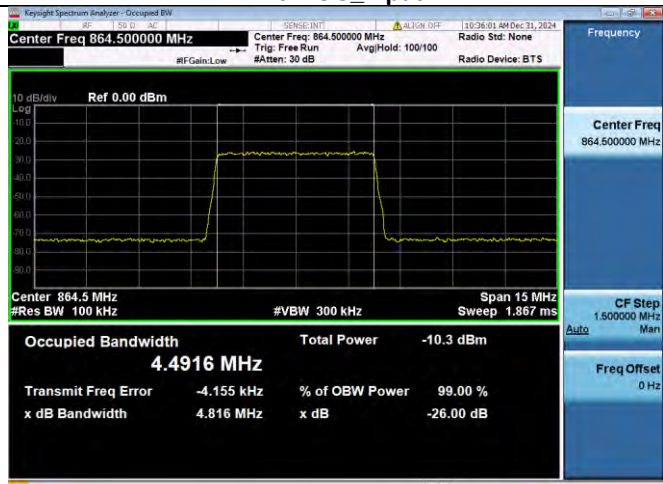
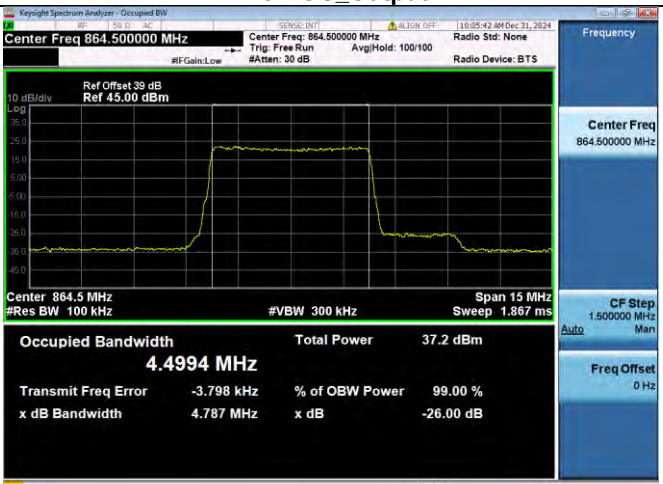
2. Input/output power and amplifier/booster gain

Mode	Operation Band	Frequency F0 (MHz)	Signal Type	Signal Level (dBm)	Input Power (dBm)	Output Power (dBm)	ERP (dBm)	Gain (dB)
Down link	862~869MHz	865.5	LTE	Pre-AGC	-10	37.33	35.18	47.33
				3dB Above AGC	-7	37.42	35.27	/
Down link	862~869MHz	865.5	GMSK	Pre-AGC	-10	37.09	34.94	47.09
				3dB Above AGC	-7	37.13	34.98	/

Remark:

- The normal power is 37dBm and the measured output power which show in above table is within±1.0dB tolerance.
- $ERP(dBm) = \text{Total Output Power}(dBm) + \text{Antenna Gain}(dBi) - 2.15dB$. Antenna Gain is 0.0dBi.

3 Input-versus-output signal comparison

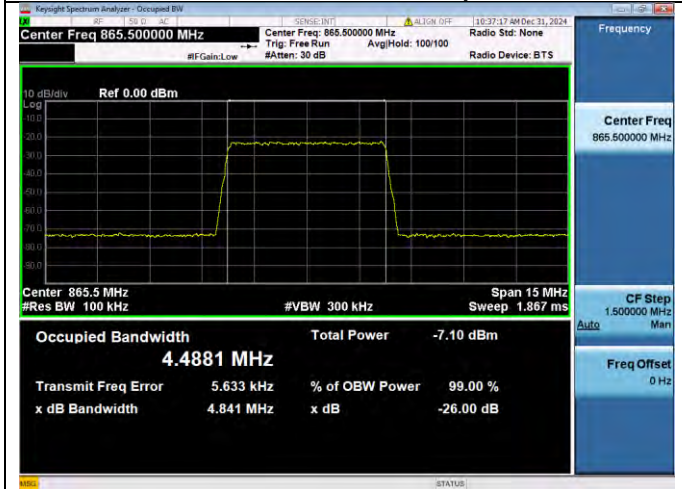
Occupied Bandwidth				
Channel Spacing (MHz)	Test Frequency (MHz)	Signal Level	Signal Type	99%Occupied Channel Bandwidth (MHz)
LTE 5M	864.5	Pre-AGC	Input	4.4916
	864.5		Output	4.4994
	864.5	3dB Above AGC	Input	4.4850
	864.5		Output	4.4970
	865.5	Pre-AGC	Input	4.4912
	865.5		Output	4.4804
	865.5	3dB Above AGC	Input	4.4881
	865.5		Output	4.4803
	866.5	Pre-AGC	Input	4.4860
	866.5		Output	4.4782
	866.5	3dB Above AGC	Input	4.4835
	866.5		Output	4.4775
LTE 5M Low				
Pre-AGC_Input		Pre-AGC_Output		
				
3dB Above Pre-AGC_Input		3dB Above Pre-AGC_Output		



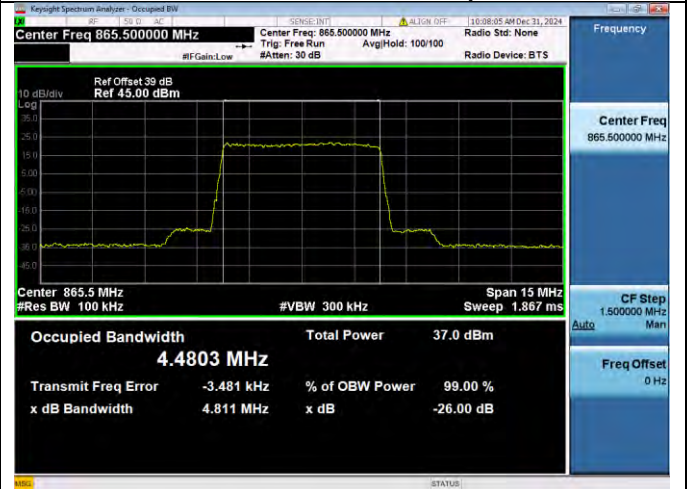
LTE 5M Middle



3dB Above Pre-AGC Input

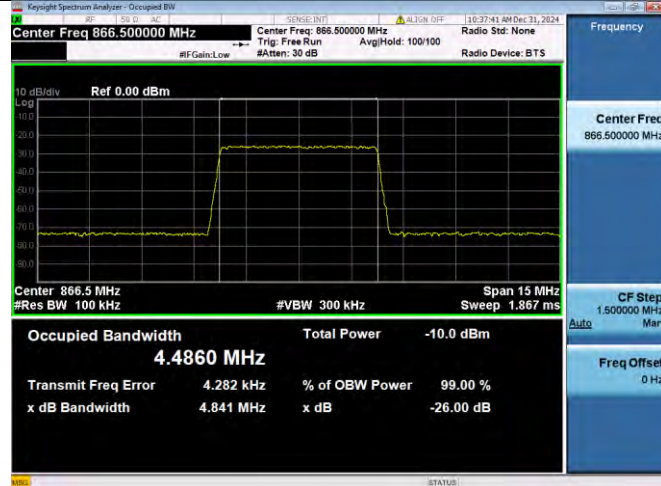


3dB Above Pre-AGC Output

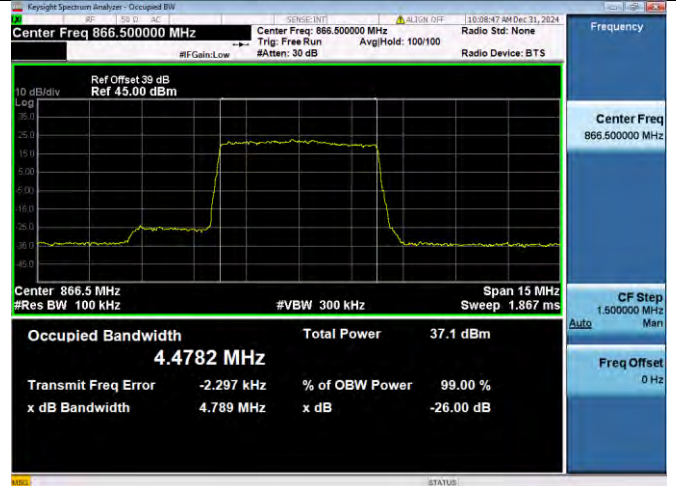


LTE 5M High

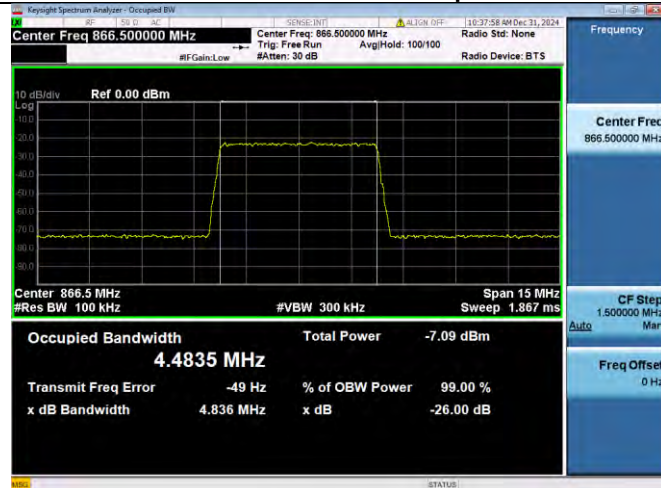
Pre-AGC_Input



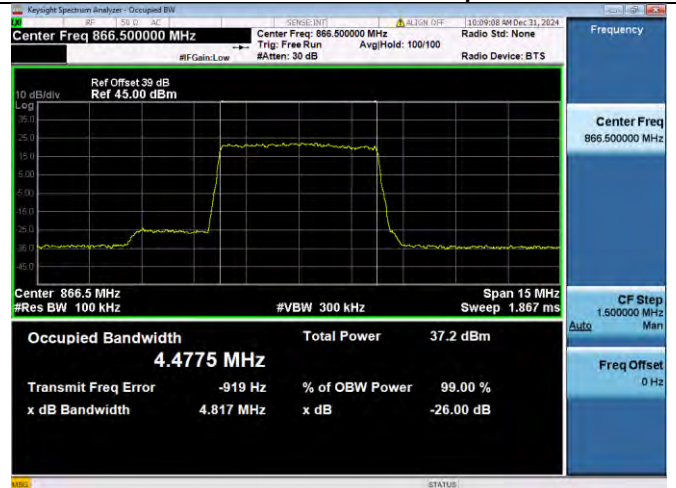
Pre-AGC_Output



3dB Above Pre-AGC_Input



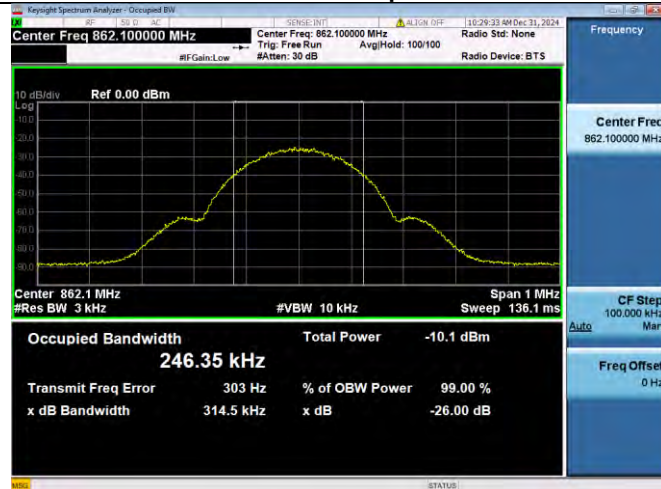
3dB Above Pre-AGC_Output



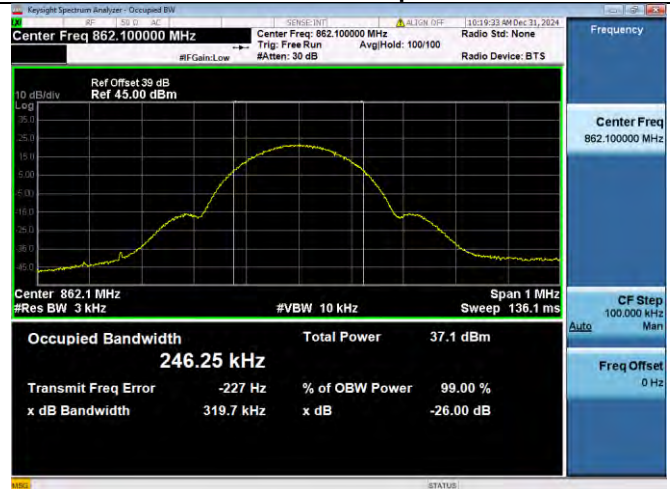
Occupied Bandwidth				
Channel Spacing (MHz)	Test Frequency (MHz)	Signal Level	Signal Type	99%Occupied Channel Bandwidth (KHz)
GMSK 0.2M	862.1	Pre-AGC	Input	246.35
	862.1		Output	246.25
	862.1	3dB Above AGC	Input	246.30
	862.1		Output	245.82
	865.5	Pre-AGC	Input	246.12
	865.5		Output	245.77
	865.5	3dB Above AGC	Input	246.38
	865.5		Output	246.24
	868.9	Pre-AGC	Input	246.51
	868.9		Output	246.13
	868.9	3dB Above AGC	Input	245.92
	868.9		Output	246.11

GMSK 0.2M Low

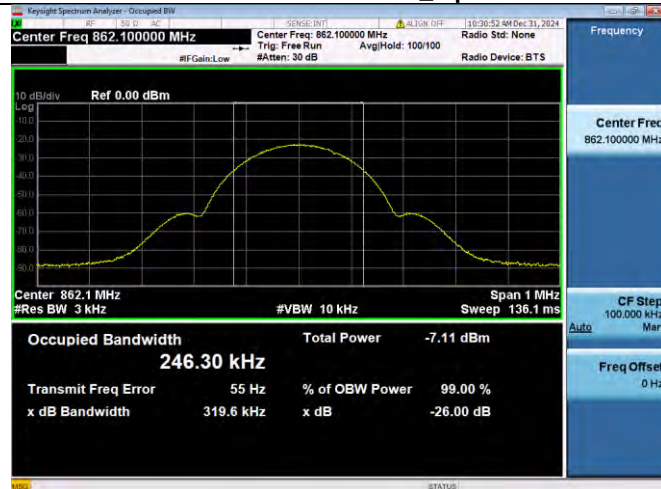
Pre-AGC_Input



Pre-AGC_Output



3dB Above Pre-AGC_Input

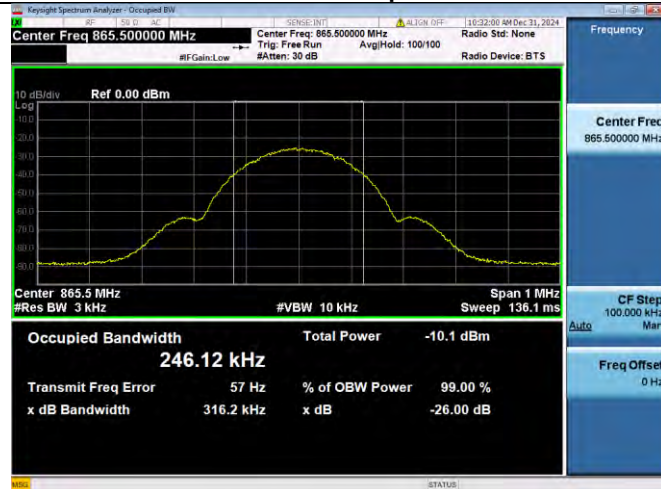


3dB Above Pre-AGC_Output

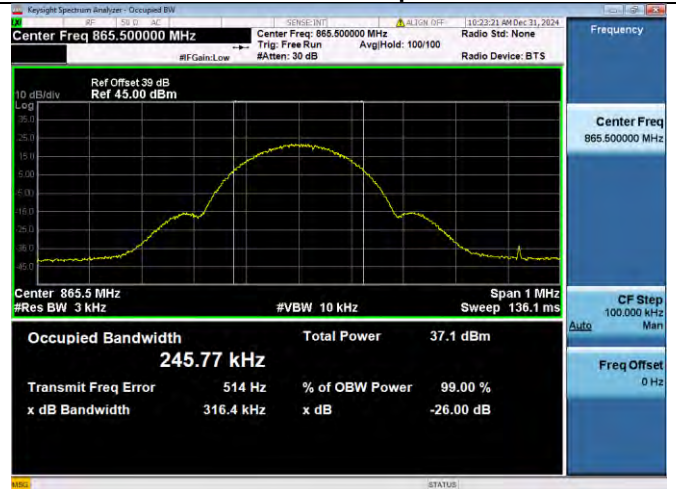


GMSK 0.2M Middle

Pre-AGC_Input



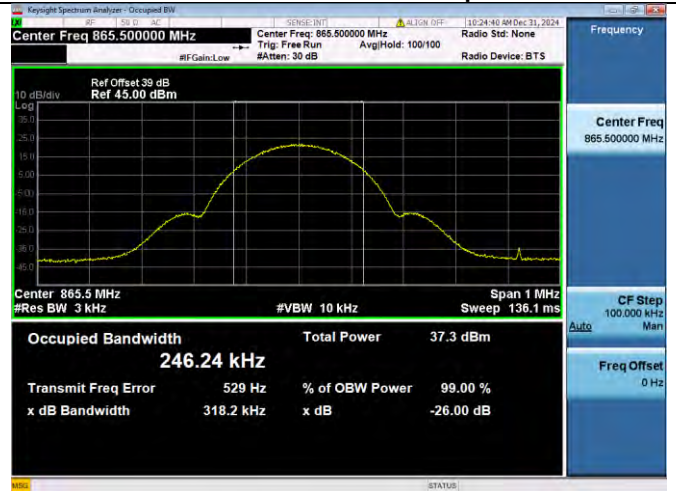
Pre-AGC_Output



3dB Above Pre-AGC_Input

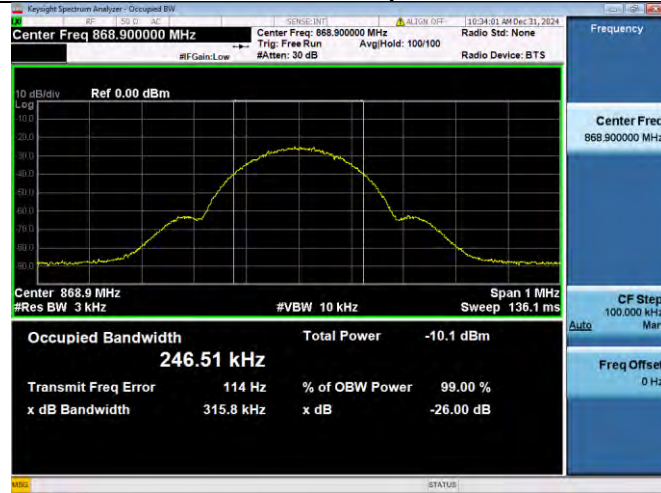


3dB Above Pre-AGC_Output

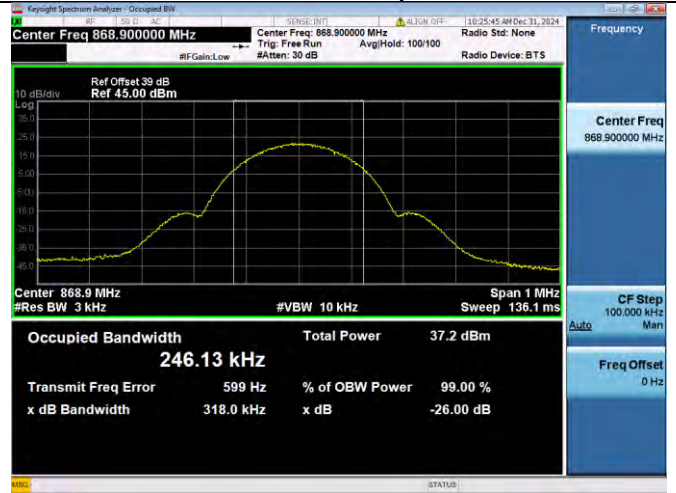


GMSK 0.2M High

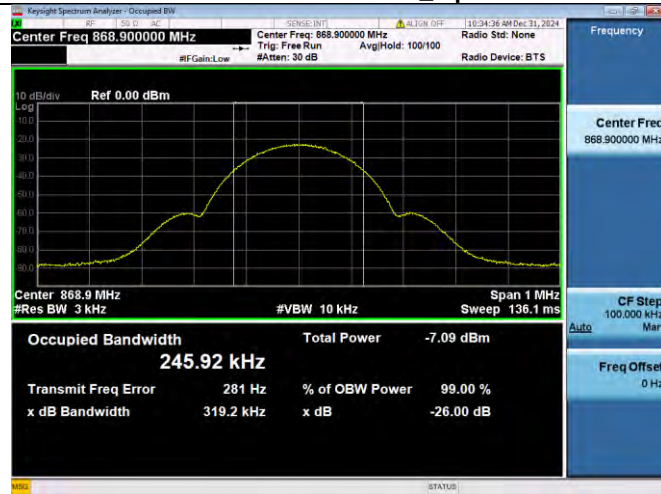
Pre-AGC Input



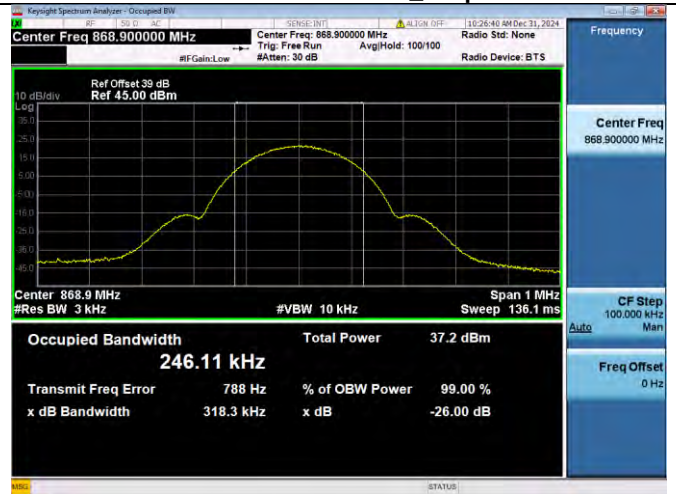
Pre-AGC Output



3dB Above Pre-AGC Input



3dB Above Pre-AGC Output



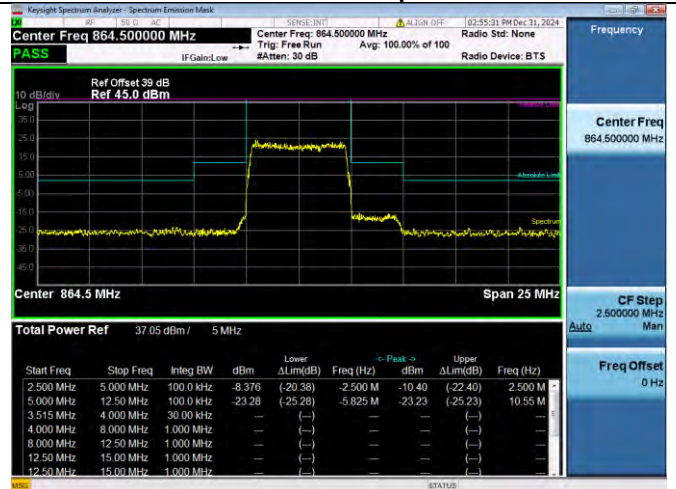
Emission masks				
Channel Spacing (MHz)	Channel	Signal Level	Signal Type	Result
LTE 5M	Low	Pre-AGC	Input	Pass
			Output	Pass
		3dB Above AGC	Input	Pass
			Output	Pass
	Middle	Pre-AGC	Input	Pass
			Output	Pass
		3dB Above AGC	Input	Pass
			Output	Pass
	High	Pre-AGC	Input	Pass
			Output	Pass
		3dB Above AGC	Input	Pass
			Output	Pass

LTE 5M-Low

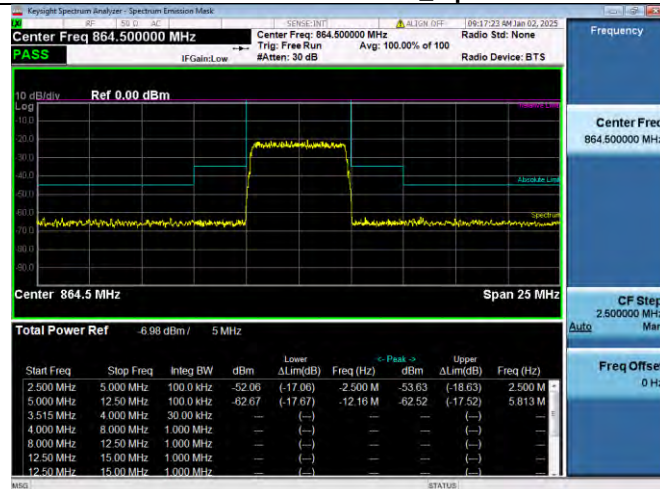
Pre-AGC Input



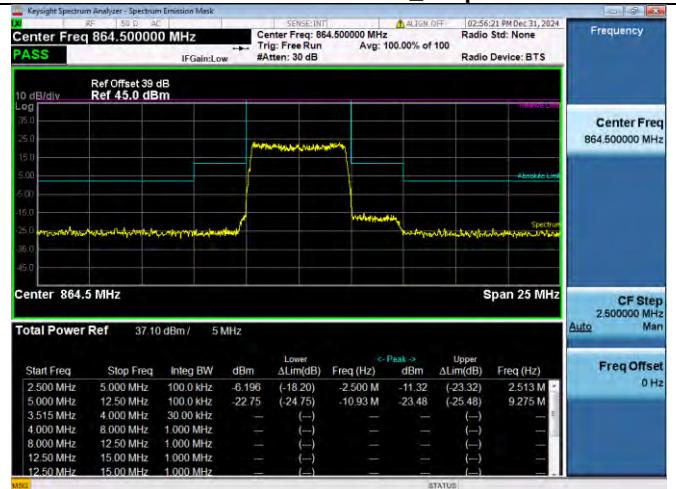
Pre-AGC Output



3dB Above Pre-AGC Input



3dB Above Pre-AGC Output

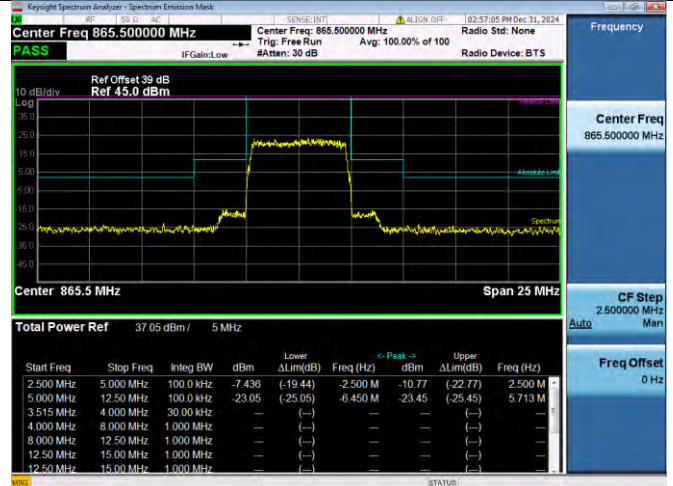


LTE 5M-Middle

Pre-AGC_Input



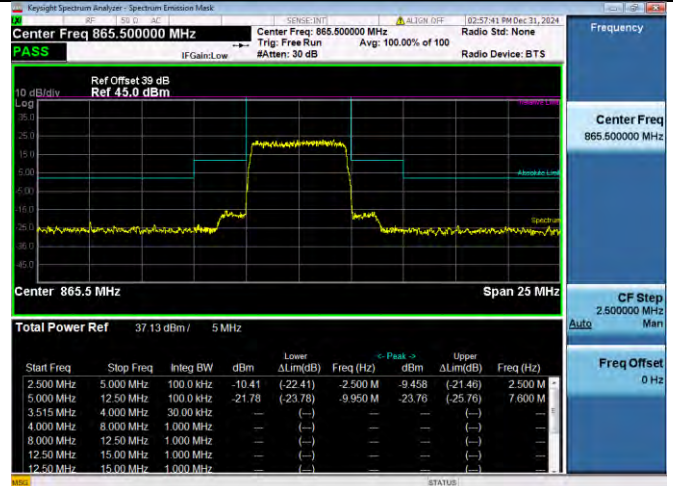
Pre-AGC_Output



3dB Above Pre-AGC_Input



3dB Above Pre-AGC_Output

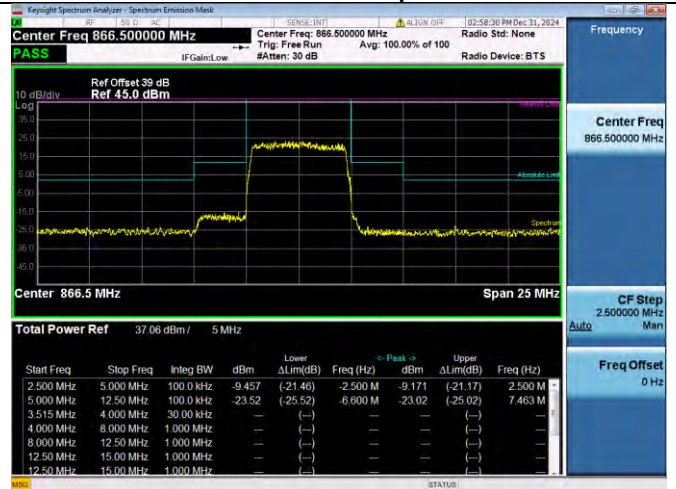


LTE 5M-High

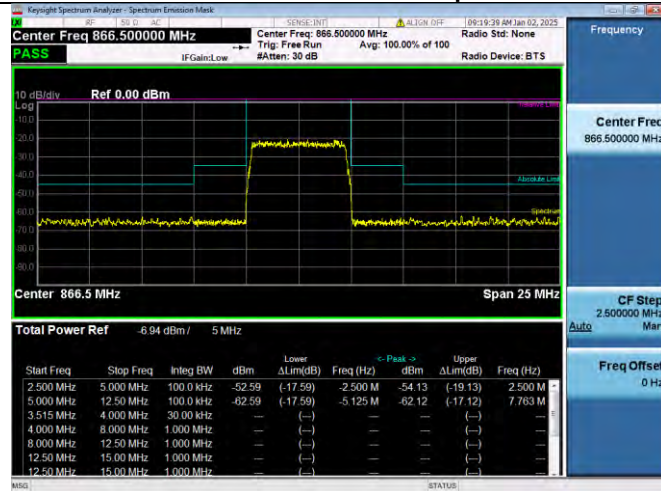
Pre-AGC_Input



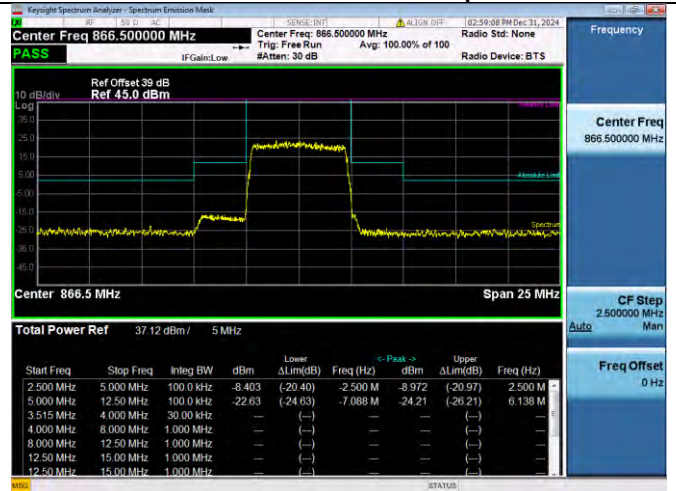
Pre-AGC_Output



3dB Above Pre-AGC_Input



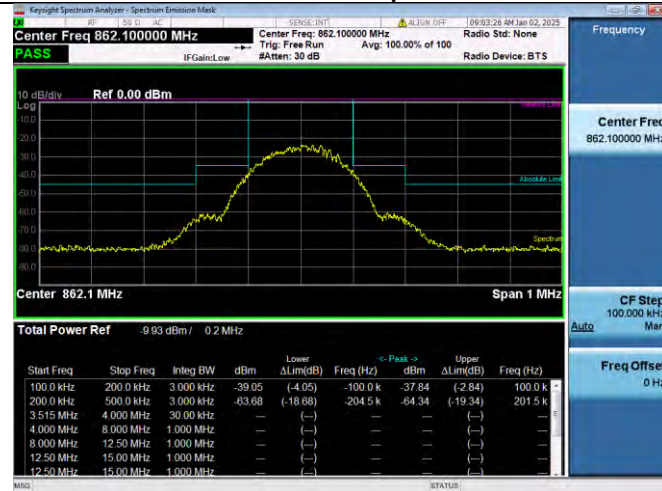
3dB Above Pre-AGC_Output



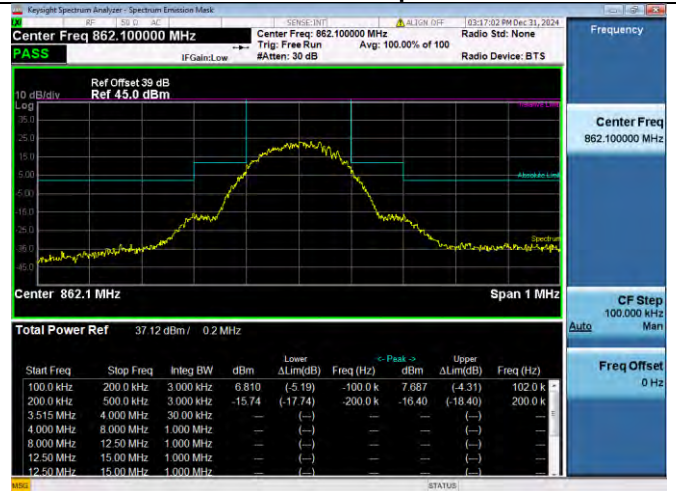
Emission masks				
Channel Spacing (MHz)	Channel	Signal Level	Signal Type	Result
GMSK 0.2M	Low	Pre-AGC	Input	Pass
			Output	Pass
		3dB Above AGC	Input	Pass
			Output	Pass
	Middle	Pre-AGC	Input	Pass
			Output	Pass
		3dB Above AGC	Input	Pass
			Output	Pass
	High	Pre-AGC	Input	Pass
			Output	Pass
		3dB Above AGC	Input	Pass
			Output	Pass

GMSK 0.2M-Low

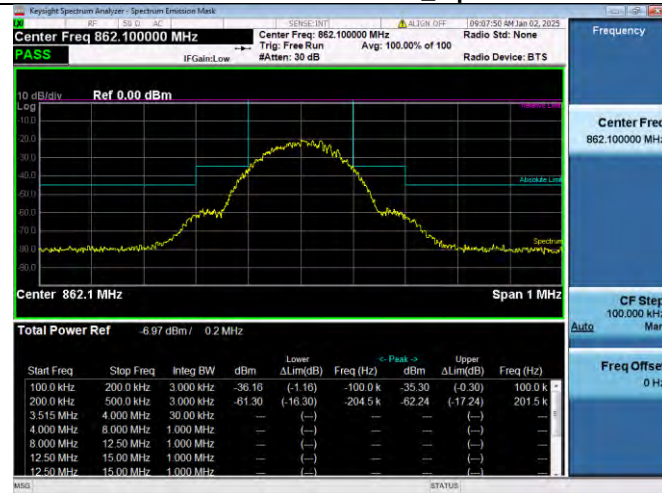
Pre-AGC_Input



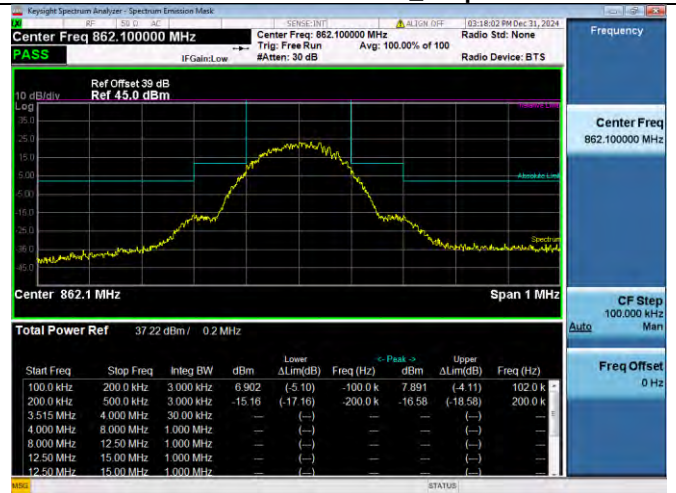
Pre-AGC_Output



3dB Above Pre-AGC_Input

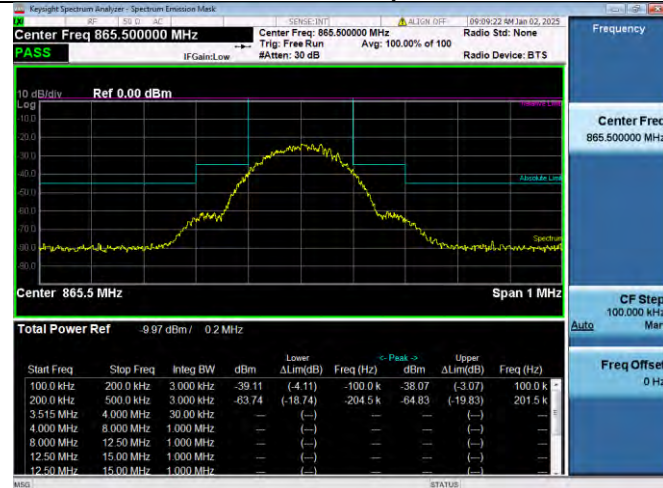


3dB Above Pre-AGC_Output

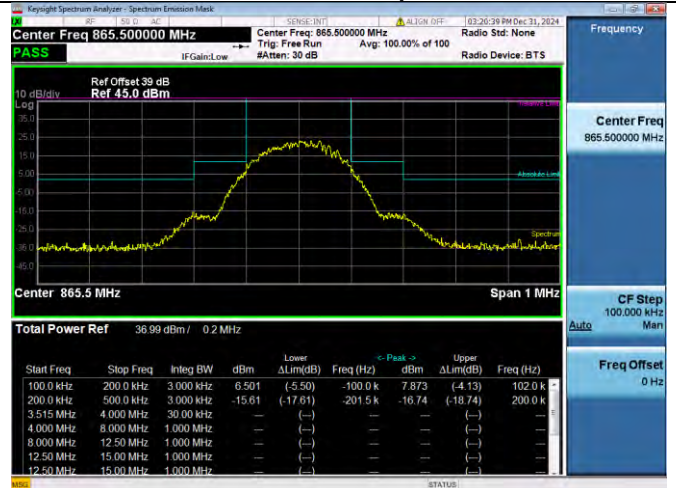


GMSK 0.2M -Middle

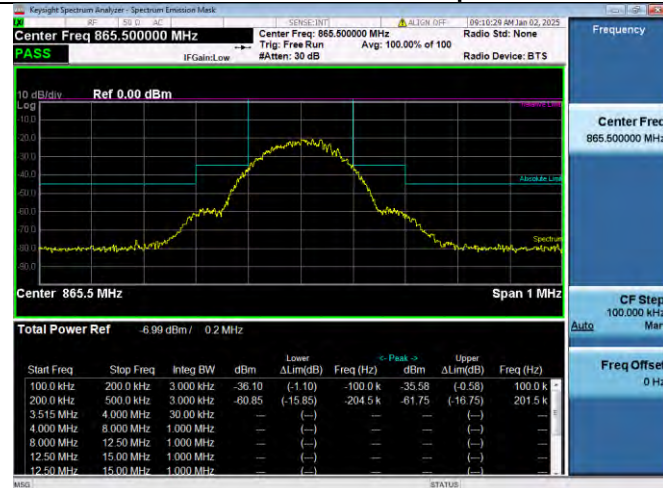
Pre-AGC_Input



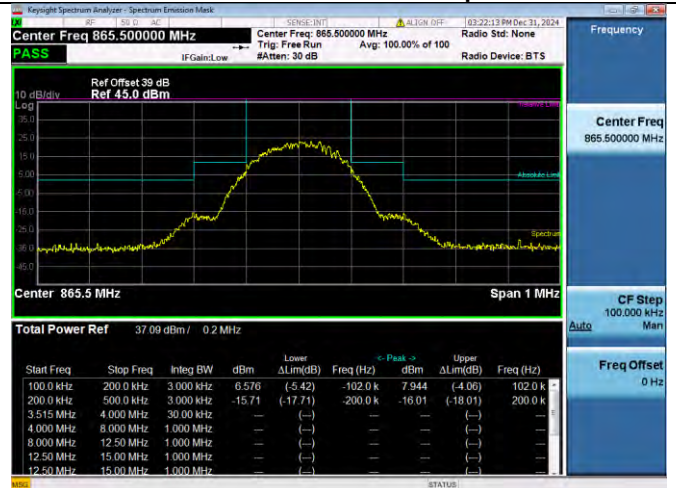
Pre-AGC_Output



3dB Above Pre-AGC_Input

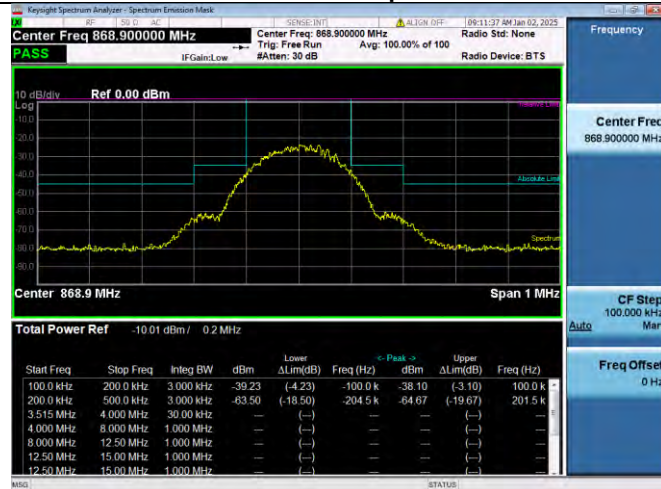


3dB Above Pre-AGC_Output

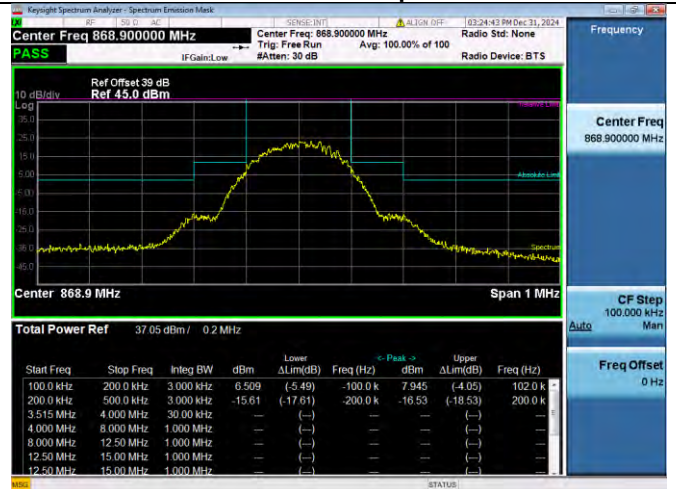


GMSK 0.2M -High

Pre-AGC Input



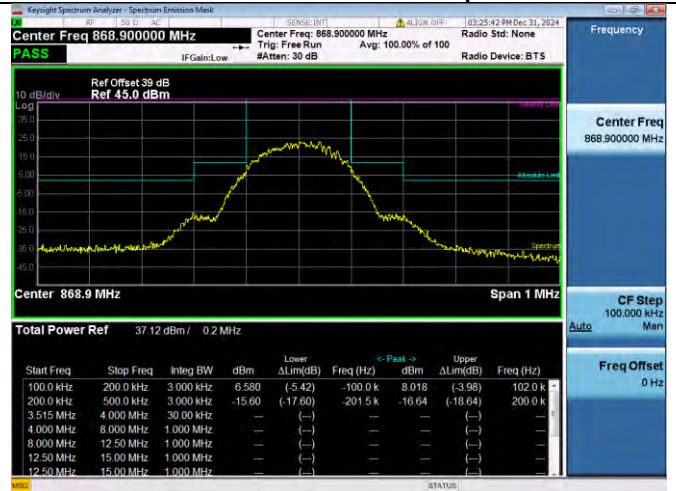
Pre-AGC Output



3dB Above Pre-AGC Input



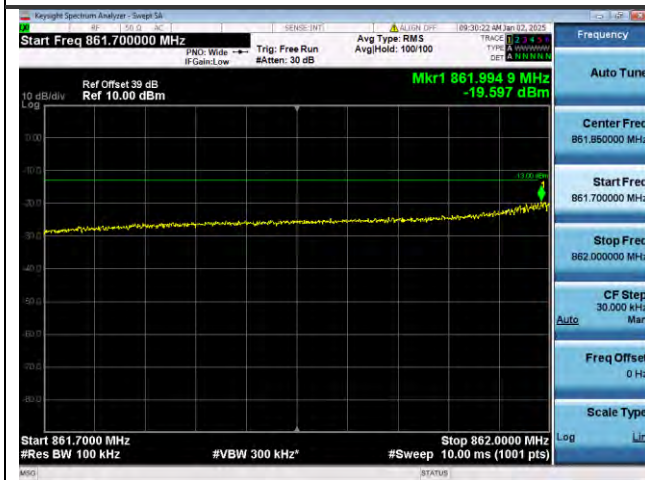
3dB Above Pre-AGC Output



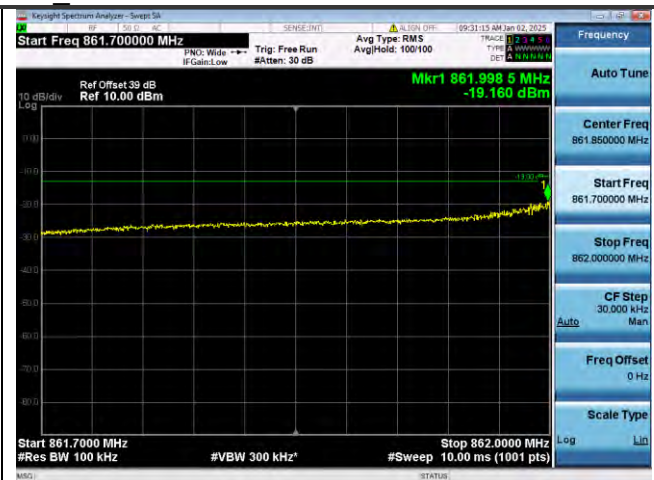
4. out of Band/out of block (including intermodulation)

Signal				Channel	TX Type	ANT	OOB (dBm)		Verdict
Input	Type	Level (dBm)	Frequency (MHz)				Result	Limit	
One	LTE 5MHz	AGC	864.5	LCH	SISO	1	-22.50	Refer To Test Graph	Pass
		AGC+3	864.5	LCH	SISO	1	-22.09	Refer To Test Graph	Pass
Two	LTE 5MHz	AGC	864.5	LCH	SISO	1	-21.92	Refer To Test Graph	Pass
		AGC+3	864.5	LCH	SISO	1	-21.89	Refer To Test Graph	Pass
One	LTE 5MHz	AGC	866.5	HCH	SISO	1	-23.78	Refer To Test Graph	Pass
		AGC+3	866.5	HCH	SISO	1	-23.16	Refer To Test Graph	Pass
Two	LTE 5MHz	AGC	866.5	HCH	SISO	1	-22.72	Refer To Test Graph	Pass
		AGC+3	866.5	HCH	SISO	1	-23.10	Refer To Test Graph	Pass

Low Channel One

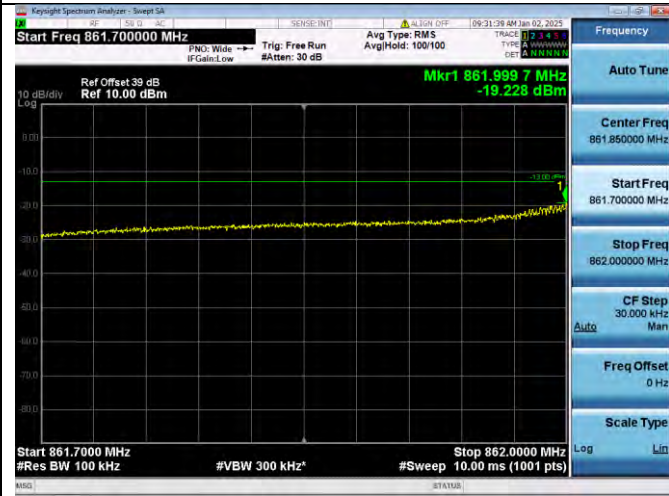


AGC

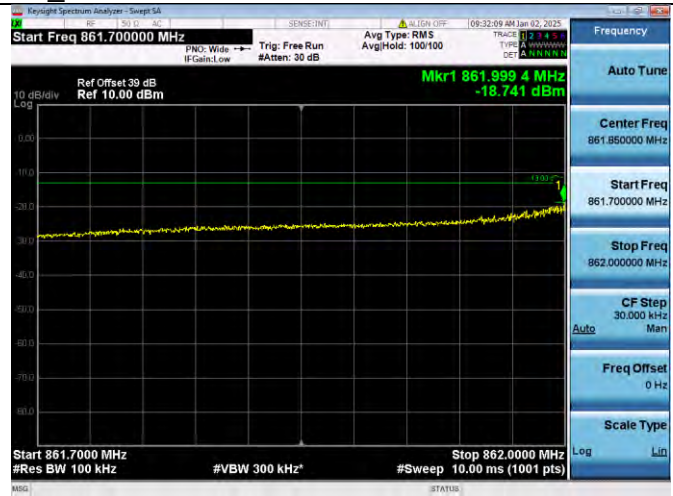


AGC+3

Low Channel Two

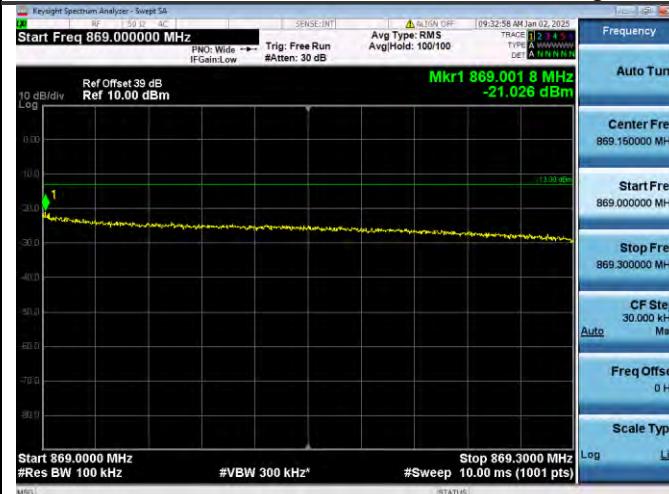


AGC

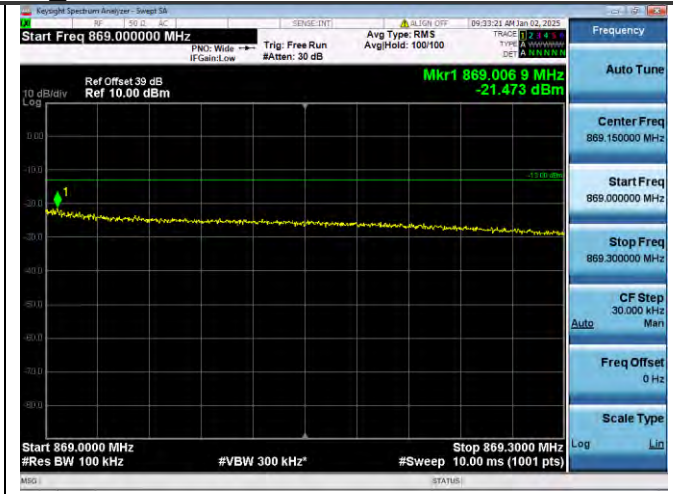


AGC+3

High Channel One

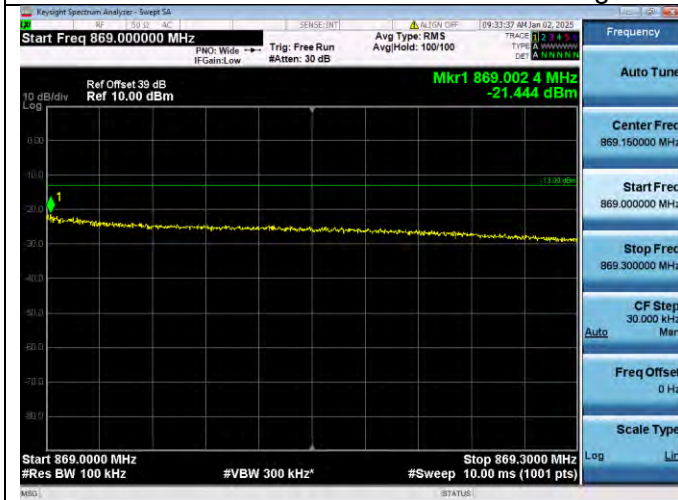


AGC

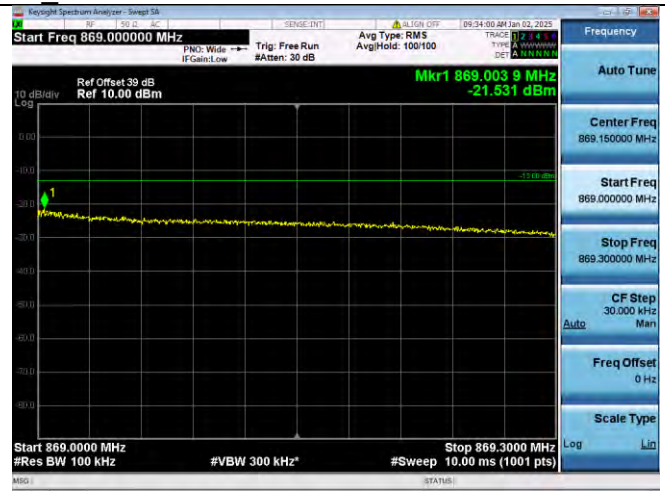


AGC+3

High Channel Two



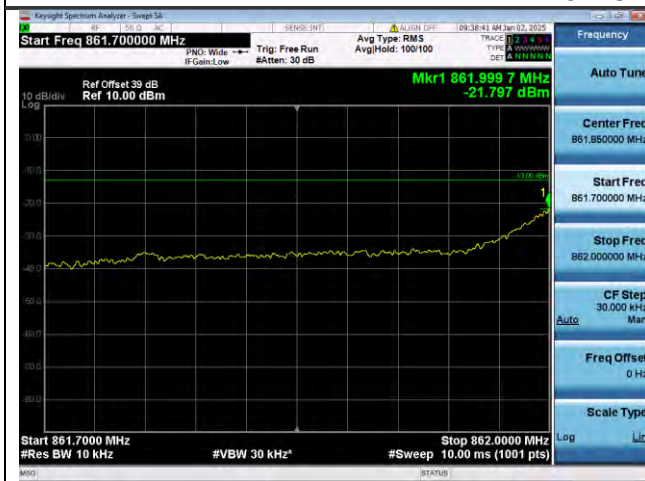
AGC



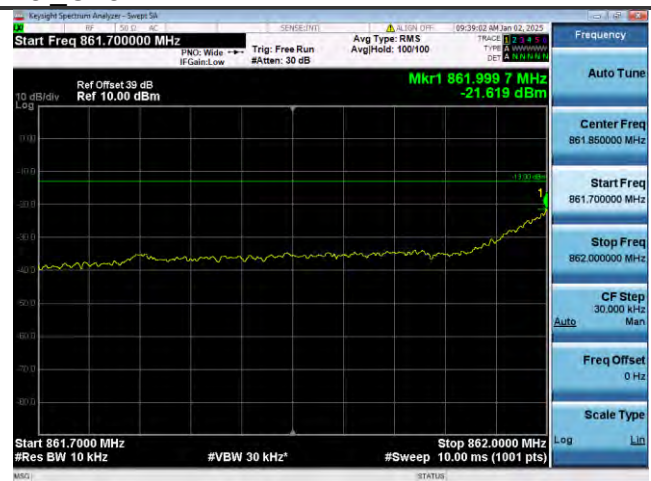
AGC+3

Signal				Channel	TX Type	ANT	OOB (dBm)		Verdict
Input	Type	Level (dBm)	Frequency (MHz)				Result	Limit	
One	GMSK 0.2MHz	AGC	862.1	LCH	SISO	1	-23.04	Refer To Test Graph	Pass
		AGC+3	862.1	LCH	SISO	1	-22.39	Refer To Test Graph	Pass
Two	GMSK 0.2MHz	AGC	862.1	LCH	SISO	1	-22.82	Refer To Test Graph	Pass
		AGC+3	862.1	LCH	SISO	1	-22.71	Refer To Test Graph	Pass
One	GMSK 0.2MHz	AGC	868.9	HCH	SISO	1	-22.71	Refer To Test Graph	Pass
		AGC+3	868.9	HCH	SISO	1	-22.53	Refer To Test Graph	Pass
Two	GMSK 0.2MHz	AGC	868.9	HCH	SISO	1	-22.79	Refer To Test Graph	Pass
		AGC+3	868.9	HCH	SISO	1	-23.12	Refer To Test Graph	Pass

Low Channel One

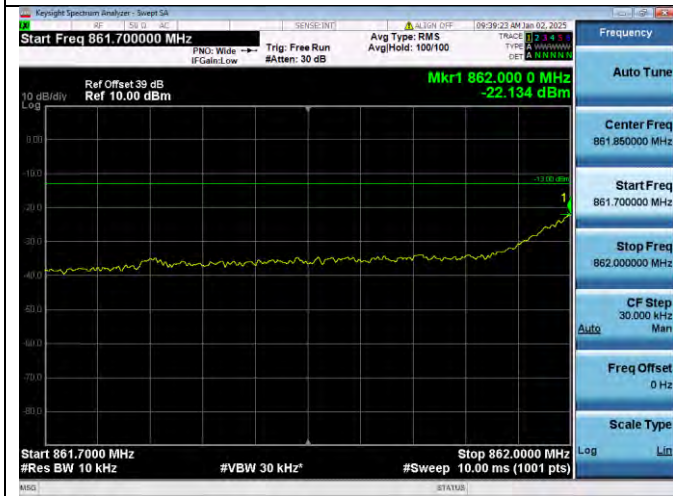


AGC

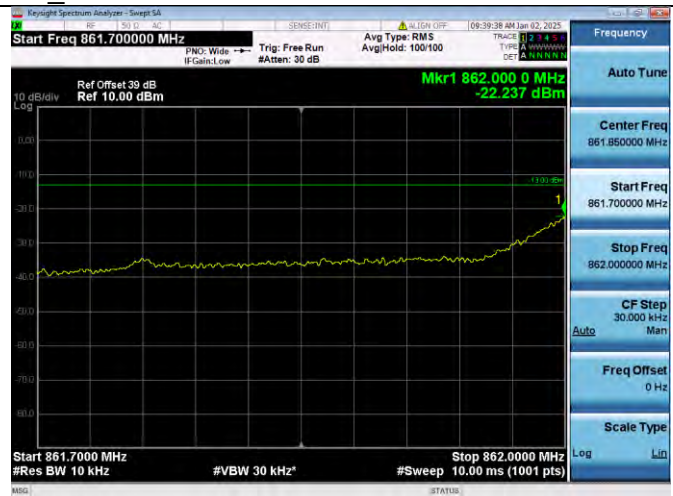


AGC+3

Low Channel Two

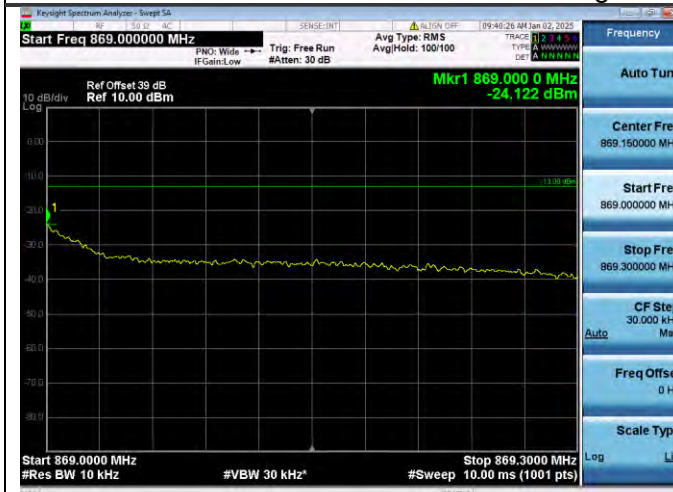


AGC

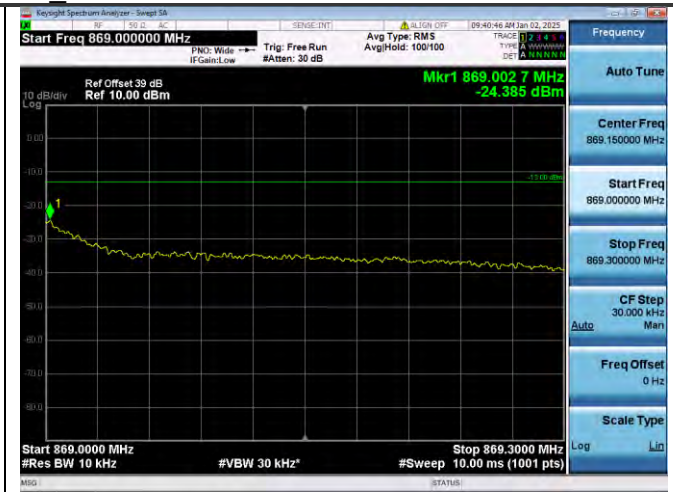


AGC+3

High Channel One

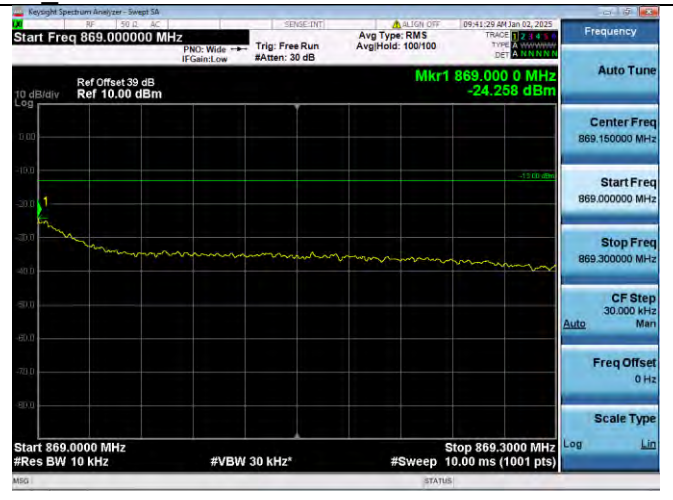
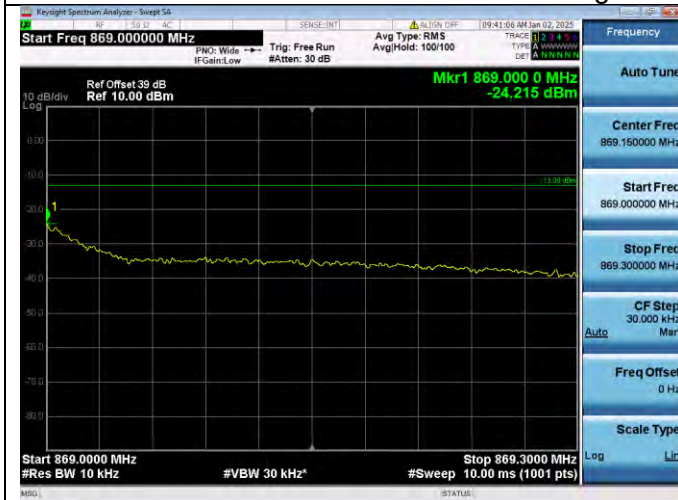


AGC



AGC+3

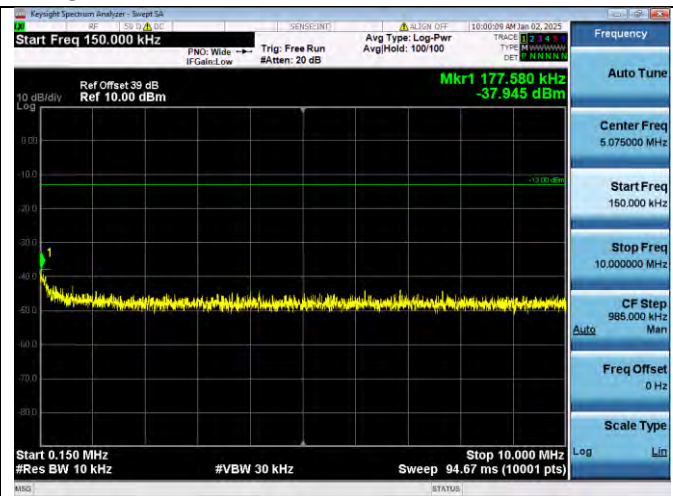
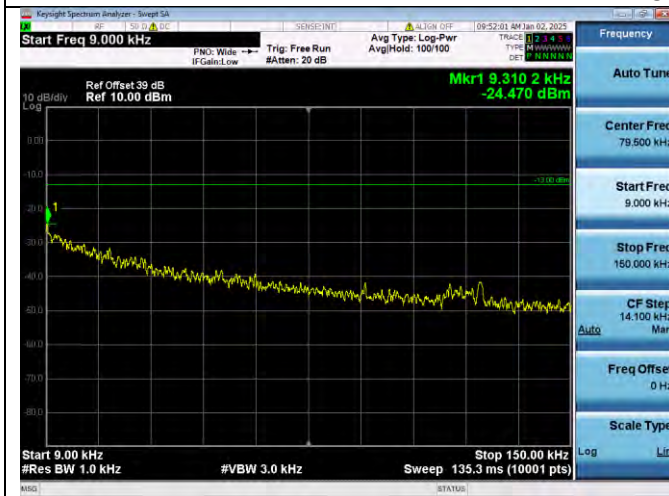
High Channel Two



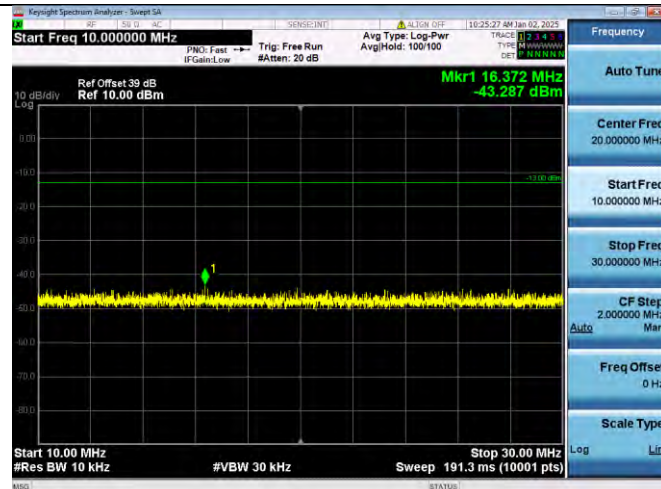
5. Conducted Spurious Emissions

Signal	Channel	Frequency Range (MHz)	Test Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
LTE 5M	LCH	0.009~0.15	-24.47	-13.00	-11.47	Pass
		0.15~10	-37.95	-13.00	-24.95	Pass
		10~30	-43.29	-13.00	-30.29	Pass
		30~1000	-33.14	-13.00	-20.14	Pass
		1000~10000	-28.61	-13.00	-15.61	Pass
	MCH	0.009~0.15	-25.67	-13.00	-12.67	Pass
		0.15~10	-37.27	-13.00	-24.27	Pass
		10~30	-43.62	-13.00	-30.62	Pass
		30~1000	-30.81	-13.00	-17.81	Pass
		1000~10000	-28.64	-13.00	-15.64	Pass
	HCH	0.009~0.15	-26.14	-13.00	-13.14	Pass
		0.15~10	-38.46	-13.00	-25.46	Pass
		10 - 30	-43.85	-13.00	-30.85	Pass
		30 - 1000	-31.56	-13.00	-18.56	Pass
		1000 - 10000	-28.75	-13.00	-15.75	Pass
GMSK 0.2M	LCH	0.009~0.15	-27.26	-13.00	-14.26	Pass
		0.15~10	-37.88	-13.00	-24.88	Pass
		10~30	-43.67	-13.00	-30.67	Pass
		30~1000	-30.28	-13.00	-17.28	Pass
		1000~10000	-28.63	-13.00	-15.63	Pass
	MCH	0.009~0.15	-27.25	-13.00	-14.25	Pass
		0.15~10	-38.24	-13.00	-25.24	Pass
		10~30	-43.40	-13.00	-30.40	Pass
		30~1000	-31.27	-13.00	-18.27	Pass
		1000~10000	-28.79	-13.00	-15.79	Pass
	HCH	0.009~0.15	-26.57	-13.00	-13.57	Pass
		0.15~10	-35.11	-13.00	-22.11	Pass
		10 - 30	-43.66	-13.00	-30.66	Pass
		30 - 1000	-32.38	-13.00	-19.38	Pass
		1000 - 10000	-28.73	-13.00	-15.73	Pass

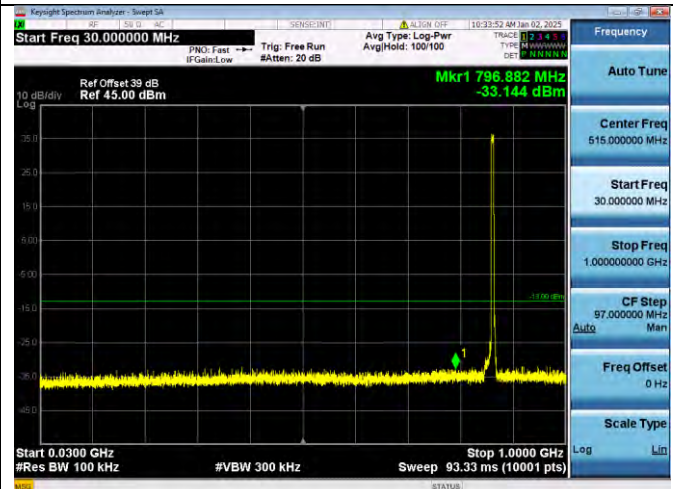
LTE 5MHz-LCH



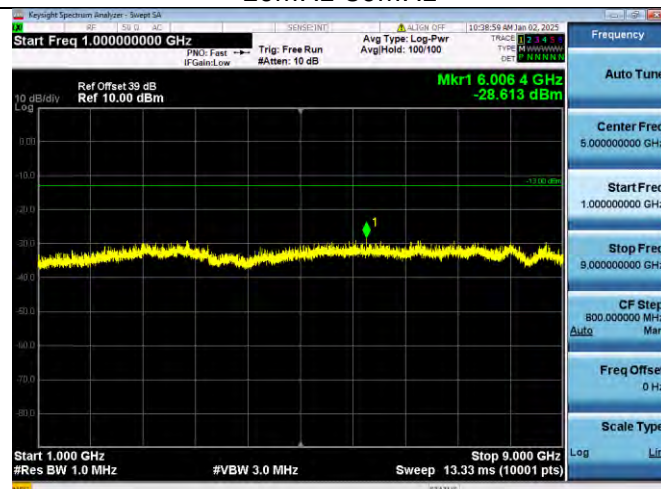
9KHz-150KHz



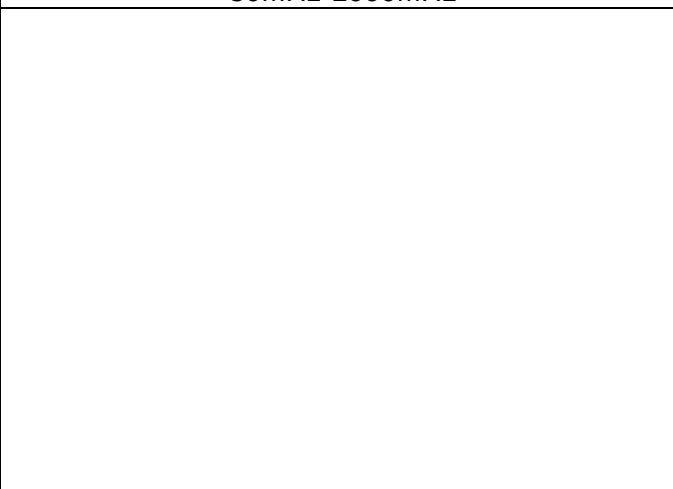
15KHz-10MHz



10MHz-30MHz

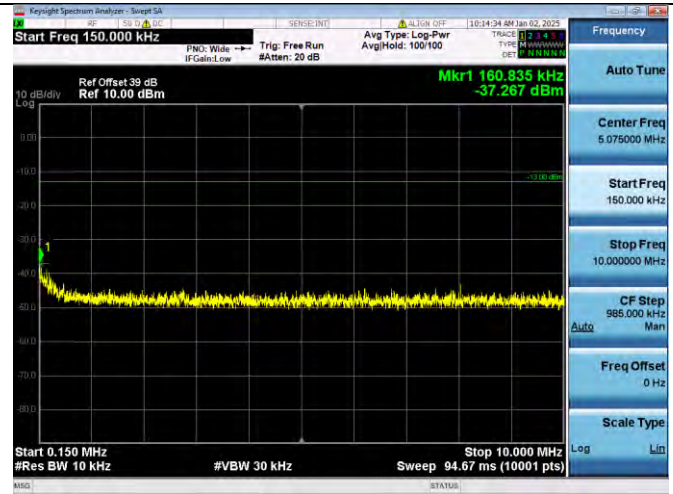
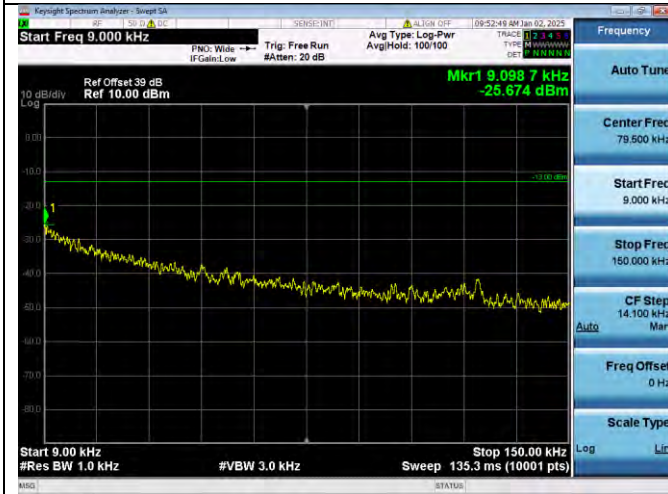


30MHz-1000MHz

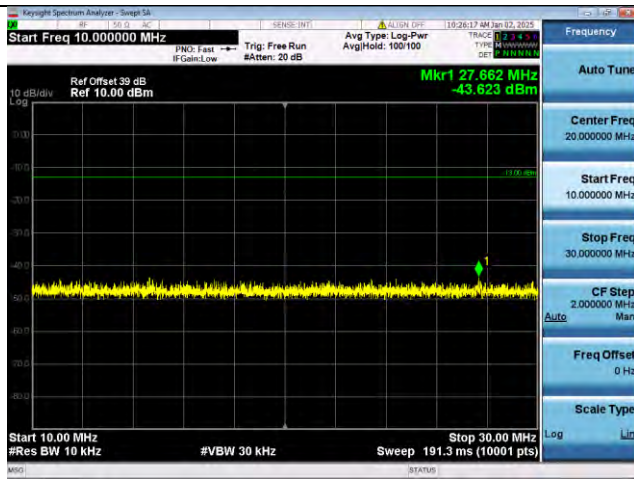


1000MHz-9000MHz

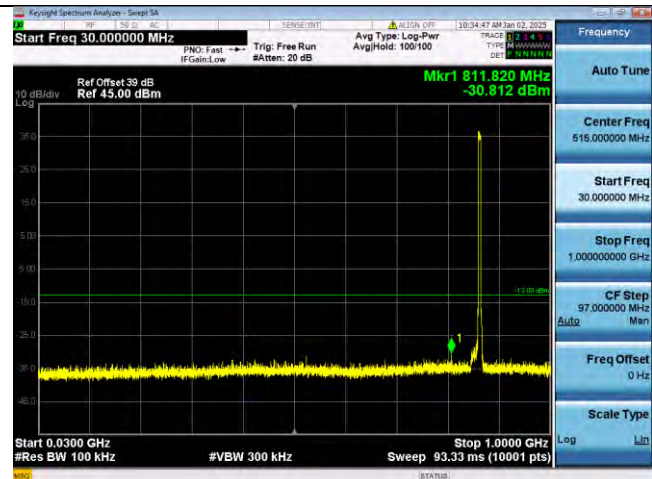
LTE 5MHz-MCH



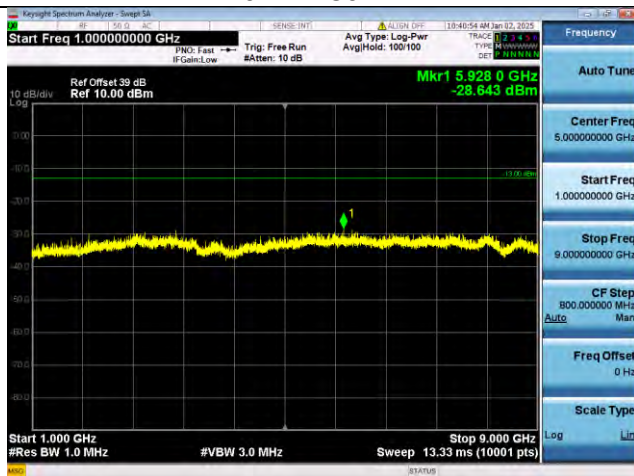
9KHz-150KHz



15KHz-10MHz



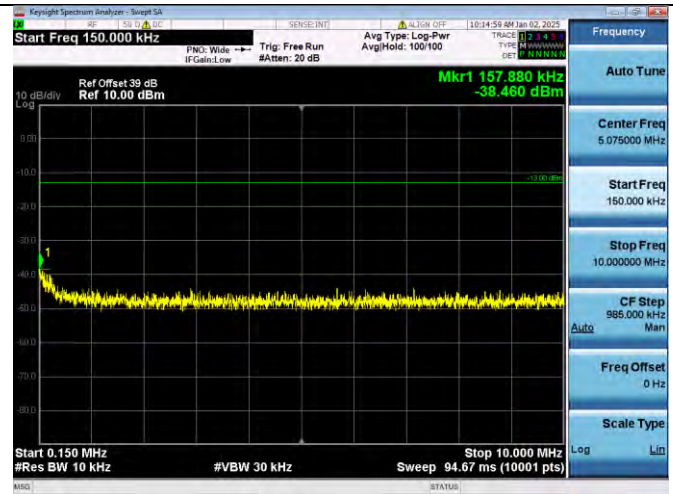
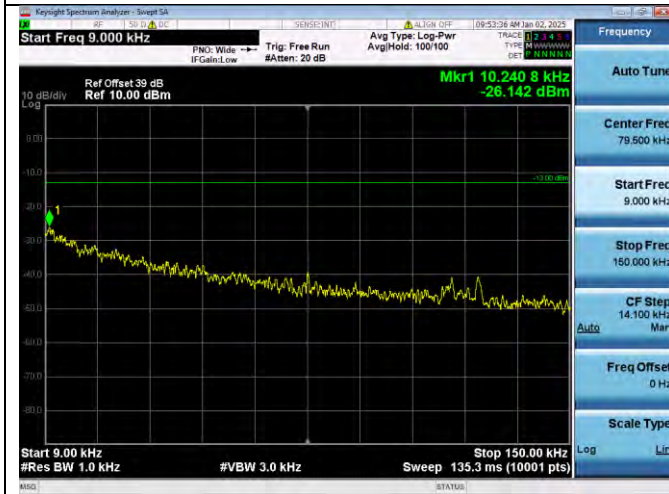
10MHz-30MHz



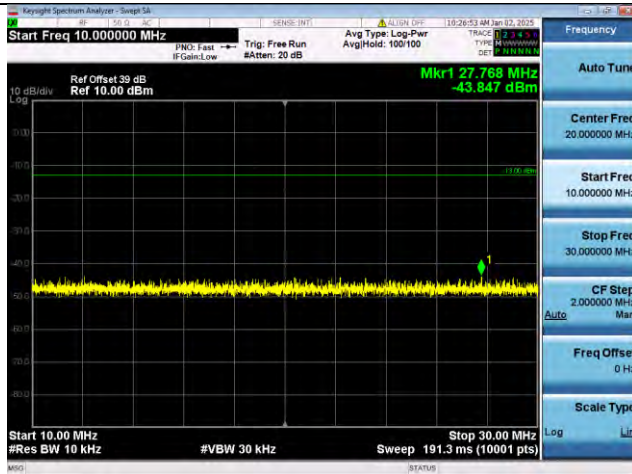
30MHz-1000MHz

1000MHz-9000MHz

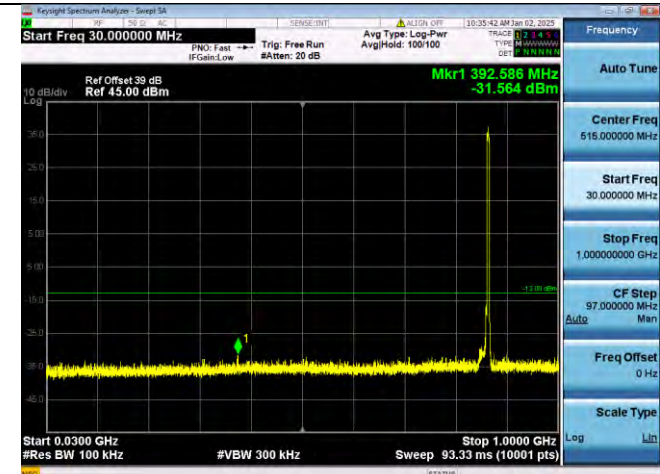
LTE 5MHz-HCH



9KHz-150KHz



150KHz-10MHz



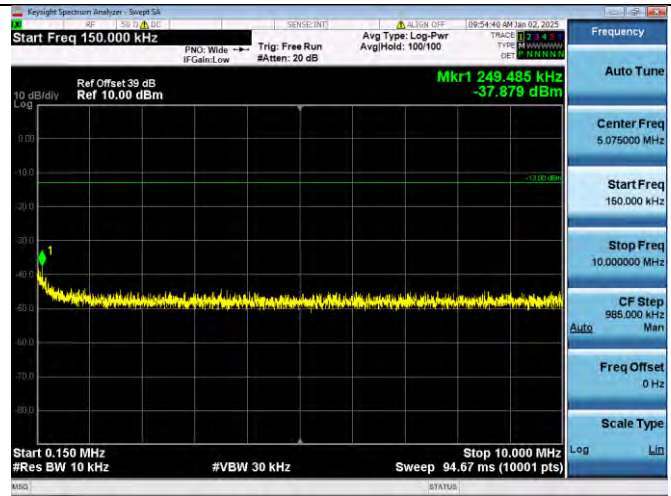
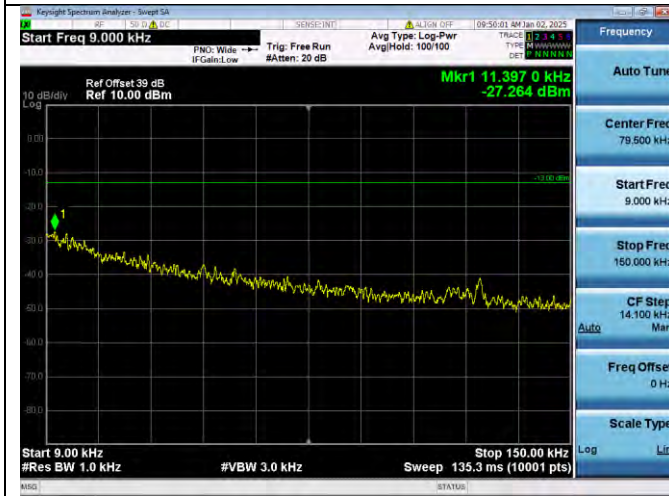
10MHz-30MHz



30MHz-1000MHz

1000MHz-9000MHz

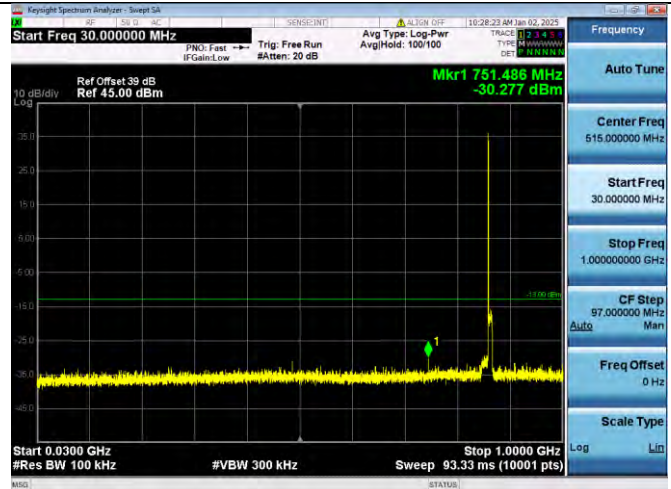
GSM 0.2MHz-LCH



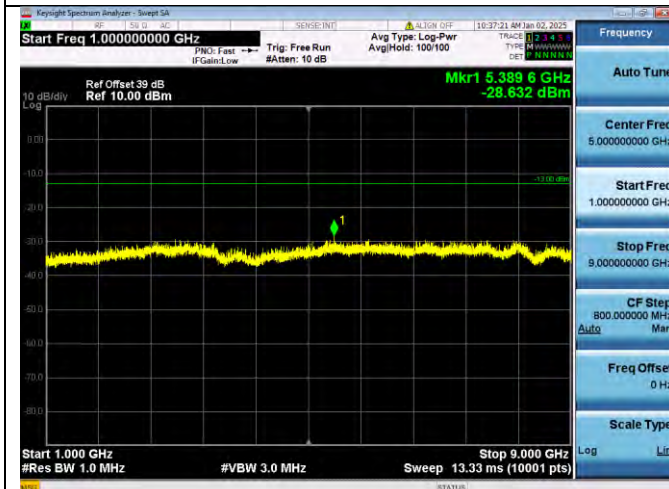
9KHz-150KHz



15KHz-10MHz



10MHz-30MHz

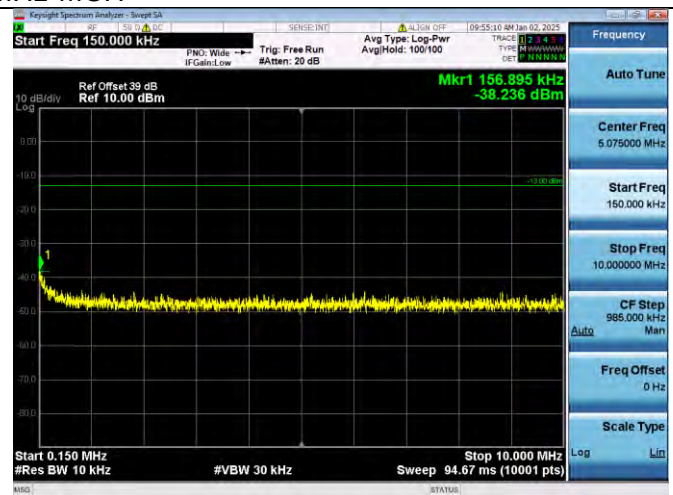


30MHz-1000MHz

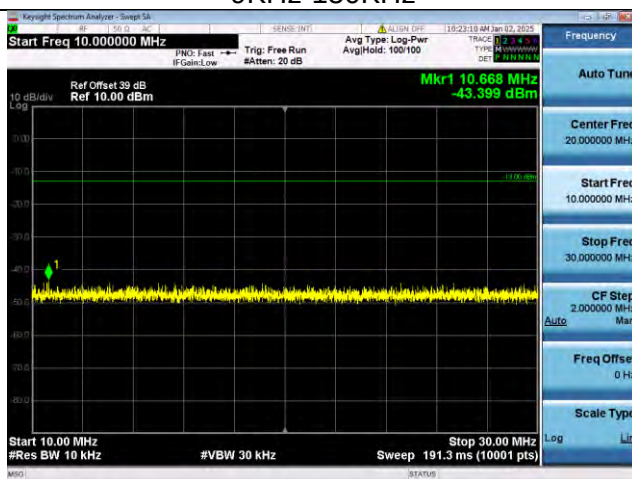


1000MHz-9000MHz

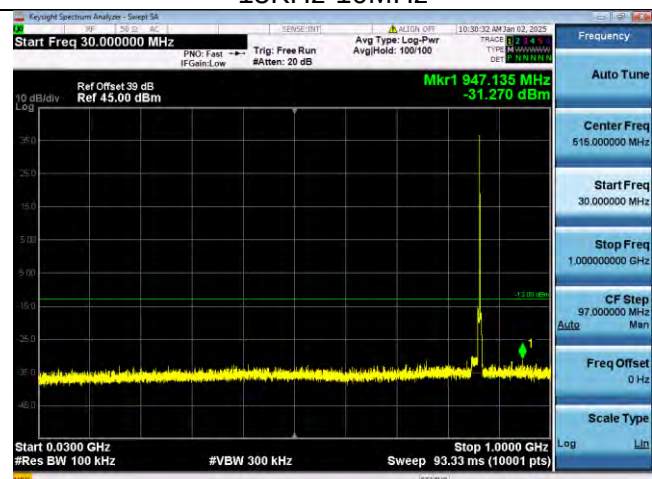
GSM 0.2MHz-MCH



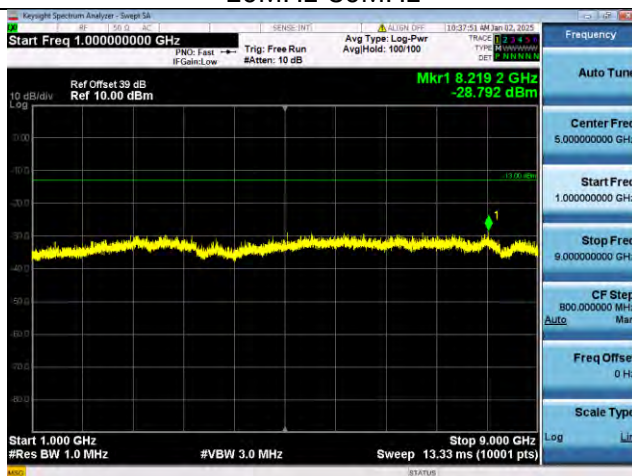
9KHz-150KHz



15KHz-10MHz



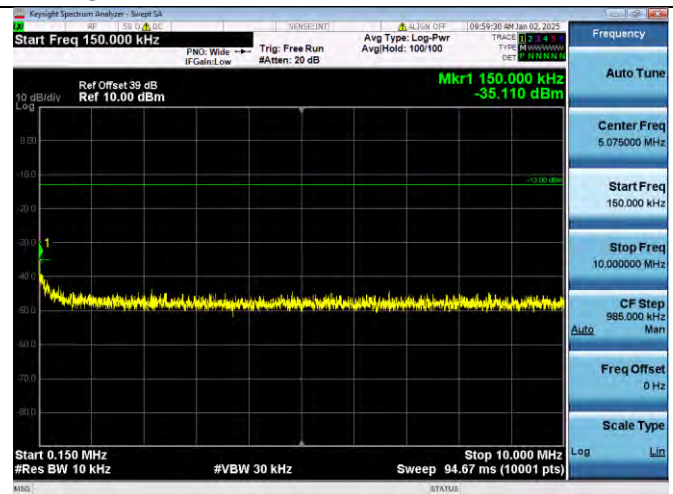
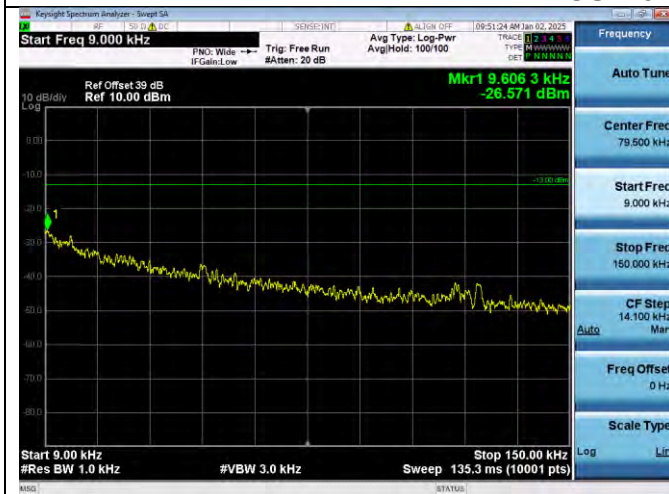
10MHz-30MHz



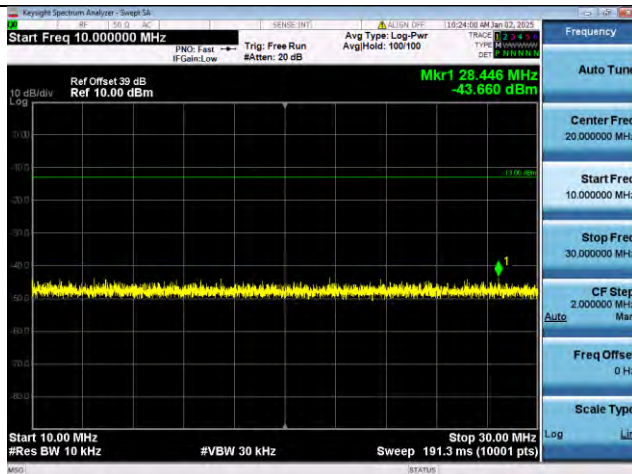
30MHz-1000MHz

1000MHz-9000MHz

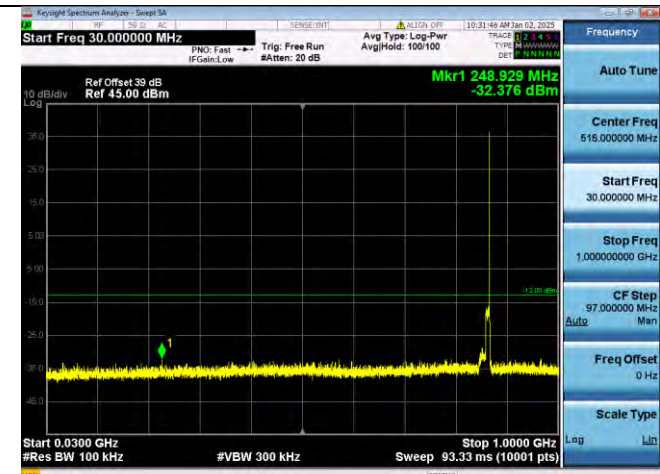
GSM 0.2MHz-HCH



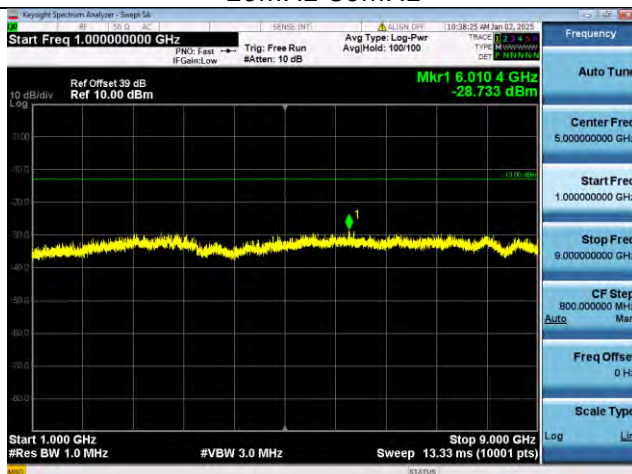
9KHz-150KHz



150KHz-10MHz



10MHz-30MHz



30MHz-1000MHz

1000MHz-9000MHz

6. Radiated Spurious Emissions

LTE 5M-862MHz-869MHz-Low Channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over Limit	Verdict
MHz	Polarization	dBm	dBm	dB	
103.64	Horizontal	-55.69	-13	-42.69	Pass
260.82	Horizontal	-53.65	-13	-40.65	Pass
756.49	Horizontal	-59.48	-13	-46.48	Pass
1940.70	Horizontal	-41.88	-13	-28.88	Pass
4550.82	Horizontal	-45.71	-13	-32.71	Pass
8673.23	Horizontal	-39.89	-13	-26.89	Pass
102.99	Vertical	-53.11	-13	-40.11	Pass
507.17	Vertical	-62.56	-13	-49.56	Pass
847.98	Vertical	-53.26	-13	-40.26	Pass
2719.14	Vertical	-36.52	-13	-23.52	Pass
3512.62	Vertical	-41.36	-13	-28.36	Pass
7526.64	Vertical	-44.33	-13	-31.33	Pass

LTE 5M-862MHz-869MHz-Middle Channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over Limit	Verdict
MHz	Polarization	dBm	dBm	dB	
125.65	Horizontal	-50.71	-13	-37.71	Pass
398.86	Horizontal	-57.77	-13	-44.77	Pass
987.43	Horizontal	-52.48	-13	-39.48	Pass
2157.14	Horizontal	-44.22	-13	-31.22	Pass
5501.85	Horizontal	-39.86	-13	-26.86	Pass
6949.06	Horizontal	-37.66	-13	-24.66	Pass
120.96	Vertical	-60.22	-13	-47.22	Pass
486.62	Vertical	-57.20	-13	-44.20	Pass
591.62	Vertical	-54.68	-13	-41.68	Pass
1356.13	Vertical	-38.44	-13	-25.44	Pass
5866.92	Vertical	-34.01	-13	-21.01	Pass
7448.75	Vertical	-39.48	-13	-26.48	Pass

LTE 5M-862MHz-869MHz-High Channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over Limit	Verdict
MHz	Polarization	dBm	dBm	dB	
57.94	Horizontal	-59.55	-13	-46.55	Pass
540.73	Horizontal	-61.29	-13	-48.29	Pass
579.79	Horizontal	-55.39	-13	-42.39	Pass
1414.16	Horizontal	-34.14	-13	-21.14	Pass
5818.72	Horizontal	-45.90	-13	-32.90	Pass
7003.84	Horizontal	-43.01	-13	-30.01	Pass
135.40	Vertical	-53.49	-13	-40.49	Pass
478.99	Vertical	-54.48	-13	-41.48	Pass
568.32	Vertical	-61.16	-13	-48.16	Pass
1176.84	Vertical	-34.26	-13	-21.26	Pass
4140.84	Vertical	-43.29	-13	-30.29	Pass
8723.32	Vertical	-44.98	-13	-31.98	Pass

GMSK 0.2M-862MHz-869MHz-Low Channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over Limit	Verdict
MHz	Polarization	dBm	dBm	dB	
88.36	Horizontal	-57.67	-13	-44.67	Pass
216.77	Horizontal	-54.47	-13	-41.47	Pass
854.27	Horizontal	-50.20	-13	-37.20	Pass
1728.60	Horizontal	-45.51	-13	-32.51	Pass
6067.69	Horizontal	-48.41	-13	-35.41	Pass
7536.45	Horizontal	-45.04	-13	-32.04	Pass
154.07	Vertical	-53.88	-13	-40.88	Pass
192.52	Vertical	-57.95	-13	-44.95	Pass
720.12	Vertical	-57.57	-13	-44.57	Pass
1971.97	Vertical	-40.48	-13	-27.48	Pass
4977.37	Vertical	-39.01	-13	-26.01	Pass
6853.91	Vertical	-42.00	-13	-29.00	Pass

GMSK 0.2M-862MHz-869MHz-Middle Channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over Limit	Verdict
MHz	Polarization	dBm	dBm	dB	
149.60	Horizontal	-56.98	-13	-43.98	Pass
503.39	Horizontal	-52.82	-13	-39.82	Pass
814.45	Horizontal	-59.33	-13	-46.33	Pass
3313.85	Horizontal	-42.64	-13	-29.64	Pass
3762.17	Horizontal	-38.45	-13	-25.45	Pass
7882.97	Horizontal	-43.02	-13	-30.02	Pass
105.46	Vertical	-62.63	-13	-49.63	Pass
520.13	Vertical	-55.17	-13	-42.17	Pass
553.92	Vertical	-54.08	-13	-41.08	Pass
1183.80	Vertical	-47.46	-13	-34.46	Pass
5916.44	Vertical	-47.45	-13	-34.45	Pass
6386.29	Vertical	-40.71	-13	-27.71	Pass

GMSK 0.2M-862MHz-869MHz-High Channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over Limit	Verdict
MHz	Polarization	dBm	dBm	dB	
136.18	Horizontal	-50.50	-13	-37.50	Pass
419.09	Horizontal	-57.83	-13	-44.83	Pass
906.17	Horizontal	-53.32	-13	-40.32	Pass
3138.52	Horizontal	-42.41	-13	-29.41	Pass
5005.21	Horizontal	-44.62	-13	-31.62	Pass
8834.54	Horizontal	-46.27	-13	-33.27	Pass
108.99	Vertical	-53.64	-13	-40.64	Pass
493.05	Vertical	-51.67	-13	-38.67	Pass
875.83	Vertical	-55.14	-13	-42.14	Pass
3035.18	Vertical	-46.91	-13	-33.91	Pass
5601.27	Vertical	-34.48	-13	-21.48	Pass
6199.11	Vertical	-35.11	-13	-22.11	Pass

7. Frequency Stability

Frequency Stability vs temperature:

Channel Bandwidth(MHz)	Temperature (°C)	Voltage (V ac)	Frequency Error(Hz)	Tolerance (ppm)	Limit(ppm)
LTE 5M	55	120	6	0.0069	0.1
	50	120	7	0.0400	0.1
	40	120	4	0.0380	0.1
	30	120	5	0.0470	0.1
	20	120	8	0.0280	0.1
	10	120	2	0.0300	0.1
	0	120	9	0.0460	0.1
	-10	120	8	0.0290	0.1
	-20	120	7	0.0400	0.1
	-30	120	4	0.0230	0.1
	-40	120	3	0.0350	0.1
GMSK 0.2M	55	120	8	0.0260	0.1
	50	120	3	0.0270	0.1
	40	120	6	0.0320	0.1
	30	120	7	0.0220	0.1
	20	120	3	0.0290	0.1
	10	120	8	0.0390	0.1
	0	120	2	0.0200	0.1
	-10	120	9	0.0250	0.1
	-20	120	3	0.0270	0.1
	-30	120	8	0.0220	0.1
	-40	120	4	0.0210	0.1

Frequency Stability vs voltage:

Channel Bandwidth(MHz)	Voltage (V ac)	Temperature (°C)	Frequency Error(Hz)	Tolerance (ppm)	Limit(ppm)
LTE 5M	102	20	4	0.0046	0.1
	120	20	7	0.0380	0.1
	138	20	3	0.0470	0.1
GMSK 0.2M	102	20	5	0.0280	0.1
	120	20	2	0.0300	0.1
	138	20	7	0.0460	0.1

8. Noise figure

